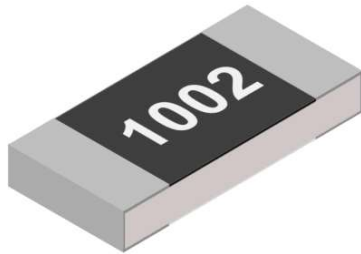
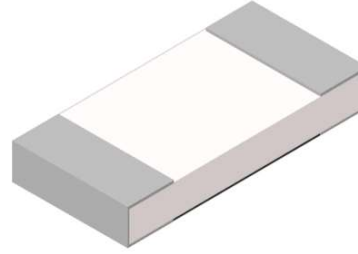


## ■ General Purpose Thin Film Chip Resistor — TR Series



Top view



Bottom view

### ■ Applications

- Computer & relative products
- Communication devices
- Measuring instrument
- Converters
- Printing equipment

### ■ Features

- Tolerance to  $\pm 0.1\%$
- Low TCR to  $\pm 10 \text{ ppm}/^\circ\text{C}$
- Down size to 0201
- Halogen free and lead free
- RoHS compliant

### ■ Parts Number Explanation

#### ■ Example:

| TR  | 1206   | B   | 10K0   | P   | 05   | 25   | Z                |
|---|--|---|--|---|--|--|------------------|
| <b>Product Type</b>                               | <b>Size (Inch)</b>   | <b>Tolerance</b>  | <b>Resistance</b>  | <b>Package</b>  | <b>Quantity (PCS)</b>  | <b>TCR (ppm/°C)</b>  | <b>Optional</b>  |
| TR Series General Purpose Thin Film Chip Resistor | 0201<br>0402<br>0603<br>0805<br>1206<br>1210<br>2010<br>2512 | B : $\pm 0.1\%$<br>C : $\pm 0.25\%$<br>D : $\pm 0.5\%$<br>F : $\pm 1\%$ | 4 digits<br>EX.<br>1R00 = 1 $\Omega$<br>10R0 = 10 $\Omega$<br>100R = 100 $\Omega$<br>2K20 = 2.2 K $\Omega$<br>332K = 332 K $\Omega$<br>1M00 = 1 M $\Omega$ | P : Paper Taping (0603~1210)<br>Q : Paper Taping (0201、0402)<br>E : Embossed Taping<br>B : Bulk | 04 : 4000<br>05 : 5000<br>10 : 10000<br>20 : 20000<br>40 : 40000<br>50 : 50000 | 10 : $\pm 10$<br>15 : $\pm 15$<br>25 : $\pm 25$<br>50 : $\pm 50$ | Z : Default Code |



# TR Series General Purpose Thin Film Chip Resistor Product Specifications

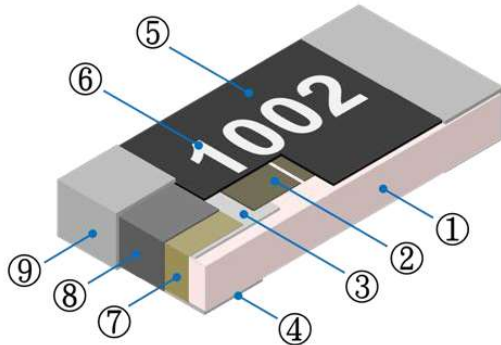
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| Document No.  | S-10-12-03-08 |
| Revision Date | 2021/05/18    |
| Page No.      | 2/9           |

