HFKW

SUBMINIATURE AUTOMOTIVE RELAY

Features

● High current contact capacity
   (Carrying current: 35A/10min 25A/1h)

● Switching capacity up to 20A (at 85°C)

● Improved heat resistance

● High resistance to vibration and shock

● Reflow soldering version available

● RoHS & ELV compliant (555)

Typical Applications

Central door lock, Mirror adjustment, Turning lamp control, Seat adjustment, Power door & windows, Speed-limit indicator control, Warm-up control, Wiper control

CHARACTERISTICS

Contact arrangement	1A, 1C
Voltage drop (initial) [1]	Typ.: 100mV (at 10A)
	Max. : 250mV (at 10A)
Max. carrying current (NO contact)	35A/10min 25A/1h [2]
Max. switching current	NO/NC: 35/20A (at 16VDC)
Max. switching voltage	60VDC
Max. switching power	210W
Contact rating	Resistive: 15A 14VDC
	Motor locked: 20A 14VDC
	Motor free: Break: 4A 14VDC
	Shock: 20A 14VDC
Min.contact load	1A 6VDC
Electrical life	See " CONTACT DATA " table
Mechanical life	1×10^7 OPS 300OPS/min
Initial insulation resistance	100MΩ (500VDC)

Dielectric strength	500VAC (1min, leakage current less than 1mA)
Operate time	Max.: 10ms (at nomi. vol.)
Release time	Max.: 5ms [3]
Temperature rise (at nomi. vol.)	Max. 60°C
Ambient temperature	-40°C to +85°C
Storage temperature	-40°C to +155°C
Vibration resistance	10Hz to 55Hz 1.5mm DA
Shock resistance	Functional: $100 m/s^2$ (10g)
	Destructive: $1000 m/s^2$ (100g)
Termination	PCB [4]
Construction	Sealed IP67 & Flux proof
Unit weight	Approx. 6g

1) Equivalent to the max. initial contact resistance is 100mΩ (1A 6VDC).
2) 25°C, measured when coil is energized with 100% nominal voltage.
3) The value is measured when voltage drops suddenly from nominal voltage to 0 VDC and coil is not paralleled with suppression circuit.
4) 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 [5]

at 20°C

Load voltage	Load type		Load current (A)			On/Off ratio		Electrical life (OPS)	Contact material	Load wiring diagram [4]
			1C		1A	On (s)	Off (s)			
			NO	NC	NO					
12VDC	Resistive	Make	15	15	15	2	2	$2×10^5$	AgSnO₂ AgNi0.15	See diagram 1
		Break	15	15	15	2	2			
	Resistive	Make	30	---	30	5	5	$1×10^5$	AgSnO₂	See diagram 2
		Break	30	---	30					
	Motor Locked	Make	25 [3]	---	25 [3]	2	2	$1×10^5$	AgSnO₂	See diagram 3
		Break	25 [3]	---	25 [3]					

Load voltage	Load type		Load current (A)			On/Off ratio		Electrical life (OPS)	Contact material	Load wiring diagram [4]
			1C		1A	On (s)	Off (s)			
			NO	NC	NO					
12VDC	Lamp [1]	Make	90 [2]	---	90 [2]	5	5	1×10^5 (at 85°C)	$AgSnO_2$	See diagram 4
		Break	8.8	---	8.8					
	Lamp [1]	Make	6×21W	---	6×21W	1	6	1×10^5	$AgSnO_2$	See diagram 4
		Break								
	Flasher	Make	3×21W	---	3×21W	0.365	0.365	2×10^6	Special $AgSnO_2$	See diagram 4
		Break								

1) When it is utilized in flasher, a special $AgSnO_2$ contact material should be used and the ordering key should be 170 as a special suffix. Please connect by the polarity according to the diagram below.
2) Corresponds to the peak inrush current on initial actuation (cold filament).
3) Corresponds to the peak inrush current on initial actuation (motor).
4) The load wiring diagrams are listed below. When special $AgSnO_2$ contacts are applied, please heed the anode and cathode's request when wired.
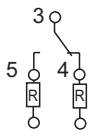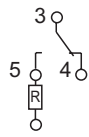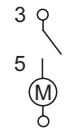

diagram 1   diagram 2   diagram 3   diagram 4

5) When the load requirement is different from content of the table above, please contact Hongfa for relay application support.

