

HFK10-T

AUTOMOTIVE RELAY



Typical Applications

Cooling fan control, Glow plug

Features

- Max.continuous current 70A
- Max.making current 200A
- Extended temp. range up to 125°C
- With highly established reliability
- Strong resistance ability to shock & vibration
- Reflow soldering version available
- RoHS & ELV compliant

CHARACTERISTICS

Contact arrangement	1U	Ambient temperature	HFK10-T:-40°C to 125°C
Voltage drop (initial) ¹⁾	Typ.: 30mV (at 10A) Max.: 250mV (at 10A)	Vibration resistance ⁷⁾	10Hz to 55Hz, double amplitude, 1.5mm
Max. continuous current ²⁾	23°C: 81A 30min/70A continuous 85°C: 75A 30min/50A continuous 125°C: 70A 30min/30A continuous	Shock resistance ⁷⁾	100m/s ² ,
Max. switching current	Make: 200A ³⁾ Break: 60A (Resistive, 13.5VDC)	Termination	PCB ⁸⁾
Max. switching voltage	16VDC	Construction	Plastic sealed, Flux proofed
Min. contact load	1A 6VDC ⁴⁾	Unit weight	Approx. 15g
Electrical endurance	See "CONTACT DATA"	<ol style="list-style-type: none"> Initial value Test under the following conditions: a. The relay is mounted on the PCB, the coil is applied with 100% rated voltage; b. The PCB board is a double layer board. The thickness of the copper foil is 4 oz (140 μm), the width of each copper foil is 13.15×(1±5%)mm, the length of the copper foil is 50mm±1mm, and the Tg value of the PCB board is 150 °C. c. The installation spacing between relay samples is 100mm. Inrush peak current under lamp load, at 13.5VDC. This value can change due to the switching frequency, environmental conditions and desired reliability level, therefore it is recommended to check this with the actual load. 1min, leakage current less than 1mA. The value is measured when voltage drops suddenly from nominal voltage to 0 VDC and coil is not paralleled with suppression circuit. When non-energized, close time of NO contacts shall not exceed 100μs, When energized, opening time of closed NO contacts shall not exceed 100μs. Since it is an environmental friendly product, please select lead-free solder when welding. The recommended soldering temperature and time is (260±3)°C, (5±0.3)s. 	
Mechanical endurance	1 x 10 ⁷ OPS		
Initial insulation resistance	100MΩ (at 500VDC)		
Dielectric strength ⁵⁾	500VAC		
Operate time	Typ.: 4ms, Max.: 10ms		
Release time ⁶⁾	Typ.: 3ms Max.: 10ms		

CONTACT DATA

Load voltage	Load type		Load current	On/Off ratio		Electrical endurance ¹⁾ OPS	Contact material	Ambient temp.
			1U	On s	Off s			
			NO					
13.5VDC	Resistive	Make ¹⁾	60	2	2	1×10 ⁵	AgSnO ₂	-40°C to 125°C
		Break	60					
	Inductive	Make ¹⁾	160	2	2	1×10 ⁵	AgSnO ₂	-40°C to 125°C
		Break	42					
	Lamp	Make ¹⁾	200	2	2	1×10 ⁵	AgSnO ₂	-40°C to 85°C
		Break	40					

Notes: 1) Corresponds to the peak inrush current on initial actuation.

2) Loads mentioned in this chart is for relays with no parallel diode or Zener Diode. For those with parallel diode, Zener Diode or other components, please contact Hongfa for more technical supports.

Please also contact Hongfa if the actual application load is different from what mentioned above.

3) 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

2024 Rev. 1.00

COIL DATA

at 23°C

Nominal voltage VDC	Pick-up voltage VDC max.	Drop-out voltage VDC min.	Coil resistance x(1±10%)Ω	Power consumption W
12	≤7.3	≥1.0	320	0.45

ORDERING INFORMATION

HFK10 -T / 12

-SH

S

T

(XXX)

Type

HFK10-T: Reflow soldering version or high heat-resistant version

Coil voltage

12: 12VDC

Contact arrangement

SH: 1 Form U

Construction

S: Plastic sealed ¹⁾ Nil: Flux proofed

Contact Material

T: AgSnO₂

Special code²⁾

XXX: Customer special requirement Nil: Standard

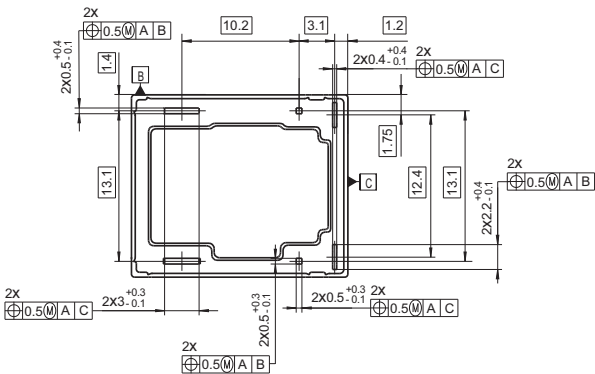
Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

2) The customer special requirement express as special code after evaluating by Hongfa. e.g. (170) stands for flasher load.The performance parameters of products with characteristic numbers shall be subject to the specific specifications provided by Hongfa.

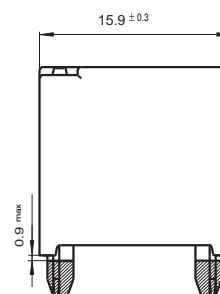
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

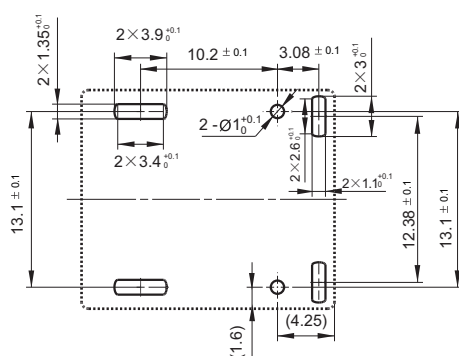
Outline Dimensions



Unit: mm



PCB Layout (Bottom view)



The graph shows the relationship between coil voltage and temperature rise for three different current levels. The y-axis represents Temperature rise in Kelvin (K), ranging from 0 to 120. The x-axis represents Coil voltage in VDC, ranging from 12V to 16V. Three linear data series are plotted: 0A, 40A, and 60A. The 0A series starts at approximately 20K at 12V and rises to about 35K at 16V. The 40A series starts at approximately 55K at 12V and rises to about 65K at 16V. The 60A series starts at approximately 95K at 12V and rises to about 105K at 16V.

Coil voltage (VDC)	0A Temperature rise (K)	40A Temperature rise (K)	60A Temperature rise (K)
12V	20	55	95
14V	25	60	100
16V	35	65	105

A line graph showing the temperature rise in Kelvin (K) on the y-axis (0 to 70) versus the coil voltage in VDC on the x-axis (12V to 16V). Three linear data series are plotted for different currents: 0A, 40A, and 50A. The 0A series starts at approximately 14K at 12V and rises to 23K at 16V. The 40A series starts at approximately 42K at 12V and rises to 50K at 16V. The 50A series starts at approximately 58K at 12V and rises to 68K at 16V. All three series show a positive linear correlation between voltage and temperature rise.

Coil voltage (VDC)	Temperature rise (K) at 0A	Temperature rise (K) at 40A	Temperature rise (K) at 50A
12V	14	42	58
14V	18	47	63
16V	23	50	68

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CHARACTERISTIC CURVES

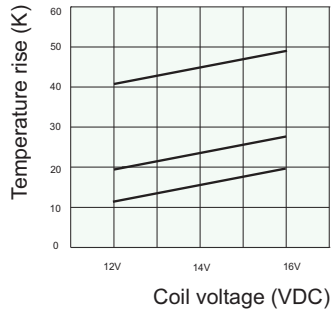
(3) Coil temperature rise (105°C)

Experiment: HFK10-T/12-SHST

Amount: three

Carrying current: 0A, 20A, 40A

Ambient temp: 105°C



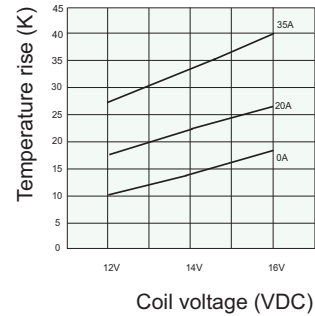
(4) Coil temperature rise (125°C)

Experiment: HFK10-T/12-SHST

Amount: three

Carrying current: 0A, 20A, 35A

Ambient temp: 125°C



Remark: The coil temperature rise test requires the relay to be installed on the PCB. The PCB is double-layered. The thickness of the copper foil is 4 oz (140 μm), the width of each copper foil is 13.15×(1±5%) mm, the length of the copper foil is 50mm±1mm, and the Tg value of the PCB board is 150°C. The installation spacing between relay samples is 100mm.

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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