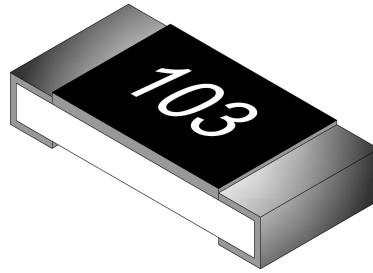


## ■ Thick Film Chip Resistor — CR Series



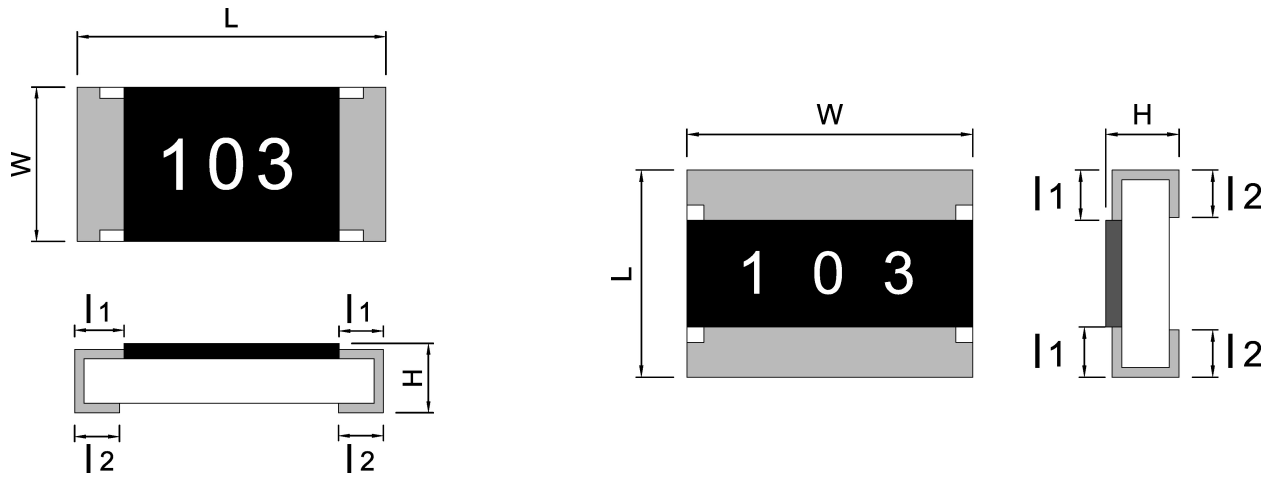
### ■ Application

- Entertainment: Stereo, TV tuners, Tape recorder
- Appliance: Air conditioner, Refrigerator
- Computer & relative products: Main board, PDA
- Communication equipment: Cell phone, Fax machine
- Power equipment: Power supply, Illumination equipment
- Measuring instrument: Electric meter, Navigation equipment

### ■ Features

- Small size and light weight
- Reduction of assembly costs and matching with placement machines
- Reliability, high quality and fast delivery

