

HFD4-I

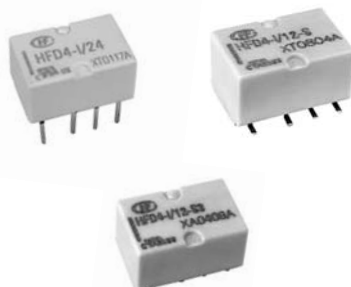
SUBMINIATURE HIGH LOAD RELAY

cRLUS

File No.:E133481



File No.:R50333270



Features

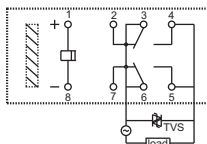
- Surge withstand current up to 3.5A(Valid value)
- Available in accordance with IEC 60335-1
- Low power consumption
- Single side stable and latching type available

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 ⁷ OPS
Electrical endurance	Resistive load 1 x 10 ⁵ ops (85°C, 1s on 9s off, 2A 30VDC) 5 x 10 ⁴ ops (40°C, 1s on 9s off, 3A 30VDC) 1 x 10 ⁵ ops (85°C, 1s on 9s off, 0.3A 125VAC) 5 x 10 ⁴ ops (85°C, 1s on 9s off, 1A 125VAC)
	Inductive load ⁽³⁾ 1 x 10 ⁵ OPS [Inrush current 3.5A (250ms) / steady state current 1A 30VAC cos Ø=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 ²
	Destructive	980m/s ²
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) 1A 125VAC (at 85°C)
		TV-1 125VAC(at 40°C)
TUV	Silver alloy + 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 Ω	Nominal Power mW approx.	Max. Voltage VDC
HFD4 -I/1.5	1.5	≤ 1.13	≥ 0.15	16 x (1 $\pm$ 10%)	140	2.2
HFD4 -I/2.4	2.4	≤ 1.8	≥ 0.24	41 x (1 $\pm$ 10%)	140	3.6
HFD4 -I/3	3	≤ 2.25	≥ 0.3	64.3 x (1 $\pm$ 10%)	140	4.5
HFD4 -I/4.5	4.5	≤ 3.38	≥ 0.45	145 x (1 $\pm$ 10%)	140	6.7
HFD4 -I/5	5	≤ 3.75	≥ 0.5	178 x (1 $\pm$ 10%)	140	7.5
HFD4 -I/6	6	≤ 4.5	≥ 0.6	257 x (1 $\pm$ 10%)	140	9
HFD4 -I/9	9	≤ 6.75	≥ 0.9	579 x (1 $\pm$ 10%)	140	13.5
HFD4 -I/12	12	≤ 9	≥ 1.2	1028 x (1 $\pm$ 10%)	140	18
HFD4 -I/24	24	≤ 18	≥ 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 Ω	Nominal Power mW approx.	Max. Voltage VDC
HFD4 -I/1.5-L	1.5	≤ 1.13	≤ 1.13	22.5 x (1 $\pm$ 10%)	100	3
HFD4 -I/2.4-L	2.4	≤ 1.8	≤ 1.8	57.6 x (1 $\pm$ 10%)	100	4.8
HFD4 -I/3-L	3	≤ 2.25	≤ 2.25	90 x (1 $\pm$ 10%)	100	6
HFD4 -I/4.5-L	4.5	≤ 3.38	≤ 3.38	202.5 x (1 $\pm$ 10%)	100	9
HFD4 -I/5-L	5	≤ 3.75	≤ 3.75	250 x (1 $\pm$ 10%)	100	10
HFD4 -I/6-L	6	≤ 4.5	≤ 4.5	360 x (1 $\pm$ 10%)	100	12
HFD4 -I/9-L	9	≤ 6.75	≤ 6.75	810 x (1 $\pm$ 10%)	100	18
HFD4 -I/12-L	12	≤ 9	≤ 9	1440 x (1 $\pm$ 10%)	100	24
HFD4 -I/24-L	24	≤ 18	≤ 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

	HFD4-I/	24	-L	S	R	(XXX)
Type						
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) ¹⁾ Nil: Tube packing(Only for DIP type)					
Special code ³⁾	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.

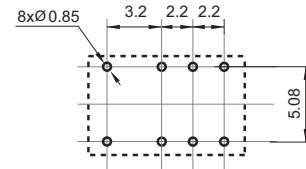
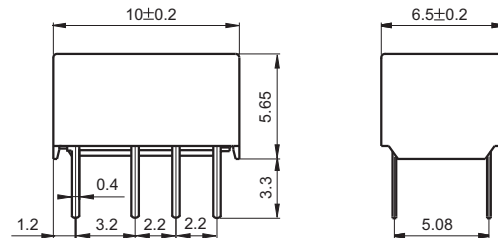
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

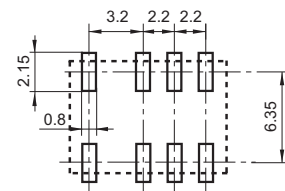
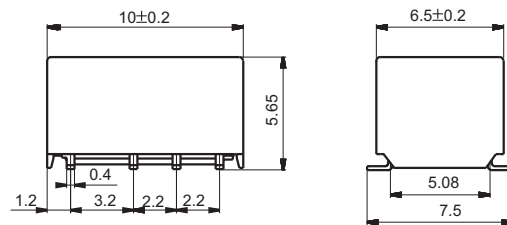
Outline Dimensions

PCB Layout
(Bottom view)

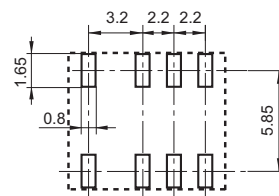
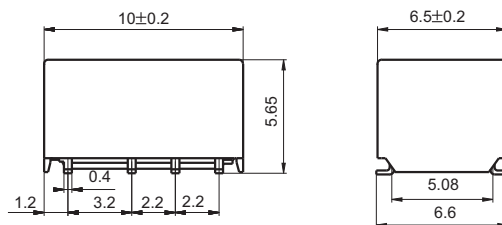
DIP type



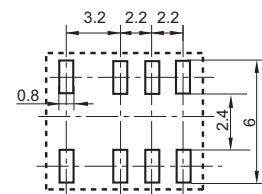
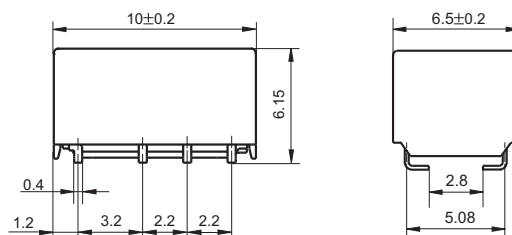
Standard
SMT type



Short terminal
SMT type



J-legs
SMT type



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram

(Bottom view)

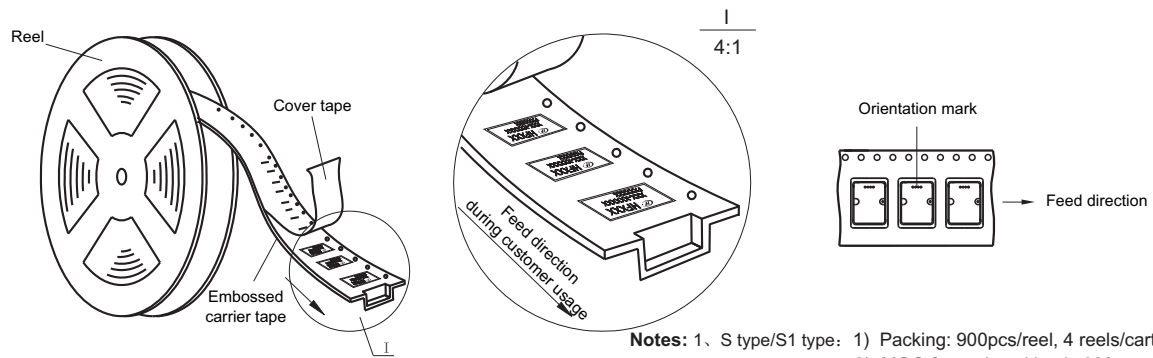


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.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

