

# HF13F

# MINIATURE INTERMEDIATE POWER RELAY



File No.:E133481



File No.:R50154518



File No.:CQC09002030028 (DC type)

CQC09002030029 (AC type)



## Features

- 1C: 15A; 2C:10A switching capability
- Various terminals available
- Sockets available
- Conform to the CE low voltage directive
- 1 & 2 pole configurations
- UL insulation system: Class F(2 form A/2 form C)

RoHS compliant

## CONTACT DATA

|                                  |   |                     |
|----------------------------------|---|---------------------|
| Contact arrangement              | 1A,1C   | 2A,2C               |
| Contact resistance <sup>1)</sup> | 100mΩ max.(at 1A 6VDC)  |                     |
| Contact material                 | See"ORDERING INFORMATION"   |                     |
| Contact rating<br>(Res. load)    | 15A<br>250VAC/30VDC   | 10A<br>250VAC/30VDC |
| Max. switching voltage           | 250VAC / 30VDC  |                     |
| Max. switching current           | 15A   | 10A                 |
| Max. switching power             | 3750VA/450W   | 2500VA/300W         |
| Mechanical endurance             | 1 x 10 <sup>7</sup> OPS   |                     |
| Electrical endurance             | 1 Form C type: 1 x 10 <sup>5</sup> OPS (15A 250VAC, Resistive load, Room temp., 1s on 9s off) |                     |
|                                  | 1Form C type: 1 x 10 <sup>5</sup> OPS (15A 30VDC, Resistive load, Room temp., 1s on 9s off)   |                     |
|                                  | 2 Form C type: 1 x 10 <sup>5</sup> OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off) |                     |
|                                  | 2 Form C type: 1 x 10 <sup>5</sup> OPS (10A 30VDC, Resistive load, Room temp., 1s on 9s off)  |                     |

Notes: The data shown above are initial values.

## CHARACTERISTICS

|   |                         |                     |
|---|-------------------------|---------------------|
| Insulation resistance                     |                         | 500MΩ (at 500VDC)   |
| Dielectric strength                       | Between coil & contacts | 1500VAC 1min        |
|   | Between open contacts   | 1000VAC 1min        |
|   | Between contact sets    | 1500VAC 1min        |
| Operate time (at nomi. volt.)             |                         | 25ms max.           |
| Release time (at nomi. volt.)             |                         | 25ms max.           |
| Temperature rise (no-load, at nomi.volt.) |                         | 60K max.            |
| Shock resistance                          | Functional              | 98m/s <sup>2</sup>  |
|   | Destructive             | 980m/s <sup>2</sup> |
| Vibration resistance                      |                         | 10Hz to 55Hz 1mm DA |
| Humidity                                  |                         | 5% to 85% RH        |
| Ambient temperature                       |                         | -40°C to 70°C       |
| Termination                               |                         | PCB, Plug-in        |
| Unit weight                               |                         | Approx. 37g         |
| Construction                              |                         | Dust protected      |

Notes: The data shown above are initial values.

## COIL

|            |  |
|------------|--|
| Coil power | DC type: Approx. 0.9W to 1.1W<br>AC type: Approx. 1.2VA to 1.8VA |
|------------|--|

