

# HFE 60

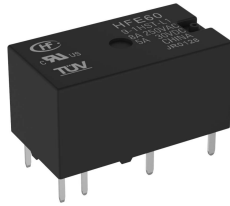
# SUBMINIATURE INTERMEDIATE POWER RELAY



File No.: E134517



File No.: B140653286012



## Features

- Low height 10.5mm
- Low coil power
- High switching capacity  
1A: 8A 250VAC  
2A, 1A+1B: 5A 250VAC
- 3kV dielectric strength (between coil and contacts)

## CONTACT DATA

Contact arrangement	1A	2A, 1A+1B
Contact 1) resistance	No gold plated: 50mΩ (at 1A 6VDC) Gold plated: 50mΩ (at 0.1A 6VDC)	
Contact material	AgSnO <sub>2</sub>	
Contact rating	8A 250VAC (COSØ=1.0) 5A 30VDC (τ =0ms)	5A 250VAC (COSØ=1.0) 5A 30VDC (τ =0ms)
Max. switching voltage	380VAC / 240VDC	
Max. switching current	8A	5A
Max. switching power	2000VA/150W	1250VA/150W
Mechanical endurance	1 x 10 <sup>7</sup> ops	
Electrical endurance	1 x 10 <sup>5</sup> ops	

Notes: 1) The data shown above are initial values.

## CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	3000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2000VAC 1min
Surge voltage (between coil and contacts)	5.5kV (1.2/50μs)	
Operate time (single side stable)	≤ 10ms	
Release time (single side stable)	≤ 5ms	
Set time (latching)	≤ 10ms	
Reset time (latching)	≤ 10ms	
Shock resistance	Functional	196m/s <sup>2</sup>
	Destructive	980m/s <sup>2</sup>
Vibration resistance	Functional	10Hz to 55Hz 2.0mm DA
	Destructive	10Hz to 55Hz 3.5mm DA
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Termination	coil termination	PCB
	load termination	PCB
Unit weight	Approx. 4.5g	
Construction	Plastic sealed Flux proofed	

Notes: The data shown above are initial values.



HONGFA RELAY

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

## COIL

Coil power	Single side stable: Approx. 300mW 1 coil latching: Approx. 150mW 2 coils latching: Approx. 300mW
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## COIL DATA

at 23°C

### Single side stable (300mW)

Nominal Voltage VDC	Pick-up VDC 1) 2)	Drop-out Voltage VDC 1) 2)	Max. Allowable Voltage VDC	Coil Resistance
3	≤ 2.4	≥ 0.3	3.9	30 x (1±10%)
5	≤ 4.0	≥ 0.5	6.5	83 x (1±10%)
6	≤ 4.8	≥ 0.6	7.8	120 x (1±10%)
9	≤ 7.2	≥ 0.9	11.7	270 x (1±10%)
12	≤ 9.6	≥ 1.2	15.6	480 x (1±10%)
18	≤ 14.4	≥ 1.8	23.4	1080 x (1±10%)
24	≤ 19.2	≥ 2.4	31.2	1920 x (1±10%)

Notes: 1) The data shown above are initial values.

2) Above driving voltage only apply to check relay normal function without load. When normal use with load, use (1~1.5)U<sub>e</sub> for latching relay set/reset voltage, use (1~1.3)U<sub>e</sub> for set voltage and 0V for release voltage for monostable relay.

## SAFETY APPROVAL RATINGS

UL/CUL	1A: 8A 250VAC 5A 30VDC B300 B300 R150 1/6HP 125VAC/250VAC	2A/1A+1B: 5A 250VAC 5A 30VDC B300 R150 1/6HP 125VAC/250VAC (For 1HD) 1/10HP 125VAC/250VAC (For 2H)
	TÜV	1A: 8A 250VAC 5A 250VAC (COSØ=0.4) 5A 30VDC

Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

## COIL DATA

at 23°C

### 1 coil latching (150mW)

Nominal Voltage VDC	Set Voltage VDC <sup>1)</sup> <sub>2)</sub>	Reset Voltage <sup>1)</sup> VDC <sub>2)</sub>	Max. Allowable Voltage VDC	Coil Resistance
3	≤2.4	≤2.4	3.9	60 x (1±10%)
5	≤4.0	≤4.0	6.5	167 x (1±10%)
6	≤4.8	≤4.8	7.8	240 x (1±10%)
9	≤7.2	≤7.2	11.7	540 x (1±10%)
12	≤9.6	≤9.6	15.6	960 x (1±10%)
18	≤14.4	≤14.4	23.4	2160 x (1±10%)
24	≤19.2	≤19.2	31.2	3840 x (1±10%)

### 2 coils latching (300mW)

Nominal Voltage VDC	Set Voltage VDC <sup>1)</sup> <sub>2)</sub>	Reset Voltage <sup>1)</sup> VDC <sub>2)</sub>	Max. Allowable Voltage VDC	Coil Resistance
3	≤2.4	≤2.4	3.9	30 x (1±10%)
5	≤4.0	≤4.0	6.5	83 x (1±10%)
6	≤4.8	≤4.8	7.8	120 x (1±10%)
9	≤7.2	≤7.2	11.7	270 x (1±10%)
12	≤9.6	≤9.6	15.6	480 x (1±10%)
18	≤14.4	≤14.4	23.4	1080 x (1±10%)
24	≤19.2	≤19.2	31.2	1920 x (1±10%)

Notes:1) The data shown above are initial values.

