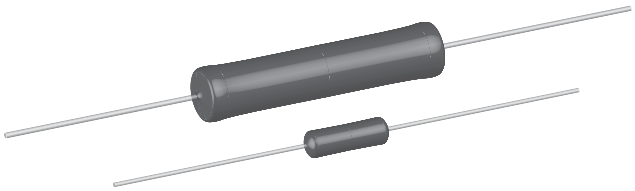
Wirewound Resistors, High Energy, Silicone Coated, Axial Lead



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)

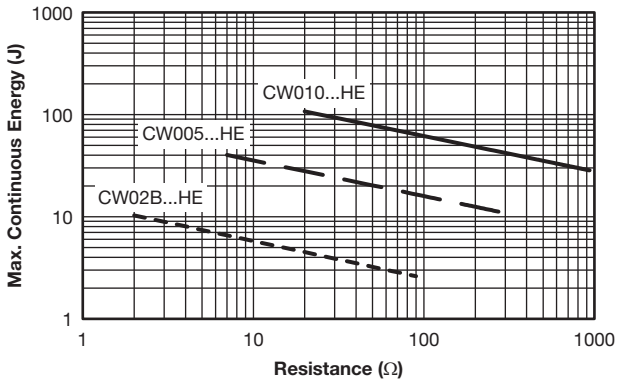
C	W	0	2	B	1	0	R	0	0	J	E	1	2	H	E	

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

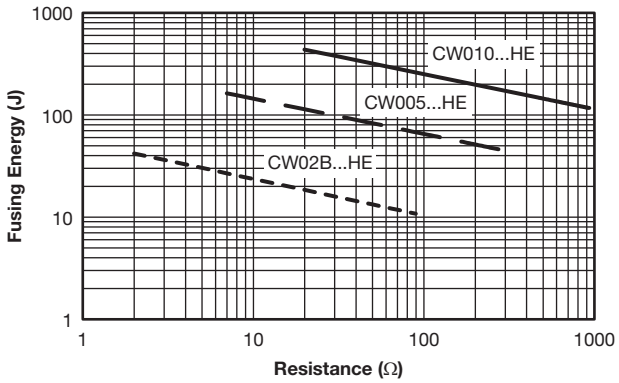
For technical questions, contact: ww2aresistors@vishay.com

STANDARD ENERGY PERFORMANCE CHARACTERISTICS

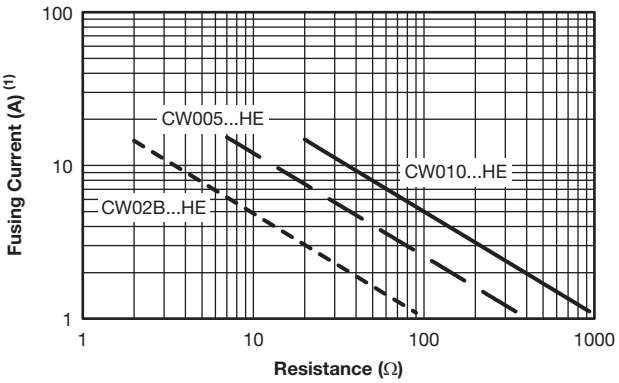
GLOBAL MODEL	RES. Ω	MAX. CONT. ENERGY J	FUSING ENERGY J	CURRENT TO FUSE (1) A	POWER TO FUSE (1) W
CW02B...HE	2.0	10.4	42.3	14.54	422.60
	2.8	9.2	37.5	11.58	375.28
	4.0	8.0	32.8	9.06	328.37
	5.6	7.1	29.1	7.20	290.55
	7.6	6.4	25.9	5.84	259.16
	10.8	5.6	22.8	4.59	227.94
	15.4	5.0	20.2	3.62	201.54
	21.8	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)

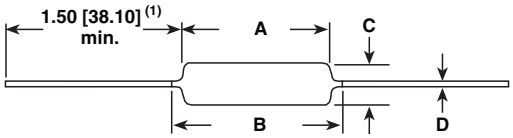


Fusing Current (A) (1)

Note

(1) Time to fuse is 0.1 s.

