HFV6

AUTOMOTIVE RELAY

Features

- 30A switching capability
- Ambient temp.: -40°C to 125°C
- Contact gap≥0.6mm
- 1 Form A & 1 Form C contact arrangement
- Wash tight and dust protected types available
- RoHS & ELV compliant

Typical Applications

Heaters (seat, front/rear windows), Fan motors control, Fuel pump control, Wiper motors control, Headlight control, Air-conditioning, Lighting control, Electromagnet control

CHARACTERISTICS

Contact arrangement	1A, 1C	Release time	Typ.: 5ms
Voltage drop (initial) [1]	Typ.: 50mV (at 10A)		Max.: 10ms [2]
	Max.: 250mV (at 10A)	Ambient temperature	-40°C to 125°C
Max. switching current	Resistive: 30A	Storage temperature	-40°C to 155°C
Max. switching voltage	Resistive: 27VDC	Vibration resistance	10Hz to 500Hz 49m/s^2 (5g)
Min. contact load	1A 6VDC	Shock resistance	196m/s^2 (20g)
Electrical endurance	1×10^5 OPS	Termination	QC, PCB [3]
Mechanical endurance	1 x 10^{7}OPS (300OPS/min)	Construction	Wash tight, Dust protected
Initial insulation resistance	500MΩ (at 500VDC)	Unit weight	Approx. 22g
Dielectric strength	500VAC (1min, leakage current less than1mA)	Mechanical data	cover retention (pull & push): 200N min.
			terminal retention (pull & push): 100N min.
Operate time	Typ.: 5ms		terminal resistance to bending
	Max.: 10ms (at nomi. vol.)		(front & side): 10N min.

1) Equivalent to the max. initial contact resistance is 50mΩ (at 1A 24VDC).
2) The value is measured when voltage drops suddenly from nominal voltage to 0 VDC and coil is not paralleled with suppression circuit.
3) 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 [6]

Load voltage	Load type [5]		Load current A			On/Off ratio		Electrical endurance OPS [3]	Contact material	Load wiring diagram [4]
			1C		1A	On s	Off s			
			NO	NC	NO					
Standard 13.5VDC	Resistive	Make	20	10	30	2	2	1×10^5	AgSnO$_2$ AgNi	See diagram 1
		Break	20	10	30	2	2			
	Motor [1]	Make	40 [1]	20	40 [1]	2	2	1×10^5	AgSnO$_2$	See diagram 2
		Break	20	10	20	2	2			
	Lamp [2]	Make	120 [2]	40	120 [2]	2	2	1×10^5	AgSnO$_2$	See diagram 3
		Break	20	10	20	2	2			
Powerful 27VDC Contact gap ≥0.6mm	Resistive	Make	20	10	20	2	2	1×10^5	AgSnO$_2$ AgNi	See diagram 4
		Break	20	10	20	2	2			
	Motor [1]	Make	38 [1]	28	38 [1]	2	2	1×10^5	AgSnO$_2$	See diagram 5
		Break	15	6	15	2	2			
	Lamp [2]	Make	70 [2]	---	70 [2]	2	2	1×10^5	AgSnO$_2$	See diagram 6
		Break	7	---	7	2	2			

1) Corresponds to the peak inrush current on initial actuation (motor).
2) Corresponds to the peak inrush current on initial actuation (cold filament).
3) Testing ambient condition refers to the ambient temperature, humidity curve of the electric life test.
4) The load wiring diagrams are listed below:

| diagram 1 | diagram 2 | diagram 3 | diagram 4 | diagram 5 | diagram 6 |
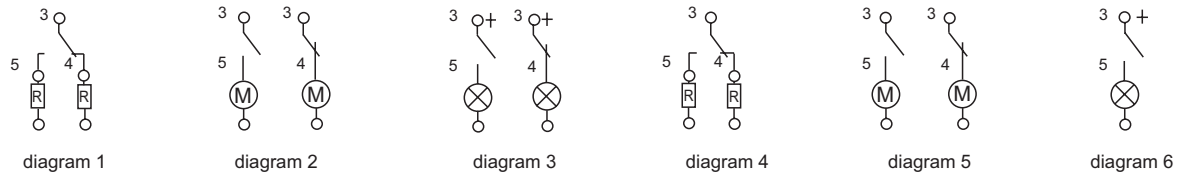
5) The load in the table excludes flasher. When applied in flasher, please connect by the polarity request according diagram 3 and diagram 6, a special silver alloy contact material should be used and the customer special code should be (170) as a suffix.
6) When the load requirement is different from 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 x(1±10%)Ω	Parallel resistance [1] x(1±5%) Ω	Equivalent resistance x(1±10%)Ω	Power consumption W	Max. allowable overdrive voltage [2] VDC	
								23°C	85°C
Standard	12	7.2	1.2	90	---	---	1.6	20	15
	12	7.2	1.2	90	680	79.5	1.8	20	15
	24	14.4	2.4	360	---	---	1.6	40	30
	24	14.4	2.4	360	2700	317.6	1.8	40	30
Sensitive (L)	12	7.2	1.2	124	---	---	1.2	25	19
	12	7.2	1.2	124	680	104.9	1.4	20	15
	24	14.4	2.4	441	---	---	1.3	47	35
	24	14.4	2.4	441	1800	354.2	1.6	33	25

