WPF60A3K-BS

Self Control Fuse

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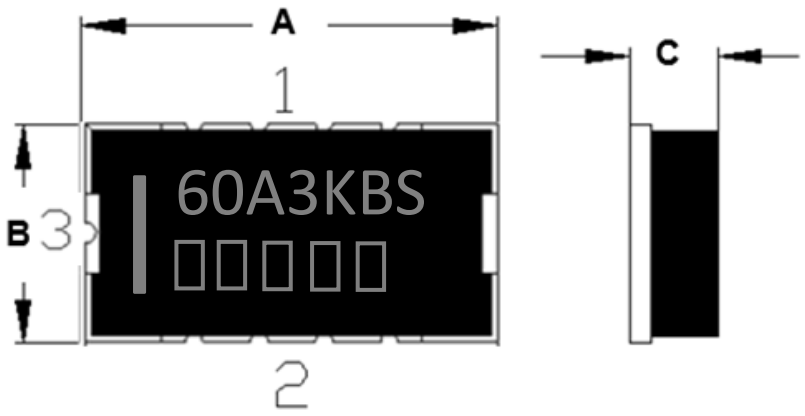
1. Features

- SMD Electronic devices
- High structural intensity
- Compatible with reflow soldering processes
- One device to achieve over current protection and overcharge protection
- UL: UL-248-1,UL-248-14 • • • • File Number: E311435

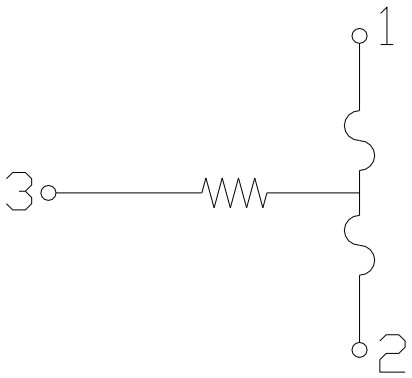
2. Product Dimensions and Recommended Land Pattern

A	B	C
9.5+0.5/-0.3	5.0+0.5/-0.3	2.0±0.3

Unit：mm



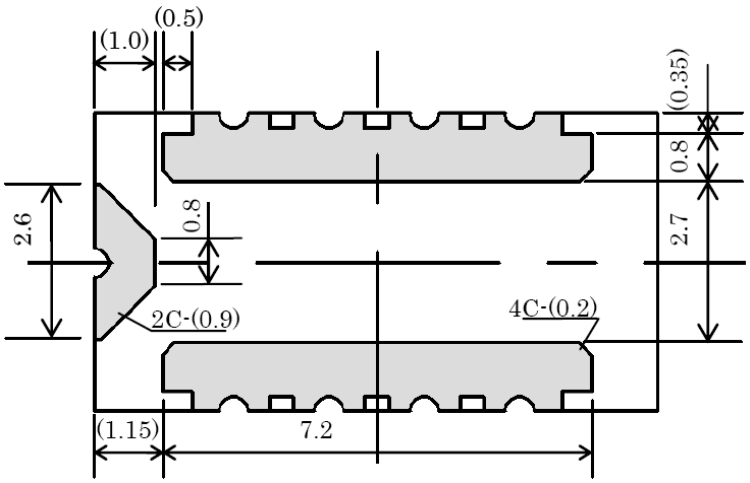
Product Dimensions



Equivalent Circuit

The cover is assembled randomly, the notch of the cover has no polarity, and the marking has direction

3. Terminal Size



Tolerances Unless Otherwise Specified: ±0.2mm

Unit: mm

4. Specification

Part Number	Current Rating	Voltage Rating	Operating Voltage	Fuse DCR	Heater DCR	Interrupting Rating	Applicable Cells in series
	A	VDC	V	mΩ	Ω	A	Cell
WPF60A3K-BS	60	80	9.6-13.5	0.5-1.5	1.83-2.75	240	3

Note:

1. PCB test board may affect the electrical performance test results.

2. Rated voltage is the maximum voltage that the fuse can block, not the action voltage of the heater assembly.

3. The safe use temperature is from - 25 ℃ to 85 ℃

5. Clear-Time Characteristics

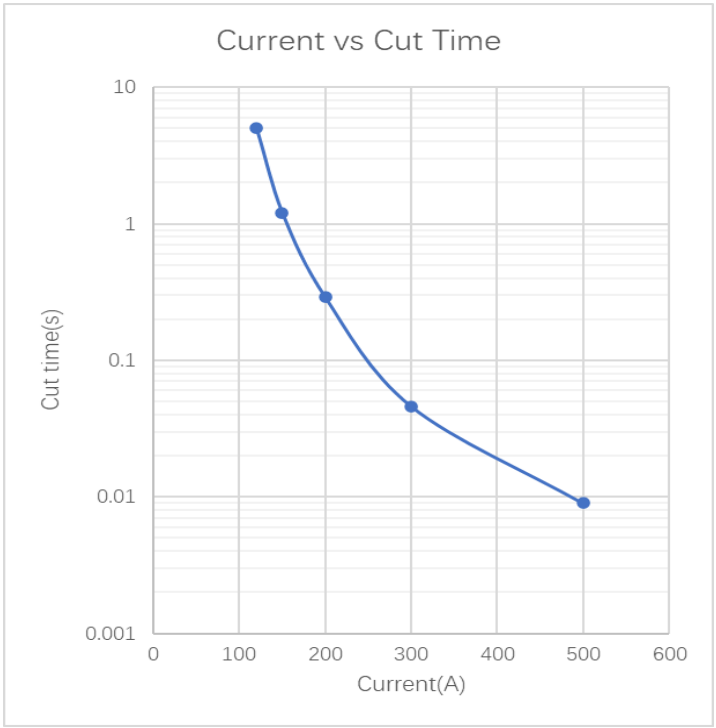
Test Item	Condition of Test	requirement at 25℃
Carrying Capacity (UL248-14)	100% of rated current, 4hr	No Melting
Fusing Time (UL248-14)	200% rated Current	≤1min
	In operation voltage range	

Operating temperature range: -10~65℃（Fusing time≤1min）

Electrical Characteristics is influenced by thermal capacity of PCB, parts, pattern width, and so on. Therefore you should check it on your PCB.

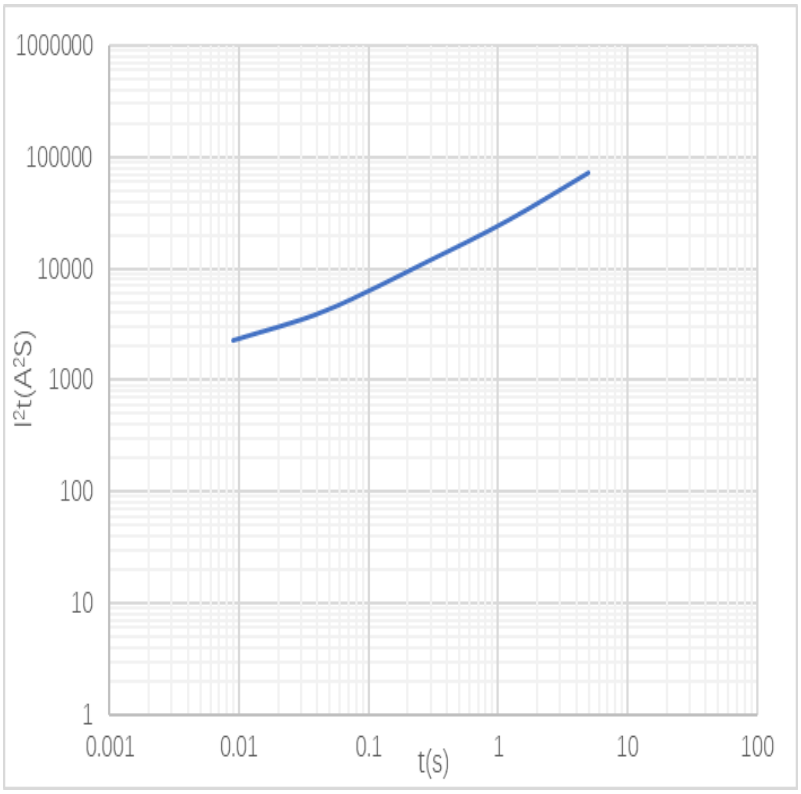
6. Electrical performance

6.1 I-T curve



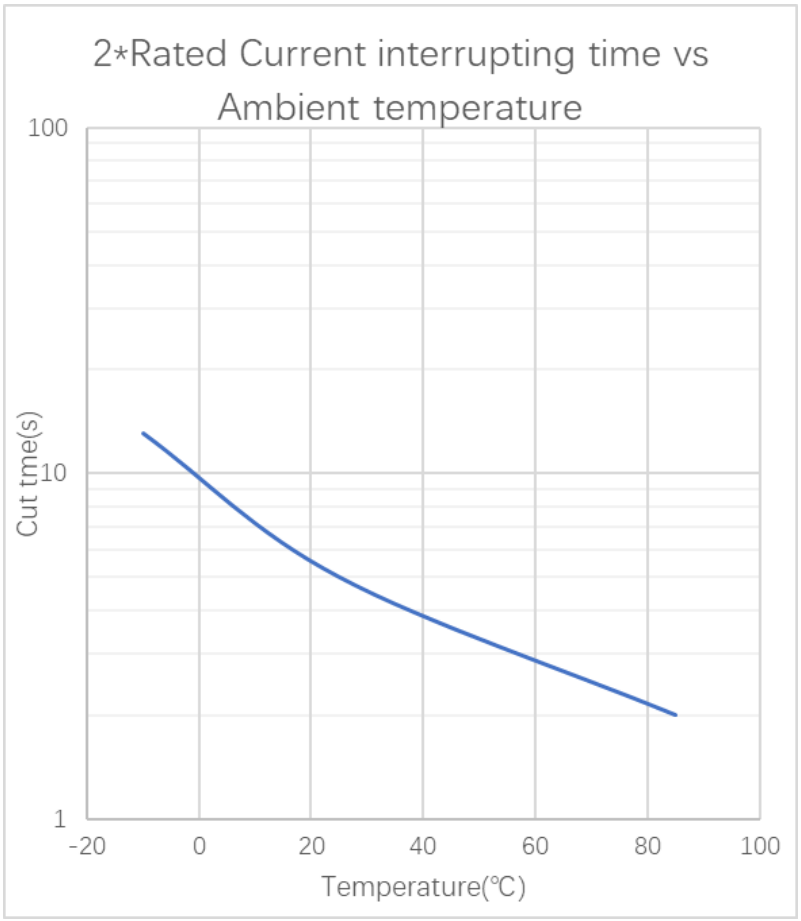
WPF60A3K-BS fuse resistance is about 0.8 mΩ.

6.2 I2t-t curve



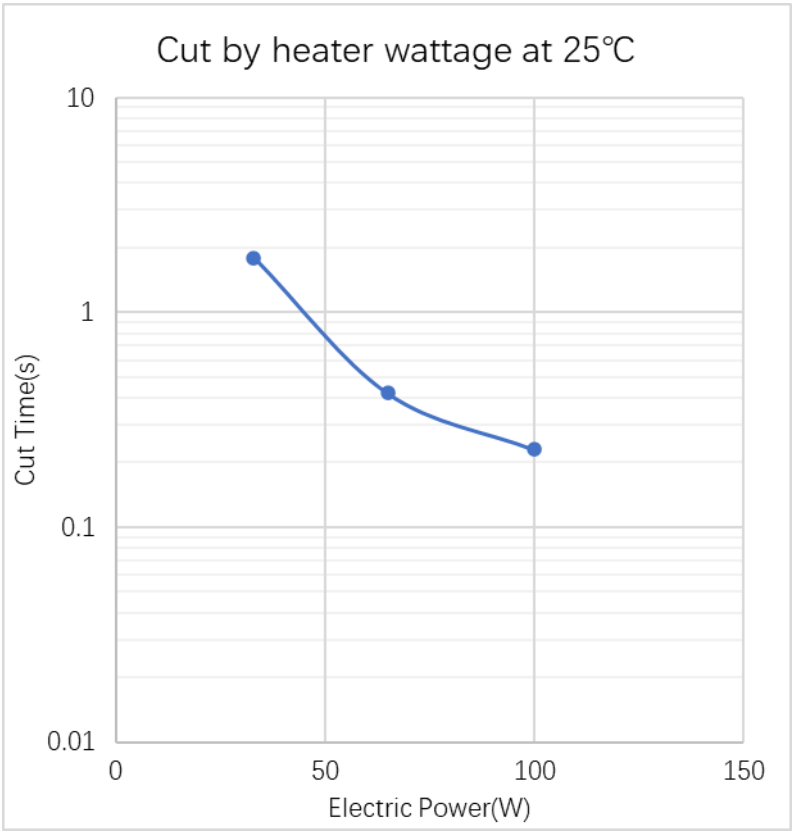
WPF60A3K-BS fuse resistance is about 0.8 mΩ.

