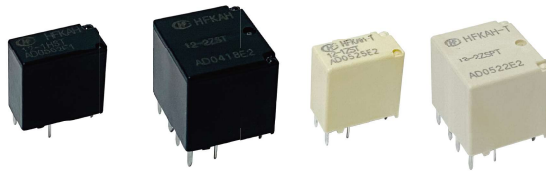


# HFKAH/HFKAH-T

## AUTOMOTIVE RELAY



### Typical Applications

Power doors and windows, Central door lock, Sunroof motor control, Seat adjustment, Indicator lamp control, Horn control, Wiper control, Heaters (seat)

### Features

- 25A motor locked load
- Extremely small relay
- Form A and Form B available
- Single and twin version available
- 30A fuse available
- Reflow soldering version available (HFKAH-T)

RoHS compliant

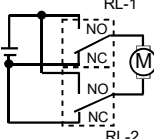
## CHARACTERISTICS

Contact arrangement	1C , 2C , 1A , 2A
Voltage drop (initial) <sup>1)</sup>	Typ.:50mV(at 10A) Max.:250mV(at 10A)
Max. continuous current <sup>2)</sup>	33.8A 10min/25A continuous(23°C) 31A 10min(85°C) HFKAH-T: 29A 10min(125°C) Monostable and low power consumption: 40.5A 30min(23°C)
Max. switching current <sup>3)</sup>	NO:60A, NC:30A
Max. switching current <sup>4)</sup>	16VDC
Min.contact load	1A 12VDC
Electrical load	See "CONTACT DATA"
Mechanical endurance	1×10 <sup>7</sup> OPS 300OPS/min
Insulation resistance (initial)	100MΩ(500VDC)
Dielectric strength (initial) <sup>5)</sup>	Between contacts: 500VAC Coil & contacts: 500VAC
Operate time(initial)	Typ.:2.5ms(at nomi. vol.) Max.:10ms(at nomi. vol.)

Release time <sup>6)</sup>	Typ.:1.2ms, Max.: 10ms
Ambient temperature	HFKAH:-40°C to 85°C HFKAH-T:-40°C to 125°C
Vibration resistance <sup>7)</sup>	10Hz to 500Hz, 49m/s <sup>2</sup>
Shock resistance <sup>7)</sup>	98 m/s <sup>2</sup>
Termination	PCB <sup>8)</sup>
Construction	Plastic sealed, Flux proofed
Unit weight	Single relay: Approx.4g Twin relay: Approx.8g

**Notes:**1) Initial value, Equivalent to the max. initial contact resistance is 100mΩ(at 1A 6VDC).  
2) The test under the follow conditions:  
a. The relay is mounted on the PCB, the coil is applied with 100% rated voltage;  
b. The PCB board is a double layer board, the thickness of the copper foil is 4 oz(140 um), the width of each copper foil is 10.64×(1±5%)mm, the length of the copper foil is 50 mm±1 mm, and the Tg value of the PCB is 150°C;  
c. Not suitable for double relay adding load simultaneously.  
d. The installation spacing between relay samples is 100mm.  
3) 23°C, 14VDC(100OPS Resistive).  
4) See "Load limit curve" for details.  
5) 1 min, leakage current less than 1mA.  
6) The value is measured when voltage drops suddenly from nominal voltage to 0VDC and coil is not paralleled with suppression circuit.  
7) When not excited, the closing time of the normally closed contact is less than 10μs. At the same time, the normally open contact cannot be closed; During excitation, the opening time of the normally open contact is less than 10μs.  
8) Since it is an environmental friendly product, please select lead-free solder when welding. The recommended soldering temperature and time is (260±3)°C, (5±0.3)s.

## CONTACT DATA<sup>1)</sup>

Load voltage	Load type <sup>2)</sup>		Load current A		On/Off ratio		Electrical endurance OPS	Load wiring diagram
			1Z, 2Z		On s	Off s		
			NO	NC				
13.5VDC	Motor	Make <sup>1)</sup>	25	—	0.5	9.5	1x10 <sup>5</sup>	
		Break	25	—				
	Simulate window operation	Make <sup>1)</sup>	25	—	0.2	4	1x10 <sup>5</sup>	
		Stable	10	—	2.3			
		Break	25	—	0.5			
	Simulate motor free operation	Make <sup>1)</sup>	27	—	0.02	1.8	1x10 <sup>5</sup>	
		Transient	17	—	0.03			
		Break	8	—	0.15			



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2025 Rev. 1.00

Notes:1) Corresponds to the peak inrush current on initial actuation (motor).

2) When applied in flasher, a special silver alloy (AgSnO<sub>2</sub>) 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, common terminal should connect with anode.

3) When the load voltage is at 24VDC or higher, or the application conditions are different from the table above, please submit the detailed application conditions to Hongfa to get more support.

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

## COIL DATA

23°C

Coil power	Nominal voltage VDC	Pick-up voltage VDC			Drop-out voltage VDC			Coil resistance ×(1±10%)Ω			Power consumption W
		23°C	85°C	125°C	23°C	85°C	125°C	23°C	85°C	125°C	
Monostable and low power consumption	12	≤7.5	≤9.4	≤10.6	≥1.0	≥1.2	≥1.4	300	374.4	422.4	0.48
Monostable and standard	12	≤7.2	≤9.0	≤10.2	≥1.0	≥1.2	≥1.4	225	280.8	316.8	0.64
Monostable and high power consumption	12	≤6.5	≤8.2	≤9.2	≥1.0	≥1.2	≥1.4	180	224.6	253.4	0.8

## ORDERING INFORMATION

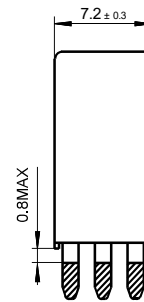
Type	HFKAH /	12	-1H	S	L	T	(XXX)
	HFKAH: Standard HFKAH-T: Reflow soldering version/ High-temperature version						
Coil voltage	12: 12VDC						
Contact arrangement	1H: 1 Form A 1Z: 1 Form C 2H: 2 Form A 2Z: 2 Form C						
Construction <sup>1)</sup>	S: Plastic sealed <sup>1)</sup> Nil: Flux proofed						
Coil power	P: Monostable and high power consumption L: Monostable and low power consumption Nil: Monostable and standard						
Contact material	T: AgSnO <sub>2</sub>						
Special code <sup>2)</sup>	XXX: Customer special requirement Nil: Standard						

Notes:1) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.

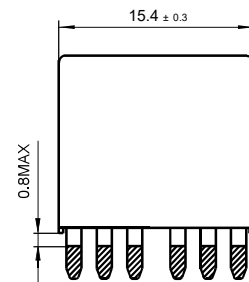
2) The customer special requirement express as special code after evaluating by Hongfa. e.g. (170) stands for flasher load. The performance parameters of products with characteristic numbers shall be subject to the specific specifications provided by Hongfa.

## Unit: mm

1C: 1 Form C (Single version)



Technical drawing of a rectangular frame assembly. The drawing shows a top view of the frame with various dimensions and tolerances. The overall width is  $14 \pm 0.3$  and the overall height is  $13.5 \pm 0.3$ . The frame consists of two main vertical sections and two main horizontal sections. The vertical sections are labeled with dimensions  $4x0.3 \pm 0.05$  and  $2x0.3 \pm 0.05$ . The horizontal sections are labeled with dimensions  $4x1.2 \pm 0.05$  and  $2x1.2 \pm 0.05$ . The frame is shown with various mounting points and fasteners, including screws and bolts. The drawing also includes a detail view of a corner joint, showing the assembly of the frame sections. The detail view shows a corner joint with dimensions  $0.4 \pm 0.2$  and  $3.5 \pm 0.3$ . The drawing is a technical drawing of a rectangular frame assembly, showing the overall dimensions and the details of the frame sections and corner joints.



