HF115F MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
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 10^7OPS	
Electrical endurance	1H3B type: 1 x 10^5OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off) 2H4B type: 5 x 10^4OPS (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^2
	Destructive	980m/s^2
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	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 **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 **2:** 5.0mm 1 pole 12A **3:** 5.0mm 1 pole 16A **4:** 5.0mm 2 pole 8A							
Contact material [3)]	**A:** $AgSnO_2$ **B:** AgNi **Nil:** AgCdO **G:** AgCdO+ Au plated **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.

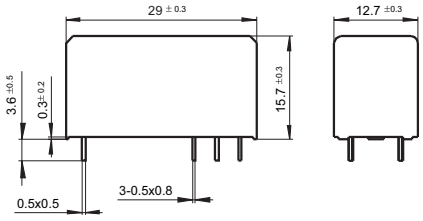
4) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT); e.g. (253) stands for Reflow soldering version, for 1 pole type.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

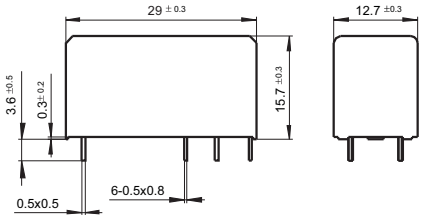
Unit: mm

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-□□

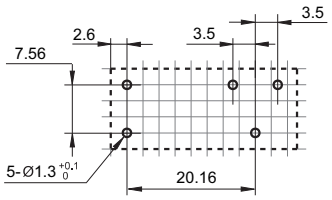
2 Form A　　2 Form B　　2 Form C

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

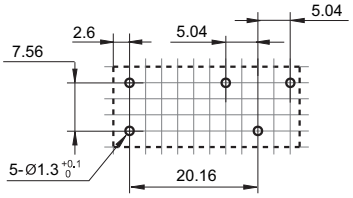
Unit: mm

PCB Layout (Bottom view)

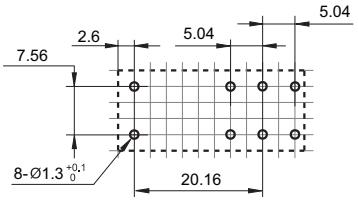
3.5mm 1Pole 12A



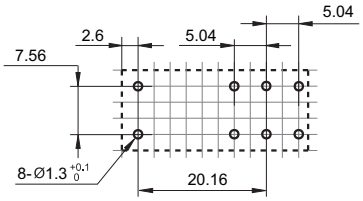
5mm 1Pole 12A



5mm 1Pole 16A



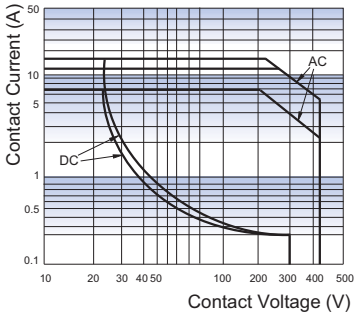
5mm 2Pole 8A



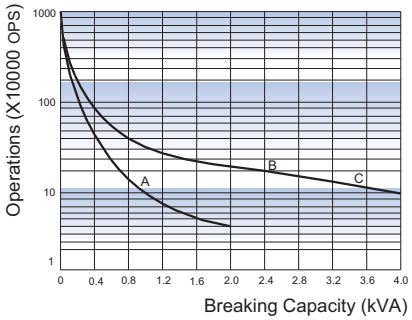
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

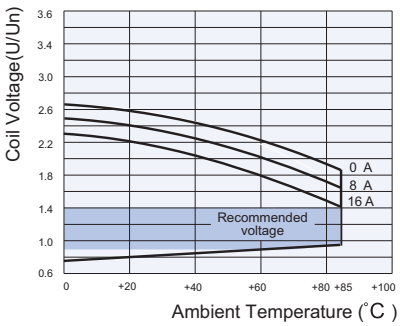


ENDURANCE CURVE



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

COIL OPERATING RANGE (DC) *



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 abver range may damage the insulation of relay coil.

Relay Sockets

CE

c UL us

File No.: E253370

Features

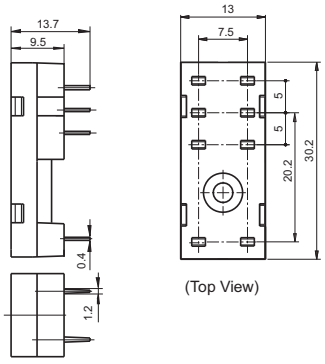
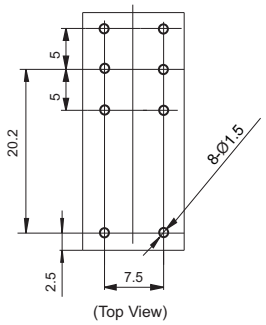
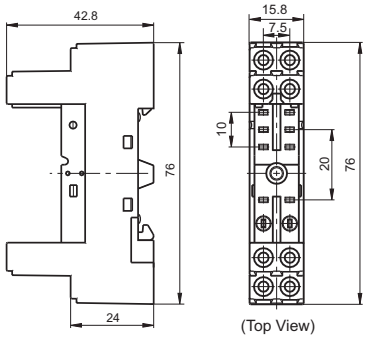
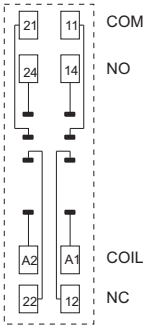
- The dielectric strength can reach 5000VAC(I/O) and the insulation resistance is 1000MΩ
- Three mounting types are available: PCB, screw mounting and DIN rail mounting.
- With finger protection device
- Many kinds of plug-in modules are available with the function of energizing indication and wiring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

