

## Melf Metal Film Resistors

# General Type

## Normal & Miniature Style [ MMF Series ]



### INTRODUCTION

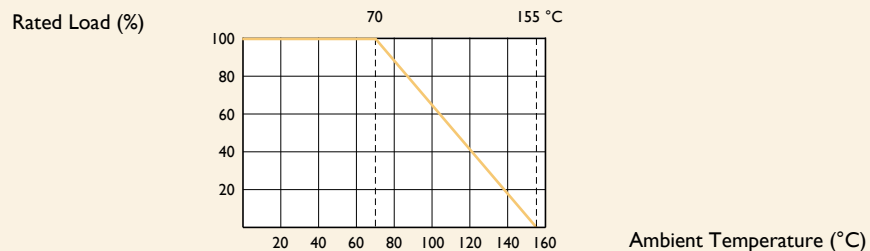
The MMF Series Melf Metal Film Resistors are manufactured using a vacuum sputtering system to deposit multiple layers of mixed metal alloys and passive materials onto a carefully treated high grade ceramic substrate. SMD enabled structure. The resistors are coated with layers of blue color lacquer.

### FEATURES

Power Rating	1/6W, 1/4W, 0.4W, 1/2W, 0.6W, 1W
Resistance Tolerance	$\pm 0.1\%$ , $\pm 0.25\%$ , $\pm 0.5\%$ , $\pm 1\%$ , $\pm 2\%$ , $\pm 5\%$
T.C.R.	$\pm 15\text{ppm}/^{\circ}\text{C}$ , $\pm 25\text{ppm}/^{\circ}\text{C}$ , $\pm 50\text{ppm}/^{\circ}\text{C}$ , $\pm 100\text{ppm}/^{\circ}\text{C}$

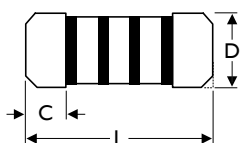
### DERATING CURVE

For resistors operated in ambient temperatures above  $70^{\circ}\text{C}$ , power rating must be derated in accordance with the curve below.



### DIMENSIONS

Unit: mm



STYLE		DIMENSION		
Normal	Miniature	L	D	C Min.
MMF-12	MMF25S / MMF204	$3.50 \pm 0.2$	$1.40 \pm 0.15$	0.5
MMF-25	MMF50S / MMF207	$5.90 \pm 0.2$	$2.20 \pm 0.1$	0.5
MMF-50	MMF1WS	$8.50 \pm 0.2$	$3.20 \pm 0.2$	0.5

Note:

## ELECTRICAL CHARACTERISTICS

STYLE	MMF-12	MMF25S	MMF204	MMF-25	MMF50S	MMF207	MMF-50	MMFIWS
Power Rating at 70°C	1/6W	1/4W	0.4W	1/4W	1/2W	0.6W	1/2W	1W
Maximum Working Voltage	150V	200V		250V			350V	
Maximum Overload Voltage	300V	400V		500V			700V	
Voltage Proof on Insulation	300V			500V			700V	
Resistance Range	1Ω - 1MΩ & 0Ω for E24 & E96 series value, 100Ω - 100KΩ for E192 series value							
Operating Temp. Range	-55°C to +155°C							
Temperature Coefficient	±15ppm/°C, ±25ppm/°C, ±50ppm/°C, ±100ppm/°C							

Note: Special value is available on request

## ENVIRONMENTAL CHARACTERISTICS

PERFORMANCE TEST	TEST METHOD		APPRAISE
Short Time Overload	IEC 60115-1 4.13	2.5 times RCWV for 5 Sec.	±0.5%+0.05Ω
Voltage Proof on Insulation	IEC 60115-1 4.7	in V-block for 60 Sec., test voltage by type	By type
Temperature Coefficient	IEC 60115-1 4.8	-55°C to +155°C	By type
Insulation Resistance	IEC 60115-1 4.6	in V-block for 60 Sec.	>10,000MΩ
Solderability	IEC 60115-1 4.17	235±5°C for 3±0.5 Sec.	95% Min. coverage
Solvent Resistance of Marking	IEC 60115-1 4.30	IPA for 5±0.5 Min. with ultrasonic	No deterioration of coatings and markings
Periodic-pulse Overload	IEC 60115-1 4.39	4 times RCWV 10,000 cycles (1 Sec. on, 25 Sec. off)	±1.0%+0.05Ω
Damp Heat Steady State	IEC 60115-1 4.24	40±2°C, 90-95% RH for 56 days, loaded with 0.1 times RCWV	±2.0%+0.1Ω
Endurance at 70°C	IEC 60115-1 4.25	70±2°C at RCWV for 1,000 Hr. (1.5 Hr. on, 0.5 Hr. off)	±2.0%+0.1Ω
Temperature Cycling	IEC 60115-1 4.19	-55°C ⇄ Room Temp. ⇄ +155°C ⇄ Room Temp. (5 cycles)	±0.75%+0.05Ω
Resistance to Soldering Heat	IEC 60115-1 4.18	260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body	±0.5%+0.05Ω

Note: RCWV(Rated Continuous Working Voltage) =  $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$  or Max. working voltage listed above, whichever less.

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