



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

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**1. Scope :**

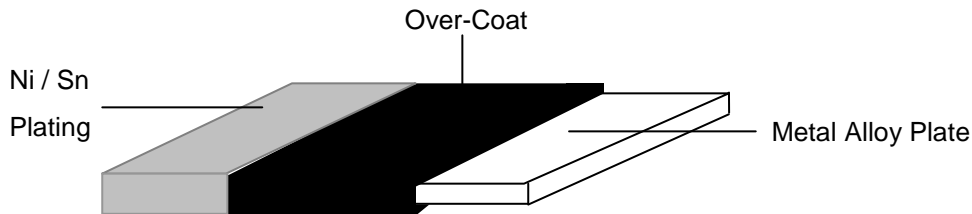
This specification applied to the products of current sensing resistor of metal foil for Lead-Free RLM series manufactured by TA-I TECHNOLOGY CO., LTD.

**2. Type Designation :**

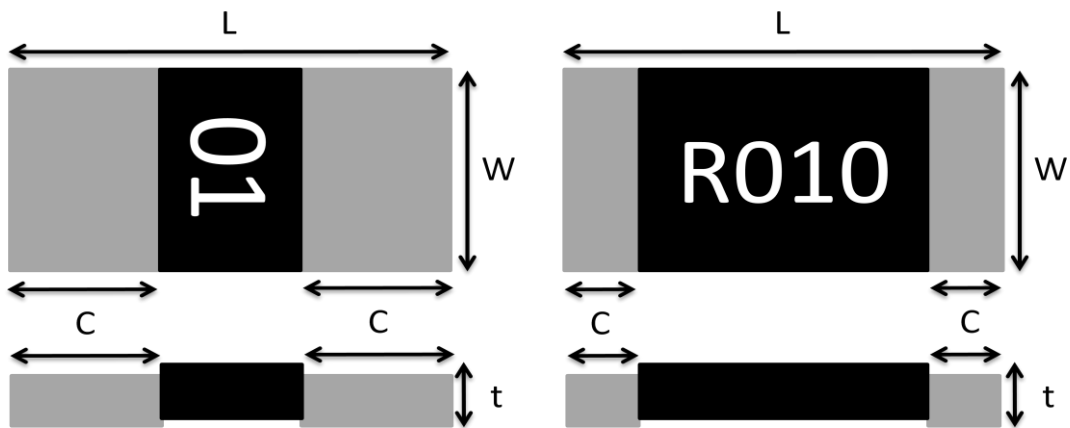
<u>RLM</u> Item	<u>12</u> Series No	<u>E</u> Resistance tolerance	<u>I</u> Packaging	<u>C</u> Power Rating	<u>M</u> Metal	<u>R001</u> Resistance
	12:1206 (3216)	F:±1% G:±2% J:±5%	T: Paper Tape	A=1/4W S=1/2W C=1W	M=MnCu	e.g: R001=1mΩ

**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)	Strip : 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	
Resistance Value	1~30mΩ	
Operation Temperature Range	-55°C ~+170°C	
Temperature Coefficient of Resistance	±200ppm/°C	R=1mΩ
	±100ppm/°C	2mΩ ≤ R ≤ 10mΩ
	±75ppm/°C	R>10mΩ
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:**

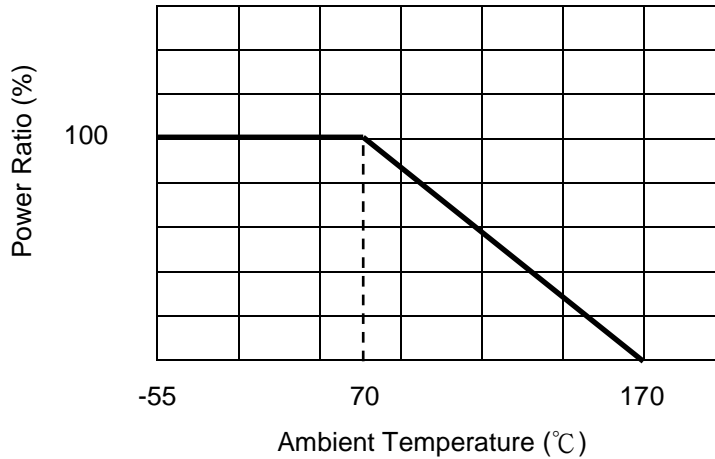
Test Items	Reference standard	Condition of Test	Test Limits
Temperature Coefficient of Resistance	IEC60115-1 4.8 JIS C 5201-1 4.8	+25°C ~ +125°C	Refer 4.0
Load Life	IEC60115-1 4.25.1 JIS C 5201-1 4.25.1	1000hours at rated power, 70°C, 1.5hours "ON", 0.5hour "OFF"	< ±1%
Short Time Overload	IEC60115-1 4.13 JIS C 5201-1 4.13	5 X rated power for 5s	< ±1%
Moisture no Load	IEC60115-1 4.24.2.1a) JIS C 5201-1 4.24.2.1a)	85°C, 85%RH, 1000hrs	< ±0.5%
Temperature cycle	IEC60115-1 4.19 JIS C 5201-1 4.19	-55°C & +155°C, 300cycle, 15min per extreme condition	< ±0.5%
Resistance to Soldering Heat	IEC60115-1 4.18 JIS C 5201-1 4.18	260±5°C for 20±1 sec	< ±0.5%
Solderability	IEC60115-1 4.17 JIS C 5201-1 4.17	245±5°C, 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°C, 1000hrs	< ±1%
Low Temperature Storage	IEC60115-1 4.23.4 JIS C 5201-1 4.23.4	-55°C, 1000hrs	< ±1%
Substrate Bending	IEC60115-1 4.33 JIS C 5201-1 4.33	Bending width 2mm	< ±0.5%
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 Voltage**

