



**Alloy Film
Low Resistance Chip Resistors
(RBL Series)
Halogen-Free**

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1. Scope :

The specification applies for the RBL Series (0603 ~ 2512) of alloy film low resistance chip resistors made by TA-I and the resistance range between 10mΩ and 91mΩ.

2. Features :

- ◆ Low Resistance and High Accuracy Resistor for Current Detection
- ◆ Large Electrode (All series)
- ◆ Good Performance for Heat Dissipation
- ◆ High Purity Alumina Substrate for High Power Dissipation
- ◆ Pb-free to Meet RoHS Requirements

3. Applications :

- ◆ Power Management Applications
- ◆ Switching Power Supply
- ◆ DC-DC Converter, Battery Pack, Charger, Adaptor
- ◆ Portable Instruments (PDA and Cell Phone)
- ◆ Voltage Regulation Module (VRM)
- ◆ Computer

4. Type Designation :

RBL	10	F	T	R030
Low Ohm Chip Resistors	Size/Power Rating	Tolerance Of Resistance at 25°C	Packaging	Nominal Resistance
	06:0603 : 0.25W 10:0805 : 0.5W 12:1206 : 0.5W 20:2010 : 0.75W 25:2512 : 1W	F : ±1.0% G : ±2.0% J : ±5.0%	T : Paper Tape E : Embossed Tape	R030 : 30mΩ



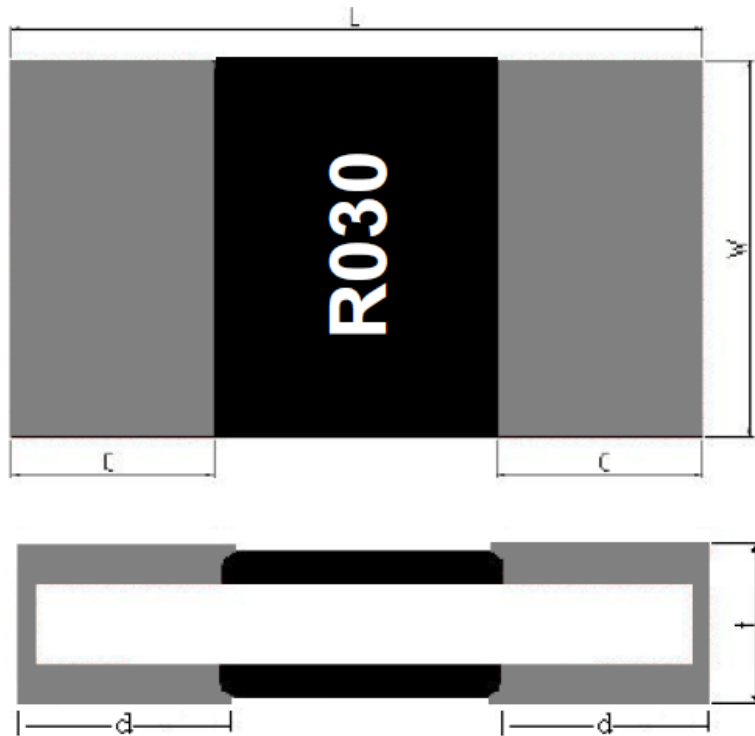
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5. Dimensions :



Unit: mm

Item	L	w	c	d	t
RBL06	1.60±0.1	0.90±0.1	0.47±0.1	0.47±0.1	0.50±0.1
RBL10	2.00±0.1	1.30±0.1	0.55±0.1	0.55±0.1	0.62±0.1
RBL12	3.10±0.1	1.60±0.1	1.10±0.2	1.10±0.2	0.62±0.2
RBL20	5.00±0.2	2.60±0.2	1.80±0.2	1.80±0.2	0.62±0.2
RBL25	6.30±0.2	3.20±0.2	2.0±0.3	2.0±0.3	0.65±0.2



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6. Electrical Characteristics :

Chip Size	Power Rating	TCR (ppm/°C)	Resistance Range (mΩ)			Operating Temp. Range
			F : ±1%	G : ±2%	J : ±5%	
0603	0.25W	± 200	10~20			-55°C~ +155°C
		± 100	21~91			
0805	0.5W	± 200	10~20			
		± 100	21~91			
1206	0.5W	± 200	10~20			
		± 100	21~91			
2010	0.75W	± 200	10~20			
		± 100	21~91			
2512	1W	± 200	10~20			
		± 100	21~91			

7. Derating Curve :

For resistors operated at ambient temperature over 70°C, power rating shall be derated in accordance with figure 1.