## COIL DATA

at 23°C

| 1 Pole              |  |   |                                |                   |
|---------------------|--|---|--------------------------------|-------------------|
| Nominal Voltage VDC | Pick-up Voltage VDC max. <sup>2)</sup> | Drop-out Voltage VDC min. <sup>2)</sup> | Max. Voltage VDC <sup>3)</sup> | Coil Resistance Ω |
| 5                   | 4.0                                    | 0.5                                     | 5.5                            | 27.5x(1±10%)      |
| 6                   | 4.8                                    | 0.6                                     | 6.6                            | 40x(1±10%)        |
| 9                   | 7.2                                    | 0.9                                     | 9.9                            | 90x(1±10%)        |
| 12                  | 9.6                                    | 1.2                                     | 13.2                           | 160x(1±10%)       |
| 21                  | 16.8                                   | 2.1                                     | 23.1                           | 490x(1±10%)       |
| 24                  | 19.2                                   | 2.4                                     | 26.4                           | 650x(1±10%)       |
| 30                  | 24.0                                   | 3.0                                     | 33.0                           | 1000x(1±10%)      |
| 36                  | 28.8                                   | 3.6                                     | 39.6                           | 1440x(1±10%)      |
| 48                  | 38.4                                   | 4.8                                     | 52.8                           | 2600x(1±15%)      |
| 60                  | 48.0                                   | 6.0                                     | 66.0                           | 4000x(1±15%)      |
| 110                 | 88.0                                   | 11.0                                    | 121                            | 11000x(1±15%)     |
| 125                 | 100.0                                  | 12.5                                    | 137.5                          | 14000x(1±15%)     |
| 220                 | 176.0                                  | 22.0                                    | 242                            | 53750x(1±15%)     |
| Nominal Voltage VAC | Pick-up Voltage VAC max. <sup>2)</sup> | Drop-out Voltage VAC min. <sup>2)</sup> | Max. Voltage VAC <sup>3)</sup> | Coil Resistance Ω |
| 6                   | 4.80                                   | 1.8                                     | 6.6                            | 11.5x(1±10%)      |
| 12                  | 9.60                                   | 3.6                                     | 13.2                           | 46x(1±10%)        |
| 24                  | 19.2                                   | 7.2                                     | 26.4                           | 184x(1±10%)       |
| 36                  | 28.8                                   | 10.8                                    | 39.6                           | 410x(1±10%)       |
| 48                  | 38.4                                   | 14.4                                    | 52.8                           | 735x(1±10%)       |
| 60                  | 48.0                                   | 18.0                                    | 66.0                           | 1100x(1±10%)      |
| 120 <sup>4)</sup>   | 96.0                                   | 36.0                                    | 132                            | 4550x(1±15%)      |
| 200                 | 160                                    | 66.0                                    | 220                            | 12950x(1±15%)     |
| 220                 | 176                                    | 72.0                                    | 242                            | 14400x(1±15%)     |
| 240 <sup>4)</sup>   | 176                                    | 72.0                                    | 264                            | 14400x(1±15%)     |
| 277                 | 221.6                                  | 83.1                                    | 304.7                          | 23590x(1±15%)     |



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2023 Rev. 2.00

## COIL DATA

at 23°C

### 2 Pole

| Nominal Voltage VDC | Pick-up Voltage VDC max. <sup>2)</sup> | Drop-out Voltage VDC min. <sup>2)</sup> | Max. Voltage VDC <sup>3)</sup> | Coil Resistance Ω |
|---------------------|--|---|--------------------------------|-------------------|
| 5                   | 4.0                                    | 0.5                                     | 5.5                            | 27.5x(1±10%)      |
| 6                   | 4.8                                    | 0.6                                     | 6.6                            | 40x(1±10%)        |
| 9                   | 7.2                                    | 0.9                                     | 9.9                            | 90x(1±10%)        |
| 12                  | 9.6                                    | 1.2                                     | 13.2                           | 160x(1±10%)       |
| 21                  | 16.8                                   | 2.1                                     | 23.1                           | 490x(1±10%)       |
| 24                  | 19.2                                   | 2.4                                     | 26.4                           | 640x(1±10%)       |
| 30                  | 24.0                                   | 3.0                                     | 33.0                           | 1000x(1±10%)      |
| 36                  | 28.8                                   | 3.6                                     | 39.6                           | 1440x(1±10%)      |
| 48                  | 38.4                                   | 4.8                                     | 52.8                           | 2560x(1±15%)      |
| 60                  | 48.0                                   | 6.0                                     | 66.0                           | 4000x(1±15%)      |
| 110 <sup>4)</sup>   | 80.0                                   | 11.0                                    | 121                            | 12250x(1±15%)     |
| 125                 | 100                                    | 12.5                                    | 137.5                          | 17360x(1±15%)     |
| 220                 | 176                                    | 22.0                                    | 242                            | 53360x(1±15%)     |

