



HONGFA RELAY



GENERAL RELAY



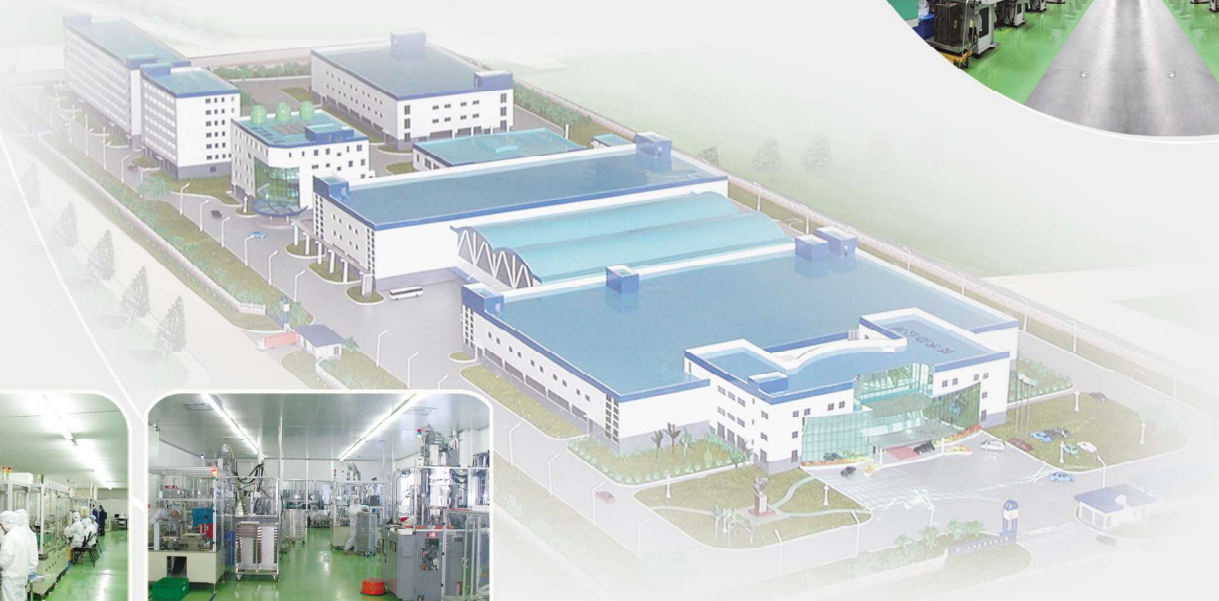
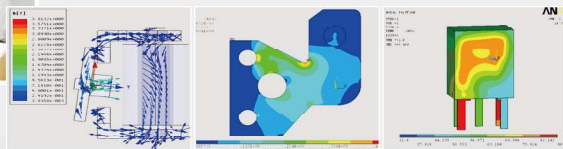
www.hongfa.com



RoHS compliant

ISO9001 ISO/TS16949 ISO14001 ISO45001 IECQ QC080000 ISO/IEC 27001 CERTIFIED

PROFESSIONAL RELAY MANUFACTURER





COMPANY INTRODUCTION

HONGFA

HONGFA (Stock code: 600885, SSE) always conforms to its business philosophy -- "Never rest on our laurels, make more progress" and uses this philosophy as the basis of its operational policy -- "Market-oriented concept, win by high quality". The following companies are fully or partially owned by HONGFA--Zhangzhou Hongfa, Jinhai, Xi'an Hongfa, Hongyuanda, Hongfa Automotive Electronics, Hongfa Signal Electronics, Hongfa Power Electronics, Hongzhou, Hongfa Wufeng, Hongfa Electrical Safety & Control, Hongfa Electric, Jinyue, Jinbo, Jinghe, Hongfa Industrial Robot, Hongfa Precision Machinery, Shanghai Hongfa, Beijing Hongfa, Sichuan Hongfa (Sales), Hongfa Hongkong, Hongfa Europe GmbH, Hongfa America Inc., KG Technologies Inc. HONGFA products include as relays, low-voltage devices, switchgears, precise parts, automatic equipment, etc..

HONGFA is now the leading relays sellers and manufacturer in China and is ranked No. 1 in the industry for overall economic efficiency. From 1995, HONGFA has continuously ranked among 'China Top-100 Electronic Components Enterprises' with a current position of the 9th and has received many awards: HONGFA has recognized as one of the China Top 100 Enterprises Of Electronic Information for the first time as the first finalist in relay, in 2014. HONGFA is authorized as "the Advanced Enterprise to implement High Technology in Torch Plan" by the Ministry of Science and Technology of PRC. HONGFA has been awarded "National foreign trade transforming and upgrading base (Automotive Components)" by the Ministry of Commerce of PRC and National Development and Reform Commission. HONGFA is the only company being awarded this honor in the Chinese relay industry.

HONGFA has a full set of quality assurance systems including ISO9001, ISO/TS16949, ISO14001, ISO45001, GJB9001A, IECQ QC 080000, ISO/IEC 27001. HONGFA has also been honorably awarded "High Quality Product exempt from National Inspection". HONGFA products are UL/CUL, VDE, TÜV, CQC and CCC approved. With high performance, top quality, competitive price and excellent technical services, HONGFA Relays have become the most perfect choice for the customers.

Since the establishment, HONGFA has been focusing on technology innovation. The technology and the equipment of all the mould tooling, parts manufacturing and products assembly and the production environment are in the leading position in Chinese relays industry. HONGFA Testing Centre is the biggest relays testing and analyzing laboratory with the most advanced technology in China, which is approved by CNAS, approved by America UL as a CTDLP lab, and approved by Germany VDE as a TDAP lab -For VDE's TDAP lab, there is only one in China and only six in the world. Hongfa is able to supply to the customers accurate, credible and authorized inspection data and test reports.

HONGFA has a wide range of relays, including Signal relays, Power relays, Automotive relays & modules, Latching relays, HVDC relays, Industrial relays, Safety relays. The company has the annual production capacity of 3.0 billion pieces of relays.

Now HONGFA has become the world leading relays research and manufacturing base. Hongfa people are looking forward to growing, developing and prospering with all the partners and customers worldwide together.

PERSEVERE FOR PROGRESS. 
STRIVE FOR EXCELLENCE!

WE ARE CONTROL EXPERT

Hongfa is a professional relay manufacturer and has a wide range of relays. Hongfa relays are UL/CUL, VDE, TÜV, CQC and CCC approved. They are widely used in those fields like industrial control, automotive, telecom equipment, home appliances, metering instruments, security and alarm systems, medical appliances and aviation.

HONGFA PRODUCTS:



Signal Relay



Power Relay



Automotive Relay & Module



Latching Relay



Green Energy Relay



Industrial Relay



Safety Relay



Low-voltage Device



Switchgear



Automatic Equipment



Precise Parts



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Notice

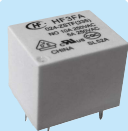
Dear Sir or Madam,

Many thanks for your choosing Hongfa products!

Please note the following important information:

1. Since all Hongfa products are RoHS compliant, we will remove the special code (551) or (555) from our current ordering types from April 1st, 2008. Please place your orders according to the newest ordering types. In the meantime, we hereby declare that all Hongfa products are RoHS compliant, no matter suffix (551) or (555) is used or not.
2. We have started to switch the old ordering type to the new one since 2005 (For example, the old ordering type is JQX-115F and the new one is HF115F). At the moment we strongly recommend that you should use the new ordering type for your orders. Please refer to "Comparative list between the old and new ordering type".
3. For the plastic sealed type, after welding, the relay should be cooled down below 40°C naturally, then start washing and surface handling, the temperature of washing liquid and surface handling cleanser should be controlled also below 40°C. When washing, please do not use washing liquid such as ultrasonic, gasoline, Freon etc. which may affect the relay structure and environment. For covers made from PC material, please prevent from contamination by some organic solvents; otherwise it is likely to bring to a chemic refaction which leads to bulging or crack.
4. For products that should satisfy the explosion-proof requirements of "IEC 60079 series" should remark [Ex] at the specification column while placing orders. Since not all of the products have explosion-proof certification, please contact us if you need any support to choose the suitable product.

Further more, all the data sheets are subject to change without notice. For updated information please visit our website: www.hongfa.com. Should you have any question, please feel free to contact us.



SIGNAL & POWER SELECTION GUIDE

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How to use the table: Please select the **CONTACT FORM**.Then choose the relay according to **SWITCHING CURRENT** and **OTHERS**(for instance,coil voltage, terminal style,etc.).

SIGNAL & POWER SELECTION GUIDE

Terminals				Coil		Relay Type	Contact Form	Page	Switching Current	[A]										
PCB	QC	Plug-in	Other	DC	AC				0	5	10	15	20	25	30	40	60	80	100	200
						HF84F	1A (SPST-NO)	448												
						HF94F		450												
						HF78F		445												
						HF36F-20		121												
						HF115F-L 1 pole		215												
						HF7520		173												
						HF152F		167												
						HF152FD		170												
						HF115F-Q		204												
						HF14FW		251												
						HF7FD(Special code:530)		160												
						HF25F		261												
						HF102F		270												
						HF160F		284												
						HF182F-L		287												
						HF161F		273												
						HF115F-25(Explosion-proof)		210												
						HF115F-25		207												
						HF196F		351												
						HF196F-Q		354												
						HF161F-W		278												
						HF37F		296												
						HF165FD		312												
						HF105F-1		357												
						HF105F-2		363												
						HF105F-4		367												
						HF105F-5		371												
						HF2100		375												
						HF2110/HF2120		379												
						HF2150/HF2151		385												
						HF2160		389												
						HF172F-100		396												
						HF116F-1		402												
						HF116F-2		406												
						HF116F-3		410												
						HF193F		346												
						HF2160(Screw type)		389												
						HF178F		299												
						HF178F-T		302												
						HF179F/HF179F-W		304												
						HF195F		349												
						HF165F		322												
						HF165FD-G		319												
						HF172F-140		398												
						HF161F-40		276												
						HF161F-40W		281												
						HF165F-50		325												
						HF165FD-50		316												
						HF116F-G	414													
						HF191F-L	340													
						HF186F	425													
						HF176F	420													
						HF116F-80	418													
						HF167F	428													

How to use the table: Please select the **CONTACT FORM**.Then choose the relay according to **SWITCHING CURRENT** and **OTHERS**(for instance,coil voltage, terminal style,etc.).

SIGNAL & POWER SELECTION GUIDE

Terminals				Coil		Relay Type	Contact Form	Page	Switching Current	[A]
PCB	QC	Plug-in	Other	DC	AC					
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 167F-G	1A (SPST-NO)	431	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 167F-140		433	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 167F-200		435	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 172F-200		400	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 192F		343	260	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 167F-270		437	270	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 181F	2A	310	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 42F		68	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 115F		188	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 115F-A		192	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 115F-L 2 pole		218	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 115FK		227	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 115FK-A		242	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 140FF		254	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 140FF-V		258	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 30F		92	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 175F		245	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 116F-1		402	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 116F-2		406	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 116F-3		410	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 177F		294	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 92F		441	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 170F		328	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 116F-G		414	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 185F		422	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 32FA	1C (SPDT)	71	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 32F		100	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 46FB		63	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 5F		97	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 41F		56	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 8		130	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 171F		105	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 3FA-W		141	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 5F		97	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 33F		108	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 36F		118	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 3FA/HF3FA-T		133	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 3FD		144	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 3FF		147	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 3F-L		150	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 7FF		157	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 21FF		164	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 7520		173	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 118F		181	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 115F-H		198	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 115F-TH		195	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 14FF		248	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 3FF-M		154	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 3FA-M		138	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div><div></div><div></div><div></div><div></div></div>				<div><div></div><div></div><div></div><div></div><div></div><div></div></div>		HF 7FD		160	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	

How to use the table: Please select the **CONTACT FORM**. Then choose the relay according to **SWITCHING CURRENT** and **OTHERS** (for instance, coil voltage, terminal style, etc.).

SIGNAL & POWER SELECTION GUIDE

Terminals				Coil	Relay Type	Contact Form	Page	Switching Current											[A]
PCB	QC	Plug-in	Other	DC	AC			0	5	10	15	20	25	30	40	60	80	100	200
					HF84F	1C (SPDT)	448												
					HF152F		167												
					HF115F		188												
					HF115F-A		192												
					HF115F-T		195												
					HF115F-I		201												
					HF115F-L 1 pole		215												
					HF115FP		224												
					HF115FK		227												
					HF115FK-T		231												
					HF115FK-A		242												
					HF158F		234												
					HF152FD		170												
					HF94F		450												
					HF14FW		251												
					HF165FD		312												
					HF105F-1		357												
					HF105F-2		363												
					HF105F-4		367												
					HF105F-5		371												
					HF2100		375												
					HF2110/HF2120		379												
					HF2150/HF2151		385												
					HF2160		389												
					HF7FD(Special code:530)		160												
					HF178F		299												
					HF165FD-50		316												
					HF115F	2C	188												
					HF115F-A		192												
					HF115F-L 2 pole		218												
					HF115FP		224												
					HF115FK		227												
					HF115FK-A		242												
					HF140FF		254												
					HF175F		245												
					HF92F		441												
					HF118F	1B (SPST-NC)	181												
					HF115F-H		198												
					HF21FF		164												
					HF165FD		312												
					HF105F-1		357												
					HF105F-2		363												
					HF105F-4		367												
					HF105F-5		371												
					HF2100		375												
					HF2110/HF2120		379												
					HF2150		385												
					HF2160		389												
					HF115F		188												
					HF115F-A		192												




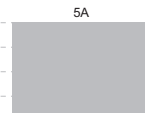

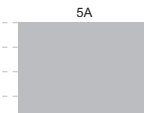
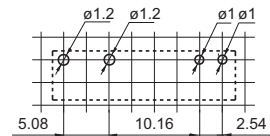
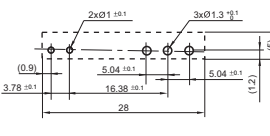
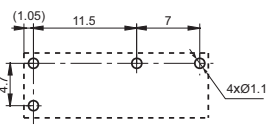
How to use the table: Please select the **CONTACT FORM**. Then choose the relay according to **SWITCHING CURRENT** and **OTHERS** (for instance, coil voltage, terminal style, etc.).

SIGNAL & POWER SELECTION GUIDE

Terminals				Coil		Relay Type	Contact Form	Page	Switching Current	[A]
PCB	QC	Plug-in	Other	DC	AC					
						HF84F	1D (SPST-NO)	448	15	
						HF94F		450	18	
						HF115F-Q		204	20	
						HF14FW		251	20	
						HF8565		453	42	
						HF115F	2B	188	8	
						HF115F-A		192	8	
						HF94F	1A+1D	450	18	
						HF166F		291	25	
						HF180F	2A+2B	307	25	
						HF190F	1A1A+1B	337	30	
						HF189F		334	42	
						HF170F	2A2A+1B	328	40	
						HF187F	4A4A+1B	331	40	




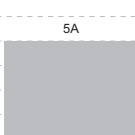
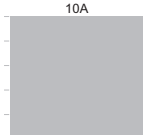
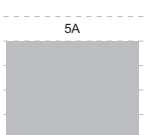
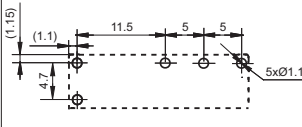
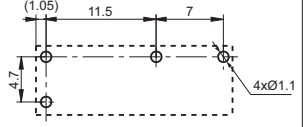
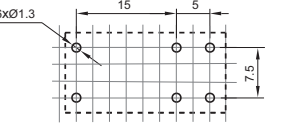
How to use the table: Please select the **CONTACT FORM**. Then choose the relay according to **SWITCHING CURRENT** and **OTHERS** (for instance, coil voltage, terminal style, etc.).

POWER RELAY SELECTION CHART

Type	HF49FD	HF41F	HF46F
Appearance			
Dimensions(L x W x H) mm	20.0 x 5.0 x 12.5	28.0 x 5.0 x 15.0	20.5 x 7.0 x 15.3
Features	<ul style="list-style-type: none"> • 5A switching capability • 3kV dielectric strength (between coil and contacts) • Surge voltage up to 6kV (between coil and contacts) • Slim size (width 5mm, height 12.5mm) • High sensitive: 120mW 	<ul style="list-style-type: none"> • Slim size (width 5mm) • 4kV dielectric strength (between coil and contacts) • Surge voltage up to 6kV (between coil and contacts) • High sensitive: 170mW 	<ul style="list-style-type: none"> • 5A switching capability • 10kV impulse withstand voltage (between coil and contacts) • Meets VDE 0631 reinforce insulation • Highly efficient magnetic circuit for high sensitivity: 200mW • Extremely small footprint utilizing PCB area
Contact Ratings			
Contact Form	1A	1A, 1C	1A
Contact Material	AgSnO ₂ , AgNi	AgSnO ₂ , AgNi	AgSnO ₂ , AgNi
Max. Switching Current (Res. load)			
Max. Switching Voltage	250VAC / 125VDC	400VAC / 300VDC	277VAC / 30VDC
Max. Switching Power	1250VA / 150W	1500VA / 180W	1385VA / 150W
Rated Load (Resistive load)	5A 250VAC 5A 30VDC	6A 250VAC 6A 30VDC	3A 250VAC/30VDC 5A 250VAC/30VDC
Coil Ratings			
Rated Voltage	5VDC to 24VDC	5VDC to 60VDC	3VDC to 24VDC
Nominal Operating Power	0.12W to 0.18W	0.17W (except 48VDC to 60VDC:0.21W)	0.2W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	3000VAC	4000VAC	4000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	10ms / 5ms	8ms / 4ms	10ms / 10ms
Mechanical Endurance min.	2 x 10 ⁷ OPS	1 x 10 ⁷ OPS	5 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS (at 3A 250VAC/30VDC)	1A: 6 x 10 ⁴ OPS (at 85°C) 1C: NO: 3 x 10 ⁴ OPS (at 85°C) NC: 1 x 10 ⁴ OPS (at 85°C)	1.2 x 10 ⁵ OPS (at 3A 250VAC/30VDC)
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL VDE CQC	UL/CUL VDE CQC
File No.	E133481 R50149334 CQC17002175722	E133481 40020043 CQC17002175724	E134517 40025215 CQC17002168380
Cross Reference	OMRON: G6DN PANASONIC: PA FUJITSU: MY/NY SCHRACK: PCN	PANASONIC: PF FUJITSU: FTR-LY SCHRACK: V23092/SNR FINDER: 34.51	OMRON: G5NB/G5T PANASONIC: LD FUJITSU: FTR-F3
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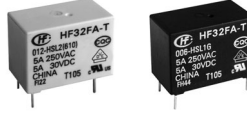
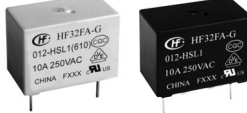

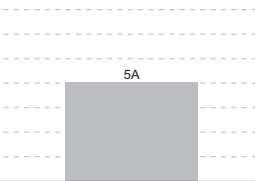
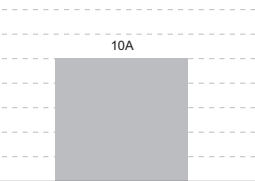
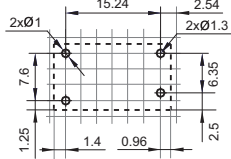
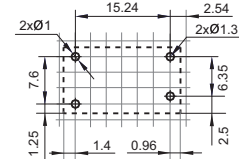
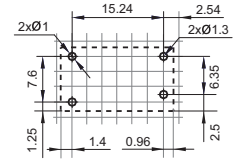
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF46FB	HF46F-G	HF42F
Appearance			
Dimensions(L x W x H) mm	23.4 x 7.0 x 15.3	20.5 x 7.0 x 15.3	24.4 x 12.8 x 24.8
Features	<ul style="list-style-type: none"> • 5A switching capability • 8kV impulse withstand voltage (between coil and contacts) • Meets reinforce insulation • width 7mm, Suitable for PCB intensive installation • UL insulation system: Class F 	<ul style="list-style-type: none"> • 10A switching capability • 10kV impulse withstand voltage (between coil and contacts) • Meets VDE 0631 reinforce insulation • Highly efficient magnetic circuit for high sensitivity: 200mW • Extremely small footprint utilizing PCB area 	<ul style="list-style-type: none"> • 5A switching capability • TV-3 125VAC approved by UL standard • 2 Form A slim configuration
Contact Ratings			
Contact Form	1C	1A	2A
Contact Material	AgNi	AgSnO ₂ , AgNi	AgSnO ₂ , AgCdO
Max. Switching Current (Res. load)			
Max. Switching Voltage	250VAC	277VAC / 30VDC	250VAC / 30VDC
Max. Switching Power	1250VA	2770VA / 300W	1250VA / 150W
Rated Load (Resistive load)	5A 250VAC	7A 250VAC/30VDC 10A 250VAC/30VDC	5A 250VAC / 30VDC
Coil Ratings			
Rated Voltage	3VDC to 24VDC	3VDC to 24VDC	5VDC to 48VDC
Nominal Operating Power	0.36W	0.2W	0.53W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	4000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 105°C (AgNi contacts) -40°C to 85°C (AgSnO ₂ contacts)	-40°C to 70°C
Operate / Release Time max.	10ms / 10ms	10ms / 10ms	15ms / 10ms
Mechanical Endurance min.	5 x 10 ⁶ OPS	5 x 10 ⁶ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS	6 x 10 ⁴ OPS(AgNi contacts), 5 x 10 ⁴ OPS(AgSnO ₂ contacts)	5 x 10 ⁴ OPS (at 5A 250VAC)
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL TÜV CQC
File No.	E134517 40049080 CQC18002202623	E134517 40025215 CQC17002168380	E133481 R50278397 CQC09002034521/CQC16002159853
Cross Reference	FUJITSU: FTR-F3	OMRON: G5NB/G5T PANASONIC: LD FUJITSU: FTR-F3	OMRON: G5PA-2 PANASONIC: LA FUJITSU: FTR-F4 NEC: CN OEG: OSA/PCI
Page	63	65	68


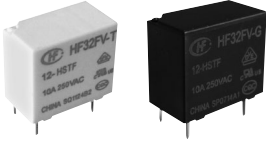

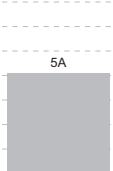
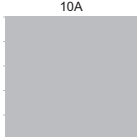
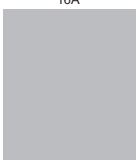
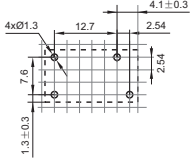
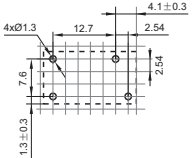
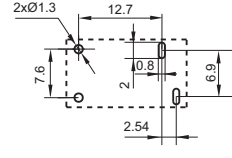
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF32FA	HF32FA-T	HF32FA-G
Appearance			
Dimensions(L x W x H) mm	17.6 x 10.1 x 12.7	17.6 x 10.1 x 12.7	17.6 x 10.1 x 12.7
Features	<ul style="list-style-type: none"> • 5A switching capability • Creepage/clearance distance>8mm • 5kV dielectric strength (between coil and contacts) • 1 Form A meets VDE 0700/0631 • 1 Form C meets VDE 0631 	<ul style="list-style-type: none"> • High temperature: 105°C • 5A switching capability • Creepage/clearance distance>8mm • 5kV dielectric strength (between coil and contacts) • Meets VDE 0700/0631 reinforce insulation 	<ul style="list-style-type: none"> • 10A switching capability • Creepage/clearance distance>8mm • 5kV dielectric strength (between coil and contacts) • Meets VDE 0700/0631 reinforce insulation
Contact Ratings			
Contact Form	1A, 1C	1A	1A
Contact Material	AgNi	AgNi	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	250VAC / 30VDC	250VAC / 30VDC	250VAC
Max. Switching Power	1250VA / 150W	1250VA / 150W	2500VA
Rated Load (Resistive load)	1A: 5A 250VAC/30VDC 1C: 3A 250VAC/30VDC	5A 250VAC 5A 30VDC	10A 250VAC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	3VDC to 24VDC	3VDC to 48VDC
Nominal Operating Power	0.2W, 0.45W	0.2W	0.23W, 0.45W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 105°C	-40°C to 85°C
Operate / Release Time max.	8ms / 4ms	8ms / 4ms	8ms / 4ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS (at 5A 250VAC)	1.5 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL VDE CQC
File No.	E134517 40006182 CQC17002175721	E134517 40006182 CQC17002175721	E134517 40006182 CQC17002175721
Cross Reference	FUJITSU: JV OEG: OJ/OJE P&B: T77	FUJITSU: JV OEG: OJ/OJE P&B: T77	FUJITSU: JV OEG: OJ/OJE P&B: T77
Page	71	74	77




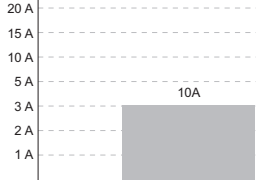
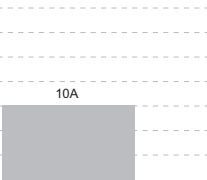
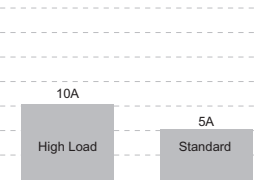
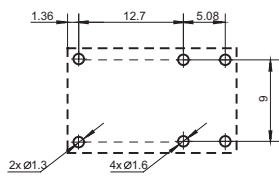
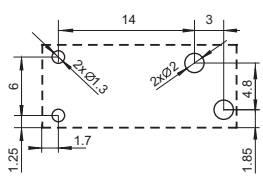
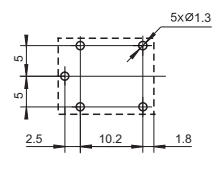
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF32FV	HF32FV-G/HF32FV-T	HF32FV-16
Appearance			
Dimensions(L x W x H) mm	18.4 x 10.2 x 15.5	18.4 x 10.2 x 15.5	18.4 x 10.2 x 15.5
Features	<ul style="list-style-type: none"> • 5A switching capability • Dielectric strength 4kV (between coil and contacts) • Relow soldering version available • Halogen-free products are available • Product in accordance to IEC60335-1 available • Meet reinforce insulation • UL insulation system: Class F 	<ul style="list-style-type: none"> • 10A switching capability • Dielectric strength 4kV (between coil and contacts) • 1 Form A configurations • Standard PCB layout • Plastic sealed and flux proofed types available • UL insulation system: Class F • Product in accordance to IEC60335-1 available • Meet reinforce insulation • Relow soldering version available • Halogen-free products are available 	<ul style="list-style-type: none"> • 16A switching capability • Dielectric strength 4kV (between coil and contacts) • 1 Form A configuration • UL insulation system: Class F • Product in accordance to IEC 62368-1 available • Product in accordance to TV-10 62368-1 available
Contact Ratings			
Contact Form	1A	1A	1A
Contact Material	AgSnO ₂ , AgCdO, AgNi	AgSnO ₂ , AgCdO, AgNi	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	277VAC / 30VDC	277VAC	277VAC
Max. Switching Power	1250VA / 150W	2770VA	4000VA
Rated Load (Resistive load)	5A 250VAC / 30VDC L type: 3A 250VAC / 30VDC	10A 250VAC 8A 250VAC	16A 250VAC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	3VDC to 48VDC	3VDC to 48VDC(0.2W,0.4W) 12VDC ,24VDC(0.8W)
Nominal Operating Power	0.2W, 0.45W	0.2W,0.45W	0.8W, 0.4W(Sensitive Type) 0.2W(Super Sensitive Type)
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	4000VAC
Ambient Temperature	-40°C to 105°C	-40°C to 105°C	-40°C to 85°C
Operate / Release Time max.	8ms / 5ms	8ms / 5ms	10ms / 5ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	See "CONTACT DATA"	1 x 10 ⁴ OPS(at 16A 250VAC,General use) 5 x 10 ³ OPS(at 16A 250VAC,Resistive load)
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL VDE CQC
File No.	E134517 40012204 CQC14002120720	E134517 40012204 CQC14002120720	E134517 40012204 CQC14002120720
Cross Reference	FUJITSU: JV OEG: OJ/OJE P&B: T77	FUJITSU: JV OEG: OJ/OJE P&B: T77	OEG: OJT GOODSKY:GQ
Page	80	84	88




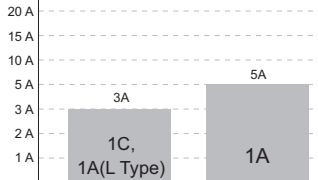

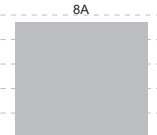
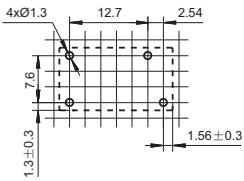
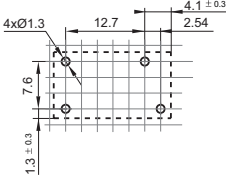
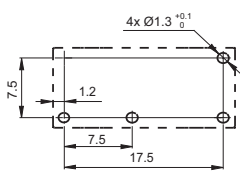
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF30F	HF39F	HF5F
Appearance			
Dimensions(L x W x H) mm	20.5 x 12.7 x 15.7	20 x 8.5 x 12.5	15.6 x 12.4 x 13.6
Features	<ul style="list-style-type: none"> • 10A switching capability • 4.0kV dielectric strength (between coil and contacts) • Contact arrangement: 2 Form A • UL insulation system: Class F • IEC60335-1 compliant products are available • TV-5 compliant products are available 	<ul style="list-style-type: none"> • 10A switching capability • creepage distance and air distance: >8mm • Dielectric strength (between coil and contacts): ≥5000VAC • TV-8 compliant products are available • UL insulation system: Class F 	<ul style="list-style-type: none"> • 10A switching capability(High Load) • contact arrangement: 1 Form A 1 Form C • UL insulation system: Class F • TV-5 compliant products are available • Ambient temperature meets 105°C
Contact Ratings			
Contact Form	2A	1A	1A
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	277VAC	277VAC	277VAC
Max. Switching Power	2770VA	2770VA	2770VA / 280W
Rated Load (Resistive load)	10A 250VAC	10A 250VAC	Standard: 5A 250VAC High Load: 10A 250VAC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	3VDC to 48VDC	3VDC to 48VDC
Nominal Operating Power	0.4W	0.3W	0.45W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	100MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	5000VAC	1500VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 105°C
Operate / Release Time max.	8ms / 5ms	8ms / 4ms	10ms / 5ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	5 x 10 ⁴ OPS	5x10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB		PCB
Approved Standards	UL/CUL VDE CQC		UL/CUL VDE CQC
File No.	E133481 40055993 CQC21002317491		E133481 40054965 CQC21002311603
Cross Reference			
Page	92	95	97




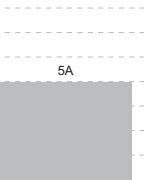
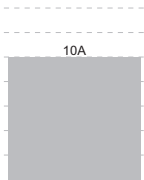
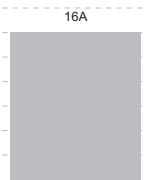
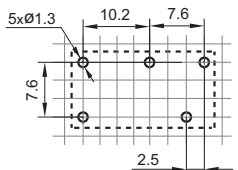
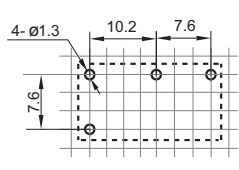
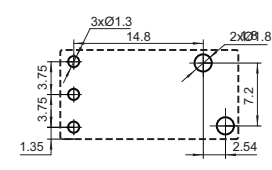
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF32F	HF32F-G	HF171F
Appearance			
Dimensions(L x W x H) mm	18.4 x 10.2 x 15.5	18.4 x 10.2 x 15.5	20.0 x 10.0 x 10.6
Features	<ul style="list-style-type: none"> • 1 Form A and 1 Form C configurations • Subminiature, standard PCB layout • Plastic sealed and flux proofed types available • UL insulation system: Class F • Product in accordance to IEC 60335-1 available 	<ul style="list-style-type: none"> • 10A switching capability • 1 Form A configurations • Subminiature standard PCB layout • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 8A switching capability • 1 form A and 1 form C configurations • High sensitivity 200mW • Creepage/clearance distance:>6mm, meets VDE 0631reinforce insulation • 5KV dielectric between coil to contacts • Class F insulation
Contact Ratings			
Contact Form	1A, 1C	1A	1A, 1C
Contact Material	AgSnO ₂ , AgNi, AgCdO	AgSnO ₂ , AgNi, AgCdO	AgSnO ₂ , AgNi
Max. Switching Current (Res. load)			
Max. Switching Voltage	250VAC / 30VDC	250VAC / 30VDC	30VDC / 277VAC
Max. Switching Power	1250VA / 150W	2500VA / 300W	1662VA / 180W
Rated Load (Resistive load)	1A: 10A 125VAC 5A 250VAC/30VDC L Type: 3A 250VAC/30VDC 1C: 3A 250VAC/30VDC	10A 250VAC 10A 30VDC	1A:6A 250VAC/30VDC 1C:NO:6A 250VAC/30VDC NC:5A 250VAC/30VDC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	3VDC to 48VDC	3VDC to 48VDC
Nominal Operating Power	0.2W, 0.45W	0.45W	0.2W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	2500VAC	2500VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	8ms / 5ms	8ms / 5ms	8ms / 5ms
Mechanical Endurance min.	5 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC		UL/CUL VDE CQC
File No.	E134517 40012204 CQC12002076528 CQC16002148335	E134517 40012204 CQC12002076528 CQC16002148335	E133481 40048577 CQC17002177419
Cross Reference	FUJITSU: JV OEG: OJ/OJE P&B: T77	FUJITSU: JV OEG: OJ/OJE P&B: T77	
Page	100	103	105




Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

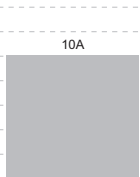


Type	HF33F	HF33F-G	HF33F-L
Appearance			
Dimensions(L x W x H) mm	20.5 x 10.2 x 15.7	20.5 x 10.2 x 15.7	20.5 x 10.2 x 15.7
Features	<ul style="list-style-type: none"> Creepage distance: 8mm (both for 1 CO and NO) Clearance distance: NO type 4.5mm; NC type 4mm Plastic sealed and flux proofed type available 	<ul style="list-style-type: none"> 10A switching capability Creepage distance: 8mm Clearance distance: NO type 4.5mm 1 Form A configurations UL insulation system: Class F Product in accordance to IEC 60335-1 available Shape and Pin compatible with HF33F 	<ul style="list-style-type: none"> Magnetic latching relay Low coil power 1 coil magnetic latching relay: Approx. 0.2W 2 coil magnetic latching relay: Approx. 0.4W High contact switching capacity: 16A 250VAC 1 Form A configurations
Contact Ratings			
Contact Form	1A, 1C	1A	1A
Contact Material	AgSnO ₂ , AgNi, AgCdO	AgSnO ₂	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	277VAC / 30VDC	277VAC	277VAC
Max. Switching Power	1250VA / 150W	2770VA	4000VA
Rated Load (Resistive load)	NO: 10A 125VAC 5A 250VAC/30VDC NC: 3A 250VAC/30VDC	10A 250VAC	16A 250VAC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	3VDC to 48VDC	3VDC to 48VDC
Nominal Operating Power	0.2W, 0.45W	0.2W, 0.45W	0.2W, 0.4W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	2500VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	8ms / 5ms	8ms / 5ms	10ms / 10ms
Mechanical Endurance min.	5 x 10 ⁶ OPS	5 x 10 ⁶ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS	3 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC		UL/CUL VDE CQC
File No.	E134517 125661 CQC12002076530		E13481 40055285 CQC21002315240
Cross Reference	OMRON: G5SB/G5Q PANASONIC: JQ/PQ FUJITSU: JY SCHRACK: RE/REL OEG: PCH		
Page	108	112	115

Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF36F	HF36F-20	HF36F-W
Appearance			
Dimensions(L x W x H) mm	24.5 x 10.5 x 24.5(Plastic sealed) 23.8 x 9.5 x 24.5(Flux proofed)	24.5 x 10.5 x 24.5	23.8 x 9.8x 24.9
Features	<ul style="list-style-type: none"> • 10A switching capability • TV-5 125VAC approved by UL standard (only for 1 Form A) • 1 Form A and 1 Form C configurations • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 10.5mm wide slim relay • 20A switching capability • High sensitivity,Coil power consumption is only 0.53W • High surge current resistance:TV-8 • Insulation distanced\geq6.1mm • Surge voltage between coil contacts 10KV • Optional explosion-proof specifications 	<ul style="list-style-type: none"> • 16A switching capability • 3kV dielectric strength (between coil and contacts) • UL insulation system: Class F • Standard PCB layout

Contact Ratings

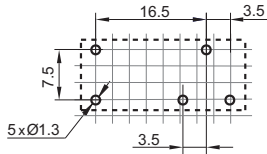
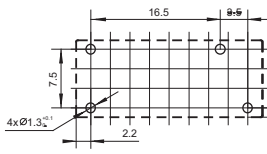
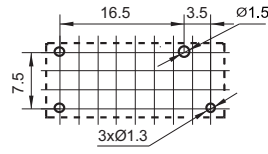
Contact Form	1A, 1C	1A	1A
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	250VAC / 30VDC	277VAC	250VAC
Max. Switching Power	2500VA / 300W	5540VA	4000VA
Rated Load (Resistive load)	10A 250VAC/30VDC TV-5 125VAC	20A 277VAC	16A 250VAC

Coil Ratings

Rated Voltage	5VDC to 48VDC	5VDC to 48VDC	5 VDC to 48VDC
Nominal Operating Power	0.25W, 0.53W	0.53W	0.65W




Specifications

Insulation Resistance	1000MΩ	1000MΩ	1000MΩ(500VDC)
Dielectric Strength (Between coil and contacts)	4000VAC (NO), 3000VAC (NC)	4000VAC	4000VAC 1min
Ambient Temperature	-40°C to 70°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	15ms / 5ms	15ms / 5ms	15ms / 5ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	2 x 10 ⁶ OPS	5 x 10 ⁵ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS (at 10A 250VAC)	5 x 10 ⁴ OPS	1 x 10 ⁴ OPS

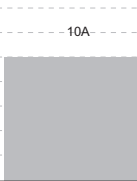
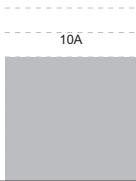
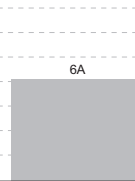
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL TÜV
File No.	E134517 R50356442 CQC18002199981\CQC16002159838	E134517 R50263288 CQC21002316568	E134517 R50356442
Cross Reference	OMRON: G5PA-1 PANASONIC: LK FUJITSU: FTR-H2/F2 NEC: CK OEG: SDT	OMRON: G5PZ-1A-E	OMRON: G5PZ-1A
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Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF36FD	HF162F	HF8/HF8A
Appearance			
Dimensions(L x W x H) mm	23.8 x 9.5 x 24.5	26.3 x 26.1 x 10.0	21.3 x 16.2 x 14.9
Features	<ul style="list-style-type: none"> 10A switching capability TV-8 125VAC approved by UL standard(118A inrush current) Ideal for device power reduction 	<ul style="list-style-type: none"> High inrush current: TV-8 125VAC (117A inrush current) Low height, only 9.3mm (excluding buttons) High sensitivity: 250mW 	<ul style="list-style-type: none"> Sub miniature, high sensitive, Standard PCB layout 1 Form A and 1 Form C configurations Plastic sealed type for automatic wave soldering

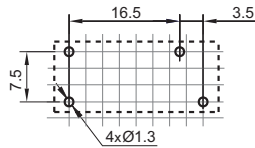
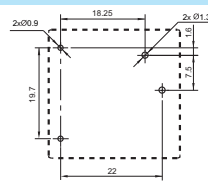
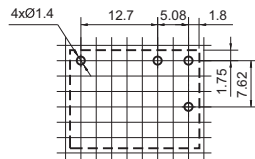
Contact Ratings

Contact Form	1A	1A	1A, 1C
Contact Material	AgSnO ₂	AgSnO ₂	AgNi
Max. Switching Current (Res. load)			
Max. Switching Voltage	250VAC / 30VDC	277VAC	300VAC / 30VDC
Max. Switching Power	2500VA / 150W	2216VA	1800VA / 300W
Rated Load (Resistive load)	10A 250VAC 5A 250VAC/30VDC TV-8 125VAC	10A 125VAC 8A/5A 277VAC TV-8 125VAC 3A/100A 250VAC (Capacitive) (Standard type)	HF8: 6A 300VAC/28VDC HF8A: 6A 277VAC/30VDC

Coil Ratings




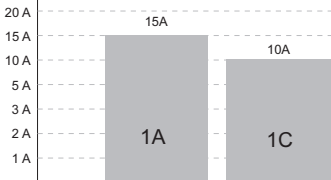

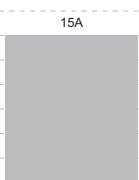
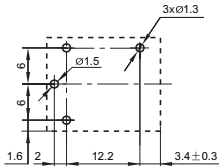
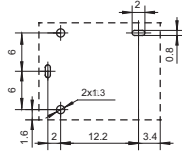
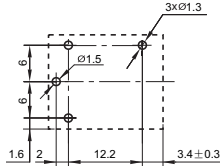
Rated Voltage	5VDC to 48VDC	3VDC to 24VDC	3VDC to 48VDC
Nominal Operating Power	0.25W, 0.53W	0.25W	0.33W, 0.45W, 0.6W

Specifications

Insulation Resistance	1000MΩ	1000MΩ	100MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	2000VAC
Ambient Temperature	-40°C to 70°C	-40°C to 70°C	-55°C to 90°C
Operate / Release Time max.	15ms / 5ms	15ms / 5ms	6ms / 3ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS (at 10A 250VAC)	5 x 10 ⁴ OPS (at 10A 125VAC)	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL VDE CQC	UL/CUL VDE
File No.	E134517 R50356444 CQC18002199980/CQC16002159846	E133481 40032669 CQC10002050942	E134517 40025189
Cross Reference	OMRON: G5PA-1 PANASONIC: LK NEC: CK OEG: SDT	OMRON: G5PF PANASONIC: LK-F	FUJITSU: LZ P&B: T73 OEG: OUDH
Page	126	128	130




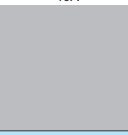


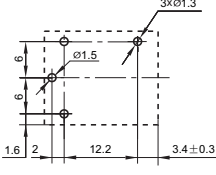
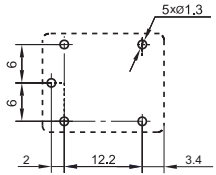
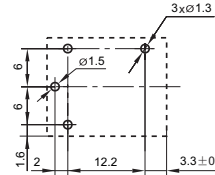
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF3FA/HF3FA-T	HF3FA-G	HF3FA-M
Appearance			
Dimensions(L x W x H) mm	19.0 x 15.2 x 15.5	19.0 x 15.2 x 15.5	19.0 x 15.2 x 15.5
Features	<ul style="list-style-type: none"> • 15A 125VAC;10A 250VAC switching capability • TV8 @ 120Vac (for version 590) • Flammability class according to UL94, V-0 • Product in accordance to IEC 60335-1 available • Subminiature, standard PCB layout • Plastic sealed and Flux proofed types available • UL insulation system: Class F 	<ul style="list-style-type: none"> • The ambient temperature can reach 85°C • 16A 125/250VAC switching capability • Climatic category UL94.V-0 • Product in accordance to IEC 60335-1 available • Subminiature, standard PCB layout • Plastic sealed and flux proofed types available • UL insulation system:Class F 	<ul style="list-style-type: none"> • 15A switching capability • Subminiature, standard PCB layout • 1 Form A and 1 Form C configurations • Plastic sealed and Flux proofed types available
Contact Ratings			
Contact Form	1A, 1C	1A	1A, 1C
Contact Material	AgSnO ₂ , AgNi, AgCdO	AgSnO ₂	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	277VAC / 28VDC	250VAC	30VDC
Max. Switching Power	2770VA / 280W	4000VA	300W
Rated Load (Resistive load)	1A: 10A 277VAC/10A 28VDC 1C: NO: 10A 277VAC/10A 28VDC NC: 5A 250VAC	16A 250VAC	NO: 15A 14VDC NC: 5A 14VDC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	3VDC to 48VDC	9VDC to 24VDC
Nominal Operating Power	0.36W	0.36W	0.45W
Specifications			
Insulation Resistance	100MΩ	100MΩ(500VDC)	100MΩ(500VDC)
Dielectric Strength (Between coil and contacts)	2500VAC	2500VAC	2000VAC
Ambient Temperature	-40°C to 105°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	10ms / 5ms	10ms / 5ms	10ms / 4ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1A:1 x 10 ⁵ OPS (10A 250VAC) 1C:5 x 10 ⁵ OPS (NO:5A/NC:5A 250VAC)	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS (NO,15A 14VDC)
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	
File No.	E134517 40023708 CQC12002076529	E134517 40023708 CQC12002076529	
Cross Reference	OMRON: G5LA SCHRACK: T7S SONG CHUAN: 833H	SRD-L	SCHRACK: T72N OMRON: G8SN
Page	133	136	138




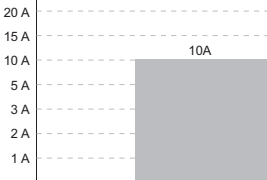

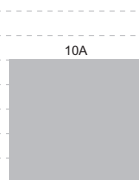
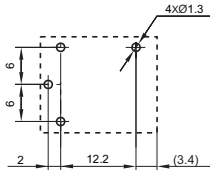
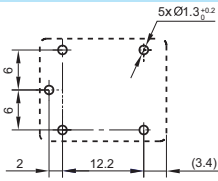
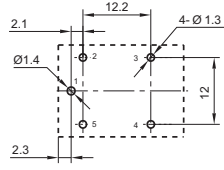
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF3FA-W	HF3FD	HF3FF
Appearance			
Dimensions(L x W x H) mm	19.0 x 15.2 x 16.1	19.0 x 15.2 x 15.5	19.0 x 15.2 x 15.5
Features	<ul style="list-style-type: none"> • 10A switching capability • Flammability class according to UL94, V-0 • Product in accordance to IEC 60335-1 available • Plastic sealed and flux proofed types available • Subminiature, standard PCB layout • UL insulation system: Class F 	<ul style="list-style-type: none"> • 15A switching capability • Subminiature, standard PCB layout • Flammability class according to UL94, V-0 • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 15A 125VAC, 10A 250VAC switching capability • Subminiature, standard PCB layout • 1 Form A and 1 Form C configurations • Plastic sealed and flux proofed types available
Contact Ratings			
Contact Form	1C	1A, 1C	1A, 1C
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂ , AgCdO
Max. Switching Current (Res. load)			
Max. Switching Voltage	277VAC / 36VDC	277VAC / 30VDC	277VAC / 28VDC
Max. Switching Power	2770VA/360W	2770VA / 300W	2770VA / 280W
Rated Load (Resistive load)	NO: 8A 277VAC/10A 24VDC NC: 5A 250VAC	1A: 10A 250VAC 1C: NO: 10A 250VAC NO/NC: 5A/5A 250VAC	10A 277VAC 10A 28VDC
Coil Ratings			
Rated Voltage	5VDC and 48VDC	3VDC to 48VDC	5VDC to 48VDC
Nominal Operating Power	0.8W	0.36W	0.36W(48VDC: 0.51W), 0.45W
Specifications			
Insulation Resistance	100MΩ(500VDC)	100MΩ	100MΩ
Dielectric Strength (Between coil and contacts)	2500VAC	2000VAC	1500VAC
Ambient Temperature	-40°C to 85°C	-40°C to 105°C	-40°C to 105°C
Operate / Release Time max.	10ms / 5ms	10ms / 5ms	10ms / 5ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS (NO, at 10A 36VDC)	5 x 10 ⁴ OPS (NO, at 10A 250VAC)	5 x 10 ⁴ OPS (NO, at 10A 250VAC)
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL VDE TÜV CQC
File No.	E134517 40023708 CQC12002076529	E134517 40014057 CQC14002114760	E134517 40025218 R50148356 CQC13002098175
Cross Reference	GOLDEN:GH-1C	OMRON: G5LB(White) PANASONIC: JS SCHRACK: T7S SONG CHUAN: 899	OMRON: G5LB(Black) PANASONIC: JS P&B: T72 OEG: PCE/ORWH FINDER: 36.11 SONG CHUAN: 833
Page	141	144	147




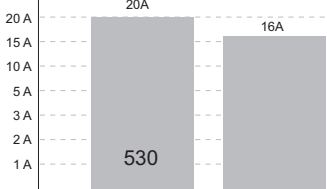
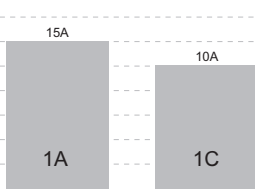
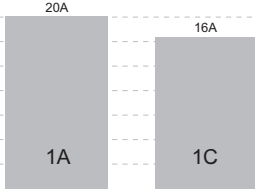
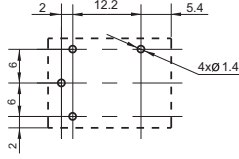
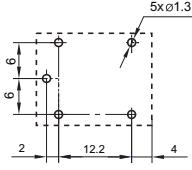
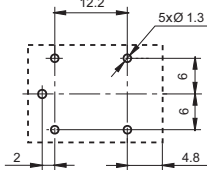
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF3F-L	HF3FF-M	HF7FF
Appearance			
Dimensions(L x W x H) mm	19.0 x 15.2 x 15.5	19.0 x 15.2 x 15.5	22.5 x 16.5 x 16.5
Features	<ul style="list-style-type: none"> • Subminiature high power latching relay • Low coil power • 15A switching capability • 1 Form A and 1 Form C configurations • Subminiature, standard PCB layout • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 15A switching capability • Subminiature, standard PCB layout • Plastic sealed and Flux proofed types available • RoHS & ELV compliant 	<ul style="list-style-type: none"> • 10A switching capability • Low cost, small package • 1 Form A and 1 Form C configurations • Plastic sealed and flux proofed types available
Contact Ratings			
Contact Form	1A, 1C	1A, 1C	1A, 1C
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂ , AgCe
Max. Switching Current (Res. load)			
Max. Switching Voltage	277VAC / 30VDC	30VDC	250VAC / 30VDC
Max. Switching Power	2770VA / 300W		2500VA / 280W
Rated Load (Resistive load)	10A 277VAC	1A: 15A 13.5VDC 1C: NO: 15A 13.5VDC NC: 5A 13.5VDC	10A 250VAC/28VDC 5A 250VAC/30VDC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	9VDC to 24VDC	3VDC to 48VDC
Nominal Operating Power	0.4W, 0.8W	0.45W, 0.64W, 0.80W	0.36W (48VDC: 0.51W)
Specifications			
Insulation Resistance	100MΩ	100MΩ	100MΩ
Dielectric Strength (Between coil and contacts)	2000VAC	1500VAC	1500VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 70°C
Operate / Release Time max.	8ms / 5ms	10ms / 10ms	10ms / 5ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁴ OPS	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC		UL/CUL CQC
File No.	E134517 40040757 CQC18002201451		E134517 CQC09002028260
Cross Reference		OMRON: G8SN PANASONIC: JSM SCHRACK: T72N	OMRON: G5LC/G5LE PANASONIC: JSM FUJITSU: CS SCHRACK: T7N OEG: PCE
Page	150	154	157


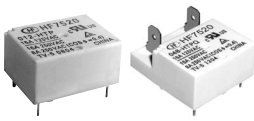

Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART


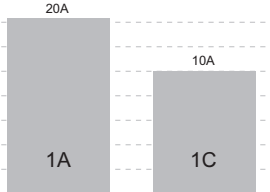
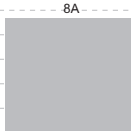
Type	HF7FD	HF21FF	HF152F
Appearance			
Dimensions(L x W x H) mm	22.0 x 16.0 x 16.6	20.2 x 16.5 x 20.2	21.0 x 16.0 x 20.6
Features	<ul style="list-style-type: none"> • 20A switching capability • TV-12 load capability • 2kV dielectric strength (between coil and contacts) • Ambient temperature meets 105°C • Product in accordance to IEC 60335-1 available • Double pins type available • 1 Form A and 1 Form C configurations • UL insulation system:Class F 	<ul style="list-style-type: none"> • 15A switching capability • 1 Form A, 1 Form B and 1 Form C configurations • Standard PCB layout • Plastic sealed and flux proofed available 	<ul style="list-style-type: none"> • 20A switching capacity • Surge voltage up to 6000VAC (between coil and contacts) • 1 Form C and 1 Form A configurations • Plastic sealed and dust protected types available
Contact Ratings			
Contact Form	1A, 1C	1A, 1B, 1C	1A, 1C
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂	AgSnO ₂ , AgNi
Max. Switching Current (Res. load)			
Max. Switching Voltage	277VAC / 28VDC	120VAC	1A: 400VAC / 1C: 400VAC(NO)
Max. Switching Power	5000VA / 280W	1800VA	1A: 4700VA / 1C: 4000VA
Rated Load (Resistive load)	HF7FD:16A 250VAC, 20A 250VAC HF7FD-T:16A 250VAC, 17A 125VAC	1A: 15A 120VAC 1C: 10A 120VAC 1B: 15A 120VAC 1800VA(Ballast)	1A: 20A 125VAC / 17A 277VAC 7A 400VAC 1C: 16A 250VAC NO: 7A 400VAC
Coil Ratings			
Rated Voltage	3VDC to 48VDC	5VDC to 48VDC	3VDC to 48VDC
Nominal Operating Power	0.36W	0.36W (48VDC: 0.53W)	0.36W
Specifications			
Insulation Resistance	100MΩ	1000MΩ	100MΩ
Dielectric Strength (Between coil and contacts)	2000VAC	1500VAC	2500VAC
Ambient Temperature	-40°C to 105°C	-40°C to 70°C	-40°C to 105°C (HF152F-T)
Operate / Release Time max.	10ms / 5ms	10ms / 5ms	10ms / 5ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS(1A)	1 x 10 ⁵ OPS	1A: 1 x 10 ⁵ OPS / 1C: 5 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE TÜV CQC	UL/CUL	UL/CUL VDE CQC
File No.	E134517 40008374 50457893 CQC16002153649	E133481	E134517 40017837 CQC09002034520
Cross Reference	PANASONIC: AJS SONGCHUAN:812H SANYOU:SRDH	OMRON: G5L SCHRACK: LN/41896 OEG: SRUDH/SRUUH	OMRON: G5LE-VD PANASONIC: JSM
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Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF152FD	HF7520	HF163F-L
Appearance			
Dimensions(L x W x H) mm	21.2 x 16.0 x 20.6	22.0 x 16.0 x 10.5	24.0 x 10.0 x 18.8
Features	<ul style="list-style-type: none"> • 20A switching capability • Ambient temperature meets 105°C • High temperature load: 17A 277VAC at 105°C • 1 Form C & 1 Form A configurations available • Product in accordance to EN 60335-1 available 	<ul style="list-style-type: none"> • Low height, flat construction • 20A switching capability • High sensitive 200mW • PCB & QC terminals available • Plastic sealed and flux proofed types available (with vent-hole cover) 	<ul style="list-style-type: none"> • Latching relay • High sensitive • Breakdown voltage (between contact and coil): 5,000 V • High switching capacity: 8A 250VAC • Surge breakdown voltage(between contact and coil): 12,000 V • Reflow soldering available

Contact Ratings

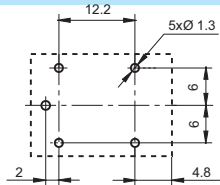
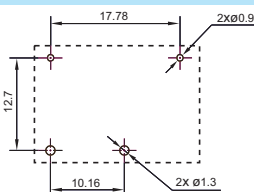
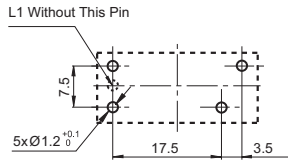
Contact Form	1A, 1C	1A	1C	1A
Contact Material	AgSnO ₂ , AgNi	AgSnO ₂ , AgNi, AgCdO		AgSnO ₂
Max. Switching Current (Res. load)				
Max. Switching Voltage	400VAC	277VAC / 30VDC		250VAC / 30VDC
Max. Switching Power	4700VA	5000VA/480W 2500VA/1500VA		2500VA/150W
Rated Load (Resistive load)	1A: 7A 400VAC 17A 277VAC 20A 125VAC 1C: NO:17A 277VAC NC:10A 277VAC	1A: 16A 125/250VAC 10A 250VAC/30VDC TV-5 1C: NO/NC:10A/6A 250VAC		8A 250VAC 5A 30VDC

Coil Ratings

Rated Voltage	3VDC to 48VDC	5VDC to 48VDC	3VAC to 24VAC / 3VDC to 24VDC
Nominal Operating Power	0.36W	0.2W, 0.4W	0.2W, 0.4W


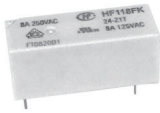

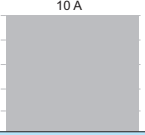
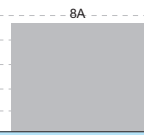
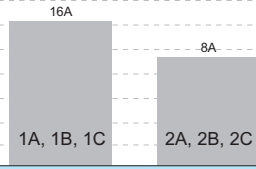
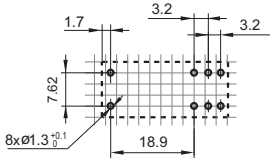
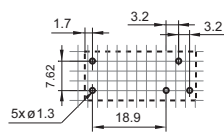
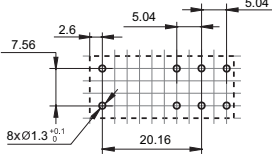
Specifications

Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	2500VAC	2500VAC	5000VAC
Ambient Temperature	-40°C to 105°C	-40°C to 105°C	-40°C to 85°C
Operate / Release Time max.	10ms / 5ms	15ms / 5ms	15ms / 15ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1A: 1 x 10 ⁵ OPS / 1C: 5 x 10 ⁴ OPS	5 x 10 ⁴ OPS	5 x 10 ⁴ OPS (at 8A 250VAC)

Layout (Bottom view)			
Terminal Type	PCB	PCB, QC	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL TÜV CQC	UL/CUL VDE
File No.	E134517 40031203 CQC12002083404	E133481 R50351269 CQC09002034524	E134517 40039460
Cross Reference	OMRON: G5LE-VD PANASONIC: JSM SCHRACK: LN-H	OMRON: G5CA PANASONIC: JV/JVN NEC: CQ OEG: PCD	PANASONIC: DW
Page	170	173	178




Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

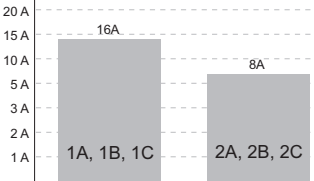

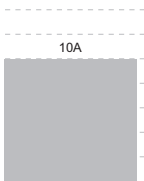
Type	HF118F	HF118FK	HF115F
Appearance			
Dimensions(L x W x H) mm	28.5 x 10.1 x 12.5	28.5 x 10.1 x 12.5	29.0 x 12.7 x 15.7
Features	<ul style="list-style-type: none"> • 10A switching capability • 5kV dielectric strength (between coil and contacts) • Low height: 12.5 mm • Creepage distance(VDE0435/0631/0700) • Product in accordance to 60335-1 available 	<ul style="list-style-type: none"> • 8A switching capability • 5kV dielectric strength (between coil and contacts) • Low height: 12.5 mm • Creepage distance >8mm • Meeting VDE 0700, 0631 reinforce insulation • Product in accordance to IEC 60335-1 available • Flux proofed types • Through-Hole Reflow Version available 	<ul style="list-style-type: none"> • Low height: 15.7 mm • 16A switching capability • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meet VDE0435/0631/0700 • Product in accordance to IEC 60335-1 available
Contact Ratings			
Contact Form	1A, 1B, 1C	1A, 1C	1A, 1B, 1C 2A, 2B, 2C
Contact Material	AgSnO ₂ , AgNi	AgSnO ₂ , AgNi	AgSnO ₂ , AgNi, AgCdO
Max. Switching Current (Res. load)			
Max. Switching Voltage	440VAC / 125VDC	440VAC / 125VDC	440VAC / 300VDC
Max. Switching Power	2500VA/300W	2000VA/240W	3000VA/4000VA 2000VA
Rated Load (Resistive load)	10A 250VAC 10A 30VDC	8A 250VAC 8A 30VDC	16A 250VAC 12A 250VAC 8A 250VAC
Coil Ratings			
Rated Voltage	5VDC to 60VDC	5VDC to 60VDC	5VDC to 110VDC
Nominal Operating Power	0.22W to 0.29W	0.22W to 0.29W	0.4W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	10ms / 5ms	10ms / 5ms	15ms / 8ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS (at 8A 250VAC)	1 x 10 ⁵ OPS	1 pole:1x10 ⁵ OPS;2 pole:5x10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL VDE CQC
File No.	E134517 40010480 CQC18002206322 CQC09002035071	E134517 40010480 CQC09002035071 CQC18002206322	E134517 116934 CQC17002168381
Cross Reference	OMRON: G6RN FUJITSU: JS SCHRACK: RYII	OMRON: G6RN FUJITSU: JS SCHRACK: RYII	OMRON: G2RL PANASONIC: LZ SCHRACK: RT FUJITSU: FTR-K1 FINDER: 41 SERIES RELPO: RM84/85
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Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF115F-A	HF115F-T/TH	HF115F-H
Appearance			
Dimensions(L x W x H) mm	29.0 x 12.7 x 15.7	29.0 x 12.7 x 15.7	29.0 x 12.7 x 15.7
Features	<ul style="list-style-type: none"> • AC coil voltage type • 16A switching capability • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meet VDE0700/0631 • Product in accordance to IEC 60335-1 available 	<ul style="list-style-type: none"> • High temperature: 105°C • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meet VDE0700/0631 • Product in accordance to IEC 60335-1 available 	<ul style="list-style-type: none"> • High sensitive: 0.25W • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meet VDE0700/0631 • Product in accordance to IEC 60335-1 available

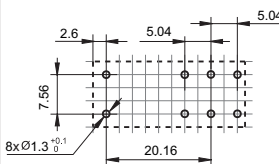
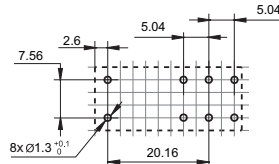
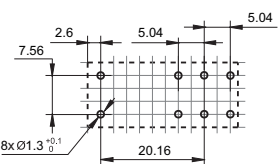
Contact Ratings

Contact Form	1A, 1B, 1C	2A, 2B, 2C	1A, 1C	1A, 1B, 1C
Contact Material	AgSnO ₂ , AgNi, AgCdO		AgSnO ₂ , AgNi, AgCdO	AgSnO ₂ , AgNi, AgCdO
Max. Switching Current (Res. load)				
Max. Switching Voltage	440VAC / 300VDC		440VAC / 300VDC	440VAC / 300VDC
Max. Switching Power	3000VA/4000VA	2000VA	HF115F-T: 4000VA HF115F-TH: 2500VA	2500VA
Rated Load (Resistive load)	16A 250VAC 12A 250VAC	8A 250VAC	HF115F-T: 16A 250VAC HF115F-TH: 10A 250VAC	10A 250VAC

Coil Ratings


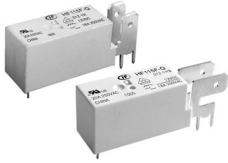

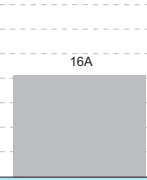
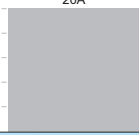

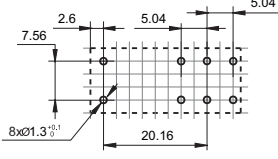
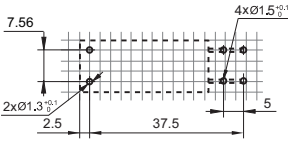
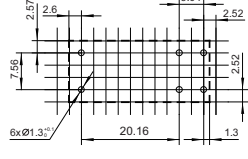
Rated Voltage	24VAC, 115VAC, 230VAC	5VDC to 60VDC	5VDC to 60VDC
Nominal Operating Power	0.75VA	0.25W, 0.4W	0.25W

Specifications

Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 70°C	-40°C to 105°C	-40°C to 85°C
Operate / Release Time max.		15ms / 8ms	15ms / 8ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS	5 x 10 ⁴ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE	UL/CUL VDE CQC	UL/CUL VDE CQC
File No.	E134517 116934 CQC17002176311	E134517 116934 CQC17002168381	E134517 116934 CQC17002168381
Cross Reference	OMRON: G5RL-AC SCHRACK: RT RELPOL: RM84/85	SCHRACK: RTH105 16A P&B: RT FUJITSU: FTR-K1	SCHRACK: RT1 Sensitive P&B: RT FUJITSU: FTR-K1
Page	192	195	198






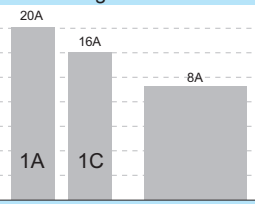
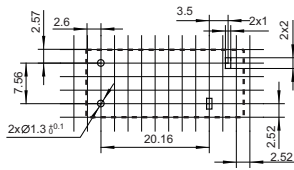
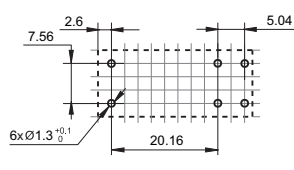
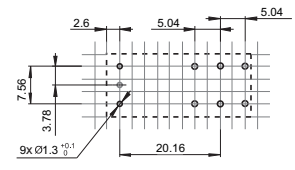
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF115F-I	HF115F-Q	HF115F-25
Appearance			
Dimensions(L x W x H) mm	29.0 x 12.7 x 15.7	Vertical: (41.0 x 12.7 x 15.7) Horizontal: (45.0 x 12.7 x 15.7)	29.0 x 12.7 x 16.5
Features	<ul style="list-style-type: none"> • High inrush: 120A 20ms • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meet VDE0700/0631 • Product in accordance to IEC 60335-1 available 	<ul style="list-style-type: none"> • Ambient temperature up to 125°C • 5kV dielectric strength (between coil and contacts) • Creepage distance >8mm • Meet VDE0700/0631 • UL94, V-0 flammability class • Product in accordance to IEC 60335-1 available 	<ul style="list-style-type: none"> • 25A switching capability • Low height: 16.5 mm • Creepage distance and air distance: 10mm/10mm • Meeting reinforce insulation • IEC60335-1 compliant products are available • UL insulation system:Class F • Meets the requirement of ambient working temperature 105°C
Contact Ratings			
Contact Form	1A,1C	1A, 1B	1A
Contact Material	AgSnO ₂	AgSnO ₂ , AgNi	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	440VAC / 300VDC	440VAC / 300VDC	277VAC
Max. Switching Power	4000VA	5000VA	6925VA
Rated Load (Resistive load)	1A: 16A 250VAC	20A 250VAC	23A 277VAC
Coil Ratings			
Rated Voltage	5VDC to 110VDC	5VDC to 60VDC	5VDC to 48VDC
Nominal Operating Power	0.4W	0.4W	0.4W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 125°C	-40°C to 105°C
Operate / Release Time max.	15ms / 8ms	15ms / 8ms	15ms / 8ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	7.5 x 10 ⁴ OPS	3 x 10 ⁴ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB, QC	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL TUV CQC
File No.	E134517 116934 CQC17002168381	E134517 116934 CQC17002168381	E133481 R 50523670 CQC21002322054
Cross Reference	SCHRACK: RT1 Inrush P&B: RT FUJITSU: FTR-H1	SCHRACK: RF/41063 125°C	G2RL
Page	201	204	207




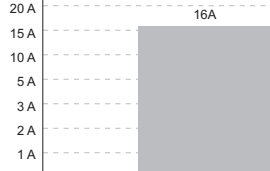
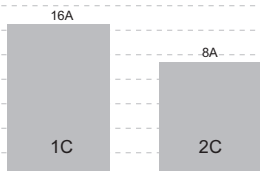
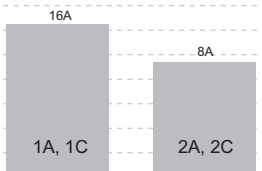
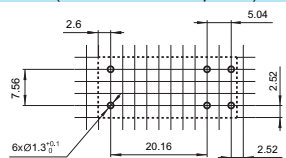
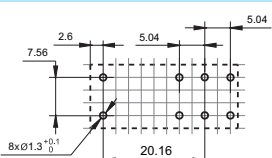
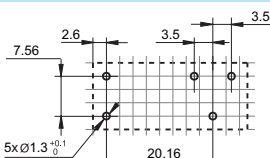
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF115F-25 (Explosion-proof type)	HF115F-S	HF115F-L	
Appearance				
Dimensions(L x W x H) mm	29.0 x 12.7 x 16.5	29.0 x 12.7 x 15.7	29.0 x 12.7 x 15.7	
Features	<ul style="list-style-type: none">• 20A switching capability• Low height: 16.5 mm• Creepage distance and air distance: 10mm/10mm• Meeting reinforce insulation• IEC60335-1 compliant products are available• UL insulation system:Class F• Meet the explosion-proof requirements of IEC60079-15 GB3836.8	<ul style="list-style-type: none">• Special contact struction• Incandescent lamp load: 3000W 230VAC• Inrush current: 165A/ 20ms; Electronic ballast:492A/1.5ms• 5kV dielectric strength(between coil and contacts)• Creepage distance: 10mm• Product in accordance to IEC 60335-1 available• Plastic sealed and flux proofed types available	<ul style="list-style-type: none">• Latching relay• 20A switching capability• 20A dielectric strength (between coil and contacts)• 5kV dielectric strength (between coil and contacts)• Creepage distance: 11mm-NO/10mm-CO version• Meeting VDE 0700, 0631 reinforce insulation• Product in accordance to IEC 60335-1 available	
Contact Ratings				
Contact Form	1A	1A	1A, 1C	2A, 2C
Contact Material	AgSnO ₂	W+AgSnO ₂	AgSnO ₂	
Max. Switching Current (Res. load)				
Max. Switching Voltage	250VAC	440VAC	440VAC / 300VDC	
Max. Switching Power	5000VA	4000VA	4000VA	2000VA
Rated Load (Resistive load)	20A 250VAC	Resistive:16A 250VACs	16A 250VAC	8A 250VAC
Coil Ratings				
Rated Voltage	5VDC to 48VDC	5VDC to 110VDC	5VDC to 24VDC	
Nominal Operating Power	0.8W	0.4W	0.4W, 0.6W	
Specifications				
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ	
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC	
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	
Operate / Release Time max.	10ms / 8ms	10ms / 5ms	10ms / 10ms	
Mechanical Endurance min.	1 x 10 ⁶ OPS	5 x 10 ⁶ OPS	2 x 10 ⁶ OPS	
Electrical Endurance min.	1 x 10 ⁵ OPS	1.2 x 10 ⁴ OPS (Incand escentlamp load)	5 x 10 ⁴ OPS	
Layout (Bottom view)				
Terminal Type	PCB	PCB	PCB	
Approved Standards	UL/CUL TUV CQC	UL/CUL VDE CQC	UL/CUL VDE CQC	
File No.	E133481 R 50523670 CQC21002322054	E134517 116934 CQC08002028130	E134517 116934 CQC17002176310	
Cross Reference		TE: RTX	PANASONIC: DJ SCHRACK: RT1 bistable FUJITSU: FTR-K1L	
Page	210	213	215	




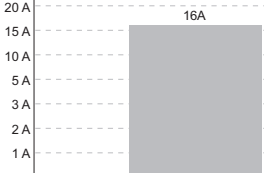


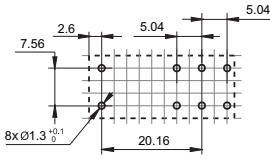
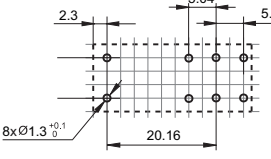
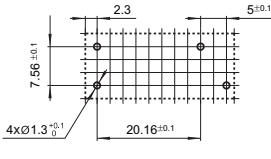
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF115F-LS	HF115FP	HF115FK		
Appearance					
Dimensions(L x W x H) mm	29.0 x 12.7 x 15.7	29.0 x 13.0 x 25.5	29.0 x 12.7 x 15.7		
Features	<ul style="list-style-type: none">• Latching relay• Incandescent lamp load: 3500W 277VAC• 5kV dielectric strength (between coil and contacts)• Creepage distance: 11mm• Low height: 15.7 mm• Meeting reinforce insulation	<ul style="list-style-type: none">• Manual test device, Type with mechanical indicator / electrical indicator• 5kV dielectric strength (between coil to contacts)• Creepage distance: 8mm• Meet VDE0700/0631• Sockets available	<ul style="list-style-type: none">• Low height: 15.7 mm• 16A switching capability• 5kV dielectric strength (between coil and contacts)• Creepage distance: 10mm• Meeting reinforce insulation• Product in accordance to IEC 60335-1 available		
Contact Ratings					
Contact Form	1A	1C	2C	1A, 1C	2A, 2C
Contact Material	W + AgSnO ₂	AgNi		AgSnO ₂ , AgNi	
Max. Switching Current (Res. load)					
Max. Switching Voltage	440VAC	440VAC		400VAC	
Max. Switching Power	4000VA	4000VA	2000VA	2500VA/3000VA /4000VA	2000VA
Rated Load (Resistive load)	16A 250VAC	16A 250VAC	8A 250VAC	12A/16A 250VAC 10A 250VAC	8A 250VAC
Coil Ratings					
Rated Voltage	5VDC to 24VDC	24VAC to 230VAC / 12VDC to 110VDC		5VDC to 48VDC	
Nominal Operating Power	0.4W, 0.6W	0.75VA, 0.4W		0.4W, 0.53W	
Specifications					
Insulation Resistance	1000MΩ	1000MΩ		1000MΩ	
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC		5000VAC	
Ambient Temperature	-40℃ to 85℃	-40℃ to 70℃		-40℃ to 85℃	
Operate / Release Time max.	10ms / 10ms	15ms / 8ms (DC)		10ms / 5ms	
Mechanical Endurance min.	2 x 10 ⁶ OPS	DC type: 5 x 10 ⁶ OPS AC type: 1 x 10 ⁶ OPS		1 x 10 ⁷ OPS	
Electrical Endurance min.	1.2 x 10 ⁴ OPS (Incand escentlamp load)	3 x 10 ⁴ OPS, 5 x 10 ⁴ OPS		5 x 10 ⁴ OPS	
Layout (Bottom view)					
Terminal Type	PCB	PCB		PCB	
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE		UL/CUL VDE CQC	
File No.	E134517 116934 CQC14002104529	E133481 116934		E134517 116934 CQC17002176308	
Cross Reference	TE: RTX/RTS3T	SCHRACK: XT		OMRON: G2RL FUJITSU: FTR-K1 PANASONIC: LZ SCHRACK: RZ	
Page	221	224		227	




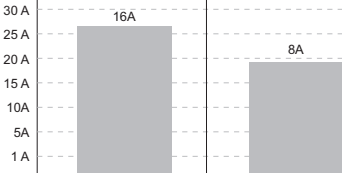
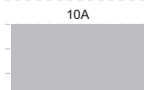
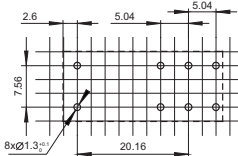
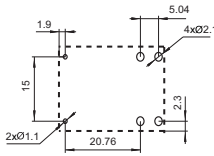
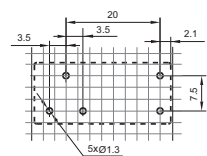
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF115FK-T	HF158F	HF158F-V
Appearance			
Dimensions(L x W x H) mm	29.0 x 12.7 x 15.7	29.0 x 12.7 x 15.7	29.0 x 12.7 x 20.0
Features	<ul style="list-style-type: none"> • High temperature: 105°C • Low height: 15.7 mm • 16A switching capability • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Meeting reinforce insulation • Sockets available 	<ul style="list-style-type: none"> • 20A switching capability • Low height: 12.5 mm • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Product in accordance to IEC 60335-1 available 	<ul style="list-style-type: none"> • 10A 300VDC high-voltage switching capability • 5kV dielectric strength (between coil and contacts) • Creepage distance: 10mm • Product in accordance to IEC60335-1 available
Contact Ratings			
Contact Form	1A 1C	1A, 1C	1A
Contact Material	AgSnO ₂	AgSnO ₂ , AgNi	AgSnO ₂
Max. Switching Current (Res. load)			
Max. Switching Voltage	400VAC	440VAC	420VDC/300VAC
Max. Switching Power	4000VA	5000VA	3000W/3324VA
Rated Load (Resistive load)	16A 250VAC	16A 250VAC	10A 300VDC 12A 277VAC
Coil Ratings			
Rated Voltage	5VDC to 48VDC	5VDC to 48VDC	5VDC to 24VDC
Nominal Operating Power	0.4W	0.4W	0.4W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 105°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	10ms / 5ms	15ms / 8ms	10ms / 5ms(Rated Voltage)
Mechanical Endurance min.	1 x 10 ⁷ OPS	2 x 10 ⁷ OPS	2 x 10 ⁶ OPS
Electrical Endurance min.	3 x 10 ⁴ OPS	1 x 10 ⁵ OPS	1 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL VDE CQC
File No.	E134517 116934 CQC17002176308	E134517 40032833 CQC17002176312	E134517 40032833 CQC17002176312
Cross Reference	P&B: RT SCHRACK:RZ FUJITSU: FTR-K1	OMRON: G2RL SCHRACK: RT PANASONIC: LZ RELPOL: RM85 FINDER: 41 SERIES FUJITSU: FTR-K1	
Page	231	234	237





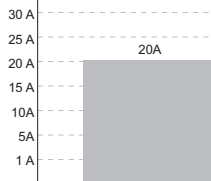
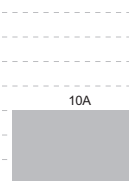
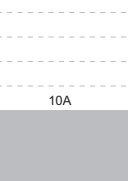
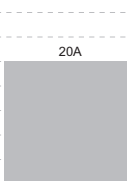
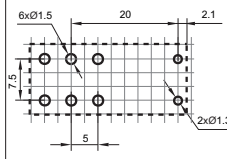
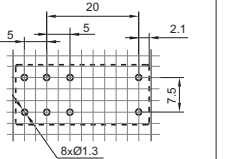
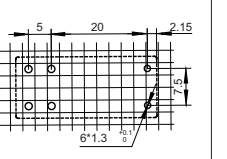
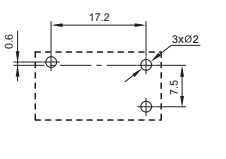
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF115FK-A	HF175F	HF14FF
Appearance			
Dimensions(L x W x H) mm	29.0 x 12.7 x 15.7	29.0 x 19.6 x 15.7	29.0 x 13.0 x 26.0
Features	<ul style="list-style-type: none">• AC coil specification• 16A switching capability• Low height: 15.7 mm• 5kV dielectric strength (between coil and contacts)• Creepage distance:10mm• Meeting reinforce insulation• IEC60335-1 compliant products are available• Sockets available• UL insulation system:Class F	<ul style="list-style-type: none">• 2 Form A and 2 Form C configurations• Low height,only 15.7mm• 5kV dielectric strength (between coil and contacts)• Creepage/clearance distance>10mm, Meets reinforce insulation• Product in accordance to IEC 60335-1 available• UL insulation system: Class F	<ul style="list-style-type: none">• 10A switching capability• 5kV dielectric strength (between coil and contacts)• 1 Form A and 1 Form C configurations• Plastic sealed and flux proofed types available
Contact Ratings			
Contact Form	1A, 1C	2A, 2C	2A, 2C
Contact Material	AgSnO ₂		AgSnO ₂ , AgNi, AgCdO
Max. Switching Current (Resistive load)			
Max. Switching Voltage	440VAC/300VDC		277VAC / 30VDC
Max. Switching Power	3000VA/4000V		2770VA / 300W
Rated Load (Resistive load)	16A 250VAC 8A 250VAC		10A 277VAC/30VDC TV-5 120VAC
Coil Ratings			
Rated Voltage	24, 115, 230VAC	5VDC to 48VDC	3VDC to 60VDC
Nominal Operating Power	0.75VA to 0.9VA	0.8W	0.53W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 70°C	-40°C to 85°C	-40°C to 70°C
Operate / Release Time max.	-	10ms / 5ms	15ms / 5ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	5 x 10 ⁶ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	H3T: 7.5 x 10 ⁴ OPS 2H4T: 5 x 10 ⁴ OPS	5 x 10 ⁴ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL/CUL TÜV CQC	UL/CUL TÜV CQC
File No.	E134517 116934 CQC17002176308	E133481 R50412801 CQC18002196447 CQC18002202622	E134517 R50140759 CQC10002046169
Cross Reference			OMRON: G2R PANASONIC: JR1/JR1A FUJITSU: VS NEC: CH P&B: RKA/RKS
Page	242	245	248




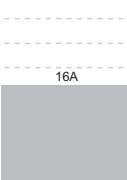
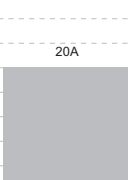
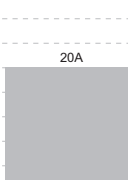
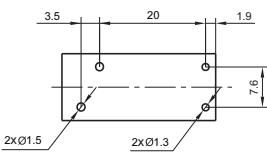
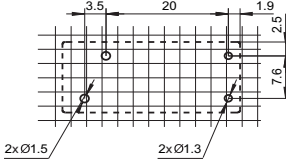
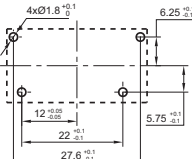
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF14FW	HF140FF	HF140FF-V	HF25F
Appearance				
Dimensions(L x W x H) mm	29.0 x 13.0 x 26.5	29.0 x 13.0 x 26.3	28.5 x 29 x 23	22.8 x 12.3 x 24.4
Features	<ul style="list-style-type: none"> • 20A switching capability • 4kV dielectric strength (between coil and contacts) • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 10A switching capability • 5kV dielectric strength (between coil and contacts) • 2.0mm contact gap available • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 10A switching capability • 5kV dielectric strength (between coil and contacts) • Standard: Creepage distance >8mm • 2 poles are connected in series to achieve DC 500V 10ADC high voltage opening and closing • Contact Gap: 3.0mm (When wired in 2-pole series) • UL insulation system: Class F available 	<ul style="list-style-type: none"> • 20A switching capability • 5kV impulse withstand voltage (between coil and contacts) • small and for microwave oven • PCB & QC layouts • Flux proofed types available
Contact Ratings				
Contact Form	1A, 1B, 1C	2A, 2C	2A	1A
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂ , AgNi, AgCdO	AgSnO ₂	AgSnO ₂
Max. Switching Current (Resistive load)				
Max. Switching Voltage	277VAC / 30VDC	250VAC / 30VDC	500VDC	250VAC / 30VDC
Max. Switching Power	5540VA / 480W	2500VA / 240W	5000W	5000VA / 480W
Rated Load (Resistive load)	Resistive: 16A 277VAC/24VDC Motor: 1HP 240VAC TV-8 125VAC (NO contact)	5A 250VAC 10A 250VAC 8A 30VDC	10A 500VDC	20A 250VAC Motor: 1.5HP 250VAC
Coil Ratings				
Rated Voltage	5VDC to 110VDC	3VDC to 60VDC	3VDC to 60VDC	5VDC to 24VDC
Nominal Operating Power	0.53W, 0.72W	0.53W, 0.8W, 1.4W	0.8W, 1.4W	0.5W
Specifications				
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	15ms / 5ms	15ms / 5ms	15ms / 5ms	15ms / 5ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	Standard: 1 x 10 ⁷ OPS W Type(1.5mm): 5 x 10 ⁵ OPS W Type(2.0mm): 3 x 10 ⁵ OPS	1 x 10 ⁶ OPS	2 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	Standard: 1 x 10 ⁵ OPS W Type(1.5mm): 1 x 10 ⁵ OPS W Type(2.0mm): 3 x 10 ⁴ OPS	1 x 10 ⁴ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)				
Terminal Type	PCB	PCB	PCB	PCB, QC
Approved Standards	UL/CUL VDE CQC	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL VDE TÜV CQC
File No.	E134517 40023508 CQC10002046170	E134517 R50149131 CQC09002030294	E133481 R50507878 CQC21002290220	E134517 40026917 R50207576 CQC09002028692
Cross Reference	OMRON: G2R PANASONIC: JR1AF FUJITSU: FBR610 P&B: RKA/RKS	OMRON: G2R/G2RG PANASONIC: JR2/JR2A FUJITSU: FBR-F1/VSB NEC: TP P&B: RKA/RKS	OMRON: G2RG-X	OMRON: G5G PANASONIC: LE
Page	251	254	258	261




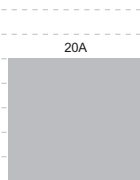
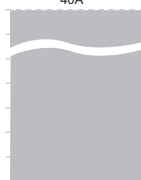
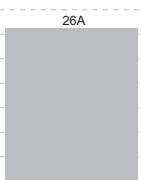
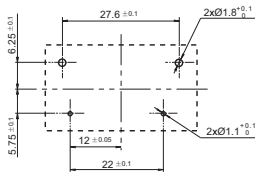
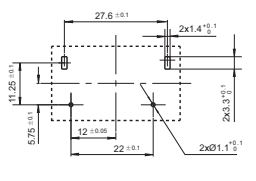
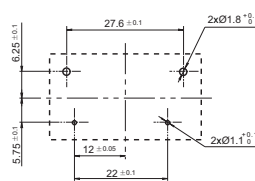
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF62F	HF62F-G	HF102F
Appearance			
Dimensions(L x W x H) mm	29.0 x 12.6 x 24.4	29.0 x 12.6 x 24.2	30.5 x 16.0 x 23.5
Features	<ul style="list-style-type: none"> • 20A switching capability • 5kV dielectric strength (between coil and contacts) • 10kV impulse withstand voltage (between coil and contacts) • creepage distance: 8mm 	<ul style="list-style-type: none"> • Suitable for microwave oven and other products • 5kV dielectric strength (between coil and contacts) • 10kV impulse withstand voltage (between coil and contacts) • 20A switching capability • Creepage distance: 8mm • UL insulation system: Class F 	<ul style="list-style-type: none"> • Heavy load up to 5000VA • Ideal for motor switching • Withstand inrush current of 80A • PCB & QC layouts available
Contact Ratings			
Contact Form	1A	1A	1A
Contact Material	AgSnO ₂	AgSnO ₂ , AgCdO	AgSnO ₂ , AgCdO
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC / 30VDC	250VAC	250VAC
Max. Switching Power	4000VA / 480W	5000VA	6250VA
Rated Load (Resistive load)	16A 250VAC/30VDC	20A 250VAC	20A 250VAC Motor: 2HP 240VAC
Coil Ratings			
Rated Voltage	5VDC to 48VDC	5VDC to 48VDC	5VDC to 48VDC
Nominal Operating Power	0.54W	0.54W	0.9W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	4500VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-25°C to 85°C
Operate / Release Time max.	20ms / 10ms	20ms / 10ms	20ms / 10ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	5 x 10 ⁶ OPS	2 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB, QC	PCB, QC	PCB, QC
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL VDE CQC
File No.	E133481 R50147086 CQC09002028470	E133481 R50147086 CQC09002028470	E134517 40024142 CQC13002098165
Cross Reference	OMRON: G5J PANASONIC: JR1AF-TMP FUJITSU: VR OEG: OMIF		OMRON: G4A PANASONIC: LF OEG: PCFN
Page	264	267	270




Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART




Type	HF161F	HF161F-40	HF161F-W
Appearance			
Dimensions(L x W x H) mm	30.4 x 15.9 x 23.3	30.4 x 15.9 x 23.3	30.4 x 15.9 x 23.3
Features	<ul style="list-style-type: none"> 4.5kV dielectric strength (between coil and contacts) Heavy load up to 6250VA Ideal for motor switching PCB layouts available 	<ul style="list-style-type: none"> 40A 277 VAC loading current capability Applicable to variable frequency air conditioning used for soft start Class F insulation system Products compliant with IEC 60079 available 	<ul style="list-style-type: none"> 31A switching capitable Applicable to inverter used for photovoltaic power generation systems Ideal for UPS 1.5mm contact gap (compliant to European Photovoltaic Standard VDE0126) The clearance distance between contact and coil is bigger than 6.4mm, the creepage distance is bigger than 8mm.
Contact Ratings			
Contact Form	1A	1A	1A
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂	AgSnO ₂
Max. Switching Current (Resistive load)			
Max. Switching Voltage	250VAC	277VAC	277VAC
Max. Switching Power	6250VA	11080VA	7750VA
Rated Load (Resistive load)	20A 250VAC Motor: 2HP 240VAC	Making 20A 100ms, loading 40A 800ms, Breaking 20 A, 277VAC, Resistive	Resistive: 26A 250VAC Inductive: 31A 250VAC
Coil Ratings			
Rated Voltage	5VDC to 48VDC	5VDC to 48VDC	9VDC to 24VDC
Nominal Operating Power	0.9W	0.9W	1.4W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4500VAC	4500VAC	4500VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C (Apply holding voltage to coil, which is 45% to 80% that of rated voltage)
Operate / Release Time max.	20ms / 10ms	20ms / 10ms	20ms / 10ms
Mechanical Endurance min.	2 x 10 ⁶ OPS	2 x 10 ⁶ 次	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ 次	3 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL VDE CQC	UL TUV CQC	UL/CUL VDE CQC
File No.	E134517 40031410 CQC10002050943 CQC18002203499	E134517 R 50475730 CQC20002246447	E134517 40031410 CQC10002050943 CQC18002203499
Cross Reference	OMRON: G4A PANASONIC: LF OEG: PCFN	BR-401L	PANASONIC: LF-G OEG: PCFN SOLAR
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Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF161F-40W	HF160F	HF182F-L
Appearance			
Dimensions(L x W x H) mm	30.4 x 15.9 x 23.3	30.4 x 15.9 x 25.4	22.0 x 10.0 x 14.0
Features	<ul style="list-style-type: none"> • Applicable to inverter used for photovoltaic power generation systems • Ideal for UPS • 43A 277VAC switching capability • Contact gap 2.0 mm, 1.8 mm is optional • Low coil holding voltage contributes to saving energy of equipment • Class F insulation system 	<ul style="list-style-type: none"> • 4.5kV dielectric strength (between coil and contacts) • Heavy load up to 6250VA • Ideal for motor switching • PCB & QC layouts 	<ul style="list-style-type: none"> • Latching relay • High capacity: 20A 277VAC • High surge current capacity: 370A • Meeting reinforce insulation • Dielectric strength: Between coil & contacts $\geq 5000\text{VAC}$ • High temperature resistance: 105°C • Meet IEC62368-1 • TV-10 240VAC Capability

Contact Ratings

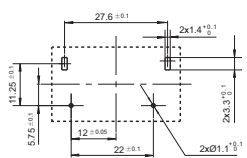
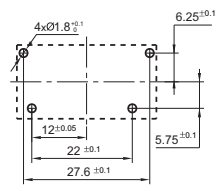
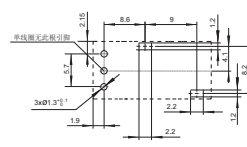
Contact Form	1A	1A	1A
Contact Material	AgSnO ₂	AgSnO ₂ , AgCdO	AgSnO ₂
Max. Switching Current (Resistive load)	 <p>43A</p>	 <p>20A</p>	 <p>20A</p>
Max. Switching Voltage	277VAC	250VAC	480VAC
Max. Switching Power	11911VA	6250VA	5540VA
Rated Load (Resistive load)	Making 20 A loading 40 A Breaking 20 A, 277VAC, Resistive	20A 250VAC Motor: 2HP 240VAC	20A 277VAC

Coil Ratings

Rated Voltage	6VDC to 24VDC	5VDC to 48VDC	3VDC to 24VDC
Nominal Operating Power	Standard type: 3.8W, 967: 1.6W	0.9W	1 coil latching: Approx. 0.53W 2 coils latching: Approx. 0.8W

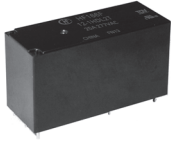


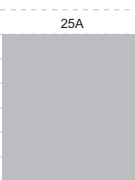


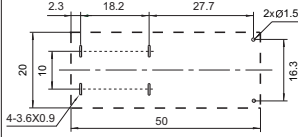
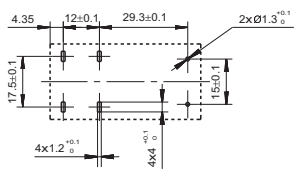
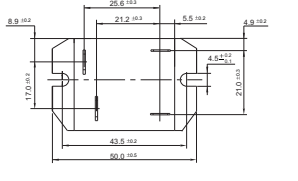
Specifications

Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4500VAC	4500VAC	5000VAC
Ambient Temperature	-40°C to 85°C (Apply holding voltage to coil)	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	20ms / 10ms	20ms / 10ms	10ms / 10ms
Mechanical Endurance min.	1 x 10 ⁵ OPS	2 x 10 ⁶ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS	1 x 10 ⁵ OPS	5 x 10 ⁴ OPS

Layout (Bottom view)			
Terminal Type	PCB	PCB, QC	PCB
Approved Standards	UL TUV CQC	UL/CUL VDE CQC	UL/CUL TÜV CQC
File No.	E134517 R 50475730 CQC20002246447	E134517 40024142 CQC12002072207 CQC18002206453	E133481 R50455116 CQC19002234396
Cross Reference	AZSR143	OMRON: G4A PANASONIC: JM FUJITSU: FTR-K3/VH OEG: PCF	
Page	281	284	287





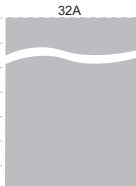

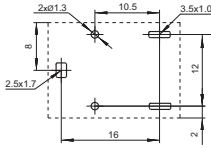
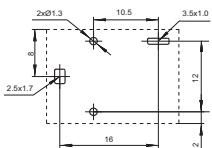
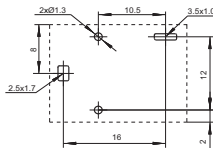
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF166F	HF177F	HF37F
Appearance			
Dimensions(L x W x H) mm	50.0 x 27.0 x 20.0	50.0 x 25.0 x 31.0	35.2 x 32.2 x 24.0
Features	<ul style="list-style-type: none"> Latching relay 4mm contact gap available 25A switching capability 5kV dielectric strength (between coil and contacts) Creepage distance between coil and contacts:10mm 	<ul style="list-style-type: none"> In series connection 10kA/in parallel connection 20kA lightning-proof current. 2 form A in series 300VDC 25A switching capability. 2 form A in series 400VDC 14A switching capability. 2.6mm contact gap 10kV dielectric strength(between coil and contacts) UL insulation system:class F available 	<ul style="list-style-type: none"> 30A switching capability 1 Form A configuration 70A withstands inrush current TV-15(at 120VAC) available
Contact Ratings			
Contact Form	1A+1B	2A	1A
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂ , AgCdO
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC	400VDC	277VAC
Max. Switching Power	6925VA	7500W	7500VA
Rated Load (Resistive load)	25A 277VAC	2 form A in series:25A 300VDC 2 form A in series:14A 400VDC	30A 250VAC
Coil Ratings			
Rated Voltage	5VDC to 48VDC	6VDC to 48VDC	5VDC to 60VDC
Nominal Operating Power	1.2W, 2.4W	4.0W	1.2W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	4000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C (Apply holding voltage to coi)	-40°C to 70°C
Operate / Release Time max.	25ms / 25ms	20ms / 10ms	20ms / 5ms
Mechanical Endurance min.	6 x 10 ⁵ OPS	2 x 10 ⁵ OPS	5 x 10 ⁵ OPS
Electrical Endurance min.	3 x 10 ⁴ OPS	1 x 10 ⁴ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	QC
Approved Standards	UL/CUL TÜV	UL/CUL TÜV CQC	UL/CUL VDE CQC
File No.	E133481 R50280244	E133481 R 50440159 CQC19002230667	E134517 40025378 CQC13002102287
Cross Reference		SONGCHUAN 118	FUJITSU: VF
Page	291	294	296




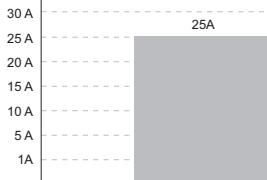

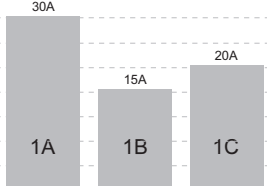
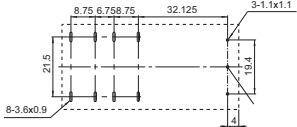
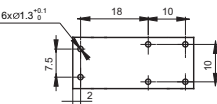
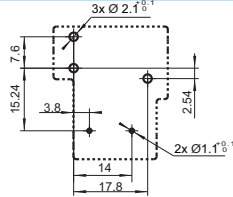
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF178F	HF178F-T	HF179F/HF179F-W
Appearance			
Dimensions(L x W x H) mm	21.5 x 16.0 x 20.6	21.5 x 16.0 x 20.6	21.5 x 16.0 x 20.6
Features	<ul style="list-style-type: none"> 32A swithing capitable. 4kV dielectric strength (between coil and contacts) (for type 1 PCB layout) Flux proofed type 	<ul style="list-style-type: none"> High Temperature:105°C 4kV dielectric strength (between coil and contacts) (for type1 PCB layout) Flux proofed type 	<ul style="list-style-type: none"> 32A swithing capitable. Ambient temperature up to 105°C 4kV dielectric strength (between coil and contacts) (for type 1/3 PCB layout) 1.8mm and 2.4mm contact gap available Flux proofed type
Contact Ratings			
Contact Form	1A, 1C	1A	1A
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC	277VAC	600VAC
Max. Switching Power	8864VA	8864VA	Standard:8864VA High Sensitive Type:7202VA
Rated Load (Resistive load)	32A 277VAC(at 85°C) 25A 277VAC(at 105°C)	32A 250VAC(at 85°C) Making 5A loading 32A Breaking 5A 277VAC(at 105°C)	Standard:32A 277VAC High Sensitive Type:26A 277VAC
Coil Ratings			
Rated Voltage	12VDC to 48VDC	12VDC to 48VDC	5VDC to 48VDC
Nominal Operating Power	1.67W	Standard:1.67W; High Sensitive Type:1.2W	Standard:2.8W; High Sensitive Type:1.67W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	Type 1:4000VAC Type 2:2500VAC	Type 1:4000VAC Type 2:2500VAC	Type 1/3:4000VAC Type 2/4:2500VAC
Ambient Temperature	-40°C to 105°C	-40°C to 105°C	-40°C to 105°C
Operate / Release Time max.	15ms / 10ms	15ms / 10ms	15ms / 10ms
Mechanical Endurance min.	3 x 10 ⁵ OPS	3 x 10 ⁵ OPS	1 x 10 ⁵ OPS
Electrical Endurance min.	1 x 10 ⁴ OPS	1 x 10 ⁴ OPS	Standard:1 x 10 ⁶ OPS; High Sensitive Type:3 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL TÜV CQC
File No.	E133481 R 50440273 CQC19002230674	E133481 R 50440273 CQC19002230674	E133481 R 50463696 CQC20002242160
Cross Reference	SONGCHUAN:207 series/110 series HASCO:HPK series	SONGCHUAN:207 series/110 series HASCO:HPK series	SONGCHUAN:207 series/110 series HASCO:HPK series
Page	299	302	304




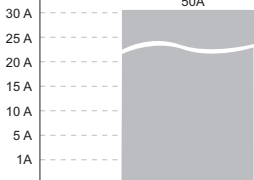
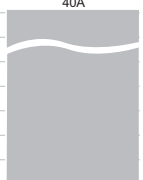
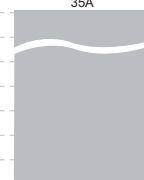
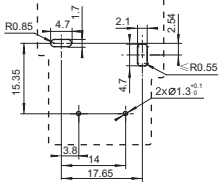
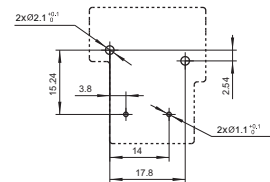
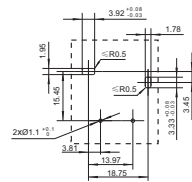
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF180F	HF181F	HF165FD
Appearance			
Dimensions(L x W x H) mm	63.6 x 38.0 x 30.0	33.0 x 14.0 x 31.0	32.2 x 27.5 x 20.4
Features	<ul style="list-style-type: none"> Latching relay, Zero consumption at standby. 2 Form A+ 2 Form B contact arrangement. General for ac/dc load. Supports multiple voltage energize, quick switch between contact sets. Contact gap $\geq 3\text{mm}$. Creepage $\geq 4\text{mm}$, Clearance $\geq 3\text{mm}$ (between contact set). 	<ul style="list-style-type: none"> 2 form A configurations 6.5 mm contact gap Withstand 10kV impulse voltage between contacts, contact groups and coil-contact 5KV dielectric between open contacts UL insulation system: Class F 	<ul style="list-style-type: none"> 30A switching capability 4kV dielectric strength (between coil and contacts) Creepage distance: 5.5mm Product in accordance to IEC 60335-1 available UL insulation system: Class F
Contact Ratings			
Contact Form	2A+2B	2A	1A, 1B, 1C
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂
Max. Switching Current (Resistive load)			
Max. Switching Voltage	410VDC/290VAC	1500VAC(2NO series connected)	277VAC
Max. Switching Power	10250W/7250VA	450VA	8310VA / 4155VA
Rated Load (Resistive load)	25A 410VDC/290VAC	250VAC 1A,30VDC 2A	1A: 30A 277VAC 1B: 15A 277VAC 1C: 20A 277VAC/10A 277VAC
Coil Ratings			
Rated Voltage	5VDC to 24VDC	5VDC to 110VDC	5VDC to 110VDC
Nominal Operating Power	Single coil latching:Approx.2.0W Double coil latching:Approx.4.0W	Approx. 4.6W	0.9W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	4000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	20ms / 20ms	30ms / 10ms	15ms / 10ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁵ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁴ OPS	1 x 10 ⁴ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL VDE CQC
File No.	E133481 R 50430279 CQC19002213614 CQC19002214098	E133481 R 50433434 CQC19002215718	E134517 40043143 CQC15002130956
Cross Reference		SONGCHUAN:207 series/110 series HASCO:HPK series	OMRON: G8P PANASONIC: JTN/JTV OEG: ORU P&B: T9A/T90 SONGCHUAN:832A
Page	307	310	312




Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

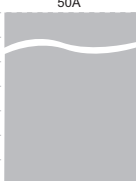
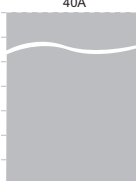
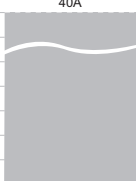
Type	HF165FD-50	HF165FD-G	HF165F
Appearance			
Dimensions(L x W x H) mm	32.2 x 27.5 x 20.4	32.2 x 27.5 x 20.4	32.2 x 27.4 x 19.4
Features	<ul style="list-style-type: none"> • 50A switching capability • 4kV dielectric strength (between coil and contacts) • Plastic sealed and flux proofed types available • UL insulation system: Class F 	<ul style="list-style-type: none"> • 40A switching capability • 4kV dielectric strength (between coil and contacts) • Creepage distance: 5.5mm • Product in accordance to IEC 60335-1 available • UL insulation system: Class F 	<ul style="list-style-type: none"> • 35A swithing capitable • Applicable to inverter used for photovoltaic power generation systems • Ideal for UPS • 1.8mm contact gap(compliant to European Photovoltaic Standard VDE0126) • Low coil holding voltage contributes to saving energy of equipment
Contact Ratings			
Contact Form	1A, 1C	1A	1A
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂
Max. Switching Current (Resistive load)	 <p>50A</p>	 <p>40A</p>	 <p>35A</p>
Max. Switching Voltage	277VAC	277VAC	277VAC
Max. Switching Power	13850VA	11080VA	9695VA
Rated Load (Resistive load)	NO:50A 277VAC NC:Making 10A,Loading 50A, Breaking 10A,277VAC	40A 277VAC	Resistive: 35A 250VAC Inductive: 35A 277VAC
Coil Ratings			
Rated Voltage	5VDC to 48VDC	5VDC to 110VDC	5VDC to 48VDC
Nominal Operating Power	1.2W	0.9W	2.25W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	4000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	15ms / 10ms	15ms / 10ms	15ms / 10ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁷ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ³ OPS	1 x 10 ⁴ OPS	3 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL VDE CQC	UL/CUL VDE TÜV CQC
File No.	E134517 R 50526316 CQC15002130956	E134517 40043143 CQC15002130956	E134517 40037289 CQC18002202621 R 50463438
Cross Reference		SONGCHUAN: 832HA	P&B: T9S SOLAR
Page	316	319	322

Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF165F-50	HF170F	HF187F
Appearance			
Dimensions(L x W x H) mm	32.2 x 27.4 x 19.4	36.0 x 30.0 x 40.0	59.0 x 35.0 x 47.0
Features	<ul style="list-style-type: none"> • 50A switching capability. • 4kV dielectric strength (between coil and contacts). • UL insulation system: class F available. 	<ul style="list-style-type: none"> • 40A switching capability • Applicable to solar photovoltaic inverter • 3.6 mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F 	<ul style="list-style-type: none"> • 4 Main contacts +1 Auxiliary contact • Detection of main contact welding makes it possible to construct a safety circuit (according to IEC 61810-3) • Meet the requirements for auxiliary contact linked with power contact (mirror contact) (according to IEC 60947-4-1) • Contact gap 3.9mm (Main contact),each contact • Low coil holding voltage contributes to energy saving • Special version fully compliant to the short circuit current test of IEC 62955 available

Contact Ratings

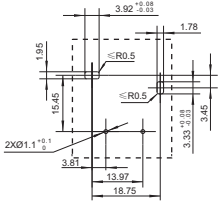
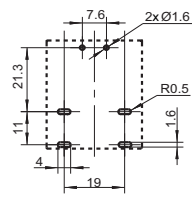
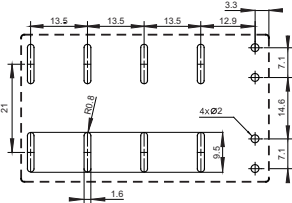
Contact Form	1A	2A/2A+1B	4A, 4A+1B
Contact Material	AgSnO ₂ , AgNi	Main contact: AgSnO ₂ , AgNi	Main contact: AgSnO ₂
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC	277VAC	440VAC
Max. Switching Power	12500VA	11080VA	17600VA
Rated Load (Resistive load)	50A 250VAC	40A 277VAC	Making 10A Loading 40A Breaking 10A, 440VAC Resistive

Coil Ratings

Rated Voltage	5VDC to 48VDC	6VDC to 48VDC	9VDC to 48VDC
Nominal Operating Power	1.2W	1.88W	4.8W






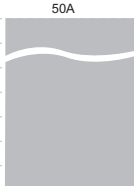
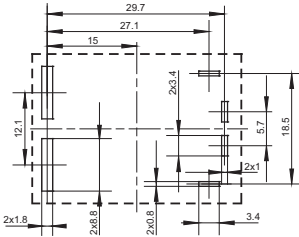
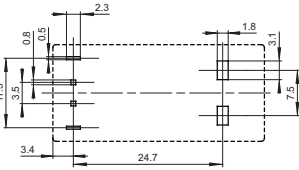
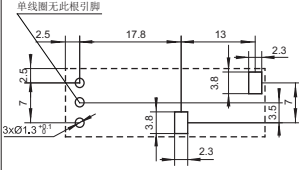
Specifications

Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 105°C	-40°C to 85°C (Apply holding voltage to coil)	-40°C to 85°C (Apply holding voltage to coil)
Operate / Release Time max.	15ms / 10ms	30ms / 10ms	50ms / 20ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁵ OPS
Electrical Endurance min.	6000 ops(50A 250VAC, Resistive load, at 65°C, 1s on 9s off, AgNi/AgSnO ₂) 3x10 ⁴ ops(40A 250VAC, Resistive load, at 85°C, 1s on 9s off, AgSnO ₂)	3 x 10 ⁴ OPS	5 x 10 ⁴ OPS

Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL TÜV CQC
File No.	E134517 R 50463438 CQC18002202621	E133481 R 50384178 CQC17002175164 CQC18002198581	E133481 R 50506590 CQC21002324800
Cross Reference	TYCO:T9VV CHUROD:CHS01 HASCO:HATF905	PANASONIC: HES HASCO:HAG02 CHUROD:CHIB-40	HER
Page	325	328	331




Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

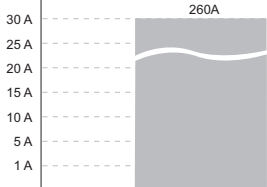


Type	HF189F	HF190F	HF191F-L
Appearance			
Dimensions(L x W x H) mm	35.0 x 25.0 x 28.0	32.0 x 16.0 x 28.0	35.0 x 12.0 x 24.0
Features	<ul style="list-style-type: none"> With auxiliary monitoring contact, Detection of main contact welding makes it possible to construct a safety circuit (according to IEC 61810-3) Contact gap: 2.25mm Main Contact Resistance to Short Circuit Current (according to IEC 62752 1.5kA 6kA2s) 4kV Dielectric strength (Between Main contact & coil) UL insulation system: Class F available 	<ul style="list-style-type: none"> With auxiliary monitoring contacts (according to Clause L.8.4 of IEC 60947-5-1) Main Contact gap: 2.25mm Main Contact Resistance to Short Circuit Current according to IEC 62752 1.5kA 6kA2s 627 type Resistance to Short Circuit Current according to IEC 62955:2018 9.11.2 3kA 4kV Dielectric strength (Between Main contacts & coil) UL insulation system: Class F available 	<ul style="list-style-type: none"> Latching relay High capacity: 50A 277VAC High surge current capacity: 480A TV-20 240VAC Capability Dielectric strength: Between coil & contacts ≥ 5000VAC
Contact Ratings			
Contact Form	1A+1B	1A+1B	1A
Contact Material	Main contact: AgSnO ₂	Main contact: AgSnO ₂	AgSnO ₂
Max. Switching Current (Resistive load)	 <p>48A</p>	 <p>32A</p>	 <p>50A</p>
Max. Switching Voltage	600VAC	277VAC	480VAC
Max. Switching Power	13296VA	8864VA	15360VA
Rated Load (Resistive load)	Main contact: Making 10A Loading 48A Breaking 10A, 277VAC	Main contact: Making 10A Loading 32A Breaking 10A, 277VAC	50A 277VAC
Coil Ratings			
Rated Voltage	5VDC to 48VDC	5VDC to 48VDC	3VDC to 48VDC
Nominal Operating Power	1.92W	1.55W/1.92W	1.2W, 2W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	30ms / 20ms	30ms / 20ms	15ms / 15ms
Mechanical Endurance min.	1 x 10 ⁵ OPS	5 x 10 ⁵ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS	5 x 10 ⁴ OPS	6 x 10 ³ OPS
Layout (Bottom view)			
Terminal Type		PCB	PCB
Approved Standards	UL TÜV	UL TÜV CQC	UL TUV CQC
File No.	E133481 R 50493573	E133481 R 50509389 CQC21002301055	CQC21002316567
Cross Reference			PANASONIC:DJ-H
Page	334	337	340

Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF192F	HF193F	HF195F
Appearance			
Dimensions(L x W x H) mm	41.4 x 45 x 50.5	20.0 x 12.7 x 15.7	26.6 x 22.2 x 29.0
Features	<ul style="list-style-type: none"> • 260A switching capability • Applicable to solar photovoltaic inverter • 4.0 mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F 	<ul style="list-style-type: none"> • High temperature 105°C • 30A 277VAC switching capability • Low holding power consumption: only 0.16W • 5kV dielectric strength (between coil and contacts) • Meeting reinforce insulation • UL insulation system: Class F 	<ul style="list-style-type: none"> • Able to work in a fluorine liquid environment • 32A carrying capability • 4kV dielectric strength (between coil and contacts) • Contact gap: ≥2.4mm • Meet to IEC62368-1 Clause G2.1 and G2.2 • UL insulation system: Class F

Contact Ratings

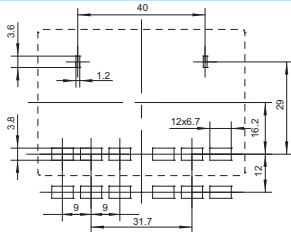
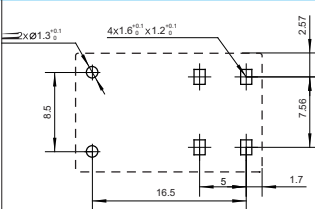
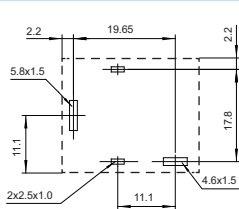
Contact Form	1A	1A	1A
Contact Material	AgNi	AgSnO ₂	AgSnO ₂
Max. Switching Current (Resistive load)			
Max. Switching Voltage	830VAC	277VAC	277VAC
Max. Switching Power	45650VA	8310VA	1385VA
Rated Load (Resistive load)	Making 55A, Loading 260A, Breaking 55A, 800VAC	30A 277VAC	Making 5A, Loading 32A, Breaking 5A, 277VAC

Coil Ratings

Rated Voltage	12VDC	5VDC to 24VDC	12VDC to 48VDC
Nominal Operating Power	3W	Approx. 1W	2.8W




Specifications

Insulation Resistance	1000MΩ	1000MΩ(500VDC)	1000MΩ(500VDC)
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 105°C (Apply holding voltage to coil)	-40°C to 85°C
Operate / Release Time max.	30ms / 10ms	15ms / 8ms	10ms / 5ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁵ OPS
Electrical Endurance min.	1 x 10 ⁴ OPS	1 x 10 ⁴ OPS	1 x 10 ⁴ OPS



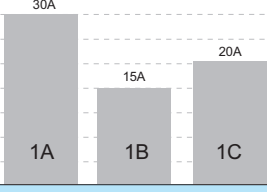
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL TÜV	UL TÜV	UL TUV CQC
File No.	E133481 R 50508861	E133481 R 50541915	E133481 R 50530822 CQC21002323731
Cross Reference			
Page	343	346	349

Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF196F	HF196F-Q	HF105F-1
Appearance			
Dimensions(L x W x H) mm	29.0 x 12.7 x 17.9	29.0 x 12.7 x 17.9(27.6)	32.3 x 27.1 x 20.0
Features	<ul style="list-style-type: none"> • 1 pole, 25 A, 1 form A (NO) • Coil power 530mW • Low Height: 17.9mm • Reinforced insulation • Product in accordance to IEC 60335-1 available • Ambient temperature up to 105°C • UL insulation system: Class F 	<ul style="list-style-type: none"> • 1 pole, 25 A, 1 form A (NO) • Coil power 530mW • Low Height: 17.9mm(27.6mm with quick connects) • Reinforced insulation • PCB & Quick connect terminal for load • Ambient temperature up to 105°C • UL insulation system: Class F 	<ul style="list-style-type: none"> • 40A switching capability • PCB coil terminals, ideal for heavy duty load • 4kV dielectric strength (between coil and contacts) • Heavy load up to 7200VA • Unenclosed, plastic sealed and dust protected types available

Contact Ratings

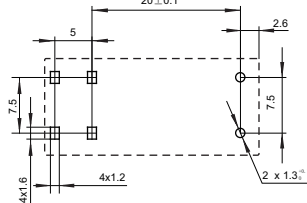
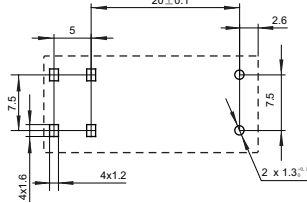
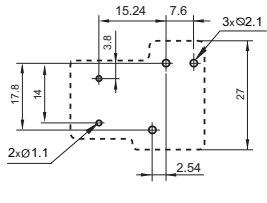
Contact Form	1A	1A	1A, 1B, 1C
Contact Material	AgSnO ₂	AgSnO ₂	AgSnO ₂ , AgCdO
Max. Switching Current (Resistive load)			
Max. Switching Voltage	250VAC	250VAC	277VAC / 28VDC
Max. Switching Power	6250VA	6250VA	7200VA / 560W
Rated Load (Resistive load)	25A 250VAC	25A 250VAC	1A: 30A 240VAC/20A 28VDC 1B: 15A 240VAC/10A 28VDC 1C: 20A/10A 240VAC/28VDC L Type(1A): 25A 240VAC/20A 28VDC

Coil Ratings

Rated Voltage	5VDC to 48VDC	5VDC to 48VDC	12VAC to 277VAC / 5VDC to 110VDC
Nominal Operating Power	0.53W	0.53W	2.0VA, 0.9W




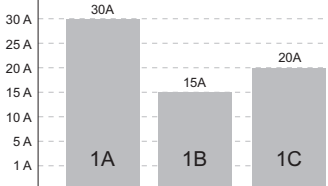
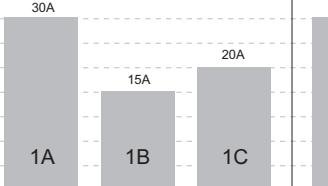
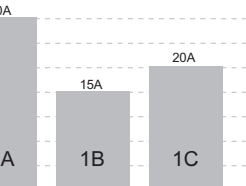
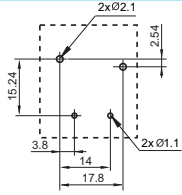
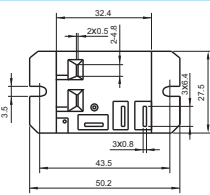
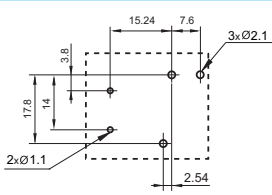
Specifications

Insulation Resistance	1000MΩ(500VDC)	1000MΩ(500VDC)	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	2500VAC / 4000VAC
Ambient Temperature	-40°C to 105°C	-40°C to 105°C	DC: -55°C to 85°C AC: -55°C to 60°C
Operate / Release Time max.	15ms / 5ms	15ms / 5ms	15ms / 10ms(DC type)
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS

Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards			UL/CUL VDE CQC
File No.			E134517_40025518(DC Type) CQC0902031229(Ningbo Factory, DC Type) CQC1202071130(Ningbo Factory, AC Type)
Cross Reference			OMRON: G8P PANASONIC: JTN/JTV OEG: ORU P&B: T9A/T90
Page	351	354	357




Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

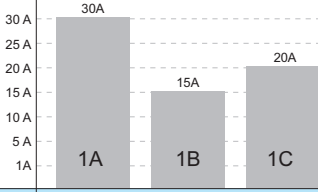
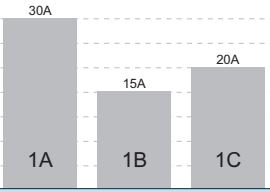
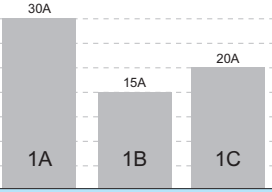
Type	HF105F-2	HF105F-4	HF105F-5
Appearance			
Dimensions(L x W x H) mm	32.2 x 27.5 x 27.8	50.0 x 27.2 x 27.8	32.4 x 27.3 x 27.8
Features	<ul style="list-style-type: none"> • 40A switching capability • PCB coil terminals, ideal for heavy duty load • Heavy load up to 7200VA • Plastic sealed and dust protected types available 	<ul style="list-style-type: none"> • 40A switching capability • 2.5kV dielectric strength (between coil and contacts) • Heavy load up to 7200VA • Plastic sealed and dust protected types available 	<ul style="list-style-type: none"> • 40A switching capability • PCB coil terminals, ideal for heavy duty load • Heavy load up to 7200VA • 4kV dielectric strength (between coil and contacts) • Plastic sealed and dust protected types available
Contact Ratings			
Contact Form	1A, 1B, 1C	1A, 1B, 1C	1A, 1B, 1C
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂ , AgCdO	AgSnO ₂ , AgCdO
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC / 28VDC	277VAC / 28VDC	277VAC / 28VDC
Max. Switching Power	7200VA / 560W	7200VA / 560W	7200VA / 560W
Rated Load (Resistive load)	1A: 30A 240VAC/20A 28VDC 1B: 15A 240VAC/10A 28VDC 1C: 20A/10A 240VAC/28VDC L Type(1A): 25A 240VAC/20A/28VDC	1A: 30A 240VAC/20A 28VDC 1B: 15A 240VAC/10A 28VDC 1C: 20A/10A 240VAC/28VDC L Type(1A): 25A 240VAC/20A/28VDC	1A: 30A 240VAC/20A 28VDC 1B: 15A 240VAC/10A 28VDC 1C: 20A/10A 240VAC/28VDC L Type(1A): 25A 240VAC/20A/28VDC
Coil Ratings			
Rated Voltage	12VAC to 277VAC / 5VDC to 110VDC	12VAC to 277VAC / 5VDC to 110VDC	12VAC to 277VAC / 5VDC to 110VDC
Nominal Operating Power	2.0VA, 0.9W	2.0VA, 0.9W	2.0VA, 0.9W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	2500VAC	2500VAC	4000VAC / 2500VAC
Ambient Temperature	DC: -55°C to 85°C AC: -55°C to 60°C	DC: -55°C to 85°C AC: -55°C to 60°C	DC: -55°C to 85°C AC: -55°C to 60°C
Operate / Release Time max.	15ms / 10ms(DC type)	15ms / 10ms(DC type)	15ms / 10ms(DC type)
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB, QC	QC	PCB, QC
Approved Standards	UL/CUL VDE CQC	UL/CUL VDE CQC	UL/CUL VDE CQC
File No.	E134517 40025518(DC Type) CQC10002049165(DC Type) CQC16002140270(Hong Yuanda Factory,DC Type)	E134517 40025518(DC Type) CQC09002031229(DC Type)	E134517 40025518(DC Type) CQC10002049165(DC Type) CQC16002140270(Hong Yuanda Factory,DC Type)
Cross Reference	OMRON: G7G/G8P PANASONIC: JT OEG: ORU P&B: 491/T9A	OMRON: G7G/G8P PANASONIC: JT OEG: ORU P&B: T9A	OMRON: G7G/G8P PANASONIC: JTN OEG: ORU P&B: T90/T9A
Page	363	367	371

Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF2100	HF2110 / HF2120	HF2150 / HF2151
Appearance			
Dimensions(L x W x H) mm	32.0 x 27.5 x 28.0	28.4 x 23.5 x 15.3	31.8 x 27.0 x 19.1
Features	<ul style="list-style-type: none"> • PCB coil terminals, ideal for heavy duty load • 2.5kV dielectric strength (between coil and contacts) • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 30A switching capability • 2.5kV dielectric strength (between coil and contacts) • Plastic sealed and flux proofed types available 	<ul style="list-style-type: none"> • 30A switching capability • 2.5kV dielectric strength (between coil and contacts) • Heavy load up to 7200VA • Plastic sealed and flux proofed type available

Contact Ratings

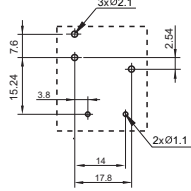
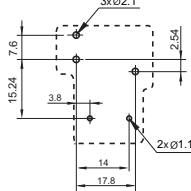
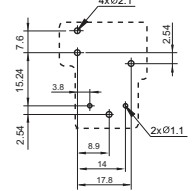
Contact Form	1A, 1B, 1C	1A, 1B, 1C	1A, 1B, 1C
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂ , AgCdO	AgSnO ₂ , AgCdO
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC / 30VDC	277VAC / 30VDC	277VAC / 30VDC
Max. Switching Power	7200VA / 600W	7200VA / 600W	7200VA / 600W
Rated Load (Resistive load)	1A: 30A 240VAC/20A 30VDC 1B: 15A 240VAC/10A 30VDC 1C: 20A/10A 240VAC/30VDC	1A: 30A 240VAC/20A 30VDC 1B: 15A 240VAC/10A 30VDC 1C: 20A/10A 240VAC/30VDC	1A: 30A 240VAC/20A 30VDC 1B: 15A 240VAC/10A 30VDC 1C: 20A/10A 240VAC/30VDC

Coil Ratings

Rated Voltage	5VDC to 110VDC	5VDC to 110VDC	5VDC to 110VDC
Nominal Operating Power	0.9W	0.9W	0.9W




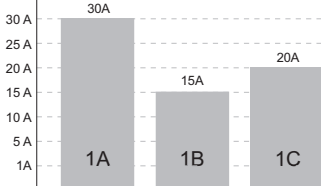
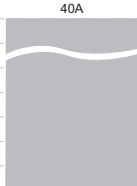

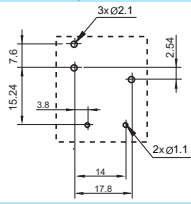
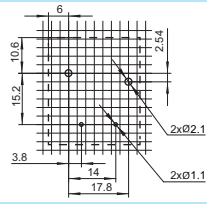
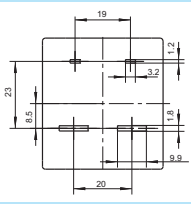
Specifications

Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	2500VAC	2500VAC	2500VAC
Ambient Temperature	-55°C to 85°C	-55°C to 85°C	-55°C to 85°C
Operate / Release Time max.	15ms / 10ms	15ms / 10ms	15ms / 10ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS (at 30A 240VAC)	1 x 10 ⁵ OPS (at 30A 240VAC)	1 x 10 ⁵ OPS (at 30A 240VAC)

Layout (Bottom view)			
Terminal Type	PCB, QC	PCB, QC	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL CQC	UL/CUL TÜV CQC
File No.	E134517 R50153835 CQC10002049166	E134517 CQC10002049166	E134517 R50153835 CQC10002049166
Cross Reference	OMRON: G7G PANASONIC: JT P&B: 491/T9A ZETTLER: AZ2100	OMRON: G7G PANASONIC: JT NEC: CT P&B: 491/T90 ZETTLER: AZ2110/AZ2120	OMRON: G7G PANASONIC: JTN/JTV NEC: CT P&B: T9A/T90 ZETTLER: AZ2150/AZ2151
Page	375	379	385




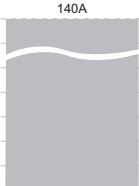

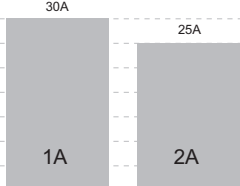
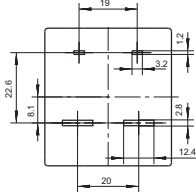
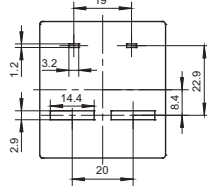
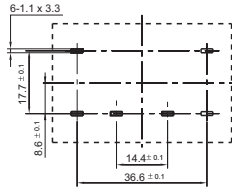
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF2160	HF2160(Screw type)	HF172F-100
Appearance			
Dimensions(L x W x H) mm	32.0 x 27.5 x 19.8	32.0 x 27.5 x 22.2	45.0 x 41.4 x 43.0
Features	<ul style="list-style-type: none"> • 30A switching capability • PCB coil terminals, ideal for heavy duty load • 2.5KV dielectric strength (between coil and contacts) • Plastic sealed and Dust proofed types available 	<ul style="list-style-type: none"> • 30A switching capability • PCB coil terminals Screw type • UL insulation system:Class F 	<ul style="list-style-type: none"> • 100A switching capability • Applicable to solar photovoltaic inverter • 4.0 mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F
Contact Ratings			
Contact Form	1A, 1B, 1C	1A	1A
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂	AgNi
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC / 30VDC	277VAC / 30VDC	800VAC
Max. Switching Power	7200VA / 600W	11080VA	24000VA
Rated Load (Resistive load)	1A: 30A 240VAC/20A 30VDC 1B: 15A 240VAC/10A 30VDC 1C: 20A/10A 240VAC/30VDC	30A 250VAC	Making 30A, Loading 100A, Breaking 30A, 690VAC 85°C
Coil Ratings			
Rated Voltage	5VDC to 110VDC	5VDC to 110VDC	6VDC to 24VDC
Nominal Operating Power	0.9W	0.9W	2.5W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	2500VAC	2500VAC	5000VAC
Ambient Temperature	-55°C to 85°C	-40°C ~ 85°C	-40°C to 85°C
Operate / Release Time max.	15ms / 10ms	15ms / 10ms	30ms / 10ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS (at 30A 240VAC)	5 x 10 ⁴ OPS	3 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB, QC	PCB, QC	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL TÜV
File No.	E134517 R50153835 CQC10002049166	E134517 50153835 CQC16002139675	E133481 R50393829
Cross Reference	PANASONIC: JT NEC: CT P&B: T9A/T90 ZETTLER: AZ2160	SONGCHUAN:511HP1	SONGCHUAN:511HP1
Page	389	393	396




Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART


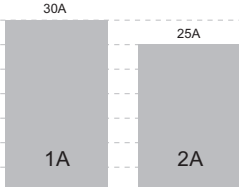
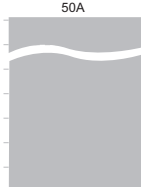
Type	HF172F-140	HF172F-200	HF116F-1
Appearance			
Dimensions(L x W x H) mm	45.0 x 41.4 x 43.0	41.4 x 45.0 x 50.5	50.5 x 32.9 x 36.0
Features	<ul style="list-style-type: none"> • 140A switching capability • Applicable to solar photovoltaic inverter • 3.0 mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F 	<ul style="list-style-type: none"> • 200A switching capability • Applicable to solar photovoltaic inverter • 4.0 mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F 	<ul style="list-style-type: none"> • 30A switching capability • 4kV dielectric strength (between coil and contacts) • Heavy load up to 8310VA • 3mm contact gap available
Contact Ratings			
Contact Form	1A	1A	1A, 2A
Contact Material	AgNi	AgSnO ₂	AgSnO ₂ , AgCdO
Max. Switching Current (Resistive load)			
Max. Switching Voltage	800VAC	830VAC	277VAC
Max. Switching Power	24000VA	166000VA	8310VA
Rated Load (Resistive load)	Making 40A, Loading 140A, Breaking 40A, 400VAC 85°C	Making 50A, Loading 200A, Breaking 50A 830VAC	1A: 30A 240VAC/30A 277VAC 2A: 25A 240VAC/25A 277VAC
Coil Ratings			
Rated Voltage	6VDC to 24VDC	12VDC	6VAC to 220/240VAC 3VDC to 200VDC
Nominal Operating Power	2.5W	3W	2.7VA, 1.9W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	4000VAC
Ambient Temperature	-40°C to 85°C	-40°C ~ 85°C	-55°C to 70°C
Operate / Release Time max.	30ms / 10ms	30ms / 10ms	30ms / 30ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁷ OPS
Electrical Endurance min.	3 x 10 ⁴ OPS	3 x 10 ⁴ OPS	1 x 10 ⁵ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB, QC, Panel Mount
Approved Standards	UL/CUL TÜV	UL/CUL TÜV	UL/CUL TÜV CQC
File No.	E133481 R50393829	E133481 R 50393829	E134517 R50154722 CQC09002031231(DC Type) CQC18002206328
Cross Reference	SONGCHUAN:511EP		OMRON: G7L PANASONIC: HE
Page	398	400	402

Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF116F-2	HF116F-3	HF116F-G
Appearance			
Dimensions(L x W x H) mm	51.5 x 34.9 x 36.0	50.5 x 32.9 x 51.0	51.5 x 34.9 x 36.0
Features	<ul style="list-style-type: none"> • 30A switching capability • 4kV dielectric strength (between coil and contacts) • 3mm contact gap available 	<ul style="list-style-type: none"> • 30A switching capability • 4kV dielectric strength (between coil and contacts) • Heavy load up to 8310VA • 3mm contact gap available 	<ul style="list-style-type: none"> • 50A switching capability • Applicable to inverter used for photovoltaic power generation systems • 4kV dielectric strength (between coil and contacts) • 3mm contact gap (compliant to European Photovoltaic Standard VDE0126, compliant to IEC 62109-2-2011)

Contact Ratings

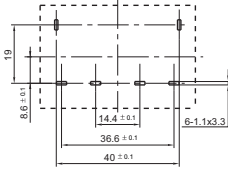
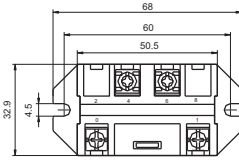
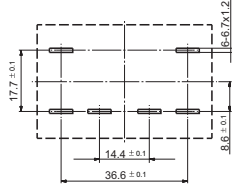
Contact Form	1A, 2A	1A, 2A	1A, 2A
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂ , AgCdO	AgSnO ₂ , AgNi
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC	277VAC	277VAC
Max. Switching Power	8310VA	8310VA	15235VA
Rated Load (Resistive load)	1A: 30A 240VAC/30A 277VAC 2A: 25A 240VAC/25A 277VAC	1A: 30A 240VAC/30A 277VAC 2A: 25A 240VAC/25A 277VAC	50A 277VAC

Coil Ratings

Rated Voltage	6VAC to 220/240VAC 3VDC to 200VDC	6VAC to 220/240VAC 3VDC to 200VDC	3VDC to 48VDC
Nominal Operating Power	2.7VA, 1.9W	2.7VA, 1.9W	3.2W




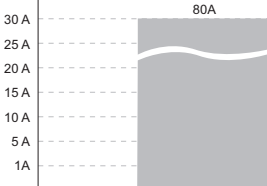
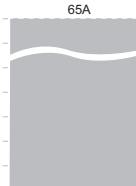
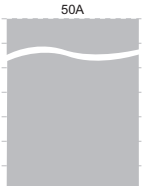
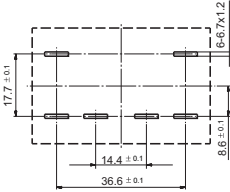
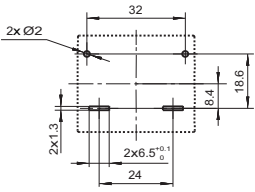
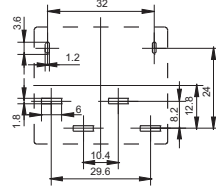
Specifications

Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	4000VAC
Ambient Temperature	-55°C to 70°C	-55°C to 70°C	-40°C to 85°C
Operate / Release Time max.	30ms / 30ms	30ms / 30ms	30ms / 30ms
Mechanical Endurance min.	1 x 10 ⁷ OPS	1 x 10 ⁷ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS	3 x 10 ⁴ OPS

Layout (Bottom view)			
Terminal Type	PCB, QC, Panel Mount	Screw	PCB
Approved Standards	UL/CUL TÜV CQC	UL/CUL TÜV CQC	UL/CUL TÜV
File No.	E134517 R50154722 DE/TUR/ExTR20.0074/00 CQC09002031231(DC Type) CQC18002206328	E134517 R50154722 CQC09002031231(DC Type) CQC18002206328	E134517 R50154722 CQC09002031231 CQC18002206328
Cross Reference	OMRON: G7L PANASONIC: HE	OMRON: G7L PANASONIC: HE	PANASONIC: HE SONGCHUAN: 510H
Page	406	410	414




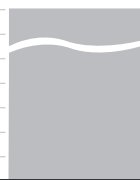
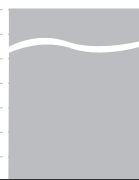
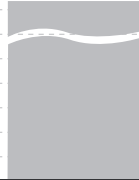
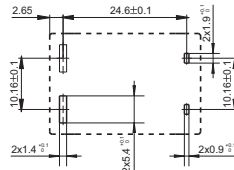
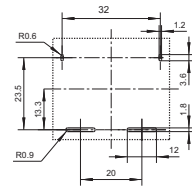
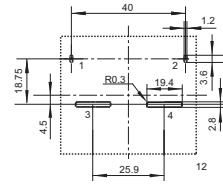
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF116F-80	HF176F	HF185F
Appearance			
Dimensions(L x W x H) mm	50.5 x 32.9 x 36.0	38.0 x 33.0 x 36.8	40.0 x 35.0 x 38.8
Features	<ul style="list-style-type: none"> • 80A switching capability • Applicable to solar photovoltaic inverter • Applicable to UPS • 3mm contact gap (compliant to European Photovoltaic Standard VDE0126, compliant to IEC 62109-2-2011) • 4kV dielectric strength (between coil and contacts) 	<ul style="list-style-type: none"> • 65A switching capability. • Applicable to solar photovoltaic inverter • 3mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F 	<ul style="list-style-type: none"> • Two groups 50A contact switching ability • Applicable to inverter used for photovoltaic power generation systems • Switching between zero line and fire line • 3.0 mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F
Contact Ratings			
Contact Form	1A	1A	2A
Contact Material	AgSnO ₂ , AgNi	AgSnO ₂ , AgNi	AgSnO ₂
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC/60VDC	400VAC	600VAC
Max. Switching Power	24930VA	18005VA	13850VA
Rated Load (Resistive load)	80A 60VDC/80A 250VAC	Making 20A, Loading 65A, Breaking 20A 277VAC 85°C	Making 20A, Loading 50A, Breaking 20A 277VAC, Resistive load
Coil Ratings			
Rated Voltage	3VDC to 48VDC	6VDC to 24VDC	6VDC to 24VDC
Nominal Operating Power	3.2W	1.92W	3W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	5000VAC 1min	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	30ms / 30ms	30ms / 10ms	30ms / 30ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	6 x 10 ³ OPS	3 x 10 ⁴ OPS	3 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV	UL/CUL TÜV CQC	UL/CUL TÜV
File No.	E134517 R 50154722 CQC09002031231 CQC18002206328	E133481 R50411032 CQC20002238014	E133481 R 50496728
Cross Reference	PANASONIC: HE SONGCHUAN: 511E	PANASONIC: HE	
Page	418	420	422




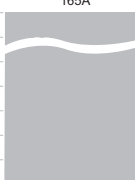
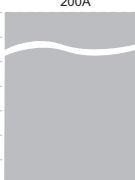
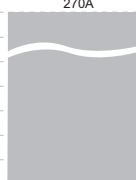
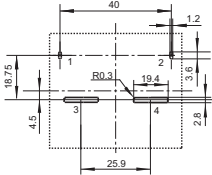
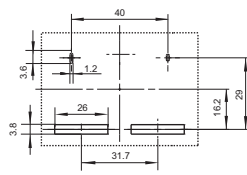
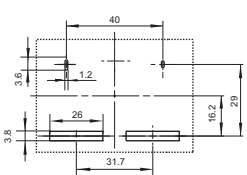
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF186F	HF167F	HF167F-G
Appearance			
Dimensions(L x W x H) mm	30.0 x 20.0 x 31.0	38.0 x 33.0 x 39.5	50.0 x 41.0 x 43.0
Features	<ul style="list-style-type: none"> • Applicable to inverter used for photovoltaic power generation systems • Applicable to UPS • 55A 277VAC loading current capability • 3.0mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F 	<ul style="list-style-type: none"> • 90A switching capability • Applicable to solar photovoltaic inverter • 3mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F 	<ul style="list-style-type: none"> • 120A switching capability • Applicable to solar photovoltaic inverter • 3.6 mm contact gap • Low coil holding voltage contributes to saving energy of equipment • UL insulation system: Class F
Contact Ratings			
Contact Form	1A	1A	1A
Contact Material	AgSnO ₂	AgSnO ₂ , AgNi	AgNi
Max. Switching Current (Resistive load)	 <p>30 A 25 A 20 A 15 A 10 A 5 A 1 A</p>	 <p>90 A</p>	 <p>120 A</p>
Max. Switching Voltage	600VAC	400VAC	800VAC
Max. Switching Power	13850VA	25920VA	44000VA
Rated Load (Resistive load)	Making 20A, Loading 55A, Breaking 20A 277VAC, Resistive load	Making 30A, Loading 100A, Breaking 30A 400VAC 85°C	Making 55A, Loading 120A, Breaking 55A 800VAC
Coil Ratings			
Rated Voltage	6VDC to 48VDC	6VDC to 24VDC	6VDC to 24VDC
Nominal Operating Power	2.5W	1.92W	2.5W
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 105°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	20ms / 10ms	30ms / 10ms	30ms / 10ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	5 x 10 ⁴ OPS	3 x 10 ⁴ OPS	6 x 10 ³ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL TUV CQC	UL/CUL TÜV CQC	UL/CUL TÜV
File No.	E133481 R 50476790 CQC20002260253	E133481 R50360703 CQC17002164558	E133481 R 50374273
Cross Reference		PANASONIC: HE	PANASONIC: HE-N
Page	425	428	431




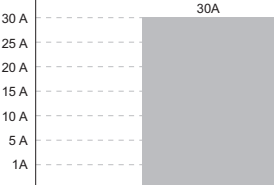

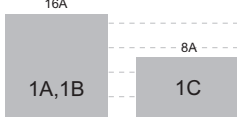
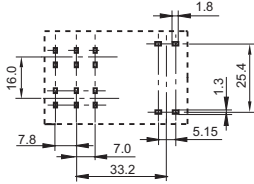
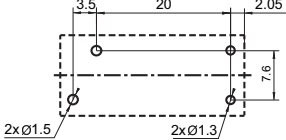
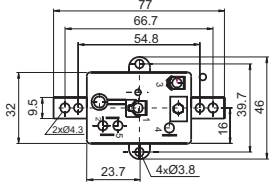
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF167F-140	HF167F-200	HF167F-270
Appearance			
Dimensions(L x W x H) mm	50.0 x 41.0 x 53.0	65.0 x 45.9 x 53.0	65.0 x 45.9 x 53.0
Features	<ul style="list-style-type: none"> 165A switching capability Applicable to solar photovoltaic inverter 3.6 mm contact gap Low coil holding voltage contributes to saving energy of equipment UL insulation system: Class F 	<ul style="list-style-type: none"> 200A switching capability Applicable to solar photovoltaic inverter 4 mm contact gap Low coil holding voltage contributes to saving energy of equipment UL insulation system: Class F 	<ul style="list-style-type: none"> 200A switching capability Applicable to solar photovoltaic inverter 4.0 mm contact gap Low coil holding voltage contributes to saving energy of equipment UL insulation system: Class F
Contact Ratings			
Contact Form	1A	1A	1H
Contact Material	AgNi	AgNi	AgSnO ₂ , AgNi
Max. Switching Current (Resistive load)	 <p>165A</p>	 <p>200A</p>	 <p>270A</p>
Max. Switching Voltage	800VAC	830VAC	1000VAC
Max. Switching Power	44000VA	45650VA	270000VA
Rated Load (Resistive load)	Making 55A Loading 165A Breaking 55A 800VAC	Making 55A, Loading 200A, Breaking 55A 800VAC	Making 50A Loading 270A Breaking 50A 1000VAC
Coil Ratings			
Rated Voltage	6VDC to 24VDC	6VDC to 24VDC	12VDC Standard type 3W High power consumption type 5W
Nominal Operating Power	2.5W	3W	
Specifications			
Insulation Resistance	1000MΩ	1000MΩ	1000MΩ
Dielectric Strength (Between coil and contacts)	5000VAC	5000VAC	5000VAC
Ambient Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operate / Release Time max.	30ms / 10ms	30ms / 10ms	30ms / 10ms
Mechanical Endurance min.	1 x 10 ⁶ OPS	1 x 10 ⁶ OPS	3 x 10 ⁵ OPS
Electrical Endurance min.	6 x 10 ³ OPS	3 x 10 ⁴ OPS	AgSnO ₂ :1 x 10 ⁴ OPS, AgNi:3 x 10 ⁴ OPS
Layout (Bottom view)			
Terminal Type	PCB	PCB	PCB
Approved Standards	UL/CUL TÜV	UL/CUL TÜV	UL/CUL TÜV
File No.	E133481 R 50374273	E133481 R 50374273	E133481 R 50374273
Cross Reference			
Page	433	435	437



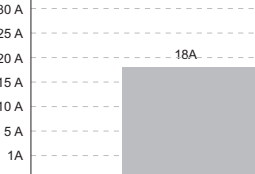

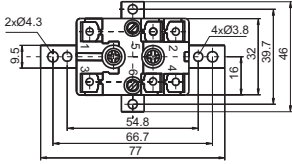
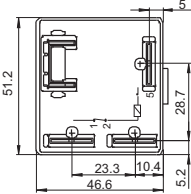
Note: Specification and dimensions in this catalog are subject to change without notice.

