

# Wirewound Resistors, Industrial, Precision Power, Silicone Coated, Axial Lead



## FEATURES

- High temperature coating (> 350 °C)
- Complete welded construction
- Meets applicable requirements of MIL-PRF-26
- Available in non-inductive styles (type NS) with Aryton-Perry winding for lowest reactive components
- Excellent stability in operation (typical resistance shift < 0.5 %)
- MIL-PRF-26 qualified, type RW resistors can be found at: [www.vishay.com/doc?30281](http://www.vishay.com/doc?30281)
- Compliant to RoHS Directive 2002/95/EC



## Notes

\* Pb containing terminations are not RoHS compliant, exemptions may apply

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

| STANDARD ELECTRICAL SPECIFICATIONS |             |   |   |                                   |                                  |                                   |   |   |                       |
|------------------------------------|-------------|---|---|-----------------------------------|----------------------------------|-----------------------------------|---|---|-----------------------|
| GLOBAL MODEL                       | HIST. MODEL | POWER RATING <sup>(1)</sup><br>$P_{25^{\circ}\text{C}}$ W<br>U ± 0.05 %<br>to ± 5 % | POWER RATING <sup>(1)</sup><br>$P_{25^{\circ}\text{C}}$ W<br>V ± 3 %<br>to ± 10 % | RESISTANCE RANGE<br>Ω<br>± 0.05 % | RESISTANCE RANGE<br>Ω<br>± 0.1 % | RESISTANCE RANGE<br>Ω<br>± 0.25 % | RESISTANCE RANGE<br>Ω<br>± 0.5 %, ± 1 % | RESISTANCE RANGE<br>Ω<br>± 3 %, ± 5 %, ± 10 % | WEIGHT (typical)<br>g |
| RS1/4                              | RS-1/4      | 0.4   | -   | 1 to 1K                           | 0.499 to 1K                      | 0.499 to 3.4K                     | 0.1 to 3.4K                             | 0.1 to 3.4K                                   | 0.21                  |
| RS1/2                              | RS-1/2      | 0.75  | -   | 1 to 1.3K                         | 0.499 to 1.3K                    | 0.499 to 4.9K                     | 0.1 to 4.9K                             | 0.1 to 4.9K                                   | 0.23                  |
| RS01A                              | RS-1A       | 1.0   | -   | 1 to 2.74K                        | 0.499 to 2.74K                   | 0.499 to 10.4K                    | 0.1 to 10.4K                            | 0.1 to 10.4K                                  | 0.34                  |
| RS01A...300                        | RS-1A-300   | 1.0   | -   | -                                 | 0.499 to 2.74K                   | 0.499 to 10.4K                    | 0.1 to 10.4K                            | 0.1 to 10.4K                                  | 0.34                  |
| RS01M                              | RS-1M       | 1.0   | -   | 1 to 1.32K                        | 0.499 to 1.67K                   | 0.499 to 6.85K                    | 0.1 to 6.85K                            | 0.1 to 6.85K                                  | 0.30                  |
| RS002                              | RS-2        | 4.0   | 5.5   | 0.499 to 12.7K                    | 0.499 to 12.7K                   | 0.1 to 47.1K                      | 0.1 to 47.1K                            | 0.1 to 47.1K                                  | 2.10                  |
| RS02M                              | RS-2M       | 3.0   | -   | 0.499 to 4.49K                    | 0.499 to 4.49K                   | 0.1 to 18.74K                     | 0.1 to 18.74K                           | 0.1 to 18.74K                                 | 0.65                  |
| RS02B                              | RS-2B       | 3.0   | 3.75  | 0.499 to 6.5K                     | 0.499 to 6.5K                    | 0.1 to 24.5K                      | 0.1 to 24.5K                            | 0.1 to 24.5K                                  | 0.70                  |
| RS02B...300                        | RS-2B-300   | 3.0   | -   | -                                 | 0.499 to 6.5K                    | 0.1 to 24.5K                      | 0.1 to 24.5K                            | 0.1 to 24.5K                                  | 0.70                  |
| RS02C                              | RS-2C       | 2.5   | 3.25  | 0.499 to 8.6K                     | 0.499 to 8.6K                    | 0.1 to 32.3K                      | 0.1 to 32.3K                            | 0.1 to 32.3K                                  | 1.6                   |
| RS02C...17                         | RS-2C-17    | 2.5   | 3.25  | 0.499 to 8.6K                     | 0.499 to 8.6K                    | 0.1 to 32.3K                      | 0.1 to 32.3K                            | 0.1 to 32.3K                                  | 1.6                   |
| RS02C...23                         | RS-2C-23    | -   | 3.25  | -                                 | -                                | -                                 | -                                       | 0.1 to 32.3K                                  | 1.6                   |
| RS005                              | RS-5        | 5.0   | 6.5   | 0.499 to 25.7K                    | 0.499 to 25.7K                   | 0.1 to 95.2K                      | 0.1 to 95.2K                            | 0.1 to 95.2K                                  | 4.2                   |
| RS005...69                         | RS-5-69     | 5.0   | -   | -                                 | 0.499 to 25.7K                   | 0.1 to 95.2K                      | 0.1 to 95.2K                            | 0.1 to 95.2K                                  | 4.2                   |
| RS005...70                         | RS-5-70     | -   | 6.5   | -                                 | -                                | -                                 | -                                       | 0.1 to 95.2K                                  | 4.2                   |
| RS007                              | RS-7        | 7.0   | 9.0   | 0.499 to 41.4K                    | 0.499 to 41.4K                   | 0.1 to 154K                       | 0.1 to 154K                             | 0.1 to 154K                                   | 4.7                   |
| RS010                              | RS-10       | 10.0  | 13.0  | 0.499 to 73.4K                    | 0.499 to 73.4K                   | 0.1 to 273K                       | 0.1 to 273K                             | 0.1 to 273K                                   | 9.0                   |
| RS010...38                         | RS-10-38    | 10.0  | -   | -                                 | 0.499 to 73.4K                   | 0.1 to 273K                       | 0.1 to 273K                             | 0.1 to 273K                                   | 9.0                   |
| RS010...39                         | RS-10-39    | -   | 13.0  | -                                 | -                                | -                                 | -                                       | 0.1 to 273K                                   | 9.0                   |