## Standard Electrical Specifications

| 項目 Item<br>型別 Type | 額定功率<br>Rated Power<br>at 70°C | 最大工作電壓<br>Max Working<br>Voltage | 最大過負載電壓<br>Max Overload<br>Voltage | 溫度係數<br>T.C.R.<br>(PPM/°C) | 阻值範圍<br>Resistance Range |                 |              |               |              |               |  |  |
|--------------------|--------------------------------|----------------------------------|------------------------------------|----------------------------|--------------------------|-----------------|--------------|---------------|--------------|---------------|--|--|
|                    |                                |                                  |                                    |                            | B<br>±0.1%               | C<br>±0.25%     | D<br>±0.5%   | F<br>±1%      |              |               |  |  |
| TR0201             | 0.05W                          | 25V                              | 50V                                | ±10                        | 10 Ω ~ 5.1 KΩ            |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±15                        | 10 Ω ~ 5.1 KΩ            |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±25                        | 10 Ω ~ 82 KΩ             |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±50                        | 10 Ω ~ 82 KΩ             |                 |              |               |              |               |  |  |
| TR0402             | 0.063W                         | 50V                              | 100V                               | ±10                        | 10 Ω ~ 68 KΩ             |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±15                        | 10 Ω ~ 68 KΩ             |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±25                        | 4.7 Ω ~ 220 KΩ           | 2.49 Ω ~ 220 KΩ |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±50                        | 4.7 Ω ~ 220 KΩ           | 2.49 Ω ~ 220 KΩ |              |               |              |               |  |  |
| TR0603             | 0.1W                           | 75V                              | 150V                               | ±10                        | 10 Ω ~ 332 KΩ            |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±15                        | 10 Ω ~ 332 KΩ            |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±25                        | 4.7 Ω ~ 680 KΩ           | 2.49 Ω ~ 680 KΩ |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±50                        | 4.7 Ω ~ 680 KΩ           | 2.49 Ω ~ 680 KΩ |              |               |              |               |  |  |
| TR0805             | 0.125W                         | 150V                             | 300V                               | ±10                        | 10 Ω ~ 680 KΩ            |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±15                        | 10 Ω ~ 680 KΩ            |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±25                        | 4.7 Ω ~ 1 MΩ             | 2.49 Ω ~ 1 MΩ   |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±50                        | 4.7 Ω ~ 1 MΩ             | 2.49 Ω ~ 1 MΩ   |              |               |              |               |  |  |
| TR1206             | 0.25W                          | 200V                             | 400V                               | ±10                        | 10 Ω ~ 1 MΩ              |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±15                        | 10 Ω ~ 1 MΩ              |                 |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±25                        | 4.7 Ω ~ 1.5 MΩ           | 2.49 Ω ~ 1.5 MΩ |              |               |              |               |  |  |
|                    |                                |                                  |                                    | ±50                        | 4.7 Ω ~ 1.5 MΩ           | 2.49 Ω ~ 1.5 MΩ |              |               |              |               |  |  |
| TR1210             | 0.25W                          |                                  |                                    | 200V                       | 400V                     | ±10             | 10 Ω ~ 1 MΩ  |               |              |               |  |  |
|                    |                                |                                  |                                    |                            |                          | ±15             | 10 Ω ~ 1 MΩ  |               |              |               |  |  |
|                    |                                |                                  |                                    |                            |                          | ±25             | 4.7 Ω ~ 1 MΩ | 2.49 Ω ~ 1 MΩ |              |               |  |  |
|                    |                                |                                  |                                    |                            |                          | ±50             | 4.7 Ω ~ 1 MΩ | 2.49 Ω ~ 1 MΩ |              |               |  |  |
| TR2010             | 0.5W                           |                                  |                                    |                            |                          | 200V            | 400V         | ±10           | 10 Ω ~ 1 MΩ  |               |  |  |
|                    |                                |                                  |                                    |                            |                          |                 |              | ±15           | 10 Ω ~ 1 MΩ  |               |  |  |
|                    |                                |                                  |                                    |                            |                          |                 |              | ±25           | 4.7 Ω ~ 1 MΩ | 2.49 Ω ~ 1 MΩ |  |  |
|                    |                                |                                  |                                    |                            |                          |                 |              | ±50           | 4.7 Ω ~ 1 MΩ | 2.49 Ω ~ 1 MΩ |  |  |
| TR2512             | 0.75W                          | 200V                             | 400V                               |                            |                          |                 |              | ±10           | 10 Ω ~ 1 MΩ  |               |  |  |
|                    |                                |                                  |                                    |                            |                          |                 |              | ±15           | 10 Ω ~ 1 MΩ  |               |  |  |
|                    |                                |                                  |                                    |                            |                          |                 |              | ±25           | 4.7 Ω ~ 1 MΩ | 2.49 Ω ~ 1 MΩ |  |  |
|                    |                                |                                  |                                    |                            |                          |                 |              | ±50           | 4.7 Ω ~ 1 MΩ | 2.49 Ω ~ 1 MΩ |  |  |

