

# HFD4-I

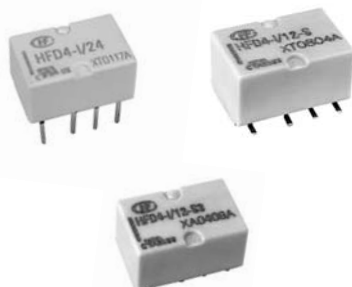
# SUBMINIATURE HIGH LOAD RELAY



File No.:E133481



File No.:R50333270



## Features

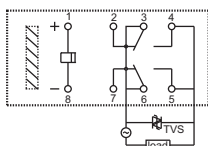
- Surge withstand current up to 3.5A(Valid value)
- Available in accordance with IEC 60335-1
- Low power consumption
- Single side stable and latching type available

**RoHS compliant**

## CONTACT DATA

Contact arrangement	2C	
Contact resistance	100mΩ max. (10mA 30mVDC)	
Contact material	Silver alloy + Au plated	
Contact rating (Res. load)	2A 30VDC 3A 30VDC 0.3A 125VAC 1A 125VAC	
Max. switching voltage	250VAC / 220VDC	
Max. switching current	3.5A(30VAC) (Valid value ,Two sets of normally open contacts in parallel )	
Max. switching power	125VA/90W	
Min. applicable load	5V 1mA	
Mechanical endurance	1 x 10 <sup>7</sup> OPS	
Electrical endurance	Resistive load	1 x 10 <sup>5</sup> ops (85°C, 1s on 9s off, 2A 30VDC) 5 x 10 <sup>4</sup> ops (40°C, 1s on 9s off, 3A 30VDC) 1 x 10 <sup>5</sup> ops (85°C, 1s on 9s off, 0.3A 125VAC) 5 x 10 <sup>4</sup> ops (85°C, 1s on 9s off, 1A 125VAC)
	Inductive load <sup>(3)</sup>	1 x 10 <sup>5</sup> OPS [Inrush current 3.5A (250ms) / steady state current 1A 30VAC cos φ=0.4] [Room temperature, 1s: 9s, two sets of normally open contacts in parallel and connected to the load, Contact plus TVS protection]

- 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) Two sets of normally open contacts in parallel wiring diagram.



## COIL

Coil power	Single side stable	See "COIL DATA"
	1 coil latching	See "COIL DATA"
Temperature rise	70K max.(At 2A load 85°C environment)	

## CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between coil &contacts	1600VAC 1min
	Between open contacts	750VAC 1min
	Between contacts sets	1800VAC 1min
Surge withstand voltage		
Between open contacts (10/160μs)		1500VAC (FCC part 68)
Between coil &contacts (2/10μs)		2500V(Telecordia)
Operate time (set time)		3ms max.
Release time (Reset time)		3ms max.
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 ~ 55Hz 3.3mm DA
	Destructive	10Hz ~ 55Hz 5.0mm DA
Termination		DIP, SMT
Unit weight		Approx. 0.8g
Moisture sensitivity levels(only for SMT type,JEDEC-STD-020)		MSL-3
Construction		Plastic sealed

- Notes:** 1) The data shown above are initial values.  
2) UL insulation system:class F

## SAFETY APPROVAL RATINGS

UL/CUL	Silver alloy + Au plated	2A 30VDC (at 85°C)
		3A 30VDC (at 40°C)
TUV	Silver alloy	1A 125VAC (at 85°C)
		TV-1 125VAC(at 40°C)
	+ Au plated	2A 30VDC (at 85°C)
		3A 30VDC (at 40°C)
		1A 125VAC (at 85°C)
		1(1)A 125VAC(at 70°C)

- Notes:**1) Only typical loads are listed above. Other load specifications can be available upon request.And different loads could have different wiring methods.



HONGFA RELAY

ISO9001,ISO/TS16949,ISO14001,OHSAS18001,IECQ QC 080000 CERTIFIF

2020 Rev. 1.01

## COIL DATA

at 23°C

### Single side stable

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Coil Resistance $\Omega$	Nominal Power mW approx.	Max. Voltage VDC
HFD4 -I/1.5	1.5	$\leq 1.13$	$\geq 0.15$	16 x (1 $\pm$ 10%)	140	2.2
HFD4 -I/2.4	2.4	$\leq 1.8$	$\geq 0.24$	41 x (1 $\pm$ 10%)	140	3.6
HFD4 -I/3	3	$\leq 2.25$	$\geq 0.3$	64.3 x (1 $\pm$ 10%)	140	4.5
HFD4 -I/4.5	4.5	$\leq 3.38$	$\geq 0.45$	145 x (1 $\pm$ 10%)	140	6.7
HFD4 -I/5	5	$\leq 3.75$	$\geq 0.5$	178 x (1 $\pm$ 10%)	140	7.5
HFD4 -I/6	6	$\leq 4.5$	$\geq 0.6$	257 x (1 $\pm$ 10%)	140	9
HFD4 -I/9	9	$\leq 6.75$	$\geq 0.9$	579 x (1 $\pm$ 10%)	140	13.5
HFD4 -I/12	12	$\leq 9$	$\geq 1.2$	1028 x (1 $\pm$ 10%)	140	18
HFD4 -I/24	24	$\leq 18$	$\geq 2.4$	2880 x (1 $\pm$ 10%)	200	36

### 1 coil latching

Coil Code	Nominal Voltage VDC	Set Voltage VDC max.	Reset Voltage VDC max.	Coil Resistance $\Omega$	Nominal Power mW approx.	Max. Voltage VDC
HFD4 -I/1.5-L	1.5	$\leq 1.13$	$\leq 1.13$	22.5 x (1 $\pm$ 10%)	100	3
HFD4 -I/2.4-L	2.4	$\leq 1.8$	$\leq 1.8$	57.6 x (1 $\pm$ 10%)	100	4.8
HFD4 -I/3-L	3	$\leq 2.25$	$\leq 2.25$	90 x (1 $\pm$ 10%)	100	6
HFD4 -I/4.5-L	4.5	$\leq 3.38$	$\leq 3.38$	202.5 x (1 $\pm$ 10%)	100	9
HFD4 -I/5-L	5	$\leq 3.75$	$\leq 3.75$	250 x (1 $\pm$ 10%)	100	10
HFD4 -I/6-L	6	$\leq 4.5$	$\leq 4.5$	360 x (1 $\pm$ 10%)	100	12
HFD4 -I/9-L	9	$\leq 6.75$	$\leq 6.75$	810 x (1 $\pm$ 10%)	100	18
HFD4 -I/12-L	12	$\leq 9$	$\leq 9$	1440 x (1 $\pm$ 10%)	100	24
HFD4 -I/24-L	24	$\leq 18$	$\leq 18$	2880 x (1 $\pm$ 10%)	200	36

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

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

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.

## ORDERING INFORMATION

Type	HFD4-I/	24	-L	S	R (XXX)
Coil voltage	1.5, 2.4, 3, 4.5, 5, 6, 9, 12, 24VDC				
Sort	L: 1 coil latching		Nil: Single side stable		
Terminal type	S: Standard SMT		S1: Short terminal SMT		
	S3: J-legs SMT		Nil: DIP		
Packing style	R: Tape and reel packing (Only for SMT type) <sup>1)</sup>				
	Nil: Tube packing(Only for DIP type)				
Special code <sup>3)</sup>	XXX: Customer special requirement		Nil: Standard		

Notes: 1) 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 10 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.

2) When coil sort, contact material, terminal type or packing style are needed, please add "-" after coil voltage is selected. For instance, HFD4-I/12-SR.

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.

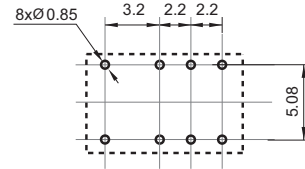
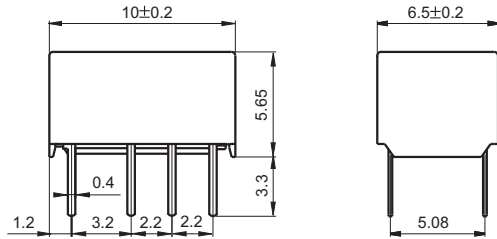
# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

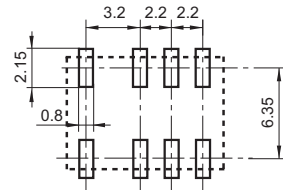
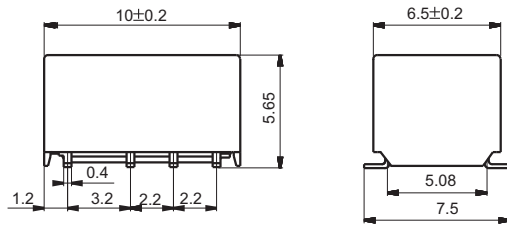
## Outline Dimensions

## PCB Layout (Bottom view)

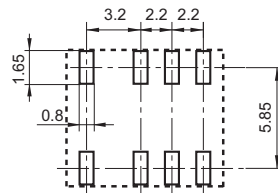
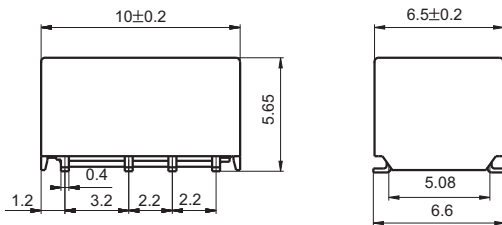
DIP type



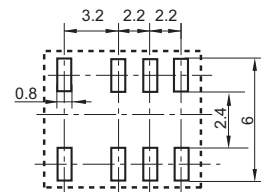
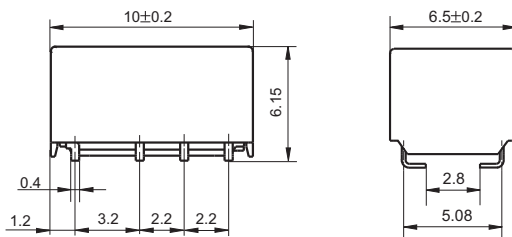
Standard SMT type



Short terminal SMT type



J-legs SMT type



# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

## Wiring Diagram

(Bottom view)



No energized condition

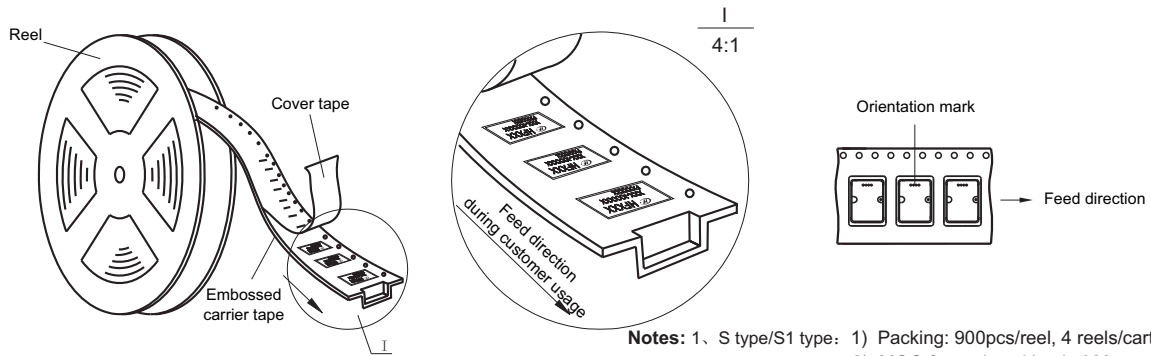
Reset condition

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  $\pm 0.1\text{mm}$ .

