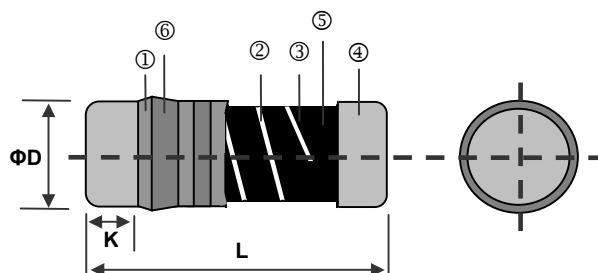


Automotive Grade Metal Film Precision Resistor – CSR..A Series

Construction



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

Features

- AEC-Q200 Compliance
- Excellent overall stability
- Tight tolerance down to $\pm 0.1\%$
- Extremely low TCR down to ± 10 PPM/ $^{\circ}$ C
- High power rating up to 1 Watts
- SMD enabled structure
- Lead-free and RoHS compliant

Dimensions

Unit: mm

Type	L	ΦD	K min.	Weight (g) (1000pcs)	Packaging
					180mm (7")
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

Applications

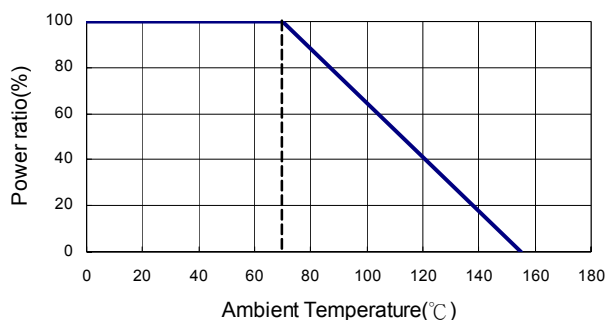
- Automotive
- Telecommunication
- Medical Equipment
- Measurement/Testing Equipment

Part Numbering

CSR	0204	D	T	D	V	1000	A
Product Type	Dimensions (L \times ΦD) 0204: 3.5x1.4 0207: 5.9x2.2	Resistance Tolerance B: $\pm 0.1\%$ C: $\pm 0.25\%$ D: $\pm 0.5\%$ F: $\pm 1\%$ J: $\pm 5\%$	Packaging Code T: Taping Reel B: Bulk	TCR (PPM/ $^{\circ}$ C) B: ± 10 N: ± 15 C: ± 25 D: ± 50 E: ± 100 - : No Specified	Power Rating T: 1W U: 1/2W V: 1/4W	Resistance 0010: 1Ω 0100: 10Ω 1000: 100Ω 2201: 2200Ω 1001: 1KΩ 1004: 1MΩ R0R0: 0Ω R050: 0.05Ω R100: 0.1Ω 22R1: 22.1Ω	Making : Standard A: Automotive Grade

** 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%	
0204	1/4W	-55 ~ +155°C	200V	400V	49.9Ω-20KΩ					±10
					49.9Ω-300KΩ					±15
					10Ω-1MΩ			10Ω-1MΩ		±25
					10Ω-1MΩ	1Ω-1MΩ		0.2Ω-1MΩ		±50
					-					0.1Ω-1MΩ
	Jumper:2A	0Ω(<15mΩ)					-			
0207	1/2W	-55 ~ +155°C	300V	500V	49.9Ω-20KΩ					±10
					49.9Ω-300KΩ					±15
					10Ω-1MΩ			10Ω-1MΩ		±25
					10Ω-1MΩ	1Ω-1MΩ		0.2Ω-1MΩ		±50
					-					0.1Ω-1MΩ
	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%	
0207	1W	-55 ~ +155°C	350V	700V	49.9Ω-100KΩ					±15
					10Ω - 1MΩ					±25
					10Ω-1MΩ	1Ω - 1MΩ		0.2Ω - 1MΩ		±50
					-					0.1Ω - 1MΩ