| Nominal Voltage VAC | Pick-up Voltage VAC max. <sup>2)</sup> | Drop-out Voltage VAC min. <sup>2)</sup> | Max. Voltage VAC <sup>3)</sup> | Coil Resistance Ω |
|---------------------|--|---|--------------------------------|-------------------|
| 6                   | 4.8                                    | 1.8                                     | 6.6                            | 11x(1±10%)        |
| 12                  | 9.6                                    | 3.6                                     | 13.2                           | 44x(1±10%)        |
| 24                  | 19.2                                   | 7.2                                     | 26.4                           | 177x(1±10%)       |
| 36                  | 28.8                                   | 10.8                                    | 39.6                           | 400x(1±10%)       |
| 48                  | 38.4                                   | 14.4                                    | 52.8                           | 708x(1±10%)       |
| 60                  | 48.0                                   | 18.0                                    | 66.0                           | 1100x(1±10%)      |
| 100                 | 80.0                                   | 30.0                                    | 110                            | 3400x(1±15%)      |
| 110 <sup>4)</sup>   | 80.0                                   | 33.0                                    | 121                            | 3400x(1±15%)      |
| 120 <sup>4)</sup>   | 88.0                                   | 36.0                                    | 132                            | 4080x(1±15%)      |
| 200                 | 160                                    | 60.0                                    | 220                            | 13600x(1±15%)     |
| 220 <sup>4)</sup>   | 160                                    | 66.0                                    | 242                            | 13600x(1±15%)     |
| 240 <sup>4)</sup>   | 176                                    | 72.0                                    | 264                            | 16300x(1±15%)     |
| 277                 | 221.6                                  | 83.1                                    | 304.7                          | 23590x(1±15%)     |

**Notes:** 1) Under ambient temperature, applying more than 80% of rating voltage to coil, relay will take action accordingly. But in order to meet the stated product performance, please apply rated voltage to coil.

2) The data shown above are initial values.

3) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

4) A110:Nominal Voltage(100~110)VAC; A120:Nominal Voltage(110~120)VAC; A220:Nominal Voltage(200~220)VAC; A240:Nominal Voltage(220~240)VAC; 110:Nominal Voltage(100~110)VAC.

## SAFETY APPROVAL RATINGS

|        |                    |                   |                      |
|--------|--------------------|-------------------|----------------------|
| UL/CUL | AgSnO <sub>2</sub> | 1 Form C/1 Form A | 15A 250VAC           |
|        |                    |                   | 15A 30VDC            |
|        |                    | 2 Form C/2 Form A | 10A 250VAC           |
|        |                    |                   | 10A 30VDC            |
|        | AgNi               | 2 Form C/2 Form A | 1/3HP,240VAC/ 120VAC |
|        |                    |                   | 10A 250VAC           |
| TÜV    | AgSnO <sub>2</sub> | 2 Form C/2 Form A | 10A 30VDC            |
|        |                    |                   | 10A 250VAC,70°C      |
|        | AgNi               | 2 Form C/2 Form A | 10A 30VDC,70°C       |
|        |                    |                   | 10A 250VAC,70°C      |

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

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

## ORDERING INFORMATION

|                                    |  |
|------------------------------------|--|
| Type                               | HF13F / A 012 -2Z 1 3 D (XXX)  |
| Coil voltage form                  | A: AC Nil: DC  |
| Coil voltage                       | DC: 5VDC to 220VDC<br>AC: 6VAC to 277VAC   |
| Contact arrangement                | 1H: 1 Form A 2H: 2 Form A<br>1Z: 1 Form C 2Z: 2 Form C   |
| Mounting termination <sup>1)</sup> | 1: Socket 2: PCB 5: Flange-Mounting  |
| Contact material                   | 3: AgNi T: AgSnO<br>3G: AgNi+Au plated TG: AgSnO+Au plated   |
| LED                                | D: With LED Nil: Without LED J: with free wheeling diode<br>DJ: with light emitting diode and with free wheeling diode |
| Special code <sup>2)</sup>         | XXX: Customer special requirement Nil: Standard  |

Notes: 1)No 1H2/1Z2 type products.

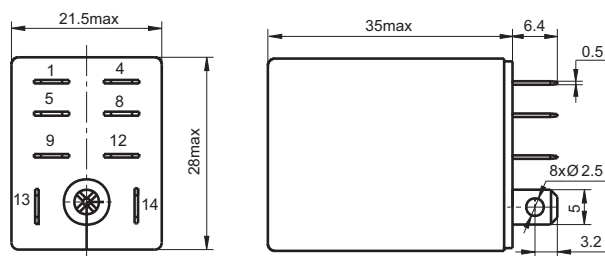
2)The customer special requirement express as special code after evaluating by Hongfa.

