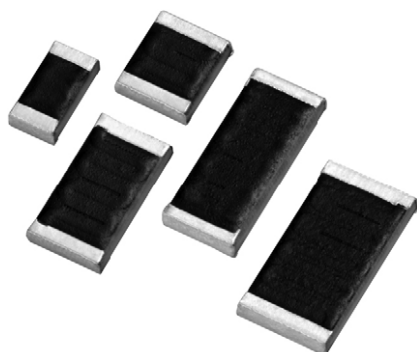


# Thick Film Chip Resistors, High Voltage



## FEATURES

- Voltages up to 3000 V
- Automatic placement capability
- Termination style:  
3-sided wraparound termination
- Tape and reel packaging available
- Suitable for solderable applications
- Internationally standardized sizes, custom sizes available
- Termination material: solder-coated nickel barrier
- Non-magnetic termination available
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
Available  
**HALOGEN  
FREE**

## LINKS TO ADDITIONAL RESOURCES



## 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<br>$P_{70^{\circ}\text{C}}$<br>W | MAX. WORKING VOLTAGE <sup>(2)</sup><br>V | RESISTANCE RANGE <sup>(1)</sup><br>$\Omega$ | TOLERANCE<br>$\pm \%$ | TEMPERATURE COEFFICIENT <sup>(3)</sup><br>$\pm \text{ppm}/^{\circ}\text{C}$ |
|--------------|-----------|-----------------------------------------------|------------------------------------------|---------------------------------------------|-----------------------|-----------------------------------------------------------------------------|
| CRMV1206     | 1206      | 0.30                                          | 1000                                     | 150 to 15M                                  | 0.5, 1, 2, 5, 10, 20  | 100                                                                         |
| CRMV1210     | 1210      | 0.35                                          | 1250                                     | 300 to 20M                                  | 0.5, 1, 2, 5, 10, 20  | 100                                                                         |
| CRMV2010     | 2010      | 0.50                                          | 2000                                     | 500 to 40M                                  | 0.5, 1, 2, 5, 10, 20  | 100                                                                         |
| CRMV2510     | 2510      | 0.80                                          | 2500                                     | 1K to 60M                                   | 0.5, 1, 2, 5, 10, 20  | 100                                                                         |
| CRMV2512     | 2512      | 1.0                                           | 3000                                     | 1K to 75M                                   | 0.5, 1, 2, 5, 10, 20  | 100                                                                         |

## Notes

- For non-standard sizes, lower values or higher power rating requirement, contact factory
- (1) Resistance values calibrated at 10 V<sub>DC</sub>. 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           | CRMV1206       | CRMV1210       | CRMV2010       | CRMV2510       | CRMV2512       |
|----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Rated dissipation at 70 °C | W              | 0.30           | 0.35           | 0.50           | 0.80           | 1.0            |
| Limiting element voltage   | V <sub>≡</sub> | 1000           | 1250           | 2000           | 2500           | 3000           |
| Insulation resistance      | $\Omega$       | $\geq 10^{11}$ | $\geq 10^{11}$ | $\geq 10^{11}$ | $\geq 10^{11}$ | $\geq 10^{11}$ |
| Category temperature range | °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           |

## VOLTAGE COEFFICIENT OF RESISTANCE

| MODEL    | VALUE ( $\Omega$ ) | VCR (ppm/V)     | FURTHER INSTRUCTIONS |
|----------|--------------------|-----------------|----------------------|
| CRMV1206 | 150 to 15M         | Consult factory | Consult factory      |
| CRMV1210 | 300 to 20M         | Consult factory | Consult factory      |
| CRMV2010 | 500 to 40M         | Consult factory | Consult factory      |
| CRMV2510 | 1K to 60M          | Consult factory | Consult factory      |
| CRMV2512 | 1K to 75M          | Consult factory | Consult factory      |

## GLOBAL PART NUMBER INFORMATION

Global Part Numbering: CRMV1210AF1K00FLET (preferred part number format)

| GLOBAL MODEL | SIZE                                 | TERMINAL STYLE | TERMINAL MATERIAL                      | RESISTANCE VALUE                                                                                                          | TOLERANCE                                                                                              | TCR                        | SOLDER TERMINATION                            | PACKAGING                                                                                                                                                     |
|--------------|--------------------------------------|----------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CRMV         | 1206<br>1210<br>2010<br>2510<br>2512 | A = 3-sided    | F = nickel barrier<br>G = non-magnetic | R = $\Omega$<br>K = k $\Omega$<br>M = M $\Omega$<br>110R = 110 $\Omega$<br>49K9 = 49.9 k $\Omega$<br>10M0 = 10 M $\Omega$ | D = $\pm 0.5\%$<br>F = $\pm 1\%$<br>G = $\pm 2\%$<br>J = $\pm 5\%$<br>K = $\pm 10\%$<br>M = $\pm 20\%$ | K = 100 ppm<br>L = 150 ppm | E = Sn100<br>N = no solder<br>T = Sn90 / Pb10 | B = bulk<br>(250 pcs max.)<br>F = T / R<br>(full reel)<br>1 = T / R<br>(1000 pcs)<br>5 = T / R<br>(500 pcs)<br>T = T / R<br>(250 pcs min.)<br>W = waffle tray |

