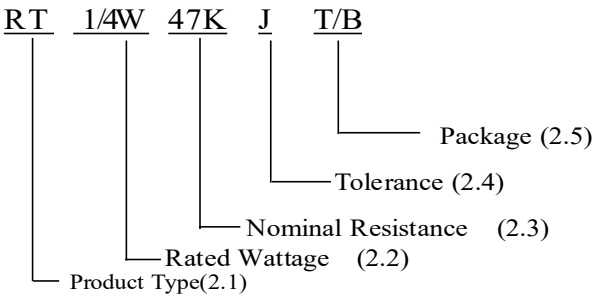
| ALTERNATION HISTORY RECORDS变更记录 | | | | | | |
|---|---|---|---|---|---|---|
| Date | Version | Mark | Page | Description | Drafter | Approver |
| 2025-12-15 | B | / | / | Revised edition release | Doris Chang | / |

## 1.Applicable Scope:

This standard specification is for use in consumer electronics, computers, telecommunications, control instruments...etc.

## 2.Part Number System:

It is composed by Type, Rated Wattage,Nominal Resistance, Tolerance and Package/Terminal Form. e.g.




2.1 Product Type

| Code | RT |
|---|---|
| Product Type | Metal Glaze High Voltage Resistors |

2.2 Rated Wattage code

| Code | 1/6W | 1/4W | 1/4WS | 1/2W | 1/2WS | 1W | 1WS | 2W | 2WS | 3WS |
|---|---|---|---|---|---|---|---|---|---|---|
| Rated Power (W) | 1/6W | 1/4W | 1/4W | 1/2W | 1/2W | 1W | 1W | 2W | 2W | 3W |

2.3 Nominal Resistance

| Code | 47K | 100K | 1M |
|---|---|---|---|
| Resistance | 47KΩ | 100KΩ | 1MΩ |

Remark:Ω is its unit which be in accordance with JIS-C6409 article 6 (EIARS-196A) series.

2.4 Resistance tolerance

| Code | F | J |
|---|---|---|
| Tolerance Range | ±1% | ±5% |

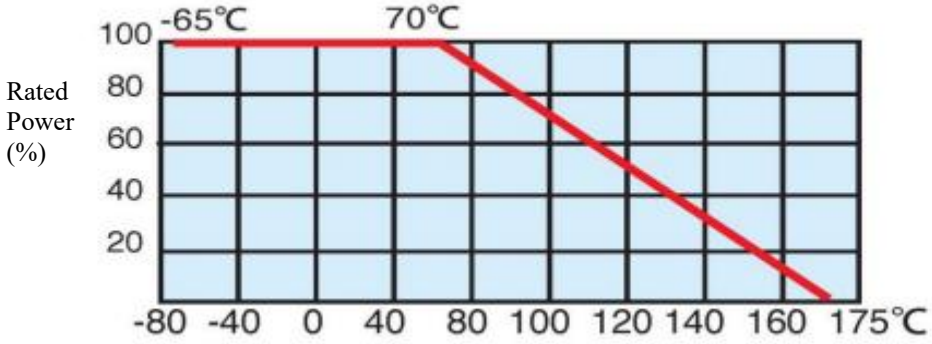
2.5 Package

| Code | T/B | NIL | T26 | T76 |
|---|---|---|---|---|
| packaging method | Tape in box | Bulk | 26 mm width special tape in box | 76 mm width special tape in box |

Remark: RT Series Resistors are RoHS & Halogen Free Compliant.

## 3. Rated Power:

Rated power is the value of Max load power specified at the ambient temperature of70℃, and shall meet the functions of electrical and mechanical performance. When the ambient temperature surpasses above mentioned temperature, the value declines as per following DERATING CURVE




3.1 Rated Voltage:

It is calculated through the following formula:

$$E = \sqrt{PxR}$$

Where E: rated voltage (V)

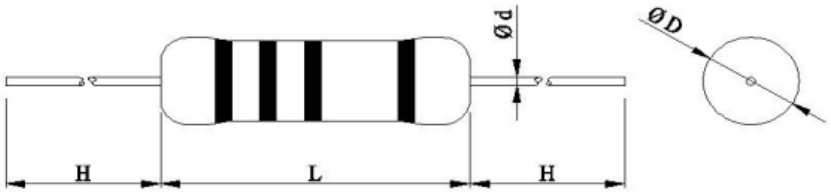
P: rated power (W)

R: total nominal resistance (Ω)

Remark: However, in case the voltage calculated exceeds the maximum load voltage, such the maximum load voltage shall be regarded as its rated voltage, means whichever less.

