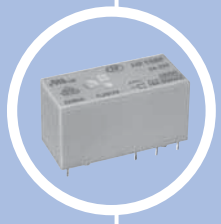
2 Power Relay



HF49FD MINIATURE POWER RELAY

File No. : E133481

File No. : 40033644

File No. : R50149334

File No.:CQC17002175722

Features

- 5A switching capability
- 3kV dielectric strength (between coil and contacts)
- Slim size (width 5mm, height 12.5mm)
- High sensitive: Min. 120mW
- Meets IEC61131-2 reinforce insulation
- Creepage/clearance distance: Min. 3.5mm
- Sockets available

CONTACT DATA

Contact arrangement	1A
Contact Resistance 1) (at 1A 6VDC)	No gold plated: 100mΩ max. Gold plated: 50mΩ max.
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	5A 250VAC/30VDC
Max. switching voltage	250VAC /30VDC
Max. switching current	5A
Max. switching power	1250VA / 150W
Min. contact load 1)	No gold plated: 5VDC 10mA Gold plated: 5VDC 1mA
Mechanical endurance	2 x 10^7OPS
Electrical endurance	1 x 10^5OPS (3A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) 5 x 10^4OPS (5A 250VAC/30VDC, Resistive load, AgNi, Room temp., 1s on 9s off)

Notes: 1) Min. contact load is reference value. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	3000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage(between coil & contacts)4)		6kV (1.2 / 50μs)
Operate time (at rated.volt.)		10ms max.
Release time (at rated.volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5%RH to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 3g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B, Class A.
4) Contact refers to the mov.-contact.

COIL

Coil power	Approx. 120mW (at 5VDC to 18VDC) Approx. 180mW (at 24VDC)

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC*3)	Coil Resistance Ω
5	3.50	0.25	6.0	208 x (1±10%)
6	4.20	0.30	7.2	300 x (1±10%)
9	6.30	0.45	10.8	675 x (1±10%)
12	8.40	0.60	14.4	1200 x (1±10%)
18	12.6	0.90	21.6	2700 x (1±15%)
24	16.8	1.20	28.8	3200 x (1±15%)

Notes: 1) All above data are tested when the relays terminals are downward position. Other positions of the terminals, the pick-up and drop-out voltages will have ±5% tolerance. For example, when the relay terminals are transverse position, the max. pick-up voltage change is 75% of nominal voltage.
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) 24VDC 120mW type are also available, please see ordering information for more details.

SAFETY APPROVAL RATINGS

UL/CUL	1H1 type	$AgSnO_2$	3A 250VAC COSØ=1 at 85°C 3A 30VDC L/R =0ms at 85°C 5A 250VAC COSØ=1 5A 30VDC L/R =0ms
		AgNi	
	1H2 type	AgNi	3A 250VAC COSØ=1 at 85°C 3A 30VDC L/R =0ms at 85°C 5A 250VAC COSØ=1 5A 30VDC L/R =0ms
VDE			5A 250VAC COSØ=1 at 85°C 5A 30VDC L/R =0ms at 85°C
TÜV			5A 250VAC COSØ=1 at 70°C 5A 30VDC L/R =0ms at 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

HF49FD /	012	-1H	1	2	G	T	F	L	(XXX)

Type

Coil voltage 5, 6, 9, 12,18, 24VDC

Contact arrangement **1H:** 1 Form A

Contact version **1:** Single contact
2: Bifurcated contact(Only for gold plated)

Space between terminals (See the following) **1:** 5.08mm **2:** 7.62mm

Contact plating **G:** Gold plated **Nil:** No gold plated (Only for single contact)

Contact material **T:** $AgSnO_2$ (Only for single contact) **Nil:** AgNi

Insulation standard **F:** Class F **B:** Class B **Nil:** Class A

Coil power **L:** Sensitive (Only for 24VDC) **Nil:** Standard

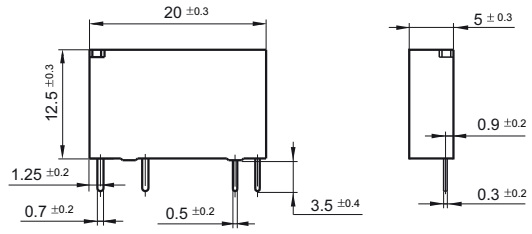
Special code[2)] **XXX:** Customer special requirement **Nil:** Standard

Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
2) The customer special requirement express as special code after evaluating by Hongfa.
3) If customer need to fix HF49FD in 49F socket (HF49FD+49F socket) in application, please choose HF49FD relay with suffix (009) or suffix (086).

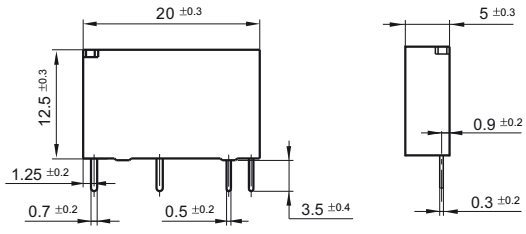
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Outline Dimensions

HF49FD/□□□ -1H□1(XXX)



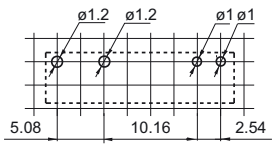
HF49FD/□ □ □ -1H□ 2(XXX)



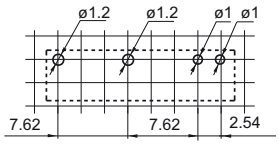
PCB Layout

(Bottom view)

HF49FD/□□□ -1H□1(XXX)



HF49FD/□□□ -1H□2(XXX)



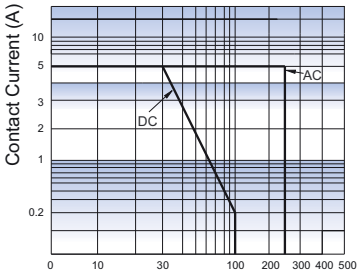
Wiring Diagram

(Bottom view)

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 2.54mm.

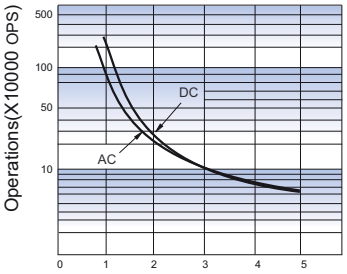
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Contact Voltage (V)

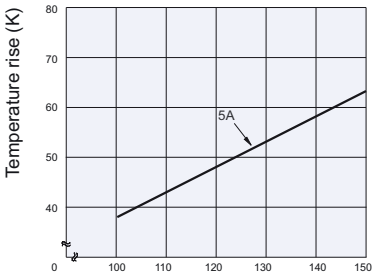
ENDURANCE CURVE



Contact Current (A)

Test conditions:
1H1 type: AgNi, Resistive load, 250VAC/30VDC,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

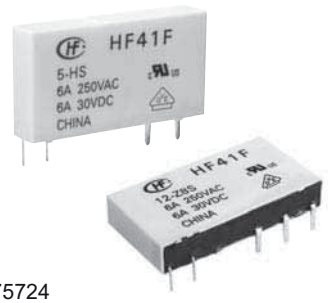
Test conditions:
5A 85˚C
(Typical curve of 24VDC standard type)

HF41F SUBMINIATURE POWER RELAY

File No.: E133481

File No.: 40020043

File No.: CQC17002175724



Features

- Slim size (width 5mm)
- 6A switching capability 4kV dielectric strength (between coil and contacts)
- Surge voltage up to 6kV (between coil and contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- High sensitive: Approx.170mW
- Sockets available
- 1 Form A and 1 Form C configurations

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	No gold plated:100mΩ max. (at 1A 6VDC) Gold plated: 30mΩ max. (at 1A 6VDC)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	6A 250VAC / 30VDC
Max. switching voltage	400VAC / 125VDC
Max. switching current	6A
Max. switching power	1500VA / 180W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	H type: 6 x 10^4OPS (6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) Z type: 3 x 10^4OPS (NO, 6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off) 1 x 10^4OPS (NC, 6A 250VAC/30VDC, Resistive load, AgNi, at 85°C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1 min
	Between open contacts	1000VAC 1 min
Operate time (at rated.volt.)		8ms max.
Release time (at rated.volt.)		4ms max.
Shock resistance*1)	Functional	49m/s²
	Destructive	980m/s²
Vibration resistance*1)		10Hz to 55Hz 1mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 5g
Construction		Plastic sealed, Flux proofed

Notes: 1) *Index is that of relay without socket and is not in relay length direction.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) Please do not install a SPDT(1 Form C) type relay on either of the smallest sides or facing downward.
5) UL insulation system: Class A.

COIL

Coil power	5VDC to 24VDC: Approx. 170mW 48VDC, 60VDC: Approx. 210mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.2)	Drop-out Voltage VDC min.2)	Max. Voltage VDC3)	Coil Resistance Ω
5	3.75	0.25	7.5	147 x (1±10%)
6	4.50	0.30	9.0	212 x (1±10%)
9	6.75	0.45	13.5	476 x (1±10%)
12	9.00	0.60	18	848 x (1±10%)
18	13.5	0.90	27	1906 x (1±15%)
24	18.0	1.20	36	3390 x (1±15%)
48 4)	36.0	2.40	72	10600 x (1±15%)
60 4)	45.0	3.00	90	16600 x (1±15%)

Notes: 1) When require pick-up voltage≤70% nominal voltage, special order allowed .
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) 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

UL/CUL	6A 30VDC at 85°C 6A 277VAC at 85°C R300 B300
VDE	6A 30VDC at 85°C 6A 250VAC at 85°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

	HF41F /	12	-H	8	S	T	G	(XXX)
Type								
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC							
Contact arrangement	**H:** 1 Form A	**Z:** 1 Form C						
Version [1]	**8:** Flat pack version	**Nil:** Vertical version						
Construction[2)3)]	**S:** Plastic sealed	**Nil:** Flux proofed						
Contact material	**T:** $AgSnO_2$	**Nil:** AgNi						
Contact plating[4)]	**G:** Gold plated	**Nil:** No gold plated						
Special code[5)]	**XXX:** Customer special requirement	**Nil:** Standard						

Notes: 1) We recommend flux proofed types for the flat pack version.

2) 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.).

3) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

4) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.

5) The customer special requirement express as special code after evaluating by Hongfa. e.g. (210) stands for pick-up voltage less than 70% of norminal voltage. e.g. (414) stands for wide coil pin type.

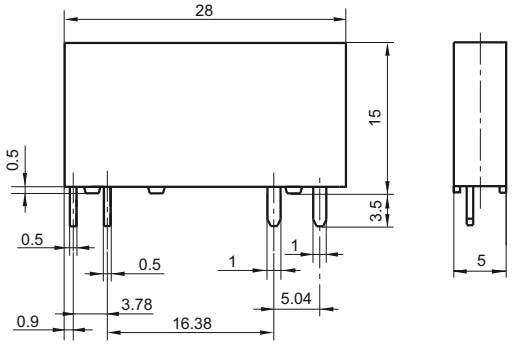
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

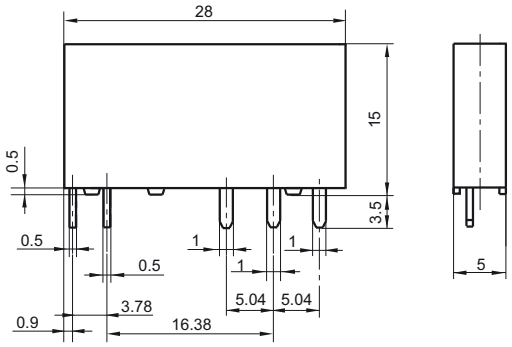
Outline Dimensions

1 Form A

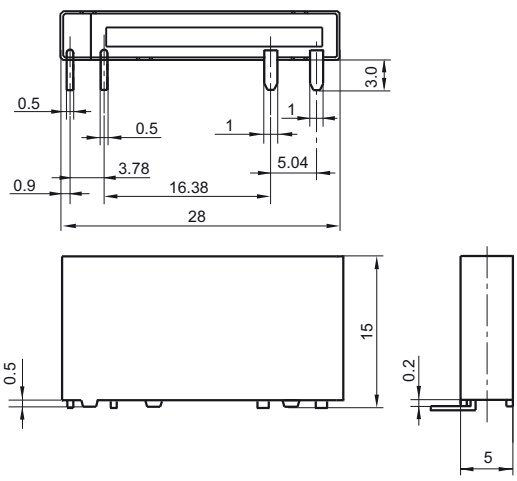
Vertical version

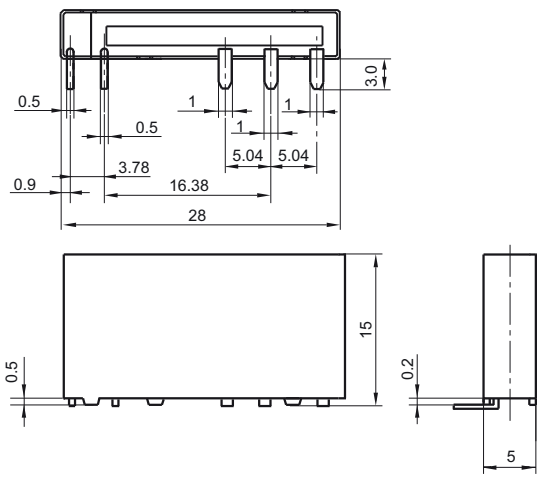


1 Form C



Flat pack version





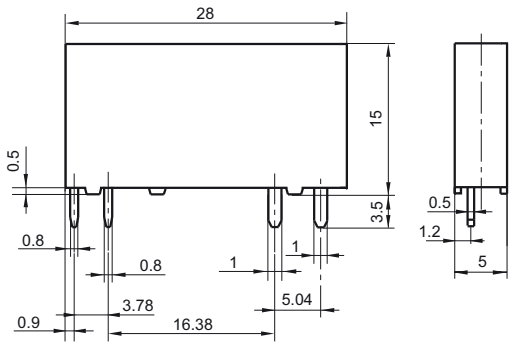
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

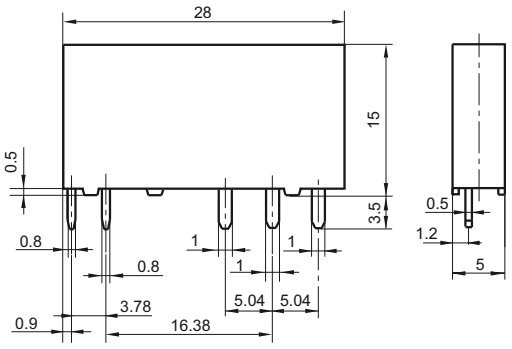
Outline Dimensions

1 Form A

Special code: (414)



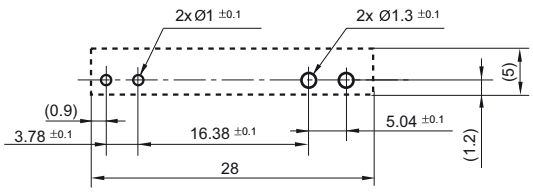
1 Form C



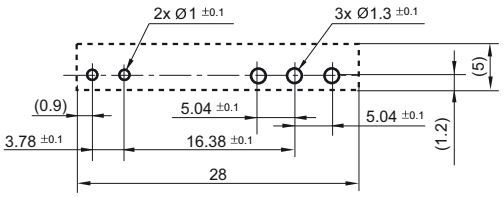
PCB Layout (Bottom view)

1 Form A

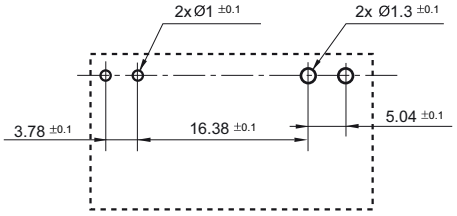
Vertical version

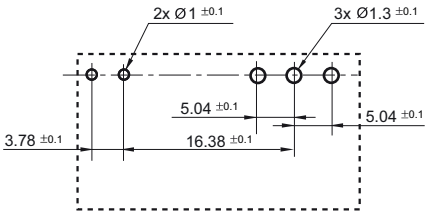


1 Form C

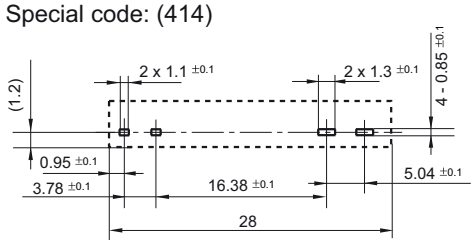


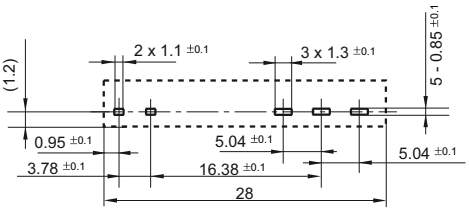
Flat pack version





Special code: (414)





Wiring Diagram (Bottom view)

1 Form A

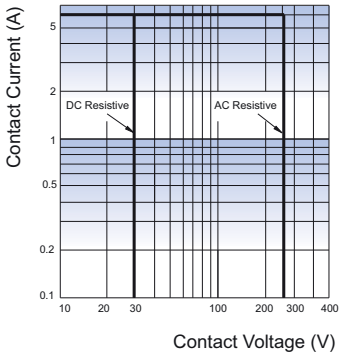
1 Form C

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.

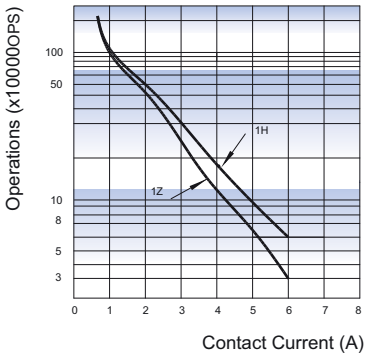
2) The tolerance without indicating for PCB layouts is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

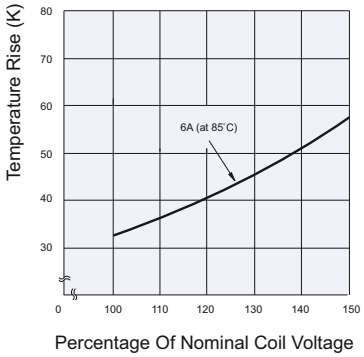


ENDURANCE CURVE



Test conditions:
NO, AgNi, Resistive load, 250VAC,
Flux proofed, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Test conditions:
6A 85℃
(Typical curve of 24VDC standard type)

HF46F SUBMINIATURE INTERMEDIATE POWER RELAY

File No.: E134517

File No.: 40025215

File No.: CQC17002168380

Features

- 5A switching capability
- 10kV impulse withstand voltage (between coil and contacts)
- Meets VDE 0631 reinforce insulation
- Highly efficient magnetic circuit for high sensitivity: 200mW
- Extremely small footprint utilizing PCB area

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max. (at 1A 6VDC)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	3A 250VAC/30VDC 5A 250VAC/30VDC
Max. switching voltage	277VAC / 30VDC
Max. switching current	5A
Max. switching power	1385VA / 150W
Mechanical endurance	5 x 10^6OPS
Electrical endurance	1 x 10^5OPS (5A 250VAC, Resistive load, AgNi, at 85°C, 1s on 1s off) 5 x 10^4OPS (5A 250VAC, Resistive load, $AgSnO_2$, at 85°C, 3s on 3s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & movable contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance 1)	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance 1)		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 3g
Construction		Plastic sealed

Notes: 1) Shock malfunciton: 49m/s² for the length direction.
Vibration: 10Hz to 55Hz 1mm DA for the length direciton.
2) The data shown above are initial values.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 200mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.25	0.18	3.90	45 x (1±10%)
5	3.75	0.25	6.50	125 x (1±10%)
6	4.50	0.30	7.80	180 x (1±10%)
9	6.75	0.45	11.7	405 x (1±10%)
12	9.00	0.60	15.6	720 x (1±10%)
18	13.5	0.90	23.4	1620 x (1±10%)
24	18.0	1.20	31.2	2880 x (1±10%)

Notes: 1) The data shown above are initial values.
2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	5A 125VAC/250VAC at 85°C 5A 277VAC/30VDC at 85°C 3A 125VAC/250VAC at 85°C 3A 277VAC/30VDC at 85°C
	$AgSnO_2$	5A 125VAC/250VAC at 85°C 5A 277VAC/30VDC at 85°C 3A 125VAC/250VAC at 85°C 3A 277VAC/30VDC at 85°C B300 R300
VDE	AgNi	5A 250VAC/30VDC at 85°C
	$AgSnO_2$	5A 250VAC/30VDC at 85°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

	HF46F /	12	-H	S	1	T	G	F	(XXX)
Type									
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC								
Contact arrangement	**H:** 1 Form A								
Construction 1)2)	**S:** Plastic sealed								
Termination	**1:** type 1								
Contact material 3)	**T:** $AgSnO_2$	**Nil:** AgNi							
Contact plating	**G:** Gold plated	**Nil:** No gold plated							
Insulation standard	**F:** Class F	**Nil:** Class B							
Special code5)	**XXX:** Customer special requirement	**Nil:** Standard							

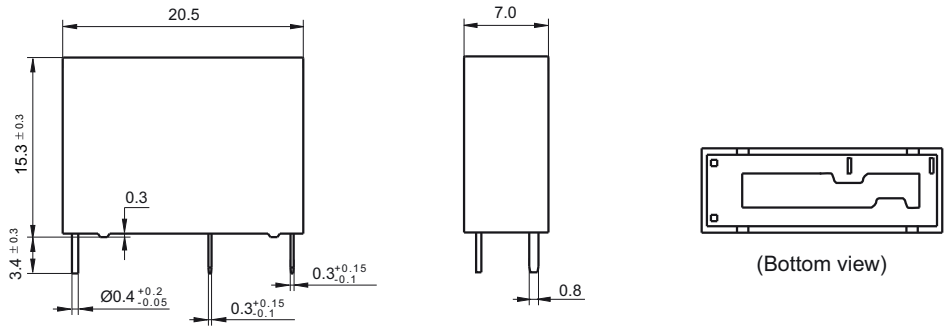
Notes: 1) We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For the loads which can bring high inrush current when relay contacts connect istantly (eg. lamp, capacitive load), $AgSnO_2$ contact material is recommended on priority.
4) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
5) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

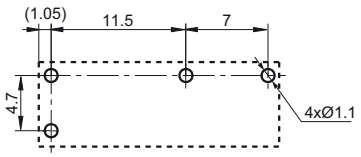
Outline Dimensions

HF46F/□□-HS1□□ (XXX)



PCB Layout

(Bottom view)



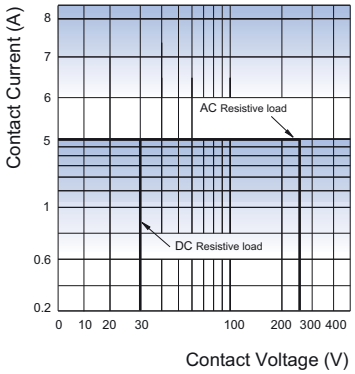
Wiring Diagram

(Bottom view)

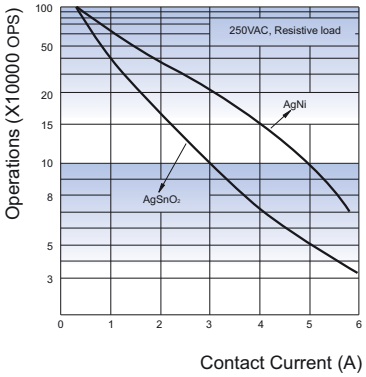
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

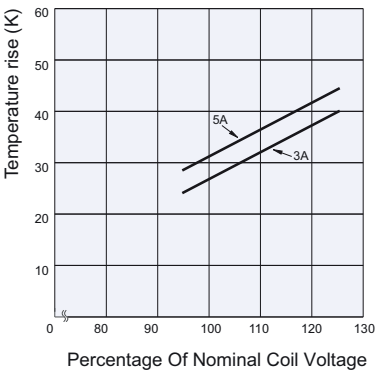
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:
AgNi, at 85°C, 1s on 1s off,
$AgSnO_2$, at 85°C, 3s on 3s off

HF46FB SUBMINIATURE INTERMEDIATE POWER RELAY

File No.: E134517

File No.: 40049080

File No.: CQC17002177913

Features

- 5A switching capability
- 8kV impulse withstand voltage (between coil and contacts)
- Meets reinforce insulation
- width 7mm, Suitable for PCB intensive installation
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1C
Contact resistance[1)]	100mΩ max. (at 1A 6VDC)
Contact material	AgNi
Contact rating (Res. load)	5A 250VAC
Max. switching voltage	250VAC
Max. switching current	5A
Max. switching power	1250VA
Mechanical endurance	5 x 10^6OPS
Electrical endurance	5 x 10^4OPS (CO:5A 250VAC, Resistive load, at 85°C, 3s on 3s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & movable contacts)		8kV (1.2 /50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 4.5g
Construction		Plastic sealed

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

COIL

Coil power	Approx. 360mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	2.25	0.18	3.9	25 x (1±10%)
5	3.75	0.25	6.5	69 x (1±10%)
6	4.50	0.30	7.8	100 x (1±10%)
9	6.75	0.45	11.7	225 x (1±10%)
12	9.00	0.60	15.6	400 x (1±10%)
18	13.5	0.90	23.4	900 x (1±10%)
24	18.0	1.20	31.2	1600 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	5A 250VAC 85°C
VDE	

Notes: 1)Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

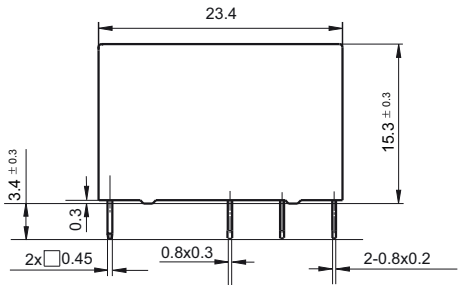
	HF46FB /	12	-Z	S	3	(XXX)
Type						
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC					
Contact arrangement	**Z:** 1 Form C					
Construction	**S:** Plastic sealed					
Contact material	**3:** AgNi					
Special code	**XXX:** Customer special requirement			**Nil:** Standard		

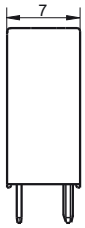
Notes: 1)The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

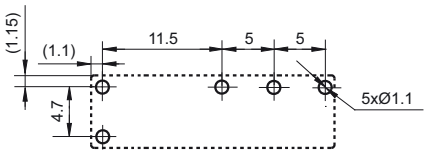
Unit: mm

Outline Dimensions

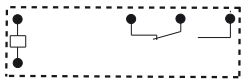




PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



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.

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.

HF46F-G SUBMINIATURE INTERMEDIATE POWER RELAY

File No.: E134517

File No.: 40025215

File No.: CQC17002168380

Features

- 10A switching capability
- 10kV impulse withstand voltage (between coil and contacts)
- Meets VDE 0631 reinforce insulation
- Highly efficient magnetic circuit for high sensitivity: 200mW
- Extremely small footprint utilizing PCB area

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	7A 250VAC / 30VDC
Max. switching voltage	277VAC / 30VDC
Max. switching current	10A
Max. switching power	2770VA / 300W
Mechanical endurance	5 x 10^6OPS
Electrical endurance	5 x 10^4OPS (7A 250VAC, Resistive load, AgNi, at 105°C, 3s on 3s off) 6 x 10^4OPS (7A 250VAC, Resistive load, $AgSnO_2$, at 85°C, 3s on 3s off) 1 x 10^4OPS (10A 250VAC, Resistive load, AgNi, at 85°C, 1s on 9s off) 1 x 10^4OPS (10A 250VAC, Resistive load, $AgSnO_2$, at 85°C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & movable contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance 1)	Functional	98m/s²
	Destructive	980m/s
Vibration resistance 1)		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 3g
Construction		Plastic sealed

Notes: 1) Shock malfunciton: 49m/s² for the length direction.
Vibration: 10Hz to 55Hz 1mm DA for the length direciton.
2) The data shown above are initial values.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 200mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.25	0.18	3.90	45 x (1±10%)
5	3.75	0.25	6.50	125 x (1±10%)
6	4.50	0.30	7.80	180 x (1±10%)
9	6.75	0.45	11.7	405 x (1±10%)
12	9.00	0.60	15.6	720 x (1±10%)
18	13.5	0.90	23.4	1620 x (1±10%)
24	18.0	1.20	31.2	2880 x (1±10%)

Notes: 1) The data shown above are initial values.
2) * Maximum voltage refers to the maximum voltage which elay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	10A 125VAC/250VAC at 85°C 10A 277VAC/30VDC at 85°C 7A 125VAC/250VAC at 105°C 7A 277VAC/30VDC at 105°C
	$AgSnO_2$	10A 125VAC/250VAC at 85°C 10A 277VAC/30VDC at 85°C 7A 125VAC/250VAC at 85°C 7A 277VAC/30VDC at 85°C TV-3
VDE	AgNi	7A 250VAC/30VDC at 105°C 10A 250VAC/30VDC at 85°C
	$AgSnO_2$	7A 250VAC/30VDC at 85°C 10A 250VAC/30VDC at 85°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

	HF46F-G /	12	-H	S	1	T	G	F	(XXX)
Type									
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC								
Contact arrangement	**H:** 1 Form A								
Construction[1)2)]	**S:** Plastic sealed								
Termination	**1:** type 1								
Contact material[3)]	**T:** $AgSnO_2$	**Nil:** AgNi							
Contact plating	**G:** Gold plated	**Nil:** No gold plated							
Insulation standard	**F:** Class F	**Nil:** Class B							
Special code[5)]	**XXX:** Customer special requirement	**Nil:** Standard							

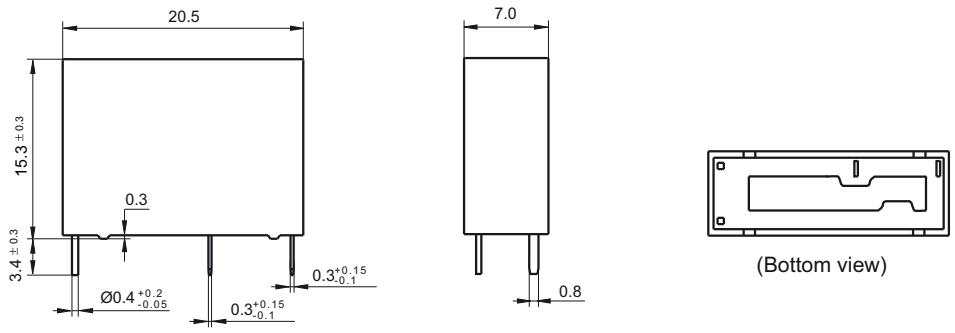
Notes: 1) We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For the loads which can bring high inrush current when relay contacts connect istantly (eg. lamp, capacitive load), $AgSnO_2$ contact material is recommended on priority.
4) For gold plated type, the min. switching current and min. switching voltage is 10mA 5VDC.
5) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

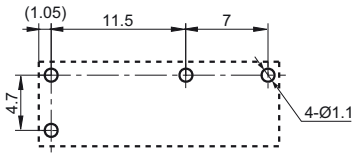
Outline Dimensions

HF46F-G/□□-HS1□□ (XXX)



PCB Layout

(Bottom view)



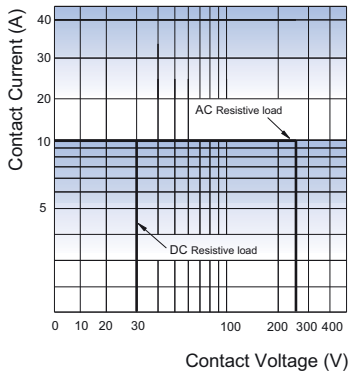
Wiring Diagram

(Bottom view)

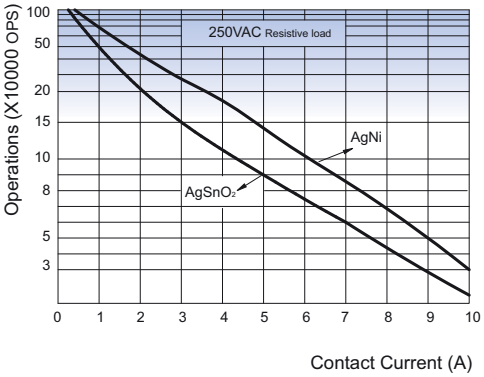
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

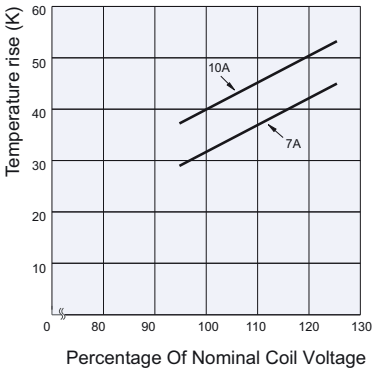
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions: at 85°C, 3s on 3s off

HF42F SUBMINIATURE INTERMEDIATE POWER RELAY

File No.:E133481

File No.:R50356443

File No.:CQC09002034521
CQC16002159853

Features

- 5A switching capability
- TV-3 125VAC approved by UL standard
- 2 Form A slim configuration

CONTACT DATA

Contact arrangement	2A
Contact resistance[1)]	100mΩ max. (at 1A 6VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating (Res. load)	5A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	5A
Max. switching power	1250VA / 150W
Mechanical endurance	1 x 10^6OPS
Electrical endurance	2H: 5 x 10^4OPS (5A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 14.5g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class A
4) For sealed type, the vent-hole cover should be excised.

COIL

Coil power	Approx. 530mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
5	3.75	0.25	6.5	47 x (1±10%)
6	4.50	0.30	7.8	68 x (1±10%)
9	6.75	0.45	11.7	155 x (1±10%)
12	9.00	0.60	15.6	270 x (1±10%)
18	13.5	0.90	23.4	620 x (1±10%)
24	18.0	1.20	31.2	1080 x (1±10%)
48	36.0	2.40	62.4	4400 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	5A 250VAC 5A 30VDC TV-3 125VAC
TÜV	5A 250VAC 5A 30VDC

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

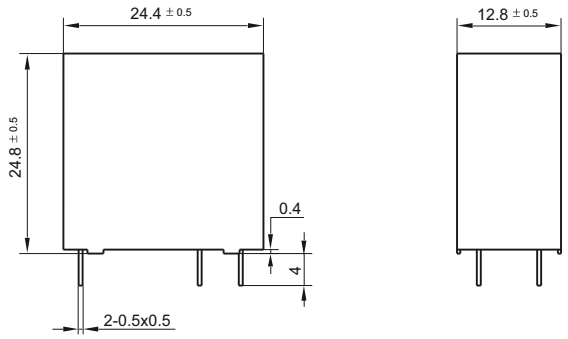
	HF42F /	012	-2H	S	T	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	**2H:** 2 Form A					
Construction [1]	**S:** Plastic sealed					
Contact material	**T:** $AgSnO_2$ **Nil:** AgCdO					
Special code[2]	**XXX:** Customer special requirement **Nil:** Standard					

Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
2) The customer special requirement express as special code after evaluating by Hongfa.

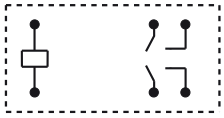
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

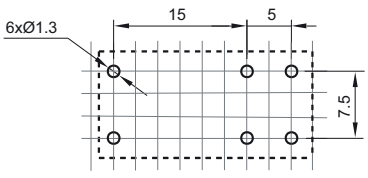
Outline Dimensions



Wiring Diagram
(Bottom view)



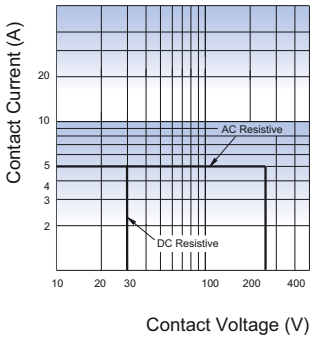
PCB Layout
(Bottom view)



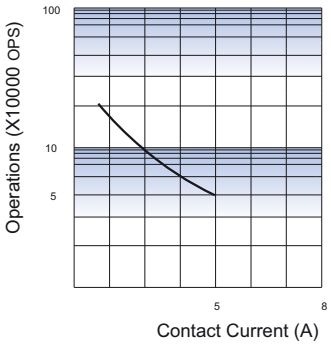
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

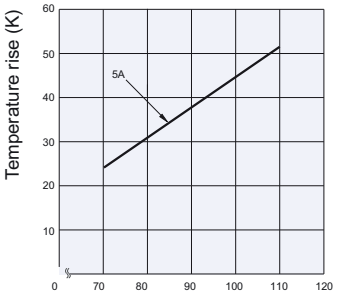


ENDURANCE CURVE



Test conditions:
5A 250VAC, Resistive load,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



HF32FA SUBMINIATURE INTERMEDIATE POWER RELAY

File No.:E134517

File No.:40006182

File No.:CQC17002175721

Features

- 5A switching capability
- Creepage/clearance distance>8mm
- 5kV dielectric strength (between coil and contacts)
- 1 Form A meets VDE 0700, 0631 reinforce insulation
- 1 Form C meets VDE 0631 reinforce insulation
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A, 1C	
Contact resistance[1)]	70mΩ max.(at 1A 6VDC)	
Contact material	AgNi	
Contact rating (Res. Load)	1A	1C
	Standard/Sensitive	Standard
	5A 250VAC 5A 30VDC	3A 250VAC 3A 30VDC
Max. switching voltage	250VAC / 30VDC	
Max. switching current	5A	
Max. switching power	1250VA / 150W	
Mechanical endurance	1 x 10^6OPS	
Electrical endurance	H type: 1 x 10^5OPS (5A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off) Z type: 1 x 10^5OPS (NO/NC, 3A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		4ms max.
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Shock resistance*	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance*	NO	10Hz to 55 Hz 1.65mm DA
	NC	10Hz to 55 Hz 0.6mm DA
Termination		PCB
Unit weight		Approx.4.6g
Construction		Plastic sealed, Flux proofed

Notes: 1) *Index is not in relay length direction.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.

COIL

Coil power	Sensitive: Approx. 200mW; Standard: Approx. 450mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48[2)]	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	2.25	0.15	5.1	45 x (1±10%)
5	3.75	0.25	8.5	125 x (1±10%)
6	4.50	0.30	10.2	180 x (1±10%)
9	6.75	0.45	15.3	400 x (1±10%)
12	9.00	0.60	20.4	720 x (1±10%)
18	13.5	0.90	30.6	1600 x (1±10%)
24	18.0	1.20	40.8	2800 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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

UL/CUL	1 Form A	5A 250VAC 5A 30VDC 1/8HP 125VAC/250VAC TV-2 C300
	1 Form C	3A 250VAC 3A 30VDC
VDE		5A 250VAC at 85˚C 2A 250VAC cosø=0.5 at 85˚C 1 Form A, Sensitive: 3A 400VAC at 85˚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.

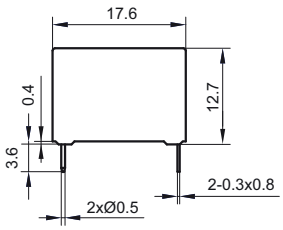
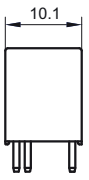
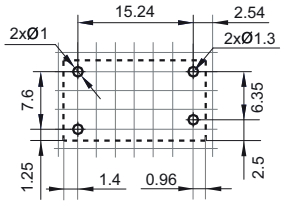
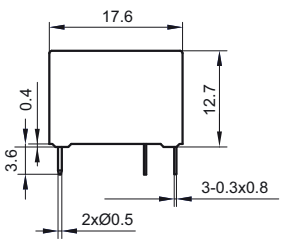
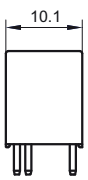
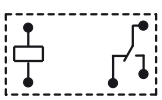
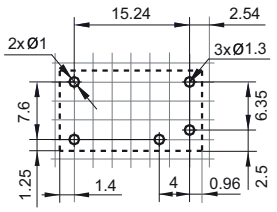
ORDERING INFORMATION

	HF32FA /	012	-H	S	L	1	G	(XXX)
Type								
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	**H:** 1 Form A **Z:** 1 Form C							
Construction[1)2)]	**S:** Plastic sealed **Nil:** Flux proofed							
Coil power	**L:** Sensitive (Only for 1 Form A) **Nil:** Standard							
Termination	**1:** Type 1 **2:** Type 2							
Contact plating[3)]	**G:** Gold plated **Nil:** No gold plated							
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 recommended 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).

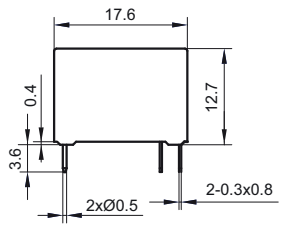
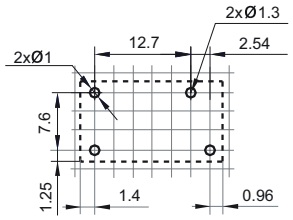
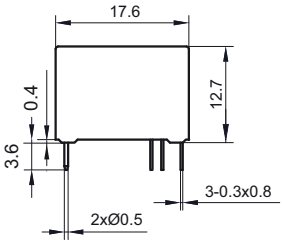
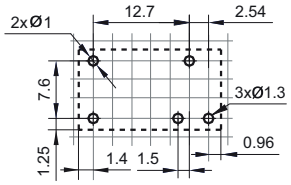
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

	Outline Dimensions		Wiring Diagram (Bottom view)	PCB Layout (Bottom view)
1 Form A & Type 1				
1 Form C & Type 1				

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

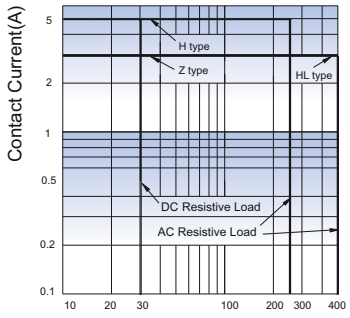
Unit: mm

	Outline Dimensions	Wiring Diagram (Bottom view)	PCB Layout (Bottom view)
1 Form A & Type 2			
1 Form C & Type 2			

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 2.54mm.

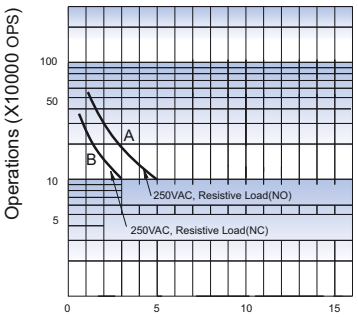
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



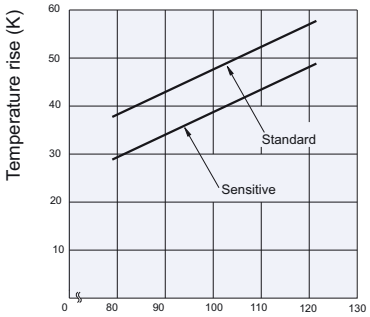
Contact Voltage (V)

ENDURANCE CURVE



Contact Current (A)

TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Notes:
1) Curve A: H type,
Curve B: Z type
2) Test conditions: Flux proofed,
Room temp., 1.5s on 1.5s off.

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.

HF32FA-T

SUBMINIATURE INTERMEDIATE HIGH TEMPERATURE POWER RELAY

c UL us
File No.:E134517

VDE
File No.:40006182

CQC
File No.: CQC17002175721

Features

- High temperature: 105˚C
- 5A switching capability
- 1 Form A configuration
- Creepage/clearance distance>8mm
- 5kV dielectric strength (between coil and contacts)
- UL insulation system: Class F
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A
Contact resistance[1)]	70mΩ max.(at 1A 6VDC)
Contact material	AgNi
Contact rating (Res. load)	5A 250VAC 5A 30VDC
Max. switching voltage	250VAC/30VDC
Max. switching current	5A
Max. switching power	1250VA/150W
Mechanical endurance	1 x 10^6OPS
Electrical endurance	1 x 10^5OPS (5A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		4ms max.
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 105˚C
Shock resistance*	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance*		10Hz to 55Hz 1.65mm DA
Termination		PCB
Unit weight		Approx.4.6g
Construction		Plastic sealed, Flux proofed

Notes: 1) *Index is not in relay length direction.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.

COIL

Coil power	Sensitive: Approx. 200mW

COIL DATA at 23˚C

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
3	2.25	0.15	5.1	45 x (1±10%)
5	3.75	0.25	8.5	125 x (1±10%)
6	4.50	0.30	10.2	180 x (1±10%)
9	6.75	0.45	15.3	400 x (1±10%)
12	9.00	0.60	20.4	720 x (1±10%)
18	13.5	0.90	30.6	1600 x (1±10%)
24	18.0	1.20	40.8	2800 x (1±10%)

Notes: 1) The data shown above are initial values.
2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	5A 250VAC
VDE	5A 250VAC at 105˚C 3A 400VAC at 105˚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

	HF32FA-T /	012	-H	S	L	1	G	(XXX)

Type	
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC
Contact arrangement	**H:** 1 Form A
Construction[1)2)]	**S:** Plastic sealed **Nil:** Flux proofed
Coil power	**L:** Sensitive
Termination	**1:** Type 1 **2:** Type 2
Contact plating[3)]	**G:** Gold plated **Nil:** No gold plated
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).

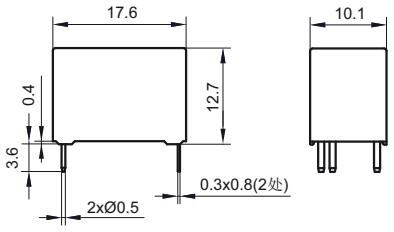
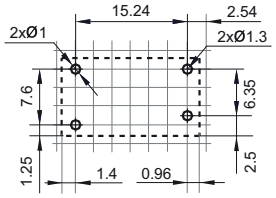
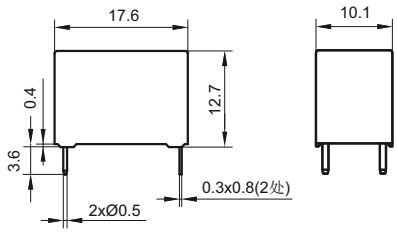
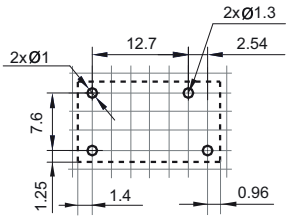
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

	Outline Dimensions	Wiring Diagram (Bottom view)	PCB Layout (Bottom view)
1 Form A & Type 1			
1 Form A & Type 2			

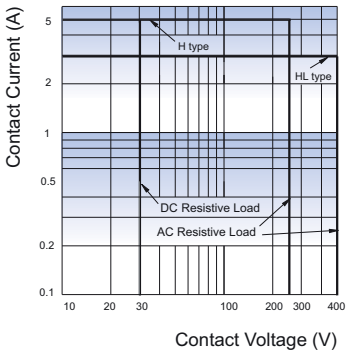
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

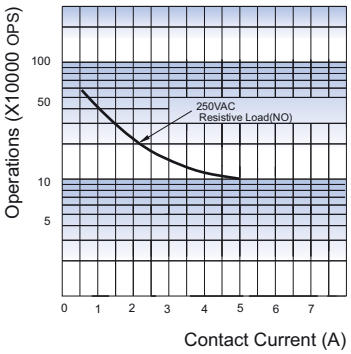
3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

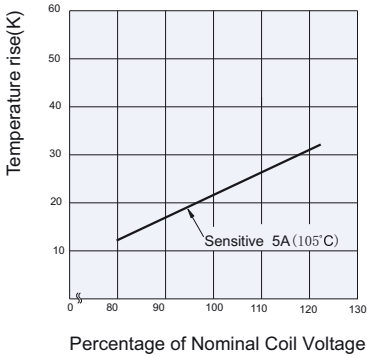
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



TEMPERATURE RISE



Test conditions: Flux proofed,
Room temp., 1.5s on 1.5s off

HF32FA-G SUBMINIATURE INTERMEDIATE POWER RELAY

File No.:E134517

File No.:40006182

File No.:CQC17002175721

Features

- 10A switching capability
- Creepage/clearance distance>8mm
- 5kV dielectric strength (between coil and contacts)
- UL insulation system: Class F
- Meets VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A
Contact resistance[1)]	70mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. Load)	10A 250VAC
Max. switching voltage	250VAC
Max. switching current	10A
Max. switching power	2500VA
Mechanical endurance	1 x 10^6 OPS
Electrical endurance	1.5 x 10^4 OPS (10A 250VAC, Resistive load, at 85°C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		4ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Shock resistance*	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance*		10Hz to 55 Hz 1.65mm DA
Termination		PCB
Unit weight		Approx.4.6g
Construction		Plastic sealed, Flux proofed

Notes: 1) *Index is not in relay length direction.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 230mW

COIL DATA at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48[3)]	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	2.25	0.15	5.1	38 x (1±10%)
5	3.75	0.25	8.5	108 x (1±10%)
6	4.50	0.30	10.2	155 x (1±10%)
9	6.75	0.45	15.3	350 x (1±10%)
12	9.00	0.60	20.4	620 x (1±10%)
18	13.5	0.90	30.6	1390 x (1±10%)
24	18.0	1.20	40.8	2480 x (1±10%)
48[3)]	36.0	2.40	81.6	9920 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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

UL/CUL	10A 250VAC at 85°C B300
VDE	10A 250VAC at 85°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.

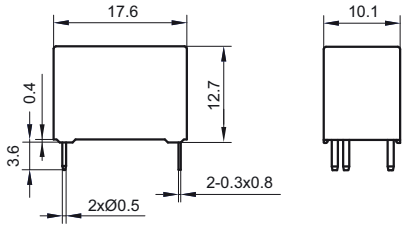
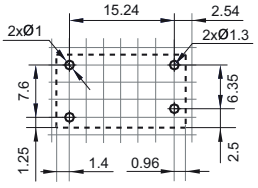
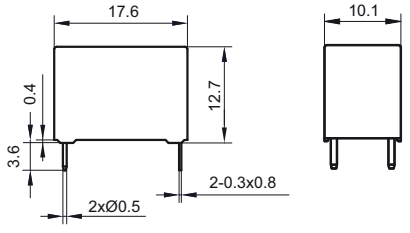
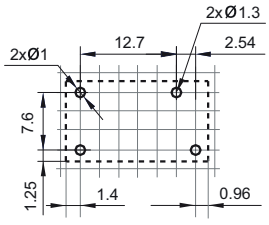
ORDERING INFORMATION

	HF32FA-G /	012	-H	S	L	1	G	(XXX)
Type								
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	**H:** 1 Form A							
Construction[1)2)]	**S:** Plastic sealed	**Nil:** Flux proofed						
Coil power	**L:** Sensitive	**Nil:** Standard						
Termination	**1:** Type 1	**2:** Type 2						
Contact plating[3)]	**G:** Gold plated	**Nil:** No gold plated						
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 recommended 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

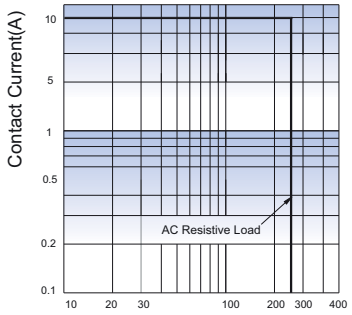
Unit: mm

	Outline Dimensions	Wiring Diagram (Bottom view)	PCB Layout (Bottom view)
1 Form A & Type 1			
1 Form A & Type 2			

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 2.54mm.

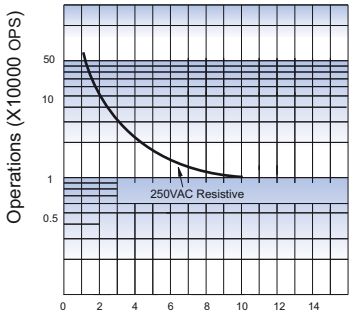
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



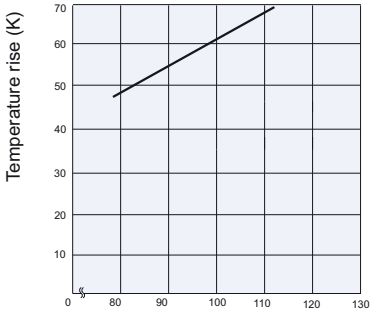
Contact Voltage (V)

ENDURANCE CURVE



Contact Current (A)

TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Test conditions: Flux proofed, at 85°C
5s on 5s off

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.

HF32FV SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

VDE
File No.:40012204

cqc
File No.:CQC14002120720

Features

- 5A switching capability
- Dielectric strength 4kV (between coil and contacts)
- 1 Form A configurations
- Standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available
- Meet reinforce insulation
- Relow soldering version available
- Halogen-free products are available

CONTACT DATA

Contact arrangement		1A	
Contact resistance 1)		100mΩ max.(at 1A 6VDC)	
Contact material		$AgSnO_2$, AgCdO, AgNi	
Contact rating (Res. load)		Standard: 5A 250VAC, 5A 30VDC	Sensitive: 3A 250VAC, 3A 30VDC
Max. switching voltager		250VAC / 30VDC	
Max. switching current		5A	3A
Max. switching power		1250VA / 150W	750VA / 90W
Mechanical endurance		1×10^7 OPS	
Electrical endurance	Standard	1×10^5 OPS (5A 250VAC Resistive load, at room temp., 1s on 9s off) 5×10^4 OPS (5A 250VAC Resistive load, at 85°C, 1s on 9s off)	
	Sensitive	1×10^5 OPS (3A 250VAC Resistive load, at room temp., 1s on 9s off) 5×10^4 OPS (3A 250VAC Resistive load, at 85°C, 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge withstand voltage		6kV(1.2 / 50μs)
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Coil temperature rise(at nomi. volt.)		60k max.
Shock * resistance	Functional	294m/s²
	Destructive	980m/s²
Vibration resistance *	Functional	10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient oprating temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) *Index is not in relay length direction.
3) In order to obtain better electrical endurance, it's better not use this product in the high temperature environment.

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 200mW

COIL DATA at 23°C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive Type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

Notes: 1) The data shown above are initial values.
2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	$AgSnO_2$	5A 277VAC /250VAC General Use at 40˚C 5A 277VAC/250VAC General Use at 85˚C 5A 30VDC Resistive at 85˚C 300W 120VAC Tunsten at 40˚C 1/4HP 250VAC at 85˚C 3A 277VAC/250VAC General Use (Sensitive) at 85˚C 3A 30VDC Resistive (Sensitive) at 85˚C TV-3 120VAC at 40˚C
	AgCdO	5A 277VAC/250VAC General Use at 85˚C 5A 30VDC Resistive at 85˚C
	AgNi	5A 277VAC/250VAC General Use at 85˚C 5A 30VDC Resistive at 85˚C 3A 30VDC Resistive (Sensitive) at 85˚C 3A 277VAC/250VAC General Use (Sensitive) at 85˚C
VDE	$AgSnO_2$	250VAC 4(2) Inductive load at 85˚C 5A 30VDC Resistive at 85˚C 5A 277VAC/250VAC Resistive at 85˚C 3A 277VAC/250VAC Resistive at 85˚C 3A 30VDC Resistive (Sensitive) at 85˚C
	AgCdO	5A 277VAC/250VAC Resistive at 85˚C 5A 30VDC Resistive at 85˚C
	AgNi	5A 277VAC/250VAC Resistive at 85˚C 3A 277VAC/250VAC Resistive (Sensitive) at 85˚C
CQC	$AgSnO_2$	5A 277VAC/250VAC Resistive at 85˚C 5A 30VDC Resistive at 85˚C 3A 277VAC/250VAC Resistive (Sensitive) at 85˚C
	AgCdO	5A 277VAC/250VAC Resistive at 85˚C 5A 30VDC Resistive at 85˚C
	AgNi	5A 277VAC/250VAC Resistive at 85˚C 5A 30VDC Resistive at 85˚C 3A 30VDC Resistive (Sensitive) at 85˚C 3A 277VAC/250VAC Resistive (Sensitive) at 85˚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

HF32FV / 12 -H S L T F (XXX)

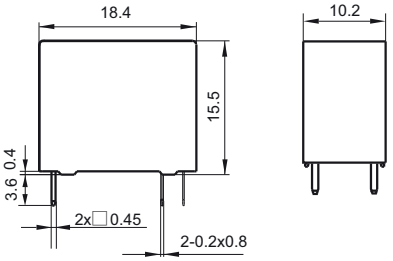
Type			
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC		
Contact arrangement	**H:** 1 Form A		
Construction [1)2)]	**S:** Plastic sealed	**Nil:** Flux proofed	
Coil power	**L:** Sensitive [3)]	**Nil:** Standard	
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO	**3:** AgNi
Insulation standard	**F:** Class F		
Customer special code [5)]	**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.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) Sensitive loading: 3A.
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.(590) stands for product in accordance to TV-3 loading,only for standard type.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



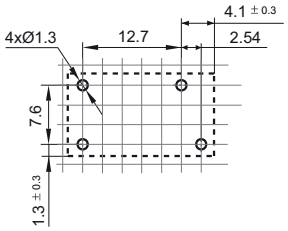
Wiring Diagram

(Bottom view)

(Bottom view)

PCB Layout

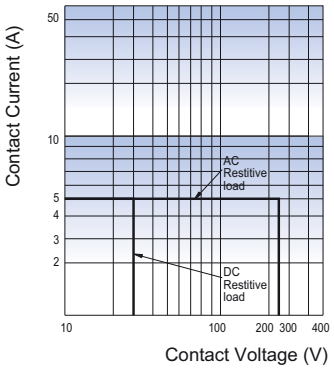
(Bottom view)



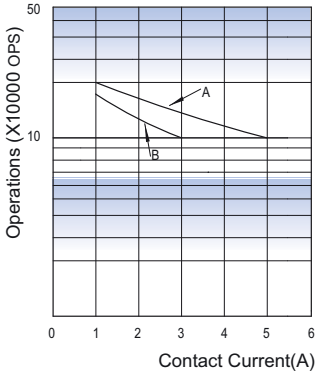
Remark: 1) *The additional tin top is max. 1mm.
2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
3) The tolerance without indicating for PCB layout is always ±0.1mm.
4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

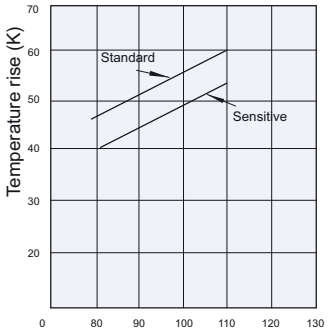


ENDURANCE CURVE



Remark:
1. Carve A: standard
   Carve B: sensitive
2. Testing conditions:
   Standard: flux proofed, resistive load,
   5A 250VAC, at room temp. 1s on 9s off.
   Sensitive: flux proofed, resistive load,
   3A 250VAC, at room temp. 1s on 9s off.

COIL TEMPERATURE RISE



Testing conditions:
Standard: 5A at 85˚C.
Sensitive: 3A at 85˚C
Mounting distance: 5mm

HF32FV-16 SUBMINIATURE HIGH POWER RELAY

File No.: E134517

File No.: 40012204

File No.: CQC14002120720

Features

- 16A switching capability
- Dielectric strength 4kV(between coil and contacts)
- 1 Form A configuration
- UL insulation system: Class F
- Product in accordance to IEC 62368-1 available

CONTACT DATA

Contact arrangement	1A
Contact resistance[1)]	⩽100mΩ (at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating(General use)	16A 250VAC
Max. switching voltage	250VAC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	1 x 10^4OPS (16A 250VAC, General use, 85˚C, 1s on 9s off) 5 x 10^4OPS (16A 250VAC, Resistive load, 85˚C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		10ms max.
Release time (at nomi. volt.)		5msmax.
Humidity	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 7g
Construction		Flux proofed

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

COIL

Coil power	Standard:Approx. 800mW Sensitive type:Approx.400mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
12	⩽9	⩾1.2	13.2	180 x (1±10%)
24	⩽18	⩾2.4	26.4	720 x (1±10%)

L type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
5	⩽3.5	⩾0.5	6.5	62 x (1±10%)
12	⩽9	⩾1.2	15.6	360x (1±10%)
24	⩽18	⩾2.4	31.2	1440 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) When using standard products,it needs to drive at rated voltage,and then step down the voltage (50% of rated voltage) to hold.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	16A 250 / 277VAC at 85˚C
VDE	1 Form A	16A 250VAC at 85˚C
CQC	1 Form A	16A 250VAC at 85˚C

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF32FV-16/	12	-H	L[1)]	T	F	(XXX)
Type							
Coil voltage	5(Only for L type), 12, 24VDC						
Contact arrangement	**H:** 1 Form A						
Coil power	**L:** Sensitive **Nil**: Standard						
Contact material	**T:** $AgSnO_2$						
Insulation standard	**F:** Class F						
Special code[1)]	**XXX:** Customer special requirement **Nil:** Standard						

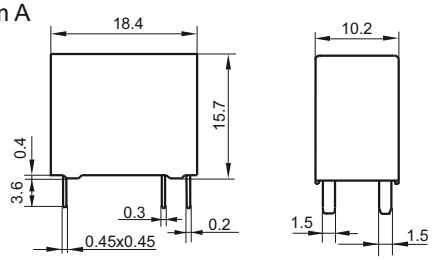
Notes: 1) Sensitive type approval is pending.
2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

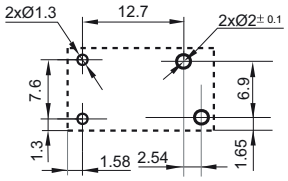
Unit: mm

Outline Dimensions

1 Form A



Wiring Diagram
(Bottom view)

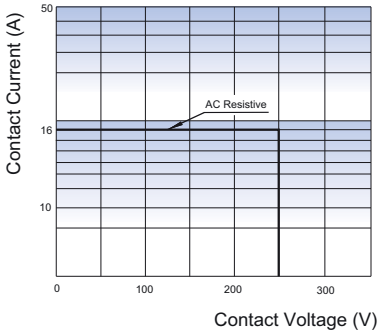


PCB Layout
(Bottom view)

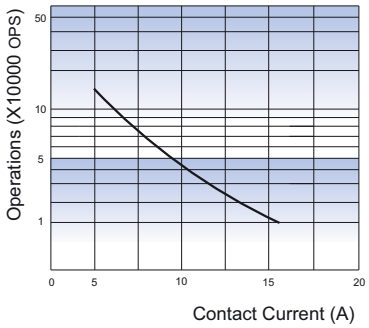
Remark:1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

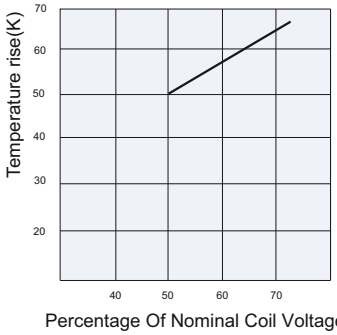


EDURANCE CURVE



Test conditions: General use,250VAC cos ϕ 0.75 , 85°C , 1s on 9s off

COIL TEMPERATURE RISE



Test conditions: : 85°C 16A
Mounting distance : 10mm
Driving voltage : Coil activated with rated voltage,then reduce to 50% of rated voltage.

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.

HF32FV-T SUBMINIATURE INTERMEDIATE POWER RELAY

File No.:E134517

File No.:40012204

File No.:CQC14002120720

Features

- High Temperature:105˚C
- 10A switching capability
- Dielectric strength 4kV (between coil and contacts)
- 1 Form A configurations
- Standard PCB layout
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating(Res. load)	Standard: 10A 250VAC
Max. switching voltager	250VAC
Max. switching current	10A
Max. switching power	2500VA
Mechanical endurance	1 x 10^7OPS
Electrical endurance	Standard: 1 x 10^5OPS (5A 250VAC Resistive load, at 105˚C, 1s on 9s off) 5 x 10^4OPS (10A 250VAC Resistive load, at 105˚C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge withstand voltage		6kV(1.2 x 50μs)
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Coil temperature rise(at rated. volt.)		50k max.
Shock resistance	Functional	294m/s²
	Destructive	980m/s²
Vibration resistance *	Functional	10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 105˚C
Termination		PCB
Unit weight		Approx. 6g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Standard: Approx. 450mW;

COIL DATA at 23˚C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC* 2)	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Notes: 1)The data shown above are initial values.
2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL	$AgSnO_2$	10A 277VAC /250VAC General Use at 105°C 10A 277VAC/250VAC Resistive at 105°C 1/3HP 250VAC Horsepower at 105°C
VDE	$AgSnO_2$	10A 277VAC/250VAC Resistive at 105°C 5A 250VAC COSØ=0.6 at 105°C
CQC	$AgSnO_2$	10A 277VAC/250VAC Resistive at 105°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

HF32FV-T / 12 -H T F (XXX)

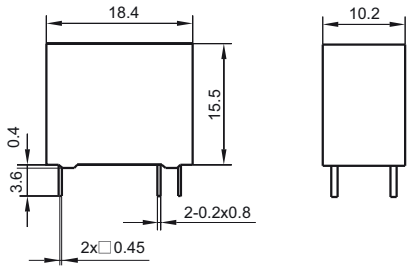
Type		
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC	
Contact arrangement	**H:** 1 Form A	
Contact material	**T:** $AgSnO_2$	
Insulation standard	**F:** Class F	
Special code[1)]	**XXX:** Customer special requirement	**Nil:** Standard

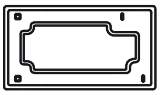
Notes: 1) Two packing methods available: paper box package, tube package.Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions





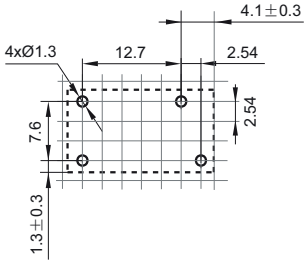
(Bottom view)

Wiring Diagram

(Bottom view)

PCB Layout

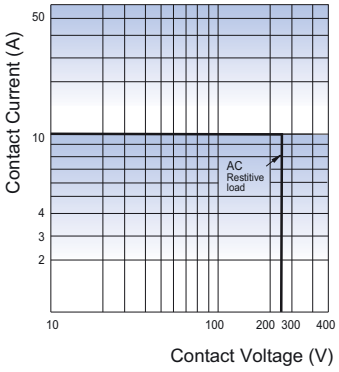
(Bottom view)



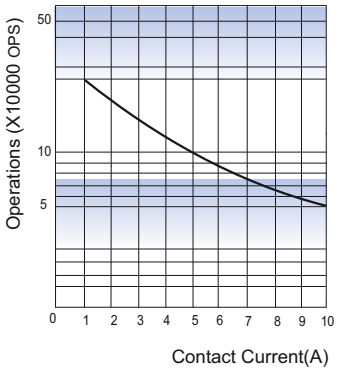
Remark: 1) * The additional tin top is max. 1mm.
2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
3) The tolerance without indicating for PCB layout is always ±0.1mm.
4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



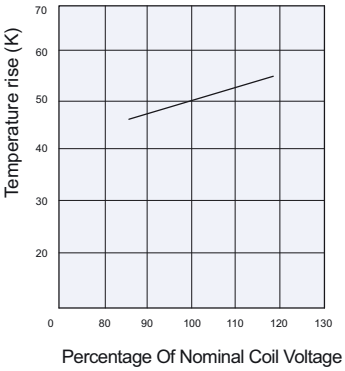
ENDURANCE CURVE



Remark:

1. Testing conditions:
   Standard: flux proofed, resistive load,
   10A/250VAC, at room temp. 1s on 9s off.

COIL TEMPERATURE RISE



Testing conditions:

Standard: 10A at 105˚C.
Mounting distance: 10mm

HF32FV-G SUBMINIATURE INTERMEDIATE POWER RELAY

File No.:E134517

File No.:40012204

File No.:CQC14002120720

Features

- 10A switching capability
- Dielectric strength 4kV (between coil and contacts)
- 1 Form A configurations
- Standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC60335-1 available
- Meet reinforce insulation
- Relow soldering version available
- Halogen-free products are available

CONTACT DATA

Contact arrangement		1A	
Contact resistance 1)		100mΩ max.(at 1A 6VDC)	
Contact material		AgNi,AgSnO2, AgCdO	
Contact rating (Res. load)		Standard	Sensitive
		10A 250VAC 10A 30VDC	8A 250VAC 8A 30VDC
Max. switching voltager		250VAC / 30VDC	
Max. switching current		10A	8A
Max. switching power		2500VA/300W	2000VA/240W
Mechanical endurance		1 x 10^7OPS	
Electrical endurance	Standard	1 x 10^5OPS (10A 250VAC Resistive load, at room temp., 1s on 9s off) 5 x 10^4OPS (10A 250VAC Resistive load, at 85°C, 1s on 9s off)	
	Sensitive	1 x 10^5OPS (8A 250VAC Resistive load, at room temp., 1s on 9s off) 5 x 10^4OPS (8A 250VAC Resistive load, at 85°C, 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge withstand voltage		6kV(1.2 / 50μs)
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Coil temperature rise(at rated. volt.)		70k max.
Shock * resistance	Functional	294m/s²
	Destructive	980m/s²
Vibration resistance *	Functional	10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient oprating temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) *Index is not in relay length direction.
3) In order to obtain better electrical endurance, it's better not use this product in the high temperature environment.

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 200mW

COIL DATA at 23°C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive Type

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

Notes: 1) The data shown above are initial values.
2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	$AgSnO_2$	10A 277VAC /250VAC Resistive at 85˚C 10A 277VAC/250VAC Resistive at 40˚C 8A 277VAC/250VAC General use (Sensitive) at 85˚C TV-5 120VAC at 40˚C TV-3 120VAC(Sensitive) at 40˚C
	AgCdO	10A 277VAC/250VAC General use at 85˚C 10A 30VDC Resistive at at 85˚C 10A 277VAC/250VAC Resistive at 40˚C 8A 277VAC/250VAC Resistive Load(Sensitive) at 85˚C
	AgNi	10A 277VAC/250VAC Resistive at 40˚C 8A 277VAC/250VAC Resistive Load (Sensitive) at 40˚C
VDE	$AgSnO_2$	10A 277VAC/250VAC Resistive at 85˚C 8A 277VAC/250VAC Resistive (Sensitive) at 85˚C
	AgCdO	10A 277VAC/250VAC Resistive at 85˚C
	AgNi	10A 277VAC/250VAC Resistive at 85˚C 8A 277VAC/250VAC Resistive (Sensitive) at 85˚C
CQC	$AgSnO_2$	10A 277VAC/250VAC Resistive at 85˚C 8A 277VAC/250VAC Resistive (Sensitive) at 85˚C
	AgCdO	10A 277VAC/250VAC Resistive at 85˚C
	AgNi	10A 277VAC/250VAC Resistive at 85˚C 10A 30VDC Resistive at 85˚C 8A 30VDC Resistive (Sensitive) at 85˚C 8A 277VAC/250VAC Resistive (Sensitive) at 85˚C

Notes: 1) Opening the vent hole under contact material $AgSnO_2$ testing.
2) All values unspecified are at room temperature.
3) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF32FV-G / 12 -H S L T F (XXX)

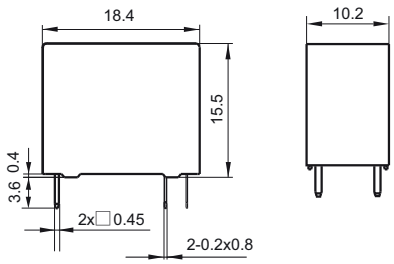
Type				
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC			
Contact arrangement	**H:** 1 Form A			
Construction 1)2)	**S:** Plastic sealed	**Nil:** Flux proofed		
Coil power	**L:** Sensitive 3)	**Nil:** Standard		
Contact material	**T:** $AgSnO_2$	**3:** AgNi	**Nil:** AgCdO	
Insulation standard	**F:** Class F			
Special code 5)	**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.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) Sensitive loading: 8A.
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); (590) stands for product in accordance to TV loading. For standard type is TV-5, for sentitive type is TV-3.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

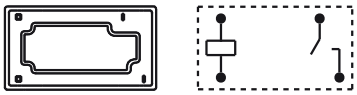
Unit: mm

Outline Dimensions



Wiring Diagram

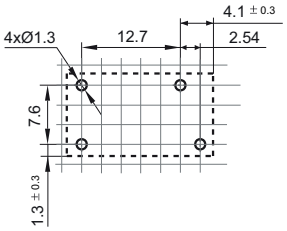
(Bottom view)



(Bottom view)

PCB Layout

(Bottom view)



Remark: 1) * The additional tin top is max. 1mm.

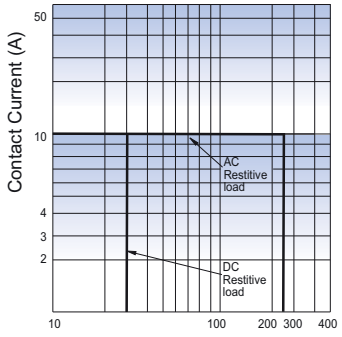
2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

3) The tolerance without indicating for PCB layout is always ±0.1mm.

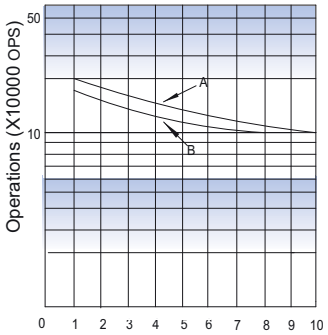
4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



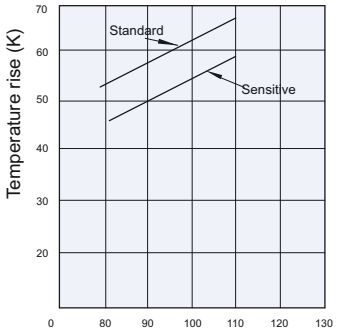
ENDURANCE CURVE



Remark:

1. Carve A: standard
   Carve B: sensitive
2. Testing conditions:
   Standard: flux proofed, resistive load,
   10A/250VAC, at room temp. 1s on 9s off.
   Sensitive: flux proofed, resistive load,
   8A/250VAC, at room temp. 1s on 9s off.