2) Above driving voltage only apply to check relay normal function without load. When normal use with load, use (1~1.5)U<sub>e</sub> for latching relay set/reset voltage, use (1~1.3)U<sub>e</sub> for set voltage and 0V for release voltage for monostable relay.

## ORDERING INFORMATION

Type	HFE60/ 12 -1HD S T G -L2 -R (XXX)
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC
Contact form	1H: 1 Form A 2H: 2 Form A 1HD: 1 Form A +1 Form B
Construction	S: Plastic sealed Nil: Flux proofed
Contact material	T: AgSnO <sub>2</sub>
Contact plating	G: Gold plated Nil: No gold plated
Sort	L1: 1 coil latching L2: 2 coils latching Nil: Single side stable
Polarity	R: Reverse polarity Nil: Standard polarity
Special code <sup>1)</sup>	XXX: Customer special requirement

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, dust, etc.).

We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, dust, etc.).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

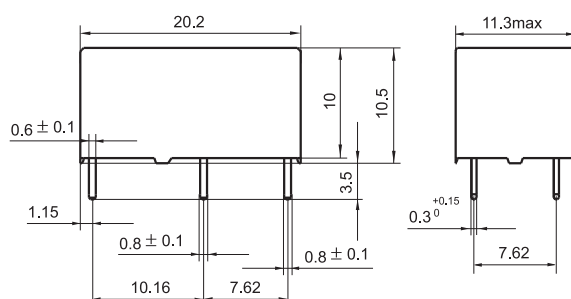
3) The customer special requirement express as special code after evaluating by Hongfa.

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

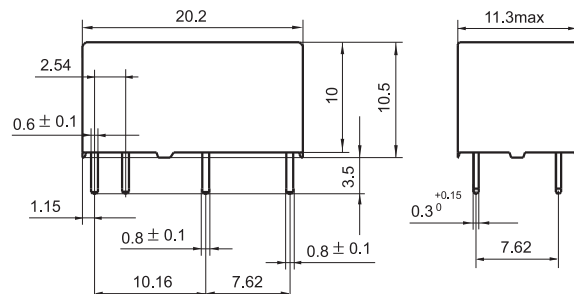
Unit: mm

### Outline Dimensions

#### Single side stable / 1 coil latching

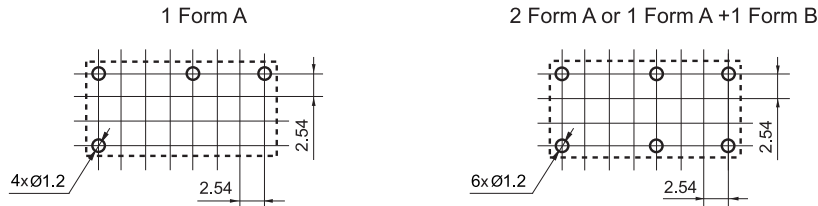


#### 2 coils latching

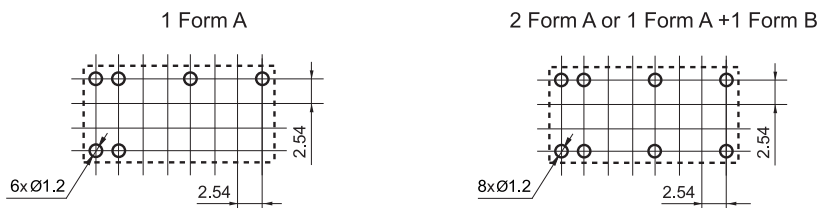


PCB Layout  
(Bottom view)

