

HFV7

AUTOMOTIVE RELAY



Typical Applications

Rear window defogger, Battery disconnection, Air-conditioning, ABS, Heating control, Fog lamp & headlight control, Cooling fan control, Fuel pump control, Traction control system, Power distribution

Features

- 70A switching capability
- Extended temperature range up to 125°C
- With transient suppression resistor
- Contact gap: 0.6mm
- 1 Form A contact arrangement
- Wash tight and dust protected types available
- RoHS & ELV compliant

CHARACTERISTICS

Contact arrangement	1A		Release time	Typ.: 4ms Max.: 7ms ⁴⁾	
Voltage drop (initial) ¹⁾	Typ.: 20mV (at 10A) Max.: 30mV (at 10A)		Ambient temperature	-40°C to 125°C	
Max. continuous current ²⁾	70A (at 23°C) 50A (at 85°C)		Storage temperature	-40°C to 155°C	
Max. switching current	70A ³⁾		Vibration resistance	10Hz to 500Hz	176m/s ² (18g)
Max. switching voltage	50VDC ³⁾		Shock resistance	294m/s ² (30g)	
Min. contact load	1A 6VDC		Termination	QC, PCB ⁵⁾	
Electrical endurance	1×10 ⁵ OPS		Construction	Wash tight, Dust protected	
Mechanical endurance	1×10 ⁷ OPS (300OPS/min)		Unit weight	Approx. 38g	
Initial insulation resistance	500MΩ (at 500VDC)		Mechanical data	cover retention (pull & push): 245N min. terminal retention (pull & push): 100N min. terminal resistance to bending (front & side): 10N min.	
Dielectric strength	500VAC (1min, leakage current less than 1mA)				
Operate time	Typ.: 6ms Max.: 10ms (at nomi. vol.)				

1) Equivalent to the max. initial contact resistance is 50mΩ (at 1A 24VDC).

2) Only for 70A standard type.

3) Only for 70A standard type. See " Load limit curve " for details.

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 ⁴⁾

Load voltage	Load type	Load current A	On/Off ratio		Electrical endurance OPS	Contact material	Load wiring diagram ³⁾	Ambient temp.	
			On s	Off s					
Standard 13.5VDC	Resistive	Make	70	2	1×10 ⁵	AgNi0.15	See diagram 1	See Ambient temp. curve	
		Break	70						
	Motor	Make ¹⁾	150	2	4	1×10 ⁵	AgSnO ₂		
		Break	50						
	Lamp ²⁾	Make	4×H4/60W	0.5	10	1×10 ⁵	AgSnO ₂		
		Break							
Standard 27VDC	Resistive	Make	40	2	2	1×10 ⁵	AgSnO ₂		
		Break	40						
Low load 13.5VDC	Resistive	Make	40	2	2	1×10 ⁵	AgSnO ₂		
		Break	40						

- 1) Corresponds to the peak inrush current on initial actuation (motor).
- 2) The load in the table excludes flasher. When applied in flasher, a special silver alloy (AgSnO₂) 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.
- 3) The load wiring diagrams are listed below:

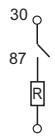


diagram 1

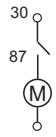


diagram 2

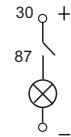


diagram 3

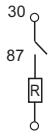


diagram 4

- 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 x(1±10%)Ω	Parallel resistance ¹⁾ x(1±5%) Ω	Equivalent resistance Ω	Power consumption W	Max. allowable overdrive voltage ²⁾ VDC	
								23°C	85°C
Standard	6	3.6	0.6	22.5	---	---	1.6	10	9
	6	3.6	0.6	22.5	180	20	1.8	9	9
	12	7.2	1.2	90	---	---	1.6	21	18
	12	7.2	1.2	90	680	79.5	1.8	18	18
	24	14.4	2.4	360	---	---	1.6	43	34
	24	14.4	2.4	360	2700	317.6	1.8	36	34
High power consumption (P)	6	3.6	0.6	18	---	---	2.0	9	7
	6	3.6	0.6	18	180	16.4	2.2	9	7
	12	7.2	1.2	72	---	---	2.0	19	14
	12	7.2	1.2	72	680	65.1	2.2	18	14
	24	14.4	2.4	288	---	---	2.0	39	28
	24	14.4	2.4	288	2700	260.2	2.2	36	28

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

2) Max. allowable overdrive voltage is stated with no load applied.

