

### General

- Chip size from 0603 to 2512
- Resistance value from 2mΩ to 200mΩ
- 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

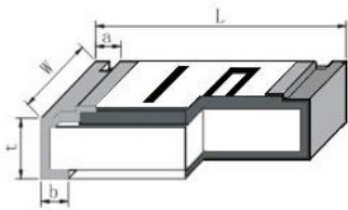
Type	Power Rating at 70°C(W)	Resistance Range(mΩ)	TCR (ppm/°C)	Resistance tolerance	Operation Temp. Range
0603	1/2	5 ≤ R < 10	±200	±0.5%(D) ±1%(F) ±2%(G) ±5%(J)	-55°C ~ +170°C
		10 ≤ R ≤ 30	±100		
0805	1/2、3/4	3 ≤ R < 10	±100		
	1/2	10 ≤ R ≤ 47	±50		
1206	1/2、1	3 ≤ R < 10	±100		
		10 ≤ R ≤ 68	±50		
2010	1	3 ≤ R < 10	±100		
		10 ≤ R ≤ 100	±50		
2512	2	2	±200		
		3 ≤ R < 10	±100		
		10 ≤ R ≤ 100	±50		
	1	100 ≤ R ≤ 200	±50		

### Part Number Information

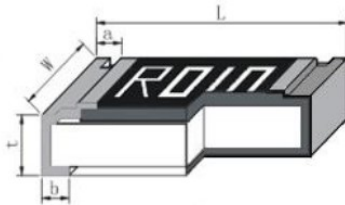
SMF 25 M 2 F R010 T  
**【1】 【2】 【3】 【4】 【5】 【6】 【7】**

- 【1】** Series Name: SART Metal Foil Type  
**【2】** Chip size:06:0603 08:0805 12:1206 20:2010 25:2512  
**【3】** Material Code: M:Mn-Cu  
**【4】** Power Code: A :0.5W C:0.75W 1:1W 2:2W  
**【5】** Resistance Tolerance: D:±0.5% F:±1% G:±2% J:±5%  
**【6】** Resistance Code:R010=10mΩ  
**【7】** Packaging Code: T: Tape& Reel B: Bulk Pack

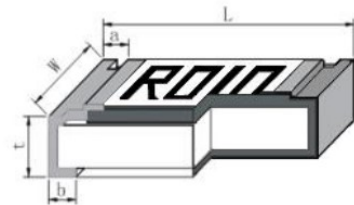
### Dimensions



(0603)



(0805 ≥ R010、1206、2512)

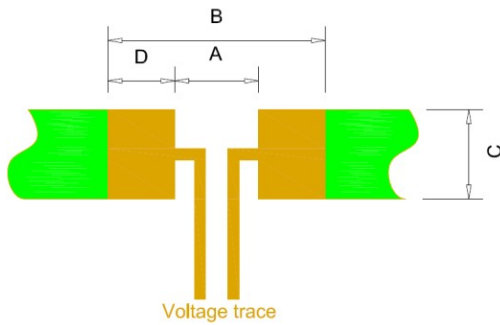


(0805 < R010、2010)

Type	Resistance Range(mΩ)	L (mm)	W (mm)	t (mm)	a (mm)	b (mm)
0603*	≥5	1.60±0.20	0.80±0.20	0.70±0.15	0.35±0.25	0.35±0.20
0805	3~4	2.00±0.20	1.25±0.20	0.70±0.15	0.40±0.25	0.70±0.30
	≥5					0.40±0.30
1206	3~4	3.20±0.20	1.60±0.20	0.75±0.15	0.50±0.30	0.90±0.30
	≥5					0.50±0.30
2010	3	5.00±0.20	2.50±0.20	0.75±0.20	0.60±0.30	1.60±0.30
	4~5					1.30±0.30
	>5					0.80±0.30
2512	2	6.40±0.20	3.20±0.20	0.75±0.20	0.90±0.30	2.30±0.30
	3					1.90±0.30
	4					1.70±0.30
	5~6					1.20±0.30
	7					1.10±0.30
	>7					0.90±0.30

