HFD3

SUBMINIATURE SIGNAL RELAY

Features

- Surge withstand voltage up to 2500VAC, meets FCC Part 68 and Telecordia
- Meets EN60950 / EN41003
- SMT and DIP types available
- Bifurcated contacts
- Single side stable and latching type available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (15.0 x 7.5 x 9.0) mm

CONTACT DATA

Contact arrangement	2C
Contact resistance	100mΩ max.(at 10mA 30mVDC)
Contact material	AgNi + Au plated
Contact rating (Res. load)	2A 30VDC
	0.5A 125VAC
Max. switching current	2A
Max. switching voltage	250VAC / 220VDC
Max. switching power	62.5VA / 60W
Min. applicable load [1]	10mV 10µA
Mechanical endurance	1 x 10^8OPS
Electrical endurance[2]	1 x 10^5OPS, 0.5A 125VAC, Resistive load, at 85°C, 1s on 9s off

Notes: 1) 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.
2) Electric endurance data are collected in one pair CO contact test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min[1]
	Between open contacts	1000VAC 1min
	Between contact sets	1500VAC 1min
Surge withstand voltage		
Between open contacts (10/160µs)		1500VAC (FCC part 68)
Between coil & contacts (2/10µs)		2500VAC (Telecordia)
Operate time (Set time)		4ms max.
Release time (Reset time)		4ms max.
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Vibration resistance		10Hz to 55Hz 3.3mm DA
Shock resistance	Functional	735m/s²
	Destructive	980m/s²
Termination		DIP, SMT
Unit weight		Approx. 2g
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 A

SAFETY APPROVAL RATINGS

UL/CUL	2A 30VDC at 85°C
	0.5A 125VAC at 85°C
VDE	2A 30VDC at 85°C
	0.5A 125VAC 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.

COIL

Coil power	Single side stable	Approx. 140mW
	1 coil latching	Approx. 100mW
	2 coils latching	Approx. 200mW
Temperature rise		50K max.

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
HFD3/1.5	1.5	1.13	0.15	16 x (1±10%)	140	2.2
HFD3/2.4	2.4	1.8	0.24	41 x (1±10%)	140	3.6
HFD3/3	3	2.25	0.3	64.3 x (1±10%)	140	4.5
HFD3/4.5	4.5	3.38	0.45	145 x (1±10%)	140	6.7
HFD3/5	5	3.75	0.5	178 x (1±10%)	140	7.5
HFD3/6	6	4.5	0.6	257 x (1±10%)	140	9
HFD3/9	9	6.75	0.9	579 x (1±10%)	140	13.5
HFD3/12	12	9	1.2	1028 x (1±10%)	140	18
HFD3/24	24	18	2.4	4114 x (1±10%)	140	36
HFD3/48	48	36	4.8	8533 x (1±10%)	270	57.6

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
HFD3/1.5-L1	1.5	1.13	1.13	22.5 x (1±10%)	100	2.7
HFD3/2.4-L1	2.4	1.8	1.8	58 x (1±10%)	100	4.3
HFD3/3-L1	3	2.25	2.25	90 x (1±10%)	100	5.4
HFD3/4.5-L1	4.5	3.38	3.38	203 x (1±10%)	100	8.1
HFD3/5-L1	5	3.75	3.75	250 x (1±10%)	100	9
HFD3/6-L1	6	4.5	4.5	360 x (1±10%)	100	10.8
HFD3/9-L1	9	6.75	6.75	810 x (1±10%)	100	16.2
HFD3/12-L1	12	9	9	1440 x (1±10%)	100	21.6
HFD3/24-L1	24	18	18	5760 x (1±10%)	100	43.2

2 coils latching

Coil Code	Nominal Voltage VDC	Set Voltage VDC max.	Reset Voltage VDC max.	Coil Resistance Ω	Nominal Power mW approx.	Max. Voltage VDC
HFD3/1.5-L2	1.5	1.13	1.13	11.2 x (1±10%)	200	2.2
HFD3/2.4-L2	2.4	1.8	1.8	29 x (1±10%)	200	3.6
HFD3/3-L2	3	2.25	2.25	45 x (1±10%)	200	4.5
HFD3/4.5-L2	4.5	3.38	3.38	101 x (1±10%)	200	6.7
HFD3/5-L2	5	3.75	3.75	125 x (1±10%)	200	7.5
HFD3/6-L2	6	4.5	4.5	180 x (1±10%)	200	9.0
HFD3/9-L2	9	6.75	6.75	405 x (1±10%)	200	13.5
HFD3/12-L2	12	9	9	720 x (1±10%)	200	18
HFD3/24-L2	24	18	18	2880 x (1±10%)	200	36

Notes: 1) When user's requirements can't be found in the above table,special order allowed.

