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DIRECT

Electronics Tech.

(MF)

Precision Resistors

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► Product Introduction

|| Precision metal-film resistors for low-cost uses.

Features :

- Low cost, low noise, operating temperature range $-55^{\circ}\text{C} \sim 155^{\circ}\text{C}$
- Precision tighted tolerance available in $\pm 0.1\%$, $\pm 0.25\%$, $\pm 0.5\%$, $\pm 1\%$
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes

Applications :

- Telecom
- Test and measurement
- All general purpose applications

Direct offers a low-cost alternative commercial metal film resistor for precision applications. The MF series offers tight tolerances and low TCRs over a wide resistance range and are suitable for applications where long-term stability is paramount.

The MF is available in a resistance range of 10Ω to $1\text{M}\Omega$ with a standard resistance tolerance of $\pm 1\%$ and a temperature coefficient of resistance (TCR) of $+15/-25\text{ppm}/^{\circ}\text{C}$, although other tolerances and TCRs are available.

The resistance element in these devices is a precisely controlled thin film of metal alloy deposited on a high quality alumina rod. Plated caps are force-fitted before the assembly is trimmed using advanced trimming techniques to ensure excellent performance and low electrical noise.

Leads are welded to the end caps prior to the resistor being coated with epoxy, and color band marking applied. A variety of standard lead forms are available for use where auto-insertion is not available or practical. This gives the advantage of the value being shown, even if the resistor is machine preformed or auto-inserted.

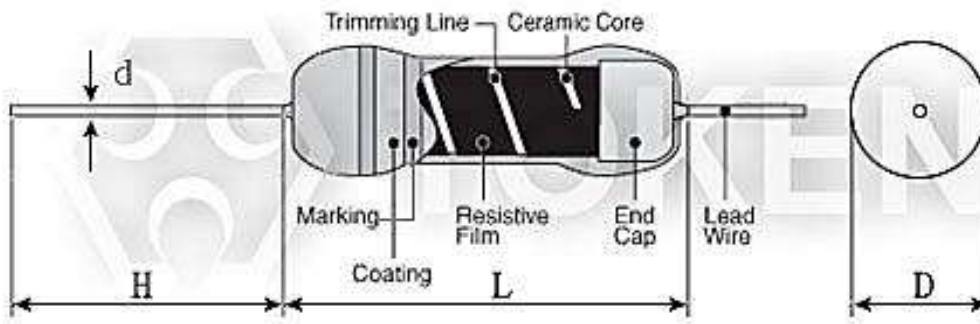
The MF is RoHS compliant with 100% lead free; Contact us with your specific needs. For more information, please link to Direct official website "[General Purpose Resistors](#)".



► **Dimensions & Specifications**

Dimensions & Specifications (Unit: mm) (MF)

STYLE	MIL STYLE	POWER RATING(W)		DIMENSION (mm)				MAX WORKING VOLTAGE		MAX OVERLOAD VOLTAGE	
		RN	RNS	L	D	H	d ± 0.05	RN	RNS	RN	RNS
MF - 12	RN-50	1/8W	1/4W	3.2± 0.2	1.5 ± 0.2	26 ± 1.0	0.40~0.45	200	150	400	300
MF - 25	RN-55	1/4W	1/2W	6.0 ± 0.3	2.3 ± 0.3	26 ± 1.0	0.40~0.50	250	200	500	400
MF - 50	RN-60	1/2W	1W	9.0 ± 0.5	3.0 ± 0.5	26 ± 1.0	0.50~0.55	350	250	700	500
MF - 100	RN-65	1W	2W	11 ± 1.0	4.0 ± 0.5	35 ± 3.0	0.75~0.80	500	300	1000	600
MF - 200	RN-70	2W	3W	15 ± 1.0	5.0 ± 0.5	35 ± 3.0	0.75~0.80	500	350	1000	700



Metal Film Resistors (MF) Dimensions (Unit: mm)

► Resistance Range

Resistance Range (MF)

