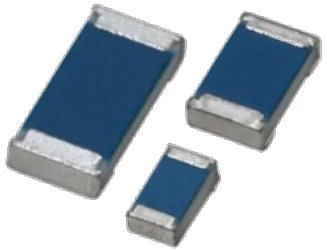
TNPU

ULTRA PRECISION THIN FILM CHIP RESISTORS PRODUCT OVERVIEW

DRALORIC BEYSCHLAG RESISTORS

A WORLD OF SOLUTIONS

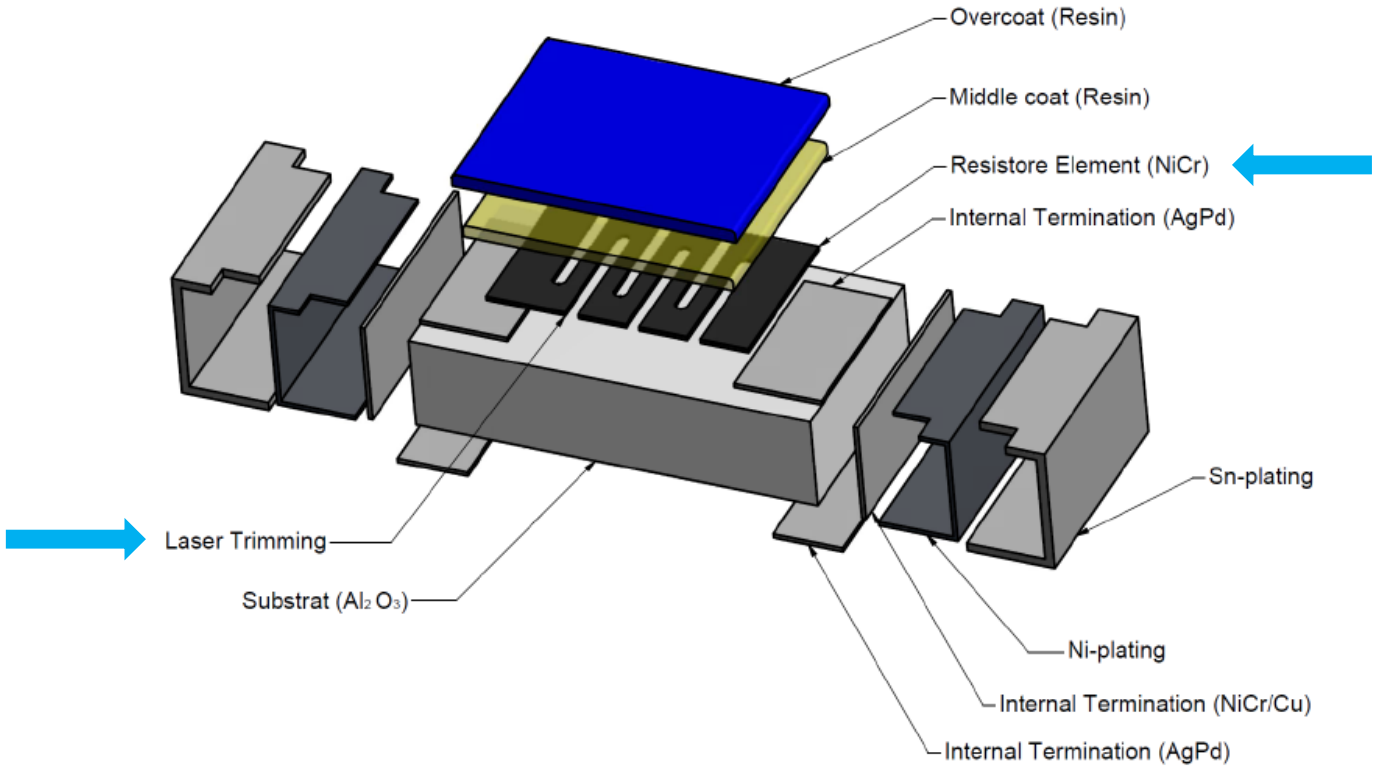
Main Features of the TNPU



- TNPU is an extension of the TNPW series
- Tolerance options: ±0.1%, ±0.05%, & ±0.02%
- TCR options: ±10 ppm/ºC & ±5 ppm/^{0}C
- Available case sizes: 0603, 0805, & 1206
- Excellent long-term stability: ≤ 0.05% after 1000h life test
- Superior moisture resistivity
- Sulfur resistance
- AEC-Q200 qualified

The TNPU ultra precision series is an extension of Vishay's TNPW series. The TNPU series are an excellent choice when tight tolerances and long term stability are required. As with the TNPW series, the TNPU offers superior moisture behavior and is resistant to Sulfur. On top of that, its Automotive AEC-Q200 qualification makes this product series an appropriate choice for high reliability applications.

