

# SMC Series

## Commercial Surface Mount Chip Resistor



The Ohmite SMC series is designed to accommodate a multitude of uses. This chip series is available in common sizes and multiple tolerances. This wide range assures the end customer will find an SMC that is right for their application. All SMC resistors are laser trimmed and covered with an protective epoxy coating.

### SERIES SPECIFICATIONS

| Series  | Power  | Max. Working Voltage | Max. Overload Voltage | Dielec. Withst. Voltage | Resistance Range (by tolerance) |        |             |
|---------|--------|----------------------|-----------------------|-------------------------|---------------------------------|--------|-------------|
|         |        |                      |                       |                         | 5.00%                           | 1.00%  | 0.1% / 0.5% |
| SMC0075 | 1/50 W | 10V                  | 25V                   | 25V                     | 10-1MΩ                          |        |             |
| SMC0100 | 1/32 W | 15V                  | 30V                   | 30V                     | 1-22MΩ                          | 1-10MΩ | 33-470KΩ    |
| SMC0201 | 1/20 W | 25V                  | 50V                   | 50V                     | 1-10MΩ                          |        |             |
| SMC0402 | 1/16 W | 50V                  | 100V                  | 100V                    | 1-22MΩ                          | 1-10MΩ | 10-1MΩ      |
| SMC0603 | 1/10 W | 75V                  | 150V                  | 150V                    | 1-22MΩ                          | 1-10MΩ |             |
| SMC0805 | 1/8 W  | 150V                 | 300V                  | 300V                    | 1-100MΩ                         | 1-1MΩ  |             |
| SMC1206 | 1/4 W  | 200V                 | 400V                  | 500V                    | 1-100MΩ                         | 1-10MΩ |             |
| SMC1210 | 1/2 W  | 200V                 | 500V                  | 500V                    | 1-22MΩ                          | 1-10MΩ |             |
| SMC2010 | 3/4 W  | 200V                 | 500V                  | 500V                    | 1-22MΩ                          | 1-10MΩ |             |
| SMC2512 | 1 W    | 200V                 | 500V                  | 500V                    | 1-22MΩ                          | 1-10MΩ |             |

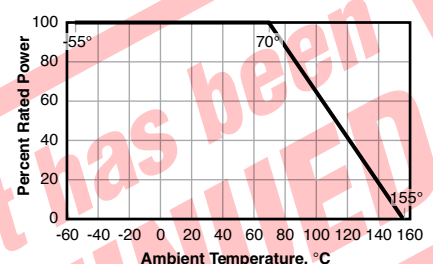
### CHARACTERISTICS

**Operating Temp. Range** -55°C to +155°C

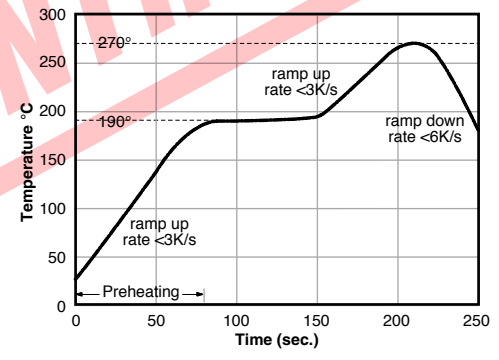
**Rated Voltage** The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:  
 $V = \sqrt{P \times R}$   
 or max. working voltage whichever is less, where:  
 $V =$  Cont. rated DC or AC (rms) working voltage (V)  
 $P =$  Rated power (W)  
 $R =$  Resistance value (Ω)

| Temperature Coeff. of Resistance | 0075    | 0100    | 0201    |
|----------------------------------|---------|---------|---------|
| 1Ω-10Ω                           | ±200ppm | ±300ppm | ±200ppm |
| 10Ω-100Ω                         | ±200ppm | ±200ppm | ±200ppm |
| 100Ω-1MΩ                         | ±200ppm | ±200ppm | ±200ppm |
| 1M-10M                           | ±200ppm | ±200ppm | ±200ppm |
| 10MΩ-22MΩ                        | ±250ppm |         |         |
| 0402-2512                        |         |         |         |
| 1Ω-10Ω                           | ±200ppm |         |         |
| 10Ω-10MΩ                         | ±100ppm |         |         |
| 10MΩ-22MΩ                        | ±200ppm |         |         |
| 24MΩ-100MΩ                       | ±300ppm |         |         |

