



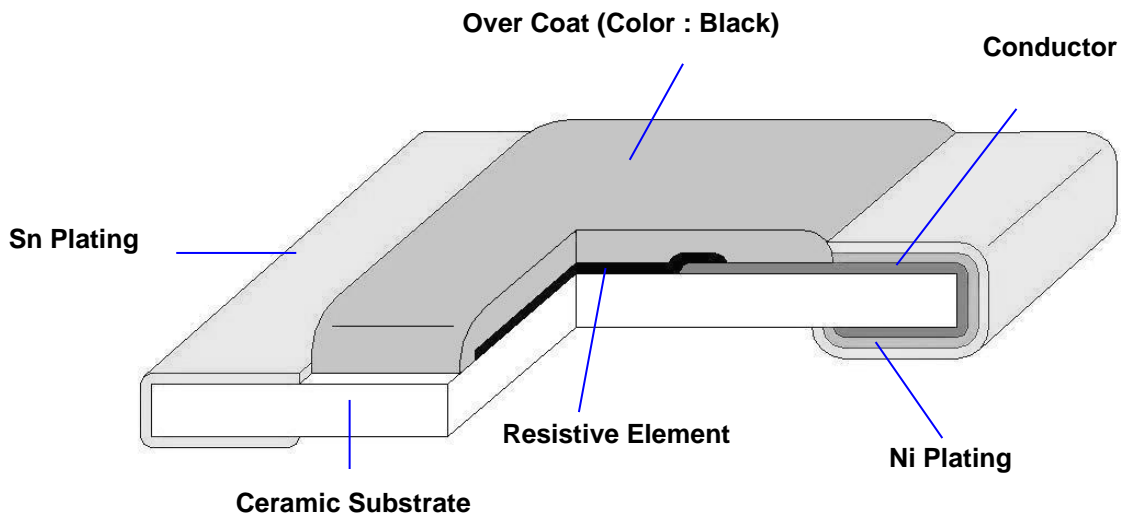
**Automotive Grade Thick Film Chip Resistors
(RMF series standard)
Halogen-Free
AEC-Q200 qualified**

| | |
|--------------|---------------|
| Document No. | TRMF-XX0S001F |
| Revise Date | 2023/03/13 |
| page number | 1/14 |

1. Scope :

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

2. Construction :



3. Type Designation :

| | | | | |
|--------------------------------------|------------------|-----------------|-----------------|--------------------|
| <u>RMF</u> | <u>10</u> | <u>J</u> | <u>T</u> | <u>103</u> |
| Product Code | Size | Tolerance | Packaging | Nominal Resistance |
| RMF : Automotive Grade Chip Resistor | Power Rating | | | Resistance |

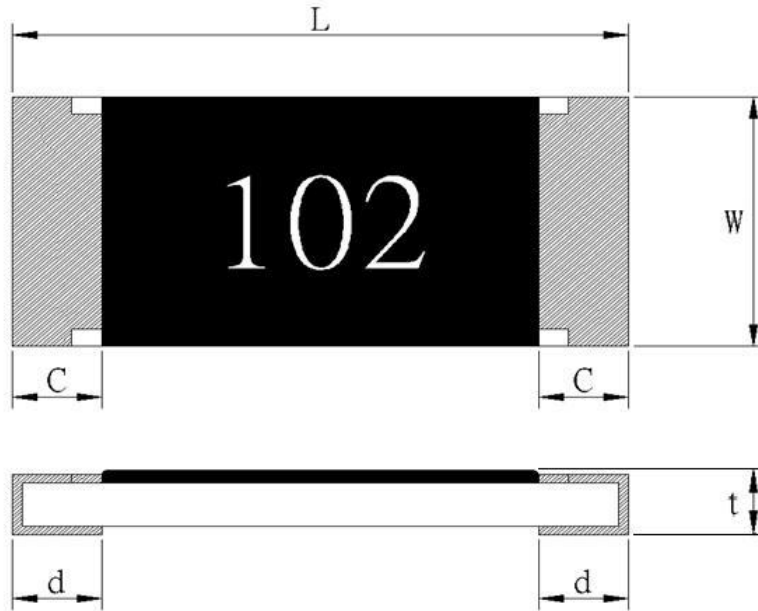
| | | | |
|--|--|-----------------------------------|--|
| 02-0201(0603) 1/20W 04-0402(1005) 1/16W 06-0603(1608) 1/10W 10-0805(2012) 1/8W 12-1206(3216) 1/4W 13-1210(3226) 1/2W 20-2010(5025) 3/4W 25-2512(6432) 1 W | J : ±5% G : ±2% F : ±1% D : ±0.5% | T- Paper Tape E- Embossed Tape | 3 digits, e.g.,: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



