HFD2 SUBMINIATURE DIP RELAY

File No.:E133481

File No.:CQC13002095174(Single side stable)
CQC13002095175(Latching)



Features

- High sensitive: 150mW
- Matching standard16 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
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (20.2 x 10.2 x 10.6) mm

CONTACT DATA

Contact arrangement	2C
Contact resistance	100mΩ max. (at 10mA 30mVDC)
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 10^8OPS
Electrical endurance[2)]	5 x 10^4OPS (2A 30VDC, Ag contact, Resistive load, at 70˚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.

COIL

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

SAFETY APPROVAL RATINGS

UL/CUL	AgPd/ AgPd+Gold plated	0.5A 60VDC 2A 30VDC 1A 120VAC 2A 125VAC 3A 30VDC
	Ag+Gold plated/ Ag+Gold plated	2A 30VDC(at 70˚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.

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)		4.5ms max.
Ambient temperature		-40 ˚C to 85˚C
Humidity		5% to 85% RH
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance	Functional	490m/s^2
	Destructive	980m/s^2
Termination		PCB (DIP)
Unit weight		Approx. 4.5g
Construction		Plastic sealed

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

COIL DATA at 23˚C

Single side stable Standard type

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Coil Resistance x(1±10%) Ω	Max. 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

COIL DATA

at 23°C

Single side stable Sensitive type

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Coil Resistance x(1±10%) Ω	Max. 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

Coil Code	Nominal Voltage VDC	Set / Reset Voltage VDC max.	Coil Resistance x(1±10%) Ω	Max. 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

Coil Code	Nominal Voltage VDC	Set / Reset Voltage VDC max.	Coil Resistance x(1±10%) Ω	Max. 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

Coil Code	Nominal Voltage VDC	Set / Reset Voltage VDC max.	Coil Resistance x(1±10%) Ω	Max. 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

Coil Code	Nominal Voltage VDC	Set / Reset Voltage VDC max.	Coil Resistance x(1±10%) Ω	Max. 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 cosø=0.7)
50mVDC	50μW	5×10^7 OPS	5×10^7 OPS
30VDC	20W	3×10^6 OPS	1×10^6 OPS
30VDC	30W	1×10^6 OPS	3×10^5 OPS
30VDC	60W	1×10^5 OPS	1.5×10^4 OPS
60VDC	20W	3×10^6 OPS	--
60VDC	30W	5×10^5 OPS	--
60VDC	60W	1×10^5 OPS	--
30VAC	40VA	3×10^6 OPS	1×10^6 OPS
30VAC	80VA	1×10^6 OPS	3×10^5 OPS
30VAC	120VA	1×10^5 OPS	1.5×10^4 OPS
60VAC	40VA	3×10^6 OPS	1×10^6 OPS
60VAC	80VA	1×10^6 OPS	3×10^5 OPS
60VAC	120VA	1×10^5 OPS	1.5×10^4 OPS
125VAC	40VA	3×10^6 OPS	1×10^6 OPS
125VAC	80VA	1×10^6 OPS	3×10^5 OPS
125VAC	125VA	1×10^5 OPS	1.5×10^4 OPS

ORDERING INFORMATION

	HFD2 /	012	-S	-L2	-A	(XXX)
Type						
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					**A:** AgPd/AgPd+Gold plated **D:** Ag+Gold plated/Ag+Gold plated **Nil:** AgPd/Ag+Gold plated [2]	
Special code[3]						**XXX:** Customer special requirement **Nil:** Standard

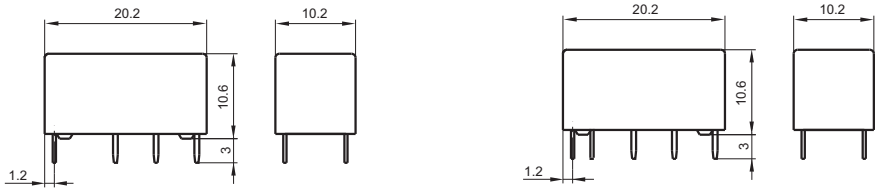
Notes: 1) 48VDC coil voltage is only for single side stable & standard type.
2) Not for new design.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Single side stable or 1 coil latching | 2 coils latching

Outline Dimensions



PCB Layout
(Bottom view)



Matching 16 pin IC socket | Matching 16 pin IC socket

Wiring Diagram
(Bottom view)



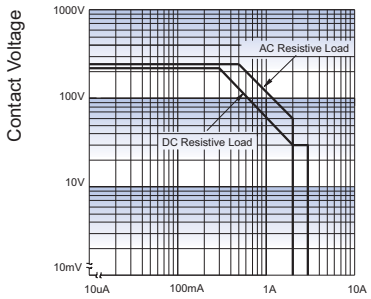
For latching, diagram shows the "reset" position
Energize terminals 1 and 16 to "set"
Reverse energize terminals 1 and 16 to "reset"

Diagram shows the "reset" position
Energize terminals 1 and 16 to "set"
Energize terminals 2 and 15 to "reset"

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

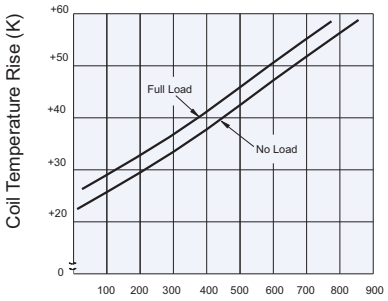
MAXIMUM SWITCHING POWER



Test conditions:

Resistive load, at 70°C, 1s on 9s off.

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) 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) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
8) 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.
9) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidetines 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.

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