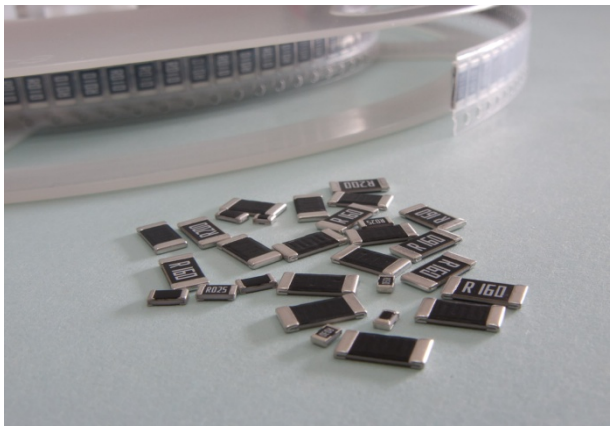


General

- Chip size from 0603 to 2512
- Resistance value from 3mΩ 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.

Ordering Information

Type	Power Rating at 70℃(W)	Resistance Range(mΩ)	TCR (PPM/℃)	Resistance tolerance	Operation Temp. Range
0603	0.5	3≤R＜10	±200	±0.5%(D) ±1%(F) ±2%(G) ±5%(J)	-55℃~+170℃
		10≤R≤30	±100		
0805	0.5 0.75	3≤R＜10	±100		
		10≤R≤47	±50		
1206	0.5 1.0	3≤R＜10	±100		
		10≤R≤68	±50		
2010	1.0	3≤R＜10	±100		
		10≤R≤100	±50		
2512	1.0 2.0	2	±200		
		3≤R＜10	±100		
		10≤R≤200	±50		

Remark:

a. 0.5 W with total solder pad trace size of 100 mm².
b. 0.75 W with total solder pad trace size of 200 mm².
c. 1.0 W with total solder pad trace size of 200 mm².
d. 2.0 W with total solder pad trace size of 300 mm².

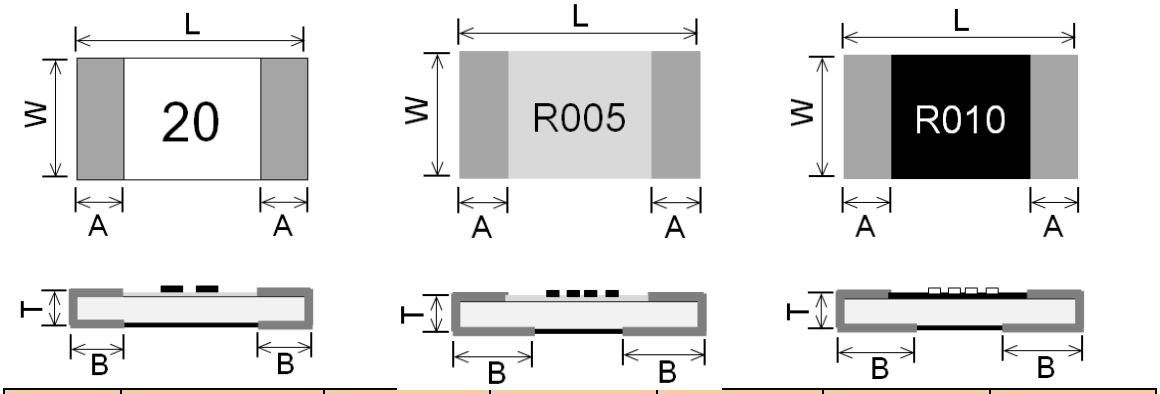
Catalog Symbol

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 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

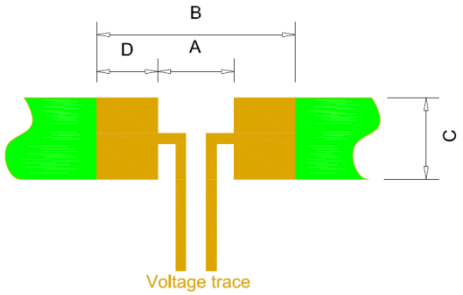


Type	Resistance	L(mm)	W(mm)	T(mm)	A(mm)	B(mm)
0603*	R003-R004	1.60±0.20	0.80±0.20	0.70±0.15	0.35±0.25	0.60±0.20
	≥R005					0.35±0.20
0805**	R003-R004	2.00±0.20	1.25±0.15	0.70±0.15	0.40±0.25	0.70±0.30
	≥R005					0.40±0.20
1206	R003-R004	3.20±0.20	1.60±0.15	0.75±0.15	0.50±0.30	0.90±0.30
	≥R005					0.50±0.20
2010	R003	5.00±0.20	2.50±0.20	0.75±0.20	0.60±0.30	1.60±0.30
	R004-R005					1.30±0.30
	>R005					0.80±0.30
2512	R002	6.40±0.20	3.20±0.20	0.75±0.20	0.90±0.30	2.30±0.30
	R003					1.90±0.30
	R004					1.70±0.30
	R005~ R006					1.20±0.30
	R007					1.10±0.30
	>R007					0.90±0.30

