

\* RoHS COMPLIANT



**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) <sup>1/2</sup>	(PR) <sup>1/2</sup>	(PR) <sup>1/2</sup>	(PR) <sup>1/2</sup>	(PR) <sup>1/2</sup>
Resistance Range 1 % R ≥ 0.10 Ω: E24 Series R < 0.10 Ω: See Value Table	0.10 to 9.10 Ω	0.05 to 9.10 Ω	0.02 to 9.10 Ω	0.02 to 9.10 Ω	0.02 to 9.10 Ω
Resistance Range 5 %* R ≥ 0.10 Ω: E24 Series R < 0.10 Ω: See Value Table	0.10 to 0.91 Ω	0.05 to 0.91 Ω	0.02 to 0.91 Ω	0.02 to 0.91 Ω	0.02 to 0.91 Ω
Temperature Coefficient 0.05 Ω ≤ R ≤ 9.1 Ω 0.02 Ω < R < 0.05 Ω R = 0.02 Ω	±200 PPM/°C ±400 PPM/°C ±600 PPM/°C				

\* For 5 % tolerance and resistance value ≥ 1 ohm, please see Bourns® Model CR Series.

### Value Table

Value (Ω)	CRL0603 1 %	CRL0603 5 %	CRL0805 1 %	CRL0805 5 %	CRL1206 1 %	CRL1206 5 %	CRL2010 1 %	CRL2010 5 %	CRL2512 1 %	CRL2512 5 %
0.020	Not Available	Not Available	Not Available	Not Available	A	A	P	P	P	P
0.022	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.024	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.027	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.030	Not Available	Not Available	Not Available	Not Available	A	A	P	P	P	P
0.033	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.036	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.039	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.040	Not Available	Not Available	Not Available	Not Available	A	A	P	P	P	P
0.043	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.047	Not Available	Not Available	Not Available	Not Available	A	A	A	A	A	A
0.050	Not Available	Not Available	A	A	P	P	P	P	P	P
0.051	Not Available	Not Available	A	A	A	A	A	A	A	A
0.056	Not Available	Not Available	A	A	A	A	A	A	A	A
0.060	Not Available	Not Available	A	A	A	A	A	A	A	A
0.062	Not Available	Not Available	A	A	A	A	A	A	A	A
0.068	Not Available	Not Available	A	A	A	A	A	A	A	A
0.070	Not Available	Not Available	A	A	A	A	A	A	A	A
0.075	Not Available	Not Available	A	A	A	A	A	A	A	A
0.080	Not Available	Not Available	A	A	A	A	A	A	A	A
0.082	Not Available	Not Available	A	A	A	A	A	A	A	A
0.090	Not Available	Not Available	A	A	A	A	A	A	A	A
0.091	Not Available	Not Available	A	A	A	A	A	A	A	A

P = Popular Value

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

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

Specifications are subject to change without notice.

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# CRL Series - Low Value Chip Resistors

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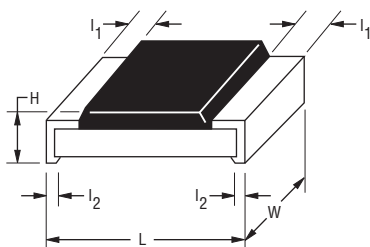
## Environmental Characteristics

Description	Method	Limit
Short Time Overload	2.5 x (PR) <sup>1/2</sup> for 5 seconds. (IEC 115-1 4.13)	1 % Tolerance: $\Delta R \leq \pm(1 \% + 0.001 \Omega)$ 5 % Tolerance: $\Delta R \leq \pm(2 \% + 0.001 \Omega)$
Load Life	(PR) <sup>1/2</sup> for 1000 hours; 1.5 hours on; 0.5 hours off. (IEC 115-1 4.25.1)	1 % Tolerance: $\Delta R \leq \pm(1 \% + 0.001 \Omega)$ 5 % Tolerance: $\Delta R \leq \pm(2 \% + 0.001 \Omega)$
Resistance to Soldering Heat	260 °C for 10 seconds. (IEC 115-1 4.18)	1 % Tolerance: $\Delta R \leq \pm(0.5 \% + 0.001 \Omega)$ 5 % Tolerance: $\Delta R \leq \pm(1 \% + 0.001 \Omega)$
Thermal Shock	5 cycles from -55 °C to +125 °C, 30 minutes at temperature. (IEC 115-1 4.19)	1 % Tolerance: $\Delta R \leq \pm(0.5 \% + 0.001 \Omega)$ 5 % Tolerance: $\Delta R \leq \pm(1 \% + 0.001 \Omega)$

