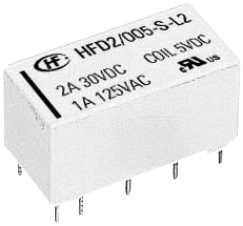
HFD2 SUBMINIATURE DIP RELAY



c US
File No.:E133481

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 10.0 x 10.6) mm

CONTACT DATA

Contact arrangement	2C
Contact resistance	50mΩ (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
Min. applicable load	125VA / 90W
Max. switching power	10mV 10μA
Mechanical endurance	1 x 10^8 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)

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Contacts to coil	1 coil: 1500VAC 1min 2 coil: 1000VAC 1min
	Contacts to contact	1000VAC 1min
Operate time (at nomi. volt.)		4ms max.
Release time (at nomi. volt.)		3ms max.
Set time (latching)		3ms
Reset time (latching)		3ms
Bounce time		1.5ms
Ambient temperature		-40 ˚C to 85 ˚C
Humidity		5% to 85% RH
Vibration resistance		10H to 55Hz 1.5mm DA
Shock resistance	Functional	500m/s²(50g)
	Destructive	1000m/s²(100g)
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		Wash tight

Notes: The data shown above are initial values.

COIL

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

COIL DATA at 23˚C

Single side stable Standard (200mW)

Order Number	Nominal Voltage VDC	Pick-up Voltage VDC	Drop-out Voltage VDC	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

Single side stable Sensitive (150mW)

Order Number	Nominal Voltage VDC	Pick-up Voltage VDC	Drop-out Voltage VDC	Coil Resistance x(1±10%) Ω	Max. Allowable Voltage VDC
003-S	3	2.4	0.3	60	7.0
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

COIL DATA

at 23°C

1 coil latching Standard (100mW)

Order Number	Nominal Voltage VDC	Set / Reset Voltage VDC	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 (200mW)

Order Number	Nominal Voltage VDC	Set / Reset Voltage VDC	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 (75mW)

Order Number	Nominal Voltage VDC	Set / Reset Voltage VDC	Coil Resistance x(1±10%) Ω	Max. Allowable Voltage VDC
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 (150mW)

Order Number	Nominal Voltage VDC	Set / Reset Voltage VDC	Coil Resistance x(1±10%) Ω	Max. Allowable Voltage VDC
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: When user's requirements can't be found in the above table, special order allowed.

TYPICAL CONTACT LIFE EXPECTANCY

Voltage	Power	Number of operations	
		Resistive Load	Inductive Load (For AC cosø=0.7)
50mVDC	50uW	5×10^7	5×10^7
30VDC	20W	3×10^6	1×10^6
30VDC	30W	1×10^6	3×10^5
30VDC	60W	1×10^5	1.5×10^4
60VDC	20W	3×10^6	--
60VDC	30W	5×10^5	--
60VDC	60W	1×10^5	--
30VAC	40VA	3×10^6	1×10^6
30VAC	80VA	1×10^6	3×10^5
30VAC	120VA	1×10^5	1.5×10^4
60VAC	40VA	3×10^6	1×10^6
60VAC	80VA	1×10^6	3×10^5
60VAC	120VA	1×10^5	1.5×10^4
125VAC	40VA	3×10^6	1×10^6
125VAC	80VA	1×10^6	3×10^5
125VAC	125VA	1×10^5	1.5×10^4

SAFETY APPROVAL RATINGS

UL&CUR	0.5A 60VDC 2A 25VDC 2A 30VDC 1A 100VAC (industrial control, business equipment) 1A 120VAC (Telephone equipment) 2A 125VAC

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

ORDERING INFORMATION

	HFD2 /	012	-S	-L2	D	(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	**D:** Ag-AuAg8 / Ag-AuAg8	**Nil:** AgPd60 / Ag-AuAg8				
Customer special code [2]	Only for special requirements, e.g. (555) stands for RoHS compliant					

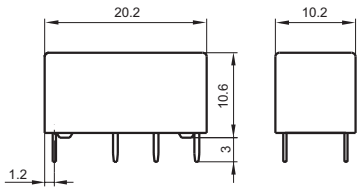
Notes: 1) 48VDC coil voltage is only for single side stable and standard type.
2) HFD2 is an environmental friendly product. Please mark a special code (555) when ordering.
3) If 3A 30VDC load is required, please note in the purchasing order.

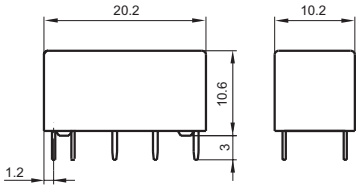
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

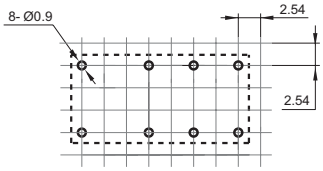
Single side stable or 1 coil latching | 2 coils latching

Outline Dimensions

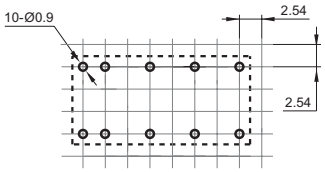




PCB Layout
(Bottom view)



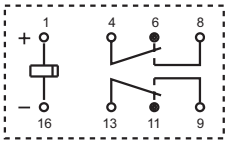
Matching 16 pin IC socket



Matching 16 pin IC socket

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.

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"

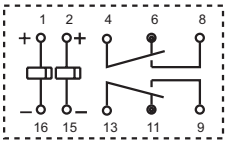


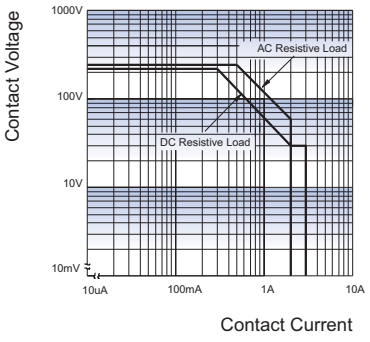
Diagram shows the "reset" position
Energize terminals 1 and 16 to "set"
Energize terminals 2 and 15 to "reset"

Notice

1. Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than “set” or “reset” time. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



COIL TEMPERATURE RISE