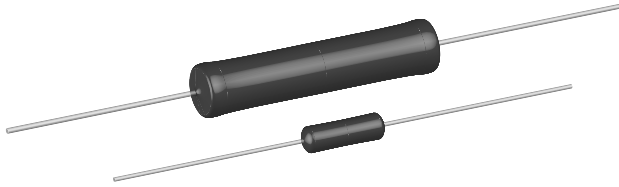


Wirewound Resistors, Commercial Power, Silicone Coated, Axial Lead


DESIGN SUPPORT TOOLS
[click logo to get started](#)

FEATURES

- High performance for low cost
- High temperature silicone coating
- Complete welded construction
- Excellent stability in operation
- High power to size ratio
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS*
Available

HALOGEN FREE
Available

GREEN
(5-2008)
Available

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 | HISTORICAL MODEL | POWER RATING ⁽¹⁾ P _{25 °C} W CHARACTERISTIC U +250 °C | POWER RATING ⁽¹⁾ P _{25 °C} W CHARACTERISTIC V +350 °C | RESISTANCE RANGE Ω | TOLERANCE ± % ⁽²⁾ | WEIGHT (max.) g |
|--------------|------------------|---|---|------------------------------|------------------------------|-----------------|
| CW1/2 | CW-1/2 | 0.5 | - | 0.1 to 1.77K | 5, 10 | 0.21 |
| CW001 | CW-1 | 1.0 | - | 0.1 to 6.37K | 5, 10 | 0.34 |
| CW01M | CW-1M | 1.0 | - | 0.1 to 3.3K | 5, 10 | 0.3 |
| CW002 | CW-2 | 4.0 | 5.5 | 0.1 to 28.7K | 5, 10 | 2.1 |
| CW02M | CW-2M | 3.0 | 3.75 | 0.1 to 12K | 5, 10 | 0.65 |
| CW02B | CW-2B | 3.0 | 3.75 | 0.1 to 15K | 5, 10 | 0.7 |
| CW02B...13 | CW-2B-13 | 4.0 | 6.0 | 0.1 to 10.89K ⁽³⁾ | 5, 10 | 0.9 |
| CW02C | CW-2C | 2.5 | 3.25 | 0.1 to 19.9K | 5, 10 | 1.8 |
| CW02C...14 | CW-2C-14 | 2.5 | 3.25 | 0.1 to 19.9K | 5, 10 | 1.2 |
| CW005 | CW-5 | 5.0 | 6.5 | 0.1 to 58.5K | 5, 10 | 4.2 |
| CW005...2 | CW-5-2 | 4.0 | 5.0 | 0.1 to 40.3K | 5, 10 | 4.2 |
| CW005...3 | CW-5-3 | 5.0 | 6.5 | 0.1 to 58.5K | 5, 10 | 4.2 |
| CW007 | CW-7 | 7.0 | 9.0 | 0.1 to 95.2K | 5, 10 | 4.7 |
| CW010 | CW-10 | 10.0 | 13.0 | 0.1 to 167K | 5, 10 | 9.0 |
| CW010...3 | CW-10-3 | 10.0 | 13.0 | 0.1 to 167K | 5, 10 | 9.0 |

Notes

- ⁽¹⁾ Vishay Dale CW models have two power ratings, depending on operating temperature and stability requirements
- ⁽²⁾ 3 % tolerance available
- ⁽³⁾ Higher values available on request

TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | CW RESISTOR CHARACTERISTICS |
|---------------------------------|-----------------|--|
| Temperature Coefficient | ppm/°C | ± 30 for 10 Ω and above, ± 50 for 1.0 Ω to 9.9 Ω, ± 90 for 0.5 Ω to 0.99 Ω |
| Dielectric Withstanding Voltage | V _{AC} | 1000 |
| Short Time Overload | - | 5 x rated power for 5 s for 3.75 W size and smaller, 10 x rated power for 5 s for 4 W size and greater |
| Terminal Strength | lb | 10 minimum |
| Maximum Working Voltage | V | (P x R) ^{1/2} |
| Operating Temperature Range | °C | Characteristic U = -65 to +250, characteristic V = -65 to +350 |
| Power Rating | - | Characteristic U = +250 °C max. hot spot temperature, ± 0.5 % max. ΔR in 2000 h load life Characteristic V = +350 °C max. hot spot temperature, ± 3.0 % max. ΔR in 2000 h load life |

GLOBAL PART NUMBER INFORMATION

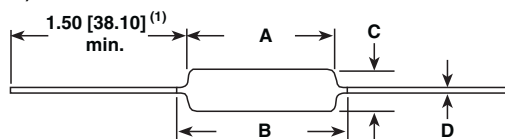
Global Part Numbering example: CW02C10K00JB1214

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| C | W | 0 | 2 | C | 1 | 0 | K | 0 | 0 | J | B | 1 | 2 | 1 | 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|

| GLOBAL MODEL | VALUE | TOLERANCE | PACKAGING | SPECIAL |
|--|--|--|---|--|
| (see Standard Electrical Specifications Global Model column for options) | R = decimal K = thousand 1R500 = 1.5 Ω 1K500 = 1.5 kΩ | H = ± 3.0 % J = ± 5.0 % K = ± 10.0 % | E70 = lead (Pb)-free, tape / reel, 1K pcs (smaller than CW005) E73 = lead (Pb)-free, tape/reel, 500 pcs E12 = lead (Pb)-free, bulk D18 = lead (Pb)-free, R1R80 tape/reel CW02B...13 pack code for Europe use only S70 = tin / lead, tape / reel, 1K pcs (smaller than CW005) S73 = tin / lead, tape / reel, 500 pcs B12 = tin / lead, bulk | (dash number) (up to 3 digits) from 1 to 999 as applicable |

Historical Part Numbering example: CW-2C-14 10 kΩ 5 % B12

| | | | |
|------------------------------|---------------------------|-----------------------|------------------|
| CW-2C-14 HISTORICAL MODEL | 10 kΩ RESISTANCE VALUE | 5 % TOLERANCE CODE | B12 PACKAGING |
|------------------------------|---------------------------|-----------------------|------------------|

DIMENSIONS in inches (millimeters)


| MODEL | DIMENSIONS in inches [millimeters] | | | |
|------------|------------------------------------|----------------------------|------------------------------|-------------------------------|
| | A | B [MAXIMUM] ⁽²⁾ | C | D |
| CW1/2 | 0.250 ± 0.031 [6.35 ± 0.787] | 0.281 [7.14] | 0.085 ± 0.020 [2.16 ± 0.508] | 0.020 ± 0.002 [0.508 ± 0.051] |
| CW001 | 0.406 ± 0.031 [10.31 ± 0.787] | 0.437 [11.10] | 0.094 ± 0.031 [2.39 ± 0.787] | 0.020 ± 0.002 [0.508 ± 0.051] |
| CW01M | 0.270 ± 0.031 [6.86 ± 0.787] | 0.311 [7.90] | 0.110 ± 0.015 [2.79 ± 0.381] | 0.020 ± 0.002 [0.508 ± 0.051] |
| CW002 | 0.625 ± 0.062 [15.87 ± 1.57] | 0.765 [19.43] | 0.250 ± 0.032 [6.35 ± 0.813] | 0.040 ± 0.002 [1.02 ± 0.051] |
| CW02M | 0.500 ± 0.062 [12.70 ± 1.57] | 0.562 [14.27] | 0.185 ± 0.032 [4.70 ± 0.813] | 0.032 ± 0.002 [0.813 ± 0.051] |
| CW02B | 0.562 ± 0.062 [14.27 ± 1.57] | 0.622 [15.80] | 0.188 ± 0.032 [4.78 ± 0.813] | 0.032 ± 0.002 [0.813 ± 0.051] |
| CW02B...13 | 0.500 ± 0.062 [12.70 ± 1.57] | 0.563 [14.30] | 0.188 ± 0.032 [4.78 ± 0.813] | 0.032 ± 0.002 [0.813 ± 0.051] |
| CW02C | 0.500 ± 0.062 [12.70 ± 1.57] | 0.593 [15.06] | 0.218 ± 0.032 [5.54 ± 0.813] | 0.040 ± 0.002 [1.02 ± 0.051] |
| CW02C...14 | 0.500 ± 0.062 [12.70 ± 1.57] | 0.593 [15.06] | 0.218 ± 0.032 [5.54 ± 0.813] | 0.032 ± 0.002 [0.813 ± 0.051] |
| CW005 | 0.875 ± 0.062 [22.22 ± 1.57] | 1.0 [25.40] | 0.312 ± 0.032 [7.92 ± 0.813] | 0.040 ± 0.002 [1.02 ± 0.051] |
| CW005...2 | 0.875 ± 0.062 [22.22 ± 1.57] | 1.0 [25.40] | 0.250 ± 0.032 [6.35 ± 0.813] | 0.032 ± 0.002 [0.813 ± 0.051] |
| CW005...3 | 0.875 ± 0.062 [22.22 ± 1.57] | 1.0 [25.40] | 0.312 ± 0.032 [7.92 ± 0.813] | 0.032 ± 0.002 [0.813 ± 0.051] |
| CW007 | 1.218 ± 0.062 [30.94 ± 1.57] | 1.281 [32.54] | 0.312 ± 0.032 [7.92 ± 0.813] | 0.040 ± 0.002 [1.02 ± 0.051] |
| CW010 | 1.781 ± 0.062 [45.24 ± 1.57] | 1.875 [47.62] | 0.375 ± 0.032 [9.52 ± 0.813] | 0.040 ± 0.002 [1.02 ± 0.051] |
| CW010...3 | 1.781 ± 0.062 [45.24 ± 1.57] | 1.875 [47.62] | 0.375 ± 0.032 [9.52 ± 0.813] | 0.032 ± 0.002 [0.813 ± 0.051] |

Notes
⁽¹⁾ On some standard reel pack methods, the leads may be trimmed to a shorter length than shown

⁽²⁾ B (maximum) dimension is clean lead to clean lead

MATERIAL SPECIFICATIONS
Element: copper-nickel alloy or nickel-chrome alloy, depending on resistance value

Core: ceramic: steatite or alumina, depending on physical size

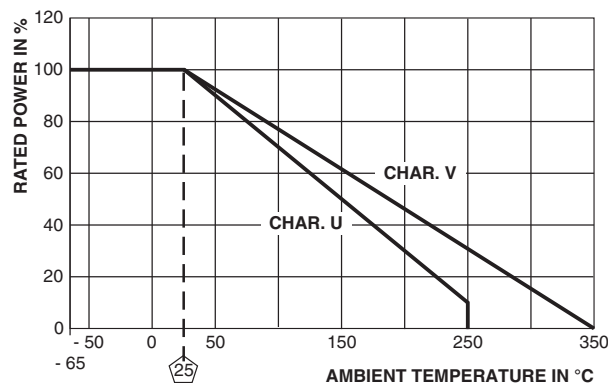
Coating: special high temperature silicone

Standard Terminals: tinned Copperweld® (CW02B...13 is tinned copper)

End Caps: stainless steel

Part Marking: DALE, model, wattage ⁽¹⁾, value, tolerance, date code

Note
⁽¹⁾ Wattage marked on resistor will be "V" characteristic, CW1/2 will not be marked with wattage.

DERATING


| PERFORMANCE | | |
|---------------------------------|--|---|
| TEST | CONDITIONS OF TEST | TEST LIMITS ⁽¹⁾ (CHARACTERISTIC V) |
| Thermal Shock | Rated power applied until thermally stable, then a minimum of 15 min at -55 °C | ± (2.0 % + 0.05 Ω) ΔR |
| Short Time Overload | 5x rated power (3.75 W and smaller), 10 x rated power (4 W and larger) for 5 s | ± (2.0 % + 0.05 Ω) ΔR |
| Dielectric Withstanding Voltage | 1000 V _{rms} , 1 min | ± (0.1 % + 0.05 Ω) ΔR |
| Low Temperature Storage | -65 °C for 24 h | ± (2.0 % + 0.05 Ω) ΔR |
| High Temperature Exposure | 250 h at +350 °C | ± (4.0 % + 0.05 Ω) ΔR |
| Moisture Resistance | MIL-STD-202 Method 106, 7b not applicable | ± (2.0 % + 0.05 Ω) ΔR |
| Shock, Specified Pulse | MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks | ± (0.2 % + 0.05 Ω) ΔR |
| Vibration, High Frequency | Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each | ± (2.0 % + 0.05 Ω) ΔR |
| Load Life | 2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF" | ± (3.0 % + 0.05 Ω) ΔR |
| Terminal Strength | 5 s to 10 s 10 pound pull test; torsion test - 3 alternating directions, 360° each | ± (1.0 % + 0.05 Ω) ΔR |

Note
⁽¹⁾ All ΔR figures shown are maximum, based upon testing requirements per MIL-PRF-26 at a maximum operating temperature of +350 °C. ΔR maximum figures are considerably lower when tested at a maximum operating temperature of +250 °C



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