Original

REVISIONS

SYMBOL	PREP BY	DESCRIPTION	DATE	APPROVAL
A	M. Lennon	Table II Lead Material was WD7	10/3/86	GHK JSC
B	M. Lennon	3.2 Physical dimensions 2.92 mm dia. ±,254 was 3.175 mm max. 3.4.5 Fourth sentence was "No heat sinks--"	3/21/88	GHK DSC

PREPARED BY Matthew J. Lennon /Sperry Systems Mgmt.	DATE 31 Jul 86	TITLE Thermistor (Thermally Sensitive Resistor), Insulated, Negative Temperature Coefficient, Super Stable, Glass Encapsulated, Style 311-424, Specification for
APPROVED Gerard F Kiernan G. Kiernan /Sperry Systems Mgmt.	8/8/86	
APPROVED John A. Henegar /GSFC	8-15-86	
APPROVED David G Cleveland D. G. Cleveland /GSFC	8.15.86	
		#S-311-424B

Office of Flight Assurance
Parts Branch

NASA
National Aeronautics and
Space Administration

GSFC
Goddard Space Flight Center
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CONTENTS

ILLUSTRATIONS

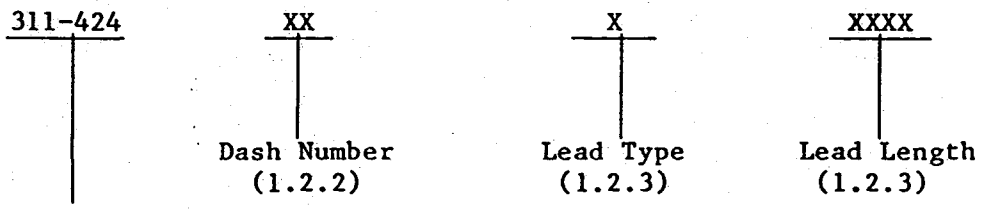
TABLES

1.0 SCOPE

1.1 This specification covers the detail requirements for Hermetic Glass Encapsulated Thermistors to be used for temperature control and measurement over the specified temperature range, during extended flight in space or in sensitive ground equipment. The maximum working temperature for these devices is 125°C.

1.2 CLASSIFICATION

1.2.1 Type Designation The type designation shall be in the following form.



GSFC Prefix (Standard for all Glass Encapsulated Thermistors)

1.2.2 Dash Number The dash number corresponds to the zero-power resistance at +25°C of the thermistor for three levels of interchangeability tolerance. These values are listed in Table I.

TABLE I

Zero-power Resistance @+25°C and Interchangeability Tolerance

Dash Number	Zero-Power Resistance Ohms @+25°C	Interchangeability Tolerance 0 to 70°C Degrees C	Tolerance %R 0 to 70°C	Resistance Ratio 25 to 125°C
11	2252	± 0.2	±1.02	29.26
12	3000	± 0.2	±1.02	29.26
13	5000	± 0.2	±1.02	29.26
14	10000	± 0.2	±0.93	23.51
15	10000	± 0.2	±1.02	29.26

TABLE I (continued)

Zero-power Resistance @+25°C and Interchangeability Tolerance

Dash	Zero-Power Resistance Ohms @+25°C	Interchangeability Tolerance 0 to 70°C Degrees C	Tolerance %R 0 to 70°C	Resistance Ratio 25 to 125°C
16	30000	± 0.2	±1.00	29.15
17	2252	± 0.1	±0.51	29.26
18	3000	± 0.1	±0.51	29.26
19	5000	± 0.1	±0.51	29.26
20	10000	± 0.1	±0.48	23.51
21	10000	± 0.1	±0.51	29.26
22	30000	± 0.1	±0.50	29.15
23	2252	± 0.05	±0.26	29.26
24	3000	± 0.05	±0.26	29.26
25	5000	± 0.05	±0.26	29.26
26	10000	± 0.05	±0.24	23.51
27	10000	+ 0.05	±0.26	29.26

1.2.3 Lead Configuration The identification of the lead configuration to be included in the Type designation for material and lead length shall be as listed in Table II.