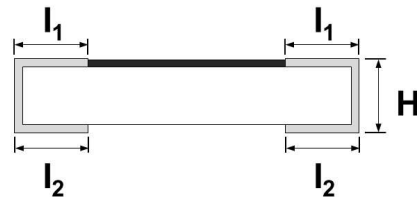
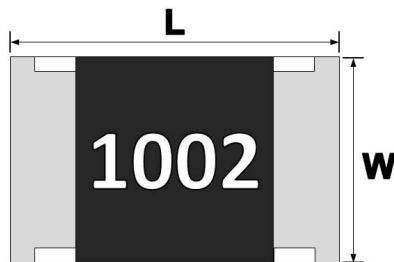
- For non-standard parts, please contact our sales dept.
- Operating Temperature Range : -55°C ~ +155°C.

■ **Construction**



|   |                     |   |                        |   |                      |
|---|---------------------|---|------------------------|---|----------------------|
| ① | Alumina Substrate   | ④ | Bottom Inner Electrode | ⑦ | Side Inner Electrode |
| ② | Resistive Layer     | ⑤ | Protective Overcoat    | ⑧ | Nickel Barrier       |
| ③ | Top Inner Electrode | ⑥ | Marking                | ⑨ | Solder coating (Sn)  |

■ **Dimensions**



Unit : mm

| TYPE   | L           | W           | H           | l <sub>1</sub> | l <sub>2</sub> |
|--------|-------------|-------------|-------------|----------------|----------------|
| TR0201 | 0.60 ± 0.05 | 0.30 ± 0.05 | 0.23 ± 0.05 | 0.12 ± 0.05    | 0.15 ± 0.05    |
| TR0402 | 1.00 ± 0.10 | 0.50 ± 0.05 | 0.30 ± 0.05 | 0.20 ± 0.10    | 0.20 ± 0.10    |
| TR0603 | 1.60 ± 0.15 | 0.80 ± 0.10 | 0.45 ± 0.10 | 0.30 ± 0.20    | 0.30 ± 0.20    |
| TR0805 | 2.00 ± 0.15 | 1.25 ± 0.15 | 0.55 ± 0.10 | 0.35 ± 0.20    | 0.40 ± 0.20    |
| TR1206 | 3.10 ± 0.15 | 1.60 ± 0.15 | 0.55 ± 0.10 | 0.45 ± 0.20    | 0.50 ± 0.20    |
| TR1210 | 3.10 ± 0.15 | 2.50 ± 0.15 | 0.55 ± 0.10 | 0.45 ± 0.20    | 0.50 ± 0.20    |
| TR2010 | 5.00 ± 0.15 | 2.50 ± 0.15 | 0.55 ± 0.10 | 0.60 ± 0.20    | 0.60 ± 0.20    |
| TR2512 | 6.30 ± 0.15 | 3.20 ± 0.15 | 0.55 ± 0.10 | 0.60 ± 0.20    | 0.60 ± 0.20    |

