

SMD PTC - Nickel Thin Film Linear Thermistors



FEATURES

- Alumina substrate base with nickel based PTC thin film element
- 0603, 0805, and 1206 sizes available
- Available in tape and reel packaging
- Standard R_{25} tolerances: $\pm 0.5\%$, $\pm 1\%$, $\pm 5\%$
- Operation range $-55\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$
- High stability over the entire temperature range
- cUL recognized component: File E148885
- AEC-Q200 qualified (grade 1)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

QUICK REFERENCE DATA				
PARAMETER	VALUE			UNIT
DESCRIPTION	TFPT0603	TFPT0805	TFPT1206	
Resistance value at $25\text{ }^{\circ}\text{C}$ ⁽²⁾	100 to 1K	100 to 5K	100 to 10K	Ω
Tolerance on R_{25} -value ⁽²⁾	± 0.5 ; ± 1 ; ± 5			%
TCR at $25\text{ }^{\circ}\text{C}$	4110			ppm/K
Tolerance on TCR at $25\text{ }^{\circ}\text{C}$ ⁽¹⁾	± 400			
Operating temperature range: at rated power at zero dissipation ⁽⁴⁾	-55 to $+70$ -55 to $+150$			$^{\circ}\text{C}$
Dissipation factor δ (for information only)	1.8	2.3	4	mW/K
Maximum rated power at $70\text{ }^{\circ}\text{C}$ (P_{70})	75	100	125	mW
Maximum working voltage RCWV ⁽³⁾	30	40	50	V
Climatic category (LCT/UCT/days)	55/150/56			-
Weight	2	5.5	10	mg

Notes

- (1) Contact Vishay if closer TCR lot tolerance is desired.
- (2) Other R_{25} -values and tolerances are available upon request.
- (3) Rated continuous working voltage is maximum working voltage or $\sqrt{P_{70} \times R}$ whichever is less.
- (4) Zero power or zero dissipation is considered as measuring power max. 1% of rated power P_{70} .

STANDARD RESISTANCE VALUES at $25\text{ }^{\circ}\text{C}$ in Ω									
100	180	330	560	1.0K	1.8K	3.3K	5.0K	8.2K	
120	220	390	680	1.2K	2.2K	3.9K	5.6K	10.0K	
150	270	470	820	1.5K	2.7K	4.7K	6.8K		

Note

- Rated continuous working voltage is maximum working voltage or $\sqrt{P_{70} \times R}$ whichever is less.

GLOBAL PART NUMBER INFORMATION														
Global Part Numbering: TFPT1206L1002FM (preferred part number format)														
T	F	P	T	1	2	0	6	L	1	0	0	2	F	M
GLOBAL MODEL				CHARACTERISTIC		RESISTANCE VALUE		TOLERANCE CODE			PACKAGING			
TFPT0603 TFPT0805 TFPT1206				L = Linear		1002 = 10K		D = $\pm 0.5\%$ F = $\pm 1\%$ J = $\pm 5\%$			M = Lead (Pb)-free, T/R (5000 pieces) V = Lead (Pb)-free, T/R (1000 pieces) Z = Tin/lead, T/R (5000 pieces) Y = Tin/lead, T/R (1000 pieces)			

DIMENSIONS in millimeters

CONSTRUCTION


PART NUMBER	A	B	C	D	E
TFPT 0603	1.55 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.30 ± 0.20	0.30 ± 0.20
TFPT 0805	2.00 ± 0.15	1.25 ± 0.15	0.45 ± 0.10	0.40 ± 0.20	0.40 ± 0.20
TFPT 1206	3.05 ± 0.15	1.50 ± 0.15	0.55 ± 0.10	0.50 ± 0.25	0.50 ± 0.25


Note

- Zero power is considered as measuring power max. 1 % of rated power P_{70} .

TESTS AND REQUIREMENTS		
TEST	CONDITIONS ⁽¹⁾	REQUIREMENTS MAX $ \Delta R_{25}/R_{25} $
High temperature exposure (storage)	AEC-Q200, 1000 h at 150 °C	0.25 %
Temperature cycling	AEC-Q200, 1000 cycles -55 °C / +125 °C	0.25 %
Biased humidity	1000 h, 1 mA biased at 85 °C / 85 % RH	0.25 %
	1000 h, 1 mA biased at 40 °C / 95 % RH	0.25 %
Operational life	1000 h, P_{70} max biased at 85 °C	0.25 %
Mechanical shock and vibration	MIL-STD 202, method 213 - 204	0.50 %
Resistance to soldering heat	MIL-STD 202, method 210, solderbath dipping 10 s at 260°C	0.25 %
ESD ⁽²⁾	AEC-Q200-002, HBM (CD) 0.5 kV (0603), 1.0 kV (0805), 1.0 kV (1206)	0.25 %
Board flex	AEC-Q200-005, 2 mm during 60 s	0.25 %
Terminal strength	AEC-Q200-006, shear test 17.7 N during 60 s	0.25 %

Notes

- ⁽¹⁾ Environmental performance specifications use test procedures as outlined in MIL-R23648D, MIL-STD 202 and AEC-Q200.
⁽²⁾ TFPTs are ESD sensitive.





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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А