

## Wirewound Resistor, Ultra Precision, Epoxy Molded, Axial Lead



### FEATURES

- Resistance values up to 6 M $\Omega$
- Resistance tolerances down to  $\pm 0.005\%$
- Tighter tolerances and lower resistance values available, please contact factory
- Temperature coefficients down to  $\pm 2$  ppm/ $^{\circ}\text{C}$ , and up to 6000 ppm/ $^{\circ}\text{C}$
- Matched resistance sets available in tolerances down to  $\pm 0.001\%$ , and in temperature coefficients down to  $\pm 0.5$  ppm/ $^{\circ}\text{C}$ , please contact factory
- Custom design capability available, please contact factory
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | POWER RATING W <sup>(1)</sup> | RESISTANCE RANGE $\Omega$<br>$\pm 0.1\%, \pm 0.25\%, \pm 0.5\%, \pm 1\%$ | RESISTANCE RANGE $\Omega$<br>$\pm 0.05\%, \pm 0.1\%, \pm 0.25\%, \pm 0.5\%, \pm 1\%$ | RESISTANCE RANGE $\Omega$<br>$\pm 0.01\%, \pm 0.05\%, \pm 0.1\%, \pm 0.25\%, \pm 0.5\%, \pm 1\%$ | RESISTANCE RANGE $\Omega$<br>$\pm 0.005\%, \pm 0.01\%, \pm 0.05\%, \pm 0.1\%, \pm 0.25\%, \pm 0.5\%, \pm 1\%$ | MAXIMUM WORKING VOLTAGE V <sup>(2)</sup> |
|--------------|-------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------|
| MR101        | 0.120                         | 1 to 400K                                                                | 5 to 400K                                                                            | 50 to 400K                                                                                       | 1K to 400K                                                                                                    | 150                                      |
| MR102        | 0.175                         | 1 to 750K                                                                | 5 to 750K                                                                            | 50 to 750K                                                                                       | 1K to 750K                                                                                                    | 200                                      |
| MR103        | 0.200                         | 1 to 750K                                                                | 5 to 750K                                                                            | 50 to 750K                                                                                       | 1K to 750K                                                                                                    | 200                                      |
| MR104        | 0.150                         | 1 to 500K                                                                | 5 to 500K                                                                            | 50 to 500K                                                                                       | 1K to 500K                                                                                                    | 100                                      |
| MR105        | 0.200                         | 1 to 1.0M                                                                | 5 to 1.0M                                                                            | 50 to 1.0M                                                                                       | 1K to 1.0M                                                                                                    | 200                                      |
| MR106        | 0.250                         | 1 to 1.2M                                                                | 5 to 1.2M                                                                            | 50 to 1.2M                                                                                       | 1K to 1.2M                                                                                                    | 300                                      |
| MR107        | 0.330                         | 1 to 2.5M                                                                | 5 to 2.5M                                                                            | 50 to 2.5M                                                                                       | 1K to 2.5M                                                                                                    | 400                                      |
| MR108        | 0.400                         | 1 to 3.8M                                                                | 5 to 3.8M                                                                            | 50 to 3.8M                                                                                       | 1K to 3.8M                                                                                                    | 300                                      |
| MR110        | 0.500                         | 1 to 3.8M                                                                | 5 to 3.8M                                                                            | 50 to 3.8M                                                                                       | 1K to 3.8M                                                                                                    | 400                                      |
| MR111        | 0.500                         | 1 to 3.8M                                                                | 5 to 3.8M                                                                            | 50 to 3.8M                                                                                       | 1K to 3.8M                                                                                                    | 400                                      |
| MR112        | 0.750                         | 1 to 6.0M                                                                | 5 to 6.0M                                                                            | 50 to 6.0M                                                                                       | 1K to 6.0M                                                                                                    | 600                                      |
| MR114        | 1.000                         | 1 to 6.0M                                                                | 5 to 6.0M                                                                            | 50 to 6.0M                                                                                       | 1K to 6.0M                                                                                                    | 800                                      |
| MR115        | 1.500                         | 1 to 6.0M                                                                | 5 to 6.0M                                                                            | 50 to 6.0M                                                                                       | 1K to 6.0M                                                                                                    | 900                                      |
| MR116        | 2.000                         | 1 to 6.0M                                                                | 5 to 6.0M                                                                            | 50 to 6.0M                                                                                       | 1K to 6.0M                                                                                                    | 1000                                     |

#### Notes

<sup>(1)</sup> Power rating is based on tolerance, please see derating chart.

