

# HFV4

# AUTOMOTIVE RELAY



### Typical Applications

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

### Features

- 40A switching capability
- Various mounting terminations available
- 1 Form A & 1 Form C contact arrangement
- Wash tight and dust protected types available
- RoHS & ELV compliant

## CHARACTERISTICS

Contact arrangement	1A, 1C	Storage temperature	-40°C to 155°C
Voltage drop (initial) <sup>1)</sup>	Typ.: 40mV (at 10A) Max.: 250mV (at 10A)	Vibration resistance	10Hz to 40Hz 1.5mm DA
Max. operating current <sup>2)</sup>	NO: 120A NC: 45A	Shock resistance	98m/s <sup>2</sup> (10g)
Max. continuous current	NO: 60A (at 23°C) NC: 40A (at 23°C)	Termination	QC, PCB <sup>5)</sup>
Min. contact load	0.1A 6VDC	Construction	Wash tight, Dust protected
Electrical endurance	1×10 <sup>5</sup> OPS	Unit weight	Weather-proof cover: Approx. 55g Others: Approx. 35g
Mechanical endurance	1 x 10 <sup>7</sup> OPS (300 OPS/min)	Mechanical data	cover retention (pull & push): 245N min. terminal retention (pull & push): 100N min. terminal resistance to bending (front & side): 10N min.
Initial insulation resistance	100MΩ (500VDC)		
Dielectric strength <sup>3)</sup>	between contacts: 500VAC between coil & contacts: 500VAC		
Operate time	Max.: 7ms (at nomi. vol.)		
Release time	Max.: 5ms <sup>4)</sup>		
Ambient temperature	-40°C to 85°C		

- 1) Equivalent to the max. initial contact resistance is 100mΩ (at 1A 6VDC).
- 2) Peak surge current of lamp load under the voltage of 14VDC.
- 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) 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>4)</sup>

Load voltage	Load type		Load current A			On/Off ratio		Electrical endurance OPS	Contact material	Ambient temp.	Load wiring diagram <sup>3)</sup>		
			1C		1A	On s	Off s						
			NO	NC	NO								
13.5VDC	Resistive	Make	40	30	40	1.5	1.5	1×10 <sup>5</sup>	AgSnO <sub>2</sub>	23°C	See diagram 1		
		Break	40	30	40								
	Resistive	Make	30	20	40	1.5	1.5	1×10 <sup>5</sup>	AgNi0.15				
		Break	30	20	40								
	Lamp <sup>1)</sup>	Make	120 <sup>2)</sup>	---	120 <sup>2)</sup>	1	9	1×10 <sup>5</sup>	AgSnO <sub>2</sub>			23°C	See diagram 2
		Break	20	---	20								

- 1) The load in the table excludes flasher. When applied in flasher, a special silver alloy (AgSnO<sub>2</sub>) contact material should be used and the customer special code should be (170) as a suffix. Please heed the anode and cathode's request when wired, terminal 30 should connect with anode.
- 2) Corresponds to the peak inrush current on initial actuation (cold filament).



HONGFA RELAY

ISO9001、ISO/TS16949、ISO14001、OHSAS18001 CERTIFIED

2007 Rev. 1.00

3) The load wiring diagrams are listed below:

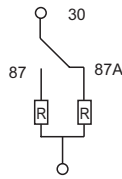


diagram 1

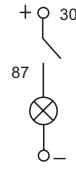


diagram 2

4) 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 $\times(1\pm 10\%)\Omega$	Parallel resistance <sup>1)</sup> $\times(1\pm 5\%)\Omega$	Equivalent resistance $\Omega$	Power consumption W	Max. allowable overdrive voltage <sup>2)</sup> VDC	
								23°C	85°C
Weather-proof cover	6	3.6	0.6	22	---	---	1.6	10.1	7.9
	6	3.6	0.6	22	180	19.6	1.8	10.1	7.9
	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
Others	6	3.9	0.6	22	---	---	1.6	10.1	7.9
	6	3.9	0.6	22	180	19.6	1.8	10.1	7.9
	12	7.8	1.2	85	---	---	1.7	20.2	15.7
	12	7.8	1.2	85	680	75.6	1.9	20.2	15.7
	24	15.6	2.4	350	---	---	1.6	40.5	31.5
	24	15.6	2.4	350	2700	309.8	1.9	40.5	31.5

1) The power consumption of parallel resistance is 0.5W.

2) Max. allowable overdrive voltage is stated with no load applied, illustrated with dust cover version.

## ORDERING INFORMATION

Type	HFV4 /	012	1H	1	S	G	R (XXX)
Coil voltage	006: 6VDC 012: 12VDC 024: 24VDC						
Contact arrangement	1H: 1 Form A 1Z: 1 Form C						
Version	1: QC Terminal 2: PCB Terminal 4: Plastic Shrouded 6: Metal Shrouded 3: Weatherproof Cover(Standard version is without metal bracket;if metal bracket is needed,please give special note when ordering)						
Construction	S: Wash tight Nil: Dust protected						
Contact Material	G: AgSnO <sub>2</sub> Nil: AgNi0.15						
Parallel resistor	D1: Parallel diode (anode on #86) R: With resistor D2: Parallel diode (anode on #85) Nil: Without resistor or diode						

**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.

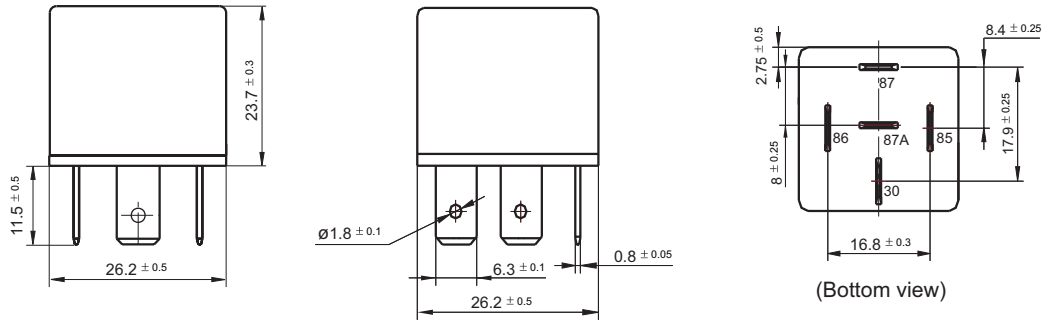
1) HFV4 is an environmental friendly product, please mark special code (555) when order.