## ■ Type Dimension



CR0201 / CR0402 / CR 0603 / CR0805  
 CR1206 / CR1210 / CR1812 / CR2010  
 CR2512

CR1218 / CR2030

## ■ Dimension

Unit: mm

| TYPE   | L               | W               | H               | $l_1$           | $l_2$           |
|--------|-----------------|-----------------|-----------------|-----------------|-----------------|
| CR0201 | $0.60 \pm 0.03$ | $0.30 \pm 0.03$ | $0.23 \pm 0.05$ | $0.10 \pm 0.05$ | $0.15 \pm 0.05$ |
| CR0402 | $1.00 \pm 0.10$ | $0.50 \pm 0.05$ | $0.30 \pm 0.05$ | $0.15 \pm 0.10$ | $0.20 \pm 0.10$ |
| CR0603 | $1.60 \pm 0.20$ | $0.80 \pm 0.15$ | $0.40 \pm 0.10$ | $0.30 \pm 0.20$ | $0.30 \pm 0.10$ |
| CR0805 | $2.00 \pm 0.20$ | $1.25 \pm 0.15$ | $0.50 \pm 0.15$ | $0.30 \pm 0.15$ | $0.40 \pm 0.15$ |
| CR1206 | $3.05 \pm 0.10$ | $1.60 \pm 0.20$ | $0.55 \pm 0.15$ | $0.40 \pm 0.20$ | $0.50 \pm 0.20$ |
| CR1210 | $3.05 \pm 0.10$ | $2.50 \pm 0.20$ | $0.55 \pm 0.15$ | $0.50 \pm 0.20$ | $0.50 \pm 0.20$ |
| CR1812 | $4.50 \pm 0.10$ | $3.00 \pm 0.10$ | $0.55 \pm 0.05$ | $0.55 \pm 0.20$ | $0.70 \pm 0.20$ |
| CR2010 | $5.00 \pm 0.20$ | $2.50 \pm 0.20$ | $0.55 \pm 0.10$ | $0.60 \pm 0.20$ | $0.60 \pm 0.20$ |
| CR1218 | $3.10 \pm 0.10$ | $4.60 \pm 0.10$ | $0.55 \pm 0.05$ | $0.40 \pm 0.20$ | $0.50 \pm 0.20$ |
| CR2512 | $6.30 \pm 0.20$ | $3.20 \pm 0.20$ | $0.55 \pm 0.10$ | $0.60 \pm 0.20$ | $0.60 \pm 0.20$ |
| CR2030 | $5.10 \pm 0.10$ | $7.60 \pm 0.10$ | $1.20 \pm 0.10$ | $0.80 \pm 0.20$ | $0.80 \pm 0.20$ |

## ■ Standard & High Power Electrical Specifications

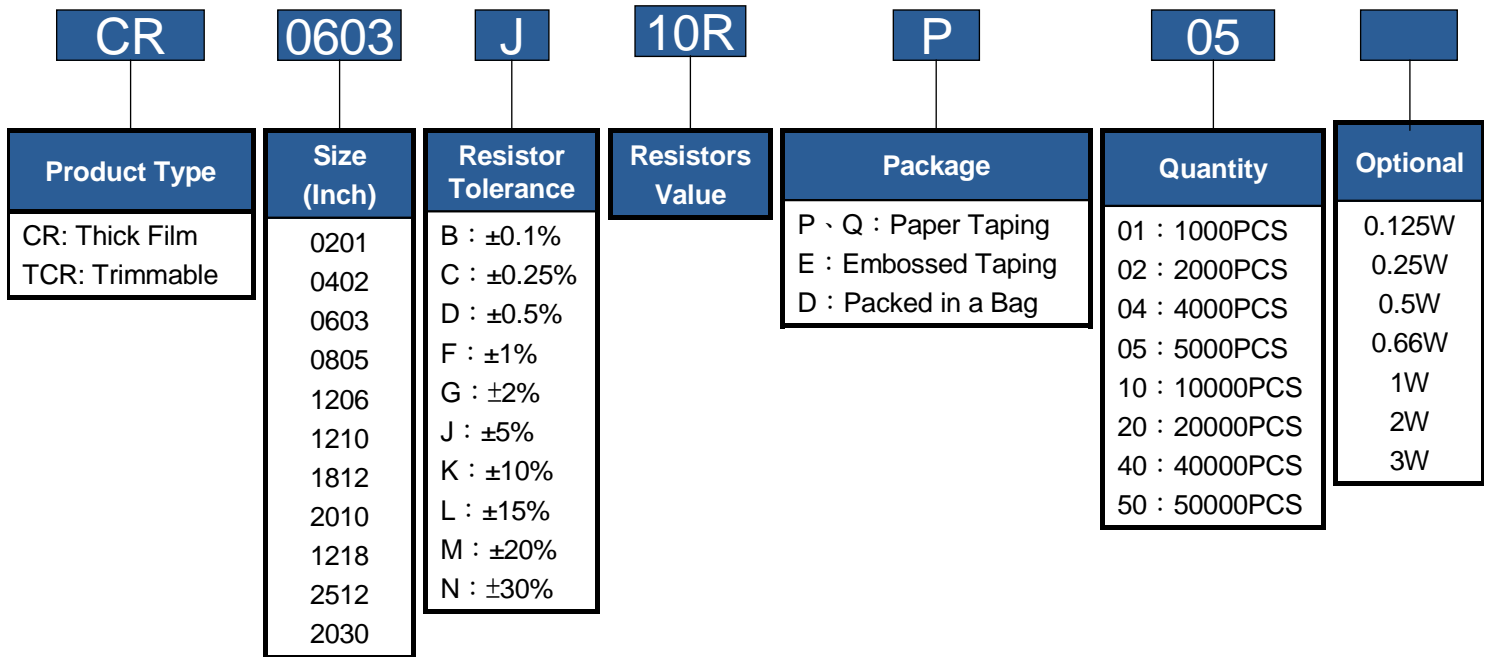
| Item<br>Type | Rated Power at 70°C |         | Max Working Voltage | Max Overload Voltage | T.C.R. (PPM/°C) | Resistance Range     |                  |                   | Operating Temperature Range |
|--------------|---------------------|---------|---------------------|----------------------|-----------------|----------------------|------------------|-------------------|-----------------------------|
|              | Standard            | High    |                     |                      |                 | B(±0.1%)<br>D(±0.5%) | F(±1%)<br>G(±2%) | J(±5%)<br>K(±10%) |                             |
|              |                     |         |                     |                      |                 |                      |                  |                   |                             |
