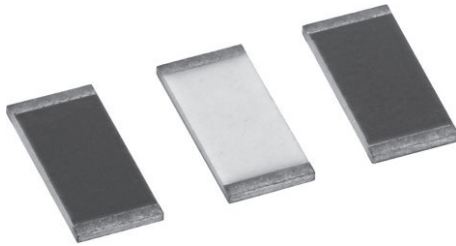


# Precision Low TCR High Temperature Thin Film Resistor, Surface Mount Chip, $\pm 5$ ppm/ $^{\circ}\text{C}$ TCR, 0.02 % Tolerance

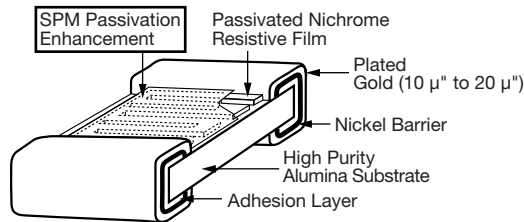


## LINKS TO ADDITIONAL RESOURCES



Vishay's proven precision thin film wraparound resistors will meet your exact requirements. These resistors are ideal for use in oil industry precision applications requiring low noise, long term stability under high temperature, ultra low temperature coefficient of resistance, and low voltage coefficient. The chip resistors are available in any resistance ohmic value in the range specified below.

## CONSTRUCTION



## FEATURES

- PLTT0603 case size is qualified to AEC-Q200 for automotive applications
- $-55^{\circ}\text{C}$  to  $215^{\circ}\text{C}$  operating temperature range
- TCR of  $\pm 5$  ppm/ $^{\circ}\text{C}$  standard
- Tolerances to  $\pm 0.02$  %
- Anti corrosion resistant film with (SPM) special passivation method
- Stable film and performance characteristics
- 0.5 % max. at 2000 h,  $215^{\circ}\text{C}$ , 25 % rated power
- Non-standard resistance values available
- Very low noise and voltage coefficient ( $< -30$  dB, 0.1 ppm/V)
- UL 94 V-0 flame resistant
- Gold terminations ( $10\ \mu\text{m}$  to  $20\ \mu\text{m}$ )
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## TYPICAL PERFORMANCE

|      | ABSOLUTE |
|------|----------|
| TCR  | 5        |
| TOL. | 0.02     |

| STANDARD ELECTRICAL SPECIFICATIONS |   |  |
|------------------------------------|---|--|
| TEST                               | SPECIFICATIONS                                  | CONDITIONS   |
| Material                           | Passivated nichrome                             | -  |
| Resistance Range                   | 75 $\Omega$ to 3 M $\Omega$                     | -  |
| TCR: Absolute                      | $\pm 5$ ppm/ $^{\circ}\text{C}$                 | $-55^{\circ}\text{C}$ to $+215^{\circ}\text{C}$    |
| Tolerance: Absolute                | $\pm 0.1$ % to $\pm 0.02$ %                     | $+25^{\circ}\text{C}$                              |
| Stability: Absolute                | $\Delta R \pm 0.5$ %                            | 2000 h at $215^{\circ}\text{C}$ , 25 % rated power |
| Stability: Ratio                   | -   | -  |
| Voltage Coefficient                | $\pm 0.1$ ppm/V (typical)                       | -  |
| Working Voltage                    | 100 V to 200 V                                  | -  |
| Operating Temperature Range        | $-55^{\circ}\text{C}$ to $+215^{\circ}\text{C}$ | -  |
| Storage Temperature Range          | $-55^{\circ}\text{C}$ to $+215^{\circ}\text{C}$ | -  |
| Noise                              | $< -35$ dB (typical)                            | -  |
| Shelf Life Stability: Absolute     | $\Delta R \pm 0.01$ %                           | 1 year at $+25^{\circ}\text{C}$                    |

