

**HFKC/HFKC-T****AUTOMOTIVE RELAY**

Single



Twin

**Typical Applications**

Central door lock, Wiper control, Indicator control, Power door & windows, Anti-theft lock, Rear window and seat heating control, Lighting/flashlight/indicator lamp control

**Features**

- Subminiature automotive relay
- Maximum continuous current 30A
- Twin separate systems (Twin version)
- The reflow soldering Version (open vent hole) available (HFKC-T)
- RoHS & ELV compliant

**CHARACTERISTICS**

|                                                      |                                               |                      |                                                        |
|------------------------------------------------------|-----------------------------------------------|----------------------|--------------------------------------------------------|
| Contact arrangement                                  | Single: 1A, 1C<br>Twin: 2A, 2C                | Release time         | Typ.: 2ms<br>Max.: 10ms <sup>4)</sup>                  |
| Voltage drop (initial) <sup>1)</sup>                 | Typ.: 100mV (at 10A)<br>Max.: 250mV (at 10A)  | Ambient temperature  | -40°C to 105°C                                         |
| Max. continuous current                              | NO/NC: 30A/25A (at 23°C)<br>20A/15A (at 85°C) | Storage temperature  | -40°C to 155°C                                         |
| Max. switching current <sup>2)</sup><br>(NO contact) | Make: 40A <sup>3)</sup><br>Break: 30A         | Vibration resistance | 10Hz to 500Hz 58.8m/s <sup>2</sup> (6g)                |
| Electrical endurance                                 | See "CONTACT DATA" table                      | Shock resistance     | 294m/s <sup>2</sup> (30g)                              |
| Mechanical endurance                                 | 1x10 <sup>7</sup> OPS (300OPS/min)            | Termination          | PCB <sup>5)</sup>                                      |
| Initial insulation resistance                        | 100MΩ (at 500VDC)                             | Construction         | Wash tight, Flux proofed                               |
| Dielectric strength                                  | 500VAC (1min, leakage current less than 1mA)  | Unit weight          | Single version: Approx. 4g<br>Twin version: Approx. 8g |
| Operate time                                         | Typ.: 4ms<br>Max.: 10ms (at nomi. vol.)       |                      |                                                        |

1) Equivalent to the max. initial contact resistance is 100mΩ (at 1A 6VDC).

2) The value apply to a resistive or inductive load with suitable spark suppression.

3) For a load current duration maximum 3s for a on/off ratio of 1:10.

4) The value is measured when voltage drops suddenly from nominal voltage to 0 VDC and coil is not paralleled with suppression circuit.

5) Since it is an environmental friendly product, please select lead-free solder when welding. The recommended soldering temperature and time is 240°C to 260°C, 2s to 5s.

**CONTACT DATA<sup>5)</sup>**

at 23°C

| Load voltage | Load type                |       | Load current A    |     | On/Off ratio |       | Electrical endurance OPS | Contact material               | Load wiring diagram <sup>4)</sup> |
|--------------|--------------------------|-------|-------------------|-----|--------------|-------|--------------------------|--------------------------------|-----------------------------------|
|              |                          |       | 1C, 2C            |     | On s         | Off s |                          |                                |                                   |
|              |                          |       | NO                | NC  |              |       |                          |                                |                                   |
| 13.5VDC      | Resistive                | Make  | 20                | --- | 1            | 3     | 3×10 <sup>5</sup>        | AgSnO <sub>2</sub><br>AgNi0.15 | See diagram 1                     |
|              |                          | Break | 20                | --- |              |       |                          |                                |                                   |
|              | Wiper<br>L=1.0mH         | Make  | 25 <sup>(1)</sup> | --- | 0.2          | 2     | 3×10 <sup>5</sup>        | AgSnO <sub>2</sub>             | See diagram 2                     |
|              |                          | Break | 5                 | --- | 1.8          |       |                          |                                |                                   |
|              | Motor locked<br>L=0.77mH | Make  | 20                | --- | 0.2          | 2     | 1×10 <sup>5</sup>        | AgSnO <sub>2</sub>             | See diagram 3                     |
|              |                          | Break | 20                | --- |              |       |                          |                                |                                   |



HONGFA RELAY

ISO9001、ISO/TS16949、ISO14001、OHSAS18001 CERTIFIED

2007 Rev. 1.11

| Load voltage | Load type             |       | Load current A    | On/Off ratio |       | Electrical endurance OPS | Contact material               | Load wiring diagram <sup>4)</sup> |
|--------------|-----------------------|-------|-------------------|--------------|-------|--------------------------|--------------------------------|-----------------------------------|
|              |                       |       | 1A, 2A            | On s         | Off s |                          |                                |                                   |
| 13.5VDC      | Resistive             | Make  | 20                | 1            | 3     | $3 \times 10^5$          | AgSnO <sub>2</sub><br>AgNi0.15 | See diagram 4                     |
|              |                       | Break | 20                |              |       |                          |                                |                                   |
|              | Flasher <sup>3)</sup> | Make  | $3 \times 21W$    | 0.365        | 0.365 | $2 \times 10^6$          | Special AgSnO <sub>2</sub>     | See diagram 5                     |
|              |                       | Break |                   |              |       |                          |                                |                                   |
|              | Lamp                  | Make  | 40 <sup>(2)</sup> | 2            | 2     | $1 \times 10^5$          | AgSnO <sub>2</sub>             | See diagram 6                     |
|              |                       | Break | 10                |              |       |                          |                                |                                   |

1) Corresponds to the peak inrush current on initial actuation (motor).

