

# HFV4-SH

# AUTOMOTIVE RELAY



### Typical Applications

Fog lamp & headlight control, Rear window & mirror defogger, Air-conditioning, Fuel pump control, Cooling fan control.

### Features

- 2x25A switching capability
- Continuous current of 25A per group contacts at 85°C
- Various mounting terminations available
- 1 Form U contact arrangement
- Dust protected type available
- RoHS & ELV compliant

## CHARACTERISTICS

Contact arrangement	1U	Shock resistance <sup>5)8)</sup>	294m/s <sup>2</sup>
Voltage drop (initial)	Typ.: 20mV (at 10A) Max.: 250mV (at 10A)	Flammability <sup>6)</sup>	UL94-HB or better (meets FMVSS 302)
Max. continuous current <sup>1)8)</sup>	NO1: 25A (at 85°C) NO2: 25A (at 85°C)	Termination	QC
Max. switching current <sup>8)</sup>	Make : 2 x100A <sup>2)</sup> Break : 2x25A (Resistive, 13.5VDC)	Construction	Dust protected
Min. contact load	1A 6VDC	Unit weight	Approx. 35g
Electrical endurance	See "CONTACT DATA"	Mechanical data	cover retention (pull & push): 200N min. terminal retention (pull & push): 100N min. terminal resistance to bending (front & side): 10N min. <sup>7)</sup>
Mechanical endurance	1 x 10 <sup>6</sup> OPS (300OPS/min)		
Initial insulation resistance	100MΩ (at 500VDC)		
Dielectric strength <sup>3)</sup>	between contacts: 500VAC between coil & contacts: 500VAC		
Operate time <sup>8)</sup>	Max.: 10ms (at nomi. vol.)		
Release time <sup>8)</sup>	Max.: 10ms <sup>4)</sup>		
Ambient temperature	-40°C to 125°C		
Vibration resistance <sup>5)8)</sup>	5Hz to 22.3Hz 10mm DA 22.3Hz to 500Hz 98m/s <sup>2</sup>		

- 1) Measured when applying 100% rated voltage on coil.
- 2) Inrush peak current under lamp load, at 13.5VDC.
- 3) 1min, leakage current less than 1mA.
- 4) The value is measured when voltage drops suddenly from nominal voltage to 0 VDC and coil is not paralleled with suppression circuit.
- 5) When energized, opening time of NO contacts shall not exceed 1ms.
- 6) FMVSS: Federal Motor Vehicle Safety Standard.
- 7) Test point is at 2mm away from terminal end, and after removing testing force, the terminal transfiguration shall not exceed 0.5mm.
- 8) Only for the 12VDC coil voltage type.

## CONTACT DATA<sup>3)</sup>

Load voltage	Load type		Load current A		On/Off ratio		Electrical endurance <sup>1)</sup> OPS	Contact material	Load wiring diagram <sup>2)</sup>	Ambient temp.
			NO1	NO2	On s	Off s				
13.5VDC	Resistive	Make	25	25	2	2	1×10 <sup>5</sup>	AgSnO <sub>2</sub>	See diagram 1	See Ambient Temp. Curve
		Break	25	25						
27VDC	Resistive	Make	10	10	1	2	1×10 <sup>5</sup>	AgSnO <sub>2</sub>	See diagram 1	See Ambient Temp. Curve
		Break	10	10						

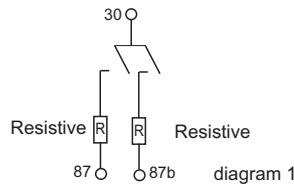


HONGFA RELAY

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

2012 Rev. 1.01

- 1) The low resistive or diode suppression device in parallel to the relay coil increases the release time and reduces the life time caused by increased erosion and / or higher risk of contact welding.
- 2) The load wiring diagrams are listed below.



- 3) Loads mentioned in this chart is for relays with no parallel diode or Zener Diode. For those with parallel diode, Zener Diode or other components, please contact Hongfa for more technical supports.  
Please also contact Hongfa if the actual application load is different from what mentioned above.