The rated voltage is calculated by the following formula:

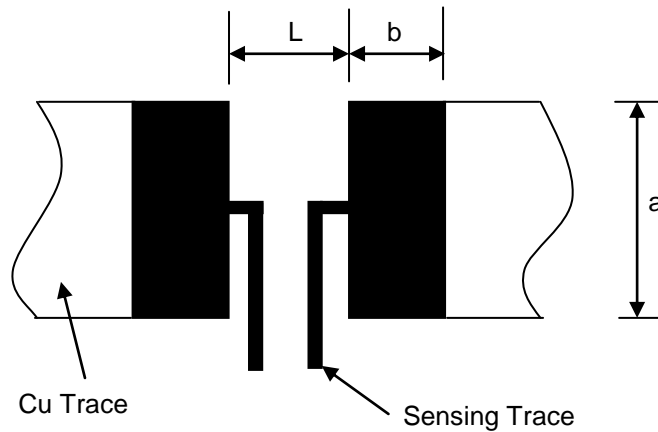
$$V = \sqrt{P \times R}$$

V: Rated Voltage (V)

P: Rated Power (W)

R: Resistance Value ( $\Omega$ )

**6. Recommended Solder Pad Dimension**



Resistance Range ( $\Omega$ )	a	b	L
0.001	1.8	2.3	1.0
0.002~0.030	1.8	1.7	1.6

Unit: mm



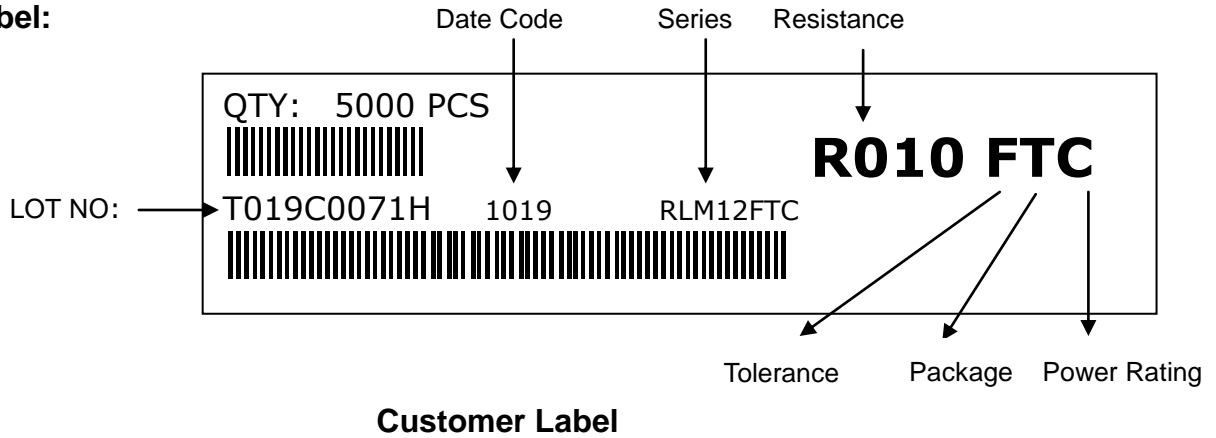
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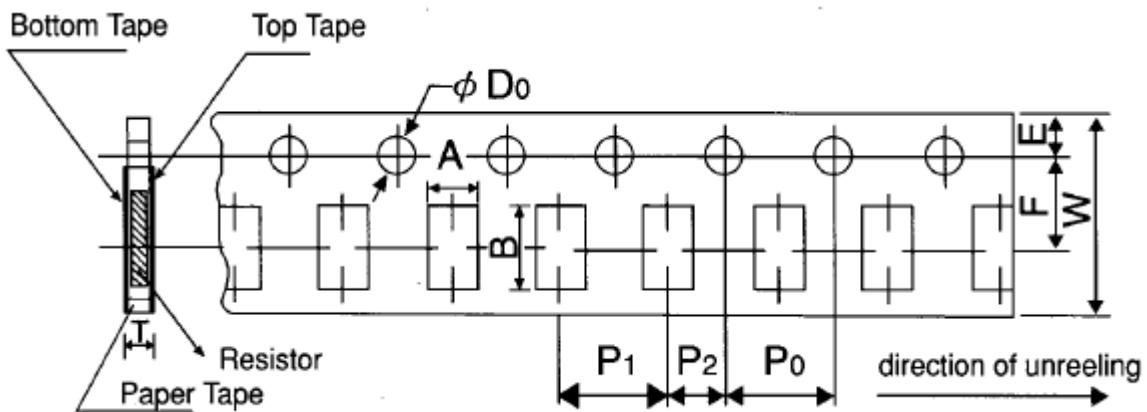
**7. Number of Package:**

