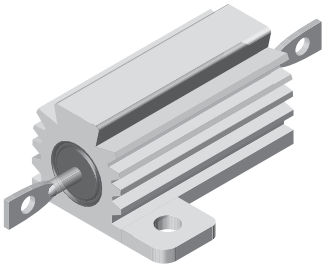
Wirewound Resistors, Industrial Power, Aluminum Housed, Chassis Mount



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 Ayrton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect
- Excellent stability in operation (< 1 % change in resistance)
- MIL-PRF-18546 qualified, type RE resistors can be found at: www.vishay.com/doc?30282
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

e4

RoHS* Available

HALOGEN FREE Available

GREEN (5-2008) Available

DESIGN SUPPORT TOOLS

click logo to get started

3D Models 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	HISTORICAL MODEL	POWER RATING $P_{25\ °C}$ W	RESISTANCE RANGE Ω ± 0.05 %, ± 0.1 %	RESISTANCE RANGE Ω ± 0.25 %	RESISTANCE RANGE Ω ± 0.5 %	RESISTANCE RANGE Ω ± 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	± 20 for 10 Ω and above; ± 50 for 1 Ω to 9.9 Ω, ± 100 for 0.1 Ω to 0.99 Ω
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Insulation Resistance	Ω	10 000 MΩ minimum dry, 1000 MΩ 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

R	H	0	0	5	4	R	1	2	5	F	C	0	2			

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

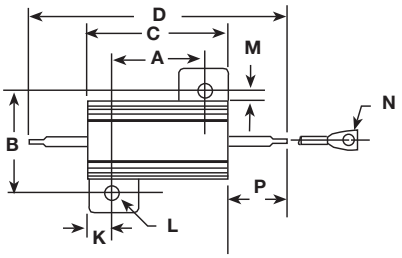
Historical Part Numbering example: RH-5 4.125 Ω 1 % C02

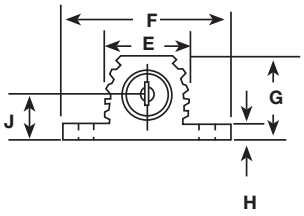
RH-5	4.125 Ω	1 %	C02
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING

For technical questions, contact: ww2aresistors@vishay.com

DIMENSIONS in inches [millimeters]

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

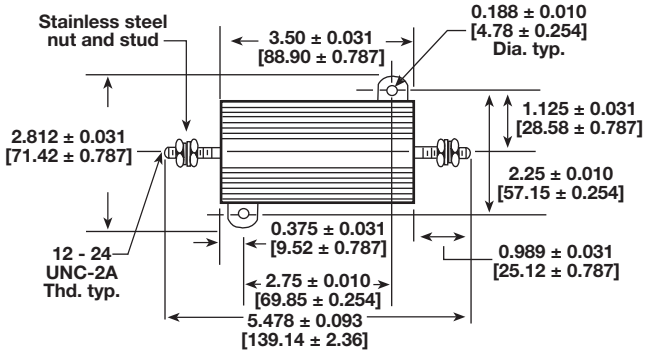


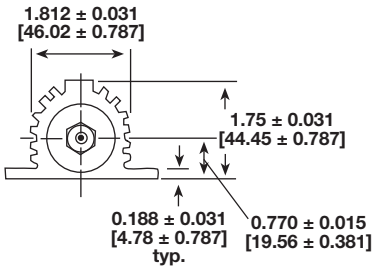


GLOBAL MODEL	DIMENSIONS in inches [millimeters]													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RH005 NH005	0.444 ± 0.005 [11.28 ± 0.127]	0.490 ± 0.005 [12.45 ± 0.127]	0.600 ± 0.030 [15.24 ± 0.787]	1.125 ± 0.062 [28.58 ± 1.57]	0.334 ± 0.015 [8.48 ± 0.381]	0.646 ± 0.015 [16.41 ± 0.381]	0.320 ± 0.015 [8.13 ± 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]

