

Metal Film Resistors

Precision Type

Normal & Miniature Style [MFP Series]



INTRODUCTION

The MFP Series Metal Film Precision Resistors are manufactured using vacuum sputtering system to deposit multiple layers of mixed metals alloy and passive 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. Ultra high precision resistors, ultra high stability, ultra low temperature coefficient.

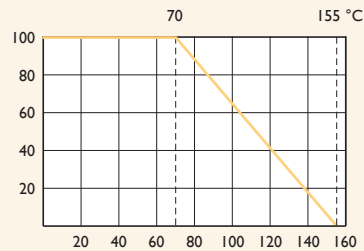
FEATURES

Power Rating	1/6W, 1/4W, 0.4W, 1/2W, 0.6W, 1W, 2W, 3W
Resistance Tolerance	0.1%, $\pm 0.25\%$
T.C.R.	$\pm 15\text{ppm}/^{\circ}\text{C}$, $\pm 25\text{ppm}/^{\circ}\text{C}$

DERATING CURVE

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

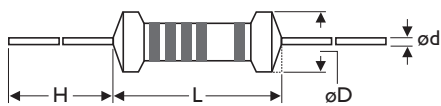
Rated Load (%)



Ambient Temperature (°C)

DIMENSIONS

Unit: mm



STYLE

DIMENSION

Normal	Miniature	L	øD	H	ød
MFP-12	MFP25S	3.4 \pm 0.3	1.9 \pm 0.2	28 \pm 2.0	0.45 \pm 0.05
MFP204	-	3.4 \pm 0.3	1.9 \pm 0.2	28 \pm 2.0	0.45 \pm 0.05
MFP-25	MFP50S	6.3 \pm 0.5	2.4 \pm 0.2	28 \pm 2.0	0.55 \pm 0.05
MFP207	-	6.3 \pm 0.5	2.4 \pm 0.2	28 \pm 2.0	0.55 \pm 0.05
MFP-50	MFP1WS	9.0 \pm 0.5	3.3 \pm 0.3	26 \pm 2.0	0.55 \pm 0.05
MFP100	MFP2WS	11.5 \pm 1.0	4.5 \pm 0.5	35 \pm 2.0	0.8 \pm 0.05
MFP200	MFP3WS	15.5 \pm 1.0	5.0 \pm 0.5	33 \pm 2.0	0.8 \pm 0.05

Note:

ELECTRICAL CHARACTERISTICS

STYLE	MFP-12	MFP25S	MFP204	MFP-25	MFP50S	MFP207	MFP-50	MFPIWS	MFPI00	MFP2WS	MFP200	MFP3WS
Power Rating at 70°C	1/6W	1/4W	0.4W	1/4W	1/2W	0.6W	1/2W	1W		2W		3W
Maximum Working Voltage	150V	200V		250V			350V	400V	500V			
Maximum Overload Voltage	300V	400V		500V	600V		700V	800V	1,000V			
Dielectric Withstanding Vol.	300V			500V				700V	1,000V			
Resistance Range	10 Ω - 1 M Ω for E192 series value											
Operating Temp. Range	-55°C to +155°C											
Temperature Coefficient	± 15 ppm/°C, ± 25 ppm/°C											

Note: Special value is available on request

ENVIRONMENTAL CHARACTERISTICS

PERFORMANCE TEST	TEST METHOD		APPRAISE
Short Time Overload	JIS-C-5202 5.5	2.5 times RCWV for 5 Sec.	$\pm 0.1\% + 0.05 \Omega$
Dielectric Withstanding Voltage	JIS-C-5202 5.7	in V-Block for 60 Sec.	By type
Temperature Coefficient	JIS-C-5202 5.2	-55°C to +155°C	By type
Insulation Resistance	JIS-C-5202 5.6	in V-Block	$> 10,000 M \Omega$
Solderability	JIS-C-5202 6.5	260 ± 5 °C for 5 ± 0.5 Sec.	95% Min. coverage
Resistance to Solvent	JIS-C-5202 6.9	IPA for 1 Min. with ultrasonic	No deterioration of coatings and markings
Terminal Strength	JIS-C-5202 6.1	Direct load for 10 Sec. in the direction of the terminal leads	≥ 2.5 kg (24.5N)
Pulse Overload	JIS-C-5202 5.8	4 times RCWV 10,000 cycles (1 Sec. on, 25 Sec. off)	$\pm 1.0\% + 0.05 \Omega$
Load Life in Humidity	JIS-C-5202 7.9	40 ± 2 °C, 90-95% RH at RCWV for 1,000 Hr. (1.5 Hr. on, 0.5 Hr. off)	$\pm 1.0\% + 0.05 \Omega$
Load Life	JIS-C-5202 7.10	70°C at RCWV for 1,000 Hr. (1.5 Hr. on, 0.5 Hr. off)	$\pm 1.0\% + 0.05 \Omega$
Temperature Cycling	JIS-C-5202 7.4	-55°C \Rightarrow Room Temp. \Rightarrow +155°C \Rightarrow Room Temp. (5 cycles)	$\pm 0.25\% + 0.05 \Omega$
Resistance to Soldering Heat	JIS-C-5202 6.4	350 ± 10 °C for 3 ± 0.5 Sec.	$\pm 0.25\% + 0.05 \Omega$

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

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