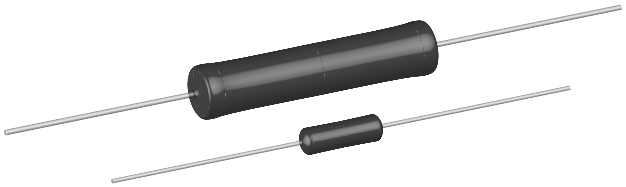
Wirewound Resistors, Commercial Coated, Axial Lead



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

Pb-free Available

RoHS* COMPLIANT

GREEN (5-2008)** 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	$(P \times R)^{1/2}$
Operating Temperature Range	°C	Characteristic U = - 65 to + 250, characteristic V = - 65 to + 350
Power Rating	-	Characteristic U = + 250 °C max. hot spot temperature, ± 0.5 % max. Δ*R* in 2000 h load life Characteristic V = + 350 °C max. hot spot temperature, ± 3.0 % max. Δ*R* 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	RES. VALUE	TOL. CODE	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 (CW005 and larger) **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 (CW005 and larger) **B12** = Tin/lead, bulk	(Dash Number) (up to 3 digits) From **1 to 999** as applicable

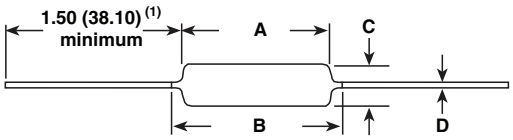
Historical Part Number Example: CW-2C-14 10 kΩ 5 % B12 (will continue to be accepted for tin/lead product only)

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

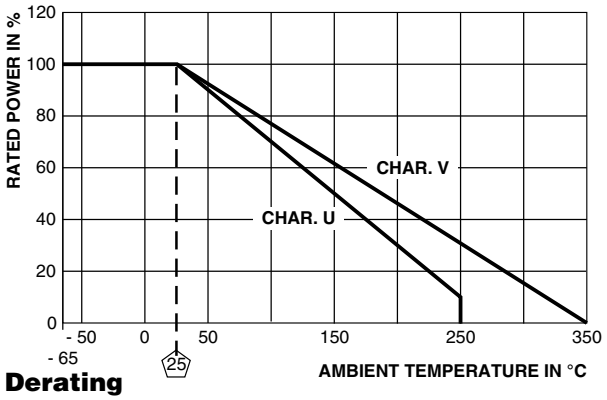
Coating: Special high temperature silicone

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



Derating

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

Note
(4) All Δ*R* figures shown are maximum, based upon testing requirements per MIL-PRF-26 at a maximum operating temperature of + 350 °C. Δ*R* maximum figures are considerably lower when tested at a maximum operating temperature of + 250 °C.

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