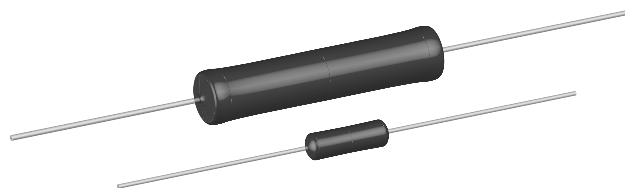


# Wirewound Resistors, Commercial Power, Silicone Coated, Axial Lead



## DESIGN SUPPORT TOOLS

[click logo to get started](#)
**3D**  
Models  
Available

## 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](http://www.vishay.com/doc?99912)

## 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


**RoHS\***  
Available

**HALOGEN**  
**FREE**  
Available

**GREEN**  
(5-2008)  
Available

## STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	HISTORICAL MODEL	POWER RATING <sup>(1)</sup> P <sub>25 °C</sub> W CHARACTERISTIC U +250 °C	POWER RATING <sup>(1)</sup> P <sub>25 °C</sub> W CHARACTERISTIC V +350 °C	RESISTANCE RANGE Ω	TOLERANCE ± % <sup>(2)</sup>	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 <sup>(3)</sup>	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 <sub>AC</sub>	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) <sup>1/2</sup>
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

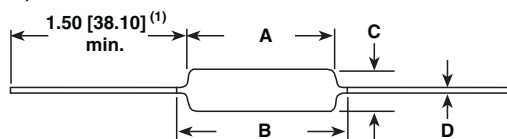
Global Part Numbering example: CW02C10K00JB1214

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] <sup>(2)</sup>	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**
<sup>(1)</sup> On some standard reel pack methods, the leads may be trimmed to a shorter length than shown

<sup>(2)</sup> 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

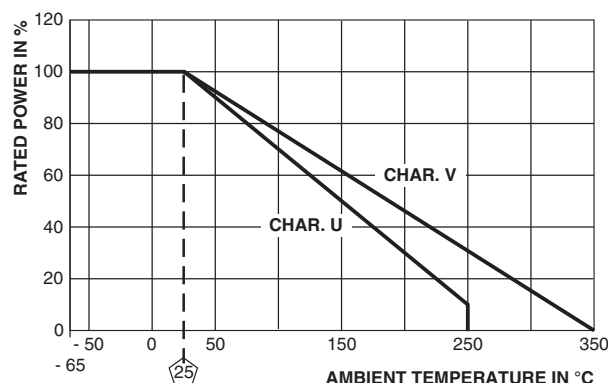
**Coating:** special high temperature silicone

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

**End Caps:** stainless steel

**Part Marking:** DALE, model, wattage <sup>(1)</sup>, value, tolerance, date code

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

**DERATING**


PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS <sup>(1)</sup> (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 <sub>rms</sub> , 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° each	± (1.0 % + 0.05 Ω) ΔR

**Note**
<sup>(1)</sup> 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, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Vishay:

[CW00535R0JB12](#) [CZ80C103MM](#) [CW1 .28 3%](#) [CW1 100 5%](#) [CW1 22 5%TR](#) [CW1 560 5%TR](#) [CW10 .25 5%TR](#)  
[CW10 .82 5%](#) [CW10 1.25K 5%](#) [CW10 1.8K 5%TR](#) [CW10 100 5%TR](#) [CW10 12 5%](#) [CW10 120 5%](#) [CW10 1K 5%TR](#)  
[CW10 220 5%TR](#) [CW10 22K 5%](#) [CW10 25 5%](#) [CW10 250 5%](#) [CW10 270 5%](#) [CW10 3.9K 5%TR](#) [CW10 30 5%TR](#)  
[CW10 33 5%TR](#) [CW10 330 5%TR](#) [CW10 33K 5%](#) [CW10 5.1K 5%](#) [CW10 5.1K 5%TR](#) [CW10 6.8K 5%TR](#) [CW10 680](#)  
[5%TR](#) [CW10 750 5%TR](#) [CW10 82K 5%](#) [CW15C681K](#) [CW2 .22 5%TR](#) [CW2 22 5%](#) [CW2 4.3K 5%](#) [CW2 470 5%](#)  
[CW2 5.1 5%](#) [CW2 680 5%](#) [CW2 910 5%TR](#) [CW2B .5 3%](#) [CW2B .5 5%TR](#) [CW2B .8 5%](#) [CW2B 1.5K 5%TR](#) [CW2B](#)  
[110 5%](#) [CW2B 118 5%TR](#) [CW2B 12 5%TR](#) [CW2B 18 5%TR](#) [CW2B 2 5%](#) [CW2B 27 5%TR](#) [CW2B 51 5%TR](#) [CW2B](#)  
[8K 3%](#) [CW2B-13 .68 5%](#) [CW2B-13 3.3K 5%](#) [CW2C .5 3%](#) [CW2C 1.5K 5%TR](#) [CW2C 10 5%TR](#) [CW2C 150 5%](#)  
[CW2C 30 5%](#) [CW2C 47 5%](#) [CW2C 5.1 5%](#) [CW2C-1 1.5 5%TR](#) [CW2C-1 3.3K 5%TR](#) [CW2C-14 10 5%TR](#) [CW2C-14](#)  
[1K 5%](#) [CW2C-14 1K 5%TR](#) [CW2C-14 300 5%](#) [CW2C-14 390 5%TR](#) [CW2C-14 3K 5%](#) [CW2C-14 4.5K 5%](#) [CW2C-14](#)  
[5.6 5%](#) [CW2C-14 500 5%](#) [CW2C-14 51 5%](#) [CW2C-14 680 5%](#) [CW2M 1.5K 5%TR](#) [CW2M 150 5%TR](#) [CW2M 18](#)  
[5%TR](#) [CW2M 1K 5%TR](#) [CW2M 2K 5%TR](#) [CW5 1 5%TR](#) [CW5 1.2 5%TR](#) [CW5 1.3K 5%](#) [CW5 1.5K 5%TR](#) [CW5](#)  
[1.8K 5%TR](#) [CW5 120 5%TR](#) [CW5 13K 5%](#) [CW5 16.4K 5%](#) [CW5 18K 5%TR](#) [CW5 2.2K 5%TR](#) [CW5 2.5 5%TR](#)  
[CW5 220 5%TR](#) [CW5 24K 5%](#) [CW5 27 5%TR](#) [CW5 270 5%TR](#) [CW5 3.3 5%](#) [CW5 3.3K 5%TR](#) [CW5 3.9K 5%TR](#)  
[CW5 33 5%TR](#) [CW5 330 5%TR](#) [CW5 350 5%TR](#) [CW5 35K 5%](#) [CW5 39K 5%](#)