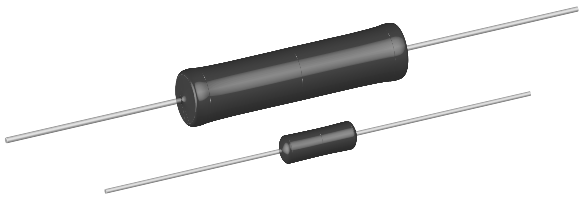
ESS, ESW, ESN, EGS, EGW, EGN

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

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	MIL-PRF-39007 TYPE	POWER RATING $P_{25°C}$ W	MILITARY RANGE Ω		WEIGHT (Typical) g
			±0.1%	±0.5 & ±1%	
EGS-1-80	RWR81S	1	0.499 - 1k	0.1 - 1k	0.21
EGW-1	RWR81W	1	0.499 - 1k	0.1 - 1k	0.21
EGN-1-80	RWR81N	1	0.499 - 499	0.1 - 499	0.21
EGN-1-10	RWR81Z	1	0.499 - 499	0.1 - 499	0.21
EGS-2	RWR82S	1.5	0.499 - 1.3k	0.1 - 1.3k	0.23
EGW-2	RWR82W	1.5	0.499 - 1.3k	0.1 - 1.3k	0.23
EGN-2	RWR82N	1.5	0.499 - 649	0.1 - 649	0.23
EGN-2-10	RWR82Z	1.5	0.499 - 649	0.1 - 649	0.23
EGS-3-80	RWR80S	2	0.499 - 3.16k	0.1 - 3.16k	0.34
EGW-3	RWR80W	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
EGN-3-10	RWR80Z	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
ESW-2A	RWR71W	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
ESN-2A-10	RWR71Z	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
ESW-2B	RWR89W	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
ESN-2B-10	RWR89Z	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
ESW-5	RWR74W	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
ESN-5-10	RWR74Z	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
EGW-10	RWR84W	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
EGN-10-10	RWR84Z	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
ESW-10	RWR78W	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
ESN-10-10	RWR78Z	10	0.499- 19.6k	0.1 - 19.6k	9.0

ORDERING INFORMATION

RWR74	S	49R9	F	M
MILITARY TYPE	TERMINAL WIRE AND WINDING	RESISTANCE	TOLERANCE	FAILURE RATE

For technical questions, contact ww2bresistors@vishay.com

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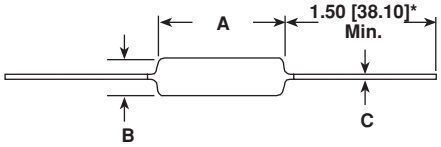
DIMENSIONS



*On some standard reel pack methods, the leads may be trimmed to a shorter length than shown.

MIL-PRF-39007	DIMENSIONS - in inches [millimeters]		
MODEL	A	B	C
RWR81	0.250 ± 0.031 [6.35 ± 0.787]	.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 [9.53 ± 0.787]	0.040 ± 0.002 [1.02 ± 0.051]

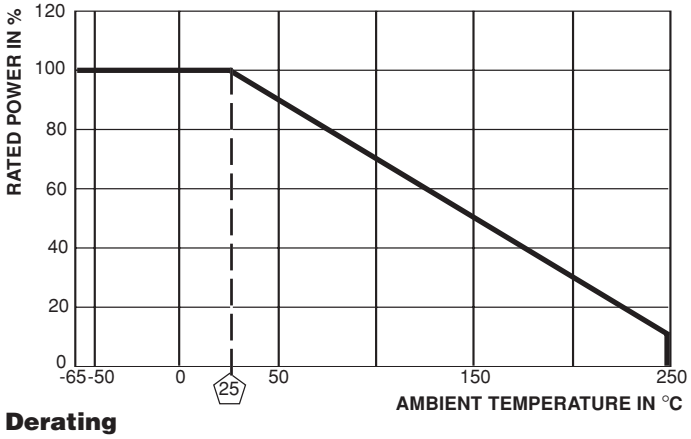
MATERIAL SPECIFICATIONS

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.



Derating

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	ESS, ESW, ESN, EGS, EGW, EGN RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	± 650 for 0.1Ω to 0.499Ω, ± 400 for 0.505Ω to 1Ω, ± 50 for 1.1Ω to 10Ω, ± 20 for 10Ω and above
Dielectric Withstanding Voltage	V_{AC}	500 minimum for 2 watt and smaller, 1000 minimum for 3 watt and larger
Short Time Overload	-	5 x rated power for 5 seconds for 3 watt size and smaller, 10 x rated power for 5 seconds for 5 watt size and greater
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Insulation Resistance	Ω	1000 Megohm minimum dry, 100 Megohm minimum after moisture test
Terminal Strength	lb	5 minimum for 2 watt and smaller, 10 minimum for 3 watt and larger
Solderability	-	Meets requirements of ANSI J-STD-002
Operating Temperature Range	°C	- 65/+ 250

PERFORMANCE

TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal Shock	MIL-STD-2.2, Method 303	± (0.2% + 0.005Ω) ΔR
Short Time Overload	5 x rated power (RWR71, 80, 81, 89, 82), 10 x rated power (RWR74, 78, 84) for 5 seconds	± (0.2% + 0.005Ω) ΔR
Dielectric Withstanding Voltage	500Vrms (RWR80, 81, 82), 1000Vrms (RWR71, 74, 78, 84, 89), 1 minute duration	± (0.1% + 0.005Ω) ΔR
Low Temperature Storage	- 65°C for 24 hours	± (0.1% + 0.005Ω) ΔR
High Temperature Exposure	250°C for 2000 hours	± (1.0% + 0.005Ω) ΔR*
Moisture Resistance	MIL-STD-202, Method 106	± (0.2% + 0.005Ω) ΔR
Shock, Specified Pulse	MIL-STD-202, Method 205, Condition C	± (0.1% + 0.005Ω) ΔR
Vibration, High Frequency	MIL-STD-202, Method 204, Condition D	± (0.1% + 0.005Ω) ΔR
Load Life	2000 hours at rated power, + 25°C, 1.5 hours "ON", 0.5 hours "OFF"	± (0.5% + 0.005Ω) ΔR
Extended Life	10,000 hours at rated power, + 25°C, 1.5 hours "ON", 0.5 hours "OFF"	± (1.0% + 0.005Ω) 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% + 0.005Ω) ΔR

*For resistance values above 100 ohms, Test Limit is ± 1.0%.

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