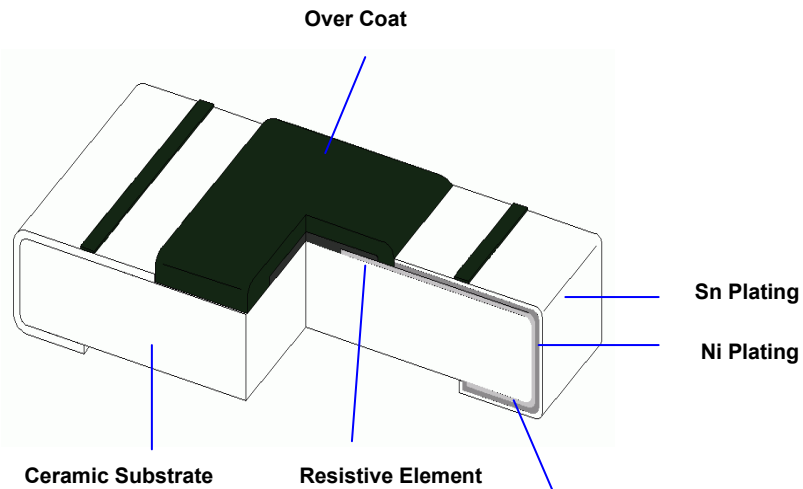


### 1. Scope :

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

### 2. Construction:



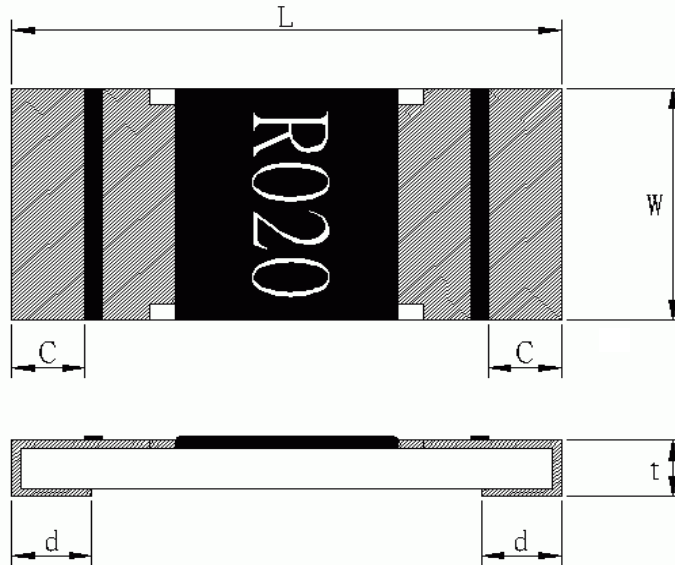
Conductor:

(Lead-free or with lead )

### 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)	$(P \cdot R)^{1/2}$			

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°C , power rating shall be figure 1.

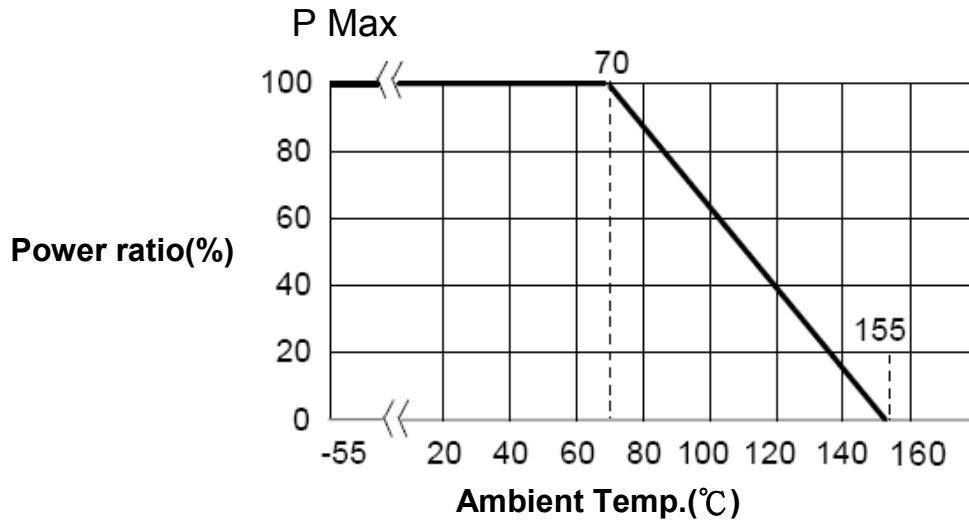


Figure 1

### 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°C , 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°C , 90~95% RH , for 1000 hours	±(2%+0.001Ω)
Rapid Change of Temperature	IEC60115-1-4.19 JIS-C5201-1-4.19	-55°C (30 min. ) / +155°C (30 min. ) 5 cycles	±(1%+0.001Ω)
Resistance to Soldering Heat	IEC60115-1-4.18 JIS-C5201-1-4.18	270 ±5°C solder , 10 ±1 sec dwell .	±(1%+0.001Ω)
Solderability	IEC60115-1-4.17 JIS-C5201-1-4.17	245±5°C 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°C 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%

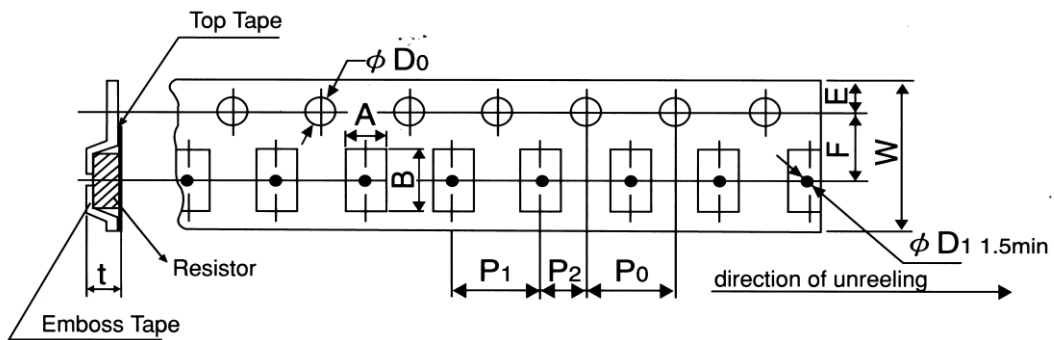
Resistance value is expressed by 4 digits, the first "R" means decimal point and the other digits represent for the normal resistance in Ω.

e.g., R020 =20 mΩ

### 8. Taping & Reel

#### 8.1 4 mm pitch Emboss

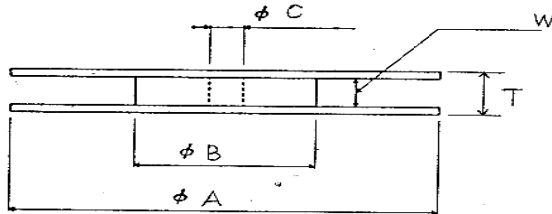
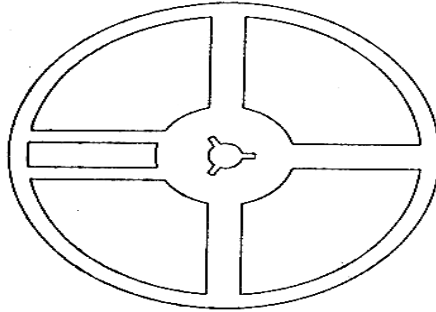
UNIT: mm



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	$\phi$ 1.5	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**

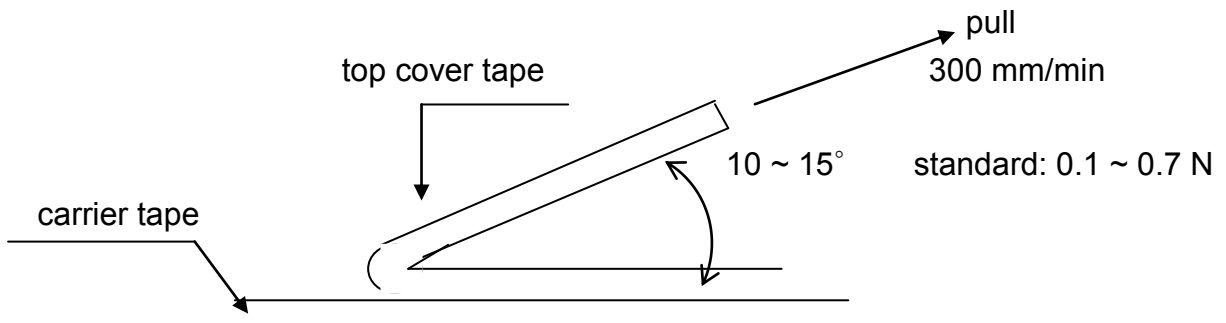


UNIT: mm

Series	$\phi A$	$\phi B$	$\phi C$	W	T
RL 20 / 25	178 $\pm$ 2.0	60.0 $\pm$ 1.0	13.0 $\pm$ 1.0	13.0 $\pm$ 1.0	15.5 $\pm$ 1.0

**8.4 Peel –off force :**

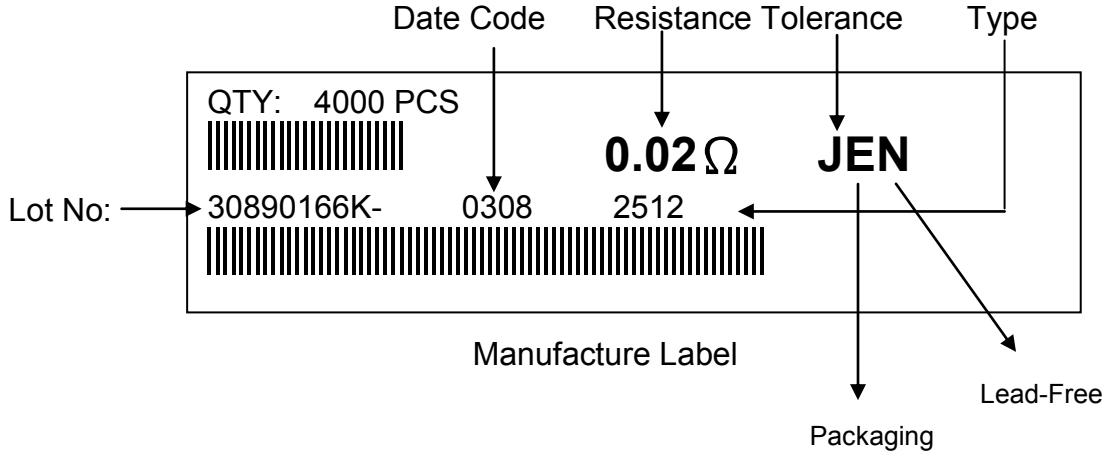
Peel –off force of paper and blister tape is in accordance with “JIS ”  
that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.



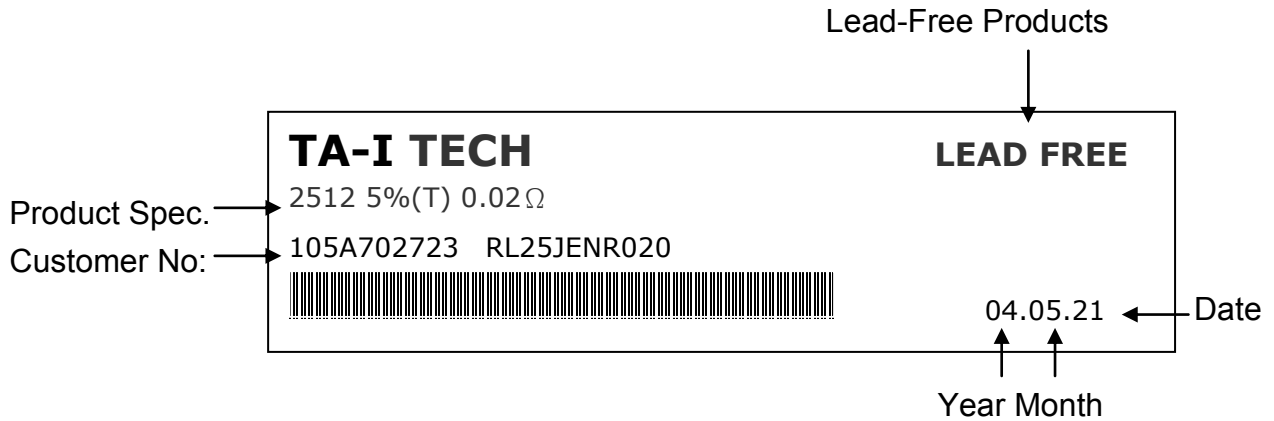
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### 9. Label

