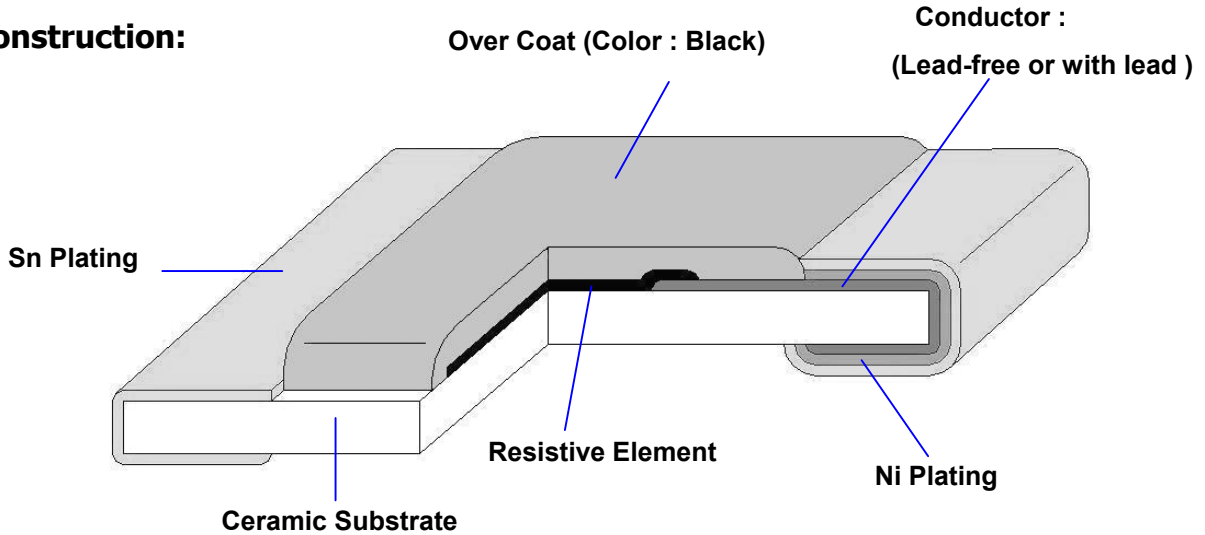


1. Scope :

This specification applies for the RM04 series of thick film chip resistors made by TA-I.

2. Construction:



3. Type Designation:

<u>RM</u>	<u>04</u>	<u>J</u>	<u>TN</u>	<u>103</u>
Product Code	Size	Tolerance	Packaging	Nominal
RM : Chip Resistor	Power Rating			Resistance
/	/	/	/	/

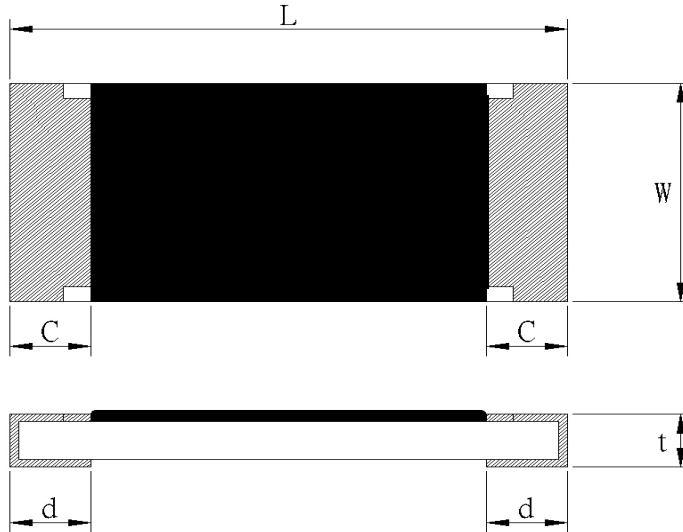
04-0402(1005) 1/16W

J - ±5%
G - ±2%
F - ±1%
D - ±0.5%
B - ±0.1%

T-Paper Tape
+N: Lead-Free

3 digits, e.g.,: (E-24) 103 = 10kΩ 0 = 0Ω
4 digits, e.g.,: (E-96) 1540 = 154Ω 43R2 = 43.2Ω

4. Dimensions:



UNIT: mm

Type	L	W	C	d	t
RM04	1.00 +0.10 -0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05