5000 Pieces / package

**8. Label:**



**9. Taping**



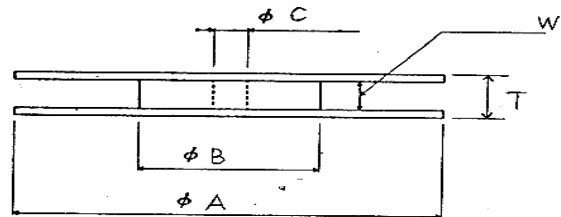
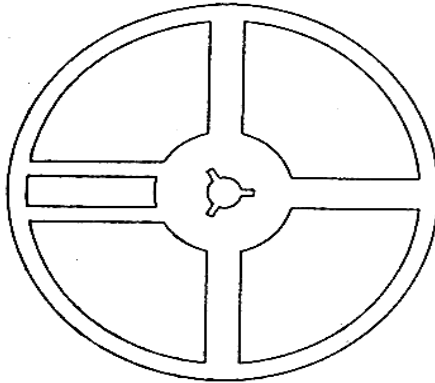
Packing	Type	A	B	W	F	E	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	D <sub>0</sub>	T
Paper Tape	RLM12	2.0±0.15	3.6±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	φ 1.5 (+0.1/-0)	0.84±0.1



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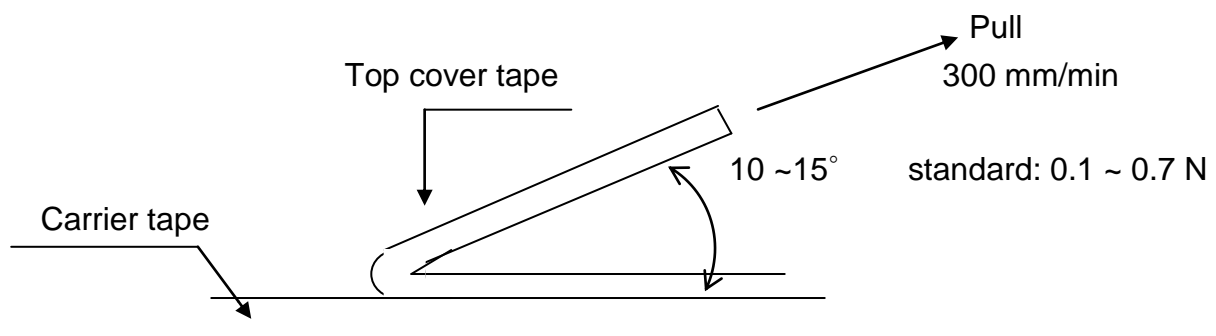
**10. Reel Specification**



Series	$\phi A$	$\phi B$	$\phi C$	W	T
RLM12	178 $\pm$ 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:**

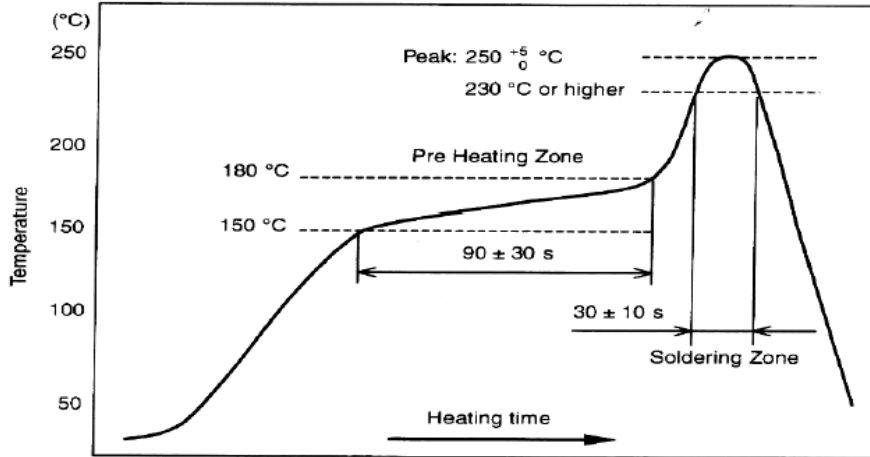
2 years from manufacturing date.



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



Peak : 250  $\pm$  5 °C , 5 sec  
- 0

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.

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