

# Metal Film Precision Resistors

## Precision Metal-Film Resistors for Low-Cost Uses

### ▶ Preview

Token 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  $10\Omega$  to  $1M\Omega$  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 colour 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.



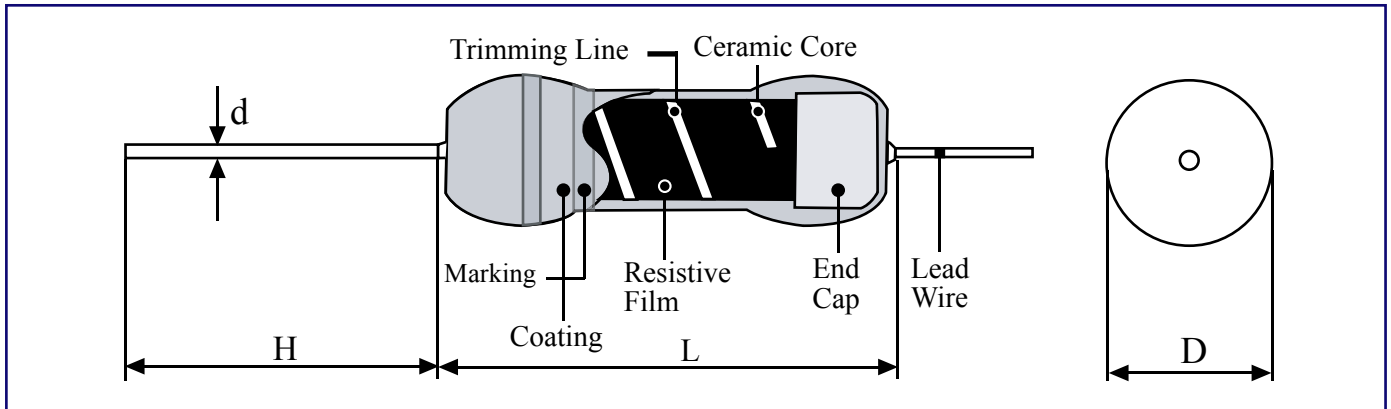
### ▶ Features

- Low cost, low noise, operating temperature range  $-55^\circ\text{C} \sim 155^\circ\text{C}$
- Precision tight 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

## ► Dimensions & Specifications (Unit: mm)



| 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 |

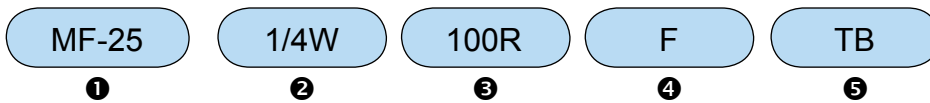
## ► Resistance Range

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

## Electrical Performance

| 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 |                    |

## How to Order



❶ Part Number: MF

❷ Rated Power (W)

❸ Resistance Value (Ω)

| Code | Resistance Value |
|------|------------------|
| 10R  | 10Ω              |
| 100R | 100Ω             |
| 1K   | 1KΩ              |
| 1M   | 1MΩ              |

❹ Resistance Tolerance (%)

| Code | Resistance Tolerance |
|------|----------------------|
| B    | ±0.10%               |
| C    | ±0.25%               |
| D    | ±0.5%                |
| F    | ±1.0%                |

❺ Package

| Code | Package    |
|------|------------|
| P    | Bulk       |
| TB   | Taping Box |

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