POWER RELAY SELECTION CHART

Type	HF92F	HF78F	HF84F
Appearance			
Dimensions(L x W x H) mm	52.0 x 33.7 x 26.7	25.5 x 12.5 x 28.5	47.0 x 32.0 x 28.5
Features	<ul style="list-style-type: none"> • 30A switching capability • Creepage distance: 8mm • 4kV dielectric strength (between coil and contacts) • Plastic sealed and flux proofed types • PCB & QC layouts 	<ul style="list-style-type: none"> • Suitable for microwave oven • 20A switching capability • 4.0kV dielectric strength (between coil and contacts) • Low height: 28.5 mm 	<ul style="list-style-type: none"> • 16A switching capability • 2.5kV dielectric strength (between coil and contacts) • Panel mount, various terminal types
Contact Ratings			
Contact Form	2A, 2C	1A	1A, 1B, 1C
Contact Material	AgSnO ₂ , AgCdO	AgSnO ₂	AgCe
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC	250VAC	240VAC
Max. Switching Power	8310VA	4000VA	3840VA
Rated Load (Resistive load)	NO: 30A 250VAC/30A 277VAC NC: 3A 250VAC/3A 277VAC	16A 250VAC 16A 30VDC	1A, 1B: 16A 120/240VAC 1C: 8A 120/240VAC
Coil Ratings			
Rated Voltage	24VAC to 277VAC 5VDC to 110VDC	3VDC to 36VDC	6VAC to 277VAC / 6VDC to 120VDC
Nominal Operating Power	4.0VA, 1.7W	0.54W	3.5VA, 2.1W
Specifications			
Insulation Resistance	1000MΩ	1200MΩ	500MΩ
Dielectric Strength (Between coil and contacts)	4000VAC	4000VAC	2500VAC
Ambient Temperature	AC: -40°C to 65°C DC: -40°C to 85°C	-40°C to 85°C	-40°C to 65°C
Operate / Release Time max.	25ms / 25ms(DC type)	15ms / 5ms	25ms / 25ms
Mechanical Endurance min.	5 x 10 ⁶ OPS	1 x 10 ⁷ OPS	1 x 10 ⁶ OPS
Electrical Endurance min.	1 x 10 ⁵ OPS	1 x 10 ⁷ OPS	1 x 10 ⁵ OPS (at 16A 250VAC)
Layout (Bottom view)			
Terminal Type	PCB, QC	PCB, QC	QC
Approved Standards	UL/CUL VDE CQC	UL/CUL TÜV CQC	UL/CUL
File No.	E134517 40016109 CQC09002037814(DC) CQC18002202752(DC) CQC18002202751(AC) CQC14002114447(AC) DE/TUR/ExTR20.0065/00 TUV 21 ATEX 8725 U	E133481 R50375929 CQC17002171481	E134517
Cross Reference	P&B, SCHRACK: T92 FEME: CS/CF30	SONGCHUAN:302	WHITE RODGERS 90-290 to 295 90-203, 204, 205
Page	441	445	448

Note: Specification and dimensions in this catalog are subject to change without notice.

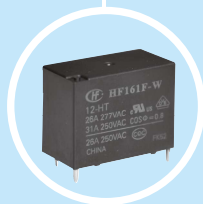
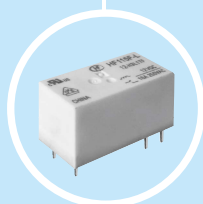
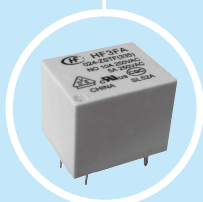
POWER RELAY SELECTION CHART

Type	HF94F	HF8565	
Appearance			
Dimensions(L x W x H) mm	47.0 x 32.0 x 28.5	51.2 x 46.6 x 36.5	
Features	<ul style="list-style-type: none"> • 25A switching capability • 2kV dielectric strength (between coil and contacts) • Panel mount, various terminal types 	<ul style="list-style-type: none"> • Motor start potential relay • 50A switching capability • 1 Form B configurations • 250" quick connect termination • Variety of mounting positions 	
Contact Ratings			
Contact Form	1A, 1B, 1C, 1A+1B	1B	
Contact Material	AgCe, AgCdO	AgCdO	
Max. Switching Current (Resistive load)			
Max. Switching Voltage	277VAC		
Max. Switching Power	4986VA		
Rated Load (Resistive load)	18A 277VAC	16A(make and break) 400VAC 35A(break only) 400VAC 50A(break only) 400VAC	
Coil Ratings			
Rated Voltage	6VAC to 277VAC / 6VDC to 120VDC		
Nominal Operating Power	4.0VA, 2.4W	5.0VA	
Specifications			
Insulation Resistance	500MΩ		
Dielectric Strength (Between coil and contacts)	2000VAC		
Ambient Temperature	-40°C to 65°C		
Operate / Release Time max.	25ms / 25ms		
Mechanical Endurance min.	1 x 10 ⁶ OPS	7.5 x 10 ⁵ OPS	
Electrical Endurance min.	5 x 10 ⁴ OPS (at 25A 277VAC)	5 x 10 ⁵ OPS (at 16A 400VAC)	
Layout (Bottom view)			
Terminal Type	QC	QC	
Approved Standards	UL/CUL	UL/CUL	
File No.	E134517	SA13318	
Cross Reference	WHITE RODGERS 90-360, 362, 364 90-370, 372, 374 90-380, 382, 384	GE: 3ARR22 ELECTRICA: RVA	
Page	450	453	

Note: Specification and dimensions in this catalog are subject to change without notice.

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HF3FA/HF3FA-T	133	HF115FK-T	231
HF3FA-G	136	HF158F	234
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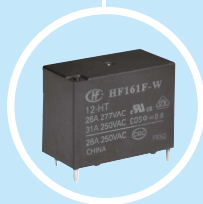
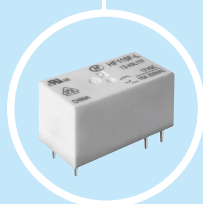
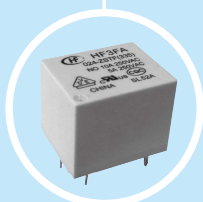
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HF179F/HF179F-W	304	HF116F-1	402
HF180F	307	HF116F-2	406
HF181F	310	HF116F-3	410
HF165FD	312	HF116F-G	414
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HF92F	441		



HF49FD

MINIATURE POWER RELAY



File No. : E133481



File No. : 40033644



File No. : R50149334



File No.:CQC17002175722



Features

- 5A switching capability
- 3kV dielectric strength (between coil and contacts)
- Slim size (width 5mm, height 12.5mm)
- High sensitive: Min. 120mW
- Meets IEC61131-2 reinforce insulation
- Creepage/clearance distance: Min. 3.5mm
- Sockets available

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact Resistance ¹⁾ (at 1A 6VDC)	No gold plated: 100mΩ max. Gold plated: 50mΩ max.
Contact material	AgSnO ₂ , AgNi
Contact rating (Res. load)	5A 250VAC/30VDC
Max. switching voltage	250VAC /125VDC(at0.3A)
Max. switching current	5A
Max. switching power	1250VA / 150W
Min. contact load ¹⁾	No gold plated: 5VDC 10mA Gold plated: 5VDC 1mA
Mechanical endurance	2 x 10 ⁷ OPS
Electrical endurance	1 x 10 ⁵ OPS (3A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) 5 x 10 ⁴ OPS (5A 250VAC/30VDC, Resistive load, AgNi, Room temp., 1s on 9s off)

Notes: 1) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	3000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage(between coil & contacts) ⁴⁾		6kV (1.2 / 50μs)
Operate time (at rated.volt.)		10ms max.
Release time (at rated.volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5%RH to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 3g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B, Class A.
4) Contact refers to the mov.-contact.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

COIL

Coil power	Approx. 120mW (at 5VDC to 18VDC) Approx. 180mW (at 24VDC)
------------	--

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ²⁾	Drop-out Voltage VDC min. ²⁾	Max. Voltage VDC ³⁾	Coil Resistance Ω
5	3.50	0.25	6.0	208 x (1±10%)
6	4.20	0.30	7.2	300 x (1±10%)
9	6.30	0.45	10.8	675 x (1±10%)
12	8.40	0.60	14.4	1200 x (1±10%)
18	12.6	0.90	21.6	2700 x (1±15%)
24	16.8	1.20	28.8	3200 x (1±15%)

Notes: 1) All above data are tested when the relays terminals are downward position. Other positions of the terminals, the pick-up and drop-out voltages will have ±5% tolerance. For example, when the relay terminals are transverse position, the max. pick-up voltage change is 75% of nominal voltage.
2) The data shown above are initial values.

3) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

4) 24VDC 120mW type are also available, please see ordering information for more details.

SAFETY APPROVAL RATINGS

UL/CUL	1H1 type	AgSnO ₂	3A 250VAC COSØ=1 at 85°C 3A 30VDC L/R =0ms at 85°C
		AgNi	5A 250VAC COSØ=1 5A 30VDC L/R =0ms
	1H2 type	AgNi	3A 250VAC COSØ=1 at 85°C 3A 30VDC L/R =0ms at 85°C 5A 250VAC COSØ=1 5A 30VDC L/R =0ms
VDE			5A 250VAC COSØ=1 at 85°C 5A 30VDC L/R =0ms at 85°C
TÜV			5A 250VAC COSØ=1 at 70°C 5A 30VDC L/R =0ms at 70°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

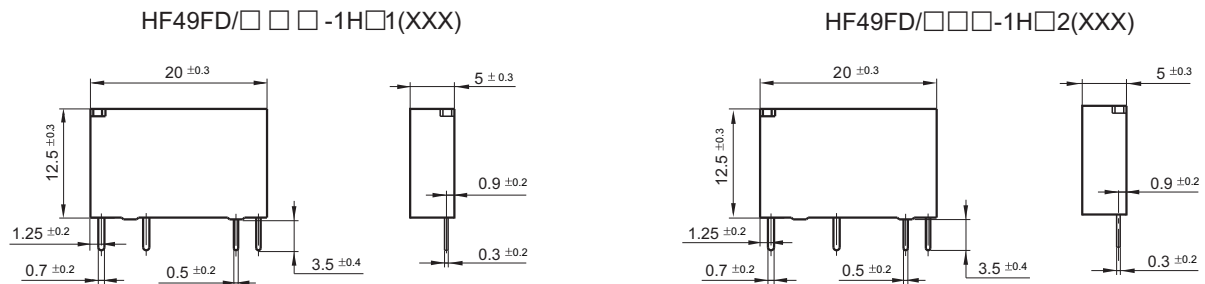
ORDERING INFORMATION

Type	HF49FD / 012 -1H 1 2 G T F L (XXX)									
Coil voltage	5, 6, 9, 12, 18, 24VDC									
Contact arrangement	1H: 1 Form A									
Contact version	1: Single contact 2: Bifurcated contact(Only for gold plated)									
Space between terminals (See the following)	1: 5.08mm 2: 7.62mm									
Contact plating	G: Gold plated Nil: No gold plated (Only for single contact)									
Contact material	T: AgSnO ₂ (Only for single contact) Nil: AgNi									
Insulation standard	F: Class F B: Class B Nil: Class A									
Coil power	L: Sensitive (Only for 24VDC) Nil: Standard									
Special code ²⁾	XXX: Customer special requirement Nil: Standard									

Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 2) The customer special requirement express as special code after evaluating by Hongfa.
 3) If customer need to fix HF49FD in 49F socket (HF49FD+49F socket) in application, please choose HF49FD relay with suffix (009) or suffix (086).
 4) Standard tube packing length is 546mm. Any special requirement needed, please contact us for more details.
 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

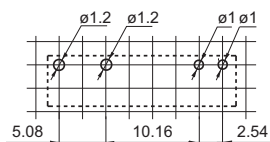
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Outline Dimensions

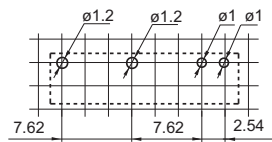


PCB Layout (Bottom view)

HF49FD/□□□-1H□1(XXX)



HF49FD/□□□-1H□2(XXX)



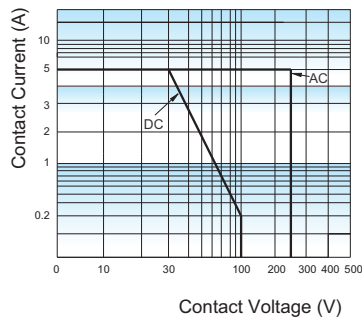
Wiring Diagram (Bottom view)



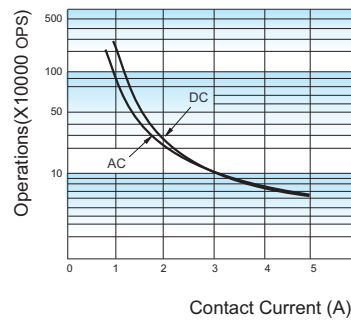
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
 2) The tolerance without indicating for PCB layout is always ± 0.1 mm.
 3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



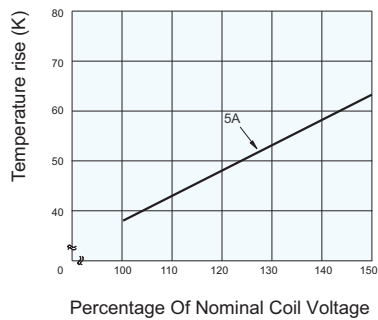
ENDURANCE CURVE



Test conditions:

1H1 type: AgNi, Resistive load, 250VAC/30VDC,
Room temp., 1s on 9s off.

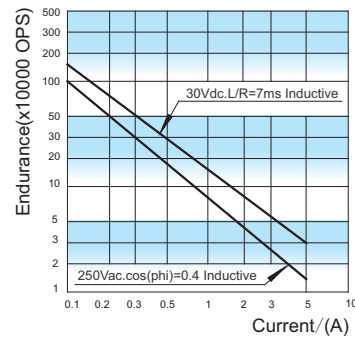
COIL TEMPERATURE RISE



Test conditions:

5A 85°C
(Typical curve of 24VDC standard type)

ELECTRICAL ENDURANCE CURVE OF INDUCTIVE LOAD



Test conditions:

1H1 : Room temp, 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF41F

SUBMINIATURE POWER RELAY



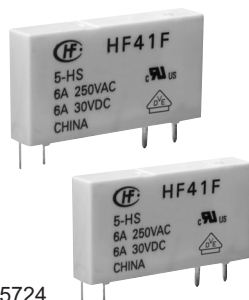
File No.: E133481



File No.: 40020043



File No.: CQC17002175724



Features

- Slim size (width 5mm)
- 6A switching capability 4kV dielectric strength (between coil and contacts)
- Surge voltage up to 6kV (between coil and contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- High sensitive: Approx.170mW
- Sockets available
- 1 Form A and 1 Form C configurations

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	No gold plated:100mΩ max. (at 1A 6VDC) Gold plated: 30mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂ , AgNi
Contact rating (Res. load)	6A 250VAC / 30VDC
Max. switching voltage	400VAC / 300VDC
Max. switching current	6A
Max. switching power	1500VA / 180W
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	H type: 6 x 10 ⁴ OPS (6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) Z type: 3 x 10 ⁴ OPS (NO, 6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) 1 x 10 ⁴ OPS (NC, 6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off)

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1 min
	Between open contacts	1000VAC 1 min
Operate time (at rated.volt.)		8ms max.
Release time (at rated.volt.)		4ms max.
Shock resistance*1)	Functional	49m/s ²
	Destructive	980m/s ²
Vibration resistance*1)		10Hz to 55Hz 1mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 5g
Construction		Plastic sealed, Flux proofed

- Notes: 1) *Index is that of relay without socket and is not in relay length direction.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) Please do not install a SPDT(1 Form C) type relay on either of the smallest sides or facing downward.
5) UL insulation system: Class A.



HONGFA RELAY

ISO9001, ISO/TS16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED 2023 Rev. 1.00

COIL

Coil power	5VDC to 24VDC: Approx. 170mW 48VDC, 60VDC: Approx. 210mW
------------	---

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ²⁾	Drop-out Voltage VDC min. ²⁾	Max. Voltage VDC ³⁾	Coil Resistance Ω
5	3.75	0.25	7.5	147 x (1±10%)
6	4.50	0.30	9.0	212 x (1±10%)
9	6.75	0.45	13.5	476 x (1±10%)
12	9.00	0.60	18	848 x (1±10%)
18	13.5	0.90	27	1906 x (1±15%)
24	18.0	1.20	36	3390 x (1±15%)
48 ⁴⁾	36.0	2.40	72	10600 x (1±15%)
60 ⁴⁾	45.0	3.00	90	16600 x (1±15%)

- Notes: 1) When require pick-up voltage ≤ 70% nominal voltage, special order allowed.
2) The data shown above are initial values.
3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	6A 30VDC at 85°C 6A 277VAC at 85°C R300 B300
VDE	6A 30VDC at 85°C 6A 250VAC at 85°C

- Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION						
Type	HF41F /	12	-H	8	S	T G (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC					
Contact arrangement	H: 1 Form A		Z: 1 Form C			
Version ¹⁾	8: Flat pack version		Nil: Vertical version			
Construction ²⁾³⁾	S: Plastic sealed		Nil: Flux proofed			
Contact material	T: AgSnO ₂		Nil: AgNi			
Contact plating ⁴⁾	G: Gold plated		Nil: No gold plated			
Special code ⁵⁾	XXX: Customer special requirement			Nil: Standard		

7) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

Unit: mm

Technical drawings of Form A and Form C, showing vertical and flat pack versions. The drawings include dimensions for width, height, and various internal features.

Form A Vertical version: Dimensions include 28 (width), 15 (height), 0.5 (top offset), 0.5 (bottom offset), 0.9 (bottom offset), 3.78 (width), 16.38 (width), 5.04 (width), 1 (width), 1 (width), 3.5 (width), and 5 (width).

Form C Vertical version: Dimensions include 28 (width), 15 (height), 0.5 (top offset), 0.5 (bottom offset), 0.9 (bottom offset), 3.78 (width), 16.38 (width), 5.04 (width), 5.04 (width), 1 (width), 1 (width), 1 (width), 3.5 (width), and 5 (width).

Form A Flat pack version: Dimensions include 28 (width), 15 (height), 0.5 (top offset), 0.5 (bottom offset), 0.9 (bottom offset), 3.78 (width), 16.38 (width), 5.04 (width), 1 (width), 1 (width), 3.0 (width), and 5 (width).

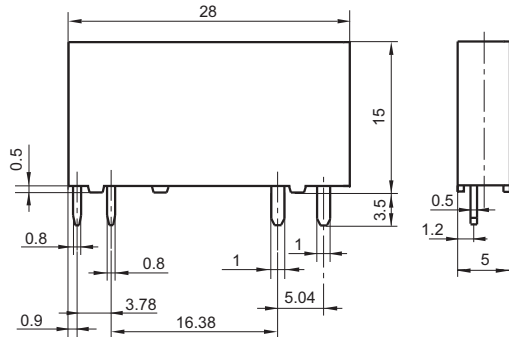
Form C Flat pack version: Dimensions include 28 (width), 15 (height), 0.5 (top offset), 0.5 (bottom offset), 0.9 (bottom offset), 3.78 (width), 16.38 (width), 5.04 (width), 5.04 (width), 1 (width), 1 (width), 1 (width), 3.0 (width), and 5 (width).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

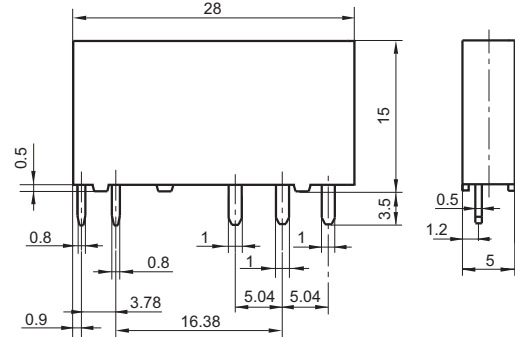
Unit: mm

Outline Dimensions

1 Form A
Special code: (414)



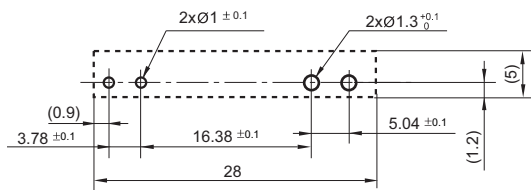
1 Form C



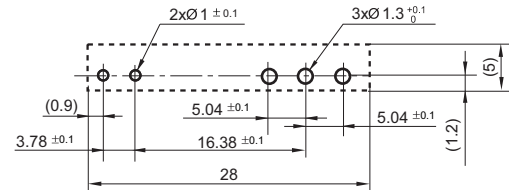
PCB Layout (Bottom view)

1 Form A

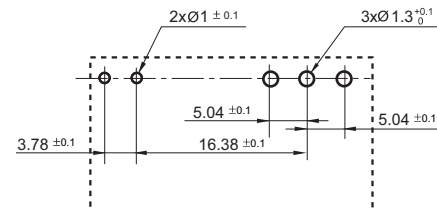
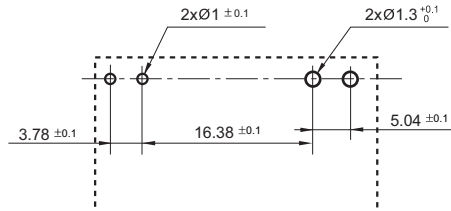
Vertical version



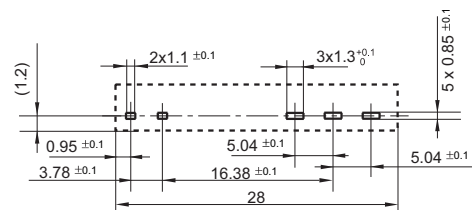
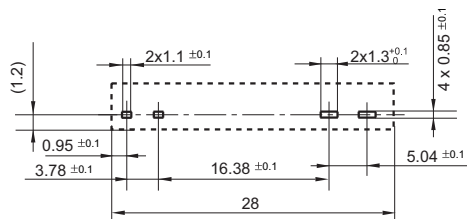
1 Form C



Flat pack version

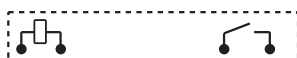


Special code: (414)



Wiring Diagram (Bottom view)

1 Form A



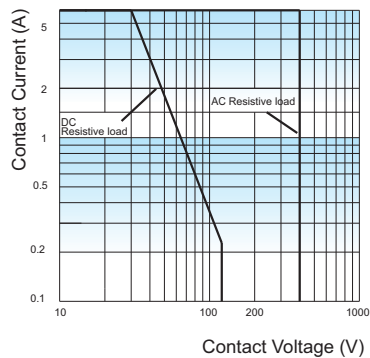
1 Form C



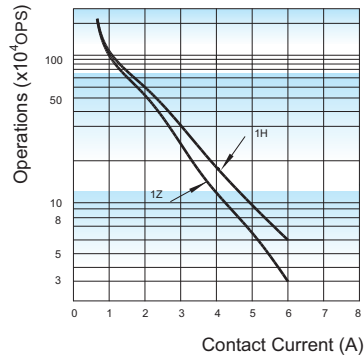
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layouts is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



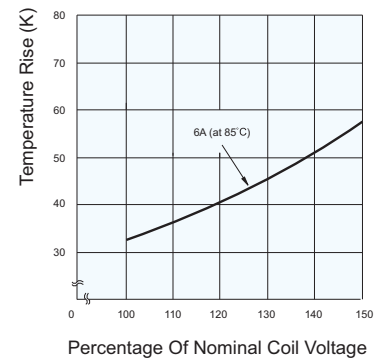
ENDURANCE CURVE



Test conditions:

NO, AgNi, Resistive load, 250VAC,
Flux proofed, Room temp., the typical
value of test 1s on 9s off.

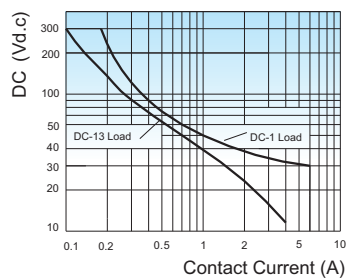
COIL TEMPERATURE RISE



Test conditions:

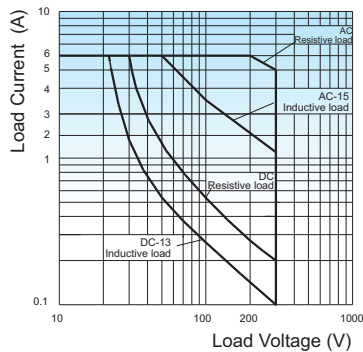
6A 85°C
(Typical curve of 24VDC standard type)

LOAD SWITCHING CAPACITY CURVE



Test conditions: NO, Room temp.

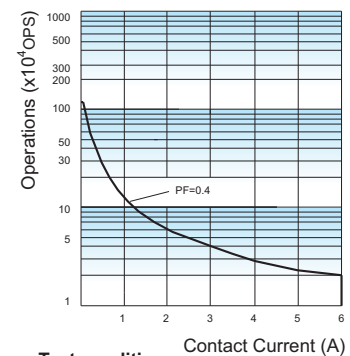
BREAKING CAPACITY TRIP CURVE



Test conditions:

Room temp., Plastic sealed, 1s on 9s off.

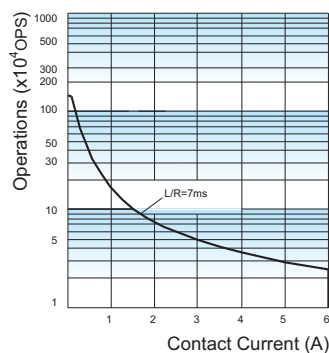
AC INDUCTIVE LOAD ENDURANCE CURVE



Test conditions:

NO, AgNi, Plastic sealed, Room temp.,
250VAC

DC INDUCTIVE LOAD ENDURANCE CURVE



Test conditions:

NO, AgNi, Plastic sealed, Room temp.,
24VDC

Notes: Characteristic data is not guaranteed value but measured values of samples from production line.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF46F

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.: E134517



File No.: 40025215



File No.: CQC17002168380



Features

- 5A switching capability
- Meets VDE 0631 reinforce insulation
- Highly efficient magnetic circuit for high sensitivity: 200mW
- Extremely small footprint utilizing PCB area

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂ , AgNi
Contact rating (Res. load)	3A 250VAC/30VDC 5A 250VAC/30VDC
Max. switching voltage	277VAC / 30VDC
Max. switching current	5A
Max. switching power	1385VA / 150W
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	1 x 10 ⁵ OPS (5A 250VAC, Resistive load, AgNi, at 85°C, 1s on 1s off) 5 x 10 ⁴ OPS (5A 250VAC, Resistive load, AgSnO ₂ , at 85°C, 3s on 3s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance ¹⁾	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance ¹⁾		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 3g
Construction		Plastic sealed

Notes: 1) Shock malfunction: 49m/s² for the length direction.
Vibration: 10Hz to 55Hz 1mm DA for the length direction.
2) The data shown above are initial values.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 200mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
3	2.25	0.18	3.90	45 x (1±10%)
5	3.75	0.25	6.50	125 x (1±10%)
6	4.50	0.30	7.80	180 x (1±10%)
9	6.75	0.45	11.7	405 x (1±10%)
12	9.00	0.60	15.6	720 x (1±10%)
18	13.5	0.90	23.4	1620 x (1±10%)
24	18.0	1.20	31.2	2880 x (1±10%)

Notes: 1) The data shown above are initial values.

2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	5A 125VAC/250VAC at 85°C
		5A 277VAC/30VDC at 85°C
		3A 125VAC/250VAC at 85°C
		3A 277VAC/30VDC at 85°C
UL/CUL	AgSnO ₂	5A 125VAC/250VAC at 85°C
		5A 277VAC/30VDC at 85°C
		3A 125VAC/250VAC at 85°C
		3A 277VAC/30VDC at 85°C
VDE	AgNi	5A 250VAC/30VDC at 85°C
	AgSnO ₂	5A 250VAC/30VDC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

ORDERING INFORMATION

Type	HF46F / 12 -H S 1 T G F (XXX)						
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC						
Contact arrangement	H: 1 Form A						
Construction ¹⁾²⁾	S: Plastic sealed						
Termination	1: type 1						
Contact material ³⁾	T: AgSnO ₂		Nil: AgNi				
Contact plating	G: Gold plated		Nil: No gold plated				
Insulation standard	F: Class F		Nil: Class B				
Special code ⁵⁾	XXX: Customer special requirement			Nil: Standard			

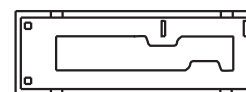
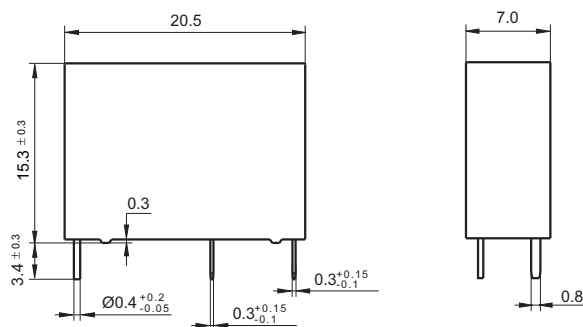
- Notes:** 1) We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For the loads which can bring high inrush current when relay contacts connect instantly (eg. lamp, capacitive load), AgSnO₂ contact material is recommended on priority.
4) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
5) The customer special requirement express as special code after evaluating by Hongfa.
6) Two packing methods available: paper box package, plastic tray package, tube package. Standard tube packing length is 560mm. Any special requirement needed, please contact us for more details.
7) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

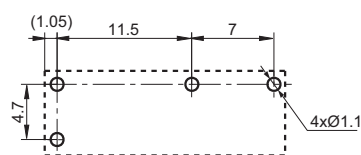
Outline Dimensions

HF46F/□ □-HS1□ □ (XXX)

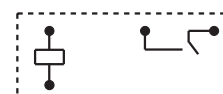


(Bottom view)

PCB Layout (Bottom view)

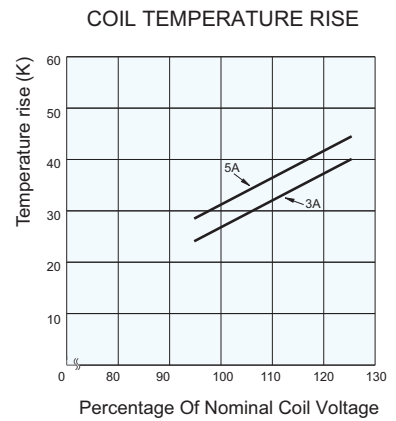
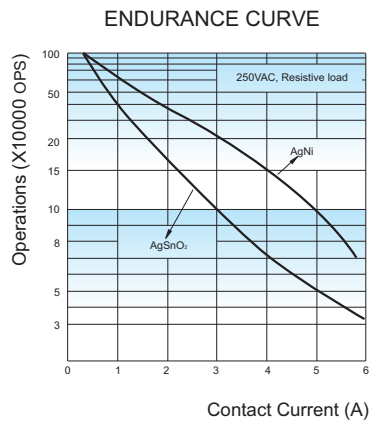
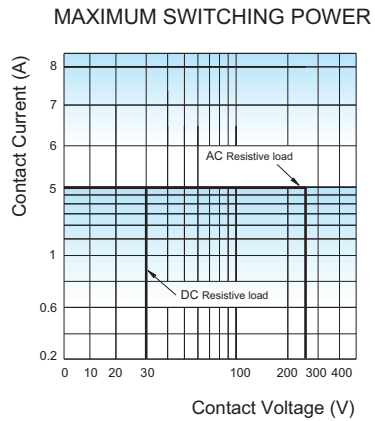


Wiring Diagram (Bottom view)



- Remark:** 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES



Test conditions:

AgNi, at 85°C, 1s on 1s off,
AgSnO₂, at 85°C, 3s on 3s off

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF46FB

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.: E134517



File No.: 40049080



File No.: CQC17002177913



Features

- 5A switching capability
- 8kV impulse withstand voltage (between coil and contacts)
- Meets reinforce insulation
- Width 7mm, Suitable for PCB intensive installation
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1C
Contact resistance ¹⁾	100mΩ max. (at 1A 6VDC)
Contact material	AgNi
Contact rating (Res. load)	5A 250VAC
Max. switching voltage	250VAC
Max. switching current	5A
Max. switching power	1250VA
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	5 x 10 ⁴ OPS (CO:5A 250VAC, Resistive load, at 85°C, 3s on 3s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & movable contacts)		8kV (1.2 /50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 4.5g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 360mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.18	3.9	25 x (1±10%)
5	3.75	0.25	6.5	69 x (1±10%)
6	4.50	0.30	7.8	100 x (1±10%)
9	6.75	0.45	11.7	225 x (1±10%)
12	9.00	0.60	15.6	400 x (1±10%)
18	13.5	0.90	23.4	900 x (1±10%)
24	18.0	1.20	31.2	1600 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	5A 250VAC 85°C
VDE	

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, ISO/TS16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED 2019 Rev. 1.02

ORDERING INFORMATION

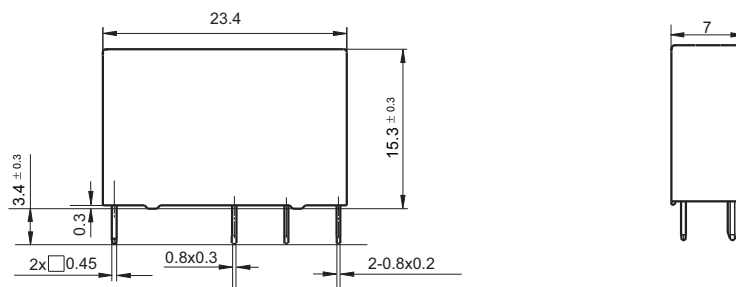
Type	HF46FB /	12	-Z	S	3	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC					
Contact arrangement	Z: 1 Form C					
Construction	S: Plastic sealed					
Contact material	3: AgNi					
Special code	XXX: Customer special requirement			Nil: Standard		

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

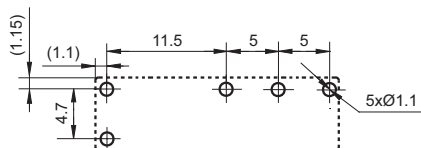
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

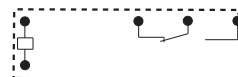
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF46F-G

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.: E134517



File No.: 40025215



File No.: CQC17002168380



Features

- 10A switching capability
- Meets VDE 0631 reinforce insulation
- Highly efficient magnetic circuit for high sensitivity: 200mW
- Extremely small footprint utilizing PCB area

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgNi
Contact rating (Res. load)	7A 250VAC / 30VDC 10A 250VAC / 30VDC
Max. switching voltage	277VAC / 30VDC
Max. switching current	10A
Max. switching power	2770VA / 300W
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	5 x 10 ⁴ OPS (7A 250VAC, Resistive load, AgNi, at 105°C, 3s on 3s off) 6 x 10 ⁴ OPS (7A 250VAC, Resistive load, AgSnO ₂ , at 85°C, 3s on 3s off) 1 x 10 ⁴ OPS (10A 250VAC, Resistive load, AgNi, at 85°C, 1s on 9s off) 1 x 10 ⁴ OPS (10A 250VAC, Resistive load, AgSnO ₂ , at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance ¹⁾	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance ¹⁾		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 3g
Construction		Plastic sealed

Notes: 1) Shock malfunction: 49m/s² for the length direction.
Vibration: 10Hz to 55Hz 1mm DA for the length direction.
2) The data shown above are initial values.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 200mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
3	2.25	0.18	3.90	45 x (1±10%)
5	3.75	0.25	6.50	125 x (1±10%)
6	4.50	0.30	7.80	180 x (1±10%)
9	6.75	0.45	11.7	405 x (1±10%)
12	9.00	0.60	15.6	720 x (1±10%)
18	13.5	0.90	23.4	1620 x (1±10%)
24	18.0	1.20	31.2	2880 x (1±10%)

Notes: 1) The data shown above are initial values.

2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	10A 125VAC/250VAC at 85°C 10A 277VAC/30VDC at 85°C 7A 125VAC/250VAC at 105°C 7A 277VAC/30VDC at 105°C
	AgSnO ₂	10A 125VAC/250VAC at 85°C 10A 277VAC/30VDC at 85°C 7A 125VAC/250VAC at 85°C 7A 277VAC/30VDC at 85°C TV-3
VDE	AgNi	7A 250VAC/30VDC at 105°C 10A 250VAC/30VDC at 85°C
	AgSnO ₂	7A 250VAC/30VDC at 85°C 10A 250VAC/30VDC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

ORDERING INFORMATION

Type	HF46F-G / 12 -H S 1 T G F (XXX)						
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC						
Contact arrangement	H: 1 Form A						
Construction ¹⁾²⁾	S: Plastic sealed						
Termination	1: type 1						
Contact material ³⁾	T: AgSnO ₂		Nil: AgNi				
Contact plating	G: Gold plated		Nil: No gold plated				
Insulation standard	F: Class F		Nil: Class B				
Special code ⁵⁾	XXX: Customer special requirement			Nil: Standard			

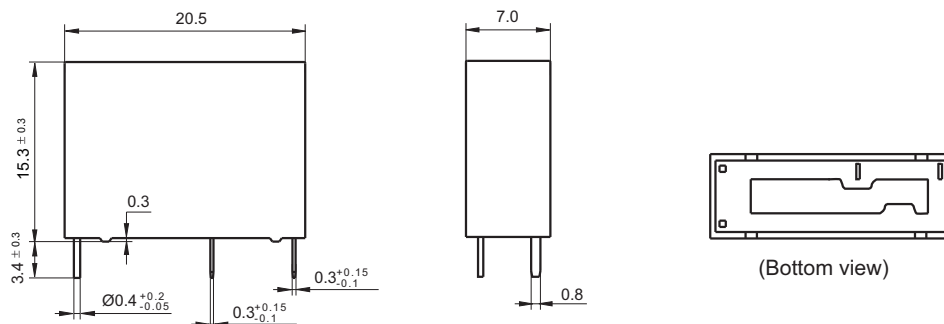
- Notes:** 1) We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For the loads which can bring high inrush current when relay contacts connect instantly (eg. lamp, capacitive load), AgSnO₂ contact material is recommended on priority.
4) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
5) The customer special requirement express as special code after evaluating by Hongfa.
6) Two packing methods available: paper box package, plastic tray package, tube package. Standard tube packing length is 560mm. Any special requirement needed, please contact us for more details.
7) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

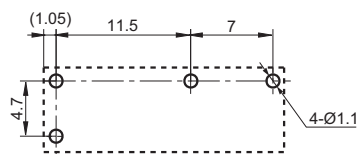
Unit: mm

Outline Dimensions

HF46F-G/□□ -HS1□□ (XXX)



PCB Layout (Bottom view)

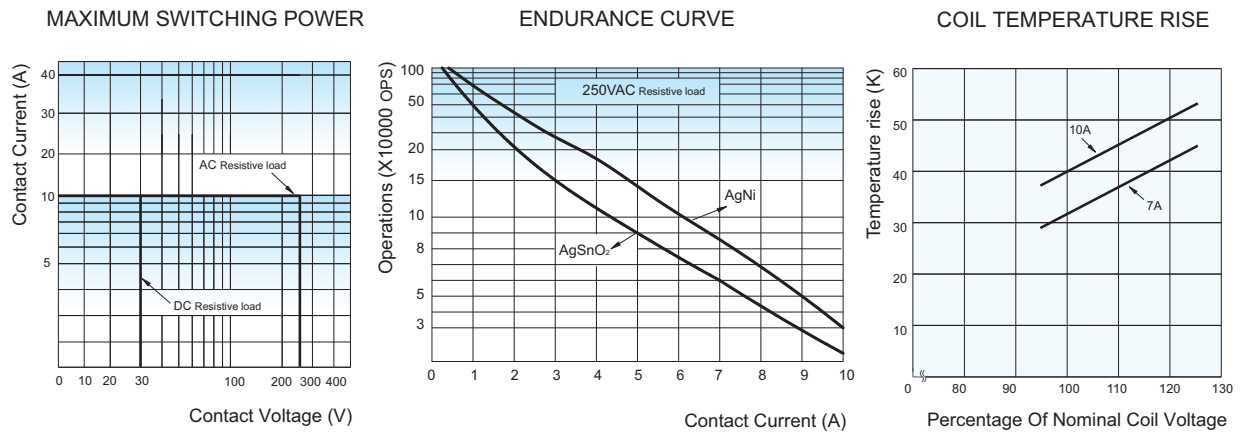


Wiring Diagram (Bottom view)



- Remark:** 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
2) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
3) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES



Test conditions: at 85°C, 3s on 3s off

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF42F

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E133481



File No.:R50356443



File No.:CQC18002199982
CQC16002159853



Features

- 5A switching capability
- TV-3 125VAC approved by UL standard
- 2 Form A slim configuration

RoHS compliant

CONTACT DATA

Contact arrangement	2A
Contact resistance ¹⁾	100mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂ , AgCdO
Contact rating (Res. load)	5A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	5A
Max. switching power	1250VA / 150W
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	2H: 5 x 10 ⁴ OPS (5A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 70°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 14.5g
Construction		Plastic sealed

- Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class A
4) For sealed type, the vent-hole cover should be excised.

COIL

Coil power	Approx. 530mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.25	6.5	47 x (1±10%)
6	4.50	0.30	7.8	68 x (1±10%)
9	6.75	0.45	11.7	155 x (1±10%)
12	9.00	0.60	15.6	270 x (1±10%)
18	13.5	0.90	23.4	620 x (1±10%)
24	18.0	1.20	31.2	1080 x (1±10%)
48	36.0	2.40	62.4	4400 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	5A 250VAC 5A 30VDC TV-3 125VAC
TÜV	5A 250VAC 5A 30VDC

- Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

	HF42F /	012	-2H	S	T	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	2H: 2 Form A					
Construction ¹⁾	S: Plastic sealed					
Contact material	T: AgSnO ₂ Nil: AgCdO					
Special code ²⁾	XXX: Customer special requirement Nil: Standard					

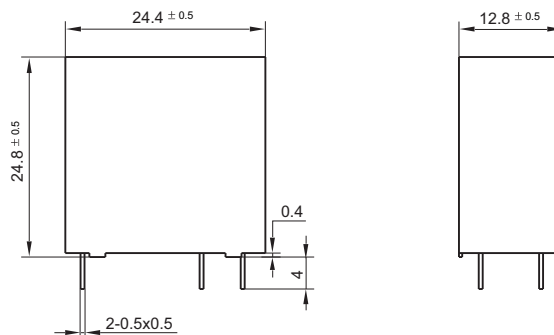
Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

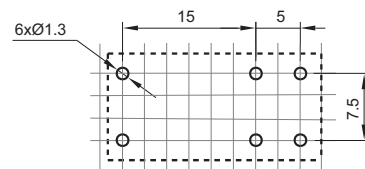
Outline Dimensions



Wiring Diagram
(Bottom view)



PCB Layout
(Bottom view)



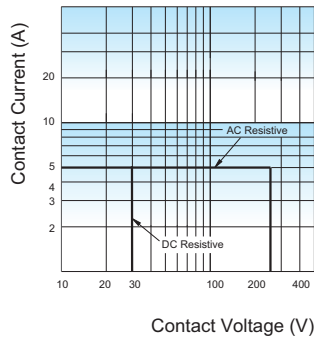
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

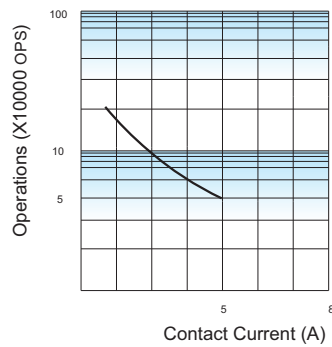
3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

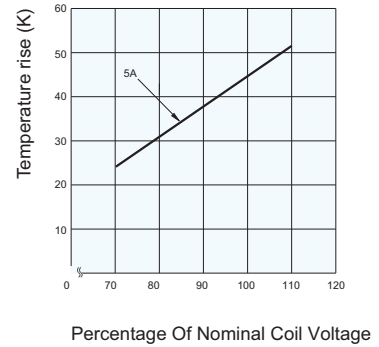
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

5A 250VAC, Resistive load,
Room temp., 1s on 9s off

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF32FA

SUBMINIATURE INTERMEDIATE POWER RELAY



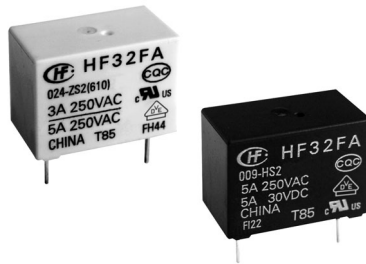
File No.:E134517



File No.:40006182



File No.:CQC17002175721



Features

- 5A switching capability
- Creepage/clearance distance>8mm
- 5kV dielectric strength (between coil and contacts)
- 1 Form A meets VDE 0700, 0631 reinforce insulation
- 1 Form C meets VDE 0631 reinforce insulation
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A, 1C	
Contact resistance ¹⁾	70mΩ max.(at 1A 6VDC)	
Contact material	AgNi	
Contact rating (Res. Load)	1A	1C
	Standard/Sensitive	Standard
	5A 250VAC 5A 30VDC	3A 250VAC 3A 30VDC
Max. switching voltage	250VAC / 30VDC	
Max. switching current	5A	
Max. switching power	1250VA / 150W	
Mechanical endurance	1 x 10 ⁶ OPS	
Electrical endurance	H type: 1 x 10 ⁵ OPS (5A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)	
	Z type: 1 x 10 ⁵ OPS (NO/NC, 3A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)	8ms max.	
Release time (at rated. volt.)	4ms max.	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Shock resistance*	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance*	NO	10Hz to 55 Hz 1.65mm DA
	NC	10Hz to 55 Hz 0.6mm DA
Termination	PCB	
Unit weight	Approx.4.6g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) *Index is not in relay length direction.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

COIL

Coil power	Sensitive: Approx. 200mW; Standard: Approx. 450mW
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COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48 ²⁾	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.15	5.1	45 x (1±10%)
5	3.75	0.25	8.5	125 x (1±10%)
6	4.50	0.30	10.2	180 x (1±10%)
9	6.75	0.45	15.3	400 x (1±10%)
12	9.00	0.60	20.4	720 x (1±10%)
18	13.5	0.90	30.6	1600 x (1±10%)
24	18.0	1.20	40.8	2800 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	5A 250VAC 5A 30VDC 1/8HP 125VAC/250VAC TV-2 C300
	1 Form C	3A 250VAC 3A 30VDC
VDE		5A 250VAC at 85°C 2A 250VAC cosφ=0.5 at 85°C
		1 Form A, Sensitive: 3A400VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, ISO/TS16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

ORDERING INFORMATION

	HF32FA / 012 -H S L 1 G (XXX)						
Type							
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	H: 1 Form A			Z: 1 Form C			
Construction ¹⁾²⁾	S: Plastic sealed			Nil: Flux proofed			
Coil power	L: Sensitive (Only for 1 Form A)			Nil: Standard			
Termination	1: Type 1			2: Type 2			
Contact plating ³⁾	G: Gold plated			Nil: No gold plated			
Special code ⁴⁾	XXX: Customer special requirement			Nil: Standard			

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

5) Two packing methods available: paper box package, tube package,Standard tube packing length is 535mm. Any special requirement needed, please contact us for more details.

6) For products that should meet the explosion-proof requirements of "IEC 60079 series",please note [Ex] after the specification while placing orders.Not all products have explosion-proof certification,so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

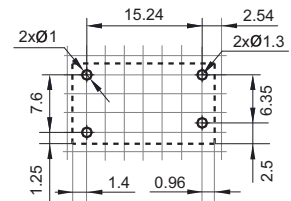
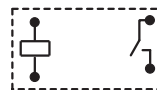
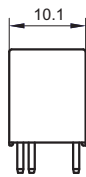
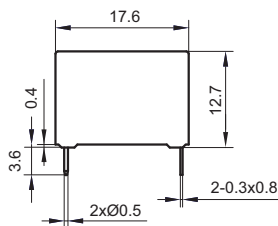
Unit: mm

Outline Dimensions

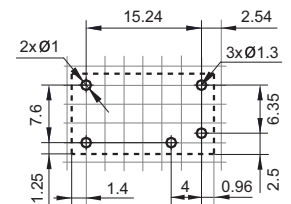
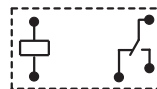
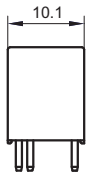
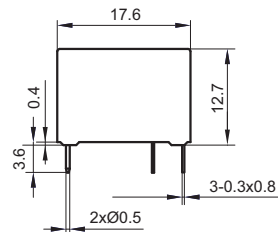
Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)

1 Form A
& Type 1

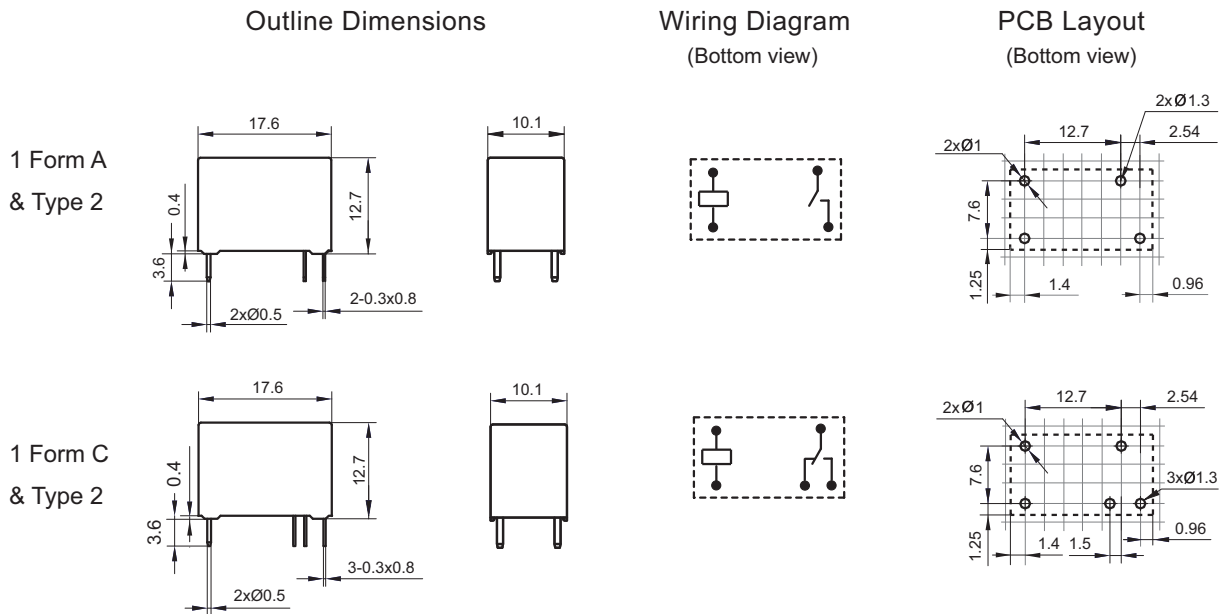


1 Form C
& Type 1



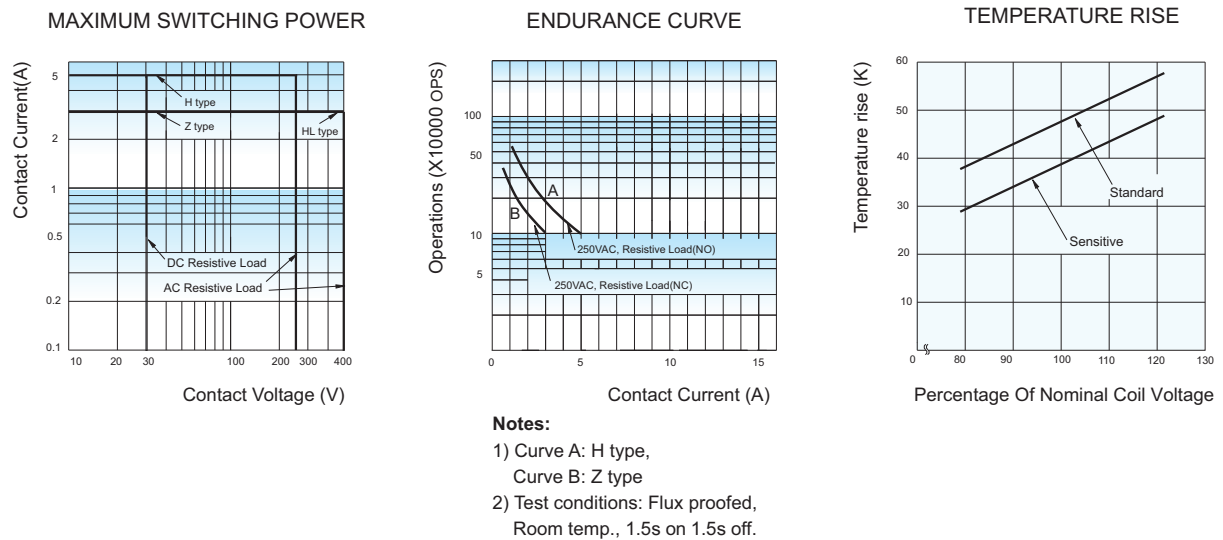
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF32FA-T

SUBMINIATURE INTERMEDIATE HIGH TEMPERATURE POWER RELAY



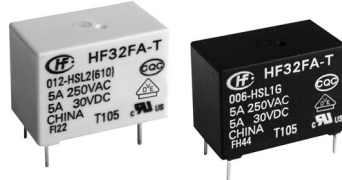
File No.:E134517



File No.:40006182



File No.: CQC17002175721



Features

- High temperature: 105°C
- 5A switching capability
- 1 Form A configuration
- Creepage/clearance distance>8mm
- 5kV dielectric strength (between coil and contacts)
- UL insulation system: Class F
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	70mΩ max.(at 1A 6VDC)
Contact material	AgNi
Contact rating (Res. load)	5A 250VAC 5A 30VDC
Max. switching voltage	250VAC/30VDC
Max. switching current	5A
Max. switching power	1250VA/150W
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	1 x 10 ⁵ OPS (5A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		4ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 105°C
Shock resistance*	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance*		10Hz to 55Hz 1.65mm DA
Termination		PCB
Unit weight		Approx.4.6g
Construction		Plastic sealed, Flux proofed

Notes: 1) *Index is not in relay length direction.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.

COIL

Coil power	Sensitive: Approx. 200mW
------------	--------------------------

COIL DATA

at 23°C

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.25	0.15	5.1	45 x (1±10%)
5	3.75	0.25	8.5	125 x (1±10%)
6	4.50	0.30	10.2	180 x (1±10%)
9	6.75	0.45	15.3	400 x (1±10%)
12	9.00	0.60	20.4	720 x (1±10%)
18	13.5	0.90	30.6	1600 x (1±10%)
24	18.0	1.20	40.8	2800 x (1±10%)

Notes: 1) The data shown above are initial values.

2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	5A 250VAC
VDE	5A 250VAC at 105°C 3A 400VAC at 105°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

ORDERING INFORMATION

HF32FA-T / 012 -H S L 1 G (XXX)	
Type	
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC
Contact arrangement	H: 1 Form A
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed
Coil power	L: Sensitive
Termination	1: Type 1 2: Type 2
Contact plating ³⁾	G: Gold plated Nil: No gold plated
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclear environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

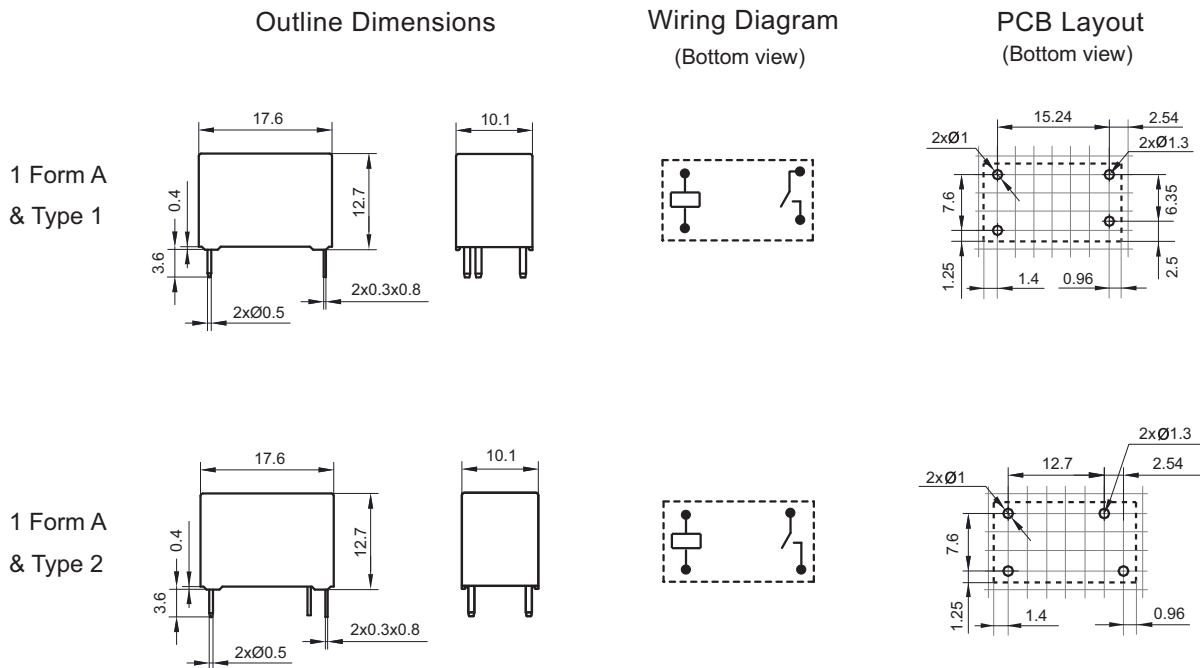
4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

5) Two packing methods available: paper box package, tube package, Standard tube packing length is 535mm. Any special requirement needed, please contact us for more details.

6) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



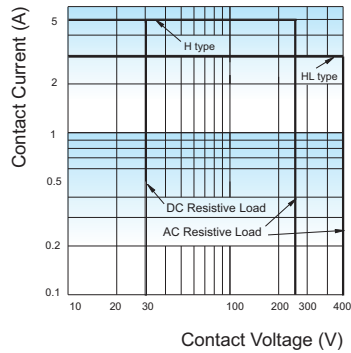
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

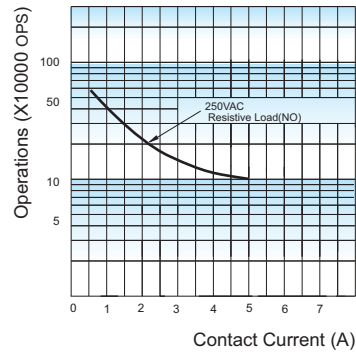
3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

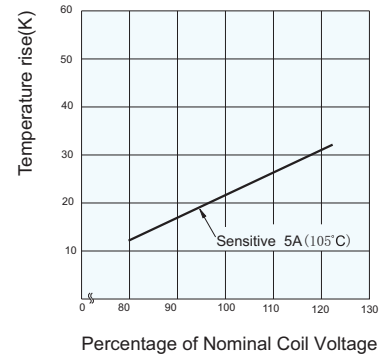


ENDURANCE CURVE



Test conditions: Flux proofed,
Room temp., 1.5s on 1.5s off

TEMPERATURE RISE



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF32FA-G

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:40006182



File No.:CQC17002175721



Features

- 10A switching capability
- Creepage/clearance distance>8mm
- 5kV dielectric strength (between coil and contacts)
- UL insulation system: Class F
- Meets VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	70mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. Load)	10A 250VAC
Max. switching voltage	250VAC
Max. switching current	10A
Max. switching power	2500VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	1.5 x 10 ⁴ OPS (10A 250VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		4ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Shock resistance*	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance*		10Hz to 55 Hz 1.65mm DA
Termination		PCB
Unit weight		Approx.4.6g
Construction		Plastic sealed, Flux proofed

Notes: 1) *Index is not in relay length direction.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 230mW
------------	--

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48 ³⁾	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.15	5.1	38 x (1±10%)
5	3.75	0.25	8.5	108 x (1±10%)
6	4.50	0.30	10.2	155 x (1±10%)
9	6.75	0.45	15.3	350 x (1±10%)
12	9.00	0.60	20.4	620 x (1±10%)
18	13.5	0.90	30.6	1390 x (1±10%)
24	18.0	1.20	40.8	2480 x (1±10%)
48 ³⁾	36.0	2.40	81.6	9920 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	10A 250VAC at 85°C B300
VDE	10A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

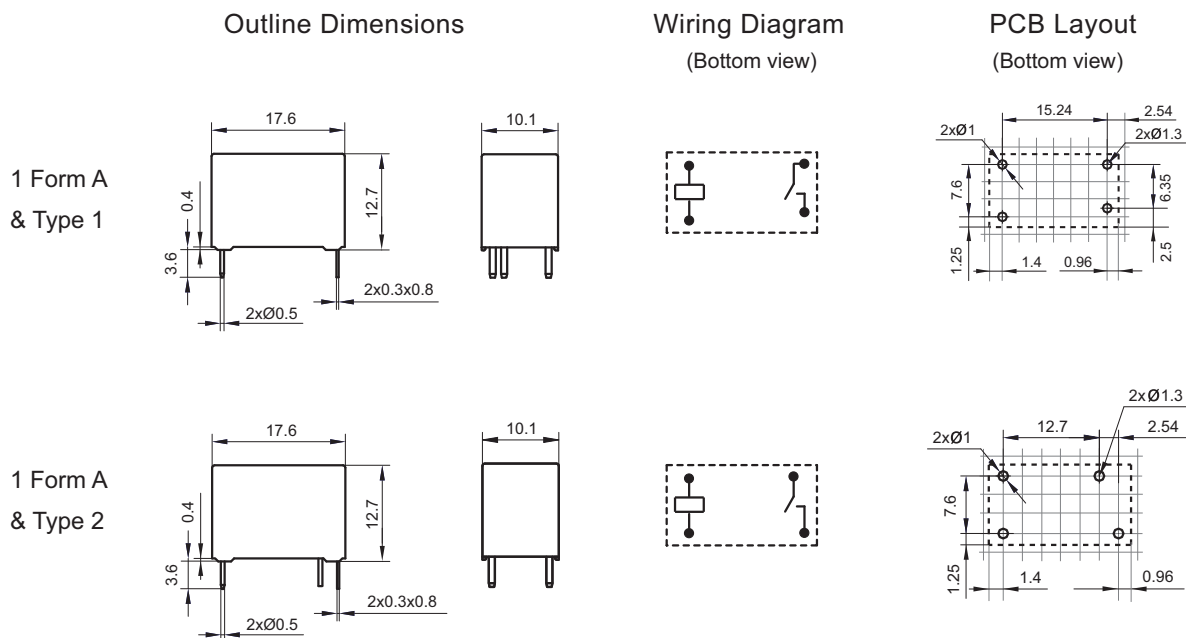
ORDERING INFORMATION

	HF32FA-G / 012 -H S L 1 G (XXX)						
Type							
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	H: 1 Form A						
Construction ¹⁾²⁾	S: Plastic sealed			Nil: Flux proofed			
Coil power	L: Sensitive			Nil: Standard			
Termination	1: Type 1			2: Type 2			
Contact plating ³⁾	G: Gold plated			Nil: No gold plated			
Special code ⁴⁾	XXX: Customer special requirement			Nil: Standard			

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
5) Two packing methods available: paper box package, tube package,Standard tube packing length is 535mm. Any special requirement needed, please contact us for more details.
6) For products that should meet the explosion-proof requirements of "IEC 60079 series",please note [Ex] after the specification while placing orders.Not all products have explosion-proof certification,so please contact us if necessary, in order to select the suitable products.

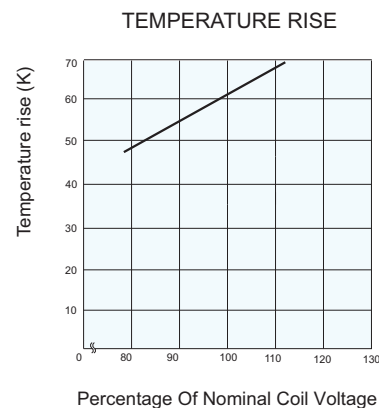
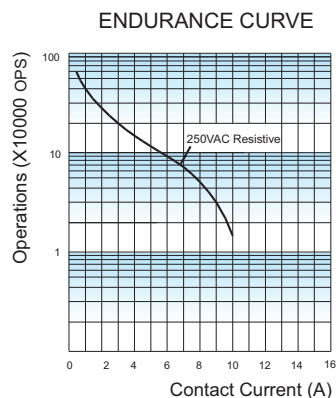
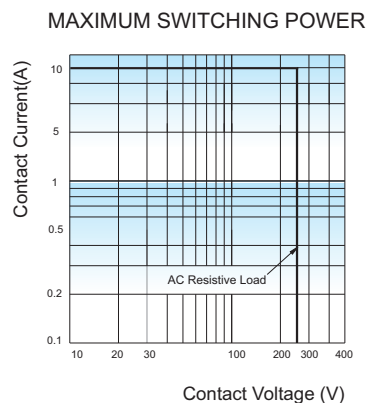
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



- Remark:** 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES



Test conditions: Flux proofed, at 85°C
5s on 5s off

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF32FV

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:40012204



File No.:CQC14002120720



Features

- 5A switching capability
- Dielectric strength 4kV (between coil and contacts)
- 1 Form A configurations
- Standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available
- Meet reinforce insulation
- Relow soldering version available
- Halogen-free products are available

CONTACT DATA

Contact arrangement	1A	
Contact resistance 1)	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂ , AgCdO, AgNi	
Contact rating (Res. load)	Standard	Sensitive
	5A 250VAC 5A 30VDC	3A 250VAC 3A 30VDC
Max. switching voltagar	277VAC / 30VDC	
Max. switching current	5A	3A
Max. switching power	1385VA / 150W	831VA / 90W
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	Standard	1 x 10 ⁵ OPS (5A 250VAC Resistive load, at room temp., 1s on 9s off) 5 x 10 ⁴ OPS (5A 250VAC Resistive load, at 85°C, 1s on 9s off)
	Sensitive	1 x 10 ⁵ OPS (3A 250VAC Resistive load, at room temp., 1s on 9s off) 5 x 10 ⁴ OPS (3A 250VAC Resistive load, at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge withstand voltage	6kV(1.2 / 50μs)	
Operate time (at rated. volt.)	8ms max.	
Release time (at rated. volt.)	5ms max.	
Shock * resistance	Functional	294m/s ²
	Destructive	980m/s ²
Vibration resistance *	Functional	10Hz to 55Hz 1.5mm DA
Humidity	5% to 85% RH	
Ambient oprating temperature	-40°C to 105°C	
Termination	PCB	
Unit weight	Approx. 6g	
Construction	Plastic sealed, Flux proofed	

Notes:1) The data shown above are initial values.

2) For working environment temperature > 85°C, please contact with Hongfa.

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 200mW
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COIL DATA

at 23°C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive Type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

Notes: 1) The data shown above are initial values.

2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.01

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	5A 277VAC /250VAC General Use at 40°C 5A 277VAC/250VAC General Use at 85°C 5A 30VDC General Use at 85°C 300W 120VAC Tunsten at 40°C 1/4HP 250VAC at 85°C 3A 277VAC/250VAC General Use (Sensitive) at 85°C 5A 277VAC/250VAC Resistive at 105°C 3A 30VDC General Use (Sensitive) at 85°C 3A 277VAC/250VAC General Use (Sensitive) at 105°C TV-3 120VAC at 40°C
	AgCdO	5A 277VAC/250VAC General Use at 85°C 5A 30VDC Resistive at 85°C
	AgNi	5A 277VAC/250VAC General Use at 85°C 5A 30VDC Resistive at 85°C 3A 30VDC Resistive (Sensitive) at 85°C 3A 277VAC/250VAC General Use (Sensitive) at 85°C 5A 277VAC/250VAC General Use at 105°C 3A 277VAC/250VAC General Use (Sensitive) at 105°C
VDE	AgSnO ₂	250VAC 4(2) Inductive load at 85°C 5A 30VDC Resistive at 85°C 5A 277VAC/250VAC Resistive at 85°C 3A 277VAC/250VAC Resistive at 85°C 3A 30VDC Resistive (Sensitive) at 85°C 5A 277VAC/250VAC Resistive at 105°C 3A 277VAC/250VAC Resistive(Sensitive) at 105°C
	AgCdO	5A 277VAC/250VAC Resistive at 85°C 5A 30VDC Resistive at 85°C
	AgNi	5A 277VAC/250VAC Resistive at 85°C 3A 277VAC/250VAC Resistive (Sensitive) at 85°C 5A 277VAC/250VAC Resistive at 105°C 3A 277VAC/250VAC Resistive (Sensitive) at 105°C
CQC	AgSnO ₂	5A 277VAC/250VAC Resistive at 85°C 5A 30VDC Resistive at 85°C 3A 277VAC/250VAC Resistive (Sensitive) at 85°C 5A 277VAC/250VAC Resistive at 105°C 3A 277VAC/250VAC Resistive (Sensitive) at 105°C
	AgCdO	5A 277VAC/250VAC Resistive at 85°C 5A 30VDC Resistive at 85°C
	AgNi	5A 277VAC/250VAC Resistive at 85°C 5A 30VDC Resistive at 85°C 3A 277VAC/250VAC Resistive (Sensitive) at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF32FV /	12	-H	S	L	T	F	(XXX)
Type								
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	H: 1 Form A							
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed							
Coil power	L: Sensitive ³⁾ Nil: Standard							
Contact material	T: AgSnO ₂ Nil: AgCdO 3: AgNi							
Insulation standard	F: Class F							
Customer special code ⁴⁾	XXX: Customer special requirement Nil: Standard							

Notes:1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) Sensitive loading: 3A.

4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT); e.g.(590) stands for product in accordance to TV-3 loading,only for standard type.

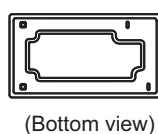
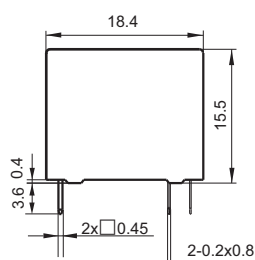
5) Two packing methods available: paper box package, tube package,Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.

6) For products that should meet the explosion-proof requirements of "IEC 60079 series",please note [Ex] after the specification while placing orders.Not all products have explosion-proof certification,so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

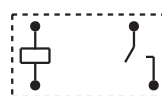
Unit: mm

Outline Dimensions



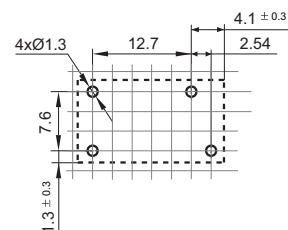
Wiring Diagram

(Bottom view)



PCB Layout

(Bottom view)



Remark: 1) *The additional tin top is max. 1mm.

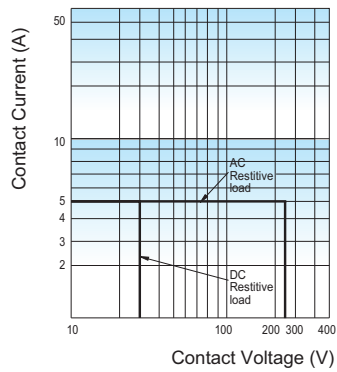
2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

3) The tolerance without indicating for PCB layout is always ±0.1mm.

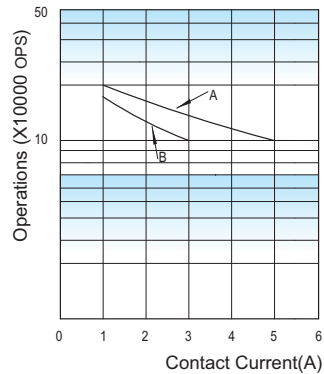
4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

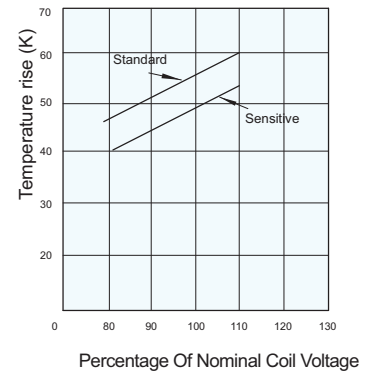
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Remark:

1. Curve A: standard
Curve B: sensitive
2. Testing conditions:
Standard: flux proofed, resistive load, 5A 250VAC, at room temp. 1s on 9s off.
Sensitive: flux proofed, resistive load, 3A 250VAC, at room temp. 1s on 9s off.

Testing conditions:

Standard: 5A at 85°C.
Sensitive: 3A at 85°C
Mounting distance: 5mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF32FV-G/HF32FV-T SUBMINIATURE INTERMEDIATE POWER RELAY



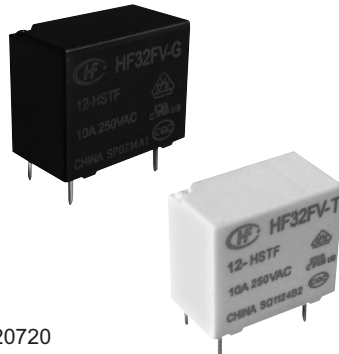
File No.:E134517



File No.:40012204



File No.:CQC14002120720



Features

- 10A switching capability
- Dielectric strength 4kV (between coil and contacts)
- TV-5 products are available
- Relow soldering version available
- Halogen-free products are available
- Product in accordance to IEC60335-1 available
- Product in accordance to IEC60730-1 available
- Product in accordance to IEC62368-1 available
- Meet reinforce insulation
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A	
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	AgNi ²⁾ ,AgSnO ₂ , AgCdO ²⁾	
Contact rating (Res. load)	Standard	Sensitive
	10A 250VAC	
Max. switching voltager	277VAC	
Max. switching current	10A	
Max. switching power	2770VA	
Mechanical endurance	1 x 10 ⁷ ops	

Electrical endurance	Standard	HF32FV-G: 1 x 10 ⁵ ops (10A 250VAC Resistive load, at room temp., 1s on 9s off) 5 x 10 ⁴ ops (10A 250VAC Resistive load, at 85°C, 1s on 9s off)
		HF32FV-T: 5 x 10 ⁴ ops (10A 250VAC Resistive load, at 105°C, 1s on 9s off)
	Sensitive	HF32FV-G(no suffix 590) 1 x 10 ⁵ ops (8A 250VAC Resistive load, at room temp., 1s on 9s off) 5 x 10 ⁴ ops (8A 250VAC Resistive load, at 85°C, 1s on 9s off)
		HF32FV-G(suffix 590) 3 x 10 ⁴ ops (10A 250VAC Resistive load, at 85°C, 1s on 9s off) HF32FV-T 3 x 10 ⁴ ops (10A 250VAC Resistive load, at 105°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) Only applicable to HF32FV-G no suffix 590.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge withstand voltage		6kV(1.2 / 50μs)
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Shock* ²⁾ resistance	Functional	294m/s ²
	Destructive	980m/s ²
Vibration resistance* ²⁾	Functional	10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient oprating temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values;
2) HF32FV-T only provides Flux proofed;
3) For working environment temperature > 85°C,please contact with Hongfa.

COIL

Coil power	Standard: Approx. 450mW;
	Sensitive: Approx. 200mW



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL DATA

at 23°C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive Type

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

Notes: 1) The data shown above are initial values.

2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	HF32FV-G	AgSnO ₂	10A 277VAC /250VAC General use	85°C	
			10A 277VAC/250VAC Resistive Load	40°C	
			10A 277VAC/250VAC Resistive Load	105°C	
			10A 277VAC/250VAC General use(Sensitive)	105°C	
			10A 277VAC/250VAC Resistive Load(Sensitive)	40°C	
			10A 277VAC/250VAC Resistive Load(Sensitive)	85°C	
			8A 277VAC/250VAC General use(Sensitive)	85°C	
			TV-5 120VAC(suffix 590)	40°C	
			3A 120VAC electronic ballast(Sensitive suffix 590)	85°C	
	HF32FV-G	AgCdO	10A 277VAC/250VAC General use	85°C	
10A 277VAC/250VAC Resistive Load			105°C		
10A 30VDC Resistive Load			85°C		
10A 277VAC/250VAC Resistive Load			40°C		
8A 277VAC/250VAC General use(Sensitive)			85°C		
10A 277VAC/250VAC Resistive Load			40°C		
8A 277VAC/250VAC Resistive Load(Sensitive)			40°C		
10A 277VAC/250VAC General use			105°C		
10A 277VAC/250VAC General use(Sensitive)			105°C		
HF32FV-T	AgSnO ₂	10A 277VAC/250VAC General use	105°C		
		10A 277VAC/250VAC Resistive Load	105°C		
		1/3HP 250VAC Motor Load	105°C		
		10A 277VAC/250VAC General use(Sensitive)	105°C		
VDE	HF32FV-G	AgSnO ₂	10A 277VAC/250VAC Resistive Load	85°C	
			10A 277VAC/250VAC Resistive Load	105°C	
			10A 277VAC/250VAC Resistive Load(Sensitive)	85°C	
			8A 277VAC/250VAC Resistive Load(Sensitive)	85°C	
			10A 277VAC/250VAC Resistive Load(Sensitive)	105°C	
	HF32FV-G	AgCdO	10A 277VAC/250VAC Resistive Load	85°C	
			AgNi	10A 277VAC/250VAC Resistive Load	85°C
				8A 277VAC/250VAC Resistive Load(Sensitive)	85°C
HF32FV-T	AgSnO ₂	10A 277VAC/250VAC Resistive Load	105°C		
		5A 250VAC COS Φ 0.6	105°C		
CQC	HF32FV-G	AgSnO ₂	10A 277VAC/250VAC Resistive Load	85°C	
			8A 277VAC/250VAC Resistive Load(Sensitive)	85°C	
			10A 277VAC/250VAC Resistive Load(Sensitive)	85°C	
			10A 277VAC/250VAC Resistive Load	105°C	
			10A 277VAC/250VAC Resistive Load(Sensitive)	105°C	
	HF32FV-G	AgCdO	10A 277VAC/250VAC Resistive Load	85°C	
			AgNi	10A 277VAC/250VAC Resistive Load	85°C
	8A 277VAC/250VAC Resistive Load(Sensitive)	85°C			
HF32FV-T	AgSnO ₂	10A 277VAC/250VAC Resistive Load	105°C		
		10A 277VAC/250VAC Resistive Load(Sensitive)	105°C		

Notes: 1) Opening the vent hole under contact material AgSnO₂ testing.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

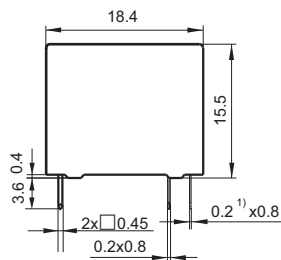
	HF32FV-G/	12	-H	S	L	T	F	(XXX)
Type	HF32FV-G HF32FV-T							
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	H: 1 Form A							
Construction ¹⁾²⁾	S: Plastic sealed ³⁾		Nil: Flux proofed					
Coil power	L: Sensitive		Nil: Standard					
Contact material	T: AgSnO ₂		3: AgNi ⁴⁾		Nil: AgCdO ⁴⁾			
Insulation standard	F: Class F							
Special code ⁵⁾	XXX: Customer special requirement				Nil: Standard			

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) Only applicable to HF32FV-G;
4) Only applicable to HF32FV-G with no suffix 590.
5) The customer special requirement express as special code after evaluating by Hongfa. e.g.(590) stands for product in accordance to the TV-5 load and is only applicable to HF32FV-G;
6) Two packing methods available: paper box package, tube package, Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.
7) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



Wiring Diagram

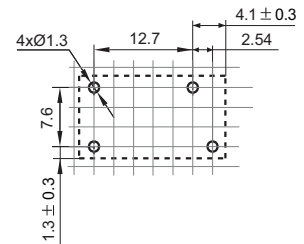
(Bottom view)



(Bottom view)

PCB Layout

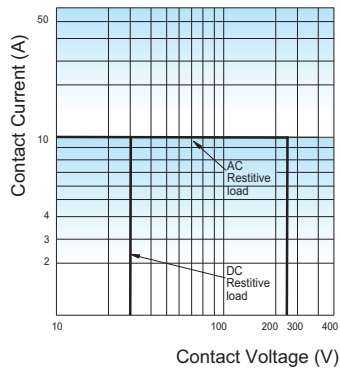
(Bottom view)



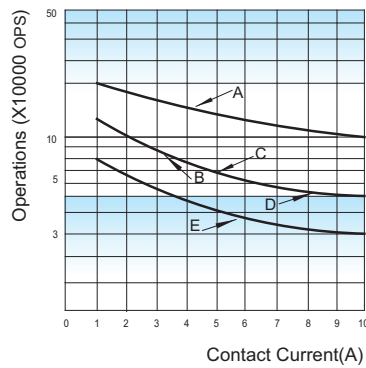
- Remark:** 1) the pin size of HF32FV-G sensitive with suffix 590 is 0.3mm.
2) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
3) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
4) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
5) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

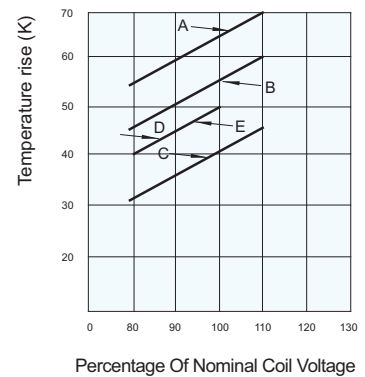
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Remark:

- Curve A: HF32FV-G standard
 Curve B: HF32FV-G sensitive(no suffix 590)
 Curve C: HF32FV-T sensitive(suffix 590)
 Curve D: HF32FV-T standard
 Curve E: HF32FV-T sensitive
- Testing conditions:
 HF32FV-G Standard: flux proofed, resistive load, 10A/250VAC, at room temp. 1s on 9s off.
 HF32FV-G Sensitive(no suffix 590): flux proofed, resistive load, 10A/250VAC, at room temp. 1s on 9s off.
 HF32FV-G Sensitive(suffix 590): resistive load, 10A/250VAC, at 85°C. 1s on 9s off.
 HF32FV-T Standard: flux proofed, resistive load, 10A/250VAC, 105°C. 1s on 9s off.
 HF32FV-T Sensitive: flux proofed, resistive load, 10A/250VAC, 105°C. 1s on 9s off.

Testing conditions:

10A at 85°C (Curve A, Curve B, Curve C)
 10A at 85°C (Curve D, Curve E)
 Mounting distance: 10mm

Disclaimer

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HF32FV-16

SUBMINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40012204



File No.: CQC14002120720



Features

- 16A switching capability
- Dielectric strength 4kV(between coil and contacts)
- 1 Form A configuration
- UL insulation system: Class F
- Product in accordance to IEC 62368-1 available
- Products which coincident with TV-8 & TV-10 products are available
- Provides products that meet 16A 1 x 10⁶Ops electrical durability

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating (General use)	16A 250VAC TV-10 TV-8
Max. switching voltage	277VAC
Max. switching current	16A
Max. switching power	4432VA
Mechanical endurance	5 x 10 ⁶ OPS

Electrical endurance	Standard type: 1 x 10 ⁴ OPS (16A 250VAC General use, 85°C, 1s on 9s off) 5x 10 ⁴ OPS (16A 250VAC Resistive load, 85°C, 1s on 9s off) Sensitive type: 5x 10 ⁴ OPS (16A 250VAC General use, 85°C, 1s on 9s off) 5x 10 ⁴ OPS (16A 250VAC Resistive load, 85°C, 1s on 9s off) 1x 10 ⁵ OPS (16A 250VAC Resistive load, at room temp., 1s on 9s off) Sensitive type:('590' special code) 5 x 10 ⁴ OPS (16A 250VAC, Resistive load, 85°C, 1s on 9s off) TV-10 Sensitive type:('931' special code) 1 x 10 ⁴ OPS (16A 250VAC General use, 85°C, 1s on 9s off) 5 x 10 ⁴ OPS (16A 250VAC, Resistive load, 85°C, 1s on 9s off) Super Sensitive type:('590' special code) 5 x 10 ⁴ OPS (16A 250VAC Resistive load, 85°C, 1s on 9s off) TV-8

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		10ms max.
Release time (at nomi. volt.)		5ms max.
Humidity	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 7g
Construction		Flux proofed

Notes:1) The data shown above are initial values.

COIL

Coil power	Standard:Approx. 800mW
	Sensitive type:Approx.400mW
	Super sensitive type:Approx.200mW

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
12	9	0.6	13.2	180 x (1±10%)
24	18	1.2	26.4	720 x (1±10%)



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL DATA

Sensitive type/Super sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω	
				Sensitivel Type Ω	Super Sensitivel Type Ω
3	2.25	0.15	3.9	22 x (1±10%)	45 x (1±10%)
5	3.75	0.25	6.5	62 x (1±10%)	125 x (1±10%)
6	4.5	0.3	7.8	90 x (1±10%)	180 x (1±10%)
9	6.75	0.45	11.7	202x (1±10%)	400 x (1±10%)
12	9	0.6	15.6	360x(1±10%)	720x (1±10%)
18	13.5	0.9	23.4	810x(1±10%)	1600x(1±10%)
24	18	1.2	31.2	1440x(1±10%)	2800x(1±10%)
48	36	2.4	62.4	5760x(1±10%)	11520x(1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) When using standard products, it needs to drive at rated voltage, and then step down the voltage (50% of rated voltage) to hold.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	16A 250VAC at 85°C Standard type 16A 250VAC at 85°C (Sensitive) 16A 250VAC at 85°C (Super Sensitive) TV-5 120VAC Standard type TV-10 Sensitive '590' special code type TV-8 Super Sensitive '590' special code type 1000W Incandescent '590' special code (Sensitive) Electronic Ballast 5A 120VAC '590' special code (Sensitive) 1/2HP 120VAC at 85°C '590' special code (Sensitive) 1HP 250VAC at 85°C '590' special code (Sensitive) Electronic Ballast 3A 120VAC '590' special code (Super Sensitive) 1/3HP 120VAC at 85°C (Super Sensitive) 3/4HP 250VAC at 85°C (Super Sensitive)
VDE	1 Form A	16A 250VAC at 85°C Standard type 16A 250VAC at 85°C (Sensitive) 16A 250VAC at 85°C (Super Sensitive)
CQC	1 Form A	16A 250VAC 85°C Standard type 16A 250VAC 85°C (Sensitive) 16A 250VAC 85°C (Super Sensitive)

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF32FV-16/	12	-H	L ¹⁾	T	F	(XXX)
Coil voltage ¹⁾	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	H: 1 Form A						
Coil power	L: Sensitive C: : Super Sensitive Nil: Standard						
Contact material	T: AgSnO ₂						
Insulation standard	F: Class F						
Special code ²⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) 3, 5, 6, 9, 12, 18, 24, 48VDC are only applicable to sensitive and super sensitive products.

2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

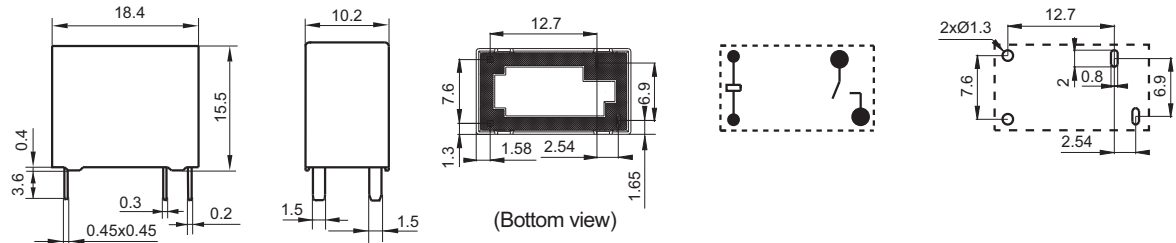
Unit: mm

Outline Dimensions

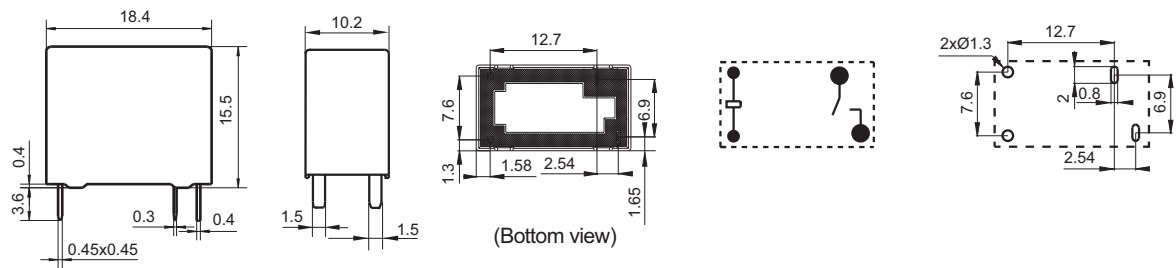
Wiring Diagram (Bottom view)

PCB Layout (Bottom view)

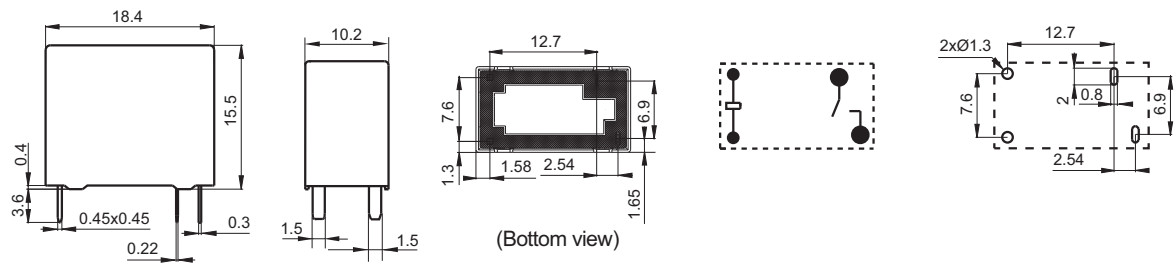
1 Form A(Standard type)



1 Form A(Sensitive type)

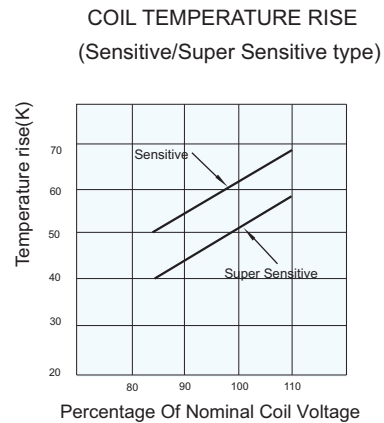
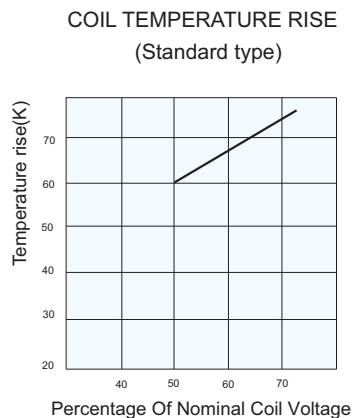
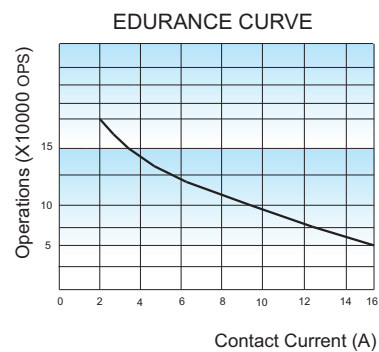
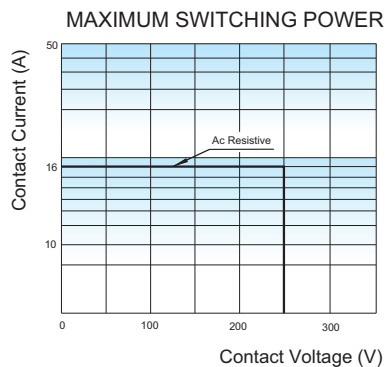


1 Form A(Super Sensitive type)



- Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

CHARACTERISTIC CURVES



Disclaimer

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HF30F

MINIATURE HIGH POWER RELAY



File No.:E133481



File No.:40055993



File No.:CQC21002317491



Features

- 10A switching capability
- 4.0kV dielectric strength (between coil and contacts)
- contact arrangement: 2 Form A
- UL insulation system: Class F
- IEC60335-1 compliant products are available
- TV-5 compliant products are available

RoHS compliant

CONTACT DATA

Contact arrangement	2A
Contact resistance	100mΩ max.(at 6VDC 1A)
Contact material	AgSnO ₂
Contact rating	10A 250VAC
Max.switching voltage	277VAC
Max.switching current	10A
Max.switching power	2770VA
Mechanical endurance	1×10 ⁶ ops
Electrical endurance	1×10 ⁵ ops
	(10A 277VAC Resistive load,Room temp.,
	1s on 9s off)
	5×10 ⁴ ops
	(10A 277VAC Resistive load,85°C,
	1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx.400mW
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COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC	Coil Resistance Ω
3	2.25	0.15	3.9	22.5×(1±10%)
5	3.75	0.25	6.5	62.5×(1±10%)
6	4.5	0.30	7.8	90×(1±10%)
9	6.75	0.45	11.7	202×(1±10%)
12	9.00	0.60	15.6	360×(1±10%)
18	13.5	0.90	23.4	810×(1±10%)
24	18.0	1.20	31.2	1440×(1±10%)
48	36.0	2.40	62.4	5760×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
	Between contacts sets	2500VAC 1min
Operate time (at nomi. volt.)		10ms
Release time (at nomi. volt.)		5ms
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 9g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	2H	10A 250VAC Resistive load,40°C,1s on 9s off
		10A 250VAC Resistive load,85°C,1s on 9s off
TUV	2H	10A 250VAC General use,85°C,1s on 9s off
		10A 250VAC Resistive load,40°C,1s on 9s off
CQC	2H	10A 250VAC Resistive load,85°C,1s on 9s off
		10A 250VAC Resistive load,40°C,1s on 9s off

Notes: 1) All values unspecified are at room temperature.

2) Only some typical rating are listed above.If more details are required,please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

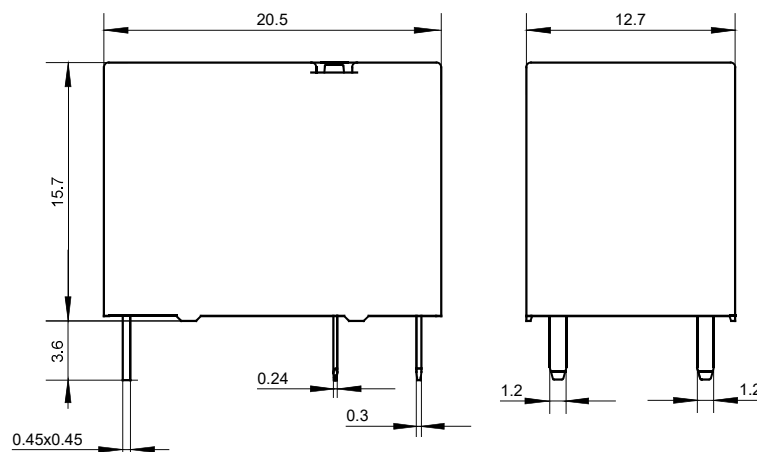
Type	HF30F/	12	-2H	S	T	F	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	2H:2 Form A						
Construction	S: Plastic sealed Nil: Flux proofed						
Contact material	T: AgSnO ₂						
Insulation class	F: Class F						
Special code	XXX: Customer special requiremen; Nil: Standard						

Notes: 1) We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
 2) When overall cleaning is not required, it is recommended to select flux products. Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.
 e.g.(335) stands for product in accordance to IEC 60335-1(GWT).

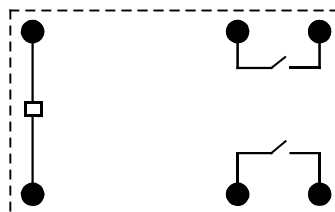
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

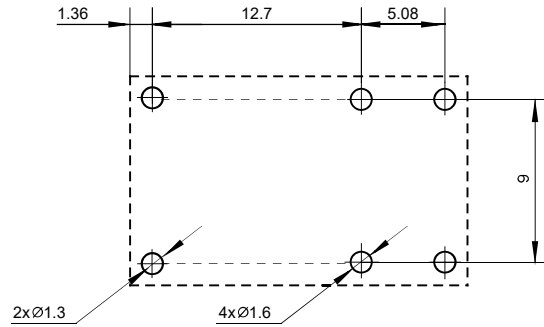
Outline Dimensions



Wiring Diagram(Bottom view)



PCB Layout(Bottom view)



- Notes:1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF39F

MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: 40054212



File No.: CQC21002290222



Features

- 10A switching capability
- creepage distance and air distance: >8mm
- High surge current resistance: 205A
- Small size: 20mm×8.5mm×12.5mm
- Dielectric strength (between coil and contacts) ≥ 5000VAC
- TV-8 compliant products are available

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating	10A 250VAC
Max. switching voltage	277VAC
Max. switching current	10A
Max. switching power	2770VA
Mechanical endurance	1×10 ⁶ OPS
Electrical endurance	5×10 ⁴ OPS (10A 250VAC Resistive load, 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		8ms max.
Release time (at nomi. volt.)		4ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.65mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 4.9g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 300mW
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COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Allowable Voltage VDC	Coil Resistance Ω
3	2.25	0.15	3.9	30×(1±10%)
5	3.75	0.25	6.5	83×(1±10%)
6	4.5	0.30	7.8	120×(1±10%)
9	6.75	0.45	11.7	270×(1±10%)
12	9.00	0.60	15.6	480×(1±10%)
18	13.5	0.90	23.4	1080×(1±10%)
24	18.0	1.20	31.2	1920×(1±10%)
48	36.0	2.40	62.4	7680×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 125VAC/250VAC/277VAC Resistive load 85°C
	10A 125VAC/250VAC/277VAC General load 85°C
	TV-5 120VAC 40°C
	TV-8 120VAC 40°C (590 Special)
	2A 277VAC electronic ballast 85°C
VDE	3A 120VAC electronic ballast 85°C
	1/2 HP motor 250VAC 85°C
	1/4 HP motor 120VAC 85°C
VDE	10A 250VAC Resistive load 85°C
CQC	10A 125VAC/250VAC/277VAC Resistive load 85°C

Notes: 1) Only some typical rating are listed above. If more details are required, please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

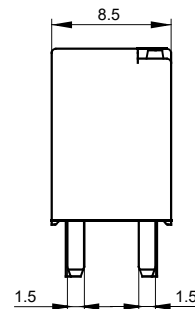
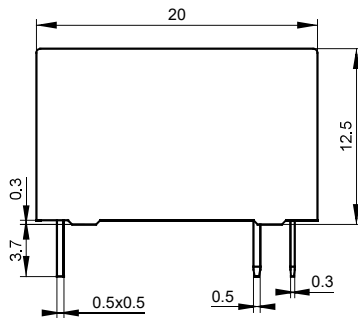
Type	HF39F/	12	-H	T	F	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	1H:1 Form A					
Contact material	T: AgSnO ₂					
Insulation class	F: Class F					
Special code	XXX: Customer special requiremen; Nil: Standard					

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.
e.g.(590) stands for product in accordance to the tv-8 load.

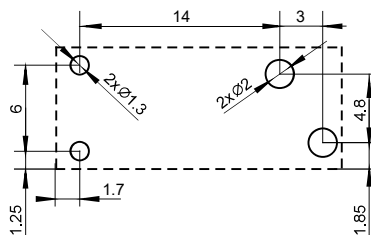
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout(Bottom view)



Wiring Diagram(Bottom view)



- Notes: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF5F

MINIATURE HIGH POWER RELAY



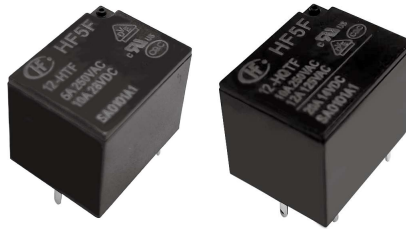
File No.:E133481



File No.:40054965



File No.:21002311603



Features

- Small volume and low height
- 1 Form A and 1 Form C configurations
- Surge Resistance Satisfies TV-8
- Ambient temperature up to 105°C
- UL insulation system: Class F available
- Outline dimensions: (15.6×12.4×13.6) mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A	1C	
		NO	NC
Contact resistance	100 mΩ max. (1A 6VDC)		
Contact material	AgSnO ₂		
Contact rating (Res. load)	Standard: 6A 250VAC/ High Load: 10A 250VAC	5A 250VAC	
	10A 28VDC	5A 28VDC	
Max.switching voltage	277VAC/28VDC		
Max.switching current	20A(14VDC)/12A(125VAC)		
Max.continuous current	20A(NO 23°C 1h)		
Mechanical endurance	1×10 ⁷ OPS		
Electrical endurance	NO:		
	Standard:		
	6A 250VAC Resistive load 5×10 ⁴ ops		
	10A 28VDC Resistive load 1×10 ⁵ ops		
	High Load:		
	10A 250VAC Resistive load 1×10 ⁵ ops		
	10A 28VDC Resistive load 1×10 ⁵ ops		
	NC:		
	5A 250VAC Resistive load 3×10 ⁴ ops		
	5A 28VDC Resistive load 5×10 ⁴ ops		

Notes: 1) The data shown above are initial values.

2) Maximum switching current and maximum continuous current only meet the high load type, the standard type is 10A.

CHARACTERISTICS

Insulation resistance	100MΩ(500VDC)	
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	600VAC 1min
Operate time(at rated voltage)	10ms max.	
Release time(at rated voltage)	5ms max.	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85%RH	
Ambient temperature	-40°C to 105°C	
Termination	PCB	
Unit weight	Approx. 5g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.

2) If plastic sealed is used or ambient temperature is higher than 85°C, please contact us.

COIL

Coil power Approx. 450mW

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC ¹⁾ max.	Drop-out Voltage VDC min.	Max. Coil Voltage ²⁾ VDC	Coil Resistance Ω
3	2.25	0.3	3.9	20 ×(1±10%)
5	3.75	0.5	6.5	55 ×(1±10%)
9	6.75	0.9	11.7	180 ×(1±10%)
12	9	1.2	15.6	320 ×(1±10%)
18	13.5	1.8	23.4	720 ×(1±10%)
24	18	2.4	31.2	1280 ×(1±10%)
48	36	4.8	62.4	5120 ×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	NO	6A 277/250/125VAC Room temp. 10A 277/250/125VAC 105°C(High Load) 12A 125VAC Room temp.(High Load) 10A 28VDC Room temp. 1/2HP 250VAC 85°C 1/4HP 120VAC 85°C TV-5 120VAC 40°C TV-8 120VAC 40°C(High Load 590) 1A, 277VAC, Electronic Ballast Room temp.
	NC	5A 277/250/125VAC Room temp. 5A 28VDC Room temp.
VDE	NO	6A 250/125VAC Room temp. 10A 250/125VAC 85°C(High Load) 10A 28VDC Room temp.
	NC	5A 250/125VAC Room temp. 5A 28VDC Room temp.
CQC	NO	6A 277/250/125VAC Room temp. 10A 277/250/125VAC 105°C(High Load) 10A 28VDC Room temp.
	NC	5A 277/250/125VAC Room temp. 5A 28VDC Room temp.

Notes: The typical loads listed above are only part of the product certification. The detailed test conditions of each load are different, so the electrical durability is different. For more information, please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF5F/	12	-H	S	Q	T	F	(XXX)
Coil voltage	3,5,9,12,18,24,48 VDC							
Contact arrangement	H: 1 Form A Z: 1 Form C							
Construction	S: Plastic sealed NIL: Flux proofed							
Contact rating	Q: High Load NIL: Standard type							
Contact material	T: AgSnO ₂							
Insulation class	F: Class F							
Special code	XXX: Customer special requiremen; Nil: Standard							

Notes: 1) If plastic sealed is used or ambient temperature is higher than 85°C, please contact us.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

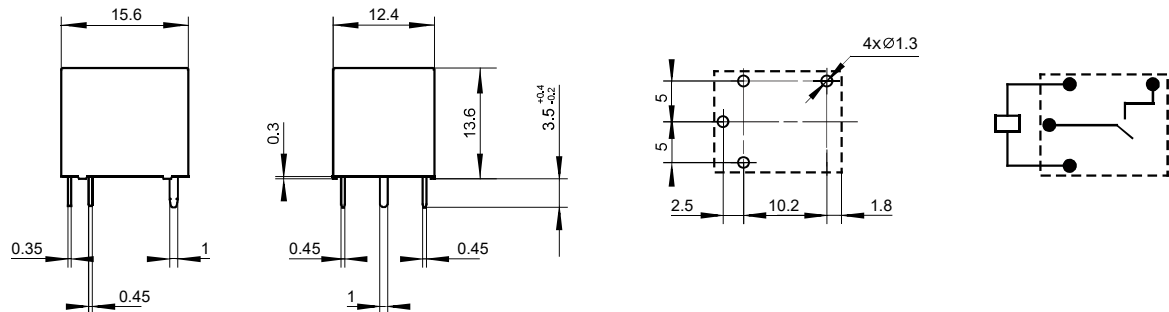
Unit: mm

Outline Dimensions

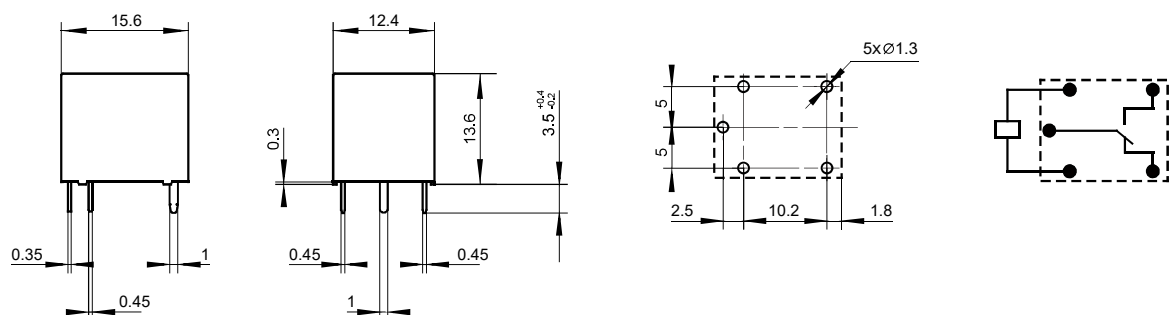
PCB Layout
(Bottom view)

Wiring Diagram
(Bottom view)

1 Form A



1 Form C



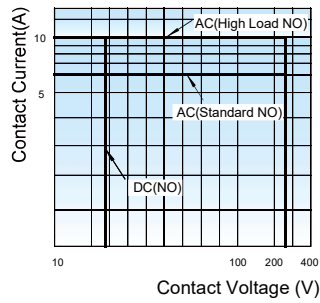
Notes: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$;

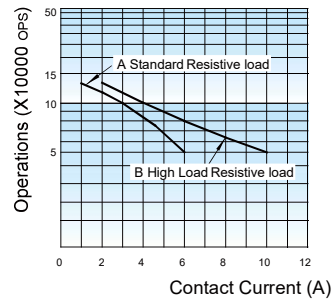
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAX.SWITCHING POWER

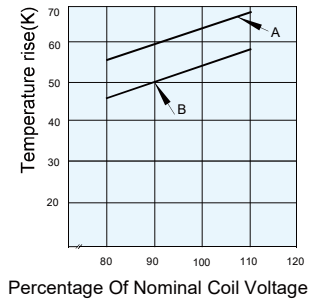


ENDURANCE CURVE



A:NO,250VAC,Resistive load,
Room temp.,1s on 9s off
B:NO,250VAC,Resistive load,
85°C,1s on 9s off

COIL TEMPERATURE RISE



Test conditions:
A:85°C 10A(High Load)
B:85°C 6A(Standard)
Mounting distance:10mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF32F

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.: E134517



File No.: 40012204



File No.: CQC12002076528



Features

- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C		
Contact resistance ¹⁾	100mΩ max(at 1A 6VDC)		
Contact material	AgSnO ₂ , AgNi, AgCdO		
Contact rating (Res. load)	1A		1C
	H type: 5A 250VAC 5A 30VDC 10A 125VAC	HL type: 3A 250VAC 3A 30VDC	3A 250VAC 3A 30VDC
Max. switching current	10A		3A
Max. switching power	1250VA/150W		750VA/90W
Max. switching voltage	250VAC/30VDC		
Mechanical endurance	5 x 10 ⁶ OPS		
Electrical endurance	H type: 1 x 10 ⁵ OPS (5A 250VAC, Resistive load, Room temp., 1s on 1s off)		
	HL type: 1 x 10 ⁵ OPS (3A 250VAC, Resistive load, Room temp., 1s on 1s off)		
	Z type: 1 x 10 ⁵ OPS (NO:3A/NC:3A, 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)		

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)	8ms max.	
Release time (at rated. volt.)	5ms max.	
Humidity	5% to 85% RH	
Operation ambient temperature	-40°C to 85°C	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Termination	PCB	
Unit weight	Approx. 6g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 200mW
------------	--

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL	1H	AgSnO ₂ ,AgCdO, AgNi	H type: 5A 250VAC /30VDC 85°C 5A 250VAC 10A 125VAC 85°C HL type: 3A 250VAC /30VDC 85°C
		AgCdO	H type: 5A 250VAC 85°C 1/10HP 125VAC 70°C 1/6HP 250VAC 85°C 10LRA /1.5FLA 120VAC 70°C HL type: 5A 125VAC 70°C
	1Z	AgSnO ₂ ,AgCdO, AgNi	3A 250VAC /30VDC 85°C
VDE	1H	AgSnO ₂ ,AgCdO, AgNi	H type: 5A 250VAC /30VDC 85°C 5A 250VAC 85°C HL type: 3A 250VAC /30VDC 85°C
	1Z	AgSnO ₂ ,AgCdO, AgNi	3A 250VAC /30VDC 85°C
CQC	1H	AgSnO ₂ ,AgCdO, AgNi	H type: 5A 250VAC /30VDC 85°C HL type: 3A 250VAC /30VDC 85°C
	1Z	AgSnO ₂ ,AgCdO, AgNi	3A 250VAC /30VDC 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF32F /	012	-H	S	L	3	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	H: 1 Form A Z: 1 Form C						
Construction ¹⁾	S: Plastic sealed Nil: Flux proofed						
Coil Power	L: Sensitive (Only for 1 Form A) Nil: Standard						
Contact material	3: AgNi T: AgSnO ₂ Nil: AgCdO						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

4) Two packing methods available: paper box package, tube package, Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.

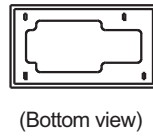
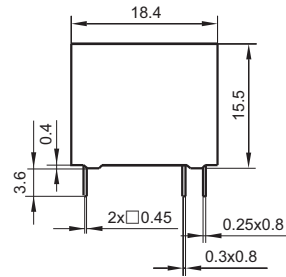
5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

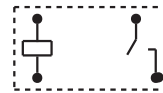
Unit: mm

Outline Dimensions

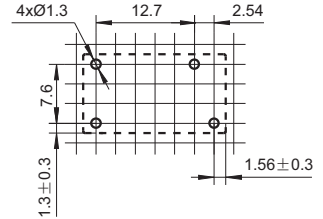
1 Form A



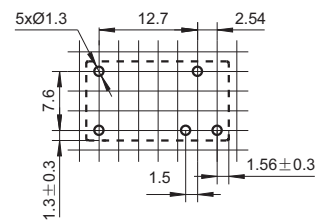
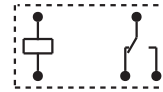
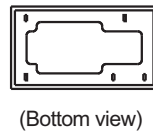
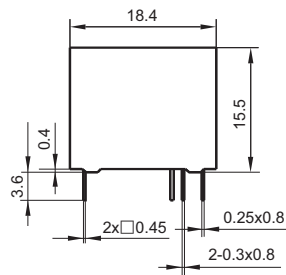
Wiring Diagram (Bottom view)



PCB Layout (Bottom view)



1 Form C

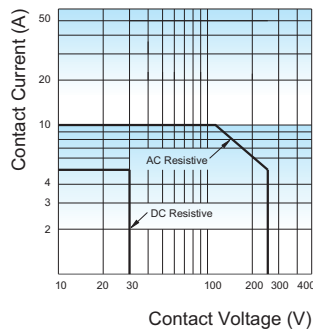


Remark: 1) * The additional tin top is max. 1mm.

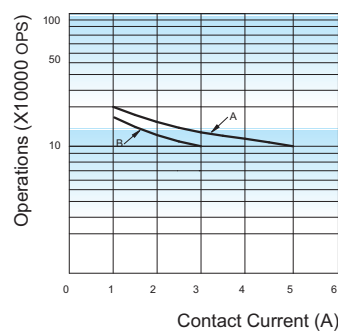
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

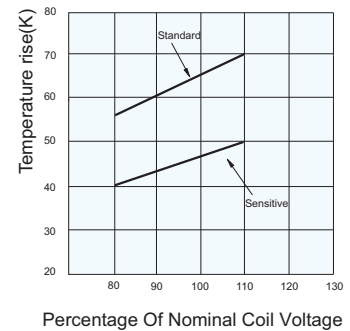
MAXIMUM SWITCHING POWER



EDURANCE CURVE



COIL TEMPERATURE RISE



Notes:

1. Curve A: H type
Curve B: HL type, Z type
2. Test conditions:
H type: Resistive load, 5A 250VAC,
Room temp., 1s on 1s off
HL type: Resistive load, 5A 250VAC,
Room temp., 1s on 1s off
Z type: NO/NC, Resistive load, 3A 250VAC,
Room temp., 1.5s on 1.5s off

Test conditions:

Standard: 5A at 85°C
Sensitive: 3A at 70°C
Mounting distance: 5mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF32F-G

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.: E134517



File No.: 40012204



File No.: CQC12002076528



Features

- 10A switching capability
- 1 Form A configuration
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgNi, AgCdO
Contact rating (Res. load)	10A 250VAC 10A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	1 x 10 ⁵ OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Operation ambient temperature		-40°C to 85°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

Notes:1) The data shown above are initial values.

COIL

Coil power	Approx. 450mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Notes:1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 277VAC / 250VAC / 30VDC at 85°C
	12A 125VAC at 85°C
VDE	10A 250VAC at 85°C
	4A 400VAC at 85°C
CQC	10A 250VAC / 30VDC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

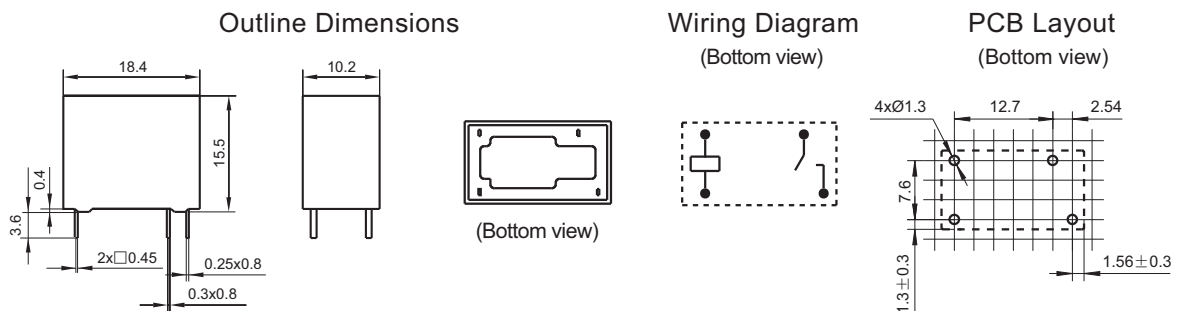
ORDERING INFORMATION

Type	HF32F-G /	012	-H	S	3	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	H: 1 Form A					
Construction ¹⁾	S: Plastic sealed		Nil: Flux proofed			
Contact material	T: AgSnO ₂		3: AgNi	Nil: AgCdO		
Special code ³⁾	XXX: Customer special requirement			Nil: Standard		

- Notes:** 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; please test the relay in real applications. If the ambience allows, flux proofed is preferentially recommended.
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
 4) Two packing methods available: paper box package, tube package, Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.
 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

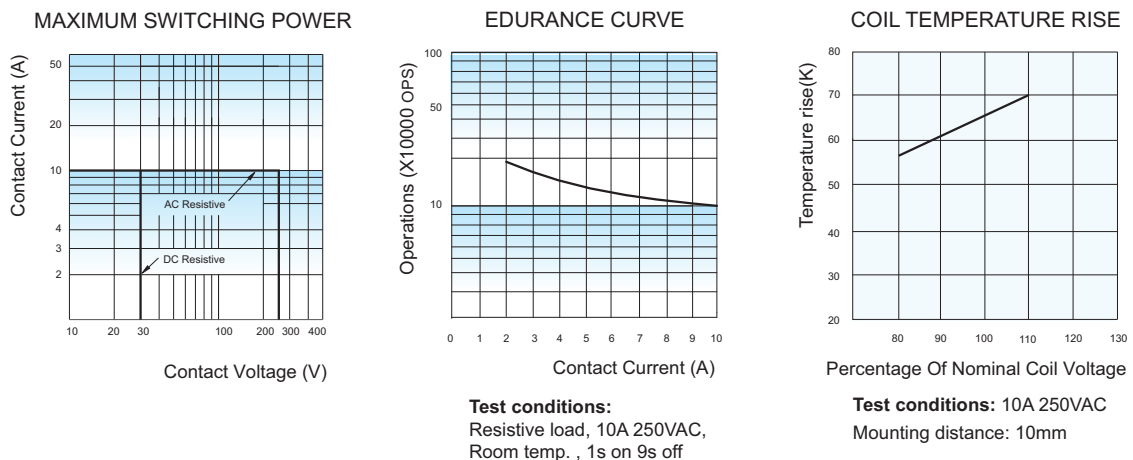
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



- Remark:** 1) * The additional tin top is max. 1mm.
 2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
 3) The tolerance without indicating for PCB layout is always ±0.1mm.
 4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF171F

MINIATURE HIGH POWER RELAY



File No.:E133481



File No.:40048577



File No.:17002177419



Features

- 8A switching capability
- 1 form A and 1 form C configurations
- High sensitivity 200mW
- Creepage/clearance distance:>6mm,meets VDE 0631reinforce insulation
- 5KV dielectric between coil to contacts
- Class F insulation

RoHS compliant

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂ AgNi	
Contact rating (Res. load)	1A	1C
	6A 250VAC	NO
	6A 30VDC	NC
Max. switching voltage	30VDC / 277VAC	
Max. switching current	8A	
Max. switching power	180W/1662VA	
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1 x 10 ⁵ OPS(Resistive load, Room temp., 1.5s on 1.5s off)	

Notes: 1)The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage(Between coil & contacts)	10KV(1.2/50μs)	
Operate time (at rated. volt.)	8ms max.	
Release time (at rated. volt.)	5ms max.	
Temperature rise (at rated.volt.)	60K max.	
Shock resistance*	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	NC*(No coil voltage)	10Hz to 55Hz 0.65mm DA
	NO	10Hz to 55Hz 1.5mm DA
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Termination	PCB	
Unit weight	Approx. 4.6g	
Construction	Flux proofed	

Notes: 1)*Index is not in relay length direction.

2)The data shown above are initial values.

COIL

Coil power	Approx. 200mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC ¹⁾ max.	Drop-out Voltage VDC ¹⁾ min.	Max. ²⁾ Allowable Voltage VDC	Coil Resistance Ω
3	2.25	0.30	3.90	45 x (1±10%)
5	3.75	0.50	6.50	125 x (1±10%)
6	4.50	0.60	7.80	180 x (1±10%)
9	6.75	0.90	11.7	405 x (1±10%)
12	9.00	1.20	15.6	720 x (1±10%)
18	13.5	1.80	23.4	1600 x (1±10%)
24	18.0	2.40	31.2	2880 x (1±10%)
36	27.0	3.60	46.8	6480 x (1±10%)
48	36.0	4.80	62.4	11520 x (1±10%)

Notes: 1)The data shown above are initial values.

2) Maximum voltage is refers to the relay coil in a short period of time can bear the biggest values.

SAFETY APPROVAL RATINGS(PENDING)

UL/CUL	1 Form A	8A 250/277VAC Resistive 85°C 6A 250/277VAC Resistive 85°C 5A 30VDC Resistive 85°C 6A 250VAC General purpose 85°C 10A 120VAC General purpose 85°C 1/4HP 240/277VAC Motor 40°C B300 Pilot duty 40°C
	1 Form C	NO:8A 250/277VAC Resistive 85°C NO:6A 250/277VAC Resistive 85°C CO:5A 250/277VAC Resistive 85°C
VDE	1 Form A	8A 250/277VAC Resistive 85°C 6A 250/277VAC Resistive 85°C 6A 30VDC Resistive 85°C AgSnO ₂ 8A 30VDC Resistive 85°C AgSnO ₂
	1 Form C	NO:8A 250/277VAC Resistive 85°C NO:6A 250/277VAC Resistive 85°C NO:6A 30VDC Resistive 85°C AgSnO ₂ NO:8A 30VDC Resistive 85°C AgSnO ₂ CO:5A 250VAC/30VDC Resistive 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.01

ORDERING INFORMATION

Type	HF171F /	12	-H	T	(XXX)
Coil voltage : 3,5,6,9,12,18,24,36,48VDC					
Contact arrangement	H: 1 Form A	Z: 1 Form C			
Construction	T: AgSnO ₂	3: AgNi			
Special code ²⁾	XXX: Customer special requirement	Nil: Standard			

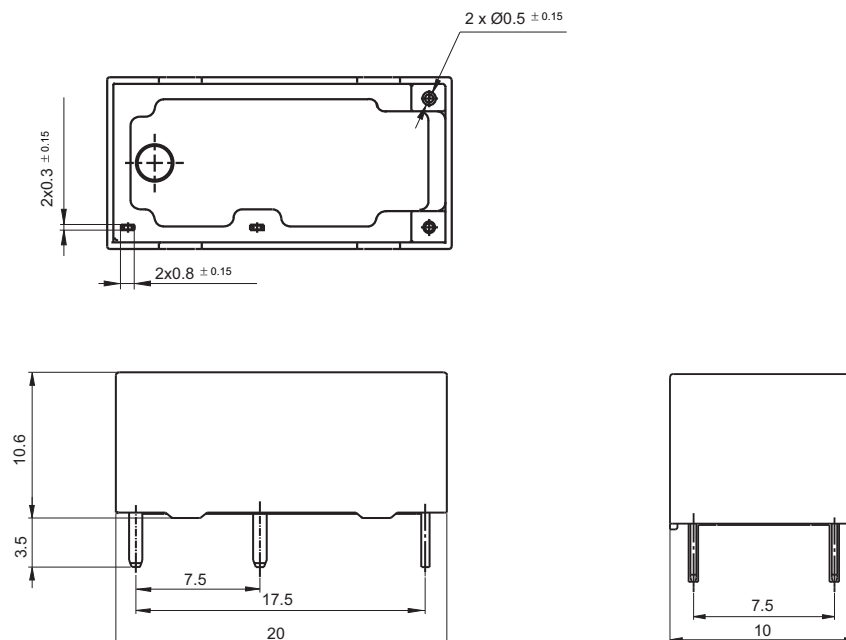
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂ dust, etc).
 2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

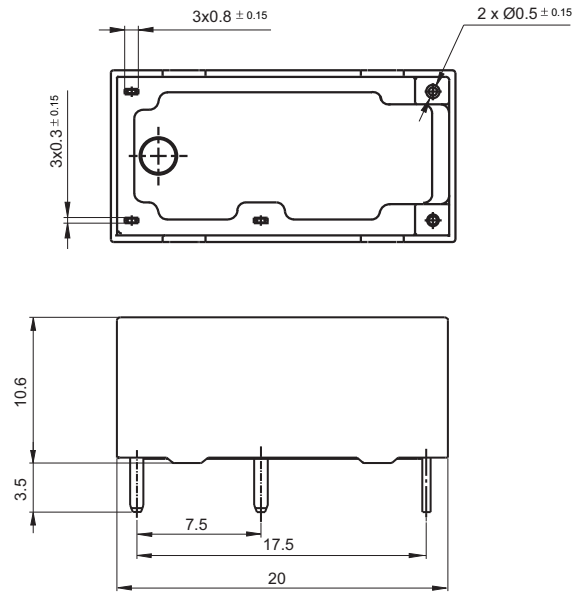
1 Form A



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

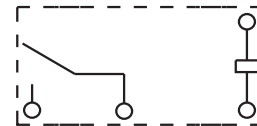
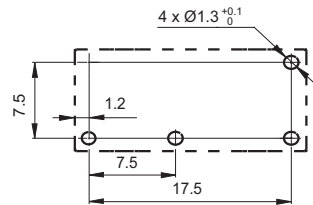
1 Form C



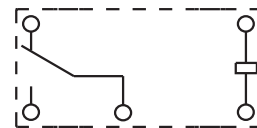
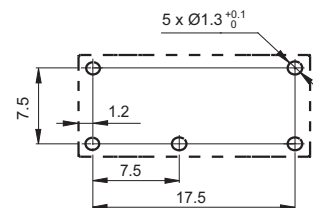
Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)

1 Form A



1 Form C



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF33F

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:125661



File No.:CQC12002076530



Features

- Provide 5A 250VAC to meet 300000 switching capability specifications
- Creepage distance: 8mm (coil & contacts)
- Clearance distance: NO type 4.5mm, NC type 4mm
- 1 Form A, 1 Form B and 1 Form C configurations
- Subminiature, standard PCB layout
- Reflow soldering version available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C, 1B			
Contact resistance	100mΩ max.(at 1A 6VDC)			
Contact material	AgSnO ₂ , AgNi, AgCdO			
Contact rating (Res. load)	1A	1C		1B
		NO	NC	NC
	5A 250VAC 5A 30VDC 10A 125VAC	5A 250VAC 5A 30VDC 10A 125VAC	3A 250VAC 3A 30VDC	5A 250VAC
Max. switching current	10A	3A	5A	
Max. switching power	1250VA / 150W	750VA	1250VA	
Max. switching voltage	250VAC / 30VDC		250VAC	
Mechanical endurance	5 x 10 ⁶ OPS			
Electrical endurance	H type: 3 x 10 ⁵ OPS(5A 250VAC, Resistive load, Room temp., 1s on 1s off)			
	Z type: 1 x 10 ⁵ OPS(NO:5A/NC:3A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)			
	D type: 1 x 10 ⁴ OPS(5A 250VAC, Resistive load, Room temp., 1s on 1s off)			

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)	8ms max.	
Release time (at rated. volt.)	5ms max.	
Ambient operating temperature	-40°C to 85°C	
Humidity	5% to 85% RH	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Termination	PCB	
Unit weight	Approx. 7g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.

2) For working environment temperature of 105°C, please contact Hongfa.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 200mW
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COIL DATA

at 23°C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

Notes: *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	AgCdO	5A 250VAC/30VDC at 40°C 8A 250VAC at 40°C 10A 125VAC at 40°C 10A 277VAC COSØ=0.4 at 40°C 1/10HP 125VAC, 1/6HP 250VAC at 40°C
		AgNi	5A 250VAC/30VDC at 85°C 8A 250VAC at 70°C 10A 125VAC at 85°C 10A 277VAC COSØ=0.4 at 70°C 1/10HP 125VAC, 1/6HP 250VAC at 70°C
		AgSnO ₂	5A 250VAC/30VDC at 85°C 10A 125VAC at 85°C
	1 Form C	AgCdO	NO:5A 250VAC/30VDC at 40°C NC:3A 250VAC/30VDC at 40°C
		AgNi	NO:5A 250VAC/30VDC at 85°C
		AgSnO ₂	NC:3A 250VAC/30VDC at 85°C
VDE	1 Form A	AgNi	5A 250VAC at 85°C
		AgCdO	5A 250VAC at 70°C
		AgSnO ₂	5A 250VAC at 85°C
	1 Form C	AgCdO	NO: 5A 250VAC at 70°C*
		AgNi	NC: 3A 250VAC at 70°C*
		AgSnO ₂	NO: 5A 250VAC at 85°C* NC: 3A 250VAC at 85°C*
CQC	1 Form A	AgNi AgCdO AgSnO ₂	5A 250VAC/30VDC at 85°C NO: 5A 250VAC at 80°C
	1 Form C	AgNi AgCdO AgSnO ₂	NO: 5A 250VAC/30VDC at 85°C NC: 3A 250VAC/30VDC at 85°C
	1 Form B	AgNi AgCdO AgSnO ₂	NC: 5A 250VAC at 40°C

Notes: 1) *The vent hole is kept open during load approval;
2) All values unspecified are at room temperature.
3) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF33F /	012	-H	S	L	3	F	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	H: 1 Form A Z: 1 Form C D: 1 Form B							
Construction ¹⁾	S: Plastic sealed Nil: Flux proofed							
Coil power	L: Sensitive (Only for 1 Form A) Nil: Standard							
Contact material	T: AgSnO ₂ 3: AgNi Nil: AgCdO							
Insulation standard	F: Class F							
Special code ³⁾	XXX: Customer special requirement Nil: Standard							

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.
4) Two packing methods available: paper box package, tube package, Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.
5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

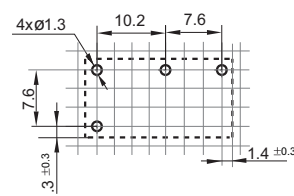
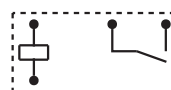
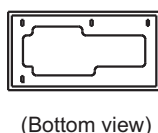
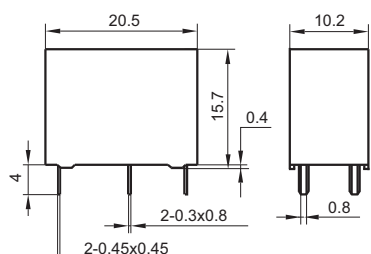
Unit: mm

Outline Dimensions

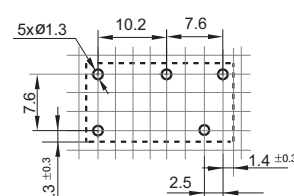
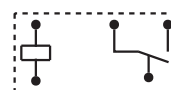
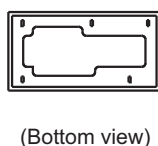
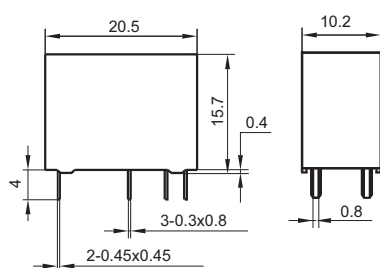
Wiring Diagram (Bottom view)

PCB Layout (Bottom view)

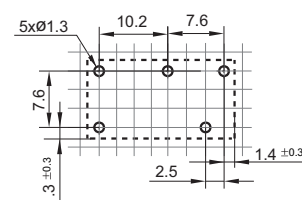
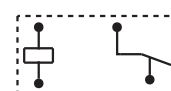
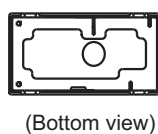
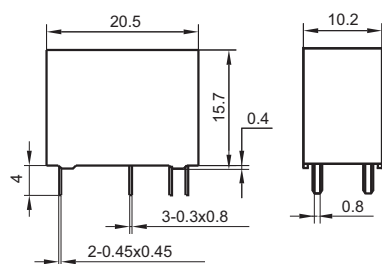
1 Form A



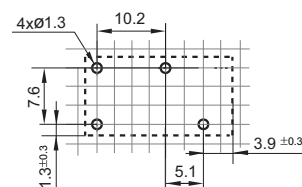
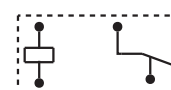
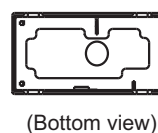
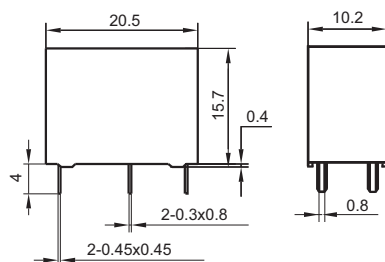
1 Form C



1 Form B (With 5 terminal)



1 Form B (With 4 terminal)

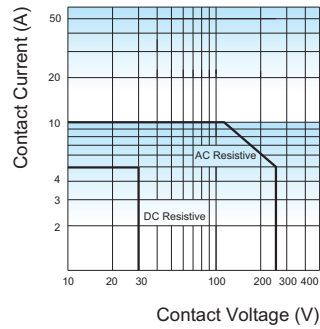


Remark:1) * The additional tin top is max. 1mm.

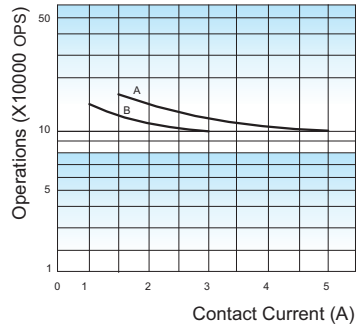
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
- 4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

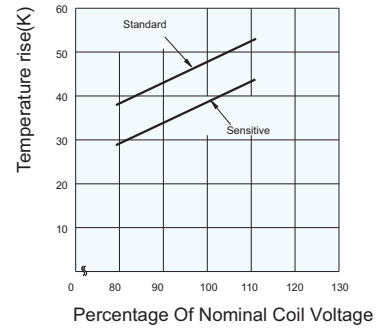
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Notes:

1. Curve A: NO contact
- Curve B: NC contact

2. Test conditions:

Curve A: NO, Resistive load, Room temp.,
flux proofed, 250VAC/30VDC, 1s on 9s off
Curve B: NC, Resistive load, Room temp.,
flux proofed, 250VAC/30VDC, 1s on 9s off

Notes:

Standard: 5A at 85°C
Sensitive: 5A at 85°C
Mounting distance: 10mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF33F-G

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:125661



File No.:CQC12002076530



Features

- 10A switching capability
- Creepage distance: 8mm
- Clearance distance: H type 4.5mm,Z type 4mm
- 1 Form A and 1 Form C configurations
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available
- Plastic sealed and flux proofed types available
- Shape and Pin compatible with HF33F

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C		
Contact resistance	100mΩ max.(at 1A 6VDC)		
Contact material	AgSnO ₂		
Contact rating (Res. load)	1A	1C	
		NO	NC
	10A 250VAC	10A 250VAC	5A 250VAC
Max.switching current	10A		5A
Max.switching power	2500VA		1250VA
Max.switching voltage	277VAC		
Mechanical endurance	5 x 10 ⁶ OPS		
Electrical endurance	NO:1 x 10 ⁵ OPS(10A 250VAC, Resistive load, 40°C, 1s on 9s off)		
	NC:1 x 10 ⁵ OPS(10A 250VAC, Resistive load, 40°C, 1s on 9s off)		

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 7g
Construction		Plastic sealed ⁽²⁾ Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 200mW
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COIL DATA

at 23°C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC	Coil Resistance Ω
3	2.25	0.15	3.9	45 x (1±10%)
5	3.75	0.25	6.5	125 x (1±10%)
6	4.50	0.30	7.8	180 x (1±10%)
9	6.75	0.45	11.7	400 x (1±10%)
12	9.00	0.60	15.6	720 x (1±10%)
18	13.5	0.90	23.4	1600 x (1±10%)
24	18.0	1.20	31.2	2800 x (1±10%)
48	36.0	2.40	62.4	11520 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

SAFETY APPROVAL RATINGS

VDE	1H	AgSnO ₂	10A 250VAC/277VAC, 85°C 10A 30VDC, 40°C 5A 250VAC/277VAC, 105°C 10A 250VAC/277VAC, 105°C(only for sensitive type) Makiing 4.4A 277VAC/Breking 2.2A 277VAC, 105°C
	1Z	AgSnO ₂	NO:10A 250VAC/277VAC, 85°C NO:10A 30VDC, 40°C NO:Makiing 4.4A 277VAC/Breking 2.2A 277VAC, 105°C NC:5A 250VAC/277VAC,85°C NC:10A 30VDC,40°C
UL/CUL ⁽¹⁾	1H	AgSnO ₂	10A 250VAC/277VAC, 40°C 10A 250VAC/277VAC, 85°C 10A 30VDC, 85°C TV-5 120VAC/240VAC, 85°C(only for standard type) 1/2HP 250VAC, 85°C 1/3HP 125VAC, 85°C Electronic Ballast,1A 120VAC, 85°C 10A 250VAC/277VAC, 105°C(only for sensitive type)
	1Z	AgSnO ₂	NO:10A 250VAC/277VAC, 40°C NO:10A 250VAC/277VAC, 85°C NO:10A 30VDC, 85°C NO:TV-5 120VAC/240VAC, 85°C(only for standard type) NO:1/2HP 250VAC, 85°C NO:1/3HP 125VAC, 85°C NO:Electronic Ballast,1A 120VAC, 85°C NO:10A 250VAC/277VAC, 105°C(only for sensitive type) NC:5A 250VAC/277VAC, 40°C NC:5A 250VAC/277VAC, 85°C NC:5A 30VDC, 85°C
CQC	1H	AgSnO ₂	10A 250VAC, 85°C
	1Z	AgSnO ₂	NO:10A 250VAC, 85°C NC:5A 250VAC, 85°C

Notes: 1) Opening the vent hole under contact material Plastic sealed types testing.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF33F-G /		12	-H	S	L	T	F	(XXX)
Type								
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	H: 1 Form A		Z: 1 Form C					
Construction ¹⁾²⁾	S: Plastic sealed		Nil: Flux proofed					
Coil power	L: Sensitive 200mW(H type only) Nil: Standard 450mW							
Contact material	T: AgSnO ₂							
Insulation standard	F: Class F							
Special code	XXX: Customer special requirement				Nil: Standard			

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

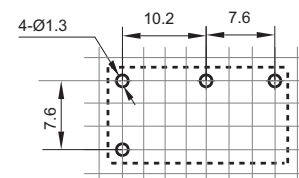
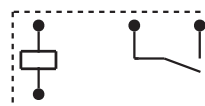
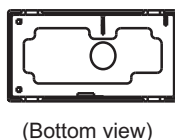
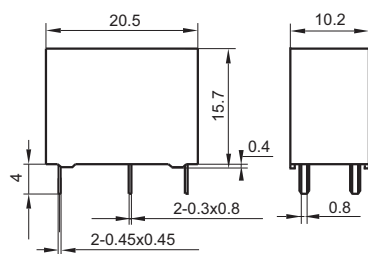
Unit: mm

Outline Dimensions

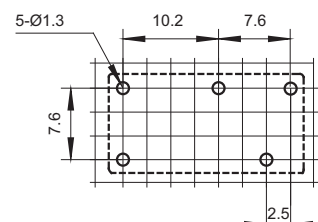
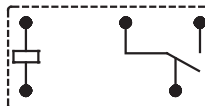
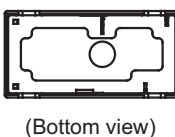
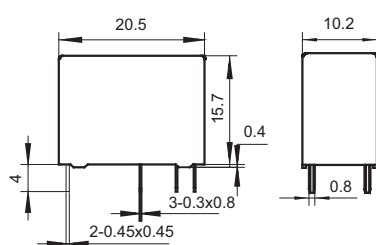
Wiring Diagram (Bottom view)

PCB Layout (Bottom view)

1 Form A



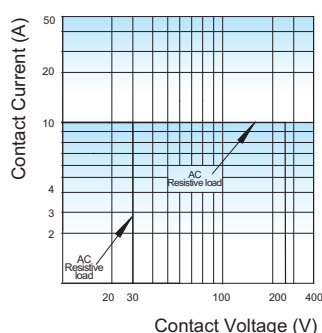
1 Form C



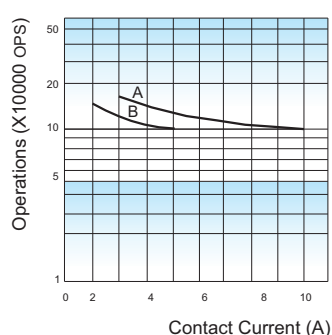
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) Mesh width is 2.54mm.

CHARACTERISTIC CURVES

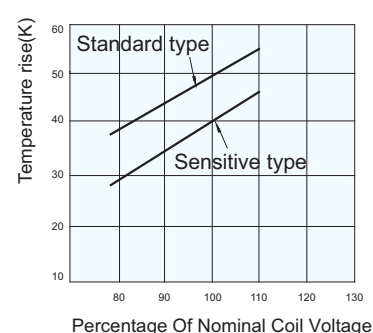
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Notes:

Curve A: NO contact

Curve B: NC contact

Test conditions:

- A: NO, 250VAC/277VAC, Resistive load
 flux proofed type, Room temp, 1s on 9s off
 B: NC, 250VAC/277VAC, Resistive load
 flux proofed type, Room temp, 1s on 9s off

Test conditions: 10A at 85°C
 Mounting distance: 10mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF33F-L

MINIATURE HIGH POWER RELAY



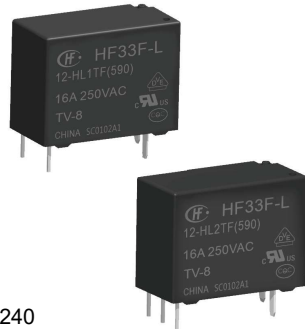
File No.: E133481



File No.: 40055285



File No.: CQC21002315240



Features

- Magnetic latching relay
- Low coil power
1 coil magnetic latching relay: Approx. 0.2W
2 coil magnetic latching relay: Approx. 0.4W
- High contact switching capacity: 16A 250VAC
- 1 Form A configurations

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res.)	10A 250VAC, 16A 250VAC
Max.switching voltage	277VAC
Max.switching current	16A
Max.switching power	4000VA
Mechanical endurance	1×10 ⁶ OPS
Electrical endurance ²⁾	3×10 ⁴ OPS (16A 250VAC, General use, 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be excised in test.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between open contacts	2500VAC 1min
	Between coil & contacts	1000VAC 1min
Operate time (at nomi. volt.)		10ms max.
Release time (at nomi. volt.)		10ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 7g
Construction		Plastic sealed Flux proofed

Notes: 1) The data shown above are initial values.

COIL

Coil power	1 coil latching	Approx. 200mW
	2 coil latching	Approx. 400mW

COIL DATA

23°C

1 coil latching(200mW)

Nominal Voltage VDC	Pick-up Voltage ¹⁾ VDC max.	Drop-out Voltage VDC min	Pulse Width ms	Coil Resistance Ω
3	2.25	2.25	≥ 100	45 x (1±10%)
5	3.75	3.75	≥ 100	125 x (1±10%)
6	4.5	4.5	≥ 100	180 x (1±10%)
9	6.75	6.75	≥ 100	405 x (1±10%)
12	9.00	9.00	≥ 100	720 x (1±10%)
18	13.5	13.5	≥ 100	1620 x (1±10%)
24	18.0	18.0	≥ 100	2880 x (1±10%)
48	36.0	36.0	≥ 100	11520 x (1±10%)

2 coil latching(400mW)

Nominal Voltage VDC	Pick-up Voltage ¹⁾ VDC max.	Drop-out Voltage VDC min	Pulse Width ms	Coil Resistance Ω
3	2.25	2.25	≥ 100	22.5 (1±10%)
5	3.75	3.75	≥ 100	62.5 (1±10%)
6	4.5	4.5	≥ 100	90 (1±10%)
9	6.75	6.75	≥ 100	202.5 (1±10%)
12	9.00	9.00	≥ 100	360 (1±10%)
18	13.5	13.5	≥ 100	810 (1±10%)
24	18.0	18.0	≥ 100	1440 (1±10%)
48	36.0	36.0	≥ 100	5760 (1±10%)

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	10A 250VAC, Resistive&General Use 85°C 16A 250VAC, Resistive&General Use 85°C TV-8 125VAC 40°C 1/2HP 250 Vac 85°C 1/3HP 120 Vac 85°C 3A, 277 Vac, Electronic Ballast 85°C 5A, 120 Vac, Electronic Ballast 85°C 8A, 120VAC, Tungsten 40°C
	CQC 16A,250VAC, Resistive&General Use 85°C
VDE	16A,250VAC, General Use 85°C



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

ORDERING INFORMATION

Type	HF33F-L/	12	-H	L1	T	F	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	1H:1 Form A						
Sort	L1: 1 coil latching L2: 2 coil latching						
Contact material	T: AgSnO ₂						
Insulation class	F: Class F						
Special code	XXX: Customer special requiremen; Nil: Standard						

- Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.);
 We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc);
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB;
 3) The customer special requirement express as special code after evaluating by Hongfa;
 4) If you need to select a product with Plastic sealed specifications , please contact Hongfa Technology.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

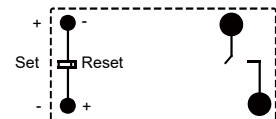
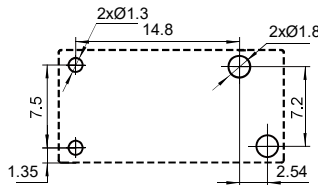
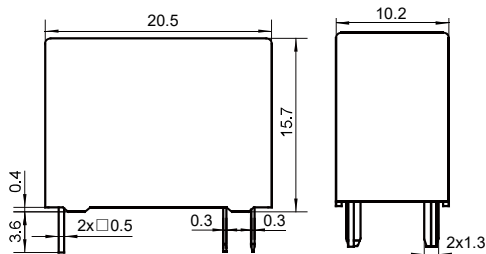
Unit: mm

Outline Dimensions

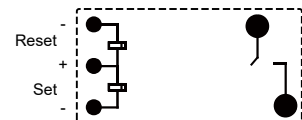
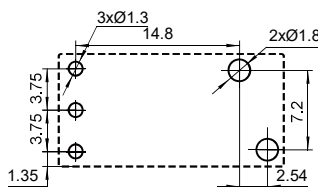
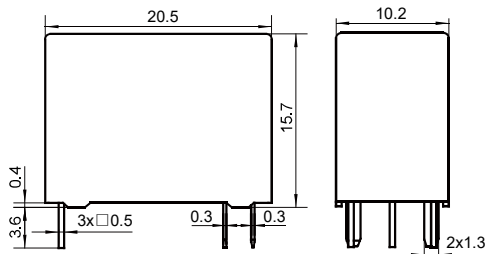
PCB Layout
(Bottom view)

Wiring Diagram
(Bottom view)

1 coil latching



2 coil latching



- Notes: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
 2) In case of no tolerance shown in outline dimension: outline dimension ≤ 1mm, tolerance should be ±0.2mm;
 outline dimension > 1mm and ≤ 5mm, tolerance should be ±0.3mm; outline dimension > 5mm, tolerance should be ±0.4mm.
 3) The tolerance without indicating for PCB layout is always ±0.1mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Notice:

1. Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
2. In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than "set" or "reset" time. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF36F

SUBMINIATURE INTERMEDIATE POWER RELAY

c  us

File No.:E134517



File No.:R50356442



File No.:CQC18002199981
CQC16002159838



Features

- 10A switching capability
- TV-5 125VAC approved by UL standard (only for 1 Form A)
- Plastic sealed and flux proofed types available
- 1 Form A and 1 Form C configurations

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgCdO
Contact rating	10A 250VAC 10A 30VDC TV-5 125VAC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10 ⁷ ops
Electrical endurance	5 x 10 ⁴ ops (10A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	NO: 4000VAC 1min NC: 3000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 70°C
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 12g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class A.

COIL

Coil power	Standard: Approx. 530mW; Sensitive: Approx. 250mW
------------	--

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.25	6.5	47 x (1±10%)
6	4.50	0.30	7.8	68 x (1±10%)
9	6.75	0.45	11.7	155 x (1±10%)
12	9.00	0.60	15.6	270 x (1±10%)
18	13.5	0.90	23.4	620 x (1±10%)
24	18.0	1.20	31.2	1080 x (1±10%)
48	36.0	2.40	62.4	4400 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.25	6.5	100 x (1±10%)
6	4.50	0.30	7.8	145 x (1±10%)
9	6.75	0.45	11.7	325 x (1±10%)
12	9.00	0.60	15.6	575 x (1±10%)
18	13.5	0.90	23.4	1300 x (1±10%)
24	18.0	1.20	31.2	2310 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form C	10A 250VAC 10A 30VDC
	1 Form A	10A 250VAC 10A 30VDC TV-5 125VAC
TÜV		10A 250VAC COSØ =1 10A 30VDC L/R=0

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF36F / 012 -H S L T (XXX)					
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	H: 1 Form A		Z: 1 Form C			
Construction ¹⁾	S: Plastic sealed		Nil: Flux proofed			
Coil power	L: Sensitive (Only for 1 Form A)		Nil: Standard			
Contact material	T: AgSnO ₂		Nil: AgCdO			
Special code ³⁾	XXX: Customer special requirement		Nil: Standard			

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

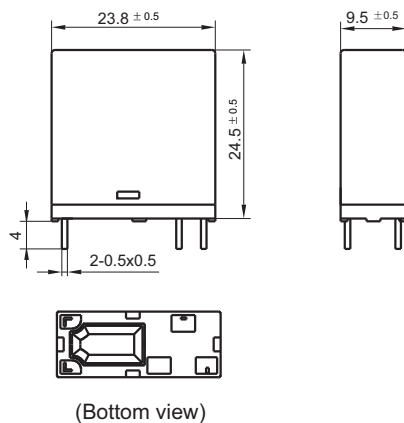
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

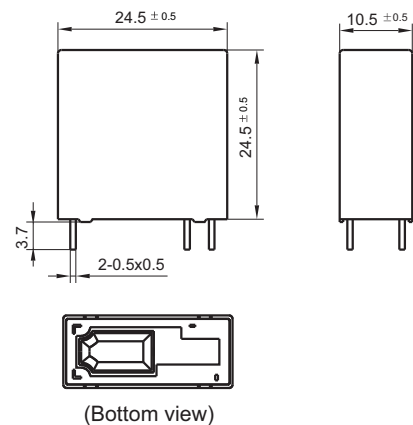
Unit: mm

Outline Dimensions

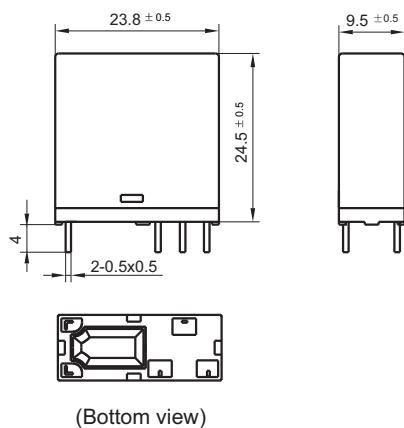
1 Form A & Flux proofed



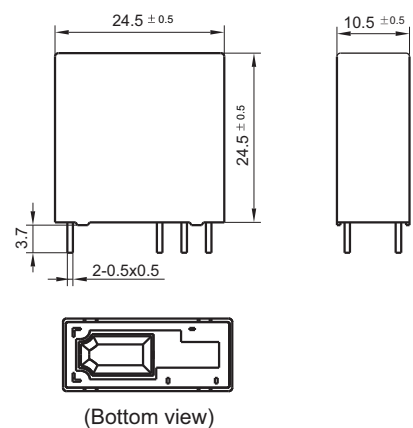
1 Form A & Plastic sealed



1 Form C & Flux proofed



1 Form C & Plastic sealed

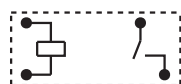


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

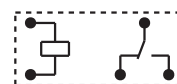
Unit: mm

Wiring Diagram
(Bottom view)

1 Form A

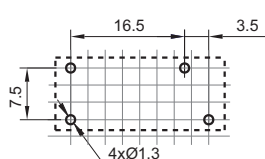


1 Form C

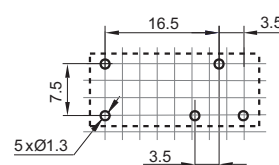


PCB Layout
(Bottom view)

1 Form A



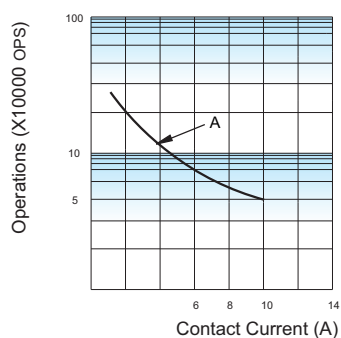
1 Form C



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

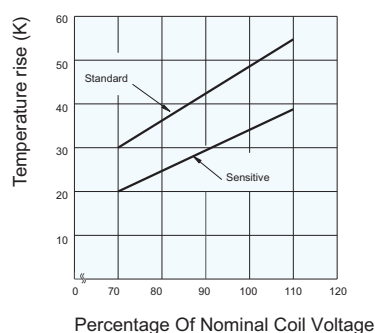
ENDURANCE CURVE



Notes:

- (1) Curve A: H type
- (2) Test conditions:
10A 250VAC, Resistive load,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



Disclaimer

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HF36F-20

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: R50263288



File No.: CQC21002316568



Features

- 10.5mm Wide Slim Relay
- 20A switching capability
- High sensitivity, Coil power consumption is only 0.53W
- High surge current resistance: TV-8
- Insulation distance $\geq 6.4\text{mm}$
- Surge Voltage between Coil Contacts 10kV
- Optional explosion-proof specifications

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100m Ω max. (at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res.)	20A 277VAC
Max.switching voltage	277VAC
Max.switching current	20A
Max.switching power	5540VA
Mechanical endurance	2 $\times 10^6$ OPS
	5 $\times 10^4$ OPS
Electrical endurance	(20A 277VAC, Resistive load, 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC	Coil Resistance Ω
5	3.75	0.25	6.5	47 $\times (1\pm 10\%)$
6	4.5	0.30	7.8	68 $\times (1\pm 10\%)$
9	6.75	0.45	11.7	155 $\times (1\pm 10\%)$
12	9.00	0.60	15.6	270 $\times (1\pm 10\%)$
24	18.0	1.20	31.2	1080 $\times (1\pm 10\%)$
48	36.0	2.40	62.4	4400 $\times (1\pm 10\%)$

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between open contacts	1000VAC 1min
	Between coil & contacts	4000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 12g
Construction		Plastic sealed Non-plastic sealed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	20A 277VAC 85°C
	16A 277VAC 85°C
	Making 20A, Breaking 5A 277VAC 85°C
	TV-8 120VAC 40°C
TUV	20A 277VAC 85°C
	16A 277VAC 85°C
	Making 20A, Breaking 5A 277VAC 85°C
	IEC62368-1 20A 277VAC 85°C
CQC	20A 277VAC 85°C
	16A 277VAC 85°C
	Making 20A, Breaking 5A 277VAC 85°C

Notes: 1) Only some typical rating are listed above. If more details are required, please contact us.

COIL

Coil power	Approx. 0.53W
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HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

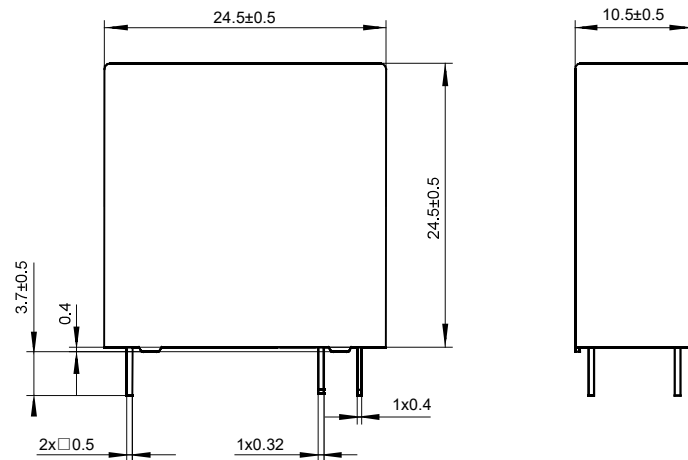
Type	HF36F-20/	12	-H	S	T	F	(XXX)
Coil voltage	5,6,9,12,24,48VDC						
Contact arrangement	H:1 Form A						
Construction ¹⁾	S: Plastic sealed Nil: Non-plastic sealed						
Contact material	T: AgSnO ₂						
Insulation class	F: Class F						
Special code	XXX: Customer special requiremen; Nil: Standard						

Notes: 1) Non-plastic sealed relays cannot be used in environment pollution (containing certain amount of H₂S, SO₂, NO₂, dust and other pollutants);
 2) Non-plastic sealed relays cannot be cleaned and treated as a whole after being loaded into PCB welding;
 3) The customer special requirement express as special code after evaluating by Hongfa.

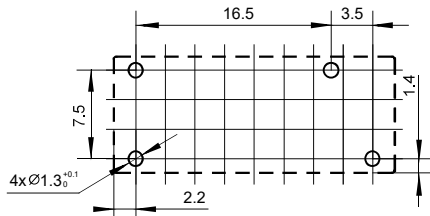
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

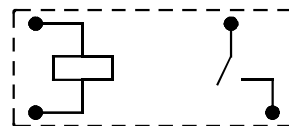
Outline Dimensions



PCB Layout(Bottom view)



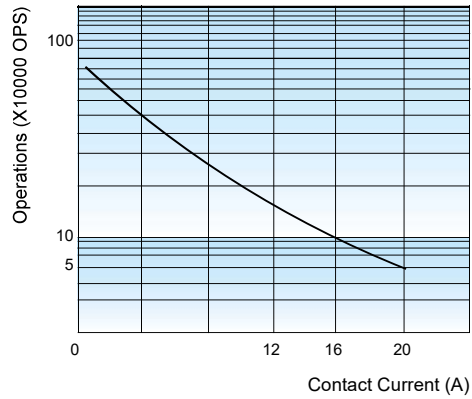
Wiring Diagram(Bottom view)



- Notes: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm and ≤ 30 mm, tolerance should be ± 0.4 mm; outline dimension > 30 mm, tolerance should be ± 0.6 mm.
- 3) The tolerance without indicating for PCB layout is always ± 0.1 mm.

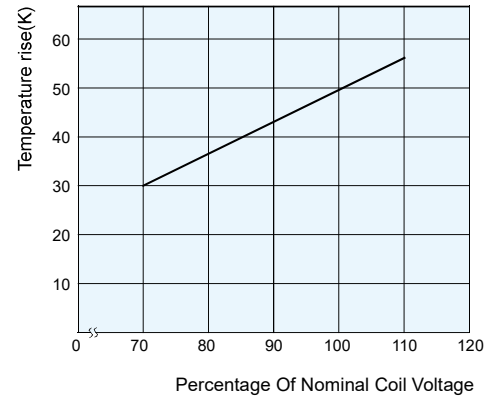
CHARACTERISTIC CURVES

ENDURANCE CURVE



Test conditions:
20A 277VAC, Resistive load, at 85°C, 1s on 9s off.

COIL TEMPERATURE RISE



Disclaimer

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HF36F-W

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:R50356442



Features

- 16A switching capability
- 3kV dielectric strength(between coil and contacts)
- UL insulation system: Class F
- Standard PCB layout
- Environmental friendly product (RoHS compliant)

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max.(1A 6VDC)
Contact material	AgSnO ₂
Contact rating	16A 250VAC 16A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	16A
Max. switching power	4000VA / 480W
Mechanical endurance	5 x 10 ⁵ OPS
Electrical endurance	≥ 1 x 10 ⁴ OPS(85°C, 1s on 9s off, 16A 250VAC, Resistive load)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open contacts	3000VAC 1min
	Between coil & contacts	4000VAC 1min
Surgevoltage (between coil&contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Coil temperature rise (at nomi. volt.)		70K max.(Contact rating 16A,temperature 85°C)
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx.12g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 650mW
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COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.25	6.5	38.5 x (1±10%)
12	9.00	0.60	15.6	221 x (1±10%)
24	18.0	1.20	31.2	886x (1±10%)
48	36.0	2.40	62.4	3544 x (1±10%)

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	16A 277VAC 16A 30VDC
TÜV	16A 277VAC 16A 30VDC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

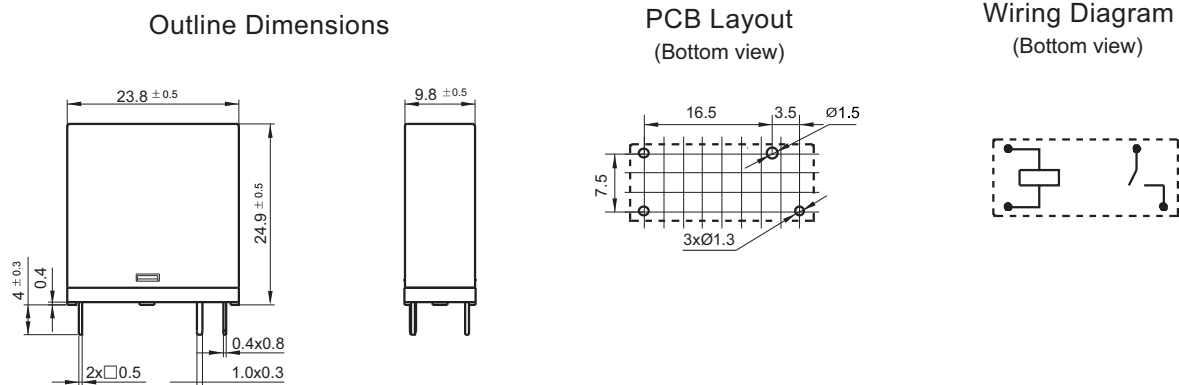
ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION					
Type	HF36F-W /	12	-H	T	F (XXX)
Coil voltage	5, 12, 24, 48VDC				
Contact arrangement	H: 1 Form A				
Contact material	T: AgSnO ₂				
Insulation standard	F: Class F				
Special code	XXX: Customer special requirement		Nil: Standard		

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT Unit: mm



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1mm, tolerance should be ±0.2mm; outline dimension > 1mm and ≤ 5mm, tolerance should be ±0.3mm; outline dimension > 5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

Disclaimer

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HF36FD

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:R50356444



File No.:CQC18002199980
CQC16002159846



Features

- 10A switching capability
- TV-8 125VAC approved by UL standard (117A inrush current)
- Ideal for device power reduction

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating	10A 250VAC 5A 250VAC 5A 30VDC TV-8 125VAC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 150W
Mechanical endurance	1 x 10 ⁶ ops 5 x 10 ⁴ ops
Electrical endurance	(10A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 70°C
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx.12g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class A

COIL

Coil power	Standard: Approx. 530mW Sensitive: Approx. 250mW
------------	---

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.25	6.5	47 x (1±10%)
6	4.50	0.30	7.8	68 x (1±10%)
9	6.75	0.45	11.7	155 x (1±10%)
12	9.00	0.60	15.6	270 x (1±10%)
18	13.5	0.90	23.4	620 x (1±10%)
24	18.0	1.20	31.2	1080 x (1±10%)
48	36.0	2.40	62.4	4400 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
5	4.00	0.25	6.5	100 x (1±10%)
6	4.80	0.30	7.8	145 x (1±10%)
9	7.20	0.45	11.7	325 x (1±10%)
12	9.60	0.60	15.6	575 x (1±10%)
18	14.4	0.90	23.4	1300 x (1±10%)
24	19.2	1.20	31.2	2310 x (1±10%)

Notes: 1) The data shown above are initial values.

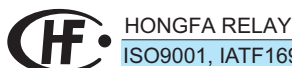
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 250VAC 5A 250VAC TV-8 125VAC
TÜV	10A 250VAC 5A 250VAC/30VDC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

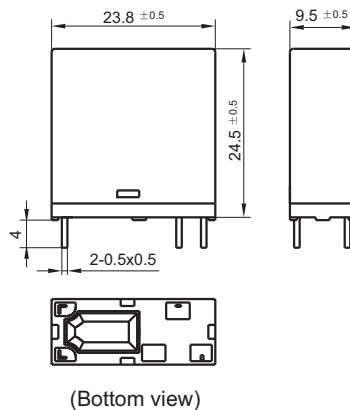
Type	HF36FD / 012 -H L T (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC
Contact arrangement	H: 1 Form A
Coil power	L: Sensitive Nil: Standard
Contact material	T: AgSnO ₂
Special code ³⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 2) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 3) The customer special requirement express as special code after evaluating by Hongfa.

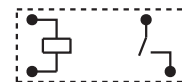
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

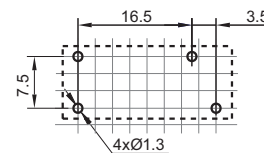
Outline Dimensions



Wiring Diagram
(Bottom view)



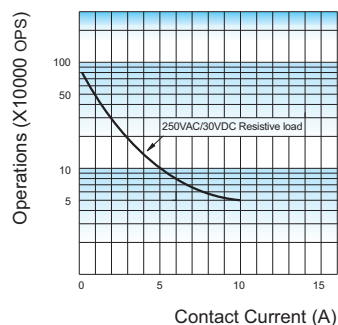
PCB Layout
(Bottom view)



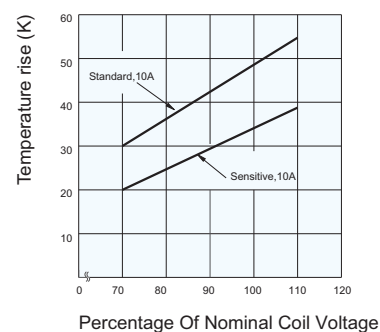
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

ENDURANCE CURVE



COIL TEMPERATURE RISE



Disclaimer

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HF162F

SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E133481



File No.:40032669



File No.:CQC10002050942



Features

- High inrush current: TV-8 125VAC (117A inrush current)
- 3A/100A 250VAC capacitive load
- High sensitivity: 250mW,
Ideal for device power reduction
- Typical applications: Flat-panel TVs, Audio visual equipment and other slim profile devices

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	Silver alloy
Contact rating	10A 125VAC 8A 277VAC 5A 277VAC TV-8 125VAC 3A/100A 250VAC (Capacitive)
Max. switching voltage	277VAC
Max. switching current	10A
Max. switching power	2216VA
Mechanical endurance	1 x 10 ⁶ ops 5 x 10 ⁴ ops
Electrical endurance	(10A 125VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Ambient temperature		-40°C to 70°C
Humidity		5% to 85% RH
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 12g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class A

COIL

Coil power	Approx. 250mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	36 x (1±10%)
5	3.75	0.5	6.5	100 x (1±10%)
6	4.5	0.6	7.8	145 x (1±10%)
9	6.75	0.9	11.7	325 x (1±10%)
12	9.0	1.2	15.6	575 x (1±10%)
18	13.5	1.8	23.4	1300 x (1±10%)
24	18.0	2.4	31.2	2300 x (1±10%)

Notes: 1) The data shown above are initial values.

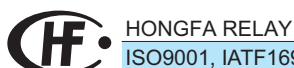
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 125VAC 8A 277VAC 5A 277VAC TV-8 125VAC
VDE	8A 250VAC 5A 250VAC 3A/100A 250VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

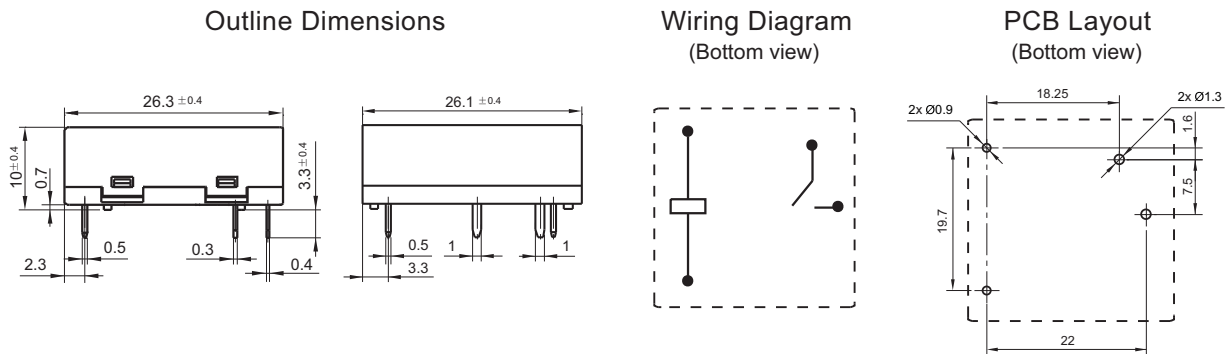
ORDERING INFORMATION

Type	HF162F /	12	-H	(XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC			
Contact arrangement	H: 1 Form A			
Special code ¹⁾	XXX: Customer special requirement		Nil: Standard	

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

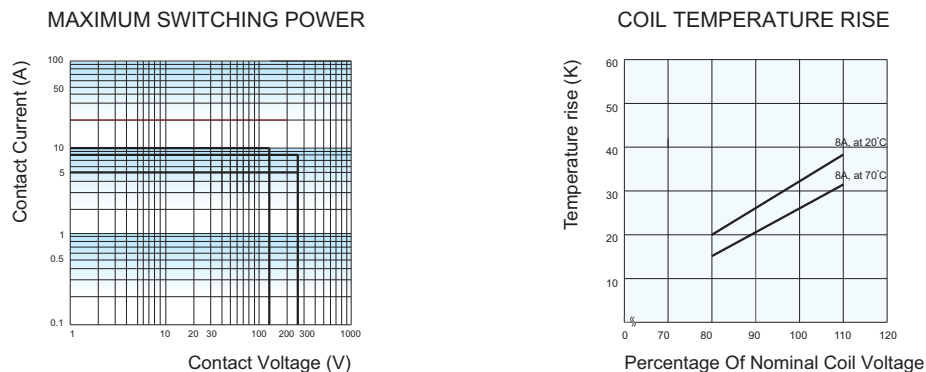
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
 2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES



Disclaimer

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HF8

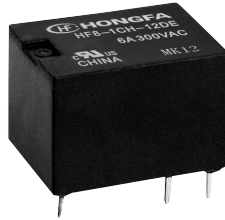
SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:40025189



Features

- 4kV impulse withstand voltage (between coil and contacts)
- 1 Form A and 1 Form C configurations
- Subminiature, high sensitive, PCB layout
- Plastic sealed type for automatic wave soldering

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 24VDC)
Contact material	AgNi
Contact rating (Res. load)	HF8: 6A 300VAC/28VDC HF8A: 6A 277VAC/30VDC
Max. switching voltage	300VAC / 30VDC
Max. switching current	6A
Max. switching power	1800VA / 300W
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance ²⁾	Plastic sealed:1 x 10 ⁴ OPS Flux proofed, Standard type:1 x 10 ⁵ OPS Flux proofed, Sensitive type:5 x 10 ⁴ OPS (NO, 6A 300VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance	100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts 2000VAC 1min Between open contacts 750VAC 1min
Operate time (at rated. volt.)	6ms max.
Release time (at rated. volt.)	3ms max.
Humidity	5% to 85% RH
Operation ambient temperature	-55°C to 90°C
Shock resistance	Functional 98m/s ² Destructive 980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA
Termination	PCB
Unit weight	Approx. 11g
Construction	Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B, Class A.

COIL

Coil power	Standard: Approx. 450mW (48VDC: Approx. 600mW) Sensitive: Approx. 330mW
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COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ²⁾	Drop-out Voltage VDC min. ²⁾	Max. Voltage VDC *3)	Coil Resistance Ω
3	2.25	0.15	3.90	20 x (1±10%)
5	3.75	0.25	6.50	56 x (1±10%)
6	4.50	0.30	7.80	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	3800 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. ²⁾	Drop-out Voltage VDC min. ²⁾	Max. Voltage VDC *3)	Coil Resistance Ω
3	2.25	0.15	3.90	28 x (1±10%)
5	3.75	0.25	6.50	80 x (1±10%)
6	4.50	0.30	7.80	110 x (1±10%)
9	6.75	0.45	11.7	250 x (1±10%)
12	9.00	0.60	15.6	440 x (1±10%)
18	13.5	0.90	23.4	1000 x (1±10%)
24	18.0	1.20	31.2	1780 x (1±10%)
48	36.0	2.40	62.4	7120 x (1±10%)

Notes: 1) When requiring pick-up voltage < 75% of nominal voltage, special order allowed.

2) The data shown above are initial values.

3) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.01

SAFETY APPROVAL RATINGS

UL/CUL	Medium Duty HF8-1CH/1AH	6A 28VDC 6A 300VAC
	General Duty HF8-1C/1A	2A 28VDC 2A 300VAC 3A 120VAC
	HF8A	6A 30VDC(NO/NC) 6A 277VAC(NO/NC)
VDE	HF8....A	2.5A 250VAC COSØ=0.4 2.5A 250VAC COSØ=0.5 5A 250VAC COSØ=1 6A 250VAC COSØ=1

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF8 HF8A	-1C	H	-12	D	S	E	F	(XXX)
Type	HF8: Standard type HF8A: Low cost type								
Contact arrangement:	1A: 1 Form A 1C: 1 Form C								
Contact capacity	H: Medium Duty (6A) Nil: General Duty (3A/2A)								
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC								
Coil voltage form	D: DC								
Coil power	S: Sensitive Nil: Standard								
Construction ¹⁾	E: Plastic sealed Nil: Flux proofed								
Insulation standard	F: Class F A: Class A (VDE version, Only for HF8-1AH/1CH) Nil: Class B								
Special code ³⁾	XXX: Customer special requirement Nil: Standard								

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.

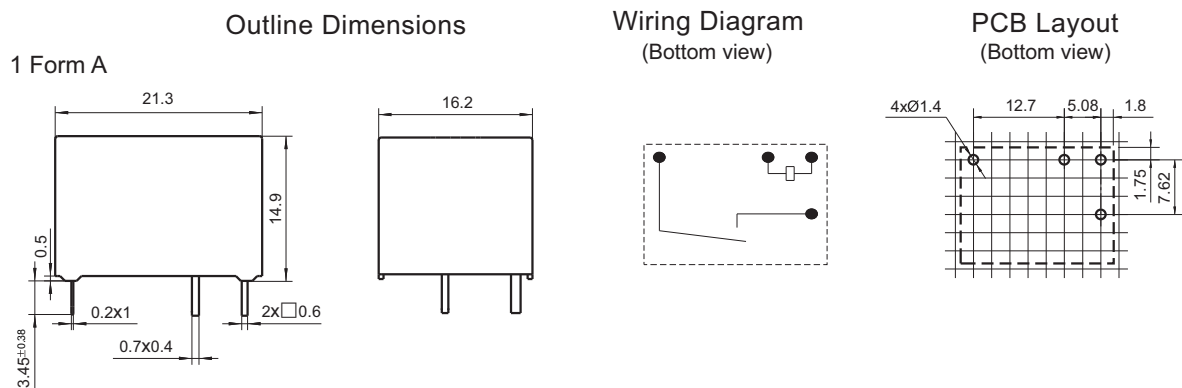
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

4) One packing methods available: tube package, Standard tube packing length is 345mm. Any special requirement needed, please contact us for more details.

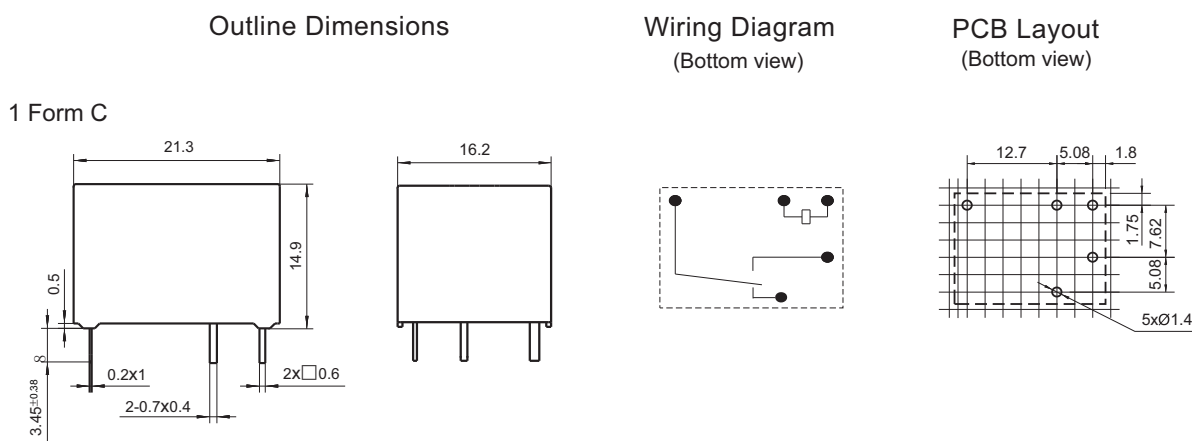
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

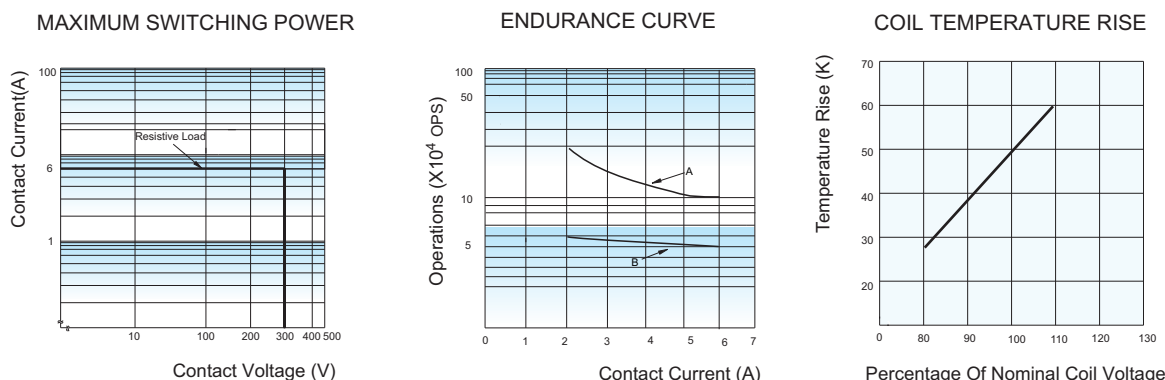
Unit: mm



Remark: 1) * The additional tin top is max. 1mm.

- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
- 4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES



Notes:

- 1) Curve A: HF8-1CH Standard type
Curve B: HF8-1CH Sensitive type
- 2) Test conditions:
NO, 6A 300VAC, Resistive load,
Flux proofed, Room temp.
1s on 9s off
- 3) For plastic sealed type, the venting-hole
should be excised in electrical endurance
test.

Testing conditions: 6A at 90°C.
Mounting distance: 25mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF3FA/HF3FA-T

SUBMINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40023708



File No.:CQC12002076529



Features

- 15A 125VAC;10A 250VAC switching capability
- TV8 @ 120Vac (for version 590)
- Flammability class according to UL94, V-0
- Product in accordance to IEC 60335-1 available
- Subminiature, standard PCB layout
- Plastic sealed and Flux proofed types available
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A	1C	
		NO	NC
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)		
Contact material	AgSnO ₂ ;AgNi;AgCdO		
Contact rating (Res. load)	10A 277VAC 10A 28VDC	10A 277VAC ²⁾ 10A 28VDC ²⁾	5A 250VAC
Max. switching voltage	277VAC/28VDC		250VAC
Max. switching current	15A	10A	5A
Max. switching power	2770VA /280W		
Mechanical endurance	1 x 10 ⁷ OPS		
Electrical endurance ³⁾	H type:1 x 10 ⁵ OPS (10A 250VAC Resistive load, Room temp., 1s on 9s off)		
	Z type:5 x 10 ⁴ OPS (NO: 5A/NC: 5A 250VAC, Resistive load, Room temp., 3s on 3s off)		

Notes: 1) The data shown above are initial values.
2) Applicable when NC is not energized with load.
3) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient operating temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 7.2 g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) For working environment temperature of 85°C, please contact with Hongfa.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.11

COIL

Coil power Approx. 360mW

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
15	11.25	1.5	19.5	625 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	HF3FA	1 Form A	10A 250VAC 85°C 6A 250VAC 105°C 15A 125VAC TV-8 120VAC (suffix 590) TV-5 120VAC
		1 Form C	NO/NC: 5A/5A 277VAC 85°C NO: TV-5 120VAC NO: TV-8 120VAC (suffix 590)
	HF3FA-T	1 Form A	10A 250VAC 105°C 12A 250VAC 105°C TV-5 120VAC
		1 Form C	NC: 6A 250VAC 105°C
VDE	HF3FA	1 Form A	6A 250VAC 105°C 10A 250VAC 85°C
		1 Form C	NO: 10A 250VAC 85°C NO: 6A 250VAC 105°C NO/NC: 5A/5A 250VAC 85°C
	HF3FA-T	1 Form A	10A 250VAC 105°C
		1 Form C	NO: 10A 250VAC 105°C NC: 6A 250VAC 105°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.
3) For sealed type, the vent-hole cover should be excised.

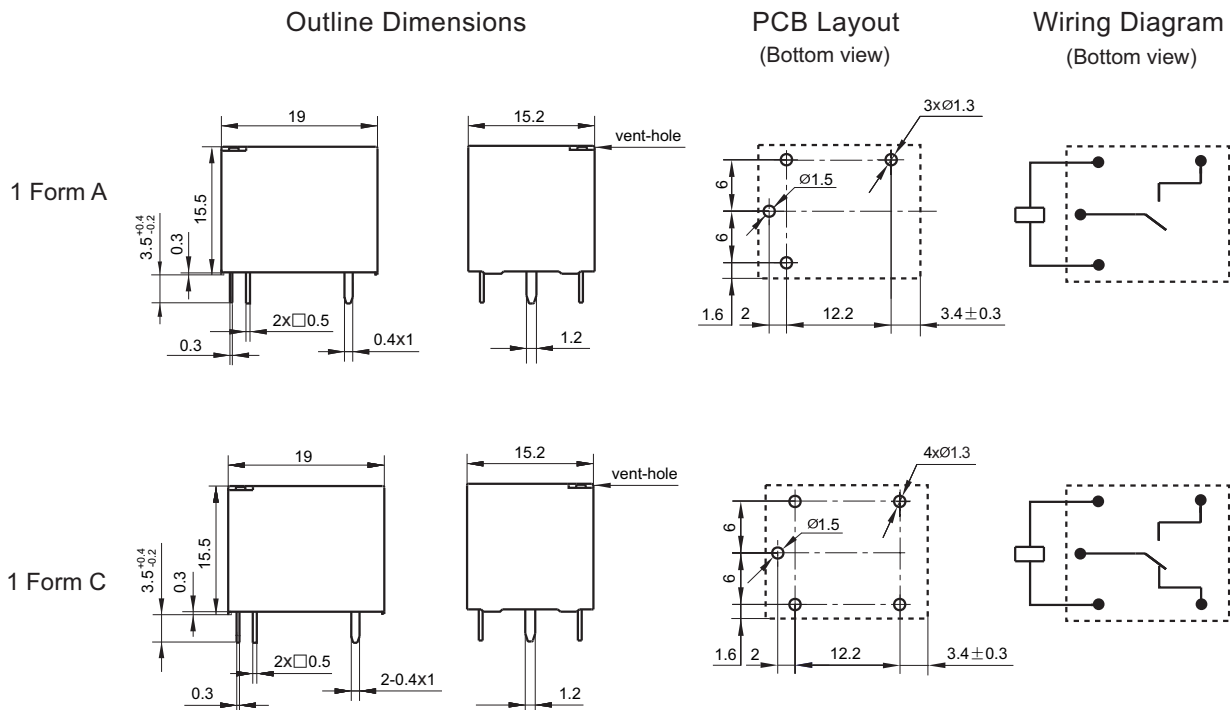
ORDERING INFORMATION

Type	HF3FA / 012 -H S T F (XXX)						
	HF3FA:85°C HF3FA-T:105°C						
Coil voltage	3,5,6,9,12,15,18,24,48VDC						
Contact arrangement	H: 1 Form A Z: 1 Form C						
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed						
Contact material	T: AgSnO ₂ 3: AgNi Nil: AgCdO						
Insulation system	F: Class F						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT); e.g.(stuffix 590) for product in accordance to TV-8 load.
4) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.
5) Two packing methods available: paper box package, tube package, Standard tube packing length is 420mm. Any special requirement needed, please contact us for more details.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

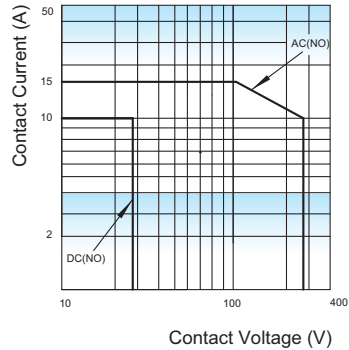
Unit: mm



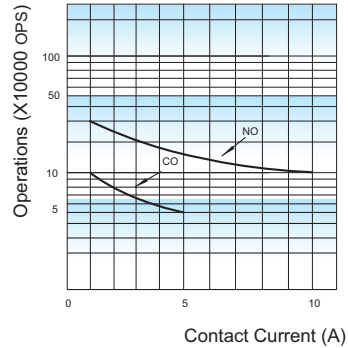
- Remark:** 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
3) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

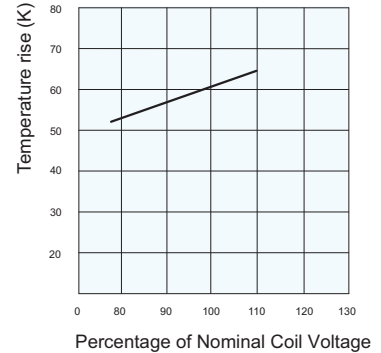
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

NO: Resistive load, Flux proofed,
Room temp., 1s on 9s off

CO: Resistive load, Flux proofed,
Room temp., 3s on 3s off

Notes: For plastic sealed type, the
venting-hole should be opened
in electrical endurance test.

Test conditions: at 85°C, 6A
Mounting distance: 10mm

Disclaimer

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HF3FA-G

SUBMINIATURE HIGH POWER RELAY



File No.: 40023708



File No.: E134517



File No.: CQC12002076529



Features

- The ambient temperature can reach 85°C
- 16A 125/250VAC switching capability
- Climatic category UL94.V-0
- Product in accordance to IEC 60335-1 available
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system:Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A	1C	
		NO	NC
Contact resistance ¹⁾		100 mΩ max.(6VDC 1 A)	
Contact material		AgSnO ₂	
Contact rating (Res. load)	16A 250VAC	16A 250VAC ²⁾	5A 250VAC
Max. switching voltage	250VAC	250VAC	250VAC
Max. switching current	16A	16A ²⁾	5A
Max. switching power		2500VAC	
Mechanical endurance		1×10 ⁷ OPS	
Electrical endurance ³⁾		H: 3×10 ⁴ OPS (16A 250VAC, 85°C)Resistive load	
		2.5×10 ⁴ OPS(TV-8 120VAC, Room temp)	
		Z: 5×10 ⁴ OPS (NC: 5A 250VAC Res. load, 85°C)Resistive load	
		3×10 ⁴ OPS(NO: 16A 250VAC, 85°C)Resistive load	
		2.5×10 ⁴ OPS(NO: TV-8 120VAC, Room temp)	

Notes: 1) The data shown above are initial values.

2) Applicable when NC is not energized with load.

3) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		100 MΩ (500 VDC)
Dielectric strength	Between coil & contacts	2500 VAC 1 min
	Between open contacts	750 VAC 1 min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max,
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10 Hz to 55 Hz 1.5mm DA
Humidity		5 % to 85 % RH
Ambient oprating temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 7.2 g
Construction		Plastic sealed,Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power Approx. 360mW

COIL DATA

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	25×(1±10%)
5	3.75	0.5	6.5	70×(1±10%)
6	4.5	0.6	7.8	100×(1±10%)
9	6.75	0.9	11.7	225×(1±10%)
12	9	1.2	15.6	400×(1±10%)
15	11.25	1.5	19.5	625×(1±10%)
18	13.5	1.8	23.4	900×(1±10%)
24	18	2.4	31.2	1600×(1±10%)
48	36	4.8	62.4	6400×(1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	H	16A 250VAC 85°C TV-8 120VAC
	Z	NO: 16A 250VAC 85°C NO: TV-8 120VAC NC: 5A 250VAC 85°C
VDC	H	16A 250VAC 85°C
	Z	NO: 16A 250VAC 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

3) For sealed type, the vent-hole cover should be excised.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

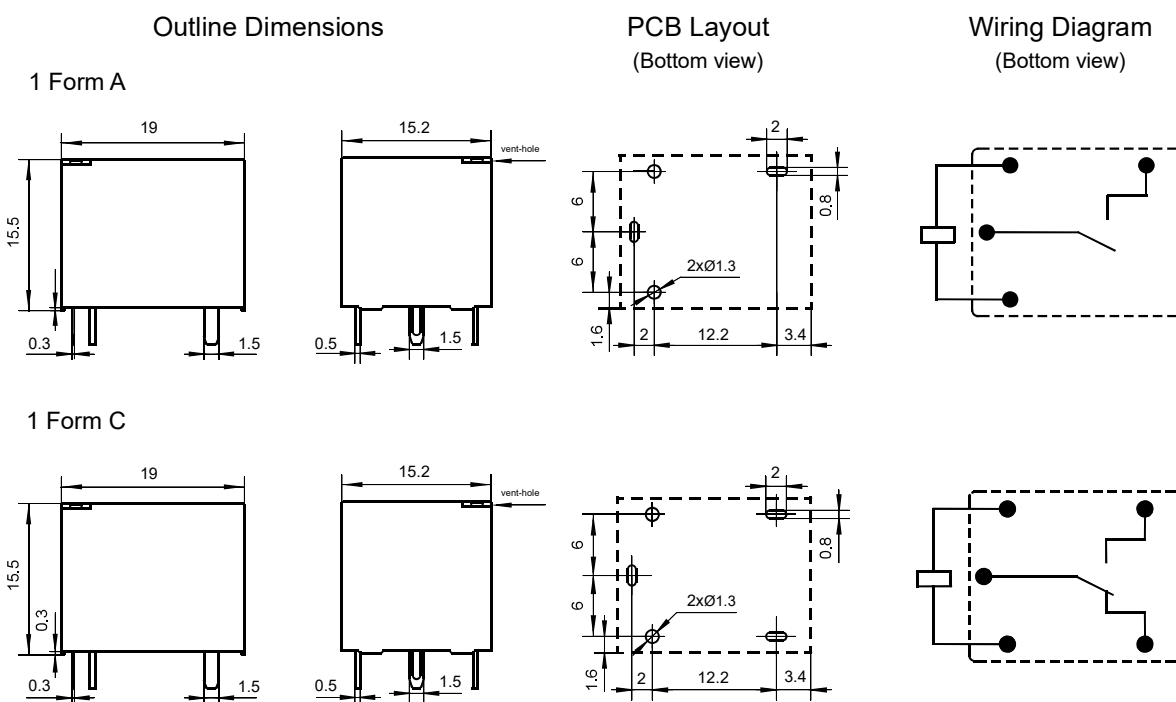
ORDERING INFORMATION

Type	HF3FA-G/	12	-H	S	T	F	(XXX)
Coil voltage	3, 5, 6, 9, 12, 15, 18, 24, 48VDC						
Contact arrangement	H: 1 Form A Z: 1 Form C						
Construction ^{1) 2)}	S: Plastic sealed Nil: Flux proofed						
Contact material	T: AgSnO ₂						
Insulation system	F: Class F						
Special code	e.g.(335) stands for product in accordance to IEC 60335-1(GWT).						

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclear environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF3FA-M

SUBMINIATURE HIGH POWER RELAY



Features

- 15A switching capability
- Subminiature, standard PCB layout
- 1 Form A and 1 Form C configurations
- Plastic sealed and Flux proofed types available

CONTACT DATA

Contact arrangement		1A	1C	
			NO	NC
Voltage drop ¹⁾		Typ.: 20mV(at 10A) Max. : 250mV(at 10A)		
Max. continuous current ²⁾		10A	10A	5A
Max. switching current ³⁾		15A	15A	5A
Max. switching voltage		30VDC		
Mechanical endurance		1 x 10 ⁷ ops		
Insulation resistance		100MΩ (500VDC)		
Dielectric strength ⁴⁾	Between coil & contacts	2000VAC 1min		
	Between open contacts	750VAC 1min		
Operation time (at rated. volt.)		10ms max.		
Release time (at rated. volt.) ⁵⁾		Typ.: 4ms Max. : 10ms		
Humidity		5% to 85% RH		
Ambient temperature		-40°C to 85°C		
Shock resistance	Functional	98m/s ²		
	Destructive	980m/s ²		
Vibration resistance		10Hz to 55Hz 1.5mm DA		
Termination		PCB		
Unit weight		Approx.7g		
Construction		Plastic sealed, Flux proofed		

Notes: 1)The original value of it also can be described as the maximum value of 100mΩ(1A 6VDC)of contact resistance.
 2)Normally open contacts, we got that result under the condition of the 100% rated voltage applied on the coil.
 3)Normally open contacts, we got that result under the voltage of 14VDC and the temperature of 23*(100 operating times).
 4)The leak current less than 1mA within 1 munite.
 5)It tests without coil suppression circuit, and the rated voltage step to 0 VDC.

COIL DATA

at 23°C

HF3FA-M

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω	Relay power consumption W
9	6.75	0.90	11.7	180 x (1±10%)	0.45
12	9.00	1.20	15.6	320 x (1±10%)	
24	18.0	2.40	31.2	1280 x (1±10%)	

HF3FA-M1

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω	Relay power consumption W
9	5.85	0.65	11.3	126 x (1±10%)	0.64
12	7.80	0.90	15.0	225 x (1±10%)	
24	15.6	1.80	30.0	900 x (1±10%)	

HF3FA-M2

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω	Relay power consumption W
9	5.15	0.60	10.8	100 x (1±10%)	0.80
12	6.80	0.80	14.4	180 x (1±10%)	
24	13.7	1.60	28.8	720 x (1±10%)	

Notes: 1) The data shown above are initial values.
 2) When no load current on contacts, coil resistance at the min. value, the max. continuous operate voltage allowed on relay coil.

CONTACT DATA

Load voltage	Load type		Load current(A)			On/Off ratio		Electrical endurance OPS	Contact material
			1Z		1H	ON s	OFF s		
			NO	NC	NO				
14VDC ⁽¹⁾	Resistive	Make	15	5	15	3	3	1 x 10 ⁵ ops	AgSnO ₂ AgNi
		Break	15	5	15	3	3		



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

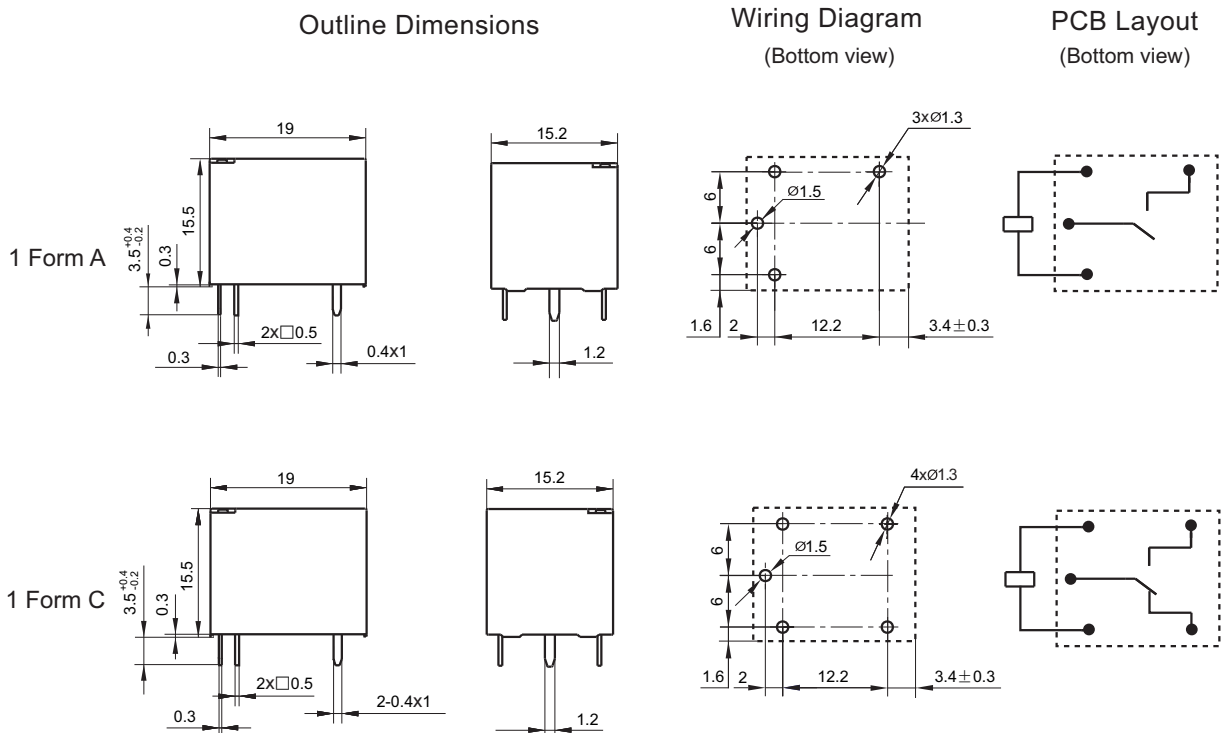
ORDERING INFORMATION

	HF3FA-M/	12	-Z	S	T	F	(XXX)
Type	HF3FA-M:0.45W HF3FA-M1:0.64W HF3FA-M2:0.8W						
Coil voltage	9, 12, 24VDC						
Contact arrangement	H: 1 Form A Z: 1 Form C						
Construction ⁽¹⁾⁽²⁾	S: Plastic sealed Nil: Flux proofed						
Contact material	T: AgSnO ₂ 3: AgNi						
Insulation system	F: Class F						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

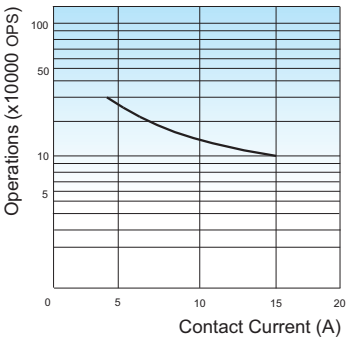
Unit: mm



Remark:1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
3) The tolerance without indicating for PCB layout is always ±0.1mm.

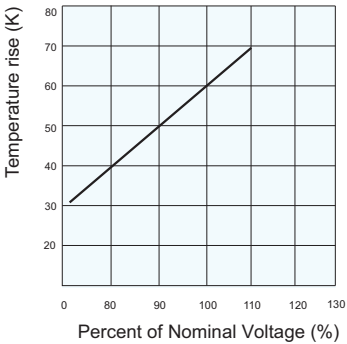
CHARACTERISTIC CURVES

ENDURANCE CURVE



Testing conditions:
Standard: flux proofed, resistive load,
14VDC, at room temp. 1s on 9s off.

COIL TEMPERATURE RISE



Testing conditions:
Standard: 10A at 85°C.
Mounting distance: 10mm

Disclaimer
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HF3FA-W

SUBMINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40023708



File No.:CQC12002076529



Features

- 10A 36VDC switching capability
- Flammability class according to UL94, V-0
- Product in accordance to IEC 60335-1 available
- Plastic sealed and flux proofed types available
- Subminiature, standard PCB layout
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1C	
	NO	NC
Contact resistance	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂	
Contact rating (Res. load)	8A 277VAC 10A 36VDC	5A 250VAC
Max. switching voltage	277VAC/36VDC	250VAC
Max. switching current	10A	5A
Max. switching power	2770VA /360W	
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	NO:1 x 10 ⁵ OPS (10A 36VDC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 800mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
12	9	0.6	15.6	180 x (1±10%)
24	18	1.2	31.2	720 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 8.0g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	Z	NO:8A 277VAC at 85°C NO:10A 24VDC at 45°C NO:10A 36VDC at 40°C
VDE	Z	NO:8A 250VAC at 85°C NO:10A 24VDC at 45°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

3) For sealed type, the vent-hole cover should be excised.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.01

ORDERING INFORMATION

HF3FA-W/		12	-Z	S	T	F	(XXX)
Type	Gap \geq 0.8mm						
Coil voltage	12, 24VDC						
Contact arrangement	Z: 1 Form C						
Construction ^{1) 2)}	S: Plastic sealed Nil: Flux proofed						
Contact material	T: AgSnO ₂						
Insulation system	F: Class F						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

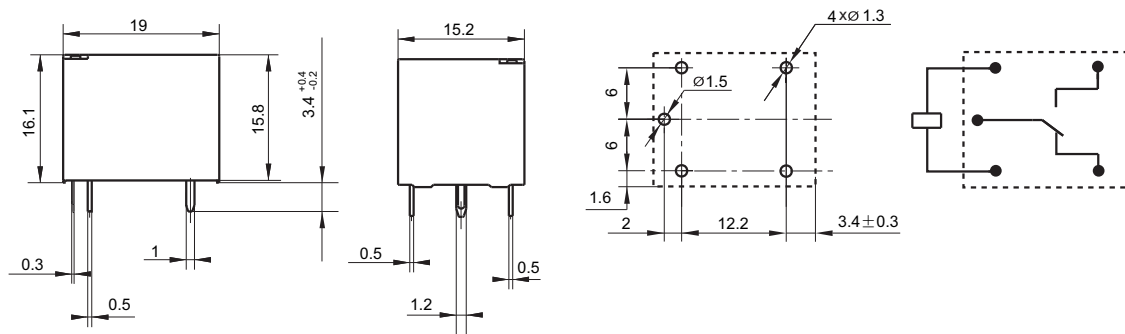
Unit: mm

Outline Dimensions

PCB Layout
(Bottom view)

Wiring Diagram
(Bottom view)

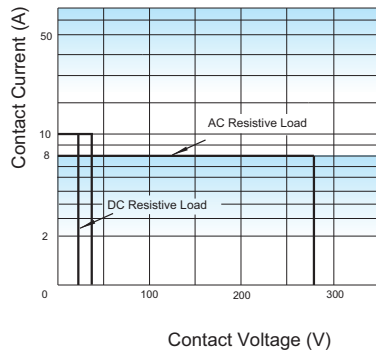
1 Form C



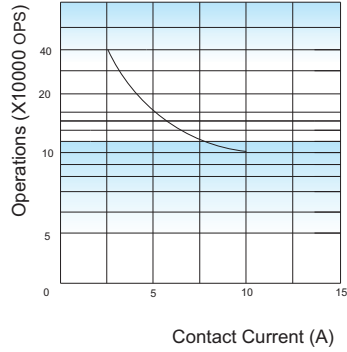
- Remark:** 1) In case of no tolerance shown in outline dimension: outline dimension \leq 1mm, tolerance should be ± 0.2 mm; outline dimension $>$ 1mm and \leq 5mm, tolerance should be ± 0.3 mm; outline dimension $>$ 5mm, tolerance should be ± 0.4 mm.
 2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



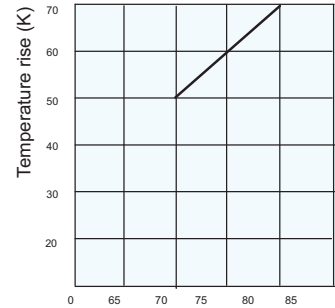
ENDURANCE CURVE



Test conditions:

NO: Resistive load, 36VDC, Flux proofed,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



Percentage of Nominal Coil Voltage

Test conditions: at 85°C, 8A

Mounting distance: 10mm

Driving voltage: Coil activated with rated voltage, then reduce to 80% of rated voltage.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF3FD

SUBMINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40014057



File No.: CQC14002114760



Features

- 15A switching capability
- Flammability class according to UL94, V-0
- Product in accordance to IEC 60335-1 available
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available

RoHS compliant

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂ /AgNi	
Contact rating (Res. load)	10A 250VAC	NO: 10A 250VAC/28VDC NO/NC: 5A/5A 250VAC
Max. switching voltage	277VAC/30VDC	
Max. switching current	15A	10A
Max. switching power	2770VA / 300W	
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance ¹⁾	5 x 10 ⁴ OPS (10A 250VAC, Resistive load, at 85°C, 5s on 5s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	100MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)	10ms max.	
Release time (at rated. volt.)	5ms max.	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 105°C	
Termination	PCB	
Unit weight	Approx. 10g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) For sealed type, the vent-hole cover should be excised.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 360mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC - ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.

2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/ CUL	AgSnO ₂	1 Form A	10A 250VAC 85°C TV-5 125VAC 15A 125VAC 40°C
		1 Form C	NO/NC:5A/5A 250VAC 85°C NO:1/2HP 125VAC NO:TV-5 125VAC 15A 125VAC 40°C
	AgNi	1 Form A	10A 250VAC 85°C 15A 125VAC 85°C TV-5 125VAC
		1 Form C	NO/NC:6A/6A 250VAC 105°C NO:7A 250VAC NO:1/2HP 125VAC TV-5 125VAC 15A 125VAC 40°C
VDE	AgSnO ₂	1 Form A	10A 250VAC at 85°C
		1 Form C	NO/NC: 5A/5A 250VAC at 85°C NO: 10A 250VAC at 85°C
	AgNi	1 Form A	6A 250VAC at 105°C 10A 250VAC at 85°C
		1 Form C	NO/NC: 7A/3A 250VAC at 85°C 10A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2021 Rev. 1.01

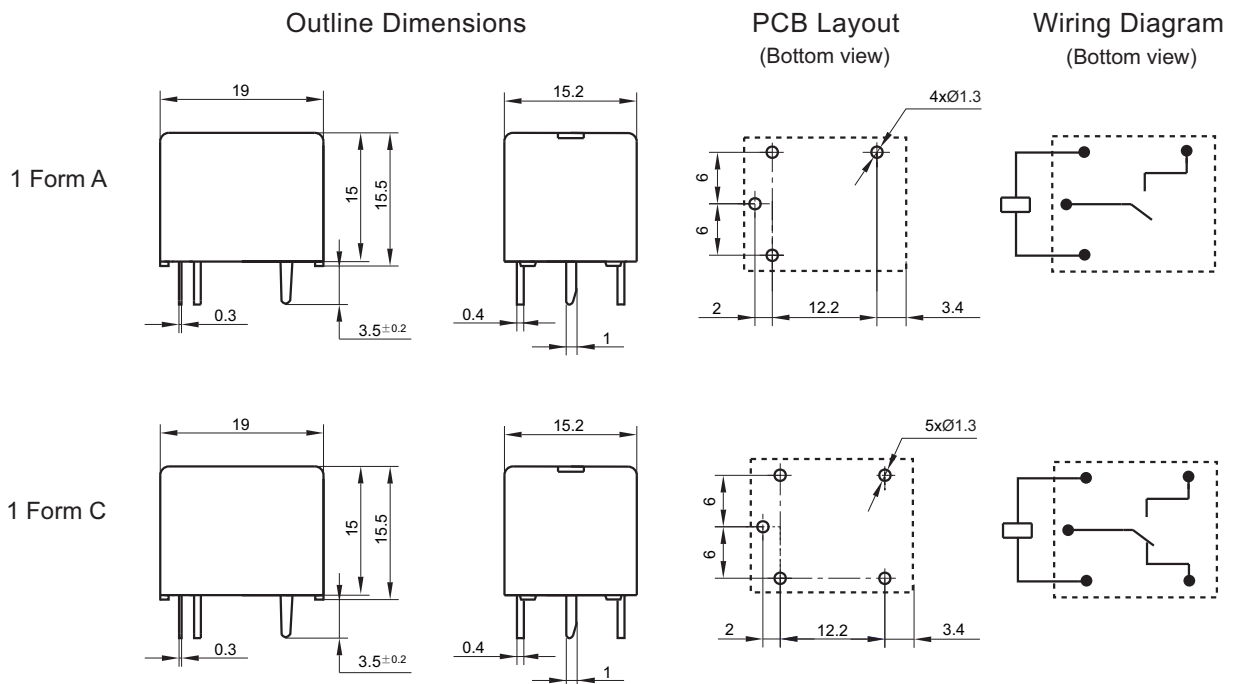
ORDERING INFORMATION

		HF3FD /		012	-H	S	T	F	(XXX)
Type									
Coil voltage		3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement		H: 1 Form A		Z: 1 Form C					
Construction ^{1) 2)}		S: Plastic sealed		Nil: Flux proofed					
Contact material		T: AgSnO ₂		3: AgNi					
Insulation standard		F: Class F		Nil: Class B					
Special code ³⁾		XXX: Customer special requirement				Nil: Standard			

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
- 4) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

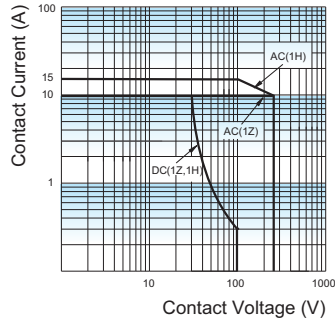
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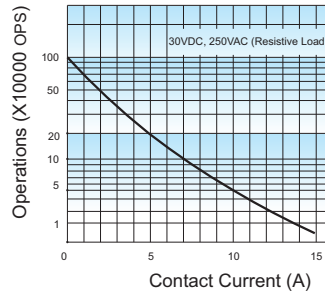
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



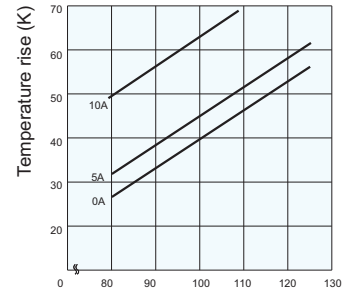
ENDURANCE CURVE



Test conditions:

NO, Flux proofed type,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Percentage of Nominal Coil Voltage
(Relay mounting distance should
be less than 10mm.)

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF3FF

SUBMINIATURE HIGH POWER RELAY



File No.:E134517



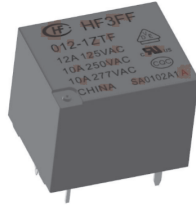
File No.:40025218



File No.:R50148356



File No.:CQC13002098175
CQC16002140467



Features

- 15A 125VAC、10A 250VAC switching capability
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A	1C	
		NO	NC
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)		
Contact material	AgSnO ₂ , AgCdO		
Contact rating (Res. load)	10A 277VAC 10A 28VDC	10A 277VAC ²⁾ 10A 28VDC ²⁾	5A 250VAC
Max. switching voltage	277VAC / 28VDC		250VAC
Max. switching current	15A	10A	5A
Max. switching power	2770VA / 280W		1250VA
Mechanical endurance	1 x 10 ⁷ OPS		
Electrical endurance ³⁾	1H type: 1x 10 ⁵ OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off) 1Z type: 5 x 10 ⁴ OPS (NO: 5A/NC: 5A 250VAC, Resistive load, Room temp., 5s on 5s off)		

Notes: 1) The data shown above are initial values.
2) Applicable when NC is not energized with load.
3) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient operating temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 10g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) If the ambient temperature is higher than 85°C, please contact with Hongfa.

COIL

Coil power	Standard type: Approx. 360mW
	48VDC: Approx. 510mW
	(899): Approx. 450mW

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ³⁾	Coil Resistance Ω	Coil Power mW
5	3.80	0.5	6.5	70 x (1±10%)	Approx. 360
6	4.50	0.6	7.8	100 x (1±10%)	
9	6.80	0.9	11.7	225 x (1±10%)	
12	9.00	1.2	15.6	400 x (1±10%)	
18	13.5	1.8	23.4	900 x (1±10%)	
24	18.0	2.4	31.2	1600 x (1±10%)	Approx. 510
48 ²⁾	36.0	4.8	62.4	6400 x (1±10%)	
48	36.0	4.8	62.4	4500 x (1±10%)	
5	3.8	0.5	6.5	55 x (1±10%)	Approx. 450 ⁴⁾
6	4.5	0.6	7.8	80 x (1±10%)	
9	6.8	0.9	11.7	180 x (1±10%)	
12	9.0	1.2	15.6	320 x (1±10%)	
18	13.5	1.8	23.4	720 x (1±10%)	
24	18.0	2.4	31.2	1280 x (1±10%)	Approx. 450
48	36.0	4.8	62.4	5120 x (1±10%)	

Notes: 1) The data shown above are initial values.
2) If 48VDC coil voltage specification of 360mW is required, please add special suffix (068) in the ordering information.
3) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
4) If 360mW type is required, please add a special suffix (068) in the ordering information.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	10A 277VAC 10A 28VDC 15A 125VAC 6A 250VAC
	1 Form C	NO:10A 277VAC NO:10A 28VDC NO:10A 120VAC NO:6A 250VAC
VDE (only AgSnO ₂)	1 Form A	10A 250VAC 12A 125VAC
	1 Form C	NO/NC:5A/5A 250VAC NO:10A 250VAC NO:12A 125VAC

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.
2) For sealed type, the vent-hole cover should be excised.

ORDERING INFORMATION

	HF3FF /		012	-1H	S	T	F	(XXX)
Type								
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	1H:1 Form A	1Z:1 Form C						
Construction ^{1) 2)}	S: Plastic sealed	Nil: Flux proofed						
Contact material	T: AgSnO ₂	Nil: AgCdO						
Insutation standard	F: Class F							
Special code ⁴⁾	XXX: Customer special requirement		Nil: Standard					

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The characteristic number represents the product with special requirements from customers, for example: 899 means power consumption 450mW. The customer special requirement express as special code after evaluating by Hongfa.
4) Two packing methods available: paper box package, tube package, Standard tube packing length is 420mm(Holds 25 relays). Any special requirement needed, please contact us for more details.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

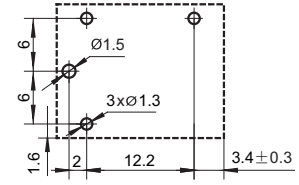
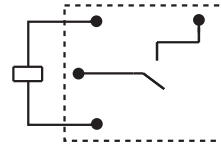
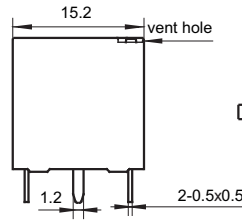
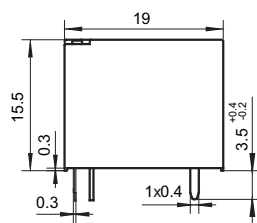
Unit: mm

Outline Dimensions

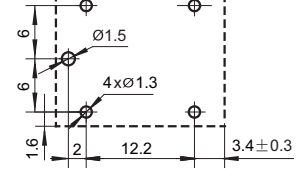
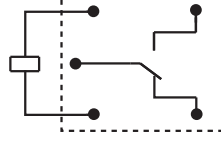
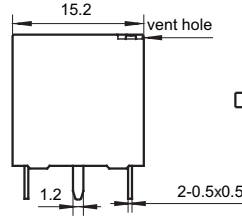
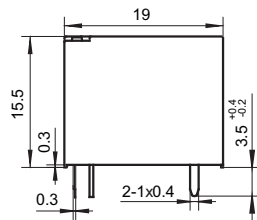
Wiring Diagram (Bottom view)

PCB Layout (Bottom view)

1 Form A



1 Form C



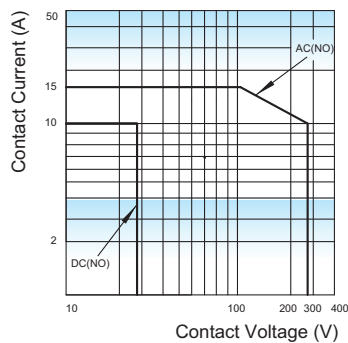
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

2) The additional tin top is max. 1mm.

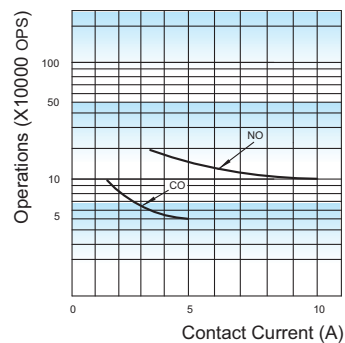
3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

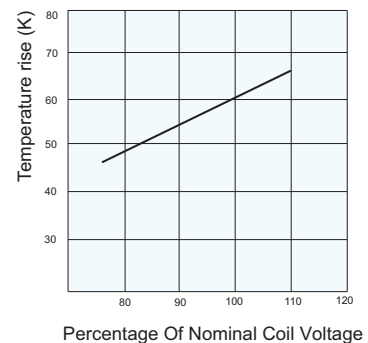
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

NO, Resistive load, 277VAC/28VDC,
Flux proofed, Room temp., 1s on 9s off
CO, Resistive load, 250VAC,
Flux proofed, Room temp., 5s on 5s off.

Notes: For plastic sealed type, the venting-hole should be opened in electrical endurance test.

Testing conditions:

10A at 85°C.
Mounting distance: 10mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF3F-L

SUBMINIATURE HIGH POWER LATCHING RELAY



File No.: E134517



File No.:40040757



File No.:CQC18002201451



Features

- Subminiature high power latching relay
- Low coil power
 - 1 coil latching: approx. 0.4W
 - 2 coils latching: approx. 0.8W
- 15A switching capability
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available

RoHS compliant

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂	
Contact rating (Res. load)	10A 277VAC/30VDC	
Max. switching voltage	277VAC / 30VDC	
Max. switching current	15A	10A
Max. switching power	2770VA / 300W	
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1HT: 6 x 10 ³ OPS (15A 120VAC, Incandescent lamp, at 60°C, 1s on 59s off) 1 x 10 ⁴ OPS (10A 277VAC, Resistive load, at 60°C, 1s on 9s off) 2 x 10 ⁴ OPS (12A 277VAC, General use, at 70°C, 1s on 9s off)	

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	100MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	750VAC 1min
Set time (at nomi. volt.)	8ms max.	
Reset time (at nomi. volt.)	5ms max.	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Termination	PCB	
Unit weight	Approx. 9g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) For sealed type, the vent-hole cover should be excised.

2) The data shown above are initial values.

COIL

Coil power	1 coil latching: Approx. 0.4W 2 coils latching: Approx. 0.8W
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HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

COIL DATA

at 23°C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Reset Voltage VDC max. 1)	Pulse Width (ms) min.	Max. Voltage VDC	Coil Resistance Ω
3	2.4	2.4	100	4.5	22.5 x (1±10%)
5	4.0	4.0	100	7.5	62.5 x (1±10%)
6	4.8	4.8	100	9	90 x (1±10%)
9	7.2	7.2	100	13.5	202.5 x (1±10%)
12	9.6	9.6	100	18	360 x (1±10%)
24	19.2	19.2	100	36	1440 x (1±10%)
48	38.4	38.4	100	72	5760 x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Reset Voltage VDC max. 1)	Pulse Width (ms) min.	Max. Voltage VDC	Coil Resistance Ω
3	2.4	2.4	100	4.5	11.25 x (1±10%)
5	4.0	4.0	100	7.5	31.5+31.5 x (1±10%)
6	4.8	4.8	100	9	45+45 x (1±10%)
9	7.2	7.2	100	13.5	101.5+101.5 x (1±10%)
12	9.6	9.6	100	18	180+180 x (1±10%)
24	19.2	19.2	100	36	720+720 x (1±10%)
48	38.4	38.4	100	72	2880+2880 x (1±10%)

Notes:1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	NO:10A 277/250/125VAC, Resistive at 60°C NO:12A 277/250/125VAC, General use at 70°C NO:Standard ballast 5.5A 277/220/120VAC at 60°C NO: Electronic ballast 5A, 120VAC at 60°C NO: Electronic ballast 5A, 277VAC at 70°C* NO:Tungsten (incandescent) 15A 120VAC at 60°C NO:Tungsten (incandescent) 5A 277VAC at 60°C NO: 1/6HP 240/120VAC at 85°C NO: TV-10 125VAC at 70°C
VDE	NO: 10A 250VAC, Resistive, at 85°C NO/NC: 5A 250VAC, Resistive, at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

3) * These ratings are tested with zero crossing device.

ORDERING INFORMATION

Type	HF3F-L / 12 -1H S L1 T R (XXX)
Coil voltage	3, 5, 6, 9, 12, 24, 48VDC
Contact arrangement	1H:1 Form A 1Z:1 Form C
Construction ^{1) 2)}	S: Plastic sealed Nil: Flux proofed
Sort	L1: 1 coil latching L2: 2 coils latching
Contact material	T: AgSnO ₂
Polarity	R: Reverse polarity Nil: Standard polarity
Special code ³⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.) .

We suggest to choose plastic sealed types and validate it in real application for an unclear environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.)

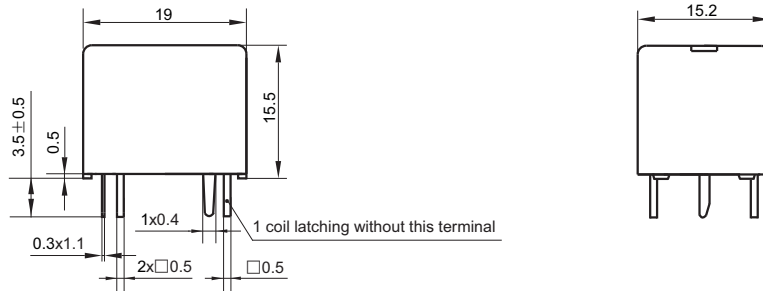
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

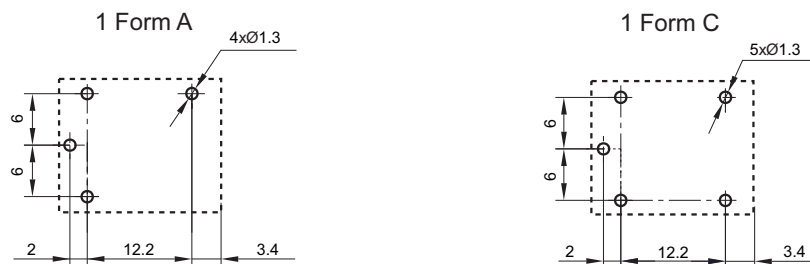
Unit: mm

Outline Dimensions



PCB Layout (Bottom view)

1 coil latching

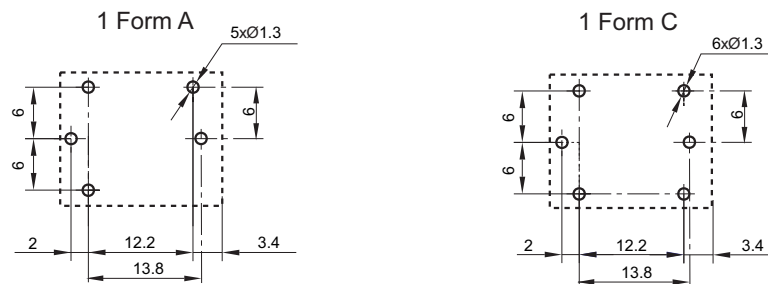


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout (Bottom view)

2 coils latching



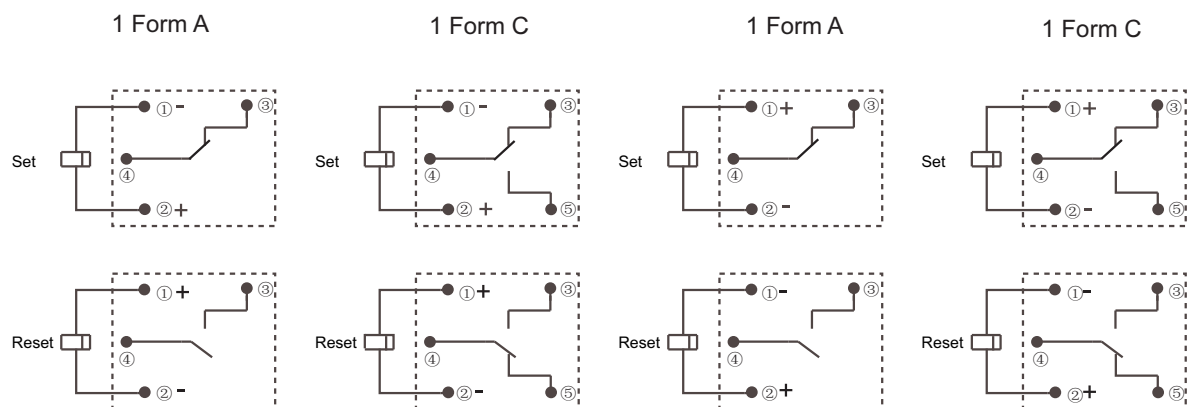
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Wiring Diagram (Bottom view)

1 coil latching

Standard Polarity

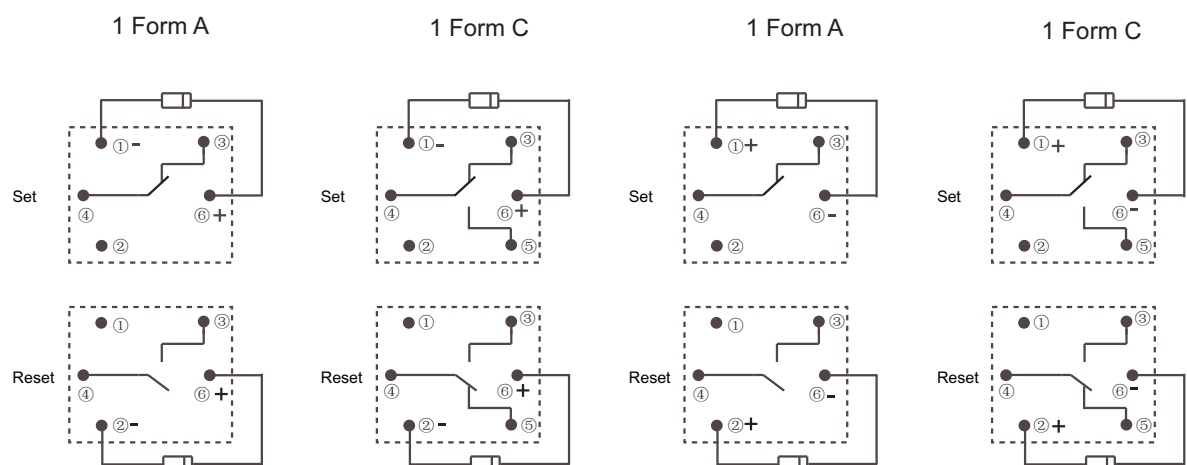
Reverse Polarity



2 coils latching

Standard Polarity

Reverse Polarity



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Notice

1. Relay is on the "reset" or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
2. In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be more than 100 ms. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

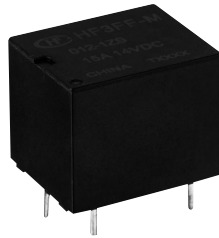
Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF3FF-M

AUTOMOTIVE RELAY



Typical Applications

Anti-theft lock, Central door lock

Features

- 15A switching capability
- Subminiature, standard PCB layout
- 1 Form A & 1 Form C contact arrangement
- Plastic sealed and Flux proofed types available
- RoHS & ELV compliant

CHARACTERISTICS


Contact arrangement	1A, 1C
Voltage drop (initial) ¹⁾	Typ: 20mV (at 10A) Max.: 250mV (at 10A)
Max. continuous current ²⁾	10A
Max. switching current ³⁾	15A
Max. switching voltage	30VDC
Min.contact load	1A 6VDC
Electrical endurance	See "CONTACT DATA"
Mechanical endurance	1×10 ⁷ OPS (300OPS/min)
Initial insulation resistance	100MΩ (at 500VDC)
Dielectric strength ⁴⁾	Between contacts: 750VAC Between coil & contacts: 1500VAC
Operate time	Typ: 5ms Max.: 10ms (at nomi. vol.)

Release time ⁵⁾	Typ: 3ms Max.: 10ms
Ambient temperature	-40°C to 85°C
Vibration resistance ⁶⁾	10Hz to 55Hz 1.5mm DA
Shock resistance ⁶⁾	98m/s ²
Termination	PCB ⁷⁾
Construction	Plastic sealed, Flux proofed
Unit weight	Approx. 10g

- 1) Equivalent to the max. initial contact resistance is 100mΩ (at 1A 6VDC).
- 2) For NO contacts, measured when applying 100% rated voltage on coil.
- 3) At 23°C, 13.5VDC (100 cycles, resistive load).
- 4) 1min, leakage current less than 1mA.
- 5) The value is measured when voltage drops suddenly from nominal voltage to 0VDC and coil is not paralleled with suppression circuit.
- 6) When energized, opening time of NO contacts shall not exceed 100μs, when non-energized, opening time of NC contacts shall not exceed 100μs, meantime, NO contacts shall not be closed.
- 7) Since it is an environmental friendly product, please select lead-free solder when welding. The recommended soldering temperature and time is (250±3)°C, (5±0.3)s.

CONTACT DATA ¹⁾

at 23°C

Load voltage	Load type		Load current A			On/Off ratio		Electrical endurance OPS	Contact material	Load wiring diagram
			1C		1A	On s	Off s			
			NO	NC	NO					
13.5VDC	Resistive	Make	15	5	15	5	5	1×10 ⁵	HF3FF-M/M1: AgSnO ₂ HF3FF-M2: AgNi	
		Break	15	5	15	5	5			

1) When the load voltage is at 24VDC or higher, or the applications conditions are different from the table above, please submit the detailed application conditions to Hongfa to get more support.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

COIL DATA

at 23°C

Type	Nominal voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Coil resistance $\times(1\pm10\%) \Omega$	Power consumption W	Max. allowable overdrive voltage ¹⁾ VDC	
						at 23°C	at 85°C
HF3FF-M	9	6.75	0.90	180	0.45	11.7	10.8
	12	9.00	1.20	320	0.45	15.6	14.4
	24	18.00	2.40	1280	0.45	31.2	28.8
HF3FF-M1	9	5.85	0.65	126	0.64	11.3	10.3
	12	7.80	0.90	225	0.64	15.0	13.8
	24	15.6	1.80	900	0.64	30.0	27.6
HF3FF-M2	9	5.15	0.60	100	0.80	10.8	9.9
	12	6.80	0.80	180	0.80	14.4	13.2
	24	13.70	1.60	720	0.80	28.8	26.4

1) Max. allowable overdrive voltage is stated with no load applied.

ORDERING INFORMATION

HF3FF-M /		012	-1H	S	(XXX)
Type	HF3FF-M: 0.45W HF3FF-M1: 0.64W HF3FF-M2: 0.80W				
Coil voltage	009: 9VDC 012: 12VDC 024: 24VDC				
Contact arrangement	1H: 1 Form A 1Z: 1 Form C				
Construction	S: Plastic sealed ¹⁾ Nil: Flux proofed				
Special code ²⁾	XXX: Customer special requirement Nil: Standard				

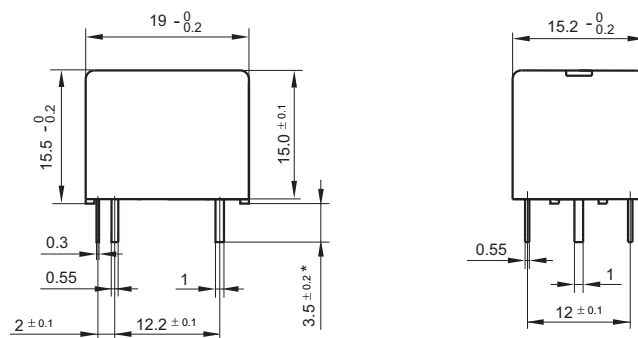
Notes: 1) If washing or surface treatment is required after the relay is assembled on PCB, please provide with the conditions in details for our confirmation or our recommendation with suitable products.

2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions (1 Form A / 1 Form C)



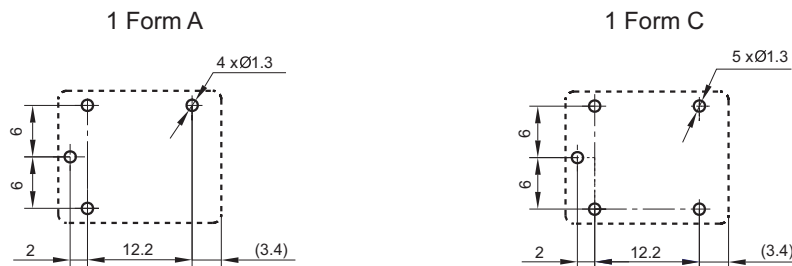
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)



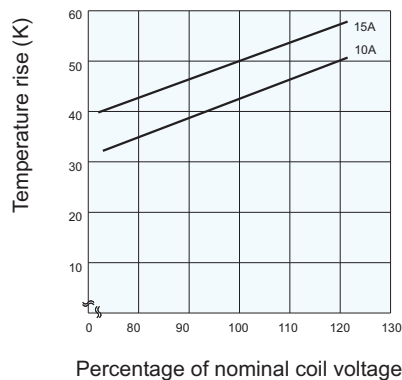
PCB Layout (Bottom view)



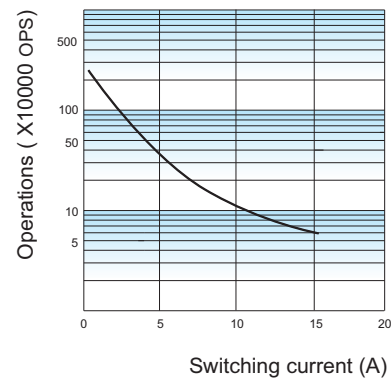
Remark: 1) * The additional tin top is max. 1mm.
2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

COIL TEMPERATURE RISE



ENDURANCE CURVE



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. In case there is specific criterion (such as mission profile, technical specification, PPAP etc.) checked and agreed by and between customer and Hongfa, this specific criterion should be taken as standard regarding any requirement on Hongfa product.

We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF7FF

SUBMINIATURE INTERMEDIATE POWER RELAY

cRLUS

File No.:E134517



File No.:CQC09002028260



Features

- 10A switching capability
- 1 Form A and 1 Form C configurations
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgCe
Contact rating (Res. load)	5A 250VAC/30VDC 10A 250VAC/28VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2400VA / 280W
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	1HT, 1ZT type: 1 x 10 ⁴ OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off) 1H, 1Z type: 1 x 10 ⁴ OPS (5A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 70°C
Termination		PCB
Unit weight		Approx. 9.5g
Construction		Plastic sealed, Flux proofed

- Notes:** 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B, Class A.

COIL

Coil power	5VDC to 24VDC: Approx. 360mW 48VDC: Approx. 510mW
------------	--

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.40	0.3	3.6	25 x (1±10%)
5	4.00	0.5	6.0	70 x (1±10%)
6	4.80	0.6	7.2	100 x (1±10%)
9	7.20	0.9	10.8	225 x (1±10%)
12	9.60	1.2	14.4	400 x (1±10%)
18	14.4	1.8	21.6	900 x (1±10%)
24	19.2	2.4	28.8	1600 x (1±10%)
48	38.4	4.8	57.6	4500 x (1±10%)

- Notes:** 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL (AgCe)	1 Form C	NO: 10A 277VAC NO/NC: 5A 277VAC NO: 5A 30VDC NC: 2FLA 4LRA 120VAC
	1 Form A	10A 277VAC 6A 30VDC
UL/CUL (AgSnO ₂)	1 Form C	12A 277VAC 12A 28VDC
	1 Form A	12A 277VAC 12A 28VDC

- Notes:** 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

	HF7FF / 012 -1H T S F (XXX)					
Type						
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	1H: 1 Form A		1Z: 1 Form C			
Contact material	T: AgSnO ₂ (10A)		Nil: AgCe (5A)			
Construction ¹⁾	S: Plastic sealed		Nil: Flux proofed			
Insulation standard	F: Class F		B: Class B		Nil: Class A	
Special code ⁴⁾	XXX: Customer special requirement			Nil: Standard		

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications.

If the ambience allows, flux proofed type is preferentially recommended.

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) If the application belongs to inductive load, AgSnO₂In₂O₃ contact material is recommended. Please add a special suffix (325) to stand for this special contact material in the ordering information.

4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

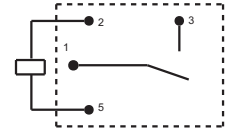
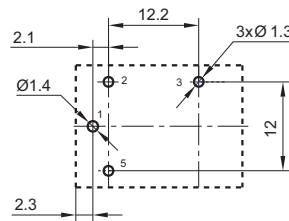
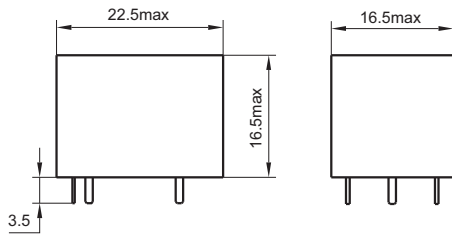
Unit: mm

Outline Dimensions

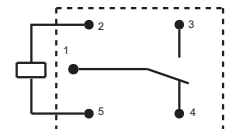
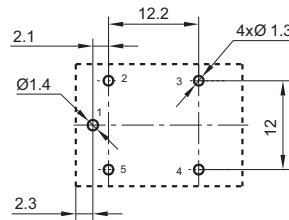
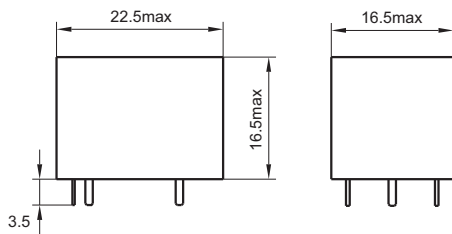
PCB Layout
(Bottom view)

Wiring Diagram
(Bottom view)

1 Form A



1 Form C

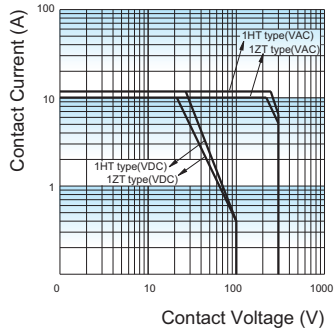


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

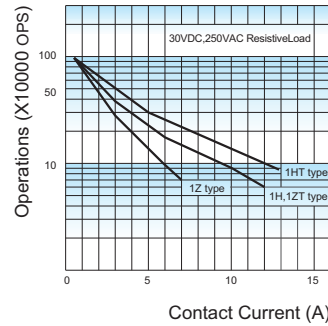
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



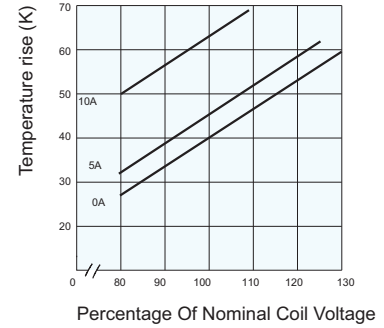
ENDURANCE CURVE



Test conditions:

NO, Resistive load, Flux proofed,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Disclaimer

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HF7FD

SUBMINIATURE HIGH POWER RELAY



File No.:E134517



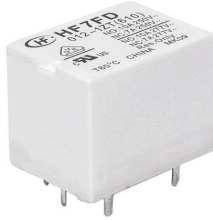
File No.: R50457893



File No.: 40008374



File No.:CQC16002153649



Features

- 20A switching capability
- TV-12 load capability
- 2kV dielectric strength (between coil and contacts)
- The ambient temperature can reach 105°C
- Product in accordance to IEC 60335-1 available
- Double pins type available
- 1 Form A and 1 Form C configurations
- UL insulation system:Class F

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance ¹⁾	100mΩ max.(1A 24VDC)	
Contact material	AgSnO ₂	
Contact rating (Res.load)	16A 250VAC 20A 250VAC	NO: 16A 250VAC 20A 250VAC NC: 7A 250VAC/28VDC 10A 250VAC
Max. switching voltage	277VAC / 28VDC	
Max. switching current	20A	20A
Max. switching power	5000VA / 280W	5000VA /280W
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance (See approval reports for more details)	HF7FD	NO:85°C 16A 250VAC 5 x 10 ⁵ OPS Resistive load, 1s on 9s off NO:85°C 20A 250VAC 5 x 10 ⁵ OPS Resistive load, 1s on 9s off NC:85°C 10A 250VAC 5 x 10 ⁵ OPS Resistive load, 1s on 9s off
	HF7FD-T	NO:105°C 17A 125VAC 1x 10 ⁵ OPS Resistive load, 1s on 9s off NO:105°C 12A 250VAC 1x 10 ⁵ OPS Resistive load, 1s on 9s off

Notes: 1) The data shown above are initial values.
2) Open the air permeability hole when testing plastic encapsulated products.

CHARACTERISTICS

Insulation resistance	100MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	750VAC 1min
Operate time (at nomi. volt.)	10ms max.	
Release time (at nomi. volt.)	5ms max.	
Humidity	5% to 85% RH	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Ambient temperature	-40°C to 105°C	
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Termination	PCB	
Unit weight	Approx. 10g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.
2) If the ambient temperature is higher than 85°C,
please contact Hongfa.

COIL

Coil power	Approx. 360mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±15%)
48	36.0	4.8	62.4	6400 x (1±15%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	HF7FD	NO:20A 250VAC 85°C (530) 16A 250VAC Resistive load / General load 85°C TV-10 240VAC/120VAC 40°C (530) TV-8 120VAC 40°C (590) 1HP 250VAC 40°C 1/2HP 125VAC 40°C NC:10A 250VAC 85°C (530) 10A 250VAC 40°C 7A 277VAC 85°C 7A 28VDC 85°C
	HF7FD-T	NO:17A 125VAC 105°C TV-10 240VAC/120VAC 40°C (530) TV-8 120VAC 40°C (590) 16A 250VAC Resistive load / General load 85°C 1HP 250VAC 40°C 1/2HP 125VAC 40°C NC:12A 277VAC/250VAC/120VAC 105°C 10A 250VAC 40°C
VDE	HF7FD	NO:16A 250VAC 85°C 17A 250VAC 85°C (530) NC:10A 250VAC 85°C 7A 250VAC 85°C
	HF7FD-T	NO:16A 250VAC 105°C 12A 250VAC 105°C NC:7A 250VAC 105°C
TUV	HF7FD	NO:16A 250VAC 85°C 17A 250VAC 85°C (530) 20A 250VAC 85°C (530) NC:10A 250VAC 85°C (530)
CQC	HF7FD	NO:20A 250VAC 85°C NO:16A 250VAC 85°C NC:10A 250VAC 85°C
	HF7FD-T	NO:16A 250VAC 105°C NC:10A 250VAC 105°C

Notes: Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.01

ORDERING INFORMATION

HF7FD / 012 -1H P S T F (XXX)	
Type	HF7FD, HF7FD-T
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC
Contact arrangement	1H: 1 Form A 1Z: 1 Form C
Pin version	P: Double pins type Nil: Single pin type
Construction ¹⁾	S: Plastic sealed Nil: Flux proofed
Contact material	T: AgSnO ₂
Insulation standard	F: Class F
Special code ¹⁾	XXX: Customer special requirement Nil: Standard

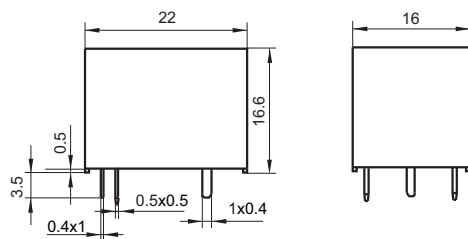
Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) If plastic sealed type is selected for cleaning purpose, the vent-hole cover should be excised after cleaning.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

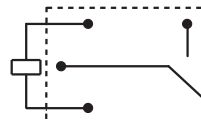
Unit: mm

Outline Dimensions

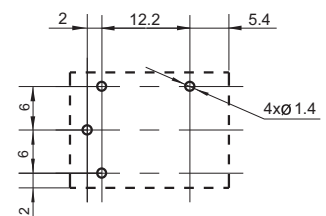
1 Form A (Single pin type)



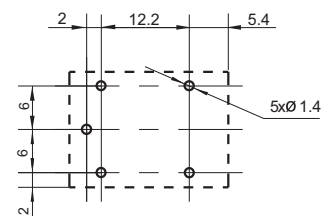
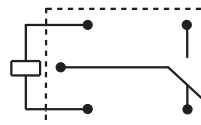
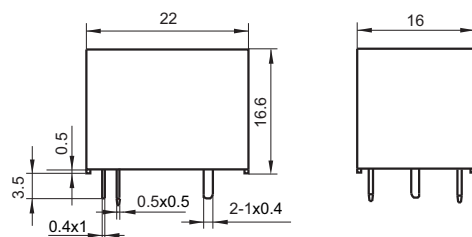
Wiring Diagram
(Bottom view)



PCB Layout
(Bottom View)



1 Form C (Single pin type)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

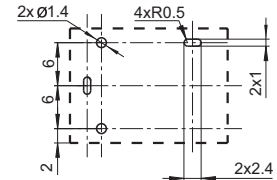
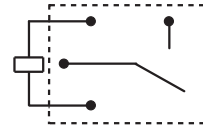
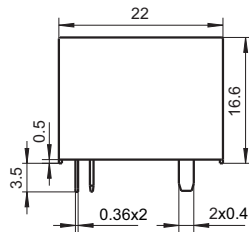
Unit: mm

Outline Dimensions

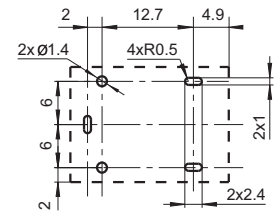
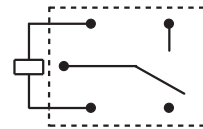
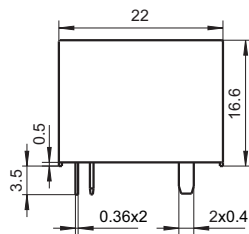
Wiring Diagram
(Bottom View)

PCB Layout
(Bottom view)

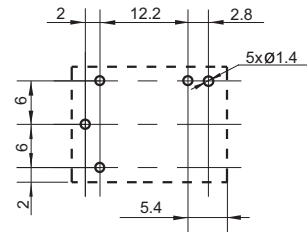
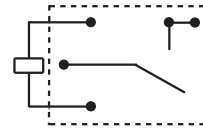
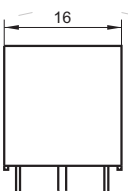
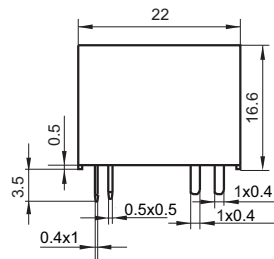
(530)1 Form A



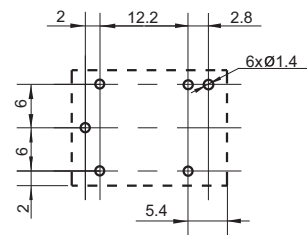
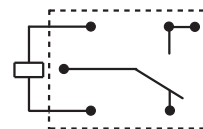
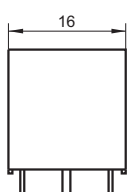
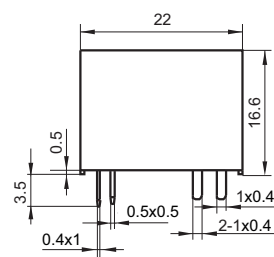
(530)1 Form C



1 Form A (Double pins type)



1 Form C (Double pins type)

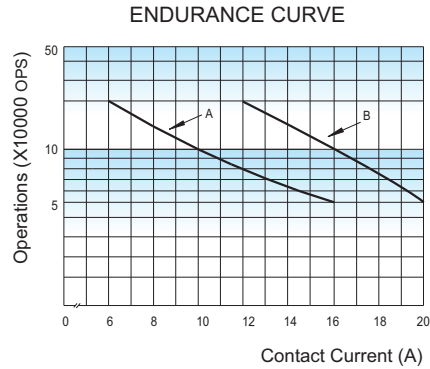
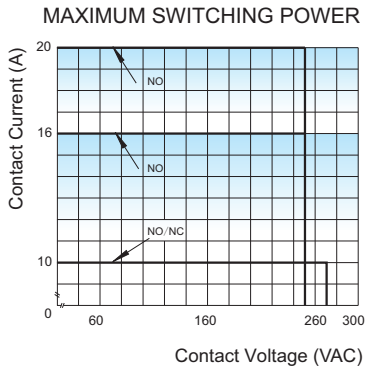


Remark:1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

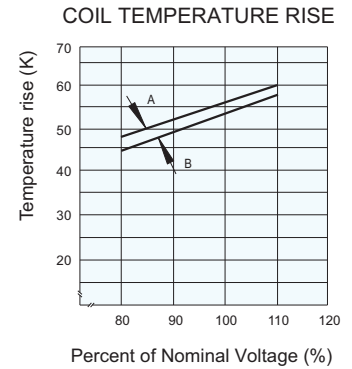
3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES



Test conditions:

Curve A: NO, Resistive load, 85°C,
flux proofed, 16A 250VAC, 1s on 9s off
Curve B: NO, Resistive load, 85°C,
flux proofed, 20A 250VAC, 1s on 9s off



Test conditions::

A:20A at 85°C.
B:16A at 85°C.
Mounting distance: 25mm

Disclaimer

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HF21FF

SUBMINIATURE HIGH POWER RELAY



File No.:E133481



Features

- 15A switching capability
- 1 Form A, 1 Form B and 1 Form C configurations
- Standard PCB layout
- Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A, 1B	1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂	
Contact rating	15A 120VAC	10A 120VAC/24VDC
Max. switching voltage	120VAC / 30VDC	
Max. switching current	15A	10A
Max. switching power	1800VA / 240W	
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1H type: 1 x 10 ⁵ OPS (15A 120VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	100MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)	10ms max.	
Release time (at rated. volt.)	5ms max.	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Operation temperature range	-40°C to 70°C	
Termination	PCB	
Unit weight	Approx. 13g	
Construction	Plastic sealed, Dust protected	

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.

COIL

Coil power	5VDC to 24VDC: Approx. 360mW; 48VDC: Approx. 530mW
------------	---

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±15%)
48	36.0	4.8	62.4	4500 x (1±15%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form C	10A 120VAC
	1 Form A	15A 120VAC TV-5 120VAC
	1 Form B	15A 120VAC 1800VA at 25°C, Ballast 6.5A 277VAC 1800VA at 25°C, Ballast 8.3A 120VAC 1000VA at 90°C, Ballast 3.6A 277VAC 1000VA at 90°C, Ballast

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.10

ORDERING INFORMATION

Type	HF21FF / 012 -1H S T F (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC
Contact arrangement	1H: 1 Form A 1D: 1 Form B 1Z: 1 Form C
Construction ¹⁾	S: Plastic sealed Nil: Dust protected
Contact material	T: AgSnO ₂
Insulation standard	F: Class F Nil: Class B
Special code ³⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, dust protected type is preferentially recommended.

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

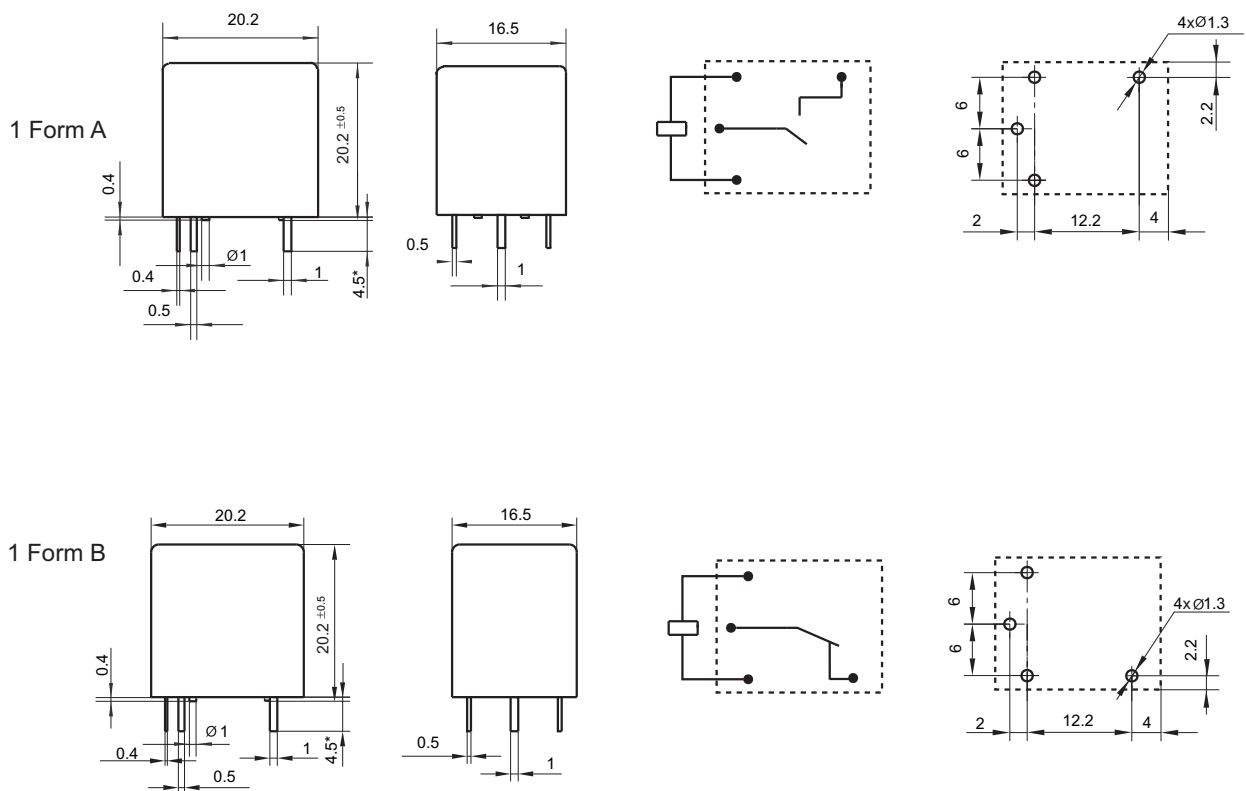
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

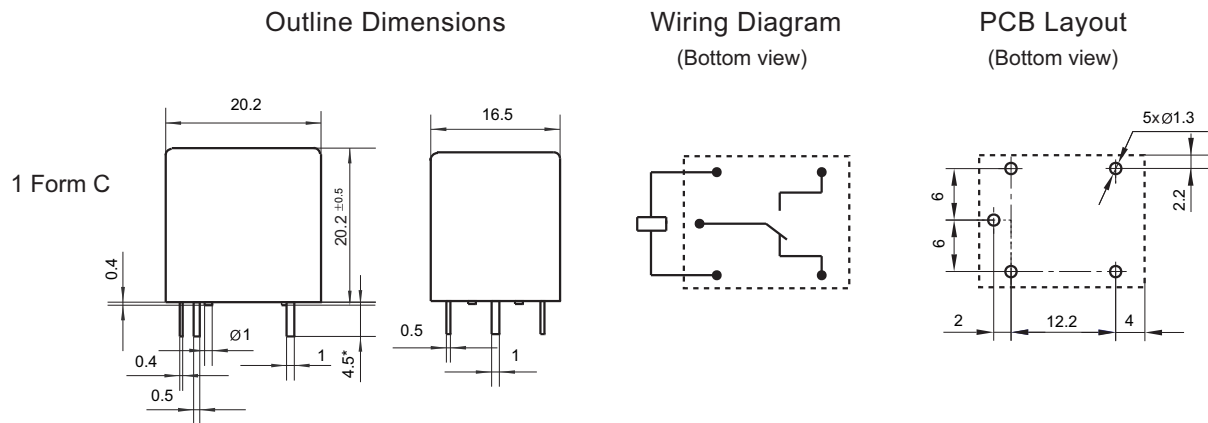
Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

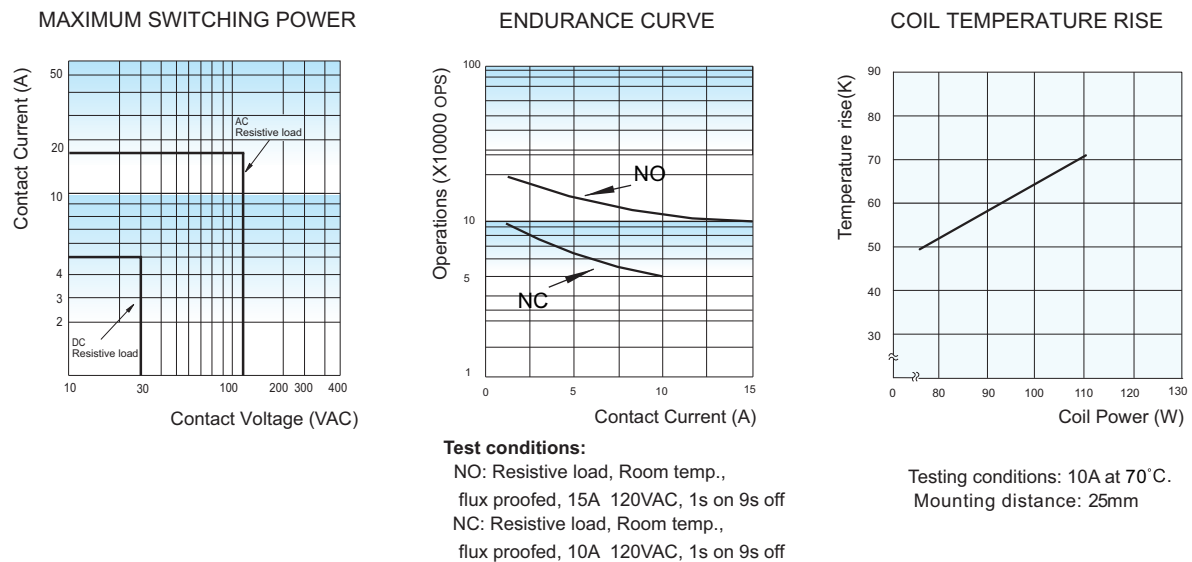
Unit: mm



Remark:1) * The additional tin top is max. 1mm.

- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF152F

SUBMINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40017837



File No.: CQC16002155734



Features

- 20A switching capability
- TV-8 125VAC
- Surge voltage up to 6kV (between coil and contacts)
- Thermal class F: standard type (at 85°C)
- Ambient temperature meets 105°C
- Product in accordance to IEC 60335-1 available
- 1 Form C and 1 Form A configurations available
- Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance ¹⁾	100mΩ max.(at 1A 24VDC)	
Contact material	AgSnO ₂ , AgNi	
Contact rating (Res. load)	20A 125VAC 17A 277VAC 7A 400VAC	16A 250VAC 7A 400VAC (NO)
Max. switching voltage	400VAC	400VAC (NO)
Max. switching current	20A	16A
Max. switching power	4700VA	4000VA
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1 x 10 ⁵ OPS (16A 250VAC, Resistive load, at 85°C, 1s on 9s off) 5 x 10 ⁴ OPS (NO, 16A 250VAC, Resistive load, Room temp., 1s on 9s off) 5 x 10 ⁴ OPS (NC, 10A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance	100MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage(between coil & contacts)	6kV (1.2 / 50μs)	
Operate time (at rated. volt.)	10ms max.	
Release time (at rated. volt.)	5ms max.	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	HF152F: -40°C to 85°C HF152F-T: -40°C to 105°C	
Termination	PCB	
Unit weight	Approx. 14g	
Construction	Plastic sealed, Dust protected	

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F

COIL

Coil power	Approx. 360mW
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SAFETY APPROVAL RATINGS

UL/CUL	AgNi	20A 125VAC NO/NC: 17A/15A 277VAC	
	AgSnO ₂	20A 125VAC TV-8 125VAC NO: 16A 250VAC at 105°C NO: 1HP 250VAC	
VDE	AgSnO ₂	1 Form A	16A 250VAC 7A 400VAC
		1 Form C	NO: 16A 250VAC NC: 7A 250VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

ORDERING INFORMATION

HF152F / 012 -1Z P S T Q (XXX)	
Type	HF152F: 85°C, HF152F-T: 105°C
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC
Contact arrangement	1H: 1 Form A 1Z: 1 Form C
Pin version	P: Double pins Nil: Single pin
Construction ¹⁾	S: Plastic sealed Nil: Dust protected
Contact material	T: AgSnO ₂ Nil: AgNi
Contact capacity	Q: High capacity type 16A 250VAC, at 105°C (Only for HF152F-T) Nil: Standard type
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

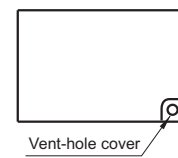
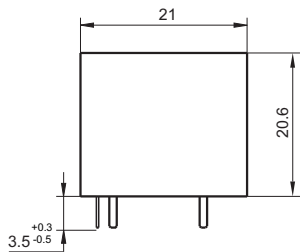
Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, dust protected type is preferentially recommended.
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) If plastic sealed type is selected for cleaning purpose, the vent-hole cover should be excised after cleaning.
 4) The customer special requirement express as special code after evaluating by Hongfa.
 5) HF152F-T is only available for AgSnO₂ contact.
 6) Two packing methods available: paper box package, tube package, Standard tube packing length is 455mm. Any special requirement needed, please contact us for more details.
 7) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

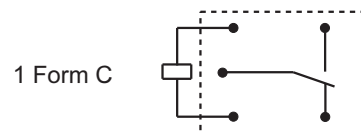
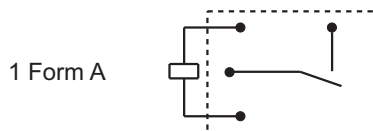
Single pin version

Outline Dimensions

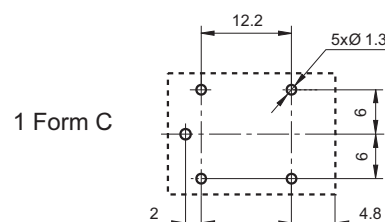
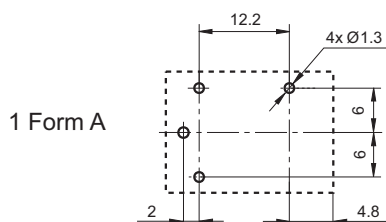


(Top view)

Wiring Diagram (Bottom view)



PCB Layout (Bottom view)

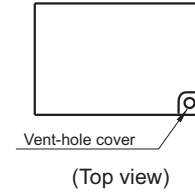
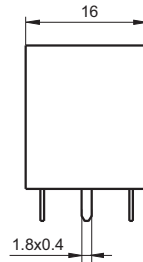
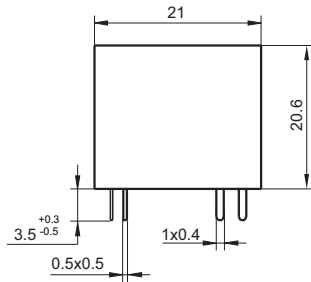


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

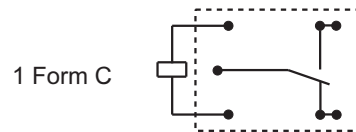
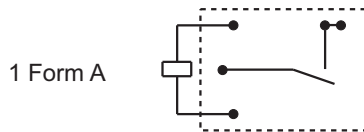
Unit: mm

Double pin version

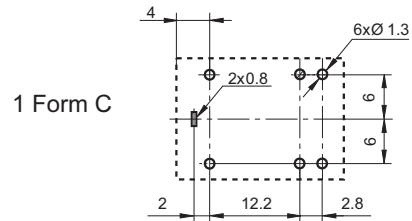
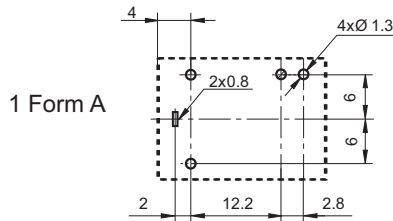
Outline Dimensions



Wiring Diagram (Bottom view)

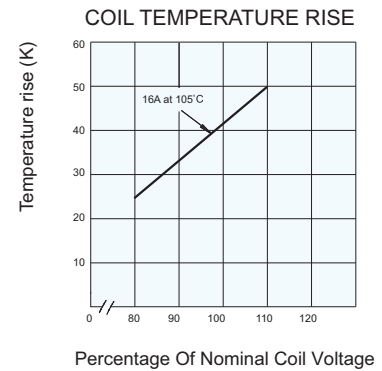
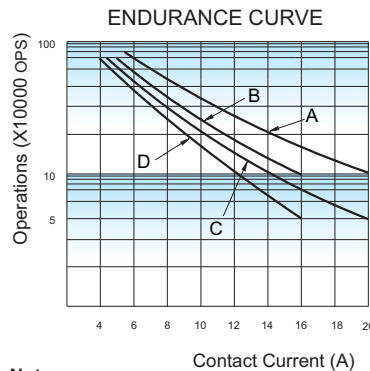
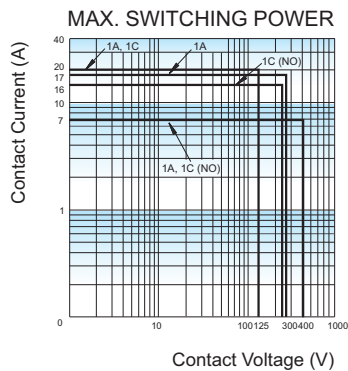


PCB Layout (Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES



Notes:

- Curve A: 1H type, Curve B: 1H type, Curve C: 1Z type, Curve D: 1Z type
- Test conditions:
Curve A: 20A 125VAC, Resistive load, Room temp., 1s on 9s off
Curve B: 16A 250VAC, Resistive load, at 85°C, 1s on 9s off
Curve C: NO, 20A 125VAC, Resistive load, Room temp., 1s on 9s off
Curve D: NO, 16A 250VAC, Resistive load, at 85°C, 1s on 9s off

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HF152FD

SUBMINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40031203



File No.: CQC16002150629



Features

- 20A switching capability
- Ambient temperature meets 105°C
- High temperature load: 17A 277VAC at 105°C (Long endurance type)
- 1 Form C and 1 Form A configurations available
- Double pins and Single pin terminal available, effectively reduce terminal temperature rise
- Product in accordance to EN 60335-1 available

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance ¹⁾	100mΩ max. (at 1A 24VDC)	
Contact material	AgSnO ₂ , AgNi	
Contact rating (Res. load)	20A 125VAC 17A 277VAC(Q type) 7A 400VAC	NO:17A 277VAC(Q type) NC:10A 277VAC
Max. switching voltage	400VAC	400VAC (NO)
Max. switching current	20A	17A
Max. switching power	4700VA	4700VA
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1H type: 5 x 10 ⁴ OPS (16A 277VAC, Resistive load, AgNi, at 85°C, 1s on 9s off) 1HT type: 1 x 10 ⁶ OPS (12A 277VAC, Resistive load, AgSO ₂ , at 105°C, 1s on 9s off)	

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)	10ms max.	
Release time (at rated. volt.)	5ms max.	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 105°C	
Termination	PCB	
Unit weight	Approx. 14g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 360mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC* ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/ CUL	NO, Standard Type	AgNi	20A 125VAC Resistive at 40°C
		AgSnO ₂	17A 125VAC Resistive at 85°C 16A 277VAC Resistive at 85°C 10A 277VAC Resistive at 105°C
		AgNi	12A 277VAC General Use at 105°C 1/2HP 125VAC at 40°C 1HP 250VAC at 40°C TV-8 125VAC at 40°C
	NO, Q Type	AgNi	17A 277VAC Resistive at 105°C 10A 277VAC Resistive at 105°C
		AgSnO ₂	20A 125VAC Resistive at 40°C 10A 277VAC Resistive at 85°C
	NC	AgNi	7A 277VAC Resistive at 105°C
VDE	1 Form A, Standard Type	AgNi	16A 250VAC Resistive at 85°C 7A 400VAC Resistive at 105°C
		AgSnO ₂	8A 250VAC COSφ=0.4 at 85°C 10(4)A 250VAC Resistive at 105°C (EN60730-1)
	1 Form A, Q Type	AgNi	17A 250VAC at 23°C 2h/ at 105°C 2h 10A 250VAC at 23°C 2h/ at 105°C 2h
	1 Form C	AgNi	NO/NC:10A/7A 250VAC at 105°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

ORDERING INFORMATION

HF152FD / 12 -1Z P S T F Q (XXX)	
Type	
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC
Contact arrangement	1H: 1 Form A 1Z: 1 Form C
Pin version	P: Double pins Nil: Single pin
Construction ¹⁾	S: Plastic sealed Nil: Flux proofed
Contact material	T: AgSnO ₂ Nil: AgNi
Insulation standard	F: Class F
Contact endurance	Q: Long endurance type (Only for AgNi type) Nil: Standard type
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

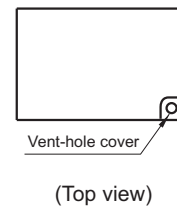
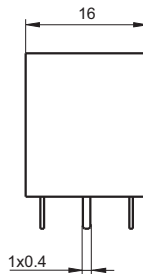
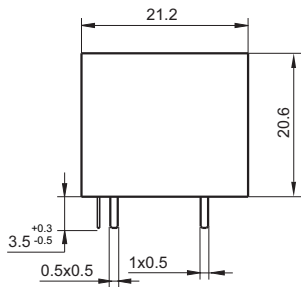
Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) If plastic sealed type is selected for cleaning purpose, the vent-hole cover should be excised after cleaning.
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

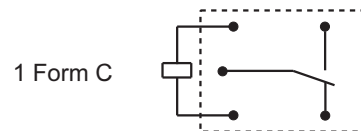
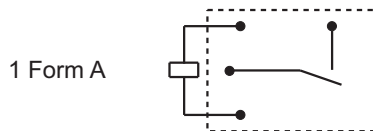
Unit: mm

Single pin version

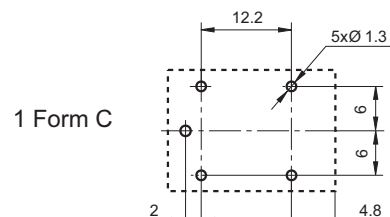
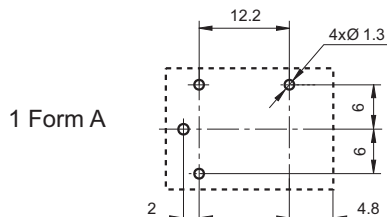
Outline Dimensions



Wiring Diagram (Bottom view)



PCB Layout (Bottom view)

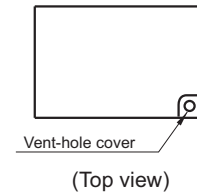
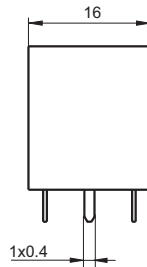
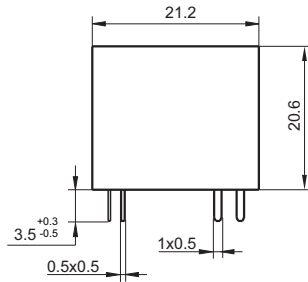


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

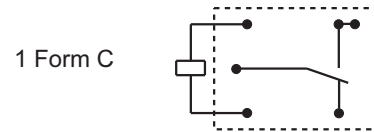
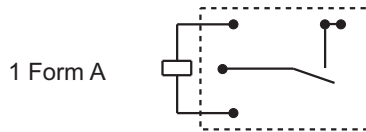
Unit: mm

Double pin version

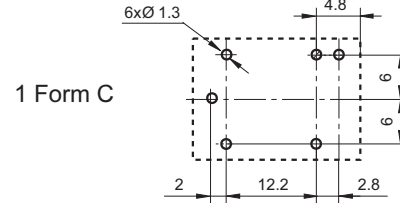
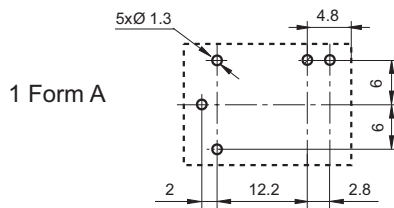
Outline Dimensions



Wiring Diagram (Bottom view)



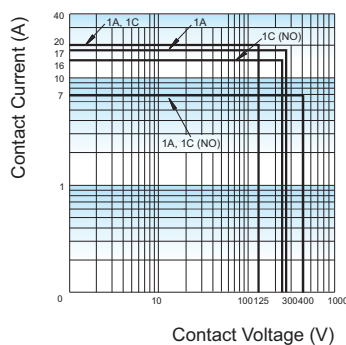
PCB Layout (Bottom view)



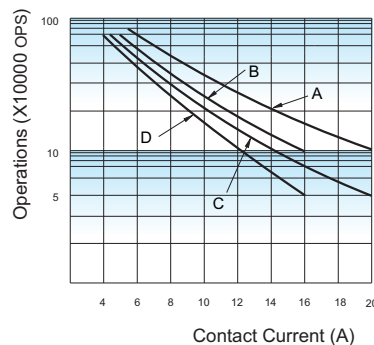
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

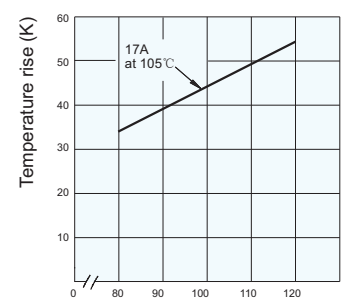
MAX. SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Notes:

- Curve A: 1H type, Curve B: 1H type, Curve C: 1Z type, Curve D: 1Z type
- Test conditions:
Curve A: 20A 125VAC, Resistive load, Room temp., 1s on 9s off
Curve B: 16A 250VAC, Resistive load, at 85°C, 1s on 9s off
Curve C: NO, 20A 125VAC, Resistive load, Room temp., 1s on 9s off
Curve D: NO, 16A 250VAC, Resistive load, at 85°C, 1s on 9s off

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF7520

SUBMINIATURE POWER RELAY



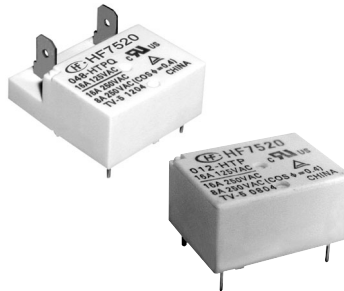
File No.: E133481



File No.: R50351269



File No.: CQC09002034524



Features

- High rating: 16A/20A
- TV-5/TV-8 load capability
- High sensitive: 200mW
- Low height, flat construction
- PCB & QC layouts available
- Plastic sealed and flux proofed types (with vent-hole cover) available
- UL insulation system: Class F
- Product in accordance to EN 60335-1 available

CONTACT DATA

Arrangement	1C	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	NO: 10A 125/250VAC	Standard type: TV-5 10A 30VDC 10A 125/250VAC
	NC: 6A 125/250VAC	High capacity type: TV-5 TV-8 16A 30VDC 16A 125VAC/250VAC 20A 125VAC/250VAC 8A 250VAC(COSØ=0.4)
Max.switching voltage	250VAC	277VAC / 30VDC
Max.switching current	NO:10A NC: 6A	20A
Max.switching power	NO: 2500VA NC: 1500VA	5000VA/480W
Mechanical endurance	1 x 10 ⁷ ops	
Electrical endurance	HP type: 5 x 10 ⁴ ops (16A 250VAC, Resistive load, Room temp., 1s on 9s off)	
	HP type(979): 5 x 10 ⁴ ops (16A 250VAC, Resistive load, Room temp., 1s on 9s off) TV-8 HP type(530): 5 x 10 ⁴ ops (20A 250VAC, Resistive load, Room temp., 1s on 9s off) H type: 5 x 10 ⁴ ops (10A 250VAC, Resistive load, Room temp., 1s on 9s off) Z type: 5 x 10 ⁴ ops (NO, 10A 250VAC, Resistive load, Room temp., 1s on 9s off) Z type: 5 x 10 ⁴ ops (NC, 6A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

COIL

Coil power	1 Form A: Approx. 200mW; 1 Form C: Approx. 400mW
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CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1 min
	Between open contacts	1000VAC 1 min
Operate time (at rated.volt)		15ms max.
Release time (at rated.volt)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient operating temperature		-40°C to 105°C
Termination		1C: PCB 1A: PCB & QC
Unit weight		PCB: Approx.9g QC: Approx.10.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	10A 250VAC 85°C Standard type 16A 125VAC 85°C HP type 20A 250VAC 85°C HP type(530) 16A 30VDC 85°C HP type 0.3A 110VDC 85°C HP type 13A 125VAC 105°C HP type 10A 250VAC 105°C HP type TV-5 120VAC HP type TV-8 120VAC HP type(979) Electronic Ballast 5A 120VAC 85°C HP type(530) 1/2HP 120VAC HP type(530) 1HP 250VAC HP type(530)
	1 Form C	NO: 10A 250VAC NC: 6A 250VAC
TÜV	1 Form A	16A 250VAC HP type 10A 30VDC HP type 20A 250VAC HP type(530) 8A 250VAC cosØ=0.4 HP type

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000 CERTIFIED

2023 Rev. 1.00

COIL DATA

at 23°C

1 Form C type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC* ²⁾	Coil Resistance Ω
5	4.0	0.5	6.5	62.5 x (1±10%)
6	4.8	0.6	7.8	90 x (1±10%)
9	7.2	0.9	11.7	202.5 x (1±10%)
12	9.6	1.2	15.6	360 x (1±10%)
18	14.4	1.8	23.4	810 x (1±10%)
24	19.2	2.4	31.2	1440 x (1±10%)
48	38.4	4.8	62.4	5760 x (1±10%)

1 Form A type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC* ²⁾	Coil Resistance Ω
5	4.0	0.5	6.5	125 x (1±10%)
6	4.8	0.6	7.8	180 x (1±10%)
9	7.2	0.9	11.7	405 x (1±10%)
12	9.6	1.2	15.6	720 x (1±10%)
18	14.4	1.8	23.4	1620 x (1±10%)
24	19.2	2.4	31.2	2880 x (1±10%)
48	38.4	4.8	62.4	11520 x (1±10%)

Notes:1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

Type	HF7520 / 012 -H S T P Q (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC
Contact arrangement	H: 1 Form A Z: 1 Form C
Construction ¹⁾	S: Plastic sealed Nil: Flux proofed
Contact material	T: AgSnO ₂ Nil: AgCdO (Only for 1 Form A) AgNi (Only for 1 Form C)
Contact capacity	P: High Capacity type (Only for 1 Form A) Nil: Standard type
Terminal type	Q: QC (Only for 1 Form A and high capacity type) Nil: PCB
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) When the ambient temperature reaches 105°C degree or more, please select flux proofed and high capacity type. Besides, please indicate the exact ambient temperature when ordering.

