

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



STANDARD ELECTRICAL SPECIFICATIONS

# **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



see



POWER RATING <sup>(1)</sup> P<sub>25 °C</sub> W CHARACTERISTIC U POWER RATING <sup>(1)</sup> P<sub>25 °C</sub> W CHARACTERISTIC V HISTORICAL WEIGHT **RESISTANCE RANGE** TOLERANCE GLOBAL MODEL MODEL ± % (2) (max.) g Ω +250 °C +350 °C 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 5.5 CW002 CW-2 4.0 0.1 to 28.7K 5, 10 2.1 5, 10 5, 10 CW02M CW-2M 3.75 0.65 3.0 0.1 to 12K CW-2B 3.75 CW02B 3.0 0.1 to 15K 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. CW-5-3 5.0 0.1 to 58.5K 4.2 .3 6.5 5, 10 CW007 CW-7 7.0 9.0 0.1 to 95.2K 5, 10 4.7 CW010 CW-10 0.1 to 167K 5, 10 9.0 10.0 13.0 CW010. 3 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

(2) (3)

Higher values available of 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 <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	$(P \times R)^{1/2}$			
Operating Temperature Range	°C	Characteristic U = $-65$ to $+250$ , characteristic V = $-65$ to $+350$			
Power Rating	-	Characteristic U = +250 °C max. hot spot temperature, $\pm$ 0.5 % max. $\Delta$ R in 2000 h load life Characteristic V = +350 °C max. hot spot temperature, $\pm$ 3.0 % max. $\Delta$ R in 2000 h load life			

GLOBAL PART NUMBER INFORMATION							
Global Part Numbering example: CW02C10K00JB1214							
С	W 0 2	<b>C</b> 1	0 K 0	0 J B 1	2 1	4	
GLOBAL MODEL	VALUE	TOLERANCE		PACKAGING		SPECIAL	
(see Standard	R = decimal	<b>H</b> = ± 3.0 %	E70 = lead (Pb)-1	ree, tape / reel, 1K pcs (smalle	r than CW005)	(dash number)	
Electrical	K = thousand	<b>J</b> = ± 5.0 %	É73 =	lead (Pb)-free, tape/reel, 500 p	ocs	(up to 3 digits)	
Specifications	<b>1R500</b> = 1.5 Ω	<b>K</b> = ± 10.0 %		E12 = lead (Pb)-free, bulk		from <b>1 to 999</b>	
Global Model	<b>1K500</b> = 1.5 kΩ			= lead (Pb)-free, R1R80 tape/re		as applicable	
column for				13 pack code for Europe use			
options)			<b>S70</b> = tin / lea	d, tape / reel, 1K pcs (smaller th	nan CW005)		
<b>S73</b> = 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		<b>κ</b> Ω	5 %		B12		
HISTORICAL MODEL RESISTAN		CE VALUE	TOLERANCE CODE	P/	ACKAGING		
	· · · ·	-			-	· · · · · · · · · · · · · · · · · · ·	

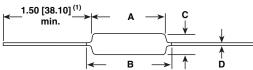
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# **DIMENSIONS** in inches (millimeters)



MODEL	DIMENSIONS in inches [millimeters]						
MODEL	A	B [MAXIMUM] <sup>(2)</sup>	С	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]			
CW02B13	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]			
CW02C14	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]			
CW0052	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]			
CW0053	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]			
CW0103	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)

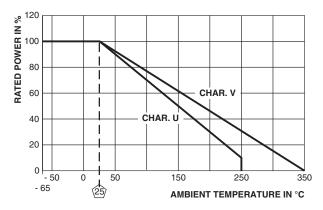
End Caps: stainless steel

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

## 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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