



Features

- Resistance value as low as 0.001 ohm
- High power density
- Inductance less than 5 nH
- Low thermal EMF: <3 $\mu\text{V}/^\circ\text{C}$ (CRF0805 and CRF1206); <40 $\mu\text{V}/^\circ\text{C}$ (CRF2512)
- RoHS compliant*
- AEC-Q200 compliant

Applications

- Power supplies
- Stepper motor drives
- Input amplifiers

CRF Series - High Power Current Sense Chip Resistor

Electrical Characteristics

| Rating | CRF0805 | CRF1206 | CRF2512 |
|-----------------------------|--------------------------------|------------------------|--|
| Power Rating @ 70 °C | 0.5 W | 1 W | (0.001 to 0.010 Ω) 2 W (0.011 to 0.050 Ω) 1 W |
| Operating Temperature Range | -55 °C to +170 °C | | |
| Derated to Zero Load at | +170 °C | | |
| Maximum Working Voltage | $(P \times R)^{1/2}$ | | |
| Resistance | 0.003 ~ 0.020 Ω | 0.001 ~ 0.030 Ω | 0.001 ~ 0.050 Ω |
| Resistance Tolerance | $\pm 1\%$, $\pm 5\%$ | | |
| Temperature Coefficient | ± 50 PPM/ $^\circ\text{C}$ | | |

Additional Information

Click these links for more information:



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Performance Characteristics

| Test | Conditions | Specification | | |
|---------------------------|--|------------------------|------------------------|---------|
| | | CRF0805 | CRF1206 | CRF2512 |
| Thermal Shock | -55 °C to +150 °C, 300 Cycles, 15 minutes | $\Delta R < \pm 1\%$ | $\Delta R < \pm 0.5\%$ | |
| Short Time Overload | 5 X Rated Power for 5 seconds | $\Delta R < \pm 0.5\%$ | $\Delta R < \pm 0.5\%$ | |
| Low Temperature Storage | -55 °C for 1000 hours | $\Delta R < \pm 0.5\%$ | $\Delta R < \pm 0.5\%$ | |
| High Temperature Exposure | 1000 hours @ + 170 °C | $\Delta R < \pm 1\%$ | $\Delta R < \pm 0.5\%$ | |
| Bias Humidity | + 85 °C, 85 % RH, 10 % Bias, 1000 hours | N/A | $\Delta R < \pm 1\%$ | |
| Mechanical Shock | 100 g for 6 milliseconds, 5 pulses | N/A | $\Delta R < \pm 0.5\%$ | |
| Vibration | Frequency varied 10-2000 KHz in one minute, 3 directions, 12 hours | N/A | $\Delta R < \pm 0.5\%$ | |
| Load Life | 1000 hours at rated power at +70 °C, 1.5 hours on, 0.5 hours off | $\Delta R < \pm 1\%$ | $\Delta R < \pm 1\%$ | |
| Resistance to Solder Heat | +260 °C, 10-12 second dwell, 25 mm/second emergence | $\Delta R < \pm 0.5\%$ | $\Delta R < \pm 0.5\%$ | |
| Moisture Resistance | MIL-STD-202 Method 106, 0 % power (7a and 7b not required) | $\Delta R < \pm 0.5\%$ | $\Delta R < \pm 0.5\%$ | |



WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

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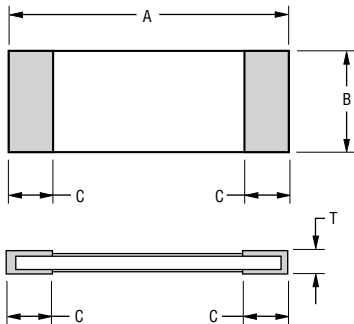
Users should verify actual device performance in their specific applications.

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CRF Series - High Power Current Sense Chip Resistor

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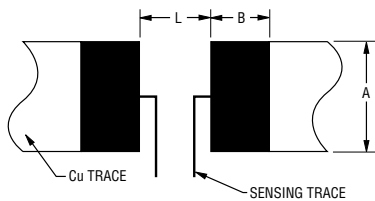
Product Dimensions