6.3 I-T curve at different temperature



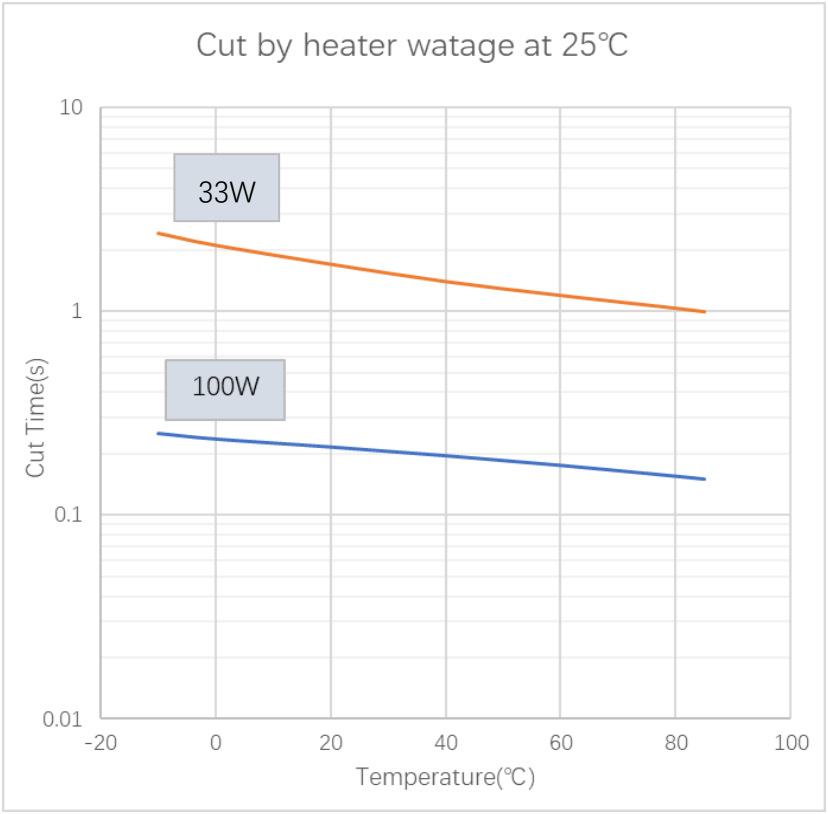
WPF60A3K-BS fuse resistance is about 0.8 mΩ.

6.4 P-T curve



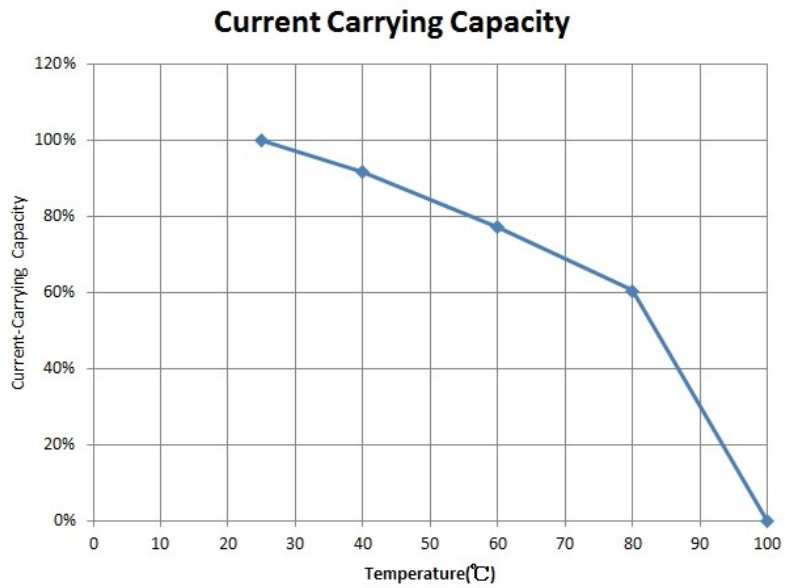
WPF60A3K-BS heater resistance is about 2.29 Ω

