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# Precision Metal Film Fixed Resistors

## Performance Specification

|                                 |   |
|---------------------------------|---|
| Temperature Coefficient         | Within the maximum temperature coefficient specified.   |
| Short Time Overload             | $\pm(0.5\% + 0.05\Omega)\text{Max}$ , with no evidence of mechanical damage.                            |
| Insulation Resistance           | Min. 10,000 Mega Ohm  |
| Dielectric Withstanding Voltage | No evidence of flashover, mechanical damage, arcing or insulation breakdown.                            |
| Pulse Overload                  | $\pm(1.0\% + 0.05\Omega)\text{Max}$ , with no evidence of mechanical damage.                            |
| Terminal Strength               | No evidence of mechanical damage.   |
| Resistance to Soldering Heat    | $\pm(1.0\% + 0.05\Omega)\text{Max}$ , with no evidence of mechanical damage.                            |
| Solderability                   | Min. 95% coverage.  |
| Resistance to Solvent           | No deterioration of protective coating and markings.  |
| Temperature Cycling             | $\pm(1.0\% + 0.05\Omega)\text{Max}$ , with no evidence of mechanical damage.                            |
| Humidity (Steady state)         | $\pm(2.0\% + 0.05\Omega)\text{Max}$ , with no evidence of mechanical damage.                            |
| Load Life in Humidity           | Normal type: $\pm(1.5\% + 0.05\Omega)\text{Max}$<br>Non-Flame type: $\pm(5.0\% + 0.05\Omega)\text{Max}$ |
| Load Life                       | Normal type: $\pm(1.5\% + 0.05\Omega)\text{Max}$<br>Non-Flame type: $\pm(5.0\% + 0.05\Omega)\text{Max}$ |

## Ordering Procedure: Ex.: MFR 1/2W, +/-5%, 200PPM, 10Ω, T/B-1000

|          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>M</b> | <b>F</b> | <b>0</b> | <b>W</b> | <b>2</b> | <b>J</b> | <b>J</b> | <b>0</b> | <b>1</b> | <b>0</b> | <b>0</b> | <b>A</b> | <b>1</b> | <b>0</b> |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

**Type:**  
MF = Metal Film  
MT = Metal Film  
Tin plated  
copper steel  
lead wire

**Wattage:**  
Normal size  
W8 = 1/8W  
W4 = 1/4W  
W2 = 1/2W  
1W = 1W  
2W = 2W  
3W = 3W

Small size  
S4 = 1/4W-S  
S2 = 1/2W-S  
06 = 0.6W-S  
M7 = 0.75W-S  
1S = 1W-S  
2S = 2W-S  
3S = 3W-S

Extra small size  
U2 = 1/2W-SS  
04 = 0.4W-SS

**Resistance Value:**

- E-24 series:  
1<sup>st</sup> digit is "0"  
2<sup>nd</sup> & 3<sup>rd</sup> digits are the significant figures of the resistance  
4<sup>th</sup> indicates the number of zeros:  
"J" ~ 0.1, "K" ~ 0.01  
**Ex.:** 4.7Ω ~ 47J, 4.7KΩ ~ 472
- E-96 series:  
1<sup>st</sup> to 3<sup>rd</sup> digits are the significant figures of the resistance and the 4<sup>th</sup> digit indicates the number of zeros.  
**Ex.:** 1.33KΩ = 1331

**Packing Type:**  
A = Tape/Box  
T = Tape/Reel  
B = Bulk/Box  
P = Tape/Box of PT-26mm

**Feature:**  
0 = Standard  
F = Non-Flame  
I = Non-Inductive

**Tolerance:**  
B =  $\pm 0.1\%$     F =  $\pm 1\%$   
C =  $\pm 0.25\%$     G =  $\pm 2\%$   
D =  $\pm 0.5\%$     J =  $\pm 5\%$

**Packing Qty:**  
1 = 1,000 pcs.    2 = 2,000 pcs.  
4 = 4,000 pcs.    5 = 5,000 pcs.  
A = 500 pcs.    B = 2,500 pcs.  
0 = Bulk/Box

**Additional Information:**  
P = Panasert type  
1 = Avisert type  
2 = Avisert type 2  
3 = Avisert type 3  
0 = PT-52mm, PT-26mm,  
Standard lead wire for Bulk/Box  
8 = PT-58mm  
9 = PT-64mm  
7 = Lead wire (H) 38mm

**PPM requirement:**  
B = 15ppm  
C = 25ppm  
F = 50ppm  
G = 100ppm  
J = 200ppm

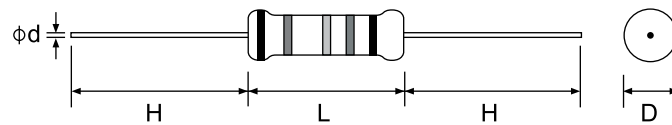
## Precision Metal Film Fixed Resistors

### Features

- EIA standard color coding
- Non-Flame type available
- Low noise & voltage coefficient
- Low temperature coefficient range
- Wide precision range in small package
- Too low or too high ohmic value can be supplied on a case to case basis
- Nichrome resistor element provides stable performance in various environment
- Multiple epoxy coating on vacuum deposited metal film provides superior moisture protection



