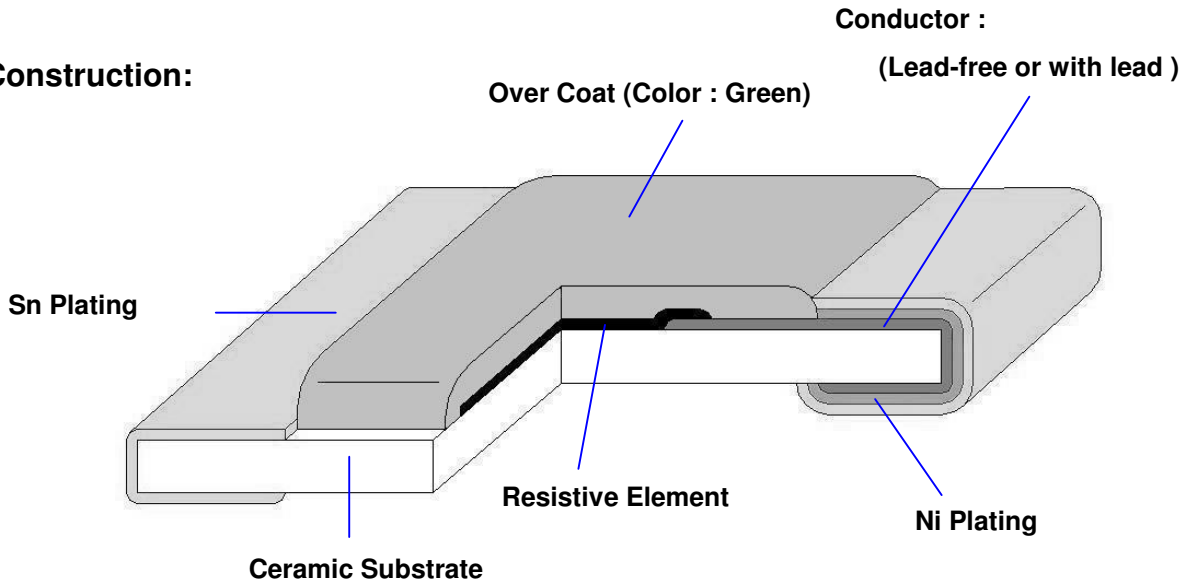


1. Scope :

This specification applies for thick film high voltage chip resistors made by TA-I.

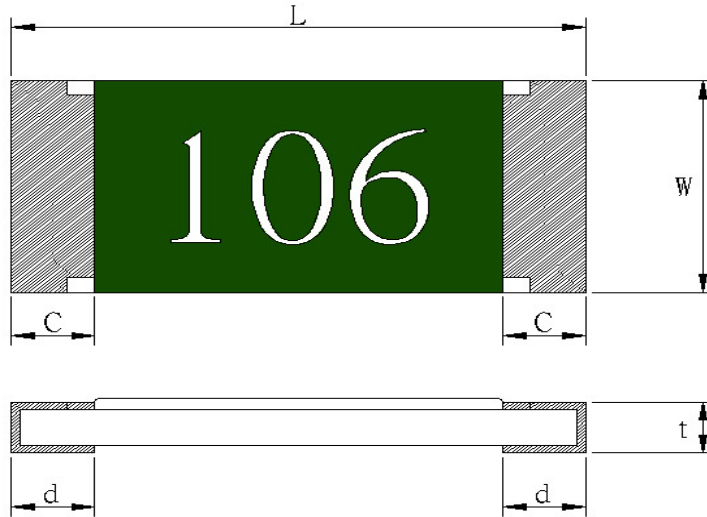
2. Construction:



3. Type Designation:

<u>RH</u>	<u>20</u>	<u>J</u>	<u>EN</u>	<u>106</u>
Product Code RH : High voltage	Size Power Rating	Tolerance	Packaging	Nominal Resistance
20-2010(5025), 1/2W	/	J- ±5%	TE-Lead Free & Emboss Tape	e.g., 106=10MΩ 5%

