

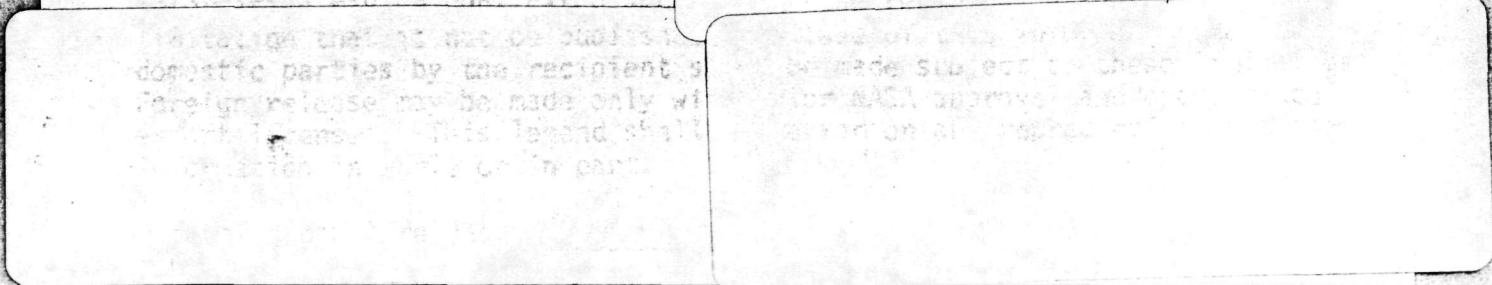
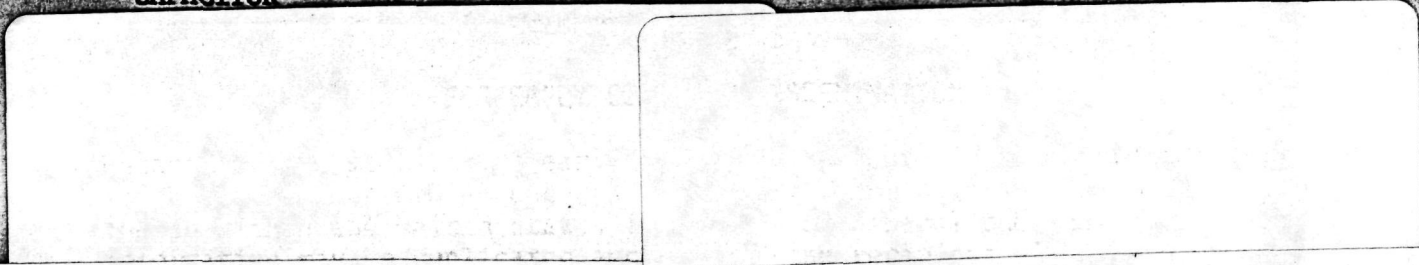
(NASA-CR-150460) IMPROVEMENT OF THE MECHANICAL AND THERMAL PROPERTIES OF THE METALLIZED POLYCARBONATE CAPACITOR Final Technical Report, 28 Jan. - 30 Jun. 1977 (Component Research Co., Santa Monica,

N79-30470

Unclas 63/33 30905

FINAL TECHNICAL REPORT

IMPROVEMENT OF THE MECHANICAL AND THERMAL PROPERTIES OF THE METALLIZED POLYCARBONATE CAPACITOR



GEORGE C. MARSHALL SPACE FLIGHT CENTER, CONTRACT NAS 8-32403



1655-26th STREET SANTA MONICA, CALIFORNIA 90404



(NASA-CR-150460) IMPROVEMENT OF THE MECHANICAL AND THERMAL PROPERTIES OF THE METALLIZED POLYCARBONATE CAPACITOR Final Technical Report, 28 Jan. - 30 Jun. 1977 An Early Domestic Dissemination (Component

Unclas 64/33 52787

TITLE: IMPROVEMENT OF THE MECHANICAL AND THERMAL PROPERTIES
OF THE METALLIZED POLYCARBONATE CAPACITOR

DATE: AUGUST 1977

CONTRACTOR: COMPONENT RESEARCH CO.
1655 26th St.
SANTA MONICA, CALIF. 90404

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MARSHALL SPACE FLIGHT CENTER, ALABAMA,
CONTRACT REPORT NO. ~~NAS. 3-1892S~~ NAS 8-32403

ABSTRACT:

The objective of this program was to develop design and process changes which enable polycarbonate metallized film capacitors to withstand 500 thermal shock cycles while maintaining electrical characteristic integrity without becoming intermittent, and without losing hermeticity. The task was for metallized polycarbonate film capacitors designed to meet MIL-C-39022/9 and MIL-C-83421/1. The capacitor design improvements implemented were the insertion of a rubber washer between spray cap and end seal and the utilization of a flexible lead assembly. One hundred fifty (150) capacitors incorporating the design improvements were manufactured and subsequently underwent 500 thermal shock cycles. One hundred forty nine (149) capacitors survived the test. Failure analysis revealed that the lone failure was due to a poor solder joint, initially detected in pre-screening tests as having poor Dissipation Factor and Equivalent Series Resistance measurement readings. Technician's error precluded the capacitor being eliminated from the test program.

FOREWORD

This report documents all work performed by Component Research Co. during the period 28 January 1977 to 30 June 1977 for George C. Marshall Space Flight Center under Contract NAS 8-32403. The project manager at George C. Marshall Space Flight Center was Leon Hamiter. The program manager at Component Research Co. was John Conklin.

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I. INTRODUCTION

Science is continually progressing and making technological advances. To keep in step with these advances better accuracy and reliability of passive components must be assured. Demands have been made upon today's state-of-the-art capacitor that make it necessary to surpass present capacitor technology.

The requirements of the Space Shuttle Program have made it necessary to develop a polycarbonate metallized film capacitor capable of withstanding 500 thermal shock cycles while maintaining electrical characteristic integrity and hermeticity, without becoming intermittent.

II. EFFECT OF THERMAL SHOCK CYCLING ON POLYCARBONATE FILM CAPACITORS

When two materials possessing dissimilar coefficients of linear thermal expansion are fastened together and subjected to extreme temperature conditions they impart upon each other mechanical stress. The magnitude and direction of this stress is dependent on the change of temperature undergone and the exact coefficients of linear thermal expansion of the materials.

The main physical components of the capacitors in this program are the film winding, a metallic case, and two end seals.

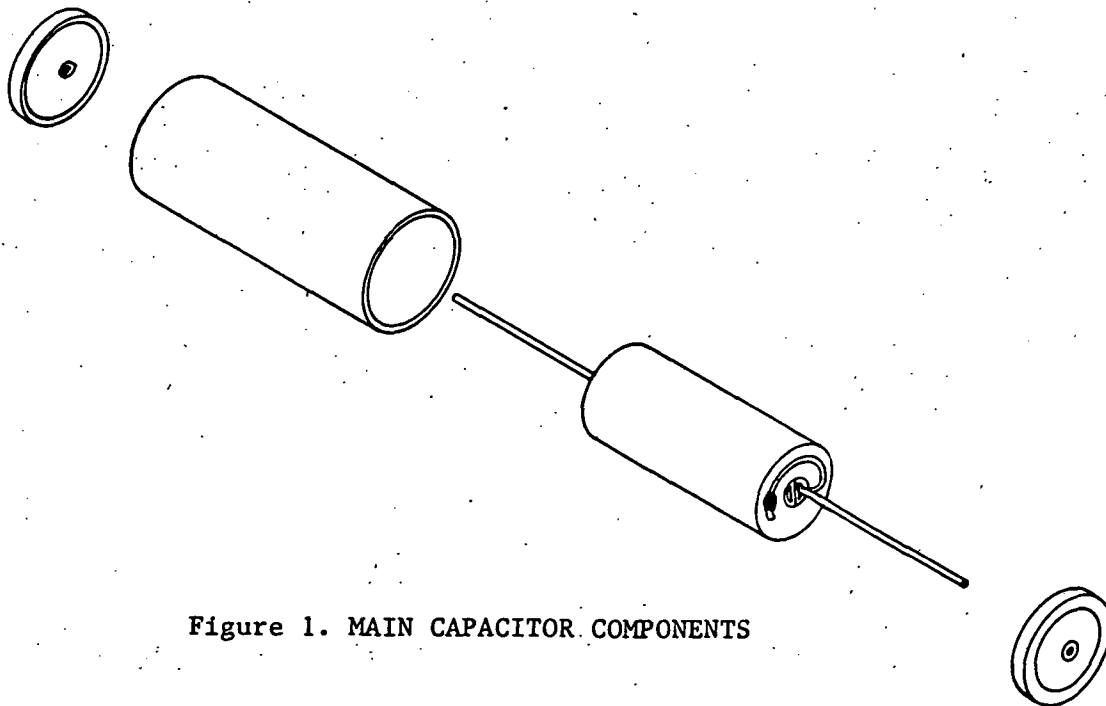


Figure 1. MAIN CAPACITOR COMPONENTS

The winding consists of metallized polycarbonate film wound on a plastic core. The metallic case is a cylindrical tube of Cupronickel 30%, Alloy 715. The end seals are circular, glass-to-metal compression seals.

Polycarbonate has a coefficient of linear thermal expansion of 70×10^{-6} per $^{\circ}$ C. Cupronickel 30% has a coefficient of linear thermal expansion of 16×10^{-6} per $^{\circ}$ C.

Due to the differences of coefficients of linear thermal expansion the capacitor winding will expand a greater magnitude than the case above ambient temperature. At temperatures below ambience the winding will contract a greater magnitude than the Cupronickel case. What interests us is the expansion and contraction along the axis of the capacitor.

Let us analyze what happens during capacitor exposure to extreme temperatures:

At temperatures above ambience both the winding and case begin to expand. The winding, possessing a higher coefficient of linear thermal expansion than the case, expands a greater magnitude and therefore compresses against the end seals.

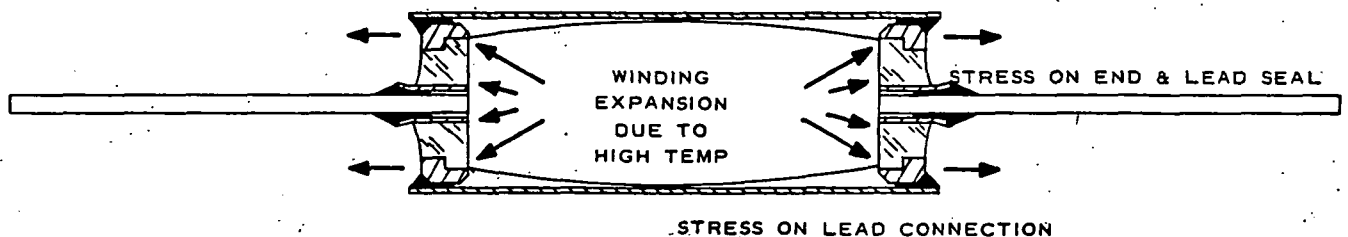


Figure 2. WINDING EXPANDING AGAINST END SEALS
DUE TO HIGH TEMPERATURE.

The effect is that the solder joint bonding the lead assembly to the spray cap is pushed through the thin mantle of tin babbitt. This situation is analagous to an ice skater standing on a thin layer of ice. The ice breaks away from the surface at the points of pressure, the skater's feet. So too here, the section of tin babbitt under the solder joint breaks away from the spray cap surface. All this results in an intermittent connection, a poor Dissipation Factor, and subsequently after extensive exposure to thermal cycling, the occurrence of an open connection.

At temperatures below ambience the winding and case both contract. Due to their inherent coefficients of linear thermal expansion the winding contracts a greater distance from its original size than does the case. The effect is a "tug of war" between the core and case with the lead wire being pulled from both ends.

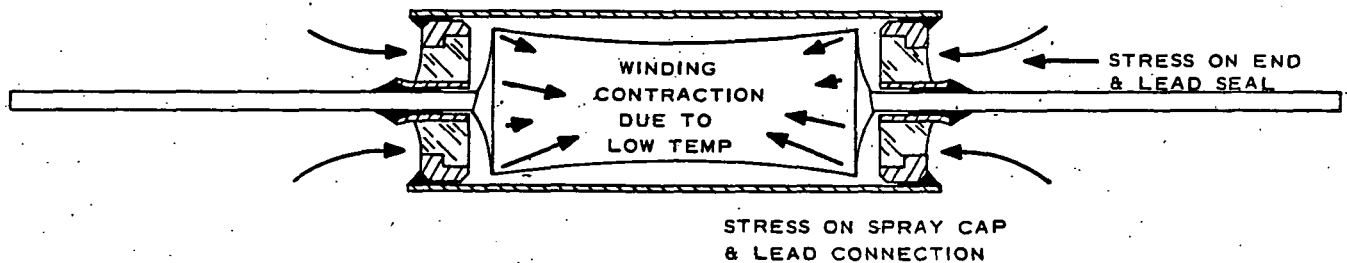


Figure 3. WINDING CONTRACTING AND PULLING LEADS FROM END SEALS DUE TO LOW TEMPERATURE

The stress along the lead wire can result in three possibilities:

1. The lead wire can pull away from the spray cap causing a poor connection, poor Dissipation Factor and eventually an open circuit.
2. The solder bead joint bonding the lead wire to the end seal becomes broken resulting in the loss of hermeticity.
3. Both 1. and 2. can occur.

III. PROPOSED DESIGN CHANGES

After having determined the causes which effect failure of metalized polycarbonate film capacitors due to thermal shock cycling, Component Research Co. proposed certain design changes:

1. To alleviate the problem present at high temperature (i.e. the crushing of the solder joint bonding the lead wire assembly and spray cap) a rubber washer was inserted between the capacitor spray cap and end seals.

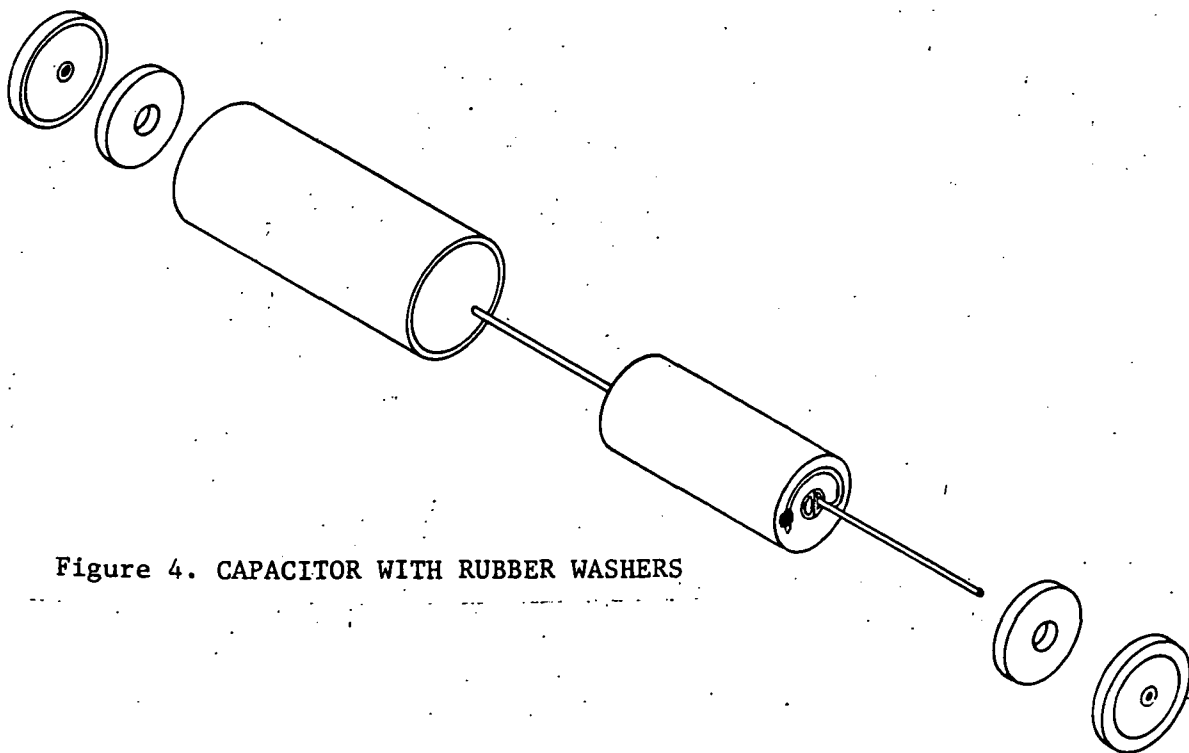


Figure 4. CAPACITOR WITH RUBBER WASHERS

2. To solve the problems which occur due to contraction at low temperatures

(i.e. breaking of solder bead joint and pulling away of lead wire assembly from the spray cap) a patented flexible lead assembly was utilized (Patent No. 3,260,906).



Figure 5. FLEXIBLE LEAD DESIGN

IV. ENVIRONMENTAL AND ELECTRICAL TESTS

The following capacitors were manufactured per MIL-C-83421/1:

<u>M83421/01-</u>	<u>Capacitance</u>	<u>Voltage</u>	<u>Diameter</u>	<u>Length</u>
-1090	.01uF	30	.170 in. (4.32mm)	.500 in. (12.70mm)
-1174	.1 uF	30	.193 in. (4.90mm)	.687 in. (17.45mm)
-1186	.15uF	30	.235 in. (5.97mm)	.562 in. (14.27mm)

After incorporating the design changes outlined in Section III, the following environmental and electrical tests were performed:

A. ENVIRONMENTAL EXPOSURE

1. Accelerated temperature cycling

Twenty (20) pieces of each part number were subjected to 500 thermal shock cycles in liquid-to-liquid, at the rate of fifty (50) cycles per day. The capacitors were immersed into each liquid for sixty (60) seconds and transferred from one bath to another within fifteen (15) seconds. The temperature extremes were -55°C and 125°C .

2. Normal temperature cycling

Thirty (30) pieces of each part number were subjected to 500 thermal shock cycles in air-to-air, at the rate of one (1) cycle per hour. The dwell time at each temperature extreme was a minimum

of thirty (30) minutes. The maximum transfer time from one chamber to another was sixty (60) seconds. The temperature extremes were -55°C and 125°C .

B. ELECTRICAL TESTING

All capacitors were 100% tested for Insulation Resistance, Capacitance Drift, Dissipation Factor and Equivalent Series Resistance.

Measurements were taken as follows:

1. Insulation Resistance at rated voltage @ 25°C and @ -55°C . I.R. @ 125°C at 50% rated voltage.
2. Capacitance Drift (at 1KHz) @ 25°C , @ -55°C and @ 125°C .
3. Dissipation Factor (at 1KHz) @ 25°C , @ -55°C and @ 125°C .
4. Dissipation Factor (at 10 KHz) @ 25°C , @ -55°C and @ 125°C .
5. Equivalent Series Resistance (at 100KHz) @ 25°C .

C. VISUAL INSPECTION

All capacitors were visually inspected at 10X magnification for damage and solder defects before and after each cycle period.

D. HERMETICITY TEST

Capacitors were tested for hermeticity per MIL-STD-202, Method 112, Condition C, Procedure IIIA, followed by Condition A.

E. MEASUREMENT POINTS

Electrical, visual, and hermeticity test measurement points occurred as follows:

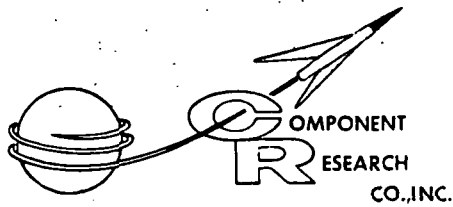
1. Accelerated temperature cycling- measurements were taken after 0, 50, 150, 250, 350, and 500 cycles.
2. Normal temperature cycling- measurements were taken after 0, 20, 140, 260, 380, and 500 cycles.

V. TEST DATA

In order to pass qualification tests per MIL-C-83421/1, Level 1, metallized polycarbonate film capacitors are required to survive ten (10) thermal shock cycles.

The capacitors listed as rejects on the proceeding data sheets are not failures but are parts which, after extensive thermal shock cycling, have fallen out of specification as delineated in MIL-C-83421/1.

After 500 thermal shock cycles, all parts passed a hot oil seal test as set forth in MIL-STD-202, Method 212, Condition A. Out of a total of one hundred fifty (150) capacitors, sixteen (16) had a leak rate faster than 1×10^{-6} Atm./Cm.³/Second, the leak rate limit set forth in MIL-STD-202, Method 112, Condition C, Procedure IIIA. All capacitors had a leak rate less than 1×10^{-4} Atm./Cm.³/Second.



TEST REPORT SUMMARY

Thermal Shock
Liquid to Liquid
500 Cycles -65°C to +125°C

TEST NO.

Report No. XT-1218-B

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PROD. NO. 0237G CUSTOMER NASA, Marshall Space Flight Center
 LOT _____ CUSTOMER P/N _____
 LOT SIZE 20 CUSTOMER P/O NAS8-32403
 C.R.C. P/N M83421/01-117R C.R.C. S/O 704-35622
 DATE COMPLETED 5/5/77

TEST	REQUIREMENT	METHOD PARAGRAPH	ACC	
			REJ	
Insulation Resistance	3.11	4.77	20	0
Capacitance	N/A	4.7.8	20	0
Dissipation Factor	3.13	4.7.9	20	0
E.S.R.			20	0
Seal Test	3.9	4.7.5	20	0

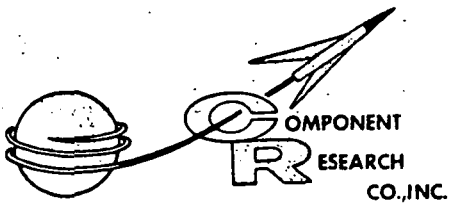
QUALITY CONTROL

DATE

SHIPPING DATA

ORDER #	DATE SHIPPED	QTY SHIPPED	INVOICE #	QTY STOCKED

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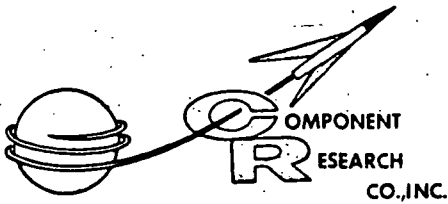
SHEET 12 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPVR.	C.R.C. P/N M83421/01-1174 R
TEST NO. XT 1218-B	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0237G
TEST VOLT. 30VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: 30pA maximum or 3,000,000 megohms minimum. After 500 cycles liquid to liquid thermal shock. There are no established limits for maximum leakage current @ +25°C		EQUIPMENT USED: D.C. Micro V Ammeter Model No. H.P. 425A ECN No. 1480 I.R. Test rack CRC None 647 D.C. volt ohm meter Simpson 260 1357 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	2	12	8	23	15	13		
002	6	12	9	10	21	19		
003	4	13	11	15	19	19		
004	6	10	9	29	21	12		
005	3	7	9	7	9	12		
006	4	5	10	6	8	11		
008	9	6	10	24	13	10		
009	2	5	9	5	7	11		
010	22	5	9	7	9	13		
011	8	5	9	15	12	10		
012	12	8	10	13	13	17		
013	14	5	15	24	29	19		
014	3	6	12	9	11	16		
015	2	4	8	5	8	10		
016	2	4	8	17	11	10		
TEST DATE	2-24-77	3-6-77	3-10-77	3-23-77	4-19-77	5-4-77		
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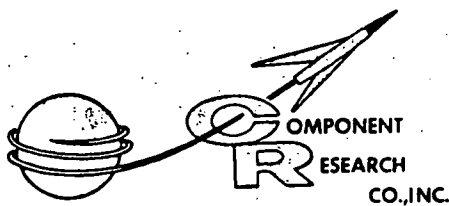
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SHEET 13 OF 188

TEST Insulation Resistance @ 25°C (Terminal to Terminal)	C.R.C. P/N	M83421/01-1174R
	CUST P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	4	6	8	20	12	9		
018	4	8	10	16	13	10		
019	8	5	7	8	7	11		
020	3	4	9	16	12	8		
021	2	5	8	7	12	8		
TEST DATE	2-24-77	3-8-77	3-10-77	3-23-77	4-19-77	4-29-77		
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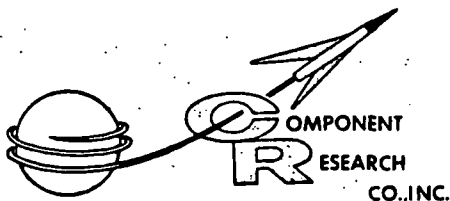
S/O - 704-35622

SHEET 14 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPVR.	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B	ENGR. <i>L.K.</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>J.M.C.</i>	PROD. NO. 0237G
TEST VOLT. 30VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55 to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: NOTE: There are no established limits for maximum leakage current @ -55°C		EQUIPMENT USED: D.C. Micro V Ammeter Model No. H.P. 425A ECN No. 1480 I.R. Test rack CRC None 647 D.C. Volt ohm meter Simpson 260 1357 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J E-485 1588 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	23	50	17	9	17	16		
002	29	13	10	7	20	15		
003	21	15	16	8	20	15		
004	20	15	17	9	19	18		
005	25	15	16	8	21	11		
006	20	15	15	6	20	16		
008	25	14	14	9	18	14		
009	21	15	15	8	18	20		
010	29	14	13	21	19	16		
011	21	14	13	17	19	16		
012	28	14	15	18	8	20		
013	28	14	23	17	8	21		
014	24	14	11	16	16	23		
015	23	14	11	17	4	25		
016	25	17	12	15	12	22		
TEST DATE	3-8-77	3-8-77	3-16-77	4-4-77	4-15-77	5-5-77		
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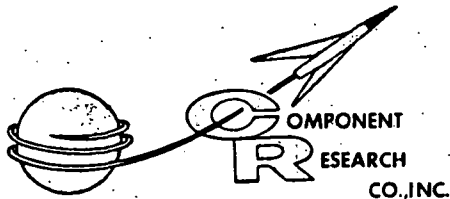
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SHEET 15 OF 188

TEST Insulation Resistance @ -55°C (Terminal to Terminal)		C.R.C. P/N M83421/01-1174R CUST P/N _____ PROD. NO. 0237G P/O NO. NAS8-32403
TEST NO.	XT 1218-B	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	21	16	11	17	14	25		
018	20	16	12	15	12	10		
019	27	15	16	14	15	15		
020	29	15	16	10	17	22		
021	30	15	15	10	17	20		
TEST DATE	3-1-77	3-8-77	3-16-77	4-4-77	4-15-77	5-5-77		
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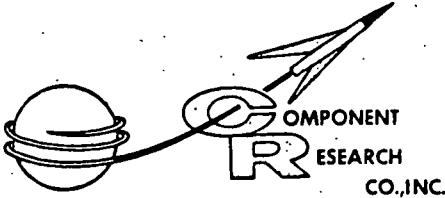
SHEET 16 OF 188

TEST: Insulation Resistance (Terminal to Terminal)		LAB SUPV. <i>[Signature]</i>	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B		ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C		Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. 18VDC			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7	
ACCEPTANCE LIMITS: 1500 pA maximum or 12,000 megohms minimum After 500 cycles liquid to liquid thermal shock there are no established limits for maximum leakage current @ +125°C		EQUIPMENT USED: D.C. Micro V Ammeter Model No. H.P. 425A ECN No. 1480 I.R. Test rack CRC none 647 D.C. volt ohm meter Simpson 260 1357 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J E-485 1588 Battery pack N/A	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	400	210	134	250	245	460		
002	1150	470	630	870	710	470		
003	690	600	360	480	500	200		
004	370	250	180	210	320	320		
005	320	200	130	360	270	230		
006	720	230	150	370	360	230		
008	470	270	180	270	270	180		
009	280	190	145	380	230	1150		
010	550	370	150	360	300	1100		
011	950	560	340	740	1750	165		
012	750	260	210	310	250	450		
013	890	730	880	1050	600	410		
014	570	280	300	410	470	280		
015	540	290	350	460	330	420		
016	430	310	220	460	400	310		
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TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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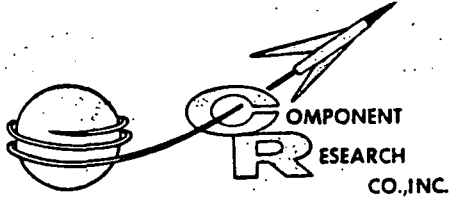
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SHEET 17 OF 188

TEST Insulation Resistance @ 125°C (Terminal to Terminal)	C.R.C. P/N	M83421/01-1174R
	CUST P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	510	350	240	610	400	350		
018	630	330	280	460	630	430		
019	630	330	270	550	420	210		
020	230	210	150	250	250	380		
021	460	180	130	160	370	280		
TEST DATE	3-2-77	3-8-77	3-14-77	4-4-77	4-15-77	5-6-77		
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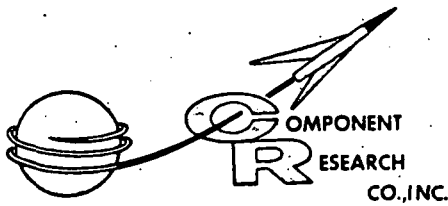
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SHEET 18 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR <i>[Signature]</i>	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: .090 uF thru .110uF After 500 cycles liquid to liquid thermal shock, there are no established % capacitance drift limits for this condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1271 Capacitor decade G.R. 1413 1274

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles	
001	.098712	+0.95	+1.35	+0.95	+1.25	+0.95	
002	.099475	+1	+1.95	+1.2	+1.19	+1.75	
003	.099292	+0.15	+1.9	+1.2	+1.15	+1	
004	.099443	+0.75	+1.65	+1.05	+1.05	+0.95	
005	.098632	+0.15	+1.7	+1	+0.9	+0.65	
006	.099752	+0.15	+1.65	+1	+1.35	+1	
008	.099606	+0.85	+1.35	+0.65	+0.55	+0.4	
009	.098973	+0.85	+0.75	+0.55	+0.85	+0.45	
010	.099139	+1	+1.55	+0.75	+1.65	+4.2	
011	.099696	+0.1	+1.65	+0.85	+1.3	+0.95	
012	.09880	+0.95	+1.55	+1.05	+1.3	+1.15	
013	.09837	+0.4	+2.1	+1.25	+1.6	+1.35	
014	.099625	+1.6	+3.2	+2.3	+2.75	+3.45	
015	.099665	+0.45	+2.05	+1.35	+1.6	+1.4	
016	.100155	+0.25	+1.9	+1.45	+1.6	+1.35	
TEST DATE	2-24-77	3-7-77	3-10-77	3-23-77	4-19-77	5-2-77	
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

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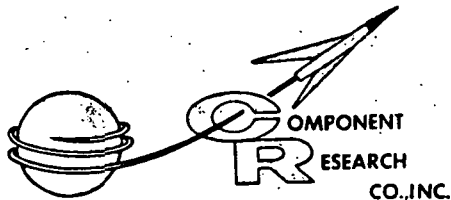
S/O - 704-35622

SHEET 19 OF 188

TEST Capacitance Drift @ 25°C with Thermal Shock	C.R.C. P/N	M83421/01-1174R
	CUST P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.099942	+0.45	+1.85	+1.05	+1.45	+1.05		
018	.099998	+1.35	+2	+1.85	+1.3	+1		
019	.100029	+0.25	+1.6	+1.15	+1.25	+1.05		
020	.099631	+1.8	+1.55	+0.9	+1.05	+0.75		
021	.099916	+1.15	+0.75	+0.95	+1	+0.7		
TEST DATE	2-24-77	3-7-77	3-10-77	3-23-77	4-10-77	5-2-77		
TEST BY								

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Customer's Name: NASA

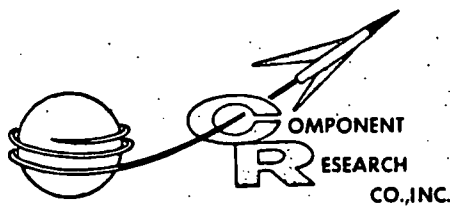
S/O - 704-35622

SHEET 20 OF 188

TEST: Capacitance Drift with Thermal Shock		LAB SUPV. ²³ FIT	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B		ENGR. <i>LOK</i>	CUST. P/N
TEST TEMP. -55°C		Q.A. <i>JH</i>	PROD. NO. 0237G
TEST VOLT. N/A			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8	
ACCEPTANCE LIMITS: There are no established limits for initial capacitance and % drift @ -55°C		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade G.R. 1413 1387 capacitor Temperature test chamber Statham 130 SDG-1 Thermometer Marshall 1588 J E485	

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles	
001	.097876	+0.45	+0.35	+0.29	+1.55	+1.25	
002	.098173	+0.5	+0.95	+2.15	+2.4	+2.25	
003	.097839	+0.55	+0.95	+1.8	+2.3	+1.8	
004	.097982	+0.65	+0.85	+1.9	+2.4	+1.75	
005	.097357	+0.75	+0.9	+1.1	+1.2	+1.4	
006	.098527	+0.55	+0.8	+1.7	+1.2	+1.7	
008	.098217	+0.4	+0.35	+0.75	+1.35	+0.65	
009	.097537	+0.45	+0.45	+1.3	+1.75	+1.3	
010	.097707	+0.4	+0.55	+1.5	+1.5	+1.64	
011	.098400	+0.25	+0.65	+1.65	+1.5	+1.23	
012	.098423	+0.65	+0.85	+1.6	+2.3	+2.6	
013	.098433	+0.35	+1.3	+2.05	+2.7	+2.2	
014	.098365	+0.85	+1.25	+1.95	+2.3	+1.7	
015	.098239	+1.15	+1.65	+2.15	+2.5	+1.9	
016	.098777	+1.2	+1.95	+2.3	+2.7	+1.2	
TEST DATE	3-1-77	3-8-77	3-16-77	4-4-77	4-13-77	5-5-77	
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

