

# HFKC/HFKC-T

# AUTOMOTIVE RELAY



### Typical Applications

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

### Features

- Subminiature automotive relay
- The weight is only 4g for single relay
- Extended temp. range up to 125°C
- The reflow soldering version (open vent hole) available (HFKC-T)
- RoHS & ELV compliant

## CHARACTERISTICS

Contact arrangement	1A, 1C
Voltage drop (initial) <sup>1)</sup>	Typ.: 50mV (at 10A) Max.: 250mV (at 10A)
Max. continuous current	NO: 30A (at 23°C, 1h) <sup>2)</sup> NC: 25A (at 23°C, 1h) <sup>3)</sup>
Max. switching current <sup>4)</sup>	30A
Max. switching voltage	16VDC
Min. contact load	1A 6VDC
Electrical endurance	See "CONTACT DATA"
Mechanical endurance	1x10 <sup>7</sup> OPS (300OPS/min)
Initial insulation resistance	100MΩ (at 500VDC)
Dielectric strength <sup>5)</sup>	500VAC
Operate time	Typ.: 4ms (at nomi. vol.) Max.: 10ms (at nomi. vol.)
Release time <sup>6)</sup>	Typ.: 2ms Max.: 10ms
Ambient temperature	-40°C to 125°C
Vibration resistance <sup>7)</sup>	10Hz to 500Hz 58.8m/s <sup>2</sup>

Shock resistance <sup>7)</sup>	294m/s <sup>2</sup>
Termination	PCB <sup>8)</sup>
Construction	Plastic sealed, Flux proofed
Unit weight	4g

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

2) Test under the following conditions:

a. The relay is mounted on the PCB, The PCB board is a double layer board. The thickness of the copper foil is 4 oz (140μm), the width of each copper foil is 7.52x(1+5%)mm, the length of the copper foil is 50 mm±1 mm, the external wire is 5.0mm<sup>2</sup> and the Tg value of the PCB board is 150 °C.

b. The installation spacing between relay samples is 100mm.

c. For NO contacts, measured when applying 100% rated voltage on coil.

3) For NC contacts, measured when applying zero voltage on coil.

4) At 23°C, 13.5VDC, on & off rate at 1s:5s, resistive load (100 cycles).

5) 1min, leakage current less than 1mA.

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

7) 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.

8) Since it is an environmental friendly product, please select lead-free solder when welding. The recommended soldering temperature and time is (260±3)°C, (5±0.3)s.

## 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		On s	Off s			
			NO	NC					
13.5VDC	Resistive	Make	20	---	1	5	3×10 <sup>5</sup>	AgSnO <sub>2</sub>	See diagram 1
		Break	20	---					
	Wiper 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	---					
	Motor locked 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, IATF16949, ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED

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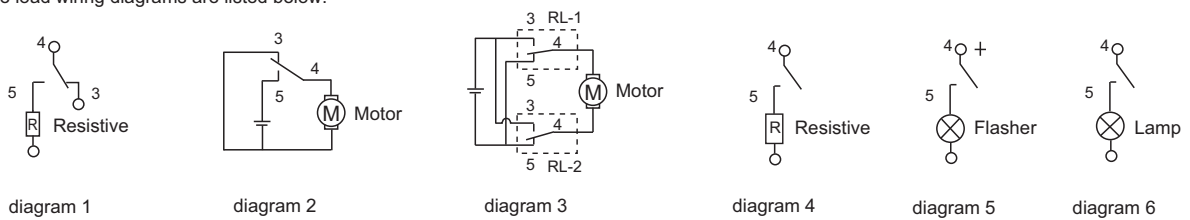
Load voltage	Load type		Load current A	On/Off ratio		Electrical endurance OPS	Contact material	Load wiring diagram <sup>4)</sup>
			1A	On s	Off s			
13.5VDC	Resistive	Make	20	1	5	3×10 <sup>5</sup>	AgSnO <sub>2</sub>	See diagram 4
		Break	20					
	Flasher <sup>3)</sup>	Make	3×21W	0.365	0.365	2×10 <sup>6</sup>	Special AgSnO <sub>2</sub>	See diagram 5
		Break						
	Lamp	Make	40 <sup>2)</sup>	2	2	1×10 <sup>5</sup>	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:



5) 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

Nominal voltage <sup>1)</sup> VDC	Pick-up voltage VDC			Drop-out voltage VDC			Coil resistance x(±10%)Ω	Power consumption W
	23°C	85°C	125°C	23°C	85°C	125°C	23°C	23°C
6	≤3.5	≤4.4	≤5.0	≥0.8	≥1.0	≥1.1	63	0.55
10	≤5.7	≤7.1	≤8.1	≥1.25	≥1.5	≥1.7	181	0.55
12	≤6.9	≤8.6	≤9.9	≥1.5	≥1.8	≥2.1	254	0.55
12	≤6.9	≤8.6	≤9.9	≥1.5	≥1.8	≥2.1	181	0.8

1) When requiring some other nominal voltage, special order allowed.

