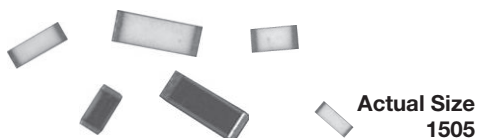


Precision Thin Film Non-Magnetic Resistor, Surface Mount Chip, ± 25 ppm/ $^{\circ}\text{C}$, Tolerances to 0.1 %



LINKS TO ADDITIONAL RESOURCES



Packages



Footprints



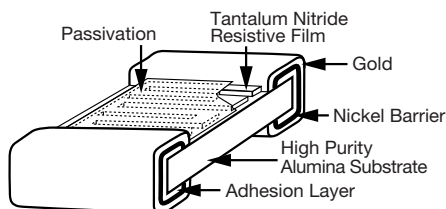
Product Page



Order Samples

These devices eliminate materials that would disturb magnetic fields applications such as in MRI magnetic resonance imaging machines. The PNM series chip resistor has been carefully engineered with non-magnetic materials to eliminate the effects of these stray magnetic fields on circuit performance, thereby resulting in simplified shielding requirements and improved sound quality in audio applications. Providing signal conditioning without distortion from magnetic fields.

CONSTRUCTION



ATTENTION!
Observe Precautions for
Handling Electrostatic Sensitive Devices!

FEATURES

- Non-magnetic
- Moisture resistant
- High purity alumina substrate
- Non-standard values available
- MIL-STD-202 method 106 moisture resistance with 10 % power
- 100 % visual inspected per MIL-PRF-55342
- Very low noise and voltage coefficient (< -30 dB)
- Non-inductive
- Laser-trimmed tolerances to ± 0.1 %
- Wraparound resistance less than 10 m Ω
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details


RoHS*
Available

HALOGEN
FREE
Available

GREEN
(5-2008)
Available

TYPICAL PERFORMANCE

	ABSOLUTE
TCR	25
TOL.	0.1

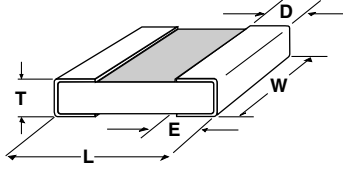
STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride	-
Resistance Range	10 Ω to 3 M Ω	-
TCR: Absolute	± 25 ppm/ $^{\circ}\text{C}$ to ± 100 ppm/ $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$
Tolerance: Absolute	± 0.1 % to ± 1.0 %	+25 $^{\circ}\text{C}$
Stability: Absolute	$\Delta R \pm 0.03$ %	-
Stability: Ratio	-	-
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	75 V to 200 V	-
Operating Temperature Range	-55 $^{\circ}\text{C}$ to +155 $^{\circ}\text{C}$	-
Storage Temperature Range	-55 $^{\circ}\text{C}$ to +155 $^{\circ}\text{C}$	-
Noise	< -30 dB	-
Shelf Life Stability: Absolute	-	-

COMPONENT RATINGS			
CASE SIZE ⁽¹⁾	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)
0402	50	75	20 to 35K
0502	100	75	20 to 65K
0505	150	75	20 to 130K
0603	150	75	10 to 130K
0805	200	100	10 to 301K
0705	200	100	10 to 301K
1005	250	100	10 to 301K
1010	500	150	50 to 600K
1206	400	200	10 to 1M
1505	400	150	10 to 1M
2208	750	150	10 to 1.75M
2010	800	200	10 to 2M
2512	1000	200	10 to 3M

Note

⁽¹⁾ 0705 and 0805 are the same (only use 0805 when ordering)