# OUTLINE DIMENSIONS AND WIRING DIAGRAM

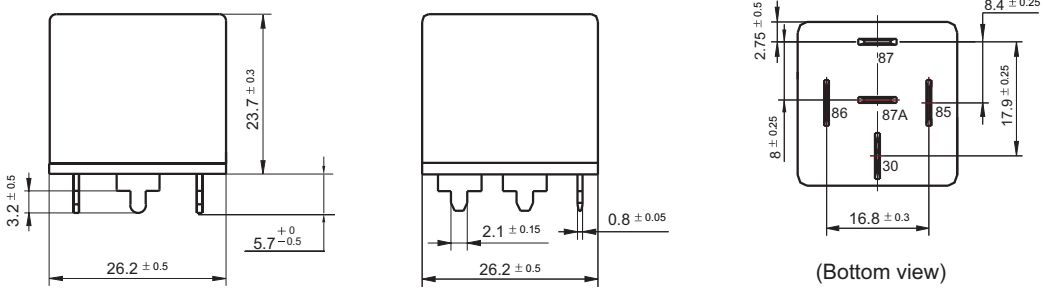
Unit: mm

## Outline Dimensions

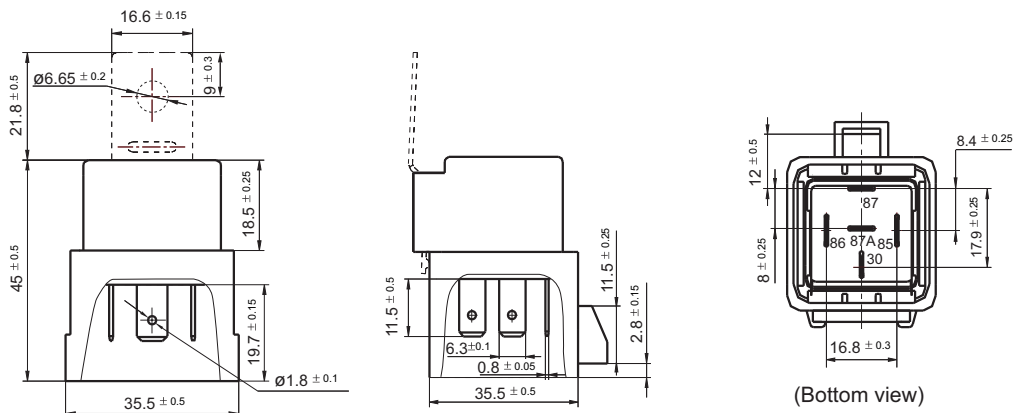
HFV4/□□□-1□1□□□(XXX)



HFV4/□□□-1□2□□□(XXX)



HFV4/□□□-1□3□□□(XXX)

