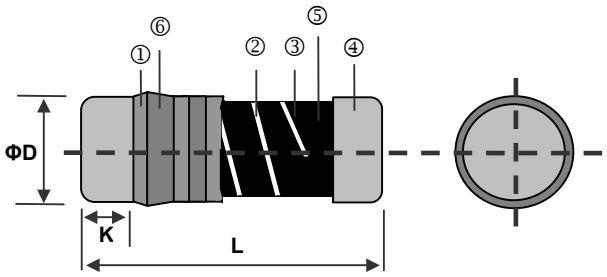
# Metal Film Precision Resistor－CSR Series



## ■Construction




| | | | |
|---|---|---|---|
| ① | Insulation Coating | ④ | Electrode Cap |
| ② | Trimming Line | ⑤ | Resistor Layer |
| ③ | Ceramic Rod | ⑥ | Marking |

## ■Features

－Excellent overall stability
－Tight tolerance down to ±0.1%
－Extremely low TCR down to ±10 PPM/°C
－High power rating up to 1 Watts

## ■Applications

－Telecommunication
－Medical Equipment
－Measurement/Testing Equipment

## ■Dimensions

Unit: mm

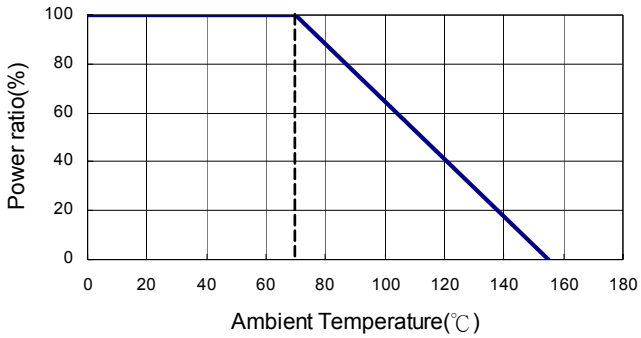
| Type | L | ΦD | K min. | Weight (g) (1000pcs) | Packaging 180mm (7") |
|---|---|---|---|---|---|
| CSR0102 | 2.00±0.10 | 1.30±0.05 | 0.5 | 7.2 | 3,000EA |
| CSR0204 | 3.50±0.20 | 1.40±0.15 | 0.5 | 18.7 | 3,000EA |
| CSR0207 | 5.90±0.20 | 2.20±0.20 | 0.5 | 80.9 | 2,000EA |

## ■Part Numbering

| CSR | 0204 | D | T | D | V | 1000 |
|---|---|---|---|---|---|---|
| Product Type | Dimensions (L×ΦD) | Resistance Tolerance | Packaging Code | TCR (PPM/°C) | Power Rating | Resistance |
| | 0102: 2.0x1.3<br>0204: 3.5x1.4<br>0207: 5.9x2.2 | B: ±0.1%<br>C: ±0.25%<br>D: ±0.5%<br>F: ±1%<br>J: ±5% | T: Taping Reel<br>B: Bulk | B: ±10<br>N: ±15<br>C: ±25<br>D: ±50<br>E: ±100<br>- : No Specified | T: 1W<br>U: 1/2W<br>V: 1/4W<br>W: 1/8W<br>P: 1/5W<br>G: 2/5W | 0100: 10Ω<br>1000: 100Ω<br>2201: 2200Ω<br>1001: 1KΩ<br>1004: 1MΩ<br>R0R0: 0Ω<br>R050: 0.05Ω<br>R100: 0.1Ω |