## 4.Dimension and Structure:

4.1 Dimension:




Unit: mm

| TYPE | D ± 1 | L ± 1 | H ± 3 | d ± 0.1 | Resistance Range | Max, Permissible Voltage | |
|---|---|---|---|---|---|---|---|
| | | | | | | DC | RMS |
| RT 1/6W, 1/4WS | 1.8± 0.2 | 3.3± 0.3 | 28 | 0.45 | 47KΩ ~ 33MΩ | 500V | 350V |
| RT 1/4W, 1/2WS | 2.4± 0.5 | 6.4 | 28 | 0.6 | 47KΩ ~ 33MΩ | 1600V | 1150V |
| RT 1/2W, 1WS | 3.5 | 9 | 28 | 0.65 | 47KΩ ~ 33MΩ | 3500V | 2500V |
| RT 1W, 2WS | 4.5 | 11 | 28 | 0.8 | 47KΩ ~ 33MΩ | 5000V | 3500V |
| RT 2W, 3WS | 5 | 15 | 28 | 0.8 | 47KΩ ~ 33MΩ | 10000V | 7000V |

◎ Note: 1. Too low or too high ohmic values can be supplied only case by case.

4.2 Structure:

4.2.1 Ceramic Rod:
It is made of Forsterite imported.

4.2.2 Terminal:
Terminal is to be firmly connected with resistors element, both electrically and mechanically, and allow easy soldering.

4.2.3 Coating:
Coating is done by light blue flameproof paint for 1W, 2WS, 2W, 3WS type
and light green epoxy paint for 1/6W, 1/4WS, 1/4W, 1/2WS, 1/2W, 1WS type
which is solid enough to be free from looseness, crack and easy breakage. It is also resistant to cleaning and industrial solvents, and the paint shall be
limited within 2mm of lead wires from resistor body.

4.2.4 Marking:
Marking is made on resistors surface, by color coding.

## 5 .Operating Temperature Range: -65℃~175℃

## 6. Storage Conditions:

The resistors with appropriate package would have a preservative duration of 1 year, under the following conditions.

T=5℃ ~ 35℃

H=40% ~ 75%

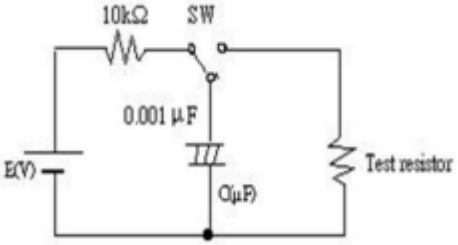
## 7. Test And Requirements:

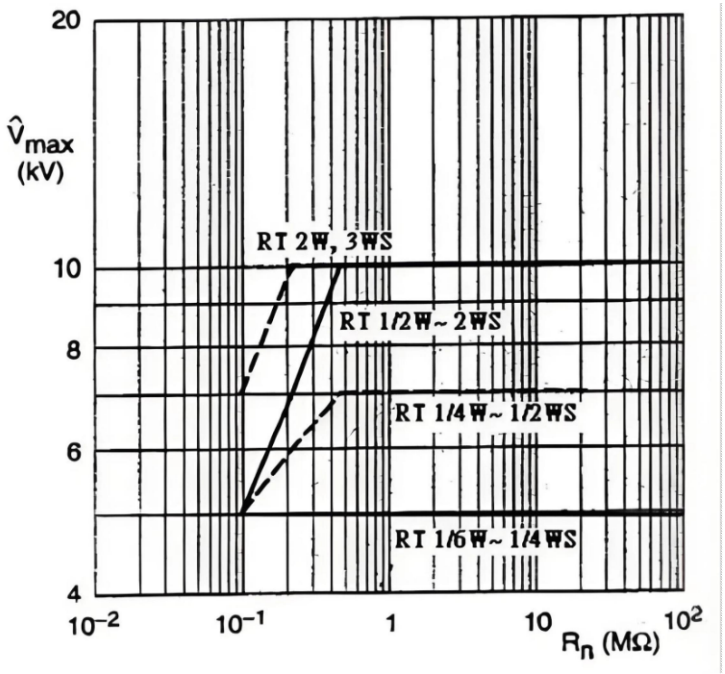
<table>
<tr><th colspan="2">Test</th><th>Test Method</th><th>Condition</th><th>Criteria</th></tr>
<tr><td rowspan="2">Mechanical Performance</td><td>Terminal tensile</td><td rowspan="2">IEC 60115-14.16</td><td>To fix the resistor body, a static load of 2.5kg(under 1/2W:1kg.). is to be gradually applied into the terminal for 10 seconds</td><td>Without causing any looseness and fall.</td></tr>
<tr><td>Twist withstand</td><td>To bend the lead wire at the point of about 6mm from resistor body to 90°, then catch the wire at 1.2 ±0.4mm apart from the bent point end and turn it (clockwise) by 360 degrees perpendicular to the resistor axis at speed of 5 seconds per turn, and do the same counterclockwise again which constitute a whole turn. Repeat the turn 2 times</td><td>Without causing any break and looseness.</td></tr>
<tr><td colspan="2">Resistance Temperature Coefficient:</td><td>IEC 60115-1 4.8</td><td>T.C (ppm/℃) =〔(R2－R1) ÷R1〕 ×〔1÷(T2－T1)〕×10$^6$<br>where<br>R1: resistance value at reference temperature<br>R2: resistance value at test temp.<br>T1: reference temp.<br>T2: test temp.</td><td>It shall be within ±200ppm/℃ .</td></tr>
<tr><td colspan="2">Temperature Cycle</td><td>IEC 60115-1 4.19</td><td>Following temp. cycles are to be made 5 times and then put at room temp. for one hour
<table>
<tr><th>Steps</th><th>Temperature (℃)</th><th>Time (minutes)</th></tr>
<tr><td>1st step</td><td>-65 ± 3</td><td>30</td></tr>
<tr><td>2nd step</td><td>Room temp.</td><td>3</td></tr>
<tr><td>3rd step</td><td>175 ± 3</td><td>30</td></tr>
<tr><td>4th step</td><td>Room temp.</td><td>3</td></tr>
</table></td><td>The resistance value change rate between pre-and-post test shall be within ±0.5%</td></tr>
<tr><td colspan="2">Voltage Withstanding</td><td>IEC 60115-1 4.7</td><td>Resistors are located in a V-shaped metal trough. Applying AC 350V for one minute</td><td>The resistance should find no physical damage to the resistors, such as arc, char...etc.</td></tr>
</table>

| Test | Test Method | Condition | Criteria |
|---|---|---|---|
| Short Time Over Load | IEC 60115-14.13 | When the resistors are applied 2.5 times as much as rated voltage for 5 seconds continuously, it shows no evidence of arc, flame...etc. Removing the voltage and place the resistors to the normal condition for 30 minutes, | The resistance value change rate between pre-and-post test shall be within ±1% . |
| Insulation Character | IEC 60115-1 4.6 | Resistors are located in a V-shaped metal trough. Using the DC 100V megger instrument 2 poles to clutch either side of lead wires and metal trough | Measuring the Insulation Resistance which shall be over 1000MΩ |
| Load Life | IEC 60115-14.25 | The resistors arrayed are sent into the 70℃ oven, applying rated voltage at the cycle of 1.5 hours ON, 0.5 hour OFF for 1000+48 -0 hours in total. Then, after removing the voltage, take the resistors out of the oven and left under normal temp. for one hour cooling. | The resistance value change rate between pre-and-post test shall be within ±3%. |
| Moisture-proof Load Life | IEC 60115-14.24 | The resistors arrayed are placed into a constant temp./humidity oven at the temp. of 40±2℃ and the humidity of 90～95%, then rated power is applied for 1.5 hours and cut off for 0.5 hour. The similar cycle will be repeated for $500^{+24}_{-0}$ hours in total (including cut-off time). Then remove the voltage, taking the resistors out of the oven and leaving them at room temp. for one hour. | The resistance value change rate between pre-and-post test shall be within ±3%. There also shall be no evidence of remarkable change on appearance, and the marking shall not be illegible. |
| Solder-ability | IEC 60115-1 4.17 | The leads with flux are dipped in a melted solder of 235 ±5℃ for 2 seconds, | more than 95% of the circumference of the lead wires shall be covered with solder. |
| Resistance to Soldering Heat | IEC 60115-1 4.18 | Two leads are together dipped in a melted solder of 270±5℃ for 10±1 seconds, or 350±10℃ for 3.5 ±0.5 seconds, Then remove the resistors and leaving them at room temp. for one hour. | The resistance value change rate between pre-and-post test shall be within ±1%. |
| Nonflammability | JIS - C 5201-4.26 | The resistors are applied the power of 16 times the rated wattage for 5 min.<br>(only for 1W, 2WS,2W, 3WS) | The resistance shall not get flame. |

