

# Wirewound Resistors, Military, MIL-PRF-18546 Qualified, Type RE, Aluminum Housed, Chassis Mount



# 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 Aryton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect
- Excellent stability in operation (< 1 % change in resistance)



GREEN

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

Compliant to RoHS Directive 2002/95/EC

GLOBAL	HISTORICAL MODEL	MIL-PRF- 18546 TYPE	POWER RATING		RESISTANCE RANGE (MIL. RANGE SHOWN IN BOLD FACE)					
MODEL			18546 <u>F25</u> °			± 0.05 %. ± 0.1 %	± 0.25 %	± 0.5 %	±1%,±2%,±5%	(typical) g
RH005	RH-5	- RE60G	7.5 (5)	5	0.5 to 6.75K	0.1 to 8.6K	0.05 to 8.6K	0.02 to 24.5K 0.10 to 3.32K	3	
NH005	NH-5	- RE60N	7.5 (5)	5	0.5 to 2.32K	0.1 to 3.27K	0.05 to 3.27K	0.05 to 12.75K 1.0 to 1.65K	3.3	
RH010	RH-10	- RE65G	12.5 (10)	10	0.5 to 12.7K	0.1 to 16.69K -	0.05 to 16.69K	0.01 to 47.1K <b>0.10 to 5.62K</b>	6	
NH010	NH-10	- RE65N	12.5 (10)	10	0.5 to 4.45K	0.1 to 5.54K	0.05 to 5.54K	0.05 to 23.5K 1.0 to 2.8K	8.8	
RH025	RH-25	- RE70G	25	20	0.5 to 25.7K	0.1 to 32.99K -	0.05 to 32.99K	0.01 to 95.2K 0.10 to 12.1K	13	
NH025	NH-25	- RE70N	25	20	0.5 to 9.09K	0.1 to 12.8K	0.05 to 12.8K	0.05 to 47.6K 1.0 to 6.04K	16.5	
RH050	RH-50	- RE75G	50	30	0.5 to 73.4K	0.1 to 96K	0.05 to 96K	0.01 to 273K 0.10 to 39.2K	28	
NH050	NH-50	- RE75N	50	30	0.5 to 26K	0.1 to 36.7K	0.05 to 36.7K	0.05 to 136K 1.0 to 19.6K	35	
RH100	RH-100	- RE77G	100	75	0.5 to 90K	0.1 to 90K	0.05 to 90K	0.05 to 90K <b>0.05 to 29.4K</b>	350	
NH100	NH-100	- RE77N	100	75	0.5 to 37.5K	0.1 to 37.5K	0.05 to 37.5K	0.05 to 37.5K 1.0 to 14.7K	385	
RH250	RH-250	- RE80G	250	120	0.5 to 116K	0.1 to 116K	0.05 to 116K	0.05 to 116K <b>0.10 to 35.7K</b>	630	
NH250	NH-250	- RE80N	250	120	0.5 to 48.5K	0.1 to 48.5K	0.05 to 48.5K	0.05 to 48.5K 1.0 to 17.4K	690	

#### Note

Figures in parentheses on RH005 and RH010 indicate wattage printed on parts, new construction allows these resistors to be rated at higher wattage but will only be printed with the higher wattage on customer request

GLOBAL PART NUMBER INFORMATION								
Global Part Numbering example: RH0054R125FC02 (preferred part number format)								
R H O	0 5	4 R 1	2 5 F C 0	2				
GLOBAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING	SPECIAL				
		Ω <b>D</b> = 0.5 % <b>F</b> = 1.0 %	E02 = Lead (Pb)-free, card pack (RH005 - F E01 = Lead (Pb)-free, skin pack (RH100 and Lead (Pb)-free is not available on RE milita C02 = Tin/lead, card pack (RH005 - RH0 J01 = Tin/lead, skin pack (RH100 and RH	RH250)`(up to 3 digits)'ary type`From 1 to 999050)as applicable				
additional P/N's) Historical Part Nun	10K00 = 10 kΩ	<b>J</b> = 5.0 %	2 (will continue to be accepted)					
RH-5         4.125 Ω         1 %         C02								
HISTORICAL MODEL RESISTANCE VALUE			TOLERANCE CODE	PACKAGING				
* Pb containing termin ** Please see docume	nations are not Rol ent "Vishay Materia	HS compliant, exemptions al Category Policy": www.	s may apply <u>vishay.com/doc?99902</u>					

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

RH005, 010, 025, 050 NH005, 010, 025, 050





MODEL	DIMENSIONS in inches [millimeters]													
MODEL	Α	В	С	D	Е	F	G	Н	J	К	L	М	Ν	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]	$0.260 \pm 0.010 = 0.600 \pm 0.254$	$0.196 \pm 0.010 \ [4.98 \pm 0.254]$	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]

RH100, NH100







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TECHNICAL SPECIFICATIONS						
PARAMETER	UNIT	RH RESISTOR CHARACTERISTICS				
Temperature Coefficient	ppm/°C	$\pm$ 100 for 0.1 $\Omega$ to 0.99 $\Omega,\pm$ 50 for 1 $\Omega$ to 9.9 $\Omega,\pm$ 20 for 10 $\Omega$ and above				
Dielectric Withstanding Voltage	V <sub>AC</sub>	1000 for RH005, RH010 and RH025, 2000 for RH050, 4500 for RH100 and RH250				
Short Time Overload	-	5 × rated power for 5 s				
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				
Terminal Strength	lb	5 minimum for RH005 and RH010, 10 minimum for all others				
Solderability	-	MIL-PRF-18546 type - meets requirements of ANSI J-STD-002				
Operating Temperature Range	°C	- 55 to + 250				

# **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)

# 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
- $\mathbf{B} = RH025$  size resistor
- C = RH050, RH100 and RH250 size resistor







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### **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.

#### Note:

Military (RE) parts are only available with tin/lead finish

**Part Marking:** DALE, model, wattage, value, tolerance, date code

### **NH 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 (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**

MIL-PRF-18546 is the military specification covering aluminum housed, chassis mount, power resistors. VISHAY RH and NH resistors are listed as qualified on the MIL-PRF-18546 QPL.

PERFORMANCE						
TEST	CONDITIONS OF TEST	TEST LIMITS				
Thermal Shock	Rated power applied until thermally stable, then a minimum of 15 min at - 55 $^\circ \text{C}$	$\pm (0.5~\% + 0.05~\Omega)\Delta R$				
Short Time Overload	5 x rated power for 5 s	$\pm$ (0.5 % + 0.05 Ω) Δ <i>R</i>				
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 $\Omega) \Delta R$				
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 $\Omega) \Delta R$				
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	$\pm (0.2 \% + 0.05 \Omega) \Delta R$				



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