

## 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.

STANDARD ELECTRICAL SPECIFICATIONS

### **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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912





HALOGEN FREE GREEN

<u>(5-2008)</u> Available

global Model	HIST. MODEL	POWER RATING <sup>(1)</sup> $P_{25 \circ C} W$ U ± 0.05 % to ± 5 %	POWER RATING <sup>(1)</sup> $P_{25 °C} W$ V ± 3 % to ± 10 %	RESISTANCE RANGE Ω ± 0.05 %	RESISTANCE RANGE Ω ± 0.1 %	RESISTANCE RANGE Ω ± 0.25 %	RESISTANCE       Ω       ± 0.5 %,       ± 1 %	RESISTANCE RANGE       Ω       ± 3 %, ± 5 %,       ± 10 %	WEIGHT (typical) 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
RS01A300	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
RS02B300	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
RS02C17	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
RS02C23	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
RS00569	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
RS00570	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
RS01038	RS-10-38	10.0	-	-	0.499 to 73.4K	0.1 to 273K	0.1 to 273K	0.1 to 273K	9.0
RS01039	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. 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 PAR	RT NUMBER I	NFO	RMATION					
Global Part Numb	ering example: R	S02C	10K00FS7017 1 0 K	0	0 F S 7	· ] [	0 1	7
GLOBAL MODEL RESISTANCE VALUE T (5 digits) (5 digits)			TOLERANCE CODE (1 digit)		PACKAGING (3 digits)	SPECIAL (up to 3 digits)		
(See Standard Electrical Specifications	<b>R</b> = Decimal <b>K</b> = Thousand <b>15R00</b> = 15 Ω <b>10K00</b> = 10 kΩ		<b>A</b> = 0.05 % <b>B</b> = 0.1 % <b>C</b> = 0.25 % <b>D</b> = 0.5 %		E70 = Lead (Pb)-free, tape/reel (smaller than RS005) E73 = Lead (Pb)-free, tape/reel (RS005 and larger) E12 = Lead (Pb)-free, bulk			(Dash Number) From <b>1 to 999</b> as applicable
column for options)			F = 0.0 %  F = 1.0 %  H = 3.0 %  J = 5.0 %  K = 10.0 %	<b>S70</b> = Tin/lead, tape/reel (smaller than RS005) <b>S73</b> = Tin/lead, tape/reel (RS005 and larger) <b>B12</b> = Tin/lead, bulk				
Historical Part Numbering example: RS-2C-17 10 k $\Omega$ 1 % S70								
RS-2C-17		<b>10 k</b> Ω		1 %		S7	70	
HISTORICAL MODEL F		RE	ESISTANCE VALUE		TOLERANCE CODE		PACKA	AGING

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# RS, NS

## Vishay Dale

## **DIMENSIONS** in inches [millimeters]



#### Note

<sup>(1)</sup> 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 <sup>(2)</sup> Wattage marked on part will be "U" characteristic.

