Metal Film Resistors

General Type

Normal & Miniature Style [MFR Series]

FEATURES

Power Rating	1/6W, 1/4W, 1/2W, 1W, 2W, 3W
Resistance Tolerance	±0.5%, ±1%, ±5%
T.C.R.	±15ppm/°C, ±25ppm/°C, ±50ppm/°C, ±100ppm/°C

DERATING CURVE

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

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 Rated Load (%)
 70
 155 °C



Ambient Temperature (°C)

DIMENSIONS



STYLE		DIMENSION						
Normal	Miniature	L	øD	н	ød			
MFR-12	MFR25S	3.4±0.3	1.9±0.2	28±2.0	0.45±0.05			
MFR-25	MFR50S	6.3±0.5	2.4±0.2	28±2.0	0.55±0.05			
MFR-50	MFRIWS	9.0±0.5	3.3±0.3	26±2.0	0.55±0.05			
MFR100	MFR2WS	.5±1.0	4.5±0.5	35±2.0	0.8±0.05			
MFR200	MFR3WS	15.5±1.0	5.0±0.5	33±2.0	0.8±0.05			

INTRODUCTION

The MFR Series Metal Film Resistors are manufactured using a vacuum sputtering system to deposit multiple layers of mixed metal alloys and passivative materials onto a carefully treated high grade ceramic substrate. After a helical groove has been cut in the resistive layer, tinned connecting leads of electrolytic copper are welded to the end-caps. The resistors are coated with layers of blue color lacquer.

Unit: mm

Note:		

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ELECTRICAL CHARACTERISTICS

STYLE	MFR-12	MFR25S	MFR-25	MFR50S	MFR-50	MFRIWS	MFRI00	MFR2WS MFR200	MFR3WS
Power Rating at 70°C	1/6W	1/4W		1/2W		IW		2W	3W
Maximum Working Voltage	200V	_	250V	300V	350V	400V	500V		_
Maximum Overload Voltage	400V		500V	600V	700V	800V	1,000V		
Voltage Proof	300V	400V	500V			700∨	1,000∨		
Resistance Range	Ω - 10M Ω & 0 Ω for E24 & E96 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 60115-14.13	2.5 times RCWV for 5 Sec.	±0.25%+0.05 Ω
Voltage Proof	IEC 60115-14.7	in V-block for 60 Sec., test voltage by type	By type
Temperature Coefficient	IEC 60115-14.8	-55°C to +155°C	By type
Insulation Resistance	IEC 60115-14.6	in V-block for 60 Sec.	>10,000M Ω
Solderability	IEC 60115-1 4.17	235±5°C for 3±0.5 Sec.	95% Min. coverage
Solvent Resistance of Marking	IEC 60115-14.30	IPA for 5±0.5 Min. with ultrasonic	No deterioration of coatings and markings
Robustness of Terminations	IEC 60115-1 4.16	Direct load for 10 Sec. in the direction of the terminal leads	≥2.5kg (24.5N)
Periodic-pulse Overload	IEC 60115-1 4.39	4 times RCWV 10,000 cycles (1 Sec. on, 25 Sec. off)	±1.0%+0.05 Ω
Damp Heat Steady State	IEC 60115-1 4.24	40±2°C, 90-95% RH for 56 days, loaded with 0.1 times RCWV	±1.5%+0.05 Ω
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)	±1.5%+0.05 Ω
Temperature Cycling	IEC 60115-1 4.19	-55°C ⇔ Room Temp. ⇔ +155°C ⇔ Room Temp. (5 cycles)	±0.75%+0.05 Ω
Resistance to Soldering Heat	IEC 60115-14.18	260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body	±0.25%+0.05 Ω

Note: Rated Continuous Working Voltage (RCWV) = $\sqrt{Power Rating \times Resistance Value}$