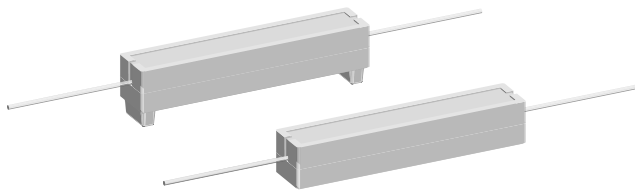




Wirewound/Metal Oxide Resistors, Commercial Power, Axial Lead



FEATURES

- High performance for low cost
- Meets or exceeds requirements of EIA Standard RS-344
- High power to size ratio
- Ceramic cases are available with circuit board stand-offs (designated with a -3 model ending)
- Special inorganic potting compound and ceramic case provide high thermal conductivity in a fireproof package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



| STANDARD ELECTRICAL SPECIFICATIONS | | | | | |
|------------------------------------|---|--|--|----------------------|--------------------------|
| GLOBAL MODEL | POWER RATING $P_{40^\circ\text{C}}$ W | RESISTANCE RANGE Ω WIREWOUND (1) | RESISTANCE RANGE Ω METAL OXIDE (1) | TOLERANCE \pm % | WEIGHT (typical) g |
| CP0002 | 2 | 0.1 to 1K | 100 to 30K | 5, 10 | 2.0 |
| CP0002...3 | 2 | 0.1 to 1K | 100 to 30K | 5, 10 | 2.2 |
| CP0003 | 3 | 0.1 to 2K | 150 to 33K | 5, 10 | 3.4 |
| CP0003...3 | 3 | 0.1 to 2K | 150 to 33K | 5, 10 | 3.6 |
| CP0005 | 5 | 0.1 to 2.4K | 150 to 50K | 5, 10 | 4.8 |
| CP0005...3 | 5 | 0.1 to 2.4K | 150 to 50K | 5, 10 | 5.0 |
| CP0007 | 7 | 0.1 to 7K | - | 5, 10 | 6.8 |
| CP0007...3 | 7 | 0.1 to 7K | - | 5, 10 | 7.0 |
| CP0010 | 10 | 0.1 to 11K | - | 5, 10 | 9.5 |
| CP0010...3 | 10 | 0.1 to 11K | - | 5, 10 | 9.9 |
| CP0015 | 15 | 0.1 to 11K | - | 5, 10 | 16.8 |
| CP0015...3 | 15 | 0.1 to 11K | - | 5, 10 | 17.4 |
| CP0020 | 20 | 0.1 to 16K | - | 5, 10 | 22.8 |
| CP0020...3 | 20 | 0.1 to 16K | - | 5, 10 | 23.6 |
| CP0022 | 22 | 0.1 to 16K | - | 5, 10 | 24.5 |
| CP0022...3 | 22 | 0.1 to 16K | - | 5, 10 | 25.3 |
| CP0025 | 25 | 0.1 to 16K | - | 5, 10 | 37.0 |

Note
 (1) To specifically order a Wirewound sub-assembly for resistance values that overlap between the Wirewound and Metal Oxide technologies, the model will be a CPxxxx...85 for standard body and CPxxxx...91 for body with stand-offs. To specifically order a Metal Oxide sub-assembly for resistance values that overlap between the Wirewound and Metal Oxide technologies, the model will be a CPxxxx...100 for a standard body and CPxxxx...101 for body with stand-offs. If no dash type is specified, either technology may be supplied.

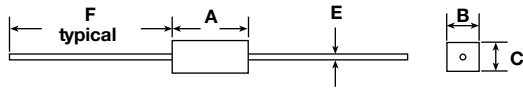
| TECHNICAL SPECIFICATIONS | | | |
|---------------------------------|-----------------------|--|------------------------------|
| PARAMETER | UNIT | WIREWOUND CHARACTERISTICS | METAL OXIDE CHARACTERISTICS |
| Temperature Coefficient | ppm/ $^\circ\text{C}$ | \pm 300 1 Ω and above; \pm 600 below 1 Ω | \pm 300 (CP0002 to CP0005) |
| Short Time Overload | - | 5 x rated power for 5 s | 5 x rated power for 5 s |
| Terminal Strength | lb | 10 minimum | 10 minimum |
| Operating Temperature Range | $^\circ\text{C}$ | -65 to +275 | -65 to +225 |
| Dielectric Withstanding Voltage | V_{AC} | 1000 | 1000 |
| Maximum Working Voltage | V | $(P \times R)^{1/2}$ | $(P \times R)^{1/2}$ |

Note
 • Wirewound CP resistors can reliably function as a fuse and as a resistor. Such components involve compromise between fusing and resistive functions; therefore, each design should be tailored to the application to ensure optimum performance. Contact factory by using the e-mail address at the bottom of this page for design assistance.

