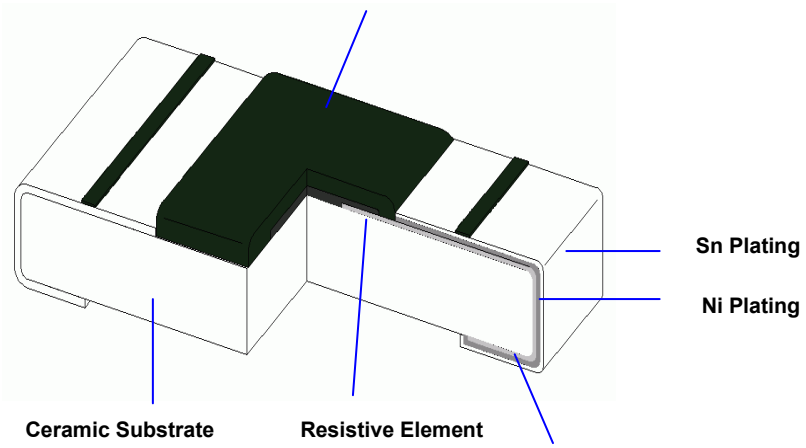
1. Scope :

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

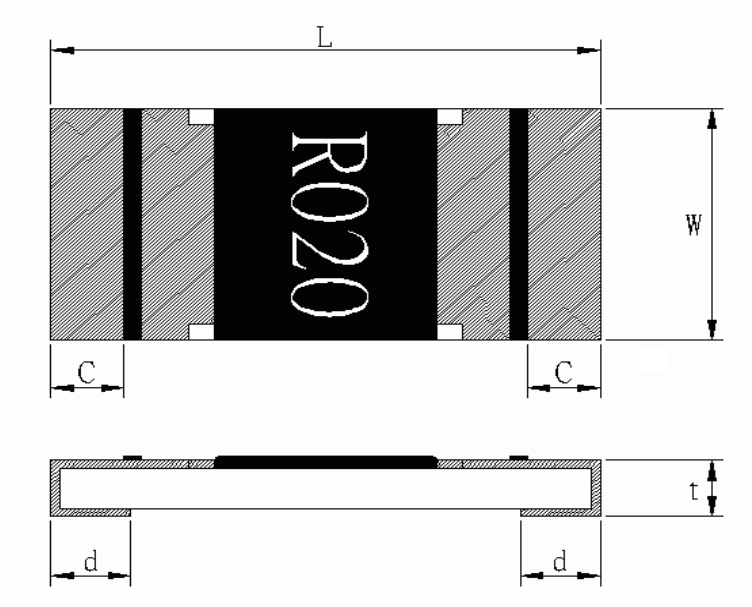
2. Construction:



3. Type Designation:

RL	25	F	EN	R020
Product Code RL : Chip Resistor	Size Power Rating	Tolerance	Packaging	Nominal Resistance
20-2010(5025) 3/4W 25-2512(6432) 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.

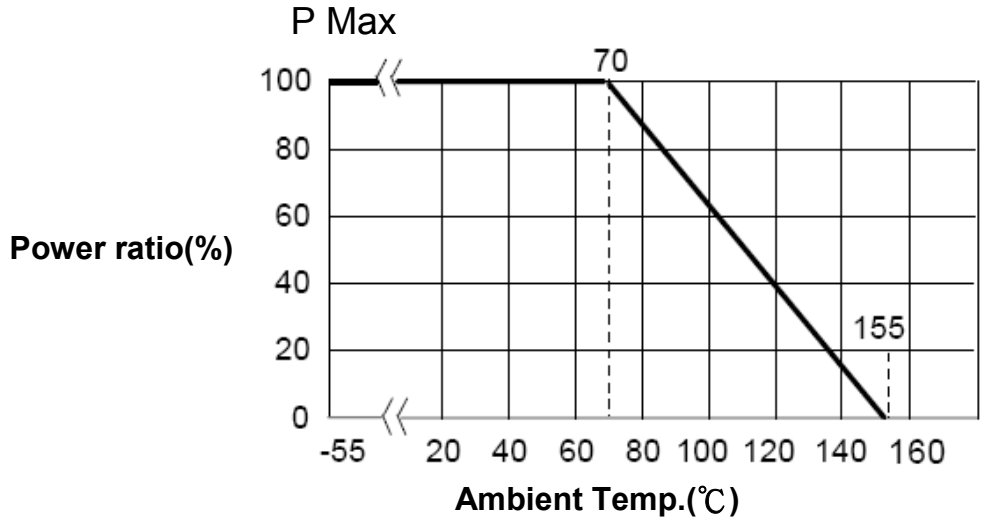


Figure 1

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 ℃	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%

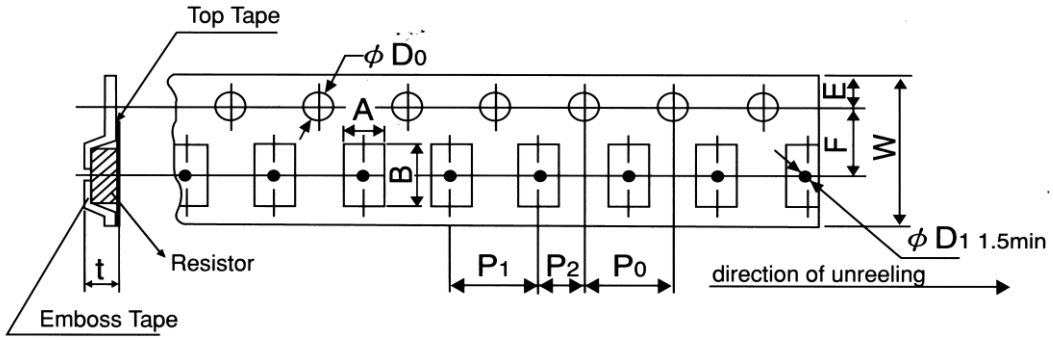
Resistance value is expressed by 4 digits, the first "R" means decimal point and the other digits represent for the normal resistance in Ω.

e.g., R020 =20 mΩ

8. Taping & Reel

8.1 4 mm pitch Emboss

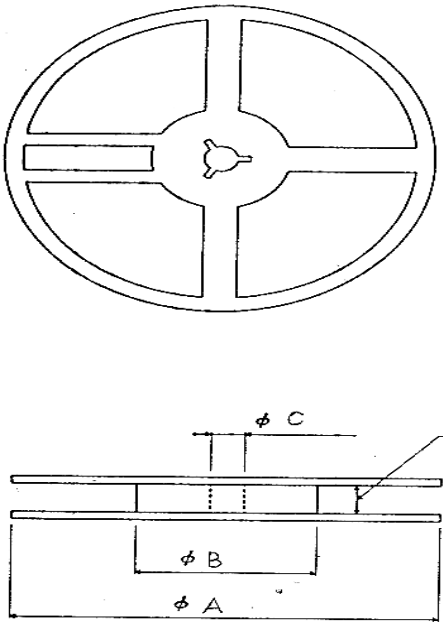
UNIT: mm



Packing	Type	A	B	W	F	E	P_1	P_2	P_0	D_0	T
Emboss	RL20	2.8±0.2	5.3±0.2	12.0±0.2	5.5±0.05	1.75±0.1	4.0±0.1	2.0±0.1	4.0±0.05	φ1.5 +0.1 -0	0.85±0.15
	RL25	3.6±0.2	6.9±0.2								

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

8.2 Reel Specifications



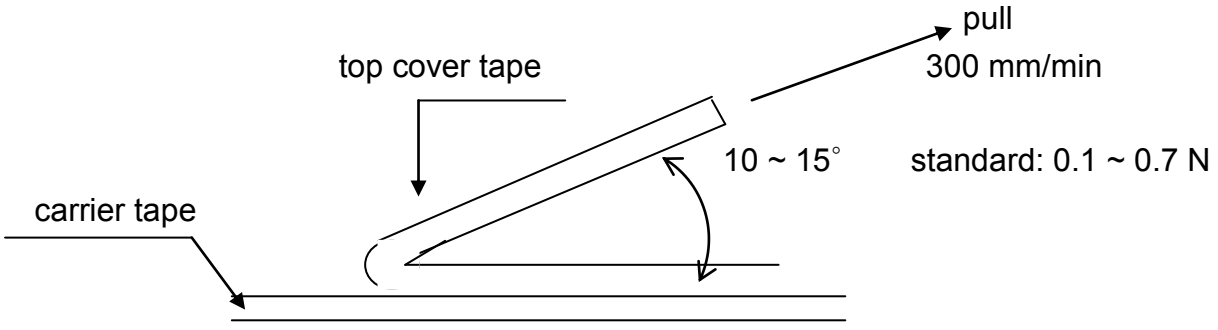
UNIT: mm

Series	ϕ A	ϕ B	ϕ C	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 :

