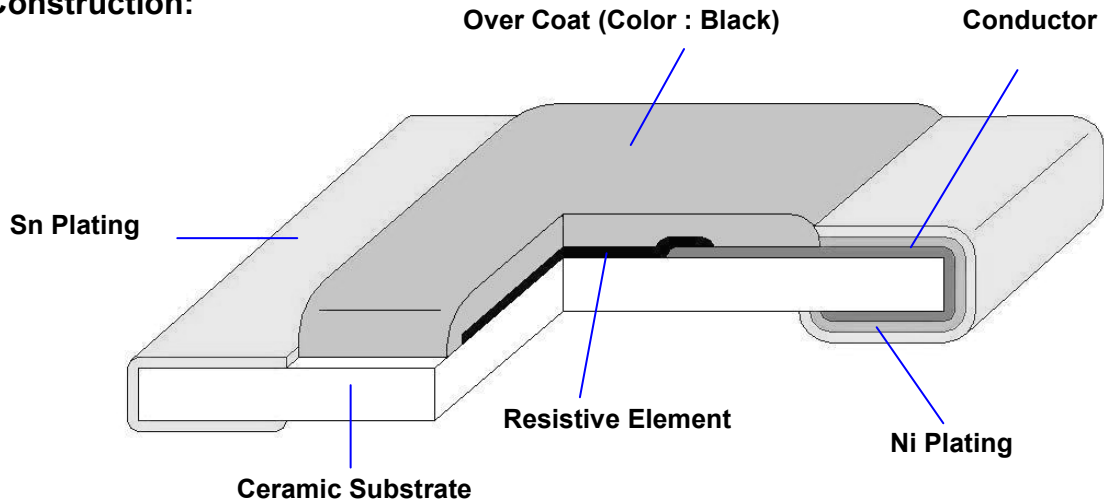


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1. Scope :

This specification applies for the RMH20 series of thick film high power chip resistors made by TA-I.

2. Construction:



3. Type Designation:

<u>RMH</u>	<u>20</u>	<u>J</u>	<u>E</u>	<u>101</u>
Product Code	Size	Tolerance	Packaging	Nominal Resistance
RMH : High Power Chip Resistor	Power Rating			
/	/	/	/	/

20-2010(5025) 1W

J - $\pm 5\%$
F - $\pm 1\%$

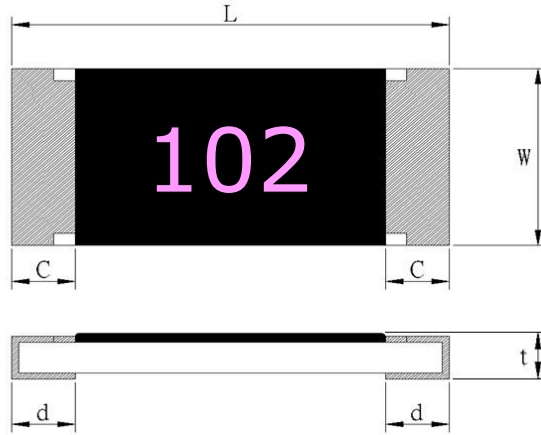
E-Emboss Tape

3 digits, e.g.,:
(E-24) 101 = 100 Ω

4 digits, e.g.,:
(E-96) 43R2 = 43.2 Ω

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4. Dimensions:



UNIT: mm

Type	L	W	C	d	t
RMH20	5.00±0.15	2.50±0.15	0.60±0.30	0.50±0.25	0.60±0.10

5. Ratings & Characteristics :

Type	Power Rating at 70°C	Rated Voltage	Max. Working Voltage	Max. Over-Load Voltage	T.C.R (PPM/°C)	Resistance Range(Ω)	
						F(±1%) E-96&E-24	J(±5%) E-24
RMH20	1W	Refer 5.2	200V	400V	±100	10Ω-400Ω	
					±200		10Ω-400Ω
					±400	1Ω-9.1Ω	1Ω-9.1Ω
Operating Temp(°C) : -55°C ~ +155°C							

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

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5.1 Derating Curve :

For resistors operated at ambient temperature over 70°C , power rating shall be derated in accordance with figure 1.

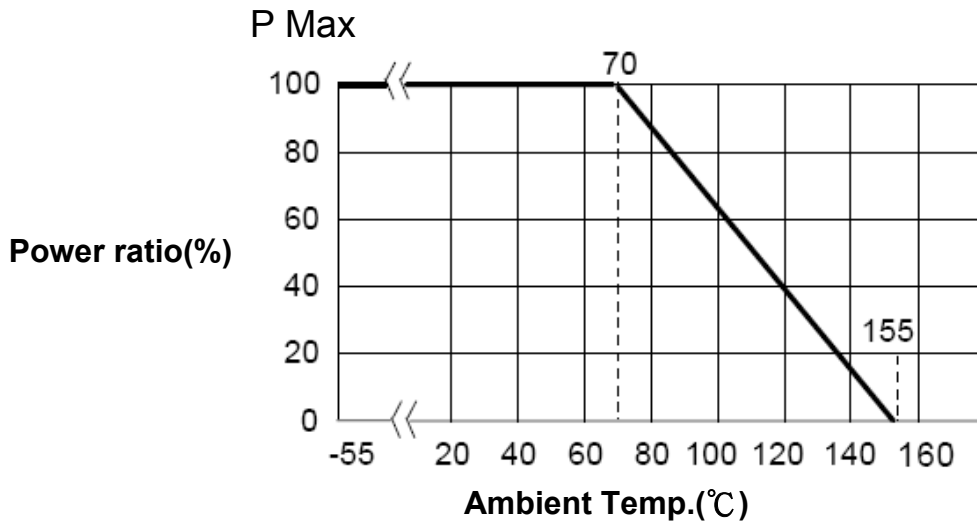


Figure 1

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 RMH20JE101 the rated voltage ?
 RMH20JE101 P:1.0W ; R:101 = 100Ω

$$E = \sqrt{1.0(W) * 100(\Omega)} = 10 (V)$$

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6. Reliability Tests:

Test Items	Reference standard	Condition of Test	Test Limits ΔR
Temperature Coefficient of Resistance	IEC60115-1-4.8 JIS-C5201-1-4.8	-55 ~ +125 °C	Refer 5.0
Short Time Overload	IEC60115-1-4.13 JIS-C5201-1-4.13	2.5 X rated voltage for 5 sec	$\pm(1\% + 0.05\Omega)$
Intermittent Overload	IEC60115-1-4.39 JIS-C5201-1-4.39	3.0 X rated voltage or Max Overloading voltage, 1sec "ON", 25sec "OFF", 10000 cycles	$\pm(5.0\% + 0.1\Omega)$
Load Life	IEC60115-1-4.25.1 JIS-C5201-1-4.25.1	1000 hours at rated voltage, 70°C, 1.5hours "ON", 0.5hour "OFF"	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.1\Omega)$
Load Life with Humidity	IEC60115-1-4.24 JIS-C5201-1-4.24	1000 hours at rated voltage, 40 \pm 2°C, 90~95% RH 1.5hours "ON", 0.5hour "OFF"	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.1\Omega)$
Rapid Change of Temperature	IEC60115-1-4.19 JIS-C5201-1-4.19	-55°C (30 min.) / +155 °C (30 min.) 5 cycles	1%: $\pm(0.5\%+0.05\Omega)$ 5%: $\pm(1.0\%+0.05\Omega)$
Solderability	IEC60115-1-4.17 JIS-C5201-1-4.17	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.
Robustness of Termination (Bending)	IEC60115-1-4.33 JIS-C5201-1-4.33	2mm deflection	1%: $\pm(0.5\%+0.05\Omega)$ 5%: $\pm(1.0\%+0.05\Omega)$
Dielectric Withstanding Voltage (Voltage Proof)	IEC60115-1-4.7 JIS-C5201-1-4.7	Applying voltage : 500V for a minute .	No abnormalities such as flashover, burning dielectric breakdown shall appear.
Insulation Resistance	IEC60115-1-4.6 JIS-C5201-1-4.6	Applying voltage 100V for 1 minute.	$\geq 1G\Omega$
Resistance to Dry Heat	IEC60115-1-4.23.2 JIS-C5201-1-4.23.2	155 \pm 5°C for 96 \pm 4Hrs	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(2.0\%+0.1\Omega)$
Resistance to Solder Heat	IEC60115-1-4.18 JIS-C5201-1-4.18	270 \pm 5°C solder, 10 \pm 1 sec dwell .	1%: $\pm(0.5\%+0.05\Omega)$ 5%: $\pm(1.0\%+0.05\Omega)$

Note* : RCWV : Rated continuous working voltage . 2 watts total Solder pad and trace size of 300mm.

7. Marking :

7.1 ±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.

E.G. : 470 = $47 \times 10^0 = 47 \Omega$

7.2 ±1% (E96)

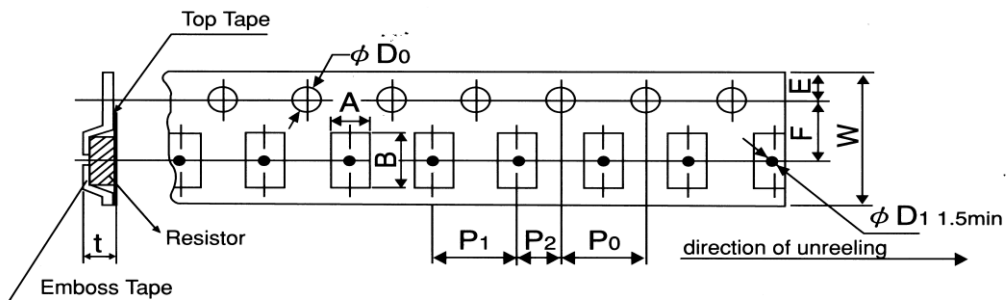
Resistance value is expressed by 4 digits, the first three digits represent the significant figures of nominal resistance value in Ω , and the fourth digit represents exponent for base of 10.

E.G. : 1000 = $100 \times 10^0 = 100 \Omega$

8. Taping & Reel :

8.1 Taping Dimensions

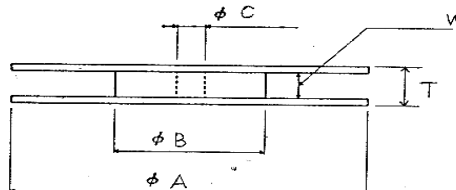
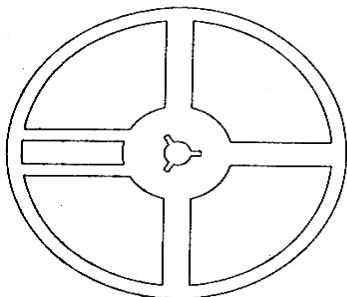
8.1.1 4 mm pitch Emboss :



Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Emboss	RMH20	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	ϕ 1.5 +0.1 -0	0.85±0.15

Type	Package	Emboss Plastic Tape 4 mm pitch
	Size	
RMH	20	4000

8.2 Reel Specifications:

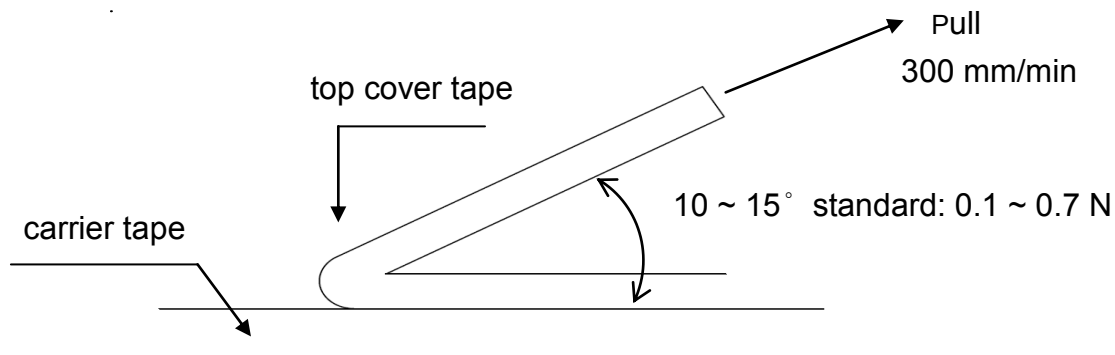


UNIT: mm

Type	ϕA	ϕB	ϕC	W	T
RMH20	178.0 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	13.0 ± 1.0	15.5 ± 1.0

8.3 Peel-off force :

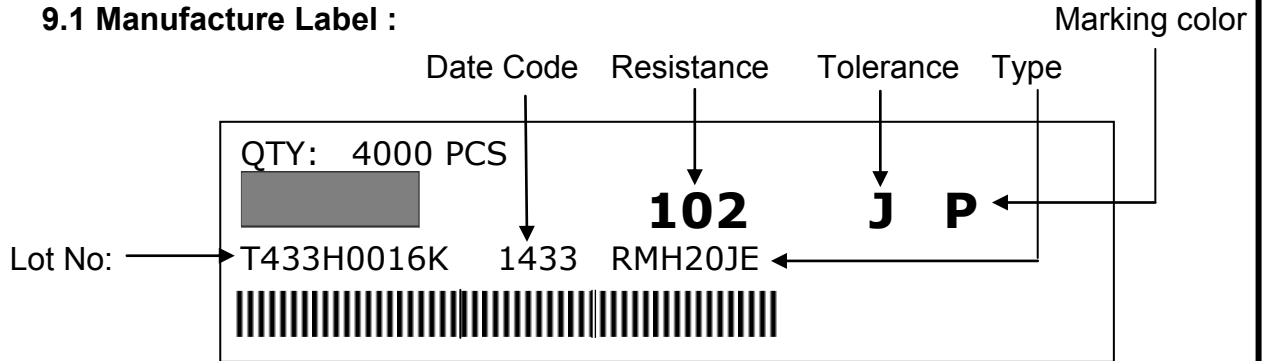
Peel-off force of paper and blister tape is in accordance with "JIS-C5202" that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.



