

## Features

- Wide terminal type
- Excellent heat dissipation
- Low inductance <5 nH
- Low thermal EMF <3  $\mu\text{V}/^\circ\text{C}$
- High reliability
- Metal foil
- RoHS compliant\* and halogen free\*\*

## Applications

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

## CFG Series Metal Foil, Wide Terminal Current Sense Resistor

### Electrical Characteristics

Characteristic	CFG0612
Power Rating @ 70 °C	1 W
Resistance Value	5 m $\Omega$ , 10 m $\Omega$
Operation Temperature Range	-55 °C ~ +155 °C
Temperature Coefficient of Resistance	$\pm 100$ ppm/°C
Tolerance	$\pm 1$ %
Insulation Resistance	Over 100 M $\Omega$
Maximum Working Voltage (V)	(P*R) <sup>1/2</sup>

Note: 1 watt with total solder pad and trace size of 300 mm<sup>2</sup>

### Additional Information

Click these links for more information:



### Reliability Tests

Test Items	Reference Standard	Condition of Test	Test Limits
Temperature Coefficient of Resistance	IEC60115-1-4.8 JIS-C5201-4.8	+25 °C ~ +125 °C	—
Load Life	IEC60115-1-4.25.1 JIS-C5201-4.25.1	1000 hours at rated power, 70 °C, 1.5 hours "ON", 0.5 hour "OFF"	< $\pm 2$ %
Short Time Overload	IEC60115-1-4.13 JIS-C5201-4.13	5 X rated power for 5 s	< $\pm 1$ %
Moisture no Load	IEC60115-1- 4.24.2.1a) JIS-C5201- 4.24.2.1a)	85 °C, 85 %RH, 1000 hrs	< $\pm 2$ %
Damp Heat with Load	IEC60115-1- 4.24 JIS-C5201-1 4.24	40 $\pm 2$ °C with relative humidity 90 to 95 %. D.C. rated power for 1.5 hours ON and 30 minutes OFF. Cycle repeated 1,000 hours	< $\pm 1$ %
Temperature Cycle	IEC60115-1-4.19 JIS-C5201-4.19	-55 °C & +125 °C, 100 cycle, 15 min per extreme condition	< $\pm 1$ %
Resistance to Soldering Heat	IEC60115-1-4.18 JIS-C5201-4.18	260 $\pm 5$ °C for 10 $\pm 1$ sec	< $\pm 1$ %
Solderability	IEC60115-1-4.17 JIS-C5201-4.17	245 $\pm 5$ °C, 2 $\pm 0.5$ sec	At least 95 % of surface area of electrode shall be covered with new solder
High Temperature Exposure	IEC60115-1- 4.23.2 JIS-C5201-4.23.2	155 °C, 1000 hrs	< $\pm 2$ %
Low Temperature Storage	EC60115-1- 4.23.4 JIS-C5201-4.23.4	-55 °C, 1000 hrs	< $\pm 2$ %
Substrate Bending	IEC60115-1-4.33 JIS-C5201-4.33	Bending width 2 mm	< $\pm 1$ %
Insulation Resistance	IEC60115-1-4.6 JIS-C5201-4.6	100 V DC for 1 minute	>100 M $\Omega$



**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://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.

Specifications are subject to change without notice.

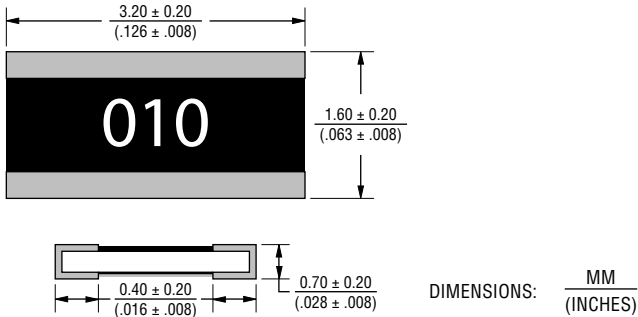
Users should verify actual device performance in their specific applications.

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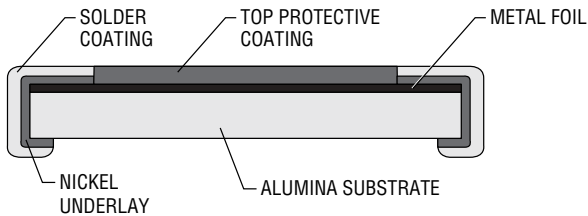
# CFG Series Metal Foil, Wide Terminal Current Sense Resistor