Table II
Lead Configuration

Lead Type	Lead Material	Lead Length
S	#32 AWG, Type WD2 per Mil-Std-1276	Four spaces (XXXX) indicate length in centimeters. Example: 7R6 - 7.6 cm Standard 10R2 - 10.2 cm 12R8 - 12.8 cm 15R2 - 15.2 cm Maximum 1/
E	Insulated Lead - TFE #30 AWG per Mil-I-22129 Bare lead - S	

1/ Longest available without special negotiation.

2.0 APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on the date of invitation for proposal, form a part of this specification to the extent specified herein. In the event of a conflict between this specification and any document referenced here-in this specification will govern.

Federal
- PPP-B-566 - Boxes Folding Paperboard
- PPP-B-636 - Box, Fiberboard
- PPP-B-676 - Boxes, Set-up
- PPP-T-60 - Tape: Pressure-sensitive adhesive, Waterproof for packaging.
- PPP-T-76 - Tape, Packaging Paper (for carton sealing)

Military
- MIL-P-116 - Preservation Methods of
- MIL-W-16878 - Wire, Electrical Insulated, High Temperature
- MIL-I-22129 - Insulation Tubing, Electrical, Polytetrafluorethyline Resin, Non-rigid
- MIL-T-23648 - Thermistor, (Thermally Sensitive Resistor) Insulated
- MIL-C-45622 - Calibration System Requirements

Military Standards
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-202D - Test Methods for Electronic and Electrical Component Parts
- MIL-STD-1276 - Leads for Electronic Component Parts

3.0 REQUIREMENTS

3.1 General. Thermistors shall be tested by MIL-T-23648 methods and shall meet the test requirements specified here-in. The recommended operating temperature range and tolerance in percentages of resistance and degrees Celsius (C) are listed in Table III.

3.2 Physical and mechanical

3.2.1 Outline Dimensions The outline dimensions shall comply with either Figure 1a or 1b.

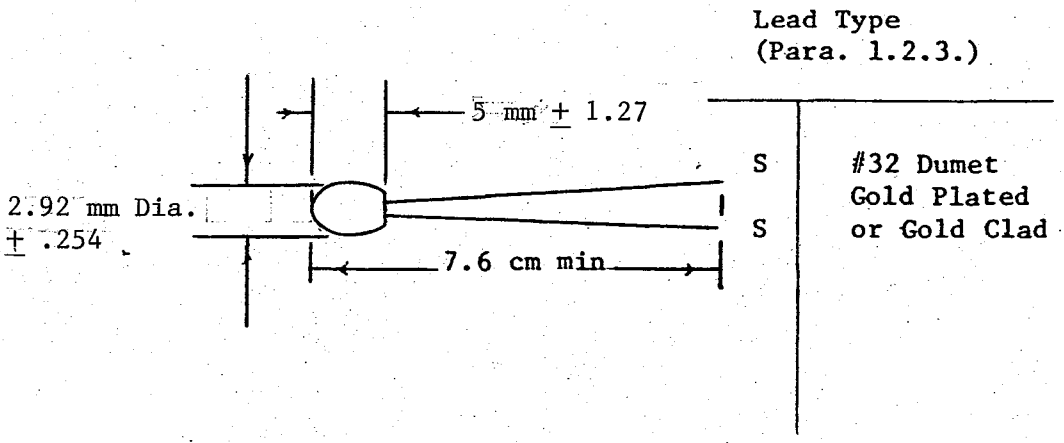


Figure 1a.

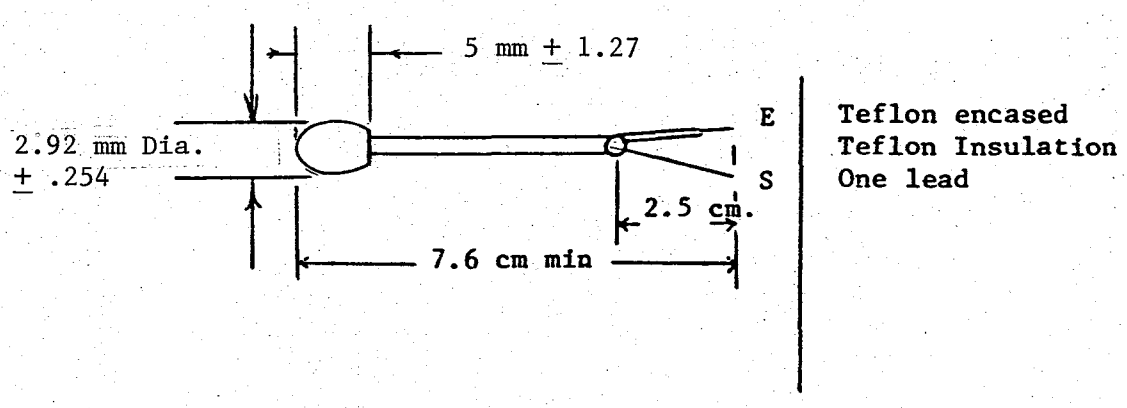


Figure 1b

Figure 1. Thermistor Configuration

Table III
Recommended Operating Range & Tolerance
(± % Resistance and ± Degrees C)