## 8. Pulse Loading Capability:

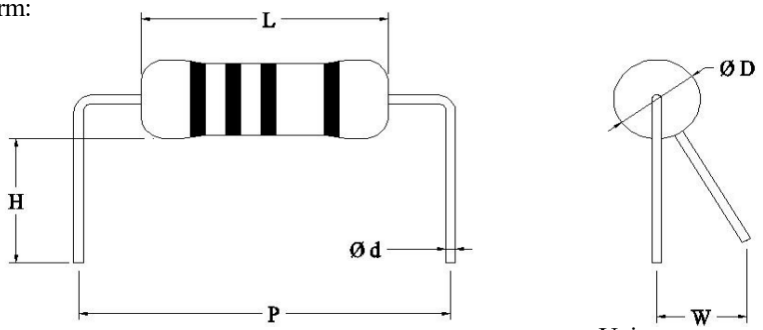
In accordance with IEC 60065 chapter 14.2a; 50 discharges from a 1 nF capacitor charged to Vmax;12 discharges/minute(drift △R/R≤2%)



## 9. Others:

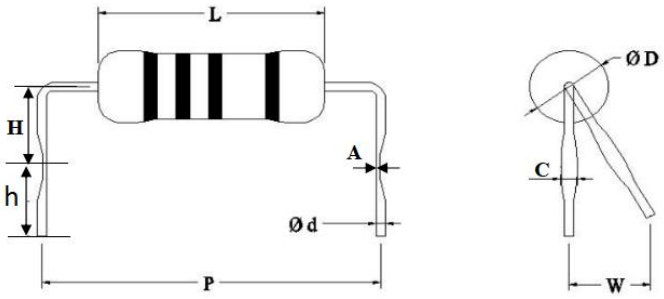
9.1 M Form:




Unit: mm

| Wattage | L±1 | D±1 | P | H±0.5 |
|---|---|---|---|---|
| 1/6W 、1/4WS | 3.3±0.3 | 1.8±0.2 | 5±0.5 | 3.5 |
| 1/4W 、1/2WS | 6.4 | 2.4±0.5 | 10±1 | 3.5 |
| 1/2W 、1WS | 9 | 3.5 | 15±1.5 | 3.5 |
| 1W 、2WS | 11 | 4.5 | 15±1.5 | 3.5 |
| 2W 、3WS | 15 | 5 | 20±2 | 3.5 |

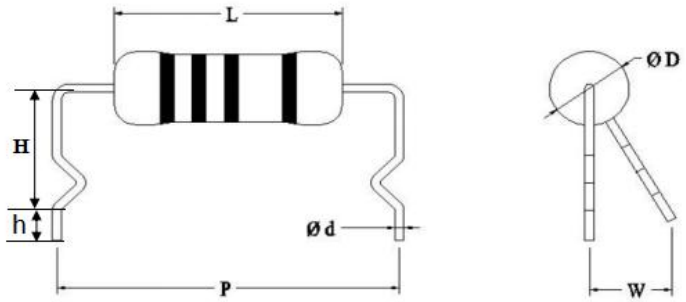
9.2 MG Form:




Unit: mm

| Wattage | L±1 | D±1 | P | H | h±1 | A±0.1 | B±0.05 | C±0.2 |
|---|---|---|---|---|---|---|---|---|
| 1/2W、1WS | 9 | 3.5 | 15±1.5 | 7±1 | 4.5 | 0.23 | 0.8 | 1.2 |
| 1W、2WS | 11 | 4.5 | 15±1.5 | 7±1 | 4.5 | 0.25 | 1 | 1.4 |
| 2W、3WS | 15 | 5 | 20±2 | 10±2 | 4.5 | 0.25 | 1 | 1.4 |

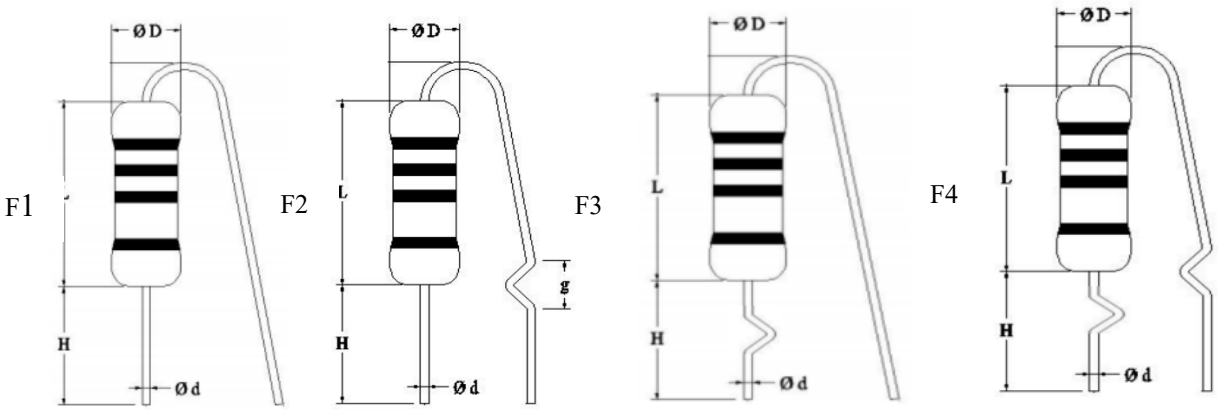
9.3 MB Form:




Unit: mm

| Wattage | D±1 | L±1 | P | H±0.5 | h + 1/ - 0.5 | B±0.05 |
|---|---|---|---|---|---|---|
| 1/2W 、1WS | 3.5 | 9 | 15±1.5 | 6.5 | 2 | 1 |
| 1W 、2WS | 4.5 | 11 | 15±1.5 | 6.5 | 2 | 1 |
| 2W 、3WS | 5 | 15 | 20±2 | 6.5 | 2 | 1 |

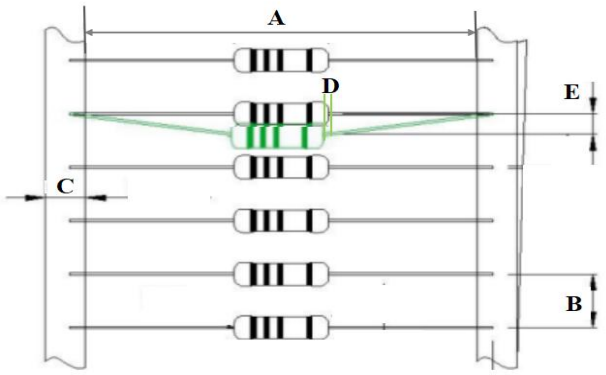
9.4 F Form:




Unit: mm

| Wattage | L±1 | D±1 | A+1/-0.5 | Applicable |
|---|---|---|---|---|
| 1/2W、1WS | 9 | 3.5 | 3.5 | F1~F4 |
| 1W 、2WS | 11 | 4.5 | 3.5 | F1~F4 |
| 2W 、3WS | 15 | 5 | 3.5 | F1~F4 |

