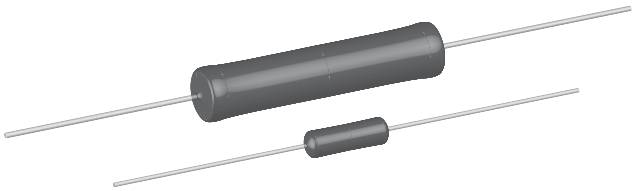
Wirewound Resistors, High Energy, Silicone Coated, Axial Lead



FEATURES

- High continuous energy handling, > 106.5 J
- High temperature silicone coating
- Complete welded construction
- Excellent stability in operation
- High power to size ratio
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

e3

RoHS COMPLIANT

HALOGEN FREE Available

GREEN (5-2008) Available

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	POWER RATING (1) $P_{25\ °C}$ W CHARACTERISTIC U +250 °C	POWER RATING (1) $P_{25\ °C}$ W CHARACTERISTIC V +350 °C	RESISTANCE RANGE Ω	MAX. CONTINUOUS ENERGY J	TOLERANCE ± %	WEIGHT (max.) g
CW02B...HE	3.0	3.75	2 to 87.5	10.4	5	0.7
CW005...HE	5.0	6.5	7.6 to 343	39.1	5	4.2
CW010...HE	10.0	13.0	20.7 to 938	106.5	5	9.0

Note

(1) Vishay Dale CW models have two power ratings, depending on operating temperature and stability requirements.

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
Short Time Overload	-	5x rated power for 5 s for CW02B...HE 10x rated power for 5 s for CW005...HE and CW010...HE
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. 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: CW02B10R00JE12HE (preferred part number format)

C	W	0	2	B	1	0	R	0	0	J	E	1	2	H	E	

GLOBAL MODEL (5 digits)	VALUE (5 digits)	TOLERANCE (1 digit)	PACKAGING (3 digits)	SPECIAL (2 digits)
CW02B **CW005** **CW010**	**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. (CW02B only) **E73** = Lead (Pb)-free, tape/reel, 500 pcs. **E12** = Lead (Pb)-free, bulk **S70** = Tin/lead, tape/reel, 1K pcs. (CW02B only) **S73** = Tin/lead, tape/reel, 500 pcs. **B12** = Tin/lead, bulk	**HE** = High energy

For technical questions, contact: ww2aresistors@vishay.com

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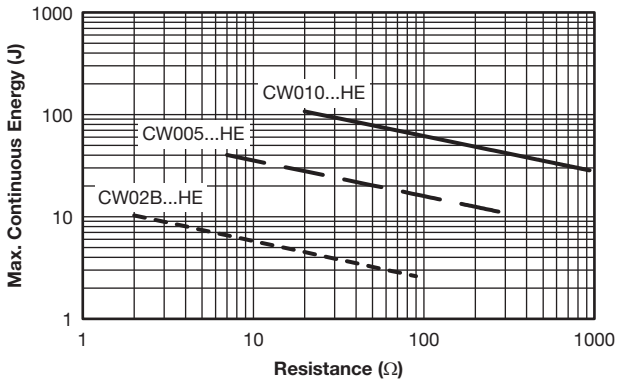
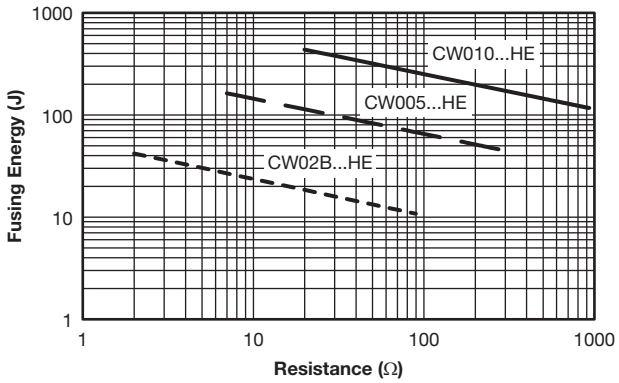
STANDARD ENERGY PERFORMANCE CHARACTERISTICS

