HFD4

SUBMINIATURE SIGNAL RELAY

c **RU** US

File No.:E133481

Features

- Offers excellent board space savings
- Surge withstand voltage up to 2500V, meets FCC Part 68 and Telecordia
- Meets EN60950/EN41003
- SMT and DIP types available
- High contact capacity 2A 30VDC
- Low power consumption
- Single side stable and latching type available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (10.0 x 6.5 x 5.4) mm

CONTACT DATA

Contact arrangement	2C
Contact resistance	70mΩ
Contact material	Silver alloy, Gold clad
Contact rating (Res. load)	2A 30VDC
	0.5A 125VDC
Max. switching current	2A
Max. switching voltage	220VDC / 250VAC
Max. switching power	60W / 62.5VA
Min. applicable load	10mV 10µA
Mechanical endurance	1×10^8OPS
Electrical endurance	1×10^5OPS (at 2A 30VDC)
	1×10^5OPS (at 0.5A 125VAC)

COIL

Coil power	Single side stable	See "COIL DATA"
	1 coil latching	See "COIL DATA"
Temperature rise		50K max.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1800VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	1800VAC 1min
Surge withstand voltage Between open contacts (10×160µs) Between coil & contacts (2×10µs)		1500VAC (FCC part 68) 2500VAC (Telecordia)
Operate time (Set time)		3ms max.
Release time (Reset time)		3ms max.
Ambient temperature		-40°C to 85°C
Humidity		98% RH, 40 °C
Vibration resistance	Functional	10Hz to 55Hz 3.3mm DA
	Destructive	10Hz to 55Hz 5.0mm DA
Shock resistance	Functional	735m/s^2
	Destructive	980m/s^2
Termination		DIP, SMT
Unit weight		Approx. 0.8g
Construction		Wash tight

Notes: The data shown above are initial values.

COIL DATA

Single side stable

Order Number	Nominal Voltage VDC	Pick-up Voltage VDC	Drop-out Voltage VDC	Coil Resistance Ω	Nominal Power mW	Max. Allowable Voltage VDC
HFD4/1.5	1.5	1.13	0.15	16 x (1±10%)	140	2.2
HFD4/3	3	2.25	0.3	64.3 x (1±10%)	140	4.5
HFD4/4.5	4.5	3.38	0.45	145 x (1±10%)	140	6.7
HFD4/5	5	3.75	0.5	178 x (1±10%)	140	7.5
HFD4/6	6	4.5	0.6	257 x (1±10%)	140	9.0
HFD4/9	9	6.75	0.9	579 x (1±10%)	140	13.5
HFD4/12	12	9	1.2	1028 x (1±10%)	140	18.0
HFD4/24	24	18	2.4	2880 x (1±10%)	200	36.0

1 coil latching

Order Number	Nominal Voltage VDC	Pick-up Voltage VDC	Drop-out Voltage VDC	Coil Resistance Ω	Nominal Power mW	Max. Allowable Voltage VDC
HFD4/1.5-L	1.5	1.13	1.13	22.5x (1±10%)	100	3.0
HFD4/3-L	3	2.25	2.25	90x (1±10%)	100	6.0
HFD4/4.5-L	4.5	3.38	3.38	203x (1±10%)	100	9.0
HFD4/5-L	5	3.75	3.75	250x (1±10%)	100	10.0
HFD4/6-L	6	4.5	4.5	360x (1±10%)	100	12.0
HFD4/9-L	9	6.75	6.75	810x (1±10%)	100	18.0
HFD4/12-L	12	9	9	1440x (1±10%)	100	24.0
HFD4/24-L	24	18	18	2880x (1±10%)	200	36.0

Notes: When user's requirements can't be found in the above table, please contact us.

ORDERING INFORMATION

HFD4 / 24 -L S R (XXX)

Type

Coil voltage   1.5, 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   **Nil:** DIP

Packing style   **R:** Tape and reel packing (Only for SMT type) [1]   **Nil:** Tube packing

Customer special code

Notes: 1) For the R type, the letter "R" will only be printed on packing tag and will not appear on relay cover.
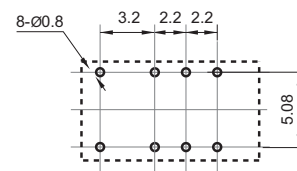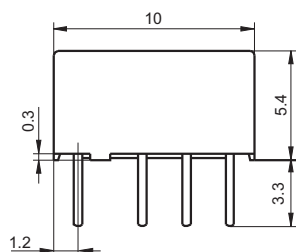
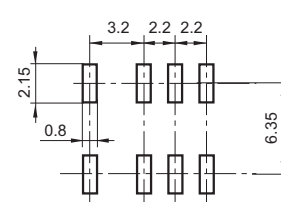## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT
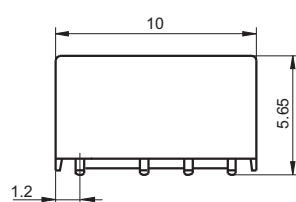
Unit: mm

