

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


**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



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**

(1) 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 (2)
Moisture Resistance	MIL-STD-202, method 106	± (0.2 % + 0.005 Ω) ΔR
Shock, Specified Pulse	MIL-STD-202, method 213, condition 1	± (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**

(2) For resistance values above 100 Ω, test limit is ± 1.0 %.



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