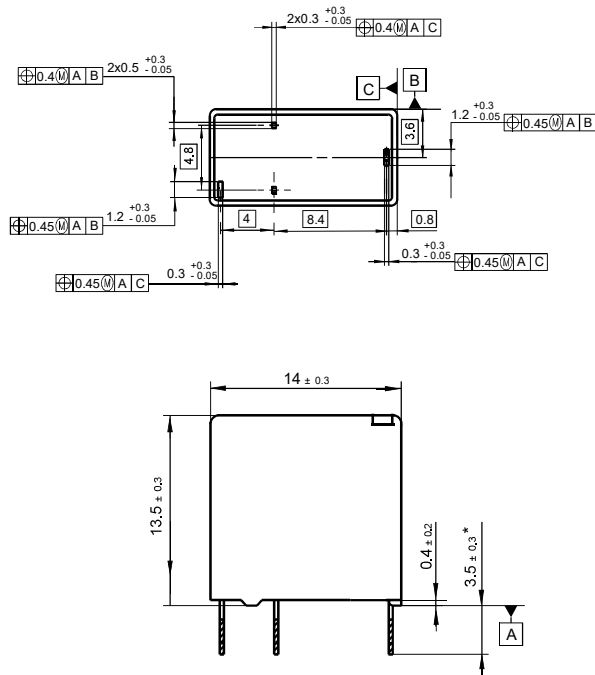
# OUTLINE DIMENSIONS, WIRING DIAGRAM AND TERMINAL FUNCTION DEFINITION

Unit: mm

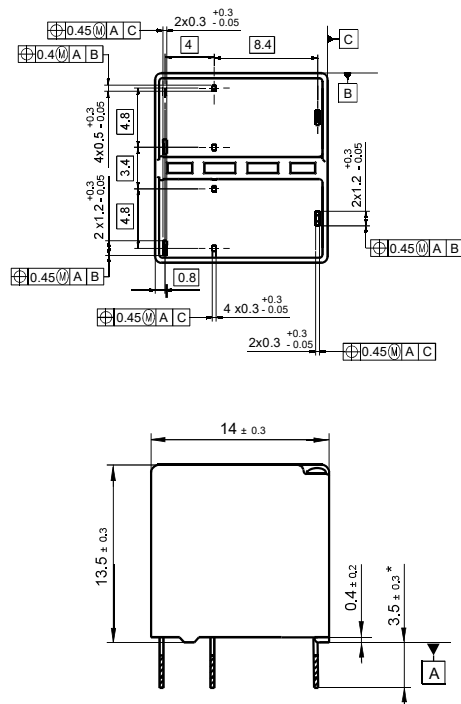
## Outline Dimensions

HFKAH(Standard)

1H: 1 Form A (Single version)



2H: 2 Form A (Twin version)



Remark: \* The additional tin top is max. 1mm.

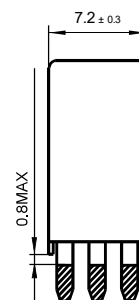
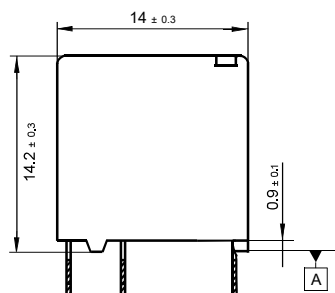
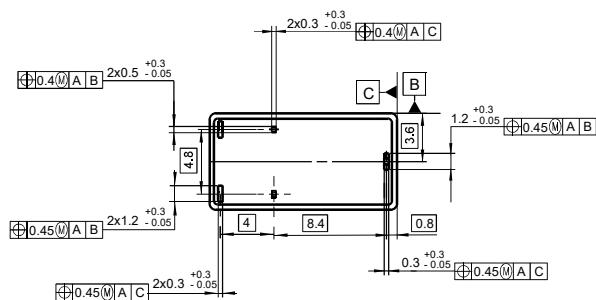
# OUTLINE DIMENSIONS, WIRING DIAGRAM AND TERMINAL FUNCTION DEFINITION

Unit: mm

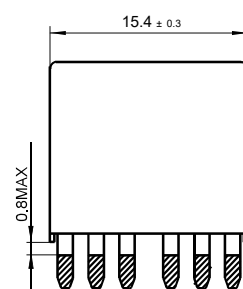
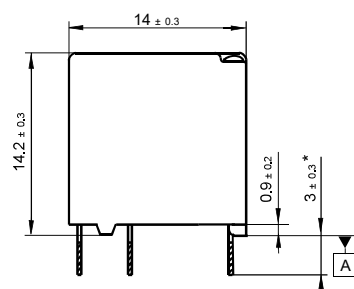
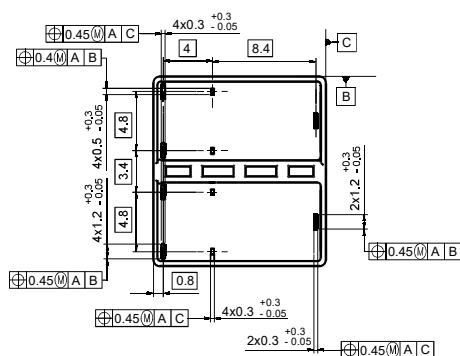
## Outline Dimensions

