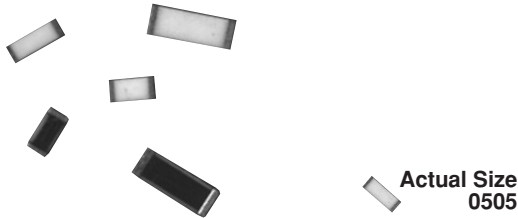


## Commercial Thin Film Chip Resistors



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 H of MIL-PRF-55342.

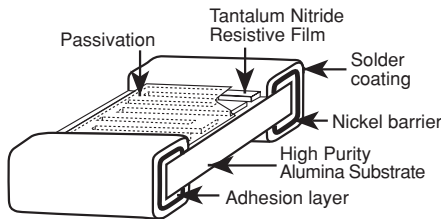
### FEATURES

- Lead (Pb)-Free available
- 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
- Very low noise and voltage coefficient
- Non-inductive
- Laser trimmed tolerances to  $\pm 0.1\%$
- Wraparound resistance less than 10 milliohms



**SURFACE MOUNT CHIPS**

### CONSTRUCTION



### TYPICAL PERFORMANCE

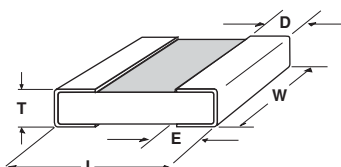
	ABS
TCR	25
TOL	0.1

### STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
<b>MATERIAL</b>	<b>TANTALUM NITRIDE</b>	
<b>Absolute TCR:</b>	$\pm 25\text{ppm}/^\circ\text{C}$ , $\pm 50\text{ppm}/^\circ\text{C}$ , $\pm 100\text{ppm}/^\circ\text{C}$	- 55°C to + 125°C
<b>Absolute Tolerance:</b>	$\pm 1.0\%$ , $\pm 0.5\%$ , and $\pm 0.1\%$	+ 25°C
<b>Operating Temperature Range</b>	- 55°C to + 125°C	
<b>Noise</b>	< - 25 dB	

CASE SIZE	POWER RATING - (MW)	MAX. WORKING VOLTAGE	RESISTANCE RANGE - (OHMS)
0402	50	75	59 – 35K
0502	100	75	59 – 65K
0505	150	75	10 – 130K
0603	150	75	10 – 80K
0705	200	100	10 – 300K
0805	200	100	10 – 300K
1005	250	100	10 – 300K
1010	500	150	50 – 600K
1206	400	200	10 – 1M
1505	400	150	10 – 1M
2208	750	150	10 – 1.75M
2010	800	200	10 – 2M
2512	1000	200	10 – 3M

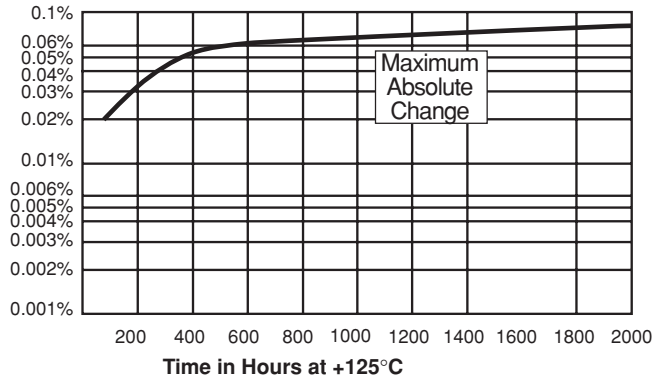
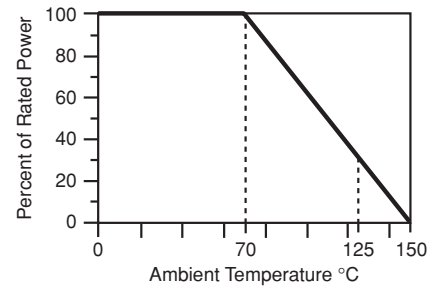
VISHAY THIN FILM • FRANCE +33.4.93.37.28.24 FAX: +33.4.93.37.27.31 • GERMANY +49.9287.710 FAX: +49 9287.70435 • ISRAEL +972.3.557.0945 FAX: +972.3.558.9121  
 • ITALY + 39.2.300.11919 FAX: +39.2.300.11999 • JAPAN +81.3.5464.6411 FAX: +81.3.5464.6433 • SINGAPORE +65.788.6668 FAX: +65.788.0988  
 • SWEDEN +46.8.594.70590 FAX: +46.8.594.70581 • UK +44 191 514 8237 FAX: +44 1953 457 722 • USA: (610) 407-4800 FAX: (610) 640-9081

