

# 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 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







HALOGEN FREE

**GREEN** <u>(5-2008)</u>

STANDARD ELECTRICAL SPECIFICATIONS								
GLOBAL MODEL	HISTORICAL MODEL	POWER RATING (1) P <sub>25 °C</sub> W CHARACTERISTIC U +250 °C	POWER RATING (1) P <sub>25 °C</sub> W CHARACTERISTIC V +350 °C	$\begin{array}{c} \textbf{RESISTANCE RANGE} \\ \Omega \end{array}$	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		
CW02B13	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		
CW02C14	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		
CW0052	CW-5-2	4.0	5.0	0.1 to 40.3K	5, 10	4.2		
CW0053	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		
CW0103	CW-10-3	10.0	13.0	0.1 to 167K	5, 10	9.0		

## Notes

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

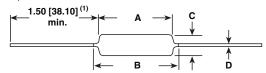
Thigher values available on request						
TECHNICAL SPECIFICATIONS						
PARAMETER	UNIT	CW RESISTOR CHARACTERISTICS				
Temperature Coefficient	ppm/°C	$\pm$ 30 for 10 $\Omega$ and above, $\pm$ 50 for 1.0 $\Omega$ to 9.9 $\Omega$ , $\pm$ 90 for 0.5 $\Omega$ to 0.99 $\Omega$				
Dielectric Withstanding 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	٧	$(P \times R)^{1/2}$				
Operating Temperature Range	ç	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 0 K 4 С 1 GLOBAL MODEL VALUE TOLERANCE PACKAGING SPECIAL 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 $H = \pm 3.0 \%$ (see Standard R = decimal (dash number) $J = \pm 5.0 \%$ (up to 3 digits) Electrical **K** = thousand **1R500** = 1.5 Ωfrom 1 to 999 Specifications $K = \pm 10.0 \%$ **1K500** = 1.5 kΩ Global Model as applicable CW02B...13 pack code for Europe use only S70 = tin / lead, tape / reel, 1K pcs (smaller than CW005) column for options) S73 = tin / lead, tape / reel, 500 pcs B12 = tin / lead, bulk Historical Part Numbering example: CW-2C-14 10 k $\Omega$ 5 % B12 CW-2C-14 **10 k**Ω 5 % **B12** HISTORICAL MODEL RESISTANCE VALUE TOLERANCE CODE **PACKAGING**