HFKAH-T (Reflow soldering version / High-temperature version)

1Z: 1 Form C (Single version)



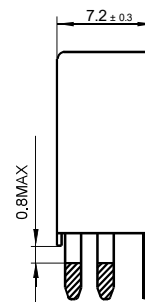
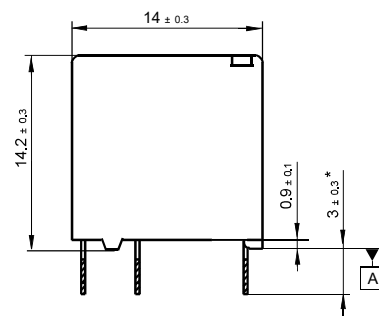
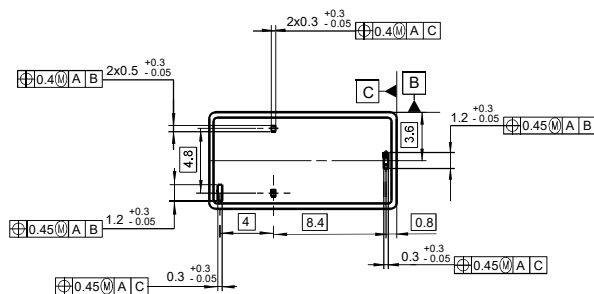
2Z: 2 Form C (Twin version)



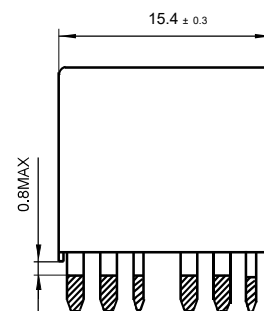
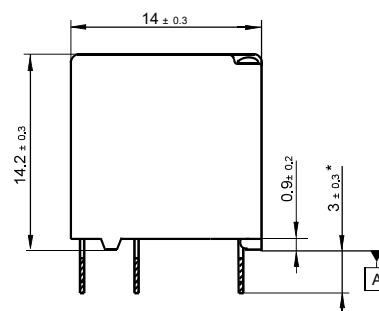
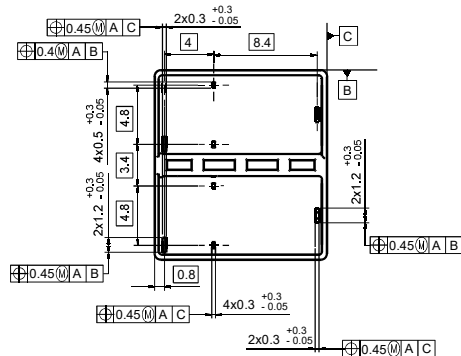
# OUTLINE DIMENSIONS, WIRING DIAGRAM AND TERMINAL FUNCTION DEFINITION

Unit: mm

## Outline Dimensions HFAH-T (Reflow soldering version / High-temperature version) 1H: 1 Form A (Single version)



## 2H: 2 Form A (Twin version)



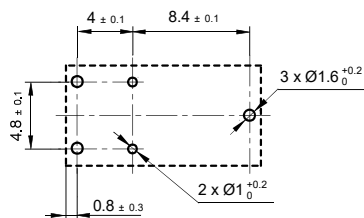
Remark: \* The additional tin top is max. 1mm.

