



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

Document No	TRLM-120S032D
Issued date	2017/12/27
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**1. Scope :**

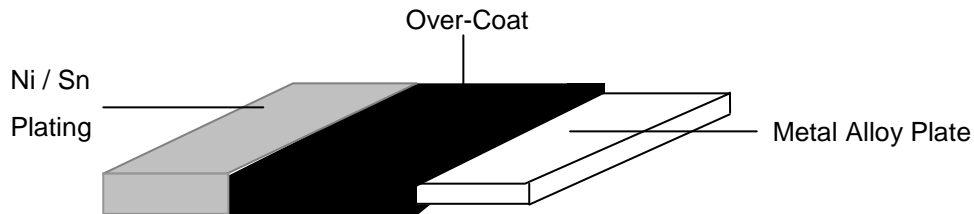
This specification applied to the products of current sensing resistor of metal foil for Lead-Free RLM series manufactured by TA-I TECHNOLOGY CO., LTD.

**2. Type Designation :**

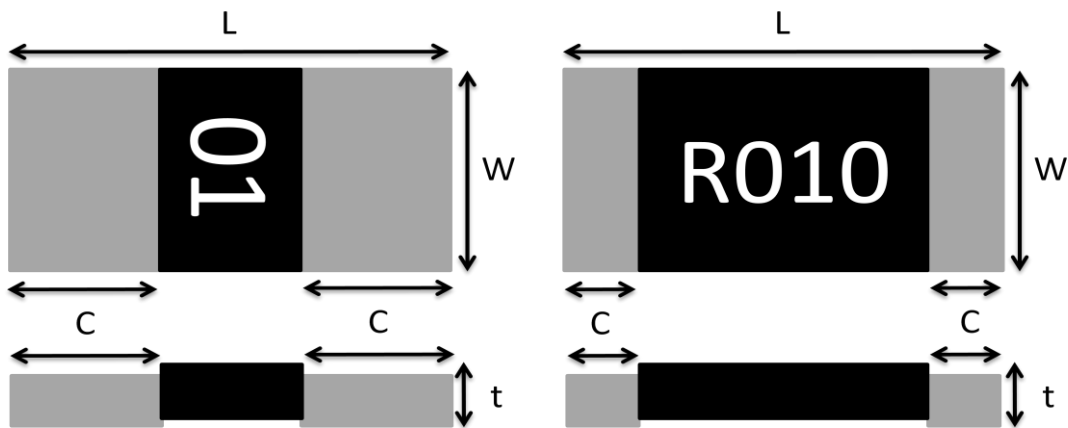
<u>RLM</u> Item	<u>12</u> Series No	<u>E</u> Resistance tolerance	<u>I</u> Packaging	<u>C</u> Power Rating	<u>M</u> Metal	<u>R001</u> Resistance
	12:1206 (3216)	F:±1% G:±2% J:±5%	T: Paper Tape	A=1/4W S=1/2W C=1W D = 1.5W	M= Metal	e.g: R001=1mΩ R030=30mΩ

**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 (R=1mΩ)	0.75 ± 0.20 (R=1mΩ)	Metal : Alloy Over Coating : molding Compound UL-94 grade
			0.5 ± 0.30 (2mΩ ≤ R ≤ 30mΩ)	0.6 ± 0.20 (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) 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:**

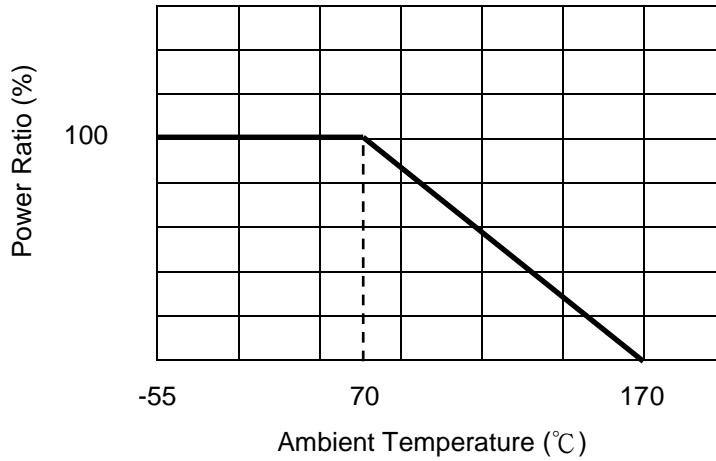
Test Items	Reference	Condition of Test	Test Limits
Temperature Coefficient of Resistance	IEC60115-1 4.8	+25 ~ 125°C	Refer 4.0
High Temperature Exposure(Storage)	MIL-STD-202 Method 108	T=125°C,1000hrs,Measurement at 24hrs after test conclusion.	< ±1%
Low temperature operation	IEC60115-1 4.23.4	-55 °C 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



