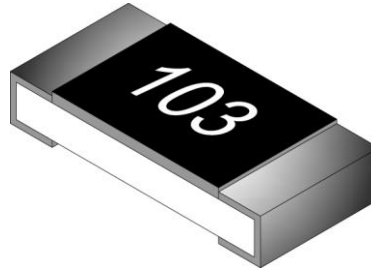




# CRH Series Thick Film High Power Chip Resistor Product Specifications

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## Thick Film High Power Chip Resistor — CRH Series



### Application

- Consumer electrical
- Home Appliance: Air conditioner, Refrigerator
- Computer & relative products: Main board
- Communication equipment: Cell phone, Fax machine
- Power equipment: Power supply , Illumination equipment
- Measuring instrument: Electric meter, Navigation equipment

### Features

- Small size and light weight
- Reliability, high quality

## Parts Number Explanation

### Example:

| CRH                                 | 0603   | J   | 10R0            | P  | 05  | Z   |
|-------------------------------------|--|---|-----------------|--|---|---|
| Product Type                        | Size(Inch)   | Resistor Tolerance  | Resistors Value | Package  | Quantity  | Optional                                      |
| Thick Film High Power Chip Resistor | 0402<br>0603<br>0805<br>1206<br>1210<br>1812<br>2010<br>2512 | B : $\pm 0.1\%$<br>D : $\pm 0.5\%$<br>F : $\pm 1\%$<br>G : $\pm 2\%$<br>J : $\pm 5\%$ |                 | P、Q : Paper Taping<br>E : Embossed Taping<br>D : Packed in a Bag | 04 : 4000PCS<br>05 : 5000PCS<br>10 : 10000PCS<br>40 : 40000PCS<br>50 : 50000PCS | Z : High Power<br>7 : TCR $\pm 200\text{ppm}$ |



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## High Power Electrical Specifications

| Item    | Rated Power at 70°C | Max Working Voltage | Max Overload Voltage | T.C.R. (PPM/°C) | Resistance Range     |                  |                   |
|---------|---------------------|---------------------|----------------------|-----------------|----------------------|------------------|-------------------|
|         |                     |                     |                      |                 | B(±0.1%)<br>D(±0.5%) | F(±1%)<br>G(±2%) | J(±5%)<br>K(±10%) |
| CRH0402 | 0.1W                | 50V                 | 100V                 | ±400            | -                    | 1Ω ≤ R < 10Ω     |                   |
|         |                     |                     |                      | ±100            | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ   |                   |
| CRH0603 | 0.125W              | 75V                 | 150V                 | ±400            | -                    | 1Ω ≤ R < 10Ω     |                   |
|         |                     |                     |                      | ±100            | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ   |                   |
| CRH0805 | 0.25 W              | 150V                | 300V                 | ±400            | -                    | 1Ω ≤ R < 10Ω     |                   |
|         |                     |                     |                      | ±100            | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ   |                   |
| CRH1206 | 0.5 W               | 200V                | 400V                 | ±400            | -                    | 1Ω ≤ R < 10Ω     |                   |
|         |                     |                     |                      | ±100            | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ   |                   |
| CRH1210 | 0.66W               |                     |                      | ±400            | -                    | 1Ω ≤ R < 10Ω     |                   |
|         |                     |                     |                      | ±100            | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ   |                   |
| CRH1812 | 1 W                 |                     |                      | ±400            | -                    | 1Ω ≤ R < 10Ω     |                   |
|         |                     |                     |                      | ±100            | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ   |                   |
| CRH2010 | 1 W                 |                     |                      | ±400            | -                    | 1Ω ≤ R < 10Ω     |                   |
|         |                     |                     |                      | ±100            | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ   |                   |
| CRH2512 | 2 W                 | ±400                | -                    | 1Ω ≤ R < 10Ω    |                      |                  |                   |
|         |                     | ±100                | 10Ω ≤ R ≤ 1MΩ        | 10Ω ≤ R ≤ 10MΩ  |                      |                  |                   |

