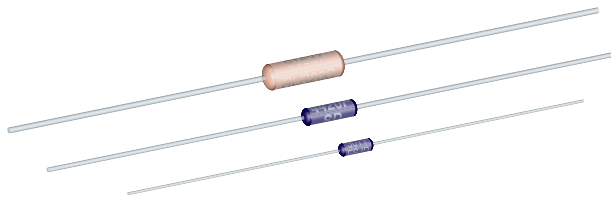


# Metal Film Resistors, Axial, Military/Established Reliability, MIL-PRF-55182 Qualified, Precision, Type RNC, Characteristics J, H, K



## FEATURES

- Meets requirements of MIL-PRF-55182
- Very low noise (-40 dB)
- Verified failure rate (contact factory for current level)
- 100 % stabilization and screening tests. Group A testing, if desired, to customer requirements
- Controlled temperature coefficient
- Epoxy coating provides superior moisture protection
- Standard lead on RNC product is solderable and weldable
- Traceability of materials and processing
- Monthly acceptance testing
- Vishay Dale has complete capability to develop specific reliability programs designed to customer requirements
- Extensive stocking program at distributors and factory on RNC50, RNC55, RNC60 and RNC65
- For MIL-PRF-55182 characteristics E and C product, see Vishay Angstrom's HDN (Military RNR/RNN) datasheet ([www.vishay.com/doc?66001](http://www.vishay.com/doc?66001))

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL                             | MIL-PRF-55182 STYLE | MIL SPEC. SHEET | POWER RATING<br>$P_{70^{\circ}\text{C}}$<br>W | POWER RATING<br>$P_{125^{\circ}\text{C}}$<br>W | TOLERANCE <sup>(4)</sup><br>$\pm$ % | MAXIMUM WORKING VOLTAGE <sup>(2)</sup><br>V | RESISTANCE RANGE<br>$\Omega$ | TEMPERATURE COEFFICIENT<br>$\pm$ ppm/ $^{\circ}\text{C}$ | LIFE FAILURE RATE <sup>(1)</sup> |
|------------------------------------------|---------------------|-----------------|-----------------------------------------------|------------------------------------------------|-------------------------------------|---------------------------------------------|------------------------------|----------------------------------------------------------|----------------------------------|
| ERC50,<br>ERC50..31 <sup>(3)</sup>       | RNC50, RNR50        | 07              | 0.10                                          | 0.05                                           | 0.1, 0.5, 1                         | 200                                         | 10 to 796K                   | 100 (K), 50 (H), 25 (J)                                  | M, P, R, S                       |
| ERC55,<br>ERC55..65 <sup>(3)</sup>       | RNC55, RNR55        | 01              | 0.125                                         | 0.10                                           | 0.1, 0.5, 1                         | 200                                         | 10 to 2M                     | 100 (K), 50 (H), 25 (J)                                  | M, P, R, S                       |
| ERC55..200,<br>ERC55..201 <sup>(3)</sup> | RNC60, RNR60        | 03              | 0.25                                          | 0.125                                          | 0.1, 0.5, 1                         | 250                                         | 10 to 2M                     | 100 (K), 50 (H), 25 (J)                                  | M, P, R, S                       |
|                                          |                     |                 |                                               |                                                |                                     |                                             | 2.01M to 3.01M               | 100 (K), 50 (H), 25 (J)                                  | M                                |
| ERC65,<br>ERC65..65 <sup>(3)</sup>       | RNC65, RNR65        | 05              | 0.50                                          | 0.25                                           | 0.1, 0.5, 1                         | 300                                         | 10 to 3.01M                  | 100 (K), 50 (H), 25 (J)                                  | M, P, R                          |
| ERC70<br>ERC70..4 <sup>(3)</sup>         | RNC70, RNR70        | 06              | 0.75                                          | 0.50                                           | 0.1, 0.5, 1                         | 350                                         | 10 to 3.01M                  | 100 (K), 50 (H), 25 (J)                                  | M, P, R                          |

### Notes

- (1) Consult factory for current QPL failure rates.
- (2) Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less.
- (3) Hot solder dipped leads.
- (4) Tolerance of  $\pm 0.1$  % is not applicable to characteristics K.

