

## General

- Chip size from 0603 to 2817
- Resistance value from 2mΩ to 700mΩ
- High power rating
- Low inductance 0.5nH to 5nH
- Low TCR
- Compatible with RoHS & Halogen free

## Application

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

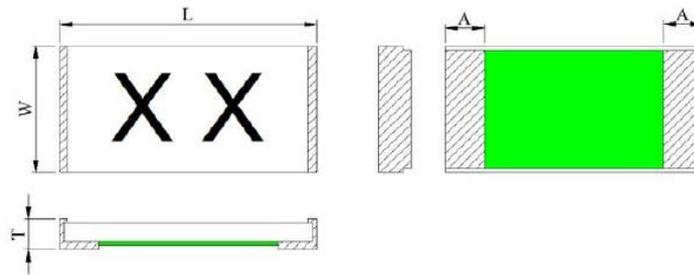
## Electrical Specifications

Type	Power Rating at 70°C(W)	Resistance Range (mΩ)	TCR (ppm/°C)	Resistance tolerance	Operating Temperature
0603	0.5	5~9	±75	±1%(F)	-55°C~+155°C
		10~100	±50	±0.5%(D),±1%(F)	
0805	0.75	3	±75	±1%(F),±1.5%(E),±2%(G)	
		4~500	±50	±0.5%(D),±1%(F)	
1206	0.5 1.0	3	±75	±0.5%(D),±1%(F),±1.5%(E),±2%(G)	
		4~700	±50	±0.5%(D),±1%(F)	
2010	1.5	2~3	±100	±1%(F),±1.5%(E),±2%(G)	
		4~9	±100	±1%(F)	
		10~700	±50	±0.5%(D),±1%(F)	
2512	2.0	2~3	±75	±1%(F),±1.5%(E),±2%(G)	
		4~700	±50	±0.5%(D),±1%(F)	
2817	5.0	2	±50	±0.5%(D),±1%(F)	
		3~15	±30	±0.5%(D),±1%(F)	

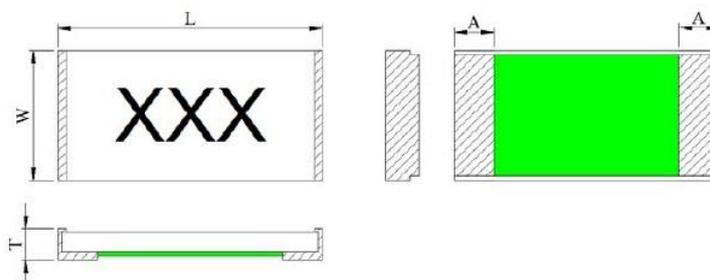
### Part Number Information

- |            |           |          |          |          |             |          |
|------------|-----------|----------|----------|----------|-------------|----------|
| <u>SMD</u> | <u>25</u> | <u>A</u> | <u>2</u> | <u>F</u> | <u>R003</u> | <u>T</u> |
| 【1】        | 【2】       | 【3】      | 【4】      | 【5】      | 【6】         | 【7】      |
- 【1】 Series Name: SART Metal Foil Type  
 【2】 Chip size: 06: 0603 08: 0805 12: 1206 20: 2010 25: 2512 28: 2817  
 【3】 Material Code: A:Alloy  
 【4】 Power Code: A: 0.5W B: 1.5W C: 0.75W 1: 1W 2: 2W 5: 5W  
 【5】 Resistance Tolerance: F:  $\pm 1\%$  D:  $\pm 0.5\%$  E:  $\pm 1.5\%$  G:  $\pm 2\%$   
 【6】 Resistance Code: R002 = 2m $\Omega$  4M50=4.5m $\Omega$  R050 = 50m $\Omega$  R200 = 200m $\Omega$   
 【7】 Packaging Code: T:Tape& Reel B: Bulk Pack

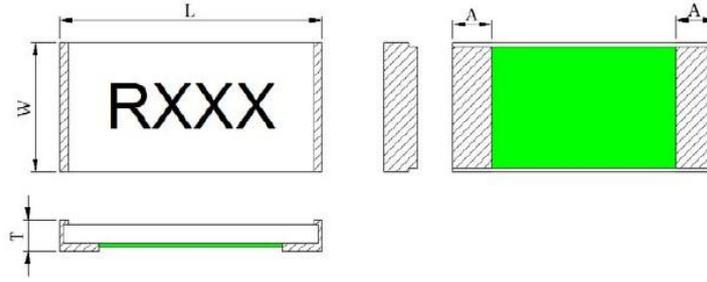
### Dimensions



Type	Resistance Range (m $\Omega$ )	L (mm)	W (mm)	T (mm)	A (mm)
0603	5	1.70 $\pm$ 0.20	0.90 $\pm$ 0.20	0.65 $\pm$ 0.20	0.50 $\pm$ 0.20
	6~100	1.70 $\pm$ 0.20	0.90 $\pm$ 0.20	0.65 $\pm$ 0.20	0.40 $\pm$ 0.20