| CR0201       | 0.05 W              | -       | 25V                 | 50V                  | ±200            | -                    | 10Ω~1MΩ          | 10Ω~1MΩ           | -55°C<br>~<br>+155°C        |
| CR0402       | 0.063 W             | 0.1W    | 50V                 | 100V                 | 0~+400          | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±300            | -                    | 10Ω~990Ω         | 10Ω~990Ω          |                             |
|              |                     |         |                     |                      | ±200            | 10Ω~1MΩ              | 1KΩ~10MΩ         | 1KΩ~10MΩ          |                             |
| CR0603       | 0.1 W               | 0.125 W | 50V                 | 100V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR0805       | 0.125 W             | 0.25 W  | 150V                | 300V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR1206       | 0.25 W              | 0.5 W   | 200V                | 400V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR1210       | 0.5 W               | 0.66 W  | 200V                | 400V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR1812       | 0.5 W               | 1 W     | 200V                | 400V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR2010       | 0.75 W              | 1 W     | 200V                | 400V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR1218       | 1 W                 | -       | 200V                | 400V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR2512       | 1 W                 | 2 W     | 200V                | 400V                 | ±400            | -                    | 1Ω~9.9Ω          | 1Ω~9.9Ω           |                             |
|              |                     |         |                     |                      | ±200            | -                    | -                | 10Ω~10MΩ          |                             |
|              |                     |         |                     |                      | ±100            | 10Ω~1MΩ              | 10Ω~10MΩ         | -                 |                             |
| CR2030       | 3 W                 | -       | 200V                | 400V                 | ±100            | -                    | 1Ω~1KΩ           | 1Ω~1KΩ            |                             |

