



**Current Sensing Resistors  
RLM Series  
( Halogen-Free )  
AEC-Q 200-Ver D qualified**

|             |               |
|-------------|---------------|
| Document No | TRLM-120S032D |
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**1. Scope :**

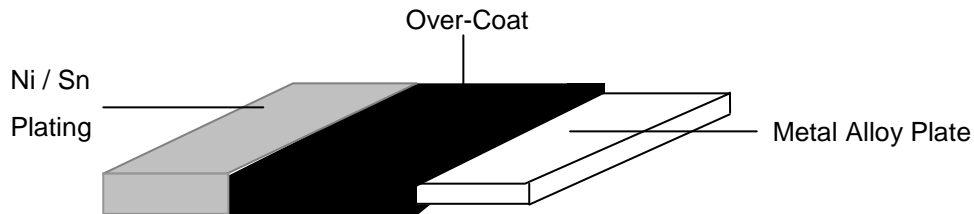
This specification applied to the products of current sensing resistor of metal foil for Lead-Free RLM series manufactured by TA-I TECHNOLOGY CO., LTD.

**2. Type Designation :**

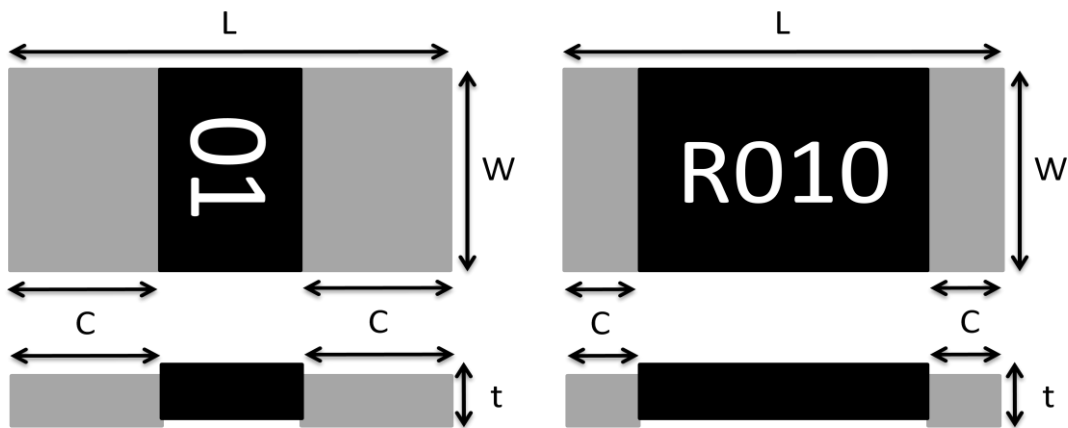
| <u>RLM</u><br>Item | <u>12</u><br>Series No | <u>E</u><br>Resistance tolerance | <u>I</u><br>Packaging | <u>C</u><br>Power Rating             | <u>M</u><br>Metal | <u>R001</u><br>Resistance     |
|--------------------|------------------------|----------------------------------|-----------------------|--------------------------------------|-------------------|-------------------------------|
|                    | 12:1206<br>(3216)      | F:±1%<br>G:±2%<br>J:±5%          | T: Paper Tape         | A=1/4W<br>S=1/2W<br>C=1W<br>D = 1.5W | M= Metal          | e.g:<br>R001=1mΩ<br>R030=30mΩ |

**3. Construction and Dimension :**

**3.1 Construction:**



**3.2 Dimension:**



UNIT: mm

| Style | L        | W        | C                              | t                              | Material  |
|-------|----------|----------|--------------------------------|--------------------------------|---|
| RLM12 | 3.2±0.20 | 1.6±0.20 | 1.1 ± 0.30<br>(R=1mΩ)          | 0.75 ± 0.20<br>(R=1mΩ)         | Metal : Alloy<br>Over Coating : molding<br>Compound UL-94 grade |
|       |          |          | 0.5 ± 0.30<br>(2mΩ ≤ R ≤ 30mΩ) | 0.6 ± 0.20<br>(2mΩ ≤ R ≤ 30mΩ) |   |



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**4. Features:**

|                                       |  |
|---------------------------------------|--|
| Type                                  | RLM12                                      |
| Power Rating                          | 1/4W & 1/2W & 1W & 1.5W                    |
| Resistance Value                      | 1~30mΩ (1/4W ~ 1W)<br>1~5 mΩ (1/4W ~ 1.5W) |
| Operation Temperature Range           | -55°C ~+170°C                              |
| Temperature Coefficient of Resistance | ±50ppm/°C                                  |
| Tolerance                             | ±1%、±2%、±5%                                |
| Insulation Resistance                 | Over 100MΩ                                 |
| Maximum Working Voltage(V)            | (P*R) <sup>1/2</sup>                       |