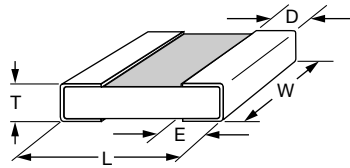


| COMPONENT RATINGS |                            |                     |                      |
|-------------------|----------------------------|---------------------|----------------------|
| CASE SIZE         | POWER RATING AT 70 °C (mW) | WORKING VOLTAGE (V) | RESISTANCE RANGE (Ω) |
| 0603              | 150                        | 75                  | 75 to 130K           |
| 0805              | 250                        | 100                 | 250 to 260K          |
| 1206              | 400                        | 200                 | 500 to 775K          |
| 2010              | 800                        | 200                 | 500 to 2M            |
| 2512              | 1000                       | 200                 | 500 to 3M            |

**Note**

- Consult factory for additional case size

**DIMENSIONS** in inches



| CASE SIZE | TERM | L             | W             | T              | D                     | E                     |
|-----------|------|---------------|---------------|----------------|-----------------------|-----------------------|
| 0603      | G    | 0.064 ± 0.006 | 0.032 ± 0.005 | 0.015 to 0.033 | 0.012 ± 0.005         | 0.015 ± 0.005         |
| 0805      | G    | 0.080 ± 0.006 | 0.050 ± 0.005 | 0.015 to 0.033 | 0.016 ± 0.008         | 0.015 ± 0.005         |
| 1206      | G    | 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 |
| 2010      | G    | 0.209 ± 0.009 | 0.098 ± 0.005 | 0.015 to 0.033 | 0.020 ± 0.005         | 0.020 ± 0.005         |
| 2512      | G    | 0.259 ± 0.009 | 0.124 ± 0.005 | 0.015 to 0.033 | 0.020 ± 0.005         | 0.020 ± 0.005         |

**ENVIRONMENTAL TESTS - MIL-PRF-55342**

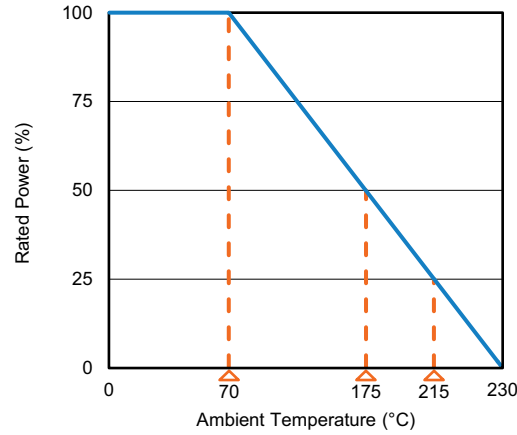
| ENVIRONMENTAL TEST           | CONDITIONS  | TYPICAL VISHAY PERFORMANCE |
|------------------------------|---|----------------------------|
| Thermal Shock                | MIL-STD-202 method 107 cond F, -65 °C to +150 °C              | ± 0.02 %                   |
| Short Time Overload          | MIL-PRF-55342 para 4.8.6, 2.5 x rated working voltage         | ± 0.01 %                   |
| Low Temperature Operation    | MIL-PRF-55342 para 4.8.5, -65 °C                              | ± 0.01 %                   |
| Resistance to Soldering Heat | MIL-STD-202 method 210  | ± 0.01 %                   |
| Moisture Resistance          | MIL-STD-202 method 106, no power applied                      | ± 0.02 %                   |
| High Temperature Exposure    | MIL-PRF-55342 para 4.8.7, at 150 °C for 100 h                 | ± 0.02 %                   |
| Life                         | MIL-STD-202 method 108, 25 % rated power for 2000 h at 215 °C | ± 0.50 %                   |
| TCR                          | MIL-STD-202 method 304  | ± 5 ppm/°C                 |

