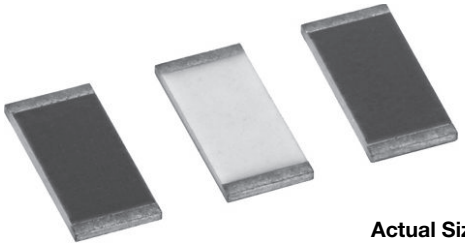
# Ultra Precision Low TCR Thin Film Resistor, Surface Mount Chip, ± 2 ppm/°C TCR, 0.01 % Tolerance



Actual Size 0603

Vishay's proven precision thin film wraparound resistors will meet your exact requirements. These resistors are ideal for precision applications requiring low noise, stability, 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.

## FEATURES

- TCR of ± 2 ppm/°C standard
- Tolerances to ± 0.01 %
- Anti-corrosion resistant film with (SPM) special passivation method
- Stable film and performance characteristics ($\Delta R$ ± 0.04 % at 70 °C, 10 000 h)
- Non-standard resistance values available
- Very low noise and voltage coefficient (< -30 dB, 0.1 ppm/V)
- UL 94 V-0 flame resistant
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

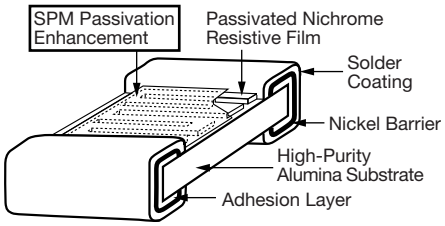
RoHS* Available

HALOGEN FREE

**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.

## CONSTRUCTION




## TYPICAL PERFORMANCE

| | ABSOLUTE |
|---|---|
| TCR | 2 |
| TOL. | 0.01 |

## STANDARD ELECTRICAL SPECIFICATIONS

| TEST | SPECIFICATIONS | CONDITIONS |
|---|---|---|
| **Material** | Passivated nichrome | - |
| **Resistance Range** | 100 Ω to 3 MΩ | - |
| **TCR: Absolute** | ± 2 ppm/°C | -55 °C to +125 °C |
| **Tolerance: Absolute** | ± 0.1 % to ± 0.01 % | +25 °C |
| **Stability: Absolute** | $\Delta R$ ± 0.02 % | 2000 h at 70 °C |
| **Stability: Ratio** | - | - |
| **Voltage Coefficient** | ± 0.1 ppm/V (typical) | - |
| **Working Voltage** | 75 V to 200 V | - |
| **Operating Temperature Range** | -55 °C to +125 °C | - |
| **Storage Temperature Range** | -55 °C to +155 °C | - |
| **Noise** | < -35 dB (typical) | - |
| **Shelf Life Stability: Absolute** | $\Delta R$ ± 0.01 % | 1 year at +25 °C |

## COMPONENT RATINGS

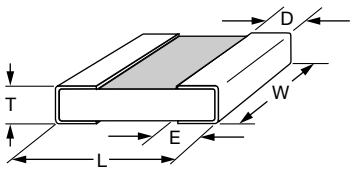
| CASE SIZE | POWER RATING (mW) | WORKING VOLTAGE (V) | RESISTANCE RANGE (Ω) |
|---|---|---|---|
| 0603 | 150 | 75 | 100 to 130K |
| 0805 | 250 | 100 | 100 to 260K |
| 1206 | 400 | 200 | 100 to 775K |
| 2010 | 800 | 200 | 150 to 2M |
| 2512 | 1000 | 200 | 200 to 3M |