Dash No.	-80°C	-40°C	0°C	+40°C	+70°C	+100°C	+125°C
11 12 13 15	1.00°C 8.6%	0.40°C 2.65%	0.20°C 1.02%	0.20°C 0.80%	0.20°C 0.68%	0.30°C 0.88%	0.65°C 1.7%
14	1.00°C 7.4%	0.40°C 2.37%	0.20°C 0.93%	0.20°C 0.74%	0.20°C 0.64%	0.30°C 0.83%	0.65°C 1.6%
16	-- --	0.40°C 2.50%	0.20°C 1.00%	0.20°C 0.80%	0.20°C 0.68%	0.30°C 0.88%	0.65°C 1.74%
17 18 19 21	-- --	0.20°C 1.33%	0.10°C 0.51%	0.10°C 0.40%	0.10°C 0.34%	0.15°C 0.44%	-- --
20	-- --	0.40°C 2.37%	0.10°C 0.48%	0.10°C 0.37%	0.10°C 0.32%	0.30°C 0.83%	-- --
22	--	0.20°C 1.25%	0.10°C 0.50%	0.10°C 0.40%	0.10°C 0.34%	0.15°C 0.44%	-- --
23 24 25 27	-- --	-- --	0.05°C 0.26%	0.05°C 0.20%	0.05°C 0.17%	-- --	-- --
26	-- --	-- --	0.05°C 0.24%	0.05°C 0.20%	0.05°C 0.16%	-- --	-- --

3.2.2 Coating Thermistor elements shall be coated with a uniform coating of glass.

3.2.3 Terminal Strength (Pull) Thermistors leads shall be subjected to 0.5 lb pull per Method 211, MIL-STD-202, Test Condition A, and shall incur no mechanical damage nor thereafter feature change in 40°C zero power resistance shall not exceed 0.5%.

3.2.4 Workmanship Thermistors shall be clean and free of foreign material and when viewed under 10X magnification shall be seen to be free of the following.

(a) Cracks in the glass or open voids
(b) Damaged wire leads by nicks or crushing

3.2.5 Solderability When thermistors are tested in accordance with Method 208 of MIL-STD-202 the dipped surface of the leads shall be at least 95 percent covered with a new solder coating. The remaining 5 percent of the lead surface shall show only small pinholes or voids and these shall not be concentrated in one area. Bare base metal shall not show and is cause for rejection as evidence of poor solderability.

3.3 Electrical

3.3.1 Zero Power Resistance The zero power values at 25°C shall be as specified in Table I. The zero power resistance values at temperatures over the temperature range -80°C to +125°C are as specified in Table IV.

(a) Measurement shall be made by submerging the thermistor in a well-stirred oil bath. The oil bath temperature shall be measured prior to, during and after the test. The temperature of the bath shall be measured and recorded within an accuracy of ±0.05°C.

(b) Dissipated power during the measurement shall not exceed 0.1 mw maximum.

3.3.2 Short Time Load Thermistors shall be mounted by normal mounting means in corrosion resistance clips.

(a) Using the value of dissipation constant and nominal resistance, compute the average value of voltage across the thermistor (E_{TH}) and current through the thermistor (I_{TH}) required to raise the thermistor to maximum power rating. Place the thermistor in the circuit of Figure 2 to accomplish this.
(b) Energize the circuit for 5 minutes. The maximum allowable change in 40°C zero power resistance as a result of the short time load test shall be 1%.

(c) De-energize the circuit for 10 minutes. Repeat this cycle for 10 complete cycles.

(d) Examine the thermistors for evidence of arcing, burning or charring and reject if such occurs.

(e) Sixty minutes after removal from cycling, the zero power resistance shall be measured as in 3.3.1 and must be as specified in Table II.

