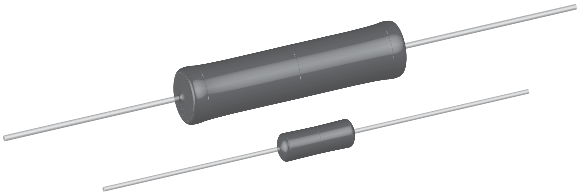
Wirewound Resistors, Military/Established Reliability
MIL-PRF-39007 Qualified, Type RWR, R Level



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 $P_{25\ °C}$ W	RESISTANCE RANGE Ω ± 0.1 %	RESISTANCE RANGE Ω ± 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	± 20 for 10 Ω and above; ± 50 for 1.1 Ω to 10 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 650 for 0.1 Ω to 0.499 Ω
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 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

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: RWR74S49R9FSB12

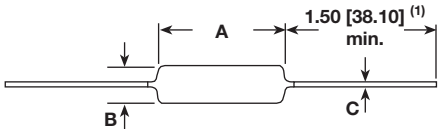
R	W	R	7	4	S	4	9	R	9	F	S	B	1	2

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 (1) **Z** = Weldable, non-inductive (1)	3 digit significant figure, followed by a multiplier **49R9** = 49.9 Ω **1000** = 100 Ω **1001** = 1000 Ω	**B** = ± 0.1 % **D** = ± 0.5 % **F** = ± 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]



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.

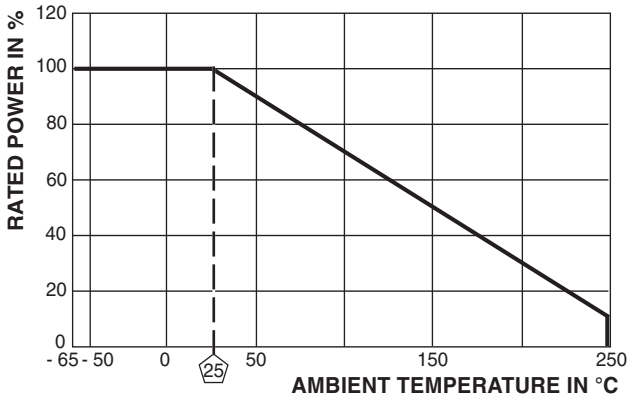
Military symbol:
S = Solderable, inductively wound
W = Weldable, inductively wound
N = Solderable, non-inductively wound
Z = Weldable, non-inductively wound

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) Δ*R*
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) Δ*R*
Dielectric Withstanding Voltage	500 V_{rms} (RWR80, RWR81, RWR82), 1000 V_{rms} (RWR71, RWR74, RWR78, RWR84, RWR89), 1 min duration	± (0.1 % + 0.005 Ω) Δ*R*
Low Temperature Storage	- 65 °C for 24 h	± (0.1 % + 0.005 Ω) Δ*R*
High Temperature Exposure	250 °C for 2000 h	± (1.0 % + 0.005 Ω) Δ*R* (2)
Moisture Resistance	MIL-STD-202, method 106	± (0.2 % + 0.005 Ω) Δ*R*
Shock, Specified Pulse	MIL-STD-202, method 205, condition C	± (0.1 % + 0.005 Ω) Δ*R*
Vibration, High Frequency	MIL-STD-202, method 204, condition D	± (0.1 % + 0.005 Ω) Δ*R*
Load Life	2000 h at rated power, + 25 °C, 1.5 h “ON”, 0.5 h “OFF”	± (0.5 % + 0.005 Ω) Δ*R*
Extended Life	10 000 h at rated power, + 25 °C, 1.5 h “ON”, 0.5 h “OFF”	± (1.0 % + 0.005 Ω) Δ*R*
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) Δ*R*

Note

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

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