

# HF33F

## SUBMINIATURE INTERMEDIATE POWER RELAY



File No.:E134517



File No.:125661



File No.:CQC12002076530



### Features

- 10A switching capability
- Creepage distance: 8mm (coil & contacts)
- Clearance distance: NO type 4.5mm, NC type 4mm
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (20.5 x 10.2 x 15.3) mm

### CONTACT DATA

|                               |                                                                                                  |                                     |                       |
|-------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------|
| Contact arrangement           | 1A, 1C                                                                                           |                                     |                       |
| Contact resistance            | 100mΩ max.(at 1A 24VDC)                                                                          |                                     |                       |
| Contact material              | AgSnO <sub>2</sub> , AgNi, AgCdO                                                                 |                                     |                       |
| Contact rating<br>(Res. load) | 1A                                                                                               | 1C                                  |                       |
|                               |                                                                                                  | NO                                  | NC                    |
|                               | 5A 250VAC<br>5A 30VDC<br>10A 125VAC                                                              | 5A 250VAC<br>5A 30VDC<br>10A 125VAC | 3A 250VAC<br>3A 30VDC |
|                               | Max. switching current                                                                           | 10A                                 | 3A                    |
| Max. switching power          | 1250VA / 150W                                                                                    |                                     | 750VA / 90W           |
| Max. switching voltage        | 250VAC / 30VDC                                                                                   |                                     |                       |
| Mechanical endurance          | 5 x 10 <sup>6</sup> OPS                                                                          |                                     |                       |
| Electrical endurance          | H type:1 x 10 <sup>5</sup> OPS (5A 250VAC, Resistive load, Room temp., 1s on 9s off)             |                                     |                       |
|                               | Z type:1 x 10 <sup>5</sup> OPS (NO:5A/NC:3A 250VAC,Resistive load, Room temp., 1.5s on 1.5s off) |                                     |                       |

### CHARACTERISTICS

|                               |                              |                     |
|-------------------------------|------------------------------|---------------------|
| Insulation resistance         | 1000MΩ (at 500VDC)           |                     |
| Dielectric strength           | Between coil & contacts      | 4000VAC 1min        |
|                               | Between open contacts        | 1000VAC 1min        |
| Operate time (at nomi. volt.) | 8ms max.                     |                     |
| Release time (at nomi. volt.) | 5ms max.                     |                     |
| Ambient temperature           | -40°C to 70°C                |                     |
| Humidity                      | 5% to 85% RH                 |                     |
| Shock resistance              | Functional                   | 98m/s <sup>2</sup>  |
|                               | Destructive                  | 980m/s <sup>2</sup> |
| Vibration resistance          | 10Hz to 55Hz 1.6mm DA        |                     |
| Termination                   | PCB                          |                     |
| Unit weight                   | Approx. 7g                   |                     |
| Construction                  | Plastic sealed, Flux proofed |                     |

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

### COIL

|            |                                                      |
|------------|------------------------------------------------------|
| Coil power | Standard: Approx. 450mW;<br>Sensitive: Approx. 200mW |
|------------|------------------------------------------------------|

### COIL DATA

at 23°C

#### Standard Type

| Nominal Voltage VDC | Pick-up Voltage VDC max. | Drop-out Voltage VDC min. | Max. Voltage VDC * | Coil Resistance Ω |
|---------------------|--------------------------|---------------------------|--------------------|-------------------|
| 3                   | 2.25                     | 0.15                      | 3.9                | 20 x (1±10%)      |
| 5                   | 3.75                     | 0.25                      | 6.5                | 55 x (1±10%)      |
| 6                   | 4.50                     | 0.30                      | 7.8                | 80 x (1±10%)      |
| 9                   | 6.75                     | 0.45                      | 11.7               | 180 x (1±10%)     |
| 12                  | 9.00                     | 0.60                      | 15.6               | 320 x (1±10%)     |
| 18                  | 13.5                     | 0.90                      | 23.4               | 720 x (1±10%)     |
| 24                  | 18.0                     | 1.20                      | 31.2               | 1280 x (1±10%)    |
| 48                  | 36.0                     | 2.40                      | 62.4               | 5120 x (1±10%)    |