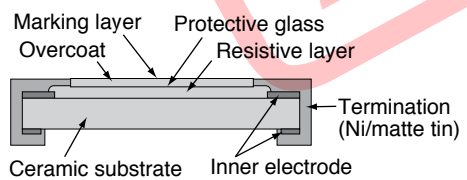
#### Derating



#### Soldering Conditions



#### Construction



# SMC Series

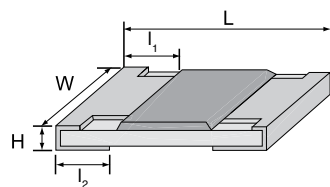
## Commercial Surface Mount Chip Resistor

### PERFORMANCE DATA

| Test Method  | Procedure  | Requirements  |
|--|--|---|
| <b>Temp. Coeff. of Res.</b> MIL-STD-202 Method 304                           | At +25/-55°C and +25/+125°C  |   |
| <b>Life/Endurance</b> MIL-STD-202 Method 108A IEC 60115-1 4.25.1             | At 70 ±2°C for 1,000 hours; SMCWV applied for 1.5 hours on and 0.5 hour off, still air required  | ±(1%+50mΩ) for B/D/F tol<br>±(3%+50mΩ) for J tol                          |
| <b>High Temp. Exposure</b> MIL-STD-202 Method 108A IEC 60068-2-2             | 1,000 hours at maximum operating temperature depending on specification, unpowered.  | ±(1%+50mΩ) for B/D/F tol<br>±(2%+50mΩ) for J tol                          |
| <b>Moisture Resistance</b> MIL-STD-202 Method 106G                           | Each temperature / humidity cycle is defined at 8 hours (method 106F), 3 cycles / 24 hours for 10d with 25°C / 65°C 95% R.H, without steps 7a & 7b, unpowered. Parts mounted on test-boards, without condensation on parts | ±(0.5%+50mΩ) for B/ D/F tol<br>±(2%+50mΩ) for J tol                       |
| <b>Humidity</b> IEC 60115-1 4.24.2   | Steady state for 1000 hours at 40°C / 95% R.H. SMCWV applied for 1.5 hours on and 0.5 hour off   | ±(1%+50mΩ) for B/D/F tol<br>±(2%+50mΩ) for J tol                          |
| <b>Thermal Shock</b> MIL-STD-202 Method 107G                                 | -55/+125°C; Note Number of cycles required is 300. Devices mounted; Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air - Air   | ±(0.5%+50mΩ) for B/D/F tol<br>±(1%+50mΩ) for J tol                        |
| <b>Short Time Overload</b> IEC 60115-1 4.13                                  | 2.5 times SMCWV or maximum overload voltage which is less for 5 seconds at room temperature  | ±(1%+50mΩ) for B/D/F tol<br>±(2%+50mΩ) for J tol<br>No visible damage     |
| <b>Board Flex/Bending</b> IEC 60115-1 4.33                                   | Device mounted or as described only 1 board bending required bending time: 60 ±5 seconds 0402:5mm; 0603/0805:3mm; 1206 and above:2mm   | ±(1%+50mΩ) for B/D/F/J Tol<br>No visible damage                           |
| <b>Solderability Wetting</b> J-STD-002 test B                                | Electrical Test not required Magnification 50X SMD conditions: 1st step: method B, aging 4 hours at 155°C dry heat; 2nd step: leadfree solder bath at 245 ±3°C Dipping time: 3 ±0.5 seconds                                | Well tinned (>95% covered)<br>No visible damage                           |
| <b>Leaching</b> J-STD-002 test D   | Leadfree solder ,260°C, 30 seconds immersion time  | No visible damage   |
| <b>Resistance to Soldering Heat</b> MIL-STD-202 Method 210F IEC 60115-1 4.18 | Condition B, no pre-heat of samples<br>Leadfree solder, 260°C ±5°C, 10 ±1 seconds immersion time; Procedure 2 for SMD: devices fluxed and cleaned with isopropanol   | ±(0.5% +50mΩ) for B/D/F tol.<br>±(1% +50mΩ) for J tol.; No visible damage |

