HFKM/HFKS AUTOMOTIVE RELAY

Features

- Switching capability up to 20A
- Six different contact arrangements
- Two terminals size for HFKM & HFKS
- Unenclosed and wash tight types available
- RoHS & ELV compliant

Typical Applications

Flasher control, Indicator control, Power door & windows, Low temperature start, Immobilizers, Central door lock, Sunproof motor control

CHARACTERISTICS

Contact arrangement	1A, 1B, 1C, 1W, 1U, 1V
Voltage drop (initial) 1)	Typ.: 50mV (at 10A) Max.: 250mV (at 10A)
Max. make current 2)	1A:60A 1B:12A 1C(NO/NC): 60/12A 1U: Resistive/Inductive: 2×40A Lamp: 2×60A ($AgSnO_2$) 1V:2×8A 1W(NO/NC):2×30A/2×5A
Max. continuous current	1A:15A, 1B:10A 1C(NO/NC):15A/10A 1U:2×10A, 1V: 2×7A 1W(NO/NC): 2×7A/2×5A
Max. switching current	1A: 20A, 1B: 10A 1C(NO/NC): 20A/10A 1U: Resistive, Inductive: 2×20A Lamp: 2×6A ($AgSnO_2$) 1V: 2×7A 1W (NO/NC): 2×15A/2×5A
Max. switching voltage	75VDC
Max. switching power	200W

Min. contact load	0.5A 6VDC
Electrical endurance	See "CONTACT DATA" table
Mechanical endurance	1 x 10^7OPS (300OPS/min)
Initial insulation resistance	100MΩ (at 500VDC)
Dielectric strength	500VAC (1min, leakage current less than 1mA)
Operate time	Typ.: 3ms Max.: 10ms (at nomi. vol.)
Release time	Typ.: 1.5ms Max.: 10ms 3)
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, Unenclosed
Unit weight	Unenclosed: Approx. 8g Wash tight: Approx.12g

1) Equivalent to the max. initial contact resistance is 100mΩ (at 1A 6VDC).
2) Max. make current is the max. shock current of lamp load.
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.

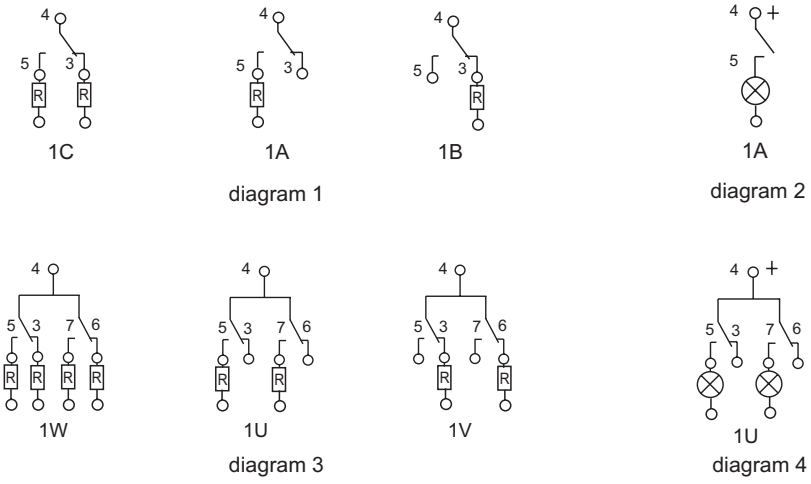
CONTACT DATA 4)

at 23˚C

Load voltage	Load type		Load current A 1C NO	1C NC	1A NO	1B NC	On/Off ratio On s	Off s	Electrical endurance OPS	Contact material 1)	Load wiring diagram 3)
13.5VDC	Resistive	Make	15	10	15	10	2	2	2×10^5	$AgSnO_2$ AgNi0.15	See diagram 1
		Break	15	10	15	10	2	2			
	Lamp 2)	Make	3×21W	---	3×21W	---	2	2	1.5×10^6	$AgSnO_2$	See diagram 2
		Break		---		---	2	2			