#### Sensitive type (Only for 1 Form A)

| Nominal Voltage VDC | Pick-up Voltage VDC max. | Drop-out Voltage VDC min. | Max. Voltage VDC * | Coil Resistance Ω |
|---------------------|--------------------------|---------------------------|--------------------|-------------------|
| 3                   | 2.25                     | 0.15                      | 4.5                | 45 x (1±10%)      |
| 5                   | 3.75                     | 0.25                      | 7.5                | 125 x (1±10%)     |
| 6                   | 4.50                     | 0.30                      | 9.0                | 180 x (1±10%)     |
| 9                   | 6.75                     | 0.45                      | 13.5               | 400 x (1±10%)     |
| 12                  | 9.00                     | 0.60                      | 18.0               | 720 x (1±10%)     |
| 18                  | 13.5                     | 0.90                      | 27.0               | 1600 x (1±10%)    |
| 24                  | 18.0                     | 1.20                      | 36.0               | 2800 x (1±10%)    |
| 48                  | 36.0                     | 2.40                      | 72.0               | 11520 x (1±10%)   |

Notes: \*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.



HONGFA RELAY

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

2015 Rev. 1.00

## SAFETY APPROVAL RATINGS

|        |          |                            |                                                                                                                                           |
|--------|----------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| UL/CUL | 1 Form A | AgCdO                      | 5A 250VAC/30VDC at 40°C<br>8A 250VAC at 40°C<br>10A 125VAC at 40°C<br>10A 277VAC COSØ =0.4 at 40°C<br>1/10HP 125VAC, 1/6HP 250VAC at 40°C |
|        |          | AgNi                       | 5A 250VAC/30VDC at 70°C<br>8A 250VAC at 70°C<br>10A 125VAC at 70°C<br>10A 277VAC COSØ =0.4 at 70°C<br>1/10HP 125VAC, 1/6HP 250VAC at 70°C |
|        |          | AgSnO <sub>2</sub>         | 5A 250VAC/30VDC at 70°C<br>10A 125VAC at 70°C                                                                                             |
|        | 1 Form C | AgCdO                      | 3A 250VAC at 40°C<br>3A 30VDC at 40°C                                                                                                     |
|        |          | AgNi<br>AgSnO <sub>2</sub> | 3A 250VAC at 70°C<br>3A 30VDC at 70°C                                                                                                     |
|        | 1 Form C | AgCdO<br>AgNi              | NC: 3A 250VAC at 70°C*                                                                                                                    |
| VDE    | 1 Form A | AgNi                       | 5A 250VAC at 85°C                                                                                                                         |
|        |          | AgCdO                      | 5A 250VAC at 70°C*                                                                                                                        |
|        |          | AgSnO <sub>2</sub>         | 5A 250VAC at 70°C                                                                                                                         |
|        | 1 Form C | AgCdO<br>AgNi              | NC: 3A 250VAC at 70°C*                                                                                                                    |

Notes: 1) \*The vent hole is kept open during load approval;  
2) For AgSnO<sub>2</sub> Contact type, the vent-hole cover should be excised.  
3) All values unspecified are at room temperature.  
4) Only typical loads are listed above. Other load specifications can be available upon request.

## ORDERING INFORMATION

|                            |                                                 |
|----------------------------|-------------------------------------------------|
| Type                       | HF33F / 012 -H S L 3 G F (XXX)                  |
| Coil voltage               | 3, 5, 6, 9, 12, 18, 24, 48VDC                   |
| Contact arrangement        | H: 1 Form A Z: 1 Form C                         |
| Construction <sup>1)</sup> | S: Plastic sealed Nil: Flux proofed             |
| Coil power                 | L: Sensitive (Only for 1 Form A) Nil: Standard  |
| Contact material           | T: AgSnO <sub>2</sub> 3: AgNi Nil: AgCdO        |
| Contact plating            | G: Gold plated Nil: No gold plated              |
| Insulation standard        | F: Class F                                      |
| Special code <sup>3)</sup> | XXX: Customer special requirement Nil: Standard |

