



# Wirewound Resistors, Industrial Power, **Aluminum Housed, Chassis Mount**



#### **LINKS TO ADDITIONAL RESOURCES**



#### **FEATURES**

- Molded construction for total environmental protection
- Complete welded construction
- Meets applicable requirements of MIL-PRF-18546
- Available in non-inductive styles (type NH) with Ayrton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect
- Excellent stability in operation (< 1 % change in</li> resistance)
- MIL-PRF-18546 qualified, type RE resistors can be found at: www.vishav.com/doc?30282
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912







HALOGEN FREE

**GREEN** 

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

#### 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

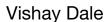
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STANDARD ELECTRICAL SPECIFICATIONS									
GLOBAL MODEL	HISTORICAL MODEL	POWER RATING P <sub>25 °C</sub> W	RESISTANCE RANGE $\Omega$ $\pm$ 0.05 %, $\pm$ 0.1 %	RESISTANCE RANGE Ω ± 0.25 %	RESISTANCE RANGE Ω ± 0.5 %	RESISTANCE RANGE $\Omega$ ± 1 %, ± 3 %, ± 5 %	WEIGHT (typical) g		
RH005	RH-5	7.5	0.5 to 6.75K	0.1 to 8.6K	0.05 to 8.6K	0.02 to 24.5K	3		
NH005	NH-5	7.5	0.5 to 2.32K	0.1 to 3.27K	0.05 to 3.27K	0.05 to 12.75K	3		
RH010	RH-10	12.5	0.5 to 12.7K	0.1 to 16.69K	0.05 to 16.69K	0.01 to 47.1K	5		
NH010	NH-10	12.5	0.5 to 4.45K	0.1 to 5.54K	0.05 to 5.54K	0.05 to 23.5K	5		
RH025	RH-25	25	0.5 to 25.7K	0.1 to 32.99K	0.05 to 32.99K	0.01 to 95.2K	12		
NH025	NH-25	25	0.5 to 9.09K	0.1 to 12.8K	0.05 to 12.8K	0.05 to 47.6K	12		
RH050	RH-50	50	0.5 to 73.4K	0.1 to 96K	0.05 to 96K	0.01 to 273K	28		
NH050	NH-50	50	0.5 to 26K	0.1 to 36.7K	0.05 to 36.7K	0.05 to 136K	28		
RH100	RH-100	100	0.5 to 90K	0.1 to 90K	0.05 to 90K	0.05 to 90K	353		
NH100	NH-100	100	0.5 to 37.5K	0.1 to 37.5K	0.05 to 37.5K	0.05 to 37.5K	353		
RH250	RH-250	250	0.5 to 116K	0.1 to 116K	0.05 to 116K	0.05 to 116K	637		
NH250	NH-250	250	0.5 to 48.5K	0.1 to 48.5K	0.05 to 48.5K	0.05 to 48.5K	637		

#### Note

RH005 and NH005 printed with 5 W power rating. RH010 and NH010 printed with 10 W power rating. New construction allows these resistors to be rated at higher wattage but will only be printed with the higher wattage upon customer request

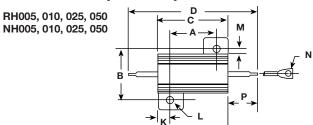
TECHNICAL SPECIFICATIONS						
PARAMETER	UNIT	RH RESISTOR CHARACTERISTICS				
Temperature Coefficient	ppm/°C	$\pm$ 20 for 10 $\Omega$ and above; $\pm$ 50 for 1 $\Omega$ to 9.9 $\Omega$ , $\pm$ 100 for 0.1 $\Omega$ to 0.99 $\Omega$				
Maximum Working Voltage	V	$(P \times R)^{1/2}$				
Insulation Resistance	Ω	10 000 M $\Omega$ minimum dry, 1000 M $\Omega$ minimum after moisture test				
Solderability	-	Meets requirements of ANSI J-STD-002				
Operating Temperature Range	°C	-55 to +250				

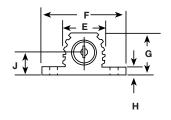
#### **GLOBAL PART NUMBER INFORMATION** Global Part Numbering Example: RH0054R125FC02 1 2 2 **GLOBAL MODEL** RESISTANCE VALUE **TOLERANCE CODE PACKAGING SPECIAL** RH005 A = 0.05 %E02 = lead (Pb)-free, card pack (RH005 - RH050) R = decimal (dash number) (up to 3 digits) from **1 to 999** E01 = lead (Pb)-free, skin pack (RH100 and RH250) (see Standard K = thousand B = 0.1 %Electrical **15R00** = 15 ΩC = 0.25 %C02 = tin / lead, card pack (RH005 - RH050) Specifications **10K00** = 10 kΩ D = 0.5 %as applicable J01 = tin / lead, skin pack (RH100 and RH250) Global Model F = 1.0 %column for H = 3.0 %options) J = 5.0 %Historical Part Numbering Example: RH-5 4.125 Ω 1 % C02 RH-5 **4.125** ΩC02 1 % HISTORICAL MODEL RESISTANCE VALUE **TOLERANCE CODE PACKAGING**