Note\*:1 Watts with total solder pad and trace size of 300mm<sup>2</sup>

**5. Reliability Tests:**

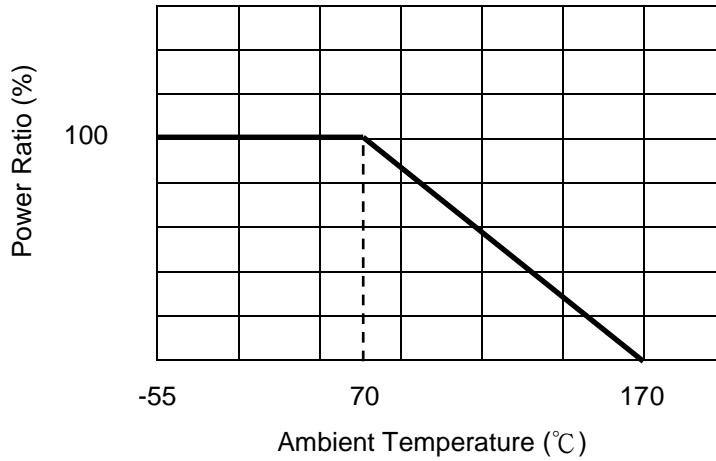
| Test Items                            | Reference              | Condition of Test   | Test Limits |
|---------------------------------------|------------------------|---|-------------|
| Temperature Coefficient of Resistance | IEC60115-1 4.8         | +25 ~ 125°C   | Refer 4.0   |
| High Temperature Exposure(Storage)    | MIL-STD-202 Method 108 | T=125°C,1000hrs,Measurement at 24hrs after test conclusion.                             | < ±1%       |
| Low temperature operation             | IEC60115-1 4.23.4      | -55 °C for 45 min   | < ±0.5%     |
| Temperature Cycling                   | JESD22 Method JA-104   | 1000Cycle (-55°C to 125 °C),Measurement at 24hrs after test conclusion.                 | < ±0.5%     |
| Short time overload                   | IEC60115-1 4.13        | 5 X rated power for 5s  | < ±0.5%     |
| Biased Humidity                       | MIL-STD-202 Method 103 | 10% Rated voltage at 85 °C,RH:85% ,1000Hrs, Measurement at 24hrs after test conclusion. | < ±0.5%     |
| Operation life                        | MIL-STD-202 Method 108 | 1000 h at +70 °C, 1.5 h "ON", 0.5 h "OFF"   | < ±1%       |
| Resistance to Soldering Heat          | IEC60115-1 4.18        | T=260+/-5°C solder,10+/-1 sec dwell   | < ±0.5%     |
| Mechanical Shock                      | MIL-STD-202 Method 213 | 100g's , Normal duration is 6ms , half sine shock pulse                                 | < ±0.5%     |
| Resistance to vibration               | MIL-STD-202 Method 204 | 5g's for 20min.12cycles, 10-2000Hz  | <±0.5%      |
| Board Flex                            | AEC-Q200-005           | Min 2mm deflection ,60sec.  | < ±0.5%     |
| Flammability                          | UL-94                  | V-0 or V-1are acceptable, Electrical test not required                                  |             |



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### 5.1 Derating Curve



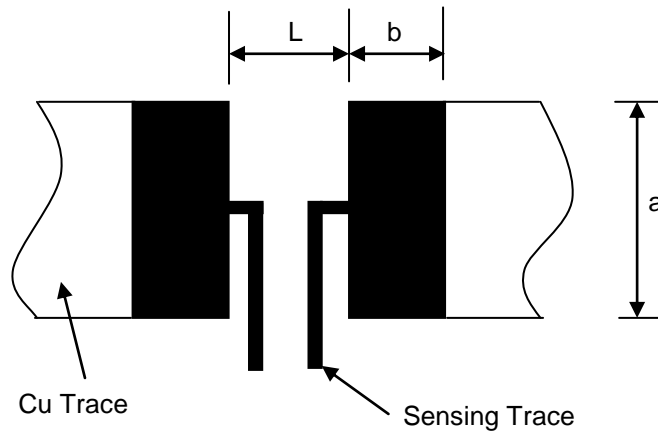
### 5.2 Rated Current

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   |
|----------------------|-----|-----|-----|
| 0.001                | 1.8 | 2.3 | 1.0 |
| 0.002~0.030          | 1.8 | 1.7 | 1.6 |