## Product Dimensions



## Construction



## Rated Voltage

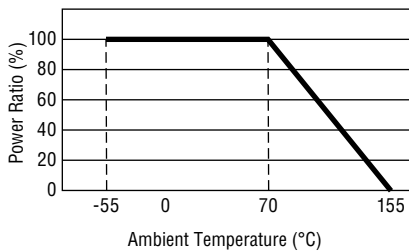
The rated voltage is calculated by the following formula:

$$V = \sqrt{P \times R}$$

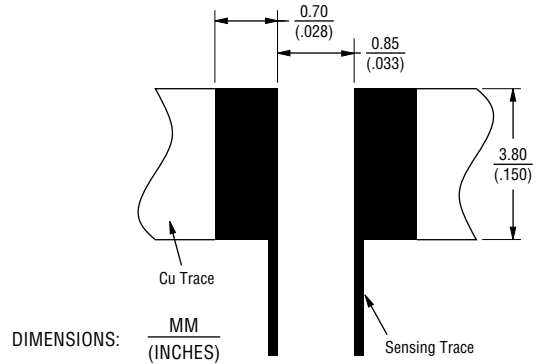
$$I = \sqrt{P \div R}$$

**V:** Rated Voltage (V)  
**I:** Rated Current (A)  
**P:** Rated Power (W)  
**R:** Resistance Value ( $\Omega$ )

## Derating Curve



## Recommended Solder Pad Dimensions



## 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

## Popular Resistance Values\*

Code	Resistance Value (milliohms)
R005	5
R010	10

\*Please consult factory for other resistance values

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# CFG Series Metal Foil, Wide Terminal Current Sense Resistor



## Solder Reflow Recommendations



Solder Profile	Lead Free Assembly
Average ramp-up rate (T <sub>Smax</sub> to T <sub>P</sub> )	3 °C / second max.
Preheat: - Temperature Min. (T <sub>Smin</sub> ) - Temperature Max. (T <sub>Smax</sub> ) - Time (T <sub>Smin</sub> to T <sub>Smax</sub> ) (t <sub>s</sub> )	150 °C 200 °C 60~150 seconds
Time maintained above: - Temperature (T <sub>L</sub> ) - Time (T <sub>L</sub> )	217 °C 60~120 seconds
Peak Temperature (T <sub>P</sub> )	260 °C
Time within +0/-5 °C of actual Peak Temperature (T <sub>P</sub> ) <sup>2</sup>	10 seconds
Ramp-down rate	6 °C / second max.
Time 25 °C to Peak Temperature	8 minutes max.

## How to Order

CFG 0612 - F X - R005 E LF

Model \_\_\_\_\_  
CFG = Metal Foil, Wide Terminal Current Sense Resistor

Size \_\_\_\_\_  
0612 = 0612 Size

Resistance Tolerance \_\_\_\_\_  
F = ±1 %

TCR \_\_\_\_\_  
X = ±100 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

Termination \_\_\_\_\_  
LF = Tin-plated (RoHS Compliant)

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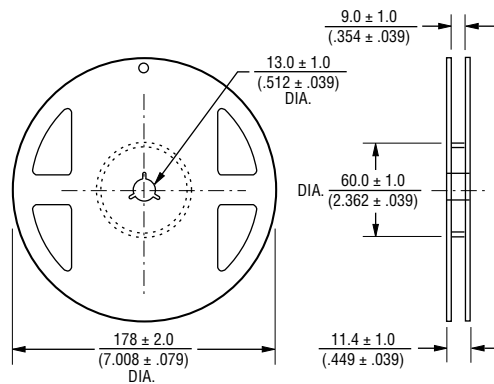
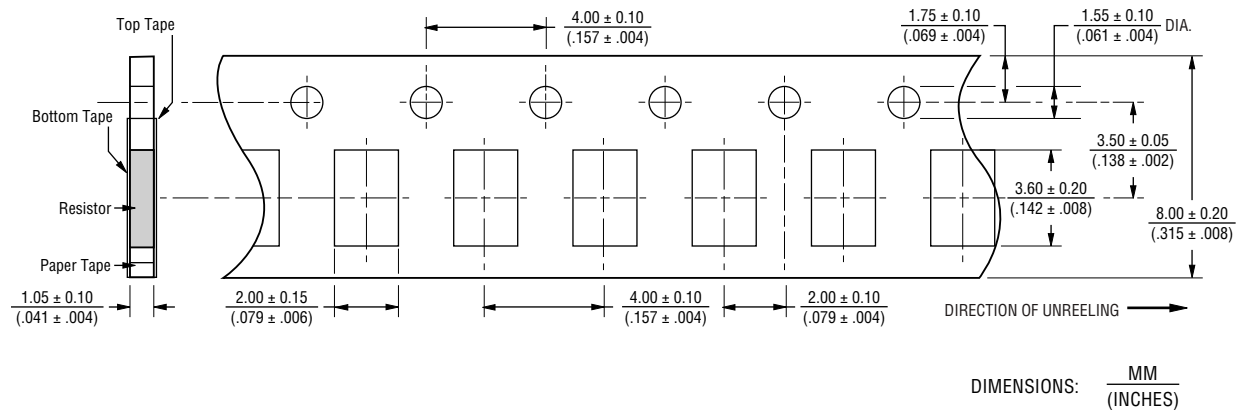
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# CFG Series Metal Foil, Wide Terminal Current Sense Resistor

**BOURNS®**

## Packaging Dimensions (Conforms to EIA RS-481A)



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