

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



## LINKS TO ADDITIONAL RESOURCES



## FEATURES

- High temperature coating (> 350 °C)
- Complete welded construction
- Meets applicable requirements of MIL-PRF-26
- Available in non-inductive styles (type NS) with Ayrton-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)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS\***  
Available

**HALOGEN FREE**  
Available

**GREEN**  
(5-2008)  
Available

## Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

| STANDARD ELECTRICAL SPECIFICATIONS |             |                            |                                                                               |                                                                             |                                   |                                  |                                   |                                         |                                               |                       |
|------------------------------------|-------------|----------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------|----------------------------------|-----------------------------------|-----------------------------------------|-----------------------------------------------|-----------------------|
| GLOBAL MODEL                       | HIST. MODEL | MIL-PRF-26 TYPE            | POWER RATING <sup>(3)</sup><br>P <sub>25 °C</sub> W<br>U ± 0.05 %<br>TO ± 5 % | POWER RATING <sup>(3)</sup><br>P <sub>25 °C</sub> 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   | <b>RW70</b> <sup>(2)</sup> | 1.0                                                                           | -                                                                           | -                                 | 0.499 to 2.74K                   | 0.499 to 2.74K                    | 0.1 to 2.74K                            | 0.1 to 2.74K                                  | 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   | <b>RW79</b> <sup>(2)</sup> | 3.0                                                                           | -                                                                           | -                                 | 0.499 to 6.49K                   | 0.1 to 6.49K                      | 0.1 to 6.49K                            | 0.1 to 6.49K                                  | 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    | <b>RW69</b> <sup>(1)</sup> | -                                                                             | 3.25                                                                        | -                                 | -                                | -                                 | -                                       | 0.1 to 2.0K                                   | 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     | <b>RW74</b> <sup>(2)</sup> | 5.0                                                                           | -                                                                           | -                                 | 0.499 to 24.3K                   | 0.1 to 24.3K                      | 0.1 to 24.3K                            | 0.1 to 24.3K                                  | 4.2                   |
| RS005...70                         | RS-5-70     | <b>RW67</b> <sup>(1)</sup> | -                                                                             | 6.5                                                                         | -                                 | -                                | -                                 | 0.1 to 8.5K                             | 0.1 to 8.5K                                   | 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    | <b>RW78</b> <sup>(2)</sup> | 10.0                                                                          | -                                                                           | -                                 | 0.499 to 71.5K                   | 0.1 to 71.5K                      | 0.1 to 71.5K                            | 0.1 to 71.5K                                  | 9.0                   |
| RS010...39                         | RS-10-39    | <b>RW68</b> <sup>(1)</sup> | -                                                                             | 13.0                                                                        | -                                 | -                                | -                                 | 0.1 to 20K                              | 0.1 to 20K                                    | 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) Available tolerance for these MIL parts is ± 5 % for 1 Ω and above, ± 10 % below 1 Ω
- (2) Available tolerance for these MIL parts is ± 0.5 % and ± 1 % for resistance values 0.1 Ω and above, ± 0.1 % for resistance values 0.499 Ω and above
- (3) 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: RS02C10K00FS7017

|                                                                          |          |                                                                                          |          |          |                                                                                                                                                                 |          |                                                                                                                                                                                                                                                                                          |          |          |          |          |                                                        |          |          |          |  |
|--------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------|----------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|--------------------------------------------------------|----------|----------|----------|--|
| <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>(5 digits)                                               |          | RESISTANCE VALUE<br>(5 digits)                                                           |          |          | TOLERANCE CODE<br>(1 digit)                                                                                                                                     |          | PACKAGING<br>(3 digits)                                                                                                                                                                                                                                                                  |          |          |          |          | SPECIAL<br>(up to 3 digits)                            |          |          |          |  |
| (see Standard Electrical Specifications Global Model column for options) |          | <b>R</b> = decimal<br><b>K</b> = thousand<br><b>15R00</b> = 15 Ω<br><b>10K00</b> = 10 kΩ |          |          | <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>H</b> = 3.0 %<br><b>J</b> = 5.0 %<br><b>K</b> = 10.0 % |          | <b>E70</b> = lead (Pb)-free, tape / reel (smaller than RS005)<br><b>E73</b> = lead (Pb)-free, tape / reel<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<br><b>B12</b> = tin / lead, bulk |          |          |          |          | (dash number)<br>From <b>1 to 999</b><br>as applicable |          |          |          |  |

Historical Part Numbering Example: RS-2C-17 10 kΩ 1 % S70

|                  |                  |                |            |
|------------------|------------------|----------------|------------|
| <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]


| GLOBAL MODEL                      | DIMENSIONS in inches [millimeters] |                  |                                                 |                                  |
|-----------------------------------|------------------------------------|------------------|-------------------------------------------------|----------------------------------|
|                                   | A                                  | B (2)<br>(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                             | 0.270 ± 0.031<br>[6.86 ± 0.787]    | 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 ± 0.031<br>[4.70 ± 0.787]                 | 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]  |

**Notes**
<sup>(1)</sup> On some standard reel pack methods, the leads may be trimmed to a shorter length than shown

<sup>(2)</sup> B (max.) dimension is clean lead to clean lead

**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>(1)</sup>, value, tolerance, date code

**Note**

<sup>(1)</sup> Wattage marked on part will be "U" characteristic

**DERATING****NS NON-INDUCTIVE**

Models of equivalent physical and electrical specifications are available with non-inductive (Ayrton-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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