9.5 Taping Specifications:

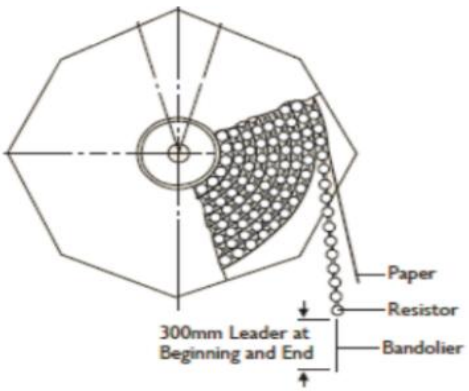



Unit: mm

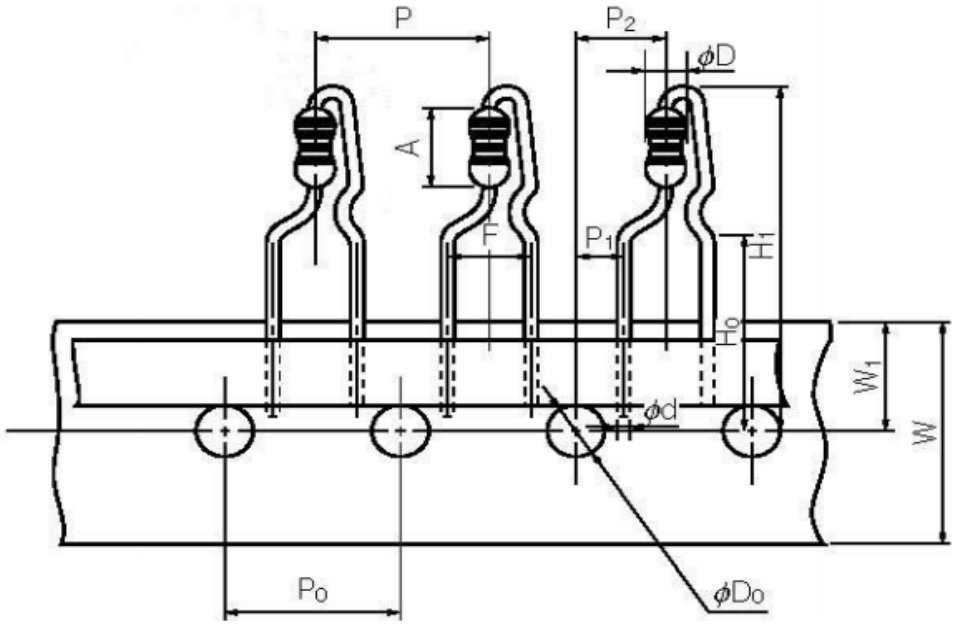
| Wattage | Size / Type | A | B | C±1 | D Max | E Max |
|---|---|---|---|---|---|---|
| ≦1/4W | T26 | 26 + 1/-0 | 5±0.5 | 6 | 0.6 | 1.2 |
| | T/B,T/R | 52±1 | 5±0.5 | 6 | 0.6 | 1.2 |
| 1/2W、1WS | T/B,T/R | 52±1 | 5±0.5 | 6 | 0.6 | 1.2 |
| 1W 、2WS | T/B,T/R | 63±1 | 5±0.5 | 6 | 0.6 | 1.2 |
| 2W 、3WS | T/B,T/R | 63±1 | 10±1 | 6 | 0.6 | 1.2 |
| | T76, R76 | 76±1.5 | 10±1 | 6 | 0.6 | 1.2 |

Tape in box

Tape in reel



9.6 Radial type lead taping(PA):




Unit: mm

| Wattage | P±1 | $P_0$±0.3 | $P_1$±0.7 | $P_2$±1 | F±0.8 | W±0.5 | $W_1$±0.5 | $H_1$ max | $H_0$±0.5 | φD±0.2 | A±1 | φd±0.1 | φD±1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4W 1/2WS | 12.7 | 12.7 | 3.85 | 6.35 | 5 | 18 | 9 | 32 | 16 | 4 | 6.4 | 0.6 | 2.4±0.5 |
| 1/2W 1WS | 12.7 | 12.7 | 3.85 | 6.35 | 5 | 18 | 9 | 32 | 16 | 4 | 9 | 0.65 | 3.5 |
| 1W 2WS | 12.7 | 12.7 | 3.85 | 6.35 | 5 | 18 | 9 | 38 | 16 | 4 | 11 | 0.8 | 4.5 |
| 2W 3WS | 12.7 | 12.7 | 3.85 | 6.35 | 5 | 18 | 9 | 38 | 16 | 4 | 15 | 0.8 | 5 |