



**Anti-Sulfurated Thick Film Chip Resistors  
( RMS series standard )  
Halogen-Free  
AEC-Q200 qualified**

|              |               |
|--------------|---------------|
| Document No. | TRMS-XX0S001J |
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**1. Scope :**

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

**2. Construction:**



**3. Type Designation:**

|  |                  |                 |                 |                    |
|--|------------------|-----------------|-----------------|--------------------|
| <b><u>RMS</u></b>                      | <b><u>10</u></b> | <b><u>J</u></b> | <b><u>I</u></b> | <b><u>103</u></b>  |
| Product Code                           | Size             | Tolerance       | Packaging       | Nominal Resistance |
| RMS : Anti-Sulfurated<br>Chip Resistor | Power Rating     |                 |                 |                    |

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



4. Dimensions :



UNIT: mm

| Type  | L                                     | W         | C         | d                                    | t          |
|-------|---------------------------------------|-----------|-----------|--------------------------------------|------------|
| RMS02 | 0.6 ±0.03                             | 0.3 ±0.03 | 0.1 ±0.05 | 0.15 ±0.05                           | 0.23 ±0.03 |
| RMS04 | 1.00 <sup>+0.1</sup> <sub>-0.05</sub> | 0.50±0.05 | 0.20±0.10 | 0.25±0.10                            | 0.32±0.05  |
| RMS06 | 1.60±0.10                             | 0.80±0.10 | 0.30±0.20 | 0.30 <sup>+0.2</sup> <sub>-0.1</sub> | 0.45±0.10  |
| RMS10 | 2.00±0.10                             | 1.25±0.10 | 0.40±0.20 | 0.40±0.20                            | 0.50±0.10  |
| RMS12 | 3.10±0.10                             | 1.55±0.10 | 0.50±0.30 | 0.40±0.20                            | 0.55±0.10  |
| RMS13 | 3.10±0.10                             | 2.55±0.10 | 0.50±0.30 | 0.40±0.20                            | 0.60±0.10  |
| RMS20 | 5.00±0.15                             | 2.50±0.15 | 0.60±0.30 | 0.50±0.25                            | 0.60±0.10  |
| RMS25 | 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            |
| RMS02 | 1/20W                | Refer 5.2      | 25V                  | 50V                     | ±200           | 100Ω~10KΩ           | 10Ω~3MΩ                  | 10Ω~3MΩ     | 10Ω~10MΩ               |
|       |                      |                |                      |                         | +600<br>-200   |                     | 1~9.1Ω                   | 1~9.1Ω      | 1~9.1Ω                 |
| RMS04 | 1/16W                | Refer 5.2      | 50V                  | 100V                    | ±100           | 100Ω~1MΩ            | 100Ω~1MΩ                 |             |                        |
|       |                      |                |                      |                         | ±200           | 10Ω≤R<100Ω          | 10Ω≤R<100Ω<br>1MΩ<R≤10MΩ | 10Ω~10MΩ    | 10Ω~10MΩ               |
|       |                      |                |                      |                         | +500<br>-200   |                     | 1Ω~9.1Ω                  | 1Ω~9.1Ω     | 1Ω~9.1Ω                |
|       |                      |                |                      |                         | ±400           |                     |                          |             | 10MΩ≤R≤20MΩ            |
| RMS06 | 1/10W                | Refer 5.2      | 50V                  | 100V                    | ±100           | 10Ω~1MΩ             | 10Ω~1MΩ                  |             |                        |