<sup>(2)</sup> The maximum working voltage is the highest voltage that can be applied to the resistor. Below this value, the maximum voltage that can continuously be applied is given by  $(P \times R)^{1/2}$ .

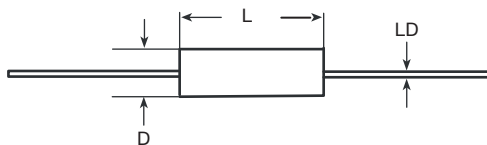
### GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: **MR106250R00TAE66** (visit [www.vishay.net](http://www.vishay.net) SAP parts manual for all options)

|                                                                                                        |          |          |          |          |                                                                                                                                                                                          |          |          |                                                                                                                                                                                                                                              |          |          |                                                                                                                                                                                                                                                   |          |                                                                       |          |          |                                                                                                                        |  |
|--------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------|----------|----------|------------------------------------------------------------------------------------------------------------------------|--|
| <b>M</b>                                                                                               | <b>R</b> | <b>1</b> | <b>0</b> | <b>6</b> | <b>2</b>                                                                                                                                                                                 | <b>5</b> | <b>0</b> | <b>R</b>                                                                                                                                                                                                                                     | <b>0</b> | <b>0</b> | <b>T</b>                                                                                                                                                                                                                                          | <b>A</b> | <b>E</b>                                                              | <b>6</b> | <b>6</b> |                                                                                                                        |  |
| GLOBAL MODEL<br>(5 digits)<br>(see Standard Electrical Specifications Global Model column for options) |          |          |          |          | VALUE<br>(6 digits)<br><b>R</b> = decimal<br><b>K</b> = thousand<br><b>M</b> = million<br><b>1R5000</b> = 1.5 $\Omega$<br><b>1K5000</b> = 1.5 k $\Omega$<br><b>1M0000</b> = 1 M $\Omega$ |          |          | TOLERANCE<br>(1 digit)<br><b>S</b> = $\pm 0.005\%$<br><b>T</b> = $\pm 0.01\%$<br><b>Q</b> = $\pm 0.02\%$<br><b>A</b> = $\pm 0.05\%$<br><b>B</b> = $\pm 0.1\%$<br><b>C</b> = $\pm 0.25\%$<br><b>D</b> = $\pm 0.5\%$<br><b>F</b> = $\pm 1.0\%$ |          |          | TC<br>(1 digit)<br><b>A</b> = standard, 10 to 30 (W)<br><b>B</b> = 3900 (Q)<br><b>C</b> = 4500 (M)<br><b>D</b> = 6000 (N)<br><b>E</b> = 3500 (P)<br><b>Y</b> = 10 ( $\geq 1\%$ )<br><b>G</b> = 5 ( $\geq 10\%$ )<br><b>J</b> = 2 ( $\geq 100\%$ ) |          | PACKAGING CODE<br>(3 digits)<br><b>E66</b> = lead (Pb)-free bulk pack |          |          | SPECIAL<br>(up to 2 digits)<br>(dash number)<br>From <b>1</b> to <b>99</b> as applicable<br><b>S</b> = 0.025" terminal |  |

Historical Part Number example: **MR106W250R0T**

|                  |                     |                                |               |
|------------------|---------------------|--------------------------------|---------------|
| <b>MR106</b>     | <b>W = STANDARD</b> | <b>250 <math>\Omega</math></b> | <b>0.01 %</b> |
| HISTORICAL MODEL | TC                  | RESISTANCE VALUE               | TOLERANCE     |

