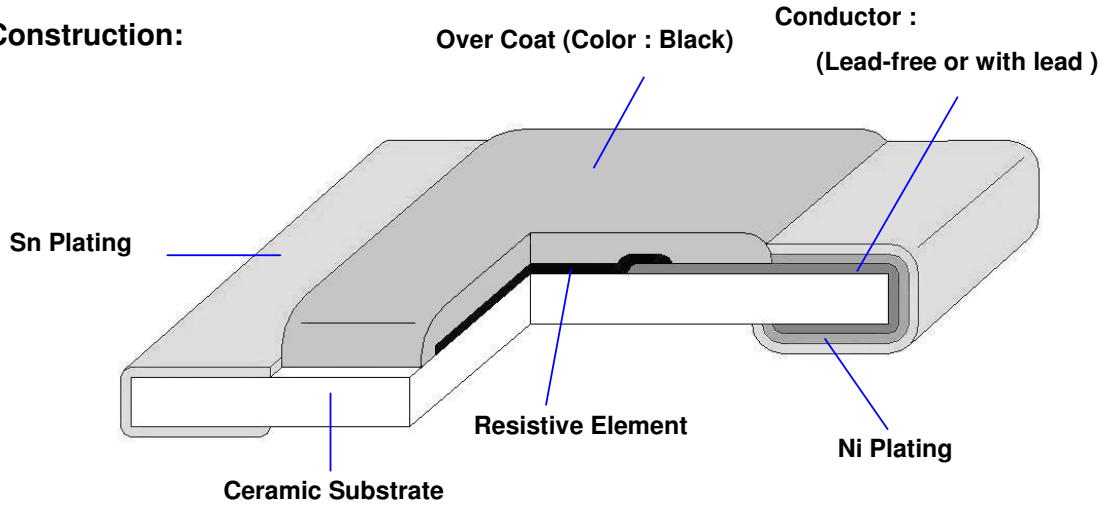


**1. Scope :**

This specification applies for the RM10 series of thick film chip resistors made by TA-I.

**2. Construction:**



**3. Type Designation:**

<b><u>RM</u></b>	<b><u>10</u></b>	<b><u>J</u></b>	<b><u>TN</u></b>	<b><u>103</u></b>
Product Code	Size	Tolerance	Packaging	Nominal
RM : Chip Resistor	Power Rating			Resistance

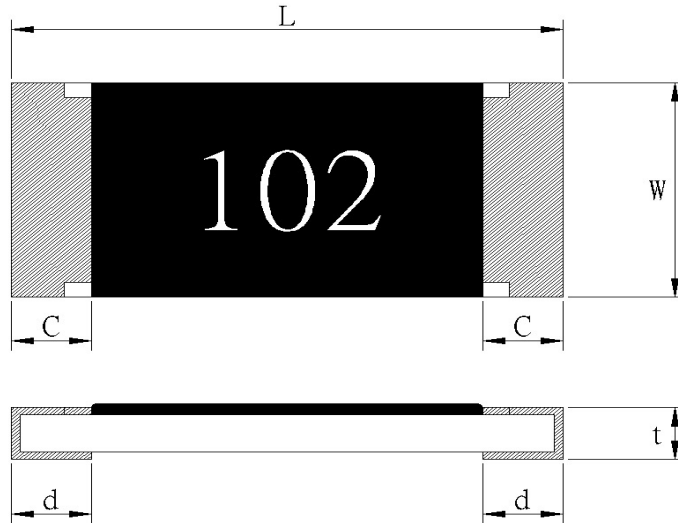
10-0805(2012)	1/8W
---------------	------

J - $\pm 5\%$ G - $\pm 2\%$ F - $\pm 1\%$ D - $\pm 0.5\%$ B - $\pm 0.1\%$	
---	--