●For non-standard parts, please contact our sales dept.

| Type                    | 0201     | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 2010 | 1218 | 2512 | 2030 |
|-------------------------|----------|------|------|------|------|------|------|------|------|------|------|
| Jumper Resistance Value | 50mΩ Max |      |      |      |      |      |      |      |      |      |      |
| Jumper Rated Current    | 0.5A     |      | 1A   |      |      | 2A   |      |      |      |      |      |

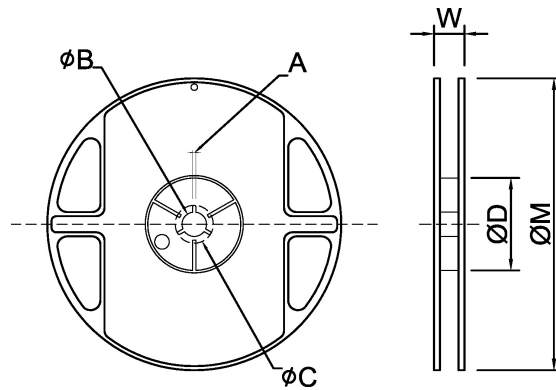
## Parts Number Explanation

### Example:



## ■ Appendix For SMD Chip Resistor

### ● Packaging Information

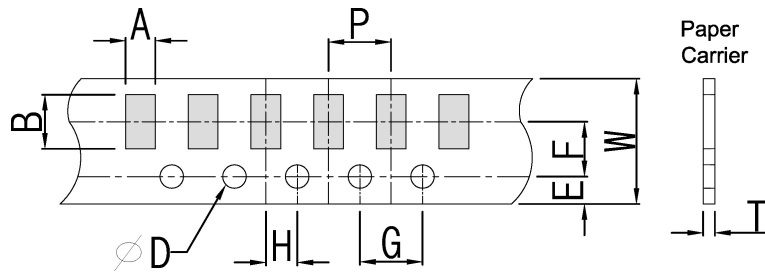


### ■ Dimension

Unit: mm

| TYPE                         | SIZE |          | A       | $\phi B$ | $\phi C$ | $\phi D$ | W        | $\phi M$ |
|------------------------------|------|----------|---------|----------|----------|----------|----------|----------|
| 0201                         | 7"   | 10K/Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 60±1.0   | 11.5±2.0 | 178±2.0  |
| 0402                         | 7"   | 10K/Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 60±1.0   | 11.5±2.0 | 178±2.0  |
|                              | 13"  | 40K/Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 100±1.0  | 11.5±2.0 | 330±2.0  |
|                              | 13"  | 50K/Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 100±1.0  | 11.5±2.0 | 330±2.0  |
|                              | 7"   | 5K/Reel  | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 60±1.0   | 11.5±2.0 | 178±2.0  |
| 0603<br>0805<br>1206         | 10"  | 10K/Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 100±1.0  | 11.5±2.0 | 254±2.0  |
|                              | 13"  | 20K/Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 100±1.0  | 11.5±2.0 | 330±2.0  |
|                              | 7"   | 5K/Reel  | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 60±1.0   | 11.5±2.0 | 178±2.0  |
| 1210                         | 7"   | 5K/Reel  | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 60±1.0   | 11.5±2.0 | 178±2.0  |
| 2010<br>2512<br>1812<br>1218 | 7"   | 4K/Reel  | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 60±1.0   | 16.0±2.0 | 178±2.0  |
| 2030                         | 7"   | 1K/Reel  | 2.0±0.5 | 13.5±1.0 | 21±1.0   | 60±1.0   | 19.0±2.0 | 178±2.0  |

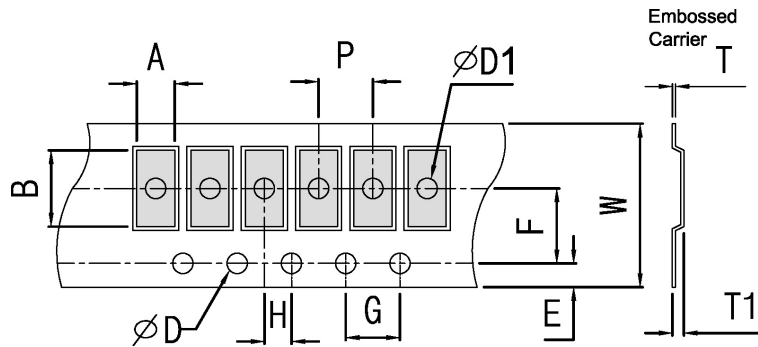
■ Tapping Specification



■ Dimension

Unit: mm

| Packaging  | Type | A         | B         | W        | E         | F        | G        | H        | T         | $\phi D$            | P       |
|------------|------|-----------|-----------|----------|-----------|----------|----------|----------|-----------|---------------------|---------|
| Paper Type | 0201 | 0.45±0.10 | 0.75±0.10 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.35±0.10 | 1.50<br>+0.10<br>-0 | 2.0±0.1 |
|            | 0402 | 0.70±0.10 | 1.20±0.10 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.45±0.10 |                     | 4.0±0.1 |
|            | 0603 | 1.05±0.20 | 1.80±0.20 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.60±0.10 |                     |         |
|            | 0805 | 1.55±0.20 | 2.30±0.20 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.75±0.10 |                     |         |
|            | 1206 | 1.90±0.20 | 3.50±0.20 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.75±0.10 |                     |         |
|            | 1210 | 2.85±0.20 | 3.50±0.20 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.75±0.10 |                     |         |



