

Metal Foil MIL-PRF-55182/RNC90 Resistors

Wilbrecht Series WQ and Series WT



FEATURES

- Temperature Coefficient of Resistance (TCR): ± 2.5 ppm/ $^{\circ}$ C available
- Shelf Life Stability: ± 25 ppm maximum for 1 year
- Power Rating: 0.3 Watts at 125 $^{\circ}$ C
- Load Life Stability: ± 150 ppm Maximum ΔR (2000 hours at rated power)
- Resistance Tolerance: $\pm 0.005\%$ to $\pm 1.0\%$
- Resistance Range: 4.99 Ohms to 121K Ohms
- Current Noise: 0.010 μ V (RMS)/ Volt of Applied Voltage
- Thermal EMF: 0.1 μ V/ $^{\circ}$ C Maximum; 0.05 μ V/ $^{\circ}$ C Typical; 1 μ V/Watt
- Rise/Decay Time: 1.0 nanosecond @ 1K Ohms

Manufactured in our Huron, SD factory, the WQ (MIL-PRF-55182/RNC90Y) and WT (MIL-PRF-55182/RNC90T) series metal foil resistors are designed for the most stringent temperature and drift stability requirements.

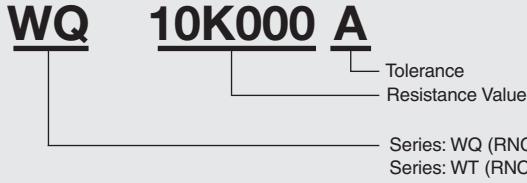
Headquartered in St. Paul, MN Wilbrecht Electronics is a registered U.S. small business. The designated CAGE code is ØKUU5.

Ultra-Precision Resistors

Series WQ and Series WT

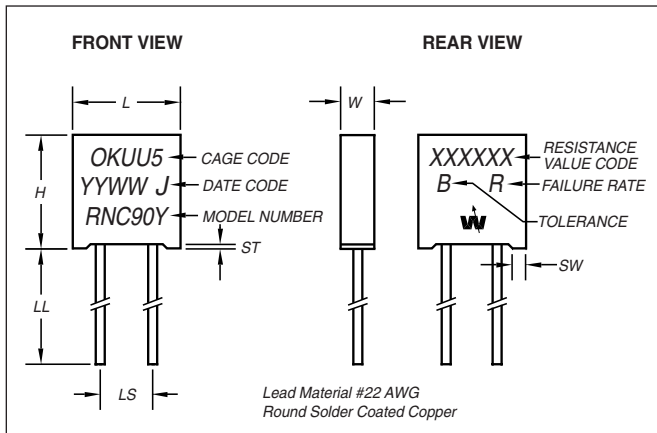
Composition of Series Number

Example:



Resistance value, in ohms, is expressed by a series of 6 characters. 5 of which represent significant digits while the 6th - R or K - is a dual purpose letter that designates both the value range (R for ohmic; K for kilo-ohm) and the location of decimal point.

Configuration

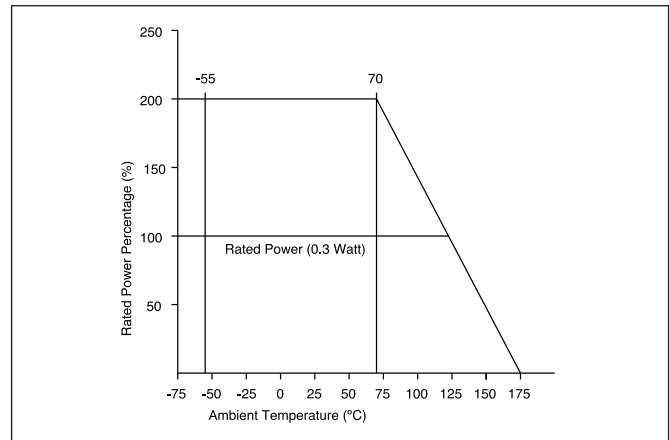


Series	Dimensions	mm	Inches
WQ WT	L	7.9 ± 0.2	0.311 ± 0.008
	SW	1.0 max	.039 max
	H	8.3 ± 0.2	0.327 ± 0.008
	ST	0.3 max	0.012 max
	LL	25 ± 5	1.0 ± 0.2
WQ	W	2.8 ± 0.2	0.110 ± 0.008
	LS	3.81 ± 0.25	0.150 ± 0.010
WT	W	2.3 ± 0.2	0.091 ± 0.008
	LS	5.08 ± 0.25	0.200 ± 0.010

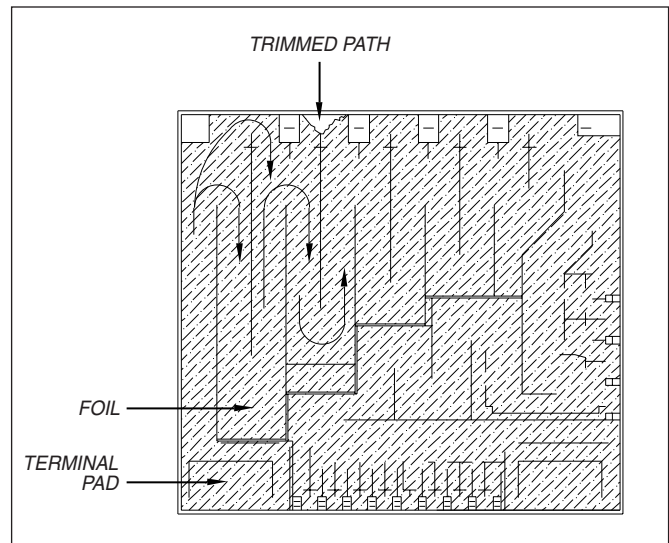
TCR, Resistance Range, Tolerance, Rated Power