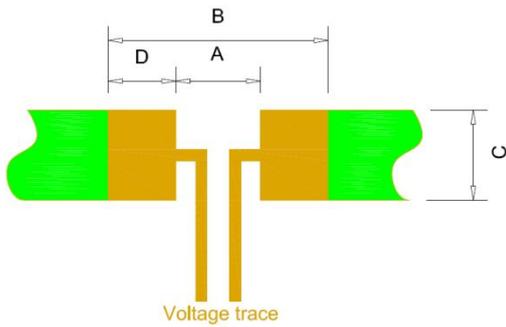


Type	Resistance Range (m $\Omega$ )	L (mm)	W (mm)	T (mm)	A (mm)
0805	3	2.10 $\pm$ 0.20	1.35 $\pm$ 0.20	0.65 $\pm$ 0.20	0.65 $\pm$ 0.20
	4~500	2.10 $\pm$ 0.20	1.35 $\pm$ 0.20	0.65 $\pm$ 0.20	0.50 $\pm$ 0.20



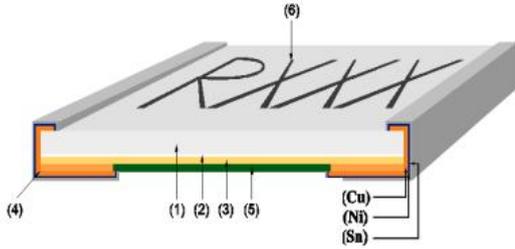
Type	Resistance Range (mΩ)	L (mm)	W (mm)	T (mm)	A (mm)
1206	3~700	3.30±0.20	1.70±0.20	0.65±0.20	0.68±0.30
2010	2~3	5.10±0.20	2.60±0.20	0.65±0.20	2.10±0.30
	4~700	5.10±0.20	2.60±0.20	0.65±0.20	0.70±0.30
2512	2	6.40±0.30	3.20±0.30	0.65±0.20	2.80±0.30
	3	6.40±0.30	3.20±0.30	0.65±0.20	2.60±0.30
	4~700	6.40±0.30	3.20±0.30	0.65±0.20	1.05±0.30
2817	2~3	7.10±0.30	4.30±0.30	0.80±0.20	2.50±0.30
	4~15	7.10±0.30	4.30±0.30	0.80±0.20	1.00±0.30

### Recommended Land Patterns



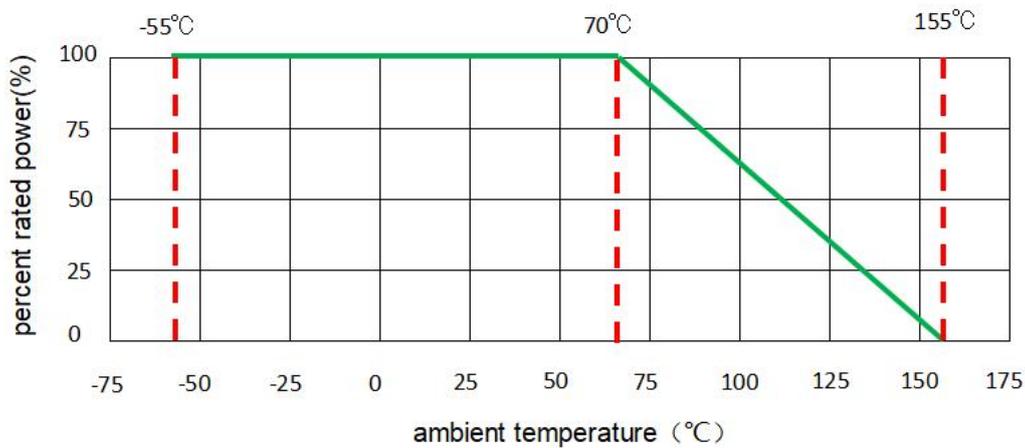
Type	Resistance Range (mΩ)	A (mm)	B (mm)	C (mm)	D (mm)
0603	5	0.50	3.20	0.92	1.35
	6~100	0.60	3.20	0.92	1.30
0805	3	0.50	3.60	1.44	1.55
	4~500	0.80	3.60	1.44	1.40
1206	3~700	1.20	4.80	1.84	1.80
2010	2~3	0.70	8.00	2.88	3.65
	4~700	2.70	8.00	2.88	2.65
2512	2	0.60	9.30	3.57	4.35
	3	0.90	9.30	3.57	4.20
	4~700	3.10	9.30	3.57	3.10
2817	2~3	1.50	9.10	4.80	3.80
	4~15	4.50	9.10	4.80	2.30

