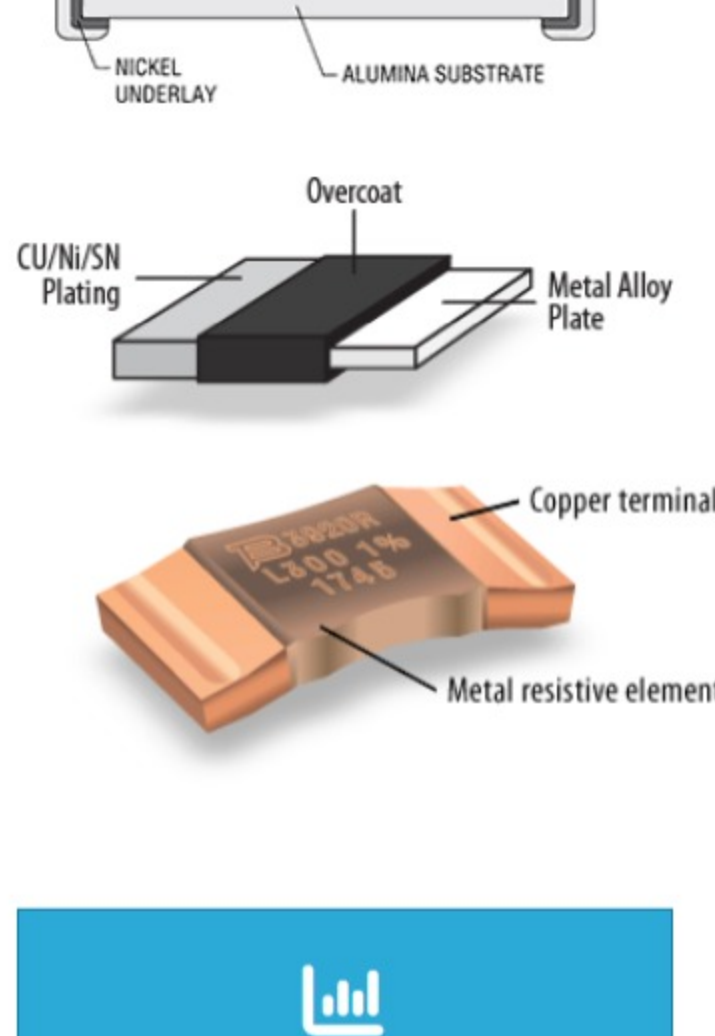


Metal Foil, Metal Strip Chip Resistors & EB Welded Shunts

Home / Products / Resistors / Metal Strip



Bourns offers metal foil and metal strip chip resistors and EB welded metal strip shunts.

These high-power resistors have very low resistance values and TCR due to their metal strip resistive element and are suitable for all types of current sensing applications.

Metal foil resistors are constructed with a metal foil resistive element mounted on a ceramic substrate for excellent heat conductivity. The metal foil resistive element of these current sense resistors results in very low inductance, low noise and excellent reliability. Available with very low resistance values (down to five milliohms) and ideal for current sensing in consumer and telecommunication electronics and industrial automation applications.

Bourns offers the standard short terminal shape (CFN Series) and a wide terminal shape (CFG Series) wide terminal model CFG Series helps to provide improved heat dissipation and higher reliability due to larger terminations and solder joint surfaces.

Metal strip chip resistors (Model CRA, CRE, CRF, CST Series) have electroplated tin (Sn) outer terminations for soldering onto the board. The resistive element is protected by an epoxy overcoat layer.

EB welded metal strip shunts (Bourns® Model CSS Series) are manufactured using an electron beam-welded metal strip with an iron chrome or manganese copper alloy resistive element, providing excellent electrical characteristics. They also feature copper alloy terminations that deliver additional mechanical strength and enable ease of solderability.

