



# 后芮驷(上海)电子有限公司

Horus International Electronics Co., LTD.

## 承认书

### SPECIFICATION FOR APPROVAL

编号:

|      |               |                       |
|------|---------------|-----------------------|
| 品名   | DESCRIPTION:  | 晶片保险丝电阻               |
| 规格   | SPEC :        | HRS-FCRXXXXXXXXXXXXXX |
| 包装   | PACKAGE:      | 卷装                    |
| 客户   | CUSTOMER:     |                       |
| 客户料号 | CUSTOMER P/N: |                       |

| APPROVED BY |                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------|
| CUSTOMER    | <div><br/>HORUS</div> |



## FCR-Series Fusible Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 1/10          |

### ■ Fusible Chip Resistor — FCR Series



#### ■ Application

- The accurate fusibility is applicable to safety circuits in the wide range of electronic sets.
- Small in size, light in weight.
- Low temperature coefficient. (under  $\pm 600$  PPM/ $^{\circ}\text{C}$ )
- Treat as the general resistance use.

#### ■ Features

- Small size and light weight
- Reliability, high quality
- RoHS compliant and Halogen free products

#### ■ Parts Number Explanation

##### ■ Example:

| FCR          | 2512                                                 | J                              | 100R                                        | E                                                                                    | 04                                            | Z                                                         |
|--------------|------------------------------------------------------|--------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|
| Product Type | Size (Inch)                                          | Resistor Tolerance             | Resistor Value                              | Package                                                                              | Quantity                                      | Optional                                                  |
| FCR          | 0402<br>0603<br>0805<br>1206<br>1210<br>2010<br>2512 | F : $\pm 1\%$<br>J : $\pm 5\%$ | 1R=1R00<br>10R=10R0<br>100R=100R<br>1K=1K00 | P : Paper Taping<br>(0603~1210)<br>Q : Paper Taping<br>(0402)<br>E : Embossed Taping | 04 : 4000PCS<br>05 : 5000PCS<br>10 : 10000PCS | Z : Default<br><br>G : 2512=1W<br>2010=0.75W<br>1210=0.5W |



## FCR-Series Fusible Chip Resistor Product Specifications

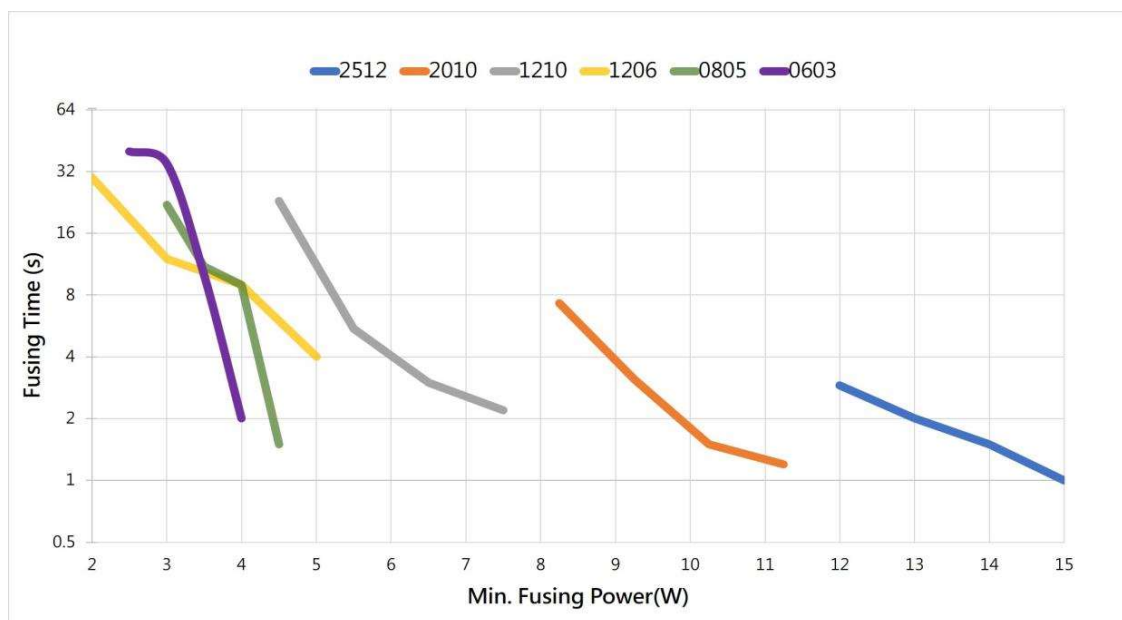
|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 2/10          |

