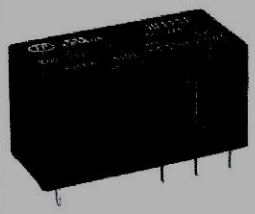
# HF115F MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.: CQC17002168381



## 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 | $1 \times 10^7$ OPS | |
| Electrical endurance | 1H3B type: $1 \times 10^5$ OPS (16A 250VAC, Resistive load, AgNi, Room temp., 1s on 9s off)<br>2H4B type: $5 \times 10^4$ OPS (8A 250VAC, Resistive load, AgNi, 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/s² |
| | Destructive | 980m/s² |
| 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 2) | 33.60 | 4.8 | 72 | 5760 x (1±15%) |
| 60 2) | 42.00 | 6.0 | 90 | 7500 x (1±15%) |
| 110 2) | 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).

## 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 |
| | HF115F....1Z(S)3(G)(F) | 16A 250VAC | at 70°C |
| | | 9A 250VAC COSØ =0.4 (NO only) | at 70°C |
| AgNi | HF115F....2(H;Z)(S)4B(G)(F) | 5A 400VAC | at 85°C |
| | | 8A 250VAC | at 85°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 |
| $AgSnO_2$ | 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 |
| | 1/2HP 250VAC |
| | 1/3HP 125VAC |
| Version 1 or 2 ($AgSnO_2$) | 12A / 277VAC |
| | B300 |
| | R300 |
| Version 1 or 2 (AgNi) | 12A 277VAC |
| Version 3 (AgCdO) | 16A 277 VAC |
| | 9A 250VAC at 105°C |
| | 1HP 250VAC |
| | 1/2HP 125VAC |
| | TV-5 125VAC |

| | |
|---|---|
| Version 3 ($AgSnO_2$) | 16A 277 VAC |
| | 1/3HP 125VAC |
| | 1/2HP 250VAC |
| | B300 |
| | R300 |
| Version 3 (AgNi) | 16A 277VAC |
| | 5FLA, 30LRA 250VAC |
| Version 4 (AgCdO) | 10A 250VAC |
| | 8A 277VAC |
| | 1/2HP 250VAC |
| | 1/4HP 125VAC |
| Version 4 ($AgSnO_2$) | 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**[1)2)] | **S:** Plastic sealed | | | **Nil:** Flux proofed | | | | | |
| **Version** | **1:** 3.5mm 1 pole 12A<br>**3:** 5.0mm 1 pole 16A | | | **2:** 5.0mm 1 pole 12A<br>**4:** 5.0mm 2 pole 8A | | | | | |
| **Contact material**[3)] | **A:** $AgSnO_2$ **B:** AgNi **Nil:** AgCdO **G:** AgCdO+ Au plated<br>**AG:** $AgSnO_2$+ Au plated **BG:** AgNi+ Au plated | | | | | | | | |
| **Insulation standard** | **F:** Class F **Nil:** Class B | | | | | | | | |
| **Special code**[4)] | **XXX:** Customer special requirement **Nil:** Standard | | | | | | | | |

**Notes:** 1) We recommend flux proofed types for a clean environment (free from contaminations like $H_2S$, $SO_2$, $NO_2$, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like $H_2S$, $SO_2$, $NO_2$, 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.

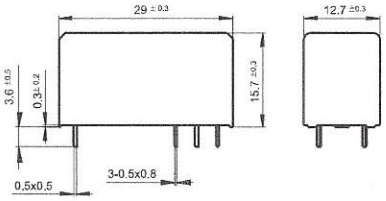
4) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT); e.g. (253) stands for Reflow soldering version, for 1 pole type.

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

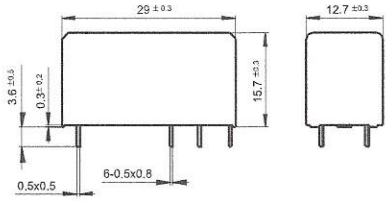
Unit: mm

### Outline Dimensions

3.5mm Pinning (HF115F/ □□□ -□□ -□ -1 -□□ )




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

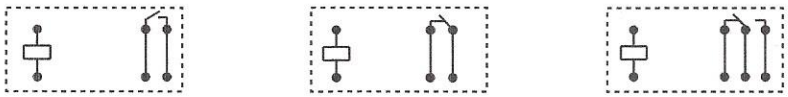



### Wiring Diagram (Bottom view)

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

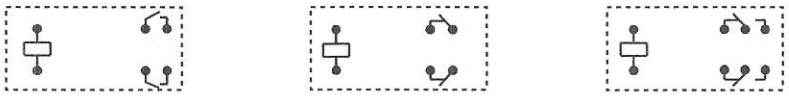
1 Form A　　1 Form B　　1 Form C

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