



TCS10K5

10 kΩ NTC Cylindrical Head Thermistor



Graphic enlarged for detail

GENERAL DESCRIPTION:

This $\pm 1\%$ thermistor is encapsulated in a polyimide tube, for assemblies where surface mounting or embedding the thermistor is required. Ideal for tight mounting spaces with 38 AWG nickel bifilar leads and a diameter of 0.5 mm by 3 mm.

Thermal Resistance or Dissipation Constant is 0.2 mW/°C.

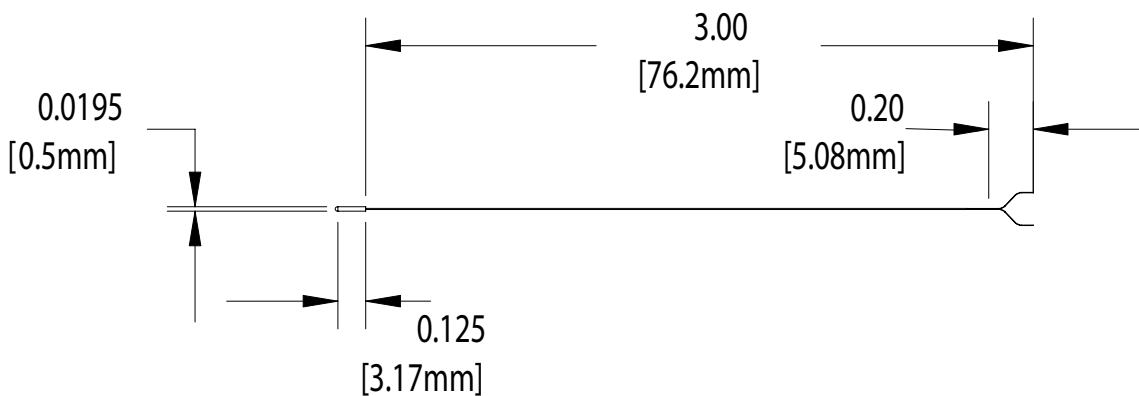
Thermal Time Constant is 200 mSec.

FEATURES:

- Low Cost
- Ideal for Optical or Thin Surfaces & Small Laser Packages
- 1% Tolerance
- 3" Long Nickel Bifilar Leads
- Isolated Leads Provide Isolation from Metal Housing
- RoHS Compliant

Thermistor Selection Guide			
MODEL	R @ 25 °C	10 μ A RANGE	100 μ A RANGE
TCS605	5 kΩ	-55 to -2 °C	-20 to +33 °C
TCS610	10 kΩ	-45 to +13 °C	-8 to +50 °C
TCS10K5	10 kΩ	-45 to +13 °C	-8 to +50 °C
TCS620	20 kΩ	-35 to +28 °C	+6 to +69 °C
TCS650	50 kΩ	-18 to +49 °C	+25 to +92 °C
TCS651	100 kΩ	-6 to +67 °C	+41 to +114 °C

Figure 1
Dimensions



RESISTANCE VERSUS TEMPERATURE RESPONSE

TCS10K5 10 kΩ THERMISTOR @ 25°C

10 μA TEMPERATURE RANGE: -45 to +13°C

100 μA TEMPERATURE RANGE: -8 to +50°C

TEMP (°C)	R _T (Ω)	VOLT (V) (10 μA)	VOLT (V) (100 μA)	TEMP (°C)	R _T (Ω)	VOLT (V) (10 μA)	VOLT (V) (100 μA)	TEMP (°C)	R _T (Ω)	VOLT (V) (10 μA)	VOLT (V) (100 μA)
-45	473200	4.732		-13	65260	0.652		19	13070		1.307
-44	441800	4.418		-12	61750	0.617		20	12490		1.249
-43	412600	4.126		-11	58450	0.584		21	11940		1.194
-42	385600	3.856		-10	55340	0.553		22	11420		1.142
-41	360500	3.605		-9	52420	0.524		23	10920		1.092
-40	337200	3.372		-8	49670	0.496	4.967	24	10450		1.045
-39	315500	3.155		-7	47080	0.470	4.708	25	10000		1.000
-38	295400	2.954		-6	44640	0.446	4.464	26	9572		0.957
-37	276700	2.767		-5	42340	0.423	4.234	27	9165		0.916
-36	259300	2.593		-4	40170	0.401	4.017	28	8777		0.877
-35	243100	2.431		-3	38120	0.381	3.812	29	8408		0.840
-34	228000	2.280		-2	36200	0.362	3.620	30	8056		0.805
-33	213900	2.139		-1	34380	0.343	3.438	31	7721		0.772
-32	200800	2.008		0	32660	0.326	3.266	32	7402		0.740
-31	188600	1.886		1	31040	0.310	3.104	33	7098		0.709
-30	177200	1.772		2	29510	0.295	2.951	34	6808		0.680
-29	166500	1.665		3	28060	0.280	2.806	35	6531		0.653
-28	156600	1.566		4	26690	0.266	2.669	36	6267		0.626
-27	147300	1.473		5	25400	0.254	2.540	37	6015		0.601
-26	138600	1.386		6	24180	0.241	2.418	38	5774		0.577
-25	130500	1.305		7	23020	0.230	2.302	39	5545		0.554
-24	122900	1.229		8	21920	0.219	2.192	40	5326		0.532
-23	115800	1.158		9	20890	0.208	2.089	41	5116		0.511
-22	109200	1.092		10	19900	0.199	1.990	42	4916		0.491
-21	103000	1.030		11	18970	0.189	1.897	43	4725		0.472
-20	97130	0.971		12	18090	0.180	1.809	44	4543		0.454
-19	91660	0.916		13	17260	0.172	1.726	45	4368		0.436
-18	86540	0.865		14	16470		1.647	46	4201		0.420
-17	81730	0.817		15	15710		1.571	47	4041		0.404
-16	77220	0.772		16	15000		1.500	48	3888		0.388
-15	72980	0.729		17	14320		1.432	49	3742		0.374
-14	69000	0.690		18	13680		1.368	50	3602		0.360

You can approximate the response of a thermistor with the Steinhart-Hart Equation. The A, B, and C values listed below apply to the following equation. The coefficients are optimized for the ranges covered by the reference currents.

$$\frac{1}{T} = A + B \times \ln R + C \times (\ln R)^3, \text{ where } R \text{ is in ohms and } T \text{ is in Kelvin}$$

Steinhart-Hart Coefficients			
10 μA RANGE		100 μA RANGE	
A	1.1235E-03	A	1.1279E-03
B	2.3500E-04	B	2.3429E-04
C	8.4538E-08	C	8.7298E-08

CERTIFICATION:

Wavelength Electronics (WEI) certifies that this product met it's published specifications at the time of shipment. Wavelength further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by that organization's calibration facilities, and to the calibration facilities of other International Standards Organization members.

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REVISION HISTORY		
REVISION	DATE	NOTES
REV. A	30-Jun-08	Added technical detail per customer request



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