1) The power consumption of parallel resistance is 0.5W.
2) Max. allowable overdrive voltage is stated with no load applied and minimum coil resistance.

ORDERING INFORMATION

HFV6 / 012 Z S L Q T R (XXX)

Type	HFV6：QC　HFV6-K：Grip & QC HFV6-P：PCB
Coil voltage	012: 12VDC　024: 24VDC
Contact arrangement	H: 1 Form A　Z: 1 Form C
Construction	S: Wash tight　Nil: Dust protected
Coil power	L: Sensitive　Nil: Standard
Contact voltage	Q：24VDC Powerful (contact gap ≥0.6mm) Nil：12VDC Standard
Contact material	T：AgSnO$_2$　3：AgNi
Transient suppression resistor [1]	R：With resistor　D: With parallel diode　Nil: Without resistor
Customer special code [2]	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) Parallel connection of diode should provide the requirement of the polarity. Coil resistance is checked by voltammetry.
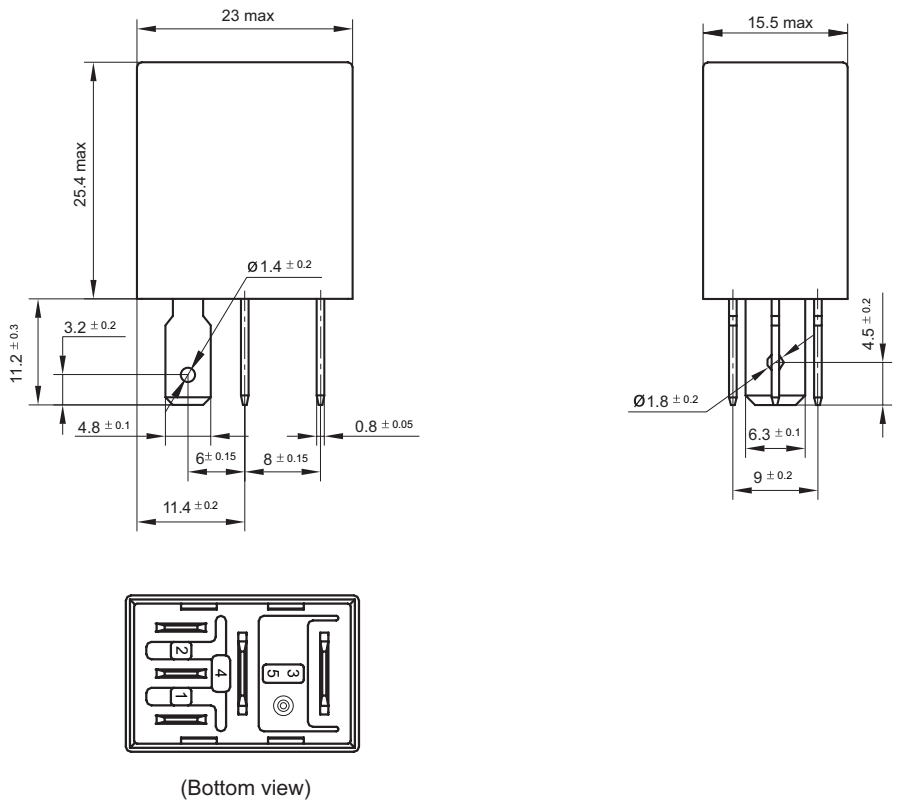2) HFV6 is an environmental friendly product, please mark special code (555) when order.
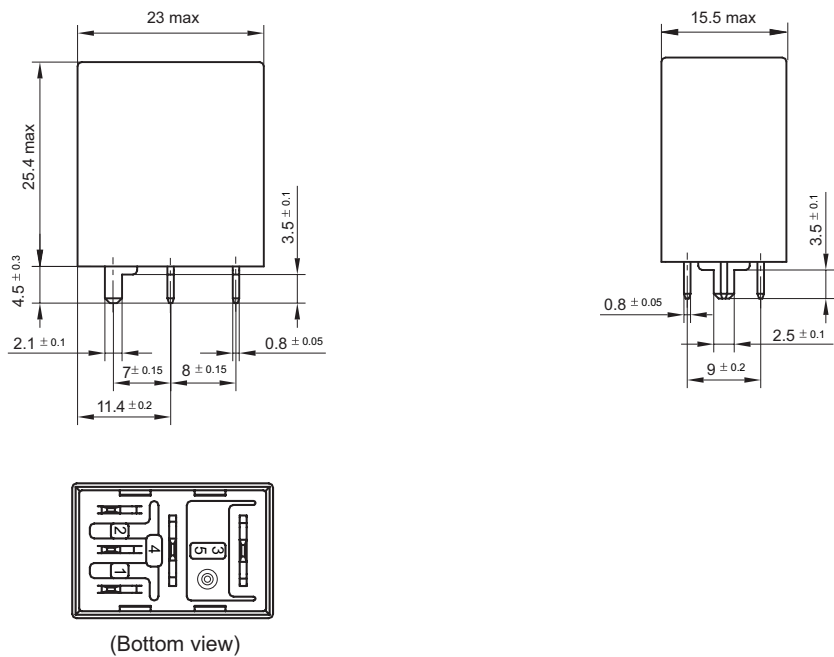
Outline Dimensions