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range : -55°C ~ +155°C.
- Type CRH0402/0603/0805/1206/1210/1812/2010/2512 1Ω ≤ R < 10Ω optional code 「7」 is TCR: ±200PPM

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



# CRH Series Thick Film High Power Chip Resistor Product Specifications

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- High Power Low Ohm Chip Resistor
- High Power Electrical Specifications

| Item    | Rated Power at 70 °C | Rated Voltage Range | Max Overload Voltage | T.C.R. (PPM/°C) | Resistance Range (m Ω) |
|---------|----------------------|---------------------|----------------------|-----------------|------------------------|
|         |                      |                     |                      |                 | F(±1%)、J(±5%)          |
| CRH0402 | 0.1W                 | 0.15 ~ 0.32 V       | 0.79 V               | ±1000           | 220 ≤ R ≤ 450          |
|         |                      |                     |                      | ±800            | 450 < R < 1000         |
| CRH0603 | 0.125W               | 0.10 ~ 0.35 V       | 0.88 V               | ±1000           | 75 ≤ R < 100           |
|         |                      |                     |                      | ±800            | 100 ≤ R ≤ 330          |
|         |                      |                     |                      | ±600            | 330 < R < 1000         |
| CRH0805 | 0.25W                | 0.05 ~ 0.50 V       | 1.25 V               | ±1800           | 10 ≤ R < 50            |
|         |                      |                     |                      | ±800            | 50 ≤ R < 100           |
|         |                      |                     |                      | ±600            | 100 ≤ R < 1000         |
| CRH1206 | 0.5W                 | 0.07 ~ 0.71 V       | 1.77 V               | ±1800           | 10 ≤ R < 50            |
|         |                      |                     |                      | ±800            | 50 ≤ R < 100           |
|         |                      |                     |                      | ±600            | 100 ≤ R < 1000         |
| CRH1210 | 0.66W                | 0.08 ~ 0.81 V       | 2.03 V               | ±1800           | 10 ≤ R < 50            |
|         |                      |                     |                      | ±800            | 50 ≤ R < 100           |
|         |                      |                     |                      | ±600            | 100 ≤ R < 1000         |
| CRH1812 | 1W                   | 0.10 ~ 1.00 V       | 2.50 V               | ±1800           | 10 ≤ R < 50            |
|         |                      |                     |                      | ±800            | 50 ≤ R < 100           |
|         |                      |                     |                      | ±600            | 100 ≤ R < 1000         |
| CRH2010 | 1W                   | 0.10 ~ 1.00 V       | 2.50 V               | ±1800           | 10 ≤ R < 50            |
|         |                      |                     |                      | ±800            | 50 ≤ R < 100           |
|         |                      |                     |                      | ±600            | 100 ≤ R < 1000         |
| CRH2512 | 2W                   | 0.14 ~ 1.41 V       | 3.54 V               | ±1800           | 10 ≤ R < 50            |
|         |                      |                     |                      | ±800            | 50 ≤ R < 100           |
|         |                      |                     |                      | ±600            | 100 ≤ R < 1000         |

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



# CRH Series Thick Film High Power Chip Resistor Product Specifications

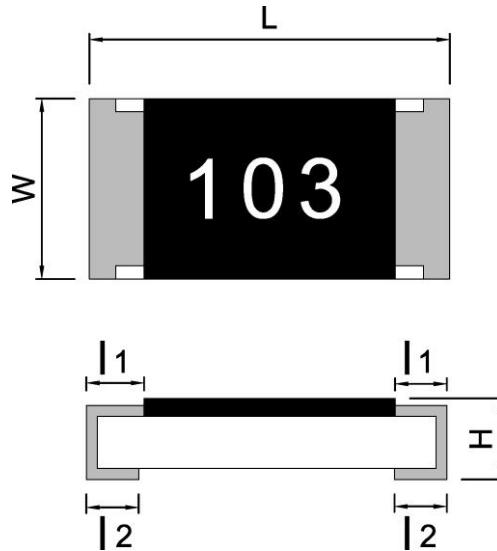
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- High Power High Ohm Chip Resistor
- High Power Electrical Specifications

