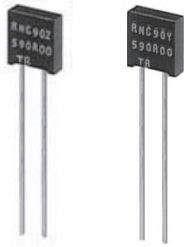


Bulk Metal[®] Foil Technology RNC90Y and RNC90Z to MIL-PRF-55182/9



Product may not be to scale

Vishay Military Established Reliability resistors are available in resistance values from 4.99 ohms through 121Kohms and for tolerances from $\pm 0.005\%$ to $\pm 1.0\%$. The same resistors are also available as a non-qualified product for customers desiring higher or lower resistance values and the same or better performance capabilities. (See Table 2.) Both the qualified and the non-qualified version are manufactured on the same production line facilities and are subjected to the same process, lot control, conditioning, and GRP A (100%) screening. Qualified versions receive additional MIL Group B and C testing.

FEATURES

- QPL product with established reliability.
- Best Load Life Stability: $\pm 0.05\% \Delta R$ for 2,000 hrs. @ + 125°C
- Best TCR: $\pm 2.0 \text{ppm}/^\circ\text{C}$ (– 55°C to + 175°C)
- Best Shelf Life: 0.0025% (25ppm) for 1 year
- Best Thermal EMF: $0.1 \mu\text{V}/^\circ\text{C}$
- Qualified Resistance Range: 4.99 Ω to 121K Ω [RNC90Y]
100 Ω to 121K Ω [RNC90Z]
- Resistance Tolerance: to $\pm 0.005\%$
- Specially conditioned non-QPL resistors available. See data sheet “Improved Performance Tested.”

TABLE 1 - SPECIFICATIONS COMPARISON

SPECIFICATION	RNC90Y (QUALIFIED) MIL-PRF-55182/9 CHARACTERISTIC Y LIMITS	RNC90Z (QUALIFIED) MIL-PRF-55182/9 CHARACTERISTIC Z LIMITS	S555 (NON-QUALIFIED) VISHAY PERFORMANCE LIMITS ⁶	Z555 (NON-QUALIFIED) VISHAY PERFORMANCE LIMITS ⁶
Temperature Coefficient of Resistance	$\pm 5 \text{ppm}/^\circ\text{C}$ (– 55°C to + 125°C) $\pm 10 \text{ppm}/^\circ\text{C}$ (+ 125°C to + 175°C)	$\pm 2 \text{ppm}/^\circ\text{C}$ (– 55°C to + 175°C)	$\pm 5 \text{ppm}/^\circ\text{C}$ ¹ (– 55°C to + 125°C)	$\pm 2 \text{ppm}/^\circ\text{C}$ ¹ (– 55°C to + 125°C)
Resistance Range	4.99 Ω to 121K Ω	100 Ω to 121K Ω	1 Ω to 150K Ω	4.99 Ω to 121K Ω
Failure Rate	Level R	Level R	Not Specified	Not Specified
Load-Life Stability 0.3W @ +125°C at 2,000 Hours at 10,000 Hours	$\pm 0.05\%$ Maximum ΔR $\pm 0.5\%$ Maximum ΔR	$\pm 0.05\%$ Maximum ΔR $\pm 0.5\%$ Maximum ΔR	$\pm 0.015\%$ Maximum ΔR ² $\pm 0.05\%$ Maximum ΔR ²	$\pm 0.015\%$ Maximum ΔR ² $\pm 0.05\%$ Maximum ΔR ²
Current Noise	Not Specified	Not Specified	– 40dB Minimum	– 40dB Minimum
High-Frequency Operation Rise-Decay Time Inductance ³ (L) Capacitance (C) Reactance	Not Specified Not Specified Not Specified Not Specified	Not Specified Not Specified Not Specified Not Specified	1.0ns at 1K Ω 0.1 μH Maximum 0.08 μH Typical 1.0pF Maximum 0.5pF Typical < 1%	1.0ns at 1K Ω 0.1 μH Maximum 0.08 μH Typical 1.0pF Maximum 0.5pF Typical < 1%
Voltage Coefficient	0.0005%/V	0.0005%/V	0.0001%/V	0.0001%/V
Working Voltage ⁴	300 Volts Maximum	300 Volts Maximum	300 Volts Maximum	300 Volts Maximum
Thermal EMF ⁵	Not Specified	Not Specified	0.1 $\mu\text{V}/^\circ\text{C}$ Maximum 1 $\mu\text{V}/\text{watt}$ Maximum	0.1 $\mu\text{V}/^\circ\text{C}$ Maximum 1 $\mu\text{V}/\text{watt}$ Maximum

NOTES:

1. Maximum TCR spread from nominal (Vishay maximum TCR): spread is defined as the 3σ (99.73% of a production lot) limit of a nominal Gaussian distribution which is within a band centered on the nominal curve. TCR is somewhat higher for resistance values < 80ohms, consult Vishay Applications Engineering.
2. Load life ΔR Maximum can be reduced by 80% through a screening procedure. Consult Vishay Applications Engineering for details.
3. Inductance (L) due mainly to the leads.
4. Not to exceed power rating of resistor.
5. $\mu\text{V}/^\circ\text{C}$ relates to EMF due to lead temperature differences and $\mu\text{V}/\text{watt}$ due to power applied to the resistor.
6. Maximum is 1.0% A.Q.L. standard for all specifications except TCR. Typical is a designers reference which represents that 85% of the units supplied, over a long period of time, will be at least the figure shown or better.

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FIGURE 1 - COMPARISON OF RNC90Y TO RNC90Z TEMPERATURE COEFFICIENT OF RESISTANCE

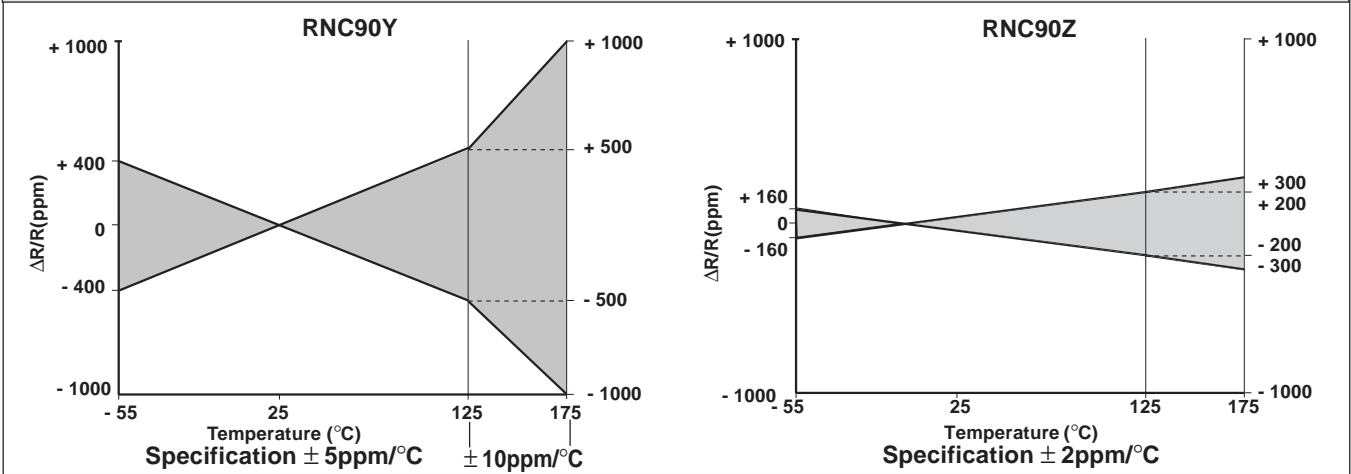


FIGURE 2 - POWER DERATING CURVE

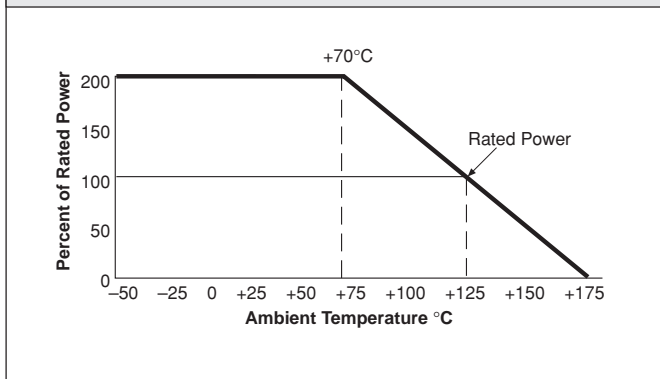


FIGURE 3 - IMPRINTING AND DIMENSIONS

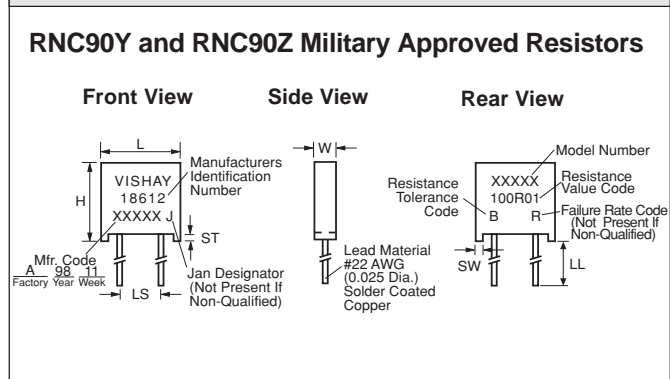


TABLE 2 - MODEL SELECTION

MODEL NUMBER	RESISTANCE RANGE (Ω)	STANDARD RESISTANCE TOLERANCE		FAILURE RATE	AMBIENT POWER RATING		AVERAGE WEIGHT IN GRAMS	DIMENSIONS	
		TIGHTEST %	LOOSEST %		@ +70°C	@ +125°C		inches	mm
RNC90Y	30.1 to 121K 16.2 to 30.0 4.99 to 16.0	±0.005 ±0.05 ±0.1	±1.0 ±1.0 ±1.0	See Table 5	0.6 Watts	0.3 Watts	0.6		
RNC90Z	100 TO 121K	±0.01	±1.0	See Table 5	0.6 Watts	0.3 Watts	0.6		
S555 (NON QPL)	30.1 to 121K 25 to < 30.1 5 to < 25 2 to < 5 1 to < 2	±0.005 ±0.01 ±0.05 ±0.1 ±0.5	±1.0 ±1.0 ±1.0 ±1.0 ±1.0	—	0.6 Watts	0.3 Watts	0.6	W: 0.105 ± 0.010 L: 0.300 ± 0.010 H: 0.326 ± 0.010 ST: 0.015 ± 0.005 SW: 0.040 ± 0.005 LL: 1.000 ± 0.125 LS: 0.150 ± 0.005	2.67 ± 0.25 7.62 ± 0.25 8.28 ± 0.25 0.381 ± 0.13 1.02 ± 0.13 25.4 ± 3.18 3.81 ± 0.13