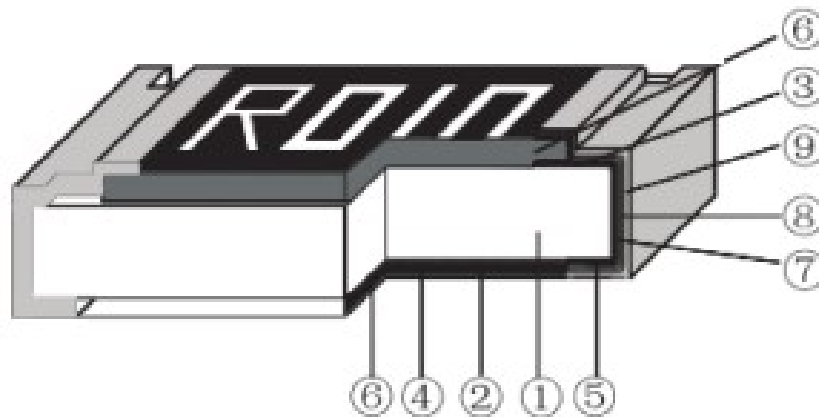
Remark\*: 0603 two-digit mark;

### Recommended Land Patterns



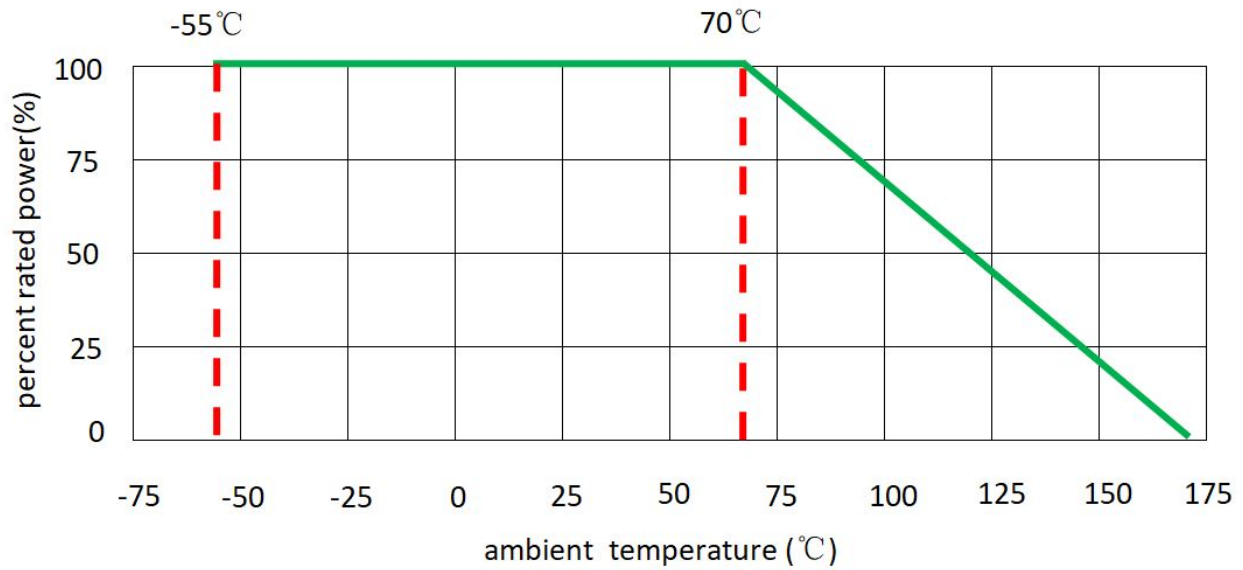
Type	Resistance Range (mΩ)	A (mm)	B (mm)	C (mm)	D (mm)
0603	5~30	0.60	2.80	1.00	1.10
0805	3~4	0.50	3.20	1.40	1.35
	5~47	0.80			1.20
1206	3~4	0.80	4.40	1.80	1.80
	5~68	1.80			1.30
2010	3~9	1.60	6.30	2.90	2.35
	10~100	2.70			1.80
2512	2~4	1.00	8.00	3.40	3.50
	5~200	3.80			2.10

### Materials



No.	Materials	No.	Materials
1	Ceramic Substrate	6	Secondary Overcoat
2	Alloy Plate	7	Edge Electrode
3	Top Electrode	8	Barrier Layer
4	Primary Overcoat	9	External Electrode
5	Cu Plating	/	/

