

## Metal Film Resistors, Military/Established Reliability, Hermetically-Sealed, MIL-PRF-55182 Qualified, Precision, 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)
- Standard lead on the RNR product is solderable and on the RNN is weldable
- MODEL RNC: For characteristics E and C (per MIL-PRF-55182) terminal model RNR shall be used as a substitute.
- For MIL-PRF-55182 Characteristics J, H and K product, see Vishay Dale’s ERC (Military RNC/RNR) datasheet

### STANDARD ELECTRICAL SPECIFICATIONS

VISHAY ANGSTROHM MODEL	MIL-PRF-55182 STYLE	MIL SPEC. SHEET	POWER RATING		TOLERANCE ± %	MAXIMUM WORKING VOLTAGE <sup>(4)</sup> V	RESISTANCE RANGE <sup>(2)</sup> Ω		LIFE FAILURE RATE <sup>(3)</sup>
			P <sub>70 °C</sub> W	P <sub>125 °C</sub> W			± 50 ppm/°C <sup>(1)</sup> (C)	± 25 ppm/°C <sup>(1)</sup> (E)	
HDN55, HDN55..65 <sup>(5)</sup>	RNR55, RNN55	01	0.125	0.10	0.1, 0.5, 1	200	10 to 1.21M	10 to 1.21M	M, P, R, S
HDN57, HDN57..1 <sup>(5)</sup>	RNR57, RNN57	02	0.25	0.125	1	250	49.9 to 200K	49.9 to 200K	M, P, R, S
HDN60, HDN60..1 <sup>(5)</sup>	RNR60, RNN60	03	0.25	0.125	0.1, 0.5, 1	250	10 to 2.49M	10 to 2.49M	M, P, R, S
HDN65, HDN65..65 <sup>(5)</sup>	RNR65, RNN65	05	0.50	0.25	0.1, 0.5, 1	300	24.9 to 4.99M	24.9 to 4.99M	M, P
HDN70, HDN70..4 <sup>(5)</sup>	RNR70, RNN70	06	0.75	0.50	0.1, 0.5, 1	350	24.9 to 4.99M	24.9 to 4.99M	M, P
HDN75, HDN75..1 <sup>(5)</sup>	RNR75, RNN75	10	2.0	1.0	0.1, 0.5, 1	750	-	49.9 to 1.21M	M

#### Notes

- (1) Temperature characteristics E and C designate hermetically-sealed enclosure.
- (2) Standard resistance values should be selected from the Resistance-Tolerance Decade table. B tolerance available in all values.
- (3) Contact factory for current QPL failure rates.
- (4) Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less.
- (5) Hot solder dipped leads.



# HDN (Military RNR/RNN)

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### GLOBAL PART NUMBER INFORMATION