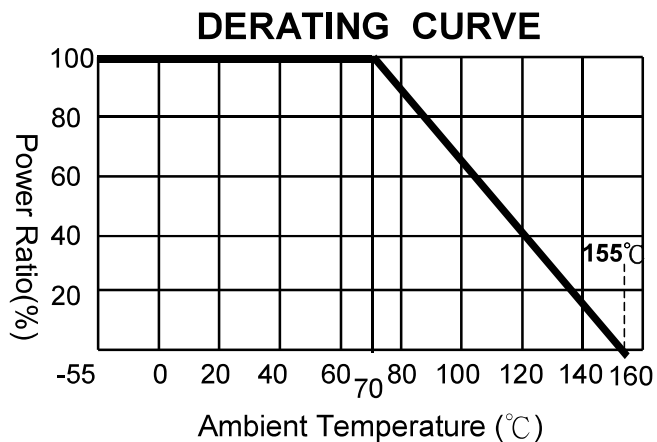


## ■ Performance Characteristics

### ■ Power Derating Curve

The Operating Temperature Range: -55°C ~+155°C.

Power 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.



### ■ Rated Voltage

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:

$$V = \sqrt{P \times R}$$

V = Rated voltage (V)

P = Rated power (W)

R = Nominal resistance ( $\Omega$ )



**TR Series General Purpose Thin Film  
Chip Resistor Product Specifications**

|                      |               |
|----------------------|---------------|
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| <b>Revision Date</b> | 2021/05/18    |
| <b>Page No.</b>      | 5/9           |

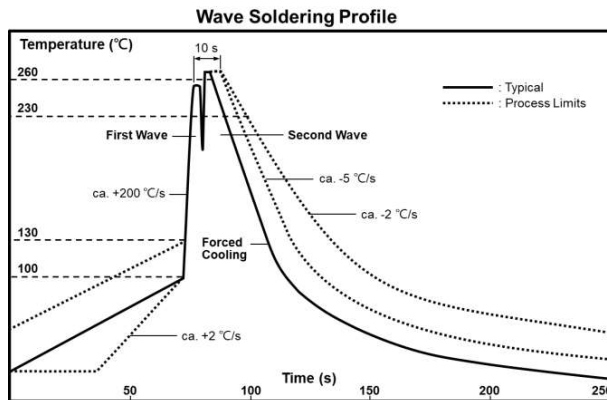
**■ Reliability Tests and Requirements**

| Test Item                                     | Test Method                               | Procedure   | Requirements                                |
|---|---|---|---|
| Temperature Coefficient of Resistance (T.C.R) | JIS-C-5201-1 4.8<br>IEC-60115-1 4.8       | At 25 / -55°C and 25°C / +125°C, 25°C is the reference temperature  | Refer to Standard Electrical Specifications |
| Short Time Overload                           | JIS-C-5201-1 4.13<br>IEC-60115-1 4.13     | 2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds.  | ±(0.5%+0.05Ω)<br>No Visual damage           |
| Insulation Resistance                         | JIS-C-5201-1 4.6<br>IEC-60115-1 4.6       | Apply 100VDC for 1 minute.  | ≥ 10GΩ                                      |
| Solderability                                 | JIS-C-5201-1 4.17<br>IEC-60115-1 4.17     | 245±5°C for 3 seconds.  | >95% Coverage<br>No Visual damage           |
| Resistance to Soldering Heat                  | JIS-C-5201-1 4.18<br>IEC-60115-1 4.18     | 260±5°C for 10 seconds.   | ±(0.5%+0.05Ω)<br>No Visual damage           |
| Leaching                                      | JIS-C-5201-1 4.18<br>IEC-60068-2-58 8.2.1 | 260±5°C for 30 seconds.   | >95% Coverage<br>No Visual damage           |
| Rapid Change of Temperature                   | JIS-C-5201-1 4.19<br>IEC-60115-1 4.19     | -55°C to +155°C, 300 cycles   | ±(0.5%+0.05Ω)<br>No Visual damage           |
| High Temperature Exposure                     | JIS-C-5201-1 4.25<br>IEC 60068-2-2        | At 155±5°C for 1000 hours.  | ±(0.5%+0.05Ω)                               |
| Resistance to Solvent                         | JIS-C-5201-1 4.29                         | The tested resistor be immersed into isopropyl alcohol of 20~25°C for 60 secs.<br>Then the resistor is left in the room for 48 hrs. | ±(0.5%+0.05Ω)<br>No Visual damage           |
| Damp Heat with Load                           | JIS-C-5201-1 4.24<br>IEC-60115-1 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"                  | ±(0.5%+0.05Ω)                               |
| Biased Humidity                               | MIL-STD-202<br>Method 103                 | 1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.                                | ±(0.5%+0.05Ω)                               |
| Load Life (Endurance)                         | JIS-C-5201-1 4.25<br>IEC-60115-1 4.25.1   | 70±2°C, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" .                            | ±(0.5%+0.05Ω)                               |
| Bending Strength                              | JIS-C-5201-1 4.33<br>IEC-60115-1 4.33     | Bending once for 5 seconds<br>D : 0201、0402、0603、0805 = 5mm<br>1206、1210 = 3mm<br>2010、2512 = 2mm                                   | ±(0.5%+0.05Ω)<br>No Visual damage           |