## Power Derating Curve



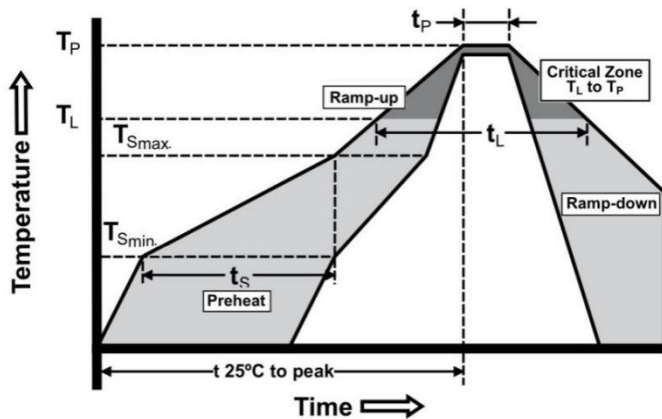
## Recommended Solder Curve

### 1. Infrared Reflow

Temperature: 260°C

Time: 5sec Max.

Recommend Reflow profile:



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T <sub>Smax</sub> to T <sub>p</sub> )	3°C/sec Max.
Preheat	150°C
Temperature Min(T <sub>Smin</sub> )	200°C
Temperature Max(T <sub>Smax</sub> )	60sec~120sec
Time(T <sub>Smin</sub> to T <sub>Smax</sub> )	260°C
Peak Temperature(T <sub>p</sub> )	5sec
Time within 5°C of actual Peak Temperature(T <sub>p</sub> )	20sec~30sec
Melting tin time(T <sub>L</sub> )	6°C/sec Max.
Ramp-Down Rate	8min Max.
Time 25°C to Peak Temperature	

### 2. Wave soldering

- Reservoir Temperature: 260°C
- Time in Reservoir: 10sec Max.

### 3. Hand Soldering

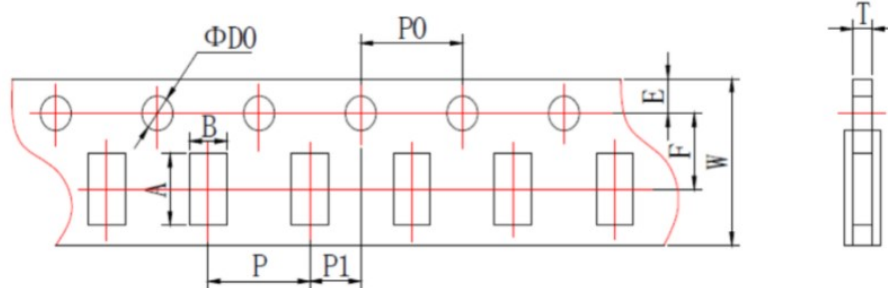
- Temperature: 350°C
- Time: 5sec Max.

### Product Characteristics

Item	Test condition/ Methods	Performance	Standard
Short Time Overload	1/2W、3/4W、1W: 5X rated power for 5 sec 2W: 4X rated power for 5 sec	$ \Delta R  \leq \pm 1\%$	IEC60115-1 4.13
Temperature Coefficient of Resistance (T.C.R.)	$TCR = \frac{R - R_0}{R_0(T_2 - T_1)} \times 10^6$ Test temperature: +25°C ~ +125°C	Refer to SART Spec	IEC60115-1 4.8
Endurance at 70°C	70°C ± 2°C, 1000 hours, rated current or limiting element current whichever is lower for 1.5hours "ON" / 0.5hours "OFF"	$ \Delta R  \leq \pm 1\%$	IEC60115-1 4.25.1
Damp Heat Steady State	40°C ± 2°C, 93% ± 3%RH, 1000 hours, rated current or limiting element current whichever is lower for 1.5hours "ON" / 0.5hours "OFF"	$ \Delta R  \leq \pm 1\%$	IEC60115-1 4.24
Rapid Change of Temperature	-55°C (30min)/normal temperature (5min)/+125°C (30min), 100 cycles	$ \Delta R  \leq \pm 1\%$	IEC60115-1 4.19
Solder ability	245°C ± 5°C, 3sec ± 0.3sec	95% coverage Min.	IEC60115-1 4.17
Resistance to Soldering Heat	270°C ± 5°C, 10sec ± 1.0sec	$ \Delta R  \leq \pm 1\%$	IEC60115-1 4.18
Endurance at Upper Category Temperature	170°C ± 2°C for 1000 hours	$ \Delta R  \leq \pm 1\%$	IEC60115-1 4.23
Bending test	Epoxy thickness 1.6mm, Fulcrums distance 90mm, Bending distance: 0603、0805、1206: 3mm; 2010、2512: 2mm; Duration: 60sec ± 5sec	$ \Delta R  \leq \pm 1\%$	IEC60115-1 4.33
Insulation Resistance	Apply DC 100V ± 15V between substrate and termination for 1minute, then check the insulation resistance	1000M Ω Min.	IEC 60115-1 4.6
Voltage Proof	Apply max. Overload voltage of AC RMS at a rate of approximately 100V/s between substrate and terminations for 60sec ± 5sec (1206: 400V)	No breakdown or flashover	IEC 60115-1 4.7
Component Solvent Resistance	IPA, 23°C ± 5°C, 10hours	$ \Delta R  \leq \pm 1\%$	IEC 60115-1 4.29

