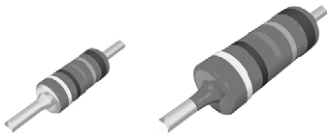
Professional Thin Film Leaded Resistors



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

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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

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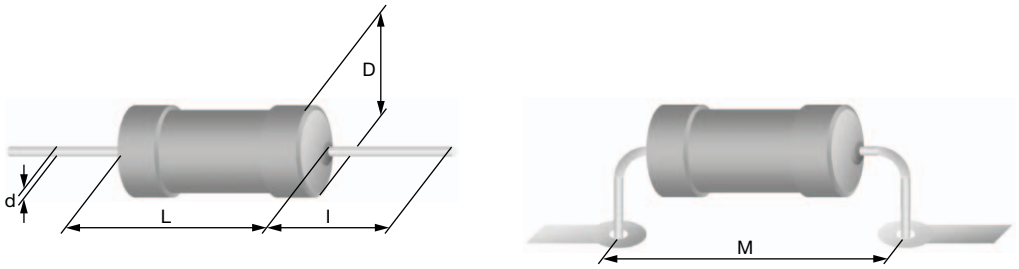
DIMENSIONS



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....

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