2) 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

HFD3	/	24	-L2	S	R	(XXX)

Type

Coil voltage 1.5, 2.4, 3, 4.5, 5, 6, 9, 12, 24, 48VDC[1]

Sort
L1: 1 coil latching   Nil: Single side stable
L2: 2 coils latching

Terminal type S: Standard SMT   S1: Short terminal SMT   Nil: DIP

Packing style
R: Tape and reel packing (Only for SMT type)[2]
Nil: Tube packing(Only for DIP type)

Special code[3]   XXX: Customer special requirement   Nil: Standard

Notes: 1) 48VDC coil voltage is only for single side stable version.
   2) For the R type, the letter "R" will only be printed on packing tag and will not appear on relay cover.
   3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(131): The Dielectric strength
      between coil & contacts is 3000VAC 1min for single side stable and 1 coil latching version.
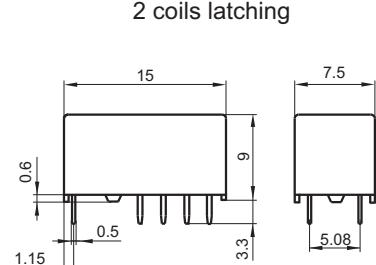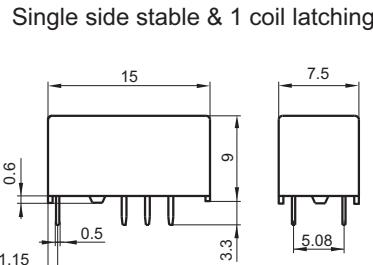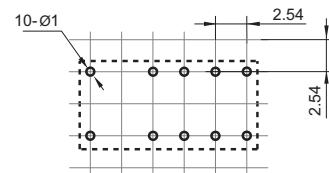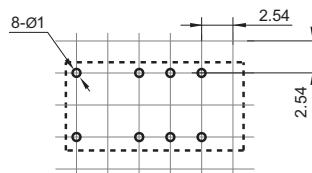
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT   Unit: mm

Single side stable & 1 coil latching   2 coils latching

Outline Dimensions
(DIP type)

Single side stable & 1 coil latching   2 coils latching

PCB Layout
(DIP type)
(Bottom view)
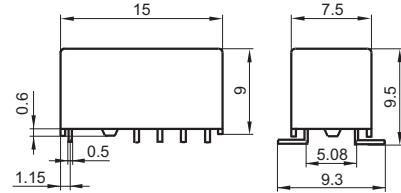
Outline Dimensions
(S type: Standard SMT)

Single side stable & 1 coil latching
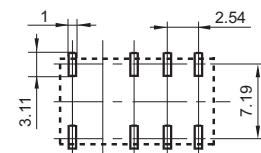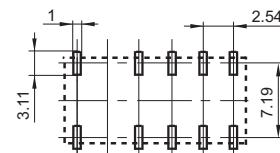
2 coils latching

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

Single side stable & 1 coil latching
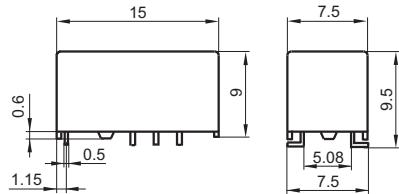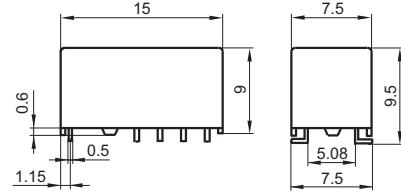
2 coils latching

Outline Dimensions
(S1 type: Short terminal SMT)

Single side stable & 1 coil latching
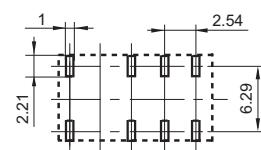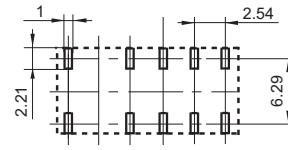
2 coils latching

**PCB Layout**
(S1 type: Short terminal SMT)
(Bottom view)

Single side stable & 1 coil latching
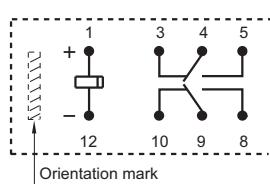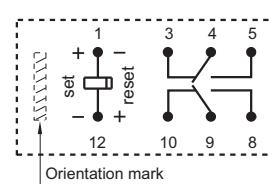
2 coils latching

Wiring Diagram
(Bottom view)

Single side stable
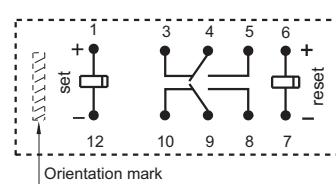
1 coil latching

2 coils latching

No energized condition
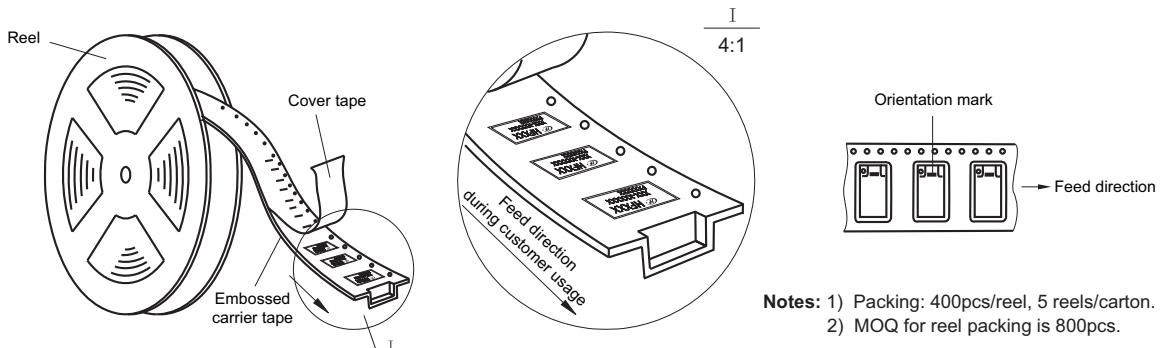
Reset condition

Reset condition
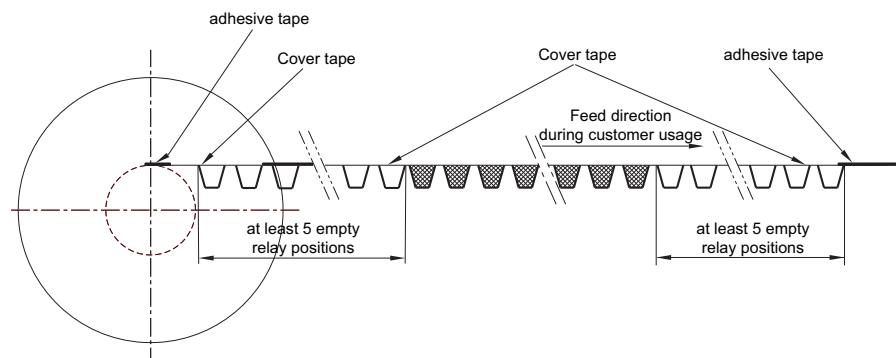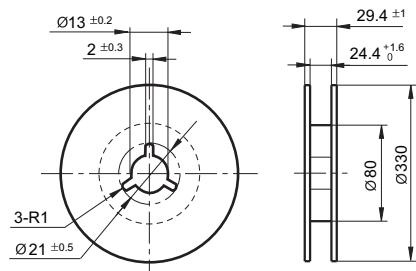
Direction of Relay Insertion

Reel

Cover tape

Embossed carrier tape

$\frac{\mathrm{I}}{4:1}$

Feed direction during customer usage

Orientation mark

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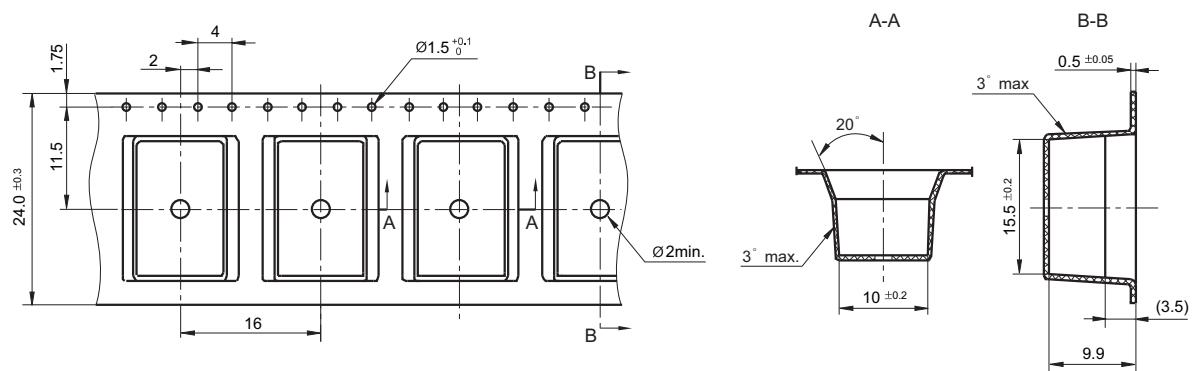
Notes: 1) Packing: 400pcs/reel, 5 reels/carton.
2) MOQ for reel packing is 800pcs.