T-Paper Tape	
+N: Lead-Free	

3 digits, e.g.,: (E-24) 103 = 10k $\Omega$ 0 = 0 $\Omega$ 4 digits, e.g.,: (E-96) 1540 = 154 $\Omega$ 43R2 = 43.2 $\Omega$	
---	--

4. Dimensions:



UNIT: mm

Type	L	W	C	d	t
RM10	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±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)				
						B(±0.1%) E-96	D(±0.5%) E-96	F(±1%) E-96	G(±2%) E-24	J(±5%) E-24
RM10	1/8W	Refer 5.2	150V	300V	±100	10 Ω -560k Ω	10 Ω -1M Ω	10 Ω -1M Ω		
					±200			1M < R ≤ 10M Ω	10 Ω -10M Ω	10 Ω -10M Ω
					±400			1 Ω -9.1 Ω	1 Ω -9.1 Ω	1 Ω -9.1 Ω 10M < R ≤ 20M Ω
<b>0 Ω THICK FILM CHIP RESISTORS</b>										
Type	Rated Current		Max Overload Current		Resistance Range					
RM10	2A		5A		50m Ω 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.

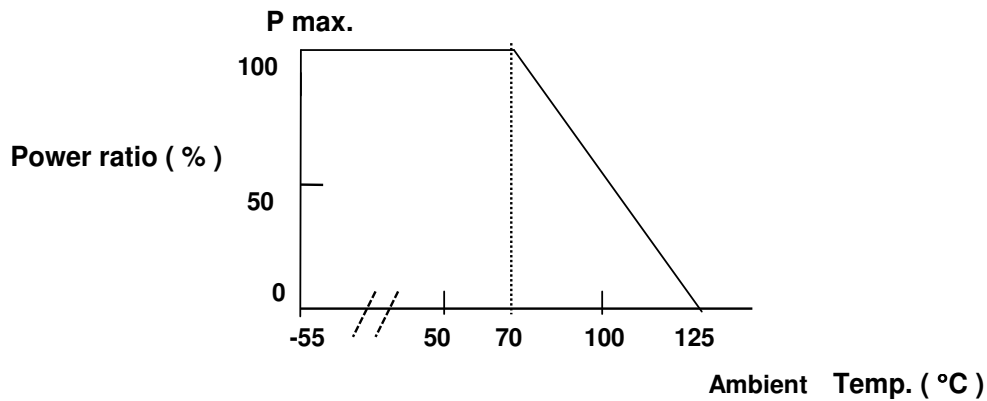


Figure 1

**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( $\Omega$ )

E.G. : What is RM10JTN102 the rated voltage ?

RM10JTN102 P:1/8W ; R:102 = 1K $\Omega$  = 1000 $\Omega$

$$E = \sqrt{0.125(W) * 1000(\Omega)} = 11.1 (V)$$

## 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 5 sec	± (1% + 0.05 Ω) 0 Ω : 50m Ω or less
Intermittent Overload	JIS-C5202-5.8	3.0 X rated voltage or Max Overloading voltage ,1sec "ON" , 25sec "OFF" , 10000 cycles	± (5.0% + 0.1 Ω) 0 Ω : 50m Ω or less
Load Life	JIS-C5202-7.10	1000 hours at rated voltage , 70°C , 1.5hours "ON" , 0.5hour "OFF"	0.5%,1%:±(1.0%+0.05 Ω) 2%,5%:±(3.0%+0.1 Ω) 0 Ω : 100m Ω 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"	0.5%,1%:±(1.0%+0.05 Ω) 2%, 5%:±(3.0%+0.1 Ω) 0 Ω : 100m Ω or less Without mechanical damage
Rapid Change of Temperature	JIS-C5202-7.4	-55°C (30 min. ) / +155 °C (30 min. ) 5 cycles	0.5%,1% : ±(0.5%+0.05 Ω) 2%, 5% : ±(1.0%+0.05 Ω) 0 Ω : 50m Ω or less
Solderability	JIS-C5202-6.11	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.
Robustness of Termination (Bending)	JIS-C5202—6.1	3mm deflection	0.5%,1%:±(0.5%+0.05 Ω) 2%,5%:±(1.0%+0.05 Ω) 0 Ω : 50m Ω or less
Dielectric Withstanding Voltage (Voltage Proof)	JIS-C5202-5.7	Applying voltage : 500V 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.	≥ 1G Ω
Resistance to Dry Heat	JIS-C5202-7.2	125±5°C for 96±4Hrs	0.5%,1% : ±(1.0%+0.05 Ω) 2%,5% : ±(2.0%+0.1 Ω) 0 Ω : 50m Ω or less
Resistance to Solder Heat	JIS-C5202-6.10	270 ±5°C solder , 10 ±1 sec dwell .	0.5%,1%:±(0.5%+0.05 Ω) 2%, 5%:±(1.0%+0.05 Ω) 0 Ω : 50m Ω or less

