# Wirewound Resistors, Commercial Power, Silicone Coated, Axial Lead

## FEATURES

- High temperature coating (> 350 °C)
- Complete welded construction
- Available in non-inductive styles with Ayrton-Perry winding for lowest reactive components, special "NI"
- Higher power to size ratio as compared to equivalent sized resistors
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | POWER RATING (1) $P_{25\,°C}$ W CHARACTERISTIC U + 250 °C | POWER RATING (1) $P_{25\,°C}$ W CHARACTERISTIC V + 350 °C | TOLERANCE (2) % | RESISTANCE RANGE Ω | WEIGHT (typical) g |
|---|---|---|---|---|---|
| MRB01 | 1.0 | 1.5 | 0.5, 1, 5 | 0.085 to 5.0K | 0.30 |
| MRB02 | 1.5 | 2.2 | 0.5, 1, 5 | 0.05 to 6.85K | 0.32 |
| MRB03 | 2.25 | 3.0 | 0.5, 1, 5 | 0.05 to 10.4K | 0.34 |
| MRB05 | 4.0 | 5.0 | 0.5, 1, 5 | 0.015 to 24.5K | 0.70 |
| MRB06 | 5.0 | 6.0 | 0.5, 1, 5 | 0.02 to 32.3K | 1.60 |
| MRB10 | 7.0 | 10.0 | 0.5, 1, 5 | 0.03 to 90.9K | 4.20 |
| MRB12 | 10.0 | 12.0 | 0.5, 1, 5 | 0.04 to 144.9K | 4.70 |

**Notes**

(1) Vishay Mills MRB models have two power ratings depending on operation temperature and stability requirements.

(2) Other tolerances may be available, contact factory

## TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | MRB RESISTOR CHARACTERISTICS |
|---|---|---|
| Temperature Coefficient | ppm/°C | ± 30 for 10 Ω and above; ± 50 for 1.0 Ω to 9.9 Ω; ± 90 for 0.5 Ω to 0.99 Ω |
| Terminal Strength | lb | 5 min (MRB01 thru MRB03) and 10 min (MRB05 and larger) |
| Dielectric Withstanding Voltage | $V_{AC}$ | 500 for 3 W and smaller; 1000 for 4 W and larger |
| Operating Temperature Range | °C | Characteristic U = - 65 to + 250, Characteristic V = - 65 to + 350 |
| Maximum Working Voltage | V | $(P \times R)^{1/2}$ |

## GLOBAL PART NUMBER INFORMATION

**Global Part Numbering example: MRB02250R0FE08** (visit www.vishay.net Vishay Dale parts numbering manual for all options)

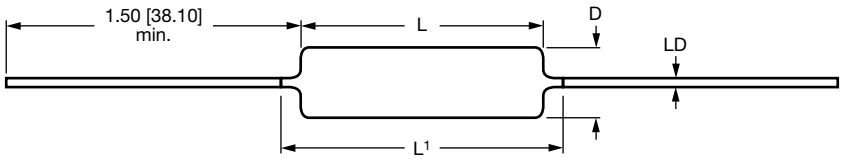
| M | R | B | 0 | 2 | 2 | 5 | 0 | R | 0 | F | E | 0 | 8 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| GLOBAL MODEL (5 digits) | VALUE (5 digits) | TOLERANCE (1 digit) | PACKAGING CODE (3 digits) | SPECIAL (up to 3 digits) |
|---|---|---|---|---|
| (See Standard Electrical Specifications Global Model column for options) | **R** = Decimal<br>**K** = Thousand<br>**1R500** = 1.5 Ω<br>**1K500** = 1.5 kΩ | **D** = ± 0.5 %<br>**F** = ± 1.0 %<br>**J** = ± 5.0 % | **E07** = Tape/reel (MRB10, MRB12)<br>**E08** = Tape/reel (MRB01, MRB02, MRB03)<br>**E48** = Tape/reel (MRB05, MRB06)<br>**E12** = Bulk, up to 100 pc boxes | (Dash Number)<br>From **1** to **999** as applicable<br>**NI** = Non-inductive |

