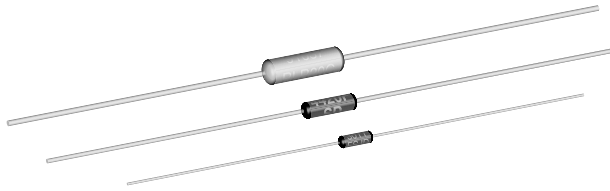


Metal Film Resistors, Military/Established Reliability, MIL-PRF-39017 Qualified, Type RLR



FEATURES

- Meets requirements of MIL-PRF-39017
- Failure rate: Verified failure rate (contact factory for current level)
- Epoxy coated construction provides superior moisture protection
- Traceability of materials and processing
- Monthly lot acceptance testing
- Very low noise (- 40 dB)
- Extensive stocking program at distributors and factory in $\pm 1\%$ and $\pm 2\%$ tolerances
- Vishay Dale has complete capability to develop specific reliability programs designed to customer requirements

STANDARD ELECTRICAL SPECIFICATIONS

| VISHAY DALE MODEL | MIL-PRF-39017 STYLE | MIL SPEC. SHEET | POWER RATING 70 °C W | RESISTANCE RANGE (1) Ω | TOLERANCE ± % | TEMPERATURE COEFFICIENT ± ppm/°C | MAXIMUM WORKING VOLTAGE (4) V | LIFE FAILURE RATE (2) |
|-------------------------|---------------------|-----------------|----------------------------|--|------------------|-------------------------------------|----------------------------------|----------------------------|
| ERL05, ERL05..19 (3) | RLR05 | 05 | 0.125 | 4.7 to 301K 302K to 1M | 1, 2 | 100 | 200 | M, P, R, S M, P, R |
| ERL07, ERL07..23 (3) | RLR07 | 01 | 0.25 | 1 to 9.76 10 to 3.01M 3.02M to 10M | 1, 2 | 100 | 250 | M M, P, R, S M, P, R |
| ERL20, ERL20..11 (3) | RLR20 | 02 | 0.50 | 4.3 to 3.01M | 1, 2 | 100 | 350 | M, P, R |
| ERL32, ERL32..1 (3) | RLR32 | 03 | 1.0 | 1 to 2.7M | 1, 2 | 100 | 500 | M, P, R |

Notes

(1) Extended Resistance Range: DSCC has created a series of drawings intended to support extended resistance ranges left otherwise void by the discontinuation of MIL-R-39008 RCR carbon composition resistors. Vishay Dale is listed as a resource on these drawings as follows:

| DSCC DRAWING NUMBER | VISHAY DALE MODEL | POWER RATING $P_{70\text{ }^{\circ}\text{C}}$ W | RESISTANCE RANGE Ω | TOLERANCE ± % | TEMPERATURE COEFFICIENT ± ppm/°C | MAXIMUM WORKING VOLTAGE V (4) |
|---------------------|----------------------------|---|-------------------------|------------------|-------------------------------------|----------------------------------|
| 98020 | ERL05..36, ERL05..37 (3) | 0.125 | 1.1M to 22M | 2, 5, 10 | 350 | 200 |
| 99011 | ERL07..100, ERL07..101 (3) | 0.25 | 11M to 22M | 2, 5, 10 | 350 | 250 |
| 98021 | ERL20..36, ERL20..37 (3) | 0.50 | 3.3M to 22M | 2, 5, 10 | 350 | 350 |
| 98022 | ERL32..36, ERL32..37 (3) | 1.0 | 3M to 22M | 2, 5, 10 | 350 | 350 |
| 97004 | ERL62..1, ERL62..2 (3) | 2.0 | 10 to 2.7M 3M to 22M | 1, 2, 5, 10 | 100 350 | 500 |

