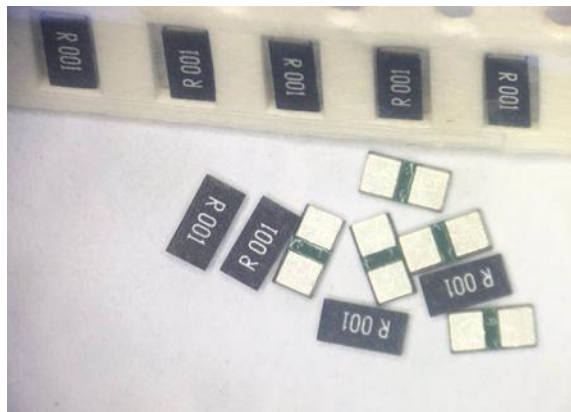




General

- Chip size from 0402 to 1206
- Resistance value from 1mΩ to 25mΩ
- Low thermal EMF
- Low TCR
- Lead free, RoHS compliant for global
- Applications and halogen free

Application

- Switching model power supply.
- Battery pack.
- Notebook, personal computer.
- Test Instrument.
- Power Amplifier.

Electrical Specifications

Type	Power Rating at 70℃(W)	Resistance Range (mΩ)	TCR (ppm/℃)	Resistance tolerance	Operating Temperature
0402	1/3	2.5≤R≤3	±150	±1%(F),±1.5%(E),±2%(G)	-55℃~+155℃
		5≤R≤25	±100	±1%(F)	
0603	1/3	2≤R≤5	±100	±1%(F)	
		6≤R≤20	±75	±1%(F)	
0805	1/2	2≤R≤5	±75	±1%(F)	
		6≤R≤20	±50	±1%(F)	
1206	1.0	1	±75	±1%(F),±1.5%(E)	
		2≤R≤4	±75	±1%(F)	
		5≤R≤20	±50	±1%(F)	

Part Number information

SMB 12 A 1 E R002 I
【1】 【2】 【3】 【4】 【5】 【6】 【7】

【1】 Series Name: SART Metal Foil PCB Type

【2】 Chip size: 12:1206 08:0805 06:0603 04:0402

【3】 Material Code:A:Alloy

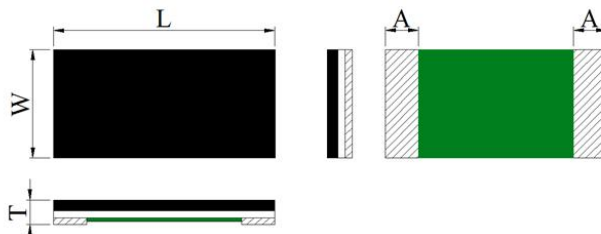
【4】 Power Code:1:1W A:1/2W K:1/3W

【5】 Resistance Tolerance: F:±1% E: ±1.5% G: ±2%

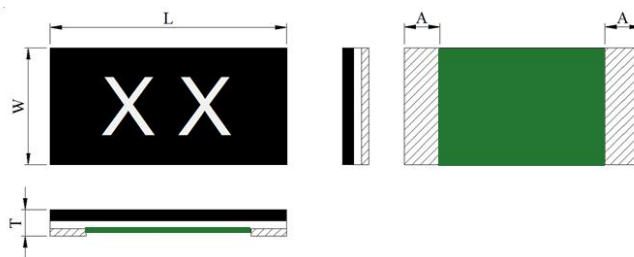
【6】 Resistance Code: R002=2mΩ 2M50=2.5mΩ

