



## Hermetic Metal Film Resistors, Military/Established Reliability, MIL-PRF-55182 Qualified, Type RNR, Characteristics E and C



For the highest degree of reliability, stability and uniformity of construction, Vishay Angstrom hermetically-sealed metal film resistors are unquestionably the first choice. The true glass-to-metal hermetic enclosure seals the resistor element in an inert gas atmosphere and protects it from virtually all adverse environmental influences. The glass enclosure will withstand in excess of 3000 psi external pressure without leakage. The reliability and stability of Vishay Angstrom hermetically-sealed resistors have been established by their use in nearly every military, missile, aerospace and oceanography program having the most demanding applications and the most hostile environments.

### FEATURES

- Qualified to MIL-PRF-55182 Characteristics E and C (E only for RNR75)
- Performance exceeds the requirements of MIL-PRF-55182
- "S" Level reliability
- Hermetic glass enclosure is impervious to harmful environments
- Inert gas filled
- Low noise (-40 dB)
- For MIL-PRF-55182 Characteristics J, H and K product, see Vishay Dale's ERC (Military RNC/RNR) data sheet

### GENERAL SPECIFICATIONS

**Resistance Range:** 10.0  $\Omega$  to 4.99 M $\Omega$

**Tolerance:**  $\pm 0.1\%$  (B),  $\pm 0.5\%$  (D),  $\pm 1.0\%$  (F)

**Temperature Characteristics:**

$\pm 25$  ppm/ $^{\circ}\text{C}$  (Characteristic E)

$\pm 50$  ppm/ $^{\circ}\text{C}$  (Characteristic C)

**Power Ratings:**

1/10, 1/8, 1/4, 1/2 and 1 watt - 125  $^{\circ}\text{C}$

1/8, 1/4, 1/2, 3/4, and 2 watt - 70  $^{\circ}\text{C}$

**Power Derating:** For ambient temperatures above 125  $^{\circ}\text{C}$ , see Power Derating Curve

**Life Failure Rate:** S, R, P, M

### STANDARD ELECTRICAL SPECIFICATIONS

VISHAY ANGSTROM MODEL	MIL- PRF- 55182 STYLE	POWER RATING		MAXIMUM WORKING VOLTAGE	TEMPERATURE CHARACTERISTIC <sup>1)</sup> (ppm/ $^{\circ}\text{C}$ )	RESISTANCE TOLERANCE (%)	QUALIFIED RESISTANCE RANGE <sup>2)</sup> ( $\Omega$ )		LIFE FAILURE RATE <sup>3)</sup>
		P <sub>70 <math>^{\circ}\text{C}</math></sub> W	P <sub>125 <math>^{\circ}\text{C}</math></sub> W				MIN.	MAX.	
HDN55	RNR55, RNN55	0.125	0.10	200	E = $\pm 25$ C = $\pm 50$	B = $\pm 0.1$ D = $\pm 0.5$ F = $\pm 1.0$	10	1.21 M	M, P, R, S
HDN57	RNR57, RNN57	0.25	0.125	250	E = $\pm 25$ C = $\pm 50$	F = $\pm 1.0$	49.9	200 k	M, P, R, S
HDN60	RNR60, RNN60	0.25	0.125	250	E = $\pm 25$ C = $\pm 50$	B = $\pm 0.1$ D = $\pm 0.5$ F = $\pm 1.0$	10	2.49 M	M, P, R, S
HDN65	RNR65, RNN65	0.50	0.25	300	E = $\pm 25$ C = $\pm 50$	B = $\pm 0.1$ D = $\pm 0.5$ F = $\pm 1.0$	24.9	4.99 M	M, P
HDN70	RNR70, RNN70	0.75	0.50	350	E = $\pm 25$ C = $\pm 50$	B = $\pm 0.1$ D = $\pm 0.5$ F = $\pm 1.0$	24.9	4.99 M	M, P
HDN75	RNR75, RNN75	2.0	1.0	750	E = $\pm 25$	B = $\pm 0.1$ D = $\pm 0.5$ F = $\pm 1.0$	49.9	1.21 M	M

#### Notes

- MODEL RNC: For characteristics E and C (per MIL-PRF-55182) terminal model RNR shall be used as a substitute.

