

# HFE20

# MINIATURE HIGH POWER LATCHING RELAY



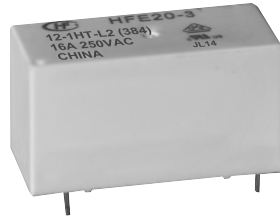
File No.:E134517



File No.: 40031831



File No.: CQC14002113728



## Features

- 16A switching capability
- Latching relay
- Have passed TV-8 (UL) certification
- Max.inrush current Capacitor 500A/2ms  
(Contact material: W+AgSnO<sub>2</sub>)
- Environmental friendly product (RoHS compliant)

## CONTACT DATA

|                        |   |
|------------------------|---|
| Contact arrangement    | 1A, 1B, 1C  |
| Contact resistance     | 20mΩ max. (at 1A 24VDC)   |
| Contact material       | AgSnO <sub>2</sub> , W+AgSnO <sub>2</sub>   |
| Contact rating         | 1A,1B: 16A 250VAC, 1 x 10 <sup>5</sup> OPS<br>(Resistive, at 85°C, 1s on 9s off)<br>1A,1B: 20A 250VAC, 2 x 10 <sup>4</sup> OPS<br>(Resistive, at 70°C, 1s on 9s off)<br>1A,1B: 1.5HP 250VAC 4 x 10 <sup>4</sup> OPS<br>(Motor, at 40°C, 0.5s on 0.5s off)<br>1A,1B: 8A 220VAC COSØ=0.4, 1x10 <sup>5</sup> OPS<br>(Inductive, at 85°C, 1s on 9s off)<br>HFE20-1/X-1HD: 3300W 277VAC, 2 x 10 <sup>4</sup> OPS<br>(Electronic rectifier, at 40°C, 1s on 9s off)<br>1C: 16A 250VAC, 5 x 10 <sup>4</sup> OPS<br>(Resistive, at 85°C, 3s on 3s off) |
| Max. switching voltage | 277VAC  |
| Max. switching current | 20A   |
| Max. switching power   | 4000VA  |
| Mechanical endurance   | 1 x 10 <sup>6</sup> OPS   |
| Electrical endurance   | See "Contact rating"  |

## SAFETY APPROVAL RATINGS

|        |    |  |
|--------|----|--|
| UL/CUL | 1H | 20A 250VAC at 70°C   |
|        |    | 16A 250VAC at 85°C   |
|        |    | 1.5HP 250VAC at 40°C   |
|        | 1Z | NO:20A 250VAC at 70°C<br>16A 250VAC at 85°C<br>NC:16A 250VAC at 85°C |
| VDE    | 1H | 20A 250VAC(COSØ=1) at 70°C   |
|        |    | 16A 250VAC(COSØ=1) at 85°C   |
|        |    | 8A 250VAC (COSØ=0.4) at 85°C   |
|        | 1Z | 16A 250VAC(COSØ=1) at 85°C   |

**Notes:** Only typical loads are listed above. other load specifications can be available upon request.

## COIL

|            |   |
|------------|---|
| Coil power | Single coil latching: Approx 400mW<br>Double coils latching: Approx 600mW |
|------------|---|

## COIL DATA

at 23°C

Single coil latching

| Nominal Voltage VDC | Set / Reset Voltage VDC max. | Pulse Duration ms min. | Coil Resistance x (1±10%) Ω |
|---------------------|------------------------------|------------------------|-----------------------------|
| 3                   | 2.4                          | 50                     | 22.5                        |
| 5                   | 4.0                          | 50                     | 62.5                        |
| 6                   | 4.8                          | 50                     | 90                          |
| 9                   | 7.2                          | 50                     | 202.5                       |
| 12                  | 9.6                          | 50                     | 360                         |
| 24                  | 19.2                         | 50                     | 1440                        |

