

MF60 0.6W 1% Metal Film Resistors

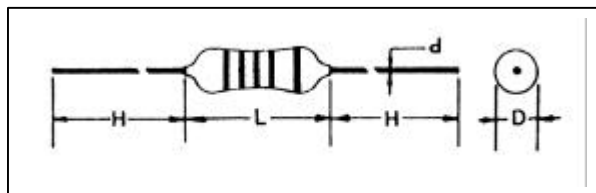
Truohm – MF60 Series

Introduction

To fill the gap between carbon film resistors and metal oxide resistors, Truohm offers a range of metal film resistors. The resistive element is a high content of AL₂O₃ ceramic rod on which a thin film of Ni/Cr alloy is deposited by vacuum sputtering system. Then contact caps are pressed on to the ends of the rod and a helical groove cut through the film to give the required resistance value. Connecting copper wire is welded to the end caps. Finally the resistors are coated with multiple layers of insulation lacquer. Truohm MF series are suitable for all circuit applications especially where tighter tolerance and low temperature coefficient is required.

Features

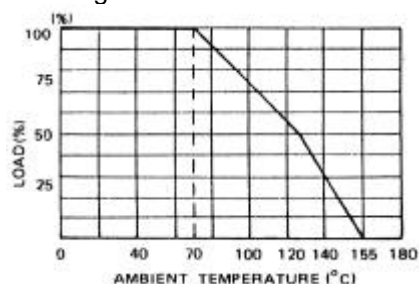
- Meets American military specification MIL-R-10509F
- Very low current noise
- Temperature coefficient of 50ppm/°C
- Wattage of 0.6W
- Tolerance of 1%
- Resistance range of 10Ω up to 1MΩ
- Small package size
- Major applications are switching power supplies, communications equipment, monitors, testing meters



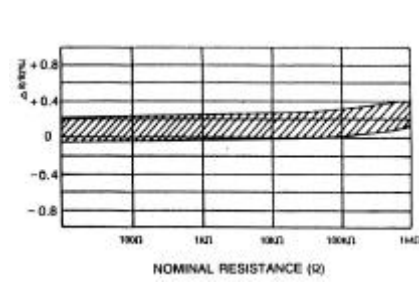
Specifications

Type	Power Rating @70°C	Dimensions (mm)				Maximum Working Voltage	Maximum Overload Voltage	Resistance Range
		L	D	H	d			
MF-60	0.6W	6.0 ±0.5	2.3 ±0.3	28 ±2	0.60 ±0.05	350V	700V	10Ω - 1MΩ

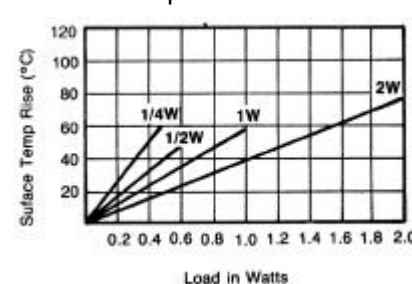
Derating Curve



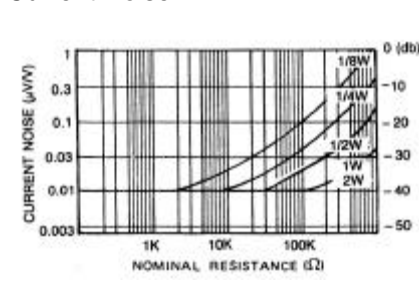
Load Life



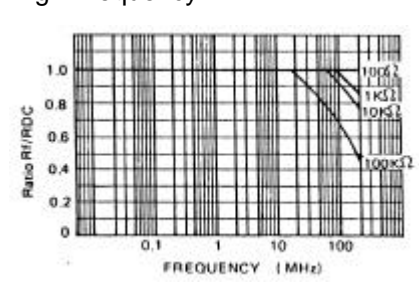
Surface Temp. Rise Vs. Load



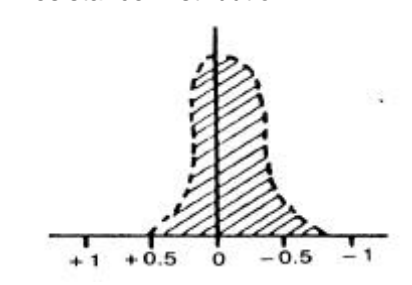
Current Noise



High Frequency



Resistance Distribution



Characteristics:

Test	Test Method	Limits				
Short-Time Overload	Resistors shall be tested at 2.5 times rated voltage for 5 seconds at ambient room temperature	Resistance shall not change more than $\pm 0.25\%$ No evidence of mechanical damage				
Terminal Strength	Pull a resistor with a weight of 1kg for 30 seconds. Bend the terminal lead wire with 500g weight to 90 degree and bend it to 90 degree in opposite direction and return to normal	Resistance shall not change more than $\pm 0.2\%$. No evidence of mechanical damage				
Resistance To Soldering Heat	Immerse each terminal wire of a resistor up to $4 \pm 0.8\text{mm}$ away from the resistor body in the solder tank at $350 \pm 10^\circ\text{C}$ for 3 ± 0.5 seconds. Measure resistance in 3 hours	Resistance shall not change more than $\pm 0.1\%$. No evidence of mechanical damage				
Moisture Resistance	At temperature of $40 \pm 2^\circ\text{C}$ and a relative humidity of 90-95% for 1000 ± 12 hours, under a rating DC voltage for 1 hour on and $\frac{1}{2}$ hour off	Resistance shall not change more than $\pm 0.5\%$ No evidence of mechanical damage				
Load Life	Thermostatic chamber at a temperature of $70 \pm 5^\circ\text{C}$ under a rated DC voltage for 1.5 hours on and $\frac{1}{2}$ hour off, repeat this cycle for 1000 ± 12 hours	Resistance shall not change more than $\pm 0.5\%$ No evidence of mechanical damage				
Insulation Resistance	Resistors shall be clamped in the trough of a 90 degree metallic V-block, apply DC 100V between this electrode and another lead wire for 1 minute	10,000 $\text{M}\Omega$ above				
Noise	Quad-Tech Laboratories Inc. Model 515B	100K Ω below 0.3 μ V/V 100K Ω - 1M Ω below 0.5 μ V/V 1M Ω - 5.6M Ω 1.0 μ V/V				
Vibration	Total amplitude of 1.5mm. The frequency shall vary from 10Hz to 55Hz, for approximate 1 second. Make this test in the direction parallel to the resistor axis, and up/down for 2 hours respectively. (all together 6 hours)	Resistance shall not change more than $\pm 0.25\%$. No evidence of mechanical damage				
Dielectric Withstanding Voltage	Resistors shall be clamped in the trough of a 90 degree metallic V-block, apply AC between this electrode and another lead wire for 1 minute	Resistance shall not change more than $\pm 0.5\%$ No evidence of mechanical damage				
Resistance To Solvents	Immerse a resistor completely in reagent at a temperature of $20-25^\circ\text{C}$ for 30 ± 0.5 seconds	No evidence of mechanical damage				
Solderability	Apply flux to the terminal wire of a resistor up to $4 \pm 0.8\text{mm}$ away from the resistor body and immerse the flux applied portion in the solder tank at $230 \pm 5^\circ\text{C}$ for 5 ± 0.5 seconds	More than 95% of a circumference of the immersed portion shall be completely covered with new solder				
Temperature Cycling	STEP	1	2	3	4	Resistance shall not change more than $\pm(0.25\% + 0.05\Omega)$ No evidence of mechanical damage
	TEMP	-55°C	25°C	155°C	25°C	
	TIME	30min	10-15min	30min	10-15min	
	Form 1 to 4 is a cycle as shown above, repeat 5 cycles measure resistance after 1 hour in normal temperature					