## Chip Dimensions

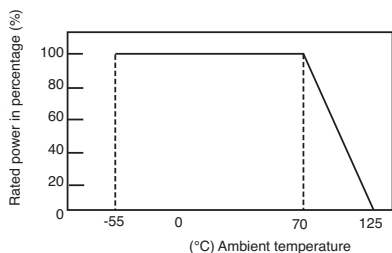
Dimension	Model CRL0603	Model CRL0805	Model CRL1206	Model CRL2010	Model CRL2512
L	$\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$	$\frac{2.00 \pm 0.15}{(0.079 \pm 0.006)}$	$\frac{3.20 \pm 0.15}{(0.126 \pm 0.006)}$	$\frac{5.00 \pm 0.20}{(0.197 \pm 0.008)}$	$\frac{6.30 \pm 0.20}{(0.248 \pm 0.008)}$
W	$\frac{0.80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

## 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 Ω ≤ R ≤ 9.1 Ω)  
 V = ±400 (0.02 Ω < R < 0.05 Ω)  
 U = ±600 (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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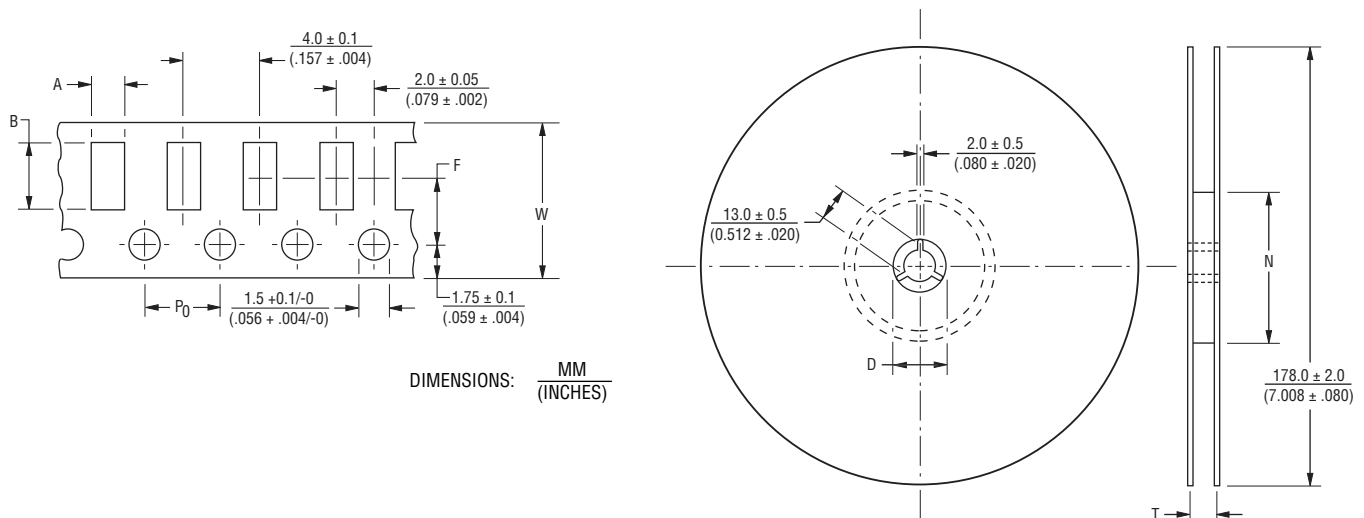
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## Packaging Dimensions - Tape

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 <sub>0</sub>	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$

## 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. 11/15

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