



Lead-Free Current Sensing Resistors
RLM Series
(Halogen-Free)

| | |
|-------------|---------------|
| Document No | TRLM-100S005D |
| Issued date | 2017/12/21 |
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1. Scope :

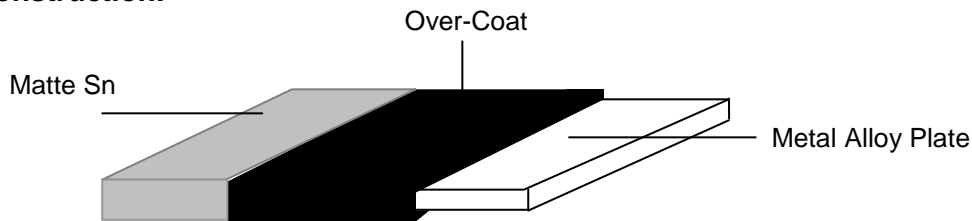
This specification applied to the products of Lead-Free current sensing resistor of metal foil for Lead-Free RLM series manufactured by TA-I TECHNOLOGY CO.,LTD.

2. Type Designation :

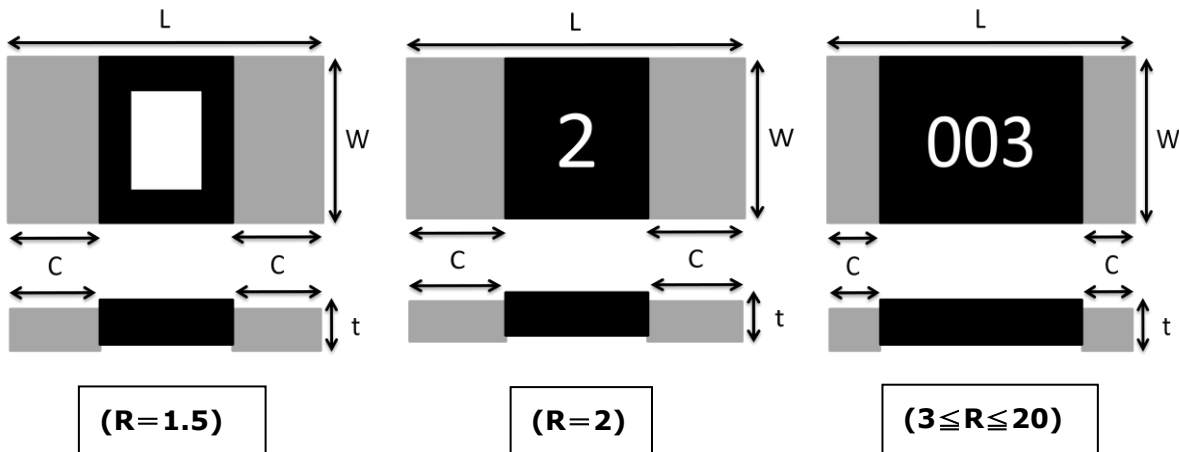
| <u>RLM</u> Item | <u>10</u> Series No. | <u>F</u> Resistance tolerance | <u>I</u> Packaging | <u>S</u> Power Rating | <u>M</u> Metal | <u>R003</u> Resistance |
|--------------------|-------------------------|----------------------------------|-----------------------|----------------------------|-------------------|--------------------------------|
| 10:0805(2012) | | F:±1% G:±2% J:±5% | T: Paper | B=1/8W A=1/4W S=1/2W | M=MnCu | e.g : R003=3mΩ R020=20mΩ |

3. Construction and Dimension :

3.1 Construction:



3.2 Dimension:



unit: mm

| Style | L | W | C | t | Material |
|-------|---------|----------|----------------------|-----------|--|
| RLM10 | 2.0±0.1 | 1.25±0.1 | 0.65±0.2 (1 < R ≤ 2) | 0.6 ±0.20 | Strip : Alloy Over Coating : molding Compound UL-94V-0 grade |
| | | | 0.4±0.2 (3 ≤ R ≤ 20) | | |



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4. Features:

| | |
|---------------------------------------|----------------------|
| Type | RLM10 |
| Power Rating | 1/8W 、 1/4W 、 1/2W |
| Resistance Value | 1.5~20 mΩ |
| Operation Temperature Range | -55℃ ~+170℃ |
| Temperature Coefficient of Resistance | ±50ppm/℃ |
| Tolerance | ±1% 、 ±2% 、 ±5% |
| Insulation Resistance | Over 100MΩ |
| Maximum Working Voltage(V) | (P*R) ^{1/2} |