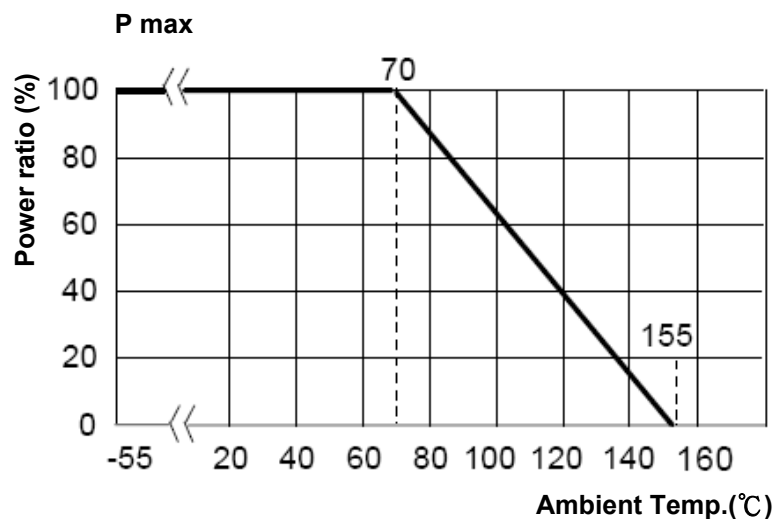


Figure 1



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8. Reliability Tests :

Test Item	Reference standard	Condition of Test	Test Limits
Temperature Coefficient of Resistance	IEC60115-1-4.8 JIS-C5201-1-4.8	-55 ~ +125℃	Refer to paragraph 6
Short Time Overload	IEC60115-1-4.13 JIS-C5201-1-4.13	2.5 X rated voltage, 5s	± (1%+0.5mΩ)
Load Life	IEC60115-1-4.25.1 JIS-C5201-1-4.25.1	1000 hours at rated power , 70℃, 1.5hours "ON ", 0.5hour "OFF"	± (2%+0.5mΩ)
Load Life with Humidity	IEC60115-1-4.24 JIS-C5201-1-4.24	1000 hours at rated power , 40 ± 2℃, 90~95% RH 1.5hours "ON ", 0.5hour "OFF"	± (2%+0.5mΩ)
Rapid Change of Temperature	IEC60115-1-4.19 JIS-C5201-1-4.19	-55℃ (30 min.) / +125 ℃(30 min.) 5 cycles	± (1%+0.5mΩ)
Resistance to Soldering Heat	IEC60115-1-4.18 JIS-C5201-1-4.18	270 ± 5℃ solder , 10 ± 1 sec dwell .	± (1%+0.5mΩ)
Solderability	IEC60115-1-4.17 JIS-C5201-1-4.17	245±5℃ solder, 2±0.5 sec dwell. Solder : Sn96.5 / Ag3.0 / Cu0.5	At least 95% of surface area of electrode shall be covered with new solder.
Robustness of Termination (Bending Strength)	IEC60115-1-4.33 JIS-C5201-1-4.33	RBL06 、 10 、 12 : 3mm deflection RBL20 、 25 : 2mm deflection	± (1%+0.5mΩ)
Resistance to Dry Heat	IEC60115-1-4.23.2 JIS-C5201-1-4.23.2	125 ± 5℃ for 96 ± 4hrs	± (1%+0.5mΩ)

Moisture Sensitivity Level : Level 1

9. Marking :

From 0805 to 2512 :

Resistance value is expressed by 4 digits, the first "R" means decimal point and the other digits represent for the normal resistance in Ω.

eg., 15mΩ= R015

For 0603 : No Marking.



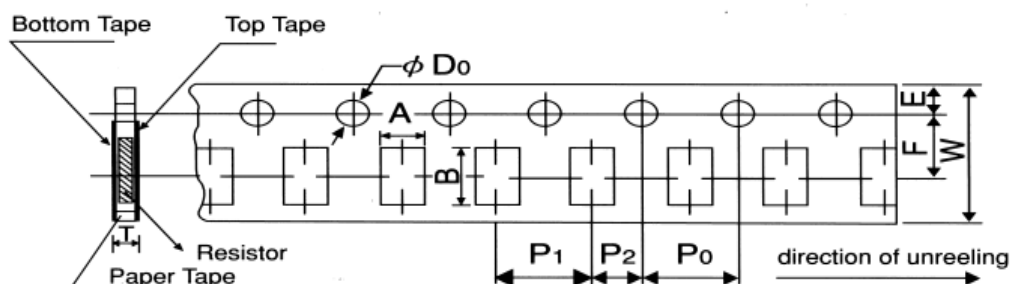
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10. Taping & Reel :

10.1 Taping Dimensions :

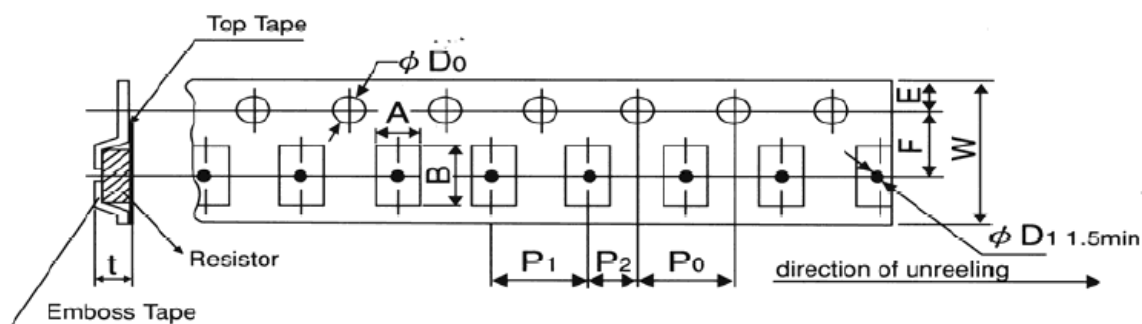
10.1.1 4 mm pitch paper :



Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Paper Tape	RBL06	1.1±0.1	1.9±0.1	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.1	4.0±0.1	$\phi 1.5^{+0.1}_{-0.1}$	0.64±0.1
	RBL10	1.6±0.15	2.4±0.2								0.84±0.1
	RBL12	2.0±0.15	3.6±0.2								0.84±0.1

UNIT: mm

10.1.2 4 mm pitch Emboss :



Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Emboss	RBL20	2.8±0.2	5.3±0.2	12.0±0.2	5.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.05	$\phi 1.5^{+0.1}_{-0.1}$	0.85±0.15
	RBL25	3.6±0.2	6.9±0.2								

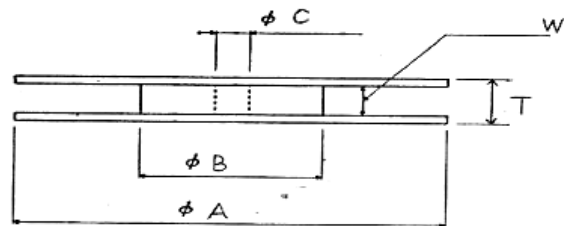
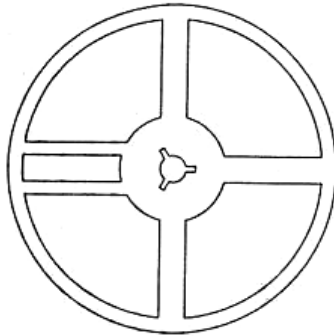
UNIT: mm



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10.2 Reel Specifications :

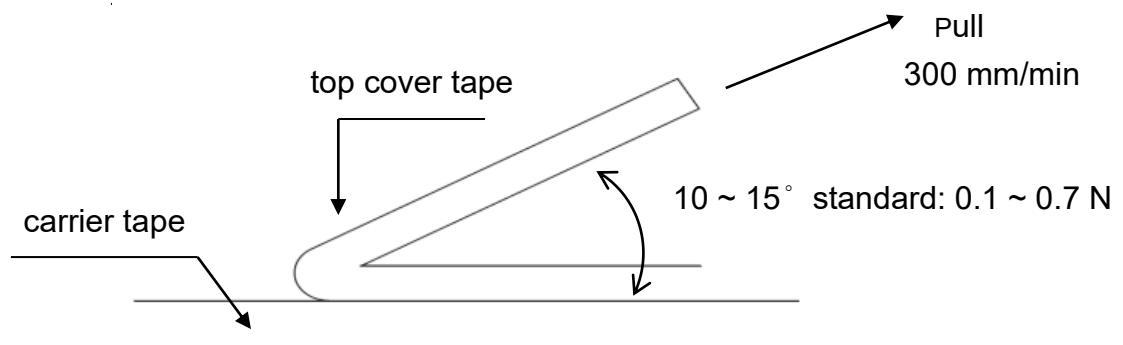


UNIT: mm

Type	ϕA	ϕB	ϕC	W	T
RBL06 / 10 / 12	178.0 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	9.0 ± 1.0	11.4 ± 1.0
RBL20 / 25				13.0 ± 1.0	15.5 ± 1.0

10.3 Peel – off force :

Peel – off force of paper and blister tape is in accordance with “JIS-C5202 ”
that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.