**Historical Part Number example: MRB02W250R0F**

| MRB02 | W = STANDARD | 250 Ω | 1 % |
|---|---|---|---|
| HISTORICAL MODEL | TC | RESISTANCE VALUE | TOLERANCE |

**DIMENSIONS** in inches [millimeters]




| MODEL | DIMENSIONS in inches [millimeters] | | | |
|---|---|---|---|---|
| | L ± 0.062 [1.57] | $L^1$ Max. | D ± 0.031 [0.79] | LD ± 0.002 [0.051] |
| MRB01 | 0.285 [7.24] | 0.375 [9.52] | 0.110 [2.79] | 0.020 [0.508] |
| MRB02 | 0.310 [7.87] | 0.420 [10.67] | 0.094 [2.39] | 0.020 [0.508] |
| MRB03 | 0.406 [10.31] | 0.500 [12.70] | 0.110 [2.79] | 0.020 [0.508] |
| MRB05 | 0.562 [14.27] | 0.650 [16.51] | 0.187 [4.75] | 0.032 [0.813] |
| MRB06 | 0.500 [12.70] | 0.600 [15.24] | 0.218 [5.54] | 0.032 [0.813] |
| MRB10 | 0.875 [22.22] | 0.975 [24.76] | 0.312 [7.92] | 0.032 [0.813] |
| MRB12 | 1.188 [30.18] | 1.280 [32.51] | 0.312 [7.92] | 0.032 [0.813] |

## MATERIAL SPECIFICATIONS

**Element:** Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

**Core:** Ceramic: Alumina

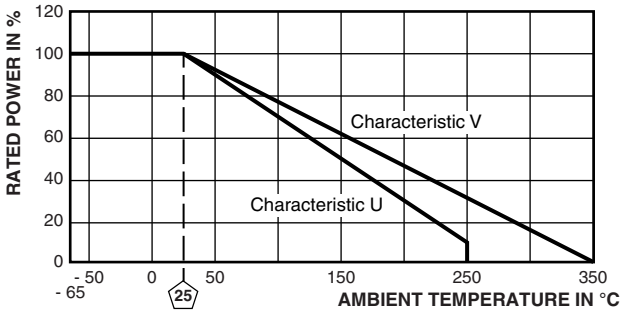
**Coating:** Special high temperature silicone

**Standard Terminals:** Tinned copper clad steel

**End Caps:** Stainless steel

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

## DERATING




| PERFORMANCE | | | |
|---|---|---|---|
| TEST | CONDITIONS OF TEST | TEST LIMITS (CHARACTERISTIC U) | TEST LIMITS (CHARACTERISTIC V) |
| Dielectric Withstanding Voltage | 500 $V_{RMS}$, 1 min (MRB01 thru MRB03); 1000 $V_{RMS}$, 1 min for all others | ± (0.1 % + 0.05 Ω) Δ*R* | ± (0.1 % + 0.05 Ω) Δ*R* |
| High Frequency Vibration | Frequency varied 10 Hz to 2000 Hz, 20 *g* peak, 2 directions 6 h each | ± (0.1 % + 0.05 Ω) Δ*R* | ± (0.2 % + 0.05 Ω) Δ*R* |
| High Temperature Exposure | 250 h at + 250 °C for U Characteristic, + 350 °C for V Characteristic | ± (0.5 % + 0.05 Ω) Δ*R* | ± (4.0 % + 0.05 Ω) Δ*R* |
| Load Life | 2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF" | ± (0.5 % + 0.05 Ω) Δ*R* | ± (3.0 % + 0.05 Ω) Δ*R* |
| Low Temperature Storage | - 65 °C for 24 h | ± (0.2 % + 0.05 Ω) Δ*R* | ± (2.0 % + 0.05 Ω) Δ*R* |
| Moisture Resistance | MIL-STD-202 Method 106, 7b not applicable | ± (0.2 % + 0.05 Ω) Δ*R* | ± (2.0 % + 0.05 Ω) Δ*R* |
| Shock, Specified Pulse | MIL-STD-202 Method 213, 100 *g*'s for 6 ms, 10 shocks | ± (0.1 % + 0.05 Ω) Δ*R* | ± (0.2 % + 0.05 Ω) Δ*R* |
| Thermal Shock | Rated power applied until thermally stable, then 15 min at - 55 °C | ± (0.2 % + 0.05 Ω) Δ*R* | ± (2.0 % + 0.05 Ω) Δ*R* |
| Short Time Overload | 5 x rated power (3 W and smaller), 10 x rated power (4 W and larger) for 5 s | ± (0.2 % + 0.05 Ω) Δ*R* | ± (2.0 % + 0.05 Ω) Δ*R* |
| Terminal Strength | Pull test 5 s to 10 s, 5 lb (MRB01 thru MRB03), 10 lb for all others; torsion test - 3 alternating directions, 360 ° each | ± (0.1 % + 0.05 Ω) Δ*R* | ± (1.0 % + 0.05 Ω) Δ*R* |

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