



RESISTORS

TNPU e3



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High Precision Thin Film Chip Resistor

FEATURES

- Low temperature coefficient: ± 5 ppm/K
- Tight tolerance: $\pm 0.05\%$
- Superior moisture resistivity: $\leq \pm 0.25\%$ (85° C; 56 days; 85% RH)
- RoHS-compliant

APPLICATIONS

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

TNPU e3 High Precision Thin Film Chip Resistor

High Precision Thin Film Chip Resistor ± 0.05 %; ± 5 ppm/K

FEATURES

- Low temperature coefficient and tight tolerances (± 0.05 %; ± 5 ppm/K)
- Superior moisture resistivity ≤ 0.25 % (85 °C; 56 days; 85 % RH)
- Lead (Pb)-free solder contacts, RoHS compliant
- Waste gas resistant



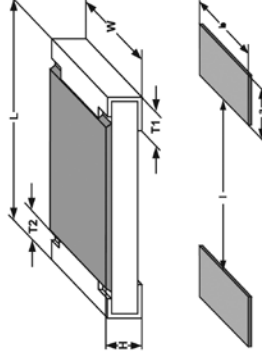
APPLICATIONS

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



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	0.3 ± 0.20	
0805	2012	2.0 ± 0.15	1.25 ± 0.15	0.45 ± 0.10	0.4 ± 0.20	0.4 ± 0.20	
1206	3216	3.2 ± 0.15	1.6 ± 0.15	0.55 ± 0.10	0.5 ± 0.25	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	1.0
0805	2012	0.7	1.3	1.2	0.9	1.3	1.3
1206	3216	0.9	1.7	2.0	1.1	1.7	2.3

TEMPERATURE COEFFICIENT AND RESISTANCE RANGE

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

PART NUMBER AND PRODUCT DESCRIPTION

PART NUMBER: TNPU12061K32AZE00

T	N	P	U	1	2	0	6	1	K	3	2	A	Z	E	A	0	0
MODEL	TNPU1206																
MODEL	TNPU0603																
MODEL	TNPU0805																
MODEL	TNPU1206																
VALUE	R = Decimal K = Thousand M = Million (4 digits)																
TOLERANCE	B = ± 0.1 % A = ± 0.05 %																
TCR	Y = ± 10 ppm/K Z = ± 5 ppm/K																
SPECIAL	up to 2 digits 00 = Standard																
PRODUCT DESCRIPTION	TNPU1206 1K32 0.05 % T-16 ET1 e3																
1K32	RESISTANCE VALUE																
0.05 %	TOLERANCE																
T-16	TCR																
ET1	LEAD (Pb)-FREE Termination Finish																
0.05 %	RESISTANCE VALUE																
± 0.05 %	TOLERANCE																
± 0.1 %	TOLERANCE																
1K32 = 1320 Ω	Examples:																

Notes

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

STANDARD ELECTRICAL SPECIFICATIONS		TNPU0603 e3	TNPU0805 e3	TNPU1206 e3
Metric size		RR 1608M	RR 2012M	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	55/125/56	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	125 °C	125 °C
Thermal resistance (θ)		550 K/W	440 K/W	220 K/W
Max. resistance change at P_{70} : $ \Delta R/R $		≤ 0.05 %		
	1000 h	≤ 0.05 %		
	8000 h	≤ 0.10 %		
	225 000 h	≤ 0.30 %		
Insulation voltage:		100 V	200 V	300 V
	U_{ins} 1 min	75 V	75 V	75 V
	Continuous	≤ 0.1 x 10 ⁻⁹ /h		
FT observed		≤ 0.1 x 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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