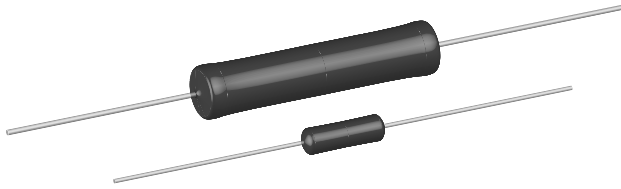


Wirewound Resistors, Commercial Coated, Axial Lead



FEATURES

- High performance for low cost
- High temperature silicone coating
- Complete welded construction
- Excellent stability in operation
- High power to size ratio
- Compliant to RoHS Directive 2002/95/EC



RoHS*
COMPLIANT
GREEN
(5-2009)**
Available

| STANDARD ELECTRICAL SPECIFICATIONS | | | | | |
|------------------------------------|------------------|--|---------------------------|--|--------------------|
| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING ⁽¹⁾ P _{25 °C} W | | RESISTANCE RANGE Ω ± 5 %, ± 10 % ⁽²⁾ | WEIGHT (max.) g |
| | | Characteristic U + 250 °C | Characteristic V + 350 °C | | |
| CW1/2 | CW-1/2 | 0.5 | - | 0.1 to 1.77K | 0.21 |
| CW001 | CW-1 | 1.0 | - | 0.1 to 6.37K | 0.34 |
| CW01M | CW-1M | 1.0 | - | 0.1 to 3.3K | 0.3 |
| CW002 | CW-2 | 4.0 | 5.5 | 0.1 to 28.7K | 2.1 |
| CW02M | CW-2M | 3.0 | 3.75 | 0.1 to 12K | 0.65 |
| CW02B | CW-2B | 3.0 | 3.75 | 0.1 to 15K | 0.7 |
| CW02B...13 | CW-2B-13 | 4.0 | 6.0 | 0.1 to 10.89K ⁽³⁾ | 0.9 |
| CW02C | CW-2C | 2.5 | 3.25 | 0.1 to 19.9K | 1.8 |
| CW02C...14 | CW-2C-14 | 2.5 | 3.25 | 0.1 to 19.9K | 1.2 |
| CW005 | CW-5 | 5.0 | 6.5 | 0.1 to 58.5K | 4.2 |
| CW005...2 | CW-5-2 | 4.0 | 5.0 | 0.1 to 40.3K | 4.2 |
| CW005...3 | CW-5-3 | 5.0 | 6.5 | 0.1 to 58.5K | 4.2 |
| CW007 | CW-7 | 7.0 | 9.0 | 0.1 to 95.2K | 4.7 |
| CW010 | CW-10 | 10.0 | 13.0 | 0.1 to 167K | 9.0 |
| CW010...3 | CW-10-3 | 10.0 | 13.0 | 0.1 to 167K | 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 | ± 90 for below 1.0 Ω, ± 50 for 1.0 Ω to 9.9 Ω, ± 30 for 10 Ω and above |
| 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

New Global Part Numbering: CW02C10K00JB1214 (preferred part number format)

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

| | | | | |
|--|----------------|--------------|---|---|
| GLOBAL MODEL (See Standard Electrical Specifications Global Model column for options) | RES. VALUE | TOL. CODE | PACKAGING | SPECIAL (Dash Number) (up to 3 digits) From 1 to 999 as applicable |
| | R = Decimal | H = ± 3.0 % | E70 = Lead (Pb)-free, tape/reel, 1K pcs (smaller than CW005) | |
| | K = Thousand | J = ± 5.0 % | E73 = Lead (Pb)-free, tape/reel, 500 pcs (CW005 and larger) | |
| | 1R500 = 1.5 Ω | K = ± 10.0 % | E12 = Lead (Pb)-free, bulk | |
| | 1K500 = 1.5 kΩ | | 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 (CW005 and larger) | |
| | | | B12 = Tin/lead, bulk | |

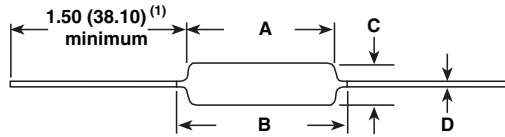
Historical Part Number Example: CW-2C-14 10 kΩ 5 % B12 (will continue to be accepted for tin/lead product only)

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

* Pb containing terminations are not RoHS compliant, exemptions may apply

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

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 | 0.285 ± 0.025 (7.24 ± 0.635) | 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 ± 0.015 (4.70 ± 0.381) | 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

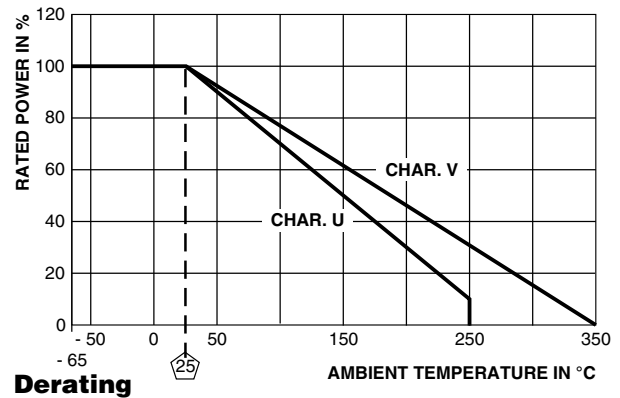
Standard Terminals: Tinned Copperweld[®]

End Caps: Stainless steel

Part Marking: DALE, model, wattage ⁽³⁾, value, tolerance, date code

Note

- ⁽³⁾ Wattage marked on resistor will be "V" characteristic, CW1/2 will not be marked with wattage



| PERFORMANCE ⁽⁴⁾ | | |
|---------------------------------|--|--------------------------------|
| TEST | CONDITIONS OF TEST | TEST LIMITS (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 | 5 x 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 | ± (0.2 % + 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 °C each | ± (1.0 % + 0.05 Ω) ΔR |

Note

- ⁽⁴⁾ 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.



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.