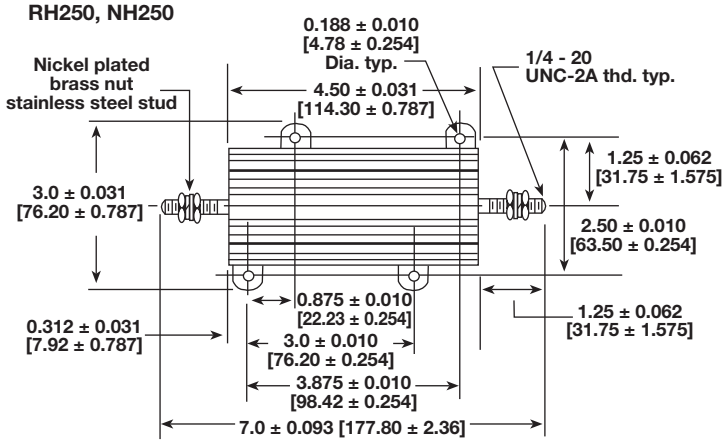
DIMENSIONS in inches [millimeters]

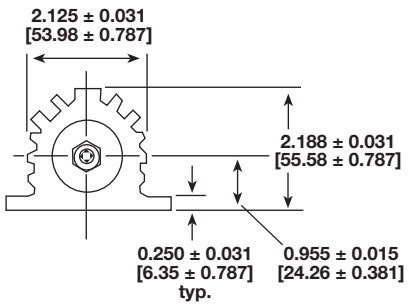
RH100, NH100





RH250, NH250





POWER RATING

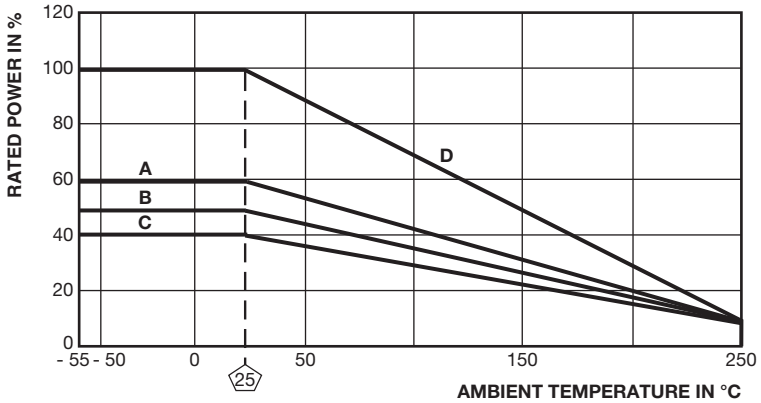
Vishay RH resistor wattage ratings are based on mounting to the following heat sink:

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

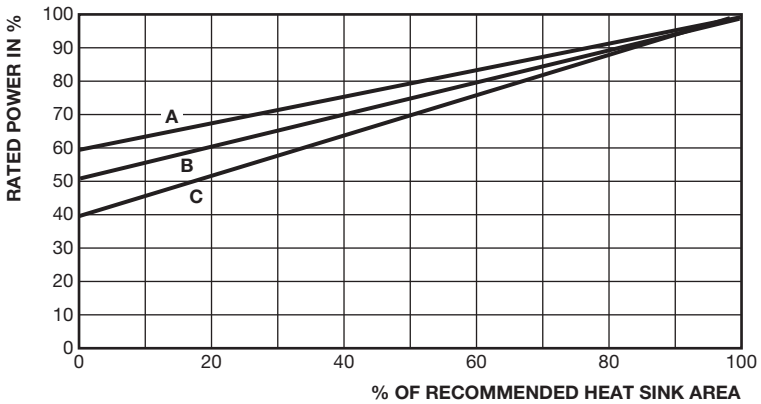
AMBIENT TEMPERATURE DERATING

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



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: www.vishay.com/doc?30282

PERFORMANCE		
TEST	**CONDITIONS OF TEST**	**TEST LIMITS**
Thermal Shock	Rated power applied until thermally stable, then a minimum of 15 min at -55 °C	± (0.5 % + 0.05 Ω) ΔR
Short Time Overload	5x rated power for 5 s	± (0.5 % + 0.05 Ω) ΔR
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	± (0.2 % + 0.05 Ω) ΔR
Temperature	250 °C for 2 h	± (0.5 % + 0.05 Ω) ΔR
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	± (1.0 % + 0.05 Ω) ΔR
Shock, Specified Pulse	MIL-STD-202 Method 213, 100 *g*'s for 6 ms, 10 shocks	± (0.2 % + 0.05 Ω) ΔR
Vibration, High Frequency	Frequency varied 10 Hz to 2000 Hz, 20 *g* peak, 2 directions 6 h each	± (0.2 % + 0.05 Ω) ΔR
Load Life	1000 h at rated power, +25 °C, 1.5 h "ON", 0.5 h "OFF"	± (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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