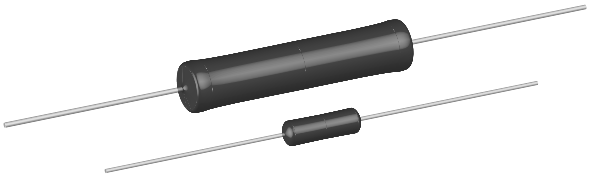
Vishay Dale

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

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	HISTORICAL MODEL	POWER RATING* $P_{25°C}$ W		RESISTANCE RANGE Ω	WEIGHT (Maximum)
		Characteristic U + 250°C	Characteristic V + 350°C	± 5%, ± 10%**	g
CW1/2	CW-1/2	0.5	—	0.1 - 1.77k	0.21
CW001	CW-1	1.0	—	0.1 - 6.37k	0.34
CW01M	CW-1M	1.0	—	0.1 - 3.3k	0.3
CW002	CW-2	4.0	5.5	0.1 - 28.7k	2.1
CW02M	CW-2M	3.0	3.75	0.1 - 12k	0.65
CW02B	CW-2B	3.0	3.75	0.1 - 15k	0.7
CW02B...13	CW-2B-13	4.0	6.0	0.1 - 6k8	0.9
CW02C	CW-2C	2.5	3.25	0.1 - 19.9k	1.8
CW02C...14	CW-2C-14	2.5	3.25	0.1 - 19.9k	1.2
CW005	CW-5	5.0	6.5	0.1 - 58.5k	4.2
CW005...2	CW-5-2	4.0	5.0	0.1 - 40.3k	4.2
CW005...3	CW-5-3	5.0	6.5	0.1 - 58.5k	4.2
CW007	CW-7	7.0	9.0	0.1 - 95.2k	4.7
CW010	CW-10	10.0	13.0	0.1 - 167k	9.0
CW010...3	CW-10-3	10.0	13.0	0.1 - 167k	9.0

*Vishay Dale CW models have two power ratings, depending on operating temperature and stability requirements.
**3% tolerance available.
• Shaded areas indicate most popular models.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CW RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	± 90 for below 1.0Ω, ± 50 for 1.0Ω to 9.9Ω, ± 30 for 10Ω and above
Dielectric Withstanding Voltage	V_{AC}	1000
Short Time Overload	-	5 x rated power for 5 seconds for 3.75 watt size and smaller, 10 x rated power for 5 seconds for 4 watt size and greater
Terminal Strength	lb	10 minimum
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Operating Temperature Range	°C	Characteristic U = - 65/+ 250, Characteristic V = - 65/+ 350
Power Rating	-	Characteristic U = + 250°C max. hot spot temperature, ± 0.5% max. ΔR in 2000 hr. load life Characteristic V = + 350°C max. hot spot temperature, ± 3.0% max. ΔR in 2000 hr. load life

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CW02C10K00JB1214 (preferred part numbering format)

C	W	0	2	C	1	0	K	0	0	J	B	1	2	1	4	

GLOBAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING	SPECIAL
(See Standard Electrical Specifications Global Model column for options)	**R** = Decimal **K** = Thousand **1R500** = 1.5Ω **1K500** = 1.5KΩ	**H** = ± 3% **J** = ± 5% **K** = ± 10%	***E70** = Lead Free, Tape/Reel ***E73** = Lead Free, Tape/Reel ***E12** = Lead Free, Bulk **S70** = Tin/Lead, Tape/Reel **S73** = Tin/Lead, Tape/Reel **B12** = Tin/Lead, Bulk	(Dash Number) (up to 3 digits) From **1-999** as applicable

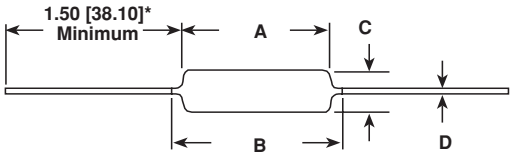
*Lead Free will not be available until Q2 2005

Historical Part Number example: CW-2C-14 10KΩ 5% B12 (will continue to be accepted)

CW-2C-14	10KΩ	5%	B12
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING

For technical questions, contact ww2aresistors@vishay.com

DIMENSIONS



*On some standard reel pack methods, the leads may be trimmed to a shorter length than shown.

MATERIAL SPECIFICATIONS

Element: Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

Core: Ceramic: Steatite or alumina, depending on physical size

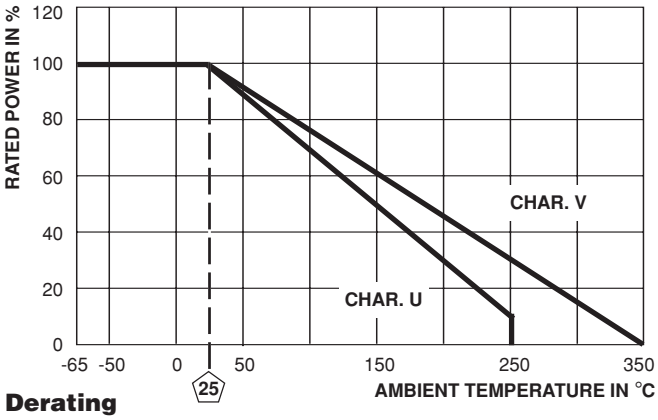
Coating: Special high temperature silicone

Standard Terminals: Tinned Copperweld®

End Caps: Stainless steel

Part Marking: DALE, Model, Wattage*, Value, Tolerance, Date Code

*Wattage marked on resistor will be "V" characteristic, CW1/2 will not be marked with wattage



Derating

MODEL	DIMENSIONS in inches [millimeters]			
	A	B (Maximum)**	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]	.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 ± .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 ± .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 ± .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]

**B (Maximum) dimension is clean lead to clean lead.

PERFORMANCE*

TEST	CONDITIONS OF TEST	TEST LIMITS (CHARACTERISTIC V)
Thermal Shock	Rated power applied until thermally stable, then a minimum of 15 minutes at - 55°C	± (2.0% + 0.05Ω) ΔR
Short Time Overload	5 x rated power (3.75 watt and smaller), 10 x rated power (4 watt and larger) for 5 seconds	± (2.0% + 0.05Ω) ΔR
Dielectric Withstanding Voltage	1000V rms, one minute	± (0.1% + 0.05Ω) ΔR
Low Temperature Storage	- 65°C for 24 hours	± (2.0% + 0.05Ω) ΔR
High Temperature Exposure	250 hours at + 350°C	± (4.0% + 0.05Ω) ΔR
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	± (2.0% + 0.05Ω) ΔR
Shock, Specified Pulse	MIL-STD-202 Method 213, 100g's for 6 milliseconds, 10 shocks	± (0.2% + 0.05Ω) ΔR
Vibration, High Frequency	Frequency varied 10 to 2000Hz, 20g peak, 2 directions 6 hours each	± (0.2% + 0.05Ω) ΔR
Load Life	2000 hours at rated power, + 25°C, 1.5 hours "ON", 0.5 hours "OFF"	± (3.0% + 0.05Ω) ΔR
Terminal Strength	5 to 10 second 10 pound pull test; torsion test - 3 alternating directions, 360° each	± (1.0% + 0.05Ω) ΔR

*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.