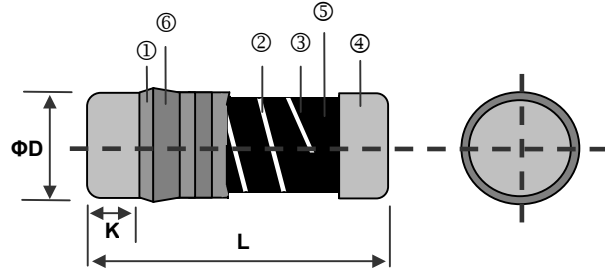


Metal Film Precision Resistor – CSR Series

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 $\pm 0.1\%$
- Extremely low TCR down to ± 10 PPM/ $^{\circ}\text{C}$
- High power rating up to 1 Watts

Applications

- Telecommunication
- Medical Equipment
- Measurement/Testing Equipment

Dimensions

Unit: mm

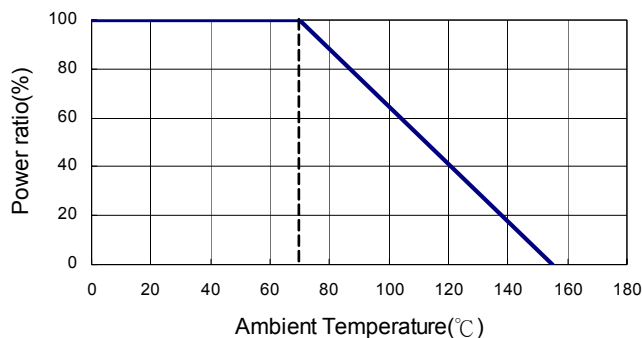
Type	L	ΦD	K min.	Weight (g) (1000pcs)	Packaging
					180mm (7")
CSR0102	2.00 \pm 0.10	1.30 \pm 0.05	0.5	7.2	3,000EA
CSR0204	3.50 \pm 0.20	1.40 \pm 0.15	0.5	18.7	3,000EA
CSR0207	5.90 \pm 0.20	2.20 \pm 0.20	0.5	80.9	2,000EA

Part Numbering

CSR	0204	D	T	D	V	1000
Product Type	Dimensions (L \times ΦD)	Resistance Tolerance	Packaging Code	TCR (PPM/ $^{\circ}\text{C}$)	Power Rating	Resistance
	0102: 2.0 \times 1.3 0204: 3.5 \times 1.4 0207: 5.9 \times 2.2	B: $\pm 0.1\%$ C: $\pm 0.25\%$ D: $\pm 0.5\%$ F: $\pm 1\%$ J: $\pm 5\%$	T: Taping Reel B: Bulk	B: ± 10 N: ± 15 C: ± 25 D: ± 50 E: ± 100 - : No Specified	T: 1W U: 1/2W V: 1/4W W: 1/8W P: 1/5W G: 2/5W	0100: 10 Ω 1000: 100 Ω 2201: 2200 Ω 1001: 1K Ω 1004: 1M Ω R0R0: 0 Ω R050: 0.05 Ω R100: 0.1 Ω

** 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) 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) 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: $\pm(1.0\%+0.05\Omega)$ 0102: $\pm(1.5\%+0.05\Omega)$	40 \pm 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: $\pm(1.0\%+0.05\Omega)$ 0102: $\pm(1.5\%+0.05\Omega)$	at +155°C for 1000 hrs
Bending Strength	$\pm(0.5\%+0.05\Omega)$	Bending once for 5 seconds with 2mm
Solderability	95% min. coverage	245 \pm 5°C for 3 seconds
Resistance to Soldering Heat	$\pm(0.5\%+0.05\Omega)$	260 \pm 5°C for 10 seconds
Voltage Proof	No breakdown or flashover	1.42 times RCWV (RMS) for 1 minute
Leaching	Individual leaching area \leq 5% Total leaching area \leq 10%	260 \pm 5°C for 30 seconds
Rapid Change of Temperature	$\pm(0.5\%+0.05\Omega)$	-55°C to +125°C, 5 cycles

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

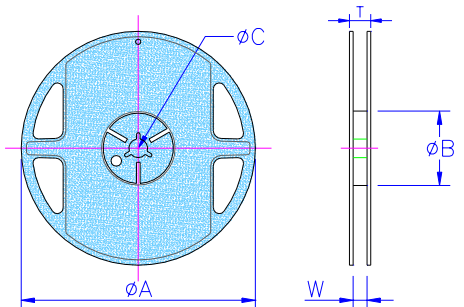
■ Storage Temperature: 25 \pm 3°C; Humidity < 80%RH

■ Packaging

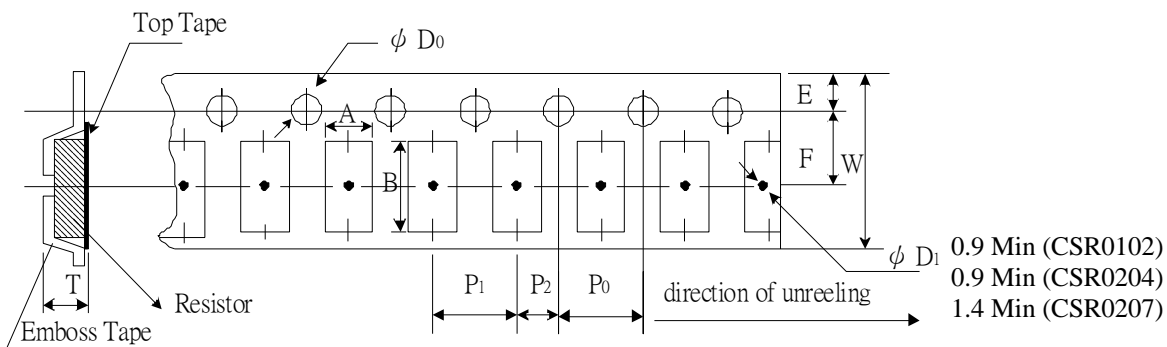
Packaging Quantity & Reel Specifications

Unit :mm

Type	ΦA	ΦB	ΦC	W	T	Emboss Plastic Tape (EA)
CSR0102	178.5 \pm 1.5	60.0 \pm 1.0	13.0 \pm 0.2	9.0 \pm 0.5	12.5 \pm 0.5	3,000
CSR0204	178.5 \pm 1.5	60.0 \pm 1.0	13.0 \pm 0.2	9.0 \pm 0.5	12.5 \pm 0.5	3,000
CSR0207	178.5 \pm 1.5	60.0 \pm 1.0	13.0 \pm 0.5	13.0 \pm 0.5	15.5 \pm 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 \pm 0.10	2.25 \pm 0.10	8.0 \pm 0.10	1.75 \pm 0.10	3.50 \pm 0.05	4.00 \pm 0.10	4.00 \pm 0.10	2.00 \pm 0.05	1.50 \pm 0.10	1.70 \pm 0.10
CSR0204	1.60 \pm 0.10	3.70 \pm 0.10	8.0 \pm 0.10	1.75 \pm 0.10	3.50 \pm 0.05	4.00 \pm 0.10	4.00 \pm 0.10	2.00 \pm 0.05	1.50 \pm 0.10	1.87 \pm 0.10
CSR0207	2.40 \pm 0.10	6.05 \pm 0.10	12.0 \pm 0.10	1.75 \pm 0.10	5.50 \pm 0.05	4.00 \pm 0.10	4.00 \pm 0.10	2.00 \pm 0.05	1.50 \pm 0.10	2.80 \pm 0.10