|       |                      |                |                      |                         | ±200           |                     | 1M<R≤10MΩ                | 10Ω~10MΩ    | 10Ω~10MΩ               |
|       |                      |                |                      |                         | ±400           |                     | 1Ω~9.1Ω                  | 1Ω~9.1Ω     | 1Ω~9.1Ω<br>10MΩ<R≤20MΩ |
| RMS10 | 1/8W                 | Refer 5.2      | 150V                 | 300V                    | ±100           | 10Ω~1MΩ             | 10Ω~1MΩ                  |             |                        |
|       |                      |                |                      |                         | ±200           |                     | 1M<R≤10MΩ                | 10Ω~10MΩ    | 10Ω~10MΩ               |
|       |                      |                |                      |                         | ±400           |                     | 1Ω~9.1Ω                  | 1Ω~9.1Ω     | 1Ω~9.1Ω<br>10MΩ<R≤20MΩ |
| RMS12 | 1/4W                 | Refer 5.2      | 200V                 | 400V                    | ±100           | 10Ω~1MΩ             | 10Ω~1MΩ                  |             |                        |
|       |                      |                |                      |                         | ±200           |                     | 1M<R≤10MΩ                | 10Ω~10MΩ    | 10Ω~10MΩ               |
|       |                      |                |                      |                         | ±400           |                     | 1Ω~9.1Ω                  | 1Ω~9.1Ω     | 1Ω~9.1Ω<br>10MΩ<R≤20MΩ |
| RMS13 | 1/3W                 | Refer 5.2      | 200V                 | 400V                    | ±100           | 10Ω~1MΩ             | 10Ω~1MΩ                  |             |                        |
|       |                      |                |                      |                         | ±200           |                     | 1M<R≤10MΩ                | 10Ω~10MΩ    | 10Ω~10MΩ               |
|       |                      |                |                      |                         | ±400           |                     | 1Ω~9.1Ω                  | 1Ω~9.1Ω     | 1Ω~9.1Ω<br>10MΩ<R≤20MΩ |
| RMS20 | 1/2W                 | Refer 5.2      | 200V                 | 400V                    | ±100           | 10Ω~1MΩ             | 10Ω~1MΩ                  |             |                        |
|       |                      |                |                      |                         | ±200           |                     | 1M<R≤10MΩ                | 10Ω~10MΩ    | 10Ω~10MΩ               |
|       |                      |                |                      |                         | ±400           |                     | 1Ω~9.1Ω                  | 1Ω~9.1Ω     | 1Ω~9.1Ω<br>10MΩ<R≤20MΩ |
| RMS25 | 1W                   | Refer 5.2      | 200V                 | 400V                    | ±100           | 10Ω~1MΩ             | 10Ω~1MΩ                  |             |                        |
|       |                      |                |                      |                         | ±200           |                     | 1M<R≤10MΩ                | 10Ω~10MΩ    | 10Ω~10MΩ               |
|       |                      |                |                      |                         | ±400           |                     | 1Ω~9.1Ω                  | 1Ω~9.1Ω     | 1Ω~9.1Ω<br>10MΩ<R≤20MΩ |