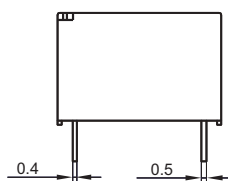
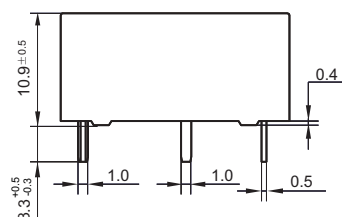
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS , WIRING DIAGRAM AND PC BOARD LAYOUT

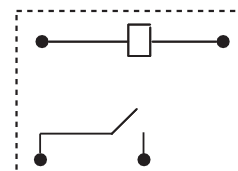
Unit: mm

1 Form A (PCB)

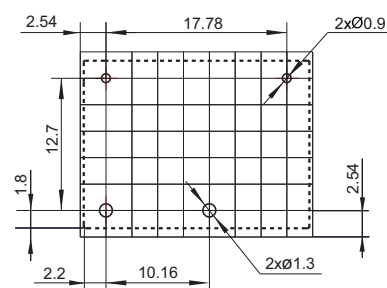
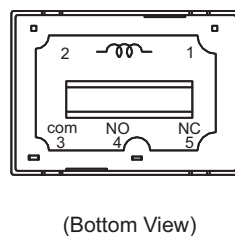
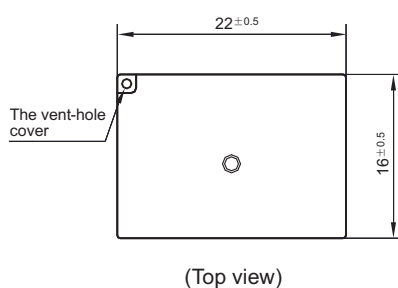
Outline Dimensions



Wiring Diagram
(Bottom View)

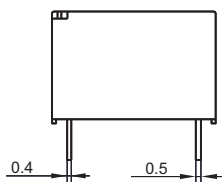
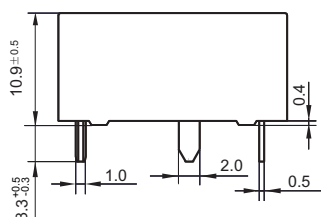


PCB Layout
(Bottom view)

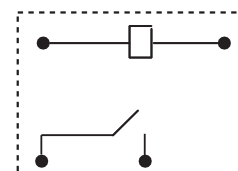


1 Form A (Wide terminal)

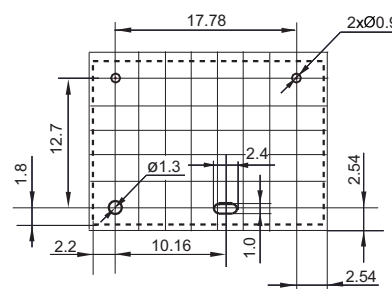
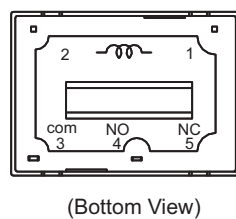
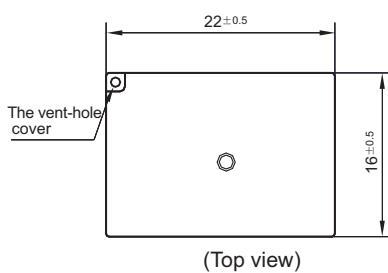
Outline Dimensions



Wiring Diagram



PCB Layout
(Bottom view)

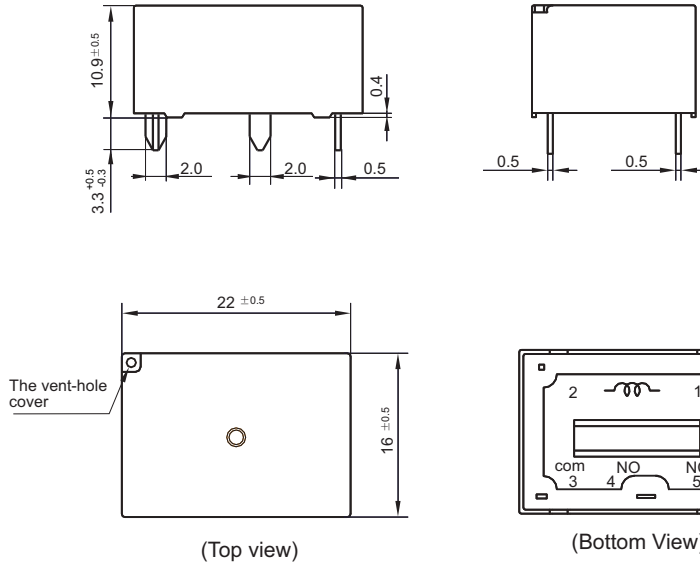


OUTLINE DIMENSIONS , WIRING DIAGRAM AND PC BOARD LAYOUT

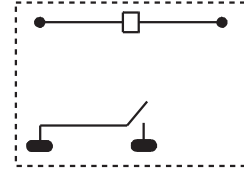
Unit: mm

1 Form A (Wide terminal) (530/979)

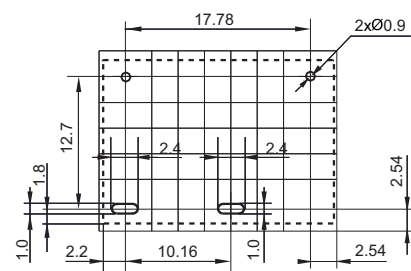
Outline Dimensions



Wiring Diagram

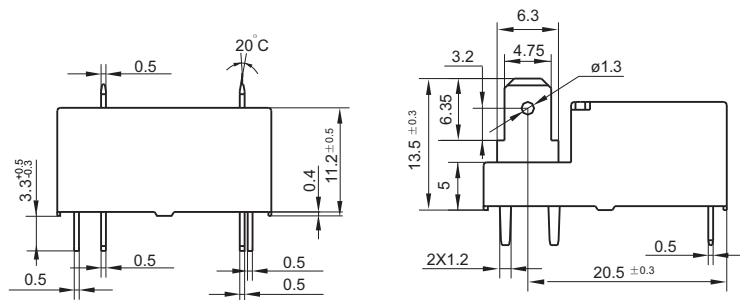


PCB Layout
(Bottom view)

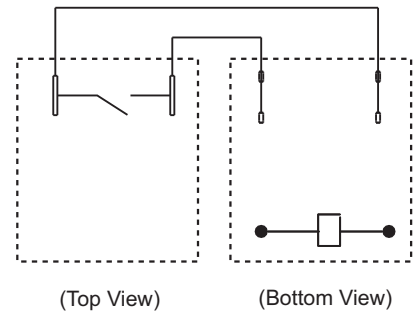


1 Form A (QC)

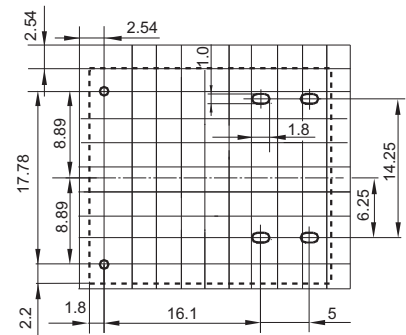
Outline Dimensions



Wiring Diagram



PCB Layout
(Bottom view)

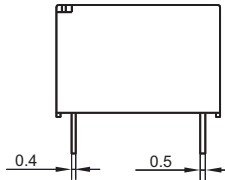
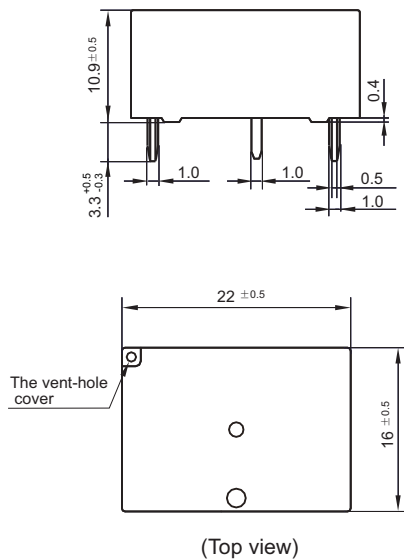


OUTLINE DIMENSIONS , WIRING DIAGRAM AND PC BOARD LAYOUT

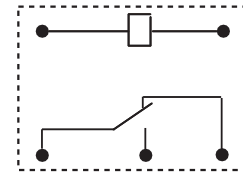
Unit: mm

1 Form C (PCB)

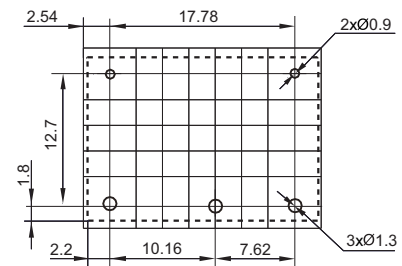
Outline Dimensions



Wiring Diagram (Bottom View)



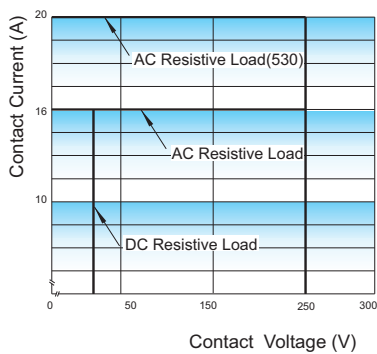
PCB Layout (Bottom view)



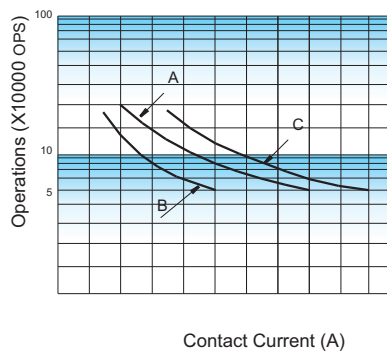
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

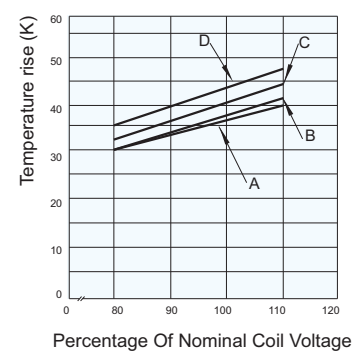
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Notes:

- Curve A: HP type
Curve B: H type
Curve C: HP type(530)
- Test conditions:
Curve A: 16A 250VAC, Resistive load, Room temp., 1s on 9s off
Curve B: 10A 250VAC, Resistive load, Room temp., 1s on 9s off
Curve C: 20A 250VAC, Resistive load, Room temp., 1s on 9s off

Notes:

- Test conditions:
A 85°C 16A (HP type)
B 85°C 10A (H Standard type)
C 85°C 20A (HP 530)
D 85°C 10A (Z Standard type)
- Mounting distance: 25mm

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF163F-L SUBMINIATURE INTERMEDIATE POWER LATCHING RELAY



File No.: E134517



File No.: 40039460



Features

- Latching relay
- High sensitive
- Breakdown voltage (between contact and coil): 5,000 V
- High switching capacity: 8A 250VAC
- Surge breakdown voltage (between contact and coil): 12,000 V
- Reflow soldering available
- 1 Form A configuration

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	8A 250VAC 5A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA/150W
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	5 x 10 ⁴ OPS(8A 250VAC, Resistive load, at 85°C, 1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Set time		15ms max.
Reset time		15ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 2.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 8g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	1 coil latching	Approx. 200mW
	2 coils latching	Approx. 400mW

COIL DATA

at 23°C

1 coil latching (200mW)

Nominal Voltage VDC	Set Voltage VDC max.	Reset Voltage VDC max.	Coil Resistance x (1±10%)Ω
3	2.4	2.4	45
5	4.0	4.0	125
6	4.8	4.8	180
9	7.2	7.2	405
12	9.6	9.6	720
24	19.2	19.2	2880

2 coils latching (400mW)

Nominal Voltage VDC	Set Voltage VDC max.	Reset Voltage VDC max.	Coil Resistance x (1±10%)Ω
3	2.4	2.4	22.5
5	4.0	4.0	62.5
6	4.8	4.8	90
9	7.2	7.2	202.5
12	9.6	9.6	360
24	19.2	19.2	1440

SAFETY APPROVAL RATINGS

UL/CUL	8A 250VAC at 85°C 5A 30VDC at 85°C 10A 250VAC at 40°C TV-3 125VAC at 40°C 800W 277VAC Tungsten at 40°C 4A 277VAC Standard Ballast at 40°C
VDE	8A 250VAC at 85°C 5A 30VDC at 85°C

- Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

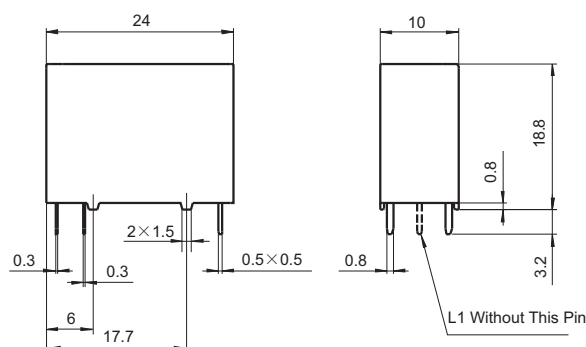
	HF163F-L/	12	-H	L2	T	(XXX)
Type						
Coil voltage	3, 5, 6, 9, 12, 24VDC					
Contact form	H: 1 Form A					
Sort	L1: 1 coil latching L2: 2 coils latching					
Contact material	T: AgSnO ₂					
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
 4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT); e.g.(470) stands for product which is suitable for reflow soldering.

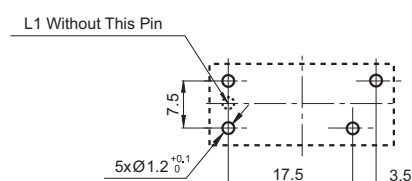
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
 2) The tolerance without indicating for PCB layout is always ± 0.1 mm.
 3) The width of the gridding is 2.54mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

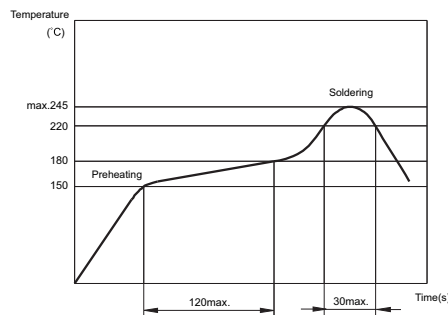
Wiring Diagram (Bottom view)

Reset Status



RECOMMENDED SOLDERING CONDITIONS

Temperature/Time profile of Reflow Soldering see below:



- Notes:** 1) Temperature profile shows Printed Circuit Board surface temperature on the relay terminal portion.
2) Please check the actual soldering condition to use other method except above mentioned temperature profiles.

Notice

- Relay is on the "reset" or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
- In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than "set" or "reset" time. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
- Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF118F

MINIATURE HIGH POWER RELAY



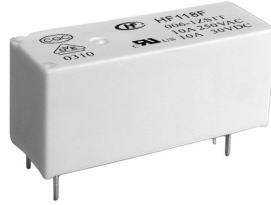
File No.: E134517



File No.: 40010480



File No.: CQC09002035071
CQC18002206322



Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Low height: 12.5 mm
- Creepage distance >8mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Sockets available
- Plastic sealed and flux proofed types available
- Through-Hole Reflow Version available

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact material	See ordering info.
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact rating (Res. load)	10A 250VAC/30VDC
Max. switching voltage	440VAC / 125VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	1H type: 1 x 10 ⁵ OPS (AgNi, 8A 250VAC, Resistive load, at 85°C, 5s on 5s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. vot.)		10ms max.
Release time (at rated. vot.)		5ms max.
Temperature rise (at rated. Volt.)		55K max.
Shock resistance *	Functional	NC: 49m/s ² NO: 98m/s ²
	Destructive	980m/s ²
Vibration resistance *	NC (no coil voltage)	10Hz to 55Hz 0.8mm DA
	NO	10Hz to 55Hz 1.65mm DA
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 8g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) * Index is not in relay length direction.

COIL

Coil power	Approx. 220mW to 290mW
------------	------------------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	113 x (1±10%)
6	4.20	0.6	9.0	164 x (1±10%)
9	6.30	0.9	13.5	360 x (1±10%)
12	8.40	1.2	18.0	620 x (1±10%)
18	12.60	1.8	27.0	1295 x (1±10%)
24	16.80	2.4	36.0	2350 x (1±15%)
48 ²⁾	33.60	4.8	72.0	8000 x (1±15%)
60 ²⁾	42.00	6.0	90.0	12500 x (1±15%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL (AgNi, AgSnO ₂)	version 1,3,5,6	10A 250VAC 10A 30VDC B300 R300 1/2HP 240VAC (NO only) AgSnO ₂ : 1/3HP 120VAC (NO only)
VDE (AgNi, AgNi+Au)	1H (;S) (1;3;5) (-;G) 1D (;S) (1;3;6) (-;G) 1Z (-;S) (1;3) (-;G)	10A 250VAC at 85°C 8A 250VAC at 85°C 10A 250VAC at 85°C
VDE (AgSnO ₂ , AgSnO ₂ +Au)	1H (-;S) (1;3;5), T.(-;G) 1D (-;S) (1;3;6), T.(-;G) 1Z (-;S) (1;3), T.(-;G) 1H (-;S) (1;3;5), T.(-;G) 1Z (-;S) (1;3), T.(-;G)	10A 250VAC at 85°C 8A 250VAC at 85°C 10A 250VAC at 85°C AC-15 (Make: 30A 250VAC COS Ø=0.7 at 85°C Break: 3A 250VAC COS Ø=0.4 at 85°C) NO: AC-15 (Make: 30A 250VAC COS Ø=0.7 at 85°C Break: 3A 250VAC COS Ø=0.4 at 85°C)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF118F / 012 -1H S 5 G (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC
Contact arrangement	1H: 1 Form A 1D: 1 Form B 1Z: 1 Form C
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed
Version (See Wiring Diagram below)	1: 3.2mm 1 Form C 3: 3.2mm 1 Form C, double pinning 5: 5mm, 1 Form A 6: 5mm, 1 Form B
Contact material ³⁾	T: AgSnO ₂ G: AgNi+Au plated TG: AgSnO ₂ +Au plated Nil: AgNi
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

4) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT); e.g.(253) means Through-Hole Reflow Version(valid for Flux proofed only).

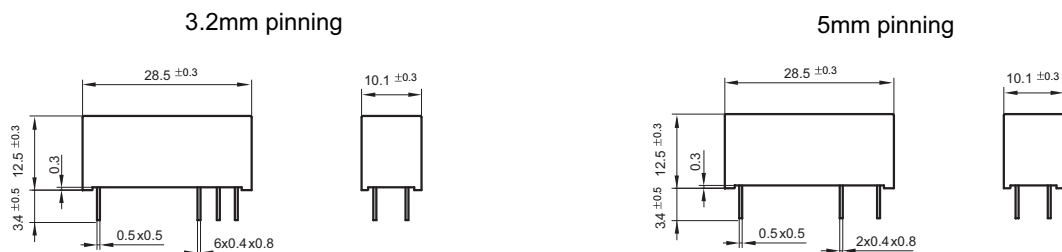
5) Standard tube packing length is 600mm. Any special requirement needed, please contact us for more details.

6) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

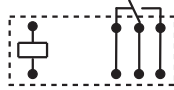
Unit: mm

Wiring Diagram (Bottom view)

1 Form C,Version 1



1 Form C,Version 3



1 Form A,Version 5

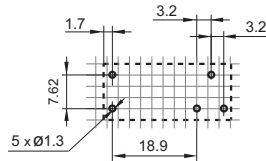


1 Form B,Version 6

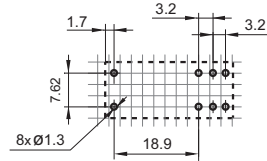


PCB Layout (Bottom view)

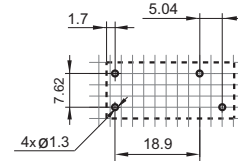
Version 1



Version 3



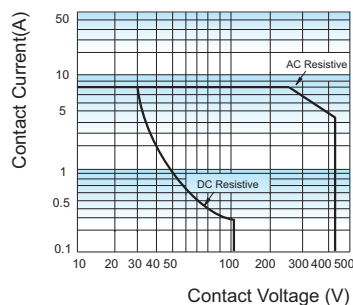
Version 5/6



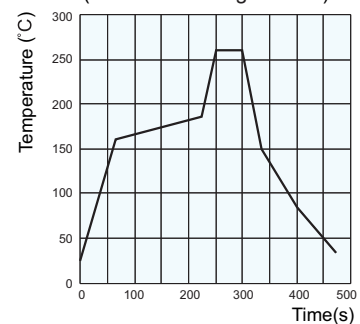
- Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
- 4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

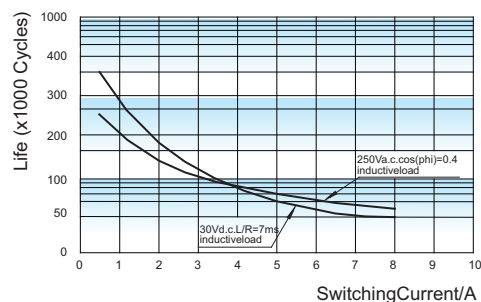
MAXIMUM SWITCHING POWER



REFLOW WELDING TEMPERATURE
(Reflow soldering version)



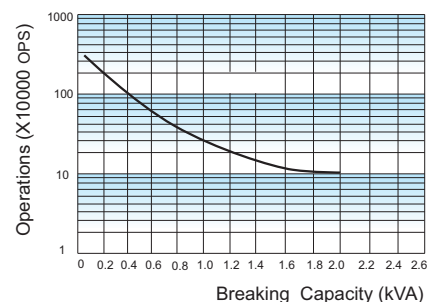
INDUCTIVE ENDURANCE CURVE



Notes:

- Test conditions:
NO, Room temp., 1s on 9s off.

ENDURANCE CURVE



Notes:

- Curve: 1Z1 type
- Test conditions:
NO, Resistive load, 250VAC
Flux proofed, Room temp., 1s on 9s off.

Disclaimer

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HF118FK

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40010480



File NO.:CQC09002035071
CQC18002206322



Features

- 8A switching capability
- 5kV dielectric strength (between coil and contacts)
- Low height: 12.5 mm
- Creepage distance >8mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Flux proofed types
- Through-Hole Reflow Version available

CONTACT DATA

Contact arrangement	A,C
Contact material	See ordering info.
Contact resistance	100mΩ max.(at 1A 6VDC)
Contact rating (Res. load)	8A 250VAC/30VDC
Max. switching voltage	440VAC / 125VDC
Max. switching current	8A
Max. switching power	2000VA / 240W
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	H type:1 x 10 ⁵ OPS (8A 250VAC, Resistive load,at 85°C ,5s on 5s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. vot.)		10ms max.
Release time (at nomi. vot.)		5ms max.
Temperature rise (at nomi. Volt.)		55K max.
Shock resistance *	Functional	NC: 49m/s ² NO: 98m/s ²
	Destructive	980m/s ²
Vibration resistance *	NC (no coil voltage)	10Hz to 55Hz 0.8mm DA
	NO	10Hz to 55Hz 1.65mm DA
Ambient temperature		-40 to 85°C
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 8g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	Approx. 220mW to 290mW
------------	------------------------

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max Allowable Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	113 x (1±10%)
6	4.20	0.6	9.0	164 x (1±10%)
9	6.30	0.9	13.5	360 x (1±10%)
12	8.40	1.2	18.0	620 x (1±10%)
18	12.60	1.8	27.0	1295 x (1±10%)
24	16.80	2.4	36.0	2350 x (1±15%)
48 ³⁾	33.60	4.8	72.0	8000 x (1±15%)
60 ³⁾	42.00	6.0	90.0	12500 x (1±15%)

Notes: 1)The data show above are initial values.
2) Maximum voltage refers to the maximum voltage Which relay coil could endurance in a short period of time.
3) For products with rated voltage ≥48V,measures should be taken to prevent coil overvoltage in order to protect coil in test and application(eg.Connect diodes in parallel).



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL (AgNi,AgSnO ₂)	version1,5	NO: 8A 250VAC at 85°C NO/NC: 8A 250VAC at 85°C B300 AgNi: R300
VDE (AgSnO ₂ ,AgSnO ₂ +Au)	H5T.(-;G)	8A 250VAC at 85°C
	Z1T.(-;G)	8A 250VAC at 85°C
	H5T.(-;G)	AC-15(Make: 15A 250VAC COSØ = 0.7 at 85°C Break: 1.5A 250VAC COSØ = 0.4 at 85°C)
VDE (AgNi,AgNi+Au)	H53.(-;G)	8A 250VAC at 85°C
	Z13.(-;G)	8A 250VAC at 85°C
	H53.(-;G)	AC-15(Make: 30A 250VAC COSØ = 0.7 at 85°C Break: 3A 250VAC COSØ = 0.4 at 85°C)
	Z13.(-;G)	NO: AC-15(Make: 30A 250VAC COSØ = 0.7 at 85°C Break: 3A 250VAC COSØ = 0.4 at 85°C)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF118FK / 12 -Z 1 T G (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC
Contact arrangement	H: 1 Form A Z: 1 Form C
Version (See Wiring Diagram below)	1: 3.2mm 1 pole 8A, only 1 Form C 5: 5mm 8A, only 1 Form A
Contact material	T: AgSnO ₂ 3:AgNi
Contact plating	G: Gold plated Nil: Standard
Customer special code	XXX:Customer special requirement Nil: Standard

Notes: 1)Flux proof relays cannot be used in polluted environment (with contaminations like H₂S,SO₂,NO₂,dust,etc.).

2)Water cleaning or surface process is not allowed in assembling relays on PCB.

3)For gold plated type,the min. switching current and min. switching voltage is 10mA 5VDC.

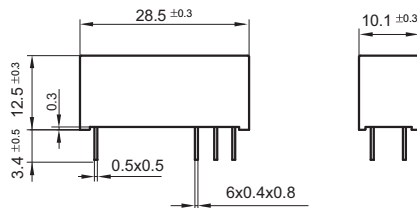
4)The customer special requirement express as special code evaluating by Hongfa. E.g.(335) standards for product in accordance to IEC 60335-1(GWT);e.g.(253) means Through-Hole Reflow Version(valid for Flux proofed only).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

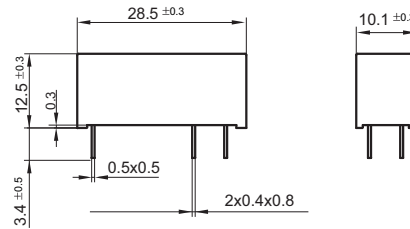
Unit: mm

Outline Dimensions

3.2mm pinning



5mm pinning



Wiring Diagram (Bottom view)

Version 1



Version 5

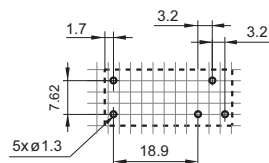


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

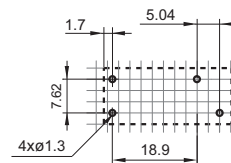
Unit: mm

PCB Layout (Bottom view)

Version 1



Version 5



Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

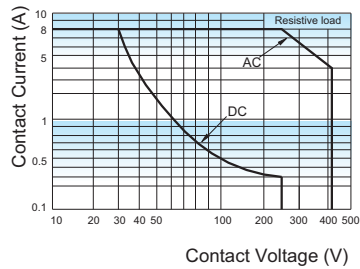
2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

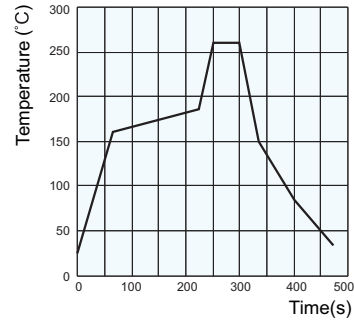
4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

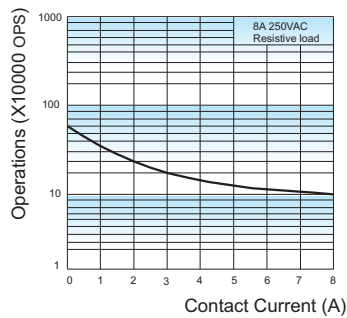
MAXIMUM SWITCHING POWER



REFLOW WELDING TEMPERATURE
(Reflow soldering version)



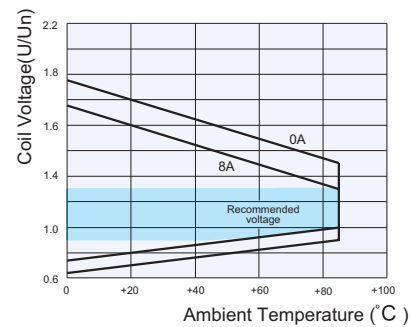
ENDURANCE CURVE



Note:

Test conditions:
NO, Resistive load, 250VAC
Flux proofed, 85°C, 5s on 5s off.

COIL OPERATING RANGE (DC) *



Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the above range may damage the insulation of relay coil.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF115F

MINIATURE HIGH POWER RELAY

CUS

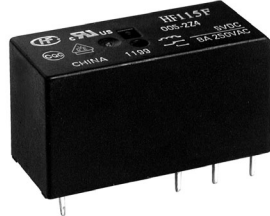
File No.:E134517



File No.:116934



File No.:CQC17002168381



Features

- Low height: 15.7 mm
- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1B, 1C	2A, 2B, 2C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	12A/16A 250VAC	8A 250VAC
Max. switching voltage ²⁾	440VAC / 300VDC	
Max. switching current	12A / 16A	8A
Max. switching power	3000VA / 4000VA	2000VA
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1H3B type: 1 x 10 ⁵ OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off) 2H4B type: 5 x 10 ⁴ OPS (8A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values,
2) see maximum switching power curve.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Surge voltage (between coil & contacts)	10kV (1.2 / 50μs)	
Operate time (at nomi. volt.)	15ms max.	
Release time (at nomi. volt.)	8ms max.	
Temperature rise (at nomi. volt.)	55K max.	
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *	10Hz to 150Hz 10g/5g	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Termination	PCB	
Unit weight	Approx. 13.5g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.
3) UL insulation system: Class F, Class B.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL

Coil power	Approx. 400mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18	360 x (1±10%)
18	12.60	1.8	27	810 x (1±10%)
24	16.80	2.4	36	1440 x (1±10%)
48 ³⁾	33.60	4.8	72	5760 x (1±15%)
60 ³⁾	42.00	6.0	90	7500 x (1±15%)
110 ³⁾	77.00	11.0	165	25200 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

VDE

Contact material	Specifications	Ratings	Ambient Temperature
AgCdO	HF115F....2(H;Z)(S)4(G)(F)	8A 250VAC	70°C
	HF115F....1H(S)(1;2)(G)(F)	12A 250VAC	70°C
		10A 250VAC	70°C
	HF115F....1Z(S)(1;2)(G)(F)	12A 250VAC	70°C
	HF115F....1H(S)3(G)(F)	16A 250VAC	70°C
		10A 250VAC	70°C
		9A 250VAC COSØ =0.4	70°C
	HF115F....1Z(S)3(G)(F)	16A 250VAC	70°C
		9A 250VAC COSØ =0.4	70°C
AgNi	HF115F....2(H;Z)(S)4B(G)(F)	5A 400VAC	85°C
		8A 250VAC	85°C
	HF115F....1H(S)(1;2)B(G)(F)	12A 250VAC	at 85°C
	HF115F....1Z(S)(1;2)B(G)(F)	12A 250VAC	at 85°C
	HF115F....1H(S)3B(G)(F)	16A 250VAC	at 85°C
		9A 250VAC COSØ =0.4	at 70°C
	HF115F....1Z(S)3B(G)(F)	16A 250VAC (NO only)	at 85°C
		12A 250VAC	at 85°C
		9A 250VAC COSØ =0.4 (NO only)	at 70°C
		10(4)A 250VAC (NO only)	at 65°C
		12(2)A 250VAC (NO only)	at 65°C
AgSnO ₂	HF115F....2(H;Z)(S)4A(G)(F)	8A 250VAC	at 85°C
	HF115F....1(H;Z)(S)(1;2)A(G)(F)	12A 250VAC	at 85°C
	HF115F....1H(S)3A(G)(F)	16A 250VAC	at 85°C
		9A 250VAC COSØ =0.4	at 70°C
	HF115F....1Z(S)3A(G)(F)	16A 250VAC (NO only)	at 85°C
		9A 250VAC COSØ =0.4 (NO only)	at 70°C

UL/CUL

Version 1 or 2 (AgCdO)	12A 277VAC	Version 3 (AgSnO ₂)	16A 277 VAC
	1/2HP 250VAC		1/3HP 125VAC
	1/3HP 125VAC		1/2HP 250VAC
Version 1 or 2 (AgSnO ₂)	12A/ 277VAC	Version 4 (AgCdO)	B300
	B300		R300
	R300		10A 250VAC
Version 3 (AgCdO)	12A 277VAC	Version 4 (AgSnO ₂)	8A 277VAC
	16A 277 VAC		1/2HP 250VAC
	9A 250VAC 105°C		1/4HP 125VAC
	1HP 250VAC	Version 4 (AgNi)	8A 277VAC
	1/2HP 125VAC		10A 250VAC
Version 3 (AgNi)	TV-5 125VAC		1/2HP 250VAC
	16A 277VAC		1/4HF 250VAC
Version 3 (AgNi)	5FLA, 30LRA 250VAC	Version 4 (AgNi)	8A 277VAC
			10A 250VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF115F / 012 -1H S 1 A F (XXX)						
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60, 110VDC						
Contact arrangement	1H: 1 Form A 1D: 1 Form B 1Z: 1 Form C 2H: 2 Form A 2D: 2 Form B 2Z: 2 Form C						
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed						
Version	1: 3.5mm 1 pole 12A 2: 5.0mm 1 pole 12A 3: 5.0mm 1 pole 16A 4: 5.0mm 2 pole 8A						
Contact material ³⁾	A: AgSnO ₂ B: AgNi Nil: AgCdO G: AgCdO+ Au plated AG: AgSnO ₂ + Au plated BG: AgNi+ Au plated						
Insulation standard	F: Class F Nil: Class B						
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard						

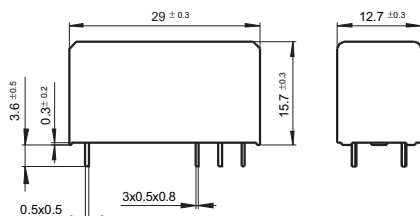
- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
- 2) Contact is recommend for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB
- 3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
- 4) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT); e.g. (253) stands for Reflow soldering version, for 1 pole type.
- 5) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.
- 6) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

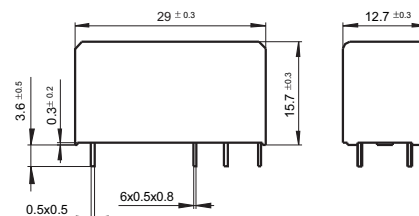
Unit: mm

Outline Dimensions

3.5mm Pinning (HF115F/□□□-□□-□-1-□□)



5mm Pinning (HF115F/□□□-□□-□-2/3/4-□□)

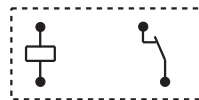


Wiring Diagram (Bottom view)

3.5/5mm Pinning, 1 Pole, 12A, HF115F/□□□-1□-□-1/2-□□



1 Form A

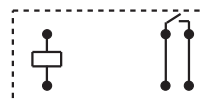


1 Form B

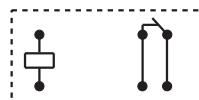


1 Form C

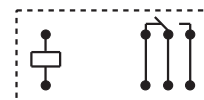
5mm Pinning, 1 Pole, 16A, HF115F/□□□-1□-□-3-□□



1 Form A

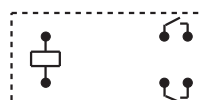


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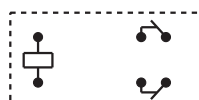


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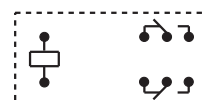
5mm Pinning, 2 Pole, 8A, HF115F/□□□-2□-□-4-□□



2 Form A



2 Form B

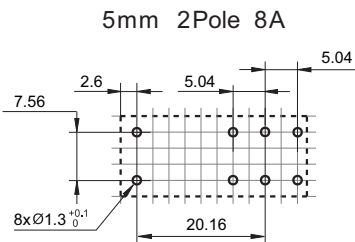
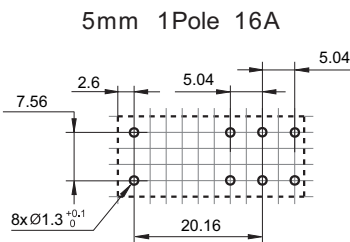
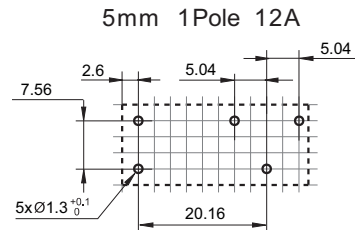
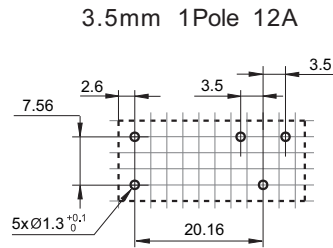


2 Form C

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

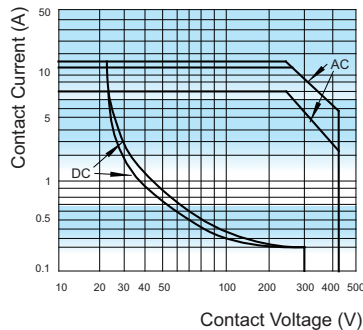
PCB Layout (Bottom view)



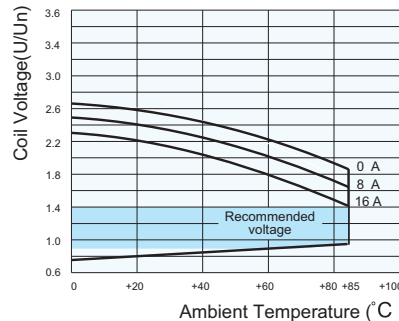
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

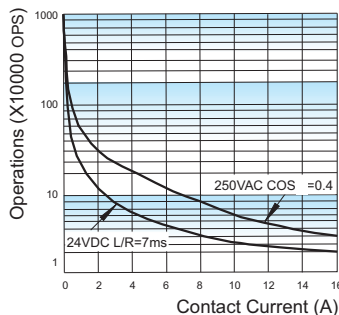


COIL OPERATING RANGE (DC) *



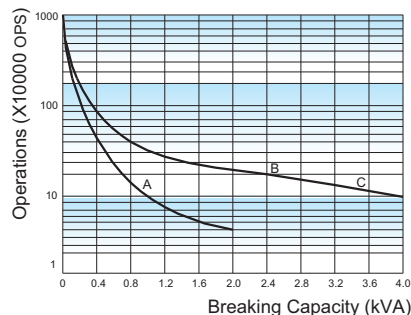
Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life. An energising voltage over the above range may damage the insulation of relay coil.

ENDURANCE CURVE(Inductive)



Remark:
 1. Curve: 1H3A type
 2. Test conditions:
 NO, 85°C,
 1s on 9s off,
 Flux proofed.

ENDURANCE CURVE(Resistive)



Remark:
 1. Curve A: 2H4B type
 Curve B: 1H1B type
 (or 1H2B type)
 Curve C: 1H3B type
 2. Test conditions:
 NO, Resistive load, 250VAC,
 Flux proofed, Room temp.,
 1s on 9s off.

Disclaimer

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HF115F-A

MINIATURE HIGH POWER RELAY

CE **UL** **US**

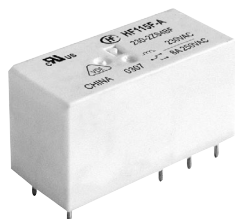
File No.:E134517



File No.:116934



File No.:CQC1702176311



Features

- AC voltage coil type
- 16A switching capability
- 1 & 2 pole configurations
- 5kV dielectric strength (between coil and contacts)
- Low height: 15.7 mm
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1B, 1C	2A, 2B, 2C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	12A/16A 250VAC	8A 250VAC
Max. switching voltage	440VAC / 300VDC	
Max. switching current	12A / 16A	8A
Max. switching power	3000VA / 4000VA	2000VA
Mechanical endurance	1 x 10 ⁶ OPS	
Electrical endurance	1H3B type: 5 x 10 ⁴ OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off) 2H4B type: 5 x 10 ⁴ OPS (8A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Temperature rise (at nomi. volt.)	85K max.	
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *	10Hz to150Hz 10g/5g	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 70°C	
Termination	PCB	
Unit weight	Approx. 13.5g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 0.75VA
------------	----------------

COIL DATA (at 50Hz) at 23°C

Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Coil Current mA	Coil DC Resistance Ω
24	18.00	3.60	31.6	350 x (1±10%)
115	86.30	17.30	6.6	8100 x (1±15%)
230	172.50	34.50	3.2	32500 x (1±15%)

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	12A 250VAC 16A 250VAC 8A 250VAC
VDE (AgNi, AgNi+Au)	12A 250VAC at 70°C 16A 250VAC at 70°C 8A 250VAC at 70°C
VDE (AgSnO ₂ , AgSnO ₂ +Au)	12A 250VAC at 70°C 8A 250VAC at 70°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF115F-A / 024 -1H S 1 A F (XXX)
Coil voltage	24, 115, 230VAC
Contact arrangement	1H: 1 Form A 1D: 1 Form B 1Z: 1 Form C 2H: 2 Form A 2D: 2 Form B 2Z: 2 Form C
Construction ^{1) 2)}	S: Plastic sealed Nil: Flux proofed
Version	1: 3.5mm 1 pole 12A 2: 5.0mm 1 pole 12A 3: 5.0mm 1 pole 16A 4: 5.0mm 2 pole 8A
Contact material ³⁾	A: AgSnO ₂ B: AgNi Nil: AgCdO G: AgCdO+Au plated AG: AgSnO ₂ +Au plated BG: AgNi+Au plated
Insulation standard	F: Class F
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

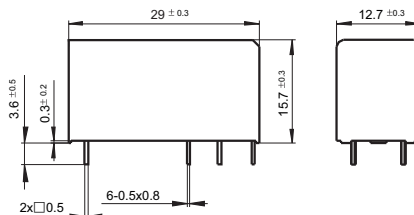
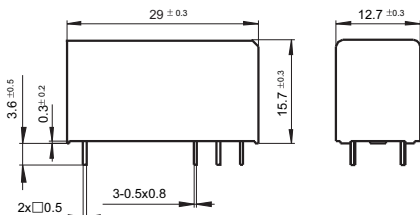
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

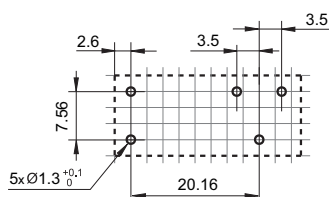
3.5mm Pinning (HF115F-A/□□□-□□-□-1-□□)

5mm Pinning (HF115F-A/□□□-□□-□-2/3/4-□□)

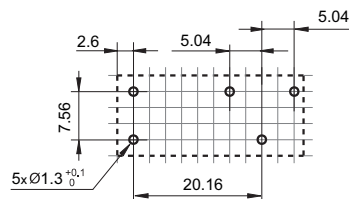


PCB Layout (Bottom view)

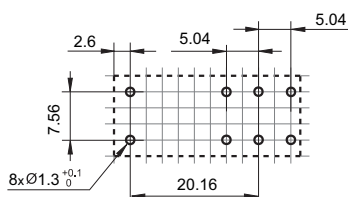
3.5mm 1Pole 12A



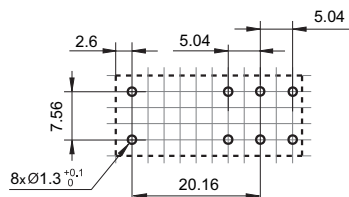
5mm 1Pole 12A



5mm 1Pole 16A



5mm 2Pole 8A



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
2) The tolerance without indicating for PCB layout is always ± 0.1 mm.
3) The width of the gridding is 2.52mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

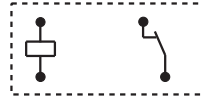
Unit: mm

Wiring Diagram (Bottom view)

HF115F-A/□□□-□□-□-1/2-□□, 3.5/5mm Pinning, 1 Pole, 12A



1 Form A



1 Form B

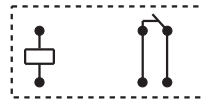


1 Form C

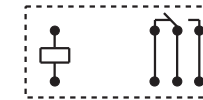
HF115F-A/□□□-□□-□-3-□□, 5mm Pinning, 1 Pole, 16A



1 Form A



1 Form B

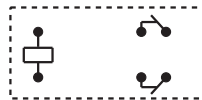


1 Form C

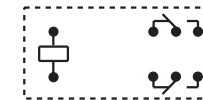
HF115F-A/□□□-□□-□-4-□□, 5mm Pinning, 2 Pole, 8A



2 Form A



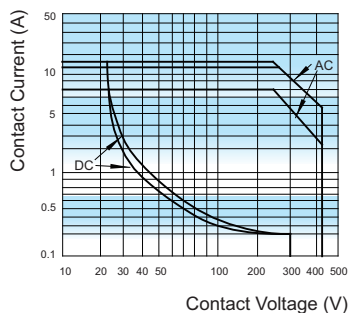
2 Form B



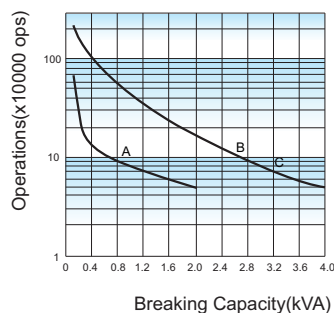
2 Form C

CHARACTERISTIC CURVES

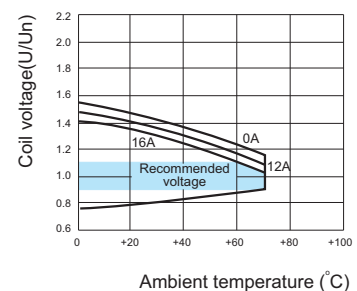
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (AC) *



Notes:

- Curve A: 2H4B type
Curve B: 1H1B(or 1H2B) type
Curve C: 1H3B type
- Test conditions:
NO, Resistive load, 250VAC
Flux proofed, Room temp., 1s on 9s off.

Notes:

* The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the above range may damage the insulation of relay coil.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice.
We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115F-T/TH

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.:116934



File No.:CQC17002168381



Features

- High Temperature: 105°C
- Low height 15.7 mm
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Sockets available
- Plastic sealed and flux proofed types available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	See ordering info.
Contact rating (Res. load)	HF115F-TH: 10A 250VAC HF115F-T: 16A 250VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	HF115F-TH:10A HF115F-T:16A
Max. switching power	HF115F-TH: 2500VA HF115F-T: 4000VA
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	HF115F-T 1H3B type: 5 x 10 ⁴ OPS (16A 250VAC, Resistive load, at 105°C, 5s on 5s off) HF115F-TH 1H3B type: 5 x 10 ⁴ OPS (10A 250VAC, Resistive load, at 105°C, 5s on 5s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		8ms max.
Temperature rise (at rated. volt.)		55K max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) * Index is not that of relay length direction.

COIL

Coil power	HF115F-TH: Approx. 250mW; HF115F-T: Approx. 400mW
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COIL DATA

at 23°C

Standard type (HF115F-T)

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	6.5	62 x (1±10%)
6	4.20	0.6	7.8	90 x (1±10%)
9	6.30	0.9	11.7	202 x (1±10%)
12	8.40	1.2	15.6	360 x (1±10%)
18	12.6	1.8	23.4	810 x (1±10%)
24	16.8	2.4	31.2	1440 x (1±10%)
48 ³⁾	33.6	4.8	62.4	5760 x (1±15%)
60 ³⁾	42.0	6.0	78	7500 x (1±15%)

Sensitive type (HF115F-TH)

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	100 x (1±10%)
6	4.50	0.6	7.8	144 x (1±10%)
9	6.75	0.9	11.7	324 x (1±10%)
12	9.00	1.2	15.6	576 x (1±10%)
18	13.50	1.8	23.4	1296 x (1±10%)
24	18.00	2.4	31.2	2304 x (1±10%)
48 ³⁾	36.00	4.8	62.4	9216 x (1±15%)
60 ³⁾	45.00	6.0	78	12857 x (1±15%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

SAFETY APPROVAL RATINGS

VDE	HF115F-T-1H(S)3A	18.4A 250VAC at 105°C
	HF115F-TH -1H(S)3	10A 250VAC at 105°C 6A 400VAC at 105°C
	HF115F-T-1H(S)3B	16A 250VAC at 105°C
	HF115F-TH -1H(S)3B	10A 250VAC at 105°C
	HF115F-T-1Z(S)3B	NO: 16A 250VAC at 105°C NC: 5A 250VAC at 105°C
UL/CUL	HF115F-TH -1H(S)3B	10A 277VAC
	HF115F-TH -1H(S)3A	10A 277VAC
	HF115F-T-1H(S)3B	16A 277VAC
	HF115F-T-1H(S)3A	16A 250VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF115F-T/TH		012	-1H	S	3	A	(XXX)
Type	HF115F-T: Standard HF115F-TH: High Sensitive						
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC						
Contact arrangement	1H: 1 Form A 1Z: 1 Form C						
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed						
Version	3: 5.0mm						
Contact material	A: AgSnO ₂ B: AgNi Nil: AgCdO						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

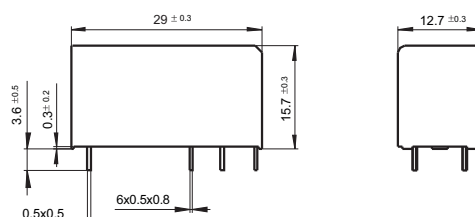
4) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.

5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

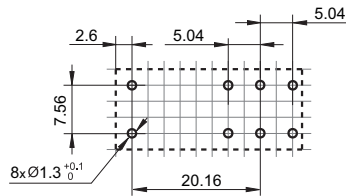
Outline Dimensions



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

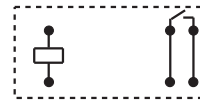
Unit: mm

PCB Layout
(Bottom view)

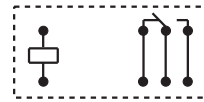


Wiring Diagram
(Bottom view)

1 Form A



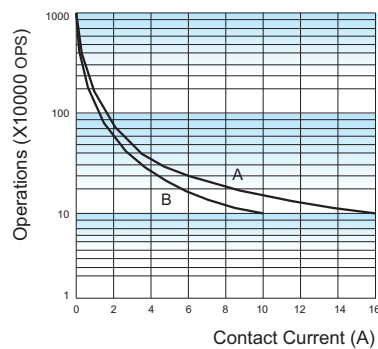
1 Form C



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

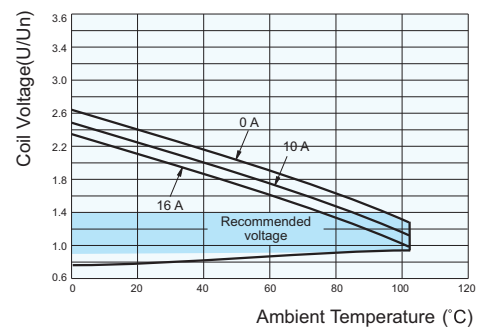
ENDURANCE CURVE



Notes:

- Curve A: HF115F-T 1H3B type
Curve B: HF115F-TH 1H3B type
- Test conditions:
NO, Resistive load, 250VAC, Flux proofed,
Room temp., 1s on 9s off

COIL OPERATING RANGE (DC) *



- Notes:** * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
 An energising voltage over the above range may damage the insulation of relay coil.

Disclaimer

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HF115F-H

MINIATURE HIGH POWER RELAY



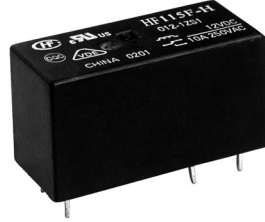
File No.:E134517



File No.:116934



File No.:CQC17002168381



Features

- High sensitive: 0.25W
- Low height: 15.7 mm
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact resistance	100mΩ max.(at 1A 6VDC)
Contact material	See ordering info.
Contact rating (Sensitive coil)	10A 250VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	10A
Max. switching power	2500VA
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	1H3 type: 1 x 10 ⁵ OPS (10A 250VAC, Resistive load, at 85°C, 5s on 5s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		8ms max.
Temperature rise (at nomi. volt.)		55K max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) * Index is not that of relay length direction.

3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 250mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	7.5	100 x (1±10%)
6	4.50	0.6	9.0	144 x (1±10%)
12	9.00	1.2	18	576 x (1±10%)
18	13.50	1.8	27	1296 x (1±10%)
24	18.00	2.4	36	2304 x (1±10%)
48 ³⁾	36.00	4.8	72	9216 x (1±15%)
60 ³⁾	45.00	6.0	90	12857 x (1±15%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

SAFETY APPROVAL RATINGS

VDE

Contact Material	Specifications	Ratings
AgSnO ₂	HF115F-H....1(H;Z)(S)(1;2;3)A(G)(F)	10A 250VAC at 85°C
AgCdO	HF115F-H....1(H;Z)(S)(1;2;3)(G)(F)	10A 250VAC at 85°C 6A 400VAC at 85°C

UL/CUL

Contact Material	Specifications	Ratings
AgCdO	HF115F-H....1(H;Z)(S)(1;2;3)(G)(F)	10A 250VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF115F-H / 012 -1H S 3 A F (XXX)
Coil voltage	5, 6, 12, 18, 24, 48, 60VDC
Contact arrangement	1H:1 Form A 1D:1 Form B 1Z:1 Form C
Construction ^{1) 2)}	S: Plastic sealed Nil: Flux proofed
Version	1: 3.5mm 1 pole 2: 5.0mm 1 pole 3: 5.0mm 1 pole
Contact materia ³⁾	A: AgSnO ₂ B: AgNi Nil: AgCdO G: AgCdO+Au plated AG: AgSnO ₂ +Au plated BG: AgNi+Au plated
Insulation standard	F: Class F Nil: Class B
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

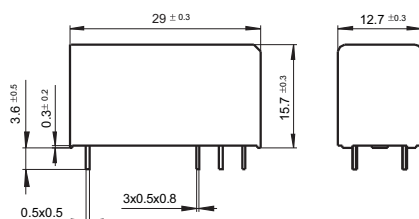
- Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
- 4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
- 5) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.
- 6) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

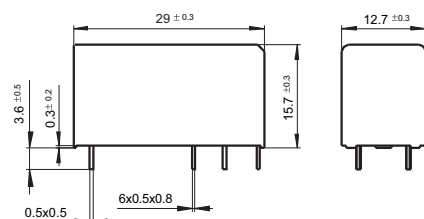
Unit: mm

Outline Dimensions

3.5mm Pinning (HF115F-H/ □□□ -□□ -1-□)



5mm Pinning (HF115F-H/ □□□ -□□ -2/3-□)

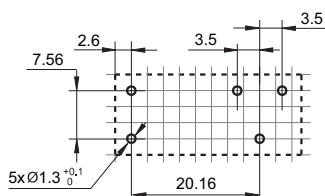


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

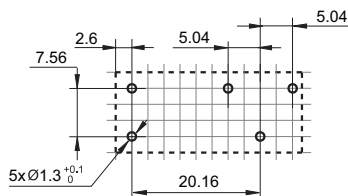
Unit: mm

PCB Layout (Bottom view)

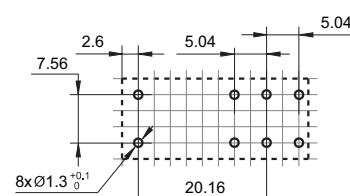
3.5mm Pinning, 1 Pole



5mm Pinning, 1 Pole

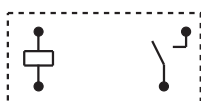


5mm Pinning, 1 Pole

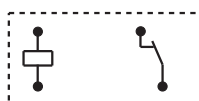


Wiring Diagram (Bottom view)

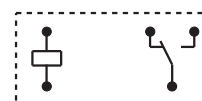
3.5/5mm Pinning, 1 Pole, 10A, HF115F-H/ □□□ -□□ -□ -1/2 -□



1 Form A

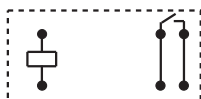


1 Form B

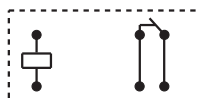


1 Form C

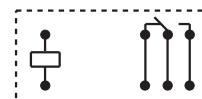
5mm Pinning, 1 Pole, 10A, HF115F-H/ □□□ -□□ -□ -3 -□



1 Form A



1 Form B

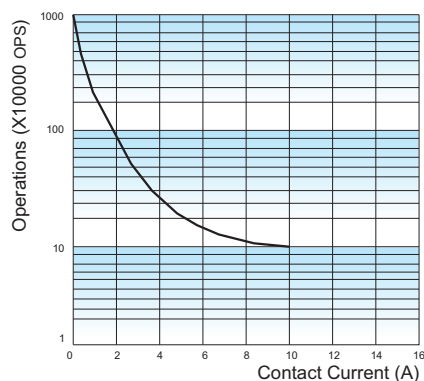


1 Form C

- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

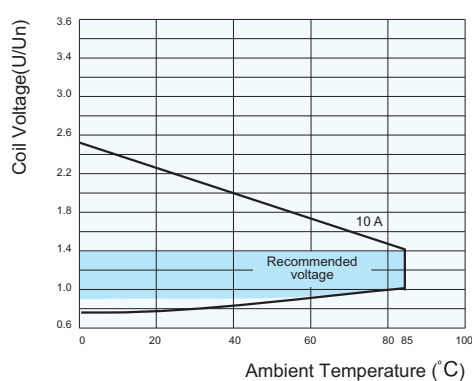
ENDURANCE CURVE



Notes:

- 1) Curve : 1H3 type
- 2) Test conditions:
NO, 250VAC, Resistive load,
Flux proofed, at 85°C, 5s on 5s off.

COIL OPERATING RANGE (DC) *



- Notes:** * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
 An energising voltage over the above range may damage the insulation of relay coil.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115F-I

MINIATURE HIGH POWER RELAY



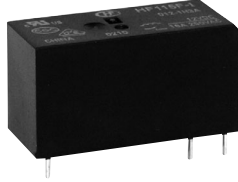
File No.:E134517



File No.:116934



File No.:CQC17002168381



Features

- Max high inrush:120A 20ms
- Low height: 15.7 mm
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating	16A 250VAC
Inrush rating (120VAC)	NO: TV-5 80A 120A / 20ms
Max. switching voltage	440VAC / 300VDC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	1 x 10 ⁷ ops
Electrical endurance	1H3A type: 7.5 x 10 ⁴ ops (16A 250VAC, General use, Room temp., 1s on 9s off) 1H3A type: 2.5 x 10 ⁴ ops (TV-5 120VAC, Room temp., 1s on 59s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		8ms max.
Temperature rise (at nomi. volt.)		55K max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 20g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 400mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18	360 x (1±10%)
18	12.6	1.8	27	810 x (1±10%)
24	16.8	2.4	36	1440 x (1±10%)
48 ³⁾	33.6	4.8	72	5760 x (1±15%)
60 ³⁾	42.0	6.0	90	7500 x (1±15%)
110 ³⁾	77.0	11.0	165	25200 x (1±15%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	HF115F-I....1Z(S)3A	NO: 16A 250VAC at 85°C
	HF115F-I....1H(S)3A	16A 250VAC TV-5,120VAC
VDE	HF115F-I....1H(S)3A	16A 250VAC at 85°C
	HF115F-I....1Z(S)3A	NO: 16A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

ORDERING INFORMATION

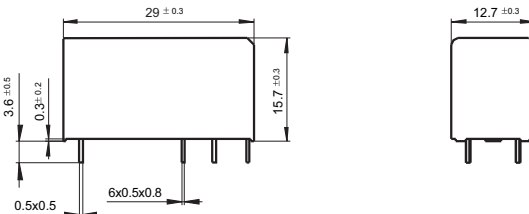
	HF115F-I /		012	-1H	S	3	A	(XXX)
Type								
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60, 110VDC							
Contact arrangement	1H: 1 Form A		1Z: 1 Form C					
Construction ¹⁾²⁾	S: Plastic sealed		Nil: Flux proofed					
Version	3: 5.0mm							
Contact material	A: AgSnO ₂							
Special code ³⁾	XXX: Customer special requirement		Nil: Standard					

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
- 4) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.
- 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

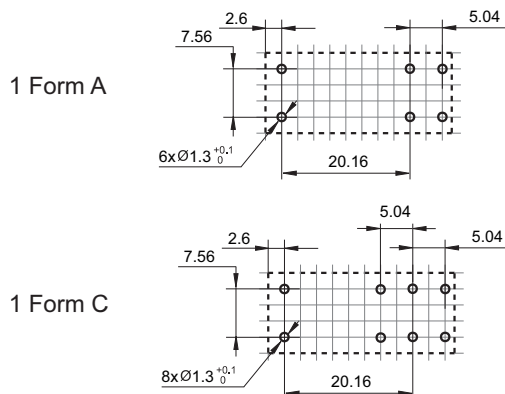
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

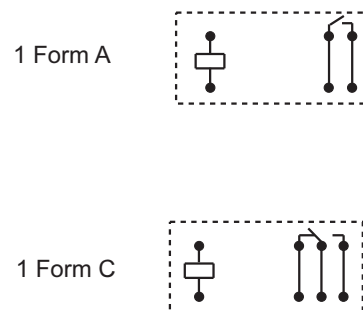
Outline Dimensions



PCB Layout (Bottom view)

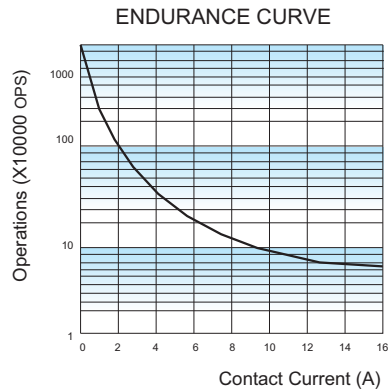


Wiring Diagram (Bottom view)



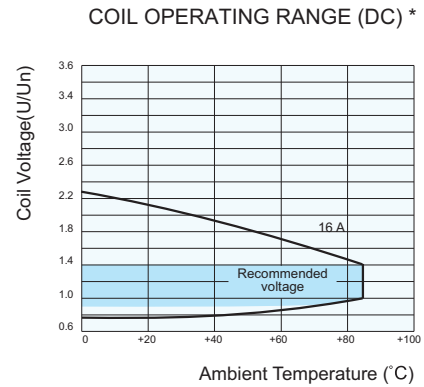
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
- 2) The tolerance without indicating for PCB layout is always ± 0.1 mm.
- 3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES



Test conditions:

NO, 250VAC, Resistance Load,
Flux proofed, Room temp., 1s on 9s off



Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the above range may damage the insulation of relay coil.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115F-Q

MINIATURE HIGH POWER RELAY



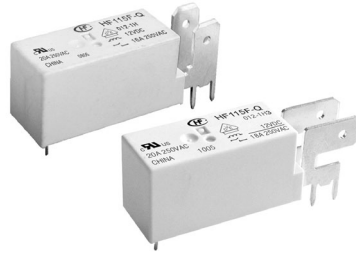
File No.: E134517



File No.: 116934



File No.: CQC17002168381



Features

- Ambient temperature up to 125 °C
- 5kV dielectric strength (between coil and contacts)
- Low height: 15.7mm
- Creepage distance >8mm
- Meeting VDE 0700, 0631 reinforce insulation
- UL94, V-0 flammability class
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1B
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgNi
Contact rating	20A 250VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	20A
Max. switching power	5000VA
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	1H type: 3 x 10 ⁴ OPS (20A 277VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		8ms max.
Temperature rise (at nomi. volt.)		55K max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		1A: 10Hz to150Hz 10g 1B: 10Hz to150Hz 5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 125°C
Termination		PCB & QC
Unit weight		Approx. 16g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 400mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18.0	360 x (1±10%)
18	12.6	1.8	27.0	810 x (1±10%)
24	16.8	2.4	36.0	1440 x (1±10%)
48 ³⁾	33.6	4.8	72.0	5760 x (1±15%)
60 ³⁾	42.0	6.0	90.0	7500 x (1±15%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

VDE	AgNi	1 Form A	18A 250VAC at 105°C 16A 250VAC at 125°C 12A 400VAC at 105°C
		1 Form B	16A 250VAC at 125°C 12A 400VAC at 105°C
UL/CUL	AgNi	1 Form A 1 Form B	20A 277VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

Type	HF115F-Q / 012 -1H 3 T (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC
Contact arrangement	1H: 1 Form A 1D: 1 Form B
Terminals	3: Quick connect terminals horizontal Nil: Quick connect terminals vertical
Contact material	T: AgSnO ₂ Nil: AgNi
Special code ³⁾	XXX: Customer special requirement Nil: Standard

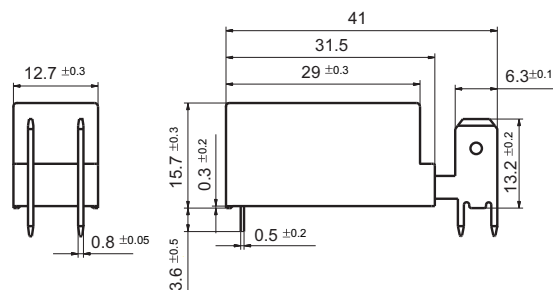
Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

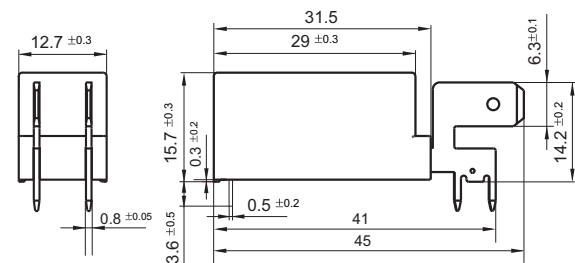
Unit: mm

Outline Dimensions

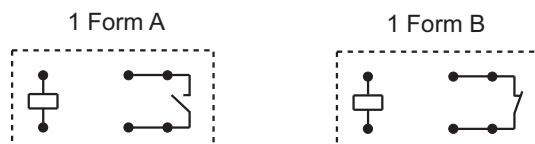
Quick connect terminals vertical



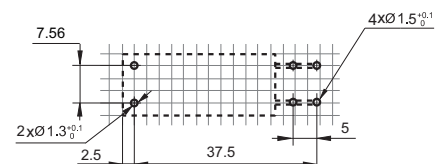
Quick connect terminals horizontal



Wiring Diagram
(Bottom view)



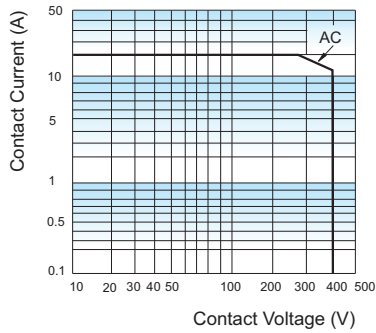
PCB Layout
(Bottom view)



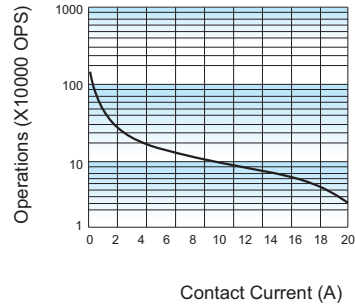
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



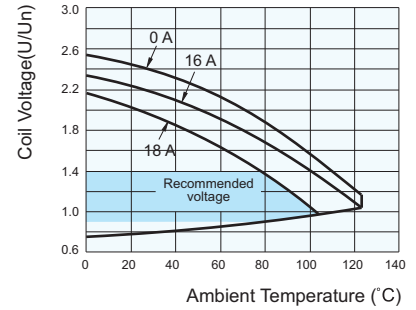
ENDURANCE CURVE



Notes:

- 1) Curve: 1H type
- 2) Test conditions:
NO, 250VAC, Resistive load, Flux proofed,
Room temp., 1s on 9s off.

COIL OPERATING RANGE (DC) *



- Notes:** * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life. An energising voltage over the abver range may damage the insulation of relay coil.

Disclaimer

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HF115F-25

MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: R50523670



File No.: CQC21002322054



Features

- 25A switching capability
- Low height: 16.5 mm
- Creepage distance and air distance: 10mm/10mm
- Meeting reinforce insulation
- IEC60335-1 compliant products are available
- UL insulation system: Class F
- Meets the requirement of ambient working temperature 105°C

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res.)	23A 277VAC
Max.switching voltage	277VAC
Max.switching current	25A
Max.switching power	6925VA
Mechanical endurance	1×10 ⁶ OPS
Electrical endurance	1×10 ⁵ OPS (23A 277VAC, Resistive load, 105°C, 1s on 9s off)
	1×10 ⁴ OPS (25A 277VAC, Resistive load, 105°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx.400mW
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COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC	Coil Resistance Ω
5	3.75	0.5	6.5	62×(1±10%)
6	4.5	0.6	7.8	90×(1±10%)
9	6.75	0.9	11.7	202×(1±10%)
12	9.00	1.2	15.6	360×(1±10%)
18	13.5	1.8	23.4	810×(1±10%)
24	18.0	2.4	31.2	1440×(1±10%)
48	36.0	4.8	62.4	5760×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge Voltage		10kV(1.2×50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		8ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 150Hz 10g
Humidity		5% to 85%RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 14g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	23A 250VAC/277VAC Resistive load 105°C
	25A 250VAC/277VAC Resistive load 105°C TV-8 120VAC 40°C
TUV	23A 250VAC/277VAC Resistive load 105°C 25A 250VAC/277VAC Resistive load 105°C
CQC	23A 250VAC/277VAC Resistive load 105°C
	25A 250VAC/277VAC Resistive load 105°C

Notes: The typical loads listed above are only part of the product certification. The detailed test conditions of each load are different, so the electrical durability is different. For more information, please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 2.00

ORDERING INFORMATION

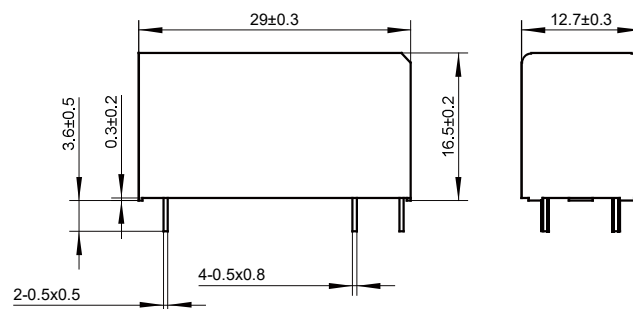
Type	HF115F-25/	12	-H	3	T	F	(XXX)
Coil voltage	5,6,9,12,18,24,48VDC						
Contact arrangement	H:1 Form A						
Structure ¹⁾	3:5.0mm						
Contact material	T: AgSnO ₂						
Insulation standard	F: Class F						
Special code	XXX: Customer special requiremen; Nil: Standard						

Notes: 1) Non-plastic sealed relays cannot be used in environment pollution (containing certain amount of H₂S, SO₂, NO₂, dust and other pollutants);
 2) Non-plastic sealed relays cannot be cleaned and treated as a whole after being loaded into PCB welding;
 3) The customer special requirement express as special code after evaluating by Hongfa.

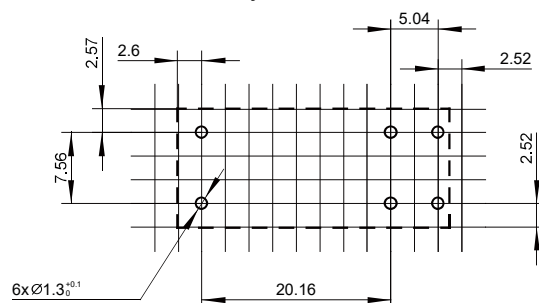
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout(Bottom view)



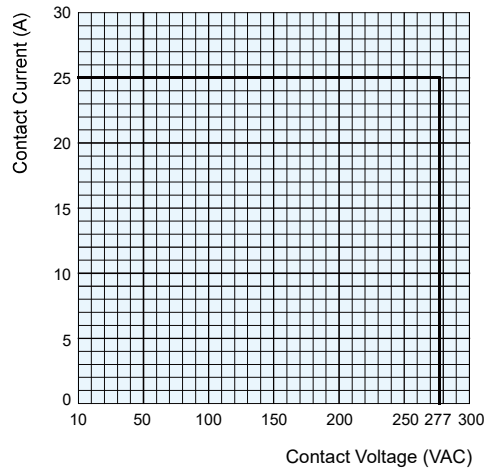
Wiring Diagram(Bottom view)



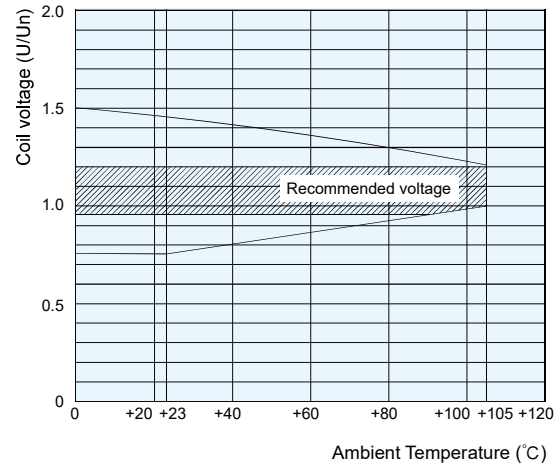
Notes: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm and ≤ 30 mm, tolerance should be ± 0.4 mm; outline dimension > 30 mm, tolerance should be ± 0.6 mm.
 2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

MAX.SWITCHING POWER



COIL OPERATING RANGE (DC)



Remark: When the relay is in use, if the excitation voltage exceeds the rated voltage, the relay electrical durability will be reduced.
Within the recommended voltage range, the effect on electrical durability is less.
The insulation of the relay coil may be damaged if it exceeds the upper limit specified by the curve in the diagram.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115F-25(Explosion-proof type) MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: R 50523670



File No.: CQC21002322054



Features

- 20A switching capability
- Low height: 16.5 mm
- Creepage distance and air distance: 10mm/10mm
- Meeting reinforce insulation
- IEC60335-1 compliant products are available
- UL insulation system: Class F
- Meet the explosion-proof requirements of IEC60079-15 GB3836.8

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res.)	20A 277VAC
Max.switching voltage	250VAC
Max.switching current	20A
Max.switching power	5000VA
Mechanical endurance	1×10 ⁶ OPS
Electrical endurance	1×10 ⁵ OPS (20A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx.800mW
------------	--------------

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC	Coil Resistance Ω
5	3.75	0.5	6.5	31×(1±10%)
6	4.5	0.6	7.8	45×(1±10%)
9	6.75	0.9	11.7	101×(1±10%)
12	9.00	1.2	15.6	180×(1±10%)
18	13.5	1.8	23.4	405×(1±10%)
24	18.0	2.4	31.2	720×(1±10%)
48	36.0	4.8	62.4	2880×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance	1000MΩ(500VDC)
Dielectric strength	Between coil & contacts 5000VAC 1min
	Between open contacts 1000VAC 1min
Surge Voltage	10kV(1.2×50μs)
Operate time (at nomi. volt.)	15ms max.
Release time (at nomi. volt.)	8ms max.
Shock resistance	Functional 98m/s ²
	Destructive 980m/s ²
Vibration resistance	10Hz to 150Hz 10g
Humidity	5% to 85%RH
Ambient temperature	-40°C to 105°C
Termination	PCB
Unit weight	Approx. 14g
Construction	Plastic sealed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	20A 250VAC Resistive load Room temp.
TUV	20A 250VAC Resistive load Room temp.

Notes: The typical loads listed above are only part of the product certification. The detailed test conditions of each load are different, so the electrical durability is different. For more information, please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 2.00

ORDERING INFORMATION

Type	HF115F-25/	12	-H	S	1	P	T	F	(XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC								
Contact arrangement	H: 1 Form A								
Construction	S: Plastic sealed								
Structure	1: 3.5mm								
Coil type	P: high power consumption type								
Contact material	T: AgSnO ₂								
Insulation standard	F: Class F								
Special code	XXX: Customer special requiremen; Nil: Standard								

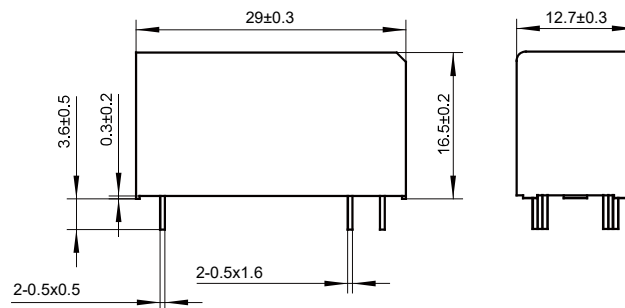
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT). (253) means Through-Hole Reflow Version(valid for Flux proofed only).

2) For products that should meet the explosion-proof requirements of "IEC 60079 series",please note [Ex] after the specification while placing orders.Not all products have explosion-proof certification,so please contact us if necessary, in order to select the suitable products.

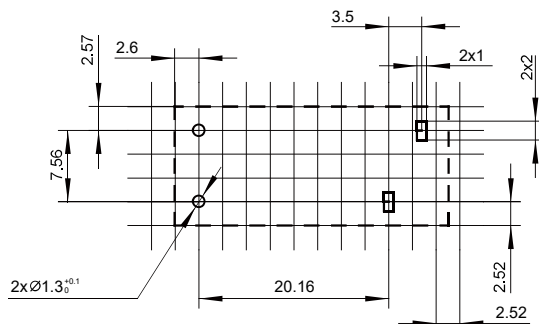
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout(Bottom view)



Wiring Diagram(Bottom view)

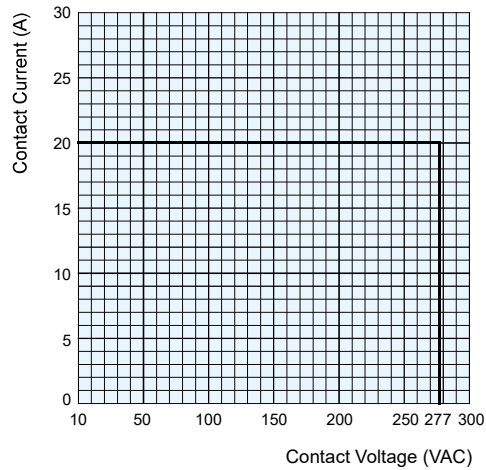


Notes:1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1mm, tolerance should be ±0.2mm; outline dimension > 1mm and ≤ 5mm, tolerance should be ±0.3mm; outline dimension > 5mm and ≤ 30mm, tolerance should be ±0.4mm; outline dimension > 30 mm, tolerance should be ±0.6mm.

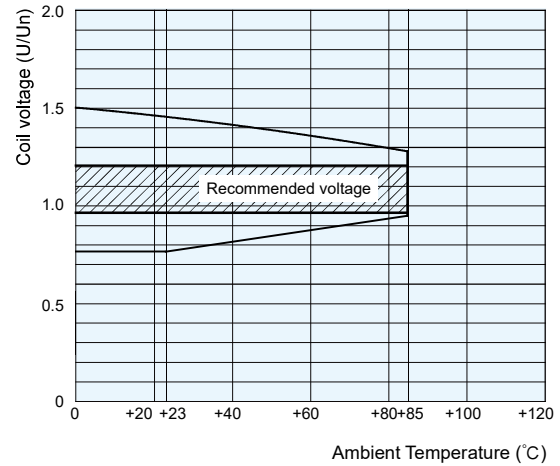
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAX.SWITCHING POWER



COIL OPERATING RANGE (DC)



Remark: When the relay is in use, if the excitation voltage exceeds the rated voltage, the relay electrical durability will be reduced.
Within the recommended voltage range, the effect on electrical durability is less.
The insulation of the relay coil may be damaged if it exceeds the upper limit specified by the curve in the diagram.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115F-S

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:116934



File No.:CQC17002168381



Features

- Special contact struction
- Incandescent lamp load: 3000W 230VAC
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 11mm
- Low height: 15.7 mm
- Meeting reinforce insulation
- Product in accordance to IEC 60335-1 available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	W+AgSnO ₂
Contact rating	Resistive: 16A 250VAC Incandescent Lamp: 3000W 230VAC Inrush current: 165A / 20ms LED(Electronic ballast): 492A/1.5ms
Max. switching voltage	440VAC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	1.2 x 10 ⁴ OPS (3000W 230VAC, Incand escentlamp load, Room temp., 1s on 11s off)

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1250VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Temperature rise (at rated. volt.)		55K max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes:1) This contact resistance value is tested under the nominal voltage.

2) * Index is not that of relay length direction.

3) The data shown above are initial values.

4) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 400mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18	360 x (1±10%)
18	12.6	1.8	27	810 x (1±10%)
24	16.8	2.4	36	1440 x (1±10%)
48 ³⁾	33.6	4.8	72	5760 x (1±15%)
60 ³⁾	42.0	6.0	90	7500 x (1±15%)
110 ³⁾	77.0	11.0	165	25200 x (1±15%)

Notes:1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

VDE	16A 250VAC at 85°C
UL/CUL	16A 250VAC at 85°C Incandescent lamp 3000W 230VAC TV-8 120VAC Incandescent lamp 1200W 120VAC at 50°C Incandescent lamp 1200W 277VAC at 50°C Standard ballast 2.2A 277VAC at 50°C Electronic ballast 16A 277/120VAC 85°C Electronic ballast 12A 277/120VAC 85°C Electronic ballast 8A 277/347VAC 85°C Electronic ballast 15A 120VAC 85°C ³⁾ Electronic ballast 8A 277/347VAC 85°C ³⁾

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

3) Zero crossing control cooperative.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

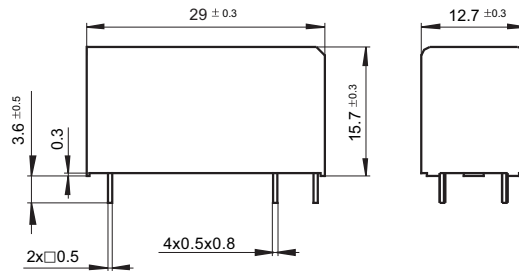
Type	HF115F-S /	12	-H	S	F	(XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60, 110VDC					
Contact arrangement	H: 1 Form A					
Construction ^{1) 2)}	S: Plastic sealed		Nil: Flux proofed			
Insulation Standard	F: Class F		Nil: Class B			
Special code ³⁾	XXX: Customer special requirement		Nil: Standard			

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
- 4) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.
- 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

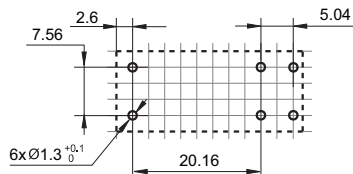
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



- Remark:** 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
- 2) The tolerance without indicating for PCB layout is always ± 0.1 mm.
- 3) The width of the gridding is 2.52mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115F-L 1 pole

MINIATURE HIGH POWER LATCHING RELAY

CULUS

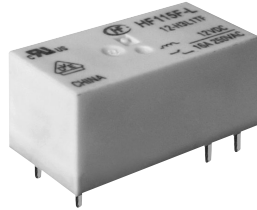
File No.:E134517



File No.:116934



File No.:CQC17002176310



Features

- Latching relay
- Low height: 15.7 mm
- 20A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 11mm-NO/10mm-CO version
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	16A 250VAC
Typ. applicable load	Incandescent lamp:1500W 277VAC Standard ballast:8A 277VAC Electronic ballast: 5A 120VAC
Max. switching voltage	480VAC / 300VDC
Max. switching current	20A
Max. switching power	4000VA
Mechanical endurance	2 x 10 ⁶ OPS
Electrical endurance	5 x 10 ⁴ OPS (NO: 16A 250VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Set time (at nomi. volt.)		10ms max.
Reset time (at nomi. volt.)		10ms max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	1 coil latching: Approx. 400mW 2 coils latching: Approx. 600mW
------------	---

COIL DATA

at 23°C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse Width (ms)		Reset Voltage VDC max.1)	Max. Voltage VDC	Coil Resistance Ω
		Typical	Min.			
5	3.5	≥50	30	3.5	6	62x (1±10%)
6	4.2	≥50	30	4.2	7.2	90x (1±10%)
9	6.3	≥50	30	6.3	10.8	202x (1±10%)
12	8.4	≥50	30	8.4	14.4	360x (1±10%)
24	16.8	≥50	30	16.8	28.8	1440x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse Width (ms)		Reset Voltage VDC max.1)	Max. Voltage VDC	Coil Resistance Ω
		Typical	Min.			
5	3.5	≥50	30	3.5	7.5	42x (1±10%)
6	4.2	≥50	30	4.2	9	55x (1±10%)
9	6.3	≥50	30	6.3	13.5	135x (1±10%)
12	8.4	≥50	30	8.4	18	240x (1±10%)
24	16.8	≥50	30	16.8	36	886x (1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A/20A 250VAC 85°C 1HP 240VAC 40°C TV-8 240VAC 40°C TV-12 120VAC 40°C (1 Form A) Tungsten 360W 125VAC 40°C (1 Form A) Tungsten 1920W 8A 240VAC 40°C Tungsten 12A 120VAC 40°C Standard ballast 16A 120VAC 40°C Standard ballast 8A 277VAC 40°C Standard ballast 5A 347VAC/480VAC 40°C Electronic ballast 5A 120VAC 40°C
	16A 250VAC at 85°C AC-15 240VAC at 85°C
VDE	

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

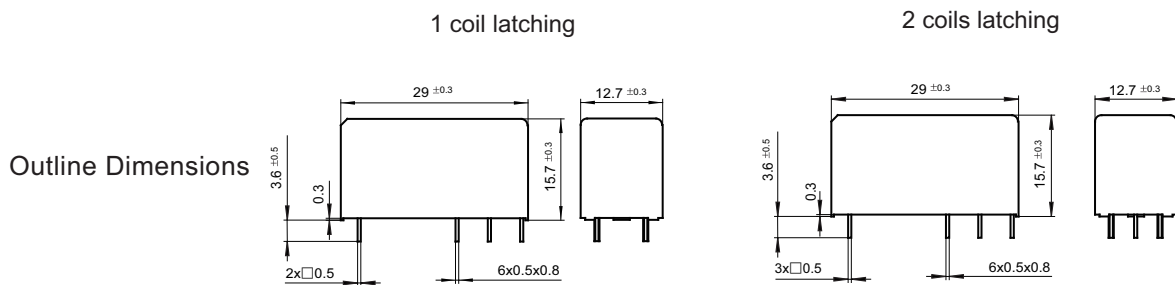
ORDERING INFORMATION

Type	HF115F-L / 12 -Z S 3 L1 T F (XXX)
Coil voltage	5, 6, 9, 12, 24VDC
Contact arrangement	H: 1 Form A Z: 1 Form C
Construction ^{1) 2)}	S: Plastic sealed Nil: Flux proofed
Version	3: 5.0mm 1 pole 16A
Sort	L1: 1 coil latching L2: 2 coils latching
Contact material	T: AgSnO ₂
Insulation standard	F: Class F
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
- 4) Two packing methods available: plastic tray package, tube package,Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.
- 5) For products that should meet the explosion-proof requirements of "IEC 60079 series",please note [Ex] after the specification while placing orders.Not all products have explosion-proof certification,so please contact us if necessary, in order to select the suitable products.

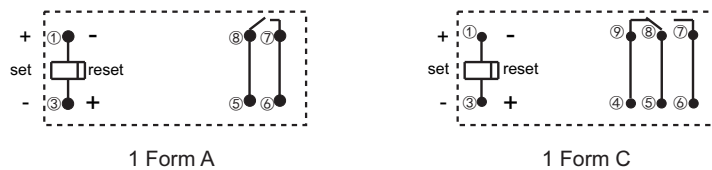
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



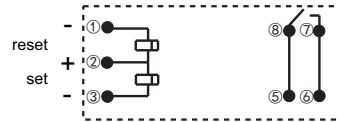
Wiring Diagram
(Bottom view)

1 coil latching(Reset Status)

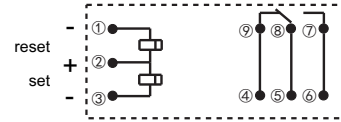


2 coils latching(Reset Status)

Wiring Diagram
(Bottom view)

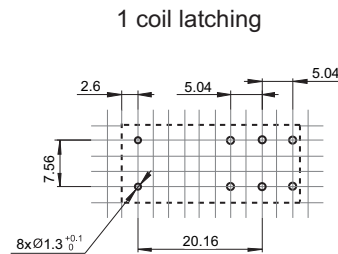


1 Form A

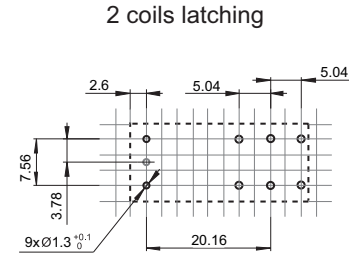


1 Form C

PCB Layout
(Bottom view)



1 coil latching



2 coils latching

- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
3) The width of the gridding is 2.52mm.

Notice

1. Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
2. In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

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HF115F-L 2 pole

MINIATURE HIGH POWER LATCHING RELAY



File No.:E134517



File No.:116934



File No.:CQC17002176310



Features

- Latching relay
- Low height: 15.7 mm
- 10A switching capability
- 5kV dielectric strength
(between coil and contacts)
- Creepage distance: 11mm-NO/10mm-CO version
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	2A, 2C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res. load)	8A 250VAC
Typ. applicable load	Lamp: Tungsten 3A 277VAC Standard ballast: 3A 277VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	10A
Max. switching power	2000VA
Mechanical endurance	2 x 10 ⁶ OPS
Electrical endurance	2H type: 5 x 10 ⁴ OPS (8A 250VAC, General use, at 85°C, 5s on 5s off) 2Z type: 1 x 10 ⁴ OPS (8A 250VAC, General use, at 85°C, 5s on 5s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Set time (at rated. volt.)		10ms max.
Reset time (at rated. volt.)		10ms max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	1 coil latching: Approx. 400mW 2 coils latching: Approx. 600mW
------------	---

COIL DATA

at 23°C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse Width (ms)		Reset Voltage VDC max.1)	Max. Voltage VDC	Coil Resistance Ω
		Typical	Min.			
5	3.5	≥50	30	3.5	6	62x (1±10%)
6	4.2	≥50	30	4.2	7.2	90x (1±10%)
9	6.3	≥50	30	6.3	10.8	202x (1±10%)
12	8.4	≥50	30	8.4	14.4	360x (1±10%)
24	16.8	≥50	30	16.8	28.8	1440x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse Width (ms)		Reset Voltage VDC max.1)	Max. Voltage VDC	Coil Resistance Ω
		Typical	Min.			
5	3.5	≥50	30	3.5	7.5	42x (1±10%)
6	4.2	≥50	30	4.2	9	55x (1±10%)
9	6.3	≥50	30	6.3	13.5	135x (1±10%)
12	8.4	≥50	30	8.4	18	240x (1±10%)
24	16.8	≥50	30	16.8	36	886x (1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A/8A 250/277VAC General use at 85°C 1/2 HP 240VAC at 40°C Standard ballast 3A 277VAC at 40°C Tungsten Lamp 3A 277VAC at 40°C
VDE	8A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF115F-L / 12 -2Z S 4 L1 T F (XXX)
Coil voltage	5, 6, 9, 12, 24VDC
Contact arrangement	2H: 2 Form A 2Z: 2 Form C
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed
Version	4: 5.0mm 2 pole 8A
Sort	L1: 1 coil latching L2: 2 coils latching
Contact material	T: AgSnO ₂
Insulation standard	F: Class F
Special code ³⁾	XXX: Customer special requirement Nil: Standard

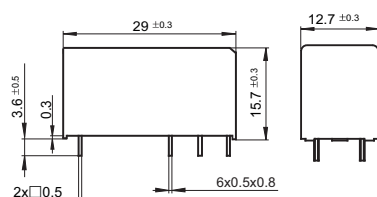
- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
- 4) Two packing methods available: plastic tray package, tube package,Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.
- 5) For products that should meet the explosion-proof requirements of "IEC 60079 series",please note [Ex] after the specification while placing orders.Not all products have explosion-proof certification,so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

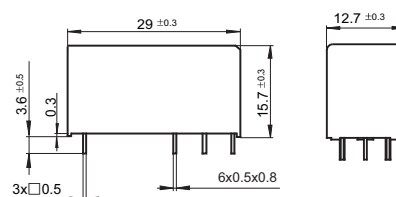
Unit: mm

Outline Dimensions

1 coil latching

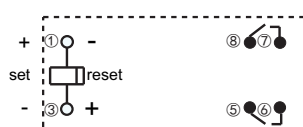


2 coils latching

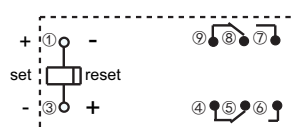


Wiring Diagram (Bottom view)

1 coil latching(Reset Status)



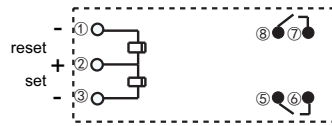
2 Form A



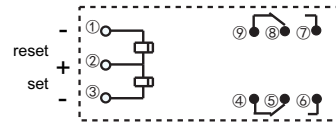
2 Form C

Wiring Diagram (Bottom view)

2 coils latching(Reset Status)



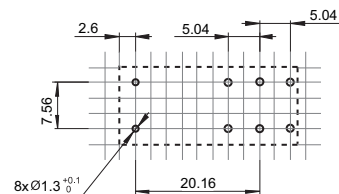
2 Form A



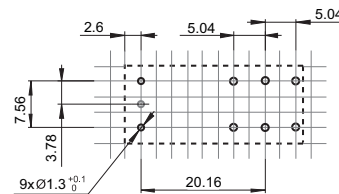
2 Form C

PCB Layout (Bottom view)

1 coil latching



2 coils latching



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.52mm.

Notice

1. Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
2. In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115F-LS

MINIATURE HIGH POWER LATCHING RELAY

c us

File No.:E134517

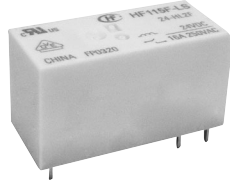


File No.:116934



File No.:CQC14002104529

CQC17002176310



Features

- Latching relay
- Special contact struction
- Incandescent lamp load: 3500W 277VAC
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 11mm
- Low height: 15.7 mm
- Meeting reinforce insulation
- Product in accordance to EN60669-1 available
- Product in accordance to IEC 60335-1 available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	W+AgSnO ₂
Contact rating	Resistive:16A 250VAC
	Incandescent Lamp: 3500W 277VAC
	Inrush current: 165A/ 20ms
	LED(Electronic ballast): 492A/1.5ms
Max. switching voltage	480VAC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	2 x 10 ⁶ OPS
Electrical endurance	1.2 x 10 ⁴ OPS (3500W 277VAC,
	Tungsten lamp, at 40°C, 1s on 59s off)
	6 x 10 ³ OPS(16A 250VAC,
	Resistive load, at 85°C, 5s on 5s off)

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1250VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Set time (at rated. volt.)		10ms max.
Reset time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		55K max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13.5g
Construction		Plastic sealed, Flux proofed

Notes:1) This contact resistance value is tested under the nominal voltage.

2) * Index is not that of relay length direction.

3) The data shown above are initial values.

4) UL insulation system: Class F.

COIL

Coil power	1 coil latching: Approx. 400mW
	2 coils latching: Approx. 600mW

COIL DATA

at 23°C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Pulse Width (ms)		Reset Voltage VDC max. 1)	Max. Voltage VDC	Coil Resistance Ω
		Typical	Min.			
5	3.5	≥50	30	3.5	6	62x (1±10%)
6	4.2	≥50	30	4.2	7.2	90x (1±10%)
9	6.3	≥50	30	6.3	10.8	202x (1±10%)
12	8.4	≥50	30	8.4	14.4	360x (1±10%)
24	16.8	≥50	30	16.8	28.8	1440x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Pulse Width (ms)		Reset Voltage VDC max. 1)	Max. Voltage VDC	Coil Resistance x (1±10%)Ω
		Typical	Min.			
5	3.5	≥50	30	3.5	7.5	42x (1±10%)
6	4.2	≥50	30	4.2	9	55x (1±10%)
9	6.3	≥50	30	6.3	13.5	135x (1±10%)
12	8.4	≥50	30	8.4	18	240x (1±10%)
24	16.8	≥50	30	16.8	36	886x (1±10%)

Notes:1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC General use at 85°C
	Standard ballast 2A 347/480VAC 60°C
VDE	Standard ballast 5A 277VAC at 40°C
	Electronic ballast 2A 347/480VAC 60°C
	Electronic ballast 16A 120VAC at 40°C
	Electronic ballast 16A 277VAC at 40°C
	3500W 277VAC Tungsten Lamp at 40°C
	TV-15 120VAC 40°C
	Tungsten 15A 120VAC 40°C
	16A 250VAC Resistive at 85°C
	EN60669:
	16A 250VAC COSØ =0.6
	16A 250VAC 140μF

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

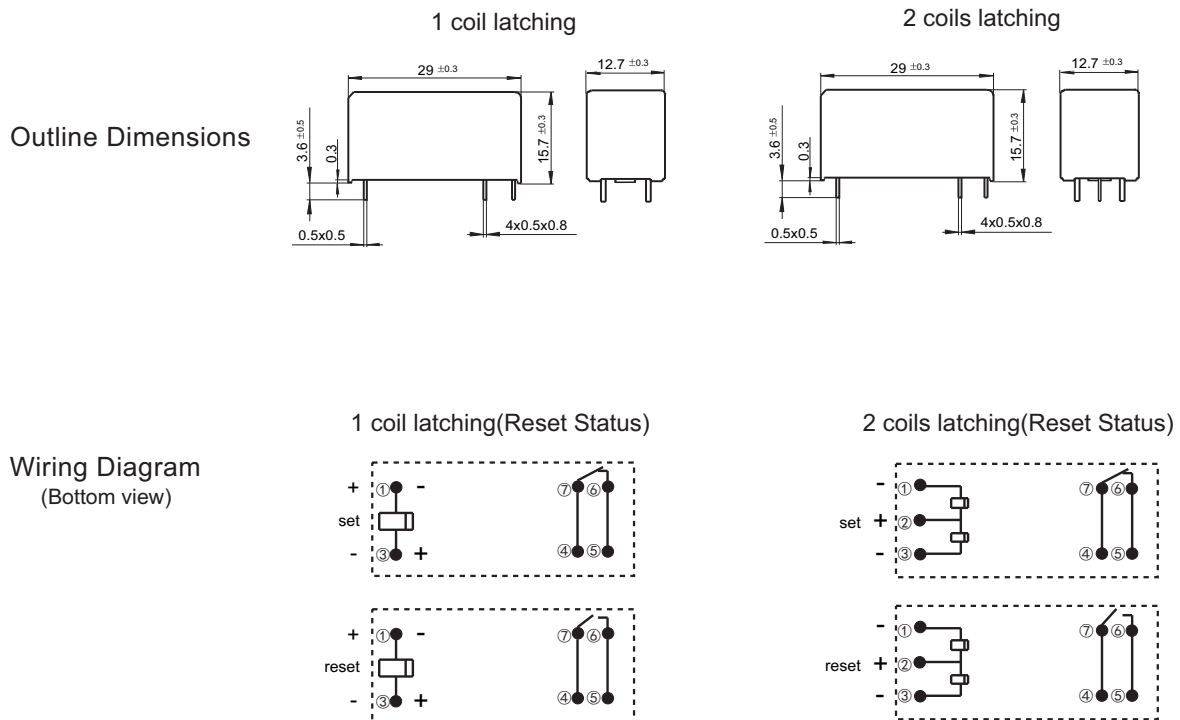
ORDERING INFORMATION

HF115F-LS /		12	-H	S	L1	F	(XXX)
Type							
Coil voltage	5, 6, 9, 12, 24VDC						
Contact arrangement	H: 1 Form A						
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed						
Sort	L1: 1 coil latching L2: 2 coils latching						
Insulation Standard	F: Class F						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT).
- 4) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.
- 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

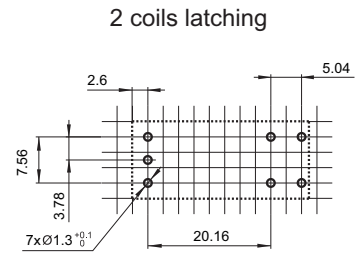
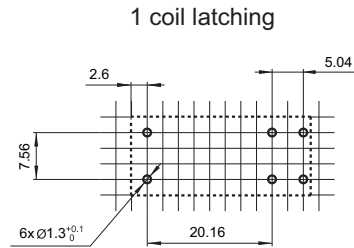
Unit: mm



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout
(Bottom view)



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
3) The width of the gridding is 2.52mm .

Notice

1. Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
2. In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115FP

MINIATURE POWER RELAY



File No.: E133481



File No.: 116934



Features

- 1 pole 16A, 2 pole 8A, 1 CO & 2 CO contacts
- 5kV dielectric, Creepage distance 8 mm (coil to contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- DC/AC coil type relay, Coil power 400mW / 0.75VA
- Manual test device
- Type with mechanical indicator / electrical indicator
- Sockets available

CONTACT DATA

Contact arrangement	1C	2C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	AgNi	
Contact rating (Res. load)	16A 250VAC	8A 250VAC
Max. switching voltage	440VAC	
Max. switching current	16A	8A
Max. switching power	4000VA	2000VA
Mechanical endurance	DC type: 5 x 10 ⁶ OPS AC type: 1 x 10 ⁶ OPS	
Electrical endurance	1Z3B type: 3x 10 ⁴ OPS (NO: 16A 250VAC, Resistive load, at 70°C, 1s on 9s off) 2Z4B type: 5 x 10 ⁴ OPS (NO: 8A 250VAC, Resistive load, at 70°C, 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Operate time (at rated. volt.)	DC type: 15ms max.	
Release time (at rated. volt.)	DC type: 8ms max.	
Temperature rise (at rated. volt.)	DC type: 60K max. AC type: 85K max.	
Shock resistance*	Function	98m/s ²
	Destructive	980m/s ²
Vibration resistance*	NO	10Hz to 150Hz 10g
	NC	length direction: 10Hz to 150Hz 2g other direction: 10Hz to 150Hz 5g
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 70°C	
Termination	PCB	
Unit weight	Approx. 16g	
Mounting distance	5mm, packing of sockets	

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.
3) UL insulation system: Class A



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL

Coil power	DC type: Approx. 400mW; AC type: Approx. 0.75VA
------------	--

Notes: The data shown above don't include the power of electronic indicating circuit when the relay picks-up.

COIL DATA

at 23°C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
12	8.4	1.2	18	360 x (1±10%)
24	16.8	2.4	36	1440 x (1±10%)
48 ³⁾	33.6	4.8	72	5760 x (1±15%)
110 ³⁾	77.0	11.0	165	25200 x (1±15%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

AC type(50Hz)

Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Coil Current mA	Coil DC Resistance Ω
24	18.0	3.6	31.6	350 x (1±10%)
115	86.3	17.25	6.6	8100 x (1±15%)
230	172.5	34.5	3.2	32500 x (1±15%)

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form C	16A 250VAC at 70°C
	2 Form C	8A 250VAC at 70°C
VDE	1 Form C	16A 250VAC at 70°C
	2 Form C	8A 250VAC at 70°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF115FP /	024	-1Z	3	B	(XXX)
Coil voltage	012 to 110: 12, 24, 48, 110 VDC A24 to A230: 24, 115, 230 VAC					
Contact arrangement	1Z: 1 Form C 2Z: 2 Form C					
Version	3: 5.0mm 1 pole 16A 4: 5.0mm 2 pole 8A					
Contact material	B: AgNi					
Special code ²⁾	XXX: Customer special requirement Nil: Standard					

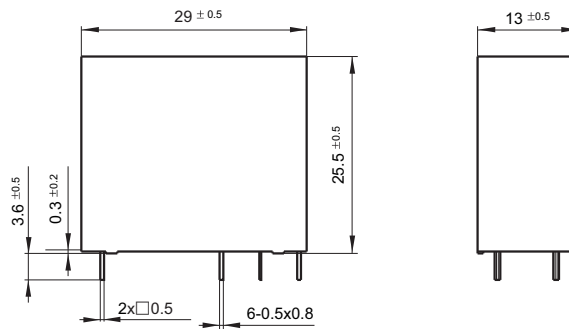
Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

2) The customer special requirement express as special code after evaluating by Hongfa.

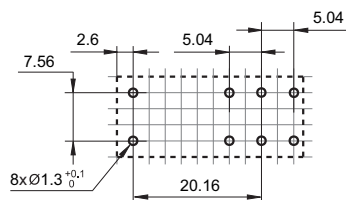
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

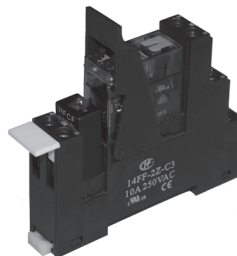
Outline Dimensions



PCB Layout (Bottom view)



DIN rail Socket



Solder Socket



Remark:1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

2) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.

3) The tolerance without indicating for PCB layout is always ± 0.1 mm.

4) The width of the gridding is 2.52mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

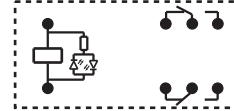
Unit: mm

Wiring Diagram (Bottom view)

HF115FP/ □□□-1Z3B



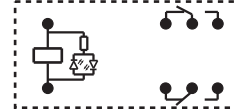
HF115FP/ □□□-2Z4B



HF115FP/A □□□-1Z3B



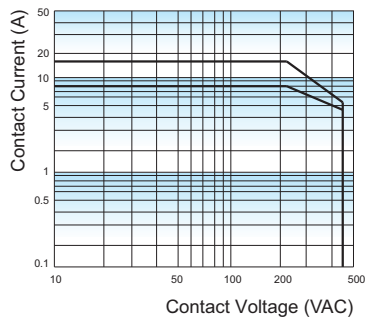
HF115FP/A □□□-2Z4B



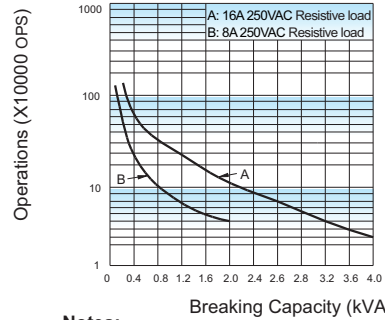
Remark: DC coil with a parallel diode is available but the coil terminal is different in positive or cathode.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



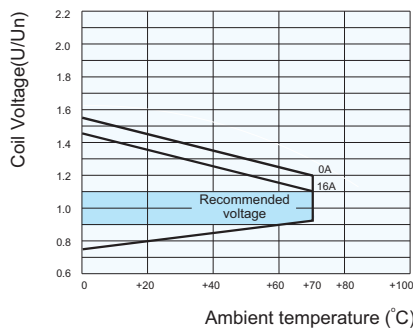
ENDURANCE CURVE



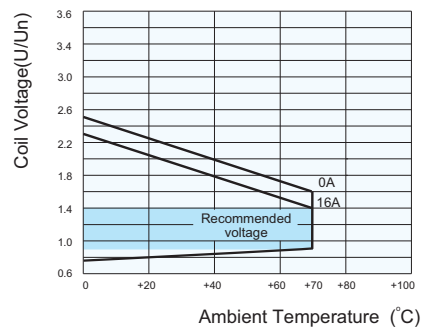
Notes:

- Curve A: 1Z3B type
Curve B: 2Z4B type
- Test conditions:
NO, Flux proofed, Room temp., 1s on 9s off

COIL OPERATING RANGE (AC) *



COIL OPERATING RANGE (DC) *



Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life. An energising voltage over the abver range may damage the insulation of relay coil.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115FK

MINIATURE HIGH POWER RELAY

c **RU** US

File No.:E134517



File No.:116934



File No.:CQC17002176308



Features

- Low height: 15.7 mm
- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting reinforce insulation
- Flux proofed type
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Through-Hole Reflow Version available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C	2A, 2C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂	
Contact rating (Res. load)	10A/12A/16A 250VAC	8A 250VAC
Max. switching voltage	400VAC	
Max. switching current	10A / 12A / 16A	10A
Max. switching power	2500VA/3000VA/4000VA	2000VA
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	H3(P/T) type: 1 x 10 ⁵ OPS (NO: 16A 277VAC, Resistive Load at 40°C, 1s on 9s off) Z1PT(875) type: 1 x 10 ⁵ OPS (NO:10A 250VAC, Resistive Load at 40°C, 1s on 9s off) Z3(P/T) type: 5 x 10 ⁴ OPS (NO: 16A 250VAC, Resistive Load at 85°C, 1s on 9s off) Z24(P/T) type: 5 x 10 ⁴ OPS (NO: 8A 250VAC, Resistive Load at 85°C, 1s on 9s off) Z33 type: 1 x 10 ⁵ OPS (NO: 16A 277VAC, Resistive Load at 40°C, 1s on 9s off) Z243 type: 5 x 10 ⁴ OPS (NO: 8A 277VAC, Resistive Load at 40°C, 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Surge voltage (between coil & contacts)	10kV (1.2 x 50μs)	
Operate time (at rated. volt.)	10ms max.	
Release time (at rated. volt.)	5ms max.	
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *	10Hz to 150Hz 10g/5g	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Termination	PCB	
Unit weight	Approx. 13g	
Construction	Flux proofed	

Notes: 1) The data shown above are initial values.

2) * Index is not in relay length direction.

COIL

Coil power	Approx. 400mW(Standard type)
	Approx. 530mW(high power consumption type)

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18	360 x (1±10%)
18	12.60	1.8	27	810 x (1±10%)
24	16.80	2.4	36	1440 x (1±10%)
48	33.60	4.8	72	5760 x (1±15%)

COIL DATA

at 23°C

high power consumption type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	47 x (1±10%)
6	4.20	0.6	9.0	68 x (1±10%)
9	6.30	0.9	13.5	153 x (1±10%)
12	8.40	1.2	18	271 x (1±10%)
18	12.60	1.8	27	611 x (1±10%)
24	16.80	2.4	36	1086 x (1±10%)
48	33.60	4.8	72	4347 x (1±15%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

Standard type

UL/CUL	AgSnO ₂	Z1T: 12A 250VAC at 85°C Z2T: 12A 250VAC at 85°C Z3T: 16A 250VAC at 85°C Z24T: 8A 250VAC at 85°C
	AgNi	Z13: 12A 250VAC at 40°C Z23: 12A 250VAC at 40°C Z33: 16A 250VAC at 40°C Z243: 8A 250VAC at 40°C
VDE	AgSnO ₂	Z1T: 12A 250VAC at 85°C Z2T: 12A 250VAC at 85°C Z3T: 16A 250VAC at 85°C Z24T: 8A 250VAC at 85°C
	AgNi	Z13: 12A 250VAC at 85°C Z23: 12A 250VAC at 85°C Z33: 16A 250VAC at 85°C Z243: 8A 250VAC at 85°C

SAFETY APPROVAL RATINGS

high power consumption type

UL/CUL	Z1PT: 12A 277VAC 85°C 16A 277VAC room temperature TV8 NO room temperature Z2PT: 12A 277VAC 85°C 6A 277VAC room temperature TV8 NO room temperature Z3PT: 16A 277VAC 85°C TV8 NO room temperature Z24PT: 8A 250VAC 85°C
VDE	Z1PT: 12A 277VAC 85°C Z2PT: 12A 277VAC 85°C Z3PT: 16A 277VAC 85°C Z24PT: 8A 250VAC 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF115FK /	12	-H	S	3	P	T (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48 VDC						
Contact arrangement	H: 1 Form A Z: 1 Form C 2H: 2 Form A 2Z: 2 Form C						
Construction	S: Plastic sealed ¹⁾ Nil: Flux proofed						
Version	1: 3.5mm 1 pole 2: 5.0mm 1 pole 3: 5.0mm 1 pole 4: 5.0mm 2 pole						
Coil type	P: high power consumption type Nil: Standard						
Contact material ^{2) 3)}	T: AgSnO ₂ 3: AgNi (Standard)						
Special code ⁴⁾	XXX: Customer special requirement Nil: Standard (875): 1 pole 10A(Only 1 version high power consumption type) (170): Meeting TV-8(Only 1 pole high power consumption type)						

Notes: 1) Only applicable to HF115FK 1 pole.

2) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

3) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

4) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT). (253) means Through-Hole Reflow Version(valid for Flux proofed only).

5) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.

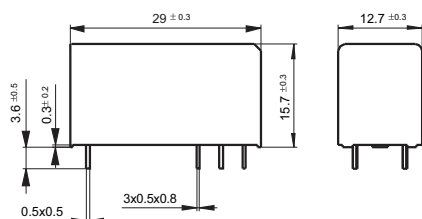
6) For the products that need to meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the model and specification when placing the order for the plastic type specification, and note [Exd] after the model and specification when placing the order for the non-plastic type specification. Our company will print the "Ex" or "Exd" logo on the product shell to distinguish them. Because not all products of the specification have explosion-proof certification, please contact us if necessary to determine the appropriate product.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

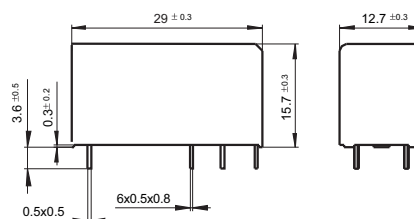
Unit: mm

Outline Dimensions

3.5mm Pinning (HF115FK/□□□-1-□)



5mm Pinning (HF115FK/□□□-□-2/3/4-□)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)

3.5/5mm Pinning, 1 Pole, 12A/16A, HF115FK/ □□□ -1/2-□



1 Form A

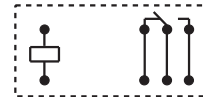


1 Form C

5mm Pinning, 1 Pole, 16A, HF115FK/ □□□ -3-□

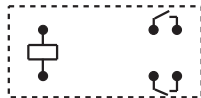


1 Form A



1 Form C

5mm Pinning, 2 Pole, 8A, HF115FK/ □□□ -2□ -4-□



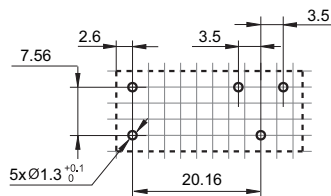
2 Form A



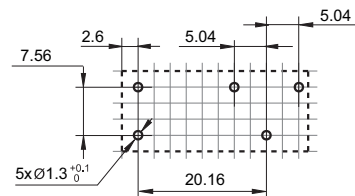
2 Form C

PCB Layout (Bottom view)

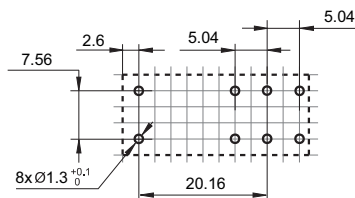
3.5mm 1Pole 12A/16A



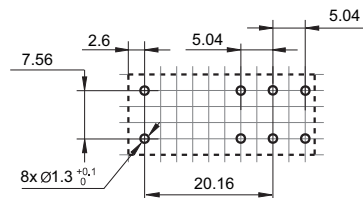
5mm 1Pole 12A



5mm 1Pole 16A



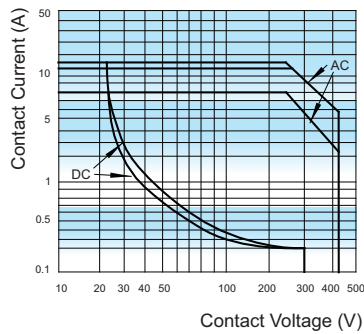
5mm 2Pole 8A



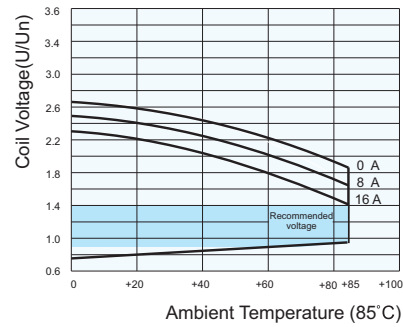
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.52mm .

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

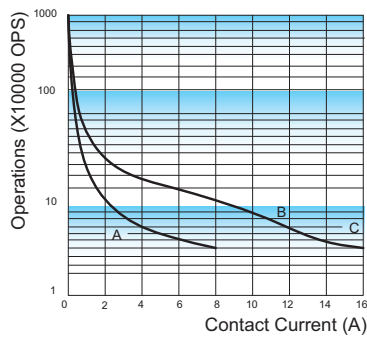


COIL OPERATING RANGE (DC) *



Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the above range may damage the insulation of relay coil.

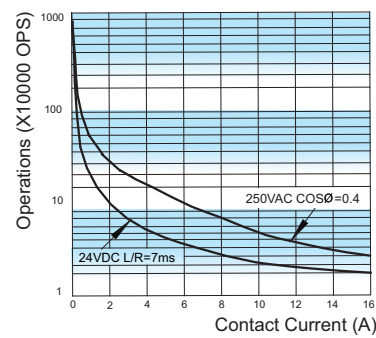
ENDURANCE CURVE



Notes:

- 1) Curve A: 2Z4T type
Curve B: Z2T type (or Z2T type)
Curve C: Z3T type
- 2) Test conditions:
NO, resistive load, 250VAC, flux proofed,
at 85°C, 1s on 9s off.

ENDURANCE CURVE



Notes:

- 1) Curve : H3T type
- 2) Test conditions:
NO, at 85°C, 1s on 9s off, flux proofed.

Disclaimer

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HF115FK-T

MINIATURE HIGH POWER RELAY



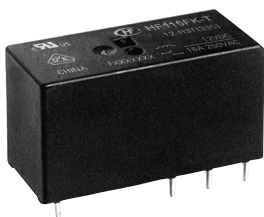
File No.:E134517



File No.:116934



File No.: CQC17002176308



Features

- High temperature: 105°C
- Low height: 15.7 mm
- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ ,AgNi
Contact rating (Res. load)	16A 250VAC
Max. switching voltage	400VAC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	H3T type: 3 x 10 ⁴ OPS (16A 250VAC, Resistive Load, at 105°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 x 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 13g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

2) * Index is not in relay length direction.

COIL

Coil power	Approx. 400mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18	360 x (1±10%)
18	12.60	1.8	27	810 x (1±10%)
24	16.80	2.4	36	1440 x (1±10%)
48	33.60	4.8	72	5760 x (1±15%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC at 105°C
VDE	16A 250VAC at 105°C 10A 250VAC at 105°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

ORDERING INFORMATION

HF115FK-T/		12	-H	3	T	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	H: 1 Form A Z: 1 Form C					
Version	3: 5.0mm 1 pole 16A					
Contact material ¹⁾	T: AgSnO ₂ 3: AgNi					
Special code ³⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

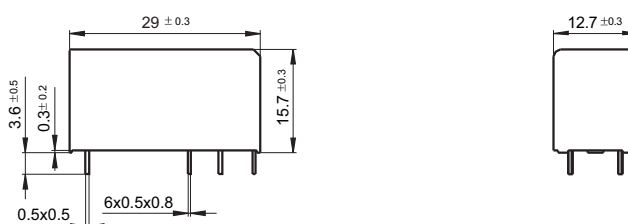
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

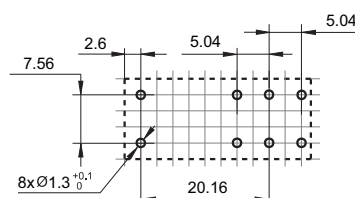
Outline Dimensions



Wiring Diagram (Bottom view)



PCB Layout (Bottom view)

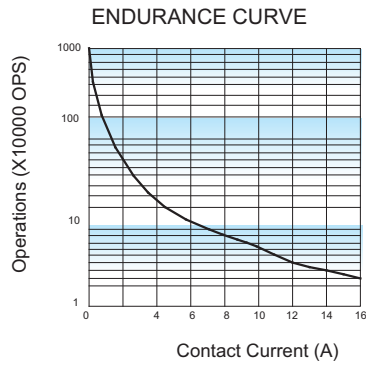


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.

2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

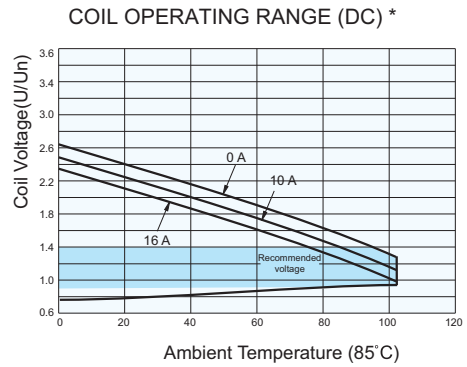


Notes:

Curve refers to H3T type, H33 type

Test conditions:

NO, resistive load, 250VAC, flux proofed,
at 105°C, 1s on 9s off



Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the abver range may damage the insulation of relay coil.

Disclaimer

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HF158F

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:40032833



File No.:CQC17002176312



Features

- 20A switching capability
- Low height: 15.7 mm
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm, meet reinforce insulation
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgNi, AgSnO ₂
Contact rating	16A 250VAC
Max. switching voltage	440VAC
Max. switching current	20A
Max. switching power	5000VA
Mechanical endurance	2 x 10 ⁷ OPS
Electrical endurance	H33 type: 1 x 10 ⁵ OPS (16A 277VAC, Resistive load, Room temp., 1s on 9s off) H3T type: 1 x 10 ⁵ OPS (16A 277VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		8ms max.
Temperature rise (at rated. volt.)		60K max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 11.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 400mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.50	0.5	9.0	62 x (1±10%)
6	4.20	0.6	10.8	90 x (1±10%)
9	6.30	0.9	16.2	202 x (1±10%)
12	8.40	1.2	21.6	360 x (1±10%)
18	12.6	1.8	32.4	810 x (1±10%)
24	16.8	2.4	43.2	1440 x (1±10%)
48 ³⁾	33.6	4.8	86.4	5760 x (1±15%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	16A 277VAC 16A 24VDC 10A 400VAC at 85°C 10A 250VAC at 105°C 20A 250VAC at 85°C
	AgSnO ₂	1HP 240VAC B300/R300 at 85°C TV-5 120VAC 16A 277VAC 16A 24VDC 10A 400VAC at 85°C 10A 250VAC at 105°C 20A 250VAC at 85°C
VDE	AgNi	13A 250VAC at 70°C 16A 250VAC at 85°C NO: 10A 250VAC at 25°C / at 105°C (Only for (217) type)
	AgSnO ₂	16A 250VAC at 85°C 8A 250VAC cosφ=0.4 at 85°C
UL/CUL (HF158F-T)	16A 277VAC at 105°C	
VDE (HF158F-T)	NO: 20A 250VAC at Room temp. / 105°C NO: 16A 250VAC at Room temp. / 105°C	

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

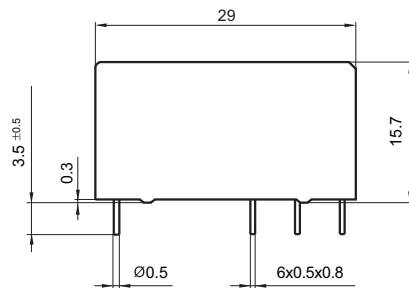
	HF158F /		12	-Z	S	3	3	(XXX)
Type	HF158F: Standard HF158F-T: High temperature							
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	H: 1 Form A		Z: 1 Form C					
Construction ^{1) 2)}	S: Plastic sealed		Nil: Flux proofed					
Version	3: 5.0mm							
Contact material	3: AgNi		T: AgSnO ₂					
Special code ³⁾	XXX: Customer special requirement		Nil: Standard					

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (217) stands for product with the electrical endurance of 3 x 10⁵ ops at 10A load.

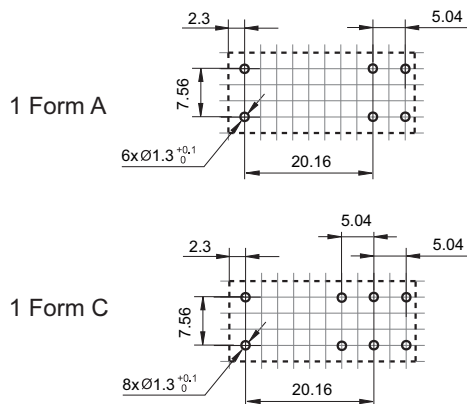
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

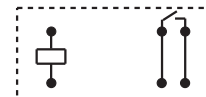


PCB Layout (Bottom view)



Wiring Diagram (Bottom view)

1 Form A



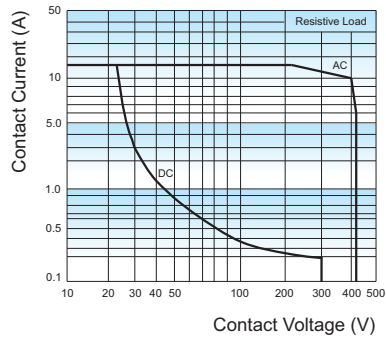
1 Form C



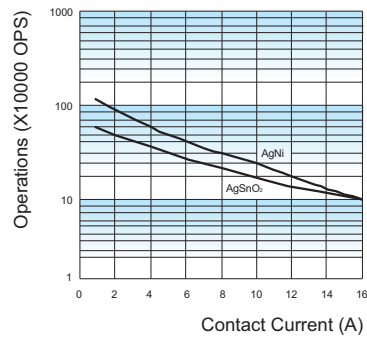
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

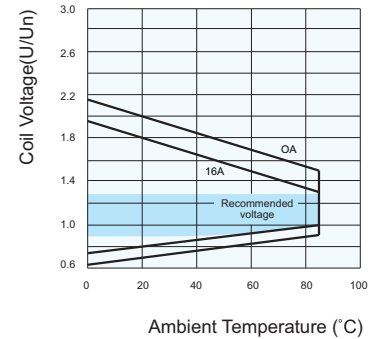
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (DC) *



Test conditions:

NO, 250VAC, Resistive load,
Flux proofed, Room temp., 1s on 9s off.

Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.

An energising voltage over the above range may damage the insulation of relay coil.

Disclaimer

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HF158F-V

MINIATURE HIGH POWER RELAY



File No.: 40032833



File No.: R50418587



File No.:E134517



File No.:CQC17002176312



Features

- 1A: 10A 300VDC high-voltage switching capability
- 2A: 10A 450VDC high-voltage switching capability
- 5kV dielectric strength(between coil and contacts)
- Creepage distance:10mm
- Meet Reinforce insulation
- Class F insulation system
- Environmental friendly product(RoHS)

RoHS compliant

CONTACT DATA

Contact arrangement	1A	2A
Contact resistance	100mΩ max.(at 1A 6VDC)	
Contact material	AgSnO ₂	
Contact rating	10A 300VDC	10A 450VDC
Max. switching voltage	420VDC	450VDC
Max. switching current	16A	12A
Max. switching power	3000W	4500W
Mechanical endurance	2 x 10 ⁶ OPS	2 x 10 ⁶ OPS
Electrical endurance	H2T type: 1 x 10 ⁴ OPS (10A 300VDC, Resistive load, at 85 °C, 1s on 9s off) H2T type: 1 x 10 ⁵ OPS (10A 220VDC, Resistive load, at 85 °C, 1s on 9s off) 2H2T type: 1 x 10 ⁵ OPS (10A 450VDC, Resistive load, at 85 °C, 1s on 9s off)	

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance *	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance *		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		1A:Approx. 15g 2A:Approx. 30g
Construction		Flux proofed

COIL

Coil power	Approx. 400mW
------------	---------------

COIL DATA

at 23°C

1H:1 Form A

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Coil Resistance Ω
5	5	3.75	0.5	62 x (1±10%)
6	6	4.50	0.6	90 x (1±10%)
9	9	6.75	0.9	200 x (1±10%)
12	12	9.00	1.2	360 x (1±10%)
18	18	13.50	1.8	810 x (1±10%)
24	24	18.00	2.4	1440 x (1±10%)

COIL DATA

at 23°C

2H:2 Form A(Coils in series, see the wiring diagrams Figure 1, 3)

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Coil Resistance Ω
5	10	7.50	1.0	124 x (1±10%)
6	12	9.00	1.2	180 x (1±10%)
9	18	13.50	1.8	400 x (1±10%)
12	24	18.00	2.4	720 x (1±10%)
18	36	27.00	3.6	1620 x (1±10%)
24	48	36.00	4.8	2880 x (1±10%)

COIL DATA

at 23°C

2H:2 Form A(Coils in parallel, see the wiring diagram Figure 2)

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Coil Resistance Ω
5	5	3.75	0.5	31 x (1±10%)
6	6	4.50	0.6	45 x (1±10%)
9	9	6.75	0.9	100 x (1±10%)
12	12	9.00	1.2	180 x (1±10%)
18	18	13.50	1.8	405 x (1±10%)
24	24	18.00	2.4	720 x (1±10%)

Notes: 1) The data shown above are initial values.

2) * Index is not that of relay length direction.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS(1A)

UL/CUL	4A 420VDC 85°C
	10A 300VDC 85°C
	16A 180VDC 85°C
	10A 220VDC 85°C
	2A 420VDC 85°C
	12A 277VAC 85°C
	13A 180VAC 85°C
	14.5A 160VAC 85°C
VDE	4A 420VDC 85°C
	10A 300VDC 85°C
	16A 180VDC 85°C
	12A 277VAC 85°C
	13A 180VAC 85°C
TÜV	10A 220VDC 85°C
	2A 420VDC 85°C

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.

SAFETY APPROVAL RATINGS(2A)

UL/CUL/TÜV	2NO in series	
	10A 450VDC 85°C	12A 336VDC 85°C
	13A 277VDC 85°C	14A 240VDC 85°C
	16A 220VDC 85°C	16A 240VDC 85°C
	13A 277VDC 85°C	

ORDERING INFORMATION

Type	HF158F-V / 12 -H S 2 T (XXX)
Coil voltage	5, 6, 9, 12, 18, 24VDC
Contact arrangement	H: 1 Form A 2H: 2 Form A
Construction	S: Plastic sealed Nil: Flux proofed
Version	2: 5.0mm 1 pole
Contact material	T: AgSnO ₂
Special code ³⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.);

2) Storage, transportation and installation can not have a strong magnetic field around;

3) The customer special requirement express as special code after evaluating by Hongfa;

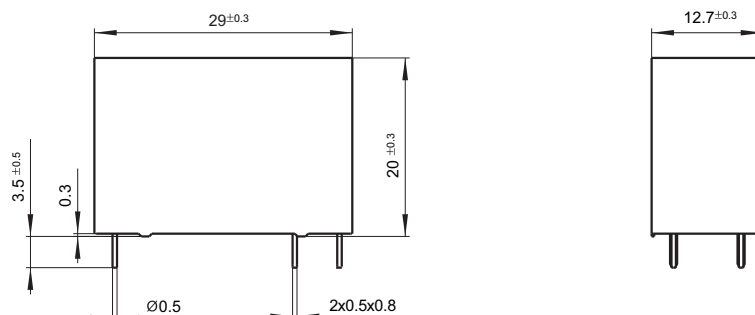
4) Product contains magnet, so there will be mutual exclusion or attraction between products. During the installation, please consider the installation mounting distance.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

1 Form A

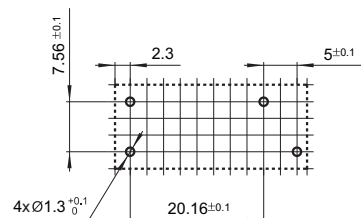


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

1 Form A

PCB Layout
(Bottom view)

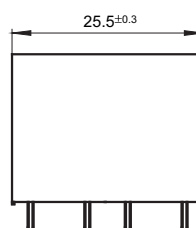
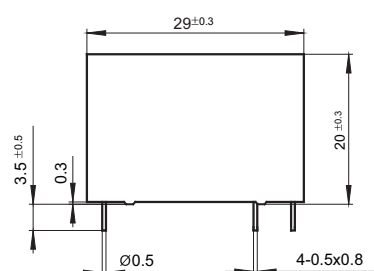


Wiring Diagram
(Bottom view)

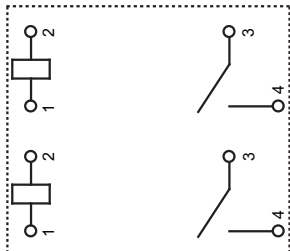


2 Form A

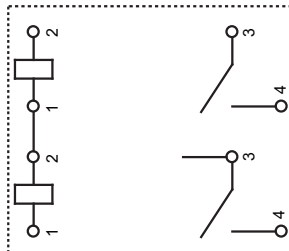
Outline Dimensions



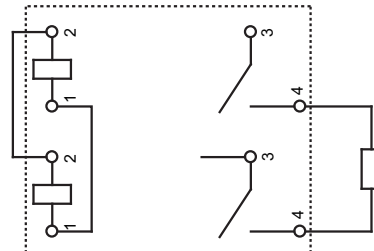
PCB Layout
(Bottom view)



Single coil

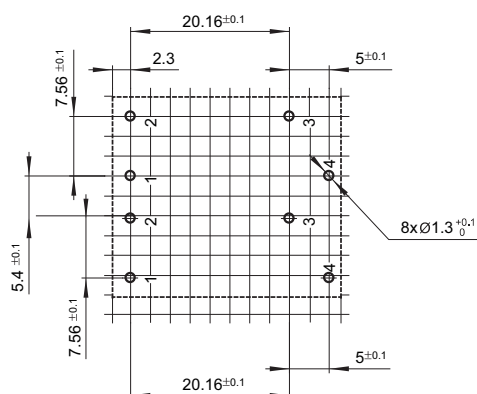


Coils in series



Coils in parallel

Wiring Diagram
(Bottom view)

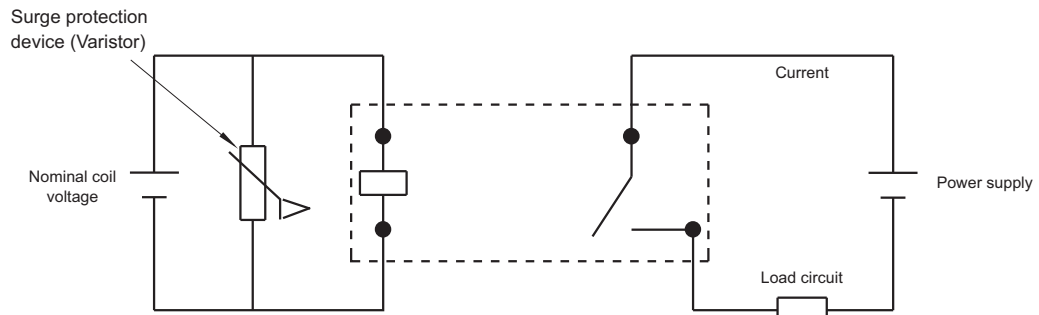


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CIRCUIT(Bottom view)

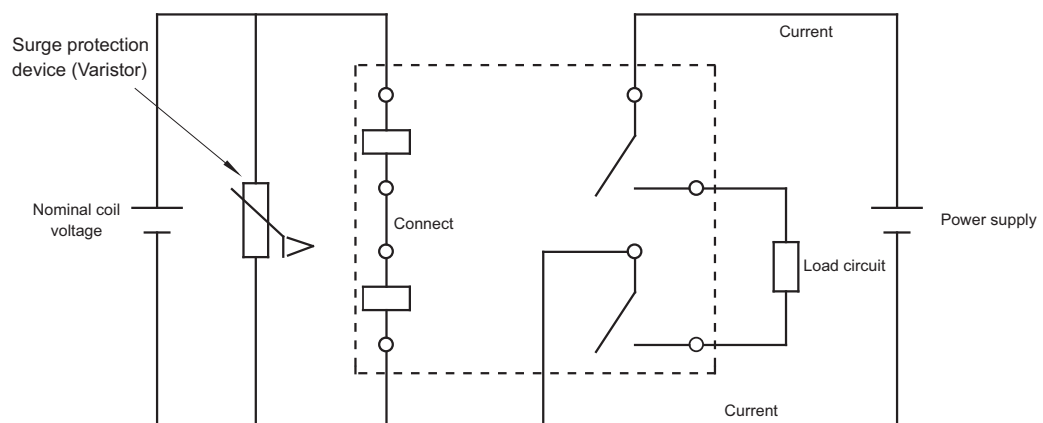
1 Form A

Load circuit and input circuit

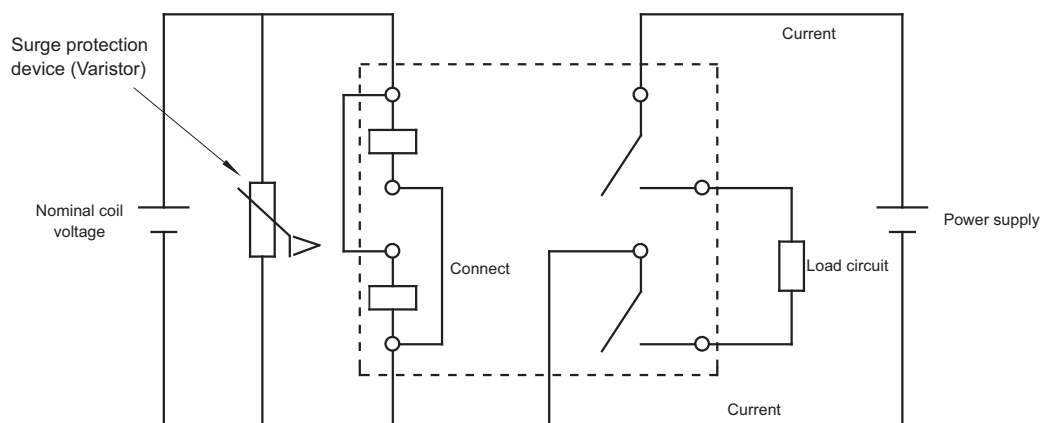


2 Form A

Wiring diagram of coils in series(Figure 1)



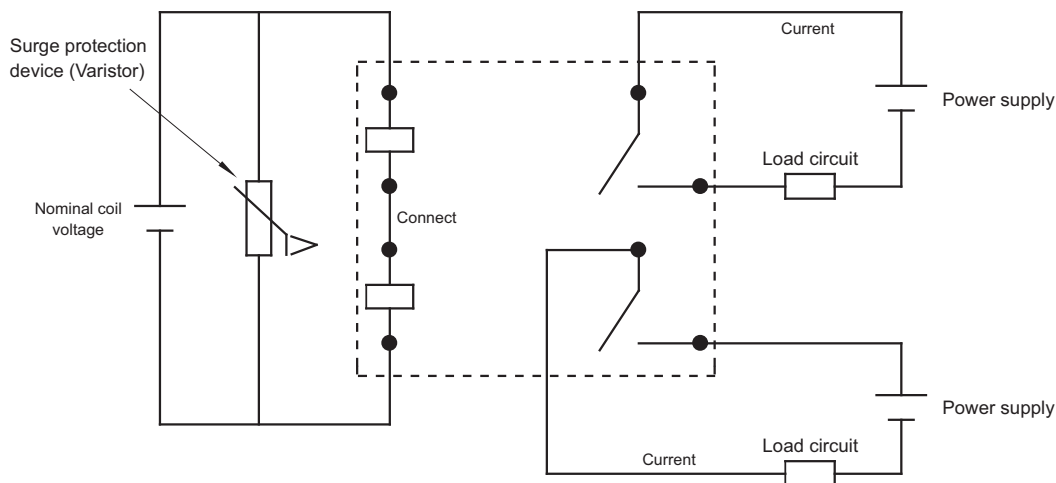
Wiring diagram of Coils in parallel(Figure 2)



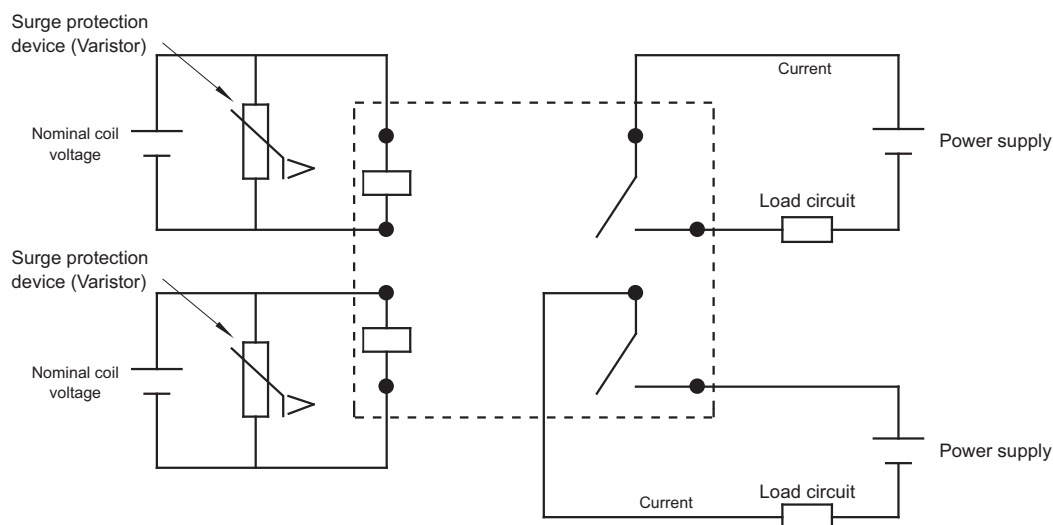
CIRCUIT(Bottom view)

2 Form A

Wiring diagram of coils in series(Figure 3)



Wiring diagram of Single coil(Figure 4)



Notes:

- 1) The output contact terminals and the input coil terminal are no polarity to distinguish.
- 2) Varistor surge protection device should be connect parallel to coils. Suitable voltage of varistor is 3 times the coil voltage.
- 3) Avoid using relay under the strong magnetic field, which will decrease the blast function and magnetic, thus cause the arc can not be interrupted and relay damaged.
- 4) To avoid using relays under strong magnetic field because it will change the parameters of relay such as pull-in and drop-out voltage.
- 5) There is magnetic element inside, the magnetism would make the relays stick to each other, in order to avoid the sticking that may lead to deformation or parameter change inside the relay, gap is needed between the relay units.
- 6) There is magnetic element inside, the magnetism would make the relays repel each other. When more than one relay need in board layout, there should be gap between each units, in order to avoid the repel and soldering issue.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF115FK-A

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 116934



File No.: CQC17002176308



Features

- AC coil specification
- 16A switching capability
- Low height: 15.7 mm
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting reinforce insulation
- IEC60335-1 compliant products are available
- Sockets available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A,1C	2A,2C
Contact resistance ¹⁾	100mΩ max. (1A 6VDC)	
Contact material	AgSnO ₂	
Contact rating(Res. load)	12A/16A 250VAC	8A 250VAC
Max.switching voltage	440VAC/300VDC	
Max.switching current	12A/16A	8A
Max.switching power	3000VA/4000VA	2000VA
Mechanical endurance	1×10 ⁶ OPS	
Electrical endurance ²⁾	H3T type: 7.5 ×10 ⁴ OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off)	
	2H4T type: 5×10 ⁴ OPS (8A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values;

2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

COIL

Coil power	Approx.0.75VA to 0.9VA
------------	------------------------

COIL DATA(at 50Hz)

at 23°C

Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Coil current mA	Coil Resistance Ω
24	18.00	3.60	31.6	350×(1±10%)
115	86.30	17.30	6.6	8100×(1±15%)
230	172.50	34.50	3.2	32500×(1±15%)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000 MΩ(500 VDC)
Dielectric strength	Between open contacts	1000VAC 1 min
	Between coil & contacts	5000VAC 1 min
	Between contacts sets	2500VAC 1 min
Coil temperature rise(at rated. volt.)		85K max.
Shock resistance ²⁾	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance ²⁾		10Hz to 55Hz 10g/5g
Humidity		5% to 85%RH
Ambient temperature		-40°C to 70°C
Termination		PCB
Unit weight		Approx. 13g
Construction		Flux proofed, Plastic sealed

Notes: 1) The data shown above are initial values;

2) Non length direction index.

SAFETY APPROVAL RATINGS

UL/CUL	NO	12A 277VAC 40°C 16A 277VAC 40°C 8A 277VAC 40°C
	NC	12A 277VAC 40°C 16A 277VAC 40°C
VDE	NO	12A 250VAC 70°C 16A 250VAC 70°C 8A 250VAC 70°C

Notes:1) All values unspecified are at room temperature.

