

# Wirewound Resistors, Commercial Power, Silicone 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



### Notes

- \* Pb containing terminations are not RoHS compliant, exemptions may apply
- \*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

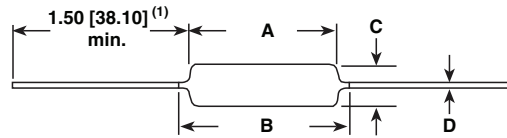
STANDARD ELECTRICAL SPECIFICATIONS						
GLOBAL MODEL	HISTORICAL MODEL	POWER RATING <sup>(1)</sup> P <sub>25 °C</sub> W CHARACTERISTIC U + 250 °C	POWER RATING <sup>(1)</sup> P <sub>25 °C</sub> W CHARACTERISTIC V + 350 °C	RESISTANCE RANGE Ω	TOLERANCE ± % <sup>(2)</sup>	WEIGHT (max.) g
CW1/2	CW-1/2	0.5	-	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

- <sup>(1)</sup> Vishay Dale CW models have two power ratings, depending on operating temperature and stability requirements
- <sup>(2)</sup> 3 % tolerance available
- <sup>(3)</sup> 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 (See Standard Electrical Specifications Global Model column for options)	VALUE R = Decimal K = Thousand 1R500 = 1.5 Ω 1K500 = 1.5 kΩ	TOLERANCE H = ± 3.0 % J = ± 5.0 % K = ± 10.0 %	PACKAGING 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	SPECIAL (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	10 kΩ	5 %	B12	
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	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	0.285 ± 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**
<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

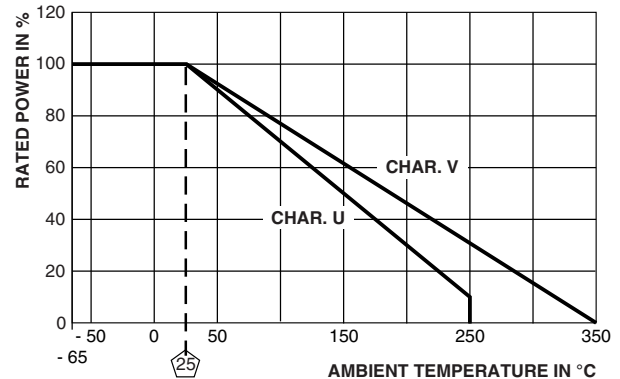
**Coating:** Special high temperature silicone

**Standard Terminals:** Tinned Copperweld<sup>®</sup> (CW02B...13 is tinned copper)

**End Caps:** Stainless steel

**Part Marking:** DALE, model, wattage <sup>(3)</sup>, value, tolerance, date code

**Note**
<sup>(3)</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>(4)</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	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 <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>(4)</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.



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