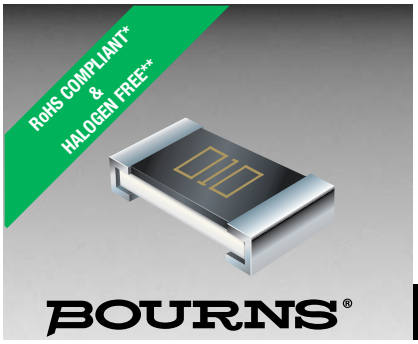


Features

- Metal foil
- High power density
- Low inductance <5 nH
- Low thermal EMF <3 µV/°C
- High reliability and stability
- RoHS compliant* and halogen free**

Applications

- Current sensing
- Power supplies
- Stepper motor drives
- Input amplifiers

CFN Series Metal Foil, Current Sense Resistor

Electrical Characteristics

Characteristic	CFN0402	CFN0603	CFN0805	CFN1206
Power Rating @ 70 °C (W)	0.25	0.5	0.75	1
Resistance Value (mΩ)	10, 20	5, 10, 20	5, 10, 20, 30	5, 10, 20, 40
Operating Temperature Range (°C)	-55 ~ +125	-55 ~ +155		
Temperature Coefficient of Resistance (ppm/°C)	±100	±50, ±100		
Tolerance (%)	±1, ±5			

Environmental Characteristics

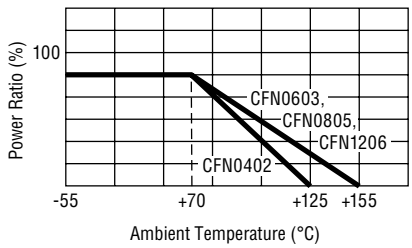
Storage Conditions
Temperature ..... +5 °C ~ +35 °C
Humidity ..... 40 % ~ 75 %
Shelf Life ..... 2 years from manufacturing date
Solder Recommendations ..... Reflow profile
(Solder: Sn96.5 / Ag3 / Cu0.5)
Moisture Sensitivity Level 1

Additional Information

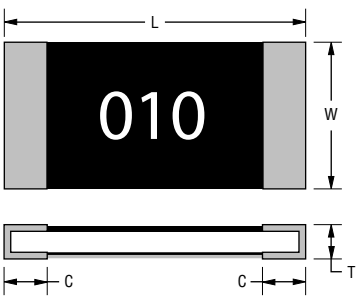
Click these links for more information:

PRODUCT | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

Derating Curve



Product Dimensions



	L	W	C	T
CFN0402	1.10 ± 0.10 (.043 ± .004)	0.55 ± 0.10 (.021 ± .004)	0.25 ± 0.20 (.010 ± .004)	0.45 ± 0.10 (.017 ± .004)
CFN0603	1.60 ± 0.20 (.063 ± .008)	0.80 ± 0.20 (.031 ± .008)	0.40 ± 0.20 (.016 ± .008)	0.60 ± 0.20 (.023 ± .008)
CFN0805	2.00 ± 0.20 (.079 ± .008)	1.25 ± 0.20 (.049 ± .008)	0.40 ± 0.20 (.016 ± .008)	0.70 ± 0.20 (.028 ± .008)
CFN1206	3.20 ± 0.20 (.126 ± .008)	1.60 ± 0.20 (.063 ±. 008)	0.50 ± 0.20 (.020 ± .008)	0.70 ± 0.20 (.028 ± .008)

DIMENSIONS: MM / (INCHES)

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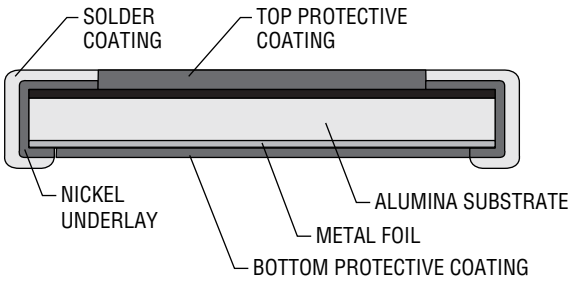
WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
** Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

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Users should verify actual device performance in their specific applications.
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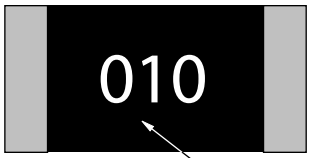
Construction



Typical Part Marking

CFN0402 & CFN0603:
No marking.

