HFE7 SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

VDE
File No.:40027342

Features

- High switching capacity
  1A, 1B: 10A 250VAC/30VDC;
  2A, 2B, 1A + 1B: 8A 250VAC/30VDC
- High sensitive
- 4kV dielectric strength (between coil & contacts)
- Single side stable and latching types available
- 1 Form A, 1 Form B, 2 Form A, 2 Form B and 1A + 1B contact arrangement
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (20.0 x 15.0 x 10.2) mm

CONTACT DATA

Contact arrangement	1A, 1B	2A, 2B, 1A +1B
Contact resistance	Gold AgNi plated: 30mΩ max. (at 1A 6VDC) No gold AgNi plated: 50mΩ max. (at 1A 6VDC) Gold $AgSnO_2$ plated: 60mΩ max. (at 1A 6VDC) No gold $AgSnO_2$ plated: 80mΩ max. (at 1A 6VDC)	
Contact material	$AgSnO_2$, AgNi	
Contact rating (Res. load)	10A 250VAC/30VDC	8A 250VAC/30VDC
Max. switching Voltage	277VAC	277VAC
Max. switching current	10A	8A
Max. switching power	2500VA	2000VA
Mechanical endurance	1×10^7OPS	
Electrical endurance	1×10^5OPS (2 Form A: 3×10^4OPS)	

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric Strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		10ms max.
Release (Reset) time (at nomi. volt.)		10ms max.
Max. operate frequency (under rated load)		20 cycles /min
Temperature rise (at nomi. volt.)		50 K max.
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance		98m/s²
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

Notes: The data shown above are initial values.

COIL

Type		Coil power	
		Sensitive	High sensitive
Single side stable	1A,1A+1B	Approx. 420mW	Approx. 200mW
	2A		Approx. 280mW
1 coil latching		Approx. 300mW	Approx. 200mW
2 coils latching		Approx. 420mW	Approx. 280mW

COIL DATA at 23˚C

Single side stable

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Coil Resistance x (1±10%)Ω		
			200mW	280mW	420mW
3	2.1	0.3	45	32.1	21.4
5	3.5	0.5	125	89.3	59.5
6	4.2	0.6	180	129	85.7
9	6.3	0.9	405	289	192.9
12	8.4	1.2	720	514	342.9
24	16.8	2.4	2880	2056	1371.4

1 coil latching

Nominal Voltage VDC	Set /Reset Voltage VDC max.	Pulse Duration ms min.	Coil Resistance x (1±10%)Ω	
			300mW	200mW
3	2.1	50	30	45
5	3.5	50	83.3	125
6	4.2	50	120	180
9	6.3	50	270	405
12	8.4	50	480	720
24	16.8	50	1920	2880

COIL DATA

at 23˚C

2 coils latching

Nominal Voltage VDC	Set / Reset Voltage VDC max.	Pulse Duration ms min.	Coil Resistance x (1±10%) Ω	
			420mW	280mW
3	2.1	50	21.4+21.4	32.1+32.1
5	3.5	50	59.5+59.5	89.3+89.3
6	4.2	50	85.7+85.7	129+129
9	6.3	50	192.9+192.9	289+289
12	8.4	50	342.9+342.9	514+514
24	16.8	50	1371.4+1371.4	2056+2056

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	$AgSnO_2$, AgNi	10A 250VAC 8A 30VDC 1/4HP 125VAC 1/3HP 250VAC
		$AgSnO_2$	10A 30VDC B300, R300
	2 Form A	$AgSnO_2$, AgNi	8A 250VAC/30VDC 1/4HP 125VAC 1/3HP 250VAC
		$AgSnO_2$	600W 125VAC B300, R300
	1 Form A+1 Form B	$AgSnO_2$, AgNi	8A 250VAC/30VDC 1/4HP 125VAC
VDE (No UL approval on Single side stable version)	1 Form A	AgNi	10A 250VAC (COSØ=1)5A 250VAC (COSØ=0.4)
	2 Form A	AgNi	8A 250VAC (COSØ=1) 3.5A 250VAC(COSØ=0.4)
	1 Form A+1 Form B	AgNi	8A 250VAC (COSØ=1) 3.5A 250VAC (COSØ=0.4)