COIL DATA

at 20°C

Nominal voltage (VDC)	Pick-up voltage (VDC)		Drop-out voltage (VDC)	Coil resistance (Ω)	Power consumption (W)
	20°C	85°C			
6	3.6	4.5	0.5	60	0.6
9	5.4	6.8	0.7	135	0.6
10	6.3	7.9	0.8	180	0.6
12	7.3	9.0	1.0	240	0.6
18	10.8	13.5	1.5	540	0.6
24	14.4	18.0	2.2	960	0.6

ORDERING INFORMATION

HFKW [1] / 012 1Z W -L XXX

Type

Coil voltage
006: 6VDC   009: 9VDC
010: 10VDC   012: 12VDC
018: 18VDC   024: 24VDC

Contact arrangement   1H: 1 Form A   1Z: 1 Form C

Contact material   W: $AgSnO_2$ N: AgNi0.15

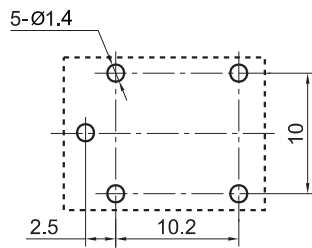**Relay version**   L: Reflow soldering version (open vent hole)   Nil: Sealed IP67

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.

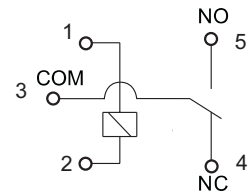1) HFKW is an environmental friendly product, please mark special code (555) when order.
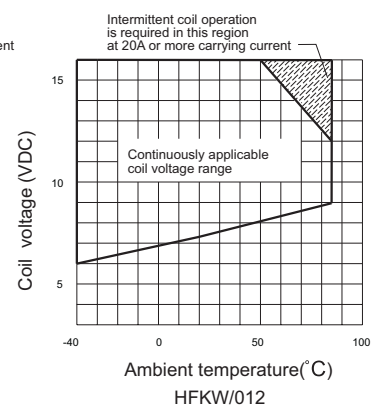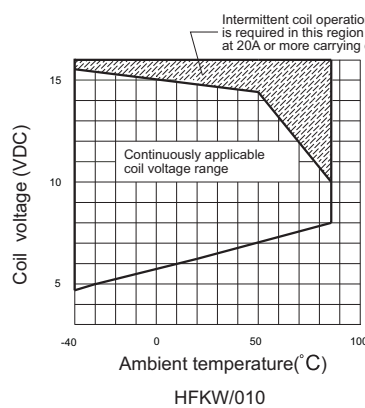
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

Outline Dimensions

15.7 max
14 max
0.4
0.3± 0.1
1.62
1 ± 0.1
1 ± 0.1
3.5± 0.3

12.5 max
0.4 ± 0.1
0.4 ± 0.1
1 ± 0.1

PCB Layout

5-Ø1.4
10
2.5
10.2

Wiring Diagram

1
3 COM
2
NO 5
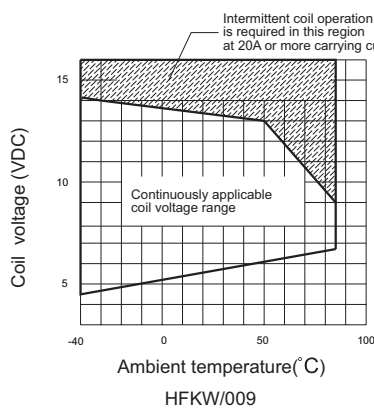NC 4
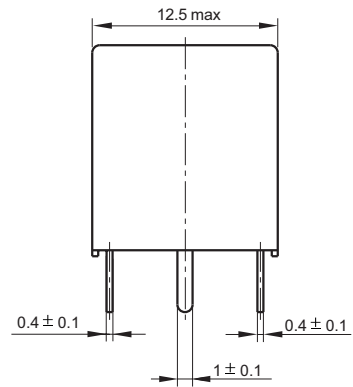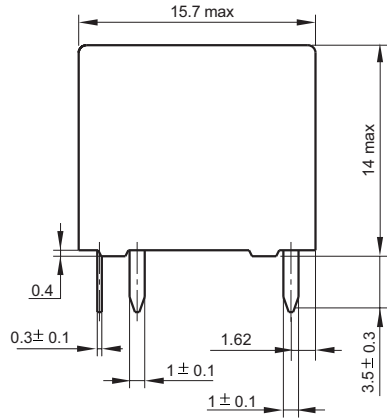
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB mounting holes is always ±0.1mm.