CHARACTERISTICS

Type	Nominal Voltage	Nominal Current	Ambient Temperature	Dielectric Strength min.	Screw Torque	Wire Strip Length
14FF-2Z-A1	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	—
14FF-2Z-C2	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C3	250VAC	10A	-40 ˚C to 70˚C	5000VAC	0.6N · m	7mm
14FF-2Z-C4	250VAC	10A	-40 ˚C to 70˚C	5000VAC	—	9mm

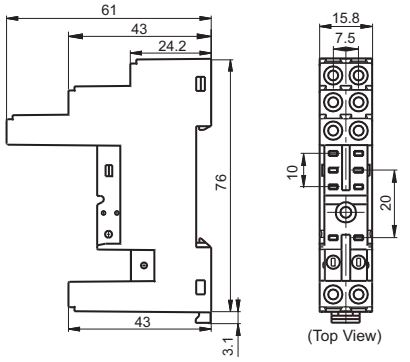
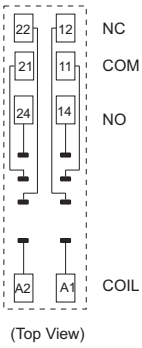
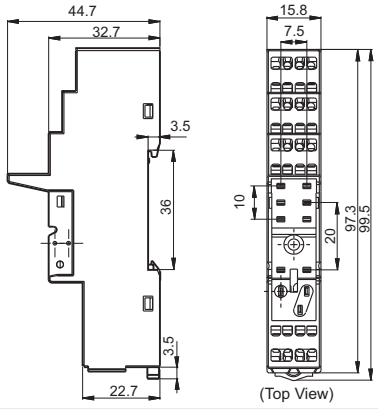
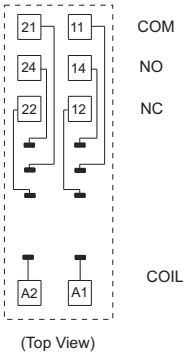
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-A1  PCB terminal, PCB or Screw mounting Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, two pole of socket load must connect in parallel.			metallic retainer 14FF-H1
14FF-2Z-C2  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H4 marker 14FF-M1 jumper 14FF-J1 plug-in module HFAA to HFHU*

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Socket	Outline Dimensions	Wiring Diagram / PCB Layout	Components Available
14FF-2Z-C3  Screw Terminal, DIN rail or Screw mounting, With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H4 marker 14FF-M1 jumper 14FF-J1 plug-in module HFAA to HFHU*
14FF-2Z-C4  Spring-loaded terminal DIN rail mounting With finger protection device Applicable for HF115F/ XXX-1XX3XXX HF115F/ XXX-1XX4XXX When it is HF115F/XXX-1XX3XXX, "21"-"11", "24"-"14", "22"-"12" of socket must connect in parallel.			plastic retainer 14FF-H4 marker 14FF-M1 plug-in module HFAA to HFHU*

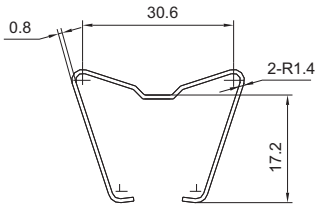
Notes: * Please refer to the product datasheet if plug-in module is required.

DIMENSION OF RELATED COMPONENT (AVAILABLE)

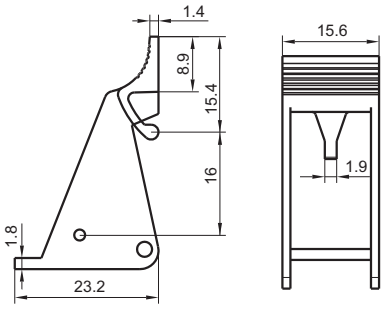
Unit: mm

Retainer

14FF-H1 (Metallic retainer)

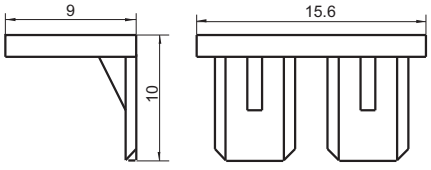


14FF-H4 (Plastic retainer)



Marker

14FF-M1

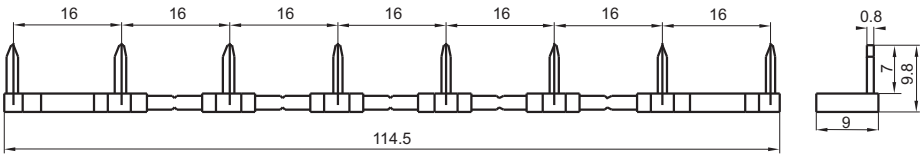


DIMENSION OF RELATED COMPONENT (AVAILABLE)

Unit: mm

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.
4. Main outline dimension(L, W, H) ≥50mm, tolerance should be ±1mm; outline dimension >20mm and <50mm, tolerance should be ±0.5mm; outline dimension ≤20mm, tolerance should be ±0.3mm.