

Wirewound Resistors, Military/Established Reliability MIL-PRF-39009 Qualified, Type RER, R Level



FEATURES

- Aluminum heat sink housing
- Molded construction for total environmental protection
- Qualified to MIL-PRF-39009
- Complete welded construction
- Available in non-inductive styles (type ENH) with Aryton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect

STANDARD ELECTRICAL SPECIFICATIONS

| MODEL | MIL-PRF-39009 TYPE | POWER RATING $P_{25\text{ }^\circ\text{C}}$ W | | MILITARY RESISTANCE RANGE $\pm 1\%$ Ω | WEIGHT (typical) g |
|--------|--------------------|-----------------------------------------------------|----------|----------------------------------------------------|-----------------------|
| | | MOUNTED | FREE AIR | | |
| ENH-5 | RER40 | 5 | 3 | 1 - 1.65K | 3.3 |
| ENH-10 | RER45 | 10 | 6 | 1 - 2.8K | 8.8 |
| ENH-25 | RER50 | 20 | 8 | 1 - 6.04K | 16.5 |
| ENH-50 | RER55 | 30 | 10 | 1 - 4.99K | 35 |
| ERH-5 | RER60 | 5 | 3 | 0.10 - 3.32K | 3 |
| ERH-10 | RER65 | 10 | 6 | 0.10 - 5.62K | 6 |
| ERH-25 | RER70 | 20 | 8 | 0.10 - 12.1K | 13 |
| ERH-50 | RER75 | 30 | 10 | 0.10 - 39.2K | 28 |

TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | ERH, ENH RESISTOR CHARACTERISTICS |
|---------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Temperature Coefficient | ppm/ $^\circ\text{C}$ | ± 100 for $0.1\ \Omega$ to $0.99\ \Omega$, ± 50 for $1\ \Omega$ to $19.9\ \Omega$, ± 20 for $20\ \Omega$ and above |
| Dielectric Withstanding Voltage | V_{AC} | 1000 for ERH-5, ERH-10 and ERH-25, 2000 for ERH-50 |
| Short Time Overload | - | 5 x rated power for 5 s |
| Maximum Working Voltage | V | $(P \times R)^{1/2}$ |
| Insulation Resistance | Ω | 10 000 M Ω minimum dry, 1000 M Ω minimum after moisture test |
| Terminal Strength | lb | 5 pull for ERH-5 and ERH-10, 10 pull for ERH-25 and ERH-50 |
| Solderability | - | Meets requirements of ANSI J-STD-002 |
| Operating Temperature Range | $^\circ\text{C}$ | - 55 to + 250 |

GLOBAL PART NUMBER INFORMATION

Global/Military Part Numbering: RER65F1001RC02

R
E
R
6
5
F
1
0
0
1
R
C
0
2

| MIL TYPE |
|------------------------------------------------------------------------------------------------------------------------------|
| RER40 RER45 RER50 RER55 RER60 RER65 RER70 RER75 |

| TOLERANCE CODE |
|------------------------|
| F = $\pm 1.0\%$ |

| RESISTANCE VALUE |
|------------------------------------------------------|
| 3 digit significant figure, followed by a multiplier |
| 49R9 = 49.9 Ω |
| 1000 = 100 Ω |
| 1001 = 1000 Ω |

| FAILURE RATE |
|--------------------------|
| M = 1.0 %/1000 h |
| P = 0.1 %/1000 h |
| R = 0.01 %/1000 h |

| PACKAGING CODE |
|--------------------------------------------------------|
| C02 = Tin/lead, card pack |
| CSL = Tin/lead, card pack, single lot date code |