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	±(0.15%+0.05Ω)	RCWV*2.5 or Max. overload voltage for 5 seconds
Insulation Resistance	≥10G	Max. overload voltage for 1 minute
Endurance	±(0.5%+0.05Ω)	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Biased Humidity	±(1.0%+0.05Ω)	1000 hrs 85°C/85%RH 10% of operating power.
High Temperature Exposure	±(1.0%+0.05Ω)	at +155°C for 1000 hrs
Bending Strength	±(0.5%+0.05Ω)	Bending once for 5 seconds with 2mm
Thermal Shock	±(0.5%+0.05Ω)	-55C/+155°C. Note: Number of cycles required-300, Maximum transfer time-20 seconds, Dwell time-15minutes. Air-Air.
Solderability	95% min. coverage	245±5°C for 3 seconds

Item	Requirement	Test Method
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
Temperature Cycling	$\pm(0.5\%+0.05\Omega)$	-55°C to +125°C, 1000 cycles
Moisture Resistance	$\pm(1.0\%+0.05\Omega)$	24 hrs/cycle
Mechanical Shock	$\pm(0.25\%+0.05\Omega)$	Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	$\pm(0.5\%+0.05\Omega)$	5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz
ESD	$\pm(1\%+0.05\Omega)$	Human body, 2KV
Flame Retardance	Not flame	Temperature sensing at 500°C, voltage power subjected to 32VDC current clamped up to 500ADC and decreased in 1.0VDC/hour.
Resistance to solvents	Marking legible	Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Terminal strength	No broken	Force of 1.8kg for 60 seconds.

■ Reference Standards: IEC60115-1, 60068-2-58; JIS-C 5201-1, 6429 ; AEC-Q200; MIL-STD-202; JESD22

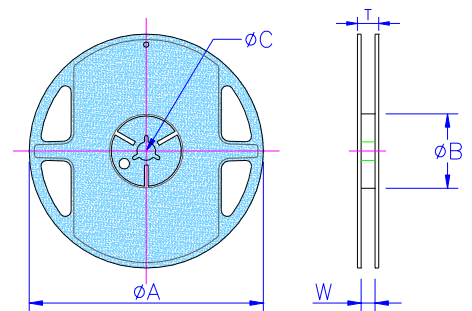
■ Storage Temperature: 25 \pm 3°C; Humidity < 80%RH

■ Packaging

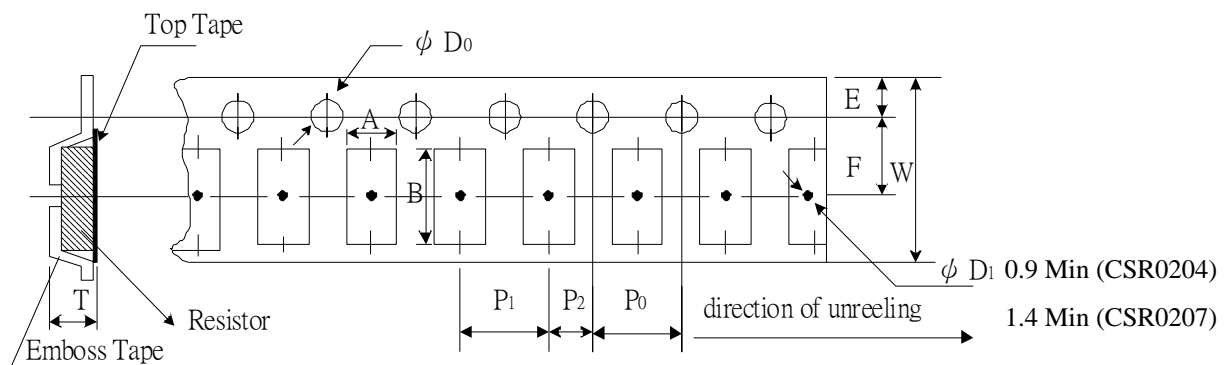
Packaging Quantity & Reel Specifications

Unit :mm

Type	ΦA	ΦB	ΦC	W	T	Emboss Plastic Tape (EA)
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
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