

# HF115F

## MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:116934



File No.:CQC08002028130



### Features

- Low height: 15.7 mm
- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (29.0 x 12.7 x 15.7) mm

### CONTACT DATA

|                            |   |            |
|----------------------------|---|------------|
| Contact arrangement        | 1A, 1B, 1C  | 2A, 2B, 2C |
| Contact resistance         | 100mΩ max.(at 1A 6VDC)  |            |
| Contact material           | See ordering info.  |            |
| Contact rating (Res. load) | 12A/16A 250VAC  | 8A 250VAC  |
| Max. switching voltage     | 440VAC / 300VDC   |            |
| Max. switching current     | 12A / 16A   | 8A         |
| Max. switching power       | 3000VA / 4000VA   | 2000VA     |
| Mechanical endurance       | 1 x 10 <sup>7</sup> OPS   |            |
| Electrical endurance       | 1H3B type: 1 x 10 <sup>5</sup> OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off)<br>2H4B type: 1 x 10 <sup>5</sup> OPS (8A 250VAC, Resistive load, Room temp., 1s on 9s off) |            |

### CHARACTERISTICS

|   |                              |                     |
|---|------------------------------|---------------------|
| Insulation resistance                   | 1000MΩ (at 500VDC)           |                     |
| Dielectric strength                     | Between coil & contacts      | 5000VAC 1min        |
|   | Between open contacts        | 1000VAC 1min        |
|   | Between contact sets         | 2500VAC 1min        |
| Surge voltage (between coil & contacts) | 10kV (1.2 / 50μs)            |                     |
| Operate time (at nomi. volt.)           | 15ms max.                    |                     |
| Release time (at nomi. volt.)           | 8ms max.                     |                     |
| Temperature rise (at nomi. volt.)       | 55K max.                     |                     |
| Shock resistance *                      | Functional                   | 98m/s <sup>2</sup>  |
|   | Destructive                  | 980m/s <sup>2</sup> |
| Vibration resistance *                  | 10Hz to 150Hz 10g/5g         |                     |
| Humidity                                | 5% to 85% RH                 |                     |
| Ambient temperature                     | -40°C to 85°C                |                     |
| Termination                             | PCB                          |                     |
| Unit weight                             | Approx. 13.5g                |                     |
| Construction                            | Plastic sealed, Flux proofed |                     |

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

2) \* Index is not in relay length direction.

3) UL insulation system: Class F, Class B.

### COIL

|            |               |
|------------|---------------|
| Coil power | Approx. 400mW |
|------------|---------------|

### COIL DATA

at 23°C

| Nominal Voltage VDC | Pick-up Voltage VDC max. | Drop-out Voltage VDC min. | Max. Voltage VDC 1) | Coil Resistance Ω |
|---------------------|--------------------------|---------------------------|---------------------|-------------------|
| 5                   | 3.50                     | 0.5                       | 7.5                 | 62 x (1±10%)      |
| 6                   | 4.20                     | 0.6                       | 9.0                 | 90 x (1±10%)      |
| 9                   | 6.30                     | 0.9                       | 13.5                | 202 x (1±10%)     |
| 12                  | 8.40                     | 1.2                       | 18                  | 360 x (1±10%)     |
| 18                  | 12.60                    | 1.8                       | 27                  | 810 x (1±10%)     |
| 24                  | 16.80                    | 2.4                       | 36                  | 1440 x (1±10%)    |
| 48 <sup>2)</sup>    | 33.60                    | 4.8                       | 72                  | 5760 x (1±15%)    |
| 60 <sup>2)</sup>    | 42.00                    | 6.0                       | 90                  | 7500 x (1±15%)    |
| 110 <sup>2)</sup>   | 77.00                    | 11.0                      | 165                 | 25200 x (1±15%)   |

Notes: 1) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

2) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).