Load voltage	Load type		Load current A				On/Off ratio		Electrical life OPS	Contact material [1]	Load wiring diagram [3]
			1W		1U	1V	On s	Off s			
			NO	NC	NO	NC					
13.5VDC	Resistive	Make	2×7	2×5	2×7	2×5	2	2	2×10^5	$AgSnO_2$ AgNi0.15	See diagram 3
		Break	2×7	2×5	2×7	2×5	2	2			
	Lamp	Make	(3x21W) x2	---	(3x21W) x2	---	2	2	1.5×10^6	$AgSnO_2$	See diagram 4
		Break		---		---	2	2			
	Flasher	Make	(4x21W) x2	---	(4x21W) x2	---	0.375	0.375	2×10^6	Special $AgSnO_2$	See diagram 4
		Break		---		---					
	Lamp	Make	(2x21W +1x5W) x2	---	(2x21W +1x5W) x2	---	0.2	3	1×10^5	$AgSnO_2$	See diagram 4
		Break		---		---					

1) $AgSnO_2$ contact is suitable for the lamp load, inductive load and motor load, while AgNi contact is suitable for resistive load;
2) When it is utilized in flasher, a special $AgSnO_2$ contact material should be used and the customer special code should be (170) as a suffix. Please connect by the polarity according to the diagrams below.
3) The load wiring diagrams are listed below. When special $AgSnO_2$ contacts are applied, please heed the anode and cathode's request when wired.



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	Power consumption W	Max. allowable overdrive voltage [1] VDC
	1A, 1B, 1C, 1U, 1V	1W	1B, 1V	1A,1C, 1U, 1W			
6	3.75	4.5	0.35	0.7	28	1.1	9.0
12	7.5	9.0	0.7	1.4	130	1.1	19.6
24	15	18.0	1.4	2.8	520	1.1	39.3

1) Max. allowable overdrive voltage is stated with 10A load applied.

ORDERING INFORMATION

Type	HFKM / HFKS /	012	1H	S	T	(XXX)

Coil voltage **006**: 6VDC, **012**: 12VDC, **024**: 24VDC

Contact arrangement **1H**: 1 Form A **1D**: 1 Form B **1Z**: 1 Form C
SH: 1 Form U **SD**: 1 Form V **SZ**: 1 Form W

Construction **S**: Wash tight **Nil**: Unenclosed

Contact material **T**: $AgSnO_2$ **Nil**: AgNi0.15

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.

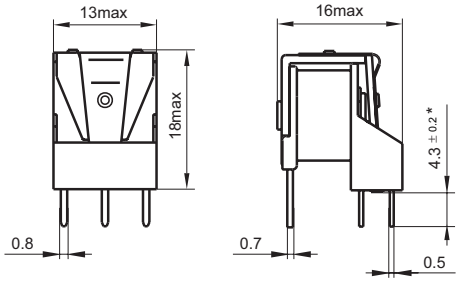
1) HFKM/HFKS is an environmental friendly product, please mark special code (555) when order.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

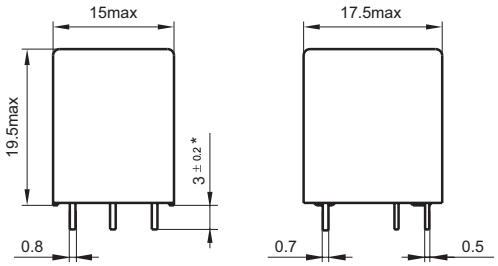
Unit: mm

Outline Dimensions

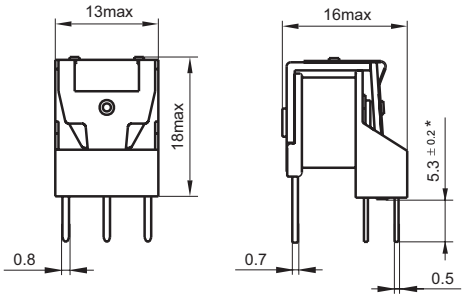
HFKM Unenclosed



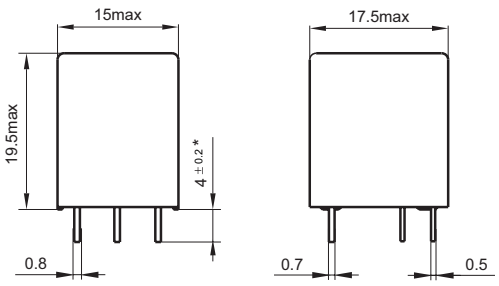
HFKM Wash tight



HFKS Unenclosed



HFKS Wash tight



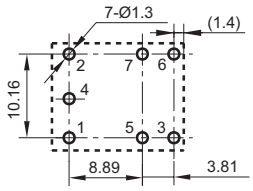
Notes: 1) * The additional tin top is max. 1mm;
2) Tthe terminal vertical deviation tolerance is 0.2mm.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

