

# HF158F-V

# MINIATURE HIGH POWER RELAY



(Only for 1 pole)

File No.: 40032833



File No.: R50418587



File No.: E134517



File No.: CQC17002176312

(Meeting the requirements of GB/T 21711.1-2023 Standard)

CQC15002129497

(Meeting the requirements of GB/T 14536.1-2022 and GB/T 21711.1-2023 Standards)



## Features

- 1A:10A 300VDC high-voltage switching capability
- 2A:10A 450VDC high-voltage switching capability (2NO connected)
- 1D:4A 300VDC high-voltage switching capability
- 5kV dielectric strength(between coil and contacts)
- Creepage distance:10mm
- Meet Reinforce insulation: Class F
- Form A and Form B available

**RoHS compliant**

## CONTACT DATA

Contact arrangement	1A	1B	2A
Contact resistance(initial)	100mΩ max.(1A 6VDC)		
Contact material	AgSnO <sub>2</sub>		
Contact rating(Res. load)	10A 300VDC	4A 300VDC	10A 450VDC(2NO connected)
Max. switching voltage	500VDC	300VDC	1000VDC
Max. switching current	16A	4A	16A
Max. switching power	3000W	1200W	5000W
Mechanical endurance	2×10 <sup>6</sup> OPS	2×10 <sup>6</sup> OPS	2×10 <sup>6</sup> OPS
Electrical endurance	H2T: 1×10 <sup>4</sup> OPS (10A 300VDC, Resistive load, at 85°C, 1s on 9s off) H2T: 1×10 <sup>5</sup> OPS (10A 220VDC, Resistive load, at 85°C, 1s on 9s off) D2T: 1×10 <sup>5</sup> OPS (4A 300VDC, Resistive load, at 85°C, 1s on 9s off) 2H2T: 1×10 <sup>5</sup> OPS (2NO 10A 450VDC, Resistive load, at 85°C, 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(500VDC)
Dielectric strength	Between coil & contacts 5000VAC 1min
	Between open contacts 1500VAC 1min
Surge voltage (Between coil & contacts)	10kV(1.2/50μs)
Set time(at rated. volt.)	10ms max.
Reset time(at rated. volt.)	5ms max.
Shock resistanc	Functional 98m/s <sup>2</sup>
	Destructive 980m/s <sup>2</sup>
Vibration resistance	10Hz to 55Hz 1.5mm DA
Humidity	5 % to 85 % RH
Ambient temperature	-40°C to 85°C
Termination	PCB
Unit weight	1A,1D:Approx. 15g 2A:Approx. 30g
Construction	Plastic sealed,Flux proofed

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

## COIL

Coil power	1A Approx. 400mW 1B Approx. 600mW 2A Approx. 800mW
------------	--

## COIL DATA

at 23°C

1H:1 Form A

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

1D:1 Form B

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC <sup>(1)</sup> max.	Drop-out Voltage VDC <sup>(1)</sup> min.	Coil Resistance Ω
5	5	3.75	0.5	41 × (1±10%)
6	6	4.50	0.6	60 × (1±10%)
9	9	6.75	0.9	135 × (1±10%)
12	12	9.00	1.2	240 × (1±10%)
18	18	13.50	1.8	540 × (1±10%)
24	24	18.00	2.4	960 × (1±10%)



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2025 Rev. 2.00

## COIL DATA

2H:2 Form A(Coils in series, see the wiring diagrams Figure 1, 3)

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC <sup>(1)</sup> max.	Drop-out Voltage VDC <sup>(1)</sup> min.	Coil Resistance $\Omega$
5	10	7.50	1.0	124 x (1±10%)
6	12	9.00	1.2	180 x (1±10%)
9	18	13.50	1.8	400 x (1±10%)
12	24	18.00	2.4	720 x (1±10%)
18	36	27.00	3.6	1620 x (1±10%)
24	48	36.00	4.8	2880 x (1±10%)

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

## SAFETY APPROVAL RATINGS(1A)

UL/CUL	4A 420VDC 85°C
	10A 300VDC 85°C
	16A 180VDC 85°C
	10A 220VDC 85°C
	2A 420VDC 85°C
	5A 500VDC 65°C
VDE	12A 277VAC 85°C
	13A 180VAC 85°C
	14.5A 160VAC 85°C
	4A 420VDC 85°C
	10A 300VDC 85°C
	16A 180VDC 85°C
TÜV	12A 250VAC 85°C
	13A 180VAC 85°C
	14.5A 160VAC 85°C
	10A 220VDC 85°C
	2A 420VDC 85°C

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

## ORDERING INFORMATION

Type	HF158F-V /	12	-H	S	2	T	(XXX)
Coil voltage	5, 6, 9, 12, 18, 24VDC						
Contact arrangement	H: 1 Form A D: 1 Form B 2H: 2 Form A						
Construction	S: Plastic sealed Nil: Flux proofed						
Version	2: 5.0mm 1 pole						
Contact material	T: AgSnO <sub>2</sub>						
Special code <sup>(4)</sup>	XXX: Customer special requirement			Nil: Standard			

Notes: 1) We recommend flux proofed types for a clean environment (free from contaminations like H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, dust, etc.); We suggest to choose plastic sealed types and validate it in real application for an unclean environment (with contaminations like H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, dust, etc).