5. Reliability Tests :

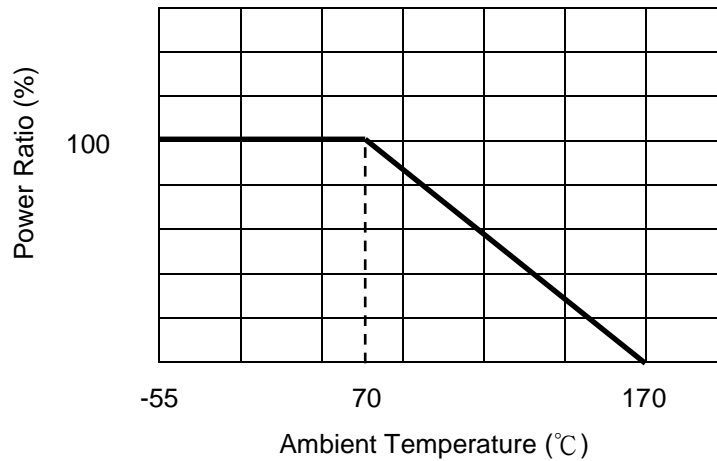
| Test Items | Reference standard | Condition of Test | Test Limits |
|---------------------------------------|--|---|--|
| Temperature Coefficient of Resistance | IEC60115-1 4.8 JIS C 5201-1 4.8 | +25℃ ~ +125℃ | Refer 4.0 |
| Load Life | IEC60115-1 4.25.1 JIS C 5201-1 4.25.1 | 1000hours at rated power, 70℃, 1.5hours "ON", 0.5hour "OFF" | < ±1% |
| Short Time Overload | IEC60115-1 4.13 JIS C 5201-1 4.13 | 5 X rated power for 5s | < ±0.5% |
| Moisture no Load | IEC60115-1 4.24.2.1a) JIS C 5201-1 4.24.2.1a) | 85℃, 85%RH, 1000hrs | < ±1% |
| Temperature cycle | IEC60115-1 4.19 JIS C 5201-1 4.19 | -55℃ & +155℃, 300cycle, 15min per extreme condition | < ±1% |
| Resistance to Soldering Heat | IEC60115-1 4.18 JIS C 5201-1 4.18 | 260±5℃ for10±1 sec | < ±0.5% |
| Solderability | IEC60115-1 4.17 JIS C 5201-1 4.17 | 245±5℃, 2±0.5sec | At least 95% of surface area of electrode shall be covered with new solder |
| High Temperature Exposure | IEC60115-1 4.23.2 JIS C 5201-1 4.23.2 | 170℃, 1000hrs | < ±1% |
| Low Temperature Storage | IEC60115-1 4.23.4 JIS C 5201-1 4.23.4 | -55℃, 1000hrs | <±0.5% |
| Substrate Bending | IEC60115-1 4.33 JIS C 5201-1 4.33 | Bending width 2mm | < ±1% |
| Insulation Resistance | IEC60115-1 4.6 JIS C 5201-1 4.6 | 100V DC for 1 minute | >100 MΩ |



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5.1 Derating Curve



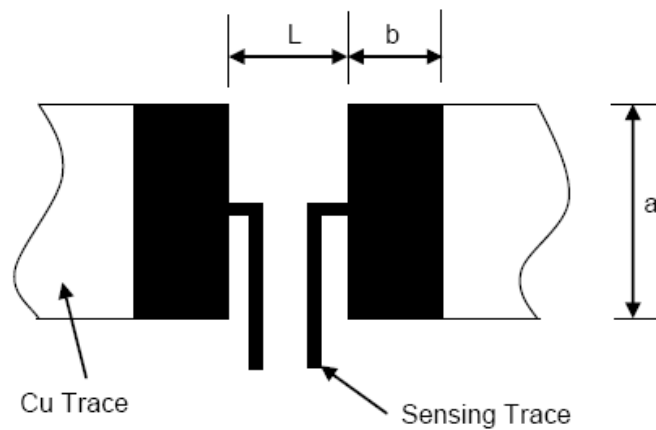
5.2 Rated Current

The rated current is calculated by the following formula:

$$I = \sqrt{P \div R}$$

I: Rated Current(A)
P: Rated Power(W)
R: Resistance Value(Ω)