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®

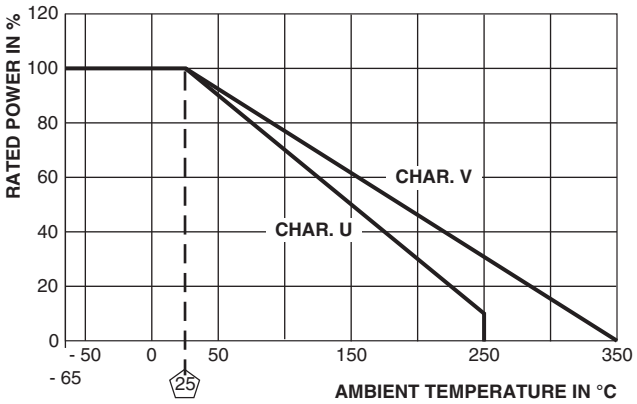
End Caps: Stainless steel

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.

WIREWOUND RESISTORS

CW - High Energy

Wirewound Resistors, High Energy, Silicone Coated, Axial Lead

KEY BENEFITS

- High continuous energy handling to 106.5 J
- High-temperature silicone coating
- Complete welded construction
- Excellent stability in operation
- High power to size ratio
- Meets IEC61000-4-5 (1.2 us/50 us) surge handling requirements

APPLICATIONS

- Power supplies
- Metering
- Welding equipment
- Power tools
- White goods / appliances

RESOURCES

- Datasheet: CW - High Energy - www.vishay.com/doc?30286
- For technical questions contact resistors@vishay.com
- Material categorization: For definitions please see www.vishay.com/doc?99912

Pb-free Available

RoHS COMPLIANT

HALOGEN FREE Available

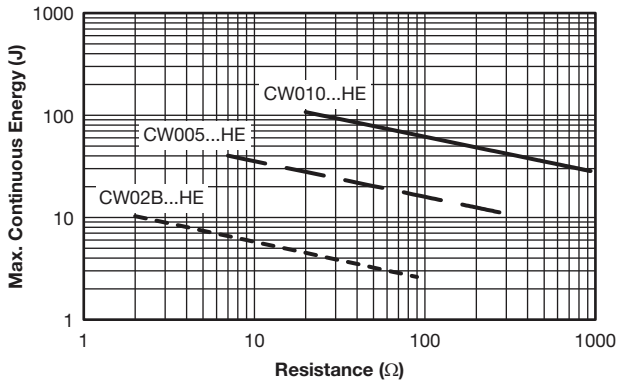
GREEN (5-2008) Available

A WORLD OF SOLUTIONS

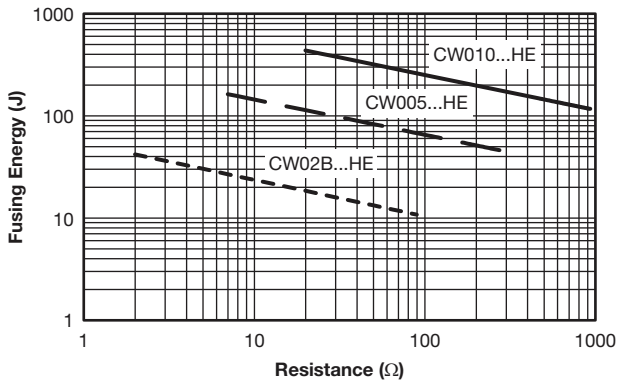
Wirewound Resistors, High Energy, Silicone Coated, Axial Lead

STANDARD ENERGY PERFORMANCE CHARACTERISTICS

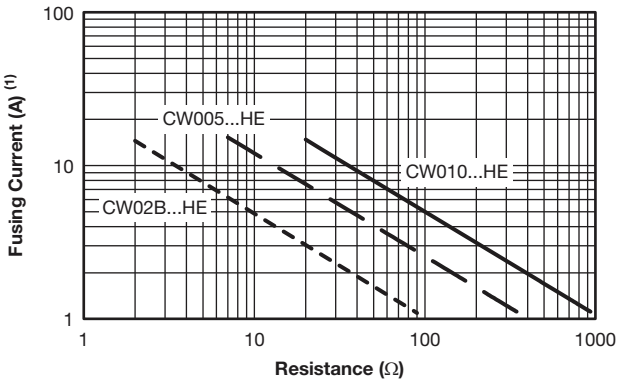
GLOBAL MODEL	RES. Ω	MAX. CONT. ENERGY J	FUSING ENERGY J	CURRENT TO FUSE (1) A	POWER TO FUSE (1) W
CW02B...HE	2.0	10.4	42.3	14.54	422.60
	2.8	9.2	37.5	11.58	375.28
	4.0	8.0	32.8	9.06	328.37
	5.6	7.1	29.1	7.20	290.55
	7.6	6.4	25.9	5.84	259.16
	10.8	5.6	22.8	4.59	227.94
	15.4	5.0	20.2	3.62	201.54
	21.8	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.

Revision 26-Feb-15

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.