1. Temperature Characteristics E and C designate hermetically-sealed enclosure.

2. Standard resistance values should be selected from the Resistance-Tolerance Decade Table.

3. Contact factory for current QPL failure rates

B Tolerance available in all values (except RNR57)

# HDN (Military RNR/RNN)

Vishay Angstrom Hermetic Metal Film Resistors, Military/Established  
Reliability, MIL-PRF-55182 Qualified, Type RNR,  
Characteristics E and C



## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: RNR55E49R9BSM76 (preferred part number format)

MIL STYLE <sup>1)</sup>	CHARACTERISTIC <sup>2)</sup>	RESISTANCE VALUE	TOLERANCE CODE	FAILURE RATE	PACKAGING	SPECIAL
RNR = Solderable only RNN = Weldable only (see Standard Electrical Specifications Table)	E = 25 ppm C = 50 ppm J = 25 ppm (75 only)	3 digit significant figure, followed by a multiplier 10R0 = 10 $\Omega$ 49R9 = 49.9 $\Omega$ 2152 = 21.5 k $\Omega$ 3014 = 3.01 M $\Omega$	B = $\pm 0.1$ % D = $\pm 0.5$ % F = $\pm 1.0$ %	M = 1.0 %/1000 h P = 0.1 %/1000 h R = 0.01 %/1000 h S = 0.001 %/1000 h	M76 = Foil Bag (55, 57, 60, 65, 70) M77 = Foil Bag (75 only) RJ7 = Reel (55, 57, 60) RJ8 = Reel (65, 70, 75) K36 = Ammo (55, 57, 60) K18 = Ammo (65, 70, 75)	Blank = Standard (Dash Number) (up to 3 digits) From 1 - 999 as applicable 65 = Hot Solder Dip (55's) 1 = Hot Solder Dip (57's) 1 = Hot Solder Dip (60's) 65 = Hot Solder Dip (65's) 4 = Hot Solder Dip (70's) 1 = Hot Solder Dip (75's)

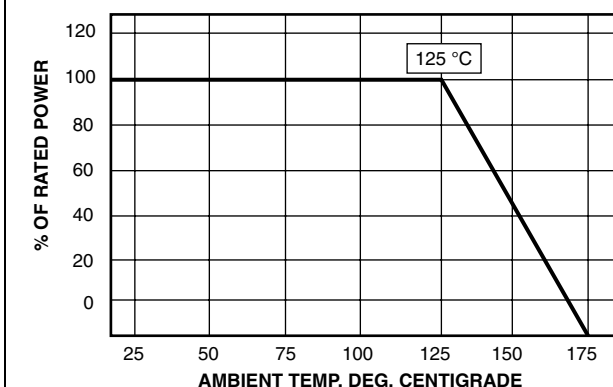
Historical Part Numbering: RNR55E49R9BS (will continue to be accepted)

RNR55	E	49R9	B	S
MIL STYLE	CHARACTERISTIC	RESISTANCE VALUE	TOLERANCE CODE	FAILURE RATE

### Note

1. MODEL RNC: For characteristics C and E (per MIL-PRF-55182) terminal model RNR shall be used as a substitute.
2. For RNR75 only: Characteristic J ( $\pm 25$  ppm/ $^{\circ}$ C) is also available

## POWER DERATING



**CAGE CODE: 17745**

## MARKING

55, 57	EXAMPLE RNR55C1002FS
- Date Code, RTC Code	005C
- Resistance Code	1002
- Tolerance, Failure Rate, Terminal, JAN	FSRJ
- Manufacturer Identification	A
60, 65, 70, 75	EXAMPLE RNR60E2501FS
- Source Code	17745
- Date Code, JAN	0005J
- Style, Size, RTC Code	RNR60E
- Resistance Code, Tolerance, Failure Rate	2501FS



