### CRS Series - High Power Anti-Surge Chip Resistor

**Features**
- Anti-surge
- Wide resistance range
- RoHS compliant*

**Applications**
- Pulse power applications
- High voltage applications
- Consumer electronics
- Telecommunications
- Power supplies

### Electrical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>CRS0805</th>
<th>CRS1206</th>
<th>CRS2010</th>
<th>CRS2512</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Rating @ 70°C</td>
<td>0.25 W</td>
<td>0.5 W</td>
<td>1 W</td>
<td>2 W</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Working Voltage</td>
<td>150 V</td>
<td>200 V</td>
<td>200 V</td>
<td>300 V</td>
</tr>
<tr>
<td>Maximum Overload Voltage</td>
<td>300 V</td>
<td>400 V</td>
<td>400 V</td>
<td>600 V</td>
</tr>
<tr>
<td>Resistance Range / Temperature Coefficient</td>
<td>±200 PPM/°C</td>
<td>±100 PPM/°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolerance / Standard Resistance Values</td>
<td>1 % / E96 + E24</td>
<td>5 % / E24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Performance Characteristics

**Test**  | **Conditions** | **Specification**  
---|---|---
Short Time Overload | 2 times rated voltage or maximum overload voltage for 5 seconds. | ΔR ≤±(2 % + 0.1 Ω) |
Solderability | 245 ±5 °C for 3 ±0.5 seconds. | Over 95 % coverage |
Resistance to Solder Heat | 260 ±5 °C for 10 ± 1 seconds. | ΔR ≤±(1 % + 0.1 Ω) |
Load Life Humidity | 40 ±2 °C, 90 to 95 %. 1.5 hours ON, 0.5 hours OFF for 1000 hours at rated power. | ΔR ≤±(3 % + 0.1 Ω) |
Load Life | 70 °C. 1.5 hours ON, 0.5 hours OFF for 1000 hours at rated power. | ΔR ≤±(3 % + 0.1 Ω) |
Temperature Cycle | -55 °C (30 min.), +25 °C (2~3 min.), +155 °C (30 min.), +25 °C (2~3 min.) for five cycles. | ΔR ≤±(1 % + 0.05 Ω) |

### Recommended Solder Pad Layout

![Solder Pad Layout](image)

### Product Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimension</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRS0805</td>
<td></td>
<td>0.20 ± 0.10</td>
<td>1.25 ± 0.10</td>
<td>0.40 ± 0.20</td>
<td>0.40 ± 0.20</td>
<td>0.50 ± 0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.079 ± 0.004)</td>
<td>(0.049 ± 0.004)</td>
<td>(0.016 ± 0.008)</td>
<td>(0.016 ± 0.008)</td>
<td>(0.020 ± 0.004)</td>
</tr>
<tr>
<td>CRS1206</td>
<td></td>
<td>3.10 ± 0.10</td>
<td>1.60 ± 0.10</td>
<td>0.50 ± 0.20</td>
<td>0.50 ± 0.20</td>
<td>0.55 ± 0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.122 ± 0.004)</td>
<td>(0.063 ± 0.004)</td>
<td>(0.020 ± 0.008)</td>
<td>(0.020 ± 0.008)</td>
<td>(0.022 ± 0.004)</td>
</tr>
<tr>
<td>CRS2010</td>
<td></td>
<td>5.00 ± 0.20</td>
<td>2.50 ± 0.20</td>
<td>0.60 ± 0.25</td>
<td>0.60 ± 0.25</td>
<td>0.55 ± 0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.197 ± 0.008)</td>
<td>(0.098 ± 0.008)</td>
<td>(0.024 ± 0.010)</td>
<td>(0.024 ± 0.010)</td>
<td>(0.022 ± 0.004)</td>
</tr>
<tr>
<td>CRS2512</td>
<td></td>
<td>6.40 ± 0.20</td>
<td>3.20 ± 0.20</td>
<td>0.60 ± 0.25</td>
<td>1.80 ± 0.25</td>
<td>0.60 ± 0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.252 ± 0.008)</td>
<td>(0.126 ± 0.008)</td>
<td>(0.024 ± 0.010)</td>
<td>(0.071 ± 0.010)</td>
<td>(0.024 ± 0.006)</td>
</tr>
</tbody>
</table>

**WARNING**
Cancer and Reproductive Harm
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

*RoHS Directive 2015/863, Mar 31, 2015 and Annex. Specifications are subject to change without notice. Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf)*
Surge Performance

Peak Power (W) vs. Surge Duration (seconds)

Peak Voltage (Volts) vs. Resistance (Ohms)

Test Method: 1.2/50 μs Waveform
5 Pulses at 12 Second Intervals

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Soldering Profile

Time (seconds)

Temperature (°C)

- 60 - 120 seconds
- 10 - 15 seconds
- 245 °C peak
- 190 °C
- 10 - 15 seconds
- 60 - 120 seconds

How to Order

CRS 2512 - F X - 24R3 E LF

Model
CRS = Anti-Surge Chip Resistor

Size
0805
1206
2010
2512

Resistance Tolerance
F = ±1 %
J = ±5 %

TCR
X = ±100 PPM/°C
W = ±200 PPM/°C

Resistance Value

1% Tolerance:
<100 ohms..... "R" represents decimal point (example: 24R3 = 24.3 ohms)
≥100 ohms...... First three digits are significant, fourth digit represents number of zeros to follow
(example: 8252 = 82.5K ohms)

5% Tolerance:
<10 ohms....... "R" represents decimal point (example: 4R7 = 4.7 ohms)
≥10 ohms........ First two digits are significant, third digit represents number of zeros to follow
(example: 474 = 470K ohms)

Packaging
E = 5,000 pieces per 7-inch reel (CRS0805, CRS1206)
4,000 pieces per 7-inch reel (CRS2010, CRS2512)

Termination
LF = Tin-plated (RoHS Compliant)

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Packaging Dimensions (Conforms to EIA RS-481A)

Model | Dimension | Pcs. per Reel | Dimension (MAX.)
--- | --- | --- | ---
CRS0805 | 1.65 ± 0.20 (0.065 ± 0.008) | 2.40 ± 0.20 (0.094 ± 0.008) | 3.50 ± 0.05 (0.138 ± 0.002) | 8.00 ± 0.30 (0.315 ± 0.012) | 5,000 | 10.00 ± 1.50 (0.394 ± 0.059) | 20.00 (0.587)
CRS1206 | 2.00 ± 0.20 (0.079 ± 0.008) | 3.60 ± 0.10 (0.142 ± 0.004) | 3.50 ± 0.05 (0.138 ± 0.002) | 8.00 ± 0.30 (0.315 ± 0.012) | 4,000 | 13.80 ± 1.50 (0.543 ± 0.059) | 16.70 (0.657)
CRS2010 | 2.80 ± 0.20 (0.110 ± 0.008) | 5.50 ± 0.20 (0.217 ± 0.008) | 5.50 ± 0.05 (0.217 ± 0.002) | 12.00 ± 0.30 (0.472 ± 0.012) | 4,000 | 13.80 ± 1.50 (0.543 ± 0.059) | 16.70 (0.657)
CRS2512 | 3.50 ± 0.20 (0.136 ± 0.008) | 6.70 ± 0.20 (0.264 ± 0.008) | 5.50 ± 0.05 (0.217 ± 0.002) | 12.00 ± 0.30 (0.472 ± 0.012) | 4,000 | 13.80 ± 1.50 (0.543 ± 0.059) | 16.70 (0.657)

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