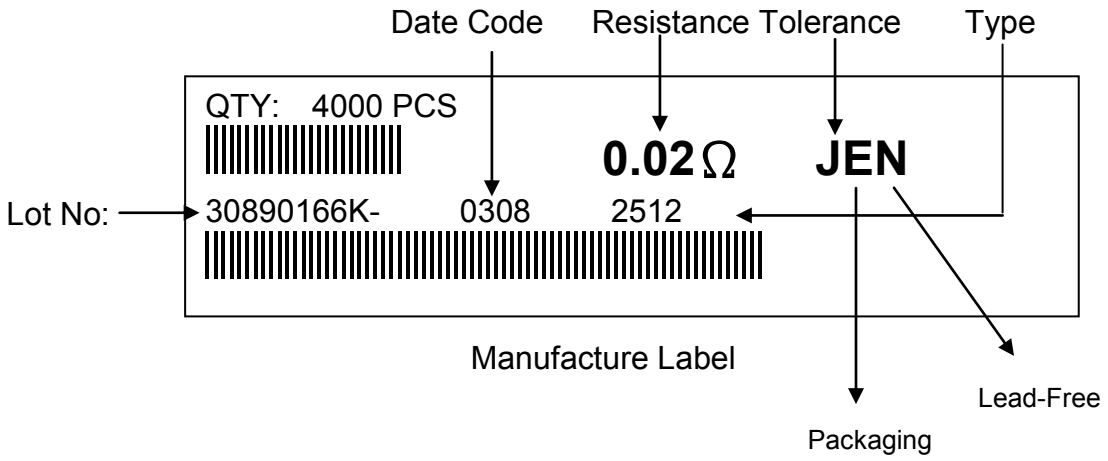
Peel –off force of paper and blister tape is in accordance with “JIS ”

that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.