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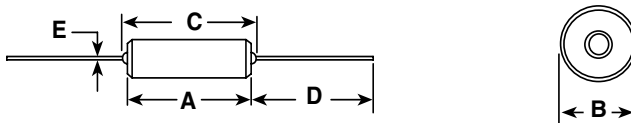
### COMPARISON OF VISHAY ANGSTROHM CHARACTERISTICS TO MIL SPECIFICATION LIMIT<sup>1)</sup>

MILITARY STYLE (RNR/RNN)	LOAD LIFE Limit $\pm 2.0$ %	MOISTURE <sup>2</sup> Limit $\pm 0.2$ %	SHOCK Limit $\pm 0.2$ %	VIBRATION Limit $\pm 0.2$ %	HIGH TEMPERATURE EXPOSURE Limit $\pm 2.0$ %	LOW TEMPERATURE OPERATION Limit $\pm 0.15$ %	RESISTANCE TO SOLDERING HEAT Limit $\pm 0.1$ %
55	< 0.2 %	< 0.03 %	< 0.02 %	< 0.02 %	< 0.4 %	< 0.004 %	< 0.02 %
57	< 0.3 %	< 0.02 %	< 0.01 %	< 0.01 %	< 0.3 %	< 0.005 %	< 0.01 %
60	< 0.3 %	< 0.03 %	< 0.01 %	< 0.01 %	< 0.4 %	< 0.004 %	< 0.02 %
65	< 0.5 %	< 0.03 %	< 0.01 %	< 0.01 %	< 0.4 %	< 0.003 %	< 0.01 %
70	< 0.6 %	< 0.01 %	< 0.01 %	< 0.01 %	< 0.4 %	< 0.006 %	< 0.01 %
75	< 0.5 %	< 0.02 %	< 0.01 %	< 0.01 %	< 0.3 %	< 0.010 %	< 0.01 %

#### Notes

1. This typical data is taken from the average resistance shifts from numerous values. The actual shifts are dependent on the value.
2. Any shift during moisture testing is due to the "load" (mini-load life) portion of the test and not due to the effect of moisture.

### DIMENSIONS PER MIL-PRF-55182 in inches [millimeters]



VISHAY ANGSTROHM MODEL	MIL- PRF- 55182 STYLE	A LENGTH	B DIAMETER	C CL TO CL (MAX.)	D LENGTH $\pm 0.125$ [ $\pm 3.18$ ]	E DIAMETER $\pm 0.002$ [ $\pm 0.051$ ]	D APPROX. WEIGHT (grams)
HDN55	RNR55, RNN55	$0.250 \pm 0.031 - 0.046$ [6.35 + 0.78 - 1.17]	$0.109 \pm 0.031$ [2.77 $\pm$ 0.78]	0.379 [9.63]	1.50 [38.10]	0.025 [0.635]	0.337
HDN57	RNR57, RNN57	$0.281 \pm 0.062$ [7.14 $\pm$ 1.57]	$0.155 \pm 0.015$ [3.94 $\pm$ 0.38]	0.467 [11.86]	1.25 [31.75]	0.025 [0.635]	0.405
HDN60	RNR60, RNN60	$0.375 \pm 0.062 - 0.115$ [9.53 + 1.57 - 2.92]	$0.125 \pm 0.040$ [3.18 $\pm$ 1.02]	0.561 [14.25]	1.50 [38.10]	0.025 [0.635]	0.450
HDN65	RNR65, RNN65	$0.625 \pm 0.031 - 0.094$ [15.8 + 0.787 - 2.39]	$0.188 \pm 0.062 - 0.031$ [4.78 + 1.57 - 0.787]	0.780 [19.81]	1.50 [38.10]	0.025 [0.635]	1.30
HDN70	RNR70, RNN70	$0.750 \pm 0.125 - 0.250$ [19.05 + 3.18 - 6.35]	$0.250 \pm 0.078 - 0.090$ [6.35 + 1.98 - 2.29]	0.939 [23.85]	1.50 [38.10]	0.032 [0.813]	1.44
HDN75	RNR75, RNN75	$1.062 \pm 0.062$ [26.98 $\pm$ 1.58]	$0.375 \pm 0.062 - 0.150$ [9.53 + 1.57 - 3.81]	1.186 [30.12]	1.50 [38.10]	0.032 [0.813]	2.500



### Notice

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