### DERATING



	DIMENSIONS in inches [millimeters]						
MODEL	A	B <sup>(3)</sup> (max.)	С	D			
RS1/4	0.250 ± 0.031 [6.35 ± 0.787]	0.281 [7.14]	$0.085 \pm 0.020$ [2.16 ± 0.508]	$\begin{array}{c} 0.020 \pm 0.002 \\ [0.508 \pm 0.051] \end{array}$			
RS1/2	0.312 ± 0.016 [7.92 ± 0.406]	0.328 [8.33]	0.078 + 0.016 - 0.031 [1.98 + 0.406 - 0.787]	$\begin{array}{c} 0.020 \pm 0.002 \\ [0.508 \pm 0.051] \end{array}$			
RS01A RS01A300	0.406 ± 0.031 [10.31 ± 0.787]	0.437 [11.10]	0.094 ± 0.031 [2.39 ± 0.787]	$\begin{array}{c} 0.020 \pm 0.002 \\ [0.508 \pm 0.051] \end{array}$			
RS01M	0.270 ± 0.031 [6.86 ± 0.787]	0.311 [7.90]	0.110 ± 0.015 [2.79 ± 0.381]	$\begin{array}{c} 0.020 \pm 0.002 \\ [0.508 \pm 0.051] \end{array}$			
RS002	0.625 ± 0.062 [15.88 ± 1.57]	0.765 [19.43]	0.250 ± 0.031 [6.35 ± 0.787]	$\begin{array}{c} 0.040 \pm 0.002 \\ [1.02 \pm 0.051] \end{array}$			
RS02M	0.500 ± 0.062 [12.70 ± 1.57]	0.562 [14.27]	0.185 ± 0.015 [4.70 ± 0.381]	$\begin{array}{c} 0.032 \pm 0.002 \\ [0.813 \pm 0.051] \end{array}$			
RS02B RS02B300	0.560 ± 0.062 [14.22 ± 1.57]	0.622 [15.80]	0.187 ± 0.031 [4.75 ± 0.787]	$\begin{array}{c} 0.032 \pm 0.002 \\ [0.813 \pm 0.051] \end{array}$			
RS02C	0.500 ± 0.062 [12.70 ± 1.57]	0.593 [15.06]	0.218 ± 0.031 [5.54 ± 0.787]	$\begin{array}{c} 0.040 \pm 0.002 \\ [1.02 \pm 0.051] \end{array}$			
RS02C17 RS02C23	0.500 ± 0.062 [12.70 ± 1.57]	0.593 [15.06]	0.218 ± 0.031 [5.54 ± 0.787]	$\begin{array}{c} 0.032 \pm 0.002 \\ [0.813 \pm 0.051] \end{array}$			
RS005 RS00569 RS00570	0.875 ± 0.062 [22.23 ± 1.57]	1.0 [25.4]	0.312 ± 0.031 [7.92 ± 0.787]	$\begin{array}{c} 0.040 \pm 0.002 \\ [1.02 \pm 0.051] \end{array}$			
RS007	1.22 ± 0.062 [30.99 ± 1.57]	1.28 [32.51]	0.312 ± 0.031 [7.92 ± 0.787]	$\begin{array}{c} 0.040 \pm 0.002 \\ [1.02 \pm 0.051] \end{array}$			
RS010 RS01039	1.78 ± 0.062 [45.21 ± 1.57]	1.87 [47.50]	0.375 ± 0.031 [9.53 ± 0.787]	$\begin{array}{c} 0.040 \pm 0.002 \\ [1.02 \pm 0.051] \end{array}$			
RS01038	1.78 ± 0.062 [45.21 ± 1.57]	1.84 [46.74]	0.375 ± 0.031 [9.53 ± 0.787]	$\begin{array}{c} 0.040 \pm 0.002 \\ [1.02 \pm 0.051] \end{array}$			

Note

<sup>(3)</sup> 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	$\pm$ 20 for 10 $\Omega$ and above, $\pm$ 50 for 1 $\Omega$ to 9.9 $\Omega,$ $\pm$ 90 for 0.5 $\Omega$ to 0.99 $\Omega$				
Maximum Working Voltage	V	(P x R) <sup>1/2</sup>				
Insulation Resistance	Ω	1000 M $\Omega$ minimum dry, 100 M $\Omega$ minimum after moisture test				
Operating Temperature Range	O°	Characterisitic U = -65 to +250, characteristic V = -65 to +350				

PERFORMANCE							
TEQT		TEST LIMITS					
TEST	CONDITIONS OF TEST	CHARACTERISTIC U	CHARACTERISTIC V				
Thermal Shock	Rated power applied until thermally stable, then a minimum of 15 min at -55 $^\circ C$	$\pm$ (0.2 % + 0.05 Ω) Δ <i>R</i>	$\pm$ (2.0 % + 0.05 $\Omega) \Delta R$				
Short Time Overload	5 x rated power (3.75 W and smaller), 10 x rated power (4 W and larger) for 5 s	$\pm$ (0.2 % + 0.05 Ω) Δ <i>R</i>	$\pm$ (2.0 % + 0.05 $\Omega) \Delta R$				
Dielectric Withstanding Voltage	500 $V_{\text{RMS}}$ min. for RS1/4 thru RS01A, 1000 $V_{\text{RMS}}$ for all others, duration of 1 min	$\pm$ (0.1 % + 0.05 Ω) Δ <i>R</i>	± (0.1 % + 0.05 Ω) ΔR				
Low Temperature Storage	-65 °C for 24 h	$\pm$ (0.2 % + 0.05 Ω) Δ <i>R</i>	$\pm$ (2.0 % + 0.05 $\Omega) \Delta R$				
High Temperature Exposure	250 h at: U = +250 °C, V = +350 °C	$\pm$ (0.5 % + 0.05 Ω) Δ <i>R</i>	$\pm$ (2.0 % + 0.05 $\Omega) \Delta R$				
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	$\pm$ (0.2 % + 0.05 Ω) ΔR	$\pm$ (2.0 % + 0.05 Ω) ΔR				
Shock, Specified Pulse	MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks	$\pm$ (0.1 % + 0.05 Ω) ΔR	$\pm$ (0.2 % + 0.05 Ω) ΔR				
Vibration, High Frequency	Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each	$\pm$ (0.1 % + 0.05 Ω) ΔR	$\pm$ (0.2 % + 0.05 Ω) ΔR				
Load Life	2000 h at rated power, +25 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm (0.5 \% + 0.05 \Omega) \Delta R$	$\pm$ (3.0 % + 0.05 $\Omega) \Delta R$				
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) Δ <i>R</i>	± (1.0 % + 0.05 Ω) ΔR				

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