

HFKW

SUBMINIATURE AUTOMOTIVE RELAY



Typical Applications

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

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

CHARACTERISTICS

| | |
|--|--|
| Contact arrangement | 1A, 1C |
| Voltage drop (initial) ¹⁾ | Typ.: 50mV (at 10A) Max. : 250mV (at 10A) |
| Contact rating | Resistive: 15A 13.5VDC Motor locked: 20A 13.5VDC Motor free: Break: 4A 13.5VDC Shock: 20A 13.5VDC |
| Max. carrying current ²⁾ (NO contact) | 35A/10min 25A/1h |
| Max. switching current | NO/NC: 35/20A (at 16VDC) |
| Max. switching voltage | 60VDC |
| Max. switching power | 210W |
| Min.contact load | 1A 6VDC |
| Electrical endurance | See " CONTACT DATA " table |
| Mechanical endurance | 1 x 10 ⁷ OPS (300OPS/min) |
| Initial insulation resistance | 100MΩ (at 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.) | 60K max. |
| Ambient temperature | -40°C to 85°C |
| Storage temperature | -40°C to 155°C |
| Vibration resistance | 10Hz to 55Hz 1.5mm DA |
| Shock resistance | 98m/s ² (10g) |
| Termination | PCB ⁴⁾ |
| Construction | Wash tight, Flux proofed |
| 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 and time is 240°C to 260°C, 2s to 5s.

CONTACT DATA ⁵⁾

at 23°C

| Load voltage | Load type | | Load current A | | | On/Off ratio | | Electrical endurance OPS | Contact material | Load wiring diagram ⁴⁾ |
|--------------|--------------|-------|------------------|-----|------------------|--------------|-------|--------------------------|--------------------------------|-----------------------------------|
| | | | 1C | | 1A | On s | Off s | | | |
| | | | NO | NC | NO | | | | | |
| 13.5VDC | Resistive | Make | 15 | 15 | 15 | 2 | 2 | 2×10 ⁵ | AgSnO ₂ AgNi0.15 | See diagram 1 |
| | | Break | 15 | 15 | 15 | 2 | 2 | | | |
| | Resistive | Make | 30 | --- | 30 | 5 | 5 | 1×10 ⁵ | AgSnO ₂ | See diagram 2 |
| | | Break | 30 | --- | 30 | | | | | |
| | Motor Locked | Make | 25 ³⁾ | --- | 25 ³⁾ | 2 | 2 | 1×10 ⁵ | AgSnO ₂ | See diagram 3 |
| | | Break | 25 ³⁾ | --- | 25 ³⁾ | | | | | |

| Load voltage | Load type | | Load current A | | | On/Off ratio | | Electrical endurance OPS | Contact material | Load wiring diagram ⁴⁾ |
|--------------|--------------------|-------|------------------|-----|------------------|--------------|-------|--------------------------------|----------------------------|-----------------------------------|
| | | | 1C | | 1A | On s | Off s | | | |
| | | | NO | NC | NO | | | | | |
| 13.5VDC | Lamp ¹⁾ | Make | 90 ²⁾ | --- | 90 ²⁾ | 1 | 9 | 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 AgSnO₂ contact material should be used and the customer special code should be (170) as a 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 AgSnO₂ contacts are applied, please heed the anode and cathode's request when wired.

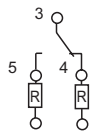


diagram 1

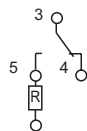


diagram 2

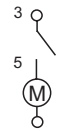


diagram 3

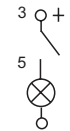


diagram 4

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

COIL DATA

at 23°C

| Nominal voltage VDC | Pick-up voltage VDC | | Drop-out voltage VDC | Coil resistance Ω | Power consumption W |
|---------------------|---------------------|------|----------------------|-------------------|---------------------|
| | 23°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

| | | | | | | |
|---------------------|--|-----------------|----|---|----|-------|
| Type | HFKW / | 012 | 1Z | W | -L | (XXX) |
| 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 | | | | |
| Version | L: Reflow soldering version (open vent hole) | Nil: Wash tight | | | | |