**Ω THICK FILM CHIP RESISTORS**

| Type  | Rated Current | Max Overload Current | Resistance Range |
|-------|---------------|----------------------|------------------|
| RMS02 | 0.5A          | 1A                   | 50mΩ MAX         |
| RMS04 | 1A            | 2.5A                 | 50mΩ MAX         |
| RMS06 | 1A            | 2.5A                 | 50mΩ MAX         |
| RMS10 | 2A            | 5A                   | 50mΩ MAX         |
| RMS12 | 2A            | 5A                   | 50mΩ MAX         |
| RMS13 | 2A            | 5A                   | 50mΩ MAX         |
| RMS20 | 2A            | 5A                   | 50mΩ MAX         |
| RMS25 | 2A            | 5A                   | 50mΩ MAX         |

Operating Temp(°C): -55°C ~ +155°C ( RMS02 : -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 RMS06JT102 the rated voltage ?

RMS06JT102 P:1/10W ; R:102 = 1K $\Omega$  = 1000 $\Omega$

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



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### 6. Reliability Tests:

| Test Items                            | Reference standard                               | Condition of Test  | Test Limits $\Delta R$  |
|---------------------------------------|--|--|---|
| 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  | $\pm(1\% + 0.05\Omega)$<br>Remarks :<br>0201: $\pm(3\% + 0.1\Omega)$<br>0402: $\pm(2\% + 0.1\Omega)$<br>0 $\Omega$ : 50m $\Omega$ or less   |
| High Temperature Exposure (Storage)   | AEC-Q200-REV C-Test 3<br>MIL-STD-202 Method 108  | 1000 hrs. @ T=125°C. Unpowered.<br>Measurement at 24 $\pm$ 2 hours after test conclusion.  | 0.5%,1%: $\pm(1.0\%+0.05\Omega)$<br>2%,5%: $\pm(2.0\%+0.1\Omega)$<br>0201 : $\pm(3\% + 0.1\Omega)$<br>0 $\Omega$ : 50m $\Omega$ or less     |
| Moisture Resistance                   | AEC-Q200-REV C-Test 6<br>MIL-STD-202 Method 106  | T=24 hours / Cycle ,10Cycles . Notes :<br>Steps 7a& 7b not required. Unpowered .   | 0.5%,1%: $\pm(1.0\%+0.05\Omega)$<br>2%,5%: $\pm(2.0\%+0.1\Omega)$<br>0201 : $\pm(3\% + 0.1\Omega)$<br>0 $\Omega$ : 50m $\Omega$ or less     |
| Biased Humidity                       | AEC-Q200-REV C-Test 7<br>MIL-STD-202 Method 103  | 1000 hours 85°C/85%RH. Note: Specified conditions: 10% of operating power(not exceeding max working voltage).<br>Measurement at 24 $\pm$ 2 hours after test conclusion.          | $\pm(3\% + 0.1\Omega)$<br>0201 : $\pm(5\% + 0.1\Omega)$<br>0 $\Omega$ : 100m $\Omega$ or less   |
| Operational Life                      | AEC-Q200-REV C-Test 8<br>MIL-STD-202 Method 108  | 1000 hours TA=70°C at rated power.<br>Measurement at 24 $\pm$ 2 hours after test conclusion.   | 0.5%,1%: $\pm(1\% + 0.1\Omega)$<br>2%.5% : $\pm(3\% + 0.1\Omega)$<br>0201 : $\pm(5\% + 0.1\Omega)$<br>0 $\Omega$ : 100m $\Omega$ or less    |
| External Visual                       | AEC-Q200-REV C-Test 9<br>MIL-STD-883 Method 2009 | Electrical test not required.<br>Inspect device construction, marking and workmanship.   |   |
| Physical Dimension                    | AEC-Q200-REV C-Test 10<br>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 C-Test 12<br>MIL-STD-202 Method 215 | a:Isopropyl Alcohol : Mineral Spirits= 1 : 3<br>b:Terpene Defluxer (Bioact EC-7R)<br>c:Deionized water : Propylene Glycol<br>Monomethyl Ether : monoethanolamine =<br>42 : 1 : 1 | Marking and protective layer can not be detached  |
| Mechanical Shock                      | AEC-Q200-REV C-Test 13<br>MIL-STD-202 Method 213 | Wave Form : Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration(D) is 6(ms)   | $\pm(1\% + 0.1\Omega)$<br>0 $\Omega$ : 50m $\Omega$ or less   |
| Vibration                             | AEC-Q200-REV C-Test 14<br>MIL-STD-202 Method 204 | 5 g's for 20 min., 12 cycles each of 3 orientations. Note: Test from 10-2000 Hz.   | $\pm(1\% + 0.1\Omega)$<br>0 $\Omega$ : 50m $\Omega$ or less   |
| Resistance to Soldering Heat          | AEC-Q200-REV C-Test 15<br>MIL-STD-202 Method 210 | Condition B :<br>Immerse the specimens in and eutectic solder at 260 $\pm$ 5°C for 10 $\pm$ 1S .   | 0.5%,1% : $\pm(0.5\% + 0.05\Omega)$<br>2%.5% : $\pm(1\% + 0.1\Omega)$<br>0201 : $\pm(2\% + 0.1\Omega)$<br>0 $\Omega$ : 50m $\Omega$ or less |
| Thermal Shock                         | AEC-Q200-REV C-Test 16<br>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.   | $\pm(1\% + 0.1\Omega)$<br>0201 : $\pm(2\% + 0.1\Omega)$<br>0 $\Omega$ : 50m $\Omega$ or less  |



