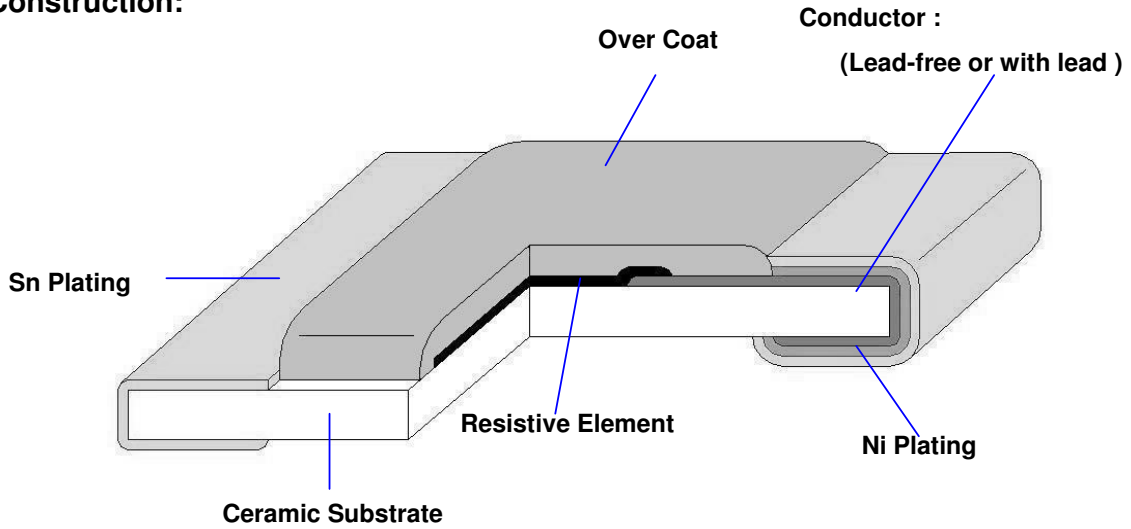


<b>TA-I</b>	<b>Thick Film Chip Resistors Low Resistance (20-91 mΩ)for 2010</b>	<b>No</b>	<b>TRL-20OS012B</b>
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**1. Scope :**

This specification applies for the RL20series of thick film chip resistors made by TA-I.

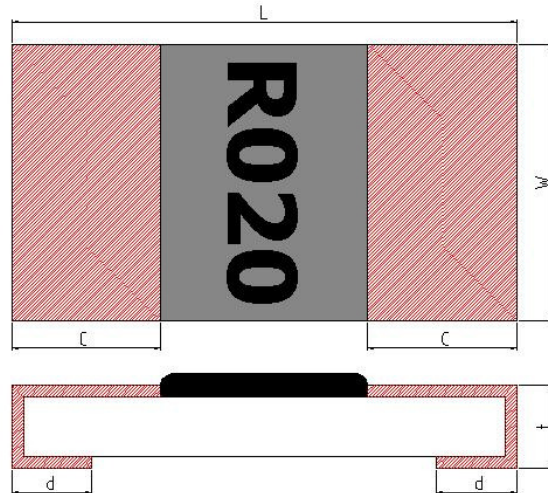
**2. Construction:**



**3. Type Designation:**

<u>RL</u>	<u>20</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)	3/4W	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	1.70 ±0.30	0.50 ±0.25	0.55 ±0.10

#### 5. Electrical characteristics :

Characteristics	Type			Measurement Method
	RL20			
Power Ratings (W)	3/4W			JIS Code 3A / JIS Code 3D
Resistance Value (mΩ)	20-91			Refer to JIS C 5202 5.1
T.C.R (ppm/°C)	20 mΩ	21-50 mΩ	51-91 mΩ	Refer to JIS C 5202 5.2
	±600	±400	±200	
Operation Temperature Range (°C)	-55 ~+125			
Resistance Tolerance (%)	±1, ±2, ±5			JIS C 5201 4.2.5
Insulation Resistance (MΩ)	Over 100			Refer to JIS C 5202 5.6 Mounting condition G
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.