# OUTLINE DIMENSIONS, WIRING DIAGRAM AND TERMINAL FUNCTION DEFINITION

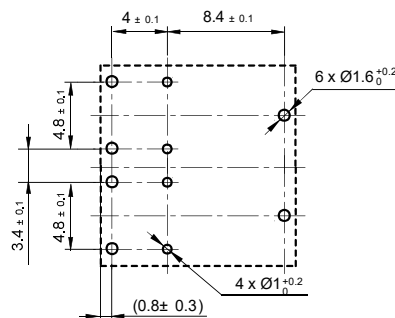
Unit: mm

## PCB Layout(Bottom view)

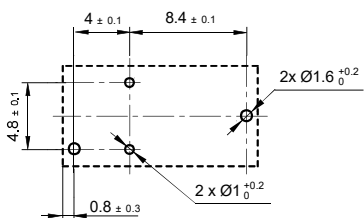
1Z: 1 Form C (Single version)



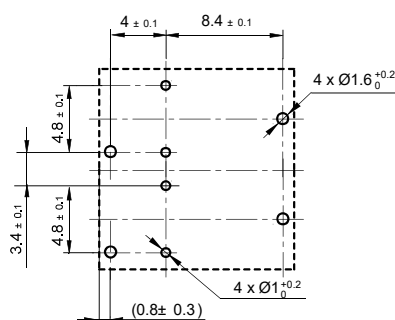
2Z: 2 Form C (Twin version)



1H: 1 Form A (Single version)

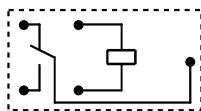


2H: 2 Form A (Twin version)

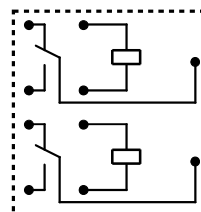


## Wiring Diagram(Bottom view)

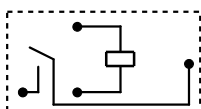
1Z: 1 Form C (Single version)



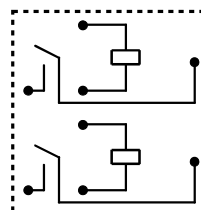
2Z: 2 Form C (Twin version)



1H: 1 Form A (Single version)



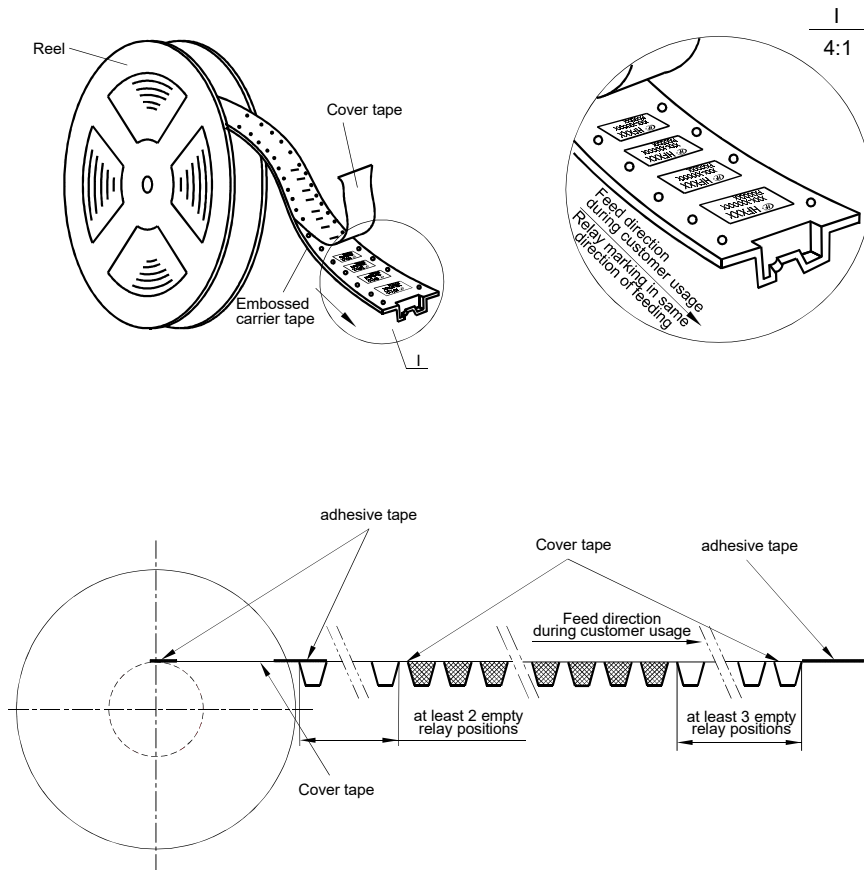
2H: 2 Form A (Twin version)