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|                         |                                     |  |  |
|-------------------------|-------------------------------------|--|--|
| ESD                     | AEC-Q200-REV C-Test 17              | verify the voltage setting at 500V   | ±(1% + 0.1 Ω )<br>0201 : ±(2% + 0.1 Ω )  |
| Solderability           | AEC-Q200-REV C-Test 18<br>J-STD-002 | Method B, aging 4 hours at 155 °C dry heat<br>Lead-free solder bath at 245±3 °C<br>Dipping time: 3±0.5 seconds | > 95% area covered with tin  |
| Flammability            | AEC-Q200-REV C-Test 17<br>UL-94     | V-0 or V-1 are acceptable. Electrical test not required.   | V-0 or V-1   |
| Board Flex ( Bending )  | AEC-Q200-REV C-Test 21              | 3mm deflection(RMS02~RMS13)<br>2mm deflection(RMS20~RMS25)   | 0.5%,1% : ±(0.5% + 0.05 Ω )<br>2%.5% : ±(1% + 0.1 Ω )<br>0201 : ±(1% + 0.1 Ω )<br>0 Ω : 50mΩ or less                           |
| Terminal Strength (SMD) | IEC 60115-1 4.32                    | Force of 1.02kg for 10±1 seconds.<br>Remarks :<br>RMS04:0.51kg<br>Remarks : 0201-NA                            | ±(0.5% + 0.05 Ω )<br>0 Ω : 50mΩ or less  |
| Sulfuration Test        | ASTM-B-809-95                       | Sulfur(saturated vapor)<br>1,000 hours,105±2°C,<br>unpowered   | 0.5%,1%:±(1%+0.05 Ω )<br>2%, 5%:±(2%+0.05 Ω )<br>0201:<br>0.5%,1%:±(2%+0.05 Ω )<br>2%, 5%:±(3%+0.05 Ω )<br>0 Ω : 100mΩ or less |

Note\* : RCWV : Rated continuous working voltage .

## 7. Marking

### 7.1 ±2% & ±5%(E24) : RMS06 / RMS10 / RMS12 / RMS13 / RMS20 / RMS25

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. :  $\overline{102} = 10 \times 10^2 = 1000 \Omega = 1K \Omega$



### 7.2 ±0.5% , ±1% (E96) : RMS10 / RMS12 / RMS13 / RMS20 / RMS25

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





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**7.3 ±0.5% , ±1% ( E96): RMS06**

When the marking space is too small in such small-sized resistors as RMS06, 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 |

**Symbol for multipliers**

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

E.G :  $\overline{01}A = 100 \times 10^0 = 100\Omega$



**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  $\underline{121}$





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**7.4  $\pm 0.5\%$  ,  $\pm 1\%$  ( E96/3digitals ) :**

The resistance value by 3 digits is requirement for customer.

**7.5 RMS04 :**



**7.6 RMS02 :**

**NO Marking**

**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   | RMS06 | 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        | $\phi 1.5$     | 0.64±0.1 |
|         | RMS10 | 1.6±0.15 | 2.4±0.2 |         |          |          |                |                |                |                | 0.84±0.1 |
|         | RMS12 | 2.0±0.15 | 3.6±0.2 |         |          |          |                |                |                |                | 0.84±0.1 |
|         | RMS13 | 2.8±0.2  | 3.6±0.2 |         |          |          |                |                |                |                | 0.84±0.1 |





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**8.1.2 2 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   | RMS02 | 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          | 0.37±0.1 |
|         | RMS04 | 0.7±0.05  | 1.2±0.05 |         |          |          | 2.0±0.1        | 2.0±0.1        |                |                | 0.45±0.1 |
|         | RMS06 | 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 <sub>1</sub> | P <sub>2</sub> | P <sub>0</sub> | D <sub>0</sub> | T         |
|---------|-------|---------|---------|----------|----------|----------|----------------|----------------|----------------|----------------|-----------|
| Emboss  | RMS20 | 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 |
|         | RMS25 | 3.6±0.2 | 6.9±0.2 |          |          |          |                |                |                |                |           |