| Item    | Rated Power at 70 °C | Max Working Voltage | Max Overload Voltage | T.C.R. (PPM/°C) | Resistance Range |         |       |       |
|---------|----------------------|---------------------|----------------------|-----------------|------------------|---------|-------|-------|
|         |                      |                     |                      |                 | F(±1%)           | J(±5%)  |       |       |
| CRH0402 | 0.1W                 | 50V                 | 100V                 | ±200            | 10.1 MΩ          | 10.1 MΩ |       |       |
| CRH0603 | 0.125 W              | 75V                 | 150V                 |                 |                  |         |       |       |
| CRH0805 | 0.25 W               | 150V                | 300V                 |                 |                  |         |       |       |
| CRH1206 | 0.5 W                | 200V                | 400V                 |                 |                  |         | ~     | ~     |
| CRH1210 | 0.66 W               |                     |                      |                 |                  |         | 30 MΩ | 30 MΩ |
| CRH2010 | 1 W                  |                     |                      |                 |                  |         |       |       |
| CRH2512 | 2 W                  |                     |                      |                 |                  |         |       |       |

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

■ **Type Dimension**

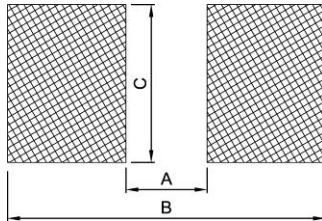


CRH0402 / CRH0603 / CRH0805 / CRH1206  
CRH1210 / CRH1812 / CRH2010 / CRH2512

| TYPE    | L           | W           | H           | l <sub>1</sub> | l <sub>2</sub> |
|---------|-------------|-------------|-------------|----------------|----------------|
| CRH0402 | 1.00 ± 0.10 | 0.50 ± 0.05 | 0.30 ± 0.05 | 0.15 ± 0.10    | 0.20 ± 0.10    |
| CRH0603 | 1.60 ± 0.20 | 0.80 ± 0.15 | 0.40 ± 0.10 | 0.30 ± 0.20    | 0.30 ± 0.10    |
| CRH0805 | 2.00 ± 0.20 | 1.25 ± 0.15 | 0.50 ± 0.15 | 0.30 ± 0.15    | 0.40 ± 0.15    |
| CRH1206 | 3.05 ± 0.10 | 1.60 ± 0.20 | 0.55 ± 0.15 | 0.40 ± 0.20    | 0.50 ± 0.20    |
| CRH1210 | 3.05 ± 0.10 | 2.50 ± 0.20 | 0.55 ± 0.15 | 0.50 ± 0.20    | 0.50 ± 0.20    |
| CRH1812 | 4.50 ± 0.10 | 3.10 ± 0.20 | 0.55 ± 0.05 | 0.55 ± 0.20    | 0.70 ± 0.20    |
| CRH2010 | 5.00 ± 0.20 | 2.50 ± 0.20 | 0.55 ± 0.10 | 0.60 ± 0.20    | 0.60 ± 0.20    |
| CRH2512 | 6.30 ± 0.20 | 3.20 ± 0.20 | 0.55 ± 0.10 | 0.60 ± 0.20    | 0.60 ± 0.20    |

## ● General Information

### ■ Recommend Land Pattern Design



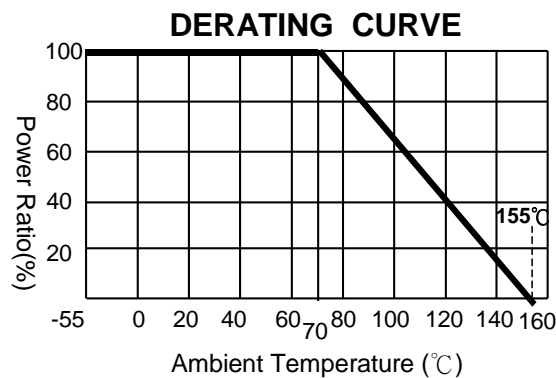
### ■ Dimension

Unit: mm

| Item \ Type | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 2010 | 2512 |
|-------------|------|------|------|------|------|------|------|------|
| A           | 0.60 | 0.80 | 1.30 | 2.20 | 2.00 | 3.11 | 3.80 | 4.90 |
| B           | 1.60 | 2.40 | 2.90 | 4.20 | 4.40 | 5.91 | 6.60 | 8.10 |
| C           | 0.70 | 1.00 | 1.40 | 1.70 | 2.70 | 3.00 | 2.70 | 3.40 |

## ■ 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( $\Omega$ )



# CRH Series Thick Film High Power Chip Resistor Product Specifications

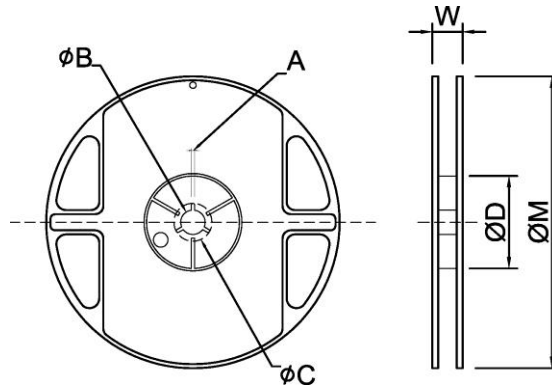
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## ● Reliability Test and Requirement

| 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 | High Power : 2.5 times RCWV or Max. Overload voltage whichever is less for 2 seconds.  | ±1 : ±(1.0%+0.05 Ω)<br>±5 : ±(2.0%+0.1 Ω)<br>Value <1Ω : ±(2.0%+0.1 Ω)                |
| IR Reflow                                     | Sony SS-00254            | <p>Peak : 250<sup>+5</sup> °C<br/>230°C or higher</p> <p>180°C --- Pre Heating Zone</p> <p>150°C --- 90 ± 30 s</p> <p>30 ± 10 s Soldering Zone</p> <p>Heating Time</p> | ±1 : ±(1.0%+0.05 Ω)<br>±5 : ±(1.0%+0.05 Ω)  |
| 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%+0.05 Ω)<br>±5 : ±(1.0%+0.05 Ω)<br>Value <1Ω : ±(1.0%+0.05 Ω)              |
| Temperature Cycling                           | JIS C 5201-1 clause 4.19 | -55°C to +155°C, 5 cycles  | 0.1%、0.5%、1% : ±(0.5%+0.05 Ω)<br>2%、5% : ±(1.0%+0.10 Ω)<br>Value <1Ω : ±(1.0%+0.10 Ω) |
| Electric Iron                                 | Sony SS-00254-5          | Preheating temperature : 350±10°C<br>Electric iron preheating time : 3+1/-0 sec  | ±1 : ±(1.0%+0.05 Ω)<br>±5 : ±(1.0%+0.05 Ω)<br>Value <1Ω : ±(1.0%+0.05 Ω)              |
| 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.<br>Then the resistor is left in the room for 48 hrs.                                    | ±1 : ±(0.5%+0.05 Ω)<br>±5 : ±(0.5%+0.05 Ω)<br>Value <1Ω : ±(1.0%+0.05 Ω)              |
| 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%+0.05 Ω)<br>2%、5% : ±(2.0%+0.05 Ω)<br>Value <1Ω : ±(2.0%+0.05 Ω) |
| 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%+0.05 Ω)<br>2%、5% : ±(3.0%+0.10 Ω)<br>Value <1Ω : ±(3.0%+0.10 Ω) |
| Insulation Resistance                         | JIS C 5201-1 clause 4.6  | 100V for 1 minute.   | ≥ 10G Ω   |
| 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>2010、2512=2mm  | ±1 : ±(1.0%+0.05 Ω)<br>±5 : ±(1.0%+0.05 Ω)  |
| Solderability                                 | JIS C 5201-1 clause 4.17 | 245±5°C for 2±0.5secs  | >95% coverage   |

