



General

- Chip size from 2512 to 5931
- Resistance value from 0.1mΩ to 5mΩ
- 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

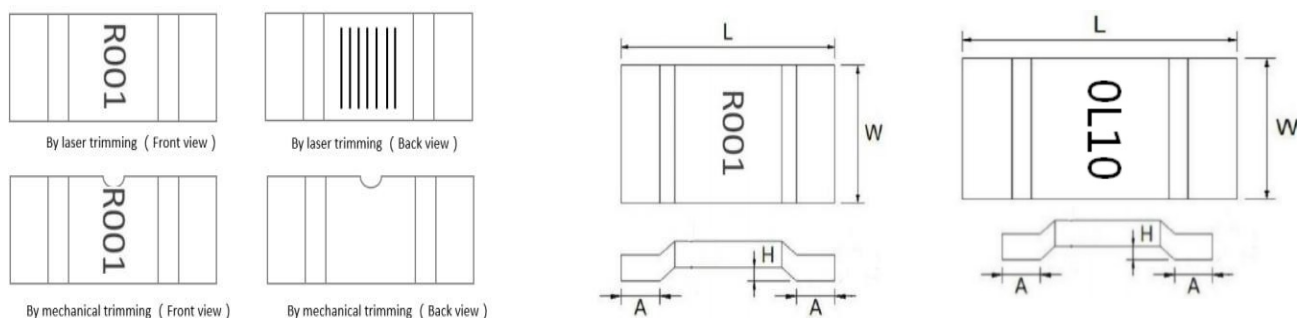
Type	Power Rating at 70℃(W)	Resistance Range (mΩ)	Material	TCR (ppm/℃)	Resistance tolerance	Operation Temp. Range
2512	3	1	MnCu	±150	±0.5%(D) ±1%(F) ±2%(G) ±3%(H) ±5%(J)	-55℃~+170℃
		2	FeCr	±75		
3921	5	0.2、0.3、0.5、1	MnCu	±150		
		1	Karma	±75		
		1、2、3、4、5	FeCr			
5931	7	0.1	CuMnSn	±300		
		0.2、0.3、0.5	MnCu	±150		
		1、2、3	FeCr	±75		

Part Number information

SMS **39** **F** **5** **F** **R002** **I**
【1】 **【2】** **【3】** **【4】** **【5】** **【6】** **【7】**

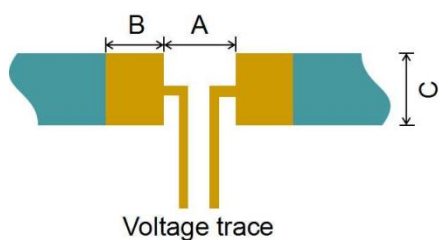
- 【1】** Series Name: SART Shunt Type
【2】 Chip size: 25:2512 39:3921 59:5931
【3】 Material Code: M: MnCu F: FeCr K: Karma S: CuMnSn
【4】 Power Code: 3:3W 5:5W 7:7W
【5】 Resistance Tolerance: D:±0.5% F:±1% G:±2% H:±3% J:±5%
【6】 Resistance Code: 0L10=0.1mΩ R001=1mΩ
【7】 Packaging Code: T: Tape& Reel B: Bulk Pack

Dimensions



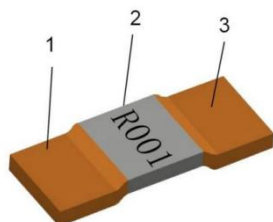
Type	Resistance range (mΩ)	L (mm)	W (mm)	A (mm)	H (mm)
2512	1、2	6.40±0.30	3.20±0.30	1.50±0.50	0.50±0.10
3921	0.2~5	10.00±0.30	5.20±0.30	2.00±0.30	0.50±0.10
5931	0.1	15.00±0.30	8.20±0.30	4.50±0.50	0.50±0.30
	0.2~3	15.00±0.30	7.70±0.30	4.20±0.30	0.50±0.10

