

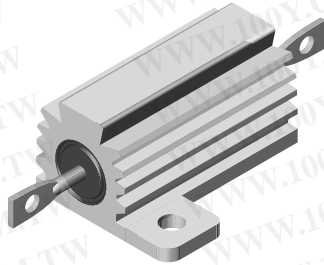
RH, NH

Vishay Dale

勝特力材料 886-3-5753170
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 Http://www.100y.com.tw



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)



RoHS* COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

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

Note

- Figures in parentheses on RH-5 and RH-10 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

New Global Part Numbering: RH0054R125FC02 (preferred part number format)

R	H	0	0	5	4	R	1	2	5	F	C	0	2			
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GLOBAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING	SPECIAL
RH005 (See "Standard Electrical Specifications" table above for additional P/N's)	L = Milliohm R = Decimal K = Thousand 8L000 = 0.008 Ω 15R00 = 15 Ω	A = 0.05 % B = 0.1 % C = 0.25 % D = 0.5 % F = 1.0 %	E02 = Lead (Pb)-free, card pack (RH005 - RH050) E01 = Lead (Pb)-free, skin pack (RH100 and RH250) Lead (Pb)-free is not available on RE military type C02 = Tin/lead, card pack (RH005 - RH050) J01 = Tin/lead, skin pack (RH100 and RH250)	(Dash Number) (up to 3 digits) From 1 - 999 as applicable

Historical Part Number Example: RH-5 4.125 Ω 1% C02 (will continue to be accepted)

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

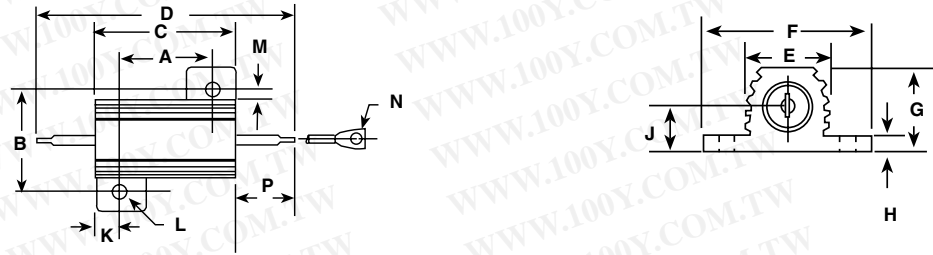
* Pb containing terminations are not RoHS compliant, exemptions may apply



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

DIMENSIONS in inches [millimeters]

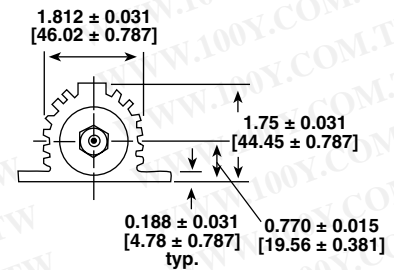
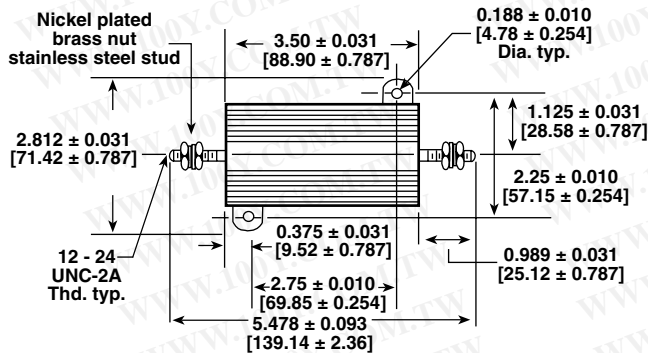
RH-5, -10, -25, -50
NH-5, -10, -25, -50



