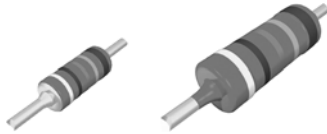


## Professional Thin Film Leaded Resistors



### DESCRIPTION

A homogeneous film of metal alloy is deposited on a high grade ceramic body. After a helical groove has been cut in the resistive layer, tinned connecting wires of electrolytic copper are welded to the end-caps. The resistors are coated with lacquer which provides electrical, mechanical, and climatic protection. Four or five color code rings designate the resistance value and tolerance according to **IEC 60062**. Suitable replacements for MRS16 and MRS25 are MBA/SMA 0204 and MBB/SMA 0207 professional.

### FEATURES

- Technology: Metal film
- Professional resistors in small outlines
- Low noise
- Lead (Pb)-free solder contacts
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Compatible to RoHS Directive 2002/95/EC



**RoHS**  
COMPLIANT

### APPLICATIONS

- All general purpose applications

TECHNICAL SPECIFICATIONS			
DESCRIPTION	UNIT	MRS16	MRS25
Resistance Range	$\Omega$	4.99 to 1M	1 to 10M
Resistance Tolerance	%	$\pm 1$	$\pm 1$
Resistance Series		E24, E96	E24, E96
Rated Dissipation, $P_{70}$	W	0.4	0.6
Thermal Resistance ( $R_{th}$ )	K/W	170	150
Temperature Coefficient	ppm/K	$\pm 50$	$\pm 50$
Operating Voltage, $U_{max}$ . AC/DC	V	200	350
Basic Specifications		IEC 60 115-1	IEC 60 115-1
Climatic Category (IEC 60068-1)		55/155/56	55/155/56
Max. Resistance Change for Resistance Range, $\Delta R$ max., after:			
Load (1000 h, $P_{70}$ )		$\pm (0.5 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
Long Term Damp Heat Test (56 Days):			
MRS16: $4.99 \Omega \leq R \leq 332 \text{ k}\Omega$ ; MRS25: $1 \Omega \leq R \leq 1 \text{ M}\Omega$		$\pm (0.5 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
MRS16: $R > 332 \text{ k}\Omega$ ; MRS25: $R > 1 \text{ M}\Omega$		$\pm (2 \% R + 0.05 \Omega)$	$\pm (2 \% R + 0.05 \Omega)$
Soldering (260 °C, 10 s):			
MRS16: $4.99 \Omega \leq R \leq 332 \text{ k}\Omega$ ; MRS25: $1 \Omega \leq R \leq 1 \text{ M}\Omega$		$\pm (0.1 \% R + 0.05 \Omega)$	$\pm (0.1 \% R + 0.05 \Omega)$
MRS16: $R > 332 \text{ k}\Omega$ ; MRS25: $R > 1 \text{ M}\Omega$		$\pm (0.5 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$
Short Time Overload:			
MRS16: $4.99 \Omega \leq R \leq 332 \text{ k}\Omega$ ; MRS25: $1 \Omega \leq R \leq 1 \text{ M}\Omega$		$\pm (0.1 \% R + 0.01 \Omega)$	$\pm (0.1 \% R + 0.01 \Omega)$
MRS16: $R > 332 \text{ k}\Omega$ ; MRS25: $R > 1 \text{ M}\Omega$		$\pm (0.5 \% R + 0.05 \Omega)$	$\pm (0.5 \% R + 0.05 \Omega)$

PACKAGING				
MODEL	REEL		BOX	
	PIECES/REEL	CODE	PIECES/BOX	CODE
MRS16	5000	RP	1000	C1
			5000	CT
MRS25	5000	RP	1000	C1
			5000	CT

**DIMENSIONS**


<b>DIMENSIONS</b> (Leaded Resistor Types, Mass and Relevant Physical Dimensions)					
TYPE	D <sub>max.</sub> (mm)	L <sub>max.</sub> (mm)	d <sub>nom.</sub> (mm)	M <sub>min.</sub> (mm)	MASS (mg)
MRS16	1.6	3.6	0.5	5.0	125
MRS25	2.5	6.5	0.6	10.0	220

**PART NUMBER AND PRODUCT DESCRIPTION**

**PART NUMBER: MRS16000C5119FCT00**

M	R	S	1	6	0	0	0	C	5	1	1	9	F	C	T	0	0
MODEL/SIZE	VARIANT		TCR			VALUE						TOLERANCE	PACKAGING <sup>(1)</sup>	SPECIAL			
MRS1600 MRS2500	0 = Neutral		C = ± 50 ppm/K			3 digit value 1 digit multiplier MULTIPLIER  7 = *10 <sup>-3</sup> 2 = *10 <sup>2</sup> 8 = *10 <sup>-2</sup> 3 = *10 <sup>3</sup> 9 = *10 <sup>-1</sup> 4 = *10 <sup>4</sup> 0 = *10 <sup>0</sup> 5 = *10 <sup>5</sup> 1 = *10 <sup>1</sup> 6 = *10 <sup>6</sup>						F = ± 1 %	RP CT C1	Up to 2 digits 00 = Standard			

**PRODUCT DESCRIPTION: MRS16 50 1 % CT 51R1**

MRS16	50	1 %	CT	51R1
MODEL/SIZE	TCR	TOLERANCE	PACKAGING <sup>(1)</sup>	RESISTANCE VALUE
MRS16 MRS25	± 50 ppm/K	± 1 %	RP CT C1	51R1 = 51.1 Ω 1K = 1 kΩ

**Notes**

- The PART NUMBER is shown to facilitate the introduction of a unified part numbering system for ordering products
- <sup>(1)</sup> Please refer packaging table

**12NC INFORMATION FOR HISTORICAL CODING REFERENCE**

- The resistors have a 12 digit numeric code starting with 2322 15.
- The subsequent 2 digits indicate the resistor type and packaging; see the 12NC Ordering Code table.
- The remaining 4 digits indicate the resistance value:
  - The first 3 digits indicate the resistance value.
  - The last digit indicates the resistance decade in accordance with the 12NC Indicating Resistance Decade table.

**Last Digit of 12NC Indicating Resistance Decade**

RESISTANCE DECADE	LAST DIGIT
1 Ω to 9.76 Ω	8
10 Ω to 97.6 Ω	9
100 Ω to 976 Ω	1
1 kΩ to 9.76 kΩ	2
10 kΩ to 97.6 kΩ	3
100 kΩ to 976 kΩ	4
1 MΩ to 9.76 MΩ	5
10 MΩ	6

**12NC Example**

The 12NC of a MRS16 resistor with value 750 Ω, supplied on a bandolier of 1000 units in ammpack is: 2322 157 17501.

<b>12NC</b> (Resistors Type and Packaging)			
TYPE	2322 15. ....		
	BANDOLIER IN AMMOPACK		BANDOLIER ON REEL
	1000 UNITS	5000 UNITS	5000 UNITS
MRS16	7 1....	7 2....	7 3....
MRS25	6 1....	6 2....	6 3....



## 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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. 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.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**