COIL TEMPERATURE RISE



Testing conditions:

Standard: 10A at 85°C.
Sensitive: 8A at 85°C
Mounting distance: 10mm

HF32F SUBMINIATURE INTERMEDIATE POWER RELAY

File No.: E134517

File No.: 40012204

File No.: CQC12002076528
CQC16002148335

Features

- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A, 1C		
Contact resistance[1)]	100mΩ max(at 1A 6VDC)		
Contact material	AgNi, AgCdO		
Contact rating (Res. load)	1A		1C
	H type: 5A 250VAC 5A 30VDC 10A 125VAC	HL type: 3A 250VAC 3A 30VDC	3A 250VAC 3A 30VDC
Max. switching current	10A		3A
Max. switching powert	1250VA/150W		750VA/90W
Max. switching voltage	250VAC/30VDC		
Mechanical endurance	5×10^6 OPS		
Electrical endurance	H type:1×10^5 OPS (5A 250VAC, Resistive load, Room temp., 1s on 1s off) HL type: 1×10^5 OPS (3A 250VAC, Resistive load, Room temp., 1s on 1s off) Z type:1×10^5 OPS (NO:3A/NC:3A, 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)		

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Operation ambient temperature		-40˚C to 70˚C
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

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

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx.200mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	AgCdO, AgNi	H type: 5A 250VAC /30VDC at 70˚C 10A 125VAC at 70˚C HL type: 3A 250VAC /30VDC at 70˚C
		AgCdO	H type: 1/10HP 125VAC at 70˚C 1/6HP 250VAC at 70˚C 10LRA /1.5FLA 120VAC at 70˚C HL type: 5A 125VAC at 70˚C
	1 Form C	AgCdO, AgNi	3A 250VAC/30VDC at 70˚C
VDE	1 Form A	AgCdO, AgNi	H type: 5A 250VAC /30VDC at 70˚C HL type: 3A 250VAC /30VDC at 70˚C
	1 Form C	AgCdO, AgNi	3A 250VAC/30VDC at 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

	HF32F /	012	-H	S	L	3	(XXX)

Type

Coil voltage 3, 5, 6, 9, 12, 18, 24, 48VDC

Contact arrangement **H:** 1 Form A **Z:** 1 Form C

Construction [1] **S:** Plastic sealed **Nil:** Flux proofed

Coil Power **L:** Sensitive (Only for 1 Form A) **Nil:** Standard

Contact material **3:** AgNi **Nil:** AgCdO

Special code[3] **XXX:** Customer special requirement **Nil:** Standard

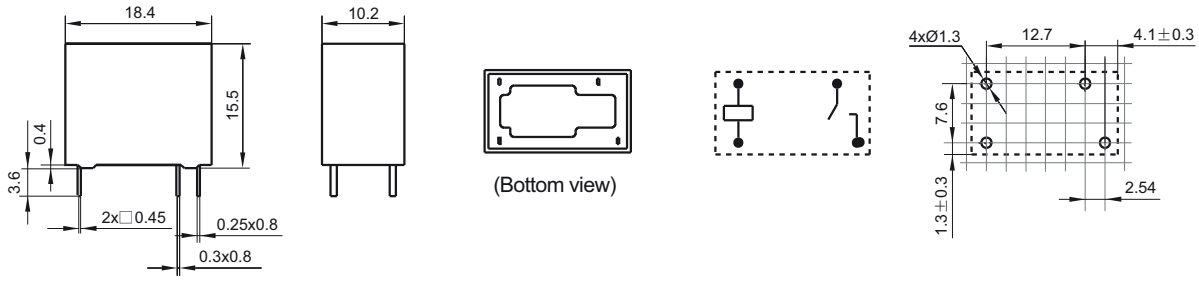
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).
4)Three packing methods available: paper box package, tube package,Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

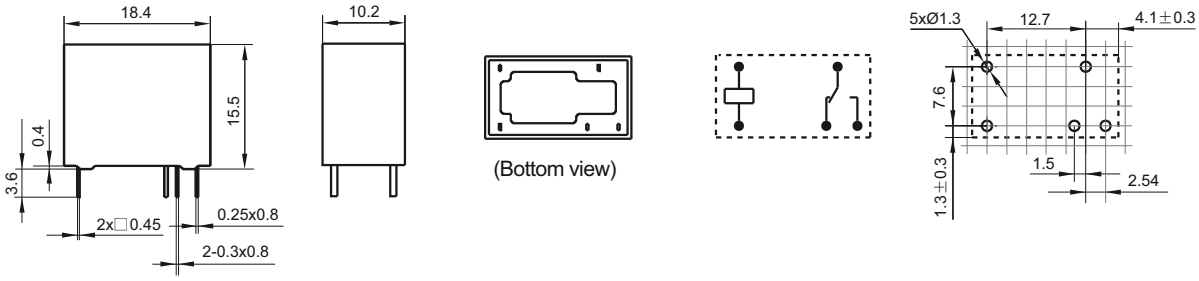
Unit: mm

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

1 Form A



1 Form C



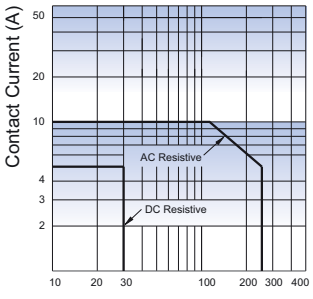
Remark:1) * The additional tin top is max. 1mm.

2) 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.

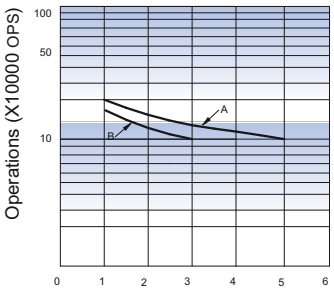
3) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



EDURANCE CURVE

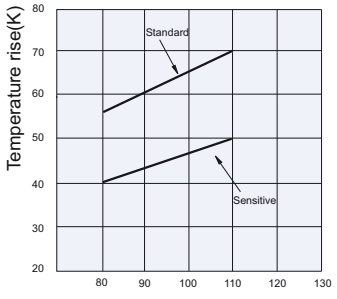


Notes:

1.Curve A: H type
Curve B: HL type, Z type

2.**Test conditions:**
H type: Resistive load, 5A 250VAC, Room temp., 1s on 1s off
HL type: Resistive load, 5A 250VAC, Room temp., 1s on 1s off
Z type: NO/NC, Resistive load, 3A 250VAC, Room temp., 1.5s on 1.5s off

COIL TEMPERATURE RISE



Test conditions:
Standard: 5A at 70℃
Sensitive: 3A at 70℃
Mounting distance: 5mm

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.

HF32F-G SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.: E134517

VDE
File No.: 40012204

CQC
File No.: CQC12002076528
CQC16002148335

Features

- 10A switching capability
- 1 Form A configuration
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgNi, AgCdO
Contact rating (Res. load)	10A 250VAC 10A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10^6OPS
Electrical endurance	1 x 10^5OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Operation ambient temperature		-40˚C to 85˚C
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

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

COIL

Coil power	Approx. 450mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Notes:1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 277VAC / 250VAC / 30VDC at 85˚C 12A 125VAC at 85˚C
VDE	10A 250VAC at 85˚C 4A 400VAC at 85˚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

	HF32F-G /	012	-H	S	3	(XXX)

Type

Coil voltage 3, 5, 6, 9, 12, 18, 24, 48VDC

Contact arrangement **H:** 1 Form A

Construction [1] **S:** Plastic sealed **Nil:** Flux proofed

Contact material **T:** $AgSnO_2$ **3:** AgNi **Nil:** AgCdO

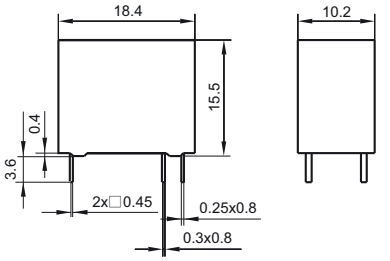
Special code[3] **XXX:** Customer special requirement **Nil:** Standard

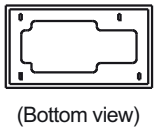
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; please test the relay in real applications. If the ambience allows, flux proofed is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).
4) Two packing methods available: paper box package, tube package, Standard tube packing length is 553mm. Any special requirement needed, please contact us for more details.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions





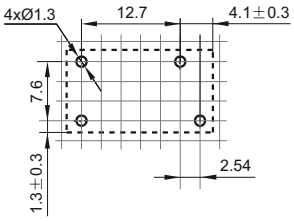
(Bottom view)

Wiring Diagram

(Bottom view)

PCB Layout

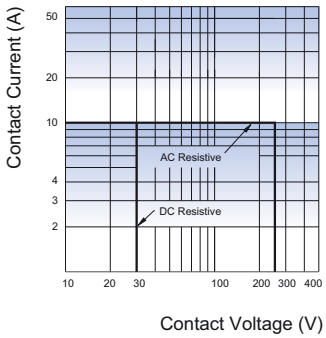
(Bottom view)



Remark:1) * The additional tin top is max. 1mm.
2) 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.
3) The tolerance without indicating for PCB layout is always ±0.1mm.
4) The width of the gridding is 2.54mm.

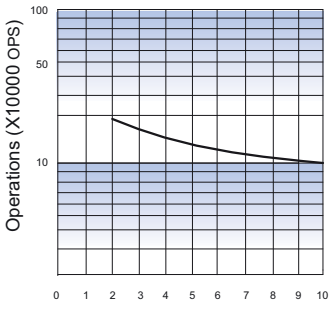
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Contact Voltage (V)

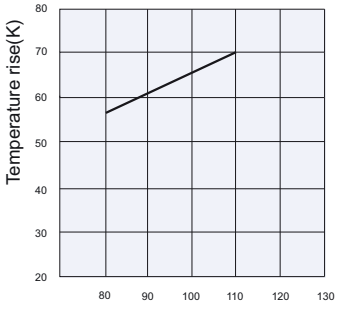
EDURANCE CURVE



Contact Current (A)

Test conditions:
Resistive load, 10A 250VAC,
Room temp. , 1s on 9s off

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Test conditions: 10A 250VAC
Mounting distance: 10mm

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.

HF171F MINIATURE HIGH POWER RELAY

File No.:E133481

File No.:40048577

File No.:17002177419

Features

- 8A switching capability
- 1 form A and 1 form C configurations
- High sensitivity 200mW
- Creepage/clearance distance:>6mm,meets VDE 0631reinforce insulation
- 5KV dielectric between coil to contacts
- Class F insulation

CONTACT DATA

Contact arrangement	1A	1C	
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)		
Contact material	$AgSnO_2$,AgNi		
Contact rating (Res. load)	1A	1C	
	6A 250VAC 6A 30VDC	NO	NC
		6A 250VAC 6A 30VDC	5A 250VAC 5A 30VDC
Max. switching voltage	30VDC / 277VAC		
Max. switching current	8A		
Max. switching power	180W/1662VA		
Mechanical endurance	1 x 10^7OPS		
Electrical endurance	1 x 10^5OPS(Resistive load, Room temp., 1.5s on 1.5s off)		

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage(Between coil & contacts)		10KV(1.2/50 μs)
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Temperature rise (at rated.volt.)		60K max.
Shock resistance*	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 4.6g
Construction		Flux proofed

Notes: 1)*Index is not in relay length direction.
2)The data shown above are initial values.

COIL

Coil power	Approx. 200mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC[1)] max.	Drop-out Voltage VDC[1)] min.	Max.[2)] Allowable Voltage VDC	Coil Resistance Ω
3	2.25	0.30	3.90	45 x (1±10%)
5	3.75	0.50	6.50	125 x (1±10%)
6	4.50	0.60	7.80	180 x (1±10%)
9	6.75	0.90	11.7	405 x (1±10%)
12	9.00	1.20	15.6	720 x (1±10%)
18	13.5	1.80	23.4	1600 x (1±10%)
24	18.0	2.40	31.2	2880 x (1±10%)
36	27.0	3.60	46.8	6480 x (1±10%)
48	36.0	4.80	62.4	11520 x (1±10%)

Notes: 1)The data shown above are initial values.
2) Maximum voltage is refers to the relay coil in a short period of time can bear the biggest values.

SAFETY APPROVAL RATINGS(PENDING)

UL/CUL	1 Form A	8A 250/277VAC Resistive 85˚C 6A 250/277VAC Resistive 85˚C 5A 30VDC Resistive 85˚C 6A 250VAC General purpose 85˚C 10A 120VAC General purpose 85˚C 1/4HP 240/277VAC Motor 40˚C B300 Pilot duty 40˚C
	1 Form C	NO:8A 250/277VAC Resistive 85˚C NO:6A 250/277VAC Resistive 85˚C CO:5A 250/277VAC Resistive 85˚C
VDE	1 Form A	8A 250/277VAC Resistive 85˚C 6A 250/277VAC Resistive 85˚C 6A 30VDC Resistive 85˚C $AgSnO_2$ 8A 30VDC Resistive 85˚C $AgSnO_2$
	1 Form C	NO:8A 250/277VAC Resistive 85˚C NO:6A 250/277VAC Resistive 85˚C NO:6A 30VDC Resistive 85˚C $AgSnO_2$ NO:8A 30VDC Resistive 85˚C $AgSnO_2$ CO:5A 250VAC/30VDC Resistive 85˚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

	HF171F /	12	-H	T	(XXX)
Type					
Coil voltage : 3,5,6,9,12,18,24,36,48VDC					
Contact arrangement	**H:** 1 Form A	**Z:** 1 Form C			
Construction	**T:** $AgSnO_2$	**3:** AgNi			
Special code[2)]	**XXX:** Customer special requirement		**Nil:** Standard		

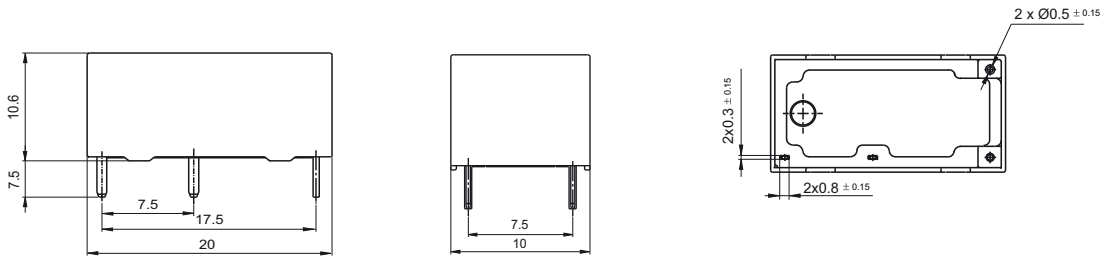
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S,SO_2,NO_2 dust,etc).
2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

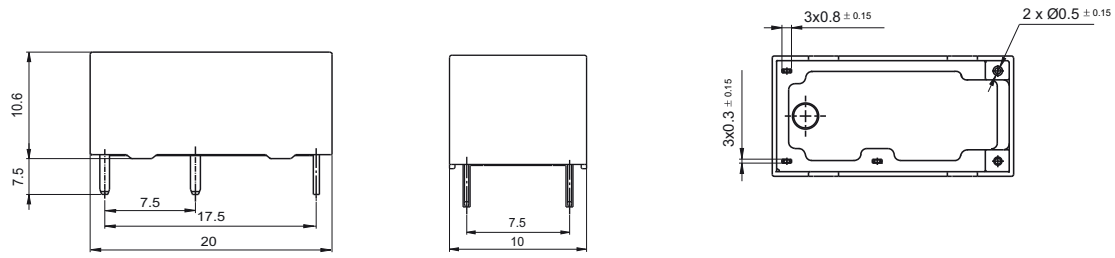
Unit: mm

Outline Dimensions

1 Form A

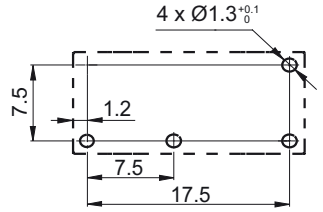
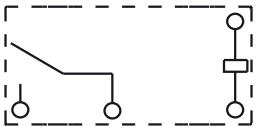
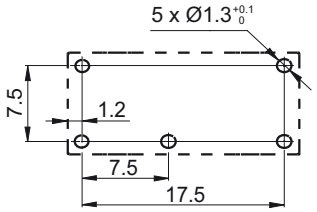
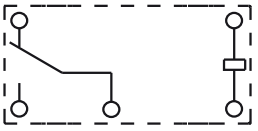


1 Form C



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

	Wiring Diagram (Bottom view)	PCB Layout (Bottom view)
1 Form A		
1 Form C		

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.

HF33F SUBMINIATURE INTERMEDIATE POWER RELAY

File No.:E134517

File No.:125661

File No.:CQC12002076530

Features

- Provide 5A 250VAC to meet 300000 switching capability specifications
- Creepage distance: 8mm (coil & contacts)
- Clearance distance: NO type 4.5mm, NC type 4mm
- 1 Form A 、1 Form B and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available

CONTACT DATA

Contact arrangement	1A, 1C,1B			
Contact resistance	100mΩ max.(at 1A 6VDC)			
Contact material	$AgSnO_2$, AgNi, AgCdO			
Contact rating (Res. load)	1A	1C		1B
		NO	NC	NC
	5A 250VAC 5A 30VDC 10A 125VAC	5A 250VAC 5A 30VDC 10A 125VAC	3A 250VAC 3A 30VDC	5A 250VAC
Max. switching current	10A		3A	5A
Max. switching power	1250VA /150W		750V	1250V
Max. switching voltage	250VAC / 30VDC			250VAC
Mechanical endurance	5×10^6 OPS			
Electrical endurance	H type:3×10^5OPS（5A 250VAC, Resistive load, Room temp., 1s on 1s off) Z type:1×10^5OPS（NO:5A /NC:3A 250VAC,Resistive load, Room temp., 1.5s on 1.5s off) D type:1×10^4OPS（5A 250VAC, Resistive load, Room temp., 1s on 1s off)			

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		8ms max.
Release time (at rated. volt.)		5ms max.
Ambient operating temperature		-40˚C to 70˚C
Humidity		5% to 85% RH
Shock resistance	Functional	$98m/s^2$
	Destructive	$980m/s^2$
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 7g
Construction		Plastic sealed, Flux proofed

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

COIL

Coil power	Standard: Approx. 450mW; Sensitive: Approx. 200mW

COIL DATA at 23˚C

Standard Type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
3	2.25	0.15	3.9	20 x (1±10%)
5	3.75	0.25	6.5	55 x (1±10%)
6	4.50	0.30	7.8	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	5120 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
3	2.25	0.15	4.5	45 x (1±10%)
5	3.75	0.25	7.5	125 x (1±10%)
6	4.50	0.30	9.0	180 x (1±10%)
9	6.75	0.45	13.5	400 x (1±10%)
12	9.00	0.60	18.0	720 x (1±10%)
18	13.5	0.90	27.0	1600 x (1±10%)
24	18.0	1.20	36.0	2800 x (1±10%)
48	36.0	2.40	72.0	11520 x (1±10%)

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

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	AgCdO	5A 250VAC/30VDC at 40˚C 8A 250VAC at 40˚C 10A 125VAC at 40˚C 10A 277VAC COSØ =0.4 at 40˚C 1/10HP 125VAC, 1/6HP 250VAC at 40˚C
		AgNi	5A 250VAC/30VDC at 70˚C 8A 250VAC at 70˚C 10A 125VAC at 70˚C 10A 277VAC COSØ =0.4 at 70˚C 1/10HP 125VAC, 1/6HP 250VAC at 70˚C
		$AgSnO_2$	5A 250VAC/30VDC at 70˚C 10A 125VAC at 70˚C
	1 Form C	AgCdO	NO:5A 250VAC/30VDC at 40˚C NC:3A 250VAC/30VDC at 40˚C
		AgNi $AgSnO_2$	NO:5A 250VAC/30VDC at 70˚C NC:3A 250VAC/30VDC at 70˚C
VDE	1 Form A	AgNi	5A 250VAC at 85˚C
		AgCdO	5A 250VAC at 70˚C
		$AgSnO_2$	5A 250VAC at 70˚C
	1 Form C	AgCdO AgNi $AgSnO_2$	NO: 5A 250VAC at 70˚C* NC: 3A 250VAC at 70˚C*
CQC	1 Form A	AgNi AgCdO $AgSnO_2$	5A 250VAC/30VDC at 85˚C NO: 5A 250VAC at 70˚C NC: 5A 250VAC at 70˚C
	1 Form C	AgNi AgCdO $AgSnO_2$	NO:5A 250VAC/30VDC at 85˚C NC:3A 250VAC/30VDC at 85˚C
	1 Form B	AgNi AgCdO $AgSnO_2$	NC:5A 250VAC at 40˚C

Notes: 1) *The vent hole is kept open during load approval;
2) All values unspecified are at room temperature.
3) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF33F /	012	-H	S	L	3	F	(XXX)
Type								
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC							
Contact arrangement	**H:** 1 Form A **Z:** 1 Form C **D:** 1 Form B							
Construction [1]	**S:** Plastic sealed **Nil:** Flux proofed							
Coil power	**L:** Sensitive (Only for 1 Form A) **Nil:** Standard							
Contact material	**T:** $AgSnO_2$ **3:** AgNi **Nil:** AgCdO							
Insulation standard	**F:** Class F							
Special code [3]	**XXX:** Customer special requirement **Nil:** Standard							

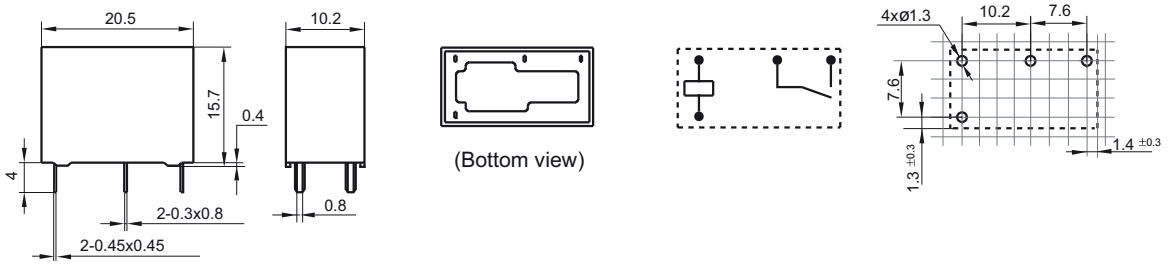
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

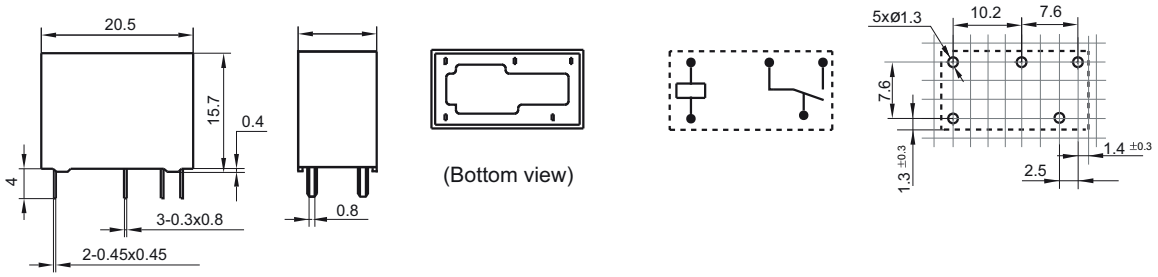
Unit: mm

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

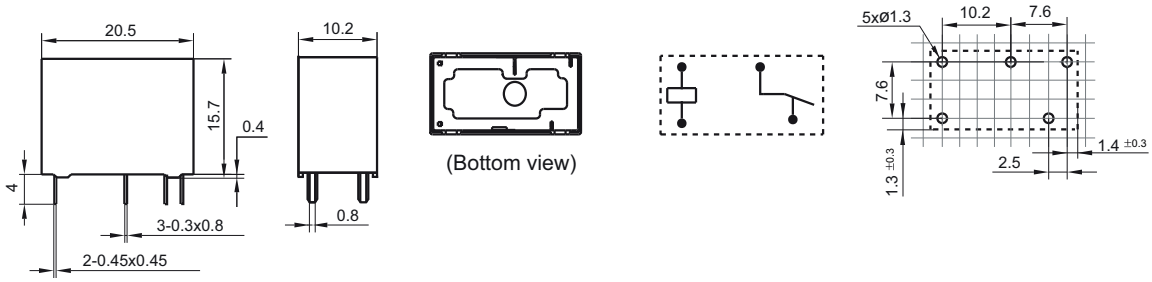
1 Form A



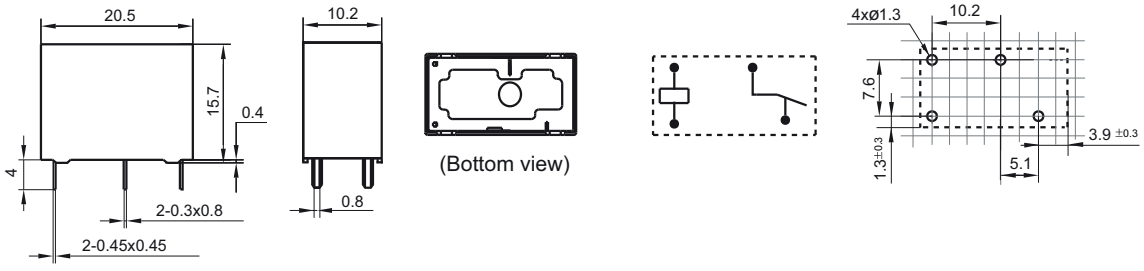
1 Form C



1 Form B（With 5 terminal）



1 Form B（With 4 terminal）



Remark:1) * The additional tin top is max. 1mm.

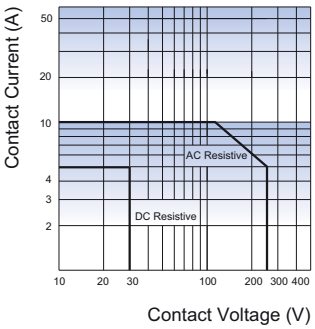
2) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension ＞1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension ＞5mm, tolerance should be ±0.4mm.

3) The tolerance without indicating for PCB layout is always ±0.1mm.

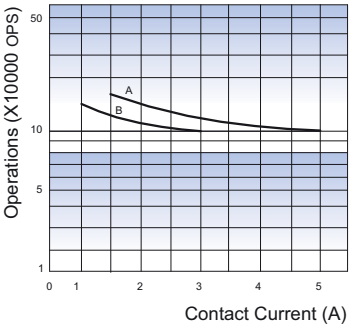
4) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE

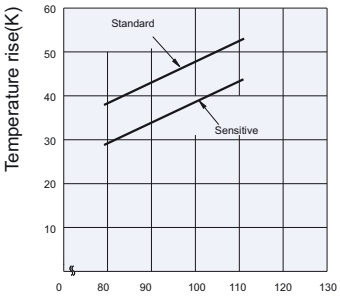


Notes:

1.Curve A: NO contact
Curve B: NC contact

2.**Test conditions:**
Curve A:NO, Resistive load, Room temp., flux proofed, 250VAC/30VDC, 1s on 9s off
Curve B: NC, Resistive load, Room temp., flux proofed, 250VAC/30VDC, 1s on 9s off

COIL TEMPERATURE RISE



Notes:

Standard: 5A at 70℃
Sensitive: 5A at 70℃
Mounting distance: 10mm

HF36F SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

File No.:R50356442

CQC
File No.:CQC16002159838

Features

- 10A switching capability
- TV-5 125VAC approved by UL standard (only for 1 Form A)
- Plastic sealed and flux proofed types available
- 1 Form A and 1 Form C configurations

CONTACT DATA

Contact arrangement	1A ,1C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating	10A 250VAC 10A 30VDC TV-5 125VAC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10^7 OPS
Electrical endurance	5 x 10^4OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	NO: 4000VAC 1min NC: 3000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx.12g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class A.

COIL

Coil power	Standard: Approx. 530mW; Sensitive: Approx. 250mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
5	3.75	0.25	6.5	47 x (1±10%)
6	4.50	0.30	7.8	68 x (1±10%)
9	6.75	0.45	11.7	155 x (1±10%)
12	9.00	0.60	15.6	270 x (1±10%)
18	13.5	0.90	23.4	620 x (1±10%)
24	18.0	1.20	31.2	1080 x (1±10%)
48	36.0	2.40	62.4	4400 x (1±10%)

Sensitive type (Only for 1 Form A)

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
5	3.75	0.25	6.5	100 x (1±10%)
6	4.50	0.30	7.8	145 x (1±10%)
9	6.75	0.45	11.7	325 x (1±10%)
12	9.00	0.60	15.6	575 x (1±10%)
18	13.5	0.90	23.4	1300 x (1±10%)
24	18.0	1.20	31.2	2310 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form C	10A 250VAC 10A 30VDC
	1 Form A	10A 250VAC 10A 30VDC TV-5 125VAC
TÜV		10A 250VAC COSØ =1 10A 30VDC L/R=0

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

	HF36F /	012	-H	S	L	T	(XXX)
Type							
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	**H:** 1 Form A **Z:** 1 Form C						
Construction [1]	**S:** Plastic sealed **Nil:** Flux proofed						
Coil power	**L:** Sensitive (Only for 1 Form A) **Nil**: Standard						
Contact material	**T:** $AgSnO_2$ **Nil:** AgCdO						
Special code[3]	**XXX:** Customer special requirement **Nil:** Standard						

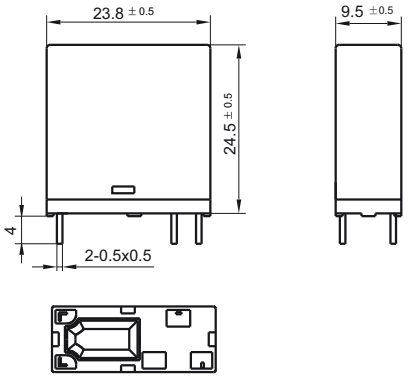
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

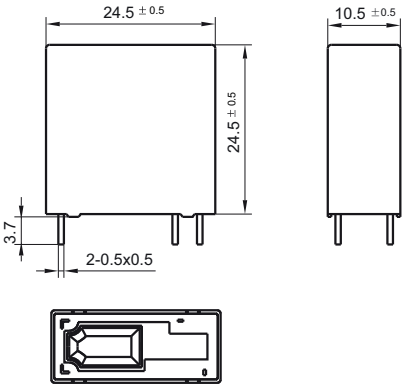
Outline Dimensions

1 Form A & Flux proofed



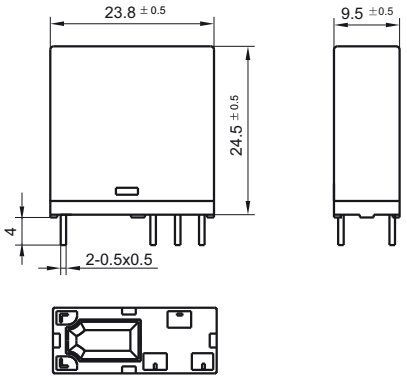
(Bottom view)

1 Form A & Plastic sealed



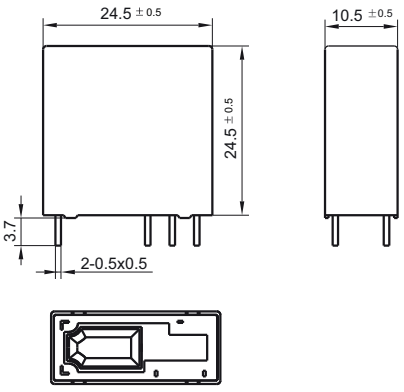
(Bottom view)

1 Form C & Flux proofed



(Bottom view)

1 Form C & Plastic sealed



(Bottom view)

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

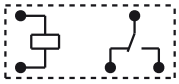
Unit: mm

Wiring Diagram

(Bottom view)

1 Form A

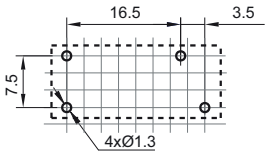
1 Form C



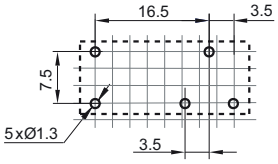
PCB Layout

(Bottom view)

1 Form A



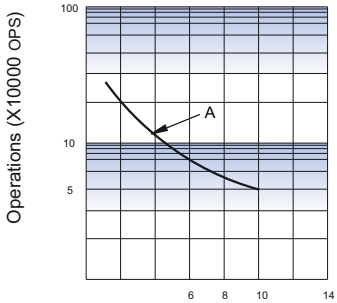
1 Form C



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 2.5mm.

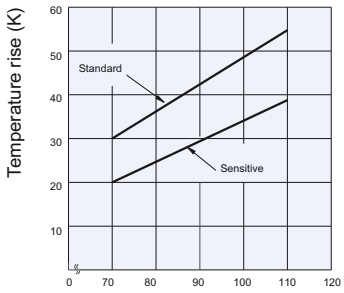
CHARACTERISTIC CURVES

ENDURANCE CURVE



Notes:
(1) Curve A: H type
(2) Test conditions:
10A 250VAC, Resistive load,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



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.

HF36FD SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

File No.:R50356444

CQC
File No.:CQC16002159846

Features

- 10A switching capability
- TV-8 125VAC approved by UL standard (118A inrush current)
- Ideal for device power reduction

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating	10A 250VAC 5A 250VAC 5A 30VDC TV-8 125VAC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 150W
Mechanical endurance	1×10^6 OPS
Electrical endurance	5×10^4 OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx.12g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class A

COIL

Coil power	Standard: Approx. 530mW; Sensitive: Approx. 250mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.25	6.5	47 x (1±10%)
6	4.50	0.30	7.8	68 x (1±10%)
9	6.75	0.45	11.7	155 x (1±10%)
12	9.00	0.60	15.6	270 x (1±10%)
18	13.5	0.90	23.4	620 x (1±10%)
24	18.0	1.20	31.2	1080 x (1±10%)
48	36.0	2.40	62.4	4400 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	4.00	0.25	6.5	100 x (1±10%)
6	4.80	0.30	7.8	145 x (1±10%)
9	7.20	0.45	11.7	325 x (1±10%)
12	9.60	0.60	15.6	575 x (1±10%)
18	14.4	0.90	23.4	1300 x (1±10%)
24	19.2	1.20	31.2	2310 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 250VAC 5A 250VAC TV-8 125VAC
TÜV	10A 250VAC 5A 250VAC/30VDC

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

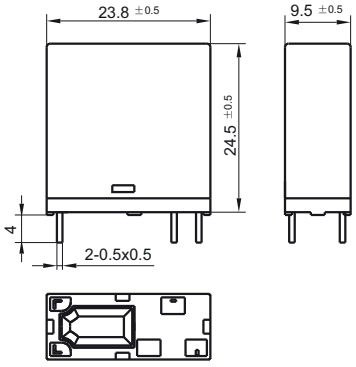
	HF36FD /	012	-H	L	T	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	**H:** 1 Form A					
Coil power	**L:** Sensitive	**Nil**: Standard				
Contact material	**T:** $AgSnO_2$					
Special code[3)]	**XXX:** Customer special requirement		**Nil:** Standard			

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
2) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

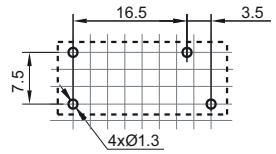
Outline Dimensions



(Bottom view)

Wiring Diagram
(Bottom view)

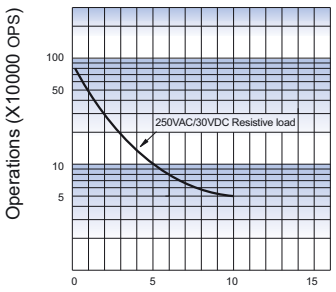
PCB Layout
(Bottom view)



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 2.5mm.

CHARACTERISTIC CURVES

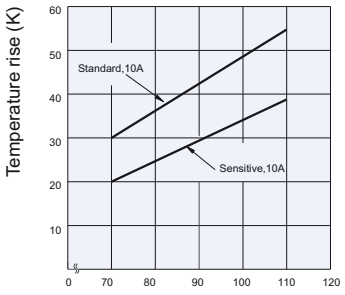
ENDURANCE CURVE



Contact Current (A)

Test conditions:
10A 250VAC, Resistive load,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

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.

HF162F SUBMINIATURE INTERMEDIATE POWER RELAY

File No.:E133481

File No.:40032669

File No.:CQC10002050942

Features

- High inrush current: TV-8 125VAC (117A inrush current)
- 3A/100A 250VAC capacitive load
- High sensitivity: 250mW, Ideal for device power reduction
- Typical applications: Flat-panel TVs, Audio visual equipment and other slim profile devices

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	Silver alloy
Contact rating	10A 125VAC 8A 277VAC 5A 277VAC TV-8 125VAC 3A/100A 250VAC (Capacitive)
Max. switching voltage	277VAC
Max. switching current	10A
Max. switching power	2216VA
Mechanical endurance	1 x 10^6 OPS
Electrical endurance	5 x 10^4 OPS (10A 125VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Ambient temperature		-40˚C to 70˚C
Humidity		5% to 85% RH
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx.12g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class A

COIL

Coil power	Approx. 250mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.25	0.3	3.9	36 x (1±10%)
5	3.75	0.5	6.5	100 x (1±10%)
6	4.5	0.6	7.8	145 x (1±10%)
9	6.75	0.9	11.7	325 x (1±10%)
12	9.0	1.2	15.6	575 x (1±10%)
18	13.5	1.8	23.4	1300 x (1±10%)
24	18.0	2.4	31.2	2300 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A 125VAC 8A 277VAC 5A 277VAC TV-8 125VAC
VDE	8A 250VAC 5A 250VAC 3A/100A 250VAC

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

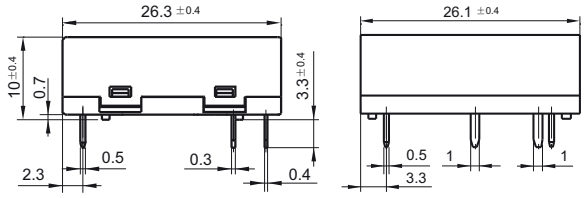
	HF162F /	12	-H	(XXX)
Type				
Coil voltage	3, 5, 6, 9, 12, 18, 24VDC			
Contact arrangement	**H:** 1 Form A			
Special code[1)]	**XXX:** Customer special requirement		**Nil:** Standard	

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

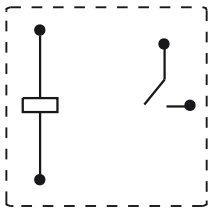
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

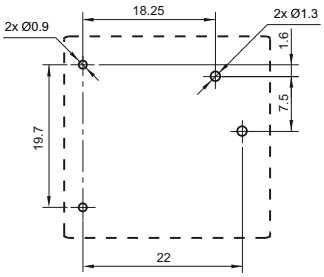
Outline Dimensions



Wiring Diagram
(Bottom view)



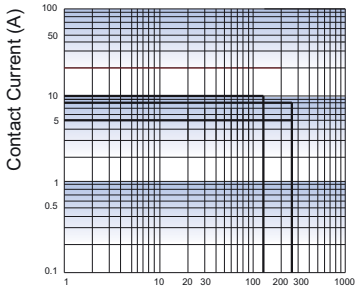
PCB Layout
(Bottom view)



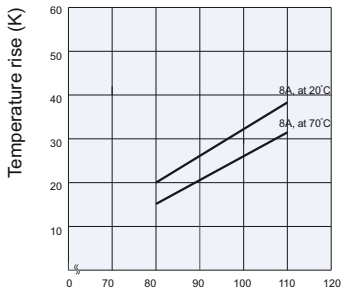
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



COIL TEMPERATURE RISE



HF8 SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

DVE
File No.:40025189

Features

- 4kV impulse withstand voltage (between coil and contacts)
- 1 Form A and 1 Form C configurations
- Subminiature, high sensitive, PCB layout
- Plastic sealed type for automatic wave soldering

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance[1)]	100mΩ max.(at 1A 24VDC)
Contact material	AgNi
Contact rating (Res. load)	HF8: 6A 300VAC/28VDC HF8A: 6A 277VAC/30VDC
Max. switching voltage	300VAC / 30VDC
Max. switching current	6A
Max. switching power	1800VA / 300W
Mechanical endurance	1 x 10^7 OPS
Electrical endurance[2)]	Plastic sealed:1 x 10^4 OPS Flux proofed, Standard type:1 x 10^5 OPS Flux proofed, Sensitive type:5 x 10^4 OPS (NO, 6A 300VAC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		6ms max.
Release time (at rated. volt.)		3ms max.
Humidity		5% to 85% RH
Operation ambient temperature		-55˚C to 90˚C
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 11g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B, Class A.

COIL

Coil power	Standard: Approx. 450mW (48VDC: Approx. 600mW) Sensitive: Approx. 330mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC *[3)]	Coil Resistance Ω
3	2.25	0.15	3.90	20 x (1±10%)
5	3.75	0.25	6.50	56 x (1±10%)
6	4.50	0.30	7.80	80 x (1±10%)
9	6.75	0.45	11.7	180 x (1±10%)
12	9.00	0.60	15.6	320 x (1±10%)
18	13.5	0.90	23.4	720 x (1±10%)
24	18.0	1.20	31.2	1280 x (1±10%)
48	36.0	2.40	62.4	3800 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC *[3)]	Coil Resistance Ω
3	2.25	0.15	3.90	28 x (1±10%)
5	3.75	0.25	6.50	80 x (1±10%)
6	4.50	0.30	7.80	110 x (1±10%)
9	6.75	0.45	11.7	250 x (1±10%)
12	9.00	0.60	15.6	440 x (1±10%)
18	13.5	0.90	23.4	1000 x (1±10%)
24	18.0	1.20	31.2	1780 x (1±10%)
48	36.0	2.40	62.4	7120 x (1±10%)

Notes: 1) When requiring pick-up voltage < 75% of nominal voltage, special order allowed.
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.

SAFETY APPROVAL RATINGS

UL/CUL	**Medium Duty** HF8-1CH/1AH	6A 28VDC 6A 300VAC
	General Duty HF8-1C/1A	2A 28VDC 2A 300VAC 3A 120VAC
	HF8A	6A 30VDC(NO/NC) 6A 277VAC(NO/NC)
VDE	HF8....A	2.5A 250VAC COSØ=0.4 2.5A 250VAC COSØ=0.5 5A 250VAC COSØ=1 6A 250VAC COSØ=1

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

	HF8 HF8A	-1C	H	-12	D	S	E	F	(XXX)
Type	**HF8:** Standard type **HF8A:** Low cost type								
Contact arrangement:		**1A:** 1 Form A **1C:** 1 Form C							
Contact capacity			**H**: Medium Duty (6A) **Nil**: General Duty (3A/2A)						
Coil voltage				3, 5, 6, 9, 12, 18, 24, 48VDC					
Coil voltage form					**D**: DC				
Coil power						**S**: Sensitive	**Nil**: Standard		
Construction [1]							**E**: Plastic sealed	**Nil**: Flux proofed	
Insulation standard								**F**: Class F **Nil**: Class B	**A**: Class A (VDE version, Only for HF8-1AH/1CH)
Special code[3]									**XXX:** Customer special requirement **Nil:** Standard

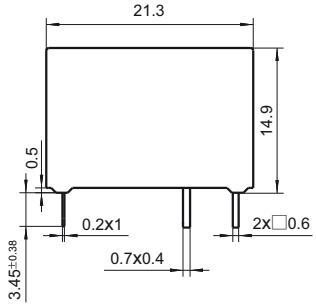
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.
4)One packing methods available: tube package,Standard tube packing length is 345mm. Any special requirement needed, please contact us for more details.

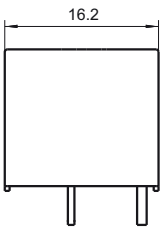
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

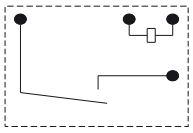
Outline Dimensions

1 Form A

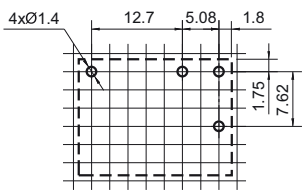




Wiring Diagram
(Bottom view)



PCB Layout
(Bottom view)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

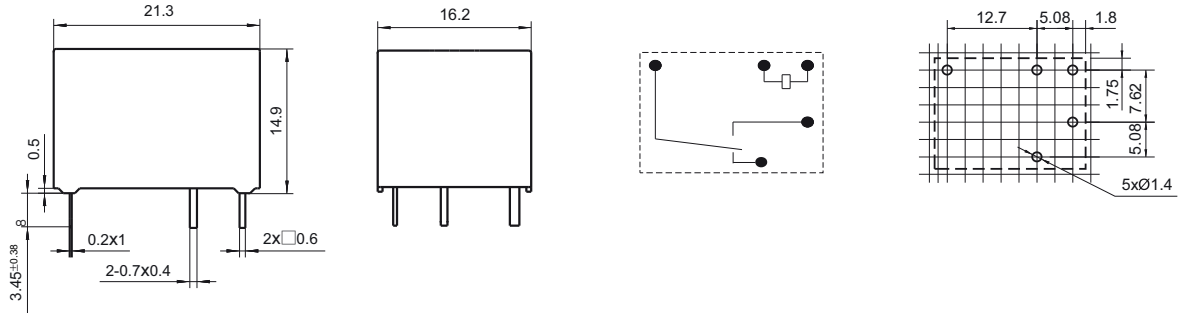
Unit: mm

Outline Dimensions

Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)

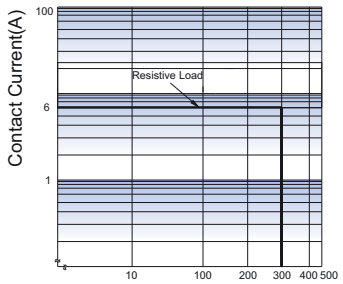
1 Form C



Remark: 1) * The additional tin top is max. 1mm.
2) 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.
3) The tolerance without indicating for PCB layout is always ±0.1mm.
4) The width of the gridding is 2.54mm.

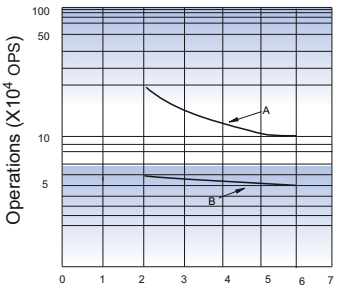
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



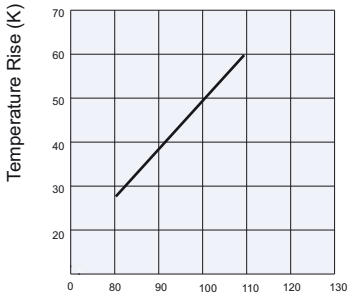
Contact Voltage (V)

ENDURANCE CURVE



Contact Current (A)

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Notes:
1) Curve A: HF8-1CH Standard type
Curve B: HF8-1CH Sensitive type
2) Test conditions:
NO, 6A 300VAC, Resistive load,
Flux proofed, Room temp.
1s on 9s off
3) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

Testing conditions: 6A at 90˚C.
Mounting distance: 25mm

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.

HF3FA SUBMINIATURE HIGH POWER RELAY

File No.: E134517

File No.: 40023708

File No.:CQC12002076529

Features

- 15A 125VAC;10A 250VAC switching capability
- Flammability class according to UL94, V-0
- CTI 250 available
- Product in accordance to IEC 60335-1 available
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A	1C	
		NO	NC
Contact resistance[1]	100mΩ max.(at 1A 6VDC)		
Contact material	$AgSnO_2$;AgNi;AgCdO		
Contact rating (Res. load)	10A 277VAC 10A 28VDC	10A 277VAC[2] 10A 28VDC[2]	5A 250VAC
Max. switching voltage	277VAC/28VDC		250VAC
Max. switching current	15A	10A	5A
Max. switching power	2770VA /280W		
Mechanical endurance	1×10^7OPS		
Electrical endurance[3]	H type:1×10^5OPS (10A 250VAC Resistive load, Room temp., 1s on 9s off) Z type:5×10^4OPS (NO: 5A/NC: 5A 250VAC, Resistive load, Room temp., 3s on 3s off)		

Notes: 1) The data shown above are initial values.
2) Applicable when NC is not energized with load.
3) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	$98m/s^2$
	Destructive	$980m/s^2$
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 7.2g
Construction		Plastic sealed, Flux proofed

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

COIL

Coil power	Approx. 360mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1]	Drop-out Voltage VDC min.[1]	Max. Voltage VDC *[2]	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
15	11.25	1.5	19.5	625 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	10A 250VAC at 85˚C 8A 277VAC at 85˚C 6A 250VAC at 105˚C 15A 125VAC TV-5 120VAC
	1 Form C	NO/NC: 5A/5A 277VAC at 85˚C
VDE	1 Form A	6A 250VAC at 105˚C 10A 250VAC at 85˚C
	1 Form C	NO: 10A 250VAC at 85˚C NO: 6A 250VAC at 105˚C NO/NC: 5A/5A 250VAC at 85˚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.
3) For sealed type, the vent-hole cover should be excised.

ORDERING INFORMATION

	HF3FA /	012	-H	S	T	F	(XXX)
Type							
Coil voltage	3,5,6,9,12,15,18,24,48VDC						
Contact arrangement	**H**: 1 Form A	**Z**: 1 Form C					
Construction [1]	**S**: Plastic sealed	**Nil**: Flux proofed					
Contact material	**T**: $AgSnO_2$	**3**: AgNi	**Nil**: AgCdO				
Insulation system	**F**: Class F						
Special code[3]	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) 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).

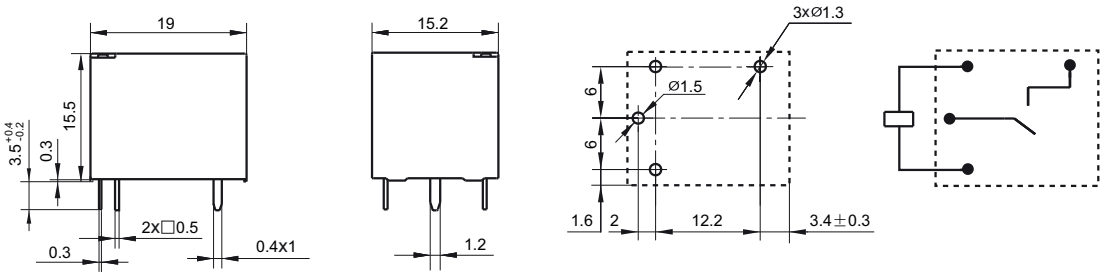
4) Two packing methods available: paper box package, tube package,Standard tube packing length is 450mm. Any special requirement needed, please contact us for more details.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

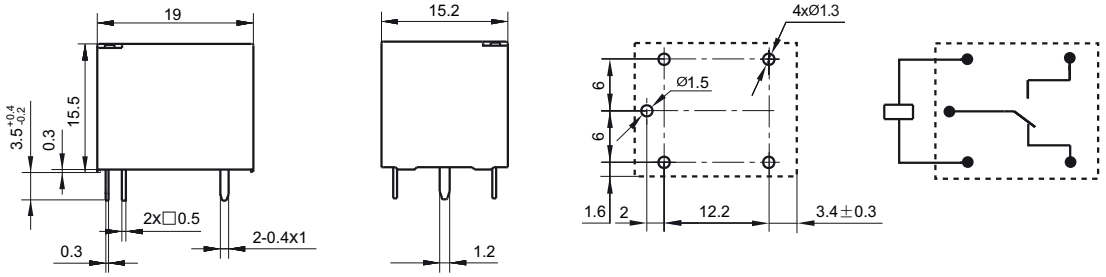
Unit: mm

Outline Dimensions | PCB Layout (Bottom view) | Wiring Diagram (Bottom view)

1 Form A



1 Form C



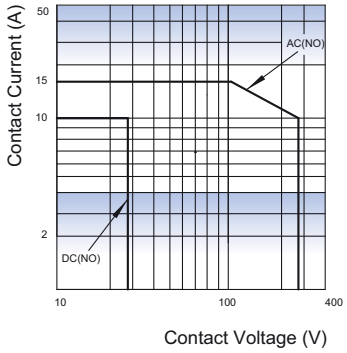
Remark: 1) * The additional tin top is max. 1mm.

2) 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.

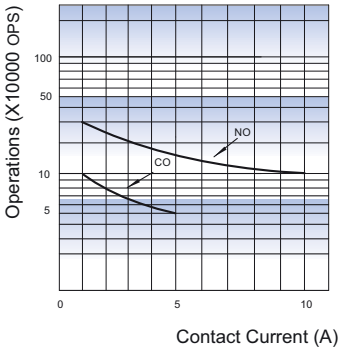
3) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

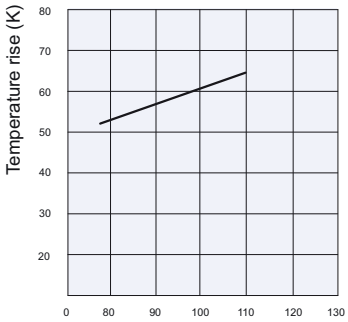


ENDURANCE CURVE



Test conditions:
NO: Resistive load, Flux proofed,
Room temp., 1s on 9s off
CO:Resistive load, Flux proofed,
Room temp., 3s on 3s off
Notes: For plastic sealed type, the venting-hole should be opened in electrical endurance test.

COIL TEMPERATURE RISE



Test conditions: at 85°C, 6A
Mounting distance: 10mm

HF3FA-W SUBMINIATURE HIGH POWER RELAY

File No.: E134517

File No.: 40023708

File No.:CQC12002076529

Features

- 10A 36VDC switching capability
- Flammability class according to UL94, V-0
- Product in accordance to IEC 60335-1 available
- Plastic sealed and flux proofed types available
- Subminiature, standard PCB layout
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1C		
	NO		NC
Contact resistance	100mΩ max.(at 1A 6VDC)		
Contact material	$AgSnO_2$		
Contact rating (Res. load)	8A 277VAC 10A 36VDC		5A 250VAC
Max. switching voltage	277VAC/36VDC		250VAC
Max. switching current	10A		5A
Max. switching power	2770VA /360W		
Mechanical endurance	1×10^7 OPS		
Electrical endurance	NO:1×10^5 OPS (10A 24VDC, Resistive load, Room temp., 1s on 9s off)		

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

COIL

Coil power	Approx. 800mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
12	9	0.6	15.6	180 x (1±10%)
24	18	1.2	31.2	720 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	$98m/s^2$
	Destructive	$980m/s^2$
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 8.0g
Construction		Plastic sealed, Flux proofed

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

SAFETY APPROVAL RATINGS

UL/CUL	Z	NO:8A 277VAC at 85˚C NO:10A 24VDC at 45˚C NO:10A 36VDC at 40˚C
VDE	Z	NO:8A 250VAC at 85˚C NO:10A 24VDC at 45˚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.
3) For sealed type, the vent-hole cover should be excised.

ORDERING INFORMATION

	HF3FA-W/	12	Z	S	T	F	(XXX)
Type							
Coil voltage	12, 24VDC						
Contact arrangement	**Z**: 1 Form C						
Construction [1) 2)]	**S**: Plastic sealed	**Nil**: Flux proofed					
Contact material	**T**: $AgSnO_2$						
Insulation system	**F**: Class F						
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard					

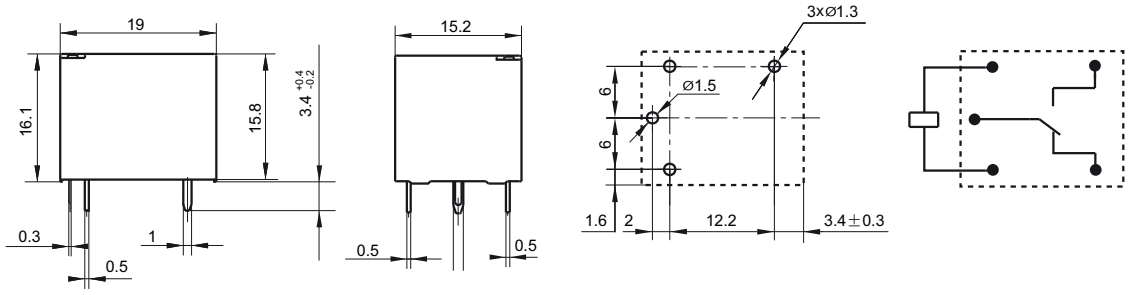
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions	PCB Layout (Bottom view)	Wiring Diagram (Bottom view)

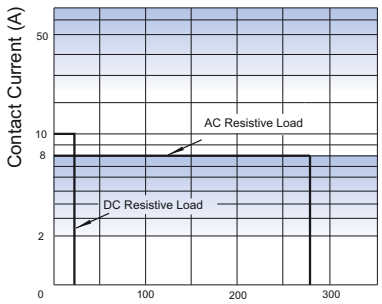
1 Form C



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.

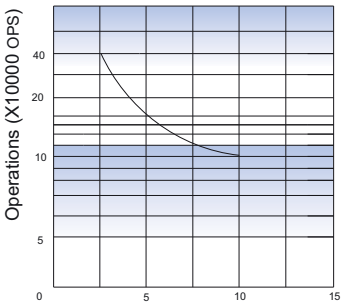
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Contact Voltage (V)

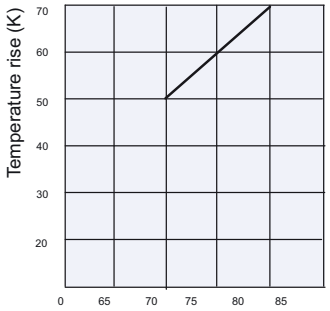
ENDURANCE CURVE



Contact Current (A)

Test conditions:
NO: Resistive load, 36VDC,Flux proofed, Room temp., 1s on 9s off

COIL TEMPERATURE RISE



Percentage of Nominal Coil Voltage

Test conditions: at 85˚C, 8A
Mounting distance: 10mm
Driving voltage: Coil activated with rated voltage,then reduce to 80% of rated voltage.

HF3FA-T SUBMINIATURE HIGH POWER RELAY

File No.: TBD

File No.: TBD

File No.:CQC12002076529

Features

- High Temperature:105˚C
- 15A 125VAC switching capability
- Flame resistance rating UL94.V-0
- Product in accordance to IEC 60335-1 available
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A	1C	
		NO	NC
Contact resistance[1]	100mΩ max.(at 1A 6VDC)		
Contact material	AgSnO2		
Contact rating (Res. load)	10A 250VAC	10A 250VAC[2]	6A 250VAC
Max. switching voltage	250VAC	250VAC	250VAC
Max. switching current	15A	15A	6A
Max. switching power	2500VAC		
Mechanical endurance	1 x 10^7OPS		
Electrical endurance[3]	H type: 5 x 10^4OPS (10A 250VAC Resistive load, at 105˚C) H type: 1 x 10^5OPS (10A 250VAC Resistive load, at 85˚C) Z type: 5 x 10^4OPS (NC: 6A 250VAC, Resistive load, at 105˚C) Z type: 5 x 10^4OPS (CO: 5A 250VAC, Resistive load, at 105˚C)		

Notes: 1) The data shown above are initial values.
2) Applicable when NC is not energized with load.
3) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	750VAC 1min
Surge withstand voltage		2.5kV(1.2 x 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 105˚C
Termination		PCB
Unit weight		Approx. 7.0g
Construction		Plastic sealed, Flux proofed

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

COIL

Coil power	Approx. 360mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
15	11.25	1.5	19.5	625 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

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

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	10A 250VAC at 85˚C 10A 250VAC at 105˚C 12A 250VAC at 105˚C TV-5 120VAC
	1 Form C	NO: 10A 250VAC at 85˚C NO: 10A 250VAC at 105˚C NC: 6A 250VAC at 105˚C
VDE	1 Form A	10A 250VAC at 85˚C 10A 250VAC at 105˚C
	1 Form C	NO: 10A 250VAC at 85˚C NO: 10A 250VAC at 105˚C NC: 6A 250VAC at 105˚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.
3) For sealed type, the vent-hole cover should be excised.

ORDERING INFORMATION

HF3FA-T/	12	-H	S	T	F	(XXX)

Type		
Coil voltage	3, 5, 6, 9, 12, 15,18, 24, 48VDC	
Contact arrangement	**H**: 1 Form A	**Z**: 1 Form C
Construction[1) 2)]	**S**: Plastic sealed	**Nil**: Flux proofed
Contact material	**T**: $AgSnO_2$	
Insulation system	**F**: Class F	
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard

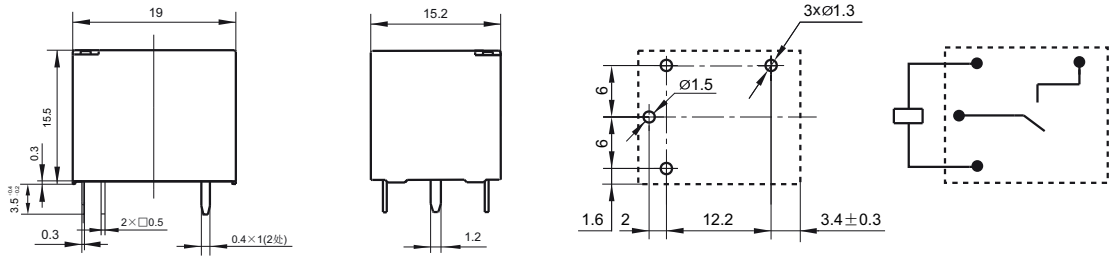
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

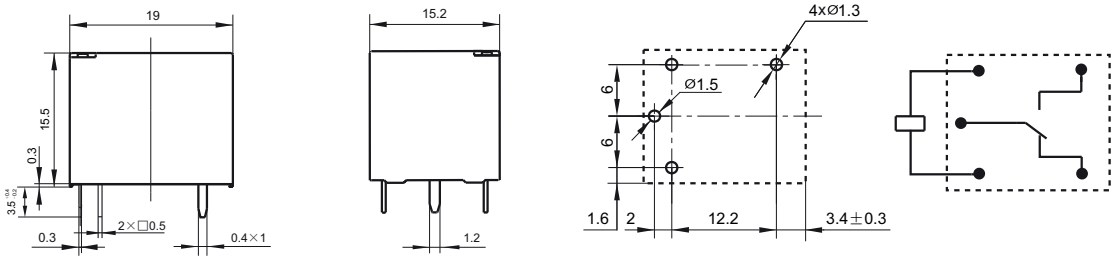
Unit: mm

Outline Dimensions | PCB Layout (Bottom view) | Wiring Diagram (Bottom view)

1 Form A



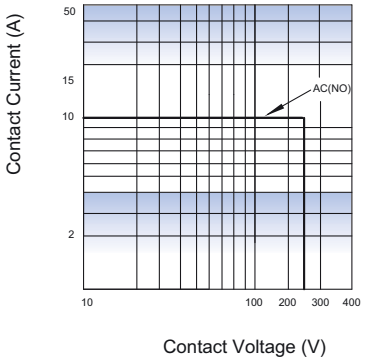
1 Form C



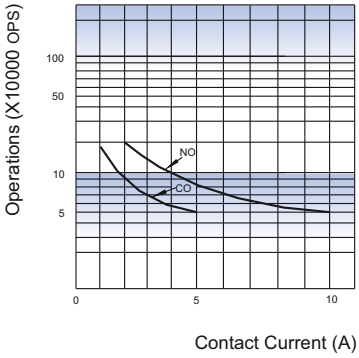
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

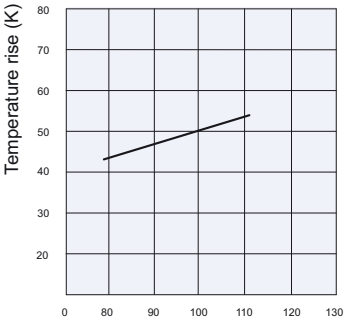


ENDURANCE CURVE



Test conditions:
NO: Resistive load, 250VAC,Flux proofed, 1s on 9s off
CO:Resistive load, 250VAC,Flux proofed, 3s on 3s off

COIL TEMPERATURE RISE



Test conditions: at 105°C, 10A
Mounting distance: 10mm

HF3FD SUBMINIATURE HIGH POWER RELAY

c UL us
File No.: E134517

VDE
File No.: 40014057

CQC
File No.: CQC14002114760

Features

- 15A switching capability
- Flammability class according to UL94, V-0
- Product in accordance to IEC 60335-1 available
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance	100mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$	
Contact rating (Res. load)	10A 250VAC	NO: 10A 250VAC/28VDC NO/NC: 5A/5A 250VAC
Max. switching voltage	277VAC/30VDC	
Max. switching current	15A	10A
Max. switching power	2770VA / 300W	
Mechanical endurance	1×10^7 OPS	
Electrical endurance[1)]	HT type: 5×10^4 OPS (10A 250VAC, Resistive load, at 85°C, 5s on 5s off)	

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

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	$98m/s^2$
	Destructive	$980m/s^2$
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx. 10g
Construction		Plastic sealed, Flux proofed

Notes: 1) For sealed type, the vent-hole cover should be excised.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 360mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC [*2)]	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.
2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/ CUL	$AgSnO_2$	1 Form A	10A 250VAC at 85°C
		1 Form C	NO/NC: 5A/5A 250VAC at 85°C NO: 1/2HP 125VAC NO: TV-5 120VAC
VDE	$AgSnO_2$	1 Form A	10A 250VAC at 85°C
		1 Form C	NO/NC: 5A/5A 250VAC at 85°C NO: 10A 250VAC at 85°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.

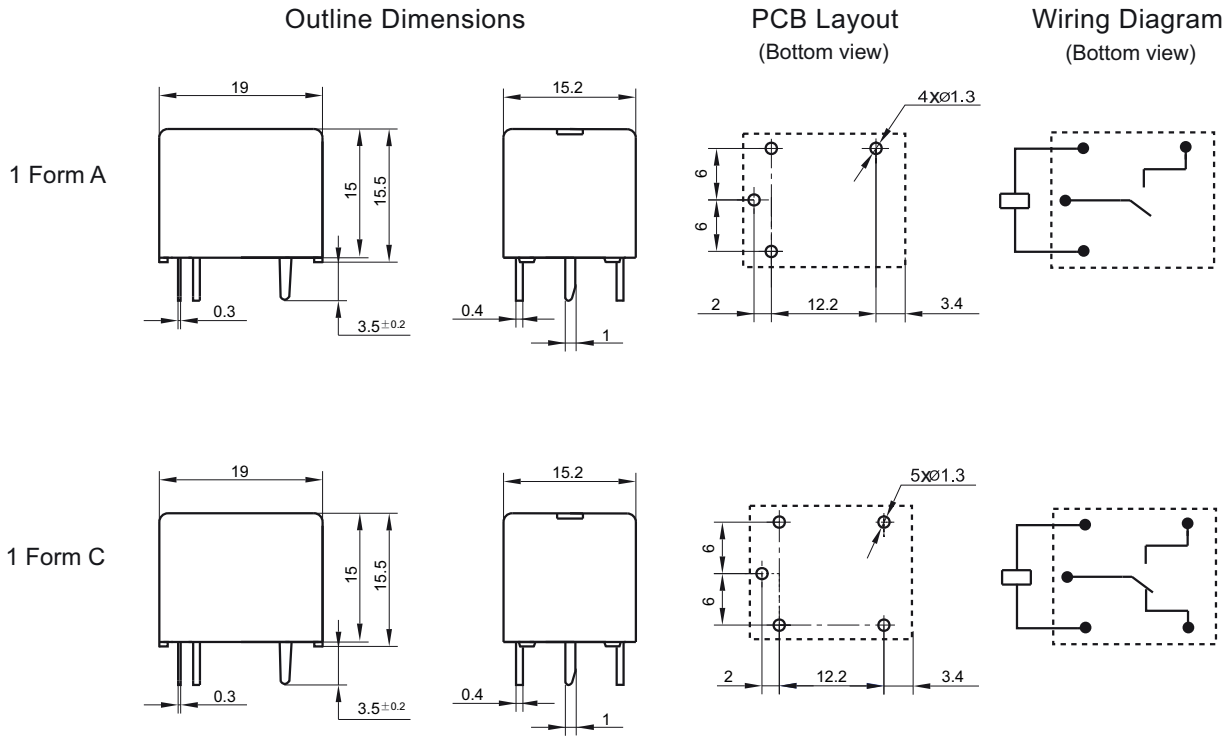
ORDERING INFORMATION

	HF3FD /	012	-H	S	T	F	(XXX)
Type							
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	**H**: 1 Form A	**Z**: 1 Form C					
Construction[1) 2)]	**S**: Plastic sealed	**Nil**: Flux proofed					
Contact material	**T**: $AgSnO_2$						
Insulation standard	**F:** Class F	**Nil:** Class B					
Special code[3)]	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

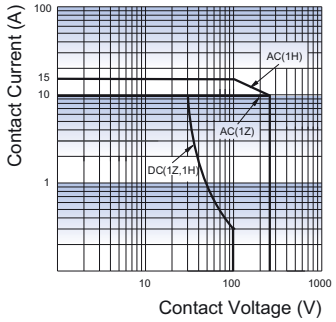
Unit: mm



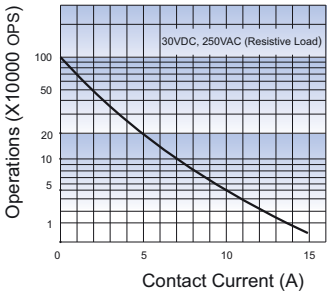
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

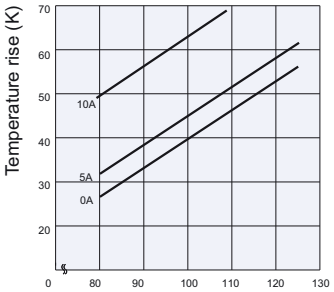


ENDURANCE CURVE



Test conditions:
NO, Flux proofed type,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



(Relay mounting distance should be less than 10mm.)

HF3FF SUBMINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:40025218

File No.:R50148356

CQC
File No.:CQC13002098175
CQC16002140467

Features

- 15A 125VAC、10A 250VAC switching capability
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A	1C	
		NO	NC
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)		
Contact material	$AgSnO_2$, AgCdO		
Contact rating (Res. load)	10A 277VAC 10A 28VDC	10A 277VAC[2)] 10A 28VDC[2)]	5A 250VAC
Max. switching voltage	277VAC / 28VDC		250VAC
Max. switching current	15A	10A	5A
Max. switching power	2770VA / 280W		1250VA
Mechanical endurance	1 x 10^7OPS		
Electrical endurance[3)]	1H type: 1x 10^5OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off) 1Z type: 5 x 10^4OPS (NO: 5A/NC: 5A 250VAC,Resistive load, Room temp., 5s on 5s off)		

Notes: 1) The data shown above are initial values.
2) Applicable when NC is not energized with load.
3) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 10g
Construction		Plastic sealed, Flux proofed

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

COIL

Coil power	5VDC to 24VDC: Approx. 360mW; 48VDC: Approx. 510mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
5	3.80	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.80	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	4500 x (1±10%)
48 [1)]	36.0	4.8	62.4	6400 x (1±10%)

Notes:1) The data shown above are initial values.
2) There are 2 types for 48V--510mW and 360mW. The coil resistance for 510mW type is 4500ohm while for that for 360mW type is 6400ohm. If 360mW type is required, please add a special suffix (068) in the ordering information.
3) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	10A 277VAC 10A 28VDC 15A 125VAC at 70˚C 1/2HP 125VAC ($AgSnO_2$)
	1 Form C	NO:10A 277VAC NO:10A 28VDC NO:10A 120VAC at 70˚C NC:10A 120VAC at 70˚C
VDE (only $AgSnO_2$)	1 Form A	10A 250VAC at 70˚C 12A 125VAC
	1 Form C	NO/NC:5A/5A 250VAC at 70˚C NO:10A 250VAC at 70˚C NO:12A 125VAC

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.
3) For sealed type, the vent-hole cover should be excised.

ORDERING INFORMATION

	HF3FF /	012	-1H	S	T	F	(XXX)
Type							
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	**1H**:1 Form A	**1Z**:1 Form C					
Construction[1) 2)]	**S**: Plastic sealed	**Nil**: Flux proofed					
Contact material	**T**: $AgSnO_2$	**Nil**: AgCdO					
Insutation standard	**F**: Class F	**Nil**: Class F					
Special code[3)]	**XXX:** Customer special requirement		**Nil:** Standard				

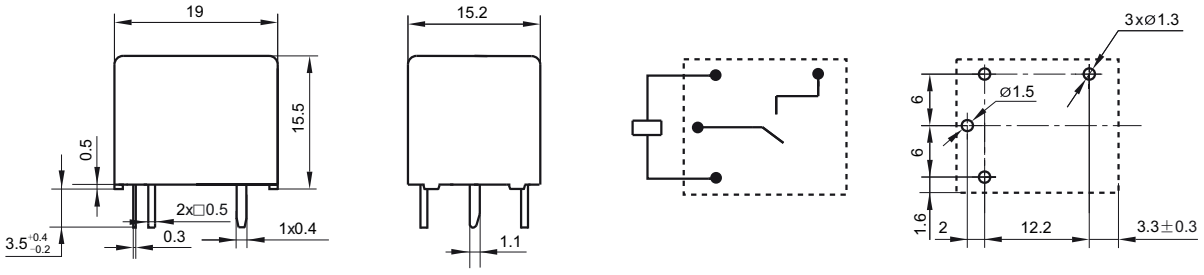
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.
4) Two packing methods available: paper box package, tube package,Standard tube packing length is 328mm. Any special requirement needed, please contact us for more details.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

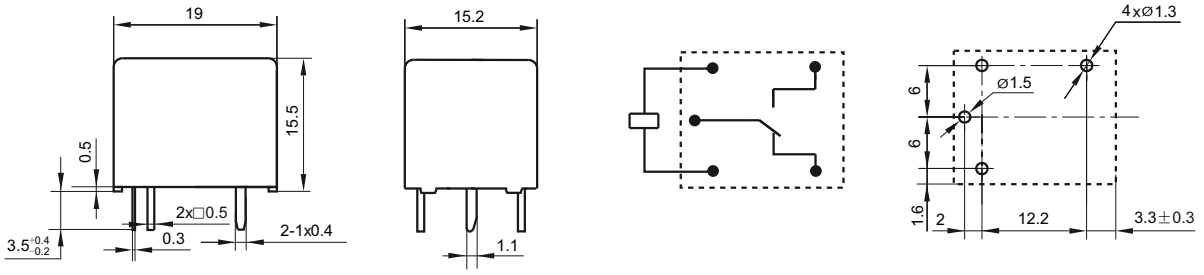
Unit: mm

Outline Dimensions | PCB Layout (Bottom view) | Wiring Diagram (Bottom view)

1 Form A



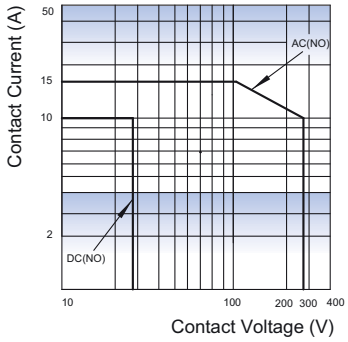
1 Form C



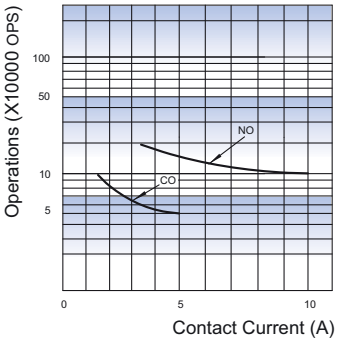
Remark:1)In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2)The additional tin top is max. 1mm.
3)The tolerance without indicating for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

CHARACTERISTIC CURVES

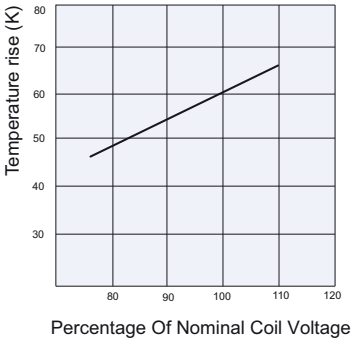
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

NO, Resistive load, 277VAC/28VDC,

Flux proofed, Room temp., 1s on 9s off

CO, Resistive load, 250VAC,

Flux proofed, Room temp., 5s on 5s off.

Notes: For plastic sealed type,the venting-hole should be opened in electrical endurance test.

Testing conditions:

10A at 85˚C.

Mounting distance: 10mm

HF3F-L SUBMINIATURE HIGH POWER LATCHING RELAY

File No.: E134517

File No.:40040757

File No.:CQC15002121475

Features

- Subminiature high power latching relay
- Low coil power
  1 coil latching: approx. 0.4W
  2 coils latching: approx. 0.8W
- 15A switching capability
- 1 Form A and 1 Form C configurations
- Subminiature, standard PCB layout
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$	
Contact rating (Res. load)	10A 277VAC/30VDC	
Max. switching voltage	277VAC / 30VDC	
Max. switching current	15A	10A
Max. switching power	2770VA / 300W	
Mechanical endurance	1 x 10^7 OPS	
Electrical endurance	1HT: 6 x 10^3 OPS (15A 120VAC, Incandescent lamp, at 60˚C, 1s on 59s off) 1 x 10^4 OPS (10A 277VAC, Resistive load, at 60˚C, 1s on 9s off) 2 x 10^4 OPS (12A 277VAC, General use, at 70˚C, 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	750VAC 1min
Set time (at nomi. volt.)		8ms max.
Reset time (at nomi. volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 9g
Construction		Plastic sealed, Flux proofed

Notes: 1) For sealed type, the vent-hole cover should be excised.
2) The data shown above are initial values.

COIL

Coil power	1 coil latching: Approx. 0.4W 2 coils latching: Approx. 0.8W

COIL DATA at 23˚C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max.[1)]	Reset Voltage VDC max.[1)]	Pulse Width (ms) min.	Max. Voltage VDC	Coil Resistance Ω
5	4.0	4.0	100	7.5	62.5x (1±10%)
6	4.8	4.8	100	9	90x (1±10%)
9	7.2	7.2	100	13.5	202.5x (1±10%)
12	9.6	9.6	100	18	360x (1±10%)
24	19.2	19.2	100	36	1440x (1±10%)
48	38.4	38.4	100	72	5760x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max.[1)]	Reset Voltage VDC max.[1)]	Pulse Width (ms) min.	Max. Voltage VDC	Coil Resistance Ω
5	4.0	4.0	100	7.5	31.5+31.5x (1±10%)
6	4.8	4.8	100	9	45+45x (1±10%)
9	7.2	7.2	100	13.5	101.5+101.5x (1±10%)
12	9.6	9.6	100	18	180+180x (1±10%)
24	19.2	19.2	100	36	720+720x (1±10%)
48	38.4	38.4	100	72	2880+2880x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	NO:10A 277/250/125VAC, Resistive at 60˚C NO:12A 277/250/125VAC, General use at 70˚C NO: Standard ballast 5.5A 277/220/120VAC at 60˚C NO: Electronic ballast 5A, 120VAC at 60˚C NO: Electronic ballast 5A, 277VAC at 70˚C* NO: Tungsten (incandescent) 15A 120VAC at 60˚C NO: Tungsten (incandescent) 5A 277VAC at 60˚C NO: 1/6HP 240/120VAC at 85˚C NO: TV-10 125VAC at 70˚C
VDE	NO: 10A 250VAC, Resistive, at 85˚C NO/NC: 5A 250VAC, Resistive, at 85˚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.
3) * These ratings are tested with zero crossing device.

ORDERING INFORMATION

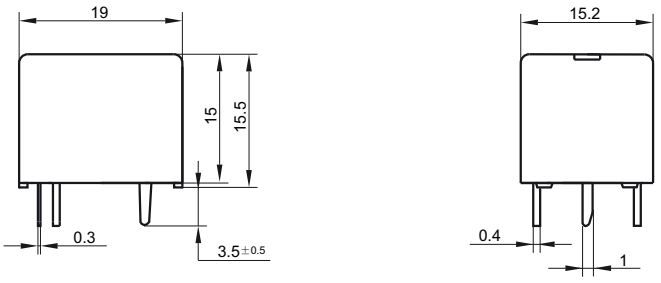
	HF3F-L /	12	-1H	S	L1	T	-R	(XXX)
Type								
Coil voltage	5, 6, 9, 12, 24, 48VDC							
Contact arrangement	**1H**:1 Form A	**1Z**:1 Form C						
Construction[1) 2)]	**S**: Plastic sealed	**Nil**: Flux proofed						
Sort	**L1**: 1 coil latching	**L2**: 2 coils latching						
Contact material	**T**: $AgSnO_2$							
Polarity	**R**: Reverse polarity	**Nil**: Standard polarity						
Special code[3)]	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

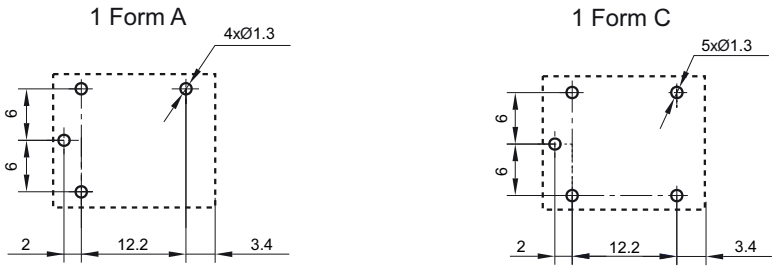
Unit: mm

Outline Dimensions



PCB Layout (Bottom view)

1 coil latching



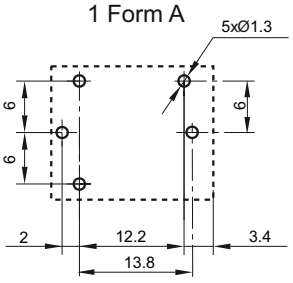
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

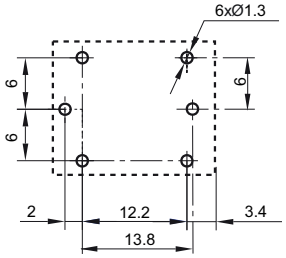
PCB Layout (Bottom view)

2 coils latching

1 Form A



1 Form C



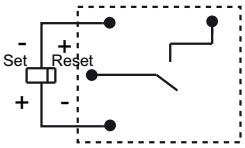
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

Wiring Diagram (Bottom view)

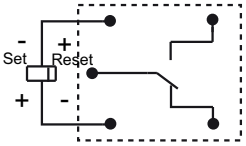
1 coil latching

Standard Polarity

1 Form A

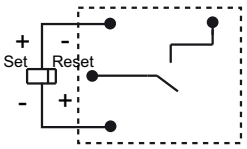


1 Form C

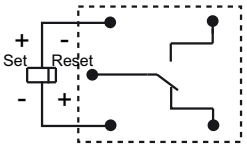


Reverse Polarity

1 Form A



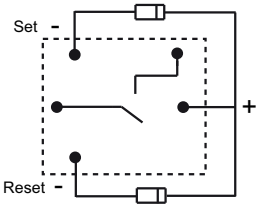
1 Form C



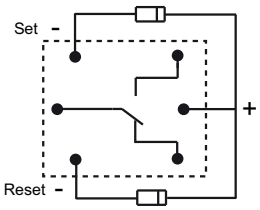
2 coils latching

Standard Polarity

1 Form A

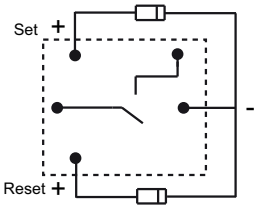


1 Form C

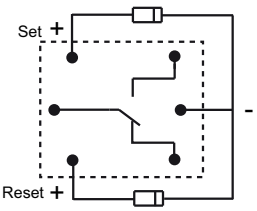


Reverse Polarity

1 Form A



1 Form C



Notice

1. Relay is on the “reset” or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or "reset" status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be more than 100 ms. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

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.

HF3FF-M AUTOMOTIVE RELAY

Features

- 15A switching capability
- Subminiature, standard PCB layout
- 1 Form A & 1 Form C contact arrangement
- Plastic sealed and Flux proofed types available
- RoHS & ELV compliant

Typical Applications

Anti-theft lock, Central door lock

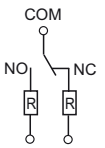
CHARACTERISTICS

Contact arrangement	1A, 1C
Voltage drop (initial) [1]	Typ: 20mV (at 10A) Max.: 250mV (at 10A)
Max. continuous current [2]	10A
Max. switching current [3]	15A
Max. switching voltage	30VDC
Min.contact load	1A 6VDC
Electrical endurance	See "CONTACT DATA"
Mechanical endurance	1×10^7OPS (300OPS/min)
Initial insulation resistance	100MΩ (at 500VDC)
Dielectric strength [4]	Between contacts: 750VAC Between coil & contacts: 1500VAC
Operate time	Typ: 5ms Max.: 10ms (at nomi. vol.)
Release time [5]	Typ: 3ms Max.: 10ms
Ambient temperature	-40˚C to 85˚C
Vibration resistance [6]	10Hz to 55Hz 1.5mm DA
Shock resistance [6]	98m/s^2
Termination	PCB [7]
Construction	Plastic sealed, Flux proofed
Unit weight	Approx.10g

1) Equivalent to the max. initial contact resistance is 100mΩ (at 1A 6VDC).
2) For NO contacts, measured when applying 100% rated votage on coil.
3) At 23˚C, 13.5VDC (100 cycles, resistive load).
4) 1min, leakage current less than 1mA.
5) The value is measured when voltage drops suddenly from nominal voltage to 0VDC and coil is not paralleled with suppression circuit.
6) When energized, opening time of NO contacts shall not exceed 100μs, when non-energized, opening time of NC contacts shall not exceed 100μs, meantime, NO contacts shall not be closed.
7) Since it is an environmental friendly product, please select lead-free solder when welding. The recommended soldering temperature and time is (250±3)˚C , (5±0.3)s.

CONTACT DATA [1]

at 23˚C

Load voltage	Load type		Load current A			On/Off ratio		Electrical endurance OPS	Contact material	Load wiring diagram
			1C		1A	On s	Off s			
			NO	NC	NO					
13.5VDC	Resistive	Make	15	5	15	5	5	1×10^5	HF3FF-M/M1: $AgSnO_2$ HF3FF-M2: AgNi	
		Break	15	5	15	5	5			

1) When the load voltage is at 24VDC or higher, or the applications conditions are different from the table above, please submit the detailed application conditions to Hongfa to get more support.

COIL DATA

at 23˚C

Type	Nominal voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Coil resistance x(1±10%)Ω	Power consumption W	Max. allowable overdrive voltage 1) VDC	
						at 23˚C	at 85˚C
HF3FF-M	9	6.75	0.90	180	0.45	11.7	10.8
	12	9.00	1.20	320	0.45	15.6	14.4
	24	18.00	2.40	1280	0.45	31.2	28.8
HF3FF-M1	9	5.85	0.65	126	0.64	11.3	10.3
	12	7.80	0.90	225	0.64	15.0	13.8
	24	15.6	1.80	900	0.64	30.0	27.6
HF3FF-M2	9	5.15	0.60	100	0.80	10.8	9.9
	12	6.80	0.80	180	0.80	14.4	13.2
	24	13.70	1.60	720	0.80	28.8	26.4

1) Max. allowable overdrive voltage is stated with no load applied.

ORDERING INFORMATION

HF3FF-M / 012 -1H S (XXX)

Type
HF3FF-M: 0.45W
HF3FF-M1: 0.64W
HF3FF-M2: 0.80W

Coil voltage **009**: 9VDC **012**: 12VDC **024**: 24VDC

Contact arrangement **1H**: 1 Form A **1Z**: 1 Form C

Construction **S**: Plastic sealed[1] **Nil**: Flux proofed

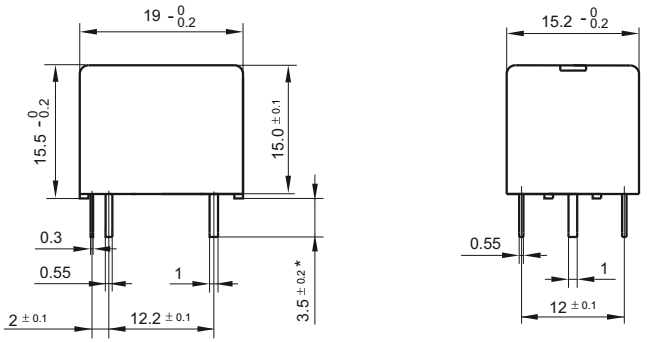
Special code[2] **XXX:** Customer special requirement **Nil:** Standard

Notes: 1) If washing or surface treatment is required after the relay is assembled on PCB, please provide with the conditions in details for our confirmation or our recommendation with suitable products.
2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions (1 Form A / 1 Form C)

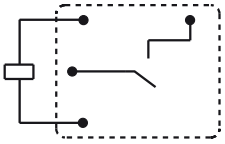


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

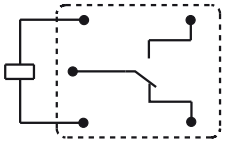
Unit: mm

Wiring Diagram (Bottom view)

1 Form A

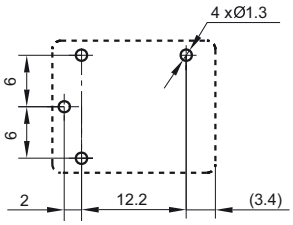


1 Form C

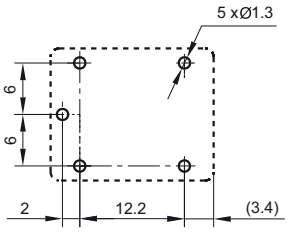


PCB Layout (Bottom view)

1 Form A



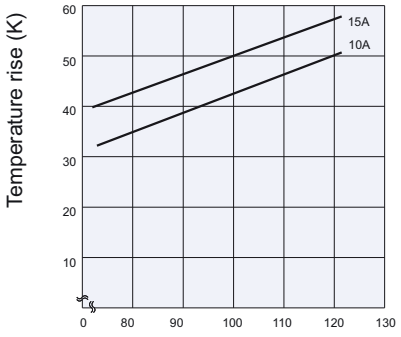
1 Form C



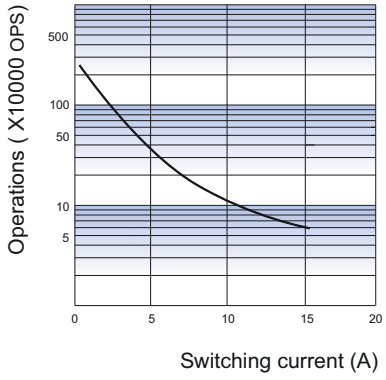
Remark: 1) * The additional tin top is max. 1mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

COIL TEMPERATURE RISE



ENDURANCE CURVE



HF7FF SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

CQC
File No.:CQC09002028260

Features

- 10A switching capability
- 1 Form A and 1 Form C configurations
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgCe
Contact rating (Res. load)	5A 250VAC/30VDC 10A 250VAC/28VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2400VA / 280W
Mechanical endurance	1 x 10^7 OPS
Electrical endurance	1HT, 1ZT type: 1 x 10^4OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off) 1H, 1Z type: 1 x 10^4OPS (5A 250VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 9.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B, Class A.

COIL

Coil power	5VDC to 24VDC: Approx. 360mW 48VDC: Approx. 510mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.40	0.3	3.6	25 x (1±10%)
5	4.00	0.5	6.0	70 x (1±10%)
6	4.80	0.6	7.2	100 x (1±10%)
9	7.20	0.9	10.8	225 x (1±10%)
12	9.60	1.2	14.4	400 x (1±10%)
18	14.4	1.8	21.6	900 x (1±10%)
24	19.2	2.4	28.8	1600 x (1±10%)
48	38.4	4.8	57.6	4500 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL (AgCe)	1 Form C	NO: 10A 277VAC NO/NC: 5A 277VAC NO: 5A 30VDC NC: 2FLA 4LRA 120VAC
	1 Form A	10A 277VAC 6A 30VDC
UL/CUL ($AgSnO_2$)	1 Form C	12A 277VAC 12A 28VDC
	1 Form A	12A 277VAC 12A 28VDC

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

	HF7FF /	012	-1H	T	S	F	(XXX)
Type							
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	**1H:** 1 Form A	**1Z:** 1 Form C					
Contact material	**T:** $AgSnO_2$ (10A)	**Nil:** AgCe (5A)					
Construction [1]	**S:** Plastic sealed	**Nil:** Flux proofed					
Insulation standard	**F:** Class F	**B:** Class B	**Nil:** Class A				
Special code[4]	**XXX:** Customer special requirement	**Nil:** Standard					

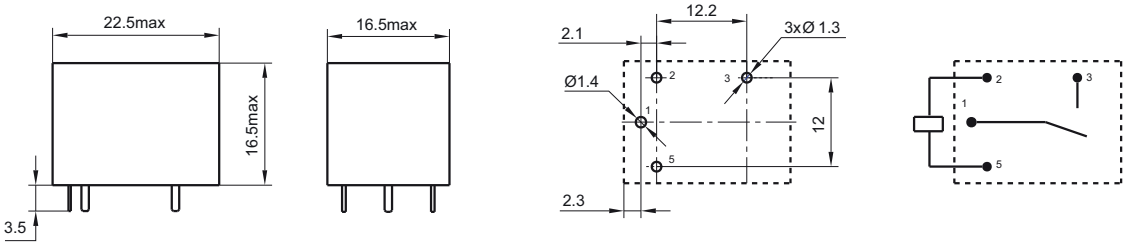
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications.
If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) If the application belongs to inductive load, $AgSnO_2In_2O_3$ contact material is recommended. Please add a special suffix (325) to stand for this special contact material in the ordering information.
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

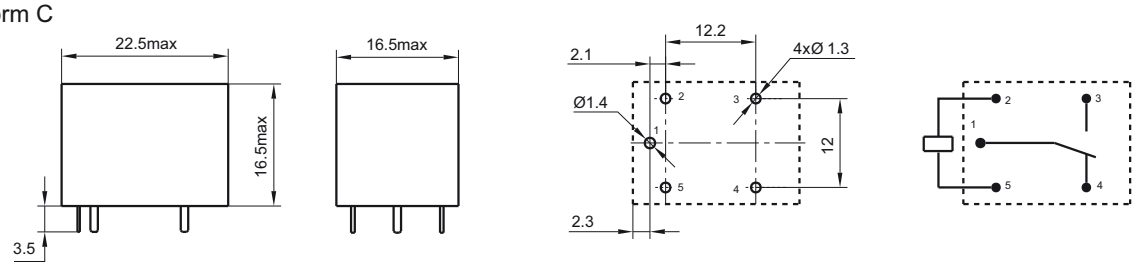
Unit: mm

Outline Dimensions | PCB Layout (Bottom view) | Wiring Diagram (Bottom view)

1 Form A



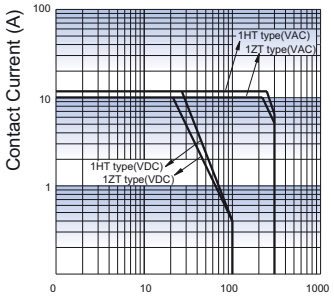
1 Form C



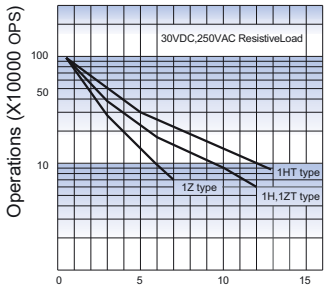
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

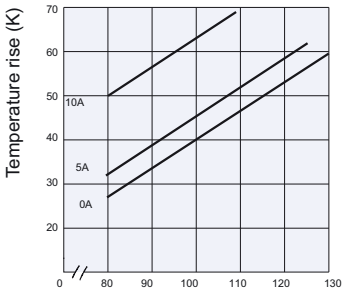


ENDURANCE CURVE



Test conditions:
NO, Resistive load, Flux proofed,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



HF7FD SUBMINIATURE HIGH POWER RELAY

File No.:E134517

File No.: 40008374

File No.:CQC16002153649

Features

- 16A switching capability
- TV-8 load capability
- 2kV dielectric strength (between coil and contacts)
- Ambient temperature meets 105°C
- Product in accordance to IEC 60335-1 available
- Double pins type available
- 1 Form A and 1 Form C configurations
- Plastic sealed and flux proofed types available
- UL insulation system:Class F

CONTACT DATA

Contact arrangement	1H		1Z
Contact resistance[1)]	⩽100mΩ (1A 24VDC)		
Contact material	$AgSnO_2$		
Contact rating (Res.load)	16A 250VAC 12A 250VAC 10A 250VAC		NO: 16A 250VAC 12A 250VAC 7A 250VAC/28VDC NC: 7A 250VAC/28VDC
Max. switching voltage	250VAC / 28VDC		
Max. switching current	16A		16A
Max. switching power	4000VA / 280W		4000VA /280W
Mechanical endurance	1×10^7OPS		
Electrical endurance (See approval reports for more details)	HF7FD	1H	85°C 16A 250VAC 5×10^4OPS Resistive load, 1s on 9s off 85°C 12A 250VAC 1×10^5OPS Resistive load, 1s on 9s off
		1Z	NO:85°C 16A 250VAC 5×10^4OPS Resistive load, 1s on 9s off 85°C 12A 250VAC 1×10^5OPS Resistive load, 1s on 9s off NC:85°C 7A 277VAC 5×10^4OPS Resistive load, 5s on 5s off 85°C 10A 250VAC 1×10^5OPS Resistive load, 1s on 9s off
	HF7FD-T	1H	105°C 10A 250VAC 1×10^5OPS Resistive load, 1s on 9s off 85°C 16A 250VAC 5×10^4OPS Resistive load, 1s on 9s off
		1Z	NO:105°C 10A 250VAC 1×10^5OPS Resistive load, 1s on 9s off 85°C 16A 250VAC 5×10^4OPS Resistive load, 1s on 9s off

Notes: 1) The data shown above are initial values.
2) Open the air permeability hole when testing plastic encapsulated products.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	750VAC 1min
Operate time (at nomi. volt.)		10ms max.
Release time (at nomi. volt.)		5ms max.
Humidity		5% to 85% RH
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Ambient temperature		HF7FD: -40°C to 85°C HF7FD-T: -40°C to 105°C
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 9.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 360mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	⩽2.25	⩾0.3	3.9	25 x (1±10%)
5	⩽3.75	⩾0.5	6.5	70 x (1±10%)
6	⩽4.50	⩾0.6	7.8	100 x (1±10%)
9	⩽6.75	⩾0.9	11.7	225 x (1±10%)
12	⩽9.00	⩾1.2	15.6	400 x (1±10%)
18	⩽13.5	⩾1.8	23.4	900 x (1±10%)
24	⩽18.0	⩾2.4	31.2	1600 x (1±15%)
48	⩽36.0	⩾4.8	62.4	6400 x (1±15%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	HF7FD	1 Form A	16A 250VAC(85°C) 12A 250VAC(85°C,Double pin) 12A 250VAC(85°C,Single pin) 12A 125VAC(85°C) 10A 277VAC/250VAC(85°C) 10A 28VDC(85°C)
		1 Form C	NO:16A 250VAC (85°C) 12A 250VAC (85°C) 12A 125VAC (85°C) 10A 277VAC/250VAC (85°C) 10A 28VDC(85°C) 7A 277VAC (85°C) 7A 28VDC (85°C) NC:12A 125VAC (85°C) 10A 250VAC (85°C) 7A 277VAC (85°C) 7A 28VDC (85°C)
	HF7FD-T	1 Form A	16A 250VAC (85°C) 10A 250VAC (105°C) 8A 250VAC(105°C) 80W 120VAC Tungsten(105°C) 1/2HP 125VAC(40°C) 1/2HP 250VAC(40°C)
		1 Form C	NO:16A 250VAC(85°C) 10A 250VAC(105°C) 8A 250VAC(105°C) 80W 120VAC Tungsten(105°C) 1/2HP 125VAC(40°C) 1/2HP 250VAC(40°C) NC:12A 125VAC(85°C) 10A 277VAC/250VAC(85°C) 7A 277VAC(85°C)
VDE	HF7FD	1 Form A	10A 250VAC(85°C) 12A 250VAC(70°C)
		1 Form C	CO:10A 250VAC(85°C) 7A 250VAC(85°C)
	HF7FD-T	1 Form C	12A 250VAC(105°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

HF7FD / 012 -1H P S T F (XXX)

Type	**HF7FD:** 85°C, **HF7FD-T:** 105°C	
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC	
Contact arrangement	**1H**: 1 Form A	**1Z**: 1 Form C
Pin version	**P**: Double pins type	**Nil**: Single pin type
Construction[1)]	**S**: Plastic sealed	**Nil**: Flux proofed
Contact material	**T**: $AgSnO_2$	
Insutation standard	**F**: Class F	**Nil**: Class B
Special code[1)]	**XXX:** Customer special requirement	**Nil:** Standard

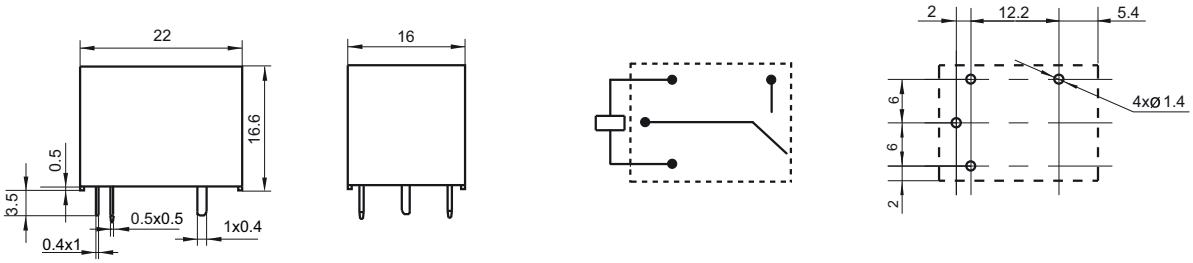
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) If plastic sealed type is selected for cleaning purpose, the vent-hole cover should be excised after cleaning.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

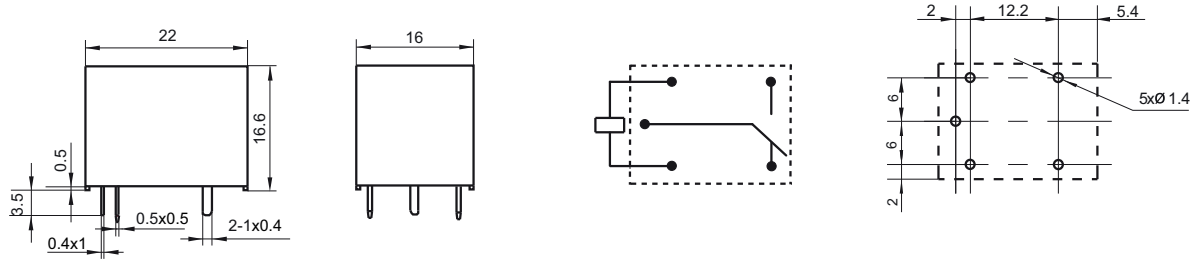
Unit: mm

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom View)

1 Form A (Single pin type)



1 Form C (Single pin type)

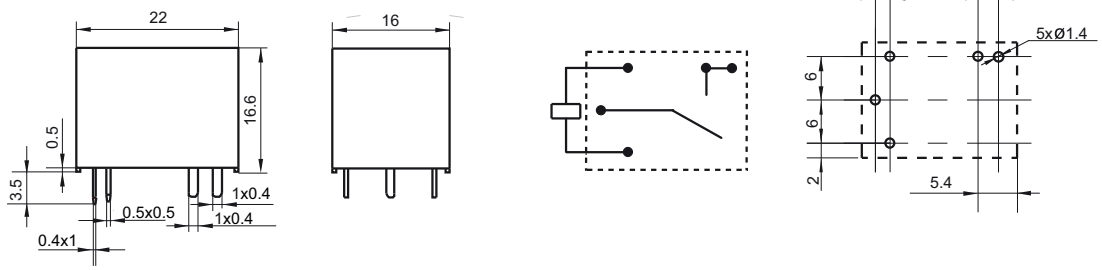


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

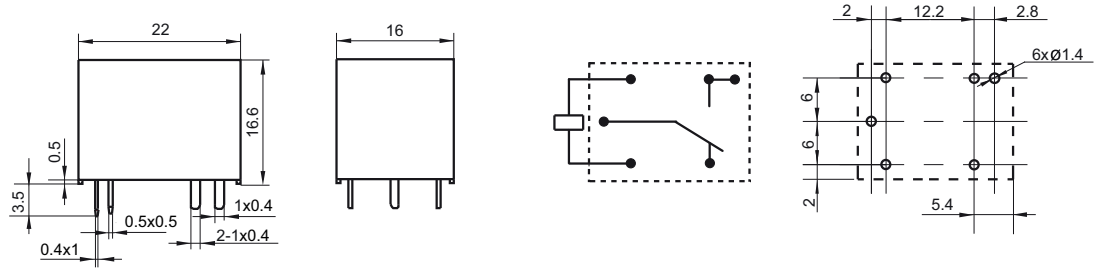
Unit: mm

Outline Dimensions | Wiring Diagram (Bottom View) | PCB Layout (Bottom view)

1 Form A (Double pins type)



1 Form C (Double pins type)



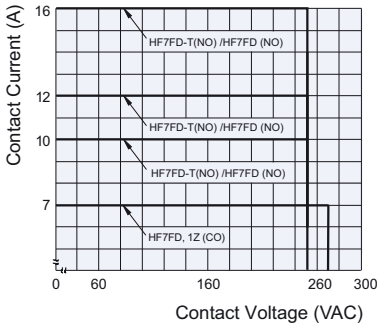
Remark:1) * The additional tin top is max. 1mm.

2) 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.

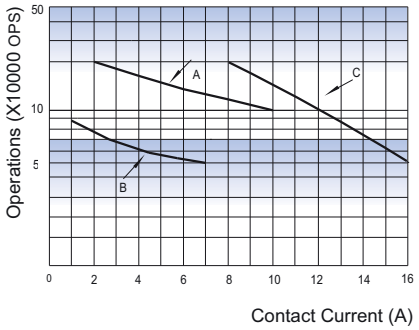
3) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



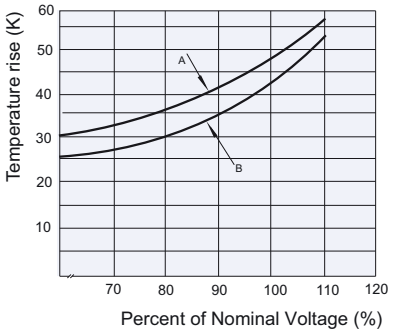
ENDURANCE CURVE



Test conditions:

Curve A:NO, Resistive load, 85˚C,
flux proofed, 10A 277VAC, 1s on 9s off
Curve B: CO, Resistive load, 85˚C,
flux proofed, 7A 277VAC, 5s on 5s off
Curve C: NO, Resistive load, Room temp.,
flux proofed, 16A 250VAC, 1s on 9s off

COIL TEMPERATURE RISE



Test conditions::

A:16A at 85˚C.
B:10A at 85˚C.
Mounting distance: 25mm

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.

HF21FF SUBMINIATURE HIGH POWER RELAY

c UL us
File No.:E133481

Features

- 15A switching capability
- 1 Form A, 1 Form B and 1 Form C configurations
- Standard PCB layout
- Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A, 1B	1C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$	
Contact rating	15A 120VAC	10A 120VAC/24VDC
Max. switching voltage	120VAC / 30VDC	
Max. switching current	15A	10A
Max. switching power	1800VA / 240W	
Mechanical endurance	1×10^7 OPS	
Electrical endurance	1H type: 1×10^5OPS (15A 120VAC, Resistive load, Room temp., 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	1500VAC 1min
	Between open contacts	750VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Operation temperature range		-40°C to 70°C
Termination		PCB
Unit weight		Approx. 13g
Construction		Plastic sealed, Dust protected

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	5VDC to 24VDC: Approx. 360mW; 48VDC: Approx. 530mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±15%)
48	36.0	4.8	62.4	4500 x (1±15%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form C	10A 120VAC
	1 Form A	15A 120VAC TV-5 120VAC
	1 Form B	15A 120VAC 1800VA at 25°C, Ballast 6.5A 277VAC 1800VA at 25°C, Ballast 8.3A 120VAC 1000VA at 90°C, Ballast 3.6A 277VAC 1000VA at 90°C, Ballast

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

	HF21FF /	012	-1H	S	T	F	(XXX)
Type							
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC						
Contact arrangement	**1H**: 1 Form A **1D**: 1 Form B **1Z**: 1 Form C						
Construction [1]	**S**: Plastic sealed **Nil**: Dust protected						
Contact material	**T**: $AgSnO_2$						
Insulation standard	**F**: Class F **Nil**: Class B						
Special code[3]	**XXX:** Customer special requirement **Nil:** Standard						

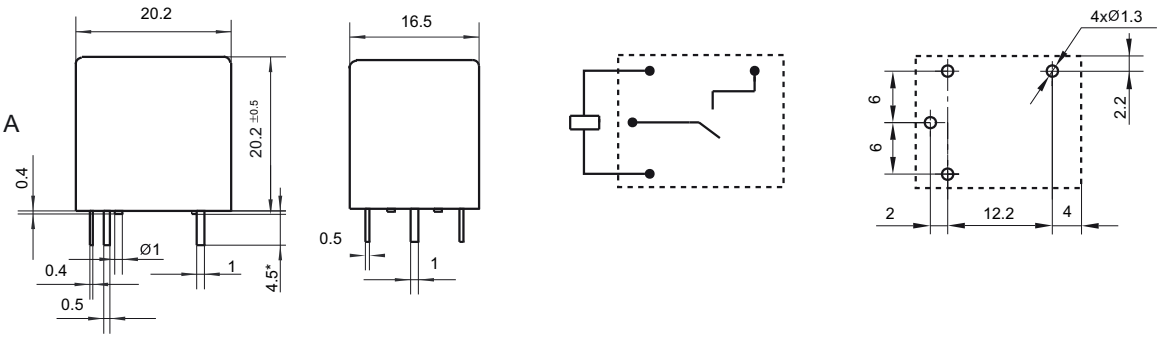
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, dust protected type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

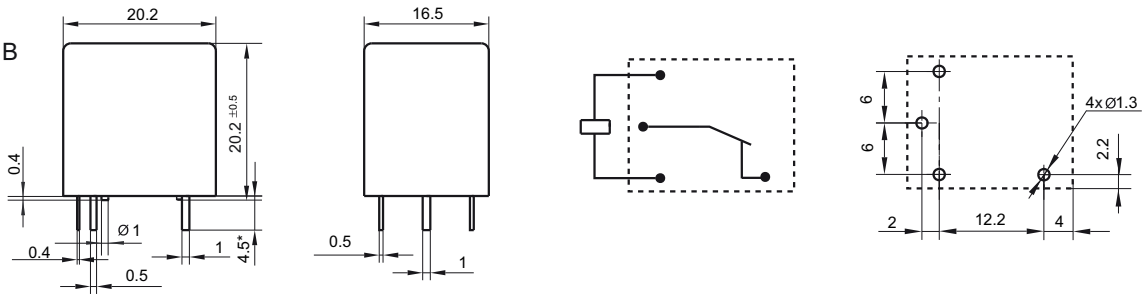
Unit: mm

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

1 Form A



1 Form B

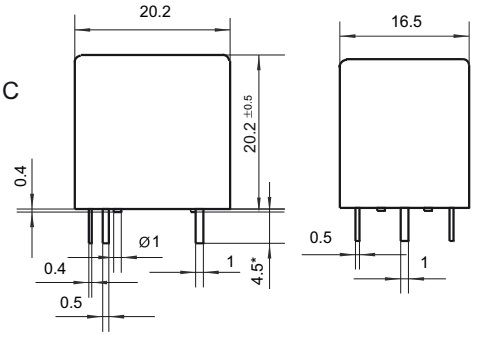


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

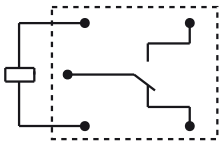
Outline Dimensions

1 Form C



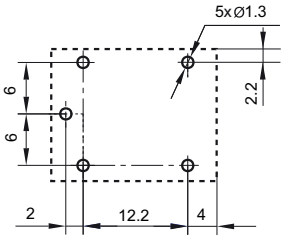
Wiring Diagram

(Bottom view)



PCB Layout

(Bottom view)



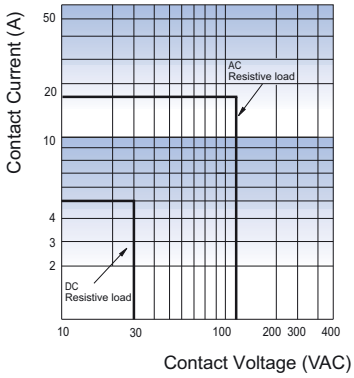
Remark:1) * The additional tin top is max. 1mm.

2) 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.

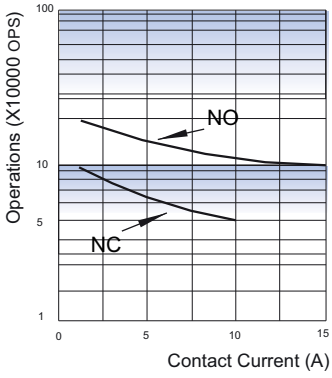
3) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



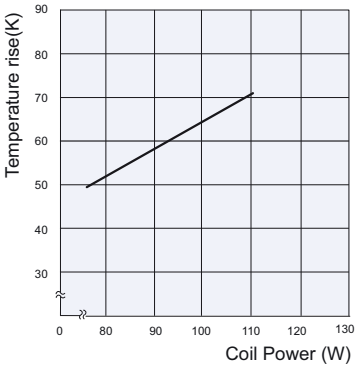
ENDURANCE CURVE



Test conditions:

NO: Resistive load, Room temp.,
flux proofed, 15A 120VAC, 1s on 9s off
NC: Resistive load, Room temp.,
flux proofed, 10A 120VAC, 1s on 9s off

COIL TEMPERATURE RISE



Testing conditions: 10A at 70°C.
Mounting distance: 25mm

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.

HF152F SUBMINIATURE HIGH POWER RELAY

c UL us
File No.: E134517

VDE
File No.: 40017837

CQC
File No.: CQC09002034520

Features

- 20A switching capability
- TV-8 125VAC
- Surge voltage up to 6kV (between coil and contacts)
- Thermal class F: standard type (at 85˚C)
- Ambient temperature meets 105˚C
- Product in accordance to IEC 60335-1 available
- 1 Form C and 1 Form A configurations available
- Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance 1)	100mΩ max.(at 1A 24VDC)	
Contact material	$AgSnO_2$, AgNi	
Contact rating (Res. load)	20A 125VAC 17A 277VAC 7A 400VAC	16A 250VAC 7A 400VAC (NO)
Max. switching voltage	400VAC	400VAC (NO)
Max. switching current	20A	16A
Max. switching power	4700VA	4000VA
Mechanical endurance	1×10^7 OPS	
Electrical endurance	1×10^5 OPS (16A 250VAC, Resistive load, at 85˚C, 1s on 9s off) 5×10^4 OPS (NO, 16A 250VAC, Resistive load, Room temp., 1s on 9s off) 5×10^4 OPS (NC, 10A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC* 2)	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		100MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage(between coil & contacts)		6kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		HF152F: -40˚C to 85˚C HF152F-T: -40˚C to 105˚C
Termination		PCB
Unit weight		Approx.14g
Construction		Plastic sealed, Dust protected

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F

COIL

Coil power	Approx. 360mW

SAFETY APPROVAL RATINGS

UL/CUL	AgNi		20A 125VAC NO/NC: 17A/15A 277VAC
	$AgSnO_2$		20A 125VAC TV-8 125VAC NO: 16A 250VAC at 105˚C NO: 1HP 250VAC
VDE	$AgSnO_2$	1 Form A	16A 250VAC 7A 400VAC
		1 Form C	NO: 16A 250VAC NC: 7A 250VAC

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

	HF152F	/	012	-1Z	P	S	T	Q	(XXX)
Type	HF152F: 85°C, HF152F-T: 105°C								
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC								
Contact arrangement	**1H**: 1 Form A		**1Z**: 1 Form C						
Pin version	**P**: Double pins		**Nil**: Single pin						
Construction [1]	**S**: Plastic sealed		**Nil**: Dust protected						
Contact material	**T**: $AgSnO_2$		**Nil**: AgNi						
Contact capacity	**Q:** High capacity type 16A 250VAC, at 105°C (Only for HF152F-T)							**Nil:** Standard type	
Special code[4]	**XXX:** Customer special requirement				**Nil:** Standard				

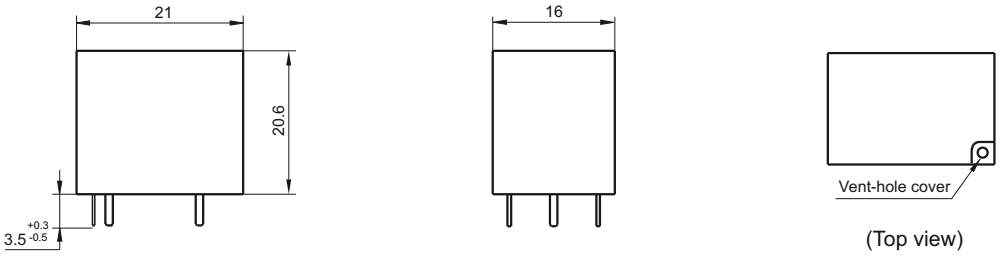
Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, dust protected type is preferentially recommended.
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) If plastic sealed type is selected for cleaning purpose, the vent-hole cover should be excised after cleaning.
4) The customer special requirement express as special code after evaluating by Hongfa.
5) HF152F-T is only available for $AgSnO_2$ contact.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

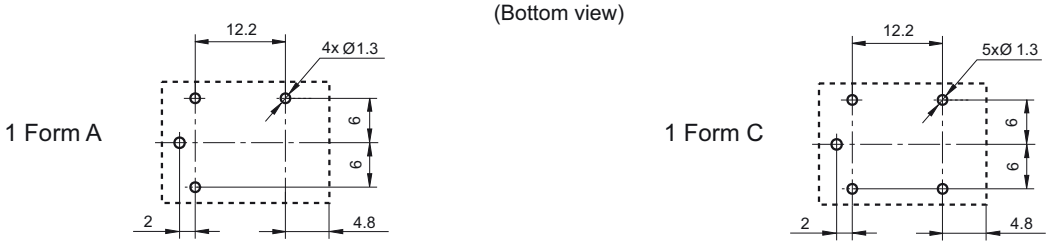
Single pin version

Outline Dimensions



Wiring Diagram
(Bottom view)

PCB Layout
(Bottom view)

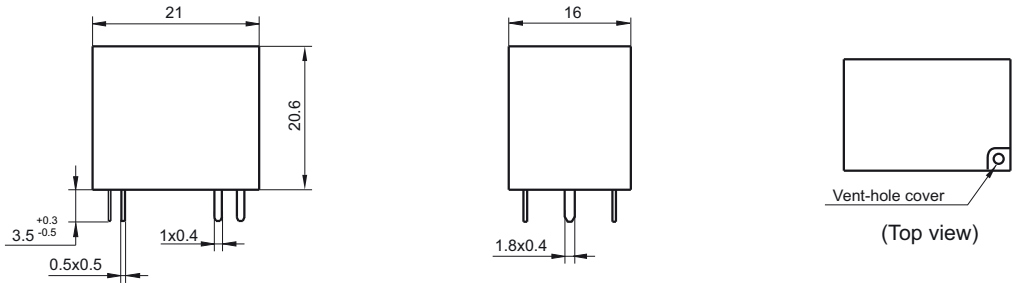


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Double pin version

Outline Dimensions



Wiring Diagram

(Bottom view)

PCB Layout

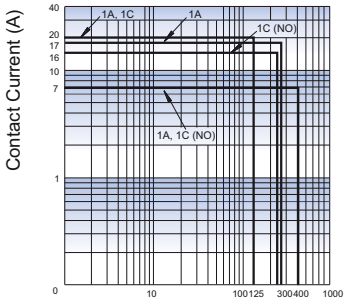
(Bottom view)

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.

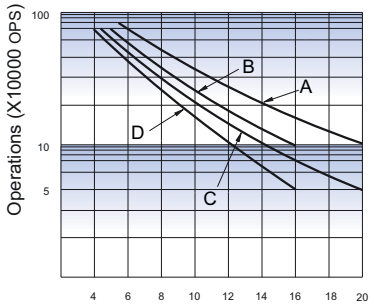
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

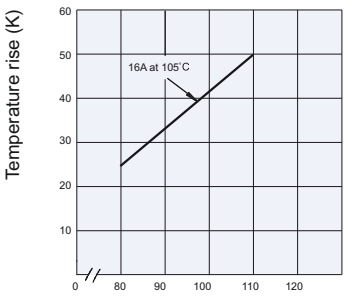
MAX. SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Notes:

1. Curve A:1H type, Curve B:1H type, Curve C:1Z type, Curve D:1Z type
2. Test conditions:
   Curve A: 20A 125VAC, Resistive load, Room temp., 1s on 9s off
   Curve B: 16A 250VAC, Resistive load, at 85°C, 1s on 9s off
   Curve C: NO, 20A 125VAC, Resistive load, Room temp., 1s on 9s off
   Curve D: NO, 16A 250VAC, Resistive load, at 85°C, 1s on 9s off

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.

HF152FD SUBMINIATURE HIGH POWER RELAY

c UL us
File No.: E134517

VDE
File No.: 40031203

CQC
File No.: CQC16002150629

Features

- 20A switching capability
- Ambient temperature meets 105°C
- High temperature load: 17A 277VAC at 105°C (Long endurance type)
- 1 Form C and 1 Form A configurations available
- Double pins and Single pin terminal available, effectively reduce terminal temperature rise
- Product in accordance to EN 60335-1 available

CONTACT DATA

Contact arrangement	1A	1C
Contact resistance[1)]	100mΩ max. (at 1A 24VDC)	
Contact material	$AgSnO_2$, AgNi	
Contact rating (Res. load)	20A 125VAC 17A 277VAC(Q type) 7A 400VAC	NO:17A277VAC(Q type) NC:10A 277VAC
Max. switching voltage	400VAC	400VAC (NO)
Max. switching current	20A	17A
Max. switching power	4700VA	4700VA
Mechanical endurance	1×10^7 OPS	
Electrical endurance	1H type: 5×10^4 OPS (16A 277VAC, Resistive load, AgNi, at 85℃, 1s on 9s off) 1HT type: 1×10^5 OPS (12A 277VAC, Resistive load, $AgSO_2$, at 105℃, 1s on 9s off)	

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	$98m/s^2$
	Destructive	$980m/s^2$
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 105°C
Termination		PCB
Unit weight		Approx.14g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 360mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC*[2)]	Coil Resistance Ω
3	2.25	0.3	3.9	25 x (1±10%)
5	3.75	0.5	6.5	70 x (1±10%)
6	4.50	0.6	7.8	100 x (1±10%)
9	6.75	0.9	11.7	225 x (1±10%)
12	9.00	1.2	15.6	400 x (1±10%)
18	13.5	1.8	23.4	900 x (1±10%)
24	18.0	2.4	31.2	1600 x (1±10%)
48	36.0	4.8	62.4	6400 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/ CUL	NO, Standard Type	AgNi $AgSnO_2$	20A 125VAC Resistive at 40°C
		AgNi	17A 125VAC Resistive at 85°C 16A 277VAC Resistive at 85°C 10A 277VAC Resistive at 105°C
		$AgSnO_2$	12A 277VAC General Use at 105°C 1/2HP 125VAC at 40°C 1HP 250VAC at 40°C TV-8 125VAC at 40°C
	NO, Q Type	AgNi	17A 277VAC Resistive at 105°C 10A 277VAC Resistive at 105°C
	NC	AgNi $AgSnO_2$	20A 125VAC Resistive at 40°C 10A 277VAC Resistive at 85°C
		AgNi	7A 277VAC Resistive at 105°C
VDE	1 Form A, Standard Type	AgNi	16A 250VAC Resistive at 85°C 7A 400VAC Resistive at 105°C
		$AgSnO_2$	8A 250VAC COSØ =0.4 at 85°C 10(4)A 250VAC Resistive at 105°C (EN60730-1)
	1 Form A, Q Type	AgNi	17A 250VAC at 23°C 2h/ at 105°C 2h 10A 250VAC at 23°C 2h/ at 105°C 2h
	1 Form C	AgNi	NO/NC:10A/7A 250VAC at 105°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

	HF152FD /	12	-1Z	P	S	T	F	Q	(XXX)
Type									
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48VDC								
Contact arrangement	**1H**: 1 Form A	**1Z**: 1 Form C							
Pin version	**P**: Double pins	**Nil**: Single pin							
Construction [1)]	**S**: Plastic sealed	**Nil**: Flux proofed							
Contact material	**T**: $AgSnO_2$	**Nil**: AgNi							
Insulation standard	**F**: Class F	**Nil**: Class B							
Contact endurance	**Q**: Long endurance type (Only for AgNi type)	**Nil**: Standard type							
Special code[4)]	**XXX:** Customer special requirement	**Nil:** Standard							

Notes: 1) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended.

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) If plastic sealed type is selected for cleaning purpose, the vent-hole cover should be excised after cleaning.

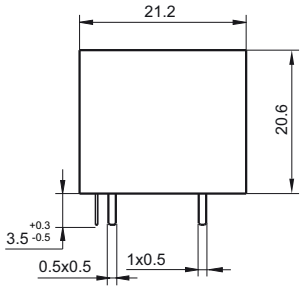
4) The customer special requirement express as special code after evaluating by Hongfa.

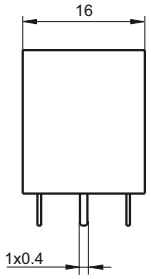
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

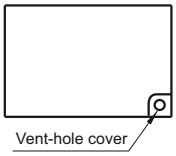
Unit: mm

Single pin version

Outline Dimensions





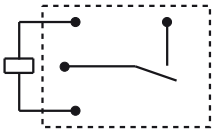


(Top view)

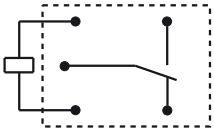
Wiring Diagram

(Bottom view)

1 Form A



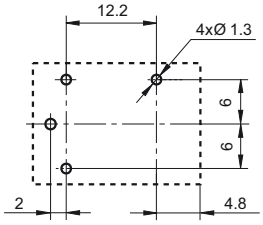
1 Form C



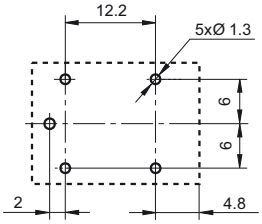
PCB Layout

(Bottom view)

1 Form A



1 Form C

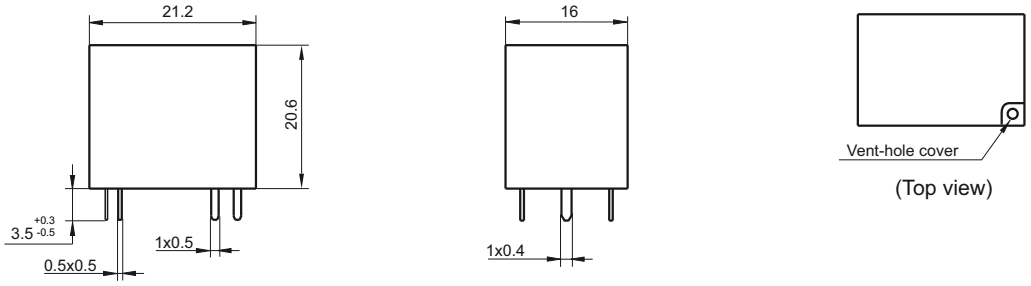


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Double pin version

Outline Dimensions



Wiring Diagram

(Bottom view)

PCB Layout

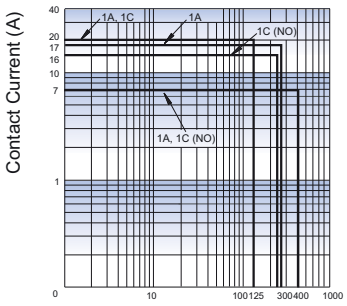
(Bottom view)

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.

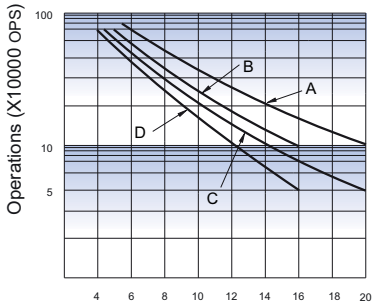
CHARACTERISTIC CURVES

MAX. SWITCHING POWER



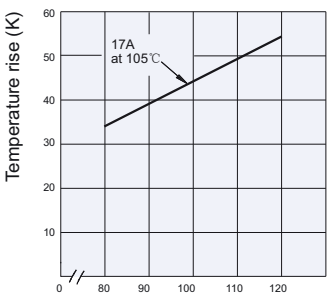
Contact Voltage (V)

ENDURANCE CURVE



Contact Current (A)

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Notes:

1. Curve A:1H type, Curve B:1H type, Curve C:1Z type, Curve D:1Z type
2. Test conditions:
   Curve A: 20A 125VAC, Resistive load, Room temp., 1s on 9s off
   Curve B: 16A 250VAC, Resistive load, at 85℃, 1s on 9s off
   Curve C: NO, 20A 125VAC, Resistive load, Room temp., 1s on 9s off
   Curve D: NO, 16A 250VAC, Resistive load, at 85℃, 1s on 9s off

Disclaimer

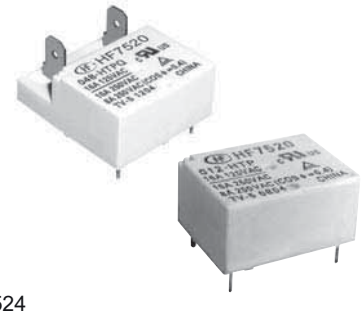
The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the 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.

HF7520 SUBMINIATURE POWER RELAY

c UL us
File No.: E133481

File No.: R50351269

File No.: CQC09002034524



Features

- High rating: 16A,
- TV-5 load capability
- High sensitive: 200mW
- Low height, flat construction
- PCB & QC layouts available
- Plastic sealed and flux proofed types (with vent-hole cover) available
- UL insulation system:Class F
- Product in accordance to EN 60335-1 available

CONTACT DATA

Arrangement	1C	1A
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	See ordering info.	
Contact rating (Res. load)	NO: 10A 125/250VAC NC: 6A 125/250VAC	Standard type: TV-5 10A 30VDC 10A 125/250VAC
		High capacity type: TV-5 16A 30VDC 16A 125/250VAC 8A 250VAC(COSØ=0.4)
Max.switching voltage	250VAC	250VAC/30VDC
Max.switching current	NO:10A NC: 6A	16A
Max.switching power	NO: 2500VA NC: 1500VA	4000VA/480W
Mechanical endurance	1 x 10^7OPS	
Electrical endurance	HP type: 5 x 10^4OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off) H type: 5 x 10^4OPS (10A 250VAC, Resistive load, Room temp., 1s on 9s off) Z type: 5 x 10^4OPS (NO, 10A 250VAC, Resistive load, Room temp., 1s on 9s off) Z type: 5 x 10^4OPS (NC, 6A 250VAC, Resistive load, Room temp., 1s on 9s off)	

Notes:1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

COIL

Coil power	1 Form A: Approx. 200mW; 1 Form C: Approx. 400mW

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1 min
	Between open contacts	1000VAC 1 min
Operate time (at rated.volt)		15ms max.
Release time (at rated.volt)		5ms max.
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient oprating temperature		-40°C to 105°C
Termination		1C: PCB 1A: PCB & QC
Unit weight		PCB: Approx.9g QC: Approx.10.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	TV-5 125VAC 16A 125VAC at 85°C 10A 250VAC at 85°C 16A 30VDC at 85°C 0.3A 110VDC at 85°C 13A 125VAC at 105°C 10A 250VAC at 105°C
	1 Form C	NO: 10A 250VAC NC: 6A 250VAC
TÜV	1 Form A	16A 250VAC 10A 30VDC 8A 250VAC (COSØ=0.4)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23˚C

1 Form C type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC*[2)]	Coil Resistance Ω
5	4.0	0.5	6.5	62.5 x (1±10%)
6	4.8	0.6	7.8	90 x (1±10%)
9	7.2	0.9	11.7	202.5 x (1±10%)
12	9.6	1.2	15.6	360 x (1±10%)
18	14.4	1.8	23.4	810 x (1±10%)
24	19.2	2.4	31.2	1440 x (1±10%)
48	38.4	4.8	62.4	5760 x (1±10%)

1 Form A type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC*[2)]	Coil Resistance Ω
5	4.0	0.5	6.5	125 x (1±10%)
6	4.8	0.6	7.8	180 x (1±10%)
9	7.2	0.9	11.7	405 x (1±10%)
12	9.6	1.2	15.6	720 x (1±10%)
18	14.4	1.8	23.4	1620 x (1±10%)
24	19.2	2.4	31.2	2880 x (1±10%)
48	38.4	4.8	62.4	11520 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF7520 / 012 -H S T P Q (XXX)

Type	
Coil voltage	5, 6, 9,12, 18, 24, 48VDC
Contact arrangement	**H:** 1 Form A **Z:** 1 Form C
Construction [1)]	**S:** Plastic sealed **Nil:** Flux proofed
Contact material	**T:** $AgSnO_2$ **Nil:** AgCdO (Only for 1 Form A) AgNi (Only for 1 Form C)
Contact capacity	**P:** High Capacity type (Only for 1 Form A) **Nil:** Standard type
Terminal type	**Q:** QC (Only for 1 Form A and high capacity type) **Nil:** PCB
Special code[4)]	**XXX:** Customer special requirement **Nil:** Standard

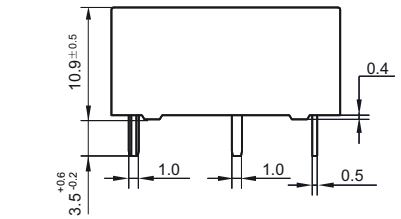
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) When the ambient temperature reaches 105˚C degree or more, please select flux proofed and high capacity type. Besides, please indicate the exact ambient temperature when ordering.
4) The customer special requirement express as special code after evaluating by Hongfa.

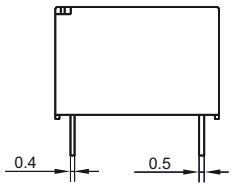
OUTLINE DIMENSIONS , WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

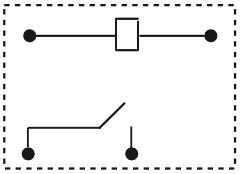
1 Form A (PCB)

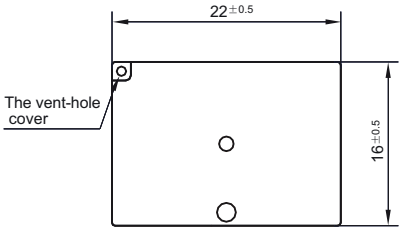
Outline Dimensions



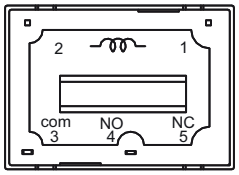


Wiring Diagram
(Bottom View)



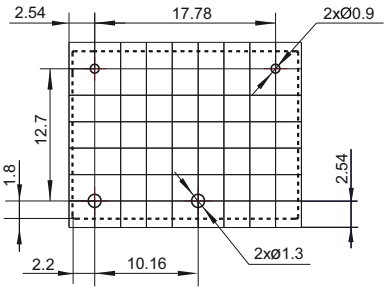


(Top view)



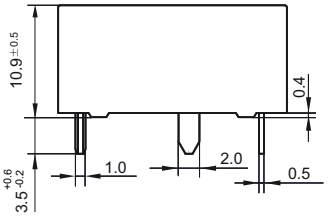
(Bottom View)

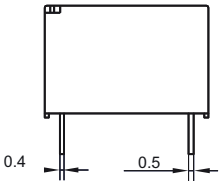
PCB Layout
(Bottom view)



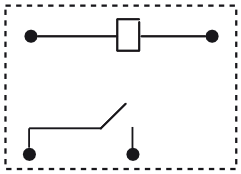
1 Form A (Wide terminal)

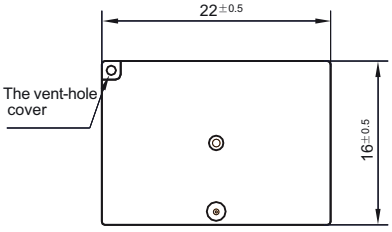
Outline Dimensions



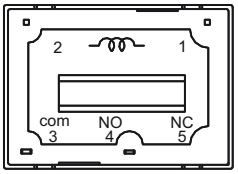


Wiring Diagram



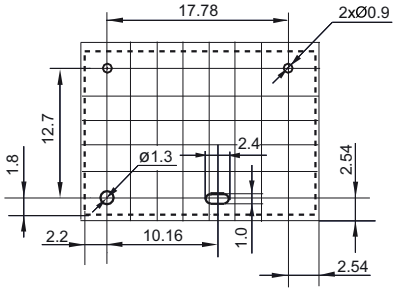


(Top view)



(Bottom View)

PCB Layout
(Bottom view)

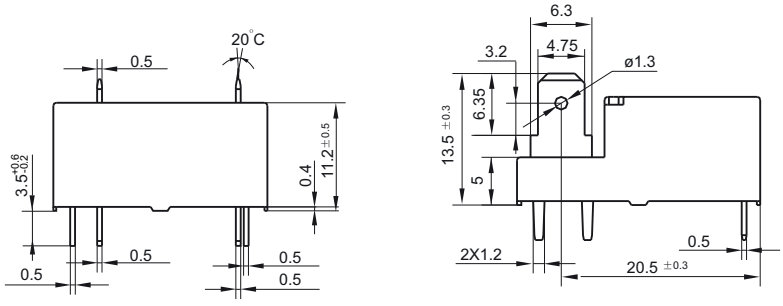


OUTLINE DIMENSIONS , WIRING DIAGRAM AND PC BOARD LAYOUT

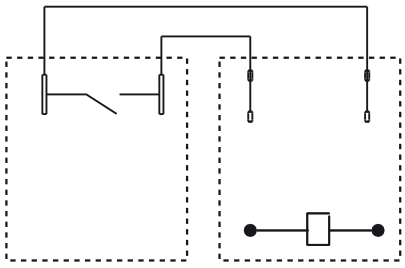
Unit: mm

1 Form A (QC)

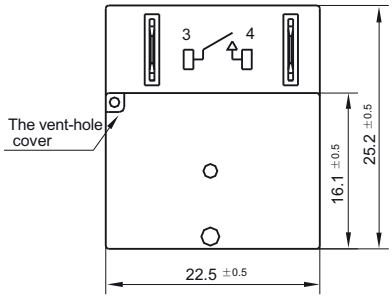
Outline Dimensions



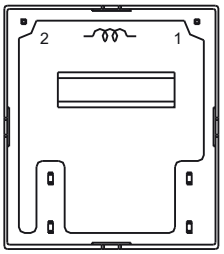
Wiring Diagram



(Top View) (Bottom View)



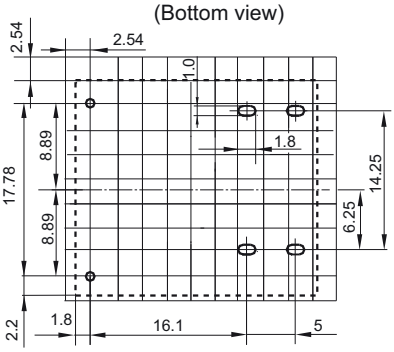
(Top view)



(Bottom View)

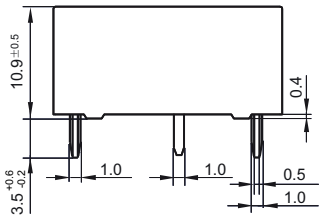
PCB Layout

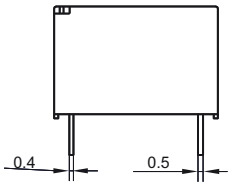
(Bottom view)



Outline Dimensions

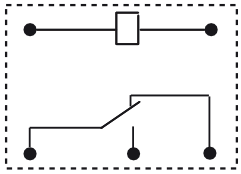
1 Form C (PCB)

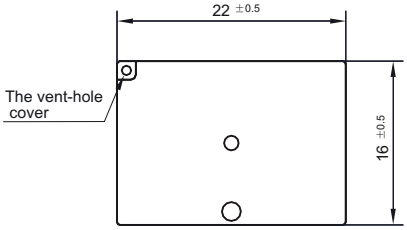




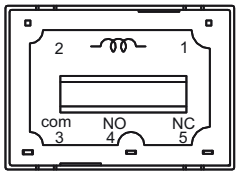
Wiring Diagram

(Bottom View)





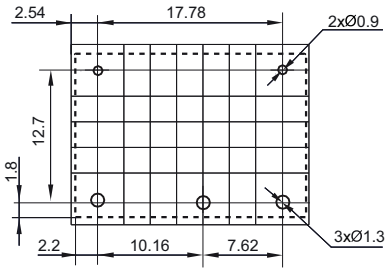
(Top view)



(Bottom View)

PCB Layout

(Bottom view)

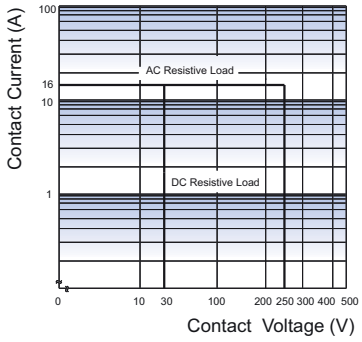


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

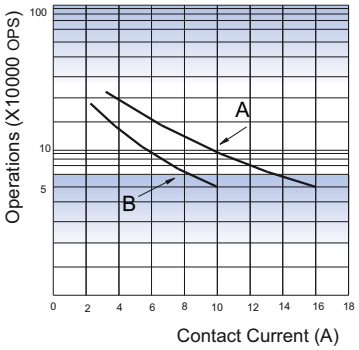
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

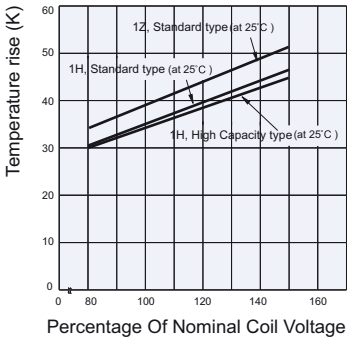
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Notes:

(1) Curve A: HP type
Curve B: H type

(2) Test conditions:
Curve A: 16A 250VAC, Resistive load,
Room temp., 1s on 9s off
Curve B: 10A 250VAC, Resistive load,
Room temp., 1s on 9s off

HF163F-L SUBMINIATURE INTERMEDIATE POWER LATCHING RELAY

c UL us
File No.: E134517

VDE
File No.: 40039460

Features

- Latching relay
- High sensitive
- Breakdown voltage (between contact and coil): 5,000 V
- High switching capacity: 8A 250VAC
- Surge breakdown voltage (between contact and coil): 12,000 V
- Reflow soldering available
- 1 Form A configuration

CONTACT DATA

Contact arrangement	1A
Contact resistance	100mΩ max. (at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	8A 250VAC 5A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA/150W
Mechanical endurance	1 x 10^6OPS
Electrical endurance	5 x 10^4OPS(8A 250VAC, Resistive load, at 85℃, 1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Set time		15ms max.
Reset time		15ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 2.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 8g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	1 coil latching	Approx. 200mW
	2 coils latching	Approx. 400mW

COIL DATA at 23˚C

1 coil latching (200mW)

Nominal Voltage VDC	Set Voltage VDC max.	Reset Voltage VDC max.	Coil Resistance x (1±10%) Ω
3	2.4	2.4	45
5	4.0	4.0	125
6	4.8	4.8	180
9	7.2	7.2	405
12	9.6	9.6	720
24	19.2	19.2	2880

2 coils latching (400mW)

Nominal Voltage VDC	Set Voltage VDC max.	Reset Voltage VDC max.	Coil Resistance x (1±10%) Ω
3	2.4	2.4	22.5
5	4.0	4.0	62.5
6	4.8	4.8	90
9	7.2	7.2	202.5
12	9.6	9.6	360
24	19.2	19.2	1440

SAFETY APPROVAL RATINGS

UL/CUL	8A 250VAC at 85˚C 5A 30VDC at 85˚C 10A 250VAC at 40˚C TV-3 125VAC at 40˚C 800W 277VAC Tungsten at 40˚C 4A 277VAC Standard Ballast at 40˚C
VDE	8A 250VAC at 85˚C 5A 30VDC at 85˚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

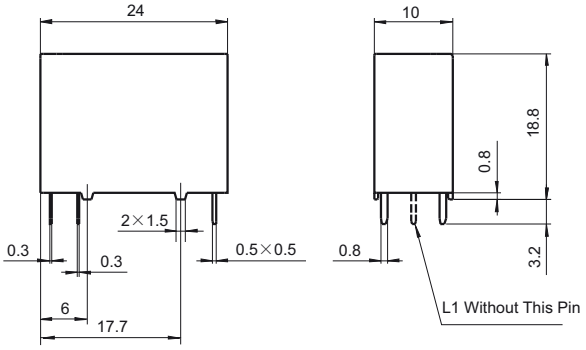
	HF163F-L/	12	-H	L2	T	(XXX)
Type						
Coil voltage	3, 5, 6, 9, 12, 24VDC					
Contact form	**H:** 1 Form A					
Sort	**L1:** 1 coil latching	**L2:** 2 coils latching				
Contact material	**T:** $AgSnO_2$					
Special code[4]	**XXX:** Customer special requirement		**Nil:** Standard			

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended 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.(470) stands for product which is suitable for reflow soldering.

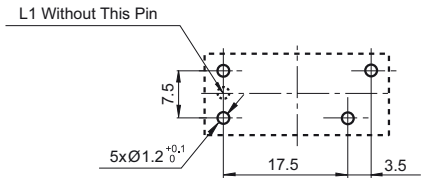
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout
(Bottom view)



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 2.54mm.

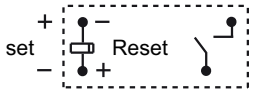
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

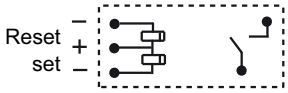
Unit: mm

Wiring Diagram

(Bottom view)

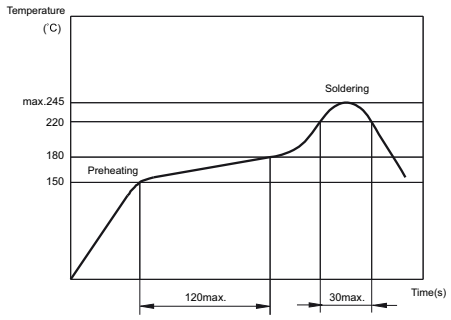
Reset Status





RECOMMENDED SOLDERING CONDITIONS

Temperature/Time profile of Reflow Soldering see below:



Notes: 1) Temperature profile shows Printed Circuit Board surface temperature on the relay terminal portion.

2) Please check the actual soldering condition to use other method except above mentioned temperature profiles.

Notice

1. Relay is on the “reset” or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or "reset" status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than “set” or “reset” time. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

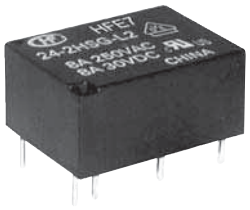
Disclaimer

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.

HFE7 SUBMINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

VDE
File No.:40027342



Features

- High switching capacity
  1A, 1B: 10A 250VAC/30VDC;
  2A, 2B, 1A + 1B: 8A 250VAC/30VDC
- High sensitive
- 4kV dielectric strength (between coil & contacts)
- Single side stable and latching types available
- 1 Form A, 1 Form B, 2 Form A, 2 Form B and 1A + 1B contact arrangement

CONTACT DATA

Contact arrangement	1A, 1B	2A, 2B, 1A +1B
Contact resistance	AgNi +Au plated: 30mΩ max.(at 1A 6VDC) AgNi: 50mΩ max.(at 1A 6VDC) $AgSnO_2$ +Au plated: 60mΩ max.(at 1A 6VDC) $AgSnO_2$: 80mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$, AgNi	
Contact rating (Res. load)	10A 250VAC/30VDC	8A 250VAC/30VDC
Max. switching Voltage	277VAC	277VAC
Max. switching current	10A	8A
Max. switching power	2500VA	2000VA
Mechanical endurance	1×10^7OPS	
Electrical endurance	1A, 1B type: 1×10^5OPS (10A 250VAC, Resistive load., at 70℃, 1.5s on 1.5s off) 1A +1B, 2A, 2B type: 3×10^4OPS (8A 250VAC, Resistive load., at 70℃, 1.5s on 1.5s off)	

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric Strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		10ms max.
Release (Reset) time (at nomi. volt.)		10ms max.
Max. operate frequency (under rated load)		20 cycles /min
Temperature rise (at rated. volt.)		50 K max.
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance		98m/s²
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70 ˚C
Termination		PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

Notes: The data shown above are initial values.

COIL

Type		Coil power	
		Sensitive	High sensitive
Single side stable	1A,1A+1B	Approx. 420mW	Approx. 200mW
	2A		Approx. 280mW
Single coils latching		Approx. 300mW	Approx. 200mW
Double coils latching		Approx. 420mW	Approx. 280mW

COIL DATA at 23˚C

Single side stable

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Coil Resistance x (1±10%)Ω		
			200mW	280mW	420mW
3	2.1	0.3	45	32.1	21.4
5	3.5	0.5	125	89.3	59.5
6	4.2	0.6	180	129	85.7
9	6.3	0.9	405	289	192.9
12	8.4	1.2	720	514	342.9
24	16.8	2.4	2880	2056	1371.4

Single coil latching

Nominal Voltage VDC	Set /Reset Voltage VDC max.	Pulse Duration ms min.	Coil Resistance x (1±10%)Ω	
			300mW	200mW
3	2.1	50	30	45
5	3.5	50	83.3	125
6	4.2	50	120	180
9	6.3	50	270	405
12	8.4	50	480	720
24	16.8	50	1920	2880

COIL DATA

at 23˚C

Double coils latching

Nominal Voltage VDC	Set / Reset Voltage VDC max.	Pulse Duration ms min.	Coil Resistance x (1±10%) Ω	
			420mW	280mW
3	2.1	50	21.4+21.4	32.1+32.1
5	3.5	50	59.5+59.5	89.3+89.3
6	4.2	50	85.7+85.7	129+129
9	6.3	50	192.9+192.9	289+289
12	8.4	50	342.9+342.9	514+514
24	16.8	50	1371.4+1371.4	2056+2056

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	AgNi	10A 250VAC 8A 30VDC 1/4HP 125VAC 1/3HP 250VAC
		$AgSnO_2$	10A 30VDC B300, R300 10A 250VAC 1/4 HP 125VAC 1/3 HP 250VAC
	2 Form A	$AgSnO_2$, AgNi	8A 250VAC/30VDC 1/4HP 125VAC 1/3HP 250VAC
		$AgSnO_2$	600W 125VAC B300, R300
	1 Form A+1 Form B	$AgSnO_2$, AgNi	8A 250VAC/30VDC 1/4HP 125VAC 1/3HP 250VAC
		$AgSnO_2$	B300, R300
VDE (No UL approval on Single side stable version)	1 Form A	AgNi	10A 250VAC (cosØ=1) 5A 250VAC (cosØ=0.4)
	2 Form A	AgNi	8A 250VAC (cosØ=1) 3.5A 250VAC(cosØ=0.4)
	1 Form A+1 Form B	AgNi	8A 250VAC (cosØ=1) 3.5A 250VAC (cosØ=0.4)

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

HFE7 / 12 -1H S T G -L2 -R (412)(XXX)

Type	
Coil voltage	3, 5, 6, 9, 12, 24VDC
Contact form[1]	**1H:** 1 Form A **1D:** 1 Form B **2H:** 2 Form A **2D:** 2 Form B **1HD:** 1A + 1B
Construction[2]	**S:** Plastic sealed **Nil:** Flux proofed
Contact material[3]	**T:** $AgSnO_2$ **Nil:** AgNi
Contact plating	**G:** Gold plated **Nil:** No gold plated
Sort	**L1:** 1 coil latching **L2:** 2 coils latching **Nil:** Single side stable
Polarity	**R:** Negative polarity **Nil:** Positive polarity
Customer special code (Coil power)[4]	**(412):** Sensitive **Nil:** High sensitive
Special code[5]	**XXX:** Customer special requirement **Nil:** Standard

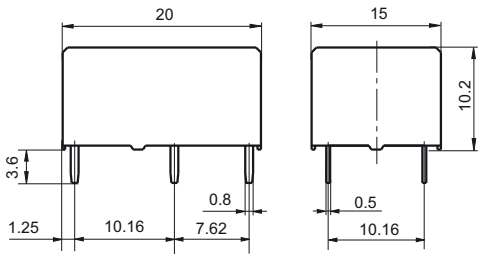
Notes: 1) 1H, 2H means that relay is on the "reset" status when delivery; 1D, 2D means that relay is on the "set" status when delivery.There are no UL approval on 1D,2D version.
2) Under the ambience with dangerous gas like H_2S, SO_2 or NO_2, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended. Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For the application with inrush current conditions, such as lamp load, motor load, capacitance load, coil load, etc., we suggest use the flux proof and no golden plated $AgSnO_2$ contact version.
4) We recommend to choose the sensitive version (same part number, but with special suffix (412)) if the higher coil activation is allowable; Please choose the sensitive version (same part number, but with special suffix (412)) if the relay to be used in the extreme environment or welded by wave soldering; Please check with HF's engineer before designing the relay to your application if there are some requirements' outside the specification we provided.
5) The customer special requirement express as special code after evaluating by Hongfa. e.g. (359) stands for Lamp load.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

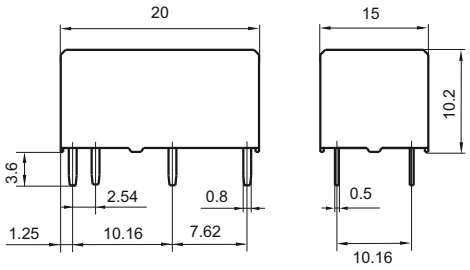
Unit: mm

Outline Dimensions

Single side stable & 1 coil latching



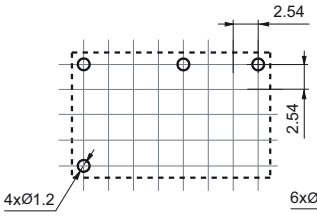
2 coils latching



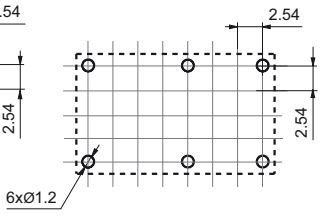
PCB Layout (Bottom view)

Single side stable & 1 coil latching

1 Form A,1 Form B

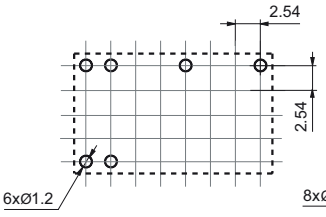


2 Form A, 2 Form B,1A + 1B

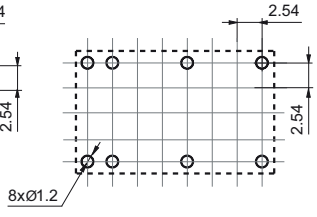


2 coils latching

1 Form A,1 Form B



2 Form A, 2 Form B,1A + 1B

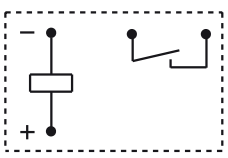


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.54mm.

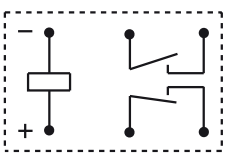
Wiring Diagram (Bottom view)

Single side stable (Standard polarity)

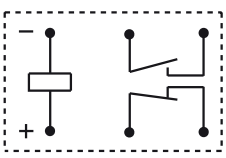
1 Form A



2 Form A



1A + 1B

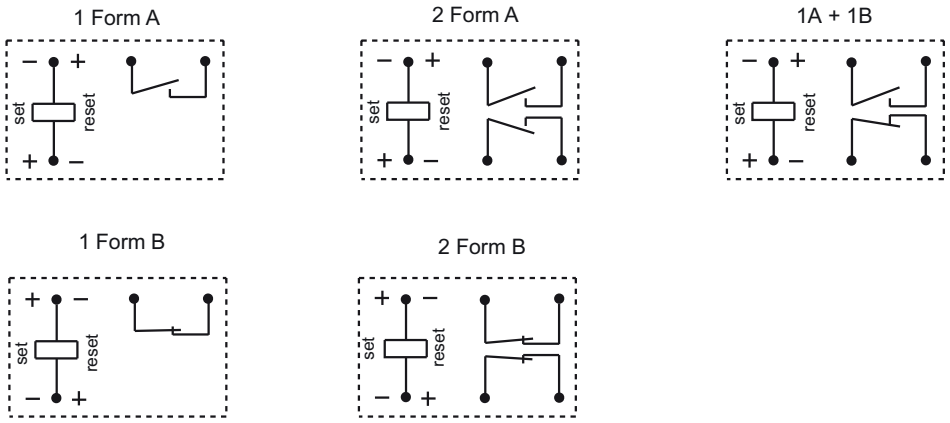


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

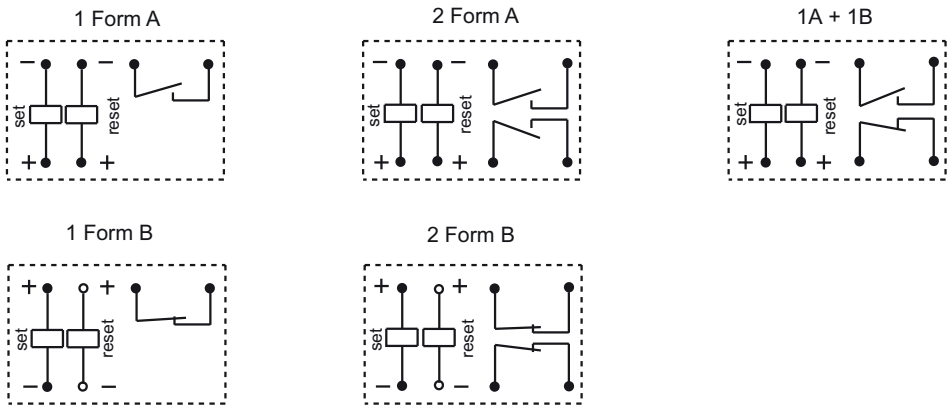
Unit: mm

Wiring Diagram (Bottom view)

1 coil latching (Standard polarity)



2 coils latching (Standard polarity)



Remark: The coil polarity of Reverse polarity and Standard polarity is opposite.

Notice

1. Relay is on the “reset” or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or "reset" status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than “set” or “reset” time. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. As the relay component part's will shrink and deformed due to the high temperature impact, our products are forbidden to be used at the temperature outside our suggested working temperature range (-40℃ to 70℃) for long time ; If the wave soldering will be used, the operating parameters we will suggest are: Up limit of the pre-heating time: 120s; Up limit of the pre-heating temperature:120℃; Soldering temperatuer: 260℃±5℃; Soldering time（10±3）s; Besides our suggested parameters, please try to shorten the pre-heating time and the soldering time and try to lower the temperature for pre-heating and the soldering as you can; the manual soldering for such relay is more recommended.

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.

HF118F MINIATURE HIGH POWER RELAY

c UL us
File No.: E134517

VDE
File No.: 40010480

CQC
File No.: CQC09002035071
CQC18002206322

Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Low height: 12.5 mm
- Creepage distance >8mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Sockets available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact material	See ordering info.
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)
Contact rating (Res. load)	10A 250VAC/30VDC
Max. switching voltage	440VAC / 125VDC
Max. switching current	10A
Max. switching power	2500VA / 300W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1H type: 1 x 10^5OPS (AgNi, 8A 250VAC, Resistive load, at 85°C, 5s on 5s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. vot.)		10ms max.
Release time (at rated. vot.)		5ms max.
Temperature rise (at rated. Volt.)		55K max.
Shock resistance *	Functional	NC: 49m/s² NO: 98m/s²
	Destructive	980m/s²
Vibration resistance *	NC (no coil voltage)	10Hz to 55Hz 0.8mm DA
	NO	10Hz to 55Hz 1.65mm DA
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 8g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	Approx. 220mW to 290mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
5	3.50	0.5	7.5	113 x (1±10%)
6	4.20	0.6	9.0	164 x (1±10%)
9	6.30	0.9	13.5	360 x (1±10%)
12	8.40	1.2	18.0	620 x (1±10%)
18	12.60	1.8	27.0	1295 x (1±10%)
24	16.80	2.4	36.0	2350 x (1±15%)
48 [2)]	33.60	4.8	72.0	8000 x (1±15%)
60 [2)]	42.00	6.0	90.0	12500 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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

UL/CUL (AgNi, $AgSnO_2$)	version 1,3,5,6	10A 250VAC 10A 30VDC B300 R300 1/2HP 240VAC (NO only) $AgSnO_2$: 1/3HP 120VAC (NO only)
VDE (AgNi, AgNi+Au)	1H (;S) (1;3;5) (-;G)	8A 250VAC at 85˚C
	1D (;S) (1;3;6) (-;G)	8A 250VAC at 85˚C
	1Z (-;S) (1;3) (-;G)	8A 250VAC at 85˚C
VDE ($AgSnO_2$, $AgSnO_2$+Au)	1H (-;S) (1;3;5), T.(-;G)	8A 250VAC at 85˚C
	1D (-;S) (1;3;6), T.(-;G)	8A 250VAC at 85˚C
	1Z (-;S) (1;3), T.(-;G)	8A 250VAC at 85˚C
	1H (-;S) (1;3;5), T.(-;G)	AC-15 (Make: 30A 250VAC COS Ø=0.7 at 85˚C Break: 3A 250VAC COS Ø=0.4 at 85˚C)
	1Z (-;S) (1;3), T.(-;G)	NO: AC-15 (Make: 30A 250VAC COS Ø=0.7 at 85˚C Break: 3A 250VAC COS Ø=0.4 at 85˚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

HF118F /	012	-1H	S	1	G	(XXX)

Type

Coil voltage 5, 6, 9, 12, 18, 24, 48, 60VDC

Contact arrangement **1H:** 1 Form A **1D:** 1 Form B **1Z:** 1 Form C

Construction [1) 2)] **S:** Plastic sealed **Nil:** Flux proofed

Version (See Wiring Diagram below)
1: 3.2mm 1 pole 8A
3: 3.2mm 1 pole 10A, double pinning
5: 5mm 8A, only 1 Form A **6:** 5mm 8A, only 1 Form B

Contact material[3)] **T:** $AgSnO_2$ **G:** AgNi+Au plated **TG:** $AgSnO_2$+Au plated **Nil:** AgNi

Special code[4)] **XXX:** Customer special requirement **Nil:** Standard

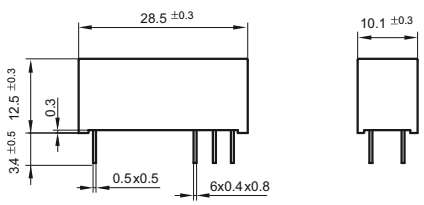
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact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

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

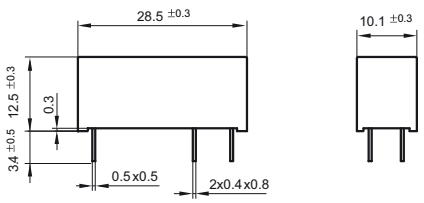
Unit: mm

Outline Dimensions

3.2mm pinning



5mm pinning



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

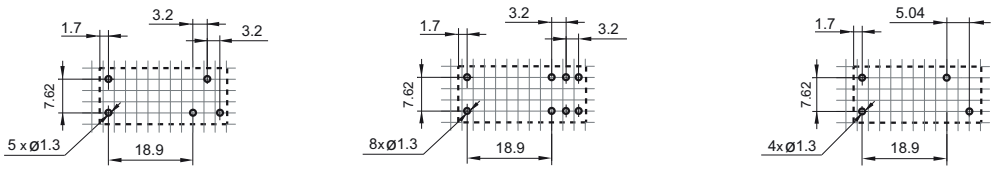
Unit: mm

Wiring Diagram (Bottom view)

Version 1 Version 3 Version 5 Version 6

PCB Layout (Bottom view)

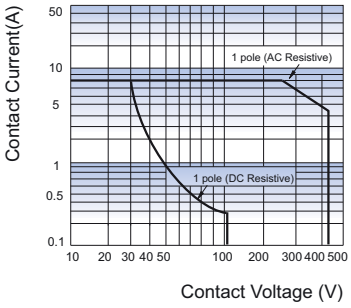
Version 1 Version 3 Version 5/6



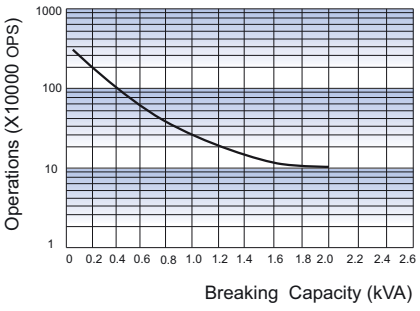
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.54mm.

CHARACTERISTIC CURVES

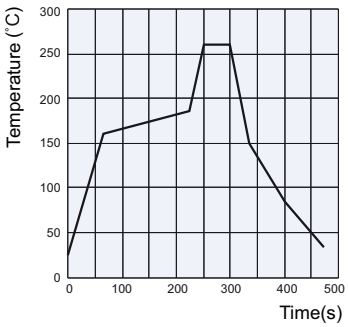
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



REFLOW WELDING TEMPERATURE
(Reflow soldering version)



Notes:

1) Curve: 1Z1 type
2) Test conditions:
NO, Resistive load, 250VAC
Flux proofed, Room temp., 1s on 9s off.

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.

HF115F MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:116934

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

CONTACT DATA

Contact arrangement	1A, 1B, 1C	2A, 2B, 2C
Contact resistance 1)	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	1H3B type: 1×10^5 OPS (16A 250VAC, Resistive load, AgNi, Room temp., 1s on 9s off) 2H4B type: 5×10^4 OPS (8A 250VAC, Resistive load, AgNi, Room temp., 1s on 9s off)	

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

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 rated. volt.)		15ms max.
Release time (at rated. volt.)		8ms max.
Temperature rise (at rated. 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.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	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) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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 **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.

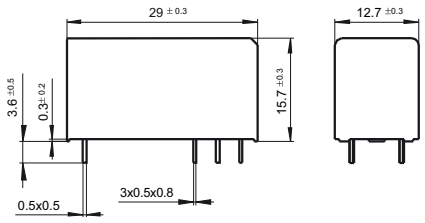
4) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT); e.g. (253) stands for Reflow soldering version, for 1 pole type.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

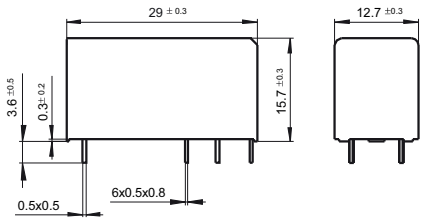
Unit: mm

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-□□

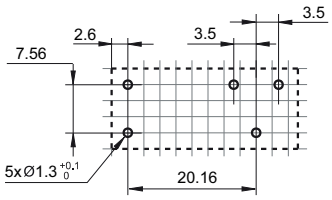
2 Form A　　2 Form B　　2 Form C

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

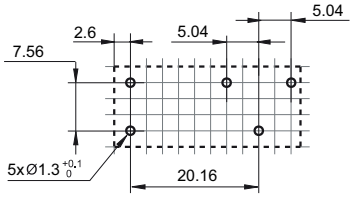
Unit: mm

PCB Layout (Bottom view)

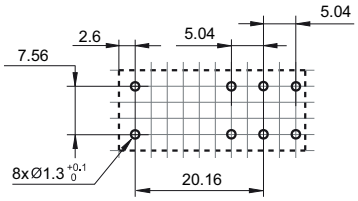
3.5mm 1Pole 12A



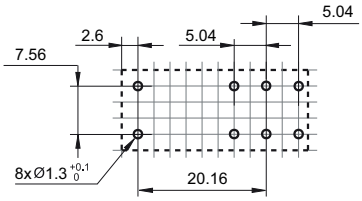
5mm 1Pole 12A



5mm 1Pole 16A



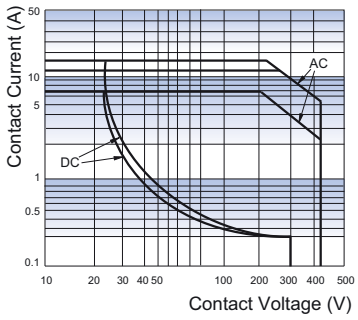
5mm 2Pole 8A



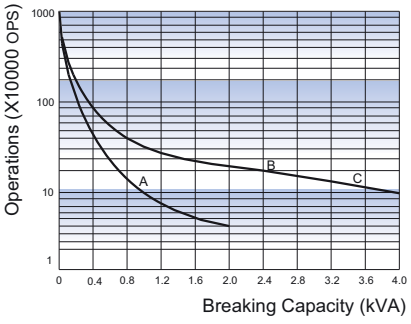
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The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

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

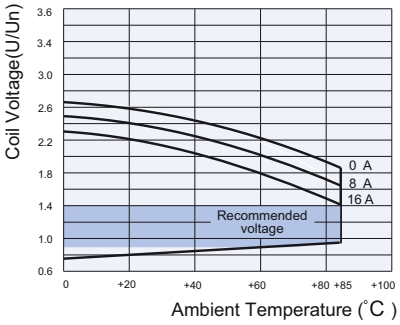


ENDURANCE CURVE



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.

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.

HF115F-A MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.: CQC17002176311

Features

- AC voltage coil type
- 16A switching capability
- 1 & 2 pole configurations
- 5kV dielectric strength (between coil and contacts)
- Low height: 15.7 mm
- 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

CONTACT DATA

Contact arrangement	1A, 1B, 1C	2A, 2B, 2C
Contact resistance 1)	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	1×10^6 OPS	
Electrical endurance	1H3B type: 5×10^4 OPS (16A 250VAC, Resistive load, Room temp., 1s on 9s off) 2H4B type: 5×10^4 OPS (8A 250VAC, Resistive load, Room temp., 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Temperature rise (at rated. volt.)		85K max.
Shock resistance *	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance*		10Hz to150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 70°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 that of relay length direction.

COIL

Coil power	Approx. 0.75VA

COIL DATA (at 50Hz) at 23°C

Nominal Voltage VAC	Pick-up Voltage VAC max. 1)	Drop-out Voltage VAC min. 1)	Coil Current mA	Coil DC Resistance Ω
24	18.00	3.60	31.6	350 x (1±10%)
115	86.30	17.30	6.6	8100 x (1±15%)
230	172.50	34.50	3.2	32500 x (1±15%)

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

SAFETY APPROVAL RATINGS

UL/CUL	12A 250VAC 16A 250VAC 8A 250VAC
VDE (AgNi, AgNi+Au)	12A 250VAC at 70°C 16A 250VAC at 70°C 8A 250VAC at 70°C
VDE ($AgSnO_2$, $AgSnO_2$+Au)	12A 250VAC at 70°C 8A 250VAC at 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

	HF115F-A /	024	-1H	S	1	A	F	(XXX)

Type	
Coil voltage	24, 115, 230VAC
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
Special code[4)]	**XXX:** Customer special requirement **Nil:** Standard

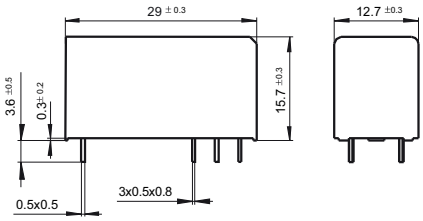
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact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

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

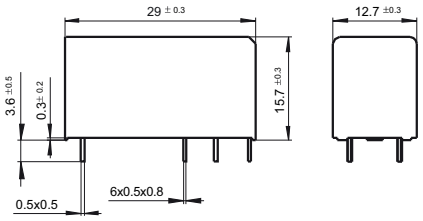
Unit: mm

Outline Dimensions

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

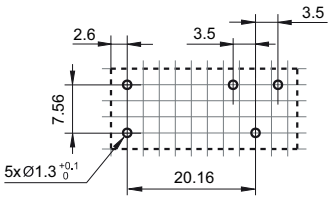


5mm Pinning (HF115F-A/ □□□ -□□ -□ -2/3/4 -□□)

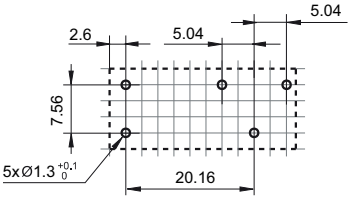


PCB Layout (Bottom view)

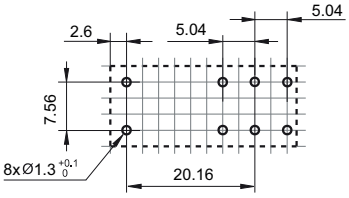
3.5mm 1Pole 12A



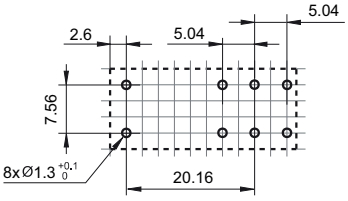
5mm 1Pole 12A



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.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)

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

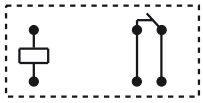
1 Form A

1 Form B

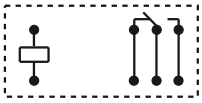
1 Form C

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

1 Form A



1 Form B



1 Form C

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

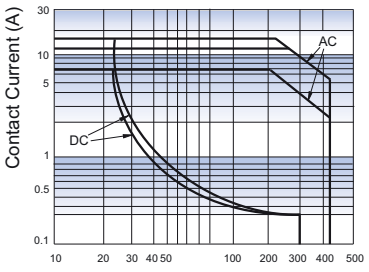
2 Form A

2 Form B

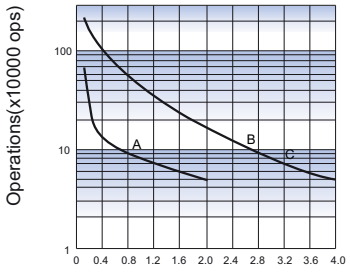
2 Form C

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



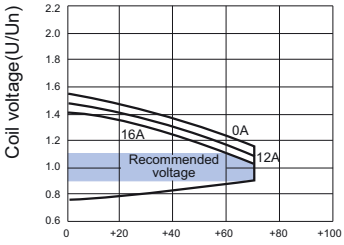
ENDURANCE CURVE



Notes:

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 (AC) *



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

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.

HF115F-T/TH MINIATURE HIGH POWER RELAY

File No.: E134517

File No.:116934

File No.:CQC17002168381

Features

- High Temperature: 105˚C
- Low height 15.7 mm
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- Sockets available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	See ordering info.
Contact rating (Res. load)	HF115F-TH: 10A 250VAC HF115F-T: 16A 250VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	HF115F-TH:10A HF115F-T:16A
Max. switching power	HF115F-TH: 2500VA HF115F-T: 4000VA
Mechanical endurance	1 x 10^7OPS
Electrical endurance	HF115F-T 1H3B type: 5 x 10^4OPS (16A 250VAC, Resistive load, at 105℃, 5s on 5s off) HF115F-TH 1H3B type: 5 x 10^4OPS (10A 250VAC, Resistive load, at 105℃, 5s on 5s off)

Notes: 1) The data shown are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		8ms max.
Temperature rise (at rated. 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 105˚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 that of relay length direction.

COIL

Coil power	HF115F-TH: Approx. 250mW; HF115F-T: Approx. 400mW

COIL DATA at 23˚C

Standard type (HF115F-T)

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil Resistance Ω
5	3.50	0.5	6.5	62 x (1±10%)
6	4.20	0.6	7.8	90 x (1±10%)
9	6.30	0.9	11.7	202 x (1±10%)
12	8.40	1.2	15.6	360 x (1±10%)
18	12.6	1.8	23.4	810 x (1±10%)
24	16.8	2.4	31.2	1440 x (1±10%)
48 3)	33.6	4.8	62.4	5760 x (1±15%)
60 3)	42.0	6.0	78	7500 x (1±15%)

Sensitive type (HF115F-TH)

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	Coil Resistance Ω
5	3.75	0.5	6.5	100 x (1±10%)
6	4.50	0.6	7.8	144 x (1±10%)
9	6.75	0.9	11.7	324 x (1±10%)
12	9.00	1.2	15.6	576 x (1±10%)
18	13.50	1.8	23.4	1296 x (1±10%)
24	18.00	2.4	31.2	2304 x (1±10%)
48 3)	36.00	4.8	62.4	9216 x (1±15%)
60 3)	45.00	6.0	78	12857 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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	HF115F-T-1H(S)3A	18.4A 250VAC at 105°C
	HF115F-TH -1H(S)3	10A 250VAC at 105°C 6A 400VAC at 105°C
	HF115F-T-1H(S)3B	16A 250VAC at 105°C
	HF115F-TH -1H(S)3B	10A 250VAC at 105°C
	HF115F-T-1Z(S)3B	NO: 16A 250VAC at 105°C NC: 5A 250VAC at 105°C
UL/CUL	HF115F-TH -1H(S)3B	10A 277VAC
	HF115F-TH -1H(S)3A	10A 277VAC
	HF115F-T-1H(S)3B	16A 277VAC
	HF115F-T-1H(S)3A	16A 250VAC

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-T/TH 012 -1H S 3 A (XXX)

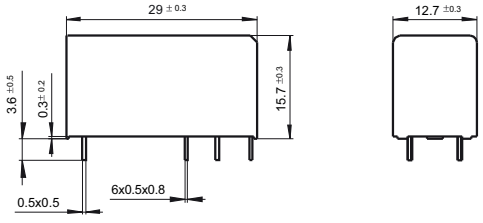
Type	HF115F-T: Standard HF115F-TH: High Sensitive
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC
Contact arrangement	**1H:** 1 Form A **1Z:** 1 Form C
Construction[1)2)]	**S:** Plastic sealed **Nil:** Flux proofed
Version	**3:** 5.0mm
Contact material	**A:** $AgSnO_2$ **B:** AgNi **Nil:** AgCdO
Special code[3)]	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

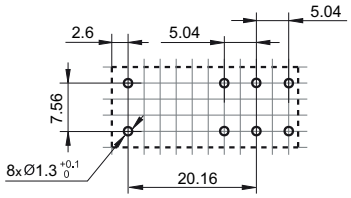
Outline Dimensions



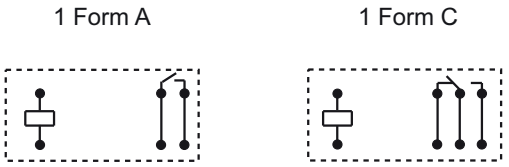
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout
(Bottom view)



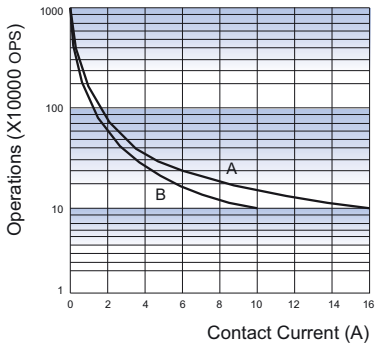
Wiring Diagram
(Bottom view)



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.

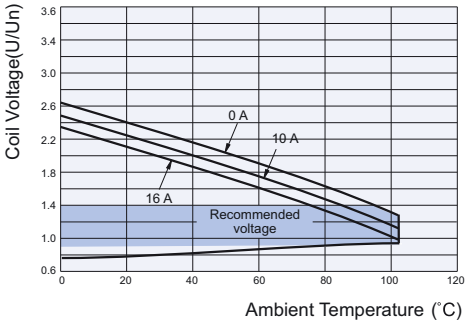
CHARACTERISTIC CURVES

ENDURANCE CURVE



Notes:
1.Curve A: HF115F-T 1H3B type
Curve B: HF115F-TH 1H3B type
2.Test conditions:
NO, Resistive load, 250VAC, Flux proofed,
Room temp., 1s on 9s off

COIL OPERATING RANGE (DC) *



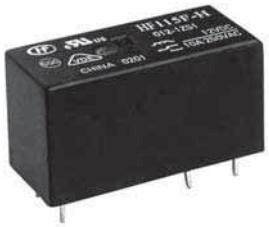
Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the abver range may damage the insulation of relay coil.

HF115F-H MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:116934

File No.:CQC17002168381



Features

- High sensitive: 0.25W
- Low height: 15.7 mm
- 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

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact resistance	100mΩ max.(at 1A 6VDC)
Contact material	See ordering info.
Contact rating (Sensitive coil)	10A 250VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	10A
Max. switching power	2500VA
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1H3 type: 1 x 10^5OPS (10A 250VAC, Resistive load, at 85°C, 5s on 5s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 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 that of relay length direction.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 250mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC 2)	Coil Resistance Ω
5	3.75	0.5	7.5	100 x (1±10%)
6	4.50	0.6	9.0	144 x (1±10%)
12	9.00	1.2	18	576 x (1±10%)
18	13.50	1.8	27	1296 x (1±10%)
24	18.00	2.4	36	2304 x (1±10%)
48 3)	36.00	4.8	72	9216 x (1±15%)
60 3)	45.00	6.0	90	12857 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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
$AgSnO_2$	HF115F-H….1(H;Z)(S)(1;2;3)A(G)(F)	10A 250VAC at 85°C
AgCdO	HF115F-H….1(H;Z)(S)(1;2;3)(G)(F)	10A 250VAC at 85°C 6A 400VAC at 85°C

UL/CUL

Contact Material	Specifications	Ratings
AgCdO	HF115F-H….1(H;Z)(S)(1;2;3)(G)(F)	10A 250VAC

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-H / 012 -1H S 3 A F (XXX)

Type								
Coil voltage	5, 6, 12, 18, 24, 48, 60VDC							
Contact arrangement	**1H:**1 Form A	**1D:**1 Form B	**1Z:**1 Form C					
Construction[1) 2)]	**S:** Plastic sealed	**Nil:** Flux proofed						
Version	**1:** 3.5mm 1 pole	**2:** 5.0mm 1 pole	**3:** 5.0mm 1 pole					
Contact materia[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						

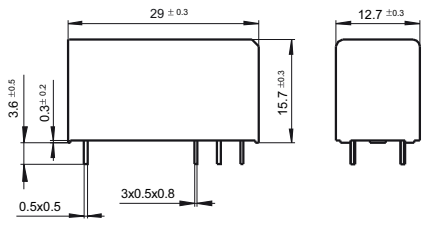
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact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

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

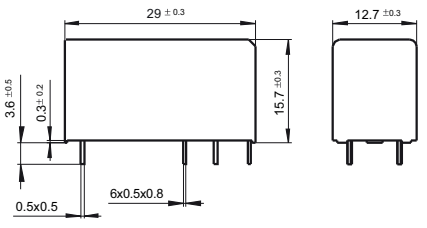
Unit: mm

Outline Dimensions

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



5mm Pinning (HF115F-H/ □□□ -□□-2/3-□)

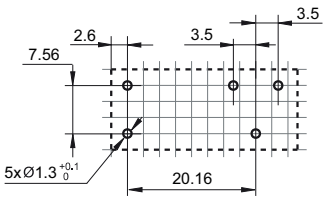


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

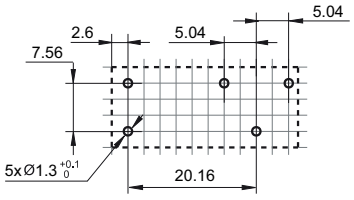
Unit: mm

PCB Layout (Bottom view)

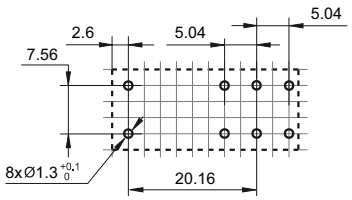
3.5mm Pinning, 1 Pole



5mm Pinning, 1 Pole



5mm Pinning, 1 Pole



Wiring Diagram (Bottom view)

3.5/5mm Pinning, 1 Pole, 10A, HF115F-H/ □□□ -□□ -□ -1/2 -□

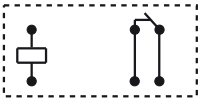
1 Form A

1 Form B

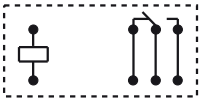
1 Form C

5mm Pinning, 1 Pole, 10A, HF115F-H/ □□□ -□□ -□ -3 -□

1 Form A



1 Form B

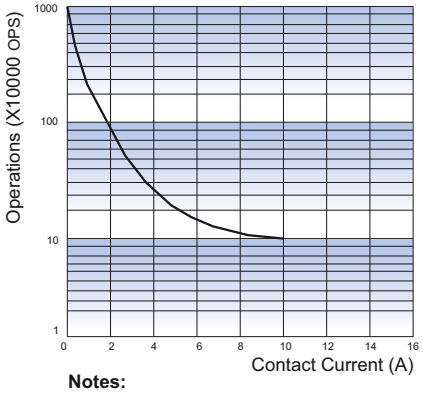


1 Form C

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

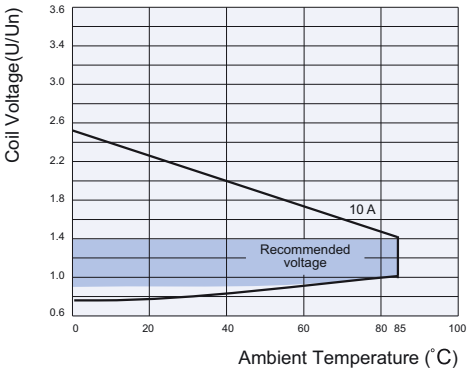
ENDURANCE CURVE



Notes:

1) Curve : 1H3 type
2) Test conditions:
NO, 250VAC, Resistive load,
Flux proofed, at 85°C, 5s on 5s 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.

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.

HF115F-I MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:116934

File No.:CQC17002168381

Features

- Max high inrush:120A 20ms
- Low height: 15.7 mm
- 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

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating	16A 250VAC
Inrush rating (120VAC)	NO: TV-5 80A 120A / 20ms
Max. switching voltage	440VAC / 300VDC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1H3A type: 7.5 x 10^4OPS (16A 250VAC, General use, Room temp., 1s on 9s off) 1H3A type: 2.5 x 10^4OPS (TV-5 120VAC, Room temp., 1s on 59s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 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 20g/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 that of relay length direction.

COIL

Coil power	Approx. 400mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC 2)	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	12.6	1.8	27	810 x (1±10%)
24	16.8	2.4	36	1440 x (1±10%)
48 3)	33.6	4.8	72	5760 x (1±15%)
60 3)	42.0	6.0	90	7500 x (1±15%)
110 3)	77.0	11.0	165	25200 x (1±15%)

Notes: 1) The data shown above are initial values.
Notes: 2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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

UL/CUL	HF115F-I....1Z(S)3A	NO: 16A 250VAC at 85°C
	HF115F-I....1H(S)3A	16A 250VAC TV-5,120VAC
VDE	HF115F-I....1H(S)3A	16A 250VAC at 85°C
	HF115F-I....1Z(S)3A	NO: 16A 250VAC at 85°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

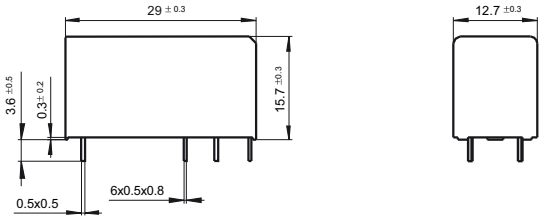
	HF115F-I /	012	-1H	S	3	A	(XXX)
Type							
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60, 110VDC						
Contact arrangement	**1H:** 1 Form A **1Z:** 1 Form C						
Construction[1)2)]	**S:** Plastic sealed **Nil:** Flux proofed						
Version	**3:** 5.0mm						
Contact material	**A:** $AgSnO_2$						
Special code[3)]	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

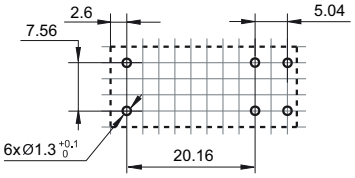
Unit: mm

Outline Dimensions

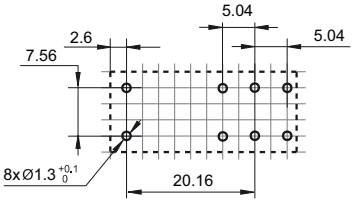


PCB Layout
(Bottom view)

1 Form A



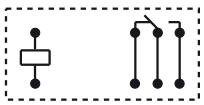
1 Form C



Wiring Diagram
(Bottom view)

1 Form A

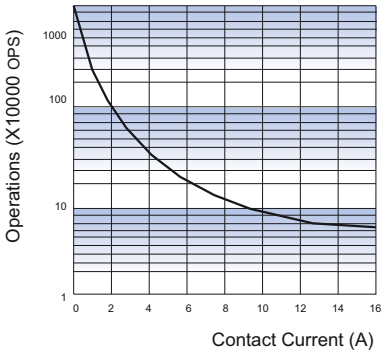
1 Form C



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.

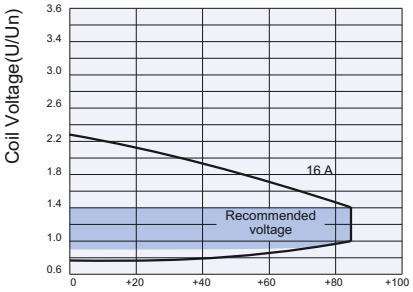
CHARACTERISTIC CURVES

ENDURANCE CURVE



Test conditions:
NO, 250VAC, Resistance Load,
Flux proofed, Room temp., 1s on 9s off

COIL OPERATING RANGE (DC) *



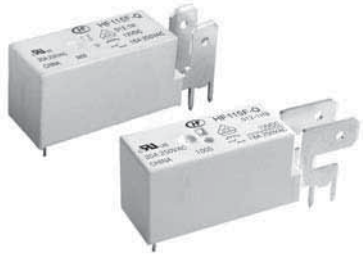
Notes: * The use of a relay with an energising voltage other than the rated coil voltage may lead to reduced electrical life.
An energising voltage over the abover range may damage the insulation of relay coil.

HF115F-Q MINIATURE HIGH POWER RELAY

File No.: E134517

File No.:116934

File No.: CQC17002168381



Features

- Ambient temperature up to 125 ˚C
- 5kV dielectric strength (between coil and contacts)
- Low height: 15.7mm
- Creepage distance >8mm
- Meeting VDE 0700, 0631 reinforce insulation
- UL94, V-0 flammability class
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1B
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgNi
Contact rating	20A 250VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	20A
Max. switching power	5000VA
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1H type: 3 x 10^4OPS (20A 277VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 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 *		1A: 10Hz to150Hz 10g 1B: 10Hz to150Hz 5g
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 125˚C
Termination		PCB & QC
Unit weight		Approx. 16g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 400mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC 2)	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	18.0	360 x (1±10%)
18	12.6	1.8	27.0	810 x (1±10%)
24	16.8	2.4	36.0	1440 x (1±10%)
48 3)	33.6	4.8	72.0	5760 x (1±15%)
60 3)	42.0	6.0	90.0	7500 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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	AgNi	1 Form A	18A 250VAC at 105˚C 16A 250VAC at 125˚C 12A 400VAC at 105˚C
		1 Form B	16A 250VAC at 125˚C 12A 400VAC at 105˚C
UL/CUL	AgNi	1 Form A 1 Form B	20A 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-Q /	012	-1H	3	T	(XXX)

Type

Coil voltage 5, 6, 9, 12, 18, 24, 48, 60VDC

Contact arrangement **1H:** 1 Form A **1D:** 1 Form B

Terminals **3:** Quick connect terminals horizontal **Nil:** Quick connect terminals vertical

Contact material **T:** $AgSnO_2$ **Nil:** AgNi

Special code[3] **XXX:** Customer special requirement **Nil:** Standard

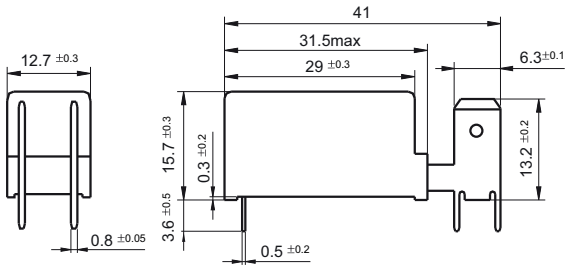
Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

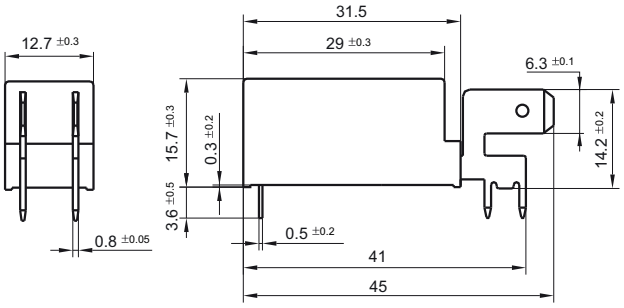
Unit: mm

Outline Dimensions

Quick connect terminals vertical



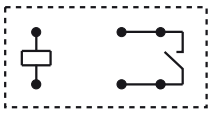
Quick connect terminals horizontal



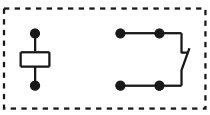
Wiring Diagram

(Bottom view)

1 Form A

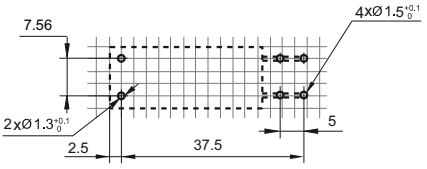


1 Form B



PCB Layout

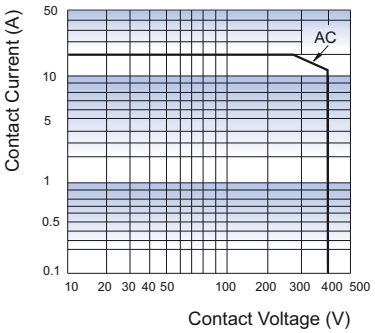
(Bottom view)



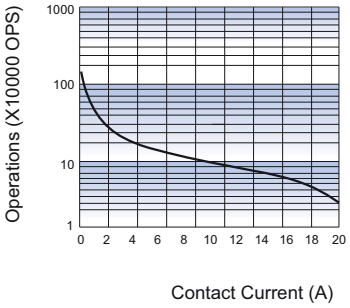
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The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

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



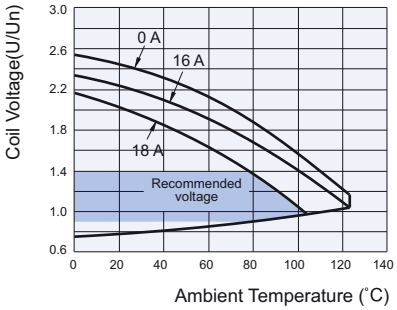
ENDURANCE CURVE



Notes:

1) Curve: 1H type
2) Test conditions:
NO, 250VAC, Resistive load, 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.

HF115F-S MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.:CQC17002168381

Features

- Special contact struction
- Incandescent lamp load: 3000W 230VAC
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 11mm
- Low height: 15.7 mm
- Meeting reinforce insulation
- Product in accordance to IEC 60335-1 available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	W+$AgSnO_2$
Contact rating	Resistive:16A 250VAC Incandescent Lamp: 3000W 230VAC Inrush current: 165A / 20ms LED(Electronic ballast): 492A/1.5ms
Max. switching voltage	440VAC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	5 x 10^6OPS
Electrical endurance	1.2 x 10^4OPS (3000W 230VAC, Incand escentlamp load, Room temp., 1s on 11s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1250VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Temperature rise (at rated. volt.)		55K max.
Shock resistance *	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance *		10Hz to 150Hz 10g
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) This contact resistance value is tested under the norminal voltage.
2) * Index is not that of relay length direction.
3) The data shown above are initial values.
4) 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.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC2)	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	12.6	1.8	27	810 x (1±10%)
24	16.8	2.4	36	1440 x (1±10%)
48 3)	33.6	4.8	72	5760 x (1±15%)
60 3)	42.0	6.0	90	7500 x (1±15%)
110 3)	77.0	11.0	165	25200 x (1±15%)

Notes:1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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	16A 250VAC at 85°C
UL/CUL	16A 250VAC at 85°C Incandescent lamp 3000W 230VAC TV-8 120VAC Incandescent lamp 1200W 120VAC at 50°C Incandescent lamp 1200W 277VAC at 50°C Standard ballast 2.2A 277VAC at 50°C Electronic ballast 16A 277/120VAC 85°C Electronic ballast 12A 277/120VAC 85°C Electronic ballast 8A 277/347VAC 85°C Electronic ballast 15A 120VAC 85°C3) Electronic ballast 8A 277/347VAC 85°C3)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.
3) Zero crossing control cooperative.

ORDERING INFORMATION

	HF115F-S /	12	-H	S	F	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60, 110VDC					
Contact arrangement	**H:** 1 Form A					
Construction[1) 2)]	**S:** Plastic sealed	**Nil:** Flux proofed				
Insulation Standard	**F:** Class F	**Nil:** Class B				
Special code[3)]	**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.).

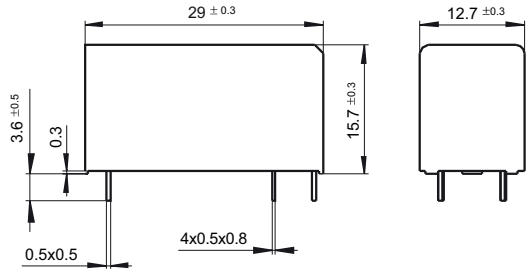
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

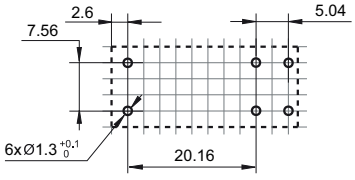
Unit: mm

Outline Dimensions



PCB Layout

(Bottom view)



Wiring Diagram

(Bottom view)

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.

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.

HF115F-L 1 pole MINIATURE HIGH POWER LATCHING RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.: CQC17002176310

Features

- Latching relay
- Low height: 15.7 mm
- 20A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 11mm-NO/10mm-CO version
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	16A 250VAC
Typ. applicable load	Incandescent lamp:1500W 277VAC Standard ballast:8A 277VAC Electronic ballast: 5A 120VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	20A
Max. switching power	4000VA
Mechanical endurance	2×10^6 OPS
Electrical endurance	5×10^4 OPS (NO: 16A 250VAC, Resistive load, at 85°C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Set time (at nomi. volt.)		10ms max.
Reset time (at nomi. volt.)		10ms 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.

COIL

Coil power	1 coil latching: Approx. 400mW 2 coils latching: Approx. 600mW

COIL DATA at 23°C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Pulse Width (ms) Typical	Pulse Width (ms) Min.	Reset Voltage VDC max. 1)	Max. Voltage VDC	Coil Resistance Ω
5	3.5	⩾50	30	3.5	6	62x (1±10%)
6	4.2	⩾50	30	4.2	7.2	90x (1±10%)
9	6.3	⩾50	30	6.3	10.8	202x (1±10%)
12	8.4	⩾50	30	8.4	14.4	360x (1±10%)
24	16.8	⩾50	30	16.8	28.8	1440x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Pulse Width (ms) Typical	Pulse Width (ms) Min.	Reset Voltage VDC max. 1)	Max. Voltage VDC	Coil Resistance Ω
5	3.5	⩾50	30	3.5	7.5	42x (1±10%)
6	4.2	⩾50	30	4.2	9	55x (1±10%)
9	6.3	⩾50	30	6.3	13.5	135x (1±10%)
12	8.4	⩾50	30	8.4	18	240x (1±10%)
24	16.8	⩾50	30	16.8	36	886x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A/20A 250VAC at 85°C 1HP 240VAC TV-12 120VAC(1 Form A) Tungsten 360W 125VAC(1 Form A) Tungsten 1920W 8A 240VAC at 40°C Tungsten 12A 120VAC Standard ballast 16A 120VAC Standard ballast 8A 277VAC Standard ballast 5A 347VAC/480VAC Electronic ballast 5A 120VAC TV-8 240VAC
VDE	16A 250VAC at 85°C AC-15 240VAC at 85°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

HF115F-L /	12	-Z	S	3	L1	T	F	(XXX)

Type	
Coil voltage	5, 6, 9, 12, 24VDC
Contact arrangement	**H:** 1 Form A **Z:** 1 Form C
Construction[1) 2)]	**S:** Plastic sealed **Nil:** Flux proofed
Version	**3:** 5.0mm 1 pole 16A
Sort	**L1:** 1 coil latching **L2:** 2 coils latching
Contact material	**T:** $AgSnO_2$
Insulation standard	**F:** Class F
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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

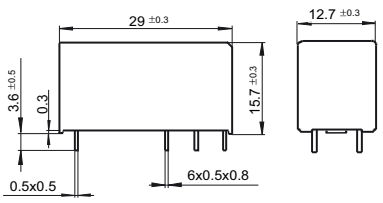
3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

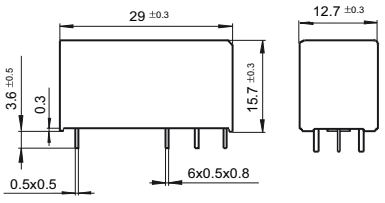
Unit: mm

Outline Dimensions

1 coil latching



2 coils latching



Wiring Diagram
(Bottom view)

1 coil latching(Reset Status)

1 Form A

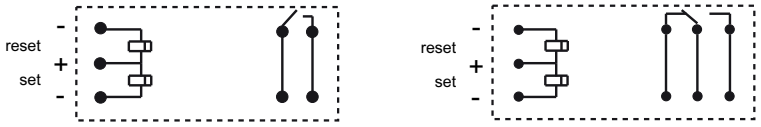
1 Form C

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

2 coils latching(Reset Status)

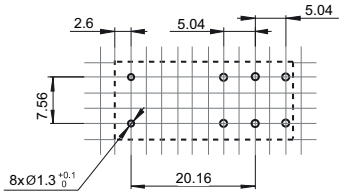
Wiring Diagram
(Bottom view)



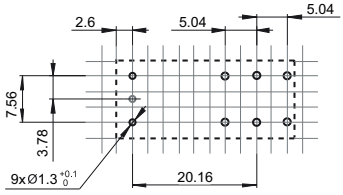
1 Form A　　1 Form C

PCB Layout
(Bottom view)

1 coil latching



2 coils latching



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.

Notice

1. Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

HF115F-L 2 pole MINIATURE HIGH POWER LATCHING RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.:CQC17002176310

Features

- Latching relay
- Low height: 15.7 mm
- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 11mm-NO/10mm-CO version
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	2A, 2C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating(Res. load)	8A 250VAC
Typ. applicable load	Lamp: Tungsten 3A 277VAC Standard ballast: 3A 277VAC
Max. switching voltage	440VAC / 300VDC
Max. switching current	10A
Max. switching power	2000VA
Mechanical endurance	2 x 10^6OPS
Electrical endurance	2H type: 5 x 10^4OPS (8A 250VAC, General use, at 85°C, 5s on 5s off) 2Z type: 1 x 10^4OPS (8A 250VAC, General use, at 85°C, 5s on 5s off)

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

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)
Set time (at rated. volt.)		10ms max.
Reset time (at rated. volt.)		10ms 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.

COIL

Coil power	1 coil latching: Approx. 400mW 2 coils latching: Approx. 600mW

COIL DATA at 23°C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Pulse Width (ms) Typical	Pulse Width (ms) Min.	Reset Voltage VDC max. 1)	Max. Voltage VDC	Coil Resistance Ω
5	3.5	⩾50	30	3.5	6	62x (1±10%)
6	4.2	⩾50	30	4.2	7.2	90x (1±10%)
9	6.3	⩾50	30	6.3	10.8	202x (1±10%)
12	8.4	⩾50	30	8.4	14.4	360x (1±10%)
24	16.8	⩾50	30	16.8	28.8	1440x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max. 1)	Pulse Width (ms) Typical	Pulse Width (ms) Min.	Reset Voltage VDC max. 1)	Max. Voltage VDC	Coil Resistance Ω
5	3.5	⩾50	30	3.5	7.5	42x (1±10%)
6	4.2	⩾50	30	4.2	9	55x (1±10%)
9	6.3	⩾50	30	6.3	13.5	135x (1±10%)
12	8.4	⩾50	30	8.4	18	240x (1±10%)
24	16.8	⩾50	30	16.8	36	886x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	10A/8A 250/277VAC General use at 85°C 1/2 HP 240VAC at 40°C Standard ballast 3A 277VAC at 40°C Tungsten Lamp 3A 277VAC at 40°C
VDE	8A 250VAC at 85°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

	HF115F-L /	12	-2Z	S	4	L1	T	F	(XXX)
Type									
Coil voltage	5, 6, 9, 12, 24VDC								
Contact arrangement	**2H:** 2 Form A **2Z:** 2 Form C								
Construction [1)2)]	**S:** Plastic sealed	**Nil:** Flux proofed							
Version	**4:** 5.0mm 2 pole 8A								
Sort	**L1:** 1 coil latching	**L2:** 2 coils latching							
Contact material	**T:** $AgSnO_2$								
Insulation standard	**F:** Class F								
Special code [3)]	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

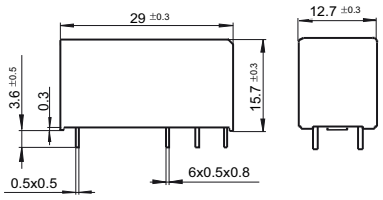
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

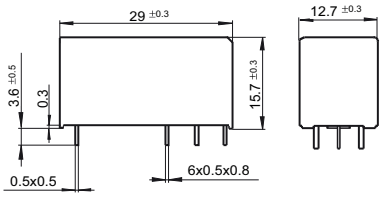
Unit: mm

Outline Dimensions

1 coil latching



2 coils latching



Wiring Diagram

(Bottom view)

1 coil latching(Reset Status)

2 Form A

2 Form C

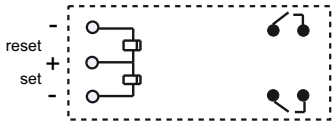
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

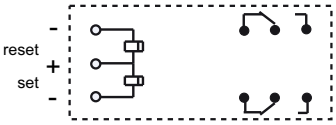
Wiring Diagram

(Bottom view)

2 coils latching(Reset Status)



2 Form A

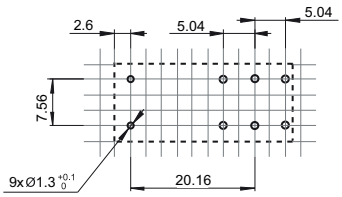


2 Form C

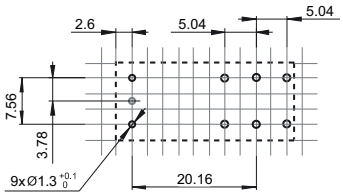
PCB Layout

(Bottom view)

1 coil latching



2 coils latching



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.

Notice

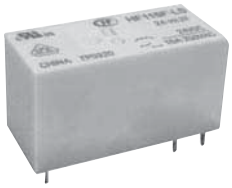
1. Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

HF115F-LS MINIATURE HIGH POWER LATCHING RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.:CQC14002104529
CQC17002176310



Features

- Latching relay
- Special contact struction
- Incandescent lamp load: 3500W 277VAC
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 11mm
- Low height: 15.7 mm
- Meeting reinforce insulation
- Product in accordance to EN60669-1 available
- Product in accordance to IEC 60335-1 available
- Plastic sealed and flux proofed types available
- UL insulation system：Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	W+AgSnO2
Contact rating	Resistive:16A 250VAC Incandescent Lamp: 3500W 277VAC Inrush current: 165A / 20ms LED(Electronic ballast): 492A/1.5ms
Max. switching voltage	440VAC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	2 x 10^6OPS
Electrical endurance	1.2 x 10^4OPS (3500W 277VAC, Tungsten lamp, at 40˚C, 1s on 59s off) 6 x 10^3OPS(16A 250VAC, Resistive load, at 85˚C, 5s on 5s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1250VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Set time (at rated. volt.)		10ms max.
Reset time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		55K max.
Shock resistance *	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance *		10Hz to 150Hz 10g
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) This contact resistance value is tested under the norminal voltage.
2) * Index is not that of relay length direction.
3) The data shown above are initial values.
4) UL insulation system: Class F.

COIL

Coil power	1 coil latching: Approx. 400mW 2 coils latching: Approx. 600mW

COIL DATA at 23˚C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse Width (ms) Typical	Pulse Width (ms) Min.	Reset Voltage VDC max.1)	Max. Voltage VDC	Coil Resistance Ω
5	3.5	≥50	30	3.5	6	62x (1±10%)
6	4.2	≥50	30	4.2	7.2	90x (1±10%)
9	6.3	≥50	30	6.3	10.8	202x (1±10%)
12	8.4	≥50	30	8.4	14.4	360x (1±10%)
24	16.8	≥50	30	16.8	28.8	1440x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse Width (ms) Typical	Pulse Width (ms) Min.	Reset Voltage VDC max.1)	Max. Voltage VDC	Coil Resistance x (1±10%)Ω
5	3.5	≥50	30	3.5	7.5	42x (1±10%)
6	4.2	≥50	30	4.2	9	55x (1±10%)
9	6.3	≥50	30	6.3	13.5	135x (1±10%)
12	8.4	≥50	30	8.4	18	240x (1±10%)
24	16.8	≥50	30	16.8	36	886x (1±10%)

Notes:1) The data shown above are initial values.
2) *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC General use at 85°C Standard ballast 5A 277VAC at 40°C Electronic ballast 16A 120VAC at 40°C Electronic ballast 16A 277VAC at 40°C 3500W 277VAC Tungsten Lamp at 40°C TV-15 120VAC 40°C Tungsten 15A 120VAC 40°C
VDE	16A 250VAC Resistive at 85°C EN60669: 16A 250VAC COSØ =0.6 16A 250VAC 140μF

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-LS /	12	-H	S	L1	F	(XXX)
Type							
Coil voltage	5, 6, 9, 12, 24VDC						
Contact arrangement	**H:** 1 Form A						
Construction[1)2)]	**S:** Plastic sealed	**Nil:** Flux proofed					
Sort	**L1:** 1 coil latching	**L2:** 2 coils latching					
Insulation Standard	**F:** Class F						
Special code[3)]	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

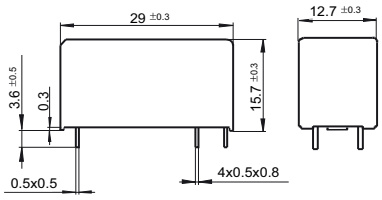
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

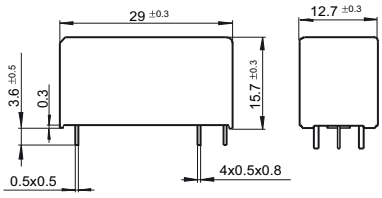
Unit: mm

Outline Dimensions

1 coil latching



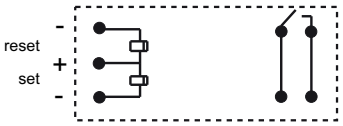
2 coils latching



Wiring Diagram
(Bottom view)

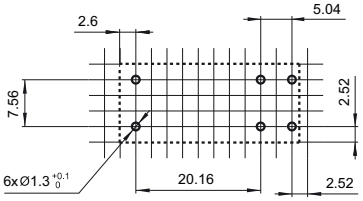
1 coil latching(Reset Status)

2 coils latching(Reset Status)

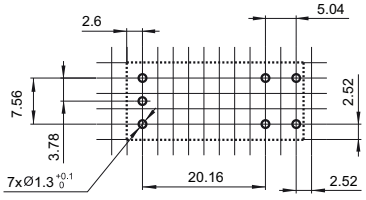


PCB Layout
(Bottom view)

1 coil latching



2 coils latching



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.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Notice

1. Relay is on the “reset” status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

HF115FP MINIATURE POWER RELAY

c UL us
File No.: E133481

VDE
File No.: 116934

Features

- 1 pole 16A, 2 pole 8A , 1 CO & 2 CO contacts
- 5kV dielectric, Creepage distance 8 mm (coil to contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- DC/AC coil type relay , Coil power 400mW / 0.75VA
- Manual test device
- Type with mechanical indicator / electrical indicator
- Sockets available

CONTACT DATA

Contact arrangement	1C	2C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	AgNi	
Contact rating (Res. load)	16A 250VAC	8A 250VAC
Max. switching voltage	440VAC	
Max. switching current	16A	8A
Max. switching power	4000VA	2000VA
Mechanical endurance	DC type: 5 x 10^6OPS AC type: 1 x 10^6OPS	
Electrical endurance	1Z3B type: 3x 10^4OPS (NO: 16A 250VAC, Resistive load, at 70˚C, 1s on 9s off) 2Z4B type: 5 x 10^4OPS (NO: 8A 250VAC, Resistive load, at 70˚C, 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Operate time (at rated. volt.)		DC type: 15ms max.
Release time (at rated. volt.)		DC type: 8ms max.
Temperature rise (at rated. volt.)		DC type: 60K max. AC type: 85K max.
Shock resistance*	Function	98m/s^2
	Destructive	980m/s^2
Vibration resistance*	NO	10Hz to 150Hz 10g
	NC	length direction: 10Hz to 150Hz 2g other direction: 10Hz to 150Hz 5g
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 16g
Mounting distance		5mm, packing of sockets

Notes: 1) The data shown above are initial values.
2)* Index is not that of relay length direction.
3) UL insulation system: Class A

COIL

Coil power	DC type: Approx. 400mW; AC type: Approx. 0.75VA

Notes: The data shown above don't include the power of electronic indicating circuit when the relay picks-up.

COIL DATA at 23˚C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC [2)]	Coil Resistance Ω
12	8.4	1.2	18	360 x (1±10%)
24	16.8	2.4	36	1440 x (1±10%)
48[3)]	33.6	4.8	72	5760 x (1±15%)
110[3)]	77.0	11.0	165	25200 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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).

AC type(50Hz)

Nominal Voltage VAC	Pick-up Voltage VAC max.[1)]	Drop-out Voltage VAC min.[1)]	Coil Current mA	Coil DC Resistance Ω
24	18.0	3.6	31.6	350 x (1±10%)
115	86.3	17.25	6.6	8100 x (1±15%)
230	172.5	34.5	3.2	32500 x (1±15%)

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

SAFETY APPROVAL RATINGS

UL/CUL	1 Form C	16A 250VAC at 70˚C
	2 Form C	8A 250VAC at 70˚C
VDE	1 Form C	16A 250VAC at 70˚C
	2 Form C	8A 250VAC at 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

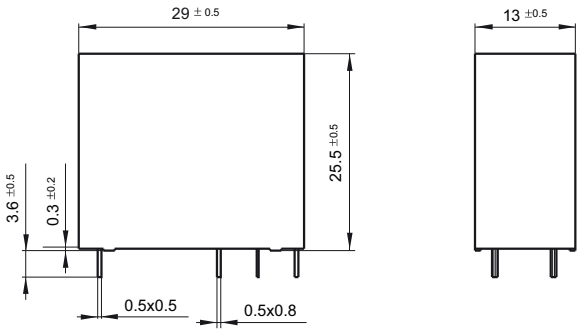
	HF115FP /	024	-1Z	3	B	(XXX)
Type						
Coil voltage	**012 to 110:** 12, 24, 48, 110 VDC **A24 to A230:** 24, 115, 230 VAC					
Contact arrangement	**1Z:** 1 Form C	**2Z:** 2 Form C				
Version	**3:** 5.0mm 1 pole 16A	**4:** 5.0mm 2 pole 8A				
Contact material	**B:** AgNi					
Special code[2)]	**XXX:** Customer special requirement	**Nil:** Standard				

Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) The customer special requirement express as special code after evaluating by Hongfa.

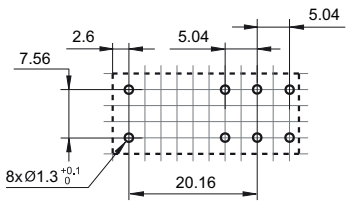
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



PCB Layout (Bottom view)



DIN rail Socket

Solder Socket

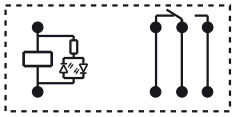
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The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

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

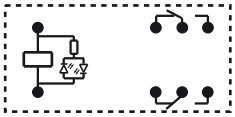
Unit: mm

Wiring Diagram (Bottom view)

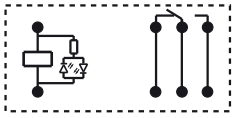
HF115FP/ □□□ -1Z3□



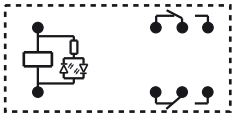
HF115FP/ □□□ -2Z4□



HF115FP/A □□□ -1Z3□



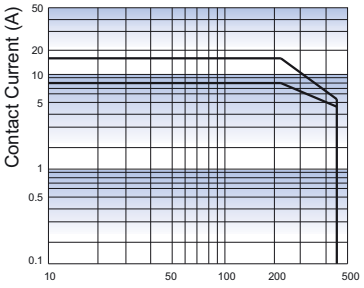
HF115FP/A □□□ -2Z4□



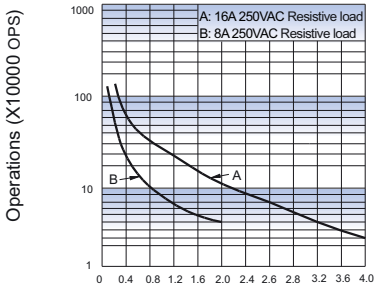
Remark: DC coil with a parrelled diode is available but the coil terminal is different in postive or cathode.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE

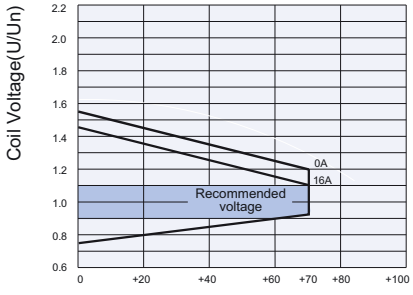


Notes:

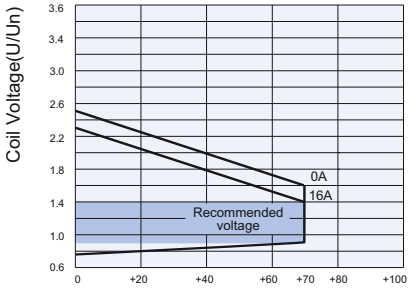
1.Curve A: 1Z3B type
Curve B: 2Z4B type

2.Test conditions:
NO, Flux proofed, Room temp.,1s on 9s off

COIL OPERATING RANGE (AC) *



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

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.

HF115FK MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:116934

File No.:CQC17002176308

Features

- Low height: 15.7 mm
- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting reinforce insulation
- Flux proofed type
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1C	2A, 2C
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$	
Contact rating (Res. load)	12A/16A 250VAC	8A 250VAC
Max. switching voltage	400VAC	
Max. switching current	12A / 16A	10A
Max. switching power	3000VA / 4000VA	2000VA
Mechanical endurance	1 x 10^7OPS	
Electrical endurance	H3(P)T type: 1 x 10^5 OPS (NO: 16A 277VAC, Resistive Load at 40°C, 1s on 9s off) Z3(P)T type: 5 x 10^4OPS (NO: 16A 250VAC, Resistive Load at 85°C, 1s on 9s off) 2Z4(P)T type: 5 x 10^4OPS (NO: 8A 250VAC, Resistive Load at 85°C, 1s on 9s off) Z33 type: 1 x 10^5 OPS (NO: 16A 277VAC, Resistive Load at 40°C, 1s on 9s off) 2Z43 type: 5 x 10^4OPS (NO: 8A 277VAC, Resistive Load at 40°C, 1s on 9s off)	

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

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 rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms 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. 13g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	Approx. 400mW(Standard type)
	Approx. 530mW(high power consumption type)

COIL DATA at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	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%)

COIL DATA at 23°C

high power consumption type

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
5	≤3.50	≥0.5	7.5	47 x (1±10%)
6	≤4.20	≥0.6	9.0	68 x (1±10%)
9	≤6.30	≥0.9	13.5	153 x (1±10%)
12	≤8.40	≥1.2	18	271 x (1±10%)
18	≤12.60	≥1.8	27	611 x (1±10%)
24	≤16.80	≥2.4	36	1086 x (1±10%)
48	≤33.60	≥4.8	72	4347 x (1±15%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

Standard type

UL/CUL	$AgSnO_2$	Z1T: 12A 250VAC at 85˚C Z2T: 12A 250VAC at 85˚C Z3T: 16A 250VAC at 85˚C 2Z4T: 8A 250VAC at 85˚C
	AgNi	Z13: 12A 250VAC at 40˚C Z23: 12A 250VAC at 40˚C Z33: 16A 250VAC at 40˚C 2Z43: 8A 250VAC at 40˚C
VDE	$AgSnO_2$	Z1T: 12A 250VAC at 85˚C Z2T: 12A 250VAC at 85˚C Z3T: 16A 250VAC at 85˚C 2Z4T: 8A 250VAC at 85˚C
	AgNi	Z13: 12A 250VAC at 85˚C Z23: 12A 250VAC at 85˚C Z33: 16A 250VAC at 85˚C 2Z43: 8A 250VAC at 85˚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.

SAFETY APPROVAL RATINGS

high power consumption type

UL/CUL	Z1PT: 12A 277VAC 85˚C 16A 277VAC room temperature TV8 NO room temperature Z2PT: 12A 277VAC 85˚C 6A 277VAC room temperature TV8 NO room temperature Z3PT: 16A 277VAC 85˚C TV8 NO room temperature 2Z4PT: 8A 250VAC 85˚C
VDE	Z1PT: 12A 277VAC 85˚C Z2PT: 12A 277VAC 85˚C Z3PT: 16A 277VAC 85˚C 2Z4PT: 8A 250VAC 85˚C

ORDERING INFORMATION

HF115FK /	12	-H	3	P	T	(XXX)	

Type

Coil voltage 5, 6, 9, 12, 18, 24, 48 VDC

Contact arrangement **H:** 1 Form A **Z:** 1 Form C **2H:** 2 Form A **2Z:** 2 Form C

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

Coil type **P:high power consumption type** **Nil:** Standard

Contact material [1] **T:** $AgSnO_2$ **3:** AgNi (Standard)

Special code[3] **XXX:** Customer special requirement **Nil:** Standard

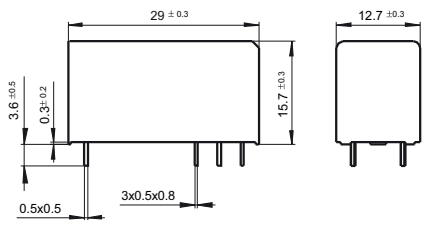
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

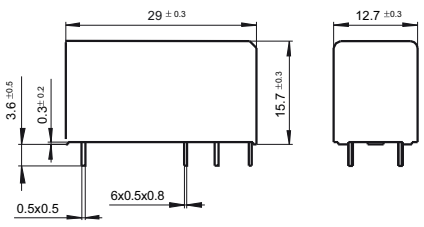
Unit: mm

Outline Dimensions

3.5mm Pinning (HF115FK/ □□□-1-□)



5mm Pinning (HF115FK/□□□-□-2/3/4-□)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)

3.5/5mm Pinning, 1 Pole, 12A, HF115FK/ □□□-1/2-□

1 Form A

1 Form C

5mm Pinning, 1 Pole, 16A, HF115FK/ □□□-3-□

1 Form A

1 Form C

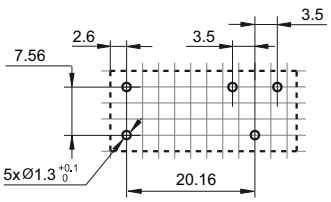
5mm Pinning, 2 Pole, 8A, HF115FK/ □□□-2□-4-□

2 Form A

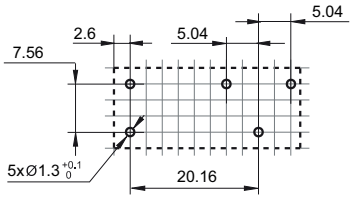
2 Form C

PCB Layout (Bottom view)

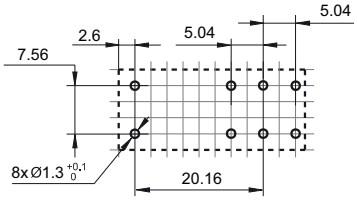
3.5mm 1Pole 12A



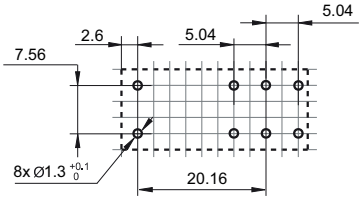
5mm 1Pole 12A



5mm 1Pole 16A



5mm 2Pole 8A



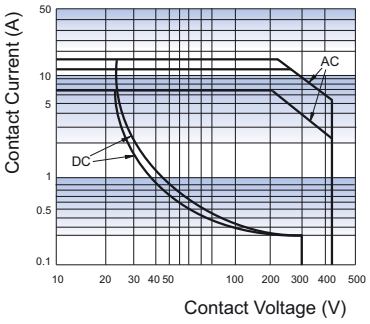
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

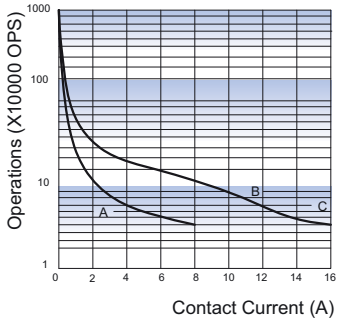
3) The width of the gridding is 2.52mm.

CHARACTERISTIC CURVES

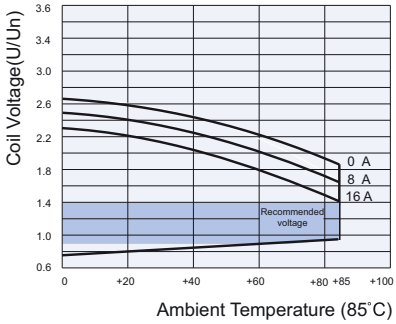
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (DC) *



Test conditions:

1) Curve A: 2Z4T type
   Curve B: Z2T type (or Z2T type)
   Curve C: Z3T type
2) Test conditions:
   NO, resistive load, 250VAC, flux proofed, at 85°C, 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 abver range may damage the insulation of relay coil.

HF115FK-T MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.: CQC17002176308

Features

* High temperature: 105 ˚C
* Low height: 15.7 mm
* 16A switching capability
* 5kV dielectric strength (between coil and contacts)
* Creepage distance: 10mm
* Meeting reinforce insulation
* Product in accordance to IEC 60335-1 available
* Sockets available
* UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	16A 250VAC
Max. switching voltage	400VAC
Max. switching current	16A
Max. switching power	4000VA
Mechanical endurance	1 x 10^7 OPS
Electrical endurance	H3T type: 3 x 10^4 OPS (16A 250VAC, Resistive Load, at 105*, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 x 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms 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 105˚C
Termination		PCB
Unit weight		Approx. 13g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	Approx. 400mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	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%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC at 105˚C
VDE	16A 250VAC at 105˚C 10A 250VAC at 105˚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

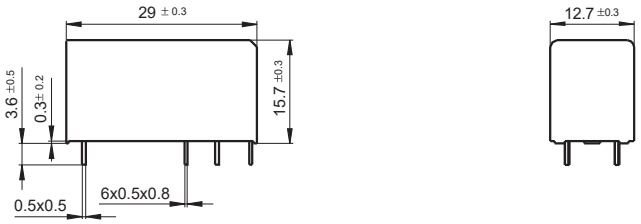
	HF115FK-T/	12	-H	3	T	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	**H:** 1 Form A **Z:** 1 Form C					
Version	**3:** 5.0mm 1 pole 16A					
Contact material [1]	**T:** $AgSnO_2$					
Special code[3]	**XXX:** Customer special requirement			**Nil:** Standard		

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) 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).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

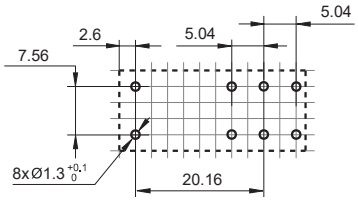
Outline Dimensions



Wiring Diagram (Bottom view)

1 Form A　　1 Form C

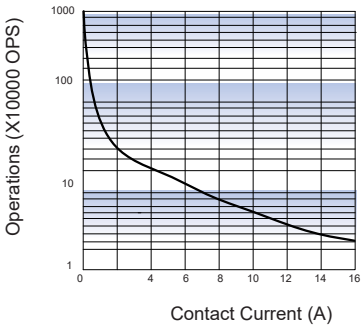
PCB Layout (Bottom view)



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.

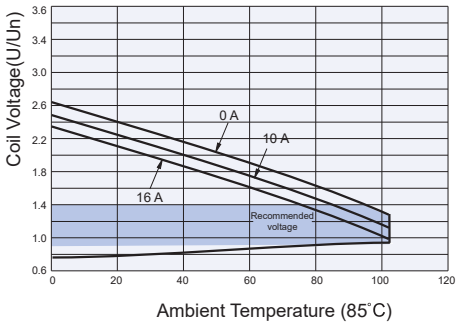
CHARACTERISTIC CURVES

ENDURANCE CURVE



Test conditions:
NO, resistive load, 250VAC, flux proofed,
at 105°C, 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.

HF158F MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

File No.:40032833

File No.:CQC17002176312

Features

- 20A switching capability
- Low height: 15.7 mm
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm, meet reinforce insulation
- UL insulation system: Class F
- Product in accordance to IEC 60335-1 available
- Sockets available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	AgNi, $AgSnO_2$
Contact rating	16A 250VAC
Max. switching voltage	440VAC
Max. switching current	20A
Max. switching power	5000VA
Mechanical endurance	2 x 10^7OPS
Electrical endurance	H33 type: 1 x 10^5OPS (16A 277VAC, Resistive load, Room temp., 1s on 9s off) H3T type: 1 x 10^5OPS (16A 277VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		8ms max.
Temperature rise (at rated. volt.)		60K 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. 11.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 400mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC2)	Coil Resistance Ω
5	3.50	0.5	9.0	62 x (1±10%)
6	4.20	0.6	10.8	90 x (1±10%)
9	6.30	0.9	16.2	202 x (1±10%)
12	8.40	1.2	21.6	360 x (1±10%)
18	12.6	1.8	32.4	810 x (1±10%)
24	16.8	2.4	43.2	1440 x (1±10%)
48 3)	33.6	4.8	86.4	5760 x (1±15%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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

UL/CUL	AgNi	16A 277VAC 16A 24VDC 10A 400VAC at 85°C 10A 250VAC at 105°C 20A 250VAC at 85°C
	$AgSnO_2$	1HP 240VAC B300/R300 at 85°C TV-5 120VAC 16A 277VAC 16A 24VDC 10A 400VAC at 85°C 10A 250VAC at 105°C 20A 250VAC at 85°C
VDE	AgNi	13A 250VAC at 70°C 16A 250VAC at 85°C
		NO: 10A 250VAC at 25°C / at 105°C (Only for (217) type)
	$AgSnO_2$	16A 250VAC at 85°C 8A 250VAC cosØ=0.4 at 85°C
UL/CUL (HF158F-T)		16A 277VAC at 105°C
VDE (HF158F-T)		NO: 20A 250VAC at Room temp. / 105°C NO: 16A 250VAC at Room temp. / 105°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

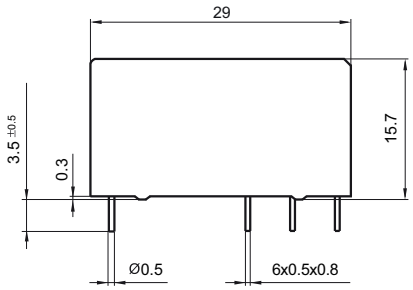
	HF158F /	12	-Z	S	3	3	(XXX)
Type	HF158F: Standard HF158F-T: High temperature						
Coil voltage	5, 6, 9,12, 18, 24, 48VDC						
Contact arrangement	**H:** 1 Form A	**Z:** 1 Form C					
Construction[1) 2)]	**S:** Plastic sealed	**Nil:** Flux proofed					
Version	**3:** 5.0mm						
Contact material	**3:** AgNi	**T:** $AgSnO_2$					
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard					

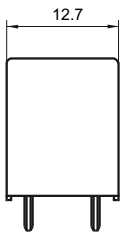
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (217) stands for product with the electrical endurance of 3 x 10^5OPS at 10A load.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

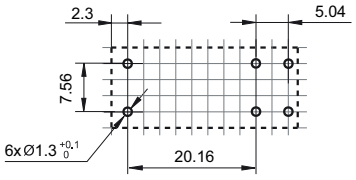




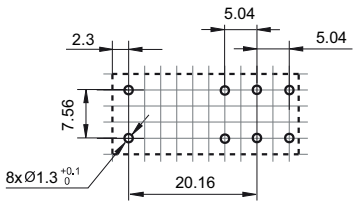
PCB Layout

(Bottom view)

1 Form A



1 Form C

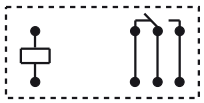


Wiring Diagram

(Bottom view)

1 Form A

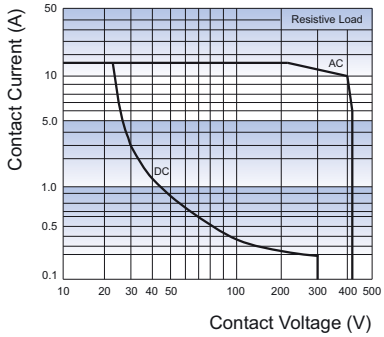
1 Form C



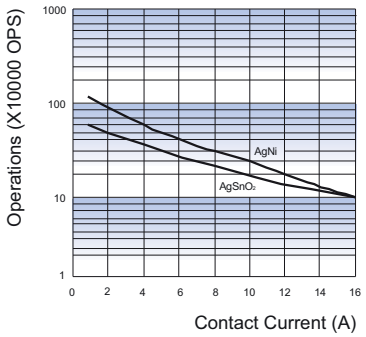
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The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

CHARACTERISTIC CURVES

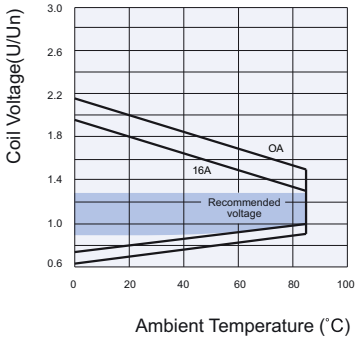
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (DC) *



Test conditions:
NO, 250VAC, Resistive load,
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 abver range may damage the insulation of relay coil.

HF158F-V 1 pole MINIATURE HIGH POWER RELAY

File No.: 40032833

File No.:E134517

File No.:CQC17002176312

Features

- 10A 300VDC high-voltage switching capability
- 5kV dielectric strength(between coil and contacts)
- Creepage distance:10mm
- Meet Reinforce insulation
- Product in accordance to IEC60335-1 available
- Class F insulation system

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating	10A 300VDC 12A 277VAC
Max. switching voltage	420VDC / 300VAC
Max. switching current	16A
Max. switching power	3000W / 3324VA
Mechanical endurance	2 x 10^6OPS
Electrical endurance	1 x 10^4OPS (10A 300VDC, Resistive load, at 85 °C, 1s on 9s off) 1 x 10^4OPS (12A 277VAC, Resistive load, at 85 °C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance *	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance *		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 15g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not that of relay length direction.

COIL

Coil power	Approx. 400mW

COIL DATA at 23°C

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Coil Resistance Ω
5	5	≤3.75	≥0.5	62 x (1±10%)
6	6	≤4.50	≥0.6	90 x (1±10%)
9	9	≤6.75	≥0.9	200 x (1±10%)
12	12	≤9.00	≥1.2	360 x (1±10%)
18	18	≤13.50	≥1.8	810 x (1±10%)
24	24	≤18.00	≥2.4	1440 x (1±10%)

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

SAFETY APPROVAL RATINGS

UL/CUL/VDE	4A 420VDC at 85°C 10A 300VDC at 85°C 16A 180VDC at 85°C 12A 277VAC at 85°C 13A 180VAC at 85°C 14.5A 160VAC at 85°C

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

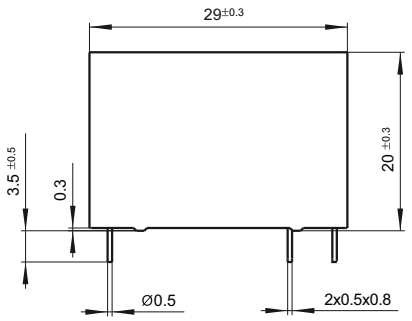
	HF158F-V /	12	-H	2	T	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24VDC					
Contact arrangement	**H:** 1 Form A					
Version	**2:** 5.0mm 1 pole					
Contact material	**T:** $AgSnO_2$					
Special code 3)	**XXX:** Customer special requirement			**Nil:** Standard		

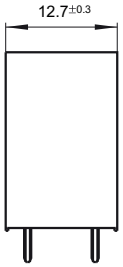
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.);
2) Storage, transportation and installation can not have a strong magnetic field around;
3) The customer special requirement express as special code after evaluating by Hongfa;
4) Product contains magnet, so there will be mutual exclusion or attraction between products. During the installation, please consider the installation mounting distance.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

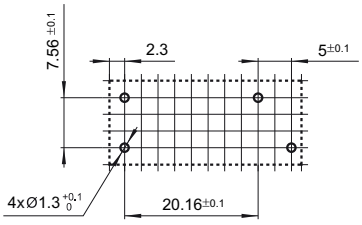
Unit: mm

Outline Dimensions





PCB Layout
(Bottom view)

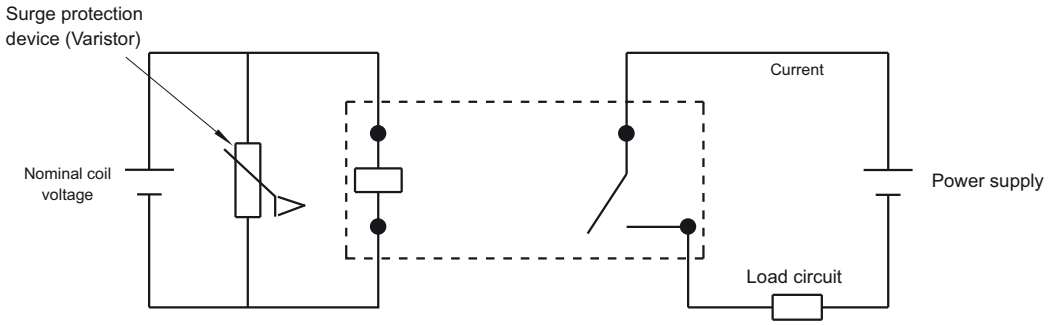


Wiring Diagram
(Bottom view)

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.

CIRCUIT

Load circuit and input circuit (Bottom view)



Notes:

1) The output contact terminals and the input coil terminal are no polarity to distinguish.
2) Please use varistor as surge protection device. If varistor will not be used, the electrical life need to be derated.
3) Varistor surge protection device should be connect parallel to coils. Suitable voltage of varistor is 3 times the coil voltage.
4) Avoid using relay under the strong magnetic field, which will decrease the blast function and magnetic, thus cause the arc can not be interrupted and relay damaged.
5) To avoid using relays under strong magnetic field because it will change the parameters of relay such as pull-in and drop-out voltage.
6) There is magnetic element inside, the magnetism would make the relays stick to each other, in order to avoid the sticking that may lead to deformation or parameter change inside the relay, gap is needed between the relay units.
7) There is magnetic element inside, the magnetism would make the relays repel each other. When more than one relay need in board layout, there should be gap between each units, in order to avoid the repel and soldering issue.

HF175F MINIATURE HIGH POWER RELAY

c UL us
File No.: E133481

File No.: R50412801

CQC
File No.: CQC18002196447
CQC18002202622

Features

- 2 From A and 2 From C configurations
- Low height,ony 15.7mm
- 5kV dielectric strength (between coil and contacts)
- Creepage/clearance distance>10mm，Meets reinforce insulation
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	2H,2Z
Contact resistance	≤100mΩ max(1A 6VDC)
Contact material	$AgSnO_2$
Contact rating(Res.load)	16A 277VAC
Max. switching voltage	277VAC
Max. switching current	16A
Max. switching power	4432VA
Mechanical endurance	5 x 10^6OPS
Electrical endurance	5 x 10^4OPS (2NO:16A 277VAC, General load 85℃，1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contacts sets	2500VAC 1min
Surge voltage (Between coil &contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		≤10ms
Release time (at rated. volt.)		≤5ms
Shock resistance	Functional*	98m/s²
	Destructive	980m/s²
Vibration resistance	NO	10Hz to 55 Hz 1.5mm DA
	NC*	10Hz to 55 Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40℃ to 85℃
Termination		PCB
Unit weight		Approx.16.5g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
(2)*means Non length index

COIL

Coil power	Approx. 800mW
Holding voltage	45% to 110%U_N(at 23℃) 55% to 100%U_N(at 85℃)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max.* Voltage VDC	Coil Resistance Ω
5	≤3.50	≥0.5	7.5	31.3 x (1±10%)
6	≤4.20	≥0.6	9.0	45 x (1±10%)
9	≤6.30	≥0.9	13.5	101.3 x (1±10%)
12	≤8.40	≥1.2	18	180 x (1±10%)
24	≤16.80	≥2.4	36	720 x (1±10%)
48	≤33.60	≥4.8	72	2880 x (1±15%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	2H	16A 277VAC General use 85℃ TV-8 120VAC 50℃ 1HP 240VAC 40℃ Electronic ballast 5A 120VAC 50℃
	2Z	16A 277VAC General use 85℃ NO: TV-8 120VAC 50℃ NO: 1HP 240VAC 40℃ NO:Electronic ballast 5A 120VAC 50℃

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

	HF175F /	12	-2H	T	F	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	**2H:** 2 Form A	**2Z:** 2 Form C				
Contact material	**T:** $AgSnO_2$					
Insulation standard	**F**: Class F					
Special code[3)]	**XXX:** Customer special requirement		**Nil:** Standard			

Notes: 1)We recommand flux proofed types for a clean environment (free from contaminations like H2S, SO2, NO2,dust,etc.)

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

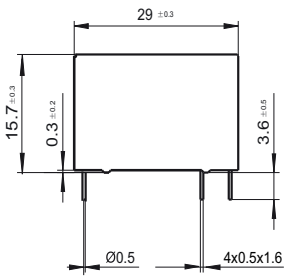
3) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

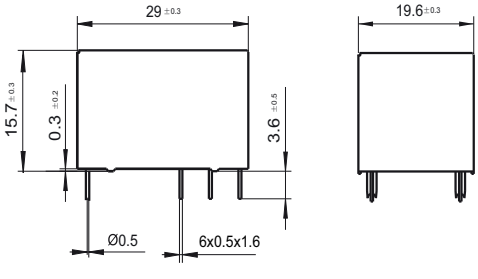
Unit: mm

Outline Dimensions

2 Form A



2 Form C



Wiring Diagram

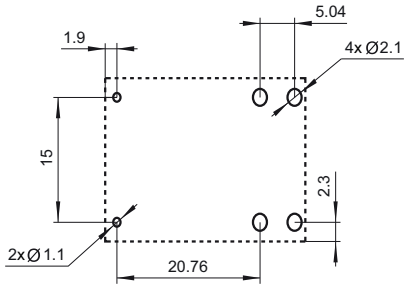
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

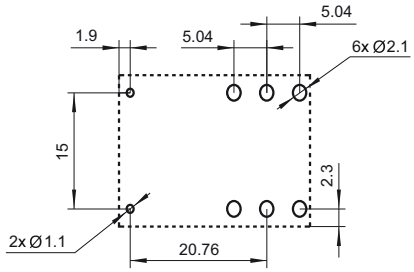
PCB Layout

(Bottom view)

2 Form A



2 Form C



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.

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.

HF14FF MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

File No.:R50140759

CQC
File No.:CQC10002046169

Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- Sockets available
- Plastic sealed and flux proofed types available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: 29.0mm x 13.0mm x 26.0mm

CONTACT DATA

Contact arrangement	1A, 1C
Contact resistance[2)]	50mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgNi, AgCdO
Contact rating	Resistive: 10A 277VAC/30VDC TV-5 120VAC
Max. switching voltage	277VAC / 30VDC
Max. switching current	10A
Max. switching power	2770VA / 300W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1 x 10^5OPS (10A 277VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10^5OPS (10A 30VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) For plastic sealed type, the venting-hole should be excised in electrical endurance test.
2) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination		PCB
Unit weight		Approx. 18g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 530mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC*[3)]	Coil Resistance Ω
3	2.25	0.3	4.2	17 x (1±10%)
5	3.75	0.5	7.0	47 x (1±10%)
6	4.50	0.6	8.4	68 x (1±10%)
9	6.75	0.9	12.6	160 x (1±10%)
12	9.00	1.2	16.8	275 x (1±10%)
18	13.5	1.8	25.2	620 x (1±10%)
24	18.0	2.4	33.6	1100 x (1±10%)
48	36.0	4.8	67.2	4170 x (1±10%)
60	45.0	6.0	84.0	7000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 75% of nominal voltage,special order allowed.
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) 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 coli.

SAFETY APPROVAL RATINGS

UL/CUL	AgCdO	1 Form A	TV-5 120VAC 10A 277VAC General purpose 10A 30VDC Resistive 1/3HP 250VAC 1/4HP 125VAC
		1 Form C	TV-5 120VAC 10A 277VAC General purpose 10A 30VDC Resistive 1/3HP 250VAC NO:1/4HP 125VAC
	$AgSnO_2$ AgNi		10A 277VAC General purpose 10A 30VDC Resistive 1/3HP 250VAC 1/4HP 125VAC TV-5 120VAC
TÜV	AgCdO $AgSnO_2$		10A 250VAC 10A 30VDC

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

	HF14FF /	012	-1H	S	T	F	(XXX)

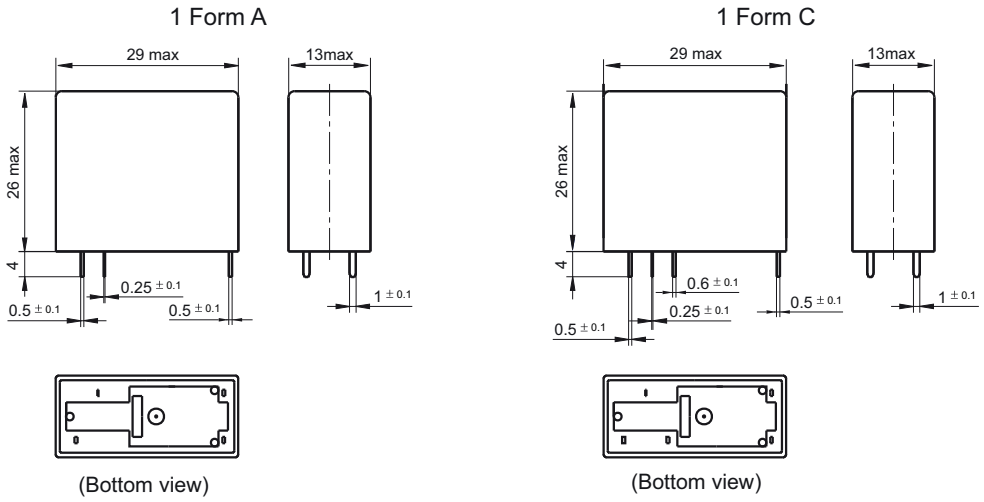
Type	
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48, 60VDC
Contact arrangement	**1H:** 1 Form A **1Z:** 1 Form C
Construction 1)	**S:** Plastic sealed(No smoky-gray cover) **Nil:** Flux proofed
Contact material	**T:** $AgSnO_2$ **3:** AgNi **Nil:** AgCdO
Insulation standard	**F:** Class F **Nil:** Class B
Special code4)	**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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The standard type is made of black cover. If smoke cover is required, please add a special suffix (611) when ordering. Please take note that smoke cover is only availabe for flux proofed type.
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



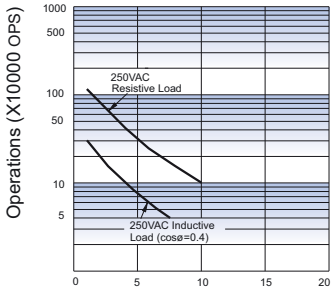
Wiring Diagram (Bottom view)

PCB Layout (Bottom view)

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 2.5mm.

CHARACTERISTIC CURVES

ENDURANCE CURVE

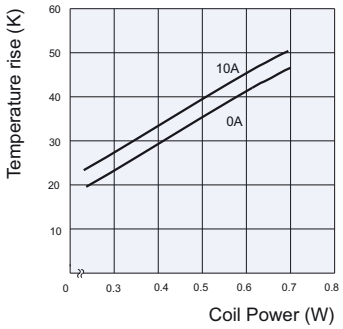


Test conditions:

No contact, Resistive load,

Flux proofed, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



HF14FW MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:40023508

CQC
File No.:CQC10002046170

Features

- 20A switching capability
- 4kV dielectric strength (between coil and contacts)
- Meeting VDE 0700, 0631 reinforce insulation
- 1 Form A, 1 Form B and 1 Form C configurations
- Sockets available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact resistance[2)]	50mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating	Resistive: 16A 240VAC/24VDC 1HP 240VAC TV-8 125VAC (NO contact)
Max. switching voltage	277VAC / 30VDC
Max. switching current	20A
Max. switching power	5540VA / 480W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1 x 10^5OPS (NO or NC, 16A 240VAC, Resistive load, Room temp., 1s on 9s off) 5 x 10^4OPS (NO or NC, 16A 24VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Ambient temperature		-40˚C to 85˚C
Humidity		5% to 85% RH
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB
Unit weight		Approx. 18.5g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Standard: Approx.720mW Sensitive: Approx.530mW

COIL DATA at 23˚C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.[3)]	Drop-out Voltage VDC min.[3)]	Max. Voltage VDC*[4)]	Coil Resistance Ω
5	3.6	0.5	5.5	36 x (1±10%)
6	4.3	0.6	6.6	50 x (1±10%)
9	6.5	0.9	9.9	115 x (1±10%)
12	8.6	1.2	13.2	200 x (1±10%)
18	13.0	1.8	19.8	460 x (1±10%)
24	17.3	2.4	26.4	820 x (1±10%)
48	34.6	4.8	52.8	3300 x (1±10%)
60	43.2	6.0	66.0	5100 x (1±10%)

Sensitive type

Nominal Voltage VDC	Pick-up Voltage VDC max.[3)]	Drop-out Voltage VDC min.[3)]	Max. Voltage VDC*[4)]	Coil Resistance Ω
5	3.60	0.5	7.0	47 x (1±10%)
6	4.30	0.6	8.4	68 x (1±10%)
9	6.50	0.9	12.6	160 x (1±10%)
12	8.60	1.2	16.8	275 x (1±10%)
18	13.0	1.8	25.2	620 x (1±10%)
24	17.3	2.4	33.6	1100 x (1±10%)
48	34.6	4.8	67.2	4170 x (1±10%)
60	43.2	6.0	84.0	7000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 72% of nominal voltage, special order allowed.
2) Suggesting to use the sensitive type.
3) The data shown above are initial values.
4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
5) 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 coli.

SAFETY APPROVAL RATINGS

UL/CUL	Standard, Sensitive	$AgSnO_2$	20A/16A/12A 277VAC Resistive 1HP (8 FLA) 240VAC TV-8 125VAC 16A 240VAC General Use 20A/16A/12A 24VDC 10FLA 60LRA 250VAC
		AgCdO	20A/16A/12A 277VAC Resistive 1HP (8 FLA) 240VAC 16A 240VAC General Use 20A/16A/12A 24VDC 20A 125VAC General Use
	(136)	$AgSnO_2$	20A 125VAC Resistive 20A 277VAC/250VAC/125VAC General Use 16A 277VAC/250VAC/125VAC Resistive 20A 30VDC Resistive 1/2HP 250VAC/125VAC TV-10 125VAC 10FLA 60LRA 250VAC
VDE (Coil power is 530mW)	$AgSnO_2$	1 Form A	20A 250VAC at 70℃ 16A 30VDC at 70℃
		1 Form C	16A 250VAC at 70℃ 16A 30VDC at 70℃ NO:20A 250VAC at 70℃

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

HF14FW / 012 -H S P T F (XXX)

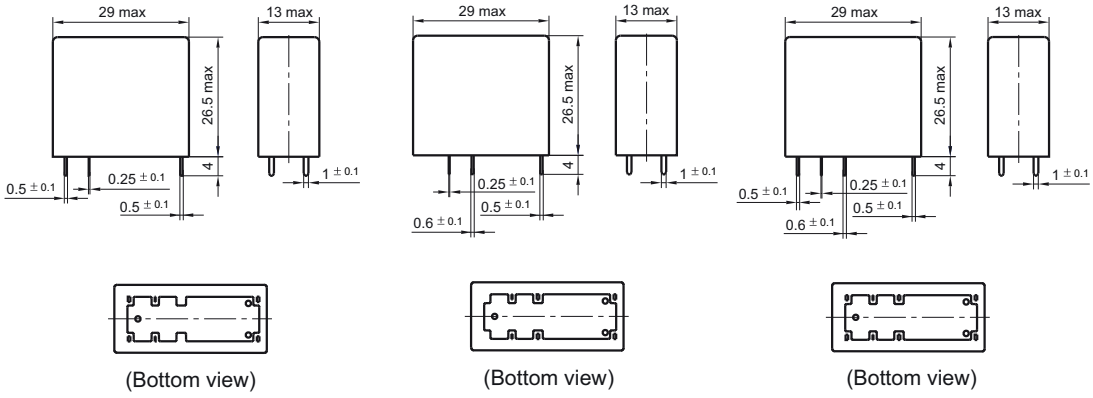
Type		
Coil voltage	5, 6, 9, 12, 18, 24, 48, 60VDC	
Contact arrangement	**H:** 1Form A **D:** 1 Form B **Z:** 1 Form C	
Construction[1)]	**S:** Plastic sealed(No smoky-gray cover)	**Nil:** Flux proofed
Coil power	**P:** Standard	**Nil:** Sensitive
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO
Insulation 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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The standard type is made of black cover. If smoky-gray cover is required, please add a special suffix (611) when ordering. Please take note that smoky-gray cover is only availabe for flux proofed.
4) The customer special requirement express as special code after evaluating by Hongfa.

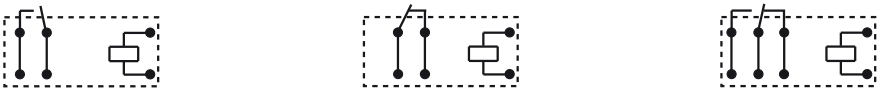
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

1 Form A | 1 Form B | 1 Form C

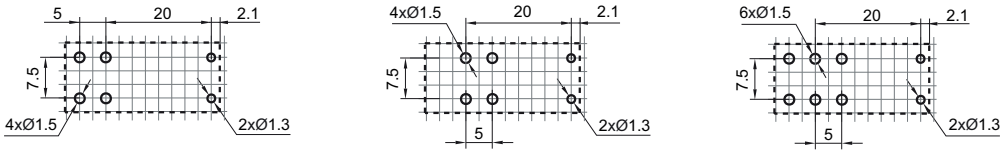
Outline Dimensions



Wiring Diagram
(Bottom view)



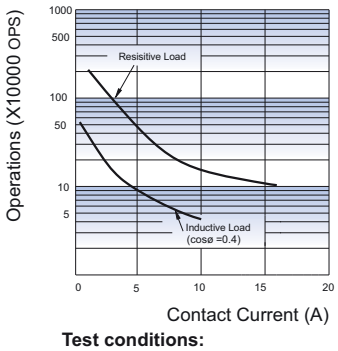
PCB Layout
(Bottom view)



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 2.5mm.

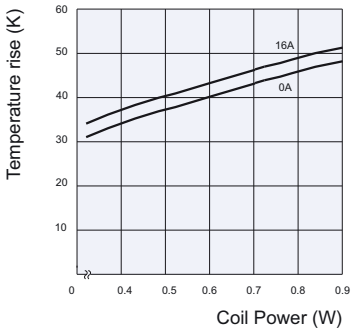
CHARACTERISTIC CURVES

ENDURANCE CURVE



Test conditions:
No contact, Resistive load,
Flux proofed, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



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.

HF140FF MINIATURE INTERMEDIATE POWER RELAY

c UL us
File No.:E134517

File No.:R50149131

File No.:CQC10002046173

Features

- 10A switching capability
- 5kV dielectric strength (between coil and contacts)
- 2.0mm contact gap available
- Sockets available
- Plastic sealed and flux proofed types available

CONTACT DATA

Contact arrangement	2H, 2Z
Contact resistance 1)	50mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgNi, AgCdO
Contact rating (Res. load)	10A 250VAC 8A 30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	10A
Max. switching power	2500VA / 240W
Mechanical endurance	Standard: 1 x 10^7OPS W type(1.5mm): 5 x10^5OPS W type(2.0mm): 3 x10^5OPS
Electrical endurance	1 x 10^5OPS (NO or NC, 10A 250VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10^5OPS (NO or NC, 8A 30VDC, Resistive load, Room temp., 1s on 9s off)

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be excised in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between contacts sets	3000VAC 1min
	Between open contacts	Standard:1000VAC 1min W type(1.5mm):2000VAC 1min W type(2.0mm):2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50 μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		5ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mmDA
Termination		PCB
Unit weight		Approx. 18g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Standard: Approx. 530mW W type(1.5mm): Approx. 800mW W type(2.0mm): Approx. 1.4W

COIL DATA at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. 2)	Drop-out Voltage VDC min. 2)	Max. Voltage VDC* 3)	Coil Resistance Ω
3	2.40	0.3	3.9	17 x (1±10%)
5	4.00	0.5	6.5	47 x (1±10%)
6	4.80	0.6	7.8	68 x (1±10%)
9	7.20	0.9	11.7	160 x (1±10%)
12	9.60	1.2	15.6	275 x (1±10%)
18	14.40	1.8	23.4	620 x (1±10%)
24	19.20	2.4	31.2	1100 x (1±10%)
48	38.40	4.8	62.4	4170 x (1±10%)
60	48.00	6.0	78.0	7000 x (1±10%)

COIL DATA

at 23˚C

W Type (1.5mm)

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Allowable Voltage VDC*[3)]	Coil Resistance Ω
3	2.25	0.3	3.3	11.3 x (1±10%)
5	3.75	0.5	5.5	31 x (1±10%)
6	4.50	0.6	6.6	45 x (1±10%)
9	6.75	0.9	9.9	101 x (1±10%)
12	9.00	1.2	13.2	180 x (1±10%)
18	13.5	1.8	19.8	405 x (1±10%)
24	18.0	2.4	26.4	720 x (1±10%)
48	36.0	4.8	52.8	2880 x (1±10%)
60	45.0	6.0	66.0	4500 x (1±10%)

W Type (2.0mm)

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Allowable Voltage VDC*[3)]	Coil Resistance Ω
5	3.75	0.5	5.5	18 x (1±10%)
6	4.50	0.6	6.6	26 x (1±10%)
9	6.75	0.9	9.9	58 x (1±10%)
12	9.00	1.2	13.2	102 x (1±10%)
24	18.0	2.4	26.4	410 x (1±10%)
48	36.0	4.8	52.8	1650 x (1±10%)

Notes: 1) When require pick-up voltage < 75% of nominal voltage, special order allowed.
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) 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 coli.
5) For the CO version whose contact gap is 1.5 mm, the operation voltage ⩽85% of rated voltage.

SAFETY APPROVAL RATINGS

UL/CUL	Standard	AgCdO	2H 2Z	TV-3 125VAC 10A 250VAC 10A 30VDC 1/4HP 240VAC 1/8HP 120VAC
		AgNi	2H3 2Z3	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C
		$AgSnO_2$	2HT	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C 3/4HP 250VAC at 40˚C
			2ZT	10A 250VAC 10A 30VDC 12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C 3/4HP 250VAC at 40˚C
	W type	AgCdO	2H	TV-3 125VAC 10A 250VAC
		$AgSnO_2$	2HT	12A 277VAC/250VAC Resistive at 70˚C 1/3HP 125VAC at 40˚C 3/4HP 250VAC at 40˚C
TÜV		AgCdO	2H 2Z	10A 250VAC 10A 30VDC
		AgNi	2H3	12A 250VAC
			2Z3	10A 250VAC
		$AgSnO_2$	2HT	12A 250VAC

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

	HF140FF/	012	-2H	S	W	T	G	F	(XXX)
Type									
Coil voltage	3, 5, 6, 9, 12, 18, 24, 48, 60VDC								
Contact arrangement	**2H:** 2 Form A **2Z:** 2 Form C								
Construction[1)2)]	**S:** Plastic sealed(No smoky-gray cover) **Nil:** Flux proofed								
Contact Gap	**W:** Large contact gap(Only for 2 Form A)[3)] **Nil:** Standard								
Contact material	**T:** $AgSnO_2$ **3:** AgNi **Nil:** AgCdO								
Contact plating	**G:** Gold plated **Nil:** No gold plated								
Insulation standard	**F:** Class F **Nil:** Class B								
Special code[5)]	**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 H2S, SO2, NO2, dust, etc).

2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) There are two specifications to W type: 1.5mm contact gap and 2.0mm contact gap.The default W type is 1.5mm. So please add the special code "(456)" when releasing order,if 2.0mm(only for 2A type) contact gap is required.

4) The standard type is made of black cover. If smoke cover is required, please add a special suffix (611) when ordering. Please take note that smoke cover is only availabe for flux proofed type.

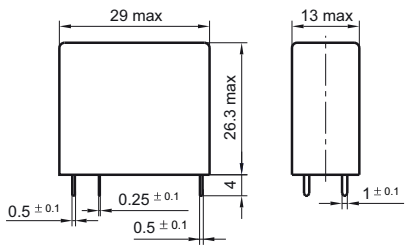
5) The customer special requirement express as special code after evaluating by Hongfa. e.g.(456) means contact gap can reach 2.0mm.

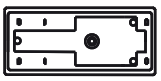
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

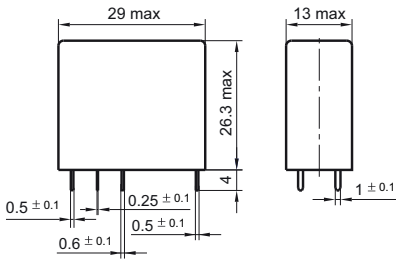
2 Form A

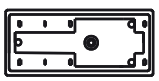




(Bottom view)

2 Form C





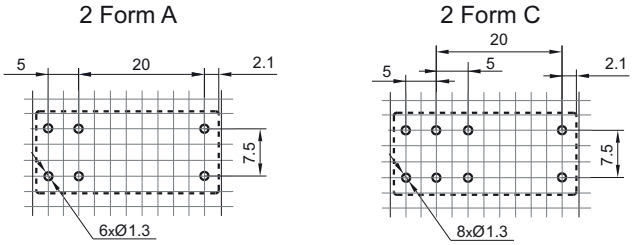
(Bottom view)

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Bottom view)

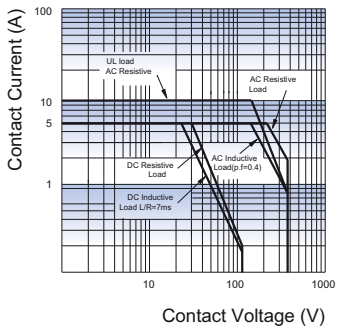
PCB Layout (Bottom view)



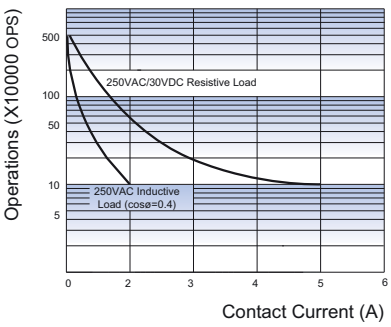
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

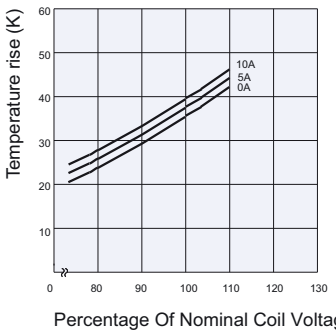
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:
No, Resistive load, Flux proofed,
Room temp., 1s on 9s off.

HF25F SUBMINIATURE HIGH POWER RELAY

File No.:E134517

File No.:40026917

File No.:R50207576

File No.:CQC09002028692

Features

- Small and for microwave oven
- 20A switching capability
- 1.5HP 250VAC approved by UL standard
- 5kV impulse withstand voltage (between coil and contacts)
- PCB & QC layouts
- Flux proofed types available

CONTACT DATA

Contact arrangement	1A
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating	Resistive: 20A 250VAC 1.5HP 250VAC
Max. switching voltage	250VAC / 30VDC
Max. switching current	20A
Max. switching power	5000VA / 480W
Mechanical endurance	2 x 10^6OPS
Electrical endurance	1 x 10^5OPS (20A 250VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Humidity		5% to 85% RH
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Ambient temperature		-40˚C to 85˚C
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		PCB & QC
Unit weight		Approx. 16.5g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F

COIL

Coil power	Approx. 500mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.[2)]	Max. Voltage VDC *[3)]	Coil Resistance Ω
5	3.75	0.25	6.50	50 x (1±10%)
6	4.50	0.30	7.80	72 x (1±10%)
9	6.75	0.45	11.7	162 x (1±10%)
12	9.00	0.60	15.6	288 x (1±10%)
18	13.5	0.90	23.4	648 x (1±10%)
24	18.0	1.20	31.2	1152 x (1±10%)

Notes: 1) The data shown above are initial values.
2) When requiring pick-up voltage <75% of nominal voltage, special order allowed.
3) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	20A 250VAC 16A 30VDC 1.5HP 250VAC
VDE	20A 250VAC 16A 30VDC
TÜV	20A 250VAC 16A 30VDC

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

	HF25F /	012	-H	1	(XXX)
Type					
Coil voltage	5, 6, 9, 12, 18, 24VDC				
Contact arrangement	**H:** 1 Form A				
Version	**1:** 1 type **2:** 2 type **3:** 3 type **4:** 4 type **Nil:** Standard type				
Special code[2)]	**XXX:** Customer special requirement **Nil:** Standard				

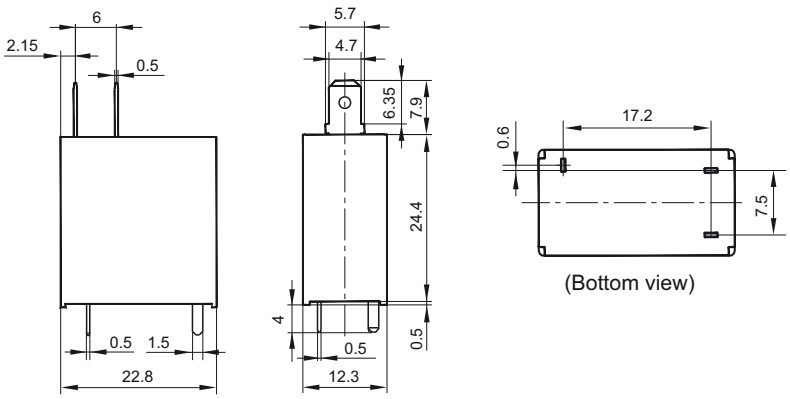
Notes: 1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
2) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

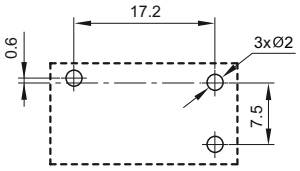
Unit: mm

Standard:

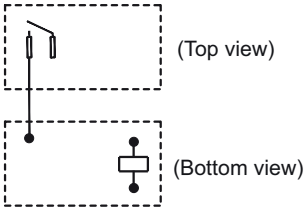
Outline Dimensions



PCB Layout (Bottom view)

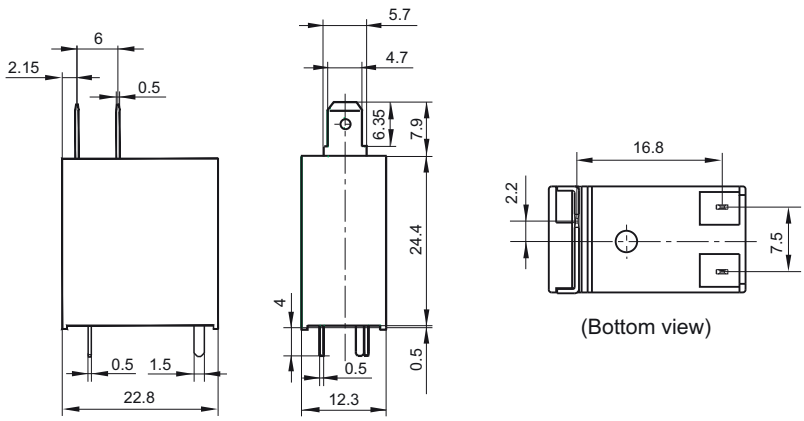


Wiring Diagram

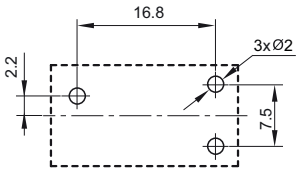


1 type:

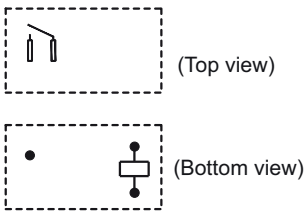
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram

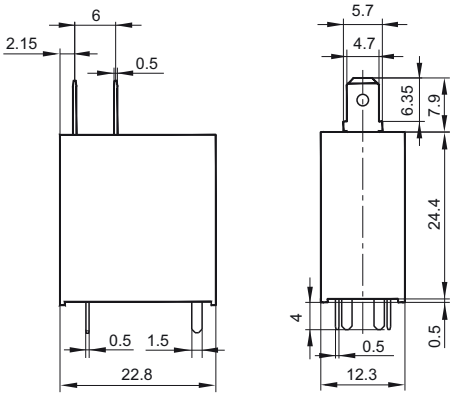


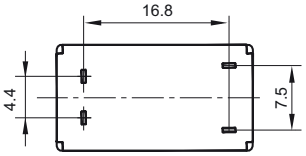
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

2 type:

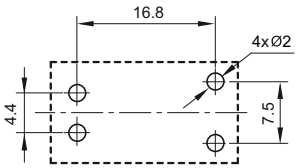
Outline Dimensions



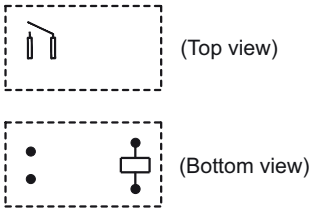


(Bottom view)

PCB Layout (Bottom view)



Wiring Diagram

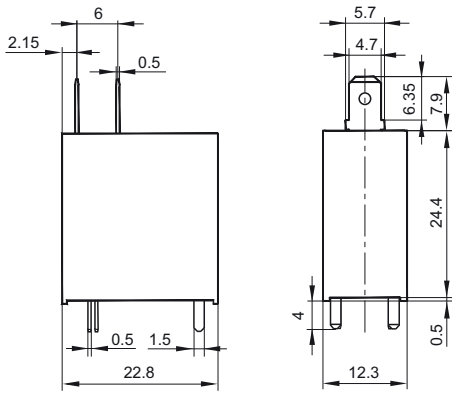


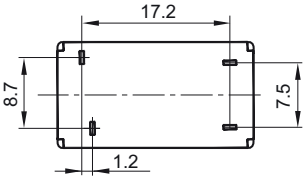
(Top view)

(Bottom view)

3 type:

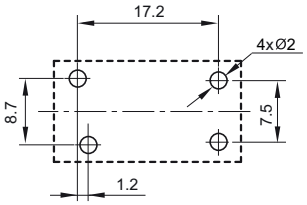
Outline Dimensions



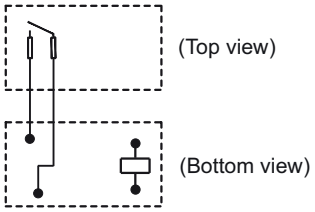


(Bottom view)

PCB Layout (Bottom view)



Wiring Diagram



(Top view)

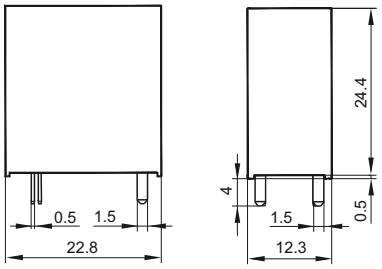
(Bottom view)

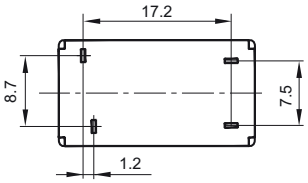
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

4 type:

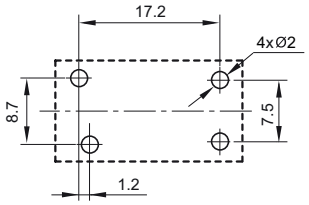
Outline Dimensions





(Bottom view)

PCB Layout (Bottom view)



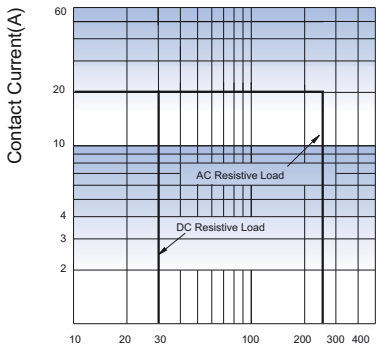
Wiring Diagram

(Bottom view)

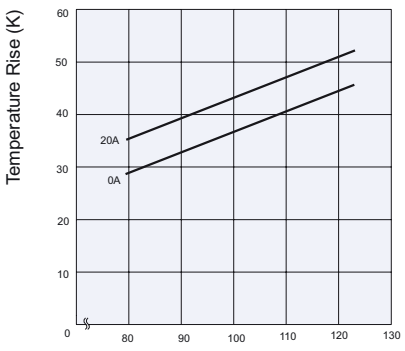
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



COIL TEMPERATURE RISE



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.

HF62F MINIATURE HIGH POWER RELAY

c UL us
File No.:E133481

File No.:R50147086

CQC
File No.:CQC09002028470

Features

- 20A switching capability
- 5kV dielectric strength (between coil and contacts)
- 10kV impulse withstand voltage (between coil and contacts)
- creepage distance: 8mm
- PCB & QC layouts available

CONTACT DATA

Cantact arrangement	1A
Contact resistance 1)	50mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	16A 250VAC 16A 30VDC
Max. switching voltage	277VAC / 30VDC
Max. switching current	20A
Max. switching power	4000VAC / 480W
Mechanical endurance	1 x 10^7OPS
Electrical endurance	1 x 10^5OPS (16A 250VAC, Resistive load, Room temp., 1s on 1s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Termination		T type: PCB Standard: PCB & QC
Unit weight		Approx.15g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 540mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	4.0	0.5	6.50	47 x (1±10%)
6	4.8	0.6	7.80	68 x (1±10%)
9	7.2	0.9	11.7	155 x (1±10%)
12	9.6	1.2	15.6	270 x (1±10%)
18	14.4	1.8	23.4	620 x (1±10%)
24	19.2	2.4	31.2	1100 x (1±10%)
48	38.4	4.8	62.4	4400 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC 16A 30VDC 20A 125VAC
TÜV	16A 250VAC COSØ =1 16A 30VDC COSØ =1

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

	HF62F /	012	-1H	T	F	(XXX)
Type						
Coil voltage	5, 6, 9, 12, 18, 24, 48VDC					
Contact arrangement	**1H:** 1 Form A					
Termination	**T:** PCB	**Nil:** PCB & QC				
Insulation Standard	**F:** Class F	**Nil:** Class B				
Special code[1)]	**XXX:** Customer special requirement	**Nil:** Standard				

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

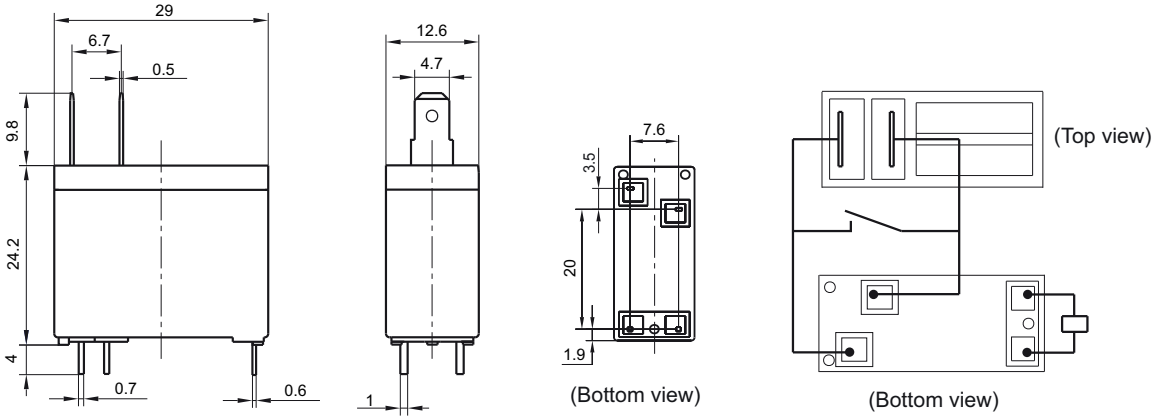
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

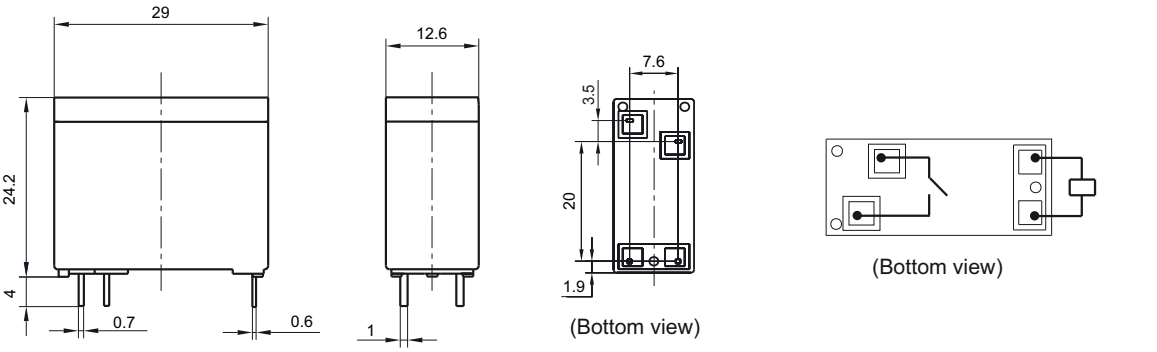
Outline Dimensions

Wiring Diagram

Standard



T type

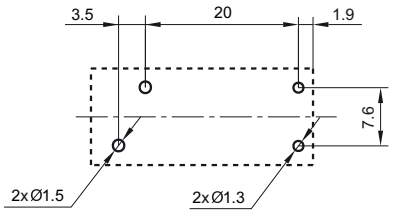


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout

(Bottom view)

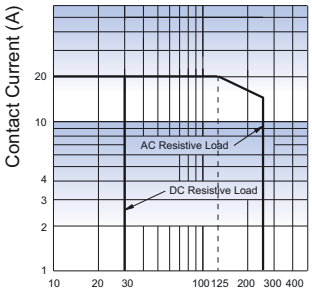


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

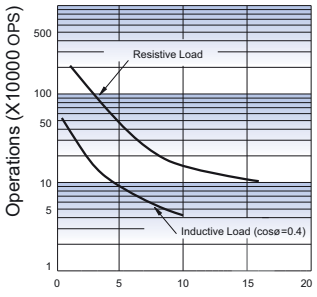
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

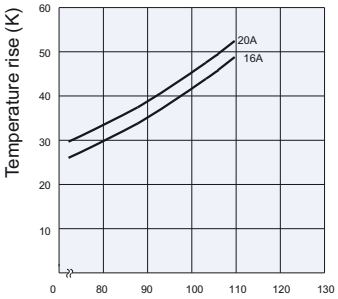


ENDURANCE CURVE



Test conditions:
Room temp., 1s on 1s off

COIL TEMPERATURE RISE



Disclaimer

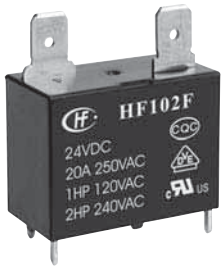
The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the 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.

HF102F MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:40024142

File No.:CQC13002098165



Features

- 4.5kV dielectric strength (between coil and contacts)
- Heavy load up to 5000VA
- Ideal for motor switching
- PCB & QC layouts available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating	Resistive: 20A 250VAC Motor: 2HP 240VAC
Max. switching voltage	250VAC
Max. switching current	Resistive: 25A
Max. switching power	6250VA
Mechanical endurance	2 x 10^6OPS
Electrical endurance	1 x 10^5OPS (20A 250VAC, Resistive load, at 85°C, 1.5s on 1.5s off)

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

COIL

Coil power	Approx. 900mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.5	0.5	6.0	27.8 x (1±10%)
12	8.4	1.2	14.4	160 x (1±10%)
24	16.8	2.4	28.8	640 x (1±10%)
48	33.6	4.8	57.6	2560 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		60K max.
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-25°C to 85°C
Humidity		5% to 85% RH
Termination		HF102F: PCB & QC HF102F-P: PCB
Unit weight		Approx. 23g
Construction		Dust protected

Notes: The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	25A 250VAC 20A 250VAC 1HP 120VAC 2HP 240VAC
VDE	25A 250VAC at 55°C 20A 250VAC at 85°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

	HF102F /	T	12VDC	(XXX)
Type	HF102F-P: PCB HF102F: PCB & QC			
Contact matcrial	**T**: $AgSnO_2$ **Nil**: AgCdO			
Coil voltage	5, 12, 24, 48VDC			
Special code[2)]	**XXX:** Customer special requirement **Nil:** Standard			

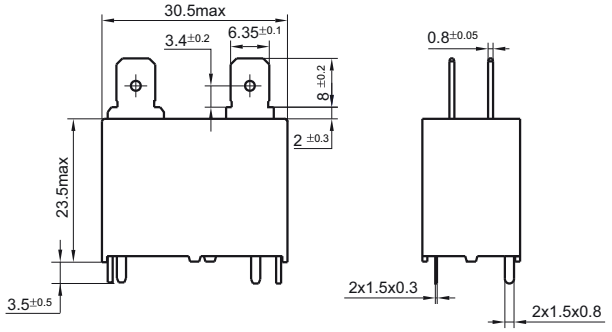
Notes: 1) HF102F is dust protected version which cannot be washed.
2) The customer special requirement express as special code after evaluating by Hongfa.

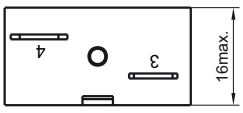
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

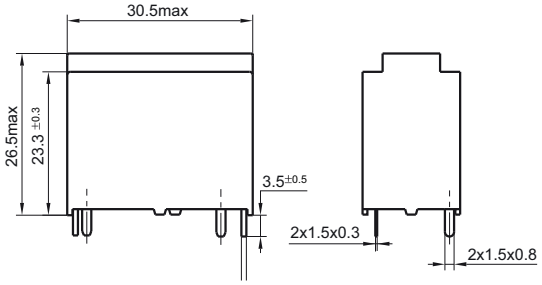
HF102F

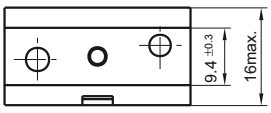




(Top view)

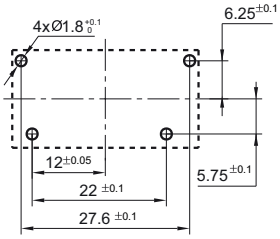
HF102F-P



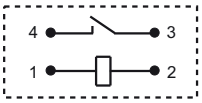


(Top view)

PCB Layout (Bottom view)



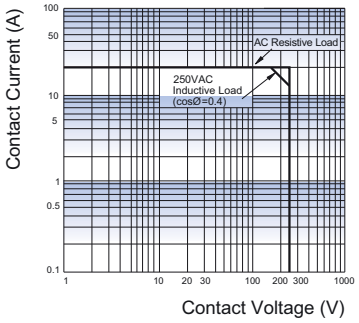
Wiring Diagram



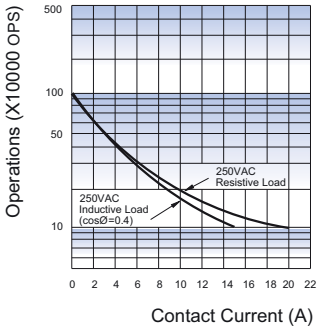
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



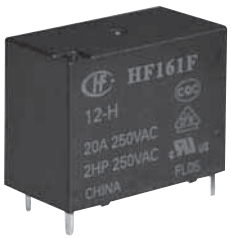
Test conditions:
Room temp. 1s on 9s off

HF161F MINIATURE HIGH POWER RELAY

File No.: E134517

File No.: 40031410

File No.:CQC10002050943
CQC18002203499



Features

- 4.5kV dielectric strength (between coil and contacts)
- Heavy load up to 6250VA
- Ideal for motor switching
- PCB layouts available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating	Resistive: 20A 250VAC Motor: 2HP 250VAC
Max. switching voltage	250VAC
Max. switching current	Resistive: 25A
Max. switching power	6250VA
Mechanical endurance	2 x 10^6OPS
Electrical endurance	HT type: 1 x 10^5OPS (20A 250VAC, Resistive load, Room temp., 1.5s on 1.5s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	1000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 / 50μs)
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		60K max.
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 85°C
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 21g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 900mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC*2)	Coil Resistance Ω
5	3.5	0.5	6.0	27.8 x (1±10%)
12	8.4	1.2	14.4	160 x (1±10%)
24	16.8	2.4	28.8	640 x (1±10%)
48	33.6	4.8	57.6	2560 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	25A 250VAC at 85°C 20A 250VAC at 85°C 2HP 250VAC at 85°C
VDE	25A 250VAC at 85°C 20A 250VAC at 85°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

	HF161F /	12	-H	T	(XXX)
Type					
Coil voltage	5, 12, 24, 48VDC				
Contact arrangement	**H:** 1 Form A				
Contact matcrial	**T:** $AgSnO_2$	**Nil**: AgCdO			
Special code[3)]	**XXX:** Customer special requirement		**Nil:** Standard		

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

2) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.

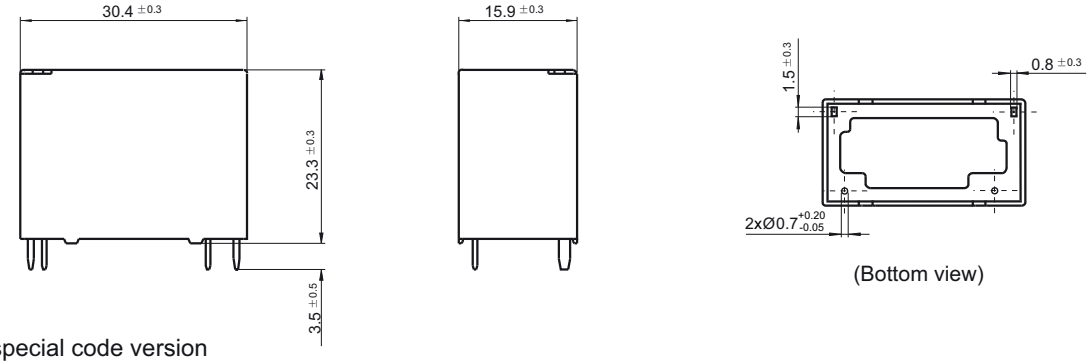
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (414) stands for product with coil terminal of 1.4X0.4.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

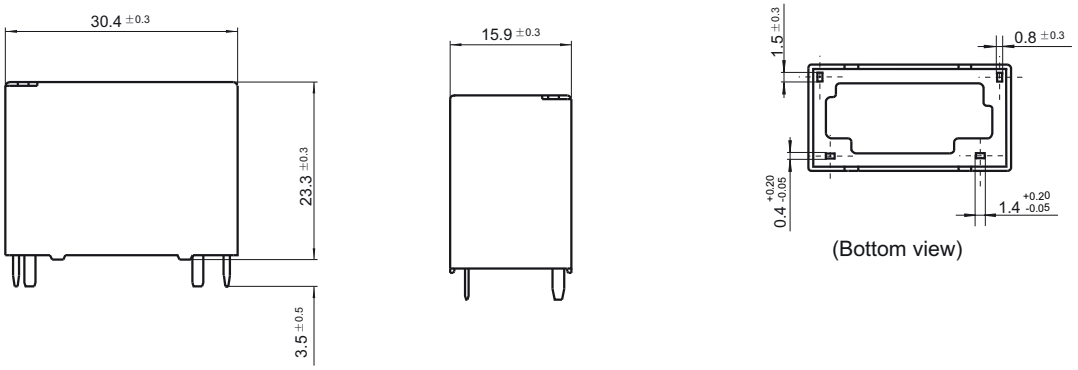
Unit: mm

Outline Dimensions

Standard type

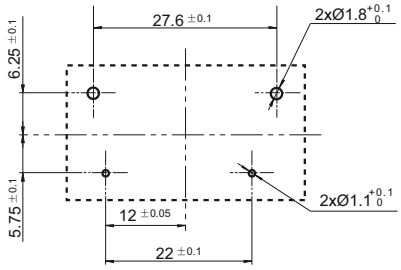


(414) special code version

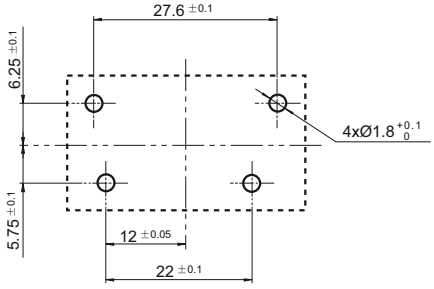


PCB Layout (Bottom view)

Standard type



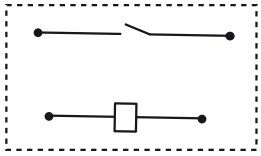
(414) special code version



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

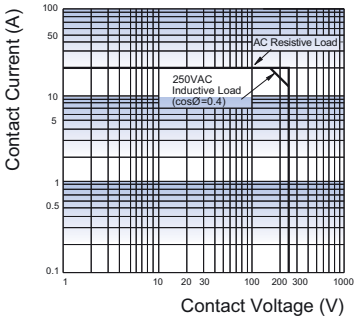
Wiring Diagram



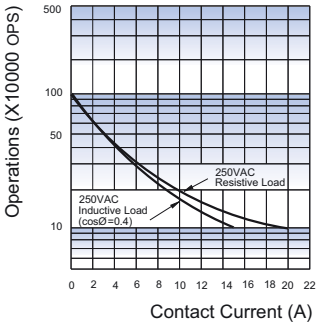
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:
Room temp., 1s on 9s off.

HF161F-W SOLAR RELAY

File No.:E134517

File No.:40031410

File No.:CQC10002050943
CQC18002203499

Features

- 31A switching capacity
- Applicable to inverter used for photovoltaic power generation systems
- Ideal for UPS
- 1.5mm contact gap (compliant to European Photovoltaic Standard VDE0126)
  1.8mm contact gap (compliant to IEC 62109-2-2011)
- The clearance distance between contact and coil is bigger than 6.4mm, the creepage distance is bigger than 8mm. (special code 477:7.5mm)
- Low coil holding voltage contributes to saving energy of equipment.
- UL insulation system: Class F

CONTACT DATA

Contact gap	1.5mm	1.8mm
Contact arrangement	1A	
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$	
Contact rating	Resistive: 26A 250VAC Inductive: 31A 250VAC (cosø=0.8) 0.1s:10s	Resistive: 26A 250VAC Inductive: 33A 250VAC (cosø=0.8) 0.1s:10s
Max. switching voltage	277VAC	
Max. switching current	31A	33A
Max. switching power	7750VA	8250VA
Mechanical endurance	1 x 10^6OPS	1 x 10^5OPS
Electrical endurance	HT type: 3 x 10^4OPS (26A 250VAC, Resistive load, at 75°C, 1.5s on 1.5s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		95K max. (Contact load current 31A, rated voltage excitation, at 60°C)
		70K max. (Contact load current 31A, 80% of rated voltage excitation, at 85°C)
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil, which is 45% to 80% that of rated voltage)
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 21g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 1.4W
Holding voltage	35% to 120%UN (at 23°C) 45% to 80%UN (at 85°C)

Notes: 1)The coil holding voltage is the voltage of coil after being applied rated voltage for 100ms
2)The relay col does not allow applied more than maximum of holding voltage values for a long time (Eg: 120% Un at 23°C; 80% Un at 85°C) , prevent overheating burned.

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
9	6.3	0.9	10.8	58 x (1±10%)
12	8.4	1.2	14.4	103 x (1±10%)
18	12.6	1.8	21.6	230 x (1±10%)
24	16.8	2.4	28.8	410 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	$AgSnO_2$	26A 277VAC at 75°C 22A 277VAC at 85°C
VDE	$AgSnO_2$	26A 277VAC at 75°C 22A 277VAC at 85°C 31A 250VAC cosØ =0.8 0.1s:10s 33A 250VAC cosØ =0.8 0.1s:10s (477)

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

	HF161F-W /	12	-H	T	(XXX)
Type					
Coil voltage	9, 12, 18, 24VDC				
Contact arrangement	**H:** 1 Form A				
Contact matcrial	**T:** $AgSnO_2$				
Special code[3)]	**XXX:** Customer special requirement		**Nil:** Standard		

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

2) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.

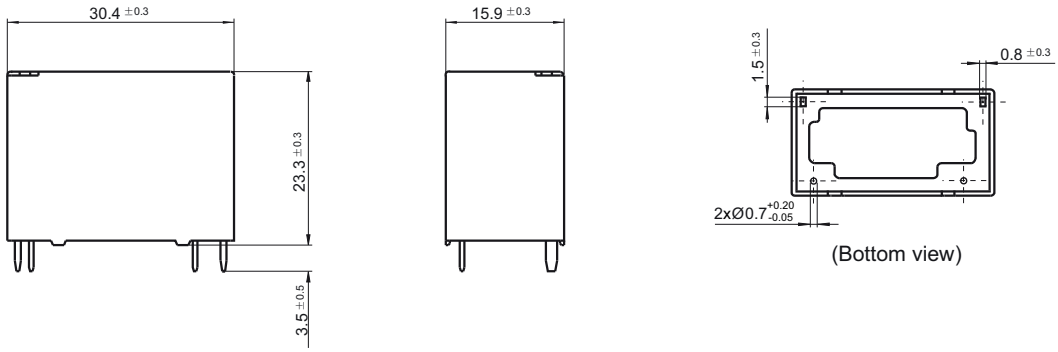
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (414) stands for product with coil terminal of 1.4X0.4; e.g. (477) stands for Contact gap: 1.8mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

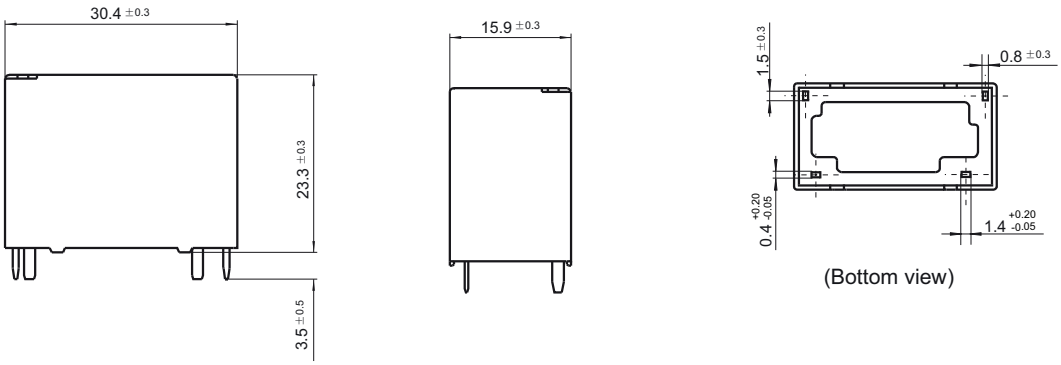
Unit: mm

Outline Dimensions

Standard type



(414) special code version

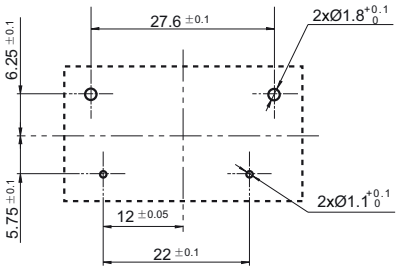


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

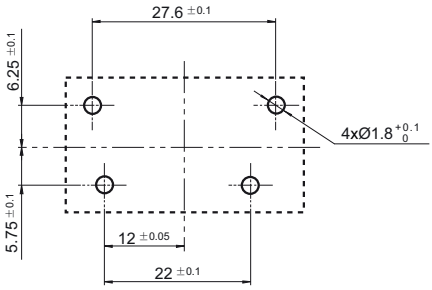
Unit: mm

PCB Layout (Bottom view)

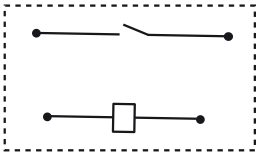
Standard type



(414) special code version



Wiring Diagram

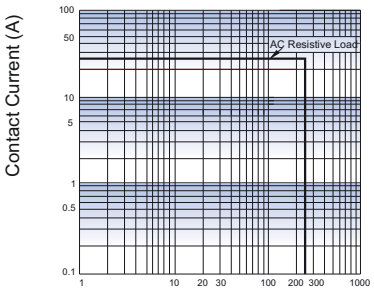


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

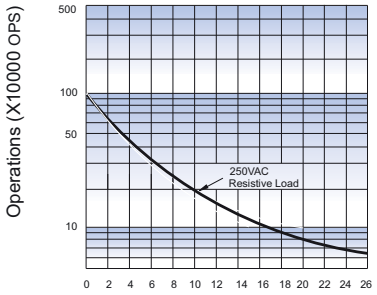
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:

at 75°C, 1.5s on 1.5s off.

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.

HF160F MINIATURE HIGH POWER RELAY

File No.:E134517

File No.: 40024142

File No.: CQC12002072207
CQC18002206453

Features

- 4.5kV dielectric strength (between coil and contacts)
- Heavy load up to 6250VA
- Ideal for motor switching
- PCB & QC layouts
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance[1)]	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating	Resistive: 20A 250VAC Motor: 2HP 240VAC
Max. switching voltage	Resistive: 250VAC
Max. switching current	25A
Max. switching power	6250VA
Mechanical endurance	2 x 10^6OPS
Electrical endurance	H, HT type: 1 x 10^5OPS (20A 250VAC, Resistive load, at 60℃, 1.5s on 1.5s off)

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 900mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC*[2)]	Coil Resistance Ω
5	3.5	0.5	6.0	27.8 x (1±10%)
12	8.4	1.2	14.4	160 x (1±10%)
24	16.8	2.4	28.8	640 x (1±10%)
48	33.6	4.8	57.6	2560 x (1±10%)

Notes: 1)The data shown above are initial values.
2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		60K max.
Shock resistance	Functional	196m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40˚C to 85˚C
Humidity		5% to 85% RH
Termination		PCB & QC
Unit weight		Approx. 26g
Construction		Flux proofed

Notes: The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	25A 277VAC 20A 250VAC 1HP 120VAC 2HP 240VAC
VDE	25A 250VAC at 55˚C 20A 250VAC at 85˚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

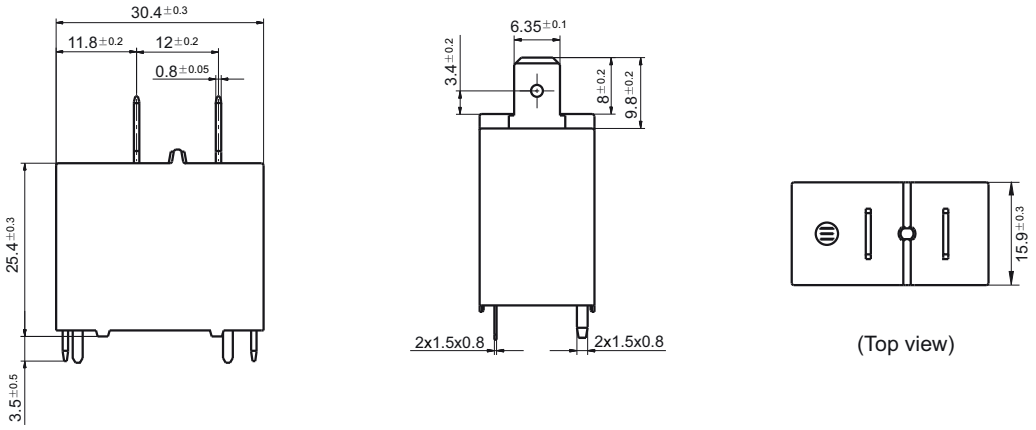
	HF160F /	12	-H	5	T	(XXX)
Type						
Coil voltage	5, 12, 24, 48VDC					
Contact arrangement	**H**: 1 Form A					
Termination	**5**: PCB & QC					
Contact matcrial	**T**: $AgSnO_2$ **Nil**: AgCdO					
Special code[3]	**XXX:** Customer special requirement **Nil:** Standard					

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
2) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

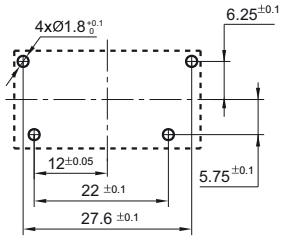
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

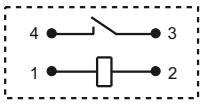
Outline Dimensions



PCB Layout (Bottom view)



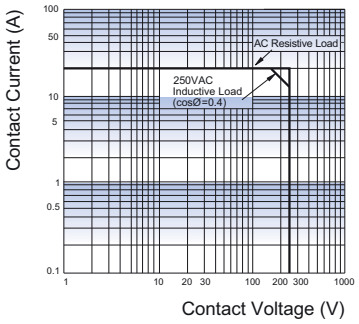
Wiring Diagram



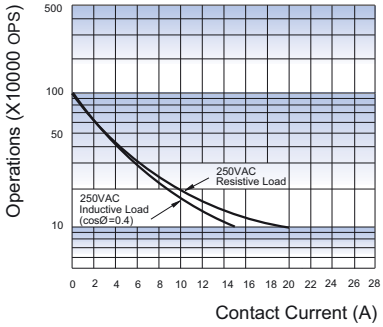
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:
Room temp., 1s on 9s off.