## CHARACTERISTICS

|                               |                              |                     |
|-------------------------------|------------------------------|---------------------|
| Insulation resistance         | 1000MΩ (at 500VDC)           |                     |
| Dielectric strength           | Between coil & contacts      | 4000VAC 1min        |
|                               | Between open contacts        | 1000VAC 1min        |
| Creepage distance             | 8mm                          |                     |
| Operate time (at nomi. volt.) | 10ms max.                    |                     |
| Release time (at nomi. volt.) | 10ms max.                    |                     |
| Shock resistance              | Functional                   | 98m/s <sup>2</sup>  |
|                               | Destructive                  | 980m/s <sup>2</sup> |
| Vibration resistance          | 10Hz to 55Hz 1.5mm DA        |                     |
| Humidity                      | 5% to 85% RH                 |                     |
| Ambient temperature           | PCB                          |                     |
| Termination                   | -40°C to 85°C                |                     |
| Unit weight                   | Approx. 13g                  |                     |
| Construction                  | Plastic sealed, Flux proofed |                     |

**Notes:** The data shown above are initial values.



HONGFA RELAY

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

2015 Rev. 1.00

## COIL DATA

at 23°C

Double coils latching

| Nominal Voltage VDC | Set / Reset Voltage VDC max. | Pulse Duration ms min. | Coil Resistance x (1±10%) Ω |
|---------------------|------------------------------|------------------------|-----------------------------|
| 3                   | 2.4                          | 50                     | 15+15                       |
| 5                   | 4.0                          | 50                     | 42+42                       |
| 6                   | 4.8                          | 50                     | 60+60                       |
| 9                   | 7.2                          | 50                     | 135+135                     |
| 12                  | 9.6                          | 50                     | 240+240                     |
| 24                  | 19.2                         | 50                     | 886+886                     |

## ORDERING INFORMATION

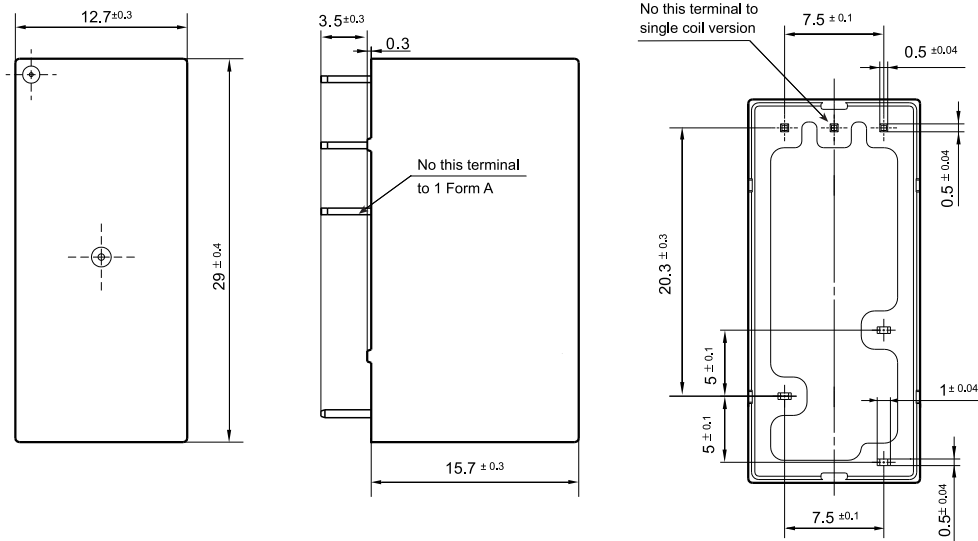
|                                  |  |            |            |  |                           |          |            |           |              |
|----------------------------------|--|------------|------------|--|---------------------------|----------|------------|-----------|--------------|
| <b>HFE20</b>                     |  | <b>- 3</b> | <b>/12</b> | <b>-1D</b>                                   | <b>S</b>                  | <b>T</b> | <b>-L2</b> | <b>-R</b> | <b>(XXX)</b> |
| <b>Type</b>                      |  |            |            |  |                           |          |            |           |              |
| <b>Version</b>                   | 1: 5mm pin<br>2: 3.5mm pin<br>3: 2.5mm pin                               |            |            |  |                           |          |            |           |              |
| <b>Coil voltage</b>              | 3, 5, 6, 9, 12, 24 VDC   |            |            |  |                           |          |            |           |              |
| <b>Contact form<sup>1)</sup></b> | 1D: 1 Form B    1H: 1 Form A<br>1Z: 1 Form C (Only for HFE20-1, HFE20-2) |            |            |  |                           |          |            |           |              |
| <b>Construction<sup>2)</sup></b> | S: Plastic sealed    Nil: Flux proofed                                   |            |            |  |                           |          |            |           |              |
| <b>Contact material</b>          | T: AgSnO2<br>D: W+AgSnO2(Only for HFE20-1/XX-1H, UL certification only)  |            |            |  |                           |          |            |           |              |
| <b>Sort</b>                      | L1: Single coil latching   |            |            |  | L2: Double coils latching |          |            |           |              |
| <b>Polarity</b>                  | R: Reverse polarity  |            |            |  | Nil: Positive polarity    |          |            |           |              |
| <b>Customer special code</b>     | (359): lamp load   |            |            | (399): Special polarity (See Wiring Diagram) |                           |          |            |           |              |

