SUNWAY R CHIP DATASHEET

Metal Alloy Resistor SP Series

Tolerance : ±0.5%/±1% /±2%/±5%
Sizes : 1206 /2512

SP SERIES DATASHEET

Type：1206/2512

Resistance range：1mR-500mR

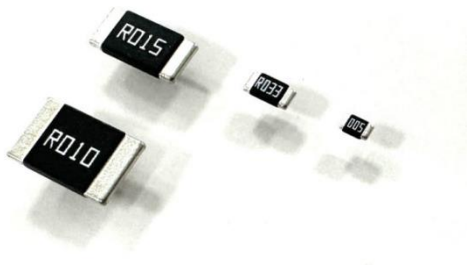
Edition：A0

Date：2025.01.10

REVISER	AUDITOR	RATIFIER
徐世华	孙中才	张磊

FEATURES

- Meet halogen free requirement
- Compliant with RoHS and REACH directive
- Suitable for wave soldering and reflow soldering
- Stable electrical performance and high reliability
- Superior mechanical and frequency characteristics
- High power，Low TCR

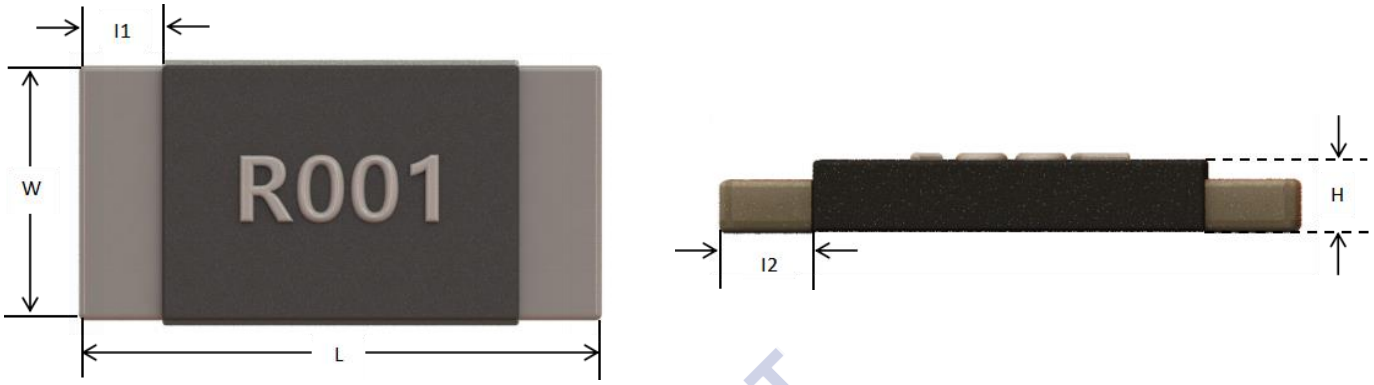


GLOBAL PART NUMBER

SP ① XXXX ② X ③ XXXX ④ X ⑤ XX ⑥ X ⑦ XX ⑧

NO.	Code	Implication	Explication
①	SP	Product series	Metal Alloy Resistor
②	XXXX	Product type	1206 /2512
③	X	Resistance accuracy	J=±5%，G=±2%，F=±1%，D=±0.5%
④	XXXX	Resistance	Example：R001 = 1mΩ，1U50=1.5mΩ
⑤	X	TCR	E=±50ppm， F=±100ppm ，J=±350ppm
⑥	XX	Power	1W ，3W
⑦	X	Control code	N：Lead Free，P：Total Lead Free
⑧	XX	Packing method	KH = 07" Embossed plastic tape，RH = 07" Paper tape，DD= Bulk