*: 0603 two-digit mark

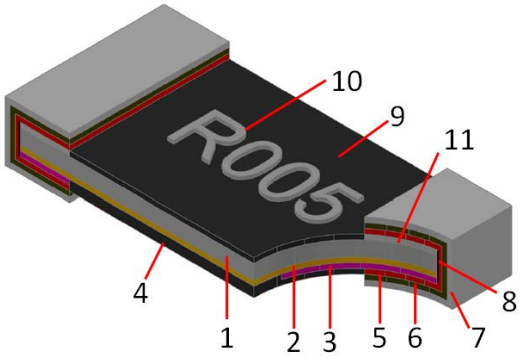
**: 0805 3mΩ≤R≤9mΩ & 2010no upper black coating

Recommended Land Patterns



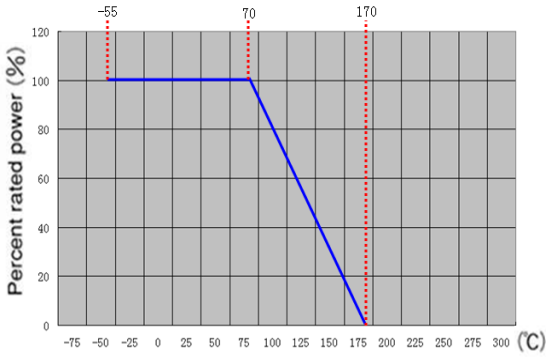
	Type	A(mm)	B(mm)	C(mm)	D(mm)
0603	R003-R004	0.40	2.80	1.00	1.20
	⩾R005	0.60			1.10
0805	R003-R004	0.50	3.20	1.40	1.35
	⩾R005	0.80			1.20
1206	R003-R004	0.80	4.40	1.80	1.80
	⩾R005	1.80			1.30
2010	R003-R009	1.60	6.30	2.90	2.35
	R010-R100	2.70			1.80
2512	R002	1.40	8.00	3.40	3.30
	R003	2.20			2.90
	R004	2.60			2.70
	R005~ R006	3.60			2.00
	R007	3.80			2.20
	＞R007	4.20			1.90

Materials



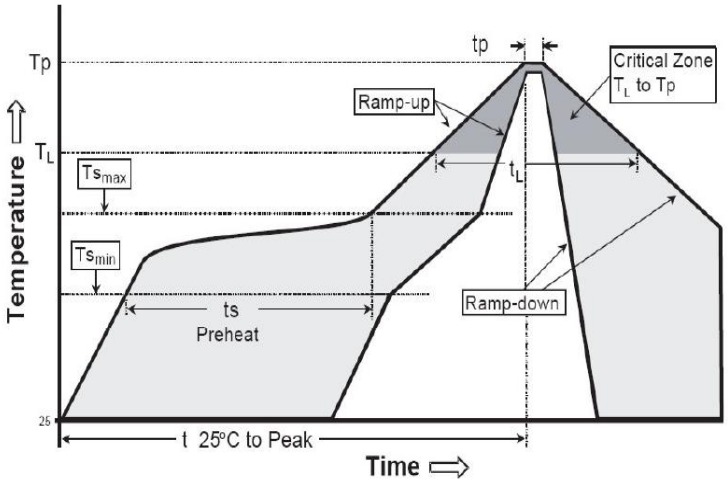
1	Ceramic	7	Tin
2	Adhesive film	8	Nicr
3	Alloy	9	Protective coating
4	Protective coating	10	Marking
5	Copper	11	Silver paste
6	Nickel	12	

Power Derating Curve



Recommended Solder Curve

1.Infrared Reflow
Temperature:260℃
Time:5secMax.
Recommend Reflow profile:



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate(Ts_{max} to Tp)	3℃/s Max.
Preheat Temperature Min(Ts_{min}) Temperature Max(Ts_{max}) Time($Ts_{min}$to Ts_{max})	 150℃ 200℃ 60sec~120sec
Peak Temperature(Tp)	260℃
Time within 5℃ of actual Peak Temperature(Tp)	5sec
Melting tin time(T_L)	20sec~30sec
Ramp-Down Rate	6℃/s Max.
Time 25℃ to Peak Temperature	8 minutes Max.

2.Wave soldering
Reservoir Temperature：260℃
Time in Reservoir：10secMax.

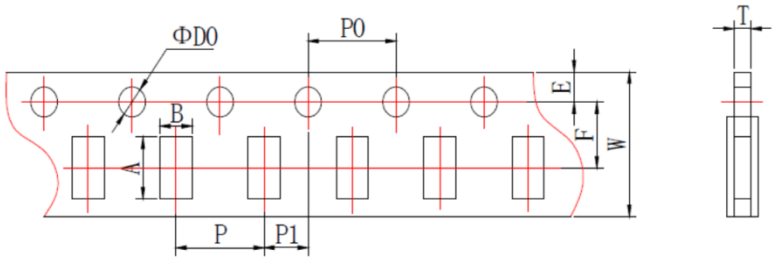
3.Hand Soldering
Temperature：350℃
Time：5secMax.

