



## General

- Chip size from 3921 to 5931
- Resistance value from 0.2mΩ to 4mΩ
- 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
3921	5	0.2、0.3、0.5	±150	±1%(F) ±2%(G) ±5%(J)	-55°C~+170°C
		1、2、3、4	±75		
5931	7	0.2、0.3、0.5	±150		
		1、2、3	±75		

## Part Number information

**SMS 39 E 5 E R002 T**

**【1】 【2】 【3】 【4】 【5】 【6】 【7】**

- 【1】 Series Name: SART Shunt Type  
 【2】 Chip size: 39:3921 59:5931  
 【3】 Material Code: M:MnCu F:FeCr  
 【4】 Power Code: 5:5W 7:7W  
 【5】 Resistance Tolerance: F:±1% G:±2% J:±5%  
 【6】 Resistance Code:0L20=0.2mΩ R002=2mΩ  
 【7】 Packaging Code: T: Tape& Reel B: Bulk Pack

## Dimensions



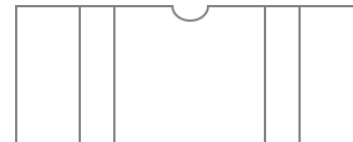
By laser trimming ( Front view )



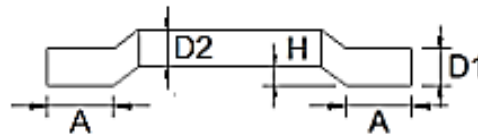
By laser trimming ( Back view )



By mechanical trimming ( Front view )

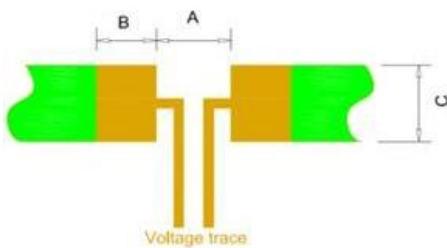


By mechanical trimming ( Back view )



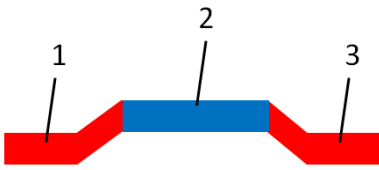
Type	Resistance (mΩ)	L (mm)	W (mm)	A (mm)	H (mm)
3921	0.2	10.00±0.30	5.20±0.30	2.00±0.30	0.50±0.10
	0.3				
	0.5				
	1				
	2				
	3				
5931	0.2	15.00±0.30	7.70±0.30	4.20±0.30	0.50±0.10
	0.3				
	0.5				
	1				
	2				
	3				

## Recommended Land Patterns



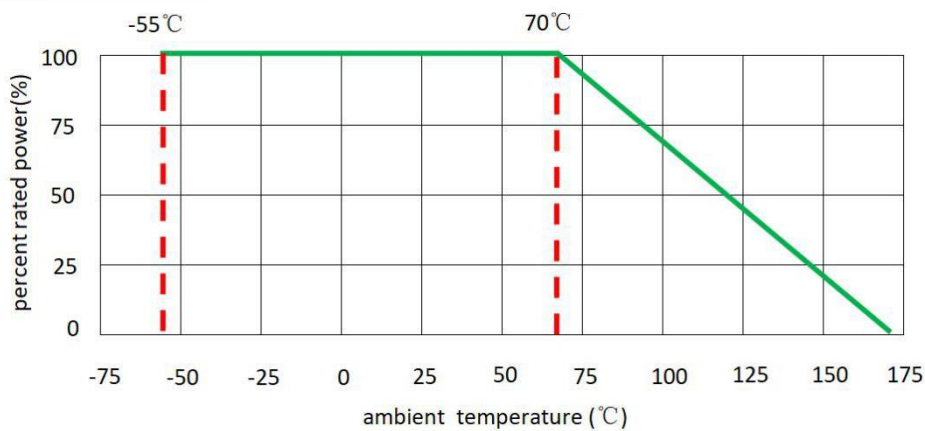
Type	A (mm)	B (mm)	C (mm)
3921	5.60	2.70	6.20
5931	5.60	5.20	8.75