Characteristics	
Size	0805, 1206 Short Terminal Metal Foil 0612 Wide-terminal Metal Foil 0805 to 2512 Metal Strip Chip 2512 to 5931 EB Welded Metal Strip
Rated power at 70 °C	0.5 W to 15 W
Resistance Range	0.2 to 100 milliohms
Resistance Tolerance	±1 %, ±5 %
Temperature Coefficient	±50, 100, ±200 ppm/°C
Operating Temperature Range	–55 to +170 °C

Available features

- RoHS compliant*
- AEC-Q200 compliant
- Very high power
- Very low resistance
- Excellent long-term stability
- Low inductance values
- Low thermal EMF
- Low TCR
- Four terminal designs
- Suitable for most types of soldering processes

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

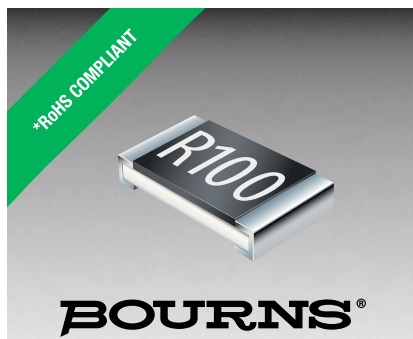
Applications

- Current sense
- Automotive comfort, entertainment, and infotainment
- Industrial
- Consumer
- Telecommunications
- Battery management system
- DC/DC converters
- Motor drives
- Power supplies

Documents

- [Chip Resistors & Arrays Short Form Brochure](#)
- [Bourns® Resistor Networks Info Sheet](#)
- [Bourns® Power Resistors Info Sheet](#)
- [Using Current Sense Resistors for Accurate Current Measurement Application Note](#)
- [Current Monitoring Using Current Sense Resistors Application Note](#)
- [Battery Management & Protection Product Profile](#)
- [Using High Power Inductors and Current Sense Resistors for Micro Hybrid Vehicle DC/DC Converters Application Note](#)
- [Energy - Current Sensing in Battery Management Systems](#)
- [Selecting the Right Sense Resistor for Motor Control with Reinforced Isolation White Paper](#)
- [Bourns® Military / Aerospace Commercial Off-The-Shelf \(COTS\) & Custom Components Short Form Brochure](#)
- [Bourns Technology Enables Efficient and Compact DC-DC Converter Design White Paper](#)
- [Resistance Measurement for Bourns® Metal Current Sense Products](#)

