



Features

- RoHS compliant*
- Values from 0.02 to 9.10 ohms
- Tolerance of 1 % or 5 %
- Five package sizes available
- Tape and reel packaging

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CRL Series - Low Value Chip Resistors

Electrical Characteristics

| Characteristic | Model CRL0603 | Model CRL0805 | Model CRL1206 | Model CRL2010 | Model CRL2512 |
|---|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Power Rating @ 70 °C | 0.100 watt | 0.125 watt | 0.250 watt | 0.50 watt | 1.00 watt |
| Operating Temperature Range | -55 to +125 °C | | | | |
| Derated to Zero Load at | +125 °C | | | | |
| Maximum Working Voltage | (PR) ^{1/2} | (PR) ^{1/2} | (PR) ^{1/2} | (PR) ^{1/2} | (PR) ^{1/2} |
| Resistance Range E24 Values: See Value Table: | 0.10 to 9.10 Ω N/A | 0.10 to 9.10 Ω 0.05 to 0.09 Ω | 0.10 to 9.10 Ω 0.02 to 0.09 Ω | 0.10 to 9.10 Ω 0.02 to 0.09 Ω | 0.10 to 9.10 Ω 0.02 to 0.09 Ω |
| Temperature Coefficient 0.05 Ω to 9.10 Ω 0.03 Ω to 0.04 Ω 0.01 Ω to 0.02 Ω | ±200 PPM/°C ±400 PPM/°C ±600 PPM/°C | | | | |

Value Table

| Value (Ω) | CRL0603 1 % | CRL0603 5 % | CRL0805 1 % | CRL0805 5 % | CRL1206 1 % | CRL1206 5 % | CRL2010 1 % | CRL2010 5 % | CRL2512 1 % | CRL2512 5 % |
|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 0.02 | Not Available | Not Available | Not Available | Not Available | A | A | P | P | P | P |
| 0.03 | Not Available | Not Available | Not Available | Not Available | A | A | P | P | P | P |
| 0.04 | Not Available | Not Available | Not Available | Not Available | A | A | P | P | P | P |
| 0.05 | Not Available | Not Available | A | A | A | A | P | P | P | P |
| 0.06 | Not Available | Not Available | A | A | A | A | A | A | A | A |
| 0.07 | Not Available | Not Available | A | A | A | A | A | A | A | A |
| 0.08 | Not Available | Not Available | A | A | A | A | A | A | A | A |
| 0.09 | Not Available | Not Available | A | A | A | A | A | A | A | A |

P = Popular Value

A = Available Value (may have greater minimum order quantity)

Environmental Characteristics

| Description | Method | Limit |
|------------------------------|--|--|
| Short Time Overload | 2.5 x (PR) ^{1/2} for 5 seconds. (IEC 115-1 4.13) | 1 % Tolerance: ΔR ≤ ±(1 % + 0.001 Ω) 5 % Tolerance: ΔR ≤ ±(2 % + 0.001 Ω) |
| Load Life | (PR) ^{1/2} for 1000 hours; 1.5 hours on; 0.5 hours off. (IEC 115-1 4.25.1) | 1 % Tolerance: ΔR ≤ ±(1 % + 0.001 Ω) 5 % Tolerance: ΔR ≤ ±(2 % + 0.001 Ω) |
| Resistance to Soldering Heat | 260 °C for 10 seconds. (IEC 115-1 4.18) | 1 % Tolerance: ΔR ≤ ±(0.5 % + 0.001 Ω) 5 % Tolerance: ΔR ≤ ±(1 % + 0.001 Ω) |
| Thermal Shock | 5 cycles from -55 °C to +125 °C, 30 minutes at temperature. (IEC 115-1 4.19) | 1 % Tolerance: ΔR ≤ ±(0.5 % + 0.001 Ω) 5 % Tolerance: ΔR ≤ ±(1 % + 0.001 Ω) |

*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.

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Customers should verify actual device performance in their specific applications.

