

## 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)
- Temperature range -65 °C to +175 °C
- 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 ([www.vishay.com/doc?31025](http://www.vishay.com/doc?31025))

### STANDARD ELECTRICAL SPECIFICATIONS

| VISHAY<br>ANGSTROM<br>MODEL        | MIL-PRF-55182<br>STYLE | MIL<br>SPEC.<br>SHEET | POWER<br>RATING<br>$P_{70\text{ }^{\circ}\text{C}}$<br>W | POWER<br>RATING<br>$P_{125\text{ }^{\circ}\text{C}}$<br>W | TOLERANCE<br>$\pm\%$ | MAXIMUM<br>WORKING<br>VOLTAGE <sup>(4)</sup><br>V | RESISTANCE<br>RANGE <sup>(2)</sup><br>$\Omega$<br>$\pm 50\text{ ppm}/^{\circ}\text{C}$ <sup>(1)</sup><br>(C) | RESISTANCE<br>RANGE <sup>(2)</sup><br>$\Omega$<br>$\pm 25\text{ ppm}/^{\circ}\text{C}$ <sup>(1)</sup><br>(E) | LIFE<br>FAILURE<br>RATE <sup>(3)</sup> |
|------------------------------------|------------------------|-----------------------|----------------------------------------------------------|-----------------------------------------------------------|----------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------|
| HDN55,<br>HDN55..65 <sup>(5)</sup> | RNR55,<br>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,<br>HDN57..1 <sup>(5)</sup>  | RNR57,<br>RNN57        | 02                    | 0.25                                                     | 0.125                                                     | 1                    | 250                                               | 49.9 to 200K                                                                                                 | 49.9 to 200K                                                                                                 | M, P, R, S                             |
| HDN60,<br>HDN60..1 <sup>(5)</sup>  | RNR60,<br>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,<br>HDN65..65 <sup>(5)</sup> | RNR65,<br>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,<br>HDN70..4 <sup>(5)</sup>  | RNR70,<br>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,<br>HDN75..1 <sup>(5)</sup>  | RNR75,<br>RNN75        | 10                    | 2.0                                                      | 1.0                                                       | 0.1, 0.5, 1          | 750                                               | 49.9 to 1.21M                                                                                                | 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



## GLOBAL PART NUMBER INFORMATION

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

| MIL STYLE (1)                                                                                                | CHARACTERISTIC (2)                     | RESISTANCE VALUE                                                                                                                                                                                                        | TOLERANCE CODE                                                           | FAILURE RATE                                                                                                | PACKAGING                                                                                                                                                                                                                           | SPECIAL                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RNR</b> = solderable only<br><b>RNN</b> = weldable only<br>(see Standard Electrical Specifications table) | <b>E</b> = 25 ppm<br><b>C</b> = 50 ppm | 3 digit significant figure, followed by a multiplier<br>Use "R" for values < 100 $\Omega$<br><b>10R0</b> = 10 $\Omega$<br><b>49R9</b> = 49.9 $\Omega$<br><b>2152</b> = 21.5 k $\Omega$<br><b>3014</b> = 3.01 M $\Omega$ | <b>B</b> = $\pm 0.1\%$<br><b>D</b> = $\pm 0.5\%$<br><b>F</b> = $\pm 1\%$ | <b>M</b> = 1.0 %/1000 h<br><b>P</b> = 0.1 %/1000 h<br><b>R</b> = 0.01 %/1000 h<br><b>S</b> = 0.001 %/1000 h | <b>M76</b> = foil bag (55, 57, 60)<br><b>M77</b> = foil bag (65, 70, 75)<br><b>BSL</b> = foil bag, single lot date code<br><b>RJ7</b> = T/R (55, 57, 60)<br><b>RJ8</b> = T/R (65, 70, 75)<br><b>RSL</b> = T/R, single lot date code | Blank = standard (dash number) (up to 3 digits) from <b>1 to 999</b> as applicable<br><b>1</b> = hot solder dip (57's, 60's, 75's)<br><b>4</b> = hot solder dip (70's)<br><b>65</b> = hot solder dip (55's, 65's) |

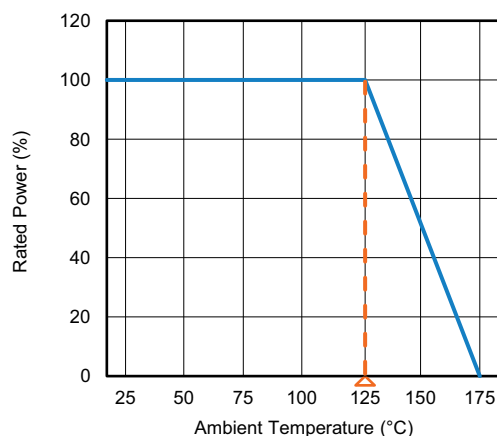
Historical Part Numbering: RNR55E49R9BS (will continue to be accepted)

