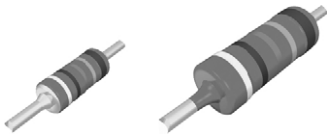
Professional Thin Film Leaded Resistors



FEATURES

- Technology: metal film
- Professional resistors in small outlines
- Low noise
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

HALOGEN FREE

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.

APPLICATIONS

- All general purpose applications

TECHNICAL SPECIFICATIONS		
DESCRIPTION	**MRS16**	**MRS25**
DIN size	0204	0207
CECC size	A	B
Resistance range	4.99 Ω to 1 MΩ	1 Ω to 10 MΩ
Resistance tolerance	± 1 %	
Temperature coefficient	± 50 ppm/K	
Rated dissipation, P_{70} (1)	0.4 W	0.6 W
Operating voltage, $U_{max.}$ AC/DC	200 V	350 V
Operating temperature range (1)	-55 °C to 155 °C	
Peak permissible film temperature (1)	155 °C	
Insulation voltage:		
1 min; U_{ins}	300 V	500 V
continuous	75 V	75 V

Note

(1) Please refer to APPLICATION INFORMATION below.

For technical questions, contact: filmresistorsleaded@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

APPLICATION INFORMATION

The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature is not exceeded. Furthermore, a high level of ambient temperature or of power dissipation may raise the temperature of the solder joint, hence special solder alloys or board materials may be required to maintain the reliability of the assembly.

These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional lifetime. The designer may estimate the performance of the particular resistor application or set certain load and temperature limits in order to maintain a desired stability.

MAXIMUM RESISTANCE CHANGE AT RATED DISSIPATION

Operation mode		Power
Climatic category		-55 °C / +155 °C / 56 days
Rated dissipation, P_{70}	MRS16	0.4 W
	MRS25	0.6 W
Applied maximum film temperature, $\vartheta_{F\ max.}$		155 °C
Max. resistance change at rated dissipation $\lvert\Delta R/R$ max.$\rvert$, after:	MRS16	4.99 Ω to 1 MΩ
	1000 h	± (0.5 % R + 0.05 Ω)
	MRS25	1 Ω to 10 MΩ
	1000 h	± (0.5 % R + 0.05 Ω)

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

TYPE	VARIANT	TCR	RESISTANCE	TOLERANCE	PACKAGING (1)	SPECIAL
MRS1600 **MRS2500**	**0** = neutral	**C** = ± 50 ppm/K	**3 digit value** **1 digit multiplier** MULTIPLIER **7** = $*10^{-3}$ **2** = $*10^{2}$ **8** = $*10^{-2}$ **3** = $*10^{3}$ **9** = $*10^{-1}$ **4** = $*10^{4}$ **0** = $*10^{0}$ **5** = $*10^{5}$ **1** = $*10^{1}$ **6** = $*10^{6}$	**F** = ± 1 %	**RP** **CT** **C1**	Up to 2 digits **00** = standard

PRODUCT DESCRIPTION: MRS16 50 1 % CT 51R1

MRS16	50	1 %	CT	51R1
TYPE	TCR	TOLERANCE	PACKAGING (1)	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

(1) Please refer packaging table

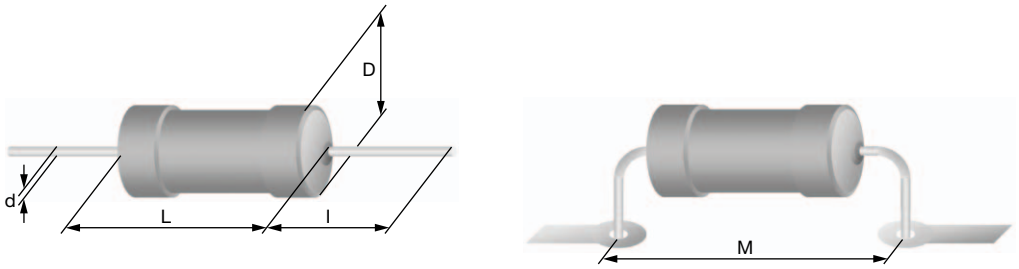
PACKAGING

TYPE	CODE	QUANTITY	PACKAGING STYLE	WIDTH	PITCH	DIMENSIONS
MRS16 MRS25	C1	1000	Taped acc. to IEC 60286-1 fan-folded in a box	53 mm	5 mm	184 mm x 75 mm x 42 mm
	CT	5000				330 mm x 75 mm x 55 mm
	RP	5000	Taped acc. to IEC 60286-1 on a reel			242 mm x 76 mm x 86 mm

For technical questions, contact: filmresistorsleaded@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

DIMENSIONS



DIMENSIONS (Leaded Resistor Types, Mass and Relevant Physical Dimensions)						
TYPE	**$D_{max.}$ (mm)**	**$L_{max.}$ (mm)**	**$d_{nom.}$ (mm)**	**$l_{min.}$ (mm)**	**$M_{min.}$ (mm)**	**MASS (mg)**
MRS16	1.6	3.6	0.5	29.0	5.0	125
MRS25	2.5	6.5	0.6	28.0	10.0	220

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 ammopack is: 2322 157 17501.

12NC (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....

For technical questions, contact: filmresistorsleaded@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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.

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.

© 2024 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED