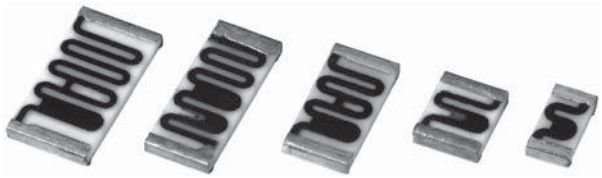
Thick Film Chip Resistors, High Voltage



FEATURES

- High voltage up to 3000 V
- Outstanding stability < 0.5 %
- Flow solderable
- Custom sizes available
- Automatic placement capability
- Tape and reel packaging available
- Termination style: 3-sided wraparound termination or single termination flip chip standard; 5-sided wraparound termination available
- Internationally standardized sizes
- Suitable for solderable, epoxy bondable, or wire bondable applications
- Termination material: solder-coated nickel barrier or solder coated non-magnetic terminations standard; gold, palladium silver, platinum gold, platinum silver or platinum palladium gold terminations available
- 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

Pb 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
CRHV1206	1206	0.30	1500	2M to 100M	0.5	100
				2M to 1G	1, 2, 5, 10, 20	
				1.1G to 8G	2, 5, 10, 20	
CRHV1210	1210	0.45	1750	4M to 100M	0.5	100
				4M to 1G	1, 2, 5, 10, 20	
				1.1G to 10G	2, 5, 10, 20	
CRHV2010	2010	0.50	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	
CRHV2510	2510	0.60	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	
CRHV2512	2512	1.0	3000	12M to 100M	0.5	100
				12M 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. The TC for “AA” option is typically 200 ppm

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CRHV1206AF100MFKFB (preferred part number format)

C	R	H	V	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
CRHV	**1206** **1210** **2010** **2512**	**A** = 3-sided **B** = top only **C** = 5-sided	**F** = nickel barrier **G** = non-magnetic **A** = palladium silver **B** = platinum gold **C** = gold **D** = platinum silver **E** = platinum palladium gold	**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 **N** = No solder **S** = Sn62/Pb36/Ag2, HSD **T** = Sn90/Pb10	**B** = bulk **F** = T/R (full reel) **1** = T/R (1000 pcs) **5** = T/R (500 pcs) **T** = T/R (250 pcs min.) **W** = waffle tray

Historical Part Numbering: CRHV1206AF1006F100e2 (will continue to be accepted)

CRHV	1206	A	F	1006	F	100	e2
HISTORICAL MODEL	SIZE	TERM STYLE	TERM MATERIAL	RESISTANCE VALUE	TOLERANCE	TCR	SOLDER TERMINATION

Note

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

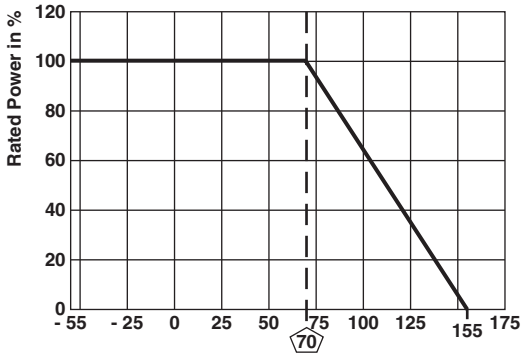
MECHANICAL SPECIFICATIONS

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

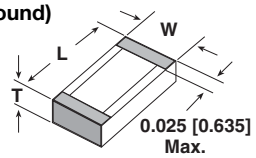
- Reference only: Not for all values specified. Consult factory for your size and value

VOLTAGE COEFFICIENT OF RESISTANCE CHART

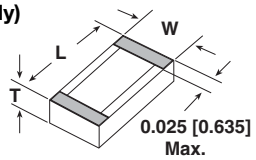
SIZE	VALUE (Ω)	VCR (ppm/V)	FURTHER INSTRUCTIONS
CRHV1206	2M to 199M	25	Values over 200M, consult factory
CRHV1210	4M to 200M	25	Values over 200M, consult factory
CRHV2010	6M to 99M	15	Values over 1G, consult factory
	100M to 1G	20	
CRHV2510	10M to 99M	10	Values over 1G, consult factory
	100M to 1G	15	
CRHV2512	12M to 999M	10	Values over 5G, consult factory
	1G to 5G	25	

DIMENSIONS in inches (millimeters)

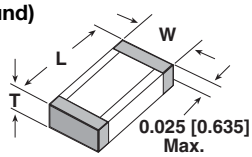
Termination Style A
(3-sided wraparound)



Termination Style B
(Top conductor only)



Termination Style C
(5-sided wraparound)



MODEL	LENGTH (L) ± 0.006 (0.152)	WIDTH (W) ± 0.006 (0.152)	THICKNESS (T) ± 0.002 (0.051)
CRHV1206	0.125	0.063	0.025
CRHV1210	0.125	0.100	0.025
CRHV2010	0.200	0.100	0.025
CRHV2510	0.250	0.100	0.025
CRHV2512	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 or S (optional) (3)
		Top only (flip chip)	BF	
		5-sided (wraparound)	CF	
	Non-magnetic	3-sided (wraparound)	AG	E or T (standard); F or S (optional) (3)
		Top only (flip chip)	BG	
Epoxy bondable/ solderable	Platinum palladium gold	3-sided (wraparound)	AE	N (standard); F or S (optional) (1)
		Top only (flip chip)	BE	
		5-sided (wraparound)	CE	
Wire bondable/ Epoxy bondable	Gold	3-sided (wraparound)	AC	N
		Top only (flip chip)	BC	
		5-sided (wraparound)	CC	
Epoxy bondable	Palladium silver (2)	3-sided (wraparound)	AA	N
		Top only (flip chip)	BA	
		5-sided (wraparound)	CA	
	Platinum gold	3-sided (wraparound)	AB	
		Top only (flip chip)	BB	
		5-sided (wraparound)	CB	
	Platinum silver	3-sided (wraparound)	AD	
		Top only (flip chip)	BD	
		5-sided (wraparound)	CD	

Notes

(1) Use solder termination N for applications requiring epoxy bondable mounting, and solder terminations F or S for applications requiring solderable mounting

(2) While not recommended, palladium silver terminations could be used for solderable applications when using a solder alloy containing silver. If the solder paste being used to solder the palladium silver terminated parts to the boards does not have a silver-based composition, then the silver in the terminations could begin to leach when it is exposed to liquidus non-silver-based solders, causing the potential for solderability and/or solder joint issues

(3) Standard solder plating for the nickel barrier and non-magnetic parts is solder terminations E or T. Hot solder dipped terminations F or S are 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

Note

- This summary is based on testing done on values up to 2 GΩ

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