

# HFD3-I

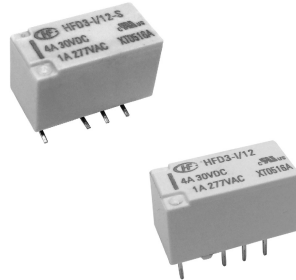
# MINIATURE SIGNAL RELAY



File No.:E133481



File No.:R 50433438



## Features

- Third generation Signal relay
- High contact switching capacity
- Withstand inrush current at 7.5A(Effective value)
- SMT and THT types available
- Single side stable and latching type available

RoHS compliant

## CONTACT DATA

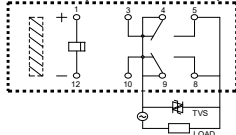
Contact arrangement	2C
Contact resistance <sup>1)</sup>	≤ 100mΩ (10mA 30mVDC)
Contact material	Ag Alloy + Au plated
Contact rating	4A 30VDC
(Res. load)	2A 30VDC 1A 277VAC
Max. switching voltage	277VAC / 220VDC
Max. switching current	4A (Single contact) 7.5A(Two sets of open contacts in parallel,Valid value)
Max. switching power	277VA / 120W
Min. applicable load <sup>2)</sup>	5V 1mA
Mechanical endurance	1 x 10 <sup>7</sup> OPS
Electrical endurance <sup>3)</sup>	1 x 10 <sup>5</sup> OPS (Resistive load,40°C 4A 30VDC) 1 x 10 <sup>5</sup> OPS (Resistive load,85°C 2A 30VDC) 1 x 10 <sup>5</sup> OPS(Resistive load,85°C 1A 277VAC) 2 x 10 <sup>5</sup> OPS (Inductive load,Room temp. 250ms Inrush current 7.5A(effective value) / Stable current 1.5A(effective value) 30VAC(COSØ=0.4)(ON:OFF=1s:9s), TVS protection for contacts (two sets of open contacts in parallel)

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

2) Min. applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions and expected contact resistance and reliability.

3) The electrical endurance of resistive load is from the tests of one set of open contacts or one sets of close contacts.The electrical endurance of inductive load is from the test with two sets of open contacts in parallel.

Two sets of open contacts in parallel:



It is in released status are in the diagram(single side stable type)

## COIL

Coil power	Single side stable	Approx. 140mW
	1 coil latching	Approx. 100mW
	2 coils latching	Approx. 200mW
Temperature rise	60K max(2A Resistive load 85°C environment)	

## CHARACTERISTICS

Insulation resistance	1000MΩ (500VDC)	
Dielectric strength	Between open contacts	1000VAC 1min
	Between contact sets	1500VAC 1min
	Between coil&contact	2000VAC 1min
Surge withstand voltage	1500VAC (FCC part 68)	
Between open contacts (10/160μs)	2500VAC (Telecordia)	
Between coil & contacts (2/10μs)		
Operate time (Set time)	≤ 4ms	
Release time (Reset time)	≤ 4ms	
Ambient temperature	-40°C to 85°C	
Humidity	5% to 85% RH	
Shock resistance	Functional	735m/s <sup>2</sup>
	Destructive	980m/s <sup>2</sup>
Vibration resistance	Functional	10Hz to 55Hz 3.3mm DA
	Destructive	10Hz to 55Hz 5.0mm DA
Termination	THT、SMT	
Unit weight	Approx.2g	
Moisture sensitivity levels (Only for SMT type, JEDEC-STD-020)	MSL-3	
Construction	Plastic	

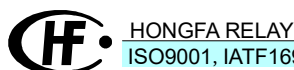
Notes: 1) The data shown above are initial values.

## SAFETY APPROVAL RATINGS

UL/CUL	Ag Alloy + Au plated	4A 30VDC, 40°C
TÜV		2A 30VDC, 85°C
		1A 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.



ISO9001, IATF16949, ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

2026 Rev. 1.00

**COIL DATA**

at 23°C

**Single side stable**

Coil Code	Nominal Voltage VDC <sup>(1)</sup>	Initial Set Voltage VDC <sup>(1)</sup> max.	Initial Reset Voltage VDC max.	Coil Resistance Ω	Nominal Power mW approx.	Max. Voltage VDC <sup>(4)</sup>
HFD3-I/1.5	1.5	1.13	0.15	16 x (1±10%)	140	3.0
HFD3-I/2.4	2.4	1.8	0.24	41 x (1±10%)	140	4.8
HFD3-I/3	3	2.25	0.3	64.3 x (1±10%)	140	6.0
HFD3-I/4.5	4.5	3.38	0.45	145 x (1±10%)	140	9.0
HFD3-I/5	5	3.75	0.5	178 x (1±10%)	140	10
HFD3-I/6	6	4.5	0.6	257 x (1±10%)	140	12
HFD3-I/9	9	6.75	0.9	579 x (1±10%)	140	18
HFD3-I/12	12	9	1.2	1028 x (1±10%)	140	24
HFD3-I/24	24	18	2.4	4114 x (1±10%)	140	48

**1 coil latching**

Coil Code	Nominal Voltage VDC <sup>(1)</sup>	Initial Set Voltage VDC <sup>(1)</sup> max.	Initial Reset Voltage VDC <sup>(1)</sup> max.	Coil Resistance Ω	Coil Resistance Ω	Max. Voltage VDC <sup>(4)</sup>
HFD3-I/1.5-L1	1.5	1.13	1.13	22.5 x (1±10%)	100	3.0
HFD3-I/2.4-L1	2.4	1.8	1.8	58 x (1±10%)	100	4.8
HFD3-I/3-L1	3	2.25	2.25	90 x (1±10%)	100	6.0
HFD3-I/4.5-L1	4.5	3.38	3.38	203 x (1±10%)	100	9.0
HFD3-I/5-L1	5	3.75	3.75	250 x (1±10%)	100	10
HFD3-I/6-L1	6	4.5	4.5	360 x (1±10%)	100	12
HFD3-I/9-L1	9	6.75	6.75	810 x (1±10%)	100	18
HFD3-I/12-L1	12	9	9	1440 x (1±10%)	100	24
HFD3-I/24-L1	24	18	18	5760 x (1±10%)	100	48

**2 coils latching**

Coil Code	Nominal Voltage VDC <sup>(1)</sup>	Initial Set Voltage VDC <sup>(1)</sup> max.	Initial Reset Voltage VDC <sup>(1)</sup> max.	Coil Resistance Ω	Coil Resistance Ω	Max. Voltage VDC <sup>(4)</sup>
HFD3-I/1.5-L2	1.5	1.13	1.13	11.2 x (1±10%)	200	3.0
HFD3-I/2.4-L2	2.4	1.8	1.8	29 x (1±10%)	200	4.8
HFD3-I/3-L2	3	2.25	2.25	45 x (1±10%)	200	6.0
HFD3-I/4.5-L2	4.5	3.38	3.38	101 x (1±10%)	200	9.0
HFD3-I/5-L2	5	3.75	3.75	125 x (1±10%)	200	10
HFD3-I/6-L2	6	4.5	4.5	180 x (1±10%)	200	12
HFD3-I/9-L2	9	6.75	6.75	405 x (1±10%)	200	18
HFD3-I/12-L2	12	9	9	720 x (1±10%)	200	24
HFD3-I/24-L2	24	18	18	2880 x (1±10%)	200	48

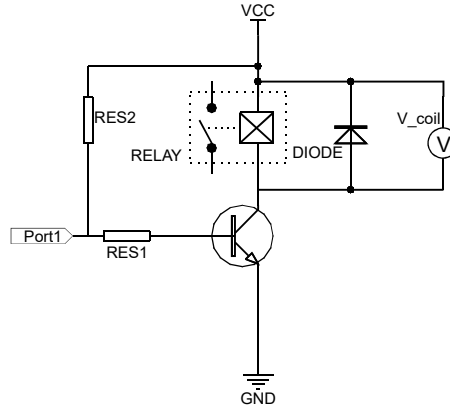
## COIL DATA

at 23°C

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

2) To supply rated step voltage to coil is the foundation of relay proper operation. Please make sure the applied voltage to the coil reach at rated values.

