

Features

- Thick film technology
- Power rating up to 2 watts at 70 °C
- High power surge withstanding
- Sulfur-resistant design (ASTM B-809)
- RoHS compliant* and halogen free**
- AEC-Q200 compliant

Applications

- Automotive systems: - Driver assistant
 - Infotainment
 - Lighting
- Power supplies
- Stepper motor drives

CRM-A Series High Power Thick Film Resistor

Electrical Characteristics

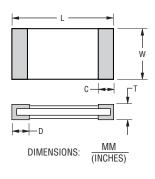
Characteristic	Model										
Characteristic	CRM0603A	CRM0805A	CRM1206A	CRM1210A	CRM2010A	CRM2512A					
Power Rating @ 70 °C	0.125 W	0.25 W	0.5 W	0.5 W	1 W	2 W					
Operating Temperature Range	-55 °C to +155 °C										
Derated to Zero Load at			+15	5 °C							
Maximum Working Voltage											
50 milliohms to 910 milliohms	477 mV	551 mV	675 mV	675 mV	954 mV	1349 mV					
1 ohm to 1 megohm	50 V	150 V	200 V	200 V	200 V	300 V					
Maximum Overload Voltage											
50 milliohms to 910 milliohms	1066 mV	1232 mV	1508 mV	1508 mV	2133 mV	3017 mV					
1 ohm to 1 megohm	100 V	300 V	400 V	400 V	400 V	600 V					
Resistance Tolerance	±0.5 %, ±1 %, ±5 %										
Temperature Coefficient											
50 milliohms to 91 milliohms	±250 ppm	±200 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm					
(±0.5 %, ±1 %, ±5 %, E24 Series)											
100 milliohms to 910 milliohms	±150 ppm*	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm					
(±0.5 %, ±1 %, ±5 %, E24 Series)											
1 ohm to 9.76 ohms	±200 ppm	±150 ppm*	±100 ppm	±100 ppm	±100 ppm	±100 ppm					
(±0.5 %, ±1 %, E24 & E96 Series)											
10 ohms to 1 megohm	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm					
(±0.5 %, ±1 %, E24 & E96 Series)											
1 ohm to 1 megohm	±200 ppm	±200 ppm	±200 ppm	±200 ppm	±200 ppm	±200 ppm					
(±5 %, E24 Series)											

* TCR code assigned as "X"; see How to Order.

For Standard Values Used in Capacitors, Inductors and Resistors, click here.

Product Dimensions

Model	L	W	С	D	т
CRM0603A	$\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$	$\frac{0.80 \pm 0.10}{(0.031 \pm 0.004)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$	$\frac{0.45 \pm 0.10}{(0.018 \pm 0.04)}$
CRM0805A	$\frac{2.00 \pm 0.10}{(0.079 \pm 0.004)}$	$\frac{1.25 \pm 0.10}{(0.049 \pm 0.004)}$	$\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$	$\frac{0.40 \pm 0.20}{(0.016 \pm 0.008)}$	$\frac{0.50 \pm 0.10}{(0.020 \pm 0.04)}$
CRM1206A	$\frac{3.10 \pm 0.10}{(0.122 \pm 0.004)}$	$\frac{1.60 \pm 0.10}{(0.063 \pm 0.004)}$	$\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$	$\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$	$\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$
CRM1210A	$\frac{3.10 \pm 0.10}{(0.122 \pm 0.004)}$	$\frac{2.60 \pm 0.10}{(0.102 \pm 0.004)}$	$\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$	$\frac{0.50 \pm 0.25}{(0.020 \pm 0.010)}$	$\frac{0.55 \pm 0.10}{(0.022 \pm 0.004)}$
CRM2010A	$\frac{5.00 \pm 0.20}{(0.197 \pm 0.008)}$	$\frac{2.50 \pm 0.20}{(0.098 \pm 0.008)}$	$\frac{0.65 \pm 0.25}{(0.026 \pm 0.010)}$	$\frac{0.60 \pm 0.25}{(0.024 \pm 0.010)}$	$\frac{0.60 \pm 0.10}{(0.024 \pm 0.004)}$
CRM2512A	$\frac{6.40 \pm 0.20}{(0.252 \pm 0.008)}$	$\frac{3.10 \pm 0.20}{(0.122 \pm 0.008)}$	$\frac{0.60 \pm 0.25}{(0.024 \pm 0.010)}$	$\frac{1.80 \pm 0.25}{(0.071 \pm 0.010)}$	$\frac{0.60 \pm 0.15}{(0.024 \pm 0.006)}$



