

HFD2

SUBMINIATURE DIP RELAY



File No.:E133481



Features

- High sensitive: 150mW
- Matching standard 16 pin IC socket
- High switching capacity: 125VA / 90W
- Bifurcated contacts
- Epoxy sealed for automatic wave soldering and cleaning
- Single side stable and latching type available
- Class A insulation system
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (20.2 x 10.2 x 10.6) mm

CONTACT DATA

| | |
|------------------------------------|---|
| Contact arrangement | 2C |
| Contact resistance | 50mΩ max. (at 0.1A 6VDC) |
| Contact material | see ordering info. |
| Contact rating (Res. load) | 1A 125VAC, 2A 30VDC 3A 30VDC |
| Max. switching voltage | 250VAC / 220VDC |
| Max. switching current | 3A |
| Max. switching power | 125VA / 90W |
| Min. applicable load ¹⁾ | 10mV 10μA |
| Mechanical endurance | 1 x 10 ⁶ OPS |
| Electrical endurance | 5 x 10 ⁵ OPS (at 1A 30VDC) 1 x 10 ⁵ OPS (at 2A 30VDC) 5 x 10 ⁴ OPS (at 3A 30VDC) |

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 | | Sensitive | Standard |
|------------------|------------------|--------------------|---------------|
| | | Single side stable | Approx. 150mW |
| Temperature rise | 1 coil latching | Approx. 75mW | Approx. 100mW |
| | 2 coils latching | Approx. 150mW | Approx. 200mW |
| | | 65K max. | |

SAFETY APPROVAL RATINGS

| | |
|--------|--------------------------------|
| UL/CUL | 0.5A 60VDC |
| | 2A 25VDC |
| | 2A 30VDC |
| | 1A 100VAC |
| | 1A 120VAC |
| | 2A 125VAC(Telephone equipment) |
| | 3A 30VDC |

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

CHARACTERISTICS

| | | |
|-------------------------------|-------------------------|---|
| Insulation resistance | 1000MΩ (at 500VDC) | |
| Dielectric strength | Between coil & contacts | 1 coil: 1500VAC 1min 2 coils: 1000VAC 1min |
| | Between open contacts | 1000VAC 1min |
| Operate time (at nomi. volt.) | 4.5ms max. | |
| Release time (at nomi. volt.) | 3.5ms max. | |
| Set time (latching) | 4.5ms max. | |
| Reset time (latching) | 3.5ms max. | |
| Bounce time | 2ms max. | |
| Ambient temperature | -40 °C to 85°C | |
| Humidity | 98% RH, 40°C | |
| Vibration resistance | 10Hz to 55Hz 1.5mm DA | |
| Shock resistance | Functional | 490m/s ² |
| | Destructive | 980m/s ² |
| Capacitance | Contact to contact | 2.0pF |
| | Contact set to contact | 1.5pF |
| | Contact to coil | 5.0pF |
| Termination | PCB (DIP) | |
| Unit weight | Approx. 4.5g | |
| Construction | Plastic sealed | |

Notes: The data shown above are initial values.

COIL DATA

at 23°C

Single side stable Standard type

| Order Number | Nominal Voltage VDC | Pick-up Voltage VDC max. | Drop-out Voltage VDC min. | Coil Resistance x(1±10%) Ω | Max. Allowable Voltage VDC |
|--------------|---------------------|--------------------------|---------------------------|----------------------------|----------------------------|
| 003-M | 3 | 2.30 | 0.3 | 45 | 6 |
| 005-M | 5 | 3.75 | 0.5 | 125 | 10 |
| 006-M | 6 | 4.50 | 0.6 | 180 | 12 |
| 009-M | 9 | 6.75 | 0.9 | 405 | 18 |
| 012-M | 12 | 9.00 | 1.2 | 720 | 24 |
| 015-M | 15 | 11.25 | 1.5 | 1125 | 30 |
| 024-M | 24 | 18.0 | 2.4 | 2880 | 48 |
| 048-M | 48 | 36.0 | 4.8 | 11520 | 96 |



