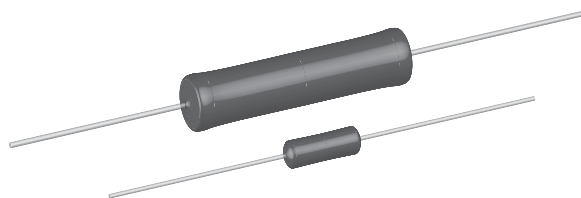


## Wirewound Resistors, Military/Established Reliability MIL-PRF-39007 Qualified, Type RWR, R Level



### FEATURES

- High temperature silicone coated
- Complete welded construction
- Qualified to MIL-PRF-39007
- Available in non-inductive styles (type N) with Aryton-Perry winding for lowest reactive components
- "S" level failure rate available

### Note

- "Terminal Wire and Winding" type "W" and "Z" are not listed below but are available upon request. Please reference MIL-PRF-39007 QPL for approved "failure rate" and "resistance tolerance/ranges"

### STANDARD ELECTRICAL SPECIFICATIONS

MILITARY MODEL	VISHAY REFERENCE MODEL	POWER RATING $P_{25^{\circ}\text{C}}$ W	RESISTANCE RANGE $\Omega$ $\pm 0.1\%$	RESISTANCE RANGE $\Omega$ $\pm 0.5\%, \pm 1\%$	WEIGHT (typical) g
RWR81S	EGS-1-80	1	0.499 to 1K	0.1 to 1K	0.21
RWR81N	EGN-1-80	1	0.499 to 499	0.1 to 499	0.21
RWR82S	EGS-2	2	0.499 to 1.3K	0.1 to 1.3K	0.23
RWR82N	EGN-2	2	0.499 to 649	0.1 to 649	0.23
RWR80S	EGS-3-80	2	0.499 to 3.16K	0.1 to 3.16K	0.34
RWR80N	EGN-3-80	2	0.499 to 1.58K	0.1 to 1.58K	0.34
RWR71S	ESS-2A	2	0.499 to 12.1K	0.1 to 12.1K	0.90
RWR71N	ESN-2A	2	0.499 to 6.04K	0.1 to 6.04K	0.90
RWR89S	ESS-2B	3	0.499 to 4.12K	0.1 to 4.12K	0.70
RWR89N	ESN-2B	3	0.499 to 2.05K	0.1 to 2.05K	0.70
RWR74S	ESS-5	5	0.499 to 12.1K	0.1 to 12.1K	4.2
RWR74N	ESN-5	5	0.499 to 6.04K	0.1 to 6.04K	4.2
RWR84S	EGS-10-80	7	0.499 to 12.4K	0.1 to 12.4K	3.6
RWR84N	EGN-10-80	7	0.499 to 6.19K	0.1 to 6.19K	3.6
RWR78S	ESS-10	10	0.499 to 39.2K	0.1 to 39.2K	9.0
RWR78N	ESN-10	10	0.499 to 19.6K	0.1 to 19.6K	9.0

### TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	RWR RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/ $^{\circ}\text{C}$	$\pm 20$ for 10 $\Omega$ and above; $\pm 50$ for 1.1 $\Omega$ to 10 $\Omega$ ; $\pm 400$ for 0.505 $\Omega$ to 1 $\Omega$ ; $\pm 650$ for 0.1 $\Omega$ to 0.499 $\Omega$
Dielectric Withstanding Voltage	$V_{AC}$	500 minimum for 2 W and smaller, 1000 minimum for 3 W and larger
Short Time Overload	-	5 x rated power for 5 s for 3 W size and smaller, 10 x rated power for 5 s for 5 W size and greater
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Insulation Resistance	-	1000 M $\Omega$ minimum dry, 100 M $\Omega$ minimum after moisture test
Terminal Strength	lb	5 minimum for 2 W and smaller, 10 minimum for 3 W and larger
Solderability	-	Meets requirements of ANSI J-STD-002
Operating Temperature Range	$^{\circ}\text{C}$	- 65 to + 250

### GLOBAL PART NUMBER INFORMATION

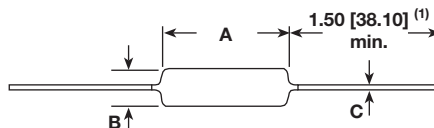
Global Part Numbering example: RWR74S49R9FSB12

R W R 7 4 S 4 9 R 9 F S B 1 2

MIL TYPE	TERMINAL WIRE AND WINDING	RESISTANCE VALUE	TOLERANCE CODE	FAILURE RATE	PACKAGING CODE
RWR71 RWR74 RWR78 RWR80 RWR81 RWR82 RWR84 RWR89	S = Solderable, inductive N = Solderable, non-inductive W = Weldable, inductive <sup>(1)</sup> Z = Weldable, non-inductive <sup>(1)</sup>	3 digit significant figure, followed by a multiplier  49R9 = 49.9 $\Omega$ 1000 = 100 $\Omega$ 1001 = 1000 $\Omega$	B = $\pm 0.1\%$ D = $\pm 0.5\%$ F = $\pm 1.0\%$	M = 1.0 %/1000 h P = 0.1 %/1000 h R = 0.01 %/1000 h S = 0.001 %/1000 h	B12 = Bulk pack S70 = Tape/reel (smaller than 5 W) S73 = Tape/reel (5 W and higher) BSL = Bulk pack, single lot date code RSL = Tape/reel, single lot date code

### Note

<sup>(1)</sup> Note that "W" and "Z" are not listed above but are available, see MIL-PRF-39007 QPL for available resistance values.

