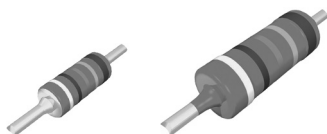


## Professional Leaded Resistors



### 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 colour code rings designate the resistance value and tolerance according to **IEC 60 062**. Suitable replacements for MRS16 and MRS25 are MBA/SMA 0204 and MBB/SMA 0207 professional.

### FEATURES

- 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 with "Restriction of the use of Hazardous Substances" (RoHS) directive 2002/95/EC (issue 2004)



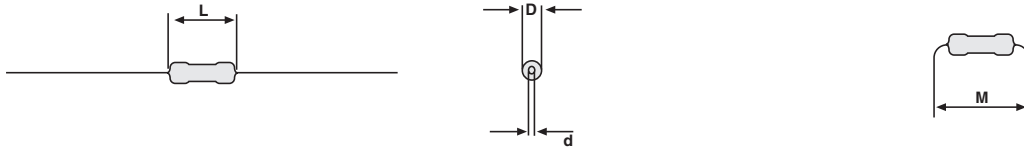
### APPLICATIONS

- All general purpose applications

| TECHNICAL SPECIFICATIONS                                             |                                 |                                 |
|----------------------------------------------------------------------|---------------------------------|---------------------------------|
| DESCRIPTION                                                          | VALUE                           |                                 |
|                                                                      | MRS16                           | MRS25                           |
| Resistance Range                                                     | 4.99 $\Omega$ to 1 M $\Omega$   | 1 $\Omega$ to 10 M $\Omega$     |
| Resistance Tolerance and Series                                      | $\pm 1\%$ ; E24/E96 series      |                                 |
| Maximum Dissipation at $T_{amb} = 70\text{ }^{\circ}\text{C}$        | 0.4 W                           | 0.6 W                           |
| Thermal Resistance ( $R_{th}$ )                                      | 170 K/W                         | 150 K/W                         |
| Temperature Coefficient                                              | $\pm 50\text{ ppm/K}$           |                                 |
| Maximum Permissible Voltage (DC or RMS)                              | 200 V                           | 350 V                           |
| Basic Specifications                                                 | IEC 60115-1 and 60115-2         |                                 |
| Climatic Category (IEC 60068)                                        | 55/155/56                       |                                 |
| Max. Resistance Change for Resistance Range, $\Delta R$ max., After: |                                 |                                 |
| Load:                                                                |                                 |                                 |
| $R \leq 100\text{ k}\Omega$                                          | $\pm (0.5\% R + 0.05\ \Omega)$  | $\pm (0.5\% R + 0.05\ \Omega)$  |
| $R > 100\text{ k}\Omega$                                             | $\pm (1\% R + 0.05\ \Omega)$    | $\pm (0.5\% R + 0.05\ \Omega)$  |
| Climatic Tests:                                                      |                                 |                                 |
| $R \leq 100\text{ k}\Omega$                                          | $\pm (0.5\% R + 0.05\ \Omega)$  | $\pm (0.5\% R + 0.05\ \Omega)$  |
| $R > 100\text{ k}\Omega$                                             | $\pm (1\% R + 0.05\ \Omega)$    | $\pm (0.5\% R + 0.05\ \Omega)$  |
| Soldering:                                                           |                                 |                                 |
| $R \leq 100\text{ k}\Omega$                                          | $\pm (0.1\% R + 0.05\ \Omega)$  | $\pm (0.1\% R + 0.05\ \Omega)$  |
| $R > 100\text{ k}\Omega$                                             | $\pm (0.25\% R + 0.05\ \Omega)$ | $\pm (0.1\% R + 0.05\ \Omega)$  |
| Short Time Overload                                                  | $\pm (0.25\% R + 0.05\ \Omega)$ | $\pm (0.25\% R + 0.05\ \Omega)$ |

| PACKAGING |             |      |              |          |
|-----------|-------------|------|--------------|----------|
| MODEL     | REEL        |      | BOX          |          |
|           | PIECES/REEL | CODE | PIECES/BOX   | CODE     |
| MRS16     | 5000        | RP   | 1000<br>5000 | C1<br>CT |
| MRS25     | 5000        | RP   | 1000<br>5000 | C1<br>CT |

## DIMENSIONS



### DIMENSIONS - leaded resistor types, mass and relevant physical dimensions

| TYPE  | D <sub>max.</sub><br>(mm) | L <sub>max.</sub><br>(mm) | d <sub>nom.</sub><br>(mm) | M <sub>min.</sub><br>(mm) | MASS<br>(mg) |
|-------|---------------------------|---------------------------|---------------------------|---------------------------|--------------|
| MRS16 | 1.6                       | 3.6                       | 0.5                       | 5.0                       | 125          |
| MRS25 | 2.5                       | 6.3                       | 0.6                       | 10.0                      | 220          |

## 12NC INFORMATION

- 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, value 750 Ω, on a bandolier of 1000 units in ammpack is: 2322 157 17501.

## 12NC - resistors type and packaging

| TYPE  | ORDERING CODE 2322 15. .... |            |                   |
|-------|-----------------------------|------------|-------------------|
|       | BANDOLIER IN AMMPACK        |            | BANDOLIER ON REEL |
|       | 1000 UNITS                  | 5000 UNITS | 5000 UNITS        |
| MRS16 | 7 1....                     | 7 2....    | 7 3....           |
| MRS25 | 6 1....                     | 6 2....    | 6 3....           |

## PART NUMBER AND PRODUCT DESCRIPTION

### PART NUMBER: MRS16000C5119FCT00

| MODEL/SIZE                                        | SPECIAL CHARACTER       | TCR                       | VALUE                                                                                                                                                                                                                                                                                     | TOLERANCE                                              | PACKAGING <sup>(1)</sup> | SPECIAL                         |
|---------------------------------------------------|-------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|---------------------------------|
| MRS1600<br>MRS2500                                | 0 = Neutral             | C = ± 50 ppm/K            | 3 digit value<br>1 digit multiplier<br>MULTIPLIER<br><br>7 = *10 <sup>-3</sup> 2 = *10 <sup>2</sup><br>8 = *10 <sup>-2</sup> 3 = *10 <sup>3</sup><br>9 = *10 <sup>-1</sup> 4 = *10 <sup>4</sup><br>0 = *10 <sup>0</sup> 5 = *10 <sup>5</sup><br>1 = *10 <sup>1</sup> 6 = *10 <sup>6</sup> | F = ± 1 %                                              | RP<br>CT<br>C1           | Up to 2 digits<br>00 = Standard |
| <b>PRODUCT DESCRIPTION: MRS 16-50 1 % CT 51R1</b> |                         |                           |                                                                                                                                                                                                                                                                                           |                                                        |                          |                                 |
| MRS16<br>MODEL/SIZE<br>MRS16<br>MRS25             | 50<br>TCR<br>± 50 ppm/K | 1 %<br>TOLERANCE<br>± 1 % | CT<br>PACKAGING <sup>(1)</sup><br>RP<br>CT<br>C1                                                                                                                                                                                                                                          | 51R1<br>RESISTANCE VALUE<br>51R1 = 51.1 Ω<br>1K = 1 kΩ |                          |                                 |

### Notes:

<sup>(1)</sup> Please refer packaging table

- The PART NUMBER is shown to facilitate the introduction of a unified part numbering system for ordering products



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