HFV6 (Standard, QC)

23 max

25.4 max

15.5 max

11.2 ± 0.3

3.2 ± 0.2

Ø1.4 ± 0.2

4.8 ± 0.1

6 ± 0.15

8 ± 0.15

0.8 ± 0.05

11.4 ± 0.2

4.5 ± 0.2

Ø1.8 ± 0.2

6.3 ± 0.1

9 ± 0.2

(Bottom view)

HFV6-P (PCB）

23 max

25.4 max

15.5 max

4.5 ± 0.3

3.5 ± 0.1

2.1 ± 0.1

7 ± 0.15

8 ± 0.15

0.8 ± 0.05

11.4 ± 0.2

3.5 ± 0.1

0.8 ± 0.05

2.5 ± 0.1

9 ± 0.2

(Bottom view)

OUTLINE DIMENSIONS AND WIRING DIAGRAM

Outline Dimensions

HFV6-K（Grip, QC）

23 max
20 ± 0.2
2 ± 0.1
3.5 ± 0.1
25.4 max
11.2 ± 0.3
3.2 ± 0.2
Ø 1.4 ± 0.2
4.8 ± 0.1
0.8 ± 0.05
8 ± 0.15
6 ± 0.15
11.4 ± 0.2

15.5 max
5 ± 0.1
2 ± 0.1
Ø 1.8 ± 0.2
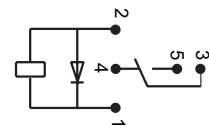4.5 ± 0.2
6.3 ± 0.1
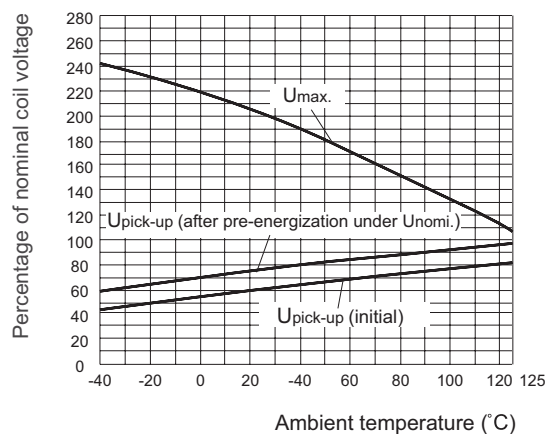9 ± 0.2
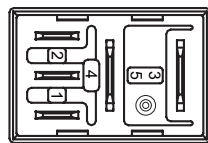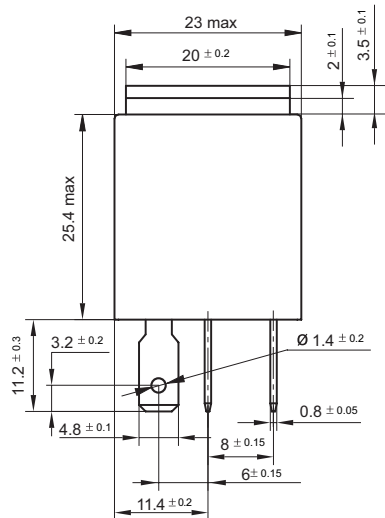
(Bottom view)
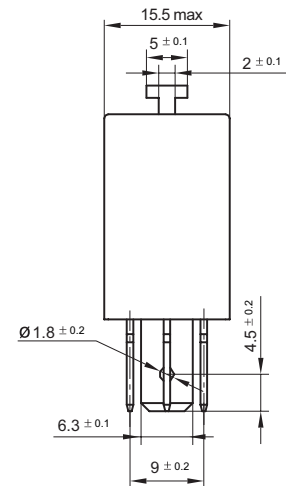
Wiring Diagram