## Materials



No.	Materials
1	Copper electrode
2	MnCuSn/MnCu/FeCr
3	Copper electrode

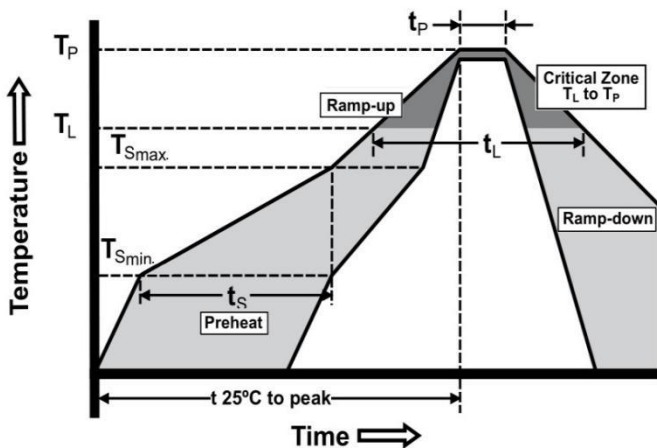
## Power Derating Curve



## Recommended Solder Curve

### 1. Infrared Reflow

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



Profile Feature	Pb-Free Assembly
Average Ramp-up Rate (Ts <sub>max</sub> to Tp)	3°C/sec Max.
Preheat Temperature Min.(Ts <sub>min</sub> ) Temperature Max.(Ts <sub>max</sub> ) Time(Ts <sub>min</sub> to Ts <sub>max</sub> )(ts)	150°C 200°C 60sec~120sec
Peak Temperature(Tp)	260°C
Time(tp) within 5°C of actual Peak Temperature(Tp)	5sec
Melting tin time(tL)	20sec~30sec
Ramp-down Rate	6°C/sec Max.
Time 25°C to peak Temperature	8 min Max.

### 2. Hand Soldering

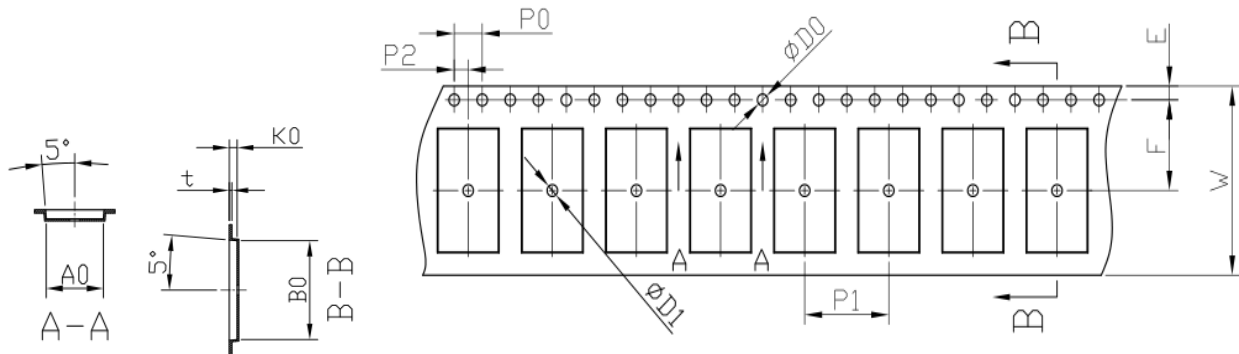
- Temperature: 350°C
- Time: 5sec Max

## 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	$TCR = \frac{R-R_0}{R_0} \frac{(T_2-T_1)}{T_1} \times 10^6$ 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\%$	IEC6011501-4.25
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's ,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

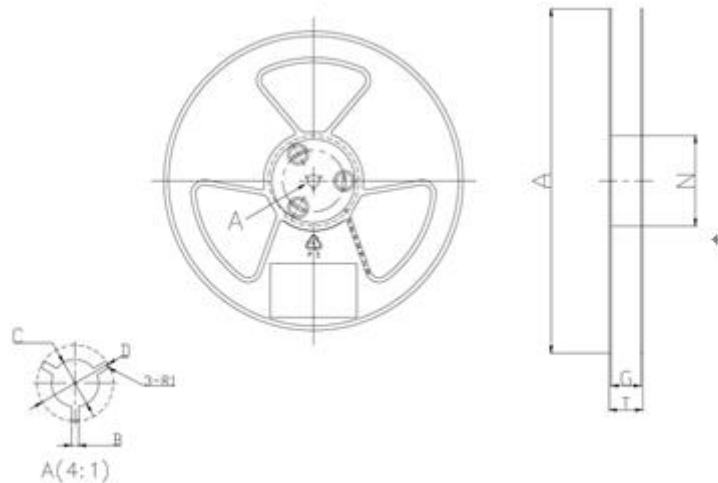
## Packaging

### 1. Embossed Tape Dimensions



Type	A (mm)	B (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

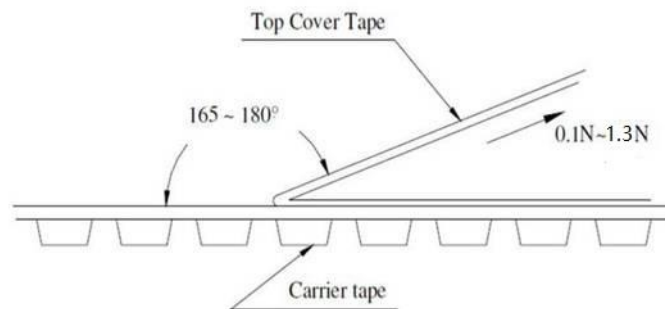


Type	A (mm)	N (mm)	C (mm)	D (mm)	B (mm)	G (mm)	T (mm)
3921	330.0±2.0	100.0±1.5	13.0±0.5	21.0±0.5	2.3±0.5	24.5±1.5	28.5±2.0
5931	330.0±2.0	100.0±1.5	13.0±0.5	21.0±0.5	2.3±0.5	24.5±1.5	28.5±2.0

### 3. Quantity of Package

Type	Resistance (mΩ)	Quantity (pcs)
3921	2,3,4	2500
	0.2,0.3,0.5,1	1500
5931	0.5,2,3	2000
	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%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.

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