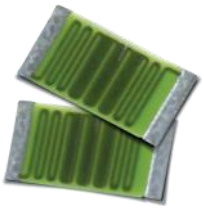
SM SERIES

High Resistance Chip Resistors

Advantages

Our patented Micropen® precision printing technology provides ultra precision, thick-film high ohmic value, surface mount resistors. Ohmcraft's Micropenned serpentine patterned resistors produce superior electrical characteristics:



- **Voltage Ratings to 600 Volts**
- **Resistance Values to 50 Gigohms**
- **Ultra High Stability**
- **Very Low Noise**
- **Tolerances to 0.1%**
- **TCR to 25 ppm/°C**
- **VCR to 1 ppm/V**
- **Custom Configurations**

Electrical Specifications

Case Size / Ratings	TCR (±ppm/°C)	Tolerance 0.10%	0.25%	0.50%	1%	2%	5%	10%	20%
0402	50				10K-100M	10K-100M	10K-100M	10K-100M	10K-100M
40mW	100				10K-500M	10K-500M	10K-500M	10K-500M	10K-500M
50V	200				10K-500M	10K-1G	10K-1G	10K-1G	10K-1G
0603	50			10K-10M	10K-100M	10K-500M	10K-500M	10K-500M	10K-500M
60mW	100			10K-10M	10K-500M	10K-1G	10K-1G	10K-1G	10K-1G
100V	200			10K-10M	10K-500M	10K-1G	10K-1G	10K-10G	10K-50G
0805	50			10K-10M	10K-500M	10K-500M	10K-500M	10K-500M	10K-500M
200mW	100			10K-10M	10K-1G	10K-1G	10K-1G	10K-1G	10K-1G
125V	200			10K-10M	10K-1G	10K-1G	10K-10G	10K-10G	10K-50G
1206	25	1M-10M	1M-100M	1M-100M	1M-100M	1M-100M	1M-100M	1M-100M	1M-100M
330mW	50	100K-10M	100K-100M	100K-500M	100K-500M	100K-500M	100K-500M	100K-500M	100K-500M
200V	100	10K-10M	10K-100M	10K-500M	10K-1G	10K-1G	10K-1G	10K-1G	10K-1G
	200	10K-10M	10K-100M	10K-500M	10K-1G	10K-10G	10K-10G	10K-10G	10K-50G
2010	25	1M-10M	1M-100M	1M-100M	1M-100M	1M-100M	1M-100M	1M-100M	1M-100M
1W	50	100K-10M	100K-100M	100K-500M	100K-500M	100K-500M	100K-500M	100K-500M	100K-500M
300V	100	10K-10M	10K-100M	10K-500M	10K-1G	10K-1G	10K-1G	10K-1G	10K-1G
	200	10K-10M	10K-100M	10K-500M	10K-1G	10K-10G	10K-10G	10K-10G	10K-50G
2512	25	1M-100M	1M-500M	1M-500M	1M-500M	1M-500M	1M-500M	1M-500M	1M-500M
2W	50	100K-100M	100K-500M	100K-1G	100K-1G	100K-1G	100K-1G	100K-1G	100K-1G
350V	100	10K-100M	10K-500M	10K-1G	10K-10G	10K-10G	10K-10G	100K-10G	100K-10G
	200	10K-100M	10K-500M	10K-1G	10K-10G	10K-10G	10K-10G	100K-50G	100K-50G
3512	25	1M-100M	1M-500M	1M-500M	1M-500M	1M-500M	1M-500M	1M-500M	1M-500M
2W	50	100K-100M	100K-500M	100K-1G	100K-1G	100K-1G	100K-1G	100K-1G	100K-1G
600V	100	10K-100M	10K-500M	10K-1G	10K-10G	10K-10G	10K-10G	100K-10G	100K-10G
	200	10K-100M	10K-500M	10K-1G	10K-10G	10K-10G	10K-10G	100K-50G	100K-50G

The continuous maximum applied voltage cannot exceed the maximum power rating and is ohmic value dependent.
Value range is case size dependent.
Standard case sizes: 0402, 0403, 0502, 0504, 0603, 0805, 1004, 1005, 1206, 1210, 1505, 2010, 2208, 2510, 2512, 3512, 4020, 5020.
For custom sizes and configurations, consult us.

How to Order

SM + [ ] + [ ] + [ ] + [ ] + [ ]

Type

Surface Mount, High Resistance Chips

Case Size

See dimension table.

Custom case sizes are available. Please consult factory.

TCR

E ±25ppm/°C

H ±50ppm/°C

K ±100ppm/°C

L ±200ppm/°C

Value

Resistance value expressed as a four digit number, where the first three numbers are the significant value, and the fourth number is the number of zeroes.

