

## Metal Film Resistors, Industrial, ± 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)
- Compliant to RoHS directive 2002/95/EC



**RoHS\***  
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS							
GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{70\text{ }^\circ\text{C}}$ W	MAXIMUM WORKING VOLTAGE (1) V	TEMPERATURE COEFFICIENT $\pm$ ppm/°C	TOLERANCE $\pm$ %	RESISTANCE RANGE $\Omega$	E-SERIES
CCF60	CCF-60	0.50/0.75/1.0	500	100	1	10 to 1M	96

**Note**

(1) 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	0.50/0.75/1.0
Maximum Working Voltage	V	≤ 500
Insulation Voltage (1 Min)	$V_{\text{eff}}$	500
Dielectric Strength	$V_{\text{AC}}$	450
Insulation Resistance	$\Omega$	≥ 10 <sup>11</sup>
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: CCF60301RFKR36 (preferred part numbering format)



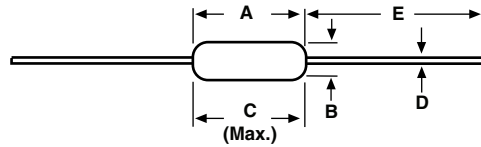
GLOBAL MODEL <b>CCF60</b>	RESISTANCE VALUE <b>R</b> = $\Omega$ <b>K</b> = k $\Omega$ <b>M</b> = M $\Omega$ <b>10R0</b> = 10 $\Omega$ <b>680K</b> = 680 k $\Omega$ <b>1M00</b> = 1.0 M $\Omega$	TOLERANCE CODE <b>F</b> = ± 1 %	TEMPERATURE COEFFICIENT <b>K</b> = 100 ppm	PACKAGING <b>E36</b> = Lead (Pb)-free, T/R (2500 pieces) <b>R36</b> = Tin/lead, T/R (2500 pieces)
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Historical Part Number example: CCF-603010F R36 (will continue to be accepted)

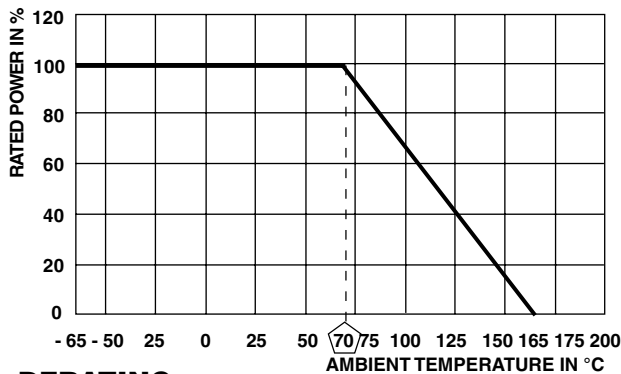
<b>CCF-60</b>	<b>3010</b>	<b>F</b>	<b>R36</b>
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING

\* Pb containing terminations are RoHS compliant, exemptions may apply

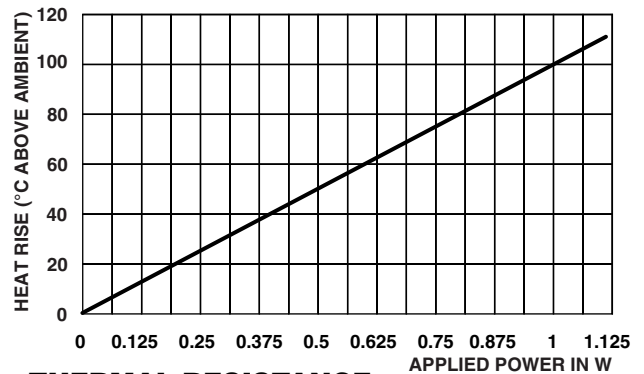
**DIMENSIONS** in inches (millimeters)



GLOBAL MODEL	A	B	C (Max.)	D	E
CCF60	0.344 ± 0.031 (8.74 ± 0.79)	0.139 ± 0.009 (3.53 ± 0.23)	0.400 (10.16)	0.025 ± 0.002 (0.64 ± 0.05)	1.000 ± 0.040 (25.40 ± 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 kΩ, 30.1 kΩ or 301 kΩ.

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 band

**PERFORMANCE**

POWER RATING at + 70 °C	MAXIMUM ΔR (TYPICAL TEST LOTS)	
	CCF60	1/2 W
<b>TEST (1)</b>		
Thermal Shock	± 0.5 %	-
Short Time Overload	± 0.5 %	-
Low Temperature Operation	± 0.5 %	-
Moisture Resistance	± 1.5 %	-
Resistance to Soldering Heat	± 0.5 %	-
Shock	± 0.5 %	-
Vibration	± 0.5 %	-
Life	± 0.5 %	± 1.0 %
Terminal Strength	± 0.2 %	-
Dielectric Withstanding Voltage	± 0.5 %	-

**Note**

(1) Test methods per MIL-STD-202



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