AUTOMOTIVE RELAY



Features

- 40A switching capability
- 1 Form A & 1 Form C contact arrangement.
- Various mounting terminations available
- Sealed IP67 and dust cover types available.
- RoHS & ELV compliant (555)

Typical Applications

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

CHARACTERISTICS

Contact arrangement	1A, 1C
Voltage drop (initial) 1)	Typ.: 40mV (at 10A) Max.: 250mV (at 10A)
Min. contact load	0.1A 6VDC
Electrical life	1×10^5 OPS
Mechanical life	1 x 10^7OPS 300OPS/min
Max. operating current 2)	NO: 120A NC: 45A
Max. continuous current	NO: 60A (at 20˚C) NC: 40A (at 20˚C)
Initial insulation resistance	100MΩ (500VDC)
Dielectric strength 3)	between contacts: 500VAC between coil & contacts: 500VAC
Operate time	Max.: 7ms (at nomi. vol.)
Release time	Max.: 5 ms 4)
Ambient temperature	-40˚C to +85˚C

Storage temperature	-40˚C to +155˚C
Vibration resistance	10Hz to 40Hz 1.5mm DA
Shock resistance	Functional: 98m/s^2 (10g) Destructive: 196m/s^2 (20g)
Termination	QC & PCB 5)
Construction	Sealed IP67 & Dust cover
Unit weight	Weather-proof cover: Approx. 55g Others: Approx. 35g
Mechanical data	cover retention (pull & push): 245N terminal retention (pull & push): 100N terminal resisitance to bending (front & side): 10N

1) Equivalent to the max. initial contact resistance is 100mΩ (at 1A 6VDC).
2) Peak surge current of lamp load under the voltage of 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) Since it is an environmental friendly product, please select lead-free solder when welding. The recommended soldering temperature is 240˚C to 260˚C.

CONTACT DATA 4)

Load voltage	Load type		Load current (A) 1C NO	1C NC	1A NO	On/Off ratio On (s)	On/Off ratio Off (s)	Electrical life (OPS)	Contact material	Ambient temp.	Load wiring diagram 3)
14VDC	Resistive	Make	40	30	40	1.5	1.5	1×10^5	$AgSnO_2$	23˚C	See diagram 1
		Break	40	30	40						
	Resistive	Make	30	20	40	1.5	1.5	1×10^5	AgNi0.15		
		Break	30	20	40						
	Lamp 1)	Make	120 2)	---	120 2)	1	9	1×10^5	$AgSnO_2$	23˚C	See diagram 2
		Break	20	---	20						

1) The load in the table excludes flasher. When applied in flasher, a special silver alloy ($AgSnO_2$) contact material should be used and the ordering key should be 170 as a special 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).

3) The load wiring diagrams are listed below:

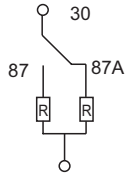


diagram 1

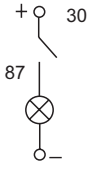


diagram 2

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 (Ω±10%)	Parallel resistance 1) (Ω±5%)	Equivalent resistance (Ω)	Power consumption (W)	Max. allowable overdrive voltage 2) (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

HFV4 1) / 012 1H 1 S G R XXX

Type

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 speical note when ordering)

Structure **S**: Sealed IP67 **Nil**: Dust cover

Contact Material **G**: $AgSnO_2$ **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 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.

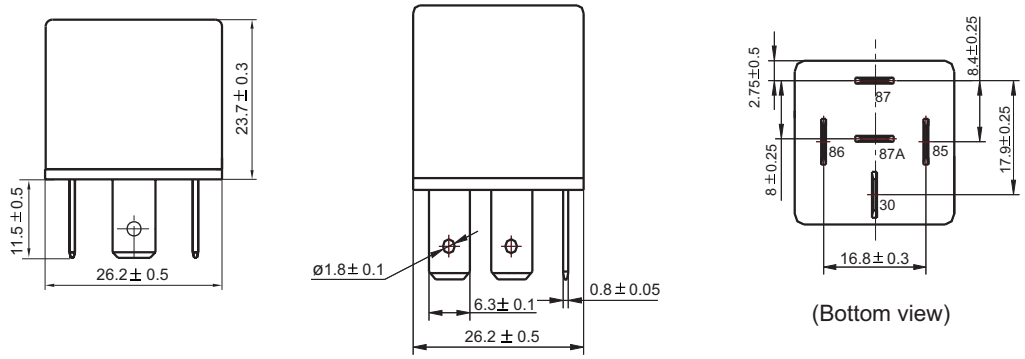
1) HFV4 is an environmental friendly product, please mark special code (555) when order.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

