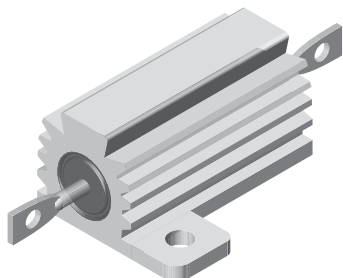


Wirewound Resistors, Military/Established Reliability

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
- Non-inductive styles manufactured with Aryton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect

STANDARD ELECTRICAL SPECIFICATIONS

MILITARY MODEL	VISHAY REFERENCE MODEL	POWER RATING $P_{25^{\circ}\text{C}}$ W	RESISTANCE RANGE Ω	TOLERANCE $\pm \%$	WEIGHT (typical) g
RER40	ENH05	5	1 to 1.65K	1	3.3
RER45	ENH10	10	1 to 2.8K	1	8.8
RER50	ENH25	20	1 to 6.04K	1	16.5
RER55	ENH50	30	1 to 4.99K	1	35
RER60	ERH05	5	0.10 to 3.32K	1	3
RER65	ERH10	10	0.10 to 5.62K	1	6
RER70	ERH25	20	0.10 to 12.1K	1	13
RER75	ERH50	30	0.10 to 39.2K	1	28

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	RER40/RER60	RER45/RER65	RER50/RER70	RER55/RER75
Free Air Power Rating at 25 °C	W	3	6	8	10
Temperature Coefficient	ppm/°C	± 20 for 20 Ω and above; ± 50 for 1 Ω to 19.9 Ω ; ± 100 for 0.1 Ω to 0.99 Ω			
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			
Solderability	-	Meets requirements of ANSI J-STD-002			
Operating Temperature Range	°C	- 55 to + 250			

MILITARY PART NUMBER INFORMATION

Military Part Numbering example: 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

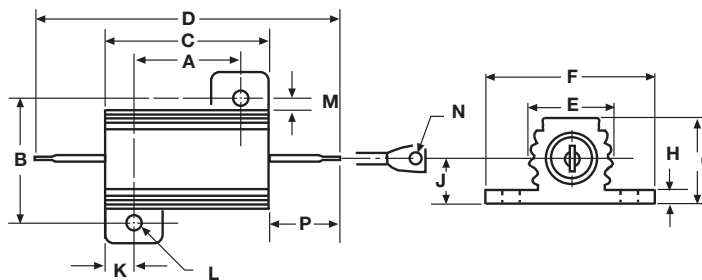
FAILURE RATE

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



MILITARY MODEL	DIMENSIONS in inches [millimeters]													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RER40 RER60	0.444	0.490	0.600	1.125	0.334	0.646	0.320	0.065	0.133	0.078	0.093	0.078	0.050	0.266
	± 0.005	± 0.005	± 0.031	± 0.062	± 0.015	± 0.015	± 0.015	± 0.010	± 0.010	± 0.005	± 0.015	± 0.015	± 0.005	± 0.062
	[11.280 ± 0.127]	[12.450 ± 0.127]	[15.240 ± 0.787]	[28.580 ± 1.570]	[8.480 ± 0.381]	[16.410 ± 0.381]	[8.130 ± 0.381]	[1.650 ± 0.254]	[3.380 ± 0.254]	[1.980 ± 0.254]	[2.360 ± 0.127]	[1.980 ± 0.381]	[1.270 ± 0.127]	[6.760 ± 1.570]
RER45 RER65	0.562	0.625	0.750	1.375	0.420	0.800	0.390	0.075	0.165	0.093	0.094	0.102	0.085	0.312
	± 0.005	± 0.005	± 0.031	± 0.062	± 0.015	± 0.015	± 0.015	± 0.010	± 0.010	± 0.010	± 0.005	± 0.015	± 0.005	± 0.062
	[14.270 ± 0.127]	[15.880 ± 0.127]	[19.050 ± 0.787]	[34.930 ± 1.570]	[10.670 ± 0.381]	[20.320 ± 0.381]	[9.910 ± 0.381]	[1.900 ± 0.254]	[4.190 ± 0.254]	[2.360 ± 0.254]	[2.390 ± 0.127]	[2.590 ± 0.381]	[2.160 ± 0.127]	[7.920 ± 1.570]
RER50 RER70	0.719	0.781	1.062	1.938	0.550	1.080	0.546	0.075	0.231	0.172	0.125	0.115	0.085	0.438
	± 0.005	± 0.005	± 0.031	± 0.062	± 0.015	± 0.015	± 0.015	± 0.010	± 0.010	± 0.010	± 0.005	± 0.015	± 0.005	± 0.062
	[18.260 ± 0.127]	[19.840 ± 0.127]	[26.970 ± 0.787]	[49.230 ± 1.570]	[13.970 ± 0.381]	[27.430 ± 0.381]	[13.870 ± 0.381]	[1.900 ± 0.254]	[5.870 ± 0.254]	[4.370 ± 0.254]	[3.180 ± 0.127]	[2.920 ± 0.381]	[2.160 ± 0.127]	[11.130 ± 1.570]
RER55 RER75	1.562	0.844	1.968	2.781	0.630	1.140	0.610	0.088	0.260	0.196	0.125	0.107	0.085	0.438
	± 0.005	± 0.005	± 0.031	± 0.062	± 0.015	± 0.015	± 0.015	± 0.010	± 0.010	± 0.010	± 0.005	± 0.015	± 0.005	± 0.062
	[39.670 ± 0.127]	[21.440 ± 0.127]	[49.990 ± 0.787]	[70.640 ± 1.570]	[16.000 ± 0.381]	[28.960 ± 0.381]	[15.490 ± 0.381]	[2.240 ± 0.254]	[6.600 ± 0.254]	[4.980 ± 0.254]	[3.180 ± 0.127]	[2.720 ± 0.381]	[2.160 ± 0.127]	[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

