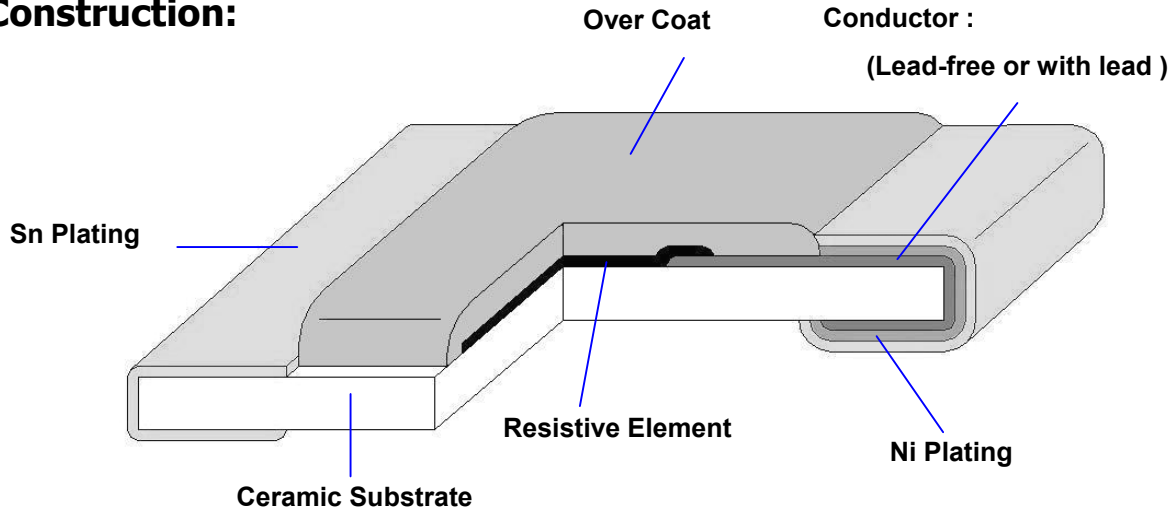


1. Scope :

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

2. Construction:

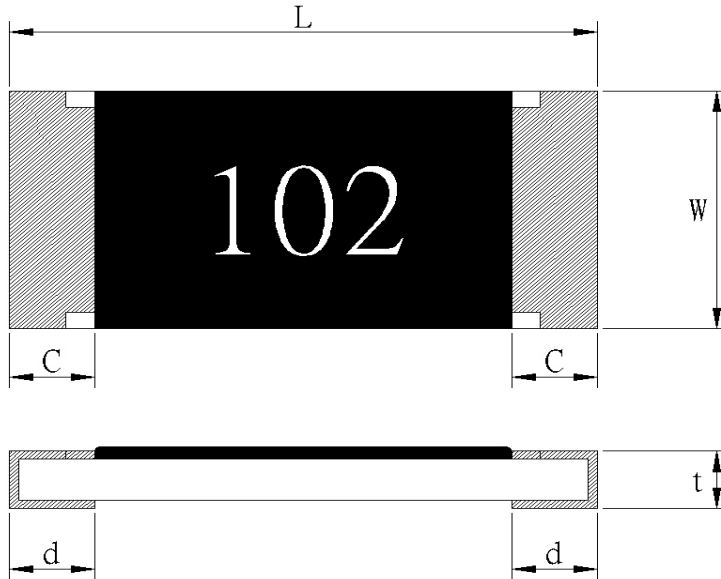


3. Type Designation:

RM **10** **J** **TN** **103**
 Product Code Size Tolerance Packaging Nominal Resistance
 RM : Chip Resistor Power Rating

| | | | |
|--|---|--|--|
| 02-0201(0603) 1/20W 04-0402(1005) 1/16W 06-0603(1608) 1/10W 10-0805(2012) 1/8W 12-1206(3216) 1/4W 13-1210(3226) 1/3w 20-2010(5025) 1/2W 25-2512(6432) 1 W | J-±5% G-±2% F-±1% D-±0.5% B-±0.1% | T-Paper Tape E-Embossed Tape B-Bulk Cassette +N: Lead-Free Special L : 06 – 2mm pitch paper Tape | 3 digits, e.g.,: (E-24) 103 = 10 ³ Ω = 10kΩ 0 = 0Ω 4 digits, e.g., : (E-96) 1540 = 154Ω 43R2 = 43.2Ω |
|--|---|--|--|