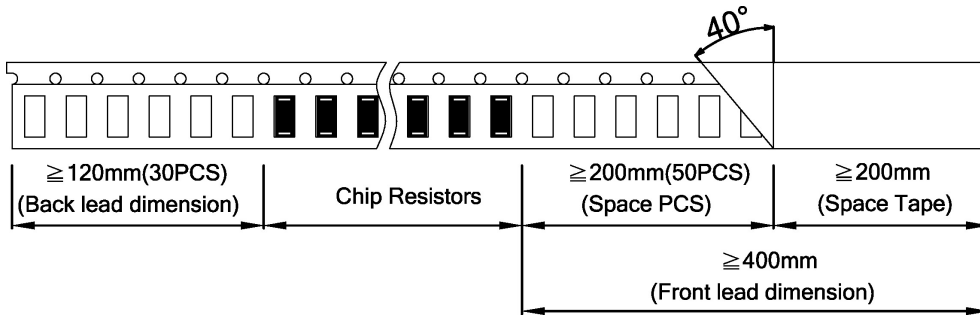
■ Dimension

Unit: mm

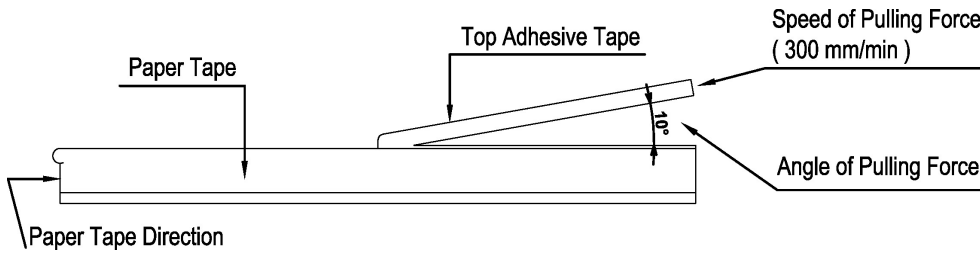
| Packaging     | Type | A         | B         | W       | E         | F        | G        | H        | T         | $\phi D$            | $\psi D1$ | T1        | P       |
|---------------|------|-----------|-----------|---------|-----------|----------|----------|----------|-----------|---------------------|-----------|-----------|---------|
| Embossed Type | 2010 | 2.80±0.20 | 5.60±0.20 | 12±0.10 | 1.75±0.10 | 5.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.23±0.10 | 1.50<br>+0.10<br>-0 | 1.50±0.10 | 0.85±0.15 | 4.0±0.1 |
|               | 2512 | 3.40±0.20 | 6.70±0.20 | 12±0.10 | 1.75±0.10 | 5.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.23±0.10 |                     | 1.50±0.10 | 0.85±0.15 |         |
|               | 1812 | 3.30±0.20 | 4.60±0.20 | 12±0.10 | 1.75±0.10 | 5.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.23±0.10 |                     | 1.50±0.10 | 0.85±0.15 |         |
|               | 1218 | 3.30±0.20 | 4.60±0.20 | 12±0.10 | 1.75±0.10 | 5.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.23±0.10 |                     | 1.50±0.10 | 0.85±0.15 |         |
|               | 2030 | 5.50±0.20 | 7.90±0.20 | 16±0.10 | 1.75±0.10 | 7.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.25±0.10 |                     | 1.50±0.10 | 0.85±0.15 | 8.0±0.2 |

■ Packing Material Data/Storage Data

■ Front & Back Lead Dimension

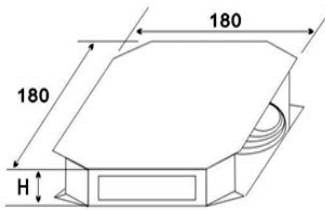


■ Top Adhesive Peel Off Strength : 10~70g

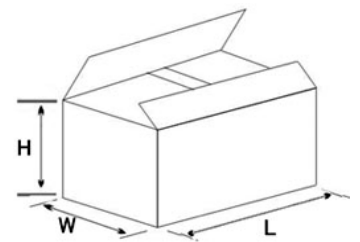


■ Package

| Inner Box Size |            |
|----------------|------------|
| Reel           | Size H(mm) |
| 1              | 13         |
| 2              | 24         |
| 3              | 36         |
| 5              | 60         |
| 10             | 113        |