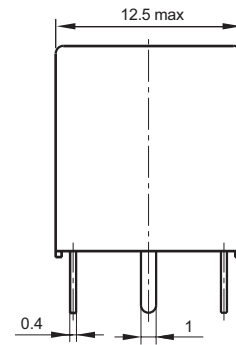
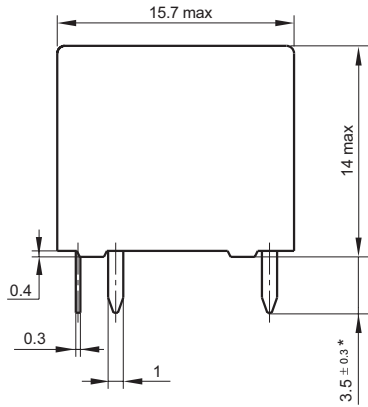
Customer special code ¹⁾ e.g. (170) stands for flasher load, (555) stands for RoHS & ELV compliant. In case there are multiple special requirements, all special codes should be followed one by one.

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

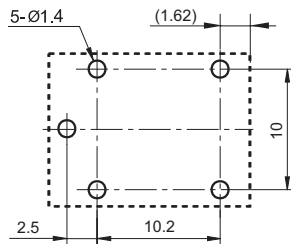
OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

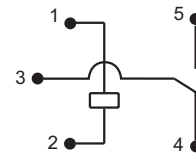
Outline Dimensions



PCB Layout (Bottom view)



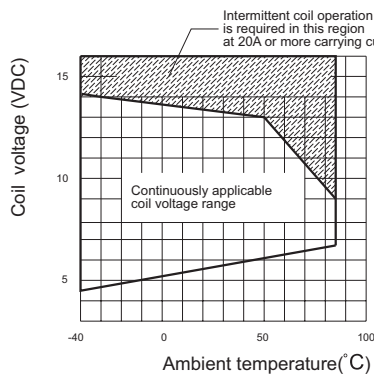
Wiring Diagram (Bottom view)



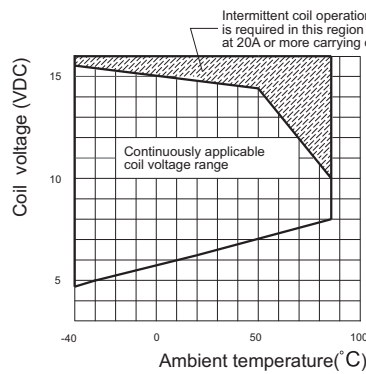
- Notes:**
- * The additional tin top is max. 1mm;
 - The terminal vertical deviation tolerance is 0.2mm;
 - In case of no tolerance shown in outline dimension: outline dimension ≤ 1 mm, tolerance should be ± 0.2 mm, outline dimension > 1 mm and ≤ 5 mm, tolerance should be ± 0.3 mm, outline dimension > 5 mm, tolerance should be ± 0.4 mm;
 - The tolerance without indicating for PCB layout is always ± 0.1 mm.