2) The typical loads listed above are only part of the product certification. The detailed test conditions of each load are different, so the electrical durability is different. For more information, please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF115FK-A/	24	-H	S	1	T	F	(XXX)
Coil voltage	24,115,230VAC							
Contact arrangement	H: 1 Form A Z: 1 Form C 2H: 2 Form A 2Z: 2 Form C							
Construction ¹⁾²⁾	S: Plastic sealed Nil: Flux proofed							
Structure	1: 3.5mm 1 pole 12A 2: 5.0mm 1 pole 12A 3: 5.0mm 1 pole 16A 4: 5.0mm 2 pole 8A							
Contact material	T: AgSnO ₂							
Insulation standard	F: Class F							
Special code ³⁾	XXX: Customer special requirement Nil: Standard							

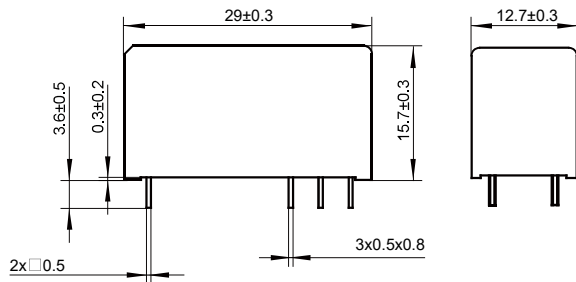
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.);
 We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
 2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB;
 3) The customer special requirement express as special code after evaluating by Hongfa;
 4) The product has two packaging options: suction tray packaging and tube packaging. Among them, the standard size of tube packaging is 616 mm. If you need special customization, please contact us.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

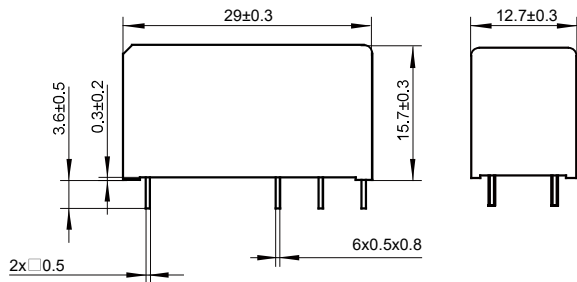
Unit: mm

Outline Dimensions

3.5mm Pinning(HF115FK-A/XXX-XX-X-1-XX)



5mm Pinning(HF115FK-A/XXX-XX-X-2/3/4-XX)



Wiring Diagram(Bottom view)

HF115FK-A/XXX-X-X-1/2-XX,3.5/5mm,1 pole 12 A



1 Form A

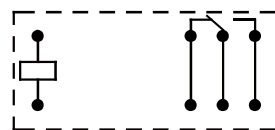


1 Form C

HF115FK-A/XXX-X-X-3-XX,5mm,1 pole 16 A



1 Form A



1 Form C

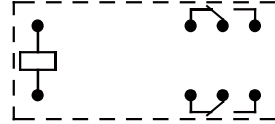
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

HF115FK-A/XXX-2X-X-4-XX,5mm,2 pole 8 A



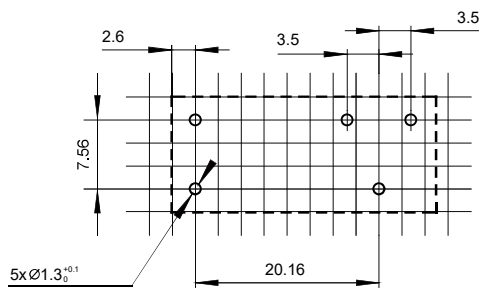
2 Form A



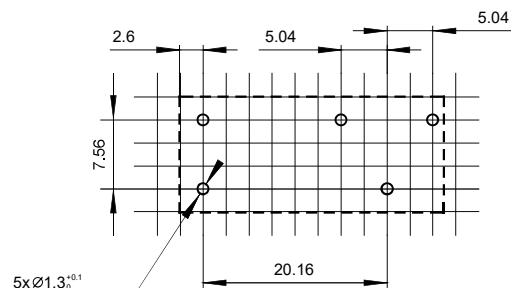
2 Form C

PCB Layout(Bottom view)

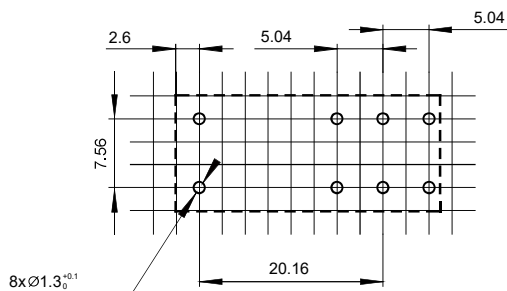
3.5mm 1 pole 12A



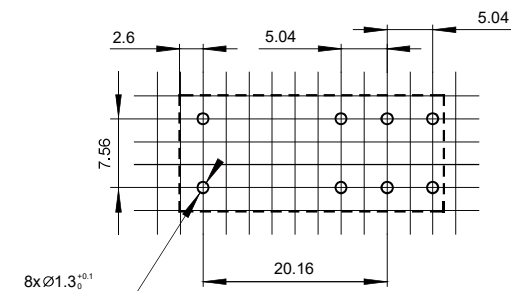
5mm 1 pole 12A



5mm 1 pole 16A



5mm 2 pole 8A



- Notes: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$;
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$;
- 4) The width of the gridding is 2.52mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF175F

MINIATURE HIGH POWER RELAY

c RU US

File No.: E133481



File No.: R50412801



File No.: CQC18002196447
CQC18002202622



Features

- 2 From A and 2 From C configurations
- Low height, only 15.7mm
- 5kV dielectric strength (between coil and contacts)
- Creepage/clearance distance > 10mm, Meets reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	2A,2C
Contact resistance	100mΩ max.(1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res.load)	16A 277VAC
Max. switching voltage	277VAC
Max. switching current	16A
Max. switching power	4432VA
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	5 x 10 ⁴ OPS (2NO:16A 277VAC, General load 85°C, 1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contacts sets	2500VAC 1min
Surge voltage (Between coil &contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional*	98m/s ²
	Destructive	980m/s ²
Vibration resistance	NO	10Hz to 55 Hz 1.5mm DA
	NC*	10Hz to 55 Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx.16.5g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2)*means Non length index

COIL

Coil power	Approx. 800mW
Holding voltage	45% to 110%U _N (at 23°C) 55% to 100%U _N (at 85°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max.* Voltage VDC	Coil Resistance Ω
5	3.50	0.5	7.5	31.3 x (1±10%)
6	4.20	0.6	9.0	45 x (1±10%)
9	6.30	0.9	13.5	101.3 x (1±10%)
12	8.40	1.2	18	180 x (1±10%)
24	16.80	2.4	36	720 x (1±10%)
48	33.60	4.8	72	2880 x (1±15%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	2H	16A 277VAC General use 85°C TV-8 120VAC 50°C 1HP 240VAC 40°C Electronic ballast 5A 120VAC 50°C
	2Z	16A 277VAC General use 85°C NO: TV-8 120VAC 50°C NO: 1HP 240VAC 40°C NO: Electronic ballast 5A 120VAC 50°C

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.01

ORDERING INFORMATION

	HF175F /	12	-2H	T	F	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	2H: 2 Form A		2Z: 2 Form C			
Contact material	T: AgSnO ₂					
Insulation standard	F: Class F					
Special code ³⁾	XXX: Customer special requirement			Nil: Standard		

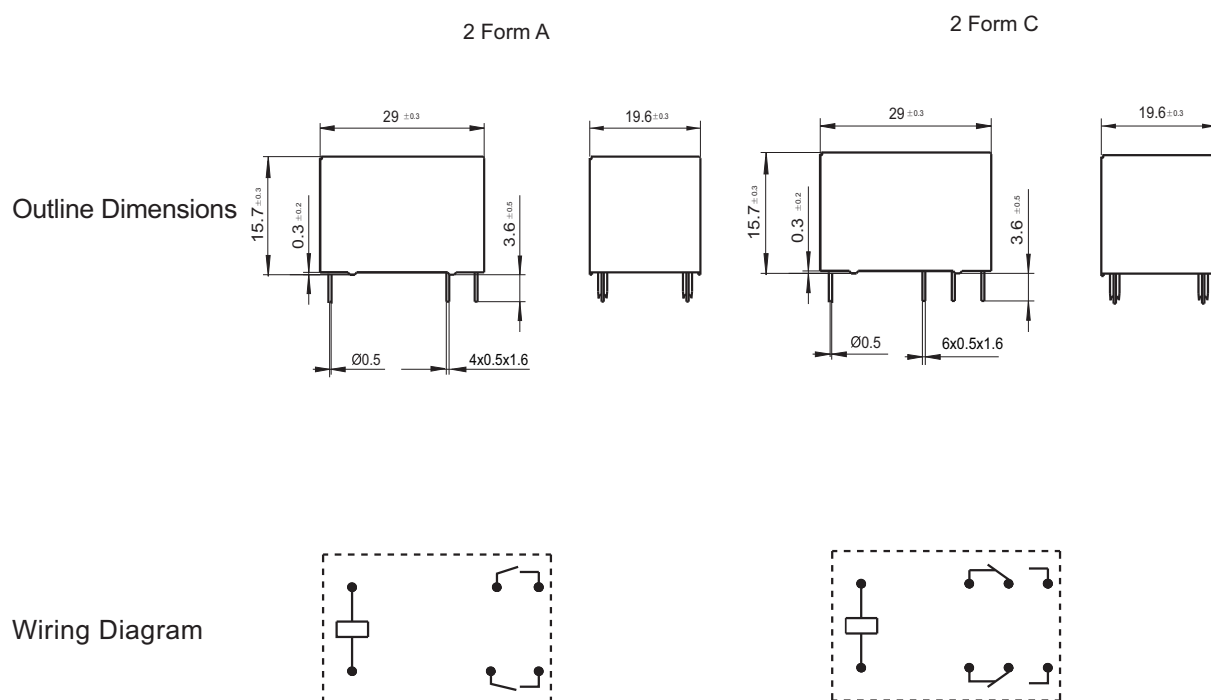
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.)

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT).

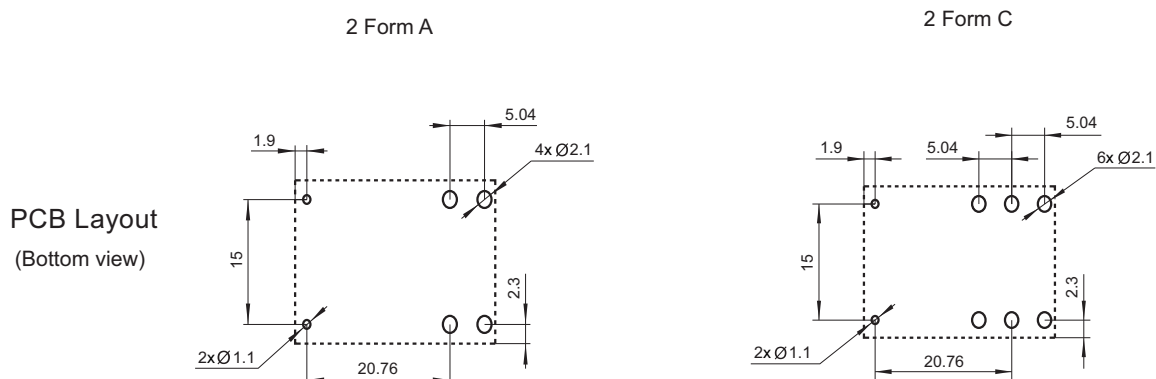
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $\leq 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF14FF

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:R50140759



File No.:CQC10002046169



Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)
Contact material	AgSnO ₂ , AgNi
Contact rating	Resistive: 10A 277VAC/30VDC TV-5 120VAC
Max. switching voltage	277VAC / 30VDC
Max. switching current	10A
Max. switching power	2770VA / 300W
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	1 x 10 ⁵ OPS (10A 277VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10 ⁵ OPS (10A 30VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Humidity		5% to 85% RH
Ambient temperature		-40°C to 70°C
Termination		PCB
Unit weight		Approx. 18g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL

Coil power	Approx. 530mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ²⁾	Drop-out Voltage VDC min. ²⁾	Max. Voltage VDC ³⁾	Coil Resistance Ω
3	2.25	0.3	4.2	17 x (1±10%)
5	3.75	0.5	7.0	47 x (1±10%)
6	4.50	0.6	8.4	68 x (1±10%)
9	6.75	0.9	12.6	160 x (1±10%)
12	9.00	1.2	16.8	275 x (1±10%)
18	13.5	1.8	25.2	620 x (1±10%)
24	18.0	2.4	33.6	1100 x (1±10%)
48	36.0	4.8	67.2	4170 x (1±10%)
60	45.0	6.0	84.0	7000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 75% of nominal voltage, special order allowed.

2) The data shown above are initial values.

3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

4) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂ AgNi	10A 277VAC General purpose 10A 30VDC Resistive 1/3HP 250VAC 1/4HP 125VAC TV-5 120VAC
TÜV	AgSnO ₂	10A 250VAC 10A 30VDC
CQC	AgSnO ₂ AgNi	10A 250VAC 10A 30VDC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

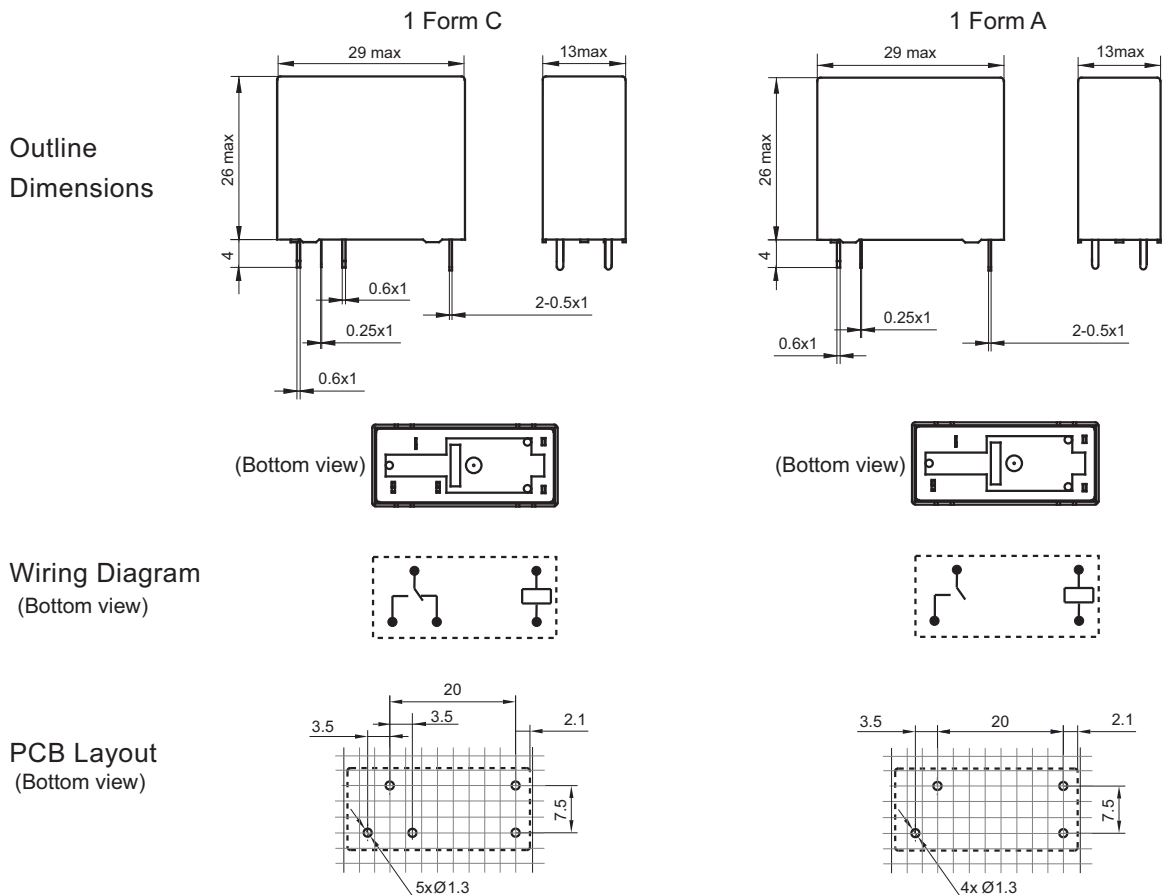
ORDERING INFORMATION

Type	HF14FF / 012 -1H S T F (XXX)					
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48, 60VDC					
Contact arrangement	1H: 1 Form A		1Z: 1 Form C			
Construction ¹⁾	S: Plastic sealed(No smoky-gray cover) Nil: Flux proofed					
Contact material	T: AgSnO ₂		3: AgNi			
Insulation standard	F: Class F		Nil: Class B			
Special code ⁴⁾	XXX: Customer special requirement		Nil: Standard			

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) The standard type is made of black cover. If smoke cover is required, please add a special suffix (611) when ordering. Please take note that smoke cover is only available for flux proofed type.
- 4) The customer special requirement express as special code after evaluating by Hongfa.
- 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

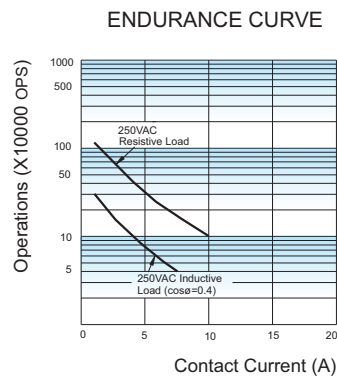
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

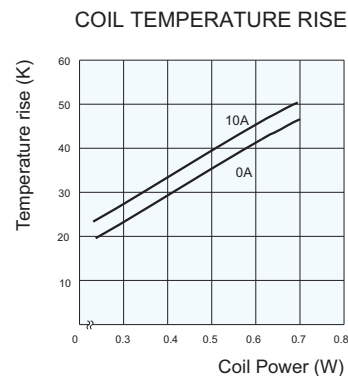


- Remark:** 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 2) The tolerance without indicating for PCB layout and pin size is always $\pm 0.1\text{mm}$.
- 3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES



Test conditions:
NO, Resistive load,
Flux proofed, Room temp., 1s on 9s off.



Disclaimer
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HF14FW

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:40023508



File No.:CQC10002046170



Features

- 20A switching capability
- 4kV dielectric strength (between coil and contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- 1 Form A and 1 Form C configurations
- Sockets available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact resistance ²⁾	50mΩ max.(at 1A 24VDC)
Contact material	AgSnO ₂
Contact rating	Resistive: 16A 277VAC/24VDC 1HP 240VAC TV-8 125VAC (NO contact)
Max. switching voltage	277VAC / 30VDC
Max. switching current	20A
Max. switching power	5540VA / 480W
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance	1 x 10 ⁵ OPS (NO or NC, 16A 277VAC, Resistive load, Room temp., 1s on 9s off) 5 x 10 ⁴ OPS (NO or NC, 16A 24VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 18.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

COIL

Coil power	Standard: Approx.720mW Sensitive: Approx.530mW
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COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ³⁾	Drop-out Voltage VDC min. ³⁾	Max. Voltage VDC* ⁴⁾	Coil Resistance Ω
5	3.6	0.5	5.5	36 x (1±10%)
6	4.3	0.6	6.6	50 x (1±10%)
9	6.5	0.9	9.9	115 x (1±10%)
12	8.6	1.2	13.2	200 x (1±10%)
18	13.0	1.8	19.8	460 x (1±10%)
24	17.3	2.4	26.4	820 x (1±10%)
48	34.6	4.8	52.8	3300 x (1±10%)
60	43.2	6.0	66.0	5100 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. ³⁾	Drop-out Voltage VDC min. ³⁾	Max. Voltage VDC* ⁴⁾	Coil Resistance Ω
5	3.60	0.5	7.0	47 x (1±10%)
6	4.30	0.6	8.4	68 x (1±10%)
9	6.50	0.9	12.6	160 x (1±10%)
12	8.60	1.2	16.8	275 x (1±10%)
18	13.0	1.8	25.2	620 x (1±10%)
24	17.3	2.4	33.6	1100 x (1±10%)
48	34.6	4.8	67.2	4170 x (1±10%)
60	43.2	6.0	84.0	7000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 72% of nominal voltage, special order allowed.

2) Suggesting to use the sensitive type.

3) The data shown above are initial values.

4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

5) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

SAFETY APPROVAL RATINGS

UL/CUL	Standard, Sensitive	AgSnO ₂	20A/16A/12A 277VAC Resistive 1HP (8 FLA) 240VAC TV-8 125VAC 16A 240VAC General Use 20A/16A/12A 24VDC 10FLA 60LRA 250VAC
	(136)	AgSnO ₂	20A 125VAC Resistive 20A 277VAC/250VAC/125VAC General Use 16A 277VAC/250VAC/125VAC Resistive 20A 30VDC Resistive 1/2HP 250VAC/125VAC TV-10 125VAC 10FLA 60LRA 250VAC
VDE (Coil power is 530mW)	AgSnO ₂	1 Form A	20A 250VAC at 70°C 16A 30VDC at 70°C
		1 Form C	16A 250VAC at 70°C 16A 30VDC at 70°C NO:20A 250VAC at 70°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF14FW /		012	-H	S	P	T	F	(XXX)
Type									
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC								
Contact arrangement	H: 1Form A		Z: 1 Form C						
Construction ¹⁾	S: Plastic sealed(No smoky-gray or transparent cover)		Nil: Flux proofed						
Coil power	P: Standard		Nil: Sensitive						
Contact material	T: AgSnO ₂								
Insulation standard	F: Class F		Nil: Class B						
Special code ⁴⁾	XXX: Customer special requirement		Nil: Standard						

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

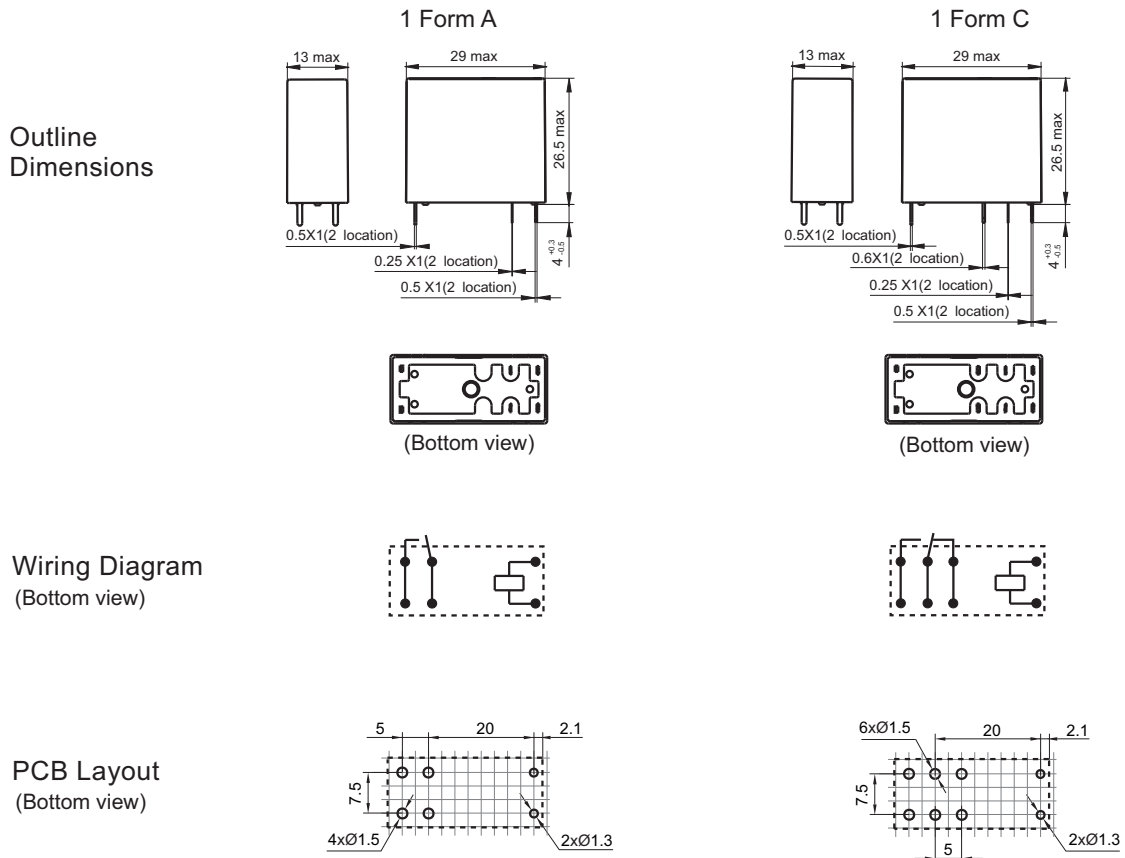
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The standard type is made of black cover. If smoky-gray or transparent cover is required, please add a special suffix (611) when ordering. Please take note that smoky-gray or transparent cover is only available for flux proofed.

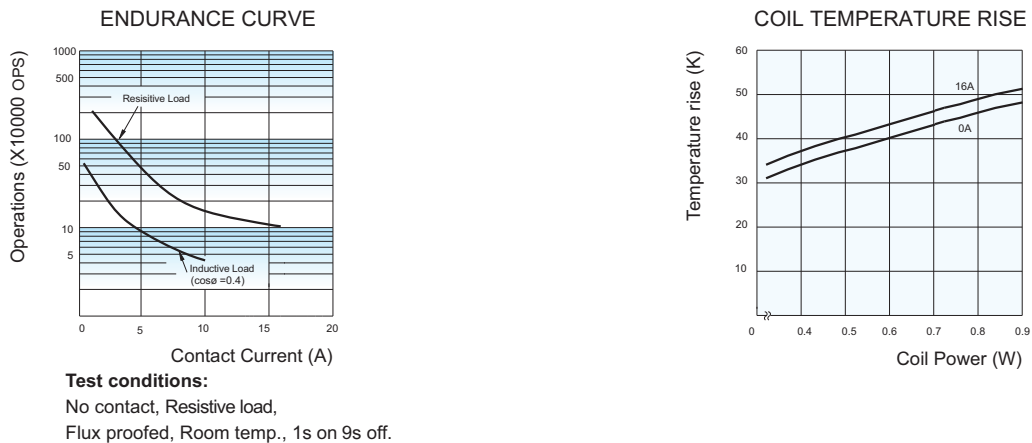
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.5mm .

CHARACTERISTIC CURVES



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF140FF

MINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:R50149131



File No.:CQC10002046173



Features

- 10A switching capability
- 5kV dielectric strength
(between coil and contacts)
- Standard: Creepage distance >8mm
- 2.0mm contact gap available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available

RoHS compliant

CONTACT DATA

Contact arrangement	2A, 2C
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)
Contact material	AgSnO ₂ , AgNi, AgCdO
Contact rating (Res. load)	10A 250VAC 8A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 240W
Mechanical endurance	Standard: 1 x 10 ⁷ OPS W type(1.5mm): 5 x 10 ⁵ OPS W type(2.0mm): 3 x 10 ⁵ OPS
Electrical endurance	Standard type: 1x10 ⁵ OPS (10A 250VAC NO or NC, Resistive load, Room temp., 1s on 9s off) 1.5 Gap type: NO 3x10 ⁴ OPS, NC 1x10 ⁴ OPS (10A 250VAC Resistive load, Room temp., 1s on 9s off) 2.0 Gap type: NO 3x10 ⁴ OPS, (10A 250VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10 ⁵ OPS (8A 30VDC, NO or NC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between contacts sets	3000VAC 1min
	Between open contacts	Standard:1000VAC 1min W type(1.5mm):2000VAC 1min W type(2.0mm):2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50 μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mmDA
Termination		PCB
Unit weight		Approx. 18g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.3	3.9	17 x (1±10%)
5	3.75	0.5	6.5	47 x (1±10%)
6	4.50	0.6	7.8	68 x (1±10%)
9	5.75	0.9	11.7	160 x (1±10%)
12	9.00	1.2	15.6	275 x (1±10%)
18	13.50	1.8	23.4	620 x (1±10%)
24	18.00	2.4	31.2	1100 x (1±10%)
48	36.00	4.8	62.4	4170 x (1±10%)
60	45.00	6.0	78.0	7000 x (1±10%)

COIL

Coil power	Standard: Approx. 530mW W type(1.5mm): Approx. 800mW W type(2.0mm): Approx. 1.4W
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Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

COIL DATA

at 23°C

W Type (1.5mm)

Nominal Voltage VDC	Pick-up Voltage VDC max. ²⁾	Drop-out Voltage VDC min. ²⁾	Max. Voltage VDC ³⁾	Coil Resistance Ω
3	2.25	0.3	3.3	11.3 x (1±10%)
5	3.75	0.5	5.5	31 x (1±10%)
6	4.50	0.6	6.6	45 x (1±10%)
9	6.75	0.9	9.9	101 x (1±10%)
12	9.00	1.2	13.2	180 x (1±10%)
18	13.5	1.8	19.8	405 x (1±10%)
24	18.0	2.4	26.4	720 x (1±10%)
48	36.0	4.8	52.8	2880 x (1±10%)
60	45.0	6.0	66.0	4500 x (1±10%)

W Type (2.0mm)

Nominal Voltage VDC	Pick-up Voltage VDC max. ²⁾	Drop-out Voltage VDC min. ²⁾	Max. Voltage VDC ³⁾	Coil Resistance Ω
5	3.75	0.5	5.5	18 x (1±10%)
6	4.50	0.6	6.6	26 x (1±10%)
9	6.75	0.9	9.9	58 x (1±10%)
12	9.00	1.2	13.2	102 x (1±10%)
24	18.0	2.4	26.4	410 x (1±10%)
48	36.0	4.8	52.8	1650 x (1±10%)

Notes: 1) When require pick-up voltage < 75% of nominal voltage, special order allowed.

2) The data shown above are initial values.

3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

4) In order to meet the stated product performance, please apply rated voltage to coil.

5) For the CO version whose contact gap is 1.5 mm, the operation voltage ≤ 85% of rated voltage, the coil resistance tolerance is (1±15%).

SAFETY APPROVAL RATINGS

UL/CUL	Standard	AgNi	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70°C 1/3HP 125VAC at 40°C	
		AgSnO ₂	2 Form A	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70°C 1/3HP 125VAC at 40°C 3/4HP 250VAC at 40°C
			2 Form C	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70°C 1/3HP 125VAC at 40°C 3/4HP 250VAC at 40°C
	W type	AgSnO ₂	2 Form A	12A 277VAC/250VAC Resistive at 70°C 1/3HP 125VAC at 40°C 3/4HP 250VAC at 40°C
TÜV		AgNi	2 Form A	12A 250VAC
			2 Form C	10A 250VAC
		AgSnO ₂	2 Form A	12A 250VAC
VDE	W type	AgSnO ₂	2HT 2ZT	10A 250VAC
CQC		AgSnO ₂	2HT 2ZT	12A 250VAC
		AgNi	2H3 2Z3	

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF140FF/	012	-2H	S	W	T	G	F	(XXX)
Type									
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48, 60VDC								
Contact arrangement	2H: 2 Form A 2Z: 2 Form C								
Construction ^{1) 2)}	S: Plastic sealed(No smoky-gray cover) Nil: Flux proofed								
Contact Gap	W: Large contact gap ³⁾ Nil: Standard								
Contact material	T: AgSnO ₂ 3: AgNi								
Contact plating	G: Gold plated Nil: No gold plated								
Insulation standard	F: Class F Nil: Class F								
Special code ⁵⁾	XXX: Customer special requirement Nil: Standard								

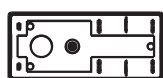
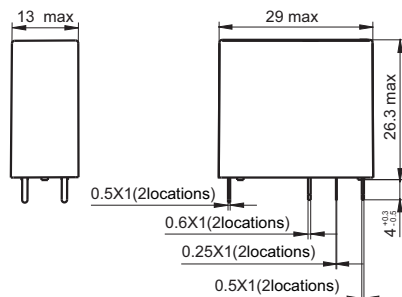
- Notes:**1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) There are two specifications to W type: 1.5mm contact gap and 2.0mm contact gap. The default W type is 1.5mm. So please add the special code "(456)" when releasing order, if 2.0mm contact gap is required. (Only for 2 Form A).
4) The standard type is made of black cover. If smoke cover is required, please add a special suffix when ordering. Please take note that smoky-gray cover is only available for flux proofed types.
5) The customer special requirement express as special code after evaluating by Hongfa. e.g.(456) means contact gap can reach 2.0mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

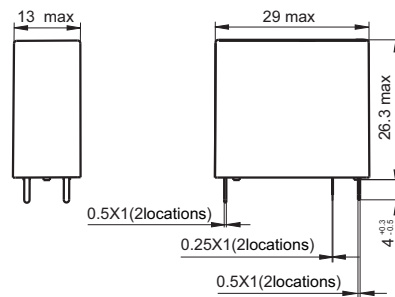
Outline Dimensions

2 Form C



(Bottom view)

2 Form A



(Bottom view)

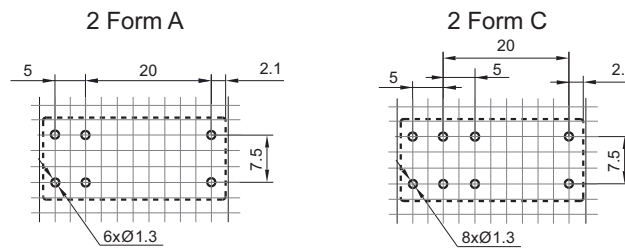
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)



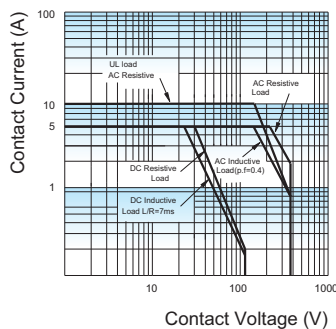
PCB Layout (Bottom view)



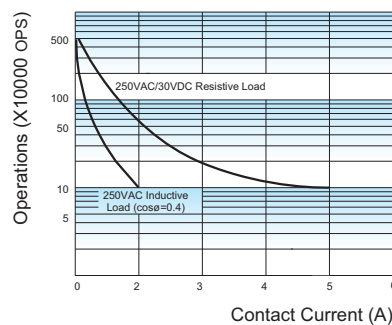
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.5mm .

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



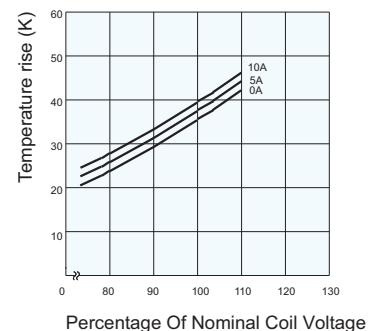
ENDURANCE CURVE



Test conditions:

NO, Resistive load, Flux proofed,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF140FF-V

MINIATURE INTERMEDIATE POWER RELAY



File No.:E133481



File No.:R50507878



File No.:CQC21002290220



Features

- 10A switching capability
- 5kV dielectric strength(between coil and contacts)
- Standard:Creepage distance >8mm
- 2 poles are connected in series to achieve DC 500V
10A DC high voltage opening and closing
- Contact Gap:3.0mm(When wired in 2-pole series)
- UL insulation system: Class F available

RoHS compliant

CONTACT DATA

Contact arrangement	2A
Contact resistance ¹⁾	100mΩ max. (1A 6VDC)
Contact material	AgSnO ₂
Contact rating	10A 500VDC
Max. switching voltage	500VAC
Max. switching current	10A
Max. switching power	5000W
Mechanical endurance	1×10 ⁶ OPS (Switching frequency18000 OPS/h)
Electrical endurance	2 poles in series: 10A 500VDC, 1×10 ⁴ OPS 2 poles in series: 1A 500VDC, 3×10 ⁴ OPS

Notes: 1) The data shown above are initial values.

2) Please refer to the performance graph for detailed electric durability information, and contact us if you have any other requirements.

CHARACTERISTICS

Insulation resistance		1000 MΩ (500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contacts & contacts	3000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10 Hz to 55 Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 28g
Construction		dust protected type

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 800mW
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COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.4	0.3	3.9	11.3×(1±10%)
5	4.0	0.5	6.5	31×(1±10%)
6	4.8	0.6	7.8	45×(1±10%)
9	7.2	0.9	11.7	101×(1±10%)
12	9.6	1.2	15.6	180×(1±10%)
15	12	1.5	19.5	280×(1±10%)
18	14.4	1.8	23.4	405×(1±10%)
24	19.2	2.4	31.2	720×(1±10%)
36	28.8	3.6	46.8	1620×(1±10%)
48	38.4	4.8	62.4	2880×(1±10%)
60	48	6.0	78	4500×(1±10%)
110	88	11	143	15125×(1±10%)

Notes: 1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

2) Max. voltage refers to the maximum voltage which relay coil could endure in a short period of time

SAFETY APPROVAL RATINGS

UL/CUL	10A 500VDC 1A 500VDC
TUV	10A 500VDC 1A 500VDC
CQC	10A 500VDC 1A 500VDC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

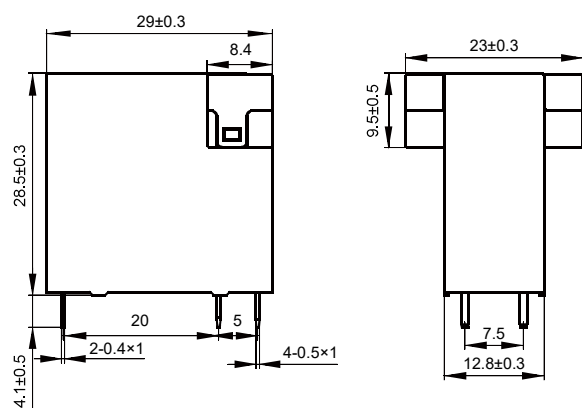
Type	HF140FF-V/	012	-2H	W	T	F	(XXX)
Coil voltage	3, 5, 6, 9, 12, 15, 18, 24, 36, 48, 60, 110 VDC						
Contact arrangement	2H: 2 Form A						
Contact Gap	W: Large contact gap						
Contact material	T: AgSnO ₂						
Insulation standard	F: Class F						
Special code ¹⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

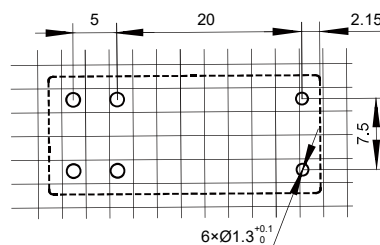
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

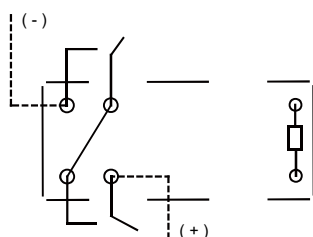
Outline Dimensions



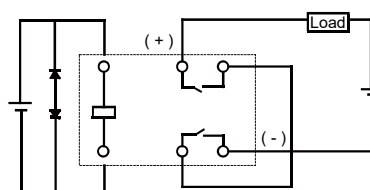
PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Circuit diagram



Remark: 1) The pin dimension of the product outline drawing is the size before tinning, and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 4\text{mm}$.

3) The tolerance without indicating for PCB layout is always $\pm 1\text{mm}$.

4) Circuit diagram: Please note that the switch section has polarity; the diode and Zener diode are for coil surge absorption, and the coil has no polarity.

PRECAUTIONS FOR USE

- About use

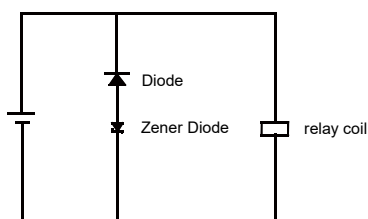
- 1) This product is an anti-solder type structure, so it cannot be cleaned as a whole.

- About installation

- 1) This product has polarity in the switch section. Please note that miswiring may result in failure to cut off.
- 2) This product is designed and manufactured on the premise of using 2-pole series wiring, so do not use it if it is only level 1.
- 3) The relay should be installed in a dry place with little dust and toxic gases. High temperature, high humidity and toxic gases may cause deterioration of performance due to condensation and corrosive substances, resulting in failure and burnout of the relay body.

- About the operation coil and diode connection

- 1) Please connect the diode and Zener diode to the relay coil (see the following figure).
- 2) Diodes are for coil surge absorption. Using only diode may affect the switching performance, so please use it in combination with Zener diode.
- 3) The coil is not polarized, so when installing the diode, please make its polarity opposite to the applied voltage to the coil.
- 4) The recommended Zener voltage of the Zener diode is 3 times the rated voltage of the coil.



Disclaimer

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HF25F

SUBMINIATURE HIGH POWER RELAY



File No.:E134517



File No.:40026917



File No.:R50207576



File No.:CQC09002028692



Features

- Small and for microwave oven
- 20A switching capability
- 1.5HP 250VAC approved by UL standard
- 5kV impulse withstand voltage (between coil and contacts)
- PCB & QC layouts
- Flux proofed types available

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating	Resistive: 20A 250VAC 1.5HP 250VAC
Max. switching voltage	250VAC / 30VDC
Max. switching current	20A
Max. switching power	5000VA / 480W
Mechanical endurance	2 x 10 ⁶ ops
Electrical endurance	1 x 10 ⁵ ops (20A 250VAC, Resistive load, Room temp., 1s on 1s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Ambient temperature		-40°C to 85°C
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB & QC
Unit weight		Approx. 16.5g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F

COIL

Coil power	Approx. 500mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC *3)	Coil Resistance Ω
5	3.75	0.25	6.50	50 x (1±10%)
6	4.50	0.30	7.80	72 x (1±10%)
9	6.75	0.45	11.7	162 x (1±10%)
12	9.00	0.60	15.6	288 x (1±10%)
18	13.5	0.90	23.4	648 x (1±10%)
24	18.0	1.20	31.2	1152 x (1±10%)

Notes: 1) The data shown above are initial values.

2) When requiring pick-up voltage <75% of nominal voltage, special order allowed.

3) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	20A 250VAC 16A 30VDC 1.5HP 250VAC
VDE	20A 250VAC 16A 30VDC
TÜV	20A 250VAC 16A 30VDC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.01

ORDERING INFORMATION

Type	HF25F /	012	-H	2	(XXX)
Coil voltage	5, 6, 9, 12, 18, 24VDC				
Contact arrangement	H: 1 Form A				
Version	2: 2 type 4: 4 type Nil: Standard type				
Special code ²⁾	XXX: Customer special requirement Nil: Standard				

Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

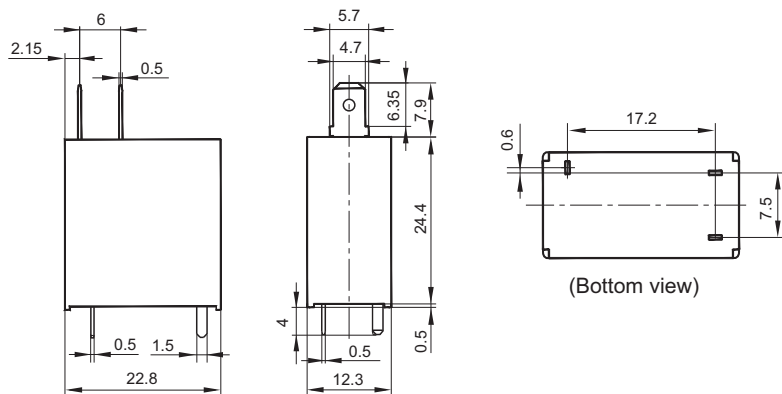
2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

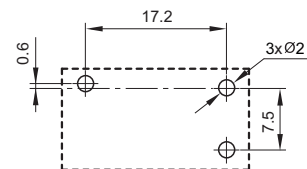
Unit: mm

Standard:

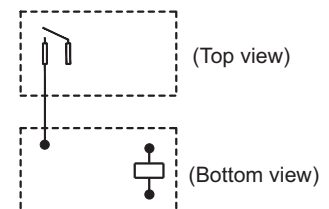
Outline Dimensions



PCB Layout (Bottom view)

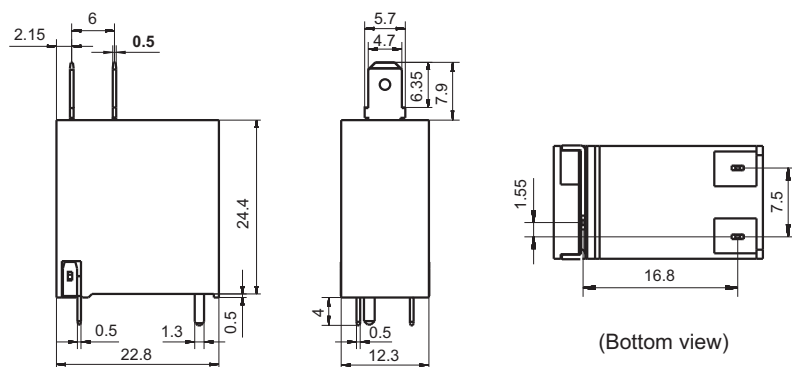


Wiring Diagram

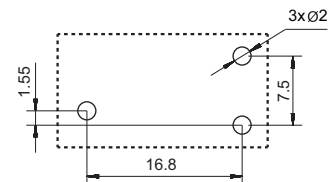


2 type:

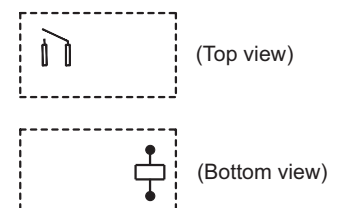
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram

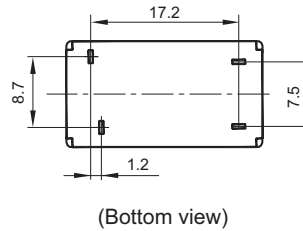
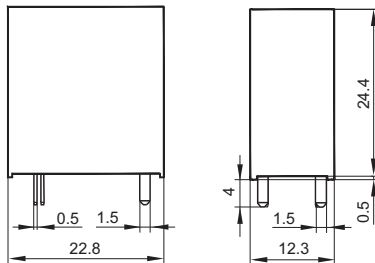


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

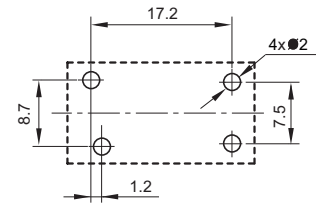
4 type:

Outline Dimensions



(Bottom view)

PCB Layout (Bottom view)



Wiring Diagram

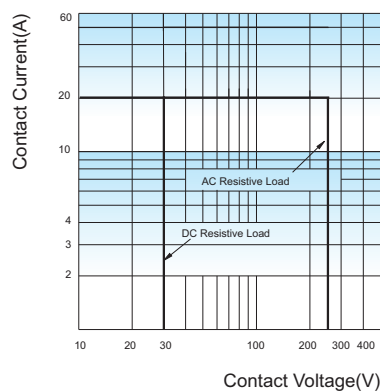


(Bottom view)

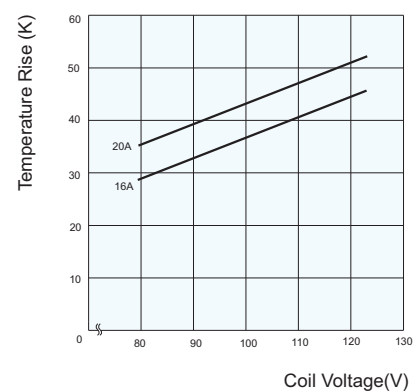
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



COIL TEMPERATURE RISE



Disclaimer

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HF62F

MINIATURE HIGH POWER RELAY



File No.:E133481



File No.:R50147086



File No.:CQC09002028470



Features

- 20A switching capability
- 5kV dielectric strength (between coil and contacts)
- 10kV impulse withstand voltage (between coil and contacts)
- creepage distance: 8mm
- PCB & QC layouts available

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	50mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	16A 250VAC 16A 30VDC
Max. switching voltage	277VAC / 30VDC
Max. switching current	20A
Max. switching power	4000VAC / 480W
Mechanical endurance	5x10 ⁶ OPS, Special code166: 1x10 ⁷ OPS
Electrical endurance	1 x 10 ⁵ OPS (16A 250VAC, Resistive load, Room temp., 1s on 1s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		T type: PCB Standard: PCB & QC
Unit weight		Approx. 15g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 540mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	4.0	0.5	6.50	47 x (1±10%)
6	4.8	0.6	7.80	68 x (1±10%)
9	7.2	0.9	11.7	155 x (1±10%)
12	9.6	1.2	15.6	270 x (1±10%)
18	14.4	1.8	23.4	620 x (1±10%)
24	19.2	2.4	31.2	1100 x (1±10%)
48	38.4	4.8	62.4	4400 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC 16A 30VDC 20A 125VAC
TÜV	16A 250VAC COSØ=1 16A 30VDC COSØ=1
CQC	-40°C to 105°C, 16A 250VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1

ORDERING INFORMATION

	HF62F / 012 -1H T F (XXX)				
Type					
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC				
Contact arrangement	1H: 1 Form A				
Termination	T: PCB		Nil: PCB & QC		
Insulation Standard	F: Class F		Nil: Class B		
Special code ¹⁾	XXX: Customer special requirement		Nil: Standard		

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

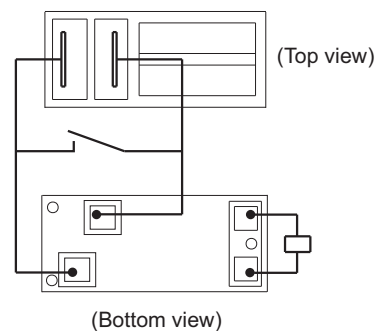
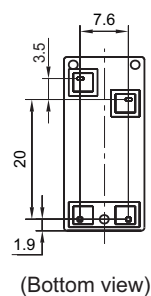
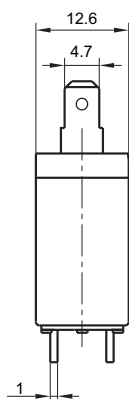
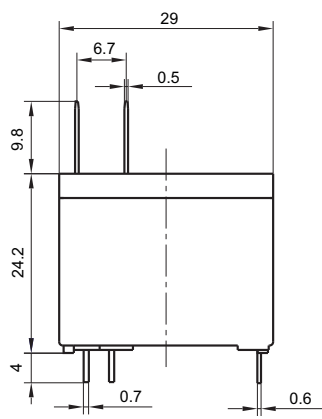
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

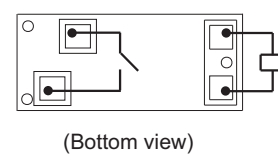
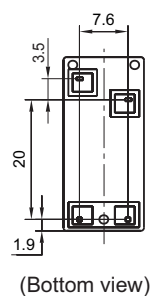
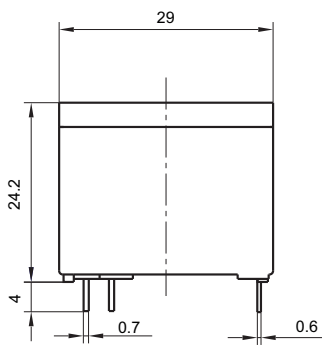
Outline Dimensions

Wiring Diagram

Standard



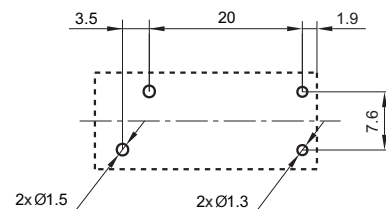
T type



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

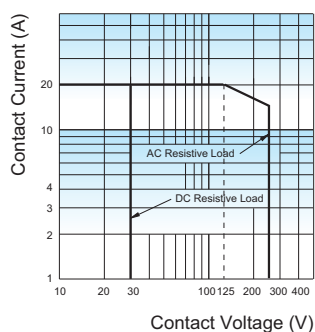
PCB Layout
(Bottom view)



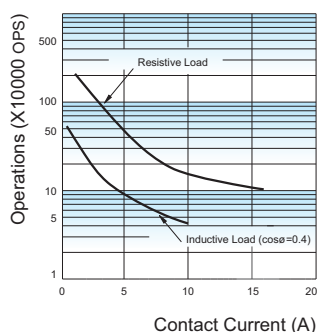
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

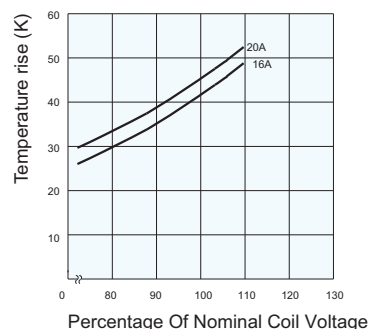


ENDURANCE CURVE



Test conditions:
Room temp., 1s on 1s off

COIL TEMPERATURE RISE



Disclaimer

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HF62F-G

MINIATURE HIGH POWER RELAY



File No.:E133481



File No.:R50147086



File No.:CQC09002028470



Features

- Suitable for microwave oven and other products
- 5kV dielectric strength (between coil and contacts)
- 10kV impulse withstand voltage (between coil and contacts)
- 20A switching capability
- creepage distance: 8mm
- UL insulation system: Class F
- Outline Dimensions: (29.0x12.6x24.2) mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	50mΩ max. (1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	20A 250VAC
Max. switching voltage	250VAC
Max. switching current	20A
Max. switching power	5000VA
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	1 x 10 ⁵ OPS (20A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)

Notes: 1) The data shown above are initial values.

2) Please refer to the performance curve for detailed electrical durability information. If you need other conditions, please contact Hongfa.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB & QC
Unit weight		Approx. 15g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 540mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
5	4.0	0.5	6.50	47 x (1±10%)
6	4.8	0.6	7.80	68 x (1±10%)
9	7.2	0.9	11.7	155 x (1±10%)
12	9.6	1.2	15.6	270 x (1±10%)
18	14.4	1.8	23.4	620 x (1±10%)
24	19.2	2.4	31.2	1100 x (1±10%)
48	38.4	4.8	62.4	4400 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	20A 250VAC
TÜV	20A 250VAC COSØ =1

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2021 Rev. 1.00

ORDERING INFORMATION

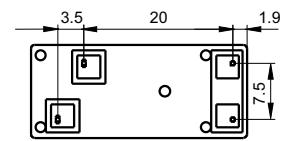
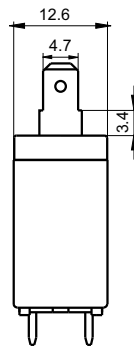
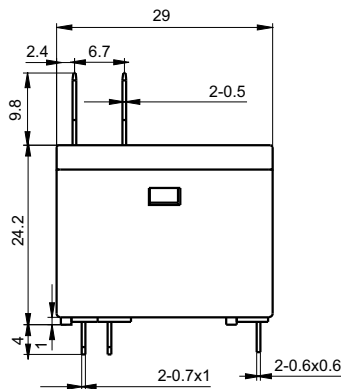
Type	HF62F-G / 012 -1H F (XXX)
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC
Contact arrangement	1H: 1 Form A
Insulation Standard	F: Class F
Special code ¹⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

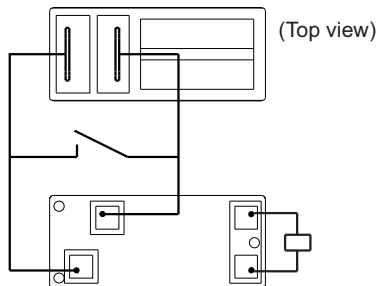
Unit: mm

Outline Dimensions



(Bottom view)

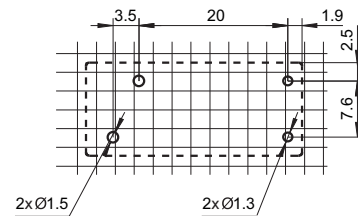
Wiring Diagram



(Top view)

PCB Layout

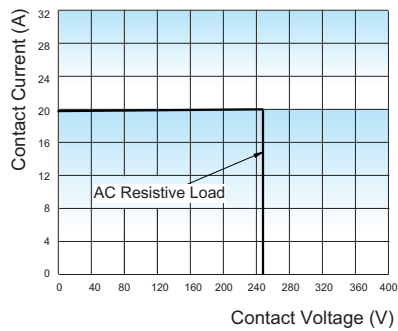
(Bottom view)



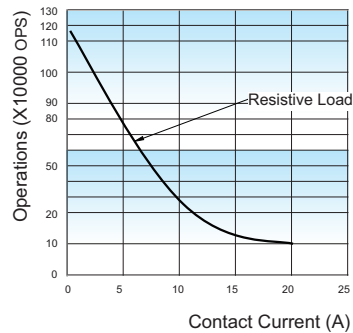
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



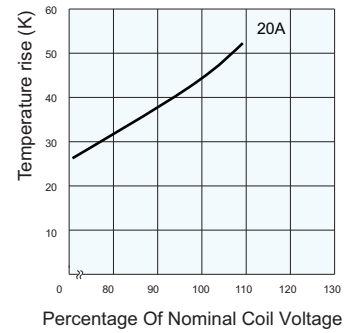
ENDURANCE CURVE



Test conditions:

Room temp., 1s on 1s off

COIL TEMPERATURE RISE



Disclaimer

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HF102F

MINIATURE HIGH POWER RELAY

CULUS

File No.:E134517



File No.:40024142



File No.:CQC13002098165



Features

- 4.5kV dielectric strength
(between coil and contacts)
- Heavy load up to 5000VA
- Ideal for motor switching
- PCB & QC layouts available
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgCdO
Contact rating	Resistive: 20A 250VAC Motor: 2HP 240VAC
Max. switching voltage	250VAC
Max. switching current	Resistive: 25A
Max. switching power	6250VA
Mechanical endurance	2 x 10 ⁶ OPS
Electrical endurance	1 x 10 ⁵ OPS (20A 250VAC, Resistive load, at 85°C, 1.5s on 1.5s off)

Notes: 1)The data shown above are initial values.

COIL

Coil power	Approx. 900mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.5	0.5	6.0	27.8 x (1±10%)
12	8.4	1.2	14.4	160 x (1±10%)
24	16.8	2.4	28.8	640 x (1±10%)
48	33.6	4.8	57.6	2560 x (1±10%)

Notes: 1)The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		60K max.
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-25°C to 85°C
Humidity		5% to 85% RH
Termination		HF102F: PCB & QC HF102F-P: PCB
Unit weight		Approx. 23g
Construction		Dust protected

Notes: The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	25A 250VAC
	20A 250VAC
	1HP 120VAC
	2HP 240VAC
VDE	25A 250VAC at 55°C
	20A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.02

ORDERING INFORMATION

Type	HF102F /		T	-12VDC	(XXX)
	HF102F-P: PCB HF102F: PCB & QC				
Contact material	T: AgSnO ₂	Nil: AgCdO			
Coil voltage	5, 12, 24, 48VDC				
Special code ²⁾	XXX: Customer special requirement		Nil: Standard		

Notes: 1) HF102F is dust protected version which cannot be washed.

2) The customer special requirement express as special code after evaluating by Hongfa.

3) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 596mm. Any special requirement needed, please contact us for more details.

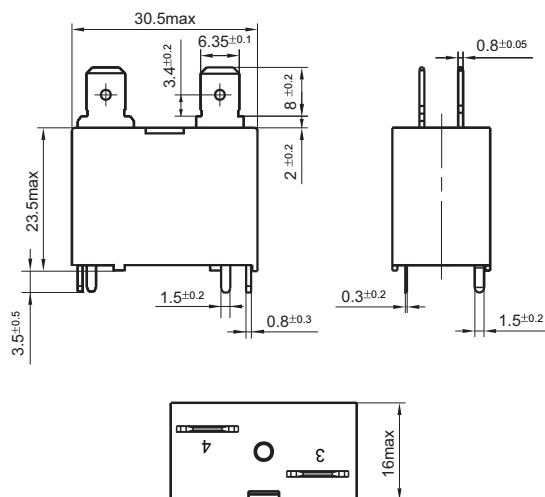
4) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

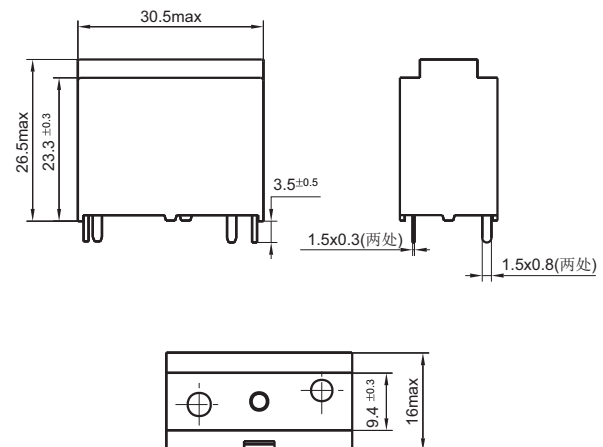
Outline Dimensions

HF102F



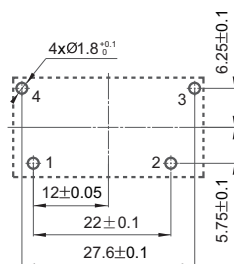
(Top view)

HF102F-P

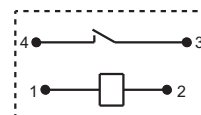


(Top view)

PCB Layout (Bottom view)



Wiring Diagram

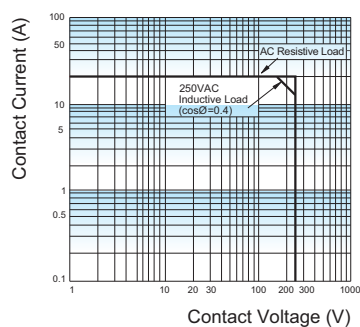


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.

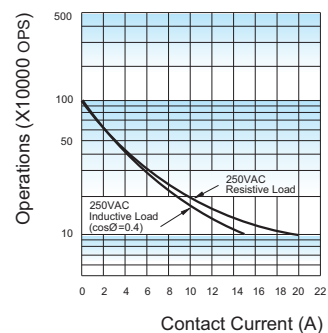
2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:

Room temp. 1s on 9s off

Disclaimer

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HF161F

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40031410



File No.:CQC10002050943
CQC18002203499



Features

- 4.5kV dielectric strength
(between coil and contacts)
- Heavy load up to 6250VA
- Ideal for motor switching
- PCB layouts available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgCdO
Contact rating	Resistive: 20A 250VAC Motor: 2HP 250VAC
Max. switching voltage	250VAC
Max. switching current	Resistive: 25A
Max. switching power	6250VA
Mechanical endurance	2 x 10 ⁶ OPS
Electrical endurance	HT type: 1 x 10 ⁵ OPS (20A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)

Notes: 1)The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		60K max.
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 21g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 900mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC*2)	Coil Resistance Ω
5	3.5	0.5	6.0	27.8 x (1±10%)
12	8.4	1.2	14.4	160 x (1±10%)
24	16.8	2.4	28.8	640 x (1±10%)
48	33.6	4.8	57.6	2560 x (1±10%)

Notes: 1)The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	25A 250VAC at 85°C
	20A 250VAC at 85°C
	2HP 250VAC at 85°C
VDE	25A 250VAC at 85°C
	20A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

ORDERING INFORMATION

Type	HF161F /	12	-H	T	(XXX)
Coil voltage	5, 12, 24, 48VDC				
Contact arrangement	H: 1 Form A				
Contact material	T: AgSnO ₂ Nil: AgCdO				
Special code ³⁾	XXX: Customer special requirement Nil: Standard				

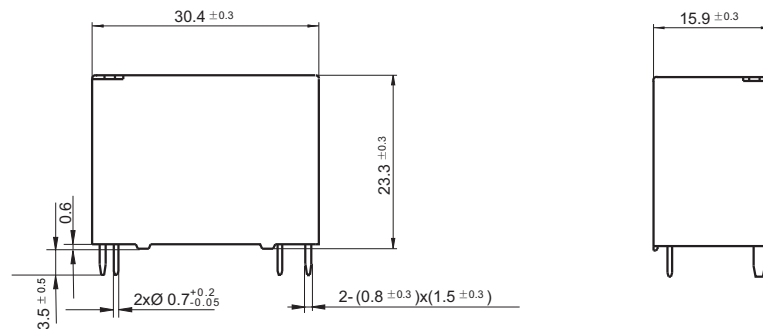
- Notes:** 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 2) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (414) stands for product with coil terminal of 1.4X0.4.
 4) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 592mm. Any special requirement needed, please contact us for more details.
 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

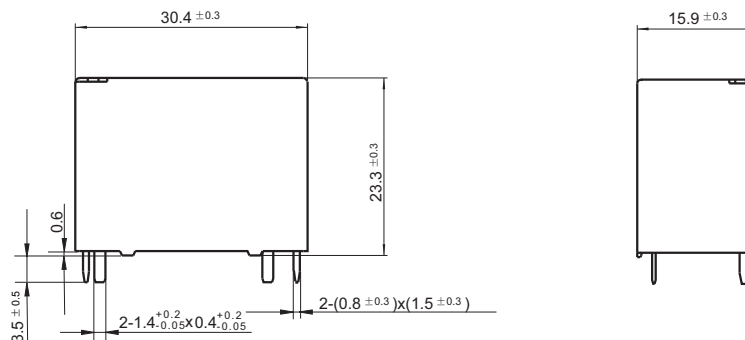
Unit: mm

Outline Dimensions

Standard type



(414) special code version

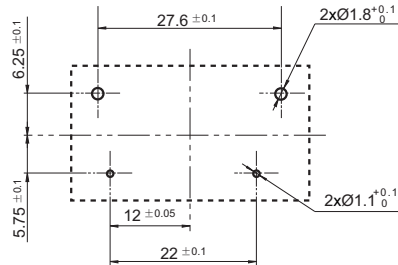


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

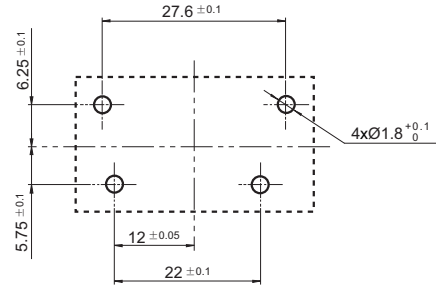
Unit: mm

PCB Layout (Bottom view)

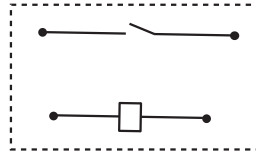
Standard type



(414) special code version



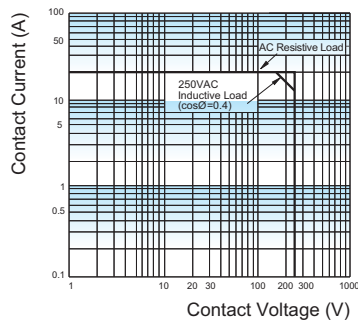
Wiring Diagram



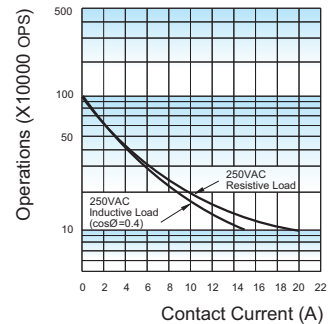
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:

Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF161F-40

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: R 50475730



File No.: CQC20002246447



Features

- Applicable to variable frequency air conditioning used for soft start
- 40 A 277 VAC loading current capability
- Class F insulation system

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	10mΩ max.(6VDC 20A)
Contact material	AgSnO ₂
Contact rating (Res. load)	Making 20A Loading 40A Breaking 20A, 277VAC
Max. switching voltage	277VAC
Max. switching current	40A
Max. continuous current	40A at 85°C
Max. switching power	11080VA
Mechanical endurance	2×10 ⁶ OPS
Electrical endurance ⁽¹⁾	1×10 ⁵ OPS MIN (85°C, 1s on 9s off, Making 20A Loading 40A Breaking 20A, 277VAC, Resistive load) 1×10 ⁴ OPS MIN (85°C, 1s on 9s off, 30A24VDC, Resistive load)

Notes: 1) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at nomi. volt.)		20ms max.
Release time (at nomi. volt.)		10ms max.
Temperature rise (at nomi. volt.)		70K max (Contact load current 40A, rated voltage excitation, at 85°C)
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²

CHARACTERISTICS

Vibration resistance	10Hz to 55Hz 1.5mm DA
Humidity	5% to 85% RH
Ambient temperature	-40°C to 85°C
Termination	PCB
Unit weight	Approx. 25g
Construction	Flux proofed Plastic sealed

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 900mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC*2)	Coil Resistance Ω
5	3.75	0.5	6.0	27.8 x (1±10%)
12	9	1.2	14.4	160 x (1±10%)
24	18	2.4	28.8	640 x (1±10%)
48	36	4.8	57.6	2560 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL TÜV CQC	Making 20A, Loading 40A, Breaking 20 A 277V a.c., Resistive, 85°C 40 A, 277V a.c., Resistive, 85°C 30 A, 24V d.c., Resistive, 85°C
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Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

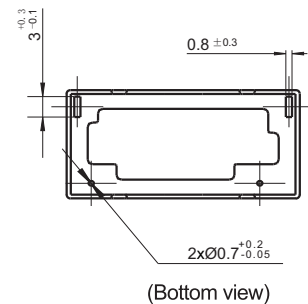
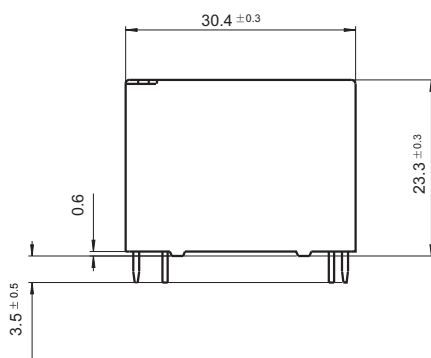
HF161F-40 / 12		-H	S	T	F	(XXX)
Type						
Coil voltage	5, 12, 24, 48VDC					
Contact arrangement	H: 1 Form A					
Construction ⁽¹⁾	S: Plastic sealed		Nil: Flux proofed			
Contact matcrial	T: AgSnO ₂					
Insulation standard	F: Class F					
Special code	XXX: Customer special requirement			Nil: Standard		

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
 2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.e.g.(335) stands for product in accordance to IEC 60335-1(GWT).

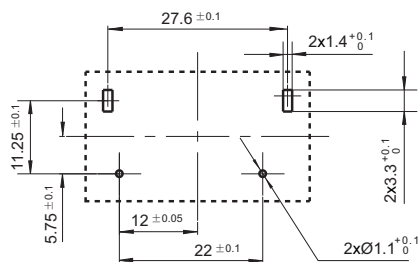
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

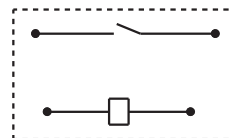
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1mm, tolerance should be ±0.2mm; outline dimension > 1mm and ≤ 5mm, tolerance should be ±0.3mm; outline dimension > 5mm, tolerance should be ±0.4mm.
 2) The tolerance without indicating for PCB layout is always ±0.1mm.

Disclaimer

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HF161F-W

SOLAR RELAY



File No.:E134517



File No.:40031410



File No.:CQC10002050943
CQC18002203499



Features

- 31A switching capacity
- Applicable to inverter used for photovoltaic power generation systems
- Ideal for UPS
- 1.5mm contact gap (compliant to European Photovoltaic Standard VDE0126)
- 1.8mm contact gap (compliant to IEC 62109-2-2011)
- The clearance distance between contact and coil is bigger than 6.4mm, the creepage distance is bigger than 8mm. (special code 477:7.5mm)
- Low coil holding voltage contributes to saving energy of equipment.
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact gap	1.5mm	1.8mm	2.0mm	2.3mm
Contact arrangement	1A			
Contact resistance ¹⁾	100mΩ max.(1A 6VDC)			
Contact material	AgSnO ₂			
Contact rating	Resistive: 26A 250VAC Inductive: 31A 250VAC (cosφ=0.8) 0.1s:10s	Resistive: 26A 250VAC Inductive: 33A 250VAC (cosφ=0.8) 0.1s:10s	Resistive: 26A 250VAC Inductive: 31A 250VAC (cosφ=0.8) 0.1s:10s	Resistive: 26A 250VAC
Max. switching voltage	277VAC			
Max. switching current	31A	33A	31A	26A
Max. switching power	7750VA	8250VA	7750VA	7202VA
Mechanical endurance	1 x 10 ⁶ OPS	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS	1 x 10 ⁵ OPS
Electrical endurance	HT type: 3 x 10 ³ OPS (26A 250VAC Resistive 75°C 1.5s on 1.5s off)	HT type: 3 x 10 ³ OPS (26A 250VAC Resistive 75°C 1.5s on 1.5s off)	HT type: 3 x 10 ³ OPS (26A 250VAC Resistive 75°C 1.5s on 1.5s off)	HT type: 3 x 10 ³ OPS (26A 250VAC Resistive Room temp. 1.5s on 1.5s off)

Notes: 1)The data shown above are initial values.

COIL

Coil power	Approx. 1.4W
Holding voltage	35% to 120%Un (at 23°C) 45% to 80%Un (at 85°C)

Notes: 1)The coil holding voltage is the voltage of coil after being applied rated voltage for 100ms

2)The relay coil does not allow applied more than maximum of holding voltage values for a long time (Eg: 120% Un at 23°C; 80% Un at 85°C), prevent overheating burned.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
9	6.3	0.9	10.8	58 x (1±10%)
12	8.4	1.2	14.4	103 x (1±10%)
18	12.6	1.8	21.6	230 x (1±10%)
24	16.8	2.4	28.8	410 x (1±10%)

Notes: 1)The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		95K max. (Contact load current 31A, rated voltage excitation, at 60°C)
		70K max. (Contact load current 31A, 80% of rated voltage excitation, at 85°C)
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil, which is 45% to 80% that of rated voltage)
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 21g
Construction		Flux proofed

Notes: The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	26A 277VAC at 75°C
		22A 277VAC at 85°C
VDE	AgSnO ₂	26A 277VAC at 75°C
		22A 277VAC at 85°C 31A 250VAC cosφ=0.8 0.1s:10s 33A 250VAC cosφ=0.8 0.1s:10s (477)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF161F-W /	12	-H	T	(XXX)
Type					
Coil voltage	9, 12, 18, 24VDC				
Contact arrangement	H: 1 Form A				
Contact material	T: AgSnO ₂				
Special code ³⁾	XXX: Customer special requirement		Nil: Standard		

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

2) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

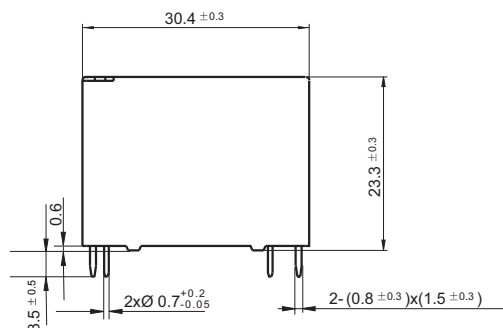
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (414) stands for product with coil terminal of 1.4X0.4; e.g. (477) stands for Contact gap: 1.8mm.(456) stands for Contact gap: 2.0mm.(704)stands for Contact gap: 2.3mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

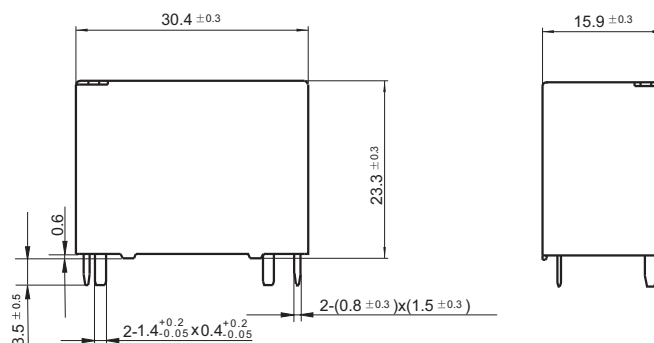
Unit: mm

Outline Dimensions

Standard type



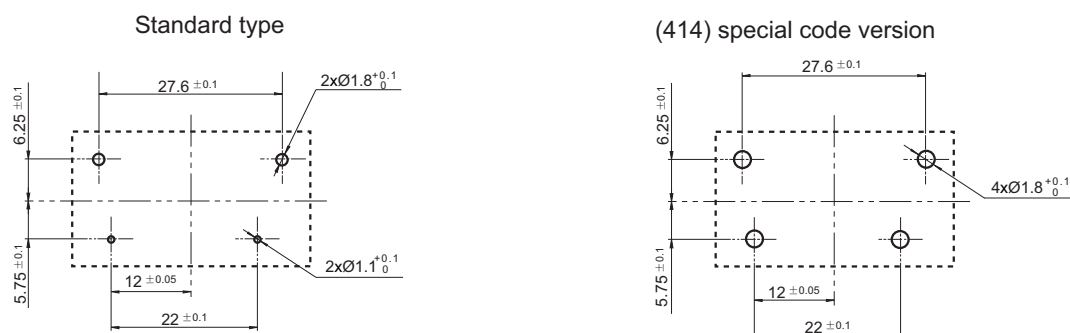
(414) special code version



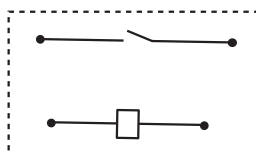
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout (Bottom view)



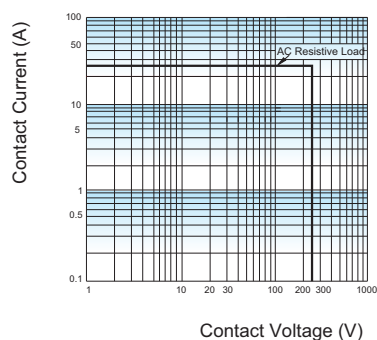
Wiring Diagram



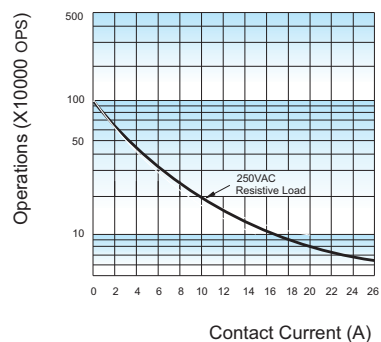
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:
at 75°C, 1.5s on 1.5s off.

Disclaimer

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HF161F-40W

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:R 50475730



File No.:20002246447



Features

- Applicable to inverter used for photovoltaic power generation systems
- Ideal for UPS
- 43 A 277 VAC switching capability
- Contact gap 2.0 mm、1.8 mm is optional
- Low coil holding voltage contributes to saving energy of equipment.
- Class F insulation system
- Outline Dimensions:(30.4×15.9×23.3)mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ⁽¹⁾	10mΩ max.(6VDC 20A)
Contact material	AgSnO ₂
Contact rating (Res. load)	Making 20A, loading 40A,breaking 20A 277VAC
Max. switching voltage	277VAC
Max. switching current	43A
Max. switching power	11911VA
Mechanical endurance	1×10 ⁵ Ops
Electrical endurance	Min. 5×10 ⁴ Ops (85°C,1s on 9s off,Making20A, loading 40 A breaking 20 A, 277VAC,Res. load)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Standard:Approx. 3.8W (967):Approx. 1.6W
Holding voltage (Standstd)	40% to 70%U _N (temperature 23°C) 40% to 55%U _N (temperature 85°C)
Holding voltage (967)	50% to 100%U _N (temperature 23°C) 55% to 70%U _N (temperature 85°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning,the coil can not be consistently applied to with voltage larger than maximum holding voltage.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between open contacts	2500VAC 1min
	Between coil & contacts	4500VAC 1min
Surge Voltage		10kV(1.2/50μs)
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 43A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 55% rated voltage, at 85°C)
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 25g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	Making 20 A loading 40 A breaking 20 A, 277 VAC, Resistive 85°C
TUV	40 A, 277 VAC, Resistive 85°C
CQC	43 A, 277 VAC, Resistive 85°C
	Making 10 A loading 43 A breaking 10 A, 277 VAC, Resistive 85°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above.Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.02

COIL DATA

at 23°C

Standard

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC	Coil Resistance Ω
6	4.2	0.3	6.6	$9.5 \times (1\pm10\%)$
9	6.3	0.45	9.9	$21.3 \times (1\pm10\%)$
12	8.4	0.6	13.2	$38 \times (1\pm10\%)$
24	16.8	1.2	26.4	$152 \times (1\pm10\%)$

(967)

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC	Coil Resistance Ω
6	4.5	0.3	6.6	$22.5 \times (1\pm10\%)$
9	6.75	0.45	9.9	$50.6 \times (1\pm10\%)$
12	9.0	0.6	13.2	$90 \times (1\pm10\%)$
24	18	1.2	26.4	$360 \times (1\pm10\%)$

Notes: *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

Type	HF161F-40W /12 -H T F (XXX)
Coil voltage	6,9,12,24VDC
Contact arrangement	H: 1 Form A
Contact material	T: AgSnO ₂
Insulation standard	F: Class F
Special code ⁽¹⁾	(967) stands for the coil power 1.6W and contact gap ≥ 1.8 mm.

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

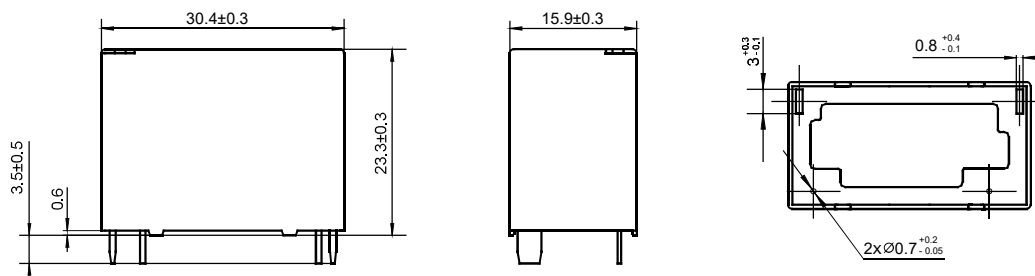
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

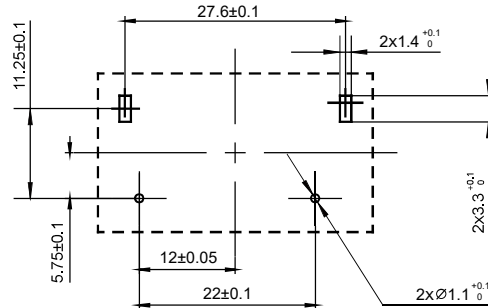
Outline Dimensions



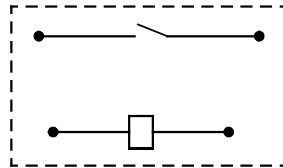
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF160F

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40024142



File No.: CQC12002072207
CQC18002206453



Features

- 4.5kV dielectric strength (between coil and contacts)
- Heavy load up to 6250VA
- Ideal for motor switching
- PCB & QC layouts
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgCdO
Contact rating	Resistive: 20A 250VAC Motor: 2HP 240VAC
Max. switching voltage	Resistive: 250VAC
Max. switching current	25A
Max. switching power	6250VA
Mechanical endurance	2 x 10 ⁶ OPS
Electrical endurance	H, HT type: 1 x 10 ⁵ OPS (20A 250VAC, Resistive load, at 60°C, 1.5s on 1.5s off)

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 900mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.5	0.5	6.0	27.8 x (1±10%)
12	8.4	1.2	14.4	160 x (1±10%)
24	16.8	2.4	28.8	640 x (1±10%)
48	33.6	4.8	57.6	2560 x (1±10%)

Notes: 1) The data shown above are initial values.

2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		60K max.
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Termination		PCB & QC
Unit weight		Approx. 26g
Construction		Flux proofed

Notes: The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	25A 277VAC
	20A 250VAC
	1HP 120VAC
	2HP 240VAC
VDE	25A 250VAC at 55°C
	20A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

ORDERING INFORMATION

Type	HF160F /	12	-H	5	T	(XXX)
Coil voltage	5, 12, 24, 48VDC					
Contact arrangement	H: 1 Form A					
Termination	5: PCB & QC					
Contact material	T: AgSnO ₂ Nil: AgCdO					
Special code ³⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

2) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

3) The customer special requirement express as special code after evaluating by Hongfa.

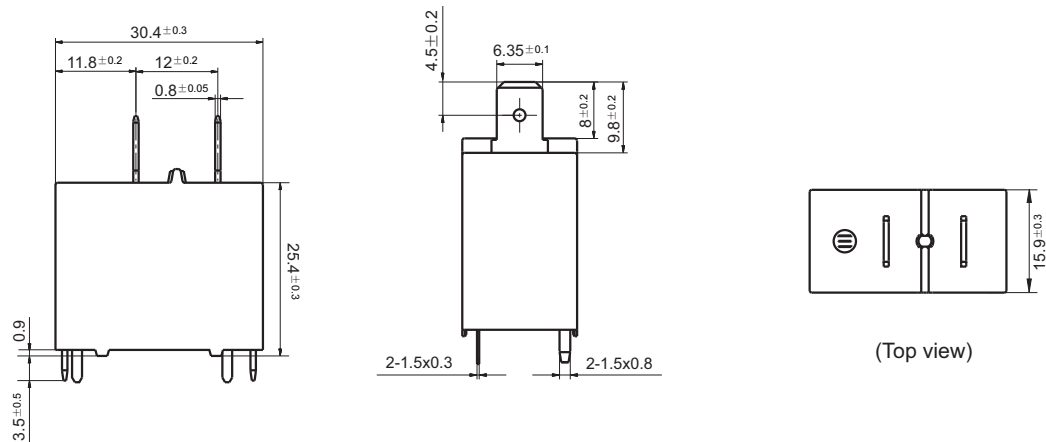
4) Two packing methods available: plastic tray package, tube package, Standard tube packing length is 596mm. Any special requirement needed, please contact us for more details.

5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

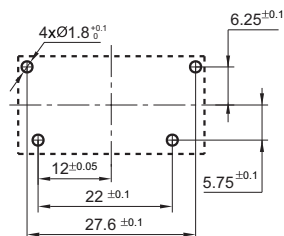
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

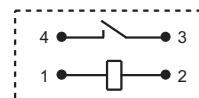
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram

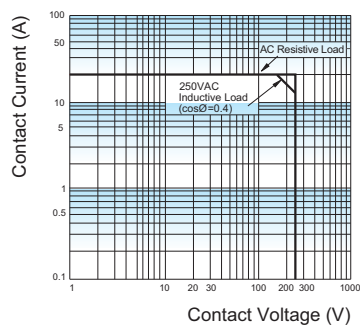


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

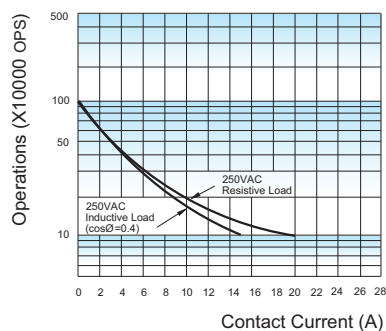
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:

Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF182F-L

POWER RELAY



File No.: E133481



File No.: R50455116



File No.: CQC19002234396



Features

- Latching relay
- High capacity: 20A 277VAC
- High surge current capacity: 370A
- Small size: 22mm x 10mm x 14mm
- Meeting reinforce insulation
- Dielectric strength:
Between coil & contacts $\geq 5000\text{VAC}$
- High temperature resistance: 105°C
- Meet IEC62368-1
- TV-10 240VAC Capability

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial) ¹⁾	100mΩ max.(1A 6VDC)
Contact materia	AgSnO ₂
Contact rating (Res. load)	16A 277VAC
Max. switching voltage	480VAC
Max. switching current	20A
Max. switching power	5540VA
Min. Applicable Load	6V 1A
Mechanical endurance	1 x 10 ⁶ ops
Electrical endurance	5 x 10 ⁴ ops(16A 277VAC, Resistive load, 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open contacts	1000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge voltage	Between coil & contacts	8kV(1.2 / 50μs)
Set time (at rated. volt.)		10ms max.
Reset time (at rated. volt.)		10ms max.
Vibration resistance		10Hz to 150Hz 2.0mm DA
Shock resistance	Functional	100m/s ²
	Destructive	1000m/s ²
Humidity		5% to 85%RH
Ambient temperature		-40°C to 105°C

Notes: 1) The data shown above are initial values.

COIL

Coil power	1 coil latching: Approx. 0.53W
	2 coils latching: Approx. 0.8W

COIL DATA

23°C

1 coil latching

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC ²⁾	Pulse Duration ms		Coil Resistance Ω
				Typ	Min	
3	2.4	2.4	6	≥ 50	30	17 x (1±10%)
5	4.0	4.0	10	≥ 50	30	47 x (1±10%)
6	4.8	4.8	12	≥ 50	30	68 x (1±10%)
9	7.2	7.2	18	≥ 50	30	152.8 x (1±10%)
12	9.6	9.6	24	≥ 50	30	271.7 x (1±10%)
24	19.2	19.2	48	≥ 50	30	1086.8 x (1±10%)

2 coils latching

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC ²⁾	Pulse Duration ms		Coil Resistance Ω
				Typ	Min	
3	2.4	2.4	6	≥ 50	30	11.25 x (1±10%)
5	4.0	4.0	10	≥ 50	30	31.5 x (1±10%)
6	4.8	4.8	12	≥ 50	30	45 x (1±10%)
9	7.2	7.2	18	≥ 50	30	101.5 x (1±10%)
12	9.6	9.6	24	≥ 50	30	180 x (1±10%)
24	19.2	19.2	48	≥ 50	30	720 x (1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time($\leq 50\text{ms}$).



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

CQC	16A 347VAC/277VAC/250VAC Resistive 105°C 16A 347VAC/277VAC/250VAC Resistive 85°C 10A 347VAC/277VAC/250VAC Resistive 85°C 20A 277VAC/250VAC Resistive 85°C
UL/CUL⁴⁾	16A 347VAC General use 105°C 16A 277VAC/250VAC/125VAC/120VAC General use 85°C 10A 277VAC/250VAC/125VAC/120VAC General use 85°C TV-8 240VAC/120VAC 85°C 2400W 240VAC Tungsten 85°C 1200W 120VAC Tungsten 85°C 1HP motor 277VAC/250VAC 85°C 3A 120VAC/277VAC electronic ballast 85°C 10A 277VAC standard ballast 85°C 20A 277VAC/250VAC/125VAC/120VAC 85°C TV-10 240VAC/120VAC 85°C 1/2HP motor 120VAC 85°C 8A 120VAC/277VAC electronic ballast 85°C 10A 120VAC electronic ballast 85°C
TÜV	16A 277VAC 105°C 10A 277VAC 85°C 10(10) 277VAC motor 85°C 8A (surge current 125A/1ms) 277VAC Tungsten 85°C 20A 277VAC 85°C *22A 277VAC/250VAC/125VAC/120VAC 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

3) * According to IEC62368-1.

4) Suitable for overvoltage category III, and shall provide protection for a rated impulse withstand voltage peak of 6 kv.

ORDERING INFORMATION

HF182F-L/		12	-H	S	L2	T	F	(XXX)
Type								
Coil voltage		3,5, 6,9, 12, 24VDC						
Contact arrangement		H: 1 Form A						
Construction ¹⁾²⁾		S: Plastic sealed		Nil: Flux proofed				
Sort		L1: 1 coil latching		L2: 2 coils latching				
Contact material		T: AgSnO ₂						
Insulation standard		F: Class F						
Special code ³⁾		XXX: Customer special requirement			Nil: Standard			

Notes: 1) Under the ambience with dangerous gas like H₂S, SO₂ or NO₂, plastic sealed type is recommended; please test the relay in real applications. If the ambience allows, flux proofed is preferentially recommended.

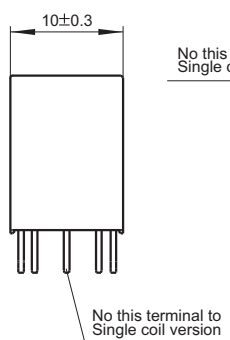
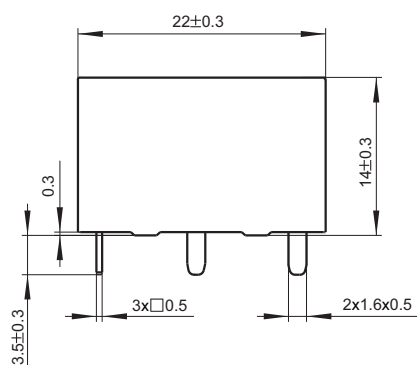
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

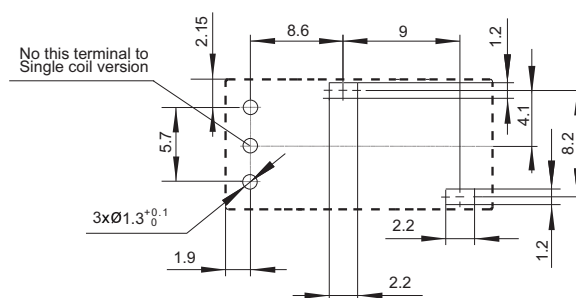
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

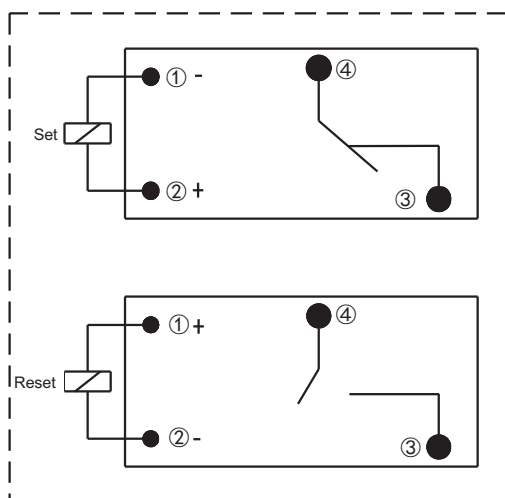


PCB Layout
(Bottom view)

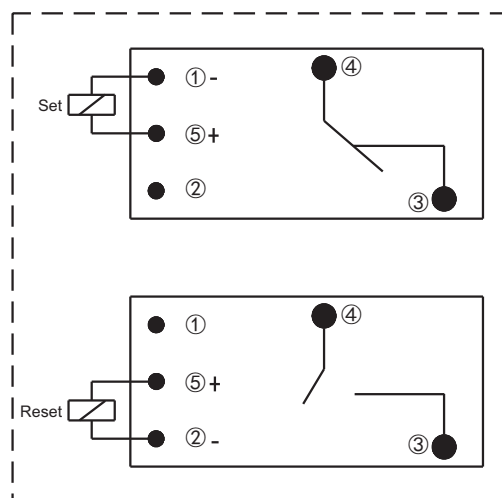


Wiring Diagram (Bottom view)

1 coil latching



2 coils latching



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Dimensional tolerance is not marked for product boundary dimensions		Dimensional tolerance is not marked for PCB board
Boundary dimensions	Dimensional tolerance	± 0.1
≤ 1	± 0.2	
$> 1 \sim 5$	± 0.3	
> 5	± 0.4	

Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Notice:

1. Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
2. In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than "set" or "reset" time. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF166F

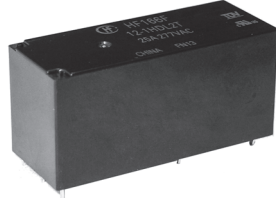
MINIATURE HIGH POWER LATCHING RELAY



File No.:E133481



File No.:R50280244



Features

- Latching relay
- 4mm contact gap available
- 25A switching capability
- 5kV dielectric strength(between coil and contacts)
- Creepage distance between coil and contacts:10mm
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- 1A + 1B configuration for power switching
- Flux proofed type available

CONTACT DATA

Contact arrangement	1A+1B
contact gap	4mm min.
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	25A 277VAC
Max. switching voltage	277VAC
Max. switching current	25A
Max. switching power	6925VA
Mechanical endurance	6 x 10 ⁵ OPS
Electrical endurance	3 x 10 ⁴ OPS (NO or NC, 25A 277VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50μs)
Set time (at rated. volt.)		25ms max.
Reset time (at rated. volt.)		25ms max.
Shock resistance	Functional	196m/s ²
	Destructive	1000m/s ²
Vibration resistance		10Hz to 55Hz 2mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 45g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL

Coil power	1 coil latching: 1.2W 2 coils latching: 2.4W
------------	---

COIL DATA

at 23°C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max. ¹⁾	Pulse width (ms) min. ¹⁾	Reset Voltage VDC max. ¹⁾	Coil Resistance Ω
5	4	150	4	20.8x (1±10%)
6	4.8	150	4.8	30x (1±10%)
12	9.6	150	9.6	120x (1±10%)
24	19.2	150	19.2	480x (1±10%)
48	38.4	150	38.4	1920x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max. ¹⁾	Pulse width (ms) min. ¹⁾	Reset Voltage VDC max. ¹⁾	Coil Resistance Ω
5	4	150	4	10.4x (1±10%)
6	4.8	150	4.8	15x (1±10%)
12	9.6	150	9.6	60x (1±10%)
24	19.2	150	19.2	240x (1±10%)
48	38.4	150	38.4	960x (1±10%)

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	25A 277VAC/250VAC/125VAC at 85°C 25A 60VDC at 85°C 0.5A 240VDC at 85°C
TÜV	25A 400VDC, at 85°C, ON:5S, OFF:5S, Contacts break without load 70A 72VDC, at 85°C, ON:0.3S, OFF:9S, Contacts break without load NO:25A 277VAC/250VAC/125VAC at 85°C 25A 60VDC at 85°C 0.5A 240VDC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

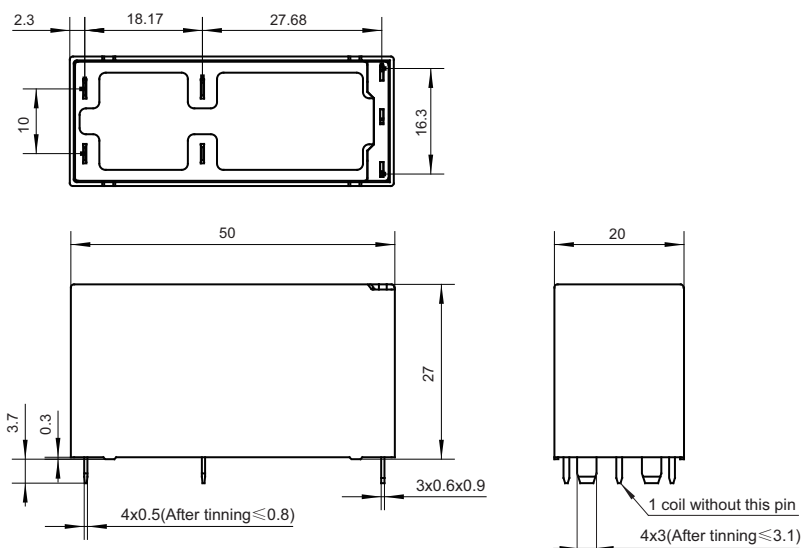
Type	HF166F /	12	-1HD	L2	T	(XXX)
Coil voltage	5, 6, 12, 24, 48VDC					
Contact arrangement	1HD: 1A + 1B					
Sort	L1: 1 coil latching L2: 2 coils latching					
Contact material	T: AgSnO ₂					
Special code ³⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

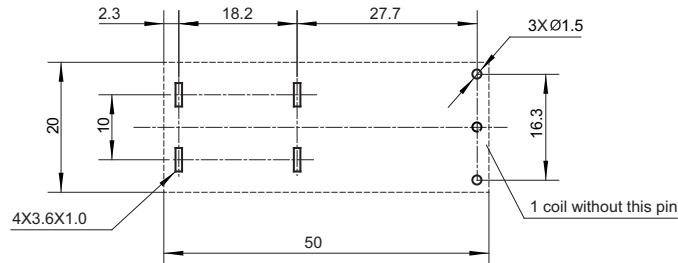
Outline Dimensions



Wiring Diagram(Bottom view)



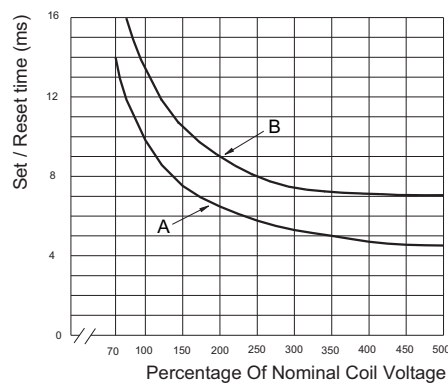
PCB Layout
(Bottom view)



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

SET \ RESET TIME AND VOLTAGE CURVE



Notes:

- Curve B: max value
 Curve A: typical value

Notice

- Relay is on the "reset" or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
- In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be more than 150 ms. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
- Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF177F

MINIATURE HIGH POWER RELAY



File No:E133481



File No.: R 50440159



File No.: CQC19002230667



Features

- In series connection 10kA/in parallel connection 20kA lightning-proof current.
- 2 form A in series 300VDC 25A switching capability
2 form A in series 400VDC 14A switching capability
40A 277VAC switching capability @(954) type
- 2.6mm/2.3mm@(954) type contact gap
- 10kV dielectric strength(between coil and contacts)
- UL insulation system:class F available

CONTACT DATA

Type	HF177F(954)	HF177F
Contact arrangement	2A	
Contact resistance (initial)	10mΩ max(at 6VDC 20A)	
Contact material	AgSnO ₂	
Contact rating (Res. load)	40A 277VAC 32A 277VAC	2 form A in series: 25A 300VDC 2 form A in series: 14A 400VDC
Max. switching voltage	277VAC	400VDC
Max. switching current	40A	25A
Max. switching power	11080VA	7500W
Mechanical endurance	2 x 10 ⁵ OPS	
Electrical endurance	1 x 10 ⁴ OPS (40A 277VAC, Resistive load, at 85°C, 1s on 9s off) 5 x 10 ⁴ OPS ((32A 277VAC, Resistive load, at 85°C, 1s on 9s off)	1 x 10 ⁴ OPS (25A 300VDC, Resistive load, 2 form A in series, at 85°C, 1s on 9s off) 1 x 10 ⁴ OPS (14A 400VDC, Resistive load, 2 form A in series, at 85°C, 1s on 9s off)

Notes: The data shown above are initial values.

COIL

Coil power	Approx.4.0W
Holding voltage	40% to 70%U _N (at 23°C) 45% to 55%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

SAFETY APPROVAL RATINGS

UL/CUL TÜV CQC	Standard type	25A 300VDC 85°C,Resistance load 14A 400VDC 85°C,Resistance load (2 form A in series)
UL/CUL TÜV CQCC	(954) type	40A 277VAC, 85°C,Resistance load 32A 277VAC, 85°C,Resistance load

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2500VAC 1min
	Between contacts	2500VAC 1min
	Between coil & contacts	5000VAC 1min
Surge voltage (between coil & contacts)		10kV(1.2 / 50μs)
Operate time (at nomi. volt.)		20ms max.
Release time (at nomi. volt.)		10ms max.
Temperature rise		70K max.(Contact load current 40A,Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% rated voltage, at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx.67g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA

at 23°C

Nominal Voltage VDC ¹⁾	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
6	4.2	0.3	6.6	9 x (1±10%)
9	6.3	0.45	9.9	20.3 x (1±10%)
12	8.4	0.6	13.2	36 x (1±10%)
24	16.8	1.2	26.4	144 x (1±10%)
48	33.6	2.4	52.8	576 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

ORDERING INFORMATION

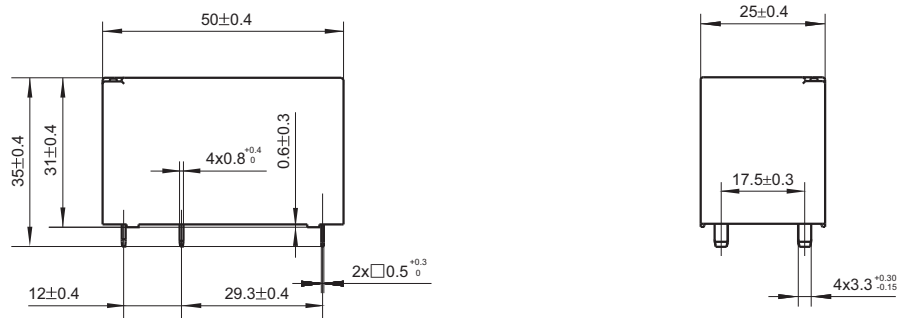
Type	HF177F/	12	-2H	T	F	(XXX)
Coil voltage	6, 9, 12, 24, 48VDC					
Contact arrangement	2H:2 Form A					
Contact material	T: AgSnO ₂					
Insulation standard	F: Class F					
Special code	XXX: Customer special requirement Nil: Standard 954: AC load					

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.
 4) Short-circuit: HF177F can fulfill the short-circuit current test according to IEC 62955:2018.
 Test sequence E: 9.11.2.3 a) 277 VAC, I_p ≥ 2.6 kA, I²t ≥ 6.5 kA²s (I_n ≤ 32A, I_{nc} = 10 000A) + 9.11.2.2 277 VAC, I_m = 500A.

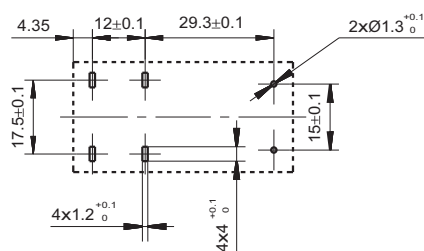
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

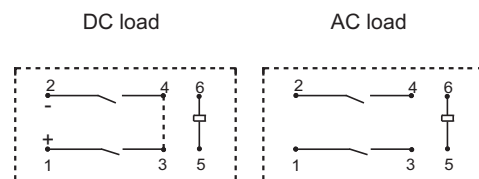
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Notes: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1mm, tolerance should be ±0.2mm; outline dimension > 1mm and ≤ 5mm, tolerance should be ±0.3mm; outline dimension > 5mm, tolerance should be ±0.4mm.
 2) The tolerance without indicating for PCB layout is always ±0.1mm.

Disclaimer

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HF37F

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:40025378



File No.:CQC13002102287



Features

- 30A switching capability
- 70A withstands inrush current
- TV-15 (at 120VAC) available
- 1 Form A configuration

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂ , AgCdO
Contact rating (Res. load)	30A 250VAC
Max. switching voltage	277VAC
Max. switching current	30A
Max. switching power	7500VA
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	1HT, 1H type: 6 x 10 ³ OPS (30A 250VAC, Resistive load, at 40°C, 1s on 9s off)
	1H type: 5 x 10 ⁴ OPS (23A cosφ=1 250VAC, Resistive load, at 70°C, 1.5s on 1.5s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1200VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 70°C
Humidity		5% to 85% RH
Termination		QC
Unit weight		Approx. 55g
Construction		Dust protected

- Notes: 1) The data shown above are initial values.
 2) Please find coil temperature curve in the characteristic curves below.
 3) UL insulation system: Class A

COIL

Coil power	Approx. 1.2W
------------	--------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.50	0.50	6.0	20.8 x (1±10%)
6	4.20	0.60	7.2	30 x (1±10%)
9	6.30	0.90	10.8	67.5 x (1±10%)
12	8.40	1.20	14.4	120 x (1±10%)
24	16.8	2.40	28.8	480 x (1±10%)
48	33.6	4.80	57.6	1920 x (1±10%)
60	42.0	6.00	72.0	3000 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	30A 250VAC 2HP 125VAC/250VAC TV-15 120VAC
	AgCdO	30A 250VAC 2HP 125VAC/250VAC TV-15 120VAC
VDE	AgCdO	23A 250VAC at 70°C

- Notes: 1) All values unspecified are at room temperature.
 2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

Type		HF37F /	012	-1H	T	(XXX)
Coil voltage		5, 6, 9, 12, 24, 48, 60VDC				
Contact arrangement		1H: 1 Form A				
Contact material		T: AgSnO ₂ Nil: AgCdO				
Special code ²⁾		XXX: Customer special requirement		Nil: Standard		

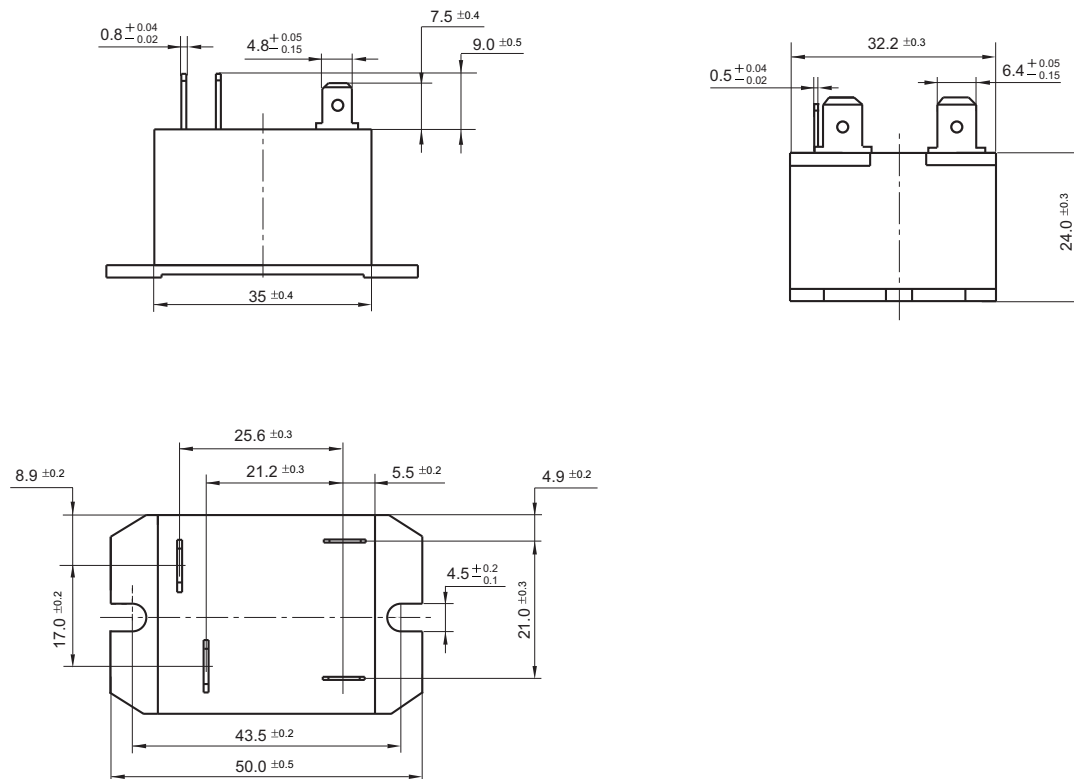
Notes: 1) The terminal for HF37F is QC type. Please don't weld directly on terminal.

2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

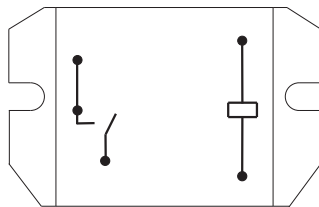
Outline Dimensions



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Top view)



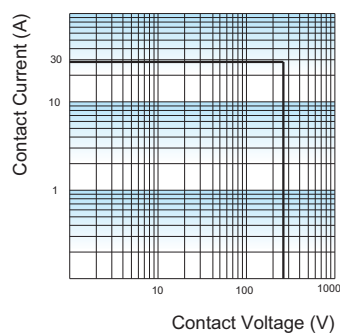
Mounting holes



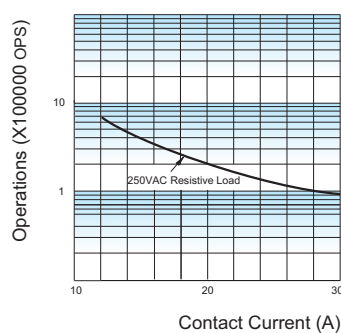
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



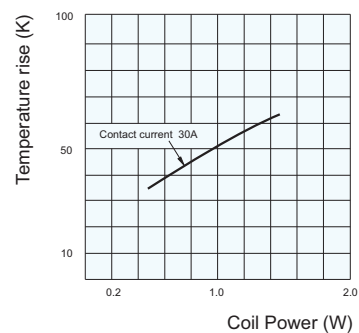
ENDURANCE CURVE



Notes:

- 1) Curve: 1HT type (or 1H type)
- 2) Test conditions: at 70°C , 1s on 9s off.

COIL TEMPERATURE RISE



Disclaimer

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HF178F

MINIATURE HIGH POWER RELAY

c  us

File No.:E133481



File No.: R50440273



File No.:CQC19002230674



Features

- 32A switching capability
- 4kV dielectric strength(between coil and contacts,for type 1 PCB layout)
- Creepage/clearance distance:>5mm(for type 1 PCB layout)
- Flux proofed type

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance ¹⁾	10mΩ max(6VDC 20A)
Contact material	AgSnO ₂
Contact rating(Res. load)	32A 277VAC
Max. switching voltage	277VAC
Max. switching current	32A
Max. switching power	8864VA
Max.continuous current	32A 85°C 25A 105°C
Mechanical endurance	3 x 10 ⁵ OPS
Electrical endurance	1 x 10 ⁴ OPS (32A 250VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	1000VAC 1min
	Between coil & contacts	4000VAC 1min(type1) 2500VAC 1min(type2)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		10ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx.16g
Construction		Flux proofed

Notes: 1)The data shown above are initial values.

COIL

Coil power	Approx.1.67W
Holding voltage	30%~80%U _N (at 23°C) 40%~50%U _N (at 85°C/105°C)

Notes: 1)The coil holding voltage is the voltage value after the rated voltage is applied to the coil for 200ms.
2)To apply higher holding voltage than specified during long time is forbidden to prevent overheating.
3)Apply 100% - 120% of the rated coil voltage for 200ms in order for the relay to operate correctly.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC 2)	Coil Resistance Ω
12	9.6	0.6	13.2	86x (1±10%)
24	19.2	1.2	26.4	345 x (1±10%)
48	38.4	2.4	52.8	1380 x (1±10%)

Notes: 1)The data shown above are initial values.
2)Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL ³⁾	NO:32A 277VAC 85°C NO:35A 277VAC 70°C NO:25A 277VAC 105°C NC:Making8A,Carrying 32A, Breaking 8A,277VAC 85°C
	NO:32A 277VAC 85°C NO:35A 277VAC 70°C NO:25A 277VAC 105°C NC:Making8A,Carrying 32A, Breaking 8A,277VAC 85°C
TÜV	NO:32A 277VAC 85°C NO:35A 277VAC 70°C NO:25A 277VAC 105°C NC:Making8A,Carrying 32A, Breaking 8A,277VAC 85°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.
3) Suitable for overvoltage category III, and shall provide protection for a rated impulse withstand voltage peak of 4 kv.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF178F/	12	-H	1	T	F	(XXX)
Coil voltage	12, 24, 48VDC						
Contact arrangement	H:1 Form A Z:1 Form C						
Construction	1:Type 1 PCB layout 2:Type 2 PCB layout						
Contact material	T: AgSnO ₂						
Insulation standard	F: Class F						
Special code ⁽¹⁾	XXX: Customer special requirement Nil: Standard						

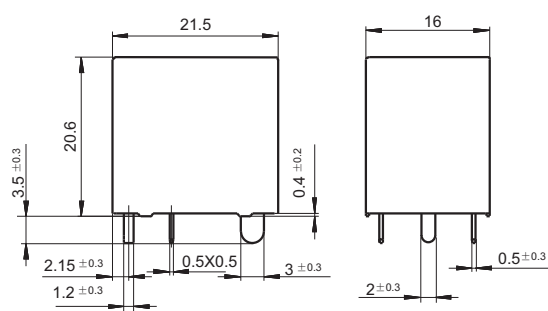
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

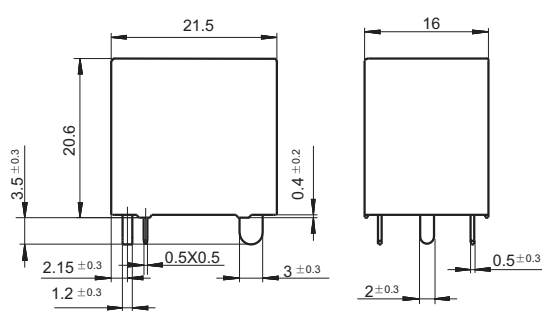
Unit: mm

Outline Dimensions

Type 1 PCB layout

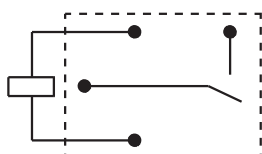


Type 2 PCB layout

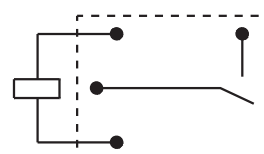


Wiring Diagram (Bottom view)

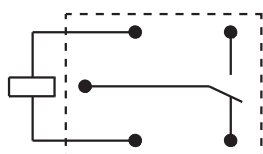
Type 1 PCB layout-1 Form A



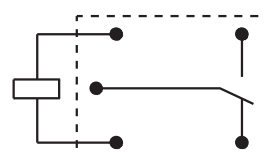
Type 2 PCB layout-1 Form A



Type 1 PCB layout-1 Form C

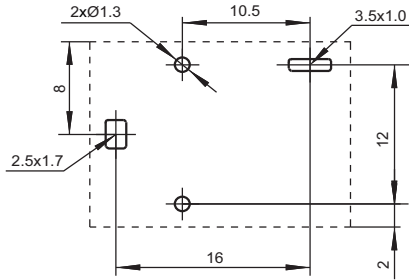


Type 2 PCB layout-1 Form C

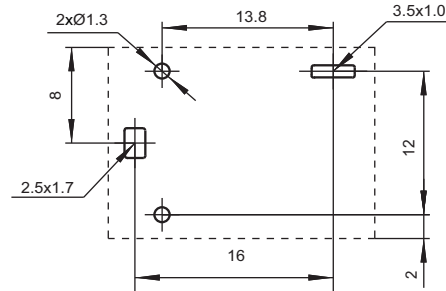


PCB Layout (Bottom view)

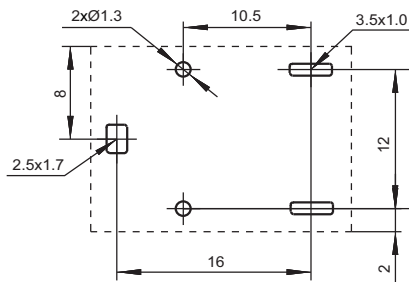
Type 1 PCB layout-1 Form A



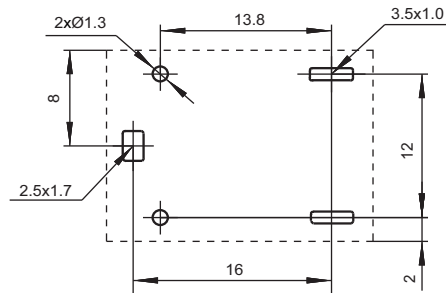
Type 2 PCB layout-1 Form A



Type 1 PCB layout-1 Form C



Type 2 PCB layout-1 Form C



- Notes:** 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF178F-T

MINIATURE HIGH POWER RELAY



File No:E133481



File No:R50440273



File No.:CQC19002230674



Features

- High Temperature:105°C
- 4kV dielectric strength(between coil and contacts,for type 1 PCB layout)
- Creepage/clearance distance:>5mm(for type 1 PCB layout)
- Flux proofed type

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	10mΩ max.(20A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res. load)	32A 277VAC
Max. switching voltage	277VAC
Max. switching current	32A
Max. switching power	8864VA
Mechanical endurance	3 x 10 ⁵ OPS
Electrical endurance	1 x 10 ⁴ OPS (25A 250VAC, Resistive load, at 105°C, 1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MQ (500VDC)
Dielectric strength	Between open contacts	1000VAC 1min
	Between coil & contacts	4000VAC 1min(type1) 2500VAC 1min(type2)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		10ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 16g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Standard type:Approx.1.67W Sensitive type:Approx.1.2W
Holding voltage	30% to 80%U _N (at 23°C) 40% to 45%U _N (at 105°C)

Notes:1)The coil holding voltage is the voltage value after the rated voltage is applied to the coil for 200ms.
2)To apply higher holding voltage than specified during long time is forbidden to prevent overheating.
3)Apply 100% to 120% of the rated coil voltage for 200ms in order for the relay to operate correctly.

COIL DATA

at 23°C

Standard type:

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil Resistance Ω
12	9.6	0.6	13.2	86 x (1±10%)
24	19.2	1.2	26.4	345 x (1±10%)
48	38.4	2.4	52.8	1380 x (1±10%)

Sensitive type:

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil Resistance Ω
12	9.6	0.6	13.2	120 x (1±10%)
24	19.2	1.2	26.4	480 x (1±10%)
48	38.4	2.4	52.8	1920 x (1±10%)

Notes: 1)The data shown above are initial values.

2)Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	32A 277VAC 85°C 35A 277VAC 70°C 25A 277VAC 105°C Making 5A,Carrying 32A, Breaking 5A,277VAC 105°C Sensitive type: Making 5A,Carrying 32A, Breaking 5A,277VAC 105°C
TÜV	32A 277VAC 85°C 35A 277VAC 70°C 25A 277VAC 105°C Making5A,Carrying 32A, Breaking 5A,277VAC 105°C Sensitive type: Making5A,Carrying 32A, Breaking 5A,277VAC 105°C

Notes:1) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.01

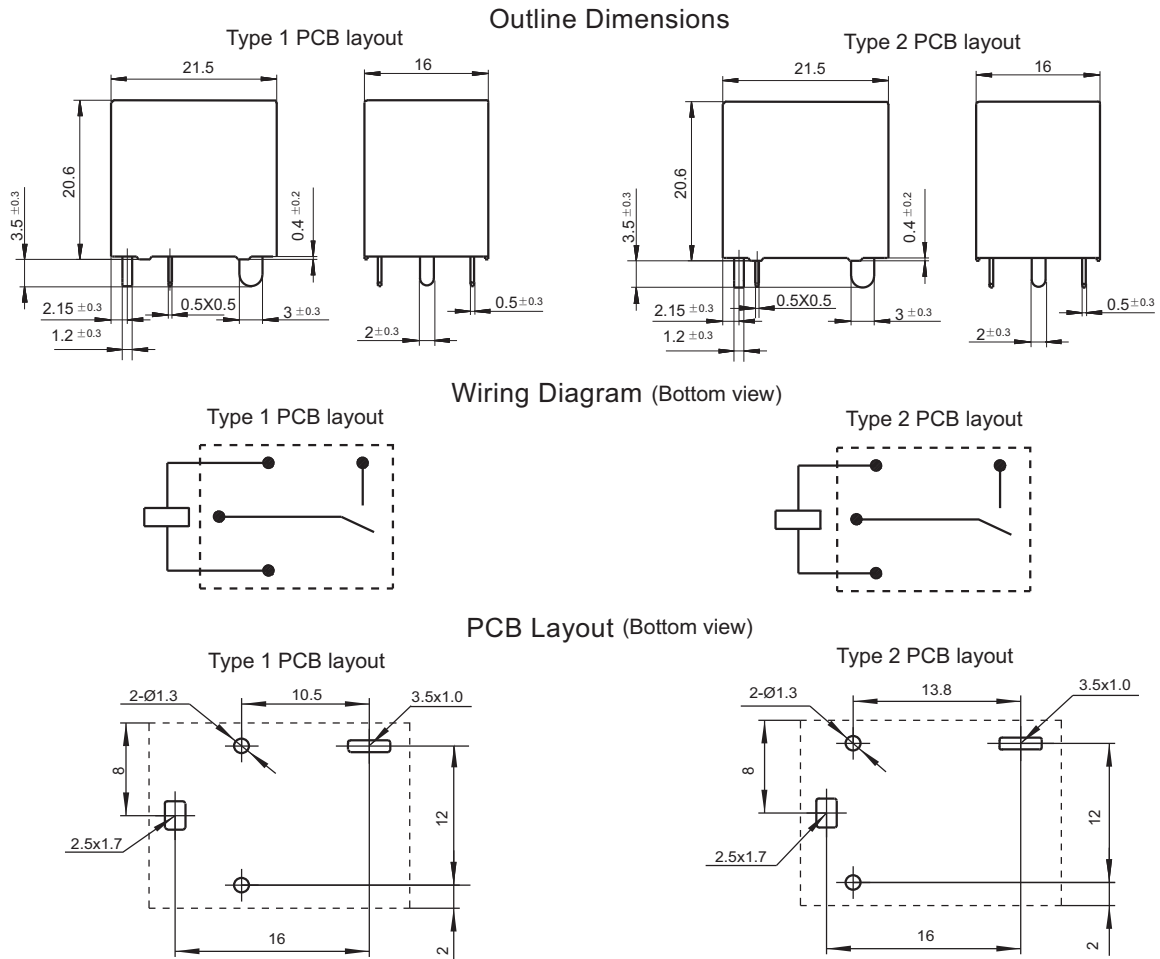
ORDERING INFORMATION

Type	HF178F-T/	12	-H	1	L	T	F	(XXX)
Coil voltage	12, 24, 48VDC							
Contact arrangement	H:1 Form A							
Construction	1:Type 1 PCB layout 2:Type 2 PCB layout							
Coil power	L:Sensitive type(1.2W) Nil: Standard(1.67W)							
Contact material	T: AgSnO ₂							
Insulation standard	F: Class F							
Special code ¹⁾	XXX: Customer special requirement Nil: Standard							

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



Notes: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF179F/HF179F-W MINIATURE HIGH POWER RELAY

cRLUS

File No.:E133481



File No.: R50463696



File No.:CQC20002242160



Features

- 32A switching capability
- Ambient temperature up to 105°C
- 4kV dielectric strength(between coil and contacts,for type 1/3 PCB layout)
- Flux proofed type

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	10mΩ max. (6VDC 20A)
Contact material	AgSnO ₂
Contact rating(Res. load)	Standard type:32A 277VAC Sensitive type:26A 277VAC
Max. switching voltage	600VAC
Max. switching current	Standard type:32A Sensitive type:26A
Max. switching power	Standard type:8864VA Sensitive type:7202VA
Mechanical endurance	1 x 10 ⁵ ops
Electrical endurance	Standard type: 1 x 10 ⁵ ops (NO: 32A 277VAC, Resistive load, 85°C, 1s on 9s off) Sensitive type: 3 x 10 ⁵ ops (NO: 26A 277VAC, Resistive load, 85°C, 1s on 9s off)

Notes: The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open contacts	HF179F:1500VAC 1min HF179F-W:2000VAC 1min
	Between coil & contacts	4000VAC 1min(type1/3) 2500VAC 1min(type2/4)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		10ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx.16g
Construction		Flux proofed

Notes: 1)The data shown above are initial values.

COIL

Coil power	Standard type: Approx.2.8W Sensitive type: Approx.1.67W
Holding voltage	Standard type: 32% to 36%U _N (at 105°C) Sensitive type: 50% to 55%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage value after the rated voltage is applied to the coil for 200ms.
2)To apply higher holding voltage than specified during long time is forbidden to prevent overheating.
3)Apply 100% - 120% of the rated coil voltage for 200ms in order for the relay to operate correctly.

COIL DATA

at 23°C

Standard type:

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
12	9.6	0.6	13.2	51x (1±10%)
24	19.2	1.2	26.4	206 x (1±10%)
48	38.4	2.4	52.8	823 x (1±10%)

Sensitive type:

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
12	9.6	0.6	13.2	86x (1±10%)
24	19.2	1.2	26.4	345 x (1±10%)
48	38.4	2.4	52.8	1380 x (1±10%)

Notes: 1)The data shown above are initial values.
2)Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL ³⁾	Standard type	32A 277VAC 85°C 25A 277VAC 105°C Making 16A, Carrying 32A, Breaking 16A 277VAC 105°C Making 16A, Carrying 32A, Breaking 16A 600VAC 105°C
	Sensitive type	26A 277VAC 85°C
TÜV	Standard type	32A 277VAC 85°C 25A 277VAC 105°C Making 16A, Carrying 32A, Breaking 16A 277VAC 105°C Making 16A, Carrying 32A, Breaking 16A 600VAC 105°C
	Sensitive type	26A 277VAC 85°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.
3) Suitable for overvoltage category III, and shall provide protection for a rated impulse withstand voltage peak of 4 kv.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

	HF179F/	12	-H	1	L	T	F	(XXX)
Type	HF179F:1.8mm contact gap HF179F-W:2.4mm contact gap							
Coil voltage	5, 9, 12, 24, 48VDC							
Contact arrangement	H:1 Form A							
Construction	1:Type 1 PCB layout 2:Type 2 PCB layout 3:Type 3 PCB layout (Only for Sensitive type) 4:Type 4 PCB layout (Only for Sensitive type)							
Coil power	Nil:Standard type(2.8W) L:Sensitive type(1.67W, Only for type3/4)							
Contact material	T: AgSnO ₂							
Insulation standard	F: Class F							
Special code ¹⁾	XXX: Customer special requirement				Nil: Standard			

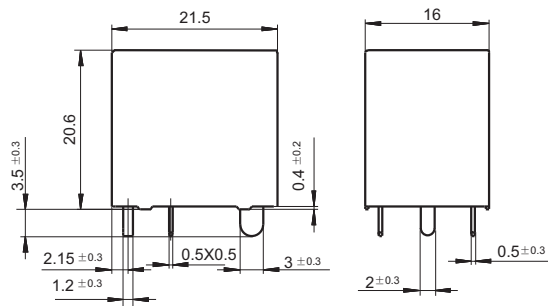
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

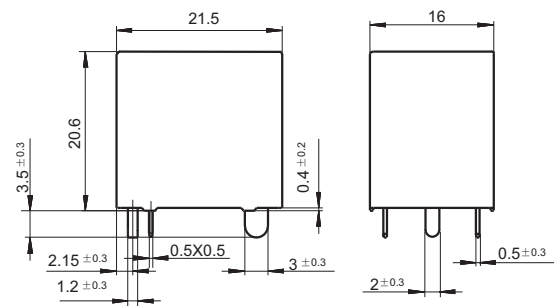
Unit: mm

Outline Dimensions

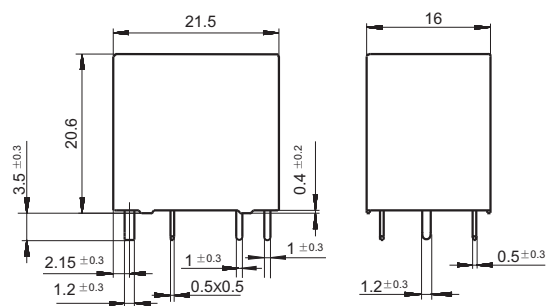
Type 1 PCB layout



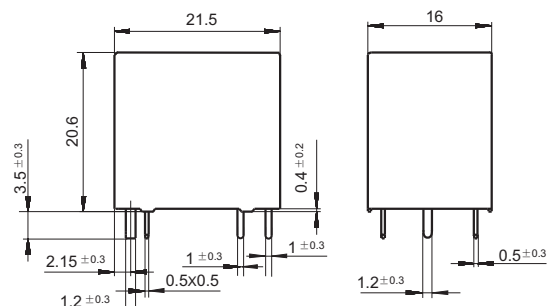
Type 2 PCB layout



Type 3 PCB layout

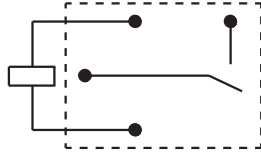


Type 4 PCB layout

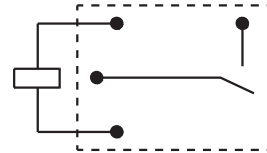


Wiring Diagram(Bottom view)

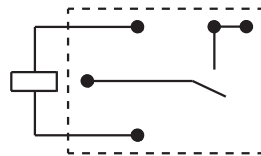
Type 1 PCB layout



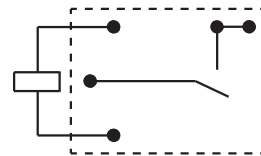
Type 2 PCB layout



Type 3 PCB layout

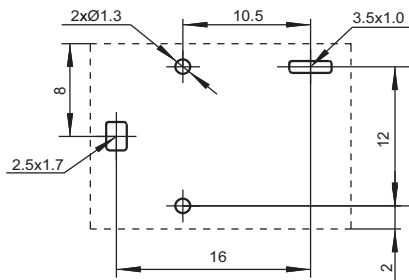


Type 4 PCB layout

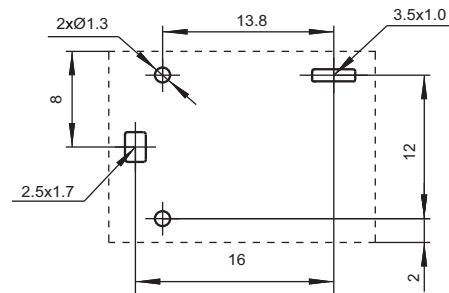


PCB Layout(Bottom view)

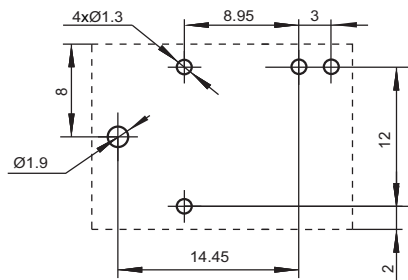
Type 1 PCB layout



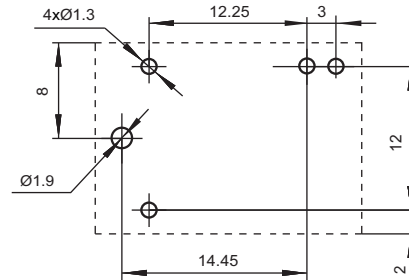
Type 2 PCB layout



Type 3 PCB layout



Type 4 PCB layout



- Notes:** 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF180F

POWER RELAY



File No.: E133481



File No.: R 50430279



File No.: CQC19002213614



Features

- Latching relay, Zero consumption at standby
- 2 Form A+ 2 Form B contact arrangement
- General for ac/dc load
- Supports multiple voltage energize, quick switch between contact sets
- Contact gap $\geq 3\text{mm}$
- Creepage $\geq 4\text{mm}$, Clearance $\geq 3\text{mm}$ (between contact set)

CONTACT DATA

Contact arrangement	2A + 2B
Contact resistance(initial) ¹⁾	15mΩ max. (6VDC 20A)
Contact materia	AgSnO ₂
Contact rating (Res. load)	25A 410VDC/290VAC
Max. switching voltage	410VDC/290VAC
Max. switching current	25A
Max. switching power	10250W/7250VA
Min. Applicable Load	6V 1A
Mechanical endurance	1 x 10 ⁶ ops
Electrical endurance	1 x 10 ⁴ ops (2H/2D: 25A 410VDC/290VAC, Resistive load, 85°C, 5s on 5 off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open contacts	2500VAC 1min
	Between coil & contacts	5000VAC 1min
	Between contact sets	2500VAC 1min
Surge voltage	Between coil & contacts	10kV(1.2 / 50μs)
	Between open contacts	4kV(1.2 / 50μs)
Operate time (at rated. volt.)		20ms max. (8ms max., at 6 times volt)
Release time (at rated. volt.)		20ms max. (8ms max., at 6 times volt)
Vibration resistance		10Hz to 55Hz 3mm DA
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C

Notes: The data shown above are initial values.

COIL

Coil power	Single coil latching: Approx. 2.0W
	Double coils latching: Approx. 4.0W

COIL DATA

23°C

Single coil latching

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Pulse Duration ms	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	4.0	4.0	100	30	12.5 x (1±10%)
9	7.2	7.2	100	54	40.5 x (1±10%)
12	9.6	9.6	100	72	72.0 x (1±10%)
24	19.2	19.2	100	144	288 x (1±10%)

Double coils latching

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Pulse Duration ms	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	4.0	4.0	100	30	6.25 x (1±10%)
9	7.2	7.2	100	54	20.25 x (1±10%)
12	9.6	9.6	100	72	36.0 x (1±10%)
24	19.2	19.2	100	144	144 x (1±10%)

Notes: 1) The data shown above are initial values.

2) *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time($\leq 50\text{s}$).

SAFETY APPROVAL RATINGS

CQC	25A 410VDC/290VAC Resistive at 85°C
UL/CUL	25A 410VDC/290VAC Resistive at 85°C
TÜV (IEC 62368)	25A 410VDC/290VAC Resistive at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 2.00

ORDERING INFORMATION

Type	HF180F/	12	-2HD	L2	T	F	(XXX)
Coil voltage	5, 9, 12, 24VDC						
Contact arrangement	2HD: 2 Form A+ 2 Form B						
Construction ⁽¹⁾⁽²⁾	Nil: Unplastic sealed						
Sort	L1: Single coil latching L2: Double coils latching						
Contact material	T: AgSnO ₂						
Insulation standard	F: Class F						
Special code ³⁾	XXX: Customer special requirement			Nil: Standard			

Notes: 1) The flux proofed relays cannot be used in a polluted environment (containing a certain amount of H₂S, SO₂, NO₂, dust and other pollutants).

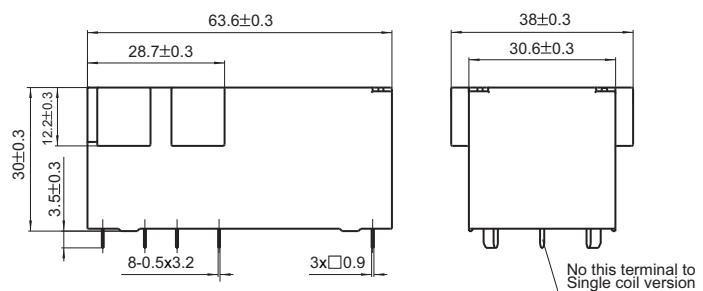
2) After the flux proofed relays are mounted on the PCB and soldered, they cannot be cleaned or surface treated.

3) The customer special requirement express as special code after evaluating by Hongfa.