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4. Dimensions :



UNIT: mm

| Type | L | W | C | d | t |
|-------|---------------------------------------|-----------|-----------|--------------------------------------|-----------|
| RMF02 | 0.60±0.03 | 0.30±0.03 | 0.10±0.05 | 0.15±0.05 | 0.23±0.03 |
| RMF04 | 1.00 ^{+0.1} _{-0.05} | 0.50±0.05 | 0.20±0.10 | 0.25±0.10 | 0.32±0.05 |
| RMF06 | 1.60±0.10 | 0.80±0.10 | 0.30±0.20 | 0.30 ^{+0.2} _{-0.1} | 0.45±0.10 |
| RMF10 | 2.00±0.10 | 1.25±0.10 | 0.40±0.20 | 0.40±0.20 | 0.50±0.10 |
| RMF12 | 3.10±0.10 | 1.55±0.10 | 0.50±0.30 | 0.40±0.20 | 0.55±0.10 |
| RMF13 | 3.10±0.10 | 2.55±0.10 | 0.50±0.30 | 0.40±0.20 | 0.60±0.10 |
| RMF20 | 5.00±0.15 | 2.50±0.15 | 0.60±0.30 | 0.50±0.25 | 0.60±0.10 |
| RMF25 | 6.30±0.20 | 3.20±0.20 | 0.60±0.30 | 0.50±0.25 | 0.60±0.10 |



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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) | | | |
|-------|----------------------|----------------|----------------------|-------------------------|----------------|-----------------------|--------------------------|--------------------------|--------------------------|
| | | | | | | D(±0.5%) E-96&E-24 | F(±1%) E-96&E-24 | G(±2%) E-24 | J(±5%) E-24 |
| RMF02 | 1/20W | Refer 5.2 | 25V | 50V | ±200 | 100Ω-10KΩ | 10Ω-3MΩ | 10Ω-3MΩ | 10Ω-10MΩ |
| | | | | | +600 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |
| RMF04 | 1/16W | Refer 5.2 | 50V | 100V | ±100 | 100Ω~1MΩ | 100Ω~1MΩ | 100Ω~1MΩ | 100Ω~1MΩ |
| | | | | | ±200 | 10Ω≤R<100Ω | 10Ω≤R<100Ω 1MΩ<R≤10MΩ | 10Ω≤R<100Ω 1MΩ<R≤20MΩ | 10Ω≤R<100Ω 1MΩ<R≤20MΩ |
| | | | | | +400 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |
| RMF06 | 1/10W | Refer 5.2 | 75V | 150V | ±100 | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ |
| | | | | | ±200 | | 1M<R≤10MΩ | 1M<R≤10MΩ | 1M<R≤20MΩ |
| | | | | | +400 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |
| RMF10 | 1/8W | Refer 5.2 | 150V | 300V | ±100 | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ |
| | | | | | ±200 | | 1M<R≤10MΩ | 1M<R≤10MΩ | 1M<R≤20MΩ |
| | | | | | +400 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |
| RMF12 | 1/4W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ |
| | | | | | ±200 | | 1M<R≤10MΩ | 1M<R≤10MΩ | 1M<R≤20MΩ |
| | | | | | +400 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |
| RMF13 | 1/2W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ |
| | | | | | ±200 | | 1M<R≤10MΩ | 1M<R≤10MΩ | 1M<R≤20MΩ |
| | | | | | +400 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |
| RMF20 | 3/4W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ |
| | | | | | ±200 | | 1M<R≤10MΩ | 1M<R≤10MΩ | 1M<R≤20MΩ |
| | | | | | +400 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |
| RMF25 | 1W | Refer 5.2 | 200V | 400V | ±100 | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ | 10Ω-1MΩ |
| | | | | | ±200 | | 1M<R≤10MΩ | 1M<R≤10MΩ | 1M<R≤20MΩ |
| | | | | | +400 -200 | | 1Ω≤R<10Ω | 1Ω≤R<10Ω | 1Ω≤R<10Ω |