### Standard Electrical Specifications

| Type\Item | Rated Power<br>at 70℃ | Max Hold-Off<br>Voltage | Fusing Time &<br>Min. Fusing Power | Resistance Range                   | T.C.R.<br>(PPM/℃)             | Standard Tolerance (%) |
|-----------|-----------------------|-------------------------|------------------------------------|------------------------------------|-------------------------------|------------------------|
| FCR0402   | 0.063W                | 50V                     | < 30 sec at 2.5W                   | $1\Omega \leq R < 48\Omega$        | ±600PPM                       | ±1%,±5%                |
|           |                       |                         |                                    | $48\Omega \leq R < 471\Omega$      | ±400PPM                       |                        |
|           |                       |                         |                                    | $471\Omega \leq R \leq 1K\Omega$   | ±200PPM                       |                        |
| FCR0603   | 0.1W                  | 100V                    | < 30 sec at 3W                     | $1\Omega \leq R < 48\Omega$        | ±600PPM                       |                        |
|           |                       |                         |                                    | $48\Omega \leq R < 471\Omega$      | ±400PPM                       |                        |
|           |                       |                         |                                    | $471\Omega \leq R \leq 1.8K\Omega$ | ±200PPM                       |                        |
| FCR0805   | 0.125W                | 150V                    | < 30 sec at 3.25W                  | $1\Omega \leq R < 48\Omega$        | ±600PPM                       |                        |
|           |                       |                         |                                    | $48\Omega \leq R < 471\Omega$      | ±400PPM                       |                        |
|           |                       |                         |                                    | $471\Omega \leq R \leq 1.8K\Omega$ | ±200PPM                       |                        |
| FCR1206   | 0.25W                 | 200V                    | < 30 sec at 5W                     | $0R47\Omega \leq R < 1\Omega$      | ±800PPM                       |                        |
|           |                       |                         |                                    | $1\Omega \leq R < 48\Omega$        | ±600PPM                       |                        |
|           |                       |                         |                                    | $48\Omega \leq R < 471\Omega$      | ±400PPM                       |                        |
|           |                       |                         |                                    | $471\Omega \leq R \leq 1.8K\Omega$ | ±200PPM                       |                        |
| FCR1210   | 0.33W                 | 250V                    | < 30 sec at 7.5W                   | $1\Omega \leq R < 48\Omega$        | ±600PPM                       |                        |
|           | 0.5W                  |                         |                                    | $48\Omega \leq R < 471\Omega$      | ±400PPM                       |                        |
| FCR2010   | 0.5W                  | 300V                    | < 30 sec at 11.25W                 | $471\Omega \leq R \leq 1.8K\Omega$ | ±200PPM                       |                        |
|           | 0.75W                 |                         |                                    | $1\Omega \leq R < 48\Omega$        | ±600PPM                       |                        |
|           |                       |                         |                                    |                                    | $48\Omega \leq R < 471\Omega$ |                        |
| FCR2512   | 0.75W                 | 400V                    | < 30 sec at 15W                    | $471\Omega \leq R \leq 1.8K\Omega$ | ±200PPM                       |                        |
|           | 1W                    |                         |                                    | $1\Omega \leq R < 48\Omega$        | ±600PPM                       |                        |
|           |                       |                         |                                    |                                    | $48\Omega \leq R < 471\Omega$ |                        |