<b>TA-I</b>	<b>Thick Film Chip Resistors (Lead-Free for RM10 Series)</b>	No	TRM-100S005E
		page	5/10

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 Solder 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 :

### 7.1 ±2% & ±5%(E24)

Resistance value is expressed by 3 digits, the first two digits represent the significant figures of

nominal resistance value in  $\Omega$ , and the third digit represents exponent for base of 10.

E.G. :, 472 =  $47 \times 10^2 = 4700 \Omega = 4.7K\Omega$

### 7.2 ±1% (E96)

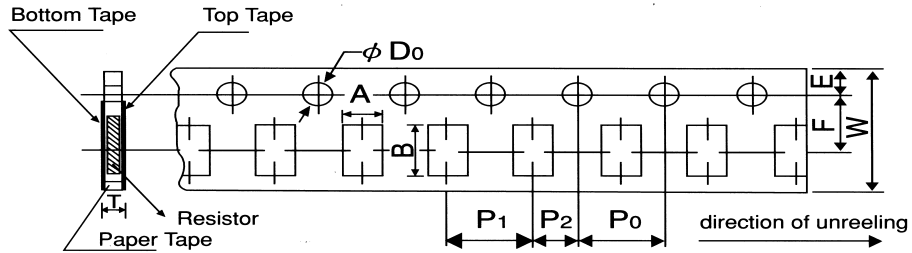
Resistance value is expressed by 4 digits or 3 digits , the first three digits represent the significant figures of nominal resistance value in  $\Omega$ , and the fourth digit represents exponent for base of 10.

E.G. : 4701 =  $470 \times 10^1 = 4700 \Omega = 4.7K$

8. Taping & Reel :

8.1 Taping Dimensions

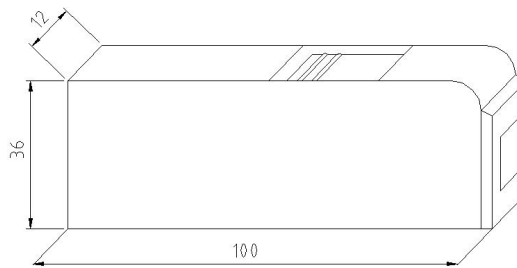
8.1.1 4 mm pitch paper :



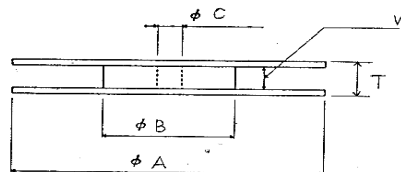
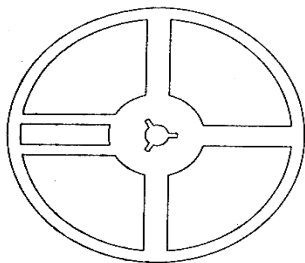
Packing	Type	A	B	W	F	E	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	D <sub>0</sub>	T
Paper	RM10	1.6±0.15	2.4±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	φ 1.5 <sup>+0.1</sup> <sub>-0</sub>	0.84±0.1