CHARACTERISTIC CURVES

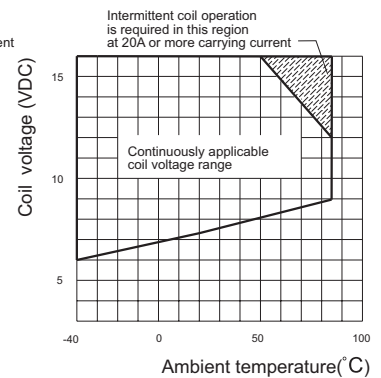
1. Coil operating voltage range



HFKW/009



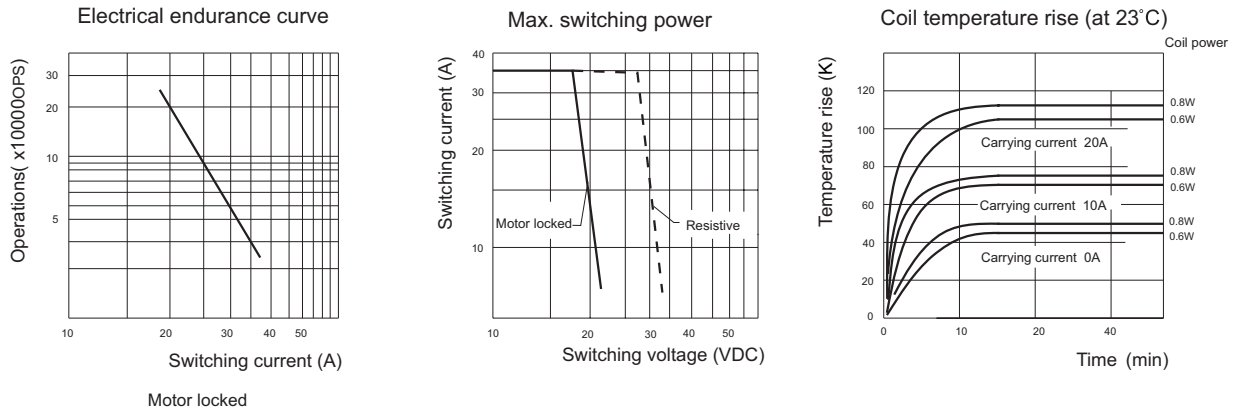
HFKW/010



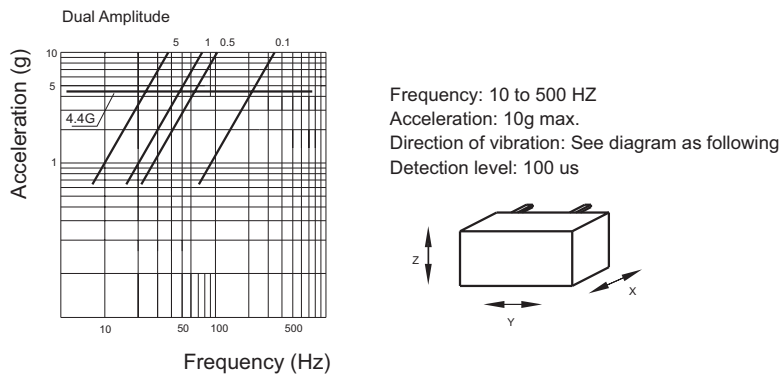
HFKW/012

CHARACTERISTIC CURVES

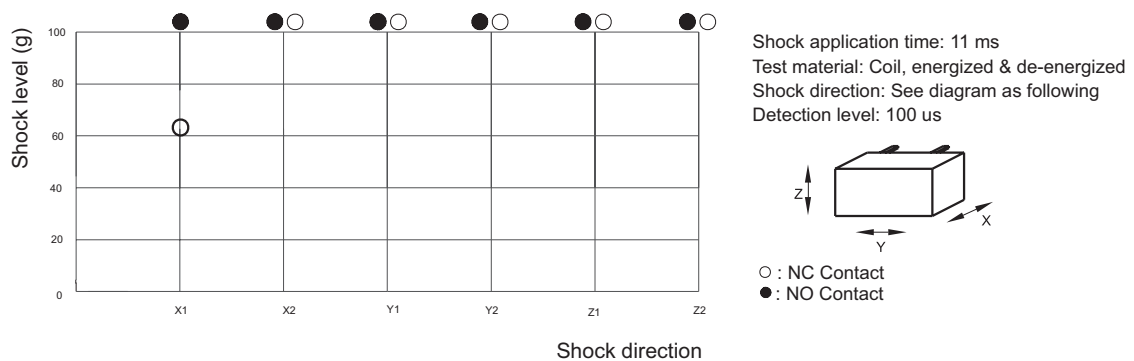
2. Load curve



3. Vibration resistance characteristics



4. Shock resistance characteristics



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.