

## General

- Chip size from 1206 to 2512
- Resistance value from 1mΩ to 500mΩ
- Low thermal EMF
- Low inductance 0.5nH to 5nH
- 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
2512	2	1~500	±50	±0.5%(D)	-55°C~+170°C
	3	1~10		±1%(F)	
1206	1	2~30		±5%(J)	
				±0.5%(D)	
				±1%(F)	

## Part Number information

**SMR 25 M 2 F R010 I**

**【1】 【2】 【3】 【4】 【5】 【6】 【7】**

【1】 Series Name: SART Metal Current Sensing Chip Resistors

【2】 Chip size: 12:1206 25:2512

【3】 Material Code: M:MnCu N:NiCu S:CuMnSn

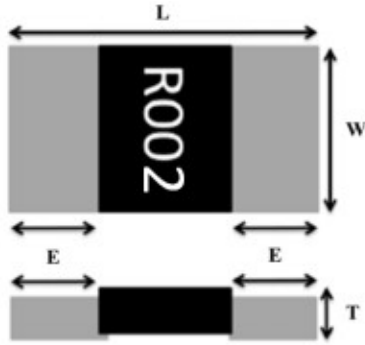
【4】 Power Code: 1:1W 2:2W 3:3W

【5】 Resistance Tolerance: F:±1% D:±0.5% J:±5%

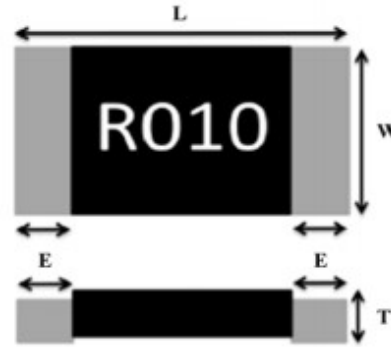
【6】 Resistance Code: R002=2mΩ、R010=10mΩ、2L50=2.5mΩ

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

## Dimensions

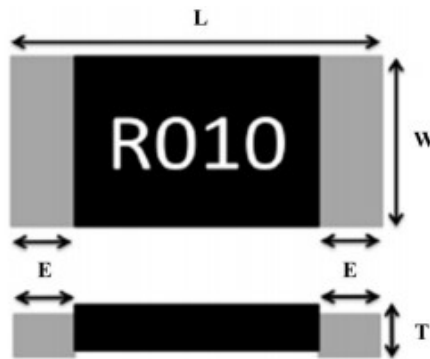


2512 (1~2mΩ)



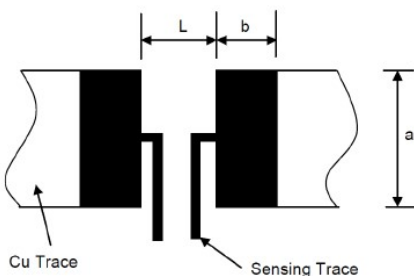
2512 (3~500mΩ)

Type	Resistance Range (mΩ)	L (mm)	W (mm)	T (mm)	E (mm)
2512	1~2	6.40±0.20	3.20±0.20	0.80±0.20	2.00±0.20
	3~500				0.90±0.20



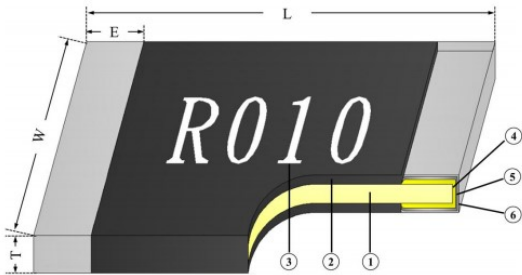
Type	Resistance Range (mΩ)	L (mm)	W (mm)	T (mm)	E (mm)
1206	2~30	3.20±0.20	1.60±0.20	0.70±0.20	0.5±0.30