TNPU Construction



The construction of TNPU ultra precision thin film chip resistors offers significant advantages when compared to other resistor types. The resistive element is a high quality homogeneous material. The meander laser trimming allows thermal energy to be evenly distributed across the entire resistive element when the resistor is in use. Evenly distributing power dissipation and thermal energy across the resistive element reduces the intensity of hot spot on the resistive film and enhances the stability of TNPU series.

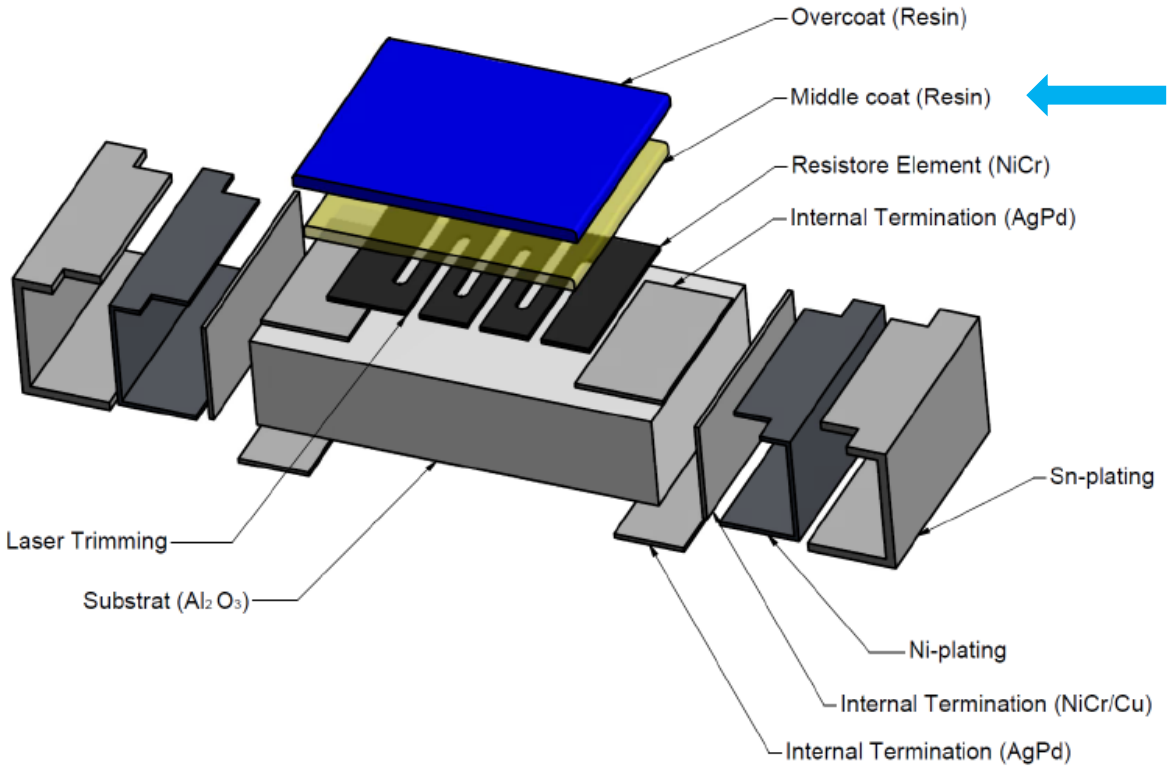
Long Term Stability

Product	Maximum Resistive Drift after 1000 hours of Life Test [1]	Maximum Resistive Drift after 8000 hours of Life Test [1]
Vishay - TNPU	**±0.05%**	**±0.1%**
Competitor A	±0.2%	-
Competitor B	±0.25%	-
Competitor C	±0.5% for ≤ 47R ±0.25% for > 47R	-
Competitor D	±0.5%	-

Note [1]: Resistive drifts shown are considering endurance specification in product datasheets and/or maximum film temperature of 125ºC. Resistive drift after 8000 hours is not shown on competitor datasheets.