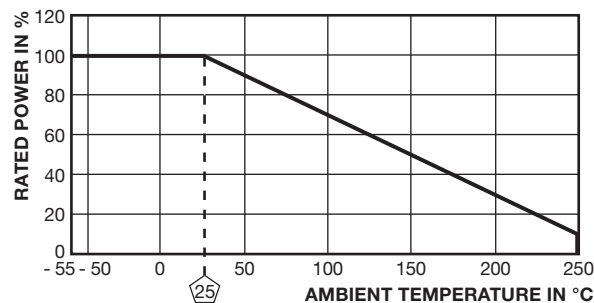
POWER RATING

Vishay RER resistor wattage ratings are based on mounting to the proper heat sink.

RER40, RER45, RER60, RER65: 4" x 6" x 2" x 0.040" thick aluminum chassis

RER50, RER55, RER70, RER75: 5" x 7" x 2" x 0.040" thick
aluminum chassis

DERATING



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 min to 30 min	$\pm (0.5 \% + 0.01 \Omega) \Delta R$
Short Time Overload	5 x rated power for 5 s	$\pm (0.3 \% + 0.01 \Omega) \Delta R$
Dielectric Withstanding Voltage	1000 V _{rms} (RER40, RER45, RER50, RER60, RER65, RER70), 2000 V _{rms} (RER55 and RER75), 1 min duration	$\pm (0.2 \% + 0.01 \Omega) \Delta R$
Low Temperature Storage	- 55 °C for 24 h	$\pm (0.3 \% + 0.01 \Omega) \Delta R$
High Temperature Exposure	250 °C for 2000 h	$\pm (1.0 \% + 0.01 \Omega) \Delta R$
Moisture Resistance	MIL-STD-202, method 106	$\pm (0.5 \% + 0.01 \Omega) \Delta R$
Shock, Specified Pulse	MIL-STD-202, method 213, condition 1	$\pm (0.2 \% + 0.01 \Omega) \Delta R$
Vibration, High Frequency	MIL-STD-202, method 204, condition D	$\pm (0.2 \% + 0.01 \Omega) \Delta R$
Load Life	2000 h at rated power, + 25 °C, 1.5 h “ON”, 0.5 h “OFF”	$\pm (1.0 \% + 0.01 \Omega) \Delta R$
Extended Life	10 000 h at rated power, + 25 °C, 1.5 h “ON”, 0.5 h “OFF”	$\pm (0.2 \% + 0.01 \Omega) \Delta R$
Terminal Strength	MIL-STD-202, method 211, condition A 5 pound (RER40, RER45, RER60, RER65), 10 pound (RER50, RER55, RER70, RER75)	$\pm (0.2 \% + 0.01 \Omega) \Delta R$



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.