Recommended Solder Pad Layout

Model	Α	В	L	Model	Α	В	L	►L ►B ►
CRM0603A	0.90	1.00	3.00	CRM1210A	3.00	1.30	4.70	
CINNOCOSA	(0.035)	(0.039)	(0.118)	CHINIZIOA	(0.118)	(0.051)	(0.185)	
CRM0805A	1.30	1.15	3.50	CRM2010A	3.00	1.50	6.80	
OT INICOUSA	$\frac{100805A}{(0.051)}$	(0.045)	(0.138)	CINZOTOA	(0.118)	(0.059)	(0.268)	
CRM1206A	1.80	1.30	<u>1.30</u> <u>4.70</u> CRM2512A <u>3.70</u> <u>2.45</u> <u>7.60</u>					
CHIVITZOOA	(0.071)	(0.051)	(0.185)	OT INIZ STZA	(0.032)	(0.096)	(0.299)	
								SENSING TRACE

* 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.

Users should verify actual device performance in their specific applications. Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific disclaimers as set forth on the last page of this document, and at <u>www.bourns.com/legal/disclaimer.pdf</u>.

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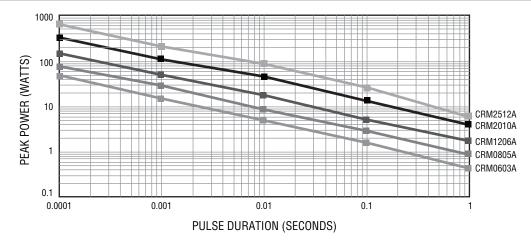
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### How to Order

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CRM      | 060    | 3 /  | A F  | • W  | 100 | )2 E | E LF |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|------|------|------|-----|------|------|
| Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |        |      |      |      |     |      |      |
| (CRM = High Power Thick Film Resistor)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |        |      |      |      |     |      |      |
| Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |        |      |      |      |     |      |      |
| 0603 = 0603 Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| 0805 = 0805 Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| 1206 = 1206 Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| 1210 = 1210 Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| 2010 = 2010 Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| 2512 = 2512 Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| Feature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |        |      | 1    |      |     |      |      |
| A = AEC-Q200 Compliant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |        |      |      |      |     |      |      |
| Resistance Tolerance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |        |      |      |      |     |      |      |
| $D = \pm 0.5 \%$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| $F = \pm 1 \%$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |        |      |      |      |     |      |      |
| $J = \pm 5 \%$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |        |      |      |      |     |      |      |
| TCR (See Electrical Characteristics chart)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |        |      |      |      |     |      |      |
| • V = ±250 PPM/°C<br>• W = ±200 PPM/°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |        |      |      |      |     |      |      |
| • W = ±200 PPM/°C<br>• X = ±100 PPM/°C NOTE: CRM0805A 0.5%, 1 %, 1 ohm to 9.76 ohms: 150 PPM/°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          |        |      |      |      |     |      |      |
| $^{\circ}X = \pm 100$ PPM/ C NOTE. CRM0603A 0.5%, 1%, 100m to 9.70 000 s. 150 PPM/ C CRM0603A 0.5%, 1%, 5%, 100 milliohms to 910 milliohms: 150 PPM/°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | C        |        |      |      |      |     |      |      |
| Resistance Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <u> </u> |        |      |      |      |     |      |      |
| 0.5 % or 1 % Tolerance:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |        |      |      |      |     |      |      |
| <100 ohms"R" represents decimal point (example: 24R3 = 24.3 ohms)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |        |      |      |      |     |      |      |
| ≥100 ohmsFirst three digits are significant, fourth digit represents number of zeros to follow (€                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | xampl    | le: 82 | 52 = | = 82 | 2.5K | ohm | s)   |      |
| • 5 % Tolerance:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |        |      |      |      |     |      |      |
| <pre></pre> |          |        |      |      |      |     |      |      |
| ≥10 ohmsFirst two digits are significant, third digit represents number of zeros to follow (exal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | nple: 4  | 474 =  | 470  | 0K d | ohme | s)  |      |      |
| Packaging                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |        |      |      |      |     |      |      |
| <ul> <li>• E = 5,000 pieces on 180 mm (7 inch) reel, paper tape - CRM0603A, CRM0805A, CRM1206A, CRM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1210A    | A      |      |      |      |     |      |      |
| 4,000 pieces on 180 mm (7 inch) reel, plastic tape - CRM2010A, CRM2512A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |        |      |      |      |     |      |      |

#### Termination -

### Surge Performance



Specifications are subject to change without notice. Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific disclaimers as set forth on the last page of this document, and at <u>www.bourns.com/legal/disclaimer.pdf</u>.