Ω THICK FILM CHIP RESISTORS

| Type | Rated Current | Max Overload Current | Resistance Range |
|-------|---------------|----------------------|------------------|
| RMF02 | 0.5A | 1A | 50mΩ MAX |
| RMF04 | 1A | 2.5A | 50mΩ MAX |
| RMF06 | 1A | 2.5A | 50mΩ MAX |
| RMF10 | 2A | 5A | 50mΩ MAX |
| RMF12 | 2A | 5A | 50mΩ MAX |
| RMF13 | 2A | 5A | 50mΩ MAX |
| RMF20 | 2A | 5A | 50mΩ MAX |
| RMF25 | 2A | 5A | 50mΩ MAX |

Operating Temp(°C): -55°C ~ +155°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.

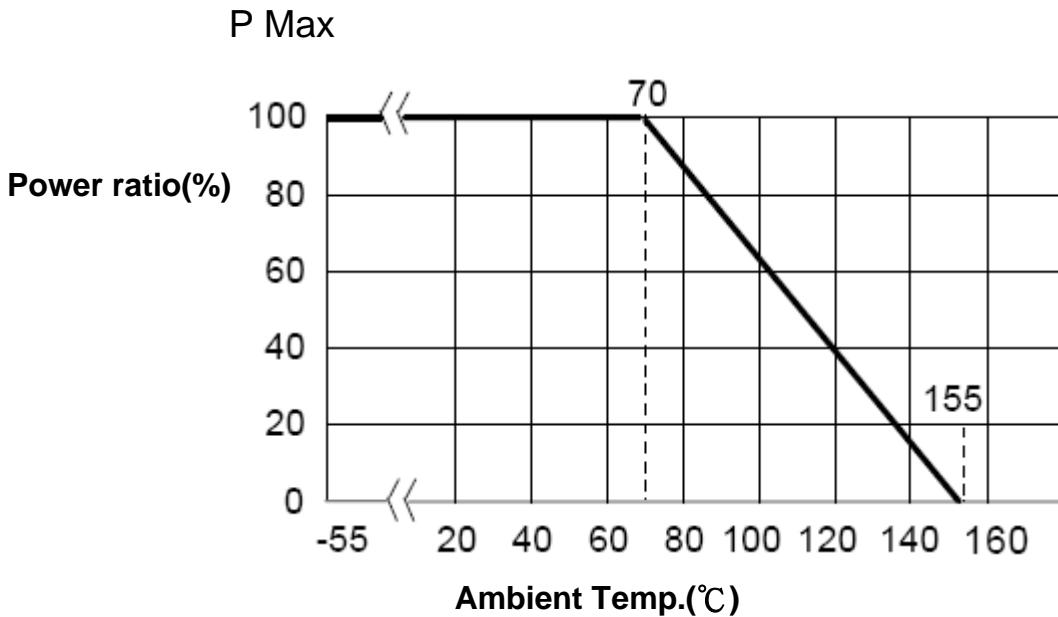


Figure 1

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 RMF06JT102 the rated voltage ?

RMF06JT102 P:1/10W ; R:102 = 1K Ω = 1000 Ω

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



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6. Reliability Tests:

| Test Items | Reference standard | Condition of Test | Test Limits ΔR |
|---------------------------------------|--|--|---|
| Temperature Coefficient of Resistance | IEC 60115-1 4.8 | -At +25/-55 °C and +25/+125 °C | Refer 5.0 |
| Short Time Overload | IEC60115-1 4.13 | 2.5 X rated voltage for 5 sec | $\pm(1\% + 0.05\Omega)$ Remarks : 0201 : $\pm(3\% + 0.1\Omega)$ 0 Ω : 50m Ω or less |
| High Temperature Exposure (Storage) | AEC-Q200-REV D-Test 3 MIL-STD-202 Method 108 | 1000 hrs. @ T=125°C. Unpowered. Measurement at 24 \pm 2 hours after test conclusion. | 0.5%,1%: $\pm(1.0\%+0.05\Omega)$ 2%,5%: $\pm(2.0\%+0.1\Omega)$ 0201 : $\pm(3\% + 0.1\Omega)$ 0 Ω : 50m Ω or less |
| Temperature Cycling | AEC-Q200-REV D-Test 4 JESD22 Method JA-104 | 1000 Cycles (-55°C to+125°C) Measurement at 24 \pm 4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. 1 min. maximum transition time. | $\pm(1\% + 0.1\Omega)$ 0201 : $\pm(2\% + 0.1\Omega)$ 0 Ω : 50m Ω or less |
| Moisture Resistance | AEC-Q200-REV D-Test 6 MIL-STD-202 Method 106 | T=24 hours / Cycle, 10 Cycles. Notes: Steps 7a & 7b not required. Unpowered . | 0.5%,1%: $\pm(1.0\%+0.05\Omega)$ 2%,5%: $\pm(2.0\%+0.1\Omega)$ 0201 : $\pm(3\% + 0.1\Omega)$ 0 Ω : 50m Ω or less |
| Biased Humidity | AEC-Q200-REV D-Test 7 MIL-STD-202 Method 103 | 1000 hours 85°C/85%RH. Note: Specified conditions: 10% of operating power(not exceeding max working voltage). Measurement at 24 \pm 2 hours after test conclusion. | $\pm(3\% + 0.1\Omega)$ 0201 : $\pm(5\% + 0.1\Omega)$ 0 Ω : 100m Ω or less |
| Operational Life | AEC-Q200-REV D-Test 8 MIL-STD-202 Method 108 | 1000 hours TA=125°C at 35% rated power. Measurement at 24 \pm 4 hours after test conclusion. | 0.5%,1%: $\pm(1\% + 0.1\Omega)$ 2%,5% : $\pm(3\% + 0.1\Omega)$ 0201 : $\pm(5\% + 0.1\Omega)$ 0 Ω : 100m Ω or less |
| External Visual | AEC-Q200-REV D-Test 9 MIL-STD-883 Method 2009 | Electrical test not required. Inspect device construction, marking and workmanship. | |
| Physical Dimension | AEC-Q200-REV D-Test 10 JESD22 Method JB-100 | Verify physical dimensions to the applicable device detail specification. Note: User(s) and Suppliers spec. Electrical test not required. | |
| Resistance to Solvents | AEC-Q200-REV D-Test 12 MIL-STD-202 Method 215 | a:Isopropyl Alcohol : Mineral Spirits= 1 : 3 b:Terpene Defluxer (Bioact EC-7R) c:Deionized water : Propylene Glycol Monomethyl Ether : monoethanolamine = 42 : 1 : 1 | Marking and protective layer can not be detached |
| Mechanical Shock | AEC-Q200-REV D-Test 13 MIL-STD-202 Method 213 | Wave Form : Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration(D) is 6(ms) | $\pm(1\% + 0.1\Omega)$ 0 Ω : 50m Ω or less |
| Vibration | AEC-Q200-REV D-Test 14 MIL-STD-202 Method 204 | 5 g's for 20 min., 12 cycles each of 3 orientations. Note: Test from 10-2000 Hz. | $\pm(1\% + 0.1\Omega)$ 0 Ω : 50m Ω or less |
| Resistance to Soldering Heat | AEC-Q200-REV D-Test 15 MIL-STD-202 Method 210 | Condition B : Immerse the specimens in and eutectic solder at 260 \pm 5°C for 10 \pm 1S . | 0.5%,1% : $\pm(0.5\% + 0.05\Omega)$ 2%,5% : $\pm(1\% + 0.1\Omega)$ 0201 : $\pm(2\% + 0.1\Omega)$ 0 Ω : 50m Ω or less |



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|----------------------------|--|--|--|
| Thermal Shock | AEC-Q200-REV D-Test 16 MIL-STD-202 Method 107 | -55°C/+155°C. Note: Number of cycles required-300, Maximum transfer time-20 seconds, Dwell time-15 minutes. Air-Air. | ±(1% + 0.1Ω) 0201 : ±(2% + 0.1Ω) 0Ω : 50mΩ or less |
| ESD | AEC-Q200-REV D-Test 17 | verify the voltage setting at 500V | ±(1% + 0.1Ω) 0201 : ±(2% + 0.1Ω) |
| Solderability | AEC-Q200-REV D-Test 18 J-STD-002 | Method B, aging 4 hours at 155 °C dry heat Lead-free solder bath at 235±3 °C Dipping time: 3±0.5 seconds | > 95% area covered with tin |
| Flammability | AEC-Q200-REV D-Test 20 UL-94 | V-0 or V-1 are acceptable. Electrical test not required. | V-0 or V-1 |
| Board Flex (Bending) | AEC-Q200-REV D-Test 21 | 3mm deflection(RMF02~RMF13) 2mm deflection(RMF20~RMF25) | 0.5%,1% : ±(0.5% + 0.05Ω) 2%,5% : ±(1% + 0.1Ω) 0201 : ±(1% + 0.1Ω) 0Ω : 50mΩ or less |
| Terminal Strength (SMD) | IEC 60115-1 4.32 | Force of 1.02kg for 10±1 seconds. Remarks : RMF02:NA ,RMF04:0.51kg | ±(0.5% + 0.05Ω) 0Ω : 50mΩ or less |
| Sulfuration Test | ASTM-B-809-95 | Sulfur(saturated vapor) 360 hours,105±2°C, unpowered | 0.5%,1%:±(1%+0.05Ω) 2%, 5%:±(2%+0.05Ω) 0Ω : 100mΩ or less |

Note* : RCWV : Rated continuous working voltage .

7. Marking

7.1 ±2% & ±5%(E24) : RMF06 / RMF10 / RMF12 / RMF13 / RMF20 / RMF25

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. :, 102 = 10×10² = 1000Ω = 1KΩ





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7.2 ±0.5% , ±1% (E96) : RMF10 / RMF12 / RMF13 / RMF20 / RMF25

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



7.3 ±0.5% , ±1% (E96): RMF06

When the marking space is too small in such small-sized resistors as RMF06, the marking can not 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 |



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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 : 01A = 100×10⁰ = 100Ω



Notes :

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

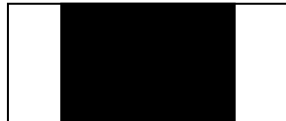
E.G. : 0603 , 120Ω , 1% Marking is 121



7.4 ±0.5% ,±1%(E96/3digitals)

The resistance value by 3 digitals is requirement for customer.

7.5 RMF02 & RMF04





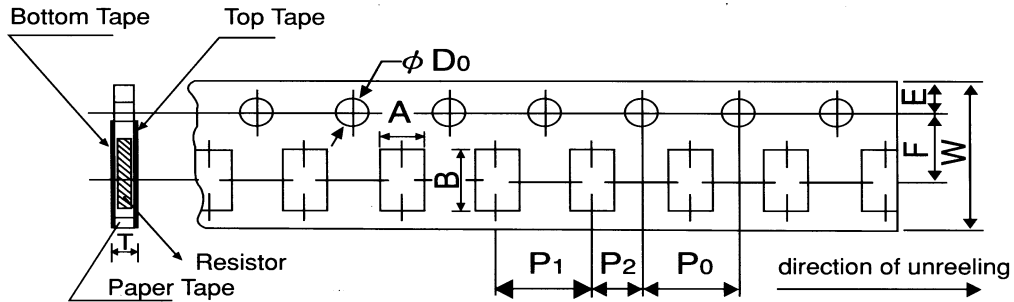
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8. Taping & Reel :

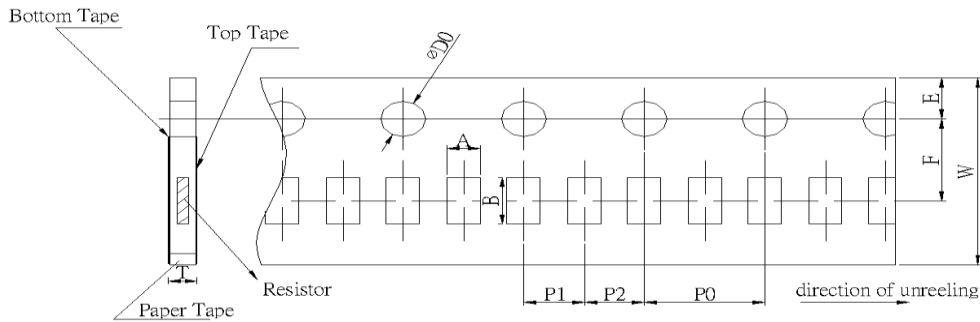
8.1 Taping Dimensions

8.1.1 4 mm pitch paper :