## ■ Appendix For SMD Chip Resistor

### ● Packaging Information



### ■ Dimension

Unit: mm

| TYPE                | SIZE | A            | φB      | φC       | φD     | W       | φM      |
|---------------------|------|--------------|---------|----------|--------|---------|---------|
| 0402                | 7"   | 10K/Reel     | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 60±1.0  | 178±2.0 |
|                     | 13"  | 40K/50K Reel | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 100±1.0 | 330±2.0 |
| 0603/0805/1206/1210 | 7"   | 5K/Reel      | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 60±1.0  | 178±2.0 |
| 0603/0805<br>/1206  | 10"  | 10K/Reel     | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 100±1.0 | 254±2.0 |
|                     | 13"  | 20K/Reel     | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 100±1.0 | 330±2.0 |
| 2010/2512/1812      | 7"   | 4K/Reel      | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 60±1.0  | 178±2.0 |

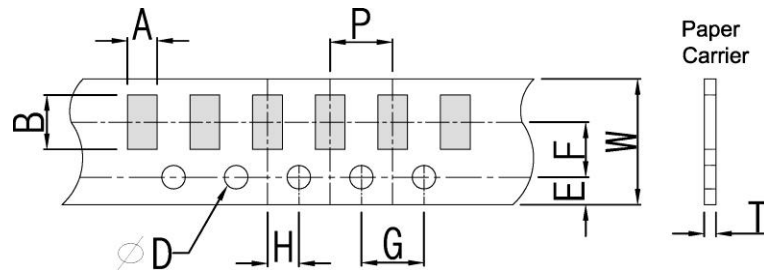




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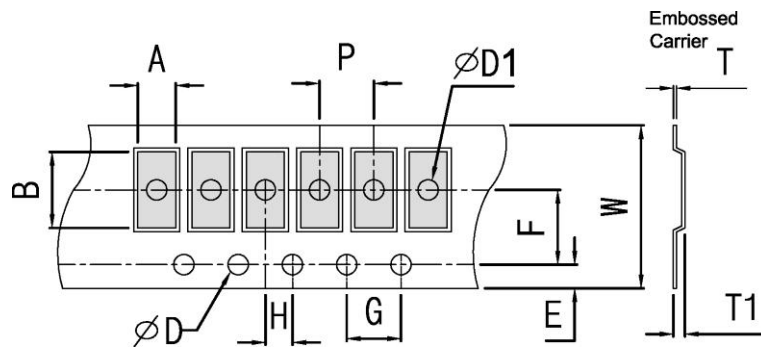
## ■ Tapping Specification



## ■ Dimension

Unit: mm

| Packaging  | Type | A        | B        | W       | E        | F        | G       | H        | T        | $\phi D$                            | P       |
|------------|------|----------|----------|---------|----------|----------|---------|----------|----------|-------------------------------------|---------|
| Paper Type | 0402 | 0.70±0.1 | 1.20±0.1 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 0.45±0.1 | 1.50 <sup>+0.10</sup> <sub>-0</sub> | 2.0±0.1 |
|            | 0603 | 1.05±0.2 | 1.80±0.2 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 0.60±0.1 |                                     | 4.0±0.1 |
|            | 0805 | 1.55±0.2 | 2.30±0.2 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 0.75±0.1 |                                     | 4.0±0.1 |
|            | 1206 | 1.90±0.2 | 3.50±0.2 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 0.75±0.1 |                                     | 4.0±0.1 |
|            | 1210 | 2.85±0.2 | 3.50±0.2 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 0.75±0.1 |                                     | 4.0±0.1 |



## ■ 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 <sup>+0.10</sup> <sub>-0</sub> | 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 |         |