Notes: 1) Under the ambience with dangerous gas like H<sub>2</sub>S, SO<sub>2</sub> or NO<sub>2</sub>, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.  
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

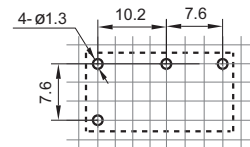
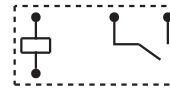
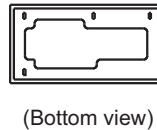
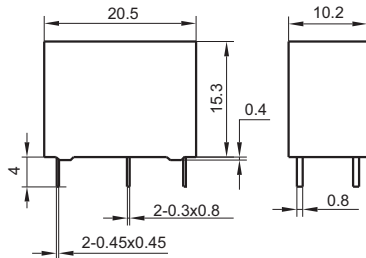
Unit: mm

### Outline Dimensions

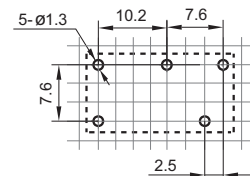
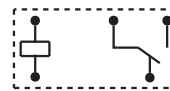
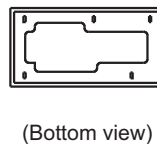
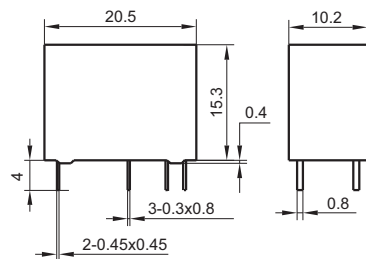
### Wiring Diagram (Bottom view)

### PCB Layout (Bottom view)

#### 1 Form A



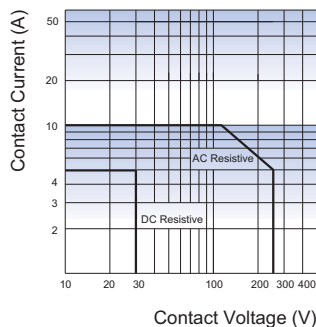
#### 1 Form C



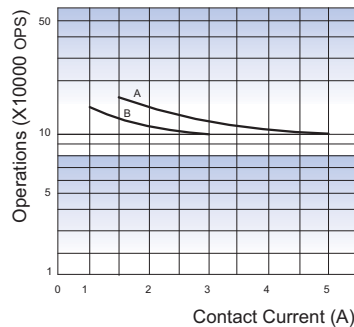
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1\text{mm}$ , tolerance should be  $\pm 0.2\text{mm}$ ; outline dimension  $> 1\text{mm}$  and  $\leq 5\text{mm}$ , tolerance should be  $\pm 0.3\text{mm}$ ; outline dimension  $> 5\text{mm}$ , tolerance should 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.

## CHARACTERISTIC CURVES

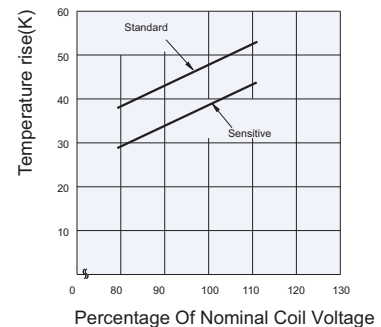
### MAXIMUM SWITCHING POWER



### ENDURANCE CURVE



### COIL TEMPERATURE RISE



#### Notes:

- Curve A: NO contact  
Curve B: NC contact
- Test conditions:**  
Curve A: NO, Resistive load, Room temp., flux proofed, 250VAC/30VDC, 1s on 9s off  
Curve B: NC, Resistive load, Room temp., flux proofed, 250VAC/30VDC, 1s on 9s off

#### Notes:

- Standard: 5A at 70°C  
 Sensitive: 5A at 70°C  
 Mounting distance: 10mm

### 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.