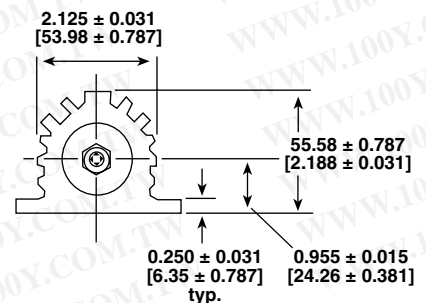
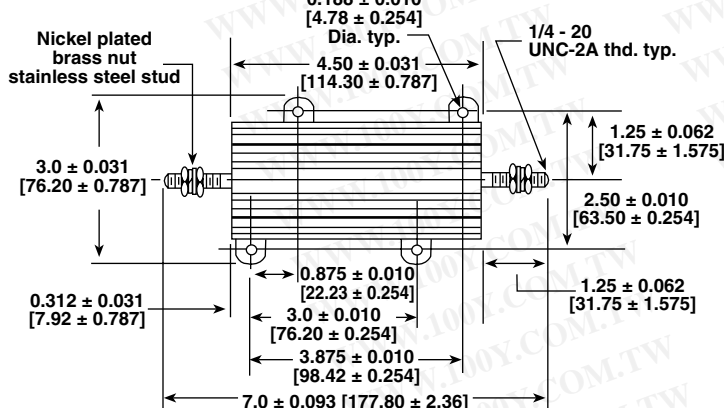
MODEL	DIMENSIONS in inches [millimeters]													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RH-5 NH-5	0.444 ± 0.005 [11.28 ± 0.127]	0.490 ± 0.005 [12.45 ± 0.127]	0.600 ± 0.030 [15.24 ± 0.787]	1.125 ± 0.062 [28.58 ± 1.57]	0.334 ± 0.015 [8.48 ± 0.381]	0.646 ± 0.015 [16.41 ± 0.381]	0.320 ± 0.015 [8.13 ± 0.381]	0.065 ± 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]
RH-10 NH-10	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]
RH-25 NH-25	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]
RH-50 NH-50	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]

RH-100, NH-100



RH-250, NH-250



TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	RH RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	± 100 for 0.1 Ω to 0.99 Ω, ± 50 for 1 Ω to 9.9 Ω, ± 20 for 10 Ω and above
Dielectric Withstanding Voltage	V _{AC}	1000 for RH/5, RH-10 and RH/25, 2000 for RH/50, 4500 for RH/100 and RH/250
Short Time Overload	-	5 × rated power for 5 s
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Insulation Resistance	Ω	10 000 MΩ minimum dry, 1000 MΩ minimum after moisture test
Terminal Strength	lb	5 minimum for RH-5 and RH-10, 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:

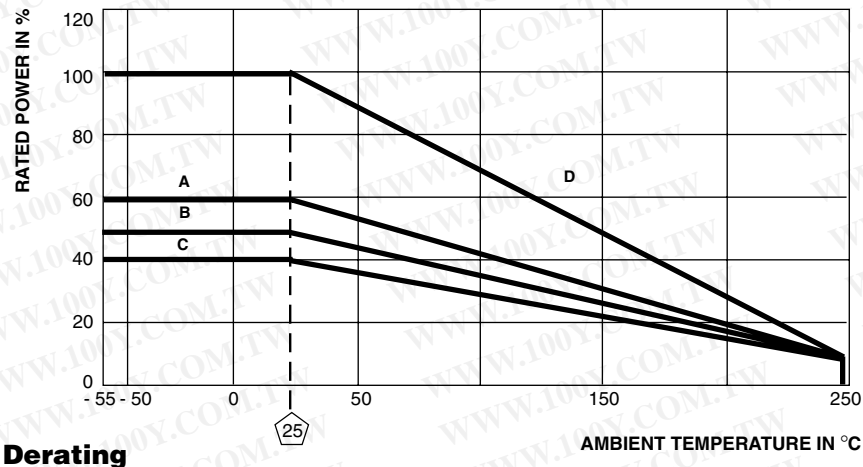
- RH-5 and RH-10: 4" x 6" x 2" x 0.040" thick aluminum chassis (129 sq. in. surface area)
- RH-25: 5" x 7" x 2" x 0.040" thick aluminum chassis (167 sq. in. surface area)
- RH-50: 12" x 12" x 0.059" thick aluminum panel (291 sq. in. surface area)
- RH-100 and RH-250: 12" x 12" x 0.125" thick aluminum 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** = RH-5 and RH-10 size resistor, unmounted
- B** = RH-25 size resistor, unmounted
- C** = RH-50, RH-100 and RH-250 size resistor, unmounted
- D** = All types mounted to recommended aluminum heat sink

