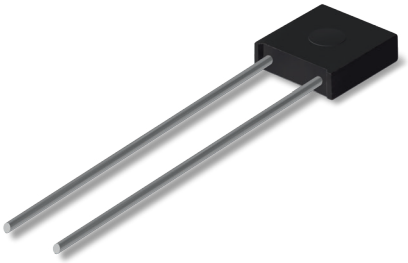
# Resistors

## Precision - Metal Foil Resistor — MR - series



- Very good Long Term Stability
- Any Resistance from 1Ω - 400kΩ
- Best Resistance Tolerance 0,005%
- Temperature Coefficient ±1 ppm/K
- Non - Inductance
- Low Current Noise
- Rugged Epoxy Housing

| Specification | MR9101 | MR9102 | MR9103 |
|---|---|---|---|
| Resistance Range (Ω) | 1 - 200k | 1 - 200k | 5 - 400k |
| Power Rating (Watts) | 0,3 (>150k 0,2) | 0,3 (>150k 0,2) | 0,5 (>200k 0,3) |
| Operating Voltage (V) | 250 (max.) | 250 (max.) | 300 (max.) |
| Tolerances (%) | 1Ω - 5Ω: ±0,5; ±1<br>5Ω - 30Ω : ±0,1; ±0,5; ±1<br>30Ω - 200k: ±0,005; ±0,01; ±0,02; ±0,05; ±0,1; ±0,5; ±1 | | 5Ω - 30Ω: ±0,1; ±0,5; ±1<br>30Ω - 400k: ±0,005; ±0,01; ±0,02; ±0,05; ±0,1; ±0,5; ±1 |
| Temperature Coefficient | 1Ω - 5Ω: 15ppm<br>5Ω - 30Ω: 5ppm<br>30Ω - 200k: 1*; 2,5; 5ppm | | 5Ω - 30Ω: 5ppm<br>30Ω - 400k: 1*; 2,5; 5ppm |
| | | | * Restricted operating temperature range 0 - 55°C |

| Mechanical Data | |
|---|---|
| Resistance Element | Metal Foil, special alloy |
| Carrier | Steatit |
| Housing | Epoxy - Moulded |
| Leads | Tin plated Copper |

| Parameter | Test | |
|---|---|---|
| Operating Temperature Range | | -65°C to 175°C |
| Thermal Shock | -65°C/30 min., +125°C/30 min., 5 Cycles | ±0,005% |
| Short Time Overload | 6x Related Power, 5 sec. | ±0,005% |
| Solderability | 240°C, 5 sec. | Covered > 95% |
| Soldering Heat Resistance | 260°C, 10 sec. | ±0,0025% |
| Insulation Resistance | 100 VDC, 2 min. | > 10000 MΩ |
| Shock | 100G, 6 ms, Saw Tooth, X, Y, 10x | ±0,0025% |
| Vibration, High Frequency | 20G, 10Hz-2kHz-10Hz, 20 min., X, Y, 4h each | ±0,0025% |
| Stability | 2x Related Voltage at 70°C, 1,5h ON, 0,5h OFF, 2000h | ±0,005% (typically) |
| Storage Life | 15 - 35°C, 15 - 75% RH, Loadfree, 10.000h | ±0,0025% |
| Current Noise | | -42dB |
| Voltage Coefficient | | 0,00003%/V |

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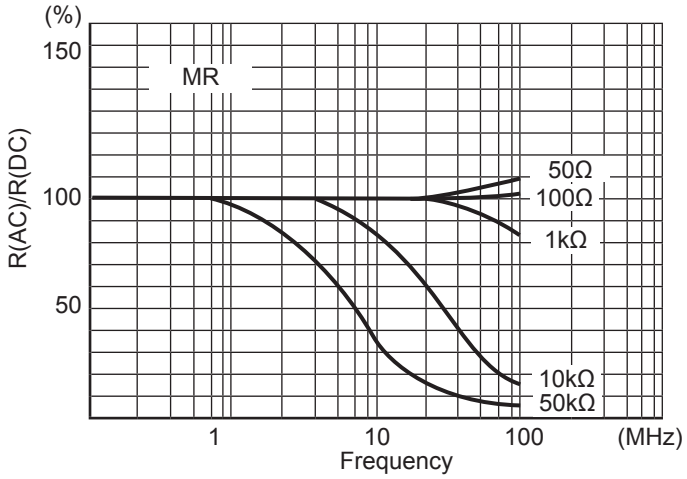
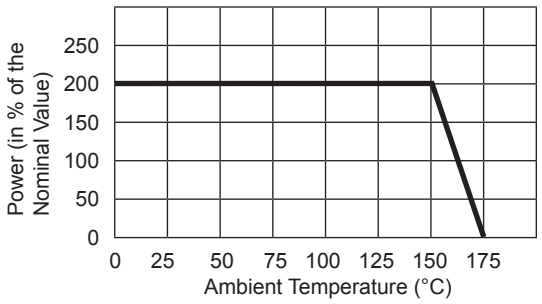
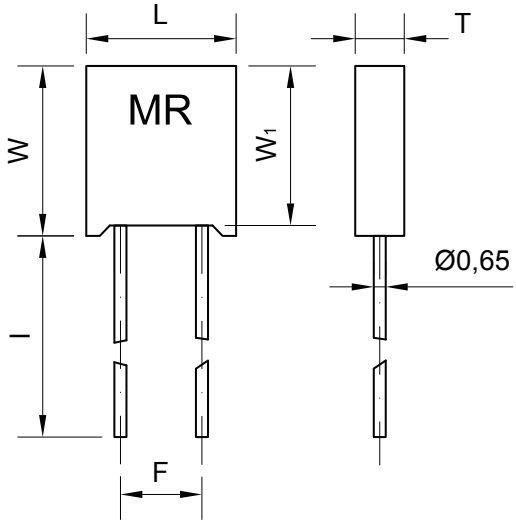
### Frequency Characteristics




### Power Derating Curve




### Technical Drawing




| Dimensions | L (±0,2) | W (±0,2) | $W_1$ (±0,2) | I (±10) | T (±0,2) | F (±0,25) |
|---|---|---|---|---|---|---|
| MR9101 | 7,9 | 8,3 | 8,0 | 25,0 | 2,8 | 3,81 |
| MR9102 | 7,9 | 8,3 | 8,0 | 10 | 2,3 | 5,08 |
| MR9103 | 13 | 10 | 9,5 | 10 | 4 | 7,5 |

All Dimensions in mm

### Ordering Information

| MR9105 | W0,1% | TK5 | 10k000 |
|---|---|---|---|
| **Type** | **Resistance Tolerance** | **Temperature Coefficent** | **Resistance Value** |
| | 1Ω - 5Ω: ±0,5; ±1<br>5Ω - 30Ω: ±0,1; ±0,5; ±1<br>30Ω - 400k: ±0,005; ±0,01; ±0,02; ±0,05; ±0,1; ±0,5; ±1 | 1Ω - 5Ω: ±15ppm<br>5Ω - 30Ω: ±5ppm<br>30Ω - 200k: ±1ppm, ±2,5ppm; ±5ppm | (1Ω - 400kΩ) |