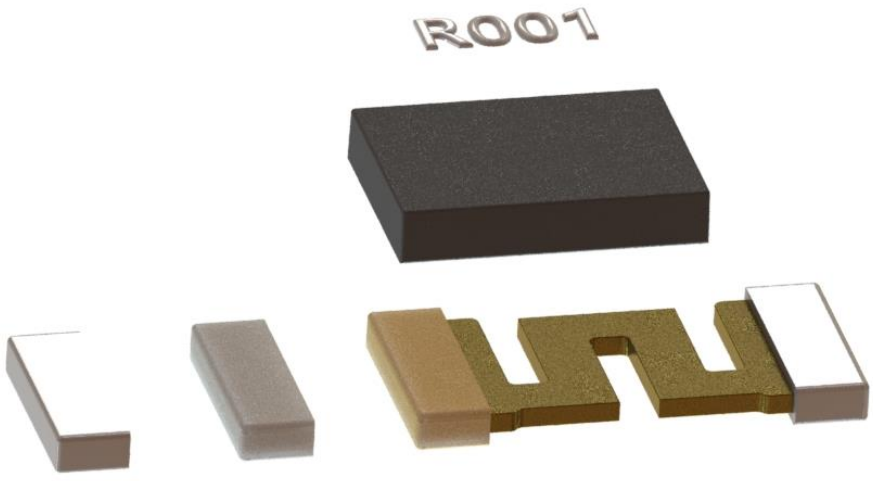
DIMENSION



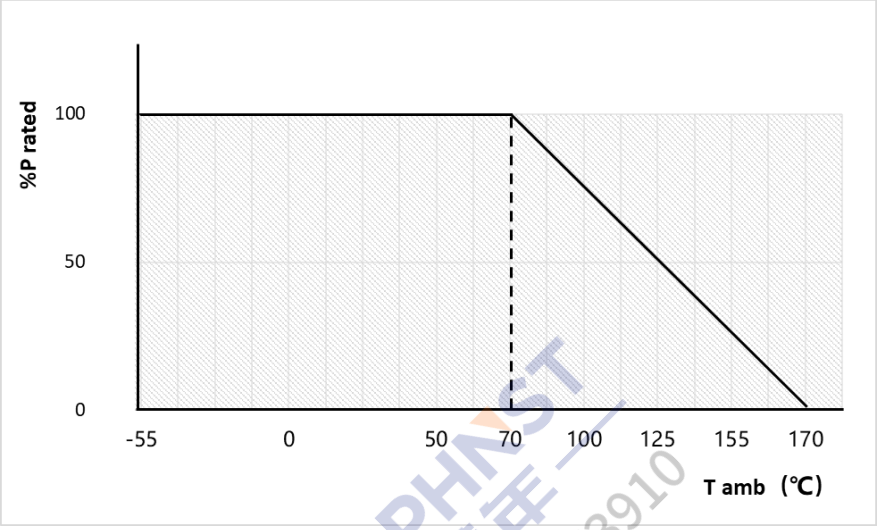
Unit: mm

Type	Resistance	L	W	H	I1	I2
SP1206	1mΩ≤R<6mΩ	3.20±0.20	1.60±0.20	0.70±0.20	0.60±0.20	0.60±0.20
SP1206	6mΩ≤R≤100mΩ	3.20±0.20	1.60±0.20	0.45±0.20	0.60±0.20	0.60±0.20
SP2512	1mΩ≤R≤500mΩ	6.40±0.20	3.20±0.20	0.80±0.20	1.00±0.20	1.00±0.20

CONSTRUCTION



DERATING CURVE



Maximum dissipation (P) in percentage of rated power as a function of the operating ambient temperature

ELECTRICAL CHARACTERISTICS

Type	Rated Power	Resistance range	TCR	Temperature range
		±0.5%、±1%、±2%、±5%		
SP1206	1W	1mΩ≤R<2mΩ	±350ppm/℃	-55℃~170℃
SP1206	1W	2mΩ≤R<3mΩ	±100ppm/℃	
SP1206	1W	3mΩ≤R≤100mΩ	±50ppm /℃	
SP2512	3W	1mΩ≤R < 2mΩ	±350ppm/℃	
SP2512	3W	2mΩ≤R≤500mΩ	±50ppm /℃	

RATED VOLTAGE

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula: $U=(P*R)^{1/2}$ or $I=(P/R)^{1/2}$

U= Continuous rated DC or AC (rms)working voltage (V)

I= Continuous rated DC or AC (rms)working current (A)

P= Rated power (W)

R= Resistance value (Ω)