### DIMENSIONS

(mm)



| Size | L          | W          | H          | I1         | I2         |
|------|------------|------------|------------|------------|------------|
| 0075 | 0.30 ±0.01 | 0.15 ±0.01 | 0.10 ±0.01 | 0.08 ±0.03 | 0.08 ±0.03 |
| 0100 | 0.40 ±0.02 | 0.20 ±0.02 | 0.13 ±0.02 | 0.10 ±0.03 | 0.10 ±0.03 |
| 0201 | 0.60 ±0.03 | 0.30 ±0.03 | 0.23 ±0.03 | 0.10 ±0.05 | 0.15 ±0.05 |
| 0402 | 1.00 ±0.05 | 0.50 ±0.05 | 0.35 ±0.05 | 0.20 ±0.10 | 0.25 ±0.10 |
| 0603 | 1.60 ±0.10 | 0.80 ±0.10 | 0.45 ±0.10 | 0.25 ±0.15 | 0.25 ±0.15 |
| 0805 | 2.00 ±0.10 | 1.25 ±0.10 | 0.50 ±0.10 | 0.35 ±0.20 | 0.35 ±0.20 |
| 1206 | 3.10 ±0.10 | 1.60 ±0.10 | 0.55 ±0.10 | 0.45 ±0.20 | 0.40 ±0.20 |
| 1210 | 3.10 ±0.10 | 2.60 ±0.15 | 0.50 ±0.10 | 0.45 ±0.15 | 0.50 ±0.20 |
| 2010 | 5.00 ±0.10 | 2.50 ±0.15 | 0.55 ±0.10 | 0.45 ±0.15 | 0.50 ±0.20 |
| 2512 | 6.35 ±0.10 | 3.10 ±0.15 | 0.55 ±0.10 | 0.60 ±0.20 | 0.50 ±0.20 |

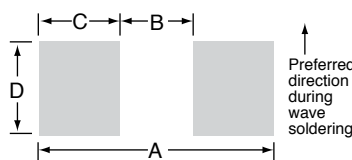
#### Reflow soldering footprint

| Size | A    | B    | C    | D         |
|------|------|------|------|-----------|
| 0075 | 0.34 | 0.14 | 0.1  | 0.15      |
| 0100 | 0.48 | 0.12 | 0.18 | 0.18~0.23 |
| 0201 | 1.0  | 0.3  | 0.35 | 0.4       |
| 0402 | 1.5  | 0.5  | 0.5  | 0.6       |
| 0603 | 2.6  | 0.8  | 0.9  | 0.8       |
| 0805 | 3.0  | 1.2  | 0.9  | 1.2       |
| 1206 | 4.2  | 2.2  | 1.0  | 1.5       |
| 1210 | 4.2  | 2.2  | 1.0  | 2.4       |
| 2010 | 6.1  | 3.3  | 1.4  | 2.4       |
| 2512 | 8.0  | 4.4  | 1.8  | 3.0       |

#### Wave soldering footprint

| Size | A    | B    | C    | D    |
|------|------|------|------|------|
| 0603 | 2.70 | 0.90 | 0.90 | 0.80 |
| 0805 | 3.30 | 1.30 | 1.00 | 1.30 |
| 1206 | 4.70 | 2.50 | 1.10 | 1.70 |
| 1210 | 4.70 | 2.50 | 1.10 | 2.50 |
| 2010 | 6.40 | 4.20 | 1.10 | 2.50 |
| 2512 | 8.20 | 5.50 | 1.35 | 3.20 |

Note: Wave soldering not recommended for parts smaller than 0603.



