

## Wirewound Resistors, Non-Magnetic, Non-Inductive, Axial Lead



### FEATURES

- High temperature coating (> 350 °C)
- Non-magnetic and all welded constructions greatly enhance frequency response. Combined with non-inductive Ayrton-Perry winding the inductive reactance and signal loss are almost totally eliminated.
- Ideal for Audio Industry
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

**GREEN**  
(5-2008)

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING <sup>(1)</sup><br>$P_{25\text{ °C}} \text{ W}$<br>CHARACTERISTIC U + 250 °C | POWER RATING <sup>(1)</sup><br>$P_{25\text{ °C}} \text{ W}$<br>CHARACTERISTIC V + 350 °C | TOLERANCE <sup>(2)</sup><br>% | RESISTANCE RANGE<br>Ω | WEIGHT (typical)<br>g |
|--------------|------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------|-----------------------|-----------------------|
| MRA-05       | MRA05            | 4.0                                                                                      | 5.0                                                                                      | 1, 5, 10                      | 0.01 to 15.0K         | 1.00                  |
| MRA-10       | MRA10            | 7.0                                                                                      | 10.0                                                                                     | 1, 5, 10                      | 0.05 to 35.0K         | 3.87                  |
| MRA-12       | MRA12            | 10.0                                                                                     | 12.0                                                                                     | 1, 5, 10                      | 0.05 to 85.0K         | 5.02                  |

**Notes**

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

(2) Other tolerances may be available, contact factory

### TECHNICAL SPECIFICATIONS

| PARAMETER                       | UNIT            | MRA 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              | 10 minimum                                                                 |
| Dielectric Withstanding Voltage | V <sub>AC</sub> | 500 for MRA-05 and 1000 for MRA-10 and MRA-12                              |
| Operating Temperature Range     | °C              | Characteristic U = - 65 to + 250, Characteristic V = - 65 to + 350         |
| Maximum Working Voltage         | V               | (P x R) <sup>1/2</sup>                                                     |

### GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: MRA-1225R00JE12 (visit [www.vishay.net](http://www.vishay.net) Vishay Dale parts numbering manual for all options)

|                                                                          |   |   |   |                                                                |   |   |   |                                            |   |   |   |                                                                                                |   |   |  |                                             |  |
|--------------------------------------------------------------------------|---|---|---|----------------------------------------------------------------|---|---|---|--------------------------------------------|---|---|---|------------------------------------------------------------------------------------------------|---|---|--|---------------------------------------------|--|
| M                                                                        | R | A | - | 1                                                              | 2 | 2 | 5 | R                                          | 0 | 0 | J | E                                                                                              | 1 | 2 |  |                                             |  |
| GLOBAL MODEL (6 digits)                                                  |   |   |   | VALUE (5 digits)                                               |   |   |   | TOLERANCE (1 digit)                        |   |   |   | PACKAGING CODE (3 digits)                                                                      |   |   |  | SPECIAL (up to 2 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 |   |   |   | F = ± 1.0 %<br>J = ± 5.0 %<br>K = ± 10.0 % |   |   |   | E07 = Tape/reel (MRA-10, MRA-12)<br>E48 = Tape/reel (MRA-05)<br>E12 = Bulk, up to 100 pc boxes |   |   |  | (Dash Number)<br>From 1 to 99 as applicable |  |

Historical Part Number example: MRA12W25R0J

|                  |              |                  |           |
|------------------|--------------|------------------|-----------|
| MRA12            | W = STANDARD | 25 Ω             | 5 %       |
| HISTORICAL MODEL | TC           | RESISTANCE VALUE | TOLERANCE |

**DIMENSIONS** in inches [millimeters]


| MODEL  | DIMENSIONS in inches [millimeters] |                     |                     |                       |
|--------|------------------------------------|---------------------|---------------------|-----------------------|
|        | L<br>± 0.062 [1.57]                | L <sup>1</sup> Max. | D<br>± 0.031 [0.79] | LD<br>± 0.002 [0.051] |
| MRA-05 | 0.562 [14.27]                      | 0.650 [16.51]       | 0.167 [4.24]        | 0.032 [0.813]         |
| MRA-10 | 0.875 [22.22]                      | 0.975 [24.76]       | 0.312 [7.92]        | 0.040 [1.016]         |
| MRA-12 | 1.188 [30.18]                      | 1.280 [32.51]       | 0.312 [7.92]        | 0.040 [1.016]         |

**MATERIAL SPECIFICATIONS**

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

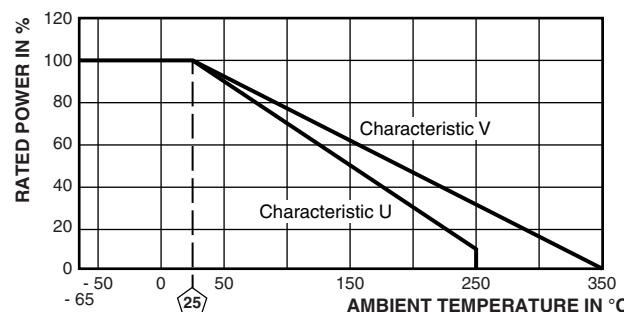
**Core:** Ceramic: Alumina

**Coating:** Special high temperature silicone

**Standard Terminals:** Tinned copper

**End Caps:** Copper alloy

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

**DERATING**

**PERFORMANCE**

| TEST                            | CONDITIONS OF TEST                                                                  | TEST LIMITS           |                       |
|---------------------------------|-------------------------------------------------------------------------------------|-----------------------|-----------------------|
|                                 |                                                                                     | (CHARACTERISTIC U)    | (CHARACTERISTIC V)    |
| Dielectric Withstanding Voltage | 1000 V <sub>RMS</sub> , 1 min                                                       | ± (0.1 % + 0.05 Ω) ΔR | ± (0.1 % + 0.05 Ω) ΔR |
| High Frequency Vibration        | Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each                 | ± (0.1 % + 0.05 Ω) ΔR | ± (0.2 % + 0.05 Ω) ΔR |
| High Temperature Exposure       | 250 h at + 250 °C for U Characteristic, + 350 °C for V Characteristic               | ± (0.5 % + 0.05 Ω) ΔR | ± (4.0 % + 0.05 Ω) ΔR |
| Load Life                       | 2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"                             | ± (0.5 % + 0.05 Ω) ΔR | ± (3.0 % + 0.05 Ω) ΔR |
| Low Temperature Storage         | - 65 °C for 24 h                                                                    | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Moisture Resistance             | MIL-STD 202 Method 106                                                              | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Shock, Specified Pulse          | MIL-STD 202 Method 213, 100 g's for 6 ms, 10 shocks                                 | ± (0.1 % + 0.05 Ω) ΔR | ± (0.2 % + 0.05 Ω) ΔR |
| Thermal Shock                   | Rated power applied until thermally stable, then 15 min at - 55 °C                  | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Short Time Overload             | 5 x rated power (5 W smaller), 10 x rated power (7 W and larger) for 5 s            | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Terminal Strength               | 5 s to 10 s 10 pound pull test; torsion test - 3 alternating directions, 360 ° each | ± (0.1 % + 0.05 Ω) ΔR | ± (1.0 % + 0.05 Ω) ΔR |

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