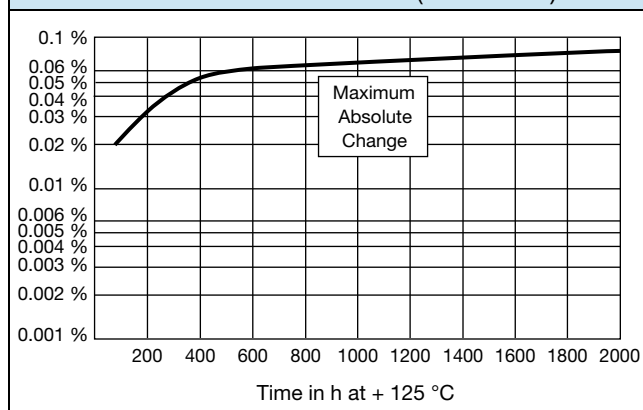
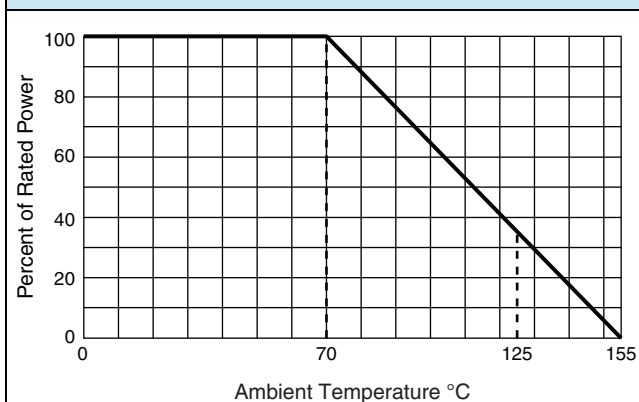
DIMENSIONS in inches (millimeters)					
					
CASE SIZE	L	W	T	D	E
0402	0.042 ± 0.008 (1.067 ± 0.203)	0.022 ± 0.005 (0.559 ± 0.127)	0.012 to 0.033 (0.305 to 0.838)	0.010 ± 0.005 (0.254 ± 0.127)	0.010 ± 0.005 (0.254 ± 0.127)
0502	0.055 ± 0.006 (1.397 ± 0.152)	0.025 ± 0.005 (0.635 ± 0.127)	0.012 to 0.033 (0.305 to 0.838)	0.010 ± 0.005 (0.254 ± 0.127)	0.015 ± 0.005 (0.381 ± 0.127)
0505	0.055 ± 0.006 (1.397 ± 0.152)	0.050 ± 0.005 (1.27 ± 0.127)	0.012 to 0.033 (0.305 to 0.838)	0.010 ± 0.005 (0.254 ± 0.127)	0.015 ± 0.005 (0.381 ± 0.127)
0603	0.064 ± 0.006 (1.626 ± 0.152)	0.032 ± 0.005 (0.813 ± 0.127)	0.020 max. (0.508 max.)	0.012 ± 0.005 (0.305 ± 0.127)	0.015 ± 0.005 (0.381 ± 0.127)
0705/0805	0.080 ± 0.006 (2.032 ± 0.152)	0.050 ± 0.005 (1.27 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.015 ± 0.005 (0.381 ± 0.127)	0.015 ± 0.005 (0.381 ± 0.127)
1005	0.105 ± 0.007 (2.667 ± 0.178)	0.050 ± 0.005 (1.27 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.015 ± 0.005 (0.381 ± 0.127)	0.015 ± 0.005 (0.381 ± 0.127)
1010	0.105 ± 0.007 (2.667 ± 0.178)	0.100 ± 0.005 (2.54 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.015 ± 0.005 (0.381 ± 0.127)	0.015 ± 0.005 (0.381 ± 0.127)
1206	0.126 ± 0.008 (3.2 ± 0.203)	0.063 ± 0.005 (1.6 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.020 ± 0.005 / -0.010 (0.508 ± 0.127 / -0.254)	0.020 ± 0.005 / -0.010 (0.508 ± 0.127 / -0.254)
1505	0.155 ± 0.007 (3.937 ± 0.178)	0.050 ± 0.005 (1.27 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.015 ± 0.005 (0.381 ± 0.127)	0.015 ± 0.005 (0.381 ± 0.127)
2010	0.209 ± 0.009 (5.309 ± 0.229)	0.098 ± 0.005 (2.489 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.020 ± 0.005 (0.508 ± 0.127)	0.020 ± 0.005 (0.508 ± 0.127)
2208	0.230 ± 0.007 (5.842 ± 0.178)	0.075 ± 0.005 (1.905 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.020 ± 0.005 (0.508 ± 0.127)	0.020 ± 0.005 (0.508 ± 0.127)
2512	0.259 ± 0.009 (6.579 ± 0.229)	0.124 ± 0.005 (3.15 ± 0.127)	0.015 to 0.033 (0.381 to 0.838)	0.020 ± 0.005 (0.508 ± 0.127)	0.020 ± 0.005 (0.508 ± 0.127)