2) Corresponds to the peak inrush current on initial actuation (cold filament).

3) When it is utilized in flasher, a special AgSnO<sub>2</sub> contact material should be used and the customer special code should be (170) as a suffix. Please connect by the polarity according to the diagrams below.

4) The load wiring diagrams are listed below. When special AgSnO<sub>2</sub> contacts are applied, please heed the anode and cathode's request when wired.

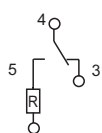


diagram 1

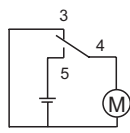


diagram 2

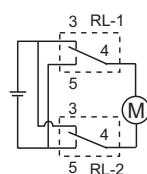


diagram 3



diagram 4

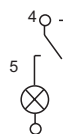


diagram 5



diagram 6

5) When the load requirement is different from content of the table above, please contact Hongfa for relay application support.

| COIL DATA           |                     |                      |                                             |                     |                                                    |      |
|---------------------|---------------------|----------------------|---------------------------------------------|---------------------|----------------------------------------------------|------|
| at 23°C             |                     |                      |                                             |                     |                                                    |      |
| Nominal voltage VDC | Pick-up voltage VDC | Drop-out voltage VDC | Coil resistance $\times(1 \pm 10\%) \Omega$ | Power consumption W | Max. allowable overdrive voltage <sup>1)</sup> VDC |      |
|                     |                     |                      |                                             |                     | 23°C                                               | 85°C |
| 6                   | 3.5                 | 0.8                  | 63                                          | 0.55                | 13.2                                               | 7.8  |
| 10                  | 5.7                 | 1.25                 | 181                                         | 0.55                | 22                                                 | 13   |
| 12                  | 6.9                 | 1.5                  | 254                                         | 0.55                | 26                                                 | 16   |
| 12                  | 6.9                 | 1.5                  | 181                                         | 0.80                | 22                                                 | 13   |
| 24                  | 13.8                | 3.0                  | 1016                                        | 0.55                | 53                                                 | 31   |

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

## ORDERING INFORMATION

|                                     |                                                                                                                                                                              |        |                             |     |   |   |   |   |       |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------|-----|---|---|---|---|-------|
|                                     |                                                                                                                                                                              | HFKC / |                             | 012 | Z | S | P | T | (XXX) |
| Type                                | HFKC: Standard<br>HFKC-T: Reflow soldering version                                                                                                                           |        |                             |     |   |   |   |   |       |
| Coil voltage                        | 006: 6VDC<br>012: 12VDC                                                                                                                                                      |        | 010: 10VDC<br>024: 24VDC    |     |   |   |   |   |       |
| Contact arrangement                 | Z: 1 Form C<br>2Z: 2 Form C                                                                                                                                                  |        | H: 1 Form A<br>2H: 2 Form A |     |   |   |   |   |       |
| Construction                        | S: Wash tight (HFKC)                                                                                                                                                         |        | Nil: Flux proofed (HFKC-T)  |     |   |   |   |   |       |
| Coil power                          | P: 0.8W                                                                                                                                                                      |        | Nil: 0.55W                  |     |   |   |   |   |       |
| Contact material                    | 3: AgNi0.15                                                                                                                                                                  |        | T: AgSnO <sub>2</sub>       |     |   |   |   |   |       |
| Customer special code <sup>1)</sup> | e.g. (170) stands for flasher load, (555) stands for RoHS & ELV compliant. In case there are multiple special requirements, all special codes should be followed one by one. |        |                             |     |   |   |   |   |       |

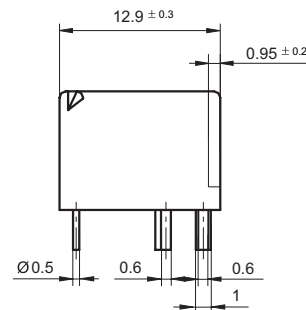
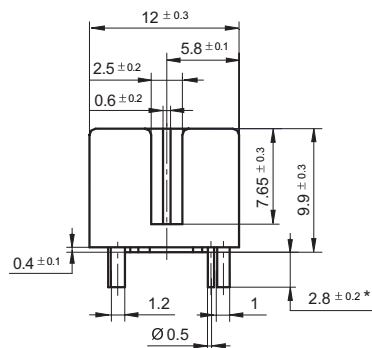
1) HFKC/HFKC-T is an environmental friendly product, please mark special code (555) when order.

