



General

- Chip size from 3921 to 5931
- Resistance value from 0.2mΩ 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°C(W) | Resistance Range (mΩ) | Material | TCR (ppm/°C) | Resistance tolerance | Operation Temp. Range |
|------|-------------------------|-----------------------|----------|--------------|----------------------------|-----------------------|
| 3921 | 12 | 0.2 | MnCu | ±150 | ±1%(F) ±2%(G) ±5%(J) | -55°C~+170°C |
| | 9 | 0.3、0.5、1 | | | | |
| | 5 | 1 | FeCr | ±75 | | |
| 5931 | 15 | 0.2 | MnCu | ±150 | | |
| | 10 | 0.3、0.5 | | | | |
| | 7 | 1 | FeCr | ±75 | | |
| | | 2、3 | | | | |

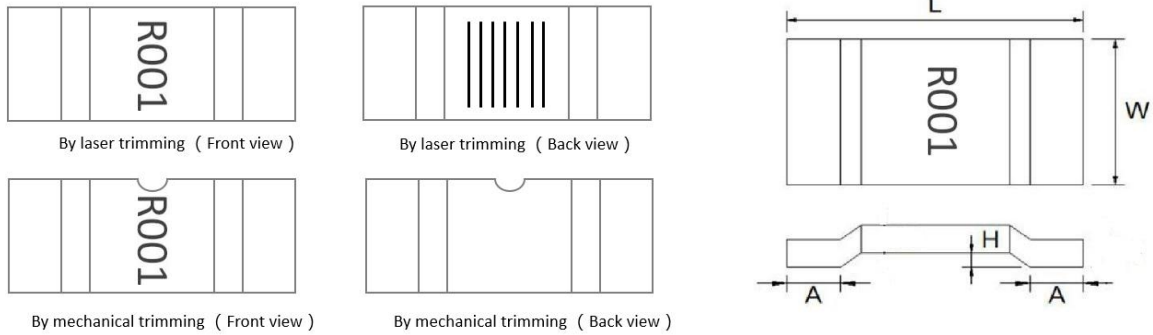
Part Number information

SMSP 39 E M E 0L20 I

【1】 【2】 【3】 【4】 【5】 【6】 【7】

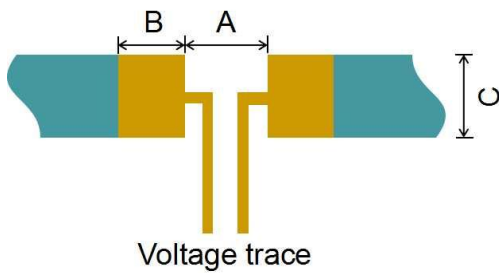
- 【1】 Series Name: SART Shunt Type
 【2】 Chip size: 39:3921 59:5931
 【3】 Material Code: M:MnCu F:FeCr
 【4】 Power Code: 5:5W I:10W M:12W N:15W
 【5】 Resistance Tolerance: F:±1% G:±2% J:±5%
 【6】 Resistance Code:0L20=0.2mΩ R002=2mΩ
 【7】 Packaging Code: T: Tape& Reel B: Bulk Pack

Dimensions



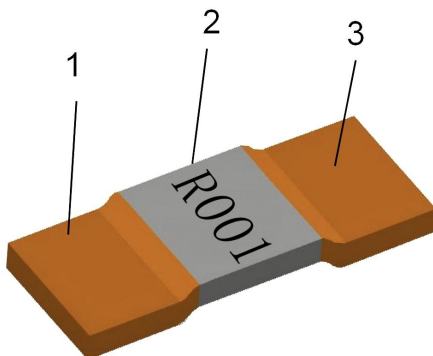
| Type | Resistance range (mΩ) | L (mm) | W (mm) | A (mm) | H (mm) |
|------|-----------------------|------------|-----------|-----------|-----------|
| 3921 | 0.2~5 | 10.00±0.30 | 5.20±0.30 | 2.00±0.30 | 0.50±0.10 |
| 5931 | 0.2~3 | 15.00±0.30 | 7.70±0.30 | 4.20±0.30 | 0.50±0.10 |

Recommended Land Patterns



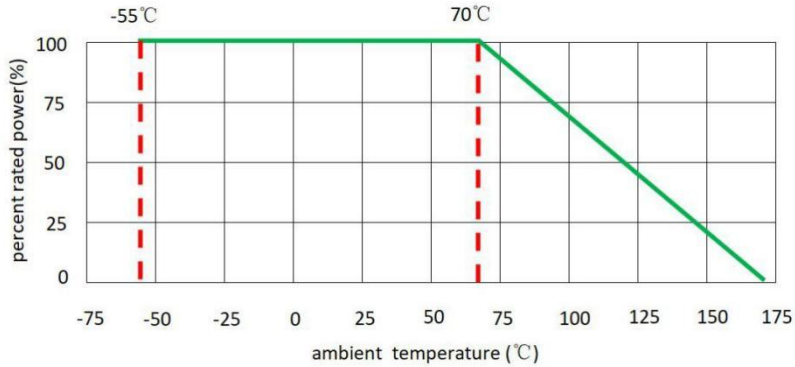
| Type | A (mm) | B (mm) | C (mm) |
|------|--------|--------|--------|
| 3921 | 5.60 | 2.70 | 6.20 |
| 5931 | 5.60 | 5.20 | 8.75 |