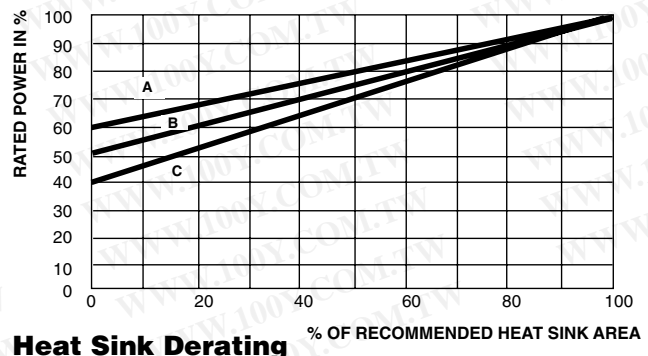


Derating

REDUCED HEAT SINK DERATING:

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

- A** = RH-5 and RH-10 size resistor
- B** = RH-25 size resistor
- C** = RH-50, RH-100 and RH-250 size resistor



Heat Sink Derating



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 RH-5 through RH-50 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 RH-100 and RH-250 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 (NH-5, 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 °C	± (0.5 % + 0.05 Ω) ΔR
Short Time Overload	5 x rated power for 5 s	± (0.5 % + 0.05 Ω) ΔR
Dielectric Withstanding Voltage	1000 V _{rms} for RH-5, RH-10 and RH-25; 2000 V _{rms} for RH-50 4500 V _{rms} for RH-100 and RH-250; 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 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 RH-5 and RH-10, 10 pound pull test for other sizes, torque test - 24 pound inch for RH-100 and 32 pound inch for RH-250	± (0.2 % + 0.05 Ω) ΔR



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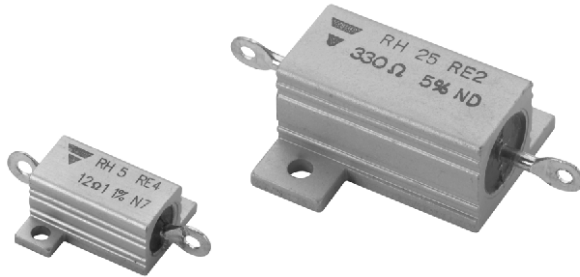
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Heatsink Encased Wirewound Power Resistors



FEATURES

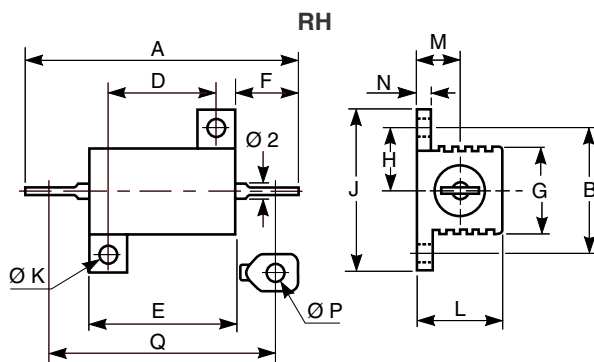
- 5 W to 50 W at 25 °C
- NF C 83-210
- CECC 40 203
- High stability < 0.05 % year
- Low temperature coefficient typically ± 15 ppm/°C
- Wide range of values from 0.006 Ω to 130 k Ω
- Termination = Sn/Ag/Cu
- Compliant to RoHS directive 2002/95/EC


RoHS
COMPLIANT

Encased in a compact and light heatsink offering complete environmental protection, great mechanical strength and easy mounting. Non inductive versions can be supplied under the RHNI designation (please indicate required specifications and frequency range upon ordering).