【7】 Packaging Code: T:Tape& Reel B:Bulk Pack

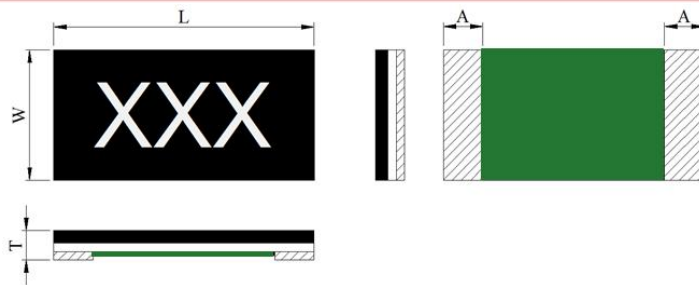
Dimensions



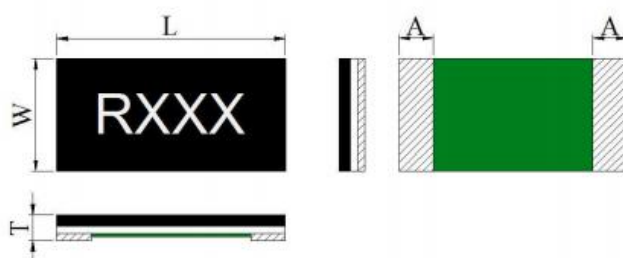
Type	Resistance Range (mΩ)	W (mm)	L (mm)	T (mm)	A (mm)
0402	$2.5 \leq R \leq 3$	0.55 ± 0.10	1.00 ± 0.10	0.30 ± 0.05	0.30 ± 0.10
	$5 \leq R \leq 25$	0.55 ± 0.10	1.00 ± 0.10	0.30 ± 0.05	0.23 ± 0.10



Type	Resistance Range (mΩ)	W (mm)	L (mm)	T (mm)	A (mm)
0603	2	0.80 ± 0.25	1.60 ± 0.25	0.40 ± 0.25	0.45 ± 0.20
	$2.5 \leq R \leq 3$	0.80 ± 0.25	1.60 ± 0.25	0.40 ± 0.25	0.35 ± 0.20
	$4 \leq R \leq 20$	0.80 ± 0.25	1.60 ± 0.25	0.40 ± 0.25	0.30 ± 0.20

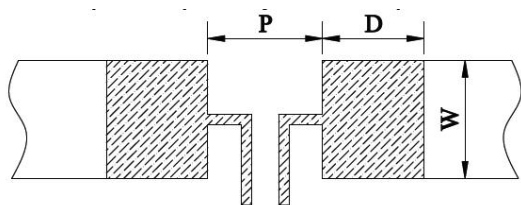


Type	Resistance Range (mΩ)	W (mm)	L (mm)	T (mm)	A (mm)
0805	2	1.25±0.25	2.00±0.25	0.40±0.25	0.60±0.20
	3≤R≤20	1.25±0.25	2.00±0.25	0.40±0.25	0.40±0.20



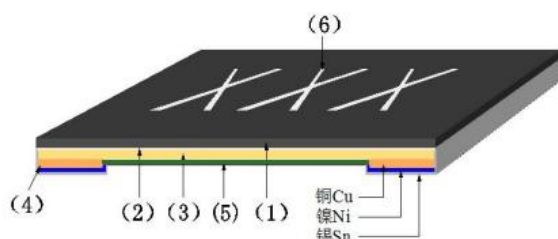
Type	Resistance Range (mΩ)	W (mm)	L (mm)	T (mm)	A (mm)
1206	1	1.60±0.25	3.20±0.25	0.40±0.25	1.25±0.30
	2	1.60±0.25	3.20±0.25	0.40±0.25	1.05±0.30
	3	1.60±0.25	3.20±0.25	0.40±0.25	0.80±0.30
	4≤R≤20	1.60±0.25	3.20±0.25	0.40±0.25	0.60±0.30

Recommended Land Patterns



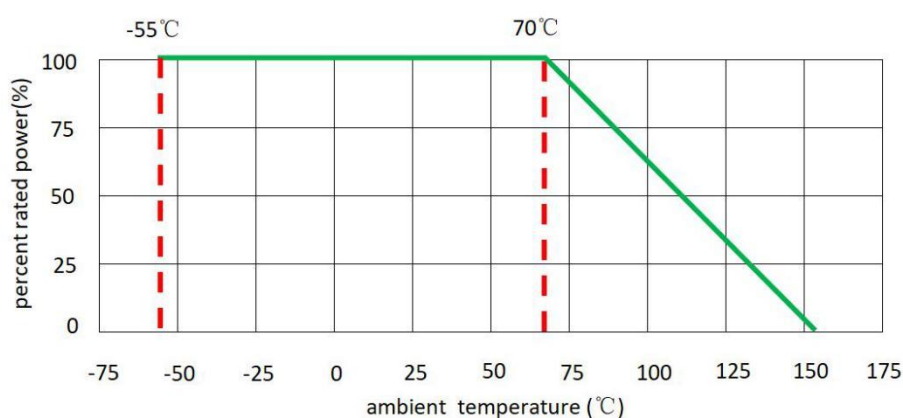
Type	Resistance Range (mΩ)	P (mm)	W (mm)	D (mm)
0402	2.5≤R≤3	0.35	0.60	0.60
	5≤R≤25	0.40	0.60	0.60
0603	2	0.38	0.92	1.41
	2.5≤R≤3	0.50	0.92	1.35
	4≤R≤20	0.60	0.92	1.30
0805	2	0.50	1.44	1.55
	3≤R≤20	0.80	1.44	1.40
1206	1	0.50	1.84	2.15
	2	0.60	1.84	2.10
	3≤R≤20	1.20	1.84	1.80

