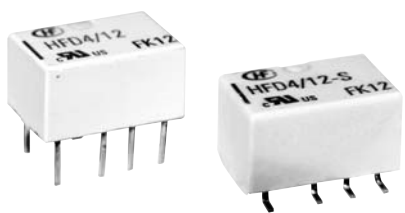



# Datasheet

## SUBMINIATURE SIGNAL RELAY



**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



File No.:E133481

### CONTACT DATA

Contact arrangement	2C
Contact resistance	70mΩ max. (at 0.1A 6VDC)
Contact material	Silver alloy+ 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 <sup>1)</sup>	10mV 10μA
Mechanical endurance	1 x 10 <sup>8</sup> OPS
Electrical endurance	1 x 10 <sup>5</sup> OPS (at 2A 30VDC) 1 x 10 <sup>5</sup> OPS (at 0.5A 125VAC)

**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.

### COIL

Coil power	Single side stable	See "COIL DATA"
	1 coil latching	See "COIL DATA"
Temperature rise	50K max.(At 1A load, 85°C environment)	

### CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	1600VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	1800VAC 1min
Surge withstand voltage		
Between open contacts (10/160μs)	1500VAC (FCC part 68)	
Between coil & contacts (2/10μs)	2500VAC (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	
Vibration resistance	10Hz to 55Hz 3.3mm DA	
Shock resistance	Functional	735m/s <sup>2</sup>
	Destructive	980m/s <sup>2</sup>
Termination	DIP, SMT	
Unit weight	Approx. 0.8g	
Construction	Plastic sealed	

**Notes:** 1) The data shown above are initial values.  
2) UL insulation system: Class A

### SAFETY APPROVAL RATINGS

UL/CUL	1A 30VDC at 85°C
	2A 30VDC at 40°C
	0.5A 125VAC at 40°C

**Notes:** Only some typical ratings are listed above. If more details are required, please contact us.

**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. Allowable Voltage VDC
HFD4/1.5	1.5	1.13	0.15	16 x (1±10%)	140	2.2
HFD4/2.4	2.4	1.8	0.24	41 x (1±10%)	140	3.6
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**

Coil Code	Nominal Voltage VDC	Set Voltage VDC max.	Reset Voltage VDC max.	Coil Resistance $\Omega$	Nominal Power mW approx.	Max. Allowable Voltage VDC
HFD4/1.5-L	1.5	1.13	1.13	22.5 x (1±10%)	100	3.0
HFD4/2.4-L	2.4	1.8	1.8	58 x (1±10%)	100	4.8
HFD4/3-L	3	2.25	2.25	90 x (1±10%)	100	6.0
HFD4/4.5-L	4.5	3.38	3.38	203 x (1±10%)	100	9.0
HFD4/5-L	5	3.75	3.75	250 x (1±10%)	100	10.0
HFD4/6-L	6	4.5	4.5	360 x (1±10%)	100	12.0
HFD4/9-L	9	6.75	6.75	810 x (1±10%)	100	18.0
HFD4/12-L	12	9	9	1440 x (1±10%)	100	24.0
HFD4/24-L	24	18	18	2880 x (1±10%)	200	36.0

**Notes:** 1) For a relay to work normally, the application of rated voltage to the coil is needed.

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.

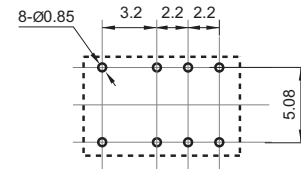
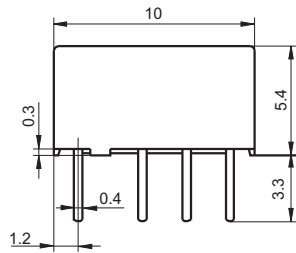
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

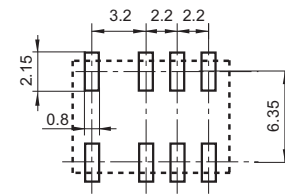
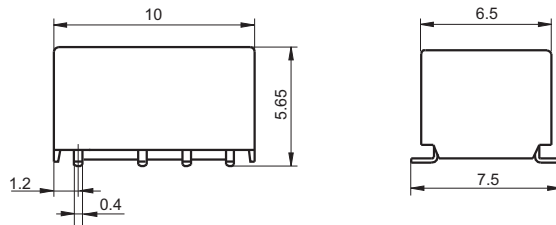
Outline Dimensions

PCB Layout  
(Bottom view)

