

## Wirewound Resistors, Military, MIL-PRF-18546 Qualified, Type RE, Aluminum Housed, Chassis Mount



### FEATURES

- Molded construction for total environmental protection
- Complete welded construction
- Qualified to MIL-PRF-18546
- Available in non-inductive styles (type N) with Aryton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect
- Excellent stability in operation (< 1 % change in resistance)

### STANDARD ELECTRICAL SPECIFICATIONS

| MILITARY MODEL | VISHAY REFERENCE MODEL | POWER RATING<br>$P_{25^{\circ}\text{C}}$<br>W | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$ | WEIGHT<br>(typical)<br>g |
|----------------|------------------------|-----------------------------------------------|------------------------------|-----------------------|--------------------------|
| RE60G          | RH005                  | 5                                             | 0.10 to 3.32K                | 1                     | 3                        |
| RE60N          | NH005                  | 5                                             | 1.0 to 1.65K                 | 1                     | 3.3                      |
| RE65G          | RH010                  | 10                                            | 0.10 to 5.62K                | 1                     | 6                        |
| RE65N          | NH010                  | 10                                            | 1.0 to 2.8K                  | 1                     | 8.8                      |
| RE70G          | RH025                  | 20                                            | 0.10 to 12.1K                | 1                     | 13                       |
| RE70N          | NH025                  | 20                                            | 1.0 to 6.04K                 | 1                     | 16.5                     |
| RE75G          | RH050                  | 30                                            | 0.10 to 39.2K                | 1                     | 28                       |
| RE75N          | NH050                  | 30                                            | 1.0 to 19.6K                 | 1                     | 35                       |
| RE77G          | RH100                  | 75                                            | 0.05 to 29.4K                | 1                     | 350                      |
| RE77N          | NH100                  | 75                                            | 1.0 to 14.7K                 | 1                     | 385                      |
| RE80G          | RH250                  | 120                                           | 0.10 to 35.7K                | 1                     | 630                      |
| RE80N          | NH250                  | 120                                           | 1.0 to 17.4K                 | 1                     | 690                      |

### TECHNICAL SPECIFICATIONS

| PARAMETER                   | UNIT                    | RE RESISTOR CHARACTERISTICS                                                                                               |
|-----------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Temperature Coefficient     | ppm/ $^{\circ}\text{C}$ | $\pm 20$ for 10 $\Omega$ and above; $\pm 50$ for 1 $\Omega$ to 9.9 $\Omega$ ; $\pm 100$ for 0.1 $\Omega$ to 0.99 $\Omega$ |
| Maximum Working Voltage     | V                       | $(P \times R)^{1/2}$                                                                                                      |
| Insulation Resistance       | $\Omega$                | 10 000 M $\Omega$ minimum dry, 1000 M $\Omega$ minimum after moisture test                                                |
| Solderability               | -                       | MIL-PRF-18546 type - meets requirements of ANSI J-STD-002                                                                 |
| Operating Temperature Range | $^{\circ}\text{C}$      | - 55 to + 250                                                                                                             |

### MILITARY PART NUMBER INFORMATION

Military Part Numbering example: RE77N1302J01

|                                              |          |          |          |                                    |          |                                                                                                                                                              |          |          |                                    |          |          |
|----------------------------------------------|----------|----------|----------|------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|------------------------------------|----------|----------|
| <b>R</b>                                     | <b>E</b> | <b>7</b> | <b>7</b> | <b>N</b>                           | <b>1</b> | <b>3</b>                                                                                                                                                     | <b>0</b> | <b>2</b> | <b>J</b>                           | <b>0</b> | <b>1</b> |
| MIL TYPE                                     |          |          |          | CHARACTERISTIC                     |          | RESISTANCE VALUE                                                                                                                                             |          |          | PACKAGING CODE                     |          |          |
| RE60<br>RE65<br>RE70<br>RE75<br>RE77<br>RE80 |          |          |          | G = Inductive<br>N = Non-inductive |          | 3 digit significant figure,<br>followed by a multiplier<br><br>49R9 = 49.9 $\Omega$<br>1000 = 100 $\Omega$<br>1001 = 1000 $\Omega$<br>1302 = 13 000 $\Omega$ |          |          | C02 = Card pack<br>J01 = Skin pack |          |          |

