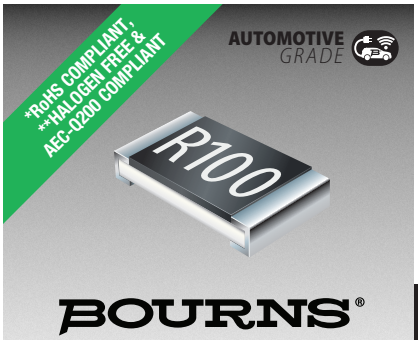


Features

- Thick film technology
- Power rating up to 2 watts at 70 °C
- High power surge protection
- RoHS compliant*
- Halogen free**
- AEC-Q200 compliant

Applications

- Power supplies
- Stepper motor drives

CRM-Q Automotive Grade High Power Chip Resistor

Electrical Characteristics

Characteristic	CRM1206Q	CRM2010Q	CRM2512Q
Power Rating @ 70 °C	0.5 W	1 W	2 W
Operating Temp. Range	-55 °C to +155 °C		
Derated to Zero Load at	+155 °C		
Maximum Working Voltage 1 Ω to 1 mΩ	200 V	200 V	300 V
Maximum Overload Voltage 1 Ω to 1 mΩ	400 V	400 V	600 V
Resistance Tolerance	±1 %, ±5 %		
Temperature Coefficient			
1 Ω to 10 Ω (±1 %, E24 & E96 series)	±200 PPM/°C	±200 PPM/°C	±200 PPM/°C
10.2 Ω to 1 MΩ (±1 %, E24 & E96 series)	±100 PPM/°C	±100 PPM/°C	±100 PPM/°C
1 Ω to 1 MΩ (±5 %, E24 series)	±200 PPM/°C	±200 PPM/°C	±200 PPM/°C

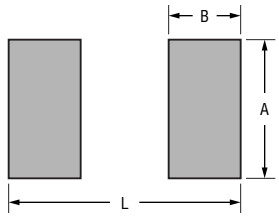
Additional Information

Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

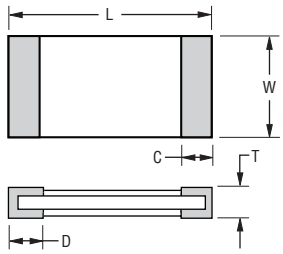
Recommended Solder Pad Layout

Model	A	B	L
CRM1206Q	1.80 (.071)	1.30 (.051)	4.70 (.185)
CRM2010Q	3.00 (.118)	1.50 (.059)	6.80 (.268)
CRM2512Q	3.70 (.146)	1.60 (.063)	7.60 (.299)



Product Dimensions

Model	L	W	C	D	T
CRM1206Q	3.10 ± 0.10 (.122 ± .004)	1.60 ± 0.10 (.063 ± .004)	0.50 ± 0.25 (.020 ± .010)	0.50 ± 0.25 (.020 ± .010)	0.55 ± 0.10 (.022 ± .004)
CRM2010Q	5.00 ± 0.20 (.197 ± .008)	2.50 ± 0.20 (.098 ± .008)	0.65 ± 0.25 (.026 ± .010)	0.60 ± 0.25 (.024 ± .010)	0.60 ± 0.10 (.024 ± .004)
CRM2512Q	6.40 ± 0.20 (.252 ± .008)	3.10 ± 0.20 (.122 ± .008)	0.60 ± 0.25 (.024 ± .010)	0.90 ± 0.25 (.035 ± .010)	0.60 ± 0.15 (.024 ± .006)



DIMENSIONS: MM (INCHES)

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www.bourns.com

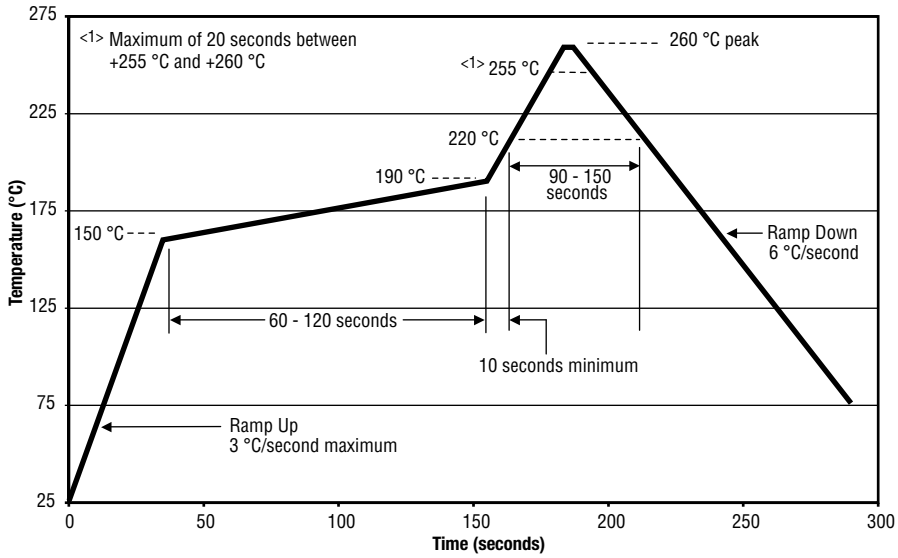
WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