CHARACTERISTIC CURVES

1. Coil operating voltage range

Intermittent coil operation is required in this region at 20A or more carrying current

Continuously applicable coil voltage range

Coil voltage (VDC)
Ambient temperature(°C)

HFKW/009

Intermittent coil operation is required in this region at 20A or more carrying current

Continuously applicable coil voltage range

Coil voltage (VDC)
Ambient temperature(°C)

HFKW/010

Intermittent coil operation is required in this region at 20A or more carrying current

Continuously applicable coil voltage range

Coil voltage (VDC)
Ambient temperature(°C)

HFKW/012

CHARACTERISTIC CURVES

2. Load curve

Electrical life curve

Max. switching power

Coil temperature rise (at 20°C)

Electrical life curve
- Operations(x10000OPS)
- Switching current (A)
- Motor locked

Max. switching power
- Switching current (A)
- Switching voltage (VDC)
- Motor locked
- Resistive

Coil temperature rise (at 20°C)
- Coil power
- Temperature rise (°C)
- Time (min)
- 0.8W / 0.6W
- Carrying current 20A
- 0.8W / 0.6W
- Carrying current 10A
- 0.8W / 0.6W
- Carrying current 0A

3. Vibration resistance characteristics

Dual Amplitude

5 1 0.5 0.1

4.4G

Acceleration (g)

Frequency (Hz)

Frequency: 10 to 500 HZ
Acceleration: 10g max.
Direction of vibration: See diagram as following
Detection level: 100 us

Z
Y
X
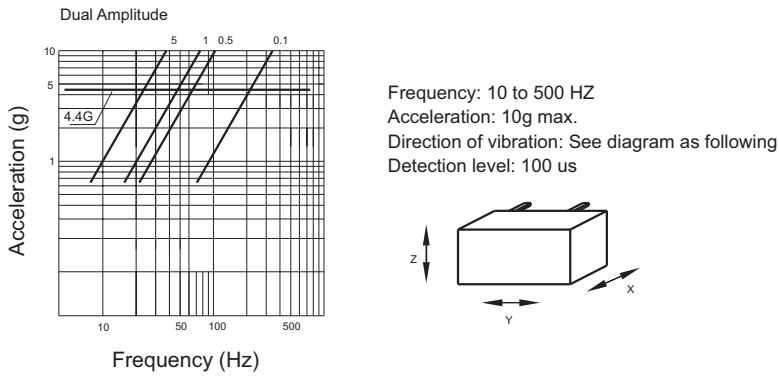
4. Shock resistance characteristics

Shock level (g)

Shock direction

X1 X2 Y1 Y2 Z1 Z2

Shock application time: 11 ms
Test material: Coil, energized & de-energized
Shock direction: See diagram as following
Detection level: 100 us

Z
Y
X

○ : NC Contact
● : NO Contact
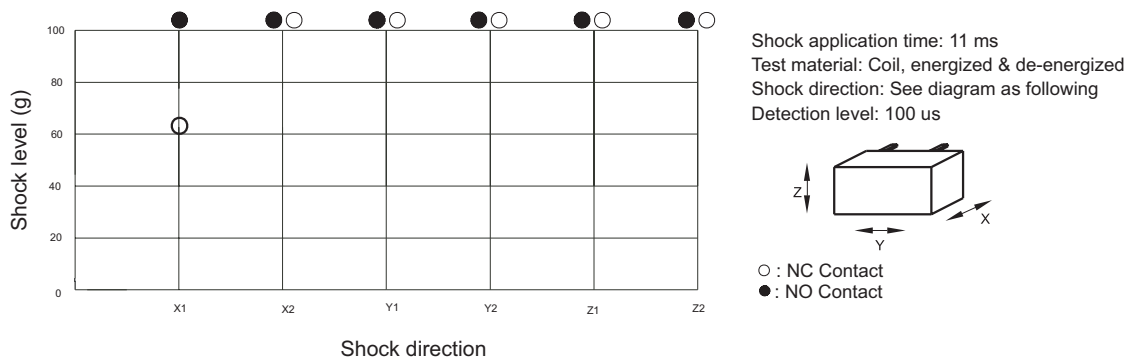
Disclaimer

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.