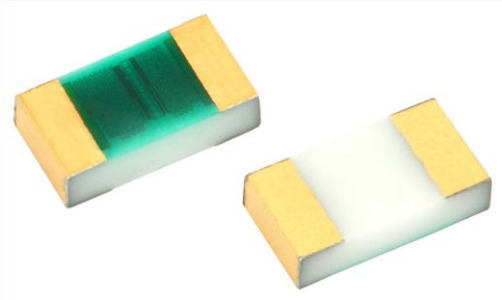
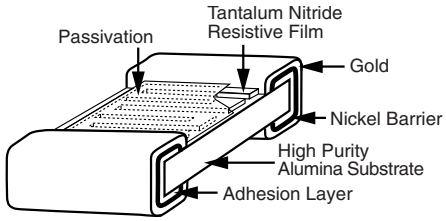
Precision Automotive High Temperature (155 °C at full rated power) Thin Film Chip Resistor, AEC-Q200 Qualified



The terminations consist of an adhesion layer, a leach resistant nickel barrier and gold plating compatible with high temperature solder systems.

CONSTRUCTION



FEATURES

- Resistance range: 1.0 Ω to 1 MΩ
- AEC-Q200 qualified, table 7F
- AEC-Q200 qualified, ESD rated class 1C (< 1 kΩ: 1 kV; > 1 kΩ: 2 kV)
- Laser trimmed to any value
- Intrinsic moisture protected resistor element
- Moisture resistant to MIL-STD-202, method 106
- Tantalum nitride resistor film on alumina substrate
- 100 % visual inspected per MIL-PRF-55342
- Laser-trimmed tolerances to ± 0.1 %
- Load life stability 0.2 % at 1000 h at 155 °C and 100 % rated power
- Very low noise and voltage coefficient (< -30 dB, < 0.1 ppm/V)
- Sulfur resistant (per ASTM B809-95 humid vapor test)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

TYPICAL PERFORMANCE

	ABSOLUTE
TCR	25
TOL.	0.1

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride	-
Resistance Range	1.0 Ω to 1 MΩ	-
TCR: Absolute	± 25 ppm/°C to ± 100 ppm/°C	-55 °C to +175 °C
Tolerance: Absolute	± 0.1 % to ± 1.0 %	+25 °C
Stability: Absolute	± 0.2 %	1000 h at 155 °C and 100 % rated power
Stability: Ratio	Not applicable	-
Voltage Coefficient	Less than 0.1 ppm/V	-
Working Voltage	75 V	-
Operating Temperature Range	-55 °C to +250 °C	-
Storage Temperature Range (1)	-55 °C to +250 °C	-
Noise	< -30 dB	-
Shelf Life Stability: Absolute	100 ppm	1 year at 25 °C

Note

(1) Storage temperature rating is for device only

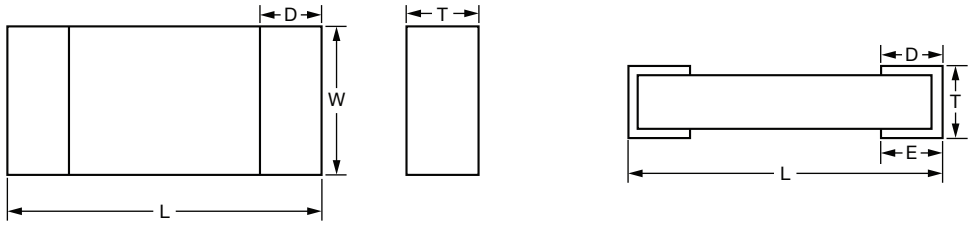
COMPONENT RATINGS

CASE SIZE	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)
0402	50	75	1.5 to 51K
0603	150	75	2.75 to 120K
0805	200	100	2.75 to 301K
1206	400	200	1.0 to 1M