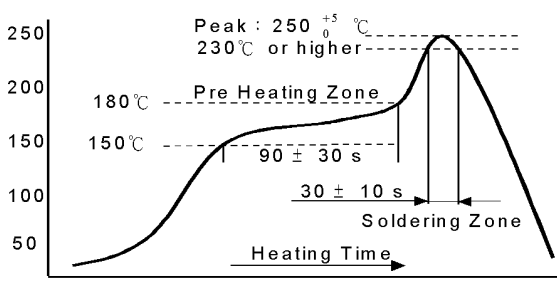
| External Box Size |             |            |             |
|-------------------|-------------|------------|-------------|
| Contain (Kpcs)    | Length (mm) | Width (mm) | Height (mm) |
| 25K               | 180         | 180        | 60          |
| 50K               | 180         | 180        | 110         |
| 150K              | 430         | 200        | 200         |
| 300K              | 400         | 400        | 200         |



■ Storage Data :

Storage time at the environment temp: 25±5°C & humidity: 60±20% is valid for one year from the date of delivery.

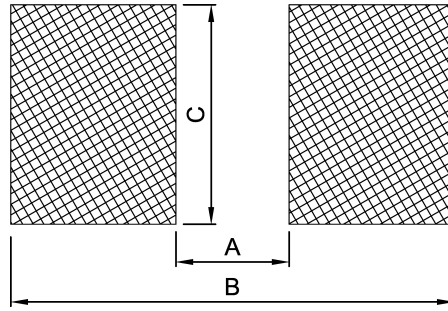
## ● Reliability Test and Requirement

| Test Item                                     | Test Method              | Procedure   | Requirements   |
|---|--------------------------|---|--|
| Temperature Coefficient of Resistance (T.C.R) | JIS C 5201-1 clause 4.8  | -55°C or +155°C, 25°C is the reference temperature  | Refer to Ratings   |
| Short Time Overload                           | JIS C 5201-1 clause 4.13 | General : 2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds.<br>High Power : 2.5 times RCWV or Max. Overload voltage whichever is less for 2 seconds. | ±1 : ±(1.0%+0.05Ω)<br>±5 : ±(2.0%+0.10Ω)   |
| IR Reflow                                     | Sony SS-00254            |   | ±1 : ±(1.0%+0.05Ω)<br>±5 : ±(1.0%+0.05Ω)   |
| Leaching                                      | Sony SS-00254-9          | 260±5°C for 30 seconds.   | >95% Coverage  |
| Soldering Heat                                | JIS C 5201-1 clause 4.18 | 260±5°C for 10 seconds.   | ±1 : ±(0.5%+0.05Ω)<br>±5 : ±(1.0%+0.05Ω)   |
| Temperature Cycling                           | JIS C 5201-1 clause 4.19 | -55°C to +155°C, 5 cycles   | 0.1%、0.5%、1% : ±(0.5%+0.05Ω)<br>2%、5% : ±(1.0%+0.10Ω)                              |
| Electric Iron                                 | Sony SS-00254-5          | Preheating temperature : 350±10°C<br>Electric iron preheating time : 3+1/-0 sec   | ±1 : ±(1.0%+0.05Ω)<br>±5 : ±(1.0%+0.05Ω)   |
| Resistance to Solvent                         | JIS C 5201-1 clause 4.29 | The tested resistor be immersed into isopropyl alcohol of 20~25°C for 60 secs. Then the resistor is left in the room for 48 hrs.  | ±1 : ±(0.5%+0.05Ω)<br>±5 : ±(0.5%+0.05Ω)   |
| Load Life in Humidity                         | JIS C 5201-1 clause 4.24 | 40±2°C, 90~95% R.H. RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" .  | 0.1%、0.5%、1% : ±(1.0%+0.05Ω)<br>2%、5% : ±(2.0%+0.05Ω)<br>Value <1Ω : ±(2.0%+0.05Ω) |
| Load Life (Endurance)                         | JIS C 5201-1 clause 4.25 | 70±2°C, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" .  | 0.1%、0.5%、1% : ±(1.0%+0.05Ω)<br>2%、5% : ±(3.0%+0.10Ω)<br>Value <1Ω : ±(3.0%+0.10Ω) |
| Insulation Resistance                         | JIS C 5201-1 clause 4.6  | 100V for 1 minute.  | ≥10GΩ  |
| Terminal Bending Strength                     | JIS C 5201-1 clause 4.33 | Bending once for 5 seconds<br>D : 0402、0603、0805=5mm<br>1206、1210、1812=3mm<br>1218、2010、2512、2030=2mm   | ±1 : ±(1.0%+0.05Ω)<br>±5 : ±(1.0%+0.05Ω)   |



