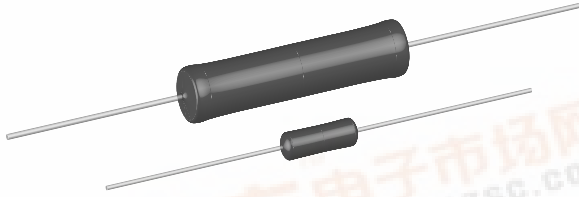


ESS, ESN, EGS, EGN



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 (types ESN and EGN) 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

MODEL	MIL-PRF-39007 TYPE	POWER RATING $P_{25^{\circ}\text{C}}$ W	MILITARY RESISTANCE RANGE Ω		WEIGHT (typical) g
			$\pm 0.1\%$	$\pm 0.5\%$ and $\pm 1\%$	
EGS-1-80	RWR81S	1	0.499 - 1K	0.1 - 1K	0.21
EGN-1-80	RWR81N	1	0.499 - 499	0.1 - 499	0.21
EGS-2	RWR82S	2	0.499 - 1.3K	0.1 - 1.3K	0.23
EGN-2	RWR82N	2	0.499 - 649	0.1 - 649	0.23
EGS-3-80	RWR80S	2	0.499 - 3.16K	0.1 - 3.16K	0.34
EGN-3-80	RWR80N	2	0.499 - 1.58K	0.1 - 1.58K	0.34
ESS-2A	RWR71S	2	0.499 - 12.1K	0.1 - 12.1K	0.90
ESN-2A	RWR71N	2	0.499 - 6.04K	0.1 - 6.04K	0.90
ESS-2B	RWR89S	3	0.499 - 4.12K	0.1 - 4.12K	0.70
ESN-2B	RWR89N	3	0.499 - 2.05K	0.1 - 2.05K	0.70
ESS-5	RWR74S	5	0.499 - 12.1K	0.1 - 12.1K	4.2
ESN-5	RWR74N	5	0.499 - 6.04K	0.1 - 6.04K	4.2
EGS-10-80	RWR84S	7	0.499 - 12.4K	0.1 - 12.4K	3.6
EGN-10-80	RWR84N	7	0.499 - 6.19K	0.1 - 6.19K	3.6
ESS-10	RWR78S	10	0.499 - 39.2K	0.1 - 39.2K	9.0
ESN-10	RWR78N	10	0.499 - 19.6K	0.1 - 19.6K	9.0

GLOBAL PART NUMBER INFORMATION

Global/Military Part Numbering: RWR74S49R9FSB12

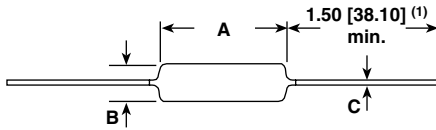
R W R 7 4 S 4 9 R 9 F S B 1 2

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, noninductive W = Weldable, inductive ⁽¹⁾ Z = Weldable, noninductive ⁽¹⁾	3 digit significant figure, followed by a multiplier 49R9 = 49.9 Ω 1000 = 100 Ω 1001 = 1000 Ω	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 (1) 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]



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

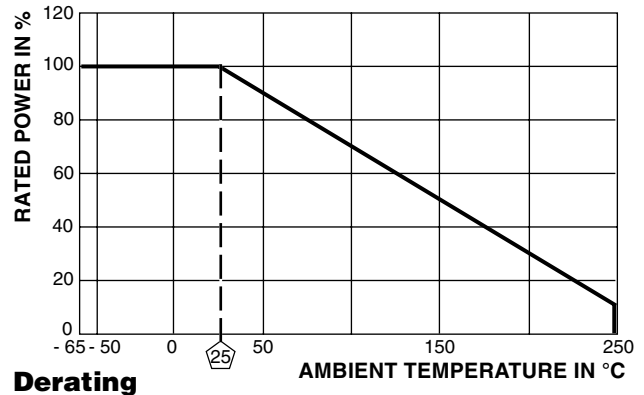
End Caps: Stainless steel

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

APPLICABLE MIL-SPECIFICATION

MIL-PRF-39007: This is the military specification covering axial lead established reliability power wirewound resistors. Vishay Dale ESS, ESW, EGS, EGW, ESN and EGN resistors meet or exceed the electrical, environmental and dimensional requirements of this specification.

MIL-PRF-39007	DIMENSIONS in inches [millimeters]		
MODEL	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]



TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	RWR RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	± 650 for 0.1 Ω to 0.499 Ω, ± 400 for 0.505 Ω to 1 Ω, ± 50 for 1.1 Ω to 10 Ω, ± 20 for 10 Ω and above
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 x R) ^{1/2}
Insulation Resistance	-	1000 MΩ minimum dry, 100 MΩ 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

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, 80, 81, 89, 82), 10 x rated power (RWR74, 78, 84) for 5 s	± (0.2 % + 0.005 Ω) ΔR
Dielectric Withstanding Voltage	500 V _{rms} (RWR80, 81, 82), 1000 V _{rms} (RWR71, 74, 78, 84, 89), 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
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, 81, 82), 10 pound (RWR71, 74, 78, 84, 89)	± (0.1 % + 0.005 Ω) ΔR

Note

• For resistance values above 100 Ω, test limit is ± 1.0 %



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