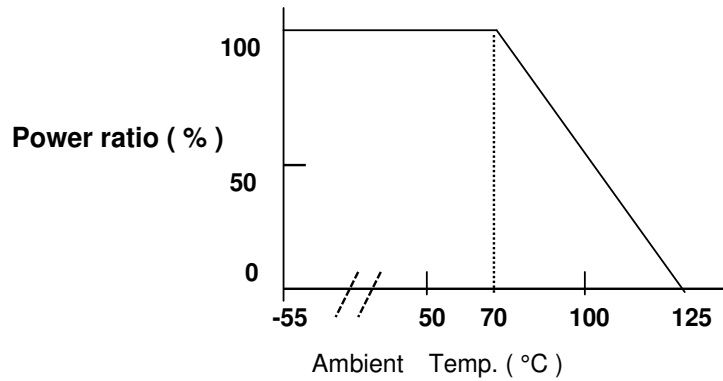


Figure 1

### 5.2 Rated Voltage:

The rated voltage is calculated by the following formula:

$$\sqrt{E = P * R}$$

E=Rated Voltage(V)

P=Rated Power(W)

R=Resistance Value(Ω)

**6. Reliability Test:(As specified in JIS C 5202)**

Test Item	Reference standard	Condition of Test	Test Limits
Temperature Coefficient of Resistance	JIS-C5202-5.2	-55 ~+125 °C	Refer to paragraph 5
Short Time Overload	JIS-C5202-5.5	2.5 X rated voltage, 5s	$\pm(2\%+0.001\ \Omega)$
Load Life	JIS-C5202-7.10	1000 hours at rated power , 70°C , 1.5hours "ON " , 0.5hour "OFF"	$\pm(2\%+0.001\ \Omega)$
Damp Heat ( Steady state )	JIS-C5202-7.5	40 $\pm$ 2°C , 90~95% RH , for 1000 hours	$\pm(2\%+0.001\ \Omega)$
Rapid Change of Temperature	JIS-C5202-7.4	-55°C (30 min. ) / +125 °C (30 min. ) 5 cycles	$\pm(1\%+0.001\ \Omega)$
Resistance to Soldering Heat	JIS-C5202-6.10	270 $\pm$ 5°C solder , 10 $\pm$ 1 sec dwell .	$\pm(1\%+0.001\ \Omega)$
Solderability	JIS-C5202-6.11	245 $\pm$ 5°C solder, 2 $\pm$ 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	JIS-C5202-7.2	125 $\pm$ 5°C for 96 $\pm$ 4hrs	$\pm(2\%+0.001\ \Omega)$

Note\* :RCWV : Rated continuous working voltage .

**7. Marking****7.1 E24: 1 , 2 , 5%**

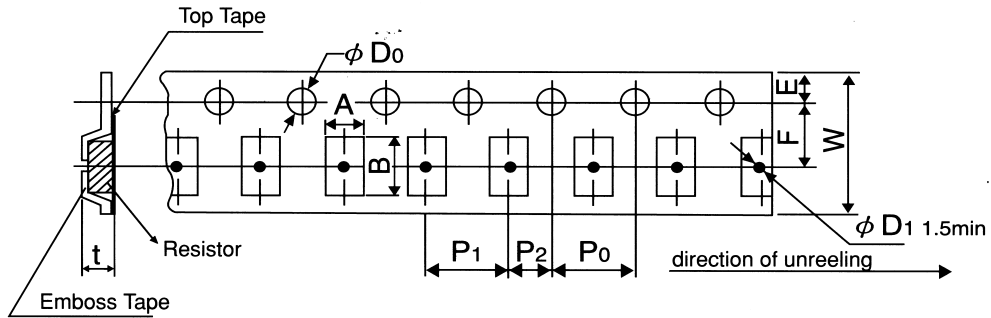
Resistance value is expressed by 4 digits, the first "R" means decimal point and the other digits represent for the normal resistance in  $\Omega$  .

e.g., R020 =20 m $\Omega$

8. Taping & Reel

8.1 4 mm pitch Emboss

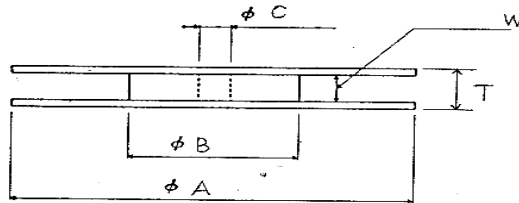
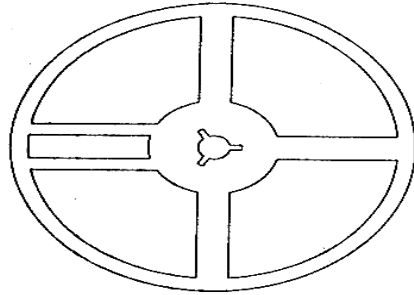
UNIT: mm



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 <sup>+0.1</sup> <sub>-0</sub>	0.85±0.15

Type Size	Emboss Plastic Tape 4 mm pitch	
RL	20	4000

8.2 Reel Specifications

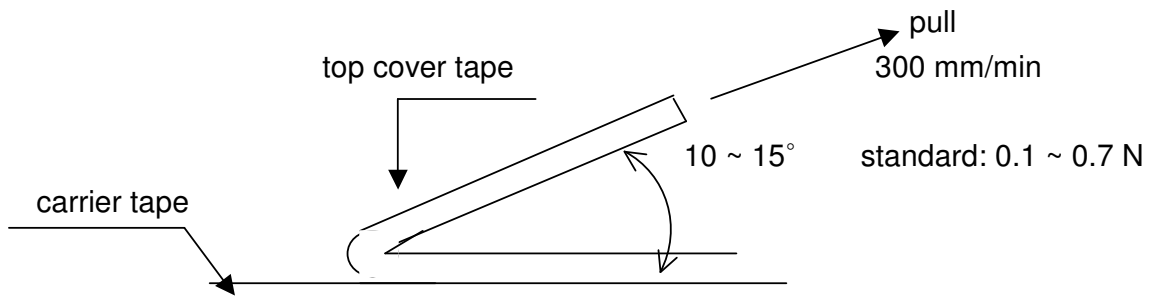


UNIT: mm

Series	φ A	φ B	φ C	W	T
RL 20	17.8 ±2.0	60.0±1.0	13.0±1.0	13.0±1.0	15.5±1.0

8.4 Peel –off force :

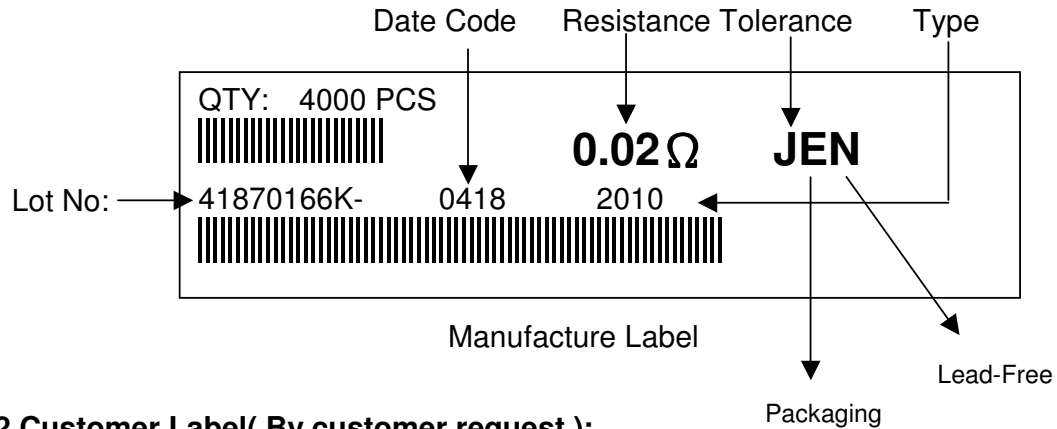
Peel –off force of paper and blister tape is in accordance with “JIS ”  
that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.



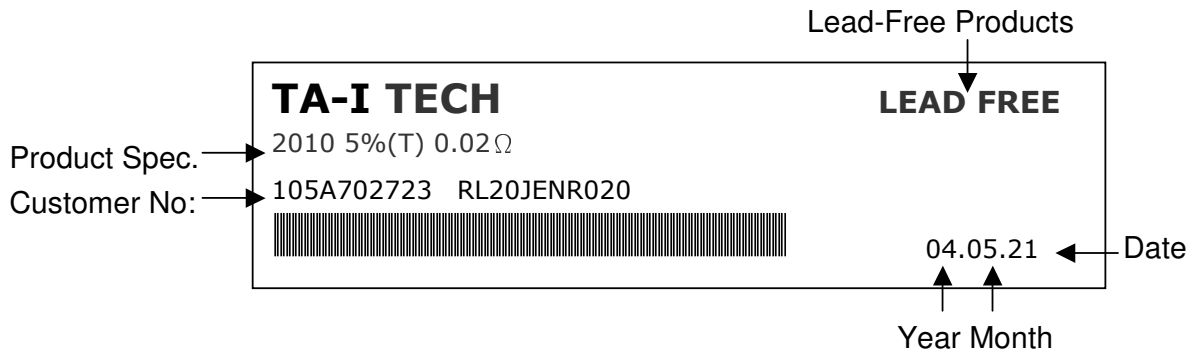
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## 9. Label