## TECHNICAL SPECIFICATIONS

| PARAMETER                   | UNIT               | CONDITION                                                                               |
|-----------------------------|--------------------|-----------------------------------------------------------------------------------------|
| Voltage Coefficient, max.   | ppm/V              | 5/V when measured between 10 % and full rated voltage                                   |
| Dielectric Strength         | $V_{AC}$           | RNC50, RNC55 and RNC60 = 450; RNC65 and RNC70 = 900                                     |
| Insulations Resistance      | $\Omega$           | $\geq 10^{11}$ dry; $\geq 10^9$ after moisture test                                     |
| Operating Temperature Range | $^{\circ}\text{C}$ | -65 to +175                                                                             |
| Terminal Strength           | lb                 | 2 lb pull test on RNC50, RNC55, RNC60 and RNC65; 4.5 lb pull test on RNC70              |
| Solderability               |                    | Continuous satisfactory coverage when tested in accordance with MIL-STD-202, method 208 |
| Weight                      | g                  | RNC50 = 0.11; RNC55 = 0.35; RNC60 = 0.35; RNC65 = 0.84; RNC70 = 1.06                    |

**GLOBAL PART NUMBER INFORMATION**

New Global Part Numbering: RNC55H2152FRR36 (preferred part numbering format)

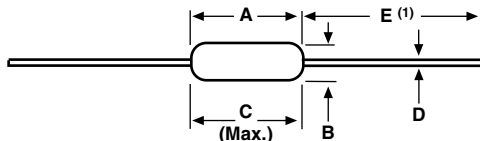
| MIL STYLE                                                                                                          | CHARACTERISTICS                                                                | RESISTANCE VALUE                                                                                                                                                                         | TOLERANCE CODE                                                           | FAILURE RATE                                                                                                | PACKAGING                                                                                                                                                                                                                                                                      | SPECIAL                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RNC</b> = solderable/weldable<br><b>RNR</b> = solderable only<br>(see Standard Electrical Specifications table) | <b>J</b> = $\pm 25$ ppm<br><b>H</b> = $\pm 50$ ppm<br><b>K</b> = $\pm 100$ ppm | 3 digit significant figure, followed by a multiplier<br>Use "R" for values < 100 $\Omega$<br><b>10R0</b> = 10 $\Omega$<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>B14</b> = tin/lead, bulk<br><b>BSL</b> = tin/lead, bulk, single lot date code<br><b>R36</b> = tin/lead, T/R (full; 50, 55, 60)<br><b>R64</b> = tin/lead, T/R (full; 65, 70)<br><b>RE6</b> = tin/lead, T/R (1000 pieces)<br><b>RSL</b> = tin/lead, T/R, single lot date code | Blank = standard (Dash number) (Up to 3 digits)<br>From <b>1 to 999</b> as applicable<br><b>4</b> = hot solder dip (70's)<br><b>31</b> = hot solder dip (50's)<br><b>65</b> = hot solder dip (55's, 65's)<br><b>201</b> = hot solder dip (60's) |

Historical Part Number Example: RNC55H2152FR R36 (will continue to be accepted)

| RNC55     | H              | 2152             | F              | R            | R36       |
|-----------|----------------|------------------|----------------|--------------|-----------|
| MIL STYLE | CHARACTERISTIC | RESISTANCE VALUE | TOLERANCE CODE | FAILURE RATE | PACKAGING |

**Note**

- For additional information on packaging, refer to the Through Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544)).

**DIMENSIONS** in inches (millimeters)**Note**

- (1) Lead length for product in bulk pack. For product supplied in Tape and Reel, the actual lead length would be based on the body size, tape spacing and lead trim.

| VISHAY DALE MODEL | MIL-PRF-55182 STYLE | A                                                     | B                                      | C (MAX.)         | D                                      | E                                      |
|-------------------|---------------------|-------------------------------------------------------|----------------------------------------|------------------|----------------------------------------|----------------------------------------|
| ERC50             | RNC50, RNR50        | 0.150 $\pm$ 0.020<br>(3.81 $\pm$ 0.51)                | 0.070 $\pm$ 0.010<br>(1.78 $\pm$ 0.25) | 0.187<br>(4.75)  | 0.016 $\pm$ 0.002<br>(0.41 $\pm$ 0.05) | 1.25 $\pm$ 0.266<br>(31.75 $\pm$ 6.76) |
| ERC55             | RNC55, RNR55        | 0.250 $\pm$ 0.031 - 0.046<br>(6.35 $\pm$ 0.79 - 1.17) | 0.094 $\pm$ 0.012<br>(2.39 $\pm$ 0.30) | 0.300<br>(7.62)  | 0.025 $\pm$ 0.002<br>(0.64 $\pm$ 0.05) | 1.50 $\pm$ 0.125<br>(38.1 $\pm$ 3.18)  |
| ERC55..200        | RNC60, RNR60        | 0.280 $\pm$ 0.020<br>(7.11 $\pm$ 0.51)                | 0.097 $\pm$ 0.012<br>(2.46 $\pm$ 0.30) | 0.350<br>(8.89)  | 0.025 $\pm$ 0.002<br>(0.64 $\pm$ 0.05) | 1.50 $\pm$ 0.125<br>(38.1 $\pm$ 3.18)  |
| ERC65             | RNC65, RNR65        | 0.562 $\pm$ 0.031<br>(14.27 $\pm$ 0.79)               | 0.180 $\pm$ 0.015<br>(4.57 $\pm$ 0.38) | 0.687<br>(17.45) | 0.025 $\pm$ 0.002<br>(0.64 $\pm$ 0.05) | 1.50 $\pm$ 0.125<br>(38.1 $\pm$ 3.18)  |
| ERC70             | RNC70, RNR70        | 0.562 $\pm$ 0.031<br>(14.27 $\pm$ 0.79)               | 0.180 $\pm$ 0.015<br>(4.57 $\pm$ 0.38) | 0.687<br>(17.45) | 0.032 $\pm$ 0.002<br>(0.81 $\pm$ 0.05) | 1.50 $\pm$ 0.125<br>(38.1 $\pm$ 3.18)  |