HONGFA RELAY

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

2015 Rev. 1.00

## SAFETY APPROVAL RATINGS

### VDE

| Contact material   | Specifications                  | Ratings                       | Ambient Temperature |
|--------------------|---------------------------------|-------------------------------|---------------------|
| AgCdO              | HF115F....2(H;Z)(S)4(G)(F)      | 8A 250VAC                     | at 70°C             |
|                    | HF115F....1H(S)(1;2)(G)(F)      | 12A 250VAC                    | at 70°C             |
|                    |                                 | 10A 250VAC                    | at 70°C             |
|                    | HF115F....1Z(S)(1;2)(G)(F)      | 12A 250VAC                    | at 70°C             |
|                    | HF115F....1H(S)3(G)(F)          | 16A 250VAC                    | at 70°C             |
|                    |                                 | 10A 250VAC                    | at 70°C             |
|                    |                                 | 9A 250VAC COSØ =0.4           | at 70°C             |
| AgNi               | HF115F....2(H;Z)(S)4B(G)(F)     | 16A 250VAC                    | at 70°C             |
|                    |                                 | 9A 250VAC COSØ =0.4           | at 70°C             |
|                    | HF115F....1H(S)(1;2)B(G)(F)     | 12A 250VAC                    | at 85°C             |
|                    | HF115F....1Z(S)(1;2)B(G)(F)     | 12A 250VAC                    | at 85°C             |
|                    | HF115F....1H(S)3B(G)(F)         | 16A 250VAC                    | at 85°C             |
|                    |                                 | 9A 250VAC COSØ =0.4           | at 70°C             |
|                    | HF115F....1Z(S)3B(G)(F)         | 16A 250VAC (NO only)          | at 85°C             |
|                    |                                 | 12A 250VAC                    | at 85°C             |
|                    |                                 | 9A 250VAC COSØ =0.4 (NO only) | at 70°C             |
|                    |                                 | 10(4)A 250VAC (NO only)       | at 65°C             |
|                    |                                 | 12(2)A 250VAC (NO only)       | at 65°C             |
| AgSnO <sub>2</sub> | HF115F....2(H;Z)(S)4A(G)(F)     | 8A 250VAC                     | at 85°C             |
|                    | HF115F....1(H;Z)(S)(1;2)A(G)(F) | 12A 250VAC                    | at 85°C             |
|                    | HF115F....1H(S)3A(G)(F)         | 16A 250VAC                    | at 85°C             |
|                    |                                 | 9A 250VAC COSØ =0.4           | at 70°C             |
|                    | HF115F....1Z(S)3A(G)(F)         | 16A 250VAC (NO only)          | at 85°C             |
|                    |                                 | 9A 250VAC COSØ =0.4 (NO only) | at 70°C             |

### UL/CUL

|                                      |                    |                                 |                    |
|--------------------------------------|--------------------|---------------------------------|--------------------|
| Version 1 or 2 (AgCdO)               | 12A 277VAC         | Version 3 (AgSnO <sub>2</sub> ) | 16A 277 VAC        |
|                                      | 1/2HP 250VAC       |                                 | 1/3HP 125VAC       |
|                                      | 1/3HP 125VAC       |                                 | 1/2HP 250VAC       |
| Version 1 or 2 (AgSnO <sub>2</sub> ) | 12A / 277VAC       | Version 3 (AgNi)                | B300               |
|                                      | B300               |                                 | R300               |
|                                      | R300               |                                 | 16A 277VAC         |
| Version 1 or 2 (AgNi)                | 12A 277VAC         | Version 4 (AgCdO)               | 5FLA, 30LRA 250VAC |
| Version 3 (AgCdO)                    | 16A 277 VAC        |                                 | 10A 250VAC         |
|                                      | 9A 250VAC at 105°C |                                 | 8A 277VAC          |
|                                      | 1HP 250VAC         |                                 | 1/2HP 250VAC       |
|                                      | 1/2HP 125VAC       |                                 | 1/4HP 125VAC       |
|                                      | TV-5 125VAC        | Version 4 (AgSnO <sub>2</sub> ) | 8A 277VAC          |
|                                      |                    | Version 4 (AgNi)                | 8A 277VAC          |

**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

|                                |  |
|--------------------------------|--|
| HF115F / 012 -1H S 1 A F (XXX) |  |
| Type                           |  |
| Coil voltage                   | 5, 6, 9, 12, 18, 24, 48, 60, 110VDC  |
| Contact arrangement            | 1H: 1 Form A 1D: 1 Form B 1Z: 1 Form C<br>2H: 2 Form A 2D: 2 Form B 2Z: 2 Form C                                       |
| Construction <sup>1)2)</sup>   | S: Plastic sealed Nil: Flux proofed  |
| Version                        | 1: 3.5mm 1 pole 12A 2: 5.0mm 1 pole 12A<br>3: 5.0mm 1 pole 16A 4: 5.0mm 2 pole 8A                                      |
| Contact material <sup>3)</sup> | A: AgSnO <sub>2</sub> B: AgNi Nil: AgCdO G: AgCdO+ Au plated<br>AG: AgSnO <sub>2</sub> + Au plated BG: AgNi+ Au plated |
| Insulation standard            | F: Class F Nil: Class B  |
| Special code <sup>4)</sup>     | XXX: Customer special requirement Nil: Standard  |

