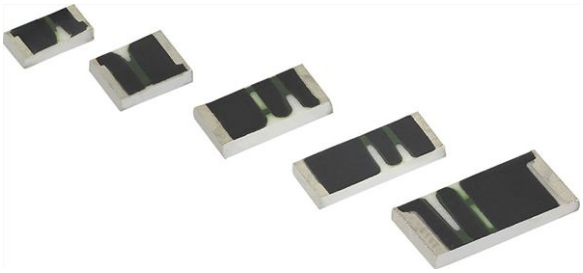
# Thick Film Chip Resistors, High Voltage



## FEATURES

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

RoHS COMPLIANT
HALOGEN FREE

## LINKS TO ADDITIONAL RESOURCES

3D Models

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | CASE SIZE | POWER RATING $P_{70\,°C}$ W | MAXIMUM WORKING VOLTAGE (1) V | RESISTANCE RANGE (2) Ω | TOLERANCE ± % | TEMPERATURE COEFFICIENT (3) (-55 °C to +155 °C) ± ppm/°C |
|---|---|---|---|---|---|---|
| CRHA1206 | 1206 | 0.30 | 1500 | 2M to 100M | 1, 2, 5, 10, 20 | 100 |
| CRHA1210 | 1210 | 0.45 | 1750 | 4M to 100M | 1, 2, 5, 10, 20 | 100 |
| CRHA2010 | 2010 | 0.50 | 2000 | 6M to 100M | 1, 2, 5, 10, 20 | 100 |
| CRHA2510 | 2510 | 0.60 | 2500 | 10M to 500M | 1, 2, 5, 10, 20 | 100 |
| CRHA2512 | 2512 | 1.0 | 3000 | 10M to 500M | 1, 2, 5, 10, 20 | 100 |

**Notes**

(1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less
(2) Resistance values are calibrated at 100 $V_{DC}$. Calibration at other voltages available upon request
(3) Reference only: not for all values specified. Consult factory for your size and value

## GLOBAL PART NUMBER INFORMATION

**Global Part Numbering: CRHA1206AF100MFKFB**

| C | R | H | A | 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 |
|---|---|---|---|---|---|---|---|---|
| **CRHA** | **1206**<br>**1210**<br>**2010**<br>**2510**<br>**2512** | **A** = 3-sided | **F** = nickel barrier | **M** = MΩ<br>**4M70** = 4.7 MΩ<br>**10M0** = 10 MΩ | **F** = ± 1 %<br>**G** = ± 2 %<br>**J** = ± 5 %<br>**K** = ± 10 %<br>**M** = ± 20 % | **K** = 100 ppm<br>**L** = 150 ppm<br>**N** = 200 ppm<br>**R** = 250 ppm<br>**M** = 300 ppm<br>**W** = 350 ppm<br>**P** = 500 ppm | **E** = Sn100 | **B** = bulk (250 pcs max.)<br>**F** = T/R (full reel)<br>**1** = T/R (1000 pcs)<br>**5** = T/R (500 pcs)<br>**T** = T/R (250 pcs min.) |

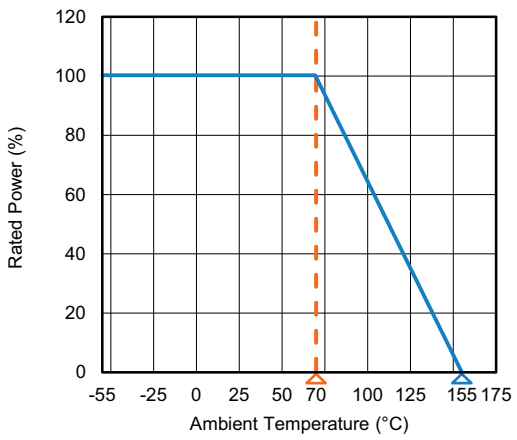
**Note**

- 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 | Nickel barrier (standard) |
| Solder finish | Pure tin |

| ENVIRONMENTAL SPECIFICATIONS | |
|---|---|
| Operating temperature | -55 °C to +155 °C |
| Life | Less than 1.0 % change when tested at full rated power |
| Short time overload | Less than 0.5 % $\Delta R$ |

## DERATING CURVE




**Note**

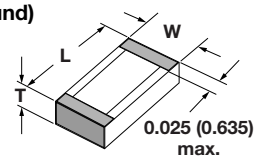
- Reference only: not for all values specified. Consult factory for your size and value

## VOLTAGE COEFFICIENT OF RESISTANCE CHART

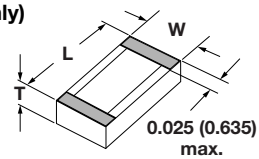
| SIZE | VALUE (Ω) | VCR (ppm/V) |
|---|---|---|
| CRHA1206 | 2M to 100M | 25 |
| CRHA1210 | 4M to 100M | 25 |
| CRHA2010 | 6M to 100M | 15 |
| CRHA2510 | 10M to 99M | 10 |
| | 100M to 500M | 15 |
| CRHA2512 | 10M to 500M | 10 |

## DIMENSIONS in inches (millimeters)

**Termination Style A**
**(3-sided wraparound)**




**Termination Style B**
**(top conductor only)**




| MODEL | LENGTH (L) ± 0.006 (0.152) | WIDTH (W) ± 0.006 (0.152) | THICKNESS (T) ± 0.004 (0.102) |
|---|---|---|---|
| CRHA1206 | 0.125 | 0.063 | 0.025 |
| CRHA1210 | 0.125 | 0.100 | 0.025 |
| CRHA2010 | 0.200 | 0.100 | 0.025 |
| CRHA2510 | 0.250 | 0.100 | 0.025 |
| CRHA2512 | 0.250 | 0.126 | 0.025 |

| PERFORMANCE | | |
|---|---|---|
| **TEST** | **CONDITIONS OF TEST** | **TEST RESULTS (TYPICAL TEST LOTS)** |
| Thermal shock | -55 °C to +150 °C, 1000 cycles, 15 min at each extreme | ± (1.0 % + 0.05 Ω) |
| High temperature exposure | 2000 h at +125 °C | ± (1.0 % + 0.05 Ω) |
| Bias humidity | +85 °C, 85 % RH, 10 % bias, 1000 h | ± (1.0 % + 0.05 Ω) (1) |
| Mechanical shock | 100 *g*'s for 6 ms, 5 pulses | ± (0.5 % + 0.05 Ω) |
| Vibration | Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h | ± (0.5 % + 0.05 Ω) |
| Load life | 1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF" | ± (1.0 % + 0.05 Ω) |
| Resistance to solder heat | +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence | ± (1.0 % + 0.05 Ω) |
| Moisture resistance | MIL-STD-202, method 106, 0 % power, 7a and 7b not required | ± (1.0 % + 0.05 Ω) |

**Note**

(1) Due to the high values and small case size, it is recommended the 1206 case size parts be potted for electrical isolation from high humidity conditions

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