| Package<br>Type Size |    | Paper Tape |         |            |         | Emboss Plastic Tape<br>4 mm pitch |
|----------------------|----|------------|---------|------------|---------|-----------------------------------|
|                      |    | 4 mm pitch |         | 2 mm pitch |         |                                   |
|                      |    | 178mm/R    | 250mm/R | 178mm/R    | 250mm/R |                                   |
| RMS                  | 02 |            |         | 10000      |         |                                   |
| RMS                  | 04 |            |         | 10000      | 20000   |                                   |
| RMS                  | 06 | 5000       | 10000   | 10000      | 20000   |                                   |
| RMS                  | 10 | 5000       | 10000   |            |         |                                   |
| RMS                  | 12 | 5000       | 10000   |            |         |                                   |
| RMS                  | 13 | 5000       |         |            |         |                                   |
| RMS                  | 20 |            |         |            |         | 4000                              |
| RMS                  | 25 |            |         |            |         | 4000                              |



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**8.2 Reel Specifications:**



UNIT: mm

| Type                            | $\phi A$        | $\phi B$       | $\phi C$       | W              | T              |
|---------------------------------|-----------------|----------------|----------------|----------------|----------------|
| RMS02 /04 / 06<br>RMS10 /12 /13 | $178.0 \pm 2.0$ | $60.0 \pm 1.0$ | $13.0 \pm 1.0$ | $9.0 \pm 1.0$  | $11.5 \pm 1.0$ |
| RMS20 / 25                      |                 |                |                | $13.0 \pm 1.0$ | $15.5 \pm 1.0$ |

**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.





**Anti-Sulfurated Thick Film Chip Resistors  
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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       |
| RMS          | 02 (0201) | 0.25~0.3         | 0.7~0.9 | 0.3~0.4 |
| RMS          | 04 (0402) | 0.50~0.6         | 1.4~1.6 | 0.4~0.6 |
| RMS          | 06 (0603) | 0.7~0.9          | 2.0~2.2 | 0.8~1.0 |
| RMS          | 10 (0805) | 1.0~1.4          | 3.2~3.8 | 0.9~1.4 |
| RMS          | 12 (1206) | 2.0~2.4          | 4.4~5.0 | 1.2~1.8 |
| RMS          | 13 (1210) | 2.0~2.4          | 4.4~5.0 | 2.3~3.5 |
| RMS          | 20 (2010) | 3.3~3.7          | 5.7~6.5 | 2.3~3.5 |
| RMS          | 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<br>(T <sub>smax</sub> to T <sub>p</sub> )   | 3°C / second max.                 |
| Preheat<br>- Temperature Min (T <sub>smin</sub> )<br>- Temperature Max (T <sub>smax</sub> )<br>- Time (T <sub>smin</sub> to T <sub>smax</sub> ) (ts) | 150°C<br>200°C<br>60 -150 seconds |
| Time maintained above :<br>- Temperature (T <sub>L</sub> )<br>- Time (t <sub>L</sub> )   | 217°C<br>60-120 seconds           |
| Peak Temperature (T <sub>p</sub> )   | 260°C                             |
| Time within $\begin{matrix} +0 \\ -5 \end{matrix}$ °C of actual Peak<br>Temperature (t <sub>p</sub> ) <sup>2</sup>                                   | 10 seconds                        |
| Ramp-down Rate   | 6°C/second max.                   |
| Time 25°C to Peak Temperature  | 8mimutes max.                     |

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



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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

TA-I TECHNOLOGY ( SU ZHOU ) CO., LTD. ( China – Su Zhou )  
Tel : 86- 512-63457879 Fax : 86-512-63457869

**Associated companies :**

(1) FORTUNE TASK RESISTOR FACTORY ( China – Dongguan )  
Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

(2) TA-I TECHNOLOGY ELECTRONIC (DONG GUAN) CO.,LTD ( China –Dongguan )  
Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

(3) TAI OHM ELECTRONICS ( M ) SDN. BHD. ( Malaysia –Penang )  
Tel : 604- 3900480 Fax : 604-3901481

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

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