



1% Thick Film Chip Resistors (RoHS Compliant) CR1-RC Series

FEATURES

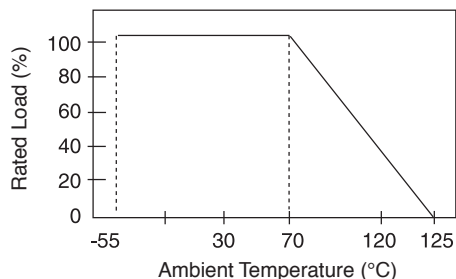
- Temperature Range: -55°C ~ +125°C
- High purity alumina substrate
- Wave or flow solderable
- Excellent high frequency characteristics
- Wrap around termination
- Inner electrode protection



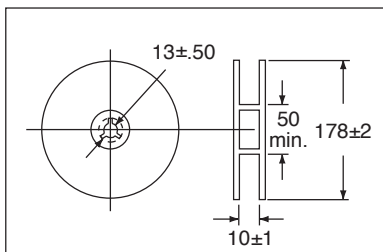
RoHS Compliant



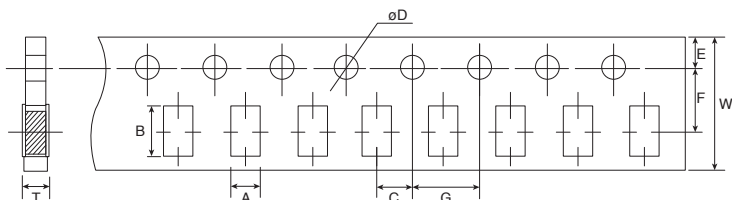
DERATING CURVE



REEL DIMENSIONS (mm)

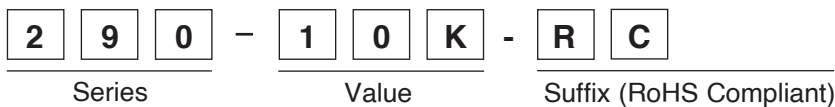


TAPING DIMENSIONS (mm)

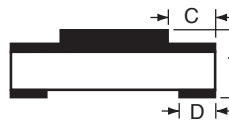
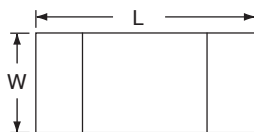


| A ± 0.2 | B ± 0.2 | C ± 0.05 | øD ± 0.1 | E ± 0.1 | F ± 0.05 | G ± 0.1 | W ± 0.2 | T ± 0.1 |
|---------|---------|----------|----------|---------|----------|---------|---------|---------|
| 2.00 | 3.60 | 2.0 | 1.5 | 1.75 | 3.5 | 4.0 | 8.0 | 0.81 |

PART NUMBERING SYSTEM



SERIES, SIZE, WATTAGE, VOLTAGE, AND DIMENSIONS



| Series | Case Size | Watts (W) | Voltage (V) (max.) | | Dimensions (mm) | | | | |
|--------|-----------|-----------|--------------------|------|-----------------|------------|-----------|-----------|-----------|
| | | | W.V. | O.V. | L | W | C | D | T |
| 304 | 0402 | 1/16 | 25 | 50 | 1.0 ± .10 | .50 ± .05 | .20 ± .10 | .25 ± .10 | .35 ± .05 |
| 302 | 0603 | 1/10 | 50 | 100 | 1.6 ± .10 | .80 ± .15 | .30 ± .20 | .30 ± .20 | .45 ± .10 |
| 292 | 0805 | 1/8 | 150 | 300 | 2.0 ± .15 | 1.25 ± .15 | .40 ± .20 | .40 ± .20 | .55 ± .10 |
| 290 | 1206 | 1/4 | 200 | 400 | 3.1 ± .15 | 1.55 ± .15 | .45 ± .20 | .45 ± .20 | .55 ± .10 |





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■ CHARACTERISTICS (Cont.)

| Characteristics | Limits | Test Methods (JIS C 5201-1) | | | | | | | | | | | | | | | |
|-----------------------|--|--|-----------------------------|-------------|------|---|-----------------------------|---------|---|------------|------------|---|------------------------------|---------|---|------------|------------|
| Temperature cycling | $\pm (1.0\% + 0.05\Omega)$ Max. | 7.4 Resistance change after continuous 5 cycles for duty shown below: | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C $\pm 3^\circ\text{C}$</td> <td>30 mins</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10~15 mins</td> </tr> <tr> <td>3</td> <td>+155°C $\pm 2^\circ\text{C}$</td> <td>30 mins</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10~15 mins</td> </tr> </tbody> </table> | Step | Temperature | Time | 1 | -55°C $\pm 3^\circ\text{C}$ | 30 mins | 2 | Room temp. | 10~15 mins | 3 | +155°C $\pm 2^\circ\text{C}$ | 30 mins | 4 | Room temp. | 10~15 mins |
| | | Step | Temperature | Time | | | | | | | | | | | | | |
| | | 1 | -55°C $\pm 3^\circ\text{C}$ | 30 mins | | | | | | | | | | | | | |
| | | 2 | Room temp. | 10~15 mins | | | | | | | | | | | | | |
| 3 | +155°C $\pm 2^\circ\text{C}$ | 30 mins | | | | | | | | | | | | | | | |
| 4 | Room temp. | 10~15 mins | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| Load life in humidity | Resistance change rate is $\pm (3.0\% + 0.1\Omega)$ Max. | 7.9 Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at 40°C $\pm 2^\circ\text{C}$ and 90 to 95 % relative humidity | | | | | | | | | | | | | | | |
| Load life | Resistance change rate is $\pm (3.0\% + 0.1\Omega)$ Max. | 7.10 Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of (1.5 hours "on", 0.5 hour "off") at 70°C $\pm 2^\circ\text{C}$ ambient | | | | | | | | | | | | | | | |
| Soldering Heat | Electrical characteristics shall be satisfied. Without distinct deformation in appearance. | <u>Solder bath method</u> Pre-Heat: 100 to 105°C, 30 ± 5 sec. Temperature: 265 $\pm 3^\circ\text{C}$, 5 +1/-0 sec <u>Reflow soldering method</u> Peak: 250 +5/-0°C 230°C or higher, 30 ± 10 Sec. <u>Solder iron method</u> Bit temperature: 350° $\pm 10^\circ\text{C}$ Application time of soldering iron: 3 +1/-0 seconds | | | | | | | | | | | | | | | |
| Solderability | 95% Coverage min. | 6.5 Test temperature of solder: 245° $\pm 3^\circ\text{C}$ Dipping them solder: 2~3 seconds | | | | | | | | | | | | | | | |



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