



Features

- RoHS compliant*
- Values from 0.01 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 (See Value Table):	0.100 to 9.10 Ω	0.050 to 9.10 Ω	0.020 to 9.10 Ω	0.020 to 9.10 Ω	0.010 to 9.10 Ω
Temperature Coefficient					
0.050 Ω to 9.10 Ω	±200 PPM/°C				
0.030 Ω to 0.040 Ω	±400 PPM/°C				
0.010 Ω to 0.020 Ω	±600 PPM/°C				

Environmental Characteristics

Description	Method	Limit
Short Time Overload	2.5 x (PR) ^{1/2} 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) ^{1/2} 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: $\Delta R \leq \pm(1 \% + 0.001 \Omega)$

How to Order

Standard Values listed on following page.

CRL 0603 - F W - R120 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 (0.050 to 9.10 Ω)
V = ±400 (0.030 to 0.040 Ω)
U = ±600 (0.010 Ω to 0.020 Ω)

Resistance Value (1 % or 5 %) _____

- R stands for decimal point. Three significant digits: (R120 = 0.12 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)

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

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Value Table

Value (Ω)	CRL0603 1 %	CRL0603 5 %	CRL0805 1 %	CRL0805 5 %	CRL1206 1 %	CRL1206 5 %	CRL2010 1 %	CRL2010 5 %	CRL2512 1 %	CRL2512 5 %
0.01	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	P	P
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
0.10	P	P	P	P	P	P	P	P	P	P
0.12	A	A	A	A	A	A	A	A	A	A
0.15	A	A	A	A	A	A	P	P	P	P
0.16	A	A	A	A	A	A	A	A	A	A
0.18	A	A	A	A	A	A	A	A	A	A
0.20	P	P	P	P	P	P	A	A	A	A
0.22	P	P	P	P	P	P	P	P	P	P
0.24	A	A	A	A	A	A	A	A	A	A
0.27	A	A	A	A	A	A	A	A	A	A
0.30	A	A	A	A	A	A	A	A	A	A
0.33	A	A	A	A	A	A	P	P	P	P
0.39	A	A	A	A	A	A	P	P	P	P
0.43	A	A	A	A	A	A	A	A	A	A
0.47	P	P	P	P	P	P	P	P	P	P
0.51	A	A	A	A	A	A	A	A	A	A
0.56	A	A	A	A	A	A	P	P	P	P
0.68	A	A	A	A	A	A	P	P	P	P
0.75	A	A	A	A	A	A	P	P	P	P
0.82	A	A	A	A	A	A	P	P	P	P
0.91	A	A	A	A	A	A	A	A	A	A
1.00	P	Use CR0603, 5%	P	Use CR0805, 5%	P	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
1.10	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
1.20	P	Use CR0603, 5%	P	Use CR0805, 5%	P	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
1.30	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
1.50	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
1.60	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
1.80	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
2.00	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
2.20	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
2.40	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
2.70	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
3.00	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
3.30	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
3.60	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
3.90	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
4.30	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
4.70	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
5.10	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
5.60	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
6.20	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
6.80	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
7.50	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
8.20	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%
9.10	A	Use CR0603, 5%	A	Use CR0805, 5%	A	Use CR1206, 5%	A	Use CR2010, 5%	A	Use CR2512, 5%

P = Popular Value

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

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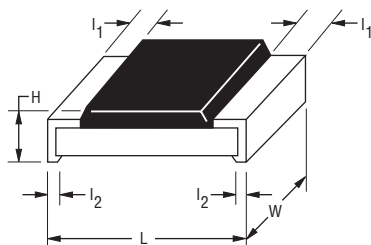
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Chip Dimensions

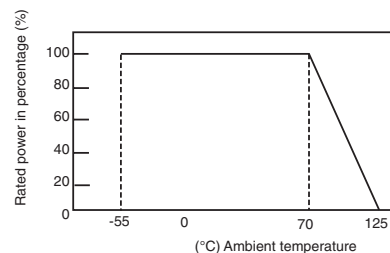
Dimension	Model CRL0603	Model CRL0805	Model CRL1206	Model CRL2010	Model CRL2512
L	$\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$	$\frac{2.00 \pm 0.15}{(0.079 \pm 0.006)}$	$\frac{3.20 \pm 0.15}{(0.126 \pm 0.006)}$	$\frac{5.00 \pm 0.20}{(0.197 \pm 0.008)}$	$\frac{6.30 \pm 0.20}{(0.248 \pm 0.008)}$
W	$\frac{0.80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



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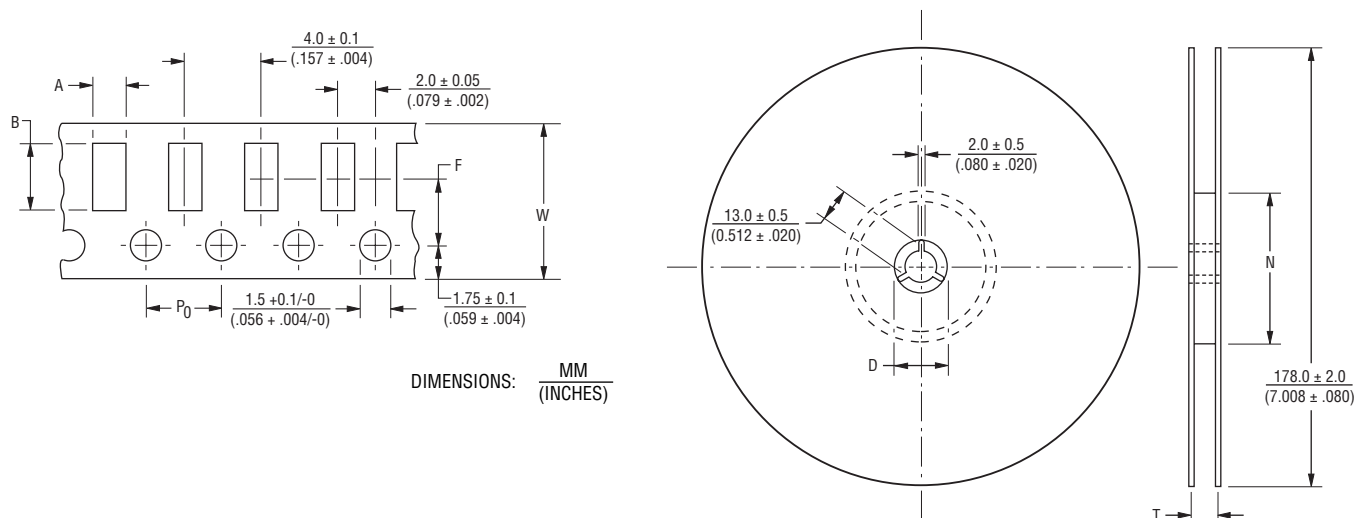
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Packaging Dimensions - Tape

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. 05/10

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