#### Note

- Only tolerance available for RE type is  $\pm 1 \%$

**DIMENSIONS** in inches [millimeters]

| MILITARY MODEL | DIMENSIONS in inches [millimeters]     |                                        |                                        |                                       |                                        |                                        |                                        |                                       |                                       |                                       |                                       |                                       |                                       |                                       |
|----------------|----------------------------------------|----------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
|                | A                                      | B                                      | C                                      | D                                     | E                                      | F                                      | G                                      | H                                     | J                                     | K                                     | L                                     | M                                     | N                                     | P                                     |
| RE60           | 0.444<br>± 0.005<br>[11.28<br>± 0.127] | 0.490<br>± 0.005<br>[12.45<br>± 0.127] | 0.600<br>± 0.030<br>[15.24<br>± 0.787] | 1.125<br>± 0.062<br>[28.58<br>± 1.57] | 0.334<br>± 0.015<br>[8.48<br>± 0.381]  | 0.646<br>± 0.015<br>[16.41<br>± 0.381] | 0.320<br>± 0.015<br>[8.13<br>± 0.381]  | 0.065<br>± 0.010<br>[1.65<br>± 0.254] | 0.133<br>± 0.010<br>[3.38<br>± 0.254] | 0.078<br>± 0.010<br>[1.98<br>± 0.254] | 0.093<br>± 0.005<br>[2.36<br>± 0.127] | 0.078<br>± 0.015<br>[1.98<br>± 0.381] | 0.050<br>± 0.005<br>[1.27<br>± 0.127] | 0.266<br>± 0.062<br>[6.76<br>± 1.57]  |
| RE65           | 0.562<br>± 0.005<br>[14.27<br>± 0.127] | 0.625<br>± 0.005<br>[15.88<br>± 0.127] | 0.750<br>± 0.031<br>[19.05<br>± 0.787] | 1.375<br>± 0.062<br>[34.93<br>± 1.57] | 0.420<br>± 0.015<br>[10.67<br>± 0.381] | 0.800<br>± 0.015<br>[20.32<br>± 0.381] | 0.390<br>± 0.015<br>[9.91<br>± 0.381]  | 0.075<br>± 0.010<br>[1.91<br>± 0.254] | 0.165<br>± 0.010<br>[4.19<br>± 0.254] | 0.093<br>± 0.010<br>[2.36<br>± 0.254] | 0.094<br>± 0.005<br>[2.39<br>± 0.127] | 0.102<br>± 0.015<br>[2.59<br>± 0.381] | 0.085<br>± 0.005<br>[2.16<br>± 0.127] | 0.312<br>± 0.062<br>[7.92<br>± 1.57]  |
| RE70           | 0.719<br>± 0.005<br>[18.26<br>± 0.127] | 0.781<br>± 0.005<br>[19.84<br>± 0.127] | 1.062<br>± 0.031<br>[26.97<br>± 0.787] | 1.938<br>± 0.062<br>[49.23<br>± 1.57] | 0.550<br>± 0.015<br>[13.97<br>± 0.381] | 1.080<br>± 0.015<br>[27.43<br>± 0.381] | 0.546<br>± 0.015<br>[13.87<br>± 0.381] | 0.075<br>± 0.010<br>[1.91<br>± 0.254] | 0.231<br>± 0.010<br>[5.87<br>± 0.254] | 0.172<br>± 0.010<br>[4.37<br>± 0.254] | 0.125<br>± 0.005<br>[3.18<br>± 0.127] | 0.115<br>± 0.015<br>[2.92<br>± 0.381] | 0.085<br>± 0.005<br>[2.16<br>± 0.127] | 0.438<br>± 0.062<br>[11.13<br>± 1.57] |
| RE75           | 1.562<br>± 0.005<br>[39.67<br>± 0.127] | 0.844<br>± 0.005<br>[21.44<br>± 0.127] | 1.968<br>± 0.031<br>[49.99<br>± 0.787] | 2.781<br>± 0.062<br>[70.64<br>± 1.57] | 0.630<br>± 0.015<br>[16.00<br>± 0.381] | 1.140<br>± 0.015<br>[28.96<br>± 0.381] | 0.610<br>± 0.015<br>[15.49<br>± 0.381] | 0.088<br>± 0.010<br>[2.24<br>± 0.254] | 0.260<br>± 0.010<br>[6.60<br>± 0.254] | 0.196<br>± 0.010<br>[4.98<br>± 0.254] | 0.125<br>± 0.005<br>[3.18<br>± 0.127] | 0.107<br>± 0.015<br>[2.72<br>± 0.381] | 0.085<br>± 0.005<br>[2.16<br>± 0.127] | 0.438<br>± 0.062<br>[11.13<br>± 1.57] |