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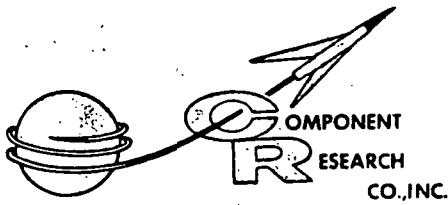
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SHEET 21 OF 188

TEST Capacitance Drift @ -55°C with Thermal Shock	C.R.C. P/N	M83421/01-1174R
	CUST. P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles
017	.098585	+0.95	+1.8	+1.95	+2.35	+1.6
018	.098546	+1.25	+1.55	+1.8	+2.25	+1.35
019	.098650	+1	+1.6	+1.85	+1.9	+1
020	.098198	+1.15	+1.05	+2.05	+1.9	+1.05
021	.098557	+1.3	+1.05	+2.6	+1.6	+0.85
TEST DATE	3-1-77	3-8-77	3-16-77	4-4-77	4-15-77	5-12-77
TEST BY	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]

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Customer's Name: NASA

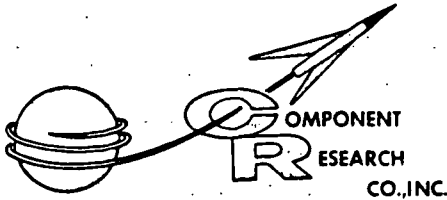
S/O - 704-35622

SHEET 22 OF 188

TEST: Capacitance Drift with Thermal Shock		LAB SUPVR.	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B		ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. 125°C		Q.A. <i>JLK</i>	PROD. NO. 0237G
TEST VOLT. N/A			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8	
ACCEPTANCE LIMITS: There are no established limits for initial capacitance and % drift @ +125°C		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor Model No. G.R. 1413 ECN No. 1337 Temperature test chamber Statham SDG-1 ECN No. 130 Thermometer Marshall J E485 ECN No. 1588	

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	099011	+0.02	+0.025	+0.06	+0.05	+0.05		
002	099995	+0.15	0.00	+0.06	+0.45	+0.04		
003	099507	+0.02	+0.025	+0.04	+0.35	+0.35		
004	099759	+0.35	+0.35	+0.07	+0.06	+0.65		
005	099089	+0.15	+0.01	+0.02	+0.15	+0.15		
006	100050	+0.15	+0.02	+0.07	+0.06	+0.65		
008	099796	+0.15	+0.15	+0.04	+0.03	+0.25		
009	099864	0.00	+0.01	+0.15	N/A	+0.15		
010	099546	+0.15	+0.15	+0.25	+0.35	+0.6		
011	100028	+0.03	+0.025	+0.075	+0.085	+0.06		
012	100334	+0.01	+0.025	+0.07	+0.55	+0.55		
013	100199	+0.01	+0.02	+0.65	+0.15	+0.05		
014	100158	+0.01	+0.15	+0.06	+0.05	+0.05		
015	100098	+0.15	+0.15	+0.05	+0.04	+0.04		
016	100564	+0.15	+0.03	+0.07	+0.05	+0.06		
TEST DATE	3-2-77	3-8-77	3-15-77	4-4-77	4-15-77	5-6-77		
TEST BY								

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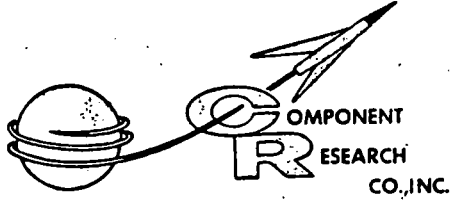
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Customer's Name: NASA S/O - 704-35622 SHEET 23 OF 188

TEST Capacitance Drift @ 125°C with Thermal Shock	C.R.C. P/N	M83421/01-1174R
	CUST P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.100378	0.00	+0.15	+0.25	+0.35	+0.4		
018	.100394	-0.05	+0.15	-0.05	-0.05	-0.05		
019	.100563	-0.05	-0.15	+0.25	+0.05	+0.15		
020	.099967	-0.01	-0.01	+0.03	+0.15	+0.25		
021	.100130	-0.15	-0.15	-0.15	0.00	+0.01		
TEST DATE	3-2-77	3-8-77	3-15-77	4-4-77	4-10-77	5-6-77		
TEST BY								


F-634-2









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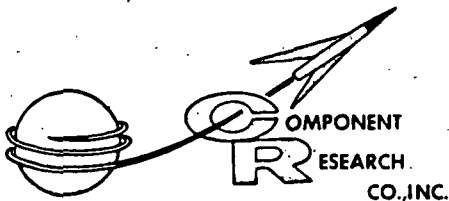
Customer's Name: NASA S/O - 704-35622 SHEET 24 OF 188

TEST: Dissipation Factor @ 1 KHz	LAB SUPVR. 	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B	ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>JUL</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: Initial limits - .15% After 500 cycles liquid to liquid thermal shock there are no established % D.F. limits		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1337

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S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.07	.085	.085	.085	.075	.08		
002	.07	.085	.085	.085	.08	.075		
003	.07	.075	.085	.085	.08	.075		
004	.06	.075	.085	.08	.08	.075		
005	.06	.075	.08	.08	.08	.075		
006	.06	.075	.075	.075	.075	.065		
008	.06	.08	.085	.08	.08	.075		
009	.06	.08	.08	.08	.08	.075		
010	.06	.085	.085	.08	.075	.11		
011	.06	.065	.08	.075	.075	.07		
012	.06	.075	.08	.075	.075	.075		
013	.06	.075	.075	.08	.075	.075		
014	.06	.08	.085	.08	.075	.075		
015	.06	.075	.085	.075	.075	.075		
016	.06	.075	.085	.075	.075	.075		
TEST DATE	2-24-77	3-1-77	3-10-77	3-23-77	4-19-77	5-2-77		
TEST BY								

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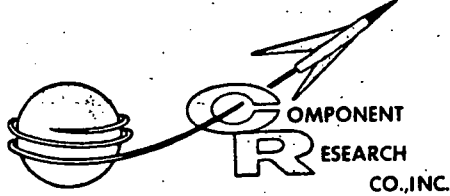
S/O - 704-35622

SHEET 25 OF 188

TEST Dissipation Factor @ 1KHz @ 25°C		C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B		CUST P/N
		PROD. NO. 0237G
		P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.06	.08	.085	.085	.075	.075		
018	.07	.08	.08	.08	.08	.075		
019	.06	.075	.08	.075	.075	.075		
020	.06	.085	.085	.08	.08	.075		
021	.06	.085	.08	.095	.08	.075		
TEST DATE	2-24-77	3-7-77	3-10-77	3-23-77	4-19-77	5-2-77		
TEST BY								

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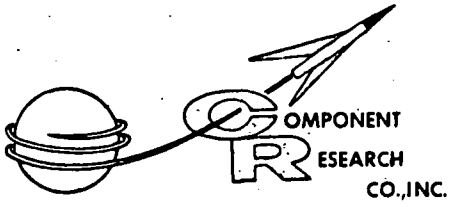
S/O - 704-35622

SHEET 26 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPVR.	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B	ENGR.	CUST. P/N
TEST TEMP. -55°C	Q.A.	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1337 Temp. test chamber Statham 130 SDG-1 Thermometer Marshall 1588 J E485

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.36	.35	.39	.35	.35	.34		
002	.35	.34	.39	.36	.34	.34		
003	.36	.35	.35	.35	.35	.35		
004	.36	.34	.35	.35	.34	.34		
005	.36	.35	.36	.36	.35	.35		
006	.34	.33	.34	.34	.33	.33		
008	.36	.35	.38	.36	.36	.35		
009	.36	.34	.35	.36	.34	.34		
010	.36	.35	.35	.35	.35	.38		
011	.34	.33	.33	.34	.33	.4		
012	.35	.34	.44	.35	.34	.36		
013	.35	.34	.36	.39	.34	.36		
014	.36	.34	.35	.35	.34	.36		
015	.36	.34	.35	.35	.34	.35		
016	.36	.34	.35	.35	.34	.36		
TEST DATE	3-7-71	3-8-71	3-16-71	4-4-71	4-15-71	5-5-71		
TEST BY								

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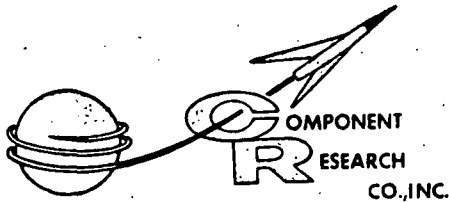
S/O - 704-35622

SHEET 27 OF 188

TEST Dissipation Factor @ 1KHz @ -55°C		C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B		CUST P/N
		PROD. NO. 0237G
		P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.35	.34	.35	.35	.35	.36		
018	.36	.35	.35	.36	.35	.34		
019	.34	.33	.34	.34	.34	.34		
020	.36	.34	.35	.4	.34	.36		
021	.36	.34	.36	.35	.35	.36		
TEST DATE	3-1-77	3-8-77	3-16-77	4-4-77	4-15-77	5-9-77		
TEST BY								

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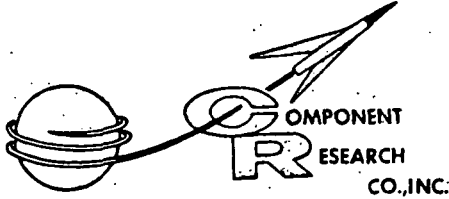
S/O - 704-35622

SHEET 28 OF 188

TEST: Dissipation Factor @ 1KHz		LAB SUPVR.	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B		ENGR.	CUST. P/N
TEST TEMP. 125°C		Q.A.	PROD. NO. 0237G
TEST VOLT. N/A			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9	
ACCEPTANCE LIMITS: There are no established % D.F. limits for this condition.		EQUIPMENT USED:	
		Impedance comparator	Model No. G.R. 1654 ECN No. 1331
		Precision decade capacitor	G.R. 1413 1337
		Temp. test chamber	Satham SDG-1 130
		Thermometer	Marshall J E485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.025	.03	.03	.06	.03	.025		
002	.035	.035	.035	.045	.035	.035		
003	.025	.03	.085	.035	.03	.03		
004	.025	.03	.03	.035	.03	.03		
005	.025	.03	.055	.035	.03	.025		
006	.03	.035	.035	.04	.035	.035		
008	.025	.03	.065	.035	.03	.025		
009	.025	.03	.03	.035	.03	.025		
010	.025	.03	.03	.03	.04	.04		
011	.025	.03	.035	.035	.03	.03		
012	.03	.035	.035	.035	.035	.03		
013	.03	.035	.045	.035	.035	.03		
014	.03	.035	.035	.035	.035	.035		
015	.03	.035	.035	.035	.035	.035		
016	.025	.03	.035	.035	.03	.03		
TEST DATE	3-2-77	3-8-77	3-15-77	4-4-77	4-15-77	5-6-77		
TEST BY								

F-634-1



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GENERAL DATA SHEET

Customer's Name: NASA

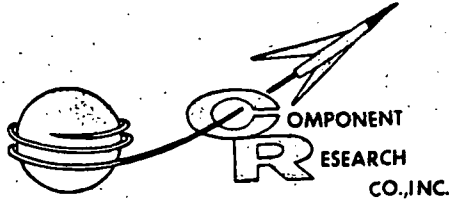
S/O - 704-35622

SHEET 29 OF 188

TEST Dissipation Factor @ 1KHz @ +125°C	C.R.C. P/N	M83421/01-1174R
	CUST P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.03	.035	.035	.035	.035	.035		
018	.03	.035	.035	.035	.035	.035		
019	.035	.035	.04	.04	.035	.035		
020	.025	.03	.03	.03	.03	.03		
021	.03	.035	.035	.035	.035	.035		
TEST DATE	3-2-77	3-8-77	3-15-77	4-4-77	4-15-77	5-6-77		
TEST BY								

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GENERAL DATA SHEET

Customer's Name: NASA

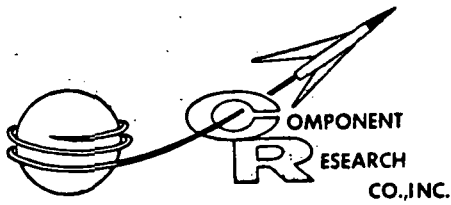
S/O - 704-35622

SHEET 30 OF 188

TEST: Dissipation Factor @ 10 KHz	LAB SUPVR.	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006. (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: Initial limits - .15% After 500 cycles liquid to liquid thermal shock there are no established % D.F. limits		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor Model No. G.R. 1413 ECN No. 1337

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.18	.185	.185	.215	.195	.205		
002	.18	.19	.185	.225	.215	.215		
003	.18	.18	.195	.22	.215	.2		
004	.18	.185	.195	.225	.215	.21		
005	.17	.165	.185	.215	.21	.2		
006	.18	.18	.185	.22	.21	.195		
008	.18	.18	.185	.215	.195	.195		
009	.17	.175	.175	.21	.2	.195		
010	.18	.185	.185	.215	.2	.195		
011	.18	.155	.18	.205	.19	.185		
012	.17	.195	.205	.215	.195	.2		
013	.17	.165	.175	.21	.205	.215		
014	.19	.19	.205	.23	.215	.21		
015	.17	.18	.21	.215	.2	.185		
016	.16	.155	.175	.195	.19	.22		
TEST DATE	3-24-77	3-7-77	3-11-77	3-23-77	4-19-77	5-2-77		
TEST BY								

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GENERAL DATA SHEET

Customer's Name: NASA

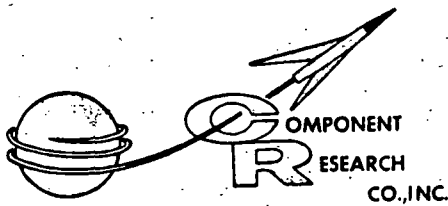
S/O - 704-35622

SHEET 31 OF 188

TEST Dissipation Factor @ 10 KHz @ 25°C	C.R.C. P/N	M83421/01-1174R
	CUST P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.19	.195	.205	.235	.22	.205		
018	.20	.185	.18	.215	.205	.19		
019	.16	.17	.18	.205	.2	.195		
020	.18	.185	.19	.215	.215	.2		
021	.19	.205	.19	.225	.21	.21		
TEST DATE	2-24-77	3-7-77	3-11-77	3-23-77	4-17-77	5-2-77		
TEST BY								

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GENERAL DATA SHEET

Customer's Name: NASA

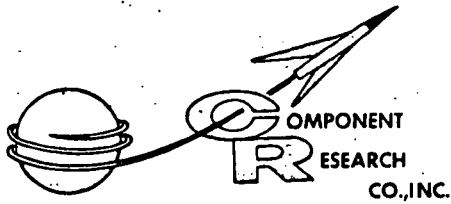
S/O - 704-35622

SHEET 32 OF 188

TEST: Dissipation Factor @ 10KHz	LAB SUPVR.	C.R.C. P/N M83421/01-1174R
	ENGR.	CUST. P/N
TEST NO. XT 1218-B	Q.A.	PROD. NO. 0237G
TEST TEMP. -55°C		P/O NO. NAS8-32403
TEST VOLT. N/A		SPECIFICATION:
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this condition.		EQUIPMENT USED:
		Impedance comparator Model No. ECN No. G.R. 1654 1331
		Precision decade capacitor G.R. 1413 1337
		Temperature test chamber Statham 130 SDG-1
		Thermometer Marshall 1588 J E485

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.49	.51	.52	.51	.51	.47		
002	.49	.51	.51	.64	.51	.48		
003	.50	.52	.52	.54	.52	.48		
004	.49	.51	.59	.54	.51	.48		
005	.5	.51	.58	.51	.51	.48		
006	.49	.49	.5	.52	.51	.48		
008	.5	.52	.78	.52	.66	.48		
009	.48	.49	.51	.55	.51	.46		
010	.51	.51	.52	.51	.52	.74		
011	.48	.48	.49	.5	.49	.76		
012	.5	.5	.52	.54	.51	.5		
013	.49	.49	.54	.68	.5	.51		
014	.5	.51	.54	.54	.52	.51		
015	.51	.51	.54	.52	.51	.49		
016	.51	.49	.57	.51	.5	.51		
TEST DATE	3-1-77	3-8-77	3-16-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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Customer's Name: NASA

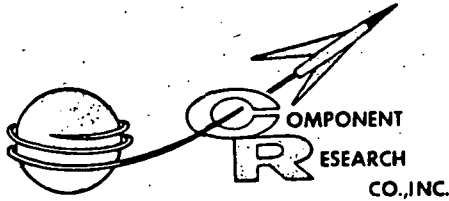
S/O - 704-35622

SHEET 33 OF 188

TEST Dissipation Factor @ 10KHz @ -55°C	C.R.C. P/N	M83421/01-1174R
	CUST P/N	
TEST NO. XT 1218-B	PROD. NO.	0237G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.5	.52	.54	.52	.52	.52		
018	.5	.51	.53	.54	.51	.49		
019	.48	.5	.51	.54	.51	.5		
020	.5	.51	.54	.72	.51	.51		
021	.5	.52	.52	.56	.64	.51		
TEST DATE	3-1-77	3-8-77	3-16-77	4-4-77	4-15-77	5-6-77		
TEST BY								

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Customer's Name: NASA

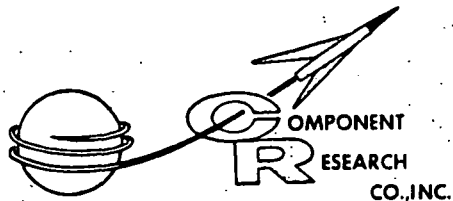
S/O - 704-35622

SHEET 34 OF 188

TEST: Dissipation Factor @ 10KHz	LAB SUPVR <i>[Signature]</i>	C.R.C. P/N M83421/01-1174R
TEST NO. XT 1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1337 Temperature test chamber Statham 130 SDG-1 Thermometer Marshall 1588 J E485

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.115	.145	.145	.155	.145	.12		
002	.135	.165	.185	.26	.175	.15		
003	.12	.155	.43	.175	.155	.13		
004	.125	.16	.17	.195	.16	.14		
005	.115	.15	.34	.175	.145	.12		
006	.135	.16	.175	.215	.165	.14		
008	.115	.15	.51	.175	.145	.12		
009	.105	.135	.145	.19	.14	.115		
010	.12	.145	.16	.155	.22	.175		
011	.11	.14	.19	.155	.14	.12		
012	.135	.15	.18	.17	.155	.13		
013	.125	.145	.225	.18	.145	.13		
014	.135	.16	.175	.18	.17	.145		
015	.125	.145	.155	.16	.15	.135		
016	.115	.145	.175	.15	.14	.12		
TEST DATE	3-2-77	3-8-77	3-15-77	4-1-77	4-8-77	5-6-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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GENERAL DATA SHEET

Customer's Name: NASA

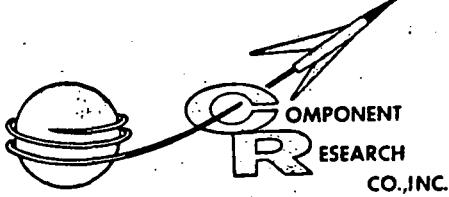
S/O - 704-35622

SHEET 35 OF 188

TEST Dissipation Factor @ 10KHz @ 125°C		C.R.C. P/N M83421/01-1174R	
TEST NO. XT 1218-B		CUST. P/N	
		PROD. NO. 0237G	
		P/O NO. NAS8-32403	

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
017	.135	.16	.195	.18	.165	.15		
018	.115	.15	.18	.155	.14	.12		
019	.135	.165	.215	.185	.16	.14		
020	.125	.155	.16	.16	.15	.135		
021	.125	.165	.17	.19	.155	.14		
TEST DATE	3-2-77	3-8-77	3-15-77	4-4-77	4-15-77	5-6-77		
TEST BY								

F-634-2



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GENERAL DATA SHEET

Customer's Name: NASA

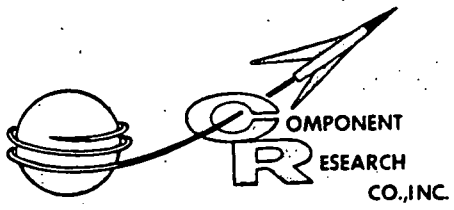
S/O - 704-35622

SHEET 36 OF 188

TEST: E.S.R.	LAB SUPVR.	C.R.C. P/N M83421/01-1174 R
TEST NO. XT-1218-B	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 Cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION:
ACCEPTANCE LIMITS: There are no established E.S.R. limits for this test condition.		EQUIPMENT USED: E.S.R. Meter Model No. Clark Hess 1130 273 Cable assembly Clark Hess 1130 27375

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)													
	Initial E.S.R.		After 50 Cycles		After 150 Cycles		After 250 Cycles		After 350 Cycles		After 500 Cycles			
	<i>W</i>	<i>R</i>	<i>W</i>	<i>R</i>	<i>W</i>	<i>R</i>	<i>W</i>	<i>R</i>	<i>W</i>	<i>R</i>	<i>W</i>	<i>R</i>		
001	.14		.17		.16		.16		.16		.16			
002	.17		.19		.19		.18		.20		.19			
003	.16		.17		.17		.16		.17		.17			
004	.17		.19		.18		.18		.18		.18			
005	.15		.16		.16		.15		.16		.15			
006	.17		.18		.18		.18		.19		.18			
008	.15		.17		.16		.15		.16		.15			
009	.15		.17		.16		.16		.15		.15			
010	.16		.17		.17		.17		.17		.16			
011	.14		.17		.16		.16		.15		.14			
012	.15		.17		.17		.17		.16		.16			
013	.15		.16		.16		.16		.16		.16			
014	.18		.19		.19		.19		.19		.19			
015	.16		.17		.17		.17		.18		.17			
016	.15		.20		.16		.15		.16		.14			
TEST DATE	2-25-77		3-7-77		3-11-77		3-24-77		4-19-77		5-2-77			
TEST BY														

F-634-1



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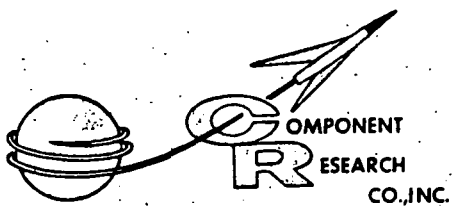
Customer's Name: NASA S/O - 704-35622 SHEET 37 OF 188

TEST E.S.R. @ 25°C	C.R.C. P/N M83421/01-1174 R
	CUST P/N
	PROD. NO. 0237G
TEST NO. XT-1218-B	P/O NO. NAS8-32403

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial E.S.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles
Q17	.18	.19	.19	.19	.20	.19
Q18	.16	.18	.16	.16	.17	.17
Q19	.16	.18	.18	.17	.17	.17
Q20	.16	.17	.16	.16	.18	.16
Q21	.17	.19	.18	.17	.17	.17

TEST DATE	2-25-77	3-7-77	3-11-77	3-24-77	4-19-77	5-2-77
TEST BY	CRC FIT	CRC FIT	CRC FIT	CRC FIT	CRC FIT	CRC FIT

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Customer's Name: NASA

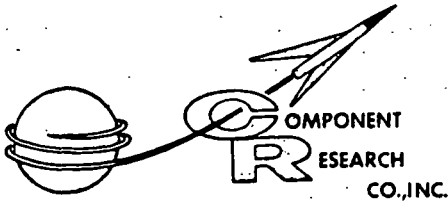
S/OCRA 704-35622

SHEET 38 OF 188

TEST: Seal Test (Fine Leak Test)	LAB SUPVR.	C.R.C. P/N M83421/01-1174 R
TEST NO. XT-1218-B	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 Cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7:5
ACCEPTANCE LIMITS: Leakage not to exceed 1×10^{-6} atm/cc/sec.		EQUIPMENT USED: Fine leak detector Model No. DuPont 24-120B ECN No. 651

S/N	Initial		After 50 μ		After 150 μ		After 250 μ		After 350 μ		After 500 μ	
	1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
001	↑		↑		↑		↑		↑		↑	
003	↑		↑		↑		↑		↑		↑	
003												
004												
005												
006												
008												
009												
010												
011												
012												
013												
014												
015	↓		↓		↓		↓		↓		↓	
016	↓		↓		↓		↓		↓		↓	
TEST DATE	2-28-77		3-9-77		3-21-77		4-8-77		4-21-77		5-25-77	
TEST BY												

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Customer's Name: NASA

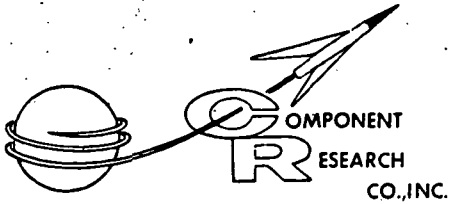
S/O - 704-35622

SHEET 39 OF 188

TEST Seal Test (Fine Leak Test)	C.R.C. P/N M83421/01-1174R
TEST NO.: XT-1218-B	CUST P/N
	PROD. NO. 0237G
	P/O NO. NAS8-32403

S/N	Initial		After 50 μ		After 150 μ		After 250 μ		After 350 μ		After 500 μ	
	1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
017	✓		✓		✓		✓		✓		✓	
018	↑		↑		↑		↑		↑		↑	
019	↓		↓		↓		↓		↓		↓	
020	↓		↓		↓		↓		↓		↓	
021	✓		✓		✓		✓		✓		✓	
TEST DATE	2-28-77	3-9-77	3-21-77	4-8-77	4-21-77	5-25-77						
TEST BY	CRC 2 FT	CRC 2 FT	CRC 2 FT	CRC 2 FT	CRC 2 FT	CRC 2 FT						

F-634-2



TEST REPORT SUMMARY

Thermal Shock
Liquid to Liquid
500 Cycles, -55°C to +125°C

TEST NO.

Report No. XT-1218-C

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PROD. NO. 0238G CUSTOMER NASA, Marshall Space Flight Center
 LOT _____ CUSTOMER P/N _____
 LOT SIZE 20 CUSTOMER P/O NAS8-32403
 C.R.C. P/N M83421/01-1186R C.R.C. S/O 704-35622
 DATE COMPLETED April 9, 1977

TEST	REQUIREMENT	METHOD PARAGRAPH	ACC	
			REJ	
Insulation Resistance	3.11	4.7.7	20	0
Capacitance	N/A	4.7.8	20	0
Dissipation Factor	3.13	4.7.9	20	0
E.S.R.			20	0
Seal Test	3.9	4.7.5	19	1

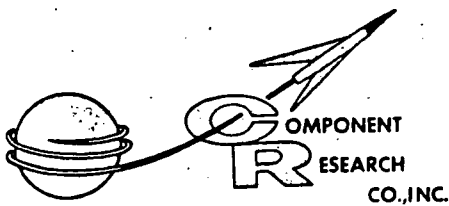
QUALITY CONTROL

DATE

SHIPPING DATA

ORDER #	DATE SHIPPED	QTY SHIPPED	INVOICE #	QTY STOCKED

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Customer's Name: NASA

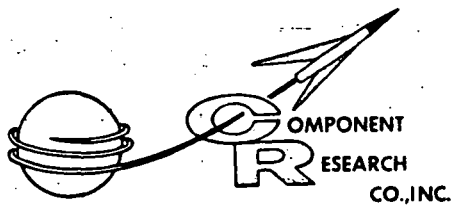
S/O - 704-35622

SHEET 41 OF 188

TEST: Insulation Resistance (Terminal to Terminal)		LAB SUPVR <i>[Signature]</i>	C.R.C. P/N M83421/01-1186 R
TEST NO. XT 1218-C		ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C		Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. 30VDC			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7	
ACCEPTANCE LIMITS: 45pA maximum or 666,000 megohms minimum After 500 cycles liquid to liquid thermal shock there are no established limits for maximum leakage current @ 25°C.		EQUIPMENT USED: D.C. Micro V Ammeter Model No. ECN No. I.R. Test rack G.R. 425A 1480 D.C. volt ohm meter CRC None 647 Battery pack Simpson 260 1357 N/A	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	9	8	14	10	44	9		
121	7	9	16	9	10	9		
122	5	8	15	10	17	8		
123	8	7	16	8	8	8		
124	7	8	14	8	32	10		
125	7	8	16	11	20	12		
126	6	10	15	10	16	34		
127	5	7	17	8	9	7		
128	10	7	17	12	90	8		
129	8	7	15	9	9	7		
130	6	6	15	9	7	5		
131	7	9	14	8	7	7		
132	6	12	15	9	9	7		
134	7	7	15	8	15	6		
135	6	7	15	6	13	6		
TEST DATE	2-28-77	3-8-77	3-11-77	3-23-77	4-19-77	4-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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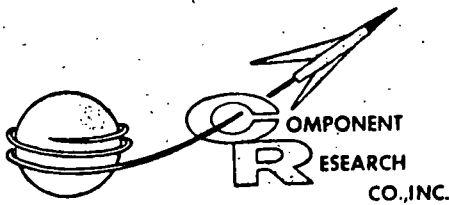
S/O - 704-35622

SHEET 42 OF 188

TEST Insulation Resistance @ 25°C (Terminal to Terminal)	C.R.C. P/N	M83421/01-1186R
	CUST P/N	
TEST NO. XT 1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles
136	6	15	16	9	17	8
137	6	20	17	8	15	6
138	7	24	13	8	7	8
139	7	13	14	7	13	7
140	6	19	14	8	17	8
TEST DATE	2-28-77	3-8-77	3-11-77	3-23-77	4-10-77	4-29-77
TEST BY						

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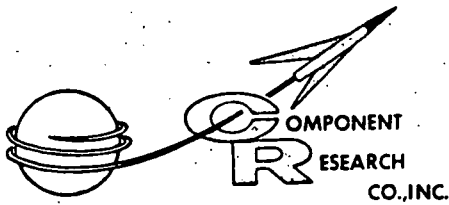
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SHEET 43 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPVR.	C.R.C. P/N M83421/01-1186 R																		
TEST NO. XT 1218-C	ENGR.	CUST. P/N																		
TEST TEMP. -55°C	Q.A.	PROD. NO. 0238G																		
TEST VOLT. 30VDC		P/O NO. NAS8-32403																		
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7																		
ACCEPTANCE LIMITS: There are no established limits for maximum leakage current @ -55°C		EQUIPMENT USED: <table border="0"> <tr> <td>D.C. Micro V Ammeter</td> <td>Model No. G.R. 425A</td> <td>ECN No. 1480</td> </tr> <tr> <td>I.R. Test rack</td> <td>CRC None</td> <td>647</td> </tr> <tr> <td>D.C. volt ohm meter</td> <td>Simpson 260</td> <td>1357</td> </tr> <tr> <td>Temperature test chamber</td> <td>Statham SDG-1</td> <td>130</td> </tr> <tr> <td>Thermometer</td> <td>Marshall J E-485</td> <td>1588</td> </tr> <tr> <td>Battery pack</td> <td>N/A</td> <td></td> </tr> </table>	D.C. Micro V Ammeter	Model No. G.R. 425A	ECN No. 1480	I.R. Test rack	CRC None	647	D.C. volt ohm meter	Simpson 260	1357	Temperature test chamber	Statham SDG-1	130	Thermometer	Marshall J E-485	1588	Battery pack	N/A	
D.C. Micro V Ammeter	Model No. G.R. 425A	ECN No. 1480																		
I.R. Test rack	CRC None	647																		
D.C. volt ohm meter	Simpson 260	1357																		
Temperature test chamber	Statham SDG-1	130																		
Thermometer	Marshall J E-485	1588																		
Battery pack	N/A																			

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	15	21	25	28	30	37		
121	13	21	10	26	21	39		
122	10	21	13	29	25	51		
123	11	21	10	20	24	19		
124	13	24	30	24	24	15		
125	11	21	10	20	25	15		
126	10	21	18	40	33	52		
127	14	18	8	18	24	15		
128	11	20	10	20	23	20		
129	10	20	6	19	32	19		
130	10	20	7	21	25	16		
131	11	24	6	23	22	15		
132	14	22	9	26	18	19		
134	12	21	8	21	18	15		
135	10	20	5	19	20	21		
TEST DATE	2-28-77	3-8-77	3-16-77	4-5-77	4-15-77	5-9-77		
TEST BY								

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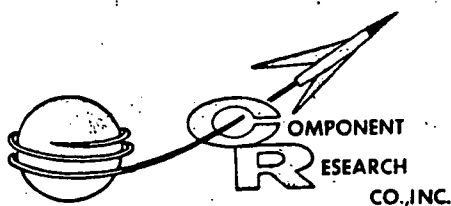
S/O - 704-35622

SHEET 44 OF 188

TEST		C.R.C. P/N	M83421/01-1186R
Insulation Resistance @ -55°C (Terminal to Terminal)		CUST P/N	
TEST NO. XT 1218-C		PROD. NO.	0238G
		P/O NO.	NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	10	20	7	20	18	18		
137	12	19	9	19	15	11		
138	10	19	6	17	20	17		
139	10	20	13	17	21	17		
140	10	19	14	18	25	16		
TEST DATE	2-28-77	3-8-77	3-16-77	4-5-77	4-15-77	5-9-77		
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SHEET 45 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPVR.	C.R.C. P/N M83421/01-1186 R
TEST NO. XT 1218-C	ENGR.	CUST. P/N
TEST TEMP. 125°C	Q.A.	PROD. NO. 0238G
TEST VOLT. 18VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: 2250 pA maximum or 8,000 megohms minimum After 500 cycles liquid to liquid thermal shock there are no established limits for maximum leakage current @ +125°C		EQUIPMENT USED: D.C. Micro V Ammeter Model No. H.P. 425A ECN No. 1480 I.R. Test rack C.R.C. None 647 D.C. volt ohm meter Simpson 260 1357 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J E-485 1588 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	300	390	570	330	330	270		
121	480	360	550	430	330	250		
122	115	470	670	540	600	310		
123	210	160	290	160	210	170		
124	300	170	280	340	210	190		
125	280	310	520	270	260	250		
126	260	170	410	950	1700	200		
127	260	380	610	360	310	320		
128	380	190	260	280	160	290		
129	260	350	540	290	370	310		
130	200	290	440	410	230	240		
131	700	105	600	580	380	410		
132	300	290	520	400	240	230		
134	600	310	510	430	490	360		
135	260	190	390	160	230	250		
TEST DATE	3-1-77	3-8-77	3-17-77	4-4-77	4-15-77	5-9-77		
TEST BY								

