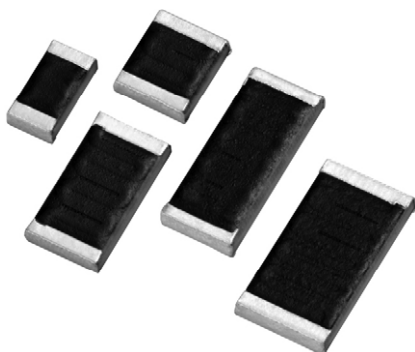


Thick Film Chip Resistors, High Voltage



FEATURES

- AEC-Q200 qualified
- Voltages up to 3000 V
- Automatic placement capability
- Termination style: 3-sided wraparound termination
- Tape and reel packaging available
- Internationally standardized sizes, custom sizes available
- Termination material: solder-coated nickel barrier or solder coated non-magnetic terminations standard
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

LINKS TO ADDITIONAL RESOURCES



STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	CASE SIZE	POWER RATING $P_{70\text{ }^{\circ}\text{C}}$ W	MAX. WORKING VOLTAGE ⁽²⁾ V	RESISTANCE RANGE ⁽¹⁾ Ω	TOLERANCE $\pm$ %	TEMPERATURE COEFFICIENT ⁽³⁾ $\pm$ ppm/ $^{\circ}\text{C}$
CRMA1206	1206	0.30	1000	150 to 15M	0.5, 1, 2, 5, 10	100
CRMA1210	1210	0.35	1250	300 to 20M	0.5, 1, 2, 5, 10	100
CRMA2010	2010	0.50	2000	500 to 40M	0.5, 1, 2, 5, 10	100
CRMA2510	2510	0.80	2500	1K to 60M	0.5, 1, 2, 5, 10	100
CRMA2512	2512	1.0	3000	1K to 75M	0.5, 1, 2, 5, 10	100

Notes

- For non-standard sizes, lower values or higher power rating requirement, contact factory
- ⁽¹⁾ Resistance values calibrated at 10 V_{DC}. Calibration at other voltages available upon request
- ⁽²⁾ Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less
- ⁽³⁾ Reference only: not for all values specified. Consult factory for your size and value

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CRMA1206	CRMA1210	CRMA2010	CRMA2510	CRMA2512
Rated dissipation at 70 $^{\circ}\text{C}$	W	0.30	0.35	0.50	0.80	1.0
Limiting element voltage	V _≡	1000	1250	2000	2500	3000
Insulation resistance	Ω	$\geq 10^{11}$	$\geq 10^{11}$	$\geq 10^{11}$	$\geq 10^{11}$	$\geq 10^{11}$
Category temperature range	$^{\circ}\text{C}$	-55 to +155	-55 to +155	-55 to +155	-55 to +155	-55 to +155
Weight/1000 (typical)	g	12.2	19.6	32.2	39.8	49.7
VCR (typical)	ppm/V	< 2	< 2	< 2	< 2	< 2

GLOBAL PART NUMBER INFORMATION

Global Part Numbering: CRMA1210AF1K00FLET (preferred part number format)

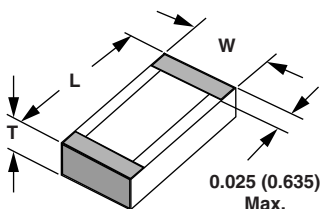
GLOBAL MODEL	SIZE	TERMINAL STYLE	TERMINAL MATERIAL	RESISTANCE VALUE	TOLERANCE	TCR	SOLDER TERMINATION	PACKAGING
CRMA	1206 1210 2010 2510 2512	A = 3-sided	F = nickel barrier G = non-magnetic	R = Ω K = $k\Omega$ M = $M\Omega$ 110R = 110 Ω 49K9 = 49.9 $k\Omega$ 10M0 = 10 $M\Omega$	D = $\pm 0.5\%$ F = $\pm 1\%$ G = $\pm 2\%$ J = $\pm 5\%$ K = $\pm 10\%$	K = 100 ppm	E = Sn100	B = bulk (250 pcs max.) F = T / R (full reel) 1 = T / R (1000 pcs) 5 = T / R (500 pcs) T = T / R (250 pcs min.) W = waffle tray