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

### Example of Fusing Characteristics

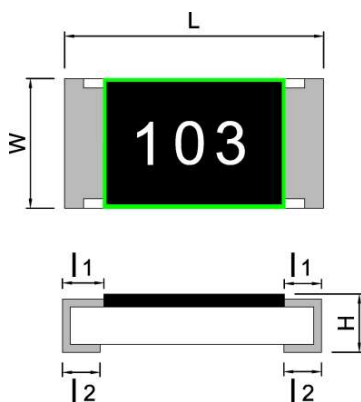




## FCR-Series Fusible Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 3/10          |

### ■ Type Dimension



### ■ Dimension

Unit: mm

| TYPE    | L           | W           | H           | l <sub>1</sub> | l <sub>2</sub> |
|---------|-------------|-------------|-------------|----------------|----------------|
| FCR0402 | 1.00 ± 0.05 | 0.50 ± 0.05 | 0.30 ± 0.05 | 0.15 ± 0.10    | 0.20 ± 0.10    |
| FCR0603 | 1.60 ± 0.10 | 0.80 ± 0.10 | 0.40 ± 0.10 | 0.30 ± 0.20    | 0.30 ± 0.10    |
| FCR0805 | 2.00 ± 0.10 | 1.25 ± 0.10 | 0.50 ± 0.15 | 0.30 ± 0.15    | 0.40 ± 0.15    |
| FCR1206 | 3.05 ± 0.10 | 1.60 ± 0.10 | 0.55 ± 0.15 | 0.40 ± 0.20    | 0.50 ± 0.20    |
| FCR1210 | 3.05 ± 0.10 | 2.50 ± 0.15 | 0.55 ± 0.15 | 0.50 ± 0.20    | 0.50 ± 0.20    |
| FCR2010 | 5.00 ± 0.20 | 2.50 ± 0.15 | 0.55 ± 0.10 | 0.60 ± 0.20    | 0.60 ± 0.20    |
| FCR2512 | 6.30 ± 0.20 | 3.20 ± 0.15 | 0.55 ± 0.10 | 0.60 ± 0.20    | 0.60 ± 0.20    |

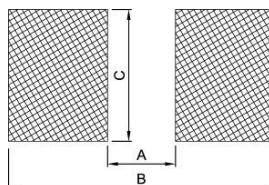


# FCR-Series Fusible Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 4/10          |

## ● General Information

### ■ Recommend Land Pattern Design



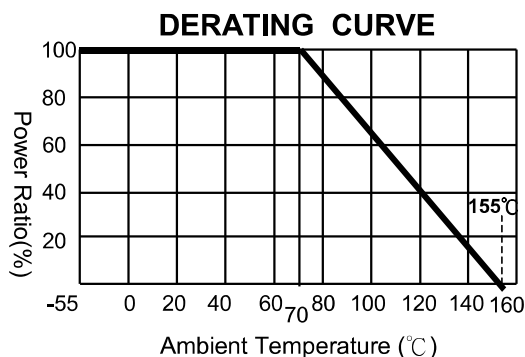
### ■ Dimension

Unit: mm

| Item \ Type | 0402 | 0603 | 0805 | 1206 | 1210 | 2010 | 2512 |
|-------------|------|------|------|------|------|------|------|
| A           | 0.60 | 0.80 | 1.30 | 2.20 | 2.00 | 3.80 | 4.90 |
| B           | 1.60 | 2.40 | 2.90 | 4.20 | 4.40 | 6.60 | 8.10 |
| C           | 0.70 | 1.00 | 1.45 | 1.80 | 2.70 | 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( $\Omega$ )



## FCR-Series Fusible Chip Resistor Product Specifications

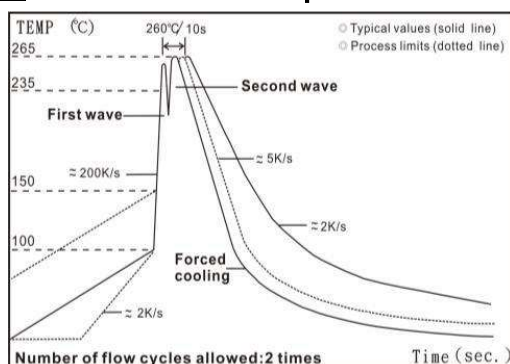
|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 5/10          |

