

## Metal Film Resistors

# High Power & Flame-Proof Type

## Ultra Miniature Style [ FMP Series ]



### INTRODUCTION

The FMP Series Metal Film High Power 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 pink color lacquer.

### FEATURES

Power Rating	1/2W, 1W, 2W, 3W, 4W
Resistance Tolerance	±1%, ±5%
T.C.R.	±100ppm/°C
Flameproof Multi-layer Coating Meets	UL-94V-0
Flameproof Feature Meets Overload Test	UL-1412

### DERATING CURVE

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



### DIMENSIONS

Unit: mm



STYLE	DIMENSION			
	L	øD	H	ød
Ultra Miniature				
FMP-50	3.4±0.3	1.9±0.2	28±2.0	0.45±0.05
FMP100	6.3±0.5	2.4±0.2	28±2.0	0.55±0.05
FMP200	9.0±0.5	3.9±0.3	26±2.0	0.55±0.05
FMP3WS	11.5±1.0	4.5±0.5	35±2.0	0.8±0.05
FMP300	15.5±1.0	5.0±0.5	33±2.0	0.8±0.05
FMP4WV	17.0±1.0	7.5±0.5	32±2.0	0.8±0.05

Note:

## ELECTRICAL CHARACTERISTICS

STYLE	FMP-50	FMP100	FMP200	FMP3WS	FMP300	FMP4WV
Power Rating at 70°C	1/2W	1W	2W	3W		4W
Maximum Working Voltage	200V	350V	500V		750V	
Maximum Overload Voltage	400V	600V	700V		1,000V	
Voltage Proof on Insulation	300V	500V				
Resistance Range	1Ω - 10MΩ & 0Ω for E24 & E96 series value					
Operating Temp. Range	-55°C to +155°C					
Temperature Coefficient	±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.	>1,000MΩ
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
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	±2.0%+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)	±2.0%+0.05Ω
Temperature Cycling	IEC 60115-1 4.19 -55°C ⇌ Room Temp. ⇌ +155°C ⇌ Room Temp. (5 cycles)	±1.0%+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	±0.25%+0.05Ω
Accidental Overload Test	IEC 60115-1 4.26 4 times RCWV for 1 Min.	No evidence of flaming or arcing

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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