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

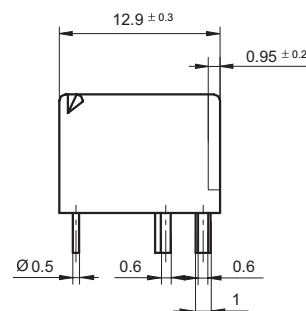
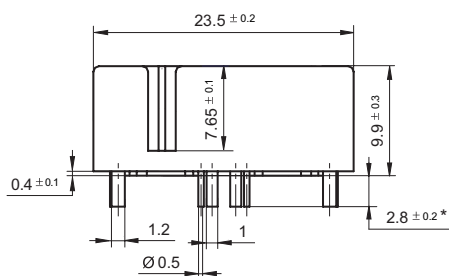
Unit: mm

### Outline Dimensions

#### Single version



#### Twin version

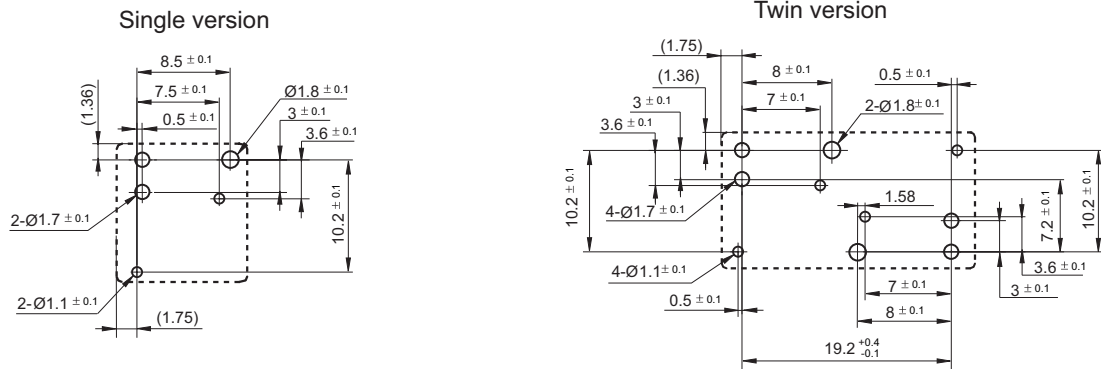


**Notes:** 1) \* The additional tin top is max. 1mm;  
 2) The terminal vertical deviation tolerance is 0.2mm.

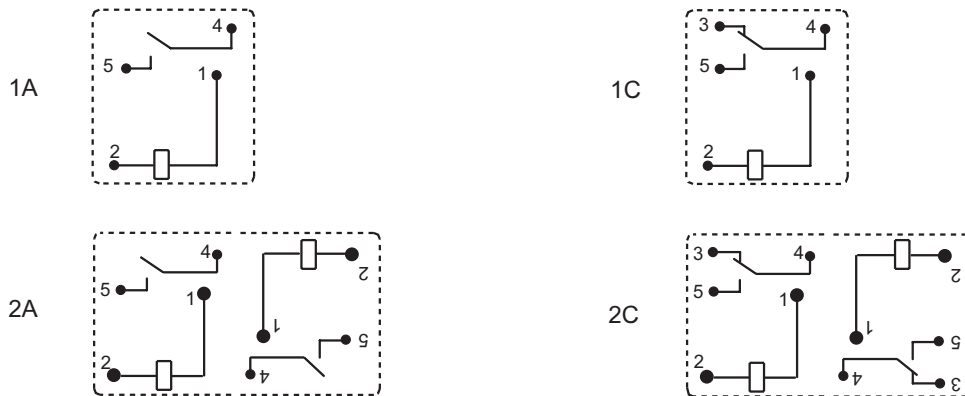
## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

PCB Layout (Bottom view)

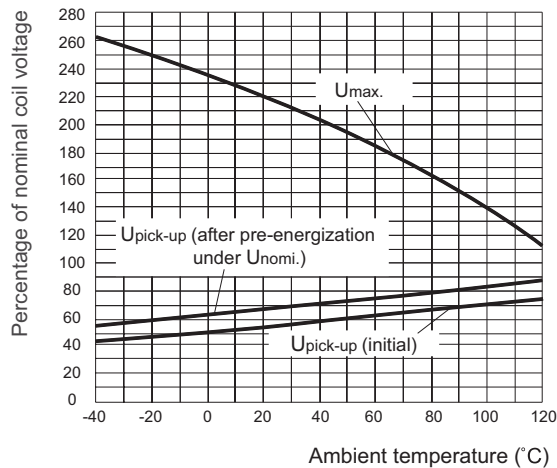


Wiring Diagram (Bottom view)



## CHARACTERISTIC CURVES

### 1. Coil operating voltage range



- 1) The operating voltage is connected with coil pre-energized time and voltage. After pre-energized, the operating voltage will increase.
- 2) The maximum allowable coil temperature is 155°C. For the coil temperature rise which is measured by resistance is average value, we recommend the coil temperature should be below 130°C under the different application ambient, different coil voltage and different load etc.
- 3) If the actual operating coil voltage is out of the specified range, please contact Hongfa for further details.

### 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.