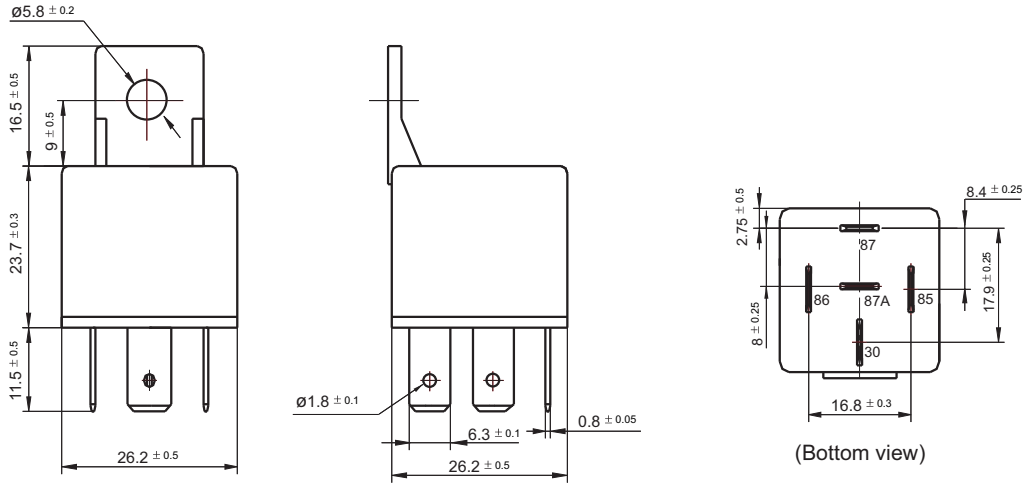


# OUTLINE DIMENSIONS AND WIRING DIAGRAM

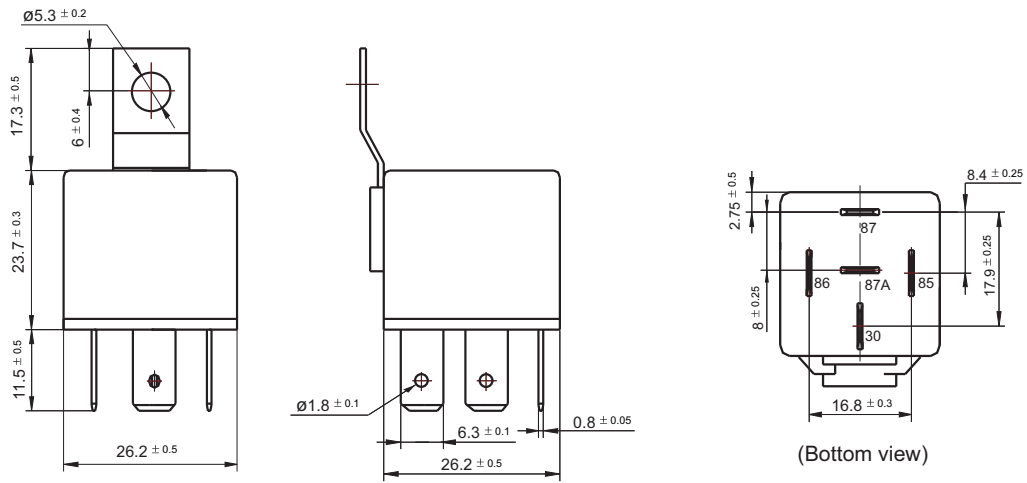
Unit: mm

## Outline Dimensions

HFV4/□□□-1□4□□□(XXX)

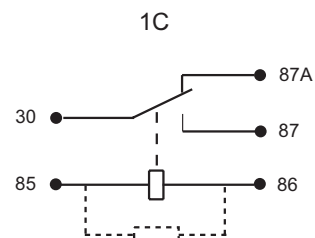
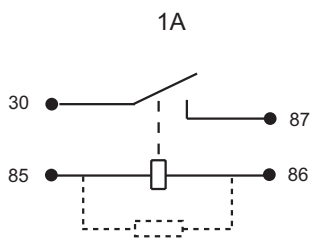


HFV4/□□□-1□6□□□(XXX)



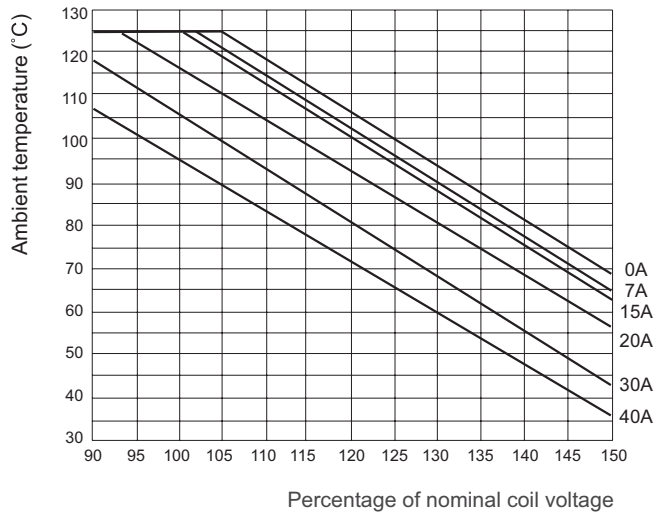
**Notes:** Terminal vertical deviation tolerance is 0.2mm.

## Wiring Diagram



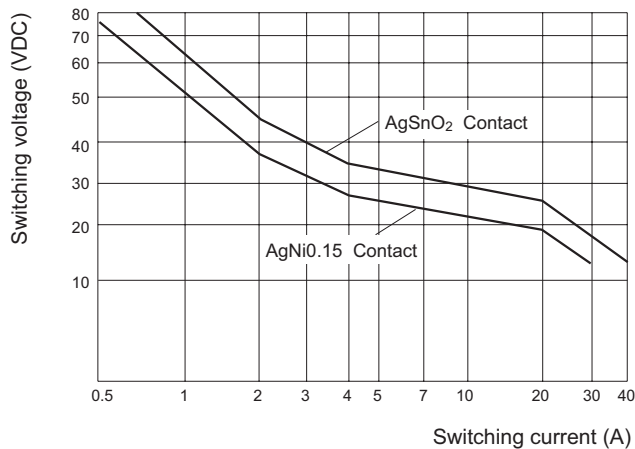
## CHARACTERISTIC CURVES

### 1. Coil operating voltage range



- 1) This chart takes dust protected version as example.
- 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 140°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.

### 2. Load limit curve (at 23°C)



- 1) This chart takes NO contact as example.
- 2) The load and electrical endurance tests are made according to "CONTACT DATA" parameters' table. If actual load voltage, current, or operate frequency is different from "CONTACT DATA" table, please arrange corresponding tests for confirmation.

### 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.