3.3.3 Insulation Resistance The thermistor insulation resistance shall be tested in accordance with Method 302 of MIL-STD-202, Test Condition A (100v), and shall be greater than 500 megohms.

3.3.4 Dissipation Constant The dissipation constant is the ratio (in milliwatts per degree C) at a specified ambient temperature, of a change in power dissipation in a thermistor to the resultant body temperature change. The dissipation constant shall be greater than or equal to 1.0 milliwatt per degree Celsius in still air.

3.3.4.1 Measure the dissipation constant, P, using the test circuit of Figure 2. First measure the zero power resistance at two temperatures, 25°C and 75°C, per 3.3.1. Place the thermistor in a still air controlled chamber with a minimum volume of 1000 times the thermistor body and test fixture volume. The chamber temperature shall be at 25 ± 1°C. Adjust E_{TH} and I_{TH} for zero power resistance values of 75°C and maintain for 15 minutes maximum. Compute the dissipation constant in mw/°C using:

$$\frac{P}{50} = \frac{E_{TH} \times I_{TH}}{75°C - 25°C}$$

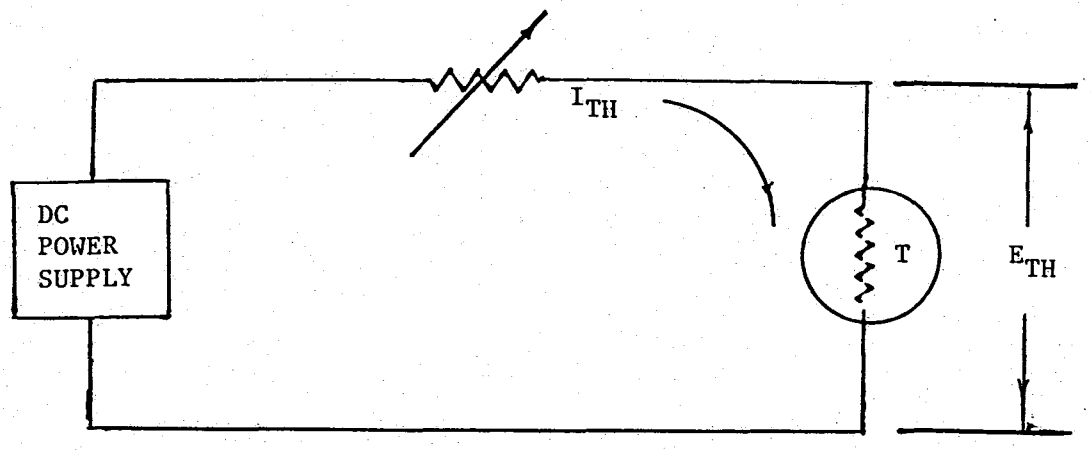


Figure 2. Test Circuit for Measuring Dissipation Constant

3.3.5 Thermal Time Constant The thermal time constant is the time required for the thermistor to change 63.2% of the total difference between its initial and final body temperature when subjected to a step function change in temperature under zero-power condition and shall not exceed 30 seconds in still air.

3.3.5.1 Measure the time constant using the test circuit of Figure 3. Measure and record the zero-power resistance at 43.4°C and 75°C per 3.3.1. Place the thermistor in a still air chamber maintained at 25 ± 1°C, with a minimum volume of 1000 times the thermistor body and test