4. Dimensions:



UNIT: mm

Type	L	W	C	d	t
RH20	5.00 ±0.20	2.50 ±0.20	0.40 ±0.25	0.50 ±0.25	0.55 ±0.10

5. Ratings & Characteristics :

Characteristics	Rating Voltage	Feature	Measurement Method
		RH20	
Power Ratings (W)	Refer 5.2	1/2W	JIS Code 3A / JIS Code 3D
Resistance Value (Ω)		47Ω ~ 22MΩ	Refer to JIS C 5202 5.1
T.C.R (ppm/°C)		±200	Refer to JIS C 5202 5.2
Operation Temperature Range (°C)		-55 ~ +125	
Resistance Tolerance (%)		±5	JIS C 5201 4.2.5
Maximum Working Voltage (V)		1500	
Maximum Overload Voltage (V)		3000	Remark RH20 : DC 3000V , AC 2122V

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 derated in accordance with figure 1.

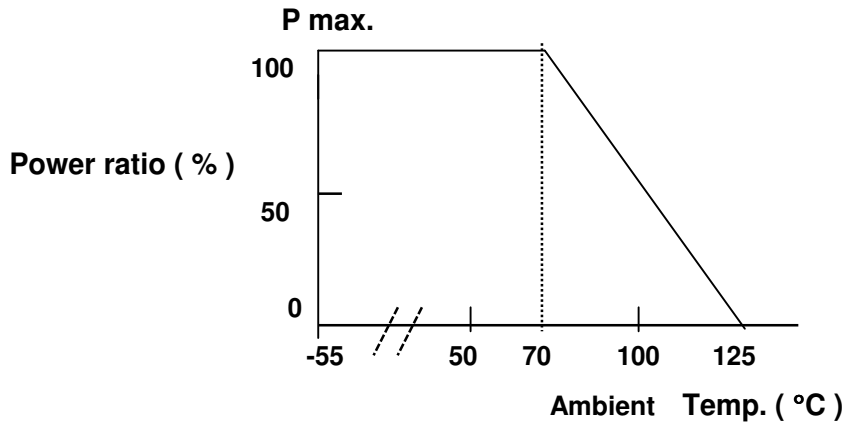


Figure 1

5.2 Rated Voltage:

The rated voltage is calculated by the following formula:

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

E=Rated Voltage(V)

P=Rated Power(W)

R=Resistance Value(Ω)

E.G. : What is RH20JEN 304 the rated voltage ?

RM20JEN304 P=1/2W ; R:304=300K Ω =300,000 Ω

$$E = \sqrt{1/2(W) * 300000 (\Omega)} = 387.29 V$$

Remark : However , it shall not exceed the maximum rated voltage .

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

Test Items	Reference standard	Condition of Test	Test Limits
Visual examination		Checked by visual examination .	The marking shall be legible , as checked by visual examination
Temperature Coefficient of Resistance	JIS-C5202-5.2	-55 ~ +125 °C	Refer to paragraph 5
Dielectric Withstanding Voltage (Voltage Proof)	JIS-C5202-5.7	500Va. c., voltage , 1 min .	No abnormalities such as flashover , burning dielectric breakdown shall appear .
Insulation Resistance	JIS-C5202-5.6	100V voltage , 1 min .	$\geq 1G \Omega$
Solderability	JIS-C5202-6.11	245 $\pm 5^{\circ}C$ solder, 2 ± 0.5 sec dwell. Solder : Sn96.5/Ag3/Cu0.5	At least 95% of surface area of electrode shall be covered with new solder.
Short Time Overload	JIS-C5202-5.5	2.0 X rated voltage, 2s DC : 3000 V Max , AC (RMS) : 2122V Max Test Substrate : pitch 10.16 mm	$\pm 1\% + 0.05 \Omega$
Resistance to Soldering Heat	JIS-C5202-6.10	270 $\pm 5^{\circ}C$ solder , 10 ± 1 sec dwell .	$\pm 1\% + 0.05 \Omega$
Rapid Change of Temperature	JIS-C5202-7.4	-55°C (30 min.) / +125 °C (30 min.) 5 cycles	$\pm 1\% + 0.05 \Omega$
Load Life	JIS-C5202-7.10	1000 hours at rated power , 70°C , 1.5hours "ON " , 0.5hour "OFF"	$\pm 5\% + 0.1 \Omega$
Solubility resistance	JIS-C5202-6.9	Ultrasonic for 1 minute Solvent : isopropyl alcohol	Marking shall be legible.

7. Marking**7.1 $\pm 5\%$ (E24)**

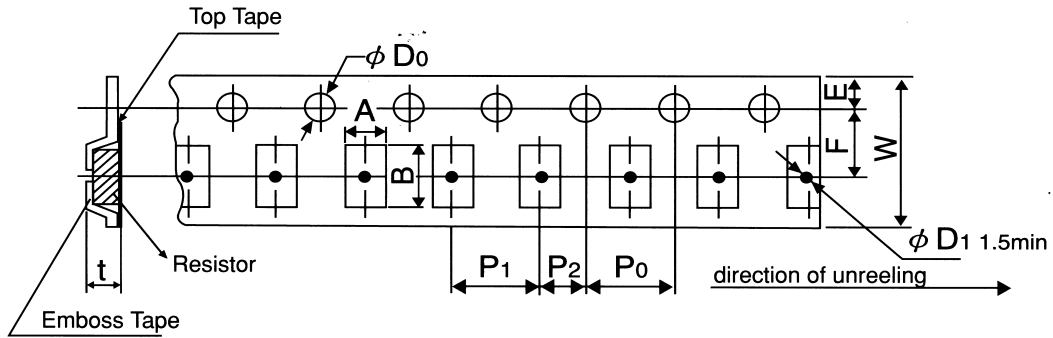
Resistance value is expressed by 3 digits, the first two digits represent the significant figures of nominal resistance value in Ω , and the third digit represents exponent for base of 10.

$$\text{Ex. } 106 = 10 \times 10^6 = 10000000 \Omega = 10M \Omega$$

8. Taping & Reel

8.1 Taping Dimensions

8.1.1 4 mm pitch Emboss

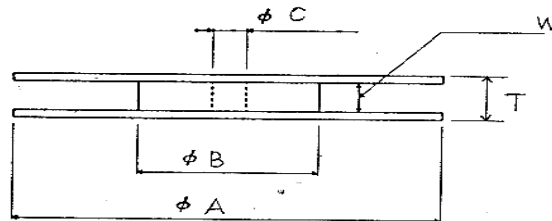
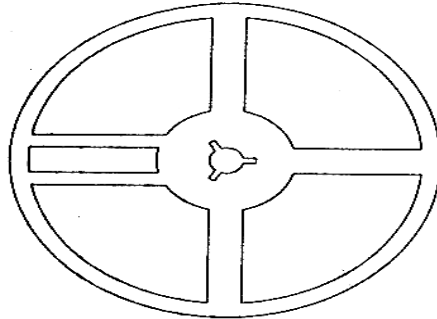


Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Emboss	RH20	2.8 ±0.2	5.3 ±0.2	12.0 ±0.2	5.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.05	φ1.5 ^{+0.1} ₋₀	0.85 ±0.15

Type series	Emboss Plastic Tape	
	4 mm pitch	
	178mm/R	
RH	20	4000

UNIT : pc

8.2 Reel Specifications

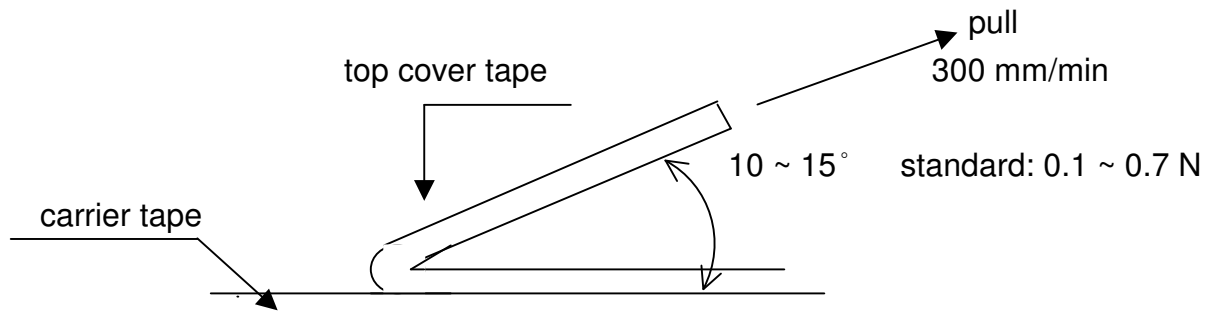


UNIT: mm

Type	ϕA	ϕB	ϕC	W	T
RH20	178 \pm 2.0	60.0 \pm 1.0	13.0 \pm 1.0	13.0 \pm 1.0	15.5 \pm 1.0

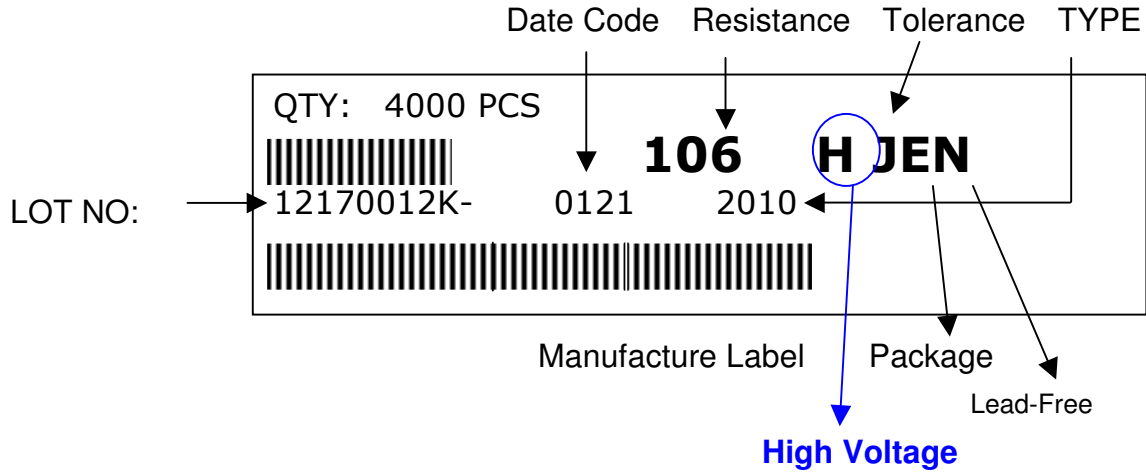
8.4. Peel –off force :

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

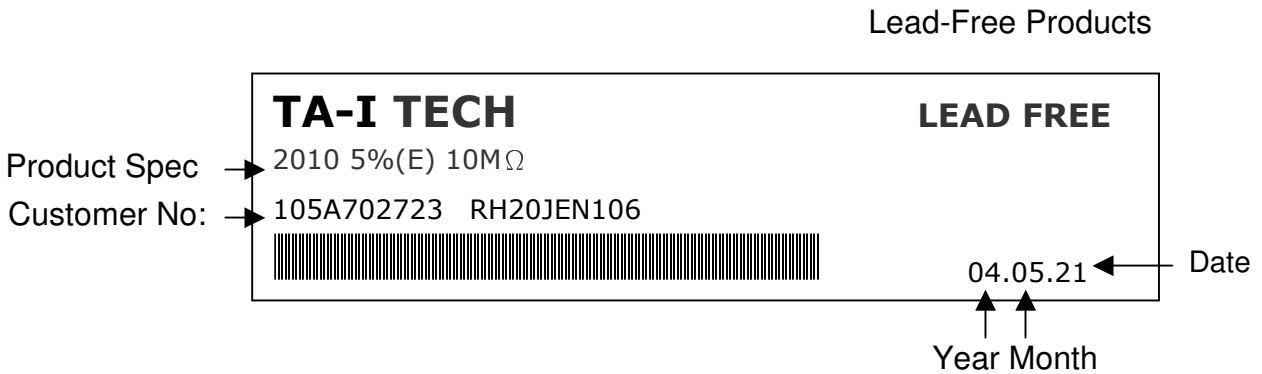


9. Label

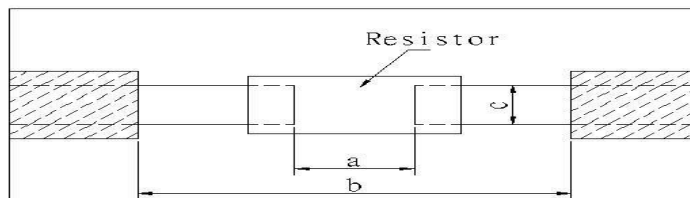
9.1 Manufacture Label :



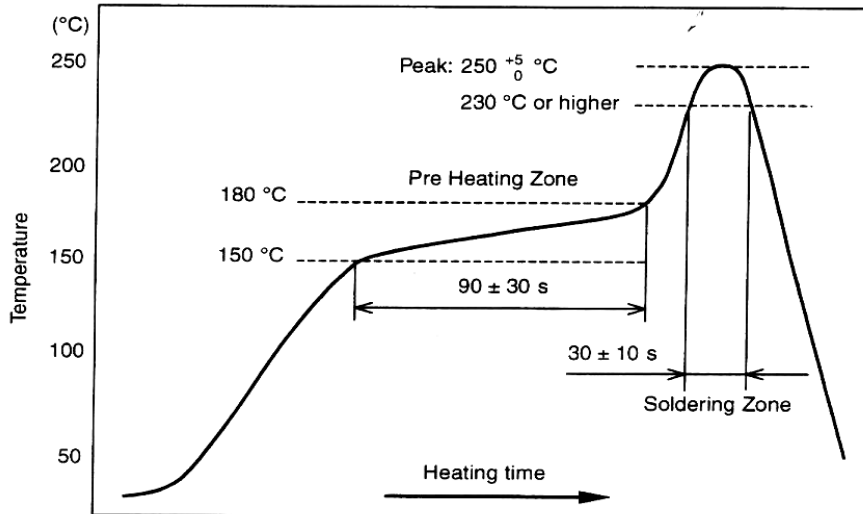
9.2 Customer Label (By customer request):



10. Recommended land patterns



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

11. Recommend IR – Reflow profile : (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.

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

Revise record

Date	Content	Owner
Jan.19.2006	1. 5.0 : Adding rating voltage : Refer 5.2 2. 5.2 : Adding , How to calculate rated voltage ?	Vincent
Jul.10.2006	1. 2. Conductor : Adding to (Lead-free or with lead) 2. 3. Type Designation: 12-1206 changed 12-1206(3216) 3. 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 4. 8.2 Reel Specifications: φ A 180+0 / -3.0 changed 178 ±2.0 φ B 60 min changed 60.0±1.0 T 15.4 ±2.0 changed 15.5 ±1.0 5. 10. Recommended land patterns : a 3.50 changed 3.3~3.7 b 6.30 changed 5.7~6.5 c 2.30 changed 2.3~3.5 6. Adding "Recommend IR – Reflow profile" 7. 9.1 Manufacture label : Series number 3 codes changed to 4 codes 8. Adding Customer label 9. Adding "shelf life" 10. 15. Manufacturing Country & City: Adding TA-I TECHNOLOGY (DONGGUAN) CO., LTD	Vincent