Thin Film Microwave Resistor

The MIC resistor chips on alumina are designed with low shunt capacitance. Most lower value resistor geometrics are compatible with strip lines, making them ideally suited for microwave circuits.

These chips are manufactured using Vishay Electro-Films (EFI) sophisticated Thin Film equipment and manufacturing technology. The MICs are 100% electrically tested and visually inspected to MIL-STD-883.

FEATURES

- Wire bondable
- High frequency
- Small single chip size: 0.020" x 0.040"
- Case: 0402
- Microwave resistance range: 20 Ω to 500 Ω
- Overall resistance range: 2 Ω to 20 kΩ
- Alumina substrate
- Low stray capacitance: < 0.2 pF
- Resistor material: Tantalum nitride, self-passivating
- Moisture resistant
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

Vishay EFI MIC chip resistors provide excellent high-frequency response and are ideally suited for prototyping. Typical application areas are:
- Amplifiers
- Oscillators
- Attenuators
- Couplers
- Filters

TEMPERATURE COEFFICIENT OF RESISTANCE, VALUES, AND TOLERANCES

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance Range</td>
<td>2 to 20K</td>
<td>Ω</td>
</tr>
<tr>
<td>Tolerances</td>
<td>± 1</td>
<td>%</td>
</tr>
<tr>
<td>TCR</td>
<td>± 25, ± 50, ± 100, ± 200</td>
<td>ppm/°C</td>
</tr>
</tbody>
</table>

Note

- Only 20 Ω to 500 Ω are standard strip line designs for microwave applications

STANDARD ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise, MIL-STD-202, Method 308</td>
<td>-20 typ.</td>
<td>dB</td>
</tr>
<tr>
<td>Moisture Resistance, MIL-STD-202, Method 106</td>
<td>± 0.1 max. ΔR/R</td>
<td>%</td>
</tr>
<tr>
<td>Stability, 1000 h, +125 °C, 62 mW</td>
<td>± 0.2 max. ΔR/R</td>
<td>%</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>-55 to +125 °C</td>
<td>°C</td>
</tr>
<tr>
<td>Thermal Shock, MIL-STD-202, Method 107, Test Condition F</td>
<td>± 0.1 max. ΔR/R</td>
<td>%</td>
</tr>
<tr>
<td>High Temperature Exposure +150 °C, 1000 h</td>
<td>± 0.2 max. ΔR/R</td>
<td>%</td>
</tr>
<tr>
<td>Dielectric Voltage Breakdown</td>
<td>400</td>
<td>V</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>10¹² min.</td>
<td>Ω</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>100 max.</td>
<td>V</td>
</tr>
<tr>
<td>DC Power Rating at +70 °C (Derated to Zero at 150 °C)</td>
<td>0.125 max.</td>
<td>W</td>
</tr>
<tr>
<td>5x Rated Power Short-Time Overload, +25 °C, 5 s</td>
<td>± 0.1 max. ΔR/R</td>
<td>%</td>
</tr>
</tbody>
</table>
DIMENSIONS in inches

SCHEMATIC

IMPEDEANCE VS. FREQUENCY
50 Ω, 20 mil x 40 mil SIZE

MECHANICAL SPECIFICATIONS

PARAMETER
Chip Size
Chip Thickness
Chip Substrate Material
Resistor Material
Bonding Pad Size
Number of Pads
Pad Material
Backing
Tape and Reel Orientation

GLOBAL PART NUMBER INFORMATION

Global Part Number: MIC5000BKMSNHWS
Global Part Number Description: MIC 50 10 %, 100 ppm/°C, MIC trim, SnPb termination, no back metal, class H, WS

GLOBAL PART NUMBER INFORMATION

For technical questions, contact: efi@vishay.com
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