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Chip Dimensions

| Dimension | Model CRL0603 | Model CRL0805 | Model CRL1206 | Model CRL2010 | Model CRL2512 |
|----------------|---|---|---|---|---|
| L | $\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$ | $\frac{2.00 \pm 0.15}{(0.079 \pm 0.006)}$ | $\frac{3.20 \pm 0.15}{(0.126 \pm 0.006)}$ | $\frac{5.00 \pm 0.20}{(0.197 \pm 0.008)}$ | $\frac{6.30 \pm 0.20}{(0.248 \pm 0.008)}$ |
| W | $\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$ | $\frac{1.25 \pm 0.10}{(0.049 \pm 0.004)}$ | $\frac{1.60 \pm 0.15}{(0.063 \pm 0.006)}$ | $\frac{2.50 \pm 0.20}{(0.098 \pm 0.008)}$ | $\frac{3.10 \pm 0.20}{(0.122 \pm 0.008)}$ |
| H | $\frac{0.45 \pm 0.10}{(0.018 \pm 0.004)}$ | $\frac{0.50 \pm 0.10}{(0.020 \pm 0.004)}$ | $\frac{0.60 \pm 0.10}{(0.024 \pm 0.004)}$ | $\frac{0.60 \pm 0.10}{(0.024 \pm 0.004)}$ | $\frac{0.60 \pm 0.10}{(0.024 \pm 0.004)}$ |
| l ₁ | $\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$ | $\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$ | $\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$ | $\frac{0.60 \pm 0.25}{(0.024 \pm 0.010)}$ | $\frac{0.60 \pm 0.25}{(0.024 \pm 0.010)}$ |
| l ₂ | $\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$ | $\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$ | $\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$ | $\frac{0.60 \pm 0.25}{(0.024 \pm 0.010)}$ | $\frac{0.60 \pm 0.20}{(0.024 \pm 0.008)}$ |

Dimensional Drawing



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

Derating Curve



How to Order

CRL 0603 - F W - R090 E LF

Model _____
(CRL = Chip Resistor Low Value)

- Size _____
- 0603
 - 0805
 - 1206
 - 2010
 - 2512

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

TCR (PPM/°C) _____
W = ±200 (0.05 to 9.10 Ω)
V = ±400 (0.03 to 0.04 Ω)
U = ±600 (0.01 Ω to 0.02 Ω)

Resistance Value (1 % or 5 %) _____
• R stands for decimal point. Three significant digits: (R090 = 0.09 Ω; 9R10 = 9.10 Ω)

Packaging _____
• CRL0603, CRL0805, CRL1206: E = Paper Tape, Plastic Reel, 5,000 pcs.
• CRL2010, CRL2512: E = Embossed Plastic Tape, Plastic Reel, 4,000 pcs.

Termination _____
LF = Tin-plated (RoHS compliant)

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Packaging Dimensions - Tape

| Dimension | Model CRL0603 | Model CRL0805 | Model CRL1206 | Model CRL2010 | Model CRL2512 |
|----------------|---|--|--|---|--|
| A | $\frac{1.10 \pm 0.10}{(0.043 \pm 0.004)}$ | $\frac{1.65 + 0.20 / - 0.10}{(0.065 + 0.008 / -.004)}$ | $\frac{1.95 + 0.10 / - 0.05}{(0.077 + 0.004 / -.002)}$ | $\frac{2.80 \pm 0.20}{(0.110 \pm 0.008)}$ | $\frac{3.50 \pm 0.20}{(0.138 \pm 0.008)}$ |
| B | $\frac{1.90 \pm 0.10}{(0.075 \pm 0.004)}$ | $\frac{2.40 + 0.20 / - 0.10}{(0.094 + 0.008 / -.004)}$ | $\frac{3.50 \pm 0.10}{(0.138 \pm 0.004)}$ | $\frac{5.50 \pm 0.20}{(0.217 \pm 0.008)}$ | $\frac{6.70 \pm 0.20}{(0.264 \pm 0.008)}$ |
| W | $\frac{8.00 \pm 0.20}{(0.315 \pm 0.008)}$ | $\frac{8.00 \pm 0.20}{(0.315 \pm 0.008)}$ | $\frac{8.00 \pm 0.20}{(0.315 \pm 0.008)}$ | $\frac{12.0 \pm 0.30}{(0.472 \pm 0.012)}$ | $\frac{12.00 \pm 0.30}{(0.472 \pm 0.012)}$ |
| F | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$ | $\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$ |
| P ₀ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |

Packaging Dimensions - Reel

| Dimension | Model CRL0603 | Model CRL0805 | Model CRL1206 | Model CRL2010 | Model CRL2512 |
|-----------|--|--|--|--|--|
| N | $\frac{80.00 \pm 1.00}{(3.150 \pm 0.040)}$ | $\frac{80.00 \pm 1.00}{(3.150 \pm 0.040)}$ | $\frac{80.00 \pm 1.00}{(3.150 \pm 0.040)}$ | $\frac{80.00 \pm 0.20}{(3.150 \pm 0.008)}$ | $\frac{80.00 \pm 0.20}{(3.150 \pm 0.008)}$ |
| D | $\frac{20.50}{(0.807)}$ | $\frac{20.50}{(0.807)}$ | $\frac{20.50}{(0.807)}$ | $\frac{20.00}{(0.787)}$ MIN. | $\frac{20.00}{(0.787)}$ MIN. |
| T | $\frac{10.00 \pm 1.50}{(0.394 \pm 0.059)}$ | $\frac{10.00 \pm 1.50}{(0.394 \pm 0.059)}$ | $\frac{10.00 \pm 1.50}{(0.394 \pm 0.059)}$ | $\frac{16.70}{(0.657)}$ MAX. | $\frac{16.70}{(0.657)}$ MAX. |



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