Vishay Dale



# 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

"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 <sub>25 °C</sub> W	RESISTANCE RANGE $\Omega$ ± 0.1 %	RESISTANCE RANGE $\Omega$ ± 0.5 %, ± 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/°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	°C	- 65 to + 250	

Operating	remperature nange   0		- 03 10 + 2	.50	
GLOBAI	GLOBAL PART NUMBER INFORMATION				
	TERMINAL WIRE AND WINDING  S = Solderable, inductive  N = Solderable, inductive  W = Weldable, inductive (1)  Z = Weldable, non-inductive (1)		R 9 F  TOLERANCE CODE  B = ± 0.1 % D = ± 0.5 % F = ± 1.0 %	S B 1 2  FAILURE RATE  M = 1.0 %/1000 h P = 0.1 %/1000 h R = 0.01 %/1000 h S = 0.001 %/1000 h	PACKAGING CODE  B12 = Bulk pack  \$70 = Tape/reel (smaller than 5 W)  \$73 = Tape/reel (5 W and higher)  BSL = Bulk pack, single lot date code  RSL = Tape/reel,
I IIII					single lot date code

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

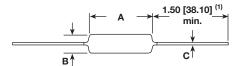
For technical questions, contact: ww2bresistors@vishay.com Document Number: 30203 Revision: 23-Feb-11



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

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#### **DIMENSIONS** in inches [millimeters]



MILITARY MODEL	DIMENSIONS in inches [millimeters]				
WILLIAM WODEL	Α	В	С		
RWR81	$0.250 \pm 0.031 \ [6.35 \pm 0.787]$	$0.085 \pm 0.020 [2.16 \pm 0.508]$	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]	$0.094 \pm 0.031 \ [2.39 \pm 0.787]$	0.020 ± 0.0015 [0.508 ± 0.038]		
RWR71	0.812 ± 0.062 [20.62 ± 1.58]	$0.187 \pm 0.031 [4.75 \pm 0.787]$	0.032 ± 0.002 [0.813 ± 0.051]		
RWR89	$0.560 \pm 0.062 [14.22 \pm 1.58]$	$0.187 \pm 0.031 [4.75 \pm 0.787]$	$0.032 \pm 0.002 [0.813 \pm 0.051]$		
RWR74	0.875 ± 0.062 [22.23 ± 1.58]	$0.312 \pm 0.031 \ [7.92 \pm 0.787]$	$0.040 \pm 0.002 [1.02 \pm 0.051]$		
RWR84	0.875 ± 0.062 [22.23 ± 1.58]	$0.312 \pm 0.031 [7.92 \pm 0.787]$	$0.040 \pm 0.002 [1.02 \pm 0.051]$		
RWR78	1.780 ± 0.062 [45.21 ± 1.58]	$0.312 \pm 0.031 \ [7.92 \pm 0.787]$	0.040 ± 0.002 [1.02 ± 0.051]		

#### Note

#### **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:

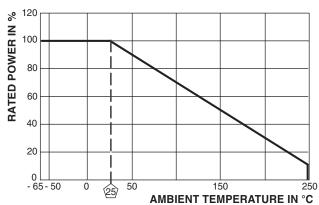
S = Solderable, inductively wound
 W = Weldable, inductively wound
 N = Solderable, non-inductively wound
 Z = Weldable, non-inductively wound

**Terminals:** Solderable - Tinned Copperweld<sup>®</sup> 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	$\pm$ (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	$\pm$ (0.1 % + 0.005 Ω) ΔR		
High Temperature Exposure	250 °C for 2000 h	$\pm$ (1.0 % + 0.005 $\Omega$ ) $\Delta R^{(2)}$		
Moisture Resistance	MIL-STD-202, method 106	$\pm$ (0.2 % + 0.005 Ω) ΔR		
Shock, Specified Pulse	MIL-STD-202, method 205, condition C	$\pm$ (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

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

<sup>(2)</sup> For resistance values above 100  $\Omega$ , test limit is  $\pm$  1.0 %.

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