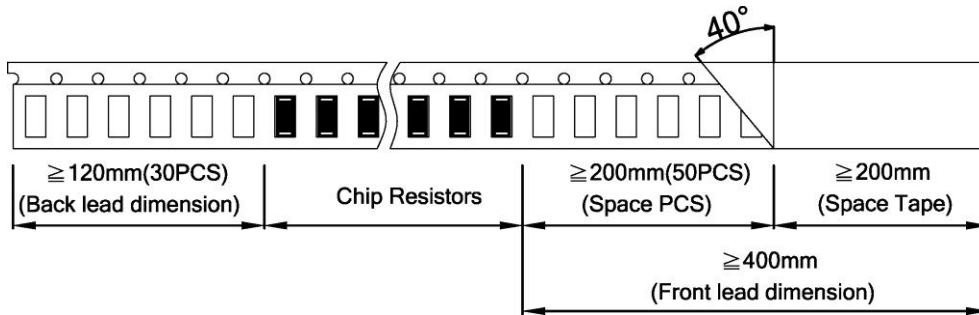


# CRH Series Thick Film High Power Chip Resistor Product Specifications

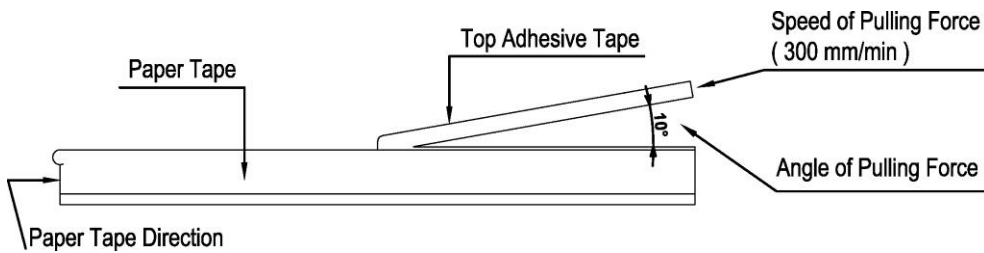
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## ■ Packing Material Data/Storage Data

### ■ Front & Back Lead Dimension

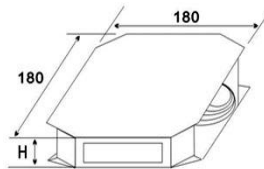


### ■ Top Adhesive Peel Off Strength : 10~70g

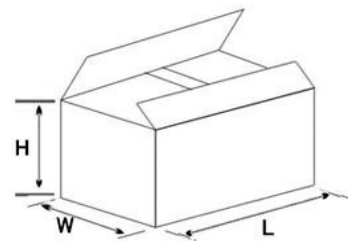


### ■ Package

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



# CRH Series Thick Film High Power Chip Resistor Product Specifications

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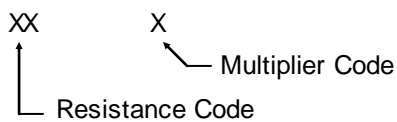
## ■ Product Testing Method:

Our products are tested with our company's tapping & testing equipments by using four-foot probe to touch at the back of both electrodes. Supposed different testing points or methods are requested, please advise beforehand and customized-made production is available.

## ■ 0603 E-96 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> |

CODING FORMULA



Example:  $10.2K\Omega = \underline{102} \times \underline{10^2}\Omega = 02C$

$33.2\Omega = \underline{332} \times \underline{10^{-1}}\Omega = 51X$

## ■ 0603 Standard E-96 Values and 0603 Resistance Codes

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



# CRH Series Thick Film High Power Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-16-03 |
| Released Date | 2019/08/22    |
| Page No.      | 12/12         |

## ■ 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.
- Note: jumper zero ohm resistor marking code is one 「0」 (except type below 0402).

| 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 |     | <b>E24</b> | <b>E12</b> | <b>E6</b> | <b>E3</b> |
| 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  |     |     |            |            |           |           |

According to IEC publication 63

单击下面可查看定价，库存，交付和生命周期等信息

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