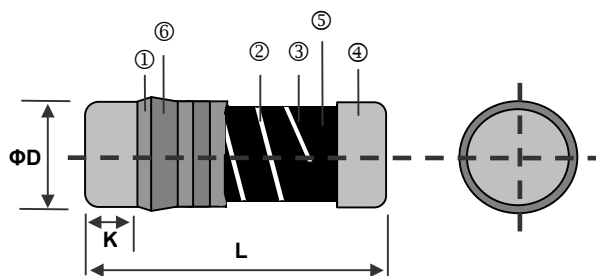


Metal Film Precision Resistor—CSR Series

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 $\pm 10 \text{ PPM}/^\circ\text{C}$
- High power rating up to 1 Watts

Applications

- Automotive
- Telecommunication
- Medical Equipment
- Measurement/Testing Equipment

Dimensions

Unit: mm

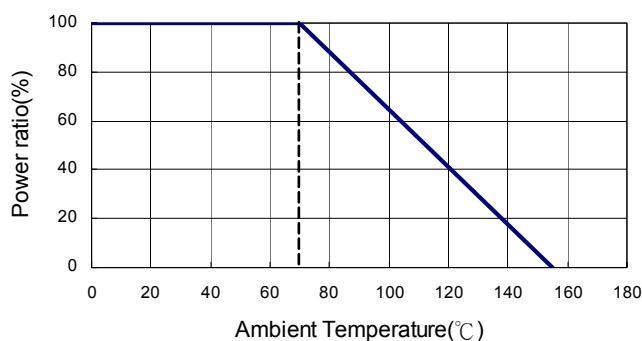
Type	L	ΦD	K min.	Weight (g) (1000pcs)	Packaging
					180mm (7")
CSR0102	2.00 ± 0.10	1.30 ± 0.05	0.5	7.2	3,000EA
CSR0204	3.50 ± 0.20	1.40 ± 0.15	0.5	18.7	3,000EA
CSR0207	5.90 ± 0.20	2.20 ± 0.20	0.5	80.9	2,000EA

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 0204: 3.5x1.4 0207: 5.9x2.2	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: 10Ω 1000: 100Ω 2201: 2200Ω 1001: 1KΩ 1004: 1MΩ R0R0: 0Ω R050: 0.05Ω 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) 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

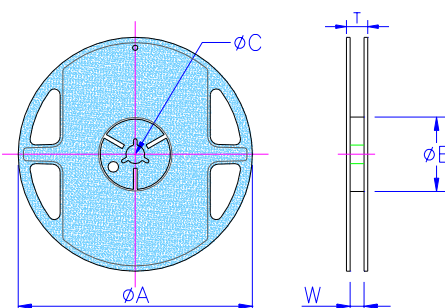
■ Storage Temperature: 25 $\pm$ 3°C; Humidity < 80%RH

■ Packaging

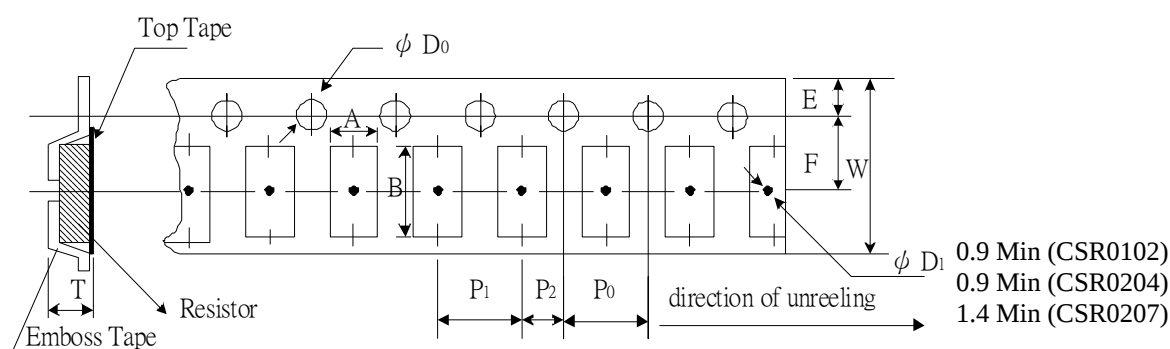
Packaging Quantity & Reel Specifications

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