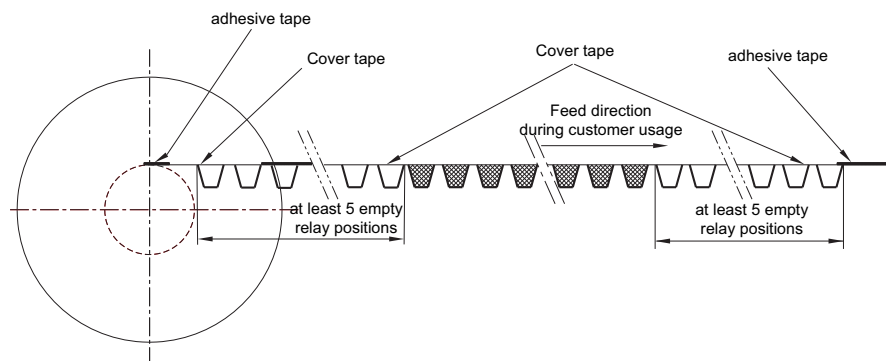
TAPE PACKING

Unit: mm

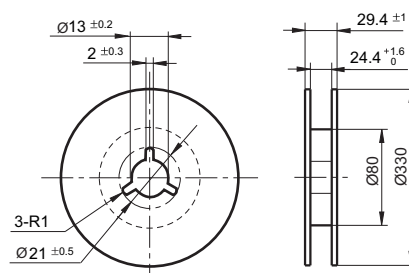
Direction of Relay Insertion



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



Technical drawing of a mechanical part, showing a front view and two cross-sections (A-A and B-B).

Front View Dimensions:

- Overall width: 24.0 ± 0.3
- Overall height: 11.5
- Distance from top edge to center of first hole: 1.75
- Distance between centers of first and second holes: 2
- Distance between centers of second and third holes: 4
- Distance between centers of third and fourth holes: 12
- Distance from center of fourth hole to right edge: 4
- Hole diameters: $\varnothing 1.5^{+0.1}_0$ (top edge), $\varnothing 2$ (center)

Cross-section A-A Dimensions:

- Width: 8.1 ± 0.2
- Height: 3

Cross-section B-B Dimensions:

- Width: 6
- Height: 10.4 ± 0.2
- Top flange width: 0.5 ± 0.05
- Top flange height: 3

Technical drawing of a mechanical part, showing a side view and two cross-sections (A-A and B-B).

Side View Dimensions:

- Overall width: 24.0 ± 0.3
- Overall height: 11.5
- Top flange thickness: 1.75
- Distance from top edge to centerline: 4
- Distance between centers of adjacent rectangular features: 12
- Radius of the top flange: $R2$
- Radius of the bottom flange: $R3$
- Radius of the internal fillet: $R1$
- Internal hole diameter: $\varnothing 1.5^{+0.1}_0$
- Section line A-A is indicated by arrows pointing to the right.
- Section line B-B is indicated by arrows pointing to the right.

Cross-section A-A Dimensions:

- Top flange thickness: 3
- Internal hole diameter: $\varnothing 1.5^{+0.1}_0$
- Bottom flange thickness: 7 ± 0.2
- Section line A-A is indicated by arrows pointing to the left.

Cross-section B-B Dimensions:

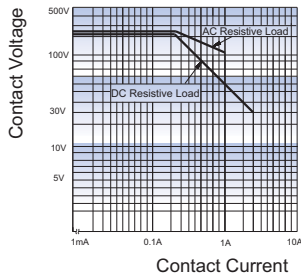
- Top flange thickness: 0.5 ± 0.05
- Internal hole diameter: $\varnothing 1.5^{+0.1}_0$
- Bottom flange thickness: 10.4 ± 0.2
- Section line B-B is indicated by arrows pointing to the left.

The drawing shows a mechanical part with the following dimensions and features:

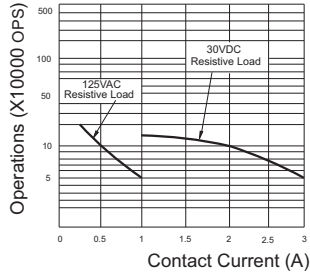
- Front View:**
 - Overall width: 24.0 ± 0.3
 - Overall height: 17.5
 - Distance from top edge to center of first hole: 11.5
 - Distance between hole centers: 12
 - Hole diameter: $\varnothing 1.5^{+0.1}_0$
 - Section line A-A is indicated.
- Side View A-A:**
 - Width: 7 ± 0.2
 - Top surface angle: 3°
 - Section line A-A is indicated.
- Section B-B:**
 - Overall height: 10.4 ± 0.2
 - Overall width: 6.5
 - Top flange width: 0.5 ± 0.05
 - Section line B-B is indicated.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



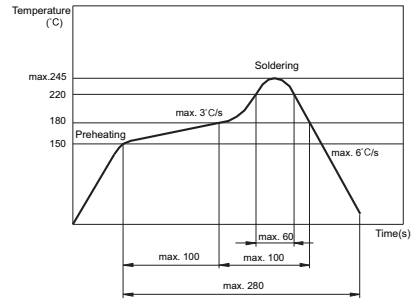
ENDURANCE CURVE



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.