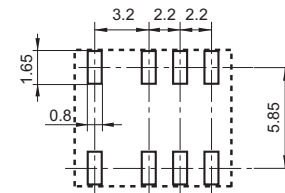
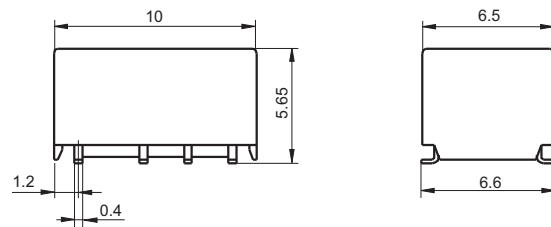
DIP type



Standard SMT type



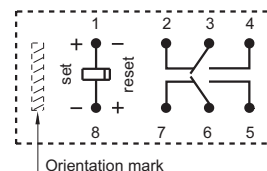
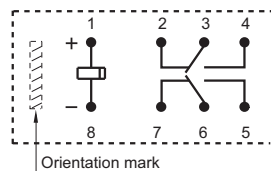
Short terminal SMT type



Wiring Diagram  
(Bottom view)

Single side stable

1 coil latching



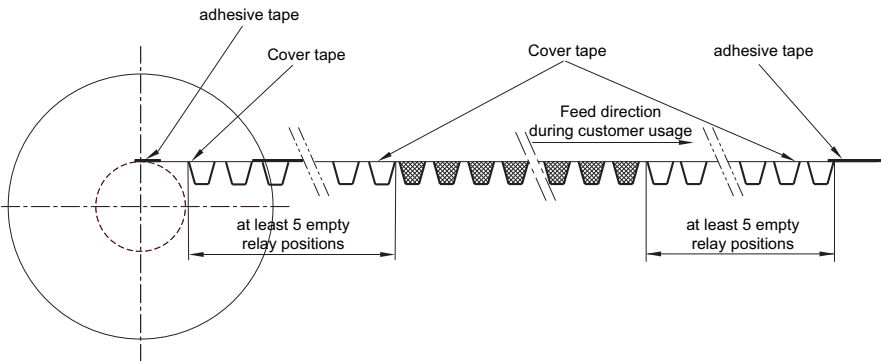
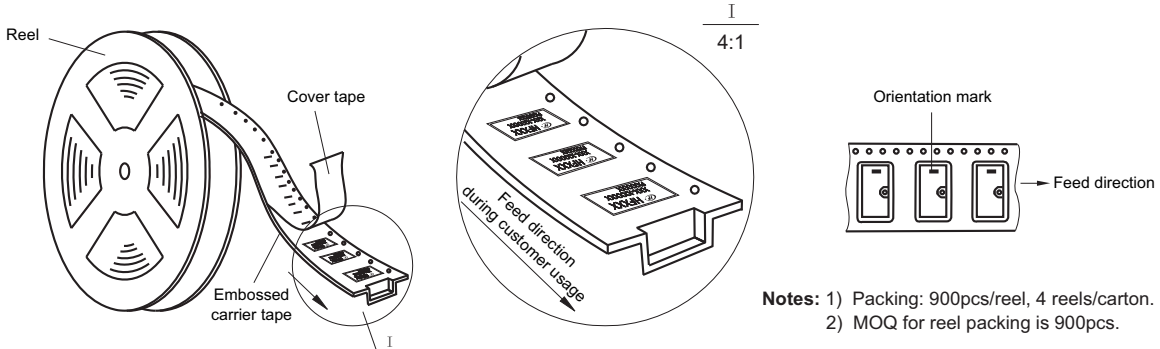
No energized condition

Reset condition

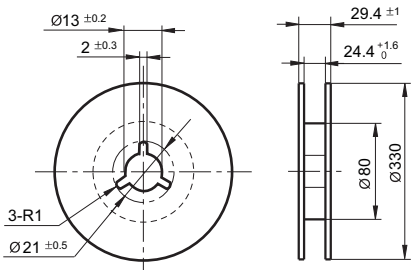
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1\text{mm}$ , tolerance should be  $\pm 0.2\text{mm}$ ; outline dimension  $> 1\text{mm}$  and  $\leq 5\text{mm}$ , tolerance should be  $\pm 0.3\text{mm}$ ; outline dimension  $> 5\text{mm}$ , tolerance should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