## Recommended Land Patterns



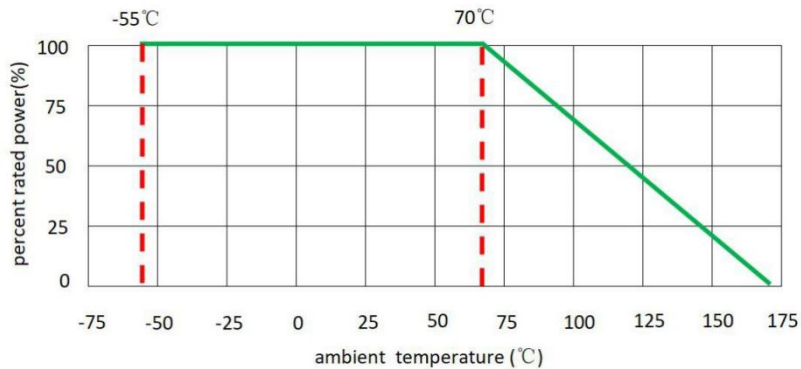
Type	Resistance Range (mΩ)	a (mm)	b (mm)	L (mm)
2512	1~2	4.00	3.10	1.80
	3~500	4.00	2.10	4.10
1206	2~30	1.80	1.70	1.60

## Materials



No.	Materials
1	Metal Alloy
2	Epoxy
3	Epoxy
4	Cu
5	Ni
6	Sn

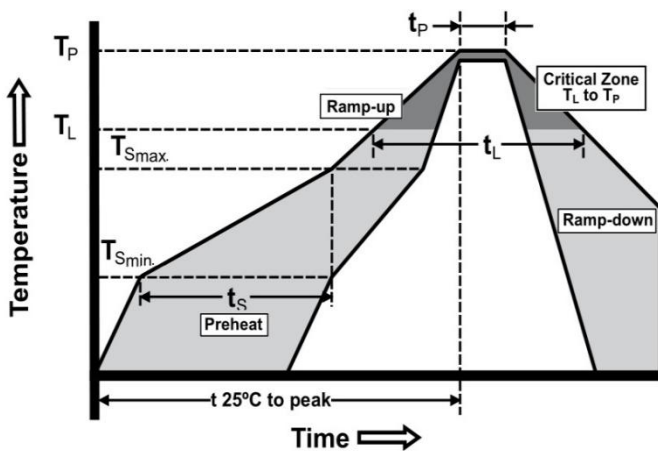
## Power Derating Curve



## Recommended Solder Curve

### 1. Infrared Reflow

- Temperature: 260°C.
- Time: 10 sec 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 Temperature Min.(T <sub>Smin</sub> ) Temperature Max.(T <sub>Smax</sub> ) Time(ts)(T <sub>Smin</sub> to T <sub>Smax</sub> )	150°C 200°C 60sec~120sec
Peak Temperature(T <sub>p</sub> )	260°C
Time (t <sub>p</sub> ) within 5°C of actual Peak Temperature(T <sub>p</sub> )	10sec Max
Liquidous temperature (T <sub>L</sub> )	217°C
Time at liquidous (T <sub>L</sub> )	60sec~150sec
Ramp-down Rate	6°C/sec Max.
Time 25°C to peak Temperature	8 min Max.

### 2. Wave soldering

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

### 3. Hand Soldering

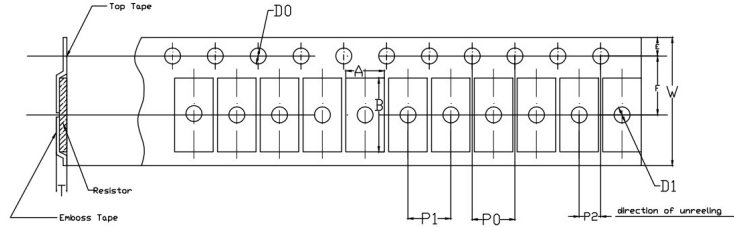
- Temperature: 350°C
- Time: 3sec Max.