## Materials



No.	Materials	No.	Materials
1	Ceramic	4	Cu, Ni, Sn
2	Epoxy	5	Coating Epoxy
3	Cu-Alloy	6	Marking Epoxy

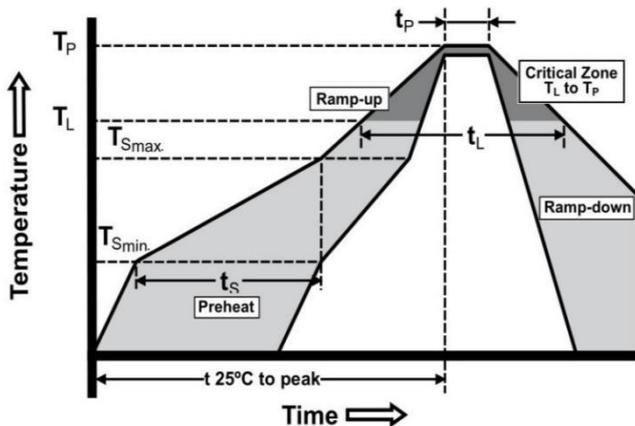
## Temperature Derating Curve



## Recommended Solder Curve

### 1. Infrared Reflow

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



### 2. Wave soldering

- Reservoir Temperature: 260°C
- Time in Reservoir: 10s Max

### 3. Hand Soldering

- Temperature: 350°C
- Time: 5s Max.

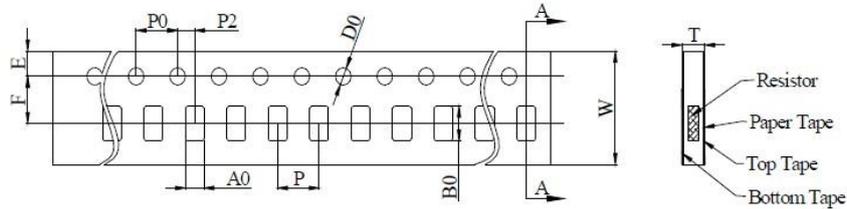
Profile Feature	Pb-Free Assembly
Average Ramp-up Rate (T <sub>Smax</sub> to t <sub>p</sub> )	3°C/s Max.
Preheat Temperature Min.(T <sub>Smin</sub> ) Temperature Max.(T <sub>Smax</sub> ) Time(T <sub>Smin</sub> to T <sub>Smax</sub> )	150°C 200°C 60s~120s
Peak Temperature(T <sub>P</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	20s
Liquidous temperature (T <sub>L</sub> )	217°C
Time at liquidous (t <sub>L</sub> )	60s~150s
Ramp-down Rate	6°C/s Max
Time 25°C to peak Temperature	8min Max

### Product Characteristics

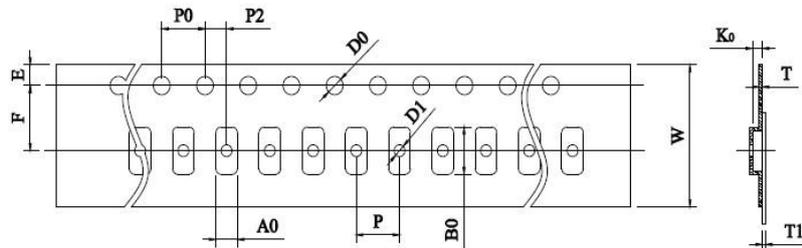
Item	Test condition / Methods	Performance	Standard
Short Time Overload	0603/0805/1206/2512 $R \leq 10m\Omega$ ; $P=5*Pr$ ; $T=25^{\circ}C \pm 2^{\circ}C$ , $t = 5sec$ Rest specifications: $P=2.5*Pr$ ; $T=25^{\circ}C \pm 2^{\circ}C$ , $t = 5sec$	$ \Delta R  \leq \pm(1\%+0.5m\Omega)$	IEC60115-1 4.13
Temperature Coefficient of Resistance (TCR)	$TCR = \frac{R-R_0}{R_0(T_2-T_1)} \times 10^6$ $\frac{T_1}{T_2}$ 2817 test temperature: $+25^{\circ}C \sim +85^{\circ}C$ $+25^{\circ}C \sim +125^{\circ}C$ Rest test temperature: $+25^{\circ}C \sim +125^{\circ}C$	Refer to SART Spec	IEC60115-1 4.8
Thermal Shock	$-55^{\circ}C(30min)/+155^{\circ}C(30min)$ , 100 cycles	$ \Delta R  \leq \pm(1\%+0.5m\Omega)$	IEC60115-1 4.19
Resistance to Solder Heat	$275^{\circ}C \pm 5^{\circ}C$ , 20sec $\pm$ 1sec	$ \Delta R  \leq \pm(1\%+0.5m\Omega)$	IEC60115-1 4.18
Solderability	$245^{\circ}C \pm 5^{\circ}C$ , 3.0sec $\pm$ 0.5sec	95% coverage Min.	IEC60115-1 4.17
Load Life	$70^{\circ}C \pm 2^{\circ}C$ , 1000 hours, at rated power 1.5hours "ON", 0.5hours "OFF"	$ \Delta R  \leq \pm(2\%+0.5m\Omega)$	IEC60115-1 4.25.1
Moisture Load Life (60°C、95%RH)	$T = 60^{\circ}C \pm 2^{\circ}C$ ; RH=95%; $V_{test} = V_{max}$ . $t = 90min$ ON, 30min OFF, 1000hours	$ \Delta R  \leq \pm(2\%+0.5m\Omega)$	IEC60115-1 4.24
Bending test	Bending width 2mm, Epoxy thickness 1.6mm, Fulcrums distance 90mm	$ \Delta R  \leq \pm(1\%+0.5m\Omega)$	IEC60115-1 4.33
High Temp. Exposure	$T = +155^{\circ}C \pm 2^{\circ}C$ ; $t = 1000$ hours	$ \Delta R  \leq \pm(1\%+0.5m\Omega)$	IEC60115-1 4.25
Low Temp. Storage	$T = -55^{\circ}C \pm 2^{\circ}C$ ; $t = 1000$ hours	$ \Delta R  \leq \pm(1\%+0.5m\Omega)$	IEC60115-1 4.25
Mechanical Shock	$a = 100G$ , $t = 6msec$ , 5 times shock	$ \Delta R  \leq \pm(1\%+0.5m\Omega)$	IEC60115-1 4.21

