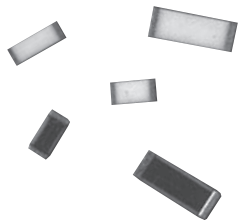
Commercial Thin Film Chip Resistor, Surface Mount Chip



Actual Size
1505

These chip resistors are available in both “top side” and “wraparound” termination styles in a variety of sizes. They incorporate self passivated, enhanced Tantalum Nitride films, to give superior performance on moisture resistance, voltage coefficient, power handling and resistance stability. The terminations consist of an adhesion layer, a leach resistant nickel barrier, and solder coating. This product will out-perform all requirements of characteristic E of MIL-PRF-55342.

FEATURES

- Moisture resistant
- High purity alumina substrate
- Non-standard values available
- Will pass +85 °C, 85 % relative humidity and 10 % rated power
- 100 % visual inspected per MIL-PRF-55342
- Non-inductive
- Very low noise and voltage coefficient (< -30 dB)
- Laser-trimmed tolerances to ± 0.05 %
- Wraparound resistance less than 10 mΩ
- Epoxy bondable termination available
- Sulfur resistant (per ASTM B809-95 humid vapor test)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* Available

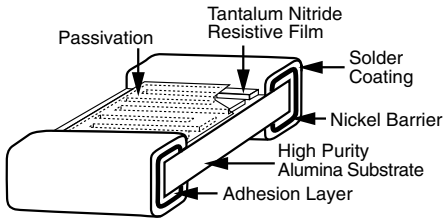
HALOGEN FREE Available

GREEN (5-2008) 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.

CONSTRUCTION



TYPICAL PERFORMANCE

	ABSOLUTE
TCR	10
TOL.	0.05

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride	-
Resistance Range	1.0 Ω to 3 MΩ	-
TCR: Absolute	± 10 ppm/°C to ± 100 ppm/°C	-55 °C to +125 °C
Tolerance: Absolute	± 0.05 % to ± 5 %	+25 °C
Stability: Absolute	ΔR ± 0.03 %	2000 h at 70 °C
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	1.5 to 51.1K
0502	100	75	1.5 to 65K
0505	150	75	10 to 130K
0603	150	75	1.5 to 130K
0705	200	100	1.0 to 310K
0805	200	100	1.0 to 310K
1005	250	100	1.5 to 360K
1010	500	150	1.0 to 600K
1206	400	200	1.5 to 1M
1505	400	150	1.25 to 1M
2208	750	150	2.0 to 1.75M
2010	800	200	1.0 to 2M
2512	2000	200	1.5 to 3M

Note

For technical questions, contact: thinfilm@vishay.com

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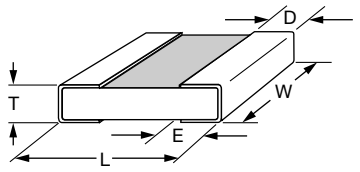
(1) 0705 and 0805 are the same (only use 0805 when ordering)

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	0.016 ± 0.008	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 "E"	TYPICAL VISHAY PERFORMANCE
Resistance Temperature Characteristic		± 25 ppm/°C	± 15 ppm/°C
Max. Ambient Temp. at Rated Wattage		+70 °C	+70 °C
Max. Ambient Temp. at Power Derating		+150 °C	+150 °C
Thermal Shock	ΔR	± 0.1 %	± 0.040 %
Low Temperature Operation	ΔR	± 0.1 %	± 0.001 %
Short Time Overload (1)	ΔR	± 0.10 %	± 0.002 %
High Temperature Exposure	ΔR	± 0.1 %	± 0.04 %
Resistance to Soldering Heat	ΔR	± 0.2 %	± 0.008 %
Moisture Resistance	ΔR	± 0.2 %	± 0.004 %
Life +70 °C at 1000 h	ΔR	± 0.50 %	± 0.02 %
Insulation Resistance		10 000 Ω minimum	> 100 000 MΩ

Note
(1) 2512 short time overload test is based on 1 W power level below critical value of 20 kΩ.