MARKING

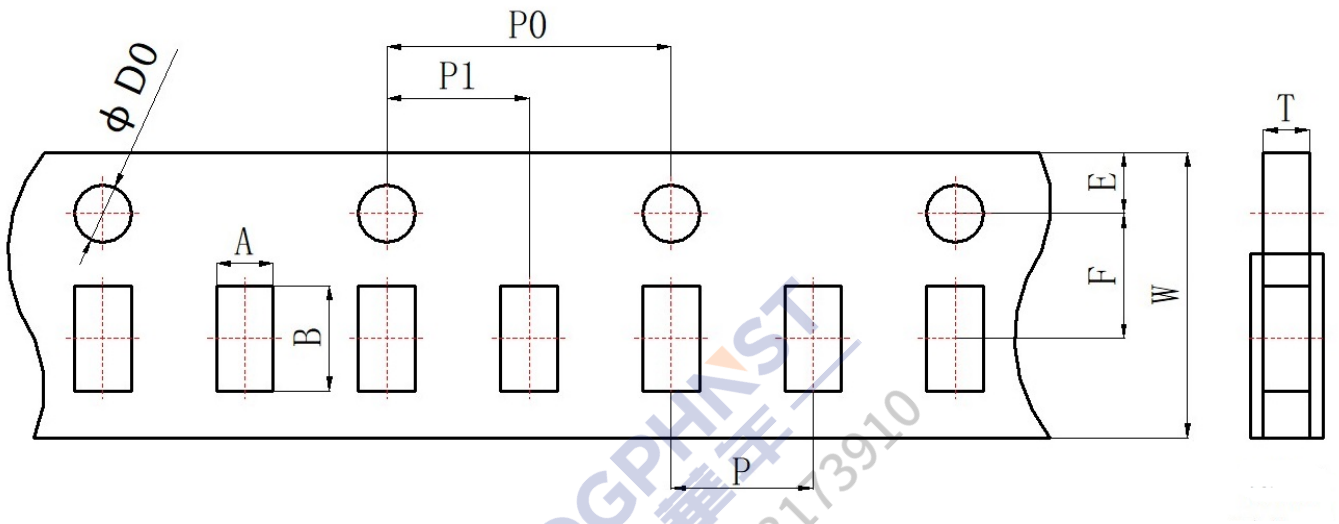
Type	Tolerance ±0.5%、±1%、±2%、±5%	Description
SP1206/2512		The "R" or "m" is used as a decimal point, The other 3 digits are significant; Example: R001=0.001Ω=1mΩ, 1R5m=0.0015Ω=1.5mΩ

RELIABILITY TEST

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Temperature Coefficient of Resistance (T.C.R.)	MIL-STD-202 Method 304	At +25/+125°C or +25/-55°C Formula: T.C.R= $\frac{R2-R1}{R1\times(t2-t1)}\times 10\text{^}6$ (ppm/C) Where t1=+25°C or specified room temperature t2=+25 °C or specified room temperature+100° C R1=resistance at reference temperature in ohms R2=resistance at test temperature in ohms	Refer to TCR specifications for electrical characteristics
STOL	IEC60115-1 4.13	2.5 times rated power, maintain 5s	▵R≤ ±1.0%
Humidity Bias	MIL-STD-202 Method 103	85℃±2℃, 85%±3%RH, 1000 hours,10% rated power	▵R ≤± 1.0%
Solder ability	J-STD-002 test B	235℃±5℃ tin tank, hold 3s±0.5s	At least 95% of surface area of electrode shall be covered with new solder
Resistance to Soldering Heat	MIL-STD-202 Method 210F Condition B	260℃±5℃ tin tank, hold for 10s±1s	▵R≤ ±1.0%
Board Flex	IEC 60115-1 4.33	Bending distance 2mm, hold time 60s±5s	▵R≤±0.5%
High Temperature Exposure	MIL-STD-202 Method 108A IEC 60068-2-2	170℃±2℃,1000H,Measurement at 4 hours after test conclusion	▵R≤ ±1.0%
Thermal Shock	MIL-STD-202 Method 107 IEC 60115-1 4.19	No load，1000 cycles，Lower Temperature -55℃，Maximum specified operating temperature but shall not exceed 155℃,Dwell Time 15min, Transition Time 20s maximum,Measurement at least 24 hours after test conclusion	▵R ≤± 1.0%
High Temperature Operating Life	MIL-STD-202 Method 108A IEC 60115-1 4.25.1	70℃±2℃, 1000 hours, rated power，1.5 hours on / 0.5 hours off	▵ R ≤± 1.0%