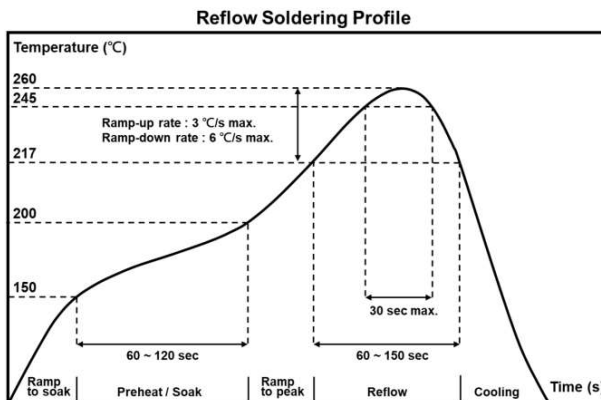
● We can also provide AEC-Q200 test reports if required by customers.

■ **Recommended Customer Soldering Parameters**

■ **Wave solder Temperature condition**



■ **Solder reflow Temperature condition**



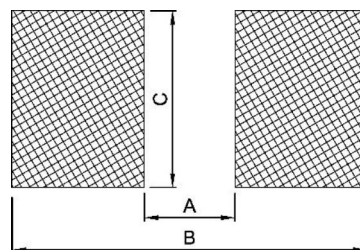
■ **Rework temperature ( hot air equipment ) : 350°C, 3~5seconds**

■ **Recommended reflow methods**

IR, vapor phase oven, hot air oven

If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

■ **Recommend Land Pattern Design**



Unit: mm

| Type<br>Item | 0201 | 0402 | 0603 | 0805 | 1206 | 1210 | 2010 | 2512 |
|--------------|------|------|------|------|------|------|------|------|
| A            | 0.25 | 0.50 | 0.80 | 1.30 | 2.20 | 2.00 | 3.80 | 4.90 |
| B            | 0.85 | 1.60 | 2.40 | 2.90 | 4.20 | 4.40 | 6.60 | 8.10 |
| C            | 0.35 | 0.70 | 1.00 | 1.40 | 1.70 | 2.70 | 2.70 | 3.40 |

**Marking**



0201 - 0402: no marking



0603: 3 digits code



0805~2512: 4 digits code

**No marking on 0201/0402 type**

**3 digits code for 0603 type**

**Standard E96 Values and 0603 Resistance Codes**

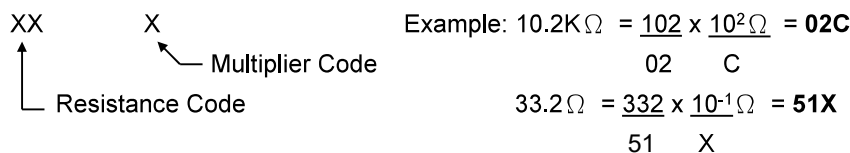
|                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|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

