

### General

- Chip size from 0603 to 1206
- Resistance value from 2mΩ to 20mΩ
- 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°C (W)	Resistance Range (mΩ)	TCR (10 <sup>-6</sup> /°C)	Resistance tolerance	Operation Temp. Range
0603	0.3	2≤R≤5	±150	±1%(F)	-55°C~+155°C
		6≤R≤20	±100		
0805	0.5	2≤R≤5	±150		
		6≤R≤20	±100		
1206	1.0	2≤R≤5	±150		
		6≤R≤20	±100		

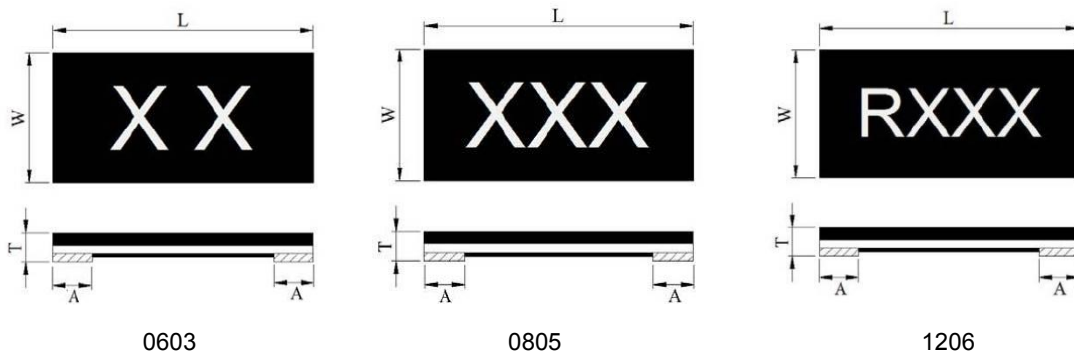
### Part Number information

**SMB 12 A 1 E R002 I**

**【1】 【2】 【3】 【4】 【5】 【6】 【7】**

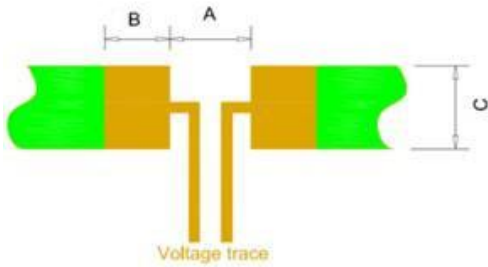
- 【1】** Series Name: SART Metal foil PCB Type
- 【2】** Chip size: 12:1206 08:0805 06:0603
- 【3】** Material Code:A:Alloy
- 【4】** Power Code:1:1W A:0.5W M:0.3W
- 【5】** Resistance Tolerance: F:±1%
- 【6】** Resistance Code: R002=2mΩ
- 【7】** Packaging Code: T: Tape& Reel B: Bulk Pack

### Dimensions



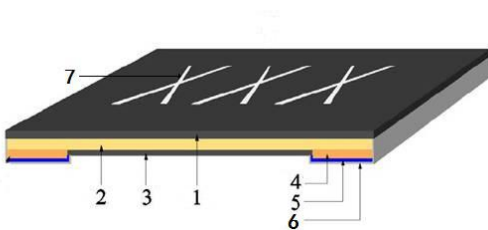
Type	Resistance Range (mΩ)	W (mm)	L (mm)	T (mm)	A (mm)
0603	2	0.80±0.25	1.60±0.25	0.40±0.25	0.45±0.20
	2.5<R≤3	0.80±0.25	1.60±0.25	0.40±0.25	0.35±0.20
	4≤R≤20	0.80±0.25	1.60±0.25	0.40±0.25	0.30±0.20
0805	2	1.25±0.25	2.00±0.25	0.40±0.25	0.60±0.20
	3≤R≤20	1.25±0.25	2.00±0.25	0.40±0.25	0.40±0.20
1206	2	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