## ORDERING INFORMATION

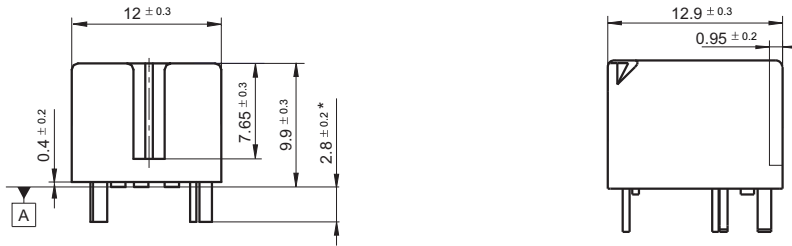
Type		HFKC / 012 -Z S P T (XXX)	
Type		HFKC: Standard HFKC-T: Reflow soldering version <sup>1)</sup>	
Coil voltage		006: 6VDC 010: 10VDC 012: 12VDC	
Contact arrangement		H: 1 Form A Z: 1 Form C	
Construction		S: Plastic sealed (HFKC) <sup>2)</sup> Nil: Flux proofed (HFKC-T)	
Coil power		P: 0.8W (Only for 12VDC type) Nil: 0.55W	
Contact material		T: AgSnO <sub>2</sub>	
Special code <sup>3)</sup>		XXX: Customer special requirement Nil: Standard	

Notes: 1) The structure of HFKC-T is only flux proof, the open vent hole is on the top of the relay.

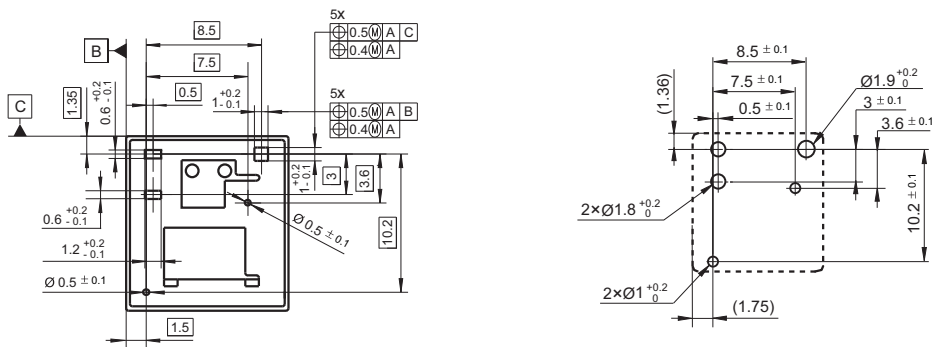
2) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (170) stands for flasher load. The performance parameters of products with characteristic numbers shall be subject to the specific specifications provided by Hongfa.

Outline Dimensions



PCB Layout (Bottom view)



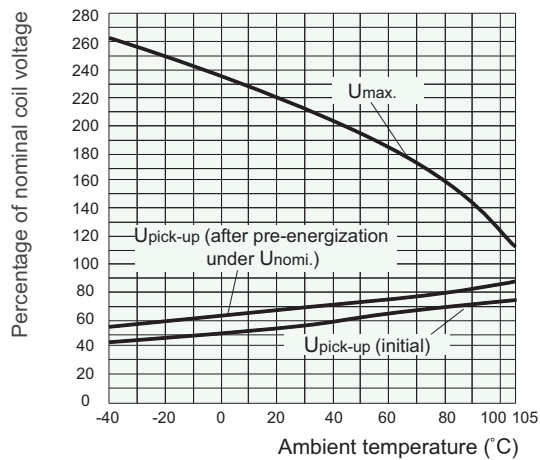
Remark: \* The additional tin top is max. 1mm.

PCB Layout (Bottom view)



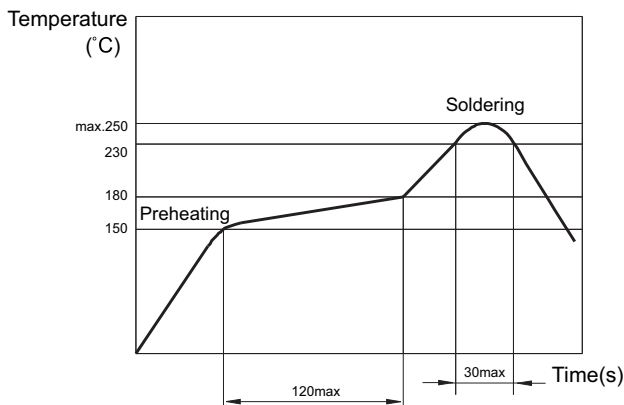
## CHARACTERISTIC CURVES

### 1. Coil operating voltage range



- 1) There should be no contact load applied when maximum continuous operation voltage is applied on coil.
- 2) The operating voltage is connected with coil pre-energized time and voltage. After pre-energized, the operating voltage will increase.
- 3) The maximum allowable coil temperature is 180°C. For the coil temperature rise which is measured by resistance is average value, we recommend the coil temperature should be below 170°C under the different application ambient, different coil voltage and different load etc.
- 4) If the actual operating coil voltage is out of the specified range, please contact Hongfa for further details.

### 2. Reflow soldering, temperature on PCB board. (Recommended soldering temperature, only for reflow soldering version)



#### Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. In case there is specific criterion (such as mission profile, technical specification, PPAP etc.) checked and agreed by and between customer and Hongfa, this specific criterion should be taken as standard regarding any requirement on Hongfa product. 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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