4. Dimensions:



UNIT: mm

| Type | L | W | C | d | t |
|------|---------------------------------------|-----------|-----------|--------------------------------------|-----------|
| RM02 | 0.60±0.03 | 0.30±0.03 | 0.1±0.05 | 0.15±0.05 | 0.25±0.05 |
| RM04 | 1.00 ^{+0.1} _{-0.05} | 0.50±0.05 | 0.20±0.10 | 0.25±0.10 | 0.35±0.05 |
| RM06 | 1.60±0.10 | 0.80±0.10 | 0.30±0.20 | 0.30 ^{+0.2} _{-0.1} | 0.45±0.10 |
| RM10 | 2.00±0.10 | 1.25±0.10 | 0.40±0.20 | 0.40±0.20 | 0.50±0.10 |
| RM12 | 3.10±0.10 | 1.55±0.10 | 0.50±0.30 | 0.40±0.20 | 0.60±0.10 |
| RM13 | 3.10±0.10 | 2.55±0.10 | 0.50±0.30 | 0.40±0.20 | 0.60±0.10 |
| RM20 | 5.00±0.15 | 2.50±0.15 | 0.60±0.30 | 0.50±0.25 | 0.60±0.10 |
| RM25 | 6.30±0.20 | 3.20±0.20 | 0.60±0.30 | 0.50±0.25 | 0.60±0.10 |

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 |
| RM02 | 1/20W | Refer 5.2 | 25V | 50V | ±200 | | | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-10MΩ |
| 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 |
| RM06 | 1/10W | Refer 5.2 | 50V | 100V | ±100 | 10Ω-560kΩ | 10Ω-1MΩ | 10Ω-1MΩ | | |
| | | | | | ±200 | | | 1M<R≤10MΩ | 10Ω-10MΩ | 10Ω-10MΩ |
| | | | | | ±400 | | | 1Ω-9.1Ω | 1Ω-9.1Ω | 10Ω-10MΩ 1-9.1Ω 10M<R≤20MΩ |
| RM10 | 1/8W | Refer 5.2 | 150V | 300V | ±100 | 10Ω-560kΩ | 10Ω-1MΩ | 10Ω-1MΩ | | |
| | | | | | ±200 | | | 1M<R≤10MΩ | 10Ω-10MΩ | 10Ω-10MΩ |
| | | | | | ±400 | | | 1Ω-9.1Ω | 1Ω-9.1Ω | 1-9.1Ω 10M<R≤20MΩ |
| RM12 | 1/4W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-560kΩ | 10Ω-1MΩ | 10Ω-1MΩ | | |
| | | | | | ±200 | | | 1M<R≤10MΩ | 10Ω-10MΩ | 10Ω-10MΩ |
| | | | | | ±400 | | | 1Ω-9.1Ω | 1Ω-9.1Ω | 1-9.1Ω 10M<R≤20MΩ |
| RM13 | 1/3W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-560kΩ | 10Ω-1MΩ | 10Ω-1MΩ | | |
| | | | | | ±200 | | | 1M<R≤10MΩ | 10Ω-10MΩ | 10Ω-10MΩ |
| | | | | | ±400 | | | 1Ω-9.1Ω | 1Ω-9.1Ω | 1-9.1Ω 10M<R≤20MΩ |
| RM20 | 1/2W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-560kΩ | 10Ω-1MΩ | 10Ω-1MΩ | | |
| | | | | | ±200 | | | 1M<R≤10MΩ | 10Ω-10MΩ | 10Ω-10MΩ |
| | | | | | ±400 | | | 1Ω-9.1Ω | 1Ω-9.1Ω | 1-9.1Ω 10M<R≤20MΩ |
| RM25 | 1W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-560kΩ | 10Ω-1MΩ | 10Ω-1MΩ | | |
| | | | | | ±200 | | | 1M<R≤10MΩ | 10Ω-10MΩ | 10Ω-10MΩ |
| | | | | | ±400 | | | 1Ω-9.1Ω | 1Ω-9.1Ω | 1-9.1Ω 10M<R≤20MΩ |