For technical questions, contact: thinfilm@vishay.com

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## DIMENSIONS in inches

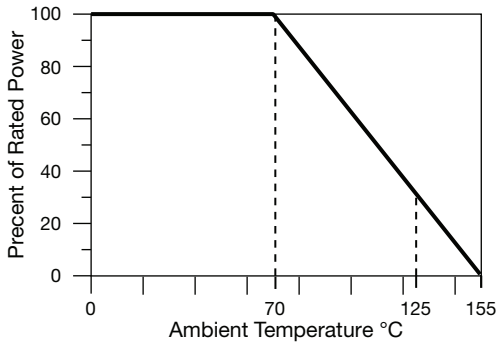



| CASE SIZE | TERM | L | W | T | D | E |
|---|---|---|---|---|---|---|
| 0603 | B | 0.064 ± 0.006 | 0.032 ± 0.005 | 0.020 max. | 0.012 ± 0.005 | 0.015 ± 0.005 |
| 0805 | B | 0.080 ± 0.006 | 0.050 ± 0.005 | 0.015 to 0.033 | 0.016 ± 0.008 | 0.015 ± 0.005 |
| 1206 | B | 0.126 ± 0.008 | 0.063 ± 0.005 | 0.015 to 0.033 | 0.020 + 0.005 / - 0.010 | 0.020 + 0.005 / - 0.010 |
| 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 - TYPICAL

| ENVIRONMENTAL TEST | 10 kΩ Δ*R* ± (%) | 100 kΩ Δ*R* ± (%) |
|---|---|---|
| **Thermal Shock** | 0.02 | 0.02 |
| **Short Time Overload** | 0.01 | 0.01 |
| **Low Temperature Operation** | 0.01 | 0.01 |
| **Resistance to Solder Heat** | 0.01 | 0.01 |
| **Moisture Resistance** | 0.02 | 0.02 |
| **High Temperature Exposure** | 0.02 | 0.02 |
| **Load Life (10 000 h, +70 °C)** | 0.04 | 0.04 |
| **TCR** | ± 2 ppm/°C | ± 2 ppm/°C |

## DERATING CURVE




## GLOBAL PART NUMBER INFORMATION

| P | L | T | U | 0 | 6 | 0 | 3 | U | 1 | 0 | 0 | 1 | Q | B | T | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| GLOBAL MODEL | CASE SIZE | TCR CHARACTERISTIC | RESISTANCE | TOLERANCE | TERMINATION | PACKAGING |
|---|---|---|---|---|---|---|
| **PLTU** | **0603**<br>**0805**<br>**1206**<br>**2010**<br>**2512** | **U** = ± 2 ppm/°C | First 3 digits are significant figures and the last digit specifies the number of zeros to follow.<br><br>Example:<br>1000 = 100 Ω<br>1001 = 1 kΩ<br><br>Use R to indicate decimal point for value below 1 kΩ (max. 5 digits).<br>982R6 = 982.6 Ω<br><br>Values above 1 kΩ (max. 4 digits).<br>1532 = 15.3 kΩ<br>1003 = 100 kΩ | **L** = ± 0.01 % (2)<br>**Q** = ± 0.02 %<br>**A** = ± 0.05 %<br>**B** = ± 0.1 %<br>**D** = ± 0.5 %<br>**F** = ± 1 % | **B** = wraparound Sn/Pb solder w/Ni barrier (63 % Sn/37 % Pb w/ nickel barrier)<br><br>**S** = wraparound lead (Pb)-free solder 96.5 % Sn/3.0 % Ag/ 0.5 % Cu RoHS-compliant - e1 | **WS** = WAFFLE PACK<br>**WI** = 100 min., 1 mult (item single lot date code)<br>**WP** = 100 min., 1 mult (package unit single lot date code)<br><br>TAPE AND REEL<br>**T0** = 100 min., 100 mult<br>**T1** = 1000 min., 1000 mult (1)<br>**T3** = 300 min., 300 mult<br>**T5** = 500 min., 500 mult<br>**TF** = Full reel<br>**TS** = 100 min., 1 mult<br>**TI** = 100 min., 1 mult (item single lot date code)<br>**TP** = 100 min., 1 mult (package unit single lot date code) |

**Notes**

(1) Preferred packaging code

(2) L and Q tolerances are available only for resistance values ≥ 250 Ω



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