| Packing | Type | A | B | W | F | E | P ₁ | P ₂ | P ₀ | D ₀ | T |
|---------|-------|----------|---------|---------|----------|----------|----------------|----------------|----------------|----------------|----------|
| Paper | RMF06 | 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 | 0.64±0.1 |
| | RMF10 | 1.6±0.15 | 2.4±0.2 | | | | | | | | +0.1 |
| | RMF12 | 2.0±0.15 | 3.6±0.2 | | | | | | | | -0 |
| | RMF13 | 2.8±0.2 | 3.6±0.2 | | | | | | | | 0.84±0.1 |

8.1.2 2 mm pitch paper :



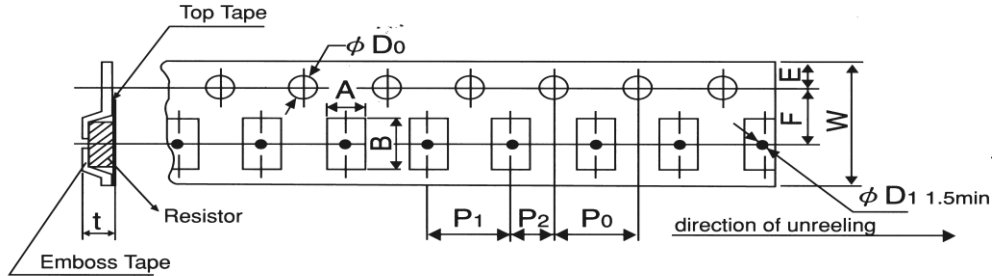
| Packing | Type | A | B | W | F | E | P ₁ | P ₂ | P ₀ | D ₀ | T |
|---------|-------|-----------|----------|---------|----------|----------|----------------|----------------|----------------|----------------|----------|
| Paper | RMF02 | 0.37±0.05 | 0.67±0.1 | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 2.0±0.05 | 2.0±0.05 | 4.0±0.1 | φ 1.5 | 0.37±0.1 |
| | RMF04 | 0.7±0.05 | 1.2±0.05 | | | | 2.0±0.1 | 2.0±0.1 | | | -0 |



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8.1.3 4 mm pitch Emboss :



UNIT: mm

| Packing | Type | A | B | W | F | E | P ₁ | P ₂ | P ₀ | D ₀ | T |
|---------|-------|---------|---------|----------|----------|----------|----------------|----------------|----------------|----------------|-----------|
| Emboss | RMF20 | 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 | 0.85±0.15 |
| | RMF25 | 3.6±0.2 | 6.9±0.2 | | | | | | | | |

UNIT: pcs

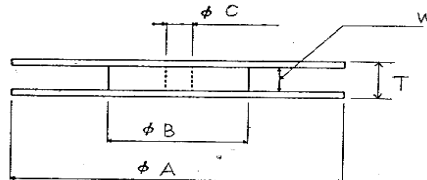
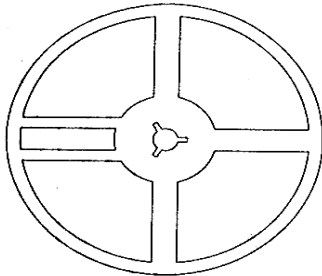
| Type | Package Size | Paper Tape | | | | Emboss Plastic Tape 4 mm pitch |
|------|--------------|------------|---------|------------|---------|-----------------------------------|
| | | 4 mm pitch | | 2 mm pitch | | |
| | | 178mm/R | 330mm/R | 178mm/R | 330mm/R | |
| RMF | 02 | | | 10000 | | |
| RMF | 04 | | | 10000 | 20000 | |
| RMF | 06 | 5000 | 10000 | | | |
| RMF | 10 | 5000 | 10000 | | | |
| RMF | 12 | 5000 | 10000 | | | |
| RMF | 13 | 5000 | | | | |
| RMF | 20 | | | | | 4000 |
| RMF | 25 | | | | | 4000 |



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8.2 Reel Specifications:

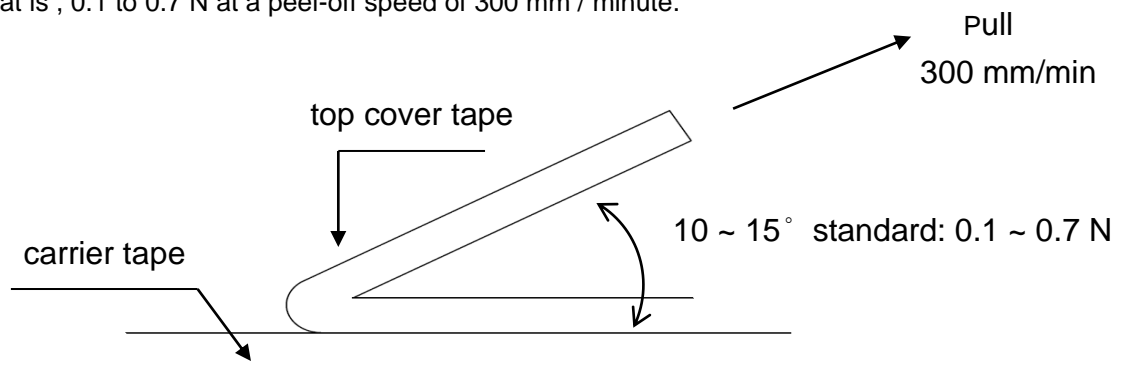


UNIT: mm

| Type | ϕA | ϕB | ϕC | W | T |
|------------------------------------|-------------|------------|------------|------------|------------|
| RMF02 / 04 / 06 RMF10 / 12 / 13 | 178.0 ± 2.0 | 60.0 ± 1.0 | 13.0 ± 1.0 | 9.0 ± 1.0 | 11.5 ± 1.0 |
| RMF20 / 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.



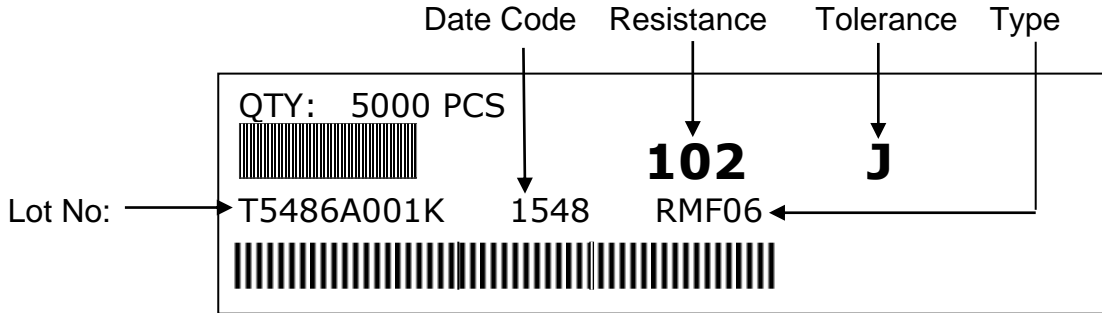


**Automotive Grade Thick Film Chip Resistors
(RMF series standard)
Halogen-Free
AEC-Q200 qualified**

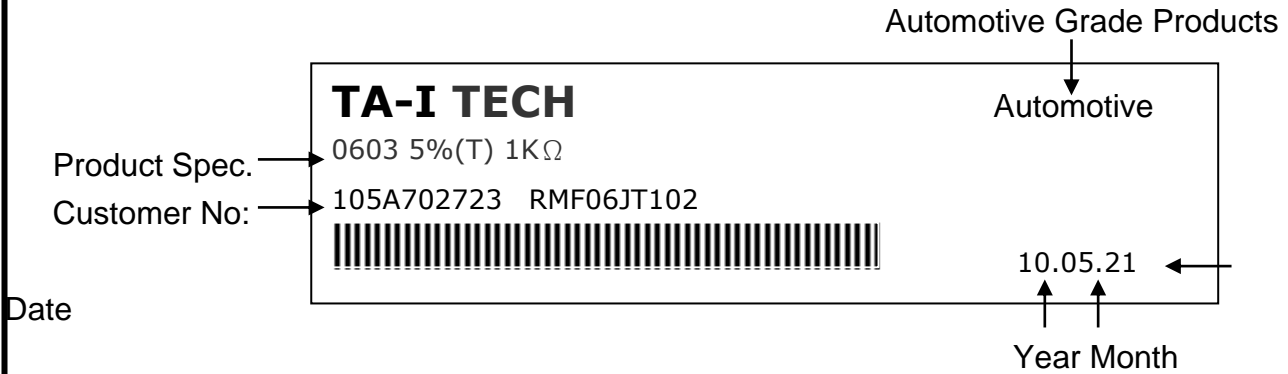
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9. Label :