O Ω THICK FILM CHIP RESISTORS

| Type | Rated Current | Max Overload Current | Resistance Range |
|------|---------------|----------------------|------------------|
| RM02 | 0.5A | 1A | 50mΩ MAX |
| RM04 | 1A | 2.5A | 50mΩ MAX |
| RM06 | 1A | 2.5A | 50mΩ MAX |
| RM10 | 2A | 5A | 50mΩ MAX |
| RM12 | 2A | 5A | 50mΩ MAX |
| RM13 | 2A | 5A | 50mΩ MAX |
| RM20 | 2A | 5A | 50mΩ MAX |
| RM25 | 2A | 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.

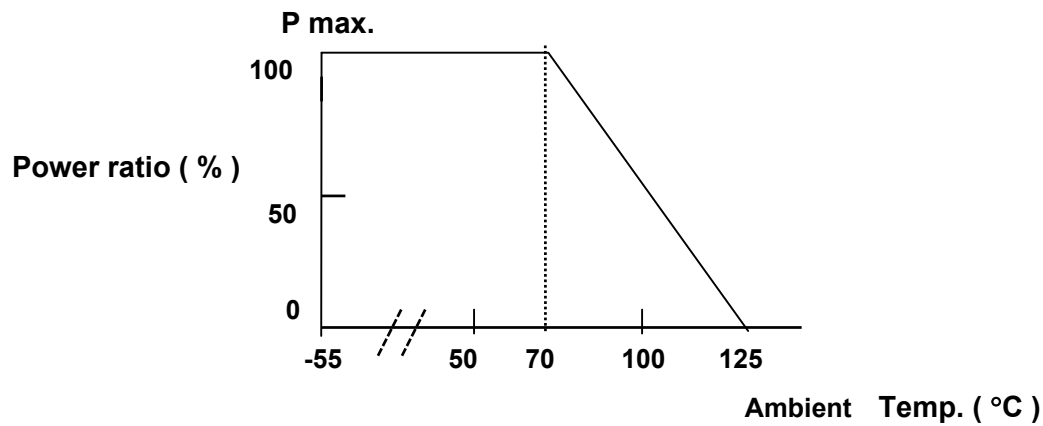


Figure 1

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 RM06JTN102 the rated voltage ?

$$\text{RM06JTN102 } P:1/10\text{W} ; R:102 = 1\text{K}\Omega = 1000\Omega$$

$$E = \sqrt{0.1(\text{W}) * 1000(\Omega)} = 10 (\text{V})$$

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 | +25~ +125 °C | Refer 5.0 |
| Short Time Overload | JIS-C5202-5.5 | 2.5 X rated voltage for 5 sec | ±(1% + 0.05 Ω) Remarks : 0201 : ±(3% + 0.1 Ω) 0402 : ±(2% + 0.1 Ω) 0 Ω : 50mΩ or less |
| Intermittent Overload | JIS-C5202-5.8 | 3.0 X rated voltage or Max Overloading voltage , 1sec "ON" , 25sec "OFF" , 10000 cycles (Remarks : 0201 / 0402 2.5 X RCWV *) | ± (5.0% + 0.1 Ω) 0 Ω : 50mΩ 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) Remarks : 0201 : ±(5.0%+0.1 Ω) 0402 : ±(3.0%+0.1 Ω) 0 Ω : 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" | 0.5%, 1%: ±(1.0%+0.05 Ω) 2%, 5%: ±(3.0%+0.1 Ω) Remarks : 0201: ±(5.0%+0.1 Ω) 0402: ±(3.0%+0.1 Ω) 0 Ω : 100mΩ 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) Remarks : 0201: ±(3.0%+0.1 Ω) 0 Ω : 50mΩ 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) Remarks : 0201 ±(1.0%+0.1 Ω) 0 Ω : 50mΩ or less |
| Dielectric Withstanding Voltage (Voltage Proof) | JIS-C5202-5.7 | Applying voltage : 0201 : 50V , 0402 & 0603 : 300V The other 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. Remark : 0201 50V | ≥ 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) Remark 0201 : ±(2.0%+0.1 Ω) 0 Ω : 50mΩ 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) Remarks : 0201 ±(3.0%+0.1 Ω) 0 Ω : 50mΩ or less |