Reliability Test

Item	Test condition/ Methods	Performance	Standard
Short Time Overload	0.5W:5X rated power for 5 sec 0.75W:5X rated power for 5 sec 1.0W:5X rated power for 5 sec 2.0W:4X rated power for 5 sec	|ΔR|≤ ±1%	IEC60115-1 4.13
Temperature Coefficient of Resistance (T.C.R.)	$TCR = (R-R_0)/R_0(T2-T1)* 10^6$ (T1 T2) Test temperature：25℃~125℃	Refer to SART Spec	IEC60115-1 4.8
Load Life	1000 hours at rated power, 70℃± 2℃, 1.5hours “ON”, 0.5hour “OFF”	|ΔR|≤±1%	IEC60115-1 4.25
Bias Humidity	40℃±2℃, 93% ±3% RH, 1,000 hours at rated power, 1.5 hours On, 0.5 hours Off	|ΔR|≤±1%	IEC60115-1 4.24
Thermal Shock	-55℃(30min.)/+125℃ (30min.), 100cycle	|ΔR|≤±1%	IEC60115-1 4.19
Solder ability	245℃± 5℃，3sec ± 0.3sec	95%coverage Min.	IEC60115-1 4.17
Resistance to Soldering Heat	270℃± 5℃，10sec ±1.0sec	|ΔR|≤±1%	IEC60115-1 4.18
High temperature Exposure	170℃± 2℃ for 1000 hours	|ΔR|≤±1%	IEC60115-1 4.23
Bending test	Epoxy thickness1.6mm, Fulcrums distance 90mm,Bending width 5mm（0603、0805）, Bending width 4mm（1206）.Bending width 2mm（2010、2512）,	|ΔR|≤±1%	IEC60115-1 4.33

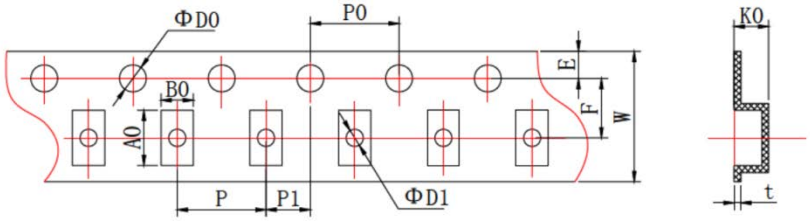
Packaging

1. Paper Tape Dimensions



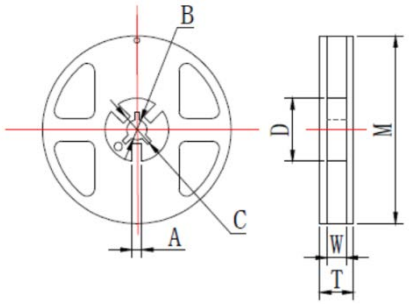
Type	A(mm)	B(mm)	W(mm)	F(mm)	E(mm)	P (mm)	P0(mm)	P1(mm)	D0(mm)	T(mm)
0603	1.85±0.10	1.10±0.10	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10
0805	2.40±0.10	1.60±0.10	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.95±0.10
1206	3.60±0.20	2.00±0.20	8.00±0.20	3.50±0.05	1.75±0.10	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	2.80±0.15	12.00±0.10	5.50±0.10	1.75±0.10	0.24±0.05
2512	6.75±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	0.85±0.05
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

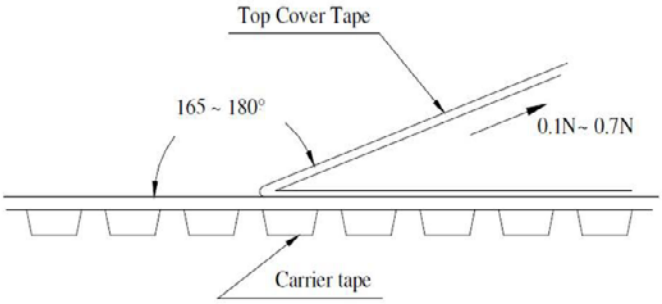


Type	M(mm)	W(mm)	T(mm)	A(mm)	B(mm)	C(mm)	D(mm)
0603 0805 1206	178.00±2.00	9.5±1.00	12.50±1.50	2.00±0.50	13.00±0.50	21.00±0.50	58.00±0.20
2010 2512	178.00±2.00	13.00±0.50	15.50±1.50	2.00±0.50	13.00±0.50	21.00±0.50	57.00±2.00

Number of Package

Packaging style	Tape and Reel				
Type	0603	0805	1206	2010	2512
Quantity(PCS）	5000			4000	

Peeling Test



Storage

- The ambient temperature shall between 5℃~30℃.
- The relative humidity recommended for storage is between 25%~60%.
- 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.