



### TCS605

5 kΩ NTC Bead Head Thermistor



TCS605 NTC THERMISTOR

#### GENERAL DESCRIPTION:

These ±1% thermistors are conformally coated, two-lead thermistors for applications where embedding the thermistor is required. The coating is baked on phenolic for durability and long term stability. They have solid nickel wires with Teflon® insulation to provide isolation when assembled in metal housings.

#### FEATURES:

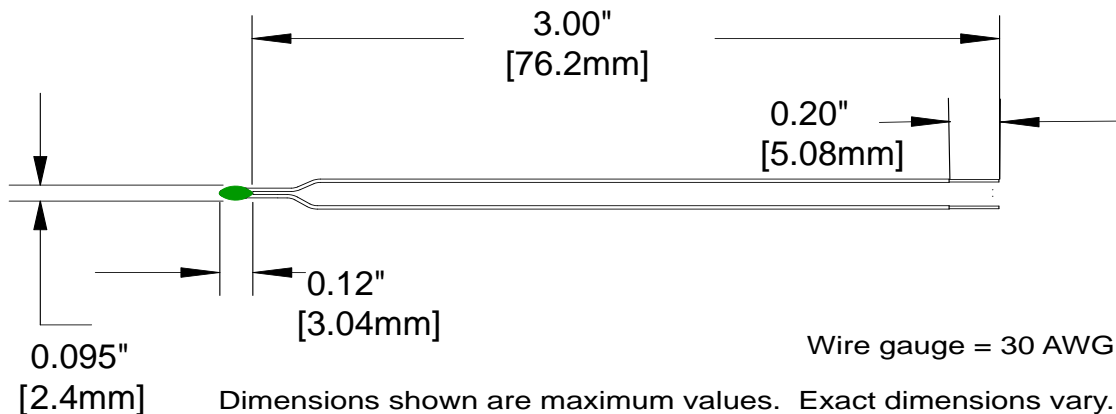
- Low Cost
- Small Size -- Conformally Coated
- Wide Resistance Range
- Available in 5 Different R-T Curves
- 1% Tolerance
- 3" Long Solid Nickel Wire Leads
- Teflon® Insulation Provides Isolation from Metal Housing
- RoHS Compliant (by exemption)

**Thermal Resistance or Dissipation Constant is 2-3 mW / °C.**

**Thermal Time Constant is 6-14 seconds.**

Thermistor Selection Guide			
MODEL	R @ 25°C	10 μA RANGE	100 μA 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

## TCS605 5 kΩ THERMISTOR @ 25°C

10 μA TEMPERATURE RANGE: -55 to -2°C

100 μA TEMPERATURE RANGE: -20 to +33°C

TEMP (°C)	R <sub>T</sub> (Ω)	VOLT (V) (10 μA)	VOLT (V) (100 μA)	TEMP (°C)	R <sub>T</sub> (Ω)	VOLT (V) (10 μA)	VOLT (V) (100 μA)	TEMP (°C)	R <sub>T</sub> (Ω)	VOLT (V) (10 μA)	VOLT (V) (100 μA)
-55	483850	4.838		-25	65250	0.652		4	13345		1.334
-54	449350	4.493		-24	61450	0.614		5	12700		1.270
-53	417600	4.176		-23	57900	0.579		6	12090		1.209
-52	388250	3.882		-22	54600	0.546		7	11510		1.151
-51	361200	3.612		-21	51500	0.515		8	10960		1.096
-50	336150	3.361		-20	48565	0.485	4.856	9	10445		1.044
-49	313050	3.130		-19	45830	0.458	4.583	10	9950		0.995
-48	291650	2.916		-18	43270	0.432	4.327	11	9485		0.948
-47	271900	2.719		-17	40865	0.408	4.086	12	9045		0.904
-46	253550	2.535		-16	38610	0.386	3.861	13	8630		0.863
-45	236600	2.366		-15	36490	0.364	3.649	14	8235		0.823
-44	220900	2.209		-14	34500	0.345	3.450	15	7855		0.785
-43	206300	2.063		-13	32630	0.326	3.263	16	7500		0.750
-42	192800	1.928		-12	30875	0.308	3.087	17	7160		0.716
-41	180250	1.802		-11	29225	0.292	2.922	18	6840		0.684
-40	168600	1.686		-10	27670	0.276	2.767	19	6535		0.653
-39	157750	1.577		-9	26210	0.262	2.621	20	6245		0.624
-38	147700	1.477		-8	24835	0.248	2.483	21	5970		0.597
-37	138350	1.383		-7	23540	0.235	2.354	22	5710		0.571
-36	129650	1.296		-6	22320	0.223	2.232	23	5460		0.546
-35	121550	1.215		-5	21170	0.211	2.117	24	5225		0.522
-34	114000	1.140		-4	20085	0.200	2.008	25	<b>5000</b>		<b>0.500</b>
-33	106950	1.069		-3	19060	0.190	1.906	26	4786		0.478
-32	100400	1.004		-2	18100	0.181	1.810	27	4583		0.458
-31	94300	0.943		-1	17190		1.719	28	4389		0.438
-30	88600	0.886		0	<b>16330</b>		<b>1.633</b>	29	4204		0.420
-29	83250	0.832		1	15520		1.552	30	4028		0.402
-28	78300	0.783		2	14755		1.475	31	3861		0.386
-27	73650	0.736		3	14030		1.403	32	3701		0.370
-26	69300	0.693						33	3549		0.354