6. Recommended Solder Pad Dimension



| Resistance Range (Ω) | a | b | L |
|----------------------|-----|------|-----|
| 0.0015~0.002 | 1.4 | 1.15 | 0.7 |
| 0.003~0.020 | 1.4 | 1.15 | 1. |

Unit: mm



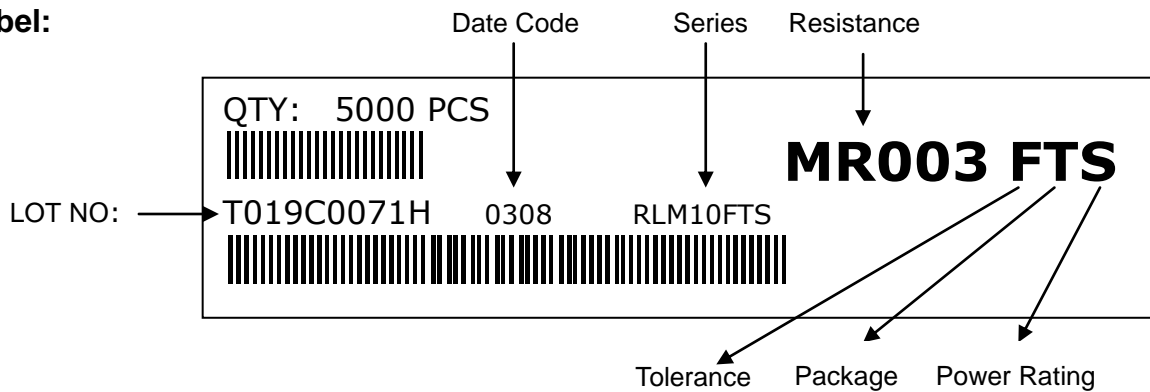
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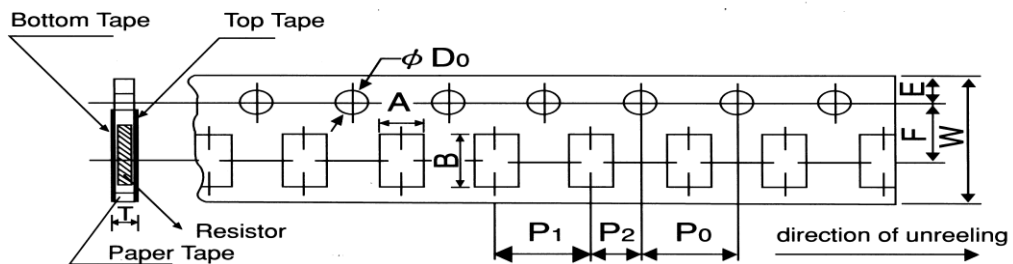
7. Number of Package:

5000 Pieces / package

8. Label:



9. Taping



| Packing | Type | A | B | W | F | E | P ₁ | P ₂ | P ₀ | D ₀ | T |
|------------|-------|----------|---------|---------|----------|----------|----------------|----------------|----------------|---------------------|----------|
| Paper Tape | RLM10 | 1.6±0.15 | 2.4±0.2 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 4.0±0.1 | 2.0±0.1 | 4.0±0.1 | +0.1 Φ 1.5 -0 | 0.84±0.1 |

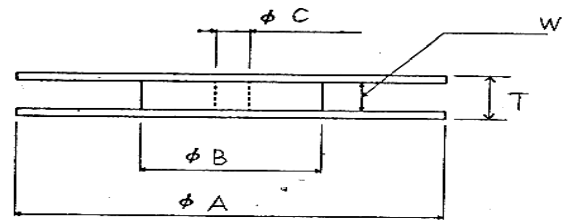
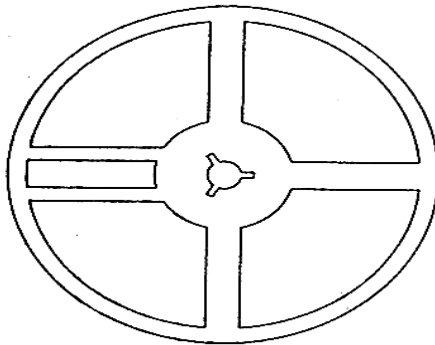
Unit:mm