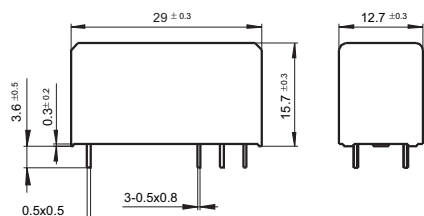
**Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, dust, etc.).  
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, dust, etc).  
2) Contact is recommend for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB  
3) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.  
4) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT); e.g. (253) stands for Reflow soldering version, for 1 pole type.

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

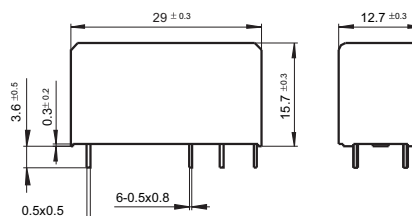
Unit: mm

### Outline Dimensions

3.5mm Pinning (HF115F/ □□□ -□□ -□ -□□ )

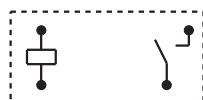


5mm Pinning (HF115F/ □□□ -□□ -□ -2/3/4 -□□ )

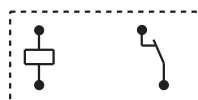


### Wiring Diagram (Bottom view)

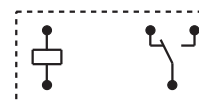
3.5/5mm Pinning, 1 Pole, 12A, HF115F/ □□□ -1 □ -□ -1/2-□□



1 Form A

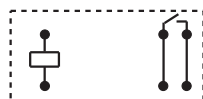


1 Form B



1 Form C

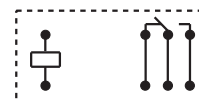
5mm Pinning, 1 Pole, 16A, HF115F/ □□□ -1 □ -□ -3-□□



1 Form A

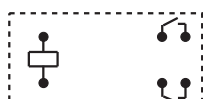


1 Form B

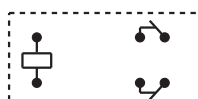


1 Form C

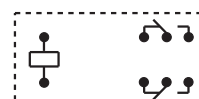
5mm Pinning, 2 Pole, 8A, HF115F/ □□□ -2 □ -□ -4-□□



2 Form A



2 Form B



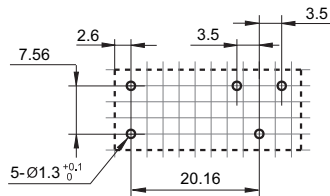
2 Form C

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

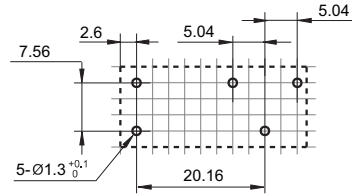
Unit: mm

### PCB Layout (Bottom view)

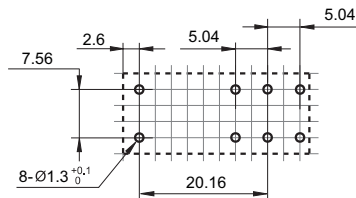
3.5mm 1Pole 12A



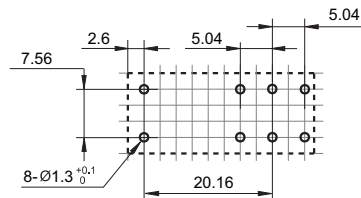
5mm 1Pole 12A



5mm 1Pole 16A



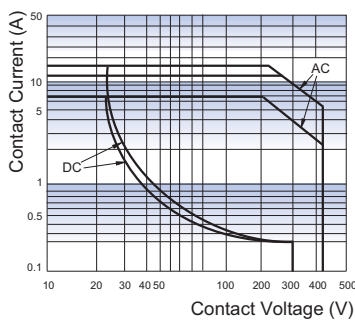
5mm 2Pole 8A



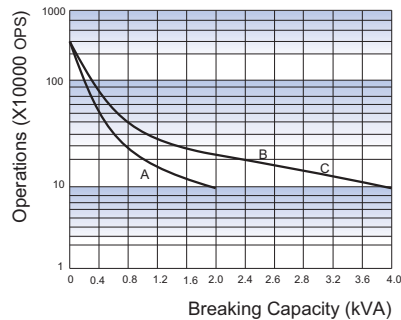
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1\text{mm}$ , tolerance should be  $\pm 0.2\text{mm}$ ; outline dimension  $> 1\text{mm}$  and  $\leq 5\text{mm}$ , tolerance should be  $\pm 0.3\text{mm}$ ; outline dimension  $> 5\text{mm}$ , tolerance should 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 2.52mm.

