HALOGEN

FREE

GREEN

(5-2008)

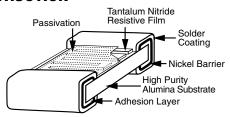


# Commercial Thin Film Chip Resistor, Surface Mount Chip



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 10 % rated power
- 100 % visual inspected per MIL-PRF-55342
- Non-inductive
- Very low noise and voltage coefficient (< -30 dB)</li>
- Laser-trimmed tolerances to ± 0.05 %
- Wraparound resistance less than 10 m $\Omega$
- Epoxy bondable termination available
- Sulfur resistant (per ASTM B809-95 humid vapor test)
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

## 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 <sup>(2)</sup>	2000	200	1.5 to 3M

## Notes

Revision: 13-Oct-16

- (1) 0705 and 0805 are the same (only use 0805 when ordering)
- (2) Reference environmental tests table for short time overload test parameters.

Document Number: 60026

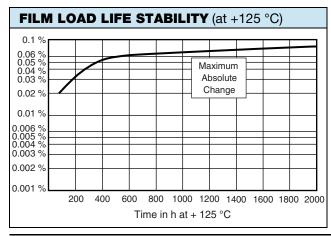
## Vishay Dale Thin Film

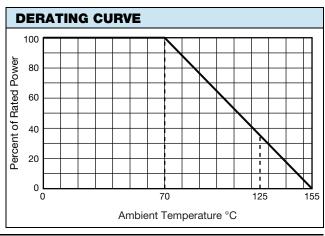
#### **DIMENSIONS** in inches **CASE SIZE** D 0402 $0.010 \pm 0.005$ $0.010 \pm 0.005$ $0.042 \pm 0.008$ $0.022 \pm 0.005$ 0.012 to 0.033 0502 0.012 to 0.033 $0.010 \pm 0.005$ $0.055 \pm 0.006$ $0.025 \pm 0.005$ $0.015 \pm 0.005$ 0505 $0.055 \pm 0.006$ $0.050 \pm 0.005$ 0.012 to 0.033 $0.010 \pm 0.005$ $0.015 \pm 0.005$ 0603 $0.064 \pm 0.006$ $0.032 \pm 0.005$ 0.020 max. $0.012 \pm 0.005$ $0.015 \pm 0.005$ 0705, 0805 <sup>(1)</sup> $0.016 \pm 0.008$ $0.080 \pm 0.006$ $0.050 \pm 0.005$ 0.015 to 0.033 $0.015 \pm 0.005$ 1005 $0.105 \pm 0.007$ $0.050 \pm 0.005$ 0.015 to 0.033 $0.015 \pm 0.005$ $0.015 \pm 0.005$ $0.100 \pm 0.005$ 1010 $0.105 \pm 0.007$ 0.015 to 0.033 $0.015 \pm 0.005$ $0.015 \pm 0.005$ 1206 $0.126 \pm 0.008$ $0.063 \pm 0.005$ 0.015 to 0.033 0.020 + 0.005/ - 0.0100.020 + 0.005/ - 0.010 1505 $0.155 \pm 0.007$ $0.050 \pm 0.005$ 0.015 to 0.033 $0.015 \pm 0.005$ $0.015 \pm 0.005$ 2010 $0.209 \pm 0.009$ $0.098 \pm 0.005$ 0.015 to 0.033 $0.020 \pm 0.005$ $0.020 \pm 0.005$ 2208 $0.230 \pm 0.007$ 0.015 to 0.033 $0.020 \pm 0.005$ $0.020 \pm 0.005$ $0.075 \pm 0.005$ 2512 $0.259 \pm 0.009$ $0.124 \pm 0.005$ 0.015 to 0.033 $0.020 \pm 0.005$ $0.020 \pm 0.005$

ENVIRONMENTAL TESTS (Vishay Performance vs. MIL-PRF-55342 Requirements)				
ENVIRONMENTAL TEST		LIMITS MIL-PRF-55342 CHARACTERISTIC "E"	TYPICAL VISHAY PERFORMANCE	
Resistance Temperature Characte	eristic	± 25 ppm/°C	± 15 ppm/°C	
Max. Ambient Temp. at Rated Wat	ttage	+70 °C	+70 °C	
Max. Ambient Temp. at Power Der	rating	+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

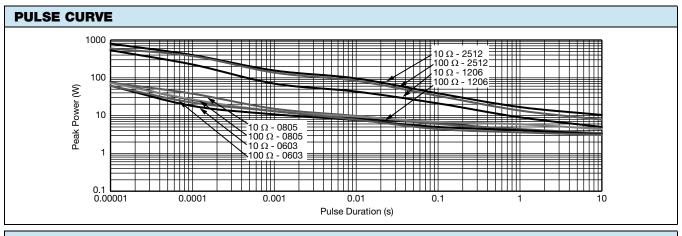
 $<sup>^{(1)}</sup>$  2512 short time overload test is based on 1 W power level below critical value of 20 k $\Omega$ .

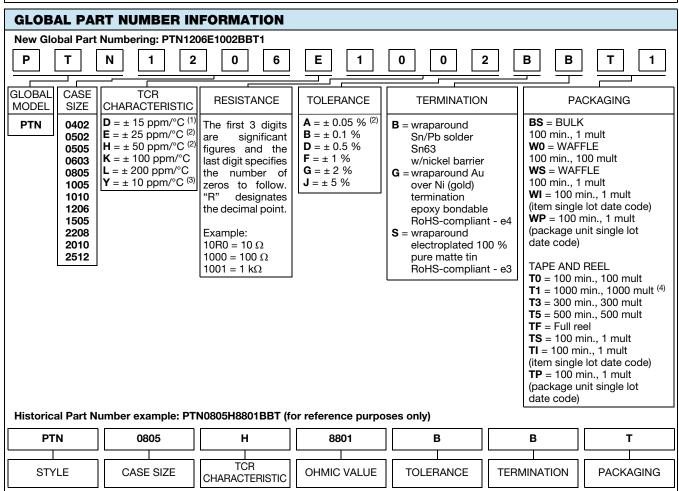












#### Notes

- (1) Not available below 50  $\Omega$ .
- (2) Not available below 10  $\Omega$ .
- $^{(3)} \geq 1 \text{ k}\Omega$
- (4) Preferred packaging code.

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



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