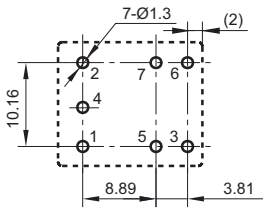
Unit: mm

PCB Layout (Bottom view)

HFKM/HFKS Unenclosed

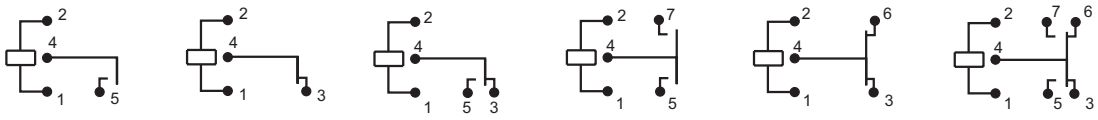


HFKM/HFKS Wash tight



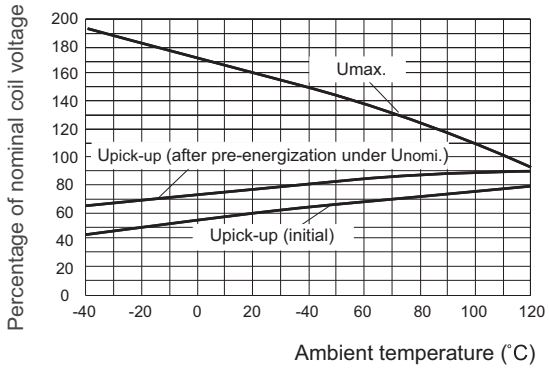
Notes: The tolerance without indicating for PCB layout is always ±0.1mm.

Wiring Diagram (Bottom view)



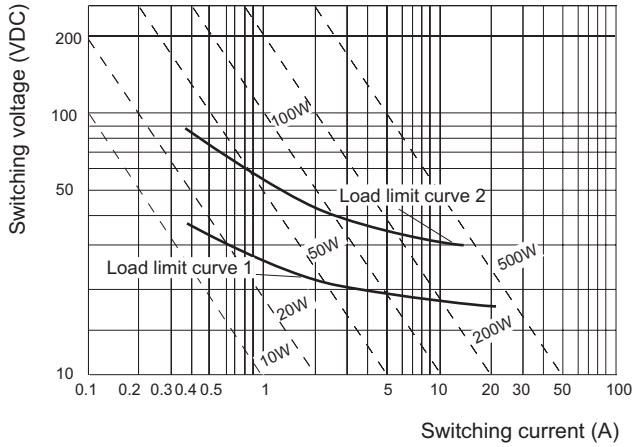
CHARACTERISTIC CURVES

1. Coil operating voltage range



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 155°C. For the coil temperature rise which is measured by resistance is average value, we recommend the coil temperature should be below 130°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



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.
2) Load limit curve 1: arc extinguishes, during transit time (change over contact).
3) Load limit curve 2: safe shutdown, no stationary arc (make contact)

CHARACTERISTIC CURVES

3. Application examples [1)]

Symbol	Relay type	Load type	On/Off ratio	Test temperature ˚C	Test time h
1	HFKM/012-1HST	Lamp: 3×21W	15s : 15s	70 40	80 320
2	HFKM/012-1HST	Lamp: 6×21W	15s : 15s	40	100
3	HFKM/012-SHST	Lamp: (2×10W)×2 Lamp: (3×15W)×2	20s : 2s	40 40	500 500
4	HFKM/012-1ZST	Lamp: 2×21W	30s : 30s	85	850
5	HFKM/012-SHT (170)	Lamp: (2×21W+1×5W)×2	500ms : 500ms	85	450

1) The actual capabilities of the relay can be higher than the example parameters.