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

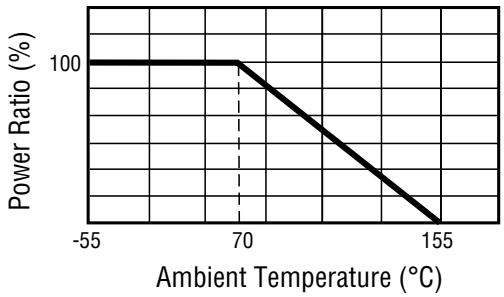
Performance Characteristics

Test Item	Method	Procedure	Test Limits ΔR
High Temperature Exposure (Storage)	AEC-Q200 Table 7.3	1,000 hrs. @ 155 °C. No power loading.	1 % tolerance: ≤ ±1 % 5 % tolerance: ≤ ±3 %
Temperature Cycling	AEC-Q200 Table 7.4	1000 cycles (-55 °C to +125 °C);	1 % tolerance: ≤ ±0.5 % 5 % tolerance: ≤ ±1 %
Moisture Resistance	AEC-Q200 Table 7.6	65 °C / 80~100 % RH / 10 cycles;	1 % tolerance: ≤ ±0.5 % 5 % tolerance: ≤ ±1 %
Biased Humidity	AEC-Q200 Table 7.7	1000 hours 85 °C / 85 % RH, 10 % of operating power	1 % tolerance: ≤ ±1 % 5 % tolerance: ≤ ±3 %
Operational Life	AEC-Q200 Table 7.8	1000 hours @ 125 °C at specified rated power	1 % tolerance: ≤ ±1 % 5 % tolerance: ≤ ±3 %
Mechanical Shock	AEC-Q200 Table 7.13	100 g's, wave: hail-sine; Duration: 6 ms, Velocity: 12.3 ft/sec.	Within product specification tolerance and no visible damage
Vibration	AEC-Q200 Table 7.14	5 g's for 20 min., 12 cycles each of 3 orientations; Test from 10-200 Hz	1 % tolerance: ≤ ±0.5 % 5 % tolerance: ≤ ±1 %
Resistance to Solder Heat	AEC-Q200 Table 7.15	Solder dipping @ 270 °C ±5 °C for 10 sec. ±1 sec.	1 % tolerance: ≤ ±0.5 % 5 % tolerance: ≤ ±1 %
Thermal Shock	AEC-Q200 Table 7.16	-55 to 155 °C / dwell time 15 min / max transfer time 20 sec / 300 cycles	1 % tolerance: ≤ ±0.5 % 5 % tolerance: ≤ ±1 %
ESD	AEC-Q200-002	Test contact min. 1 KV	≤ ±1 %
Solderability	AEC-Q200 Table 7.18	a) Baking 155 °C 4 hrs.; dipping 235 °C, 5 sec b) Steam 8 hrs., dipping 215 °C 5 sec c) Steam 8 hrs., dipping 260 °C 7 sec	Over 95 % of 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 (2512, 1210, 1206),	1 % tolerance: ≤ ±0.5 % 5 % tolerance: ≤ ±1 %
Terminal Strength	AEC-Q200 Table 7.22	Force 1.8 Kg for 60 sec	No mechanical damage
Short Term Overload	IEC 60115-1, 4.13	5X rated power for 5 sec	1 % tolerance: ≤ ±1 % 5 % tolerance: ≤ ±2 %

Soldering Profile



Derating Curve



Typical Part Marking

±5 % (E24): **CRM1206Q, CRM2010Q, CRM2512Q**

Resistance value is expressed by 3 digits. The first two digits represent the significant figures of the nominal resistance value in ohms; the third digit represents the exponent for a base of 10.

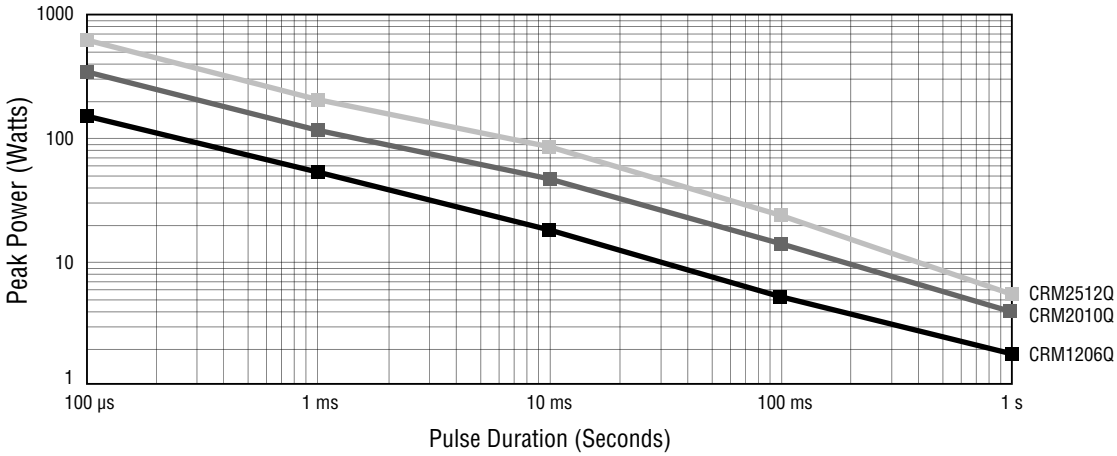
*Example: **301** = 30 x 10^1 = 300 ohms*

±1 % (E24/E96): **CRM1206Q, CRM2010Q, CRM2512Q**

Resistance value is expressed by 4 digits. The first three digits represent the significant figures of the nominal resistance value in ohms; the third digit represents the exponent for a base of 10.

*Example: **1542** = 154 x 10^2 = 15.4K ohms*

Surge Performance



How to Order

CRM 1206 Q F X - 1002 E LF

Model
CRM = High Power Surge Resistor

Size
1206 = 1206 Size
2010 = 2010 Size
2512 = 2512 Size

Feature
Q = AEC-Q200 Compliant

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

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

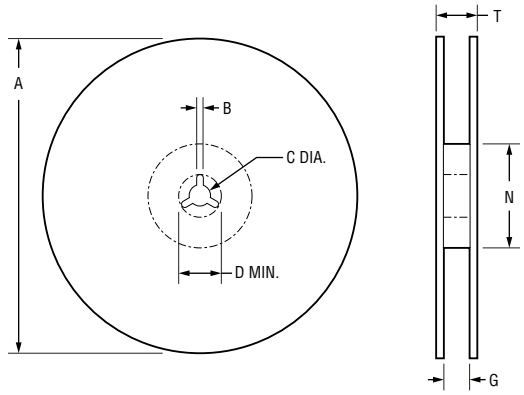
Resistance Value
1% Tolerance:
<100 ohms .....“R” represents decimal point (example: 24R3 = 24.3 ohms)
≥100 ohms.....First three digits are significant, fourth digit represents number of zeros to follow *(example: 8252 = 82.5K ohms)*

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)*

Packaging
E = 5,000 pieces on 180 mm (7 inch) reel with paper tape - CRM1206Q
4,000 pieces on 180 mm (7 inch) reel with plastic tape - CRM2010Q, CRM2512Q

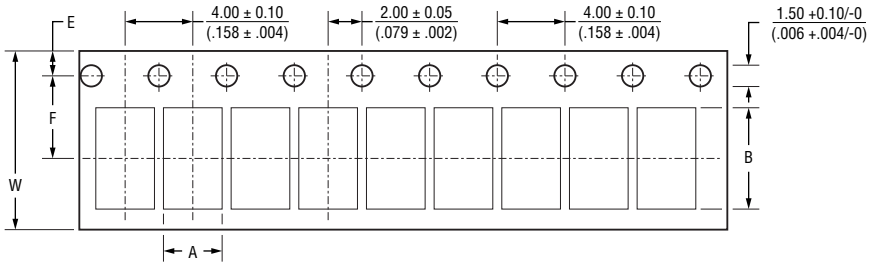
Termination
LF = Tin-plated (RoHS Compliant)

Packaging Dimensions (Conforms to EIA RS-481A)



DIMENSIONS: MM / (INCHES)

Model	Packaging Qty.	A	N	C	D (min.)	B	G	T (max.)
CRM1206Q	5000 pcs./reel	178 ± 2.0 (7.008 ± .008)	60 ± 0.5 (2.362 ± .020)	13.0 ± 0.5 (.512 ± .020)	20 (.787)	2.0 ± 0.5 (.079 ± .020)	10.0 ± 1.5 (.394 ± .059)	14.9 (.587)
CRM2010Q	4000 pcs./reel	178 ± 2.0 (7.008 ± .008)	60 ± 0.5 (2.362 ± .020)	13.0 ± 0.5 (.512 ± .020)	20 (.787)	2.0 ± 0.5 (.079 ± .020)	13.8 ± 1.5 (.543 ± .059)	16.7 (.657)
CRM2512Q								



DIMENSIONS: MM / (INCHES)

Model	Tape Type	A	B	W	F	E
CRM1206Q	Paper	2.00 ± 0.20 (.079 ± .008)	3.60 ± 0.20 (.142 ± .008)	8.00 ± 0.30 (.315 ± .012)	3.50 ± 0.05 (.138 ± .002)	1.75 ± 0.10 (.069 ± .004)
CRM2010Q	Plastic	2.80 ± 0.20 (.110 ± .008)	5.50 ± 0.20 (.217 ± .008)	12.0 ± 0.30 (.472 ± .012)	3.50 ± 0.05 (.138 ± .002)	1.75 ± 0.10 (.069 ± .004)
CRM2512Q	Plastic	3.50 ± 0.20 (.138 ± .008)	6.70 ± 0.20 (.264 ± .008)	12.0 ± 0.30 (.472 ± .012)	3.50 ± 0.05 (.138 ± .002)	1.75 ± 0.10 (.069 ± .004)

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