



THIN FILM RESISTORS

TNPU e3



High Precision Thin Film Chip Resistor

KEY BENEFITS

- Low temperature coefficient: ± 5 ppm/K
- Tight tolerance: ± 0.05 %
- Superior moisture resistivity: $\leq \pm 0.25$ % (85 °C; 56 days; 85 % RH)
- AEC-Q200 qualified
- Compliant to RoHS directive 2002/95/EC

APPLICATIONS

- Instrumentation
- Industrial equipment
- Automotive
- Aerospace
- Telecommunications infrastructure
- Medical equipment

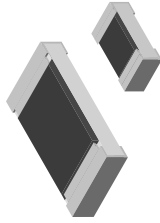
High Precision Thin Film Chip Resistor

FEATURES

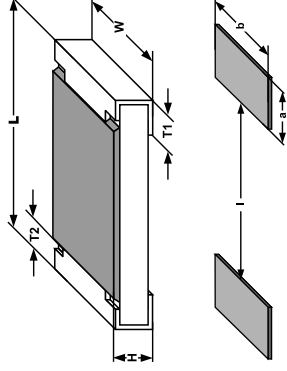
- Low temperature coefficient and tight tolerances ($\pm 0.05\%$; ± 5 ppm/K)
- Superior moisture resistivity $\leq 0.25\%$ (85 °C; 56 days; 85 % RH)
- Waste gas resistant
- AEC-Q200 qualified
- Compliant to RoHS directive 2002/95/EC
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications



TNPU e3 High Precision Thin Film Flat Chip Resistors combine the proven reliability of TNPW e3 products with a most advanced level of precision and stability. This unique combination makes the product perfectly suited for all applications with outstanding requirements towards size, reliable precision and stability.



DIMENSIONS



SIZE	DIMENSIONS in millimeters					
	INCH	METRIC	L	W	H	T1 T2
0603	1608	1.6 ± 0.10	0.85 ± 0.10	0.45 ± 0.10	0.3 ± 0.20	
0805	2012	2.0 ± 0.15	1.25 ± 0.15	0.45 ± 0.10	0.4 ± 0.20	
1206	3216	3.2 ± 0.15	1.6 ± 0.15	0.55 ± 0.10	0.5 ± 0.25	

SOLDER PAD DIMENSIONS in millimeters

SIZE	REFLOW SOLDERING			WAVE SOLDERING				
	INCH	METRIC	a	b	i	a	b	i
0603	1608	0.5	0.9	1.0	0.9	0.9	0.9	1.0
0805	2012	0.7	1.3	1.2	0.9	1.3	1.3	1.3
1206	3216	0.9	1.7	2.0	1.1	1.7	1.7	2.3

- Industrial equipment
- Telecommunication
- Medical equipment
- Instrumentation
- Test and measuring equipment
- Automotive

STANDARD ELECTRICAL SPECIFICATIONS

Metric size	TNPU0603 e3 RR 1608M	TNPU0805 e3 RR 2012M	TNPU1206 e3 RR 3216M
Resistance range	100 Ω to 100 kΩ	100 Ω to 332 kΩ	100 Ω to 511 kΩ
Resistance tolerance	± 0.1%; ± 0.05 %		
Temperature coefficient	± 10 ppm/K; ± 5 ppm/K		
Climatic category (LCT/UCT/days)	55/125/56		
Rated dissipation, P_{70} (1)	0.1 W	0.125 W	0.25 W
Operating voltage, U_{max} AC/DC	75 V	150 V	200 V
Maximum permissible film temperature	125 °C		
Thermal resistance (2)	550 K/W	440 K/W	220 K/W
Max. resistance change at P_{70} ; $ \Delta R/R $	$\leq 0.05\%$ $\leq 0.10\%$ $\leq 0.30\%$	$\leq 0.05\%$ $\leq 0.10\%$ $\leq 0.30\%$	$\leq 0.05\%$ $\leq 0.10\%$ $\leq 0.30\%$
Insulation voltage:	U_{ins} 1 min Continuous	200 V 75 V	300 V 75 V
FTT observed	$\leq 0.1 \times 10^{-9}$ h		
Weight/1000 pieces	2 g	5.5 g	10 g

Notes

(1) Rated voltage, $\sqrt{P \times R}$. 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.

(2) Measuring conditions in accordance with EN 140401-801.

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For technical questions, contact thinfilmchip@vishay.com

TEMPERATURE COEFFICIENT AND RESISTANCE RANGE

TYPE	TCR	TOLERANCE	RESISTANCE VALUE	E-SERIES
TNPU0603 e3	± 10 ppm/K ± 5 ppm/K	± 0.05 % ± 0.1 % ± 0.05 %	100 Ω to 100 kΩ	
TNPU0805 e3	± 10 ppm/K ± 5 ppm/K	± 0.05 % ± 0.1 % ± 0.05 %	100 Ω to 332 kΩ	E24 to E192
TNPU1206 e3	± 10 ppm/K ± 5 ppm/K	± 0.05 % ± 0.1 % ± 0.05 %	100 Ω to 511 kΩ	

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: TNPU12061K32AE00

MODEL	VALUE	TOLERANCE	TCR	PACKAGING (1)	SPECIAL
TNPU0603 TNPU0805 TNPU1206	R = Decimal K = Thousand M = Million (4 digits)	B = ± 0.1 % A = ± 0.05 %	Y = ± 10 ppm/K Z = ± 5 ppm/K	EA EN	Up to 2 digits 00 = Standard

Product Description: TNPU1206 1K32 0.05 % T-16 ET1 e3

TNPU1206	1K32	0.05 %	T-16	ET1	e3
MODEL	RESISTANCE VALUE	TOLERANCE	TCR	PACKAGING (1)	LEAD (Pb)-FREE
TNPU0603 TNPU0805 TNPU1206	E-samples: 1K32 = 1320 Ω	± 0.05 % ± 0.1 %	T-16 = ± 10 ppm/K T-16 = ± 5 ppm/K	ET1 E52	e3 = Pure Pb termination finish

Notes

- Products can be ordered using either the PRODUCT DESCRIPTION or the PART NUMBER.
- (1) Please refer to PACKAGING table.

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