STYLE	MIL STYLE	TOLERANCE	TC+15-25PPM	TC+50PPM	TC+100PPM	REMARK
MF-12	RN-50	±1% ±0.5% ±0.25%	100Ω-100KΩ 100Ω-100KΩ 100Ω-100KΩ	10Ω-1MΩ	10Ω-1MΩ	* Standard resistance is 10Ω-1MΩ, below or over this resistance on request.
MF-25	RN-55	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-511KΩ 51.1Ω-511KΩ 100Ω-300KΩ 100Ω-300KΩ	10Ω-1MΩ	10Ω-1MΩ	
MF-50	RN-60	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-1KΩ 51.1Ω-1KΩ 100Ω-551KΩ 100Ω-330KΩ	10Ω-1MΩ	10Ω-1MΩ	
MF-100	RN-65	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-1KΩ 51.1Ω-1KΩ 100Ω-551KΩ 100Ω-330KΩ	10Ω-1MΩ	10Ω-1MΩ	
MF-200	RN-70	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-1KΩ 51.1Ω-1KΩ 100Ω-551KΩ 100Ω-330KΩ	10Ω-1MΩ	10Ω-1MΩ	

► Electrical Performance

Electrical Performance (MF)

REQUIREMENTS	CHARACTERISTICS	JIS C 5202	MIL-R-10509F
Operating Temp. Range	-55°C ~ 155°C		
Temp Coefficient (°C)	±25 ±50 ±100	5.2	4.6.12
Short Time Overload	±(0.5%+0.05Ω)	5.5 A	4.6.6
Dielectric Withstanding V	±(0.5%+0.05Ω)	5.7 A	4.6.8
Effect of Soldering	±(0.5%+0.05Ω)	6.4 350°C 3 sec	4.6.10
Temperature Cycling	±(0.5%+0.05Ω)	7.4	4.6.4
Low Temp Operation	±(0.5%+0.05Ω)		4.6.5
Terminal Strength	±(0.5%+0.05Ω)	6.1	4.6.7
Moisture Resistance	±(1%+0.05Ω)	7.9 1,000hr	MIL R-22684 4.6.10
Load Life	±(1%+0.05Ω)	7.10 1,000hr	4.6.13
Storage	±(0.2%+0.05Ω)	Shelved one year in a room of normal temperature and humidity	



Order Codes

Order Codes (MF)

MF-25	1/4W	100R		F		TB	
Part Number	Rated Power (W)	Resistance Value (Ω)		Resistance Tolerance (%)		Package	
MF		10R	10 Ω	B	$\pm 0.10\%$	P	Bulk
		100R	100 Ω	C	$\pm 0.25\%$	TB	Taping Box
		1K	1K Ω	D	$\pm 0.5\%$		
		1M	1M Ω	F	$\pm 1.0\%$		

General Information

General Purpose Resistors with Customized Service

Direct Electronics is expanding business to include a broad range of General Purpose Resistor products designed for high volume applications. This expanded range of commercial resistor presents a more comprehensive product offering for Customer Experience Management (CEM) and other high volume customers that require quality products at competitive pricing.

Backed by the same customer service, technical support and quality assurance that Direct has always provided, these new commercial products enable you the opportunity to source a wider range of resistors from a trusted supplier.

General Use

When an ambient temperature exceeds a rated ambient temperature, resistor shall be applied on the derating curve by derating the load power. General purpose resistor under overloads is not combustion resistant and is likely to emit, flame, gas, smoke, red heat, etc. Flame retardant resistor generally emits smoke and red heat in a certain power and over but do not emit fire or flame.

When resistors are shielded or coated with resin etc., stress from the storage heat and the resins are applied. So, performance and reliability should be checked well before use.

When a voltage higher than rated is applied in a short time (single pulse, repeated pulses, surge, etc.), it does not necessarily ensure safety that an effective wattage is not higher than a rated wattage. Then consult with us with your specified pulse wave shape. Resistors shall be used in a condition causing no dew condensation.

Keep temperature from rising by choosing resistor with a higher rated capacity; do not use a component having the exact load value required. For considerations of safety in extended period applications, the rating should be more than four times higher than the actual wattage involved, but never use resistors at less than 25% of its rated power.

In applications where resistors are subject to intermittent current surges and spikes, be sure in advance that the components selected are capable of withstanding brief durations of increased load.

Do not exceed the recommended rated load. Resistor must use within the rated voltage range to prevent the shortening of service life and/or failure of the wound resistance elements.

Minimum load: Resistor must be utilized at 1/10 or more of the rated voltage to prevent poor conductance due to oxidation build-up. For basic particulars for cautions, refer to EIAJ Technical Report RCR-2121 "Guidance for care note on fixed-resistors".