HONGFA RELAY

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

2011 Rev. 1.00

COIL DATA

at 23°C

Single side stable Sensitive type

| Order Number | Nominal Voltage VDC | Pick-up Voltage VDC max. | Drop-out Voltage VDC min. | Coil Resistance x(1±10%) Ω | Max. Allowable Voltage VDC |
|--------------|---------------------|--------------------------|---------------------------|----------------------------|----------------------------|
| 005-S | 5 | 4.0 | 0.5 | 167 | 11.5 |
| 006-S | 6 | 4.8 | 0.6 | 240 | 13.8 |
| 009-S | 9 | 7.2 | 0.9 | 540 | 20.8 |
| 012-S | 12 | 9.6 | 1.2 | 960 | 27.7 |
| 015-S | 15 | 12.0 | 1.5 | 1500 | 34.6 |
| 024-S | 24 | 19.2 | 2.4 | 3840 | 55.4 |

1 coil latching Standard type

| Order Number | Nominal Voltage VDC | Set / Reset Voltage VDC max. | Coil Resistance x(1±10%) Ω | Max. Allowable Voltage VDC |
|--------------|---------------------|------------------------------|----------------------------|----------------------------|
| 003-M-L1 | 3 | 2.25 | 90 | 8.4 |
| 005-M-L1 | 5 | 3.75 | 250 | 14 |
| 006-M-L1 | 6 | 4.5 | 360 | 17 |
| 009-M-L1 | 9 | 6.75 | 810 | 25 |
| 012-M-L1 | 12 | 9.0 | 1440 | 34 |
| 015-M-L1 | 15 | 11.25 | 2220 | 42 |
| 024-M-L1 | 24 | 18.0 | 4000 | 56 |

2 coils latching Standard type

| Order Number | Nominal Voltage VDC | Set / Reset Voltage VDC max. | Coil Resistance x(1±10%) Ω | Max. Allowable Voltage VDC |
|--------------|---------------------|------------------------------|----------------------------|----------------------------|
| 003-M-L2 | 3 | 2.25 | 45 | 6 |
| 005-M-L2 | 5 | 3.75 | 125 | 10 |
| 006-M-L2 | 6 | 4.5 | 180 | 12 |
| 009-M-L2 | 9 | 6.75 | 405 | 18 |
| 012-M-L2 | 12 | 9.0 | 720 | 24 |
| 015-M-L2 | 15 | 11.25 | 1125 | 30 |
| 024-M-L2 | 24 | 18.0 | 2040 | 48 |

1 coil latching Sensitive type

| Order Number | Nominal Voltage VDC | Set / Reset Voltage VDC max. | Coil Resistance x(1±10%) Ω | Max. Allowable Voltage VDC |
|--------------|---------------------|------------------------------|----------------------------|----------------------------|
| 003-S-L1 | 3 | 2.4 | 60 | 6.9 |
| 005-S-L1 | 5 | 4.0 | 330 | 16 |
| 006-S-L1 | 6 | 4.8 | 480 | 19 |
| 009-S-L1 | 9 | 7.2 | 1080 | 29 |
| 012-S-L1 | 12 | 9.6 | 1920 | 39 |
| 015-S-L1 | 15 | 12.0 | 3000 | 43 |
| 024-S-L1 | 24 | 19.2 | 7680 | 78 |

2 coils latching Sensitive type

| Order Number | Nominal Voltage VDC | Set / Reset Voltage VDC max. | Coil Resistance x(1±10%) Ω | Max. Allowable Voltage VDC |
|--------------|---------------------|------------------------------|----------------------------|----------------------------|
| 003-S-L2 | 3 | 2.4 | 60 | 6.9 |
| 005-S-L2 | 5 | 4.0 | 167 | 11.5 |
| 006-S-L2 | 6 | 4.8 | 240 | 13.8 |
| 009-S-L2 | 9 | 7.2 | 540 | 20.8 |
| 012-S-L2 | 12 | 9.6 | 960 | 27.7 |
| 015-S-L2 | 15 | 12.0 | 1500 | 34.6 |
| 024-S-L2 | 24 | 19.2 | 3840 | 55.4 |

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.