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

<b>R</b>	<b>N</b>	<b>R</b>	<b>5</b>	<b>5</b>	<b>E</b>	<b>4</b>	<b>9</b>	<b>R</b>	<b>9</b>	<b>B</b>	<b>S</b>	<b>M</b>	<b>7</b>	<b>6</b>			
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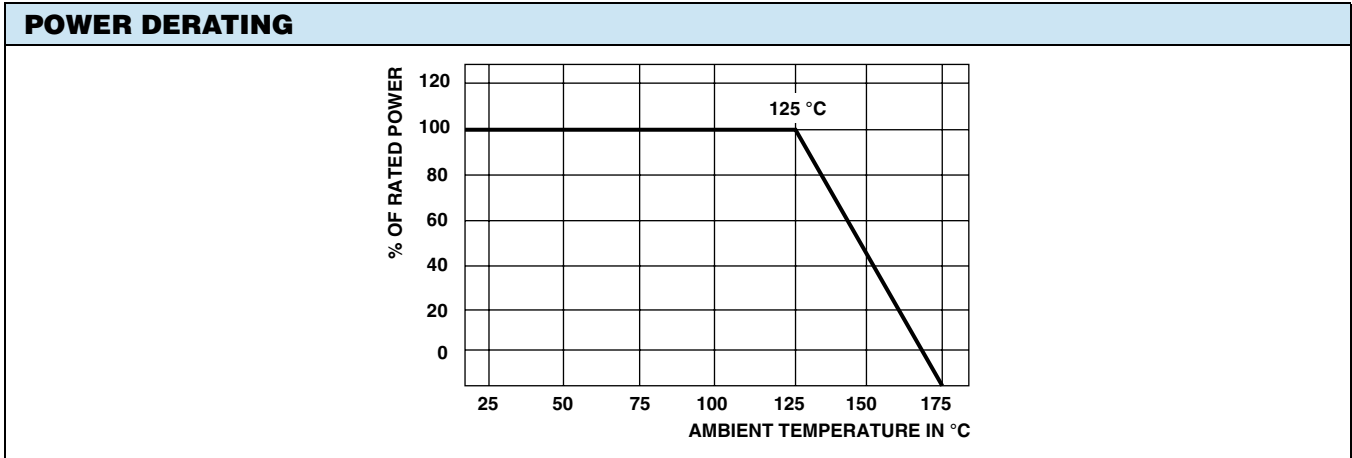
MIL STYLE (1)	CHARACTERISTIC (2)	RESISTANCE VALUE	TOLERANCE CODE	FAILURE RATE	PACKAGING	SPECIAL
RNR = Solderable only RNN = Weldable only (see Standard Electrical Specifications table)	E = 25 ppm C = 50 ppm	3 digit significant figure, followed by a multiplier Use "R" for values < 100 Ω <b>10R0</b> = 10 Ω <b>49R9</b> = 49.9 Ω <b>2152</b> = 21.5 kΩ <b>3014</b> = 3.01 MΩ	<b>B</b> = ± 0.1 % <b>D</b> = ± 0.5 % <b>F</b> = ± 1 %	<b>M</b> = 1.0 %/1000 h <b>P</b> = 0.1 %/1000 h <b>R</b> = 0.01 %/1000 h <b>S</b> = 0.001 %/1000 h	<b>M76</b> = Foil bag (55, 57, 60, 65, 70) <b>M77</b> = Foil bag (75 only) <b>BSL</b> = Foil bag, single lot date code <b>RJ7</b> = T/R (55, 57, 60) <b>RJ8</b> = T/R (65, 70, 75) <b>RSL</b> = Foil bag, single lot date code	Blank = Standard (Dash Number) (up to 3 digits) From <b>1 to 999</b> as applicable <b>1</b> = Hot solder dip (57's, 60's, 75's) <b>4</b> = Hot solder dip (70's) <b>65</b> = Hot solder dip (55's, 65's)

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

<b>RNR55</b>	<b>E</b>	<b>49R9</b>	<b>B</b>	<b>S</b>
MIL STYLE	CHARACTERISTIC	RESISTANCE VALUE	TOLERANCE CODE	FAILURE RATE

**Notes**

- (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 (± 25 ppm/°C) is also available



**CAGE CODE: 17745**

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

COMPARISON OF VISHAY ANGSTROMH CHARACTERISTICS TO MIL SPECIFICATION LIMIT (1)							
MILITARY STYLE (RNR/RNN)	LOAD LIFE LIMIT $\pm 2.0$ %	MOISTURE (2) 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.

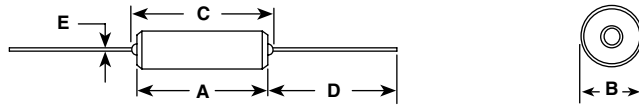
(2) Any shift during moisture testing is due to the "load" (mini-load life) portion of the test and not due to the effect of moisture



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## 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 ± 0.125 (± 3.18)	E DIAMETER ± 0.002 (± 0.051)	D APPROX. WEIGHT (g)
HDN55	RNR55, RNN55	0.250 + 0.031 - 0.046 (6.35 + 0.78 - 1.17)	0.109 ± 0.031 (2.77 ± 0.78)	0.379 (9.63)	1.50 (38.10)	0.025 (0.635)	0.337
HDN57	RNR57, RNN57	0.281 ± 0.062 (7.14 ± 1.57)	0.155 ± 0.015 (3.94 ± 0.38)	0.467 (11.86)	1.25 (31.75)	0.025 (0.635)	0.405
HDN60	RNR60, RNN60	0.375 + 0.062 - 0.115 (9.53 + 1.57 - 2.92)	0.125 ± 0.040 (3.18 ± 1.02)	0.561 (14.25)	1.50 (38.10)	0.025 (0.635)	0.450
HDN65	RNR65, RNN65	0.625 + 0.031 - 0.094 (15.8 + 0.787 - 2.39)	0.188 + 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 + 0.125 - 0.250 (19.05 + 3.18 - 6.35)	0.250 + 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 ± 0.062 (26.98 ± 1.58)	0.375 + 0.062 - 0.150 (9.53 + 1.57 - 3.81)	1.186 (30.12)	1.50 (38.10)	0.032 (0.813)	2.500



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