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)[1)]	Typ.: 50mV (at 10A) Max.: 250mV (at 10A)
Max. continuous current[2)]	NO: 30A (at 23˚C, 1h) NC: 25A (at 23˚C, 1h)
Max. switching current[3)]	30A
Max. switching voltage	16VDC
Min. contact load[4)]	1A 12VDC
Electrical endurance	See "CONTACT DATA"
Mechanical endurance	1x10^{7}OPS (300OPS/min)
Initial insulation resistance	100MΩ (at 500VDC)
Withstand voltage[5)]	500VAC
Operate time	Typ.: 4ms (at nomi. vol.) Max.: 10ms (at nomi. vol.)
Release time [6)]	Typ.: 2ms Max.: 10ms
Ambient temperature	-40˚C to 125˚C
Vibration resistance [7)]	10Hz to 500Hz 58.8m/s^2
Shock resistance[7)]	294m/s^2
Termination	PCB[8)]
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. For NO contacts, measured when 100% rated voltage is applied to the coil; For NC contacts, measured when applying zero voltage on coil.
   b. The relay is mounted on the PCB,The PCB board is a double layer board. The thickness of the copper foil is 4oz (140μm),the width of copper foil is 3.76x(1±5%)mm, the length of the copper foil is (50±1)mm, and the Tg value of the PCB is 150˚C.
   c. The installation spacing between relay samples is 100mm.
   d.It varies by connection conditions. Additionally, reliable performance under repeated power-on cannot be guaranteed. Verify based on actual operating conditions during use.
3) At 23˚C, No contacts, measured in a 13.5VDC resistive circuit with an on-off cycle of 1.5s on : 1.5s off (100 cycles).
4) Lower limit target for on-off operation at low load. This value varies by on-off frequency, environmental conditions and expected reliability level; verify with actual load during use.
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±0.5)s.

CONTACT DATA [5)]

at 23˚C

Load voltage	Load type		Load current A 1C NO	Load current A 1C NC	On/Off ratio On s	On/Off ratio Off s	Electrical endurance OPS	Contact material	Load wiring diagram [4)]
13.5VDC	Resistive	Make	20	—	1	5	3×10^5	$AgSnO_2$	See diagram 1
		Break	20	—					
	Wiper L=1.0mH	Make	25 [1)]	—	0.2	2	3×10^5	$AgSnO_2$	See diagram 2
		Break	5	—	1.8				
	Motor locked L=0.77mH	Make	20	—	0.2	2	1×10^5	$AgSnO_2$	See diagram 3
		Break	20	—					

Load voltage	Load type		Load current A	On/Off ratio		Electrical endurance OPS	Contact material	Load wiring diagram [4]
			1A	On s	Off s			
13.5VDC	Resistive	Make	20	1	5	3×10^5	$AgSnO_2$	See diagram 4
		Break	20					
	Flasher [3]	Make	3×21W	0.365	0.365	2×10^6	Special $AgSnO_2$	See diagram 5
		Break						
	Lamp	Make	40 [2]	2	2	1×10^5	$AgSnO_2$	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 $AgSnO_2$ 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:

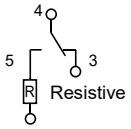


diagram 1

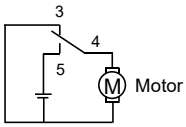


diagram 2

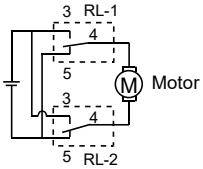


diagram 3

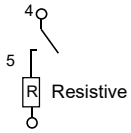


diagram 4

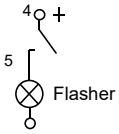


diagram 5

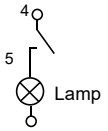


diagram 6

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 [1] VDC	Pick-up voltage VDC max.			Drop-out voltage VDC min.			Coil resistance x(1±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	0.57
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	0.57
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

	HFKC /	012	-Z	S	P	T	(XXX)

Type **HFKC**: Standard
HFKC-T: Reflow soldering version[1]