Materials



No.	Materials	No.	Materials
1	Epoxy substrate	4	Terminal electrode
2	Epoxy	5	Protective coating
3	Alloy	6	Marking

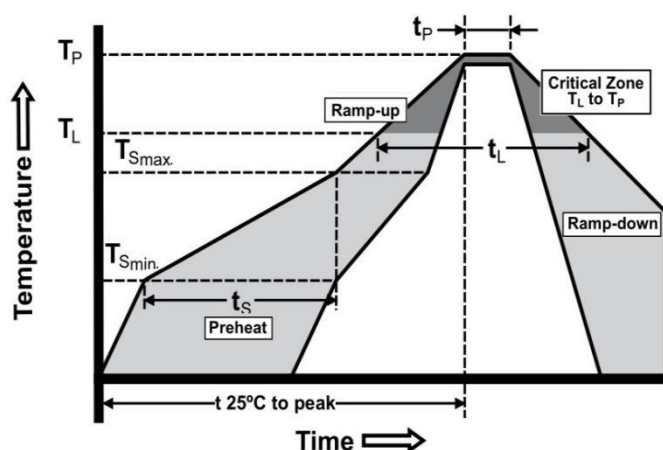
Power Derating Curve



Recommended Solder Curve

1. Infrared Reflow

- Temperature: 260°C
- Time: 5sec Max.
- Recommend Reflow profile:



Profile Feature	Pb-Free Assembly
Average Ramp-up Rate (T_{Smax} to T_p)	3°C/sec Max.
Preheat Temperature Min. (T_{Smin}) Temperature Max. (T_{Smax}) Time (T_{Smin} to T_{Smax})	150°C 200°C 60sec~120sec
Peak Temperature (T_p)	260°C
Time within 5°C of actual Peak Temperature (T_p)	5sec
Melting tin time (T_L)	20sec~30sec
Ramp-down Rate	6°C/sec Max.
Time 25°C to peak Temperature	8 min Max.

2. Hand Soldering

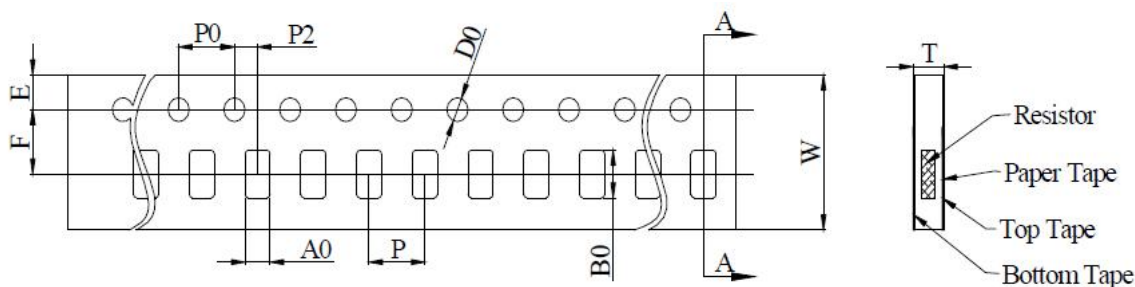
- Temperature: 350°C
- Time: 5sec Max.

