

RMF series Metal Strip Current Sensing Resistor

◆ Features

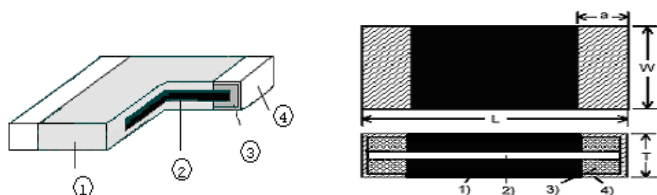
- » High power rating and low T.C.R.
- » Low resistance and high precision (1%)
- » Suitable for lead free soldering
- » Excellent reliability and suitable cost
- » RoHS compliant & Halogen Free

◆ Applications

- » Switching model power supply
- » Battery pack
- » Notebook, Tablet PC
- » Test Instrument
- » Power Amplifier

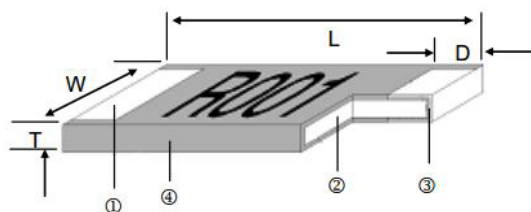


◆ Configuration



| TYPE | RMF |
|-----------------------|-------------|
| 1. Protective Molding | Resin |
| 2. Resistive Element | Alloy Metal |
| 3. Internal Terminal | Copper |
| 4. External Terminal | Solder |

2512 0R0005



Black – Wave or IR reflow soldering

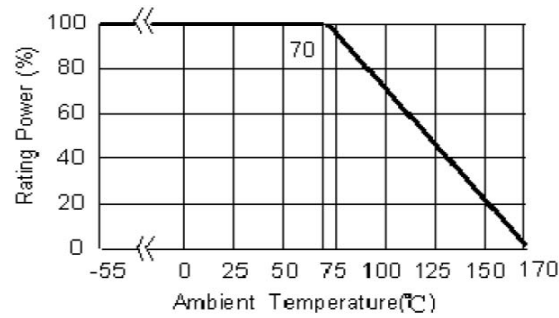
| | |
|-----------------------|----------------------|
| ① Solder Plating (Sn) | ③ Barrier Layer (Ni) |
| ② Alloy Plate | ④ Overcoat |

◆ Dimension

| TYPE | | L | W | T | a |
|---------|-----------|---------------|---------------|---------------|---------------|
| RMF5931 | | 15.0+/-0.20 | 7.80+/-0.20 | 0.70+/-0.20 | 3.50+/-0.20 |
| RMF2512 | | 6.20+/-0.20 | 3.20+/-0.20 | 0.60+/-0.20 | 0.80+/-0.20 |
| RMF2512 | 0,5mR | 6.35+/-0.254 | 3.18+/-0.254 | 1.25+/-0.20 | 1.30+/-0.38 |
| | 2mR | 6.25+/-0.254 | 3.30+/-0.254 | 0.8+/-0.254 | 1.88+/-0.254 |
| RMF2010 | 1~3mR | 5.08+/-0.254 | 2.54+/-0.254 | 0.787+/-0.254 | 1.295+/-0.254 |
| | 3.1~100mR | | | 0.645+/-0.254 | 0.787+/-0.254 |
| RMF1206 | | 3.10+/-0.20 | 1.65+/-0.20 | 0.60+/-0.20 | 0.60+/-0.20 |
| RMF2728 | | 6.706+/-0.254 | 7.188+/-0.254 | 0.991+/-0.254 | 1.143+/-0.254 |