Standard : 2% ,5% ,10% -- E-24 series  
1% -- E-96 series



| Part No.           | Style    | Power Rating at 70°C | Dimension (mm) |       |     |                     |    | Std Packing Qty |
|--------------------|----------|----------------------|----------------|-------|-----|---------------------|----|-----------------|
|                    |          |                      | D Max          | L Max | H±3 | d±0.05              | PT |                 |
| <b>Normal Size</b> |          |                      |                |       |     |                     |    |                 |
| MF0W8              | MF 12    | 1/8W (0.125W)        | 1.85           | 3.5   | 28  | 0.45                | 52 | 5,000           |
| MF0W4              | MF 25    | 1/4W (0.25W)         | 2.5            | 6.8   | 28  | 0.54 <sup>(1)</sup> | 52 | 5,000           |
| MF0W2              | MF 50    | 1/2W (0.50W)         | 3.5            | 10.0  | 28  | 0.54                | 52 | 1,000           |
| MF01W              | MF 100   | 1W                   | 5.0            | 12.0  | 25  | 0.70                | 52 | 1,000           |
| MF02W              | MF 200   | 2W                   | 5.5            | 16.0  | 28  | 0.70                | 64 | 1,000           |
| MF03W              | MF 300   | 3W                   | 6.5            | 17.5  | 28  | 0.75                | 64 | 500             |
| <b>Small Size</b>  |          |                      |                |       |     |                     |    |                 |
| MF0S4              | MF 25-S  | 1/4W (0.25W)         | 1.85           | 3.5   | 28  | 0.45                | 52 | 5,000           |
| MFF04              | MF 40-SS | 0.4W                 | 1.9            | 3.7   | 28  | 0.45                | 52 | 5,000           |
| MFFU2              | MF 50-SS | 1/2W (0.50W)         | 2.5            | 6.8   | 28  | 0.54 <sup>(1)</sup> | 52 | 5,000           |
| MF0S2              | MF 50-S  | 1/2W (0.50W)         | 3.0            | 9.0   | 28  | 0.54                | 52 | 4,000           |
| MF006              | MF 60-S  | 0.6W                 | 2.5            | 6.8   | 28  | 0.54 <sup>(1)</sup> | 52 | 5,000           |
| MF0M7              | MF 75-S  | 0.75W                | 3.5            | 10.0  | 28  | 0.54                | 52 | 1,000           |
| MF01S              | MF 100-S | 1W                   | 3.5            | 10.0  | 28  | 0.54                | 52 | 1,000           |
| MF02S              | MF 200-S | 2W                   | 5.0            | 12.0  | 25  | 0.70                | 52 | 1,000           |
| MF03S              | MF 300-S | 3W                   | 5.5            | 16.0  | 28  | 0.70                | 64 | 1,000           |

**Note:**

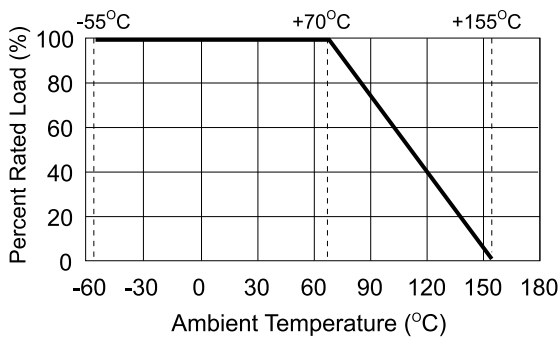
- Extra small size types (-SS) are Non flame coating (Dark Green color).
- <sup>(1)</sup> Lead diameter of MF0W4, MF006 & MFFU2 can be provided in 0.50mm, 0.54mm & 0.60mm