DIMENSIONS


| MODEL | DIMENSIONS in inches [millimeters] | | | | | | | | | | | | | |
|------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | P |
| ERH-5 ENH-5 | 0.444 ± 0.005 [11.280 ± 0.127] | 0.490 ± 0.005 [12.450 ± 0.127] | 0.600 ± 0.031 [15.240 ± 0.787] | 1.125 ± 0.062 [28.580 ± 1.570] | 0.334 ± 0.015 [8.480 ± 0.381] | 0.646 ± 0.015 [16.410 ± 0.381] | 0.320 ± 0.015 [8.130 ± 0.381] | 0.065 ± 0.010 [1.650 ± 0.254] | 0.133 ± 0.010 [3.380 ± 0.254] | 0.078 ± 0.010 [1.980 ± 0.254] | 0.093 ± 0.005 [2.360 ± 0.127] | 0.078 ± 0.015 [1.980 ± 0.381] | 0.050 ± 0.005 [1.270 ± 0.127] | 0.266 ± 0.062 [6.760 ± 1.570] |
| ERH-10 ENH-10 | 0.562 ± 0.005 [14.270 ± 0.127] | 0.625 ± 0.005 [15.880 ± 0.127] | 0.750 ± 0.031 [19.050 ± 0.787] | 1.375 ± 0.062 [34.930 ± 1.570] | 0.420 ± 0.015 [10.670 ± 0.381] | 0.800 ± 0.015 [20.320 ± 0.381] | 0.390 ± 0.015 [9.910 ± 0.381] | 0.075 ± 0.010 [1.900 ± 0.254] | 0.165 ± 0.010 [4.190 ± 0.254] | 0.093 ± 0.010 [2.360 ± 0.254] | 0.094 ± 0.005 [2.390 ± 0.127] | 0.102 ± 0.015 [2.590 ± 0.381] | 0.085 ± 0.005 [2.160 ± 0.127] | 0.312 ± 0.062 [7.920 ± 1.570] |
| ERH-25 ENH-25 | 0.719 ± 0.005 [18.260 ± 0.127] | 0.781 ± 0.005 [19.840 ± 0.127] | 1.062 ± 0.031 [26.970 ± 0.787] | 1.938 ± 0.062 [49.230 ± 1.570] | 0.550 ± 0.015 [13.970 ± 0.381] | 1.080 ± 0.015 [27.430 ± 0.381] | 0.546 ± 0.015 [13.870 ± 0.381] | 0.075 ± 0.010 [1.900 ± 0.254] | 0.231 ± 0.010 [5.870 ± 0.254] | 0.172 ± 0.010 [4.370 ± 0.254] | 0.125 ± 0.005 [3.180 ± 0.127] | 0.115 ± 0.015 [2.920 ± 0.381] | 0.085 ± 0.005 [2.160 ± 0.127] | 0.438 ± 0.062 [11.130 ± 1.570] |
| ERH-50 ENH-50 | 1.562 ± 0.005 [39.670 ± 0.127] | 0.844 ± 0.005 [21.440 ± 0.127] | 1.968 ± 0.031 [49.990 ± 0.787] | 2.781 ± 0.062 [70.640 ± 1.570] | 0.630 ± 0.015 [16.000 ± 0.381] | 1.140 ± 0.015 [28.960 ± 0.381] | 0.610 ± 0.015 [15.490 ± 0.381] | 0.088 ± 0.010 [2.240 ± 0.254] | 0.260 ± 0.010 [6.600 ± 0.254] | 0.196 ± 0.010 [4.980 ± 0.254] | 0.125 ± 0.005 [3.180 ± 0.127] | 0.107 ± 0.015 [2.720 ± 0.381] | 0.085 ± 0.005 [2.160 ± 0.127] | 0.438 ± 0.062 [11.130 ± 1.570] |

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: Tinned Copperweld®

Part Marking: Source code, JAN, military PIN, date/lot code

POWER RATING

Vishay ERH and ENH resistor wattage ratings are based on mounting to the proper heat sink.

ERH-5 and ERH-10: 4" x 6" x 2" x 0.040" thick aluminum chassis

ERH-25 and ERH-50: 5" x 7" x 2" x 0.040" thick aluminum chassis


APPLICABLE MIL SPECIFICATION

MIL-PRF-39009: This is the military specification covering housed chassis mount established reliability power wirewound resistors. Vishay ERH and ENH resistors are listed as qualified on the MIL-PRF-39009 QPL.

| PERFORMANCE | | |
|---------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|
| TEST | CONDITIONS OF TEST | TEST LIMITS |
| Low Temperature Operation | Apply rated power until thermal stability, remove power subject to air temperature of - 55 °C for 15 to 30 min | ± (0.5 % + 0.01 Ω) ΔR |
| Short Time Overload | 5 x rated power for 5 s | ± (0.3 % + 0.01 Ω) ΔR |
| Dielectric Withstanding Voltage | 1000 V _{rms} (RER 40, 45, 50, 60, 65, 70), 2000 V _{rms} (RER55 and 75), 1 min duration | ± (0.2 % + 0.01 Ω) ΔR |
| Low Temperature Storage | - 55 °C for 24 h | ± (0.3 % + 0.01 Ω) ΔR |
| High Temperature Exposure | 250 °C for 2000 h | ± (1.0 % + 0.01 Ω) ΔR |
| Moisture Resistance | MIL-STD-202, Method 106 | ± (0.5 % + 0.01 Ω) ΔR |
| Shock, Specified Pulse | MIL-STD-202, Method 213, condition 1 | ± (0.2 % + 0.01 Ω) ΔR |
| Vibration, High Frequency | MIL-STD-202, Method 204, condition D | ± (0.2 % + 0.01 Ω) ΔR |
| Load Life | 2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF" | ± (1.0 % + 0.01 Ω) ΔR |
| Extended Life | 10 000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF" | ± (2.0 % + 0.01 Ω) ΔR |
| Terminal Strength | MIL-STD-202, Method 211, condition A 5 pound (RER40, 45, 60, 65), 10 pound (RER50, 55, 70, 75) | ± (0.2 % + 0.01 Ω) ΔR |



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