



Thick Film Chip Resistors, High Voltage



FEATURES

- AEC-Q200 qualified
- High voltage up to 3000 V
- Outstanding stability < 0.5 %
- Automatic placement capability
- Tape and reel packaging available
- Termination style: 3-sided wraparound termination or single termination flip chip standard
- 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

| STANDARD ELECTRICAL SPECIFICATIONS | | | | | | |
|------------------------------------|-----------|---|---|---|----------------------|---|
| GLOBAL MODEL | CASE SIZE | POWER RATING $P_{70^\circ\text{C}}$ W | MAXIMUM WORKING VOLTAGE ⁽¹⁾ V | RESISTANCE RANGE ⁽²⁾ Ω | TOLERANCE \pm % | TEMPERATURE COEFFICIENT ⁽³⁾ (-55 °C to +155 °C) \pm ppm/°C |
| CRHA1206 | 1206 | 0.30 | 1500 | 2M to 100M | 0.5, 1, 2, 5, 10, 20 | 100 |
| CRHA1210 | 1210 | 0.45 | 1750 | 4M to 100M | 0.5, 1, 2, 5, 10, 20 | 100 |
| CRHA2010 | 2010 | 0.50 | 2000 | 6M to 100M | 0.5, 1, 2, 5, 10, 20 | 100 |
| CRHA2510 | 2510 | 0.60 | 2500 | 10M to 500M | 0.5, 1, 2, 5, 10, 20 | 100 |
| CRHA2512 | 2512 | 1.0 | 3000 | 10M to 500M | 0.5, 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 | | | | | | | | | | | | |
| GLOBAL MODEL | SIZE | TERMINAL STYLE | TERMINAL MATERIAL | RESISTANCE VALUE | TOLERANCE | TCR | SOLDER TERMINATION | PACKAGING | | | | |
| CRHA | 1206 1210 2010 2510 2512 | A = 3-sided B = top only | F = nickel barrier | M = M Ω 4M70 = 4.7 M Ω 10M0 = 10 M Ω | D = \pm 0.5 % F = \pm 1 % G = \pm 2 % J = \pm 5 % K = \pm 10 % M = \pm 20 % | K = 100 ppm L = 150 ppm N = 200 ppm R = 250 ppm M = 300 ppm W = 350 ppm P = 500 ppm | E = Sn100 | B = bulk F = T/R (full reel) 1 = T/R (1000 pcs) 5 = T/R (500 pcs) T = T/R (250 pcs min.) | | | | |

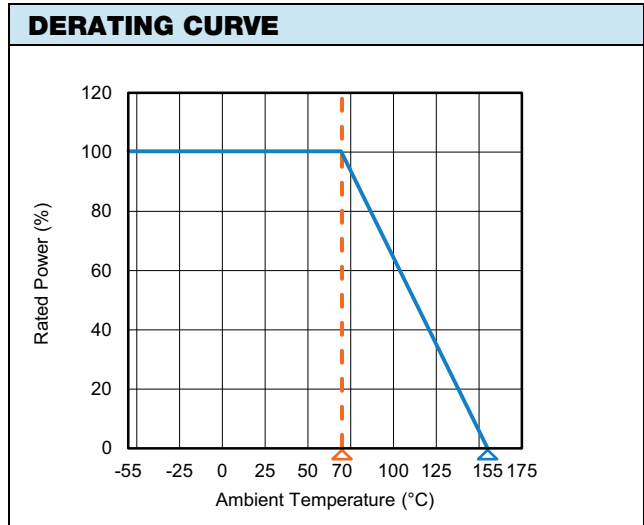
Note

- 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 0.5 % change when tested at full rated power |
| Short time overload | Less than 0.5 % ΔR |



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