| | | | |
|-------------|--|-------------|---------------------|
| TA-I | Thick Film Chip Resistors | No | TRM-XX0S001J |
| | (Lead – Free for RM series standard) | page | 6/13 |

| | | | |
|---------------------------|--------------------|---|---|
| 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 Ω , 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 3digits , 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. : 4701 = $470 \times 10^1 = 4700 \Omega = 4.7K$

7.3 ±1%(RM06/E96)

When the marking space is too small in such small-sized resistors as RM06, the marking can not be made by 4 digits and may be made by two digits combined with one English capital.

Symbol for E96 series nominal resistance value

| Symbol | E96 | Symbol | E96 | Symbol | E96 | Symbol | E96 |
|--------|-----|--------|-----|--------|-----|--------|-----|
| 01 | 100 | 25 | 178 | 49 | 316 | 73 | 562 |
| 02 | 102 | 26 | 182 | 50 | 324 | 74 | 576 |
| 03 | 105 | 27 | 187 | 51 | 332 | 75 | 590 |
| 04 | 107 | 28 | 191 | 52 | 340 | 76 | 604 |
| 05 | 110 | 29 | 196 | 53 | 348 | 77 | 619 |
| 06 | 113 | 30 | 200 | 54 | 357 | 78 | 634 |
| 07 | 115 | 31 | 205 | 55 | 365 | 79 | 649 |
| 08 | 118 | 32 | 210 | 56 | 374 | 80 | 665 |
| 09 | 121 | 33 | 215 | 57 | 383 | 81 | 681 |
| 10 | 124 | 34 | 221 | 58 | 392 | 82 | 698 |
| 11 | 127 | 35 | 226 | 59 | 402 | 83 | 715 |
| 12 | 130 | 36 | 232 | 60 | 412 | 84 | 732 |
| 13 | 133 | 37 | 237 | 61 | 422 | 85 | 750 |
| 14 | 137 | 38 | 243 | 62 | 432 | 86 | 768 |
| 15 | 140 | 39 | 249 | 63 | 442 | 87 | 787 |
| 16 | 143 | 40 | 255 | 64 | 453 | 88 | 806 |
| 17 | 147 | 41 | 261 | 65 | 464 | 89 | 825 |
| 18 | 150 | 42 | 267 | 66 | 475 | 90 | 845 |
| 19 | 154 | 43 | 274 | 67 | 487 | 91 | 866 |
| 20 | 158 | 44 | 280 | 68 | 499 | 92 | 887 |
| 21 | 162 | 45 | 287 | 69 | 511 | 93 | 909 |
| 22 | 165 | 46 | 294 | 70 | 523 | 94 | 931 |
| 23 | 169 | 47 | 301 | 71 | 536 | 95 | 953 |
| 24 | 174 | 48 | 309 | 72 | 549 | 96 | 976 |

Symbol for multipliers

| Symbol | A | B | C | D | E | F | G | H | X | Y | Z |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|
| multipliers | 10 ⁰ | 10 ¹ | 10 ² | 10 ³ | 10 ⁴ | 10 ⁵ | 10 ⁶ | 10 ⁷ | 10 ⁻¹ | 10 ⁻² | 10 ⁻³ |

E.G : 02C = 102×10² = 10.2kΩ

Notes :

When the resistance value is not in the list of E96 , 3 digitals with underline in E-24 series is used as mark .

E.G.: 0603 , 120Ω , 1% Marking is 121

7.4 ±1%(E96/3digitals)

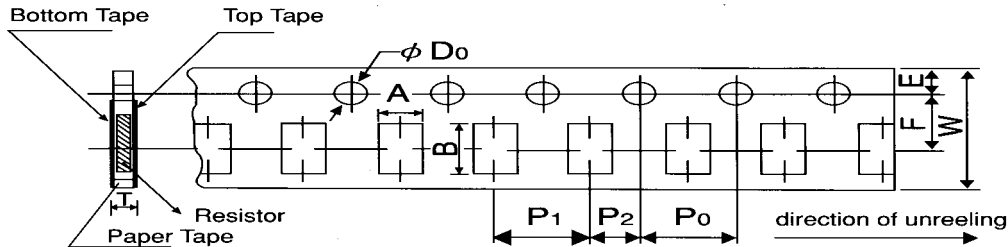
The resistance value by 3 digits is requirement for customer.

7.5 No Marking for RM04

8. Taping & Reel :

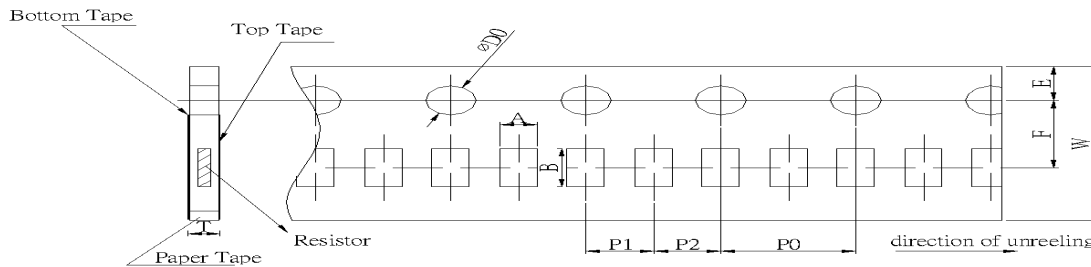
8.1 Taping Dimensions

8.1.1 4 mm pitch paper:



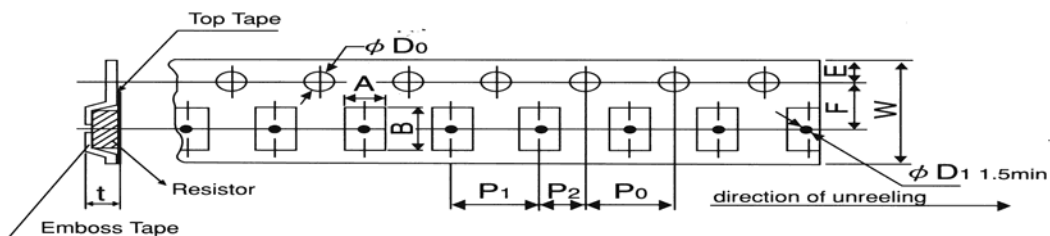
| Packing | Type | A | B | W | F | E | P ₁ | P ₂ | P ₀ | D ₀ | T |
|---------|------|----------|---------|---------|----------|----------|----------------|----------------|----------------|---------------------|----------|
| Paper | RM06 | 1.1±0.1 | 1.9±0.1 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 4.0±0.1 | 2.0±0.05 | 4.0±0.1 | φ 1.5 +0.1 -0 | 0.64±0.1 |
| | RM10 | 1.6±0.15 | 2.4±0.2 | | | | | | | | 0.84±0.1 |
| | RM12 | 2.0±0.15 | 3.6±0.2 | | | | | | | | |
| | RM13 | 2.8±0.2 | 3.6±0.2 | | | | | | | | |

8.1.2 2 mm pitch paper :



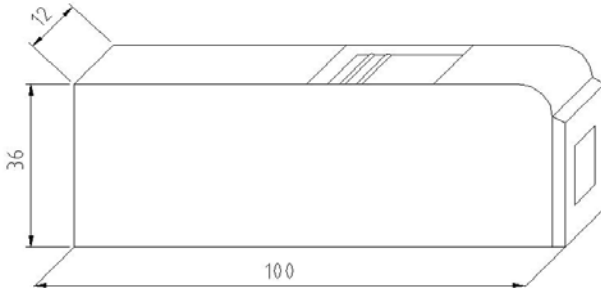
| Packing | Type | A | B | W | F | E | P ₁ | P ₂ | P ₀ | D ₀ | T |
|---------|------|-----------|----------|---------|----------|----------|----------------|----------------|----------------|---------------------|----------|
| Paper | RM02 | 0.37±0.05 | 0.67±0.1 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 2.0±0.1 | 2.0±0.05 | 4.0±0.1 | φ 1.5 +0.1 -0 | 0.37±0.1 |
| | RM04 | 0.7±0.05 | 1.2±0.05 | | | | 2.0±0.1 | 2.0±0.1 | | | 0.45±0.1 |
| | RM06 | 1.1±0.1 | 1.9±0.1 | | | | 2.0±0.1 | 2.0±0.1 | | | 0.64±0.1 |

8.1.3 4 mm pitch Emboss :



| Packing | Type | A | B | W | F | E | P ₁ | P ₂ | P ₀ | D ₀ | T |
|---------|------|---------|---------|----------|----------|----------|----------------|----------------|----------------|---------------------|-----------|
| Emboss | RM20 | 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 |
| | RM25 | 3.6±0.2 | 6.9±0.2 | | | | | | | | |

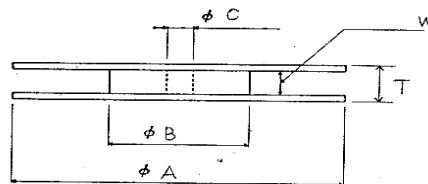
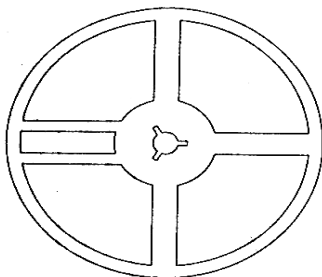
8.14. Bulk Case Specifications:



UNIT: mm

| Package | | Paper Tape | | | | Emboss Plastic Tape 4 mm pitch | Bulk |
|---------|------|------------|---------|------------|---------|-----------------------------------|-------|
| | | 4 mm pitch | | 2 mm pitch | | | |
| | | 180mm/R | 250mm/R | 180mm/R | 250mm/R | | |
| Type | Size | | | | | | |
| RM | 02 | | | 10000 | | | |
| RM | 04 | | | 10000 | 20000 | | 50000 |
| RM | 06 | 5000 | 10000 | 10000 | 20000 | | 20000 |
| RM | 10 | 5000 | 10000 | | | | 10000 |
| RM | 12 | 5000 | 10000 | | | | 5000 |
| RM | 13 | 5000 | | | | | |
| RM | 20 | | | | | 4000 | |
| RM | 25 | | | | | 4000 | |

8.2 Reel Specifications:

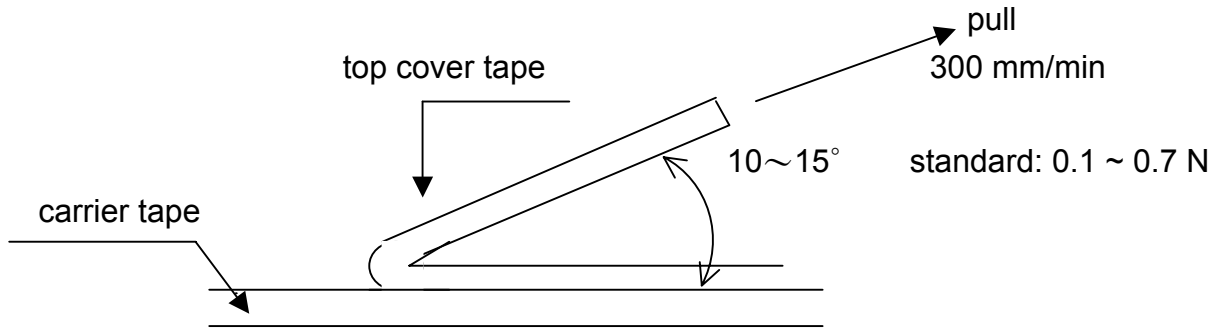


UNIT: mm

| Type | ϕA | ϕB | ϕC | W | T |
|----------------------------------|-----------------|----------------|----------------|----------------|----------------|
| RM02 / 04 / 06 RM10 / 12 / 13 | 178.0 ± 1.0 | 60.0 ± 1.0 | 13.0 ± 1.0 | 9.0 ± 1.0 | 11.5 ± 1.0 |
| RM20 / 25 | | | | 13.0 ± 1.0 | 15.5 ± 1.0 |