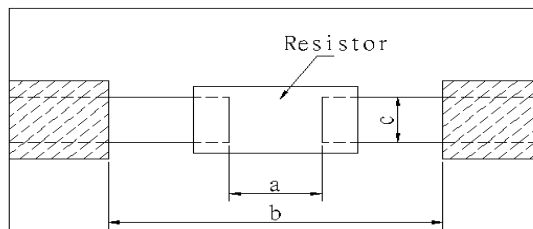
9.1 Manufacture Label :



9.2 Customer Label (By customer request):



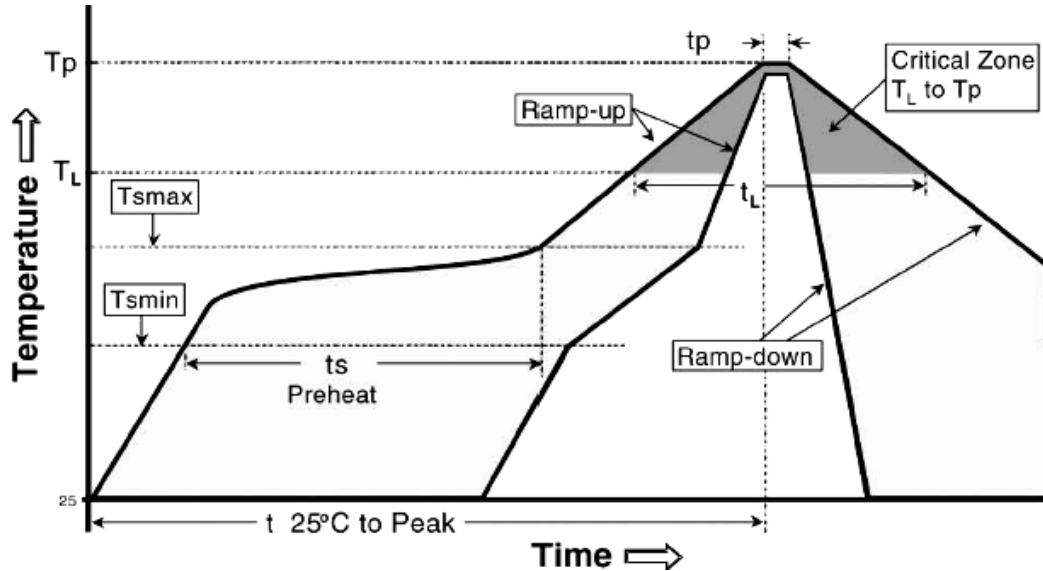
10. Recommended land patterns :



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



| Profile Feature | Lead (Pb)-Free Assembly |
|---|-----------------------------------|
| Average ramp-up rate (T _{smax} to T _p) | 3°C / second max. |
| Preheat - Temperature Min (T _{smin}) - Temperature Max (T _{smax}) - Time (T _{smin} to T _{smax}) (t _s) | 150°C 200°C 60 -120 seconds |
| Time maintained above : - Temperature (T _L) - Time (T _L) | 217°C 60-150 seconds |
| Peak Temperature (T _p) | 260°C |
| Time within $\begin{matrix} +0 \\ -5 \end{matrix}$ °C of actual Peak Temperature (t _p) ² | 10 seconds |
| Ramp-down Rate | 6°C/second max. |
| Time 25°C to Peak Temperature | 8minutes max. |

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



**Automotive Grade Thick Film Chip Resistors
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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 – Penang)
Tel :604- 3900480 Fax : 604-3901481

(5) P.T.TAI ELECTRONICS Indonesia (Indonesia – Jakarta)
Tel :62-21-89830123 Fax : 62-21-89830703

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[MCR01MZPJ125](#) [MCR01MZPJ751](#) [MCR03EZHJ103](#) [MCR03EZPFX2004](#) [MCR03EZPJ270](#) [MCR03EZPJ821](#) [MCR10EZPF1102](#)
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