◆ Power Derating Curve

Operating Temperature Range: -55 to +170 deg. C



◆ Rating

| TYPE | Power Rating At 70°C (W) | Resistance Tolerance (%) | Temperature coefficient of Resistance (ppm/°C) | Resistance Range (mΩ) |
|---------|--------------------------|--------------------------|--|-----------------------|
| RMF5931 | 5 | ±1%(F) ±5%(J) | ± 100 | 3 |
| | | | ± 70 | 5 |
| RMF2512 | 3 | ±1%(F) ±5%(J) | ±75 | 0.5, 0.75 |
| | | | ±70 | 1, 1.5, 2 |
| | | | ±50 | 3~100 |
| RMF2512 | 2 | ±1%(F) ±5%(J) | ±70 | 1, 1.5, 2 |
| | | | ±50 | 3~100 |
| RMF2512 | 1 | ±1%(F) ±5%(J) | ± 70 | 1, 1.5, 2 |
| | | | ± 50 | 3~100 |
| RMF2010 | 1 | ±1%(F) ±5%(J) | ±75 | 1 |
| | 1.5 | | ±50 | 2-100 |
| RMF1206 | 1 | ±1%(F) ±5%(J) | ±75 | 1 |
| | | | ± 50 | 2-40 |
| RMF1206 | 1/2 | ±1%(F) ±5%(J) | ± 75 | 1~15 |
| | | | ± 50 | 20~50 |
| RMF2728 | 4 | ±1%(F) ±5%(J) | ± 25 | 4-50 |

Operating Current= $\sqrt{P/R}$, Operating Voltage= $\sqrt{P \cdot R}$

All product specification and data are subject to change without notice

◆ Part Number

| RMF | 2512 | J | T | R002 | □ | □□ | |
|------|------|-----------|---------------------------|----------|-----------------|------------|--------------------------------|
| Type | Size | Tolerance | Watt | R Value | TCR (ppm/°C) | Reel Size | Package Quantity |
| RMF | 2512 | F: 1% | T: 1W | R002=2mΩ | Blank=Standard | Blank = 7" | (standard package As below) |
| | 2010 | J: 5% | S: 2W | | E: 100ppm | B= 13" | 08= 8K per reel |
| | 1206 | | U:1/2W | | L: 70ppm | C= 10" | 16= 16K per reel |
| | 5931 | | H: 5W | | D: 50ppm | | |
| | 0805 | | D:1/4W | | C: 25ppm | | |
| | 2728 | | R: 3W A: 4W V: 1.5W | | W: 75ppm | | |

» Standard Package Q'ty for each size is as following.

| TYPE | Standard Package Q'ty |
|---------------|-----------------------|
| RMF0805 | 5K per reel |
| RMF1206 | 4K per reel |
| RMF2010 | 2K per reel |
| RMF2512 | 4K per reel |
| RMF2512 0,5mR | 2K per reel |
| RMF5931 | 3K per reel |
| RMF2728 | 1K per reel |

