

# HF158F

# MINIATURE HIGH POWER RELAY



File No.:E134517



File No.:40032833



## 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
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (29.0 x 12.7 x 15.7) mm

## CONTACT DATA

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

## CHARACTERISTICS

|   |                              |                     |
|---|------------------------------|---------------------|
| Insulation resistance                   | 1000MΩ (at 500VDC)           |                     |
| Dielectric strength                     | Between coil & contacts      | 5000VAC 1min        |
|   | Between open contacts        | 1000VAC 1min        |
| 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.)       | 60K max.                     |                     |
| Shock resistance *                      | Functional                   | 98m/s <sup>2</sup>  |
|   | Destructive                  | 980m/s <sup>2</sup> |
| 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. | Drop-out Voltage VDC min. | Max. Voltage VDC <sup>1)</sup> | 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 <sup>2)</sup>    | 33.6                     | 4.8                       | 86.4                           | 5760 x (1±15%)    |

Notes: 1) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

2) For products with rated voltage ≥ 48V, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

## SAFETY APPROVAL RATINGS

|                   |                    |  |
|-------------------|--------------------|--|
| UL/CUL            | AgNi               | 16A 277VAC<br>16A 24VDC<br>10A 400VAC at 85°C<br>10A 250VAC at 105°C<br>20A 250VAC at 85°C   |
|                   | AgSnO <sub>2</sub> | 1HP 240VAC<br>B300/R300 at 85°C<br>TV-5 120VAC<br>16A 277VAC<br>16A 24VDC<br>10A 400VAC at 85°C<br>10A 250VAC at 105°C<br>20A 250VAC at 85°C |
| VDE               | AgNi               | 13A 250VAC at 70°C<br>16A 250VAC at 85°C<br>NO: 10A 250VAC at 25°C / at 105°C (Only for (217) type)  |
|                   | AgSnO <sub>2</sub> | 16A 250VAC at 85°C<br>8A 250VAC cosθ=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<br>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.



HONGFA RELAY

ISO9001, ISO/TS16949, ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

2014 Rev. 1.01

## ORDERING INFORMATION

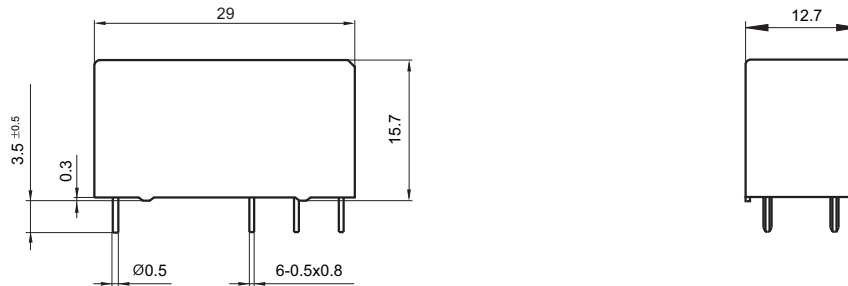
|                               |   |    |                       |   |   |   |       |
|-------------------------------|---|----|-----------------------|---|---|---|-------|
| Type                          | HF158F /  | 12 | -Z                    | S | 3 | 3 | (XXX) |
|                               | HF158F: Standard<br>HF158F-T: High temperature  |    |                       |   |   |   |       |
| Coil voltage                  | 5, 6, 9, 12, 18, 24, 48VDC  |    |                       |   |   |   |       |
| Contact arrangement           | H: 1 Form A   |    | Z: 1 Form C           |   |   |   |       |
| Construction <sup>1) 2)</sup> | S: Plastic sealed   |    | Nil: Flux proofed     |   |   |   |       |
| Version                       | 3: 5.0mm  |    |                       |   |   |   |       |
| Contact material              | 3: AgNi   |    | T: AgSnO <sub>2</sub> |   |   |   |       |
| Customer special code         | e.g. (217) stands for product with the electrical endurance of 3 x 10 <sup>5</sup> ops at 10A load. |    |                       |   |   |   |       |

- 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.

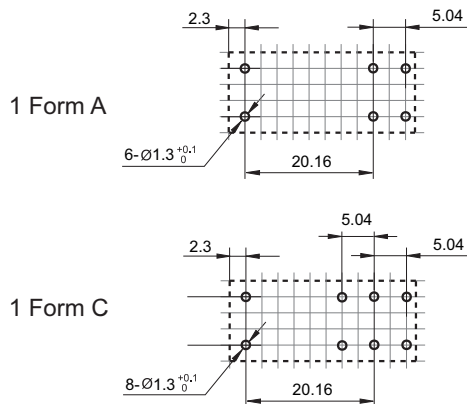
## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

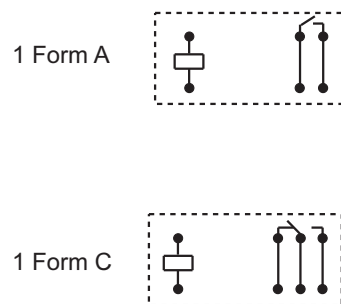
### Outline Dimensions



### PCB Layout (Bottom view)



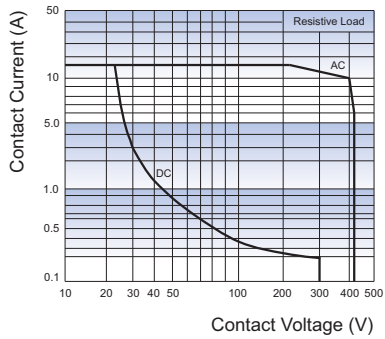
### Wiring Diagram (Bottom view)



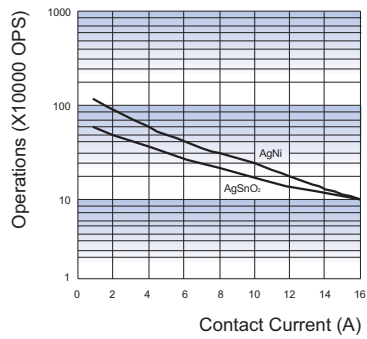
- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1$ mm, tolerance should be  $\pm 0.2$ mm; outline dimension  $> 1$ mm and  $\leq 5$ mm, tolerance should be  $\pm 0.3$ mm; outline dimension  $> 5$ mm, tolerance should be  $\pm 0.4$ mm.
- 2) The tolerance without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

## CHARACTERISTIC CURVES

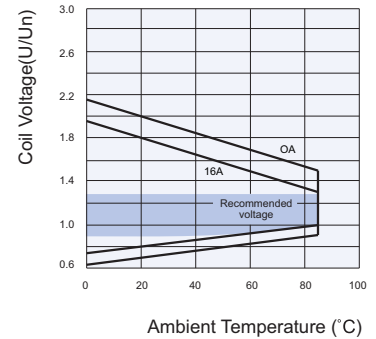
MAXIMUM SWITCHING POWER



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 above 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.

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