## CHARACTERISTIC CURVES

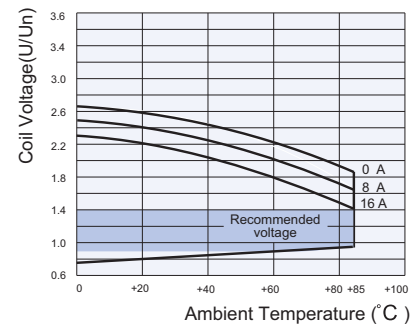
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (DC) \*

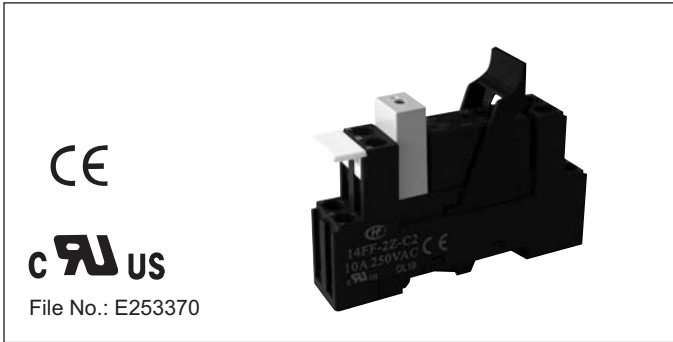


#### Notes:

- Curve A: 2H4B type  
Curve B: 1H1B(or 1H2B) type  
Curve C: 1H3B type
- Test conditions:  
NO, Resistive load, 250VAC,  
Flux proofed, Room temp., 1s on 9s off.

**Notes:** \* The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.  
 An energising voltage over the above range may damage the insulation of relay coil.

# Relay Sockets



## Features


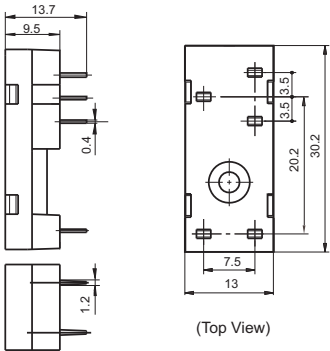
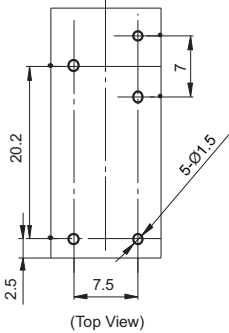

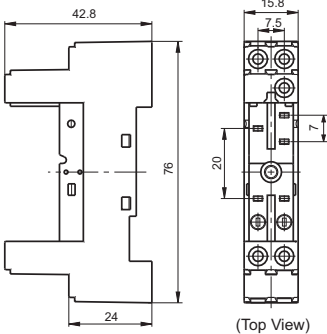
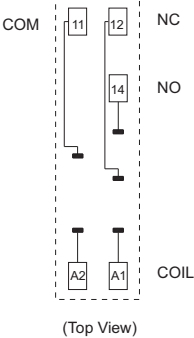
- The dielectric strength can reach 5000VAC(I/O) and the insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting.
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring protection.
- Environmental friendly product (RoHS compliant)

## CHARACTERISTICS

| Type       | Nominal Voltage | Nominal Current | Ambient Temperature | Dielectric Strength min. | Screw Torque | Wire Strip Length |
|------------|-----------------|-----------------|---------------------|--------------------------|--------------|-------------------|
| 14FF-1Z-A1 | 250VAC          | 10A             | -40℃ to 70℃         | 5000VAC                  | —            | —                 |
| 14FF-1Z-C2 | 250VAC          | 10A             | -40℃ to 70℃         | 5000VAC                  | 0.6N·m       | 7mm               |
| 14FF-1Z-C3 | 250VAC          | 10A             | -40℃ to 70℃         | 5000VAC                  | 0.6N·m       | 7mm               |
| 14FF-2Z-A1 | 250VAC          | 10A             | -40℃ to 70℃         | 5000VAC                  | —            | —                 |
| 14FF-2Z-C2 | 250VAC          | 10A             | -40℃ to 70℃         | 5000VAC                  | 0.6N·m       | 7mm               |
| 14FF-2Z-C3 | 250VAC          | 10A             | -40℃ to 70℃         | 5000VAC                  | 0.6N·m       | 7mm               |
| 14FF-2Z-C4 | 250VAC          | 10A             | -40℃ to 70℃         | 5000VAC                  | 0.6N·m       | 7mm               |