PACKING STYLE

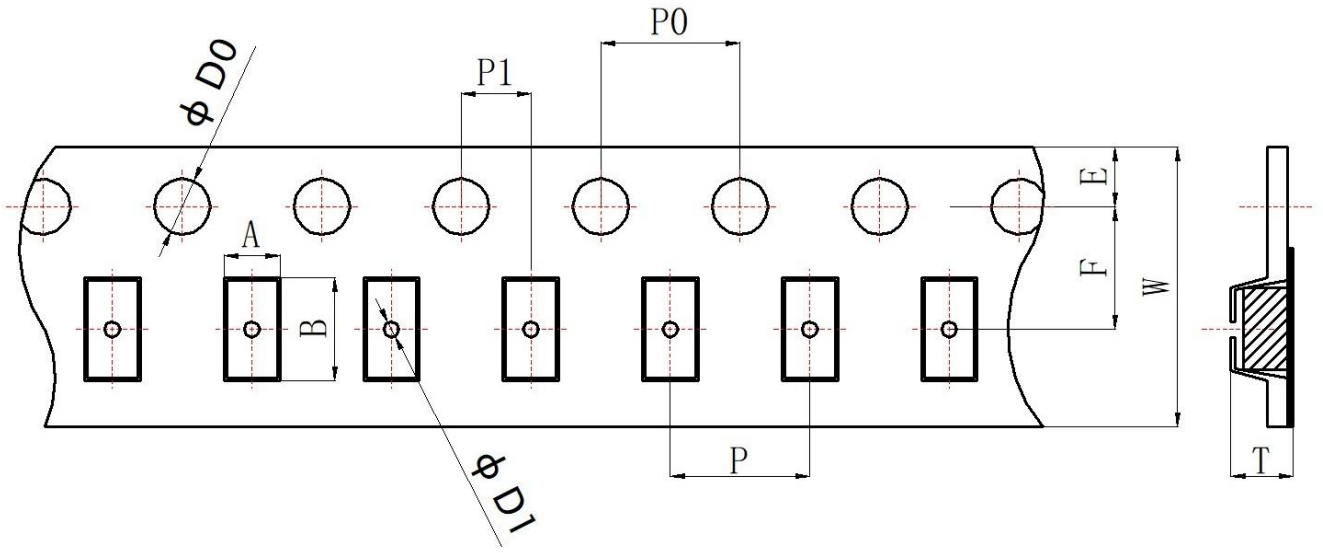
- **Dimension of Paper Taping ： (Unit：mm)**



Unit：mm

Type	A	B	W	F	E	P	P1	P0	D0	T
SP1206	2.0±0.15	3.6±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1/0	0.87±0.1

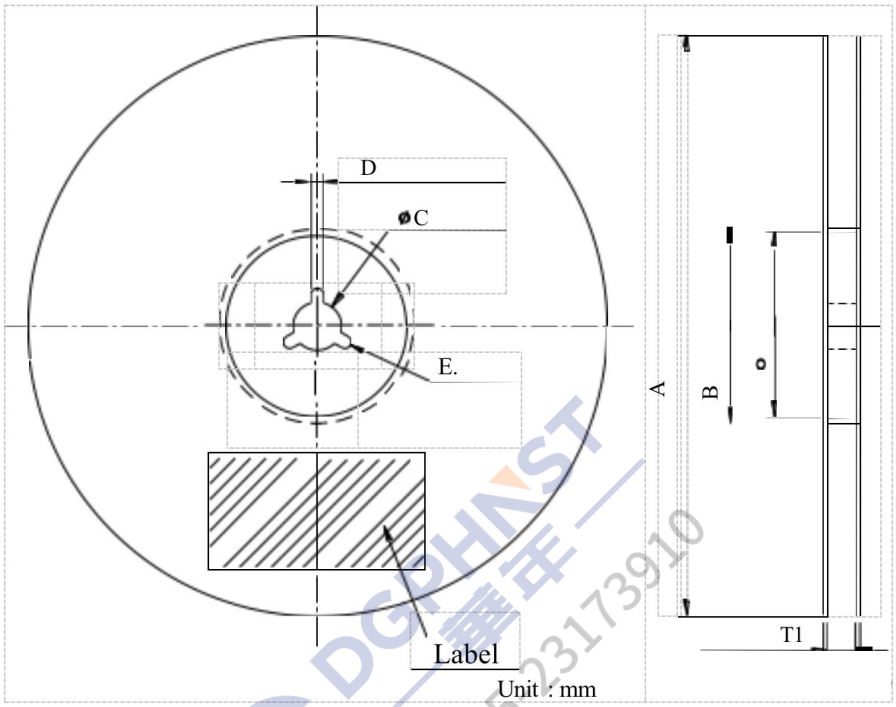
- **Dimension of Embossed Taping ： (Unit：mm)**



Unit：mm

Type	A	B	W	F	E	P	P1	P0	D0	T
SP2512	3.5±0.15	6.8±0.2	12.0±0.2	5.5±0.05	1.75±0.1	4.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1/0	1.23±0.1