◆ Resistance
◆ Marking



For 1 ~ 2mΩ



For 3 ~ 50mΩ

R002 = 2 mΩ

R020 = 20mΩ

◆ Specification

Specification and Test Methods

| TEST ITEM | SPECIFICATON | TEST METHOD |
|---|--|---|
| DC Resistance | F : ±1% J : ±5% | IEC 60115-1 / JIS C 5201-1 , Clause 4.5 Measure the resistance Value. |
| Short Time Overload | $\Delta R \leq \pm (1\% + 0.1m\Omega)$ | IEC 60115-1 / JIS C 5201-1 , Clause 4.13 5 × Rated power for 5 seconds 5 × Rated power for 2 seconds (for 5931) Measure resistance after 30 minutes |
| Solderability | Over 95% of termination must be covered with Solder | IEC 60115-1 / JIS C 5201-1 , Clause 4.17 After immersing flux, dip in the 245± 2°C molten solder bath for 3± 0.5 sec. |
| Resistance to Solder Heat | $\Delta R \leq \pm (1\% + 0.1m\Omega)$ No mechanical damage | IEC 60115-1/JIS C 5201-1 , Clause 4.18 With 260± 5°C for 10± 1sec. |
| Load Life Humidity | $\Delta R \leq \pm (1\% + 0.5m\Omega)$ | IEC 60115-1 / JIS C 5201-1 , Clause 4.24 Maintain the temperature of the resistor at 40±2°C and 90% ~ 95% R.H. with the rated voltage applied. Cycle ON for 1.5 hours and OFF for 0.5 hour for 1000+48/-0 hours. After 1 ~ 4 hours, measure the resistance value. |
| Temperature Coefficient of Resistance (TCR) | ± 100ppm/°C ± 70ppm/°C | IEC 60115-1 / JIS C 5201-1 , Clause 4.8 Test temperature : 25°C(T1) → -55°C(T2) 25°C(T1) → +155°C(T2) $TCR(ppm/°C) = \frac{R2 - R1}{R1} \times \frac{1}{T2 - T1} \times 10^6$ T1: 25°C T2: Test temperature R1: Resistance at reference temperature (T1) R2: Resistance at test temperature (T2) |
| Load Life | $\Delta R \leq \pm (1\% + 0.5m\Omega)$ | IEC 60115-1 / JIS C 5201-1 , Clause 4.25 Permanent resistance change after 1000+48/-0 hours (1.5 hours ON, 0.5 hour OFF) at RCWV or Max. Keep the resistor at 70 ± 2°C ambient. |
| Temperature Cycle | $\Delta R \leq \pm (1\% + 0.5m\Omega)$ No mechanical damage | IEC 60115-1 / JIS C 5201-1 , Clause 4.19 Repeat 5 cycles as follows -55°C (30min.) → +25°C (2~3min.) → +155°C (30min.) → +25°C (2~3min.) |
| Insulation Resistance | Between termination and coating must be over 1000MΩ | IEC 60115-1 / JIS C 5201-1 , Clause 4.6 Test voltage : 100±15V |
| Bending Strength | $\Delta R \leq \pm (1\% + 0.5m\Omega)$ No mechanical damage | IEC 60115-1 / JIS C 5201-1 , Clause 4.33 Resistance changes after bended on the 90mm PCB. Bend :2mm |