Materials



| No. | Materials |
|-----|------------------|
| 1 | Copper electrode |
| 2 | MnCu/FeCrCl |
| 3 | Copper electrode |

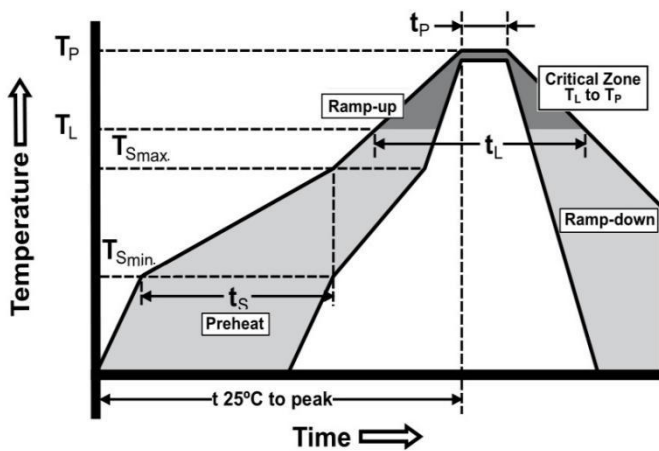
Power Derating Curve



Recommended Solder Curve

1. Infrared Reflow

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



| Profile Feature | Pb-Free Assembly |
|--|--------------------------------|
| Average Ramp-up Rate (T_{Smax} to T_p) | 3°C/sec Max. |
| Preheat Temperature Min. (T_{Smin}) Temperature Max. (T_{Smax}) Time (T_{Smin} to T_{Smax}) (t_s) | 150°C 200°C 60sec~120sec |
| Peak Temperature (T_p) | 260°C |
| Time (t_p) 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. |

2. Hand Soldering

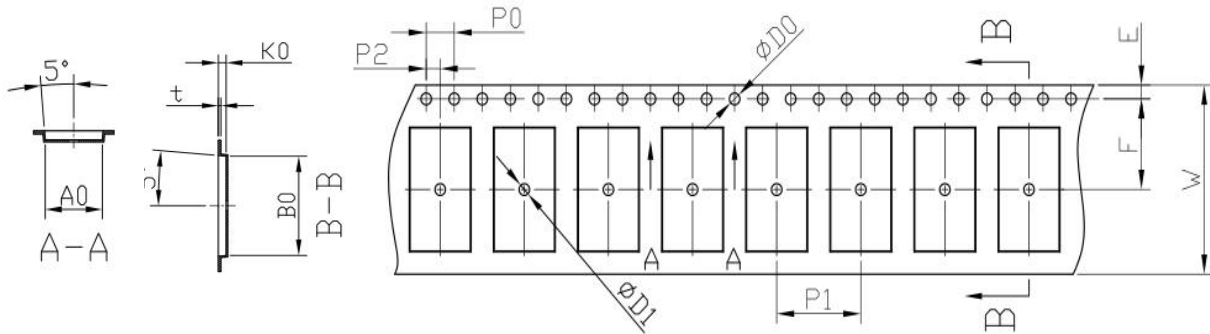
- Temperature: 350°C
- Time: 10sec Max

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\%$ | 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'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 |

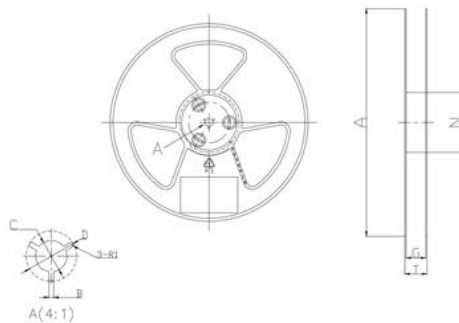
Packaging

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(type A) 2.50±0.10(type B) |
| 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(type A) 2.35±0.10(type B) |

2. Reel Dimensions

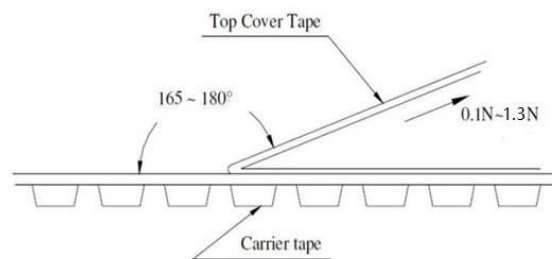


| Type | A (mm) | N (mm) | C (mm) | D (mm) | B (mm) | G (mm) | T (mm) |
|------|-----------|-----------|----------|----------|---------|----------|----------|
| 3921 | 330.0±2.0 | 100.0±1.5 | 13.0±0.5 | 21.0±0.5 | 2.3±0.5 | 24.5±1.5 | 28.5±2.0 |
| 5931 | 330.0±2.0 | 100.0±1.5 | 13.0±0.5 | 21.0±0.5 |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

3. Quantity of Package

| Type | Resistance (mΩ) | Type of embossed tape | Quantity (pcs) |
|------|-----------------|-----------------------|----------------|
| 3921 | 2~5 | 3921-A | 2500 |
| | 0.2~1 | 3921-B | 1500 |
| 5931 | 0.5,2~3 | 5931-A | 2000 |
| | 0.2~0.3,1 | 5931-B | 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.
- The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.