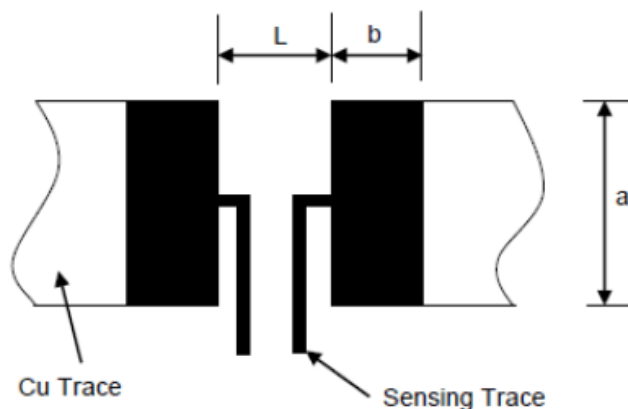
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11. Recommended land patterns :



Type	Size	Land pattern	Dimension (mm)		
			a	b	L
RBL	06 (0603)		0.90±0.10	0.65±0.10	0.80
RBL	10 (0805)		1.15±0.20	1.15±0.20	1.20
RBL	12 (1206)		1.50±0.20	1.25±0.20	2.20
RBL	20 (2010)		2.90±0.20	1.30±0.20	3.50
RBL	25 (2512)		2.90±0.20	2.15±0.20	3.80

12. 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.

13. Storage Conditions :

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

14. Shelf Life :

2 years from manufacturing date.



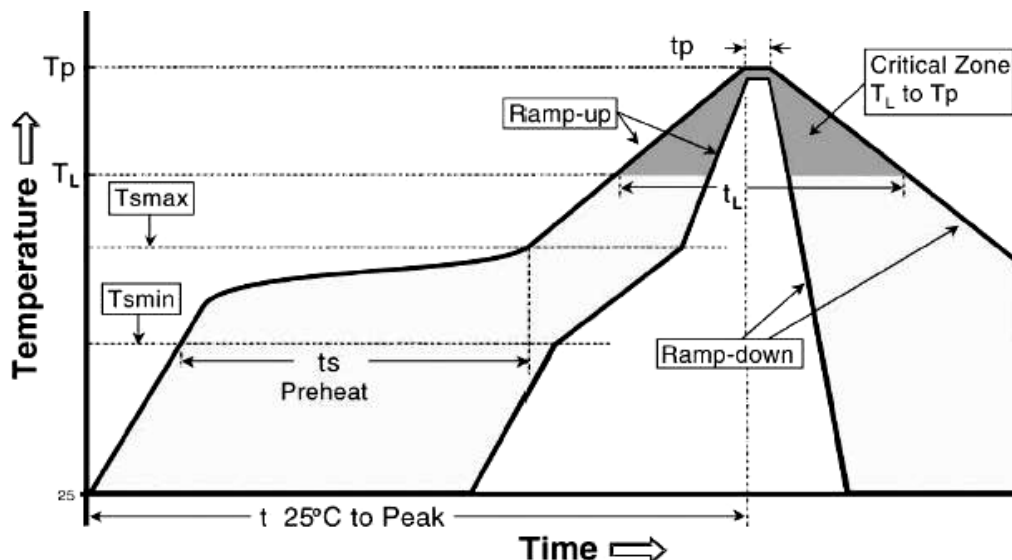
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15.Recommend IR – Reflow profile : (solder : Sn96.5 / Ag3 / Cu0.5)



Profile Feature	Lead (Pb)-Free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C / second max.
Preheat - Temperature Min (T _{smin}) - Temperature Max (T _{smax}) - Time (T _{smin} to T _{smax}) (ts)	150°C 200°C 60 -120 seconds
Time maintained above : - Temperature (T _L) - Time (T _L)	217°C 60-150 seconds
Peak Temperature (T _p)	260°C
Time within $\begin{matrix} +0 \\ -5 \end{matrix}$ °C of actual Peak Temperature (tp) ²	10 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8minutes max.

Allowed Re-flow times : 3 times

Remark : To avoid discoloration phenomena of chip on terminal electrodes,
please use N2 Re-flow furnace.