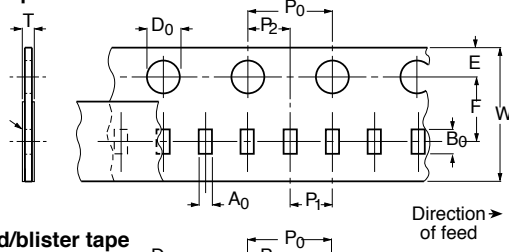
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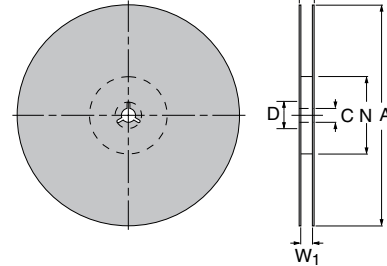
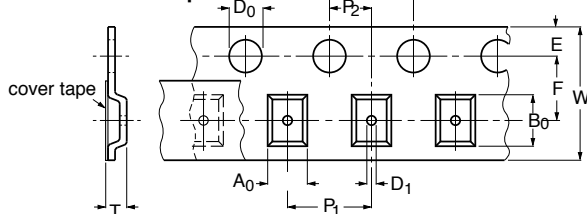
### TAPE AND REEL

(mm)

Paper/PE tape



Embossed/blister tape



Paper/PE tape

| Size | A0         | B0         | W         | E          | F         | P0        | P1        | P2        | ØD0         | T           | Qty. per reel (178mm) |
|------|------------|------------|-----------|------------|-----------|-----------|-----------|-----------|-------------|-------------|-----------------------|
| 0075 | 0.17±0.02  | 0.32±0.02  | 4.0±0.05  | 0.90±0.05  | 1.80±0.02 | 2.0±0.04  | 1.0±0.02  | 1.0±0.02  | 0.8±0.04    | 0.14±0.02   | 20,000                |
| 0100 | 0.24 ±0.03 | 0.45 ±0.03 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 2.0 ±0.05 | 2.0 ±0.05 | 1.5+0.1/-0  | 0.33 ±0.10  | 20,000                |
| 0201 | 0.35 ±0.10 | 0.65 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 2.0 ±0.05 | 2.0 ±0.05 | 1.5 +0.1/-0 | 0.35 ±0.10* | 10000                 |
| 0402 | 0.65 ±0.10 | 1.15 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 2.0 ±0.05 | 2.0 ±0.05 | 1.5 +0.1/-0 | 0.53 ±0.10  | 10000                 |
| 0603 | 1.10 ±0.10 | 1.90 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 4.0 ±0.05 | 2.0 ±0.05 | 1.5 +0.1/-0 | 0.70 ±0.10  | 5000                  |
| 0805 | 1.65 ±0.10 | 2.40 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 4.0 ±0.05 | 2.0 ±0.05 | 1.5 +0.1/-0 | 0.85 ±0.10  | 5000                  |
| 1206 | 1.90 ±0.10 | 3.50 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 4.0 ±0.05 | 2.0 ±0.05 | 1.5 +0.1/-0 | 0.85 ±0.10  | 5000                  |
| 1210 | 2.80 ±0.10 | 3.50 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 4.0 ±0.05 | 2.0 ±0.05 | 1.5 +0.1/-0 | 0.85 ±0.10  | 5000                  |

\*For size 0201, the typical value of thickness (excluding cover tape) is 0.42 mm for paper tape and 0.33 mm for PE tape.