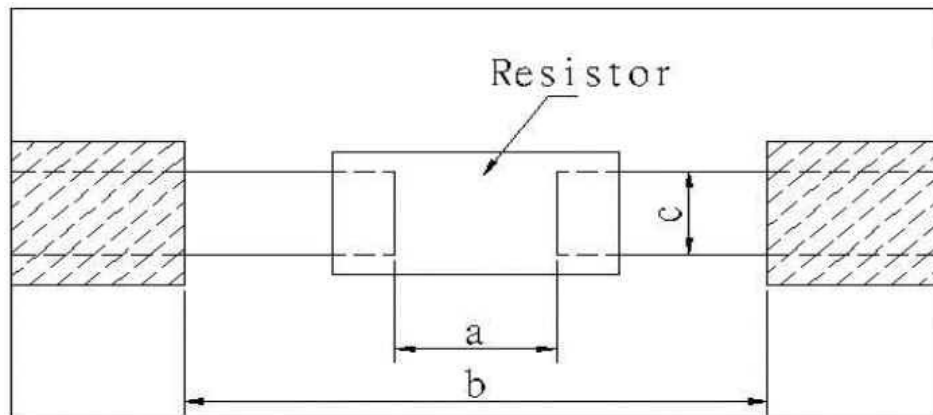
#### 9.1 Manufacture Label :



#### 9.2 Customer Label: ( By customer request )

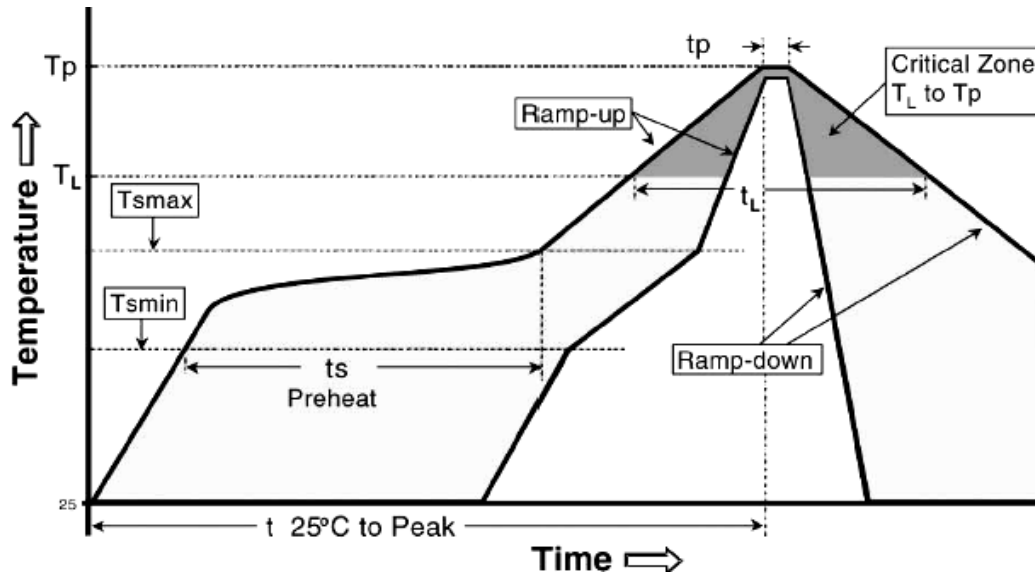


### 10. Recommended land patterns



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 (Tsmax to Tp)	3°C / second max.
Preheat - Temperature Min (T Amin) - Temperature Max (Tsmax) - Time (T Amin to Tsmax) (ts)	150°C 200°C 60 -150 seconds
Time maintained above : - Temperature (Tl) - Time (Tl)	217°C 60-120 seconds
Peak Temperature (Tp)	260°C
Time within $\begin{matrix} +0 \\ -5 \end{matrix}$ °C of actual Peak Temperature (tp) <sup>2</sup>	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**

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**12. Storage Conditions:**

Temperature: 5°C~35°C, 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.



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

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