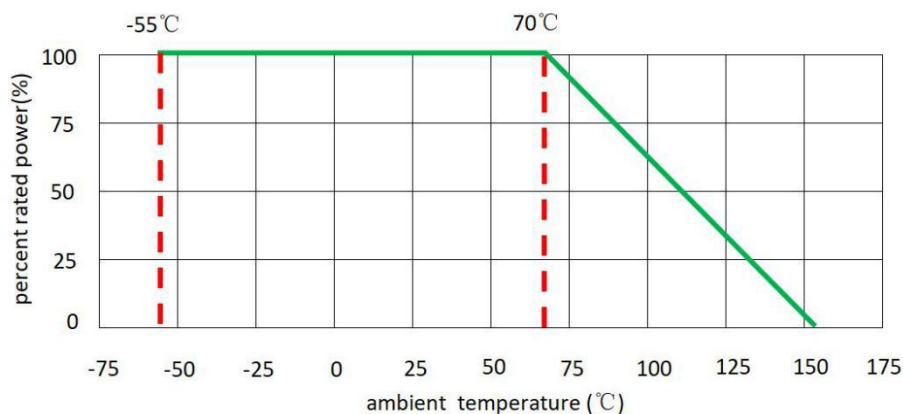
Type	Resistance range (mΩ)	A (mm)	B (mm)	C (mm)
0603	2	0.50	1.35	0.92
	2.5≤R≤20	0.60	1.30	0.92
0805	2	0.50	1.55	1.44
	3≤R≤20	0.80	1.40	1.44
1206	2	0.70	1.75	1.84
	3	1.00	1.90	1.84
	4≤R≤20	1.20	1.80	1.84

### Materials



No.	Material	No.	Material
1	Epoxy substrate	5	Nickel
2	Alloy	6	Tin
3	Protective coating	7	Marking
4	Copper	/	/

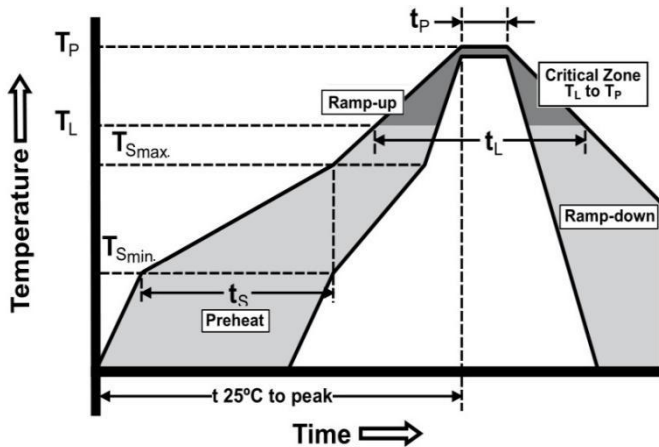
### Power Derating Curve



## Recommended Solder Curve

### 1. Infrared Reflow

- Temperature: 260°C
- Time: 5secMax.
- 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 ( $T_L$ )	20se~30sec
Ramp-down Rate	6°C/sec Max.
Time 25°C to peak Temperature	8 minutes Max.

### 2. Wave soldering

- Reservoir Temperature: 260°C
- Time in Reservoir: 10secMax.

### 3. Hand Soldering

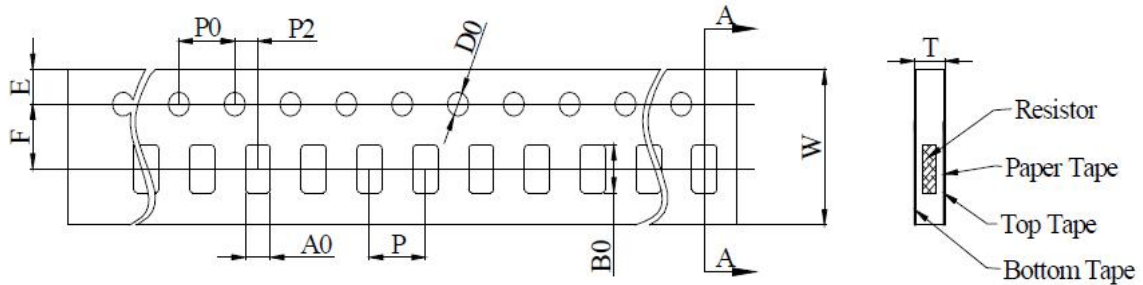
- Temperature: 350°C
- Time: 5secMax.

