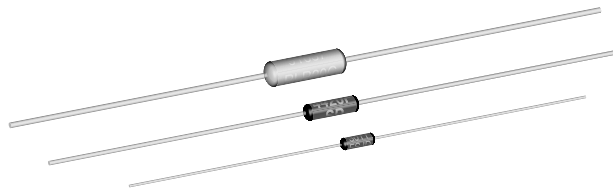




## Metal Film Resistors, Military/Established Reliability, MIL-PRF-39017 Qualified, Type RLR



### 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	POWER RATING $P_{70^\circ\text{C}}$ , W	RESISTANCE RANGE $\Omega$ <sup>(1)</sup>	RESISTANCE TOLERANCE %	TEMPERATURE COEFFICIENT ppm/ $^\circ\text{C}$	MAXIMUM WORKING VOLTAGE	LIFE FAILURE RATE <sup>(2)</sup>
ERL05	RLR05	0.125	4R7 - 1M0	$\pm 1, \pm 2$	100	200	M, P, R, S
ERL07	RLR07	0.25	1R0 - 10M	$\pm 1, \pm 2$	100	250	M, P, R, S
ERL20	RLR20	0.50	4R3 - 3M01	$\pm 1, \pm 2$	100	350	M, P, R
ERL32	RLR32	1.0	1R0 - 2M7	$\pm 1, \pm 2$	100	500	M, P, R

### Notes

<sup>(1)</sup> 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 $P_{70^\circ\text{C}}$ , W	RESISTANCE RANGE $\Omega$	RESISTANCE TOLERANCE %	TEMPERATURE COEFFICIENT ppm/ $^\circ\text{C}$	MAXIMUM WORKING VOLTAGE
98020	ERL05..36, ERL05..37 <sup>(3)</sup>	0.125	1M1 - 22M	$\pm 2, \pm 5, \pm 10$	350	200
99011	ERL07..100, ERL07..101 <sup>(3)</sup>	0.25	11M - 22M	$\pm 2, \pm 5, \pm 10$	350	250
98021	ERL20..36, ERL20..37 <sup>(3)</sup>	0.50	3M3 - 22M	$\pm 2, \pm 5, \pm 10$	350	350
98022	ERL32..36, ERL32..37 <sup>(3)</sup>	1.0	3M0 - 22M	$\pm 2, \pm 5, \pm 10$	350	350
97004	ERL62..1, ERL62..2 <sup>(3)</sup>	2.0	10R - 2M7 3M0 - 22M	$\pm 1, \pm 2, \pm 5, \pm 10$	100 350	500

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

<sup>(2)</sup> Consult factory for current QPL failure rates

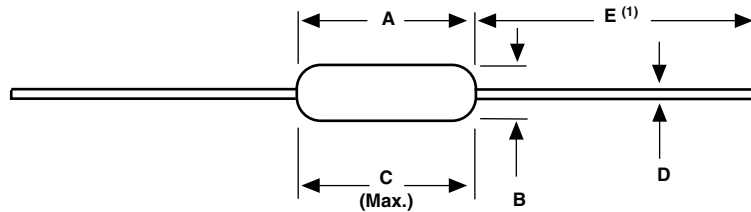
<sup>(3)</sup> Hot solder dipped leads

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	CONDITION
Voltage Coefficient, max.	ppm/ $^\circ\text{C}$	5/V when measured between 10% and full rated voltage
Dielectric Strength	$V_{AC}$	RLR05 = 300; RLR07 and RLR20 = 500; RLR32 = 1000
Insulations Resistance	$\Omega$	$\geq 10^9$ min. dry; $\geq 10^{11}$ min. after moisture test
Operating Temperature Range	$^\circ\text{C}$	-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 1R00 = 1.0 $\Omega$ 3302 = 33 k $\Omega$ 1005 = 10 M $\Omega$	F = $\pm 1\%$ G = $\pm 2\%$	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 - 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)  $1.08 \pm 0.125$  [27.43 ± 3.18] if tape and reel

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

MATERIAL SPECIFICATIONS			
<b>Element:</b>	Vacuum-deposited nickel-chrome alloy	<b>Encapsulation:</b>	Specially formulated epoxy compound
<b>Core:</b>	Fire-cleaned high purity ceramic	<b>Termination:</b>	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:**

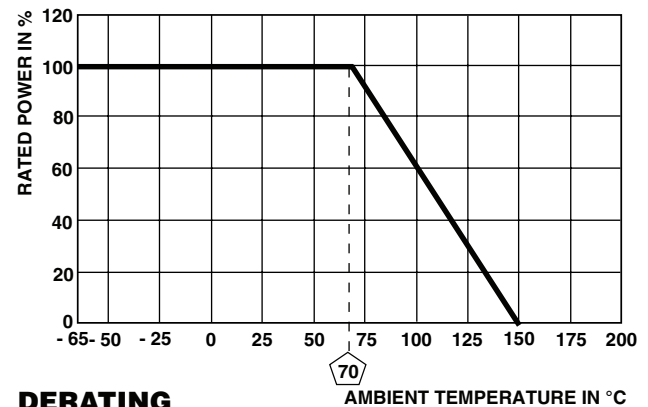
Qualification and failure rate verification test data is maintained by Vishay Dale and is available upon request. Lot traceability and identification data is maintained by Vishay Dale for five years.

**CAGE CODE: 91637**

**POWER RATING**

Power ratings are based on the following two conditions:

- ± 2.0 % maximum R in 2000 h load life
- + 150 °C maximum operating temperature



**DERATING**

MARKING
- Per MIL-PRF-39017



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.