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TEST Insulation Resistance @ 125°C (Terminal to Terminal)	C.R.C. P/N	M83421/01-1186 R
	CUST P/N	
TEST NO. XT 1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	600	180	350	360	210	440		
137	900	350	590	460	310	340		
138	650	270	550	350	530	510		
139	480	400	350	600	850	1100		
140	500	170	100	250	240	260		
TEST DATE	3-1-77	3-8-77	3-10-77	4-2-77	4-15-77	5-9-77		
TEST BY								

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SHEET 47 OF 188

TEST: Capacitance Drift with Thermal Shock		LAB SUPVR. <i>[Signature]</i>	C.R.C. P/N M83421/01-1186 R
TEST NO. XT 1218-C		ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C		Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8	
ACCEPTANCE LIMITS: .135uF to .165uF After 500 cycles liquid to liquid thermal shock there are no established % capacitance drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387	

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	.150087	+ .1	+ .185	+ .27	+ .3	+ .28		
121	.150065	+ .105	+ .13	+ .34	+ .37	+ .35		
122	.150597	+ .095	+ .095	+ .205	+ .23	+ .215		
123	.148717	+ .005	+ .085	+ .15	+ .195	+ .165		
124	.151585	+ .085	+ .075	+ .125	+ .175	+ .14		
125	.148677	+ .015	+ .1	+ .135	+ .17	+ .145		
126	.148131	+ .1	+ .085	+ .47	+ .25	+ .15		
127	.150381	+ .015	+ .1	+ .15	+ .185	+ .155		
128	.148977	+ .005	+ .085	+ .1	+ .135	+ .13		
129	.151465	+ .01	+ .085	+ .065	+ .1	+ .09		
130	.148015	+ .085	+ .075	+ .155	+ .195	+ .165		
131	.153885	+ .095	+ .09	+ .19	+ .23	+ .2		
132	.149588	+ .01	+ .085	+ .15	+ .18	+ .15		
134	.150117	+ .11	+ .09	+ .18	+ .205	+ .18		
135	.149099	+ .025	+ .085	+ .14	+ .175	+ .14		
TEST DATE	2-28-77	3-7-77	3-11-77	3-28-77	4-19-77	5-2-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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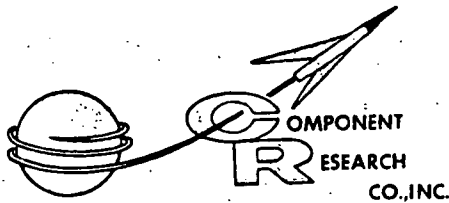
SHEET 48 OF 188

TEST Capacitance Drift @ 25°C with Thermal Shock	C.R.C. P/N	M83421/01-1186 R
	CUST P/N	
TEST NO. XT 1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	150674	+0.3	+0.9	+1.55	+1.95	+1.17		
137	148509	+1	+0.95	+1.55	+1.85	+1.65		
138	151082	+4.9	+5.6	+5.8	+6.2	+6		
139	149832	+1.35	+1.25	+1.05	+1.85	+1.55		
140	149618	+0.85	+0.6	+0.5	+0.65	+0.45		
TEST DATE	2-28-77	3-7-77	3-11-77	3-28-77	4-19-77	5-2-77		
TEST BY								

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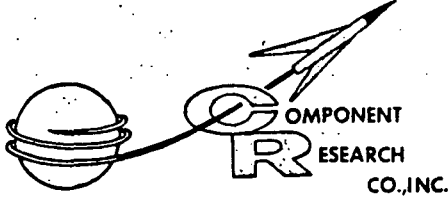
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SHEET 49 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR.	C.R.C. P/N M83421/01-118R
TEST NO. XT 1218-C	ENGR.	CUST. P/N
TEST TEMP. -55°C	Q.A.	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial capacitance and % capacitance drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J E-485 1588

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	.148207	-0.35	-0.15	+1.15	+2.28	+1.55		
121	.148167	-0.25	+0.03	+1.17	+1.32	+2.23		
122	.148722	-0.25	+0.15	+0.55	+2.21	+1.11		
123	.146762	0.00	+0.07	+0.25	+1.19	+1.05		
124	.149622	-0.15	+0.04	-0.15	+1.17	+0.15		
125	.146822	-0.05	+0.35	-0.05	+1.15	+0.25		
126	.146252	-0.15	-1.35	+3.32	+1.05	+1.3		
127	.148452	+0.05	+1.25	+0.05	+1.55	+1.045		
128	.147122	0.00	+1	-0.15	+1.17	+0.35		
129	.149592	-0.15	+1	-0.95	+1.11	-0.25		
130	.146142	-0.01	-0.45	-0.15	+1.19	+0.55		
131	.151962	-0.05	-0.45	+0.45	+2.23	+0.09		
132	.147532	-0.15	0.00	+0.35	+1.19	+0.45		
134	.148812	-0.05	-0.03	+0.03	+2.21	+0.08		
135	.147182	-0.25	-0.03	-0.35	+1.15	+0.05		
TEST DATE	2-28-77	3-8-77	3-16-77	4-5-77	4-15-77	5-9-77		
TEST BY								

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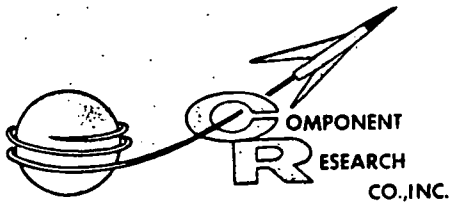
SHEET 50 OF 188

TEST Capacitance Drift @ -55°C with Thermal Shock	C.R.C. P/N	M83421/01-1186 R
	CUST P/N	
	PROD. NO.	0238G
	P/O NO.	NAS8-32403

TEST NO. XT 1218-C

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	.148672	+005	+075	+04	+24	+1		
137	.146638	+005	+12	+005	+195	+06		
138	.149902	-01	+11	-055	+145	+025		
139	.148012	+025	+135	-125	+14	+115		
140	.147582	+015	+19	-145	+115	-005		
TEST DATE	2-28-77	3-8-77	3-16-77	4-4-77	4-10-77	5-1-77		
TEST BY								

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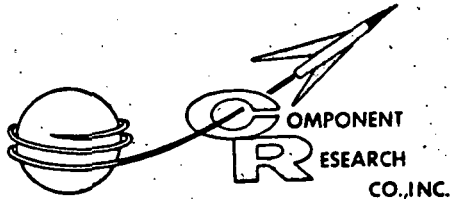
SHEET 51

OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR.	C.R.C. P/N M83421/01-1186 R
TEST NO. XT 1218-C	ENGR.	CUST. P/N
TEST TEMP. 125°C	O.A.	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial capacitance and % capacitance drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J E-485 1588

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	150446	+0.35	-0.4	+1.65	+1.55	+1.35		
121	150506	+0.35	-0.85	+2.05	+1.9	+1.85		
122	150866	+0.25	-0.05	+1.35	+1.05	+1.05		
123	149036	+0.15	-0.45	+0.95	+0.9	+0.9		
124	151856	+0.15	-0.4	+0.7	+0.7	+0.75		
125	148946	+0.15	-0.1	+0.7	+0.7	+0.75		
126	148346	+0.1	-0.25	+0.73	+1.4	+2.4		
127	150716	+0.3	-0.5	+0.95	+0.95	+1.05		
128	149202	+0.15	0.00	+0.5	+0.55	+0.65		
129	151672	+0.25	+0.1	+0.45	+0.55	+0.7		
130	148272	+0.2	-0.35	+1.05	+1.05	+1.1		
131	154042	+0.15	+0.55	+1.25	+1.12	+1.25		
132	149682	+0.15	+0.95	+0.95	+0.95	+0.95		
134	150452	+0.1	-0.5	+1	+1	+1.05		
135	149512	+0.65	-1.1	+0.65	+0.65	+0.65		
TEST DATE	3-1-77	3-8-77	3-10-77	4-4-77	4-15-77	5-9-77		
TEST BY								

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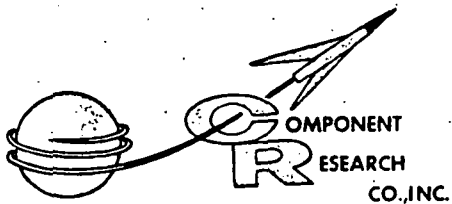
S/O - 704-35622

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TEST Capacitance Drift @ 125°C with Thermal Shock	C.R.C. P/N	M83421/01-1186 R
	CUST P/N	
TEST NO. XT 1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	150952	+0.15	-0.2	+0.85	+0.85	+0.95		
137	148872	+0.15	-0.8	+0.7	+0.75	+0.75		
138	152142	+0.25	-0.55	+0.7	+0.6	+0.65		
139	150282	+0.25	-0.55	+0.75	+0.7	+0.85		
140	149782	+0.1	+0.3	+0.35	+0.3	+0.4		
TEST DATE	3-1-77	3-8-77	3-10-77	3-23-77	4-15-77	5-9-77		
TEST BY								

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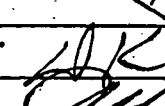
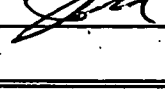
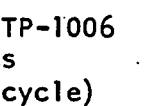
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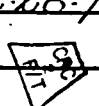


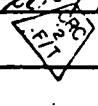

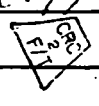
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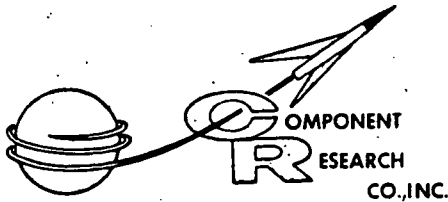
704-35622

SHEET 53 OF 188

TEST: Dissipation Factor @ 1 KHz	LAB SUPVR. 	C.R.C. P/N M83421/01-1186 R
TEST NO. XT 1218-C	ENGR. 	CUST. P/N
TEST TEMP. 25°C	Q.A. 	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: 15% After 500 cycles liquid to liquid thermal shock there are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor Model No. G.R. 1413 ECN No. 1387

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	.07	.075	.085	.08	.08	.08		
121	.085	.09	.09	.09	.095	.09		
122	.07	.085	.085	.09	.08	.08		
123	.07	.075	.085	.085	.085	.085		
124	.07	.075	.075	.085	.085	.08		
125	.07	.075	.09	.08	.08	.085		
126	.07	.08	.085	.095	.145	.19		
127	.07	.075	.085	.08	.085	.08		
128	.07	.075	.085	.075	.08	.08		
129	.07	.075	.085	.075	.08	.08		
130	.07	.075	.085	.075	.08	.105		
131	.07	.085	.085	.08	.08	.08		
132	.07	.075	.085	.08	.08	.08		
134	.07	.08	.085	.07	.08	.08		
135	.075	.075	.08	.075	.075	.08		
TEST DATE	2-28-77	3-7-77	3-11-77	3-28-77	4-19-77	5-2-77		
TEST BY								

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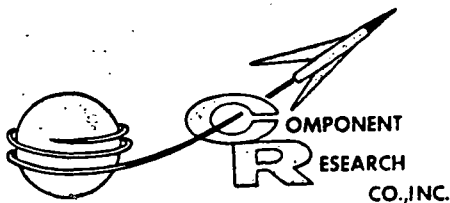
S/O - 704-35622

SHEET 54 OF 188

TEST Dissipation Factor @ 1KHz @ 25°C	C.R.C. P/N	M83421/01-1186R
	CUST P/N	
TEST NO. XT 1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (055°C to +125°C)					
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles
136	.07	.08	.085	.085	.08	.085
137	.07	.075	.085	.075	.075	.075
138	.07	.065	.08	.075	.08	.075
139	.075	.075	.08	.075	.075	.08
140	.075	.08	.085	.075	.08	.075
TEST DATE	2-28-77	3-7-77	3-11-77	3-28-77	4-19-77	5-2-77
TEST BY						

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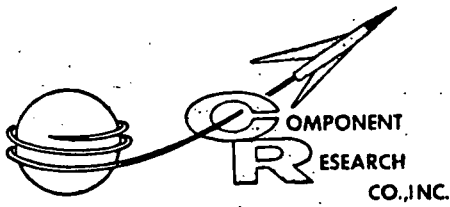
704-35622

SHEET 55 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPVR.	C.R.C. P/N M83421/01-1186 R
TEST NO. XT 1218-C	ENGR.	CUST. P/N
TEST TEMP. -55°C	Q.A.	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J 1588 E-485

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						ORIGINAL PAGE IS OF POOR QUALITY
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles	
118	.36	.37	.39	.37	.36	.37	
121	.37	.36	.4	.39	.37	.38	
122	.36	.36	.4	.37	.38	.37	
123	.37	.36	.44	.38	.36	.38	
124	.35	.36	.38	.37	.36	.37	
125	.36	.36	.44	.38	.36	.38	
126	.35	.36	.49	.51	.4	.56	
127	.36	.36	.39	.38	.36	.38	
128	.40	.36	.4	.37	.36	.37	
129	.36	.36	.39	.39	.36	.37	
130	.48	.35	.37	.36	.36	.36	
131	.36	.37	.76	.46	.36	.37	
132	.37	.36	.4	.39	.36	.37	
134	.37	.36	.42	.41	.36	.37	
135	.36	.36	.44	.36	.36	.37	
TEST DATE	2-26-77	3-8-77	3-16-77	4-5-77	4-15-77	5-9-77	
TEST BY							

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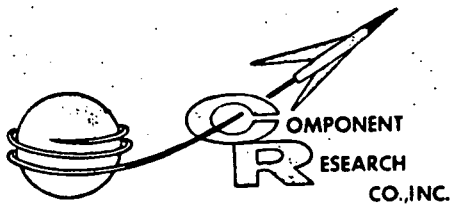
S/O - 704-35622

SHEET 56 OF 188

TEST Dissipation Factor @ 1KHz @ -55°C	C.R.C. P/N	M83421/01-1186.R
	CUST P/N	
TEST NO. XT 1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	.37	.36	.39	.38	.37	.38		
137	.35	.36	.37	.37	.36	.36		
138	.37	.36	.4	.38	.36	.37		
139	.42	.41	.44	.44	.41	.44		
140	.37	.39	.39	.38	.36	.37		
TEST DATE	2-28-77	3-8-77	3-16-77	4-4-77	4-15-77	5-9-77		
TEST BY								

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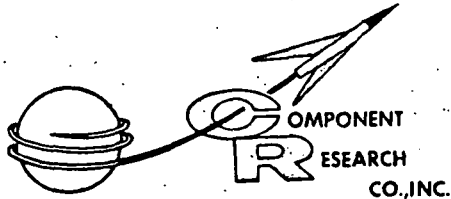
S/O 704-35622

SHEET 57 OF 188

TEST: Dissipation Factor @ 1KHz		LAB SUPVR.	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C		ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C		Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)			SPECIFICATION: - MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor Model No. G.R. 1413 ECN No. 1387 Temperature test chamber Statham SDG-1 ECN No. 130 Thermometer Marshall J E-485 ECN No. 1588	

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	.04	.045	.085	.035	.04	.035		
121	.04	.045	.09	.045	.05	.035		
122	.04	.035	.08	.035	.04	.035		
123	.04	.03	.09	.04	.045	.035		
124	.04	.035	.085	.035	.04	.035		
125	.04	.04	.085	.04	.04	.035		
126	.03	.035	.08	.045	.06	.075		
127	.04	.045	.09	.04	.045	.035		
128	.04	.035	.085	.035	.04	.035		
129	.05	.04	.085	.04	.04	.035		
130	.13	.035	.085	.035	.035	.035		
131	.04	.06	.085	.045	.045	.035		
132	.04	.035	.085	.035	.035	.03		
134	.04	.04	.085	.035	.04	.035		
135	.04	.035	.08	.035	.035	.03		
TEST DATE	3-1-77	3-8-77	3-10-77	4-4-77	4-15-77	5-9-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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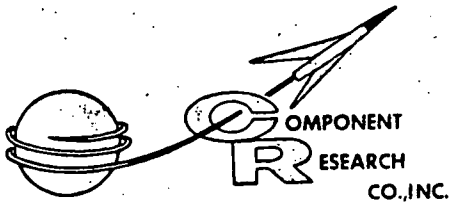
Customer's Name: NASA

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TEST Dissipation Factor @ 1KHz @ +125°C	C.R.C. P/N	M83421/01-1186R
	CUST P/N	
TEST NO. XT-1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles
136	.04	.045	.085	.04	.045	.035
137	.04	.035	.08	.035	.035	.03
138	.04	.04	.085	.04	.04	.035
139	.04	.04	.085	.04	.04	.035
140	.04	.07	.085	.04	.045	.035
TEST DATE	3-1-77	3-8-77	3-10-77	3-23-77	4-15-77	5-9-77
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Customer's Name: NASA

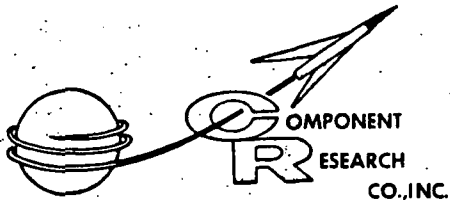
510 - 704-35622

SHEET 59 OF 188

TEST: Dissipation Factor @ 10KHz	LAB SUPVR <i>[Signature]</i>	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	O.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4:7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor Model No. G.R. 1413 ECN No. 1387

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK @ 10 KHz (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	.17	.165	.18	.175	.185	.18		
121	.19	.24	.25	.23	.23	.22		
122	.14	.165	.165	.165	.17	.165		
123	.17	.195	.215	.22	.225	.225		
124	.15	.165	.19	.185	.2	.19		
125	.165	.185	.215	.195	.2	.205		
126	.145	.165	.17	.16	.18	.195		
127	.17	.175	.2	.195	.205	.2		
128	.155	.17	.19	.18	.195	.205		
129	.15	.165	.185	.17	.18	.18		
130	.16	.18	.19	.19	.20	.19		
131	.165	.195	.2	.185	.20	.205		
132	.16	.17	.185	.175	.18	.185		
134	.155	.175	.185	.16	.19	.18		
135	.18	.155	.165	.165	.17	.17		
TEST DATE	2-28-77	3-7-77	3-11-77	3-28-77	4-19-77	5-2-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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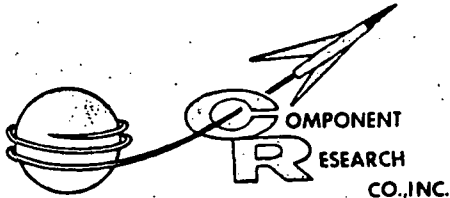
S/O - 704-35622

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TEST Dissipation Factor @ 10 KHz @ 25°C		C.R.C. P/N M83421/01-1186R	
TEST NO. XT-1218-C		CUST P/N	
		PRD. NO. 0238G	
		P/O NO. NAS8-32403	

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK @ 10 KHz (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	.145	.205	.22	.22	.22	.225		
137	.15	.165	.175	.165	.17	.18		
138	.15	.15	.175	.17	.18	.195		
139	.155	.175	.185	.185	.19	.195		
140	.17	.185	.2	.195	.2	.21		
TEST DATE	2-26-77	3-7-77	3-11-77	3-26-77	4-19-77	5-2-77		
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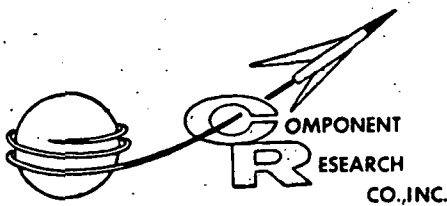
CRS/0 - 704-35622

SHEET 61 OF 188

TEST: Dissipation Factor @ 10KHz	LAB SUPVR.	C.R.C. P/N M83421/01-1186R
TEST NO. XT 1218-C	ENGR. <i>D.K.C.</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK @ 10 KHz (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	.52	.6	.74	.59	.55	.51		
121	.58	.59	.8	.63	.63	.56		
122	.51	.54	.76	.58	.65	.51		
123	.58	.58	.81	.6	.62	.55		
124	.53	.56	.58	.58	.55	.53		
125	.54	.56	.86	.59	.58	.53		
126	.50	.54	.84	.71	.64	.63		
127	.54	.56	.62	.6	.58	.54		
128	.85	.55	.81	.59	.54	.53		
129	.55	.56	.74	.56	.54	.51		
130	.87	.55	.62	.56	.56	.52		
131	.55	.64	1.75	.88	.56	.56		
132	.55	.56	.74	.6	.56	.52		
134	.55	.56	.93	.81	.56	.53		
135	.54	.54	.9	.68	.55	.5		
TEST DATE	2-28-77	3-8-77	3-16-77	4-5-77	4-15-77	5-9-77		
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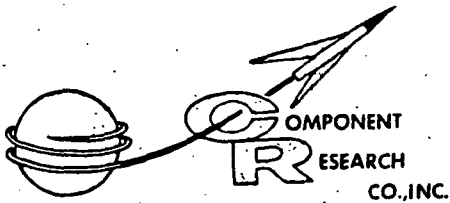
S/O - 704-35622

SHEET 62 OF 188

TEST Dissipation Factor @ 10KHz @ -55°C	C.R.C. P/N M83421/01-1186R
	CUST P/N _____
	PROD. NO. 0238G
TEST NO. XT 1218-C	P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK @ 10 kHz (-55°C to +125°C)					
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles
136	.58	.59	.67	.6	.59	.55
137	.53	.54	.6	.61	.54	.5
138	.55	.56	.82	.56	.55	.51
139	.58	.6	.8	.7	.6	.56
140	.55	.8	.8	.59	.58	.54
TEST DATE	2-28-77	3-8-77	3-16-77	4-5-77	4-15-77	5-9-77
TEST BY						

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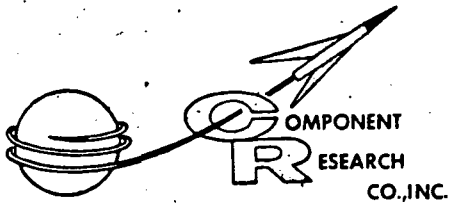
S/O - 704-35622

SHEET 63 OF 188

TEST: Dissipation Factor @ 10KHz	LAB SUPVR. <i>[Signature]</i>	C.R.C. P/N M83421/01-1186R
TEST NO. XT 1218-C	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK @ 10 KHz (-55°C to +125°C)						
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles	
118	.15	.22	.18	.175	.195	.135	
121	.23	.29	.24	.23	.31	.185	
122	.18	.175	.16	.18	.21	.125	
123	.21	.225	.22	.22	.245	.18	
124	.17	.195	.185	.185	.215	.145	
125	.17	.21	.2	.205	.225	.155	
126	.15	.175	.16	.19	.3	.21	
127	.18	.215	.2	.205	.215	.16	
128	.23	.195	.19	.195	.205	.15	
129	.24	.195	.18	.185	.2	.145	
130	.65	.2	.21	.2	.21	.15	
131	.22	.42	.195	.21	.19	.16	
132	.20	.19	.185	.19	.195	.135	
134	.20	.205	.18	.185	.195	.14	
135	.18	.185	.195	.175	.185	.125	
TEST DATE	3-1-77	3-8-77	3-10-77	3-23-77	4-13-77	5-9-77	
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

F-634-1



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Customer's Name: NASA

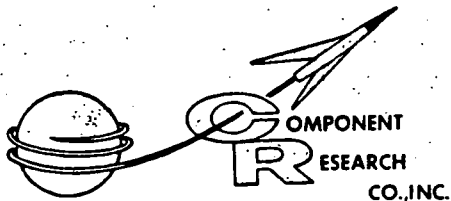
S/O - 704-35622

SHEET 64 OF 188

TEST Dissipation Factor @ 10KHz @ 125°C		C.R.C. P/N	M83421/01-1186R
		CUST P/N	
		PROD. NO.	0238G
TEST NO. XT 1218-C		P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK @ 10KHz (-55°C to +125°C)						
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles	
136	.24	.245	.215	.235	.24	.185	
137	.18	.185	.165	.165	.18	.125	
138	.20	.20	.17	.19	.185	.13	
139	.21	.21	.185	.21	.205	.15	
140	.22	.22	.20	.215	.31	.16	
TEST DATE	3-1-77	3-8-77	3-10-77	3-23-77	4-15-77	5-9-77	
TEST BY							

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Customer's Name: NASA

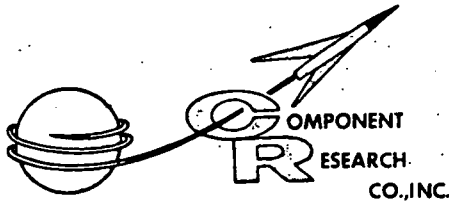
S/O 704-35622

SHEET 65 OF 188

TEST: E.S.R.	LAB SUPVR. 	C.R.C. P/N M83421/01-1186 R
TEST NO. XT-1218-C	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 Cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION:
ACCEPTANCE LIMITS: There are no established E.S.R. limits for this test condition.		EQUIPMENT USED: E.S.R. Meter Model No. Clark-Hess 1130 273 Cable Assembly Clark-Hess 1130 27375

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial E.S.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
118	.11	.12	.11	.11	.11	.11		
121	.14	.19	.19	.16	.18	.20		
122	.10	.10	.10	.10	.10	.09		
123	.13	.18	.16	.16	.16	.15		
124	.10	.12	.15	.12	.12	.11		
125	.13	.13	.13	.13	.14	.13		
126	.10	.10	.10	.10	.10	.09		
127	.12	.14	.14	.13	.13	.13		
128	.11	.13	.13	.13	.13	.13		
129	.13	.13	.12	.12	.12	.11		
130	.11	.13	.13	.13	.13	.13		
131	.12	.13	.13	.13	.13	.13		
132	.11	.11	.11	.11	.11	.11		
134	.11	.14	.12	.12	.12	.11		
135	.13	.11	.12	.11	.11	.10		
TEST DATE	2-26-77	3-7-77	3-10-77	3-24-77	4-19-77	5-2-77		
TEST BY								

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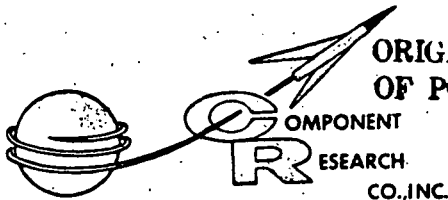
SHEET 66 OF 188

TEST E.S.R. @ 25°C	C.R.C. P/N M83421/01-1186R
	CUST P/N
	PROD. NO. 0238G
TEST NO. XT-1218-C	P/O NO. NAS8-32403

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial E.S.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
136	.14	.16	.16	.16	.16	.16		
137	.10	.10	.11	.10	.11	.10		
138	.10	.11	.13	.10	.11	.10		
139	.11	.13	.13	.13	.13	.13		
140	.12	.13	.14	.14	.14	.14		
TEST DATE	2-28-77	3-7-77	3-10-77	3-24-77	4-14-77	5-2-77		
TEST BY								

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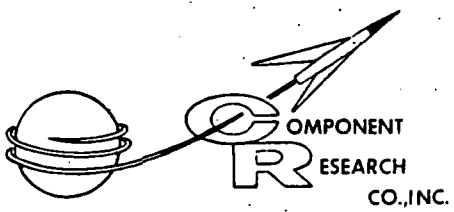
704 - 704-35622

SHEET 67 OF 188

TEST: Seal Test (Fine Leak Test)	LAB SUPVR.	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 Cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.5
ACCEPTANCE LIMITS: Leakage not to exceed 1×10^{-6} atm/cc/sec.		EQUIPMENT USED: Fine leak detector Model No. Du-Pont 24-120B ECN No. 651

S/N	Initial		After 50 N		After 150 N		After 250 N		After 350 N		After 500 N			
	1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}			
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail		
118	✓		✓		✓		✓		✓		✓			
121	✓		✓		✓		✓		✓		✓			
122														
123														
124											✓			
125											✓			
126												✓		
127											✓			
128											✓			
129														
130														
131														
132														
134	✓		✓		✓		✓		✓		✓			
135	✓		✓		✓		✓		✓		✓			
TEST DATE	2-28-77	3-9-77	3-21-77	4-8-77	4-21-77	5-25-77								
TEST BY														

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TEST REPORT SUMMARY
 Thermal Shock
 Liquid to Liquid
 500 Cycles, -55°C to +125°C

TEST NO.
 REPORT NO. XT-1218A
 PAGE 69 OF 188

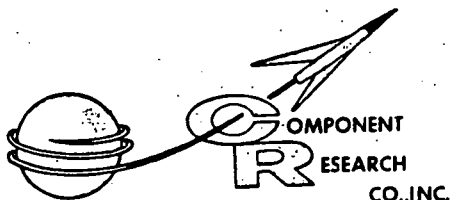
PROD. NO. 0236G CUSTOMER NASA, MARSHALL SPACE FLIGHT CENTER
 LOT _____ CUSTOMER P/N _____
 LOT SIZE 20 CUSTOMER P/O NAS8-32403
 C.R.C. P/N M83421/01-1090R C.R.C. S/O 704-35622
 DATE COMPLETED April 5, 1977

TEST	REQUIREMENT	METHOD PARAGRAPH	ACC	
			REJ	
Insulation Resistance	3.11	4.7.7	20	0
Capacitance	N/A	4.7.8	20	0
Dissipation Factor	3.13	4.7.9	20	0
E.S.R.			20	0
Seal Test	3.9	4.75	18	2

QUALITY CONTROL _____ DATE _____

SHIPPING DATA				
ORDER #	DATE SHIPPED	QTY SHIPPED	INVOICE #	QTY STOCKED

F-634-3



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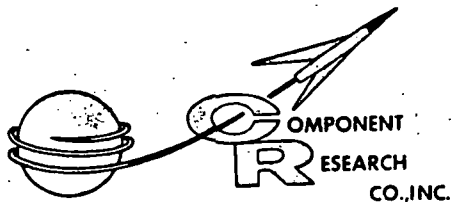
SHEET 70 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPVR <i>[Signature]</i>	C.R.C. P/N M83421/01-1090R
TEST NO. XT 1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. 30VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated thermal shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: Initial limits: 30 pA maximum or 3,000,000 megohms minimum. After 500 cycles liquid to liquid thermal shock there are no established limits for maximum leakage currents @ 25°C		EQUIPMENT USED: D.C. Micro V. Ammeter Model No. H.P. 425A ECN No. 1480 I.R. Test rack CRC none 647 D.C. volt ohm meter Simpson 1357 260 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	3	2	3	5	3	2		
002	4	2	3	5	5	4		
003	4	5	3	4	3	2		
004	2	3	3	7	5	2		
005	2	2	2	7	4	3		
006	5	2	4	4	3	5		
007	3	2	3	4	2	4		
008	3	2	4	8	5	3		
009	3	2	3	4	3	2		
010	17	2	3	4	4	3		
011	8	2	2	8	3	3		
012	3	2	2	4	2	2		
013	2	2	3	4	4	2		
014	4	2	4	3	5	2		
015	1	2	3	2	4	4		
TEST DATE	2-24-77	3-8-77	3-10-77	3-25-77	4-16-77	4-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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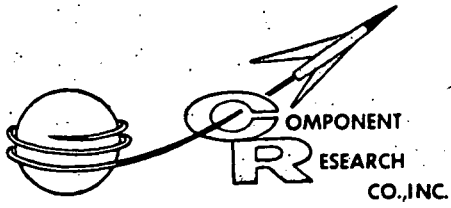
70 - 704-35622

SHEET 72 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPERVISOR <i>[Signature]</i>	C.R.C. P/N M83421/01-1090R
TEST NO. XT 1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. 30VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55 to +125°C (2 mins. per cycle) 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: There are no established limits for maximum leakage current @ -55°C		EQUIPMENT USED: D.C. Micro V. Ammeter I.R. Test rack D.C. volt ohm meter Temperature test chamber Thermometer Battery pack
		Model No. ECN No. H.P. 425A 1480 CRC none 647 Simpson 1357 260 Statham 130 SD9-1 Marshall 1588 J E-485 N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	9	3	6	7	6	5		
002	7	3	6	6	7	8		
003	7	2	7	7	5	10		
004	5	2	8	5	5	7		
005	6	2	5	5	6	5		
006	10	2	8	7	6	9		
007	6	2	7	8	5	7		
008	9	3	7	7	6	7		
009	3	3	6	6	5	6		
010	5	2	8	6	4	5		
011	5	3	8	6	6	12		
012	4	3	8	4	5	6		
013	4	2	9	4	6	10		
014	5	2	3	5	6	5		
015	5	2	7	4	4	7		
TEST DATE	3-1-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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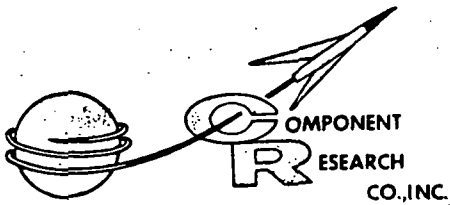
S/O - 704-35622

SHEET 73 OF 188

TEST Insulation Resistance @ -55°C (Terminal to Terminal)		C.R.C. P/N M83421/01-1090R CUST P/N _____ PROD. NO. 0236G P/O NO. NAS8-32403
TEST NO. XT 1218-A		