### ● Reliability Test and Requirement

| 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°C / -55°C and 25°C / +155°C, 25°C is the reference temperature                                                                | As Spec                                                                                                                  |
| 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.                                                            | 1% and below : $\pm(1.0\%+0.05\Omega)$<br>2%、5% : $\pm(2.0\%+0.10\Omega)$                                                |
| Leaching                                      | JIS-C-5201-1 4.18<br>IEC-60068-2-58 8.2.1 | 260 $\pm$ 5°C for 30 seconds.                                                                                                       | Individual leaching area $\leq$ 5%<br>Total leaching area $\leq$ 10%                                                     |
| Resistance to Soldering Heat                  | JIS-C-5201-1 4.18<br>IEC-60115-1 4.18     | 260 $\pm$ 5°C for 10 seconds.                                                                                                       | 1% and below : $\pm(0.5\%+0.05\Omega)$<br>2%、5% : $\pm(1.0\%+0.05\Omega)$                                                |
| Rapid Change of Temperature                   | JIS-C-5201-1 4.19<br>IEC-60115-1 4.19     | -55°C to +155°C, 5 cycles                                                                                                           | 1% and below : $\pm(0.5\%+0.05\Omega)$<br>2%、5% : $\pm(1.0\%+0.10\Omega)$                                                |
| 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. | 1% and below : $\pm(0.5\%+0.05\Omega)$<br>2%、5% : $\pm(0.5\%+0.05\Omega)$                                                |
| Damp Heat with Load                           | JIS-C-5201-1 4.24<br>IEC-60115-1 4.24     | 40 $\pm$ 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 hrs "OFF".          | 1% and below : $\pm(1.0\%+0.05\Omega)$<br>2%、5% : $\pm(2.0\%+0.05\Omega)$<br>Value <1 $\Omega$ : $\pm(2.0\%+0.05\Omega)$ |
| Load Life (Endurance)                         | JIS-C-5201-1 4.25<br>IEC-60115-1 4.25.1   | 70 $\pm$ 2°C, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF".                       | 1% and below : $\pm(1.0\%+0.05\Omega)$<br>2%、5% : $\pm(3.0\%+0.10\Omega)$<br>Value <1 $\Omega$ : $\pm(3.0\%+0.10\Omega)$ |
| Insulation Resistance                         | JJIS-C-5201-1 4.6<br>IEC-60115-1 4.6      | Apply 100VDC for 1 minute.                                                                                                          | $\geq$ 10G $\Omega$                                                                                                      |
| Bending Strength                              | JIS-C-5201-1 4.33<br>IEC-60115-1 4.33     | Bending once for 5 seconds<br>D : 0402、0603、0805=5mm<br>1206、1210、1812=3mm<br>2010、2512、2030=2mm                                    | 1% and below : $\pm(1.0\%+0.05\Omega)$<br>2%、5% : $\pm(1.0\%+0.05\Omega)$                                                |

### ■ Recommended Customer Soldering Parameters

#### ■ Wave solder Temperature condition

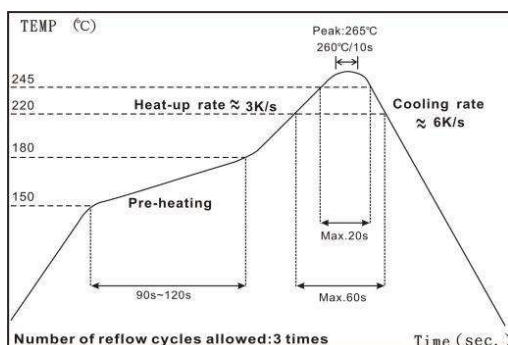




## FCR-Series Fusible Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 6/10          |

### ■ Solder reflow Temperature condition



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

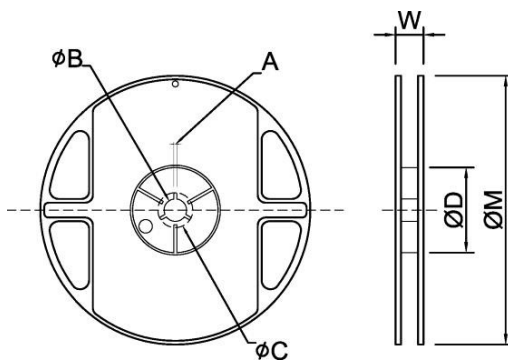
### ■ Recommended reflow methods

IR, vapor phase oven, hot air oven

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

## ■ Appendix For SMD Chip Resistor

### ● Packaging Information



### ■ Dimension

Unit: mm

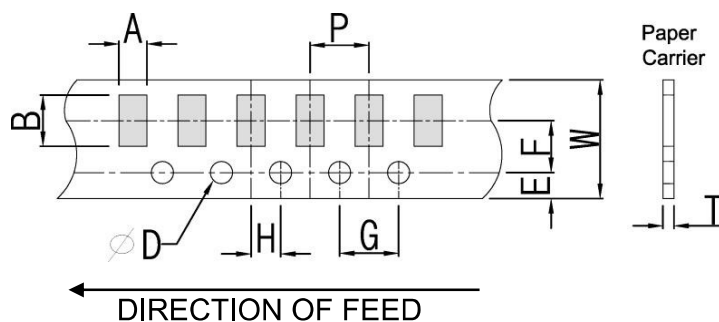
| TYPE                    | SIZE |              | A       | ∅B       | ∅C     | ∅D      | W        | ∅M      |
|-------------------------|------|--------------|---------|----------|--------|---------|----------|---------|
| 0402                    | 7"   | 10K/Reel     | 2.0±0.5 | 13.5±1.0 | 21±1.0 | 60±1.0  | 11.5±2.0 | 178±2.0 |
|                         | 13"  | 40K/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/<br>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<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 |
| 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 |