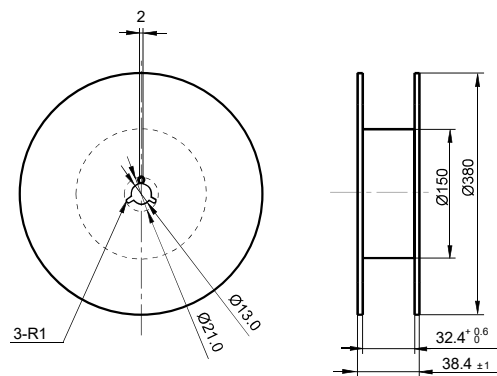
## TAPE AND REEL PACKING

Unit: mm

### Direction of Relay Insertion



### Reel Dimensions

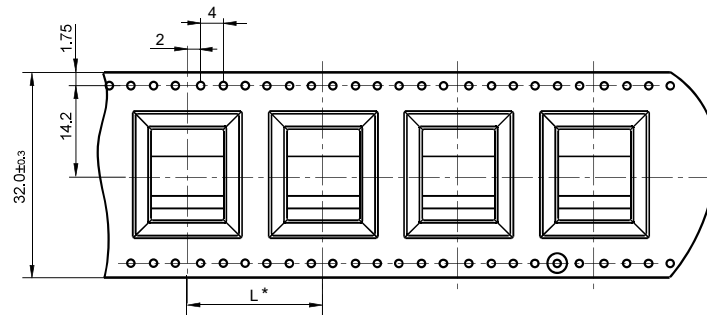




## TAPE AND REEL PACKING

Unit: mm

Tape Dimensions

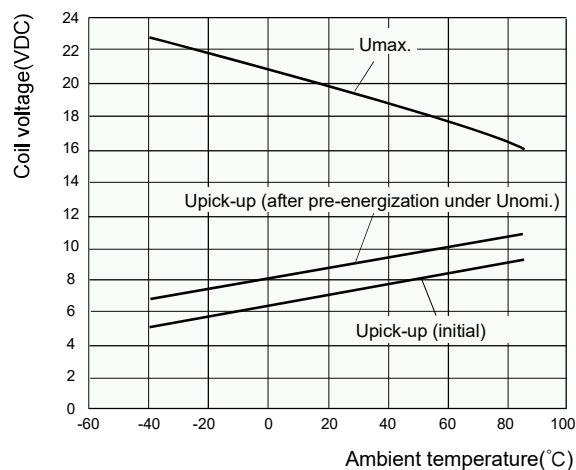


Remark: \* For Single relay, L is 20mm; for Twin relay, L is 28mm.

## CHARACTERISTIC CURVES

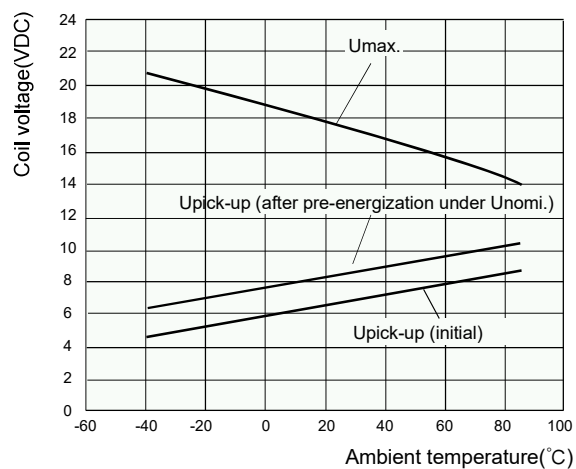
### 1. Coil operating voltage range

225Ω coil resistance



- 1) There should be no contact load applied when maximum continuous operation voltage is applied on coil.
- 2) The operating voltage is connected with coil pre-energized time and voltage. After pre-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\* 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.

