

# HFK9-LT

# AUTOMOTIVE RELAY



### Typical Applications

Rear window defogger, Lamp control, Engine control, Energy management, Main switch/supply relay, quiescent current management, etc.

### Features

- Single/double coil magnetic latching relay for automobile
- Max. continuous current 40A (at 23°C)
- Max. making current 160A
- Extended temp. Range up to 125°C
- With highly established reliability
- Strong resistance ability to shock & vibration
- RoHS & ELV compliant

## CHARACTERISTICS

Contact arrangement	1U(SH)
Voltage drop <sup>1)</sup>	Typ: 50mV (at 10A) Max.: 250 mV (at 10A)
Max. continuous current <sup>2)</sup>	54A 30min/40A continuous(at 23°C) 30A continuous(at 85°C) 20A 500h(at 125°C)
Max. making current	Make: 160A <sup>3)</sup> Break: 40A (Resistive, 14VDC)
Max. switching voltage	16VDC
Min. contact load	1A 6VDC
Electrical endurance	See "CONTACT DATA"
Mechanical endurance	1×10 <sup>6</sup> ops 120 ops/min
Insulation resistance (initial)	100MΩ (500VDC)
Dielectric strength (initial) <sup>4)</sup>	Between contacts: 500VAC Between coil & contacts: 500VAC
Operate time	Typ.:4ms Max:10ms
Release time <sup>5)</sup>	Typ: 1.5 ms Max:10ms

Ambient temperature	-40°C to 125°C	
Vibration resistance (initial)	Functional <sup>6)</sup>	10Hz to 100Hz, 44.1m/s <sup>2</sup>
	Destructive	10Hz to 500Hz, 44.1m/s <sup>2</sup>
Shock resistance (initial)	Functional <sup>6)</sup>	100 m/s <sup>2</sup>
	Destructive	1000 m/s <sup>2</sup>
Termination	PCB <sup>7)</sup>	
Construction	Plastic sealed, Flux Proofed	
Unit weight	Approx. 11g	

- Notes:**
- 1) Initial value, equivalent to the Max. Initial contact resistance is 100mΩ(1A 6VDC);
  - 2) Measured when applying 100% rated voltage on coil (100ms); Test Printed Circuit Board dimensions: double board, thickness of copper foil is 4oz; 13.15×(1±5%)mm width and 50±1 mm length of NO, NC and Com side; Tg value of PCB Board is 150°C;
  - 3) Inrush peak current under lamp load, at 14VDC;
  - 4) 1min, leak current is less than 1mA;
  - 5) The valve is measured when voltage drops suddenly from normal to 0 and there's no suppression circuit paralleled on the coil;
  - 6) NO contact closure time is less than 100us at reset status, NO contact break time is less than 100us at set status;
  - 7) Since it's an environmental friendly product, please select lead-free solder when welding. The recommended soldering temp. and time is (260±3) °C, (5±3)s.

## CONTACT DATA <sup>1) 2)</sup>

-40°C~125°C

Load voltage VDC	Load type		Load current A	On/Off ratio		Electrical endurance ops	Contact material	Load wiring diagram <sup>4)</sup>
				SH	On s			
14	Resistive	Make	40	2	2	1×10 <sup>5</sup>	AgSnO <sub>2</sub>	See Figure 1
		Break	40					
	Inductive L=0.5mH	Make <sup>3)</sup>	80	2	2	1×10 <sup>5</sup>	AgSnO <sub>2</sub>	See Figure 2
		Break	33					
	Lamp	Make	160	2	2	1×10 <sup>5</sup>	AgSnO <sub>2</sub>	See Figure 3
		Break	20					



HONGFA RELAY

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

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Notes:1)In this table, the resistive load is the physical load, while the inductive load and the lamp load are the analog load.If the load conditions are not consistent with this table, please provide the corresponding detailed conditions to Hongfa for more support.

2)Loads mentioned in this chart is for relays with no parallel diode or Zener Diode. When relay coils are connected in parallel with diode or Zener Diode, the contact wear will be aggravated and the risk of contact sticking will be increased, that is, the life of the relay will be reduced.For those with parallel diode, Zener Diode or other components, please contact Hongfa for more technical supports.