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	5	2	9	4	5	10		
017	6	2	9	5	4	10		
018	7	6	8	5	4	10		
019	6	3	7	4	5	12		
020	6	4	10	4	5	5		
TEST DATE	3-1-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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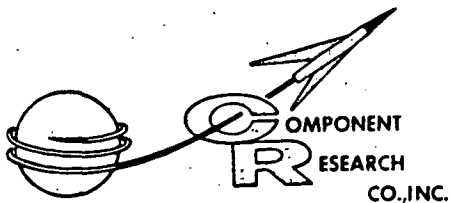
S/O - 704-35622

SHEET 74 OF 188

TEST: Insulation Resistance (Terminal to Terminal)		LAB SUPVR.	C.R.C. P/N M83421/01-1090R
TEST NO. XT 1218-A		ENGR.	CUST. P/N
TEST TEMP. 125°C		Q.A.	PROD. NO. 0236G
TEST VOLT. 18VDC			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7	
ACCEPTANCE LIMITS: Initial limits - 1500 pA max or 12,000 megohms minimum. After 500 cycles liquid to liquid thermal shock there are no established limits for maximum current leakage @ +125°C		EQUIPMENT USED: D.C. Micro V. Ammeter Model No. H.P. 425A ECN No. 1480 I.R. Test rack C.R.C. none 647 D.C. volt ohm meter Simpson 260 1357 Temp. test chamber Statham 130 SD9-1 Thermometer Marshall 1588 J E-485 Battery pack N/A	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	28	22	60	23	25	31		
002	25	25	27	30	32	35		
003	29	22	9	18	20	40		
004	17	13	19	36	47	78		
005	17	13	16	15	18	30		
006	18	11	15	13	15	32		
007	15	14	16	23	11	34		
008	15	15	4	15	35	50		
009	18	16	12	8	17	33		
010	20	16	7	15	19	39		
011	21	15	25	33	22	50		
012	25	10	23	8	16	43		
013	18	8	12	9	21	47		
014	44	23	29	29	21	42		
015	39	31	32	25	33	65		
TEST DATE	2-25-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
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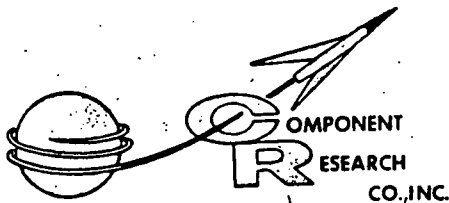
S/O - 704-35622

SHEET 75 OF 188

TEST Insulation Resistance @ 125°C (Terminal to Terminal)		C.R.C. P/N M83421/01-1090R CUST P/N _____ PROD. NO. 0236G
TEST NO. XT 1218-A	P/O NO. NAS8-32403	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	12	15	16	19	25	32		
017	11	7	10	20	13	22		
018	13	16	15	19	14	24		
019	20	25	13	17	24	32		
020	27	25	10	13	22	28		
TEST DATE	2-28-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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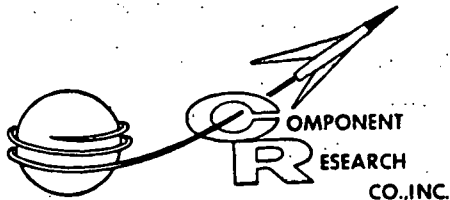
S/O - 704-35622

SHEET 76 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR.	C.R.C. P/N M83421/01-10 90 R
TEST NO. XT 1218-A	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 02366
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) 500 cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: - MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: Initial limit .0090uF to .0110 uF. After 500 cycles liquid to liquid thermal shock there are no established % cap. drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1337

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.009922	-0.35	+14	+0.85	-0.25	-0.2		
002	.009937	+0.6	+14.5	+1.35	+0.71	+1.35		
003	.009993	-0.55	+1.35	+0.01	-0.6	-0.75		
004	.009978	+0.35	+1.35	+0.25	-0.3	-0.45		
005	.009910	+0.5	+1.15	-0.05	-0.5	-0.7		
006	.009839	-0.35	+1.75	+0.65	+0.05	-0.65		
007	.009928	+0.75	+1.35	+0.5	-0.05	-0.15		
008	.009856	+0.55	+1.6	+0.45	-0.25	-0.4		
009	.009919	+1.05	+1.75	+0.65	+1.225	+0.5		
010	.009898	+0.65	+1.5	+0.4	-0.2	-0.15		
011	.009789	+0.7	+1.2	+0.5	-0.05	-0.05		
012	.009804	-0.25	+1.25	+0.3	-0.3	-0.75		
013	.009908	-0.15	+1.0	-0.05	-0.7	-1.15		
014	.009917	-0.15	+1.15	+0.15	-0.35	-0.55		
015	.009768	-0.15	+1.6	+0.4	-0.02	-0.45		
TEST DATE	2-24-77	3-7-77	3-10-77	3-23-77	4-18-77	5-2-77		
TEST BY								

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


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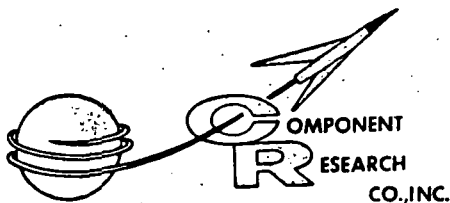
S/O - 704-35622

SHEET 77 OF 188

TEST Capacitance Drift @ 25°C with Thermal Shock	C.R.C. P/N	M83421/01-1090R
	CUST P/N	
TEST NO. XT 1218-A	PROD. NO.	0236G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles	
016	.009831	+0.35	+1.8	+0.25	-0.35	-0.45	
017	.009911	+0.5	+1.05	+0.25	-0.25	-0.45	
018	.009846	+0.65	+1.25	+0.15	-0.6	-0.6	
019	.009694	-0.25	+1	+0.15	-0.55	-0.8	
020	.009854	+0.45	+1.15	+0.25	-0.5	-0.7	
TEST DATE	2-24-77	3-7-77	3-10-77	3-23-77	4-16-77	5-2-77	
TEST BY							

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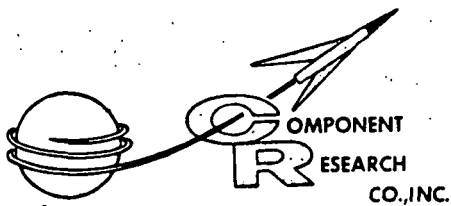
S/O - 704-35622

SHEET 78 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR.	C.R.C. P/N M83421/01-1090 R
TEST NO. XT 1218-A	ENGR.	CUS. P/N
TEST TEMP. -55°C	Q.A.	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C (2 mins. per cycle) 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial capacitance and % capacitance drift limits for this test condition.	EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1337 Temperature test chamber Satham 130 SD9-1 Thermometer Marshall 1588 J E-485	

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.009748	+0.03	+0.075	+0.045	+0.10	+0.095		
002	.009762	+0.015	+0.06	+0.075	+0.39	+1.45		
003	.009622	+0.005	+0.025	-0.025	+0.035	+0.005		
004	.009815	+0.015	+0.055	-0.01	+0.085	+0.065		
005	.009740	+0.025	+0.045	-0.005	+0.05	+0.025		
006	.009670	0.00	0.00	-0.35	+0.15	+0.02		
007	.009770	+0.055	+0.10	+0.025	+0.085	+0.045		
008	.009692	+0.04	+0.11	+0.06	+0.075	+0.07		
009	.009789	+0.045	+0.15	-0.07	+0.17	+0.58		
010	.009724	+0.02	+0.155	-0.025	+0.055	+0.065		
011	.009624	+0.045	+0.08	+0.06	+0.09	+0.13		
012	.009643	-0.01	-0.015	+0.075	-0.015	+0.025		
013	.009741	-0.02	-0.035	-0.075	-0.02	+0.015		
014	.009761	+0.035	+0.015	+0.02	+0.065	+0.055		
015	.009613	+0.015	+0.02	+0.025	+0.065	+0.10		
TEST DATE	3-1-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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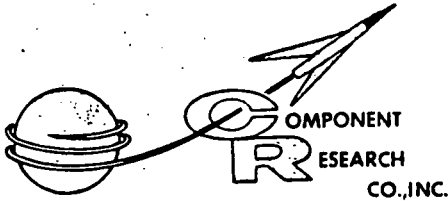
S/O - 704-35622

SHEET 79 OF 188

TEST Capacitance Drift @ -55°C with Thermal Shock		C.R.C. P/N M83421/01-1090 R
TEST NO. XT- 1218-A		CUST P/N
		PROD. NO. 0236G
		P/O NO. NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	.009659	+0.55	+0.65	+0.03	+0.95	+0.34		
017	.009736	+0.45	+0.05	-0.01	+0.55	+0.35		
018	.009674	+0.55	+0.05	+0.03	+0.05	+0.01		
019	.009519	+0.06	+0.75	-0.05	+0.60	+0.15		
020	.009686	+0.55	+1.05	0.00	+1.10	+0.55		
TEST DATE	3-1-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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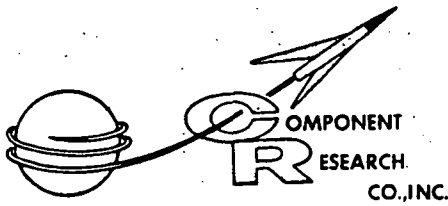
S/O - 704-35622

SHEET 80 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPERVISOR <i>[Signature]</i>	C.R.C. P/N M83421/01-1090R
TEST NO. XT 1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C, 2 mins. per cycle, 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial capacitance and % capacitance drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1337 Temperature test chamber Statham SD9-1 130 Thermometer Marshall J E-485 1588

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.009968	+0.15	-0.05	-0.05	-0.01	+0.05		
002	.009966	+0.15	+0.01	+0.79	+1.05	+2.05		
003	.009859	+0.15	-0.05	-0.01	-0.05	+0.02		
004	.010014	-0.01	-0.03	-0.35	-0.35	-0.05		
005	.009950	+0.15	-0.05	-0.05	-0.05	+0.02		
006	.009896	+0.05	-0.05	-0.05	-0.05	+0.05		
007	.009940	+0.05	-0.05	-0.05	-0.15	+0.15		
008	.009896	+0.05	-0.05	-0.05	-0.03	-0.05		
009	.009972	-0.05	-0.15	0.00	+1.19	+0.8		
010	.009940	+0.05	+0.15	+0.01	+0.15	+0.45		
011	.009838	+0.05	-0.05	+0.05	+0.05	+0.35		
012	.009824	-0.35	-0.04	-0.55	-0.75	-0.6		
013	.009940	0.00	-0.05	-0.05	-0.15	+0.05		
014	.009945	+0.05	0.00	+0.05	-0.05	+0.02		
015	.009820	-0.02	-0.35	-0.25	-0.05	-0.01		
TEST DATE	2-28-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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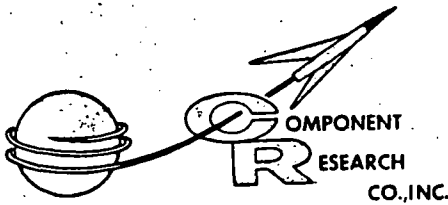
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SHEET 81 OF 188

TEST Capacitance Drift @ 125°C with Thermal Shock	C.R.C. P/N	M83421/01-1090R
	CUST P/N	
TEST NO. XT-1218-A	PROD. NO.	0236G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	.009860	-.035	-.03	-.04	-.065	-.045		
017	.009957	+.015	+.01	+.015	+.01	+.03		
018	.009902	-.015	-.015	-.015	-.035	-.02		
019	.009750	-.015	-.03	-.015	-.04	-.02		
020	.009893	-.005	-.015	-.005	-.015	+.01		
TEST DATE	2-28-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
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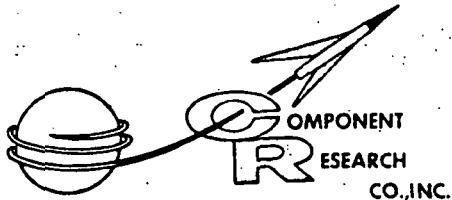
CRS/O - 704-35622

SHEET 82 OF 188

TEST: Dissipation Factor @ 1 KHz	LAB SUPV. <i>[Signature]</i>	C.R.C. P/N M83421/01-1090R
	ENGR. <i>[Signature]</i>	CUST. P/N
	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
		P/O NO. NAS8-32403
TEST NO. XT 1218-A		SPECIFICATION:
TEST TEMP. 25°C		MIL-C-83421, Para. 4.7.9
TEST VOLT. N/A		
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C (2 mins. per cycle) 500 cycles		
ACCEPTANCE LIMITS: Initial limit - .15% After 500 cycles liquid to liquid thermal shock there are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade G.R. 1413 1337 capacitor

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
.001	.08	.08	.09	.085	.07	.085		
.002	.075	.085	.095	.125	.175	.2		
.003	.075	.085	.085	.085	.075	.08		
.004	.075	.095	.085	.08	.075	.085		
.005	.075	.085	.09	.085	.08	.085		
.006	.075	.085	.09	.085	.08	.085		
.007	.075	.085	.085	.08	.075	.085		
.008	.075	.075	.085	.08	.075	.08		
.009	.075	.085	.09	.08	.085	.095		
.010	.075	.08	.085	.075	.075	.075		
.011	.075	.08	.085	.08	.075	.075		
.012	.075	.08	.085	.08	.075	.085		
.013	.08	.085	.095	.085	.08	.09		
.014	.075	.08	.085	.075	.08	.085		
.015	.075	.075	.085	.08	.075	.08		
TEST DATE	2-24-77	3-7-77	3-10-77	3-23-77	4-18-77	5-2-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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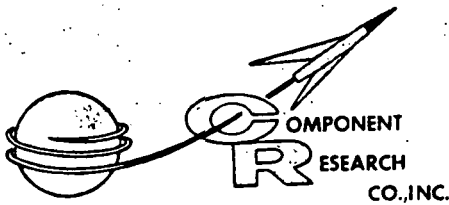
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SHEET 83 OF 188

TEST Dissipation Factor @ 1KHz @ 25°C	C.R.C. P/N <u>M83421/01-1090R</u>
	CUST P/N _____
TEST NO. <u>XT 1218-A</u>	PROD. NO. <u>0236G</u>
	P/O NO. <u>NAS8-32403</u>

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	.075	.08	.085	.075	.075	.075		
017	.08	.095	.09	.075	.075	.075		
018	.08	.085	.09	.08	.08	.08		
019	.07	.075	.085	.08	.075	.08		
020	.075	.09	.075	.075	.075	.08		
TEST DATE	2-24-77	3-7-77	3-10-77	3-23-77	4-16-77	5-2-77		
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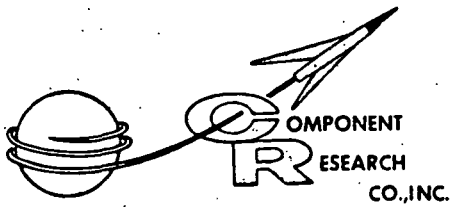
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SHEET 84 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPVR <i>[Signature]</i>	C.R.C. P/N M83421/01-1090R
TEST NO. XT 1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C (2 mins. per cycle) 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. G.R.1615 ECN No. 1331 Precision decade capacitor G.R. 1413 1337 Temperature test chamber Statham 130 SD -1 Thermometer Marshall 1588 J E-485

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.4	.38	.38	.4	.39	.39		
002	.4	.38	.38	.5	.44	.61		
003	.39	.38	.37	.39	.37	.38		
004	.39	.37	.37	.39	.38	.38		
005	.39	.38	.38	.39	.38	.39		
006	.4	.39	.38	.4	.39	.39		
007	.39	.38	.37	.39	.41	.38		
008	.39	.38	.37	.39	.38	.39		
009	.39	.38	.37	.41	.41	.61		
010	.39	.39	.37	.39	.38	.39		
011	.39	.38	.38	.45	.38	.39		
012	.39	.38	.38	.4	.45	.39		
013	.39	.38	.38	.4	.38	.38		
014	.39	.38	.38	.39	.38	.39		
015	.4	.38	.38	.4	.38	.39		
TEST DATE	3-1-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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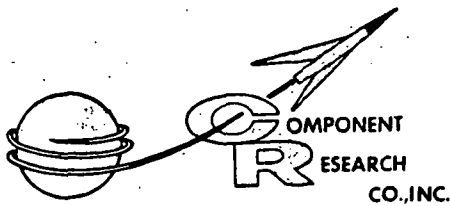
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SHEET 85 OF 188

TEST Dissipation Factor @ 1KHz @ -55°C		C.R.C. P/N	M83421/01-1090 R
		CUST P/N	
		PROD. NO.	0236G
TEST NO. XT-1218-A		P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK: (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	.39	.37	.38	.39	.37	.38		
017	.39	.37	.37	.39	.37	.38		
018	.4	.38	.38	.4	.39	.39		
019	.39	.37	.37	.41	.37	.38		
020	.39	.37	.36	.39	.37	.38		
TEST DATE	3-1-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
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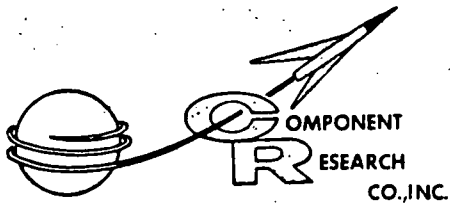
S/O - 704-35622

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TEST: Dissipation Factor @ 1KHz	LAB SUPVR. ²³ FIT	C.R.C. P/N M83421/01-1090R
TEST NO. XT 1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C (2 mins. per cycle) 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1615 ECN No. 1331 Precision decade G.R. 1413 1337 capacitor Temperature test chamber Statham 130 SD -1 Thermometer Marshall 1588 J E-485

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles	
001	.015	.015	.015	.015	.015	.02	
002	.015	.02	.02	.035	.035	.045	
003	.015	.015	.015	.015	.02	.02	
004	.015	.015	.015	.015	.015	.02	
005	.015	.015	.015	.015	.015	.02	
006	.015	.015	.015	.02	.015	.02	
007	.015	.015	.015	.015	.015	.015	
008	.015	.015	.015	.015	.015	.015	
009	.01	.015	.015	.015	.015	.025	
010	.015	.015	.015	.015	.015	.015	
011	.015	.015	.015	.015	.015	.015	
012	.015	.015	.015	.015	.03	.015	
013	.015	.02	.02	.02	.02	.025	
014	.015	.015	.015	.02	.015	.02	
015	.015	.02	.02	.02	.02	.02	
TEST DATE	2-28-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77	
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

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TEST Dissipation Factor @ 1KHz @ +125°C	C.R.C. P/N	M83421/01-1090R
	CUST P/N	
TEST NO. XT 1218-A	PROD. NO.	0236G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	.015	.015	.015	.015	.015	.02		
017	.015	.015	.015	.015	.015	.02		
018	.015	.015	.015	.03	.015	.02		
019	.015	.015	.015	.03	.015	.02		
020	.015	.015	.015	.015	.015	.015		
TEST DATE	2-28-77	5-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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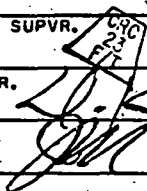
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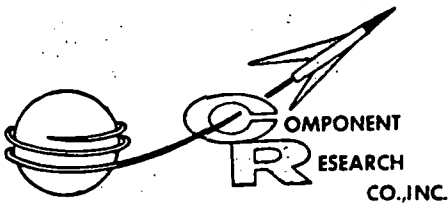
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SHEET 88 OF 188

TEST: Dissipation Factor @ 10 KHz	LAB SUPVR. 	C.R.C. P/N M83421/01-1090 R
TEST NO. XT 1218- A	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C (2 mins. per cycle) 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1615 ECN No. 1331 Precision decade capacitor G.R. 1413 1337

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.175	.18	.19	.185	.18	.195		
002	.17	.205	.205	.185	.21	.22		
003	.17	.165	.18	.175	.175	.185		
004	.17	.19	.185	.175	.17	.185		
005	.17	.2	.19	.185	.175	.195		
006	.18	.19	.205	.195	.195	.205		
007	.165	.19	.18	.165	.165	.175		
008	.175	.18	.195	.185	.18	.185		
009	.165	.18	.185	.175	.175	.195		
010	.165	.175	.175	.165	.165	.19		
011	.16	.17	.185	.17	.17	.165		
012	.17	.185	.185	.175	.17	.19		
013	.195	.215	.235	.225	.22	.23		
014	.175	.18	.19	.18	.165	.205		
015	.16	.16	.175	.165	.165	.175		
TEST DATE	2-24-77	3-8-77	3-10-77	3-23-77	4-16-77	5-2-77		
TEST BY								

F-634-1



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Customer's Name: NASA

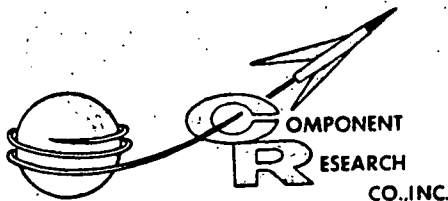
S/O - 704-35622

SHEET 89 OF 188

TEST Dissipation Factor @ 10 KHz @ 25°C	C.R.C. P/N	M83421/01-1090R
	CUST P/N	
TEST NO. XT 1218-A	PROD. NO.	0236G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	.16	.175	.18	.165	.165	.175		
017	.175	.195	.19	.17	.165	.175		
018	.18	.195	.20	.185	.19	.19		
019	.17	.195	.19	.185	.18	.185		
020	.165	.195	.17	.165	.175	.18		
TEST DATE	2-22-77	3-8-77	3-10-77	3-23-77	4-16-77	5-2-77		
TEST BY								

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Customer's Name: NASA

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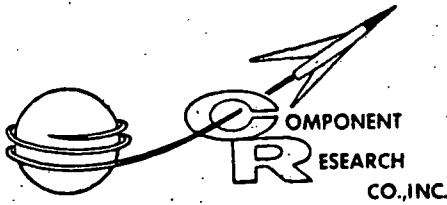
SHEET 90

OF 188

TEST: Dissipation Factor @ 10 KHz	LAB SUPVR.	C.R.C. P/N M83421/01-1090 R
TEST NO. XT 1218-A	ENGR.	CUST. P/N
TEST TEMP. -55°C	Q.A.	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C (2 mins. per cycle) 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1615 ECN No. 1331 Precision decade G.R. 1413 1337 capacitor Temperature test chamber Statham 130 SD -1 Thermometer Marshall 1588 J E-485

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.5	.48	.48	.49	.49	.48		
002	.5	.49	.48	.53	.5	.65		
003	.48	.48	.48	.48	.48	.45		
004	.48	.47	.47	.48	.48	.46		
005	.48	.48	.49	.49	.49	.46		
006	.5	.49	.49	.5	.49	.46		
007	.48	.47	.47	.49	.55	.46		
008	.49	.49	.51	.49	.48	.46		
009	.48	.47	.48	.47	.49	.61		
010	.5	.49	.48	.48	.47	.46		
011	.48	.48	.47	.62	.47	.45		
012	.49	.49	.49	.5	.54	.51		
013	.52	.5	.51	.57	.51	.47		
014	.49	.48	.48	.51	.49	.45		
015	.51	.5	.48	.5	.45	.45		
TEST DATE	3-1-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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Customer's Name: NASA

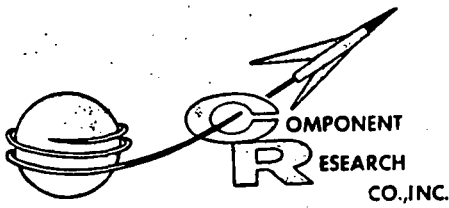
S/O - 704-35622

SHEET 91 OF 188

TEST Dissipation Factor @ 10KHz @ -55°C	C.R.C. P/N	M83421/01-1090R
	CUST P/N	
TEST NO. XT 1218-A	PROD. NO.	0236G
	P/O NO.	NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	.48	.47	.49	.48	.48	.45		
017	.48	.47	.49	.48	.47	.46		
018	.5	.49	.5	.5	.5	.5		
019	.5	.48	.48	.53	.48	.46		
020	.49	.47	.47	.48	.48	.48		
TEST DATE	3-1-77	3-6-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

F-634-2



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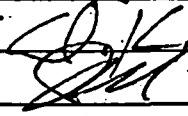
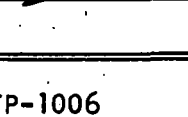
TWX 910-343-6864







GENERAL DATA SHEET

Customer's Name: NASA

S/O - 704-35622

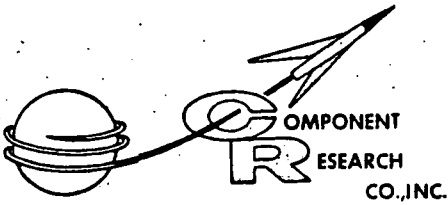
SHEET 92 OF 188

TEST: Dissipation Factor @ 10 KHz	LAB SUPVR. 	C.R.C. P/N M83421/01-1090R
TEST NO. XT 1218-A	ENGR. 	CUST. P/N
TEST TEMP. 125°C	Q.A. 	PROD. NO. 02366
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP-1006 (Liquid to Liquid) -55°C to +125°C (2 mins per cycle) 500 cycles		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1615 ECN No. 1331 Precision decade capacitor G.R. 1413 1337 Temperature test chamber Satham SD -1 130 Thermometer Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	.045	.06	.06	.065	.065	.075		
002	.05	.055	.065	.115	.13	.165		
003	.045	.055	.055	.06	.065	.07		
004	.04	.05	.055	.055	.055	.065		
005	.045	.055	.06	.065	.065	.08		
006	.06	.07	.075	.08	.08	.09		
007	.05	.045	.05	.05	.055	.05		
008	.045	.065	.065	.065	.07	.075		
009	.045	.05	.05	.055	.06	.08		
010	.035	.045	.045	.05	.05	.055		
011	.035	.05	.055	.065	.055	.06		
012	.045	.055	.06	.065	.09	.065		
013	.075	.095	.095	.105	.11	.115		
014	.05	.065	.065	.075	.07	.08		
015	.04	.065	.055	.06	.055	.065		
TEST DATE	2-28-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77		
TEST BY								

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C-2



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GENERAL DATA SHEET

Customer's Name: NASA

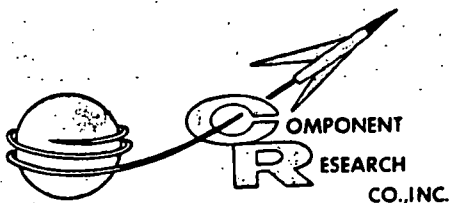
S/O - 704-35622

SHEET 93 OF 188

TEST	
Dissipation Factor @ 10KHz @ 125°C	C.R.C. P/N M83421/01-1090R
	CUST P/N
	PROD. NO. 0236G
TEST NO. XT 1218-A	P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial D.F.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles
016	.045	.055	.055	.055	.055	.065
017	.04	.055	.065	.055	.055	.065
018	.055	.065	.065	.075	.075	.075
019	.045	.06	.06	.085	.065	.065
020	.045	.055	.055	.06	.06	.06
TEST DATE	2-28-77	3-8-77	3-14-77	4-4-77	4-15-77	5-5-77
TEST BY						

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Customer's Name: NASA

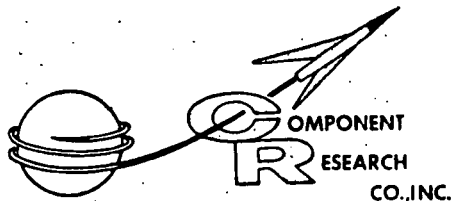
S/O - 704-35622

SHEET 94 OF 188

TEST: E.S.R.	LAB SUPV.	C.R.C. P/N M83421/01-1090 R
TEST NO. XT-1218-A	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Thermal Shock per TP- 1006 (Liquid to Liquid) 500 Cycles -55°C to 125°C (2 mins. per cycle)		SPECIFICATION:
ACCEPTANCE LIMITS: There are no established E.S.R. limits for this test condition.		EQUIPMENT USED: E.S.R. Meter Model No. 273 ECN. No. 1130 Cable assembly Model No. 27375 ECN. No. 1130

S/N	E.S.R. WITH THERMAL SHOCK (-55°C TO +125°C)							
	Initial E.S.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
001	1.1	1.0	1.2	1.2	1.2	1.1		
002	1.1	1.0	1.3	1.2	1.3	1.2		
003	1.0	1.0	1.2	1.1	1.1	1.1		
004	1.0	1.0	1.1	1.0	1.0	1.0		
005	1.1	1.0	1.2	1.2	1.2	1.2		
006	1.2	1.0	1.4	1.4	1.4	1.4		
007	.9	1.0	1.0	.9	1.0	.9		
008	1.1	1.0	1.3	1.3	1.3	1.2		
009	1.0	1.0	1.1	1.1	1.1	1.0		
010	1.0	1.0	1.0	1.0	1.0	1.0		
011	.9	1.0	1.0	1.0	1.0	1.1		
012	1.1	1.0	1.2	1.2	1.2	1.2		
013	1.5	1.0	1.8	1.8	1.8	1.9		
014	1.3	1.0	1.3	1.3	1.3	1.3		
015	.9	1.0	1.0	1.0	1.0	1.1		
TEST DATE	2-25-77	3-7-77	3-11-77	3-24-77	4-16-77	5-2-77		
TEST BY								

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Customer's Name: NASA

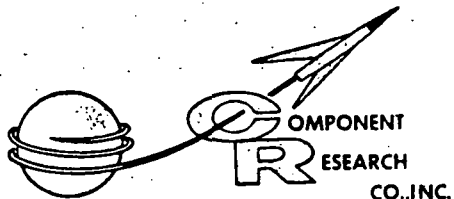
S/O - 704-35622

SHEET 95 OF 188

TEST E.S.R. @ 25°C	C.R.C. P/N M83421/01-1090 R
	CUST P/N _____
TEST NO. XT-1218-A	PROD. NO. 0236G
	P/O NO. NAS8-32403

S/N	E.S.R. WITH THERMAL SHOCK (-55°C TO +125°C)							
	Initial E.S.R.	After 50 Cycles	After 150 Cycles	After 250 Cycles	After 350 Cycles	After 500 Cycles		
016	1.0	1.0	1.1	1.1	1.1	1.0		
017	1.0	1.0	1.1	1.1	1.1	1.1		
018	1.2	1.0	1.3	1.4	1.4	1.4		
019	1.1	1.0	1.2	1.3	1.3	1.3		
020	1.1	1.0	1.2	1.2	1.1	1.2		
TEST DATE	2-25-77	3-7-77	3-11-77	3-24-77	4-18-77	5-2-77		
TEST BY								

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Customer's Name: NASA

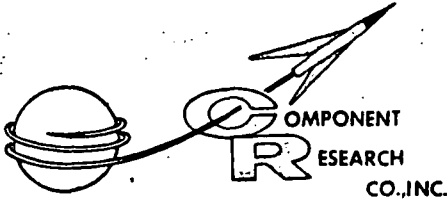
S/O - 704-35622

SHEET 96 OF 188

TEST: Seal Test (Fine Leak Test)		LAB SUPV. ²³ FIT	C.R.C. P/N M83421/01-1090 R
TEST NO. XT1218-A		ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C		Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A			P/O NO. NAS8-32403
SPECIAL NOTES: Accelerated Termal Shock per TP-1006 (Liquid to Liquid) 500 Cycles -55°C to +125°C (2 mins. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.5	
ACCEPTANCE LIMITS: Leakage not to exceed 1×10^{-6} atm/cc/sec.		EQUIPMENT USED: Fine leak detector Model No. Du Pont 24-120B ECN No. 651	

S/N	Initial		After 50 Cycles		After 150 Cycles		After 250 Cycles		After 350 Cycles		After 500 Cycles	
	1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
001	✓		✓		✓		✓		✓		✓	
002	✓		✓		✓		✓		✓		✓	
003											✓	
004											✓	
005											✓	
006											✓	
007											✓	
008											✓	
009											✓	
010											✓	
011											✓	
012											✓	
013											✓	
014	✓		✓		✓		✓		✓		✓	
015	✓		✓		✓		✓		✓		✓	
TEST DATE	2-28-77		3-9-77		3-21-77		4-8-77		4-21-77		5-25-77	
TEST BY	CRC 2 FIT		CRC 2 FIT		CRC 2 FIT		CRC 2 FIT		CRC 2 FIT		CRC 2 FIT	

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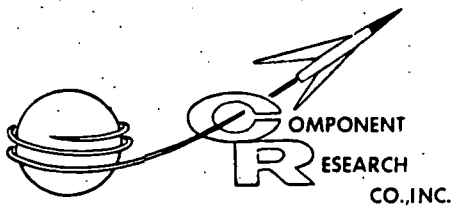
GENERAL DATA SHEET

Customer's Name: NASA S/O - 704-35622 SHEET 97 OF 188

TEST Seal Test (Fine Leak Test)	C.R.C. P/N <u>M83421/01-1090 R</u> CUST P/N _____ PROD. NO. <u>0236G</u> P/O NO. <u>NAS8-32403</u>
TEST NO. <u>XT-1218-A</u>	

S/N	Initial		After 50 \sim		After 150 \sim		After 250 \sim		After 350 \sim		After 500 \sim	
	1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
016	↑		↑		↑		↑		↑		↑	
017	↑		↑		↑		↑		↑		↑	
018	↓		↓		↓		↓		↓		↓	
019	↓		↓		↓		↓		↓		↓	
020	↓		↓		↓		↓		↓		↓	
TEST DATE	2-26-77	3-4-77	3-21-77	4-8-77	4-21-77	5-25-77						
TEST BY												