Tolerance

B ±0.1%

C ±0.25%

D ±0.5%

F ±1.0%

G ±2.0%

J ±5.0%

K ±10%

L ±20%

Termination

T Solderable wraparound matte tin Sn99.9 on Ni barrier, RoHS

B Solderable wraparound Sn63Pb37 solder over Ni barrier

Z Solderable single surface matte tin Sn99.9 on Ni barrier, flip-chip, RoHS

S Solderable single surface Sn63Pb37, flip-chip

G Wire bondable gold, Au, RoHS

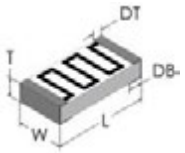
Packaging options: Bulk, Tape & Reel or Flat Pack

High Resistance Chip Resistors

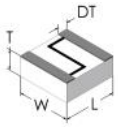
SM SERIES

Chip Dimensions

Wrap-around
B and T Terminations



Bondable
G Termination



Case Size	Length	Width	Thickness (Max.)	DT	DB	Units
0402	0.040 ±0.005 1.02 ±0.13	0.020 ±0.003 0.51 ±0.08	0.020 0.51	0.008 ±0.004 0.20 ±0.10	0.010 +0.002/-0.004 0.25 +0.05/-0.10	inches mm
0603	0.063 +0.01/-0.005 1.60 +0.25/-0.13	0.031 ±0.005 0.79 ±0.13	0.020 0.51	0.010 ±0.005 0.25 ±0.13	0.012 ±0.008 0.30 ±0.20	inches mm
0805	0.079 +0.01/-0.005 2.01 +0.25/-0.13	0.050 ±0.005 1.27 ±0.13	0.025 0.64	0.010 ±0.005 0.25 ±0.13	0.013 ±0.008 0.33 ±0.20	inches mm
1206	0.126 +0.01/-0.005 3.20 +0.25/-0.13	0.063 ±0.005 1.60 ±0.13	0.030 0.76	0.010 ±0.005 0.25 ±0.13	0.020 ±0.010 0.51 ±0.25	inches mm
2010	0.200 +0.01/-0.005 5.08 +0.25/-0.13	0.100 ±0.005 2.54 ±0.13	0.030 0.76	0.018 ±0.010 0.46 ±0.25	0.020 ±0.010 0.51 ±0.25	inches mm
2512	0.250 +0.01/-0.005 6.35 +0.25/-0.13	0.125 ±0.005 3.18 ±0.13	0.030 0.76	0.020 ±0.010 0.51 ±0.25	0.024 ±0.010 0.61 ±0.25	inches mm
3512	0.350 +0.01/-0.005 8.89 +0.25/-0.13	0.125 ±0.005 3.18 ±0.13	0.030 0.76	0.020 ±0.010 0.51 ±0.25	0.024 ±0.010 0.61 ±0.25	inches mm

Other available case sizes: 0403, 0502, 0503, 0504, 1004, 1005, 1210, 1505, 2208, 2510, 4020, 5020. Please contact us

Typical Performance Characteristics

Test	Maximum ΔR
Short Time Overload	0.1%
Load Life	0.1%
Thermal Shock	0.1%
Resistance to Soldering Heat	0.05%

Parameter	Typical
Operating Temperature	-55°C to 150°C
TCR	Measured from 25°C to 75°C
Resistance Value	Values > 10M are measured at 100 VDC For custom test voltages consult factory

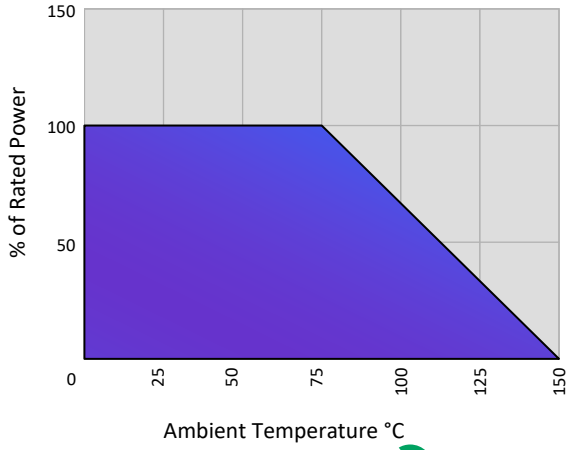
Material Construction

Resistive Element	Thick Film
Substrate	96% Alumina
Encapsulation	Epoxy
Termination	Tin over nickel barrier, lead solder over nickel barrier, or gold

Tape and Reel Specifications

Parts are packaged in accordance with EIA-481 tape and reel specifications.

Power Derating Curve



Custom Configurations Available Upon Request

Please consult us with our knowledgeable sales staff for help specifying custom parts to meet your needs.