

FMF 1/8, 1/4, 1/2, 1, 2

## INTRODUCTION

MEGASTAR-OHM series flame-proof type Metal Film Resistors are manufactured by vacuum deposit metal film on high thermal conductivity ceramic rods and are coated with layers of light-blue color flame-proof lacquer. These resistors meet overload tests in accordance with UL specification #1412 without producing a fire hazard. (UL-1412 is the standard for fusing resistors and temperature-limited resistors)

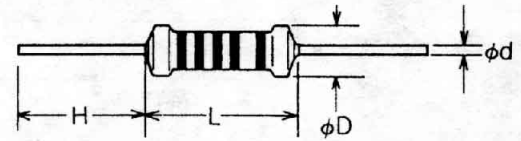
This FMF flame-proof metal film resistor is designed to replace the metal oxide resistors and low power wire wound resistors when flame-proof and small size is needed.

### FEATURES

Flame-proof Coating ..... UL-1412  
 Power Rating ..... 1/4W, 1/2W, 1W, 2W  
 Resistance Tolerance ..... -1%, -2%, -5%  
 TCR ..... -50ppm, -100ppm

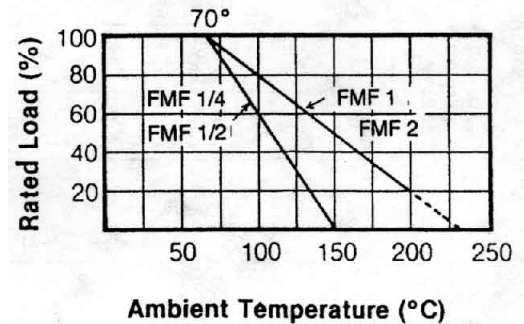
Flame-proof Type

## Dimensions



## POWER DERATING CURVE

For resistor operated in ambient temperatures above 70°C, power rating must be derated in accordance with the curve below.



## General Specifications

Type	Power Rating (W)		Dimensions (mm)				Max Working Voltage		Max Overload Voltage	
	70 °C	125 °C	L	D	H(MIN)	d	70 °C	125 °C	70 °C	125 °C
FMF	0.125W	0.05W	3.7±0.4	1.5±0.2	27	0.46±0.02	200	150	400	300
FMF	0.25W	0.1W	6.5±0.5	2.3±0.2	27	0.58±0.02	250	200	500	400
FMF	0.50W	0.125W	9.0±1	3.5±0.5	27	0.65±0.02	350	250	700	500
FMF	1 W	0.25W	12±1.0	4.5±0.5	27	0.80±0.03	500	300	1000	600
FMF	2 W	0.5W	16±1.0	5.5±0.5	27	0.80±0.03	500	350	1000	700

## Part Numbering system

**FMF**

Type
FMF

**1/4**

Rated Power (@70°C)
1/8W ↓ 2 W

**5 %**

Resistance tolerance
±5%
±2%
±1%

**2K2**

Nominal Resistance	
Code	Description
2R2	2.2 OHM s
22R	22 OHM s
2K2	2.2X10 <sup>3</sup> OHM s
22K	22X10 <sup>3</sup> OHM s
22M	22X10 <sup>6</sup> OHM s

**TR**

Packaging	
Code	Description
B	Bulk
TR	Tape & Reel
TB	Tape & Box
PATR	Avisert T/R
PNTR	Panasert T/R