adhesive tape

Cover tape

Cover tape

adhesive tape

Feed direction during customer usage

at least 5 empty relay positions

at least 5 empty relay positions

Reel Dimensions

Ø13 ±0.2

2 ±0.3

3-R1

Ø21 ±0.5

29.4 ±1

24.4 $^{+1.6}_{0}$

Ø80

Ø330

Tape Dimensions (S type: Standard SMT)

1.75

2

4

Ø1.5 $^{+0.1}_{0}$

B

24.0 ±0.3

11.5

A

A

16

B

Ø2min.

A-A

20°

3° max.

10 ±0.2

B-B

0.5 ±0.05

3° max

15.5 ±0.2

(3.5)

9.9
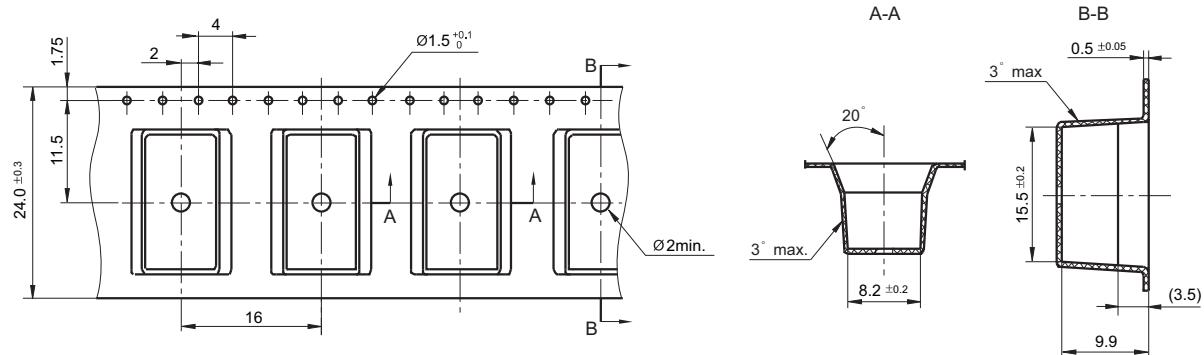
## TAPE PACKING
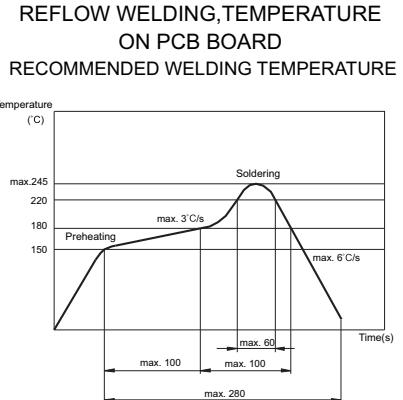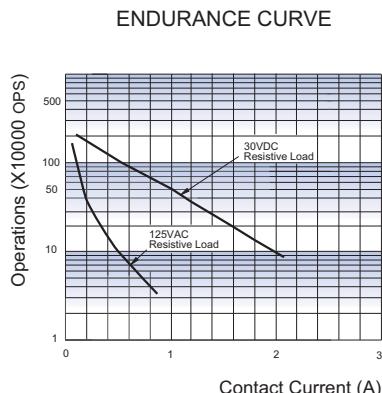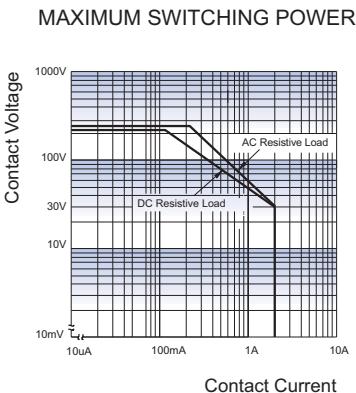
### Tape Dimensions (S1 type: Short terminal SMT)

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.
3) The width of the gridding is 2.54mm.

## CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

ENDURANCE CURVE

Test conditions:
Resistive load, at 85°C, 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 2 coil latching relay, do not energize voltage to "set" coil and "reset" coil simultaneously.

6) The relay may be damaged because of falling or when shocking conditions exceed the requirement.

7) 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.

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

9) Regarding the plastic sealed relay, we should leave it cooling naturally untill 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.

10) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidtines of relay".

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.