Outline Dimensions

PCB Layout
(Bottom view)

DIP type

10

6.5

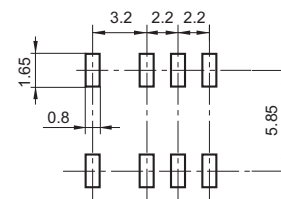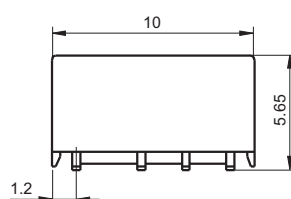0.3

5.4

3.3

1.2

8-Ø0.8

3.2 2.2 2.2

5.08

Standard SMT type

10

6.5

5.65

1.2

7.5

3.2 2.2 2.2

2.15

0.8

6.35

Short terminal SMT type

10

6.5

5.65

1.2

6.6

3.2 2.2 2.2

1.65

0.8

5.85

Wiring Diagram
(Bottom view)

Single side stable

```
     1      2   3   4
  +  o      ●   o   o
  
  -  o      ●   o   o
     8      7   6   5
```
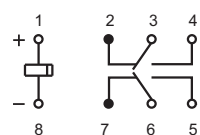
No energized condition

1 coil latching

```
        1          2   3   4
  set + o    -     ●   o   o
        |   reset
  -  o    +        ●   o   o
        8          7   6   5
```
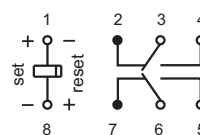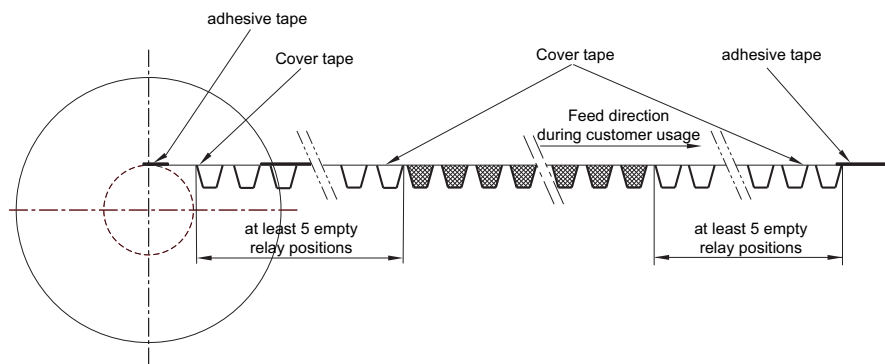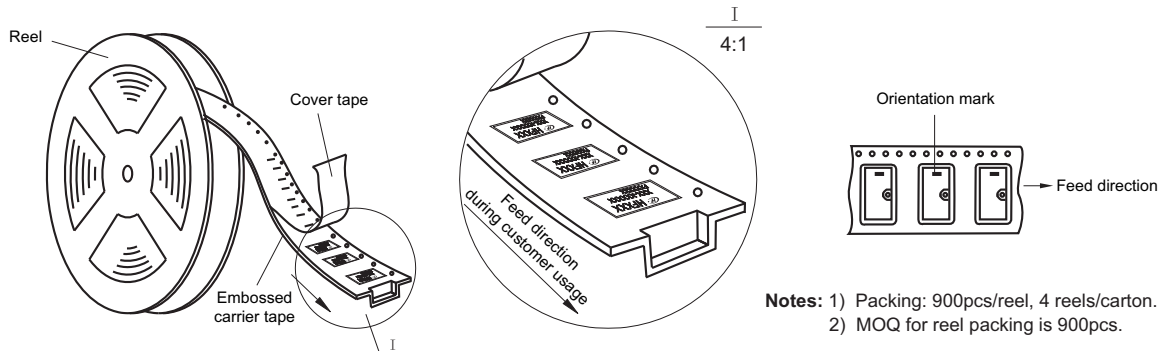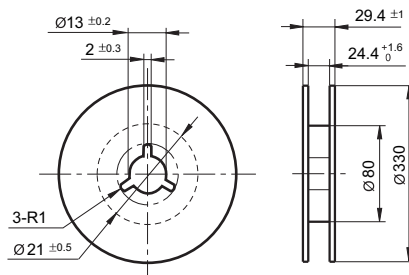
reset condition

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.

TAPE PACKING

Direction of Relay Insertion

Reel

Cover tape

Embossed
carrier tape

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

Feed direction
during customer usage

I

Orientation mark

Feed direction

Notes: 1) Packing: 900pcs/reel, 4 reels/carton.
2) MOQ for reel packing is 900pcs.