# FCR-Series Fusible Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 7/10          |

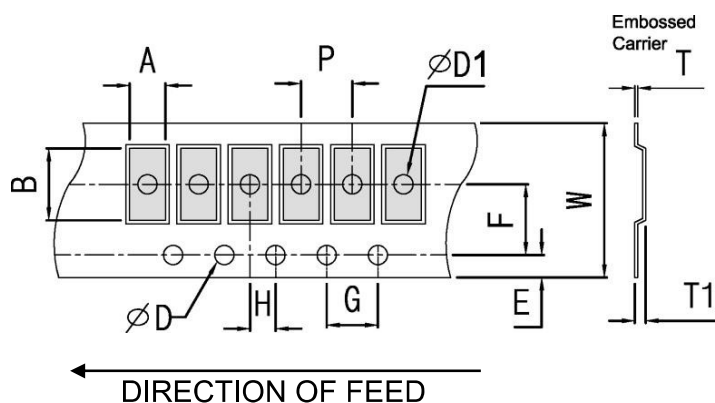
## ■ Tapping Specification



## ■ Dimension

| 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 |                                     |         |
|            | 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 |                                     |         |
|            | 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 |                                     |         |

Unit: mm



## ■ Dimension

Unit: mm

| Packaging     | Type | A         | B         | W       | E         | F        | G        | H        | T         | $\phi D$                            | $\phi D1$ | 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 |         |

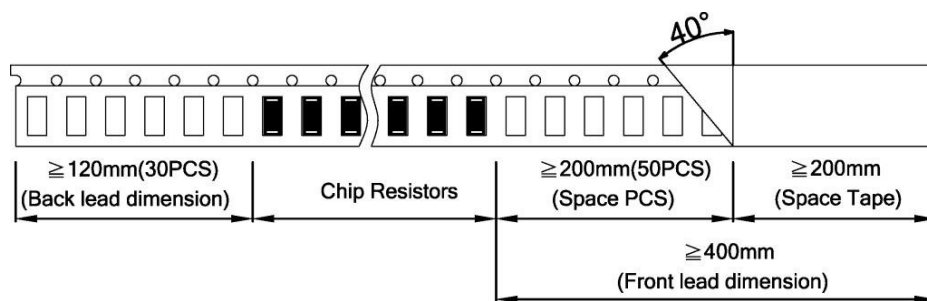


# FCR-Series Fusible Chip Resistor Product Specifications

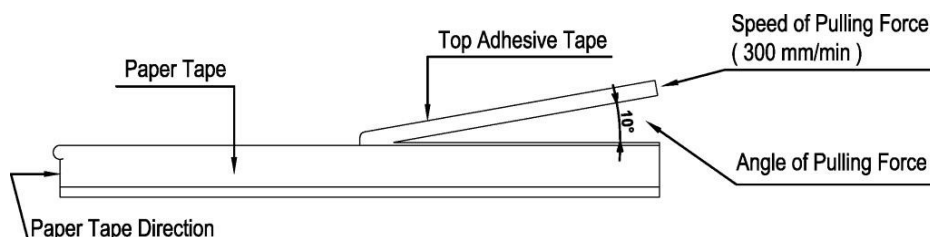
|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 8/10          |

## ■ Packing Material Data/Storage Data

### ■ Front & Back Lead Dimension

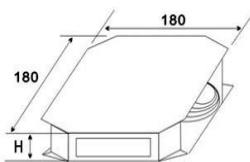


### ■ Top Adhesive Peel Off Strength : 10~70g

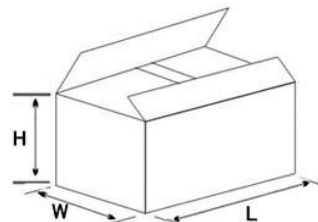


### ■ Package

| 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.