6.5 P-T curve at different temperature



WPF60A3K-BS heater resistance is about 2.29 Ω

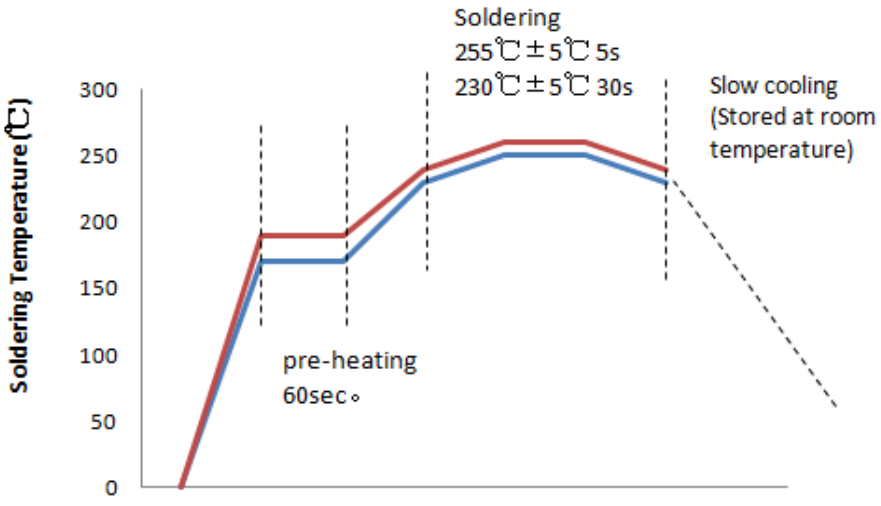
6.6 Current and temperature characteristics



Measure the current to reach the surface temperature which is 100℃ with different ambient temperature.

WPF60A3K-BS fuse resistance is about 0.8 mΩ.

7. Solder Reflow Recommendations



Reflow soldering method:

Peak temp: 255℃±5℃ 5s, 230℃±5℃ 30s.The specimen shall be passed through the reflow furnace for 2times.

8. Standard test condition

In the absence of additional test environmental standards, the test environmental standards are as follows;

Ambient temperature: 5 to 35℃;

Relative humidity: 45 to 85%RH;

Air pressure: 86 to 106kPa.

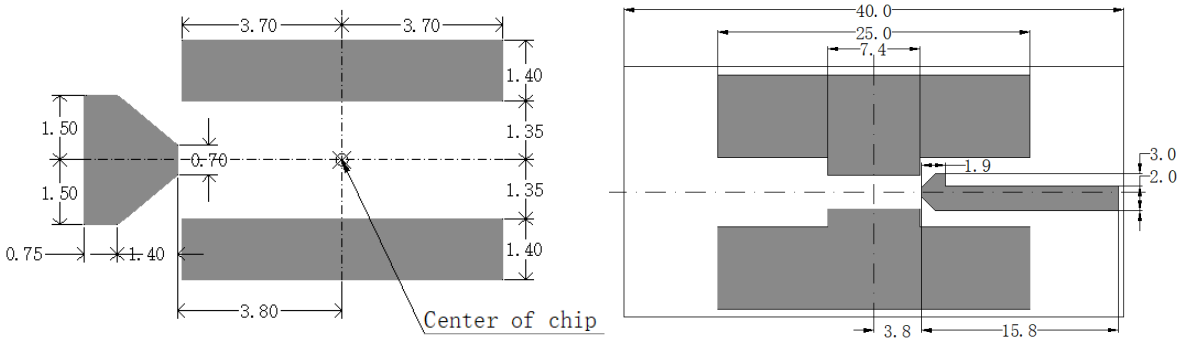
If you have any questions about the test results, please follow the following environmental standards;

Ambient temperature: 20±2℃;

Relative humidity: 60 to 70%RH;

Air pressure: 86 to 106kPa.