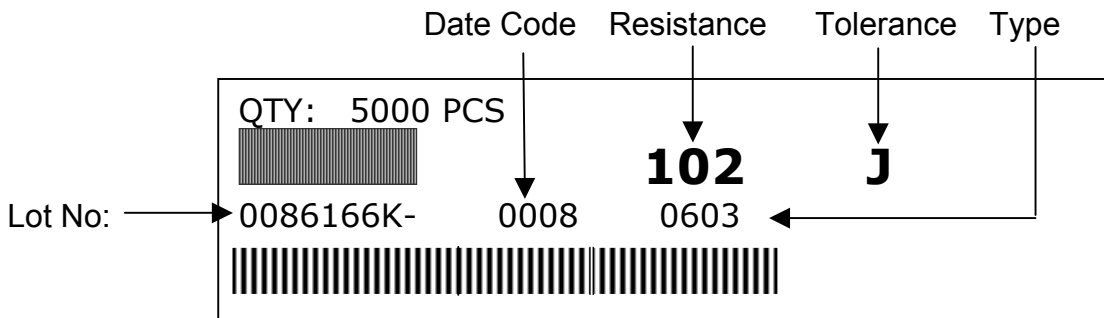
8.3. Peel –off force :

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.

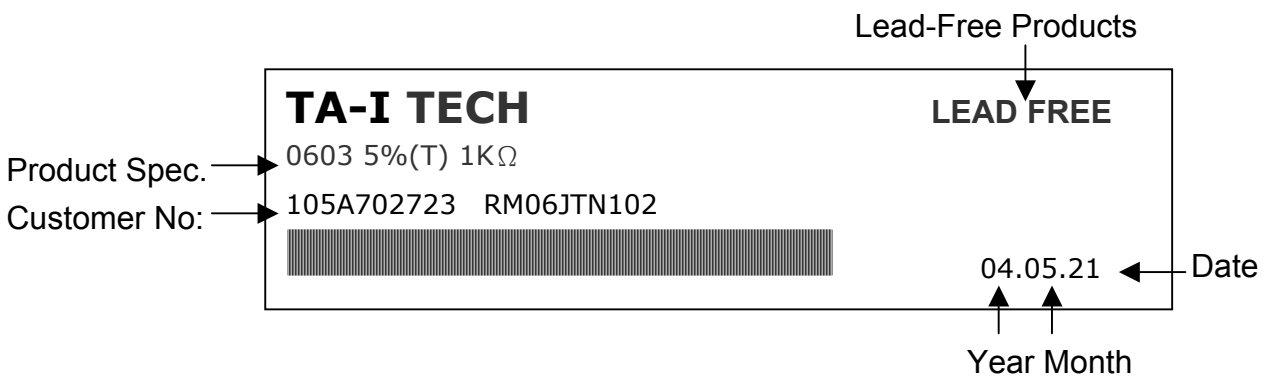


9. Label :

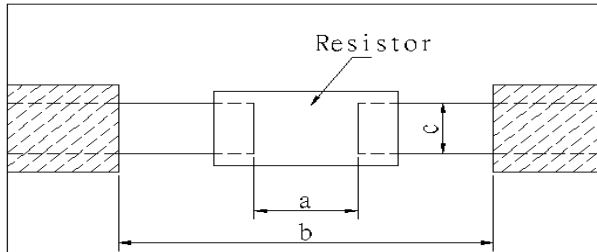
9.1 Manufacture Label :