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10. Reel Specification

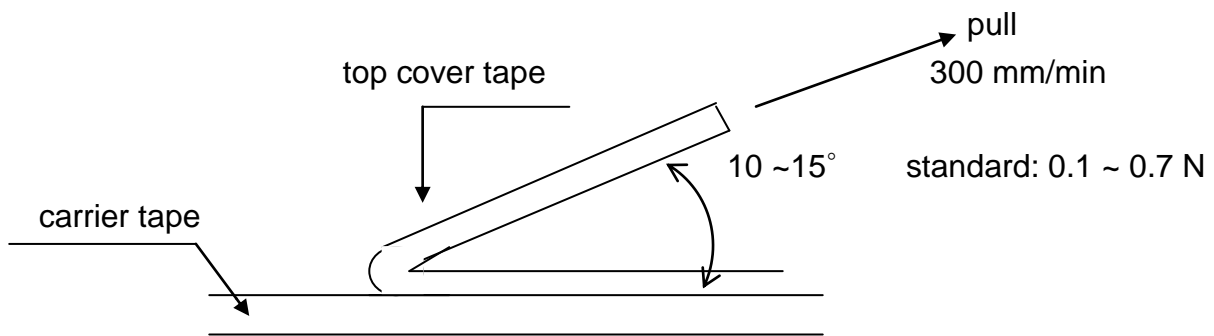


| Series | ϕA | ϕB | ϕC | W | T |
|--------|------------|-----------|-----------|----------|-----------|
| RLM 10 | 178.0 ±2.0 | 60.0 ±1.0 | 13.0 ±1.0 | 9.0 ±1.0 | 11.4 ±1.0 |

Unit: mm

11. Peeling Strength of Top Cover Tape

Peel – off force of paper and blister tape is in accordance with “JIS ” that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.



12. Storage Conditions:

Temperature: 5°C ~35°C, Humidity:40%~75%

13. Shelf Life:

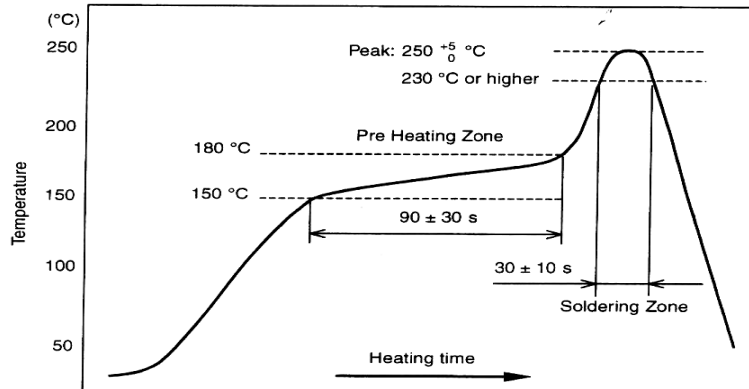
2 years from manufacturing date.



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14. Recommend IR – Reflow profile : (solder : Sn96.5 / Ag3 / Cu0.5)



Peak : $260 \begin{matrix} +5 \\ -5 \end{matrix} \text{ }^{\circ}\text{C}$, 10 ± 1 sec

Pre – heat Zone : 150 to 180 °C , 90 ± 30 sec

Soldering Zone : 230°C or higher , 30 ± 10 sec

Iron Solder: 350 ± 10 °C , $3 + 1 / - 0$ sec

15. ECN

Engineering Change Notice: The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.

16. Manufacturing Country & City :

TA-I TECHNOLOGY CO., LTD. (Taiwan– Tao Yuan)

Tel: (+886) 3-3246169 Fax : (+886) 3-3246167

Associated companies :

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(2) TA-I TECHNOLOGY ELECTRONIC (DONGGUAN) CO., LTD. (China –Dongguan)

Tel : (+86) 769-8339-4790~3 Fax : (+86) 769-8339-4794

(3) TAI OHM ELECTRONICS (M) SDN. BHD. (Malaysia –Penang)

Tel : 604- 3900480 Fax : 604-3901481

(4) P.T.TAI ELECTRONICS Indonesia (Indonesia – Jakarta)

Tel : 62-21-89830123 Fax : 62-21-89830703

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