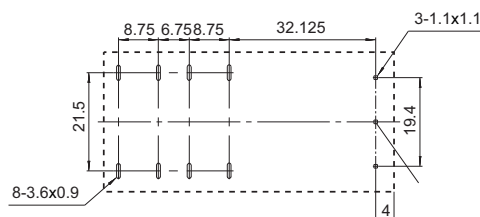
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

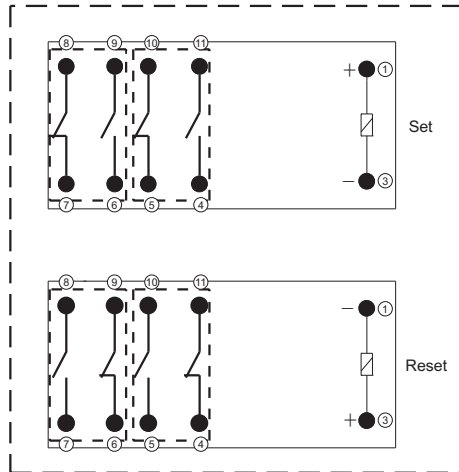


PCB Layout (Bottom view)

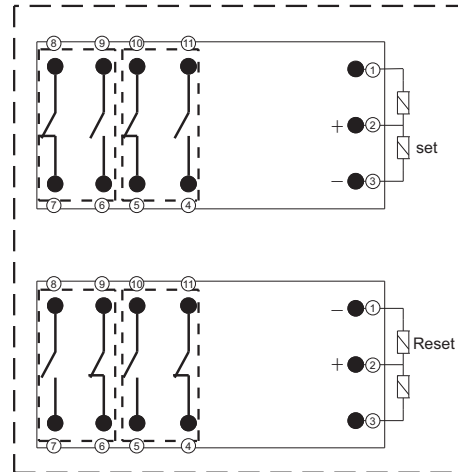


Wiring Diagram (Bottom view)

Single coil latching



Double coils latching



- Remark:1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Notice:

- Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.
- In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than "set" or "reset" time. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
- Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

Disclaimer

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HF181F

MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: R50433434



File No.: CQC19002215718



Features

- 2 form A configurations
- 6.5 mm contact gap
- Withstand 10kV impulse voltage between contacts, contact groups and coil-contact
- 5KV dielectric between open contacts
- Meeting reinforce insulation
- Class F insulation
- Outline Dimensions: (32.6 x 14 x 30.5) mm

CONTACT DATA

Contact arrangement	2A
Contact resistance	100mΩ max (1A 6VDC)
Contact material	AgNi+Au, AgNi
Contact rating (Res. load)	0.1A 250VAC 1A 30VDC
Max. switching voltage	30VDC/277VAC
Max. switching current	1A
Max. switching power	30W/277VA
Mechanical endurance	1 x 10 ⁵ OPS
Electrical endurance	1 x 10 ⁴ OPS (30VDC, 1A, Resistive load, room temp, 1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	5000VAC 1min
	Between contact sets	5000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage	Between open contacts	10kV(1.2 X 50μs)
	Between contact sets	10kV(1.2 X 50μs)
	Between coil & contacts	10kV(1.2 X 50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance*		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 25g
Construction		Plastic sealed Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 4.6W
Holding voltage	40% to 50% U _N (at 25°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC* ²⁾	Coil Resistance Ω
5	3.5	0.25	5	5.6 x (1±10%)
6	4.2	0.30	6	8.0 x (1±10%)
9	6.3	0.45	9	18 x (1±10%)
12	7.2	0.60	12	32 x (1±10%)
15	10.5	0.75	15	50 x (1±10%)
18	12.6	0.90	18	70 x (1±10%)
24	16.8	1.20	24	125 x (1±10%)
36	25.2	1.80	36	280 x (1±10%)
48	33.6	2.40	48	500 x (1±10%)
60	42	3.00	60	800 x (1±10%)
110	77	5.50	110	2660 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Max. Voltage refers to the Max. Voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/TUV	2NO	0.1A 250VAC Resistive 85°C 0.3A 50VAC Resistive 85°C 1.0A 30VAC Resistive 85°C
	0.3A 1500VDC (2 NO series connected)	

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

ORDERING INFORMATION

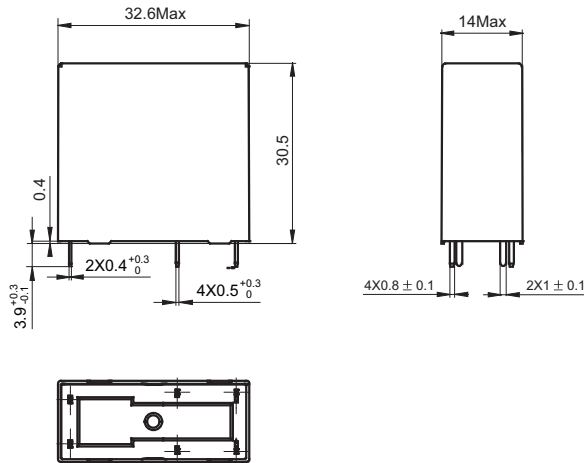
Type	HF181F/	12	-2H	S	3	F	G	(XXX)
Coil voltage	5, 6, 9, 12, 15, 18, 24, 36, 48, 60, 110VDC							
Contact arrangement	2H: 2 Form A							
Construction	S: Plastic sealed Nil: Flux proofed							
Contact material	3: AgNi							
Insulation standard	F: Class F							
Contact plating	G: Gold plated Nil: No gold plated							
Special code ³⁾	XXX: Customer special requirement Nil: Standard							

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

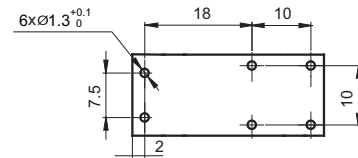
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

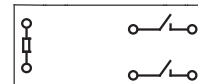
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF165FD

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40043143



File No.: CQC15002130956
CQC18002199524



Features

- 30A switching capability
- Breakdown voltage (between contact and coil): 4kV
- Creepage distance: 5.5mm(high voltage)
- Plastic sealed and flux proofed types available
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A	1B	1C
Contact resistance ¹⁾	100mΩ max. (at 1A 6VDC)		
Contact material	AgSnO ₂		
Contact rating (Res. load)	30A 277VAC	15A 277VAC	20A 277VAC 10A 277VAC
Max. switching voltage	277VAC		
Max. switching current	30A	30A	30A 15A
Max. switching power	8310VA	8310VA	8310VA 4155VA
Mechanical endurance	1 x 10 ⁷ OPS		
Electrical endurance ²⁾	1 x 10 ⁵ OPS (NO: 30A 277VAC, Resistive load, Room temp., 1s on 9s off)		

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between open contacts	1500VAC 1min
	Between coil & contacts	2500VAC 1min(Standard) 4000VAC 1min(V Type)
Surge voltage	6kV (1.2/50μs)	
Operate time (at rated. volt.)	15ms max.	
Release time (at rated. volt.)	10ms max.	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Termination	PCB	
Unit weight	Approx. 25g	
Construction	Plastic sealed Flux proofed	

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 900mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48 ³⁾	36.00	4.8	62.4	2560 x (1±10%)
70 ³⁾	52.50	7.0	91.0	5500 x (1±10%)
110 ³⁾	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

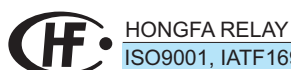
3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	NO	30A 277VAC at 85°C 20A 277VAC at 105°C 2HP 240VAC/1HP 120VAC at 40°C 96LRA 30FLA 277VAC at 40°C TV-8 125VAC at 40°C
	NC	30A 277VAC at 40°C 20A 277VAC at 85°C 15A 277VAC at 40°C
VDE	NO	30A 250VAC at 60°C 20A 250VAC at 85°C
	NC	15A 250VAC at 85°C
	CO	20A/10A 250VAC at 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

Type	HF165FD	/12	-H	Y1	S	T	F	V	(XXX)
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110								
Contact arrangement	H: 1 Form A D: 1 Form B Z: 1 Form C								
Termination	Y1: Without Pin NO.6 Y2: With Pin NO.6								
Construction ¹⁾	S: Plastic sealed Nil: Flux proofed								
Contact material	T: AgSnO ₂								
Insulation standard	F: Class F								
Dielectric strength standard	Nil: Standard product(2500VAC Between coil & contacts) V : High Dielectric strength(Only for Y1 Termination) (4000VAC Between coil & contacts)								
Special code ²⁾	XXX: Customer special requirement Nil: Standard								

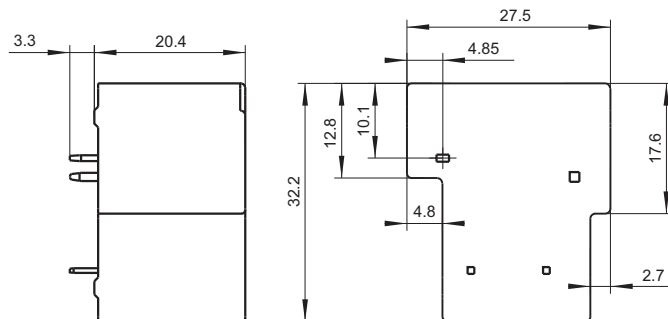
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
2) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

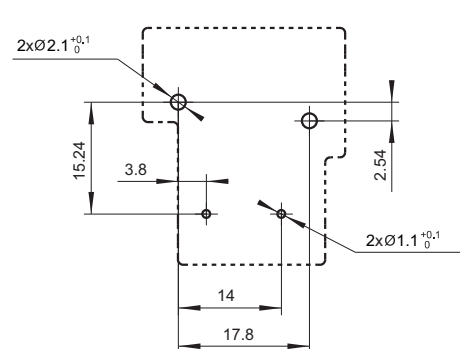
Outline Dimensions

HF165FD/□□-HY1□□□□

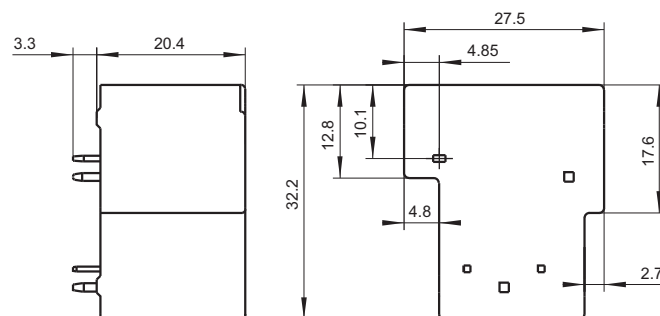


PCB Layout (Bottom view)

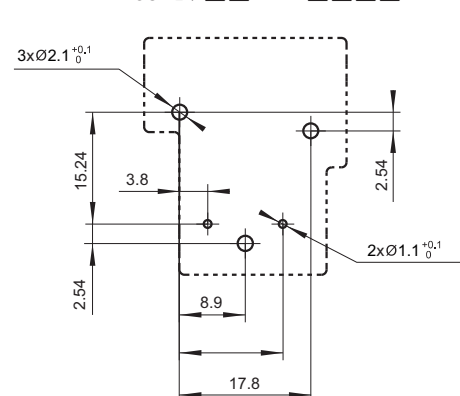
HF165FD/□□-HY1□□□□



HF165FD/□□-HY2□□□□



HF165FD/□□-HY2□□□□

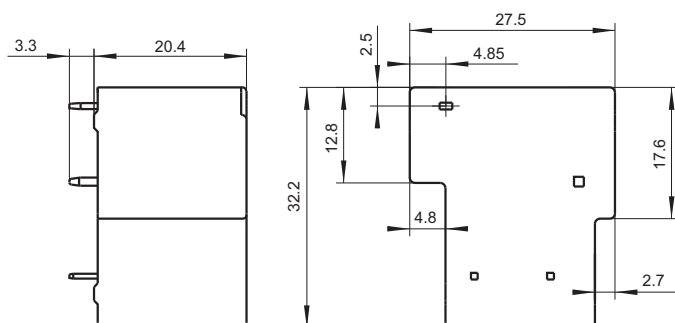


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

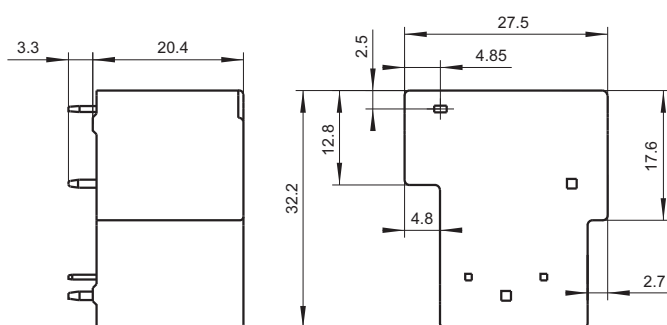
Unit: mm

Outline Dimensions

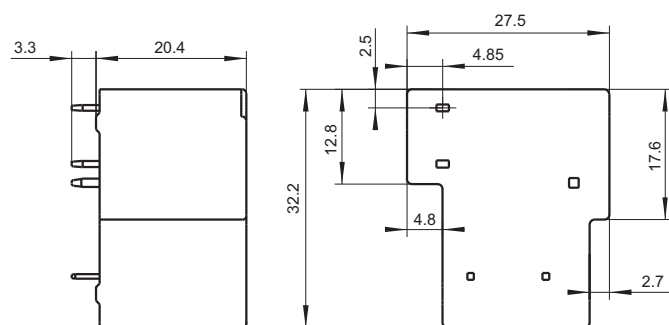
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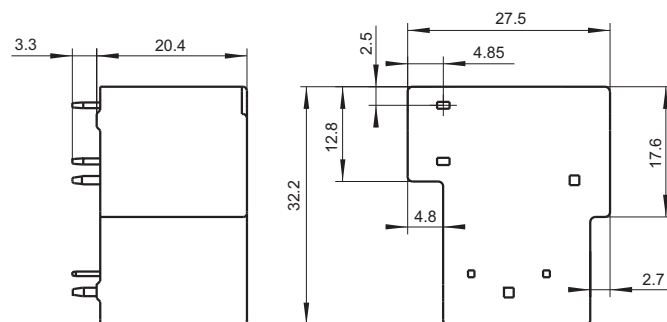
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HF165FD/□□-ZY1□□□□

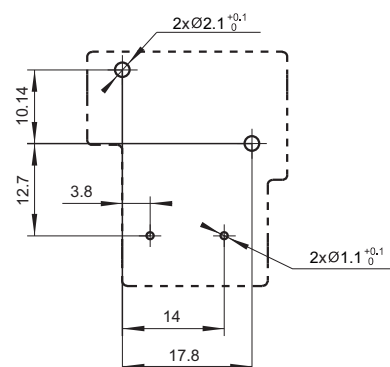


HF165FD/□□-ZY2□□□□

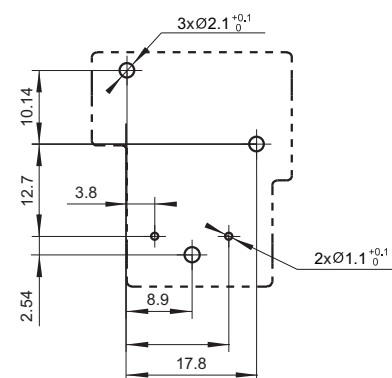


PCB Layout (Bottom view)

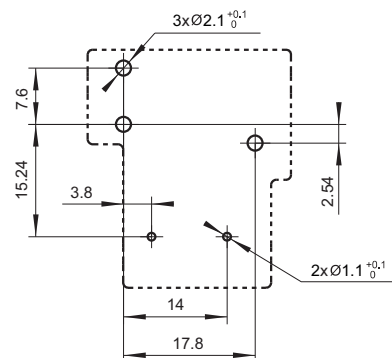
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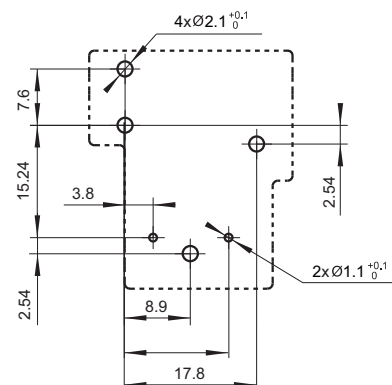
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HF165FD/□□-ZY1□□□□



HF165FD/□□-ZY2□□□□

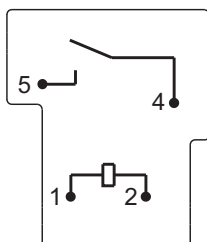


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

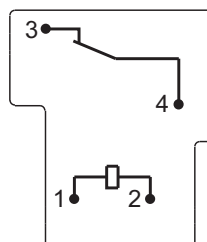
Unit: mm

Wiring Diagram (Bottom view)

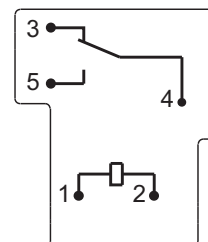
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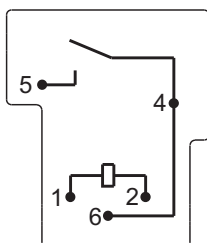
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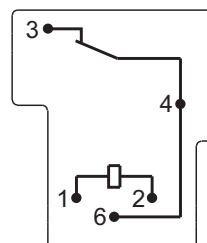
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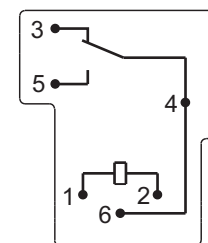
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HF165FD/□□-DY2□□□□



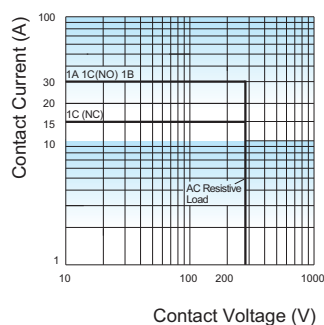
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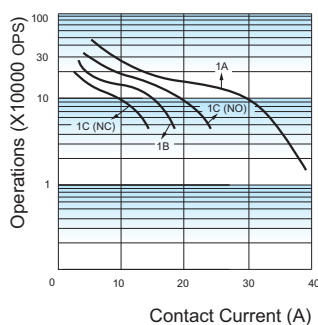
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
 3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

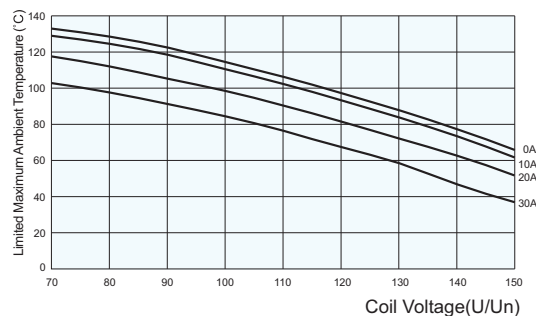
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (AC)



Test conditions:

Flux proofed, Room temp.,
1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF165FD-50

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: R 50526316



File No.: CQC 15002130956



Features

- 50A switching capability
- 4kV dielectric strength (between coil and contacts)
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Outline Dimensions: (32.2×27.5×20.4)mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A	1C
Contact voltage drop ¹⁾	200mV max.(20A 6VDC)	
Contact material	AgSnO ₂	
Contact rating(Res.load)	50A 277VAC	NO: 50A 277VAC NC: Making 10A, Loading 50A, Breaking 10A, 277VAC
Max. Switching voltage	277VAC	
Max. Switching current	50A	50A
Max.continuous current	50A	NO: 50A NC: 50A
Max. Switching power	13850VA	13850VA
Mechanical endurance	1×10 ⁶ OPS	
Electrical endurance ²⁾	1000OPS(NO:50A 277VAC, Resistive load,65°C,1s on 9s off) 1×10 ⁴ OPS(NO:40A 277VAC, Resistive load,85°C,1s on 9s off) 3×10 ⁴ OPS(NC: Making 10A,Loading 50A,Breaking 10A, 277VAC, Resistive load,65°C,1s on 9s off)	

Notes: 1)The data shown above are initial values;
2)For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000 MΩ (500VDC)
Dielectric strength	Between open contacts	1500VAC 1min
	Between coil & contacts	4000VAC 1min
Surge voltage		6kV(1.2/50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx.36g
Construction		Flux proofed,Plastic sealed

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 1.2W
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COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC ¹⁾ max.	Drop-out Voltage VDC ¹⁾ min.	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	20.8×(1±10%)
6	4.50	0.6	7.8	30×(1±10%)
9	6.75	0.9	11.7	67.5×(1±10%)
12	9.00	1.2	15.6	120×(1±10%)
15	11.25	1.5	19.5	187.5×(1±10%)
18	13.5	1.8	23.4	270×(1±10%)
24	18.00	2.4	31.2	480×(1±10%)
48 ³⁾	36.00	4.8	62.4	1920×(1±10%)

Notes: 1)The data shown above are initial values;
2)Maximum voltage is refers to the relay coil in a short period of time can bear the biggest voltage values;
3)For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	NO	50A 277VAC 65°C 40A 277VAC 85°C
	NC	Making 10A,loading 50A,breaking 10A, 277VAC 65°C
TUV	NO	50A 277VAC 65°C 40A 277VAC 85°C
	NC	Making 10A,loading 50A,breaking 10A, 277VAC 65°C

Notes: 1)All values unspecified are at room temperature;
2)Only some typical rating are listed above.If more details are required,please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF165FD-50/	12	-H	S	T	F	V	(XXX)
Coil voltage	5,6,9,12,15,18,24,48VDC							
Contact arrangement	H: 1 Form A Z: 1 Form C							
Construction	S: Plastic sealed Nil: Flux proofed							
Contact material	T: AgSnO ₂							
Insulation standard	F: Class F							
Dielectric strength standard	V: High Dielectric strength							
Special code	XXX: Customer special requirement Nil: Standard type							

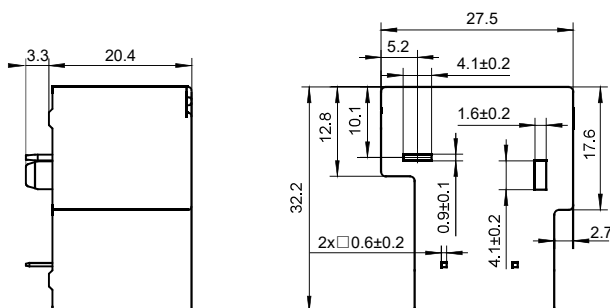
Notes: 1) We recommend flux proofed types for a clean environment(free from contaminations like H₂S, SO₂, NO₂, dust,etc.).
 We suggest to choose plastic sealed types and validate it in real application for an unclean environment(with contaminations like H₂S, SO₂, NO₂, dust,etc.).
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

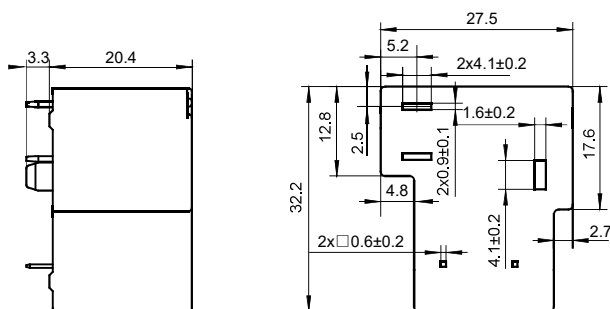
Unit: mm

Outline Dimensions

HF165FD-50/□□-H□□□□

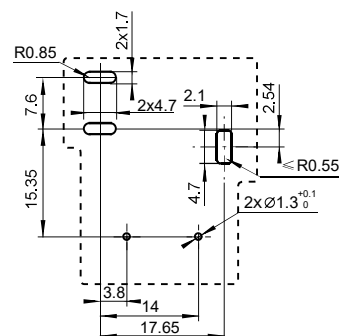
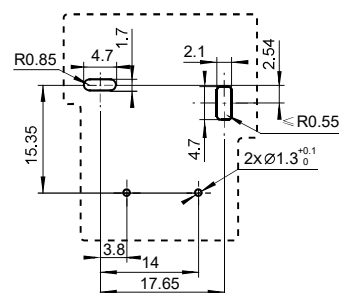


HF165FD-50/□□-Z□□□□



PCB Layout

(Bottom view)



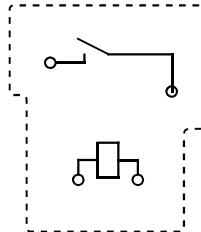
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

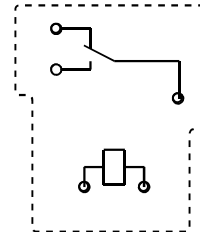
Wiring Diagram

(Bottom view)

HF165FD-50/□□-H□□□□



HF165FD-50/□□-Z□□□□



- Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF165FD-G

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: 40043143



File No.: CQC15002130956
CQC18002199524



Features

- 40A switching capability
- Breakdown voltage (between contact and coil): 4kV
- Creepage distance: 5.5mm(high voltage)
- Plastic sealed and flux proofed types available
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	100mΩ max. (at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	40A 277VAC
Max. switching voltage	277VAC
Max. switching current	40A
Max. continuous current ²⁾	30A
Max. switching power	11080VA
Mechanical endurance	1 x 10 ⁷ OPS
Electrical endurance ³⁾	1 x 10 ⁴ OPS (NO: 40A 277VAC, Resistive load, Room temp., 1s on 9s off, Flux proofed)

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited
3) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	1500VAC 1min
	Between coil & contacts	2500VAC 1min(Standard)
		4000VAC 1min(V Type)
Surge voltage		6kV (1.2/50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		10ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 25g
Construction		Plastic sealed Flux proofed

Notes: 1) The data shown above are initial values.
2) Avoid close arrangement and installation of relays and relays, relays and other heating components

COIL

Coil power	Approx. 900mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48 ³⁾	36.00	4.8	62.4	2560 x (1±10%)
70 ³⁾	52.50	7.0	91.0	5500 x (1±10%)
110 ³⁾	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

SAFETY APPROVAL RATINGS

UL/CUL	NO	40A 277VAC 40°C 30A 277VAC 85°C 2HP 240VAC/1HP 120VAC 40°C 96LRA, 30FLA 40°C TV-8 125VAC 40°C
		40A 250VAC
VDE	NO	

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

	HF165FD-G		/12	-H	Y1	S	T	F	V	(XXX)
Type										
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110									
Contact arrangement	H: 1 Form A									
Termination	Y1: Without Pin NO.6		Y2: With Pin NO.6							
Construction ¹⁾	S: Plastic sealed		Nil: Flux proofed							
Contact material	T: AgSnO ₂									
Insulation standard	F: Class F									
Dielectric strength standard	Nil: Standard product(2500VAC Between coil & contacts) V : High Dielectric strength(Only for Y1 Termination) (4000VAC Between coil & contacts)									
Special code ²⁾	XXX: Customer special requirement		Nil: Standard							

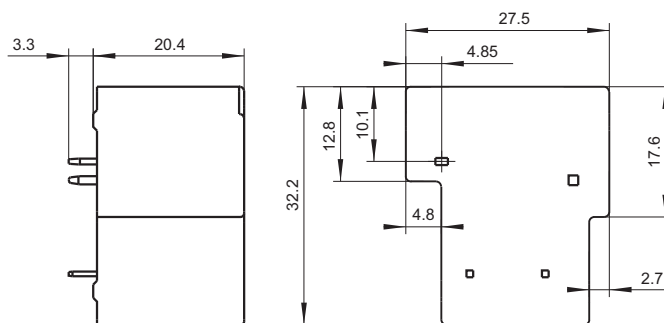
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
2) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

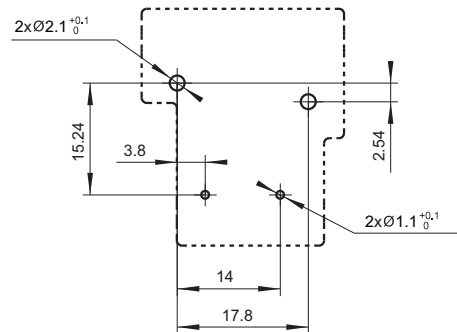
Outline Dimensions

HF165FD-G/□□-HY1□□□□

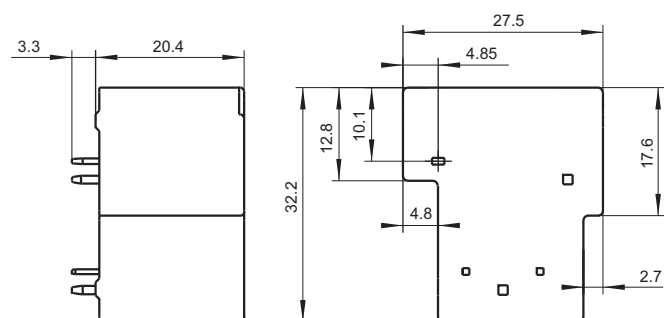


PCB Layout (Bottom view)

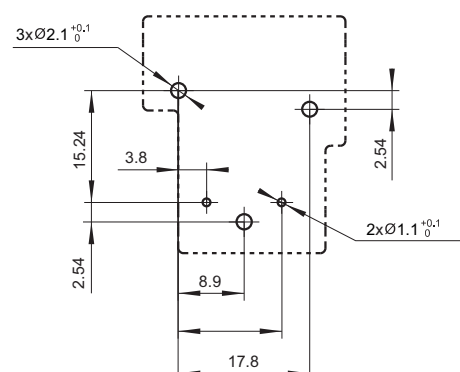
HF165FD-G/□□-HY1□□□□



HF165FD-G/□□-HY2□□□□



HF165FD-G/□□-HY2□□□□

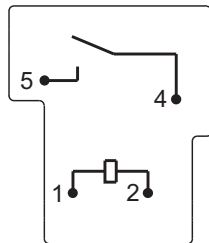


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

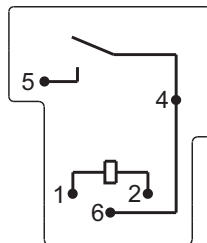
Unit: mm

Wiring Diagram (Bottom view)

HF165FD-G/□□-HY1□□□□



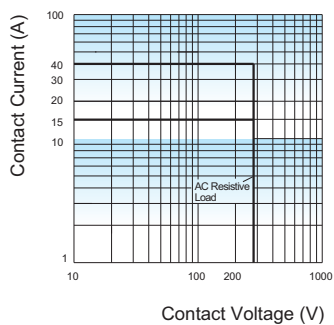
HF165FD-G/□□-HY2□□□□



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Disclaimer

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HF165F

SOLAR RELAY



File No:E134517



File No:40037289



File No:R 50463438



File No:CQC18002189685
CQC18002202621



Features

- 35A switching capitable.
- Applicable to inverter used for photovoltaic power generation systems.
- Ideal for UPS.
- 1.8mm contact gap(compliant to European Photovoltaic Standard VDE0126).
- Product in accordance to IEC 60335 available.
- Low coil holding voltage contributes to saving energy of equipment.
- UL insulation system: class F.

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Voltage drop	Typ.: 15mV(at 10A) Max.: 100mV(at 10A)
Contact material	AgSnO ₂
Contact rating (Res. load)	Resistive: 35A 250VAC Inductive: 35A 277VAC (cosφ=0.8) 1s:9s
Max. switching voltage	277VAC
Max. switching current ¹⁾	35A
Max. switching power	9695VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	3 x 10 ⁴ OPS (35A 250VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1)The relay connections and wiring have to be designed with an adequate cross sections to ensure the current flow and heat dissipation.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2500VAC 1min
Surge voltage (between coil & contacts)		6kV (1.2/50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		70K max.(Contact load current 43A, 50% of rated voltage excitation, at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx.36g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx.2.25W
Holding voltage	40% to 110%U _N (at 23°C) 50% to 70%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC ¹⁾	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.35	5.5	11.1 x (1±10%)
12	9	0.84	13.2	64 x (1±10%)
24	18	1.68	26.4	256 x (1±10%)
48	36	3.36	52.8	1024 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	35A 277VAC/250VAC general use 3 x 10 ⁴ OPS 85°C
VDE	35A 250VAC 3 x 10 ⁴ OPS 85°C
TUV	43A 277VAC/250VAC 85°C Making 10A Carrying 43A Breaking10A 85°C
CQC	40A 277VAC/250VAC 60°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.01

ORDERING INFORMATION

	HF165F /	12	-H	T	(XXX)
Type					
Coil voltage	5, 12, 24, 48VDC				
Contact arrangement	H:1 Form A				
Contact material	T: AgSnO ₂				
Special code ³⁾	XXX: Customer special requirement		Nil: Standard		

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

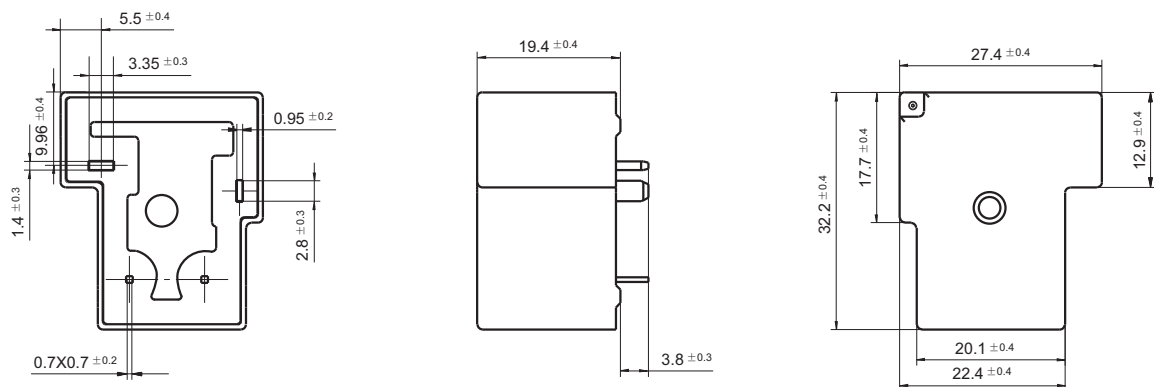
2) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

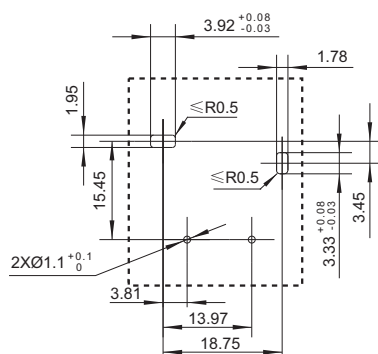
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

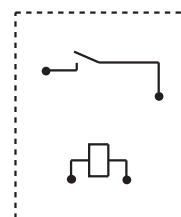
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram

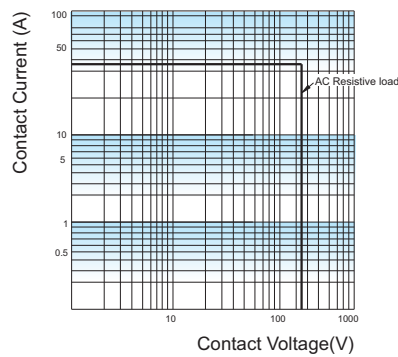


Notes: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

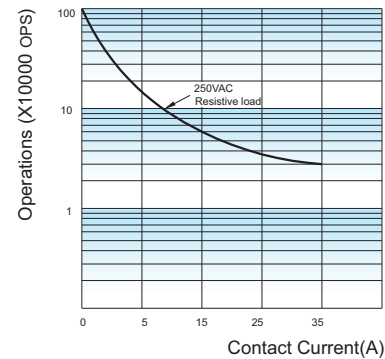
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:
Resistive load, 250VAC,
Flux proofed, at 85°C, 1s on 9s off

Disclaimer
The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

HF165F-50

MINIATURE HIGH POWER RELAY

c **us**

File No:E134517



File No:R 50463438



File No:CQC18002189685



Features

- 50A switching capability.
- 4kV dielectric strength(between coil and contacts).
- UL insulation system: class F available.

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Voltage drop ¹⁾	100mV max.(at 10A 13.5VDC)
Contact material	AgSnO ₂ /AgNi
Contact rating (Res. load)	50A 250VAC
Max. switching voltage	250VAC
Max. switching current ²⁾	50A
Max. switching power	12500VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	1x10 ⁴ OPS(50A 250VAC, Resistive load, at 65°C, 1s on 9s off,AgNi/AgSnO ₂) 3x10 ⁴ OPS(40A 250VAC, Resistive load, at 85°C, 1s on 9s off,AgSnO ₂)

Notes: 1)The data shown above are initial values.

2)The relay connections and wiring have to be designed with an adequate cross sections to ensure the current flow and heat dissipation.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1500VAC 1min
Surge voltage (between coil & contacts)		6kV (1.2/50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		90K max.(Contact load current 50A, rated voltage excitation, at 65°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 105°C
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx.36g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Standard type: Approx.1.2W Sensitive type: Approx.0.9W
------------	---

COIL DATA

at 23°C

Standard type

Nominal Voltage VDC ¹⁾	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.5	6.5	20.8 x (1±10%)
6	4.5	0.6	7.8	30 x (1±10%)
12	9	1.2	15.6	120 x (1±10%)
24	18	2.4	31.2	480 x (1±10%)
48	36	4.8	62.4	1920 x (1±10%)

Sensitive type

Nominal Voltage VDC ¹⁾	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.5	6.5	27.8 x (1±10%)
6	4.5	0.6	7.8	40 x (1±10%)
12	9	1.2	15.6	160 x (1±10%)
24	18	2.4	31.2	640 x (1±10%)
48	36	4.8	62.4	2560 x (1±10%)

Notes: 1)The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL TUV	Standard type	Resistance load 50A 250VAC 65°C (AgNi/AgSnO ₂) Resistance load 40A 250VAC 85°C (AgSnO ₂) Resistance load 32A 250VAC 105°C (AgSnO ₂) Resistance load Making 20A Carrying 60A Breaking 20A 60°C (AgSnO ₂) Resistance load 24VDC 30A 85°C (AgSnO ₂)
	Sensitive type	Resistance load Making 60A Breaking 20A 400VAC 85°C (AgSnO ₂)
CQC	Standard type	32A 277VAC 105°C (AgNi/AgSnO ₂)
	Sensitive type	Resistance load Making 60A Breaking 20A 400VAC 85°C (AgSnO ₂)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF165F-50 /	12	-H	L	T	(XXX)
Coil voltage	5, 6, 12, 24, 48VDC					
Contact arrangement	H: 1 Form A					
Coil power	H: Standard L: Sensitive					
Contact material	T: AgSnO ₂ 3: AgNi					
Special code ³⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

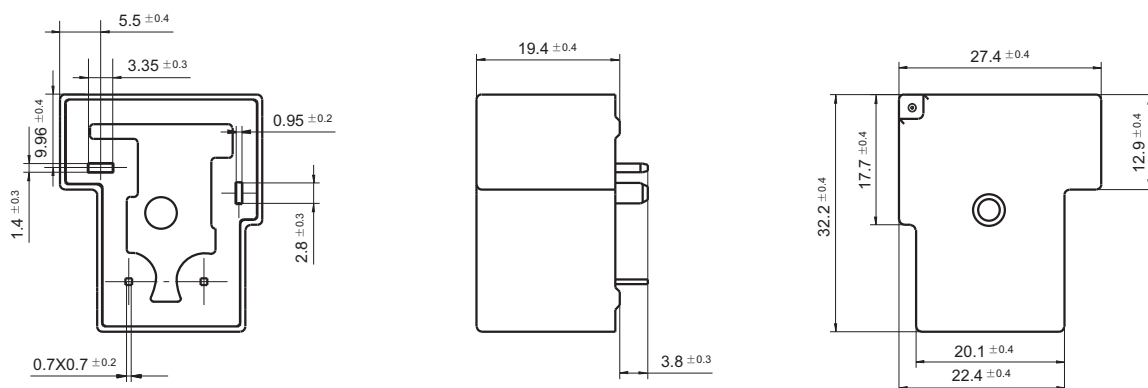
2) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

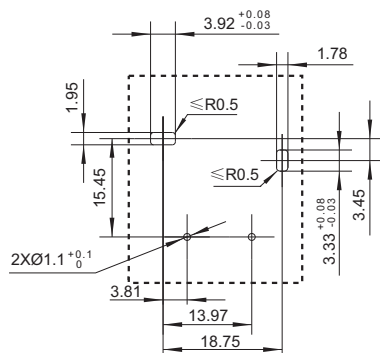
Outline Dimensions



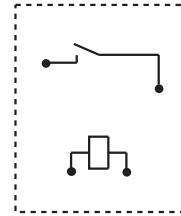
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout (Bottom view)



Wiring Diagram



- Notes:** 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF170F

SOLAR RELAY



File No.: E133481



File No.: R 50384178



File No.: CQC17002175164
: CQC18002198581



Features

- 2 Main contact +1 Auxiliary contact
- Detection of main contact welding makes it possible to construct a safety circuit (according to IEC 61810-3)
- Contact gap: 3.6mm(Main contact)
1.0mm(Auxiliary contact)
- Auxiliary contact: Min.0.5mm. (When Main contact welded)
- Applicable to solar photovoltaic inverter、AC charging station
- Low coil holding voltage contributes to saving energy of equipment
- 40A switching capability
- Mirror contact mechanisms (Compliant with EN60947-4-1 mirror contact)
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	2A	2A1B
Contact resistance (initial)	Main contact	10mΩ max.(6VDC 20A)
	Auxiliary contact	100mΩ max.(6VDC 1A)
Contact material	Main contact	AgNi,AgSnO2
	Auxiliary contact	AgNi
Contact rating (Resistive)	Main contact	40A 277VAC
	Auxiliary contact	1A 277VAC/30VDC
Max. switching voltage	Main contact	480VAC
	Auxiliary contact	277VAC,30VDC
Max. switching current	Main contact	40A
	Auxiliary contact	1A
Max. switching power	Main contact	11080VA
	Auxiliary contact	277VA/30W
Min. switching load ²⁾ (Auxiliary contact)		NC: 100mA 12VDC NC(Gold plated): 10mA 12VDC
Mechanical endurance		1 x 10 ⁵ ops
Electrical endurance	1NO: 35A 277VAC, Resistive load, 85°C, 1s on 9s off, 3 x 10 ⁴ ops 1NO: 40A 277VAC, Resistive load, 85°C, 1s on 9s off, 1 x 10 ⁴ ops 2NO: Making 10A Loading 40A Breaking 10A 277VAC, Resistive load, 85°C, 1s on 9s off, 5 x 10 ⁴ ops	
	NC: 1A 277VAC/30VDC, Resistive load, 85°C, 1s on 9s off, 10 x 10 ⁴ ops	

Notes: 1) The data shown above are initial values.
2) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max	Drop-out Voltage VDC min	Max. Voltage VDC *	Coil Resistance Ω
6	4.5	0.3	6.6	19.1 x (1±10%)
9	6.75	0.45	9.9	43.1 x (1±10%)
12	9	0.6	13.2	76.6 x (1±10%)
24	18	1.2	26.4	306.4 x (1±10%)
48	36	2.4	52.8	1225.5 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Contact arrangement	2A	2A1B
Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open main contacts	2000VAC 1min
	Between main contact and Auxiliary contact	5000VAC 1min
	Between main contacts sets	2000VAC 1min
	Between coil and Main contacts	5000VAC 1min
	Between coil and Auxiliary contacts	2000VAC 1min
	Between open Auxiliary contacts	1000VAC 1min
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 40A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 60% rated voltage, at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 66g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 1.88W
Holding voltage	30% to 110% U _N (at 25°C) 40% to 60% U _N (at 85°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL	NO	AgSnO ₂	35A 277VAC Resistive 85°C
		AgNi	40A 277VAC Resistive 85°C
			Making 10A Loading 40A Breaking 10A, 277VAC Resistive 85°C
	NC	AgNi	1A 277VAC/30VDC Resistive 85°C
TÜV	NO	AgSnO ₂	35A 277VAC Resistive 85°C
		AgNi	40A 277VAC Resistive 85°C
			Making 10A Loading 40A Breaking 10A, 277VAC Resistive 85°C
	NC	AgNi	1A 277VAC/30VDC Resistive 85°C
CQC	NO	AgSnO ₂	35A 277VAC Resistive 85°C
		AgNi	40A 277VAC Resistive 85°C
			Making 10A Loading 40A Breaking 10A, 277VAC Resistive 85°C
	NC	AgNi	1A 277VAC/30VDC Resistive 85°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF170F/	12	-2H	1D	T	F	(XXX)
Coil voltage	6, 9, 12, 24, 48VDC						
Main contact arrangement	2H: 2 Form A						
Auxiliary contact arrangement	Nil: Standard 1D: 1 Form B						
Main contact material	Nil: AgNi T: AgSnO ₂						
Insulation standard	F: Class F						
Special code ³⁾	XXX: Customer special requirement Nil: Standard 991: Auxiliary contact gold plated						

Notes: 1) Flux-proofed relays should not be used in the polluted environment (containing certain amount of H₂S, SO₂, NO₂, dust and other pollutants)

2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

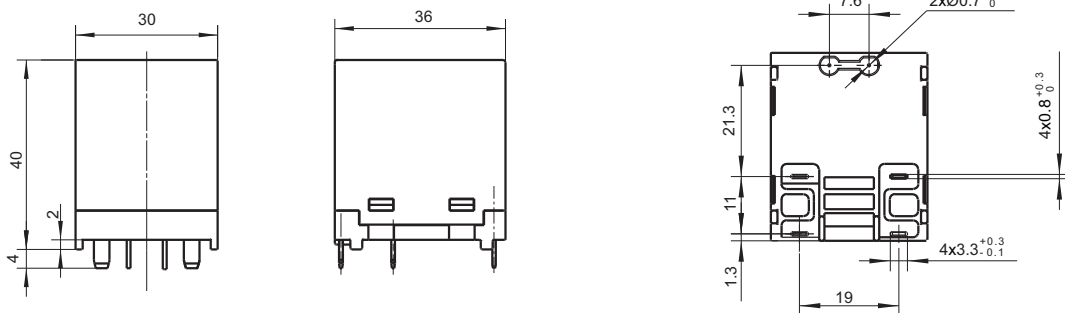
4) If you need double cutting with zero line firing line, please contact Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

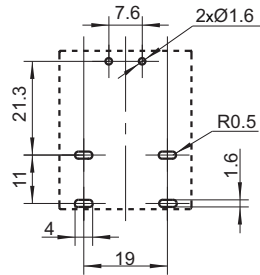
Unit: mm

Outline Dimensions

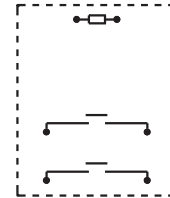
2H:



PCB Layout
(Bottom view)

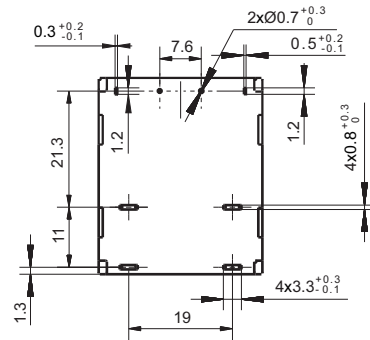
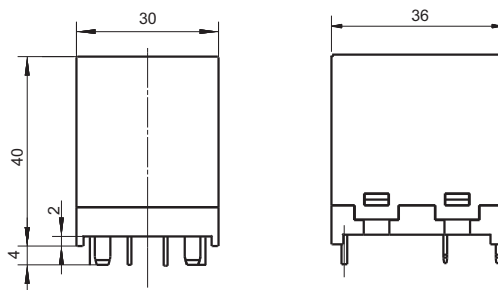


Wiring Diagram
(Bottom view)

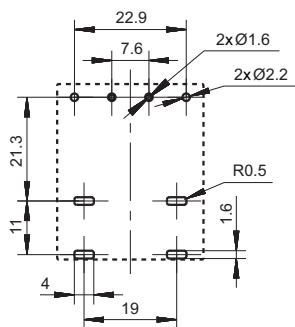


Outline Dimensions

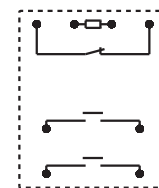
2H1D(with Auxiliary contact) :



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF187F

MINIATURE HIGH POWER RELAY



File No.:E133481



File No.:R 50506590



File No.:CQC 21002324800



Features

- 4 Main contacts +1 Auxiliary contact
- Detection of main contact welding makes it possible to construct a safety circuit (according to IEC 61810-3)
- Meet the requirements for auxiliary contact linked with power contact (mirror contact) (according to IEC 60947-4-1)
- Contact gap: 3.9mm (Main contact), each contact
- Low coil holding voltage contributes to energy saving
- Special version fully compliant to the short circuit current test of IEC 62955 available
- Outline dimensions: (59×35×47)mm

RoHS compliant

CONTACT DATA

Contact arrangement		4A/4A+1B
Contact resistance (initial)	Main contact	10mΩ max(at 6VDC 20A)
	Auxiliary contact	100mΩ max(at 6VDC 1A)
Contact material		Main contact: AgSnO ₂ Auxiliary contact: AgNi
Contact rating (resistance)	Main contact	40A 440VAC
	Auxiliary contact	1A 277VAC, 1A 30VDC
Max. switching voltage	Main contact	440VAC
	Auxiliary contact	277V AC, 30VDC
Max. switching current		Main contact:40A Auxiliary contact:1A
Max. switching power		Main contact:17600VA Auxiliary contact:277VA/30W
Min. switching load ²⁾ (Auxiliary contact)		NC: 100mA 12VDC NC(Gold plated): 10mA 12VDC
Mechanical endurance		1×10 ⁵ ops
Electrical endurance		NO: Making 10A Loading 40A Breaking 10A,440VAC, Resistive load, 85°C, 5×10 ⁴ ops NC:1A 125VAC/30VDC, Resistive load, 85°C, 1s on 9s off,1×10 ⁴ ops

Notes:1) The data shown above are initial values.

2) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

COIL

Coil power	Approx.4.8W
Holding voltage	35% to 80%U _N (at 23°C) 40% to 60%U _N (at 85°C)

Notes:1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning,the coil can not be consistently applied with voltage higher than maximum holding voltage.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC ¹⁾	Coil Resistance Ω
9	6.75	0.45	9.9	16.9×(1±10%)
12	9	0.6	13.2	30×(1±10%)
24	18	1.2	26.4	120×(1±10%)
48	36	2.4	52.8	480×(1±10%)

Notes:1) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open Main contacts	2000VAC 1min
	Between Main contact & Auxiliary contact	5000VAC 1min
	Between Main contact sets	3500VAC 1min
	Between coil & Auxiliary contacts	2000VAC 1min
	Between coil & Main contacts	5000VAC 1min
	Between open Auxiliary contacts	1000VAC 1min
Operate time (at nomi. volt.)		40ms max.
Release time (at nomi. volt.)		20ms max.
Temperature rise		70K max. (Contact load current 40A, Applied voltage of coil 100% rated voltage for 100 ms then reduce to 60% rated voltage for holding,at 85°C)
Shock resistance	Functional	Main contact:98m/s ²
	Destructive	980m/s ²
Vibration resistance		Main contact:10Hz to 55Hz 1.0mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 200g
Construction		Flux proofed

SAFETY APPROVAL RATINGS

UL/CUL	NO: Making 10A Loading 40A Breaking 10 A,440VAC NC: 1A 125VAC/30VDC Resistive 85°C
TUV	NO: Making 10A Loading 40A Breaking 10 A,440VAC NO: 32A 440VAC Resistive 85°C NC:1A 277VAC/30VDC Resistive 85°C 32A 440VAC 85°C
CQC	NO: Making 10A Loading 40A Breaking 10A,440VAC NC:1A 277VAC/30VDC Resistive 85°C

Notes:1) All values unspecified are at room temperature.

2) Only some typical rating are listed above.If more details are required,please contact us.



HONGFA RELAY

ISO9001,IATF16949,ISO14001,ISO45001,IECQ QC 080000 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF187F/	12	-4H	B	T	F	(XXX)
Coil voltage	9,12,24,48 VDC						
Main contact arrangement	4H: 4 Form A						
Auxiliary contact arrangement	B: 1 Form B Nil: Without auxiliary contact						
Main contact material	T: AgSnO ₂						
Insulation class	F: Class F						
Special code	XXX: Customer special requirement; Nil: Standard ⁴⁾ 955: Fully compliant to the short circuit current test of IEC 62955 ⁵⁾ 991: Auxiliary contact gold plated						

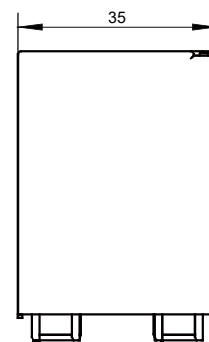
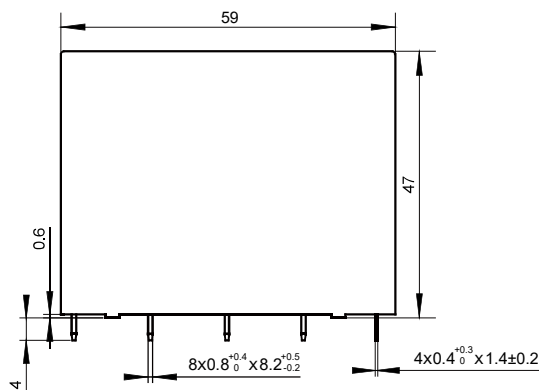
Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.
 4) Short circuit capability: $I_p \geq 2.6\text{kA}$, $I^2t \geq 6.5\text{kA}^2\text{s}$ (compliant to IEC 62955 9.11.2.3 a))
 5) Test Sequence E: 9.11.2.3 a) 440VAC, $I_p \geq 2.6\text{kA}$, $I^2t \geq 6.5\text{kA}^2\text{s}$ ($I_n \leq 32\text{A}$, $I_{nc} = 10\text{kA}$) + 9.11.2.2 440VAC, $I_m = 500\text{A}$.
 Test Sequence F: 9.11.2.3 b) 440VAC, $I_m = 500\text{A}$ + 9.11.2.3 c) 440VAC, $I_p \geq 2.6\text{kA}$, $I^2t \geq 6.5\text{kA}^2\text{s}$ ($I_n \leq 32\text{A}$, $I_{\Delta c} = 10\text{kA}$)

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

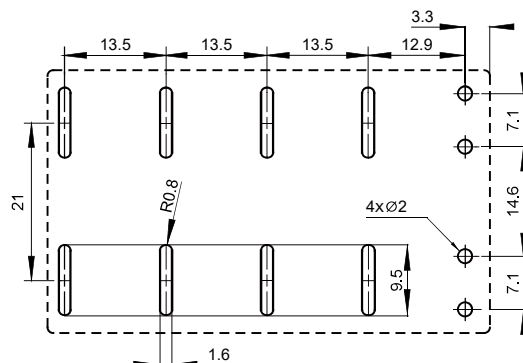
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4HB

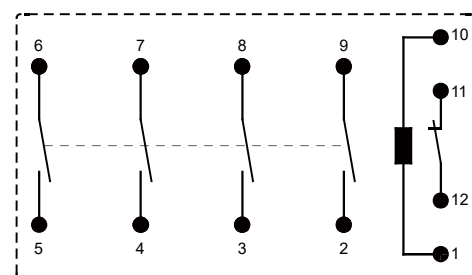
Outline Dimensions



PCB Layout(Bottom view)



Wiring Diagram(Bottom view)

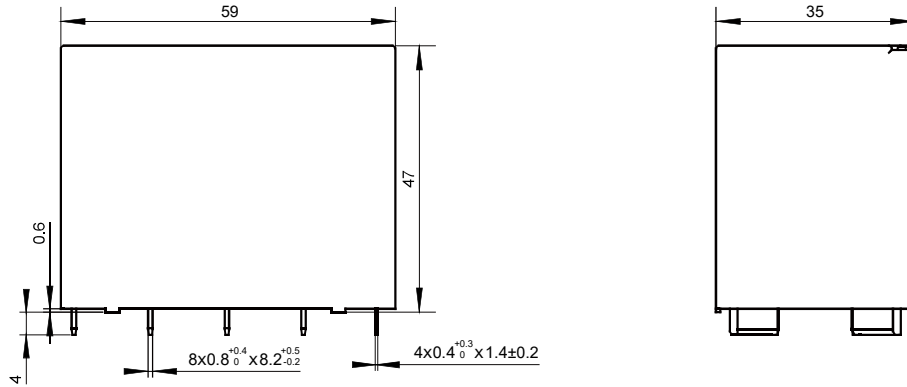


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

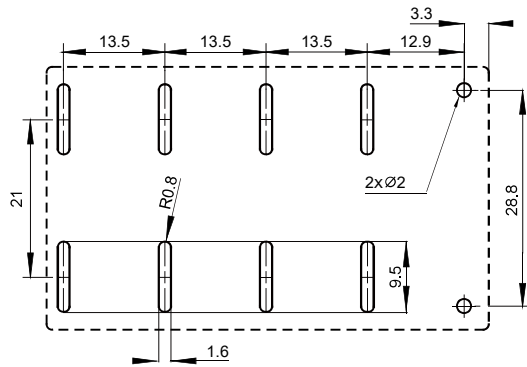
Unit: mm

4H

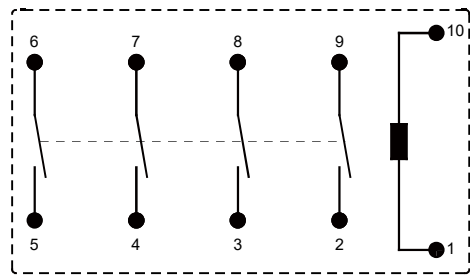
Outline Dimensions



PCB Layout(Bottom view)



Wiring Diagram(Bottom view)



- Notes:**1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF189F

MINIATURE HIGH POWER RELAY



认证号:E133481



认证号:R 50493573



Features

- With auxiliary monitoring contact, Detection of main contact welding makes it possible to construct a safety circuit (according to IEC 61810-3)
- Contact gap: 2.25mm
- Main Contact Resistance to Short Circuit Current (according to IEC 62752 1.5kA 6kA²s)
- 4kV Dielectric strength (Between Main contact & coil)
- UL insulation system: Class F available

RoHS compliant

CONTACT DATA

Contact arrangement	1A(Main contact)+1B(Auxiliary contact)
Contact resistance ¹⁾	Main contact ≤ 10mΩ(6VDC 20A)
Contact material	Main contact: AgSnO ₂ Auxiliary contact: AgNi
Contact clearance	Main contact ≥ 2.25mm
Contact rating (resistance)	Main contact: Making 10A, Loading 48A, Breaking 10A 277VAC, Auxiliary contact: 1A 12VDC
Max. switching voltage	Main contact: 600VAC
Max. switching current	Main contact: 48A Auxiliary contact: 1A
Max. switching power	Main contact: 13296VA Auxiliary contact: 12W
Min. switching load ²⁾ (Auxiliary contact)	NC: 100mA 12VDC NC(Gold plated): 10mA 12VDC
Mechanical endurance	1×10 ⁵ ops
Electrical endurance	Main contact ≥ 5×10 ⁴ ops (85°C, 1s on 9s off, Making 10A, Loading 48A, Breaking 10A 277VAC, Resistive load)

Notes: 1) The data shown above are initial values.

2) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & Main contact	4000VAC 1min
	Between open Main contact	2500VAC 1min
	Between Main contact & Auxiliary contact	4000VAC 1min
	Between coil & Auxiliary contact	2000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV(1.2/50μs)
Operate time (at nomi. volt.)		30ms Max.
Release time (at nomi. volt.)		20ms Max.
Temperature rise		70K max. (Rated voltage excitation will reach hold voltage, at 85°C)
Shock resistance	Functional	Main contact: 10g
	Destructive	Main contact: 100g
Vibration resistance		Main contact: 10Hz to 55Hz DA 1.5mm
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 66g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Allowable Voltage VDC ¹⁾	Coil Resistance Ω
5	3.50	0.30	5.5	13×(1±10%)
9	6.30	0.45	9.9	42.2×(1±10%)
12	8.40	0.60	13.2	75×(1±10%)
18	12.6	0.90	19.8	168.8×(1±10%)
24	16.8	1.20	26.4	300×(1±10%)
48	33.6	2.40	52.8	1200×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

COIL

Coil power	Approx. 1.92W
Holding voltage ¹⁾	35% to 100%U _N (at 23°C) 45% to 55%U _N (at 85°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL ³⁾	Main contact: Making 10A, Loading 48A, Breaking 10A, 277VAC/600VAC, 85°C, 1s on 9s off, 5×10 ⁴ ops Main contact: Making 48A, Breaking 10A, 277VAC/600VAC, 85°C, 1s on 9s off, 5×10 ⁴ ops
TUV	Main contact: Making 10A, Loading 48A, Breaking 10A, 277VAC/600VAC, 85°C, 1s on 9s off, 5×10 ⁴ ops Main contact: Making 48A, Breaking 10A, 277VAC/600VAC, 85°C, 1s on 9s off, 5×10 ⁴ ops

Notes: 1) All values unspecified are at room temperature.

2) Only some typical rating are listed above. If more details are required, please contact us.

3) Suitable for overvoltage category III, and shall provide protection for a rated impulse withstand voltage peak of 6 kv.

ORDERING INFORMATION

Type	HF189F/	12	-H	B		T	F	(XXX)
Coil voltage	5,9,12,18,24,48 VDC							
Main contact arrangement	H:1 Form A							
Auxiliary contact arrangement	Nil: Without auxiliary contact B:1 Form B							
Construction	Nil: flux proofed types							
Main contact material	T: AgSnO ₂							
Insulation class	F: Class F							
Special code	XXX: Customer special requirement Nil: Standard 991: Auxiliary contact gold plated							

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

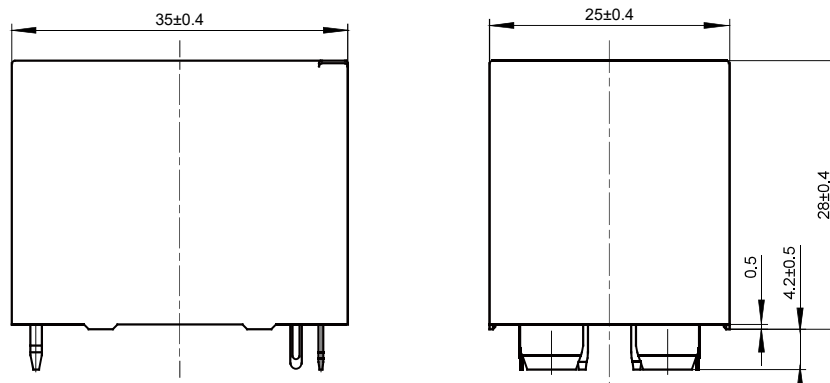
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

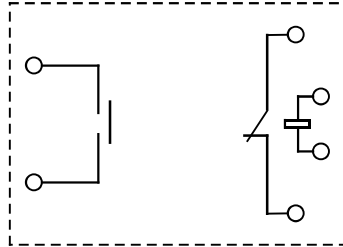
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

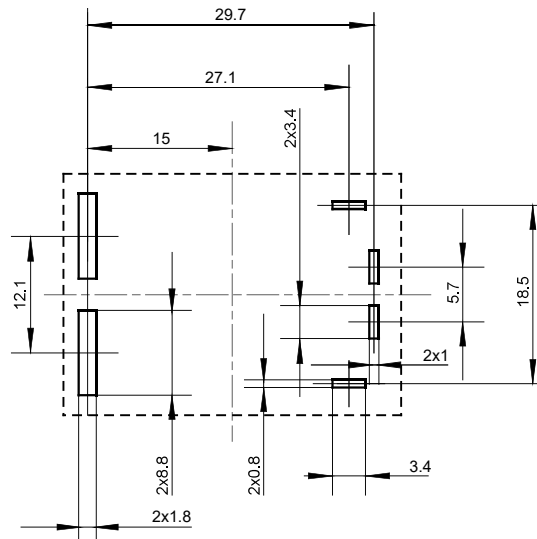
Outline Dimensions



Wiring Diagram(Bottom view)



PCB Layout(Bottom view)



Notes:1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.

3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF190F

MINIATURE HIGH POWER RELAY



File No.:E133481



File No.:R 50509389



File No.:CQC21002301055



Features

- With auxiliary monitoring contacts (according to Clause L.8.4 of IEC 60947-5-1)
 - Contact gap: 2.25mm
 - Main Contact Resistance to Short Circuit Current: according to IEC 62752 1.5kA 6kA²s
627 type Resistance to Short Circuit Current: according to IEC 62955:2018 9.11.2 3kA
 - 4kV Dielectric strength (Between Main contacts & coil)
 - UL insulation system: Class F available
- RoHS compliant**

CONTACT DATA

Contact arrangement	1A(Main contact)+1B(Auxiliary contact)
Contact resistance ¹⁾	Main contact ≤ 10mΩ(6VDC 20A)
Contact material	Silver Alloys
Contact clearance	Main contact ≥ 2.25mm
Contact rating (resistance)	Main contact: 32A 277VAC /30VDC Auxiliary contacts: 1A 30VDC
Max.switching voltage	277VAC
Max.switching current	Main contact: 32A Auxiliary contact: 1A
Max.switching power	Main contact: 8864VA / 480W Auxiliary contacts: 30W
Min. switching load ²⁾ (Auxiliary contact)	NC: 100mA 12VDC NC(Gold plated): 10mA 12VDC
Mechanical endurance	5×10 ⁵ ops
Electrical endurance	Main contact ≥ 5×10 ⁴ ops (85°C, 1s on 9s off,Making 10A, Loading 32A,Breaking 10A 277VAC, Resistive load)

Notes: 1) The data shown above are initial values.

2) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between open Main contacts	2500VAC 1min
	Between coil & Main contacts	4000VAC 1min
	Between Main contact & Auxiliary contact	4000VAC 1min
	Between coil & Auxiliary contacts	2000VAC 1min
Surge Voltage		10kV(1.2/50μs)
Operate time (at nomi. volt.)		30ms
Release time (at nomi. volt.)		20ms
Temperature rise		70K max. (Rated voltage excitation will reach hold voltage,at 85°C)
Shock resistance	Functional	Main contact: 10g
	Destructive	Main contact: 100g
Vibration resistance		Main contact: 10Hz to 55Hz DA 1.5mm
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx.30g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL

Coil power	Standard type: Approx.1.55W 627 type: Approx.1.92W
Holding voltage ¹⁾	45% to 100%U _N (at 23°C) 50% to 70%U _N (at 85°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.

SAFETY APPROVAL RATINGS

UL/CUL	Making 10A Loading 32A Breaking 10A,277VAC 85°C, 1s on 9s off,5×10 ⁴
TUV	Making 10A Loading 32A Breaking 10A,277VAC 85°C, 1s on 9s off,5×10 ⁴
CQC	Making 10A Loading 32A Breaking 10A,277VAC 85°C, 1s on 9s off,5×10 ⁴

Notes: 1) All values unspecified are at room temperature.

2) Only some typical rating are listed above.If more details are required,please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL DATA

23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC ¹⁾	Coil Resistance Ω
5	3.75	0.25	5.5	16.1×(1±10%)
9	6.75	0.45	9.9	52×(1±10%)
12	9.00	0.60	13.2	93×(1±10%)
18	13.5	0.90	19.8	209×(1±10%)
24	18.0	1.20	26.4	372×(1±10%)
48	36.0	2.40	52.8	1486×(1±10%)

627 type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC ¹⁾	Coil Resistance Ω
5	3.75	0.25	5.5	13×(1±10%)
9	6.75	0.45	9.9	42×(1±10%)
12	9.00	0.60	13.2	75×(1±10%)
18	13.5	0.90	19.8	168.7×(1±10%)
24	18.0	1.20	26.4	300×(1±10%)
48	36.0	2.40	52.8	1200×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

Type	HF190F/	12	-H	B	T	F	(XXX)
Coil voltage	5,9,12,18,24,48 VDC						
Main contact arrangement	H:1 Form A						
Auxiliary contact arrangement	B:1 Form B Nil: Without auxiliary contact						
Main contact material	T: AgSnO ₂						
Insulation class	F: Class F						
Special code	XXX: Customer special requirement Nil: Standard 991: Auxiliary contact gold plated						

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

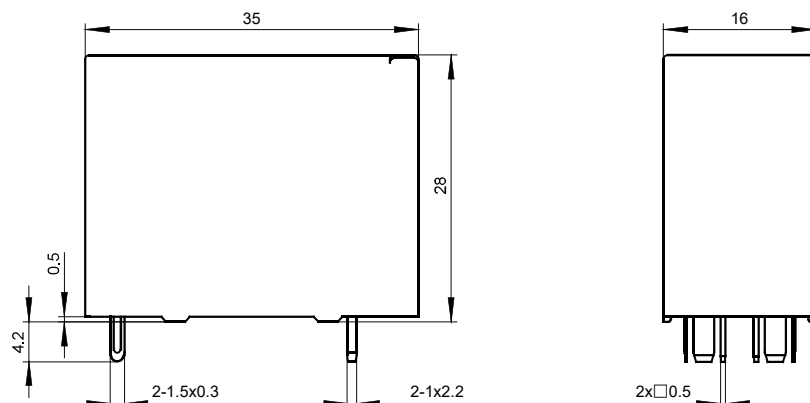
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

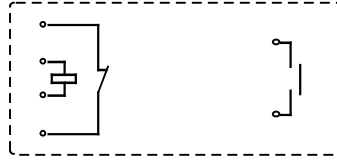
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

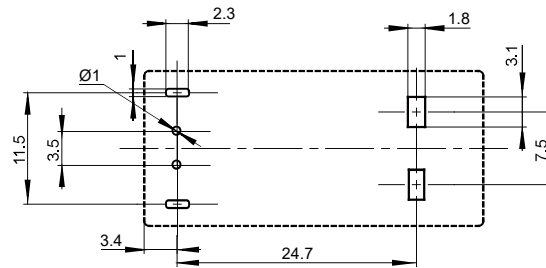
Outline Dimensions



Wiring Diagram(Bottom view)



PCB Layout(Bottom view)



- Notes:1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 2) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.
- 3) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF191F-L

MINIATURE HIGH POWER LATCHING RELAY



File No.: E133481



File No.: To be applied



File No.: CQC 21002316567



Features

- Latching relay
- High capacity: 50A 277VAC
- High surge current capacity: 480A/2.1ms
- TV-20 250VAC Capability
- Dielectric strength: Between coil & contacts ≥ 5000 VAC
- Outline Dimensions: (35×12×24) mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial) ¹⁾	Max.100mΩ(1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res. load)	50A 277VAC
Max. switching voltage	480VAC
Max. switching current	50A
Max. switching power	15360VA
Mechanical endurance	1×10 ⁶ OPS
Electrical endurance	6000OPS (50A 277VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

2) For plastic sealed type, the venting hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	5000VAC 1min
Surge voltage (Between coil & contacts)		10kV(1.2/50μs)
Set time(at rated. volt.)		Max.15ms
Reset time(at rated. volt.)		Max.15ms
Shock resistanc	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 2.0mm DA
Humidity		5 % to 85 % RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 22g
Construction		Plastic sealed,Flux proofed

Notes: 1) The data shown above are initial values.

COIL

Coil power	1 coil latching: Approx. 1.2W 2 coils latching: Approx. 2W
------------	---

COIL DATA

at 23°C

1 coil latching

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Pulse Duration ms		Coil Resistance Ω
				Typ	Min	
3	2.4	2.4	6	50	30	7.5×(1±10%)
5	4.0	4.0	10	50	30	20.8×(1±10%)
6	4.8	4.8	12	50	30	30×(1±10%)
9	7.2	7.2	18	50	30	67.5×(1±10%)
12	9.6	9.6	24	50	30	120×(1±10%)
15	12	12	30	50	30	187.5×(1±10%)
18	14.4	14.4	36	50	30	270×(1±10%)
24	19.2	19.2	48	50	30	480×(1±10%)
48	38.4	38.4	96	50	30	1920×(1±10%)

2 coils latching

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Pulse Duration ms		Coil Resistance Ω
				Typ	Min	
3	2.4	2.4	6	50	30	4.5×(1±10%)
5	4.0	4.0	10	50	30	12.5×(1±10%)
6	4.8	4.8	12	50	30	18×(1±10%)
9	7.2	7.2	18	50	30	40.5×(1±10%)
12	9.6	9.6	24	50	30	72×(1±10%)
15	12	12	30	50	30	112.5×(1±10%)
18	14.4	14.4	36	50	30	162×(1±10%)
24	19.2	19.2	48	50	30	288×(1±10%)
48	38.4	38.4	96	50	30	1152×(1±10%)

Notes: 1) The data shown above are initial values;

2) Max. voltage refers to the maximum voltage which relay coil could endure in a short period of time(≤50ms).



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL	50A 277/250/125/120VAC Resistive load 85°C 40A 277/250/125/120VAC Resistive load 85°C TV-20 250/240/120VAC 40°C 16A 277VAC/120VAC Electronic ballast 85°C
TUV(To be applied)	50A 277/250/125/120VAC Resistive load 85°C 40A 277/250/125/120VAC Resistive load 85°C
CQC	50A 277/250/125/120VAC Resistive load 40°C 32A 480/380/277/250/125/120VAC Resistive load 40°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF191F-L/	12	-H	S	L1	T	F	K	(XXX)
Coil voltage	3,5,6,9,12,15,18,24,48VDC								
Contact arrangement	H: 1 Form A								
Construction ¹⁾²⁾	S: Plastic sealed(no manual switch) Nil: Flux proofed								
Sort	L1: 1 coil latching L2: 2 coils latching								
Contact material	T: AgSnO ₂								
Insulation standard	F: Class F								
Manual switch	K: With manual switch Blank: No manual switch								
Special code ³⁾	XXX: Customer special requirement Nil: Standard type								

Notes: 1) We recommend flux proofed types for a clean environment(free from contaminations like H₂S, SO₂, NO₂, dust,etc.).We suggest to choose plastic sealed types and validate it in real application for an unclean environment(with contaminations like H₂S, SO₂,NO₂, dust,etc.).

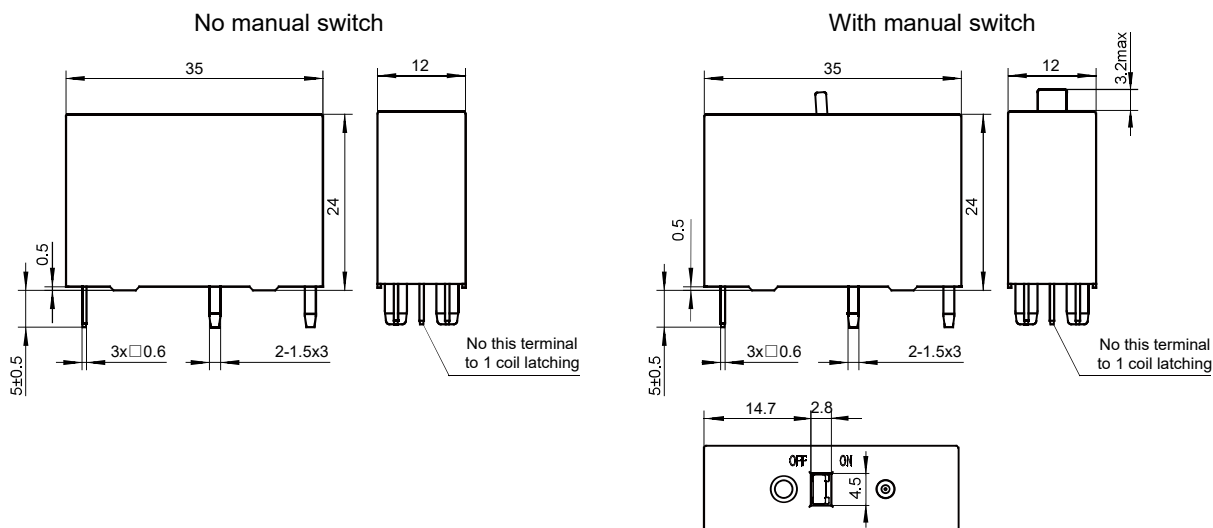
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

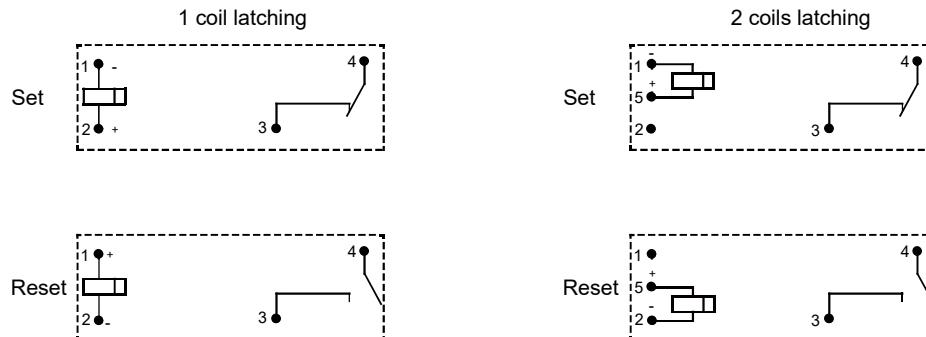
Outline Dimensions



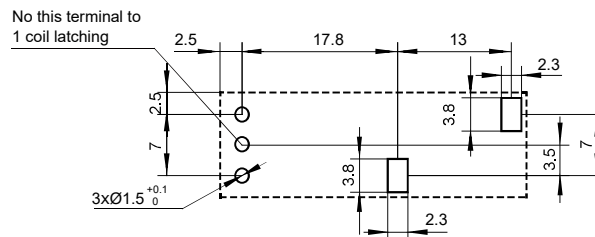
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram
(Bottom view)



PCB Layout
(Bottom view)



Dimensional tolerance is not marked for product boundary dimensions		Dimensional tolerance is not marked for PCB board
Outline Dimensions	Dimensional tolerance	±0.1
≤1	±0.2	
>1~5	±0.3	
>5	±0.4	

Remark: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

3) The tolerance without indicating for PCB layout is always ±0.1mm.

Notice: 1) Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.

2) In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.

3) Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

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HF192F

SOLAR RELAY



File No.: E133481



File No.: R50508861



Features

- 260A switching capability
- Applicable to solar photovoltaic inverter
- 4.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	1mΩ max.(6VDC 20A)
Contact material	AgNi
Contact rating (Res. load)	Making 55A, carrying 260A, breaking 55A, 800VAC
Max. switching voltage	830VAC
Max. switching current	260A
Max. switching power	45650VA
Mechanical endurance	1×10 ⁶ OPS ≥1×10 ⁴ OPS
Electrical endurance	(85°C, 1s on 9s off, Making 55A, carrying 260A, breaking 55A, 800VAC, Resistive load)

CHARACTERISTICS

Insulation resistance	1000 MΩ (500VDC)
Dielectric strength	Between open contacts 2000VAC 1min
	Between coil & contacts 5000VAC 1min
Surge voltage (Between coil & Main contacts)	10kV(1.2/50μs)
Operate time (at rated. volt.)	30ms max.
Release time (at rated. volt.)	10ms max.
Temperature rise	70K max. (Contact load current 260A, Coil rated voltage is reduced to holding voltage after 100ms of excitation, at 85°C)
Shock resistance	Functional 98m/s ²
	Destructive 980m/s ²
Vibration resistance	10Hz to 55Hz 1.0mm DA
Humidity	5 % to 85 % RH -40°C to 85°C
Ambient temperature	(Coil rated voltage is reduced to holding voltage after 100ms of excitation)
Termination	PCB
Unit weight	Approx.265g
Construction	Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx.3W
Holding voltage	40% to 100%UN(at 25°C) 50% to 60%UN(at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC ¹⁾	Coil Resistance Ω
6	4.5	0.6	7.2	12×(1±10%)
9	6.75	0.9	10.8	27×(1±10%)
12	9	1.2	14.4	48×(1±10%)
24	18	2.4	28.8	192×(1±10%)

Notes: Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	Making 55A, carrying 260A, breaking 55A, 830VAC, 85°C, 10000OPS, Resistive load
TUV	Making 55A, carrying 260A, breaking 55A, 830VAC, 85°C, 10000OPS, Resistive load



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

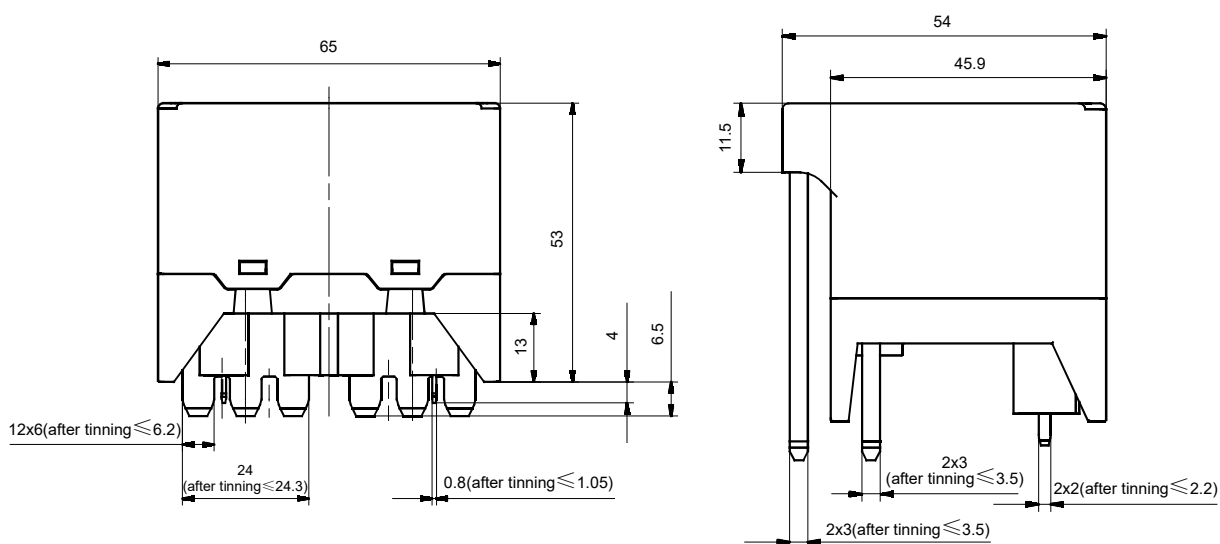
Type	HF192F/	12	-H	3	F	(XXX)
Coil voltage	6,9,12,24VDC					
Contact arrangement	H: 1 Form A					
Contact material	3: AgNi					
Insulation standard	F: Class F					
Special code	XXX: Customer special requirement Nil: Standard type					

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

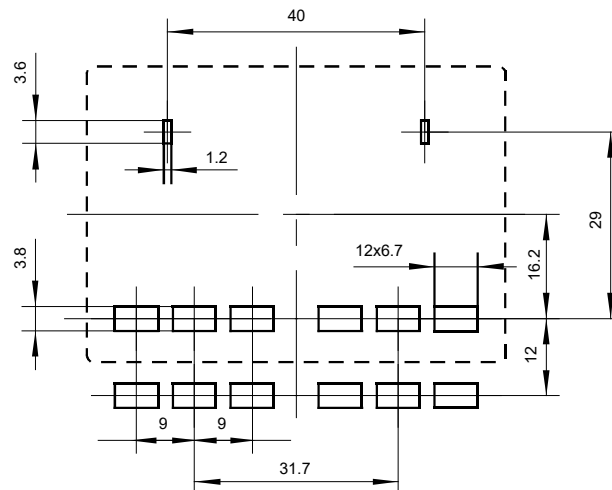
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

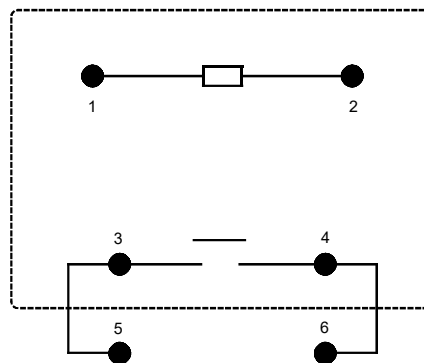
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF193F

MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: R 50541915



Features

- High temperature: 105°C
- 30A 277VAC switching capability
- Low holding power consumption: only 0.16W
- 5kV dielectric strength (between coil and contacts)
- Meeting reinforce insulation
- UL insulation system: Class F
- Outline Dimensions: (20×12.7×15.7)mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	6mΩ max.(20A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res.load)	30A 277VAC
Max. Switching voltage	277VAC
Max. Switching current	30A
Max. Switching power	8310VA
Mechanical endurance	1×10 ⁶ OPS
Electrical endurance	1×10 ⁵ OPS (making 16A ,loading 30A,Breaking 16A,277VAC,Resistive load,1s on 9s off)
	1×10 ⁴ OPS (making 30A,Breaking 10A,277VAC, 105°C,Resistive load,1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000 MΩ (500VDC)
Dielectric strength	Between open contacts	1000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge voltage		6kV(1.2/50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		8ms max.
Temperature rise		50K max. (Contact load 30A, 50% rated voltage holding, 105°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 10g
Construction		Flux proofed,Plastic sealed

Notes: The data shown above are initial values.

Coil power	Approx. 1W
Holding voltage	35% to 70%UN(at 23°C) 40% to 50%UN(at 85°C/105°C)

Notes: 1)The coil holding voltage is the voltage applied to coil after applying the rated voltage for 100ms.
2)To avoid overheating and burning, the coil can not be permanently applied with voltage higher than maximum holding voltage.

COIL DATA 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.5	0.25	5.5	25×(1±10%)
6	4.2	0.3	6.6	36×(1±10%)
9	6.3	0.45	9.9	81×(1±10%)
12	8.4	0.6	13.2	144×(1±10%)
24	16.8	1.2	26.4	576×(1±10%)

Notes: 1)The data shown above are initial values;
2)Max. voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	Flux proofed type: 30A 277 VAC 105°C Making 5A,Loading 30A,Breaking 5A 277VAC 105°C Making 16A,Loading 30A, Breaking 16A 277VAC Room temperature Making 30A,Breaking 5A 277VAC 85°C Plastic sealed type: Making 30A,Breaking 5A 277VAC 85°C
TUV	Flux proofed type: Making 30A,Breaking 10A 277VAC 105°C (Follow IEC 62368-1 Clause G2.1 and G2.2) Making 5A,Loading 30A,Breaking 5A 277VAC 105°C Making 16A,Loading 30A, Breaking 16A 277VAC Room temperature Making 30A,Breaking 5A 277VAC 85°C Plastic sealed type: Making 30A,Breaking 5A 277VAC 85°C

Notes: 1)All values unspecified are at room temperature;
2)Only some typical rating are listed above.If more details are required,please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

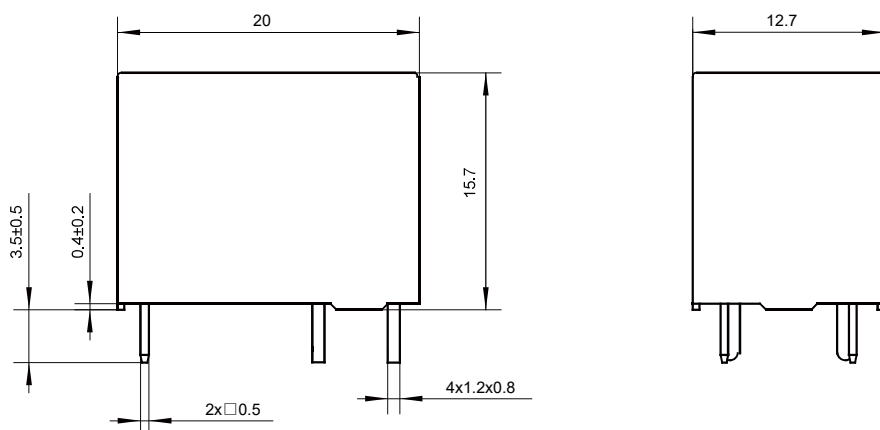
Type	HF193F/	12	-H	S	T	F	(XXX)
Coil voltage	6,9,12,24VDC						
Contact arrangement	H: 1 Form A						
Construction	S: Plastic sealed Nil: Flux proofed						
Contact material	T: AgSnO ₂						
Insulation standard	F: Class F						
Special code	XXX: Customer special requirement Nil: Standard type						

Notes: 1) We recommend flux proofed types for a clean environment(free from contaminations like H₂S, SO₂, NO₂, dust,etc.).
 We suggest to choose plastic sealed types and validate it in real application for an unclean environment(with contaminations like H₂S, SO₂, NO₂, dust,etc.).
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

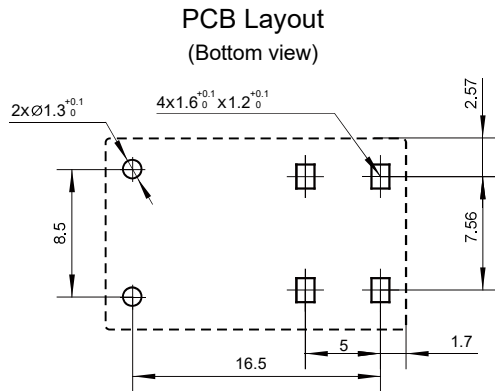
Unit: mm

Outline Dimensions

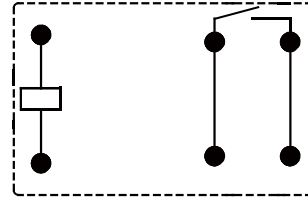


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF195F

MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: R50530822



File No.: CQC21002323731



Features

- Able to work in a fluorine liquid environment
- 32A carrying capability
- 4kV dielectric strength (between coil and contacts)
- Contact gap: $\geq 2.4\text{mm}$
- Meet to IEC62368-1 Clause G2.1 and G2.2
- UL insulation system: Class F
- Outline Dimensions: (26.6 × 22.2 × 29) mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	10mΩ max. (20A 6VDC)
Contact material	AgSnO ₂
Max. Switching voltage	277VAC
Max. Carrying current	32A
Mechanical endurance	1×10 ⁵ ops
	1×10 ⁴ ops
Electrical endurance	(Making 5A, Carrying 32A, Breaking 5A, 277VAC, Resistive load, 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 2.8W
Holding voltage	32% to 36% U _N (at 85°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2) To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.
3) To energize relay properly apply 100%~120% rated coil voltage for 200ms.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC	Coil Resistance Ω
12	9.6	0.6	13.2	51×(1±10%)
24	19.2	1.2	26.4	206×(1±10%)
48	38.4	2.4	52.8	823×(1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2000VAC 1min
Surge Voltage(Between coil & contacts)		6kV(1.2×50μs)
Operate time (at nomi. volt.)		10ms max.
Release time (at nomi. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40℃ to 85℃
Termination		PCB
Unit weight		Approx.30g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	Making 5A, Loading 32A, Breaking 5A 277VAC 85°C
	Making 5A, Loading 25A, Breaking 5A 277VAC 105°C
TUV	Making 5A, Loading 32A, Breaking 5A 277VAC 85°C
	Making 5A, Loading 25A, Breaking 5A 277VAC 105°C

Notes: The typical loads listed above are only part of the product certification. The detailed test conditions of each load are different, so the electrical durability is different. For more information, please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

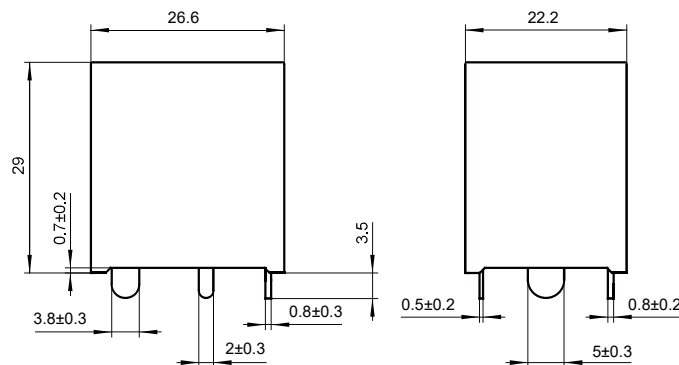
Type	HF195F/	12	-H	S	1	T	F	(XXX)
Coil voltage	12, 24, 48VDC							
Contact arrangement	H: 1 Form A							
Construction	S: Plastic sealed							
Version	1: Type 1 PCB layout							
Contact material	T: AgSnO ₂							
Insulation standard	F: Class F							
Special code	XXX: Customer special requiremen; Nil: Standard							

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

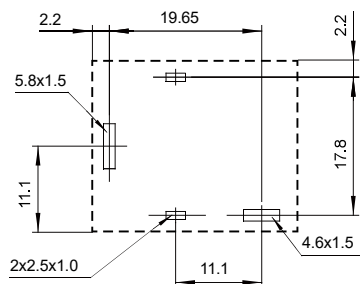
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

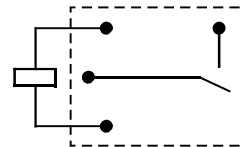
Outline Dimensions



PCB Layout(Bottom view)



Wiring Diagram(Bottom view)



- Notes: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF196F

MINIATURE HIGH POWER RELAY



File No.:Pending



File No.:Pending



File No.:Pending



Features

- 1 pole, 25 A, 1 form A (NO)
- Coil power 530mW
- Low Height: 17.9mm
- Reinforced insulation
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available
- Ambient temperature up to 105°C

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max.(1A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res.Load)	25A 250VAC
Max.switching voltage	250VAC
Max.switching current	25A
Max.switching power	6250VA
Mechanical endurance	1×10 ⁶ ops
Electrical endurance	1×10 ⁵ ops (25A 250VAC, Resistive load, 105°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx.0.53W
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CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge Voltage (Between coil & contacts)		10kV (1.2×50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40℃ to 105℃
Termination		PCB
Unit weight		Approx. 15g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC ¹⁾	Coil Resistance Ω
5	3.75	0.5	7.5	47× (1±10%)
6	4.50	0.6	9.0	67× (1±10%)
9	6.75	0.9	13.5	153× (1±10%)
12	9	1.2	18	272× (1±10%)
18	13.5	1.8	27	611× (1±10%)
24	18	2.4	36	1086× (1±10%)
48	36	4.8	72	4347× (1±15%)

Notes: 1) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	30A 120/125/220/250/277VAC, Resistive load 105°C 25A 120/125/220/250/277VAC, Resistive load 105°C 16A 250VAC, cosφ=0.4, 105°C 1HP 250VAC, 105°C 2HP 250VAC, 40°C TV-8 120VAC, 40°C
	30A 120/125/220/250/277VAC, Resistive load 105°C 25A 120/125/220/250/277VAC, Resistive load 105°C 16A 250VAC, cosφ=0.4, 105°C

Notes: 1) Only some typical rating are listed above.If more details are required,please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF196F/	12	-H	T	F	(XXX)
Coil voltage	5,6,9,12,18,24,48VDC					
Contact arrangement	H:1 Form A					
Contact material	T: AgSnO ₂					
Insulation class	F: Class F					
Special code	XXX: Customer special requiremen; Nil: Standard					

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

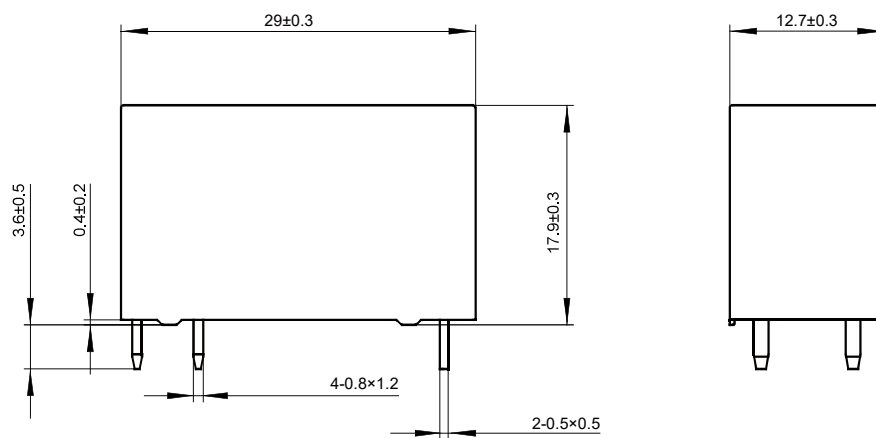
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.e.g.(335) stands for product in accordance to IEC 60335-1(GWT).

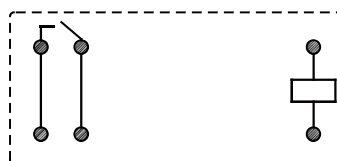
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



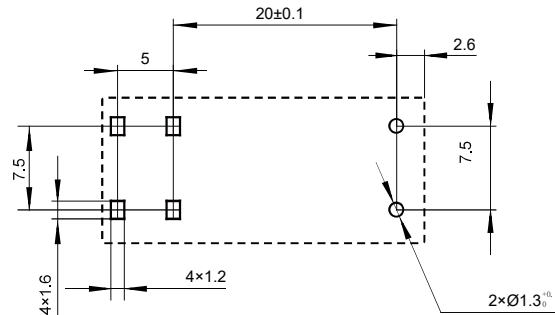
Wiring Diagram(Bottom view)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

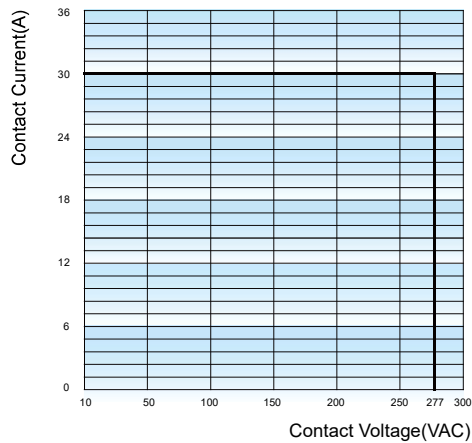
PCB Layout(Bottom view)



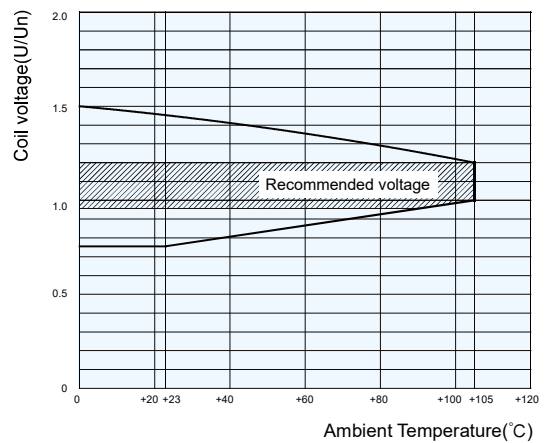
- Notes: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAX.SWITCHING POWER



COIL OPERATING RANGE (DC)



Remark: When the relay is in use, if the excitation voltage exceeds the rated voltage, the relay electrical durability will be reduced.
Within the recommended voltage range, the effect on electrical durability is less.
The insulation of the relay coil may be damaged if it exceeds the upper limit specified by the curve in the diagram.

Disclaimer

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HF196F-Q

MINIATURE HIGH POWER REALY



File No.:Pending



File No.:Pending



File No.:Pending



Features

- 1 pole, 25 A, 1 form A (NO)
- Coil power 530mW
- Low Height: 17.9mm(27.6mm with quick connects)
- PCB & Quick connect terminal for load
- Reinforced insulation
- UL insulation system: Class F
- Ambient temperature up to 105°C

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max.(1A 6VDC)
Contact materail	AgSnO ₂
Contact rating (Res.Load)	25A 250VAC
Max.switching voltage	250VAC
Max.switching current	25A
Max.switching power	6250VA
Mechanical endurance	1×10 ⁶ ops
Electrical endurance	1×10 ⁵ ops (25A 250VAC,Resistive load,105°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx.0.53W
------------	--------------

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge Voltage (Between coil & contacts)		10kV (1.2×50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 16g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC ¹⁾	Coil Resistance Ω
5	3.75	0.5	7.5	47× (1±10%)
6	4.50	0.6	9.0	67× (1±10%)
9	6.75	0.9	13.5	153× (1±10%)
12	9	1.2	18	272× (1±10%)
18	13.5	1.8	27	611× (1±10%)
24	18	2.4	36	1086× (1±10%)
48	36	4.8	72	4347× (1±15%)

Notes: 1) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	30A 120/125/220/250/277VAC, Resistive load 105°C 25A 120/125/220/250/277VAC, Resistive load 105°C 16A 250VAC, cosφ=0.4,105°C 1HP 250VAC,105°C 2HP 250VAC, 40°C TV-8 120VAC, 40°C
	30A 120/125/220/250/277VAC, Resistive load 105°C 25A 120/125/220/250/277VAC, Resistive load 105°C 16A 250VAC, cosφ=0.4, 105°C

Notes: 1) Only some typical rating are listed above.If more details are required,please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF196F-Q/	12	-H	T	F	(XXX)
Coil voltage	5,6,9,12,18,24,48VDC					
Contact arrangement	H:1 Form A					
Contact material	T: AgSnO ₂					
Insulation class	F: Class F					
Special code	XXX: Customer special requiremen; Nil: Standard					

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

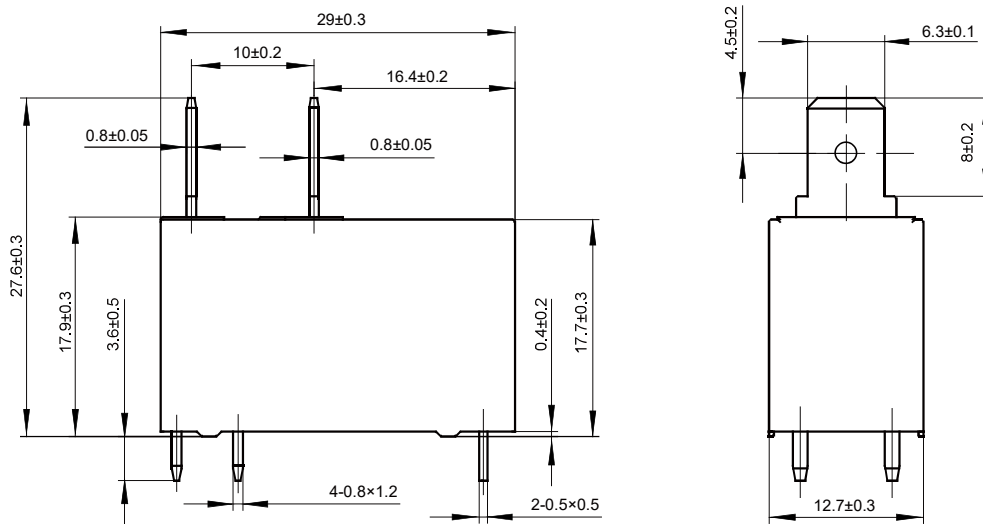
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.e.g.(335) stands for product in accordance to IEC 60335-1(GWT).

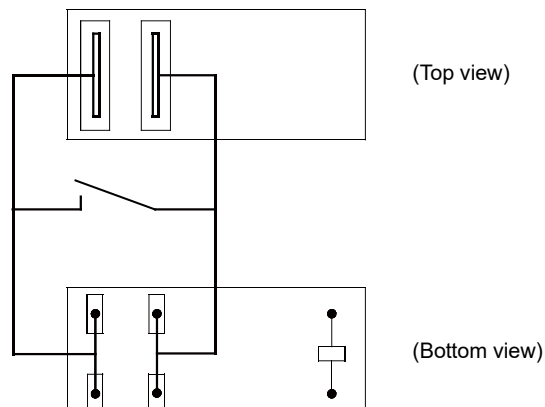
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



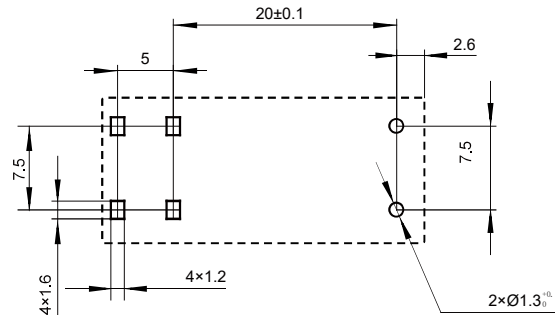
Wiring Diagram



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

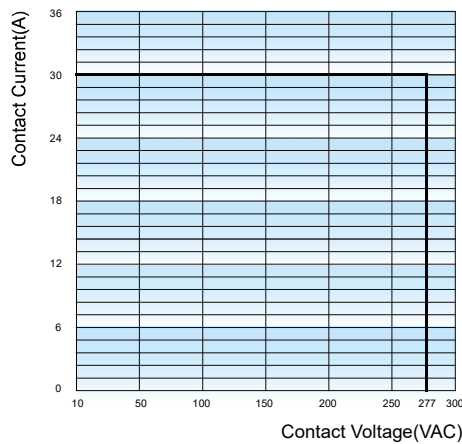
PCB Layout(Bottom view)



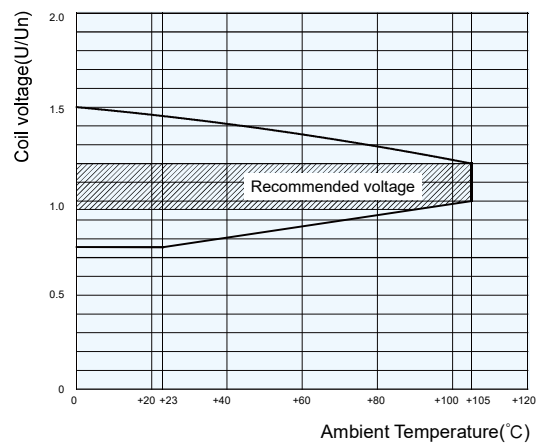
- Notes: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm and ≤ 30 mm, tolerance should be ± 0.4 mm; outline dimension > 30 mm, tolerance should be ± 0.6 mm.
2) The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

MAX. SWITCHING POWER



COIL OPERATING RANGE (DC)



Remark: When the relay is in use, if the excitation voltage exceeds the rated voltage, the relay electrical durability will be reduced.
Within the recommended voltage range, the effect on electrical durability is less.
The insulation of the relay coil may be damaged if it exceeds the upper limit specified by the curve in the diagram.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF105F-1

MINIATURE HIGH POWER RELAY

C **UL** **US**

File No.:E134517



File No.:40025518 (DC Type)



File No.:R 50454580 (AC type)



File No.:CQC12002071130(DC Type)

CQC10002049165(DC Type)

CQC16002140270(DC Type)



Features

- 40A switching capability
- 4kV dielectric strength (between coil and contacts)
- Heavy load up to 7200VA
- PCB coil terminals, ideal for heavy duty load
- Unenclosed, Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance ¹⁾	50mΩ max. (at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Max. switching capacity	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 28VDC			
Max. switching current	40A ²⁾	15A	20A	10A
HF105F-1 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-1L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1 x 10 ⁷ OPS			
Electrical endurance	1H type(Non-plastic sealed): 1 x 10 ⁵ OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.

2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC/4000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)	DC type: 15ms max.	
Release time (at rated. volt.)	DC type: 10ms max.	
Ambient temperature	DC: -55°C to 85°C AC: -55°C to 60°C	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Termination	PCB	
Unit weight	Approx.36g	
Construction	Unenclosed (Only for DC coil), Plastic sealed, Dust protected	

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

COIL

Coil power	DC type: Approx. 900mW; AC type: Approx. 2VA
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SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A	AgSnO ₂	30A 277VAC 40A 277VAC 2HP 250VAC 1HP 125VAC
		AgCdO	30A 28VDC 28A 277VAC 277VAC(FLA=20)(LRA=60)
	1 Form B	AgCdO	15A 277VAC 10A 28VDC 1/2HP 250VAC 1/4HP 125VAC 277VAC(FLA=10)(LRA=33)
		AgCdO	20A 277VAC 20A 28VDC 277VAC(FLA=20)(LRA=60)
	1 Form C	AgSnO ₂	20A 277VAC 1/2HP 250VAC 1/4HP 125VAC
		AgCdO	10A 277VAC 10A 28VDC 277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23°C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max. ³⁾	Drop-out Voltage VDC min. ³⁾	Max. Voltage VDC * ⁴⁾	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max. ³⁾	Drop-out Voltage VAC min. ³⁾	Max. Voltage VDC * ⁴⁾	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

- Notes:** 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
 2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.
 3) The data shown above are initial values.
 4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

Type		HF105F-1 / 018 D T -1H S T F (XXX)	
		HF105-1: 30A (Unenclosed, only for DC coil) HF105-1L: 25A (Unenclosed, only for DC coil) HF105F-1: 30A HF105F-1L: 25A	
Coil voltage		DC: 5VDC to 110VDC AC: 12VAC to 277VAC	
Coil voltage form		D: DC A: AC	
Termination		6: With Pin NO.6, Dielectric Strength Between Coil and Contact: 2500VAC T: Without Pin NO.6, Dielectric Strength Between Coil and Contact: 4000VAC Nil: Without Pin NO.6, Dielectric Strength Between Coil and Contact: 2500VAC	
Contact arrangement		1H: 1 Form A 1D: 1 Form B 1Z: 1 Form C	
Construction ¹⁾²⁾		S: Plastic sealed Nil: Dust protected (For HF105F-1, HF105F-1L) Unenclosed (For HF105-1, HF105-1L)	
Contact material		T: AgSnO ₂ Nil: AgCdO	
Insulation standard		F: Class F Nil: Class B	
Special code ³⁾		XXX: Customer special requirement Nil: Standard	

- Notes:** 1) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.
 4) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

HF105F-1

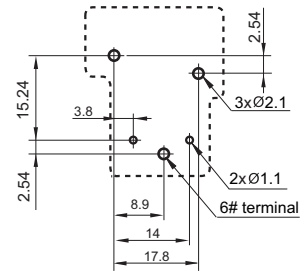
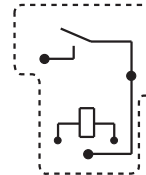
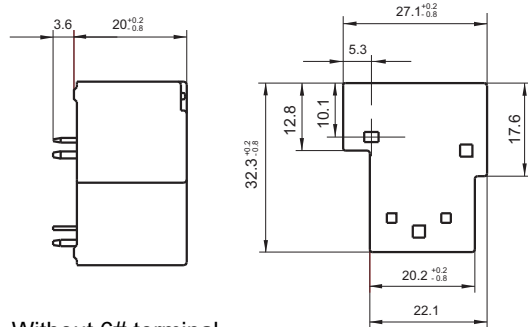
1 Form A

Outline Dimensions

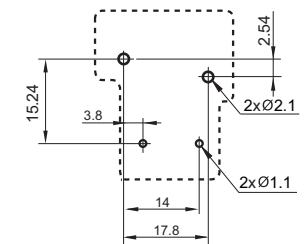
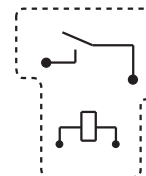
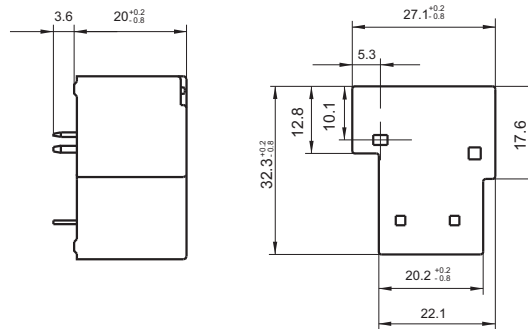
Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)

With 6# terminal

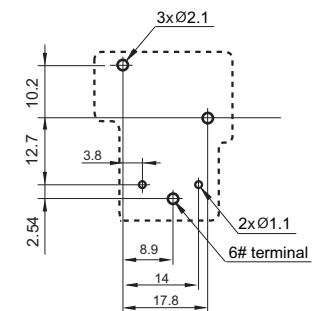
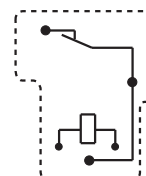
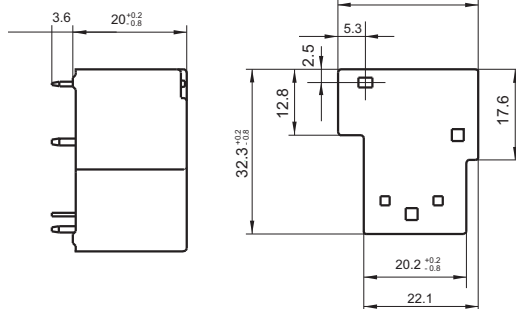


Without 6# terminal

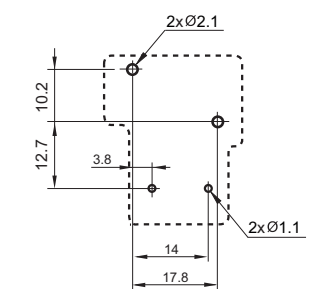
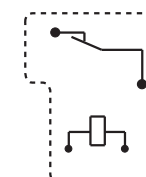
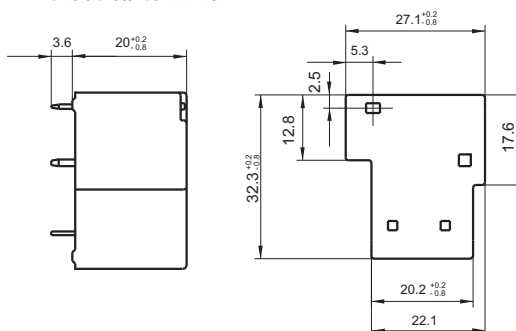


1 Form B

With 6# terminal



Without 6# terminal



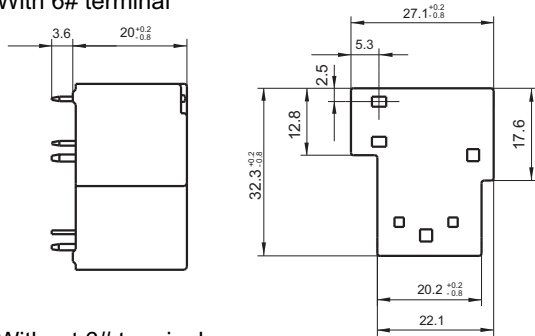
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

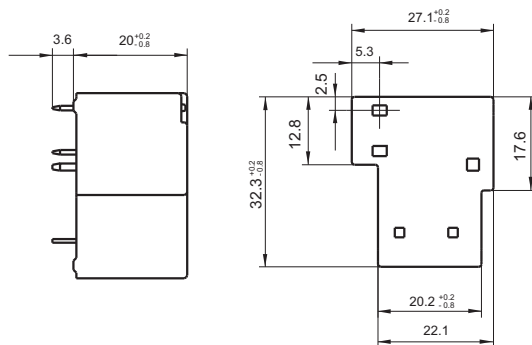
1 Form C

Outline Dimensions

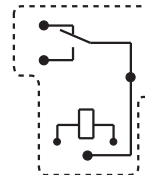
With 6# terminal



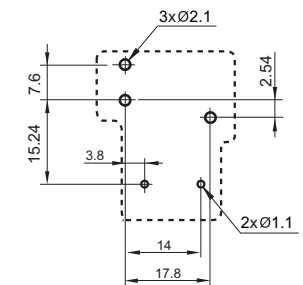
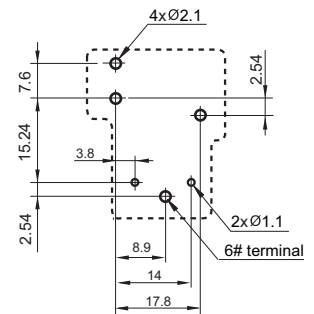
Without 6# terminal



Wiring Diagram (Bottom view)



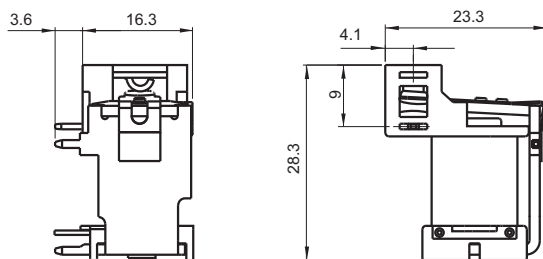
PCB Layout (Bottom view)



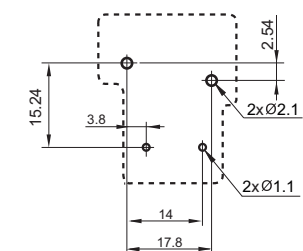
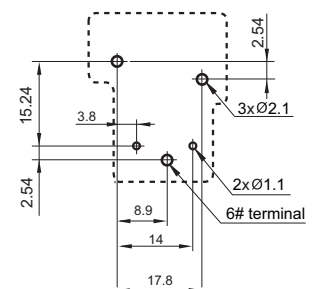
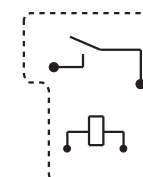
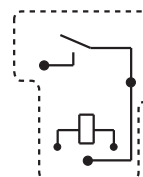
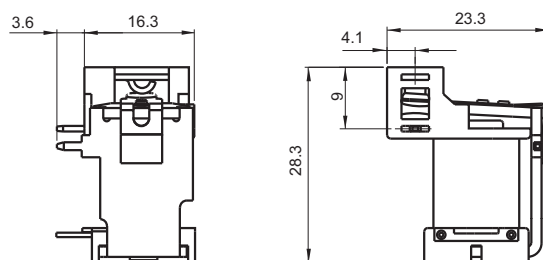
HF105-1

1 Form A

With 6# terminal



Without 6# terminal



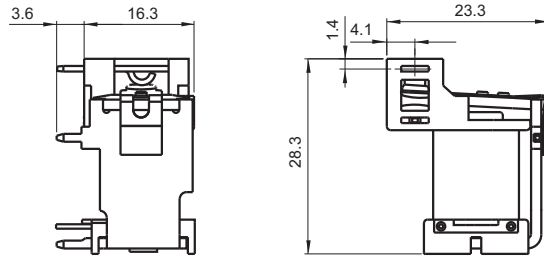
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

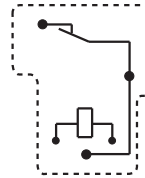
1 Form B

Outline Dimensions

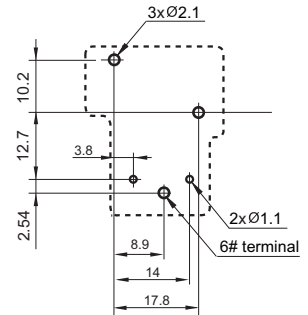
With 6# terminal



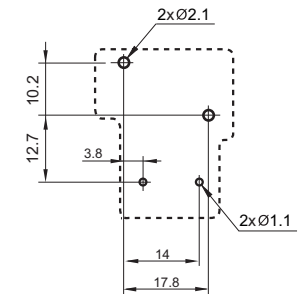
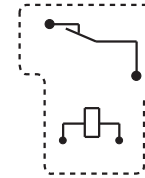
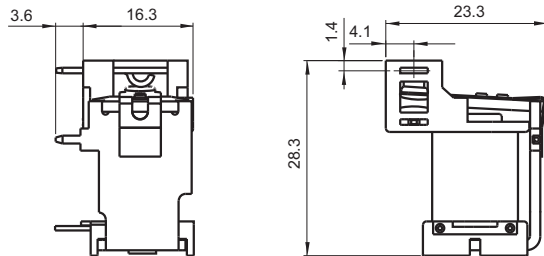
Wiring Diagram (Bottom view)



PCB Layout (Bottom view)

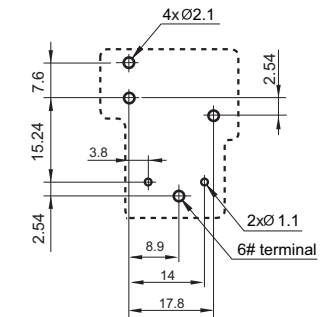
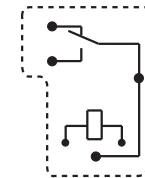
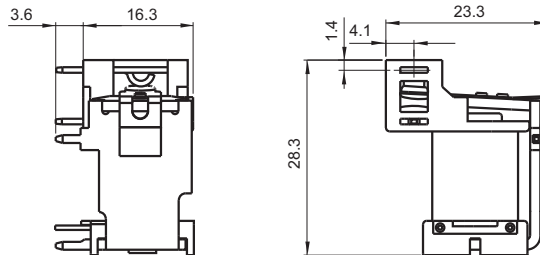


Without 6# terminal

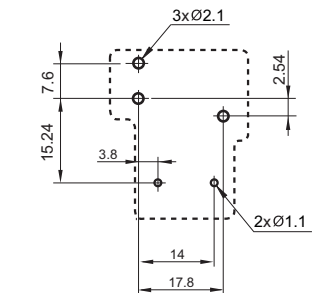
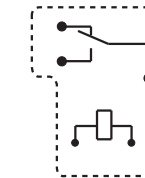
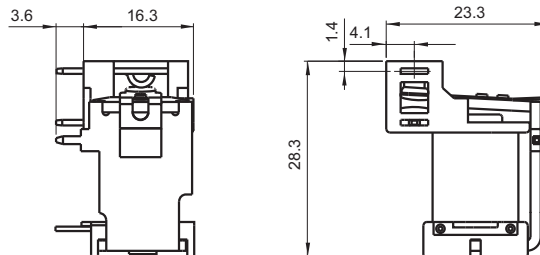


1 Form C

With 6# terminal



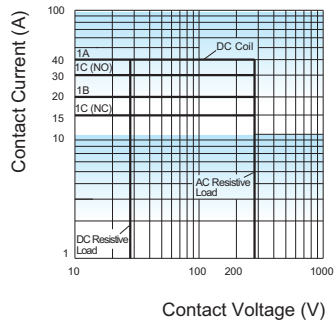
Without 6# terminal



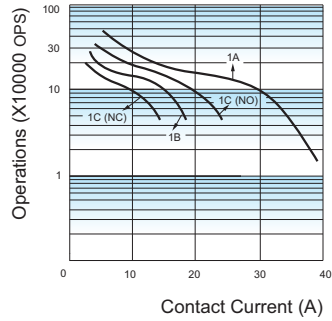
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

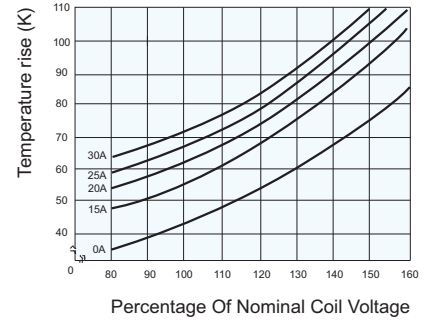
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF105F-2

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:40025518 (DC type)



File No.: CQC10002049165(DC type)
CQC16002140270(DC type)



Features

- 40A switching capability
- Heavy load up to 7200VA
- PCB coil terminals, ideal for heavy duty load
- Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Max. switching capacity	7200VA/560W	3600VA/280W	4800VA/560W	2400VA/280W
Max. switching voltage	277VAC/28VDC			
Max. switching current	40A ²⁾	15A	20A	10A
Max. continuous current	When PCB terminals carry current ≤30A When PCB terminals do not carry current (only QC terminals carry current) ≤25A			
HF105F-2 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-2L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1 x 10 ⁷ OPS			
Electrical endurance	1H type(Non-plastic sealed): 1 x 10 ⁵ OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes:1) The data shown above are initial values.

2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)	DC type: 15ms max.	
Release time (at rated. volt.)	DC type: 10ms max.	
Ambient temperature		DC: -55°C to 85°C AC: -55°C to 60°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Termination	PCB & QC	
Unit weight	Approx. 36g	
Construction	Plastic sealed, Dust protected	

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.02

COIL

Coil power	DC type: Approx. 900mW; AC type: Approx. 2VA
------------	---

SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A	AgSnO ₂ AgCdO	30A 277VAC 40A 277VAC 2HP 250VAC 1HP 125VAC
		AgCdO	30A 28VDC 28A 277VAC 277VAC(FLA=20)(LRA=60)
	1 Form B	AgCdO	15A 277VAC 10A 28VDC 1/2HP 250VAC 1/4HP 125VAC 277VAC(FLA=10)(LRA=33)
		AgCdO	30A 277VAC 2HP 250VAC 1HP 125VAC
	1 Form C	AgCdO	20A 277VAC 20A 28VDC 277VAC(FLA=20)(LRA=60)
		AgCdO	20A 277VAC 1/2HP 250VAC 1/4HP 125VAC 10A 277VAC 10A 28VDC 277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23°C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max. ³⁾	Drop-out Voltage VDC min. ³⁾	Max. Voltage VDC ^{*4)}	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max. ³⁾	Drop-out Voltage VAC min. ³⁾	Max. Voltage VDC ^{*4)}	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

- Notes:** 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.
3) The data shown above are initial values.
4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF105F-2 / 018 D -1H S T F (XXX)	
Type	HF105F-2: 30A HF105F-2L: 25A
Coil voltage	DC: 5VDC to 110VDC AC: 12VAC to 277VAC
Coil voltage form	D: DC A: AC
Contact arrangement	1H:1 Form A 1D:1 Form B 1Z:1 Form C
Construction¹⁾	S: Plastic sealed Nil: Dust protected
Contact material	T: AgSnO ₂ Nil: AgCdO
Insulation standard	F: Class F Nil: Class B
Special code³⁾	XXX: Customer special requirement Nil: Standard

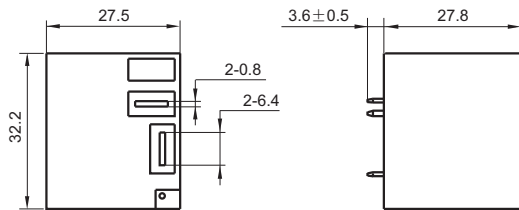
- Notes:** 1) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

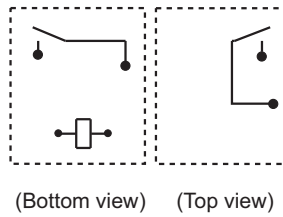
Unit: mm

1 Form A

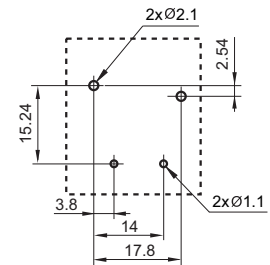
Outline Dimensions



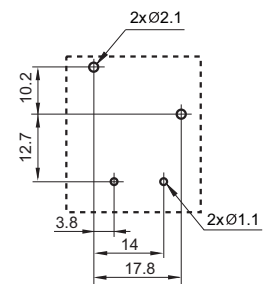
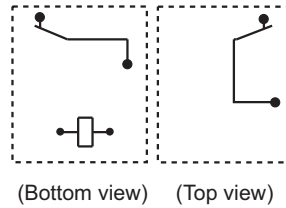
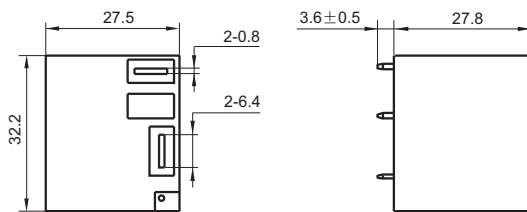
Wiring Diagram



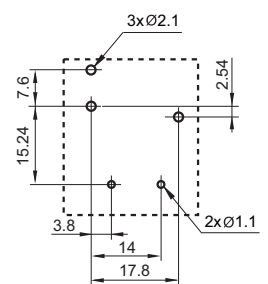
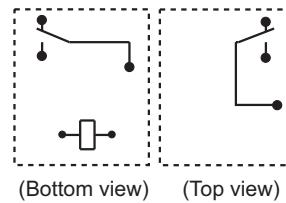
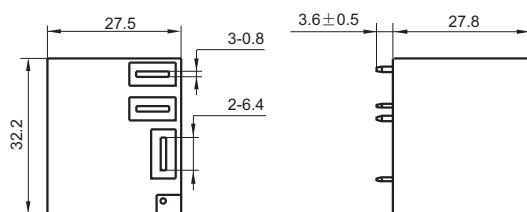
PCB Layout
(Bottom view)



1 Form B



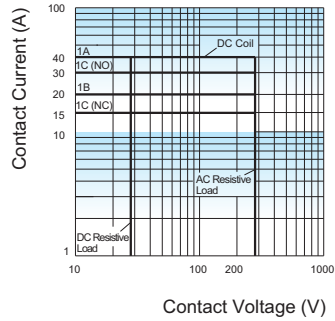
1 Form C



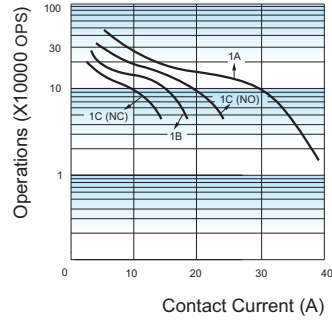
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

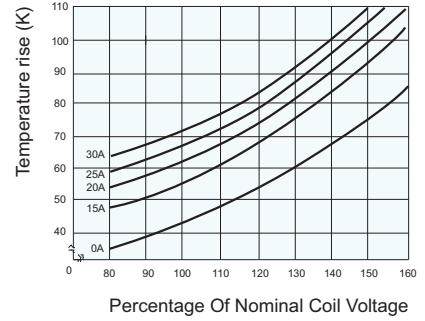
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF105F-4

MINIATURE HIGH POWER RELAY

c us

File No.:E134517



File No.:40025518 (DC type)



File No.:R 50454580 (AC type)



File No.:CQC09002031229(DC type)

CQC10002049165(DC type)



Features

- 40A switching capability
- 2.5kV dielectric strength
(between coil and contacts)
- Heavy load up to 7200VA

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Max. switching capacity	7200VA/560W	3600VA/280W	4800VA/560W	2400VA/280W
Max. switching voltage	277VAC/28VDC			
Max. switching current	40A ²⁾	15A	20A	10A
Max.continuous current	25A max.			
HF105F-4 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-4L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1 x 10 ⁷ OPS			
Electrical endurance	1H type(Non-plastic sealed): 1 x 10 ⁵ OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes:1) The data shown above are initial values.

2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)	DC type: 15ms max.	
Release time (at rated. volt.)	DC type: 10ms max.	
Ambient temperature	DC: -55°C to 85°C	
	AC: -55°C to 60°C	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Termination	QC	
Unit weight	Approx. 36g	
Construction	Plastic sealed, Dust protected	

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B.

COIL

Coil power

DC type: Approx. 900mW;
AC type: Approx. 2VA

SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A	AgSnO ₂ AgCdO	30A 277VAC
			40A 277VAC
	1 Form B	AgCdO	2HP 250VAC
			1HP 125VAC
			30A 28VDC
			28A 277VAC
	1 Form C	NO	277VAC(FLA=20)(LRA=60)
			15A 277VAC
	1 Form C	NC	10A 28VDC
			1/2HP 250VAC
			1/4HP 125VAC
			277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

COIL DATA

at 23°C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max. ³⁾	Drop-out Voltage VDC min. ³⁾	Max. Voltage VDC ^{*4)}	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max. ³⁾	Drop-out Voltage VAC min. ³⁾	Max. Voltage VDC ^{*4)}	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

- Notes:** 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
 2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.
 3) The data shown above are initial values.
 4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

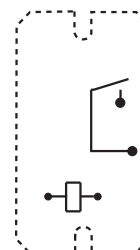
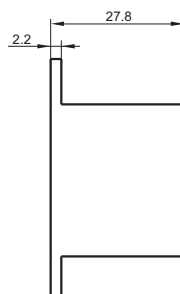
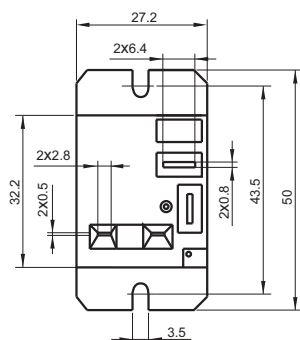
Type		HF105F-4: 30A HF105F-4L: 25A		HF105F-4 / 018 D K -1H S T F (XXX)	
Coil voltage		DC: 5VDC to 110VDC AC: 12VAC to 277VAC			
Coil voltage form		D: DC A: AC			
Coil terminal width		K: 4.8mm Nil: 2.8mm			
Contact arrangement		1H:1 Form A 1D:1 Form B 1Z:1 Form C			
Construction¹⁾		S: Plastic sealed Nil: Dust protected			
Contact material		T: AgSnO ₂ Nil: AgCdO			
Insulation standard		F: Class F Nil: Class B			
Special code³⁾		XXX: Customer special requirement Nil: Standard			

- Notes:** 1) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).
 We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).
 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

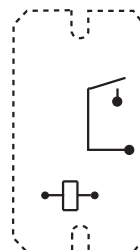
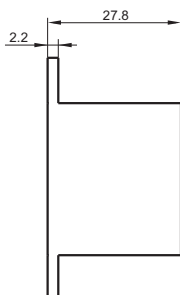
Unit: mm

Outline Dimensions

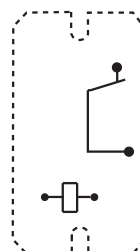
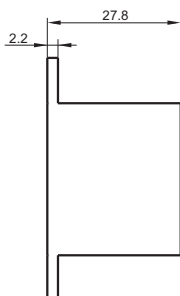
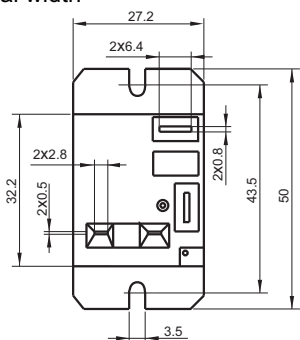
2.8mm Terminal width



Technical drawing of a mechanical part, likely a bracket or plate, showing dimensions in millimeters. The drawing includes a top view and a side view. Key dimensions are: overall width 27.2, overall height 50, and various internal features with dimensions like 2x6.4, 2x4.8, 2x0.5, 2x0.8, 43.5, and 3.5.

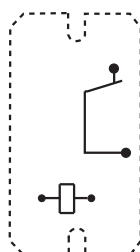
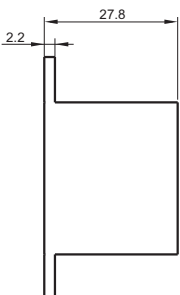


2.8mm Terminal width



Technical drawing of a rectangular plate with the following dimensions and features:

- Overall width: 27.2
- Overall height: 50
- Top horizontal slot: 2x6.4
- Left vertical slot: 2x4.8
- Right vertical slot: 2x0.8
- Bottom horizontal slot: 3.5
- Internal features include two rectangular cutouts and two circular holes.



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

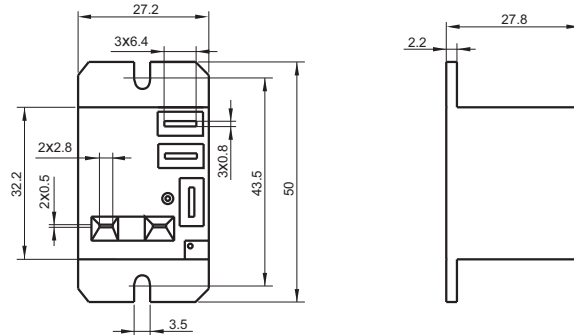
Unit: mm

1 Form C

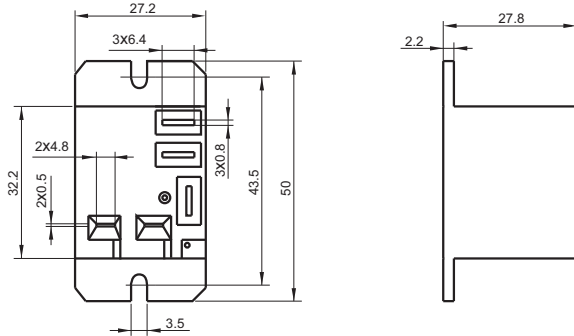
Outline Dimensions

Wiring Diagram (Top view)

2.8mm Terminal width



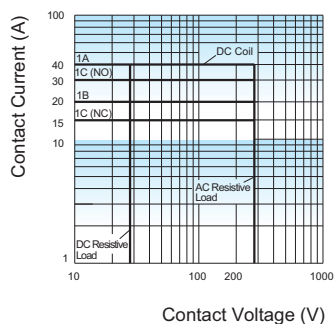
4.8mm Terminal width



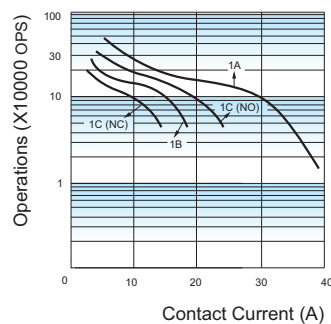
Remark: In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

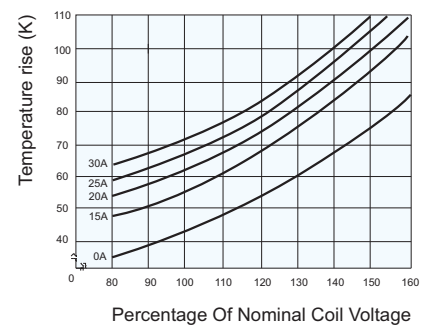


ENDURANCE CURVE



Test conditions:
Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF105F-5

MINIATURE HIGH POWER RELAY

c  US

File No.:E134517



File No.:40025518 (DC type)



File No.:R 50454580 (AC type)



File No.:CQC10002049165(DC type)

CQC16002140270(DC type)



Features

- 40A switching capability
- Heavy load up to 7200VA
- PCB coil terminals, ideal for heavy duty load
- Plastic sealed and dust protected types available
- 4kV dielectric strength (between coil and contacts)

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Max. switching capacity	7200VA/560W	3600VA/280W	4800VA/560W	2400VA/280W
Max. switching voltage	277VAC / 28VDC			
Max. switching current	40A ²⁾	15A	20A	10A
Max.continuous current	When PCB terminals carry current≤30A When PCB terminals do not carry current (only QC terminals carry current)≤25A			
HF105F-5 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-5L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1 x 10 ⁷ OPS			
Electrical endurance	1H type(Non-plastic sealed): 1 x 10 ⁵ OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes:1) The data shown above are initial values.

2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC/4000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		DC type: 15ms max.
Release time (at rated. volt.)		DC type: 10ms max.
Ambient temperature		DC: -55°C to 85°C AC: -55°C to 60°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB & QC
Unit weight		Approx. 36g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

COIL

Coil power	DC type: Approx. 900mW; AC type: Approx. 2VA
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SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A	AgSnO ₂	30A 277VAC
		AgCdO	40A 277VAC
	1 Form B	AgCdO	2HP 250VAC
		AgCdO	1HP 125VAC
	1 Form C	AgCdO	30A 28VDC
		AgCdO	28A 277VAC
UL/ CUL	1 Form A	AgSnO ₂	277VAC(FLA=20)(LRA=60)
		AgCdO	15A 277VAC
	1 Form B	AgCdO	10A 28VDC
		AgCdO	1/2HP 250VAC
	1 Form C	AgCdO	1/4HP 125VAC
		AgCdO	277VAC(FLA=10)(LRA=33)
UL/ CUL	1 Form A	AgSnO ₂	30A 277VAC
		AgCdO	2HP 250VAC
	1 Form B	AgCdO	1HP 125VAC
		AgCdO	20A 277VAC
	1 Form C	AgCdO	20A 28VDC
		AgCdO	277VAC(FLA=20)(LRA=60)
UL/ CUL	1 Form A	AgSnO ₂	20A 277VAC
		AgCdO	1/2HP 250VAC
	1 Form B	AgCdO	1/4HP 125VAC
		AgCdO	10A 277VAC
	1 Form C	AgCdO	10A 28VDC
		AgCdO	277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23°C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max. ³⁾	Drop-out Voltage VDC min. ³⁾	Max. Voltage VDC ⁴⁾	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max. ³⁾	Drop-out Voltage VAC min. ³⁾	Max. Voltage VDC ⁴⁾	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.

2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.

3) The data shown above are initial values.

4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF105F-5 / 018 D T -1H S T F (XXX)	
Type	HF105F-5: 30A HF105F-5L: 25A
Coil voltage	DC: 5VDC to 110VDC AC: 12VAC to 277VAC
Coil voltage form	D: DC A: AC
Dielectric strength (between coil & contacts)	T: 4000VAC Nil: 2500VAC
Contact arrangement	1H:1 Form A 1D:1 Form B 1Z:1 Form C
Construction ¹⁾	S: Plastic sealed Nil: Dust protected
Contact material	T: AgSnO ₂ Nil: AgCdO
Insulation standard	F: Class F Nil: Class B
Special code ³⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

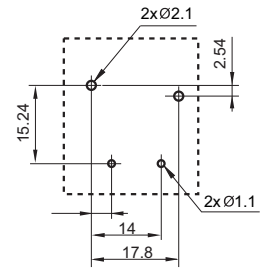
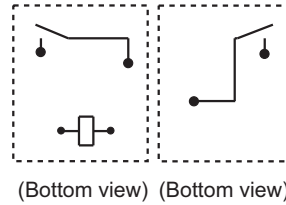
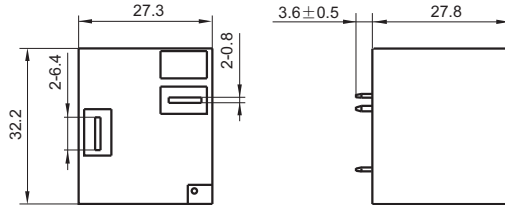
Unit: mm

Outline Dimensions

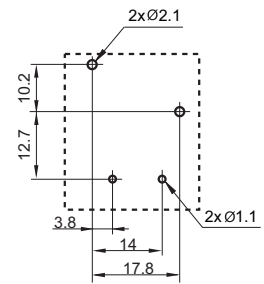
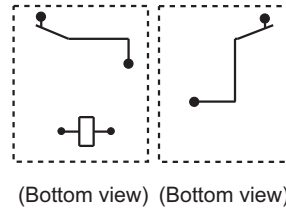
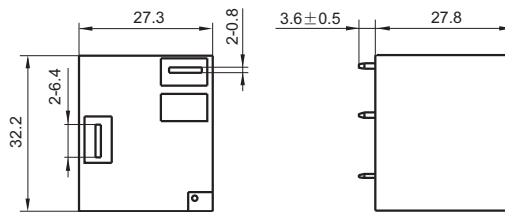
Wiring Diagram

PCB Layout (Bottom view)

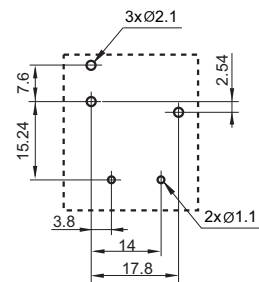
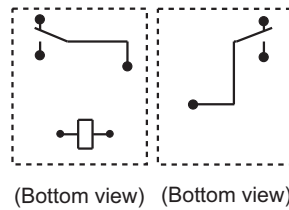
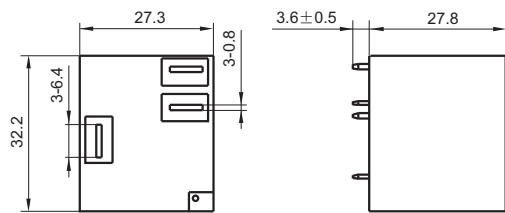
1 Form A



1 Form B



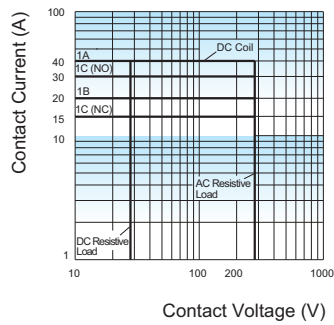
1 Form C



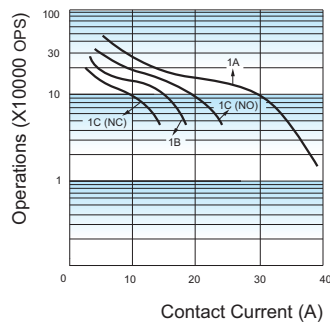
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

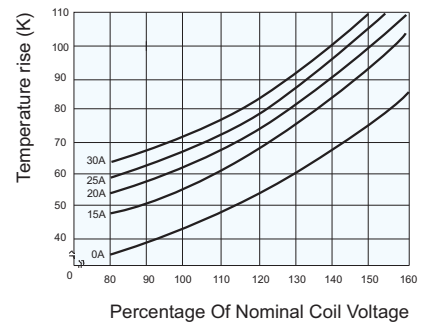
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:
Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF2100

MINIATURE HIGH POWER RELAY

c  US

File No.:E134517



File No.:R50153835



File No.:CQC10002049166



Features

- 30A switching capability
- PCB coil terminals, ideal for heavy duty load
- 2.5kV dielectric strength (between coil and contacts)
- Plastic sealed and Dust protected types available
- UL insulation system: Class F available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A 240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A ²⁾	15A	20A	10A
Max.continuous current	When PCB terminals carry current ≤30A When PCB terminals do not carry current (only QC terminals carry current) ≤25A			
Mechanical endurance	1 x 10 ⁷ OPS			
Electrical endurance	1A type(Non-plastic sealed): 1 x 10 ⁵ OPS (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes:1) The data shown above are initial values.

2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)	15ms max.	
Release time (at rated. volt.)	10ms max.	
Ambient temperature	-55°C to 85°C	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Termination	PCB & QC	
Unit weight	Approx. 35g	
Construction	Plastic sealed, Dust protected	

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B.

5) It is recommended that the terminal of the process QC cannot pass through more than 25A current for a long period of time .

COIL

Coil power	Approx. 900mW
------------	---------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes:1)The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949 , ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL

Contact material	Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
AgCdO	General purpose	125/240VAC	30A	15A	30A	15A
		277VAC	30A	30A	30A	30A
	Resistive	125/240VAC	30A	15A	--	--
		30VDC	20A	10A	20A	10A
		277VAC	20A	--	--	--
		240VAC	15A	--	--	--
		250VAC	40A		40A	
	Ballast	125/240/277VAC	6A	3A	6A	3A
	Pilot duty	125VAC	800VA	290VA	800VA	290VA
		125VAC	690VA	--	690VA	--
		125VAC	800VA	--	800VA	--
		240VAC	1152VA	768VA	1152VA	768VA
		277VAC	764VA	--	764VA	--
	Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
		240VAC	2HP	1HP	2HP	1HP
		125VAC	1HP	--	1HP	--
		125/277VAC	3/4HP	--	3/4HP	--
	Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	--	82.8LRA, 13.8FLA	--
		125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
		125VAC	82.8LRA, 27FLA	--	82.8LRA, 27FLA	--
		240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		240VAC	41.4LRA, 6.9FLA	--	41.4LRA, 6.9FLA	--
		277VAC	60LRA, 20FLA	--	60LRA, 20FLA	--
	Tungsten	125VAC	15A	--	15A	--
		240VAC	5A	--	5A	3A
		120VAC	--	3A	--	--
		240VAC	--	3A	--	--
AgSnO ₂	General purpose	125/240VAC	30A	--	--	--
	Resistive	250VAC	40A	--	--	--
	General purpose	240VAC	--	15A	--	--

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF2100	-1A	-12D	E	T	F	(XXX)
Contact arrangement	1A: 1 Form A 1B: 1 Form B 1C: 1 Form C						
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC						
Construction ¹⁾	E: Plastic sealed		Nil: Dust protected				
Contact material	T: AgSnO ₂		Nil: AgCdO				
Insulation standard	F: Class F		Nil: Class B				
Special code ³⁾	XXX: Customer special requirement			Nil: Standard			

Notes: 1) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

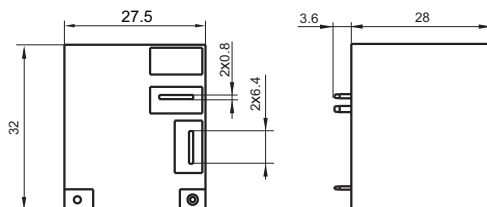
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

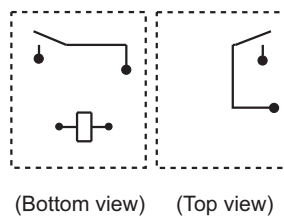
Unit: mm

1 Form A

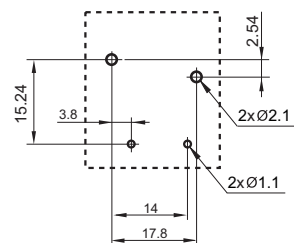
Outline Dimensions



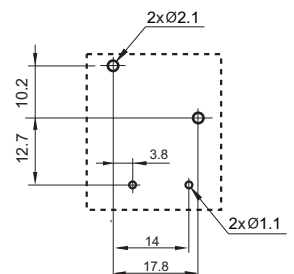
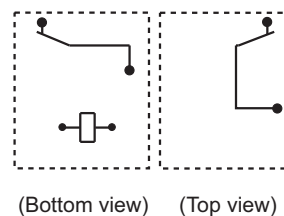
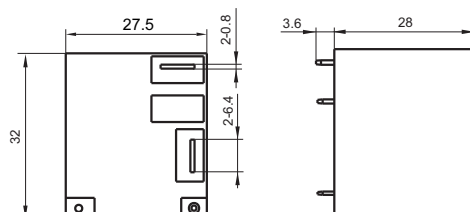
Wiring Diagram



PCB Layout
(Bottom view)



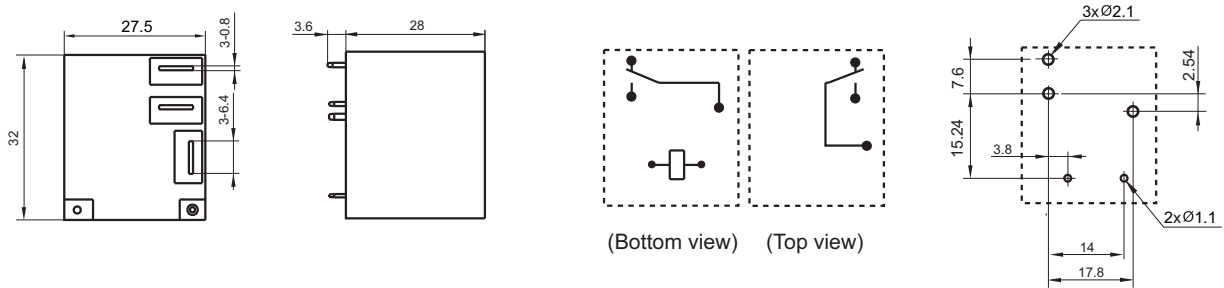
1 Form B



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

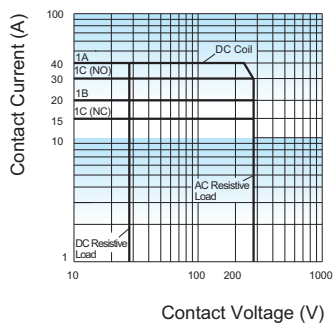
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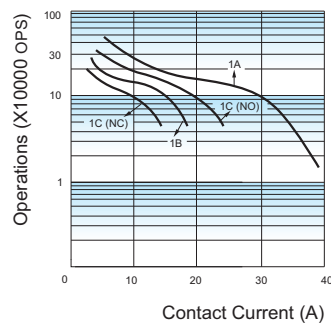
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

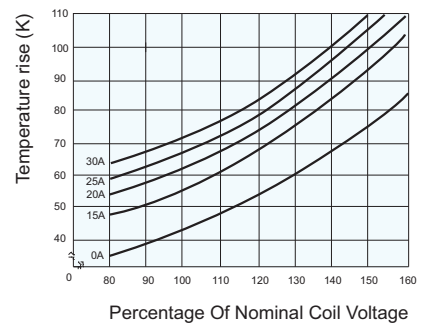
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

Resistive load, AgCdO, Dust protected,
 Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF2110/HF2120

MINIATURE HIGH POWER RELAY

CRUS

File No.:E134517



File No.:CQC10002049166



Features

- 30A switching capability
- PCB coil terminals, ideal for heavy duty load
- 2.5kV dielectric strength (between coil and contacts)
- Unenclosed type available

CONTACT DATA

Contact arrangement	1A	1B	1C(NO)	1C(NC)
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A 240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4511VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A	15A	20A	10A
Mechanical endurance	1 x 10 ⁷ OPS			
Electrical endurance	1A type: 1 x 10 ⁵ OPS (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	HF2110/HF2120: 2500VAC 1min HF2111/HF2121: 2000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)	15ms max.	
Release time (at rated. volt.)	10ms max.	
Ambient temperature	-55°C to 85°C	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1mm DA	
Humidity	5% to 85% RH	
Termination	HF2110/2111: PCB HF2120/2121: PCB & QC	
Unit weight	Approx. 25g	
Construction	Unenclosed	

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 900mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC* ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL					
Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
General purpose	125/240VAC	30A	15A	30A	15A
	277VAC	30A	30A	30A	30A
Resistive	125/240VAC	30A	15A	--	--
	30VDC	20A	10A	20A	10A
	277VAC	20A	--	--	--
	240VAC	15A	--	--	--
	250VAC	40A	--	40A	--
Ballast	125/240/277VAC	6A	3A	6A	3A
Pilot duty	125VAC	800VA	290VA	800VA	290VA
	125VAC	690VA	--	690VA	--
	125VAC	800VA	--	800VA	--
	240VAC	1152VA	768VA	1152VA	768VA
	277VAC	764VA	--	764VA	--
Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
	240VAC	2HP	1HP	2HP	1HP
	125VAC	1HP	--	1HP	--
	125/277VAC	3/4HP	--	3/4HP	--
Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	--	82.8LRA, 13.8FLA	--
	125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
	125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
	125VAC	82.8LRA, 27FLA	--	82.8LRA, 27FLA	--
	240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
	240VAC	41.4LRA, 6.9FLA	--	41.4LRA, 6.9FLA	--
	277VAC	60LRA, 20FLA	--	60LRA, 20FLA	--
Tungsten	125VAC	15A	--	15A	--
	240VAC	5A	--	5A	3A
	120VAC	--	3A	--	--
	240VAC	--	3A	--	--

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF2110 HF2120	-1A	-12D	T	F	(XXX)
Contact arrangement	1A: 1 Form A 1B: 1 Form B 1C: 1 Form C					
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC					
Contact material	T: AgSnO ₂ Nil: AgCdO					
Insulation standard	F: Class F Nil: Class B					
Special code ⁵⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.