TYPICAL CONTACT LIFE EXPECTANCY

| Voltage | Power | Electrical endurance | |
|---------|-------|-------------------------|----------------------------------|
| | | Resistive Load | Inductive Load (For AC cosφ=0.7) |
| 50mVDC | 50μW | 5 x 10 ⁷ OPS | 5 x 10 ⁷ OPS |
| 30VDC | 20W | 3 x 10 ⁶ OPS | 1 x 10 ⁶ OPS |
| 30VDC | 30W | 1 x 10 ⁶ OPS | 3 x 10 ⁵ OPS |
| 30VDC | 60W | 1 x 10 ⁵ OPS | 1.5 x 10 ⁴ OPS |
| 60VDC | 20W | 3 x 10 ⁶ OPS | -- |
| 60VDC | 30W | 5 x 10 ⁵ OPS | -- |
| 60VDC | 60W | 1 x 10 ⁵ OPS | -- |
| 30VAC | 40VA | 3 x 10 ⁶ OPS | 1 x 10 ⁶ OPS |
| 30VAC | 80VA | 1 x 10 ⁶ OPS | 3 x 10 ⁵ OPS |
| 30VAC | 120VA | 1 x 10 ⁵ OPS | 1.5 x 10 ⁴ OPS |
| 60VAC | 40VA | 3 x 10 ⁶ OPS | 1 x 10 ⁶ OPS |
| 60VAC | 80VA | 1 x 10 ⁶ OPS | 3 x 10 ⁵ OPS |
| 60VAC | 120VA | 1 x 10 ⁵ OPS | 1.5 x 10 ⁴ OPS |
| 125VAC | 40VA | 3 x 10 ⁶ OPS | 1 x 10 ⁶ OPS |
| 125VAC | 80VA | 1 x 10 ⁶ OPS | 3 x 10 ⁵ OPS |
| 125VAC | 125VA | 1 x 10 ⁵ OPS | 1.5 x 10 ⁴ OPS |