Recommended Land Patterns



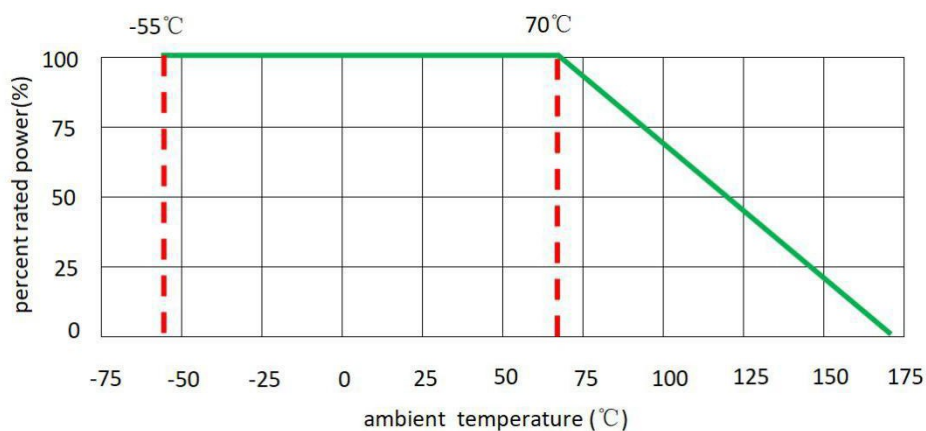
Type	A (mm)	B (mm)	C (mm)
2512	3.40	1.80	3.40
3921	5.60	2.70	6.20
5931	5.60	5.20	8.75

Materials



No.	Materials
1	Copper electrode
2	MnCu/FeCr/Karma/CuMnSn
3	Copper electrode

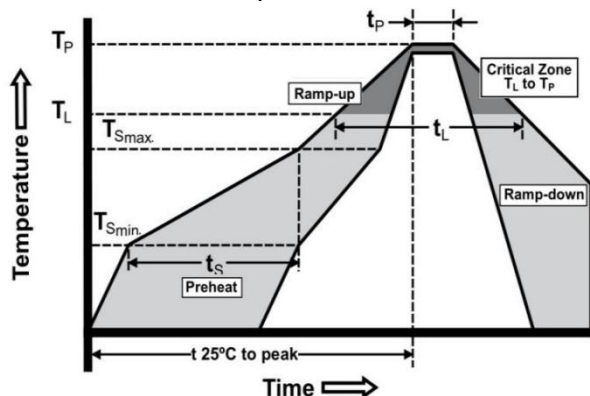
Power Derating Curve



Recommended Solder Curve

1. Infrared Reflow

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



2. Hand Soldering

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

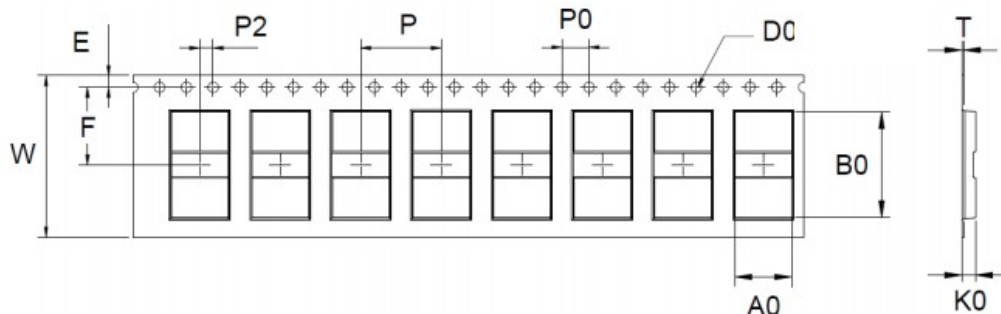
Profile Feature	Pb-Free Assembly
Average Ramp-up Rate (T_{Smax} to T_P)	3°C/s Max.
Preheat Temperature Min. (T_{Smin}) Temperature Max. (T_{Smax}) Time (T_{Smin} to T_{Smax})	150°C 200°C 60sec~120sec
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (T_P)	5sec
Melting tin time (T_L)	20sec~30sec
Ramp-down Rate	6°C/sec Max.
Time 25°C to peak Temperature	8 min Max.