	> 121K to 150K	±0.005	±1.0	—	0.4 Watts	0.2 Watts	0.6		
Z555 (NON QPL)	30.1 to 121K 25 to < 30.1 4.99 to < 25	±0.005 ±0.01 ±0.05	±1.0 ±1.0 ±1.0	—	0.6 Watts	0.3 Watts	0.6		

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THROUGH HOLE

Military Established Reliability



Vishay Foil Resistors

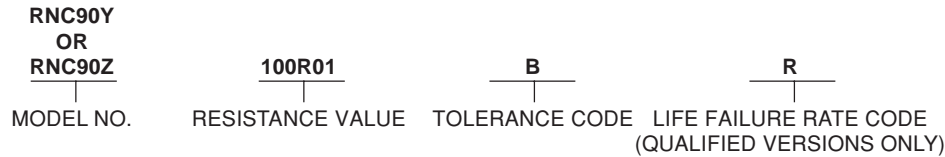
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RNC90Y and RNC90Z to MIL-PRF-55182/9

THROUGH HOLE

TABLE 3 - ORDERING INFORMATION RNC90Y/RNC90Z SERIES

Please specify Vishay RNC90Y and RNC90Z Series Resistors as follows: (See Table 2, 4 and 5 for further details.)

Example:



Resistance value, in ohms, is expressed by a series of 6 characters, 5 of which represent significant digits while the 6th is a dual purpose letter that designates both the multiplier and the location of the decimal point.

For Military approved resistors with improved performance testing a unique 3XXXXX part number will be assigned.

RESISTANCE RANGE	LETTER DESIGNATOR	MULTIPLIER FACTOR	EXAMPLE
1Ω to < 1KΩ	R	x 1	100R01 = 100.01Ω
1KΩ to 121KΩ	K	x 10 ³	15K231 = 15,231Ω

Note: The S555 and Z555 non-qualified versions are ordered by specifying model RNC90Y or RNC90Z without specifying a failure rate code

TABLE 4 - STANDARD RESISTANCE TOLERANCE AND SYMBOLS FOR RNC90Y AND RNC90Z

TOLERANCE	SYMBOL
± 0.005%	V
± 0.01%	T
± 0.05%	A
± 0.1%	B
± 0.5% *	D
± 1.0% *	F

*± 0.5% and ± 1.0% resistors available only in standard values per MIL-PRF-55182

TABLE 5 - LIFE FAILURE RATE (LFR)

MODEL	FAILURE RATE	
RNC90Y	M, P, R	
RNC90Z	M, P, R	
Failure rate code:	SYMBOL	LFR
	M	1.0%
	P	0.1%
	R	0.01%

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