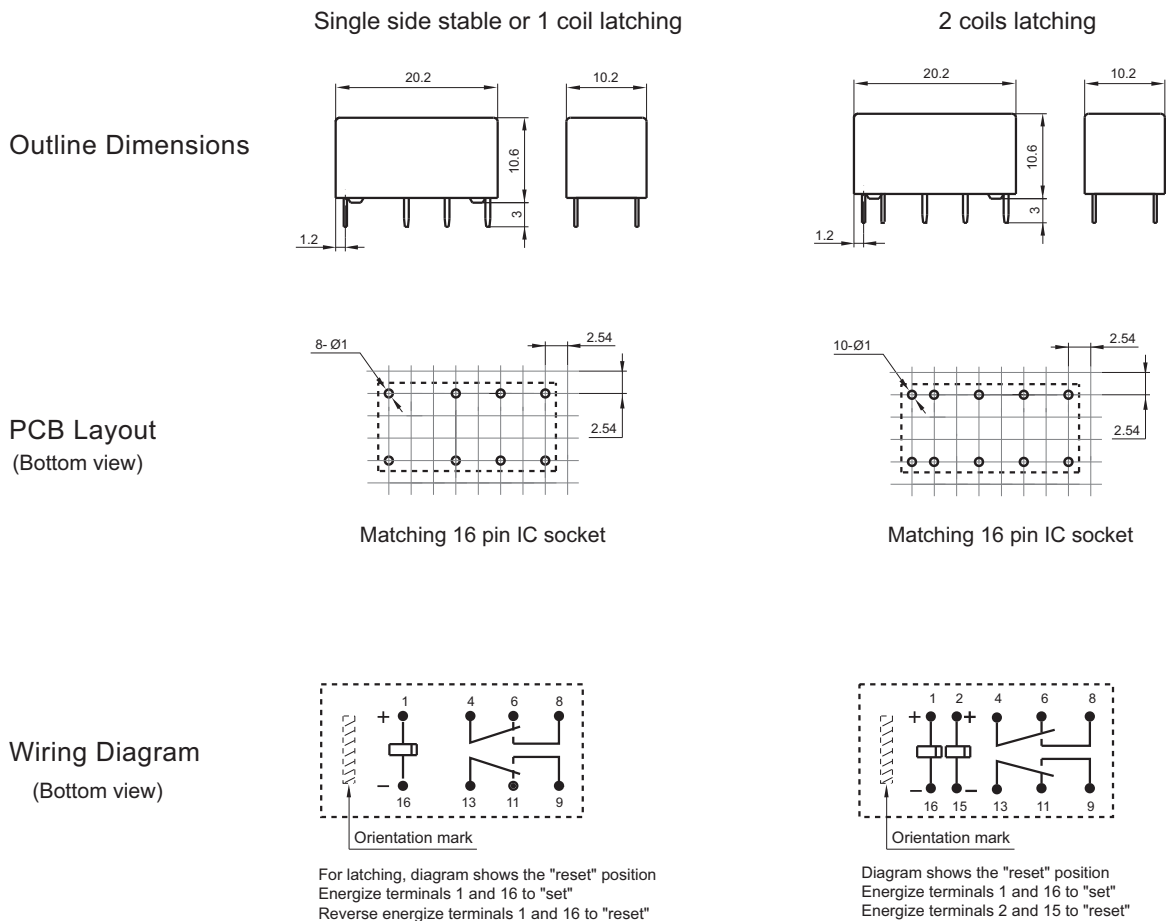
ORDERING INFORMATION

| | | | | | | | |
|------------------------------|---|----------------------|-------------------------|----|-----|---|-------|
| Type | | HFD2 / 012 | | -S | -L2 | D | (XXX) |
| Coil voltage | 3, 5, 6, 9, 12, 15, 24, 48VDC ¹⁾ | | | | | | |
| Coil power | M: Standard | S: Sensitive | | | | | |
| Sort | L1: 1 coil latching | L2: 2 coils latching | Nil: Single side stable | | | | |
| Contact material | D: Ag-AuAg8 / Ag-AuAg8 | | Nil: AgPd60 / Ag-AuAg8 | | | | |
| Customer special code | | | | | | | |

Notes: 1) 48VDC coil voltage is only for single side stable & standard type.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

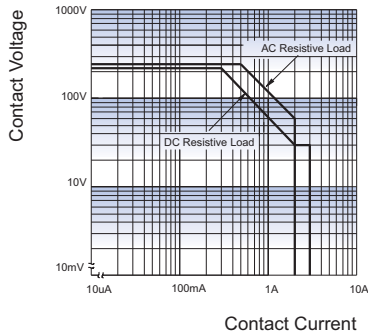
Unit: mm



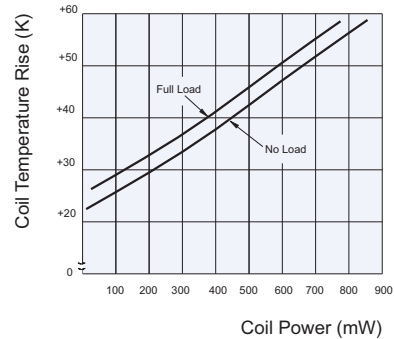
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm; outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm; outline dimension > 5 mm, tolerance should be ± 0.4 mm.
 2) The tolerance without indicating for PCB layout is always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

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



COIL TEMPERATURE RISE



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) 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) 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.