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	1×10^7 OPS	
Electrical endurance	1×10^5 OPS (See approval reports for more details)	

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 x 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. Allowable Voltage VDC *	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	33.60	4.8	72	5760 x (1±15%)
60	42.00	6.0	90	7500 x (1±15%)
110	77.00	11.0	165	25200 x (1±15%)

Notes: * The max. allowable voltage in the COIL DATA is coil overdrive voltage, it is the instantaneous max. voltage which the relay coil could endure in a very short time.

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
		12A 250VAC	at 85°C
		9A 250VAC COSØ =0.4	at 85°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: Only some typical ratings are listed above. If more details are required, please contact us.

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]	**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 [2]	**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							
Customer special code	e.g. (335) stands for product in accordance to IEC 60335-1 (GWT) (253) stands for Reflow soldering version, for 1 pole type							

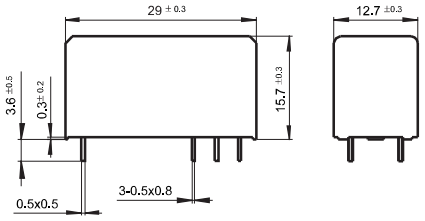
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
If water cleaning is required after the relay is assembled on PCB, please contact us for suggestion about suitable parts.
2) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

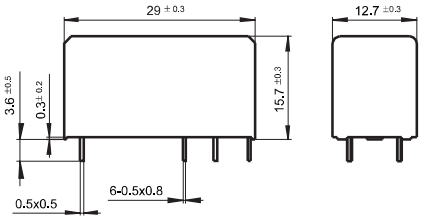
Unit: mm

Outline Dimensions

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



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



Wiring Diagram (Bottom view)

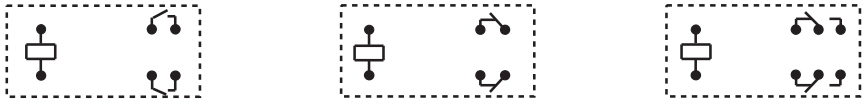
3.5/5mm Pinning, 1 Pole, 12A, HF115F/ □ □ □ -1 □ -□ -1/2-□ □

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-□ □



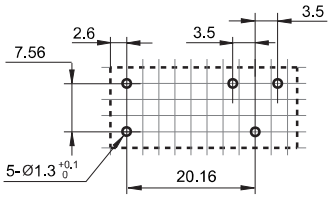
2 Form A　　2 Form B　　2 Form C

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

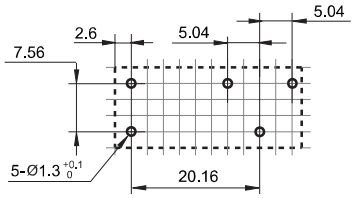
Unit: mm

PCB Layout (Bottom view)

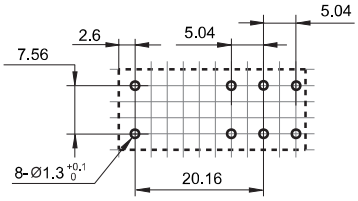
3.5mm 1Pole 12A



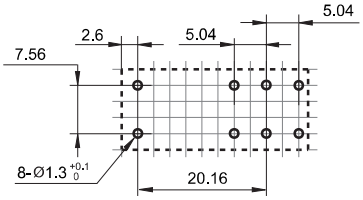
5mm 1Pole 12A



5mm 1Pole 16A



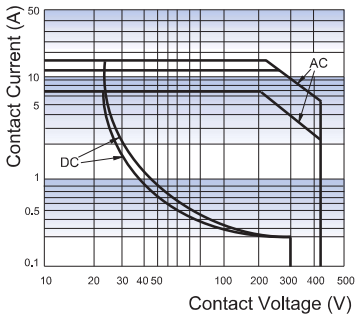
5mm 2Pole 8A



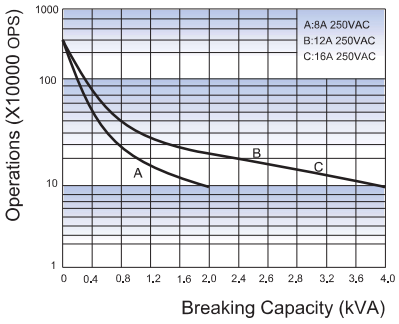
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The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

CHARACTERISTIC CURVES

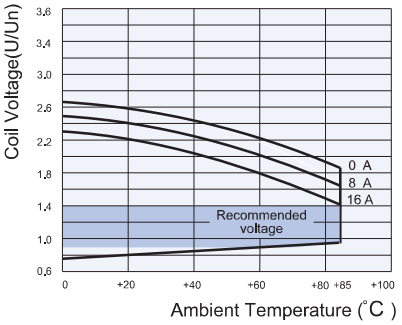
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



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.

Disclaimer

This datasheet is for the customers' reference. All the specifications are 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.