Vishay Dale Thin Film

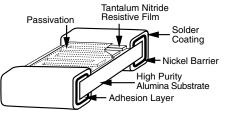




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These chip resistors are available in both "top side" and "wraparound" termination styles in a variety of sizes. They incorporate self passivated, enhanced Tantalum Nitride films, to give superior performance on moisture resistance, voltage coefficient, 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.

CONSTRUCTION



FEATURES

- Moisture resistant
- · High purity alumina substrate
- Non-standard values available
- Will pass +85 °C, 85 % relative humidity and RoHS 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

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	10
TOL.	0.05

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	$\Delta R \pm 0.03 \%$	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 ⁽²⁾	2000	200	1.5 to 3M

Notes

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

⁽²⁾ Reference environmental tests table for short time overload test parameters

Revision: 08-Jan-2020

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Document Number: 60026

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HALOGEN

FREE

GREEN

<u>(5-2008)</u>

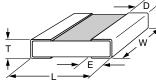


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PTN

DIMENSIONS in inches



CASE SIZE	L	w	Т	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

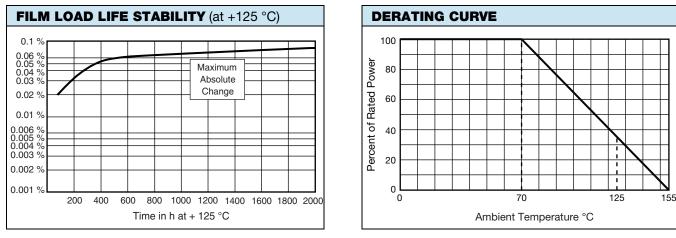
Note

 $^{(1)}\,$ 0705 and 0805 are the same (only use 0805 when ordering)

ENVIRONMENTAL TESTS	ENVIRONMENTAL TESTS (Vishay Performance vs. MIL-PRF-55342 Requirements)		
ENVIRONMENTAL TEST		LIMITS MIL-PRF-55342 CHARACTERISTIC "E"	TYPICAL VISHAY PERFORMANCE
Resistance Temperature Characte	ristic	± 25 ppm/°C	± 15 ppm/°C
Max. Ambient Temp. at Rated Wat	tage	+70 °C	+70 °C
Max. Ambient Temp. at Power Der	ating	+150 °C	+150 °C
Thermal Shock	ΔR	± 0.1 %	± 0.040 %
Low Temperature Operation	ΔR	± 0.1 %	± 0.001 %
Short Time Overload ⁽¹⁾	Δ R	± 0.10 %	± 0.002 %
High Temperature Exposure	ΔR	± 0.1 %	± 0.04 %
Resistance to Soldering Heat	ΔR	± 0.2 %	± 0.008 %
Moisture Resistance	∆ R	± 0.2 %	± 0.004 %
Life +70 °C at 1000 h	∆ R	± 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 $k\Omega$



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ΡΤΝ

PULSE CURVE 1000 $\begin{array}{c} 10 \ \Omega \ - \ 2512 \\ 100 \ \Omega \ - \ 2512 \\ 10 \ \Omega \ - \ 1206 \\ 100 \ \Omega \ - \ 1206 \end{array}$ ╡┤┤<u></u> TΠ П 100 S Power 10 10 Ω - 0805 Peak I ²100 Ω - 0805 100 Ω - 0603 1 100 Ω - 0603 ₫. Шţ 0.1 0.00001 0.0001 0.001 0.01 0.1 10 1 Pulse Duration (s) **GLOBAL PART NUMBER INFORMATION** New Global Part Numbering: PTN1206E1002BBT1 0 2 В Т Ρ т Ν 1 2 0 6 Е 1 0 В 1 GLOBAL CASE TCR RESISTANCE TOLERANCE **TERMINATION** PACKAGING MODEL CHARACTERISTIC SIZE $D = \pm 15 \text{ ppm/}^{\circ}C^{(1)}$ **PTN** 0402 The first 3 digits $A = \pm 0.05 \% (4)$ **B** = wraparound BS = BULK $E = \pm 25 \text{ ppm/°C}^{(2)}$ significant 100 min., 1 mult. **W0** = WAFFLE 0502 $B = \pm 0.1 \%$ Sn/Pb solder are $H = \pm 50 \text{ ppm/°C}^{(2)}$ 0505 figures and the $D = \pm 0.5 \%$ Sn63 0603 **K** = ± 100 ppm/°C last digit specifies **F** = ± 1 % w/nickel barrier 100 min., 100 mult. 0805 $L = \pm 200 \text{ ppm/°C}$ $G = \pm 2\%$ **G** = wraparound Au WS = WÁFFLE the number of zeros to follow. "R" designates **Y** = ± 10 ppm/°C ⁽³⁾ 1005 $J = \pm 5 \%$ over Ni (gold) 100 min., 1 mult. **WI** = 100 min., 1 mult. (item single lot date code) 1010 designates termination epoxy bondable RoHS-compliant - e4 1206 the decimal point. 1505 **WP** = 100 min., 1 mult. 2208 $\mathbf{S} = wraparound$ (package unit single lot Example: $10R0 = 10 \Omega$ $1000 = 100 \Omega$ date code) 2010 electroplated 100 % 2512 pure matte tin RoHS-compliant - e3 TAPE AND REEL 1001 = 1 kΩ **TO** = 100 min., 100 mult. **T1** = 1000 min., 1000 mult. ⁽⁵⁾ **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 Н 8801 в в т TCR TOLERANCE TERMINATION PACKAGING STYLE CASE SIZE OHMIC VALUE CHARACTERISTIC Notes ⁽¹⁾ Not available below 50 Ω ⁽²⁾ Not available below 10 Ω ⁽³⁾ Not available below 100 Ω ⁽⁴⁾ Only available in \geq 1 k Ω

⁽⁵⁾ Preferred packaging code

RESISTANCE	TCR (ppm/°C)	TOLERANCE (%)
10 Ω to 49.9 Ω	25, 50, 100, 200	0.1, 0.5, 1, 2, 5
50 Ω to 99 Ω	15, 25, 50, 100, 200	0.1, 0.5, 1, 2, 5
100 Ω to 999 Ω	10, 15, 25, 50, 100, 200	0.1, 0.5, 1, 2, 5
1 k Ω to 3 M Ω	10, 15, 25, 50, 100, 200	0.05, 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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