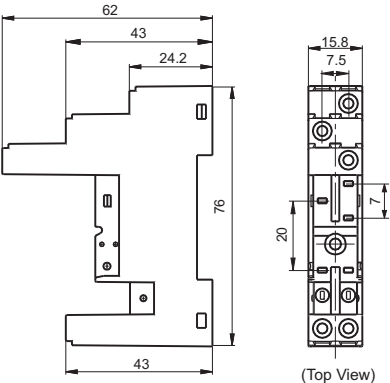
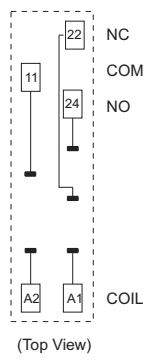

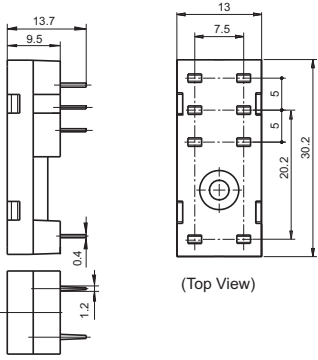
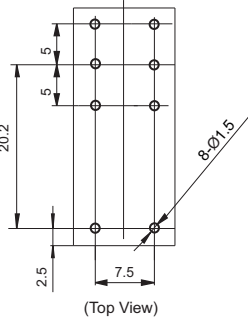

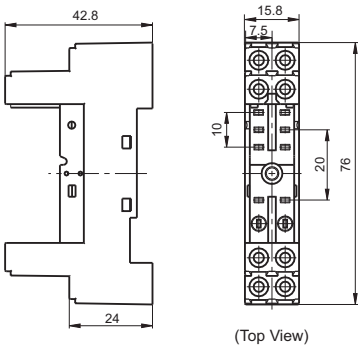
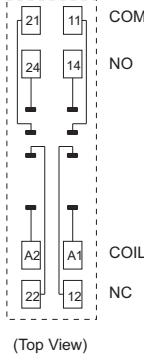

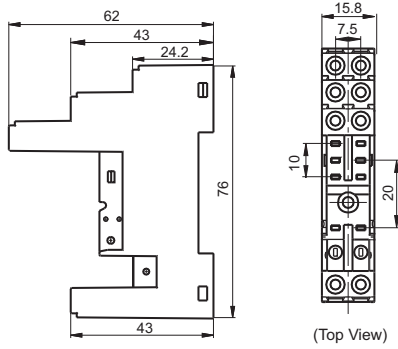
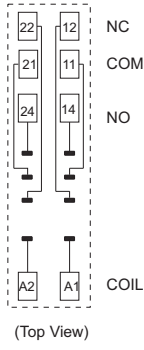
## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

| Socket   | Outline Dimensions  | Wiring Diagram / PCB Layout  | Components Available  |
|--|---|--|---|
| <p>14FF-1Z-A1</p>  <p>PCB terminal,<br/>PCB or Screw mounting<br/>Applicable for<br/>HF115F/ XXX-1XX1XXX</p>                                      |  <p>(Top View)</p> |  <p>(Top View)</p> | <p>metallic retainer<br/>14FF-H1</p>  |
| <p>14FF-1Z-C2</p>  <p>Screw terminal,<br/>PCB or Screw mounting,<br/>With finger protection device<br/>Applicable for<br/>HF115F/ XXX-1XX1XXX</p> |  <p>(Top View)</p> |  <p>(Top View)</p> | <p>plastic retainer 14FF-H4</p> <p>marker 14FF-M1</p> <p>jumper 14FF-J1</p> <p>plug-in module<br/>HFAA to HFHU*</p> |