## FCR-Series Fusible Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 9/10          |

### ■ Equipments Applicable:

Our company's products are produced under low temperature processing applicable to IR reflow surface mounting devices. It is comparatively not applicable to wave soldering which will possibly cause the risk ablating the element protection layer and the front conductor and cause the drift of the resistance value and ablation of the markings.

### ■ Product Testing Method:

Our products are tested with our company's tapping & testing equipments by using four-feet 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 | $10^0$ | $10^1$ | $10^2$ | $10^3$ | $10^4$ | $10^5$ | $10^6$ | $10^7$ | $10^{-1}$ | $10^{-2}$ | $10^{-3}$ |

CODING FORMULA

$\begin{array}{c} \text{XX} \\ \uparrow \\ \text{Resistance Code} \end{array}$ 
 $\begin{array}{c} \text{X} \\ \nwarrow \\ \text{Multiplier Code} \end{array}$

Example:  $10.2\text{K}\Omega = \underline{102} \times \underline{10^2}\Omega = 02\text{C}$   
 $33.2\Omega = \underline{332} \times \underline{10^{-1}}\Omega = 51\text{X}$

### ■ 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  |



## FCR-Series Fusible Chip Resistor Product Specifications

|               |               |
|---------------|---------------|
| Document No.  | S-10-12-23-09 |
| Released Date | 2021/11/19    |
| Page No.      | 10/10         |

### ■ 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).**

| E96 | E48 | E96 | E48 | E96 | E48 | E96 | E48 | E96 | E48 |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 100 | 100 | 169 | 169 | 287 | 287 | 487 | 487 | 825 | 825 |    |    |
| 102 |     | 174 |     | 294 |     | 499 |     | 845 |     |    |    |
| 105 | 105 | 178 | 178 | 301 | 301 | 511 | 511 | 866 | 866 |    |    |
| 107 |     | 182 |     | 309 |     | 523 |     | 887 |     |    |    |
| 110 | 110 | 187 | 187 | 316 | 316 | 536 | 536 | 909 | 909 |    |    |
| 113 |     | 191 |     | 324 |     | 549 |     | 931 |     |    |    |
| 115 | 115 | 196 | 196 | 332 | 332 | 562 | 562 | 953 | 953 |    |    |
| 118 |     | 200 |     | 340 |     | 576 |     | 976 |     |    |    |
| 121 | 121 | 205 | 205 | 348 | 348 | 590 | 590 |     |     |    |    |
| 124 |     | 210 |     | 357 |     | 604 |     | E24 | E12 | E6 | E3 |
| 127 | 127 | 215 | 215 | 365 | 365 | 619 | 619 | 10  | 10  | 10 | 10 |
| 130 |     | 221 |     | 374 |     | 634 |     | 11  | 12  |    |    |
| 133 | 133 | 226 | 226 | 383 | 383 | 649 | 649 | 12  | 13  |    |    |
| 137 |     | 232 |     | 392 |     | 665 |     | 15  | 15  | 15 |    |
| 140 | 140 | 237 | 237 | 402 | 402 | 681 | 681 | 16  | 18  |    |    |
| 143 |     | 243 |     | 412 |     | 698 |     | 18  | 20  |    |    |
| 147 | 147 | 249 | 249 | 422 | 422 | 715 | 715 | 22  | 22  | 22 | 22 |
| 150 |     | 255 |     | 432 |     | 732 |     | 24  | 27  |    |    |
| 154 | 154 | 261 | 261 | 442 | 442 | 750 | 750 | 27  | 30  |    |    |
| 158 |     | 267 |     | 453 |     | 768 |     | 33  | 33  | 33 |    |
| 162 | 162 | 274 | 274 | 464 | 464 | 787 | 787 | 36  | 39  |    |    |
| 165 |     | 280 |     | 475 |     | 806 |     | 39  | 43  |    |    |
|     |     |     |     |     |     |     |     | 47  | 47  | 47 | 47 |
|     |     |     |     |     |     |     |     | 51  | 56  |    |    |
|     |     |     |     |     |     |     |     | 56  | 62  |    |    |
|     |     |     |     |     |     |     |     | 68  | 68  | 68 |    |
|     |     |     |     |     |     |     |     | 75  | 82  |    |    |
|     |     |     |     |     |     |     |     | 82  |     |    |    |
|     |     |     |     |     |     |     |     | 91  |     |    |    |

According to IEC publication 63