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

## Notes

- For additional information on packaging, refer to the Through-Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544))
- (1) MODEL RNC: For characteristics C and E (per MIL-PRF-55182) terminal model RNR shall be used as a substitute

## POWER DERATING



CAGE CODE: 91637

## MARKING (per MIL-PRF-55182)

Characteristics: C = 50 ppm, E = 25 ppm  
Tolerance: F = 1 %, D = 0.5 %, B = 0.1 %  
Value: Three significant figures and multipliers  
J = JAN (Joint Army - Navy) brand

RNR/RNN55, RNR/RNN57: (4 lines)

RNR/RNN60, RNR/RNN65, RNR/RNN70, RNR/RNN75: (5 lines)

|      |                                                |        |                                   |
|------|------------------------------------------------|--------|-----------------------------------|
| A    | Manufacturer's code                            | 91637  | CAGE code                         |
| 205C | 3 digit date code and characteristic           | 1205J  | 4 digit date code and JAN         |
| 1002 | Value                                          | RNR60E | Style and characteristic          |
| FSRJ | Tolerance, failure rate, lead material and JAN | 2501FS | Value, tolerance and failure rate |
|      |                                                | 1203A  | Production lot code               |

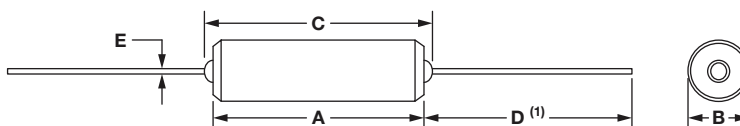
## COMPARISON OF VISHAY ANGSTROMHM CHARACTERISTICS TO MIL SPECIFICATION LIMIT <sup>(1)</sup>

| MILITARY STYLE (RNR/RNN) | LOAD LIFE LIMIT<br>± 2.0 % | MOISTURE LIMIT <sup>(2)</sup><br>± 0.2 % | SHOCK LIMIT<br>± 0.2 % | VIBRATION LIMIT<br>± 0.2 % | HIGH TEMPERATURE EXPOSURE LIMIT<br>± 2.0 % | LOW TEMPERATURE OPERATION LIMIT<br>± 0.15 % | RESISTANCE TO SOLDERING HEAT LIMIT<br>± 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

- <sup>(1)</sup> This typical data is taken from the average resistance shifts from numerous values. The actual shifts are dependent on the value  
<sup>(2)</sup> 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 ANGSTROMHM MODEL | MIL-PRF-55182 STYLE | A LENGTH                                       | B DIAMETER                                     | C CL TO CL (MAX.) | D LENGTH<br>± 0.125 (± 3.18) | E DIAMETER<br>± 0.002 (± 0.051) | APPROX. WEIGHT (g) |
|-------------------------|---------------------|------------------------------------------------|------------------------------------------------|-------------------|------------------------------|---------------------------------|--------------------|
| HDN55                   | RNR55, RNN55        | 0.250 + 0.031 - 0.046<br>(6.35 + 0.78 - 1.17)  | 0.109 ± 0.031<br>(2.77 ± 0.78)                 | 0.379<br>(9.63)   | 1.50<br>(38.10)              | 0.025<br>(0.635)                | 0.337              |
| HDN57                   | RNR57, RNN57        | 0.281 ± 0.062<br>(7.14 ± 1.57)                 | 0.155 ± 0.015<br>(3.94 ± 0.38)                 | 0.467<br>(11.86)  | 1.25<br>(31.75)              | 0.025<br>(0.635)                | 0.405              |
| HDN60                   | RNR60, RNN60        | 0.375 + 0.062 - 0.115<br>(9.53 + 1.57 - 2.92)  | 0.125 ± 0.040<br>(3.18 ± 1.02)                 | 0.561<br>(14.25)  | 1.50<br>(38.10)              | 0.025<br>(0.635)                | 0.450              |
| HDN65                   | RNR65, RNN65        | 0.625 + 0.031 - 0.094<br>(15.8 + 0.787 - 2.39) | 0.188 + 0.062 - 0.031<br>(4.78 + 1.57 - 0.787) | 0.780<br>(19.81)  | 1.50<br>(38.10)              | 0.025<br>(0.635)                | 1.30               |
| HDN70                   | RNR70, RNN70        | 0.750 + 0.125 - 0.250<br>(19.05 + 3.18 - 6.35) | 0.250 + 0.078 - 0.090<br>(6.35 + 1.98 - 2.29)  | 0.939<br>(23.85)  | 1.50<br>(38.10)              | 0.032<br>(0.813)                | 1.44               |
| HDN75                   | RNR75, RNN75        | 1.062 ± 0.062<br>(26.98 ± 1.58)                | 0.375 + 0.062 - 0.150<br>(9.53 + 1.57 - 3.81)  | 1.186<br>(30.12)  | 1.50<br>(38.10)              | 0.032<br>(0.813)                | 2.500              |

### Note

- <sup>(1)</sup> Lead length for product in foil bag pack. For product supplied in tape and reel, the actual lead length would be based on the body size, tape spacing and lead trim



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