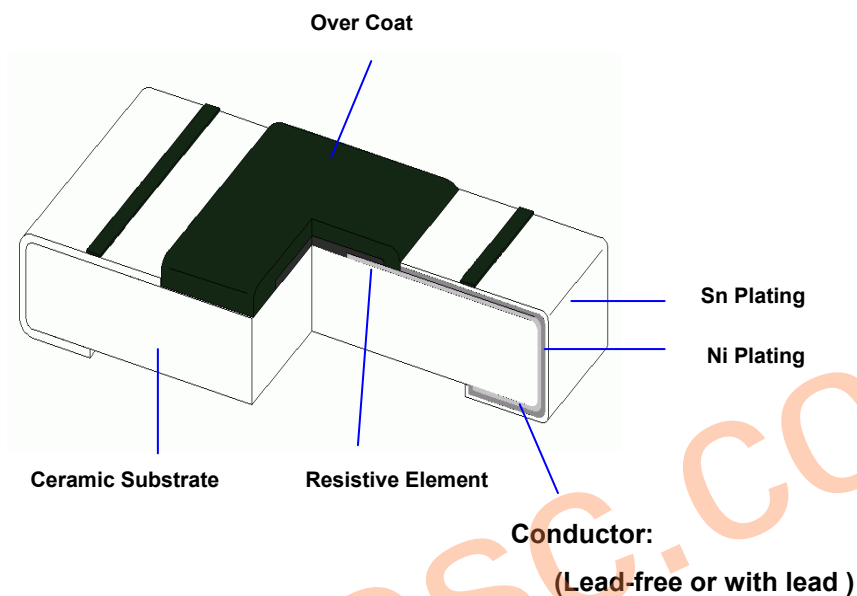


1. Scope :

This specification applies for the RL series of alloy film chip resistors made by TA-I.

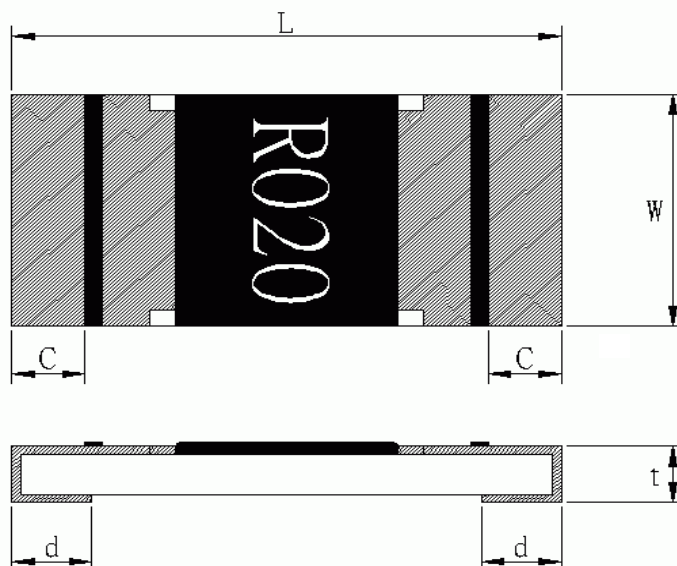
2. Construction:



3. Type Designation:

<u>RL</u>	<u>25</u>	<u>F</u>	<u>EN</u>	<u>R020</u>
Product Code	Size	Tolerance	Packaging	Nominal Resistance
RL : Chip Resistor	Power Rating			
20-2010(5025) 25-2512(6432)	3/4W 1W	J-±5% G-±2% F-±1%	EN-Lead Free & Embossed Tape N-Lead Free	4 Digits e.g.,: (E24) R020=20mΩ

4. Dimensions:



UNIT : mm

Type	L	W	C	d	t
RL20	5.00 ±0.20	2.50 ±0.20	0.60 ±0.30	0.50 ±0.25	0.55 ±0.10
RL25	6.30 ±0.20	3.20 ±0.20	0.60 ±0.30	0.50 ±0.25	0.55 ±0.10

