

## Carbon Film Resistor



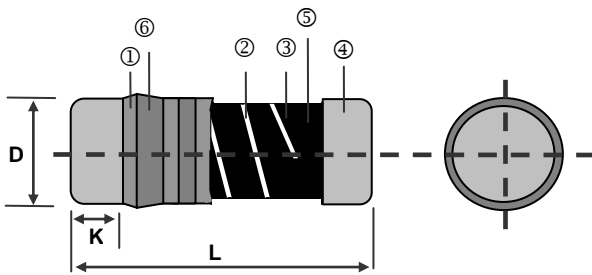
### ■ Features

- SMD style carbon resistor
- Free direction for mounting due to cylindrical design
- High solder ability due to specially plated electrodes
- Electrodes strength is higher than flat chip resistors
- Lower current noise than thick film flat chip resistors
- Suitable for reflow, flow and iron soldering

### ■ Applications

- Automotive
- Telecommunication
- Medical Equipment
- Consumer Product

### ■ Construction



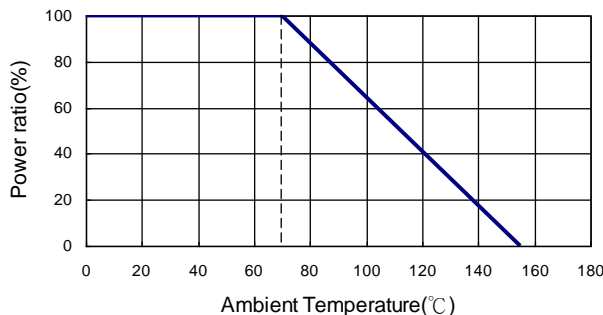
① Insulation Coating	④ Electrode Cap
② Trimming Line	⑤ Resistor Layer
③ Ceramic Rod	⑥ Marking

### ■ Dimensions

Unit: mm

Type	L	ΦD	K min.	Wight (g) (1000pcs)	Packaging	
					180mm/7"	330mm/13"
CFS0204	3.50±0.2	1.40±0.15	0.5	19	3000EA	—
CFS0207	5.90±0.2	2.20±0.20	0.5	81	2000EA	—
CFS0309	8.50±0.2	3.20±0.20	0.5	95	—	2500EA

### ■ Derating Curve



**Carbon Film Resistor**

**Part Numbering**

<b>CFS</b>	<b>0204</b>	<b>G</b>	<b>T</b>	<b>-</b>	<b>V</b>	<b>1000</b>
Product Type	Dimensions (LxΦD)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance
	0204: 3.5x1.4 0207: 5.9x2.2 0309: 8.5x3.2	G: ±2% J: ±5%	T: Taping Reel B: Bulk	--: No specified	S: 2W T: 1W U: 1/2W V: 1/4W	0010: 1Ω 1R20: 1.2Ω 1000: 100Ω 2201: 2200Ω 1001: 1KΩ 1004: 1MΩ

**Standard Electrical Specifications**

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range	
					±2%	±5%
0204	1/4W	-55 ~ +155°C	250V	500V	1Ω - 1MΩ	
0207	1/2W		300V	600V	1Ω - 1MΩ	
0309	1W		350V	700V	1Ω - 1MΩ	

**High Power Rating Electrical Specifications**

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range	
					±2%	±5%
0207	1W	-55 ~ +155°C	350V	700V	1Ω - 1MΩ	
0309	2W		350V	700V	1Ω - 1MΩ	

Operating Voltage= $\sqrt{P \cdot R}$  or Max. operating voltage listed above, whichever is lower.  
 Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$  or Max. overload voltage listed above, whichever is lower.

**Environmental Characteristics**

Item	Requirement	Test Method
Short Time Overload	$\Delta R \pm 1\%$	<b>JIS-C-5201-1 5.5</b> RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
Endurance	$\Delta R \pm 3\%$	<b>JIS-C-5201-1 7.10</b> 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	$\Delta R \pm 5\%$	<b>JIS-C-5201-1 7.9</b> 40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Dry Heat	$\Delta R \pm 2\%$	<b>JIS-C-5201-1 7.2</b> at +155°C for 1000 hrs
Solderability	95% min. coverage	<b>JIS-C-5201-1 6.5</b> 245±5°C for 3 seconds
Resistance to Soldering Heat	$\Delta R \pm 1\%$	<b>JIS-C-5201-1 6.4</b> 260±5°C for 10 seconds

RCWV(Rated continuous working voltage)=  $\sqrt{P \cdot R}$  or Max. Operating voltage whichever is lower

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