<sup>·</sup> LF = Tin-plated (RoHS Compliant)

# BOURNS

#### **Typical Part Marking**

#### CRM0603A, CRM0805A, CRM1206A, CRM1210A, CRM2010A, CRM2512A

E96 ±5 % 3 digits identify the resistance value



 $301 = 30 \times 10^1 = 300 \text{ ohms}$ 

#### CRM0805A, CRM1206A, CRM1210A, CRM2010A, CRM2512A

E24 / E96 ±1 % 4 digits identify the resistance value



 $1542 = 154 \times 10^2 = 15.4 \text{K ohms}$ 

CRM0603A E24 ±1 % 3 digits identify the resistance value



 $222 = 22 \times 10^2 = 2.2$ K ohms

### CRM0603A

E96 ±1 % 3 digits identify the resistance value



01B = 1K ohms(Refer to Marking Table below)

#### E96 Marking for CRM0603A, 1 %

| Code | R Value | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01   | 100     | 13   | 133     | 25   | 178     | 37   | 237     | 49   | 316     | 61   | 422     | 73   | 562     | 85   | 750     |
| 02   | 102     | 14   | 137     | 26   | 182     | 38   | 243     | 50   | 324     | 62   | 432     | 74   | 576     | 86   | 768     |
| 03   | 105     | 15   | 140     | 27   | 187     | 39   | 249     | 51   | 332     | 63   | 442     | 75   | 590     | 87   | 787     |
| 04   | 107     | 16   | 143     | 28   | 191     | 40   | 255     | 52   | 340     | 64   | 453     | 76   | 604     | 88   | 806     |
| 05   | 110     | 17   | 147     | 29   | 196     | 41   | 261     | 53   | 348     | 65   | 464     | 77   | 619     | 89   | 825     |
| 06   | 113     | 18   | 150     | 30   | 200     | 42   | 267     | 54   | 357     | 66   | 475     | 78   | 634     | 90   | 845     |
| 07   | 115     | 19   | 154     | 31   | 205     | 43   | 274     | 55   | 365     | 67   | 487     | 79   | 649     | 91   | 866     |
| 08   | 118     | 20   | 158     | 32   | 210     | 44   | 280     | 56   | 374     | 68   | 499     | 80   | 665     | 92   | 887     |
| 09   | 121     | 21   | 162     | 33   | 215     | 45   | 287     | 57   | 383     | 69   | 511     | 81   | 681     | 93   | 909     |
| 10   | 124     | 22   | 165     | 34   | 221     | 46   | 294     | 58   | 392     | 70   | 523     | 82   | 698     | 94   | 931     |
| 11   | 127     | 23   | 169     | 35   | 226     | 47   | 301     | 59   | 402     | 71   | 536     | 83   | 715     | 95   | 953     |
| 12   | 130     | 24   | 174     | 36   | 232     | 48   | 309     | 60   | 412     | 72   | 549     | 84   | 732     | 96   | 976     |

This table shows the first two digits for the three-digit E96 part marking scheme. The third character is a letter multiplier:  $A=10^{\circ}$   $B=10^{1}$   $C=10^{2}$   $D=10^{3}$   $E=10^{4}$   $F=10^{5}$   $G=10^{-6}$   $H=10^{-7}$   $X=10^{-1}$   $Y=10^{-2}$   $Z=10^{-3}$ 

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

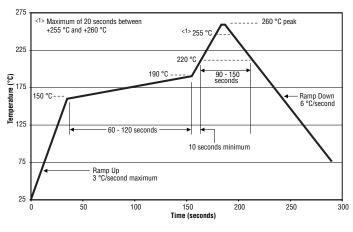
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# BOURNS

