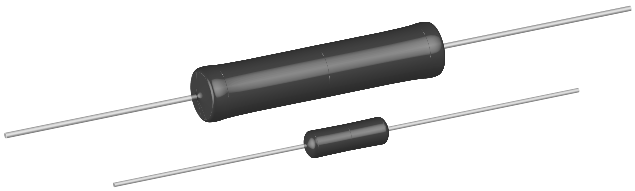
Wirewound Resistors, High Energy, Silicone Coated, Axial Lead



FEATURES

- High continuous energy handling up to 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

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	MAXIMUM SHORT TERM PULSE ENERGY J	TOLERANCE ± %	WEIGHT (max.) g
CW02B...HE	3.0	3.75	1.5 to 87.5	10.4	5, 10	0.7
CW005...HE	5.0	6.5	5.5 to 343.6	39.1	5, 10	4.2
CW010...HE	10.0	13.0	15.0 to 938.0	106.5	5, 10	9.0

Note

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

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CW...HE RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	± 30 for 10 Ω and above, ± 50 for 1.0 Ω to 9.9 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

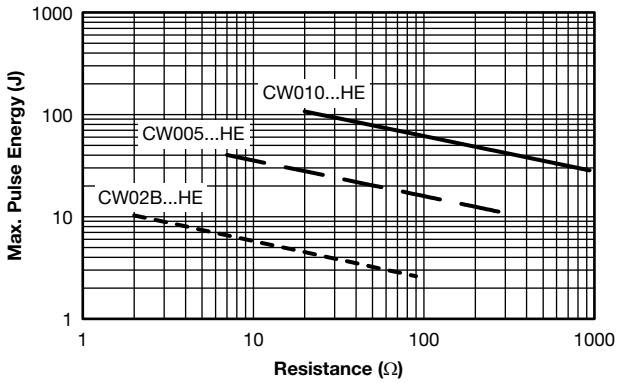
Global Part Numbering example: CW02B10R00JE12HE (preferred part number format)

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

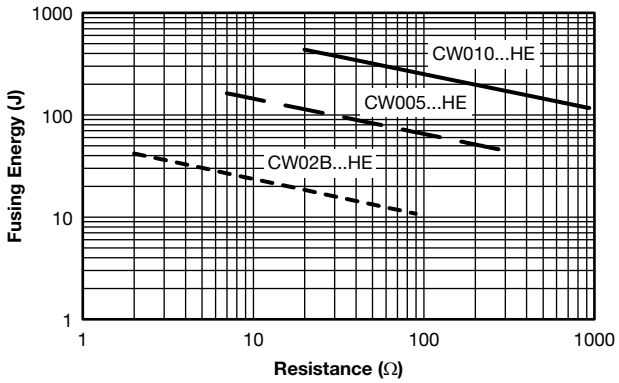
GLOBAL MODEL (5 digits)	VALUE (5 digits)	TOLERANCE (1 digit)	PACKAGING (3 digits)	SPECIAL (2 to 3 digits)
CW02B **CW005** **CW010**	**R** = Decimal **10R00** = 10 Ω	**J** = ± 5.0 % **K** = ± 10.0 %	**E70** = Lead (Pb)-free, tape/reel, 1K pcs. (CW02B only) **E73** = Lead (Pb)-free, tape/reel, 500 pcs. **E12** = Lead (Pb)-free, bulk	**HE** = High energy
			S70 = Tin/lead, tape/reel, 1K pcs. (CW02B only) **S73** = Tin/lead, tape/reel, 500 pcs. **B12** = Tin/lead, bulk	