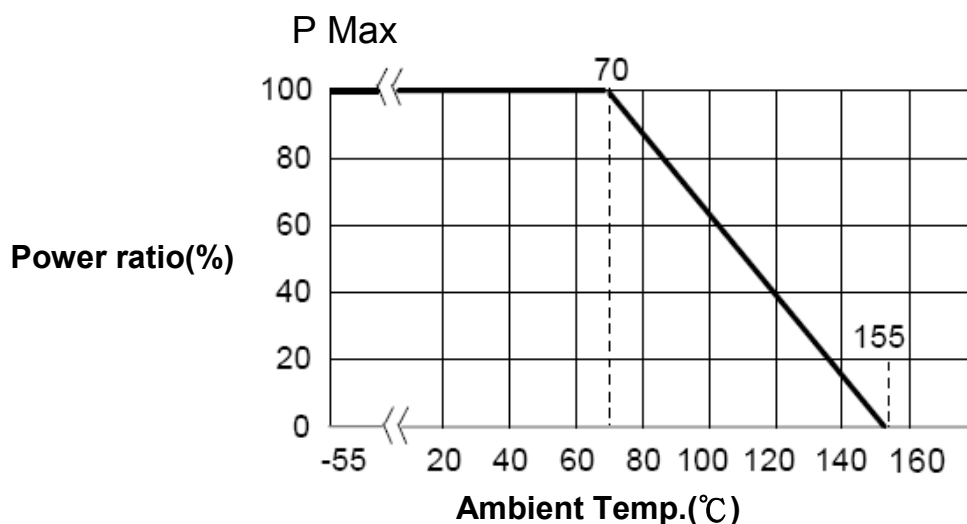
5. Electrical characteristics :

Characteristics	Type			Measurement Method
	RL20	RL25		
Power Ratings (W)	3/4W	1W		JIS Code 3A / JIS Code 3D
Resistance Value (mΩ)	20-91			Refer to JIS C 5201-1-4.5
T.C.R (ppm/°C)	20 mΩ	21-50 mΩ	51-91 mΩ	Refer to JIS C 5201-1-4.8
	±600	±400	±200	
Operation Temperature Range (°C)	-55 ~+155			
Resistance Tolerance (%)	±1, ±2, ±5			JIS C 5201-1-4.2.5
Insulation Resistance (MΩ)	Over 100			Refer to JIS C 5201-1-4.6
Maximum Working Voltage (V)	(P*R) ^{1/2}			

Note : Except for the above standardized products, we also provide the customized products.

5.1 Derating Curve :

For resistors operated at ambient temperature over 70℃ , power rating shall be figure 1.

**Figure 1****6. Reliability Test:**

Test Item	Reference standard	Condition of Test	Test Limits
Temperature Coefficient of Resistance	IEC60115-1-4.8 JIS-C5201-1-4.8	-55 ~ +125 °C	Refer to paragraph 5
Short Time Overload	IEC60115-1-4.13 JIS-C5201-1-4.13	2.5 X rated voltage, 5s	±(2%+0.001Ω)
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%+0.001Ω)
Damp Heat (Steady state)	IEC60115-1-4.24.2 JIS-C5201-1-4.24.2	40±2℃ , 90~95% RH , for 1000 hours	±(2%+0.001Ω)
Rapid Change of Temperature	IEC60115-1-4.19 JIS-C5201-1-4.19	-55℃ (30 min.) / +155℃ (30 min.) 5 cycles	±(1%+0.001Ω)
Resistance to Soldering Heat	IEC60115-1-4.18 JIS-C5201-1-4.18	270 ±5℃ solder , 10 ±1 sec dwell .	±(1%+0.001Ω)
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.
Resistance to Dry Heat	IEC60115-1-4.33 JIS-C5201-1-4.33	155±5℃ for 96±4 hrs	±(2%+0.001Ω)
Robustness of Termination (Bending Strength)	IEC60115-1-4.33 JIS-C5201-1-4.33	2mm deflection	±(1%+0.005Ω)

Note* :RCWV : Rated continuous working voltage .