HF166F MINIATURE HIGH POWER LATCHING RELAY

c UL us
File No.:E133481

File No.:R50280244

Features

- Latching relay
- 4mm contact gap available
- 25A switching capability
- 5kV dielectric strength(between coil and contacts)
- Creepage distance between coil and contacts:10mm
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F
- 1A + 1B configuration for power switching
- Flux proofed type available

CONTACT DATA

Contact arrangement	1A+1B
contact gap	4mm min.
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	25A 277VAC
Max. switching voltage	277VAC
Max. switching current	25A
Max. switching power	6925VA
Mechanical endurance	6 x 10^5OPS
Electrical endurance	3 x 10^4OPS (NO or NC, 25A 277VAC, Resistive load, at 85℃, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	2000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50μs)
Set time (at rated. volt.)		25ms max.
Reset time (at rated. volt.)		25ms max.
Shock resistance	Functional	100m/s²
	Destructive	1000m/s²
Vibration resistance		10Hz to 55Hz 2mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 45g
Construction		Flux proofed

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

COIL

Coil power	1 coil latching: 1.2W 2 coils latching: 2.4W

COIL DATA at 23˚C

1 coil latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse width (ms) min.1)	Reset Voltage VDC max.1)	Coil Resistance Ω
5	4	150	4	20.8x (1±10%)
6	4.8	150	4.8	30x (1±10%)
12	9.6	150	9.6	120x (1±10%)
24	19.2	150	19.2	480x (1±10%)
48	38.4	150	38.4	1920x (1±10%)

2 coils latching

Nominal Voltage VDC	Set Voltage VDC max.1)	Pulse width (ms) min.1)	Reset Voltage VDC max.1)	Coil Resistance Ω
5	4	150	4	10.4x (1±10%)
6	4.8	150	4.8	15x (1±10%)
12	9.6	150	9.6	60x (1±10%)
24	19.2	150	19.2	240x (1±10%)
48	38.4	150	38.4	960x (1±10%)

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

SAFETY APPROVAL RATINGS

UL/CUL	25A 277VAC/250VAC/125VAC at 85˚C 25A 60VDC at 85˚C 0.5A 240VDC at 85˚C
TÜV	25A 400VDC, at 85˚C,ON:5S,OFF:5S, Contacts break without load 70A 72VDC, at 85˚C,ON:0.3S,OFF:9S, Contacts break without load NO:25A 277VAC/250VAC/125VAC at 85˚C 25A 60VDC at 85˚C 0.5A 240VDC at 85˚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

	HF166F /	12	-1HD	L2	T	(XXX)
Type						
Coil voltage	5, 6, 12, 24, 48VDC					
Contact arrangement	**1HD:** 1A + 1B					
Sort	**L1**:1 coil latching	**L2**: 2 coils latching				
Contact material	**T**: $AgSnO_2$					
Special code[3]	**XXX:** Customer special requirement		**Nil:** Standard			

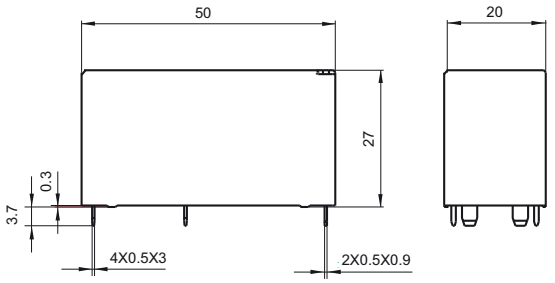
Notes: 1) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

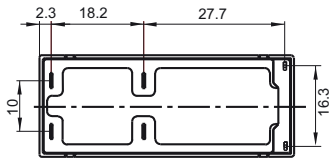
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

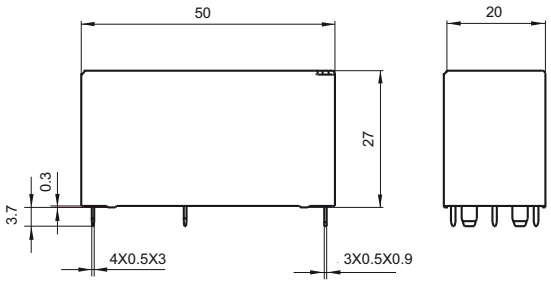
Outline Dimensions

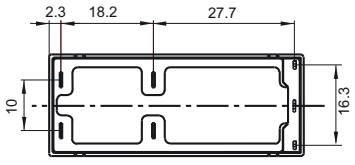
1 coil latching





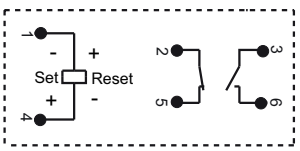
2 coils latching



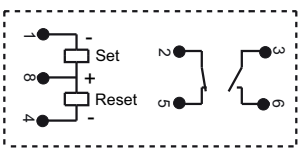


Wiring Diagram (Bottom view)

1 coil latching



2 coils latching

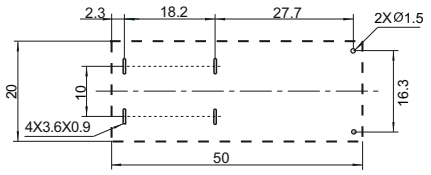


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

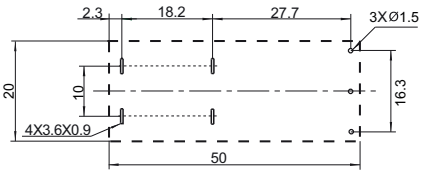
Unit: mm

PCB Layout
(Bottom view)

1 coil latching



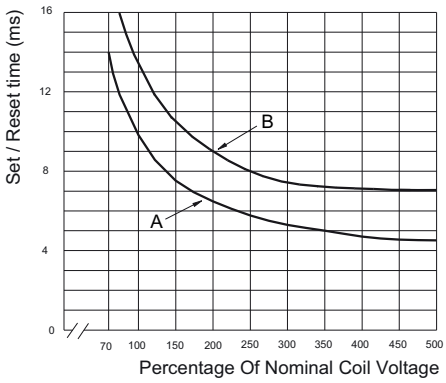
2 coils latching



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

SET \ RESET TIME AND VOLTAGE CURVE



Notes:
Curve B: max value
Curve A: typical value

Notice

1. Relay is on the “reset” or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to “set” or "reset" status, therefore, when application (connecting the power supply), please reset the relay to “set” or “reset” status on request.
2. In order to maintain “set” or “reset” status, energized voltage to coil should reach the rated voltage, impulse width should be more than 150 ms. Do not energize voltage to “set” coil and “reset” coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. Keep the product away from strong magnetic field during transportation, storage and application, to avoid change of set/reset voltage.

HF37F MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:40025378

File No.:CQC13002102287

Features

- 30A switching capability
- 70A withstands inrush current
- TV-15 (at 120VAC) available
- 1 Form A configuration

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating (Res. load)	30A 250VAC
Max. switching voltage	277VAC
Max. switching current	30A
Max. switching power	7500VA
Mechanical endurance	5×10^6 OPS
Electrical endurance	1HT, 1H type: 6×10^3 OPS (30A 250VAC, Resistive load, at 40°C, 1s on 9s off) 1H type: 5×10^4 OPS (23A cosØ=1 250VAC, Resistive load, at 70°C, 1.5s on 1.5s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1200VAC 1min
Operate time (at rated. volt.)		20ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	$196 m/s^2$
	Destructive	$980 m/s^2$
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 70°C
Humidity		5% to 85% RH
Termination		QC
Unit weight		Approx. 55g
Construction		Dust protected

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class A

COIL

Coil power	Approx. 1.2W

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.50	0.50	6.0	20.8 x (1±10%)
6	4.20	0.60	7.2	30 x (1±10%)
9	6.30	0.90	10.8	67.5 x (1±10%)
12	8.40	1.20	14.4	120 x (1±10%)
24	16.8	2.40	28.8	480 x (1±10%)
48	33.6	4.80	57.6	1920 x (1±10%)
60	42.0	6.00	72.0	3000 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	$AgSnO_2$	30A 250VAC 2HP 125VAC/250VAC TV-15 120VAC
	AgCdO	30A 250VAC 2HP 125VAC/250VAC TV-15 120VAC
VDE	AgCdO	23A 250VAC at 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

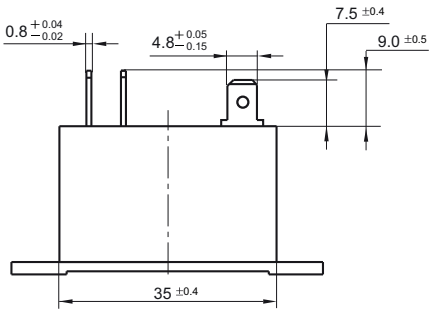
	HF37F /	012	-1H	T	(XXX)
Type					
Coil voltage	5, 6, 9, 12, 24, 48, 60VDC				
Contact arrangement	**1H:** 1 Form A				
Contact material	**T:** $AgSnO_2$ **Nil:** AgCdO				
Special code[2)]	**XXX:** Customer special requirement		**Nil:** Standard		

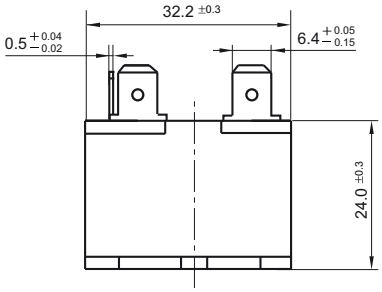
Notes: 1) The terminal for HF37F is QC type. Please don't weld directly on terminal.
2) The customer special requirement express as special code after evaluating by Hongfa.

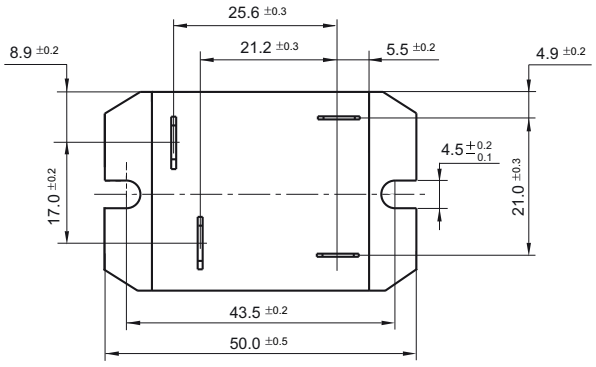
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions



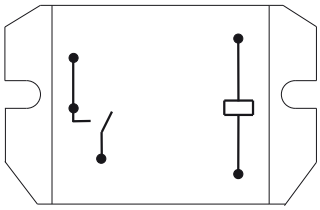




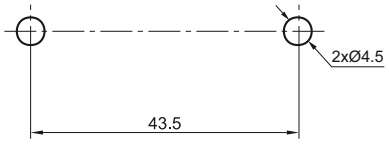
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Wiring Diagram (Top view)



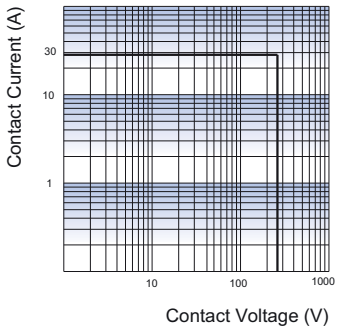
Mounting holes



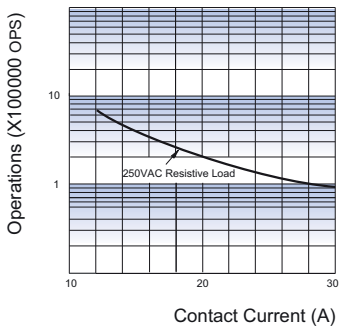
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

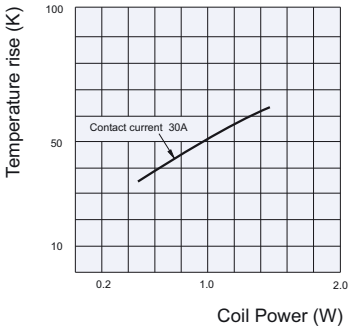
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Notes:
1) Curve:1HT type (or 1H type)
2) Test conditions: at 70˚C, 1s on 9s off.

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.

HF165FD MINIATURE HIGH POWER RELAY

c UL us
File No.: E134517

VDE
File No.: 40043143

CQC
File No.: CQC15002130956
CQC18002199524

Features

- 30A switching capability
- Breakdown voltage (between contact and coil): 4kV
- Creepage distance: 5.5mm(high voltage)
- Plastic sealed and flux proofed types available
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A	1B	1C	
Contact resistance[1]	100mΩ max. (at 1A 6VDC)			
Contact material	$AgSnO_2$			
Contact rating (Res. load)	30A 277VAC	15A 277VAC	20A 277VAC	10A 277VAC
Max. switching voltage	277VAC			
Max. switching current	30A	30A	30A	15A
Max. switching power	8310VA	8310VA	8310VA	4155VA
Mechanical endurance	1×10^7 OPS			
Electrical endurance[2]	1×10^5 OPS (NO: 30A 277VAC, Resistive load, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	1500VAC 1min
	Between coil & contacts	2500VAC 1min(Standard) 4000VAC 1min(V Type)
Surge voltage		6kV (1.2/50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40℃ to 85℃
Termination		PCB
Unit weight		Approx. 25g
Construction		Plastic sealed Flux proofed

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

COIL

Coil power	Approx. 900mW

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC max[1]	Drop-out Voltage VDC min[1]	Max. Voltage VDC[2]	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48[3]	36.00	4.8	62.4	2560 x (1±10%)
70[3]	52.50	7.0	91.0	5500 x (1±10%)
110[3]	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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

UL/CUL	NO	30A 277VAC at 85℃ 20A 277VAC at 105℃ 2HP 240VAC/1HP 120VAC at 40℃ 96LRA 30FLA 277VAC at 40℃ TV-8 125VAC at 40℃
	NC	30A 277VAC at 40℃ 20A 277VAC at 85℃ 15A 277VAC at 40℃
VDE	NO	30A 250VAC at 60℃ 20A 250VAC at 85℃
	NC	15A 250VAC at 85℃
	CO	20A/10A 250VAC at 85℃

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

	HF165FD	/12	-H	Y1	S	T	F	V	(XXX)

Type		
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110	
Contact arrangement	**H:** 1 Form A **D:** 1 Form B **Z:** 1 Form C	
Termination	**Y1:** Without Pin NO.6	**Y2:** With Pin NO.6
Construction [1)]	**S:** Plastic sealed	**Nil:** Flux proofed
Contact material	**T:** $AgSnO_2$	
Insulation standard	**F:** Class F	
Dielectric strength standard	**Nil:** Standard product(2500VAC Between coil & contacts) **V :** High Dielectric strength(Only for Y1 Termination) (4000VAC Between coil & contacts)	
Special code[2)]	**XXX:** Customer special requirement	**Nil:** Standard

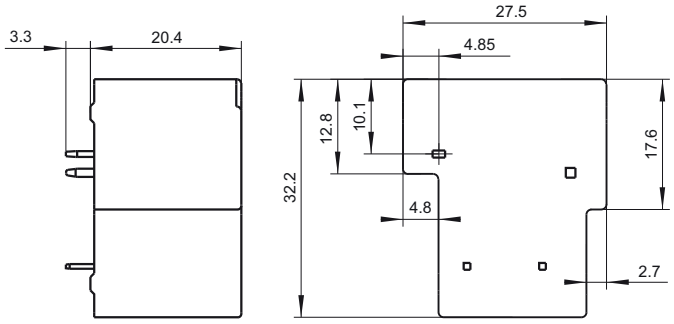
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

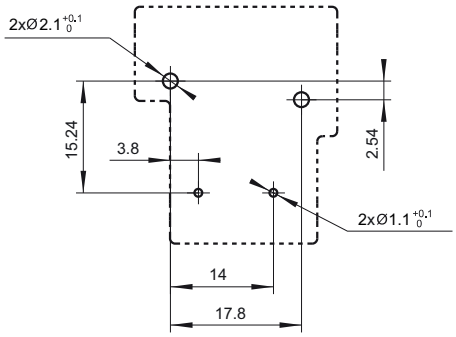
Outline Dimensions

HF165FD/□□-HY1□□□□

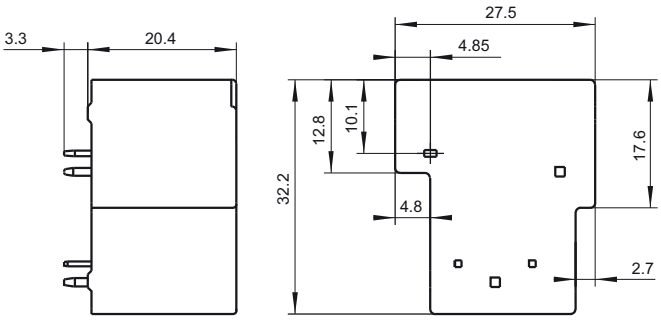


PCB Layout (Bottom view)

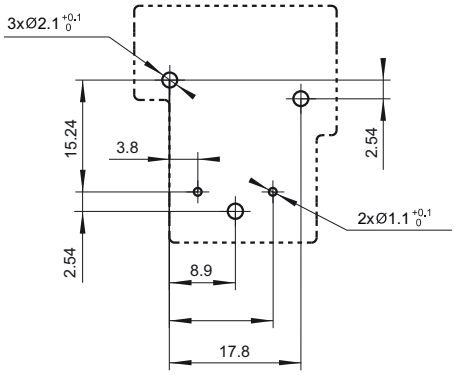
HF165FD/□□-HY1□□□□



HF165FD/□□-HY2□□□□



HF165FD/□□-HY2□□□□

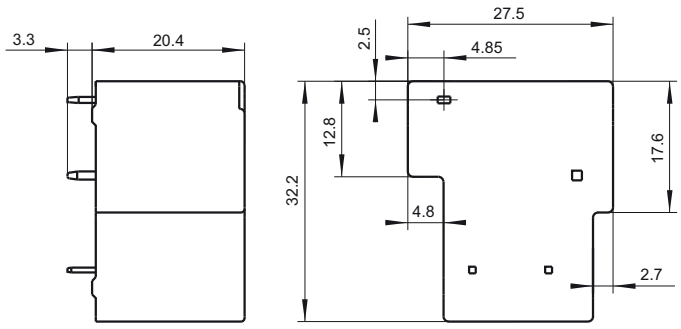


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

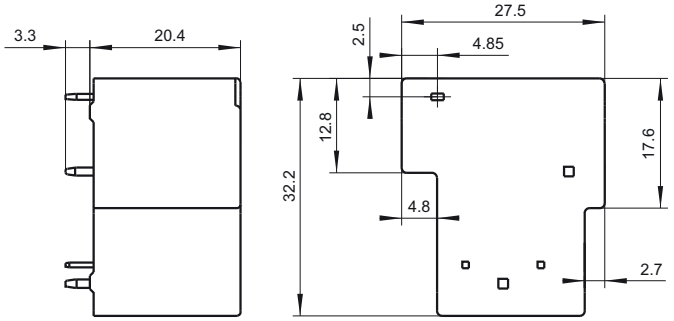
Unit: mm

Outline Dimensions

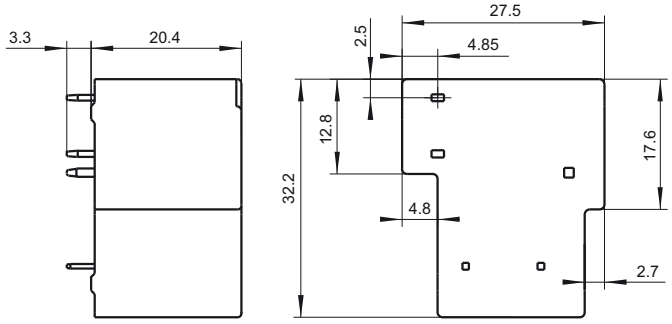
HF165FD/□□-DY1□□□□



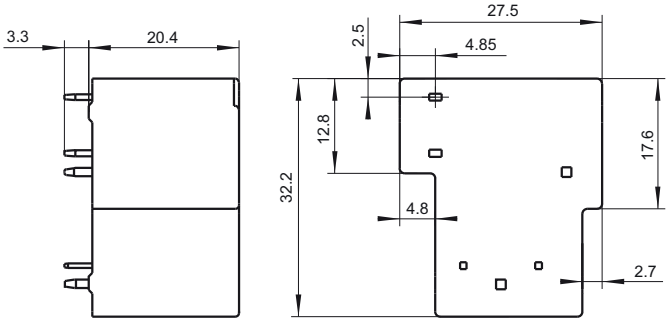
HF165FD/□□-DY2□□□□



HF165FD/□□-ZY1□□□□

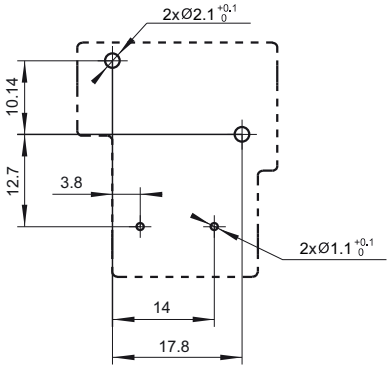


HF165FD/□□-ZY2□□□□

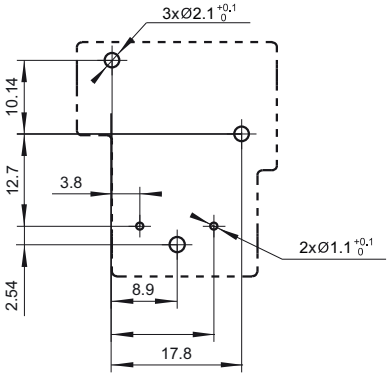


PCB Layout (Bottom view)

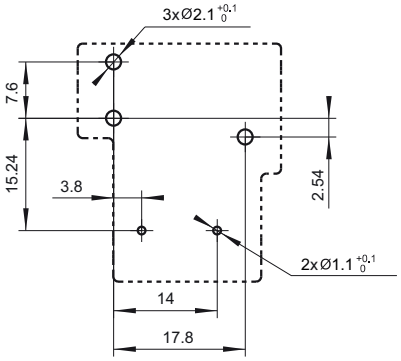
HF165FD/□□-DY1□□□□



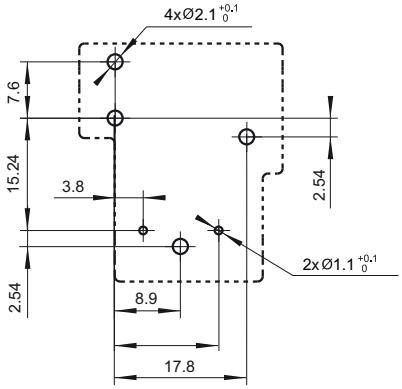
HF165FD/□□-DY2□□□□



HF165FD/□□-ZY1□□□□



HF165FD/□□-ZY2□□□

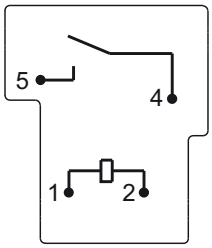


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

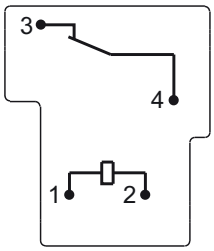
Unit: mm

Wiring Diagram (Bottom view)

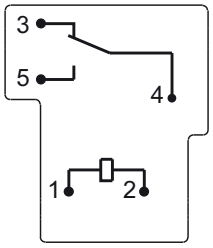
HF165FD/□□-HY1□□□□



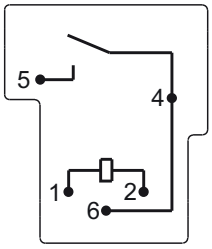
HF165FD/□□-DY1□□□□



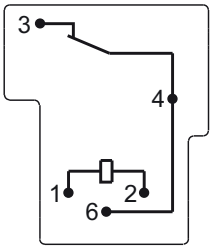
HF165FD/□□-ZY1□□□□



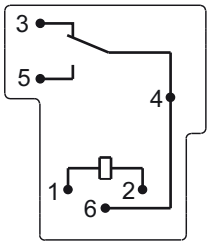
HF165FD/□□-HY2□□□□



HF165FD/□□-DY2□□□□



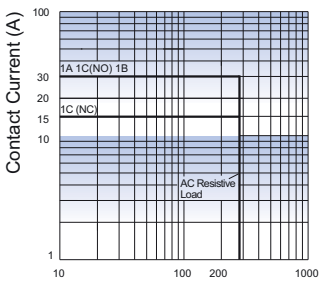
HF165FD/□□-ZY2□□□□



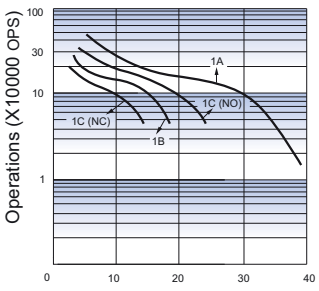
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
3) The width of the gridding is 2.5mm.

CHARACTERISTIC CURVES

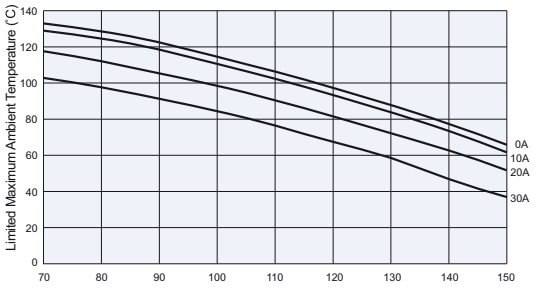
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL OPERATING RANGE (AC)



Test conditions:
Flux proofed, Room temp.,
1s on 9s off.

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.

HF165FD-G MINIATURE HIGH POWER RELAY

c UL us
File No.: E134517

VDE
File No.: 40043143

CQC
File No.: CQC15002130956
CQC18002199524

Features

- 40A switching capability
- Breakdown voltage (between contact and coil): 4kV
- Creepage distance: 5.5mm(high voltage)
- Plastic sealed and flux proofed types available
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	100mΩ max. (at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating (Res. load)	40A 277VAC
Max. switching voltage	277VAC
Max. switching current	40A
Max. continuous current 2)	30A
Max. switching power	11080VA
Mechanical endurance	1 x 10^7OPS
Electrical endurance 3)	1 x 10^4OPS (NO: 40A 277VAC, Resistive load, Room temp., 1s on 9s off, Flux proofed)

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.
3) For plastic sealed type, the venting-hole should be opened in electrical endurance test.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	1500VAC 1min
	Between coil & contacts	2500VAC 1min(Standard) 4000VAC 1min(V Type)
Surge voltage		6kV (1.2/50μs)
Operate time (at nomi. volt.)		15ms max.
Release time (at nomi. volt.)		10ms max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40℃ to 85℃
Termination		PCB
Unit weight		Approx. 25g
Construction		Plastic sealed Flux proofed

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

COIL

Coil power	Approx. 900mW

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC max 1)	Drop-out Voltage VDC min 1)	Max. Voltage VDC 2)	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48 3)	36.00	4.8	62.4	2560 x (1±10%)
70 3)	52.50	7.0	91.0	5500 x (1±10%)
110 3)	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.
2) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
3) 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

UL/CUL	NO	40A 277VAC 40℃ 30A 277VAC 85℃ 2HP 240VAC/1HP 120VAC 40℃ 96LRA, 30FLA 40℃ TV-8 125VAC 40℃
VDE	NO	40A 250VAC

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

	HF165FD-G	/12	-H	Y1	S	T	F	V	(XXX)

Type		
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110	
Contact arrangement	**H:** 1 Form A	
Termination	**Y1:** Without Pin NO.6	**Y2:** With Pin NO.6
Construction [1)]	**S:** Plastic sealed	**Nil:** Flux proofed
Contact material	**T:** $AgSnO_2$	
Insulation standard	**F:** Class F	
Dielectric strength standard	**Nil:** Standard product(2500VAC Between coil & contacts) **V :** High Dielectric strength(Only for Y1 Termination) (4000VAC Between coil & contacts)	
Special code [2)]	**XXX:** Customer special requirement	**Nil:** Standard

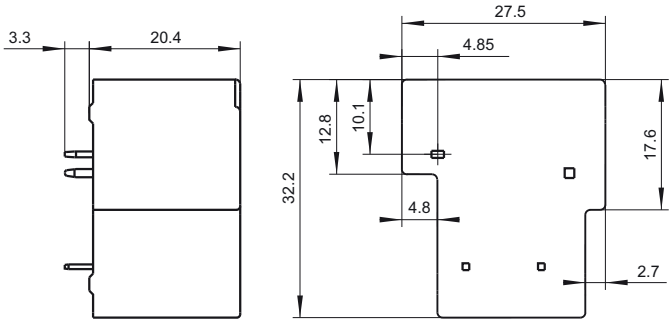
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

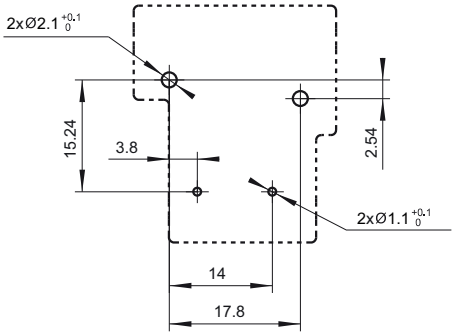
Outline Dimensions

HF165FD-G/□□-HY1□□□□

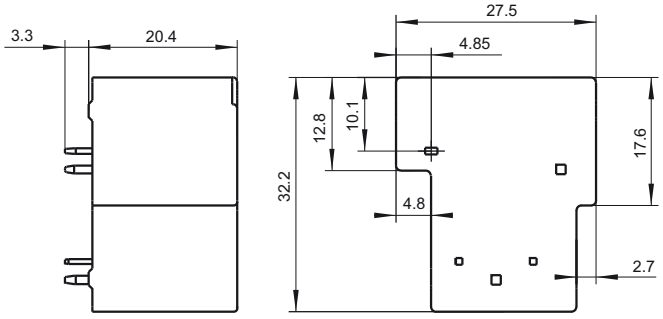


PCB Layout (Bottom view)

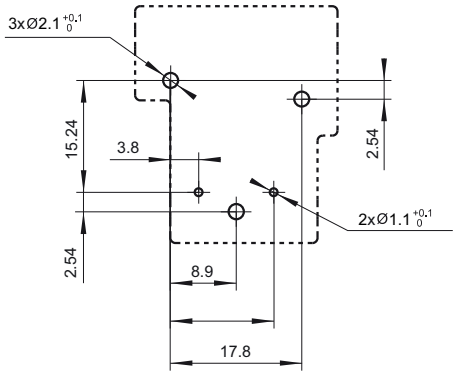
HF165FD-G/□□-HY1□□□□



HF165FD-G/□□-HY2□□□□



HF165FD-G/□□-HY2□□□□

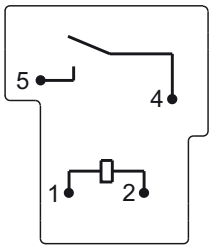


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

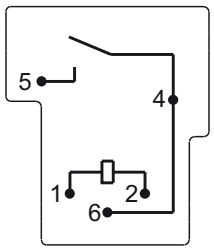
Unit: mm

Wiring Diagram (Bottom view)

HF165FD-G/□□-HY1□□□□



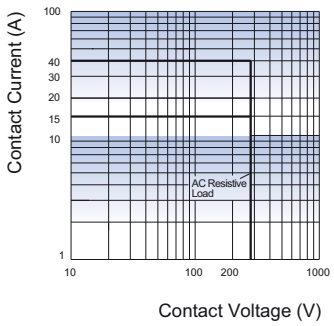
HF165FD-G/□□-HY2□□□□



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 2.5mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



HF165F SOLAR RELAY

c UL us
File No:E134517

VDE
File No:40037289

CQC
File No: CQC18002189685
CQC18002202621

Features

- 35A swithing capitable.
- Applicable to inverter used for photovoltaic power generation systems.
- Ideal for UPS.
- 1.8mm contact gap(compliant to European Photovoltaic Standard VDE0126).
- Product in accordance to IEC 60335 available.
- Low coil hoilding voltage contributes to saving energy of equipment.
- UL insulation system: class F.

CONTACT DATA

Contact arrangement	1A
Voltage drop	Typ.: 15mV(at 10A) Max.: 100mV(at 10A)
Contact material	$AgSnO_2$
Contact rating (Res. load)	Resistive: 35A 250VAC Inductive: 35A 277VAC (cosø=0.8) 1s:9s
Max. switching voltage	277VAC
Max. switching current 1)	35A
Max. switching power	9695VA
Mechanical endurance	1 x 10^6 OPS
Electrical endurance	3 x 10^4 OPS (35A 250VAC, Resistive load, at 85°C, 1s on 9s off)

Notes: 1)The relay connections and wiring have to be designed with an adequate cross setions to ensure the current flow and heat dissipation.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2500VAC 1min
Surge voltage (between coil & contacts)		6kV (1.2/50μs)
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise (at rated. volt.)		70K max.(Contact load current 35A, 50% of rated voltage excitation, at 85°C)
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx.36g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx.2.25W
Holding voltage	40% to 110%U_N(at 23℃) 50% to 70%U_N(at 85℃)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA at 23°C

Nominal Voltage VDC 1)	Pick-up Voltage VDC max1)	Drop-out Voltage VDC min1)	Max. Voltage VDC *2)	Coil Resistance Ω
5	3.75	0.35	5.5	11.1 x (1±10%)
12	9	0.84	13.2	64 x (1±10%)
24	18	1.68	26.4	256 x (1±10%)
48	36	3.36	52.8	1024 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	35A 277VAC/250VAC general use 3 x 10^4OPS at 85°C
VDE	35A 250VAC 3 x 10^4OPS at 85°C
CQC	40A 277VAC/250VAC 60°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

	HF165F /	12	-H	T	(XXX)
Type					
Coil voltage	5, 12, 24, 48VDC				
Contact arrangement	**H:**1 Form A				
Contact matcrial	**T:** $AgSnO_2$				
Special code[3)]	**XXX:** Customer special requirement		**Nil:** Standard		

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.

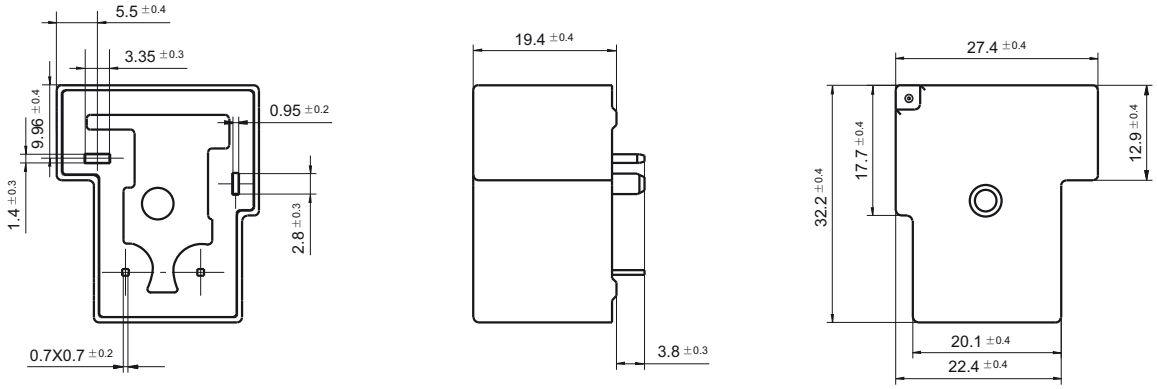
2) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.

3) 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).

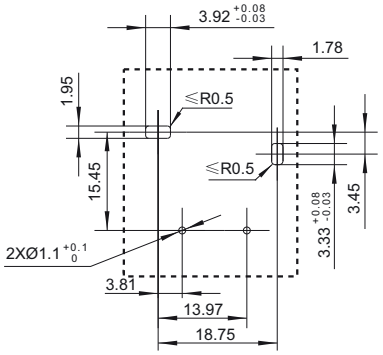
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

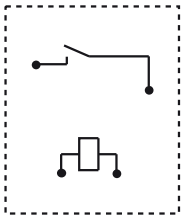
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram

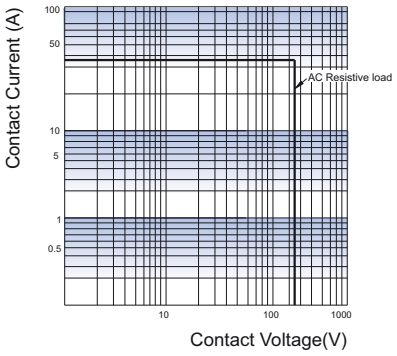


Notes: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

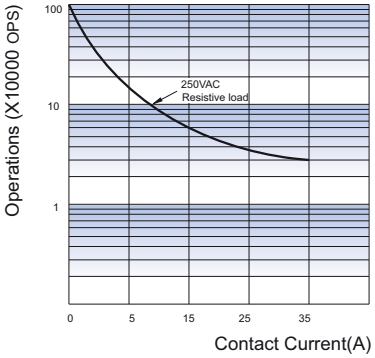
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



Test conditions:
Resistive load, 250VAC,
Flux proofed, at 85°C, 1s on 9s off

HF170F SOLAR RELAY

File No.: E133481

File No.: R 50384178

File No.: CQC17002175164
: CQC18002198581

Features

- 35A switching capability
- Applicable to solar photovoltaic inverter
- 3.6 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	2A
Contact resistance(initial)	10mΩ max.(6VDC 20A)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	35A 277VAC
Max. switching voltage	277VAC
Max. switching current	35A
Max. switching power	9695VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	3 x 10^4OPS (NO: 35A 277VAC, Resistive load, at 85˚C, 1s on 9s off)

COIL

Coil power	Approx. 1.88W
Holding voltage	30% to 110% U_N (at 25˚C) 40% to 60%U_N (at 85˚C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
	Between contact sets	2000VAC 1min
Surge Voltage		10kV (1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 35A, rated voltage excitation60%, at 85˚C)
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB
Unit weight		Approx. 66g
Construction		Flux proofed

Notes: The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi $AgSnO_2$	35A 277VAC Resistive at 85˚C
TÜV	AgNi $AgSnO_2$	35A 250VAC cos ϕ =0.8 85˚C
CQC	AgNi $AgSnO_2$	35A 277VAC Resistive at 85˚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.

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max	Drop-out Voltage VDC min	Max. Voltage VDC *	Coil Resistance Ω
6	4.5	0.3	6.6	19.1 x (1±10%)
9	6.75	0.45	9.9	43.1 x (1±10%)
12	9	0.6	13.2	76.6 x (1±10%)
24	18	1.2	26.4	306.4 x (1±10%)
48	36	2.4	52.8	1225.5 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

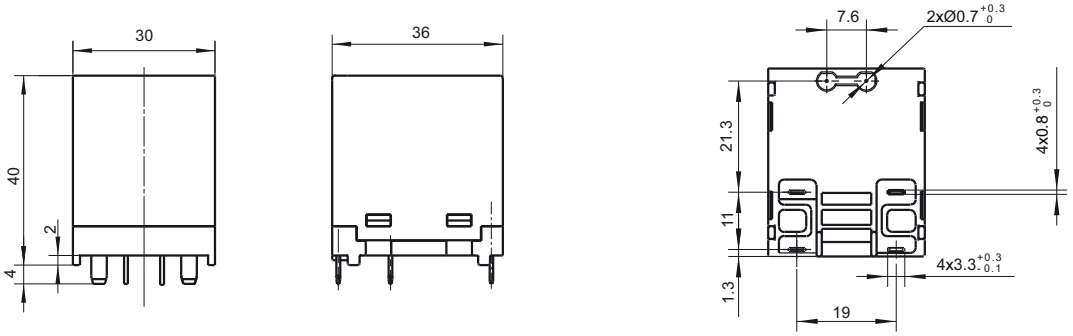
	HF170F/	12	-2H	T	F	(XXX)
Type						
Coil voltage	6, 9, 12, 24,48VDC					
Contact arrangement	**2H:** 2 Form A					
Contact material	**T:** $AgSnO_2$	**Nil:** AgNi				
Insulation standard	**F:** Class F					
Special code 3)	**XXX:** Customer special requirement	**Nil:** Standard				

Notes: 1) Flux-proofed relays can not be used inthe environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

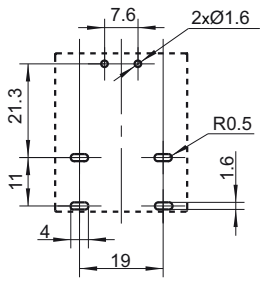
Unit: mm

Outline Dimensions



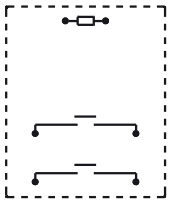
PCB Layout

(Bottom view)



Wiring Diagram

(Bottom view)



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.

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.

HF105F-1 MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:40025518 (DC Type)

File No.:CQC12002071130(DC Type)
CQC10002049165(DC Type)
CQC16002140270(DC Type)

Features

- 40A switching capability
- 4kV dielectric strength (between coil and contacts)
- Heavy load up to 7200VA
- PCB coil terminals, ideal for heavy duty load
- Unenclosed, Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance 1)	50mΩ max. (at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Max. switching capacity	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 28VDC			
Max. switching current	40A 2)	15A	20A	10A
HF105F-1 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-1L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1×10^7 OPS			
Electrical endurance	1H type(Non-plastic sealed): 1×10^5 OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC/4000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		DC type: 15ms max.
Release time (at rated. volt.)		DC type: 10ms max.
Ambient temperature		DC: -55℃ to 85℃ AC: -55℃ to 60℃
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx.36g
Construction		Unenclosed (Only for DC coil), Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 900mW; AC type: Approx. 2VA

SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A		$AgSnO_2$ AgCdO	30A 277VAC 40A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	30A 28VDC 28A 277VAC 277VAC(FLA=20)(LRA=60)
	1 Form B		AgCdO	15A 277VAC 10A 28VDC 1/2HP 250VAC 1/4HP 125VAC 277VAC(FLA=10)(LRA=33)
	1 Form C	NO	$AgSnO_2$ AgCdO	30A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	20A 277VAC 20A 28VDC 277VAC(FLA=20)(LRA=60)
		NC	$AgSnO_2$ AgCdO	20A 277VAC 1/2HP 250VAC 1/4HP 125VAC
			AgCdO	10A 277VAC 10A 28VDC 277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23˚C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max.[3)]	Drop-out Voltage VDC min.[3)]	Max. Voltage VDC *[4)]	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max.[3)]	Drop-out Voltage VAC min.[3)]	Max. Voltage VDC *[4)]	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.
3) The data shown above are initial values.
4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF105F-1 / 018 D T -1H S T F (XXX)

Type
HF105-1: 30A (Unenclosed, only for DC coil)
HF105-1L: 25A (Unenclosed, only for DC coil)
HF105F-1: 30A
HF105F-1L: 25A

Coil voltage
DC: 5VDC to 110VDC
AC: 12VAC to 277VAC

Coil voltage form **D:** DC **A:** AC

Termination
6: With Pin NO.6, Dielectric Strength Between Coil and Contact: 2500VAC
T: Without Pin NO.6, Dielectric Strength Between Coil and Contact: 4000VAC
Nil: Without Pin NO.6, Dielectric Strength Between Coil and Contact: 2500VAC

Contact arrangement **1H:** 1 Form A **1D:** 1 Form B **1Z:** 1 Form C

Construction[1)2)]
S: Plastic sealed
Nil: Dust protected (For HF105F-1, HF105F-1L)
Unenclosed (For HF105-1, HF105-1L)

Contact material **T:** $AgSnO_2$ **Nil:** AgCdO

Insulation standard **F:** Class F **Nil:** Class B

Special code[3)] **XXX:** Customer special requirement **Nil:** Standard

Notes: 1) We recommend dust protected 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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

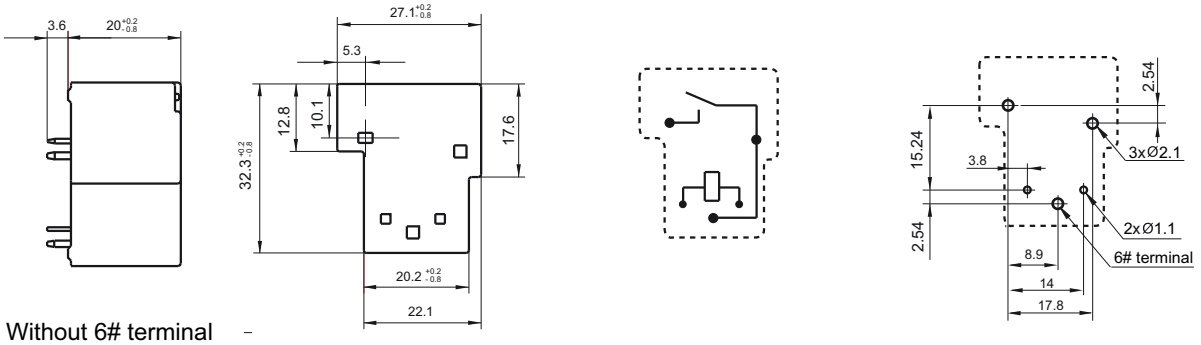
Unit: mm

HF105F-1

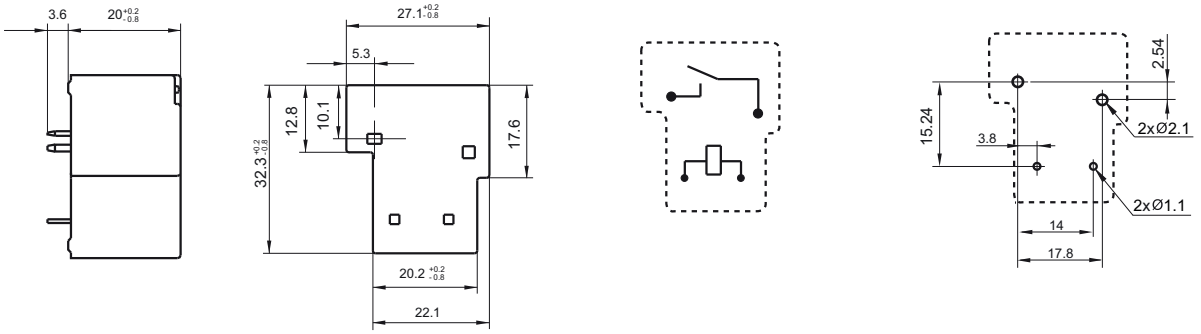
1 Form A

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

With 6# terminal

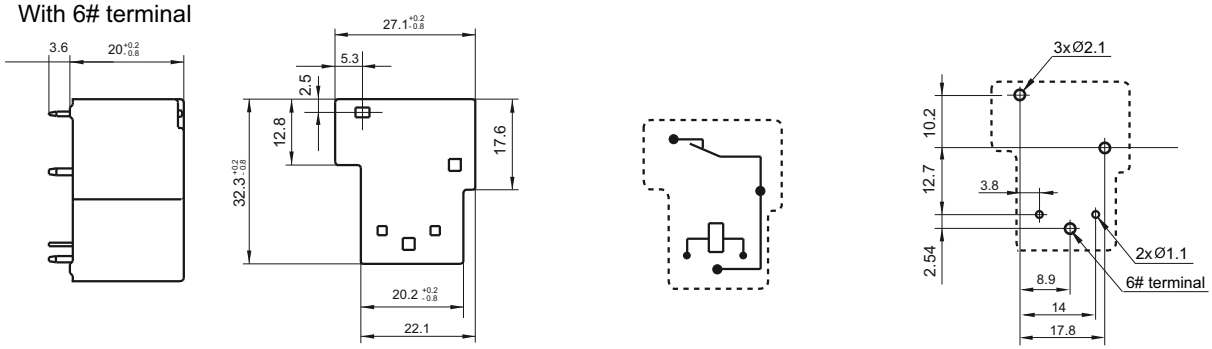


Without 6# terminal

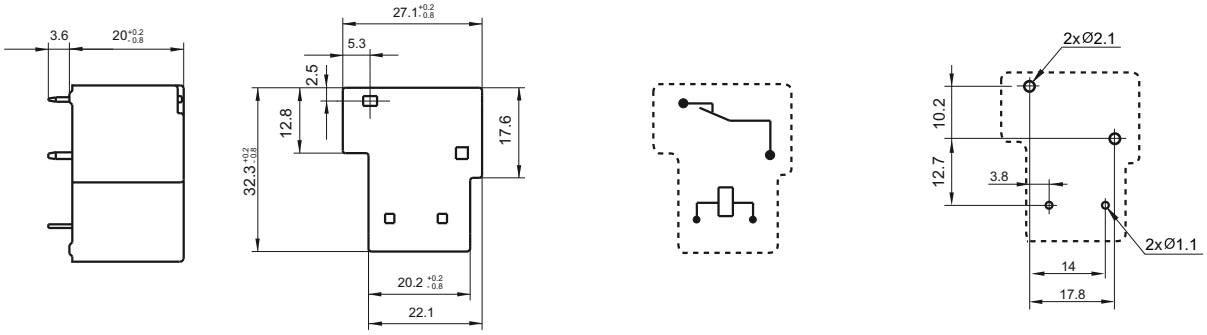


1 Form B

With 6# terminal



Without 6# terminal



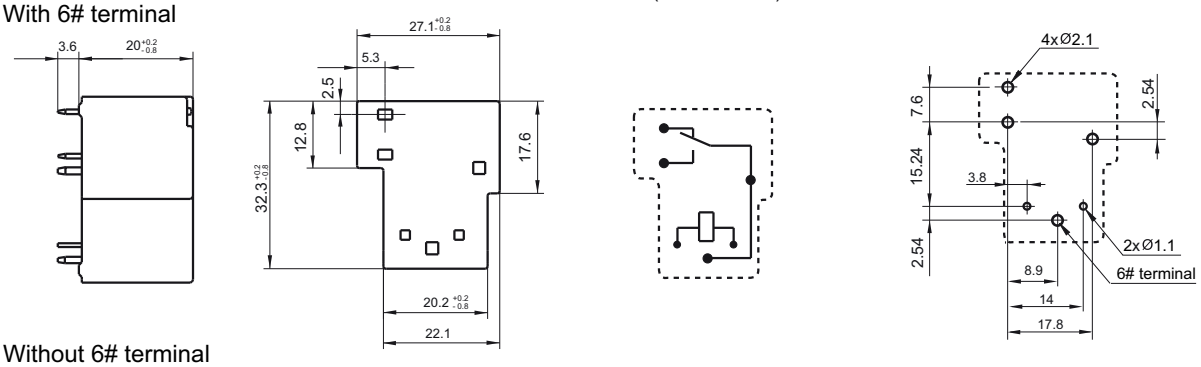
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

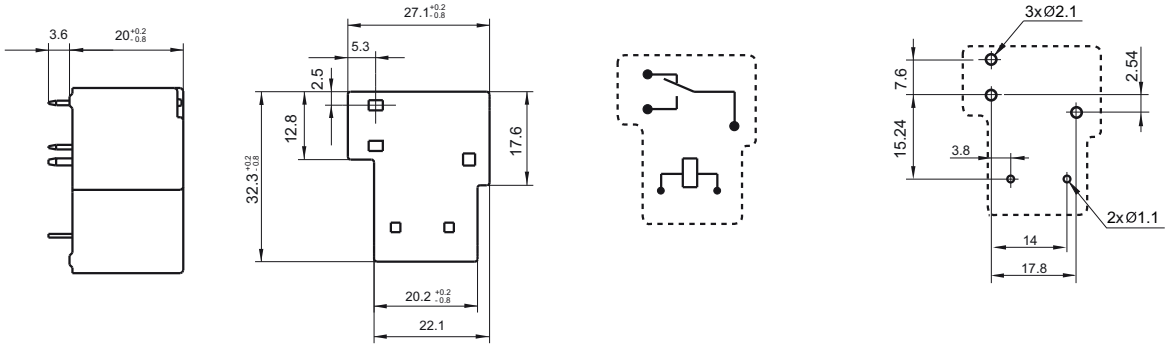
1 Form C

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

With 6# terminal



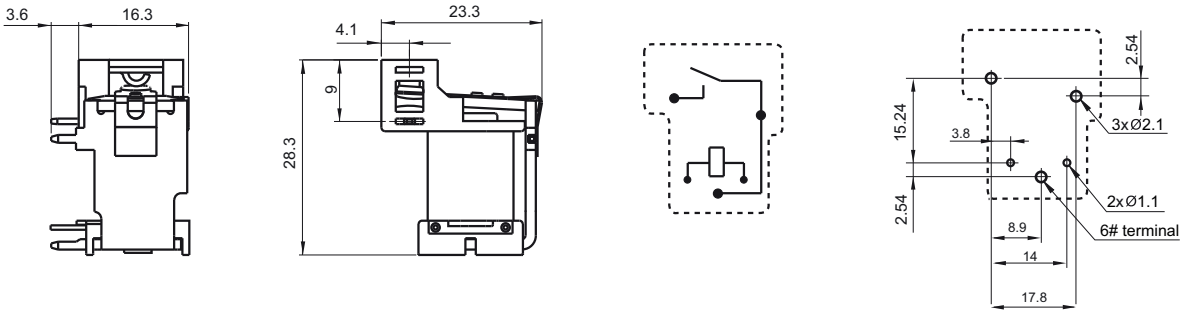
Without 6# terminal



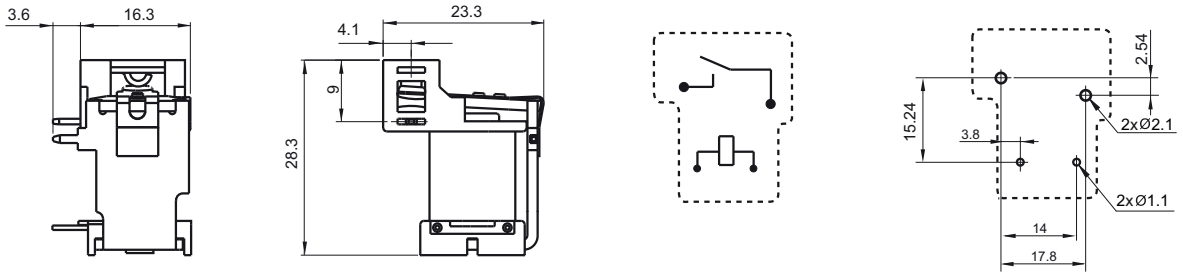
HF105-1

1 Form A

With 6# terminal



Without 6# terminal



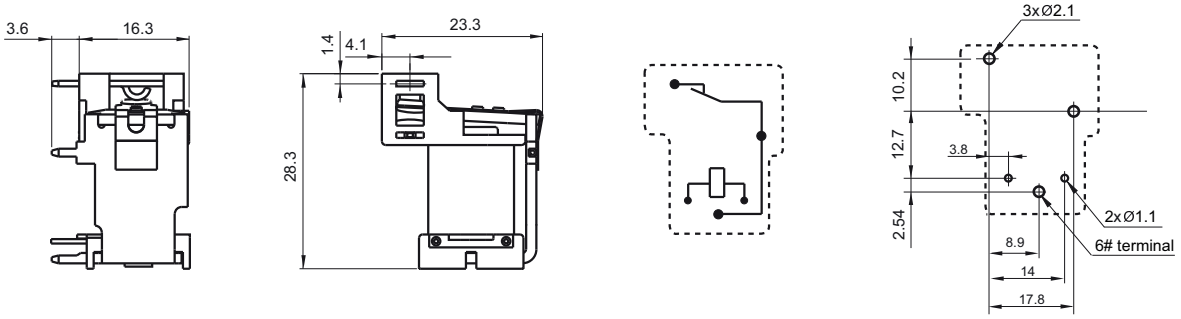
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

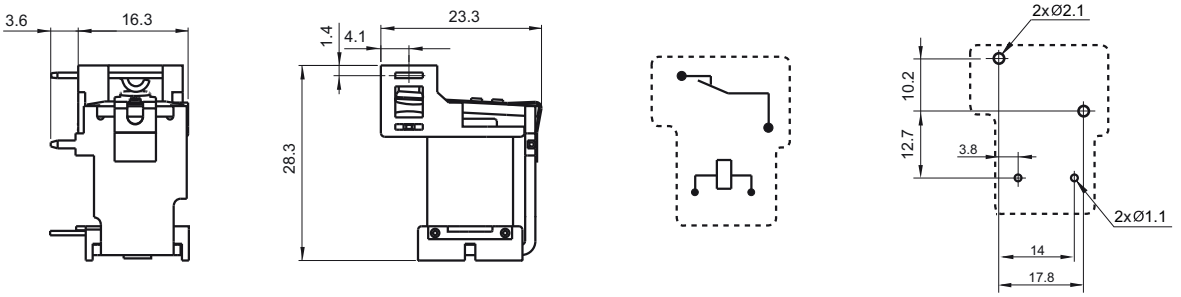
1 Form B

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

With 6# terminal

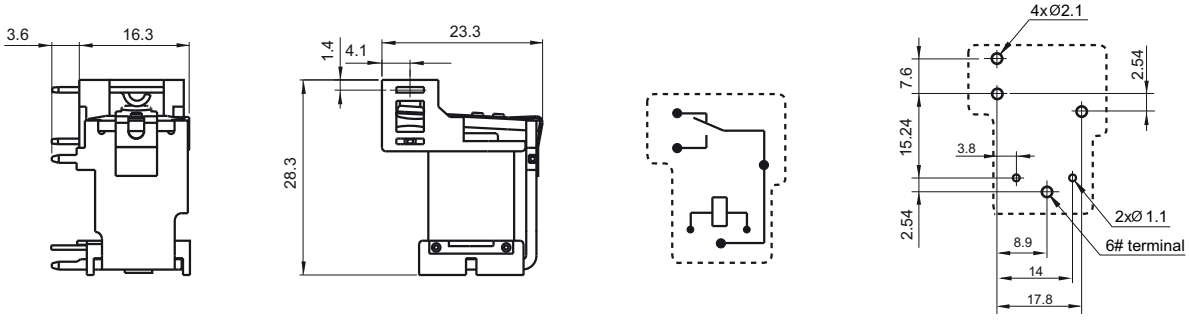


Without 6# terminal

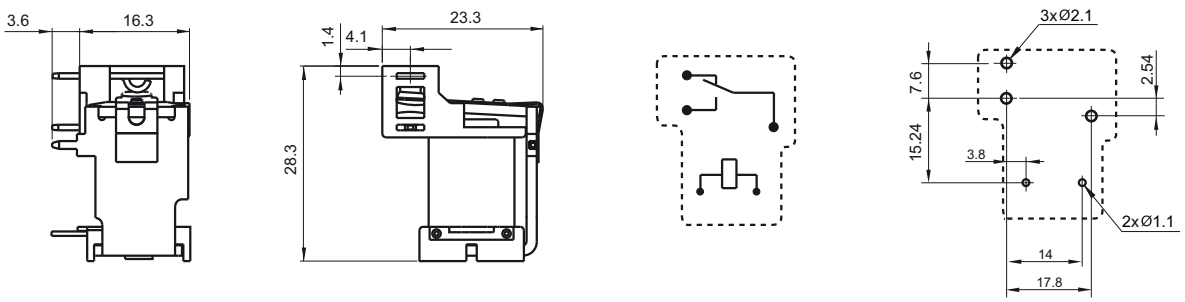


1 Form C

With 6# terminal



Without 6# terminal

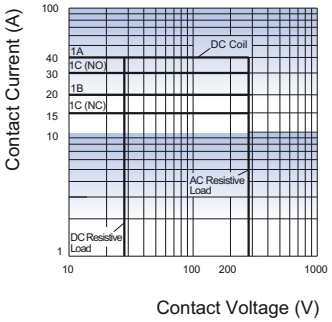


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

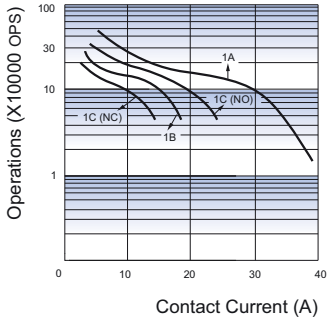
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

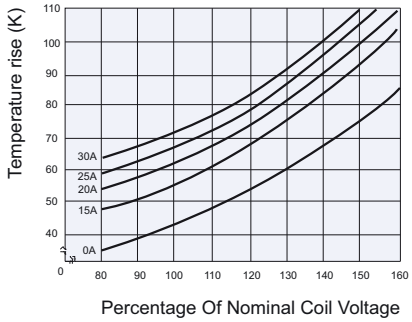
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:
Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

HF105F-2 MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:40025518 (DC type)

CQC
File No.: CQC10002049165(DC type)
CQC16002140270(DC type)

Features

- 40A switching capability
- Heavy load up to 7200VA
- PCB coil terminals, ideal for heavy duty load
- Plastic sealed and dust protected types available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance[1)]	50mΩ max.(at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Max. switching capacity	7200VA/560W	3600VA/280W	4800VA/560W	2400VA/280W
Max. switching voltage	277VAC/28VDC			
Max. switching current	40A[2)]	15A	20A	10A
Max.continuous current	When PCB terminals carry current≤30A When PCB terminals do not carry current (only QC terminals carry current)≤25A			
HF105F-2 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-2L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1×10^7OPS			
Electrical endurance	1H type(Non-plastic sealed): 1×10^5OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		DC type: 15ms max.
Release time (at rated. volt.)		DC type: 10ms max.
Ambient temperature		DC: -55℃ to 85℃ AC: -55℃ to 60℃
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB & QC
Unit weight		Approx. 36g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 900mW; AC type: Approx. 2VA

SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A		$AgSnO_2$ AgCdO	30A 277VAC 40A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	30A 28VDC 28A 277VAC 277VAC(FLA=20)(LRA=60)
	1 Form B		AgCdO	15A 277VAC 10A 28VDC 1/2HP 250VAC 1/4HP 125VAC 277VAC(FLA=10)(LRA=33)
	1 Form C	NO	$AgSnO_2$ AgCdO	30A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	20A 277VAC 20A 28VDC 277VAC(FLA=20)(LRA=60)
		NC	$AgSnO_2$ AgCdO	20A 277VAC 1/2HP 250VAC 1/4HP 125VAC
			AgCdO	10A 277VAC 10A 28VDC 277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23˚C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max.3)	Drop-out Voltage VDC min.3)	Max. Voltage VDC *4)	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max.3)	Drop-out Voltage VAC min.3)	Max. Voltage VDC *4)	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.
3) The data shown above are initial values.
4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF105F-2 / 018 D -1H S T F (XXX)

Type	HF105F-2: 30A HF105F-2L: 25A		
Coil voltage	**DC:** 5VDC to 110VDC **AC:** 12VAC to 277VAC		
Coil voltage form	**D:** DC	**A:** AC	
Contact arrangement	**1H:**1 Form A	**1D:**1 Form B	**1Z:**1 Form C
Construction 1)	**S:** Plastic sealed	**Nil:** Dust protected	
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO	
Insulation standard	**F:** Class F	**Nil:** Class B	
Special code3)	**XXX:** Customer special requirement	**Nil:** Standard	

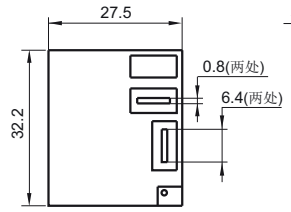
Notes: 1) We recommend dust protected types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

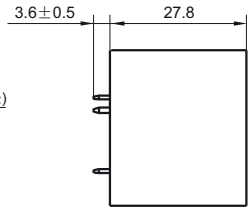
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

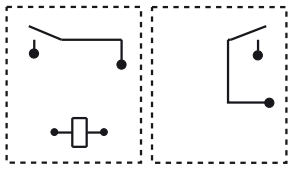
1 Form A

Outline Dimensions





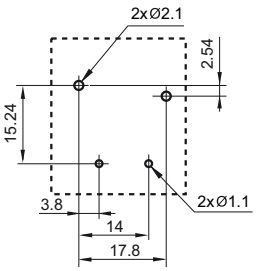
Wiring Diagram



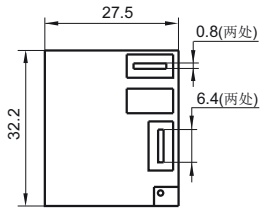
(Bottom view) (Top view)

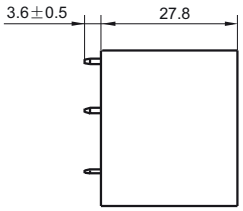
PCB Layout

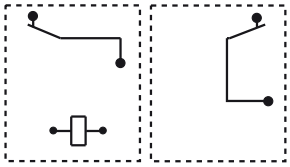
(Bottom view)



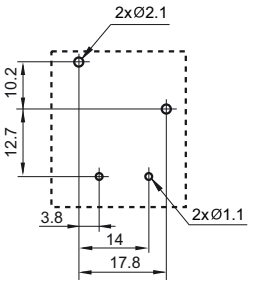
1 Form B



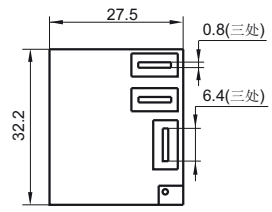


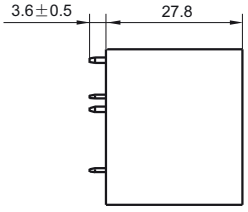


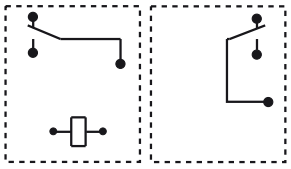
(Bottom view) (Top view)



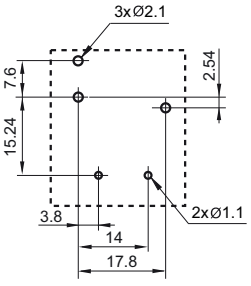
1 Form C







(Bottom view) (Top view)

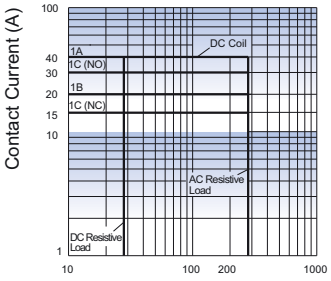


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

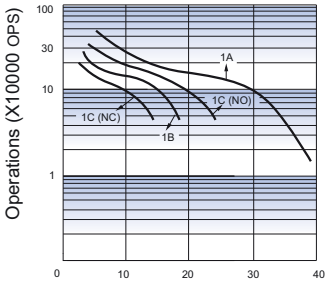
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

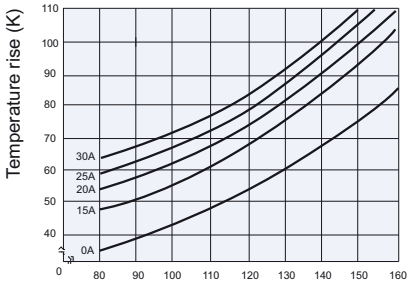
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:
Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

HF105F-4 MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:40025518 (DC type)

File No.:CQC09002031229(DC type)
CQC10002049165(DC type)

Features

- 40A switching capability
- 2.5kV dielectric strength (between coil and contacts)
- Heavy load up to 7200VA

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance[1)]	50mΩ max.(at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Max. switching capacity	7200VA/560W	3600VA/280W	4800VA/560W	2400VA/280W
Max. switching voltage	277VAC/28VDC			
Max. switching current	40A[2)]	15A	20A	10A
Max.continuous current	⩽25A			
HF105F-4 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-4L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1×10^7OPS			
Electrical endurance	1H type(Non-plastic sealed): 1×10^5OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		DC type: 15ms max.
Release time (at rated. volt.)		DC type: 10ms max.
Ambient temperature		DC: -55˚C to 85˚C AC: -55˚C to 60˚C
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		QC
Unit weight		Approx. 36g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 900mW; AC type: Approx. 2VA

SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A		$AgSnO_2$ AgCdO	30A 277VAC 40A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	30A 28VDC 28A 277VAC 277VAC(FLA=20)(LRA=60)
	1 Form B		AgCdO	15A 277VAC 10A 28VDC 1/2HP 250VAC 1/4HP 125VAC 277VAC(FLA=10)(LRA=33)
	1 Form C	NO	$AgSnO_2$ AgCdO	30A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	20A 277VAC 20A 28VDC 277VAC(FLA=20)(LRA=60)
		NC	$AgSnO_2$ AgCdO	20A 277VAC 1/2HP 250VAC 1/4HP 125VAC
			AgCdO	10A 277VAC 10A 28VDC 277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23˚C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max.[3)]	Drop-out Voltage VDC min.[3)]	Max. Voltage VDC*[4)]	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max.[3)]	Drop-out Voltage VAC min.[3)]	Max. Voltage VDC*[4)]	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.
3) The data shown above are initial values.
4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF105F-4 / 018 D K -1H S T F (XXX)

Type	HF105F-4: 30A HF105F-4L: 25A		
Coil voltage	**DC:** 5VDC to 110VDC **AC:** 12VAC to 277VAC		
Coil voltage form	**D:** DC	**A:** AC	
Coil terminal width	**K:** 4.8mm	**Nil:** 2.8mm	
Contact arrangement	**1H:**1 Form A	**1D:**1 Form B	**1Z:**1 Form C
Construction [1)]	**S:** Plastic sealed	**Nil:** Dust protected	
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO	
Insulation standard	**F:** Class F	**Nil:** Class B	
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard	

Notes: 1) We recommend dust protected 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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

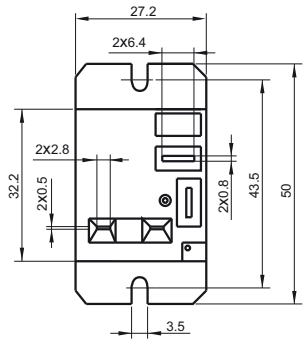
Unit: mm

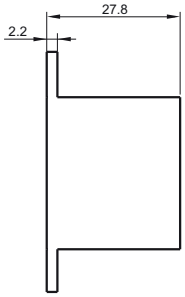
1 Form A

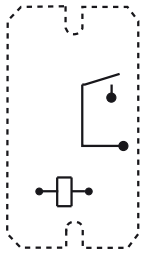
Outline Dimensions

Wiring Diagram
(Top view)

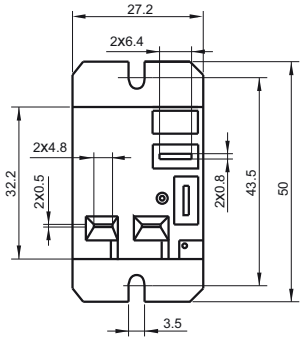
2.8mm Terminal width

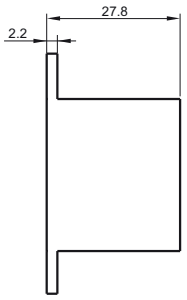


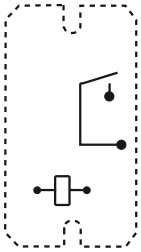




4.8mm Terminal width

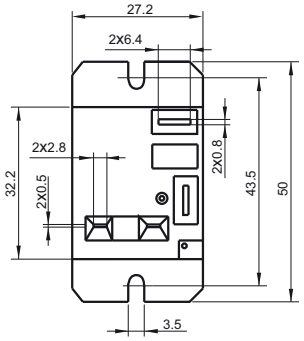


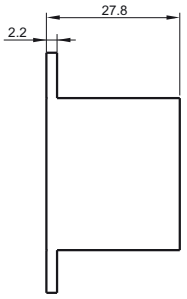


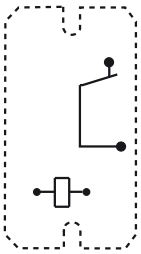


1 Form B

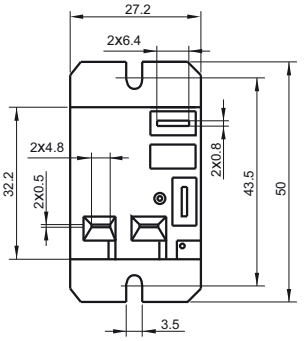
2.8mm Terminal width

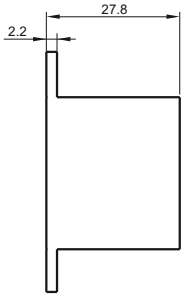


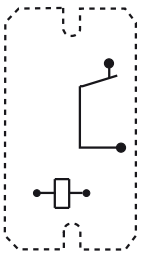




4.8mm Terminal width







OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

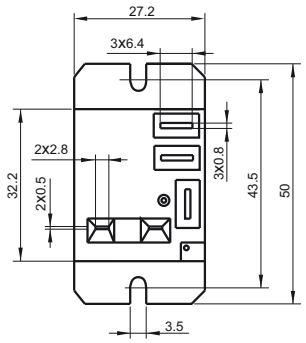
1 Form C

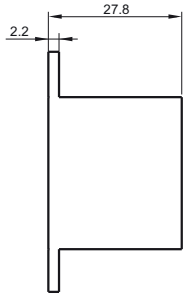
Outline Dimensions

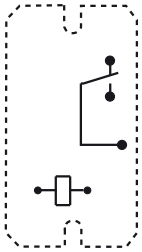
Wiring Diagram

(Top view)

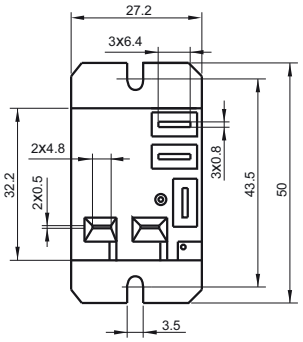
2.8mm Terminal width

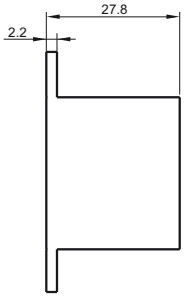


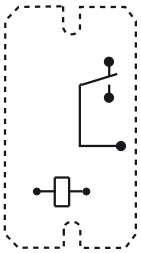




4.8mm Terminal width



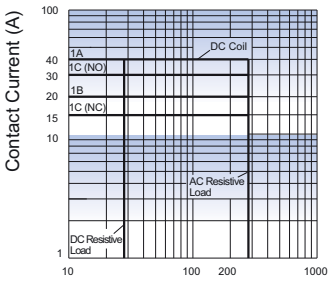




Remark: In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

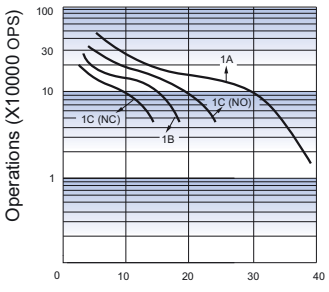
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Contact Voltage (V)

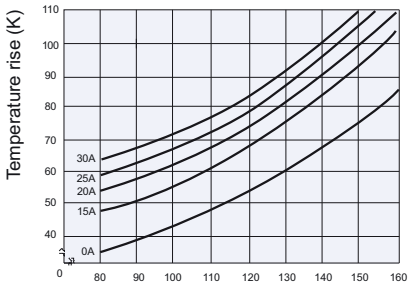
ENDURANCE CURVE



Contact Current (A)

Test conditions:
Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

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.