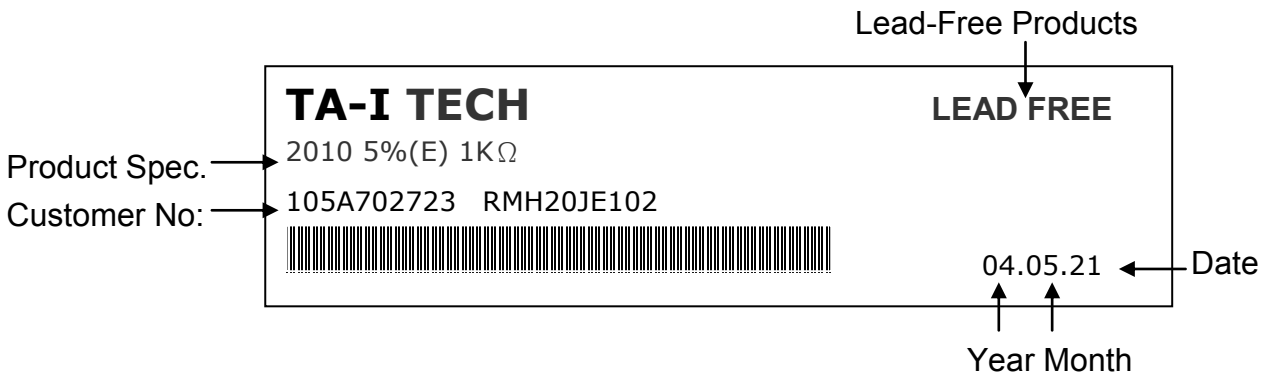
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9. Label :

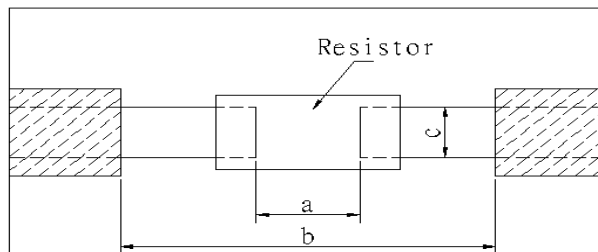
9.1 Manufacture Label :



9.2 Customer Label (By customer request):

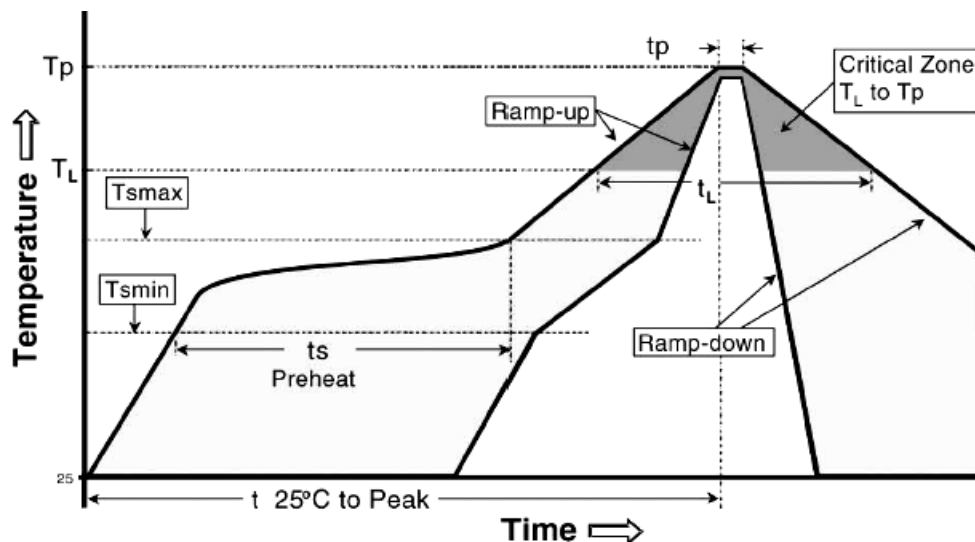


10. Recommended land patterns :



Land pattern		Dimension (mm)		
Type	Size	a	b	c
RMH	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)



Allowed Re-flow times : 3 times

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

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) ²	10 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8mimutes max.

12. Storage Conditions:

Temperature : 5 to 35 °C

Related Humidity :40 to 75% RH

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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 :

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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

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

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