Table IV

Resistance Versus Temperature °C

Dash No.	11 17 23	12 18 24	13 19 25	15 21 27	14 20 26	16 22
Ohms @ 25°C	2252	3000	5000	10,000	10,000	30,000
Temp °C	Ohms					
-80	1660K	2211K	3685K	7371K	3558K	--
-75	1071K	1426K	2378K	4756K	2440K	--
70	702.3K	935.4K	1560K	3119K	1694K	--
65	467.9K	623.3K	1039K	2018K	1190K	--
60	316.5K	421.5K	702.9K	1405K	845.9K	--
55	217.1K	289.2K	482.2K	964.0K	607.K	--
50	151.0K	201.1K	335.3K	670.5K	441.3K	--
45	99.26K	132.2K	220.5K	440.8K	304.6K	--
40	75.79K	101.0K	168.3K	336.5K	239.8K	884.6K
-35	54.66K	78.81K	121.4K	242.K	179.2K	649.3K
30	39.86K	53.10K	88.53K	177.0K	135.2K	481.0K
25	29.38K	39.13K	65.24K	130.5K	102.9K	359.6K
20	21.87K	29.13K	48.56K	97.11K	78.91K	271.2K
15	16.43K	21.89K	36.49K	72.96K	61.02K	206.2K
10	12.46K	16.60K	27.67K	56.33K	47.54K	158.0K
5	9534	12.70K	21.17K	42.34K	37.31K	122.1K
0	7355	9796	16.33K	32.66K	29.49K	94.98K
+ 5	5719	7618	12.70K	25.40K	23.46K	74.44K
10	4482	5971	9951	19.90K	18.79K	58.75K
15	3539	4714	7857	15.71K	15.13K	46.67K
20	2814	3748	6247	12.50K	12.26K	37.30K
25	2252	3000	5000	10.00K	10.00K	30.00K
30	1815	2417	4029	8060	8194	24.27K
35	1471	1959	3266	6532	6752	19.74K
40	1200	1598	2663	5329	5592	16.15K
+43.4	1048	1396	2327	4652	4934	14.13K
45	983.8	1310	2184	4369	4655	13.28K
50	811.3	1081	1801	3603	3893	10.97K
55	672.5	895.8	1493	2986	3270	9109
60	560.3	746.3	1244	2488	2760	7599
65	469.0	624.7	1041	2083	2339	6367

Table IV (continued)

Resistance Versus Temperature °C

Dash No.	11 17 23	12 18 24	13 19 25	15 21 27	14 20 26	16 22
Ohms @ 25°C	2252	3000	5000	10,000	10,000	30,000
Temp °C	Ohms					
70	394.5	525.4	875.7	1752	1990	5359
75	333.1	444.0	740.0	1479	1700	4529
80	282.7	376.9	628.1	1255	1458	3843
85	240.9	321.2	535.4	1070	1255	3273
90	206.1	274.9	458.2	915.2	1084	2799
95	177.1	236.2	393.7	786.4	939.3	2402
100	152.8	203.8	339.6	678.5	816.8	2069
105	132.3	176.4	294.0	587.5	712.6	1788
110	115.0	153.2	255.4	510.7	623.5	1550
115	100.2	133.6	222.6	444.9	547.3	1348
120	87.7	116.8	194.7	389.4	481.8	1176
125	77.0	102.5	170.8	341.9	425.3	1029

fixture volume. With switch A-A closed adjust E_{TH}/I_{TH} ratio equal to the zero-power resistance at 75°C. Allow 15 minutes (maximum) for stabilization. Set the bridge for null with the zero-power resistance value measured at 43.4°C. Prepare to measure the time from the instant that the switch is thrown to the position B-B to the time the bridge indicator passes through the null point. Throw the switch and record the time.