● General Information

■ Recommend Land Pattern Design ( For Reflow Soldering )



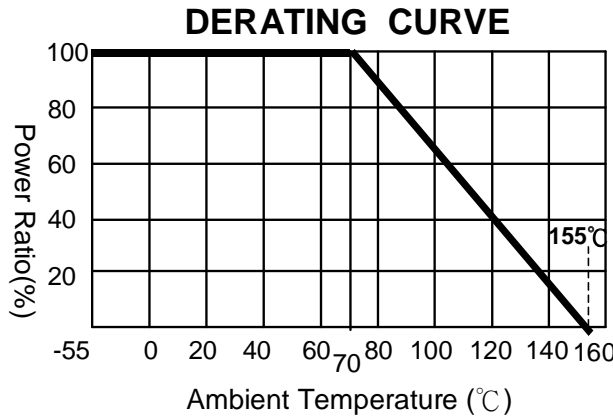
■ Dimension

Unit: mm

| Type Item | 0201 | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 2010 | 1218 | 2512 | 2030 |
|-----------|------|------|------|------|------|------|------|------|------|------|------|
| A         | 0.25 | 0.60 | 0.80 | 1.30 | 2.20 | 2.00 | 3.11 | 3.80 | 2.04 | 4.90 | 3.50 |
| B         | 1.10 | 1.60 | 2.40 | 2.90 | 4.20 | 4.40 | 5.91 | 6.60 | 4.24 | 8.10 | 7.50 |
| C         | 0.32 | 0.70 | 1.00 | 1.40 | 1.70 | 2.70 | 3.00 | 2.70 | 4.50 | 3.40 | 7.80 |

■ Performance Characteristics

■ Power Derating Curve



Power rating or current rating is in the case based on continuous full-load at ambient temperature of 70°C. For operation at ambient temperature in excess of 70°C, the load should be derated in accordance with figure of derating Curve.

■ Voltage Rating or Current Rating

Resistance Range:  $\geq 1 \Omega$

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$$E(RCWV) = \sqrt{P \times R}$$

E=Rated voltage(V)  
 P=Power rating(W)  
 R=Nominal resistance( $\Omega$ )



## Standard Resistance Values in a Decade

Marking code:

- 1%: marking code, please refer to E96 and E24 data form as below  
 Ex: 120K, The marking code is 1203 in E24  
 121K, The marking code is 1213 in E96
- 5%: marking code, please refer to E24 data form as below  
 Ex: 120K, The marking code is 124 in E24
- Note: 0402 series resistor has no marking code.
- Type: 0603 1% marking code, please refer to E-96 multiplier code.

