CW - High Energy

www.vishay.com

Vishay Dale

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



HALOGEN FREE Available GREEN (5-2008) Available

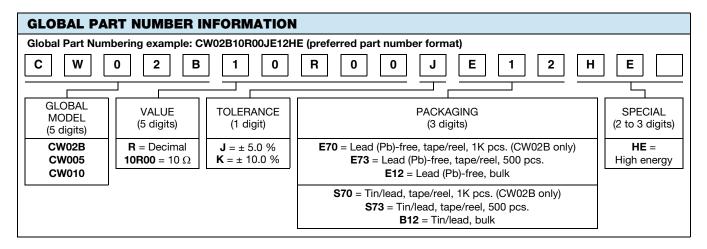
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS						
GLOBAL MODEL	POWER RATING ⁽¹⁾	POWER RATING ⁽¹⁾	RESISTANCE RANGE Ω	MAXIMUM SHORT TERM PULSE ENERGY J	TOLERANCE ± %	WEIGHT (max.) g
CW02BHE	3.0	3.75	1.5 to 87.5	10.4	5, 10	0.7
CW005HE	5.0	6.5	5.5 to 343.6	39.1	5, 10	4.2
CW010HE	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	CWHE RESISTOR CHARACTERISTICS		
Temperature Coefficient	ppm/°C	\pm 30 for 10 Ω and above, \pm 50 for 1.0 Ω to 9.9 Ω		
Short Time Overload	-	5x rated power for 5 s for CW02BHE 10x rated power for 5 s for CW005HE and CW010HE		
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, \pm 0.5 % max. ΔR in 2000 h load life Characteristic V = +350 °C max. hot spot temperature, \pm 3.0 % max. ΔR in 2000 h load life		



1

CW - High Energy



1000

100

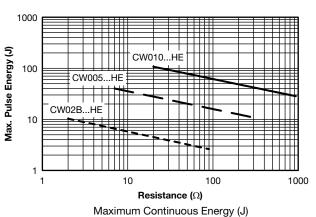
Vishay Dale

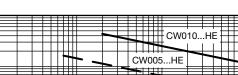
STANDARD ENERGY PERFORMANCE CHARACTERISTICS

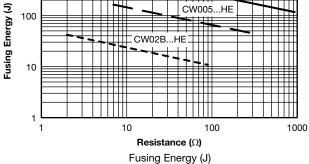
www.vishay.com

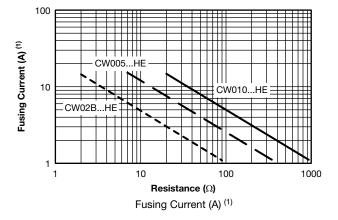
VISHAY

GLOBAL MODEL	RESISTANCE RANGE Ω	MAX. PULSE ENERGY J/Ω	FUSING ENERGY J/Ω	CURRENT TO FUSE ⁽¹⁾ Α/Ω	POWER TO FUSE ⁽¹⁾ W/Ω
	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
CW02BHE	7.7 to 10.8	0.519	2.111	0.4250	21.1056
GW02BHL	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
	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
CW005HE	29.4 to 41.8	0.519	2.110	0.1098	21.1053
CW005RE	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
	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
CW010HE	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









Note

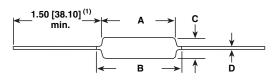
⁽¹⁾ Time to fuse is 0.1 s.

For technical questions, contact: ww2aresistors@vishay.com THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000



Vishay Dale

DIMENSIONS in inches (millimeters)



MODEL	DIMENSIONS in inches [millimeters]					
MODEL	А	B [MAXIMUM] ⁽²⁾	С	D		
CW02BHE	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]		
CW005HE	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]		
CW010HE	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

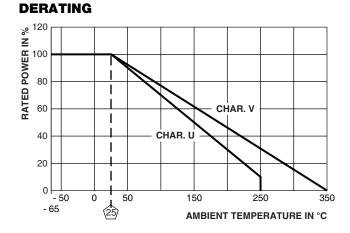
Standard Terminals: Tinned Copperweld®

End Caps: Stainless steel

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

Note

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



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 $^{\circ}\mathrm{C}$	± (2.0 % + 0.05 Ω) Δ <i>R</i>			
Short Time Overload	5x rated power for 5 s for CW02BHE 10x rated power for 5 s for CW005HE and CW010HE	± (2.0 % + 0.05 Ω) Δ <i>R</i>			
High Temperature Exposure	250 h at +350 °C	± (4.0 % + 0.05 Ω) ΔR			
Load Life	2000 h at rated power, +25 °C, 1.5 h "ON", 0.5 h "OFF"	± (3.0 % + 0.05 Ω) ΔR			

Note

⁽⁴⁾ 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.



Vishay

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.