

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 (www.vishay.com/doc?31025)

STANDARD ELECTRICAL SPECIFICATIONS

VISHAY ANGSTROM MODEL	MIL-PRF-55182 STYLE	MIL SPEC. SHEET	POWER RATING $P_{70^{\circ}\text{C}}$ W	POWER RATING $P_{125^{\circ}\text{C}}$ W	TOLERANCE $\pm \%$	MAXIMUM WORKING VOLTAGE ⁽⁴⁾ V	RESISTANCE RANGE ⁽²⁾ Ω $\pm 50 \text{ ppm}/^{\circ}\text{C}$ ⁽¹⁾ (C)	RESISTANCE RANGE ⁽²⁾ Ω $\pm 25 \text{ ppm}/^{\circ}\text{C}$ ⁽¹⁾ (E)	LIFE FAILURE RATE ⁽³⁾
HDN55, HDN55..65 ⁽⁵⁾	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 ⁽⁵⁾	RNR57, RNN57	02	0.25	0.125	1	250	49.9 to 200K	49.9 to 200K	M, P, R, S
HDN60, HDN60..1 ⁽⁵⁾	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 ⁽⁵⁾	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 ⁽⁵⁾	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 ⁽⁵⁾	RNR75, 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
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 10R0 = 10 Ω 49R9 = 49.9 Ω 2152 = 21.5 k Ω 3014 = 3.01 M Ω	B = ± 0.1 % D = ± 0.5 % F = ± 1 %	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) M77 = foil bag (65, 70, 75) BSL = foil bag, single lot date code RJ7 = T/R (55, 57, 60) RJ8 = T/R (65, 70, 75) RSL = T/R, single lot date code	Blank = standard (dash number) (up to 3 digits) from 1 to 999 as applicable 1 = hot solder dip (57's, 60's, 75's) 4 = hot solder dip (70's) 65 = hot solder dip (55's, 65's)

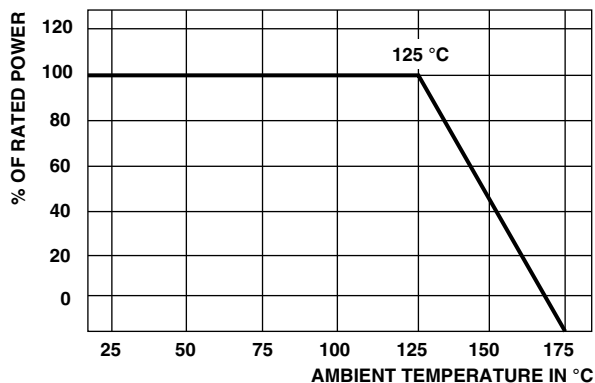
Historical Part Numbering: RNR55E49R9BS (will continue to be accepted)

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)
- (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

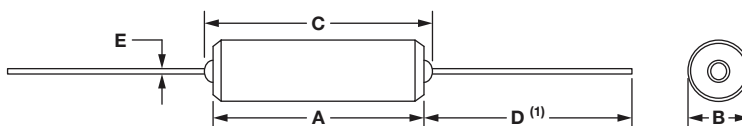
COMPARISON OF VISHAY ANGSTROMH CHARACTERISTICS TO MIL SPECIFICATION LIMIT ⁽¹⁾

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

Note

⁽¹⁾ 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



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.