ORDERING INFORMATION

HFE7 / 12 -1H S T G -L2 -R (412)(XXX)

Type	
Coil voltage	3, 5, 6, 9, 12, 24VDC
Contact form [1]	**1H:** 1 Form A **1D:** 1 Form B **2H:** 2 Form A **2D:** 2 Form B **1HD:** 1A + 1B
Construction [2]	**S:** Plastic sealed **Nil:** Flux proofed
Contact material [3]	**T:** $AgSnO_2$ **Nil:** AgNi
Contact plating	**G:** Gold plated **Nil:** No gold plated
Sort	**L1:** 1 coil latching **L2:** 2 coils latching **Nil:** Single side stable
Polarity	**R:** Negative polarity **Nil:** Positive polarity
Customer special code (Coil power) [4]	**(412):** sensitive **Nil:** High sensitive
Customer special code	**(359):** stands for Lamp load

Notes: 1) 1H, 2H means that relay is on the "reset" status when delivery; 1D, 2D means that relay is on the "set" status when delivery.There are no UL approval on 1D,2D version.

2) Under the ambience with dangerous gas like H2S, SO2 or NO2, plastic sealed type is recommended; Please test the relay in real applications. If water cleaningis required after the relay is assembled on PCB, please contact us for suggestion about suitable parts. If the ambience allows, flux proofed type

3) For the application with inrush current conditions, such as lamp load, motor load, capacitance load, coil load, etc., we suggest use the flux proof and no golden plated AgSnO2 contact version.

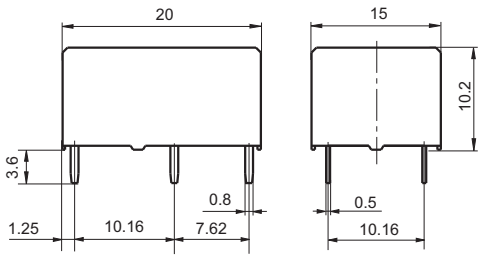
4) We recommend to choose the sensitive version (same part number, but with special suffix (412)) if the higher coil activation is allowable; Please choose the sensitive version (same part number, but with special suffix (412)) if the relay to be used in the extreme environment or welded by wave soldering; Please check with HF's engineer before designing the relay to your application if there are some requirements' outside the specification we provided.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

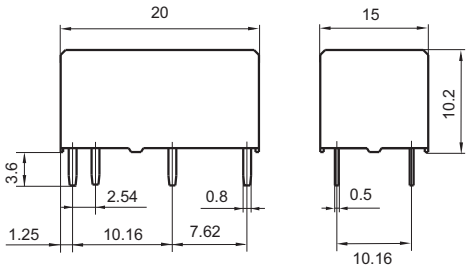
Unit: mm

Outline Dimensions

Single side stable & 1 coil latching



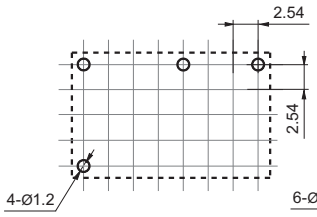
2 coils latching



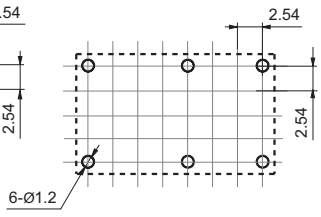
PCB Layout (Bottom view)

Single side stable & 1 coil latching

1 Form A,1 Form B

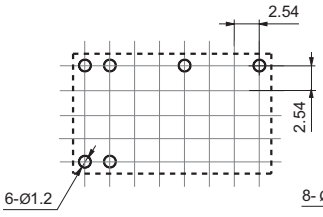


2 Form A, 2 Form B,1A + 1B

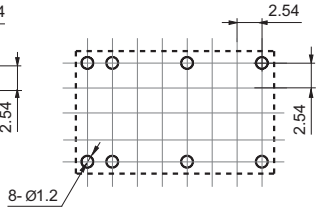


2 coils latching

1 Form A,1 Form B



2 Form A, 2 Form B,1A + 1B

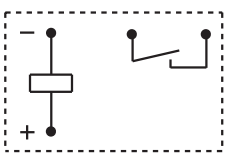


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The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

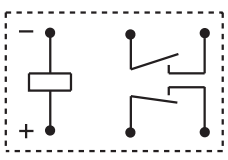
Wiring Diagram (Bottom view)

Single side stable (Standard polarity)

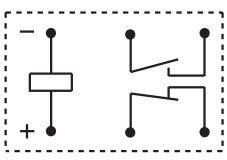
1 Form A



2 Form A



1A + 1B

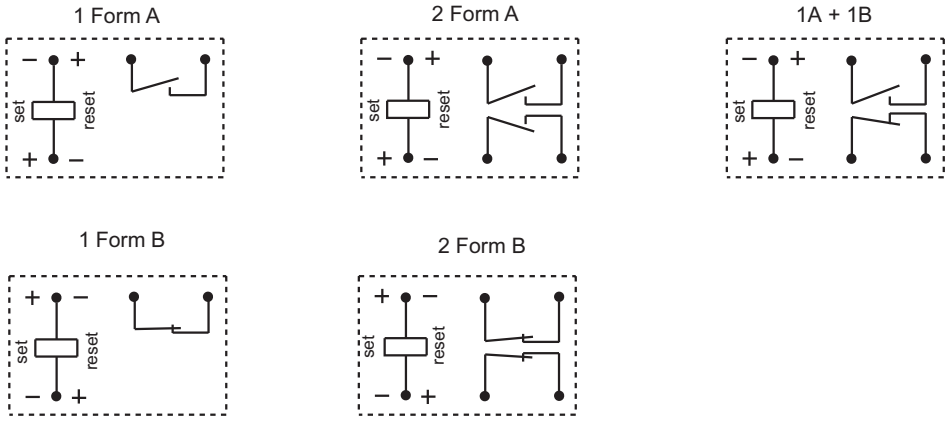


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

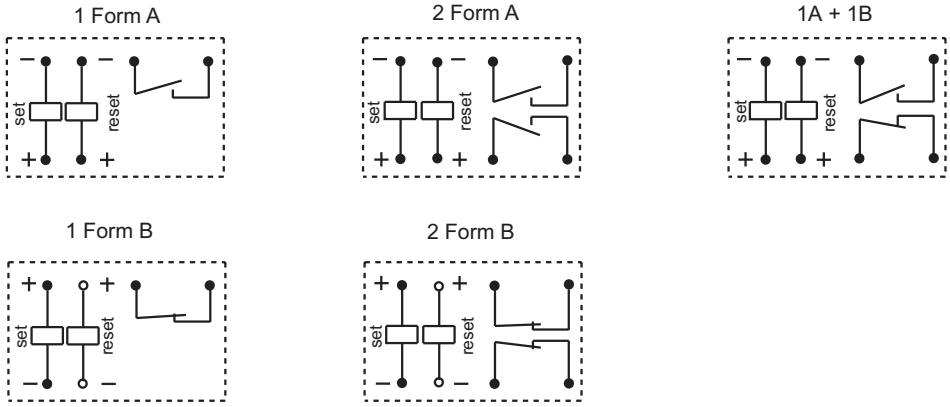
Unit: mm

Wiring Diagram (Bottom view)

1 coil latching (Standard polarity)



2 coils latching (Standard polarity)



Remark: The coil polarity of Reverse polarity and Standard polarity is opposite.

Notice

1. Relay is on the “reset” or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or "reset" 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 time (more than 1 min) should be avoided.
3. As the relay component part's will shrink and deformed due to the high temperature impact, our products are forbidden to be used at the temperature outside our suggested working temperature range (-40℃～70℃) for long time ; If the wave soldering will be used, the operating parameters we will suggest are: Up limit of the pre-heating time: 120s;Up limit of the pre-heating temperature:120℃; Soldering temperatuer:260℃±5℃; Soldering time（10±3）s; Besides our suggested parameters, please try to shorten the pre-heating time and the soldering time and try to lower the temperature for pre-heating and the soldering as you can; the manual soldering for such relay is more recommended.

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.