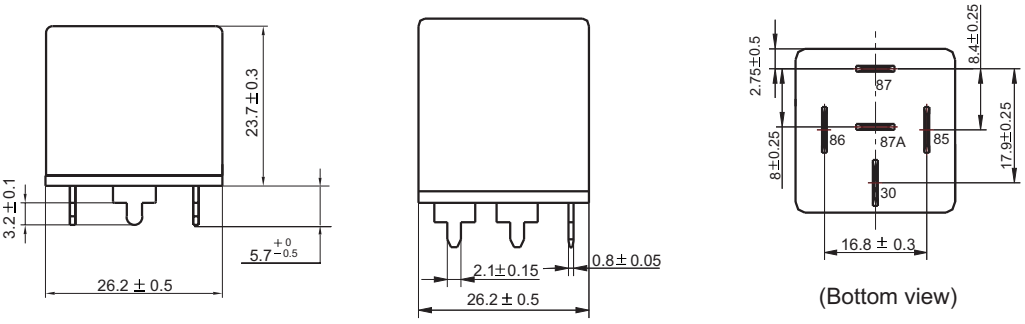
Outline Dimensions

HFV4/□□□-1□1□□□(XXX)



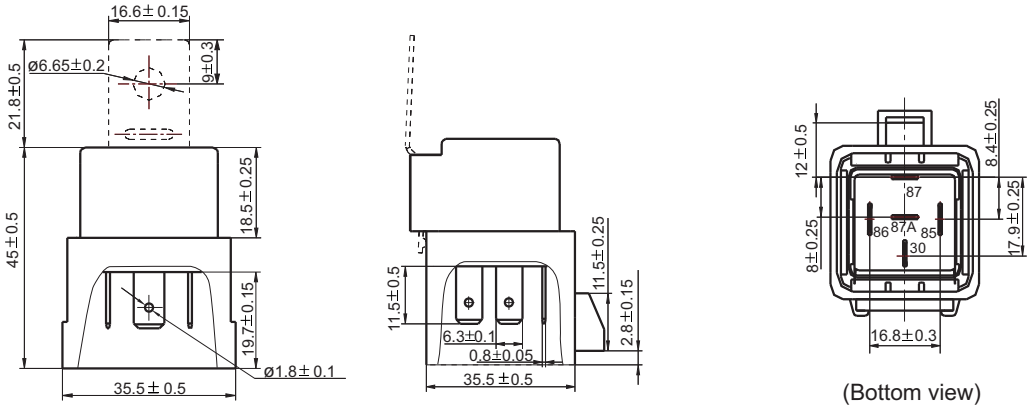
Remark: Terminal vertical deviation tolerance is 0.2mm.

HFV4/□□□-1□2□□□(XXX)



Remark: Terminal vertical deviation tolerance is 0.2mm.

HFV4/□□□-1□3□□□(XXX)

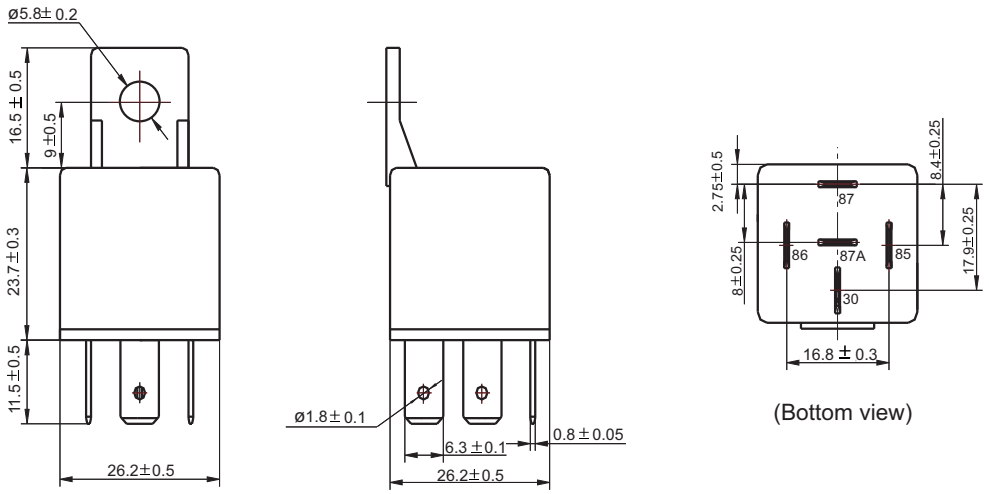


Remark: Terminal vertical deviation tolerance is 0.2mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