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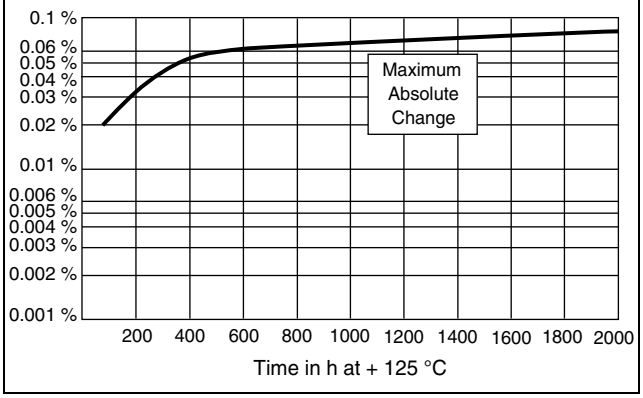
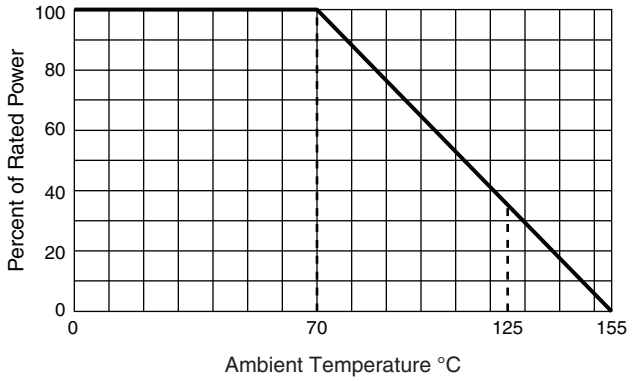
FILM LOAD LIFE STABILITY (at +125 °C)



DERATING CURVE



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: PTN1206E1002BBT1

P	T	N	1	2	0	6	E	1	0	0	2	B	B	T	1

GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC	RESISTANCE	TOLERANCE	TERMINATION	PACKAGING
PTN	**0402** **0502** **0505** **0603** **0805** **1005** **1010** **1206** **1505** **2208** **2010** **2512**	**D** = ± 15 ppm/°C (1) **E** = ± 25 ppm/°C (1) **H** = ± 50 ppm/°C (1) **K** = ± 100 ppm/°C **L** = ± 200 ppm/°C **Y** = ± 10 ppm/°C (2)	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	**A** = ± 0.05 % (2) **B** = ± 0.1 % **D** = ± 0.5 % **F** = ± 1 % **G** = ± 2 % **J** = ± 5 %	**B** = wraparound Sn/Pb solder Sn63 w/nickel barrier **G** = wraparound Au over Ni (gold) termination epoxy bondable RoHS-compliant - e4 **S** = wraparound electroplated 100 % pure matte tin RoHS-compliant - e3	**BS** = BULK 100 min., 1 mult **W0** = WAFFLE 100 min., 100 mult **WS** = WAFFLE 100 min., 1 mult **WI** = 100 min., 1 mult (item single lot date code) **WP** = 100 min., 1 mult (package unit single lot date code) TAPE AND REEL **T0** = 100 min., 100 mult **T1** = 1000 min., 1000 mult (3) **T3** = 300 min., 300 mult **T5** = 500 min., 500 mult **TF** = Full reel **TS** = 100 min., 1 mult **TI** = 100 min., 1 mult (item single lot date code) **TP** = 100 min., 1 mult (package unit single lot date code)

Historical Part Number example: PTN0805H8801BBT (for reference purposes only)

PTN	0805	H	8801	B	B	T
STYLE	CASE SIZE	TCR CHARACTERISTIC	OHMIC VALUE	TOLERANCE	TERMINATION	PACKAGING

Notes

(1) Not available below 10 Ω.

(2) ≥ 1 kΩ

(3) Preferred packaging code.

RESISTANCE	TCR (ppm/°C)	TOLERANCE (%)
10 Ω to 3 MΩ	25, 50, 100, 200	0.1, 0.5, 1, 2, 5
5 Ω to 10 Ω	100, 200	1, 2, 5
1.0 Ω to 5 Ω	200	1, 2, 5

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