



Wirewound/Metal Oxide Resistors, Commercial Power, Axial Lead



FEATURES

- High performance for low cost
- Meets or exceeds requirements of EIA Standard RS-344
- High power to size ratio
- Ceramic cases are available with circuit board stand-offs (designated with a -3 model ending)
- Special inorganic potting compound and ceramic case provide high thermal conductivity in a fireproof package
- Material categorization:

For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

HALOGEN
FREE
Available

GREEN
(5-2008)
Available

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	POWER RATING $P_{40^{\circ}\text{C}}$ W	RESISTANCE RANGE Ω WIREWOUND ⁽¹⁾	RESISTANCE RANGE Ω METAL OXIDE ⁽¹⁾	TOLERANCE $\pm \%$	WEIGHT (typical) g
CP0002	2	0.1 to 1K	100 to 30K	5, 10	2.0
CP0002...3	2	0.1 to 1K	100 to 30K	5, 10	2.2
CP0003	3	0.1 to 2K	150 to 33K	5, 10	3.4
CP0003...3	3	0.1 to 2K	150 to 33K	5, 10	3.6
CP0005	5	0.1 to 2.4K	150 to 50K	5, 10	4.8
CP0005...3	5	0.1 to 2.4K	150 to 50K	5, 10	5.0
CP0007	7	0.1 to 5K	1K to 50K	5, 10	6.8
CP0007...3	7	0.1 to 5K	1K to 50K	5, 10	7.0
CP0010	10	0.1 to 30K	1K to 50K	5, 10	9.5
CP0010...3	10	0.1 to 30K	1K to 50K	5, 10	9.9
CP0015	15	0.1 to 8K	1K to 50K	5, 10	16.8
CP0015...3	15	0.1 to 8K	1K to 50K	5, 10	17.4
CP0020	20	0.1 to 10K	1K to 50K	5, 10	22.8
CP0020...3	20	0.1 to 10K	-	5, 10	23.6
CP0022	22	0.1 to 10K	-	5, 10	24.5
CP0022...3	22	0.1 to 10K	-	5, 10	25.3
CP0025	25	0.1 to 10K	-	5, 10	37.0

Note

- ⁽¹⁾ To specifically order a Wirewound sub-assembly for resistance values that overlap between the Wirewound and Metal Oxide technologies, the model will be a CPxxxx...85 for standard body and CPxxxx...91 for body with stand-offs. To specifically order a Metal Oxide sub-assembly for resistance values that overlap between the Wirewound and Metal Oxide technologies, the model will be a CPxxxx...100 for a standard body and CPxxxx...101 for body with stand-offs. If no dash type is specified, either technology may be supplied.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	WIREWOUND CHARACTERISTICS	METAL OXIDE CHARACTERISTICS
Temperature Coefficient	ppm/ $^{\circ}\text{C}$	± 300 1 Ω and above; ± 600 below 1 Ω	± 300 (CP0002 to CP0005); ± 400 (CP0007 to CP0020)
Short Time Overload	-	5 x rated power for 5 s	5 x rated power for 5 s
Terminal Strength	lb	10 minimum	10 minimum
Operating Temperature Range	$^{\circ}\text{C}$	- 65 to + 275	- 65 to + 225
Dielectric Withstanding Voltage	V_{AC}	1000	1000
Maximum Working Voltage	V	$(P \times R)^{1/2}$	$(P \times R)^{1/2}$

Note

- Wirewound CP resistors can reliably function as a fuse and as a resistor. Such components involve compromise between fusing and resistive functions; therefore, each design should be tailored to the application to ensure optimum performance. Contact factory by using the e-mail address at the bottom of this page for design assistance.

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: CP000515R00JB143

C P 0 0 0 5 1 5 R 0 0 J B 1 4 3

GLOBAL MODEL	VALUE	TOLERANCE	PACKAGING	SPECIAL
(See Standard Electrical Specifications Global Model column for options)	R = Decimal K = Thousand R1500 = 0.15 Ω 1K500 = 1500 Ω	J = $\pm 5.0 \%$ K = $\pm 10.0 \%$	E14 = Lead (Pb)-free bulk pack E31 = Lead (Pb)-free four layer bulk pack B14 = Bulk pack B31 = Four layer bulk pack	(Dash Number) (up to 3 digits) From 1 to 999 as applicable

Historical Part Numbering example: CP-5-3 15 Ω 5 % B14

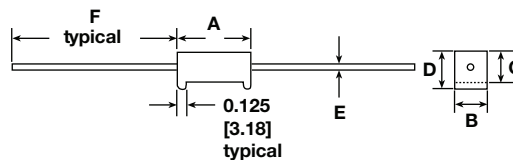
CP-5-3	15 Ω	5 %	B14
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING

DIMENSIONS in inches [millimeters]