STANDARD ENERGY PERFORMANCE CHARACTERISTICS

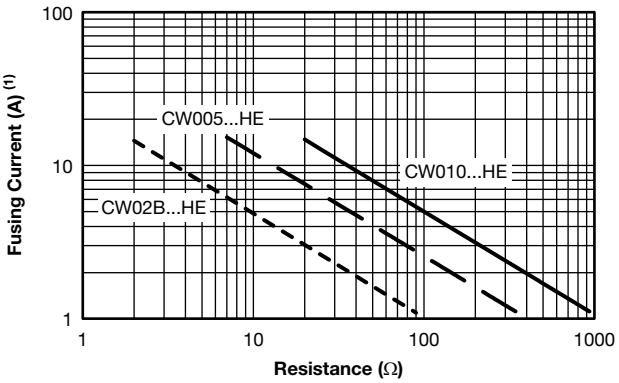
GLOBAL MODEL	RESISTANCE RANGE Ω	MAX. PULSE ENERGY J/Ω	FUSING ENERGY J/Ω	CURRENT TO FUSE (1) A/Ω	POWER TO FUSE (1) W/Ω
CW02B...HE	1.5 to 2.0	5.200	21.150	7.2700	211.3000
	2.1 to 2.8	3.286	13.393	4.1357	134.0286
	2.9 to 4.0	2.000	8.200	2.2650	82.0925
	4.1 to 5.6	1.268	5.196	1.2857	51.8839
	5.7 to 7.6	0.842	3.408	0.7684	34.1000
	7.7 to 10.8	0.519	2.111	0.4250	21.1056
	10.9 to 15.4	0.325	1.312	0.2351	13.0870
	15.5 to 21.8	0.202	0.817	0.1312	8.1839
	21.9 to 30.5	0.121	0.521	0.0748	5.1980
	30.6 to 41.7	0.084	0.341	0.0444	3.4101
	41.8 to 59.1	0.052	0.213	0.0247	2.1289
	59.2 to 87.5	0.031	0.125	0.0128	1.2442
CW005...HE	5.5 to 7.6	5.145	20.921	1.9026	209.2105
	7.7 to 10.5	3.324	13.552	1.1086	135.4800
	10.6 to 15.1	2.040	8.311	0.6040	83.1311
	15.2 to 21.4	1.280	5.206	0.3369	52.0425
	21.5 to 29.3	0.836	3.410	0.1993	34.1003
	29.4 to 41.8	0.519	2.110	0.1098	21.1053
	41.9 to 59.6	0.322	1.309	0.0607	13.0871
	59.7 to 84.6	0.201	0.818	0.0338	8.1840
	84.7 to 118.6	0.120	0.519	0.0192	5.1980
	118.7 to 162.3	0.084	0.341	0.0114	3.4100
	162.4 to 230.6	0.052	0.213	0.0063	2.1290
	230.7 to 343.6	0.031	0.125	0.0033	1.2442
CW010...HE	15.0 to 20.7	5.145	20.923	0.6986	209.2101
	20.8 to 28.6	3.329	13.549	0.4070	135.4773
	28.7 to 41.0	2.037	8.312	0.2224	83.1395
	41.1 to 58.0	1.281	5.217	0.1243	52.1643
	58.1 to 79.7	0.836	3.410	0.0733	34.1003
	79.8 to 113.6	0.518	2.111	0.0404	21.1054
	113.7 to 162.3	0.322	1.309	0.0223	13.0871
	162.4 to 230.5	0.201	0.818	0.0124	8.1841
	230.6 to 323.2	0.120	0.520	0.0071	5.1980
	323.3 to 442.7	0.084	0.341	0.0042	3.4100
	442.8 to 629.3	0.052	0.213	0.0023	2.1290
	629.4 to 938.0	0.031	0.124	0.0012	1.2442



Maximum Continuous Energy (J)



Fusing Energy (J)

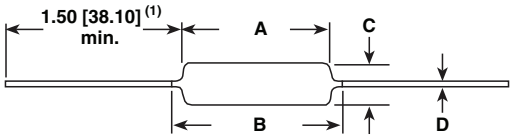


Fusing Current (A) (1)

Note

(1) Time to fuse is 0.1 s.

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: Nickel-chrome alloy

Core: Ceramic: Steatite

Coating: Special high temperature silicone

Standard Terminals: Tinned Copperweld®

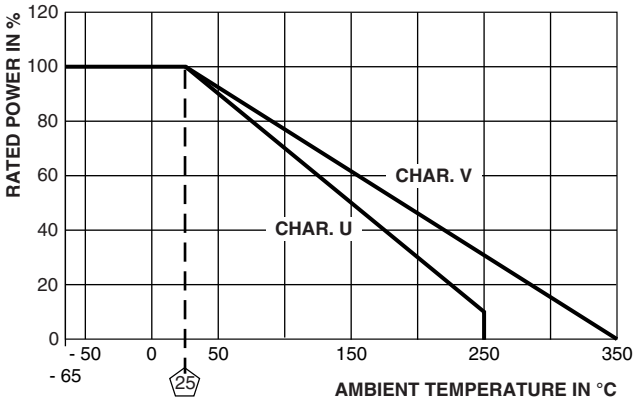
End Caps: Stainless steel

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 5 s for CW02B...HE 10x rated power for 5 s for CW005...HE and CW010...HE	± (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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