Without parallel diode
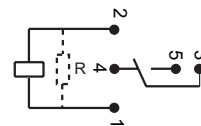
With parallel diode

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

CHARACTERISTIC CURVES

1. Coil operating voltage range

Percentage of nominal coil voltage

Umax.

Upick-up (after pre-energization under Unomi.)

Upick-up (initial)

Ambient temperature (˚C)

1) The operating voltage is connected with coil pre-energized time and voltage. After pre-energized, the operating voltage will increase.

2) 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.

3) If the actual operating coil voltage is out of the specified range, please contact Hongfa for further details.

## CHARACTERISTIC CURVES

2. Load limit curve
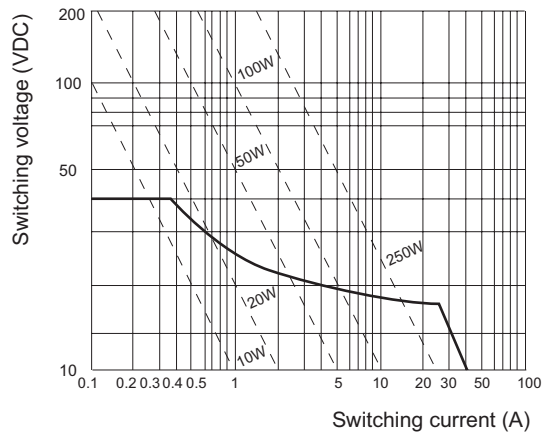
1) The load and electrical endurance tests are made according to "CONTACT DATA" parameters' table. If actual load voltage, current, or operate frequency is different from "CONTACT DATA" table, please arrange corresponding tests for confirmation.

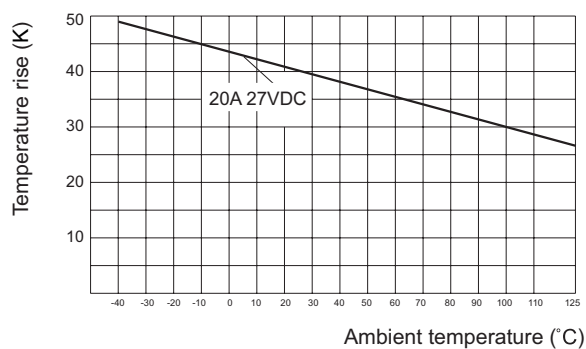### 3. Ambient temperature and humidity curve of the electrical endurance test

Temperature curve (One cycle)
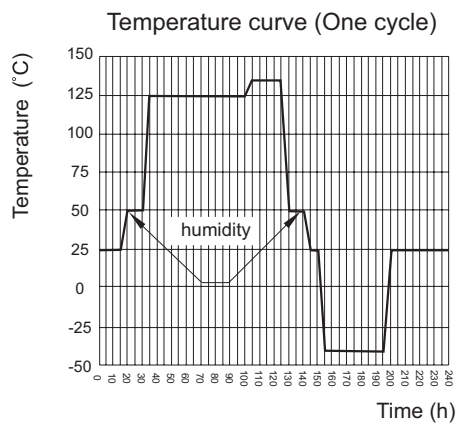
1) Humidity>90%; The maximum temperature is 135°C.

4. Ambient temperature curve
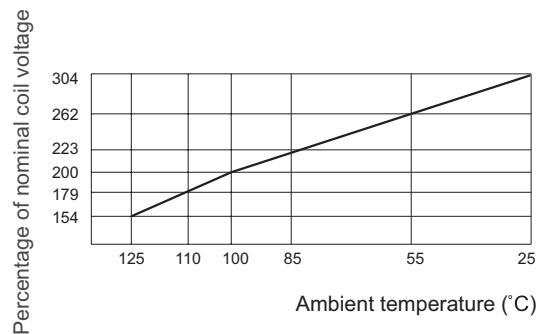
5. Coil temperature rise curve

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.