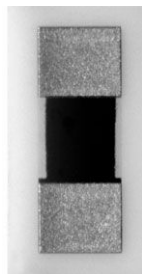


Thin Film Microwave Resistor



Product may not be to scale

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 k Ω
- 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



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

Vishay EFI MIC chip resistors provide excellent high-frequency response and are ideally suited for prototyping.

Typical application areas are:

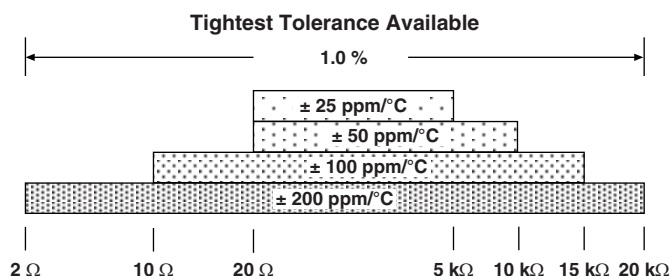
- Amplifiers
- Oscillators
- Attenuators
- Couplers
- Filters

TEMPERATURE COEFFICIENT OF RESISTANCE, VALUES, AND TOLERANCES

PARAMETER	VALUE	UNIT
Resistance Range	2 to 20K	Ω
Tolerances	± 1	%
TCR	$\pm 25, \pm 50, \pm 100, \pm 200$	ppm/ $^{\circ}$ C

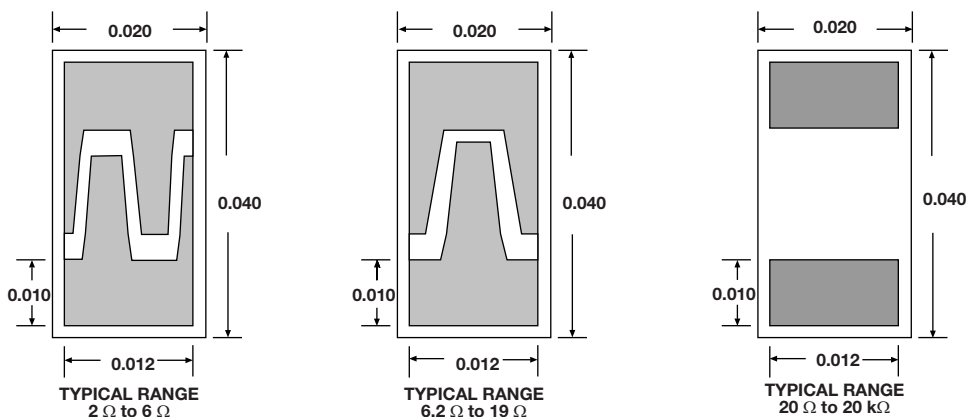
Note

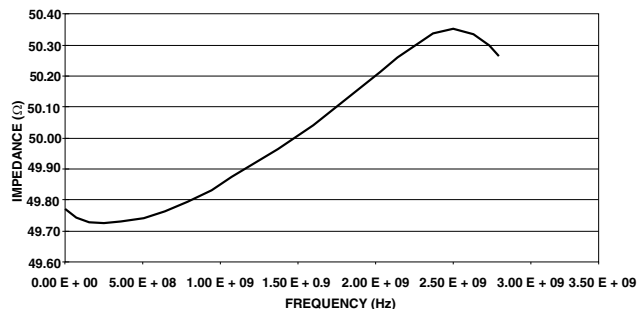
- Only 20 Ω to 500 Ω are standard strip line designs for microwave applications



STANDARD ELECTRICAL SPECIFICATIONS

PARAMETER	VALUE	UNIT
Noise, MIL-STD-202, Method 308	-20 typ.	dB
Moisture Resistance, MIL-STD-202, Method 106	± 0.1 max. $\Delta R/R$	%
Stability, 1000 h, +125 $^{\circ}$ C, 62 mW	± 0.2 max. $\Delta R/R$	%
Operating Temperature Range	-55 to +125	$^{\circ}$ C
Thermal Shock, MIL-STD-202, Method 107, Test Condition F	± 0.1 max. $\Delta R/R$	%
High Temperature Exposure +150 $^{\circ}$ C, 1000 h	± 0.2 max. $\Delta R/R$	%
Dielectric Voltage Breakdown	400	V
Insulation Resistance	10^{12} min.	Ω
Operating Voltage	100 max.	V
DC Power Rating at +70 $^{\circ}$ C (Derated to Zero at 150 $^{\circ}$ C)	0.125 max.	W
5x Rated Power Short-Time Overload, +25 $^{\circ}$ C, 5 s	± 0.1 max. $\Delta R/R$	%

DIMENSIONS in inches

SCHEMATIC

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

MECHANICAL SPECIFICATIONS

PARAMETER	
Chip Size	0.020" x 0.040" ± 0.003" (0.5 mm x 1.0 mm ± 0.076 mm)
Chip Thickness	0.010" ± 0.002" (0.254 mm ± 0.05 mm)
Chip Substrate Material	99.6 % alumina, 2 μ" to 4 μ" finish
Resistor Material	Tantalum nitride, self-passivating
Bonding Pad Size	0.010" x 0.012" (0.254 mm x 0.30 mm) min.
Number of Pads	2
Pad Material	25 kÅ minimum gold standard
Backing	None

TAPE AND REEL STANDARD LOAD ORIENTATION
Note

- VEFI will load die pattern side up in tape unless otherwise specified



Product image may not be to scale



GLOBAL PART NUMBER INFORMATION

Global Part Number: MIC5000BKKMSNHWS

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

M I C 5 0 0 0 B K K M S N H W S

MODEL	RESISTANCE	RESISTANCE MULTIPLIER CODE	TOL. CODE (%)	TCR (ppm/°C)	TRIM STYLE	TERMINATION	BACK METAL	VISUAL CLASS	PACKAGING CODE
MIC 20 x 40 size microwave resistor TaN on alumina	First 4 digits are significant figures of resistance	C = 0.001 B = 0.01 A = 0.1 0 = 1 1 = 10	F = 1.0 G = 2.0 H = 2.5 J = 5.0 K = 10 M = 20	E = ± 25 C = ± 50 K = ± 100 L = ± 200 R = 0 / -250	M = microwave S = standard	G = Au S = SnPb A = Al T = lead (Pb)-free (e1)	G = Au N = none	H = class H K = class K	WS = waffle pack 100 min., 1 mult. TS = tape and reel 100 min., 1 mult. TF = tape and reel 5000 min., 1 mult.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.