Product Characteristics

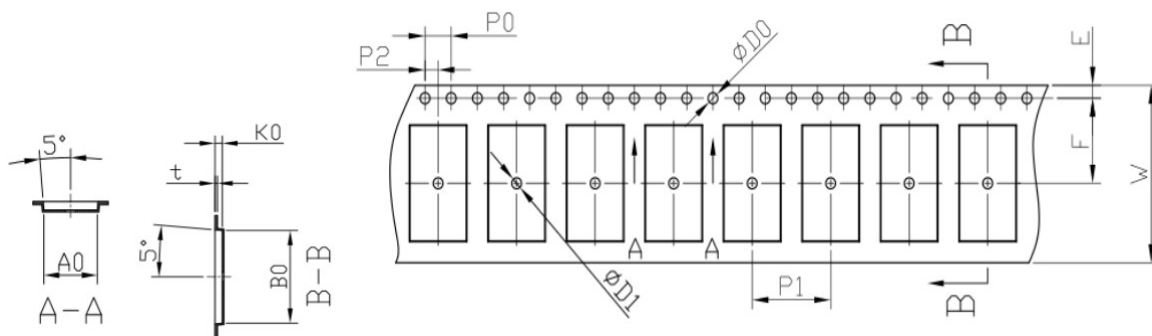
Item	Test condition/ Methods	Performance	Standard
Resistance	Measuring resistance value at room temperature 25°C±5°C	Refer to SART Spec	IEC60115-1 4.5
Temperature coefficient of resistance	$TCR = (R - R_0) / R_0 (T_2 - T_1) \times 10^6$ T1 T2 Test temperature: +25°C~+125°C	Refer to SART Spec	MIL-STD-202 Method 304
Short time Overload	5 times the rated power for 5 seconds	$ \Delta R \leq \pm 1\%$	IEC 60115-1 4.13
Resistance to Soldering Heat	260°C± 5°C time: 10sec± 0.5sec	$ \Delta R \leq \pm 1\%$	MIL-STD-202 Method 210
Thermal shock	-55°C (15min)/+150°C(15min), 1000 cycles	$ \Delta R \leq \pm 1\%$	MIL-STD-202 Method107G
Low temperature operation	Rating power at -65°C for 45 min	$ \Delta R \leq \pm 1\%$	MIL-STD-26E
High Temperature Storage	170°C for 1000hours, No power	$ \Delta R \leq \pm 1\%$	IEC60115-1 4.25
Temperature Humidity Bias Test	+85°C, 85% RH, 10%bias, 1000hours	$ \Delta R \leq \pm 0.5\%$	MIL-STD-202 Method103
Mechanical shock	100 g'sec ,6 msec, 5pulses	$ \Delta R \leq \pm 0.5\%$	MIL-STD-202 Method 213
Vibration	The frequency varies from 10HZ to 2000HZ, 1 min, 3 directions, and 12 hours	$ \Delta R \leq \pm 0.5\%$	MIL-STD-202 Method 204
Load life	70°C± 2°C, 1000 hours, at rated power 1.5 hours "ON", 0.5 hours "OFF"	$ \Delta R \leq \pm 1\%$	MIL-STD-202 Method 108
Moisture resistance	MIL-STD-202,method 106, No power, 7b not required	$ \Delta R \leq \pm 1\%$	MIL-STD-202 Method 106

Packaging

1. Embossed Tape Dimensions

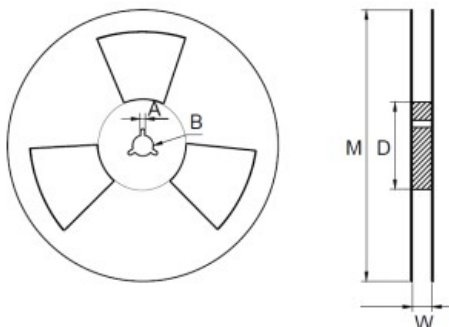


Type	A0 (mm)	B0 (mm)	W (mm)	E (mm)	F (mm)	D0 (mm)
2512	3.75±0.10	6.75±0.10	12.00±0.30	1.75±0.10	5.50±0.10	1.50±0.10
Type	T (mm)	K0 (mm)	P (mm)	P0 (mm)	P2 (mm)	/
2512	0.30±0.05	2.20±0.10	8.00±0.10	4.00±0.10	2.00±0.10	/

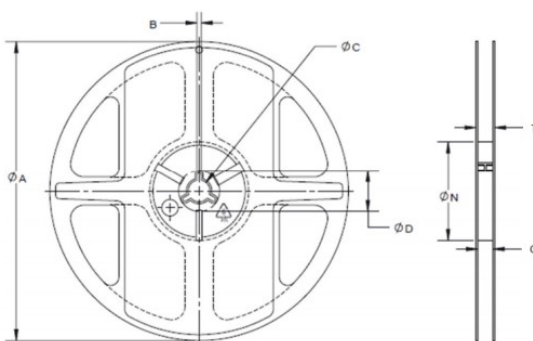


Type	A0 (mm)	B0 (mm)	E (mm)	F (mm)	W (mm)	t (mm)
3921	6.00±0.20	10.60±0.20	1.75±0.10	11.50±0.10	24.00±0.30	0.40±0.05
5931	8.60±0.20	15.60±0.20	1.75±0.10	11.50±0.10	24.00±0.30	0.40±0.05
Type	P0 (mm)	P1 (mm)	P2 (mm)	D0 (mm)	D1 (mm)	K0 (mm)
3921	4.00±0.10	8.00±0.10	2.00±0.05	1.50±0.10	1.50±0.10	1.20±0.10/2.50±0.10
5931	4.00±0.10	12.00±0.10	2.00±0.05	1.50±0.10	1.50±0.10	1.20±0.10/2.35±0.10

2. Reel Dimensions



Type	W (mm)	M (mm)	A (mm)	B (mm)	D (mm)
2512	12.80±0.50	178.00±1.00	2.40±1.00	13.50±1.00	60.00±2.00

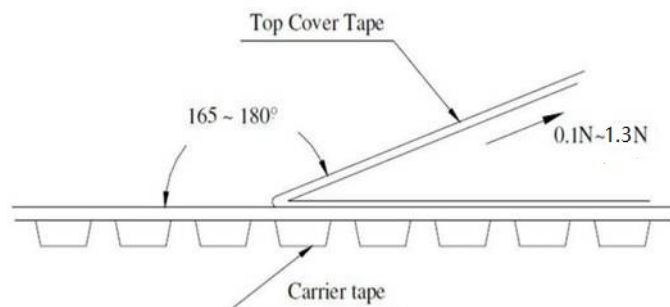


Type	A (mm)	N (mm)	C (mm)	D (mm)	B (mm)	G (mm)	T (mm)
3921	330.00±2.00	100.00±1.50	13.00±0.50	21.00±0.50	2.30±0.50	24.50±1.50	28.50±2.00
5931	330.00±2.00	100.00±1.50	13.00±0.50	21.00±0.50	2.30±0.50	24.50±1.50	28.50±2.00

3. Quantity of Package

Type	Resistance Range (mΩ)	Quantity (pcs)
2512	1、2	1000
3921	2、3、4、5	2500
	0.2、0.3、0.5、1	1500
5931	0.5、2、3	2000
	0.1、0.2、0.3、1	1000

4. Peeling Test



Storage

- The ambient temperature shall be between 5°C~30°C.
- 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.