**ENVIRONMENTAL TESTS - AEC-Q200 PLTT0603 Case Size Only**

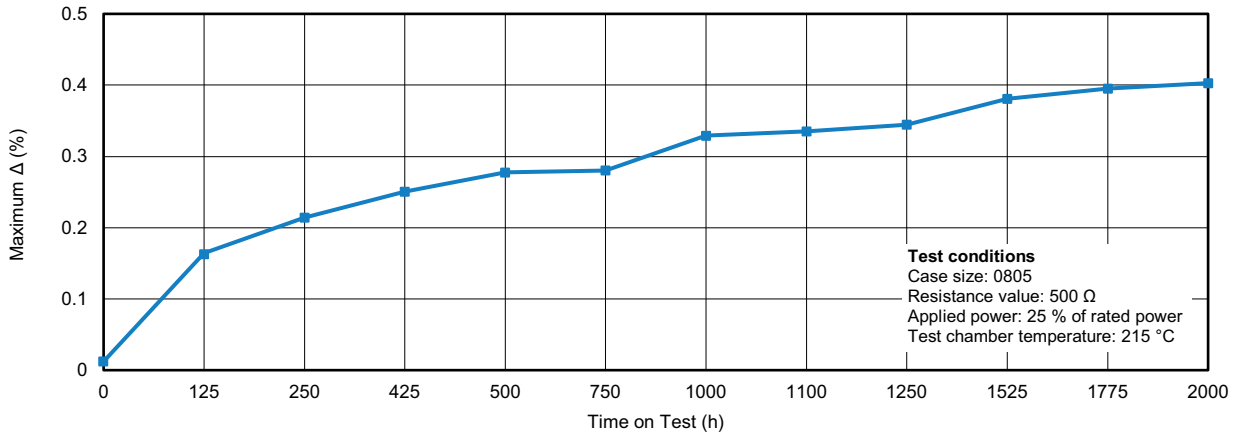
| ENVIRONMENTAL TEST           | CONDITIONS   | TYPICAL VISHAY PERFORMANCE |
|------------------------------|--|----------------------------|
| High temperature storage     | MIL-STD-202 method 108, 1000 h at 125 °C                           | ± 0.10 %                   |
| Temperature cycling          | JESD22 method JA-104, 1000 cycles, -55 °C to +155 °C               | ± 0.25 %                   |
| Moisture resistance          | MIL-STD-202 method 106, no power applied                           | ± 0.10 %                   |
| Biased humidity              | MIL-STD-202 method 103, 1000 h at 85 °C, 85 % RH, 10 % rated power | ± 0.20 %                   |
| Life                         | MIL-STD-202 method 108, 1000 h at 175 °C, 50 % rated power         | ± 0.50 %                   |
| Mechanical shock             | MIL-STD-202 method 213, condition C                                | ± 0.02 %                   |
| Vibration                    | MIL-STD-202 method 204, 10 Hz to 2 kHz                             | ± 0.02 %                   |
| Resistance to soldering heat | MIL-STD-202 method 210, condition B                                | ± 0.02 %                   |
| Electrostatic discharge      | AEC-Q200-002, human body (< 1 kΩ: 1 kV; > 1 kΩ: 2 kV)              | < 1 kΩ: 1 kV; > 1 kΩ: 2 kV |
| Solderability                | MIL-STD-883 method 2003 para 2.3.1 and J-STD-002                   | Pass                       |
| TCR                          | MIL-STD-202 method 304   | ± 5 ppm /°C                |
| Die shear                    | MIL-PRF-55342, 0.5 kg for 30 s minimum                             | Pass                       |
| Flame retardance             | AEC-Q200-001 para 4.0  | Pass                       |