ORDERING INFORMATION

Type	HFV7: QC type HFV7-P: PCB type	012	H	S	P	T	M	-R	(L)	(XXX)
Coil voltage 006: 6VDC 012: 12VDC 024: 24VDC										
Contact arrangement H: 1 Form A										
Construction S: Wash tight Nil: Dust protected										
Coil power P: High power consumption Nil: Standard										
Contact material T: AgSnO₂ 3: AgNi0.15										
Length of terminal M: Short terminal & QC type 14.5mm Nil: Long terminal & QC type 17mm, or PCB type										
Transient suppression resistor¹⁾ R: With resistor D: With parallel diode Nil: Without resistor										
Load type (L): Low load type 40A Nil: Standard type 70A										
Customer special code²⁾ 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.

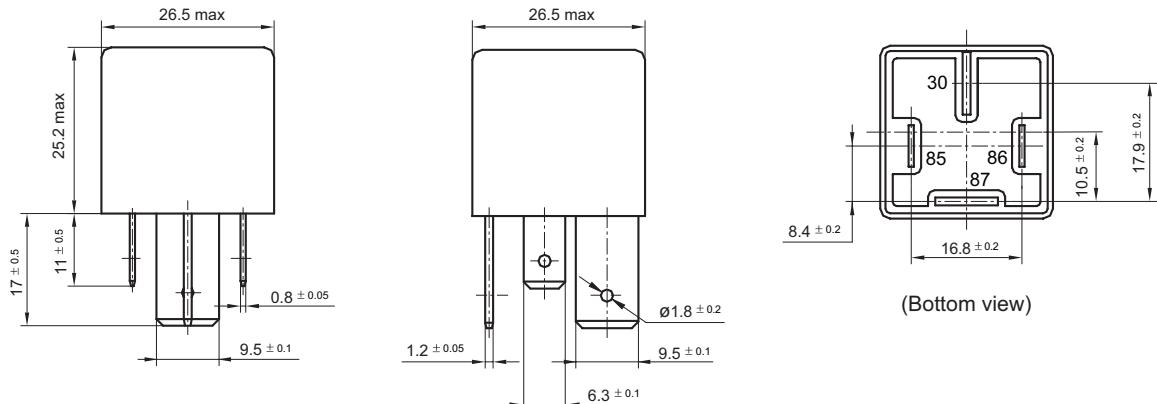
2) HFV7 is an environmental friendly product, please mark special code (555) when order.

OUTLINE DIMENSIONS AND WIRING DIAGRAM

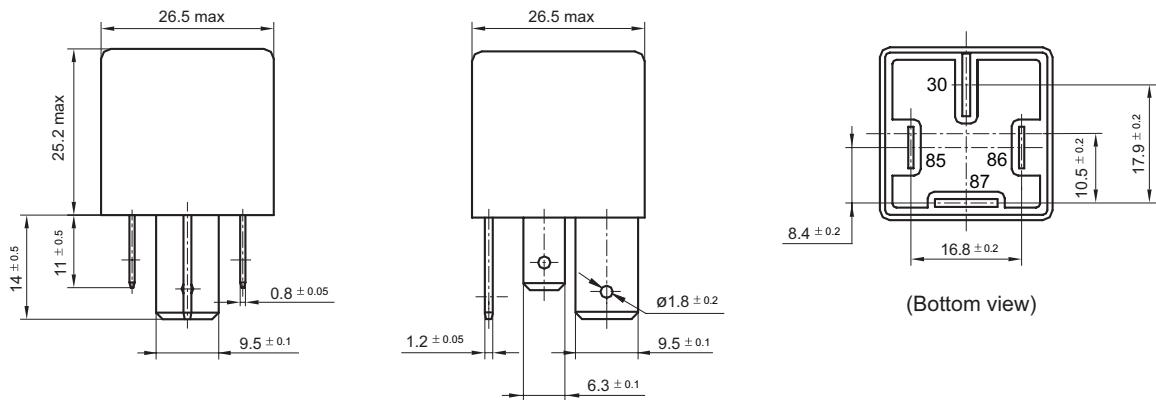
Unit: mm

Outline Dimensions

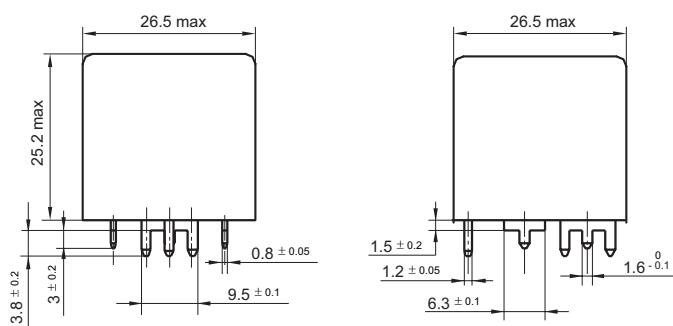
HFV7 (Long terminal & QC type)