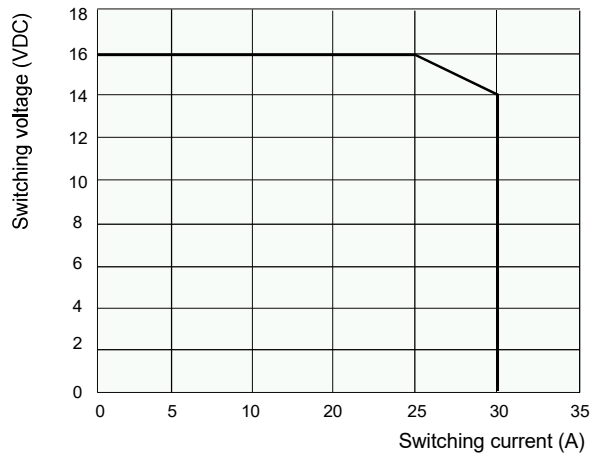
180Ω coil resistance



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

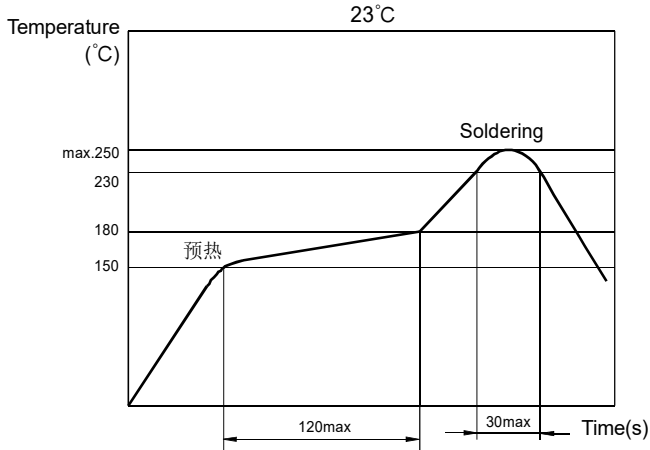
## CHARACTERISTIC CURVES

### 2. Load limit curve (at 23°C)



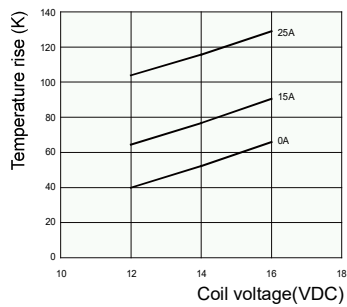
- 1) This chart takes NO contact, resistive load as example.
- 2) The load and electrical endurance tests are made according to "ONTACT DATA" parameters?table. If actual load voltage, current or operate frequency is different from "ONTACT DATA" table, please arrange corresponding tests for confirmation.

### 3. Reflow soldering, temperature on PCB board. (Recommended soldering temperature, only for reflow soldering version)

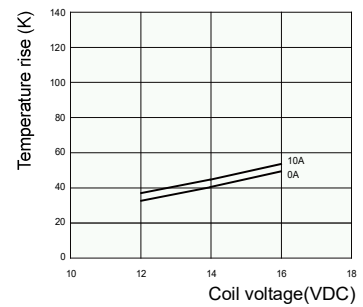


### 4. Coil temperature rise

#### 1) Coil temperature rise (23°C) Experiment:HFKAH-T/12-1ZT



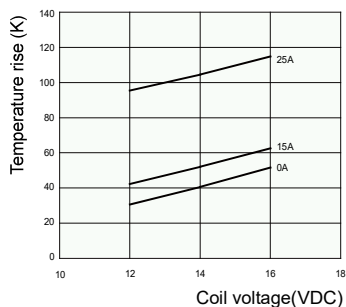
#### 2) Coil temperature rise (125°C) Experiment:HFKAH-T/12-1ZT



## CHARACTERISTIC CURVES

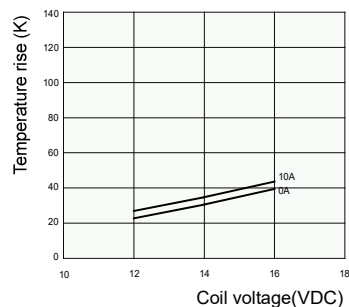
### 2) Coil temperature rise (23°C)

Experiment:HFKAH-T/12-1ZSLT(377)(908)



### 3) Coil temperature rise (125°C)

Experiment:HFKAH-T/12-1ZSLT(377)(908)



Remark: The coil temperature rise test requires the relay to be installed on the PCB. The PCB is double-layered. The thickness of the copper foil is 4 oz (140μm), the width of each copper foil is 3.76 x(1 ± 5%) mm, the length of the copper foil is 50mm?mm, and the Tg value of the PCB board is 150°C.The installation spacing between relay samples is 100mm.。

### Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications 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.

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