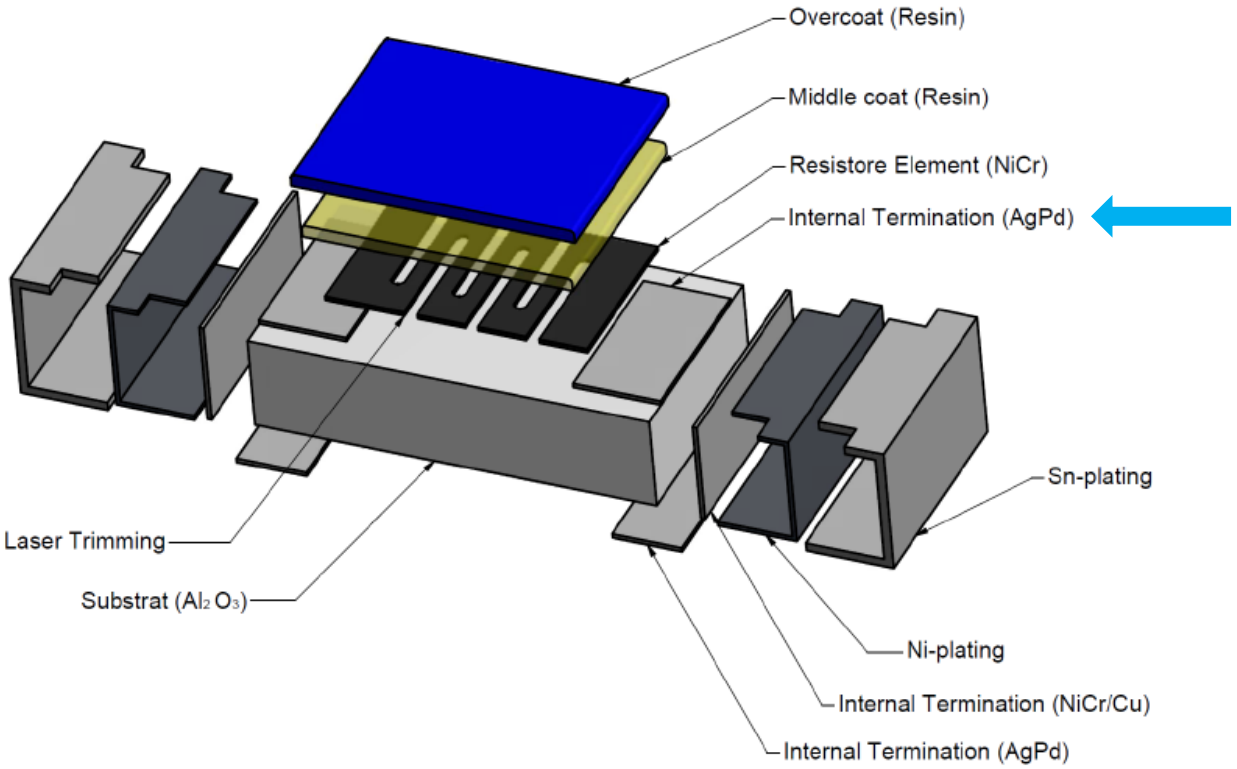
The construction of the TNPU allows the product to be specified with resistive drift of less than 0.1% when considering 8000 hours of operation with full power applied to for the resistor. This is also known as the endurance at 70^0C test as described on the product datasheet. The table shown here illustrates the specified resistive drift over time of the TNPU series in comparison with thin film components offered by competitors of Vishay. The values shown are specified limits, not typical values. The typical resistive drift over time is much lower than the specified limits.

Superior Moisture Resistance



The TNPU special passivation method is used during production to provide the component with superior moisture resistivity, tested according to the 85^0C/85% R.H. biased humidity test for 56 days.

Superior Sulfur Resistance



An increase in incidents of corrosion failures related to high sulfur-containing environments has been observed in the electronics industry which has increased the interest in sulfur resistant resistors by designers. With silver palladium inner termination and a special design which protects the integrity of the junction between the product termination and the top coating, the TNPU series is impervious to sulfur exposure as verified in accordance with the ASTM B 809 standard.

Applications

Automotive

- Battery Voltage Regulator
- Transmission Control
- Engine Control Unit

Industrial

- Instrumentation
- Test and Measurement
- PLC Controller

AMS
(Avionics, Military, Space)

- Military Imaging Systems
- Satellite

Medical

- Ultrasound Probe
- Endoscope
- MRI

The TNPU series is used in different applications and market segments. From automotive to instrumentation and medical applications, there is a place for the TNPU series in a wide variety of circuitry types where high accuracy (tight tolerance and TCR) and long term stability are required.