NF F 16101, 10/1988 and 16102, 04/1992: Not applicable (our parts contain less than 10 g of combustible materials).

DIMENSIONS in millimeters



MODEL AND STYLE	RH5	RH10	RH25	RH50
A	28.5 ± 1.5	35 ± 1.5	49 ± 1.3	70.2 ± 1.4
B ± 0.2	12.5	15.9	19.8	21.4
D ± 0.2	11.3	14	18.3	39.7
E ± 0.5	16.3	19	28	50
F	6.8 ± 1.5	7.9 ± 1.5	11.1 ± 1.5	11 ± 1.2
G ± 1	8.5	11	14	15.5
H ± 0.7	6.2	7.9	9.9	10.7
J ± 0.5	16.4	20.6	27.5	29.4
Ø K ± 0.1	2.4	2.4	3.2	3.2
L max.	8.9	11	15	15
M ± 0.5	4.3	5.6	8	8
N ± 0.3	1.6	2	2.4	2.4
Ø P min.	2.1	2.1	2.1	2.1
Q	25.3 ± 1.5	30.6 ± 1.5	44.6 ± 1.3	66.5 ± 1.4
Weight in g	4	6.4	16.1	28.6

ELECTRICAL SPECIFICATIONS							
VISHAY SFERNICE MODEL AND STYLE			RH5	RH10	RH25	RH50	
NF C 83-210 (CECC 40 203)			RE4	RE1	RE2	RE3	
Power Rating	Chassis Mounted Resistors	MIL Limits	25 °C	5 W	10 W	20 W	30 W
			70 °C	4 W	8 W	16 W	24 W
	413 cm ² for RH5 and RH10 536 cm ² for RH25 and RH50	VISHAY SFERNICE Limits	25 °C	10 W	12.5 W	25 W	50 W
			70 °C	8 W	10 W	20 W	40 W
Unmounted Resistors	VISHAY SFERNICE Limits	25 °C	4 W	6 W	9W	12 W	
		70 °C	3.2 W	4.8 W	7.2 W	9.6 W	
Rated Maximum Voltage (VRMS)			160 V	250 V	550 V	1285 V	
Dielectric Strength VRMS			1000 V	1500 V	2500 V	2500 V	
Ohmic Range			VISHAY SFERNICE	0.01 Ω 12 k Ω	0.006 Ω 20 k Ω	0.006 Ω 62 k Ω	0.006 Ω 130 k Ω
Qualified Ohmic Range			NF C 83-210	0.1 Ω 2.7 k Ω	0.1 Ω 4.99 k Ω	0.1 Ω 11.8 k Ω	0.1 Ω 33.2 k Ω
Minimum Ohmic Values in Relation to Tolerance	E 96	± 0.1 %	1 Ω		1 Ω		
	E 96	± 0.5 %	0.1 Ω		0.1 Ω		
	E 96	± 1 %	0.1 Ω		0.05 Ω		
	E 48	± 2 %	0.01 Ω		0.01 Ω		
	E 24	± 5 %	0.01 Ω		0.01 Ω		
	E 12	± 10 %	0.01 Ω	0.008 Ω	0.006 Ω		

Undergoes European Quality Insurance System (CECC)