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

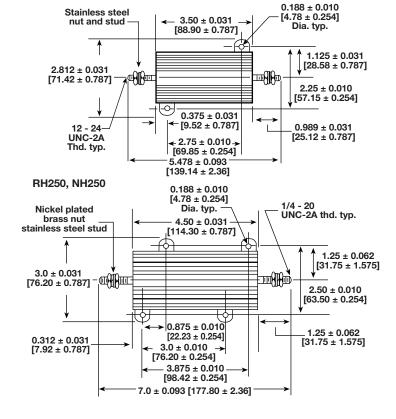


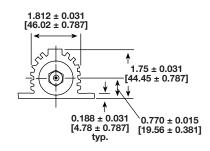


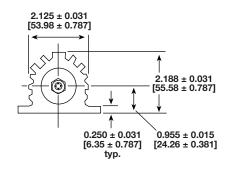
GLOBAL	DIMENSIONS in inches [millimeters]													
MODEL	Α	В	С	D	E	F	G	Н	J	K	L	М	N	Р
RH005 NH005	0.444 ± 0.005 [11.28 ± 0.127]	0.490 ± 0.005 [12.45 ± 0.127]	0.600 ± 0.030 [15.24 ± 0.787]	1.125 ± 0.062 [28.58 ± 1.57]	0.334 ± 0.015 [8.48 ± 0.381]	0.646 ± 0.015 [16.41 ± 0.381]	0.320 ± 0.015 [8.13 ± 0.381]	0.065 ± 0.010 [1.65 ± 0.254]	0.133 ± 0.010 [3.38 ± 0.254]	0.078 ± 0.010 [1.98 ± 0.254]	0.093 ± 0.005 [2.36 ± 0.127]	0.078 ± 0.015 [1.98 ± 0.381]	0.050 ± 0.005 [1.27 ± 0.127]	0.266 ± 0.062 [6.76 ± 1.57]
RH010 NH010	0.562 ± 0.005 [14.27 ± 0.127]	0.625 ± 0.005 [15.88 ± 0.127]	0.750 ± 0.031 [19.05 ± 0.787]	1.375 ± 0.062 [34.93 ± 1.57]	0.420 ± 0.015 [10.67 ± 0.381]	0.800 ± 0.015 [20.32 ± 0.381]	0.390 ± 0.015 [9.91 ± 0.381]	0.075 ± 0.010 [1.91 ± 0.254]	0.165 ± 0.010 [4.19 ± 0.254]	0.093 ± 0.010 [2.36 ± 0.254]	0.094 ± 0.005 [2.39 ± 0.127]	0.102 ± 0.015 [2.59 ± 0.381]	0.085 ± 0.005 [2.16 ± 0.127]	0.312 ± 0.062 [7.92 ± 1.57]
RH025 NH025	0.719 ± 0.005 [18.26 ± 0.127]	0.781 ± 0.005 [19.84 ± 0.127]	1.062 ± 0.031 [26.97 ± 0.787]	1.938 ± 0.062 [49.23 ± 1.57]	0.550 ± 0.015 [13.97 ± 0.381]	1.080 ± 0.015 [27.43 ± 0.381]	0.546 ± 0.015 [13.87 ± 0.381]	0.075 ± 0.010 [1.91 ± 0.254]	0.231 ± 0.010 [5.87 ± 0.254]	0.172 ± 0.010 [4.37 ± 0.254]	0.125 ± 0.005 [3.18 ± 0.127]	0.115 ± 0.015 [2.92 ± 0.381]	0.085 ± 0.005 [2.16 ± 0.127]	0.438 ± 0.062 [11.13 ± 1.57]
RH050 NH050	1.562 ± 0.005 [39.67 ± 0.127]	0.844 ± 0.005 [21.44 ± 0.127]	1.968 ± 0.031 [49.99 ± 0.787]	2.781 ± 0.062 [70.64 ± 1.57]	0.630 ± 0.015 [16.00 ± 0.381]	1.140 ± 0.015 [28.96 ± 0.381]	0.610 ± 0.015 [15.49 ± 0.381]	0.088 ± 0.010 [2.24 ± 0.254]	0.260 ± 0.010 [6.60 ± 0.254]	0.196 ± 0.010 [4.98 ± 0.254]	0.125 ± 0.005 [3.18 ± 0.127]	0.107 ± 0.015 [2.72 ± 0.381]	0.085 ± 0.005 [2.16 ± 0.127]	0.438 ± 0.062 [11.13 ± 1.57]

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











#### **POWER RATING**

Vishay RH resistor wattage ratings are based on mounting to the following heat sink:

RH005 and RH010: 4" x 6" x 2" x 0.040" thick aluminum chassis (129 sq. in. surface area) RH025: 5" x 7" x 2" x 0.040" thick aluminum chassis (167 sq. in. surface area) RH050: 12" x 12" x 0.059" thick aluminum panel (291 sq. in. surface area) RH100 and RH250: 12" x 12" x 0.125" thick aluminum panel (294 sq. in. surface area)

FREE AIR POWER RATING									
GLOBAL MODEL	RH005 NH005	RH010 NH010	RH025 NH025	RH050 NH050	RH100 NH100	RH250 NH250			
W at 25 °C	4.5	7.5	12.5	20	40	100			

#### AMBIENT TEMPERATURE DERATING

Derating is required for ambient temperatures above 25 °C, see the following graph.

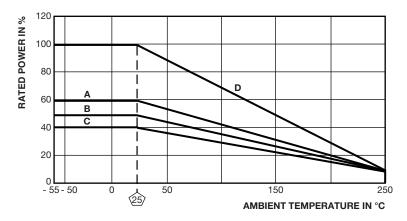
Curves A, B, C apply to operation of unmounted resistors. Curve D applies to all types when mounted to specified heat sink.

A = RH005 and RH010 size resistor, unmounted

**B** = RH025 size resistor, unmounted

C = RH050, RH100 and RH250 size resistor, unmounted

**D** = All types mounted to recommended aluminum heat sink



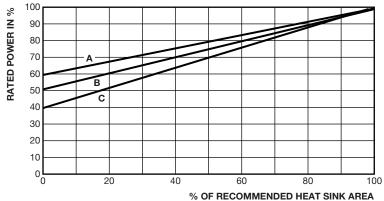
#### REDUCED HEAT SINK DERATING

Derating is also required when recommended heat sink area is reduced.

A = RH005 and RH010 size resistor

**B** = RH025 size resistor

C = RH050, RH100 and RH250 size resistor





Vishay Dale

#### **MATERIAL SPECIFICATIONS**

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

Core: ceramic, steatite or alumina, depending on physical

size

**Encapsulant:** silicone molded construction **Housing:** aluminum with hard anodic coating

End Caps: stainless steel

**Standard Terminals:** For RH005 through RH050 size terminal finish - tin / lead is 60/40 Sn/Pb w/Nickel underplate and lead (Pb)-free is Ni/Pd/Au, finish is on copper clad steel core terminal. For RH100 and RH250 terminals are threaded stainless steel.

Part Marking: Dale, model, wattage, value, tolerance, date

code

#### **NH 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 (NH005, for example).

#### SPECIAL MODIFICATIONS

A number of special modifications to the aluminum housed resistor style are available upon request. Special modifications include:

- · Terminal configurations and materials
- · Resistance values and tolerances
- Low resistance temperature coefficient (RTC)
- · Housing configuration
- Threaded mounting holes
- · Preconditioning and other additional testing

### **APPLICABLE MIL SPECIFICATIONS**

Vishay RH and NH resistors are listed as qualified on the MIL-PRF-18546 QPL. MIL-PRF-18546 qualified, type RE resistors can be found at: <a href="https://www.vishay.com/doc?30282">www.vishay.com/doc?30282</a>

PERFORMANCE							
TEST	CONDITIONS OF TEST	TEST LIMITS					
Thermal Shock	Rated power applied until thermally stable, then a minimum of 15 min at -55 °C	$\pm$ (0.5 % + 0.05 $\Omega$ ) $\Delta R$					
Short Time Overload	5x rated power for 5 s	$\pm$ (0.5 % + 0.05 $\Omega$ ) $\Delta R$					
Dielectric Withstanding Voltage	1000 $V_{RMS}$ for RH005, RH010 and RH025; 2000 $V_{RMS}$ for RH050; 4500 $V_{RMS}$ for RH100 and RH250; duration 1 min	$\pm$ (0.2 % + 0.05 $\Omega$ ) $\Delta R$					
Temperature	250 °C for 2 h	$\pm$ (0.5 % + 0.05 $\Omega$ ) $\Delta R$					
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	$\pm$ (1.0 % + 0.05 Ω) ΔR					
Shock, Specified Pulse	MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks	$\pm$ (0.2 % + 0.05 $\Omega$ ) $\Delta R$					
Vibration, High Frequency	Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each	$\pm$ (0.2 % + 0.05 $\Omega$ ) $\Delta R$					
Load Life	1000 h at rated power, +25 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm$ (1.0 % + 0.05 Ω) ΔR					
Terminal Strength	30 s, 5 pound pull test for RH005 and RH010, 10 pound pull test for other sizes; torque test - 24 pound inch for RH100 and 32 pound inch for RH250	± (0.2 % + 0.05 Ω) ΔR					



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Vishay

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