## COIL DATA at 23°C

Nominal voltage VDC	Pick-up voltage VDC max.	Drop-out voltage VDC min.	Coil resistance $x(1\pm 10\%)\Omega$	Parallel resistance $^2) x(1\pm 5\%)\Omega$	Equivalent resistance $\Omega$	Power consumption W	Max. allowable overdrive voltage $^1) \text{ VDC}$	
							at 23°C	at 85°C
12	7.2	1.2	90	---	---	1.6	20.2	15.7
12	7.2	1.2	90	680	79.5	1.8	20.2	15.7
24	14.4	2.4	360	---	---	1.6	40.5	31.5
24	14.4	2.4	360	2700	317.6	1.8	40.5	31.5

- 1) Max. allowable overdrive voltage is stated with no load applied, illustrated with dust cover version.  
2) Illustrated with the type with parallel resistor (680Ω, 12V), (2700Ω, 24V).

## ORDERING INFORMATION

	<b>HFV4 / 012 -SH 1 G R (XXX)</b>
<b>Type</b>	
<b>Coil voltage</b>	<b>012:</b> 12VDC <b>024:</b> 24VDC
<b>Contact arrangement</b>	<b>SH:</b> 1 Form U
<b>Version</b>	1: QC Terminal 3: Weatherproof Cover (Without metal bracket) 5: Weatherproof Cover (With metal bracket)
<b>Contact Material</b>	<b>G:</b> AgSnO <sub>2</sub>
<b>Parallel coil <sup>1)</sup> components</b>	<b>R:</b> Parallel transient suppression resistors(680Ω, 12V) (2700Ω, 24V) <b>R1:</b> Parallel transient suppression resistors(560Ω, 12V) (1200Ω, 24V) <b>R2:</b> Parallel transient suppression resistors(470Ω, 12V) (1000Ω, 24V) <b>D1:</b> Parallel transient suppression diode,with anode connected to terminal#86 <b>D2:</b> Parallel transient suppression diode,with anode connected to terminal#85 <b>Nil:</b> Without parallel components
<b>Customer special code</b>	

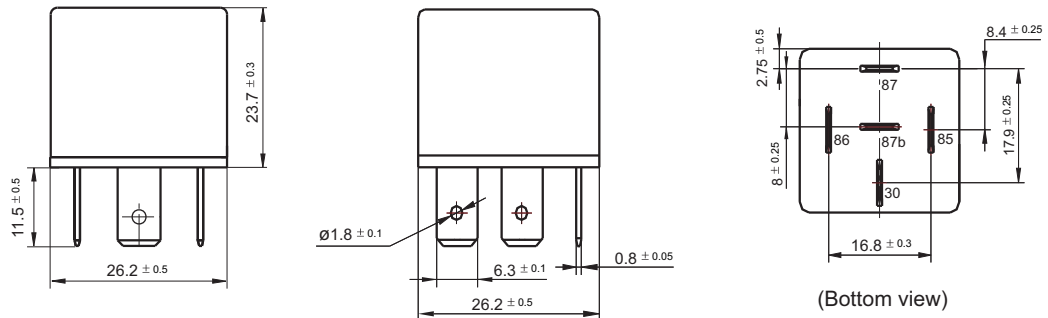
- 1) If the switch-off peak voltage of coil is required to be smaller than 100V, R1 or R2 shall be used (measured voltage of 12V is 13.5V, that of 24V is 27V); If parallel diode, Zener Diode or other components are required, please contact Hongfa for more technical supports.

# OUTLINE DIMENSIONS AND WIRING DIAGRAM

Unit: mm

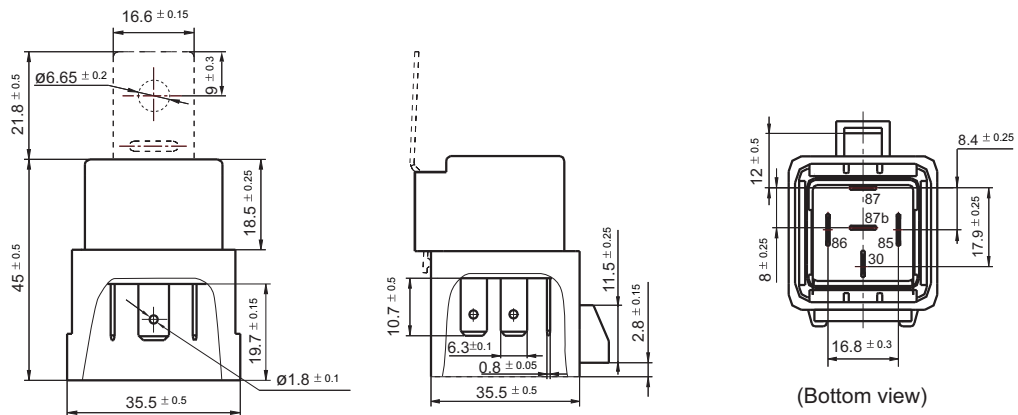
## Outline Dimensions

HFV4/□□□-SH1□□(XXX)



HFV4/□□□-SH3□□(XXX)

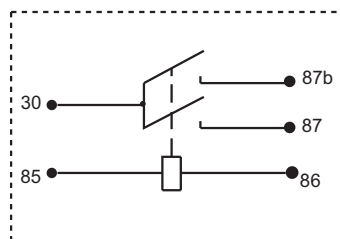
HFV4/□□□-SH5□□(XXX)



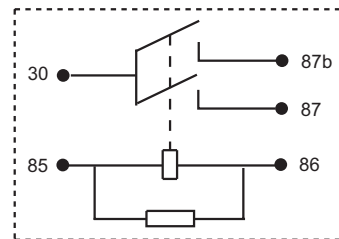
Remark: Terminal vertical deviation tolerance is 0.3mm.

## Wiring Diagram

HFV4/□□□-SH□□□(XXX)



HFV4/□□□-SH□□□R(XXX)

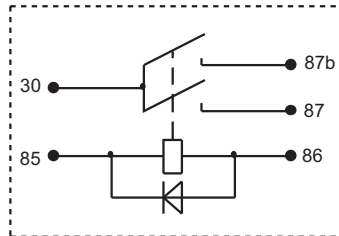


## OUTLINE DIMENSIONS AND WIRING DIAGRAM

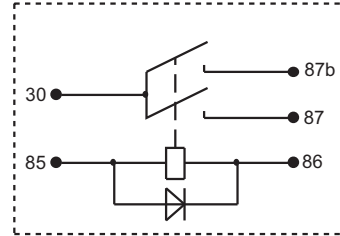
Unit: mm

### Wiring Diagram

HFV4/□□□-SH□□□D1(XXX)

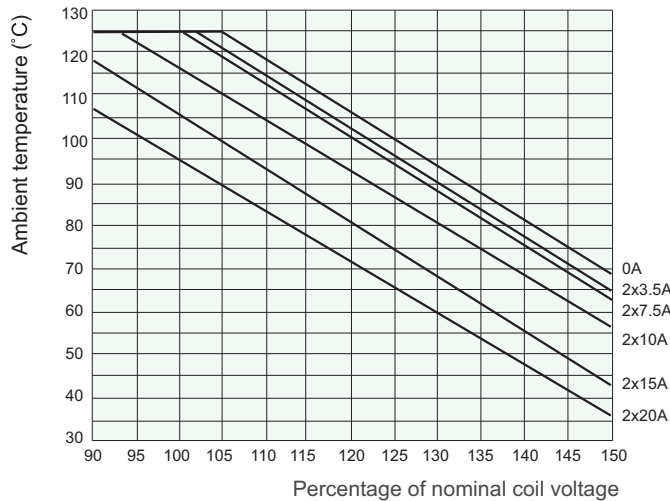


HFV4/□□□-SH□□□D2(XXX)



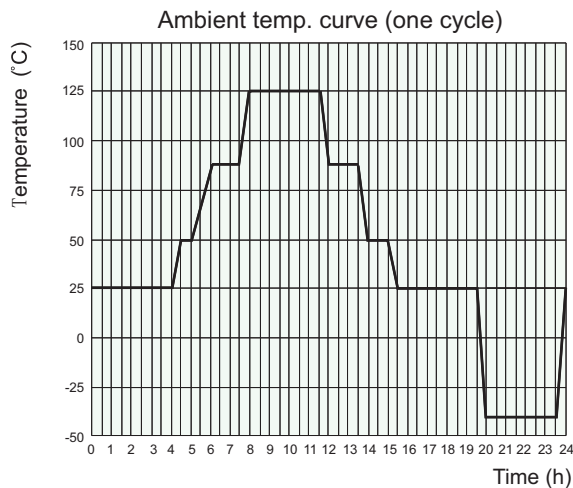
## CHARACTERISTIC CURVES

### 1. Coil operating voltage range



- 1) There should be no contact load applied when maximum continuous operation voltage is applied on coil.
- 2) This chart takes dust protected, 12VDC coil voltage version as example.
- 3) The maximum allowable coil temperature is 180°C. Considering 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. Ambient temperature curve of the electrical endurance test



- 1) The minimum temperature is -40°C.
- 2) The maximum temperature is 125°C.

### 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.

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