## Product Characteristics

Item	Test condition / Methods	Performance	Standard
Short Time Overload	$P = 2.5 \cdot P_r$ ; $T = 25 \pm 2^\circ\text{C}$ , $t = 5\text{sec}$	$ \Delta R  \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.13
Temperature Coefficient of Resistance (TCR)	$\text{TCR} = \frac{(R - R_0) / R_0}{T_2 - T_1} \times 10^6$ Test temperature: $+25^\circ\text{C} \sim +125^\circ\text{C}$	Refer to SART Spec	IEC 60115-1 4.8.4.2
Thermal Shock	$-55^\circ\text{C}$ 30min. $\rightarrow$ R.T. 3min. $\rightarrow$ $+150^\circ\text{C}$ 30min. $\rightarrow$ R.T. 3min, 100Cycles	$ \Delta R  \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.19
Resistance to Solder Heat	$275^\circ\text{C} \pm 5^\circ\text{C}$ , 20sec $\pm$ 1sec	$ \Delta R  \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.18
Solderability	$245^\circ\text{C} \pm 5^\circ\text{C}$ , 3sec $\pm$ 0.5sec	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", 0.5hour "OFF"	$ \Delta R  \leq \pm(2\% + 0.5\text{ m}\Omega)$	IEC 60115-1 4.25
Moisture Load Life (60°C、95%RH)	$V_{\text{test}} = V_{\text{max}}$ ; $T = 60^\circ\text{C} \pm 2^\circ\text{C}$ ; RH=95%; $t = 90\text{min ON}$ , 30min OFF, 1000h	$ \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	$170^\circ\text{C} \pm 2^\circ\text{C}$ , 1000h	$ \Delta R  \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC60115-1 4.25
Low Temp. Storage	$-55^\circ\text{C} \pm 2^\circ\text{C}$ , 1000h	$ \Delta R  \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC60115-1 4.25
Mechanical Shock	$a = 100\text{G}$ , $t = 11\text{ms}$ , 5 times shock	$ \Delta R  \leq \pm(1\% + 0.5\text{ m}\Omega)$	IEC60115-1 4.21

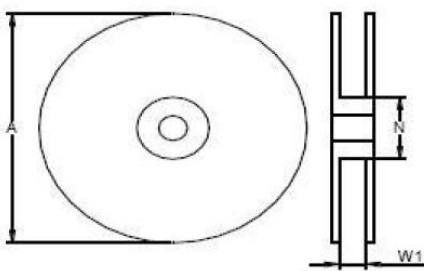
## Packaging

### 1. Embossed Tape Dimensions



Type	A0 (mm)	B0 (mm)	W (mm)	F (mm)	E (mm)
0603	1.18±0.20	1.98±0.20	8.00±0.30	3.50±0.10	1.75±0.10
0805	1.68±0.20	2.38±0.20	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)
0603	4.00±0.10	2.00±0.10	4.00±0.10	1.50±0.10	0.58±0.10
0805	4.00±0.10	2.00±0.10	4.00±0.10	1.50±0.10	0.58±0.20
1206	4.00±0.10	2.00±0.10	4.00±0.10	1.50±0.10	0.58±0.20

### 2. Reel Dimensions

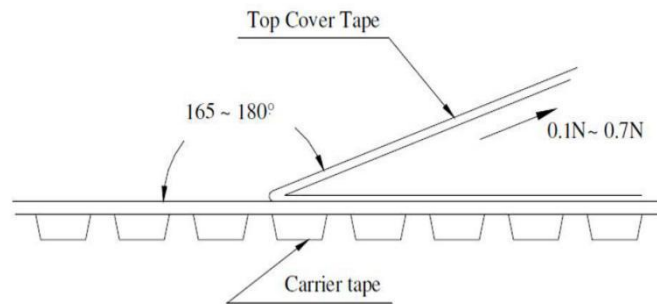


Type	A (mm)	N (mm)	W1 (mm)
0603	178.00±5.00	60.00±2.00	9.00±1.00
0805			
1206			

### 3. Quantity of Package

Type	0603	0805	1206
Quantity(pcs)	5000	5000	5000

#### 4. Peeling Test



### Storage

- The ambient temperature shall be between  $5^\circ\text{C} \sim 30^\circ\text{C}$ .
- 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.