Series	TCR (ppm/°C) -55°C to +125°C	Resistance Range (Ω)	Resistance Tolerance (%)	Rated Power (W) at 125°C
WQ WT	0 ± 5 ppm/°C	4.99 Ω - 121 K	±1.0 (F), ±0.5 (D) ±0.1 (B), ±0.05 (A), ±0.01 (T) ±0.005 (V)	0.3

Power Derating Curve

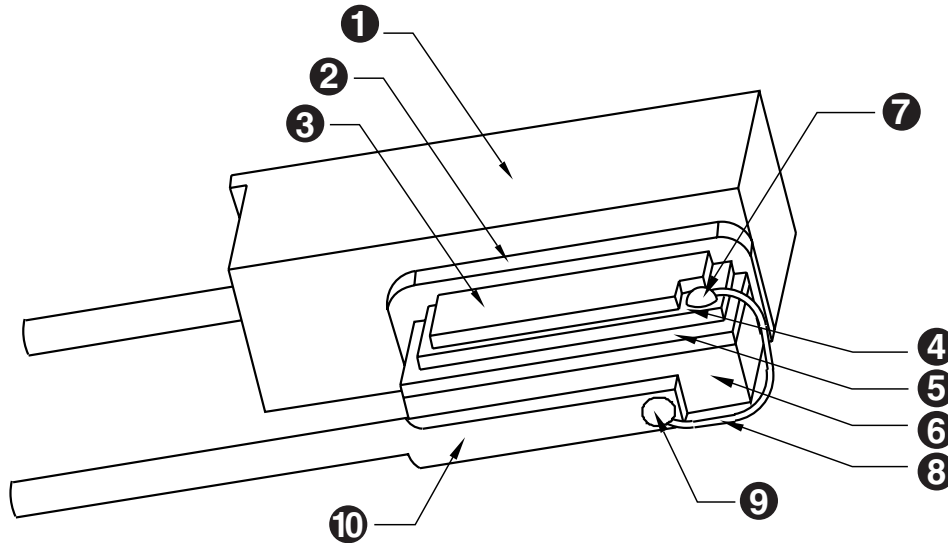


Adjustment of Resistance Value



Low TCR nichrome foil, bonded to an alumina substrate, is photoetched to create a resistance pattern. Sections of the resistance pattern can be trimmed to provide overall resistance tolerances as tight as ±0.005%. The resulting current path (arrows in diagram) is stable and will not generate electrical noise over time.

WQ
WT



- 1** TRANSFER MOLDED EPOXY
- 2** MOISTURE BARRIER / BUFFER COATING
- 3** PROTECTIVE COATING
- 4** NiCr FOIL (ETCHED RESISTIVE ELEMENT)
- 5** BONDING LAYER
- 6** ALUMINA SUBSTRATE
- 7** EXPOY STRENGTHENED WELD JOINT
- 8** SECONDARY LEAD (FOR MECHANICAL STRESS RELIEF)
- 9** HIGH TEMPERATURE SOLDER
- 10** THROUGH HOLE LEAD

Performance

Certified to MIL-PRF-55182/RNC90Y and MIL-PRF-55182/RNC90T

Parameters	Test Condition	MIL-PRF-55182/9 Specification
Max. Rated Operating Temperature Working Temperature Range Max. Working Voltage		125°C -65°C to +175°C 300V
Power Conditioning Thermal Shock Overload	125°C, Rated Power, 100hrs -65°C 30min. ↔ +150°C /30min., 5 cycles Rated Power × 6.25, 5 sec.	±(0.20%+0.01Ω) ±0.05% ±0.05%
Solderability Resistance to Solvents	Steam Aging 8hrs, 245°C, 5sec. ① Isopropyl Alcohol+Mineral Spirits ② Water+Butyl Cellosolve+Monoethanolamine	over 95% coverage no damage
Low Temperature Storage Low Temperature Operation Terminal Strength	-65°C, 24hrs -65°C, Rated Voltage, 45min. 0.908kg (2pounds), 10 sec.	±0.05% ±0.05% ±0.02%
Dielectric Withstanding Voltage Insulation Resistance Resistance to Soldering Heat Moisture Resistance	Atmospheric : 300V rms. Barometric : 200V rms. DC 100V, 2 min. +260°C, 10 sec. +65°C to -10°C, 90%RH to 98%RH, Rated Voltage, 10 cycles (240hrs)	±0.02% over 10,000MΩ ±0.02% ±0.05%
Shock(Specified pulse) Vibration, High Frequency	100G, 6ms, Sawtooth Wave, X, Y, each 10 shocks 20G, 10Hz to 2000Hz to 10Hz, 20min., X, Y, each 4hrs	±0.01% ±0.02%
Life	125°C, Rated Voltage, 1.5hr.-ON, 0.5hr.-OFF, 2000hrs	±0.05%
Life 70 °C Power Rating	70°C, Rated Voltage ×2, 1.5hr.-ON, 0.5hr.-OFF, 2000hrs	±0.05%
Storage Life	15°C to 35°C, 15%RH to 75%RH, No Load, 10000hrs	±0.005%
High Temperature Exposure	175°C, No Load, 2000hrs	±0.5 %
Current Noise Voltage Coefficient Thermal EMF		-32dB 0.0005%/V 1.0µV/°C