

CSR0204 / CSR0207 / CSR0309

Metal Film Precision Resistor

- 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
- Automotive, telecommunication, medical equipment
- Measurement / testing equipment



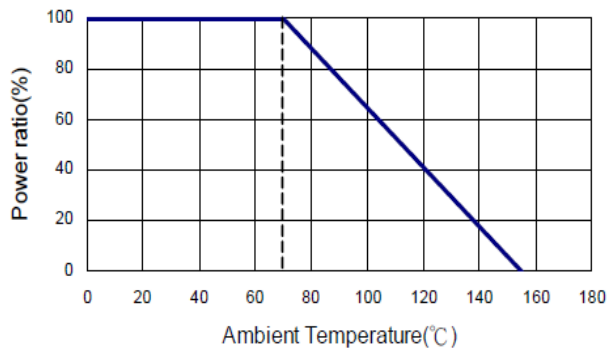
■ GENERAL SPECIFICATIONS

Item Model	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/ $^{\circ}\text{C}$)
					$\pm 0.1\%$	$\pm 0.25\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 5\%$	
0204	1/4W[V]	-55~ +155 $^{\circ}\text{C}$	200V	400V	10 Ω -20K Ω					± 10
					10 Ω -300K Ω					± 15
					10 Ω -1M Ω			10 Ω -4.7M Ω		± 25
					10 Ω -1M Ω	1 Ω -1M Ω	0.2 Ω -10M Ω		± 50	
					-			0.1 Ω -10M Ω		± 100
	Jumper: 2A	0 Ω (<15m Ω)					-			
0207	1/2W[U]	-55~ +155 $^{\circ}\text{C}$	300V	500V	10 Ω -20K Ω					± 10
					10 Ω -300K Ω					± 15
					10 Ω -1M Ω			10 Ω -4.7M Ω		± 25
					10 Ω -1M Ω	1 Ω -1M Ω	0.2 Ω -10M Ω		± 50	
					-			0.1 Ω -10M Ω		± 100
	Jumper: 4A	0 Ω (<15m Ω)					-			
0309	1W	-55~ +155 $^{\circ}\text{C}$	350V	700V	100 Ω - 100k Ω	100 Ω -330k Ω		None	± 15	
					100-560k Ω				± 25	
					100 Ω - 100k Ω	10 Ω -1M Ω			± 50	

■ HIGH POWER RATING ELECTRICAL SPECIFICATION

Item Model	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/ $^{\circ}\text{C}$)
					$\pm 0.1\%$	$\pm 0.25\%$	$\pm 0.5\%$	$\pm 1\%$	$\pm 5\%$	
0204	2/5W[G]	-55~ +155 $^{\circ}\text{C}$	200V	400V	10 Ω -100K Ω					± 15
					10 Ω -1M Ω					± 25
					10 Ω -1M Ω	1 Ω -1M Ω		0.2 Ω -1M Ω		± 50
					-			0.1 Ω -1M Ω		± 100
0207	1W[T]	-55~ +155 $^{\circ}\text{C}$	350V	700V	10 Ω -100K Ω					± 15
					10 Ω -10M Ω					± 25
					10 Ω -1M Ω	1 Ω -1M Ω		0.2 Ω -10M Ω		± 50
					-			0.1 Ω -10M Ω		± 100
0309	2W	-55~ +155 $^{\circ}\text{C}$	350V	700V	100 Ω - 100k Ω	100 Ω -330k Ω		None	± 15	
					100-560k Ω				± 25	
					100 Ω - 100k Ω	10 Ω -1M Ω			± 50	

■ DERATING CURVE



■ 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	Model : 0204 / 0207 $\pm(0.15\%+0.05\Omega)$	RCWV*2.5 or Max. Overload voltage for 5 seconds
	Model : 0309 $\pm(0.25+0.05\Omega)$	
Insulation Resistance	$\geq 10G\Omega$	Max. overload voltage for 1 minute
Endurance	$\pm(0.5\%+0.05\Omega)$	70 \pm 2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	$\pm(1.0\%+0.05\Omega)$	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	$\pm(1.0\%+0.05\Omega)$	at +155°C for 1000 hrs
Bending Strength	$\pm(0.5\%+0.05\Omega)$	Bending once for 5 seconds with 2mm
Solder ability	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, 60068-2-58; JIS-C 5201-1

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

■ DIMENSIONS

Unit : mm

Model	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	
CSR0309	8.50 \pm 0.20	3.4 \pm 0.20	0.5		2,500EA	

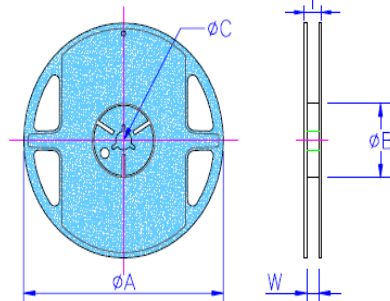
	①	Insulation Coating	②	Trimming Line
	③	Ceramic Rod	④	Electrode Cap
	⑤	Resistor Layer	⑥	Marking

■ Packaging

Packaging Quantity & Reel Specifications

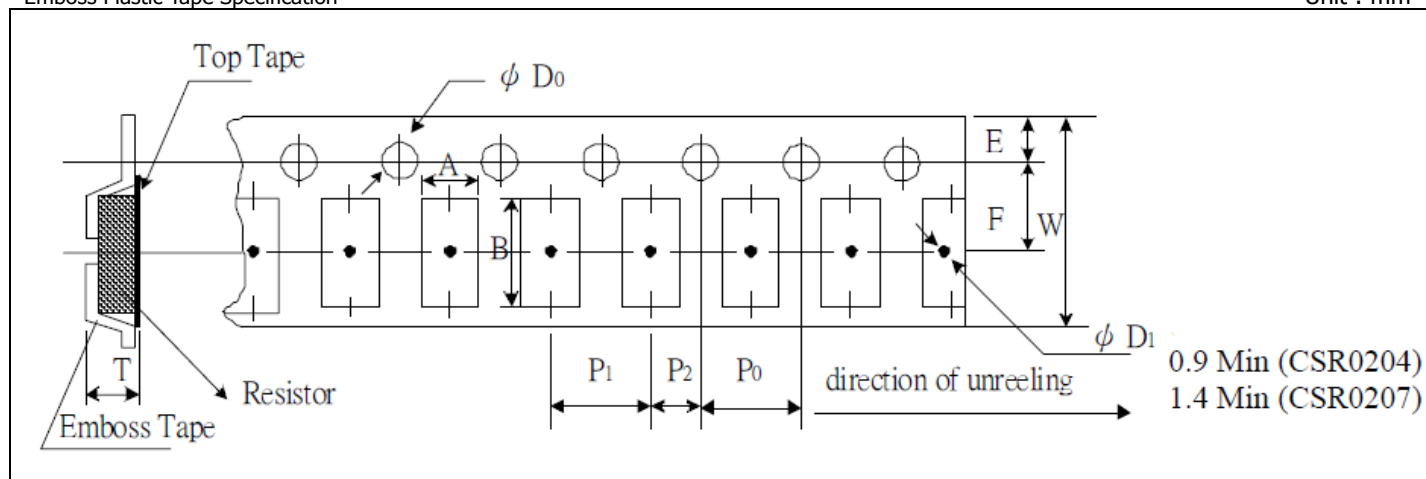
Unit : mm

Model	ΦA	ΦB	ΦC	W	T	Emboss Plastic Tape(EA)
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
CSR0309	330±1.0	100±1.0	13.0±0.5	17.0±0.5	21.5±0.2	2,500



Emboss Plastic Tape Specification

Unit : mm



0.9 Min (CSR0204)
1.4 Min (CSR0207)

Model	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
CSR0204	1.6±0.1	3.7±0.1	8.0±0.1	1.75±0.1	3.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	1.5±0.1	1.87±0.1
CSR0207	2.4±0.1	6.05±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	1.5±0.1	2.8±0.1
CSR0309	3.5±0.1	8.85±0.1	16.0±0.1	1.75±0.1	7.50±0.1	4.00±0.1	8.00±0.1	2.00±0.1	1.50±0.1	3.50±0.1

■ ORDERING PROCEDURE EXAMPLE

Model	Dimensions	Resistance Tolerance	Packaging code	T.C.R (ppm/°C)	Power rating	Resistance
CSR	0204	D	T	D	V	1000
	0204 : 3.5X1.4 0207 : 5.9X2.2 0309 : 8.5X3.4	B : ±0.1% C : ±0.25% D : ±0.5% F : ±1.0% J : ±5.0%	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	0010 : 1Ω 0100 : 10Ω 1000 : 100Ω 2201 : 2200Ω 1001 : 1KΩ 1004 : 1MΩ R0R0 : 0Ω R050 : 0.05Ω R100 : 0.1Ω 22R1 : 22.1Ω