Please refer to the typical diagram below for single side stable relay. The "V\_coil" is the rated voltage:



3) In case 5V of transistor drive circuit, it is recommended to use 4.5V type relay, and 3V to use 2.4V type relay.

4) For monostable relays, if you need to drop down voltage and hold mode after reliably operating, make sure that the effective value of holding voltage is not less than 60% of the rated voltage.

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

6) When user's requirements can't be found in the above table, special order allowed.

7) During the relay pick-up or drop-out processes, there are stages of contact pressure change, contact vibration and unstable contact etc. When the voltage applied to coil is gradually changed, it will lengthen the unstable stage and affect relay endurance. To reduce this influence, please apply step voltage (switching circuit) to relay coil.

## ORDERING INFORMATION

Type	HFD3-I /	24	-L1	S	R	(XXX)
Coil voltage	1.5, 2.4, 3, 4.5, 5, 6, 9, 12, 24VDC					
Sort	L1: 1 coil latching Nil: Single side stable L2: 2 coils latching					
Terminal type	S: Standard SMT S1: Short terminal SMT Nil: THT <sup>1)</sup>					
Packing style	R: Tape and reel packing (Only for SMT type) <sup>2)</sup> Nil: Tube packing (Only for THT type)					
Special code <sup>3)</sup>	XXX: Customer special requirement		Nil: Standard			

**Notes:** 1) THT relays: Use wave or manual soldering. Confirm reflow soldering feasibility with us first.

2) R type (tape and reel) packing is moisture-proof which meets requirement of MSL-3. Please choose R type packing for SMT products. For R type, the letter "R" will only be printed on packing tag but not on relay cover. Tube packing is normally not available for SMT products unless specially requested by customer. But please note that tube packing is not moisture-proof so please bake the products before use according to description of Notice 11 herewith. In addition, tube packaging will be adopted when the ordering quantity of R type is equal to or less than 100 pieces unless otherwise specified.

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

4) When coil sort, contact material, terminal type or packing style are needed, please add "-" after coil voltage is selected. For instance, HFD3-I/12-SR.

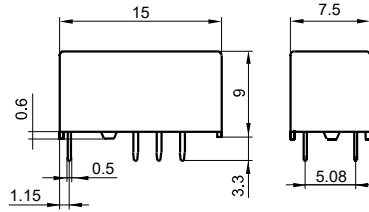
5) For products that should meet the explosion-proof requirements of "IEC 60079 series", please note [Ex] after the specification while placing orders. Not all products have explosion-proof certification, so please contact us if necessary, in order to select the suitable products.

# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

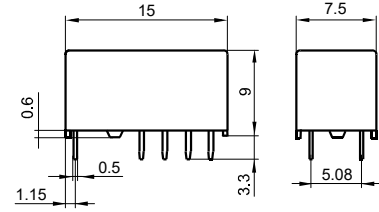
Unit: mm

Outline Dimensions  
(THT type)

Single side stable & 1 coil latching

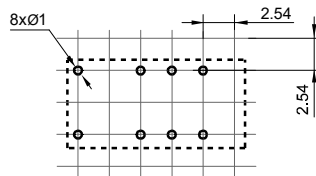


2 coils latching

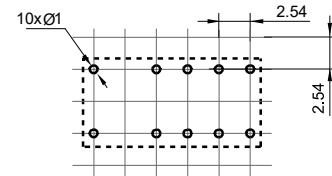


PCB Layout  
(THT type)  
(Bottom view)

Single side stable & 1 coil latching

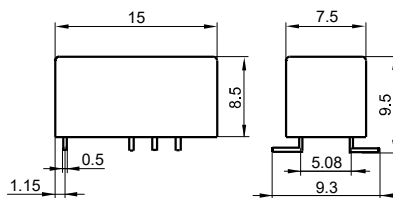


2 coils latching

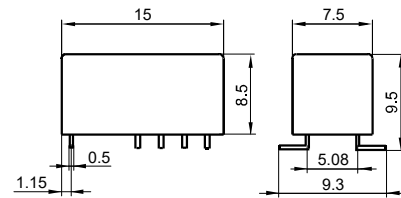


Outline Dimensions  
(S type: Standard SMT)