- **Dimension of Reel: (Unit: mm)**



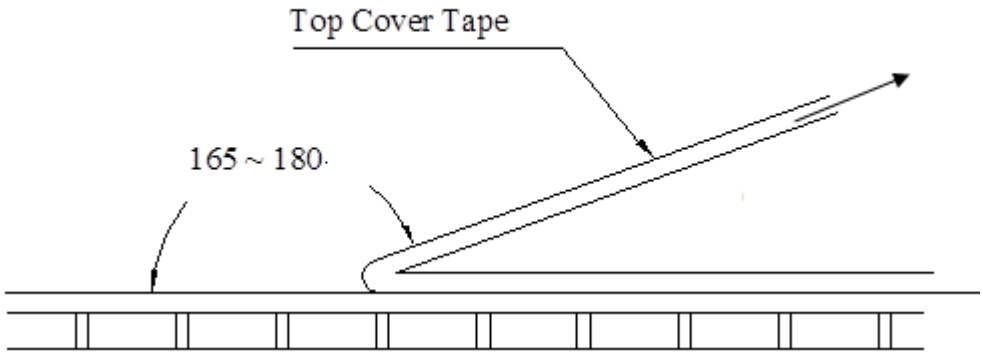
Unit: mm

Type	Reel	Qty	A	B	C	D	E	T1
SP1206	7"	5000Pcs	178±2.0	60±1.0	13±1.0	2.0±0.5	>22	9.0±0.3
SP2512	7"	4000Pcs	178±2.0	60±1.0	13±1.0	2.0±0.5	>22	13±0.3

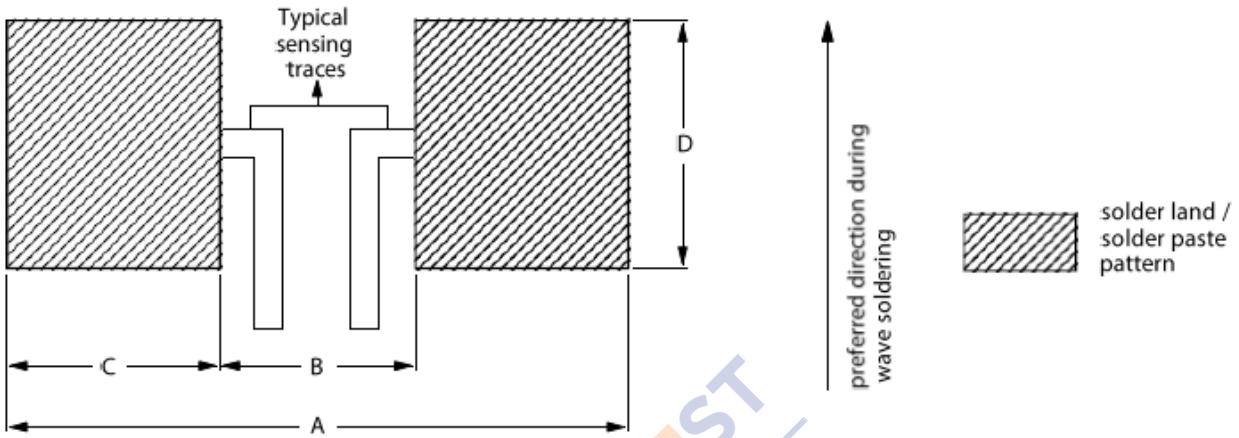
PEEL-OFF FORCE

- Peel-off forces of both paper/PE and embossed/blister tapes are in accordance with "IEC 60286-3".

Carrier width	Peeling force	Peeling rate	Peeling angle
8mm	0.1N ~1.0N	300±10mm/min	165°~180°
12mm ~56mm	0.1N ~1.3N		