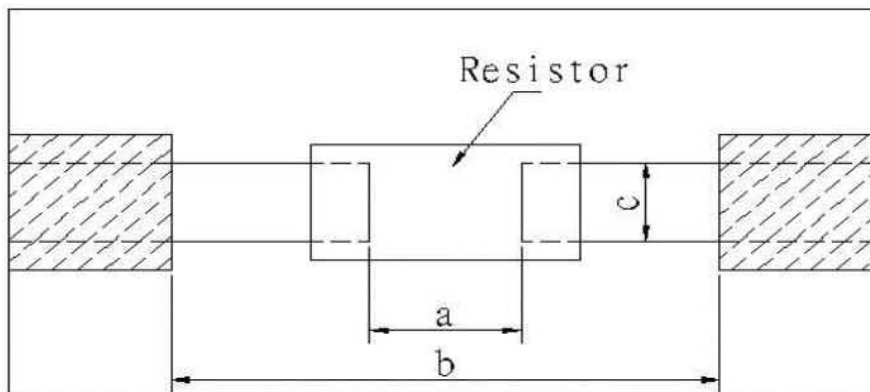
### 9.1 Manufacture Label :



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

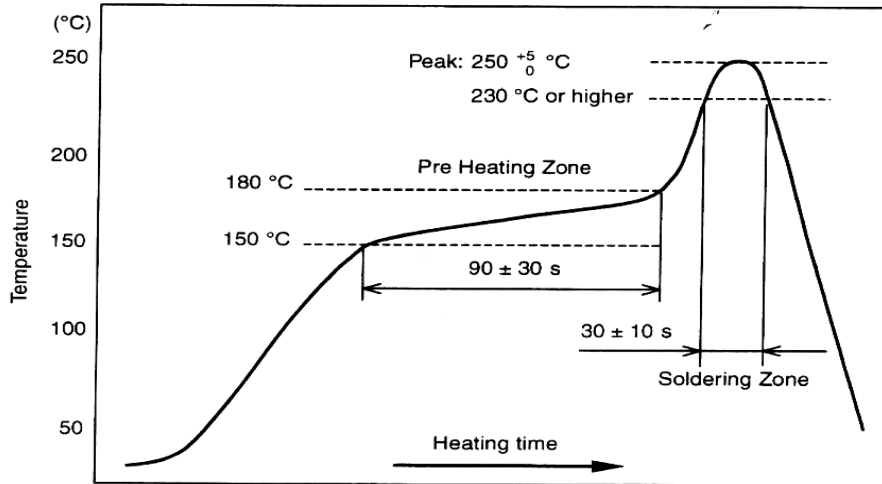


## 10. Recommended land patterns



Land pattern		Dimension ( mm )		
		a	b	c
Type	Size			
RL	20 (2010 )	3.3~3.7	5.7~6.5	2.3~3.5

**TA-I TECHNOLOGY CO., LTD**

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

Peak :  $250 \begin{smallmatrix} +5 \\ -0 \end{smallmatrix} \text{ } ^\circ\text{C}$  , 5 sec

Pre – heat Zone : 150 to 180 °C , 90±30 sec

Soldering Zone : 230°C or higher , 30±10 sec

**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.



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**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 :002-62-21-44820254 Fax : 002-62-21-44820256

**TA-I TECHNOLOGY CO., LTD**

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**Revise record**

Date	Content	Owner
Jul.11.2006	<ol style="list-style-type: none"> <li>1. Adding "Recommend IR – Reflow profile"</li> <li>2. Adding Customer label</li> <li>3. Adding shelf life</li> <li>4. 2. Conductor : Adding to (Lead-free or with lead)</li> <li>5. 3. Type Designation: 20-2012 changed 20-2012(5025)</li> <li>6. Reliability Tests:  Solderability : 235 ± 5°C solder, 2 ± 0.5 sec dwell.                    Changed to    245±5°C solder, 2±0.5 sec dwell.    Solder : Sn96.5 / Ag3.0 / Cu0.5</li> <li>Resistance to Dry Heat :  Test Limits : ± 3%+0.005 Ω changed ± 2%+0.001 Ω</li> <li>7. 8.2 Reel Specifications:  φ A  1780+2.0 / -2.0 changed 178 ±2.0  φ B  60 min changed  60.0±1.0</li> <li>8. 9.1 Manufacture label :  Series number 3 codes changed to 4 codes</li> <li>9. 15. Manufacturing Country &amp; City:  Adding TA-I TECHNOLOGY (DONGGUAN ) CO., LTD</li> </ol>	Vincent