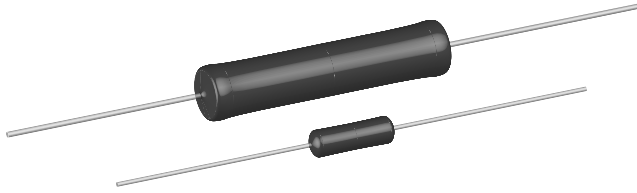




# Wirewound Resistors, Industrial, Precision Power, Silicone Coated, Axial Lead



### 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.

### 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

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HIST. MODEL | POWER RATING <sup>(1)</sup><br>P <sub>25°C</sub> W<br>U ± 0.05 %<br>to ± 5 % | POWER RATING <sup>(1)</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   | 1.0  | -  | -                                 | 0.499 to 2.74K                   | 0.499 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                            | -   | 0.70                  |
| 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

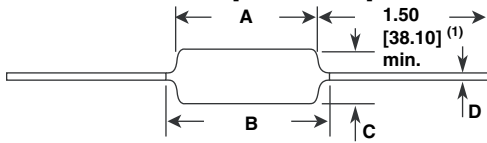
Global Part Numbering example: RS02C10K00FS7017

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| R | S | 0 | 2 | C | 1 | 0 | K | 0 | 0 | F | S | 7 | 0 | 1 | 7 |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|

| 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) | R = decimal<br>K = thousand<br>15R00 = 15 Ω<br>10K00 = 10 kΩ | A = 0.05 %<br>B = 0.1 %<br>C = 0.25 %<br>D = 0.5 %<br>F = 1.0 %<br>H = 3.0 %<br>J = 5.0 %<br>K = 10.0 % | E70 = lead (Pb)-free, tape / reel (smaller than RS005)<br>E73 = lead (Pb)-free, tape / reel (RS005 and larger)<br>E12 = lead (Pb)-free, bulk<br><br>S70 = tin / lead, tape / reel (smaller than RS005)<br>S73 = tin / lead, tape / reel (RS005 and larger)<br>B12 = tin / lead, bulk | (dash number) from 1 to 999 as applicable |

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

|                  |                  |                |           |
|------------------|------------------|----------------|-----------|
| RS-2C-17         | 10 kΩ            | 1 %            | S70       |
| 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

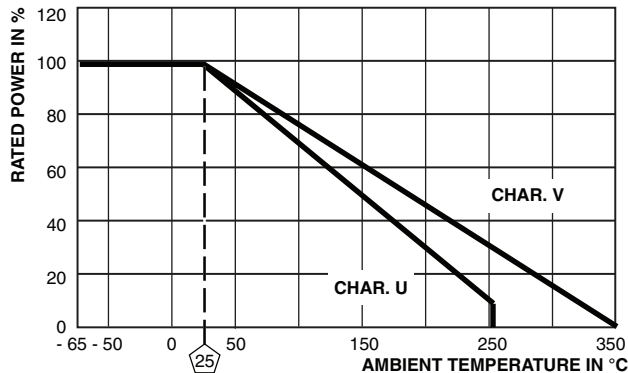
**Standard Terminals:** 100 % Sn, or 60/40 Sn/Pb coated Copperweld®

**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                             | 0.270 ± 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]  |

**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 (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             | 5x 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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