**DIMENSIONS** in inches

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

**ENVIRONMENTAL TESTS (VISHAY PERFORMANCE VS. MIL-PRF-55342 REQUIREMENTS)**

ENVIRONMENTAL TEST	LIMITS MIL-PRF-55342 CHARACTERISTIC "H"	TYPICAL VISHAY PERFORMANCE
Resistance Temperature Characteristic	± 50ppm/°C	± 35ppm/°C
Max. Ambient Temp. at Rated Wattage	+ 70°C	+ 70°C
Max. Ambient Temp. at Power Derating	+ 150°C	+ 150°C
Thermal Shock $\Delta R$	± 0.25%	± 0.040%
Low Temperature Operation $\Delta R$	± 0.25%	± 0.005%
Short Time Overload $\Delta R$	± 0.10%	± 0.010%
High Temperature Exposure $\Delta R$	± 0.20%	± 0.150%
Resistance to Bonding Exposure $\Delta R$	± 0.25%	± 0.005%
Moisture Resistance $\Delta R$	± 0.40%	± 0.029%
Life + 70°C at 1,000 hours $\Delta R$	± 0.50%	± 0.035%
Insulation Resistance ohms	10,000 Minimum	> 100,000M ohms

**FILM LOAD LIFE STABILITY (AT+125°C)**

**DERATING CURVE**

**SURFACE MOUNT CHIPS**
**How to Order**

STYLE	CASE SIZE	TCR CHARACTERISTIC	OHMIC VALUE	TOLERANCE	TERMINATION	PACKAGE
<b>PTN =</b> Tantalum Nitride Film	<b>0402</b>	<b>E</b> = ±25 ppm/°C	The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point. e.g. <b>10R0</b> = 10 ohms <b>1000</b> = 100 ohms <b>1001</b> = 1K ohms Non-standard values (3 decimal points) 10K125 = 10.125K ohms 100R15 = 100.15 ohms	<b>B</b> = ±0.1% <b>D</b> = ±0.5% <b>F</b> = ±1.0% <b>G</b> = ±2.0% <b>J</b> = ±5.0% <b>S</b> = Special	<b>B</b> = Solderable (solder coat w/nickel barrier) <b>G</b> = Epoxy/Solderable (AU over Ni) <b>S</b> = Lead (Pb)-Free 96.5% Sn 3.0% Ag 0.5% Cu	<b>T</b> = Tape & Reel  <b>W</b> = Waffle Pack
	<b>0502</b>	<b>H</b> = ±50 ppm/°C				
	<b>0505</b>	NOTE: Values 10 ohms ±25 ppm/°C best				
	<b>0603</b>					
	<b>0805*</b>					
	<b>0705*</b>					
	<b>1005</b>					
	<b>1010</b>					
	<b>1206</b>					
	<b>1505</b>					
<b>2208</b>						
<b>2010</b>						
<b>2512</b>						

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

**Example:** **PTN0705H8801BBT** is a thin film wraparound chip resistor, 75 x 50 mil, with a TCR of ±50 ppm/°C, a value of 8800 ohms, ±0.1% tolerance with solder coated nickel barrier terminations, on tape and reel packaging.

**Lead (Pb)-Free Example:** PTN1206EXXXB