CFN0805 & CFN1206:



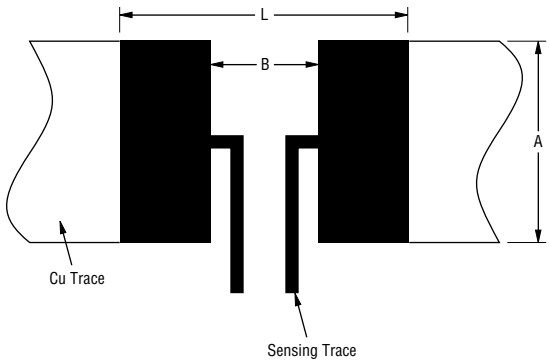
RESISTANCE CODE:
005 = 5 mΩ
6.5 = 6.5 mΩ
010 = 10 mΩ
020 = 20 mΩ

Popular Resistance Values*

Code	Resistance Value (milliohms)	Model
R005	5	CFN0603
R010	10	CFN0402, 0603, 0805, 1206
R020	20	CFN0402, 0603, 0805, 1206
R030	30	CFN0805
R040	40	CFN1206

*Please consult factory for other resistance values.

Recommended Solder Pad Dimensions



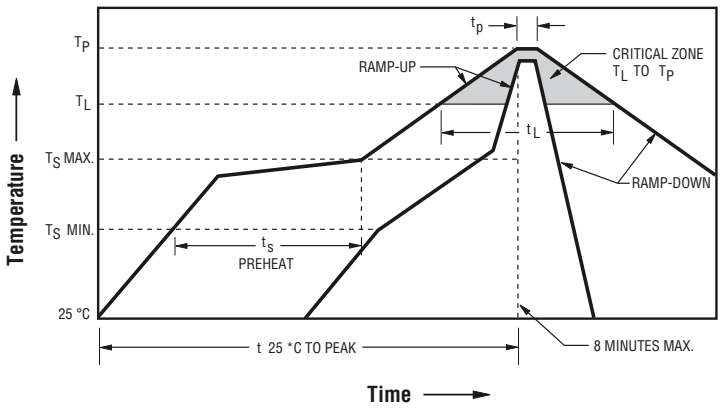
Model	Resistance	A	L	B
CFN0402	10 ≤ R < 20	0.70 (.027)	1.20 (.047)	0.45 (.018)
CFN0603	10 ≤ R < 20	1.00 (.039)	2.80 (.110)	0.60 (.024)
CFN0805	10 ≤ R < 30	1.40 (.055)	3.20 (.126)	1.20 (.047)
CFN1206	20 ≤ R < 30	1.80 (.071)	4.70 (.185)	1.60 (.063)
	R = 40			2.20 (.087)

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Solder Reflow Recommendations



Solder Profile	Lead Free Assembly
Average ramp-up rate (T_{smax} to T_p)	3 °C / second max.
Preheat: - Temperature Min. (T_{smin}) - Temperature Max. (T_{smax}) - Time (T_{smin} to T_{smax}) (t_s)	 150 °C 200 °C 60~150 seconds
Time maintained above: - Temperature (T_L) - Time (T_L)	 217 °C 60~120 seconds
Peak Temperature (T_p)	260 °C
Time within +0/-5 °C of actual Peak Temperature (T_p)[2]	10 seconds
Ramp-down rate	6 °C / second max.
Time 25 °C to Peak Temperature	8 minutes max.