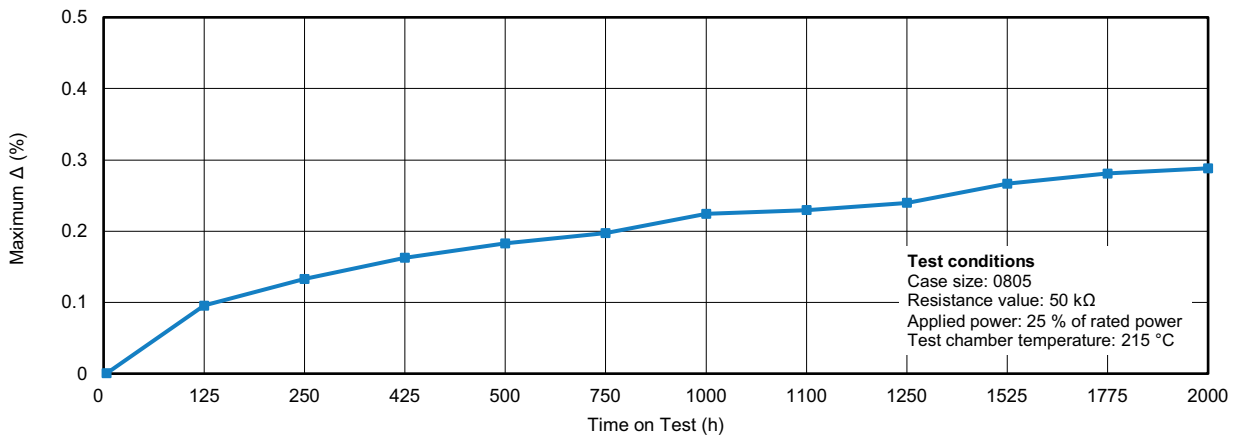
**DERATING CURVE**



**PLTT0805 500 Ω STABILITY TEST RESULTS**



**PLTT0805 50 kΩ STABILITY TEST RESULTS**



**Note**

- Performance obtained with following mounting conditions  
PCB: Polyimide IPC-7831A STD land patterns  
Solder paste: PbSnAg (93.5/5/1.5)



| GLOBAL PART NUMBER INFORMATION |                                      |                    |  |  |   |  |   |   |   |   |   |   |   |   |   |   |
|--------------------------------|--------------------------------------|--------------------|--|--|---|--|---|---|---|---|---|---|---|---|---|---|
| P                              | L                                    | T                  | T  | 0  | 8   | 0  | 5 | Z | 1 | 0 | 0 | 1 | Q | G | T | 1 |
| GLOBAL MODEL                   | CASE SIZE                            | TCR CHARACTERISTIC | RESISTANCE   | TOLERANCE  | TERMINATION   | PACKAGING  |   |   |   |   |   |   |   |   |   |   |
| PLTT                           | 0603<br>0805<br>1206<br>2010<br>2512 | Z = ± 5 ppm/°C     | <p>The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point.</p> <p>Example:<br/> <b>1001</b> = 1 kΩ<br/> <b>2500</b> = 250 Ω</p> <p>Special values with more than 4 significant figures, use a R for value below 1 kΩ and a K for values greater than 1 kΩ to signify a decimal point.</p> <p><b>982R6</b> = 982.6 Ω<br/> <b>532R41</b> = 532.41 Ω</p> | <p><b>Q</b> = ± 0.02 % <sup>(1)</sup><br/> <b>A</b> = ± 0.05 %<br/> <b>B</b> = ± 0.1 %<br/> <b>D</b> = ± 0.5 %<br/> <b>F</b> = ± 1 %<br/> <b>G</b> = ± 2 %</p> | <p><b>G</b> = wraparound gold over Ni barrier (10 μ" min. Au)</p> | <p><b>WS</b> = WAFFLE<br/> <b>WI</b> = 100 min., 1 mult. (item single lot date code)<br/> <b>WP</b> = 100 min., 1 mult. (package unit single lot date code)</p> <p><b>TAPE AND REEL</b><br/> <b>T0</b> = 100 min., 100 mult.<br/> <b>T1</b> = 1000 min., 1000 mult.<br/> <b>T5</b> = 500 min., 500 mult.<br/> <b>TF</b> = full reel<br/> <b>TS</b> = 100 min., 1 mult.<br/> <b>TI</b> = 100 min., 1 mult. (item single lot date code)<br/> <b>TP</b> = 100 min., 1 mult. (package unit single lot date code)</p> |   |   |   |   |   |   |   |   |   |   |

**Note**

<sup>(1)</sup> Q tolerances are available only for resistance values ≥ 250 Ω



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