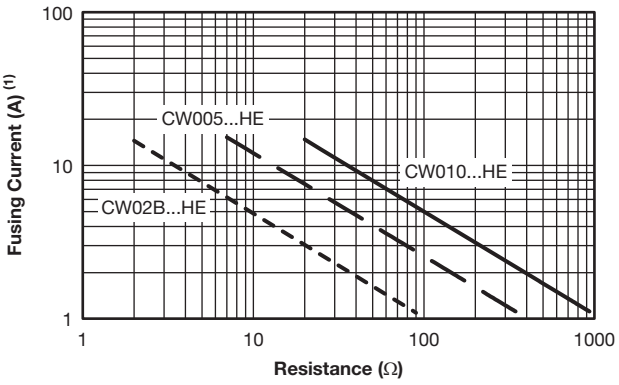
GLOBAL MODEL	RES. Ω	MAX. CONT. ENERGY J	FUSING ENERGY J	CURRENT TO FUSE (1) A	POWER TO FUSE (1) W
CW02B...HE	2.0	10.4	42.3	14.54	422.60
	2.8	9.2	37.5	11.58	375.28
	4.0	8.0	32.8	9.06	328.37
	5.6	7.1	29.1	7.20	290.55
	7.6	6.4	25.9	5.84	259.16
	10.8	5.6	22.8	4.59	227.94
	15.4	5.0	20.2	3.62	201.54
	21.8	4.4	17.8	2.86	178.41
	30.5	3.7	15.9	2.28	158.54
	41.7	3.5	14.2	1.85	142.20
	59.1	3.1	12.6	1.46	125.82
	87.5	2.7	10.9	1.12	108.87
CW005...HE	7.6	39.1	159.0	14.46	1590.00
	10.5	34.9	142.3	11.64	1422.54
	15.1	30.8	125.5	9.12	1255.28
	21.4	27.4	111.4	7.21	1113.71
	29.3	24.5	99.9	5.84	999.14
	41.8	21.7	88.2	4.59	882.20
	59.6	19.2	78.0	3.62	779.99
	84.6	17.0	69.2	2.86	692.37
	118.6	14.2	61.6	2.28	616.48
	162.3	13.6	55.3	1.85	553.45
	230.6	12.1	49.1	1.46	490.94
	343.6	10.5	42.8	1.12	427.51
CW010...HE	20.7	106.5	433.1	14.46	4330.65
	28.6	95.2	387.5	11.64	3874.65
	41.0	83.5	340.8	9.12	3408.72
	58.0	74.3	302.6	7.21	3025.53
	79.7	66.6	271.8	5.84	2717.79
	113.6	58.8	239.8	4.59	2397.57
	162.3	52.2	212.4	3.62	2124.04
	230.5	46.3	188.6	2.86	1886.43
	323.2	38.7	168.0	2.28	1679.99
	442.7	37.0	151.0	1.85	1509.62
	629.3	32.9	134.0	1.46	1339.76
	938.0	28.7	116.7	1.12	1167.06



Maximum Continuous Energy (J)



Fusing Energy (J)



Fusing Current (A) (1)

Note

(1) Time to fuse is 0.1 s.

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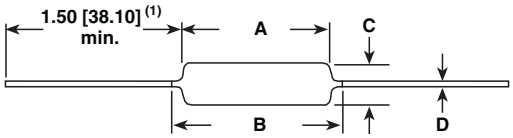
DIMENSIONS in inches (millimeters)



MODEL	DIMENSIONS in inches [millimeters]			
	A	B [MAXIMUM] (2)	C	D
CW02B...HE	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]
CW005...HE	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]
CW010...HE	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]

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

Coating: Special high temperature silicone

Standard Terminals: Tinned Copperweld®

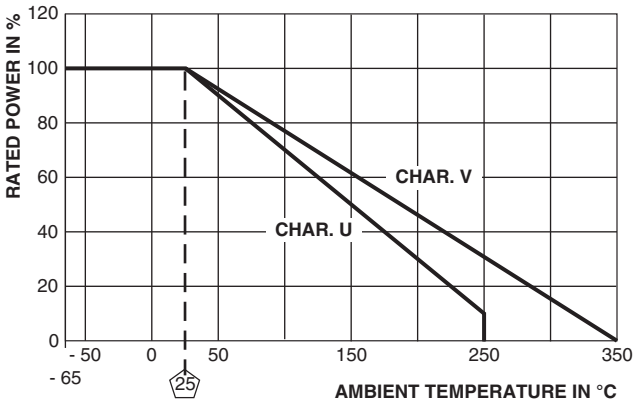
End Caps: Stainless steel

Part Marking: DALE, model, wattage (3), value, tolerance, date code

Note

(3) Wattage marked on resistor will be “V” characteristic.

DERATING



PERFORMANCE

TEST	CONDITIONS OF TEST	TEST LIMITS (4) (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	5x rated power for CW02B, 10 x rated power for CW005 and CW010 for 5 s	± (2.0 % + 0.05 Ω) Δ*R*
High Temperature Exposure	250 h at +350 °C	± (4.0 % + 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*

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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