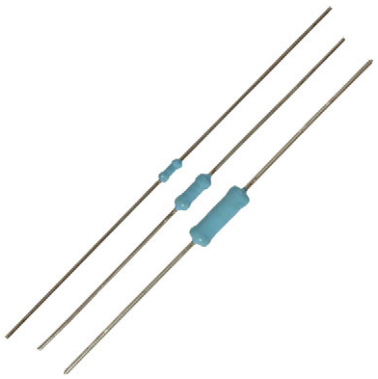
Metal Film Resistors, Axial, Industrial, Precision



FEATURES

- Small size - conformal coated
- Flame retardant epoxy coating
- Controlled temperature coefficient
- Excellent high frequency characteristics
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

HALOGEN FREE

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	HISTORICAL MODEL	MAXIMUM WORKING VOLTAGE (1) V	POWER RATING $P_{70\,°C}$ W	RESISTANCE RANGE Ω	TOLERANCE ± %	TEMPERATURE COEFFICIENT ± ppm/°C
CMF50	CMF-50	200	0.25	43 to 332K	0.1	25
				22 to 332K	0.25	
				10 to 475K	0.5, 1	
				10 to 475K	0.5	50, 100, 150, 200, 300
				1 to 10M	1	
				0.22 to 10M	5	
CMF55	CMF-55	350	0.4	10 to 1M	0.1, 0.25, 0.5, 1	25
				10 to 1M	0.5	50, 100, 150, 200, 300
				1 to 10M	1	
				0.22 to 22M	5	
CMF60	CMF-60	500	0.65	43 to 1M	0.1	25
				22 to 1.5M	0.25	
				10 to 2.43M	0.5, 1	
				10 to 2.43M	0.5	50, 100, 150, 200, 300
				1 to 22M	1	
				0.22 to 22M	5	
CMF07	CMF-07	350	0.4	1 to 10M	1	50, 100, 150, 200, 300
				0.22 to 22M	5	
CMF20	CMF-20	500	0.65	1 to 22M	1	50, 100, 150, 200, 300
				0.22 to 22M	5	

Note

(1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less

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GLOBAL PART NUMBER INFORMATION

Global Part Numbering: CMF55301R00FKEK

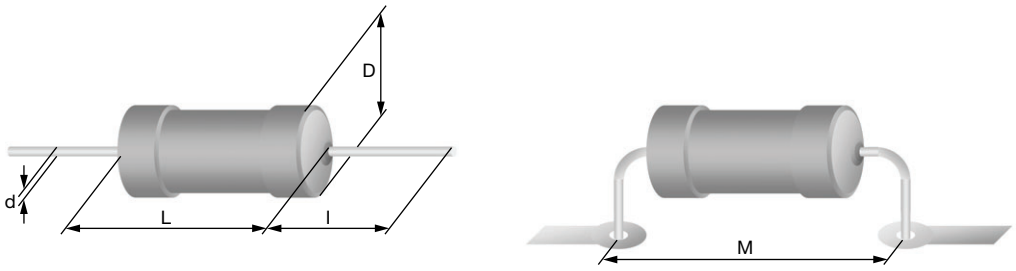
C	M	F	5	5	3	0	1	R	0	0	F	K	E	K

GLOBAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	TEMPERATURE COEFFICIENT	PACKAGING
(See Standard Electrical Specifications table)	**R** = Ω **K** = kΩ **M** = MΩ **R10000** = 0.1 Ω **680K00** = 680 kΩ **1M0000** = 1.0 MΩ	**B** = ± 0.1 % **C** = ± 0.25 % **D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 %	**E** = 25 ppm **H** = 50 ppm **K** = 100 ppm **L** = 150 ppm **N** = 200 ppm **M** = 300 ppm	**EA** = lead (Pb)-free, T/R (full) **EB** = lead (Pb)-free, ammo pack (1000 pieces)

Note

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

DIMENSIONS in millimeters



GLOBAL MODEL	$D_{max.}$	$L_{max.}$	$d_{nom.}$	$l_{min.}$	$M_{min.}$	MASS (mg)
CMF50	1.6	3.6	0.5	29	5	125
CMF55	2.5	6.5	0.6	28	10	220
CMF60	4.2	11.9	0.8	31	15	700
CMF07	2.5	6.5	0.6	28	10	220
CMF20	4.2	11.9	0.8	31	15	700

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	CMF50	CMF55	CMF07	CMF60	CMF20
Maximum Working Voltage	V≅	≤ 300	≤ 250	≤ 250	≤ 500	≤ 500
Insulation Voltage (1 Min)	V_{eff}	300	500	500	800	800
Dielectric Strength	V_{AC}	300	450	450	750	750
Insulation Resistance	Ω	≥ 10^{11}				
Operating Temperature Range	°C	-55 to +125				
Terminal Strength (Pull Test)	lb	2	2	5	2	5
Weight (Max.)	mg	125	220	220	700	700