2) Relays may be damaged because of falling or when shocking conditions exceed the requirement.

3) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidelines of relay".

4) For unenclosed type, because there is no cover protection, the products may be contaminated by particles during transportation assembly or usage, which may cause relay failure, so the products should be effectively protected at customer side, Hongfa suggest to use HF2150/HF2160 type, if no other special requirement.

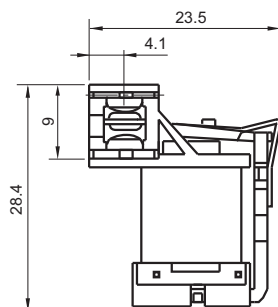
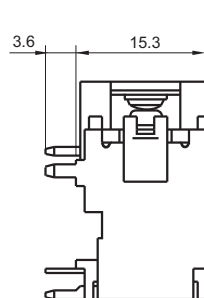
5) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

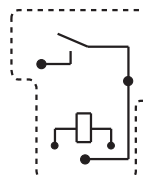
Unit: mm

1 Form A

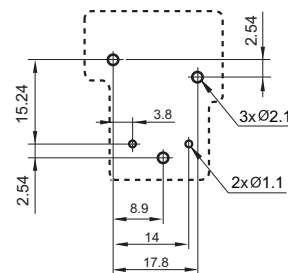
HF2111 Outline Dimensions



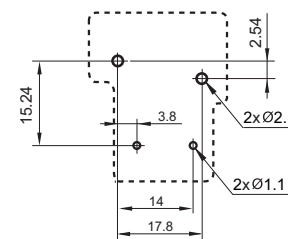
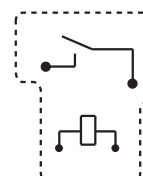
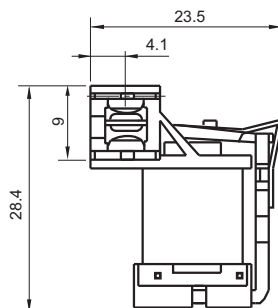
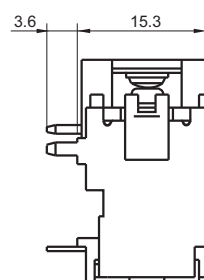
Wiring Diagram (Bottom view)



PCB Layout (Bottom view)

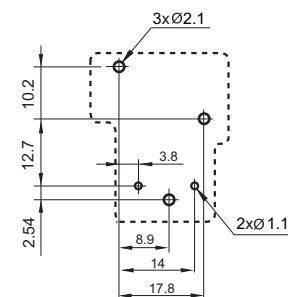
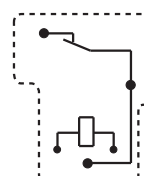
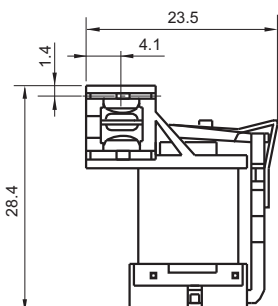
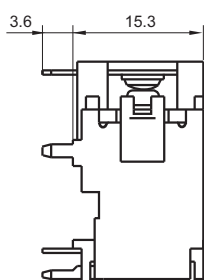


HF2110

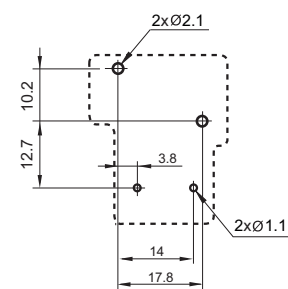
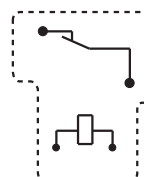
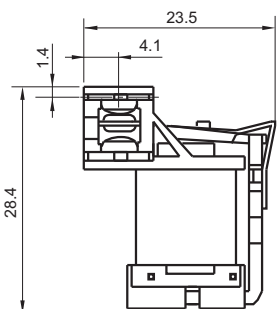
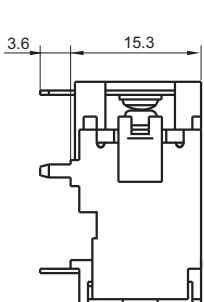


1 Form B

HF2111



HF2110



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

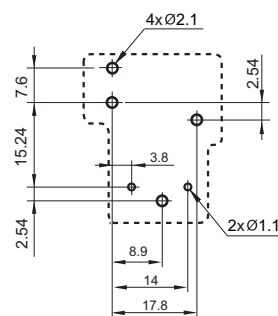
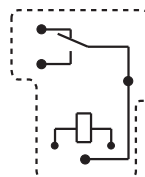
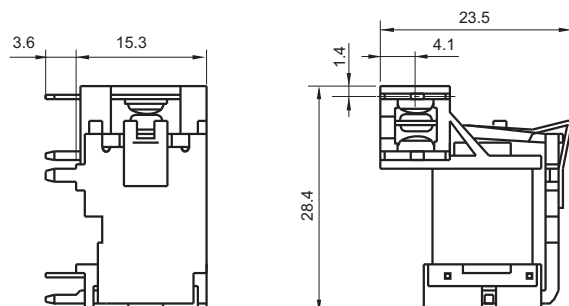
1 Form C

Outline Dimensions

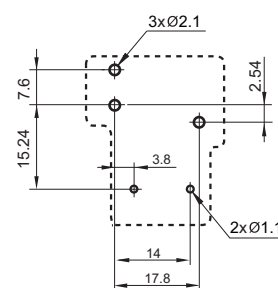
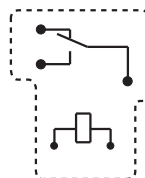
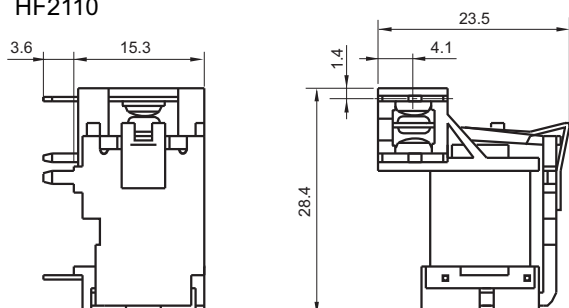
Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)

HF2111

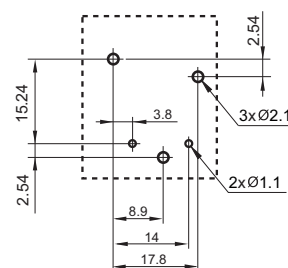
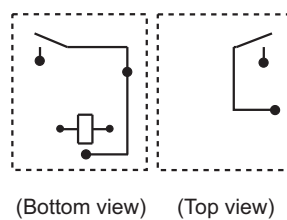
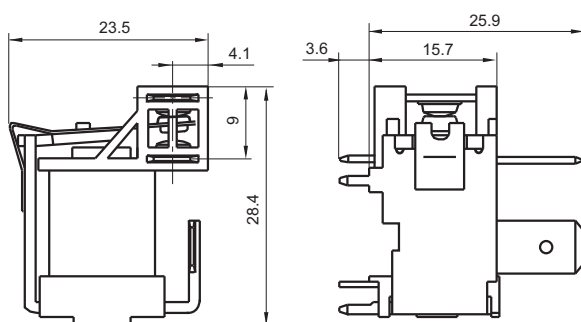


HF2110

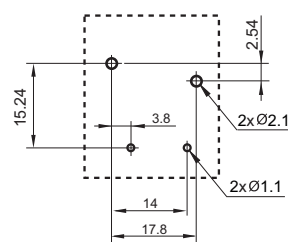
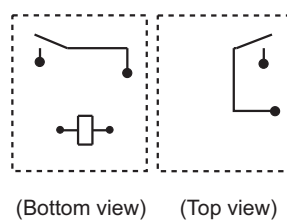
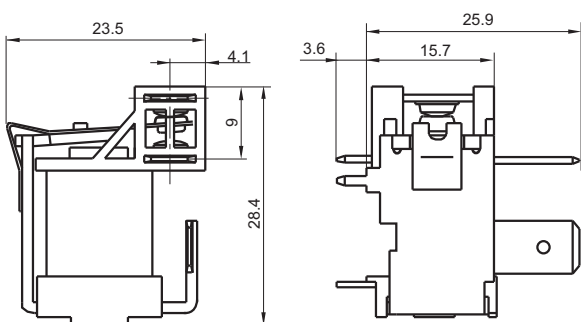


1 Form A

HF2121



HF2120



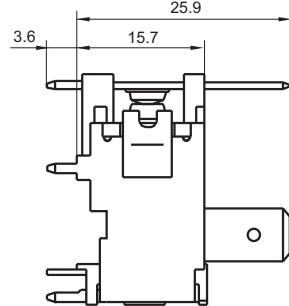
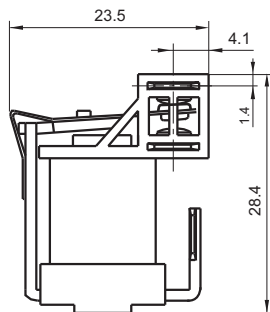
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

1 Form B

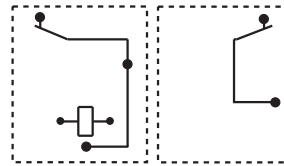
Outline Dimensions

HF2121



Wiring Diagram

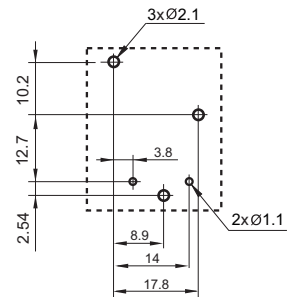
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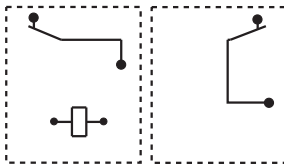
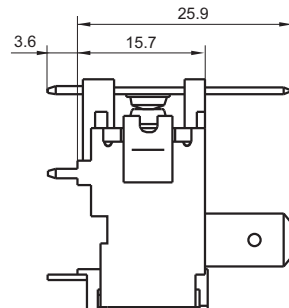
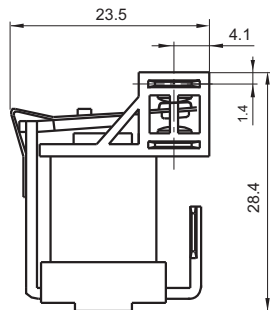
(Bottom view) (Top view)

PCB Layout

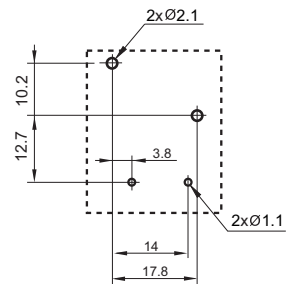
(Bottom view)



HF2120

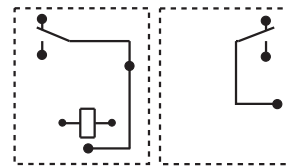
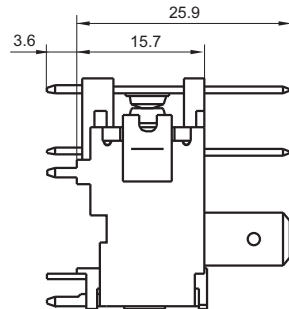
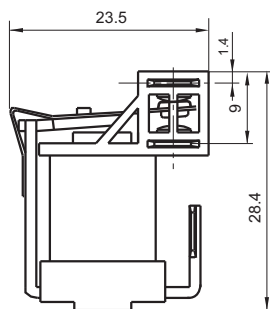


(Bottom view) (Top view)

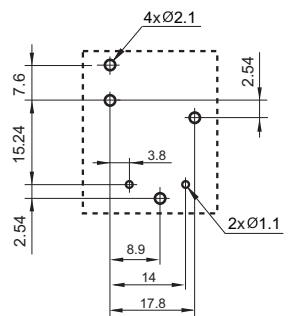


1 Form C

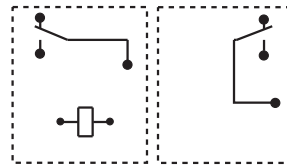
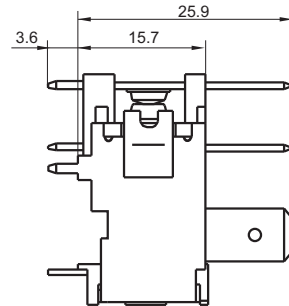
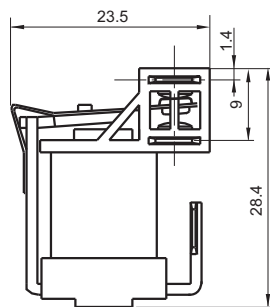
HF2121



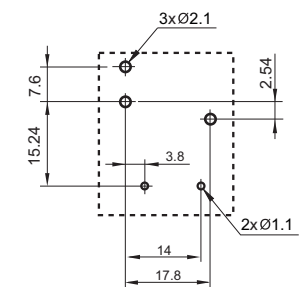
(Bottom view) (Top view)



HF2120



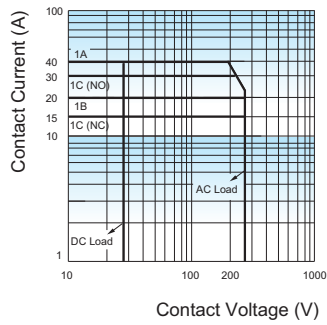
(Bottom view) (Top view)



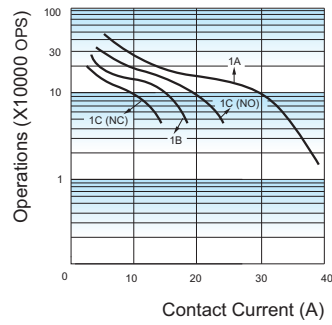
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



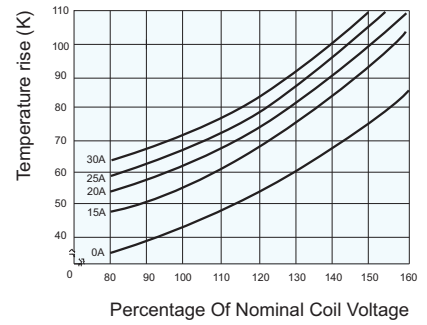
ENDURANCE CURVE



Test conditions:

Resistive load, AgCdO, Room temp.,
1s on 9s off.

COIL TEMPERATURE RISE



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF2150/HF2151

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.: R50153835



File No.:CQC10002049166
CQC16002139675



Features

- 30A switching capability
- PCB coil terminals, ideal for heavyduty load
- Heavy load up to 7200VA
- Plastic sealed and Dust protected type available

CONTACT DATA

Contact arrangement	1A	1B	1C(NO)	1C(NC)
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A 240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A ²⁾	15A	20A	10A
Mechanical endurance	1 x 10 ⁷ OPS			
Electrical endurance	1A type(Non-plastic sealed): 1 x 10 ⁵ OPS (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes:1) The data shown above are initial values.

2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	HF2150: 2500VAC 1min HF2151: 2000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Ambient temperature		-55°C to 85°C
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 30g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

COIL

Coil power	Approx. 900mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes:1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL

Contact material	Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
AgCdO	General purpose	125/240VAC	30A	15A	30A	15A
		277VAC	30A	30A	30A	30A
	Resistive	125/240VAC	30A	15A	--	--
		30VDC	20A	10A	20A	10A
		277VAC	20A	--	--	--
		240VAC	15A	--	--	--
		250VAC	40A		40A	
	Ballast	125/240/277VAC	6A	3A	6A	3A
	Pilot duty	125VAC	800VA	290VA	800VA	290VA
		125VAC	690VA	--	690VA	--
		125VAC	800VA	--	800VA	--
		240VAC	1152VA	768VA	1152VA	768VA
		277VAC	764VA	--	764VA	--
	Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
		240VAC	2HP	1HP	2HP	1HP
		125VAC	1HP	--	1HP	--
		125/277VAC	3/4HP	--	3/4HP	--
	Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	--	82.8LRA, 13.8FLA	--
		125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
		125VAC	82.8LRA, 27FLA	--	82.8LRA, 27FLA	--
		240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		240VAC	41.4LRA, 6.9FLA	--	41.4LRA, 6.9FLA	--
		277VAC	60LRA, 20FLA	--	60LRA, 20FLA	--
	Tungsten	125VAC	15A	--	15A	--
		240VAC	5A	--	5A	3A
		120VAC	--	3A	--	--
		240VAC	--	3A	--	--
AgSnO ₂	General purpose	125/240VAC	30A	--	--	--
	Resistive	250VAC	40A	--	--	--
	General purpose	240VAC	--	15A	--	--

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF2150 HF2151	-1A	-12D	E	T	F	(XXX)
Contact arrangement	1A: 1 Form A 1B: 1 Form B 1C: 1 Form C						
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC						
Construction ¹⁾	E: Plastic sealed Nil: Dust protected						
Contact material	T: AgSnO ₂ Nil: AgCdO						
Insulation standard	F: Class F Nil: Class B						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

4) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

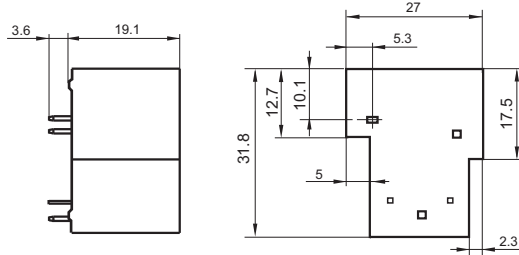
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

1 Form A

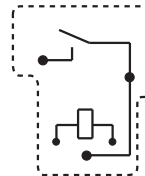
Outline Dimensions

HF2151



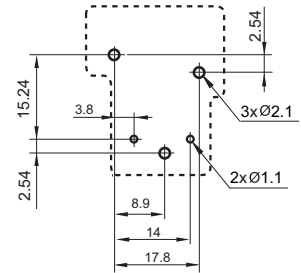
Wiring Diagram

(Bottom view)

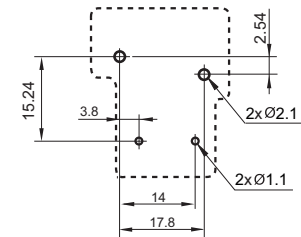
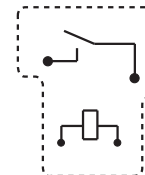
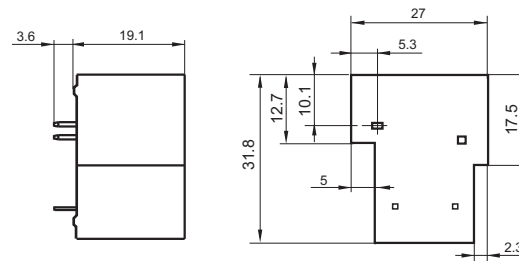


PCB Layout

(Bottom view)

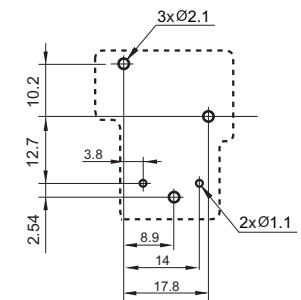
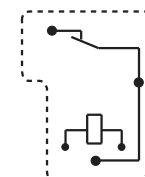
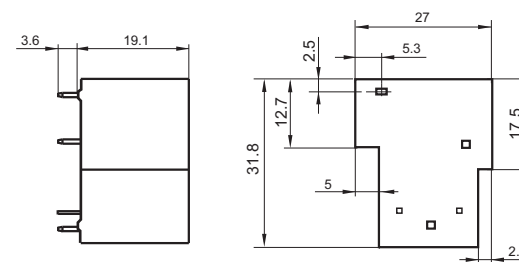


HF2150

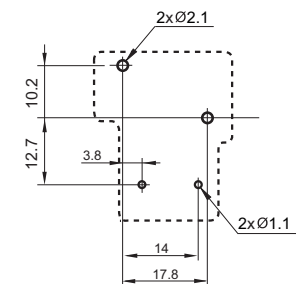
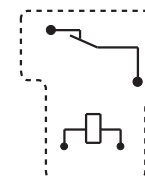
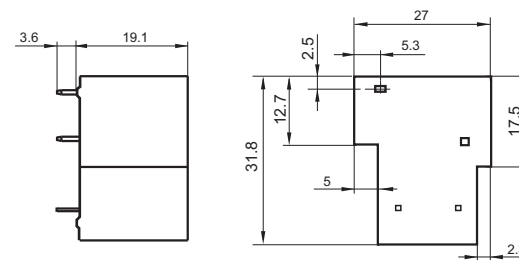


1 Form B

HF2151



HF2150



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

1 Form C

Outline Dimensions

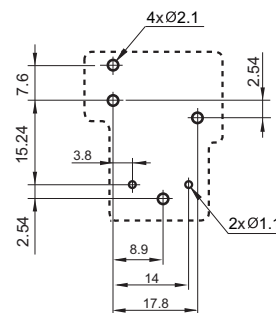
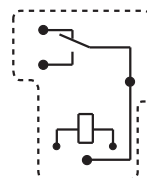
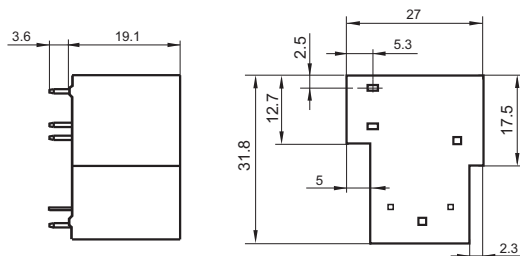
Wiring Diagram

PCB Layout

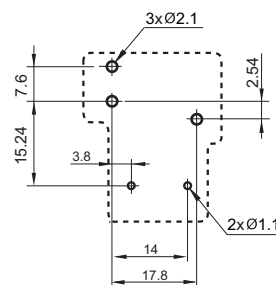
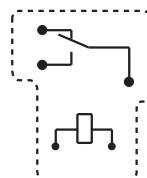
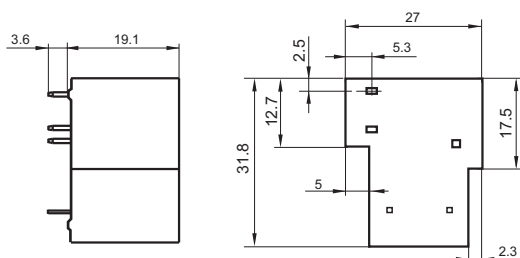
(Bottom view)

(Bottom view)

HF2151



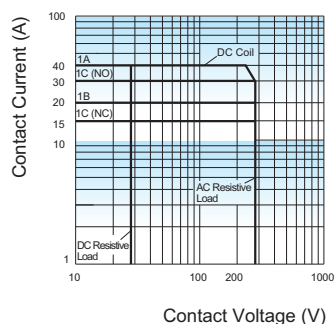
HF2150



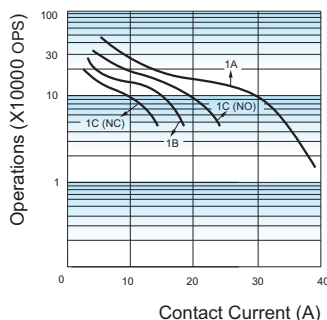
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

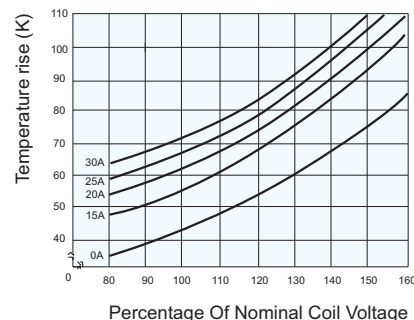
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

Resistive load, AgCdO, Dust protected,
Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF2160

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.: R50153835



File No.:CQC10002049166

CQC16002139675



Features

- 30A switching capability
- PCB coil terminals, ideal for heavy duty load
- 2.5kV dielectric strength
(between coil and contacts)
- Plastic sealed and Dust protected types available
- Products with QC 3.2mm pin diameter of 909 code are available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)			
Contact material	AgSnO ₂ , AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A 240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A ²⁾	15A	20A	10A
Max.continuous current	When PCB terminals carry current≤30A When PCB terminals do not carry current (only QC terminals carry current)≤25A			
Mechanical endurance	1 x 10 ⁷ ops			
Electrical endurance	1A type(Non-plastic sealed): 1 x 10 ⁵ ops (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off) 1B type(Non-plastic sealed): 1 x 10 ⁵ ops (15A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes:1) The data shown above are initial values.

2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)	15ms max.	
Release time (at rated. volt.)	10ms max.	
Ambient temperature	-55°C to 85°C	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Termination	PCB & QC	
Unit weight	Approx. 30g	
Construction	Plastic sealed, Dust protected	

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.

2) The data shown above are initial values.

3) Please find coil temperature curve in the characteristic curves below.

4) UL insulation system: Class F, Class B.

5) It is recommended that the terminal of the process QC cannot pass through more than 25a current for a long period of time .



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.00

COIL

Coil power	Approx. 900mW
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ^{*2)}	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes:1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL						
Contact material	Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
AgCdO	General purpose	125/240VAC	30A	15A	30A	15A
		277VAC	30A	30A	30A	30A
	Resistive	125/240VAC	30A	15A	--	--
		30VDC	20A	10A	20A	10A
		277VAC	20A	--	--	--
		240VAC	15A	--	--	--
		250VAC	40A		40A	
	Ballast	125/240/277VAC	6A	3A	6A	3A
	Pilot duty	125VAC	800VA	290VA	800VA	290VA
		125VAC	690VA	--	690VA	--
		125VAC	800VA	--	800VA	--
		240VAC	1152VA	768VA	1152VA	768VA
		277VAC	764VA	--	764VA	--
	Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
		240VAC	2HP	1HP	2HP	1HP
		125VAC	1HP	--	1HP	--
		125/277VAC	3/4HP	--	3/4HP	--
	Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	--	82.8LRA, 13.8FLA	--
		125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
		125VAC	82.8LRA, 27FLA	--	82.8LRA, 27FLA	--
		240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		240VAC	41.4LRA, 6.9FLA	--	41.4LRA, 6.9FLA	--
		277VAC	60LRA, 20FLA	--	60LRA, 20FLA	--
	Tungsten	125VAC	15A	--	15A	--
		240VAC	5A	--	5A	3A
		120VAC	--	3A	--	--
		240VAC	--	3A	--	--
AgSnO ₂	General purpose	125/240VAC	30A	--	--	--
	Resistive	250VAC	40A	--	--	--
	General purpose	240VAC	--	15A	--	--

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF2160	-1A	-12D	E	T	F	(XXX)
Contact arrangement	1A: 1 Form A 1B: 1 Form B 1C: 1 Form C						
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC						
Construction ¹⁾²⁾	E: Plastic sealed Nil: Dust protected						
Contact material	T: AgSnO ₂ Nil: AgCdO						
Insulation standard	F: Class F Nil: Class B						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

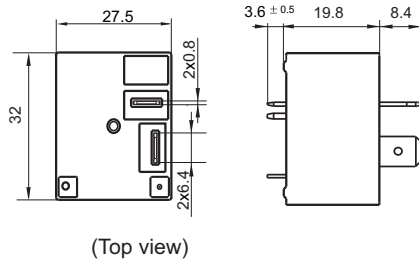
3) The customer special requirement express as special code after evaluating by Hongfa.

4) Code:909 means 3.2mm pin diameter.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

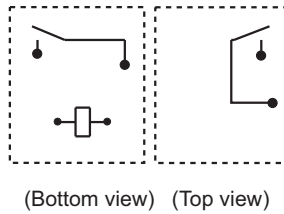
Unit: mm

Outline Dimensions

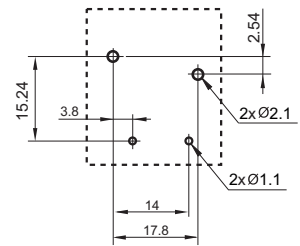


Wiring Diagram

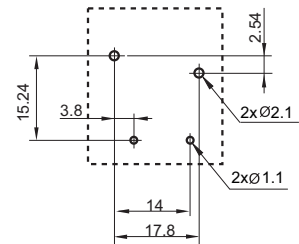
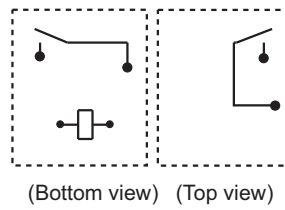
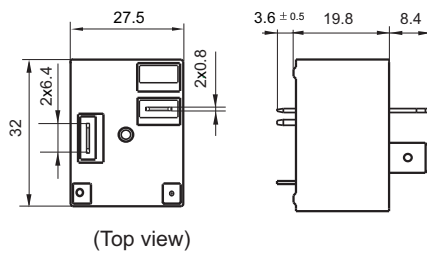
1 Form A



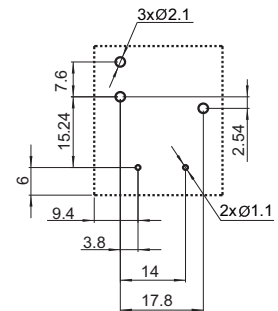
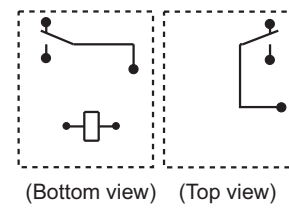
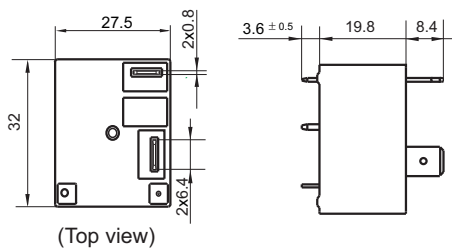
PCB Layout
(Bottom view)



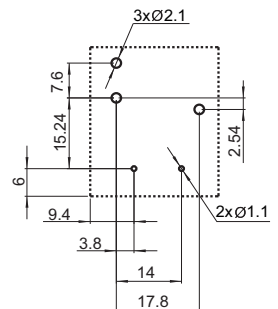
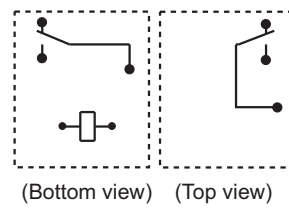
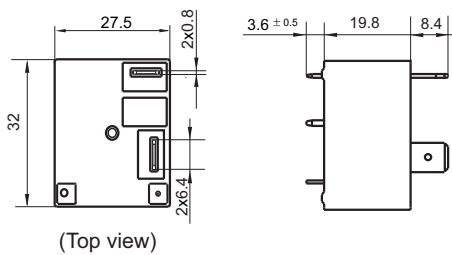
1 Form A(With 502 features)



1 Form B



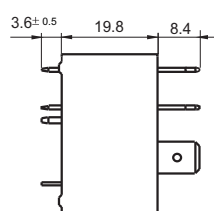
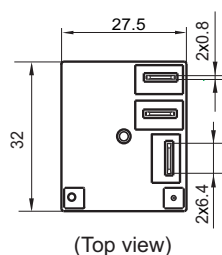
1 Form B(With 502 Special code)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

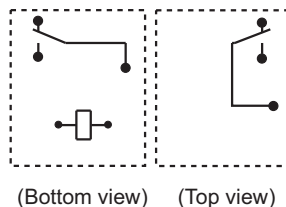
Unit: mm

Outline Dimensions

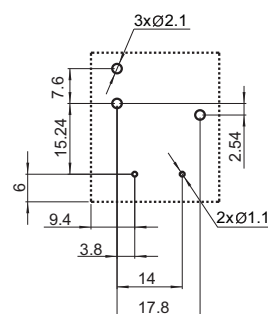


Wiring Diagram

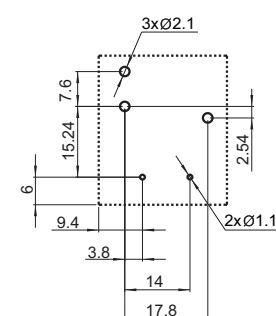
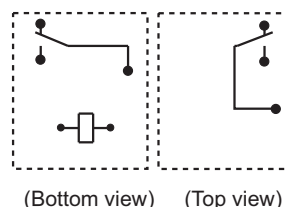
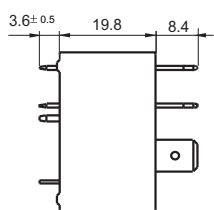
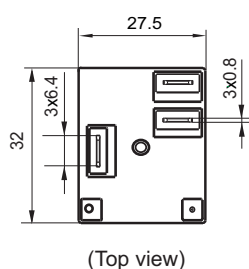
1 Form C



PCB Layout (Bottom view)



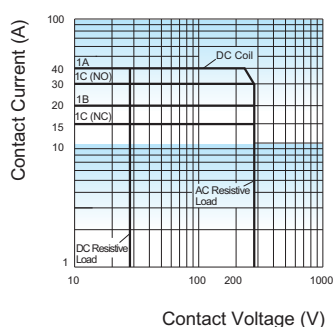
1 Form C(With 502 Special code)



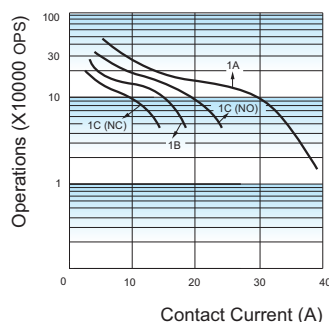
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

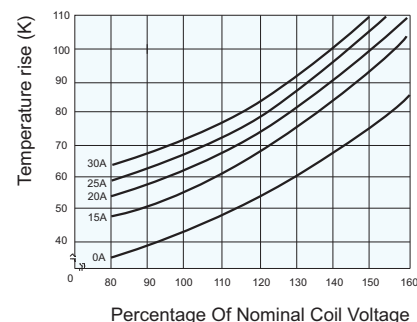
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

Resistive load, AgCdO, Dust protected,
Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF2160(Screw Type)

MINIATURE HIGH POWER RELAY



File No.: E134517



File No.: R50153835



File No.: CQC16002139675



Features

- Application to heater
- 30A switching capability
- PCB coil terminals, Screw type
- UL insulation system:Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max.(1A 6VDC)
Contact material	AgSnO ₂
Contact rating(Res.)	30A 250VAC
Max.switching voltage	277 VAC
Max.switching current	40 A
Max.switching power	11080 VAC
Mechanical endurance	1×10 ⁷ OPS
Electrical endurance	5×10 ⁴ OPS (30A 250VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx.900mW
------------	--------------

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min	Max. Allowable Voltage VDC	Coil Resistance Ω
5	3.75	0.5	6.5	27×(1±10%)
6	4.50	0.6	7.8	40×(1±10%)
9	6.75	0.9	11.7	97×(1±10%)
12	9.00	1.2	15.6	155×(1±10%)
15	11.25	1.5	19.5	256×(1±10%)
18	13.50	1.8	23.4	380×(1±10%)
24	18.00	2.4	31.2	660×(1±10%)
48	36.00	4.8	62.4	2560×(1±10%)
70	52.50	7.0	91.0	5500×(1±10%)
110	82.5	11.0	143.0	13450×(1±10%)

Notes: 1) The data shown above are initial values.

2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance	1000MΩ(500VDC)
Dielectric strength	Between open contacts 1500VAC 1min Between coil & contacts 2500VAC 1min
Operate time(at nomi. volt.)	15ms max.
Release time(at nomi. volt.)	10ms max.
Shock resistance	Functional 98m/s ² Destructive 980m/s ²
Vibration resistance	10Hz to 55Hz 1.5 mm DA
Humidity	5% to 85%RH
Ambient temperature	-40°C to 85°C
Termination	PCB,Screw type
Unit weight	Approx. 28g
Construction	Flux proofed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	30 A, 125VAC, Resistive load 30 A, 277VAC, Resistive load 40 A, 250VAC, Resistive load
--------	--

Notes: The typical loads listed above are only part of the product certification. The detailed test conditions of each load are different, so the electrical durability is different. For more information, please contact us.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

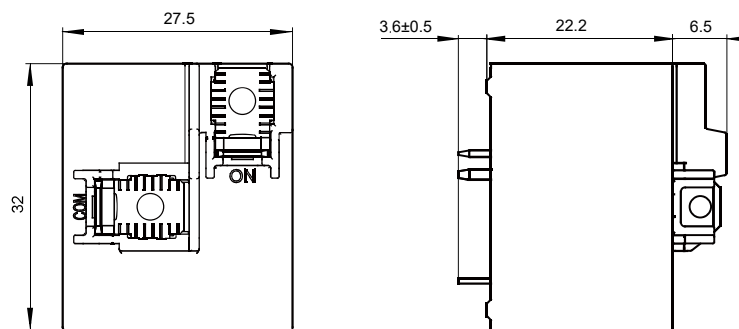
Type	HF2160	-1A	-12D	<input type="checkbox"/>	T	F	N	(XXX)
Contact arrangement	H: 1 Form A							
Coil voltage	6, 9, 12, 24VDC							
Construction	Nil: Dust protected							
Contact material	T: AgSnO ₂							
Insulation standard	F: Class F							
Contact terminal type	N: Screw type							
Special code	XXX: Customer special requirement; Nil: Standard							

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

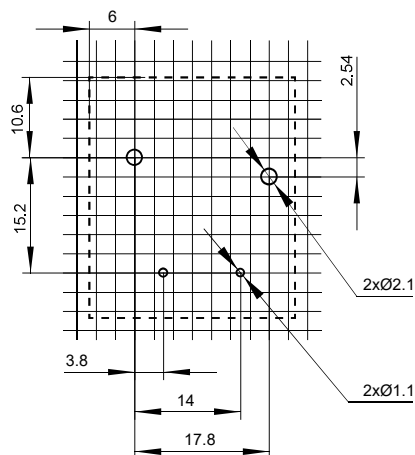
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

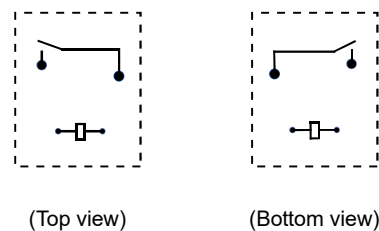
Outline Dimensions



PCB Layout(Bottom view)



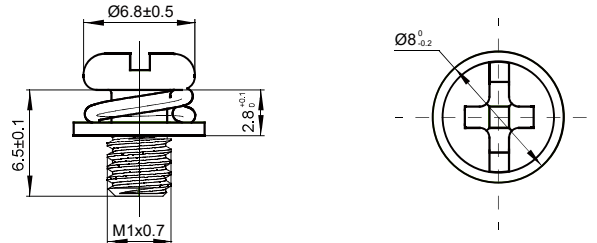
Wiring Diagram



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

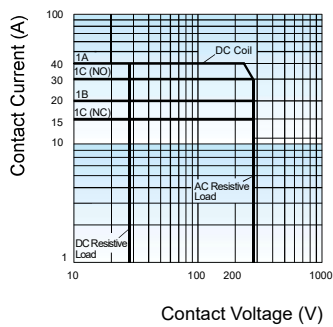
Unit: mm

- Notes: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$ and $\leq 30\text{mm}$, tolerance should be $\pm 0.4\text{mm}$; outline dimension $> 30\text{mm}$, tolerance should be $\pm 0.6\text{mm}$.
- 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.
- 3) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
- 4) Recommended screw size:

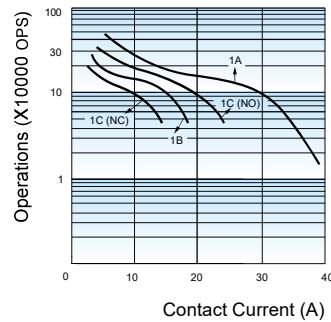


CHARACTERISTIC CURVES

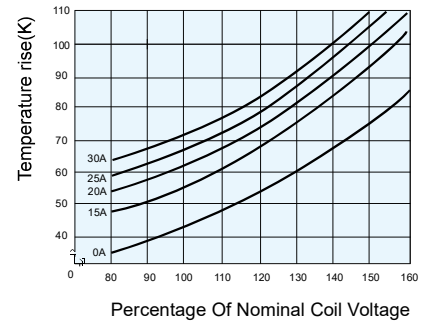
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:
Resistive load, Dust protected,
Room temp., 1s on 9s off.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF172F-100

SOLAR RELAY



File No.: E133481



File No.: R50393829



Features

- 100A switching capability
- Applicable to solar photovoltaic inverter
- 4.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	6mΩ max.(6VDC 20A)
Contact material	AgNi/AgSnO ₂
Contact rating (Res. load)	Making 30A,carrying 100A breaking 30A, 800VAC at 85°C
Max. switching voltage	800VAC
Max. switching current	100A
Max. switching power	24000VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	3 x 10 ⁴ OPS (Resistive load 800VAC,Making 30A,carrying 100A,Breaking 30A, at 85°C 1s on 9s off)

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 2.5W
Holding voltage	40% to 100% U _N (at 25°C) 50% to 60%U _N (at 85°C)

- Notes:** 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

SAFETY APPROVAL RATINGS

UL/CL	Making 60A, carrying 100A breaking 60A, 277VAC at 85°C Making 30A, carrying 100A breaking 30A, 800VAC at 85°C
TÜV (pending)	Making 60A, carrying 100A breaking 60A, 277VAC at 85°C Making 30A, carrying 100A breaking 30A, 800VAC at 85°C

- Notes:** 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV(1.2 / 50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 100A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage,at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 125g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
6	4.5	0.3	6.6	14.4 x (1±10%)
9	6.75	0.45	9.9	32.4 x (1±10%)
12	9	0.6	13.2	57.6 x (1±10%)
24	18	1.2	26.4	230.4 x (1±10%)

Notes: *Maximun voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

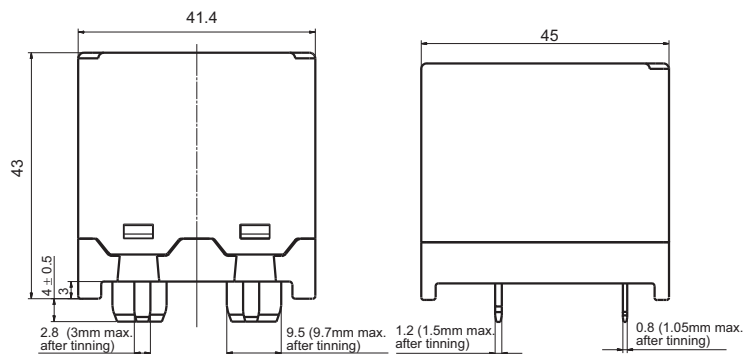
Type	HF172F-100/	12	-H	-T	F	(XXX)
Coil voltage	6, 9, 12, 24VDC					
Contact arrangement	H:1 Form A					
Contact material	T: AgSnO ₂ Nil: AgNi					
Insulation standard	F: Class F					
Special code ³⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

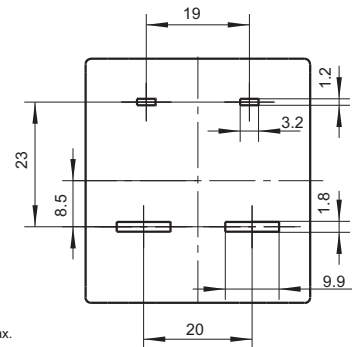
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

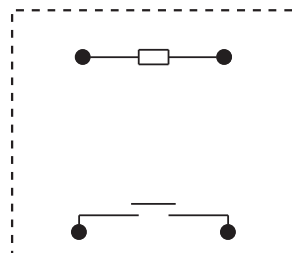
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF172F-140

SOLAR RELAY



File No.: E133481



File No.: R50393829



Features

- 140A switching capability
- Applicable to solar photovoltaic inverter
- 3.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	6mΩ max.(6VDC 20A)
Contact material	AgNi
Contact rating (Res. load)	Making 30A,carrying 140A breaking 30A, 800VAC at 85°C
Max. switching voltage	800VAC
Max. switching current	140A
Max. switching power	24000VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	3 x 10 ⁴ OPS (Resistive load 800VAC,Making 30A,carrying 140A,Breaking 30A, at 85°C 1s on 9s off)

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 2.5W
Holding voltage	40% to 100% U _N (at 25°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

SAFETY APPROVAL RATINGS

UL/CUL	Making 60A, carrying 140A breaking 60A, 277VAC at 85°C Making 40A, carrying 140A breaking 40A, 400VAC at 85°C Making 30A, carrying 140A breaking 30A, 800VAC at 85°C
TÜV	Making 60A, carrying 140A breaking 60A, 277VAC at 85°C Making 40A, carrying 140A breaking 40A, 400VAC at 85°C Making 30A, carrying 140A breaking 30A, 800VAC at 85°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV(1.2 / 50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 140A,Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage,at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 135g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
6	4.5	0.3	6.6	14.4 x (1±10%)
9	6.75	0.45	9.9	32.4 x (1±10%)
12	9	0.6	13.2	57.6 x (1±10%)
24	18	1.2	26.4	230.4 x (1±10%)

Notes: *Maximun voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF172F-140/	12	-H	F	(XXX)
Coil voltage	6, 9, 12, 24VDC				
Contact arrangement	H:1 Form A				
Insulation standard	F: Class F				
Special code ³⁾	XXX: Customer special requirement		Nil: Standard		

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

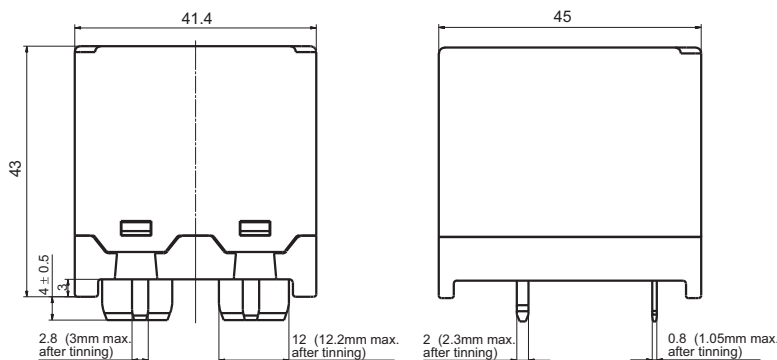
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

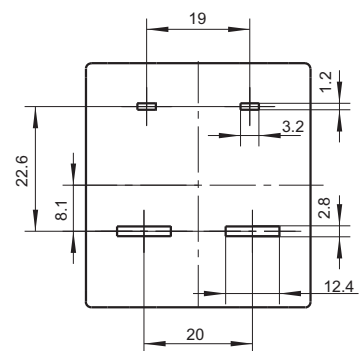
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

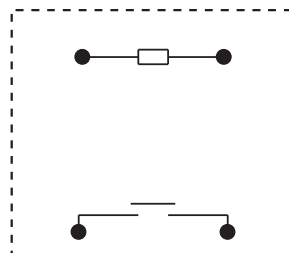
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF172F-200

SOLAR RELAY



File No.:E133481



File No.:R 50393829



Features

- 200A switching capability
- Applicable to solar photovoltaic inverter
- 4.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ⁽¹⁾	1mΩ max.(6VDC 20A)
Contact material	AgSnO ₂
Contact rating (Res. load)	Making 50A, carrying 200A, breaking 50A 830VAC
Max. switching voltage	830VAC
Max. switching current	200A
Max. switching power	166000VA
Mechanical endurance	1×10 ⁶ OPS
Electrical endurance	3×10 ⁴ OPS (85°C, 1s on 9s off, Making 50A, carrying 200A, breaking 50A, 830VAC, Res. load)

Notes: 1) The data shown above are initial values.

COIL

Coil power	Approx. 3W
Holding voltage	40% to 100%U _N (at 25°C) 50% to 60%U _N (at 25°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.

2) To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
6	4.2	0.6	7.2	12× (1±10%)
9	6.3	0.9	10.8	27× (1±10%)
12	8.4	1.2	14.4	48× (1±10%)
24	16.8	2.4	28.8	192× (1±10%)

Notes: *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV(1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 200A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage,at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 215g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	Making 50A, carrying 200A, breaking 50A 830VAC, 85°C, 3×10 ⁴ Ops, Res. load
TUV	Making 50A, carrying 200A, breaking 50A 830VAC, 85°C, 3×10 ⁴ Ops, Res. load



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

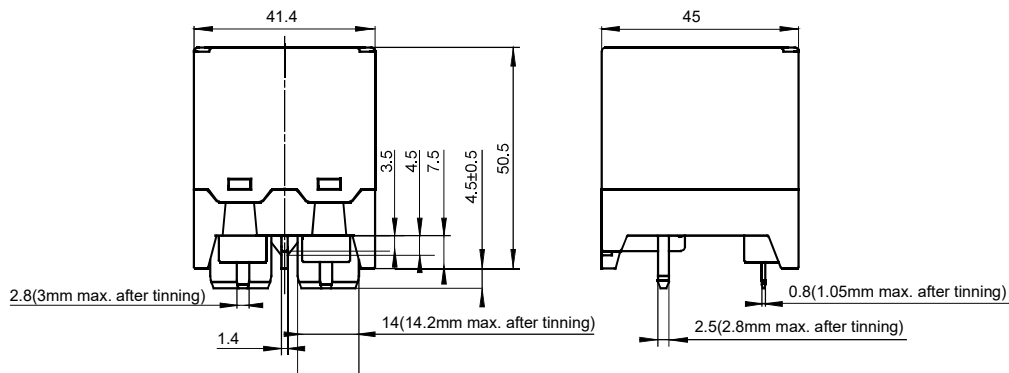
Type	HF172F-200 /	12	-H	T	F	(XXX)
Coil voltage	6,9,12,24VDC					
Contact arrangement	H: 1 Form A					
Contact material	T: AgSnO ₂					
Insulation standard	F: Class F					
Special code ⁽¹⁾	XXX: Customer special requirement			Nil: Standard		

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

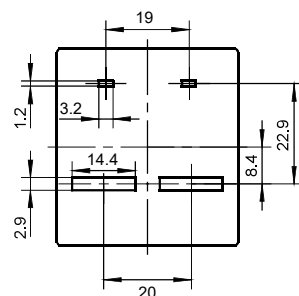
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

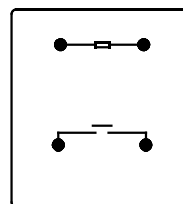
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1mm, tolerance should be ±0.2mm; outline dimension > 1mm and ≤ 5mm, tolerance should be ±0.3mm; outline dimension > 5mm, tolerance should be ±0.4mm.
 2) The tolerance without indicating for PCB layout is always ±0.1mm.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF116F-1

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:R 50154722



File No.:CQC09002031231
CQC18002206328



Features

- 30A switching capability
- 4kV dielectric strength (between coil and contacts)
- 3mm contact gap available

CONTACT DATA

Contact arrangement	1A	2A
Contact resistance ¹⁾	100mΩ max.(at 1A 24VDC)	
Contact material	AgSnO ₂ , AgCdO	
Contact rating (Res. load)	30A 240VAC 30A 277VAC	25A 240VAC 25A 277VAC
Max. switching voltage	277VAC	
Max. switching current	30A	25A
Max. switching power	8310VA	6925VA
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1H,1HT type: 1 x 10 ⁵ OPS (30A 240VAC, Resistive load, Room temp., 1s on 9s off) 2H,2HT type: 1 x 10 ⁵ OPS (25A 240VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2000VAC 1min
Operate time (at nomi. volt.)	30ms max.(DC type)	
Release time (at nomi. volt.)	30ms max.(DC type)	
Shock resistance	Functional	Standard:98m/s ² Pulse width 11ms W type:98m/s ² Pulse width 6ms
	Destructive	980m/s ² Pulse width 6ms
Vibration resistance	Standard:10H to 55Hz 1.5mm DA W type:10H to 55Hz 1.0mm DA	
Ambient temperature	-55°C to 70°C	
Humidity	5% to 85% RH	
Termination	PCB, QC, Screw	
Unit weight	Approx. 120g	
Construction	Dust protected	

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 1.9W; AC type: Approx. 2.7VA
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COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
3	2.25	0.3	3.3	4.7 x (1±10%)
6	4.50	0.6	6.6	18.8 x (1±10%)
12	9.00	1.2	13.2	75 x (1±10%)
24	18.0	2.4	26.4	300 x (1±10%)
48	36.0	4.8	52.8	1200 x (1±10%)
100	75.0	10.0	110	5200 x (1±10%)
110	82.5	11.0	121	6300 x (1±10%)
200	150	20.0	220	21000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC ¹⁾	Drop-out Voltage VAC ¹⁾	Max. Voltage VAC * ²⁾	Coil Resistance Ω
6	4.80	0.90	6.6	18.8 x (1±10%)
12	9.60	1.80	13.2	75 x (1±10%)
24	19.2	3.60	26.4	300 x (1±10%)
48	38.4	7.20	52.8	1200 x (1±10%)
120	96.0	18.0	132	5200 x (1±10%)
220/240	176	33.0	242	20800 x (1±10%)

Notes: 1) The data shown above are initial values.

2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	30A 277VAC 85°C 1.5HP 120VAC 3HP 240VAC 85°C 10A 120VAC Tungsten 240VAC(FLA=20.5)(LRA=105) 85°C 25A Making 400VDC Breaking 60VDC 85°C
	AgCdO	30A 277VAC 1.5HP 120VAC 3HP 240VAC 10A 120VAC Tungsten TV-10 120VAC
TÜV		27A 240VAC COSØ =0.8 25A 240VAC COSØ =0.4 25A 240VAC COSØ =1

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

HF116F-1 / 012 D A -1H T F W C (XXX)	
Type	
Coil voltage	DC: 3VDC to 200VDC AC: 6VAC to 220VAC
Coil voltage form	D: DC A: AC
Mounting	A: Mount P: PCB F: Flanged
Contact arrangement	1H:1 Form A 2H: 2 Form A
Contact material	T: AgSnO ₂ Nil: AgCdO
Insulation standard	F: Class F Nil: Class B
Contact Gap	W: 3.0mm Nil: Standard
Capacitor	C: With Capacitor(Only for AC) Nil: Without Capacitor
Special code ³⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) Water cleaning or surface process is not suggested after the dust-protected relays are assembled on PCB.

2) Dust-protected relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

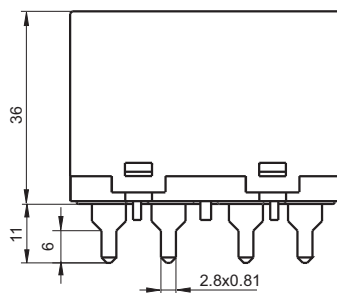
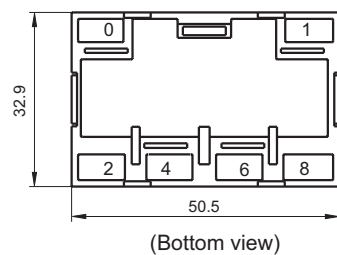
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

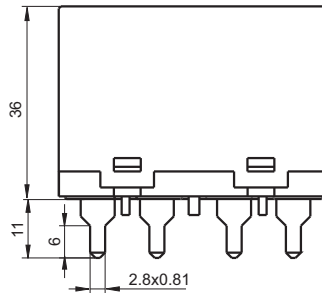
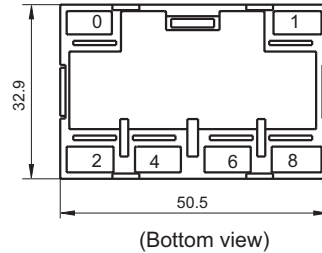
Unit: mm

Outline Dimensions

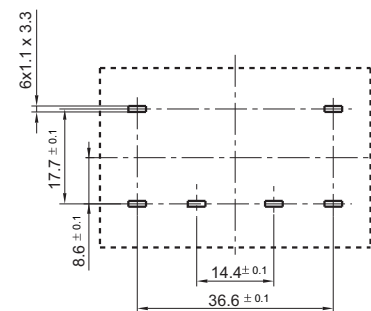
HF116F-1/□□□ -□ -P-1H-□



HF116F-1/□□□ -□ -P-2H-□

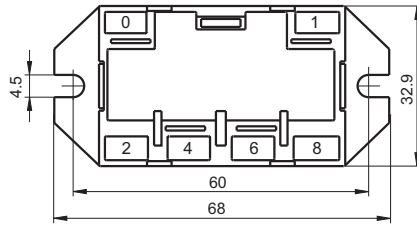


PCB Layout
(Bottom view)

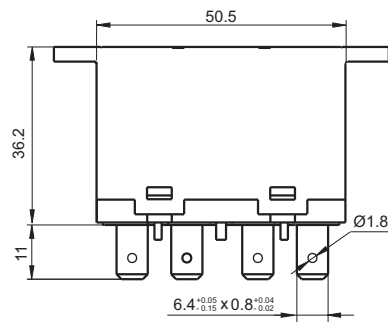


Outline Dimensions

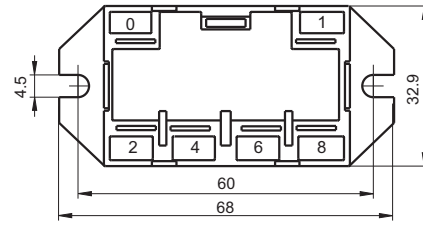
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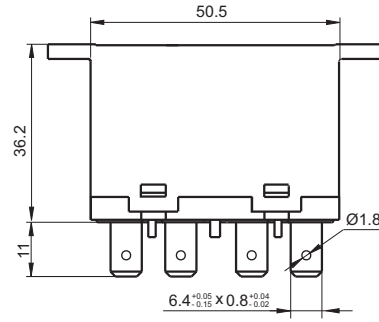
(Bottom view)



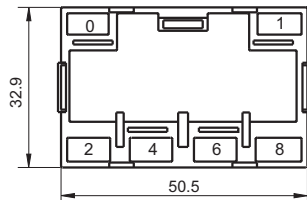
HF116F-1/□□□□-□-F-2H-□



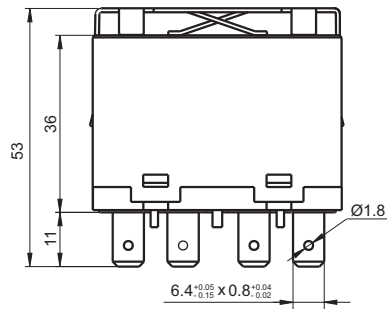
(Bottom view)



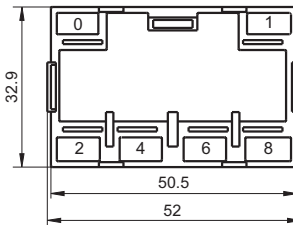
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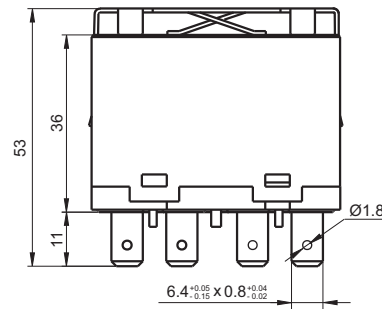
(Bottom view)



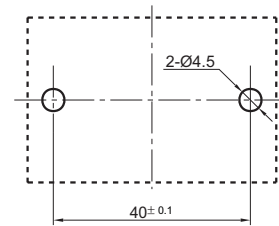
HF116F-1/□□□□-□-A-2H-□



(Bottom view)



Mounting Holes

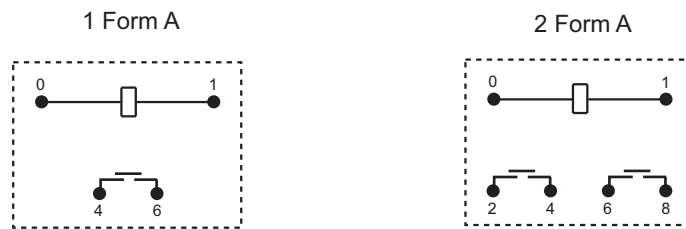


- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram
(Bottom view)

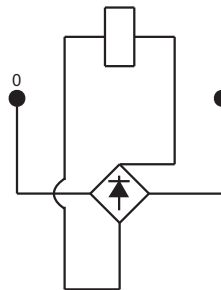


Coil Inner Circuit

DC operation coil

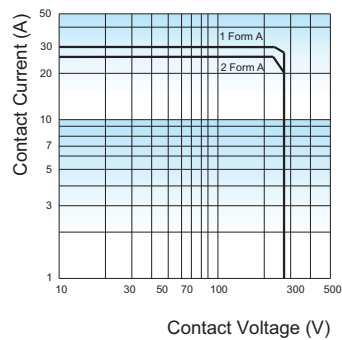


AC operation coil

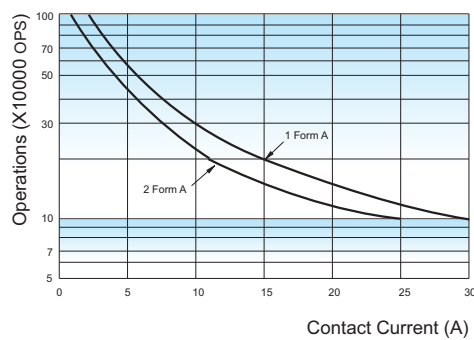


CHARACTERISTIC CURVES

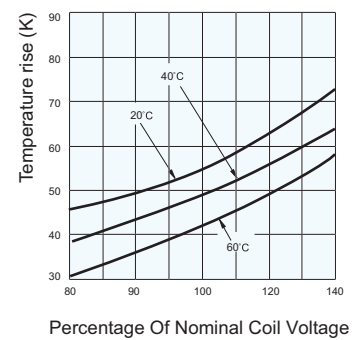
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

250VAC, Resistive load, Room temp.,
1s on 9s off

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF116F-2

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:R 50154722



File No.:CQC09002031231
CQC18002206328



Features

- 30A switching capability
- 4kV dielectric strength (between coil and contacts)
- 3mm contact gap available

CONTACT DATA

Contact arrangement	1A	2A
Contact resistance ¹⁾	100mΩ max.(at 1A 24VDC)	
Contact material	AgSnO ₂ , AgCdO	
Contact rating (Res. load)	30A 240VAC 30A 277VAC	25A 240VAC 25A 277VAC
Max. switching voltage	277VAC	
Max. switching current	30A	25A
Max. switching power	8310VA	6925VA
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1H,1HT type: 1 x 10 ⁵ OPS (30A 240VAC, Resistive load, Room temp., 1s on 9s off) 2H,2HT type: 1 x 10 ⁵ OPS (25A 240VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2000VAC 1min
Operate time (at nomi. vot.)	30ms max.(DC type)	
Release time (at nomi. vot.)	30ms max.(DC type)	
Shock resistance	Functional	Standard:98m/s ² Pulse width 11ms W type:98m/s ² Pulse width 6ms
	Destructive	980m/s ² Pulse width 6ms
Vibration resistance	Standard:10H to 55Hz 1.5mm DA W type:10H to 55Hz 1.0mm DA	
Ambient temperature	-55°C to 70°C	
Humidity	5% to 85% RH	
Termination	PCB, QC, Screw	
Unit weight	Approx. 120g	
Construction	Plastic sealed, Flux proofed	

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) For the plastic sealed type, please open two vent holes after installing relay (or cleansing PCB board) in order to increase the relay reliability.
4) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 1.9W; AC type: Approx. 2.7VA
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HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC* ²⁾	Coil Resistance Ω
3	2.25	0.3	3.3	4.7 x (1±10%)
6	4.50	0.6	6.6	18.8 x (1±10%)
12	9.00	1.2	13.2	75 x (1±10%)
24	18.0	2.4	26.4	300 x (1±10%)
48	36.0	4.8	52.8	1200 x (1±10%)
100	75.0	10.0	110	5200 x (1±10%)
110	82.5	11.0	121	6300 x (1±10%)
200	150	20.0	220	21000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Max. Voltage VAC* ²⁾	Coil Resistance Ω
6	4.80	0.90	6.6	18.8 x (1±10%)
12	9.60	1.80	13.2	75 x (1±10%)
24	19.2	3.60	26.4	300 x (1±10%)
48	38.4	7.20	52.8	1200 x (1±10%)
120	96.0	18.0	132	5200 x (1±10%)
220/240	176	33.0	242	20800 x (1±10%)

Notes: 1) The data shown above are initial values.

2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	30A 277VAC 85°C 1.5HP 120VAC 3HP 240VAC 85°C 10A 120VAC Tungsten 240VAC(FLA=20.5)(LRA=105) 85°C 25A Making 400VDC Breaking 60VDC 85°C
	AgCdO	30A 277VAC 1.5HP 120VAC 3HP 240VAC 10A 120VAC Tungsten TV-10 120VAC
TÜV	27A 240VAC COSØ=0.8 25A 240VAC COSØ=0.4 25A 240VAC COSØ=1	

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF116F-2 / 012 D L -1H S T F W (XXX)		
Type		
Coil voltage	DC: 3VDC to 200VDC AC: 6VAC to 220VAC	
Coil input	D: DC	A: AC
Mounting	P: PCB	L: Screw
Contact arrangement	1H: 1 Form A	2H: 2 Form A
Construction ¹⁾²⁾	S: Plastic sealed	Nil: Flux proofed
Contact material ³⁾	T: AgSnO ₂	Nil: AgCdO
Insulation standard	F: Class F	Nil: Class B
Contact Gap	W: 3.0mm	Nil: Standard
Special code ⁴⁾	XXX: Customer special requirement	Nil: Standard

- Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc).
- 2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 3) For the applications of motor load, capacitive load and high inrush current, AgSnO₂ contact material is recommended. For the applications of resistive load or low inductive load, AgCdO contact material is recommended.
- 4) The customer special requirement express as special code after evaluating by Hongfa.
- 5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

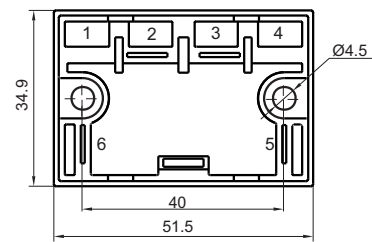
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

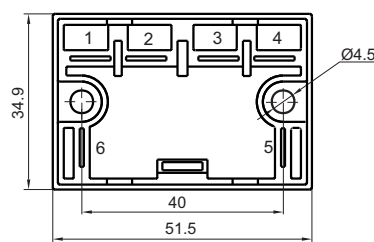
Mounting Holes

HF116F-2/□□□□-□-L-1H-□

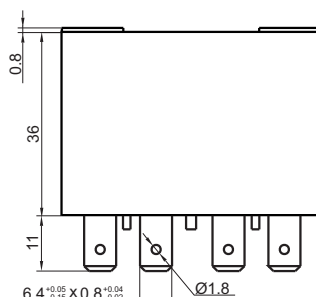
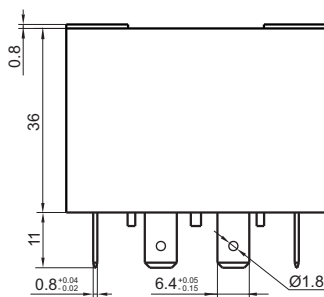
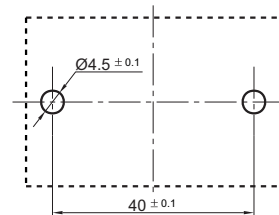


(Bottom view)

HF116F-2/□□□□-□-L-2H-□



(Bottom view)

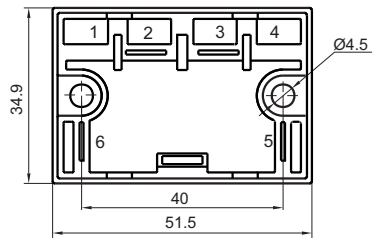


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

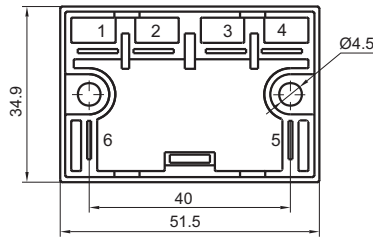
Outline Dimensions

HF116F-2/□□□□-□-P-1H-□

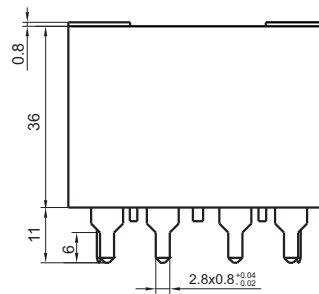
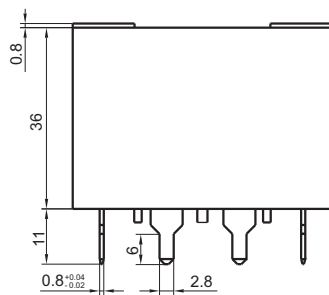


(Bottom view)

HF116F-2/□□□□-□-P-2H-□

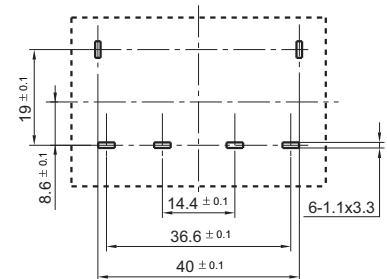


(Bottom view)



PCB Layout

(Bottom view)

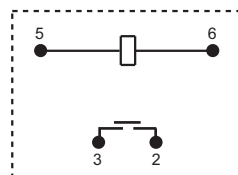


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

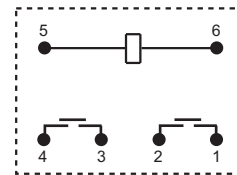
Wiring Diagram

(Bottom view)

1 Form A



2 Form A

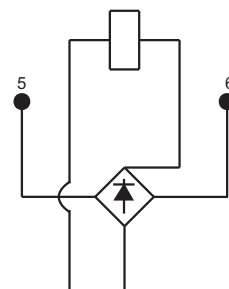


Coil Inner Circuit

DC operation coil

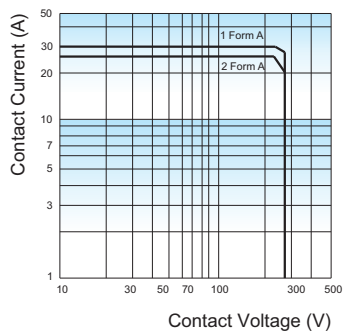


AC operation coil

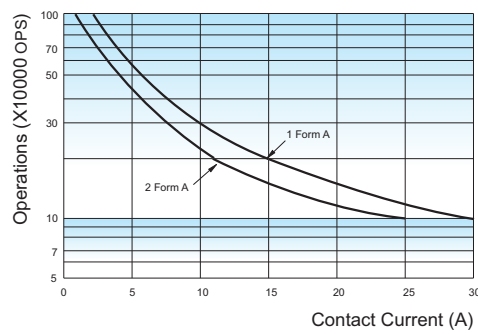


CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

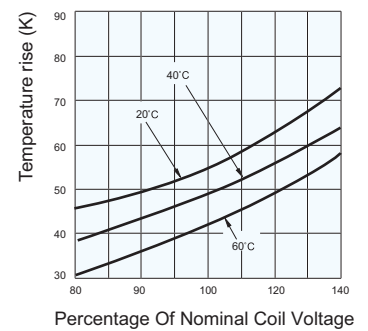


ENDURANCE CURVE



Test conditions:
250VAC, Resistive load, Flux proofed,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF116F-3

MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:R 50154722



File No.:CQC09002031231
CQC18002206328



Features

- 30A switching capability
- 4kV dielectric strength
(between coil and contacts)
- 3mm contact gap available

CONTACT DATA

Contact arrangement	1A	2A
Contact resistance ¹⁾	100mΩ max.(at 1A 24VDC)	
Contact material	AgSnO ₂ , AgCdO	
Contact rating (Res. load)	30A 240VAC 30A 277VAC	25A 240VAC 25A 277VAC
Max. switching voltage	277VAC	
Max. switching current	30A	25A
Max. switching power	8310VA	6925VA
Mechanical endurance	1 x 10 ⁷ OPS	
Electrical endurance	1H, 1HT type: 1 x 10 ⁵ OPS (30A 240VAC, Resistive load, Room temp., 1s on 9s off) 2H, 2HT type: 1 x 10 ⁵ OPS (25A 240VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2000VAC 1min
Operate time (at nomi. volt.)	30ms max.(DC type)	
Release time (at nomi. volt.)	30ms max.(DC type)	
Shock resistance	Functional	Standard:98m/s ² Pulse width 11ms W type:98m/s ² Pulse width 6ms
	Destructive	980m/s ² Pulse width 6ms
Vibration resistance	Standard:10H to 55Hz 1.5mm DA W type:10H to 55Hz 1.0mm DA	
Ambient temperature	-55°C to 70°C	
Humidity	5% to 85% RH	
Termination	PCB, QC, Screw	
Unit weight	Approx. 120g	
Construction	Dust protected	

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

3) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 1.9W; AC type: Approx. 2.7VA
------------	--

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
3	2.25	0.3	3.3	4.7 x (1±10%)
6	4.50	0.6	6.6	18.8 x (1±10%)
12	9.00	1.2	13.2	75 x (1±10%)
24	18.0	2.4	26.4	300 x (1±10%)
48	36.0	4.8	52.8	1200 x (1±10%)
100	75.0	10.0	110	5200 x (1±10%)
110	82.5	11.0	121	6300 x (1±10%)
200	150	20.0	220	21000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Max. Voltage VAC * ²⁾	Coil Resistance Ω
6	4.80	0.90	6.6	18.8 x (1±10%)
12	9.60	1.80	13.2	75 x (1±10%)
24	19.2	3.60	26.4	300 x (1±10%)
48	38.4	7.20	52.8	1200 x (1±10%)
120	96.0	18.0	132	5200 x (1±10%)
220/240	176	33.0	242	20800 x (1±10%)

Notes: 1) The data shown above are initial values.

2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	30A 277VAC 85°C 1.5HP 120VAC 3HP 240VAC 85°C 10A 120VAC Tungsten 240VAC(FLA=20.5)(LRA=105) 85°C 25A Making 400VDC Breaking 60VDC 85°C
	AgCdO	30A 277VAC 1.5HP 120VAC 3HP 240VAC 10A 120VAC Tungsten TV-10 120VAC
TÜV		27A 240VAC COSØ=0.8 25A 240VAC COSØ=0.4 25A 240VAC COSØ=1

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

HF116F-3 / 012 D F -1H T F W C (XXX)		
Type		
Coil voltage	DC: 3VDC to 200VDC AC: 6VAC to 240VAC	
Coil voltage form	D: DC	A: AC
Mouting	A: Mount	F: Flanged
Contact arrangement	1H: 1 Form A	2H: 2 Form A
Contact material	T: AgSnO ₂	Nil: AgCdO
Insulation standard	F: Class F	Nil: Class B
Contact Gap	W: 3.0mm	Nil: Standard
Capacitor	C: With Capacitor(Only for AC) Nil: Without Capacitor	
Special code ³⁾	XXX: Customer special requirement	Nil: Standard

Notes: 1) Water cleaning or surface process is not suggested after the dust-protected relays are assembled on PCB.

2) dust-protected relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

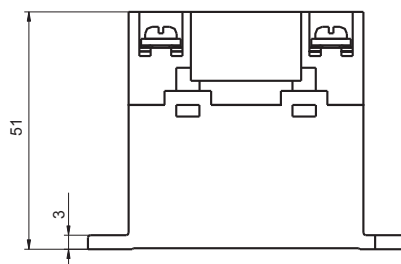
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

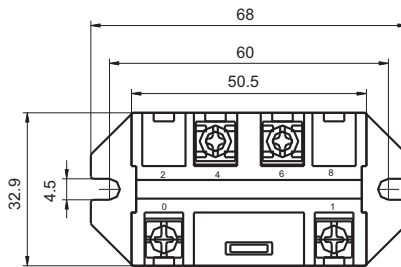
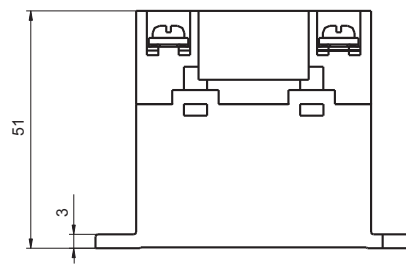
Unit: mm

Outline Dimensions

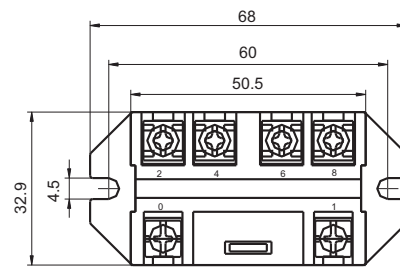
HF116F-3/□□□□-F-1H



HF116F-3/□□□□-F-2H



(Bottom view)

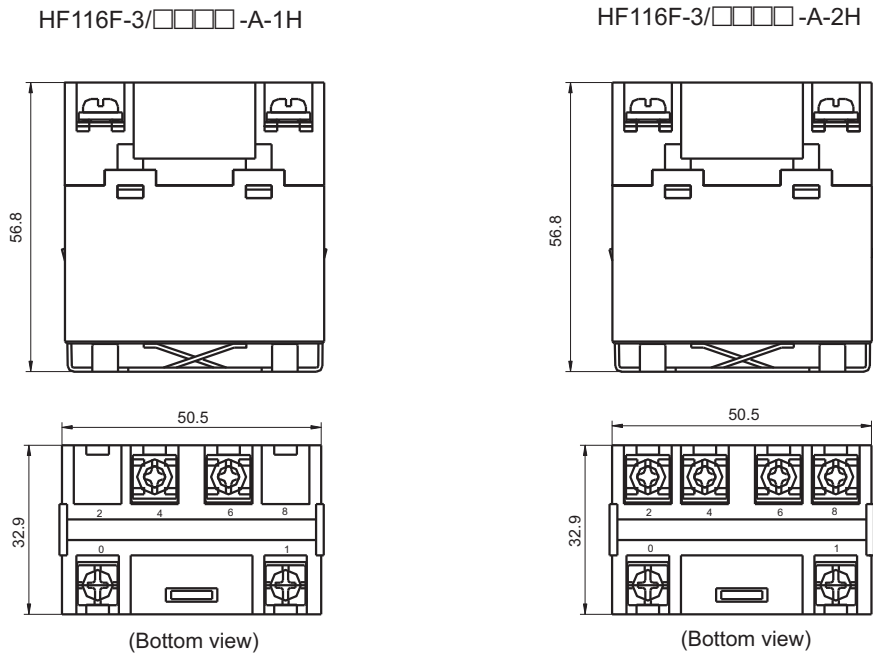


(Bottom view)

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

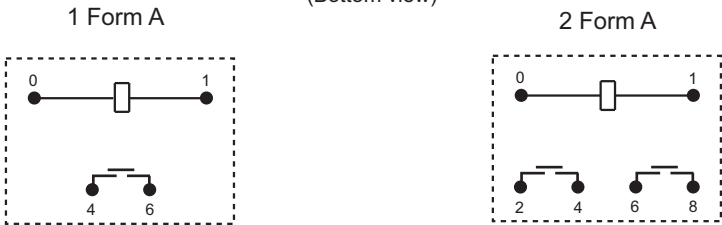
Unit: mm

Outline Dimensions

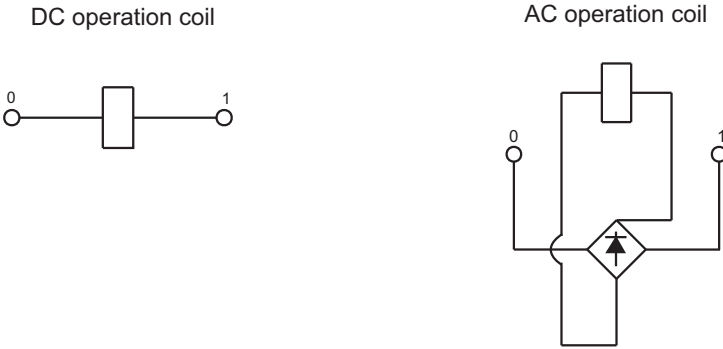


Remark: In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

Wiring Diagram (Bottom view)

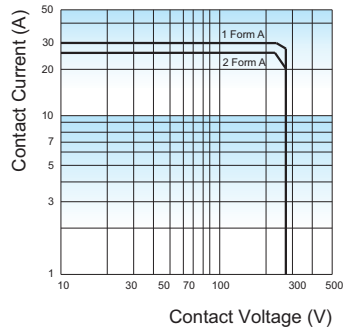


Coil Inner Circuit

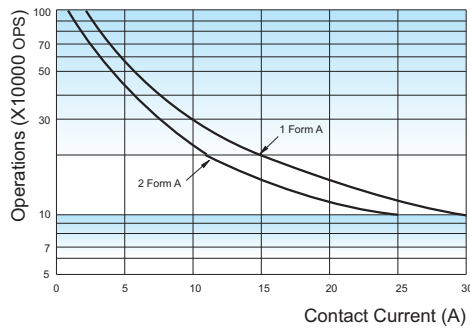


CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



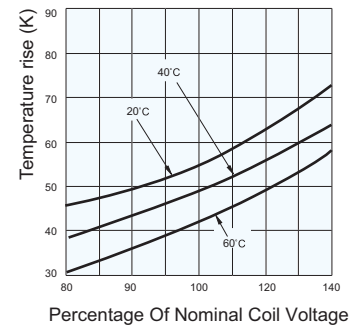
ENDURANCE CURVE



Test conditions:

250VAC, Resistive load,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF116F-G

SOLAR RELAY



File No.:E134517



File No.:R 50154722



File No.: CQC09002031231
CQC18002206328



Features

- 50A switching capability
- Applicable to inverter used for photovoltaic power generation systems
- 4kV dielectric strength(between coil and contacts)
- 3mm contact gap
(compliant to European Photovoltaic Standard VDE0126, compliant to IEC 62109-2-2011)
- 1A and 2A configuration available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 2A
Contact resistance ¹⁾	10mΩ max(at 10A 13.5VDC)
Contact material	AgSnO ₂ , AgNi
Contact rating (Res. load)	50A 277VAC
Max. switching voltage	277VAC
Max. switching current	55A
Max. switching power	15235VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	3 x 10 ⁴ OPS (50A 277VAC, at room temp, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	4000VAC 1min
	Between contact sets	2000VAC 1min
Surge Voltage		6kV (1.2/50μs)
Operate time (at nomi. volt.)		30ms max
Release time (at nomi. volt.)		30ms max
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance*	Functional	10Hz to 55Hz 1.5mm DA
	Destructive	10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination ²⁾		PCB
Unit weight		Approx. 120g
Construction		G1: Dust protected; G2, G3: Flux proofed

Notes: 1) The data shown above are initial values.
2) It does not allow using quick-connect terminations.
3)*Index is not in relay width direction.

COIL

Coil power	Approx. 3.2W
Holding voltage	60% to 120%U _N (at 23°C) 70% to 95%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.25	0.3	3.3	2.8 x (1±10%)
6	4.50	0.6	6.6	11.3 x (1±10%)
9	6.75	0.9	9.9	25 x (1±10%)
12	9.00	1.2	13.2	45 x (1±10%)
24	18.0	2.4	26.4	180 x (1±10%)
48	36.0	4.8	52.8	720 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximun voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	277VAC 50A
TÜV	AgSnO ₂	250VAC 50A
	AgNi	250VAC 55A

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2022 Rev. 1.00

ORDERING INFORMATION

Type	HF116F-G1/		12	-1H	T	F	(XXX)
	G1: Type 1 G2: Type 2 G3: Type 3						
Coil voltage	3, 6, 9, 12, 24, 48VDC						
Contact arrangement	1H: 1 Form A 2H: 2 Form A						
Contact material	T: AgSnO ₂ Nil: AgNi						
Insulation standard	F: Class F						
Special code ¹⁾	XXX: Customer special requirement			Nil: Standard			

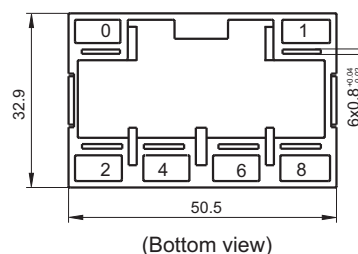
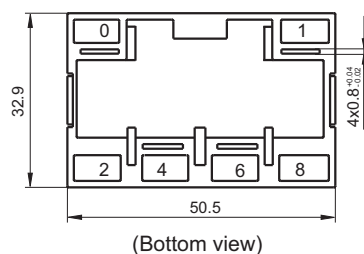
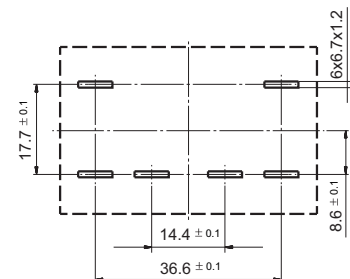
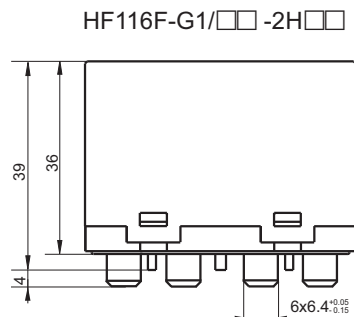
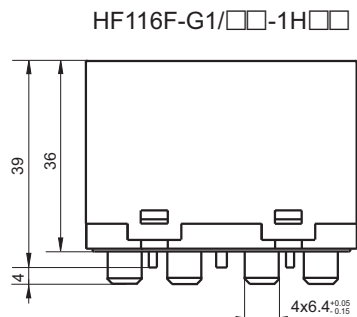
Notes: 1) Water cleaning or surface process is not suggested after the dust protected relays are assembled on PCB.
2) Dust protected relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

PCB Layout
(Bottom view)

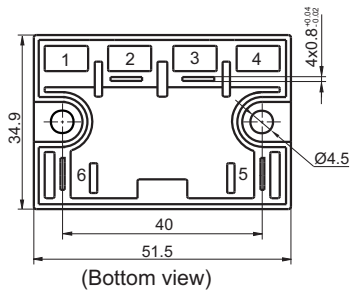
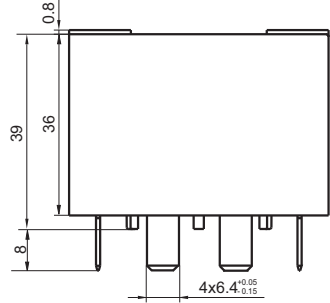


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

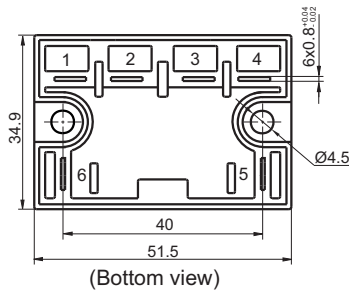
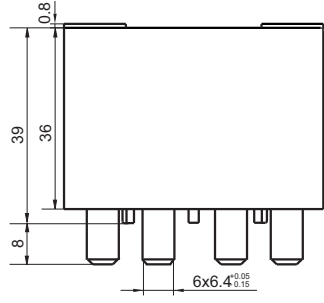
Unit: mm

Outline Dimensions

HF116F-G2/□□ -1H□□

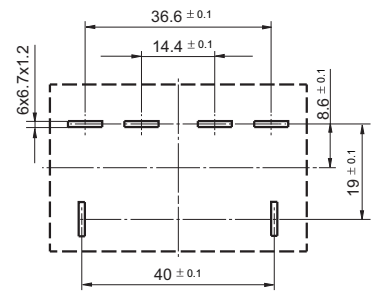


HF116F-G2/□□ -2H□□



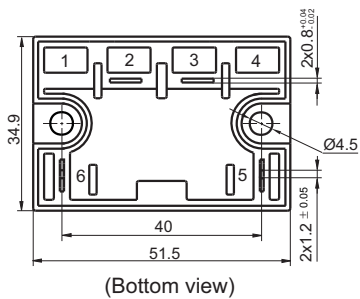
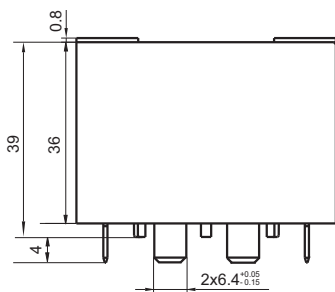
PCB Layout

(Bottom view)

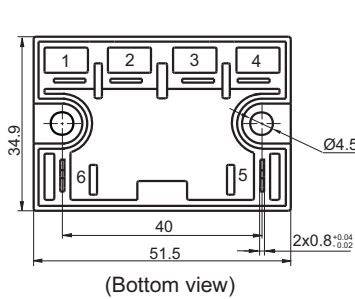
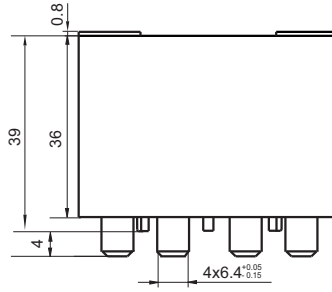


Outline Dimensions

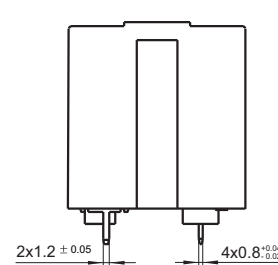
HF116F-G3/□□ -1H□□



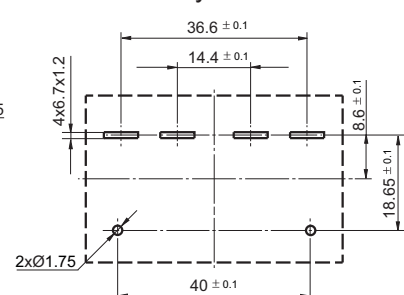
HF116F-G3/□□ -2H□□



HF116F-G3



PCB Layout (Bottom view)

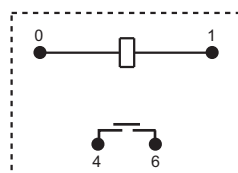


- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

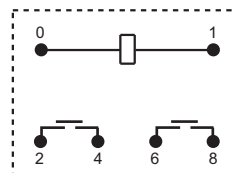
Wiring Diagram (Bottom View)

G1 Type

1 Form A

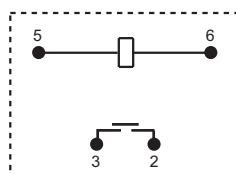


2 Form A

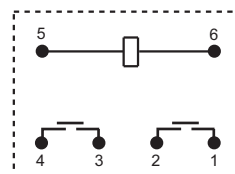


G2, G3 Type

1 Form A



2 Form A



Disclaimer

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HF116F-80

HIGH POWER RELAY



File No.:E134517



File No.:R 50154722



File No.: CQC09002031231
CQC18002206328



Features

- 80A switching capability
- Applicable to solar photovoltaic inverter
- Applicable to UPS
- 3mm contact gap
(compliant to European Photovoltaic Standard VDE0126, compliant to IEC 62109-2-2011)
- 4kV dielectric strength(between coil and contacts)
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	10mΩ max(at 10A 13.5VDC)
Contact material	AgSnO ₂ , AgNi
Contact rating (Res. load)	80A 60VDC/80A 250VAC
Max. switching voltage	277VAC/60VDC
Max. switching current	90A
Max. load current	100A 15min at room temp.
Max. switching power	24930VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	6 x 10 ³ OPS
	(80A 250VAC, at 85°C, 1s on 9s off)
	6 x 10 ³ OPS (80A 60VDC, at 85°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	4000VAC 1min
Surge Voltage		6kV (1.2/50μs)
Operate time (at nomi. volt.)		30ms max
Release time (at nomi. volt.)		30ms max
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance*		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination ²⁾		PCB
Unit weight		Approx. 90g
Construction		Dust protected

Notes: 1) The data shown above are initial values;
2) It does not allow using quick-connect terminations.
3)*Index is not in relay width direction.

COIL

Coil power	Approx. 3.2W
Holding voltage	60% to 120%U _N (at 23°C) 70% to 95%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ¹⁾	Drop-out Voltage VDC min ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
3	2.25	0.3	3.3	2.8 x (1±10%)
6	4.50	0.6	6.6	11.3 x (1±10%)
9	6.75	0.9	9.9	25 x (1±10%)
12	9.00	1.2	13.2	45 x (1±10%)
24	18.0	2.4	26.4	180 x (1±10%)
48	36.0	4.8	52.8	720 x (1±10%)

Notes: 1) The data shown above are initial values;
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO ₂	277VAC 80A 60VDC 80A
TÜV	AgSnO ₂	277VAC 90A 277VAC 80A Making 35A 100ms 250VAC,loading 90A 800ms 250VAC,Breaking 35A 100ms 250VAC
	AgNi	Making 35A 100ms 250VAC,loading 90A 800ms 250VAC,Breaking 35A 100ms 250VAC

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

	HF116F-80/		12	-1H	T	F	(XXX)
Type							
Coil voltage	3, 6, 9, 12, 24, 48VDC						
Contact arrangement	1H:1 Form A						
Contact material	T: AgSnO ₂		Nil: AgNi				
Insulation standard	F: Class F						
Special code ¹⁾	XXX: Customer special requirement		Nil: Standard				

Notes: 1) Water cleaning or surface process is not suggested after the dust protected relays are assembled on PCB.

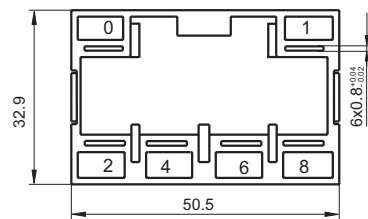
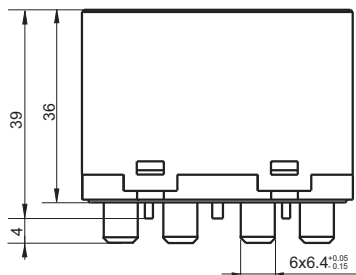
2) Dust protected relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

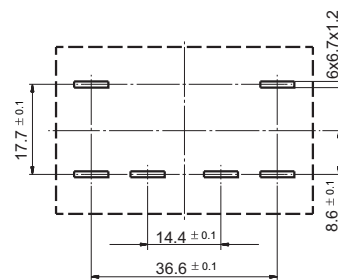
Unit: mm

Outline Dimensions

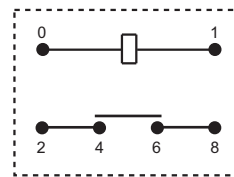


(Bottom view)

PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF176F

SOLAR RELAY

CRUS

File No.:E133481



File No.: R50411032



File No.: CQC20002238014



Features

- 80A swithing capitable.
- Applicable to solar photovoltaic inverter
- 4mm contact gap
- Low coil hoilding voltage contributes to saving energy of equipment.
- UL insulation system : class F.

RoHS compliant

CONTACT DATA

Contact gap ¹⁾	3mm (Standard)	4mm (A37)
Contact arrangement	1A	
Contact resistance ¹⁾	10mΩ max. (6VDC 20A)	
Contact material	AgNi,AgSnO ₂	
Contact rating (Res. load)	Making 20A, Carrying 65A, Breaking 20A, 400VAC	Making 30A, Carrying 80A, Breaking 30A, 1000VAC
Max. switching voltage	400VAC	1000VAC
Max. switching current	65A	80A
Max. switching power	18005VA	30000VA
Mechanical endurance	1 x 10 ⁶ OPS	
Electrical endurance	3 x 10 ⁴ OPS(Making 20A, Carrying 65A, Breaking 20A,400VAC, Resistive load, at 85°C, 1s on 9s off)	3 x 10 ⁴ OPS(Making 30A, Carrying 80A, Breaking 30A,1000VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1)The data shown above are initial values.

COIL

Coil power	Approx.1.92W
Holding voltage	40% to 100%U _N (at 25°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.

2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larding voltage.

COIL DATA at 23°C

Standard type

Nominal Voltage VDC ¹⁾	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
6	4.2	0.6	6.6	18.8 x (1±10%)
9	6.3	0.9	9.9	42.2 x (1±10%)
12	8.4	1.2	13.2	75 x (1±10%)
24	16.8	2.4	26.4	300 x (1±10%)

Notes: 1)The data shown above are initial values.

2)Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	2000VAC 1min
Surge voltage (between coil & contacts)	10kV(1.2 / 50μs)	
Operate time (at nomi. volt.)	30ms max.	
Release time (at nomi. volt.)	10ms max.	
Temperature rise (at nomi. volt.)	Standard type: 70K max.(Contact load current 65A,Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage, at 85°C) A37 type: 70K max.(Contact load current 80A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage, at 85°C)	
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C (Apply holding voltage to coil)	
Termination	PCB	
Unit weight	Approx.100g	
Construction	Flux proofed	

Notes: 1)The data shown above are initial values.

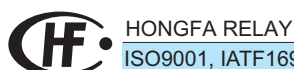
COIL DATA at 23°C

A37 type

Nominal Voltage VDC ¹⁾	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
6	4.5	0.6	6.6	18.8 x (1±10%)
9	6.75	0.9	9.9	42.2 x (1±10%)
12	9	1.2	13.2	75 x (1±10%)
24	18	2.4	26.4	300 x (1±10%)

Notes: 1)The data shown above are initial values.

2)Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.



ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

Standard type	AgNi	UL/CUL	Making 20A, Carrying 65A,Breaking 20A 400VAC,at 85°C,Resistive 60A 277VAC,at 85°C,General use
		TÜV	
		CQC	
	AgSnO ₂	UL/CUL	Making 20A, Carrying 65A,Breaking 20A 400VAC,at 85°C,Resistive 65A 277VAC,at 85°C,Resistive 65A 30VDC,at 85°C,Resistive 65A 60VDC,at 85°C,Resistive
		TÜV	
		CQC	

A37 type	AgNi/ AgSnO ₂	UL/CUL	Making 30A, Carrying 80A,Breaking 30A 1000VAC,at 85°C,Resistive
		TÜV	
		CQC	

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

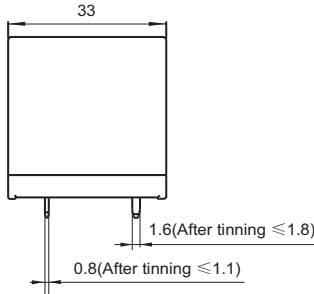
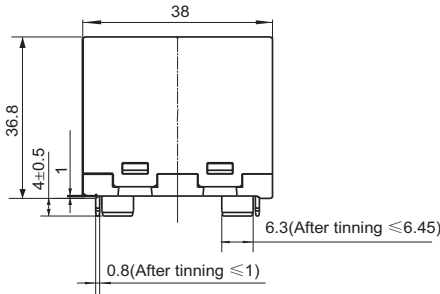
Type	HF176F/	12	-H	3	F	(XXX)
Coil voltage	6, 9, 12, 24VDC					
Contact arrangement	H:1 Form A					
Contact material	3: AgNi T: AgSnO ₂					
Insulation standard	F: Class F					
Special code	XXX: Customer special requirement Nil: Standard					

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
2) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

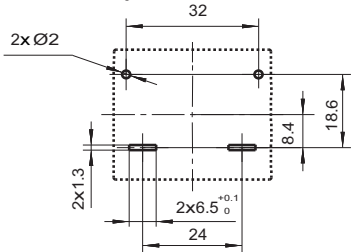
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

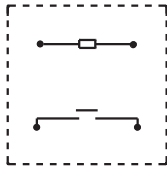
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Notes: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

Disclaimer

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HF185F

MINIATURE HIGH POWER RELAY

CULUS

File No.:E133481



File No.:R50496728



Features

- Two groups 50A contact switching ability
- Applicable to inverter used for photovoltaic power generation systems
- Switching between zero line and fire line
- 3.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	2A
Contact resistance	10mΩ max. (20 A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	Making 20A Loading 50A, Breaking 20A 277VAC
Max.switching voltage	600VAC
Max.switching current	50A
Max.switching power	13850VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	2NO:3 × 10 ⁴ OPS max. (85°C, 1s on 9s off, Making 20A Loading 50A Breaking 20A 277VAC, Resistive load)

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 3W
Holding voltage	40% to 100%Un (at 25°C) 50% to 60%Un (at 85°C)

- Notes:** 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open contacts	2500VAC 1min
	Between coil & contacts	5000VAC 1min
	Between contact sets	2500VAC 1min
Surge voltage	Between coil & contacts	6kV(1.2 / 50μs)
Operate time (at rated. volt.)		30ms max
Release time (at rated. volt.)		30ms max
Temperature rise(at nomi. volt.)		70K max(Contact load current 50A,Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage,at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C (Coil applied holding voltage)
Termination		PCB
Unit weight		Approx. 105g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ⁽¹⁾	Drop-out Voltage VDC min ⁽¹⁾	Max. Voltage VDC ⁽²⁾	Coil Resistance Ω
6	4.2	0.6	7.2	12 x (1±10%)
9	6.3	0.9	10.8	27 x (1±10%)
12	8.4	1.2	14.4	48 x (1±10%)
24	16.8	2.4	28.8	192 x (1±10%)

- Notes:** 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	2NO:Making 20A,loading 50A breaking 20A 600 VAC 85°C, 1s on 9s off, Resistive load 50A 277 VAC 85°C, 1s on 9s off, Resistive load
TÜV	2NO:Making 20A,loading 50A breaking 20A 600 VAC 85°C, 1s on 9s off, Resistive load 50A 277 VAC 85°C, 1s on 9s off, Resistive load

- Notes:** 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

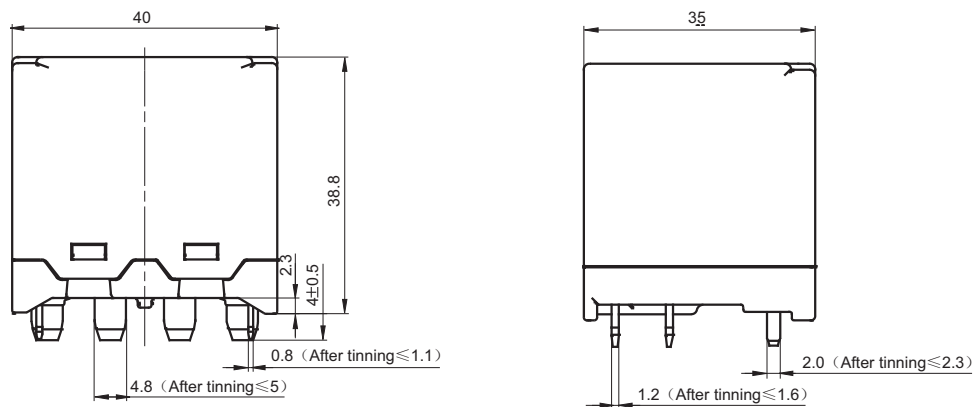
Type	HF185F/	12	-2H	T	F	(XXX)
Coil voltage	6, 9, 12, 24 VDC					
Contact arrangement	2H: 2 Form A					
Contact material	T: AgSnO ₂					
Insulation standard	F: Class F					
Special code ³⁾	XXX: Customer special requirement		Nil: Standard			

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

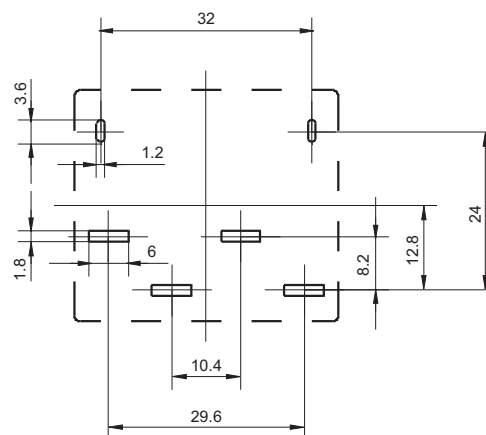
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

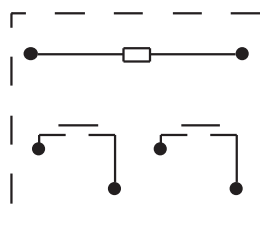
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$;
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF186F

MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: R 50476790



File No.: CQC20002260253



Features

- 55A 277VAC loading current capability
- 3.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment.
- 10kV surge voltage(Between coil and contact)
- UL insulation system: Class F
- outline dimensions: (30×20×31) mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	10mΩ max. (20 A 6VDC)
Contact material	AgSnO ₂
Contact rating (Res. load)	Making 20A Loading 55A, Breaking 20A 277VAC
Max.switching voltage	600VAC
Max.switching current	50A
Max.continuous current	66A at 85°C 55A at 105°C
Max.switching power	13850VAC
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	≥5 × 10 ⁴ OPS (105°C, 1s on 9s off, Making 20 A Loading 55 A breaking 20A, 277VAC, Resistive load) ≥1 × 10 ⁴ OPS (85°C, 1s on 9s off, 50A 277VAC, Resistive load)

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 2.5W
Holding voltage	40% to 70%U _N (at 23°C) 45% to 55%U _N (at 105°C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning,the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

23°C

Nominal Voltage VDC	Pick-up Voltage VDC max ⁽¹⁾	Drop-out Voltage VDC min ⁽¹⁾	Max. Voltage VDC ⁽²⁾	Coil Resistance Ω
6	4.2	0.3	6.6	14.4 x (1±10%)
9	6.3	0.45	9.9	32.4 x (1±10%)
12	8.4	0.6	13.2	57.6 x (1±10%)
24	16.8	1.2	26.4	230.4 x (1±10%)
48	33.6	2.4	52.8	921.6 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between open contacts	2500VAC 1min
	Between coil & contacts	5000VAC 1min
Surge voltage	Between coil & contacts	10kV(1.2 / 50μs)
Operate time (at rated. volt.)		20ms max
Release time (at rated. volt.)		10ms max
Coil temperature rise		50K max (Contact load current 55A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% rated voltage,at 105°C)
Shock resistance	Functional	196m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85%RH(Coil applied holding voltage)
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 55g
Construction		Flux proofed

Notes: The data shown above are initial values.

SAFETY APPROVAL RATINGS

CQC UL/CUL TÜV	Making 20A,loading 66 A breaking 20 A, 600 VAC ,85°C
	Making 20A,loading 55 A breaking 20 A, 277 VAC 105°C
	50 A,277 VAC, 85°C
TÜV	Making 20A,loading 60 A breaking 20 A, 277 VAC ,85°C
	40A 60VDC 85°C

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949 , ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

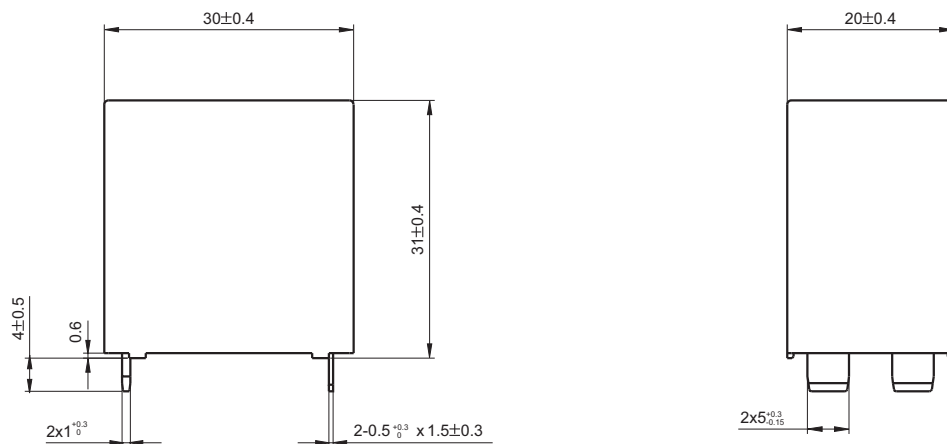
Type	HF186F/	12	-H	T	F	(XXX)
Coil voltage	6, 9, 12, 24, 48 VDC					
Contact arrangement	1H: 1 Form A					
Contact material	T: AgSnO ₂					
Insulation standard	F: Class F					
Special code ³⁾	XXX: Customer special requirement		Nil: Standard			

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

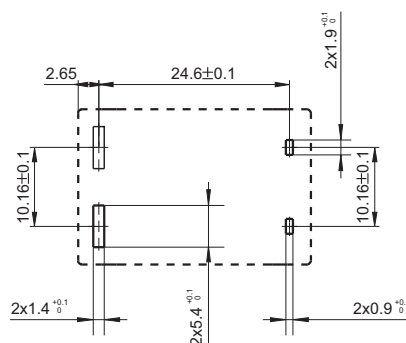
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)



Remark:1) In case of no tolerance shown in outline dimension: outline dimension-1mm, tolerance should be $\pm 0.2\text{mm}$; outline dimension $>1\text{mm}$ and $<5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$, outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$;
 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

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HF167F

SOLAR RELAY



File No.: E133481



File No.: R50360703



File No.: CQC17002164558



Features

- 90A switching capability
- Applicable to solar photovoltaic inverter
- 3.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	10mΩ max.(6VDC 20A)
Contact material	AgSnO ₂ , AgNi
Contact rating (Res. load)	90A 320VAC
Max. switching voltage	1000VAC
Max. switching current	90A
Max. switching power	30000VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	1 x 10 ³ OPS (NO: 90A 320VAC, Resistive load, at 85°C, 1s on 9s off) 3 x 10 ⁴ OPS (NO: Making 30A, carrying 100A, breaking 30A, 400VAC, Resistive load, at 85°C, 1s on 9s off) 3 x 10 ⁴ OPS (NO: Making 30A, carrying 100A, breaking 30A, 1000VAC, Resistive load, at 85°C, 1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 100A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage, at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance*		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination ²⁾		PCB
Unit weight		Approx. 100g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC* ²⁾	Coil Resistance Ω
6	4.2	0.6	6.6	18.8 x (1±10%)
9	6.3	0.9	9.9	42.2 x (1±10%)
12	8.4	1.2	13.2	75 x (1±10%)
24	16.8	2.4	26.4	300 x (1±10%)

Notes: 1)The data shown above are initial values.

2)*Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

COIL

Coil power	Approx. 1.92W
Holding voltage	40% to 100% U _N (at 23°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.

2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	90A 320VAC at 85°C General use 60A 320VAC at 85°C General use Making 30A, carrying 100A, breaking 30A, 1000VAC, at 85°C Resistive
	AgSnO ₂	90A 320VAC at 85°C General use TV-15 120VAC at 85°C Making 30A, carrying 100A, breaking 30A, 1000VAC, at 85°C Resistive
TÜV	AgNi	90A 320VAC at 85°C Resistive Making 30A, carrying 100A, breaking 30A, 400VAC, at 85°C Resistive Making 30A, carrying 100A, breaking 30A, 1000VAC, at 85°C Resistive
	AgSnO ₂	Making 30A, carrying 100A, breaking 30A, 1000VAC, at 85°C Resistive
CQC	AgNi	90A 320VAC at 85°C Resistive Making 30A, carrying 100A, breaking 30A, 400VAC, at 85°C Resistive Making 30A, carrying 100A, breaking 30A, 1000VAC, at 85°C Resistive
	AgSnO ₂	90A 320VAC at 85°C Resistive Making 30A, carrying 100A, breaking 30A, 400VAC, at 85°C Resistive Making 30A, carrying 100A, breaking 30A, 1000VAC, at 85°C Resistive

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF167F/		12	-H	T	F	(XXX)
Type							
Coil voltage	6, 9, 12, 24VDC						
Contact arrangement	H:1 Form A						
Contact material	T: AgSnO ₂		Nil: AgNi				
Insulation standard	F: Class F						
Special code ³⁾	XXX: Customer special requirement		Nil: Standard				

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

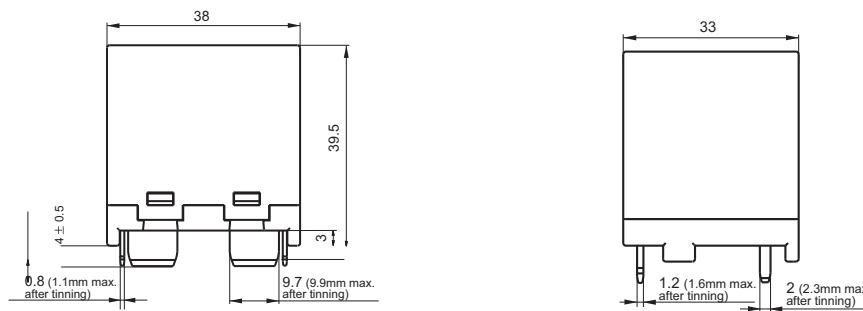
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

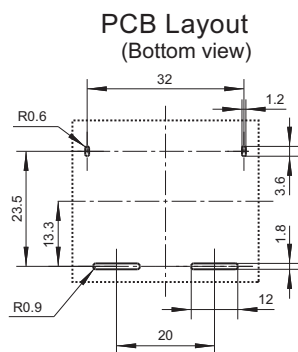
Unit: mm

Outline Dimensions

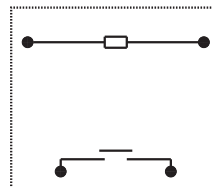


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm



Wiring Diagram
(Bottom view)



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF167F-G

SOLAR RELAY



File No.: E133481



File No.: R 50374273



Features

- 120A switching capability
- Applicable to solar photovoltaic inverter
- 3.6 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	1mΩ max.(6VDC 20A)
Contact material	AgNi
Contact rating (Res. load)	Making 55A carrying 120A breaking 55A 800VAC
Max. switching voltage	800VAC
Max. switching current	120A
Max. switching power	44000VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	6 x 10 ³ OPS Making 55A, carrying 120A, breaking 55A, 800VAC, Resistive load, at 85°C, 1s on 9s off

Notes: 1)The data shown above are initial values.

COIL

Coil power	Approx. 2.5W
Holding voltage	40% to 100% U _N (at 23°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		100K max. (Contact load current 120A, rated voltage excitation, at 55° C) 70K max. (Contact load current 120A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage, at 85° C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40° C to 85° C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 135g
Construction		Flux proofed

Notes: 1)The data shown above are initial values.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
6	4.2	0.6	7.2	14.4x (1±10%)
9	6.3	0.9	10.8	32.4 x (1±10%)
12	8.4	1.2	14.4	57.6x (1±10%)
24	16.8	2.4	28.8	230.4 x (1±10%)

Notes: 1)The data shown above are initial values.

2)Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	Making 55A, carrying 120A,breaking 55A, 800VAC, 85°C, 6 x 10 ³ OPS, General use
TÜV	Making 55A, carrying 120A,breaking 55A, 800VAC, 85°C,6 x 10 ³ OPS, Resistive



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

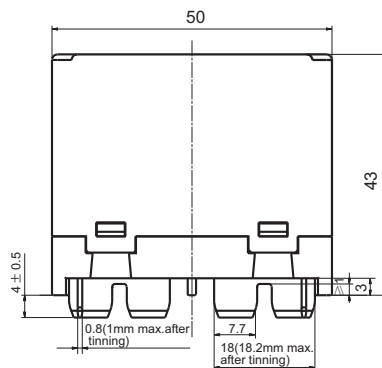
ORDERING INFORMATION			
	HF167F-G/	12	-H F (XXX)
Type			
Coil voltage	6, 9, 12, 24VDC		
Contact arrangement	H:1 Form A		
Insulation standard	F: Class F		
Special code ¹⁾	XXX: Customer special requirement		Nil: Standard

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

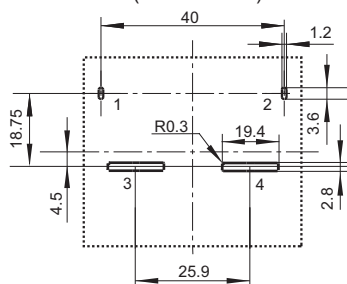
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT Unit: mm

Unit: mm

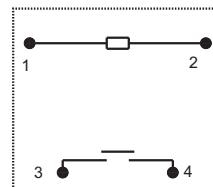
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram (Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF167F-140

SOLAR RELAY



File No.: E133481



File No.: R 50374273



Features

- 165A switching capability
- Applicable to solar photovoltaic inverter
- 3.6 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	1mΩ max.(6VDC 20A)
Contact material	AgNi
Contact rating (Res. load)	Making 55A carrying 165A breaking 55A 800VAC
Max. switching voltage	800VAC
Max. switching current	165A
Max. switching power	44000VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	6 x 10 ³ OPS Making 55A, carrying 165A, breaking 55A, 800VAC, Resistive load, at 85°C, 1s on 9s off

Notes: 1)The data shown above are initial values.

COIL

Coil power	Approx. 2.5W
Holding voltage	40% to 100% U _N (at 25°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.

2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
6	4.2	0.6	7.2	14.4x (1±10%)
9	6.3	0.9	10.8	32.4 x (1±10%)
12	8.4	1.2	14.4	57.6x (1±10%)
24	16.8	2.4	28.8	230.4 x (1±10%)

Notes: 1)The data shown above are initial values.

2)Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 165A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage, at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination ¹⁾		PCB
Unit weight		Approx. 158g
Construction		Flux proofed

Notes: 1)The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	Making 55A, carrying 150A,breaking 55A, 800VAC, 85°C, 6 x 10 ³ OPS, Resistive
TÜV	Making 55A, carrying 165A,breaking 55A, 800VAC, 85°C,6 x 10 ³ OPS, Resistive

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

HF167F-200

SOLAR RELAY



File No.: E133481



File No.: R 50374273



Features

- 200A switching capability
- Applicable to solar photovoltaic inverter
- 4 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	1mΩ max.(6VDC 20A)
Contact material	AgNi
Contact rating (Res. load)	Making 55A carrying 200A breaking 55A 800VAC
Max. switching voltage	830VAC
Max. switching current	200A
Max. switching power	45650VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	3 x 10 ⁴ OPS Making 55A, carrying 200A, breaking 55A, 800VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1)The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage (Between coil & Main contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 200A, Applied voltage of coil 100% rated voltage for 100ms holding voltage of coil 50% to 60% rated voltage, at 85°C)
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance*		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination ²⁾		PCB
Unit weight		Approx. 215g
Construction		Flux proofed

Notes: 1)The data shown above are initial values.

COIL

Coil power	Approx. 3W
Holding voltage	40% to 100% U _N (at 25°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
6	4.2	0.6	7.2	12x (1±10%)
9	6.3	0.9	10.8	27x (1±10%)
12	8.4	1.2	14.4	48x (1±10%)
24	16.8	2.4	28.8	192 x (1±10%)

Notes: 1)The data shown above are initial values.

2)Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	Making 55A, carrying 200A,breaking 55A, 830VAC,85°C,3 x 10 ⁴ OPS, Resistive
TÜV	Making 55A, carrying 200A,breaking 55A, 830VAC,85°C,3 x 10 ⁴ OPS, Resistive

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

Type	HF167F-200/	12	-H	3	F	(XXX)
Coil voltage	6, 9, 12, 24VDC					
Contact arrangement	H:1 Form A					
Contact material	3: AgNi					
Insulation standard	F: Class F					
Special code ¹⁾	XXX: Customer special requirement		Nil: Standard			

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.

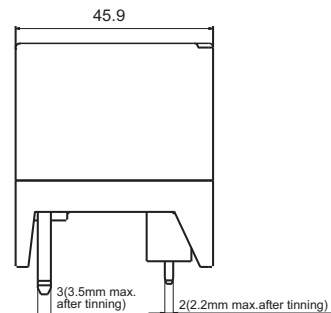
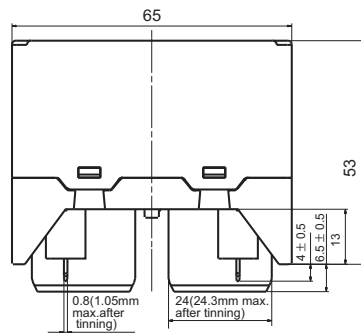
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa.

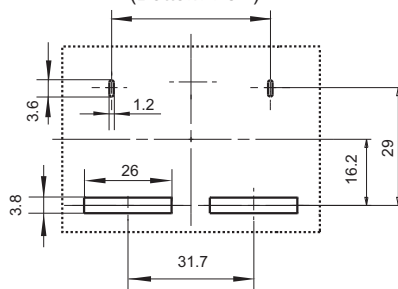
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

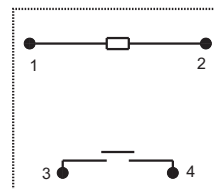
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

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HF167F-270

SOLAR RELAY



File No.: E133481



File No.: R50374273



Features

- 270A switching capability
- Applicable to solar photovoltaic inverter
- 4.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F
- Available with heat sink specifications for better heat dissipation

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	1mΩ max.(6VDC 20A)
Contact material	AgNi, AgSnO ₂
Contact rating (Res. load)	Making 50A, carrying 270A, breaking 50A, 1000VAC
Max. switching voltage	1000VAC
Max. switching current	270A
Max. switching power	270000VA
Mechanical endurance	3×10 ⁵ OPS
Electrical endurance	AgNi: ≥1×10 ⁴ OPS (85°C, 1s on 9s off, Making 50A, carrying 270A, breaking 50A, 1000VAC, Resistive load) AgSnO ₂ : ≥3×10 ⁴ OPS (85°C, 1s on 9s off, Making 50A, carrying 270A, breaking 50A, 1000VAC, Resistive load)

CHARACTERISTICS

Insulation resistance		1000 MΩ (500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge voltage (Between coil & Main contacts)		10kV(1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 270A, Rated voltage is reduced to holding voltage after 100ms of excitation, at 85°C)
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.0mm DA
Humidity		5 % to 85 % RH -40°C to 85°C
Ambient temperature		(Coil rated voltage is reduced to holding voltage after 100ms of excitation)
Termination		PCB
Unit weight		Approx.265g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	High power consumption type: Approx.5W
Holding voltage	40% to 100%U _N (at 23°C) 50% to 60%U _N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA

23°C

High power consumption type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC ¹⁾	Coil Resistance Ω
6	4.5	0.3	7.2	7.2×(1±10%)
9	6.75	0.45	10.8	16.2×(1±10%)
12	9	0.6	14.4	28.8×(1±10%)
24	18	1.2	28.8	115.2×(1±10%)

Notes: Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	Making 50A, carrying 270A, breaking 50A, 1000VAC, 85°C, 10000OPS, Resistive load
	AgSnO ₂	Making 50A, carrying 270A, breaking 50A, 1000VAC, 85°C, 30000OPS, Resistive load 270A 1000VAC, 85°C, 100OPS, Resistive load
TUV	AgNi	Making 50A, carrying 270A, breaking 50A, 1000VAC, 85°C, 10000OPS, Resistive load
	AgSnO ₂	Making 50A, carrying 270A, breaking 50A, 1000VAC, 85°C, 30000OPS, Resistive load 270A 1000VAC, 85°C, 100OPS, Resistive load



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

ORDERING INFORMATION

	HF167F-270/	12	-H	P	3	F	L	(XXX)
Type								
Coil voltage	6,9,12,24VDC							
Contact arrangement	H: 1 Form A							
Coil type	P: Coil power consumption 5W							
Contact material	3: AgNi T: AgSnO ₂							
Insulation standard	F: Class F							
Special Requirement	Nil: Standard type L: With heat sink							
Special code	XXX: Customer special requirement Nil: Standard type							

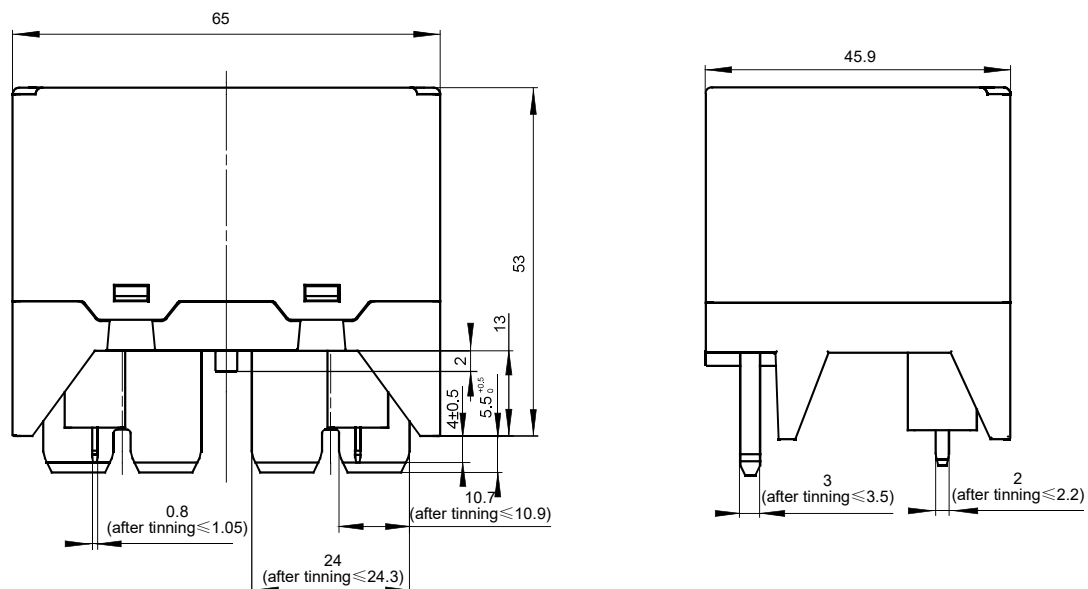
Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H₂S, SO₂, NO₂, dust, etc.
 2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
 3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

Without heat sink type:

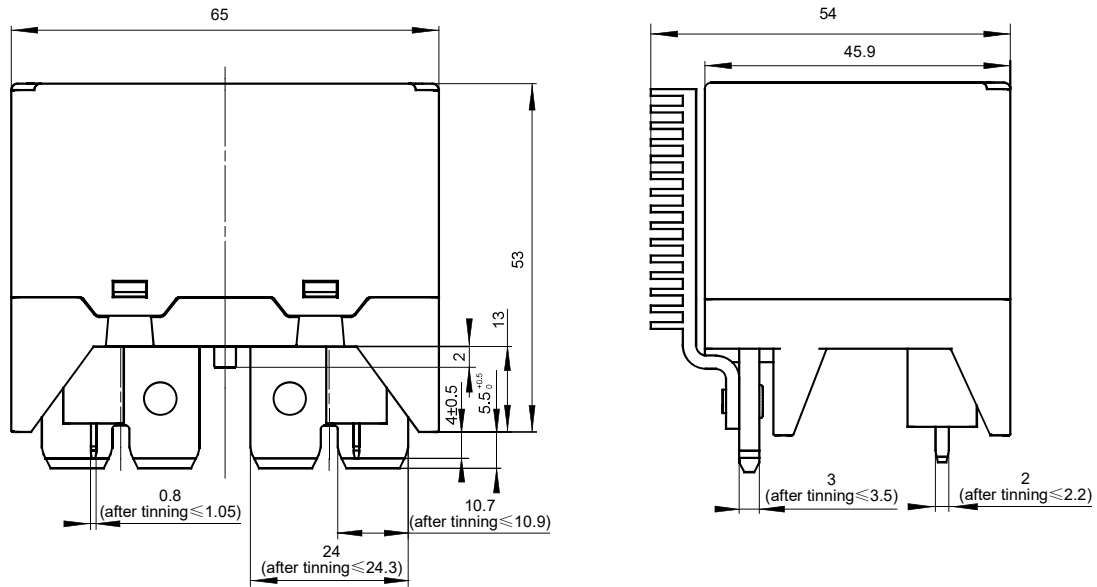


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

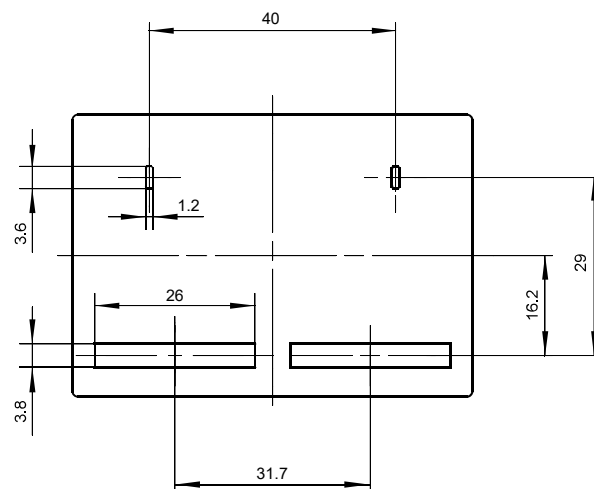
Unit: mm

Outline Dimensions

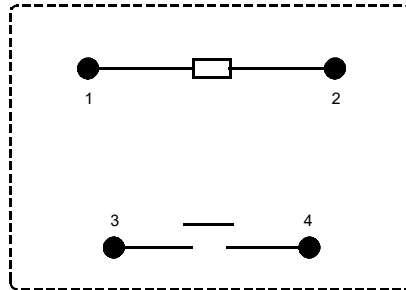
With heat sink type:



PCB Layout (Bottom view)



Wiring Diagram
(Bottom view)



Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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HF92F

MINIATURE INTERMEDIATE POWER RELAY

cUL US

File No.:E134517



File No.:40016109



File No.:CQC09002037814 (DC type) CQC18002202752 (DC type)

CQC14002114447 (AC type) CQC18002202751 (AC type)



Features

- 30A switching capability
- Creepage distance: 8mm
- 4kV dielectric strength (between coil and contacts)
- UL insulation system: Class F
- Plastic sealed and dust protected types available
- PCB & QC layouts available

CONTACT DATA

Contact arrangement	2A, 2C
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)
Contact material	AgSnO ₂ , AgCdO
Contact rating (Res. load)	NO: 30A 250VAC; 30A 277VAC NC: 3A 250VAC; 3A 277VAC
Max. switching voltage	277VAC
Max. switching current	30A
Max. switching power	8310VA
Mechanical endurance	5 x 10 ⁶ OPS
Electrical endurance	1 x 10 ⁵ OPS (NO: 30A 277VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10 ⁵ OPS (NC: 3A 277VAC, Resistive load, Room temp., 1s on 9s off)

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1500VAC 1min
	Between contact poles	2000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		DC type: 25ms max.
Release time (at rated. volt.)		DC type: 25ms max.
Temperature rise (at rated. volt.)		AC type:90K max. DC type:70K max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.65mm DA
Humidity		5% to 85% RH
Ambient temperature		AC: -40°C to 65°C DC: -40°C to 85°C
Termination		PCB, QC
Unit weight		Approx. 86g
Construction		Plastic sealed, Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	DC type: Approx. 1.7W; AC type: Approx. 4.0VA
------------	--

COIL DATA

at 23°C

DC type

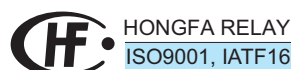
Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC * ²⁾	Coil Resistance Ω
005D	5	3.8	0.5	8.0	15.3x (1±10%)
006D	6	4.5	0.6	9.6	22x (1±10%)
012D	12	9	1.2	19.2	86x (1±10%)
024D	24	18	2.4	38.4	350x (1±10%)
048D	48	36	4.8	76.8	1390x (1±10%)
110D	110	82.5	11	176	7255x (1±10%)

AC type (at 50Hz)

Coil Code	Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Max. Voltage VAC * ²⁾	Coil Resistance Ω
024A5	24	19.2	4.8	26.4	45x (1±10%)
120A5	120	96	24	132	1125x (1±10%)
208A5	208	166.4	41.6	229	3278x (1±10%)
220A5	220	176	44	242	3800x (1±10%)
240A5	240	192	48	264	4500x (1±10%)
277A5	277	221.6	55.4	305	5960x (1±10%)

AC type (at 60Hz)

Coil Code	Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Max. Voltage VAC * ²⁾	Coil Resistance Ω
024A6	24	19.2	4.8	26.4	35.7x (1±10%)
120A6	120	96	24	132	830x (1±10%)
208A6	208	166.4	41.6	229	2600x (1±10%)
220A6	220	176	44	242	2870x (1±10%)
240A6	240	192	48	264	3800x (1±10%)
277A6	277	221.6	55.4	305	4700x (1±10%)



ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 1.00

COIL DATA

at 23°C

AC type (at 50Hz/60Hz)

Coil Code	Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾		Drop-out Voltage VAC min. ¹⁾		Max. Voltage VDC ²⁾	Coil Resistance Ω
		50Hz	60Hz	50Hz	60Hz		
120A	120	88	96	22	24	132	950 x (1±10%)
208A	208	160	166.4	40	41.6	229	2841 x (1±10%)
240A	240	176	192	44	48	264	3800 x (1±10%)
277A	277	200	221.6	50	55.4	305	5485 x (1±10%)

Notes:1) The data shown above are initial values.

2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL ¹⁾	NO	30A 277VAC 1HP 120VAC 2.5HP 240VAC 110 LRA/25.3FLA 240VAC(DC type) 30A 277VAC 85°C(DC type) 30A 277VAC 65°C(AC type) 1.5HP 120VAC 2 pole making/breaking 3HP 240VAC 3phase 3HP 480VAC 3phase 3HP 600VAC 3phase
	NC	3A 277VAC
VDE ¹⁾ (AgSnO ₂)	NO	30A 250VAC 20A 250VAC
	NC	3A 250VAC

Notes: 1) UL certified loads that does not indicate the ambient temperature are tested at 40°C. VDE certified loads are tested at 85°C (DC products) or 50°C (AC products)

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

Type	HF92F	-012D	-2C	2	2	F	(XXX)
Coil Code	XXX D: DC type(5,6,12,24,48,110VDC) XXX A5: AC type 50Hz(24,120,208,220,240,277VAC) XXX A6: AC type 60Hz(24,120,208,220,240,277VAC) XXX A: AC type 50Hz/60Hz(120,208,240,277VAC)						
Contact arrangement	2A: 2 Form A 2C: 2 Form C						
Termination ¹⁾	1: PCB 2, 3: QC						
Contact material	1: AgSnO ₂ 2: AgCdO						
Construction ²⁾	S: Plastic sealed F: Flux proofed						
Special code ³⁾	XXX: Customer special requirement Nil: Standard						

Notes: 1) For QC terminals, no soldering or washing is allowed. For PCB terminals, please refer to us for soldering condition and part specification for necessary washing or surface processing after it is soldered to PCB.

2) We recommend dust protected types for a clean environment (free from contaminations like H₂S, SO₂, NO₂, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H₂S, SO₂, NO₂, dust, etc.).

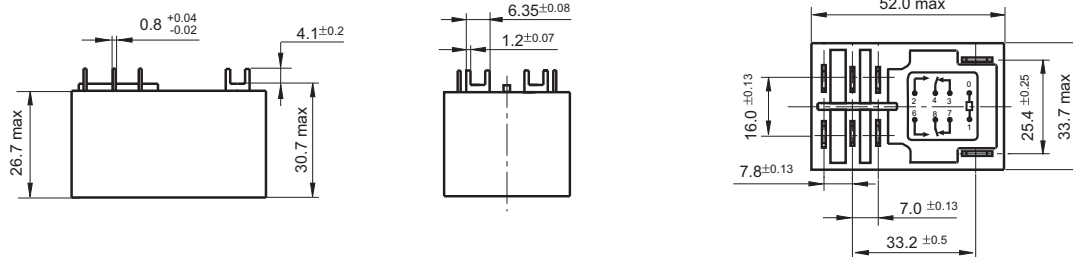
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

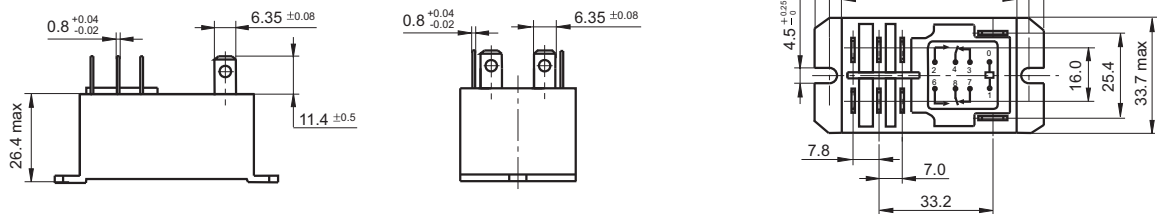
Unit: mm

Outline Dimensions

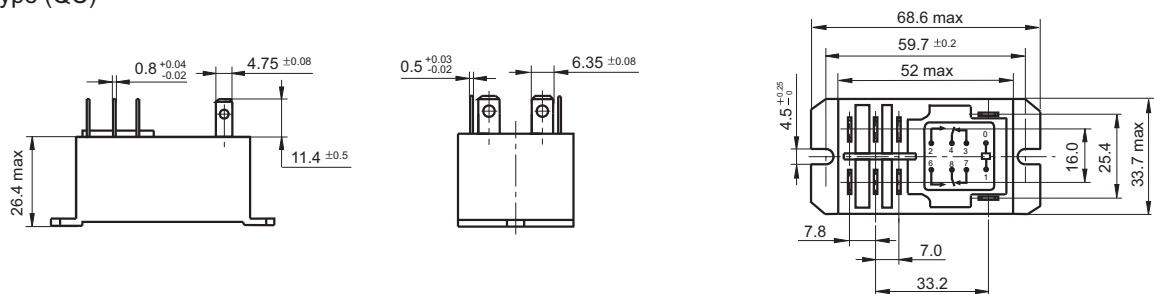
1 Type (PCB)



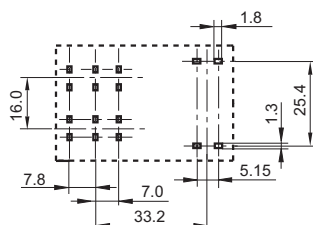
2 Type (QC)



3 Type (QC)

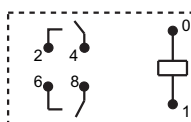


PCB Layout (Bottom view)

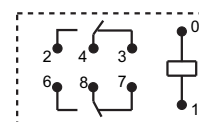


Wiring Diagram (Bottom view)

2 Form A

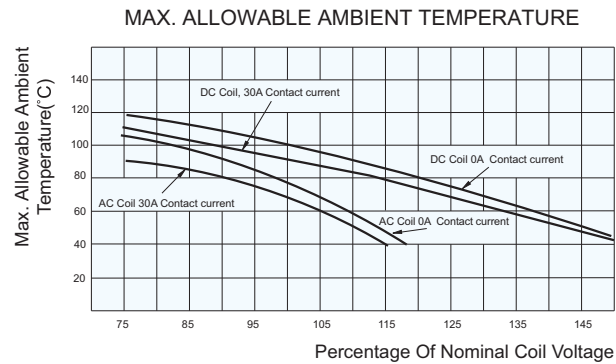


2 Form C



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES



Disclaimer

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HF78F

MINIATURE HIGH POWER RELAY



File No.: E133481



File No.: R50375929



File No.: CQC17002171481



Features

- Small and for microwave oven
- 20A switching capability
- 4.0kV dielectric strength (between coil and contacts)
- Low height: 28.5 mm

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance ¹⁾	50mΩ max.(at 1A 6VDC)
Contact material	AgSnO ₂
Contact rating	16A 250VAC/24VDC 16A 30VDC
Max. switching voltage	277VAC / 32VDC
Max. switching current	20A
Max. switching power	4432VA / 512W
Mechanical endurance	1 x 10 ⁷ OPS

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1200MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s ²
	Destructive	980m/s ²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB & QC
Unit weight		Approx. 16g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.

2) Please find coil temperature curve in the characteristic curves below.

COIL

Coil power	540mW
------------	-------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC ²⁾	Coil Resistance Ω
3	2.40	0.3	3.9	17.2 x (1±10%)
5	4.00	0.5	6.5	47.7x (1±10%)
6	4.80	0.6	7.8	68.8x (1±10%)
12	9.60	1.2	15.6	270 x (1±10%)
24	19.2	2.4	31.2	1100 x (1±10%)
36	28.8	3.6	46.8	2475x (1±15%)

Notes: 1) The data shown above are initial values.