Unit: mm



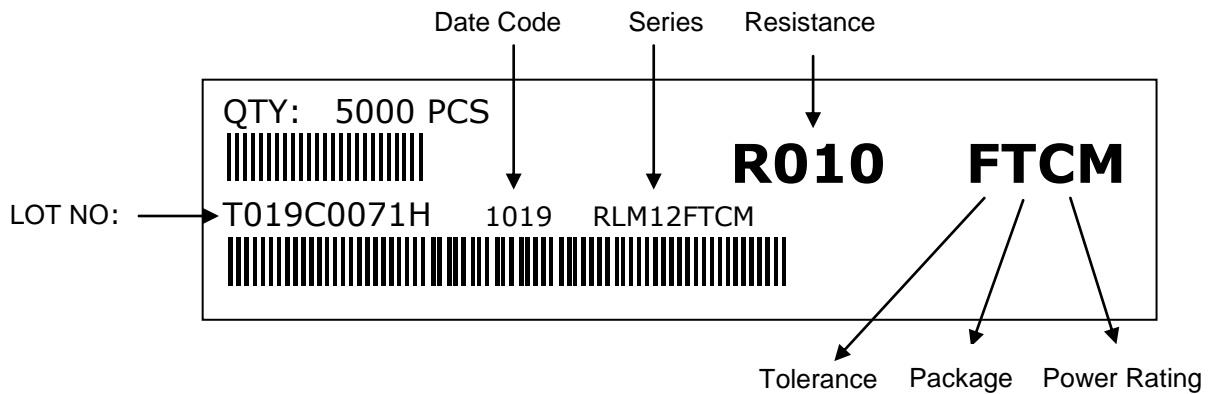
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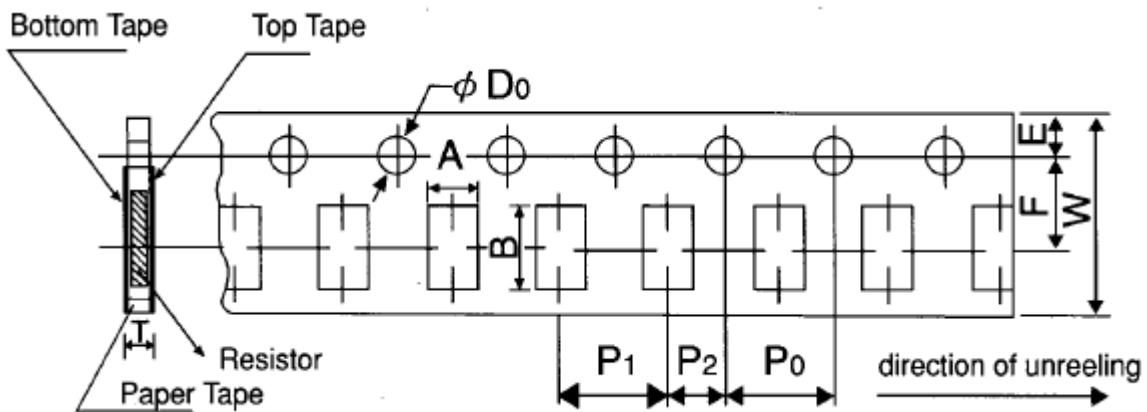
**7. Number of Package:**

5000 Pieces / package

**8. Label:**



**9. Taping**



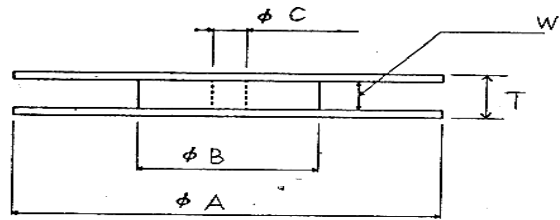
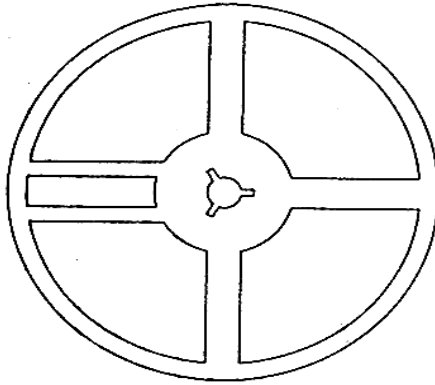
| Packing    | Type  | A        | B       | W       | F        | E        | P <sub>1</sub> | P <sub>2</sub> | P <sub>0</sub> | D <sub>0</sub>          | T        |
|------------|-------|----------|---------|---------|----------|----------|----------------|----------------|----------------|-------------------------|----------|
| Paper Tape | RLM12 | 2.0±0.15 | 3.6±0.2 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 4.0±0.1        | 2.0±0.05       | 4.0±0.1        | $\phi 1.5$<br>(+0.1/-0) | 0.84±0.1 |