TEMPERATURE COEFFICIENT CODES

GLOBAL TC CODE	TEMPERATURE COEFFICIENT
E	25 ppm/°C
H	50 ppm/°C
K	100 ppm/°C
L	150 ppm/°C
N	200 ppm/°C
M	300 ppm/°C

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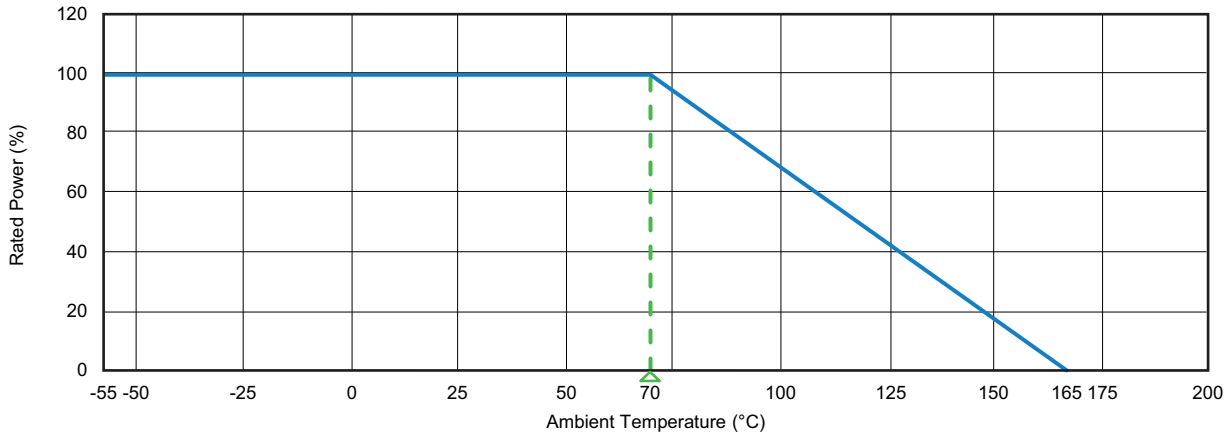
LOAD LIFE SHIFT DUE TO POWER AND DERATING AT +70 °C

The power rating for the CMF parts is tied to the derating temperature, the heat rise of the parts, and the ΔR for the load life performance. When the tables/graphs below are used together they show that when the parts are run at their higher power ratings, the parts will run hotter, which has the potential of causing the resistance of the parts to shift more over the life of the part.

LOAD LIFE SHIFT VS. POWER RATING			
LOAD LIFE	**MAXIMUM Δ*R* (TYPICAL TEST LOTS)**		
	± 0.15 %	± 0.5 %	± 1.0 %
MODEL	**POWER RATING AT +70 °C**		
CMF50	1/10 W	1/8 W	1/4 W
CMF55, CMF07	1/8 W	1/4 W	1/2 W
CMF60, CMF20	1/4 W	1/2 W	1 W

CMF resistors have an operating temperature range of -55 °C to +125 °C. They must be derated at high ambient temperatures according to the derating curve.



DERATING

MATERIAL SPECIFICATIONS

Element	Vacuum-deposited nickel-chrome alloy	**Coating**	Flame retardant epoxy, formulated for superior moisture protection
Core	Fire-cleaned high purity ceramic	**Solderability**	Continuous satisfactory coverage when tested in accordance with JSTD-002

MARKING

Temperature coefficient: T00 = 200 ppm, T0 = 150 ppm, T1 = 100 ppm, T2 = 50 ppm, T9 = 25 ppm, M = 300 ppm

CMF50: (2 lines)

3.01	Value
K 1 %	Ohm, K or M sign and tolerance

CMF55, CMF60, CMF65, CMF70: (4 lines)

DALE	Manufacturer's name
CMF55	Style and size
49.9 kΩ	Value
1 % T2	Tolerance and TC

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PERFORMANCE	
TEST (TEST METHODS - MIL-STD-202)	**AT +70 °C**
	MAXIMUM ΔR (TYPICAL TEST LOTS)
Short Time Overload	± 0.05 %
Shock	± 0.01 %
Vibration	± 0.04 %
Temperature Cycling	± 0.15 %
Load Life	Varies based on power rating used; see “Load Life Shift Due to Power And Derating” table
Dielectric Withstanding Voltage	± 0.01 %
Effect of Solder	± 0.03 %

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