Model/Datasheet	Photo	MSL	Soldering Profiles	Packaging Label	Terminal	Co/C	3rd Party Test Reports	MDS	China RoHS
CFG Series		1	See Data Sheet		e3	CFG, CFN	Request Report	CFG0612	TBD
CFN Series		1	See Data Sheet		e3	CFG, CFN	Request Report	CFN0602 CFN0603 CFN0805 CFN1206	TBD
CHP Series		1	See Data Sheet	Chip Label A	e3	CHP/CHV	Request Report	CHP0603 CHP0805 CHP1206 CHP2512	China RoHS2 EFUP50 - Chip Resistors 7c-1
CHP-A Series		1	See Data Sheet	Chip Label A	e3	CHP/CHV	Request Report	CHP0603-A CHP0805-A CHP1206-A CHP2512-A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CHV Series		See note	Std	Chip Label A	e3	CHP/CHV	Request Report	CHV Series	China RoHS2 EFUP50 - Chip Resistors 7c-1
CHV-A Series		See note	See Data Sheet	Chip Label A	e3	CHP/CHV	Request Report	CHV0603-A CHV0805-A CHV1206-A CHV2512-A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CHV-ST Series		See note	See Data Sheet	Chip Label A	e3	CHP/CHV	Request Report	CHV0603-ST CHV0805-ST CHV1206-ST CHV2010-ST CHV2512-ST	China RoHS2 EFUP50 - Chip Resistors 7c-1
CMP Series		1	See Data Sheet	Chip Label A	e3	CMP/CMP-A	Request Report	CMP0603 CMP1206 CMP2010 CMP2512	China RoHS2 EFUP50 - Chip Resistors 7c-1
CMP-A Series		1	See Data Sheet	Chip Label A	e3	CMP/CMP-A	Request Report	CMP0603A CMP1206A CMP2010A CMP2512A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR0100S		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0100S	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR0201		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0201	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR0201A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0201A	China RoHS2 - Chip Resistors
CR0201A-AS		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0201A-AS	China RoHS2 - Chip Resistors
CR0402		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0402	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR0402A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0402A	China RoHS2 - Chip Resistors
CR0402-PF		1	See Data Sheet	Chip Label A	e3	CR-PF Series	Request Report	CR0402-PF ≤ 100 Ω CR0402-PF > 100 Ω	China RoHS2 - Chip Resistors
CR0603		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0603	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR0603A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0603A	China RoHS2 - Chip Resistors
CR0603A-AS		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0603A-AS	China RoHS2 - Chip Resistors
CR0603-PF		1	See Data Sheet	Chip Label A	e3	CR-PF Series	Request Report	CR0603-PF ≤ 100 Ω CR0603-PF > 100 Ω	China RoHS2 - Chip Resistors
CR0805		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0805	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR0805A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0805A	China RoHS2 - Chip Resistors
CR0805A-AS		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR0805A-AS	China RoHS2 - Chip Resistors
CR0805-PF		1	See Data Sheet	Chip Label A	e3	CR-PF Series	Request Report	CR0805-PF ≤ 100 Ω CR0805-PF > 100 Ω	China RoHS2 - Chip Resistors
CR1206		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR1206	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR1206A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR1206A	China RoHS2 - Chip Resistors
CR1206A-AS		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR1206A-AS	China RoHS2 - Chip Resistors
CR1206-PF		1	See Data Sheet	Chip Label A	e3	CR-PF Series	Request Report	CR1206-PF ≤ 100 Ω CR1206-PF > 100 Ω	China RoHS2 - Chip Resistors
CR1210A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR1210A	China RoHS2 - Chip Resistors
CR1210A-AS		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR1210A-AS	China RoHS2 - Chip Resistors
CR2010		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR2010	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR2010A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR2010A	China RoHS2 - Chip Resistors
CR2010A-AS		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR2010A-AS	China RoHS2 - Chip Resistors
CR2512		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR2512	China RoHS2 EFUP50 - Chip Resistors 7c-1
CR2512A		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR2512A	China RoHS2 - Chip Resistors
CR2512A-AS		See note	See Data Sheet	Chip Label A	e3	CRb	Request Report	CR2512A-AS	China RoHS2 - Chip Resistors
CRA2512		See note	Std	Chip Label A		CRx 2	Request Report	CRA2512	China RoHS2 - Chip Resistors
CRE2512		See note	See Data Sheet	Chip Label A	e3	CRx 2	Request Report	CRE2512	China RoHS2 - Chip Resistors
CRF0805		See note	See Data Sheet	Chip Label A	e3	CRx 2	Request Report	CRF0805	China RoHS2 - Chip Resistors
CRF1206		See note	See Data Sheet	Chip Label A		CRx 2	Request Report	CRF1206	China RoHS2 - Chip Resistors
CRF2512		See note	Std	Chip Label A	e3	CRx 2	Request Report	CRF2512 Series NiCu	China RoHS2 - Chip Resistors
CRG2512		1	See Data Sheet		e3	CRx 2	Request Report	CRG2512	China RoHS2 - Chip Resistors
CRK Series		1	See Data Sheet		e3	CRx 2	Request Report	CRK0612 CRK0815	TBD
CRL0603		See note	Std	Chip Label A	e3	CRx 2	Request Report	CRL0603	China RoHS2 - Chip Resistors
CRL0805		See note	Std	Chip Label A	e3	CRx 2	Request Report	CRL0805	China RoHS2 - Chip Resistors
CRL1206		See note	Std	Chip Label A	e3	CRx 2	Request Report	CRL1206 (0.01-0.091 ohms) CRL1206 (0.1-0.91 ohms)	China RoHS2 - Chip Resistors
CRL2010		See note	Std	Chip Label A	e3	CRx 2	Request Report	CRL2010	China RoHS2 - Chip Resistors
CRL2512		See note	Std	Chip Label A	e3	CRx 2	Request Report	CRL2512 CRL2512 (0.1-0.91Ω)	China RoHS2 - Chip Resistors
CRM0603A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRM0603A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM0805		See note	Std	Chip Label A	e3	CRb	Request Report	CRM0805 MDS (under 1Q) CRM0805 MDS (over 1Q)	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM0805A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRM0805A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM1206		See note	Std	Chip Label A	e3	CRb	Request Report	CRM1206 MDS (under 1Q) CRM1206 MDS (over 1Q)	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM1206A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRM1206A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM1210A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRM1210A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM2010		See note	Std	Chip Label A	e3	CRb	Request Report	CRM2010 MDS (under 1Q) CRM2010 MDS (over 1Q)	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM2010A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRM2010A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM2512		See note	Std	Chip Label A	e3	CRb	Request Report	CRM2512 MDS (under 1Q) CRM2512 MDS (over 1Q)	China RoHS2 EFUP50 - Chip Resistors 7c-1 China RoHS2 - Chip Resistors
CRM2512A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRM2512A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRM2512-FT		See note	Std	Chip Label A	e3	CRb	Request Report	CRM2512-FT	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRS Series		See note	Std	Chip Label A	e3	CRb	Request Report	CRS0805 Series CRS1206 CRS2010 Series CRS2512	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRS0603A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRS0603A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRS0805A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRS0805A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRS1206A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRS1206A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRS1210A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRS1210A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRS2010A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRS2010A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRS2512A		1	See Data Sheet	Chip Label A	e3	CRb	Request Report	CRS2512A	China RoHS2 EFUP50 - Chip Resistors 7c-1
CRT0402		See note	Std	Chip Label A	e3	CRx 2	Request Report	CRT0402	China RoHS2 - Chip Resistors
CRT0402-AS		See note	Std	Chip Label A	e3	CRx 			