**DIMENSIONS** in inches [millimeters]


MILITARY MODEL	DIMENSIONS in inches [millimeters]		
	A	B	C
RWR81	0.250 ± 0.031 [6.35 ± 0.787]	0.085 ± 0.020 [2.16 ± 0.508]	0.020 ± 0.0015 [0.508 ± 0.038]
RWR82	0.312 ± 0.016 [7.92 ± 0.406]	0.078 ± 0.016 - 0.031 [1.98 ± 0.406 - 0.787]	0.020 ± 0.0015 [0.508 ± 0.038]
RWR80	0.406 ± 0.031 [10.31 ± 0.787]	0.094 ± 0.031 [2.39 ± 0.787]	0.020 ± 0.0015 [0.508 ± 0.038]
RWR71	0.812 ± 0.062 [20.62 ± 1.58]	0.187 ± 0.031 [4.75 ± 0.787]	0.032 ± 0.002 [0.813 ± 0.051]
RWR89	0.560 ± 0.062 [14.22 ± 1.58]	0.187 ± 0.031 [4.75 ± 0.787]	0.032 ± 0.002 [0.813 ± 0.051]
RWR74	0.875 ± 0.062 [22.23 ± 1.58]	0.312 ± 0.031 [7.92 ± 0.787]	0.040 ± 0.002 [1.02 ± 0.051]
RWR84	0.875 ± 0.062 [22.23 ± 1.58]	0.312 ± 0.031 [7.92 ± 0.787]	0.040 ± 0.002 [1.02 ± 0.051]
RWR78	1.780 ± 0.062 [45.21 ± 1.58]	0.312 ± 0.031 [7.92 ± 0.787]	0.040 ± 0.002 [1.02 ± 0.051]

**Note**
<sup>(1)</sup> On some standard reel pack methods, the leads may be trimmed to a shorter length than shown.

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

**Core:** Ceramic, beryllium oxide, steatite or alumina, depending on power requirement

**Coating:** Special high temperature silicone

**Terminal and Winding:** The terminal and the winding are identified by a letter symbol in the military type designation.

Military symbol:

**S** = Solderable, inductively wound

**W** = Weldable, inductively wound

**N** = Solderable, non-inductively wound

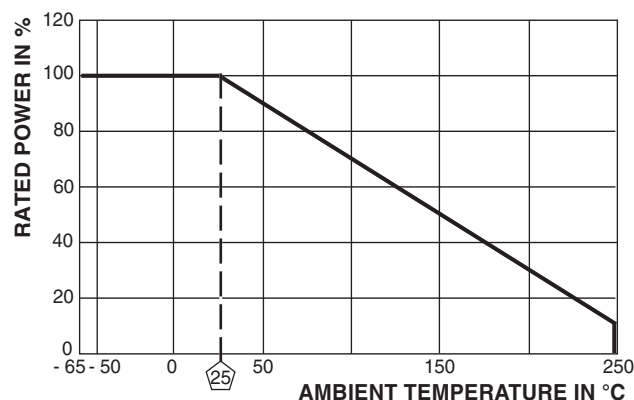
**Z** = Weldable, non-inductively wound

**Terminals:** Solderable - Tinned Copperweld®

Weldable - bare nickel per MIL-STD-1276, Type N-1

**End Caps:** Stainless steel

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

**DERATING**


PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal Shock	MIL-STD-2.2, method 303	± (0.2 % + 0.005 Ω) ΔR
Short Time Overload	5 x rated power (RWR71, RWR80, RWR81, RWR89, RWR82), 10 x rated power (RWR74, RWR78, RWR84) for 5 s	± (0.2 % + 0.005 Ω) ΔR
Dielectric Withstanding Voltage	500 V <sub>rms</sub> (RWR80, RWR81, RWR82), 1000 V <sub>rms</sub> (RWR71, RWR74, RWR78, RWR84, RWR89), 1 min duration	± (0.1 % + 0.005 Ω) ΔR
Low Temperature Storage	- 65 °C for 24 h	± (0.1 % + 0.005 Ω) ΔR
High Temperature Exposure	250 °C for 2000 h	± (1.0 % + 0.005 Ω) ΔR <sup>(2)</sup>
Moisture Resistance	MIL-STD-202, method 106	± (0.2 % + 0.005 Ω) ΔR
Shock, Specified Pulse	MIL-STD-202, method 205, condition C	± (0.1 % + 0.005 Ω) ΔR
Vibration, High Frequency	MIL-STD-202, method 204, condition D	± (0.1 % + 0.005 Ω) ΔR
Load Life	2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	± (0.5 % + 0.005 Ω) ΔR
Extended Life	10 000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	± (1.0 % + 0.005 Ω) ΔR
Terminal Strength	MIL-STD-202, method 211, condition A and C 5 pound (RWR80, RWR81, RWR82), 10 pound (RWR71, RWR74, RWR78, RWR84, RWR89)	± (0.1 % + 0.005 Ω) ΔR

**Note**
<sup>(2)</sup> For resistance values above 100 Ω, test limit is ± 1.0 %.



### 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.