9.2 Customer Label:

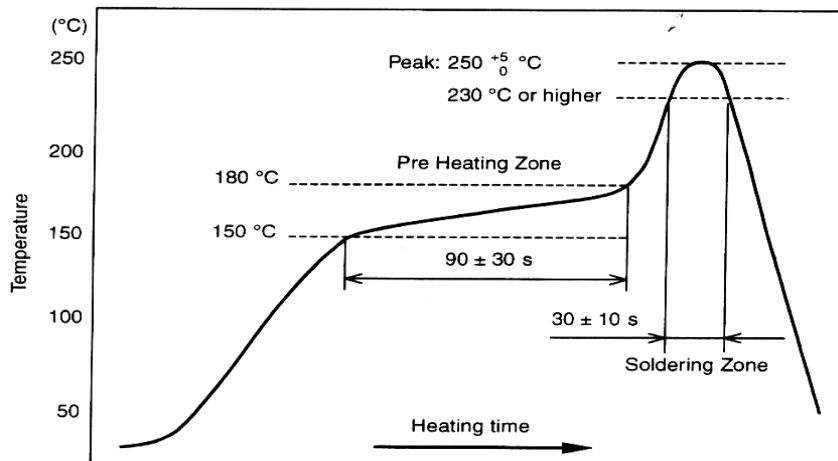


10. Recommended land patterns :



| Type | Size | Land pattern | | | Dimension (mm) | | |
|------|------------|--------------|---------|---------|------------------|---|---|
| | | a | b | c | a | b | c |
| RM | 02 (0201) | 0.25~0.3 | 0.7~0.9 | 0.3~0.4 | | | |
| RM | 04 (0402) | 0.50~0.6 | 1.4~1.6 | 0.4~0.6 | | | |
| RM | 06 (0603) | 0.7~0.9 | 2.0~2.2 | 0.8~1.0 | | | |
| RM | 10 (0805) | 1.0~1.4 | 3.2~3.8 | 0.9~1.4 | | | |
| RM | 12 (1206) | 2.0~2.4 | 4.4~5.0 | 1.2~1.8 | | | |
| RM | 13 (1210) | 2.0~2.4 | 4.4~5.0 | 2.3~3.5 | | | |
| RM | 20 (2010) | 3.3~3.7 | 5.7~6.5 | 2.3~3.5 | | | |
| RM | 25 (2512) | 3.6~4.0 | 7.6~8.6 | 2.3~3.5 | | | |

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±30 sec

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

| | | | |
|-------------|--|-------------|--------------|
| TA-I | Thick Film Chip Resistors (Lead – Free for RM series standard) | No | TRM-XX0S001J |
| | | page | 12/13 |

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)

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

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|-------------|--|------|--------------|
| TA-I | Thick Film Chip Resistors | No | TRM-XX0S001J |
| | (Lead – Free for RM series standard) | page | 13/13 |

Revise record

| Date | Content | Owner |
|------------|--|----------|
| 2005/11/25 | 4. Ratings & Characteristics : Adding Rating Voltage | Hank Liu |
| 2005/12/12 | 6. Reliability Tests Short Time Overload : add 0402 & 0201 Intermittent Overload : add 0402 & 0201 Load Life : add 0402 & 0201 Load Life with Humidity : add 0402 & 0201 Rapid Change of Temperature: add 0402 & 0201 Robustness of Termination : add 0402 & 0201 Dielectric Withstanding Voltage (Voltage Proof) : add 0402 & 0201 Insulation Resistance : add 0402 & 0201 Resistance to Dry Heat : add 0402 & 0201 Resistance to Solder Heat : add 0402 & 0201 | Hank Liu |
| 2006/03/15 | 1. Adding resistance range for 1% 0603~2512 size from 1M Ω to 10 M Ω . | Vincent |
| 2006/05/11 | 2. Adding resistance range for 1%,2% 0402 size from 1M Ω to 10 M Ω . | Vincent |
| 2006/05/22 | 1. Adding metric system for product size. 2. Construction: Conductor: New add : Lead-free material (Original :With lead material) | Vincent |
| 2006/06/09 | 2. Adding resistance range : 0402 size : Adding 0.1% : from 10 Ω to 200 K Ω . Adding 0.5% : from 10 Ω to 1 M Ω . 0603-2512 size : 0.1% , 0.5% : before :from 56 Ω to 560k Ω . after : from 10 Ω to 1 M Ω . Adding 5% :10M Ω to 20M Ω . | Vincent |