Single side stable & 1 coil latching

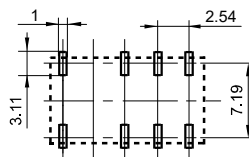


2 coils latching

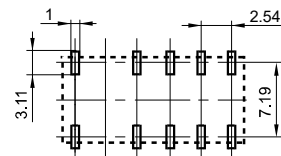


PCB Layout  
(S type: Standard SMT)  
(Bottom view)

Single side stable & 1 coil latching



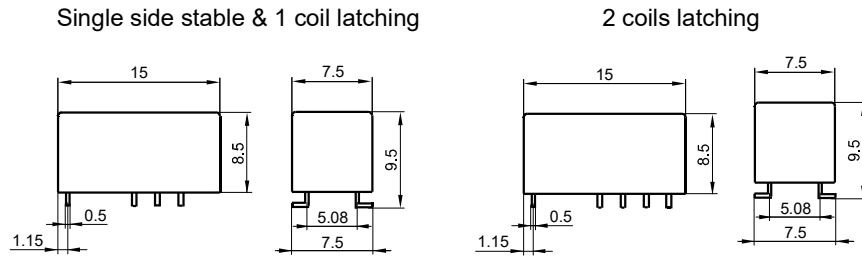
2 coils latching



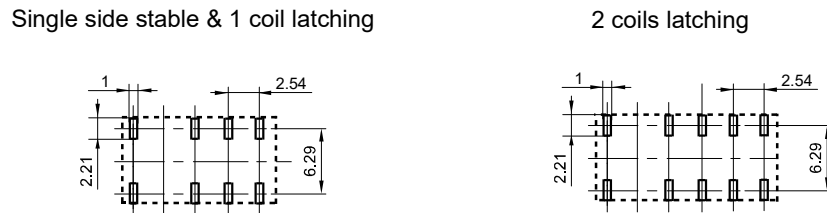
# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

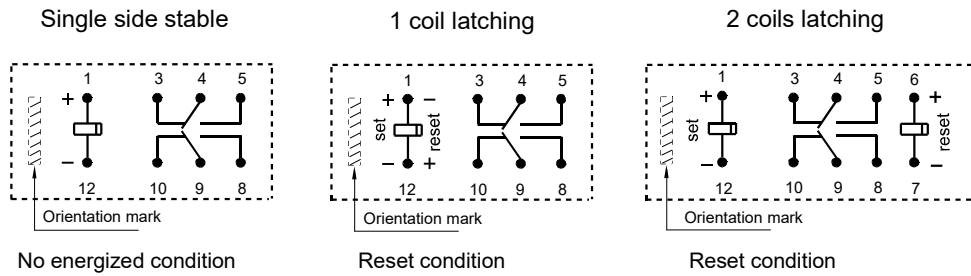
Outline Dimensions  
(S1 type: Standard SMT)



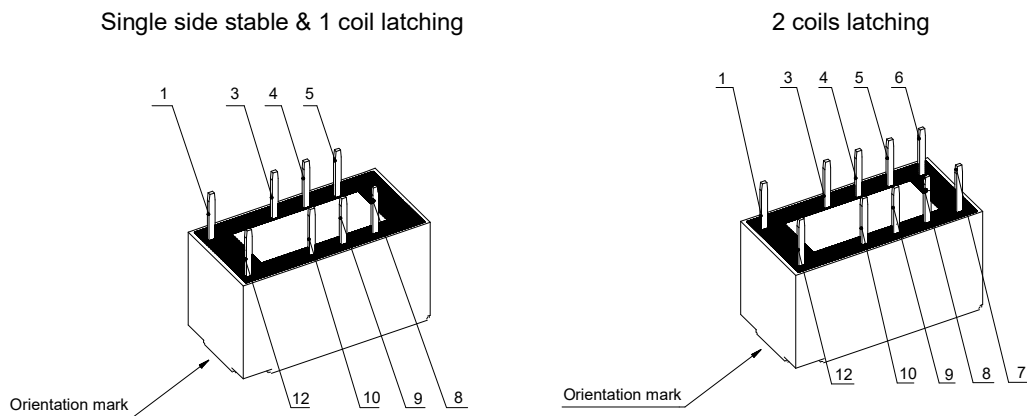
PCB Layout  
(S1 type: Standard SMT)  
(Bottom view)