Note

⁽¹⁾ 0705 and 0805 are the same (only use 0805 when ordering)

**ENVIRONMENTAL TESTS** (Vishay Performance vs. MIL-PRF-55342 Requirements)

ENVIRONMENTAL TEST	LIMITS MIL-PRF-55342 CHARACTERISTIC "H"	TYPICAL VISHAY PERFORMANCE
Resistance Temperature Characteristic	$\pm 50 \text{ ppm/}^\circ\text{C}$	$\pm 35 \text{ ppm/}^\circ\text{C}$
Max. Ambient Temperature at Rated Wattage	$+70 \text{ }^\circ\text{C}$	$+70 \text{ }^\circ\text{C}$
Max. Ambient Temperature at Power Derating	$+150 \text{ }^\circ\text{C}$	$+150 \text{ }^\circ\text{C}$
Thermal Shock ΔR	$\pm 0.25 \%$	$\pm 0.040 \%$
Low Temperature Operation ΔR	$\pm 0.25 \%$	$\pm 0.005 \%$
Short Time Overload ΔR	$\pm 0.10 \%$	$\pm 0.010 \%$
High Temperature Exposure ΔR	$\pm 0.20 \%$	$\pm 0.150 \%$
Resistance to Bonding Exposure ΔR	$\pm 0.25 \%$	$\pm 0.005 \%$
Moisture Resistance ΔR	$\pm 0.40 \%$	$\pm 0.029 \%$
Life + $70 \text{ }^\circ\text{C}$ at 1000 hours ΔR	$\pm 0.50 \%$	$\pm 0.03 \%$
Insulation Resistance	10 000 Ω minimum	$> 100 \text{ } 000 \text{ M}\Omega$

FILM LOAD LIFE STABILITY (at $+125 \text{ }^\circ\text{C}$)**DERATING CURVE****GLOBAL PART NUMBER INFORMATION**

P	N	M	1	2	0	6	E	1	0	0	2	B	B	T	1
GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC	RESISTANCE				TOLERANCE	TERMINATION				PACKAGING			
PNM non-magnetic resistor	0402 0502 0505 0603 0805 1005 1010 1206 1505 2208 2010 2512	E = 25 ppm ($R \geq 100 \Omega$) H = 50 ppm ($R \geq 50 \Omega$) K = 100 ppm ($R \geq 10 \Omega$)	The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point. Example: 10R0 = 10 Ω 1000 = 100 Ω 1001 = 1 k Ω				B = $\pm 0.1 \%$ ⁽¹⁾ D = $\pm 0.5 \%$ F = $\pm 1 \%$ G = $\pm 2 \%$ J = $\pm 5 \%$	B = wraparound Sn/Pb solder 63 % Sn / 37 % Pb S = wraparound lead (Pb)-free solder 96.5 % Sn/3.0 % Ag/ 0.5 % Cu RoHS compliant - e1				BS = BULK 100 min., 1 mult WS = WAFFLE 100 min., 1 mult TAPE AND REEL T0 = 100 min., 100 mult T1 = 1000 min., 1000 mult ⁽²⁾ T3 = 300 min., 300 mult T5 = 500 min., 500 mult TF = Full reel TS = 100 min., 1 mult			

Notes⁽²⁾ B = 0.1 % tolerance available only above 100 Ω ⁽³⁾ Preferred packaging code



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