**Notes:** 1) 1H means that relay is on the "reset" status when delivery; 1D means that relay is on the "set" status when delivery. we will recommend use one form B if customer can use normally (except the pre-make version HFE20-1/XX-1HxD).

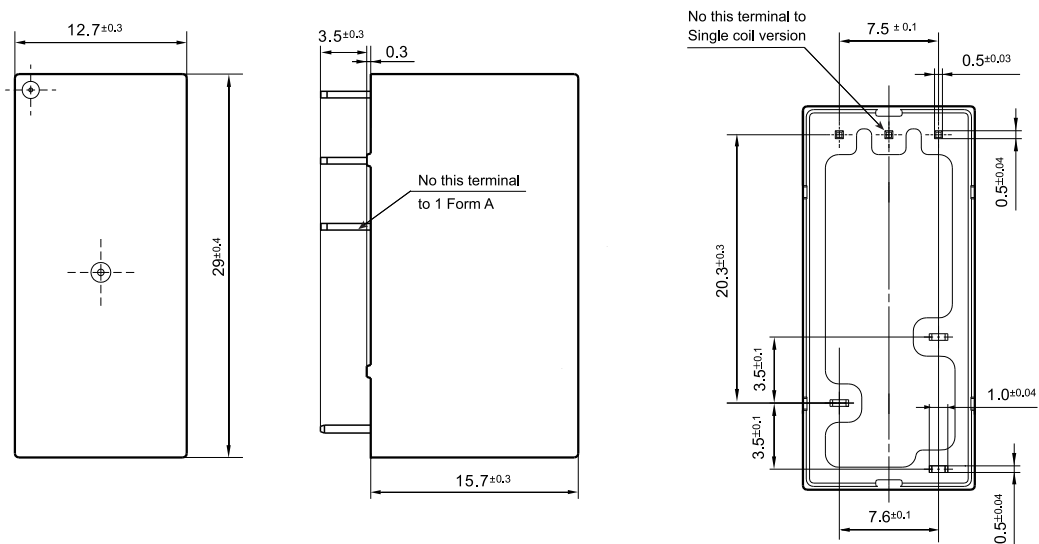
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