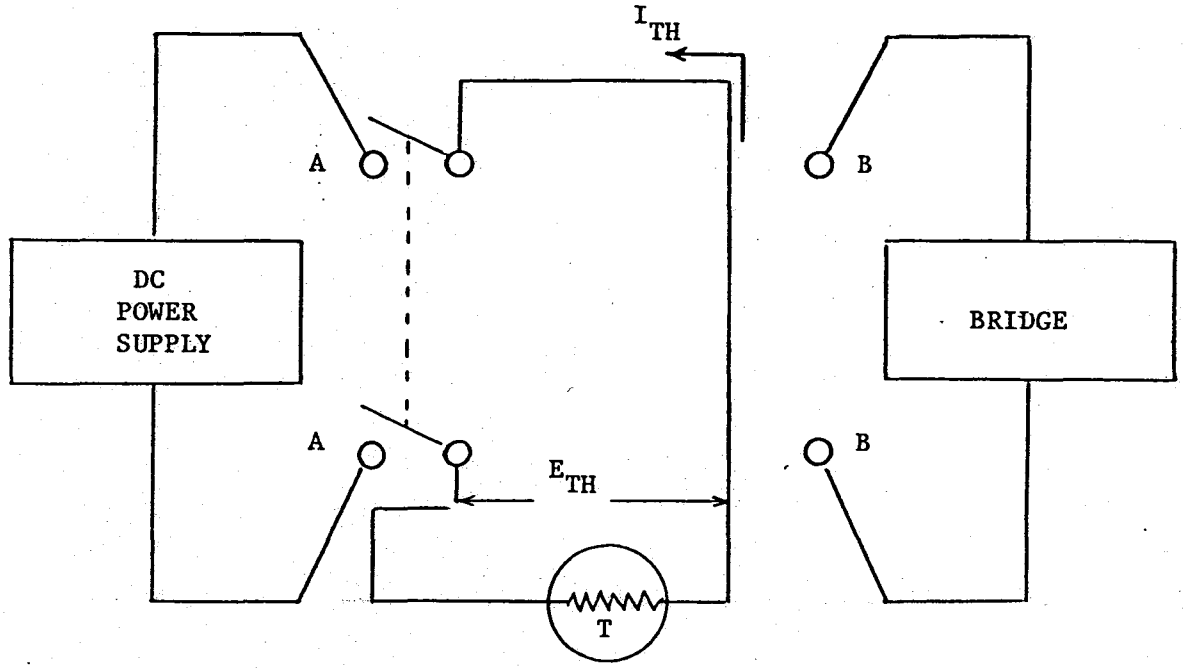


Figure 3. Test Circuit for Measuring Thermal Time Constant

3.4 Environmental

3.4.1 General. The devices shall be glass encapsulated to form a hermetic seal to enable the device to meet the performance requirements of the specification and that the device shall not be affected physically, mechanically or electrically over the temperature range -80^{+5}_{-0}°C to +125°C.

3.4.2 Low Temperature Storage. Thermistor shall be maintained at -80^{+5}_{-0}° for a period of not less than three hours. The stabilized zero power resistance shall be measured initially and at completion per 3.3.1. The change in resistance at 40°C shall be less than 1%. The thermistors shall show no voids, cracks or other physical damage either prior to or at the completion of this test.

3.4.3 High Temperature Storage. Thermistor shall be maintained at 125°C + 0°C, -8°C, for a period of 100 hours. The stabilized zero power resistance shall be measured initially and at completion per paragraph 3.3.1. The change in resistance at 40°C shall be less than 0.5%. The thermistors

shall show no evidence of voids or cracks either prior to or at the completion of this test.

3.4.4 Thermal Shock Thermistors shall be tested in accordance with Method 107, Condition C, of MIL-STD-202. The zero power resistance shall be measured initially and at completion per 3.3.1. The thermistors shall show no voids, cracks or evidence of mechanical damage either prior to or at the completion of this test. The maximum change in resistance at 40°C as a result of this test shall be 1%.

3.4.5 Resistance to Soldering Heat Thermistors shall be tested per Method 210 of MIL-STD-202. The temperature of the molten solder shall be 300 ± 10°C. Immersion shall be to a point 1/8 to 3/16 inches from the thermistor body and the time of immersion shall be 2 ± 1 sec. Heat sinks shall be used and examination and measurements shall be after a cooling time of 24 ± 4 hours. The zero power measurement shall be made initially and after cooling per 3.3.1. Thermistors shall show no voids, cracks or evidence of mechanical damage either prior to or at the completion of this test. The maximum allowable change in resistance is ±0.5%.

3.4.6 Moisture Resistance Thermistors shall be tested in accordance with Method 106 of MIL-STD-202. Thermistors shall be measured at 40°C per 3.3.1 prior to and after the completion of the test. During the test the thermistor will be maintained at 100% of the maximum power specified. The final reading must be taken within 24 hours of the last cycle. The maximum allowable change in resistance shall be ±5%.

3.4.7 High Temperature Exposure Thermistors shall be maintained at 125°C + 0°C, -8°C for 1000 hours + 20 hours, -0 hours. Zero power resistance shall be measured at 40°C per 3.3.1 initially after the completion of 100 hours + 10 hours, -0 hours and at the completion of the test. The maximum allowable change in resistance at 100 hours shall be less than 0.5% and at completion 1%.

3.4.8 Vibration High Frequency Thermistors shall be tested per Method 204, Test Condition D, of MIL-STD-202. Thermistors shall be mounted by their leads with spacing of 1/4 inch maximum from mounting surface to body. Measurement shall be made during test to detect any discontinuity of 0.1 millisecond duration or greater. Zero power resistance shall be measured per 3.3.1 initially and at completion of test. The change in resistance shall be less than 1%. Thermistors shall show no voids, cracks or evidence of mechanical damage either prior to or at the completion of the test.