• Low inductance: DSCC has created a drawing intended to support a resistor which exhibits low inductance over a frequency range of 1 MHz to 30 MHz. Vishay Dale is listed as a resource on these drawings as follows:

| DSCC DRAWING NUMBER | VISHAY DALE MODEL | POWER RATING $P_{70\text{ }^{\circ}\text{C}}$ W | RESISTANCE RANGE Ω | MAXIMUM INDUCTANCE nH | TOLERANCE ± % | TEMPERATURE COEFFICIENT ± ppm/°C | MAXIMUM WORKING VOLTAGE V (4) |
|---------------------|-------------------|---|-----------------------|--------------------------|------------------|-------------------------------------|----------------------------------|
| 96002 | ERL07..62 | 0.25 | 1 to 10 11 to 49.9 | 10 8 | 1, 2 | 100 | 250 |

These drawings can be viewed at: www.dscclia.mil/Programs/MilSpec/ListDwgs.asp?DocType=DSCCdwg

(2) Consult factory for current QPL failure rates

(3) Hot solder dipped leads

(4) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less.

TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | CONDITION |
|-----------------------------|-----------------|---|
| Voltage Coefficient, max. | ppm/V | 5/V when measured between 10 % and full rated voltage |
| Dielectric Strength | V _{AC} | RLR05 = 300; RLR07 and RLR20 = 500; RLR32 = 1000 |
| Insulations Resistance | Ω | ≥ 10 ⁹ min. dry; ≥ 10 ¹¹ min. after moisture test |
| Operating Temperature Range | °C | - 65 to + 150 |
| Terminal Strength | lb | 2 lb pull test on RLR05; 5 lb pull test on all other sizes |
| Solderability | | Continuous satisfactory coverage when tested in accordance with MIL-STD-202, Method 208 |
| Weight | g | RLR05 = 0.11; RLR07 = 0.35; RLR20 = 0.75; RLR32 = 1.50 |

GLOBAL PART NUMBER INFORMATION

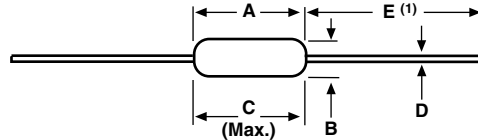
New Global Part Numbering: RLR07C3001FRR36 (preferred part numbering format)

| | | | | | | | | | | | | | | | | | |
|----------------------------------|-----------------------------|---|------------------------|---|--|----------|----------|--|----------|----------|----------|----------|----------|----------|--|--|--|
| R | L | R | 0 | 7 | C | 3 | 0 | 0 | 1 | F | R | R | 3 | 6 | | | |
| MIL STYLE | LEAD MATERIAL | RESISTANCE VALUE | TOLERANCE CODE | FAILURE RATE | PACKAGING | | | SPECIAL | | | | | | | | | |
| RLR05 RLR07 RLR20 RLR32 | C = Solderable/ weldable | 3 digit significant figure, followed by a multiplier Use "R" for values < 100 Ω 1R00 = 1.0 3302 = 33 kΩ 1005 = 10 MΩ | F = ± 1 % G = ± 2 % | M = 1.0%/1000 h P = 0.1%/1000 h R = 0.01%/1000 h S = 0.001%/1000 h | B14 = Tin/lead, bulk BSL = Tin/lead, bulk, single lot date code R36 = Tin/lead, T/R (full, except 32's) R64 = Tin/lead, T/R (full; 32's only) RE6 = Tin/lead, T/R (1000 pieces) RSL = Tin/lead, T/R, single lot date code | | | Blank = Standard (Dash number) (Up to 3 digits) From 1 to 999 as applicable 1 = Hot solder dip (32's) 11 = Hot solder dip (20's) 19 = Hot solder dip (05's) 23 = Hot solder dip (07's) | | | | | | | | | |

Historical Part Number example: RLR07C3001FR (will continue to be accepted)

| | | | | | |
|------------------|----------------------|-------------------------|-----------------------|---------------------|------------------|
| RLR07 | C | 3001 | F | R | R36 |
| MIL STYLE | LEAD MATERIAL | RESISTANCE VALUE | TOLERANCE CODE | FAILURE RATE | PACKAGING |

DIMENSIONS in inches (millimeters)



