Precision Hermetic Metal Film Resistors

Established Reliability "S" Level, MIL-PRF-55182 Characteristics E and C

FEATURES

- Qualified to MIL-PRF-55182 Characteristics E and C (E and J for RNR75).
- Performance exceeds the requirements of MIL-PRF-55182.
- Excellent long term stability.
- "S" Level reliability.
- Hermetic glass enclosure is impervious to harmful environments.
- Inert gas filled.
- Low noise.

For the highest degree of reliability, stability and uniformity of construction, Vishay Angstrohm 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 Angstrohm hermetically-sealed resistors have been established by their use in nearly every military, missile, aerospace and oceangraphy program having the most demanding applications and the most hostile environments.

GENERAL SPECIFICATIONS

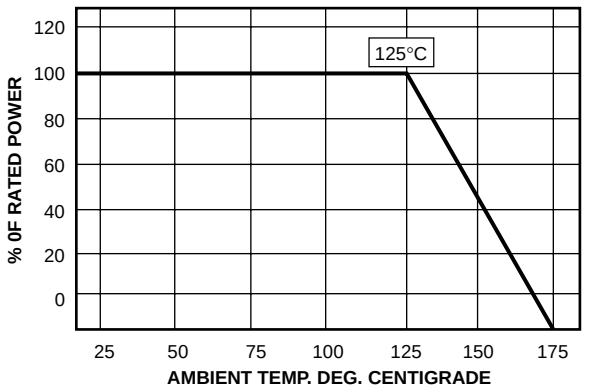
Resistance Range: 10.0 Ω to 4.99M (see Table 1). Standard values should be selected from the Resistance-Tolerance Decade Table on page 11.
Tolerance: ± 0.1% (B), ± 0.5% (D), ± 1.0% (F).
Temperature Characteristics:
± 25ppm/°C (Characteristic E and J).
± 50ppm/°C (Characteristic C).
Power Ratings:
1/10, 1/8, 1/4, 1/2 and 1 watt - 125°C.
1/8, 1/4, 1/2, 3/4, and 2 watt - 70°C.
Power Derating: For ambient temperatures above 125°C, see Power Derating Curve.
Life Failure Rate: S, R, P, M.

TABLE 1 - MODEL SELECTION / ELECTRICAL SPECIFICATION

MILITARY MODEL	MILITARY POWER RATING 125°C	MILITARY POWER RATING 70°C	MAXIMUM WORKING VOLTAGE	TEMPERATURE CHARACTERISTIC[1] (PPM/°C)	RESISTANCE TOLERANCE (%)	QUALIFIED RESISTANCE RANGE[2] Min.	QUALIFIED RESISTANCE RANGE[2] Max.	LIFE FAILURE RATE
RNR55 RNN55	1/10	1/8	200	E = ± 25 C = ± 50	B = ± 0.1 D = ± 0.5 F = ± 1.0	10.0 Ω	1.21M	S, R, P, M
RNR57 RNN57	1/8	1/4	250	E = ± 25 C = ± 50	F = ± 1.0	49.9 Ω	200K	S, R, P, M
RNR60 RNN60	1/8	1/4	250	E = ± 25 C = ± 50	B = ± 0.1 D = ± 0.5 F = ± 1.0	10.0 Ω	2.49M	S, R, P, M
RNR65 RNN65	1/4	1/2	300	E = ± 25 C = ± 50	B = ± 0.1 D = ± 0.5 F = ± 1.0	24.9 Ω	4.99M	P, M
RNR70 RNN70	1/2	3/4	350	E = ± 25 C = ± 50	B = ± 0.1 D = ± 0.5 F = ± 1.0	24.9 Ω	4.99M	P, M
RNR75 RNN75	1	2	750	E = ± 25 J = ± 25	B = ± 0.1 D = ± 0.5 F = ± 1.0	49.9 Ω	1.21M	M

NOTE: 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.
B Tolerance available in all values (except RNR57.)

POWER DERATING



CAGE #17745

"Commercial and Government Entity"

Formerly "FSCM".

MARKING

55, 57	**Example RNR55C1002FS**
— Date Code, RTC Code	005C
— Resistance Code	1002
— Tolerance, Failure Rate, Terminal, JAN	FSRJ
— Manufacturer Identification	A

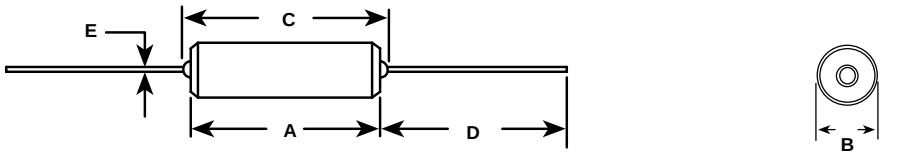
60, 65, 70, 75	**Example RNR60E2501FS**
— Source Code	17745
— Date Code, JAN	0005J
— Style, Size, RTC Code	RNR60E
— Resistance Code, Tolerance, Failure Rate	2501FS

COMPARISON OF VISHAY ANGSTROHM CHARACTERISTICS TO MIL SPECIFICATION LIMIT[1]

MILITARY STYLE (RNR/RNN)	**LOAD LIFE Limit ± 2.0%**	**MOISTURE[2] Limit ± 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%

NOTE: [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]



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

ORDERING INFORMATION

Example: RNR55E49R9BS

RNR — STYLE AND TERMINAL LEVEL MODEL[1]
- RNR = Solderable
- RNN = Weldable

55 — SIZE
- 55
- 57
- 60
- 65
- 70
- 75

E — RESISTANCE / TEMPERATURE CHARACTERISTICS (RTC)[2]
- Hermetic = E
- = C
- RTC = ± 25 ppm/°C
- = ± 50 ppm/°C

49R9 — RESISTANCE VALUE

The nominal resistance value expressed in ohms is a four digit number. The first three digits represent significant figures and the last digit specifies the number of zeros to follow.
When the value is less than 100 ohms, the letter "R" is substituted for one of the significant figures to represent the decimal point. The resistance values shall follow the Resistance-Tolerance Decade Table (page 11).

Examples:

1.00 Ω = 1R00	10,000 Ω = 1002
10.0 Ω = 10R0	100,000 Ω = 1003
100 Ω = 1000	1,000,000 Ω = 1004
1000 Ω = 1001	

B — TOLERANCE

Initial resistance is identified by a single letter.
- B = ± 0.1%
- D = ± 0.5%
- F = ± 1.0%

S — LIFE FAILURE-R (%/1000 HOURS)
- M = 1.0
- P = 0.1
- R = 0.01
- S = 0.001

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: Characteristics J (± 25 ppm/°C) is also available.