**DIMENSIONS** in inches [millimeters]

## RE77



## RE80



**POWER RATING**

Vishay RE resistor wattage ratings are based on mounting to the following heat sink:

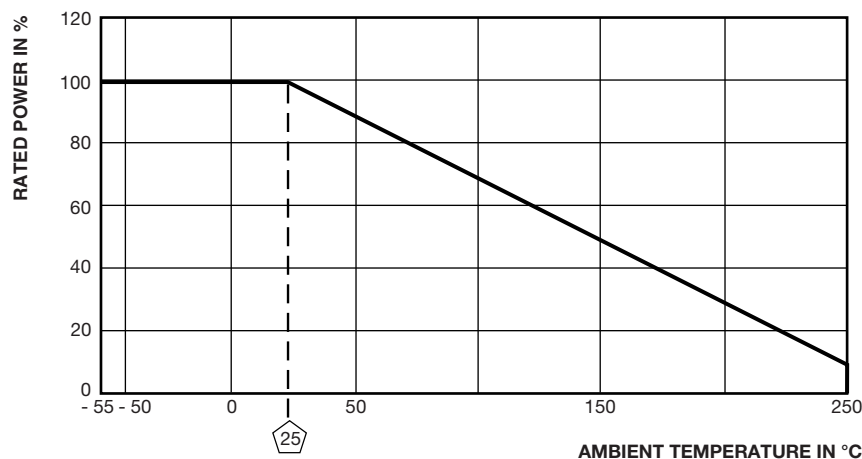
|                |                                              |
|----------------|----------------------------------------------|
| RE60 and RE65: | 4" x 6" x 2" x 0.040" thick aluminum chassis |
| RE70 and RE75: | 5" x 7" x 2" x 0.040" thick aluminum chassis |
| RE77 and RE80: | 7" x 9" x 2" x 0.060" thick aluminum chassis |