Wiring Diagram  
(Bottom view)

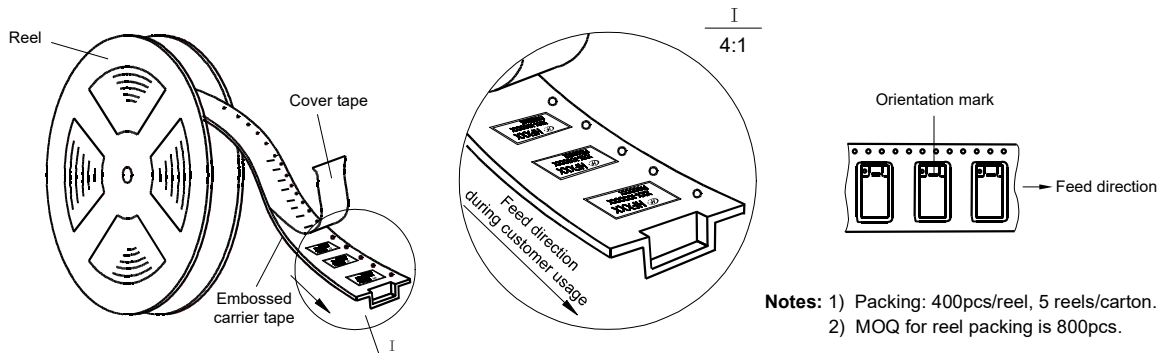


Pin Layout

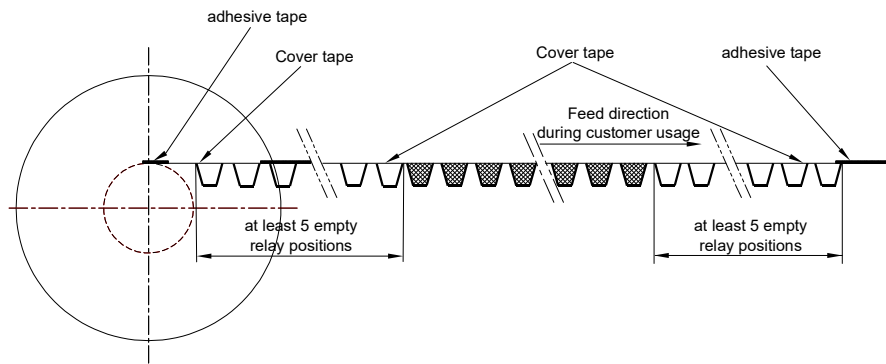


- Remark: 1) The pin dimensions are before tin dipping(it will be larger after tin dipping).The mount hole dimensions are recommended for PCB hole design. The final PCB hole dimensions can be adjusted according to the actual measured values of products.
- 2) In case of no tolerance shown in outline dimension: 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  $\pm 0.1\text{mm}$ .

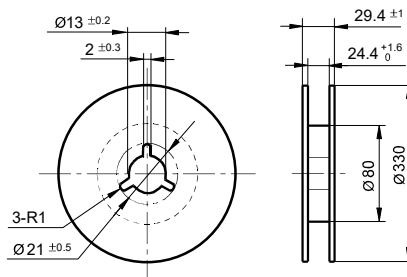
**Direction of Relay Insertion**



- Notes:** 1) Packing: 400pcs/reel, 5 reels/carton.  
2) MOQ for reel packing is 800pcs.



**Reel Dimensions**



**Tape Dimensions (S type: Standard SMT)**