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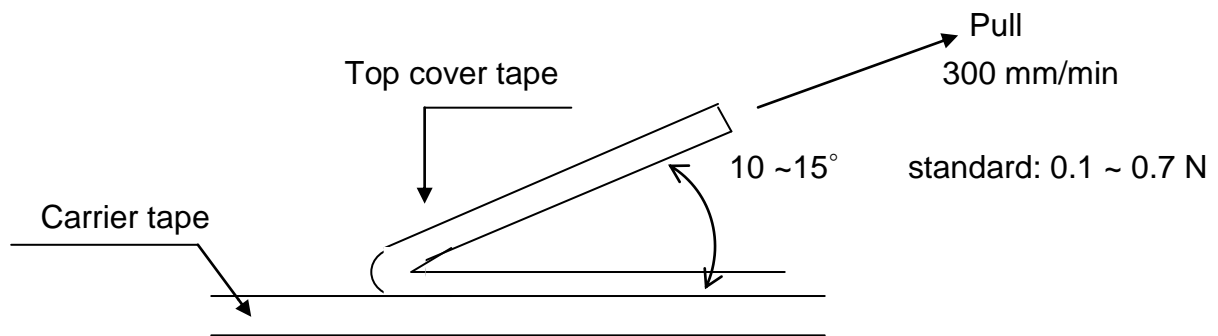
**10. Reel Specification**



| Series | $\phi A$      | $\phi B$       | $\phi C$       | W             | T              |
|--------|---------------|----------------|----------------|---------------|----------------|
| RLM12  | 178 $\pm$ 2.0 | 60.0 $\pm$ 1.0 | 13.0 $\pm$ 1.0 | 9.0 $\pm$ 1.0 | 11.5 $\pm$ 1.0 |

**11. Peeling Strength of Top Cover Tape**

Test Condition: 0.1 to 0.7 N at a peel-off speed of 300 mm / min.



**12. Storage Conditions:**

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

**13. Shelf Life:**

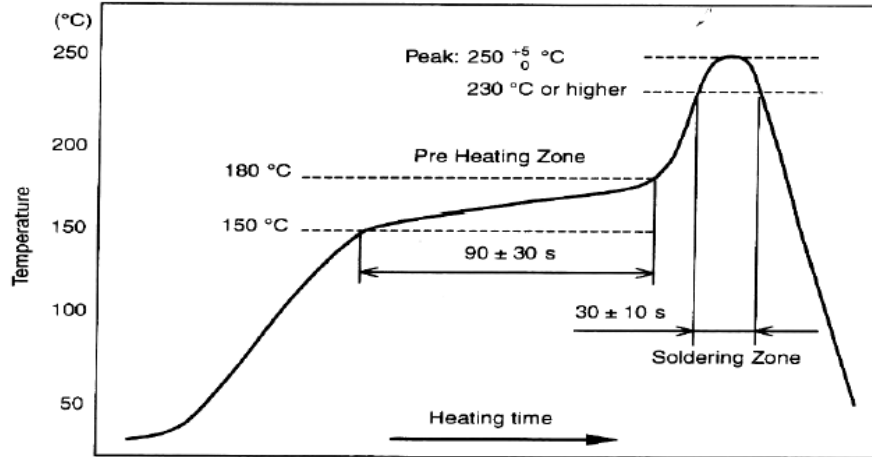
2 years from manufacturing date.



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



Peak :  $250 \begin{matrix} +5 \\ -0 \end{matrix} \text{ }^{\circ}\text{C}$  , 5 sec

Pre-heat zone : 150 to 180  $^{\circ}\text{C}$  , 90 $\pm$ 30 sec

Soldering zone : 230 $^{\circ}\text{C}$  or higher , 30 $\pm$ 10 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)

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(5) P.T.TAI ELECTRONIC Indonesia (Indonesia – Jakarta)

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[PR2512FKF7W0R004L](#) [RC1005F124CS](#) [RL73K3AR56JTDF](#) [RL7520WT-R001-F](#) [RL7520WT-R009-G](#) [RL7520WT-R020-F](#)  
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[LRF2010-R003JW](#) [KRL1632E-C-R200-F-T5](#) [KRL1632E-C-R200-F-T1](#) [Y14880R02000B9R](#) [RLP73M1ER051FTDF](#) [RLP73M2AR051FTDF](#)  
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[SR731ERTTP4R70F](#) [SR731ERTTP2R20F](#) [SR731ERTTP3R90F](#) [SR731ERTTP1R00F](#) [SR731ERTTP10R0F](#) [SR731ERTTP2R00F](#)  
[SR731ERTTP8R20F](#) [SR731ERTTP3R9J](#) [SR731ERTTP8R2J](#) [SR731ERTTP2R0J](#) [SR731ERTTP4R7J](#) [SR731ERTTP9R1J](#) [SR731ERTTP1R0J](#)  
[SR731ERTTP2R2J](#) [SR731ERTTP5R1J](#) [SR731ERTTP6R8J](#) [SR731ERTTP9R10F](#)