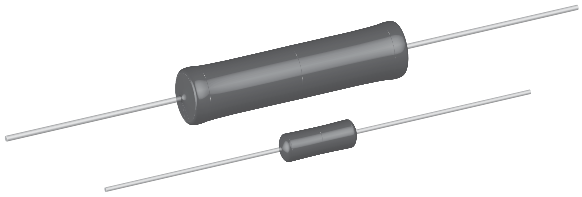
Wirewound Resistors, Military/Established Reliability, MIL-PRF-39007 Qualified, Type RWR, Up to S Level, Axial Lead



DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

FEATURES

- High temperature silicone coated
- Complete welded construction
- Qualified to MIL-PRF-39007
- Available in non-inductive styles (type N) with Ayrton-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	1.5	0.499 to 1.3K	0.1 to 1.3K	0.23
RWR82N	EGN-2	1.5	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

Note

- RWR82S and RWR82N: Core consists of beryllium oxide ceramic

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 (5 digits)	TERMINAL WIRE AND WINDING (1 digit)	RESISTANCE VALUE (4 digits)	TOLERANCE CODE (1 digit)	FAILURE RATE (1 digit)	PACKAGING CODE (3 digits)
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 (500 pieces) **BSL** (2) = bulk pack, single lot date code **RSL** (2) = tape/reel, single lot date code

Notes

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

(2) Maximum order sizes apply for single lot date code package codes, please see table below

For technical questions, contact: ww2aresistors@vishay.com

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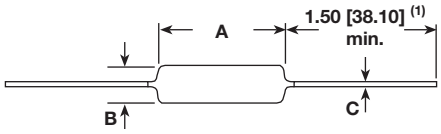
MAXIMUM ORDER SIZE FOR SINGLE LOT DATE CODE PACKAGE CODES

MODEL	MAXIMUM ORDER SIZE (PIECES)
RWR81	1000
RWR82	1000
RWR80	1000
RWR71	500
RWR89	1000
RWR74	500
RWR84	300
RWR78	300

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]	0.375 ± 0.031 [9.525 ± 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

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	RWR RESISTOR CHARACTERISTICS
Dielectric Withstanding Voltage	V_{AC}	500 minimum for 2 W and smaller, 1000 minimum for 3 W and larger
Short Time Overload	-	5x rated power for 5 s for 3 W size and smaller, 10x 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	-55 to +250

RESISTANCE TEMPERATURE COEFFICIENT

TEMPERATURE COEFFICIENT (ppm/°C)	RWR71	RWR74	RWR78	RWR80	RWR81	RWR82	RWR84	RWR89
	RESISTANCE RANGE (Ω)	RESISTANCE RANGE (Ω)	RESISTANCE RANGE (Ω)	RESISTANCE RANGE (Ω)	RESISTANCE RANGE (Ω)	RESISTANCE RANGE (Ω)	RESISTANCE RANGE (Ω)	RESISTANCE RANGE (Ω)
+650 max.	0.1 to 0.499	0.1 to 0.499	0.1 to 0.499	0.1 to 0.499	0.1 to 0.499	0.1 to 0.499	0.1 to 0.499	0.1 to 0.499
+400 max.	0.505 to 1.0	0.505 to 1.0	0.505 to 1.0	0.505 to 1.0	0.505 to 1.0	0.505 to 1.0	0.505 to 1.0	0.505 to 1.0
± 50	1.01 to 10	1.01 to 10	1.01 to 10	1.01 to 10	1.01 to 10	1.01 to 10	1.01 to 10	1.01 to 10
± 30	10.1 to 73.2	10.1 to 158	10.1 to 453	-	-	-	10.1 to 158	10.1 to 42.2
± 20	74.1 and above	160 and above	459 and above	10.1 and above	10.1 and above	10.1 and above	160 and above	42.7 and above

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MATERIAL SPECIFICATIONS

Element: copper-nickel alloy or nickel-chrome alloy, depending on resistance value

Core: ceramic, beryllium oxide [1], 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

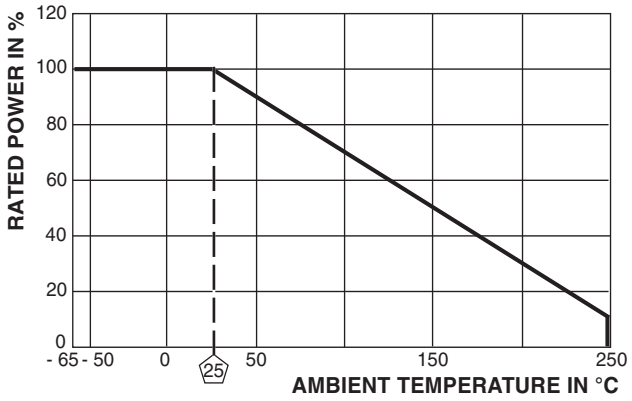
End Caps: stainless steel

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

Note

(1) RWR82S and RWR82N: Core consists of beryllium oxide ceramic

DERATING



PERFORMANCE

TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal Shock	MIL-STD-202, method 107	± (0.2 % + 0.005 Ω) Δ*R*
Short Time Overload	5x 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	-55 °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* [1]
Moisture Resistance	MIL-STD-202, method 106	± (0.2 % + 0.005 Ω) Δ*R*
Shock, Specified Pulse	MIL-STD-202, method 213, condition I	± (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

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

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