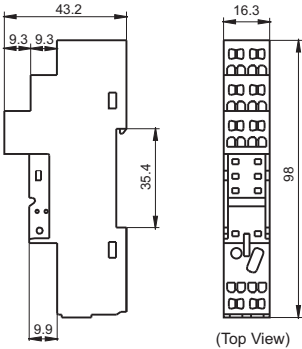
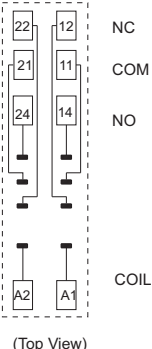
# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

| Socket  | Outline Dimensions  | Wiring Diagram / PCB Layout  | Components Available  |
|---|---|--|---|
| <p>14FF-1Z-C3</p>  <p>Screw Terminal,<br/>DIN rail or Screw mounting,<br/>With finger protection device<br/>Applicable for<br/>HF115F/ XXX-1XX1XXX</p>                           |  <p>(Top View)</p>   |  <p>(Top View)</p>   | <p>plastic retainer 14FF-H4</p> <p>marker 14FF-M1</p> <p>jumper 14FF-J1</p> <p>plug-in module<br/>HFAA to HFHU*</p> |
| <p>14FF-2Z-A1</p>  <p>PCB terminal,<br/>PCB or Screw mounting<br/>Applicable for<br/>HF115F/ XXX-1XX3XXX<br/>HF115F/ XXX-1XX4XXX</p>   |  <p>(Top View)</p>  |  <p>(Top View)</p>  | <p>metallic retainer<br/>14FF-H1</p>  |
| <p>14FF-2Z-C2</p>  <p>Screw Terminal,<br/>DIN rail or Screw mounting,<br/>With finger protection device<br/>Applicable for<br/>HF115F/ XXX-1XX3XXX<br/>HF115F/ XXX-1XX4XXX</p> |  <p>(Top View)</p> |  <p>(Top View)</p> | <p>plastic retainer 14FF-H4</p> <p>marker 14FF-M1</p> <p>jumper 14FF-J1</p> <p>plug-in module<br/>HFAA to HFHU*</p> |
| <p>14FF-2Z-C3</p>  <p>Screw Terminal,<br/>DIN rail or Screw mounting,<br/>With finger protection device<br/>Applicable for<br/>HF115F/ XXX-1XX3XXX<br/>HF115F/ XXX-1XX4XXX</p> |  <p>(Top View)</p> |  <p>(Top View)</p> | <p>plastic retainer 14FF-H4</p> <p>marker 14FF-M1</p> <p>jumper 14FF-J1</p> <p>plug-in module<br/>HFAA to HFHU*</p> |

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

| Socket  | Outline Dimensions   | Wiring Diagram / PCB Layout   | Components Available  |
|---|--|---|---|
| <div>14FF-2Z-C4</div> <div></div> <div>Spring-loaded terminal<br/>DIN rail mounting<br/>With finger protection device<br/>Applicable for<br/>HF115F/ XXX-1XX3XXX<br/>HF115F/ XXX-1XX4XXX</div> | <div></div> <div>(Top View)</div> | <div></div> <div>(Top View)</div> | <div>plastic retainer 14FF-H4</div> <div>marker 14FF-M1</div> <div>plug-in module<br/>HFAA to HFHU*</div> |

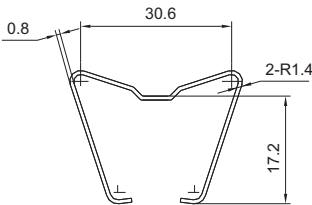
Notes: \* Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

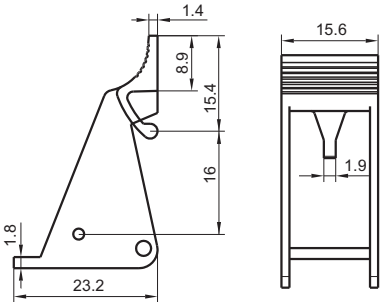
Unit: mm

Retainer

14FF-H1 (Metallic retainer)

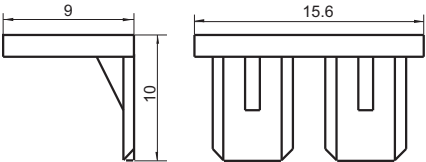


14FF-H4 (Plastic retainer)



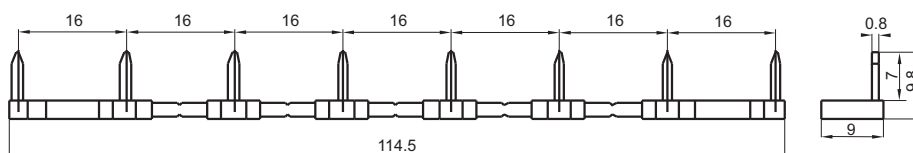
Marker

14FF-M1



## Jumper

### 14FF-J1



#### 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. Socket which can be mounted with markers is furnished with a marker; 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 HF115F relay. If you have any special requirements, please contact us.

#### 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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