Coil voltage **006**: 6VDC **010**: 10VDC **012**: 12VDC

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

Construction **S**: Plastic sealed (HFKC)[2] **Nil**: Flux proofed(HFKC-T)

Coil power **P**: 0.8W (Only for 12VDC type) **Nil**: See "COIL DATA"

Contact material **T**: $AgSnO_2$

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

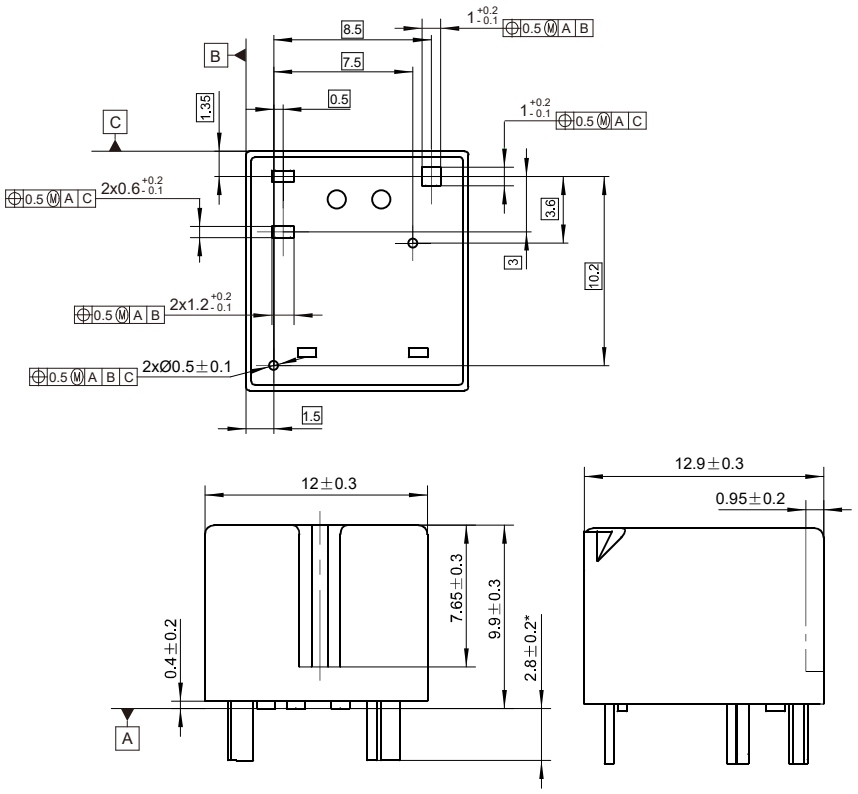
Notes: 1) The structure of HFKC-T is only flux proof, the open vent hole is on the top of the relay.
2) Contact us for suitable soldering conditions and product specifications if post-soldering cleaning or surface treatment is required after the relays are soldered onto the PCB.
3)The customer special 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, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

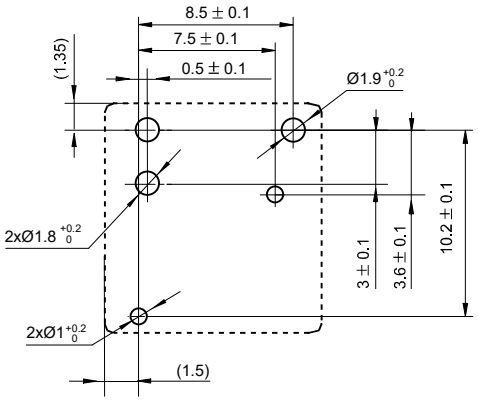
1 Form C

Outline Dimensions

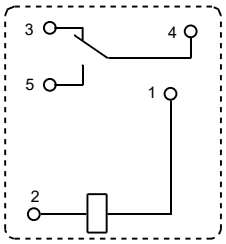


Remark: * The additional tin top is max. 1mm.