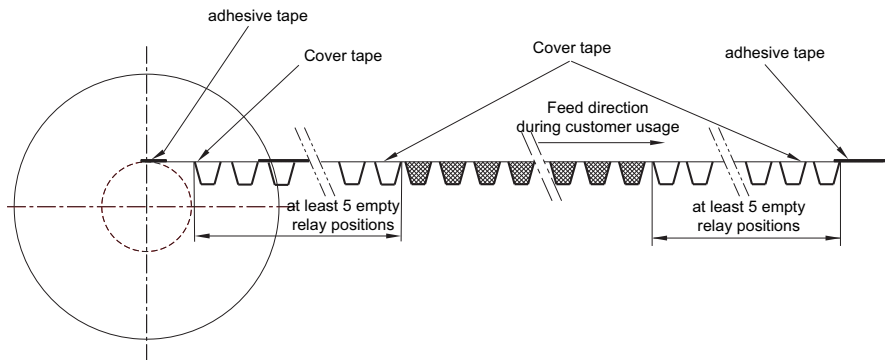
## TAPE PACKING

Unit: mm

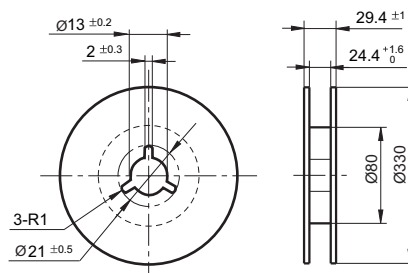
### Direction of Relay Insertion



**Notes:** 1、S type/S1 type: 1) Packing: 900pcs/reel, 4 reels/carton.  
 2) MOQ for reel packing is 900pcs.  
 2、S3 type: 1) Packing: 850pcs/reel, 4 reels/carton.  
 2) MOQ for reel packing is 850pcs.



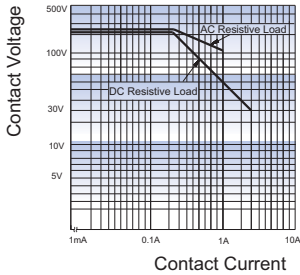
### Reel Dimensions



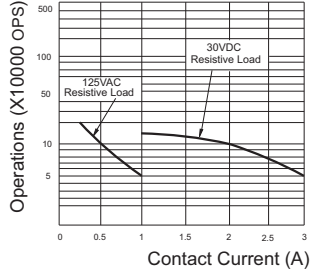


## CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

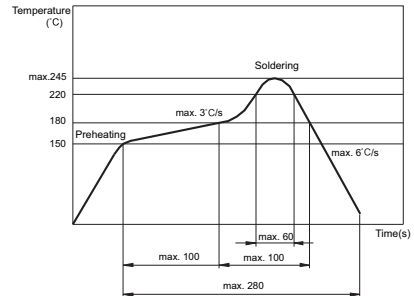


ENDURANCE CURVE



**Test conditions:**  
Energized with rated voltage  
Resistive load, 1s on 9s off.

REFLOW WELDING, TEMPERATURE  
ON PCB BOARD  
RECOMMENDED WELDING TEMPERATURE



### Notice

- 1) This relay is highly sensitive polarized relay, if correct polarity is not applied to the coil terminals, the relay does not operate properly.
- 2) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.
- 3) Relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, it should be changed to the "set" status when application(connecting to the power supply). Please reset the relay to "set" or "reset" status on request.
- 4) Energizing coil with rated voltage is basic for normal operation of a relay, please make sure the energized voltage to relay coil have reached the rated voltage. Regarding latching relay, in order to maintain the "set" or "reset" status, impulse width of the rated voltage applied to coil should be more than 5 times of "set" or "reset" time.
- 5) For monostable relays, if the regulator needs to be stepped down after reliable operation, please ensure that the effective value of the holding voltage is not lower than 60% of the rated voltage;
- 6) For the in-line relay welding method, please use wave soldering or manual soldering. If reflow soldering is required, please confirm the feasibility with our company;
- 7) The relay may be damaged because of falling or when shocking conditions exceed the requirement.
- 8) For SMT products, validation with real application should be done before your series production, if the reflow-soldering temperature curve is out of our recommendation. Generally, two-time reflow-soldering is not recommended for the relay. However, if two-time reflow-soldering is required, a 60-min. interval should be guaranteed and a validation should be done before production.
- 9) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
- 10) Regarding the plastic sealed relay, we should leave it cooling naturally until below 40°C after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40°C. Please avoid cleaning the relay by ultrasonic, avoid using the solvents like gasoline, Freon, and so on, which would affect the configuration of relay or influence the environment.
- 11) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidelines of relay".
- 12) Relays packaged in moisture barrier bags meet MSL-3 requirements. The relays should be stored at ambient conditions of  $\leq 30^\circ\text{C}$  and  $\leq 60\%$  RH after they are removed from their packaging, and should be used within 168 hours. If the relays cannot be used within 168 hours, please repack them or store them in a drying oven at  $25^\circ\text{C} \pm 5^\circ\text{C}$ ,  $\leq 10\%$  RH. Otherwise, relays may be subjected to a soldering test to check their performance, or they may be used after keeping them in an oven for 72 hours at with  $50^\circ\text{C} \pm 5^\circ\text{C}$ ,  $\leq 30\%$  RH.

### 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.