5. Ratings & Characteristics :

Type	Power Rating at 70°C	Rating Voltage	Max. Working Voltage	Max. Over- Load Voltage	T.C.R (PPM/°C)	Resistance Range(Ω)				
						B(±0.1%) E-96	D(±0.5%) E-96	F(±1%) E-96	G(±2%) E-24	J(±5%) E-24
RM04	1/16W	Refer 5.2	50V	100V	±200	10Ω -200kΩ	10Ω -1MΩ	10Ω -10MΩ	10Ω -10MΩ	10Ω -10MΩ
					+500 -200			1Ω -9.1Ω	1Ω -9.1Ω	1 -9.1Ω
					±400			10MΩ ≤R≤20MΩ	10MΩ ≤R≤20MΩ	10MΩ ≤R≤20MΩ

O Ω THICK FILM CHIP RESISTORS			
Type	Rated Current	Max Overload Current	Resistance Range
RM04	1A	2.5A	50mΩ MAX
2. Operating Temp(°C): : -55°C ~ +125°C			

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.

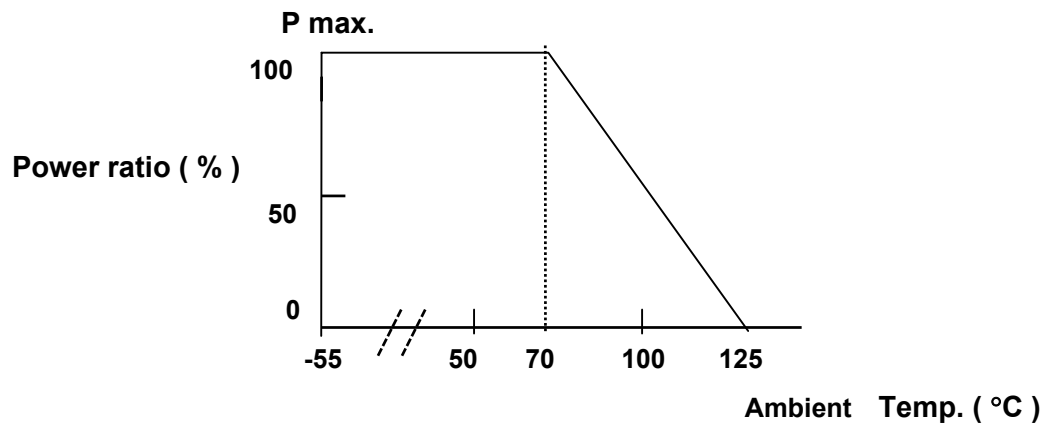


Figure 1

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 RM04JTN102 the rated voltage ?

$$\text{RM04JTN102 } P:1/16\text{W} ; R:102 = 1\text{K}\Omega = 1000\Omega$$

$$E = \sqrt{0.0625(\text{W}) * 1000(\Omega)} = 7.9 (\text{V})$$

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

Test Items	Reference standard	Condition of Test	Test Limits
Temperature Coefficient of Resistance	JIS-C5202-5.2	-55~ +125 °C	Refer 5.0
Short Time Overload	JIS-C5202-5.5	2.5 X rated voltage for 5s	± (2% + 0.1Ω) 0Ω : 50mΩ or less
Intermittent Overload Test	JIS-C5202-5.8	2.5 X rated voltage or Max Overloading voltage ,1sec "ON" , 25sec "OFF" , 10000 cycles	± (5.0% + 0.1Ω) 0Ω : 50mΩ or less
Load Life	JIS-C5202-7.10	1000 hours at rated voltage, 70°C , 1.5hours "ON" , 0.5hour "OFF"	± (3.0% + 0.1Ω) 0Ω : 100mΩ or less
Load Life with Humidity	JIS-C5202-7.9	1000 hours at rated voltage , 40±2°C , 90~95% RH 1.5hours "ON" , 0.5hour "OFF"	± (3.0% + 0.1Ω) 0Ω : 100mΩ or less Without mechanical damage
Rapid Change of Temperature	JIS-C5202-7.4	-55°C (30 min.) / +155 °C(30 min.) 5 cycles	1% : ±(0.5%+0.05Ω) 2%, 5% : ±(1.0%+0.05Ω) 0Ω : 50mΩ or less
Solderability	JIS-C5202-6.11	245±5°C solder, 3±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 Strength)	JIS-C5202—6.1	3mm deflection	0.5%,1%:±(0.5%+0.05Ω) 2%,5%:±(1.0%+0.05Ω) 0Ω: 50mΩ or less
Dielectric Withstanding Voltage (Voltage Proof)	JIS-C5202-5.7	Applying voltage : 300V for a minute .	No abnormalities such as flashover, burning dielectric breakdown shall appear.
Insulation Resistance	JIS-C5202-5.6	Applying voltage 100V for 1 minute.	≥ 1GΩ
Resistance to Dry Heat	JIS-C5202-7.2	125±5°C for 96±4hrs	1% : ±(1.0%+0.05Ω) 2%,5% : ±(2.0%+0.1Ω) 0Ω: 50mΩ or less
Resistance to Soldering Heat	JIS-C5202-6.10	270 ±5°C solder , 10 ±1 sec dwell .	0.5%,1%:±(0.5%+0.05Ω) 2%, 5%:±(1.0%+0.05Ω) 0Ω: 50mΩ or less