| Dim. | CRF0805 | CRF1206 | CRF2512 | |
|------|---|--|---|---|
| | | | 0.001 ~ 0.003 Ω | 0.004 ~ 0.050 Ω |
| A | $\frac{2.0 \pm 0.10}{(0.079 \pm 0.004)}$ | $\frac{3.20 \pm 0.20}{(0.126 \pm 0.008)}$ | $\frac{6.40 \pm 0.20}{(0.252 \pm 0.008)}$ | $\frac{6.40 \pm 0.20}{(0.252 \pm 0.008)}$ |
| B | $\frac{1.25 \pm 0.10}{(0.049 \pm 0.004)}$ | $\frac{1.65 \pm 0.20}{(0.064 \pm 0.008)}$ | $\frac{3.20 \pm 0.20}{(0.126 \pm 0.008)}$ | $\frac{3.20 \pm 0.20}{(0.126 \pm 0.008)}$ |
| C | $\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$ | $\frac{0.50 \pm 0.30}{(0.0197 \pm 0.012)}$ | $\frac{2.00 \pm 0.30}{(0.079 \pm 0.012)}$ | $\frac{0.95 \pm 0.30}{(0.037 \pm 0.012)}$ |
| T | $\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$ | $\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$ | $\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$ | $\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$ |

DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

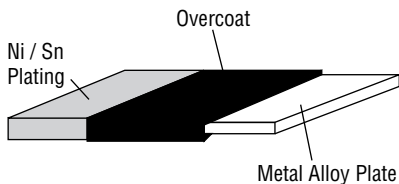
Recommended Solder Pad Layout



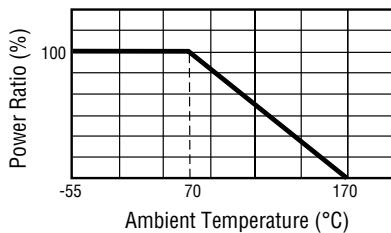
DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

| Dim. | CRF0805 | CRF1206 | | CRF2512 | |
|------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 0.003 ~ 0.020 Ω | 0.001 Ω | 0.002 ~ 0.030 Ω | 0.001 ~ 0.003 Ω | 0.004 ~ 0.050 Ω |
| A | $\frac{1.4}{(0.055)}$ | $\frac{1.8}{(0.070)}$ | $\frac{1.8}{(0.070)}$ | $\frac{4.0}{(0.157)}$ | $\frac{4.0}{(0.157)}$ |
| B | $\frac{1.15}{(0.045)}$ | $\frac{2.3}{(0.090)}$ | $\frac{1.7}{(0.066)}$ | $\frac{3.1}{(0.122)}$ | $\frac{2.1}{(0.083)}$ |
| L | $\frac{1.2}{(0.047)}$ | $\frac{1.0}{(0.039)}$ | $\frac{1.6}{(0.062)}$ | $\frac{1.3}{(0.051)}$ | $\frac{4.1}{(0.161)}$ |

Construction



Derating Curve



Resistance Value Tables

CRF0805

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R003 | 0.003 | R010 | 0.010 |
| R004 | 0.004 | R015 | 0.015 |
| R005 | 0.005 | R020 | 0.020 |
| R009 | 0.009 | | |

CRF1206

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R001 | 0.001 | R010 | 0.010 |
| R002 | 0.002 | R012 | 0.012 |
| 3L50 | 0.0035 | R014 | 0.014 |
| R004 | 0.004 | R015 | 0.015 |
| R005 | 0.005 | R020 | 0.020 |
| R006 | 0.006 | R022 | 0.022 |
| R007 | 0.007 | R025 | 0.025 |
| R008 | 0.008 | R030 | 0.030 |
| R009 | 0.009 | | |

CRF2512 (1W)

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R011 | 0.011 | R030 | 0.030 |
| R012 | 0.012 | R033 | 0.033 |
| R015 | 0.015 | R035 | 0.035 |
| R018 | 0.018 | R040 | 0.040 |
| R020 | 0.020 | R050 | 0.050 |
| R025 | 0.025 | | |

CRF2512 (2W)

| Code | R Value | Code | R Value |
|------|---------|------|---------|
| R001 | 0.001 | R005 | 0.005 |
| 1L50 | 0.0015 | R006 | 0.006 |
| R002 | 0.002 | R007 | 0.007 |
| R003 | 0.003 | R008 | 0.008 |
| R004 | 0.004 | R010 | 0.010 |

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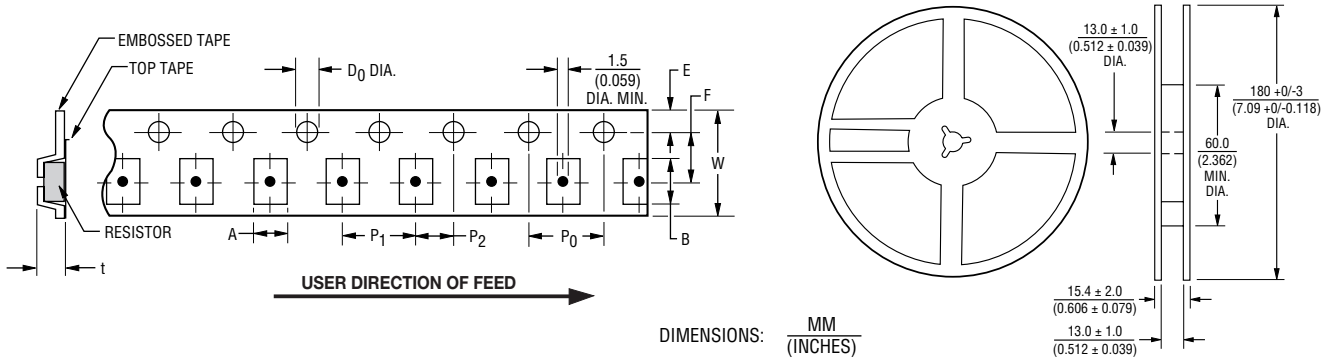
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Packaging Dimensions (Conforms to EIA RS-481A)



| Packing | Model | A | B | W | F | E | P1 | P2 | P0 | D0 | t |
|---------------|---------|---|--|---|--|---|--|--|--|---------------------------------------|---|
| Paper Tape | CRF0805 | $\frac{1.6 \pm 0.15}{(0.063 \pm 0.006)}$ | $\frac{2.4 \pm 0.20}{(0.094 \pm 0.008)}$ | $\frac{8.0 \pm 0.20}{(0.315 \pm 0.008)}$ | $\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ | $\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{2.0 \pm 0.1}{(0.079 \pm 0.004)}$ | $\frac{4.0 \pm 0.1}{(0.157 \pm 0.004)}$ | $\frac{1.5+0.1/-0}{(0.059+0.004/-0)}$ | $\frac{0.84 \pm 0.10}{(0.033 \pm 0.004)}$ |
| Paper Tape | CRF1206 | $\frac{2.0 \pm 0.15}{(0.079 \pm 0.006)}$ | $\frac{3.6 \pm 0.20}{(0.142 \pm 0.008)}$ | $\frac{8.0 \pm 0.20}{(0.315 \pm 0.008)}$ | $\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ | $\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$ | $\frac{4.0 \pm 0.05}{(0.157 \pm 0.002)}$ | $\frac{1.5+0.1/-0}{(0.059+0.004/-0)}$ | $\frac{0.85 \pm 0.15}{(0.033 \pm 0.006)}$ |
| Embossed Tape | CRF2512 | $\frac{3.60 \pm 0.20}{(0.142 \pm 0.008)}$ | $\frac{6.9 \pm 0.20}{(0.272 \pm 0.008)}$ | $\frac{12.0 \pm 0.20}{(0.472 \pm 0.008)}$ | $\frac{5.5 \pm 0.05}{(0.217 \pm 0.002)}$ | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ | $\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$ | $\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$ | $\frac{1.5+0.1/-0}{(0.059+0.004/-0)}$ | $\frac{0.85 \pm 0.15}{(0.033 \pm 0.006)}$ |

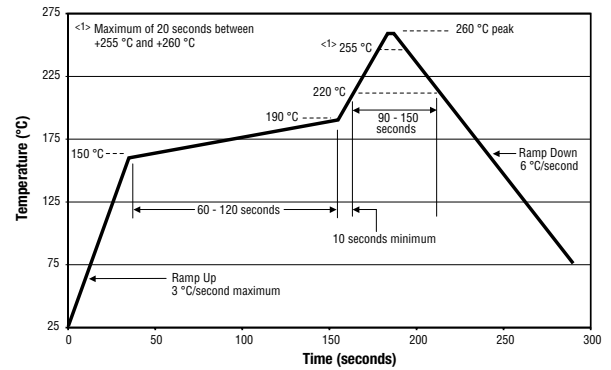
How to Order

CRF 0805 - F Z - R020 E LF

- Model _____
(CRF = Precision Chip Resistor)
- Size _____
0805 = 0805 Size
1206 = 1206 Size
2512 = 2512 Size
- Resistance Tolerance _____
• F = ±1 %
• J = ±5 %
- TCR (PPM/°C) _____
• Z = ±50 PPM/°C
- Resistance Value Code _____
(See Resistance Value Tables)
- Packaging _____
• E = 5,000 pcs./180 mm (7-inch) reel (CRF0805 & CRF1206)
or 4,000 pcs./180 mm (7-inch) reel (CRF2512)
- Termination _____
• LF = Tin-plated (RoHS compliant)

Soldering Profile

Can be soldered in accordance with IPC/JEDEC-J-STD-020.



REV. 06/21

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