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

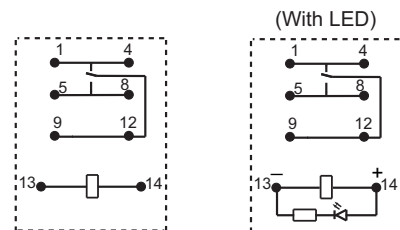
Unit: mm

HF13F/□□□□-1Z1□

Outline Dimensions



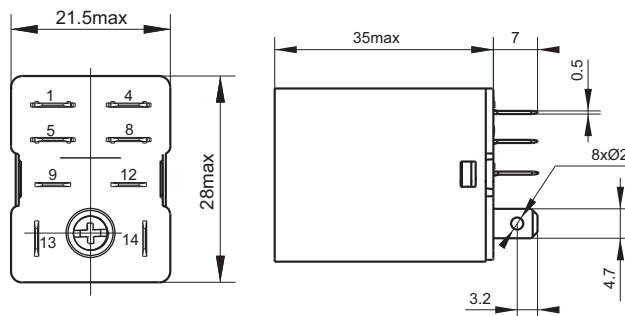
Wiring Diagram  
(Bottom view)



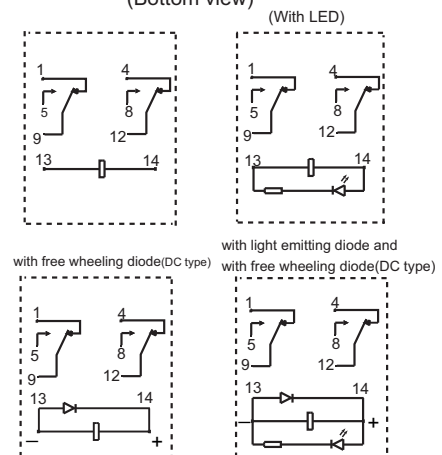
Remark: For AC parts with diode, the positive and negative pole markings on wiring diagram are not applicable.

HF13F/□□□□-2Z1□

Outline Dimensions



Wiring Diagram  
(Bottom view)



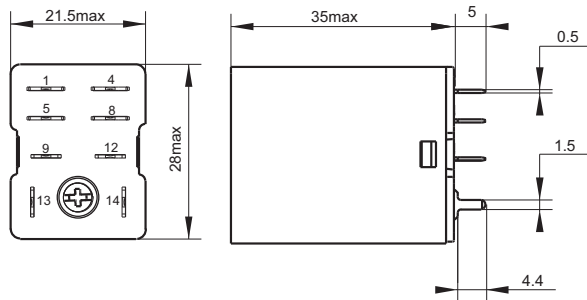
Remark: Fly-wheel products need to distinguish between the cathode. Only with LED products do not need to distinguish between the cathode. Only DC relays have freewheeling diodes.

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

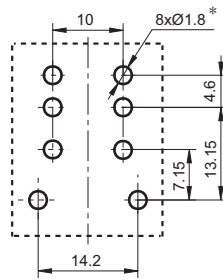
Unit: mm

HF13F/□□□□-2Z2□

Outline Dimensions

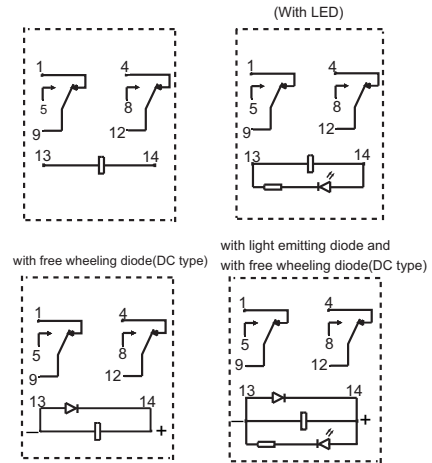


PCB Layout  
(Bottom view)



\*: Please adjust the site of this diameter according to the actual application.

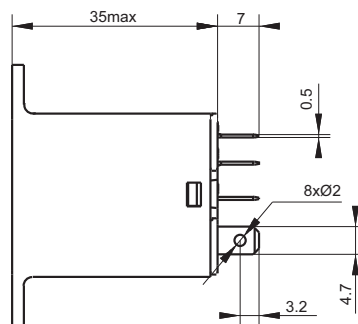
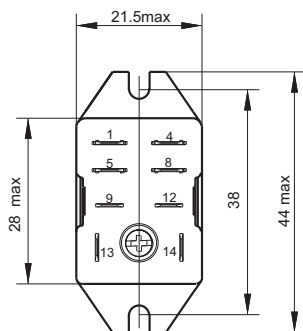
Wiring Diagram  
(Bottom view)



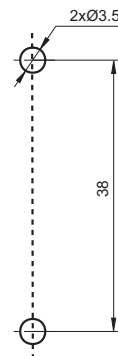
Remark: Fly-wheel products need to distinguish between the cathode. Only with LED products do not need to distinguish between the cathode. Only DC relays have freewheeling diodes.