9. Recommended Solder Pad Dimensions



Unit: mm

Type	Materials	Base thickness	Copper thickness	Covered wires
60A	FR-4	0.6mm	3.0OZ	AWG6

When the patch on the PCB board printed solder paste steel mesh thickness is best not more than 0.12 mm

10. Reliability

Test Item	Project	Condition	Requirements
Electrical performance	Over voltage	Operating voltage shall be applied to heater	Fusing Time≤1min
	Insulation	@100VDC after OV operating voltage test	>0.2MΩ
	Withstand voltage	@100VAC @50-60Hz@60s after OV operating voltage test	No breakdown
	Over current	200% of Rated current	Fusing Time≤1min
	Carrying Capacity	100% of rated current, 4hr	No Melting
Reliability performance	High temperature	100℃±5℃@250hr	Without deformation of case or excessive looseness of caps. Electrical characteristics shall be satisfied.
	High humidity	60℃±2℃@90%~95%@250hr	
	Keeping cold	-20℃±3℃ @ 500hr	
	Pulse	5×In（In = rated current）A @ 25℃ @on 5ms/off 995 ms，100,000 cycles	No operating;
Mounting Characteristics	Solder ability	Solder: Pb-free (Sn96.5/Ag3/Cu0.5[%]) Flux: 25wt％Rosin Ethanol solution Dipping depth: 2～2.5mm Temperature: 245±5℃ Dipping time: 3±0.5s Dipping and drawing speed: 25±2.5mm/s	A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed.
	Resistance to soldering heat	① Reflow soldering method Peak temp: 255℃±5℃ 5s 230℃±5℃ 30s At electrode temperature of the specimen.(Solder temperature) The specimen shall be passed through the reflow furnace with the condition shown in the above profile for 2times. The specimen shall be stored at standard atmospheric conditions for 24h after which the measurement shall be made. ② Soldiering iron method Bit temperature: 300±5℃ Application of soldering iron: 3±1s Apply the soldering iron to the electrode. The specimen shall be stored at standard atmospheric condition for 24h, after which the measurements shall be made	Without deformation of case or excessive looseness of caps. Electrical characteristics shall be satisfied.

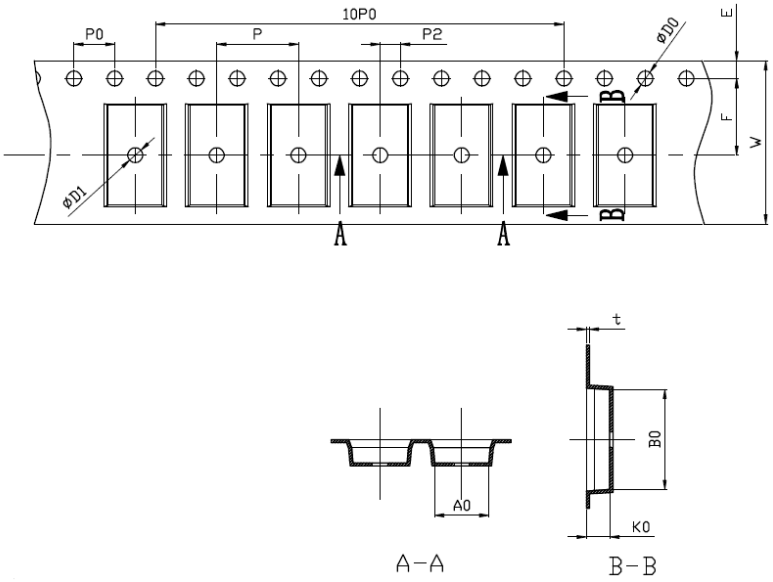
Electrical Characteristics is influenced by thermal capacity of PCB, parts, pattern width, and so on. Therefore you should check it on your PCB.

11. Packaging Data

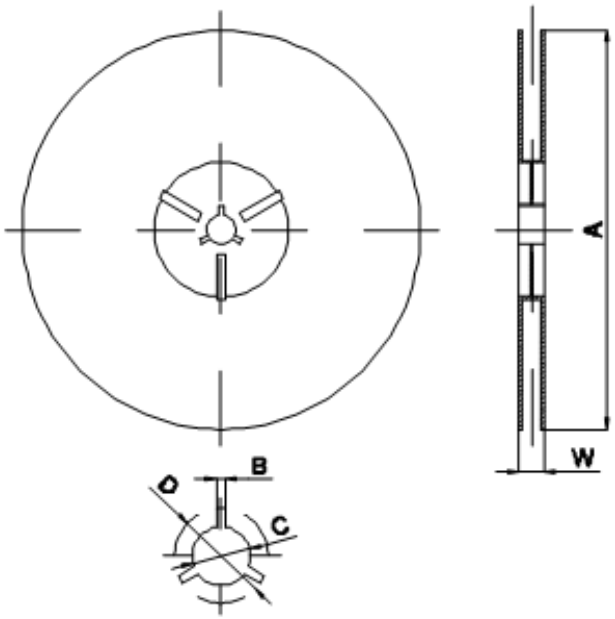
Package form is embossed tape packing.

