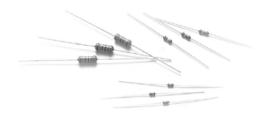


General Type

Normal & Miniature Style [MFR Series]



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.

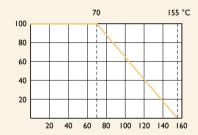
FEATURES

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.

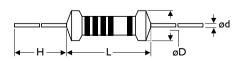
Rated Load (%)



Ambient Temperature (°C)

DIMENSIONS

Unit: mm



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	11.5±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			

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Note:			

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 on Insulation	300V	400V	500V			700V	I,000V		
Resistance Range	ΙΩ - ΙΟΜΩ	$I\Omega$ - I 0M Ω & 0Ω for E24 & E96 series value							
Operating Temp. Range	-55°C to +155°C								
Temperature Coefficient	±15ppm/°C, ±25ppm/°C, ±50ppm/°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.	±0.25%+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.	>10,000ΜΩ
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
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%+0.05Ω
Damp Heat Steady State	IEC 60115-1 4.24	40±2°C, 90-95% RH for 56 days, loaded with 0.1 times RCWV	±1.5%+0.05Ω
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%+0.05Ω
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 I0±1 Sec., immersed to a point 3±0.5mm from the body	±0.25%+0.05Ω

EXPLANATIONS OF ORDERING CODE

Code I - 3 **Series Name**

See Index

Code 4 - 6 **Power Rating**

-05 = ød0.5mm-06 = ød0.6mm-07 = ød0.7mm-08 = ød0.8mm-10 = ød1.0mm-14 = ød1.4mm-12 = 1/6W-25 = 1/4W25S = 1/4WS-50 = 1/2W50S = 1/2WS100 = 1 WIWS = IWS200 = 2W2WS = 2WS204 = 0.4W207 = 0.6W300 = 3W3WS = 3WS3WM = 3WM400 = 4W500 = 5W5WS = 5WS5SS = 5WSS700 = 7W7WS = 7WS10A = 10W20A = 20W

Code 7 **Tolerance** $P = \pm 0.02 \%$ $A = \pm 0.05 \%$

 $K = \pm 10 \%$

- = Base on Spec

B = +0.1%C = +0.25% $D = \pm 0.5 \%$ F = ±1 % $G = \pm 2 \%$ $| = \pm 5 \%$

Code 8 **Packing Style**

T = Tape/BoxR = Tape/Reel B = Bulk

Code 9

Temperature Coefficient of Resistance - = Base on Spec.

 $A = \pm 5 \text{ ppm/}^{\circ}\text{C}$ $B = \pm 10 \text{ ppm/}^{\circ}\text{C}$ $C = \pm 15 \text{ ppm/}^{\circ}C$ $S = \pm 20ppm/^{\circ}C$

 $D = \pm 25 \text{ ppm/°C}$ $E = \pm 50 \text{ ppm/}^{\circ}\text{C}$ $F = \pm 100 \text{ ppm/°C}$

 $G = \pm 200 \text{ ppm/}^{\circ}C$ $H = \pm 250 \text{ ppm/°C}$ $I = \pm 300 \text{ ppm/°C}$

 $I = \pm 350 \text{ ppm/°C}$

Code 10 - 12

Forming Type 26 - 26mm

52-

73 - = 73 mm81 - 81 mm

52- = 52.4mm

91 - = 91 mmF = FType

FK = FKType

FKK = FKK Type FFK = F-form Kink

M = M-Type Forming MB = M-form W/flat MT = MT Type Forming

MR = MRTypeAV = AVIsertPN = PANAsert $\overline{100}R$

Code 13 - 17 Resistance Value

0RI = 0.1100R = 10010K = 10.00010M = 10,000,000

EXCEPTION:

• Cement series:

<Code 8>: Special packing style code

30A = 30W40A = 40W50A = 50W10S = 10WS15A = 15W25A = 25W10B = 100W 25B = 250W

B: Bulk with wirewound or metal oxide sub-assembly for resistance value

W: Bulk with ceramic based wirewound sub-assembly for resistance value

M: Bulk with metal oxide sub-assembly for resistance value

F: Bulk with Fiberglass based wirewound sub-assembly for resistance value

<Code 10-12>: Without forming code

Example: SQP500|B-I0R

• JPW series:

<Code 13-17>: without resistance value code

Example: **JPW-06-T-52-**

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Yageo:

MFR-25FBF52-4K7 MFR-25FBF52-698K MFR-25FBF52-90K9 MFR-25FTE52-51R MFR-25FBF52-23R2 MFR-25FBF52-23R7 MFR-25FBF52-240K MFR-25FBF52-240R MFR-25FBF52-243K MFR-25FBF52-243R MFR-25FBF52-249K MFR-25FBF52-249R MFR-25FBF52-24K MFR-25FBF52-24K3 MFR-25FBF52-24K9 MFR-25FBF52-24R MFR-25FBF52-24R3 MFR-25FBF52-24R9 MFR-25FBF52-255K MFR-25FBF52-255R MFR-25FBF52-25K5 MFR-25FBF52-25R5 MFR-25FBF52-261K MFR-25FBF52-261R MFR-25FBF52-267K MFR-25FBF52-267R MFR-25FBF52-26K1 MFR-25FBF52-26K7 MFR-25FBF52-26R1 MFR-25FBF52-26R7 MFR-25FBF52-270K MFR-25FBF52-270R MFR-25FBF52-274K MFR-25FBF52-274R MFR-25FBF52-27K MFR-25FBF52-27K4 MFR-25FBF52-27R MFR-25FBF52-27R4 MFR-25FBF52-280K MFR-25FBF52-280R MFR-25FBF52-287K MFR-25FBF52-287R MFR-25FBF52-28K MFR-25FBF52-28K7 MFR-25FBF52-28R MFR-25FBF52-28R7 MFR-25FBF52-294K MFR-25FBF52-294R MFR-25FBF52-29K4 MFR-25FBF52-29R4 MFR-25FBF52-2K MFR-25FBF52-2K05 MFR-25FBF52-2K1 MFR-25FBF52-2K15 MFR-25FBF52-2K2 MFR-25FBF52-2K21 MFR-25FBF52-2K26 MFR-25FBF52-2K32 MFR-25FBF52-2K47 MFR-25FBF52-2K4 MFR-25FBF52-2K43 MFR-25FBF52-2K49 MFR-25FBF52-2K55 MFR-25FBF52-2K61 MFR-25FBF52-2K67 MFR-25FBF52-2K7 MFR-25FBF52-2K74 MFR-25FBF52-2K8 MFR-25FBF52-2K87 MFR-25FBF52-2K94 MFR-25FBF52-2M MFR-25FBF52-2M2 MFR-25FBF52-2M26 MFR-25FBF52-2M32 MFR-25FBF52-2M43 MFR-25FBF52-2M49 MFR-25FBF52-2M55 MFR-25FBF52-2M7 MFR-25FBF52-2M74 MFR-25FBF52-2M8 MFR-25FBF52-2M87 MFR-25FBF52-2R MFR-25FBF52-2R1 MFR-25FBF52-300K MFR-25FBF52-300R MFR-25FBF52-301K MFR-25FBF52-301R MFR-25FBF52-309K MFR-25FBF52-309R MFR-25FBF52-30K MFR-25FBF52-30K1 MFR-25FBF52-30K9 MFR-25FBF52-30R MFR-25FBF52-30R1 MFR-25FBF52-30R9 MFR-25FBF52-316K MFR-25FBF52-316R MFR-25FBF52-31K6 MFR-25FBF52-31R6 MFR-25FBF52-324K