**FREE AIR POWER RATING**

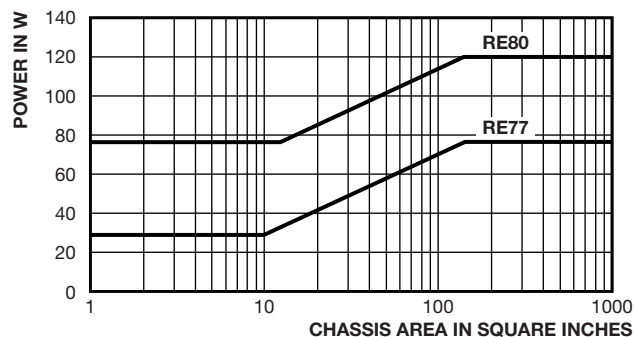
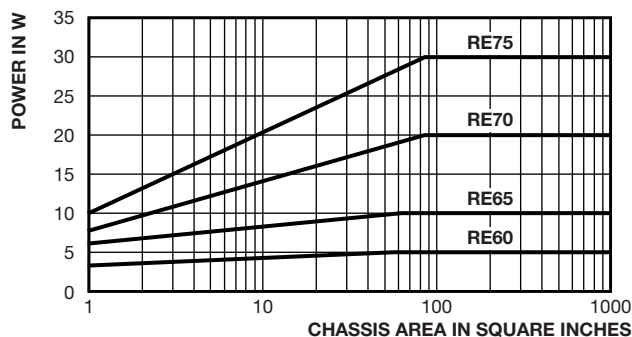
| MILITARY MODEL | RE60 | RE65 | RE70 | RE75 | RE77 | RE80 |
|----------------|------|------|------|------|------|------|
| W at 25 °C     | 3    | 6    | 8    | 10   | 30   | 75   |

**AMBIENT TEMPERATURE DERATING**

Derating is required for ambient temperatures above 25 °C when mounted to specified heat sink, see the following graph.

**REDUCED HEAT SINK DERATING**

Derating is also required when recommended heat sink area is reduced.



**MATERIAL SPECIFICATIONS**

**Element:** Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

**Core:** Ceramic, steatite or alumina, depending on physical size

**Encapsulant:** Silicone molded construction

**Housing:** Aluminum with hard anodic coating

**End Caps:** Stainless steel

**Standard Terminals:** For RE77 and RE80 terminals are threaded stainless steel. All others are 60/40 tin/lead (Sn/Pb) w/Nickel underplate on copper clad steel core terminal.

**Part Marking:** Dale, model, wattage, value, tolerance, date code

**NON-INDUCTIVE (TYPE N)**

Models of equivalent physical and electrical specifications are available with non-inductive (Aryton-Perry) winding. They are identified by substituting the letter N for G in the model number (RE60N, for example).

| PERFORMANCE                     |                                                                                                                                                |                                       |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| TEST                            | CONDITIONS OF TEST                                                                                                                             | TEST LIMITS                           |
| Thermal Shock                   | Rated power applied until thermally stable, then a minimum of 15 min at - 55 °C                                                                | $\pm (0.5 \% + 0.05 \Omega) \Delta R$ |
| Short Time Overload             | 5 x rated power for 5 s                                                                                                                        | $\pm (0.5 \% + 0.05 \Omega) \Delta R$ |
| Dielectric Withstanding Voltage | 1000 V <sub>rms</sub> for RE60, RE65 and RE70; 2000 V <sub>rms</sub> for RE75; 4500 V <sub>rms</sub> for RE77 and RE80; duration 1 min         | $\pm (0.2 \% + 0.05 \Omega) \Delta R$ |
| Temperature                     | 250 °C for 2 h                                                                                                                                 | $\pm (0.5 \% + 0.05 \Omega) \Delta R$ |
| Moisture Resistance             | MIL-STD-202 Method 106, 7b not applicable                                                                                                      | $\pm (1.0 \% + 0.05 \Omega) \Delta R$ |
| Shock, Specified Pulse          | MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks                                                                                            | $\pm (0.2 \% + 0.05 \Omega) \Delta R$ |
| Vibration, High Frequency       | Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each                                                                            | $\pm (0.2 \% + 0.05 \Omega) \Delta R$ |
| Load Life                       | 1000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"                                                                                        | $\pm (1.0 \% + 0.05 \Omega) \Delta R$ |
| Terminal Strength               | 30 s, 5 pound pull test for RE60 and RE65, 10 pound pull test for other sizes; torque test - 24 pound inch for RE77 and 32 pound inch for RE80 | $\pm (0.2 \% + 0.05 \Omega) \Delta R$ |



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