PCB Layout (Bottom view)



Wiring Diagram (Bottom view)

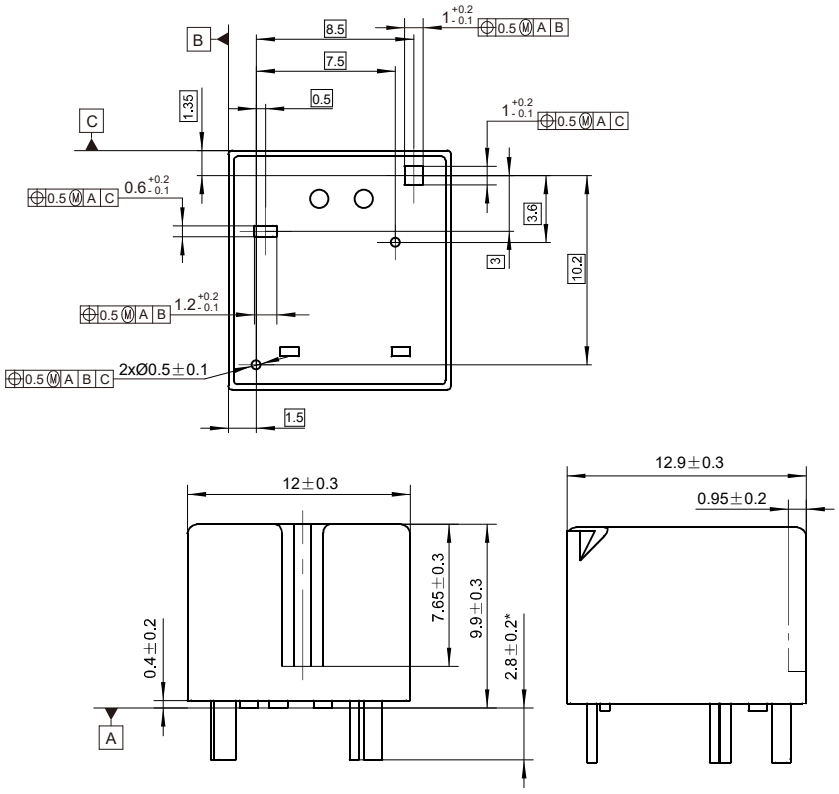


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

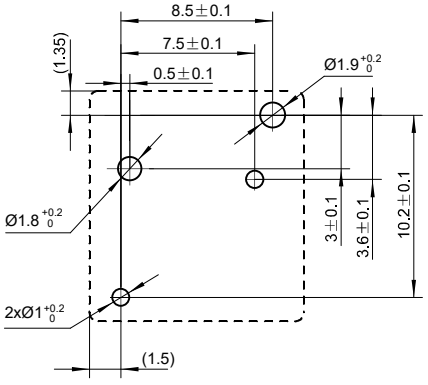
1 Form A

Outline Dimensions

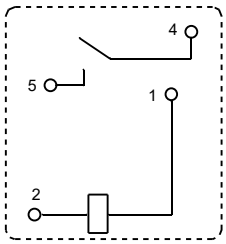


Remark: * The additional tin top is max. 1mm.

PCB Layout (Bottom view)

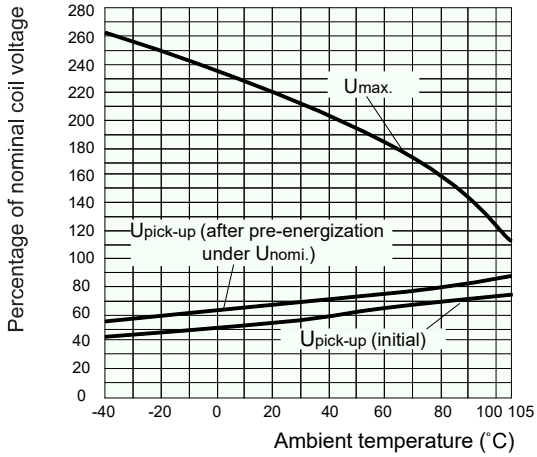


Wiring Diagram (Bottom view)



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)