How to Order

CFN 0805 - F X - R005 E LF

Model
- CFN = Metal Foil Current Sense Resistor

Size
- 0402 = 0402 Size
- 0603 = 0603 Size
- 0805 = 0805 Size
- 1206 = 1206 Size

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

TCR
- X = ±100 PPM/°C
- Z = ±50 PPM/°C

Resistance Code – (See Popular Resistance Table)
- "R" (decimal point) followed by three significant digits *(example: R005 = 0.005 ohms)*

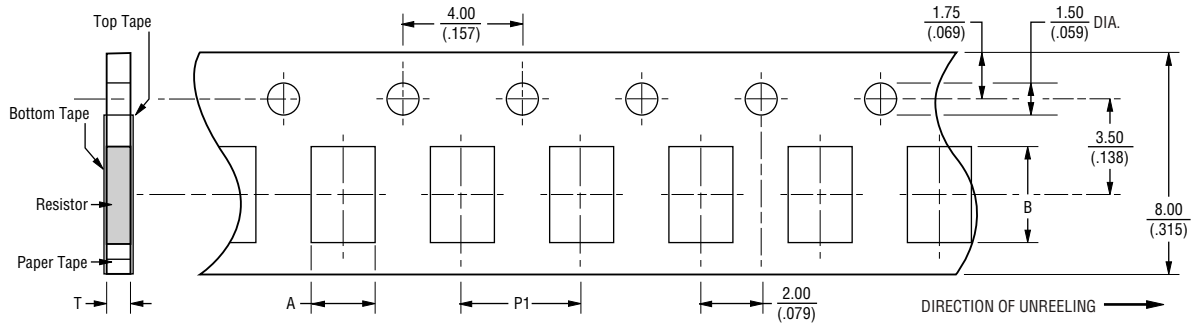
Packaging
- E = Tape and Reel
  - 4,000 pcs. / 7-inch reel, paper tape (CFN0805, CFN1206)
  - 5,000 pcs. / 7-inch reel, paper tape (CFN0603)
  - 10,000 pcs. / 7-inch reel, paper tape (CFN0402)

Termination
- LF = Tin-plated (RoHS Compliant)

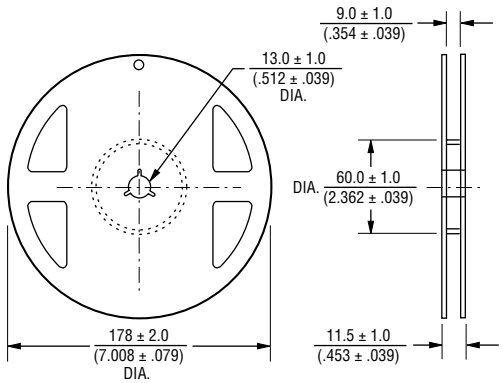
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Packaging Dimensions (Conforms to EIA RS-481A)



Model	A	B	P1	T
CFN0402	0.75 (.030)	1.30 (.051)	2.00 (.079)	0.65 (.026)
CFN0603	1.10 (.043)	1.90 (.075)	4.00 (.157)	0.85 (.034)
CFN0805	1.60 (.063)	2.40 (.094)		1.05 (.041)
CFN1206	2.00 (.079)	3.60 (.142)		



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Reliability Tests

Test Items	Condition of Test	ΔR Maximum
Load Life	1000 hours at rated power, 70 °C, 1.5 hours “ON”, 0.5 hour “OFF”	< ±1 %
Short Time Overload	5 X rated power for 5 sec.	< ±1 %
Moisture no Load	85 °C, 85 %RH, 1000 hrs.	< ±1 %
Temperature Cycle	-55 °C & +155 °C, 100 cycles, 15 min. per extreme condition (CFN0402: -55 °C & +125 °C, 100 cycles)	< ±1 %
Resistance to Soldering Heat	260 ±5 °C for 10 ±1 sec.	< ±0.5 %
Solderability	245 ±5 °C, 2 ±0.5 sec.	At least 95 % of surface area of electrode shall be covered with new solder
High Temperature Exposure	+155 °C, 1000 hrs. (CFN0402: +125 °C, 1000 hrs.	< ±1 %
Low Temperature Storage	-55 °C, 1000 hrs.	< ±1 %
Substrate Bending	Bending width 2 mm	< ±0.5 %
Insulation Resistance	100 V DC for 1 minute	>100 MΩ

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