# METAL FILM FIXED RESISTORS



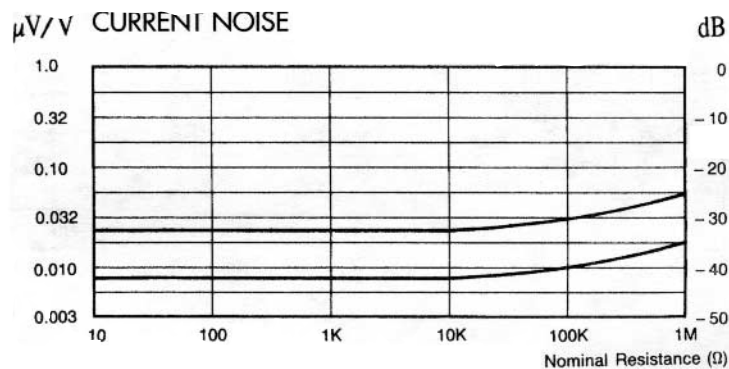
FMF

FMF

LEADFREE  
RoHS Compliant

Flame-proof Type

Characteristics	Specification	Test Method
		(All resistance measurements should be performed after stabilisation or conditioning periods)
DC RESISTANCE	Within specified tolerance	MIL-STD-202 Method 303
TEMPERATURE COEFFICIENT	As buyer requested $\pm 25\text{ppm}/^\circ\text{C} \pm 100\text{ppm}/^\circ\text{C}$ $\pm 25\text{ppm}/^\circ\text{C} \pm 100\text{ppm}/^\circ\text{C}$	MIL-STD-202 Method 304
DIELECTRIC STRENGTH	No flashover or change	MIL-STD-202 Method 301 1/8W 300V 1 minute 1/4W 500V 1 minute 1/2W 700V 1 minute 1,2W 750V 1 minute
INSULATION RESISTANCE	At least 1,000M	MIL-STD-202 Method 302 100V 1 minute
CURRENT NOISE TEST	Below 10K below $0.05\mu\text{V}/\text{V}$ 10K ~below $0.1\mu\text{V}/\text{V}$ below 1M7 below $0.2\mu\text{V}/\text{V}$	MIL-STD-202 Method 308
CURRENT NOISE TEST	Below 10K below $0.05\mu\text{V}/\text{V}$ 10K ~below $0.1\mu\text{V}/\text{V}$ below 1M7 below $0.2\mu\text{V}/\text{V}$	MIL-STD-202 Method 308
VIBRATION	$^3\text{R}$ within $\pm(0.25\% + 0.05)$	MIL-STD-202 Method 301 10-HZ X.Y.Z. 3 directions 2 hours each
TERMINAL STRENGTH	Lead is not broken or loose	MIL-STD-202 Method 211
RESISTANCE TO SOLDERING HEAT	$^3\text{R}$ within $\pm(0.25\% + 0.05)$	MIL-STD-202 Method 210 350°C, 3±0.05 sec.
SOLDERABILITY	At least 95% coverage	MIL-STD-202 Method 208 230°C, 5 sec.
THERMAL SHOCK	$^3\text{R}$ within $\pm(0.5\% + 0.05)$	MIL-STD-202 Method 207 -55°C~+155°C 5 cycles
SHORT TIME OVERLOAD	$^3\text{R}$ within $\pm(0.05\% + 0.05\%)$	MIL-R-10509 Para. 4.6.6, 2.5 times rated working voltage 5 sec.
HUMIDITY	$^3\text{R}$ with $\pm(1\% + 0.05)$ NO mechanical damage	MIL-STD-202 Method 103 40°C, RH95% 500
LOW TEMPERATURE OPERATION	$^3\text{R}$ within $\pm(0.5\% + 0.05)$	MIL-R-10509 Para. 4.6.5, rated working voltage at -65°C 45 minutes
LOAD LIFE	$^3\text{R}$ within $\pm(1\% + 0.05)$	MIL-STD-202 Method 108 Rated working voltage 1.5 hrs. ON .5 hrs. OFF for total of 1,000 hrs.
RESISTANCE TO SOLVENT	No bands legible No mechanical damage	MIL-STD-202 Method 215





### Characteristics

Requirements	Characteristics	Test Method
Non-Combustibility	<p>Flame resistance</p> <p>Will not burn continuously for more than 5 seconds</p> <p>Overload burning resistance</p> <p>Will not fume under the overload of less than 5 times of the rated power.</p> <p>The volume of fumes emitted under the overload of more than 5 times of rated power is less than that of stilled fumes emitted by one cigarette.</p> <p>During the test the flame height will not exceed 3mm and the burning does not continue for more than 3 seconds.</p>	<p>MIL-STD-202 Method 111</p> <p>JIS C 5202 7.12</p> <p>EIAJ-RC 2658 5.1</p>

### Performance Specifications Comparison

Test		FMF series % change in resistance ( <sup>3</sup> R)					MIL-R-22684	MIL-R-10509
		FMF1/8	FMF1/4	FMF1/2	FMF1	FMF2	Style RL Requirement	Style RN Requirement
1. Temperature cycling, -65°C to +150°C	(%)	±0.50	±0.50	±0.50	±0.50	±0.50	1.00	0.50
2. Low temperature operation, -65°C	(%)	±0.50	±0.50	±0.50	±0.50	±0.50	0.50	0.50
3. Short time overload	(%)	±0.25	±0.25	±0.25	±0.25	±0.25	0.50	0.50
4. Terminal strength, 5lb. pull	(%)	±0.20	±0.20	±0.20	±0.20	±0.20	0.50	0.20
5. Resistance to soldering heat, +350°C	(%)	±0.10	±0.10	±0.10	±0.10	±0.10	0.50	0.50
6. Moisture resistance, MIL STD 202	(%)	±1.00	±1.00	±1.00	±1.00	±1.00	1.50	1.50
7. Life 1000 hrs (rated power)	(%)	±1.00	±1.00	±1.00	±1.00	±1.00	2.00	1.00
8. Shock, 50G, 11ms	(%)	±0.25	±0.25	±0.25	±0.25	±0.25	0.50	0.50
9. Vibration-high frequency, 10-2000Hz	(%)	±0.25	±0.25	±0.25	±0.25	±0.25	0.50	0.50