Features

- Thick film technology
- Power rating of 2 watts at 70 °C
- Low resistance value available
- RoHS compliant*

Applications

- Current sensing
- Power supplies
- Stepper motor drives
- Snubber resistor for flyback power supplies

CRM2512 - High Power Current Sense Chip Resistors

General Information

The Bourns® CRM2512 Series is a thick film power resistor with a rating of 2 watts in a standard 2512 chip format. This product has a very wide resistance range, making it suitable for different applications in power supply circuits including current sensing and current limiting.

Additional Information

Click these links for more information:



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Electrical Characteristics

Characteristic	Model CRM2512			
	(0.047 to 0.91 Ω)	(0 Ω,1 Ω to 1 M Ω)		
Power Rating @ 70 °C	2 W			
Operating Temp. Range	-55 °C to +155 °C			
Derated to Zero Load at	+155 °C			
Maximum Working Voltage	1349 mV	300 V		
Maximum Overload Voltage	3017 mV	600 V		
Insulation Resistance	> 1000 MΩ			
Resistance Range	0.047 - 0.91 Ω (E24 Values)	1 Ω - 9.76 Ω (E96 + E24 Values)	10 Ω - 1 MΩ (E96 + E24 Values)	0 Ω, 1.0 - 1 MΩ (E24 Values)
Resistance Tolerance	±1 % & ±5 %	±1 %	±1 %	±5 %
Temperature Coefficient	±100 PPM/°C	±100 PPM/°C, ±200 PPM/°C	±100 PPM/°C	±200 PPM/°C
Zero Ohm Jumper <0.02 Ω Max. Rated Current	6A			

Notes:

(1) CRM2512 2 W loading with total solder pad and trace size of 300 mm².

(2) $E = (P \times R)^{1/2}$

E: Working Voltage (V); P: Rated Power (W); R: Resistance Value (Ω)

(3) Jumper (0 Ω): Rated current 6 A maximum with 300 mm² pad.
Temperature coefficient is not applicable.

For Standard Values Used in Capacitors, Inductors, and Resistors,
[click here](#).

Environmental Characteristics

Moisture Sensitivity Level..... 1

Characteristic Data

Test	ΔR Max.
Load Life (1000 hours) 1 % Tolerance 5 % Tolerance	< 1 % < 3 %
Short Term Overload 1 % Tolerance 5 % Tolerance	< 1 % < 2 %
Thermal Shock 1 % Tolerance 5 % Tolerance	< 0.5 % < 1 %



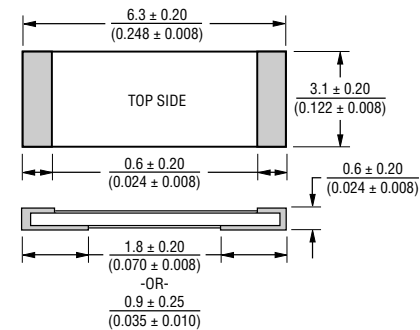
WARNING
Cancer and Reproductive Harm
www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
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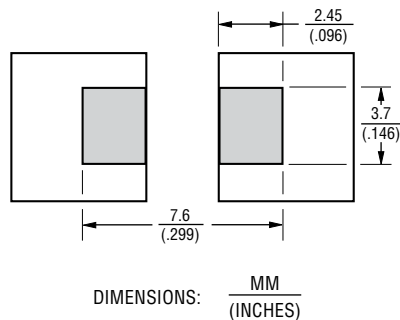
CRM2512 - High Power Current Sense Chip Resistors