## Notes

• Models not available as lead (Pb)-free: RS01A...300, RS02B...300, RS02C...23, RS005...69, RS005...70, RS010...38, RS010...39

• Shaded area indicates most popular models

(1) Vishay Dale RS models have two power ratings depending on operation temperature and stability requirements. Models not available for characteristic V are: RS1/4, RS1/2, RS01A, RS01A...300, RS01M, RS02M, RS02B...300, RS005...69, and RS010...38

| GLOBAL PART NUMBER INFORMATION   |  |   |          |   |          |            |          |  |          |          |          |          |          |          |          |  |
|--|--|---|----------|---|----------|------------|----------|--|----------|----------|----------|----------|----------|----------|----------|--|
| Global Part Numbering example: <b>RS02C10K00FS7017</b>                                   |  |   |          |   |          |            |          |  |          |          |          |          |          |          |          |  |
| <b>R</b>   | <b>S</b>   | <b>0</b>  | <b>2</b> | <b>C</b>  | <b>1</b> | <b>0</b>   | <b>K</b> | <b>0</b>   | <b>0</b> | <b>F</b> | <b>S</b> | <b>7</b> | <b>0</b> | <b>1</b> | <b>7</b> |  |
| GLOBAL MODEL<br>(See Standard Electrical Specifications Global Model column for options) | RESISTANCE VALUE<br><b>R</b> = Decimal<br><b>K</b> = Thousand<br><b>15R00</b> = 15 Ω<br><b>10K00</b> = 10 kΩ | TOLERANCE CODE<br><b>A</b> = 0.05 %<br><b>B</b> = 0.1 %<br><b>C</b> = 0.25 %<br><b>D</b> = 0.5 %<br><b>F</b> = 1.0 %<br><b>J</b> = 5.0 %<br><b>K</b> = 10.0 % |          | PACKAGING<br><b>E70</b> = Lead (Pb)-free, tape/reel (smaller than RS005)<br><b>E73</b> = Lead (Pb)-free, tape/reel (RS005 and larger)<br><b>E12</b> = Lead (Pb)-free, bulk<br><br><b>S70</b> = Tin/lead, tape/reel (smaller than RS005)<br><b>S73</b> = Tin/lead, tape/reel (RS005 and larger)<br><b>B12</b> = Tin/lead, bulk |          |            |          | SPECIAL<br>(Dash Number) (up to 3 digits) From <b>1 to 999</b> as applicable |          |          |          |          |          |          |          |  |
| Historical Part Numbering example: <b>RS-2C-17 10 kΩ 1 % S70</b>                         |  |   |          |   |          |            |          |  |          |          |          |          |          |          |          |  |
| <b>RS-2C-17</b>  |  | <b>10 kΩ</b>  |          | <b>1 %</b>  |          | <b>S70</b> |          |  |          |          |          |          |          |          |          |  |
| HISTORICAL MODEL   |  | RESISTANCE VALUE  |          | TOLERANCE CODE  |          | PACKAGING  |          |  |          |          |          |          |          |          |          |  |

**DIMENSIONS** in inches [millimeters]

**Note**

(1) On some standard reel pack methods, the leads may be trimmed to a shorter length than shown

**MATERIAL SPECIFICATIONS**

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

**Core:** Ceramic, steatite or alumina, depending on physical size

**Coating:** Special high temperature silicone

**Standard Terminals:** 100 % Sn, or 60/40 Sn/Pb coated Copperweld®

**End Caps:** Stainless steel

**Part Marking:** DALE, model, wattage <sup>(2)</sup>, value, tolerance, date code

**Note**

(2) Wattage marked on part will be "U" characteristic

**DERATING**


| GLOBAL MODEL                      | DIMENSIONS in inches [millimeters] |                         |   |                                  |
|-----------------------------------|------------------------------------|-------------------------|---|----------------------------------|
|                                   | A                                  | B <sup>(3)</sup> (max.) | C   | D                                |
| RS1/4                             | 0.250 ± 0.031<br>[6.35 ± 0.787]    | 0.281<br>[7.14]         | 0.085 ± 0.020<br>[2.16 ± 0.508]                 | 0.020 ± 0.002<br>[0.508 ± 0.051] |
| RS1/2                             | 0.312 ± 0.016<br>[7.92 ± 0.406]    | 0.328<br>[8.33]         | 0.078 ± 0.016 - 0.031<br>[1.98 ± 0.406 - 0.787] | 0.020 ± 0.002<br>[0.508 ± 0.051] |
| RS01A<br>RS01A...300              | 0.406 ± 0.031<br>[10.31 ± 0.787]   | 0.437<br>[11.10]        | 0.094 ± 0.031<br>[2.39 ± 0.787]                 | 0.020 ± 0.002<br>[0.508 ± 0.051] |
| RS01M                             | 0.285 ± 0.025<br>[7.24 ± 0.635]    | 0.311<br>[7.90]         | 0.110 ± 0.015<br>[2.79 ± 0.381]                 | 0.020 ± 0.002<br>[0.508 ± 0.051] |
| RS002                             | 0.625 ± 0.062<br>[15.88 ± 1.57]    | 0.765<br>[19.43]        | 0.250 ± 0.031<br>[6.35 ± 0.787]                 | 0.040 ± 0.002<br>[1.02 ± 0.051]  |
| RS02M                             | 0.500 ± 0.062<br>[12.70 ± 1.57]    | 0.562<br>[14.27]        | 0.185 ± 0.015<br>[4.70 ± 0.381]                 | 0.032 ± 0.002<br>[0.813 ± 0.051] |
| RS02B<br>RS02B...300              | 0.560 ± 0.062<br>[14.22 ± 1.57]    | 0.622<br>[15.80]        | 0.187 ± 0.031<br>[4.75 ± 0.787]                 | 0.032 ± 0.002<br>[0.813 ± 0.051] |
| RS02C                             | 0.500 ± 0.062<br>[12.70 ± 1.57]    | 0.593<br>[15.06]        | 0.218 ± 0.031<br>[5.54 ± 0.787]                 | 0.040 ± 0.002<br>[1.02 ± 0.051]  |
| RS02C...17<br>RS02C...23          | 0.500 ± 0.062<br>[12.70 ± 1.57]    | 0.593<br>[15.06]        | 0.218 ± 0.031<br>[5.54 ± 0.787]                 | 0.032 ± 0.002<br>[0.813 ± 0.051] |
| RS005<br>RS005...69<br>RS005...70 | 0.875 ± 0.062<br>[22.23 ± 1.57]    | 1.0<br>[25.4]           | 0.312 ± 0.031<br>[7.92 ± 0.787]                 | 0.040 ± 0.002<br>[1.02 ± 0.051]  |
| RS007                             | 1.22 ± 0.062<br>[30.99 ± 1.57]     | 1.28<br>[32.51]         | 0.312 ± 0.031<br>[7.92 ± 0.787]                 | 0.040 ± 0.002<br>[1.02 ± 0.051]  |
| RS010<br>RS010...39               | 1.78 ± 0.062<br>[45.21 ± 1.57]     | 1.87<br>[47.50]         | 0.375 ± 0.031<br>[9.53 ± 0.787]                 | 0.040 ± 0.002<br>[1.02 ± 0.051]  |
| RS010...38                        | 1.78 ± 0.062<br>[45.21 ± 1.57]     | 1.84<br>[46.74]         | 0.375 ± 0.031<br>[9.53 ± 0.787]                 | 0.040 ± 0.002<br>[1.02 ± 0.051]  |

**Note**

(3) B (max.) dimension is clean lead to clean lead

**NS NON-INDUCTIVE**

Models of equivalent physical and electrical specifications are available with non-inductive (Aryton-Perry) winding. They are identified by substituting the letter N for R in the model number (NS005, for example).

Two conditions apply:

1. For NS models, divide maximum resistance values by two
2. Body O.D. on NS02C may exceed that of the RS02C by 0.010"

| TECHNICAL SPECIFICATIONS    |        |  |
|-----------------------------|--------|--|
| PARAMETER                   | UNIT   | RS RESISTOR CHARACTERISTICS  |
| Temperature Coefficient     | ppm/°C | ± 20 for 10 Ω and above, ± 50 for 1 Ω to 9.9 Ω, ± 90 for 0.5 Ω to 0.99 Ω |
| Maximum Working Voltage     | V      | $(P \times R)^{1/2}$   |
| Insulation Resistance       | Ω      | 1000 MΩ minimum dry, 100 MΩ minimum after moisture test                  |
| Operating Temperature Range | °C     | Characteristic U = - 65 to + 250, characteristic V = - 65 to + 350       |

| PERFORMANCE                     |  |                       |                       |
|---------------------------------|--|-----------------------|-----------------------|
| TEST                            | CONDITIONS OF TEST   | TEST LIMITS           |                       |
|                                 |  | CHARACTERISTIC U      | CHARACTERISTIC V      |
| Thermal Shock                   | Rated power applied until thermally stable, then a minimum of 15 min at - 55 °C  | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Short Time Overload             | 5 x rated power (3.75 W and smaller), 10 x rated power (4 W and larger) for 5 s  | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Dielectric Withstanding Voltage | 500 V <sub>RMS</sub> min. for RS1/4 thru RS01A, 1000 V <sub>RMS</sub> for all others, duration of 1 min                  | ± (0.1 % + 0.05 Ω) ΔR | ± (0.1 % + 0.05 Ω) ΔR |
| Low Temperature Storage         | - 65 °C for 24 h   | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| High Temperature Exposure       | 250 h at: U = + 250 °C, V = + 350 °C   | ± (0.5 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Moisture Resistance             | MIL-STD-202 Method 106, 7b not applicable  | ± (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 |
| Vibration, High Frequency       | 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 |
| 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 |
| Terminal Strength               | Pull test 5 s to 10 s, 5 lb (RS1/4 thru RS01A), 10 lb for all others; torsion test - 3 alternating directions, 360° each | ± (0.1 % + 0.05 Ω) ΔR | ± (1.0 % + 0.05 Ω) ΔR |



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