TA-I	Thick Film Chip Resistors (Lead-Free for RM04 Series)	No.	TRM-040S003E
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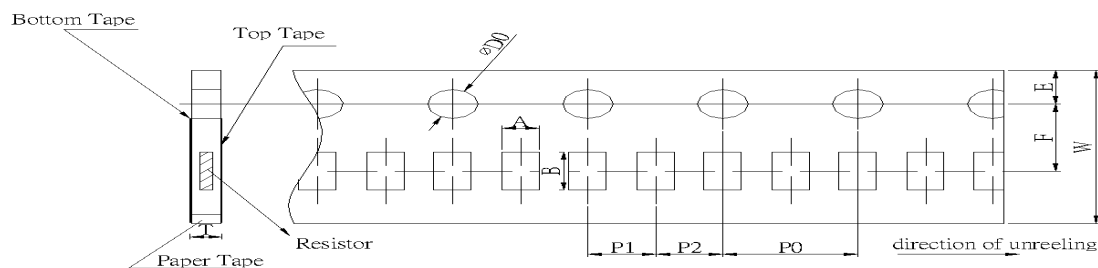
Whisker	SONY SS-00254-8	<p>Component , Lead-Free Soldering part 8 : Solder Heat Resistance Test for SMD. Lead-Free Soldering "</p> <p>Temp. Cycles : -35 ± 5°C / 125 ± 5°C , Keep 7 min Testing duration : 500±4 hours</p> <p>Temp. Humidity Chambers: Temperature : 85°C Humidity : 85% RH Testing duration : 500±4 hours .</p>	Whisker formation : 50 um or less .
Resistance to soldering heat	SONY SS-00254-5	<p>Component , Lead-Free Soldering part 5 : Solder Heat Resistance Test for SMD. Lead-Free Soldering "</p> <p>Flow Solder : Pre – heat : 100 to 105 °C 30±5 sec Temperature : 260±3°C 10 +1/-0 sec The entire sample shall be dipped in solder. The specimen shall be stored at standard atmospheric conditions for 1 hour .</p> <p>Iron Solder : Bit temperature : 350 ±10°C Application time of soldering iron : 3 +1/- 0sec Apply the soldering iron to the electrode . The specimen shall be stored at standard atmospheric conditions for 1 hour , after which the measurements shall be made</p>	Electrical characteristics shall be Satisfied . Without distinct deformation in appearance

Note* : RCWV : Rated continuous working voltage .

7. Marking : No Marking

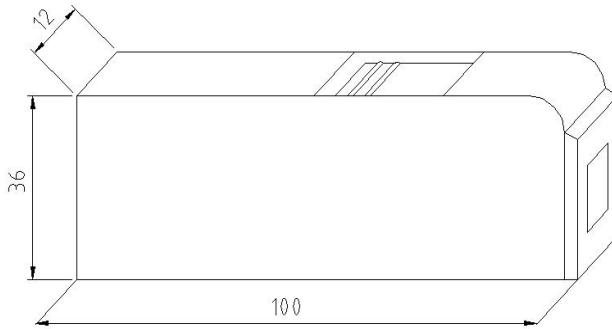
8. Taping & Reel :

8.1 Taping Dimensions 2 mm pitch paper :

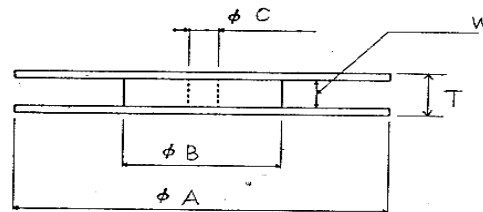
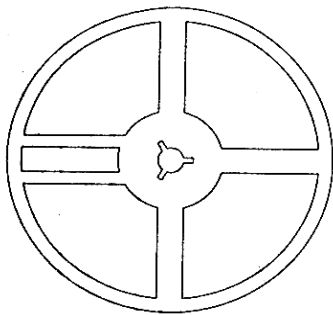


