THIN FILM CHIP RESISTORS

TNPV e3

High-Voltage Thin Film Flat Chip Resistors

KEY BENEFITS

- High operating voltage up to 1000 V
- Low voltage coefficient < 1 ppm/V
- Unrivaled precision and high stability at high voltages
- Excellent overall stability at different environmental conditions
- Superior moisture resistivity
- Sulfur resistance verified according to ASTM B 809

APPLICATIONS

- Industrial power and frequency inverters: photovoltaics and wind energy
- Automotive power and frequency inverter: electric and hybrid-electric vehicles
- Battery management systems: electric and hybrid-electric vehicles
- Test and measuring equipment

RESOURCES

- Datasheet: TNPV e3 - www.vishay.com/doc?28881
- For technical questions contact thinfilmchip@vishay.com
- Material categorization: For definitions, please see www.vishay.com/doc?99912

Pb RoHS COMPLIANT HALOGEN FREE

A WORLD OF SOLUTIONS

THIN FILM CHIP RESISTORS

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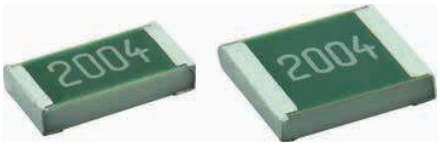

TNPV e3 precision thin film flat chip resistors are the perfect choice for most fields of modern electronics where the highest reliability and stability at high operating voltages are of major concern. Typical applications include industrial and automotive inverters, voltage measurement systems as implemented in battery management systems, and test and measuring equipment.

FEATURES

- High operating voltage $U_{max.}$ up to 1000 V
- Low voltage coefficient < 1 ppm/V
- Excellent overall stability at different environmental conditions ≤ 0.05 % (1000 h rated power at 70 °C)
- Superior moisture resistivity (85 °C; 85 % RH)
- AEC-Q200 qualification under preparation
- Sulfur resistance verified according to ASTM B 809
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- Industrial and automotive inverters
- Battery management system
- Test and measuring equipment

TECHNICAL SPECIFICATIONS		
DESCRIPTION	**TNPV1206 e3**	**TNPV1210 e3**
Imperial size	1206	1210 (1)
Metric size code	RR3216M	RR3225M (1)
Resistance range	160 kΩ to 2 MΩ	121 kΩ to 3.01 MΩ
Resistance tolerance	± 1 %; ± 0.5 %; ± 0.1 %	
Temperature coefficient	± 50 ppm/K; ± 25 ppm/K; ± 15 ppm/K; ± 10 ppm/K	
Voltage coefficient |c|	< 1 ppm/V	
Rated dissipation, P_{70} (2)	0.25 W	0.33 W
Maximum operating voltage, $U_{max.}$ AC_{RMS} or DC (3)	700 V	1000 V
Permissible film temperature, $\vartheta_{F\ max.}$ (2)	155 °C	
Operating temperature range	-55 °C to 125 °C (155 °C)	

Notes

(1) Size not specified in EN 140401-801.
(2) Please refer to APPLICATION INFORMATION below.
(3) Application-specific safety requirements may set limitations to the applicability of the specified voltage.

APPLICATION INFORMATION

The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature is not exceeded. Furthermore, a high level of ambient temperature or of power dissipation may raise the temperature of the solder joint, hence special solder alloys or board materials may be required to maintain the reliability of the assembly.

These resistors do not feature a lifetime limitation when operated within the limits of rated dissipation, permissible operating voltage, and permissible film temperature. However, the resistance typically increases due to the resistor's film temperature over operating time, generally known as drift. The drift may exceed the stability requirements of an individual application circuit and thereby limits the functional lifetime. The designer may estimate the performance of the particular resistor application or set certain load and temperature limits in order to maintain a desired stability.

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