Thick Film Chip Resistors, High Voltage



FEATURES

- High voltage up to 3000 V
- Outstanding stability < 0.5 %
- Flow solderable
- Automatic placement capability
- Tape and reel packaging available
- Termination style:
  3-sided wraparound termination
- Internationally standardized sizes
- Termination material: solder-coated nickel barrier or solder coated non-magnetic terminations standard
- Multiple styles, termination materials and configurations, allow wide design flexibility
- Epoxy bondable or wire bondable non-magnetic terminations available
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Available

RoHS* Available

HALOGEN FREE

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	CASE SIZE	POWER RATING $P_{70\,°C}$ W	MAXIMUM WORKING VOLTAGE (1) V	RESISTANCE RANGE (2) Ω	TOLERANCE (3) ± %	TEMPERATURE COEFFICIENT (4) (-55 °C to +155 °C) ± ppm/°C
CRHP1206	1206	0.50	1675	2M to 100M	0.5	100
				2M to 1G	1, 2, 5, 10, 20	
				1.1G to 8G	2, 5, 10, 20	
CRHP1210	1210	0.70	1870	4M to 100M	0.5	100
				4M to 1G	1, 2, 5, 10, 20	
				1.1G to 10G	2, 5, 10, 20	
CRHP2010	2010	1.0	2000	6M to 100M	0.5	100
				6M to 1G	1, 2, 5, 10, 20	
				1.1G to 10G	2, 5, 10, 20	
				11G to 35G	5, 10, 20	
CRHP2510	2510	1.2	2500	10M to 100M	0.5	100
				10M to 1G	1, 2, 5, 10, 20	
				1.1G to 10G	2, 5, 10, 20	
				11G to 40G	5, 10, 20	
CRHP2512	2512	1.5	3000	10M to 100M	0.5	100
				10M to 1G	1, 2, 5, 10, 20	
				1.1G to 10G	2, 5, 10, 20	
				11G to 50G	5, 10, 20	

Notes

- For non-standard sizes, lower values or higher power rating requirement, contact factory

(1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less

(2) Resistance values below 1 GΩ are calibrated at 100 V_{DC}, and values of 1 GΩ and above are calibrated at 1000 V_{DC}. Calibration at other voltages available upon request

(3) Contact factory for tighter tolerances

(4) Reference only: not for all values specified. Consult factory for your size and value

For technical questions, contact: te1resistors@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CRHP1206AF100MFKFB (preferred part number format)

C	R	H	P	1	2	0	6	A	F	1	0	0	M	F	K	F	B

GLOBAL MODEL	SIZE	TERMINAL STYLE	TERMINAL MATERIAL	RESISTANCE VALUE	TOLERANCE	TCR	SOLDER TERMINATION	PACKAGING
CRHP	**1206** **1210** **2010** **2510** **2512**	**A** = 3-sided	**F** = nickel barrier **G** = non-magnetic	**M** = MΩ **G** = GΩ **4M70** = 4.7 MΩ **10M0** = 10 MΩ **1G00** = 1 GΩ	**D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 % **K** = ± 10 % **M** = ± 20 %	**K** = 100 ppm **L** = 150 ppm **N** = 200 ppm **R** = 250 ppm **M** = 300 ppm **W** = 350 ppm **P** = 500 ppm	**E** = Sn100 **F** = Sn95/Ag5, HSD **T** = Sn90/Pb10	**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

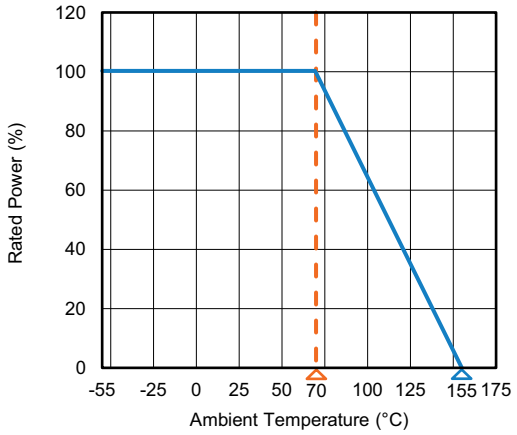
MECHANICAL SPECIFICATIONS

Resistive element	Ruthenium oxide
Encapsulation	Glass
Substrate	96 % alumina
Termination	Solder-coated nickel barrier or solder coated non-magnetic terminations standard
Solder finish	Pure tin or tin/lead solder alloys standard. Tin/silver solder alloy available.

ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-55 °C to +155 °C
Life	Less than 0.5 % change when tested at full rated power
Short time overload	Less than 0.5 % ΔR

DERATING CURVE



Note

- Reference only: not for all values specified. Consult factory for your size and value

VOLTAGE COEFFICIENT OF RESISTANCE CHART

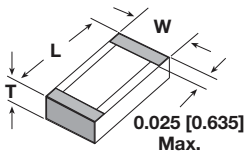
SIZE	VALUE (Ω)	VCR (ppm/V)	FURTHER INSTRUCTIONS
CRHP1206	2M to 199M	25	Values over 200M, consult factory
CRHP1210	4M to 200M	25	Values over 200M, consult factory
CRHP2010	6M to 99M	15	Values over 1G, consult factory
	100M to 1G	20	
CRHP2510	10M to 99M	10	Values over 1G, consult factory
	100M to 1G	15	
CRHP2512	10M to 999M	10	Values over 5G, consult factory
	1G to 5G	25	

For technical questions, contact: te1resistors@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

DIMENSIONS in inches (millimeters)

Termination Style A
(3-sided wraparound)



MODEL	LENGTH (L) ± 0.006 (0.152)	WIDTH (W) ± 0.006 (0.152)	THICKNESS (T) ± 0.002 (0.051)
CRHP1206	0.125	0.063	0.025
CRHP1210	0.125	0.100	0.025
CRHP2010	0.200	0.100	0.025
CRHP2510	0.250	0.100	0.025
CRHP2512	0.250	0.126	0.025

TYPE	TERMINATION MATERIAL	TERMINATION STYLE	TERMINATION STYLE / MATERIAL CODE	SOLDER TERMINATION CODE
Solderable	Nickel barrier	3-sided (wraparound)	AF	E or T (standard); F (optional) (1)
	Non-magnetic	3-sided (wraparound)	AG	E or T (standard); F (optional) (1)

Note

(1) Standard solder plating for the nickel barrier and non-magnetic parts is solder terminations E or T. Hot solder dipped termination F is also available

PERFORMANCE

TEST	CONDITIONS OF TEST	TEST RESULTS (TYPICAL TEST LOTS)
Life	MIL-STD-202, method 108, 1000 h rated power at +70 °C	≤ ± 0.5 %
High temperature exposure	MIL-STD-202, method 108	≤ ± 0.2 %
Low temperature operation	MIL-PRF-55342, paragraph 4.8.5	≤ ± 0.05 %
Resistance to bonding exposure	MIL-STD-202, methods 210	≤ ± 0.1 %
Moisture resistance	MIL-PRF-55342, paragraph 4.8.9	≤ ± 0.06 %
Solder mounting integrity	MIL-PRF-55342, paragraph 4.8.13, 2 kg for 30 s	No evidence of mechanical damage
Solderability	MIL-STD-202, method 208	95 % coverage

For technical questions, contact: te1resistors@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. 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.

© 2022 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED