

Metal Film Resistors, Industrial, $\pm 1\%$ Tolerance



FEATURES

- Power ratings: 1/2 W, 3/4 W and 1 W at + 70 °C
- ± 100 ppm/°C temperature coefficient
- Superior electrical performance
- Flame retardant epoxy conformal coating
- Standard 5 band color code marking for ease of identification after mounting
- Tape and reel packaging for automatic insertion (52.4 mm inside tape spacing per EIA-296-E)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS*
COMPLIANT

Note

- * Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{70^{\circ}\text{C}}$ W	MAXIMUM WORKING VOLTAGE ⁽¹⁾ V	TEMPERATURE COEFFICIENT $\pm$ ppm/°C	TOLERANCE $\pm$ %	RESISTANCE RANGE Ω	E-SERIES
CCF60	CCF-60	1.0	500	100	1	10 to 1M	96

Note

- Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CCF60
Rated Dissipation at 70 °C	W	1.0
Maximum Working Voltage	V	≤ 500
Insulation Voltage (1 Min)	V _{eff}	500
Dielectric Strength	V _{AC}	450
Insulation Resistance	Ω	$\geq 10^{11}$
Operating Temperature Range	°C	- 65 to + 165
Terminal Strength (Pull Test)	lb	2
Weight	g	0.75 max.

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CCF60301RFR36 (preferred part numbering format)

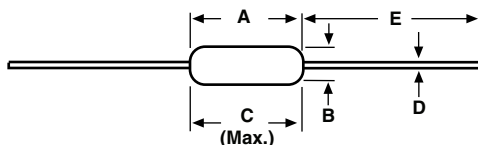
C	C	F	6	0	3	0	1	R	F	K	R	3	6
GLOBAL MODEL		RESISTANCE VALUE				TOLERANCE CODE		TEMPERATURE COEFFICIENT		PACKAGING			
CCF60		R = Ω K = k Ω M = M Ω 10R0 = 10 Ω 680K = 680 k Ω 1M00 = 1.0 M Ω				F = $\pm 1\%$		K = 100 ppm		E36 = Lead (Pb)-free, T/R (2500 pieces) R36 = Tin/lead, T/R (2500 pieces)			

Historical Part Number example: CCF-603010F R36 (will continue to be accepted)

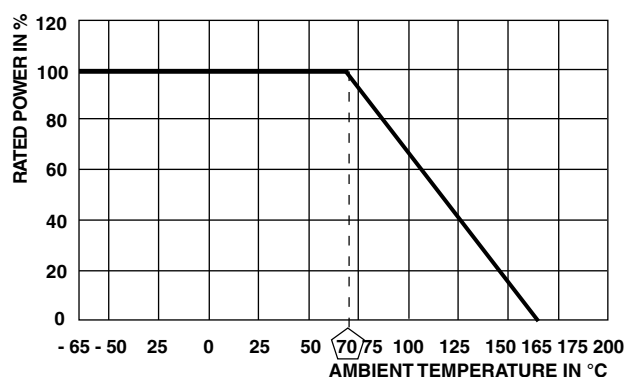
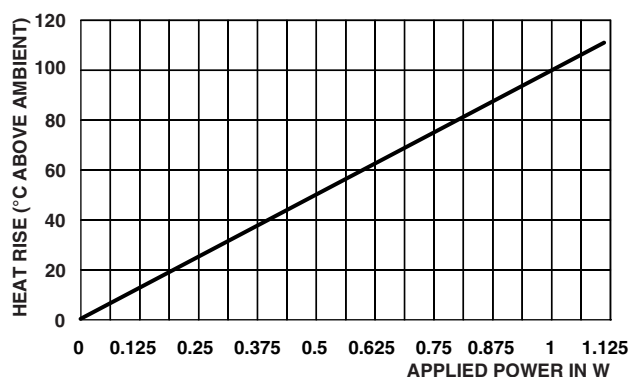
CCF-60	3010	F	R36
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING

Note

- For additional information on packaging, refer to the Through-Hole Resistor Packaging document (www.vishay.com/doc?31544).

DIMENSIONS in inches (millimeters)


GLOBAL MODEL	A	B	C (Max.)	D	E
CCF60	0.344 ± 0.031 (8.74 $\pm$ 0.79)	0.139 ± 0.009 (3.53 $\pm$ 0.23)	0.400 (10.16)	0.025 ± 0.002 (0.64 $\pm$ 0.05)	1.000 ± 0.040 (25.40 $\pm$ 1.02)


DERATING

THERMAL RESISTANCE
RESISTANCE VALUES

Vishay Dale model CCF60 is available in the standard 96 resistance values per decade. Values are obtained from the following decade table by multiplying by powers of 10. As an example: 30.1 can represent 30.1 Ω , 301 Ω , 3.01 k Ω , 30.1 k Ω or 301 k Ω .

10.0	14.7	21.5	31.6	46.4	68.1
10.2	15.0	22.1	32.4	47.5	69.8
10.5	15.4	22.6	33.2	48.7	71.5
10.7	15.8	23.2	34.0	49.9	73.2
11.0	16.2	23.7	34.8	51.1	75.0
11.3	16.5	24.3	35.7	52.3	76.8
11.5	16.9	24.9	36.5	53.6	78.7
11.8	17.4	25.5	37.4	54.9	80.6
12.1	17.8	26.1	38.3	56.2	82.5
12.4	18.2	26.7	39.2	57.6	84.5
12.7	18.7	27.4	40.2	59.0	86.6
13.0	19.1	28.0	41.2	60.4	88.7
13.3	19.6	28.7	42.2	61.9	90.9
13.7	20.0	29.4	43.2	63.4	93.1
14.0	20.5	30.1	44.2	64.9	95.3
14.3	21.0	30.9	45.3	66.5	97.6

MARKING

Color code marking with 5 color bands

PERFORMANCE

POWER RATING AT + 70 °C	MAXIMUM ΔR (TYPICAL TEST LOTS)	
CCF60	1/2 W	3/4 W and 1 W
TEST ⁽¹⁾		
Thermal Shock	$\pm 0.5 \%$	-
Short Time Overload	$\pm 0.5 \%$	-
Low Temperature Operation	$\pm 0.5 \%$	-
Moisture Resistance	$\pm 1.5 \%$	-
Resistance to Soldering Heat	$\pm 0.5 \%$	-
Shock	$\pm 0.5 \%$	-
Vibration	$\pm 0.5 \%$	-
Life	$\pm 0.5 \%$	$\pm 1.0 \%$
Terminal Strength	$\pm 0.2 \%$	-
Dielectric Withstanding Voltage	$\pm 0.5 \%$	-

Note

⁽¹⁾ Test methods per MIL-STD-202



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.