HF13F/□□□□-2Z5□

Outline Dimensions



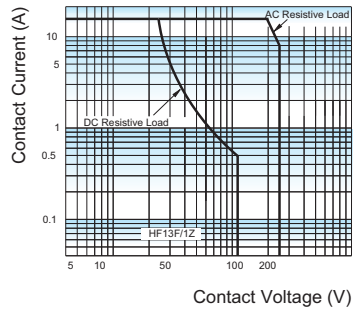
Mounting holes



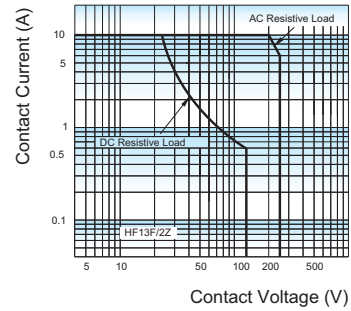
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension 1mm, tolerance should be  $\pm 0.2$ mm; outline dimension  $> 1$ mm and  $\leq 5$ mm, tolerance should be  $\pm 0.3$ mm; outline dimension  $> 5$ mm, tolerance should be  $\pm 0.4$ mm.  
2) The tolerance without indicating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

## CHARACTERISTIC CURVES

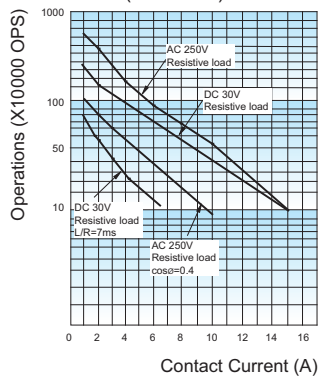
MAXIMUM SWITCHING POWER  
(1 Form C)



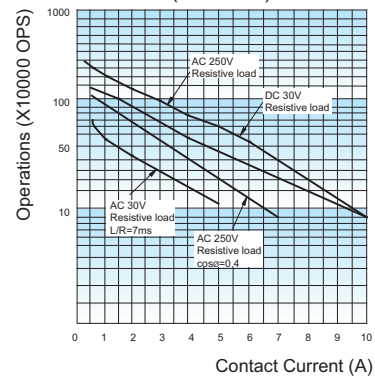
MAXIMUM SWITCHING POWER  
(2 Form C)



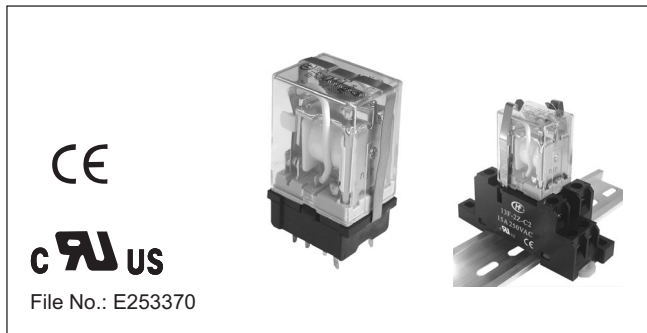
ENDURANCE CURVE  
(1 Form C)



ENDURANCE CURVE  
(2 Form C)



## Relay Sockets



### Features

- The dielectric strength can reach 2000VAC and the insulation resistance is 1000 MΩ
- Three mounting types are available: PCB mounting, screw mounting and DIN rail mounting.
- With finger protection device
- Components available: metallic retainer


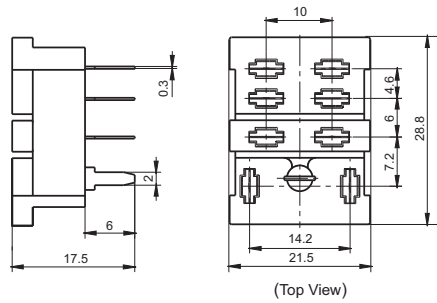
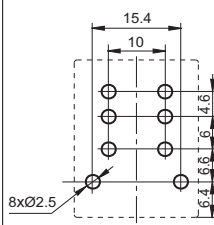