7. Marking

7.1 E24: 1, 2, 5%

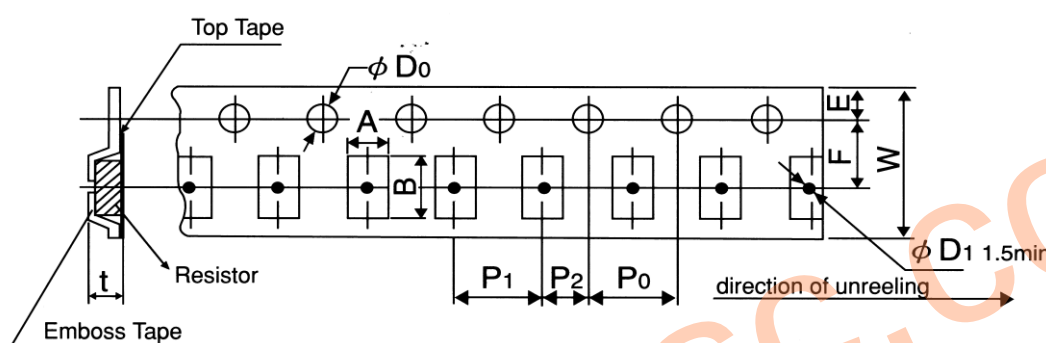
Resistance value is expressed by 4 digits, the first "R" means decimal point and the other digits represent for the normal resistance in Ω .

e.g., R020 = 20 m Ω

8. Taping & Reel

8.1 4 mm pitch Emboss

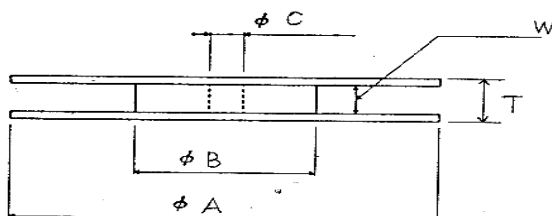
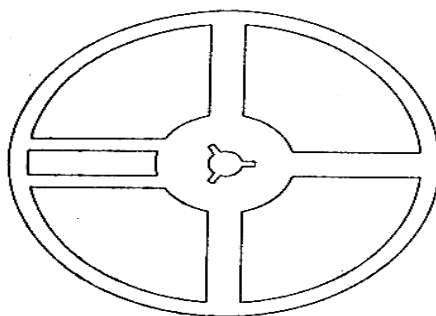
UNIT: mm



Packing	Type	A	B	W	F	E	P_1	P_2	P_0	D_0	T
Emboss	RL20	2.8 $\pm$ 0.2	5.3 $\pm$ 0.2	12.0 $\pm$ 0.2	5.5 $\pm$ 0.05	1.75 $\pm$ 0.1	4.0 $\pm$ 0.1	2.0 $\pm$ 0.1	4.0 $\pm$ 0.05	ϕ 1.5 ^{+0.1} ₋₀	0.85 $\pm$ 0.15
	RL25	3.6 $\pm$ 0.2	6.9 $\pm$ 0.2								

Type Size		Emboss Plastic Tape 4 mm pitch	
RL	20	4000	
RL	25	4000	

8.2 Reel Specifications

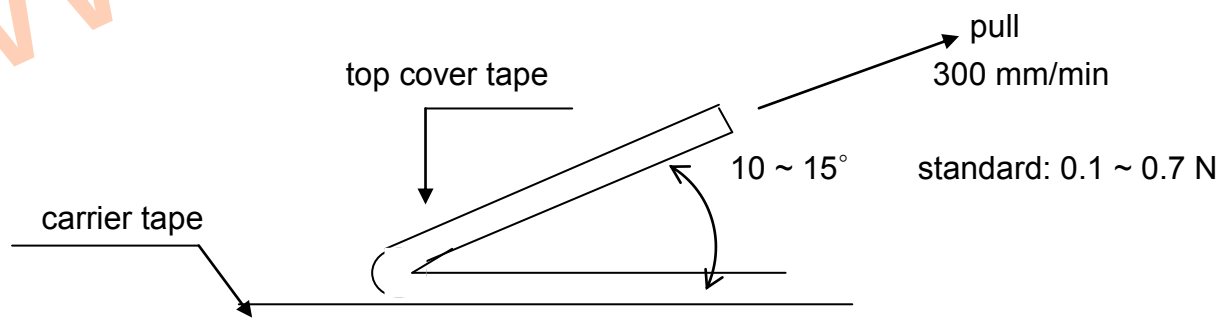


UNIT: mm

Series	ϕA	ϕB	ϕC	W	T
RL 20 / 25	178 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	13.0 ± 1.0	15.5 ± 1.0

8.4 Peel –off force :

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.