3)Make current refers to peak current.

4)The load wiring diagrams are listed below:

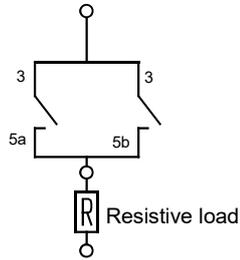


Figure 1

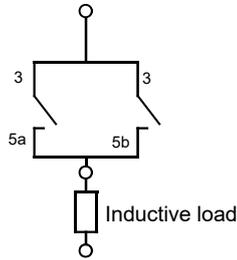


Figure 2

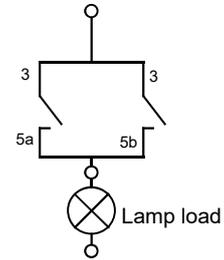


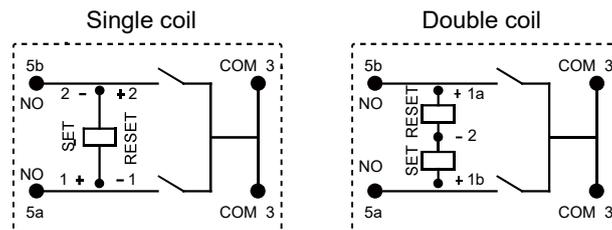
Figure 3

## COIL DATA

Coil type	Nominal voltage VDC	Set voltage <sup>1)</sup> VDC			Reset voltage <sup>1)</sup> VDC			Set coil resistance $\times(1\pm 10\%) \Omega$			Reset coil resistance $\times(1\pm 10\%) \Omega$		
		23°C	85°C	125°C	23°C	85°C	125°C	23°C	85°C	125°C	23°C	85°C	125°C
Single coil(L1) <sup>2)</sup>	12	≤7.2	≤9.0	≤10.2	≤7.2	≤9.0	≤10.2	75	93.6	105.6	75	93.6	105.6
Double coil(L2)	12	≤7.2	≤9.0	≤10.2	≤7.2	≤9.0	≤10.2	75	93.6	105.6	75	93.6	105.6

Notes:1) The excitation mode of voltage should be as per the diagram. Please connect the positive “+” and negative “-” of the coil according to the instruction of the wiring diagram. If it's not connected correctly, it may cause false operation or fail to work.

2) The single coil set coil and the reset coil are the same coil.

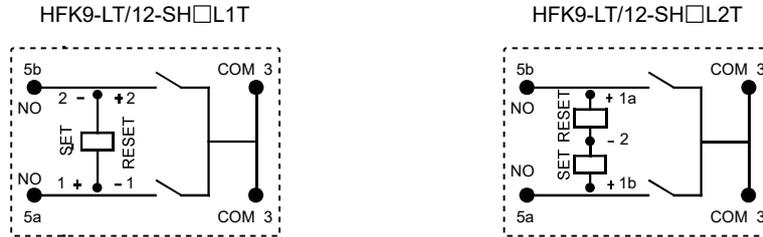


Polarity for set/reset	SET	RESET
Single coil	Pin1 (+) , Pin2 (-)	Pin1 (-) , Pin2 (+)
Double coil	Pin1b (+) , Pin2 (-)	Pin1a (+) , Pin2 (-)





Wiring Diagram(Bottom view)



Note:

- 1) Latching relay is on the "reset" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to the "set" status, when application(connecting the power supply),please reset the relay to "set" or "reset" status on request.
- 2) In order to ensure the operation or resetting of the magnetic holding relay, the excitation voltage applied to the coil must exceed the rated rectangular wave voltage for more than 5 times the unit operation or resetting time;Do not apply voltage to the operating coil and the reset coil voltage at the same time;Do not apply voltage to the coil for a long time (more than 1 minute).
- 3) For reflow type specifications, apply the rated rectangular wave voltage to the reset coil for more than 5 times the unit reset time before reflow soldering to ensure that the relay is in the reset state to ensure product performance.
- 4) The latching relay should not be placed in a strong magnetic field environment during transportation, storage and use, so as not to change the set voltage and reset voltage of the product.

**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.