◆ Packing

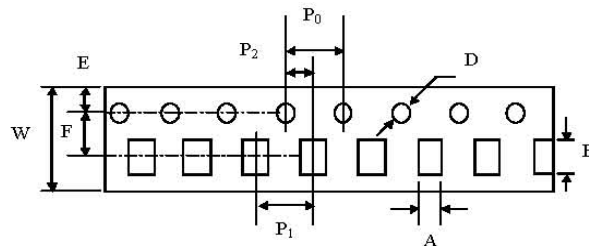
Peel Strength of Top Cover Tape

The peel speed shall be about 300 mm/min

The peel force of top cover tape shall be between 0.1 to 0.7N



Tape Packaging Dimensions

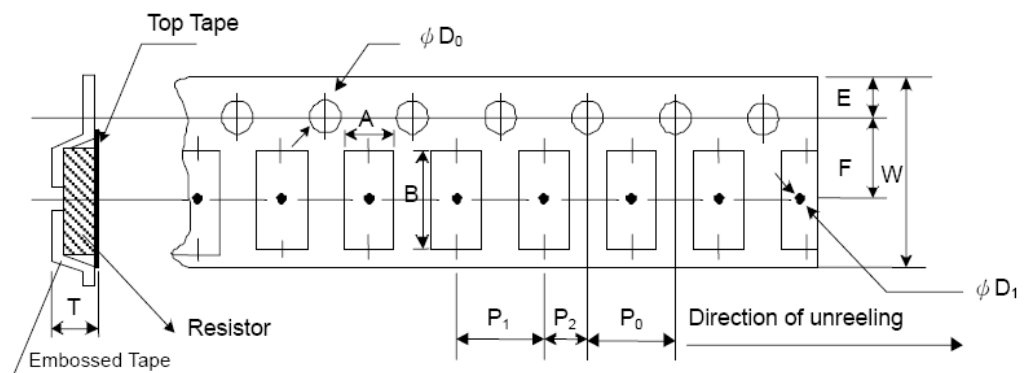


Accumulated dimensional tolerance $40\pm 0.2\text{mm}$

| Size | A | B | W | F | E | P1 | P2 | P0 | D |
|------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|----------------|
| 2010 | 2.90 ± 0.10 | 5.45 ± 0.10 | 12.0 ± 0.15 | 5.50 ± 0.10 | 1.75 ± 0.10 | 4.0 ± 0.10 | 2.0 ± 0.10 | 4.0 ± 0.10 | 1.50 ± 0.10 |
| 2512 | 3.50 ± 0.20 | 6.75 ± 0.20 | 12.0 ± 0.30 | 5.50 ± 0.05 | 1.75 ± 0.10 | 4.0 ± 0.10 | 2.0 ± 0.05 | 4.0 ± 0.10 | 1.50 ± 0.10 |
| 1206 | 2.0 ± 0.20 | 3.60 ± 0.20 | 8.0 ± 0.30 | 3.50 ± 0.05 | 1.75 ± 0.10 | 4.0 ± 0.10 | 2.0 ± 0.05 | 4.0 ± 0.10 | 1.50 ± 0.10 |
| 5931 | 8.2 ± 0.10 | 15.4 ± 0.10 | 24.0 ± 0.30 | 11.5 ± 0.10 | 1.75 ± 0.10 | 12.0 ± 0.10 | 2.0 ± 0.10 | 4.0 ± 0.10 | 1.50 ± 0.10 |
| 2728 | 7.80 ± 0.20 | 7.15 ± 0.20 | 12.0 ± 0.30 | 5.50 ± 0.05 | 1.75 ± 0.10 | 12 ± 0.10 | 2.0 ± 0.05 | 4.0 ± 0.10 | 1.50 ± 0.10 |

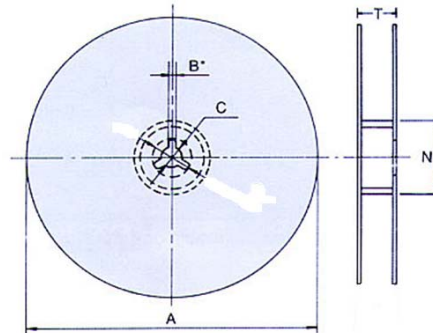
Unit: mm

Embossed Plastic Tape Specifications



| Size | A | B | W | E | F | P0 | P1 | P2 | D0 | D1 | T |
|---------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|----------------|---------|----------------|
| 2512 0,5mR | 3.40 ± 0.10 | 6.75 ± 0.10 | 12.0 ± 0.10 | 1.75 ± 0.10 | 5.5 ± 0.10 | 4.0 ± 0.10 | 4.0 ± 0.10 | 2.0 ± 0.05 | 1.55 ± 0.05 | 1.4min. | 1.45 ± 0.20 |

Reel Dimensions



| Size | Packing Q'ty | A | N | C | B | T |
|------|-----------------------|-----------|-----------|----------|---------|----------|
| 2512 | 4kpcs/Reel (7") | 178.0±2.0 | 60.0±0.5 | 13.0±0.5 | 2.0±0.5 | 16.7max. |
| | 0,5mR 2kpcs/Reel (7") | 178.0±2.0 | 60.0±0.5 | 13.0±0.5 | 2.0±0.5 | 16.7max. |
| | 8kpcs/Reel (10") | 254.0±2.0 | 100.0±0.5 | 13.0±0.5 | 2.0±0.5 | 20.0max. |
| | 16kpcs/Reel (13") | 330.0±2.0 | 100.0±1.0 | 13.0±0.5 | 2.0±0.5 | 20.0max. |
| 1206 | 4kpcs/Reel (7") | 178.0±2.0 | 60.0±0.5 | 13.0±0.5 | 2.0±0.5 | 14.9max. |
| 2010 | 2kpcs/Reel (7") | 178.0±2.0 | 60.0±0.5 | 13.5±0.5 | 2.5±0.5 | 16.7max. |
| 5931 | 3kpcs/Reel (7") | 330.0±2.0 | 99.5±1.0 | 13.0±0.5 | 2.0±0.5 | 28.6max. |
| 2728 | 1kpcs/Reel (7") | 178.0±2.0 | 60±0.5 | 13.0±0.5 | 2.0±0.5 | 21.0max. |

Unit: mm