HFD2 SUBMINIATURE DIP RELAY

c US
File No.:E133481

Features

- High sensitive: 150mW
- Matching standard16 pin IC socket
- High switching capacity 60W/125VA
- Bifurcated contacts
- Epoxy sealed for automatic wave soldering and cleaning
- Single side stable and latching type available
- Environmental friendly product available (RoHS compliant)
- Outline Dimensions: 20.2 x 10.0 x 10.6 mm

CONTACT DATA

Contact arrangement	2C
Initial contact resistance	50mΩ
Contact material	see ordering info.
Contact rating (Res. load)	2A 30VDC 1A 125VAC
Max. switching power	60W / 125VA
Max. switching voltage	220VDC / 250VAC
Max. switching current	2A
Min. applicable load	10mV 10μA
Electrical life	1 x 10^5 OPS (at 2A 30VDC) 5 x 10^5 OPS (at 1A 30VDC)
Mechanical life	1 x 10^8 OPS

CHARACTERISTICS

Initial insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Contacts to coil	1coil: 1500VAC 1min. 2coil: 1000VAC 1min.
	Contacts to contact	1000VAC 1min.
Operate time (at nomi. volt.)		Max. 4ms
Release time (at nomi. volt.)		Max. 3ms
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		10 to 55Hz 196m/s^2 (20g)
Shock resistance	Functional	490m/s^2 (50g)
	Destructive	980m/s^2 (100g)
Capacitance	Contact to contact	2.0pF
	Contact set to contact	1.5pF
	Contact to coil	5.0pF
Termination		PCB (DIP)
Unit weight		4.5g
Construction		Sealed IP67

COIL

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

COIL DATA

Single side stable Standard (200mW) at 20˚C

Order Number	Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Coil Resistance (Ω±10%)	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) at 20 ˚C

Order Number	Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Coil Resistance (Ω±10%)	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

1 coil latching Standard (100mW) at 20 ˚C

Order Number	Nominal Voltage (VDC)	Set / Reset Voltage (VDC)	Coil Resistance (Ω±10%)	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) at 20 ˚C

Order Number	Nominal Voltage (VDC)	Set / Reset Voltage (VDC)	Coil Resistance (Ω±10%)	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 (150mW) at 20˚C

Order Number	Nominal Voltage (VDC)	Set / Reset Voltage (VDC)	Coil Resistance (Ω±10%)	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) at 20 ˚C

Order Number	Nominal Voltage (VDC)	Set / Reset Voltage (VDC)	Coil Resistance (Ω±10%)	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.

SAFETY APPROVAL RATINGS

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

TYPICAL CONTACT LIFE EXPECTANCY

Voltage	Power	Number of operations	
		Resistive Load	Inductive Load (For AC cos ø=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

ORDERING INFORMATION

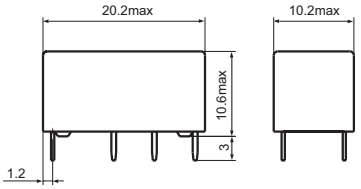
	HFD2 /	012	S	L2	D	XXX
Type						
Coil voltage	3, 5, 6, 9, 12, 15, 24, 48VDC(Standard Single only)					
Coil power	**M:** Standard	**S:** Sensitive				
Sort	**L1:** 1 coil latching	**L2:** 2 coils latching	**Nil:** Single side stable			
Contact material	**D:** Ag-AuAg8 / Ag-AuAg8	**Nil:** AgPd60 / Ag-AuAg8				
Customer special code	(Only for special requirements, e.g. 555 stands for RoHS compliant)					

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

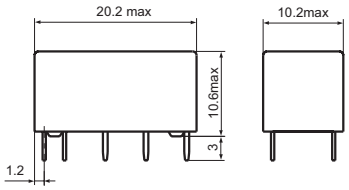
Unit: mm

Outline Dimensions

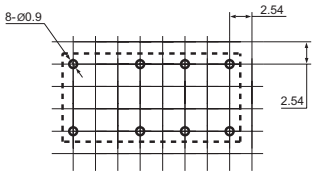
Single side stable or 1 coil latching



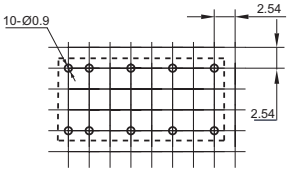
2 coils latching



PCB Layout

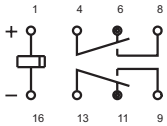


Matching 16 pin IC socket



Matching 16 pin IC socket

Wiring Diagram



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

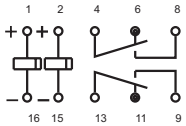
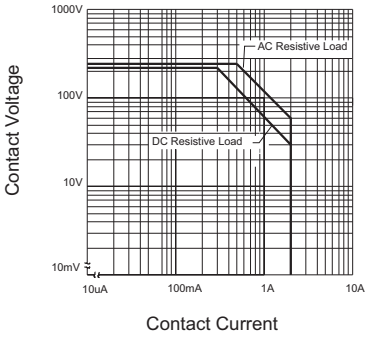


Diagram shows the "reset" position
Energize terminals 1 and 16 to "set"
Energize terminals 2 and 15 to "reset"

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



COIL TEMPERATURE RISE