### Note

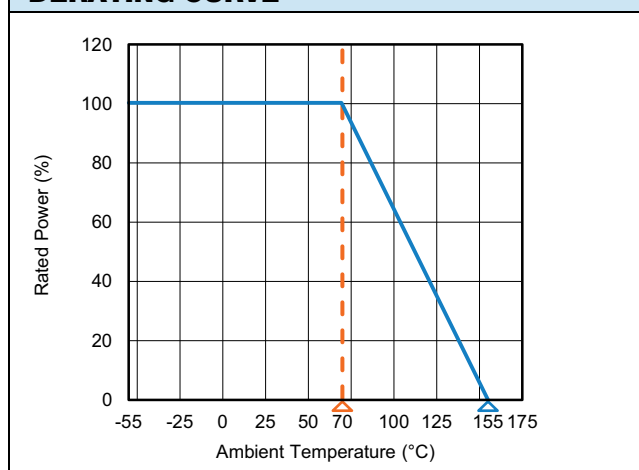
- For additional information on packaging, refer to the Surface Mount Resistor Packaging document ([www.vishay.com/doc?31543](http://www.vishay.com/doc?31543))

## DIMENSIONS in inches (millimeters)

| TERMINATION STYLE A<br>(3-SIDED WRAPAROUND) | MODEL    | LENGTH<br>(L)                          | WIDTH<br>(W)                           | THICKNESS<br>(T)                       |
|---------------------------------------------|----------|----------------------------------------|----------------------------------------|----------------------------------------|
|                                             | CRMV1206 | 0.125 $\pm$ 0.006<br>(3.18 $\pm$ 0.15) | 0.063 $\pm$ 0.006<br>(1.60 $\pm$ 0.15) | 0.025 $\pm$ 0.004<br>(0.64 $\pm$ 0.10) |
|                                             | CRMV1210 | 0.125 $\pm$ 0.006<br>(3.18 $\pm$ 0.15) | 0.100 $\pm$ 0.006<br>(2.54 $\pm$ 0.15) | 0.025 $\pm$ 0.004<br>(0.64 $\pm$ 0.10) |
|                                             | CRMV2010 | 0.200 $\pm$ 0.006<br>(5.08 $\pm$ 0.15) | 0.100 $\pm$ 0.006<br>(2.54 $\pm$ 0.15) | 0.025 $\pm$ 0.004<br>(0.64 $\pm$ 0.10) |
|                                             | CRMV2510 | 0.250 $\pm$ 0.006<br>(6.35 $\pm$ 0.15) | 0.100 $\pm$ 0.006<br>(2.54 $\pm$ 0.15) | 0.025 $\pm$ 0.004<br>(0.64 $\pm$ 0.10) |
|                                             | CRMV2512 | 0.250 $\pm$ 0.006<br>(6.35 $\pm$ 0.15) | 0.126 $\pm$ 0.006<br>(3.20 $\pm$ 0.15) | 0.025 $\pm$ 0.004<br>(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 or T                  |
|            | Non-magnetic         |                      | AG                                |                         |

## DERATING CURVE



## MATERIAL SPECIFICATIONS

|                   |                                                                         |
|-------------------|-------------------------------------------------------------------------|
| Resistive element | Ruthenium oxide                                                         |
| Encapsulation     | Epoxy                                                                   |
| Substrate         | 96 % alumina                                                            |
| Termination       | Solder-coated nickel barrier or solder coated non-magnetic terminations |
| Solder finish     | Pure tin or tin / lead solder alloys standard                           |



| PERFORMANCE                    |                                                         |                                  |
|--------------------------------|---------------------------------------------------------|----------------------------------|
| TEST                           | CONDITIONS OF TEST                                      | TEST RESULTS (TYPICAL TEST LOTS) |
| Life                           | MIL-STD-202, method 108<br>1000 h rated power at +70 °C | $\leq \pm 0.50 \%$               |
| Short time overload            | MIL-PRF-55342, paragraph 4.8.6                          | $\leq \pm 0.02 \%$               |
| Thermal shock                  | MIL-STD-202, method 107<br>-55 °C to +150 °C            | $\leq \pm 0.50 \%$               |
| Low temperature operation      | MIL-PRF-55342, paragraph 4.8.5                          | $\leq \pm 0.02 \%$               |
| Resistance to bonding exposure | MIL-STD-202, methods 210                                | $\leq \pm 0.05 \%$               |
| Moisture resistance            | MIL-PRF-55342, paragraph 4.8.9                          | $\leq \pm 0.06 \%$               |
| Solder mounting integrity      | MIL-PRF-55342, paragraph 4.8.13<br>2 kg for 30 s        | No evidence of mechanical damage |
| Solderability                  | MIL-STD-202, method 208                                 | 95 % coverage                    |



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