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3 1006712

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03036	10/Dec/63	WHK
A	REVISED PER TDRR 06243	1-16-64	WHK
B	REVISED PER TDRR 08861	6/2/64	WHK
C	REVISED PER TDRR 12767	4/24/65	WHK
D	REVISED PER TDRR 19731	8/15/65	WHK
E	REVISED PER TDRR 24692	12/20/65	WHK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS AS LISTED IN TABLE III WITH REFERENCES TO MIL-T-23648 AND ND 1002057. ANY UNIT WILL BE CONSIDERED A FAILURE IF ITS ZERO-POWER RESISTANCE CHANGES BY MORE THAN 1.0% AS A RESULT OF HAVING BEEN SUBJECTED TO ANY OF THE ENVIRONMENTAL TESTS SPECIFIED.
   - D. MARKING: UNIT PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE OR SERIAL NUMBER, DATE OF MANUFACTURE, AND THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).
2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEAD MATERIAL: NICKEL (GRADE A) PER ND PS 1015400.
     - (2) PROTECTIVE VARNISH: MOISTURE AND FUNGUS PROOF VARNISH PER MIL-V-173.
     - (3) MATERIAL AND FINISH CERTIFICATION: LEAD MATERIAL AND RESISTOR MOISTURE PROOF VARNISH COMPLIANCE SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS (AT 25° ± 0.1°C):
     - (1) ZERO-POWER RESISTANCE VALUE: TABLE I VALUE ± 1%.
3. DESIGN REQUIREMENTS:
   - A. DISSIPATION CONSTANT: SEE TABLE I FOR THE AMOUNT OF POWER WHICH WILL RAISE THE THERMISTOR ONE DEGREE CENTIGRADE ABOVE AMBIENT.
   - B. TIME CONSTANT: SEE TABLE I FOR THE TIME REQUIRED FOR THE THERMISTOR TO REACH 63% OF THE TEMPERATURE CHANGE FOR A CERTAIN CHANGE IN AMBIENT TEMPERATURE. THE THERMISTOR WILL REACH 98% OF TEMPERATURE CHANGE IN APPROX 5 TIMES THE CONSTANT LISTED.
   - C. STORAGE LIFE: 1 YEAR MINIMUM AT ROOM TEMPERATURE AND HUMIDITY WHEN STORED IN UNOPENED CONTAINERS.
   - D. CONSTRUCTION: RESISTIVE WAFER MATERIAL WITH LEADS SOLDERED IN PLACE.
   - E. ENVIRONMENTAL: CAPABLE OF OPERATION OVER THE AMBIENT TEMPERATURE RANGE OF -55°C TO +105°C.
4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING: RESISTORS SHALL BE TESTED PER MIL-STD-202, METHOD 102, CONDITION C EXCEPT TEMPERATURE EXTREMES OF -55°C AND +105°C. RESISTANCE, ONE HOUR AFTER TESTING, SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.
   - B. BURN-IN: RESISTORS SHALL BE BURNED IN NON-OPERATING AT 50°C FOR 100 HOURS. RESISTANCE, ONE HOUR AFTER TESTING SHALL NOT VARY MORE THAN ± 1% FROM THE INITIAL MEASUREMENT. THERE SHALL BE NO MECHANICAL DAMAGE.

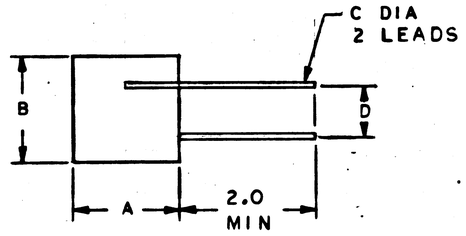
SPECIAL CONDITIONING (CONT'D)

   - C. FOLLOWING BURN-IN. THE ZERO-POWER RESISTANCE OF EACH UNIT SHALL BE MEASURED AT THREE(3) TEMPERATURES;

     0° ± 0.1°C, 25° ± 0.1°C, AND 50° ± 0.1°C. THE RESISTANCE MEASURED AT THESE TEMPERATURES SHALL BE SUPPLIED FOR EACH UNIT. A CERTIFICATE OF COMPLIANCE TO THE REQUIREMENTS OF PARA. 4A AND 4B ABOVE SHALL ALSO BE SUPPLIED WITH EACH LOT SHIPPED.

5. VENDOR SUPPLIED INFORMATION:
   - A. THE FOLLOWING DATA AND INFORMATION TO BE SUPPLIED WITH EACH SHIPMENT UNLESS OTHERWISE SPECIFIED. ALL DATA SUPPLIED WILL REFERENCE THE UNIT PART NUMBER, APPLICABLE DASH NUMBER, AND APPLICABLE PURCHASE ORDER NUMBER.
     - (1) A CERTIFICATE OF COMPLIANCE COVERING REQUIREMENTS OF PARA 2.A(3) AND 4.C. OF THIS SPECIFICATION AND PARA 3.3.3 OF ND1015404.
     - (2) TEST DATA AS REQUIRED BY PARA 4.C OF THIS SPECIFICATION.

.09 MAX



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS. — DWG. NO. — CONTRACT

DRAWN Ray Wheeler DATE Aug 63
CHECKED J. Ruggeri / A. Wright
APPROVAL C. MAYO 9/9/63
APPROVAL

NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006712
SCALE NONE	WT	SHEET 1 OF 2

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E 1006712

REVISIONS 03038			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 03038	10/Nov/63	WK
A	REVISED PER TDRR 06243	2-18-64	WK
B	REVISED PER TDRR 08861	6/2/64	WK
C	REVISED PER TDRR 12767	4/21/65	WK
D	REVISED PER TDRR 19731	6/15/65	WK
E	REVISED PER TDRR 24692	12/14/65	WK

TABLE I

DASH NO.	ZERO-POWER RESISTANCE IN OHMS +25±0.1°C	0±0.1°C	+50±0.1°C	DISSIPATION CONSTANT MW/°C MIN	TIME CONSTANT SECONDS MIN	DIMENSIONS A	B	C	D NOM
-1	500±1%	1,635±3%	179.7±3%	2.25	5.25	.19 .11	.19 .11	.021 .019	.10
-2	1,000±1%	3,274±3%	359.5±3%	1.95	3.75	.13 .07	.13 .07	.021 .019	.10
-3	5,000±1%	17,700±3%	1,630±3%	3.225	3.95	.28 .18	.28 .18	.021 .019	.20

TABLE II

EXAMINATION OR TEST	REQUIREMENT PARAGRAPHS
GENERAL QUALIFICATION REQUIREMENTS	PARA. 3.2 THROUGH 3.9.2 OF ND - 1002057
GROUP I (ALL SAMPLES)	
VISUAL & MECHANICAL	PARA 4.2.1 OF ND -1002057
ZERO-POWER RESISTANCE	PARA 4.5.2 OF MIL-T-23648 EXCEPT MEASURE AT 25°C, +50°C & 0°C
DISSIPATION CONSTANT	PARA 4.5.4 OF MIL-T-23648
THERMAL TIME CONSTANT	PARA 4.5.5 OF MIL-T-23648
MAXIMUM POWER RATING	PARA 3.3.7 OF MIL-T-23648 EXCEPT MEASURE POWER THAT PRODUCES TEMPERATURE RISE OF +80°C
GROUP II (1/3 OF SAMPLES)	
CHARACTERISTICS	
TEMPERATURE CYCLING	PARA 4.5.8 OF MIL-T-23648 (EXCEPT USE TEST CONDITION A OF MIL-STD-202)
THERMAL STABILITY	PARA 4.5.6 OF MIL-T-23648 EXCEPT TEMPERATURE IN PARA 4.5.6.2 WILL BE +105 ± 2°C
LOW TEMPERATURE STORAGE	PARA 4.5.7 OF MIL-T-23648 EXCEPT LOW TEMPERATURE WILL BE -55 ± 3°C
TERMINAL STRENGTH	PARA 4.5.10 OF MIL-T-23648
GROUP III (1/3 OF SAMPLES)	
VIBRATION	PARA 4.2.11 OF ND 1002057 (SEE NOTE 1)
SHOCK	PARA 4.2.12 OF ND 1002057 (SEE NOTE 1)
MOISTURE RESISTANCE	PARA 4.5.13 OF MIL-T-23648 (SEE NOTE 2)
GROUP IV (1/3 OF SAMPLES)	
LOAD LIFE	PARA 4.5.15 OF MIL-T-23648 EXCEPT INITIAL RESISTANCE MAY BE MEASURED PRIOR TO START OF LIFE. MAX OPERATING TEMPERATURE IS +105°C
LEAD COMPOSITION	PARA 4.2.16 OF ND 1002057

NOTE 1

THE AMOUNT OF POWER TO BE APPLIED WILL BE THAT NECESSARY TO RAISE THE THERMISTOR TEMPERATURE TO APPROX. +65°C UNDER NORMAL FREE AIR CONDITIONS. ZERO-POWER RESISTANCE WILL BE MEASURED BEFORE AND AFTER TEST PER PARA. 4.5.2. OF MIL-T-23648.

NOTE 2

INDICATED STEPS (a), (d), AND (f) REPLACED BY (1), (4), AND (7) RESPECTIVELY.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
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MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wade DATE 15 aug 63
CHECKED J. Ruggiero / M. Marquis 19 aug 63
APPROVAL A.Y. C. MAYO 9/9/63
APPROVAL Edward C Hall 9 Sept 63
NASA APPROVAL [signature] 9/19/63
MIT APPROVAL W Taylor for 10/Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, TEMPERATURE SENSITIVE, WAFER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006712
SCALE NONE	WT	SHEET 2 OF 2

MASTER