Precision Metal Film Fixed Resistors

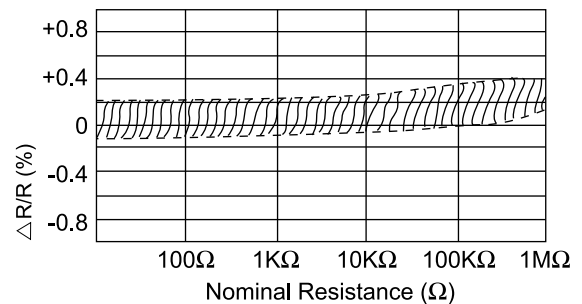
| Part No. | Style    | Max Working Voltage | Max Overload Voltage | Dielectric Withstanding Voltage | Tolerance % | Resistance Range | T.C.R.     | Special Order |                  |           |
|----------|----------|---------------------|----------------------|---------------------------------|-------------|------------------|------------|---------------|------------------|-----------|
|          |          |                     |                      |                                 |             |                  |            | Tolerance %   | Resistance Range | T.C.R.    |
| MF0W8    | MF 12    | 200V                | 400V                 | 400V                            | ±1%         | 10Ω ~ 1MΩ        | ± 50PPM/°C | ±0.25%        | 51.1Ω ~ 200KΩ    | ±15PPM/°C |
| MF0S4    | MF 25-S  |                     |                      |                                 | ±2%         | 10Ω ~ 1MΩ        | ±100PPM/°C | ±0.5%         | 51.1Ω ~ 511KΩ    | ±25PPM/°C |
| MFF04    | MF 40-SS |                     |                      |                                 | ±5%         | 1Ω ~ 1MΩ         | ±200PPM/°C |               | ±50PPM/°C        |           |
| MF0W4    | MF 25    | 250V                | 500V                 | 500V                            | ±1%         | 10Ω ~ 1MΩ        | ± 50PPM/°C | ±0.1%         | 100Ω ~ 100KΩ     | ±15PPM/°C |
| MF006    | MF 60-S  |                     |                      |                                 | ±2%         | 10Ω ~ 1MΩ        | ±100PPM/°C | ±0.25%        | 51.1Ω ~ 330KΩ    | ±25PPM/°C |
| MFFU2    | MF 50-SS |                     |                      |                                 | ±5%         | 1Ω ~ 1MΩ         | ±200PPM/°C | ±0.5%         | 10Ω ~ 1MΩ        | ±50PPM/°C |
| MF0W2    | MF 50    | 350V                | 700V                 | 700V                            | ±1%         | 10Ω ~ 1MΩ        | ±50PPM/°C  | ±0.1%         | 100Ω ~ 330KΩ     | ±15PPM/°C |
| MF0S2    | MF 50-S  |                     |                      |                                 | ±2%         | 10Ω ~ 1MΩ        | ±100PPM/°C | ±0.25%        | 51.1Ω ~ 511KΩ    | ±25PPM/°C |
| MF0M7    | MF 75-S  |                     |                      |                                 | ±5%         | 1Ω ~ 1MΩ         | ±200PPM/°C | ±0.5%         | 10Ω ~ 1MΩ        | ±50PPM/°C |
| MF01S    | MF 100-S |                     |                      |                                 |             |                  |            |               |                  |           |
| MF02S    | MF 200-S | 500V                | 1,000V               | 1,000V                          | ±1%         | 51.1Ω ~ 1MΩ      | ±50PPM/°C  | ±0.1%         | 100Ω ~ 330KΩ     | ±15PPM/°C |
| MF03S    | MF 300-S |                     |                      |                                 | ±2%         | 51.1Ω ~ 1MΩ      | ±100PPM/°C | ±0.25%        | 51.1Ω ~ 511KΩ    | ±25PPM/°C |
| MF01W    | MF 100   |                     |                      |                                 | ±5%         | 10Ω ~ 1MΩ        | ±200PPM/°C | ±0.5%         | 51.1Ω ~ 1MΩ      | ±50PPM/°C |
| MF02W    | MF 200   |                     |                      |                                 |             |                  |            |               |                  |           |
| MF03W    | MF 300   |                     |                      |                                 |             |                  |            |               |                  |           |

Note: MFFU2 (MF50-SS) Dielectric Withstanding Voltage Non flame 250V  
Epoxy 500V

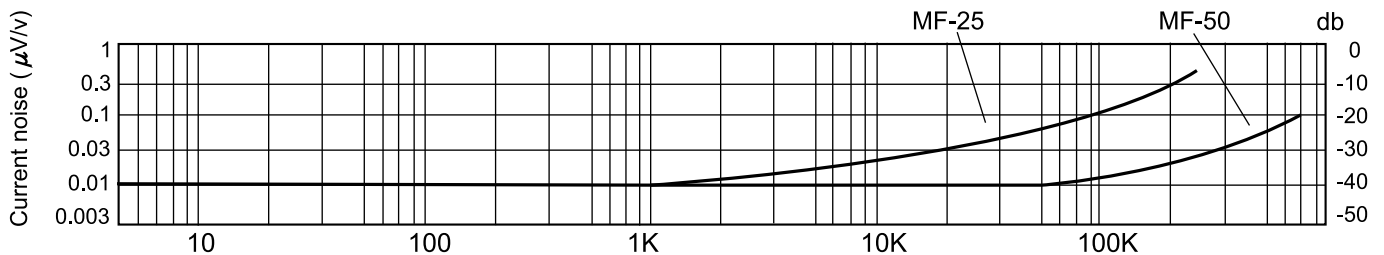
Derating Curve



Load Life



Current Noise Level



\* Only for your reference