

BOURNS®

Features

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

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.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

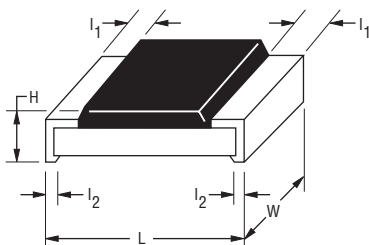
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Chip Dimensions

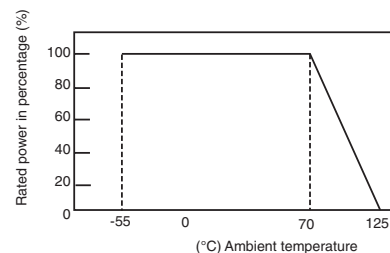
Dimension	Model CRL0603	Model CRL0805	Model CRL1206	Model CRL2010	Model CRL2512
L	$\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$	$\frac{2.00 \pm 0.15}{(0.079 \pm 0.006)}$	$\frac{3.20 \pm 0.15}{(0.126 \pm 0.006)}$	$\frac{5.00 \pm 0.20}{(0.197 \pm 0.008)}$	$\frac{6.30 \pm 0.20}{(0.248 \pm 0.008)}$
W	$\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$	$\frac{1.25 \pm 0.10}{(0.049 \pm 0.004)}$	$\frac{1.60 \pm 0.15}{(0.063 \pm 0.006)}$	$\frac{2.50 \pm 0.20}{(0.098 \pm 0.008)}$	$\frac{3.10 \pm 0.20}{(0.122 \pm 0.008)}$
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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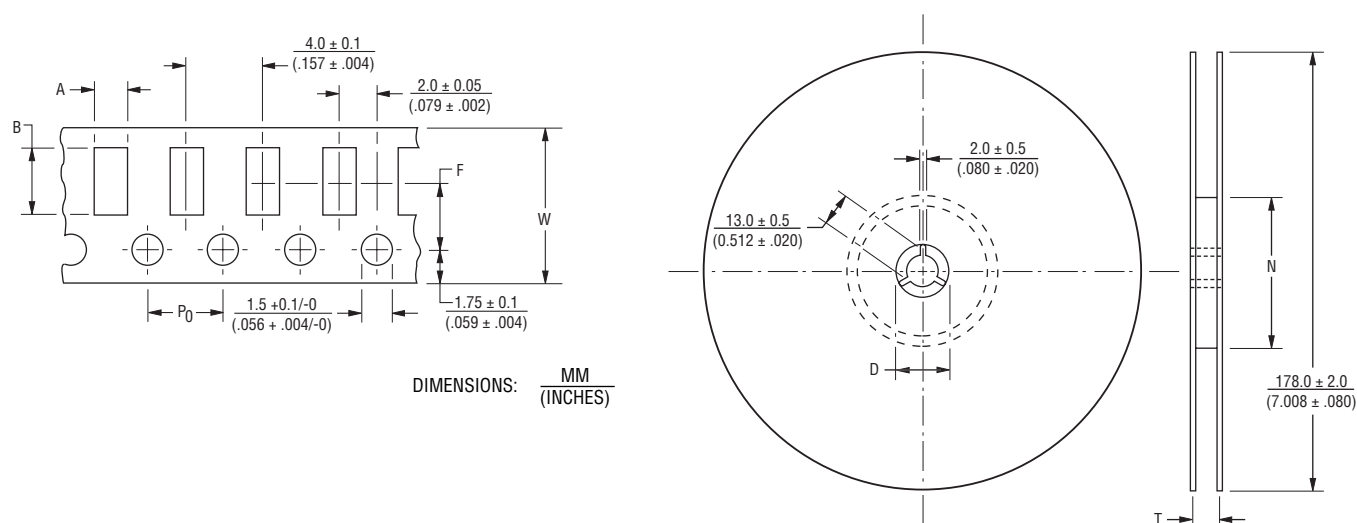
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Packaging Dimensions - Tape

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.



REV. 02/11

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