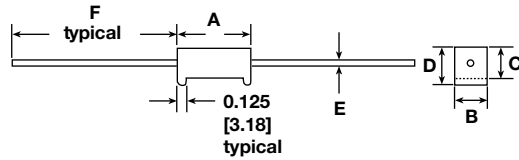
| GLOBAL PART NUMBER INFORMATION | | | | | | | | | | | | | | | | | |
|--|---|--|---|--|---|---|---|-----------|---|---|---|---|---|---|---|--|--|
| Global Part Numbering example: CP000515R00JE143 | | | | | | | | | | | | | | | | | |
| C | P | 0 | 0 | 0 | 5 | 1 | 5 | R | 0 | 0 | J | E | 1 | 4 | 3 | | |
| GLOBAL MODEL (See Standard Electrical Specifications Global Model column for options) | | VALUE R = Decimal K = Thousand R1500 = 0.15 Ω 1K500 = 1500 Ω | | TOLERANCE J = \pm 5.0 % K = \pm 10.0 % | | PACKAGING E14 = Lead (Pb)-free bulk pack E31 = Lead (Pb)-free four layer bulk pack B14 = Bulk pack B31 = Four layer bulk pack | | | | SPECIAL (Dash Number) (up to 3 digits) From 1 to 999 as applicable | | | | | | | |
| Historical Part Numbering example: CP-5-3 15 Ω 5 % B14 | | | | | | | | | | | | | | | | | |
| CP-5-3 | | 15 Ω | | 5 % | | | | B14 | | | | | | | | | |
| HISTORICAL MODEL | | RESISTANCE VALUE | | TOLERANCE CODE | | | | PACKAGING | | | | | | | | | |

DIMENSIONS in inches [millimeters]

CPxxxx



CPxxxx...3



| GLOBAL MODEL | DIMENSIONS in inches [millimeters] | | | | | | | |
|-----------------------|--|-------------------------|-------------------------|-------------------------|----------------------|----------------|------------------------------|------------------------|
| | A ⁽¹⁾ ± 0.031 [0.794] | B ± 0.031 [0.794] | C ± 0.031 [0.794] | D ± 0.031 [0.794] | E ± 0.001 [0.025] | | F | |
| | | | | | WIREWOUND | METAL OXIDE | WIREWOUND ± 0.125 [3.175] | METAL OXIDE MINIMUM |
| CP0002 | 0.688 [17.46] | 0.250 [6.35] | 0.250 [6.35] | - | 0.032 [0.813] | 0.0236 [0.600] | 1.500 [38.10] | 0.750 [19.05] |
| CP0002...3 | 0.688 [17.46] | 0.250 [6.35] | 0.250 [6.35] | 0.313 [7.94] | 0.032 [0.813] | 0.0236 [0.600] | 1.500 [38.10] | 0.750 [19.05] |
| CP0003 | 0.875 [22.22] | 0.313 [7.94] | 0.313 [7.94] | - | 0.036 [0.914] | 0.032 [0.813] | 1.500 [38.10] | 1.000 [25.40] |
| CP0003...3 | 0.875 [22.22] | 0.313 [7.94] | 0.313 [7.94] | 0.375 [9.52] | 0.036 [0.914] | 0.032 [0.813] | 1.500 [38.10] | 1.000 [25.40] |
| CP0005 | 0.875 [22.22] | 0.375 [9.52] | 0.344 [8.73] | - | 0.036 [0.914] | 0.032 [0.813] | 1.500 [38.10] | 1.000 [25.40] |
| CP0005...3 | 0.875 [22.22] | 0.375 [9.52] | 0.344 [8.73] | 0.406 [10.32] | 0.036 [0.914] | 0.032 [0.813] | 1.500 [38.10] | 1.000 [25.40] |
| CP0007 | 1.391 [35.32] | 0.375 [9.52] | 0.344 [8.73] | - | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0007...3 | 1.391 [35.32] | 0.375 [9.52] | 0.344 [8.73] | 0.469 [11.91] | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0010 | 1.875 [47.62] | 0.375 [9.52] | 0.344 [8.73] | - | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0010...3 | 1.875 [47.62] | 0.375 [9.52] | 0.344 [8.73] | 0.469 [11.91] | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0015 | 1.875 [47.62] | 0.500 [12.70] | 0.500 [12.70] | - | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0015...3 | 1.875 [47.62] | 0.500 [12.70] | 0.500 [12.70] | 0.625 [15.87] | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0020 ⁽²⁾ | 2.500 [63.50] | 0.500 [12.70] | 0.500 [12.70] | - | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0020...3 | 2.500 [63.50] | 0.500 [12.70] | 0.500 [12.70] | 0.625 [15.87] | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0022 | 2.500 [63.50] | 0.500 [12.70] | 0.500 [12.70] | - | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0022...3 | 2.500 [63.50] | 0.500 [12.70] | 0.500 [12.70] | 0.625 [15.87] | 0.036 [0.914] | - | 1.500 [38.10] | - |
| CP0025 | 2.500 [63.50] | 0.625 [15.87] | 0.625 [15.87] | - | 0.040 [1.016] | - | 1.500 [38.10] | - |