Type	Size	Paper Tape		Bulk
		4 mm pitch		
		178mm/R	250mm/R	
RM	10	5000	10000	10000

8.1.2 Bulk Case Specifications:



8.2 Reel Specifications:

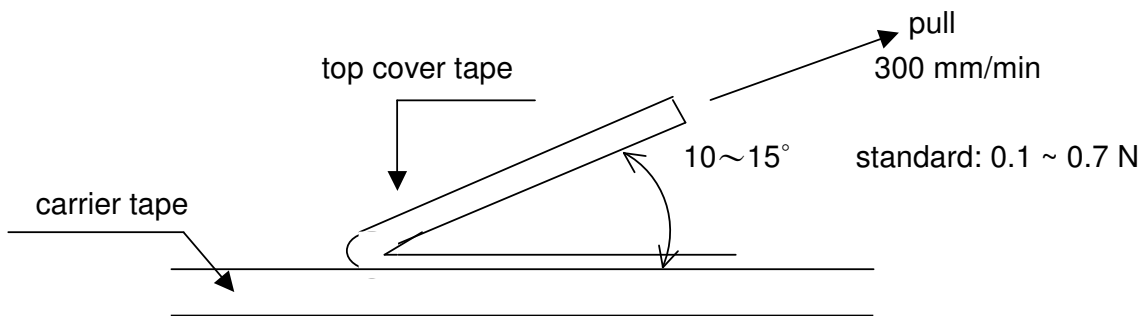


**UNIT: mm**

Type	$\phi A$	$\phi B$	$\phi C$	W	T
RM10	178.0 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	9.0 ± 1.0	11.5 ± 1.0

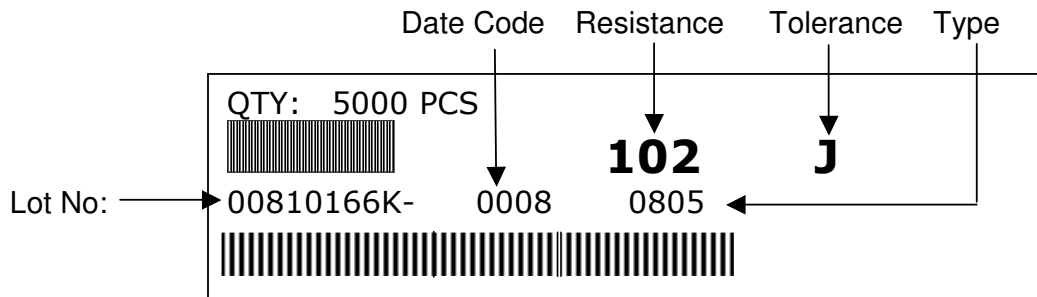
**8.3. Peel –off force :**

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.

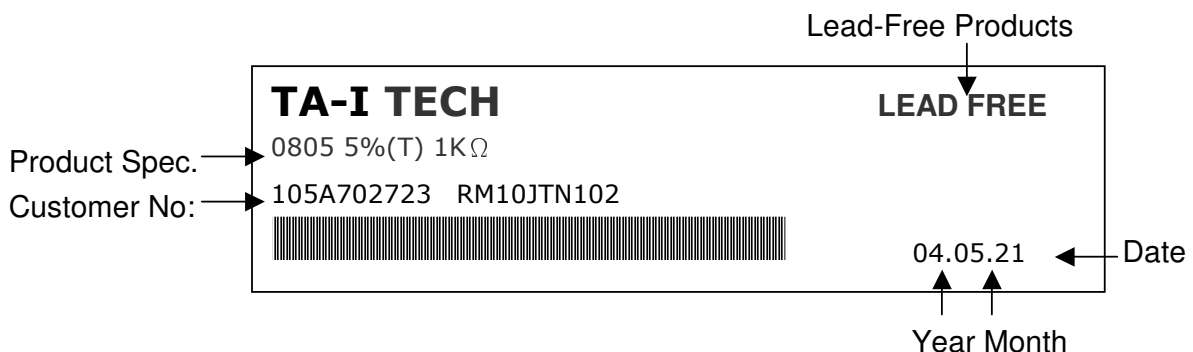


**9. Label :**

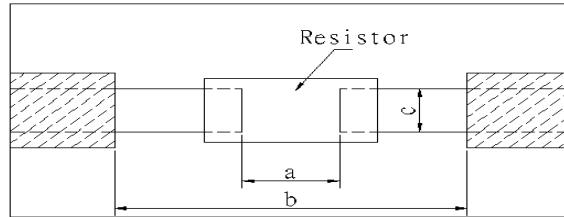
**9.1 Manufacture Label :**



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

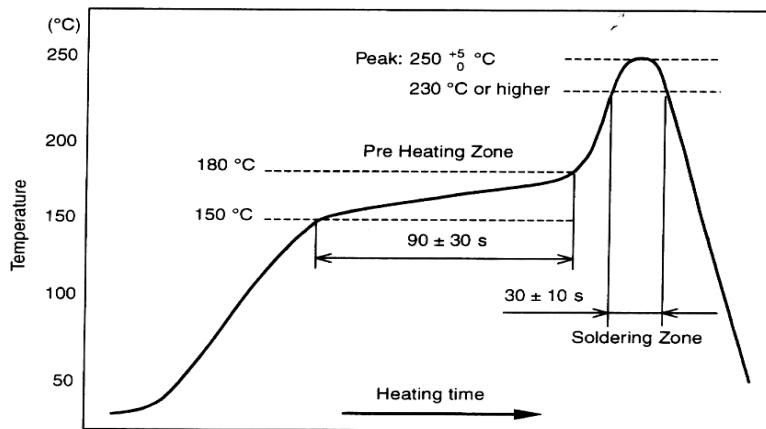


10. Recommended land patterns :



Land pattern		Dimension ( mm )		
Type	Size	a	b	c
RM	10 (0805 )	1.0~1.4	3.2~3.8	0.9~1.4

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



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

Pre – heat Zone : 150 to 180 °C ,  $90 \pm 30$  sec

Soldering Zone : 230°C or higher ,  $30 \pm 10$  sec

12. Storage Conditions:

Temperature : 5 to 35 °C

Related Humidity :40 to 75% RH

13. Shelf Life :

2 Years from manufacturing date.



<b>TA-I</b>	<b>Thick Film Chip Resistors (Lead-Free for RM10 Series)</b>	<b>No</b>	TRM-100S005E
		<b>page</b>	9/10

**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

<b>TA-I</b>	<b>Thick Film Chip Resistors (Lead-Free for RM10 Series)</b>	No	TRM-100S005E
		page	10/10

**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: 10-0805 changed 10-0805(2012) (E-24) 103 = $10^3\Omega$ = 10k $\Omega$ changed 103 = 10k $\Omega$ 5. Ratings & Characteristics : Resistance Range( $\Omega$ ) : B( $\pm 0.1\%$ ) E-96 (TCR $\pm 100$ ): 56 $\Omega$ -560k $\Omega$ changed 10 $\Omega$ -560K $\Omega$ D( $\pm 0.5\%$ )E-96(TCR $\pm 100$ ) : 56 $\Omega$ -560k $\Omega$ changed 10 $\Omega$ -1M $\Omega$ F( $\pm 1\%$ )E-96 (TCR $\pm 200$ ) : Adding To 1M<R $\leq$ 10M $\Omega$ J( $\pm 5\%$ )E-24 (TCR $\pm 400$ ) : : Adding To 10M<R $\leq$ 20M $\Omega$ 9.1 Manufacture label : Series number 3 codes changed to 4 codes 15. Manufacturing Country & City: Adding TA-I TECHNOLOGY (DONGGUAN ) CO., LTD	Vincent