| E192 | E96 | E48 | E192 | E96 | E48 | E192 | E96 | E48 | E192 | E96 | E48 | E192 | E96 | E48 |    |
|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|----|
| 100  | 100 | 100 | 169  | 169 | 169 | 287  | 287 | 287 | 487  | 487 | 487 | 825  | 825 | 825 |    |
| 101  |     |     | 172  |     |     | 291  |     |     | 493  |     |     | 835  |     |     |    |
| 102  | 102 |     | 174  | 174 |     | 294  | 294 |     | 499  | 499 |     | 845  | 845 |     |    |
| 104  |     |     | 176  |     |     | 298  |     |     | 505  |     |     | 856  |     |     |    |
| 105  | 105 | 105 | 178  | 178 | 178 | 301  | 301 | 301 | 511  | 511 | 511 | 866  | 866 | 866 |    |
| 106  |     |     | 180  |     |     | 305  |     |     | 517  |     |     | 876  |     |     |    |
| 107  | 107 |     | 182  | 182 |     | 309  | 309 |     | 523  | 523 |     | 887  | 887 |     |    |
| 109  |     |     | 184  |     |     | 312  |     |     | 530  |     |     | 898  |     |     |    |
| 110  | 110 | 110 | 187  | 187 | 187 | 316  | 316 | 316 | 536  | 536 | 536 | 909  | 909 | 909 |    |
| 111  |     |     | 189  |     |     | 320  |     |     | 542  |     |     | 920  |     |     |    |
| 113  | 113 |     | 191  | 191 |     | 324  | 324 |     | 549  | 549 |     | 931  | 931 |     |    |
| 114  |     |     | 193  |     |     | 328  |     |     | 556  |     |     | 942  |     |     |    |
| 115  | 115 | 115 | 196  | 196 | 196 | 332  | 332 | 332 | 562  | 562 | 562 | 953  | 953 | 953 |    |
| 117  |     |     | 198  |     |     | 336  |     |     | 569  |     |     | 965  |     |     |    |
| 118  | 118 |     | 200  | 200 |     | 340  | 340 |     | 576  | 576 |     | 976  | 976 |     |    |
| 120  |     |     | 203  |     |     | 344  |     |     | 583  |     |     | 988  |     |     |    |
| 121  | 121 | 121 | 205  | 205 | 205 | 348  | 348 | 348 | 590  | 590 | 590 |      |     |     |    |
| 123  |     |     | 208  |     |     | 352  |     |     | 597  |     |     |      |     |     |    |
| 124  | 124 |     | 210  | 210 |     | 357  | 357 |     | 604  | 604 |     | E24  | E12 | E6  | E3 |
| 126  |     |     | 213  |     |     | 361  |     |     | 612  |     |     | 10   | 10  | 10  | 10 |
| 127  | 127 | 127 | 215  | 215 | 215 | 365  | 365 | 365 | 619  | 619 | 619 | 11   |     |     |    |
| 129  |     |     | 218  |     |     | 370  |     |     | 626  |     |     | 12   | 12  |     |    |
| 130  | 130 |     | 221  | 221 |     | 374  | 374 |     | 634  | 634 |     | 13   |     |     |    |
| 132  |     |     | 223  |     |     | 379  |     |     | 642  |     |     | 15   | 15  | 15  |    |
| 133  | 133 | 133 | 226  | 226 | 226 | 383  | 383 | 383 | 649  | 649 | 649 | 16   |     |     |    |
| 135  |     |     | 229  |     |     | 388  |     |     | 657  |     |     | 18   | 18  |     |    |
| 137  | 137 |     | 232  | 232 |     | 392  | 392 |     | 665  | 665 |     | 20   |     |     |    |
| 138  |     |     | 234  |     |     | 397  |     |     | 673  |     |     | 22   | 22  | 22  | 22 |
| 140  | 140 | 140 | 237  | 237 | 237 | 402  | 402 | 402 | 681  | 681 | 681 | 24   |     |     |    |
| 142  |     |     | 240  |     |     | 407  |     |     | 690  |     |     | 27   | 27  |     |    |
| 143  | 143 |     | 243  | 243 |     | 412  | 412 |     | 698  | 698 |     | 30   |     |     |    |
| 145  |     |     | 246  |     |     | 417  |     |     | 706  |     |     | 33   | 33  | 33  |    |
| 147  | 147 | 147 | 249  | 249 | 249 | 422  | 422 | 422 | 715  | 715 | 715 | 36   |     |     |    |
| 149  |     |     | 252  |     |     | 427  |     |     | 723  |     |     | 39   | 39  |     |    |
| 150  | 150 |     | 255  | 255 |     | 432  | 432 |     | 732  | 732 |     | 43   |     |     |    |
| 152  |     |     | 258  |     |     | 437  |     |     | 741  |     |     | 47   | 47  | 47  | 47 |
| 154  | 154 | 154 | 261  | 261 | 261 | 442  | 442 | 442 | 750  | 750 | 750 | 51   |     |     |    |
| 156  |     |     | 264  |     |     | 448  |     |     | 759  |     |     | 56   | 56  |     |    |
| 158  | 158 |     | 267  | 267 |     | 453  | 453 |     | 768  | 768 |     | 62   |     |     |    |
| 160  |     |     | 271  |     |     | 459  |     |     | 777  |     |     | 68   | 68  | 68  |    |
| 162  | 162 | 162 | 274  | 274 | 274 | 464  | 464 | 464 | 787  | 787 | 787 | 75   |     |     |    |
| 164  |     |     | 277  |     |     | 470  |     |     | 796  |     |     | 82   | 82  |     |    |
| 165  | 165 |     | 280  | 280 |     | 475  | 475 |     | 806  | 806 |     | 91   |     |     |    |
| 167  |     |     | 284  |     |     | 481  |     |     | 816  |     |     |      |     |     |    |

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