FOOTPRINT DIMENSIONS



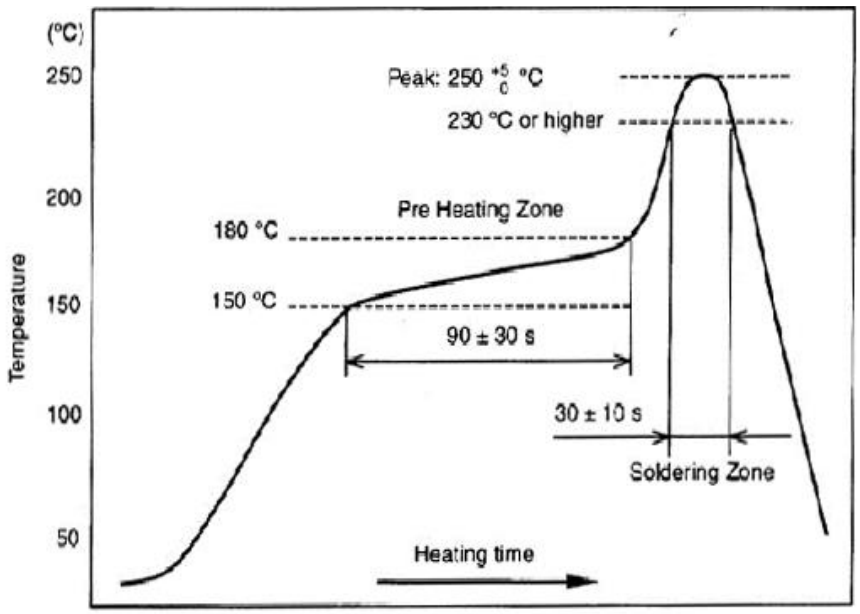
Single resistor chips recommended dimensions of footprints

Unit: mm

Type	A	B	C	D
SP1206	5.0	1.6	1.7	1.8
SP2512	8.3	4.1	2.1	4.0

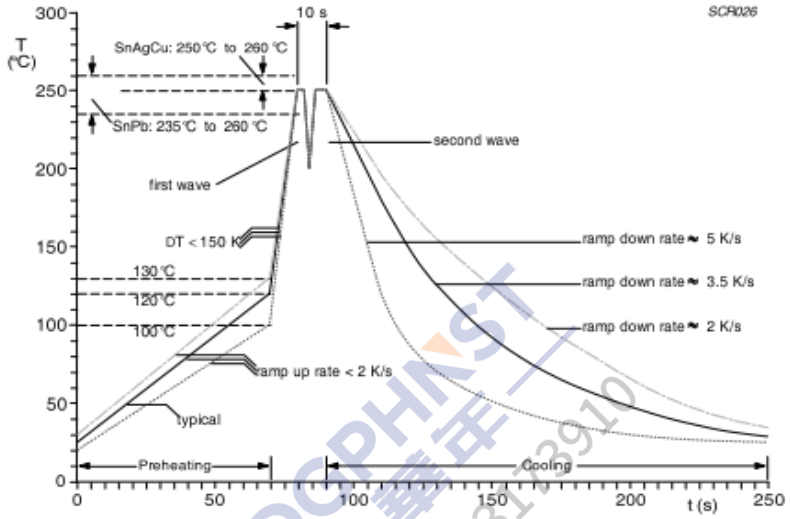
SOLDERING CONDITIONS

- **Lead Free IR Reflow Soldering Profile**



- **Lead Free Double-Wave Soldering Profile**

Typical values (solid line)
Process limits (dotted lines)
The resistors may be soldered twice in accordance with this method if desired



NOTICE

- RoHS compliant &REACH &Halogen free
- It can be stored for two years at 5~30℃ and 30%~75%.
- The product may be subject to transient overload and result in loss of function of the product. Please pay attention to your manufacturing process and storage to avoid the application of transient current higher than the product specification.
- Operation and handling precautions:

(1) Ensure that the resistance edge and protective layer are free from mechanical stress during operation.

(2) Caution should be exercised when the printed circuit board (PCB) is separated or fixed to the support body, as the bending of the printed circuit board (PCB) installation can cause mechanical stress on the resistor.

(3) The resistance should be used within the rated power range in the specification, especially when the power exceeds the rated value, it will be loaded on the resistance, which may cause machine damage due to temperature rise.

(4) If the resistor is likely to receive a large load (pulse wave) impact, the operating environment must be set before use.

(5) When using the product, please evaluate and confirm it in the actual installation state of your company, and fully consider the fail-safe design to ensure the safety of the system.

- If the client intends to use the Company's products in special circumstances or conditions (including but not limited to the following), it must recognize the product characteristics and information for the following or other application circumstances Depend on type.

(1) For use in high temperature and humidity environments;

(2) Exposure to sea wind or other corrosive gases: Cl_2, H_2S, NH_3, SO_2 and NO_2;

(3) Use in non-certified liquids, including water, oils, chemicals and organic solvents;

(4) Use non-certified resins or other coating materials to seal or coat our products;

(5) For cleaning after soldering, use a water-soluble cleaner to clean the residual flux in the product. Cleaning is recommended even if a no-cleans flux is used.

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTIONN
A0	2025.01.10	-	-First issue of this specification