F-634-2



TEST REPORT SUMMARY
 THERMAL SHOCK
 AIR TO AIR
 500 CYCLES, -55°C to +125°C

TEST NO.
 REPORT #XT-1218-B

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PROD. NO. 0237G CUSTOMER NASA, MARSHALL SPACE FLIGHT CENTER
 LOT _____ CUSTOMER P/N _____
 LOT SIZE 30 CUSTOMER P/O NAS8-32403
 C.R.C. P/N M83421/01-1174R C.R.C. S/O 704-35622
 DATE COMPLETED July 1, 1977

TEST	REQUIREMENT	METHOD PARAGRAPH	ACC	
			REJ	
Insulation Resistance	3.11	4.7.7	30	0
Capacitance	N/A	4.7.8	30	0
Dissipation Factor	3.13	4.7.9	30	0
E.S.R.			30	0
Seal Test	3.9	4.7.5	27	3

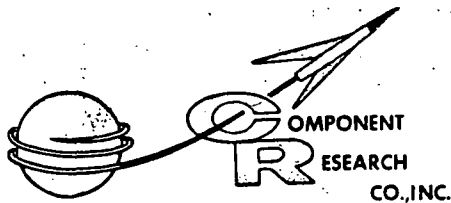
QUALITY CONTROL

DATE

SHIPPING DATA

ORDER #	DATE SHIPPED	QTY SHIPPED	INVOICE #	QTY STOCKED

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GENERAL DATA SHEET

Customer's Name: NASA

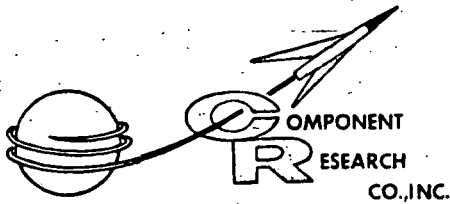
S/O - 704-35622

SHEET 99 OF 188

TEST: Insulation Resistance (Terminal to Terminal)		LAB SUPVR.	C.R.C. P/N M83421/01-1174 R															
TEST NO. XT-1218-B		ENGR.	CUST. P/N															
TEST TEMP. 25°C		Q.A.	PROD. NO. 0237G															
TEST VOLT. 30 VDC			P/O NO. NAS8-32403															
SPECIAL NOTES: Normal Thermal Shock (Air to Air) per TP-1006, 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7																
ACCEPTANCE LIMITS: 30pA maximum or 3,000,000 megohms minimum After 500 thermal shock cycles there are no established limits for maximum leakage current @ 25°C.		EQUIPMENT USED: <table border="0"> <tr> <td></td> <td>Model No.</td> <td>ECN No.</td> </tr> <tr> <td>D.C. Micro V. ammeter - H.P. 425A</td> <td></td> <td>1480</td> </tr> <tr> <td>I.R. Test rack</td> <td>CRC None</td> <td>647</td> </tr> <tr> <td>D.C. volt ohm meter - Simpson 260</td> <td></td> <td>1357</td> </tr> <tr> <td>Battery pack</td> <td>N/A</td> <td></td> </tr> </table>			Model No.	ECN No.	D.C. Micro V. ammeter - H.P. 425A		1480	I.R. Test rack	CRC None	647	D.C. volt ohm meter - Simpson 260		1357	Battery pack	N/A	
	Model No.	ECN No.																
D.C. Micro V. ammeter - H.P. 425A		1480																
I.R. Test rack	CRC None	647																
D.C. volt ohm meter - Simpson 260		1357																
Battery pack	N/A																	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	2	10	5	6	5	7		
023	20	7	5	8	5	6		
024	4	4	5	8	4	6		
025	4	4	5	11	6	7		
026	2	4	4	6	6	11		
027	12	8	3	8	5	7		
028	2	5	5	6	4	7		
029	2	4	5	8	5	6		
030	16	3	5	7	9	10		
032	4	6	5	7	4	4		
033	2	5	4	7	4	5		
034	8	3	3	4	4	6		
035	2	5	6	3	7	7		
036	4	5	4	6	5	5		
037	2	3	5	9	4	5		
TEST DATE	2-24-77	3-11-77	5-4-77	5-27-77	6-14-77	6-29-77		
TEST BY								

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GENERAL DATA SHEET

Customer's Name: NASA

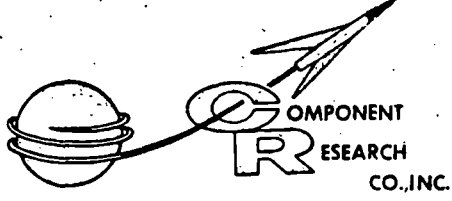
S/O - 704-35622

SHEET 100 OF 188

TEST Insulation Resistance @ 25°C (Terminal to Terminal)	C.R.C. P/N M83421/01-1174R
	CUST P/N
	PROD. NO. 0237G
TEST NO. XT-1218-B	P/O NO. NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	18	3	4	7	4	4		
039	6	12	8	8	7	12		
040	3	4	4	9	4	8		
041	4	5	5	4	7	31		
042	10	3	6	5	4	7		
043	2	6	7	6	3	6		
044	2	4	5	6	4	2		
045	2	3	6	8	5	3		
046	4	10	9	8	7	4		
047	2	4	6	8	4	2		
048	4	3	6	8	3	3		
049	2	5	6	6	4	2		
050	4	5	6	8	4	4		
051	6	5	5	9	5	4		
052	2	4	4	9	2	4		
TEST DATE	2-24-77	3-11-77	5-4-77	5-27-77	6-14-77	6-29-77		
TEST BY								

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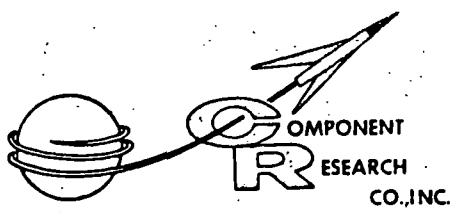
S/O - 704-35622

SHEET 101 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPERVISOR ENGR. Q.A.	C.R.C. P/N M83421/01-1174 R
TEST NO. XT-1218-B		CUST. P/N
TEST TEMP. -55°C		PROD. NO. 0237G
TEST VOLT. 30 VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: There are no established limits for maximum leakage current @-55°C		EQUIPMENT USED: Model No. ECN No. D.C. Micro V. Ammeter - H.P. 425 A 1480 I.R. Test rack CRC None 647 D.C. volt ohm meter - Simpson 260 1357 Temperature test - Statham SD9-1 chamber 130 Thermometer - Marshall J E-485 1588 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	26	15	20	25	21	25		
023	25	15	20	25	25	75		
024	24	14	20	21	27	25		
025	20	13	20	25	20	24		
026	22	17	21	20	25	23		
027	20	10	21	16	18	45		
028	27	15	21	21	18	25		
029	28	15	21	25	21	25		
030	20	10	24	20	43	33		
032	25	12	33	35	50	40		
033	26	37	21	30	22	25		
034	20	31	21	22	24	28		
035	21	10	23	23	25	40		
036	24	13	24	19	17	20		
037	26	17	19	20	24	27		
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-16-77	6-28-77		
TEST BY								

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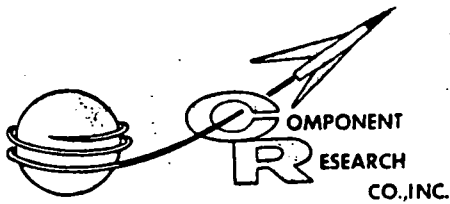
S/O - 704-35622

SHEET 102 OF 188

TEST Insulation Resistance @ -55°C (Terminal to Terminal)	C.R.C. P/N M83421/01-1174 R
	CUST P/N
TEST NO. XT-1218-B	PROD. NO. 0237G
	P/O NO. NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	20	14	21	30	33	40		
039	22	16	17	22	33	40		
040	20	16	18	26	52	23		
041	21	15	23	23	32	22		
042	22	12	15	55	23	24		
043	20	16	22	24	26	19		
044	20	9	24	11	20	35		
045	28	15	24	12	13	42		
046	27	11	24	23	13	35		
047	28	10	21	21	33	55		
048	24	11	35	41	15	50		
049	27	12	34	21	13	30		
050	25	14	30	22	27	50		
051	24	10	33	38	16	30		
052	27	21	29	35	33	50		
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-16-77	6-28-77		
TEST BY								

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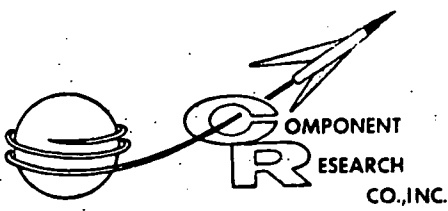
S/O 704-35622

SHEET 103 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPVR. <i>[Signature]</i>	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. 18 VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to 125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: 1500 pA maximum or 12,000 megohms minimum. After 500 cycles air to air thermal shock there are no established limits for maximum leakage current @ +125°C.		EQUIPMENT USED: Model No. ECN No. D.C. Micro V Ammeter - H.P. 425A 1480 I.R. test rack CRC None 647 D.C. volt ohm meter - Simpson 260 1357 Temperature test Statham SD9-1 130 chamber Thermometer - Marshall J E-485 1588 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	240	170	180	330	150	245		
023	420	330	570	550	900	270		
024	150	130	230	1650	11,500	10,000		
025	440	260	250	140	670	280		
026	210	150	190	150	460	250		
027	430	180	190	350	490	200		
028	220	320	235	210	290	140		
029	440	100	370	320	560	300		
030	350	130	390	250	730	200		
032	350	740	180	410	240	210		
033	240	200	410	560	92	400		
034	400	270	420	350	730	580		
035	570	230	370	390	400	270		
036	420	200	270	320	470	300		
037	250	230	310	420	520	95		
TEST DATE	3-2-77	3-14-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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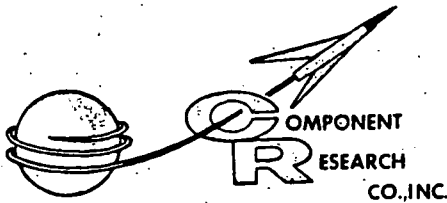
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SHEET 104 OF 188

TEST Insulation Resistance @ 125°C (Terminal to Terminal)	C.R.C. P/N M83421/01-1174 R CUST P/N _____ PROD. NO. 0237G P/O NO. NAS8-32403
TEST NO. XT-1218-B	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	250	150	230	530	260	200		
039	250	160	340	440	470	300		
040	530	110	330	1300	410	370		
041	440	150	1500	450	4400	780		
042	960	680	230	2750	310	350		
043	740	130	1750	490	450	650		
044	170	280	420	360	330	265		
045	300	380	460	620	350	215		
046	700	120	480	310	420	280		
047	410	150	390	200	390	115		
048	180	120	185	250	270	120		
049	910	120	265	400	350	195		
050	380	69	520	560	400	140		
051	600	230	490	585	580	590		
052	120	129	540	290	540	330		
TEST DATE	3-2-77	3-14-77	5-6-77	5-31-77	6-17-77	6-28-77		
TEST BY								

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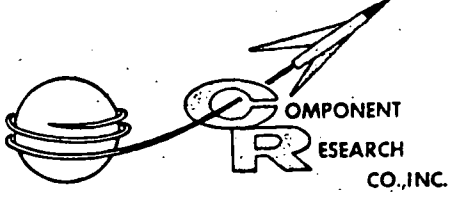
940 - 704-35622

SHEET 105 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR.	C.R.C. P/N M83421/01-1174 R
TEST NO. XT-1218-B	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421; Para. 4.7.8
ACCEPTANCE LIMITS: .135uF to .165uF After 500 cycles air to air thermal shock there are no established % capacitance drift limits for this test condition.		EQUIPMENT USED: Impedance comparator - Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. In uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	.099916	+0.25	+0.25	+1.15	+1.75	+2.2		
023	.099587	+0.55	+0.8	+1.45	+2.85	+2.21		
024	.100295	+0.55	+0.65	+0.95	+1.7	+0.85		
025	.100015	+0.25	+0.25	+1.05	+1.35	+1.45		
026	.099416	+0.05	+0.55	+1.25	+1.4	+1.65		
027	.100468	+1.0	+1.0	+1.05	+1.1	+1.2		
028	.100138	+0.45	+0.15	+0.25	+0.25	+0.15		
029	.100589	+0.45	+0.65	+1.65	+2.75	+3.4		
030	.100225	+0.5	+0.6	+2.5	+3.6	+4.5		
032	.099683	+0.4	+0.55	+1.85	+2.75	+3		
033	.099973	+0.35	+0.45	+1.55	+1.6	+1.75		
034	.101236	+0.55	+0.95	+2.15	+2.8	+3.3		
035	.099490	+0.45	+0.45	+1.55	+2.05	+1.9		
036	.100181	+0.6	+0.75	+1.65	+1.85	+1.9		
037	.099406	+0.55	+0.45	+0.95	+0.8	+0.8		
TEST DATE	2-24-77	3-11-77	5-3-77	5-27-77	6-14-77	6-29-77		
TEST BY								

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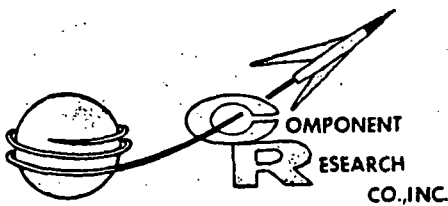
SHEET 106 OF 188

TEST Capacitance Drift with Thermal Shock @ 25°C	C.R.C. P/N	M83421/01-1174R	
	CUST P/N		
	PROD. NO.	0237G	
TEST NO.	XT-1218-B	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial Cap. In UF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
038	.099178	+185	+095	+135	-125	-48	
039	.097960	+225	+185	+235	-1	-175	
040	.097510	+245	+125	+15	+145	+085	
041	.101335	+125	+195	+02	+8.4	+6.3	
042	.098381	+115	+155	+155	+21	+22	
043	.097807	+125	+21	+26	+35	+6	
044	.097164	+115	+1	+1	+16	+115	
045	.097401	+105	+105	+09	+14	+09	
046	.099387	+17	+205	+33	+44	+4	
047	.097971	+17	+06	+095	+44	-02	
048	.098476	+26	+12	+175	+195	-21	
049	.098758	+285	+09	+105	+12	+135	
050	.097840	+125	+05	+025	+21	-085	
051	.097999	+175	+05	+14	+21	+205	
052	.098509	+145	+045	+125	+26	+19	
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-17-77	6-27-77	
TEST BY							

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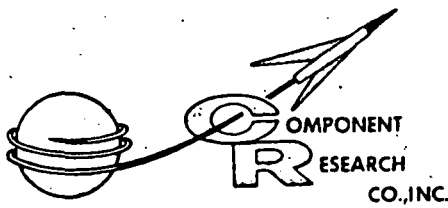
S/O - 704-35622

SHEET 107 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB. ENGR. <i>D.K.</i> O.A. <i>JMK</i>	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B		CUST. P/N
TEST TEMP. -55°C		PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial cap. & % cap. drift limits for this test condition.	EQUIPMENT USED: Impedance comparator - Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor - G.R. 1413 1387 Temp. test chamber - Statham SD9-1 130 Thermometer - Marshall J E-485 1580	

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. In uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
023	.098260	+0.85	+0.6	+2.3	+2.8	+2.8		
023	.098900	+1.35	+1.35	+2.4	+2.3	+1.8		
024	.098573	+1.05	+1.05	+1.6	+1.2	+0.85		
025	.098628	+0.85	+0.55	+2	+2.25	+1.8		
026	.098495	+1.3	+1.05	+2	+2.4	+2.2		
027	.100251	+0.55	+0.65	+1.75	+2.4	+1.65		
028	.098675	+1.15	+0.8	+1.2	+1.25	+0.45		
029	.099216	+1.55	+1.6	+3	+3.9	+4		
030	.098834	+1.1	+0.85	+1.85	+1.35	0.00		
032	.098217	+0.45	+0.25	+0.25	+0.95	+1.8		
033	.098564	+0.95	+1.45	+2.45	+2.95	+2.9		
034	.099898	+1.35	+1.9	+3.1	+3.6	+3.4		
035	.098159	+0.85	+1.1	+2.25	+3.1	+2.8		
036	.098834	+1.25	+1.7	+2.6	+2.6	+2		
037	.098017	+1.55	+1.4	+1.7	+1.35	+0.7		
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-17-77	6-27-77		
TEST BY								

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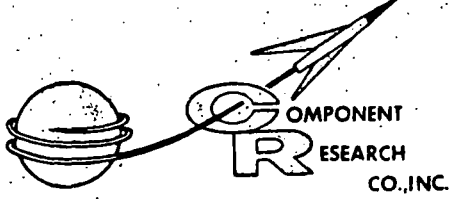
S/O - 704-35622

SHEET 108 OF 188

TEST Capacitance Drift @ -55°C with Thermal Shock	C.R.C. P/N M83421/01-1174 R
	CUST P/N
	PROD. NO. 0237G
TEST NO. XT-1218-B	P/O NO. NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. In uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	.100939	-0.05	-0.05	-0.04	+0.45	-1.5		
039	.099714	-0.01	-0.35	+0.05	+0.07	-0.6		
040	.099272	-0.45	-0.7	-0.55	-0.5	-1.35		
041	.103088	-0.3	+2.3	+5.1	+6.5	+5.5		
042	.100050	-0.9	-0.45	+0.25	+0.9	+0.25		
043	.099659	+0.15	-0.3	+0.25	+0.3	-0.6		
044	.098795	-0.05	-0.4	-0.15	-0.25	-0.8		
045	.099127	-0.15	-0.5	-0.45	-0.55	-1.25		
046	.100998	+0.05	+0.15	+0.7	+0.85	+0.55		
047	.099510	0.02	-0.2	+3.1	+4.5	+1.05		
048	.100223	-0.05	-0.15	+0.1	+0.15	-0.05		
049	.100321	-0.15	-0.2	-0.15	-0.3	-1.05		
050	.099493	-0.4	-0.45	+2.1	+1.7	-0.65		
051	.099585	-0.4	+0.05	+0.25	+0.1	-0.6		
052	.100169	-1.35	+0.15	+1.1	+0.75	+0.5		
TEST DATE	3-2-77	3-15-77	5-5-77	5-31-77	6-16-77	6-28-77		
TEST BY	CR2 PIT	CR2 PIT	CR2 PIT	CR2 PIT	CR2 PIT	CR2 PIT		

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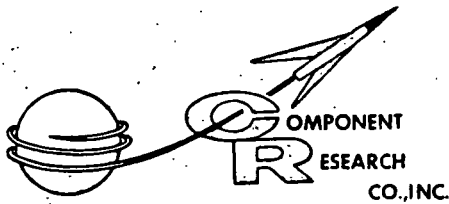
710 - 704-35622

SHEET 109 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPV. <i>[Stamp]</i>	C.R.C. P/N M83421/01-1174 R
TEST NO. XT-1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial cap. & % cap. drift limits for this test condition.		EQUIPMENT USED: Impedance comparator - Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor - G.R. 1413 1387 Temp. test chamber - Satham SD9-1 130 Thermometer - Marshall J E-485 1588

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. In uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	.099915	+0.05	-0.05	+0.01	+0.075	+0.035		
023	.100670	-0.01	-0.005	+0.02	+0.045	-0.02		
024	.100262	+0.01	-0.01	-0.01	-0.015	-0.11		
025	.100317	-0.005	-0.01	D.P.D	+0.02	-0.005		
026	.100174	+0.005	-0.02	-0.015	+0.025	-0.04		
027	.101817	-0.005	-0.015	+0.005	+0.065	-0.01		
028	.100367	-0.035	-0.06	-0.065	-0.08	-0.18		
029	.100965	-0.065	+0.01	+0.095	+0.165	+0.105		
030	.100717	-0.09	D.P.D	+0.37	+0.37	+0.115		
032	.099809	+0.005	+0.005	+0.31	+0.4	-0.025		
033	.100261	+0.01	-0.035	D.P.D	+0.015	-0.085		
034	.101567	+0.015	-0.005	+0.08	+0.16	+0.095		
035	.099971	+0.01	-0.03	+0.045	+0.04	+0.025		
036	.100487	-0.01	-0.045	D.P.D	+0.015	-0.09		
037	.099580	-0.005	-0.025	+0.01	+0.015	-0.07		
TEST DATE	3-2-77	3-15-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY	<i>[Stamp]</i>	<i>[Stamp]</i>	<i>[Stamp]</i>	<i>[Stamp]</i>	<i>[Stamp]</i>	<i>[Stamp]</i>		

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Customer's Name: NASA

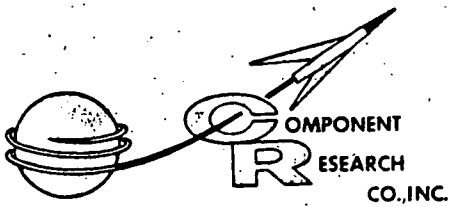
S/O - 704-35622

SHEET 110 OF 188

TEST Capacitance Drift @ +125°C with Thermal Shock	C.R.C. P/N <u>M83421/01-1174R</u>
	CUST P/N _____
TEST NO. <u>XT-1218-B</u>	PROD. NO. <u>0237G</u>
	P/O NO. <u>NAS8-32403</u>

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. In uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
<u>038</u>	<u>.100673</u>	<u>+0.5</u>	<u>+0.45</u>	<u>+0.95</u>	<u>+0.95</u>	<u>+1.05</u>		
<u>039</u>	<u>.099475</u>	<u>+0.65</u>	<u>+0.6</u>	<u>+1.35</u>	<u>+1.5</u>	<u>+1.95</u>		
<u>040</u>	<u>.099021</u>	<u>+0.65</u>	<u>+0.35</u>	<u>+0.8</u>	<u>+0.55</u>	<u>+0.45</u>		
<u>041</u>	<u>.102847</u>	<u>+0.4</u>	<u>+1.95</u>	<u>+2.3</u>	<u>+2.2</u>	<u>+5.9</u>		
<u>042</u>	<u>.099780</u>	<u>+0.45</u>	<u>+0.15</u>	<u>+0.85</u>	<u>+1.1</u>	<u>+1.25</u>		
<u>043</u>	<u>.099327</u>	<u>+0.5</u>	<u>+0.55</u>	<u>+1.55</u>	<u>+1.95</u>	<u>+2.25</u>		
<u>044</u>	<u>.098589</u>	<u>+0.55</u>	<u>+0.3</u>	<u>+0.8</u>	<u>+0.65</u>	<u>+0.95</u>		
<u>045</u>	<u>.098850</u>	<u>+0.55</u>	<u>+0.5</u>	<u>+0.95</u>	<u>+0.65</u>	<u>+0.65</u>		
<u>046</u>	<u>.100692</u>	<u>+0.55</u>	<u>+0.85</u>	<u>+2.35</u>	<u>+2.3</u>	<u>+3.4</u>		
<u>047</u>	<u>.099388</u>	<u>+0.55</u>	<u>+0.3</u>	<u>+1.4</u>	<u>+2.35</u>	<u>+3</u>		
<u>048</u>	<u>.099847</u>	<u>+0.45</u>	<u>+0.45</u>	<u>+1.05</u>	<u>+0.85</u>	<u>+1.95</u>		
<u>049</u>	<u>.100132</u>	<u>+0.3</u>	<u>+0.15</u>	<u>+0.5</u>	<u>+0.65</u>	<u>+0.6</u>		
<u>050</u>	<u>.099288</u>	<u>+0.5</u>	<u>+0.4</u>	<u>+1.4</u>	<u>+1.65</u>	<u>+2.6</u>		
<u>051</u>	<u>.099358</u>	<u>+0.3</u>	<u>+0.25</u>	<u>+0.85</u>	<u>+1.05</u>	<u>+1.2</u>		
<u>052</u>	<u>.099860</u>	<u>+0.25</u>	<u>+0.25</u>	<u>+1.1</u>	<u>+1.95</u>	<u>+2.65</u>		
TEST DATE	<u>2/6/77</u>	<u>3/6/77</u>	<u>5/5/77</u>	<u>5/21/77</u>	<u>6/4/77</u>	<u>6/29/77</u>		
TEST BY								

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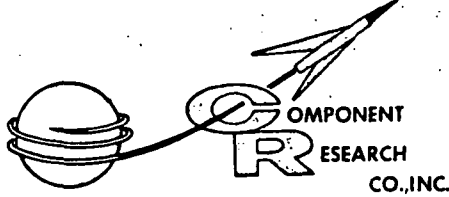
GENERAL DATA SHEET

Customer's Name: NASA S/O - 704-35622 SHEET 111 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPVA. ⁵³ F/T	C.R.C. P/N M83421/01-1174 R
TEST NO. XT-1218-B	ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: After 500 cycles air to air thermal shock there are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator - Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	.06	.075	.075	.085	.075	.075		
023	.06	.075	.075	.075	.08	.075		
024	.06	.08	.075	.085	.08	.075		
025	.06	.075	.075	.08	.085	.08		
026	.06	.075	.075	.08	.08	.08		
027	.06	.085	.075	.08	.085	.075		
028	.07	.085	.075	.09	.095	.095		
029	.06	.08	.075	.075	.08	.08		
030	.08	.075	.075	.08	.08	.075		
032	.09	.08	.075	.07	.095	.075		
033	.09	.075	.075	.075	.08	.08		
034	.08	.075	.065	.075	.08	.075		
035	.08	.07	.065	.075	.075	.065		
036	.09	.075	.07	.075	.085	.075		
037	.08	.075	.075	.085	.085	.08		
TEST DATE	0-24-77	3-11-77	5-5-77	5-27-77	6-14-77	6-20-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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Customer's Name: NASA

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SHEET 112 OF 188

TEST		PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)					
Dissipation Factor @ 1KHz @ 25°C		Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles
C.R.C. P/N M83421/01-1174R							
CUST P/N							
PROD. NO. 0237G							
P/O NO. NAS8-32403							
TEST NO.	XT-1218-B						
S/N							
038		.09	.08	.075	.08	.085	.075
039		.08	.075	.07	.08	.085	.075
040		.09	.08	.075	.08	.085	.08
041		.09	.075	.07	.07	.08	.075
042		.08	.075	.07	.07	.075	.075
043		.08	.075	.065	.065	.075	.075
044		.09	.075	.075	.075	.085	.08
045		.09	.075	.075	.075	.085	.085
046		.09	.075	.075	.075	.085	.085
047		.09	.075	.075	.075	.095	.075
048		.09	.075	.07	.07	.075	.075
049		.09	.08	.075	.075	.085	.085
050		.09	.075	.075	.075	.08	.075
051		.09	.075	.07	.07	.08	.095
052		.08	.075	.065	.065	.075	.075
TEST DATE		2-25-77	3-11-77	5-5-77	5-27-77	6-14-77	6-29-77
TEST BY							

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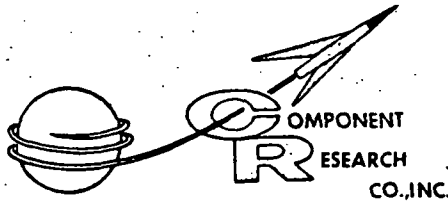
SHEET 113 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPPLY FIT	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator - Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temp. test chamber Statham SD9-1 130 Thermometer Marshall J E-485 1588

PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)

S/N	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	.36	.35	.36	.36	.42	.35		
023	.35	.34	.36	.42	.35	.42		
024	.36	.36	.36	.37	.36	.36		
025	.36	.35	.36	.36	.35	.36		
026	.36	.36	.36	.36	.36	.36		
027	.36	.35	.36	.36	.35	.42		
028	.37	.36	.36	.37	.36	.37		
029	.35	.35	.35	.36	.42	.35		
030	.35	.34	.36	.49	.46	.44		
032	.36	.36	.44	.51	.47	.45		
033	.35	.38	.36	.36	.35	.44		
034	.34	.34	.34	.35	.34	.34		
035	.34	.34	.34	.34	.36	.37		
036	.35	.35	.35	.36	.36	.42		
037	.36	.38	.36	.36	.54	.39		
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-17-77	6-27-77		
TEST BY								

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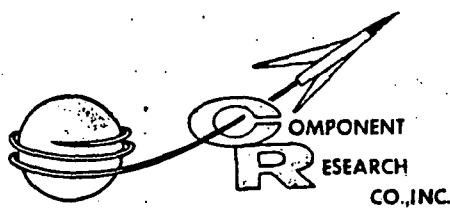
S/O - 704-35622

SHEET 114 OF 188

TEST Dissipation Factor @ 1KHz @ -55°C		C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B		CUST P/N
		PROD. NO. 0237G
		P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	.36	.36	.36	.37	.44	.41		
039	.36	.35	.36	.36	.44	.55		
040	.36	.35	.36	.37	.37	.48		
041	.36	.43	.52	.5	.45	.38		
042	.34	.34	.34	.35	.34	.34		
043	.34	.35	.34	.35	.33	.34		
044	.36	.43	.35	.36	.35	.37		
045	.36	.38	.35	.36	.36	.36		
046	.35	.36	.35	.36	.34	.35		
047	.36	.36	.36	.52	.5	.49		
048	.35	.34	.35	.35	.35	.45		
049	.36	.36	.36	.36	.37	.36		
050	.36	.34	.39	.51	.51	.46		
051	.35	.31	.35	.36	.5	.36		
052	.35	.32	.35	.37	.35	.36		
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-17-77	6-27-77		
TEST BY								

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SHEET 115 OF 188

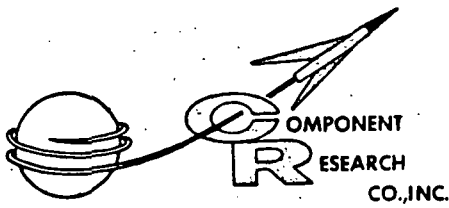
TEST: Dissipation Factor @ 1KHz	LAB SUPPLY	C.R.C. P/N M83421/01-1174 R															
TEST NO. XT-1218-B	ENGR. <i>[Signature]</i>	CUST. P/N															
TEST TEMP. +125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G															
TEST VOLT. N/A		P/O NO. NAS8-32403															
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.9															
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: <table border="1"> <tr> <td></td> <td>Model No.</td> <td>ECN No.</td> </tr> <tr> <td>Impedance comparator</td> <td>G.R. 1654</td> <td>1331</td> </tr> <tr> <td>Precision decade capacitor</td> <td>G.R. 1413</td> <td>1387</td> </tr> <tr> <td>Temp. test chamber - Statham SD9-1</td> <td></td> <td>130</td> </tr> <tr> <td>Thermometer - Marshall J E-485</td> <td></td> <td>1588</td> </tr> </table>		Model No.	ECN No.	Impedance comparator	G.R. 1654	1331	Precision decade capacitor	G.R. 1413	1387	Temp. test chamber - Statham SD9-1		130	Thermometer - Marshall J E-485		1588
	Model No.	ECN No.															
Impedance comparator	G.R. 1654	1331															
Precision decade capacitor	G.R. 1413	1387															
Temp. test chamber - Statham SD9-1		130															
Thermometer - Marshall J E-485		1588															

PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)

S/N	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	.025	.04	.03	.03	.035	.03		
023	.03	.055	.035	.035	.04	.035		
024	.025	.035	.03	.035	.035	.035		
025	.03	.035	.035	.035	.04	.035		
026	.03	.035	.03	.035	.085	.065		
027	.03	.035	.035	.035	.035	.035		
028	.035	.04	.04	.045	.055	.055		
029	.03	.04	.035	.035	.105	.05		
030	.03	.035	.035	.035	.05	.04		
032	.035	.03	.03	.03	.045	.035		
033	.03	.26	.035	.035	.045	.065		
034	.025	.035	.03	.03	.035	.035		
035	.025	.03	.025	.03	.045	.09		
036	.03	.035	.03	.035	.045	.04		
039	.025	.03	.03	.03	.06	.045		
TEST DATE	3-2-77	3-15-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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




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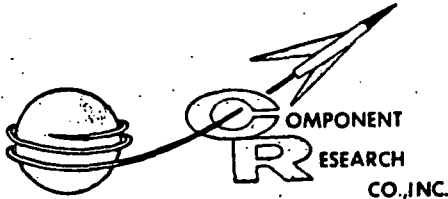
S/O - 704-35622

SHEET 116 OF 188

TEST Dissipation Factor @ 1KHz @ 125°C	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B	CUST P/N
	PROD. NO. 0237G
	P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	.025	.035	.03	.03	.04	.03		
039	.025	.03	.03	.025	.035	.025		
040	.025	.03	.025	.03	.035	.04		
041	.03	.035	.03	.035	.125	.125		
042	.025	.035	.025	.03	.035	.035		
043	.025	.03	.025	.03	.035	.03		
044	.025	.035	.025	.03	.035	.035		
045	.025	.06	.025	.03	.04	.04		
046	.03	.035	.035	.035	.045	.04		
047	.025	.03	.03	.03	.04	.025		
048	.03	.035	.035	.035	.04	.035		
049	.03	.04	.03	.035	.05	.1		
050	.025	.03	.03	.035	.04	.03		
051	.035	.03	.03	.035	.065	.055		
052	.035	.03	.03	.035	.035	.05		
TEST DATE	3-2-77	3-15-77	5-5-77	5-31-77	6-16-77	6-28-77		
TEST BY								

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Customer's Name: NASA

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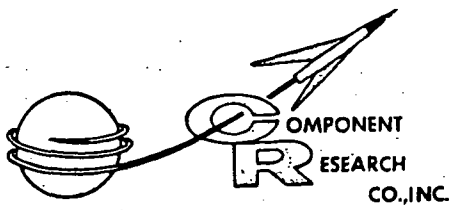
SHEET 117 OF 188

TEST: Dissipation Factor @ 10 KHZ	LAB SUPERVISOR FIT	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator - Model No. ECN No. Precision decade capacitor - G.R. 1654 1331 G.R. 1413 1387