Single side stable/1 coil latching

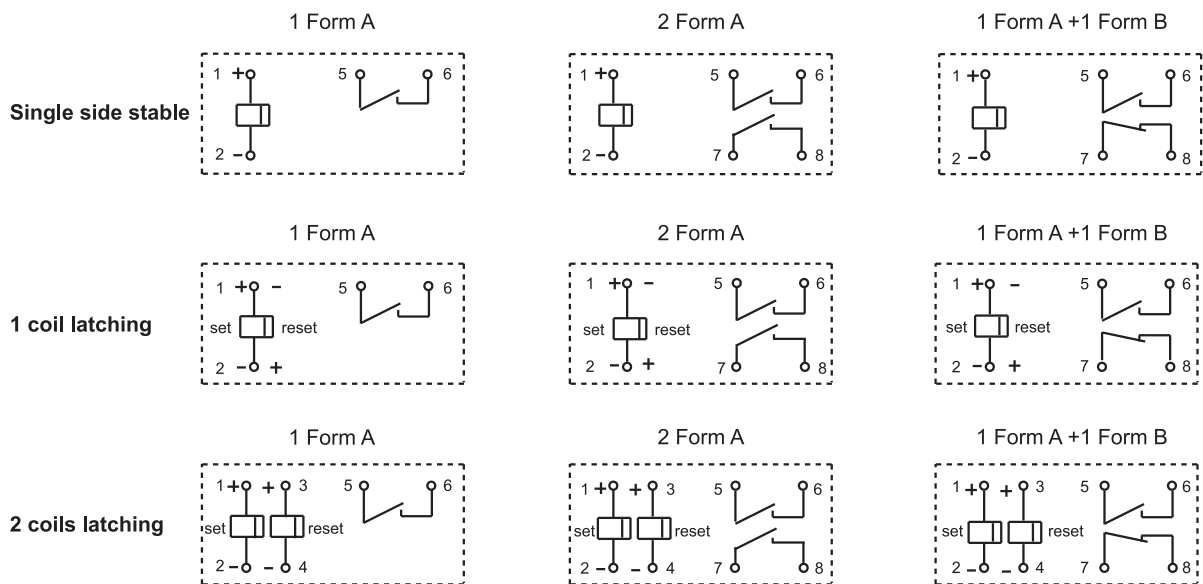
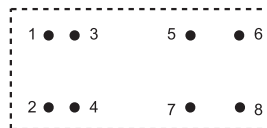


2 coils latching



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

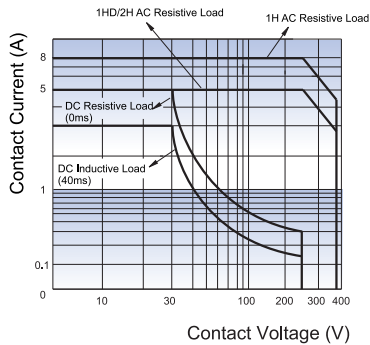
Wiring Diagram  
(Bottom view)



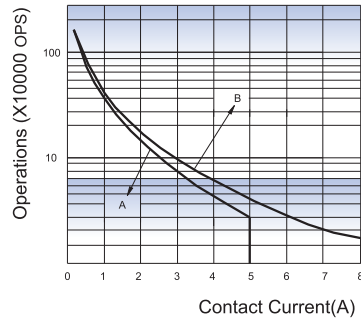
Remark: The above is wiring diagram for product with standard polarity, the coil polarity of reverse polarity and standard polarity is opposite.

## CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



**Test conditions:**

1) Curve A: 1A+1B type (or 2A type)

Curve B: 1A type

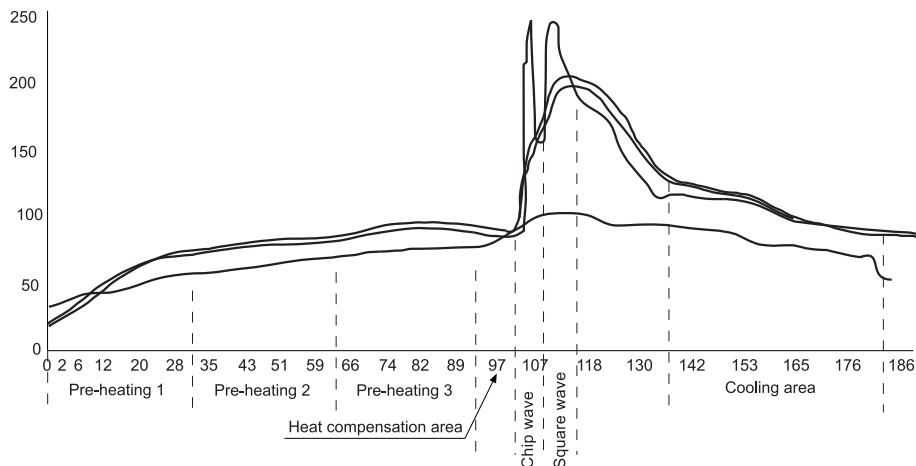
2) Test conditions:

Resistive load, 120VAC~250VAC, 40°C.

**Notice:**

1. Latching 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. When choose the relay with PCB termination, the recommended welding temperature range and duration is 240°C to 260°C, 2s to 5s; Please do not use the reflow welding method, if the reflow is really required, please contact our technicals; the normal recommended wave soldering temperature is 250°C within 2s; the below chart is the wave soldering temperature distribution chart we recommended for your reference.
4. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.
5. This is a polarized relay. Please pay attention to the coil polarity according to the datasheet when using it.

Wave soldering temperature distribution chart



**Disclaimer**

The specification is for reference only. 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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