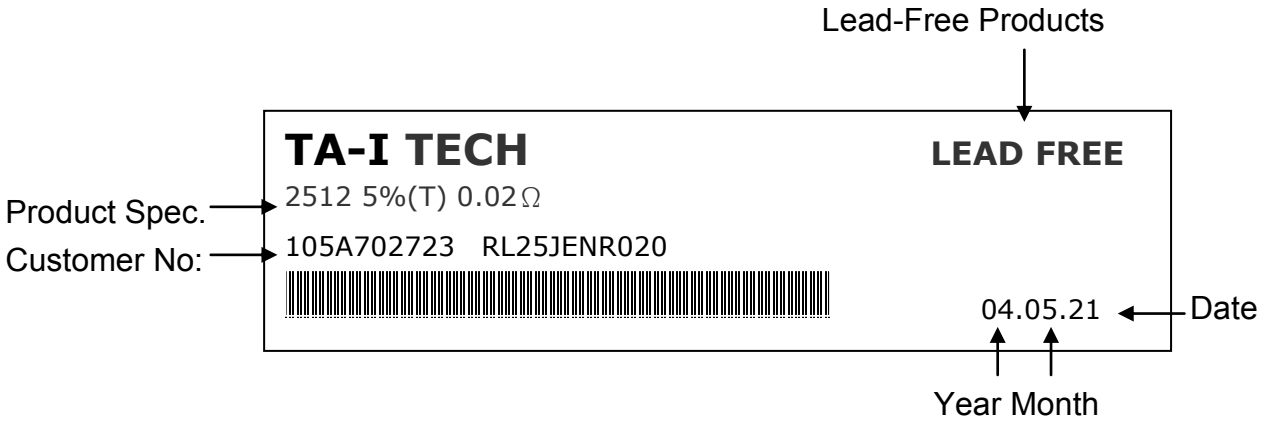


9. Label

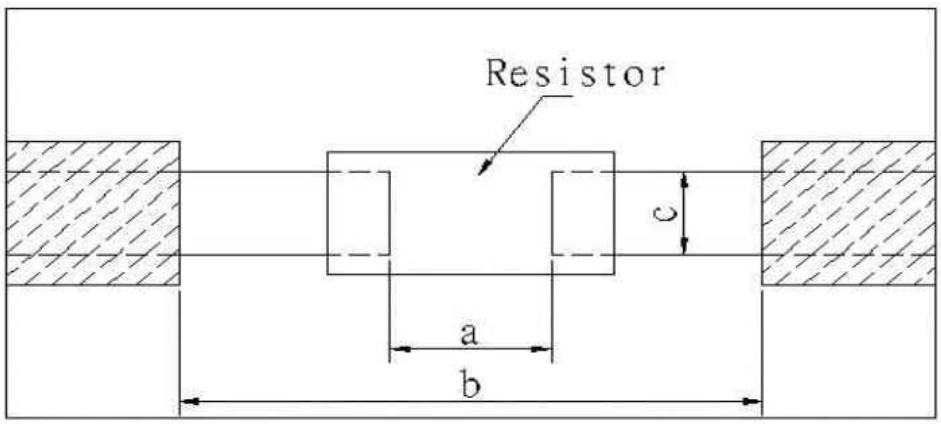
9.1 Manufacture Label :



9.2 Customer Label: (By customer request)

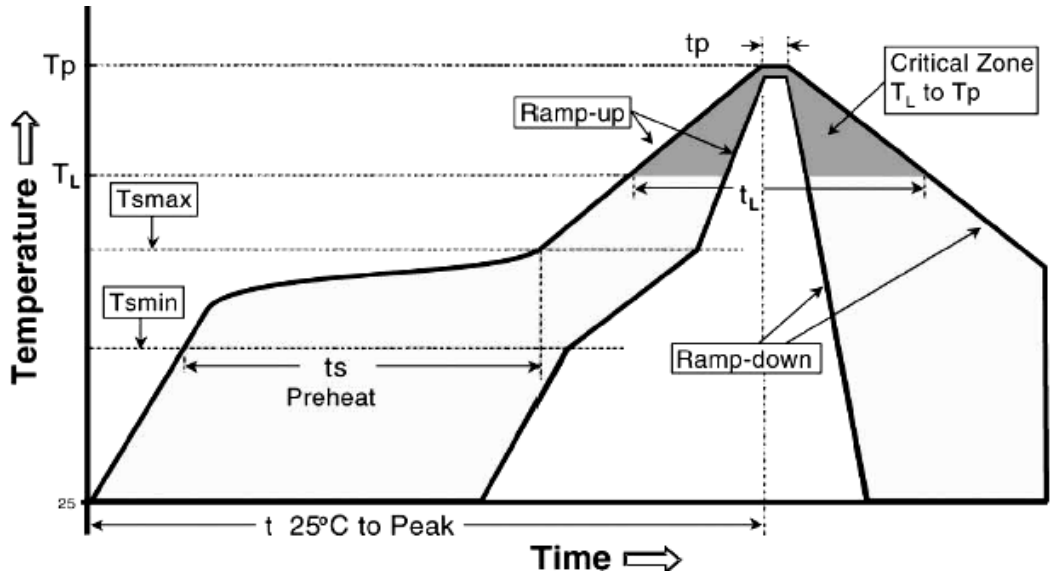


10. Recommended land patterns



Land pattern / Type	Size	Dimension (mm) 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 (Tsmax to Tp)	3℃ / second max.
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (Ts_{min} to Ts_{max}) (ts)	 150℃ 200℃ 60 -150 seconds
Time maintained above : - Temperature (T_L) - Time (T_L)	 217℃ 60-120 seconds
Peak Temperature (Tp)	260℃
Time within $^{+0}_{-5}$℃ of actual Peak Temperature $(tp)^2$	10 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8mimutes max.

Alloyed Re-flow times : 3 times

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

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.

15. Manufacturing Country & City :

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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