### Product Characteristics

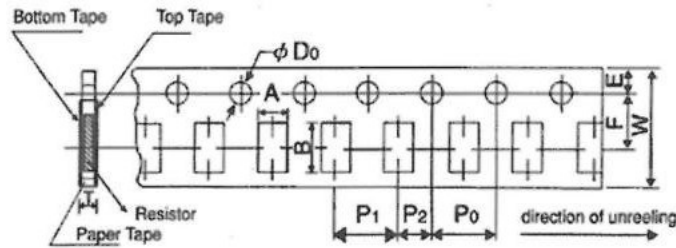
Item	Test condition/ Methods	Performance	Standard
Resistance	Measuring resistance value at room temperature 25°C ±5°C	Refer to SART Spec	IEC60115-1 4.5
Temperature coefficient of resistance	$TCR = (R-R_0)/R_0(T_2-T_1) \times 10^{-6}$ T1 T2 Test temperature: +25°C~+125°C	Refer to SART Spec	MIL-STD-202 Method 304
Short time Overload	5 times the rated power for 5 sec	$ \Delta R  \leq 1.0\%R$	IEC 60115-1 4.13
Resistance to Soldering Heat	260°C± 5°C, time: 10 sec±1 sec	$ \Delta R  \leq 1.0\%R$	MIL-STD-202 Method 210
Thermal shock	-55°C(15min)/+125°C(15min), 300 cycles	$ \Delta R  \leq 1.0\%R$	MIL-STD-202 Method107G
Low temperature storage	-55°C for 45 min, No power	$ \Delta R  \leq 1.0\%R$	IEC60115-1 4.23.4
High Temperature storage	125°C for 1000 hours, No power	$ \Delta R  \leq 1.0\%R$	MIL-STD-202 Method 108
Temperature Humidity Bias Test	+85°C, 85% RH, 10%bias, 1000hours	$ \Delta R  \leq 1.0\%R$	MIL-STD-202 Method103
Mechanical shock	100 g's ,6 ms, 5pulses	$ \Delta R  \leq 1.0\%R$	MIL-STD-202 Method 213
Vibration	The frequency varies from 10Hz to 2000Hz, 1 min, 3 directions, and 12 hours	$ \Delta R  \leq 1.0\%R$	MIL-STD-202 Method 204
Load life	70°C± 2°C, 1000 hours, at rated power 1.5 hours "ON", 0.5 hours "OFF"	2512 3W: $ \Delta R  \leq 2\%R$	MIL-STD-202 Method 108
		Other: $ \Delta R  \leq 1.0\%R$	
Solderability	Dip the terminal in a flux and then dip into a soldering bath at 245°C±5°C for 2sec~3sec	Min 95% coverage	J-STD-002B Test B
Board Flex	Min 2 mm deflection,60sec	$ \Delta R  \leq 1.0\%R$	AEC-Q200-005
ESD test	Other: 2KV, 2 times /1sec	$ \Delta R  \leq 1.0\%R$	AEC-Q200-002

### Packaging

#### 1. Embossed Tape Dimensions



Type	A (mm)	B (mm)	W (mm)	F (mm)	E (mm)
2512	$3.60 \pm_{0.18}^{0.20}$	$6.90 \pm 0.20$	$12.00 \pm 0.20$	$5.50 \pm 0.05$	$1.75 \pm 0.10$
Type	P1 (mm)	P2 (mm)	P0 (mm)	D0/D1 (mm)	T (mm)
2512	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$4.00 \pm 0.05$	$1.50 \pm_0^{0.10}$	$1.00 \pm 0.15$



Type	A (mm)	B (mm)	W (mm)	F (mm)	E (mm)
1206	$2.00 \pm 0.15$	$3.60 \pm 0.20$	$8.00 \pm 0.20$	$3.50 \pm 0.05$	$1.75 \pm 0.10$
Type	P1 (mm)	P2 (mm)	P0 (mm)	D0 (mm)	T (mm)
1206	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$4.00 \pm 0.10$	$1.50 \pm_0^{0.10}$	$0.84 \pm 0.10$

### 2. Reel Dimensions

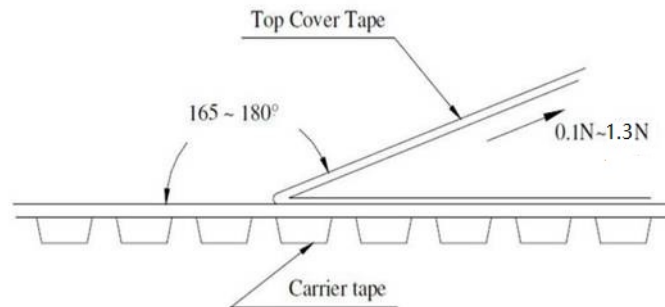


Type	$\phi A$ (mm)	$\phi B$ (mm)	$\phi C$ (mm)	F (mm)	W (mm)
2512	178.00±2.00	60.00±1.00	13.50±0.50	15.40±1.00	13.00±0.30
1206	178.00±2.00	60.00±1.00	13.50±0.50	11.40±0.10	9.00±0.30

### 3. Quantity of Package

Type	Quantity(pcs )
2512	4000
1206	5000

### 4. Peeling Test



## Storage

- The ambient temperature shall be between  $5^\circ C \sim 35^\circ C$ .
- The relative humidity recommended for storage is between 25%RH~75%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.

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