Notes
⁽¹⁾ Potting compound may extend outside of ceramic case up to 0.060 [1.52] maximum per side.

⁽²⁾ Dimensions for the metal oxide are: A = 2.360 [59.94], B = 0.570 [14.48], C = 0.530 [13.46], E = 0.032 [0.813], F = 1.000 [25.40]

MATERIAL SPECIFICATIONS
Element: Wirewound = Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

Metal Oxide = High temperature fired metal oxide film

Core: Wirewound = Woven fiberglass

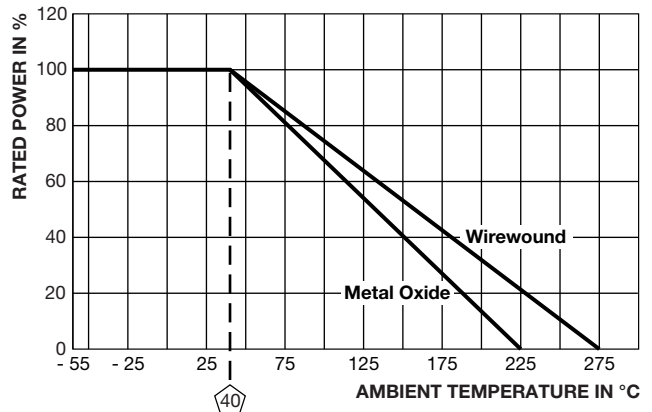
Metal Oxide = Alumina ceramic

Body: Steatite ceramic case with inorganic potting compound

End Caps: Tin plated steel

Terminals: Tinned copper

Part Marking: DALE, model, wattage, value, tolerance, date code

DERATING


| PERFORMANCE | | |
|---------------------------------|--|------------------------|
| TEST | CONDITIONS OF TEST | TEST LIMITS (EIA-344) |
| Thermal Shock | -55 °C to +275 °C (+225 °C for Metal Oxide), 5 cycles, 30 min dwell time | ± (5.0 % + 0.05 Ω) ΔR |
| Short Time Overload | 5 x rated power for 5 s | ± (4.0 % + 0.05 Ω) ΔR |
| Dielectric Withstanding Voltage | 1000 V _{RMS} , for 1 min | ± (2.0 % + 0.05 Ω) ΔR |
| Low Temperature Storage | -65 °C, full rated working voltage for 45 min | ± (3.0 % + 0.05 Ω) ΔR |
| Humidity | 75 °C, 90 % to 100 % RH, 240 h | ± (5.0 % + 0.05 Ω) ΔR |
| Load Life | 1000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF" | ± (10.0 % + 0.05 Ω) ΔR |
| Terminal Strength | 5 pounds for 30 s; body twisted about axis, 3 x 360° rotations | ± (2.0 % + 0.05 Ω) ΔR |
| Resistance to Solder Heat | Terminal immersed 3.5 s in molten solder at 1/8" to 3/16" from body | ± (4.0 % + 0.05 Ω) ΔR |



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