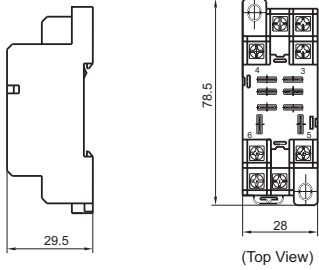
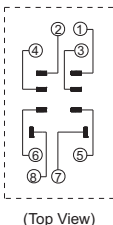
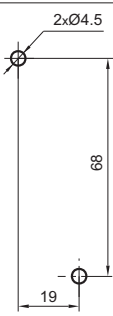

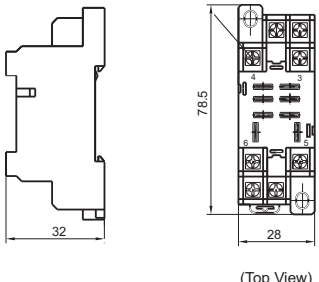
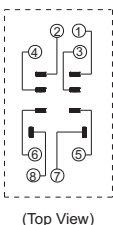
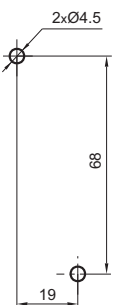
RoHS compliant

### CHARACTERISTICS

| Type      | Nominal Voltage | Nominal Current | Ambient Temperature | Dielectric Strength min. | Screw Torque | Wire Strip Length | Unit weight |
|-----------|-----------------|-----------------|---------------------|--------------------------|--------------|-------------------|-------------|
| 13F-2Z-A2 | 250VAC          | 10A/15A         | -40 °C to 70°C      | 2000VAC                  | —            | —                 | Approx. 9g  |
| 13F-2Z-C1 | 250VAC          | 10A/15A         | -40 °C to 70°C      | 2000VAC                  | 1.0N·m       | 7mm               | Approx. 51g |
| 13F-2Z-C2 | 250VAC          | 10A/15A         | -40 °C to 70°C      | 2000VAC                  | 1.0N·m       | 7mm               | Approx. 52g |

### OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

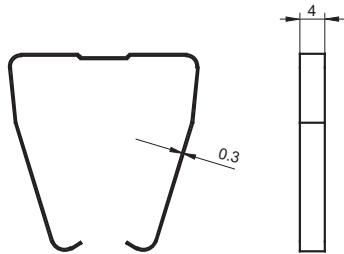
| Socket  | Outline Dimensions  | Wiring Diagram   | PCB Layout  | Components Available                              |
|---|---|--|---|---|
| <b>13F-2Z-A2</b><br><br>PCB terminal,<br>PCB mounting  | <br>(Top View) |  |  | Metallic retainer<br>18FF-H1                      |
| <b>13F-2Z-C1</b><br><br>Screw terminal,<br>DIN rail or Screw mounting,<br>Without finger protection device | <br>(Top View) | <br>(Top View) |  | Metallic retainer<br>18FF-H2<br>(be used in sets) |
| <b>13F-2Z-C2</b><br><br>Screw terminal,<br>DIN rail or Screw mounting,<br>With finger protection device    | <br>(Top View) | <br>(Top View) |  | Metallic retainer<br>18FF-H2<br>(be used in sets) |

## DIMENSION OF RELATED COMPONENT (AVAILABLE)

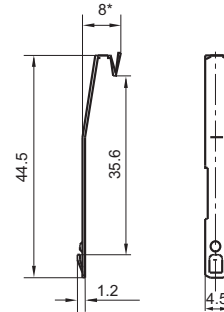
Unit: mm

### Retainer

18FF-H1 (Metallic retainer)



18FF-H2 (Metallic retainer)



**Notes:** 18FF-H2 retainer has to be used in sets,  
please pay special attention while placing the  
order.

#### Things to be noticed when selecting sockets:

1. Please choose suitable relay socket according to the actual mounting environment, relay contact poles and terminal layout. If there is any query on selection, please contact Hongfa for the technical service.
2. As for other related components, they should be selected separately. Please do give clear indication of the types of relay sockets and related components you choose while placing order.
3. The above is only an example of typical socket and related component type which is suitable to HF13F relay. If you have any special requirements, please contact us.
4. Main outline dimension(L, W, H)  $\geq 50$ mm, tolerance should be  $\pm 1$ mm; outline dimension  $> 20$ mm and  $< 50$ mm, tolerance should be  $\pm 0.5$ mm; outline dimension  $\leq 20$ mm, tolerance should be  $\pm 0.3$ mm.
5. DIN rail mounting: recommend to use standard rail  $35 \times 7.5 \times 1$ mm,  $35 \times 15 \times 1$ mm.

#### 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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