TA-I**Alloy Film Chip Resistors
Low Resistance (20-91 mΩ)
Halogen-Free**

No

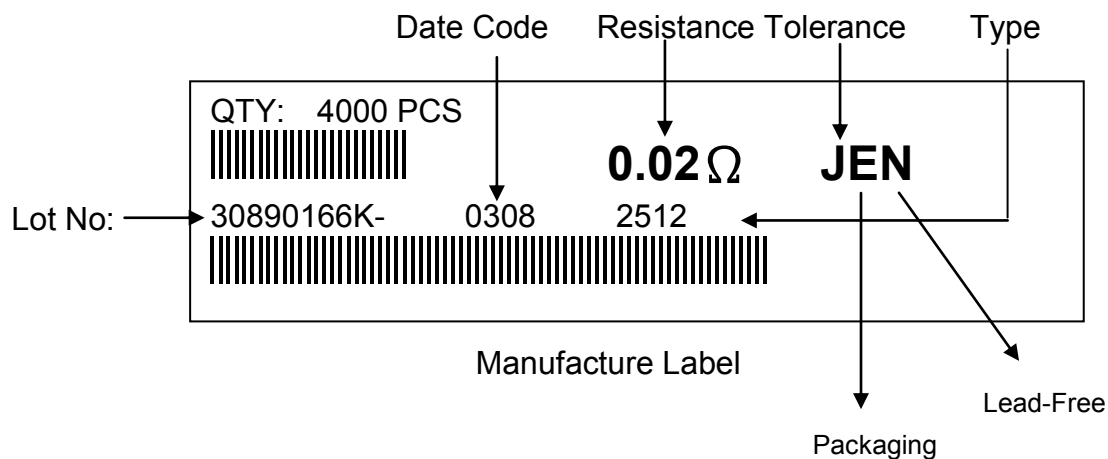
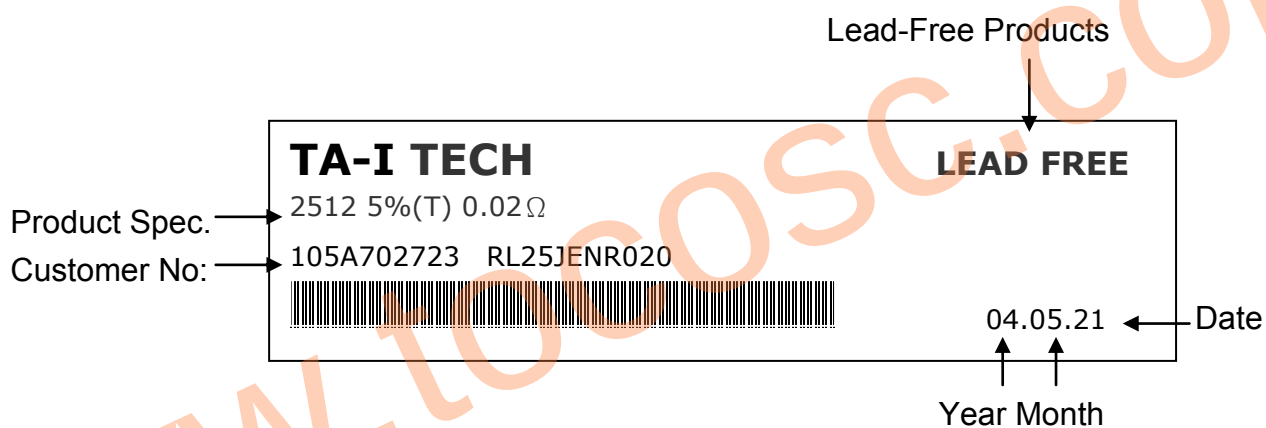
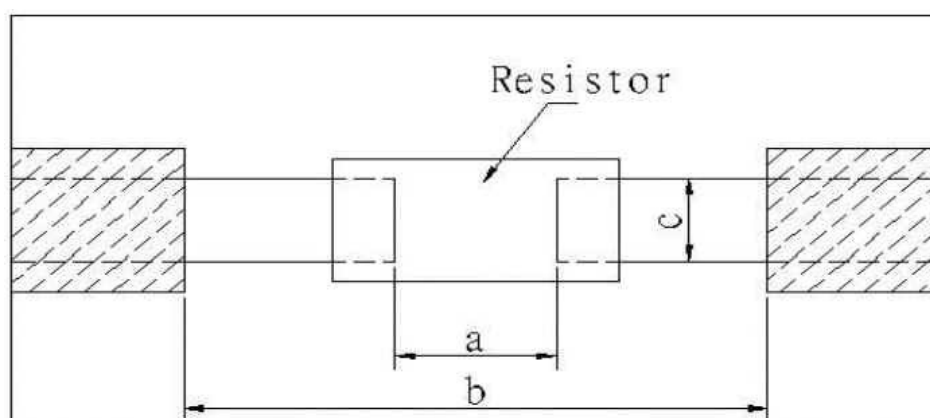
TRL-XX0S008H