Note

- For additional information on packaging, refer to the Surface Mount Resistor Packaging document (www.vishay.com/doc?31543)

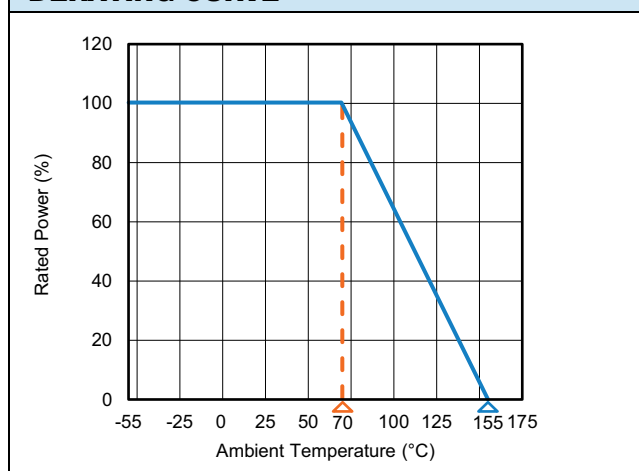
DIMENSIONS in inches (millimeters)

TERMINATION STYLE A (3-SIDED WRAPAROUND)	MODEL	LENGTH (L)	WIDTH (W)	THICKNESS (T)
	CRMA1206	0.125 $\pm$ 0.006 (3.18 $\pm$ 0.15)	0.063 $\pm$ 0.006 (1.60 $\pm$ 0.15)	0.025 $\pm$ 0.004 (0.64 $\pm$ 0.10)
	CRMA1210	0.125 $\pm$ 0.006 (3.18 $\pm$ 0.15)	0.100 $\pm$ 0.006 (2.54 $\pm$ 0.15)	0.025 $\pm$ 0.004 (0.64 $\pm$ 0.10)
	CRMA2010	0.200 $\pm$ 0.006 (5.08 $\pm$ 0.15)	0.100 $\pm$ 0.006 (2.54 $\pm$ 0.15)	0.025 $\pm$ 0.004 (0.64 $\pm$ 0.10)
	CRMA2510	0.250 $\pm$ 0.006 (6.35 $\pm$ 0.15)	0.100 $\pm$ 0.006 (2.54 $\pm$ 0.15)	0.025 $\pm$ 0.004 (0.64 $\pm$ 0.10)
	CRMA2512	0.250 $\pm$ 0.006 (6.35 $\pm$ 0.15)	0.126 $\pm$ 0.006 (3.20 $\pm$ 0.15)	0.025 $\pm$ 0.004 (0.64 $\pm$ 0.10)



TYPE	TERMINATION MATERIAL	TERMINATION STYLE	TERMINATION STYLE / MATERIAL CODE	SOLDER TERMINATION CODE
Solderable	Nickel barrier	3-sided (wraparound)	AF	E
Solderable	Non-magnetic	3-sided (wraparound)	AG	E

DERATING CURVE



MATERIAL SPECIFICATIONS

Resistive element	Ruthenium oxide
Encapsulation	Epoxy
Substrate	96 % alumina
Termination	Solder-coated nickel barrier
Solder finish	Pure tin standard



PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST RESULTS (TYPICAL TEST LOTS)
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	$\pm (1.0 \% + 0.0005 \Omega)$
High temperature exposure	1000 h at +170 °C	$\pm (1.0 \% + 0.0005 \Omega)$
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	$\pm (1.0 \% + 0.0005 \Omega)$
Mechanical shock	100 g's for 6 ms, 5 pulses	$\pm (0.5 \% + 0.0005 \Omega)$
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	$\pm (0.5 \% + 0.0005 \Omega)$
Load life	1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm (1.0 \% + 0.0005 \Omega)$
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	$\pm (1.0 \% + 0.0005 \Omega)$
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	$\pm (1.0 \% + 0.0005 \Omega)$



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.