TAPE PACKING

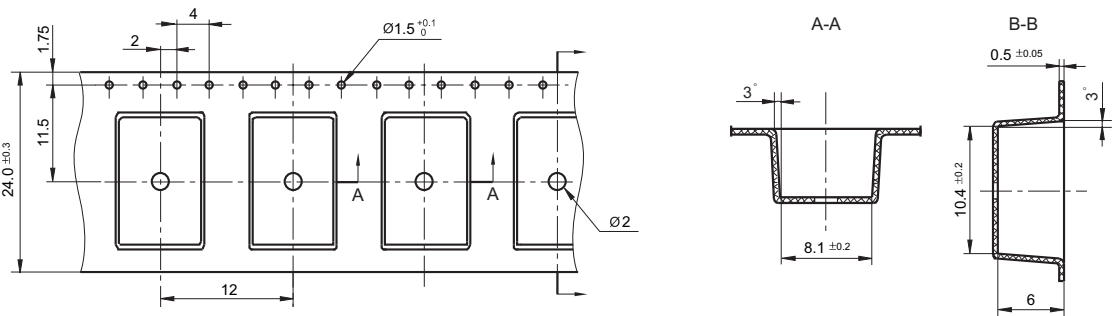
Direction of Relay Insertion



Reel Dimensions

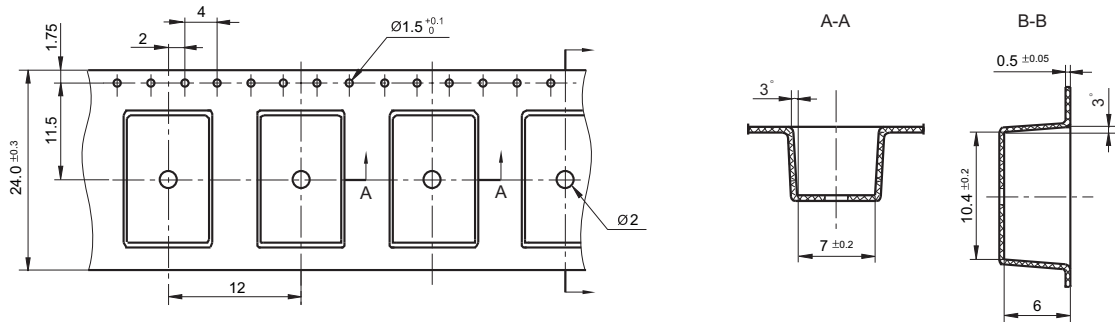


Tape Dimensions (S type: Standard SMT)



TAPE PACKING

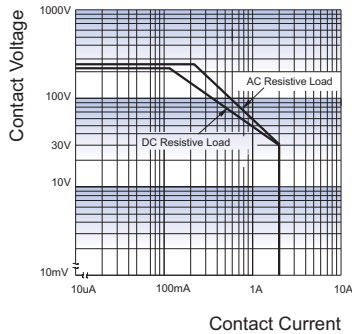
Tape Dimensions (S1 type: Short terminal SMT)



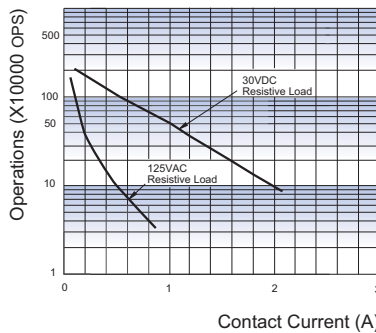
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1\text{mm}$ , tolerance should be  $\pm 0.2\text{mm}$ ; outline dimension  $> 1\text{mm}$  and  $\leq 5\text{mm}$ , tolerance should be  $\pm 0.3\text{mm}$ ; outline dimension  $> 5\text{mm}$ , tolerance should be  $\pm 0.4\text{mm}$ .  
 2) The tolerance without indicating for PCB layout is always  $\pm 0.1\text{mm}$ .  
 3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

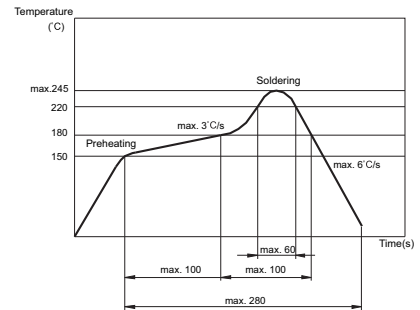
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



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 arisen 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) The relay may be damaged because of falling or when shocking conditions exceed the requirement.
- 6) 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.
- 7) 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.
- 8) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidelines 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.