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	.18	.185	.21	.36	.27	.255		
023	.17	.16	.19	.18	.265	.26		
024	.17	.17	.19	.175	.25	.23		
025	.16	.17	.2	.185	.27	.25		
026	.18	.185	.21	.205	.28	.265		
027	.17	.195	.265	.2	.28	.26		
028	.20	.22	.21	.28	.42	.42		
029	.18	.185	.215	.215	.3	.295		
030	.23	.18	.2	.205	.265	.24		
032	.24	.185	.21	.185	.265	.235		
033	.25	.185	.215	.205	.31	.295		
034	.21	.16	.175	.165	.25	.235		
035	.25	.165	.185	.185	.265	.205		
036	.25	.175	.195	.2	.3	.285		
037	.22	.185	.195	.205	.29	.31		
TEST DATE	2-24-77	3-11-77	5-5-77	5-27-77	6-14-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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TEST Dissipation Factor @ 10 KHz @ 25°C	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B	CUST. P/N _____
	PROD. NO. 0237G
	P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	.24	.17	.19	.185	.26	.21		
039	.22	.17	.19	.19	.265	.23		
040	.24	.18	.195	.195	.28	.26		
041	.26	.175	.205	.2	.175	.35		
042	.24	.175	.195	.185	.265	.25		
043	.22	.17	.19	.18	.245	.235		
044	.24	.175	.195	.195	.29	.265		
045	.24	.175	.205	.195	.265	.265		
046	.24	.175	.2	.205	.23	.31		
047	.24	.175	.2	.195	.26	.235		
048	.28	.185	.205	.2	.245	.255		
049	.23	.18	.195	.195	.29	.29		
050	.24	.175	.205	.205	.27	.245		
051	.25	.175	.205	.205	.31	.46		
052	.22	.175	.19	.18	.26	.24		
TEST DATE	2-25-77	3-11-77	5-5-77	5-27-77	6-14-77	6-29-77		
TEST BY								

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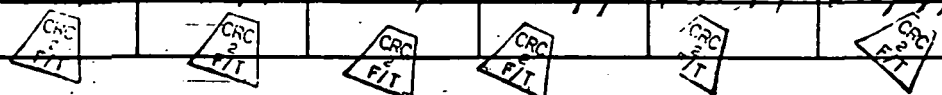
S/O - 704-35622

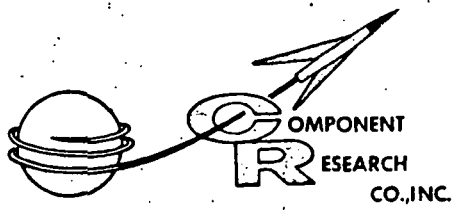
SHEET 119 OF 188

TEST: Dissipation Factor @ 10KHz	LAB SUPERVISOR ENGR. Q.A.	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B	<i>J.K.</i>	CUST. P/N
TEST TEMP. -55°C		PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator - G.R. 1654 Model No. 1331 Precision decade capacitor G.R. 1413 1387 Temp. test chamber - Satham SD9-1 130 Thermometer - Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles
022	.5	.54	.51	.53	.92	.52
023	.48	.52	.5	.73	.54	.51
024	.51	.64	.51	.52	.54	.54
025	.49	.56	.51	.52	.54	.51
026	.5	.67	.53	.54	.54	.62
027	.5	.51	.51	.52	.52	.52
028	.56	.56	.56	.61	.62	.67
029	.49	.56	.5	.52	.86	.52
030	.52	.52	.52	.59	.65	.54
032	.5	.55	.51	.6	.56	.56
033	.49	.76	.51	.53	.59	.99
034	.48	.53	.46	.51	.5	.47
035	.48	.53	.48	.5	.69	.84
036	.49	.55	.49	.52	.65	.73
037	.5	.79	.49	.52	.56	.8
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-11-77	6-27-77
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

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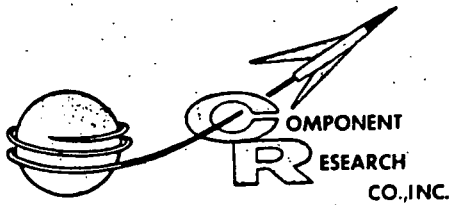
GENERAL DATA SHEET

Customer's Name: NASA S/O - 704-35622 SHEET 120 OF 188

TEST Dissipation Factor @ 10 KHz @ -55°C	C.R.C. P/N <u>M83421/01-1174R</u>
	CUST P/N _____
TEST NO. <u>XT-1218-B</u>	PROD. NO. <u>0237G</u>
P/O NO. <u>NAS8-32403</u>	

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
038	.5	.6	.48	.51	.54	.49	
039	.49	.54	.49	.51	.54	.74	
040	.5	.54	.49	.52	.54	1.1	
041	.5	.62	.59	.59	.92	.70	
042	.48	.51	.47	.51	.51	.49	
043	.47	.64	.46	.49	.51	.5	
044	.5	1.6	.48	.52	.52	.66	
045	.5	.76	.49	.52	.62	.58	
046	.5	.66	.51	.54	.54	.55	
047	.5	.55	.49	.61	.58	.57	
048	.49	.54	.49	.51	.59	.55	
049	.5	.66	.5	.52	.72	.77	
050	.5	.55	.5	.6	.65	.55	
051	.5	.56	.49	.52	.95	.64	
052	.49	.56	.48	.51	.52	.54	
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-17-77	6-27-77	
TEST BY							

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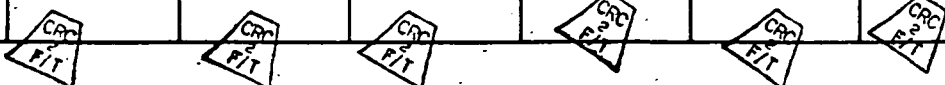
S/O - 704-35622

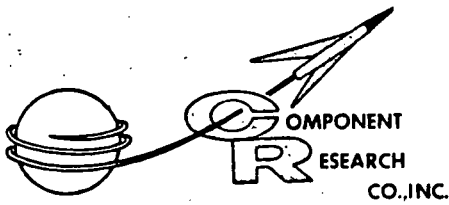
SHEET 121 OF 188

TEST: Dissipation Factor @ 10 KHz	LAB SUPVR. <i>[Signature]</i>	C.R.C. P/N M83421/01-1174R
TEST NO. XT-1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Model No. ECN No. Impedance comparator - G.R. 1654 1331 Precision decade capacitor - G.R. 1413 1387 Temp. test chamber - Statham SD9-1 130 Thermometer - Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
022	.135	.24	.145	.17	.22	.165	
023	.12	.34	.14	.185	.2	.18	
024	.115	.195	.13	.145	.165	.14	
025	.125	.185	.145	.165	.2	.185	
026	.115	.175	.145	.16	.35	.39	
027	.13	.175	.15	.17	.18	.165	
028	.17	.23	.19	.275	.35	.37	
029	.145	.23	.17	.19	.43	.31	
030	.13	.19	.185	.165	.28	.225	
032	.125	.17	.14	.155	.21	.21	
033	.135	.56	.185	.17	.29	.45	
034	.11	.165	.115	.13	.16	.195	
035	.125	.175	.125	.145	.26	.49	
036	.125	.17	.12	.155	.27	.23	
037	.125	.16	.135	.145	.41	.28	
TEST DATE	3-2-77	3-15-77	5-6-77	5-23-77	6-16-77	6-28-77	
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

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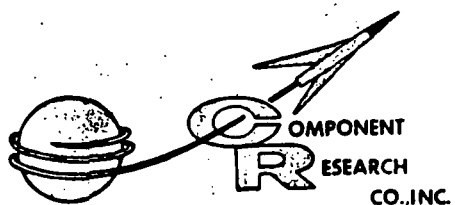
Customer's Name: NASA

S/O - 704-35622

SHEET 122 OF 188

TEST Dissipation Factor @ 10 KHz @ +125°C			C.R.C. P/N M83421/01-1174 R				
TEST NO. XT-1218-B			CUST P/N _____				
			PROD. NO. 0237G				
			P/O NO. NAS8-32403				
S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
038	.115	.17	.115	.135	.175	.14	
039	.115	.165	.135	.135	.18	.14	
040	.115	.16	.115	.14	.185	.25	
041	.125	.195	.125	.16	.6	.34	
042	.115	.18	.125	.145	.19	.4	
043	.12	.165	.12	.14	.19	.165	
044	.12	.195	.12	.145	.185	.175	
045	.115	.5	.115	.14	.165	.3	
046	.125	.18	.14	.165	.215	.25	
047	.115	.165	.125	.145	.18	.13	
048	.125	.175	.14	.145	.205	.165	
049	.125	.215	.135	.155	.31	.52	
050	.12	.165	.135	.18	.23	.145	
051	.125	.165	.14	.18	.47	.41	
052	.115	.15	.125	.15	.19	.31	
TEST DATE	3-2-77	3-15-77	5-5-77	5-31-77	6-16-77	6-28-77	
TEST BY							

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Customer's Name: NASA

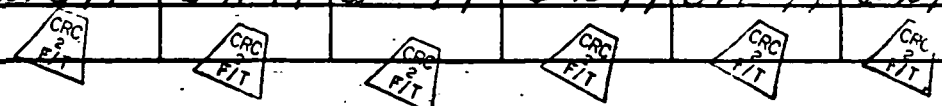
S/O - 704-35622

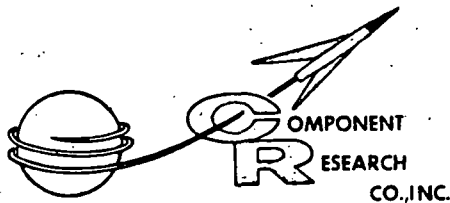
SHEET 123 OF 188

TEST: E.S.R.	LAB SUPPLY FIT	C.R.C. P/N M83421/01-1174R.
TEST NO. XT-1218-B	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION:
ACCEPTANCE LIMITS: There are no established E.S.R. limits for this test condition		EQUIPMENT USED: Model No. ECN No. E.S.R. meter - Clark & Hess 273 1130 Cable assembly Clark & Hess 27375 1130

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial E.S.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
022	.16	.18	.18	.20	.22	.22		
023	.14	.15	.15	.18	.22	.24		
024	.15	.16	.15	.18	.20	.19		
025	.15	.16	.17	.19	.22	.22		
026	.15	.17	.19	.20	.23	.23		
027	.16	.17	.17	.20	.22	.23		
028	.19	.24	.28	.35	.43	.47		
029	.16	.19	.21	.24	.28	.29		
030	.16	.18	.18	.21	.22	.22		
033	.16	.17	.18	.26	.20	.19		
033	.16	.18	.19	.23	.26	.28		
034	.14	.15	.15	.17	.20	.21		
035	.15	.17	.17	.20	.21	.24		
036	.16	.17	.18	.22	.26	.29		
037	.15	.16	.16	.19	.25	.31		
TEST DATE	2-25-77	3-11-77	5-4-77	6-2-77	6-14-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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TEST E.S.R. @ 25°C		C.R.C. P/N M83421/01-1174R
		CUST P/N
		PROD. NO. 0237G
TEST NO. XT-1218-B	P/O NO. NAS8-32403	

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial E.S.R. In Ω	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
038	.15	.16	.16	.18	.19	.18		
039	.14	.16	.16	.18	.20	.18		
040	.14	.16	.16	.19	.22	.23		
041	.16	.17	.19	.21	.21	.20		
042	.16	.17	.17	.20	.22	.22		
043	.14	.16	.16	.18	.20	.21		
044	.15	.16	.16	.19	.22	.24		
045	.14	.16	.16	.19	.22	.23		
046	.16	.17	.18	.23	.27	.31		
047	.15	.16	.17	.19	.19	.19		
048	.17	.18	.19	.21	.22	.23		
049	.16	.17	.18	.20	.24	.28		
050	.15	.16	.17	.20	.21	.21		
051	.16	.17	.18	.22	.23	.53		
052	.15	.16	.17	.20	.20	.19		
TEST DATE	2-25-71	3-11-71	5-4-71	6-2-71	6-14-71	6-29-71		
TEST BY								

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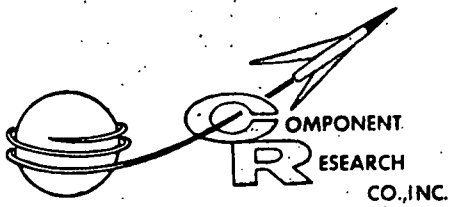
S/O - 704-35622

SHEET 125 OF 188

TEST: Seal Test (Fine Leak Test)	LAB SUPV. <i>[Signature]</i> ENGR. <i>[Signature]</i> Q.A. <i>[Signature]</i>	C.R.C. P/N M83421/01-1174 R
TEST NO. XT-1218-B		CUST. P/N
TEST TEMP. 25°C		PROD. NO. 0237G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.5
ACCEPTANCE LIMITS: Leakage not to exceed 1×10^{-6} atm/cc/sec.		EQUIPMENT USED: Model No. ECN No. Fine leak detector - DuPont 24-120B 651

S/N	Initial		After 20		After 140		After 260		After 380		After 500	
	1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
022	✓		✓		✓		✓		✓		✓	
023	✓		✓		✓		✓		✓			X
024												
025												
026												
027												
028												
029												
030												
032												
033												
034												
035												
036	✓		✓		✓		✓		✓		✓	
037	✓		✓		✓		✓		✓		✓	
TEST DATE	2-28-77		3-16-77		5-10-77		6-2-77		6-15-77		7-1-77	
TEST BY	<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>	

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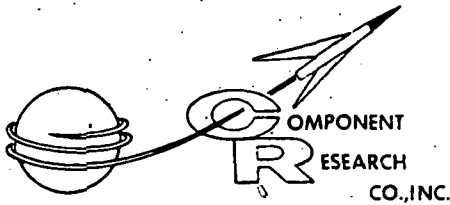
Customer's Name: NASA

S/O - 704-35622

SHEET 126 OF 188

TEST		C.R.C. P/N M83421/01-1174R												
Seal Test (Fine Leak Test)		CUST P/N												
		PROD. NO. 0237G												
TEST NO. XT-1218-B		P/O NO. NAS8-32403												
S/N	Initial		After 20		After 140		After 260		After 380		After 500			
	1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶			
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
038	/		/		/		/		/		/		/	
039	/		/		/		/		/		/		/	
040	/		/		/		/		/		/		/	
041														
042														
043														
044														
045														
046														
047														
048														
049														
050														
051	/		/		/		/		/		/		/	
052	/		/		/		/		/		/		/	
TEST DATE	2-28-77	3-16-77	5-10-77	6-2-77	6-15-77	7-1-77								
TEST BY														

F-634-2



TEST REPORT SUMMARY
 THERMAL SHOCK
 AIR TO AIR
 500 CYCLES
 -55°C to +125°C

TEST NO.
 REPORT #XT-1218-C

PAGE 127 OF 188

PROD. NO. 0238G CUSTOMER NASA, MARSHALL SPACE FLIGHT CENTER
 LOT _____ CUSTOMER P/N _____
 LOT SIZE 30 CUSTOMER P/O NAS8-32403
 C.R.C. P/N M83421/01-1186R C.R.C. S/O 704-35622
 DATE COMPLETED July 1, 1977

TEST	REQUIREMENT	METHOD PARAGRAPH	ACC	
			REJ	
Insulation Resistance	3.11	4.7.7	29	1
Capacitance	N/A	4.7.8	30	0
Dissipation Factor	3.13	4.7.9	30	0
E.S.R.			30	0
Seal Test	3.9	4.7.5	21	9

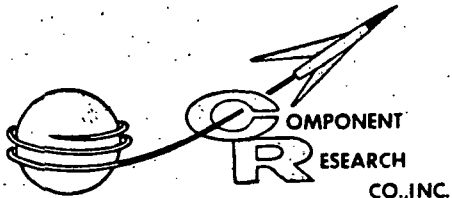
QUALITY CONTROL

DATE

SHIPPING DATA

ORDER #	DATE SHIPPED	QTY SHIPPED	INVOICE #	QTY STOCKED

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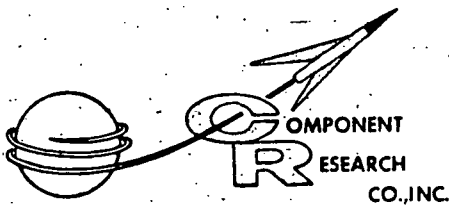
SHEET 128 OF 188

TEST: Insulation Resistance (Terminal to Terminal)		LAB SUPVR. <i>[Signature]</i>	C.R.C. P/N M83421/01-1186 R
TEST NO. XT-1218-C		ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C		Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. 30 VDC			P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle			SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: 45pA maximum or 666,000 megohms minimum. After 500 cycles air to air thermal shock there are no established limits for maximum leakage current @ 25°C			EQUIPMENT USED: Model No. ECN No. D.C. Micro V-Ammeter H.P. 425A 1480 I.R. Test rack CRC None 647 D.C. volt ohm meter - Simpson 260 1357 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
086	10	12	6	9	7	8		
087	14	13	8	9	6	9		
088	14	18	7	6	7	8		
089	18	14	7	5	8	9		
090	12	15	7	8	7	8		
091	13	12	7	10	8	8		
092	6	10	6	6	6	8		
093	7	10	8	10	7	7		
094	6	5	5	11	9	8		
095	6	6	8	6	5	7		
096	6	12	5	7	8	8		
097	7	6	5	9	7	8		
098	5	12	6	8	8	8		
099	5	7	10	10	7	8		
100	7	6	8	9	8	10		
TEST DATE	2-25-77	3-11-77	5-4-77	5-27-77	6-14-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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Customer's Name: NASA

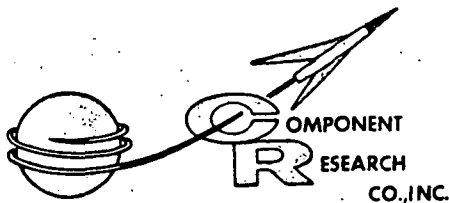
S/O - 704-35622

SHEET 129 OF 188

TEST Insulation Resistance @ 25°C (Terminal to Terminal)		C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C		CUST P/N _____
		PROD. NO. 0238G
		P/O NO. NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles
101	5	7	7	10	7	8
102	6	6	7	10	5	7
103	6	6	7	9	5	8
104	6	9	8	10	6	8
105	6	7	8	9	5	7
106	6	8	8	9	6	5
108	5	6	6	9	5	7
109	3	12	8	10	5	7
110	7	5	9	10	5	5
111	9	11	9	13	4	7
112	8	12	8	13	5	6
113	7	9	8	10	5	6
114	7	5	2	10	7	7
116	8	5	7	14	8	7
117	8	15	27 μ A	180 μ A	2.6 μ A	8.6 μ A
TEST DATE	2-25-77	3-11-77	5-4-77	5-27-77	6-14-77	6-29-77
TEST BY						

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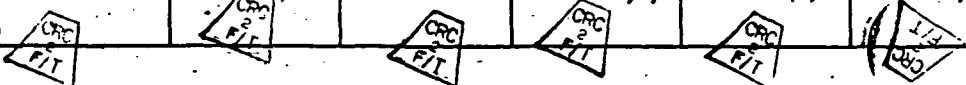
S/O - 704-35622

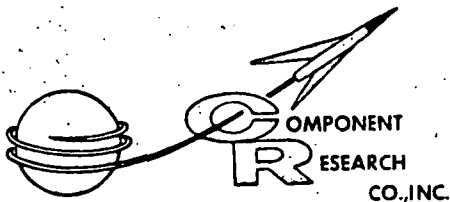
SHEET 130 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPPLY FIT	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. 30 VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: There are no established limits for maximum leakage current @ -55°C		EQUIPMENT USED: Model No. ECN No. D.C. Micro V-Ammeter H.P. 425A 1480 I.R. Test rack CRC None 647 D.C. volt ohm meter - Simpson 260 1357 Temperature test chamber - Statham 130 SDG-1 Thermometer - Marshall J E-485 1588 Battery pack N/A

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
086	10	29	27	25	19	40		
087	13	19	29	28	21	45		
088	12	18	35	30	43	72		
089	12	30	42	25	22	50		
090	10	16	35	30	45	70		
091	13	12	30	56	27	45		
092	13	20	30	28	42	75		
093	10	19	28	55	41	68		
094	10	15	29	25	42	78		
095	12	21	32	55	16	45		
096	10	15	20	22	12	66		
097	10	21	17	18	17	120		
098	11	22	34	21	35	84		
099	10	17	32	20	16	55		
100	14	20	30	18	14	52		
TEST DATE	3-1-77	3-17-77	5-9-77	5-31-77	6-17-77	6-28-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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Customer's Name: NASA

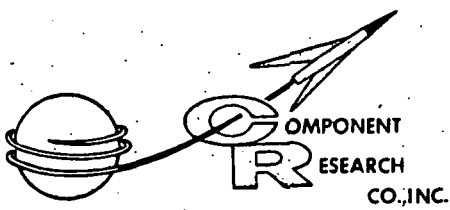
S/O - 704-35622

SHEET 131 OF 188

TEST Insulation Resistance @ -55°C (Terminal to Terminal)	C.R.C. P/N M83421/01-1186 R
TEST NO. XT-1218-C	CUST P/N
	PROD. NO. 0238G
	P/O NO. NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles
101	15	18	30	25	18	54
102	12	18	23	17	19	50
103	15	27	27	15	43	82
104	16	24	31	42	33	84
105	14	22	27	43	42	84
106	12	33	27	42	25	90
108	14	19	31	17	38	125
109	12	19	40	43	22	85
110	13	19	30	55	42	82
111	12	8	25	32	34	75
112	14	20	20	34	17	130
113	9	26	25	35	20	55
114	11	19	35	90	20	42
116	15	17	30	40	30	22
117	14	10	200µA	240µA	10µA	70µA
TEST DATE	3-1-77	3-17-77	5-9-77	5-31-77	6-17-77	6-28-77
TEST BY						

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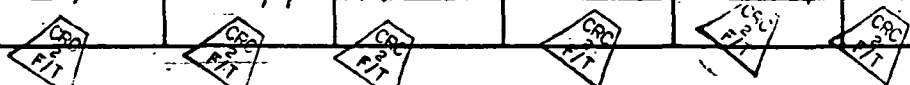
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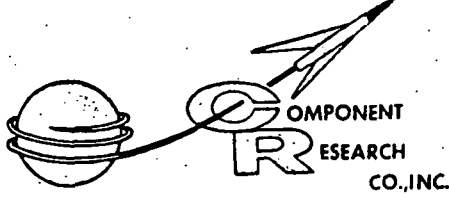
SHEET 133 OF 188

TEST	Insulation Resistance @ 125°C (Terminal to Terminal)	C.R.C. P/N M83421/01-1186R
	TEST NO. XT-1218-C	PROD. NO. 0238G P/O NO. NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
101	600	330	950	250	410	240	
102	660	370	390	500	360	400	
103	760	590	670	570	650	260	
104	400	420	260	390	720	190	
105	600	550	630	550	450	400	
106	460	570	370	410	540	200	
108	330	780	650	330	580	290	
109	360	950	910	700	250	380	
110	1050	450	350	330	240	230	
111	600	500	1400	2050	275	2000	
112	500	850	570	910	560	340	
113	900	610	750	430	920	620	
114	500	460	210	990	1100	370	
116	460	320	410	370	240	240	
117	1500	5900	11,11A	115,11A	92,11A	93,11A	
TEST DATE	3-1-77	3-16-77	5-9-77	5-31-77	6-17-77	6-29-77	

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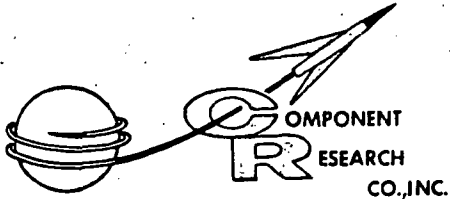
GENERAL DATA SHEET

Customer's Name: NASA S/O - 704-35622 SHEET 134 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR.	C.R.C. P/N M83421/01-1186 R
TEST NO. XT-1218-C	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: .135uF to .165uF After 500 cycles air to air thermal shock there are no established % capacitance drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. In	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
086	.148335	+0.35	+0.65	+1.3	+1.6	+1.85		
087	.149630	+0.45	+1.05	+1.35	+2.15	+2.9		
088	.148703	+0.4	+1.15	+1.8	+2.25	+2.5		
089	.150061	+0.25	+0.5	+0.85	+1.5	+2.95		
090	.148003	+0.4	+0.85	+0.95	+0.85	+0.95		
091	.148746	+0.25	+0.9	+1.85	+2.75	+4.6		
092	.148389	+0.45	+0.85	+1.4	+1.7	+2.65		
093	.151276	+0.3	+0.6	+1.55	+2.8	+4		
094	.147891	+0.35	+0.45	+1.05	+1.5	+1.75		
095	.148260	+0.55	+0.85	+1.45	+1.75	+1.8		
096	.148091	+0.55	+1.5	+2.15	+2.4	+2.7		
097	.150944	+0.15	+0.45	+0.6	+1.05	+2.15		
098	.149056	+0.5	+1.55	+2	+2.2	+2.6		
099	.148114	+0.4	+1	+1.75	+1.75	+2.4		
100	.151327	+0.35	+1	+1.3	+1.7	+1.9		
TEST DATE	2-25-77	3-11-77	5-3-77	5-27-77	6-14-77	6-30-77		
TEST BY								

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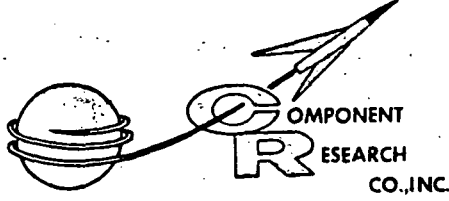
CUSTOMER'S NAME: NASA S/O-704-35622

SHEET 135 OF 188

TEST Capacitance drift with thermal shock	C.R.C. P/N M83421/01 - 1186R
	CUST P/N
TEST NO. XT-1218-C	PROD. NO. 0238G
	P/O NO. NAS8-32403

S/N	Percent capacitance change with thermal shock -55°C to +125°C					
	Initial capacitance in uF	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles
101	.148386	+0.25	+1	+1.16	+1.85	+1.15
102	.149718	+0.06	+1.35	+2.1	+3	+3.39
103	.148084	+0.45	+1.11	+1.95	+2.7	+3.36
104	.149354	+0.45	+0.95	+1.17	+2.4	+3.4
105	.150858	+0.01	+0.9	+1.5	+1.17	+2.05
106	.147468	+0.3	+1.5	+1.85	+2.4	+3.33
108	.148813	+0.35	+2.35	+2.7	+2.9	+3.38
109	.148410	+0.45	+1.2	+1.95	+2.7	+3.36
110	.149340	+0.65	+1.55	+1.5	+1.95	+3.33
111	.151038	+0.75	+1.17	+2.15	+2.4	+2.26
112	.149596	+0.4	+1.05	+1.5	+1.17	+2.35
113	.148946	+0.06	+1.05	+1.6	+1.65	+1.65
114	.153162	+0.06	+1.45	+2.25	+2.25	+4.1
116	.148967	+0.05	+0.95	+1.1	+1.15	+1.65
117	.148771	+0.06	+3.38	+1.1	+1.6	+1.1
TEST DATE	2-25-77	3-11-77	5-3-77	5-27-77	6-14-77	6-30-77
TEST BY						

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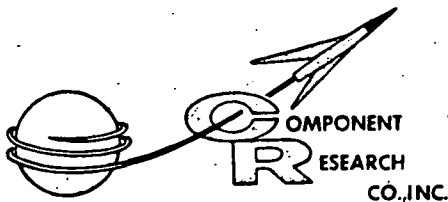
SHEET 136 OF 188

TEST: Capacitance drift with thermal shock	LAB SUPVR <i>[Signature]</i>	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial cap. and % cap. drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer - Marshall J E-485 1588

S/N	Percent capacitance change with thermal shock -55°C to +125°C							
	Initial capacitance in u.f.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
086	.146421	-0.5	+1.2	+1.5	+2.2	+2.2		
087	.147590	-0.5	+1.2	+1.55	+2	-1.55		
088	.146830	-0.55	+1.3	+1.9	+2.8	+3		
089	.148130	-0.15	+0.9	-0.65	+1.4	-2.7		
090	.146195	-0.35	+0.8	+0.95	+0.75	+0.95		
091	.146855	-0.5	-0.75	+1.8	+1.9	+1.5		
092	.146550	-0.5	+0.9	+1.35	+0.25	-3.4		
093	.149300	-0.5	+3.1	+3	+2.8	-2.7		
094	.146060	-0.8	+0.55	+1.25	+1.9	+1.75		
095	.146330	-0.75	+1.1	+1.8	+2.1	+1.65		
096	.146340	-0.7	+1.5	+2	+2.4	+2.25		
097	.149040	-0.45	+1.2	+1.45	-0.15	-3.9		
098	.147220	-0.5	+1.95	+2.15	+2.4	+2.55		
099	.146260	-0.6	+1.3	+1.9	+1.9	+1.45		
100	.149360	-0.4	+1	+1.75	+1.5	+2		
TEST DATE	3-1-77	3-17-77	5-9-77	5-31-77	6-17-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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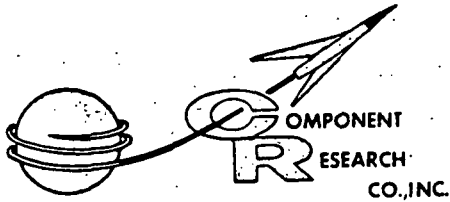
CUSTOMER'S NAME: NASA S/O-704-35622

SHEET 137 OF 188

TEST Capacitance drift @ -55°C with thermal shock	C.R.C. P/N M83421/01 - 1186R
	CUST P/N
TEST NO. XT-1218-C	PROD. NO. 0238G
	P/O NO. NAS8-32403

S/N	Percent capacitance change with thermal shock -55°C to +125°C							
	Initial capacitance in u.f.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
101	.146520	-.03	+145	+23	+2	+22		
102	.147920	-.04	+15	-18	+125	-3		
103	.146200	-.045	+115	-225	+24	-195		
104	.147350	-.055	+115	-14	+25	-14		
105	.148880	-.075	+135	+175	+22	+155		
106	.145598	-.055	+095	-22	+23	-37		
108	.147019	-.079	+17	+245	+27	-27		
109	.146529	-.055	-29	-235	+265	-205		
110	.147439	-.05	+045	-055	+075	-31		
111	.149179	-.07	+065	+2	+15	+225		
112	.147743	-.025	+05	+18	+16	+04		
113	.147163	-.05	-015	+125	+12	+41		
114	.151217	-.005	+095	-31	+04	-105		
116	.147177	-.06	+015	+075	+085	+13		
117	.147037	-.025	+41	+64	+92	+37		
TEST DATE	2-28-77	3-16-77	5-9-77	5-31-77	6-17-77	6-28-77		
TEST BY								

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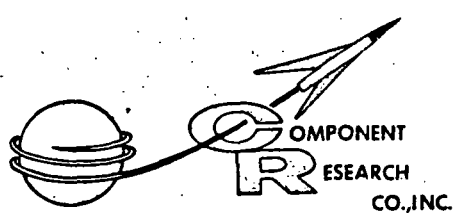
S/O - 704-35622

SHEET 138 OF 188

TEST: Capacitance drift with thermal shock	LAB SUPPLY 23 FIT	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>D.K.</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: Mil-C-83421, para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial capacitance and % cap. drift limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham 130 SDG-1 Thermometer - Marshall J E-485 1588

S/N	Percent capacitance change with thermal shock -55°C to +125°C							
	Initial capacitance in u.f.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
086	.148472	+0.45	+0.05	+0.3	+0.55	+0.4		
087	.149652	+0.6	+0.3	+0.4	+2.6	+0.6		
088	.148822	+0.55	+0.25	+0.65	+1	+0.75		
089	.150152	+0.4	+0.1	+0.7	+2.4	+0.35		
090	.146022	+0.45	-0.05	+0.05	+0.65	-0.3		
091	.148862	+0.45	-0.45	-1.35	+1.7	+0.3		
092	.148532	+0.45	+0.05	+0.25	+1.85	+0.3		
093	.151662	+0.15	0.00	+2.15	+3.2	+0.1		
094	.147952	+0.1	-0.1	+0.15	+0.45	+0.35		
095	.148452	+0.4	+0.15	+0.35	+0.45	+0.1		
096	.148452	+0.05	+0.15	+0.35	+0.6	+0.35		
097	.151002	+0.5	-0.1	+0.1	+1	-0.1		
098	.149332	+0.75	+0.3	+0.35	+0.5	+0.2		
099	.148262	+0.55	+0.3	+0.65	+0.35	+0.05		
100	.151622	+0.55	+0.15	+0.35	+0.4	-0.05		
TEST DATE	3-1-77	3-17-77	5-6-77	5-31-77	6-17-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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CUSTOMER'S NAME: NASA

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SHEET 139 OF 188

TEST Capacitance drift @ +125°C with thermal shock	C.R.C. P/N M83421/01-1186R
	CUST P/N _____
TEST NO. XT-1218-C	PROD. NO. 0238G
	P/O NO. NAS8-32403