** Letter "R" is a decimal point.

## ■Derating Curve



## ■Standard Electrical Specifications

| Item / Type | Power Rating at 70˚C | Operating Temp. Range | Max. Operating Voltage | Max. Overload Voltage | Resistance Range | | | | | TCR (PPM/˚C) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ±0.1% | ±0.25% | ±0.5% | ±1% | ±5% | |
| 0102 | 1/8W | -55 ~ +155°C | 150V | 300V | 100Ω-56KΩ | | | | | ±15 |
| | | | | | 100Ω-100KΩ | | | | | ±25 |
| | | | | | - | | 1Ω-1MΩ | | | ±50 |
| | | | | | - | | | 0.22Ω-2MΩ | | ±100 |
| 0204 | 1/4W | -55 ~ +155°C | 200V | 400V | 10Ω-20KΩ | | | | | ±10 |
| | | | | | 10Ω-300KΩ | | | | | ±15 |
| | | | | | 10Ω-1MΩ | | | 10Ω-4.7MΩ | | ±25 |
| | | | | | 10Ω-1MΩ | 1Ω-1MΩ | | 0.2Ω-10MΩ | | ±50 |
| | | | | | - | | | 0.1Ω-10MΩ | | ±100 |
| | Jumper: 2A | | | | 0Ω(<15mΩ) | | | | | - |
| 0207 | 1/2W | -55 ~ +155°C | 300V | 500V | 10Ω-20KΩ | | | | | ±10 |
| | | | | | 10Ω-300KΩ | | | | | ±15 |
| | | | | | 10Ω-1MΩ | | | 10Ω-4.7MΩ | | ±25 |
| | | | | | 10Ω-1MΩ | 1Ω-1MΩ | | 0.2Ω-10MΩ | | ±50 |
| | | | | | - | | | 0.1Ω-10MΩ | | ±100 |
| | Jumper: 4A | | | | 0Ω(<15mΩ) | | | | | - |

## ■High Power Rating Electrical Specifications

| Item / Type | Power Rating at 70°C | Operating Temp. Range | Max. Operating Voltage | Max. Overload Voltage | Resistance Range | | | | | TCR (PPM/°C) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ±0.1% | ±0.25% | ±0.5% | ±1% | ±5% | |
| 0102 | 1/5W | -55 ~ +155°C | 200V | 400V | 100Ω-56KΩ | | | | | ±15 |
| | | | | | 100Ω-100KΩ | | | | | ±25 |
| | | | | | - | | 1Ω-1MΩ | | | ±50 |
| | | | | | - | | | | 0.5Ω-2MΩ | ±100 |
| 0204 | 2/5W | -55 ~ +155°C | 200V | 400V | 10Ω-100KΩ | | | | | ±15 |
| | | | | | 10Ω-1MΩ | | | | | ±25 |
| | | | | | 10Ω-1MΩ | 1Ω-1MΩ | | 0.2Ω-1MΩ | | ±50 |
| | | | | | - | | | 0.1Ω-1MΩ | | ±100 |
| 0207 | 1W | -55 ~ +155°C | 350V | 700V | 10Ω-100KΩ | | | | | ±15 |
| | | | | | 10Ω-1MΩ | | | | | ±25 |
| | | | | | 10Ω-1MΩ | 1Ω-1MΩ | | 0.2Ω-10MΩ | | ±50 |
| | | | | | - | | | 0.1Ω-10MΩ | | ±100 |

## ■Environmental Characteristics

| Item | Requirement | Test Method |
|---|---|---|
| Temperature Coefficient of Resistance (T.C.R.) | As Spec. | -55°C~+125°C, 25°C is the reference temperature |
| Short Time Overload | 0204/0207: ±(0.15%+0.05Ω)<br>0102: ±(0.5%+0.05Ω) | RCWV*2.5 or Max. overload voltage for 5 seconds |
| Insulation Resistance | ≥10G | Max. overload voltage for 1 minute |
| Endurance | 0204/0207: ±(0.5%+0.05Ω)<br>0102: ±(1.5%+0.05Ω) | 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF” |

| Item | Requirement | Test Method |
|---|---|---|
| Damp Heat with Load | 0204/0207: ±(1.0%+0.05Ω)<br>0102: ±(1.5%+0.05Ω) | 40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF” |
| Dry Heat | 0204/0207: ±(1.0%+0.05Ω)<br>0102: ±(1.5%+0.05Ω) | at +155°C for 1000 hrs |
| Bending Strength | ±(0.5%+0.05Ω) | Bending once for 5 seconds with 2mm |
| Solderability | 95% min. coverage | 245±5°C for 3 seconds |
| Resistance to Soldering Heat | ±(0.5%+0.05Ω) | 260±5°C for 10 seconds |
| Voltage Proof | No breakdown or flashover | 1.42 times RCWV (RMS) for 1 minute |
| Leaching | Individual leaching area ≦5%<br>Total leaching area ≦ 10% | 260±5°C for 30 seconds |
| Rapid Change of Temperature | ±(0.5%+0.05Ω) | -55°C to +125°C, 5 cycles |