### Packaging

#### 1. Tape Packaging Dimensions

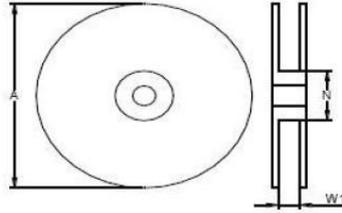


Type	A0 (mm)	B0 (mm)	W (mm)	F (mm)	E (mm)	T (mm)
0603	1.10±0.10	1.90±0.10	8.00±0.30	3.50±0.10	1.75±0.10	0.75±0.10
0805	1.55±0.10	2.30±0.10	8.00±0.30	3.50±0.10	1.75±0.10	0.87±0.10
1206	2.05±0.20	3.65±0.20	8.00±0.30	3.50±0.10	1.75±0.10	0.87±0.10
Type	P (mm)	P0 (mm)	P2 (mm)	D0 (mm)	/	/
0603	4.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	/	/
0805	4.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	/	/
1206	4.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	/	/



Type	A0 (mm)	B0 (mm)	W (mm)	F (mm)	E (mm)	T (mm)
2010	2.85±0.20	5.45±0.20	12.00±0.30	5.50±0.10	1.75±0.10	0.25±0.10
2512	3.40±0.20	6.75±0.20	12.00±0.30	5.50±0.10	1.75±0.10	0.25±0.10
2817	4.60±0.20	7.50±0.20	12.00±0.30	5.50±0.10	1.75±0.10	0.25±0.10
Type	P (mm)	P0 (mm)	P2 (mm)	D0 (mm)	T1 (mm)	K0 (mm)
2010	4.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	0.1 Max.	0.80±0.20
2512	4.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	0.1 Max.	1.00±0.20
2817	8.00±0.10	4.00±0.10	2.00±0.10	1.50±0.10	0.1 Max.	1.00±0.20

### 2. Reel Dimensions

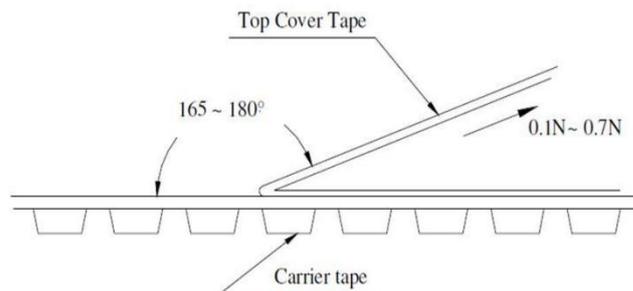


Type	A (mm)	N (mm)	W1 (mm)
0603	178.00±5.00	60.00±2.00	9.00±1.00
0805	178.00±5.00	60.00±2.00	9.00±1.00
1206	178.00±5.00	60.00±2.00	9.00±1.00
2010	178.00±5.00	60.00±2.00	13.00±1.00
2512	178.00±5.00	60.00±2.00	13.00±1.00
2817	178.00±5.00	60.00±2.00	13.00±1.00

### Quantity of Package

Type	Quantities (PCS)
0603/0805/1206	5000
2010/2512	4000
2817	2000

### Peeling Test



### Storage

- The ambient temperature shall 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.