CPxxxx



CPxxxx...3



GLOBAL MODEL	DIMENSIONS in inches [millimeters]							
	A ⁽¹⁾ ± 0.031 [0.794]	B ± 0.031 [0.794]	C ± 0.031 [0.794]	D ± 0.031 [0.794]	E ± 0.001 [0.025]		F	
					WIREWOUND	METAL OXIDE	WIREWOUND ± 0.125 [3.175]	METAL OXIDE MINIMUM
CP0002	0.688 [17.46]	0.250 [6.35]	0.250 [6.35]	-	0.032 [0.813]	0.0236 [0.600]	1.500 [38.10]	0.750 [19.05]
CP0002...3	0.688 [17.46]	0.250 [6.35]	0.250 [6.35]	0.313 [7.94]	0.032 [0.813]	0.0236 [0.600]	1.500 [38.10]	0.750 [19.05]
CP0003	0.875 [22.22]	0.313 [7.94]	0.313 [7.94]	-	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0003...3	0.875 [22.22]	0.313 [7.94]	0.313 [7.94]	0.375 [9.52]	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0005	0.875 [22.22]	0.375 [9.52]	0.344 [8.73]	-	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0005...3	0.875 [22.22]	0.375 [9.52]	0.344 [8.73]	0.406 [10.32]	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0007	1.391 [35.32]	0.375 [9.52]	0.344 [8.73]	-	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0007...3	1.391 [35.32]	0.375 [9.52]	0.344 [8.73]	0.469 [11.91]	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0010	1.875 [47.62]	0.375 [9.52]	0.344 [8.73]	-	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0010...3	1.875 [47.62]	0.375 [9.52]	0.344 [8.73]	0.469 [11.91]	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0015	1.875 [47.62]	0.500 [12.70]	0.500 [12.70]	-	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0015...3	1.875 [47.62]	0.500 [12.70]	0.500 [12.70]	0.625 [15.87]	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0020 ⁽²⁾	2.500 [63.50]	0.500 [12.70]	0.500 [12.70]	-	0.036 [0.914]	0.032 [0.813]	1.500 [38.10]	1.000 [25.40]
CP0020...3	2.500 [63.50]	0.500 [12.70]	0.500 [12.70]	0.625 [15.87]	0.036 [0.914]	-	1.500 [38.10]	-
CP0022	2.500 [63.50]	0.500 [12.70]	0.500 [12.70]	-	0.036 [0.914]	-	1.500 [38.10]	-
CP0022...3	2.500 [63.50]	0.500 [12.70]	0.500 [12.70]	0.625 [15.87]	0.036 [0.914]	-	1.500 [38.10]	-
CP0025	2.500 [63.50]	0.625 [15.87]	0.625 [15.87]	-	0.040 [1.016]	-	1.500 [38.10]	-

Notes
⁽¹⁾ Potting compound may extend outside of ceramic case up to 0.060 [1.52] maximum per side.

⁽²⁾ Dimensions for the metal oxide are: A = 2.360 [59.94], B = 0.570 [14.48], C = 0.530 [13.46], E = 0.032 [0.813], F = 1.000 [25.40]

MATERIAL SPECIFICATIONS
Element: Wirewound = Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

Metal Oxide = High temperature fired metal oxide film

Core: Wirewound = Woven fiberglass

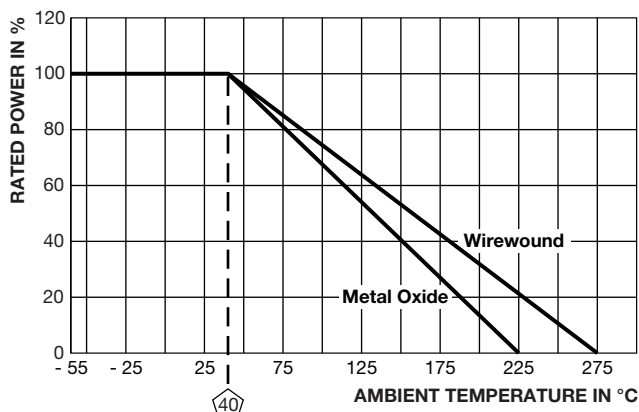
Metal Oxide = Alumina ceramic

Body: Steatite ceramic case with inorganic potting compound

End Caps: Tin plated steel

Terminals: Tinned copper

Part Marking: DALE, model, wattage, value, tolerance, date code

DERATING


PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS (EIA-344)
Thermal Shock	- 55 °C to + 275 °C (+ 225 °C for Metal Oxide), 5 cycles, 30 min dwell time	± (5.0 % + 0.05 Ω) ΔR
Short Time Overload	5 x rated power for 5 s	± (4.0 % + 0.05 Ω) ΔR
Dielectric Withstanding Voltage	1000 V _{RMS} , for 1 min	± (2.0 % + 0.05 Ω) ΔR
Low Temperature Storage	- 65 °C, full rated working voltage for 45 min	± (3.0 % + 0.05 Ω) ΔR
Humidity	75 °C, 90 % to 100 % RH, 240 h	± (5.0 % + 0.05 Ω) ΔR
Load Life	1000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	± (10.0 % + 0.05 Ω) ΔR
Terminal Strength	5 pounds for 30 s; body twisted about axis, 3 x 360° rotations	± (2.0 % + 0.05 Ω) ΔR
Resistance to Solder Heat	Terminal immersed 3.5 s in molten solder at 1/8" to 3/16" from body	± (4.0 % + 0.05 Ω) ΔR



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.