Revision: 15-Nov-17 Document Number: 30215



### **DIMENSIONS** in inches (millimeters)



MODEL	DIMENSIONS in inches [millimeters]						
MODEL	Α	B [MAXIMUM] (2)	С	D			
CW1/2	$0.250 \pm 0.031 \ [6.35 \pm 0.787]$	0.281 [7.14]	0.085 ± 0.020 [2.16 ± 0.508]	0.020 ± 0.002 [0.508 ± 0.051]			
CW001	$0.406 \pm 0.031 [10.31 \pm 0.787]$	0.437 [11.10]	$0.094 \pm 0.031 [2.39 \pm 0.787]$	0.020 ± 0.002 [0.508 ± 0.051]			
CW01M	$0.270 \pm 0.031 \ [6.86 \pm 0.787]$	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]	$0.250 \pm 0.032 [6.35 \pm 0.813]$	0.040 ± 0.002 [1.02 ± 0.051]			
CW02M	0.500 ± 0.062 [12.70 ± 1.57]	0.562 [14.27]	$0.185 \pm 0.032 [4.70 \pm 0.813]$	0.032 ± 0.002 [0.813 ± 0.051]			
CW02B	$0.562 \pm 0.062 [14.27 \pm 1.57]$	0.622 [15.80]	$0.188 \pm 0.032 [4.78 \pm 0.813]$	$0.032 \pm 0.002 [0.813 \pm 0.051]$			
CW02B13	$0.500 \pm 0.062 [12.70 \pm 1.57]$	0.563 [14.30]	$0.188 \pm 0.032 [4.78 \pm 0.813]$	$0.032 \pm 0.002 [0.813 \pm 0.051]$			
CW02C	$0.500 \pm 0.062 [12.70 \pm 1.57]$	0.593 [15.06]	$0.218 \pm 0.032 [5.54 \pm 0.813]$	$0.040 \pm 0.002 [1.02 \pm 0.051]$			
CW02C14	$0.500 \pm 0.062 [12.70 \pm 1.57]$	0.593 [15.06]	$0.218 \pm 0.032 [5.54 \pm 0.813]$	$0.032 \pm 0.002 [0.813 \pm 0.051]$			
CW005	$0.875 \pm 0.062 [22.22 \pm 1.57]$	1.0 [25.40]	$0.312 \pm 0.032 [7.92 \pm 0.813]$	$0.040 \pm 0.002 [1.02 \pm 0.051]$			
CW0052	$0.875 \pm 0.062 [22.22 \pm 1.57]$	1.0 [25.40]	$0.250 \pm 0.032 [6.35 \pm 0.813]$	$0.032 \pm 0.002 [0.813 \pm 0.051]$			
CW0053	$0.875 \pm 0.062 [22.22 \pm 1.57]$	1.0 [25.40]	$0.312 \pm 0.032 [7.92 \pm 0.813]$	$0.032 \pm 0.002 [0.813 \pm 0.051]$			
CW007	1.218 ± 0.062 [30.94 ± 1.57]	1.281 [32.54]	$0.312 \pm 0.032 [7.92 \pm 0.813]$	$0.040 \pm 0.002 [1.02 \pm 0.051]$			
CW010	1.781 ± 0.062 [45.24 ± 1.57]	1.875 [47.62]	$0.375 \pm 0.032 [9.52 \pm 0.813]$	$0.040 \pm 0.002 [1.02 \pm 0.051]$			
CW0103	1.781 ± 0.062 [45.24 ± 1.57]	1.875 [47.62]	$0.375 \pm 0.032 [9.52 \pm 0.813]$	$0.032 \pm 0.002 [0.813 \pm 0.051]$			

#### 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

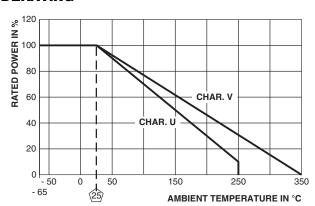
Part Marking: DALE, model, wattage (1), value, tolerance,

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	$\pm$ (2.0 % + 0.05 $\Omega$ ) $\Delta R$			
Short Time Overload	5x rated power (3.75 W and smaller), 10 x rated power (4 W and larger) for 5 s	$\pm$ (2.0 % + 0.05 $\Omega$ ) $\Delta R$			
Dielectric Withstanding Voltage	1000 V <sub>rms</sub> , 1 min	$\pm$ (0.1 % + 0.05 $\Omega$ ) $\Delta R$			
Low Temperature Storage	-65 °C for 24 h	$\pm$ (2.0 % + 0.05 $\Omega$ ) $\Delta R$			
High Temperature Exposure	250 h at +350 °C	$\pm$ (4.0 % + 0.05 $\Omega$ ) $\Delta R$			
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	$\pm$ (2.0 % + 0.05 $\Omega$ ) $\Delta R$			
Shock, Specified Pulse	MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks	$\pm$ (0.2 % + 0.05 $\Omega$ ) $\Delta R$			
Vibration, High Frequency	Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each	$\pm$ (0.2 % + 0.05 $\Omega$ ) $\Delta R$			
Load Life	2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm$ (3.0 % + 0.05 $\Omega$ ) $\Delta R$			
Terminal Strength	5 s to 10 s 10 pound pull test; torsion test - 3 alternating directions, 360° each	$\pm$ (1.0 % + 0.05 $\Omega$ ) $\Delta R$			

### 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



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