■ **Reference Standards: IEC 60115-1 ; JIS-C 5201-1**

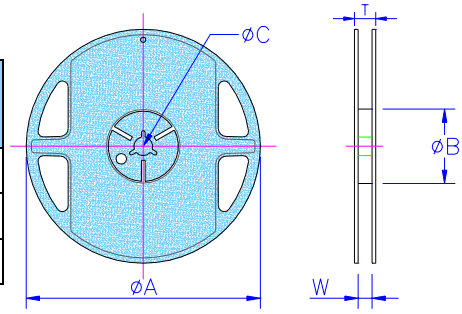
■ **Storage Temperature: 25±3°C; Humidity < 80%RH**

## ■Packaging

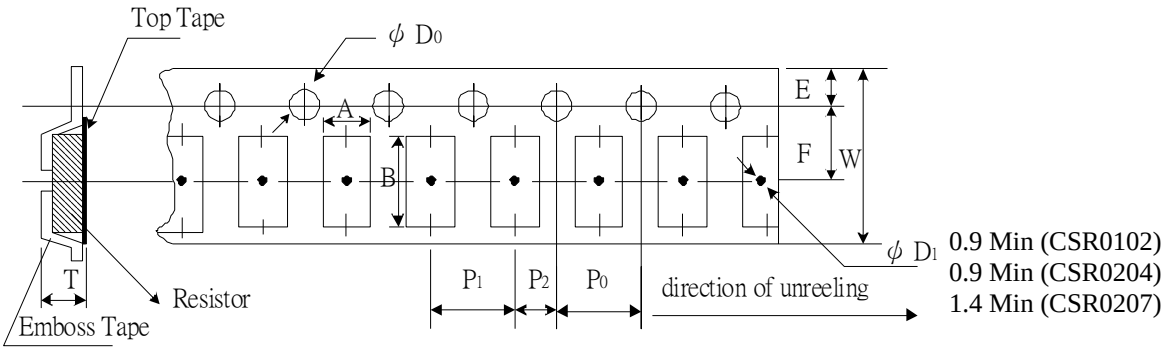
Packaging Quantity & Reel Specifications

Unit :mm

| Type | ΦA | ΦB | ΦC | W | T | Emboss Plastic Tape (EA) |
|---|---|---|---|---|---|---|
| CSR0102 | 178.5±1.5 | 60.0+1.0 | 13.0±0.2 | 9.0±0.5 | 12.5±0.5 | 3,000 |
| CSR0204 | 178.5±1.5 | 60.0+1.0 | 13.0±0.2 | 9.0±0.5 | 12.5±0.5 | 3,000 |
| CSR0207 | 178.5±1.5 | 60.0+1.0 | 13.0±0.5 | 13.0±0.5 | 15.5±0.5 | 2,000 |




Emboss Plastic Tape Specifications




Unit: mm

| Type | A | B | W | E | F | $P_0$ | $P_1$ | $P_2$ | $ΦD_0$ | T |
|---|---|---|---|---|---|---|---|---|---|---|
| CSR0102 | 1.45±0.10 | 2.25±0.10 | 8.0±0.10 | 1.75±0.10 | 3.50±0.05 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10 | 1.70±0.10 |
| CSR0204 | 1.60±0.10 | 3.70±0.10 | 8.0±0.10 | 1.75±0.10 | 3.50±0.05 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10 | 1.87±0.10 |
| CSR0207 | 2.40±0.10 | 6.05±0.10 | 12.0±0.10 | 1.75±0.10 | 5.50±0.05 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10 | 2.80±0.10 |

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ARG03BTC2741 ARG03FTC2551 AR05BTCW2003 AR06CTC8202 ARG06BTC0200 ARG06DTC6803
ARG06FTC0100 ARG02BTC2741 ARG03BTC5491 ARG03FTC0470 ARG03FTC3163 ARG06DTC2201
ARG06FTC1003 ARG06FTC1503 LR12FTDS1M50 ARG03BTC5601 ARG03FTC1502 ARG05BTC2R40