2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC/30VDC 20A 125VAC
TÜV	16A 250VAC/30VDC 20A 125VAC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2020 Rev. 1.01

ORDERING INFORMATION

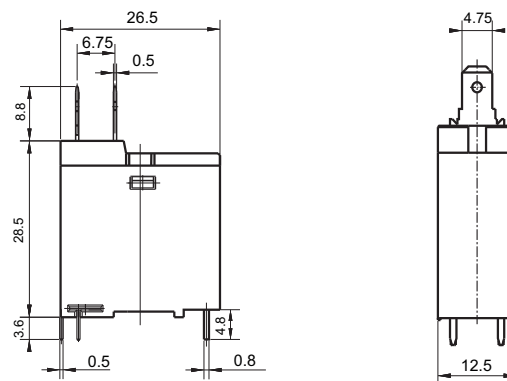
	HF78F / 12 -H 3 T F (XXX)					
Type						
Coil voltage	3, 5, 6, 12, 24, 36VDC					
Contact arrangement	1H: 1 Form A					
Termination	S: Plastic sealed Nil: Dust protected					
Contact material	T: AgSnO ₂					
Insulation standard	F: Class F					
Special code ¹⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

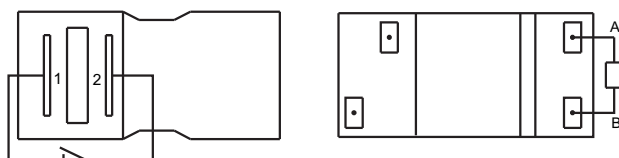
Unit: mm

Outline Dimensions



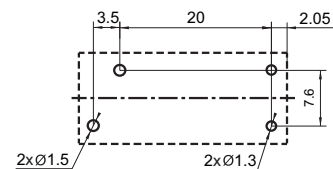
Wiring Diagram

(Bottom view)



PCB Layout

(Bottom view)

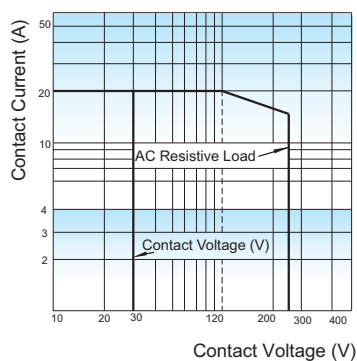


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

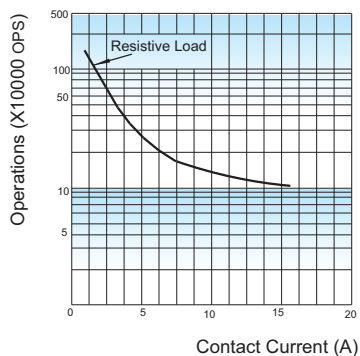
2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$.

CHARACTERISTIC CURVES

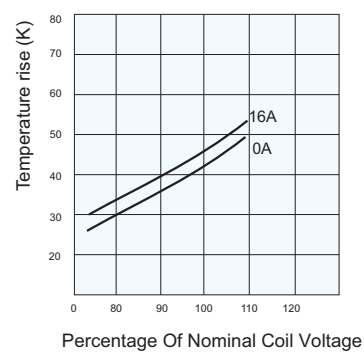
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



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HF84F

HIGH POWER RELAY



File No.:E134517 (AC type)



Features

- 16A switching capability
- 2.5kV dielectric strength (between coil and contacts)
- Panel mount types available

RoHS compliant

CONTACT DATA

Contact arrangement	1A, 1B, 1C	
Contact resistance ¹⁾	50mΩ max.(at 1A 24VDC)	
Contact material	AgCe	
Contact rating (Res.load)	1A, 1C	1B
	16A 250VAC, Resistive load	8A 250VAC, General load
Max. switching voltage	250VAC	
Max. switching current	16A	
Max. switching power	4000VAC	
Mechanical endurance	1 x 10 ⁶ OPS	
Electrical endurance	7 type: 3 x 10 ⁴ OPS (8A 250VAC, General use, at 40°C, 1s on 9s off) 1, 4 type: 1 x 10 ⁵ OPS (16A 250VAC, Resistive load, at 65°C, 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance	500MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)	DC type: 25ms max.	
Release time (at rated. volt.)	DC type: 25ms max.	
Temperature rise (at rated. volt.)	90K max.	
Shock resistance (Functional)	147m/s ² 11ms	
Vibration resistance	10Hz to 55Hz 2.54mm DA	
Ambient temperature	-40°C to 65°C	
Humidity	5% to 85% RH	
Termination	QC	
Unit weight	Approx. 75g	
Construction	Dust protected	

Notes: 1) The data shown above are initial values.

2) UL insulation system: Class A.

COIL

Coil power	DC type: 2.1W ; AC type: 3.5VA
------------	-----------------------------------

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
6	4.50	0.6	6.6	17.5 x (1±10%)
9	6.75	0.9	9.9	40 x (1±10%)
12	9.00	1.2	13.2	70 x (1±10%)
24	18.0	2.4	26.4	280 x (1±10%)
48	36.0	4.8	52.8	1120 x (1±10%)
120	90.0	12.0	132	7000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max. 1)	Drop-out Voltage VAC min. 1)	Max. Voltage VAC *2)	Coil Resistance Ω
6	5.1	1.2	6.6	4.8 x (1±10%)
12	10.2	2.4	13.2	19 x (1±10%)
24	20.4	4.8	26.4	90 x (1±10%)
48	40.6	9.6	52.8	300 x (1±10%)
120	102	24	132	2000 x (1±10%)
240	204	48	264	7200 x (1±10%)
277	235	55.4	304.7	11000 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL (AC type)	HF84F-1	8FLA, 25LRA 250VAC at 40°C 16A 250VAC Resistive at 65°C 8A 250VAC General use at 40°C
	HF84F-4	8FLA, 25LRA 250VAC at 40°C 16A 250VAC Resistive at 65°C 8A 250VAC General use at 40°C
	HF84F-7	8FLA, 25LRA 250VAC at 40°C 8A 250VAC General use at 40°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2019 Rev. 1.00

ORDERING INFORMATION

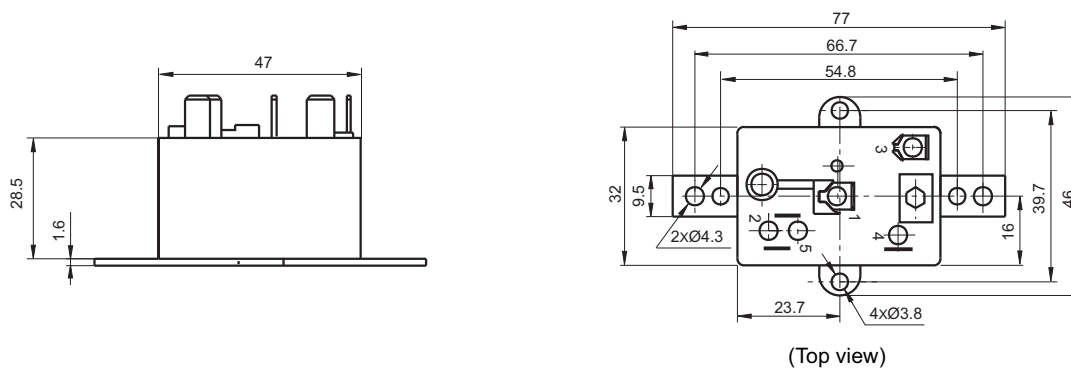
	HF84F	-1	A	24	(XXX)
Type					
Contact arrangement	1: 1 Form C 4: 1 Form A 7: 1 Form B				
Coil voltage form	D: DC A: AC				
Coil voltage	AC: 6VAC to 277VAC DC: 6VDC to 120VDC (No UL approved)				
Special code ¹⁾	XXX: Customer special requirement Nil: Standard				

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

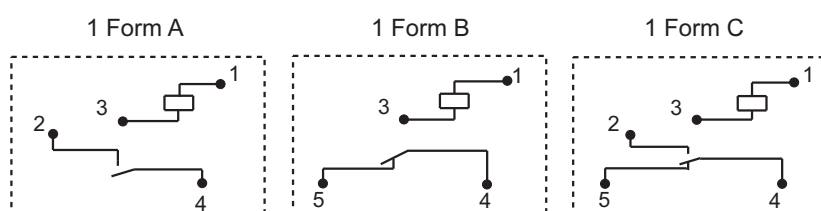
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

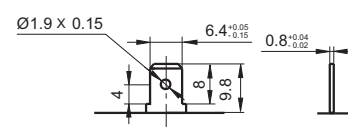
Outline Dimensions



Wiring Diagram (Top view)



Terminals type



Remark: In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

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HF94F

HIGH POWER RELAY



File No.:E134517 (AC type)



Features

- 25A switching capability
- 2kV dielectric strength
(between coil and contacts)
- Panel mount, various terminal types
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1B, 1C, 1A + 1B
Contact resistance ¹⁾	200mΩ max.(at 1A 24VDC)
Contact material	AgCe, AgCdO
Contact rating (Res.load)	18A 277VAC
Max. switching voltage	277VAC
Max. switching current	18A
Max. switching power	4986VA
Mechanical endurance	1 x 10 ⁶ OPS
Electrical endurance	5 x 10 ⁴ OPS (25A 277VAC, Resistive load, AgCdO, at 65°C, 1s on 9s off) 3 x 10 ⁴ OPS (3A 277VAC, General load, AgCe, at 65°C, 1s on 9s off)

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		500MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		DC type: 25ms max.
Release time (at rated. volt.)		DC type: 25ms max.
Temperature rise (at rated. volt.)		90K max.
Shock resistance (Functional)		98m/s²
Vibration resistance		10Hz to 55Hz 0.5mm DA
Ambient temperature		-40°C to 65°C
Humidity		5% to 85% RH
Termination		QC
Unit weight		Approx. 85g
Construction		Dust protected

Notes: 1) The data shown above are initial values.

COIL

Coil power	DC type: Approx. 2.4W; AC type: Approx. 4.0VA
------------	--

COIL DATA

Nominal Voltage VDC	Pick-up Voltage VDC max. ¹⁾	Drop-out Voltage VDC min. ¹⁾	Max. Voltage VDC *2)	Coil Resistance Ω
6	4.50	0.6	6.6	17.5 x (1±10%)
9	6.75	0.9	9.9	40 x (1±10%)
12	9.00	1.2	13.2	70 x (1±10%)
24	18.0	2.4	26.4	280 x (1±10%)
48	36.0	4.8	52.8	1120 x (1±10%)
120	90.0	12.0	132	7000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max. ¹⁾	Drop-out Voltage VAC min. ¹⁾	Max. Voltage VAC *2)	Coil Resistance Ω
6	5.1	1.2	6.6	4.8 x (1±10%)
12	10.2	2.4	13.2	19 x (1±10%)
24	20.4	4.8	26.4	77 x (1±10%)
48	40.8	9.6	52.8	280 x (1±10%)
120	102	24	132	2000 x (1±10%)
240	204	48	264	7250 x (1±10%)
277	235	55.4	304.7	11000 x (1±10%)

Notes: 1) The data shown above are initial values.

2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

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SAFETY APPROVAL RATINGS

UL/CUL	HF94F-10	NO	AgCdO	12FLA,60LRA,120VAC at 65°C 8FLA,48LRA,250VAC at 65°C 8FLA,48LRA,277VAC at 65°C 7FLA,42LRA,277VAC at 65°C 25A,277VAC,Resistive at 65°C
			AgCe	3A,277VAC,Gen Use at 65°C 277VAC pilot duty,10A inrush,1A break at 65°C
	HF94F-11	NC	AgCdO	14FLA,84LRA,125VAC at 40°C 8FLA,48LRA,250VAC at 65°C 8FLA,48LRA,277VAC at 65°C 7FLA,42LRA,277VAC at 65°C 25A,277VAC,Resistive at 65°C
			AgCe	3A,277VAC,Gen Use at 65°C 277VAC pilot duty,10A inrush,1A break at 65°C
	HF94F-12	NO/NC	AgCdO	14FLA,84LRA,125VAC at 40°C 8FLA,48LRA,250VAC at 65°C 8FLA,48LRA,277VAC at 65°C 7FLA,42LRA,277VAC at 65°C 25A,277VAC,Resistive at 65°C
			AgCe	3A,277VAC,Gen Use at 65°C 277VAC pilot duty,10A inrush,1A break at 65°C
	HF94F-13	NO/NC	AgCdO	12FLA,60LRA,120VAC at 65°C 8FLA,48LRA,250VAC at 65°C 8FLA,48LRA,277VAC at 65°C 7FLA,42LRA,277VAC at 65°C 18A,277VAC,Resistive at 65°C 25A,277VAC,Resistive at 65°C
			AgCe	3A,277VAC,Gen Use at 65°C 277VAC pilot duty,10A inrush,1A break at 65°C

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF94F	-10	A	24	E	-1	(XXX)
Type							
Contact arrangement	10: 1 Form A 11: 1 Form B 12: 1 Form C 13: 1 Form A+1 Form B						
Coil voltage form	A: AC D: DC						
Coil voltage	AC: 6VAC to 277VAC DC: 6VDC to 120 VDC (No UL approved)						
Contact material	E: AgCe Nil: AgCdO						
Mounting	1: Flang, Mounting Distance 54.8mm. diameter Ø3.8mm 2: Flang, Mounting Distance 66.7mm. diameter Ø4.8mm Nil: Metal Bracket						
Special code ¹⁾	XXX: Customer special requirement Nil: Standard						

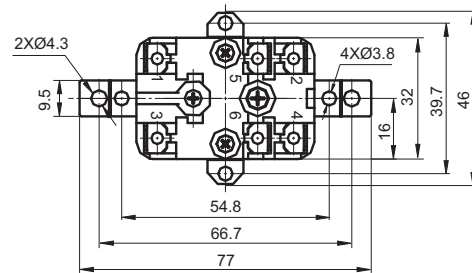
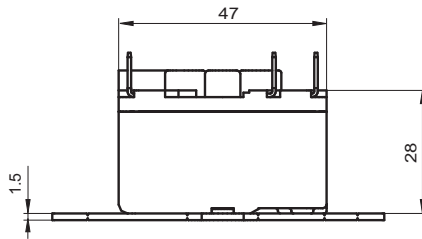
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

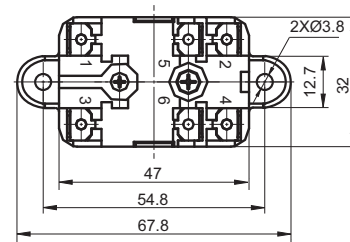
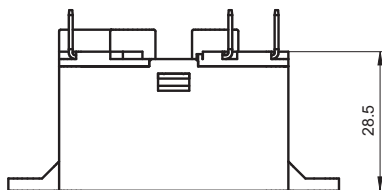
Outline Dimensions

Metal Bracket



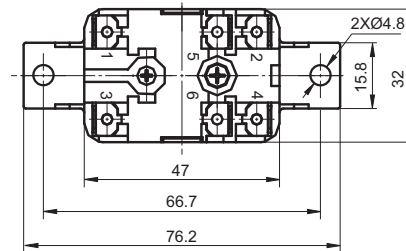
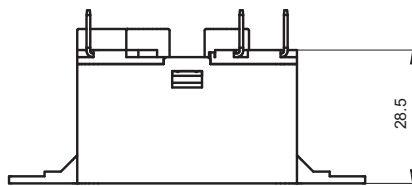
(Top view)

Flang, Mounting Distance 54.8mm



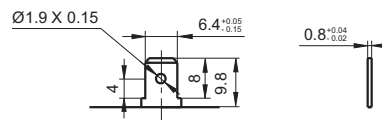
(Top view)

Flang, Mounting Distance 66.7mm



(Top view)

Terminals type

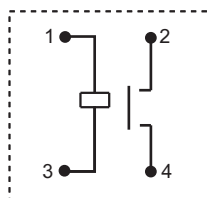


Remark: In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.

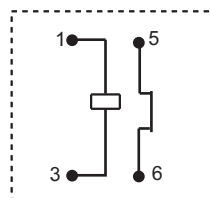
Wiring Diagram

(Top view)

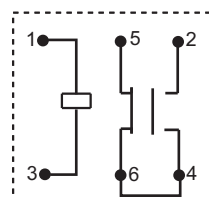
1 Form A



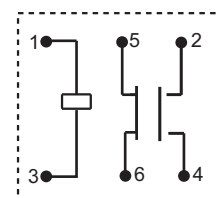
1 Form B



1 Form C



1A+1B



Disclaimer

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HF8565

MOTOR START POTENTIAL RELAY



File No.:SA13318



Features

- 50A switching capability
- 1 Form B configuration available
- 250" quick connect termination
- UL insulation system: Class F
- Various of mounting positions

CONTACT DATA

Contact arrangement	1B
Contact resistance	100mΩ max.(at 1A 24VDC)
Contact material	Silver alloy
Contact rating (Res. load)	16A(make and break) 400VAC COS Ø=0.85 35A(break only) 400VAC COS Ø=0.85 50A(break only) 400VAC COS Ø=0.85
Mechanical endurance	7.5 x 10 ⁵ OPS
Electrical endurance	SPST-NC: 5 x 10 ⁵ OPS (16A on and off 400VAC cosØ=0.7-0.8 at 25°C 1s on 9s off) SPST-NC: 2 x 10 ⁵ OPS (35A only off 400VAC cosØ=0.7-0.8 at 25°C 1s on 9s off) SPST-NC: 1 x 10 ⁵ OPS (50A only off 400VAC cosØ=0.7-0.8 at 25°C 1s on 9s off)

CHARACTERISTICS

Weight	Approx. 110g
Termination	QC
Construction	Dust protected

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 5VA
Coil voltage	See table below
Coil resistance	See table below
Insulation system	Class B

OPERATING CHARACTERISTICS at 50Hz

Coil number		2		3		4		5		6		7		8		9	
Vmax at 40°C (V)		299		338		378		356		452		151		530		228	
Resistance (1± 10%) Ω at 25°C		5600		7500		10700		10000		13800		1500		19500		3900	
	H.P.U.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.
A	120-130											111-124	20-45			111-124	35-77
B	130-140											120-134	20-45			120-134	35-77
C	150-160	140-153	40-90									130-144	20-45			130-144	35-77
D	160-170	150-163	40-90	150-163	40-90							140-153	20-45			140-153	35-77
E	170-180	162-175	40-90	162-175	40-90											149-163	35-77
F	180-190	171-184	40-90	171-184	40-90			180-195	40-105							157-172	35-77
G	190-200	180-193	40-90	180-195	40-105	180-195	40-105	189-205	40-105							168-182	35-77
H	200-220	186-215	40-90	190-215	40-105	195-224	50-110	186-214	60-133							178-192	35-77
I	220-240	205-234	40-105	208-239	50-110	204-233	50-110	204-233	60-133							183-213	35-77
L	240-260	224-252	40-105	224-252	50-110	223-259	50-110	223-252	60-133	223-252	60-130					203-231	35-77
M	260-280	243-271	40-105	239-270	50-110	242-272	50-110	242-272	60-133	239-268	60-135			239-268	75-170		
N	280-300			260-289	50-110	262-290	60-121	262-290	60-133	258-287	60-135			258-287	75-170		
O	300-320					280-310	60-121	280-310	60-133	277-305	60-135			277-305	75-170		
P	320-340					300-328	60-121	300-328	60-154	295-324	60-135			295-324	75-170		
Q	340-360					318-347	60-121			314-342	60-135			314-342	75-180		
R	350-370													323-352	75-180		
S	360-380													332-361	75-180		

Notes: H.P.U.means Approximate pick-up value at 90°C , P.U. means pick-up value at 25°C, D.O.means drop out value at 25°C.



HONGFA RELAY

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OPERATING CHARACTERISTICS at 60Hz

Coil number		2		3		4		5		6		7		8		9	
Vmax at 40°C (V)		332		375		420		395		502		168		588		253	
Resistance (1 ±10%) Ω at 25°C		5600		7500		10700		10000		13800		1500		19500		3900	
	H.P.U.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.
AA	120-130											111-124	20-45			111-124	35-77
AB	130-140											120-134	20-45			120-134	35-77
AC	150-160											130-144	20-45			130-144	35-77
AD	160-170	150-163	40-90									140-153	20-45			140-153	35-77
AE	170-180	162-175	40-90									149-163	20-45			149-163	35-77
AF	180-190	171-184	40-90					180-195	40-105							157-172	35-77
AG	190-200	180-193	40-90	180-195	40-105			189-205	40-105							168-182	35-77
AH	200-220	186-215	40-90	190-215	40-105	195-224	60-121	186-214	60-130							178-192	35-77
AI	220-240	205-234	40-90	208-239	50-110	204-233	60-121	204-233	60-130							183-213	35-77
AL	240-260	224-252	40-105	224-252	50-110	223-259	60-121	223-252	60-130							203-231	35-77
AM	260-280	243-271	40-105	239-270	50-110	242-272	60-121	242-272	60-140	239-268	60-135					221-250	35-77
AN	280-300			260-289	50-110	262-290	60-121	262-290	60-140	258-287	60-135			258-287	75-170		
AO	300-320					280-310	60-121	280-310	60-140	277-305	60-135			277-305	75-170		
AP	320-340					300-328	60-121	300-328	60-140	295-324	60-135			295-324	75-170		
AQ	340-360					318-347	60-121			314-342	60-135			314-342	75-180		
AR	350-370													323-352	75-180		
AS	360-380													332-361	75-180		

Notes: H.P.U.means Approximate pick-up value at 90°C , P.U. means pick-up value at 25°C, D.O.means drop out value at 25°C.

OPERATING POSITION

	1	2	3	4	5	6
PLASTIC TAB MOUNT						
PANEL MOUNT						
METAL TAB MOUNT						

TERMINAL CONFIGURATION

	3 dual QC (#1, 2, 5)
PLASTIC TAB MOUNT	D
PANEL MOUNT	P
METAL TAB MOUNT	Z

ORDERING INFORMATION

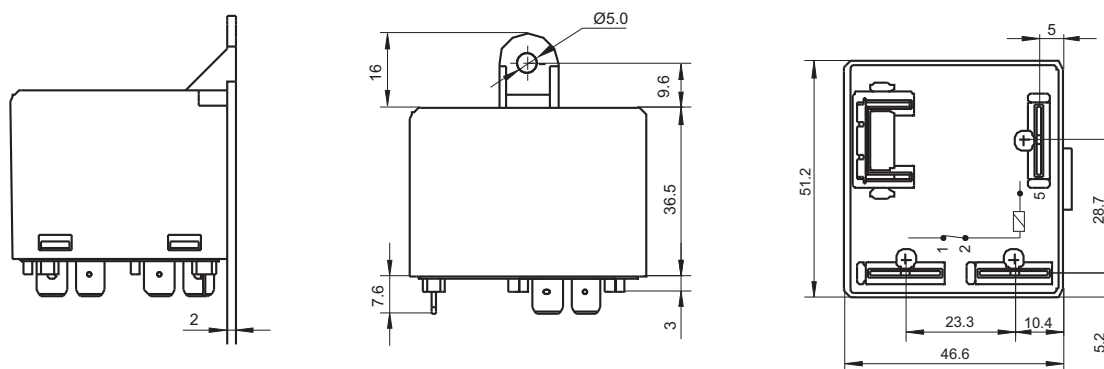
Type	HF8565 / D 6 A 1 (XXX)
Terminal configuration	D、P、Z(See table for terminal configuration)
Coil number	2、3、4、5、6、7、8、9
Operation characteristics	AA to AS (See table for operating characteristics)
Operation position	1、2、3、4、5、6
Special code ¹⁾	XXX: Customer special requirement Nil: Standard

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

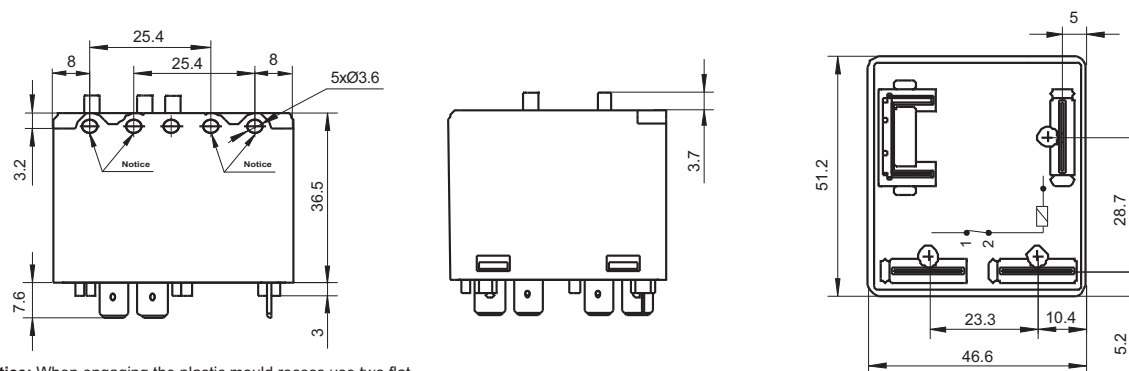
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Plastic Tab Mount

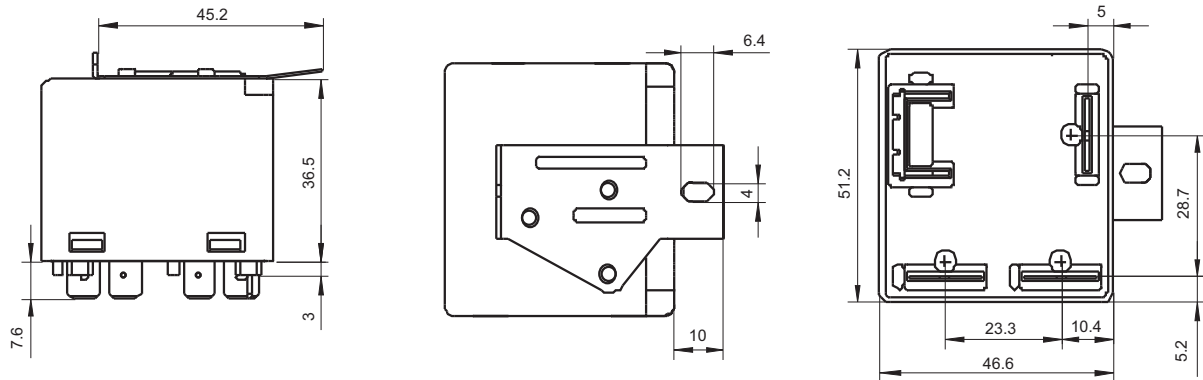


Panel Mount



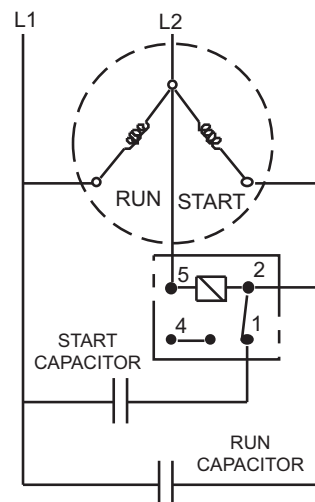
Notice: When engaging the plastic mould recess, use two flat head, self tapping screw, size 4.2mm, 9.5mm long.

Metal Tab Mount



Remark: In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.

Wiring Diagram



Disclaimer

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COMPARATIVE LIST BETWEEN THE OLD AND NEW ORDERING TYPE

New Ordering Type	Old Ordering Type	New Ordering Type	Old Ordering Type
HF3F-L	---	HF46F-G	---
HF3FA/HF3FA-T	---	HF49FD	---
HF3FA-G	-HF3FA	HF62F	JQX-62F
HF3FA-M	---	HF78F	JQX-78F
HF3FA-W	---	HF84F	8400
HF3FD	---	HF92F	692
HF3FF	JQC-3FF	HF94F	9400
HF3FF- M	---	HF102F	JQX-102F
HF7FD	JQC-7FD	HF105F-1	JQX-105F-1
HF7FF	JZC-7FF	HF105F-2	JQX-105F-2
HF8	---	HF105F-4	JQX-105F-4
HF14FF	JQX-14FF	HF105F-5	JQX-105F-5
HF14FW	JQX-14FW	HF115F	JQX-115F
HF21FF	JQC-21FF	HF115F-A	---
HF25F	JQC-25F	HF115F-H	JQX-115F-H
HF32F	JZC-32F	HF115F-I	JQX-115F-I
HF32F-G	---	HF115F-L 1 pole	---
HF32FA	JZC-32FA	HF115F-L 2 pole	---
HF32FA-T	JZC-32FA-T	HF115F-LS	---
HF32FA-G	---	HF115F-Q	JQX-115F-Q
HF32FV	---	HF115F-S	---
HF32FV-G/HF32FV-T	---	HF115F-T/TH	JQX-115F-T/TH
HF32FV-16	---	HF115FP	---
HF33F	JZC-33F	HF115FK	---
HF36F	JZC-36F	HF115FK-T	---
HF36FD	---	HF116F-1	JQX-116F-1
HF37F	JQX-37F	HF116F-2	JQX-116F-2
HF41F	---	HF116F-3	JQX-116F-3
HF42F	JZC-42F	HF116F-80	---
HF46F	---	HF116F-G	---



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

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COMPARATIVE LIST BETWEEN THE OLD AND NEW ORDERING TYPE

New Ordering Type	Old Ordering Type	New Ordering Type	Old Ordering Type
HF118F	JQX-118F	HF167F-200	---
HF118FK		HF170F	---
HF140FF	JZX-140FF	HF171F	---
HF152F	---	HF172F-100	---
HF152FD	---	HF172F-140	---
HF158F	---	HF175F	---
HF158F-V 1 pole	---	HF176F	---
HF160F	---	HF177F	---
HF161F	---	HF178F	---
HF161F-W	---	HF178F-T	---
HF162F	---	HF179F/HF179F-W	---
HF163F-L	---	HF180F	---
HF165F	---	HF	---
HF165F-50	---	HF2100	---
HF165FD	---	HF2110/HF2120	---
HF165FD-G	---	HF2150	---
HF166F	---	HF2160	---
HF167F	---	HF7520	---
HF167F-G	---	HF8565	---
HF167F-140	---		

Notes: Now we have finished switching to be the head of "HF" as new ordering type, we strongly recommend that you should use the new ordering type for your orders.



HONGFA RELAY

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CROSS REFERENCE GUIDE

HONGFA	OMRON	PANASONIC	TE			NEC
			OEG	P&B	SCHRACK	
HF3FA	G5LA	JS			T7S	
HF3FA-G	SRD-L					
HF3FA-T	G5LA					
HF3FA-M	G5SN				T72N	
HF3FD	G5LB	JS			T7S	
HF3FF	G5LC/G5LE	JS	PCE/ORWH	T72	T7N	
HF3FF-M						
HF7FD	G5LE-VD	JSM	PCE	T7N	T7N-WG	KB
HF7FF	G5LC/G5LE	JSM	PCE	T7N	T7N	
HF8			ODUH	T73	41891/UB	
HF14FF	G2R	JR1/JR1A	OMI	RKA/RKS	409/cardE/RPII1	CH
HF14FW	G2R	JR1AF	OMI-H/OZ	RKA/RKS		
HF21FF	G5L		SRUDH/SRUUH	T7C	LN/41896	
HF25F	G5G	LE				
HF32F			OJ/OJE	T77		CS
HF32F-G			OJ/OJE	T77		
HF32FA/HF32FA-T			OJ/OJE	T77		
HF32FA-G			OJ/OJE	T77		
HF32FV			OJ/OJE	T77		CS
HF32FV-G			OJ/OJE	T77		
HF32FV-16			OJT			
HF33F	G5SB/G5Q	JQ/PQ	PCH	T77	RE/REL	
HF36F/HF36FD	G5PA-1	LK	SDT			CK
HF36F-20	G5PZ-1A-E					
HF36F-W	G5PZ-1A					
HF37F				T74		
HF41F		PF			V23092/SNR	
HF42F	G5PA-2	LA	OSA/PCI			CN
HF46F/HF46F-G	G5NB/G5T	LD				CU

This table is just for reference. if you have any questions, please contact our local agent or send e-mail to marketing@hongfa.com.



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CROSS REFERENCE GUIDE

HONGFA	FUJITSU	FEME	FINDER	SONGCHUAN
HF3FA				899
HF3FA-G				
HF3FA-T				833H
HF3FA-M				
HF3FD				899
HF3FF		VTA/H	36.11	833H
HF3FF-M				
HF7FD	FBR160			812BH
HF7FF	CS			812
HF8	LZ	EM-EMH		843
HF14FF	VS	MZPA-001	40.31	845-1P
HF14FW	FBR610	MZPA-001	40.61	793P
HF21FF				801H
HF25F				
HF32F	JV			835/835NL
HF32F-G	JV			835/835NL
HF32FA/HF32FA-T	JV			835/835NL
HF32FA-G	JV			835/835NL
HF32FV	JV			835/835NL
HF32FV-G	JV			
HF32FV-16				
HF33F	JY	JF		892
HF36F/HF36FD	FTR-H2/F2	MXH		
HF36F-20				
HF36F-W				
HF37F	VF			
HF41F	FTR-LY		34,51	
HF42F				401
HF46F/HF46F-G	FTR-F4			202/202H

This table is just for reference. if you have any questions, please contact our local agent or send e-mail to marketing@hongfa.com.



HONGFA RELAY

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CROSS REFERENCE GUIDE

HONGFA	OMRON	PANASONIC	TE			NEC
			OEG	P&B	SCHRACK	
HF46FB						
HF49FD	G6DN	APAN			PCN	
HF62F	G5J	JR1AF-TMP	OMIF			
HF78F						
HF92F				T92	T92	
HF102F	G4A	LF	PCFN			
HF105F-1	G8P	JTN/JTV	ORU	T9A/T90	T9A	CT
HF105F-2	G7G/G8P	JT	ORU	491/T9A		
HF105F-4	G7G/G8P	JT	ORU	T9A		
HF105F-5	G7G/G8P	JTN	ORU	T90/T9A		
HF115F	G2RL	LZ		RT	RT/42900/RT1/RT2	TH
HF115-A	G5RL-AC				RT1/RT2/RX1/RX2	
HF115F-H				RT	RT1 sensitive	
HF115F-I				RT	42903/42903A/	
HF115F-L		DJ			RT1 inrush/RX1	
HF115F-LS					RT1 bistable	
HF115F-Q					RTX/RTS3T	
HF115F-25					RF/41063 125°C	
HF115F-T/TH				RT	RTH105 16A	
HF115FP					XT	
HF115FK	G2RL	LZ			RZ	
HF115FK-T				RT	RZ	
HF158F	G2RL	LZ			RT	
HF116F-1	G7L	HE				
HF116F-2	G7L	HE				
HF116F-3	G7L	HE				
HF116F-80		HE				
HF116F-G		HE				
HF118F/HF118FKF	G6RN				RYII	

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HONGFA	FUJITSU	FEME	FINDER	SONGCHUAN
HF46FB	FTR-F3			
HF49FD	MY/NY			
HF62F				302
HF78F	VR			302
HF92F		CS/CF30		
HF102F				
HF105F-1				832
HF105F-2				832
HF105F-4				832
HF105F-5				832
HF115F	FTR-K1	M25	41series	881/888
HF115-A				881
HF115F-H	FTR-K1			881/845N
HF115F-I	FTR-H1			881/888
HF115F-L	FTR-K1L			
HF115F-LS				
HF115F-Q				881WP
HF115F-25				
HF115F-T/TH	FTR-K1			881
HF115FP				
HF115FK	FTR-K1			
HF115FK-T	FTR-K1			
HF158F	FTR-K1		41series	
HF116F-1				841
HF116F-2				841
HF116F-3				841
HF116F-80				511E
HF116F-G				510H
HF118F/HF118FK	JS	M15E		

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HONGFA	OMRON	PANASONIC	TE			NEC
			OEG	P&B	SCHRACK	
HF140FF	G2R/G2RG	JR2/JR2A	OMI	RKA/RKS	409/RPII2/SR2M	TP
HF140FF-V	G2R2-X					
HF152F	G5LE-VD	JSM				
HF160F	G4A	JM	PCF		PCJ	CU
HF161	G4A	LF	PCFN			
HF161F-W		LF-G	PCFN SOLAR			
HF162F	G5PF	LK-F				
HF163F-L		DW				
HF165FD	G8P	JTN/JTV	ORU	T9A/T90	T9A	CT
HF165FD-G						
HF165F				T9S SOLAR		
HF165F-50				T9VV		
HF167F		HE				
HF167F-G		HE-N				
HF170F		HES				
HF172F-100						
HF172F-140						
HF172F-200						
HF175F						
HF176F		HE				
HF178F/HF178F-T						
HF179F/HF179F-W						
HF186F						
HF187F		AHER				
HF191F-L		DJ-H				
HF2100	G7G	JT		491/T9A		CT
HF2110/HF2120	G7G	JT		491/T90	T9A	CT
HF2150/HF2151	G7G	JTN/JTV		T9A/T90		CT
HF2160		JT		T9A/T90		CQ

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HF140FF	FTR-F1/VSB	MZPA-002	40.52	845-2P
HF140FF-V				
HF152F				875
HF160F	VH/FTR-K3			821
HF161				
HF161F-W				
HF162F				
HF163F-L				
HF165FD				832
HF165FD-G				832HA
HF165F				
HF165F-50				
HF167F				
HF167F-G				
HF170F				
HF172F-100				511HP1
HF172F-140				511EP
HF172F-200				511HP1
HF175F				
HF176F				
HF178F/HF178F-T				207/110 series
HF179F/HF179F-W				207/110 series
HF186F				117L
HF187F				
HF191F-L				
HF2100		CGQ		
HF2110/HF2120		CGQ		832A
HF2150/HF2151				832
HF2160				852

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HONGFA	OMRON	PANASONIC	TE			NEC
			OEG	P&B	SCHRACK	
HF7520	G5CA	JV/JVN		PCD		

HONGFA	FUJITSU	FEME	FINDER	SONGCHUAN
HF7520				201

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Packing list

Type	Packing Method	Tube Size L x W x H cm	Carton Size L x W x H cm	QTY/CTN pcs	Approx. N.W. kg	Approx. G.W. kg	Stacking Layers Limit n
HF3FA/HF3FA-T HF3FA-M HF3FA-W	100 pcs/box	-	37.7 x 24 x 16	1000	7.2	8.1	5
	25 pcs/tube	42 x 2.14 x 2.24	47 x 20.5 x 14.7	1000	7.2	9.5	5
HF3FD	35 pcs/tube	57.6 x 2 x 2.1	62 x 20 x 14.7	1400	11.2	14.6	6
	100 pcs/box	-	35 x 23 x 16	1000	8	9.9	6
HF3FF	100 pcs/box	-	35.5 x 23.5 x 16	1000	10	11.1	5
	20 pcs/tube	32.8 x 2.14 x 2.24	37 x 25 x 17	1000	10	11.7	5
HF3F-L	100 pcs/box	-	33.5 x 27.5 x 20.5	1000	7.13	8.5	7
	35 pcs/tube	57.6 x 2.14 x 2.24	62.5 x 20.5 x 15	1400	9.9	12.7	7
HF7FD	100 pcs/box	-	46 x 30.5 x 22	1000	9.5	11.1	5
	20 pcs/tube	34.5 x 2.42 x 2.29	39 x 29 x 19	1000	9.5	11.6	5
HF7FF	100 pcs/box	-	39.5 x 26.5 x 17.2	1000	9.5	10.5	8
	20 pcs/tube	34.6 x 2.43 x 2.37	37.5 x 27.5 x 15.5	1000	9.5	10.5	9
HF8	20 pcs/tube	34.5 x 2.34 x 2.24	39 x 29 x 22.5	1000	11	13.4	5
HF14FF	50 pcs/tray	-	35 x 29 x 19	500	8.3	10.3	6
HF14FW	50 pcs/tray	-	35 x 29 x 19	500	8.7	10.6	6
HF21FF	15 pcs/tube	26.8 x 2.21 x 2.74	35 x 30 x 19.5	1000	13	15.5	5
HF25F	50 pcs/tray	-	35 x 29 x 17	500	7.5	9.1	6
HF30F	100 pcs/reel	25 x 16 x 2.6	32.5 x 25.5 x 13	1000	9	10	5
HF32F/HF32FV HF32FV-T/-G HF32F-G	100 pcs/reel	-	29.7 x 23.9 x 14.5	1000	6	6.8	5
	50 pcs/tube	55.3 x 2.22 x 2.35	61 x 17 x 15	1000	6	8	5
HF32FV-16	50 pcs/tube	55.3 x 2.22 x 2.35	61 x 17 x 15	1000	6	8	5
HF32FA HF32FA-T HF32FA-G	100 pcs/box	-	33.5 x 27.5 x 20.5	1000	4.8	5.9	7
	50 pcs/tube	53.5 x 2.12 x 1.99	58 x 17 x 15	1500	7.1	9.2	7
HF33F	100 pcs/reel	-	29.7 x 23.9 x 14.5	1000	7	7.9	5
	50 pcs/tube	55.3 x 2.43 x 2.31	59.5 x 16.5 x 14	1000	7	9.4	5
HF33F-G/-L	100 pcs/reel	25 x 16 x 2.6	32.5 x 25.5 x 13	1000	7	8	5
HF36F/HF36FD	50 pcs/box	-	37.5 x 29.5 x 27	1000	11.1	12.6	7
HF36F-20	50 pcs/box	-	37.5 x 29.5 x 27	1000	11.1	12.6	7
HF36F-W	50 pcs/box	-	37.5 x 29.5 x 24	1000	11.1	12.6	7
HF37F	25 pcs/tray	-	37.5 x 29.5 x 27	100	5.5	7	7
HF39F	100 pcs/reel	24.5 x 13 x 2.6	26.6 x 25.1 x 13	1000	4.9	5.9	5
FHF41F	100 pcs/tube	55 x 2.46 x 3.01	59.5 x 18.5 x 14.5	2000	9.7	11.5	7

Notes:1)This above list is the typical packing specification. Specifications and dimensions in this catalog are subject to change without notice.



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Packing list

Type	Packing Method	Tube Size L x W x H cm	Carton Size L x W x H cm	QTY/CTN pcs	Approx. N.W. kg	Approx. G.W. kg	Stacking Layers Limit n
HF42F	50 pcs/box	-	38.5 x 33.5 x 24	1000	13.2	15.0	7
HF46F HF46F-G	160 pcs/tray	-	40 x 27 x 20	1600	4.0	5.9	7
	150 pcs/box	-	33.5 x 27.5 x 20.5	1500	5.9	4.7	7
	75 pcs/tube	56 x 2.44 x 2.34	60.5 x 24.5 x 16.5	3000	9.4	13.5	7
HF46FB	140 pcs/tray	-	40 x 27 x 20	1400	6	7.5	7
HF46FA	160 pcs/tray	-	40 x 27 x 20	1600	6	7.5	7
HF49FD	100 pcs/tube	54.6 x 2.31 x 1.96	59.5 x 18 x 18.5	3000	8.2	10.4	7
HF5F	140 pcs/reel	-	41 x 24 x 13.5	1400	6.7	7.6	5
HF62F	50 pcs/tray	-	35 x 29 x 19	500	7.5	9.1	6
HF62F-G	50 pcs/tray	-	34.5 x 28.5 x 19.3	500	7.5	9.1	6
HF78F	105 pcs/box	-	49.4 x 34 x 19.4	840	14.5	17.7	6
HF84F/HF94F	1 pcs/box	-	34.2 x 34.2 x 20.3	100	5.5	7.5	7
	25 pcs/tray	-	34.2 x 34.2 x 20.3	100	5.5	7.5	7
HF92F	20 pcs/tray	-	35 x 29 x 24	100	7	9.3	7
HF102F	50 pcs/box	-	38.5 x 25.5 x 16	400	9.2	9.7	6
	35 pcs/tube	59.6 x 3.18 x 4.02	64 x 21 x 16.2	525	12.1	14.09	6
HF105F-1	40 pcs/tray	-	34.5 x 26.5 x 20	400	10.4	11.6	6
HF105F-1	20 pcs/tube	57.7 x 3.47 x 2.67	60.7 x 20.5 x 12.5	300	36	43	6
HF105F-2/-5	30 pcs/box	-	33 x 23 x 26.5	300	36	39	5
HF105F-3	40 pcs/tray	-	34.5 x 26.5 x 20	400	10.4	11.6	6
HF105F-4	40 pcs/tray	-	34.5 x 26.5 x 20	400	10.4	11.6	6
HF115F-A	50 pcs/box	-	39 x 23 x 22	500	6.5	7.8	7
	20 pcs/tube	61.6 x 1.45 x 2.23	65 x 18 x 14	1000	12.9	15.4	7
HF115F/-H/-I/ -T/TH/-L/-S/-LS	50 pcs/tray	-	40 x 27 x 20	500	6.6	8.3	7
	20 pcs/tube	61.6 x 1.45 x 2.23	65 x 18 x 14	1000	13.3	17.8	7
HF115FD	50 pcs/tray	-	40 x 27 x 20	500	6.6	8.3	7
	20 pcs/tube	61.6 x 1.45 x 2.23	65 x 18 x 14	1000	13.3	17.8	7
HF115FK/-T	50 pcs/tray	-	40 x 27 x 20	500	6.6	8.3	7
	20 pcs/tube	61.6 x 1.45 x 2.23	65 x 18 x 14	1000	13.3	17.8	7
HF115F-Q	40 pcs/tray	-	40 x 27 x 20	400	6	7.5	7
	12 pcs/tube	53.0 x 1.45 x 2.23	57.5 x 19 x 15.5	600	6	7.5	7
HF115FK-A	50 pcs/box	-	39 x 23 x 22	500	6.5	7.8	7

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Packing list

Type	Packing Method	Tube Size L x W x H cm	Carton Size L x W x H cm	QTY/CTN pcs	Approx. N.W. kg	Approx. G.W. kg	Stacking Layers Limit n
HF115FP	50 pcs/tray	-	35 x 29 x 24	500	7.6	10	7
HF116F-1/-2	16 pcs/tray	-	35 x 29 x 24	80	7	9.3	7
HF116F-3 A type	5 pcs/box	-	31.5 x 16.5 x 19	50	5.7	6.3	7
HF116F-3 F type	5 pcs/box	-	32.5 x 18.5 x 19	50	5.4	6.1	7
HF116F-G/-80	16 pcs/tray	-	35 x 29 x 24	80	7.7	9.3	7
HF118F/HF118FK	20 pcs/tube	60 x 1.22 x 1.88	63.5 x 17 x 15	1000	8.3	10.3	6
HF140FF	50 pcs/tray	-	35 x 29 x 19	500	8.7	10.6	6
HF140FF-V	30 pcs/tray		34.5 x 28.5 x 19.3	300	8.4	9.9	6
HF152F	50 pcs/box	-	44 x 29.2 x 21.5	1000	13.5	14.8	6
HF152FD	25 pcs/tube	45.5 x 2.22 x 2.78	47.5 x 20 x 16.5	1000	13.5	16.3	6
HF158F/158F-T	50 pcs/tray	-	40 x 27 x 20	500	5.5	7	7
	20 pcs/tube	61.6 x 1.45 x 2.23	65 x 18 x 14	1000	10.9	12.6	7
HF160F	50 pcs/tray	-	40 x 27 x 17.5	400	9.6	10.6	7
	35 pcs/tube	59.6 x 3.26 x 4.26	64.5 x 18 x 18	420	10	13	7
HF161F/-W	35 pcs/tube	60 x 3.28 x 3.07	63.5 x 17 x 15	420	8.3	10	7
	50 pcs/tray	-	40 x 27 x 17.5	400	8.6	9	7
HF161F-40/-40W	50 pcs/tray	-	40 x 27 x 17.5	400	8.6	9	7
	35 pcs/tube	60 x 32.8 x 30.7	63.5 x 17 x 13.5	420	-	-	7
HF162F	50 pcs/box	-	40 x 34 x 27.5	1000	10.7	12	7
HF163F-L	40 pcs/tube	44.4 x 2.5 x 2.5	48.5 x 17 x 18.5	1000	7	9.3	8
HF165F/-50	35 pcs/tray	-	40 x 27 x 17.5	280	8	9.7	7
HF165FD/-G	40 pcs/tray	-	40 x 27 x 20	400	8.9	11	7
HF165FD-50	40 pcs/tray	-	40 x 27 x 20	400	14.4	-	-
HF166F	30 pcs/tray	-	40 x 27 x 20	240	9.1	10.1	7
HF166F-V	10 pcs/tube	55 x 3.3 x 3.3	59.5 x 18.5 x 14.5	120	5.4	6.5	7
HF167F	20 pcs/tray	-	40 x 27 x 20	120	11	12.7	7
HF167F-G	15 pcs/tray	-	40 x 27 x 24	90	11	12.58	7
HF167F-140	15 pcs/tray	-	40 x 27 x 24	90	13.1	14.5	7
HF167F-200	8 pcs/tray	-	40 x 27 x 24	48	9.6	11	7
HF167F-270	6 pcs/tray	-	40 x 27 x 24	36	7.8	-	7
HF170F	20 pcs/tray	-	40 x 27 x 20	120	13.2	14.8	7
HF171F	110 pcs/tray	-	40 x 27 x 20	1100	5.3	6.7	7

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Packing list

Type	Packing Method	Tube Size L x W x H cm	Carton Size L x W x H cm	QTY/CTN pcs	Approx. N.W. kg	Approx. G.W. kg	Stacking Layers Limit n
HF172F-100	15 pcs/tray	-	40 x 27 x 20	90	9.1	10.6	7
HF172F-140	15 pcs/tray	-	40 x 27 x 20	90	10	11.5	7
HF172F-200	15 pcs/tray	-	40 x 27 x 24	90	12.5	14	7
HF175F	40 pcs/tray	-	40 x 27 x 20	400	6.5	8	7
HF176F	20 pcs/tray	-	40 x 27 x 24	120	10.3	11.8	7
HF178F-T	80 pcs/tray	-	40 x 27 x 20	800	11.6	12.9	7
HF179F-W	30 pcs/tube	53 x 23.9 x 28.1	58 x 17 x 15	600	8.2	10	7
HF180F	10 pcs/tray	-	40 x 27 x 24	60	4.6	6.1	7
HF181F	50 pcs/tray	-	40 x 27 x 17.5	400	8.3	9.9	7
HF182F-L	100 pcs/tray	-	40 x 27 x 17.5	1000	5.9	7.2	7
HF185F	20 pcs/tray	-	40 x 27 x 20	120	11.6	13	7
HF186F	45 pcs/tray	-	40 x 27 x 24	360	13.7	16	7
HF187F	10 pcs/box	-	40 x 27 x 24	60	13.1	14.9	7
HF189F	30 pcs/tray	-	40 x 27 x 20	240	12.4	13.9	7
HF190F	50 pcs/box	-	40 x 27 x 20	400	12.5	13.8	7
HF191F-L	60 pcs/tray	-	40 x 27 x 20	480	10.3	12	7
HF192F	6 pcs/tray	-	40 x 27 x 24	36	12.2	-	7
HF195F	40 pcs/tray	-	40 x 27 x 20	320	9	10.5	7
	25 pcs/tube	60 x 29 x 36.4	63.5 x 17 x 15	300	9	10.7	7
HF196F	20 pcs/tube	61.6 x 1.45 x 2.42	64.5 x 20.5 x 11	700	11	14.5	7
HF196F-Q	20 pcs/tube	61.6 x 1.45 x 3.48	64.5 x 20.5 x 11	500	8	11	7
HF2100	40 pcs/tray	-	33.5 x 27.5 x 22.5	240	7.2	9	7
HF2110	30 pcs/tray	-	35 x 26.5 x 17.5	300	25	29	6
HF2120	40 pcs/tray	-	33.5 x 27.5 x 20	200	5.1	6.7	7
HF2150/HF2151	40 pcs/tray	-	34.5 x 26.5 x 20	400	10.4	11.6	6
HF2160	35 pcs/tray	-	34.5 x 26.5 x 20	350	10.5	11.9	6
HF2160(Screw type)	30 pcs/box	-	32 x 23 x 27.5	300	9.5	10.7	5
HF7520	50 pcs/box	-	45 x 32.5 x 17.5	1000	8.8	10.3	5
HF8565	10 pcs/box	-	38.2 x 28.5 x 20	90	9.5	11.5	7

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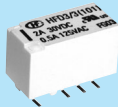
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Terminology Interpretation and Application Guidelines

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PREFACE

1. Principles

HF and its affiliates have made every effort to guarantee the accuracy of instructions and specifications. Still, errors may occur. Therefore, HF and its affiliates reserve the right to make any modifications to the instructions and specifications.

HF and its affiliates claim only the responsibility of the clearly confirmed experiment clauses and condition of sale as well as the application condition and test results stated in particular specifications. We disclaim any assumptions or implications of any of our specifications and instructions.

Given the impossibility of defining all the requirements of all the relays in every application, users shall select relays accordingly and re-check through careful evaluation, or turn to HF and its affiliates for Technical support if necessary. Users shall take full responsibility for relay selection.

2. Definition and Classification

Relay is a kind of component by which when the input reached to a certain value, one or more outputs will produce the scheduled changes.

For electromagnetic relay, SSR and combined relay, it can be simply understood as the following way: it is a switch by which in the input the speculated electrical signals are applied, the output makes or breaks the controlled circuit.

There are many kinds of classifications about relay, we take the following classifications shown as table 1.

Table 1

Classifications		Application Fields	Advantages
Electromagnetic Relay	Signal relay	Generally for telecom and signal control	<ul style="list-style-type: none">● Without leakage current in the open output end● In the large load, it is unnecessary to add the radiators
	Power relay	Generally for home application	
	Industrial relay	Generally for industrial application	
	Latching relay	Generally for power control	
	Automotive relay	For automotive fields	
	Hermetically sealed relay	For the fields where the environment is bad and the high reliability is required	
SSR & Power Module		For the fields where the environment is bad, low noise and high reliability are required.	<ul style="list-style-type: none">● With long electrical endurance● Without noise● Good shock and vibration capability
Combined Relay		For the fields where the certain control functions are required.	<ul style="list-style-type: none">● With certain control logic



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According to the classifications of relay, our catalogues can be divided into general relay fascicule, automotive relay & module fascicule, industrial relay fascicule, latching relay fascicule and hermetically sealed relay fascicule. In general relay fascicule, power relay and signal relay are included; and in automotive relay & module fascicule, plug-in relay, PCB relay and automotive module are included. We also provide the sockets which match to the relays.

This article states the basic information about the electromagnetic relay, lists the selecting principles and cautions of applications.

The parameters in the catalogue are the initial values measured under the standard Conditions, which are as following, unless otherwise stated.

- 1) Ambient temperature: 15°C to 35°C
- 2) Relative humidity: 25% to 75%
- 3) Air pressure: 86kPa to 106kPa

Generally the drawing stated in the catalogue is the first quadrant projection way as shown in figure 1, unless otherwise stated.

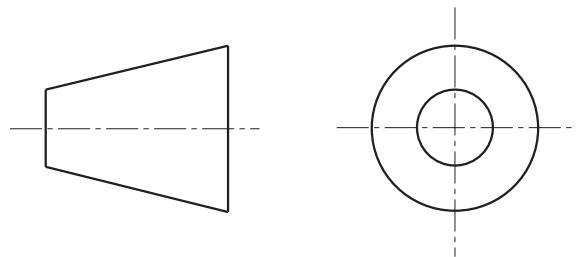


Figure 1

CHAPTER 1 THE BASIC TERMINOLOGY OF RELAY

1. Contact Parameters

1.1 Contact forms are the arrangements of relay contacts. The basic contact arrangements are shown in Table 2, the multi-contact arrangements can be in the same manner.

Table 2

Name	Symbol	Alphabet Letter	
		China	Others
Normally Open Contacts		H	A (or NO)
Normally Closed Contacts		D	B (or NC)
Change-Over Contacts		Z	C (or CO)



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- 1.2 Contact resistance** is the total resistance between the contacts, the terminals and spring jointed with contacts, generally shown in $m\Omega$.
Unless otherwise stated in the catalogue, generally for the relay with contact load below 2A, its contact resistance is measured in 6Vd.c., 0.1A; for the relay with contact load above 2A, its contact resistance is measured in 6Vd.c., 1A. contact resistance should be tested with the max applicable voltage and current according to the corresponding load type in IEC61810-7.
- 1.3 Contact voltage drop** generally is, in the load circuit, the total voltage drop between contacts, springs jointed with contact and the terminals. It is generally described as the voltage drop value under the regulated current, for example 50mV (measured in 10A).
- 1.4 Contact material** is the material used in contacts and generally shown in chemistry formula, for example, AgNi represents silver-nickel alloy contacts. The material used in the relay, its characteristics and its application environment can be seen in 1.2 'Contact material' in chapter 2 'the principles for selecting relays'.
- 1.5 Contact rated load** generally refers to the load the contacts can switch reliably under the certain conditions. Generally it is shown as the combination of the voltage and the current. The loads listed in catalogue are resistive loads, unless otherwise stated.
- 1.6 Max. switching voltage** is the maximum load voltage of which the contacts can switch. This voltage value shall not be surpassed in general application, or the relay endurance will be reduced.
- 1.7 Max. switching current** is the maximum load current of which relay contacts can switch. This voltage value shall not be surpassed in general application, or the relay endurance will be reduced.
- 1.8 Max. switching power** is the maximum power of relay contacts can switch reliably. It is shown in VA for AC load and W for DC load in general.
- 1.9 Mechanical endurance** refers to the operations that the relays without load or with load do not lead to failure under the rated voltage, normally switch in the specified, generally it is shown in operations.
- 1.10 Electrical endurance** generally refers to the operations that the relay can normally switch when the specified load is applied on the contacts and the rated voltage is applied to the coil under the conditions that the relay is placed in the certain speculated environment. Generally it is shown in operations.
- 1.11 Surge current** generally refers to the maximum transient current of which relay can endure in the specified load.
- 1.12 Min. applicable load** generally is reference value of minimum load that the relay can switch. Please conduct validation test with actual load before production since reference value may change according to switching frequency, environmental condition and expected contact resistance and reliability.

2. Characteristics Parameters

- 2.1 Insulation resistance** is the impedance when the conductors insulated with insulating material are applied to voltage and it is generally shown in " $M\Omega$ ". The speculated voltage discribed above are general 500Vd.c.(or 250 Vd.c.).
- 2.2 Dielectric strength** is the voltage value when, within the speculated time, the conductors insulated with insulated material are applied to the voltage and the leakage current is less than the speculated current. The certain voltage above generally is the effective value of AC voltage and unless otherwise stated, the leakage current is generally less 1mA.
- 2.3 Operation time** refers to, with the relay in the released state, the elapsed time from the initial application of power to the coil, till the closure of the normal open contacts. It does not include any bounce time, and expressed in "ms".
For the latching relays, operation time refers to, with the relay in the reset state, the elapsed time from the initial application of power to the coil, till the closure of the normal open contacts. Seen in figure 2.



2.4 Release time refers to, with the relay in the operation state, the elapsed time from the initial removal of coil power till the re-close of the normal closed contacts. It does not include bounce time and expressed in "ms". Seen in figure 2.

2.5 Reset time (only for the latching relays) refers to, with the relay in the operation state, the time from the first application of power to the reset coil till the re-close of the normally closed contacts. Seen in figure 2.

2.6 Bounce time generally refers to the time from the initial close of the contacts till the complete close and generally expressed in "ms". Seen in figure 2.

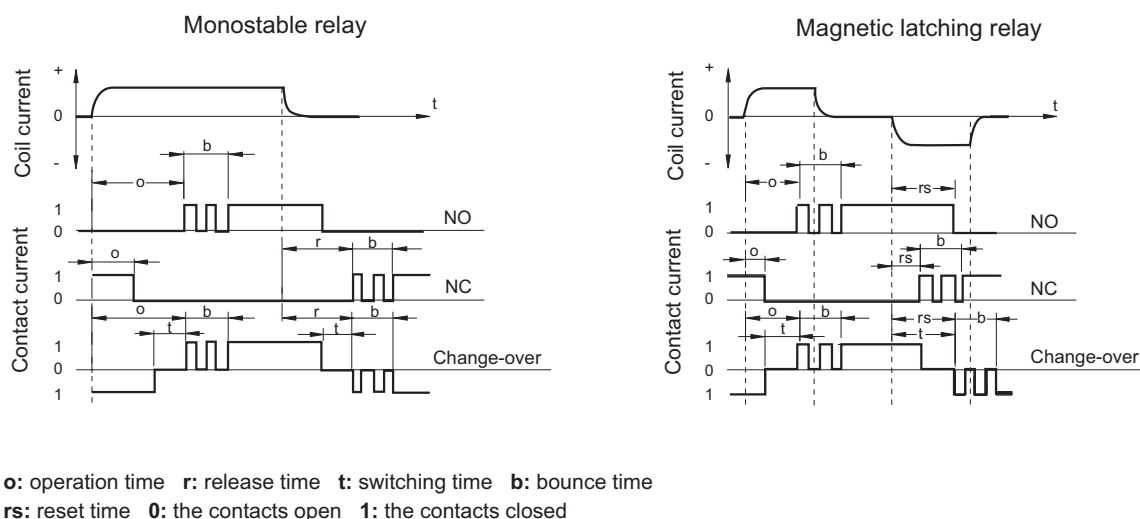


Figure 2

2.7 Switching frequency refers to the cycling times of the operation and release in united time.

2.8 Ambient temperature refers to the temperature in which the relay can normally be applied and it is generally expressed in the range of temperature.

2.9 Coil temperature rise refers to the temperature that the coil rises by after the temperature becomes stable and under the conditions that in the suitable maximum ambient environment the rated voltage is impressed on the coil and the rated load is impressed on the contacts. Generally it refers to the maximum value, expressed

2.10 Shock is divided into shock functional and survival.

Shock functional refers to the acceleration the relay can suffer the shock value under the condition of the NC contact open time and open contact closing time at specified time. Usually it is expressed in the combination of the acceleration value "g" and the duration "ms".

Shock survival refers to the shock value that can not damage the relay construction, Usually it is expressed in the combination of the acceleration value "g" ($1g=9.8m/s^2$) and the duration "ms".

2.11 Vibration resistance is divided into Vibration function and survival.

Vibration function refers to the vibration the relay can suffer without causing the closed contacts to open for more than the specified time and the open contacts to close for more than the specified time. It is usually expressed in the combination of the vibration "mm" and the vibration frequency "Hz".

Vibration survival refers to the vibration the relay can suffer without damaging their construction. It is usually expressed in the combination of the vibration "mm" and the vibration frequency "Hz".



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2.12 Humidity refers to the required humidity in which the relay can reliably work and generally expressed in relative humidity "%RH".

2.13 Model of Terminals

The terminals model of the relays also shows the applicable fields. Generally speaking, the models of terminals are PCB, THT, SMT, plug-in, QC and others.

2.14 Weight : the weight of the relay.

2.15 Enclosure type refers to the protection mode for the relay body. It is divided into enclosed, dust protected, flux proofed, plastic sealed and hermetically sealed. Seen in 3.1 'mode of encapsulation' in chapter 2 'the principles of selecting the relays'

3. Coil Parameters

3.1 The rated coil power refers to the power consumed by the coil when the coil are applied to the rated voltage. Generally for the DC relay, it is expressed in W while for the AC relay in VA.

3.2 Rated voltage is the voltage applied to the coil that can make relay work normally. It is expressed in "V". For the polarized relay, the direction in which the voltage is impressed should be notified.

3.3 Operate voltage is the voltage which closes the NO contacts when the relay is in the releasing state (for the latching relay in the reset state) and the coil voltage is increased gradually. Usually it is expressed in "V". It is usually the maximum value listed in the instructions, which is about 80% of rated voltage.

3.4 Release voltage is the voltage which closes the NC contacts when the relay is in the operation state and the coil voltage is gradually reduced from the rated voltage. It is usually expressed in "V". The minimum value is listed in the instructions, which is about 10% of the rated voltage.

3.5 Reset voltage is the voltage which closes the NC contacts when the latching relay is in the operation state and the reset coil voltage is increased. It is expressed in "V". The maximum value is listed in the catalogue, which is about 80% of the rated voltage.

3.6 Coil resistance generally refers to the DC resistance and is expressed in " Ω ". In the catalogue the combination of the nominal value and tolerance is given.

3.7 Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time. It is expressed in V.

4. Safety Approval

4.1 UL Approval

UL, the abbreviation of Underwriter Laboratories Inc, is a non-profitable organization founded in 1984. The electrical products authorized by this organization can be freely sold in American market, while the electrical products not authorized by this organization will be limited when they are sold in most of the states of America. Due to the authority of UL, the products approved by UL are accepted by many countries.

4.2 CSA Approval

CSA, the abbreviation of Canadian Standards Association, is the authorized approval institution. The electrical products approved by this institution can be freely sold in Canadian market. The products approved by the CSA can be only sold in Canadian market and if these products want to enter into the American market, they should get the American approval of UL.

4.3 UL&CUR

UL&CUR is the approval which simultaneously meets the American standard and the Canadian standard and can be used in North America.



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4.4 VDE Approval

VDE, the abbreviation of Verband Deutscher Elektrotechniker, is one of Germany authorized organizations in electrical component and other equipment. The electric products approved by this institution will be admitted in Germany law.

4.5 TÜV Approval

TÜV, the abbreviation of Technischer Überwachungsverein, has the same authority as VDE. TÜV is one of the authorized institution in electric equipments. The electric products approved by this institution will be admitted in Germany law.

4.6 CQC Approval

CQC, the abbreviation of China Quality Certification, is the most authorized approval institution in China. The products not listed in the catalogue of 3C approval can make CQC approval in China Quality Certification Center.

5. Ordering Code

Ordering code is a code which is used to ensure the type and the specifications of the relay, which includes the basic information of relay, such as the type of the products, coil voltage, contacts arrangement, enclosure type etc.. The ordering code of HONGFA brand relay can be seen in Chapter 5 "the ordering code".

6. Outline Dimensions, Wiring Diagram and the Size Drawing of the Mounting Holes

Ordering mark is a mark which is used to ensure the type and the specifications of the relay, which includes the basic information of the relays, such as the type of the products, the coil voltage, contacts arrangement, the mode of encapsulation etc.. The ordering marks of HONGFA brand relay can be seen in Chapter 5 "the ordering marks".

6.1 Outline dimensions describes the drawing of the relay outline size and the mounting space needed by relay.










6.2 Wiring diagram describes the wiring way of the input and output terminals respondent to the terminals of the relays.

6.3 The size drawing of the mounting holes describes the position of the relay terminals and the size of their mounting holes.

6.4 Examples

The examples of the common components can be seen in table 3.

Table 3

Coil	Polarized Coil	Contact	Resistance	Capacitance	Diode	Zener Diode	LED	Varistor
								

7. Characteristic Curves

7.1 Max. switching power curves represent the loads the relay can support.

7.2 Electrical Endurance Curve: The electrical endurance curve indicates the typical endurance under rated load. The data of all the electrical endurance do not guarantee a minimum value.

- 1) The data of all the electrical endurance are only valid for stated contact materials, special contact materials excluded. No deductions should be made from the data.
- 2) No deductions should be made from the data, especially to the situation when the current is below 0.5A as contact wear is not the dominant failure mode.



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7.3 Coil temperature rise curve shows the measured temperature rise value of the coil when the relay is energized with different voltage and loads under the speculated ambient temperature.

8. Monostable, Latching and Polarized Relay

8.1 Monostable Relay:

For this relay, the contacts operate when the coil is energized while the contacts will reset when the coil is deenergized.

8.2 Latching Relay:

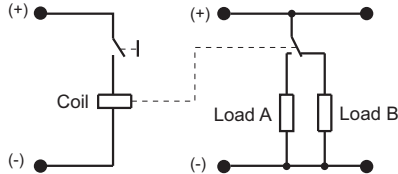
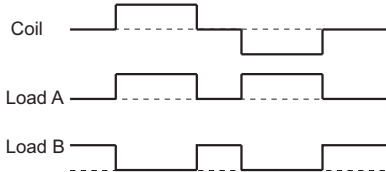
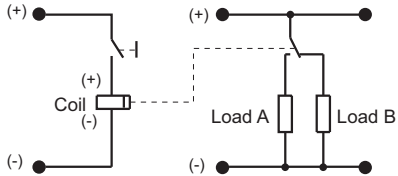
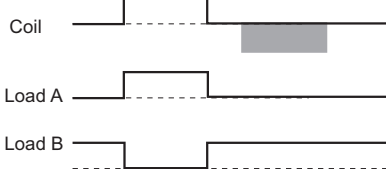
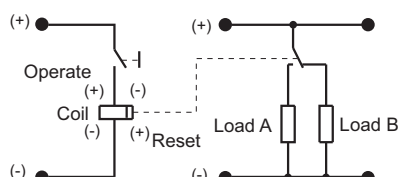
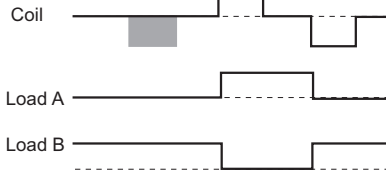
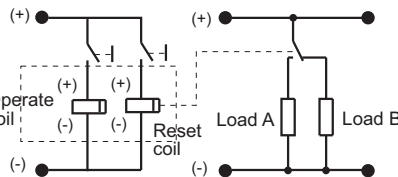

For this relay, the contacts operate when the coil is energized while the contacts will keep the state when the coil is deenergized. To reset the contacts, the counter-energization will be applied to the single-coil coil or the energization is applied to the double-coil reset coil .

8.3 Polarized Relay:

The switch of the contact state is dependent on the polarity of the energized voltage in the terminals of the coil. Part of the monostable relays and all the magnetic latching relays belong to polarized relays.

The basic circuit and operating wave of the several common relays can be seen in table 4.

Table 4

Type	The Basic Circuit and Operating Waveform		
Non-Polarized Monostable			
Polarized Monostable			
Single-coil Latching			
Two-coil Latching			

Notes: the voltage with the correct polarity is required to impress on the coil of polarized relays or the relays will not work, as shown in the shaded area in the figures above.



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CHAPTER 2 THE PRINCIPLES OF SELECTING RELAY

In order to correctly select relays, customers need know the characteristics of the relays to ensure whether these characteristics meet with the practical requirements. It will be more reliable if these characteristics can be tested in the practical environment. The principles of selecting relays can be seen in table 5. In table 5, in the column "must be confirmed" the item with mark \checkmark is confirmed and a type of relay can be selected. If there is further requirement, the correspondent items with the mark \checkmark are required to be further confirmed.

Table 5

Item		The considered points	Confirmed	Reference	Influence factors
Contact	Contact load	AC, DC, size and types (inductive or resistive)	\checkmark		<ul style="list-style-type: none"> the ambient temperature as for AC load, is the operation and the load synchronous or not Does the contact material match the load?
	Contact arrangement	NO or NC or switching? how many pairs of the contacts?	\checkmark		
	Electrical endurance	The frequency and the expected operation times?	\checkmark		
	Contact material	Which material?		\checkmark	
	Contact resistance	How much and the testing conditions?		\checkmark	
Coil	Rated voltage	How much, direction, AC, DC?	\checkmark		<ul style="list-style-type: none"> the ambient temperature the power fluctuation the voltage drop driven by semi-conductor
	Coil resistance	How much? The input power consumption?	\checkmark		
	Operate voltage	How much? The influence of the power wave?		\checkmark	
	Release voltage	How much? The influence of the power fluctuation?		\checkmark	
	Max. allowable voltage	How much? How long?		\checkmark	
	Coil temperature rise	How much? Insulation level?		\checkmark	
Performance	Enclosure type	Unenclosed type, dust protected, flux proofed, or plastic sealed?	\checkmark		<ul style="list-style-type: none"> the ambient atmosphere the safety requirements
	Dielectric strength	How much? where?	\checkmark		
	Insulation resistance	How much where?		\checkmark	
	Vibration resistance	How much? Functional or destructive?		\checkmark	
	Shock resistance	How much? Functional or strength?		\checkmark	
Practical Environment	Ambient temperature	High or low? How long?	\checkmark		<ul style="list-style-type: none"> insulation level method of encapsulation the life
	Atmosphere	Humidity? Harmful gases ?		\checkmark	
Outline and Mounting	Outline	Size and dimension	\checkmark		<ul style="list-style-type: none"> the required mounting size mounting method
	Type of Terminals	PCB, QC, plug-in or screw fixed model?	\checkmark		
	Welding mode	Manual solder, wave solder, reflow solder ? Is cleaning needed or not?		\checkmark	
	Mounting gap	Cling or with gap?		\checkmark	
Others	Safety approval	UL、VDE、TUV、CQC etc ?		\checkmark	<ul style="list-style-type: none"> zone the customers' requirements
	Special requirements and conditions	The requirements of the customers		\checkmark	

The following will give the further explanation about the items in the table above.



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1. Contact Parameters

1.1 Contact Load

Before ensuring whether the load the relay can carry in order to meet with the application, we should confirm the type of the real load except for confirming the load value for different loads have different steady state value and inrush value. Seen in table 6 The load given in the instructions are generally the resistive load, unless otherwise stated.

Table 6

The Type of Load	Inrush Current
Resistive Load	once steady state current
Motor Load	5-10 times steady state current
Capacitive Load	20-40 times steady state current
Transformer Load	5--15 times steady state current
Solenoid Load	10--20 times steady state current
Incandescent Lamp Load	10-15 times steady state current
Mercury Lamp Load	3 times steady state current
Mercury Lamp Load	3 times steady state current
Sodium Vapor Lamp Load	1-3 times steady state current

Figure 3 shows the relations between the representative load and the inrush current. In addition, according to the characteristics that the polarity of different moving and stationary contacts will influence the electrical endurance. Please check in the practical application or consult the technician of HONGFA company.

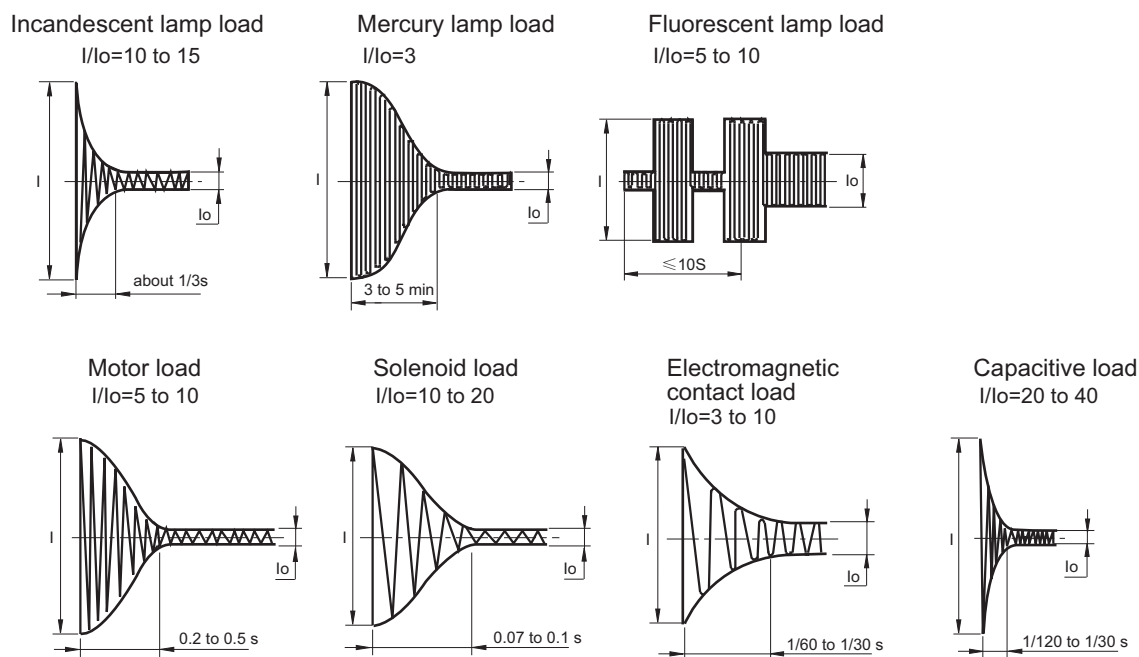


Figure 3

1.2 Contact Material

For the same type of relay, different contact materials are applicable to different load types or ranges. Seen in table 7.



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GUIDELINES OF RELAY

Table 7

Material	Feature	Typical Application
AgNi+ Au (gold plating)	<ul style="list-style-type: none"> ● gold plating with good resistance to erode in the air ● by contrast to other material, lower contact resistance and better consistency in low load ● high electrical conductivity and thermal conductivity 	<ul style="list-style-type: none"> ● Small load: gold plating almost not eroded, from 10mW(5V, 2mA) to1.5W (24V,62.5mA) (resistive load) ● Middle load: gold plating is eroded after seve operations and AgNi functions mainly, from 2.4W (24V, 100mA) to 60W (30V, 2A) (resistive load) Note: Break the low load, the typical value is 1mW (0.1V 1mA) (eg. in the testing devices); Suggest to use two pairs of the contacts in parallel.
AgPd	<ul style="list-style-type: none"> ● good resistance to erode and sulfur in room temperature ● low contact resistance and good consistency ● expensive 	<ul style="list-style-type: none"> ● the same as the above
AgNi	<ul style="list-style-type: none"> ● the standard material of most contact material ● high electrical conductivity and thermal conductivity ● high resistance to burn ● average resistance to solder ● easily produce the sulfured film in the atmosphere with sulfid. 	<ul style="list-style-type: none"> ● resistive load and low inductive load ● rated current below 12A ● surge current below 25A
AgCdO	<ul style="list-style-type: none"> ● high AC load ● high electrical conductivity and thermal conductivity ● good resistance to burn ● great resistance to welding ● easily produce the sulfured film in the atmosphere with sulfid 	<ul style="list-style-type: none"> ● resistive load, motor load and inductive load ● rated current below 30A ● surge current below 30A
AgSnO ₂	<ul style="list-style-type: none"> ● great resistance to welding ● the materials transferred less than those above3 in DC load ● easily produce the sulfured film in the atmosphere with sulfid. 	<ul style="list-style-type: none"> ● lamp load, inductive load and capacitive load ● excessively high surge current load (up to 120A)
AgSnO ₂ (with other oxide matter)	<ul style="list-style-type: none"> ● the same as the above 	<ul style="list-style-type: none"> ● lamp load, inductive load and capacitive load ● excessively high surge current load (up to 120A) ● with different oxide matter, the different applicable load

Notes:

1) Consider the maximum current value specified in different relays.

2) It would be better to be checked and tested in application when the conditions are catalogue allowable.

Gold plating of the contacts shows good performance for the low loads. However, for the high load, it can only keep the initial contact performance of the contacts before the relays are used.



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1.3 Electrical Endurance

Unless otherwise specified, the electrical endurance in the instruction refers to the standard value under rated load in the circumstance that:

- a) standard condition
- b) NO contact
- c) 50Hz for AC load
- d) Make-break rate 1:9
- e) Resistive load
- f) Flux-proof
- g) Downwards PCB terminals
- h) Separated installation
- i) Failure and malfunction criteria and final dielectric test comply with the relevant regulation of IEC61810-1:2015
- j) See IEC61810-1:2015 for unstated information

Considering the flux-proof and the dust-proof types have longer electrical endurance than the sealed type of the same relay, it is preferred to select the flux-proof and the dust-proof types if possible.

1.4 Mechanical Endurance

Unless otherwise specified, the mechanical endurance in the instruction refers to the standard value under rated load in the circumstance that:

- a) no contact load
- b) Rated frequency of operation, duty factor 50%
- c) Downwards PCB terminals
- d) 50Hz for AC load
- e) See IEC 61810-7 for failure modes

2. Coil

2.1 Voltage

To make the relay work reliably, be sure that work circuit can supply the rated voltage to the coil.

In the case of transistor drive circuit, that the voltage on the coil is less than the normal voltage of the transistor drive circuit because of the voltage drop on the transistor, it is recommended to use 4.5V type relay which in 5V transistor circuit and 2.4V type relay in 3V transistor circuit.

Sometimes to shorten the operating time, the coil can be applied to maximum allowable voltage to the coil in the short time. However it should be ensured that the relay will not overheat or even be damaged.

For polarized relays, please check the polarity of the coil voltage.

2.2 Coil Resistance

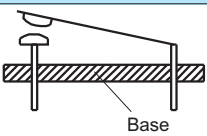
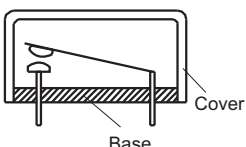
To make the relay work reliably, be sure that work circuit supplies the nominal coil power consumption to the relay. Therefore please select the suitable coil resistance.

3. Performances

3.1 Enclosure Type

To ensure the reliability of the relay, different ways of encapsulation will require different post-processing(table 8).

Table 8

Type	Construction	Features	Auto- matic Solder	Auto- matic Clean- ing	Dust Resis- tance	Liquid Proof	Harmful Gas Resis- tance
Un- enclosed		Without the protective case	X	X	X	X	X
Dust Protected		With the dust protective case; the case and the base are fitted together and their joint is close to PCB.	X	X	√	Δ	X

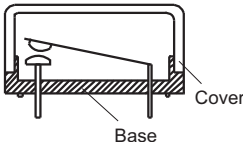
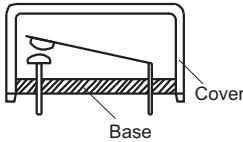
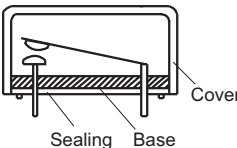
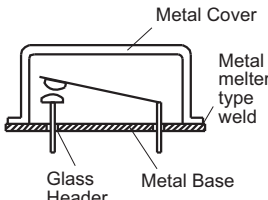


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GUIDELINES OF RELAY

To be continued

Type	Construction	Features	Auto matic solder	Auto matic clean ing	Dust resist ance	Liquid proof	Harmful Gas Resis tance
Flux Proofed	 Cover Base	With the dust protective case; the case and the base are fitted together and their joint is close to PCB. The terminals are plastically sealed on the base or the base and the terminals are fitted with sealing epoxy; the fitted joint is far from PCB. Without exceeding the scheduled position, the flux will not penetrate the relay.	√	X	√	Δ	X
	 Cover Base	Base, terminals and case are fitted with sealing epoxy; there is ventilating hole far from PCB. Without exceeding the scheduled position, the flux will not penetrate the relay.	√	X	Δ	Δ	X
Plastic Sealed *	 Cover Sealing Base	Base, terminals and case are fitted with sealing epoxy; The internal of the relay is sealed in the case and base. Washable in limited condition.	√	√	√	√	√
Sealed or Hermetically	 Metal Cover Metal melter type weld Glass Header Metal Base	Metal case and metal base are sealed; terminals and base are sealed with glass. The leakage rate of the air in the internal of the relay meet with the requirements.	√	√	√	√	√

Notes:

- 1) "√" means good; "X" means not good; "Δ" means to notify.
- 2) Because the plastic has the certain leakage, please use hermetic relays in the conditions that there are harmful gases or the explosive proof is required.
- 3) * Hongfa recommends to implement washing-free soldering process to avoid washing on relay, ultrasonic cleaning is prohibited. If water cleaning is required after the relay is assembled on PCB, it is a must that you should get contact with hongfa and specify detailed washing method, we'll help you to choose suitable product.

3.2 Dielectric Strength and Insulation Resistance

Please confirm that these two parameters can meet the application requirement and will not lead to such conditions as the breakdown of the circuit, short circuit.

3.3 Vibration Resistance and Shock Resistance

Please confirm that these two parameters can meet the application requirement and will not lead to the failure of the relay in the course of the application.

4. Temperature

4.1 Ambient Temperature

Generally speaking, when the temperature does not exceed temperature range speculated in the catalogue, the relay can normally work. When the temperature in application is higher than the temperature speculated in the instructions, please contact Hongfa to ensure whether the relay can be normally used according to the loads.



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4.2 Atmosphere

In the atmosphere with high humidity, moisture, even freezing dew and much dust, recommend to use sealed relays. Under high humidity, it would easily accelerate the rust of the relay parts and the dust easily result in the failure of the relay contacts.

In the atmosphere with organic silicon, unsealed relays shall not be used for the organic silicon will accelerate the failure of the contacts. In the atmosphere with moisture and harmful gases as H₂S、SO₂、NO₂ etc., the flux proofed and dust protected products can not be applied while the plastic sealed products can be used and tested in application.

In application, if the ambient atmosphere is better, recommend to use the dust protected and flux proofed relays for they can get the longer electric endurance than plastic sealed relays.

5. Outline and Mounting

5.1 Outline and Mounting Gap

The outline sizes of the relays usually have a certain tolerance. Therefore when the circuit and the mounting gap are designed, the design is suggested to be done according to the maximum size in the instructions.

5.2 Welding Methods

Since July 1st, 2006, the terminals of the relays produced have been lead-free. The suggested welding temperature and time are respectively 240°C to 260 °C, 2s to 5s.

If reflow solder is required, it should be confirmed the relay can be reflow soldered according to the instructions.

If you have questions, please contact Hongfa.

5.3 The Model of Terminals

Select the suitable shapes of the terminals and mounting methods according to the real conditions.

Table 9






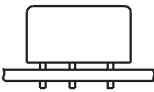

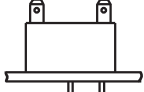
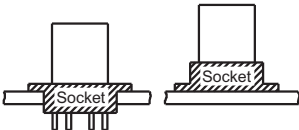
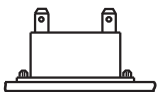
Classification	PCB (THT)	(SMT)	(Plug-in)	(QC)	(Screw)
Terminals type					
Representative products	HFD27 HF115F HFKC	HFD3	HF13F HF18FF	HF105F HFV7 HF3501	HF116F-3

Table 10

Classification	PCB Mounting			Plug-in Mounting	Screwing Mounting
	THT	SMT	THT and QC		
Mounting type					
Representative products	HFD27 HF115F HFKC	HFD3	HF102F HF105F-4 HF2160	HF13F HFV7 HF18FF HF3501	HF105F-4 HF92F HF116F

6. Others

6.1 Safety Approval

Generally UL/CUR approvals are applicable in North America and VDE&TÜV approvals are applicable in Europe. However, due to the international authority of these approvals, most of countries also accept them. If you have questions, please contact Hongfa.

6.2 Special Requirements

Except for normal products, we accept the customer's order for the products with special specifications. Please contact Hongfa when required.



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CHAPTER 3 PRECAUTIONS FOR RELAY APPLICATION

To properly use the relay, when the relay is selected and its characteristics are learnt, the precautions for using are required to be known and ensure the reliable operation of the relay.

The following precautions will be considered in application:

- 1) The relays are used within the range of the parameters listed in the catalogue, to the extent that it is possible.
- 2) The rated load and the life are the referent values, which will be different due to the different environments, load features and types. Therefore they should be tested in the practical or stimulated application.
- 3) DC relays are controlled by rectangle wave to the extent that it is possible while the AC relays are controlled by sine wave.
- 4) To maintain the performances of relays, please do not make the relay drop or be shocked strongly. Suggest that the relays dropped not be used.
- 5) Relays is used in the ambient temperature and normal humidity and in the atmosphere with less dust and harmful gas. The harmful gases include gases with sulfur, silicon and nitrogen oxide etc.
- 6) For the latching relays, please set them in the operate or reset state before they are used. Please pay attention to polarity and pulse width when energizing on the coil
- 7) For polarized relay, please notify the polarity (+, -) of the coil voltage.
- 8) Except for the above there are other precautions. In the following they will be described one by one in the order listed in table 2.

1. Precautions for Contacts

Contacts are the most important elements of relay construction. Contact life is influenced by contact material, voltage and current value applied to the contacts (especially the voltage and current waveforms at the time of application and release), the type of load, switching frequency, ambient atmosphere, form of contact and the contact bouncing etc. The material transfer, welding, abnormal usage and the increase in contact resistance bring about the failure of the contacts. Please pay attention to them in application.

In order to better apply the relay, please refer to the following precautions of the contacts.

1.1 Load

The resistive load value is usually listed in the catalogue, however, which is not enough. It should be checked and tested in the practical contact circuit.

The minimum load described in the instructions is not the standard lower limit value the relay can switch reliably. The reliability of this load value is different due to differences of the ON-OFF frequency, the environment, the change of the required CR and absolute values.

1.1.1 Voltage

When the inductive circuit is switched off, there are the reverse voltage which is higher than the electrical circuit. The higher this voltage is the more the energy is. Correspondently the contact wear and material transfer also increase. Therefore notify the load type and load value the contacts of the relay control.

In the same current, DC voltage value the relay can switch reliably is much less than AC voltage value for AC current exists zero point (the point when the current is zero) and the electrical arc produced easily extinguishes. However for DC current, the electrical arc extinguishes when the contact gap is up to the certain value. Therefore the duration of the arc is longer than that in AC current and the contact wear and material transfer increases.

1.1.2 Current

When the contacts are on or off, the inrush currents will greatly influence the contacts. For example, when the load is motor load or lamp load, the higher the inrush current when the contact is on, the more the contact wear and the material transfer increase, and the more easily lead to the contact weld and not to separate. Please check in practical application.

1.2 Precautions for Application

1.2.1 Avoiding Switching both the Large Load and the Micro Load in the Same Relay

When switching the high load, the scattered contact material is produced, which will attach to the contacts with the low load and lead to the failure of the contacts. Therefore, please avoid the same relay switching both the high load and the low load. If it is the only choice to do against this, when mounting please place the contacts switching the little load over the contacts switching the large load. However the reliability will be influenced.



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1.2.2 Precautions for the Two Pairs of Contacts Connected in Parallel

When the two poles of contacts are connected in parallel, the reliability will be improved but the load capacity could not, for the two poles of contacts could not be opened or closed at the same time.

1.2.3 The Problems about Phase Synchronism of Contact Operation and AC Load

If the operation of the relay contacts is synchronized with the phase of the AC power and the contacts always make or break in the high load voltage, seen in figure 4, the contact weld or material transfer will increase to lead the relay to prematurely fail. Please check whether the random phase are used in actual application. When the relay is driven by timer, micro computer etc., it will appear the power phase synchronism.

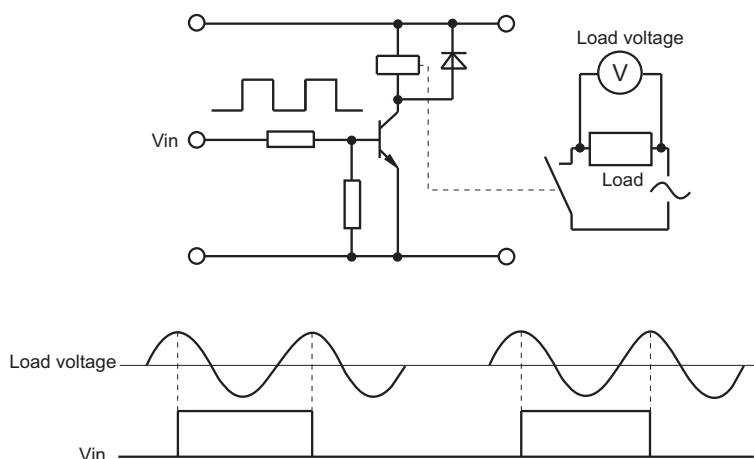


Figure 4

1.2.4 Electrical Endurance in the High Temperature

Electrical endurance of the relay will be lower in the high temperature than that in the low temperature. Please check while it is operating in the actual application.

1.2.5 Connection of Multiple Pairs of Contacts and Load

Multi-contacts are arranged in the same polarity of the supply power to the extent that it is possible and the passive polarity in the other polarity of the supply power, as shown in figure 5 (a). Thus, the short circuits between the contacts, due to voltage differences between the contacts, can be possibly avoided. The wiring as shown in figure 5 (b) can be avoided.

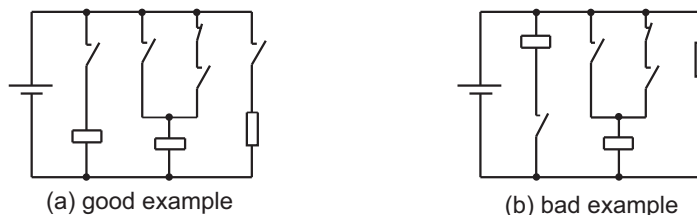


Figure 5

1.2.6 Avoid Short Circuit Caused by Contacts Weld and Electrical Arc

In the electrical circuit, the following points should be considered (seen in the figure 6)

- 1) Generally the gap between the contacts are small. The reason can probably be that the electrical arc between the contacts results in the short circuit. Please do not adopt the circuit shown in figure 6(b). The circuit shown in figure 6(a) is suggested to use and the certain interval can be set in the operation between Con1 and Con2.
- 2) It should be considered that the overcurrent should not be generated to make the circuit overload or burn when short circuit is caused by contact welding and error operation.
- 3) Care should be taken that the two pairs of switching contacts are not used to build the forward circuit and the reverse circuit, as shown in figure 6(d). Suggest that the circuit shown in Figure in 6(c) is applied and the certain interval is set in the operation between Con1 and Con2.



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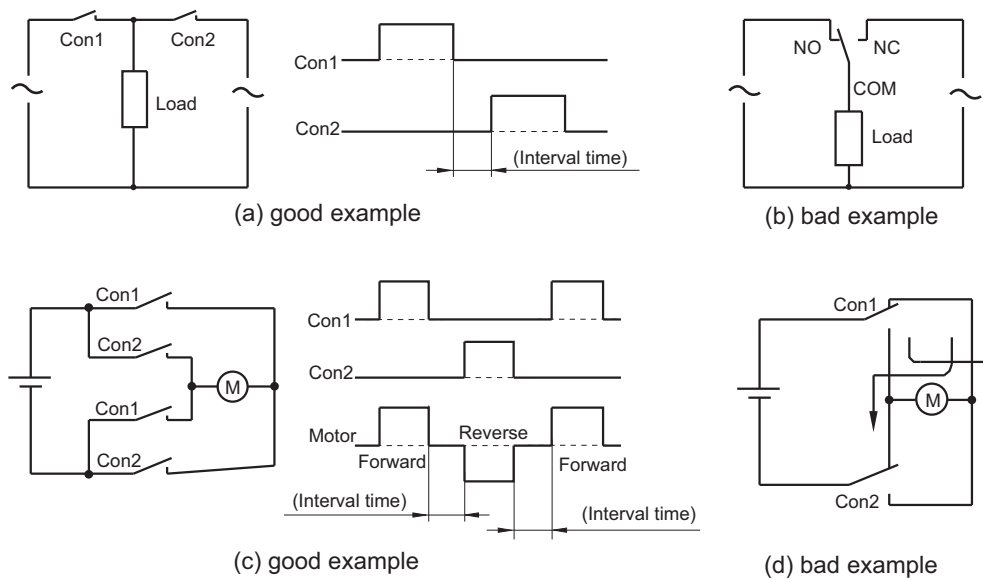


Figure 6

1.2.7 Avoid Short Circuit between Contacts

The miniaturization of the electrical control equipments makes the control components tend to miniaturization, so the relay with multiple poles of contacts are used, care is taken of the differences of the voltage between the poles of contacts and load types. Suggest that large differences of the voltage among the contacts do not exist in order to avoid short circuit between poles of contacts.

1.2.8 Precautions for Using Long Lead Wire

In the contact circuit of the relay, when the lead wire with more than 10m length is used, the inrush current will be generated due to the capacitance in the lead wire. Please connect in series the resistance (about 10 to 50) in the contact circuit, as shown in Figure 7.

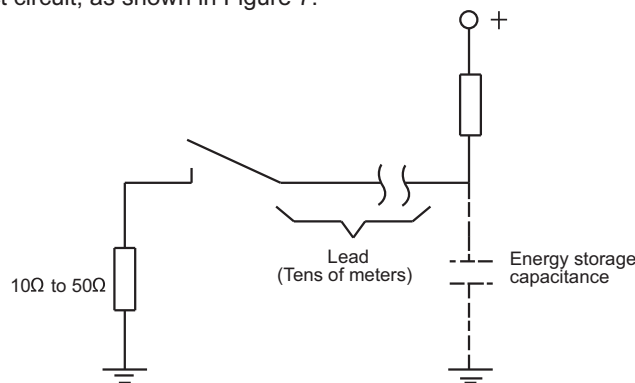


Figure 7

1.2.9 Precautions for the Contacts of the Magnetic Latching Relay

Generally the latching relays are shipped from the factory in the reset states. However during shipping or mounting relays the shock of the relay may change the operate state. Therefore suggest that in application it be set in the required state.

1.3 Contact Protection

1.3.1 Inrush Current and Reverse Voltage

When the motor, capacitance, solenoid and lamp load make, the inrush current is generated, which is several multiple steady state currents.



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When the inductive load such as solenoid, the motor, contactor, the reverse voltage which are from hundreds of to thousands of volts. Generally in the normal temperature and atmospheric pressure the critical insulation destruction voltage of the air is 200 to 300V. Therefore if the reverse voltage exceeds this value, the discharge phenomena between contacts will happen.

Both inrush current and the reverse voltage will greatly damage the contacts and obviously shorten the relay life. Therefore the proper use of the contact protection circuit may increase the life of the relay.

1.3.2 Material Transfer of Contacts

Material transfer of contacts refers to the transfer of the contact material from one contact to the other. When material transfer becomes serious, the accidented contact surface can be seen by eyes. As shown in figure 8, the accidented surface easily causes contact welding.

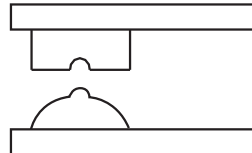


Figure 8

Generally, material transfer of contacts is caused by the one-way flowing of the large current or the inrush current of the capacitive load and often happens in DC circuit. Generally it shows the protruding shape in the passive polarity and the concave shape in the positive polarity. Therefore the proper use of the contact protection circuit or the use of AgSnO contact which has better resistance against material transfer may reduce the material transfer of contacts. AC load with large capacity should be checked in actual application in the test.

1.3.3 The Protective Circuit of Contacts

Generally speaking, in contrast to resistive load, inductive load more easily damages the contacts. The use of properly protective circuit may make the influence of inductive load on the contacts equal to the influence of resistive load on the contacts. Care is taken that the incorrect use will generate the counter effect. Table 11 shows the typical examples of the contact protective circuit.

Table 11

Circuits Example		Application		Featrues	Device Selection
		AC	DC		
CR Circuit		Δ	√	<ul style="list-style-type: none"> The supply voltage is usu. 24 to 48V. The load is a timer or a contactor, the release time lengthens If the load is a time, leakage current flows through the CR circuit causing faulty operation. If used with AC voltage, be sure the impedance of the load is sufficiently smaller than that of the CR circuit. 	<p>A: As a guide in selecting C and R</p> <p>C: 0.5 to 1μF per 1A contact current</p> <p>R: 0.5 to 1Ω per 1V contact voltage</p> <p>Values vary depending on the properties of the load and variations in relay characteristics; Please check by test.</p> <p>Capacitor C acts to suppress the discharge the moment the contacts open.</p>
		√	√	<ul style="list-style-type: none"> Applicable to the supply voltage of 100 to 200V If the load is a relay or a contactor, the release time lengthens. 	<p>The dielectric strength of the capacitor C is usu. 200 to 300V or more than two times the load voltage.</p> <p>Please use AC capacitor (non polaried) in AC circuit.</p>

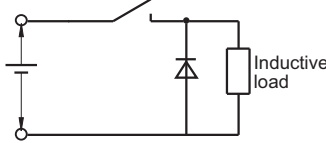
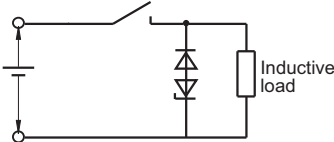
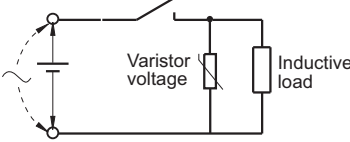
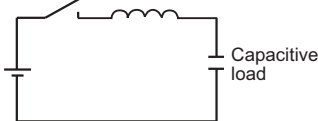
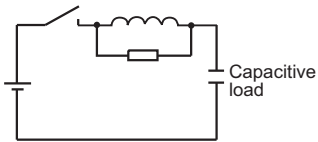


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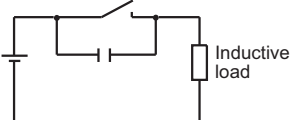
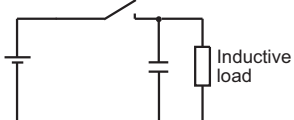
GUIDELINES OF RELAY

To be continued

Circuits Example		Application		Features	Device Selection
		AC	DC		
Diode Circuit		X	√	<ul style="list-style-type: none"> At the terminals of the inductive load the diode is connected in parallel, which can reduce the reverse voltage. The release time is longer than that in CR circuit. 	<p>Select a diode with the reverse breakdown voltage at least 10 times the circuit voltage and a forward current at least as large as the load current.</p> <p>In electric circuits where the circuit voltages are not high, a diode can be used with a reverse breakdown voltage of about 2 to 3 times the supply voltage.</p>
Diode and Zener Diode Circuit		X	√	<ul style="list-style-type: none"> If the zener diode is added in the diode circuit the release time is reduced. 	Use a zener diode with a zener voltage about the same as the supply voltage.
Piezo Resistance Circuit		√	√	<ul style="list-style-type: none"> Reduce the excessive high voltage between the contacts If the load is a timer and a contactor, the release time lengthens 	Use the piezo resistance with control voltage V_c 1.5 times the supply voltage peak value. If the control voltage is excessively high, the effect of the reverse control is not good. Please check in application.
Inductance Circuit		√	√	<ul style="list-style-type: none"> Effective when piezo resistance is connected to both contacts if the supply voltage is 24V or 48V. Effective when piezo resistance is connected to the load if the supply voltage is 100V or 200V. 	
Inductance and Resistance Circuit		√	√	<ul style="list-style-type: none"> Reduce the excessively high voltage between the contacts 	

Notes: the mark "√" means good, the mark "X" means bad, the mark "" means notice. Please avoid using the following circuit as table 12.

Table 12

	
When the contacts are OFF, the effect on controlling the electric arc is good. However in this case the capacitor C stores the energy, so the energy in the capacitor C will release to the contacts, when the contacts are ON, will result in the easy welding of the contacts.	When the contacts are OFF, the effect on controlling the electric arc is good. However the contacts are easily welding due to the large charge current of the capacitor C when the contacts are ON.



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1.3.4 Precaution for Mounting Protective Elements

When the protective elements such as diode, C-R, piezo resistance are mounted, they must be mounted beside the load or the contacts. If the distance is far, the protective effect will not be good. Suggest to be mounted within 50cm.

2. Precautions for Coil

The application of rated voltage to the coil is the basis for a relay to work normally. Only applied the voltage beyond the operate voltage, the relay can work, but the rated voltage must be applied to the coil for the changes caused by the temperature and the variation of the power voltage will influence the normal operation of the relay.

2.1 Types

2.1.1 AC Operation Type (AC type)

Generally the work voltage of the relay is always a commercial frequency (50Hz or 60Hz). Suggest that the products with standard voltage specifications listed in the instructions be selected to the extent that it is possible. If the products with other specifications are required, Please contact the technicians in HONGFA company. For AC relays, due to the factors such as eddy current loss, hysteresis loss and lower coil efficiency, the temperature rise is greater than that for DC type. When voltage exceeds $\pm 10\%$ of rated voltage, the buzz is easily produced. Please notify the variation of the power voltage.

For AC relays, when the coil breaks, there should not remain any DC voltage in the circuit; otherwise the relays can not release normally.

2.1.2 DC Operation Type (DC type)

Generally the DC relays mostly are voltage drive type. Suggest that to the extent that it is impossible, the products with the standard voltages listed in the instructions should be selected. If the products with other specifications are required, Please contact the technicians.

Please check the voltage polarities of the relay coils in the instructions. If the diode for the control or the elements for displaying are added, once the opposite connection of the voltage will lead to the abnormal operation of the relays or the abnormal operation of the added elements or even short circuit. When the coil is paralleled with diode or LED, the release time will be prolonged which may reduce the electrical endurance. Please note that. In addition, for polarized relay, the polarity of the voltage applied to the coil is opposite to that in the instruction, the relay will not work.

2.2 Input Power of Coil

2.2.1 Input Power for AC Coil

To make the relay work reliably, please apply rated voltage to the coil. If the voltage, which does not make the relay completely operate, is continuously applied to the coil, the coil will abnormally heat to make the coil abnormal wear.

The supply voltage of AC relay would better be sine curve. The AC coil can better control the buzz. If the waveform distorts or deforms, the control function can not be displayed better. Figure 9 shows several examples of common waveforms.

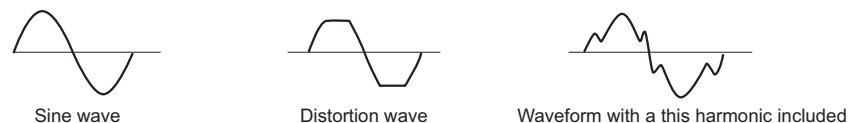


Figure 9

If the parts such as the motor, solenoid and transformer are connected in the drive circuit of the relay, when the parts work the coil voltage of the relay will reduce and then the relay contacts will shake to cause the contact welding, abnormal wear or non-conduction. The alike phenomena of the reduction of the coil voltage will happen when the miniature transformer are used, no transformer with rich capacity can be used as the power source and the wiring is long, the wiring used in the house or the shop etc. is thin. If the similar failure happens, Please use the synchro oscilloscope to check and properly adjust.

If using the loads with large variation such as the motor, Please separate the drive circuit of the coil from the power circuit according to the usage.

If the AC relay could not work reliably, switch AC to DC and then select the proper DC relay.

2.2.2 Input Power for DC Coil

In order to work steadily, the voltage applied to the two terminals of the coil of the DC relay is suggested to use



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the coil rated voltage under $\pm 5\%$ or the relay could not work steadily, to cause the contact welding or abnormal wear, especially when such parts as the motor, solenoid or transformer etc. are connected in the drive circuit of the relay, the case will be more obvious

As the power source of DC relay, there are the accumulator, the full(as shown in 10-1) or half wave rectifier circuit of smoothing capacitor, which will influence the operating characteristics of the relays. Please check in the practical application.

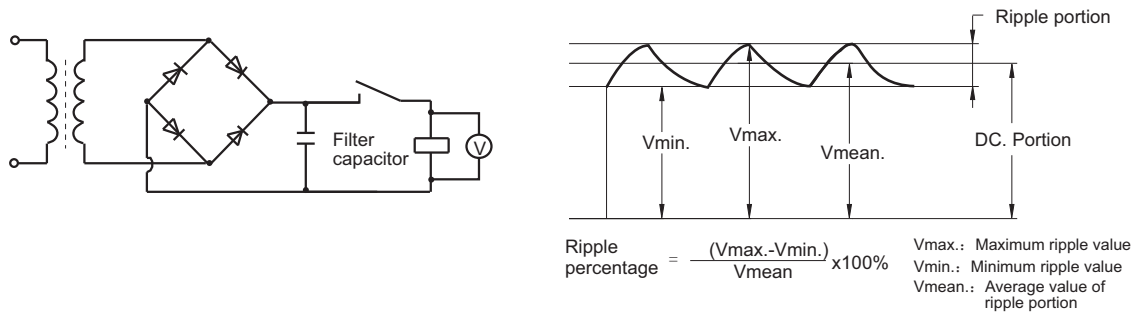


Figure 10-1

By reducing the holding voltage of the coil, the power consumption can be reduced. The common method to reduce the power consumption of the coil is that inputting the rated voltage pulse of the coil and then reducing the coil voltage or using PWM pulse width modulation. Please take the following Figure 10-2 for reference.

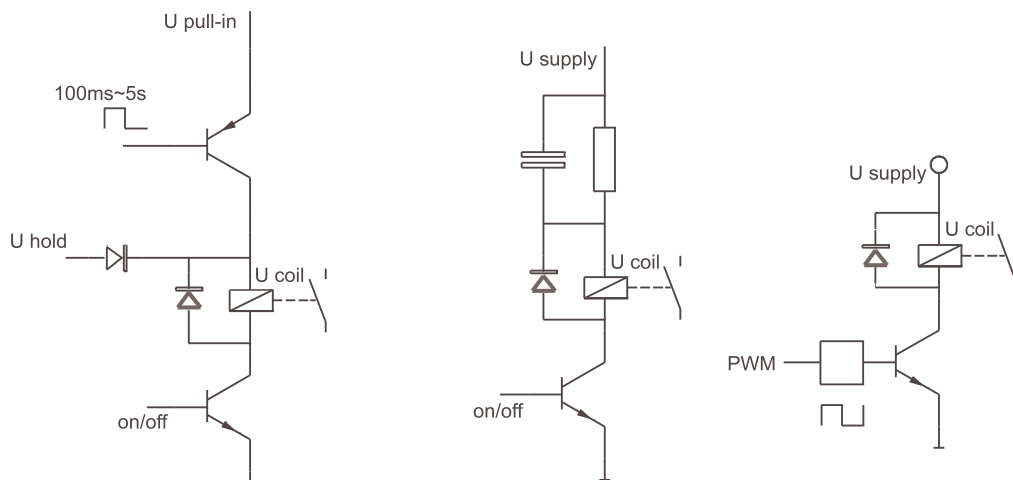


Figure 10-2

Please note the following items when PWM is used:

- 1) the coil must be energized by 1-1.5 times of rated voltage for more than 100ms; 2) frequency 10-25kHz is recommended;
- 3) the duty cycle is recommended by 50%-70%. If the duty cycle is less than 50%, Hongfa should be informed for special control;
- 4) both ends of the coil must be connected in parallel with the continuous current diode.

2.3 Maximum Voltage of Coil

Except for the limits from the coil temperature rise and the heat-resistant temperature of insulation material of the coil electro-magnetic wire (once beyond the heat-resistant temperature, short circuit will locally happen in the coil and even the coil burns), the maximum voltage of the coil will be influenced by heat distortion and the aging of the insulation materials. Especially it can not destroy other machines, hurt the human body or cause the fire, so it must be limited with the certain range. Therefore please do not make it beyond the regulated value in the instructions.

Maximum voltage is the maximum value of the voltage which can be applied to the coil of the relay in short time rather than the value of the voltage allowed to be continuously applied with.

2.4 Coil Temperature Rise

2.4.1 Temperature Rise

In the course of the relay operation, the coil temperature will be increased. When a pulse voltage with ON time of less than 2 minutes is used, the coil temperature rise value is related to the ON time and the ratio of ON time to OFF time. The various relays are essentially the same in this aspect.(table 13)

Table 13

(Current Passage Time) For Continuous Passage	(%) Temperature Rise Value Is 100%
ON:OFF = 3:1	about 80%
ON:OFF = 1:1	about 50%
ON:OFF = 1:3	about 35%

2.4.2 Pick-up Voltage Change Due To Coil Temperature Rise

The temperature rise causes the increase of the coil resistance and correspondently the pick-up voltage will increase. the resistance temperature coefficiency of the copper wire is about 0.4% per 1°C . with this ratio, the coil resistance increases. Pick-up, release and reset voltages in the instructions are all the values in 23°C . When the coil temperature is beyond 23°C ,pick-up voltage surpasses sometimes the speculated value in the catalogue. Please check in the practical application.

2.5 Leakage Current

When designing the circuit, please avoid the leakage current flowing through the relay when the relay does not work.

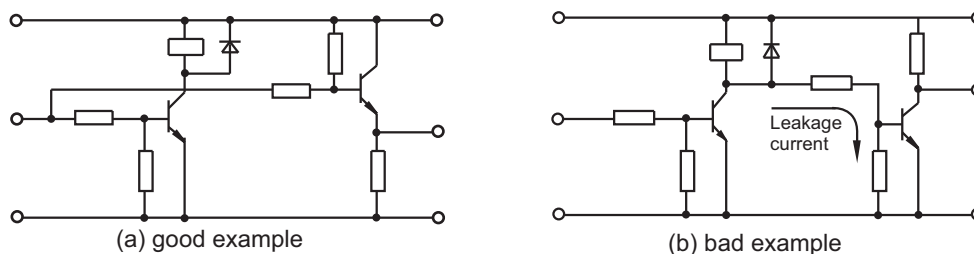


Figure 11



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2.6 Energized Voltage of Coil and Operation Time

In the case of AC operation, there is extensive variation in operate time according to the difference of the phase when the coil is applied with the voltage.

In the case of the DC operation, although the voltage applied to the coil increases and operate time of the relay will properly become rapid, the contact bounce time when the contacts closes is extended to cause the reduction of the life or the contacts welding when they work in the rated load or in the large inrush current.

2.7 The Application of Relay Connected in Parallel and in Series.

Several relays connected in parallel, please take care of the wrong operation for the bypass current and leakage current shown as figure 12.

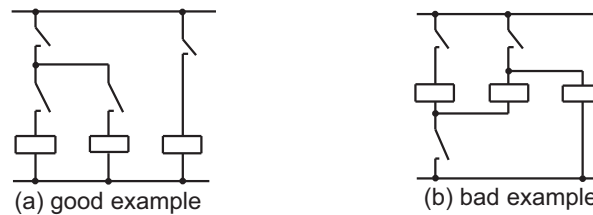


Figure 12

2.8 Avoid Gradual Increase of Coil Impressed Voltage

In the course of the operation, the relay experiences such phases as contact pressure changing, contact bounce and the unstable condition of the contacts. When gradual increase of coil impressed voltage happens, the time of the unstable phase becomes longer to affect the life of the relay.

In order to reduce the influence on the relay, please impress bypass voltage to the coil, to the extent that it is possible.

2.9 Precaution for Long Power Wire

If the power wire is longer, please select the relay according to the principles of impressing the rated voltage after testing the coil voltage of the relay.

If paralleled with the power line and long distance, when the supply power of the coil is switched, the voltage at the terminals of the coil will be generated due to the capacitance stored in the wire and then result in the release worse. In this case, Please connect the bypass resistor at the two ends of the coil.

2.10 Long Term Current Carrying

If the coil is continuously applied the power to for a long term, the self heating of the coil promotes the aging of the insulation materials of the coil and the worse characteristics, so in this case please use the latching relay.

If the monostable relay must be used, please use the hermetic relay which is not easily influenced by the external environments and also use the suitably protective circuit to prevent the loss due to the contact failure or the break of the coil wire.

2.11 Low ON-OFF Frequency

When the ON-OFF frequency is below once per month, please periodically check the states of the contacts. If the contacts keep the non ON-OFF state for a long time, the organic film will be formed on the surface of the contacts and result in the contact failure.

2.12 Electrolytic Corrosion of Coils

When the relays are placed in high temperature and high humidity atmospheres or with continuous passage of current, that the coil is grounded will make the coil electrolytic erosion to cause the break of the electro-magnetic wires. Therefore please do not make the coil grounded to the extent that it is possible. In the case where unavoidably the coil is grounded, please set the control switch of the relay coil in the positive side of the coil.



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2.13 Precaution for Coil of Magnetic Latching Relay

2.13.1 Coil Voltage

Please check whether the direction of coil impressed voltage is correct or not, or the relay may not work. Due to the characteristics of the magnetic latching relays, to prevent the relay against overheating and then burning, the long-term impressed voltage on the coil are not allowable.

2.13.2 Self-locking of Relay

Please avoid using the NC contacts of the relay itself to switch off its own coil. Otherwise the failure will happen due to the instability of the relay operation. (Figure 13)

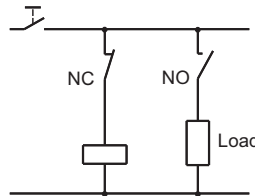


Figure 13

2.13.3 Precautions for Using Relay Connected In Parallel

When the coil of the latching relay is connected in parallel with the coil and the solenoid of other relays, please add diode to prevent the reverse voltage from influencing the normal work of the relay.

2.13.4 Width of Minimum Impulse In Operating and Resetting

In order to make the latching relay operate or reset, please impress the rectangle rated voltage for more than 5 times at the operate time or the reset time on the coil and then operate it. If the impulse width can not meet the requirements above, please check in the actual application.

Please avoid using in the conditions that the power source has many surges.

2.13.5 Precautions for Double-Coil Relay

Do not impress the voltage on the set coil and reset coil at the same time, or the relay will abnormally heat, abnormally operate and even abnormally wear.

As shown in figure 14, when the terminals of either of operate coil and reset coil in the circuit are required to connect and the other terminals are connected to the same polarity of the power source, Please directly connect the terminals to connect (short circuit) and then connect to the power source. Thus the insulation between the coils can be maintained well.

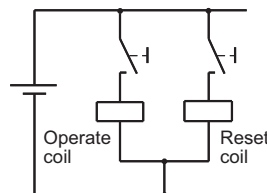


Figure 14

2.13.6 Drive Circuit of Latching Single-Coil Relay

As shown in figure 15, it is one of the drive circuits of the latching single-coil relay. When the signals are input, the current charges the capacitance C and in turn charges the coil and then make the relay operate; when the signals are removed, the electric power stored in the capacitance C will discharge through trinode Tr and the coil and make the relay reset.

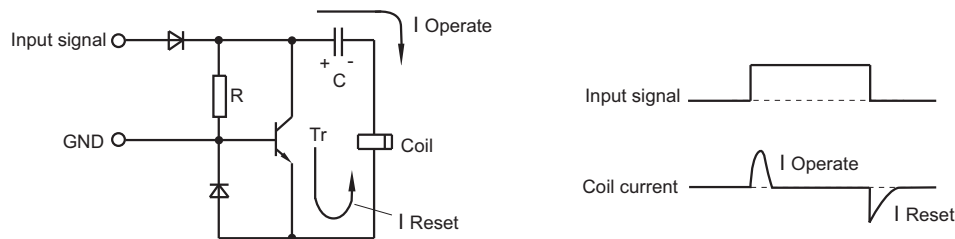


Figure 15



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3. Performance

3.1 Precautions for Plastic Sealed Relay

Hermetic relays can resist under bad surrounding. However, please pay attention to the following precautions in application to avoid the failure.

3.1.1. Regarding Practical Environment

Plastic sealed relays are not suitable for using in the environment which has the special requirement for the air seal. Please avoid using them in the pressure exceeding 86kPa to 106kPa.

3.1.2. Regarding washing

When washing PC board after the terminals soldered on PC board, suggest that the washing can be done by washing solvent of alcohol series.

Please avoid supersonic washing for supersonic washing may cause the break of the coil wire and the light contact welding.

3.2 Vibration and Shock

The transient break of the contacts when the relays are shocked strongly, will lead to the false operation. Therefore, when the relays are mounted on the same board with other parts (such as electromagnetic switch, air switch et.) which can produce the shock, the measures of reducing the influence of the shock on the relay should be taken. For example, make the direction of the shock and direction of relay contacts make/break at the right angles to the moving direction of armature, or to mount these components on different boards, or using a buffer tablet, or to take some measures in the application circuit to reduce the impact of false operation of relay contacts (as illustrated by figure 16):

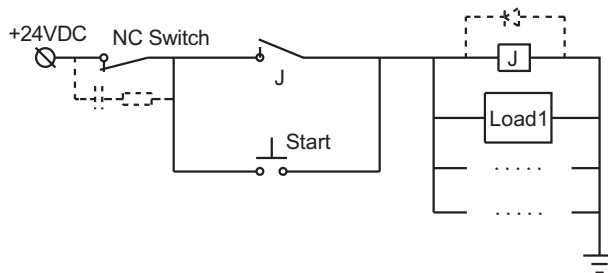


Figure 16

Remarks: in the above figure, a RC is parallel connected to NC switch, and a FWD is parallel connected to relay coil. This measure can avoid the abnormal cut-off of the circuit caused by the abrupt break of NC switch under strong shock and vibration.

In addition, for the relay in the vibration atmosphere in the long term (such as electrical car), please avoid combining with the socked in application. Suggest that the relay be directly soldered on the PC board.

3.3 The Influence of External Magnetic Fields

If there is the strong magnetic fields around the relay, if the relay is mounted beside the large relay, transformer or the speaker, the characteristics will produce the false operation with the variation of the external magnetic fields, especially for polarized relays. Because the operation of the relay is dependent on the internal permanent magnet, it is easily influenced by the external magnetic fields. Please pay attention to the mounting position in practical application and check.

3.4 Vibration, Shock and Weight During Shipping

During shipping the relay or the equipment with the relay installed, the large vibration, shock and weight will cause the failure of the relay functions. Please use the cushion package to control the vibration and shock within the allowable range.



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4. Environments

4.1 Regarding Ambient Temperature and Atmosphere

Care is taken that the ambient temperature at the installation does not exceed the value listed in the instructions. In addition, the contact surface will form sulfured film, oxide film or attached dust in an atmosphere with dust, moisture and sulfur gases (SO₂, H₂S etc.) or organic gases to cause the unstable contact and the failure of the contacts. Therefore please select sealed relays. If the plastic sealed relay is selected, it is required to check in application.

4.2 Harmful Gases To Relay

Please do not use the relay in the atmosphere with the following gases. In these atmospheres, plastic sealed relays can not avoid the influence of gases on the contacts. Please use the hermetic relays.

4.2.1 Silicon Atmosphere

Silicon-based substances (silicon rubber, silicon oil, silicon-based coating material and silicon caulking compound etc.) around the relay will emit volatile silicon gas, which may cause the silicon to adhere to the contacts and may result in contact failure.

4.2.2 Sulfureted Gas

Sulfured gases easily sulfur the contacts and result in the contact failure or non-conduction.

4.2.3 NO_x Gas

When a relay is used in an atmosphere high in humidity to switch a load which easily produces an arc, the NO_x created by the arc and the water absorbed from outside the relay combine to produce nitric acid. This corrodes the internal metal parts and adversely affects operation. Please do not use the relay in the atmosphere where the humidity is beyond 85%RH (at 20°C).

4.3 The Circumstance with Water, Leechdom, Solvent and Oil

Do not use and store the relays in the atmosphere where the relays may be attached to by water, leechdom, solvent and oil etc. for water and leechdom may make the parts rusted, the plastics aging and also result in leakage current which damages the relays or the circuit and solvent and oil may make the marks disappearing or the parts aging. For covers made from PC materials, please prevent from contamination by some organic solvents; otherwise it is likely to lead to bulging or crack.

4.4 Atmosphere of Usage, Storage and Transport

During usage, storage and transportation, avoid locations subject to direct sunlight and maintain normal temperature, humidity and pressure conditions. The allowable range of the temperature and humidity suitable for usage, storage and transportation are shown in the unshaded part in figure 17. The allowable temperature may differ with the types of the relays. In case that the condition in real application is different from that of IEC 61810-1, UL508, UL60947-4-1, GB/T21711.1, etc. the electrical endurance of the relay must be confirmed by tests.

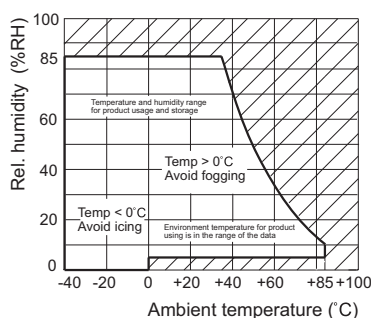


Figure 17

The suggested ranges of the temperature and humidity during usage, transportation and storage are as follows.

- 1) temperature: 0°C to 40°C
- 2) humidity: 5%RH to 85%RH
- 3) air pressure: 86kPa to 106kPa.



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4.4.1 Atmosphere High in Humidity

In the atmosphere high in humidity, when the temperature around sharply changes, the dew will be formed in the internal of the relay and result in the cracking of the insulation material, the break of the coil wire and the rust. The typical examples will happen on the ship transporting on the sea.

Dewing is a phenomena that the vapor freezes water drops in the atmosphere high in temperature when the temperature sharply reduces from the high temperature to the low temperature or the relay is moved in the high temperature from the low temperature

4.4.2 Low Temperature (under 0°C) Environment

Please note the icing phenomena in the environment with low temperature (under 0°C). Icing may result in the welding of the movable parts, the delay of the operation or preventing the operation etc.

Icing refer to the phenomena that water attached to the relay will freeze ice when the temperature reducing below freezing point.

4.4.3 Low Temperature, Low Humidity Environment

Note that the plastics may embrittle in low temperature, low humidity environment.

4.4.4 High Temperature, High Humidity Environment

Note that if the relay is in high temperature, high humidity environment for a long time the contact surface easily forms the oxidized film and then results in the unstable contact and the failure of the contacts. Other metal parts also are easily oxidized or rusted to result in the failure of the functions

4.4.5 SMT Environment

Relay of SMT type is sensitive to the humidity so they are packed with humidity proof package. The following points should be considered during storage.

- 1) Please use the humidity proof packing bags as soon as possible after they are unsealed.
- 2) If the humidity proof packing bags need long term storage after they are unsealed, it is suggested that the desiccator with humidity control be used to store them.

5. Outline and Mounting

5.1 Top View and Bottom View

Generally the bottom view is the projection whose projection plane is terminal side. Otherwise, the top view is the projection whose projection plane is cover side. Please take care of it when using the instructions or mounting the relays.

5.2 Mounting Direction

Unless otherwise stated, mounting direction of the relays is arbitrary. In order that the relay can work more stable and reliable, mounting direction need cosidering.

5.2.1 Vibration Resistance and Shock Resistance

It is ideal to mount the relay so that the movement of the contacts and movable parts is perpendicular to the direction of vibration or shock. Especially when the coil is not excited, the vibration or shock resistance of NC contacts is weak. If mounting direction is proper, their functions can be ensured.(figure 18)

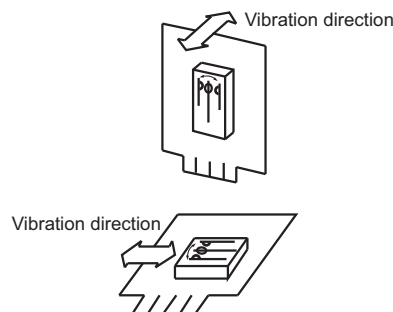


Figure 18



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5.2.2 Contact Reliability

Mounting the relay so the surfaces of its contacts are vertical prevents dirt and dust as well as scattered contact material and powdered metal from adhering to them when the arc is generated.

5.3 Adjacent Mounting

When many relays are mounted close together, abnormally high temperatures may result from the combined heat generated. To prevent the heat buildup, please mount relays with sufficient spacing between them. When many boards mounted with relays are installed in a card rack, please be sure that the ambient temperature of the relay does not exceed the value listed in the instructions.

5.4 Shroud Mounting

Use the gaskets when mounting to prevent from the damages and deforms. Keep the screwing moment in the range of 0.49 to 0.686N · m (5 to 7kgf·cm. To prevent from loosening, please use the spring gasket.

5.5 Mounting the Plug-In Terminals

When mounting the relay with plug-in terminals, the plug-in strength is based on 40N to 70N (4kgf to 7kgf).

5.6 Supersonic Cleaning

Do not clean the relay by the way supersonic cleaning, for the supersonic will result in the contact welding and the break of the coil wire.

5.7 Mounting and Soldering of THT Relay

The mounting and soldering of the THT relay can be divided into the following steps.(figure 19)

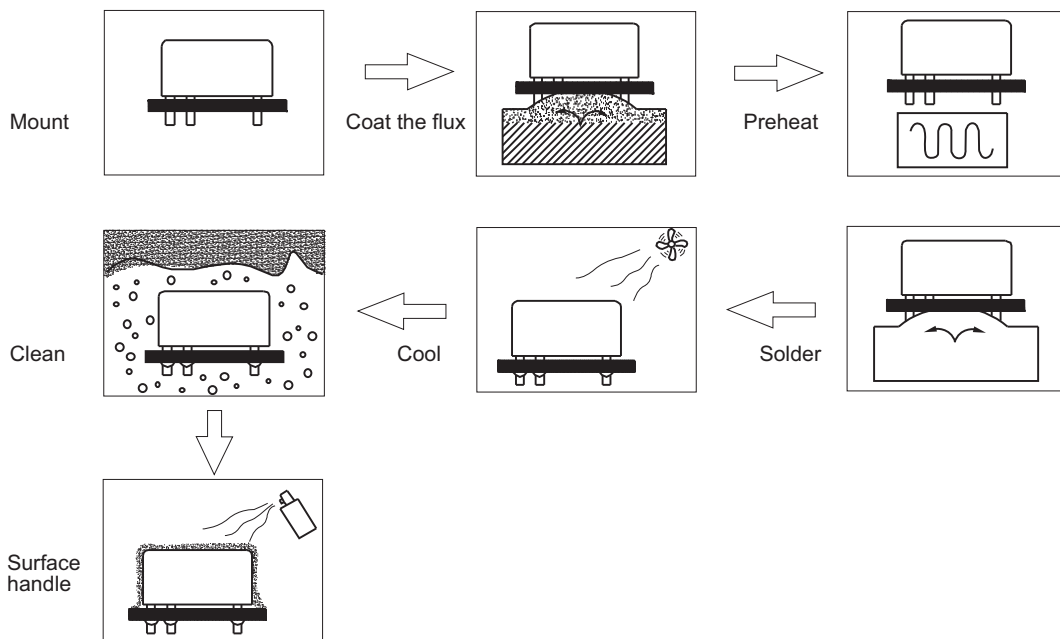


Figure 19

In the following the considered points are described when THT relay is soldered on the PC board. Please refer to them in application.

Note that if the solder entered the relay due to the carelessness, the functions of relay will be destroyed. There will be such problems as the relay not be suitable for the automatic soldering or cleaning due to the different protective constructions. Please see the details in the constructions and characteristics in 3.1 pattern of encapsulation in Chapter 2.

5.7.1 Mounting

Do not bend the terminals of the relay (figure 20) for it may destroy the initial performances of the relay.
Please correctly process the PC board according to the mounting hole drawing in the instructions.
Please maintain the balance of the relay.
Please note that the set force of the hook for mounting is too much large to result in the internal failure of the relay.

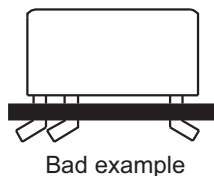


Figure 20

5.7.2 Coating Flux

Please use the rosin flux which is not corrosive and the alcohol solvent which is less chemistry.
Please use the thin and even coating flux to prevent from penetrating the relay. As for the dipping coating, please keep the surface of the flux stable.
Please adjust the places to ensure that the flux will not overflow through the surface of PCB.
Please do not make the flux attached to the parts of the relay except for the terminals. Otherwise the insulation of the relays will be reduced.
For the dust protected relays and flux proofed relays, do not use the coating method of pushing deeply PCB from the above into the sponge absorbing the flux, as shown in figure 21. This will make the flux penetrating the relay, especially for the dust protective type.

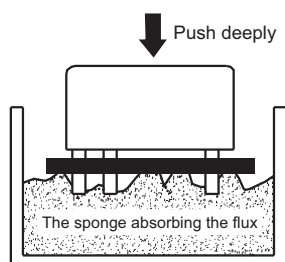


Figure 21

5.7.3 Preheating

In order to improve the soldering performance, please preheat without failure.
Please preheat under 100°C (the soldered surface of the PC board) within 1 minute.
Do not use the relays which are placed in the high temperature for a long time due to the set failure for their initial performance may have changed.

5.7.4 Soldering

Precautions for soldering seen in table 14.

Table 14

Automatic Soldering	Manual Soldering
<ul style="list-style-type: none"> To maintain the soldering stable, the suggested soldering method is wave solder. Adjust the height of flux liquid level to make them not overflow the PCB. Please do it according to following suggested conditions. Soldering temperature: about 260°C ± 5°C (Applicable to Power relays) Soldering temperature: about 250°C ± 5°C (Applicable to Signal relays) Soldering time: within about 5s. 	<ul style="list-style-type: none"> Please sufficiently clean the head of searing-iron with fluxing to make the surface of it smooth. Please do it according to the following suggested conditions. Searing-iron: 30W or 60W The temperature of the head of searing-iron: about 280°C or 300°C Soldering time: within about 3s Use the solder with rosin fluxing.



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- Remarks: 1. The preheating and soldering temperature and time for automatic soldering should be reduced as low as possible to avoid any change in relay performance due to excessively high temperature or too long time preheating or soldering.
2. It is normal if some relay covers become slightly bulging under right soldering conditions.
3. In the process of manual soldering it is prohibited to press or pull the relay terminals because such doing will lead to changes in product performance or even relay failures.

5.7.5 Cooling

After automatic soldering, please ventilate and cool them to avoid the aging of the relay or its parts caused by the heat generated when the relay soldered.

Although the sealed relay can be cleaned, it is not cleaned for the sudden connection with the cool solvent may damage the hermetic characteristics of the relay.

5.7.6 Cleaning

Please select the cleaning method in table 15 when cleaning.

Table 15

Dust Protected Type	Flux Proofed Type	Plastic Sealed Type
<ul style="list-style-type: none"> Hot cleaning or soap cleaning not allowable Scrub the welding surface of PCB 		<ul style="list-style-type: none"> Washable in limited condition. Use the alcohol solvent or water. The temperature for cleaning is under 40°C. Do not do supersonic cleaning or truncate the terminals of the relays, or the break of the coil wire and the contact welding will happen.

Due to different soldering condition, sealed relays can be impaired when mounting on PCB. If cleaning is necessary after soldering, it is recommended to solder under the condition provided by HF and to select special sealed relays (customer code: 310).

Avoid cleaning with Freon, Trichloroethane, diluent or gasoline.

5.7.7 Surface Handling

In order to prevent the insulation of PCB from worsening, Please note the following precautions when surface handling.

The dust protected type and the flux proofed type result in the failure due to the surface handling agents penetrating the relay. Therefore please do not do the surface handling or mount the relay after surface handling.

Due to the bad influence of the surface handling agents on the relay eg. melting the cover, please select carefully and check and test in application.

Spraying and brushing processes are recommended for surface treatment, and dip-coating is prohibited. Surface treatment agent should best be room-temperature liquid agent, which should be sprayed when the relay is cooled down to room-temperature. The agent can be dried naturally or under constant temperature which should not exceed 60°C. Meanwhile, the drying temperature is not allowed to be decreased when the agent is not completely dried, otherwise the agent could be absorbed into the relay and thus lead to relay failure.

Please contact us when special surface treatments processes are used so that we can provide you a suitable product.

There are the following suggestions on the coat, as shown in table 16.

Table 16

Type of the Coat	Plastic Sealed Relay
Epoxy resin	Allowable
Polyurethane	Allowable
Silicon	Not allowable
Fluorin	Allowable



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5.8 Mounting and Soldering of SMT Relay

The mounting and soldering of SMT relays have the following steps, as shown in figure 22. In the following the considered points are listed when the SMT relays are soldered on PCB.

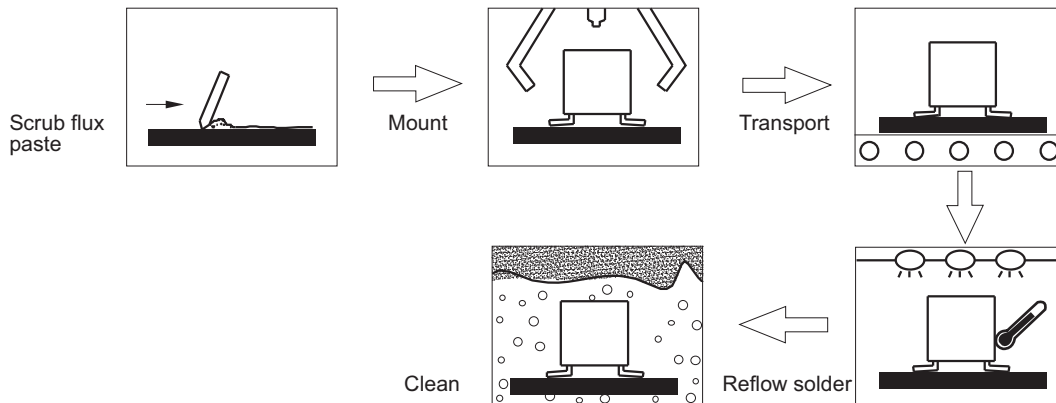


Figure 22

Please refer to these in application. Note that the relays are not damaged in processing.

5.8.1 Scrub Flux Paste

Please use the rosin and chlorine-free flux paste for chlorine may erode the terminals and circuit panel. Flux paste should be coated evenly and the thickness is 0.15mm or 0.2mm.

5.8.2 Mounting

When mounting the relays, do not set the conservative force of the finger within the range specified in table 17, unless otherwise stated in the catalogue.

		Table 17	
Direction	Maintaining Force		
Direction A	Below 1.96N		
Direction B	Below 4.9N		
Direction C	Below 1.96N		

5.8.3 Transportation

During the transport, the relays will not fall off due to the factors such as the shock and vibration to avoid the bad soldering produced thereby.

5.8.4 Reflow Solder

Figure 23 shows the temperature curve of the PCB surface when the infrared ray are used to reflow solder. Please consult the specification of the relays due to the different characteristics of the different relays. If there is no statement in the instructions, Please use the temperature curve as shown in the following figure.

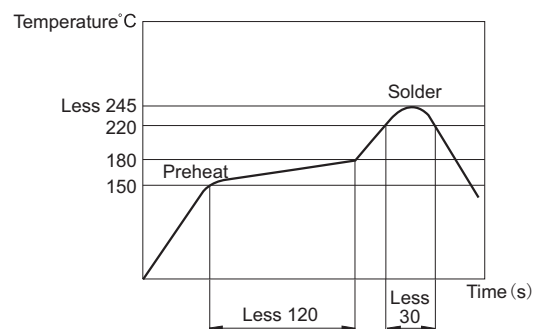


Figure 23



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When just finishing soldering, please do not clean the relay immediately, for the connection with the cool solvent may damage the hermetic characteristics of the internal parts.
Do not dip the relay in the flux groove for it will deform the plastics and then result in the failure of the relays.
Please see the soldered state in figure 24.

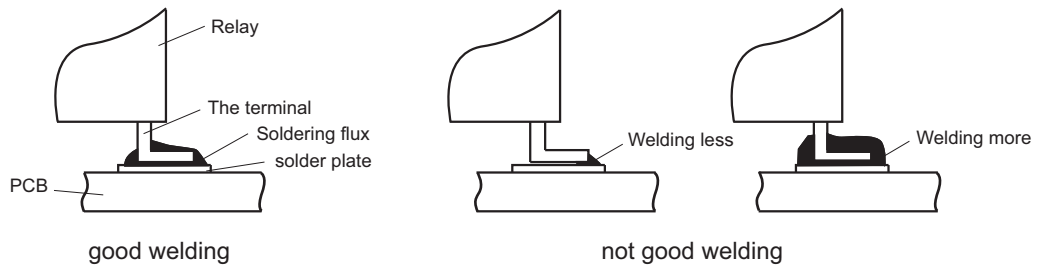


Figure 24

5.8.5 Cleaning

Hot cleaning or soap cleaning can be used and the cleaning temperature should be controlled under 40°C. Please use the alcohol solvent or water to clean and do not use Freon, thinner or gasoline to clean. Do not use supersonic to clean, or the break of the coil wire and the contact welding will be resulted in. Improper welding will decrease the relay sealing, so please do not clean the relay or do the surface treating (soaking prtector).

6. Other Precautions

6.1 Precautions for the Safety

When the relay works, do not touch the relay with hands for there is the danger of getting the electric shock. Please switch off the power when mounting, maintaining and handling the relays (including the connecting parts such as terminals and sockets).
When connecting the terminals, firstly refer to the wiring diagram in the instructions, and then make correct connection. The false connection may result in the unexpected false operation, abnormal heating or fire.
If the contact welding, the failure of the contact or the break of the coil wire happens, other properties or lives will be threatened. Please use the double mounting sets.

6.2 Tube Packaging

When packing the relay by the tube, do not shake the tube to shock the relays, for which will result in the failure of the relays. If the package uses the stop plug, be sure to slide the stopper plug to hold the remaining relays firmly together so they would not move in the tube.

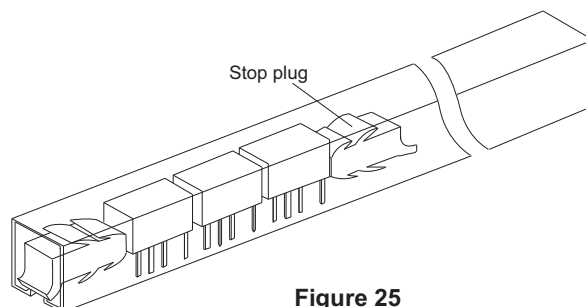


Figure 25



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CHAPTER 4 QUICK REFERENCE TABLE ON CAUSES OF RELAY FAILURE

Some common failure phenomena, failure modes, and the reasons. See table 18:

Table 18

Failure Phenomena	Failure Mode	Failure Reason
Non-operation	No current at the terminals of the coil	<ul style="list-style-type: none"> ● Breaking circuit ● Worse connected or short circuit ● Terminal welded worse
	Insufficient voltage in the circuit	<ul style="list-style-type: none"> ● Insufficient voltage supply ● Power circuit too long ● the voltage of the chosen relay too high
	Circuit unconnected	<ul style="list-style-type: none"> ● Welded worse ● Coil breaking
	Relay failure	<ul style="list-style-type: none"> ● Drop, bumped badly ● Contact failure
	Voltage polarity of the polarized relay is wrong	<ul style="list-style-type: none"> ● Bumped during the transportation ● circuit connected badly
No Release	Surplus voltage too high	<ul style="list-style-type: none"> ● Energy storage component's influence ● Leakage current or bypass current ● Surplus voltage of the semiconductor too high
	Relay failure	<ul style="list-style-type: none"> ● Drop, bumped badly ● contact failure
Unsteady Operation	Unsteady power	<ul style="list-style-type: none"> ● PARD(periodic and random deviation) ● Insufficient voltage ● Resistor beyond the tolerance
	Unsteady parameter	<ul style="list-style-type: none"> ● Drop or bumped badly ● Short form among the coils
	False operation of the relay	<ul style="list-style-type: none"> ● Something wrong with the control procedure ● The vibration excessively strong in application
NC/NO Contact Welding	Current excessively high	<ul style="list-style-type: none"> ● Load excessively high ● Surge current too high
	Contact Moving abnormally	<ul style="list-style-type: none"> ● External vibration excessively strong ● AC relay's unstable operation; with buzz ● Unstable operation
NC/NO Contact Welding	Operation frequency excessively high	
	Ambient temperature excessively high	
	Use beyond the life	
NC/NO Contact Not Closed	Contact resistance too high	<ul style="list-style-type: none"> ● Weld worse ● Contamination in the contact ● Bad using environment, contact oxidizing or sulphidizing
	No current in the contacts surface	<ul style="list-style-type: none"> ● Load circuit break ● Circuit connected worse or short circuit ● Terminal welded worse
	Use beyond the life	

Notes: when failure happens, if there's any question, please contact us.



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CHAPTER 5 ORDERING EXAMPLE

Ordering code contains the basic information of the relays. Table 19 is an ordering example of a typical Hongfa product. Please refer to the datasheet of each product for part no. selection.

						Table 19
		HF161F / ¹⁾	12	-H	T	(XXX)
Type						
Coil voltage	5, 12, 24, 48VDC					
Contact arrangement	H: 1 Form A					
Contact material	T: AgSnO ₂ Nil: AgCdO					
Special code ²⁾	XXX: Customer special requirement Nil: Standard					

Notes: 1) The symbol "/" used in the product code of Hongfa relay, which is only for separating the product type code and specification code, and there is no other actual meaning.

2) The customer special requirement express as special code after evaluating by Hongfa. e.g. (414) stands for product with coil terminal of 1.4X0.4.

3) For products that should satisfy the explosion-proof requirements of "IEC 60079 series" should remark [Ex] at the specification column while placing orders. Since not all of the products have explosion-proof certification, please contact us if you need any support to choose the suitable product.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

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