**MATERIAL SPECIFICATIONS**

|                      |                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------|
| <b>Element</b>       | Vacuum-deposited nickel-chrome alloy                                                             |
| <b>Core</b>          | Fire-cleaned high purity ceramic                                                                 |
| <b>Encapsulation</b> | Specially formulated epoxy compound                                                              |
| <b>Termination</b>   | Standard lead material is solder-coated copper. Solderable and weldable per MIL-STD-1276, type C |

**POWER RATING**

Power ratings are based on the following two conditions:

- $\pm 2.0$  % maximum  $\Delta R$  in 10 000 h load life
- +175  $^{\circ}\text{C}$  maximum operating temperature

**APPLICABLE MIL-SPECIFICATIONS****MIL-PRF-55182:**

The ERC series meets the electrical, environmental and dimensional requirements of MIL-PRF-55182.

**MIL-R-10509:**

MIL-PRF-55182 supersedes MIL-R-10509 on new designs. The ERC series meets or exceeds MIL-R-10509 requirements.

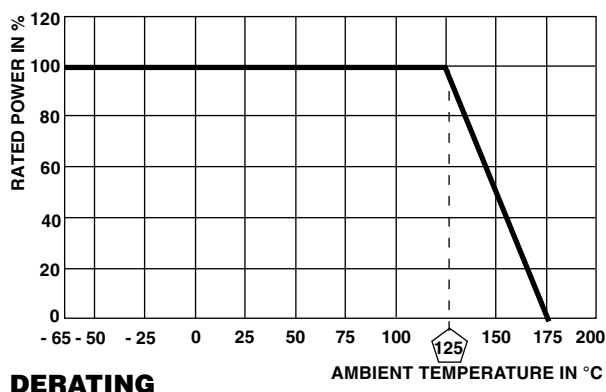
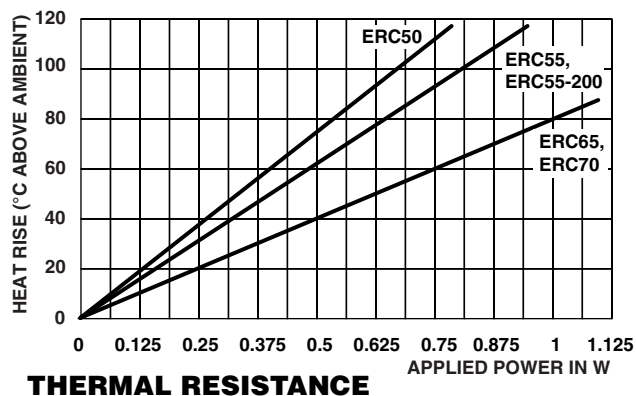
**DOCUMENTATION:**

Qualification and failure rate verification test data is maintained by Vishay Dale and is available upon request. Lot traceability and identification data is maintained by Vishay Dale for five years.

**CAGE CODE: 91637**



Vishay Dale ERC resistors have an operating temperature range of -65 °C to +175 °C. They must be derated according to the following curve:



## MARKING (per MIL-PRF-55182)

Characteristics: K = 100 ppm, H = 50 ppm, J = 25 ppm

Tolerance: F = 1 %, D = 0.5 %, B = 0.1 %

Value = three significant figures and multiplier

J = JAN (Joint Army - Navy) brand

RNC/RNR50, 55 (4 lines)

|      |                                                |
|------|------------------------------------------------|
| D    | Manufacturer's code                            |
| 210H | 3 digit date code and characteristic           |
| 1003 | Value                                          |
| FSCJ | Tolerance, failure rate, lead material and JAN |

RNC/RNR60, 65, 70 (5 lines)

|        |                                    |
|--------|------------------------------------|
| 91637  | CAGE code                          |
| 1213J  | 4 digit date code and JAN          |
| RNC60J | Style and characteristic           |
| 1211FS | Value, tolerance, and failure rate |
| 1209A  | Production lot code                |



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