PERFORMANCE					
TESTS	MIL-R-18546 D		NF C 83-210		TYPICAL DRIFTS
	CONDITIONS		REQUIREMENTS		
Operating Temperature Range	- 55 °C + 200 °C		-		-
Momentary Overload	5 Pr/5 s		± (0.25 % + 0.05 Ω)		± (0.1 % + 0.05 Ω)
Climatic Sequence	- 55 °C + 200 °C 5 cycles		± (0.25 % + 0.05 Ω)		± (0.1 % + 0.05 Ω)
Load Life Test at High Temperature	2 h at + 275 °C		± (1 % + 0.05 Ω) Ins. resistance ≥ 1 GΩ		± (0.1 % + 0.05 Ω)
Humidity (Steady State)	56 days		± (1 % + 0.05) Ins. resistance ≥ 100 MΩ		± (0.5 % + 0.05 Ω)
Resistance to Moisture	Climatic sequences test, with load and polarisation		± (1 % + 0.05 Ω)		± (0.5 % + 0.05 Ω)
Temperature Coefficient	5 to 10 > 10		± 50 ppm/°C ± 25 ppm/°C		± 15 ppm/°C
Load Life at Maximum Temperature	1000 h 25 °C	Pn MIL	VISHAY	± (1 % + 0.05 Ω)	± (0.1 % + 0.05 Ω)
	200 °C	30 % of Pn	SFERNICE	Ins. resistance ≥ 1 GΩ	± (0.5 % + 0.05 Ω)

MOMENTARY OVERLOAD

1. Momentary overload (> 2 s):

See example in table below. In all cases, it should be understood that:

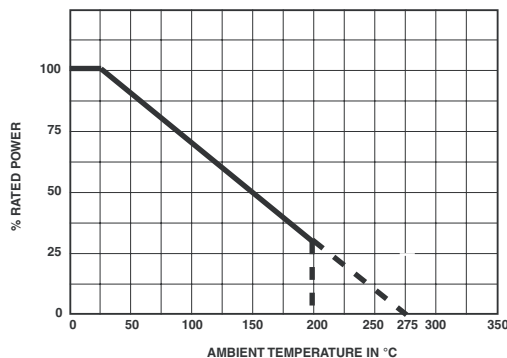
- The 12 Pn overload applies only to ohmic values 0.1.
- The overload voltage shall not be higher than that used for the dielectric strength test (see Standard Electrical Specifications).

2. Short time overload (< 2 s):

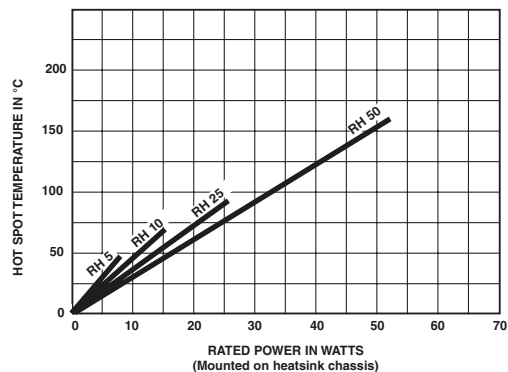
For times shorter than 2 s, higher overloads can be sustained in some cases. Consult VISHAY SFERNICE.

POWER LOADING	DURATION
2.5 Pn	10 s
5 Pn	5 s
12 Pn	2 s

POWER RATING CHART



TEMPERATURE RISE



MARKING

VISHAY SFERNICE trademark, model, style, CECC style (if applicable) nominal resistance (in Ω), tolerance (in %), manufacturing date.

PACKAGING

Bag of 10 units



ORDERING INFORMATION					
RH	05	N	18R00	J	S03
MODEL	STYLE	NON INDUCTIVE WINDING Optional	OHMIC VALUE	TOLERANCE	PACKAGING

GLOBAL PART NUMBER INFORMATION														
		R	H	5	0	3	3	0	0	1	J	S	0	3
GLOBAL MODEL	SIZE	OPTION		OHMIC VALUE			TOLERANCE	PACKAGING		SPECIAL				
RH	05 10 25 50	N = Non inductive winding		The first four digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point. 33001 = 33 kΩ 680R0 = 680 Ω 20302 = 20.3 kΩ 88R88 = 88.88 Ω ...			D = 0.5 % F = 1 % G = 2 % J = 5 %	Standard Packaging: S03 = Bag, 10 pieces		As applicable Ex = HDX				



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