Issued date

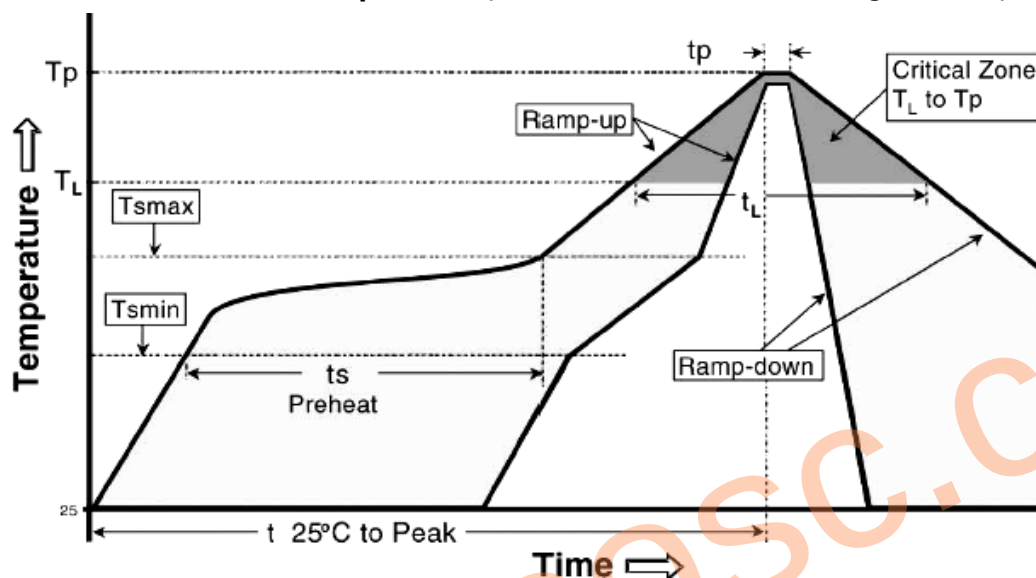
2012/09/21

page

6/9

9. Label**9.1 Manufacture Label :****9.2 Customer Label: (By customer request)****10. Recommended land patterns**

Land pattern		Dimension (mm)		
Type	Size	a	b	c
RL	20 (2010)	3.3~3.7	5.7~6.5	2.3~3.5
RL	25 (2512)	3.6~4.0	7.6~8.6	2.3~3.5

11. Recommend IR – Reflow profile : (Lead-Free solder : Sn96.5 / Ag3 / Cu0.5)


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

Alloyed Re-flow times : 3 times

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

TA-I	Alloy Film Chip Resistors Low Resistance (20-91 mΩ) Halogen-Free	No	TRL-XX0S008H
		Issued date	2012/09/21
		page	8/9

12. Storage Conditions:

Temperature: 5℃~35℃, Humidity: 40%~75%

13. Shelf Life:

2 years from manufacturing date

14. 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.

www.tocosc.com

TA-I	Alloy Film Chip Resistors Low Resistance (20-91 mΩ) Halogen-Free	No	TRL-XX0S008H
		Issued date	2012/09/21
		page	9/9

15. Manufacturing Country & City :

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

Tel: 886-3-3246169 Fax : 886-3-3246167

Associated companies :

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

Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

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

Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

(3) TA-I TECHNOLOGY (SU ZHOU) CO., LTD. (China – Su Zhou)

Tel :86- 512-63457879 Fax : 86-512-63457869

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

Tel :604- 3900480 Fax : 604-3901481

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

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