S/N	Percent capacitance change with thermal shock -55°C to +125°C							
	Initial capacitance in u.f.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
101	.146642	+0.65	+0.75	+0.35	+0.5	+0.05		
102	.149999	+0.65	+0.3	+2.25	+3.2	+0.3		
103	.148300	+0.7	+0.15	+2.25	+3.5	+0.45		
104	.149479	+0.65	0.00	+2.05	+2.9	+0.35		
105	.151069	+0.75	+0.35	+0.65	+1	+0.7		
106	.147549	+1.35	+0.6	+2.3	+2	+0.15		
108	.149169	+2.3	+1.35	+1.3	-1.95	+1.2		
109	.148499	+1.05	+1.05	+1.9	+3.2	+0.25		
110	.149629	+0.65	+0.35	+0.15	+1.9	-0.05		
111	.151389	+0.85	+0.45	+0.5	+0.6	+0.15		
112	.149749	+0.65	+0.4	+0.35	+0.55	+0.25		
113	.149169	+0.6	+0.05	+0.15	+0.4	+0.1		
114	.153479	+0.7	+0.35	+1.5	+3.4	+0.65		
116	.149219	+0.65	+0.1	-0.05	-0.05	-0.2		
117	.148929	+0.55	+1.65	+5.0	+1.85	+1.45		
TEST DATE	3-1-77	3-17-77	5-6-77	5-31-77	6-17-77	6-20-77		
TEST BY								

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CUSTOMER'S NAME: NASA

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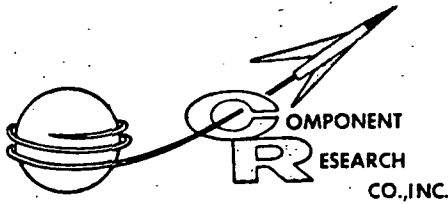
SHEET 140 OF 188

TEST: Dissipation factor @ 1KHz	LAB SUPVR. <i>[Signature]</i>	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C, 1 Hr. per cycle		SPECIFICATION: Mil-C-83421, para. 4.7.9
ACCEPTANCE LIMITS: After 500 cycles air to air thermal shock there are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387

S/N	Percent dissipation factor with thermal shock -55°C to +125							
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
086	.07	.08	.07	.08	.075	.075		
087	.07	.08	.07	.08	.075	.08		
088	.07	.085	.075	.085	.085	.085		
089	.07	.085	.075	.085	.075	.08		
090	.07	.085	.075	.085	.08	.08		
091	.07	.08	.07	.08	.08	.075		
092	.075	.09	.08	.095	.095	.1		
093	.07	.085	.075	.085	.085	.075		
094	.07	.08	.065	.08	.075	.075		
095	.07	.085	.065	.075	.075	.08		
096	.065	.08	.07	.08	.075	.08		
097	.07	.085	.075	.085	.08	.085		
098	.07	.085	.075	.085	.085	.085		
099	.07	.08	.075	.085	.08	.085		
100	.07	.085	.075	.08	.075	.08		
TEST DATE	2-25-77	3-11-77	5-3-77	5-27-77	6-14-77	6-30-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

F-634-1





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CUSTOMER'S NAME: NASA

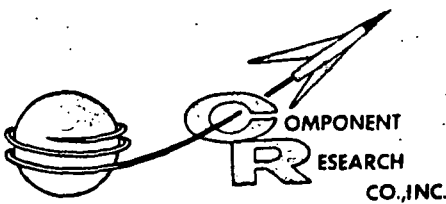
S/O-704-35622

SHEET 141 OF 188

TEST Dissipation factor @ 1KHz @ 25°C	C.R.C. P/N M83421/01-1186R
	CUST P/N
	PROD. NO. 0238G
TEST NO. XT-1218-C	P/O NO. NAS8-32403

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)						
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles	
101	.07	.075	.075	.08	.075	.065	
102	.07	.08	.07	.085	.085	.08	
103	.07	.08	.065	.085	.085	.075	
104	.075	.085	.075	.09	.085	.085	
105	.075	.085	.075	.085	.085	.085	
106	.07	.075	.075	.085	.085	.08	
108	.07	.085	.075	.085	.085	.085	
109	.07	.08	.065	.08	.08	.075	
110	.07	.08	.075	.085	.085	.08	
111	.07	.085	.075	.085	.085	.085	
112	.07	.075	.065	.08	.075	.075	
113	.07	.08	.07	.075	.085	.065	
114	.07	.085	.07	.085	.085	.08	
116	.07	.075	.07	.075	.075	.145	
117	.07	.08	.075	.84	.09	.08	
TEST DATE	2-28-77	3-11-77	5-3-77	5-27-77	6-14-77	6-30-77	
TEST BY							

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GENERAL DATA SHEET

CUSTOMER'S NAME: NASA

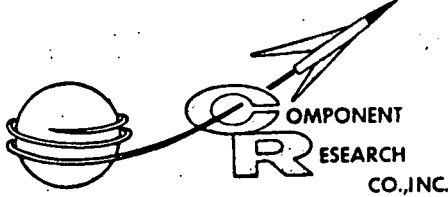
S/O-704-35622

SHEET 142 OF 188

TEST: Dissipation factor @ 1KHz	LAB SUPVR.	C.R.C. P/N M83421/01-1186 R												
TEST NO. XT-1218-C	ENGR. <i>D.K.</i>	CUST. P/N												
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G												
TEST VOLT. N/A		P/O NO. NAS8-32403												
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION: MIL-C-83421, para. 4.7.9												
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: <table border="0"> <tr> <td>Impedance comparator</td> <td>Model No. G.R. 1654</td> <td>ECN No. 1331</td> </tr> <tr> <td>Precision Decade capacitor</td> <td>G.R. 1413</td> <td>1387</td> </tr> <tr> <td>Temperature test chamber - Statham</td> <td>SDG-1</td> <td>130</td> </tr> <tr> <td>Thermometer - Marshall J E-485</td> <td></td> <td>1588</td> </tr> </table>	Impedance comparator	Model No. G.R. 1654	ECN No. 1331	Precision Decade capacitor	G.R. 1413	1387	Temperature test chamber - Statham	SDG-1	130	Thermometer - Marshall J E-485		1588
Impedance comparator	Model No. G.R. 1654	ECN No. 1331												
Precision Decade capacitor	G.R. 1413	1387												
Temperature test chamber - Statham	SDG-1	130												
Thermometer - Marshall J E-485		1588												

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)							
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
086	.40	.38	.37	.38	.36	.36		
087	.40	.4	.39	.39	.51	.56		
088	.36	.41	.37	.39	.36	.41		
089	.37	.37	.37	.46	.64	.6		
090	.37	.36	.37	.38	.37	.39		
091	.35	.36	.4	.45	.49	.63		
093	.38	.38	.38	.39	.47	.65		
093	.37	.37	.5	.51	.64	.5		
094	.36	.36	.37	.38	.37	.37		
095	.37	.37	.37	.39	.51	.4		
096	.37	.36	.36	.37	.36	.36		
097	.36	.39	.37	.38	.44	.47		
098	.37	.42	.37	.37	.36	.66		
099	.37	.36	.38	.39	.38	.44		
100	.37	.39	.37	.38	.58	.39		
TEST DATE	3-1-77	3-17-77	5-9-77	5-31-77	6-17-77	6-29-77		
TEST BY								

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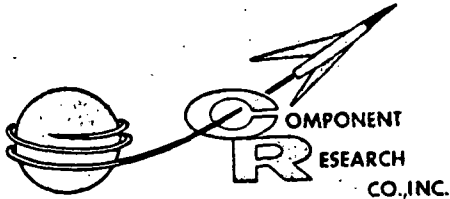
S/O-704-35622

SHEET 143 OF 188

TEST Dissipation factor @ 1KHz @ -55°C	C.R.C. P/N M83421/01-1186R
	CUST P/N
TEST NO. XT-1218-C	PROD. NO. 0238G
	P/O NO. NAS8-32403

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)							
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
101	.36	.36	.37	.38	.44	.4		
102	.37	.37	.38	.52	.52	.87		
103	.36	.36	.37	.5	.52	.5		
104	.37	.4	.38	.52	.62	.5		
105	.37	.38	.38	.39	.38	.47		
106	.36	.5	.37	.52	.56	.5		
108	.36	.39	.37	.38	.67	.55		
109	.36	.36	.47	.59	.51	.51		
110	.37	.38	.39	.44	.49	.53		
111	.37	.36	.39	.39	.37	.46		
112	.36	.36	.37	.37	.51	.41		
113	.36	.36	.37	.38	.44	.66		
114	.37	.37	.38	.5	.49	.49		
116	.35	.36	.36	.37	.52	.39		
117	.36	.38	.5	.52	.52	.61		
TEST DATE	2-28-77	3-16-77	5-9-77	5-31-77	6-17-77	6-29-77		
TEST BY								

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CUSTOMER'S NAME: NASA

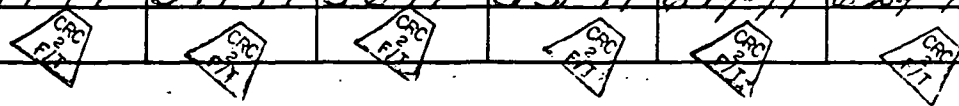
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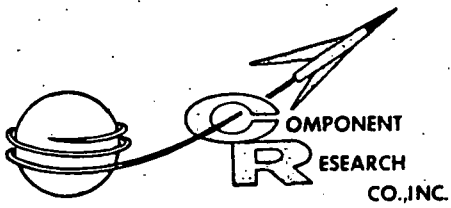
SHEET 144 OF 188

TEST: Dissipation factor @ 1KHz	LAB SUPPLY ENGR. Q.A.	C.R.C. P/N M83421/01-1186R CUST. P/N PROD. NO. 0238G P/O NO. NAS8-32403
TEST NO. XT-1218-C		
TEST TEMP. 125°C		
TEST VOLT. N/A		
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to 125°C, 1 HR. per cycle		SPECIFICATION: MIL-C-83421, para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade cap. G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer - Marshall J E-485 1588

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)						
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles	
086	.08	.04	.035	.035	.04	.04	
087	.08	.04	.035	.035	.055	.045	
088	.04	.05	.04	.045	.05	.065	
089	.04	.04	.035	.035	.14	.06	
090	.04	.045	.035	.04	.05	.075	
091	.03	.04	.03	.03	.07	.06	
092	.04	.05	.045	.045	.065	.065	
093	.04	.045	.035	.035	.21	.035	
094	.03	.035	.03	.035	.045	.035	
095	.03	.04	.035	.035	.075	.055	
096	.03	.045	.03	.035	.045	.035	
097	.04	.045	.035	.045	.06	.045	
098	.04	.045	.04	.04	.05	.065	
099	.03	.045	.04	.04	.045	.045	
100	.04	.045	.04	.035	.07	.135	
TEST DATE	3-1-77	3-17-77	5-6-77	5-31-77	6-17-77	6-29-77	
TEST BY							

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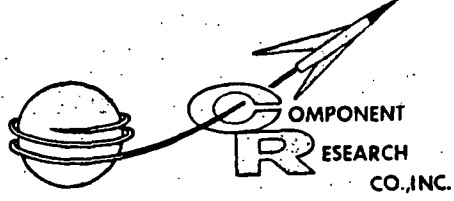
S/O-704-35622

SHEET 145 OF 188

TEST Dissipation factor @ 1KHz @ 125°C		G.R.C. P/N M83421/01-1186R	
TEST NO. XT-1218-C		CUST P/N _____	
		PROD. NO. 0238G	
		P/O NO. NAS8-32403	

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)							
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
101	.04	.045	.035	.035	.045	.055		
102	.04	.04	.035	.035	.045	.08		
103	.04	.04	.035	.035	.05	.035		
104	.04	.045	.04	.04	.1	.045		
105	.04	.05	.045	.045	.055	.06		
106	.04	.04	.035	.035	.05	.05		
108	.04	.045	.035	.04	.095	.09		
109	.03	.04	.03	.035	.04	.03		
110	.04	.045	.035	.035	.44	.17		
111	.04	.045	.04	.045	.045	.23		
112	.03	.04	.03	.035	.045	.035		
113	.03	.04	.03	.035	.04	.14		
114	.04	.04	.035	.035	.04	.04		
116	.03	.04	.03	.03	.075	.105		
117	.04	.045	1.45	6.5	1.75	.9		
TEST DATE	3-1-77	3-17-77	5-6-77	5-31-77	6-17-77	6-29-77		
TEST BY								

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CUSTOMER'S NAME: NASA

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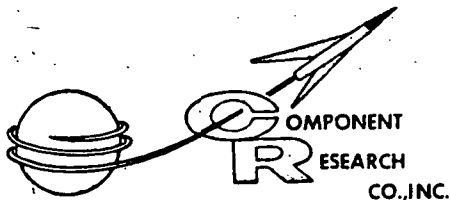
SHEET 146 OF 188

TEST: Dissipation factor @ 10KHz	LAB SUPERVISOR <i>[Signature]</i>	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C, 1 hour per cycle		SPECIFICATION: MIL-C-83421, para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN 1331 Precision decade capacitor G.R. 1413

S/N	Percent dissipation factor with thermal shock -55°C to +125°C							
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
086	.15	.175	.18	.195	.205	.215		
087	.15	.18	.175	.195	.205	.21		
088	.17	.21	.22	.26	.28	.31		
089	.15	.185	.175	.2	.2	.205		
090	.155	.195	.195	.225	.24	.255		
091	.15	.175	.175	.195	.205	.21		
092	.195	.245	.265	.31	.37	.42		
093	.145	.185	.18	.205	.205	.205		
094	.15	.175	.16	.19	.195	.205		
095	.14	.175	.17	.19	.21	.235		
096	.14	.165	.155	.18	.19	.21		
097	.15	.185	.2	.23	.245	.175		
098	.165	.21	.23	.255	.265	.31		
099	.15	.185	.205	.245	.25	.26		
100	.145	.17	.165	.185	.2	.21		
TEST DATE	2-25-77	3-11-77	5-3-77	5-27-77	6-14-77	6-30-77		
TEST BY								

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CUSTOMER'S NAME: NASA

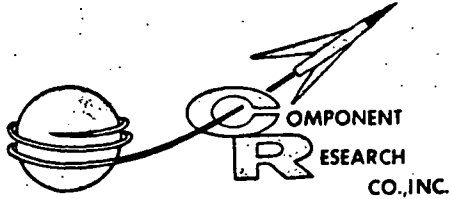
S/O-704-35622

SHEET 147 OF 188

TEST Dissipation factor @ 10 KHz @ 25°C	C.R.C. P/N M83421/01-1186R
	CUST P/N _____
TEST NO. XT-1218-C	PROD. NO. 0238G
	P/O NO. NAS8-32403

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)						
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles	
101	.15	.165	.175	.18	.205	.205	
102	.15	.175	.17	.215	.22	.23	
103	.16	.175	.165	.205	.21	.215	
104	.2	.225	.22	.26	.26	.275	
105	.18	.22	.23	.265	.28	.29	
106	.15	.165	.195	.215	.225	.23	
108	.165	.2	.205	.235	.26	.28	
109	.145	.16	.15	.175	.175	.175	
110	.15	.175	.185	.205	.22	.22	
111	.165	.19	.195	.225	.26	.3	
112	.15	.165	.155	.18	.185	.19	
113	.145	.16	.155	.175	.175	.17	
114	.155	.175	.16	.19	.185	.195	
116	.14	.16	.16	.18	.19	.54	
117	.155	.175	.18	.31	.24	.225	
TEST DATE	2-28-77	3-11-77	5-3-77	5-27-77	6-14-77	6-20-77	
TEST BY							

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CUSTOMER'S NAME: NASA

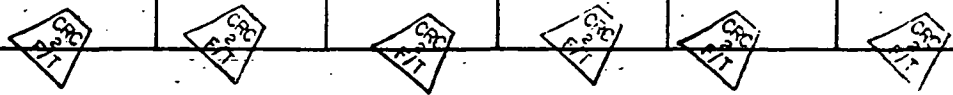
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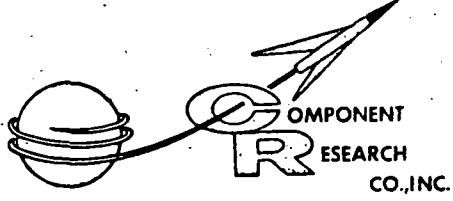
SHEET 148 OF 188

TEST: Dissipation factor @ 10 KHz	LAB SUPERVISOR <i>[Signature]</i>	C.R.C. P/N M83421/01-1186R															
TEST NO. XT-1218-C	ENGR. <i>[Signature]</i>	CUST. P/N															
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G															
TEST VOLT. N/A		P/O NO. NAS8-32403															
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to 125°C, 1 hour per cycle		SPECIFICATION: MIL-C-83421, para. 4.7.9															
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: <table border="0"> <tr> <td></td> <td>Model No.</td> <td>ECN No.</td> </tr> <tr> <td>Impedance comparator</td> <td>G.R. 1654</td> <td>1331</td> </tr> <tr> <td>Precision decade cap.</td> <td>G.R. 1413</td> <td>1387</td> </tr> <tr> <td>Temperature test chamber</td> <td>Statham SDG-1</td> <td>130</td> </tr> <tr> <td>Thermometer - Marshall</td> <td>J E-485</td> <td>1588</td> </tr> </table>		Model No.	ECN No.	Impedance comparator	G.R. 1654	1331	Precision decade cap.	G.R. 1413	1387	Temperature test chamber	Statham SDG-1	130	Thermometer - Marshall	J E-485	1588
	Model No.	ECN No.															
Impedance comparator	G.R. 1654	1331															
Precision decade cap.	G.R. 1413	1387															
Temperature test chamber	Statham SDG-1	130															
Thermometer - Marshall	J E-485	1588															

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)							
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles		
086	.88	.62	.53	.56	.56	.54		
087	.9	.57	.65	.56	.67	1.05		
088	.55	.59	.58	.6	.63	.94		
089	.54	.56	.53	.57	1.10	1.35		
090	.55	.57	.54	.57	.59	.66		
091	.52	.55	.51	.56	.65	1.15		
092	.59	.66	.6	.63	.74	1.1		
093	.55	.57	.69	.62	1.45	.59		
094	.53	.56	.54	.55	.62	.53		
095	.53	.56	.53	.56	1.15	.82		
096	.53	.55	.51	.54	.57	.54		
097	.54	.62	.56	.59	.7	.67		
098	.55	.66	.57	.6	.61	1.5		
099	.54	.57	.57	.6	.59	1.0		
100	.52	.76	.52	.56	1.25	.79		
TEST DATE	2-28-77	3-16-77	5-9-77	5-31-77	6-17-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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CUSTOMER'S NAME: NASA

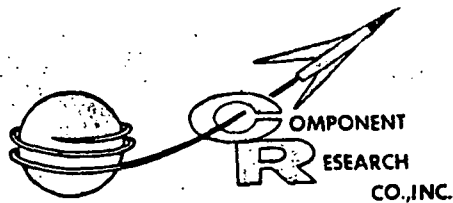
S/O-704-35622

SHEET 149 OF 188

TEST Dissipation factor @ 10KHz @ -55°C	C.R.C. P/N	M83421/01-1186R
	CUST P/N	
TEST NO. XT-1218-C	PROD. NO.	0238G
	P/O NO.	NAS8-32403

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)						
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles	
101	.51	.55	.54	.56	.84	.84	
102	.55	.56	.54	.65	.69	1.25	
103	.51	.55	.52	.63	.68	.62	
104	.56	.84	.61	.67	1.05	.66	
105	.57	.67	.58	.61	.7	.9	
106	.52	.84	.52	.63	.95	.68	
108	.55	.76	.55	.6	1.0	.94	
109	.50	.56	.52	1.65	.65	.75	
110	.53	.6	.53	.57	.75	.85	
111	.55	.59	.55	.59	.59	.91	
112	.51	.55	.51	.54	1.35	.65	
113	.52	.56	.5	.54	.94	1.75	
114	.52	.61	.51	.59	.6	.62	
116	.52	.56	.5	.54	1.05	.74	
117	.52	.59	1.15	.66	.8	.59	
TEST DATE	2-26-77	3-16-77	5-9-77	5-31-77	6-17-77	6-29-77	
TEST BY							

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CUSTOMER'S NAME: NASA

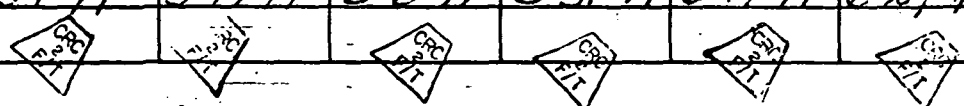
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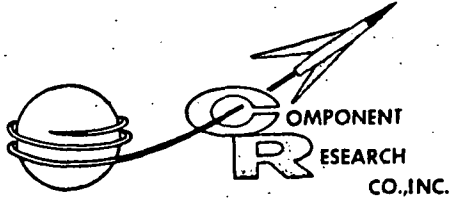
SHEET 150 OF 188

TEST: Dissipation factor @ 10KHz	LAB SUPPLY FIT	C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C, 1 Hr. per cycle		SPECIFICATION: MIL-C-83421, para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade cap. G.R. 1413 1387 Temperature test chamber Statham SDG-1 130 Thermometer - Marshall J E-485 1588

S/N	Percent Dissipation Factor with Thermal Shock (-55°C to +125°C)							
	Initial D.F.	After 20 cycle	After 140 cycle	After 260 cycle	After 380 cycle	After 500 cycle		
086	.57	.215	.155	.18	.22	.24		
087	.58	.205	.155	.17	.32	.28		
088	.21	.31	.215	.24	.34	.49		
089	.19	.205	.165	.175	.27	.42		
090	.19	.225	.165	.215	.31	.52		
091	.15	.195	.15	.155	.34	.43		
092	.24	.3	.255	.3	.44	.44		
093	.19	.215	.19	.185	.39	.165		
094	.15	.19	.145	.165	.165	.165		
095	.15	.195	.16	.18	.36	.35		
096	.14	.22	.14	.15	.23	.175		
097	.16	.235	.185	.215	.32	.245		
098	.19	.27	.215	.24	.33	.48		
099	.16	.235	.18	.22	.26	.3		
100	.15	.215	.15	.175	.27	.8		
TEST DATE	3-1-77	3-17-77	5-6-77	5-31-77	6-17-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

F-634-1





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GENERAL DATA SHEET

CUSTOMER'S NAME: NASA

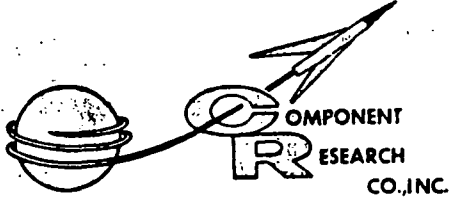
S/O-704-35622

SHEET 151 OF 188

TEST Dissipation factor @ 10KHz @ +125°C		C.R.C. P/N M83421/01-1186R
TEST NO. XT-1218-C		CUST P/N
		PROD. NO. 0238G
		P/O NO. NAS8-32403

S/N	Percent dissipation factor with thermal shock (-55°C to +125°C)								
	Initial D.F.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles			
101	.15	.205	.145	.175	.235	.34			
102	.16	.2	.15	.19	.26	.55			
103	.2	.2	.15	.185	.275	.21			
104	.21	.265	.21	.24	.3	.3			
105	.22	.275	.225	.265	.35	.4			
106	.16	.205	.155	.195	.3	.31			
108	.19	.26	.19	.22	.63	.59			
109	.14	.185	.125	.17	.195	.14			
110	.16	.225	.16	.185	.77	.49			
111	.18	.245	.18	.215	.25	.62			
112	.15	.215	.135	.15	.28	.195			
113	.14	.205	.125	.145	.225	1.0			
114	.15	.195	.14	.165	.195	.225			
116	.14	.215	.13	.155	.52	.54			
117	.16	.24	.36	1.25	.89	.66			
TEST DATE	3-1-77	3-17-77	5-6-77	5-31-77	6-17-77	6-29-77			
TEST BY									

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GENERAL DATA SHEET

CUSTOMERS NAME: NASA

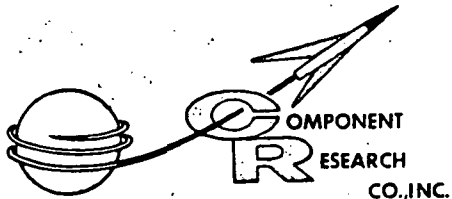
S/O-704-35622

SHEET 152 OF 188

TEST: E.S.R.	LAB SUPVR.	C.R.C. P/N M83421/01-1186R
TEST NO. XT 1218-C	ENGR.	CUST. P/N
TEST TEMP. 25°C	Q.A.	PROD. NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: NORMAL thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C (1 Hr. per cycle)		SPECIFICATION:
ACCEPTANCE LIMITS: There are no established E.S.R. limits for this test condition.		EQUIPMENT USED: E.S.R. meter - Clark-Hess-273 ECN No. 1130 Cable Assembly Clark-Hess 27375 1130

S/N	ESR with thermal shock (-55°C to +125°C)							
	Initial E.S.R. Ω	After 20 cycles Ω	After 140 cycles Ω	After 260 cycles Ω	After 380 cycles Ω	After 500 cycles Ω		
086	.11	.11	.13	.15	.14	.16		
087	.11	.10	.12	.14	.15	.15		
088	.15	.15	.16	.21	.24	.26		
089	.11	.11	.13	.14	.14	.14		
090	.12	.13	.15	.18	.20	.21		
091	.10	.11	.12	.14	.15	.14		
092	.17	.19	.22	.26	.33	.38		
093	.11	.12	.13	.15	.15	.14		
094	.11	.11	.11	.14	.14	.15		
095	.10	.11	.12	.14	.16	.17		
096	.10	.10	.11	.13	.14	.15		
097	.12	.12	.15	.18	.21	.22		
098	.14	.15	.18	.21	.24	.26		
099	.12	.13	.16	.19	.20	.20		
100	.11	.11	.11	.14	.15	.15		
TEST DATE	2-28-77	3-11-77	5-4-77	6-2-77	6-14-77	6-29-77		
TEST BY								

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GENERAL DATA SHEET

CUSTOMER'S NAME: NASA

S/O 704-35622

SHEET 153 OF 188

TEST E.S.R. @ 25°C	C.R.C. P/N M83421/01-1186R
	CUST P/N
TEST NO. XT-1218-C	PROD. NO. 0238G
	P/O NO. NAS8-32403

S/N	E.S.R. with thermal shock (-55°C to +125°C)					
	Initial E.S.R.	After 20 cycles	After 140 cycles	After 260 cycles	After 380 cycles	After 500 cycles
101	.11	.11	.12	.14	.16	.17
102	.11	.11	.12	.16	.16	.17
103	.11	.11	.12	.15	.16	.15
104	.15	.16	.17	.18	.21	.21
105	.14	.17	.18	.22	.23	.23
106	.10	.11	.13	.16	.17	.17
108	.13	.14	.16	.19	.21	.21
109	.10	.09	.10	.12	.12	.11
110	.11	.11	.13	.16	.16	.16
111	.12	.13	.15	.18	.21	.24
112	.11	.10	.10	.12	.13	.12
113	.10	.10	.10	.12	.13	.12
114	.10	.10	.10	.12	.13	.12
116	.10	.10	.10	.13	.15	1.03
117	.11	.11	.12	.16	.16	.15
TEST DATE	2-28-77	3-11-77	5-5-77	6-2-77	6-15-77	6-29-77
TEST BY						

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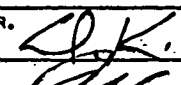
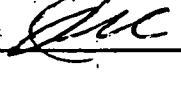
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

GENERAL DATA SHEET

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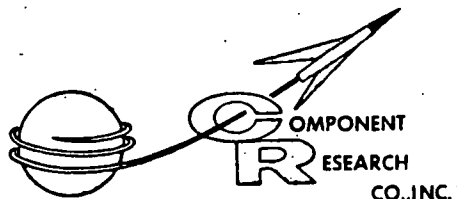
S/O 704-35622

SHEET 154 OF 188

TEST: Seal test (fine leak test)	LAB SUPVR 	C.R.C. P/N M83421/01-1186
TEST NO. XT 1218-C	ENGR. 	CUST. P/N
TEST TEMP. 25°C	Q.A. 	PROD NO. 0238G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal thermal shock per T.P. 1006 (Air to Air) 500 cycles -55°C to +125°C (1 HR. per cycle)		SPECIFICATION: MIL-C-83421, para. 4.7.5
ACCEPTANCE LIMITS: Leakage not to exceed 1×10^{-6} ATM/cc/sec		EQUIPMENT USED: Model No. ECN No. Fine leak detector - DuPont 651 24-120B

S/N	Initial		After 20 cycles		After 140 cycle		After 260 cycle		After 380 cycle		After 500 cycle			
	1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}			
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail		
086	↑		↑		↑		↑		↑		↑			
087	↑		↑		↑		↑		↑		↑			
088														
089													X	
090														
091														
092														
093														
094														
095														
096														
097														
098														
099	↓		↓		↓		↓		↓		↓		X	
100	↓		↓		↓		↓		↓		↓			
TEST DATE	2-28-77		3-16-77		5-10-77		6-2-77		6-15-77		7-1-77			
TEST BY														

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GENERAL DATA SHEET

CUSTOMER'S NAME: NASA

S/O 704-35622

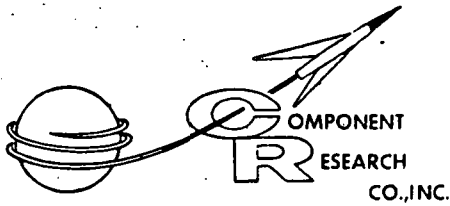
SHEET 155 OF 188

TEST Seal test @ 25°C (Fine leak test)		C.R.C. P/N <u>M83421/01-1186R</u>	
TEST NO. <u>XT-1218-C</u>		CUST. P/N _____	
		PROD. NO. <u>0238G</u>	
		P/O NO. <u>NAS8-32403</u>	

S/N	Initial		After 20 cyc		After 140 cyc		After 260 cyc		After 380 cyc		After 500 cyc	
	1x10 ⁻⁶		1x10 ⁻⁶		1x10 ⁻⁶		1x10 ⁻⁶		1x10 ⁻⁶		1x10 ⁻⁶	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
101	✓		✓		✓		✓		✓		✓	
102	↑		↑		↑		↑		↑			+
103	↑											+
104											/	
105											/	
106											/	
108												+
109												+
110											/	
111											/	
112												+
113											/	
114											/	
116	↓		↓		↓		↓		↓			+
117	/		/		/		/		/			+

TEST DATE	<u>2-26-77</u>	<u>3-16-77</u>	<u>5-10-77</u>	<u>6-2-77</u>	<u>6-15-77</u>	<u>7-1-77</u>
TEST BY						

F-634-2



TEST REPORT SUMMARY

Thermal Shock
Air to Air
500 Cycles, -55°C to +125°C

TEST NO.