BOURNS®

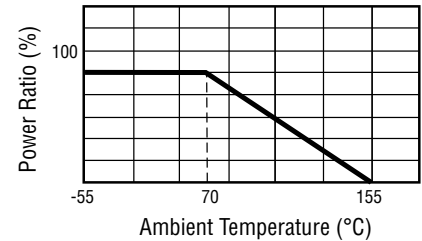
Product Dimensions



Recommended Solder Pad Layout



Derating Curve



How to Order

CRM 2512 - F X - R100 E LF

Model _____
(CRM = Precision Chip Resistor)

Size _____
2512 = 2512 Size

Resistance Tolerance _____
• F = $\pm 1\%$
• J = $\pm 5\%$

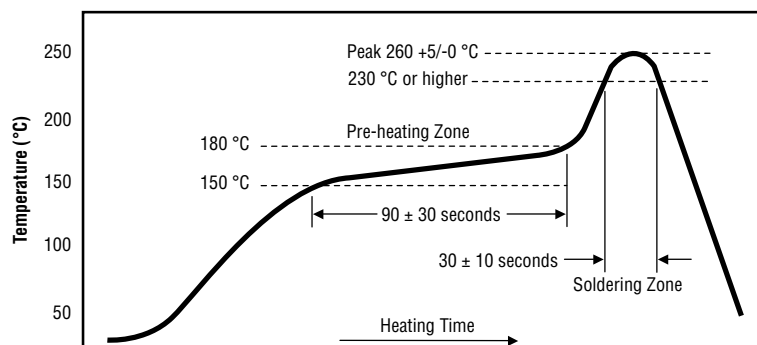
TCR (PPM/°C - See Electrical Characteristics chart) _____
• W = ± 200 PPM/°C
• X = ± 100 PPM/°C
• / = Jumper

Resistance Value _____
• **1% or 5% Tolerance:**
R < 1 ohm "R" represents decimal point followed by three significant digits (example: R100 = 0.100 ohm)
• **1% Tolerance:**
< 100 ohms "R" represents decimal point (example: 24R3 = 24.3 ohms)
≥ 100 ohms First three digits are significant, fourth digit represents number of zeros to follow (example: 8252 = 82.5K ohms)
• **5% Tolerance:**
< 10 ohms "R" represents decimal point (example: 4R7 = 4.7 ohms)
≥ 10 ohms First two digits are significant, third digit represents number of zeros to follow (example: 474 = 470K ohms)
0 ohm Jumper "000"

Packaging _____
• E = 4000 pieces per 180 mm (7 inch) reel

Termination _____
• LF = Tin-plated (RoHS Compliant)

Soldering Profile



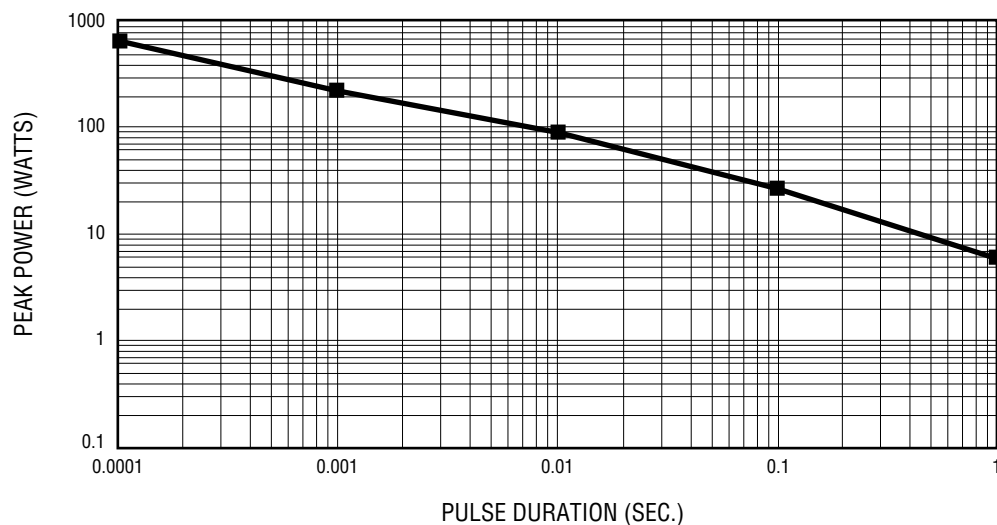
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CRM2512 - High Power Current Sense Chip Resistors

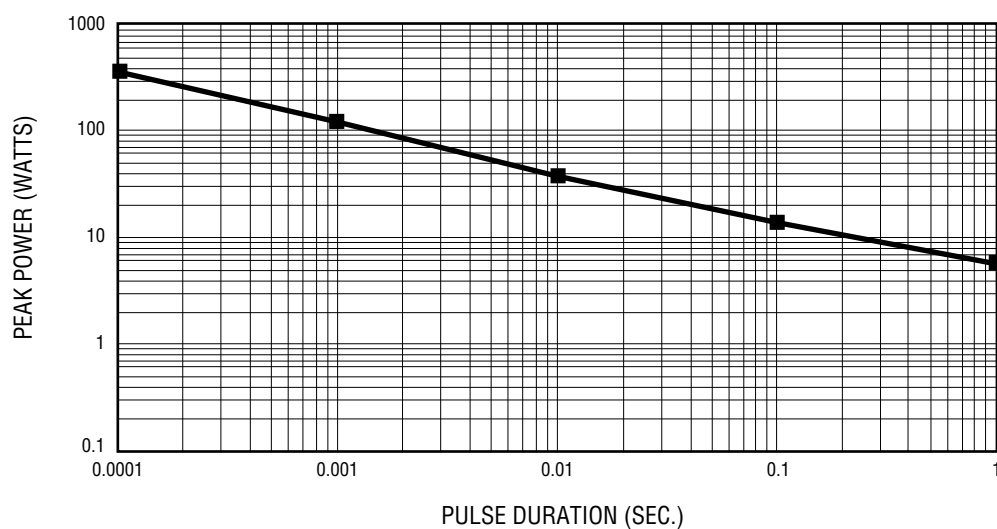
BOURNS®

Pulse Load Characteristics

Resistance Values ≥ 1 Ohm



Resistance Values < 1 Ohm



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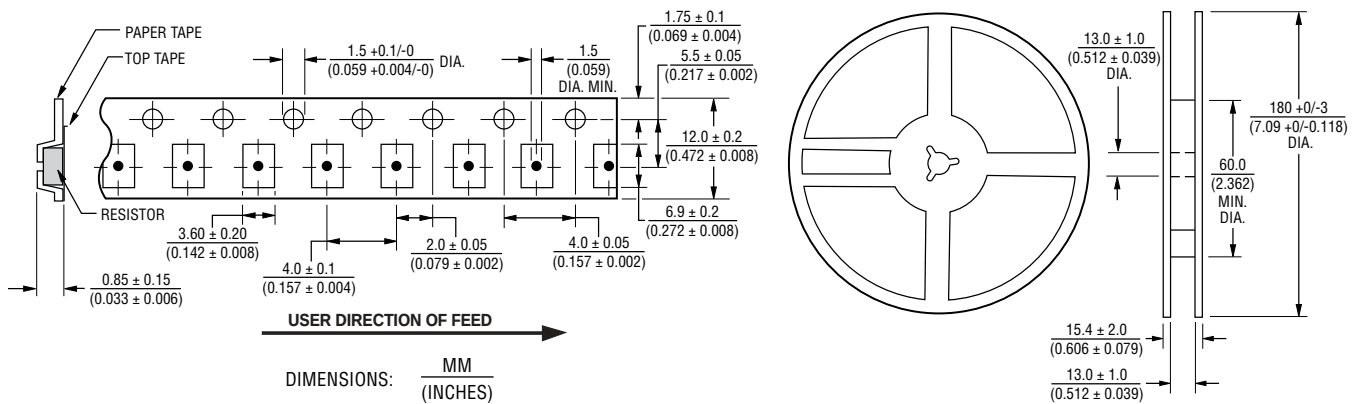
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CRM2512 - High Power Current Sense Chip Resistors

BOURNS®

Packaging Dimensions (Conforms to EIA RS-481A)



BOURNS®

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EMEA: Tel: +36 88 885 877 • Email: eurocus@bourns.com

The Americas: Tel: +1-951 781-5500 • Email: americus@bourns.com

www.bourns.com

REV. 08/21

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