3.4.9 Immersion Thermistors shall be tested in accordance with Method 104, Condition B, of MIL-STD-202. Zero power resistance shall be measured at 40°C per 3.3.1 initially and within 24 hours after the last cycle. The maximum allowable change in resistance shall be less than 2%. The insulation resistance per 3.3.3 shall be measured within two hours of the completion of the last cycle.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection The supplier shall be responsible for the performance of all inspection requirements as specified herein. Inspection records of examination and tests shall be kept complete and available.

4.1.1 Test Equipment and Inspection Facilities The test equipment and inspection facilities shall be of sufficient accuracy to perform the required inspections. The supplier shall establish and maintain a calibration system of all instrumentation in accordance with MIL-C-45662.

4.1.2 Qualification Inspection The thermistors shall be tested to demonstrate the capability to meet the specified requirements to the qualified construction, materials and processes.

4.1.2.1 Sample A Sample consisting of 50 thermistors shall have 25 sample units of the lowest and 25 sample units of the highest resistance values.

4.1.2.2 Test Data Each submission shall be accompanied by the test data obtained from these tests.

4.1.2.3 Test Routine Sample units shall be subjected to the qualification inspection specified in Table V, in the order shown. All sample units with the exception of those in group IA shall be subjected to the inspection of Group I. The 50 sample units from Group I shall then be divided as specified in Table V for Group II thru V inclusive and subjected to the inspection for their particular Group.

4.1.2.4 Resistance Temperature Characteristics The thermistors shall be stabilized at each of the ambient temperatures listed in Table VI for the Group III test. Zero power measurements shall be performed per 3.3.1 at each specified temperature, after a stabilization time equal to but not less than 12 seconds. The resistance shall be tabulated for each temperature.

4.1.2.5 Retention of Qualification In order to retain qualification, the supplier shall forward at six month intervals a summary of Group A tests indicating as a minimum, the number of lots which passed, and the number which failed. All lots that fail shall be reported to NASA individually as they occur:

Table V

Qualification Inspection

Examination or Test	Requirement Paragraph	Number of Sample Units	Allowable Defectives[1]
Group I			
Visual and mechanical examination	3.2	All sample units[3]	0
Zero-power resistance[2]	3.3.1		
Group IA			
Solderability (If specified)	3.2.6	20 single or 10 both leads	1
Group II			
Short time load	3.3.2		
Insulation resistance	3.3.3		
Low temperature storage	3.4.2	10	1
High temperature storage	3.4.3		
Dissipation constant[2]	3.3.4		
Thermal time constant[2]	3.3.5		
Terminal strength	3.2.4		
Group III			
Resistance-temperature characteristic[2]	4.1.2.5		
Thermal shock	3.4.4		
Resistance to soldering heat (If applicable)	3.4.5	10	1
Moisture resistance	3.4.6		
Group IV			
High temperature exposure	3.4.7	10	1
Group V			
Vibration, high frequency	3.4.8		
Immersion	3.4.9	10	1

1 Failure of the same thermistor in one or more tests of a group shall be charged as a single defective thermistor.

2. Nondestructive tests.

3. Sample units for Group IA shall not be subjected to Group I.

Table VI

Resistance-Temperature Characteristic Test Temperatures

Step	Temperature(C)
1	-80^{-0}_{+5}
2	-35
3	-15
4	0
5	+25
6	+40 or +50
7	+70 or +75
8	+125

4.1.3 Quality Conformance Inspection Quality Conformance Inspection is performed to demonstrate the capability of the thermistor to meet the specified requirements with the established construction, design, material and processes. This inspection is performed on a deliverable product from a particular lot.

4.1.3.1 Inspection Lot The inspection lot shall consist of all of the thermistors with the same design and materials manufactured to the same production processes within a period not to exceed 6 weeks or 1000 units. All thermistors shall be identical in all respects and shall be directly interchangeable in form, fit and function with other thermistors in the lot.

4.1.3.2 Group A Inspection Group A inspection shall consist of the examination and tests specified in Table VII and shall be performed in the order therein on 100% of the inspection lot. The thermistors shall be stabilized at steps 4, 6 and 7 of Table VI in satisfying the requirements of Step 7 of Table VII. Zero power resistance shall be made per 3.3.1.