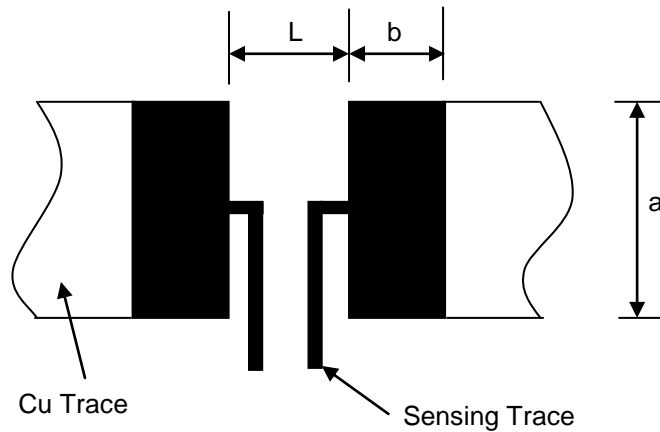
### 5.2 Rated Current

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



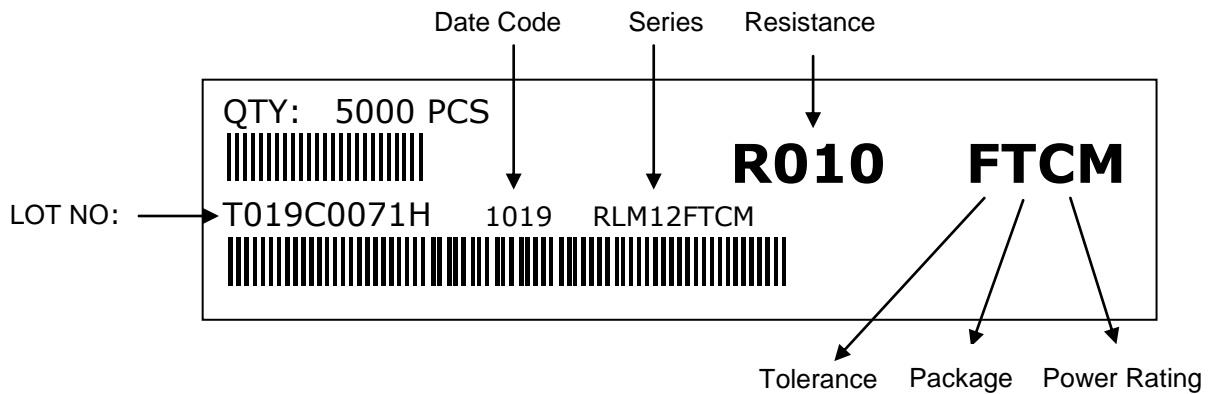
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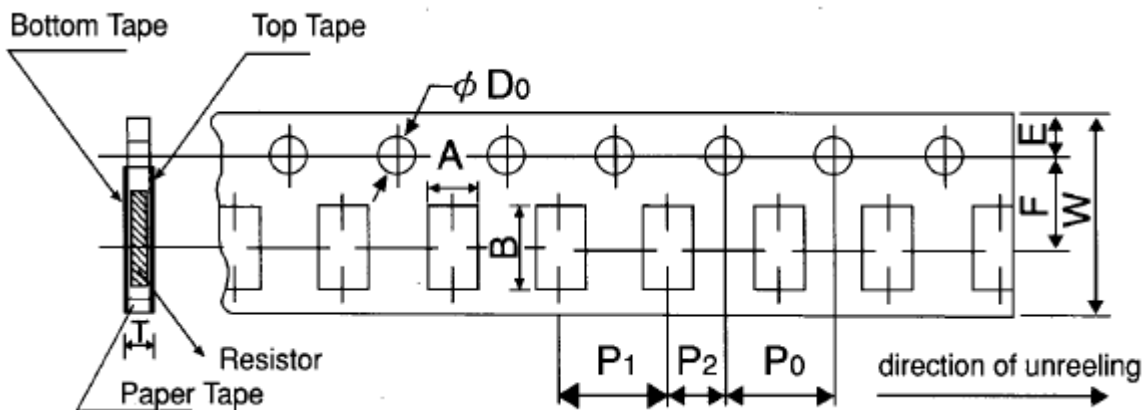
**7. Number of Package:**