11.1 Dimension of Tape and Reels

Code	（mm）
E	1.75±0.10
F	7.50±0.10
P2	2.00±0.1
D0	1.50+0.1/-0
D1	1.50+0.1/-0
P0	4.00±0.10
10P0	40.0±0.20
W	16.00±0.30
P	8.00±0.10
A0	5.30±0.10
B0	9.8±0.10
K0	2.3±0.10
t	0.30±0.05



Code	（mm）
A	330±1.0
B	2+0.5/-0
C	13±0.2
D	21±0.2
W	22.7±0.5

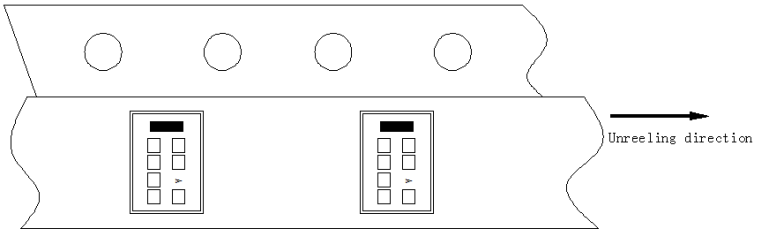


11.2 Packing Quantity

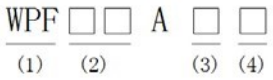
3000 pcs /reel.

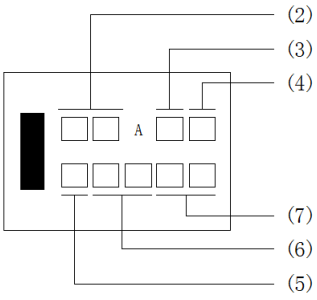
11.3 Direction of Taping

The direction shall be seen from the top cover tape side.



11.4 Marking requirements





(1) WPF: SCF/Way-on SCF protector;

(2) Rated current: 60A;

(3) Number of electric core string;

(4) Length width size code; K: 9.5×5.0mm; BS：business code;

(5) Year: I: 2023; J: 2024; K: 2025; L: 2026; M: 2027……;

(6) Week of year: 01、02……52;

(7) Running number: 01、02…….

11.5 Label

The label contains the following content:

(1) manufacturer of trademark and factory address,

(2) product type,

(3) product batch number,

(4) quantity,

(5) shipment inspection personnel quality code,

(6) date of shipment,

(7) the certification mark.

12. Storage

The product must be stored in carton or plastic bag, in the conditions of ambient temperature of -10℃ to 40℃, RH of less than 60%, no radical temperature change, no direct sunshine, excessive vibration and shock.

The maximum storage period under above condition is 1 year after the delivery date.

Should avoid to store at where there is possibility of generating corrosive gas, such as salt mist, chlorine, hydrogen sulfide, ammonium, sulfide-oxidation, hydrogen chloride, etc.

13. Cautions for using product

(1) Can predict, the heat capacity of the test board current carrying capacity of a heater to work with the use of the relevant characteristics, therefore, before use to check the test board PCB you use, generally PCB plate heat capacity is bigger, the longer the action.

(2) The data referred to in this specification are tested under the PCB standard of UL(0.6t Glass Epoxy single-sided copper laminated), The characteristics influenced thermal capacity of PCB, on the machine before using the PCB to do the actual test to confirm the by.

(3) Ultrasonic-cleaning or immersion-cleaning and so on must not be done to SCF before and after mounted. When cleaning is done, flux on element would flow, and it would not be satisfied

its specification. Moreover, a similar influence happens when the product comes in contact with cleaning-solution. These products after cleaning will not be guaranteed..

(4) This product can not be used in resin packaging, packaging process of resin into the product, resulting in poor product performance.

(5) Please do not re-use of the product removed by the solder correction.

(6) Please confirm the connection with the three terminal circuit board , where in 1-3, 2-3 is used as a heating end with high resistance.

(7) This product is designed and used in conventional electronic devices, so we do not recommend the use of military, medical and other areas of other people and property may cause direct damage.

(8) If there is any doubt or change in the contents of this book, please inform us in advance so that both parties can reach an agreement.