**DIMENSIONS** in inches [millimeters]

| GLOBAL MODEL | DIMENSIONS in inches [millimeters] |                       |                              |
|--------------|------------------------------------|-----------------------|------------------------------|
|              | $L \pm 0.025$ [0.635]              | $D \pm 0.005$ [0.127] | $LD \pm 0.002$ [0.051]       |
| MR101        | 0.250 [6.35]                       | 0.187 [4.75]          | 0.025 [0.635]                |
| MR102        | 0.375 [9.52]                       | 0.187 [4.75]          | 0.025 [0.635]                |
| MR103        | 0.450 [11.43]                      | 0.187 [4.75]          | 0.025 [0.635]                |
| MR104        | 0.250 [6.35]                       | 0.250 [6.35]          | 0.025 [0.635]                |
| MR105        | 0.375 [9.52]                       | 0.250 [6.35]          | 0.032 [0.813] <sup>(1)</sup> |
| MR106        | 0.500 [12.70]                      | 0.250 [6.35]          | 0.032 [0.813] <sup>(1)</sup> |
| MR107        | 0.750 [19.05]                      | 0.250 [6.35]          | 0.032 [0.813] <sup>(1)</sup> |
| MR108        | 0.500 [12.70]                      | 0.375 [9.52]          | 0.032 [0.813]                |
| MR110        | 0.750 [19.05]                      | 0.375 [9.52]          | 0.032 [0.813]                |
| MR111        | 0.750 [19.05]                      | 0.375 [9.52]          | 0.032 [0.813]                |
| MR112        | 1.000 [25.40]                      | 0.375 [9.52]          | 0.032 [0.813]                |
| MR114        | 1.000 [25.40]                      | 0.500 [12.70]         | 0.032 [0.813]                |
| MR115        | 1.500 [38.10]                      | 0.500 [12.70]         | 0.032 [0.813]                |
| MR116        | 2.000 [50.80]                      | 0.500 [12.70]         | 0.032 [0.813]                |

**Note**

<sup>(1)</sup> 0.025" [0.635] available, this is called out by putting an "S" in the SPECIAL section of the part number.

**MATERIAL SPECIFICATIONS**

**Element:** nickel-chrome alloy, other materials available depending on TC requirements

**Core:** molded epoxy

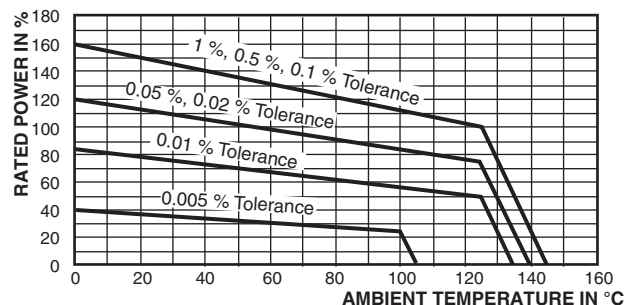
**Encapsulant:** epoxy

**Standard Terminals:** 100 % matte tinned copper

**Part Marking:** Mills, model, value, tolerance, date code

**Note**

- Due to resistor size limitations some resistors will have minimal information marked on parts

**DERATING**

| TECHNICAL SPECIFICATIONS        |          |                                                                                                     |
|---------------------------------|----------|-----------------------------------------------------------------------------------------------------|
| PARAMETER                       | UNIT     | MR100 RESISTOR CHARACTERISTICS                                                                      |
| Temperature Coefficient         | ppm/°C   | $\pm 10$ for $> 100 \Omega$ ; $\pm 20$ for $10 \Omega$ to $100 \Omega$ ; $\pm 30$ for $< 10 \Omega$ |
| Terminal Strength               | lb       | 4.5                                                                                                 |
| Dielectric Withstanding Voltage | $V_{AC}$ | 750                                                                                                 |
| Operating Temperature Range     | °C       | -55 to +145 (see derating chart)                                                                    |



## 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.