Packing	Type	A	B	W	F	E	P ₁	P ₂	P ₀	D ₀	T
Paper	RM04	0.7±0.05	1.2±0.05	8.0±0.2	3.5±0.05	1.75±0.1	2.0±0.1	2.0±0.1	4.0±0.1	+0.1 φ 1.5 -0	0.45±0.1
Package Type	Size	Paper Tape							Bulk		
		2 mm pitch									
		178mm/R				250mm/R					
RM	04	10000				20000		50000			

8.2. Bulk Case Specifications:



8.3 Reel Specifications:

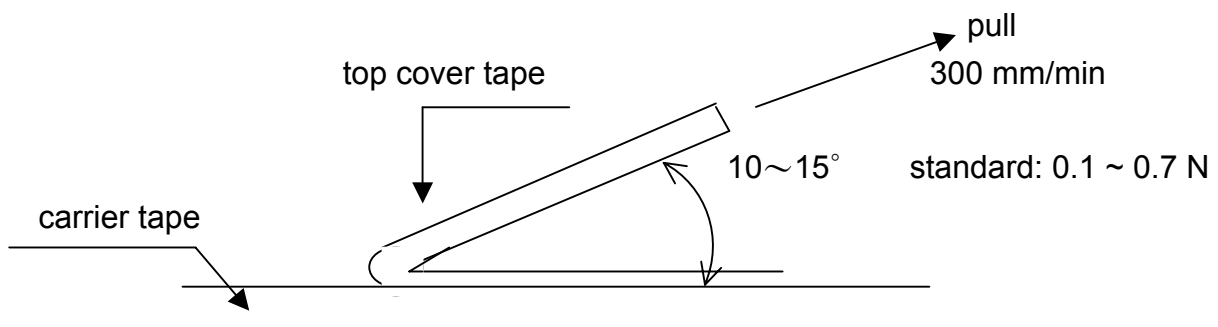


UNIT: mm

Type	φ A	φ B	φ C	W	T
RM04	178.0 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	9.0 ± 1.0	11.5 ± 1.0

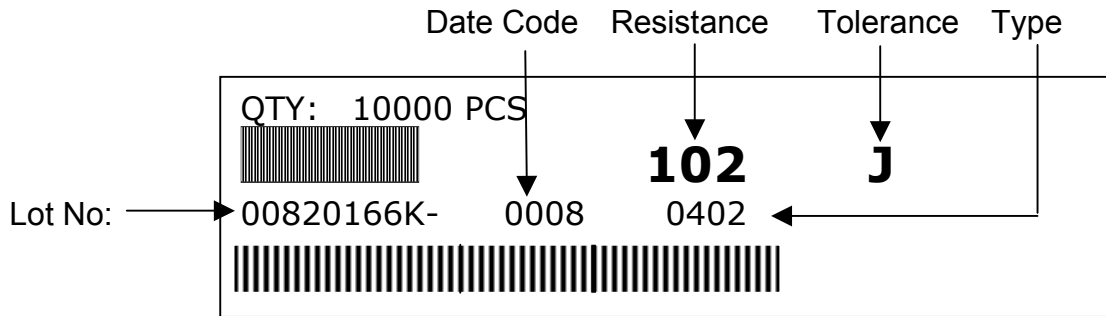
8.4 Peel –off force :

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.