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

3) Storage, transportation and installation can not have a strong magnetic field around;

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

5) Product contains magnet, so there will be mutual exclusion or attraction between products. During the installation, please consider the installation mounting distance.

6) Standard tube packing length is 616mm. Any special requirement needed, please contact us for more details.

## COIL DATA

at 23°C

2H:2 Form A(Coil in parallel, see wiring diagram figure 2)

Coil Code	Nominal Voltage VDC	Pick-up Voltage VDC <sup>(1)</sup> max.	Drop-out Voltage VDC <sup>(1)</sup> min.	Coil Resistance $\Omega$
5	5	3.75	0.5	31 x (1±10%)
6	6	4.50	0.6	45 x (1±10%)
9	9	6.75	0.9	100 x (1±10%)
12	12	9.00	1.2	180 x (1±10%)
18	18	13.50	1.8	405 x (1±10%)
24	24	18.00	2.4	720 x (1±10%)

## SAFETY APPROVAL RATINGS(2A)

UL/CUL	2 NO connected: 10A 450VDC 85°C 12A 336VDC 85°C 13A 277VDC 85°C 14A 240VDC 85°C 16A 220VDC 85°C 13A 277VAC 85°C 16A 240VAC 85°C
	2 NO connected: 5A 1000VDC 85°C 10A 450VDC 85°C 12A 336VDC 85°C 13A 277VDC 85°C 14A 240VDC 85°C 16A 220VDC 85°C 13A 277VAC 85°C 16A 240VAC 85°C

## SAFETY APPROVAL RATINGS(1B)

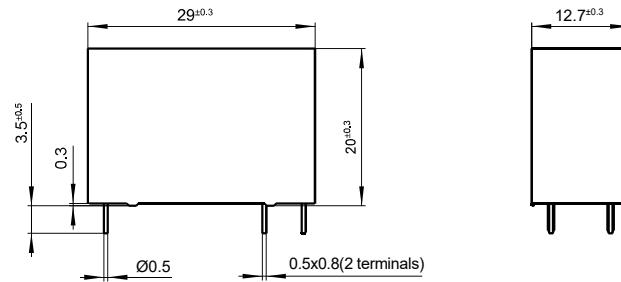
CQC	1B: 4A 300VDC 85°C
-----	--------------------

# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

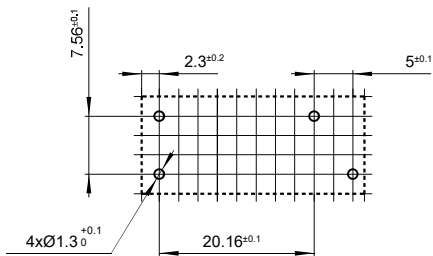
Unit: mm

1 Form A

## Outline Dimensions



## PCB Layout(Bottom view)

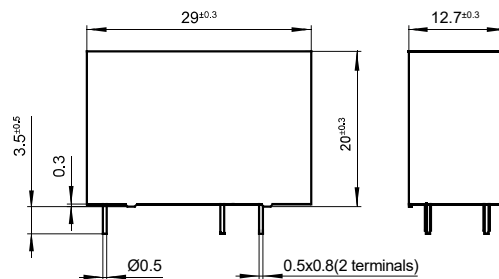


## Wiring Diagram(Bottom view)

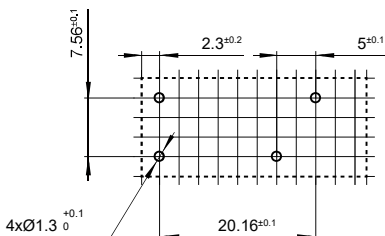


1 Form D

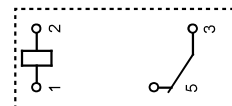
## Outline Dimensions



## PCB Layout(Bottom view)



## Wiring Diagram(Bottom view)



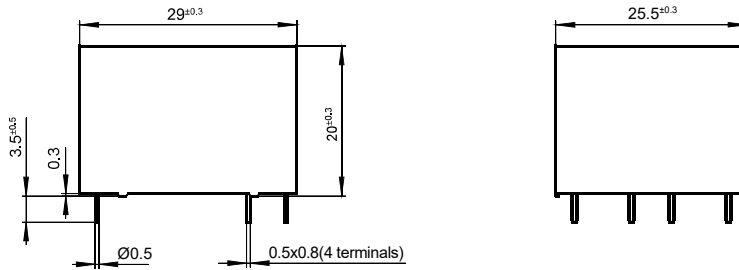
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1$ mm, tolerance should be  $\pm 0.2$ mm; outline dimension  $> 1$ mm and  $\leq 5$ mm, tolerance should be  $\pm 0.3$ mm; outline dimension  $> 5$ mm, tolerance should be  $\pm 0.4$ mm.  
 2) The tolerance without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

# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

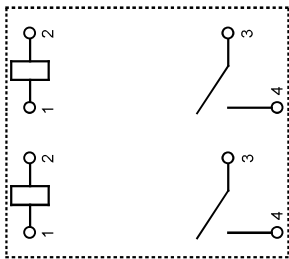
Unit: mm

2 Form A

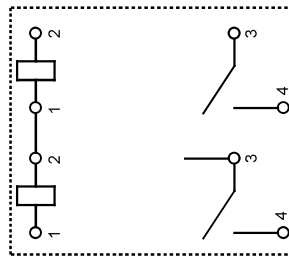
## Outline Dimensions



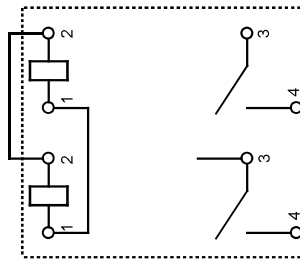
## Wiring Diagram(Bottom view)



Single coil

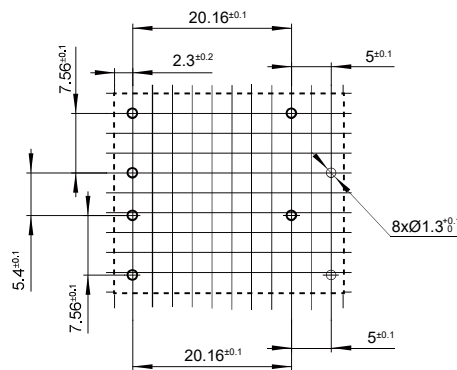


Coils in series



Coils in parallel

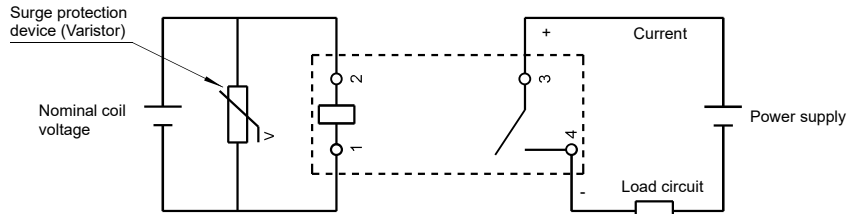
## PCB Layout(Bottom view)



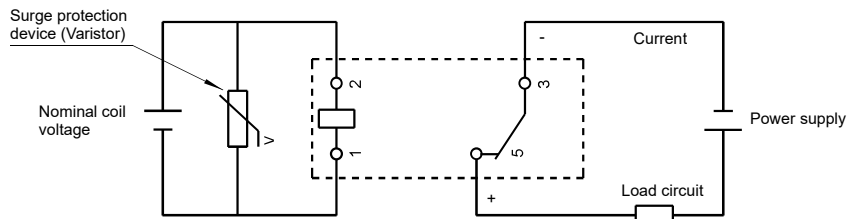
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1$ mm, tolerance should be  $\pm 0.2$ mm; outline dimension  $> 1$ mm and  $\leq 5$ mm, tolerance should be  $\pm 0.3$ mm; outline dimension  $> 5$ mm, tolerance should be  $\pm 0.4$ mm.  
 2) The tolerance without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