HF105F-5 MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:40025518 (DC type)

File No.: CQC10002049165(DC type)
CQC16002140270(DC type)

Features

- 40A switching capability
- Heavy load up to 7200VA
- PCB coil terminals, ideal for heavy duty load
- Plastic sealed and dust ptotected types available
- 4kV dielectric strength
  (between coil and contacts)

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance[1]	50mΩ max.(at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Max. switching capacity	7200VA/560W	3600VA/280W	4800VA/560W	2400VA/280W
Max. switching voltage	277VAC / 28VDC			
Max. switching current	40A[2]	15A	20A	10A
Max.continuous current	When PCB terminals carry current≤30A When PCB terminals do not carry current (only QC terminals carry current)≤25A			
HF105F-5 rating	30A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
HF105F-5L rating	25A 240VAC 20A 28VDC	15A 240VAC 10A 28VDC	20A 240VAC 20A 28VDC	10A 240VAC 10A 28VDC
Mechanical endurance	1×10^7 OPS			
Electrical endurance	1H type(Non-plastic sealed): 1×10^5 OPS (28A 277VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC/4000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		DC type: 15ms max.
Release time (at rated. volt.)		DC type: 10ms max.
Ambient temperature		DC: -55℃ to 85℃ AC: -55℃ to 60℃
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB & QC
Unit weight		Approx. 36g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 900mW; AC type: Approx. 2VA

SAFETY APPROVAL RATINGS

UL/ CUL	1 Form A		$AgSnO_2$ AgCdO	30A 277VAC 40A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	30A 28VDC 28A 277VAC 277VAC(FLA=20)(LRA=60)
	1 Form B		AgCdO	15A 277VAC 10A 28VDC 1/2HP 250VAC 1/4HP 125VAC 277VAC(FLA=10)(LRA=33)
	1 Form C	NO	$AgSnO_2$ AgCdO	30A 277VAC 2HP 250VAC 1HP 125VAC
			AgCdO	20A 277VAC 20A 28VDC 277VAC(FLA=20)(LRA=60)
		NC	$AgSnO_2$ AgCdO	20A 277VAC 1/2HP 250VAC 1/4HP 125VAC
			AgCdO	10A 277VAC 10A 28VDC 277VAC(FLA=10)(LRA=33)

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

COIL DATA

at 23˚C

DC type

Nominal Voltage VDC	Pick-up Voltage VDC max.3)	Drop-out Voltage VDC min.3)	Max. Voltage VDC*4)	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91	5500 x (1±10%)
110	82.50	11	143	13450 x (1±10%)

AC type

Nominal Voltage VAC	Pick-up Voltage VAC max.3)	Drop-out Voltage VAC min.3)	Max. Voltage VDC*4)	Coil Resistance Ω
12	9.6	2.4	15.6	25 x (1±10%)
24	19.2	4.8	31.2	100 x (1±10%)
120	96.0	24.0	156	2500 x (1±10%)
208	166.4	41	270.4	11000 x (1±10%)
220	176	44	286	13490 x (1±10%)
240	192	48	286	13490 x (1±10%)
277	220	54	360.1	15000 x (1±10%)

Notes: 1) When requiring pick-up voltage < 80% of nominal voltage, special order allowed.
2) The data shown above are initial values at 50Hz. When requiring 60Hz, special order allowed.
3) The data shown above are initial values.
4) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

HF105F-5 / 018 D T -1H S T F (XXX)

Type	HF105F-5: 30A HF105F-5L: 25A
Coil voltage	**DC:** 5VDC to 110VDC **AC:** 12VAC to 277VAC
Coil voltage form	**D:** DC **A:** AC
Dielectric strength (between coil & contacts)	**T:** 4000VAC **Nil:** 2500VAC
Contact arrangement	**1H:**1 Form A **1D:**1 Form B **1Z:**1 Form C
Construction 1)	**S:** Plastic sealed **Nil:** Dust protected
Contact material	**T:** $AgSnO_2$ **Nil:** AgCdO
Insulation standard	**F:** Class F **Nil:** Class B
Special code3)	**XXX:** Customer special requirement **Nil:** Standard

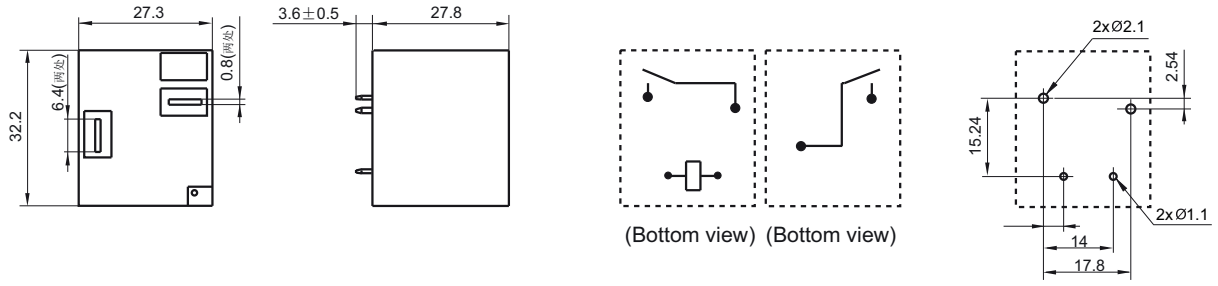
Notes: 1) We recommend dust protected types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.). We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

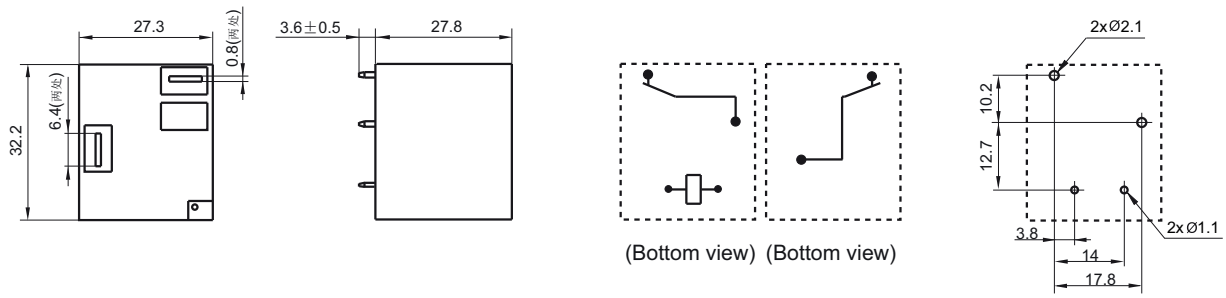
Unit: mm

Outline Dimensions | Wiring Diagram | PCB Layout (Bottom view)

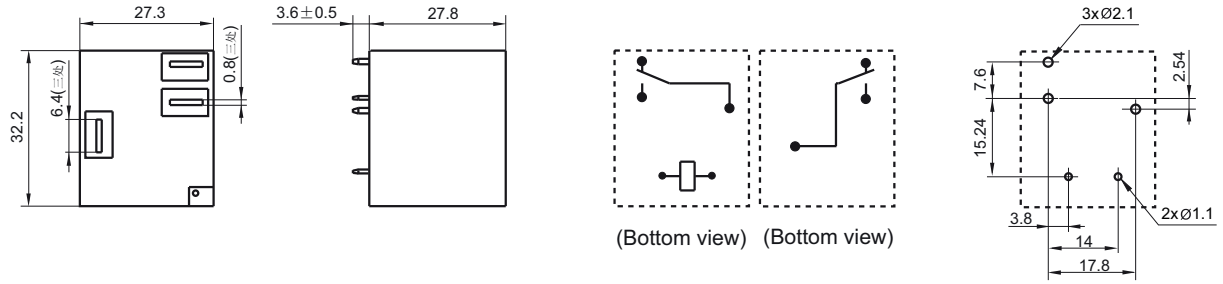
1 Form A



1 Form B



1 Form C

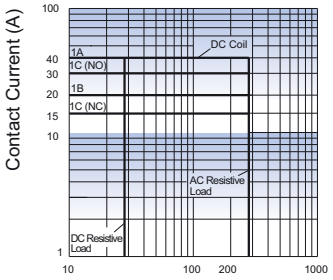


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

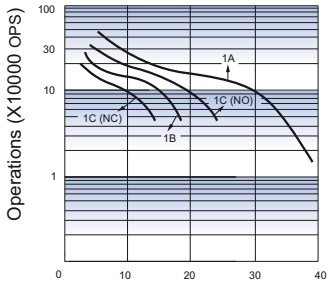
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



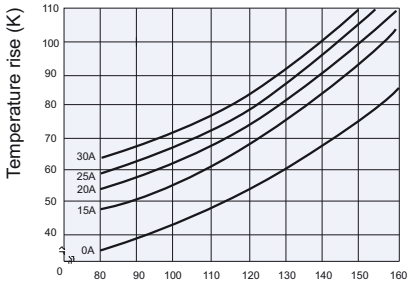
Contact Voltage (V)

ENDURANCE CURVE



Contact Current (A)

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Test conditions:
Resistive load, Dust protected,
AgCdO, Room temp., 1s on 9s off.

HF2100 MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:R50153835

File No.:CQC10002049166

Features

- 30A switching capability
- PCB coil terminals, ideal for heavy duty load
- 2.5kV dielectric strength (between coil and contacts)
- Plastic sealed and Dust protected types available
- UL insulation system: Class F available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance 1)	50mΩ max.(at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A 2)	15A	20A	10A
Max.continuous current	When PCB terminals carry current≤30A When PCB terminals do not carry current (only QC terminals carry current)≤25A			
Mechanical endurance	1×10^7 OPS			
Electrical endurance	1A type(Non-plastic sealed): 1×10^5 OPS (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Ambient temperature		-55℃ to 85℃
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB & QC
Unit weight		Approx. 35g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.
5) It is recommended that the terminal of the process QC cannot pass through more than 25A current for a long period of time .

COIL

Coil power	Approx. 900mW

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC* 2)	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL

Contact material	Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
AgCdO	General purpose	125/240VAC	30A	15A	30A	15A
		277VAC	30A	30A	30A	30A
	Resistive	125/240VAC	30A	15A	– –	– –
		30VDC	20A	10A	20A	10A
		277VAC	20A	– –	– –	– –
		240VAC	15A	– –	– –	– –
		250VAC	40A		40A	
	Ballast	125/240/277VAC	6A	3A	6A	3A
	Pilot duty	125VAC	800VA	290VA	800VA	290VA
		125VAC	690VA	– –	690VA	– –
		125VAC	800VA	– –	800VA	– –
		240VAC	1152VA	768VA	1152VA	768VA
		277VAC	764VA	– –	764VA	– –
	Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
		240VAC	2HP	1HP	2HP	1HP
		125VAC	1HP	– –	1HP	– –
		125/277VAC	3/4HP	– –	3/4HP	– –
	Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	– –	82.8LRA, 13.8FLA	– –
		125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
		125VAC	82.8LRA, 27FLA	– –	82.8LRA, 27FLA	– –
		240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		240VAC	41.4LRA, 6.9FLA	– –	41.4LRA, 6.9FLA	– –
		277VAC	60LRA, 20FLA	– –	60LRA, 20FLA	– –
	Tungsten	125VAC	15A	– –	15A	– –
		240VAC	5A	– –	5A	3A
		120VAC	– –	3A	– –	– –
		240VAC	– –	3A	– –	– –
$AgSnO_2$	General purpose	125/240VAC	30A	– –	– –	– –
	Resistive	250VAC	40A	– –	– –	– –
	General purpose	240VAC	– –	15A	– –	– –

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	HF2100	-1A	-12D	E	T	F	(XXX)
Contact arrangement	**1A:** 1 Form A **1B:** 1 Form B **1C:** 1 Form C						
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC						
Construction[1)]	**E:** Plastic sealed	**Nil:** Dust protected					
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO					
Insulation standard	**F:** Class F	**Nil:** Class B					
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard					

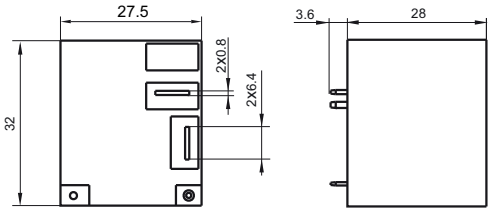
Notes: 1) We recommend dust protected types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc.).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

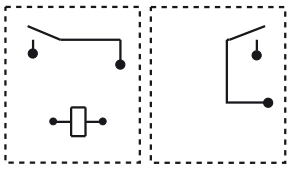
Unit: mm

1 Form A

Outline Dimensions



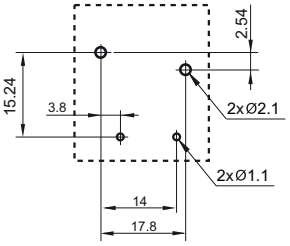
Wiring Diagram



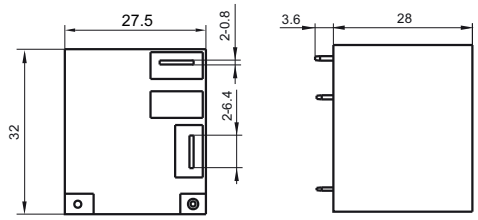
(Bottom view) (Top view)

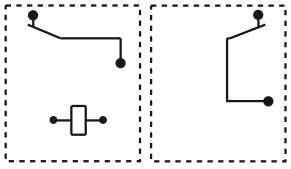
PCB Layout

(Bottom view)

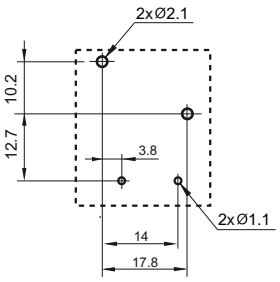


1 Form B





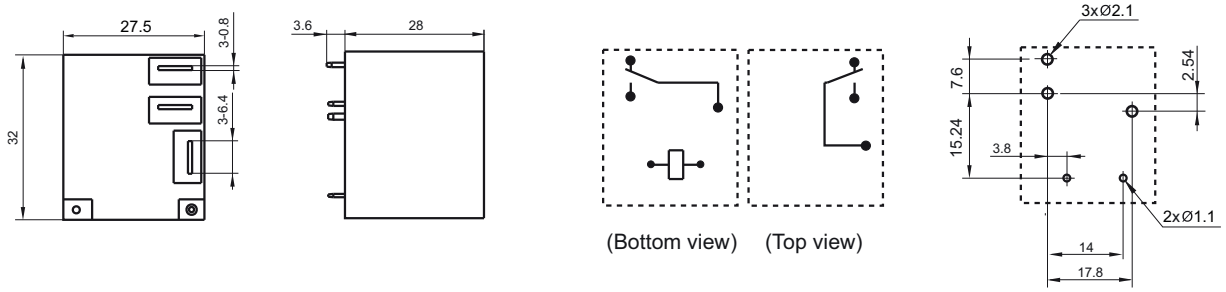
(Bottom view) (Top view)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

1 Form C

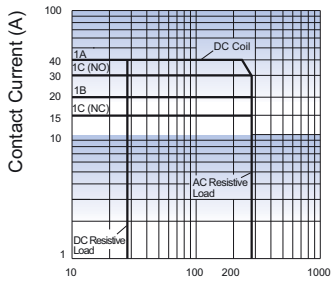


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

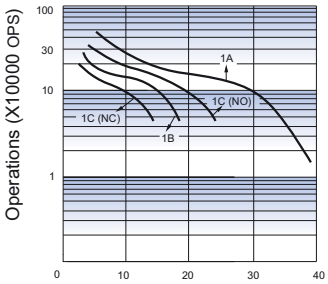
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Contact Voltage (V)

ENDURANCE CURVE

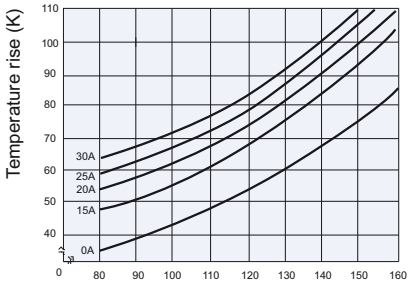


Contact Current (A)

Test conditions:

Resistive load, AgCdO, Dust protected,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

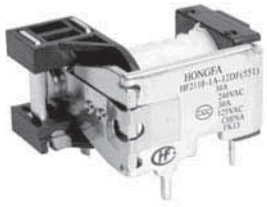
Disclaimer

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.

HF2110/HF2120 MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:CQC10002049166



Features

- 30A switching capability
- PCB coil terminals, ideal for heavy duty load
- 2.5kV dielectric strength (between coil and contacts)
- Unenclosed type available

CONTACT DATA

Contact arrangement	1A	1B	1C(NO)	1C(NC)
Contact resistance 1)	50mΩ max.(at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A 240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4511VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A	15A	20A	10A
Mechanical endurance	1×10^7 OPS			
Electrical endurance	1A type: 1×10^5 OPS (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	HF2110/HF2120: 2500VAC 1min HF2111/HF2121: 2000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Ambient temperature		-55°C to 85°C
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1mm DA
Humidity		5% to 85% RH
Termination		HF2110/2111: PCB HF2120/2121: PCB & QC
Unit weight		Approx. 25g
Construction		Unenclosed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 900mW

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC*2)	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL

Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
General purpose	125/240VAC	30A	15A	30A	15A
	277VAC	30A	30A	30A	30A
Resistive	125/240VAC	30A	15A	– –	– –
	30VDC	20A	10A	20A	10A
	277VAC	20A	– –	– –	– –
	240VAC	15A	– –	– –	– –
	250VAC	40A	– –	40A	– –
Ballast	125/240/277VAC	6A	3A	6A	3A
Pilot duty	125VAC	800VA	290VA	800VA	290VA
	125VAC	690VA	– –	690VA	– –
	125VAC	800VA	– –	800VA	– –
	240VAC	1152VA	768VA	1152VA	768VA
	277VAC	764VA	– –	764VA	– –
Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
	240VAC	2HP	1HP	2HP	1HP
	125VAC	1HP	– –	1HP	– –
	125/277VAC	3/4HP	– –	3/4HP	– –
Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	– –	82.8LRA, 13.8FLA	– –
	125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
	125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
	125VAC	82.8LRA, 27FLA	– –	82.8LRA, 27FLA	– –
	240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
	240VAC	41.4LRA, 6.9FLA	– –	41.4LRA, 6.9FLA	– –
	277VAC	60LRA, 20FLA	– –	60LRA, 20FLA	– –
Tungsten	125VAC	15A	– –	15A	– –
	240VAC	5A	– –	5A	3A
	120VAC	– –	3A	– –	– –
	240VAC	– –	3A	– –	– –

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

HF2110 / HF2120 -1A -12D T F (XXX)

Type	HF2110 HF2120	
Contact arrangement	**1A:** 1 Form A **1B:** 1 Form B **1C:** 1 Form C	
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC	
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO
Insulation standard	**F:** Class F	**Nil:** Class B
Special code[5]	**XXX:** Customer special requirement	**Nil:** Standard

Notes: 1) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.
2) Relays may be damaged because of falling or when shocking conditions exceed the requirement.
3) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidetines of relay".
4) For unenclosed type, beaucause there is no cover protection, the products may be contaminate by particles during transportation assembly or usage, which may cause relay failure, so the produces should be effectively protected at customer side, Hongfa suggest to use HF2150/HF2160 type, if no other special requirement.
5) The customer special requirement express as special code after evaluating by Hongfa.

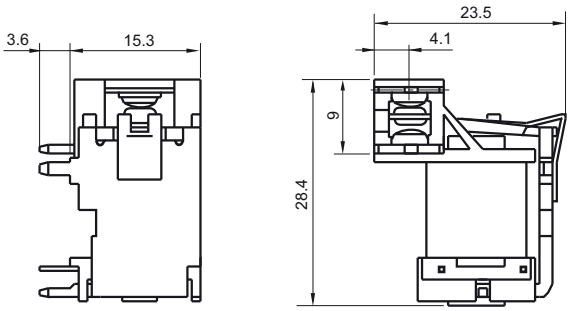
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

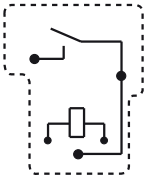
1 Form A

HF2111

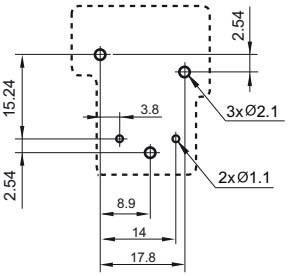
Outline Dimensions



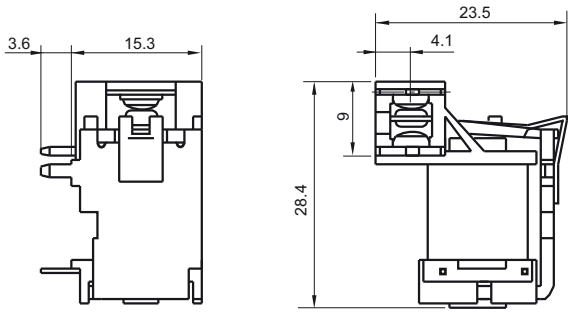
Wiring Diagram
(Bottom view)

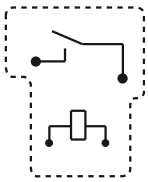


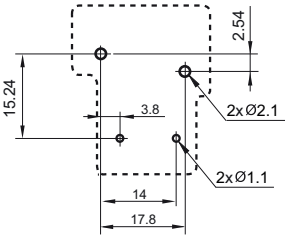
PCB Layout
(Bottom view)



HF2110

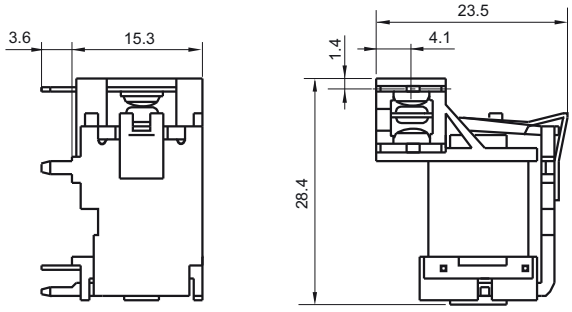


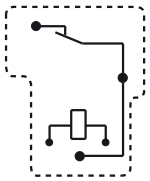


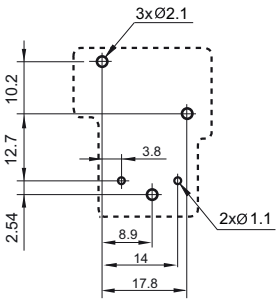


1 Form B

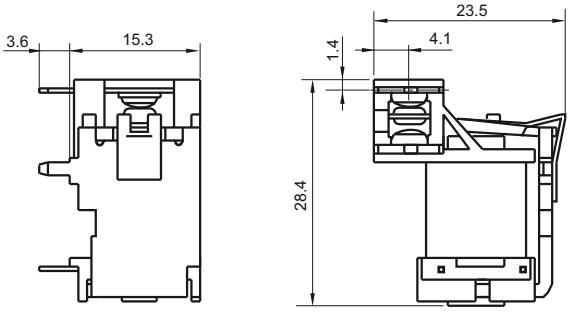
HF2111

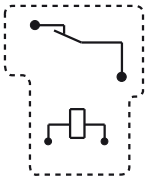


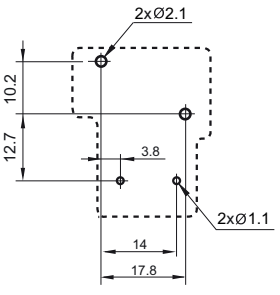




HF2110







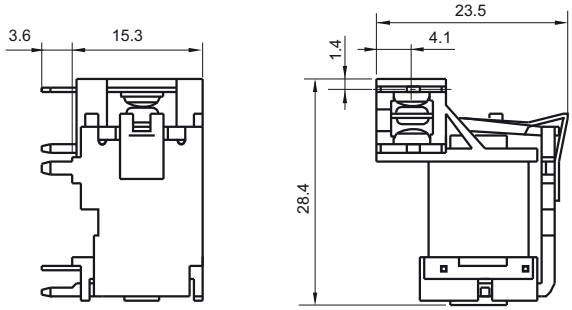
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

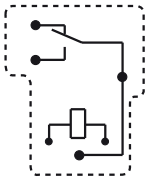
Unit: mm

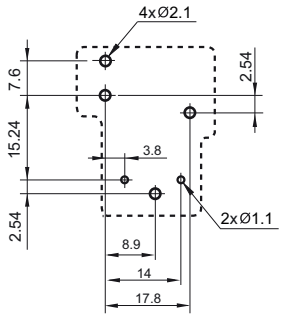
1 Form C

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

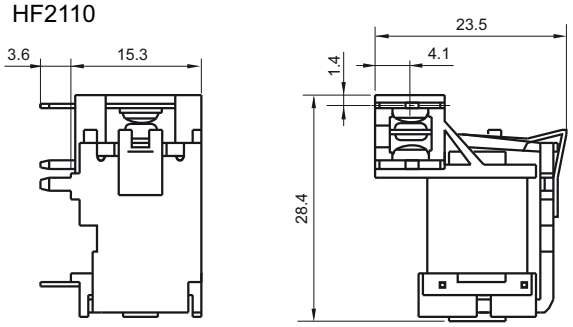
HF2111

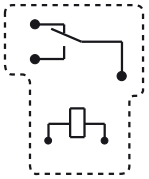


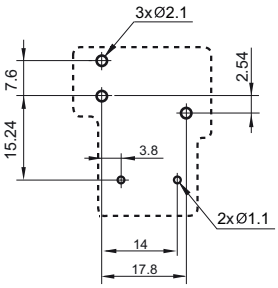




HF2110

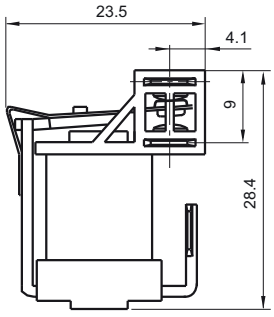


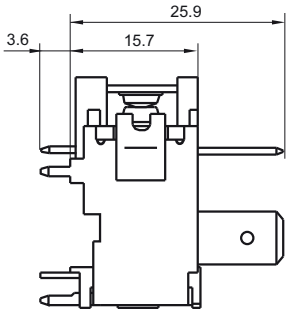


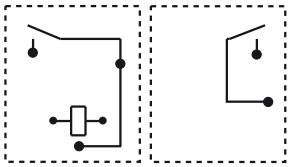


1 Form A

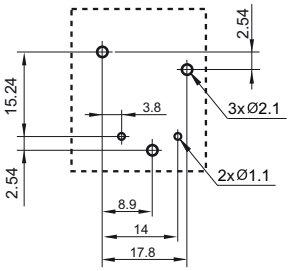
HF2121



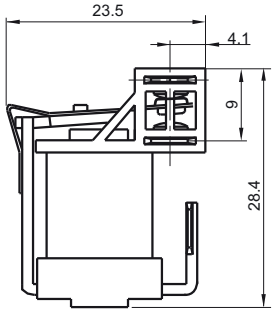


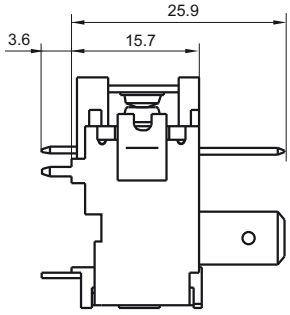


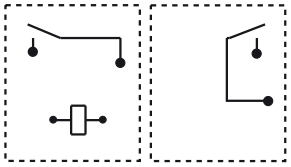
(Bottom view) (Top view)



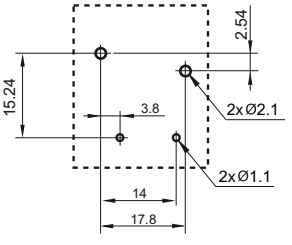
HF2120







(Bottom view) (Top view)



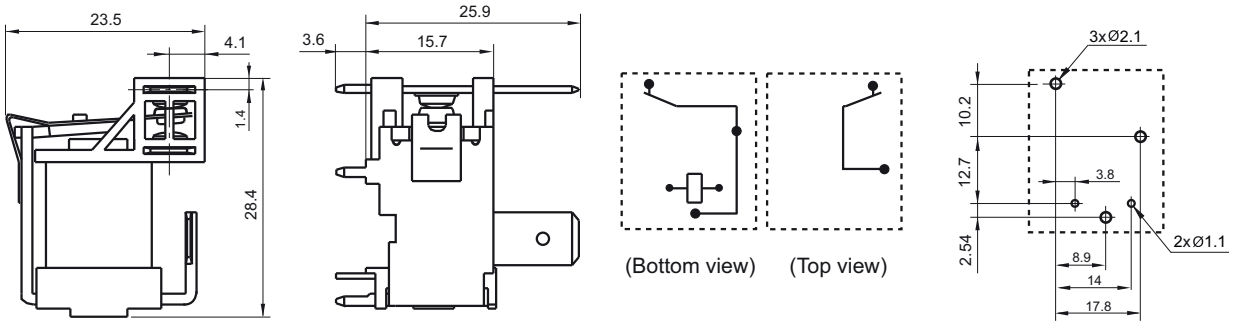
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

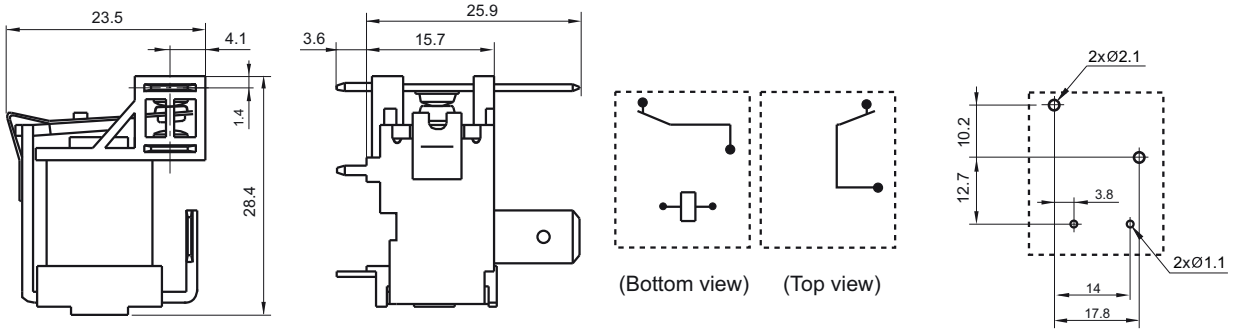
1 Form B

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

HF2121

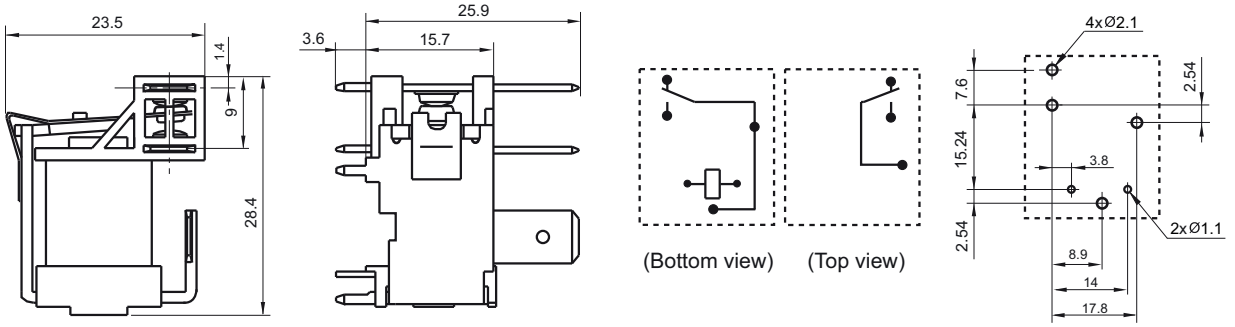


HF2120

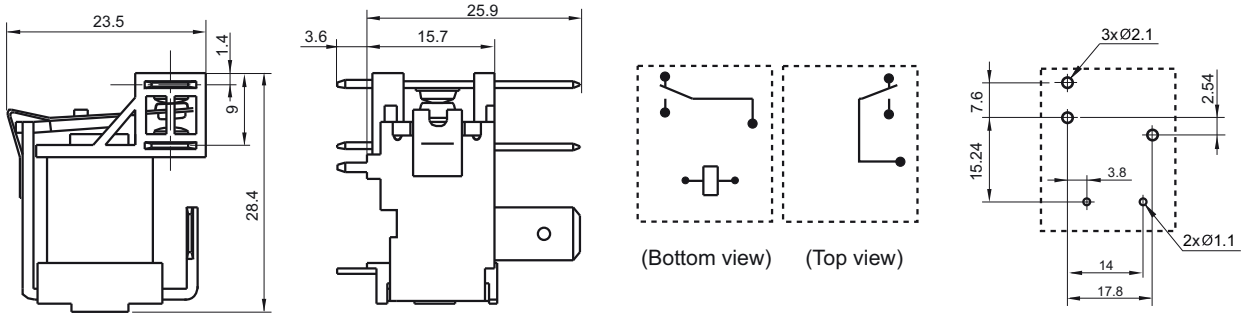


1 Form C

HF2121



HF2120

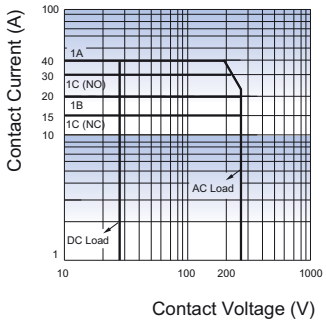


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

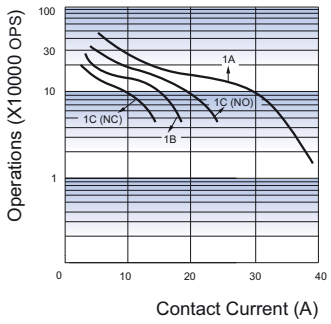
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

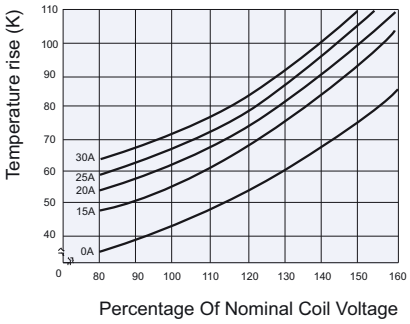


ENDURANCE CURVE



Test conditions:
Resistive load, AgCdO, Room temp.,
1s on 9s off.

COIL TEMPERATURE RISE



HF2150/HF2151 MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

File No.: R50153835

CQC
File No.:CQC10002049166
CQC16002139675

Features

- 30A switching capability
- PCB coil terminals, ideal for heavyduty load
- Heavy load up to 7200VA
- Plastic sealed and Dust protected type available

CONTACT DATA

Contact arrangement	1A	1B	1C(NO)	1C(NC)
Contact resistance 1)	50mΩ max.(at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A 240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A 2)	15A	20A	10A
Mechanical endurance	1×10^7 OPS			
Electrical endurance	1A type(Non-plastic sealed): 1×10^5 OPS (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	HF2150: 2500VAC 1min HF2151: 2000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Ambient temperature		-55℃ to 85℃
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB
Unit weight		Approx. 30g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.

COIL

Coil power	Approx. 900mW

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC* 2)	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL

Contact material	Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
AgCdO	General purpose	125/240VAC	30A	15A	30A	15A
		277VAC	30A	30A	30A	30A
	Resistive	125/240VAC	30A	15A	– –	– –
		30VDC	20A	10A	20A	10A
		277VAC	20A	– –	– –	– –
		240VAC	15A	– –	– –	– –
		250VAC	40A		40A	
	Ballast	125/240/277VAC	6A	3A	6A	3A
	Pilot duty	125VAC	800VA	290VA	800VA	290VA
		125VAC	690VA	– –	690VA	– –
		125VAC	800VA	– –	800VA	– –
		240VAC	1152VA	768VA	1152VA	768VA
		277VAC	764VA	– –	764VA	– –
	Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
		240VAC	2HP	1HP	2HP	1HP
		125VAC	1HP	– –	1HP	– –
		125/277VAC	3/4HP	– –	3/4HP	– –
	Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	– –	82.8LRA, 13.8FLA	– –
		125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
		125VAC	82.8LRA, 27FLA	– –	82.8LRA, 27FLA	– –
		240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		240VAC	41.4LRA, 6.9FLA	– –	41.4LRA, 6.9FLA	– –
		277VAC	60LRA, 20FLA	– –	60LRA, 20FLA	– –
	Tungsten	125VAC	15A	– –	15A	– –
		240VAC	5A	– –	5A	3A
		120VAC	– –	3A	– –	– –
		240VAC	– –	3A	– –	– –
$AgSnO_2$	General purpose	125/240VAC	30A	– –	– –	– –
	Resistive	250VAC	40A	– –	– –	– –
	General purpose	240VAC	– –	15A	– –	– –

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

	HF2150	-1A	-12D	E	T	F	(XXX)	
Type	HF2151							

Contact arrangement	**1A:** 1 Form A **1B:** 1 Form B **1C:** 1 Form C	
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC	
Construction[1)]	**E:** Plastic sealed	**Nil:** Dust protected
Contact material	**T:** **$AgSnO_2$**	**Nil:** **AgCdO**
Insulation standard	**F:** Class F	**Nil:** Class B
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard

Notes: 1) We recommend dust protected 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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

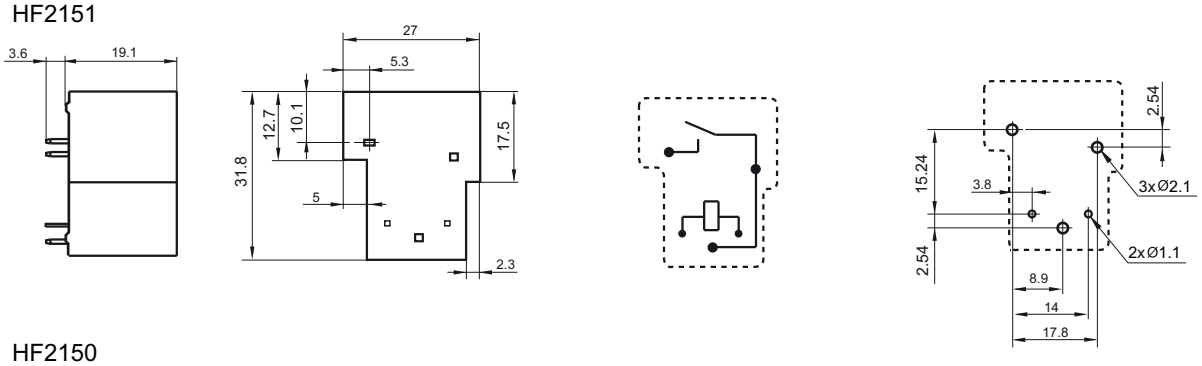
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

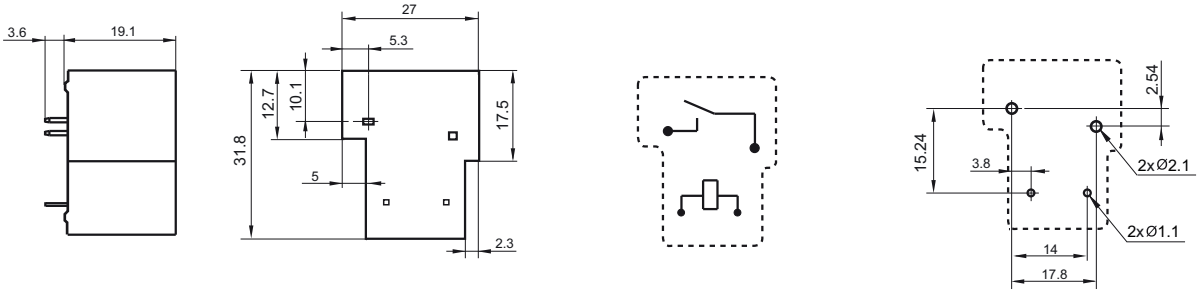
1 Form A

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

HF2151

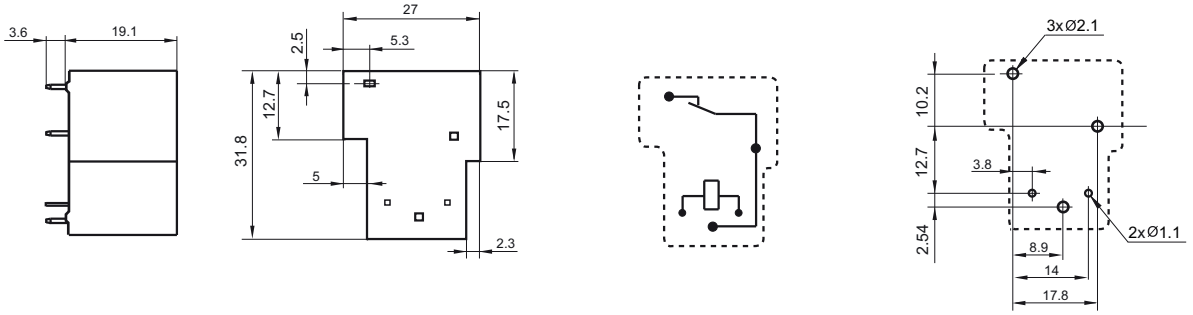


HF2150

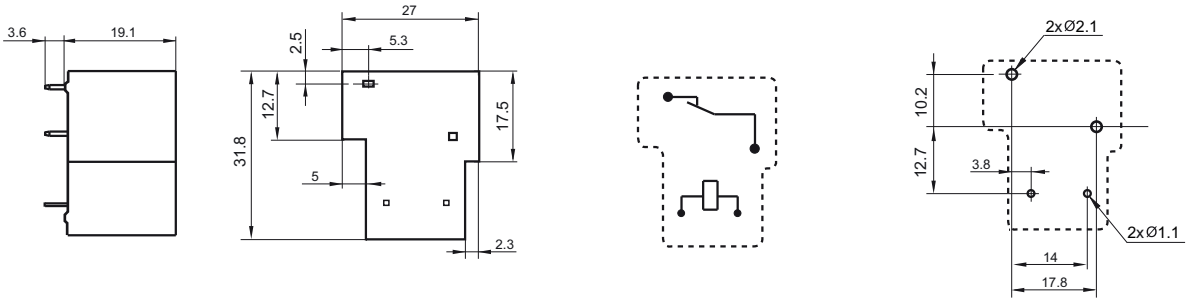


1 Form B

HF2151



HF2150



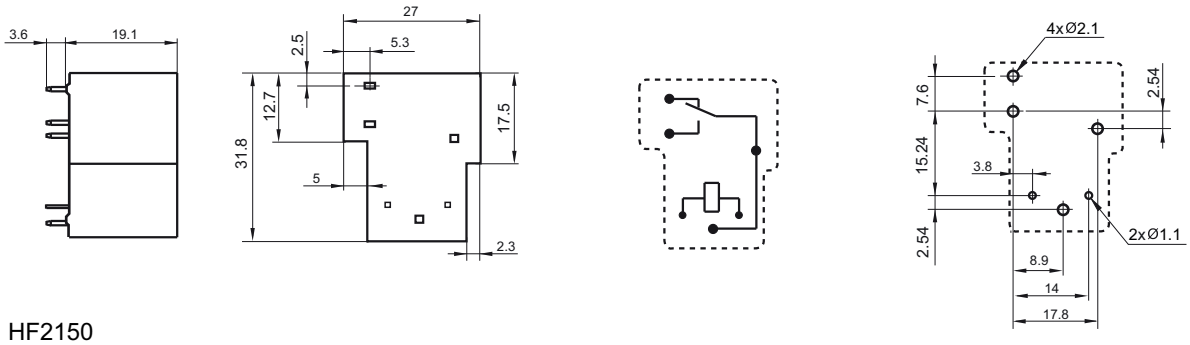
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

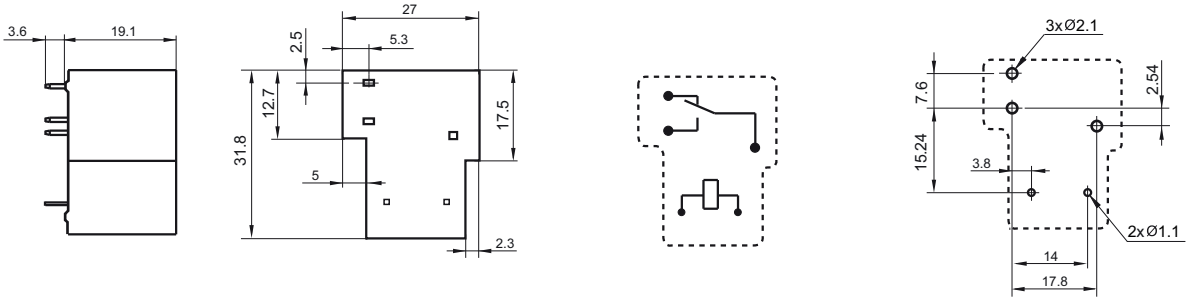
1 Form C

Outline Dimensions | Wiring Diagram (Bottom view) | PCB Layout (Bottom view)

HF2151



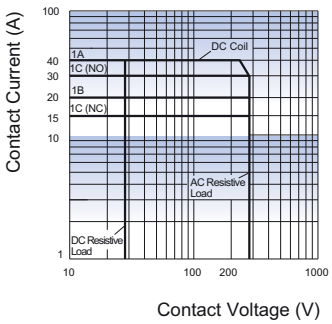
HF2150



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 lauout is always ±0.1mm.

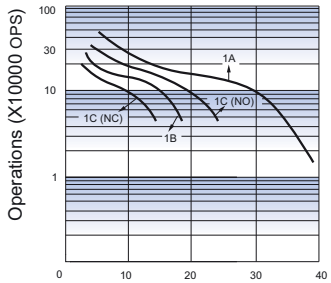
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



Contact Voltage (V)

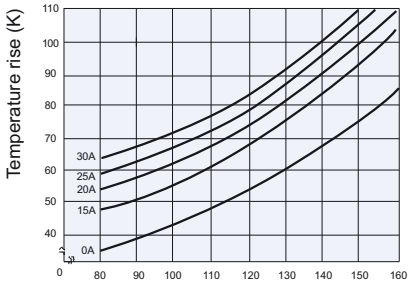
ENDURANCE CURVE



Contact Current (A)

Test conditions:
Resistive load, AgCdO, Dust protected,
Room temp., 1s on 9s off.

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

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.

HF2160 MINIATURE HIGH POWER RELAY

File No.:E134517

File No.: R50153835

File No.:CQC10002049166
CQC16002139675

Features

- 30A switching capability
- PCB coil terminals, ideal for heavy duty load
- 2.5kV dielectric strength (between coil and contacts)
- Plastic sealed and Dust protected types available

CONTACT DATA

Contact arrangement	1A	1B	1C (NO)	1C (NC)
Contact resistance 1)	50mΩ max.(at 1A 24VDC)			
Contact material	$AgSnO_2$, AgCdO			
Contact rating (Res. load)	30A 240VAC 20A 30VDC	15A 240VAC 10A 30VDC	20A 240VAC 20A 30VDC	10A 240VAC 10A 30VDC
Max. switching power	11080VA 1200W	4155VA 450W	5540VA 600W	2770VA 300W
Max. switching voltage	277VAC / 30VDC			
Max. switching current	40A 2)	15A	20A	10A
Max.continuous current	When PCB terminals carry current≤30A When PCB terminals do not carry current (only QC terminals carry current)≤25A			
Mechanical endurance	1×10^7 OPS			
Electrical endurance	1A type(Non-plastic sealed): 1×10^5 OPS (30A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off) 1B type(Non-plastic sealed): 1×10^5 OPS (15A 240VAC, Resistive load, AgCdO, Room temp., 1s on 9s off)			

Notes: 1) The data shown above are initial values.
2) Long time current-carrying under 40A condition is prohibited.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		10ms max.
Ambient temperature		-55℃ to 85℃
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Termination		PCB & QC
Unit weight		Approx. 30g
Construction		Plastic sealed, Dust protected

Notes: 1) For plastic sealed type, the venting-hole should be opened in test.
2) The data shown above are initial values.
3) Please find coil temperature curve in the characteristic curves below.
4) UL insulation system: Class F, Class B.
5) It is recommended that the terminal of the process QC cannot pass through more than 25a current for a long period of time .

COIL

Coil power	Approx. 900mW

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC*2)	Coil Resistance Ω
5	3.75	0.5	6.5	27 x (1±10%)
6	4.50	0.6	7.8	40 x (1±10%)
9	6.75	0.9	11.7	97 x (1±10%)
12	9.00	1.2	15.6	155 x (1±10%)
15	11.25	1.5	19.5	256 x (1±10%)
18	13.50	1.8	23.4	380 x (1±10%)
24	18.00	2.4	31.2	660 x (1±10%)
48	36.00	4.8	62.4	2560 x (1±10%)
70	52.50	7.0	91.0	5500 x (1±10%)
110	82.50	11.0	143.0	13450 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL

Contact material	Load type	Volts	1 Form A	1 Form B	1 Form C (NO)	1 Form C (NC)
AgCdO	General purpose	125/240VAC	30A	15A	30A	15A
		277VAC	30A	30A	30A	30A
	Resistive	125/240VAC	30A	15A	– –	– –
		30VDC	20A	10A	20A	10A
		277VAC	20A	– –	– –	– –
		240VAC	15A	– –	– –	– –
		250VAC	40A		40A	
	Ballast	125/240/277VAC	6A	3A	6A	3A
	Pilot duty	125VAC	800VA	290VA	800VA	290VA
		125VAC	690VA	– –	690VA	– –
		125VAC	800VA	– –	800VA	– –
		240VAC	1152VA	768VA	1152VA	768VA
		277VAC	764VA	– –	764VA	– –
	Motor load	125VAC	1HP	1/4HP	1HP	1/4HP
		240VAC	2HP	1HP	2HP	1HP
		125VAC	1HP	– –	1HP	– –
		125/277VAC	3/4HP	– –	3/4HP	– –
	Definite purpose (LRA-loaded rotor) (FLA-full load)	120VAC	82.8LRA, 13.8FLA	– –	82.8LRA, 13.8FLA	– –
		125VAC	96LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		125VAC	60LRA, 20FLA	30LRA, 12FLA	60LRA, 20FLA	30LRA, 12FLA
		125VAC	82.8LRA, 27FLA	– –	82.8LRA, 27FLA	– –
		240VAC	80LRA, 30FLA	33LRA, 10FLA	60LRA, 20FLA	33LRA, 10FLA
		240VAC	41.4LRA, 6.9FLA	– –	41.4LRA, 6.9FLA	– –
		277VAC	60LRA, 20FLA	– –	60LRA, 20FLA	– –
	Tungsten	125VAC	15A	– –	15A	– –
		240VAC	5A	– –	5A	3A
		120VAC	– –	3A	– –	– –
		240VAC	– –	3A	– –	– –
$AgSnO_2$	General purpose	125/240VAC	30A	– –	– –	– –
	Resistive	250VAC	40A	– –	– –	– –
	General purpose	240VAC	– –	15A	– –	– –

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

	HF2160	-1A	-12D	E	T	F	(XXX)

Type		
Contact arrangement	**1A:** 1 Form A **1B:** 1 Form B **1C:** 1 Form C	
Coil voltage	5, 6, 9, 12, 15, 18, 24, 48, 70, 110VDC	
Construction [1)2)]	**E:** Plastic sealed	**Nil:** Dust protected
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO
Insulation standard	**F:** Class F	**Nil:** Class B
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard

Notes: 1) We recommend dust protected 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 recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

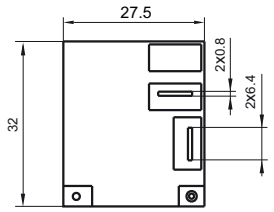
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

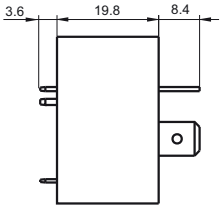
Unit: mm

1 Form A

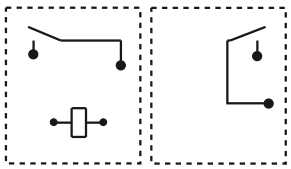
Outline Dimensions



(Top view)



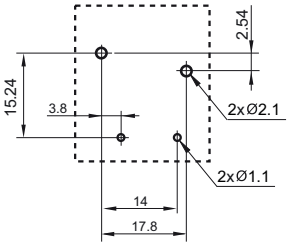
Wiring Diagram



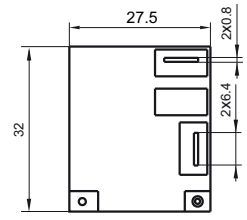
(Bottom view) (Top view)

PCB Layout

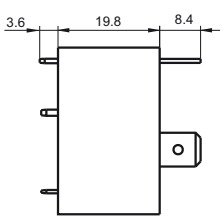
(Bottom view)

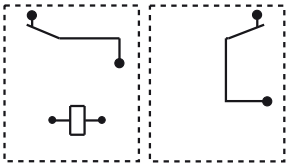


1 Form B

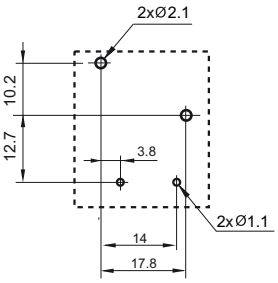


(Top view)





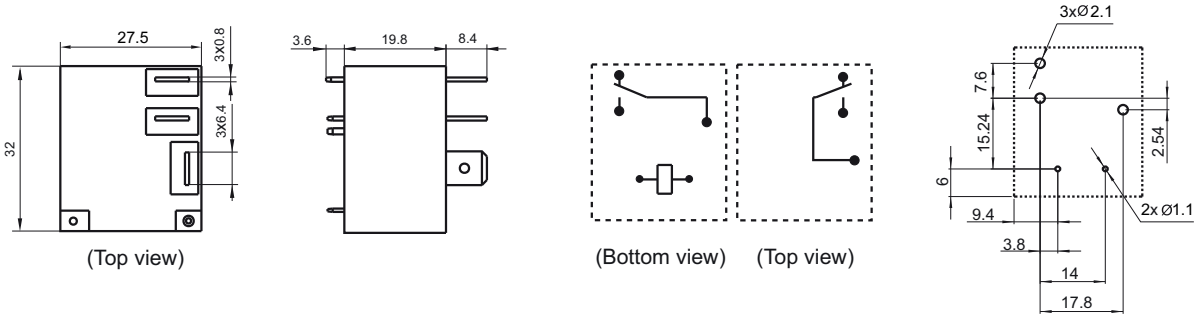
(Bottom view) (Top view)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

1 Form C

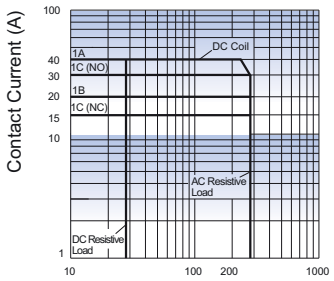


(Top view) (Bottom view) (Top view)

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.

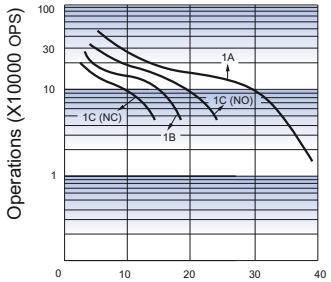
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



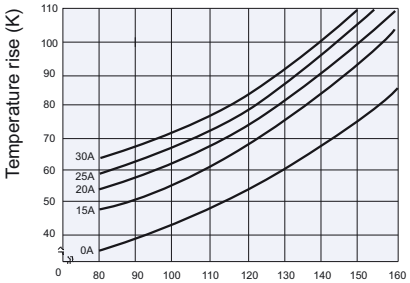
Contact Voltage (V)

ENDURANCE CURVE



Contact Current (A)

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Test conditions:
Resistive load, AgCdO, Dust protected,
Room temp., 1s on 9s off.

HF172F-100 SOLAR RELAY

c UL us
File No.: E133481

File No.: R50393829

Features

- 100A switching capability
- Applicable to solar photovoltaic inverter
- 4.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	6mΩ max.(6VDC 20A)
Contact material	AgNi
Contact rating (Res. load)	Making 30A,carrying 100A breaking 30A, 690VAC at 85˚C
Max. switching voltage	800VAC
Max. switching current	100A
Max. switching power	24000VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	3 x10^4OPS (Making 30A, carrying 100A breaking 30A, at 85˚C 1s on 9s off)

COIL

Coil power	Approx. 2.5W
Holding voltage	40% to 100% U_N (at 25˚C) 50% to 60%U_N (at 85˚C)

Notes: 1) The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2) To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

SAFETY APPROVAL RATINGS

UL/CUL (pending)	Making 60A, carrying 100A breaking 60A, 277VAC at 85˚C Making 30A, carrying 100A breaking 30A, 800VAC at 85˚C
TÜV (pending)	Making 60A, carrying 100A breaking 60A, 277VAC at 85˚C Making 30A, carrying 100A breaking 30A, 800VAC at 85˚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.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage		10kV(1.2 / 50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 100A, 50% to 60% rated voltage excitation, at 85˚C)
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 125g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
6	4.5	0.3	6.6	14.4 x (1±10%)
9	6.75	0.45	9.9	32.4 x (1±10%)
12	9	0.6	13.2	57.6 x (1±10%)
24	18	1.2	26.4	230.4 x (1±10%)

Notes: *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

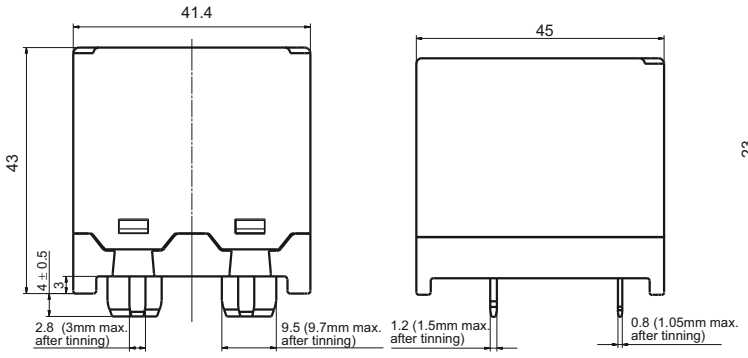
	HF172F-100/	12	-H	F	(XXX)
Type					
Coil voltage	6, 9, 12, 24VDC				
Contact arrangement	**H:**1 Form A				
Insulation standard	**F:** Class F				
Special code 3)	**XXX:** Customer special requirement		**Nil:** Standard		

Notes: 1) Flux-proofed relays can not be used inthe environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

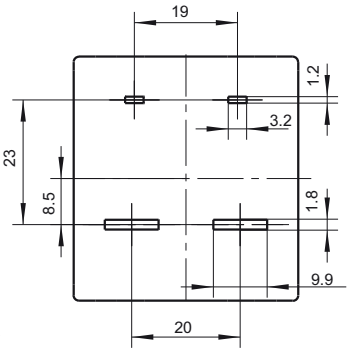
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

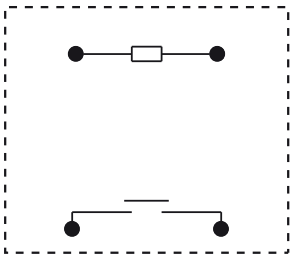
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



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.

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.

HF172F-140 SOLAR RELAY

c UL us
File No.: E133481

File No.: R50393829

Features

- 140A switching capability
- Applicable to solar photovoltaic inverter
- 3.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	6mΩ max.(6VDC 20A)
Contact material	AgNi
Contact rating (Res. load)	Making 40A,carrying 140A breaking 40A, 400VAC at 85°C
Max. switching voltage	800VAC
Max. switching current	140A
Max. switching power	24000VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	3 x10^4OPS (Making 40A,carrying 140A breaking 40A, at 85°C 1s on 9s off)

COIL

Coil power	Approx. 2.5W
Holding voltage	40% to 100% U_N (at 25°C) 50% to 60%U_N (at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

SAFETY APPROVAL RATINGS

UL/CUL	Making 60A, carrying 140A breaking 60A, 277VAC at 85°C Making 40A, carrying 140A breaking 40A, 400VAC at 85°C Making 30A, carrying 140A breaking 30A, 800VAC at 85°C
TÜV	Making 60A, carrying 140A breaking 60A, 277VAC at 85°C Making 40A, carrying 140A breaking 40A, 400VAC at 85°C Making 30A, carrying 140A breaking 30A, 800VAC at 85°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.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage		10kV(1.2 / 50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 140A, 50% to 60% rated voltage excitation, at 85°C)
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx. 135g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC *	Coil Resistance Ω
6	4.5	0.3	6.6	14.4 x (1±10%)
9	6.75	0.45	9.9	32.4 x (1±10%)
12	9	0.6	13.2	57.6 x (1±10%)
24	18	1.2	26.4	230.4 x (1±10%)

Notes: *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

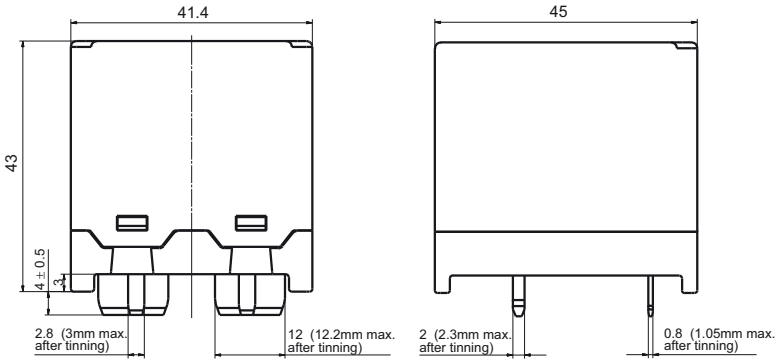
	HF172F-140/	12	-H	F	(XXX)
Type					
Coil voltage	6, 9, 12, 24VDC				
Contact arrangement	**H:**1 Form A				
Insulation standard	**F:** Class F				
Special code 3)	**XXX:** Customer special requirement		**Nil:** Standard		

Notes: 1) Flux-proofed relays can not be used inthe environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

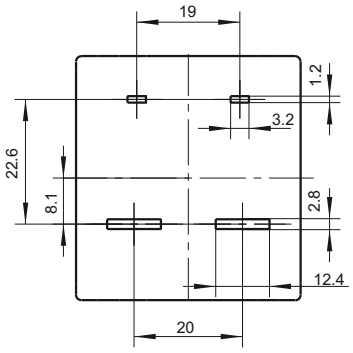
Unit: mm

Outline Dimensions



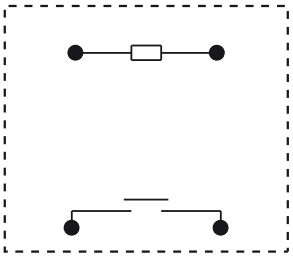
PCB Layout

(Bottom view)



Wiring Diagram

(Bottom view)



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.

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.

HF116F-1 MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

File No.:R 50154722

CQC
File No.:CQC09002031231
CQC18002206328

Features

- 30A switching capability
- 4kV dielectric strength (between coil and contacts)
- 3mm contact gap available

CONTACT DATA

Contact arrangement	1A	2A
Contact resistance[1)]	100mΩ max.(at 1A 24VDC)	
Contact material	AgSnO2, AgCdO	
Contact rating (Res. load)	30A 240VAC 30A 277VAC	25A 240VAC 25A 277VAC
Max. switching voltage	277VAC	
Max. switching current	30A	25A
Max. switching power	8310VA	6925VA
Mechanical endurance	1 x 10^7 OPS	
Electrical endurance	1H,1HT type: 1 x 10^5 OPS (30A 240VAC, Resistive load, Room temp., 1s on 9s off) 2H,2HT type: 1 x 10^5 OPS (25A 240VAC, Resistive load, Room temp., 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2000VAC 1min
Operate time (at nomi. volt.)		30ms max.(DC type)
Release time (at nomi. volt.)		30ms max.(DC type)
Shock resistance	Functional	Standard:98m/s² Pulse width 11ms W type:98m/s² Pulse width 6ms
	Destructive	980m/s² Pulse width 6ms
Vibration resistance		Standard:10H to 55Hz 1.5mm DA W type:10H to 55Hz 1.0mm DA
Ambient temperature		-55°C to 70°C
Humidity		5% to 85% RH
Termination		PCB, QC, Screw
Unit weight		Approx. 120g
Construction		Dust protected

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 1.9W; AC type: Approx. 2.7VA

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max[1)]	Drop-out Voltage VDC min[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
3	2.25	0.3	3.3	4.7 x (1±10%)
6	4.50	0.6	6.6	18.8 x (1±10%)
12	9.00	1.2	13.2	75 x (1±10%)
24	18.0	2.4	26.4	300 x (1±10%)
48	36.0	4.8	52.8	1200 x (1±10%)
100	75.0	10.0	110	5200 x (1±10%)
110	82.5	11.0	121	6300 x (1±10%)
200	150	20.0	220	21000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC[1)]	Drop-out Voltage VAC[1)]	Max. Voltage VAC *[2)]	Coil Resistance Ω
6	4.80	0.90	6.6	18.8 x (1±10%)
12	9.60	1.80	13.2	75 x (1±10%)
24	19.2	3.60	26.4	300 x (1±10%)
48	38.4	7.20	52.8	1200 x (1±10%)
120	96.0	18.0	132	5200 x (1±10%)
220/240	176	33.0	242	20800 x (1±10%)

Notes: 1) The data shown above are initial values.
2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgSnO2	30A 277VAC 1.5HP 120VAC 3HP 240VAC 10A 120VAC Tungsten
	AgCdO	30A 277VAC 1.5HP 120VAC 3HP 240VAC 10A 120VAC Tungsten TV-10 120VAC
TÜV		27A 240VAC COSØ =0.8 25A 240VAC COSØ =0.4 25A 240VAC COSØ =1

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

	HF116F-1 /	012	D	A	-1H	T	F	W	C	(XXX)
Type										
Coil voltage	**DC:** 3VDC to 200VDC **AC:** 6VAC to 220VAC									
Coil voltage form	**D:** DC	**A:** AC								
Mounting	**A:** Mount	**P:** PCB	**F:** Flanged							
Contact arrangement	**1H:**1 Form A	**2H:** 2 Form A								
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO								
Insulation standard	**F:** Class F	**Nil:** Class B								
Contact Gap	**W:** 3.0mm	**Nil:** Standard								
Capacitor	**C:** With Capacitor(Only for AC)	**Nil:** Without Capacitor								
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard								

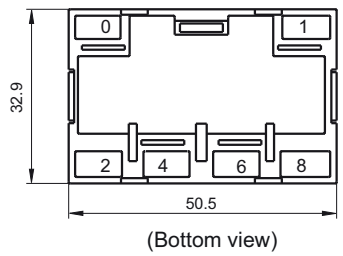
Notes: 1) Water cleaning or surface process is not suggested after the dust-protected relays are assembled on PCB.
2) Dust-protected relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

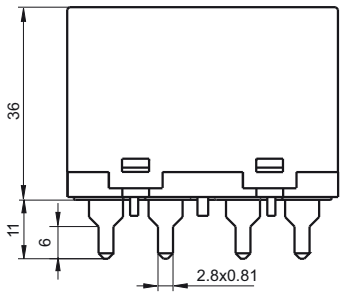
Unit: mm

Outline Dimensions

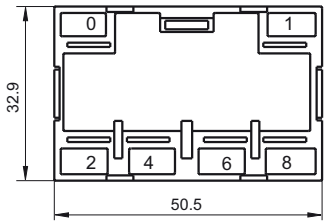
HF116F-1/□□□ -□ -P-1H-□



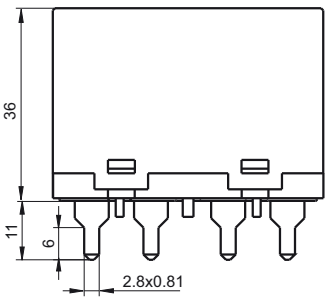
(Bottom view)



HF116F-1/□□□ -□ -P-2H-□

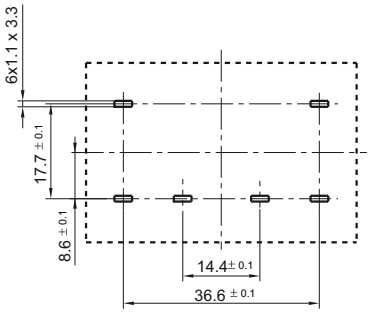


(Bottom view)



PCB Layout

(Bottom view)

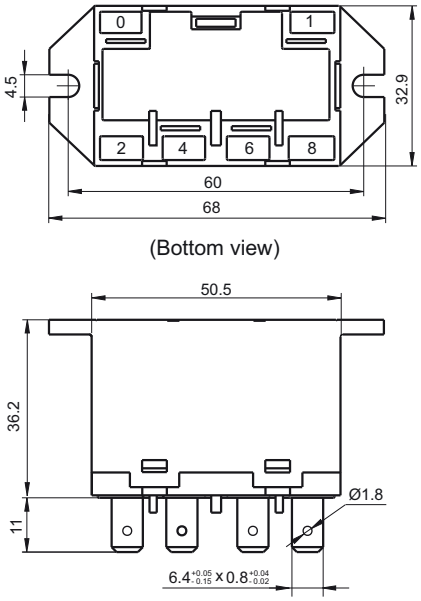


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

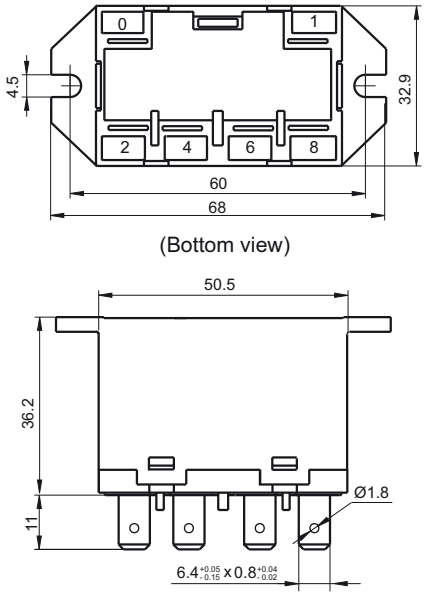
Unit: mm

Outline Dimensions

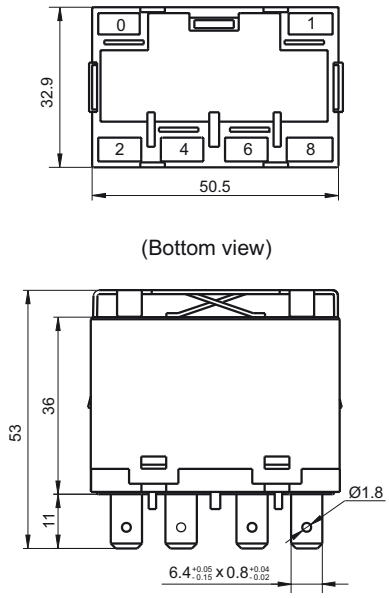
HF116F-1/□□□ -□ -F-1H-□



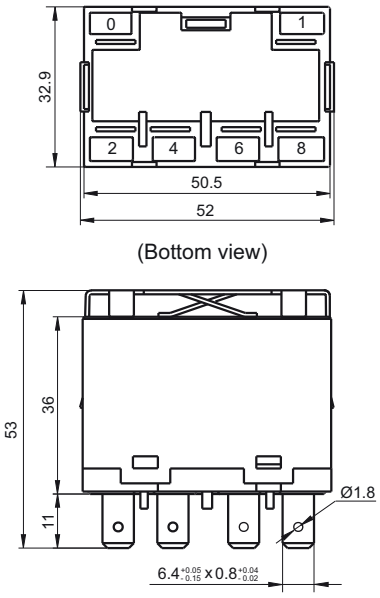
HF116F-1/□□□ -□ -F-2H-□



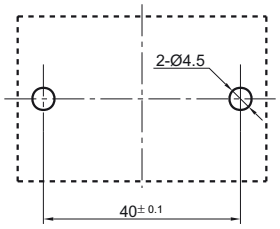
HF116F-1/□□□ -□ -A-1H-□



HF116F-1/□□□ -□ -A-2H-□



Mounting Holes



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.