Embossed/blister tape

| Size | A0         | B0         | W         | E          | F         | P0        | P1        | P2        | ØD0         | ØD1           | T         | Qty/reel |
|------|------------|------------|-----------|------------|-----------|-----------|-----------|-----------|-------------|---------------|-----------|----------|
| 2010 | 2.80 ±0.20 | 5.40 ±0.20 | 12 ±0.20  | 1.75 ±0.10 | 5.5 ±0.05 | 4.0 ±0.10 | 4.0 ±0.10 | 2.0 ±0.05 | 1.5 +0.1/-0 | 1.50 +0.25/-0 | 1.0 ±0.10 | 4000     |
| 2512 | 3.50 ±0.20 | 6.70 ±0.20 | 12 ±0.20  | 1.75 ±0.10 | 5.5 ±0.05 | 4.0 ±0.10 | 4.0 ±0.10 | 2.0 ±0.05 | 1.5 +0.1/-0 | 1.50 +0.25/-0 | 1.0 ±0.10 | 4000     |
| 1210 | 2.80 ±0.10 | 3.50 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.5 ±0.05 | 4.0 ±0.10 | 4.0 ±0.05 | 2.0 ±0.05 | 1.5 +0.1/-0 | 0.85 ±0.10    |           | 5000     |

Reel dimensions

| Size           | Qty./reel | 8mm tape    | 12mm tape   | A         | N        | C         | D         | W1        | W2 max.   |
|----------------|-----------|-------------|-------------|-----------|----------|-----------|-----------|-----------|-----------|
| 0075           | 20,000    | 7" (Ø178mm) | ---         | 180 +0/-3 | 60 +1/-0 | 13.0 ±0.2 | 21.0 ±0.8 | 9.0 ±0.2  | 12.0 ±0.2 |
| 0100           | 20,000    | 7" (Ø178mm) | ---         | 180 +0/-3 | 60 +1/-0 | 13.0 ±0.2 | 21.0 ±0.8 | 9.0 ±0.2  | 12.0 ±0.2 |
| 0201           | 10,000    | 7" (Ø178mm) | ---         | 180 +0/-3 | 60 +1/-0 | 13.0 ±0.2 | 21.0 ±0.8 | 9.0 ±0.2  | 12.0 ±0.2 |
| 0402           | 10,000    | 7" (Ø178mm) | ---         | 180 +0/-3 | 60 +1/-0 | 13.0 ±0.2 | 21.0 ±0.8 | 9.0 ±0.2  | 12.0 ±0.2 |
| 0603/0805/1206 | 5,000     | 7" (Ø178mm) | ---         | 180 +0/-3 | 60 +1/-0 | 13.0 ±0.2 | 21.0 ±0.8 | 9.0 ±0.2  | 12.0 ±0.2 |
| 1210           | 5,000     | 7" (Ø178mm) | ---         | 180 +0/-3 | 60 +1/-0 | 13.0 ±0.2 | 21.0 ±0.8 | 9.0 ±0.2  | 12.0 ±0.2 |
| 2010           | 4,000     | ---         | 7" (Ø178mm) | 180 +0/-3 | 60 +1/-0 | 13.5 ±0.5 | 21.0 ±0.8 | 13.6 ±0.5 | 16.5 ±0.5 |
| 2512           | 4,000     | ---         | 7" (Ø178mm) | 180 +0/-3 | 60 +1/-0 | 13.5 ±0.5 | 21.0 ±0.8 | 13.6 ±0.5 | 16.5 ±0.5 |

### ORDERING INFORMATION

RoHS Compliant

**SMC 0603J1K00ET**

|                                   |      |  |   |             |
|-----------------------------------|------|--|---|-------------|
| Part series<br>Surface mount chip | Size | Tolerance<br>K = 10%<br>J = 5%<br>F = 1%<br>D = 0.5%<br>B = 0.1% | Ohms<br>5% in E24 values, 1% and lower tolerances available in E24 and E96 values | Tape & reel |
|-----------------------------------|------|--|---|-------------|

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