**Load circuit and input circuit(Bottom view)**

1 Form A

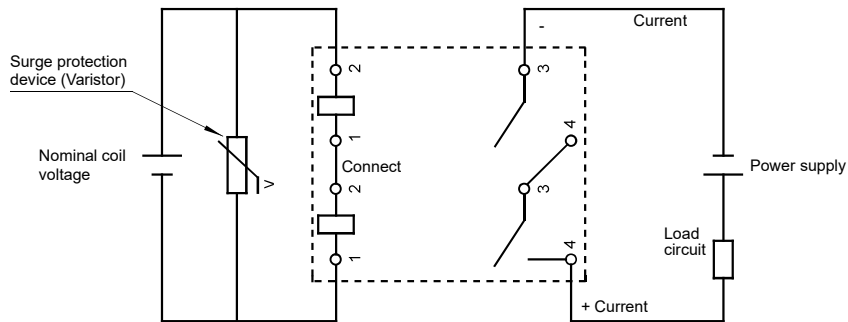


1 Form B

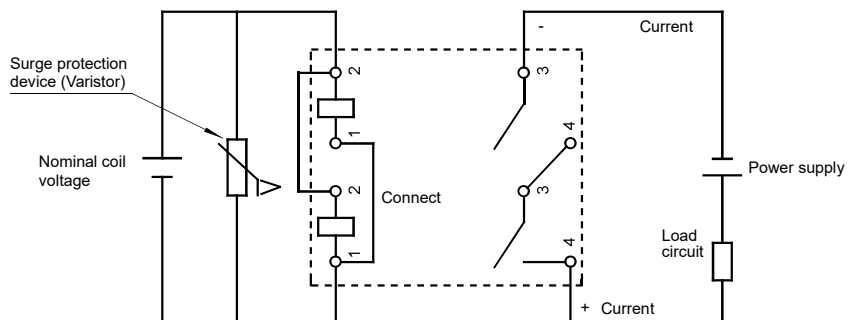


2 Form A

**Wiring diagram of coils in series(Figure 1)**

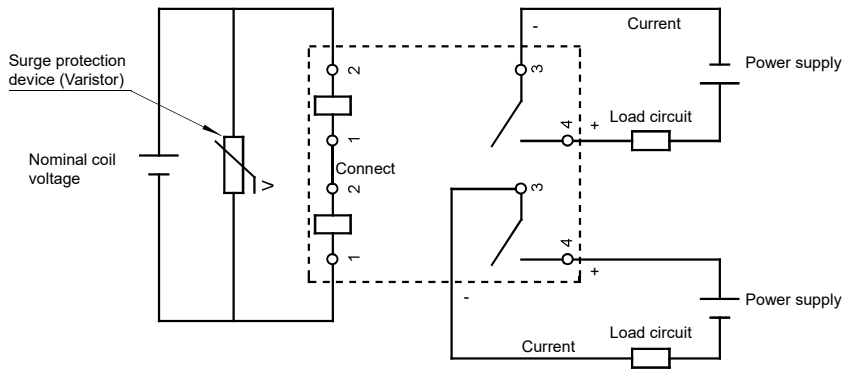


**Wiring diagram of Coils in parallel(Figure 2)**

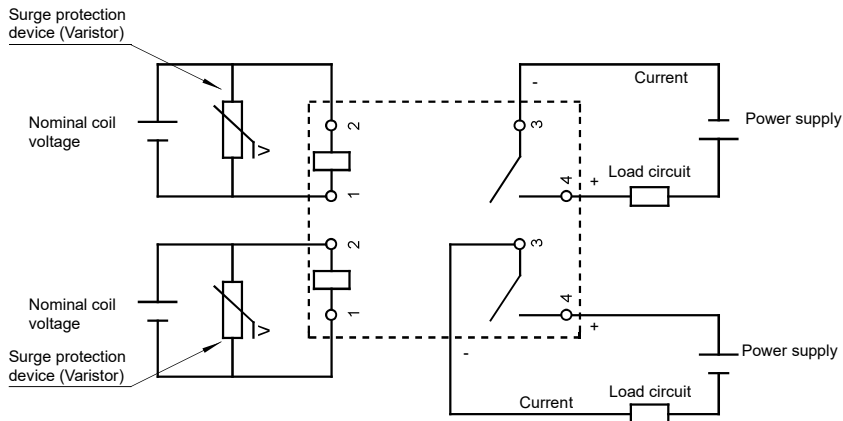


2 Form A

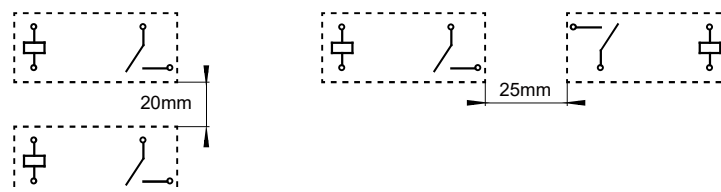
Wiring diagram of coils in series(Figure 3)



Wiring diagram of Single coil(Figure 4)



- Notes:**
- 1) The output contact terminals and the input coil terminal are no polarity to distinguish.
  - 2) If there is a coil voltage reduction and holding application, the positive pole of the coil needs to be input from pin "2".
  - 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.
  - 8) 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.
  - 9) When the relays are installed side by side, it is recommended to install  $\geq 20\text{mm}$ , and the recommended installation spacing is  $\geq 25\text{mm}$  when installing opposite the same column.



**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.

© Xiamen Hongfa Electroacoustic Co., Ltd. All rights of Hongfa are reserved.