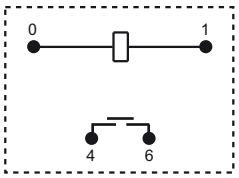
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

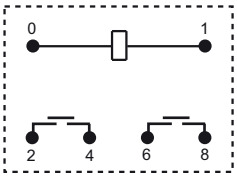
Wiring Diagram

(Bottom view)

1 Form A

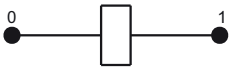


2 Form A

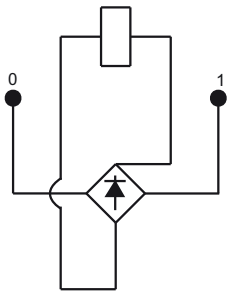


Coil Inner Circuit

DC operation coil

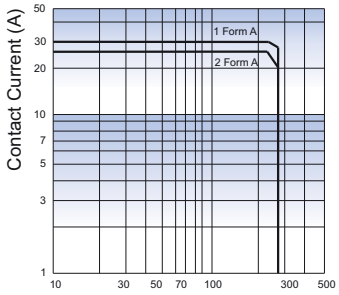


AC operation coil



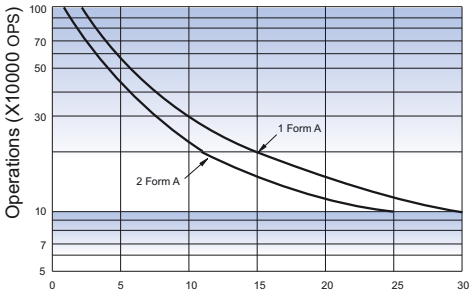
CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



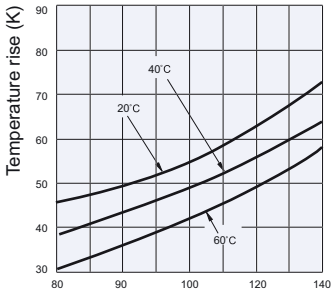
Contact Voltage (V)

ENDURANCE CURVE



Contact Current (A)

COIL TEMPERATURE RISE



Percentage Of Nominal Coil Voltage

Test conditions:

250VAC, Resistive load, Room temp.,
1s on 9s off

HF116F-2 MINIATURE HIGH POWER RELAY

File No.:E134517

File No.:R 50154722

File No.:CQC09002031231
CQC18002206328

Features

- 30A switching capability
- 4kV dielectric strength (between coil and contacts)
- 3mm contact gap available

CONTACT DATA

Contact arrangement	1A	2A
Contact resistance 1)	100mΩ max.(at 1A 24VDC)	
Contact material	$AgSnO_2$, AgCdO	
Contact rating (Res. load)	30A 240VAC 30A 277VAC	25A 240VAC 25A 277VAC
Max. switching voltage	277VAC	
Max. switching current	30A	25A
Max. switching power	8310VA	6925VA
Mechanical endurance	1 x 10^7OPS	
Electrical endurance	1H,1HT type: 1 x 10^5OPS (30A 240VAC, Resistive load, Room temp., 1s on 9s off) 2H,2HT type: 1 x 10^5OPS (25A 240VAC, Resistive load, Room temp., 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2000VAC 1min
Operate time (at nomi. vot.)		30ms max.(DC type)
Release time (at nomi. vot.)		30ms max.(DC type)
Shock resistance	Functional	Standard:98m/s² Pulse width 11ms W type:98m/s² Pulse width 6ms
	Destructive	980m/s² Pulse width 6ms
Vibration resistance		Standard:10H to 55Hz 1.5mm DA W type:10H to 55Hz 1.0mm DA
Ambient temperature		-55˚C to 70˚C
Humidity		5% to 85% RH
Termination		PCB, QC, Screw
Unit weight		Approx.120g
Construction		Plastic sealed, Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) For the plastic sealed type, please open two vent holes after installing relay (or cleansing PCB board) in order to increase the relay reliability.
4) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 1.9W; AC type: Approx. 2.7VA

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC*2)	Coil Resistance Ω
3	2.25	0.3	3.3	4.7 x (1±10%)
6	4.50	0.6	6.6	18.8 x (1±10%)
12	9.00	1.2	13.2	75 x (1±10%)
24	18.0	2.4	26.4	300 x (1±10%)
48	36.0	4.8	52.8	1200 x (1±10%)
100	75.0	10.0	110	5200 x (1±10%)
110	82.5	11.0	121	6300 x (1±10%)
200	150	20.0	220	21000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max.1)	Drop-out Voltage VAC min.1)	Max. Voltage VAC*2)	Coil Resistance Ω
6	4.80	0.90	6.6	18.8 x (1±10%)
12	9.60	1.80	13.2	75 x (1±10%)
24	19.2	3.60	26.4	300 x (1±10%)
48	38.4	7.20	52.8	1200 x (1±10%)
120	96.0	18.0	132	5200 x (1±10%)
220/240	176	33.0	242	20800 x (1±10%)

Notes: 1) The data shown above are initial values.
2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	$AgSnO_2$	30A 277VAC 1.5HP 120VAC 3HP 240VAC 10A 120VAC Tungsten
	AgCdO	30A 277VAC 1.5HP 120VAC 3HP 240VAC 10A 120VAC Tungsten TV-10 120VAC
TÜV		27A 240VAC COSØ =0.8 25A 240VAC COSØ =0.4 25A 240VAC COSØ =1

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

	HF116F-2 /	012	D	L	-1H	S	T	F	W	(XXX)
Type										
Coil voltage	**DC:** 3VDC to 200VDC **AC:** 6VAC to 220VAC									
Coil input	**D:** DC	**A:** AC								
Mounting	**P:** PCB	**L:** Screw								
Contact arrangement	**1H:** 1 Form A	**2H:** 2 Form A								
Construction[1)2)]	**S:** Plastic sealed	**Nil:** Flux proofed								
Contact material[3)]	**T:** $AgSnO_2$	**Nil:** AgCdO								
Insulation standard	**F:** Class F	**Nil:** Class B								
Contact Gap	**W:** 3.0mm	**Nil:** Standard								
Special code[4)]	**XXX:** Customer special requirement	**Nil:** Standard								

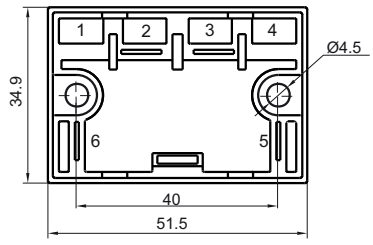
Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H_2S, SO_2, NO_2, dust, etc.).
We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H_2S, SO_2, NO_2, dust, etc).
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For the applications of motor load, capacitive load and high inrush current, $AgSnO_2$ contact material is recommended. For the applications of resistive load or low inductive load, AgCdO contact material is recommened.
4) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

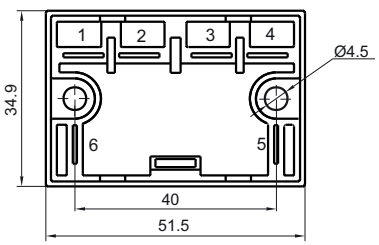
Outline Dimensions

HF116F-2/□□□ −□ -L-1H-□



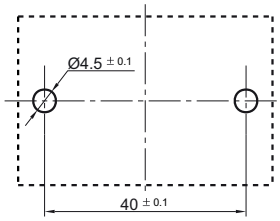
(Bottom view)

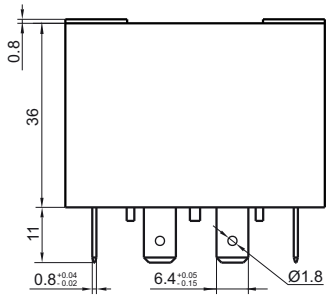
HF116F-2/□□□ -□ -L-2H-□

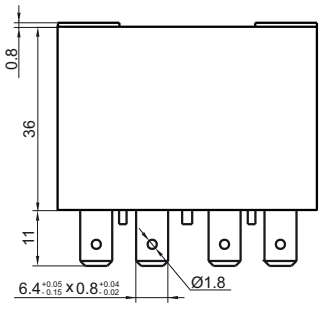


(Bottom view)

Mounting Holes





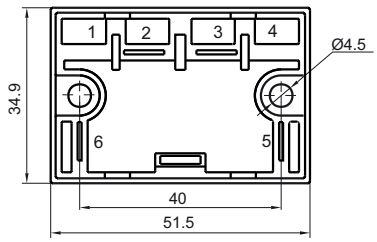


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

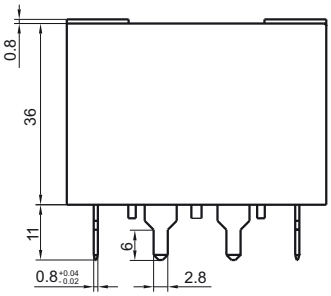
Unit: mm

Outline Dimensions

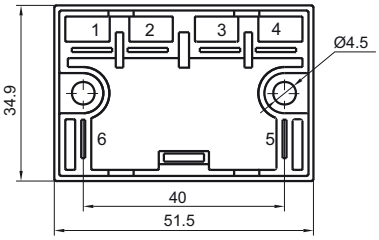
HF116F-2/□□□ -□-P-1H-□



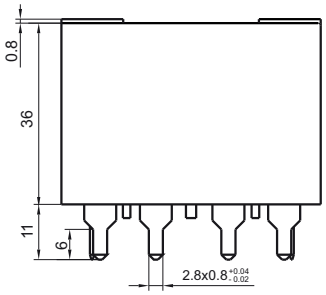
(Bottom view)



HF116F-2/□□□ -□-P-2H-□

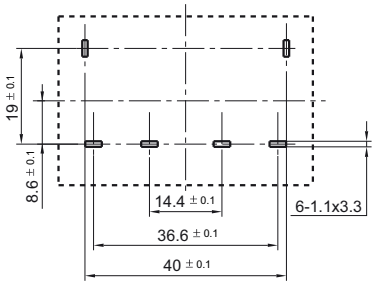


(Bottom view)



PCB Layout

(Bottom view)



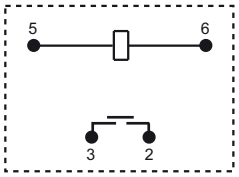
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

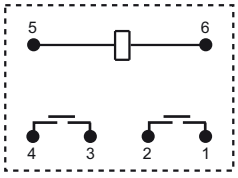
Wiring Diagram

(Bottom view)

1 Form A

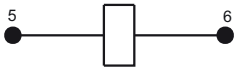


2 Form A

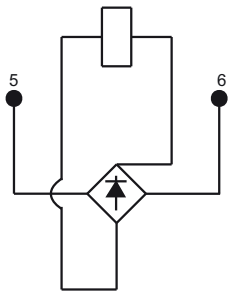


Coil Inner Circuit

DC operation coil

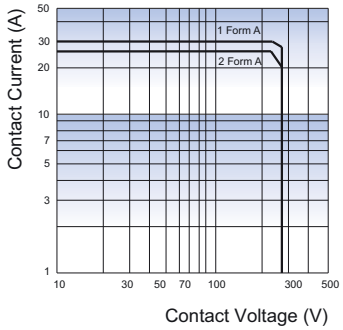


AC operation coil

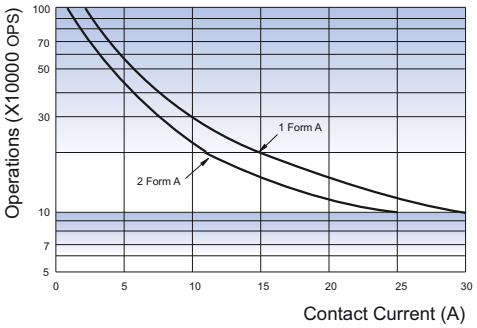


CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER

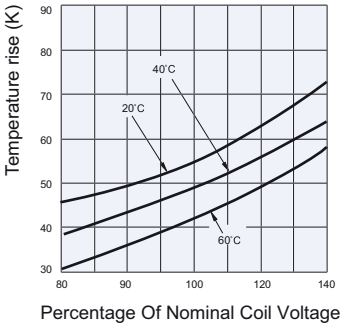


ENDURANCE CURVE



Test conditions:
250VAC, Resistive load, Flux proofed,
Room temp., 1s on 9s off

COIL TEMPERATURE RISE



HF116F-3 MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

File No.:R 50154722

CQC
File No.:CQC09002031231
CQC18002206328

Features

- 30A switching capability
- 4kV dielectric strength (between coil and contacts)
- 3mm contact gap available

CONTACT DATA

Contact arrangement	1A	2A
Contact resistance[1)]	100mΩ max.(at 1A 24VDC)	
Contact material	$AgSnO_2$, AgCdO	
Contact rating (Res. load)	30A 240VAC 30A 277VAC	25A 240VAC 25A 277VAC
Max. switching voltage	277VAC	
Max. switching current	30A	25A
Max. switching power	8310VA	6925VA
Mechanical endurance	1 x 10^7OPS	
Electrical endurance	1H, 1HT type: 1 x 10^5OPS (30A 240VAC, Resistive load, Room temp., 1s on 9s off) 2H, 2HT type: 1 x 10^5OPS (25A 240VAC, Resistive load, Room temp., 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	2000VAC 1min
Operate time (at nomi. volt.)		30ms max.(DC type)
Release time (at nomi. volt.)		30ms max.(DC type)
Shock resistance	Functional	Standard:98m/s² Pulse width 11ms W type:98m/s² Pulse width 6ms
	Destructive	980m/s² Pulse width 6ms
Vibration resistance		Standard:10H to 55Hz 1.5mm DA W type:10H to 55Hz 1.0mm DA
Ambient temperature		-55°C to 70°C
Humidity		5% to 85% RH
Termination		PCB, QC, Screw
Unit weight		Approx.120g
Construction		Dust protected

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

COIL

Coil power	DC type: Approx. 1.9W; AC type: Approx. 2.7VA

COIL DATA

at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max[1)]	Drop-out Voltage VDC min[1)]	Max. Voltage VDC*[2)]	Coil Resistance Ω
3	2.25	0.3	3.3	4.7 x (1±10%)
6	4.50	0.6	6.6	18.8 x (1±10%)
12	9.00	1.2	13.2	75 x (1±10%)
24	18.0	2.4	26.4	300 x (1±10%)
48	36.0	4.8	52.8	1200 x (1±10%)
100	75.0	10.0	110	5200 x (1±10%)
110	82.5	11.0	121	6300 x (1±10%)
200	150	20.0	220	21000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max.[1)]	Drop-out Voltage VAC min.[1)]	Max. Voltage VAC*[2)]	Coil Resistance Ω
6	4.80	0.90	6.6	18.8 x (1±10%)
12	9.60	1.80	13.2	75 x (1±10%)
24	19.2	3.60	26.4	300 x (1±10%)
48	38.4	7.20	52.8	1200 x (1±10%)
120	96.0	18.0	132	5200 x (1±10%)
220/240	176	33.0	242	20800 x (1±10%)

Notes: 1) The data shown above are initial values.
2)* Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	$AgSnO_2$	30A 277VAC 1.5HP 120VAC, 3HP 240VAC 10A 120VAC Tungsten
	AgCdO	30A 277VAC 1.5HP 120VAC, 3HP 240VAC 10A 120VAC Tungsten TV-10 120VAC
TÜV		27A 240VAC COSØ =0.8 25A 240VAC COSØ =0.4 25A 240VAC COSØ =1

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

	HF116F-3 /	012	D	F	-1H	T	F	W	C	(XXX)
Type										
Coil voltage	**DC:** 3VDC to 200VDC **AC:** 6VAC to 240VAC									
Coil voltage form	**D:** DC	**A:** AC								
Mouting	**A:** Mount	**F:** Flanged								
Contact arrangement	**1H:** 1 Form A	**2H:** 2 Form A								
Contact material	**T:** $AgSnO_2$	**Nil:** AgCdO								
Insulation standard	**F:** Class F	**Nil:** Class B								
Contact Gap	**W:** 3.0mm	**Nil:** Standard								
Capacitor	**C:** With Capacitor(Only for AC)	**Nil:** Without Capacitor								
Special code[3)]	**XXX:** Customer special requirement	**Nil:** Standard								

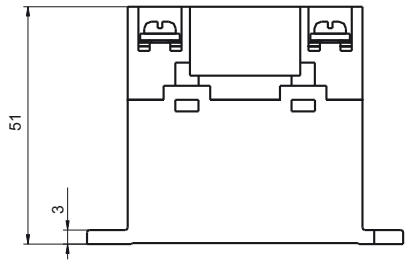
Notes: 1) Water cleaning or surface process is not suggested after the dust-protected relays are assembled on PCB.
2) dust-protected relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

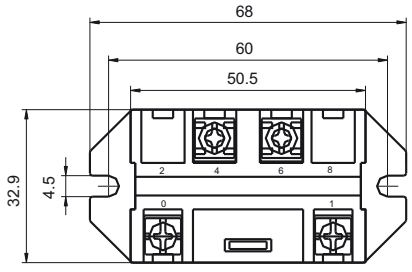
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

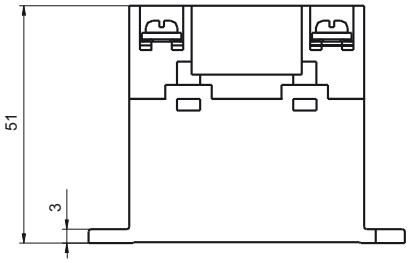
HF116F-3/□□□□-F-1H

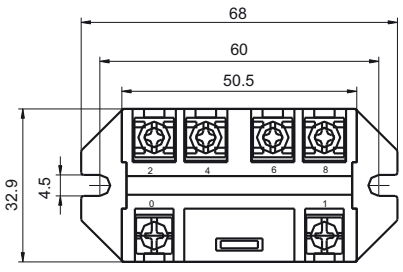




(Bottom view)

HF116F-3/□□□□-F-2H





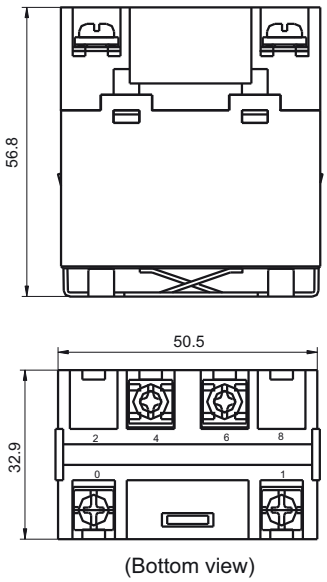
(Bottom view)

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

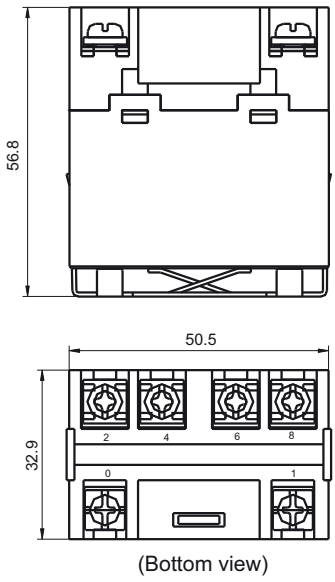
Outline Dimensions

HF116F-3/□□□□-A-1H



(Bottom view)

HF116F-3/□□□□-A-2H



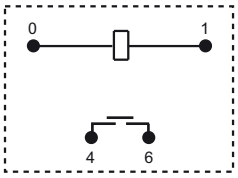
(Bottom view)

Remark: 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.

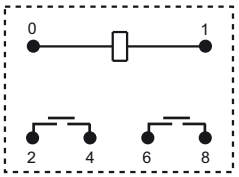
Wiring Diagram

(Bottom view)

1 Form A

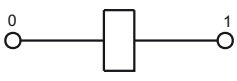


2 Form A

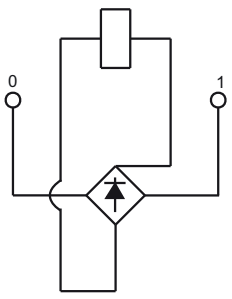


Coil Inner Circuit

DC operation coil

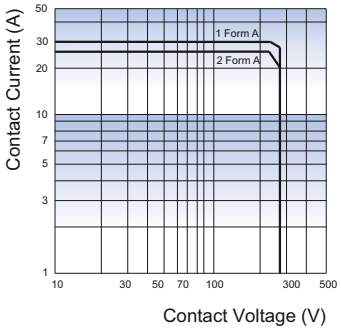


AC operation coil

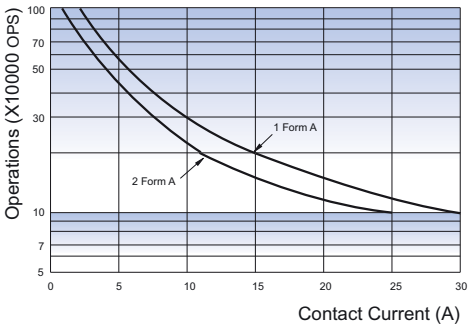


CHARACTERISTIC CURVES

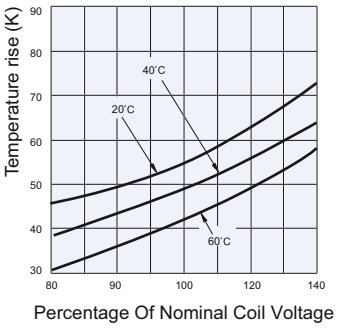
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



Test conditions:

250VAC, Resistive load,
Room temp., 1s on 9s off

HF116F-G SOLAR RELAY

File No.:E134517

File No.:R 50154722

File No.: CQC09002031231
CQC18002206328

Features

- 50A switching capability
- Applicable to inverter used for photovoltaic power generation systems
- 4kV dielectric strength(between coil and contacts)
- 3mm contact gap (compliant to European Photovoltaic Standard VDE0126, compliant to IEC 62109-2-2011)
- 1A and 2A configuration available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 2A
Contact resistance[1)]	10mΩ max(at 10A 13.5VDC)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	50A 277VAC
Max. switching voltage	277VAC
Max. switching current	55A
Max. switching power	15235VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	3 x 10^4OPS (50A 277VAC, at room temp, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	4000VAC 1min
	Between contact sets	2000VAC 1min
Surge Voltage		6kV (1.2/50μs)
Operate time (at nomi. volt.)		30ms max
Release time (at nomi. volt.)		30ms max
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance*	Functional	10Hz to 55Hz 1.5mm DA
	Destructive	10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination[2)]		PCB
Unit weight		Approx. 120g
Construction		G1: Dust protected; G2, G3: Flux proofed

Notes: 1) The data shown above are initial values.
2) It does not allow using quick-connect terminations.
3)*Index is not in relay width direction.

COIL

Coil power	Approx. 3.2W
Holding voltage	60%～120%U_N(at 23˚C) 70%～95%U_N(at 85˚C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max[1)]	Drop-out Voltage VDC min[1)]	Max. Voltage VDC[2)]	Coil Resistance Ω
3	2.25	0.3	3.3	2.8 x (1±10%)
6	4.50	0.6	6.6	11.3 x (1±10%)
9	6.75	0.9	9.9	25 x (1±10%)
12	9.00	1.2	13.2	45 x (1±10%)
24	18.0	2.4	26.4	180 x (1±10%)
48	36.0	4.8	52.8	720 x (1±10%)

Notes: 1) The data shown above are initial values.
2) *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	**$AgSnO_2$**	277VAC 50A
TÜV	**$AgSnO_2$**	250VAC 50A
	AgNi	250VAC 55A

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

	HF116F-G1/	12	-1H	T	F	(XXX)
Type	**G1:** Type 1 **G2:** Type 2 **G3:** Type 3					
Coil voltage	3, 6, 9, 12, 24, 48VDC					
Contact arrangement	**1H:**1 Form A **2H:** 2 Form A					
Contact material	**T:** $AgSnO_2$ **Nil:** AgNi					
Insulation standard	**F:** Class F					
Special code[1)]	**XXX:** Customer special requirement **Nil:** Standard					

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

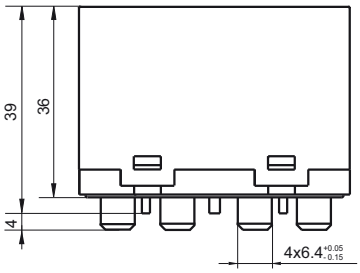
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

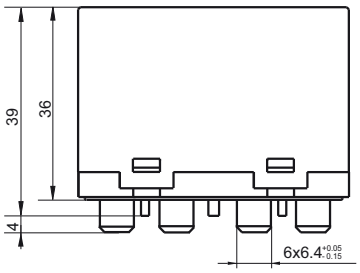
Outline Dimensions

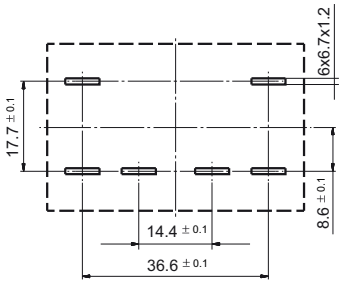
PCB Layout
(Bottom view)

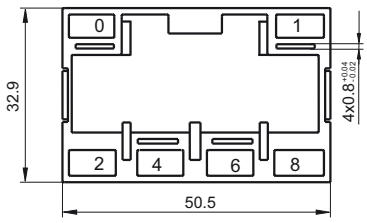
HF116F-G1/□□-1H□□



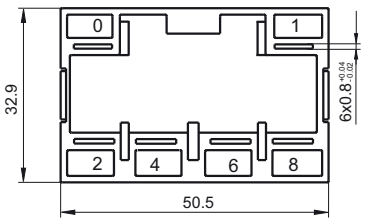
HF116F-G1/□□ -2H□□







(Bottom view)



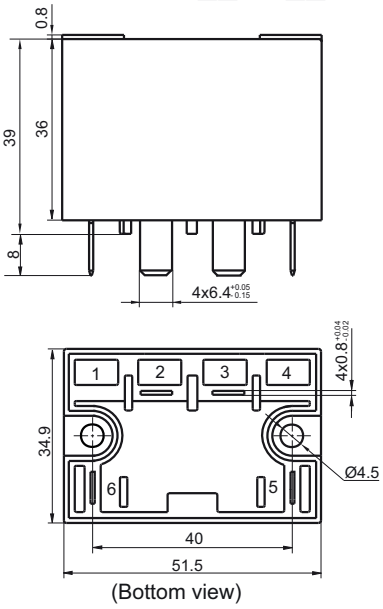
(Bottom view)

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

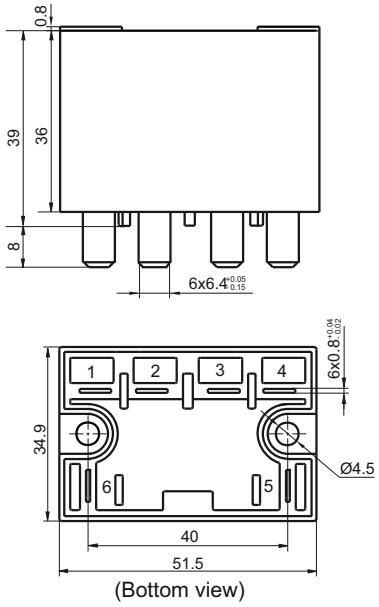
Outline Dimensions

HF116F-G2/□□ -1H□□



(Bottom view)

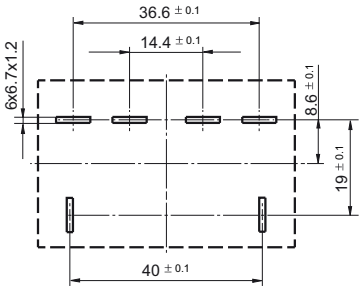
HF116F-G2/□□ -2H□□



(Bottom view)

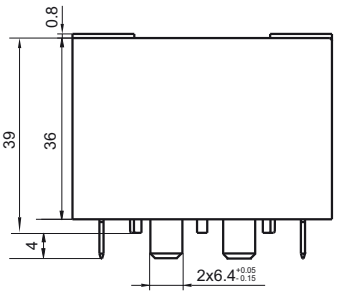
PCB Layout

(Bottom view)



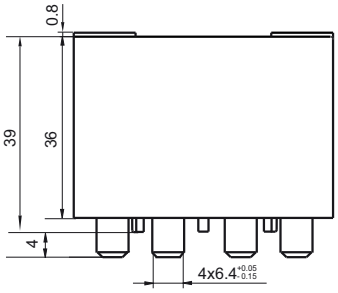
Outline Dimensions

HF116F-G3/□□ -1H□□



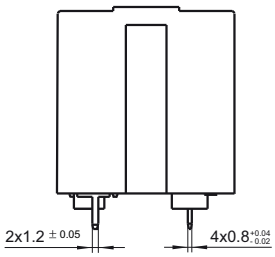
(Bottom view)

HF116F-G3/□□ -2H□□

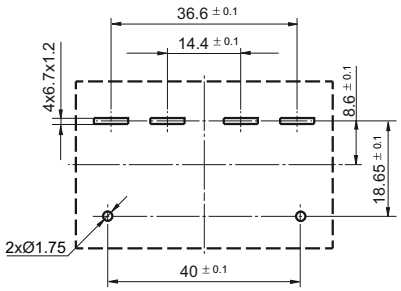


(Bottom view)

HF116F-G3



PCB Layout (Bottom view)



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.

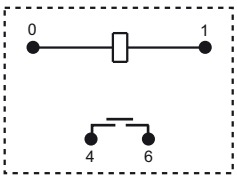
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

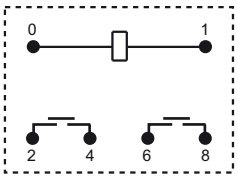
Wiring Diagram
(Bottom View)

G1 Type

1 Form A

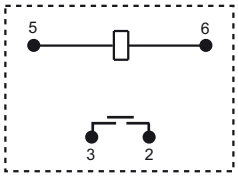


2 Form A

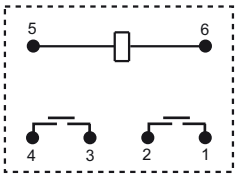


G2, G3 Type

1 Form A



2 Form A



HF116F-80 HIGH POWER RELAY

File No.:E134517

File No.:R 50154722

File No.: CQC09002031231
CQC18002206328

Features

- 80A switching capability
- Applicable to solar photovoltaic inverter
- Applicable to UPS
- 3mm contact gap
  (compliant to European Photovoltaic Standard VDE0126, compliant to IEC 62109-2-2011)
- 4kV dielectric strength(between coil and contacts)
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance[1)]	10mΩ max(at 10A 13.5VDC)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	80A 60VDC/80A 250VAC
Max. switching voltage	277VAC/60VDC
Max. switching current	90A
Max. load current	100A 15min at room temp.
Max. switching power	24930VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	6 x 10^3OPS (80A 250VAC, at 85℃, 1s on 9s off) 6 x 10^3OPS (80A 60VDC, at 85℃, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	4000VAC 1min
Surge Voltage		6kV (1.2/50μs)
Operate time (at nomi. volt.)		30ms max
Release time (at nomi. volt.)		30ms max
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance*		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40℃ to 85℃
Termination[2)]		PCB
Unit weight		Approx. 90g
Construction		Dust protected

Notes: 1) The data shown above are initial values;
2) It does not allow using quick-connect terminations.
3)*Index is not in relay width direction.

COIL

Coil power	Approx. 3.2W
Holding voltage	60%～120%U_N(at 23℃) 70%～95%U_N(at 85℃)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA at 23℃

Nominal Voltage VDC	Pick-up Voltage VDC max[1)]	Drop-out Voltage VDC min[1)]	Max. Voltage VDC *[2)]	Coil Resistance Ω
3	2.25	0.3	3.3	2.8 x (1±10%)
6	4.50	0.6	6.6	11.3 x (1±10%)
9	6.75	0.9	9.9	25 x (1±10%)
12	9.00	1.2	13.2	45 x (1±10%)
24	18.0	2.4	26.4	180 x (1±10%)
48	36.0	4.8	52.8	720 x (1±10%)

Notes: 1) The data shown above are initial values;
2) *Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	**$AgSnO_2$**	277VAC 80A 60VDC 80A
TÜV	**$AgSnO_2$**	277VAC 90A 277VAC 80A Making 35A 100ms 250VAC,loading 90A 800ms 250VAC,Breaking 35A 100ms 250VAC
	AgNi	Making 35A 100ms 250VAC,loading 90A 800ms 250VAC,Breaking 35A 100ms 250VAC

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

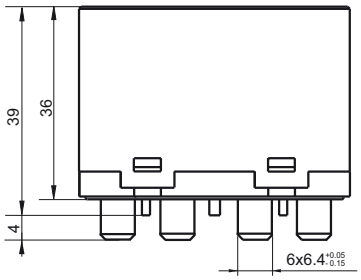
	HF116F-80/	12	-1H	T	F	(XXX)
Type						
Coil voltage	3, 6, 9, 12, 24, 48VDC					
Contact arrangement	**1H:** 1 Form A					
Contact material	**T:** $AgSnO_2$	**Nil:** AgNi				
Insulation standard	**F:** Class F					
Special code[1)]	**XXX:** Customer special requirement	**Nil:** Standard				

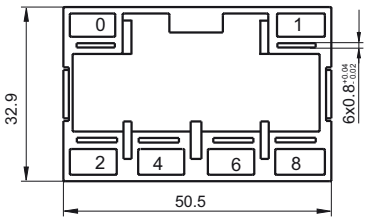
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa. e.g.(335) stands for product in accordance to IEC 60335-1 (GWT).

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

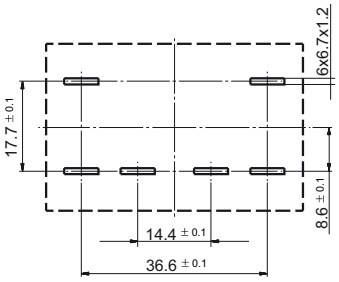




(Bottom view)

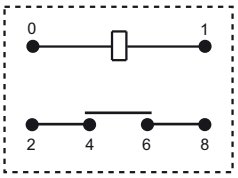
PCB Layout

(Bottom view)



Wiring Diagram

(Bottom view)



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.

HF176F SOLAR RELAY

c UL us
File No:E133481

File No.: R50411032

Features

- 65A swithing capitable.
- Applicable to solar photovoltaic inverter
- 3mm contact gap
- Low coil hoilding voltage contributes to saving energy of equipment.
- UL insulation system: class F.

CONTACT DATA

Contact arrangement	1H
Contact resistance (Initial)	≤10mΩ max(6VDC 2A)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	Making 20A, Carrying 65A, Breaking 20A, 277VAC 85°C
Max. switching voltage	400VAC
Max. switching current	65A
Max. switching power	18005VA
Mechanical endurance	1 x 10^6 OPS
Electrical endurance	3 x 10^4 OPS (Making 20A, Carrying 65A, Breaking 20A, Resistive load, at 85°C, 1s on 9s off)

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	2000VAC 1min
Surge voltage (between coil & contacts)		10kV(1.2 / 50μs)
Operate time (at nomi. volt.)		30ms max.
Release time (at nomi. volt.)		10ms max.
Temperature rise (at nomi. volt.)		70K max.(Contact load current 65A, 50% to 60% of rated voltage excitation, at 85°C)
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C (Apply holding voltage to coil)
Termination		PCB
Unit weight		Approx.100g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	Approx.1.92W
Holding voltage	40% to 100%U_N(at 25°C) 50% to 60%U_N(at 85°C)

Notes: 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

COIL DATA at 23°C

Nominal Voltage VDC 1)	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage2) VDC	Coil Resistance Ω
6	≤4.2	≥0.6	6.6	18.8 x (1±10%)
9	≤6.3	≥0.9	9.9	42.2 x (1±10%)
12	≤8.4	≥1.2	13.2	75 x (1±10%)
24	≤16.8	≥2.4	26.4	300 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	Making 20A,Carrying 65A,Breaking 20A,400VAC Resistive at 85°C 48A 277VAC General use at 85°C 60A 277VAC General use at 85°C
	$AgSnO_2$	Making 20A,Carrying 65A,Breaking 20A,400VAC Resistive at 85°C 65A 277VAC Resistive at 85°C 65A 30VDC Resistive at 85°C 65A 60VDC Resistive at 85°C
TÜV	AgNi	Making 20A,Carrying 65A,Breaking 20A,400VAC Resistive at 85°C 48A 277VAC 85°C,cos ϕ =0.8 60A 277VAC 85°C,cos ϕ =0.8
	$AgSnO_2$	Making 20A,Carrying 65A,Breaking 20A,400VAC Resistive at 85°C 65A 277VAC 85°C,cos ϕ =0.8 65A 30VDC 85°C,L/R=0 65A 60VDC 85°C,L/R=0

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

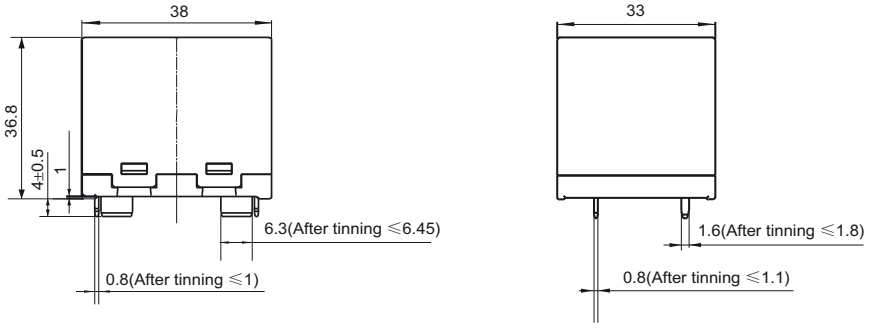
	HF176F/	12	-H	3	F	(XXX)
Type						
Coil voltage	6, 9, 12, 24VDC					
Contact arrangement	**H:**1 Form A					
Contact matcrial	**3:** AgNi **T:** $AgSnO_2$					
Insulation standard	**F:** Class F					
Special code	**XXX:** Customer special requirement **Nil:** Standard					

Notes: 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.
2) Flux-proofed relays can not be used in the environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

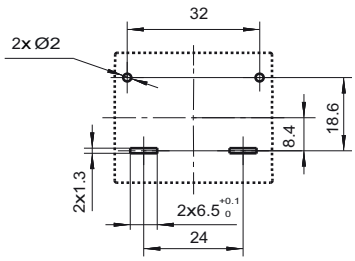
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

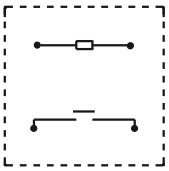
Outline Dimensions



PCB Layout (Bottom view)



Wiring Diagram
(Bottom view)



Notes: 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.

HF167F SOLAR RELAY

File No.: E133481

File No.: R50360703

File No.: CQC17002164558

Features

- 90A switching capability
- Applicable to solar photovoltaic inverter
- 3.0 mm contact gap
- Low coil holding voltage contributes to saving energy of equipment
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A
Contact resistance(initial)	10mΩ max.(6VDC 20A)
Contact material	$AgSnO_2$, AgNi
Contact rating (Res. load)	90A 320VAC
Max. switching voltage	400VAC
Max. switching current	90A
Max. switching power	25920VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	1 x 10^3OPS (NO: 90A 320VAC, Resistive load, at 85˚C, 1s on 9s off) 3 x 10^4OPS (NO: Making 30A, carrying 100A, breaking 30A, 400VAC, Resistive load, at 85˚C, 1s on 9s off)

COIL

Coil power	Approx. 1.92W
Holding voltage	40% to 100% U_N (at 23˚C) 50% to 60%U_N (at 85˚C)

Notes: 1)The coil holding voltage is the voltage applied to coil 200ms after the rated voltage.
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

SAFETY APPROVAL RATINGS

UL/CUL	AgNi	90A 320VAC at 85˚C General use 60A 320VAC at 85˚C General use
	$AgSnO_2$	90A 320VAC at 85˚C General use TV-15 120VAC at 85˚C
TÜV	AgNi	90A 320VAC at 85˚C Resistive Making 30A, carrying 100A, breaking 30A, 400VAC, at 85˚C Resistive
CQC	AgNi	90A 320VAC 85˚C Resistive Making 30A, carrying 100A, breaking 30A, 400VAC, at 85˚C Resistive
	$AgSnO_2$	90A 320VAC 85˚C Resistive Making 30A, carrying 100A, breaking 30A, 400VAC, at 85˚C Resistive

Notes: 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between open contacts	2000VAC 1min
	Between coil & contacts	5000VAC 1min
Surge Voltage		10kV (1.2/50μs)
Operate time (at rated. volt.)		30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max. (Contact load current 90A, 50% to 60% rated voltage excitation, at 85˚C)
Shock resistance	Functional	98m/s^2
	Destructive	980m/s^2
Vibration resistance*		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C (Apply holding voltage to coil)
Termination[2)]		PCB
Unit weight		Approx. 100g
Construction		Flux proofed

Notes: The data shown above are initial values.

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.[1)]	Drop-out Voltage VDC min.[1)]	Max. Voltage VDC*[2)]	Coil Resistance Ω
6	4.2	0.6	6.6	18.8 x (1±10%)
9	6.3	0.9	9.9	42.2 x (1±10%)
12	8.4	1.2	13.2	75 x (1±10%)
24	16.8	2.4	26.4	300 x (1±10%)

Notes: 1)The data shown above are initial values.
2)*Maximun voltage refers to the maximun voltage which relay coil could endure in a short period of time.

ORDERING INFORMATION

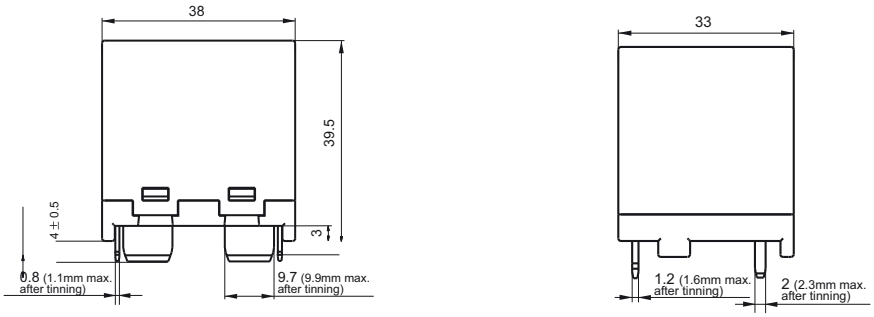
	HF167F/	12	-H	T	F	(XXX)
Type						
Coil voltage	6, 9, 12, 24VDC					
Contact arrangement	**H:**1 Form A					
Contact material	**T:** $AgSnO_2$	**Nil:** AgNi				
Insulation standard	**F:** Class F					
Special code 3)	**XXX:** Customer special requirement		**Nil:** Standard			

Notes: 1) Flux-proofed relays can not be used inthe environment with pollutants like H_2S, SO_2, NO_2, dust, etc.
2) Water clearing or surface process is not suggested after the flux-proofed relays are assembled on PCB.
3) The customer special requirement express as special code after evaluating by Hongfa.

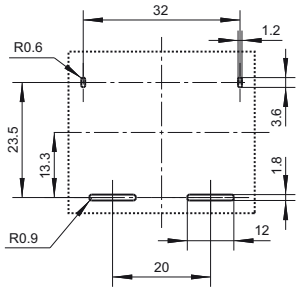
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

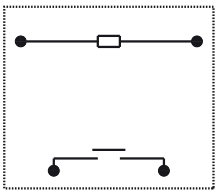
Outline Dimensions



PCB Layout
(Bottom view)



Wiring Diagram
(Bottom view)



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.

Disclaimer

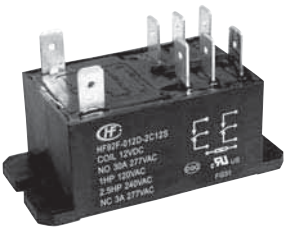
The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the 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.

HF92F MINIATURE INTERMEDIATE POWER RELAY

File No.:E134517

File No.:40016109

File No.:CQC09002037814 (DC type) CQC18002202752 (DC type)
CQC14002114447 (AC type) CQC18002202751 (AC type)



Features

- 30A switching capability
- Creepage distance: 8mm
- 4kV dielectric strength (between coil and contacts)
- UL insulation system: Class F
- Plastic sealed and dust protected types available
- PCB & QC layouts available

CONTACT DATA

Contact arrangement	2A, 2C
Contact resistance 1)	50mΩ max.(at 1A 24VDC)
Contact material	$AgSnO_2$, AgCdO
Contact rating (Res. load)	NO: 30A 250VAC; 30A 277VAC NC: 3A 250VAC; 3A 277VAC
Max. switching voltage	277VAC
Max. switching current	30A
Max. switching power	8310VA
Mechanical endurance	5 x 10^6 OPS
Electrical endurance	1 x 10^5 OPS (NO: 30A 277VAC, Resistive load, Room temp., 1s on 9s off) 1 x 10^5 OPS (NC: 3A 277VAC, Resistive load, Room temp., 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1500VAC 1min
	Between contact poles	2000VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2/50μs)
Operate time (at rated. volt.)		DC type: 25ms max.
Release time (at rated. volt.)		DC type: 25ms max.
Temperature rise (at rated. volt.)		AC type:90K max. DC type:70K max.
Shock resistance	Functional	98m/s²
	Destructive	980m/s²
Vibration resistance		10Hz to 55Hz 1.65mm DA
Humidity		5% to 85% RH
Ambient temperature		AC: -40°C to 65°C DC: -40°C to 85°C
Termination		PCB, QC
Unit weight		Approx. 86g
Construction		Plastic sealed, Flux proofed

Notes: The data shown above are initial values.

COIL

Coil power	DC type: Approx. 1.7W; AC type: Approx. 4.0VA

COIL DATA at 23°C

DC type

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
005D	5	3.8	0.5	8.0	15.3x (1±10%)
006D	6	4.5	0.6	9.6	22x (1±10%)
012D	12	9	1.2	19.2	86x (1±10%)
024D	24	18	2.4	38.4	350x (1±10%)
048D	48	36	4.8	76.8	1390x (1±10%)
110D	110	82.5	11	176	7255x (1±10%)

AC type (at 50Hz)

Coil Code	Nominal Voltage VAC	Pick-up Voltage VAC max. 1)	Drop-out Voltage VAC min. 1)	Max. Voltage VAC *2)	Coil Resistance Ω
024A5	24	19.2	4.8	26.4	45x (1±10%)
120A5	120	96	24	132	1125x (1±10%)
208A5	208	166.4	41.6	229	3278x (1±10%)
220A5	220	176	44	242	3800x (1±10%)
240A5	240	192	48	264	4500x (1±10%)
277A5	277	221.6	55.4	305	5960x (1±10%)

AC type (at 60Hz)

Coil Code	Nominal Voltage VAC	Pick-up Voltage VAC max. 1)	Drop-out Voltage VAC min. 1)	Max. Voltage VAC *2)	Coil Resistance Ω
024A6	24	19.2	4.8	26.4	35.7x (1±10%)
120A6	120	96	24	132	830x (1±10%)
208A6	208	166.4	41.6	229	2600x (1±10%)
220A6	220	176	44	242	2870x (1±10%)
240A6	240	192	48	264	3800x (1±10%)
277A6	277	221.6	55.4	305	4700x (1±10%)

COIL DATA

at 23˚C

AC type (at 50Hz/60Hz)

Coil Code	Nominal Voltage VAC	Pick-up Voltage VAC max.[1)]		Drop-out Voltage VAC min.[1)]		Max. Voltage VDC *[2)]	Coil Resistance Ω
		50Hz	60Hz	50Hz	60Hz		
120A	120	88	96	22	24	132	950 x (1±10%)
208A	208	160	166.4	40	41.6	229	2841 x (1±10%)
240A	240	176	192	44	48	264	3800 x (1±10%)
277A	277	200	221.6	50	55.4	305	5485 x (1±10%)

Notes: 1) The data shown above are initial values.
2) * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL [1)]	NO	30A 277VAC 1HP 120VAC 2.5HP 240VAC 110 LRA/25.3 FLA 240VAC (DC type)
	NC	3A 277VAC
VDE [1)] ($AgSnO_2$)	NO	30A 250VAC 20A 250VAC
	NC	3A 250VAC

Notes: 1) UL certified loads are tested at 40℃. VDE certified loads are tested at 85℃ (DC products) or 50℃ (AC products).
2) Only typical loads are listed above. Other load specifications can be available upon request.

ORDERING INFORMATION

HF92F -012D -2C 2 2 F (XXX)

Type

Coil Code
XXX D: DC type(5,6,12,24,48,110VDC)
XXX A5: AC type 50Hz(24,120,208,220,240,277VAC)
XXX A6: AC type 60Hz(24,120,208,220,240,277VAC)
XXX A: AC type 50Hz/60Hz(120,208,240,277VAC)

Contact arrangement **2A:** 2 Form A **2C:** 2 Form C

Termination [1)] **1:** PCB **2, 3:** QC

Contact material **1:** $AgSnO_2$ **2:** AgCdO

Construction [2)] **S:** Plastic sealed **F:** Flux proofed

Special code[3)] **XXX:** Customer special requirement **Nil:** Standard

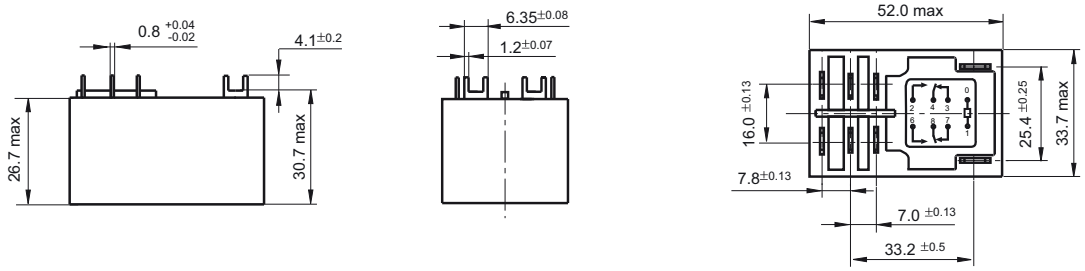
Notes: 1) For QC terminals, no soldering or washing is allowed. For PCB terminals, please refer to us for soldering condition and part specification for necessary washing or surface processing after it is soldered to PCB.
2) We recommend dust protected types for a clean environment (free from contaminations 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.).
3) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

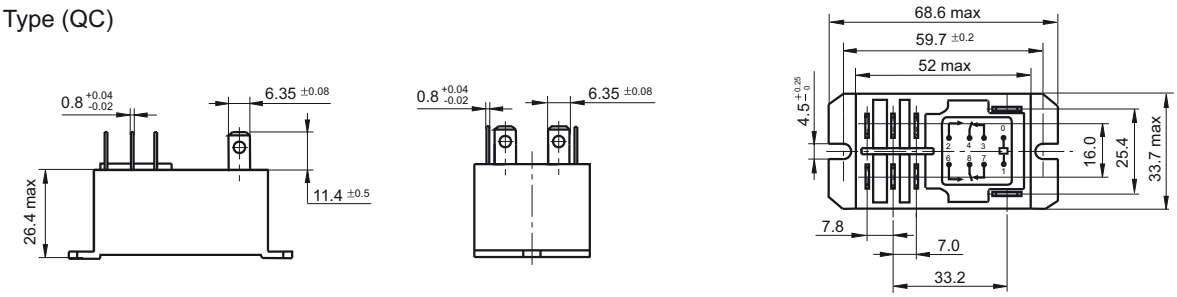
Unit: mm

Outline Dimensions

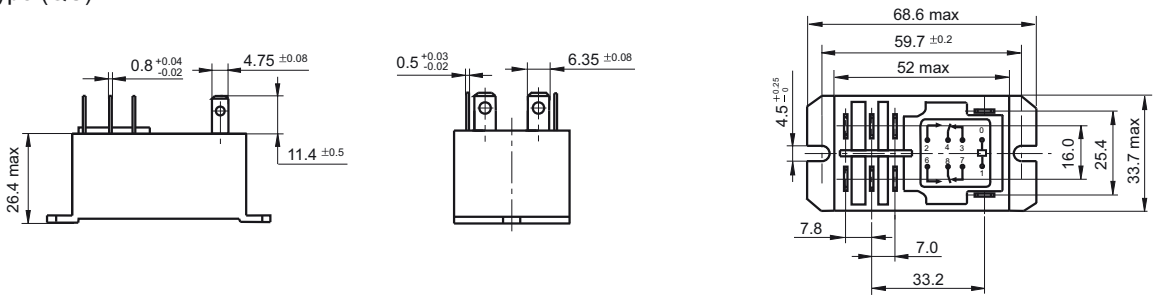
1 Type (PCB)



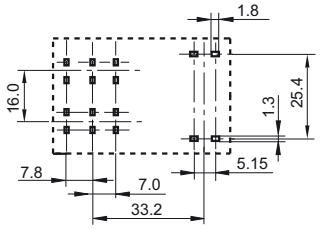
2 Type (QC)



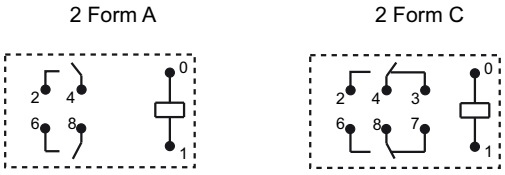
3 Type (QC)



PCB Layout (Bottom view)



Wiring Diagram (Bottom view)

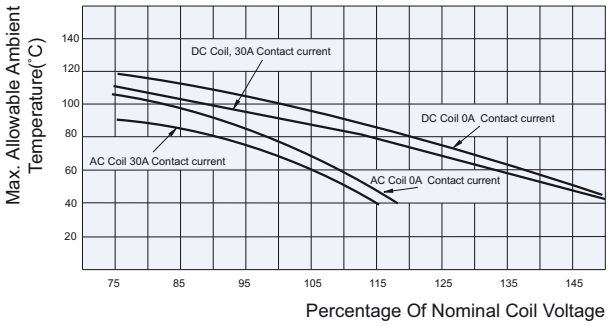


Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAX. ALLOWABLE AMBIENT TEMPERATURE

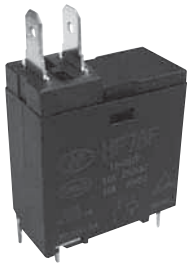


HF78F MINIATURE HIGH POWER RELAY

c UL us
File No.: E133481

File No.: R50375929

CQC
File No.: CQC17002171481



Features

- Small and for microwave oven
- 20A switching capability
- 4.0kV dielectric strength (between coil and contacts)
- Low height: 28.5 mm

CONTACT DATA

Contact arrangement	1A
Contact resistance 1)	50mΩ max.(at 1A 6VDC)
Contact material	$AgSnO_2$
Contact rating	16A 250VAC/24VDC 16A 30VDC
Max. switching voltage	277VAC / 32VDC
Max. switching current	20A
Max. switching power	4432VA / 512W
Mechanical endurance	1×10^7 OPS

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

CHARACTERISTICS

Insulation resistance		1200MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1500VAC 1min
Operate time (at rated. volt.)		15ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance	Functional	$98m/s^2$
	Destructive	$980m/s^2$
Vibration resistance		10Hz to 55Hz 1.5mm DA
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 85˚C
Termination		PCB & QC
Unit weight		Approx. 16g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.

COIL

Coil power	540mW

COIL DATA at 23˚C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
3	2.40	0.3	3.9	17.2 x (1±10%)
5	4.00	0.5	6.5	47.7x (1±10%)
6	4.80	0.6	7.8	68.8x (1±10%)
12	9.60	1.2	15.6	270 x (1±10%)
24	19.2	2.4	31.2	1100 x (1±10%)
36	28.8	3.6	46.8	2475x (1±15%)

Notes: 1) The data shown above are initial values.
2) *Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	16A 250VAC/30VDC 20A 125VAC
TÜV	16A 250VAC/30VDC 20A 125VAC

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

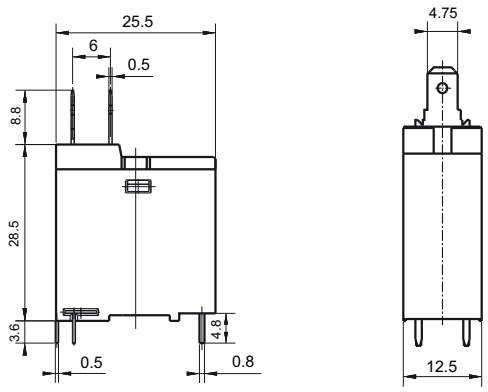
	HF78F /	12	-H	3	T	F	(XXX)
Type							
Coil voltage	3, 5, 6, 12, 24, 36VDC						
Contact arrangement	**1H**: 1 Form A						
Termination	**S**: Plastic sealed	**Nil**: Dust protected					
Contact material	**T**: $AgSnO_2$						
Insulation standard	**F**: Class F						
Special code[1)]	**XXX:** Customer special requirement	**Nil:** Standard					

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

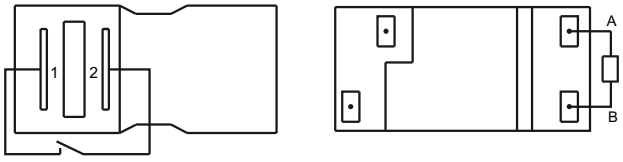
Unit: mm

Outline Dimensions



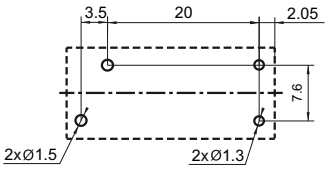
Wiring Diagram

(Bottom view)



PCB Layout

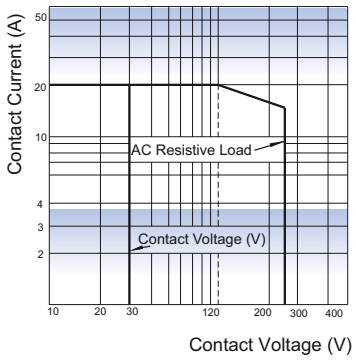
(Bottom view)



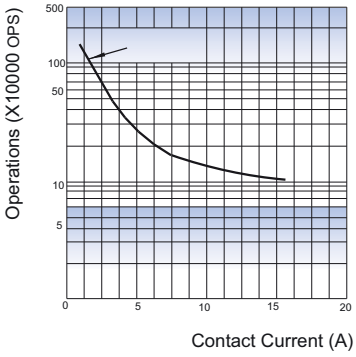
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

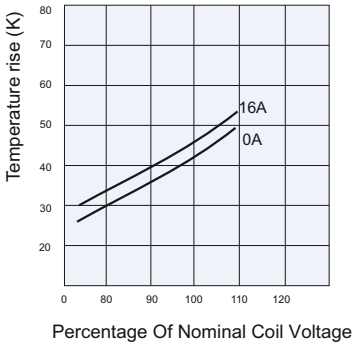
MAXIMUM SWITCHING POWER



ENDURANCE CURVE



COIL TEMPERATURE RISE



HF84F HIGH POWER RELAY

c UL us

File No.:E134517 (AC type)

Features

- 16A switching capability
- 2.5kV dielectric strength (between coil and contacts)
- Panel mount types available

CONTACT DATA

Contact arrangement	1A, 1B, 1C	
Contact resistance 1)	50mΩ max.(at 1A 24VDC)	
Contact material	AgCe	
Contact rating (Res.load)	1A, 1C	1B
	16A 250VAC, Resistive load	8A 250VAC, General load
Max. switching voltage	250VAC	
Max. switching current	16A	
Max. switching power	4000VAC	
Mechanical endurance	1 x 10^6OPS	
Electrical endurance	7 type: 3 x 10^4OPS (8A 250VAC, General use, at 40°C, 1s on 9s off) 1, 4 type: 1 x 10^5OPS (16A 250VAC, Resistive load, at 65°C, 1s on 9s off)	

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

CHARACTERISTICS

Insulation resistance		500MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2500VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		DC type: 25ms max.
Release time (at rated. volt.)		DC type: 25ms max.
Temperature rise (at rated. volt.)		90K max.
Shock resistance (Functional)		147m/s² 11ms
Vibration resistance		10Hz to 55Hz 2.54mm DA
Ambient temperature		-40°C to 65°C
Humidity		5% to 85% RH
Termination		QC
Unit weight		Approx. 75g
Construction		Dust protected

Notes: 1) The data shown above are initial values.
2) UL insulation system: Class A.

COIL

Coil power	DC type: 2.1W ; AC type: 3.5VA

COIL DATA at 23°C

Nominal Voltage VDC	Pick-up Voltage VDC max.1)	Drop-out Voltage VDC min.1)	Max. Voltage VDC *2)	Coil Resistance Ω
6	4.50	0.6	6.6	17.5 x (1±10%)
9	6.75	0.9	9.9	40 x (1±10%)
12	9.00	1.2	13.2	70 x (1±10%)
24	18.0	2.4	26.4	280 x (1±10%)
48	36.0	4.8	52.8	1120 x (1±10%)
120	90.0	12.0	132	7000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max.1)	Drop-out Voltage VAC min.1)	Max. Voltage VAC *2)	Coil Resistance Ω
6	5.1	1.2	6.6	4.8 x (1±10%)
12	10.2	2.4	13.2	19 x (1±10%)
24	20.4	4.8	26.4	90 x (1±10%)
48	40.6	9.6	52.8	300 x (1±10%)
120	102	24	132	2000 x (1±10%)
240	204	48	264	7200 x (1±10%)
277	235	55.4	304.7	11000 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL (AC type)	HF84F-1	8FLA, 25LRA 250VAC at 40°C 16A 250VAC Resistive at 65°C 8A 250VAC General use at 40°C
	HF84F-4	8FLA, 25LRA 250VAC at 40°C 16A 250VAC Resistive at 65°C 8A 250VAC General use at 40°C
	HF84F-7	8FLA, 25LRA 250VAC at 40°C 8A 250VAC General use at 40°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

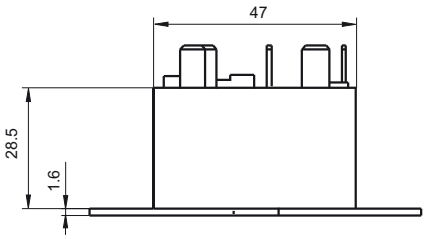
	HF84F	-1	A	24	(XXX)
Type					
Contact arrangement	**1:** 1 Form C **4:** 1 Form A **7:** 1 Form B				
Coil voltage form	**D:** DC **A:** AC				
Coil voltage	**AC:** 6VAC to 277VAC **DC:** 6VDC to 120VDC (No UL approved)				
Special code[1)]	**XXX:** Customer special requirement **Nil:** Standard				

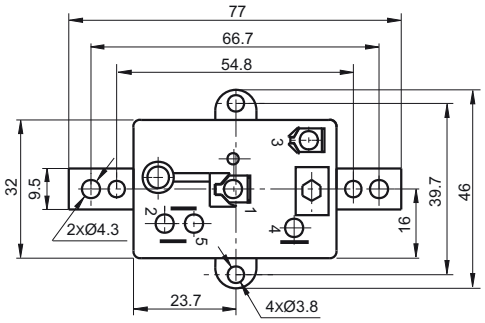
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

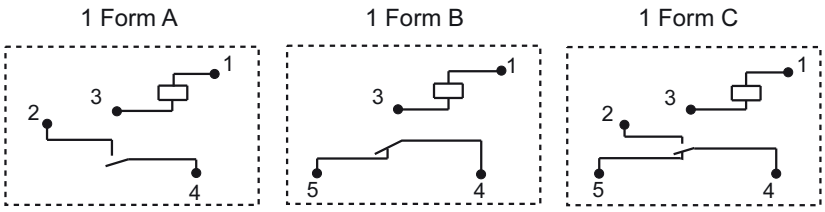




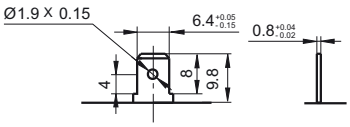
(Top view)

Wiring Diagram

(Top view)



Terminals type



Remark: 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.

HF94F HIGH POWER RELAY

c UL us
File No.:E134517 (AC type)

Features

- 25A switching capability
- 2kV dielectric strength (between coil and contacts)
- Panel mount, various terminal types
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1B, 1C, 1A + 1B
Contact resistance 1)	200mΩ max.(at 1A 24VDC)
Contact material	AgCe, AgCdO
Contact rating (Res.load)	18A 277VAC
Max. switching voltage	277VAC
Max. switching current	18A
Max. switching power	4986VA
Mechanical endurance	1 x 10^6OPS
Electrical endurance	5 x 10^4OPS (25A 277VAC, Resistive load, AgCdO, at 65°C, 1s on 9s off) 3 x 10^4OPS (3A 277VAC, General load, AgCe, at 65°C, 1s on 9s off)

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

CHARACTERISTICS

Insulation resistance		500MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	2000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (at rated. volt.)		DC type: 25ms max.
Release time (at rated. volt.)		DC type: 25ms max.
Temperature rise (at rated. volt.)		90K max.
Shock resistance (Functional)		98m/s²
Vibration resistance		10Hz to 55Hz 0.5mm DA
Ambient temperature		-40°C to 65°C
Humidity		5% to 85% RH
Termination		QC
Unit weight		Approx. 85g
Construction		Dust protected

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

COIL

Coil power	DC type: Approx. 2.4W; AC type: Approx. 4.0VA

COIL DATA

Nominal Voltage VDC	Pick-up Voltage VDC max. 1)	Drop-out Voltage VDC min. 1)	Max. Voltage VDC *2)	Coil Resistance Ω
6	4.50	0.6	6.6	17.5 x (1±10%)
9	6.75	0.9	9.9	40 x (1±10%)
12	9.00	1.2	13.2	70 x (1±10%)
24	18.0	2.4	26.4	280 x (1±10%)
48	36.0	4.8	52.8	1120 x (1±10%)
120	90.0	12.0	132	7000 x (1±10%)

Nominal Voltage VAC	Pick-up Voltage VAC max. 1)	Drop-out Voltage VAC min. 1)	Max. Voltage VAC *2)	Coil Resistance Ω
6	5.1	1.2	6.6	4.8 x (1±10%)
12	10.2	2.4	13.2	19 x (1±10%)
24	20.4	4.8	26.4	77 x (1±10%)
48	40.8	9.6	52.8	280 x (1±10%)
120	102	24	132	2000 x (1±10%)
240	204	48	264	7250 x (1±10%)
277	235	55.4	304.7	11000 x (1±10%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

SAFETY APPROVAL RATINGS

UL/CUL	HF94F-10	NO	AgCdO	12FLA,60LRA,120VAC at 65˚C 8FLA,48LRA,250VAC at 65˚C 8FLA,48LRA,277VAC at 65˚C 7FLA,42LRA,277VAC at 65˚C 25A,277VAC,Resistive at 65˚C
			AgCe	3A,277VAC,Gen Useat 65˚C 277VAC pilot duty,10A inrush,1A break at 65˚C
	HF94F-11	NC	AgCdO	14FLA,84LRA,125VAC at 40˚C 8FLA,48LRA,250VAC at 65˚C 8FLA,48LRA,277VAC at 65˚C 7FLA,42LRA,277VAC at 65˚C 25A,277VAC,Resistive at 65˚C
			AgCe	3A,277VAC,Gen Use at 65˚C 277VAC pilot duty,10A inrush,1A break at 65˚C
	HF94F-12	NO/NC	AgCdO	14FLA,84LRA,125VAC at 40˚C 8FLA,48LRA,250VAC at 65˚C 8FLA,48LRA,277VAC at 65˚C 7FLA,42LRA,277VAC at 65˚C 25A,277VAC,Resistive at 65˚C
			AgCe	3A,277VAC,Gen Use at 65˚C 277VAC pilot duty,10A inrush,1A break at 65˚C
	HF94F-13	NO/NC	AgCdO	12FLA,60LRA,120VAC at 65˚C 8FLA,48LRA,250VAC at 65˚C 8FLA,48LRA,277VAC at 65˚C 7FLA,42LRA,277VAC at 65˚C 18A,277VAC,Resistive at 65˚C 25A,277VAC,Resistive at 65˚C
			AgCe	3A,277VAC,Gen Use at 65˚C 277VAC pilot duty,10A inrush,1A break at 65˚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

	HF94F	-10	A	24	E	-1	(XXX)

Type

Contact arrangement **10:** 1 Form A **11:** 1 Form B **12:** 1 Form C **13:** 1 Form A+1 Form B

Coil voltage form **A:** AC **D:** DC

Coil voltage **AC:** 6VAC to 277VAC **DC:** 6VDC to 120 VDC (No UL approved)

Contact material **E:** AgCe **Nil:** AgCdO

Mounting
1: Flang, Mounting Distance 54.8mm. diameter Ø3.8mm
2: Flang, Mounting Distance 66.7mm. diameter Ø4.8mm
Nil: Metal Bracket

Special code[1)] **XXX:** Customer special requirement **Nil:** Standard

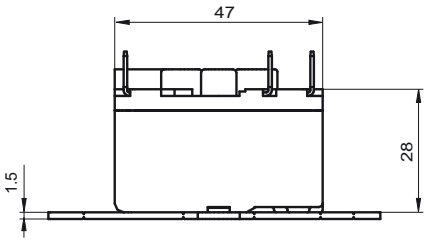
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

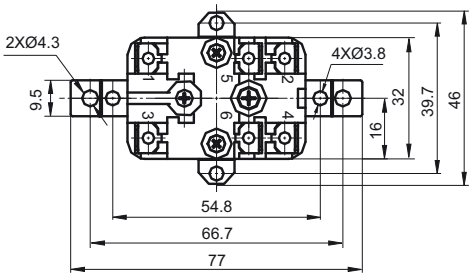
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

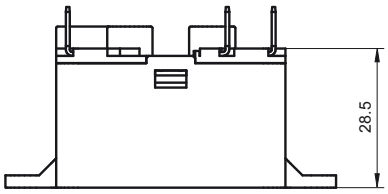
Metal Bracket

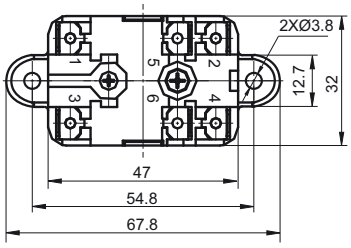




(Top view)

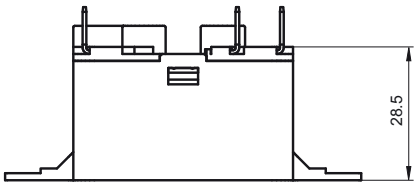
Flang, Mounting Distance 54.8mm

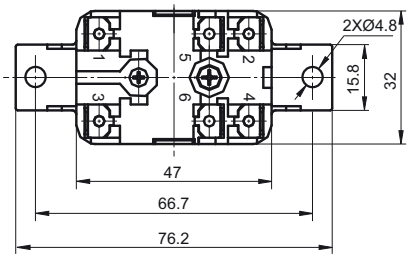




(Top view)

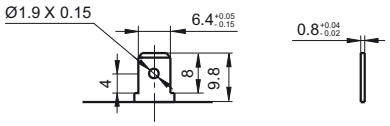
Flang, Mounting Distance 66.7mm





(Top view)

Terminals type

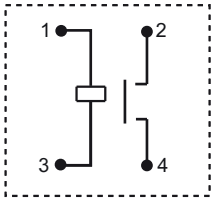


Remark: In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

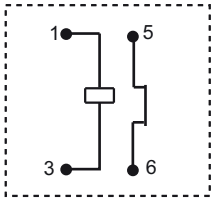
Wiring Diagram

(Top view)

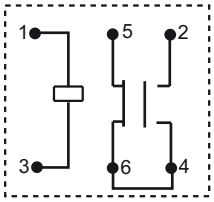
1 Form A



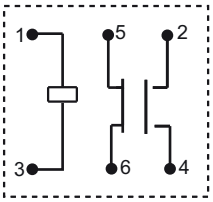
1 Form B



1 Form C



1A+1B



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.

HF8565 MOTOR START POTENTIAL RELAY

c UL us
File No.:SA13318

Features

- 50A switching capability
- 1 Form B configuration available
- 250" quick connect termination
- UL insulation system: Class F
- Various of mounting positions

CONTACT DATA

Contact arrangement	1B
Contact resistance	100mΩ max.(at 1A 24VDC)
Contact material	Silver alloy
Contact rating (Res. load)	16A(make and break) 400VAC COS Ø=0.85 35A(break only) 400VAC COS Ø=0.85 50A(break only) 400VAC COS Ø=0.85
Mechanical endurance	7.5 x 10^5 OPS
Electrical endurance	SPST-NC: 5 x 10^5OPS (16A on and off 400VAC cosØ=0.7-0.8 at 25°C 1s on 9s off) SPST-NC: 2 x 10^5OPS (35A only off 400VAC cosØ=0.7-0.8 at 25°C 1s on 9s off) SPST-NC: 1 x 10^5OPS (50A only off 400VAC cosØ=0.7-0.8 at 25°C 1s on 9s off)

CHARACTERISTICS

Weight	Approx. 110g
Termination	QC
Construction	Dust protected

Notes: The data shown above are initial values.

COIL

Coil power	Approx. 5VA
Coil voltage	See table below
Coil resistance	See table below
Insulation system	Class B

OPERATING CHARACTERISTICS at 50Hz

Coil number		2		3		4		5		6		7		8		9	
Vmax at 40°C (V)		299		338		378		356		452		151		530		228	
Resistance (1±10%) Ω at 25°C		5600		7500		10700		10000		13800		1500		19500		3900	
	H.P.U.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.
A	120-130											111-124	20-45			111-124	35-77
B	130-140											120-134	20-45			120-134	35-77
C	150-160	140-153	40-90									130-144	20-45			130-144	35-77
D	160-170	150-163	40-90	150-163	40-90							140-153	20-45			140-153	35-77
E	170-180	162-175	40-90	162-175	40-90											149-163	35-77
F	180-190	171-184	40-90	171-184	40-90			180-195	40-105							157-172	35-77
G	190-200	180-193	40-90	180-195	40-105	180-195	40-105	189-205	40-105							168-182	35-77
H	200-220	186-215	40-90	190-215	40-105	195-224	50-110	186-214	60-133							178-192	35-77
I	220-240	205-234	40-105	208-239	50-110	204-233	50-110	204-233	60-133							183-213	35-77
L	240-260	224-252	40-105	224-252	50-110	223-259	50-110	223-252	60-133	223-252	60-130					203-231	35-77
M	260-280	243-271	40-105	239-270	50-110	242-272	50-110	242-272	60-133	239-268	60-135			239-268	75-170		
N	280-300			260-289	50-110	262-290	60-121	262-290	60-133	258-287	60-135			258-287	75-170		
O	300-320					280-310	60-121	280-310	60-133	277-305	60-135			277-305	75-170		
P	320-340					300-328	60-121	300-328	60-154	295-324	60-135			295-324	75-170		
Q	340-360					318-347	60-121			314-342	60-135			314-342	75-180		
R	350-370													323-352	75-180		
S	360-380													332-361	75-180		

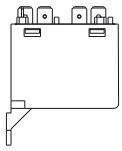
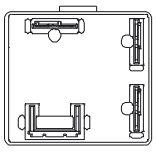
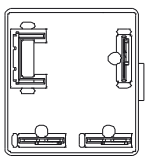
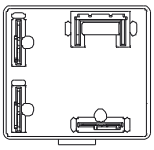
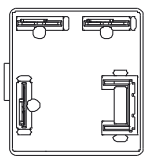
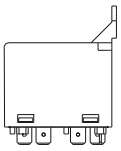
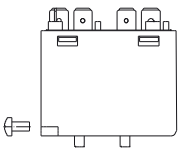
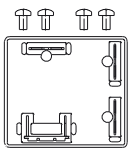
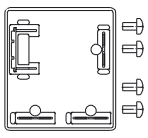
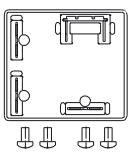
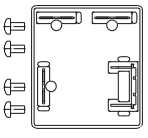
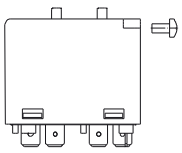
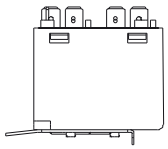
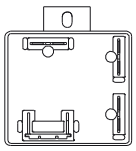
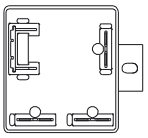
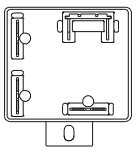
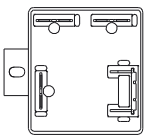
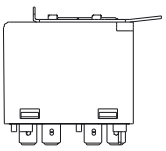
Notes: H.P.U.means Approximate pick-up value at 90°C , P.U. means pick-up value at 25°C, D.O.means drop out value at 25°C.

OPERATING CHARACTERISTICS at 60Hz

Coil number		2		3		4		5		6		7		8		9	
Vmax at 40˚C (V)		332		375		420		395		502		168		588		253	
Resistance (1 ±10%) Ω at 25˚C		5600		7500		10700		10000		13800		1500		19500		3900	
	H.P.U.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.	P.U.	D.O.
AA	120-130											111-124	20-45			111-124	35-77
AB	130-140											120-134	20-45			120-134	35-77
AC	150-160											130-144	20-45			130-144	35-77
AD	160-170	150-163	40-90									140-153	20-45			140-153	35-77
AE	170-180	162-175	40-90									149-163	20-45			149-163	35-77
AF	180-190	171-184	40-90					180-195	40-105							157-172	35-77
AG	190-200	180-193	40-90	180-195	40-105			189-205	40-105							168-182	35-77
AH	200-220	186-215	40-90	190-215	40-105	195-224	60-121	186-214	60-130							178-192	35-77
AI	220-240	205-234	40-90	208-239	50-110	204-233	60-121	204-233	60-130							183-213	35-77
AL	240-260	224-252	40-105	224-252	50-110	223-259	60-121	223-252	60-130							203-231	35-77
AM	260-280	243-271	40-105	239-270	50-110	242-272	60-121	242-272	60-140	239-268	60-135					221-250	35-77
AN	280-300			260-289	50-110	262-290	60-121	262-290	60-140	258-287	60-135			258-287	75-170		
AO	300-320					280-310	60-121	280-310	60-140	277-305	60-135			277-305	75-170		
AP	320-340					300-328	60-121	300-328	60-140	295-324	60-135			295-324	75-170		
AQ	340-360					318-347	60-121			314-342	60-135			314-342	75-180		
AR	350-370													323-352	75-180		
AS	360-380													332-361	75-180		

Notes: H.P.U.means Approximate pick-up value at 90˚C , P.U. means pick-up value at 25˚C, D.O.means drop out value at 25˚C.

OPERATING POSITION

	1	2	3	4	5	6
PLASTIC TAB MOUNT						
PANEL MOUNT						
METAL TAB MOUNT						

TERMINAL CONFIGURATION

	3 dual QC (#1, 2, 5)
PLASTIC TAB MOUNT	D
PANEL MOUNT	P
METAL TAB MOUNT	Z

ORDERING INFORMATION

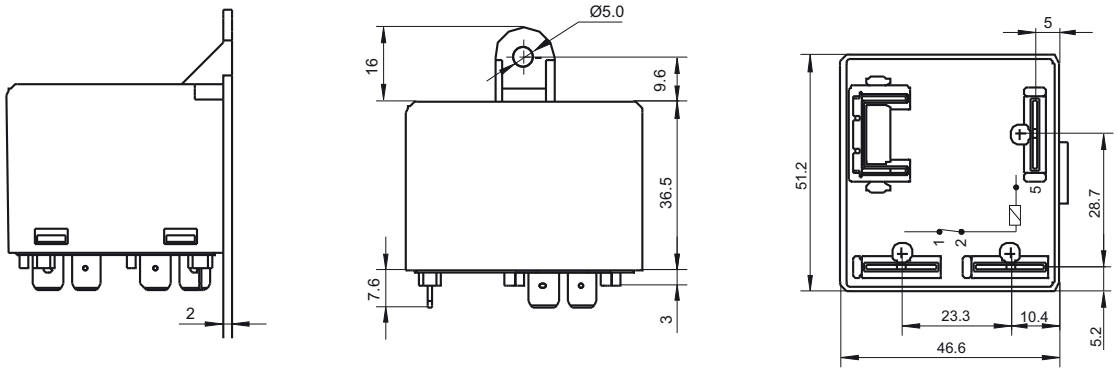
	HF8565 /	D	6	A	1	(XXX)
Type						
Terminal configuration	**D**、**P**、**Z** (See table for terminal configuration)					
Coil number	**2**、**3**、**4**、**5**、**6**、**7**、**8**、**9**					
Operation characteristics	**AA to AS** (See table for operating characteristics)					
Operation position	**1**、**2**、**3**、**4**、**5**、**6**					
Special code[1)]	**XXX:** Customer special requirement		**Nil:** Standard			

Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

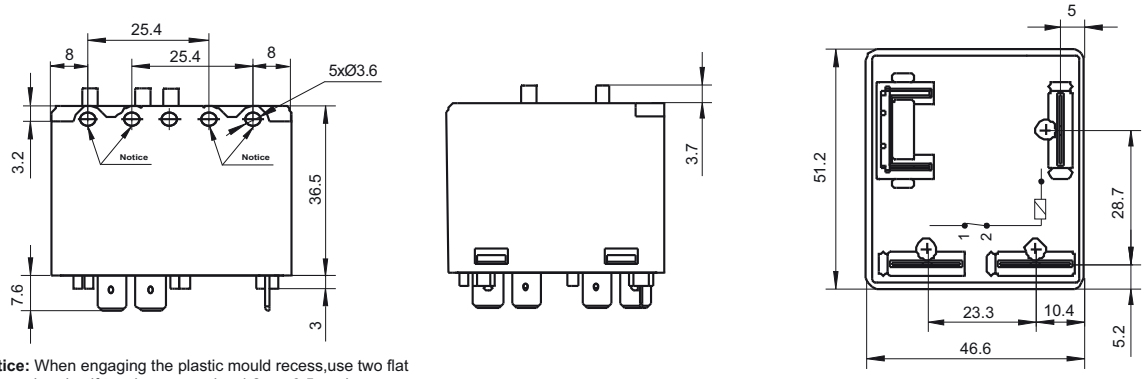
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Plastic Tab Mount



Panel Mount

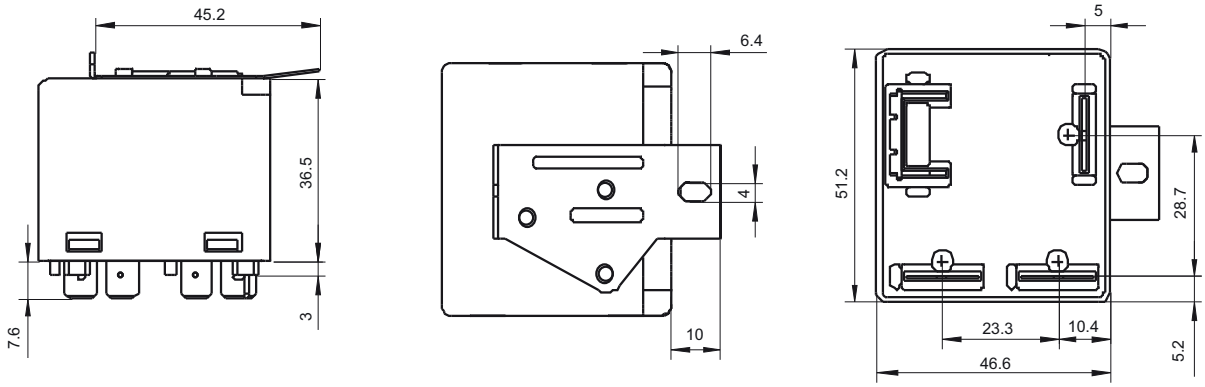


Notice: When engaging the plastic mould recess,use two flat head,self tapping screw,size 4.2mm,9.5mm long.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

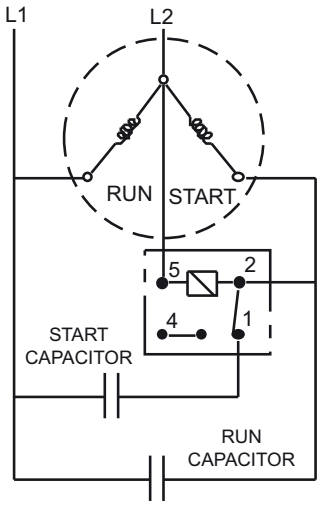
Unit: mm

Metal Tab Mount



Remark: 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.

Wiring Diagram



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.