### Performance Characteristics (AEC-Q200)

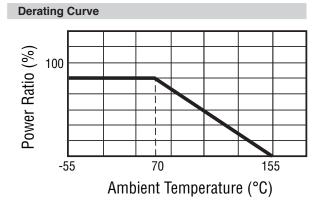
| Test                                                | Method              | Procedure                                                                                                                                               | Test Limits ∆R                                            |
|-----------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| High Temperature<br>Exposure Storage                | AEC-Q200 Table 7.3  | 1,000 hours @ +125 °C; no power loading                                                                                                                 | 0.5 %, 1 % tolerance: ≤±1 %<br>5 % tolerance: ≤±3 %       |
| Temperature Cycling AEC-Q200 Table 7.4              |                     | -55 °C to +125 °C, 1,000 cycles                                                                                                                         | 0.5 %, 1 % tolerance: ≤±1 %<br>5 % tolerance: ≤±3 %       |
| Moisture Resistance                                 | AEC-Q200 Table 7.6  | +65 °C / 80~100 % RH / 10 cycles                                                                                                                        | 0.5 %, 1 % tolerance: ≤±0.5 %<br>5 % tolerance: ≤±1 %     |
| Biased Humidity                                     | AEC-Q200 Table 7.7  | 1,000 hours @ +85 °C / 85 % RH,<br>10 % operating power                                                                                                 | 0.5 %, 1 % tolerance: ≤±1 %<br>5 % tolerance: ≤±3 %       |
| Operational Life AEC-Q200 Ta                        |                     | 1,000 hours @ +125 °C, at specified rated power                                                                                                         | 0.5 %, 1 % tolerance: ≤±1 %<br>5 % tolerance: ≤±3 %       |
| Mechanical Shock AEC-Q200 Table 7                   |                     | 100 g, half-sine, 6 ms, velocity: 12.3 ft./sec.                                                                                                         | Within product specification tolerance; no visible damage |
| Vibration                                           | AEC-Q200 Table 7.14 | 5 g for 20 minutes, 12 cycles each of 3 durations;<br>10~200 Hz                                                                                         | 0.5 %, 1 % tolerance: ≤±0.5 %<br>5 % tolerance: ≤±1 %     |
| Resistance to Solder Heat                           | AEC-Q200 Table 7.15 | +270 °C ±5 °C, 10 ±1 seconds                                                                                                                            | 0.5 %, 1 % tolerance: ≤±0.5 %<br>5 % tolerance: ≤±1 %     |
| Thermal Shock                                       | AEC-Q200 Table 7.16 | -55 °C to +155 °C, dwell time 15 minutes, max. transfer time 20 seconds/300 cycles                                                                      | 0.5 %, 1 % tolerance: ≤±0.5 %<br>5 % tolerance: ≤±1 %     |
| ESD                                                 | AEC-Q200-002        | 1 kV min.                                                                                                                                               | ≤±1 %                                                     |
| Solderability                                       | AEC-Q200 Table 7.18 | a) Backing +155 °C, 4 hours, dipping +235 °C, 5 seconds<br>b) Steam 8 hours, dipping +215 °C, 5 seconds<br>c) Steam 8 hours, dipping +260 °C, 7 seconds | Over 95 % of the termination must be covered with solder  |
| Flammability                                        | AEC-Q200 Table 7.20 | UL 94 V-0 or V-1 are acceptable                                                                                                                         | Refer to UL 94                                            |
| Board Flex                                          | AEC-Q200 Table 7.21 | Bending 2 mm (CRM1206A, 1210A, 2010A, 2512A)<br>Bending 3 mm (CRM0603A, 0805A)                                                                          | 0.5 %, 1 % tolerance: ≤±0.5 %<br>5 % tolerance: ≤±1 %     |
| Terminal Strength                                   | AEC-Q200 Table 7.22 | Force 1.8 Kg for 60 seconds                                                                                                                             | No mechanical damage                                      |
| Sulfur-resistant<br>(Applies only when<br>R ≥1 ohm) | ASTM B-809          | +50 °C ±2 °C, 1,000 hours                                                                                                                               | ≤±1 %                                                     |

## **Soldering Profile**



## **Environmental Characteristics**

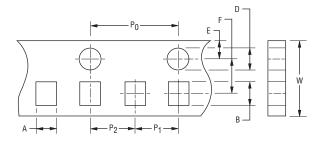
| Moisture Sensitivity Level 1 |  |
|------------------------------|--|
| ESD Classification (HBM) 1A  |  |



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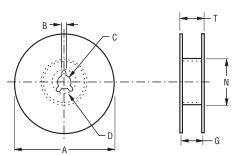
### Packaging Dimensions (Conforms to EIA RS-481A)



 $\frac{40 \pm 0.2}{(1.575 \pm .008)}$ Accumulated dimensional tolerance

> MM (INCHES) DIMENSIONS:

| Model      | Таре Туре | Α               | В               | W               | F               | E             | P1            | P <sub>2</sub>  | Po              | D               |
|------------|-----------|-----------------|-----------------|-----------------|-----------------|---------------|---------------|-----------------|-----------------|-----------------|
| CRM0603A   | Dapor     | $1.10 \pm 0.20$ | 1.90 ± 0.20     | $8.00 \pm 0.30$ | $3.50 \pm 0.05$ | 1.75 ± 0.10   | 4.00 ± 0.10   | $2.00\pm0.05$   | $4.00 \pm 0.10$ | 1.50 +0.10/-0   |
| CHIVIUOUSA | Paper     | (.043 ± .008)   | (.075 ± .008)   | (.315 ± .012)   | (.138 ± .002)   | (.069 ± .004) | (.158 ± .004) | (.079 ± .002)   | (.158 ± .004)   | (.006 +.004/-0) |
| CRM0805A   | Paper     | $1.65 \pm 0.20$ | $2.40 \pm 0.20$ | 8.00 ± 0.30     | $3.50 \pm 0.05$ | 1.75 ± 0.10   | 4.00 ± 0.10   | $2.00 \pm 0.05$ | 4.00 ± 0.10     | 1.50 +0.10/-0   |
| CHIVIUOUJA | Faper     | (.065 ± .008)   | (.094 ± .008)   | (.315 ± .012)   | (.138 ± .002)   | (.069 ± .004) | (.158 ± .004) | (.079 ± .002)   | (.158 ± .004)   | (.006 +.004/-0) |
| CRM1206A   | Deper     | $2.00 \pm 0.20$ | $3.60 \pm 0.20$ | 8.00 ± 0.30     | $3.50 \pm 0.05$ | 1.75 ± 0.10   | 4.00 ± 0.10   | $2.00 \pm 0.05$ | $4.00 \pm 0.10$ | 1.50 +0.10/-0   |
| CRIVITZUOA | Paper     | (.079 ± .008)   | (.142 ± .008)   | (.315 ± .012)   | (.138 ± .002)   | (.069 ± .004) | (.158 ± .004) | (.079 ± .002)   | (.158 ± .004)   | (.006 +.004/-0) |
| CRM1210A   | Dapor     | $3.00 \pm 0.20$ | $3.60 \pm 0.20$ | 8.00 ± 0.30     | $3.50 \pm 0.05$ | 1.75 ± 0.10   | 4.00 ± 0.10   | $2.00 \pm 0.05$ | 4.00 ± 0.10     | 1.50 +0.10/-0   |
|            | Paper     | (.118 ± .008)   | (.142 ± .008)   | (.315 ± .012)   | (.138 ± .002)   | (.069 ± .004) | (.158 ± .004) | (.079 ± .002)   | (.158 ± .004)   | (.006 +.004/-0) |
| CRM2010A   | Plastic   | $2.80 \pm 0.20$ | 5.50 ± 0.20     | 12.00 ± 0.30    | $3.50 \pm 0.05$ | 1.75 ± 0.10   | 4.00 ± 0.10   | $2.00 \pm 0.05$ | 4.00 ± 0.10     | 1.50 +0.10/-0   |
| GRIVIZUTUA | Plastic   | (.110 ± .008)   | (.217 ± .008)   | (.472 ± .012)   | (.138 ± .002)   | (.069 ± .004) | (.158 ± .004) | (.079 ± .002)   | (.158 ± .004)   | (.006 +.004/-0) |
| CRM2512A   | Plastic   | $3.50 \pm 0.20$ | $6.70 \pm 0.20$ | 12.00 ± 0.30    | $3.50 \pm 0.05$ | 1.75 ± 0.10   | 4.00 ± 0.10   | $2.00 \pm 0.05$ | 4.00 ± 0.10     | 1.50 +0.10/-0   |
|            | FIASUC    | (.138 ± .008)   | (.264 ± .008)   | (.472 ± .012)   | (.138 ± .002)   | (.069 ± .004) | (.158 ± .004) | (.079 ± .002)   | (.158 ± .004)   | (.006 +.004/-0) |



MM (INCHES) DIMENSIONS:

| Model    | Packaging<br>Quantity | А             | N              | C             | D Min.  | В               | G             | T Max. |
|----------|-----------------------|---------------|----------------|---------------|---------|-----------------|---------------|--------|
| CRM0603A |                       |               |                |               |         |                 |               |        |
| CRM0805A | 5,000 pcs. per        |               |                |               |         |                 | 10.00 ± 1.50  | 14.9   |
| CRM1206A | reel                  | 1.78 ± 2.00   | $60 \pm 0.50$  | 13.0 ± 0.50   | 20.0    | $2.00 \pm 0.50$ | (.394 ± .006) | (.587) |
| CRM1210A |                       | (.070 ± .079) | (2.362 ± .020) | (.512 ± .020) | (8.661) | (.079 ± .020)   |               |        |
| CRM2010A | 4,000 pcs. per        |               |                |               |         |                 | 13.80 ± 1.50  | 16.7   |
| CRM2512A | reel                  |               |                |               |         |                 | (.543 ± .006) | (.657) |

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