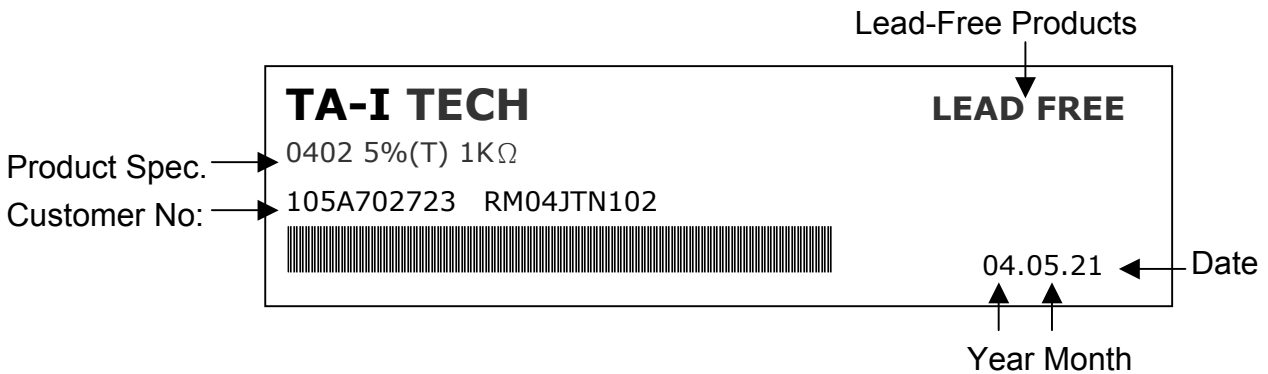


9. Label :

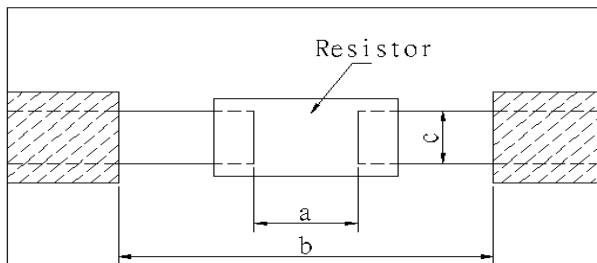
9.1 Manufacture Label :



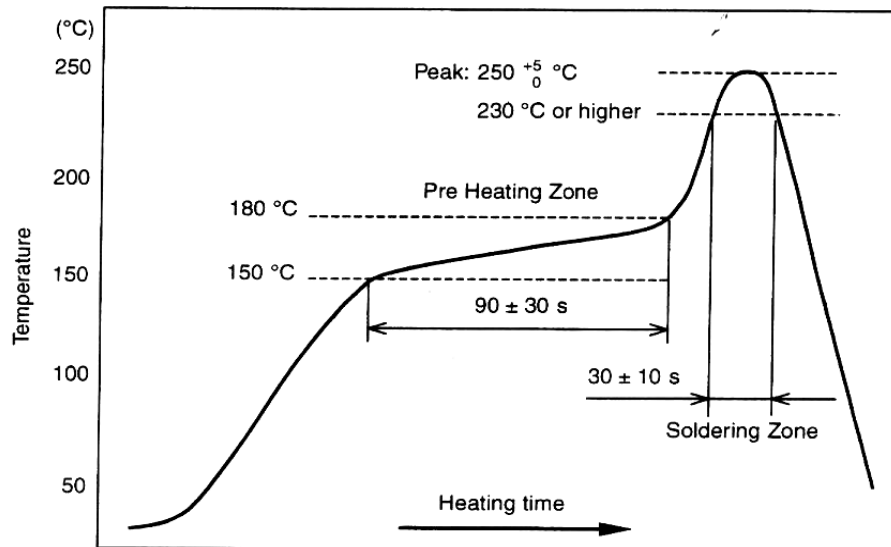
9.2 Customer Label (By customer request):



10. Recommended land patterns :



Land pattern		Dimension (mm)		
Type	Size	a	c	
RM	04 (0402)	0.50~0.6	1.4~1.6	0.4~0.6

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

Peak : $250 \begin{matrix} +5 \\ -0 \end{matrix} ^\circ\text{C}$, 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 to 35 °C

Related Humidity :40% to 75% RH

13. Shelf Life :

2 Years from manufacturing date.

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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

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Revise record

Date	Content	Owner
Nov.25.2005	4. Ratings & Characteristics : Adding Rating Voltage 5. Reliability Tests: Adding to Whisker & Resistance to soldering heat 7.3 Storage Conditions: Deleted to Storage Conditions 8.2 Customer Label Adding to Customer Label 10. Recommend IR – Reflow profile Adding to Recommend IR – Reflow profile 11. Storage Conditions: Adding to Storage Conditions: 12. Shelf Life Adding to Shelf Life :	Hank Liu
Jul.10.2006	2. Conductor : Adding to (Lead-free or with lead) 3. Type Designation: 04-0402 changed 04-0402(1005) (E-24) 103 = $10^3\Omega = 10k\Omega$ changed 103 = $10k\Omega$ 5. Ratings & Characteristics : Resistance Range(Ω) : Adding to B($\pm 0.1\%$) E-96, D($\pm 0.5\%$)E-96 F($\pm 1\%$) E-96 & G($\pm 2\%$)E-24 : 10Ω - $1M\Omega$ changed 10Ω - $10M\Omega$ 9.1 Manufacture label : Series number 3 codes changed to 4 codes 15. Manufacturing Country & City: Adding TA-I TECHNOLOGY (DONGGUAN) CO., LTD	Vincent
May.03.2007	Adding resistance range $10M\Omega \leq R \leq 20M\Omega$	Vincent