For technical questions, contact: thinfilm@vishay.com

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DIMENSIONS in inches



CASE SIZE	L	W	T	D	E
0402	0.042 ± 0.008	0.022 ± 0.005	0.015 ± 0.003	0.010 ± 0.005	0.010 ± 0.005
0603	0.064 ± 0.006	0.032 ± 0.005	0.015 ± 0.003	0.012 ± 0.005	0.015 ± 0.005
0805	0.080 ± 0.006	0.050 ± 0.005	0.015 ± 0.003	0.016 ± 0.008	0.015 ± 0.005
1206	0.126 ± 0.008	0.063 ± 0.005	0.015 ± 0.003	0.020 + 0.005 / - 0.01	0.020 + 0.005 / -0.01

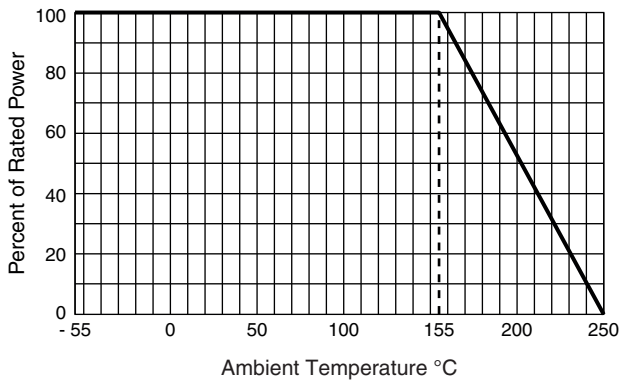
ENVIRONMENTAL TESTS

ENVIRONMENTAL TEST	CONDITIONS	TYPICAL VISHAY PERFORMANCE
High temperature storage	MIL-STD-202 method 108, 1000 h at 125 °C	± 0.05 %
Temperature cycling	JESD22 method JA-104, 1000 cycles, -55 °C to +155 °C	± 0.115 %
Moisture resistance	MiIL-STD-202 method 106	± 0.017 %
Biased humidity	MIL-STD-202 method 103, 1000 h at 85 °C, 85 % RH, 10 % rated power	± 0.133 %
Life	MIL-STD-202 method 108, 1000 h at 155 °C	± 0.20 % at 100 % rated power and 155 °C. Effective film temperature is 200 °C.
Mechanical shock	MIL-STD-202 method 213, condition C	± 0.008 %
Vibration	MIL-STD-202 method 204, 10 Hz to 2 kHz	± 0.008 %
Resistance to soldering heat	MIL-STD-202 method 210, condition B	± 0.09 %
Electrostatic discharge	AEC-Q200-002, human body (< 1 kΩ: 1 kV; > 1 kΩ: 2 kV)	± 0.10 % at 2 kV
Solderability	MIL-STD-883 method 2003 para 2.3.1 and J-STD-002	Pass
Die shear	MIL-PRF-55342	Pass
Flame retardance	AEC-Q200-001 para 4.0	Pass

MECHANICAL SPECIFICATIONS

Resistive element	Tantalum nitride
Substrate material	Alumina
Terminations	Gold (10 µin. min.) over nickel (50 µin. min.)

DERATING CURVE



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GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: PATT0603E1002BGT1

P	A	T	T	0	6	0	3	E	1	0	0	2	B	G	T	1

GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC	RESISTANCE	TOLERANCE	TERMINATION	PACKAGING
PATT	**0402** **0603** **0805** **1206**	**E** = ± 25 ppm/°C **H** = ± 50 ppm/°C **K** = ± 100 ppm/°C (1) **L** = ± 200 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. Example: 10R0 = 10 Ω 1000 = 100 Ω 1002 = 10 kΩ	**B** = ± 0.1 % **D** = ± 0.5 % **F** = ± 1.0 % **G** = ± 2.0 % **J** = ± 5.0 %	**G** = wraparound gold over nickel barrier	BULK **BS** = 100 min., 1 mult WAFFLE **WS** = 100 min., 1 mult **W0** = 100 min.,100 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 **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)

Note

(1) Characteristic TCR - (R < 10 Ω)

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

Note

(2) Resistance values from 1.0 Ω to 10 Ω are undergoing PPAP qualification; results are expected to be similar to PPAP qualified 10 Ω to 120 kΩ

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