**E96 Multiplier Code**

| Code       | A               | B               | C               | D               | E               | F               | G               | H               | X                | Y                | Z                |
|------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|
| Multiplier | 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> |

1. 0603 3 digits coding formula for E96 values as following:

CODING FORMULA



EX.: 7.5Ω=85Y ; 11Ω=05X ; 130Ω=12A ; 2KΩ= 30B ; 10KΩ=01C ; 150KΩ=18D

| E24 | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 30 | 33 | 36 | 39 | 43 | 47 | 51 | 56 | 62 | 68 | 75 | 82 | 91 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

2. 0603 3 digits for E24 values

Examples:

| Resistance    | 4.7Ω | 33Ω | 470Ω | 5.6KΩ | 62KΩ | 680KΩ |
|---------------|------|-----|------|-------|------|-------|
| 3 digits code | 4R7  | 330 | 471  | 562   | 623  | 684   |

("R"= decimal point)

3. 0603 E192 values have no marking code.

**4 digits code for 0805 ~ 2512 type**

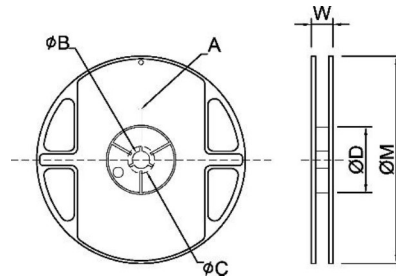
First 3 digits are the significant figures, the 4th digit is the multiplier. "R"= decimal point.

Examples:

| Resistance    | 5.6Ω | 10Ω  | 22.6Ω | 100Ω | 1.1KΩ | 10KΩ | 332KΩ | 1MΩ  |
|---------------|------|------|-------|------|-------|------|-------|------|
| 4 digits code | 5R60 | 10R0 | 22R6  | 1000 | 1101  | 1002 | 3323  | 1004 |

**■ Packaging Information**

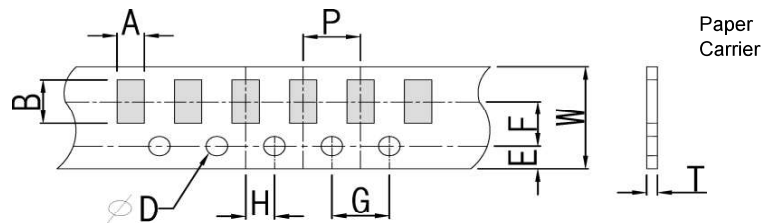
**■ Reel Dimensions**



Unit: mm

| TYPE                | SIZE             | A       | φB       | φC     | φD      | W        | φM      |
|---------------------|------------------|---------|----------|--------|---------|----------|---------|
| 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 |
| 0402                | 13" 40K/50K Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 100±1.0 | 11.5±2.0 | 330±2.0 |
| 0603/0805/1206/1210 | 7" 5K/Reel       | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 60±1.0  | 11.5±2.0 | 178±2.0 |
| 0603/0805           | 10" 10K/Reel     | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 100±1.0 | 11.5±2.0 | 254±2.0 |
| /1206               | 13" 20K/Reel     | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 100±1.0 | 11.5±2.0 | 330±2.0 |
| 2010/2512           | 7" 4K/Reel       | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 60±1.0  | 16.0±2.0 | 178±2.0 |