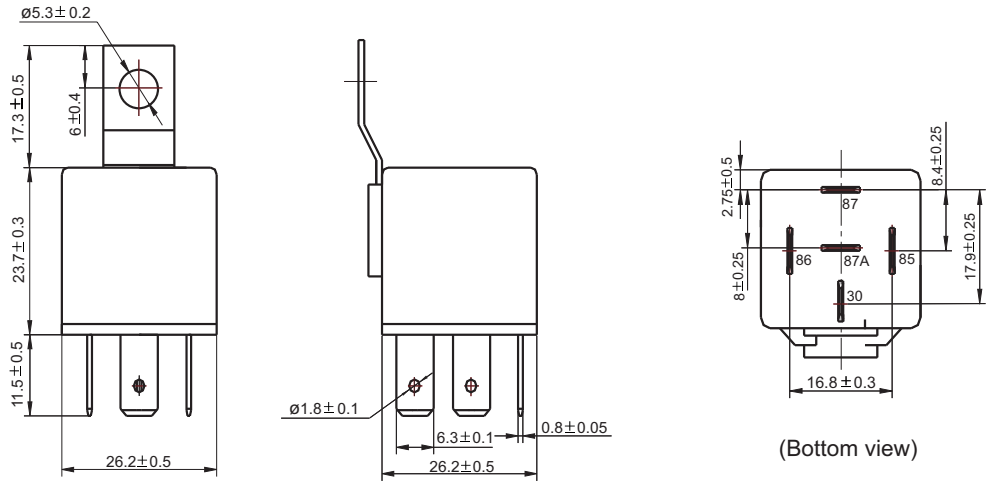
Unit: mm

HFV4/□□□-1□4□□□(XXX)



Remark: Terminal vertical deviation tolerance is 0.2mm.

HFV4/□□□-1□6□□□(XXX)



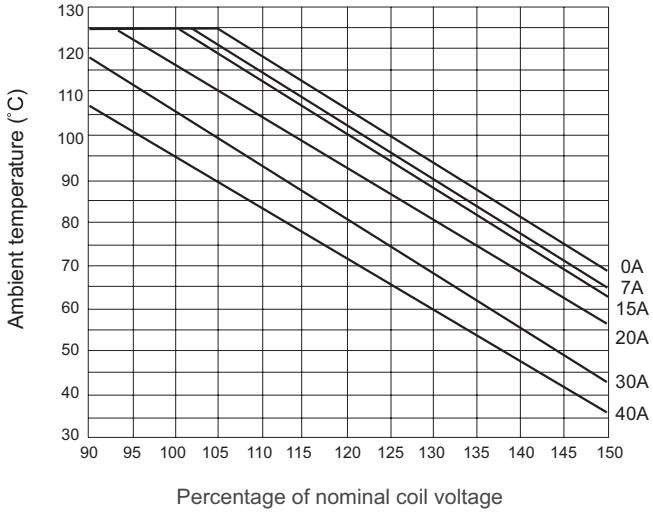
Remark: Terminal vertical deviation tolerance is 0.2mm.

Wiring Diagram



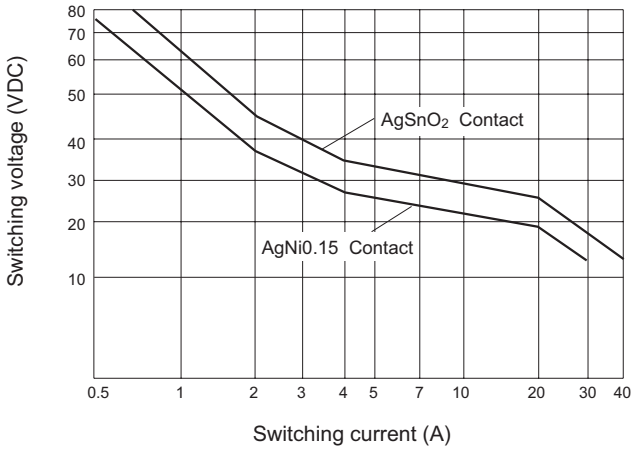
CHARACTERISTIC CURVES

1. Coil operating voltage range



1) This chart takes dust cover 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 life 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.