Note
(¹) 1.08 ± 0.125 (27.43 ± 3.18) if tape and reel

| VISHAY DALE MODEL | A | B | C (Max.) | D | E |
|-------------------|--|--------------------------------|------------------|---|--------------------------------|
| ERL05 | 0.150 ± 0.020 (3.81 ± 0.51) | 0.066 ± 0.008 (1.68 ± 0.21) | 0.187 (4.75) | 0.016 ± 0.002 (0.41 ± 0.05) | 1.25 ± 0.266 (31.75 ± 6.76) |
| ERL07 | 0.250 ± 0.031 - 0.046 (6.35 ± 0.79 - 1.17) | 0.090 ± 0.008 (2.29 ± 0.21) | 0.300 (7.62) | 0.025 ± 0.002 (0.64 ± 0.05) | 1.50 ± 0.125 (38.10 ± 3.18) |
| ERL20 | 0.375 ± 0.041 (9.53 ± 1.04) | 0.138 ± 0.023 (3.51 ± 0.58) | 0.450 (11.43) | 0.032 ± 0.002 (0.81 ± 0.05) | 1.50 ± 0.125 (38.10 ± 3.18) |
| ERL32 | 0.562 ± 0.031 (14.27 ± 0.79) | 0.190 ± 0.015 (4.83 ± 0.38) | 0.625 (15.87) | 0.032 + 0.002 - 0.001 (0.81 + 0.05 - 0.03) | 1.50 ± 0.125 (38.10 ± 3.18) |
| ERL62 | 0.562 + 0.031 - 0.042 (14.27 + 0.79 - 1.07) | 0.230 ± 0.015 (5.84 ± 0.38) | 0.650 (16.51) | 0.032 + 0.002 - 0.001 (0.81 + 0.05 - 0.03) | 1.50 ± 0.125 (38.10 ± 3.18) |

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

APPLICABLE MIL-SPECIFICATIONS

MIL-PRF-39017:

The ERL series meets the electrical, environmental and dimensional requirements of MIL-PRF-39017.

MIL-PRF-22684:

MIL-PRF-39017 supercedes MIL-PRF-22684 on new designs. The ERC series meet or exceed MIL-PRF-22684 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.

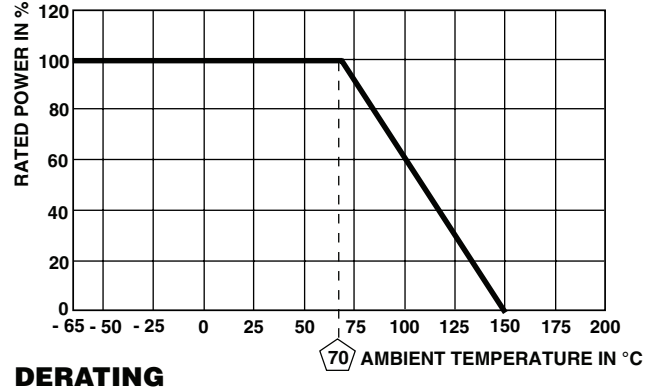
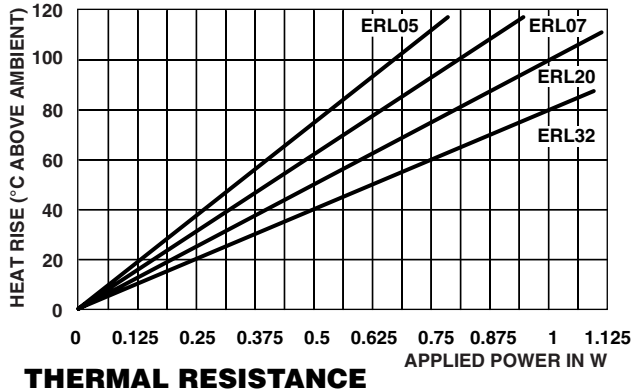
CAGE CODE: 91637

ERL (Military RLR)



Vishay Dale

Metal Film Resistors, Military/Established Reliability,
MIL-PRF-39017 Qualified, Type RLR



MARKING

- Per MIL-PRF-39017



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