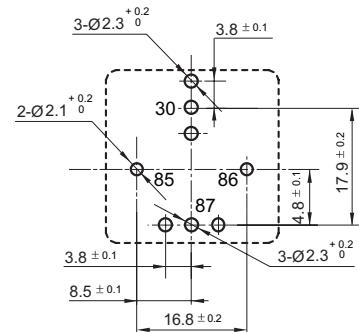
HFV7 (Short terminal & QC type)



HFV7-P (PCB type)



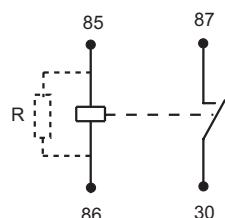
PCB Layout (Bottom view)



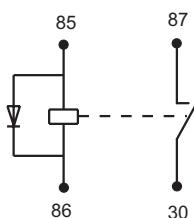
Notes: Terminal vertical deviation tolerance is 0.2mm.

Wiring Diagram

Without parallel diode

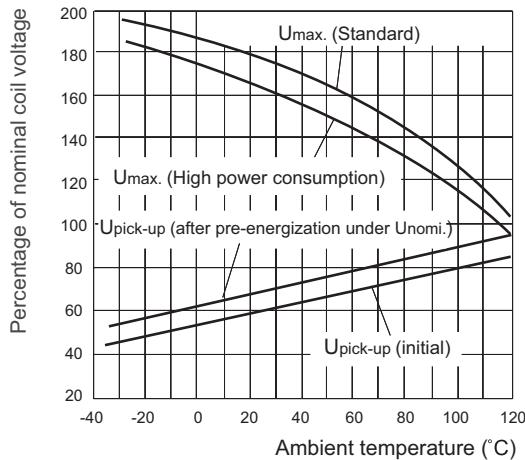


With parallel diode

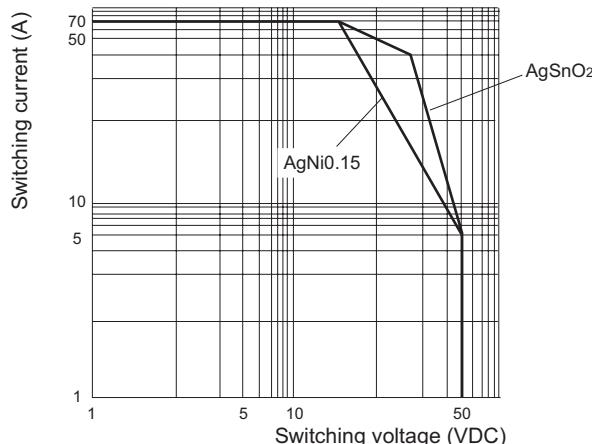


CHARACTERISTIC CURVES

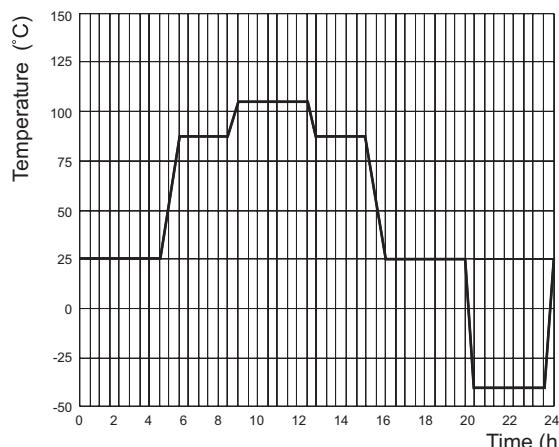
1. Coil operating voltage range



2. Load limit curve



3. Ambient temperature curve of the electrical endurance test



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.

- 1) The curve is applicable under the condition of no contact load applied.
- 2) The operating voltage is connected with coil energized time and voltage. After energized, the operating voltage will increase.
- 3) 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.
- 4) If the actual operating coil voltage is out of the specified range, please contact Hongfa for further details.

- 1) The contact load is resistive.
- 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.

- 1) The minimum temperature is -40°C.
- 2) The maximum temperature is 105°C.