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	1.2851E-03	A	1.2751E-03
B	2.3627E-04	B	2.3781E-04
C	9.2045E-08	C	8.6537E-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.

**WARRANTY:**

This Wavelength product is warranted against defects in materials and workmanship for a period of one (1) year from date of shipment. During the warranty period, Wavelength will, at its option, either repair or replace products which prove to be defective.

**WARRANTY SERVICE:**

For warranty service or repair, this product must be returned to the factory. An RMA is required for products returned to Wavelength for warranty service. The Buyer shall prepay shipping charges to Wavelength and Wavelength shall pay shipping charges to return the product to the Buyer upon determination of defective materials or workmanship. However, the Buyer shall pay all shipping charges, duties, and taxes for products returned to Wavelength from another country.

**LIMITATIONS OF WARRANTY:**

The warranty shall not apply to defects resulting from improper use or misuse of the product or operation outside published specifications.

No other warranty is expressed or implied. Wavelength specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

**EXCLUSIVE REMEDIES:**

The remedies provided herein are the Buyer's sole and exclusive remedies. Wavelength shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.



**WAVELENGTH ELECTRONICS, INC.**

**51 Evergreen Drive  
Bozeman, Montana, 59715  
phone: (406) 587-4910 Sales/Tech Support  
fax: (406) 587-4911  
e-mail: [sales@teamwavelength.com](mailto:sales@teamwavelength.com)  
web: [www.teamwavelength.com](http://www.teamwavelength.com)**



**NOTICE:**

The information contained in this document is subject to change without notice. Wavelength will not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of Wavelength.

**SAFETY:**

There are no user serviceable parts inside this product. Return the product to Wavelength Electronics for service and repair to ensure that safety features are maintained.

**LIFE SUPPORT POLICY:**

As a general policy, Wavelength Electronics, Inc. does not recommend the use of any of its products in life support applications where the failure or malfunction of the Wavelength Electronics, Inc. product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. Wavelength Electronics, Inc. will not knowingly sell its products for use in such applications unless it receives written assurances satisfactory to Wavelength Electronics, Inc. that the risks of injury or damage have been minimized, the customer assumes all such risks, and there is no product liability for Wavelength Electronics, Inc. Examples of devices considered to be life support devices are neonatal oxygen analyzers, nerve stimulators (for any use), auto transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, ventilators of all types, and infusion pumps as well as other devices designated as "critical" by the FDA. The above are representative examples only and are not intended to be conclusive or exclusive of any other life support device.

REVISION HISTORY		
REVISION	DATE	NOTES
REV. A	17-Jun-08	Added technical detail per customer request
REV. B	25-Sep-09	Updated to reflect RoHS status
REV. C	5-Feb-11	Updated dimensions in Figure 1
REV. D	30-Aug-13	Added wire gauge and extended warranty