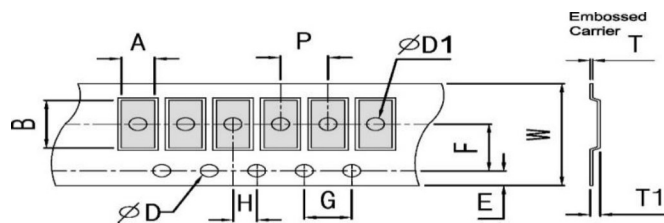
**■ Paper Tape Dimensions**



Unit: mm

| Type | A         | B         | W        | E         | F        | G        | H        | T         | φD                                  | P        |
|------|-----------|-----------|----------|-----------|----------|----------|----------|-----------|-------------------------------------|----------|
| 0201 | 0.40±0.05 | 0.70±0.05 | 8.0±0.20 | 1.75±0.10 | 3.5±0.05 | 4.0±0.10 | 2.0±0.05 | 0.45±0.10 | 1.50 <sup>+0.10</sup> <sub>-0</sub> | 2.0±0.10 |
| 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 |                                     | 2.0±0.10 |
| 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 |                                     | 4.0±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 |                                     | 4.0±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 |                                     | 4.0±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 |                                     |          |

**■ Plastic Embossed Tape Dimensions**

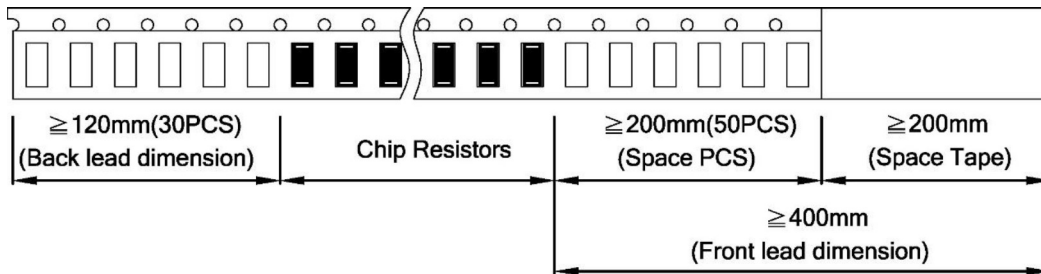


Unit: mm

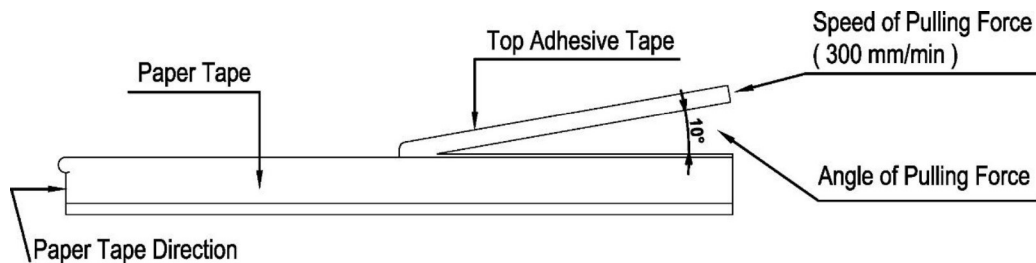
| Type | A         | B         | W       | E         | F        | G        | H        | T         | φD                                  | φD1       | T1        | P        |
|------|-----------|-----------|---------|-----------|----------|----------|----------|-----------|-------------------------------------|-----------|-----------|----------|
| 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 <sup>+0.10</sup> <sub>-0</sub> | 1.50±0.10 | 0.85±0.15 | 4.0±0.10 |
| 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 |          |



■ **Front & Back Lead Dimensions**

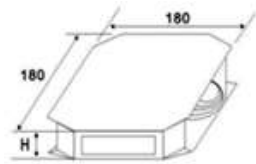


■ **Top Adhesive Peel Off Strength : 10~70g**

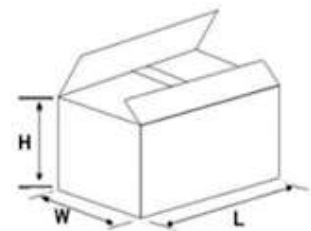


■ **Package**

| 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:  $25\pm 5^{\circ}\text{C}$  & humidity:  $60\pm 20\%$  is valid for one year from the date of delivery.

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