5000 Pieces / package

**8. Label:**



**9. Taping**



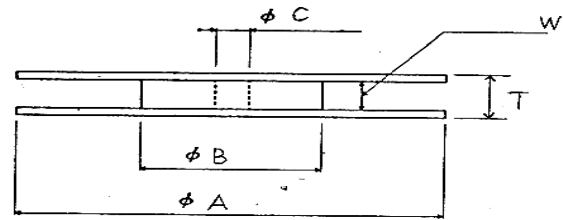
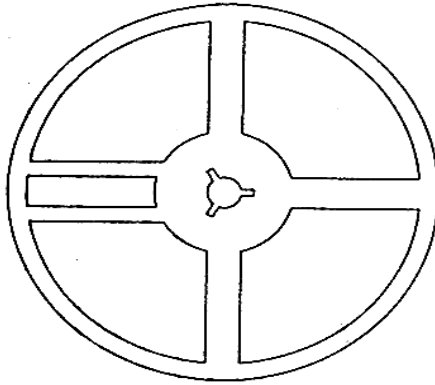
Packing	Type	A	B	W	F	E	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	D <sub>0</sub>	T
Paper Tape	RLM12	2.0±0.15	3.6±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	$\phi 1.5$ (+0.1/-0)	0.84±0.1



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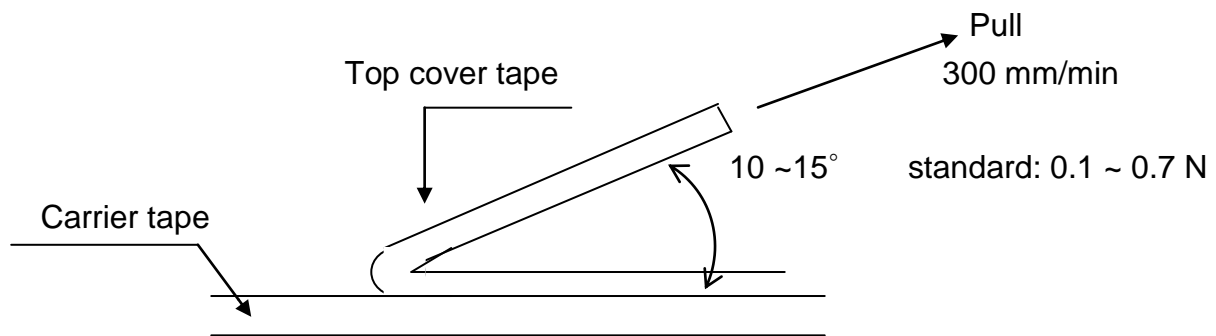
**10. Reel Specification**



Series	$\phi A$	$\phi B$	$\phi C$	W	T
RLM12	178±2.0	60.0±1.0	13.0±1.0	9.0±1.0	11.5±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:**

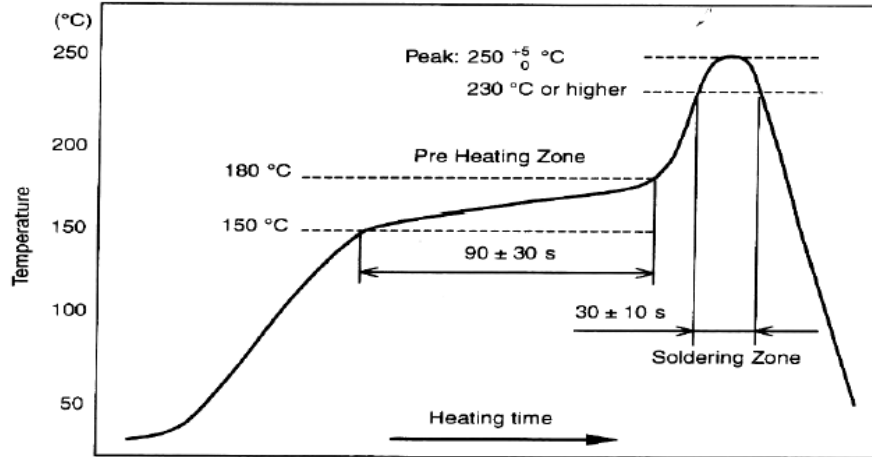
2 years from manufacturing date.



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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 °C , 90±30 sec

Soldering zone : 230°C or higher , 30±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)

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

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(3) FORTUNE TASK RESISTOR FACTORY (China – Dongguan)

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

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