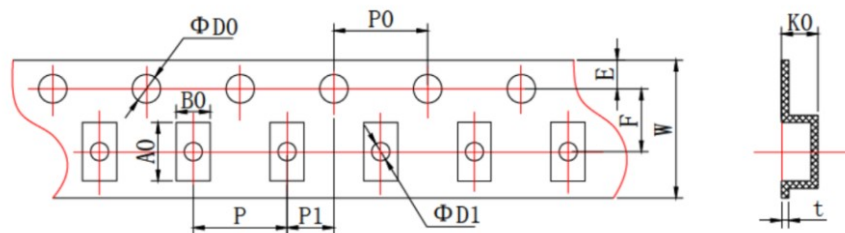
### Packaging

#### 1. Paper Tape Dimensions



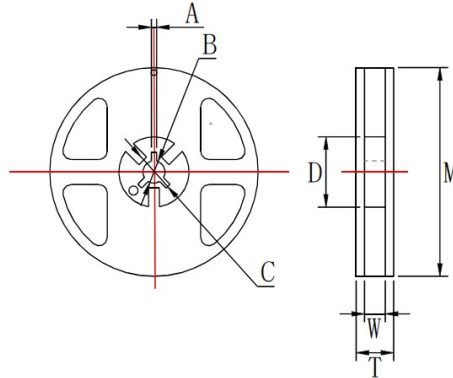
Type	A (mm)	B (mm)	W (mm)	F (mm)	E (mm)
0603	1.85±0.10	1.10±0.10	8.00±0.20	3.50±0.05	1.75±0.10
0805	2.35±0.10	1.65±0.10	8.00±0.20	3.50±0.05	1.75±0.10
1206	3.50±0.20	1.90±0.20	8.00±0.20	3.50±0.05	1.75±0.10
Type	P (mm)	P0 (mm)	P1 (mm)	∅D0 (mm)	T (mm)
0603	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10
0805	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.95±0.10
1206	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.95±0.10

#### 2. Embossed Tape Dimensions



Type	A0 (mm)	B0 (mm)	W (mm)	F (mm)	E (mm)	t (mm)
2010	5.50±0.15	2.82±0.15	12.00±0.10	5.50±0.10	1.75±0.10	0.25±0.05
2512	6.78±0.15	3.45±0.15	12.00±0.10	5.50±0.10	1.75±0.10	0.25±0.05
Type	P (mm)	P0 (mm)	P1 (mm)	∅D0 (mm)	∅D1 (mm)	K0 (mm)
2010	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10/-0	1.50±0.10	0.84±0.10
2512	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10/-0	1.50±0.10	1.00±0.10

### 3. Reel Dimensions

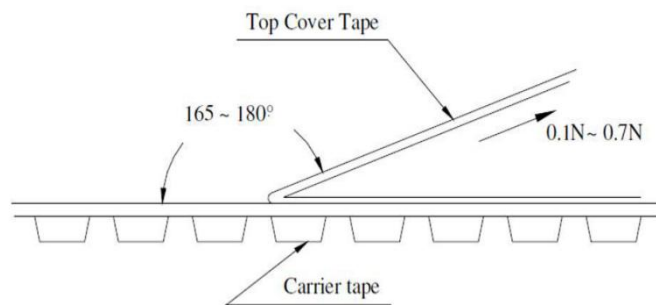


Type	M (mm)	W (mm)	T (mm)	A (mm)	B (mm)	C (mm)	D (mm)
0603 0805 1206	178.00±2.00	9.50±1.00	12.50±1.50	2.00±0.50	13.00±0.50	21.00±0.50	58.00±2.00
2010 2512	178.00±2.00	13.00±0.50	15.50±1.50	2.00±0.50	13.00±0.50	21.00±0.50	57.00±2.00

### 4. Quantity of Package

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

### 5. 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.