Product Characteristics

Item	Test condition / Methods	Performance	Standard
Short Time Overload	0805 $2m\Omega \leq R \leq 10m\Omega$: $P = 5 \cdot P_r$; 1206 $1m\Omega \leq R \leq 10m\Omega$: $P = 5 \cdot P_r$; $T = 25^\circ\text{C} \pm 2^\circ\text{C}$, $t = 5\text{sec}$ Rest specifications: $P = 2.5 \cdot P_r$; $T = 25 \pm 2^\circ\text{C}$, $t = 5\text{sec}$	$ \Delta R \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.13
Temperature Coefficient of Resistance (TCR)	$\text{TCR} = (R - R_0) / R_0 (T_2 - T_1) \times 10^6$ $T_1 \quad T_2$ Test temperature: $+25^\circ\text{C} \sim +125^\circ\text{C}$	Refer to SART Spec	IEC 60115-1 4.8
Thermal Shock	$-55^\circ\text{C} (30\text{min}) / +155^\circ\text{C} (30\text{min})$, 100 cycles	$ \Delta R \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.19
Resistance to Solder Heat	$270^\circ\text{C} \pm 5^\circ\text{C}$, $20\text{sec} \pm 1\text{sec}$	$ \Delta R \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.18
Solderability	$245^\circ\text{C} \pm 5^\circ\text{C}$, $3.0\text{sec} \pm 0.5\text{sec}$	95% coverage Min.	IEC 60115-1 4.17
Load Life	1000 hours at rated power, $70^\circ\text{C} \pm 2^\circ\text{C}$, 1.5hours "ON", 0.5hours "OFF"	$ \Delta R \leq \pm(2\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.25
Moisture Load Life (60°C 、95%RH)	$T = 60^\circ\text{C} \pm 2^\circ\text{C}$; RH=95%; $V_{\text{test}} = V_{\text{max}}$; $t = 1.5\text{hours "ON", 0.5hours "OFF",}$ 1000hours	$ \Delta R \leq \pm(2\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.24
Bending test	Bending width 2mm, Epoxy thickness 1.6mm, Fulcrums distance 90mm	$ \Delta R \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.33
High Temp. Exposure	$155^\circ\text{C} \pm 2^\circ\text{C}$, 1000hours	$ \Delta R \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC60115-1 4.23
Low Temp. Storage	$-55^\circ\text{C} \pm 2^\circ\text{C}$, 1000hours	$ \Delta R \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC60115-1 4.23
Mechanical Shock	$a = 100\text{G}$, $t = 6\text{ms}$, 5 times shock	$ \Delta R \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC60115-1 4.21

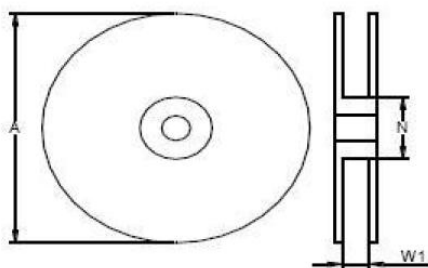
Packaging

1. Paper Tape Dimensions



Type	A0 (mm)	B0 (mm)	W (mm)	F (mm)	E (mm)
0402	0.65±0.10	1.10±0.10	8.00±0.30	3.50±0.10	1.75±0.10
0603	0.98±0.10	1.85±0.10	8.00±0.30	3.50±0.10	1.75±0.10
0805	1.55±0.10	2.30±0.10	8.00±0.30	3.50±0.10	1.75±0.10
1206	2.05±0.20	3.65±0.20	8.00±0.30	3.50±0.10	1.75±0.10
Type	P (mm)	P2 (mm)	P0 (mm)	D0 (mm)	T (mm)
0402	2.00±0.10	2.00±0.10	4.00±0.10	1.50±0.10	0.42±0.05
0603	4.00±0.10	2.00±0.10	4.00±0.10	1.50±0.10	0.60±0.05
0805	4.00±0.10	2.00±0.10	4.00±0.10	1.50±0.10	0.60±0.10
1206	4.00±0.10	2.00±0.10	4.00±0.10	1.50±0.10	0.60±0.10

2. Reel Dimensions

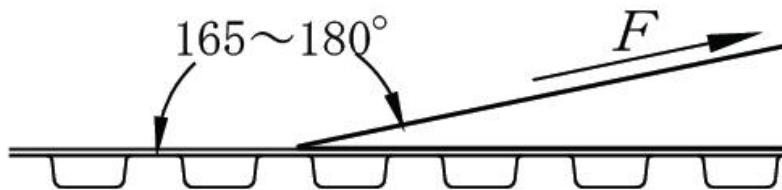


Type	A (mm)	N (mm)	W1 (mm)
0402	178.00±5.00	60.00±2.00	9.00±1.00
0603	178.00±5.00	60.00±2.00	9.00±1.00
0805	178.00±5.00	60.00±2.00	9.00±1.00
1206	178.00±5.00	60.00±2.00	9.00±1.00

3. Quantity of Package

Type	Quantities (PCS)
0402	10000
0603/0805/1206	5000

4. Peeling Test



F=Peeling Strength:0.1-1.0N(10~100gf)

Storage

- The ambient temperature shall be between 5°C~30°C.
- The relative humidity recommended for storage is between 25%RH~60%RH.
- Sealed plastic bags with desiccant shall be used to reduce the oxidation of the termination and shall only be opened prior to use.
- The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.