Table VII

Group A Inspection

Step	Examination or Test 100% Inspection	Requirement Para.#
1	Visual & Mechanical	3.2
2	Zero-power resistance	3.3.1
3	Thermal Shock	3.4.4
4	High Temp. Storage	3.4.3
5	Zero-power resistance	3.3.1
6	Insulation resistance	3.3.3
7	Resistance-temperature characteristic	3.3.1

5.0 PREPARATION FOR DELIVERY

5.1 Preservation and Packaging Preservation and packaging shall be level A or C, as specified (see 6.1).

5.1.1 Level A

5.1.1.1 Cleaning Thermistors shall be cleaned in accordance with MIL-P-116, process C-1.

5.1.1.2 Drying Thermistors shall be dried in accordance with one or more of the procedures listed in MIL-P-116. The procedure used shall not be injurious to the item.

5.1.1.3 Preservative Application None required.

5.1.1.4 Unit Packaging Thermistors shall be individually packaged in a manner to insure compliance with the Physical (Methods of Preservation) and General paragraphs of MIL-P-116, method IA8.

5.1.1.5 Intermediate Packaging Thermistors, packaged as described in 5.1.1.4, shall be placed in intermediate containers conforming to PPP-B-566 or PPP-B-676. Intermediate containers shall be uniform in size and shape, shall be of minimum cube and tare, and shall contain multiples of five unit packages, not to exceed 100 packages or ten pounds. No intermediate packaging is required when the total quantity shipped to a single destination is less than 100 units.

5.1.2 Level C Thermistors shall be preserved and packaged in a manner that will afford adequate protection against corrosion, deterioration, and physical damage during shipment from supply source to the first receiving activity for immediate use. This package may conform to the suppliers commercial practice for retail distribution when such meets the requirements of this level.

5.2 Packing Packing shall be level A, B, or C, as specified (see 6.1).

5.2.1 Level A The packaged item(s) shall be packed in fiberboard containers conforming to PPP-B-636, weather resistant, style optional, special requirement. In lieu of the closure and waterproof requirements in the appendix of PPP-B-636, closures and waterproofing shall be accomplished by sealing the center seams, ends edges, and manufacturer's joints with waterproof tape, 2 inches wide, conforming to PPP-T-60, class 1 or PPP-T-76. Banding (reinforcement requirements) shall be applied in accordance with the appendix to PPP-B-636, using non-metallic or tape banding only.

5.2.2 Level B The packaged item(s) shall be packed in fiberboard containers conforming to PPP-B-636, class domestic, style and use requirements optional. Closure shall be in accordance with the appendix thereto.

5.2.3 Level C The packaged item(s) shall be packed in a manner that will afford adequate protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. This pack shall conform to the applicable carrier rules and regulations and may be the supplier's commercial practice when such conforms to the requirements of this level.

5.3 Marking(see 6.1) In addition to any special marking required by the contract or order, each unit package, intermediate and exterior containers shall be marked in accordance with MIL-STD-129.

5.4 General Exterior containers shall be of a minimum tare and cube consistent with the protection required and shall contain equal quantities of identical items to the greatest extent possible.

NOTES

6.1 Ordering Data Procurement documents should specify the following:

(a) Title, number and date of this detail specification, solderability when required, and the complete part number (see 1.2.1).

(b) Levels of preservation and packaging and packing and applicable marking (see 5.0)

(c) Method of preservation and packaging of MIL-P-116, if other than method of IA8 (see 5.1).

(d) Number of unit packages if other than that specified in 5.1.1.5.

6.2 Data Address When supplemental data, reports, or information requests are to be transmitted to GSFC, the following address shall be used unless otherwise specified.

Parts Branch, Code 311
Goddard Space Flight Center
Greenbelt, Maryland 20771

6.3 Qualification With respect to products requiring qualification, awards will be made only for products which have been tested and approved by GSFC before the time set for opening of bids. The attention of the suppliers is called to this requirement. Manufacturers should arrange to have qualification tests made on products which they propose to offer to GSFC to become eligible for awards of contracts or orders for products covered by this specification. The manufacturer shall bear the cost of qualification inspection to this specification. Information pertaining to qualification of products may be obtained from the Parts Branch, whose address is listed in 6.2.

6.4 WARNING. USE HEAT SINKS WHEN SOLDERING OR WELDING TO THERMISTOR LEADS.