Outline Dimensions

HFE20-1

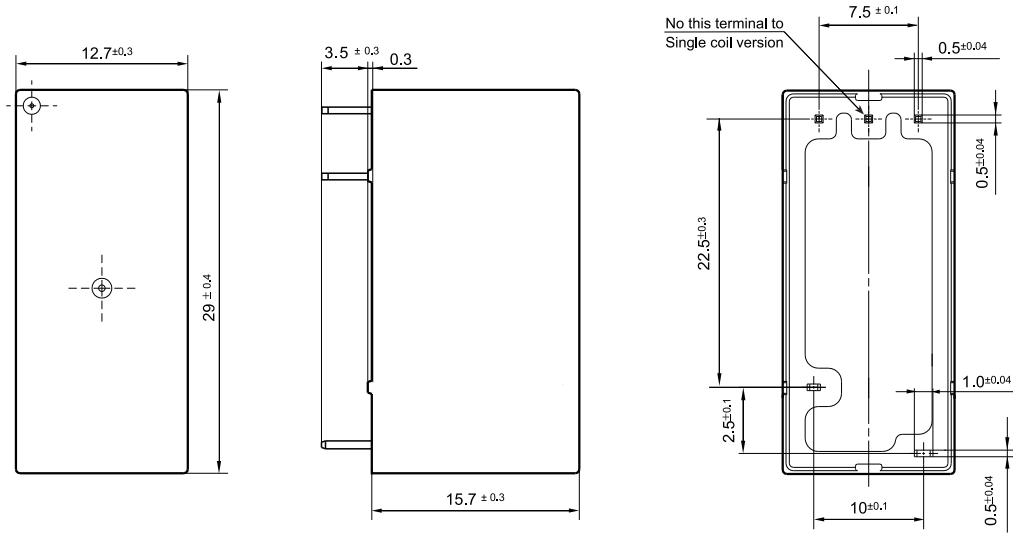


HFE20-2



Outline Dimensions

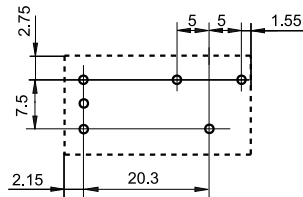
HFE20-3



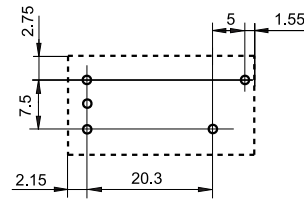
PCB Layout (Bottom view)

HFE20-1

1 Form C

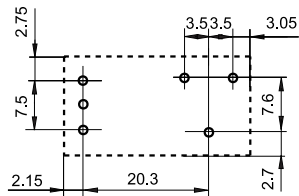


1 Form A, 1 Form B

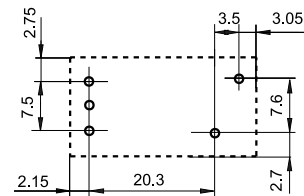


HFE20-2

1 Form C

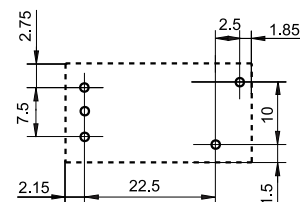


1 Form A, 1 Form B



HFE20-3

1 Form A, 1 Form B



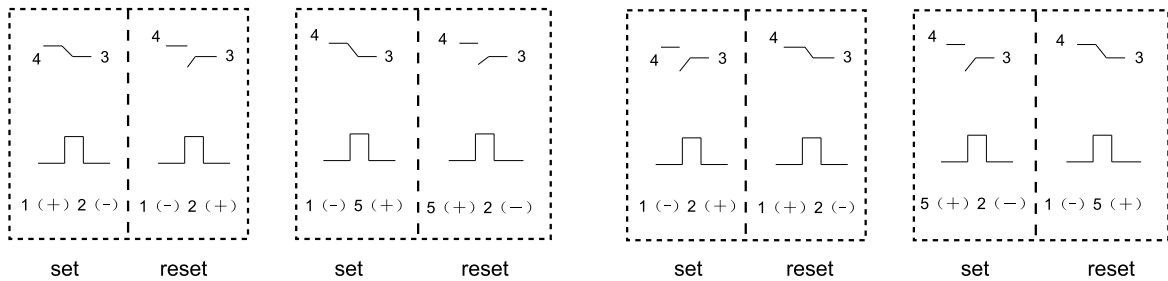
Wiring Diagram (Bottom view)

HFE20-3



Positive polarity

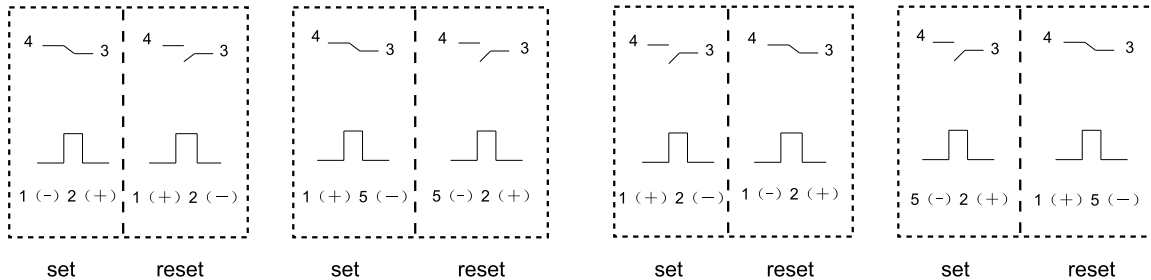
Single coil latching, 1 Form A Double coils latching, 1 Form A Single coil latching, 1 Form B Double coils latching, 1 Form B



Wiring Diagram (Bottom view)

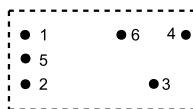
Reverse polarity

Single coil latching, 1 Form A Double coils latching, 1 Form A Single coil latching, 1 Form B Single coils latching, 1 Form B



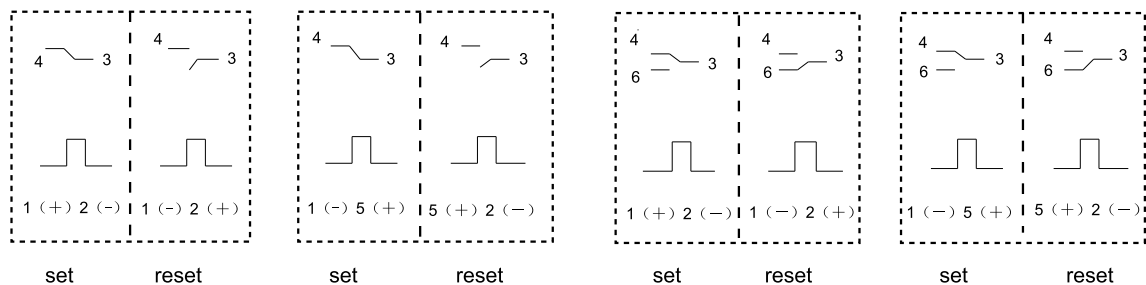
Wiring Diagram (Bottom view)

HFE20-1  
HFE20-2



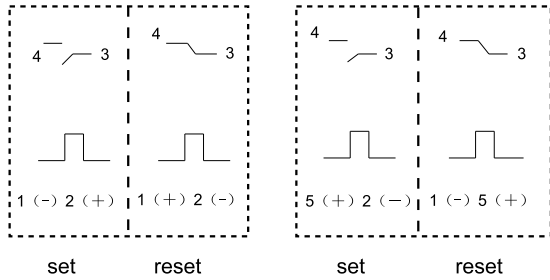
Positive polarity

Single coil latching, 1 Form A Double coils latching, 1 Form A Single coil latching, 1 Form C Double coils latching, 1 Form C



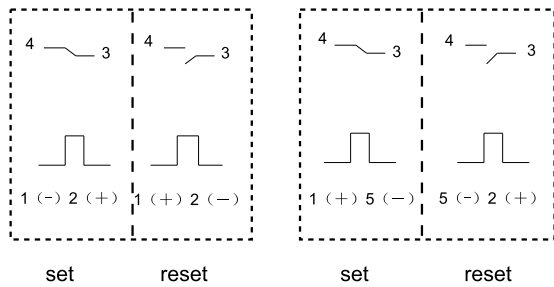
Wiring Diagram (Bottom view)

Single coil latching, 1 Form B Double coils latching, 1 Form B

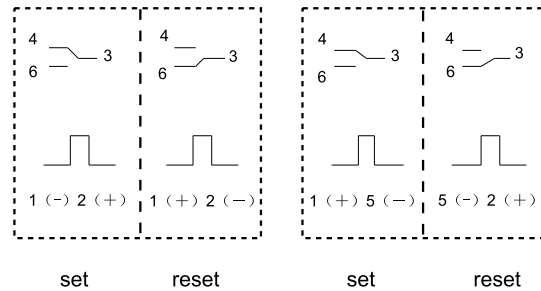


Reverse polarity

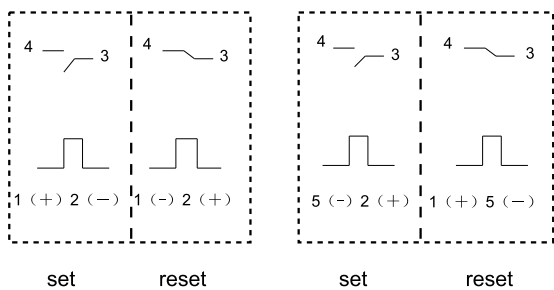
Single coil latching, 1 Form A Double coils latching, 1 Form A



Single coil latching, 1 Form C Double coils latching, 1 Form C

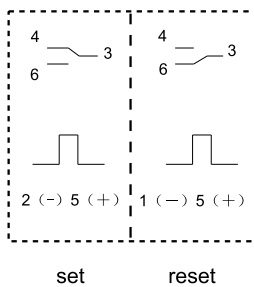


Single coil latching, 1 Form B Double coils latching, 1 Form B



**(399): Special polarity**

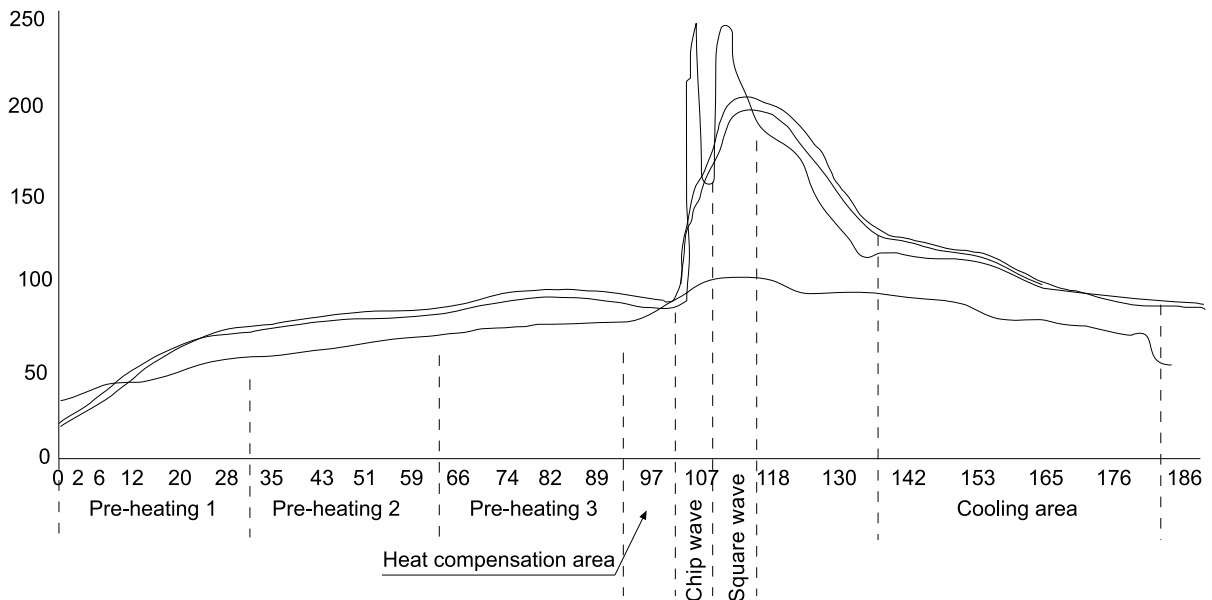
Double coils latching



## NOTICE

### 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. When choose the relay with PCB termination, the recommended welding temperature range and duration is 240°C~260°C, 2s~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.



wave soldering temperature distribution chart

### 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.

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