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

11.5

24.0 ±0.3

A

A

B

Ø2

12

A-A

3°

8.1 ±0.2

B-B

0.5 ±0.05

3°

10.4 ±0.2

6

59
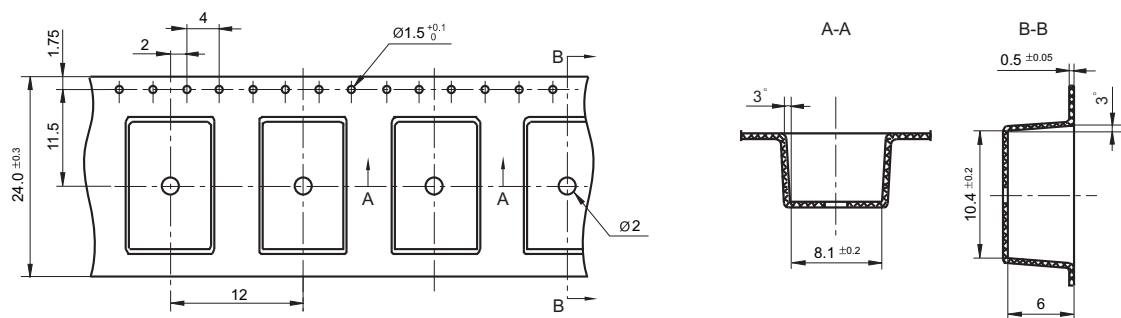
Tape Dimensions (S1 type: Short terminal SMT)
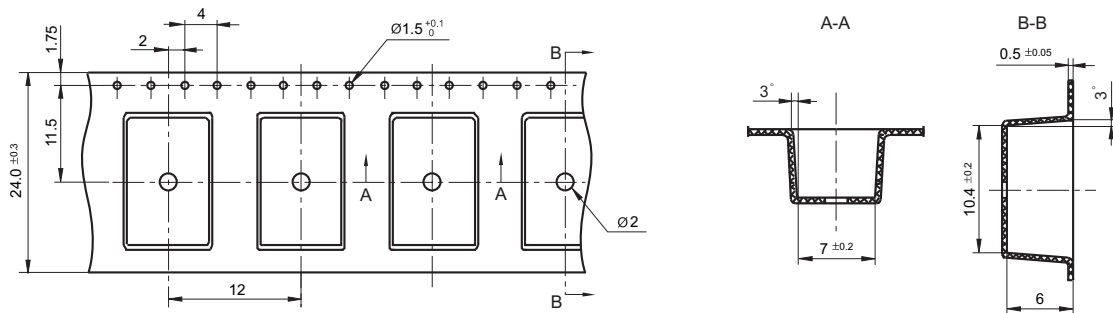
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.54mm.
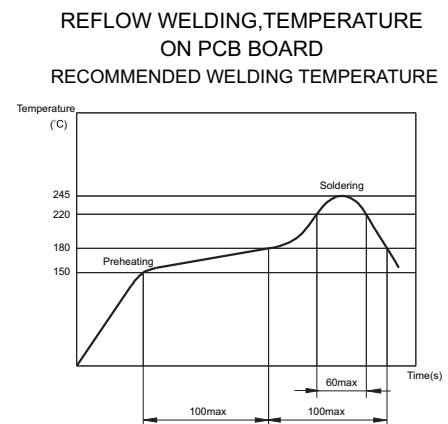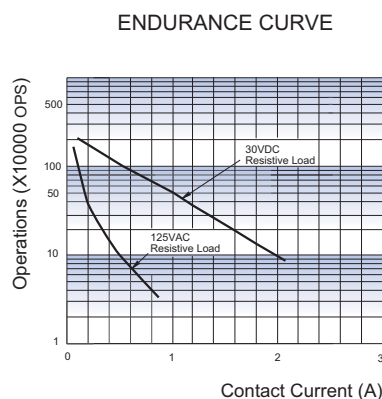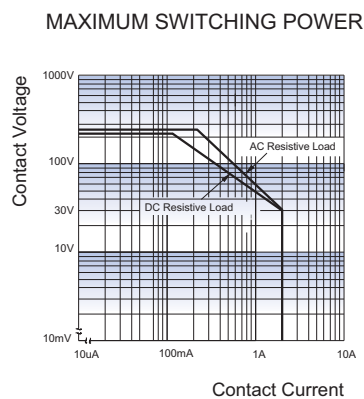
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

Contact Voltage / Contact Current
AC Resistive Load
DC Resistive Load

ENDURANCE CURVE

Operations (X10000 OPS) / Contact Current (A)
30VDC Resistive Load
125VAC Resistive Load

REFLOW WELDING,TEMPERATURE ON PCB BOARD
RECOMMENDED WELDING TEMPERATURE

Temperature (℃) / Time(s)
245, 220, 180, 150
Soldering
Preheating
60max, 100max, 100max

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) In order to maintain the "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be more than 5 times of "set" or "reset" time.

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

6) Regarding the wash tight relay, we should leave it cooling naturally untill below 40℃ after welding, then clean it and deal with coating, remarkably the temperature of solvents should also be controlled below 40℃.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.

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

Disclaimer

This datasheet is for the customers' reference. All the specifications are 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.