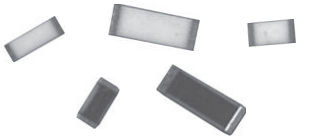
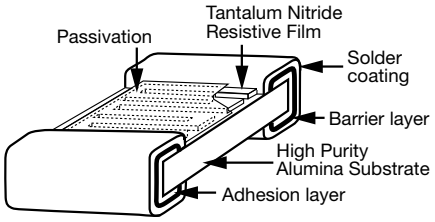
Precision Thin Film Non-Magnetic Resistor, Surface Mount Chip, ± 25 ppm/°C, Tolerances to 0.1 %



Actual Size
1505

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



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 mΩ
- Sulfur resistant (per ASTM B809-95 humid vapor test)n
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* Available

HALOGEN FREE Available

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.

TYPICAL PERFORMANCE

	ABSOLUTE
TCR	25
TOL.	0.1

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride	-
Resistance Range	10 Ω to 3 MΩ	-
TCR: Absolute	± 25 ppm/°C to ± 100 ppm/°C	-55 °C to +125 °C
Tolerance: Absolute	± 0.1 % to ± 1.0 %	+25 °C
Stability: Absolute	ΔR ± 0.03 %	-
Stability: Ratio	-	-
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	75 V to 200 V	-
Operating Temperature Range	-55 °C to +155 °C	-
Storage Temperature Range	-55 °C to +155 °C	-
Noise	< -30 dB	-
Shelf Life Stability: Absolute	-	-

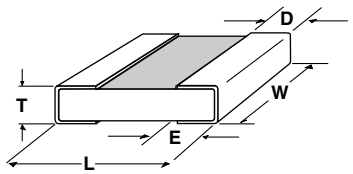
COMPONENT RATINGS

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



CASE SIZE	L	W	T	D	E
0402	0.042 ± 0.008	0.022 ± 0.005	0.012 to 0.033	0.010 ± 0.005	0.010 ± 0.005
0502	0.055 ± 0.006	0.025 ± 0.005	0.012 to 0.033	0.010 ± 0.005	0.015 ± 0.005
0505	0.055 ± 0.006	0.050 ± 0.005	0.012 to 0.033	0.010 ± 0.005	0.015 ± 0.005
0603	0.064 ± 0.006	0.032 ± 0.005	0.020 Max.	0.012 ± 0.005	0.015 ± 0.005
0705, 0805 (1)	0.080 ± 0.006	0.050 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
1005	0.105 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
1010	0.105 ± 0.007	0.100 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
1206	0.126 ± 0.008	0.063 ± 0.005	0.015 to 0.033	0.020 + 0.005/- 0.010	0.020 + 0.005/- 0.010
1505	0.155 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
2010	0.209 ± 0.009	0.098 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005
2208	0.230 ± 0.007	0.075 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005
2512	0.259 ± 0.009	0.124 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005

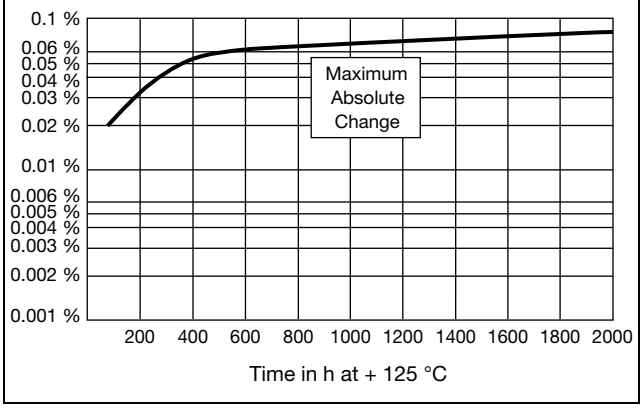
Note

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

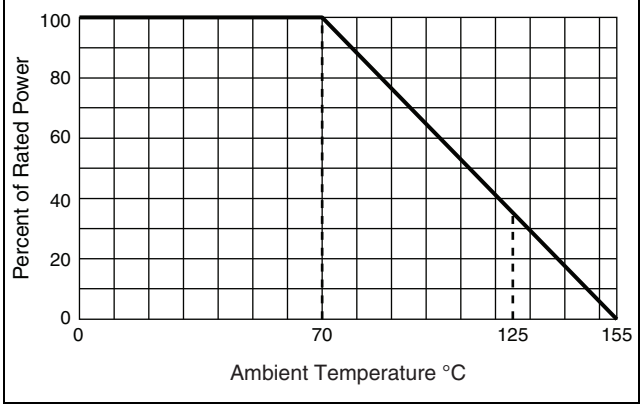
ENVIRONMENTAL TESTS (Vishay Performance vs. MIL-PRF-55342 Requirements)

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

FILM LOAD LIFE STABILITY (at +125 °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 > 100 Ω) **H** = 50 ppm (R > 50 Ω) **K** = 100 ppm (R > 10 Ω)	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 kΩ	**B** = ± 0.1 % [1] **D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 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

[1] B = 0.1 % tolerance available only above 100 Ω.

[2] Preferred packaging code.

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