REPORT NO. XT-1218-A

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PROD. NO. 0236G CUSTOMER NASA, MARSHALL SPACE FLIGHT CENTER
 LOT _____ CUSTOMER P/N _____
 LOT SIZE 30 CUSTOMER P/O NAS8-32403
 C.R.C. P/N M83421/01-1090R C.R.C. S/O 704-35622
 DATE COMPLETED July 1, 1977

TEST	REQUIREMENT	METHOD PARAGRAPH	ACC	
			REJ	
Insulation Resistance	3.11	4.7.7	29	1
Capacitance	N/A	4.7.8	29	1
Dissipation Factor	3.13	4.7.9	29	1
E.S.R.			29	1
Seal Test	3.9	4.7.5	27	2

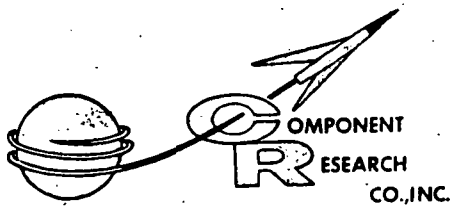
QUALITY CONTROL

DATE

SHIPPING DATA

ORDER #	DATE SHIPPED	QTY SHIPPED	INVOICE #	QTY STOCKED

F-634-3



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GENERAL DATA SHEET

Customer's Name: NASA

S/O - 704-35622

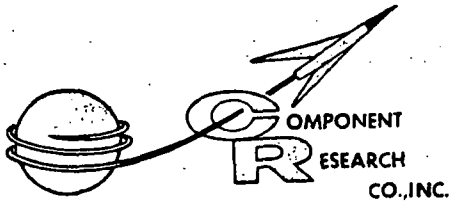
SHEET 157 OF 188

TEST: Insulation Resistance (Terminal to Terminal)		LAB SUPVR. <i>[Signature]</i>	C.R.C. P/N M83421/01-1090 R
TEST NO. XT 1218-A		ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C		Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. 30VDC			P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: -MIL-C-83421, Para. 4.7.7	
ACCEPTANCE LIMITS: 30pA maximum or 3,000,000 megohms minimum After 500 cycles air to air thermal shock there are no established limits for maximum leakage current @ 25°C		EQUIPMENT USED: Model No. ECN No. D.C. Micro V Ammeter H.P. 425 A 1480 I.R. Test rack CRC None 647 D.C. volt ohm meter Simpson 260 1357 Battery pack N/A	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	1	3	2	2	2	2		
022	5	4	2	3	2	2		
023	5	4	2	3	2	2		
024	3	6	2	3	2	2		
025	1	3	2	2	2	2		
026	7	5	2	3	3	5		
027	3	4	3	3	2	6		
029	3	5	3	4	2	2		
030	1	5	2	3	2	1		
031	2	4	2	2	2	1		
032	2	4	2	2	2	1		
033	7	3	2	3	2	2		
034	2	4	2	3	2	2		
035	3	6	2	3	2	2		
036	3	4	3	2	2	2		
TEST DATE	2-24-77	3-11-77	5-4-77	5-27-77	6-14-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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GENERAL DATA SHEET

Customer's Name: NASA

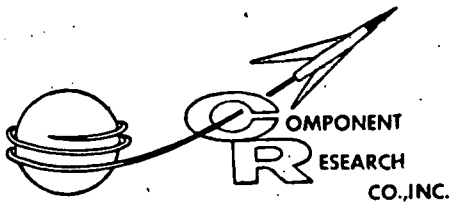
S/OC-704-35622

SHEET 159 OF 188

TEST: Insulation Resistance (Terminal to Terminal)	LAB SUPVR.	C.R.C. P/N M83421/01-1090 R
TEST NO. XT 1218-A	ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. 30 VDC		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles, -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.7
ACCEPTANCE LIMITS: There are no established limits for maximum leakage current @ -55°C	EQUIPMENT USED: D.C. Micro V Ammeter Model No. H.P. 425A ECN No. 1480 I.R. test rack CRC None 647 D.C. volt ohm meter Simpson 260 1357 Temperature test chamber Statham SD9-1 130 Thermometer Marshall J E-485 1588 Battery pack N/A	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	5	8	6	9	5	7		
022	5	8	8	7	5	4		
023	6	11	4	9	5	8		
024	4	12	5	11	5	11		
025	10	10	5	6	5	6		
026	3	12	4	11	7	11		
027	8	11	5	13	8	10		
029	4	9	5	11	7	7		
030	5	10	4	9	9	9		
031	7	9	5	9	7	8		
032	5	11	5	9	6	15		
033	4	11	8	12	5	21		
034	5	12	5	10	6	12		
035	5	6	6	11	7	10		
036	7	12	15	16	5	13		
TEST DATE	3-1-77	3-14-77	5-5-77	5-31-77	6-16-77	6-29-77		
TEST BY								

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Customer's Name: NASA

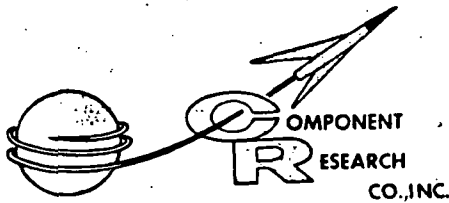
S/O - 704-35622

SHEET 160 OF 188

TEST	INSULATION RESISTANCE @ -55°C (Terminal to Terminal)	C.R.C. P/N M83421/01-1090R
		CUST P/N
		PROD. NO. 0236G
TEST NO. XT 1218-A		P/O NO. NAS8-32403

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles
037	5	13	8	10	6	10
038	3	13	5	9	8	9
039	4	11	10	10	9	13
040	4	18	5	11	6	16
041	5	18	5	17	6	11
042	6	8	10	7	35	25
043	3	5	30	5	15	5
044	2	10	10	8	12	12
045	5	12	9	7	10	13
046	3	7	5	10	6	7
047	3	11	6	13	10	15
048	2	OPEN				
049	4	10	3	10	9	11
050	5	8	3	7	14	9
051	6	7	4	7	8	9
TEST DATE	3-1-77	3-14-77	5-5-77	5-31-77	6-16-77	6-29-77
TEST BY	CRC FIT	CRC FIT	CRC FIT	CRC FIT	CRC FIT	CRC FIT

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GENERAL DATA SHEET

Customer's Name: NASA

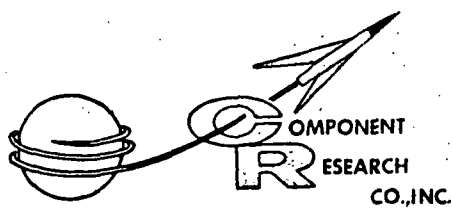
704-35622

SHEET 161 OF 188

TEST: Insulation Resistance (Terminal to Terminal)		LAB SUPVR.	C.R.C. P/N M83421/01-1090 R																					
TEST NO. XT 1218-A		ENGR.	CUST. P/N																					
TEST TEMP. 125°C		Q.A.	PROD. NO. 0236G																					
TEST VOLT. 18 VDC			P/O NO. NAS8-32403																					
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles, -55°C to +125°C (1 hr. per cycle)			SPECIFICATION: MIL-C-83421, Para. 4.7:7																					
ACCEPTANCE LIMITS: 1500pA maximum or 12,000 megohms minimum After 500 cycles air to air thermal shock there are no established limits for maximum leakage current @ +125°C		EQUIPMENT USED: <table border="0"> <tr> <td>D.C. Micro V Ammeter</td> <td>Model No. H.P. 425A</td> <td>ECN No. 1480</td> </tr> <tr> <td>I.R. Test rack</td> <td>CRC None</td> <td>647</td> </tr> <tr> <td>D.C. volt ohm meter</td> <td>Simpson 260</td> <td>1357</td> </tr> <tr> <td>Temperature test chamber</td> <td></td> <td></td> </tr> <tr> <td>Thermometer - Marshall</td> <td>Satham SD9-1</td> <td>130</td> </tr> <tr> <td>Battery pack</td> <td>J E-485</td> <td>1588</td> </tr> <tr> <td></td> <td>N/A</td> <td></td> </tr> </table>		D.C. Micro V Ammeter	Model No. H.P. 425A	ECN No. 1480	I.R. Test rack	CRC None	647	D.C. volt ohm meter	Simpson 260	1357	Temperature test chamber			Thermometer - Marshall	Satham SD9-1	130	Battery pack	J E-485	1588		N/A	
D.C. Micro V Ammeter	Model No. H.P. 425A	ECN No. 1480																						
I.R. Test rack	CRC None	647																						
D.C. volt ohm meter	Simpson 260	1357																						
Temperature test chamber																								
Thermometer - Marshall	Satham SD9-1	130																						
Battery pack	J E-485	1588																						
	N/A																							

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	21	4	38	20	18	10		
022	4	71	40	15	14	100		
023	27	6	50	14	24	18		
024	66	43	45	24	32	32		
025	24	6	65	33	14	120		
026	19	19	55	25	31	36		
027	4	19	45	37	47	31		
028	33	47	43	17	68	15		
029	25	4	40	15	10	10		
031	18	8	45	27	11	28		
032	16	50	60	14	25	11		
033	19	20	35	30	53	50		
034	29	22	45	20	29	29		
035	100	150	45	25	13	27		
036	69	15	43	50	25	28		
TEST DATE	2-28-77	3-14-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY								

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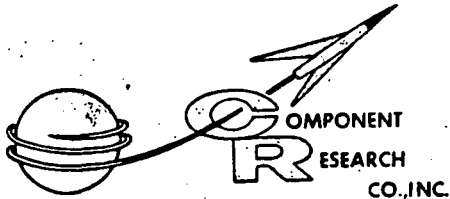
S/O - 704-35622

SHEET 162 OF 188

TEST Insulation Resistance @ 125°C (Terminal to Terminal)	C.R.C. P/N <u>M83421/01-1090R</u> CUST P/N _____ PROD. NO. <u>0236G</u> P/O NO. <u>NAS8-32403</u>
TEST NO. <u>XT 1218-A</u>	

S/N	INSULATION RESISTANCE WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial I.R.	After 20 Cycles	After 140 Cycles	After 260 - Cycles	After 380 Cycles	After 500 Cycles	
037	81	12	45	92	20	31	
038	85	12	45	35	21	27	
039	23	11	30	24	23	26	
040	4	6	30	23	60	240	
041	20	32	35	20	23	30	
042	15	30	35	18	13	53	
043	35	45	25	27	27	21	
044	19	73	35	15	10	33	
045	33	17	38	25	30	115	
046	21	85	30	35	32	40	
047	18	17	20	28	24	28	
048	17	OPEN					
049	11	36	30	43	34	15	
050	115	15	50	21	31	8	
051	33	17	180	45	8	32	
TEST DATE	<u>12-28-71</u>	<u>3-14-71</u>	<u>5-6-71</u>	<u>5-31-71</u>	<u>6-16-71</u>	<u>6-28-71</u>	
TEST BY							

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SHEET 163 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPERVISOR: <i>[Signature]</i>	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles, -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: .009uF to .011uF After 500 cycles air to air thermal shock there are no established % capacitance drift limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	.009868	+0.35	+0.1	+0.3	+0.25	+1.85		
022	.009780	-0.2	-1	-0.95	-1.85	-2.15		
023	.009913	+0.05	-0.05	-0.05	+0.05	+0.05		
024	.009776	0.00	-0.4	-1.55	-1.7	-2.05		
025	.009890	+0.25	-0.25	+0.05	-0.25	-0.35		
026	.009930	-0.05	-0.15	-0.25	+0.2	+0.45		
027	.009945	+1	+1.4	+2.15	+2.7	+3.2		
029	.009736	0.00	-0.25	+0.95	+1.89	+1.89		
030	.009898	-0.05	+0.4	+0.25	-0.4	0.00		
031	.009800	+0.15	-0.3	-0.65	-1.1	-1.4		
032	.009769	+0.05	-0.45	-0.25	-0.3	-0.2		
033	.009839	-0.05	0.00	+0.15	+0.55	-0.2		
034	.009718	-0.15	-0.05	-1.05	-1.2	-1.7		
035	.009803	+0.45	-0.45	-1.1	-1.3	-1.7		
036	.009765	+0.2	-0.75	-0.7	-0.95	-1.05		
TEST DATE:	2-24-77	3-11-77	5-3-77	5-27-77	6-14-77	6-29-77		
TEST BY:	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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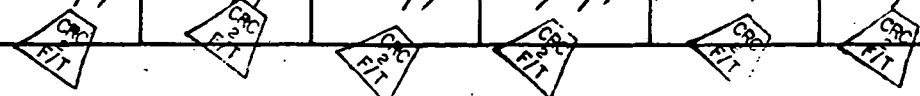
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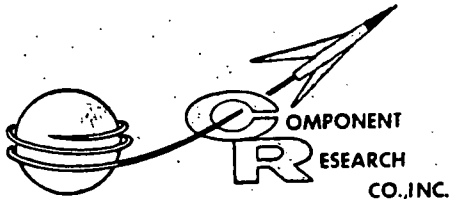
SHEET 164 OF 188

TEST	Capacitance Drift with Thermal Shock	C.R.C. P/N	M83421/01-1090 R
		CUST P/N	
		PROD. NO.	0236G
		P/O NO.	NAS8-32403
TEST NO. XT-1218-A			

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
037	.009888	-0.2	-0.7	-0.85	-0.95	-1.1		
038	.009897	+0.45	+0.35	+0.85	-0.7	+0.4		
039	.009916	-0.05	-0.3	-0.15	-0.5	+0.05		
040	.009634	-0.1	-0.15	-0.15	-1.25	-1.4		
041	.010001	+0.05	-1.65	-1.15	-2.35	-2.75		
042	.009866	+0.05	-0.55	-0.9	-1.4	-1.9		
043	.009871	+0.35	-0.5	-0.4	-0.65	-0.7		
044	.009880	+0.25	-0.25	-0.1	+0.15	+1.75		
045	.009991	-0.15	-0.65	-0.75	-1.35	-1.55		
046	.009927	+0.05	-0.55	-0.95	-1.5	-2.55		
047	.009911	-0.15	-0.15	-0.2	-0.55	-0.35		
048	.010173	OPEN						
049	.009947	+0.1	-0.45	-0.35	-0.55	-0.9		
050	.009886	-0.15	-0.75	-1.05	-0.65	+0.55		
051	.009845	-0.05	-0.35	0.10	-0.65	-1.2		
TEST DATE	2-24-77	3-11-77	5-3-77	5-27-77	6-14-77	6-29-77		
TEST BY	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]		

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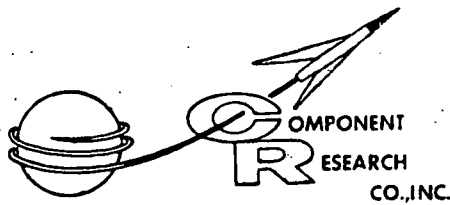
S/O 704-35622

SHEET 165 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR.	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	ENGR.	CUST. P/N
TEST TEMP. -55°C	Q.A.	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles, -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial capacitance and % capacitance drift limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade G.R. 1413 1387 capacitor Temperature test chamber - Statham SD9-1 130 Thermometer - Marshall J E-485 1588

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	.009696	+1.05	+1.13	+1.185	-1.165	-1.19		
022	.009617	+1.11	+1.02	-1.005	-1.215	-1.26		
023	.009748	+1.11	+1.125	+1.52	+1.045	-1.035		
024	.009608	+1.075	+1.07	-1.055	-1.21	-1.36		
025	.009434	+1.08	+1.035	+1.045	-1.12	-1.205		
026	.009762	+1.095	+1.065	+1.085	-1.01	-1.02		
027	.009770	+1.005	+1.13	+1.36	+1.25	+1.31		
029	.009563	+1.14	+1.07	+1.20	+1.92	+1.5		
030	.009732	+1.165	+1.195	+1.155	+1.115	-1.035		
031	.009635	+1.15	+1.005	+1.04	-1.21	-1.33		
032	.009592	+1.125	+1.09	+1.24	+1.085	-1.005		
033	.009676	+1.13	+1.14	+1.245	-1.03	-1.16		
034	.009545	+1.035	+1.025	+1.125	-1.135	-1.89		
035	.009620	+1.1	-1.015	+1.065	-1.085	-1.21		
036	.009627	+1.075	+1.025	+1.025	-1.145	-1.95		
TEST DATE	3-17-77	3-14-77	5-5-77	5-31-77	6-16-77	6-27-77		
TEST BY								

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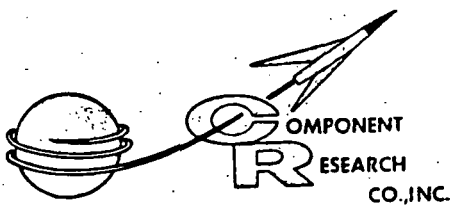
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SHEET 166 OF 188

TEST Capacitance Drift @ -55°C with Thermal Shock	C.R.C. P/N	M83421/01-i090R
	CUST P/N	
TEST NO. XT-1218-A	PROD. NO.	0236G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap. in uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
037	.009719	+09	+065	+085	-08	-185		
038	.009705	+13	+135	+15	+11	-01		
039	.009745	+125	+02	+055	-075	-38		
040	.009761	+245	+07	+13	-085	-22		
041	.009824	+47	-05	-11	-22	-45		
042	.009687	+075	+015	+03	-16	-29		
043	.009706	+15	+03	+085	-04	-14		
044	.009713	+11	+08	+095	+05	-32		
045	.009820	+095	+015	-025	-13	-3		
046	.009753	+09	-005	-035	-26	-46		
047	.009741	+075	-155	+15	-12	-44		
048								
049	.009786	+09	-015	+065	-085	-18		
050	.009720	+195	-03	-05	-1	-56		
051	.0096	+39	+01	-013	-18	-33		
TEST DATE	3-1-77	3-14-77	5-5-77	5-31-77	6-17-77	6-27-77		
TEST BY								

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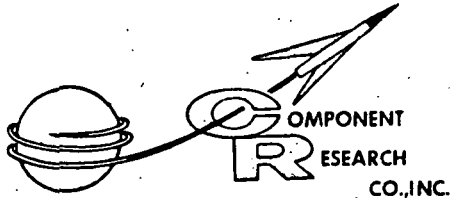
S/O - 704-35622

SHEET 167 OF 188

TEST: Capacitance Drift with Thermal Shock	LAB SUPVR. ²³ FIT	C.R.C. P/N M83421/01-1090 R
TEST NO. XT-1218-A	ENGR. <i>J.K.</i>	CUST. P/N
TEST TEMP. 125°C	O.A. <i>J.K.</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles, -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.8
ACCEPTANCE LIMITS: There are no established initial capacitance and % capacitance drift limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SD9-1 130 Thermometer - Marshall J E-485 1588

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap In uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	.009918	-0.05	-0.05	+0.02	-0.02	-0.11		
022	.009808	+0.01	-0.15	-0.03	-0.09	-0.26		
023	.009951	-0.05	-0.02	-0.45	-0.14	-0.31		
024	.009833	-0.25	-0.45	-0.15	-0.65	-0.36		
025	.009941	-0.01	0.00	-0.45	-0.65	-0.34		
026	.009979	0.00	-0.65	-0.15	-0.85	-0.16		
027	.009986	+0.85	+1.55	+2.15	+2.27	+1.85		
029	.009787	-0.05	+0.04	+0.53	+1.25	+0.85		
030	.009943	-0.15	+0.35	-0.08	-0.13	-0.225		
031	.009847	-0.05	-0.04	-0.075	-0.13	-0.31		
032	.009820	-0.25	-0.55	-0.95	-0.11	-0.26		
033	.009868	-0.45	-0.08	-0.15	-0.85	-0.34		
034	.009779	-0.25	-0.45	-0.11	-0.155	-0.36		
035	.009865	-0.35	-0.105	-0.2	-0.3	-0.4		
036	.009829	-0.02	-0.05	-0.13	-0.17	-0.225		
TEST DATE	2-28-77	3-17-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY	<i>J.K.</i>	<i>J.K.</i>	<i>J.K.</i>	<i>J.K.</i>	<i>J.K.</i>	<i>J.K.</i>		

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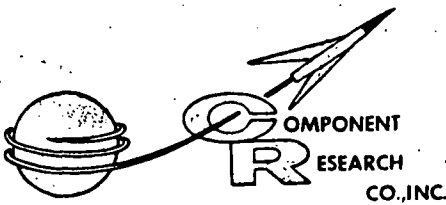
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SHEET 168 OF 188

TEST Capacitance Drift @ +125°C with Thermal Shock	C.R.C. P/N	M83421/01-1090R
	CUST P/N	
TEST NO. XT-1218-A	PROD. NO.	0236G
	P/O NO.	NAS8-32403

S/N	PERCENT CAPACITANCE CHANGE WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial Cap in uF	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
C37	.009932	-0.15	-0.5	-0.6	-0.7	-1.9		
C38	.009929	+0.15	+0.25	+0.55	+0.15	-1.3		
C39	.009945	+0.1	-0.15	-0.5	-1.6	-3.1		
C40	.009687	-0.55	-0.65	-0.85	-1.6	-2.4		
C41	.010223	-0.75	-0.75	-0.9	-1.15	-3.9		
C42	.009895	-0.05	+0.2	+0.15	-1.1	-3		
C43	.009919	-0.05	0.00	-0.15	-0.95	-2.4		
C44	.009980	-0.25	-0.55	-0.4	-0.45	-1.75		
C45	.010006	+0.1	+0.3	+0.6	+0.15	-0.9		
C46	.009954	+0.05	-0.04	-0.15	-1.15	-2.8		
C47	.009938	-0.1	+0.07	+0.29	+0.3	-1.6		
C48	.010246	OPEN						
C49	.009988	+0.05	+0.2	+0.2	-0.7	-2.8		
C50	.009915	-0.1	-0.05	+0.15	+0.77	+1.45		
C51	.009893	-0.6	-0.25	-0.35	-0.8	-2.3		
TEST DATE	2-28-77	3-14-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY								

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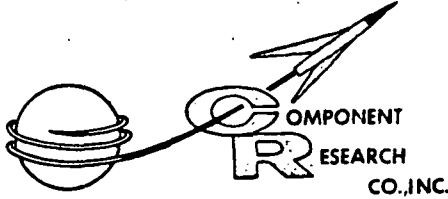
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SHEET 169 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPV. <i>[Signature]</i>	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles, -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: 15% After 500 cycles air to air thermal shock there are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade G.R. 1413 1387 capacitor

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	.08	.085	.085	.085	.08	.095		
022	.075	.085	.08	.095	.09	.095		
023	.075	.085	.08	.085	.085	.075		
024	.08	.085	.08	.095	.085	.1		
025	.075	.085	.075	.09	.085	.105		
026	.075	.085	.07	.085	.085	.065		
027	.075	.085	.085	.095	.095	.095		
029	.075	.08	.075	.085	.095	.095		
030	.08	.085	.085	.09	.095	.085		
031	.075	.085	.075	.09	.085	.095		
032	.075	.075	.075	.085	.085	.095		
033	.075	.08	.075	.085	.085	.09		
034	.075	.085	.075	.085	.095	.09		
035	.075	.075	.075	.08	.075	.075		
036	.065	.08	.075	.08	.075	.07		
TEST DATE	2-24-77	3-11-77	5-4-77	5-27-77	6-14-77	6-29-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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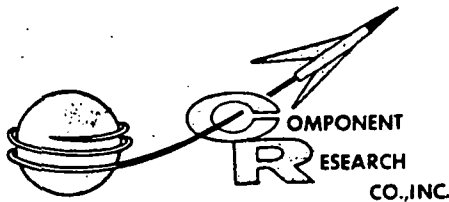
S/O - 704-35622

SHEET 170 OF 188

TEST Dissipation Factor @ 1KHz @ 25°C	C.R.C. P/N	M83421/01-1090R
	CUST P/N	
	PROD. NO.	0236G
	P/O NO.	NAS8-32403
TEST NO. XT-1218-A		

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
037	.075	.08	.075	.085	.085	.095		
038	.075	.075	.075	.085	.085	.08		
039	.075	.075	.075	.085	.09	.095		
040	.07	.08	.075	.09	.095	.105		
041	.065	.1	.075	.085	.085	.095		
042	.075	.085	.075	.085	.085	.095		
043	.07	.08	.08	.1	.08	.075		
044	.07	.075	.075	.08	.075	.085		
045	.07	.085	.075	.085	.095	.09		
046	.075	.085	.085	.1	.095	.105		
047	.07	.08	.075	.085	.08	.08		
048	.1	OPEN						
049	.075	.08	.08	.085	.085	.085		
050	.065	.08	.075	.08	.085	.085		
051	.075	.085	.075	.085	.095	.095		
TEST DATE	2-24-77	3-11-77	5-3-77	5-27-77	6-14-77	6-29-77		
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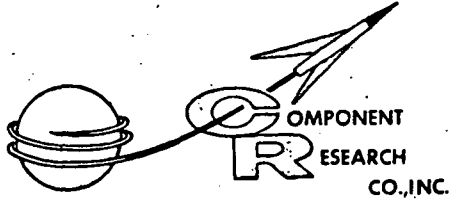
S/O - 704-35622

SHEET 171 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPPLY FIT	C.R.C. P/N M83421/01-1090R
TEST NO. Xt-1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. -55°C	D.A.	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. ECN No. G.R. 1654 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham 130 SD9-1 Thermometer Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
021	.39	.37	.38	.4	.44	.42	
022	.39	.38	.39	.4	.39	.39	
023	.39	.37	.39	.4	.39	.39	
024	.39	.38	.39	.4	.39	.39	
025	.39	.37	.39	.4	.38	.39	
026	.39	.38	.39	.41	.4	.41	
027	.41	.46	.46	.5	.46	.48	
029	.39	.37	.39	.59	.52	.42	
030	.4	.38	.42	.44	.38	.4	
031	.39	.37	.39	.4	.39	.39	
032	.39	.38	.39	.4	.39	.39	
033	.39	.38	.39	.4	.38	.39	
034	.4	.39	.4	.41	.39	.39	
035	.39	.38	.39	.4	.38	.39	
036	.38	.36	.38	.39	.38	.43	
TEST DATE	3-1-77	3-14-77	5-5-77	5-31-77	6-16-77	6-27-77	
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

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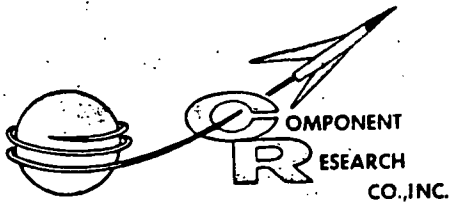
S/O - 704-35622

SHEET 172 OF 188

TEST Dissipation Factor @ 1KHz @ -55°C	C.R.C. P/N. M83421/01-1090R
	CUST P/N
TEST NO. XT-1218-A	PROD. NO. 0236G
	P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
037	.39	.37	.39	.39	.38	.39		
038	.39	.38	.39	.4	.38	.39		
039	.39	.38	.39	.4	.39	.43		
040	.4	.38	.4	.4	.39	.39		
041	.39	.35	.44	.4	.39	.39		
042	.4	.39	.54	.41	.39	.39		
043	.39	.41	.39	.4	.4	.38		
044	.39	.4	.39	.4	.38	.46		
045	.39	.37	.39	.4	.39	.39		
046	.4	.39	.41	.42	.39	.4		
047	.39	.38	.52	.6	.53	.46		
048	.4							
049	.4	.37	.39	.39	.38	.39		
050	.39	.36	.39	.4	.52	.47		
051	.4	.36	.4	.41	.39	.4		
TEST DATE	3-1-77	3-14-77	5-5-77	5-31-77	6-16-77	6-27-77		
TEST BY								

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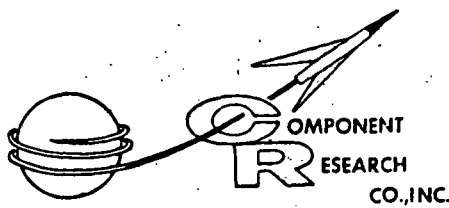
S/O - 704-35622

SHEET 173 OF 188

TEST: Dissipation Factor @ 1KHz	LAB SUPERVISOR ENGR. Q.A.	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	<i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C		PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SD9-1 1588 Thermometer - Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	.015	.015	.03	.025	.03	.035		
022	.015	.015	.02	.03	.04	.055		
023	.015	.015	.02	.025	.035	.03		
024	.015	.02	.025	.03	.035	.045		
025	.015	.02	.025	.035	.045	.075		
026	.015	.015	.02	.025	.03	.03		
027	.015	.02	.02	.025	.03	.035		
029	.015	.02	.025	.03	.05	.045		
030	.015	.02	.03	.035	.045	.035		
031	.015	.015	.02	.025	.035	.055		
032	.015	.015	.02	.025	.035	.045		
033	.015	.015	.02	.025	.035	.035		
034	.015	.02	.025	.025	.035	.035		
035	.015	.015	.015	.015	.02	.02		
036	.015	.015	.015	.02	.025	.025		
TEST DATE	2-28-77	3-14-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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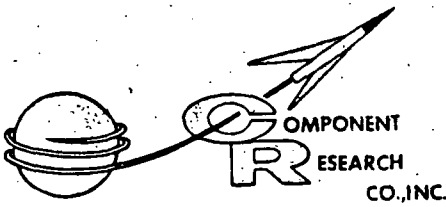
S/O - 704-35622

SHEET 174 OF 188

TEST Dissipation Factor @ 1KHz @ 125°C	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	CUST P/N
	PROD. NO. 0236G
	P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
037	.015	.015	.025	.025	.035	.045	
038	.015	.03	.025	.025	.03	.04	
039	.015	.015	.03	.03	.035	.04	
040	.015	.02	.035	.035	.055	.095	
041	.015	.015	.025	.025	.035	.05	
042	.015	.015	.025	.03	.045	.07	
043	.015	.025	.02	.025	.03	.035	
044	.015	.015	.02	.025	.03	.03	
045	.015	.045	.02	.025	.035	.045	
046	.015	.025	.03	.045	.075	.095	
047	.015	.015	.015	.02	.03	.03	
048	.025	OPEN					
049	.015	.015	.02	.025	.025	.03	
050	.015	.015	.015	.02	.035	.03	
051	.02	.015	.02	.03	.045	.075	
TEST DATE	2-28-77	3-14-77	5-6-77	5-31-77	6-16-77	6-28-77	
TEST BY	CRC FIT	CRC FIT	CRC FIT	CRC FIT	CRC FIT	CRC FIT	

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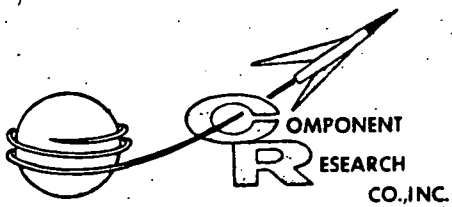
^{CRC} S/O - 704-35622

SHEET 175 OF 188

TEST: Dissipation Factor @ 10KHz	LAB SUPPLY	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	ENGR. <i>D.K.</i>	CUST. P/N
TEST TEMP. 25°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. ECN No. G.R. 1654 1331 Precision decade capacitor G.R. 1413 1381

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)					
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles
021	.175	.19	.195	.18	.2	.34
022	.185	.205	.21	.26	.26	.4
023	.165	.185	.185	.205	.215	.225
024	.19	.195	.21	.27	.25	.38
025	.17	.185	.195	.25	.23	.37
026	.17	.19	.18	.23	.25	.265
027	.16	.18	.185	.205	.21	.215
029	.17	.185	.215	.27	.3	.31
030	.205	.225	.26	.34	.34	.33
031	.17	.185	.185	.23	.24	.37
032	.165	.175	.185	.215	.21	.3
033	.165	.18	.185	.21	.21	.28
034	.185	.205	.21	.225	.225	.32
035	.155	.17	.175	.23	.185	.19
036	.145	.165	.175	.185	.195	.22
TEST DATE	2-24-77	3-11-77	5-3-77	5-27-77	6-14-77	6-29-77
TEST BY	^{CRC} FIT	^{CRC} FIT	^{CRC} FIT	^{CRC} FIT	^{CRC} FIT	^{CRC} FIT

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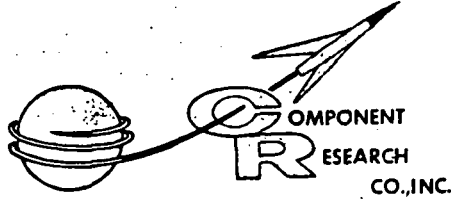
SHEET 176 OF 188

TEST Dissipation Factor @ 10KHz @ 25°C		C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A		CUST P/N
		PROD. NO. 0236G
		P/O NO. NAS8-32403

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
037	.165	.185	.165	.23	.27	.34		
038	.16	.165	.185	.2	.23	.26		
039	.17	.185	.195	.26	.28	.38		
040	.18	.205	.215	.265	.28	.49		
041	.155	.19	.195	.23	.24	.36		
042	.175	.195	.205	.25	.26	.33		
043	.165	.185	.195	.21	.215	.21		
044	.16	.18	.18	.21	.22	.3		
045	.165	.195	.2	.24	.265	.285		
046	.185	.21	.265	.35	.33	.49		
047	.155	.18	.18	.195	.185	.2		
048	.3	OPEN						
049	.155	.175	.18	.195	.21	.24		
050	.155	.175	.18	.2	.225	.22		
051	.165	.185	.2	.24	.26	.4		
TEST DATE								
TEST BY	2-24-77	3-11-77	5-13-77	5-27-77	6-14-77	6-29-77		

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FIT
2-24-77 3-11-77 5-13-77 5-27-77 6-14-77 6-29-77



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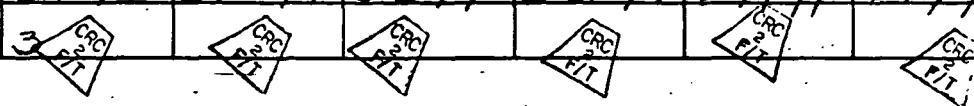
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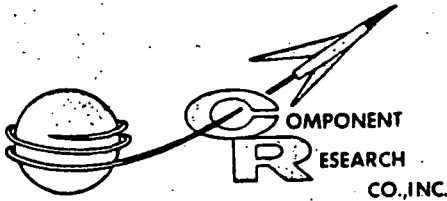
SHEET 177 OF 188

TEST: Dissipation Factor @ 10KHz	LAB. SUPPLY	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	ENGR. <i>G.K.</i>	CUST. P/N
TEST TEMP. -55°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition.		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber Statham SD9-1 130 Thermometer - Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)						
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles	
021	.49	.48	.49	.52	.55	.57	
022	.5	.5	.5	.54	.53	.51	
023	.49	.48	.49	.51	.58	.49	
024	.5	.5	.5	.52	.51	.5	
025	.49	.51	.49	.49	.48	.5	
026	.49	.52	.49	.52	.53	.54	
027	.49	.5	.51	.56	.54	.54	
029	.5	.49	.5	.66	.69	.63	
030	.52	.52	.56	.62	.61	.6	
031	.49	.5	.49	.52	.49	.51	
032	.49	.5	.49	.52	.55	.54	
033	.49	.51	.5	.53	.49	.5	
034	.51	.51	.51	.54	.51	.52	
035	.48	.49	.47	.5	.49	.48	
036	.47	.46	.46	.48	.51	.55	
TEST DATE	3-1-77	3-14-77	5-5-77	5-31-77	6-17-77	6-27-77	
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	

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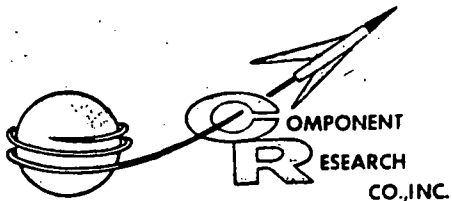
SHEET 179 OF 188

TEST: Dissipation Factor @ 10KHz	LAB. SURV. FIT	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	ENGR. <i>[Signature]</i>	CUST. P/N
TEST TEMP. 125°C	Q.A. <i>[Signature]</i>	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles, -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.9
ACCEPTANCE LIMITS: There are no established % D.F. limits for this test condition		EQUIPMENT USED: Impedance comparator Model No. G.R. 1654 ECN No. 1331 Precision decade capacitor G.R. 1413 1387 Temperature test chamber - Statham SD9-1 130 Thermometer - Marshall J E-485 1588

S/N	PERCENT DISSIPATION FACTOR WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial D.F.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
021	.045	.06	.07	.095	.1	.18		
022	.055	.075	.095	.135	.135	.285		
023	.045	.055	.07	.08	.09	.145		
024	.065	.08	.13	.135	.13	.28		
025	.05	.065	.095	.155	.155	.32		
026	.055	.065	.075	.105	.11	.13		
027	.045	.06	.07	.075	.095	.095		
029	.065	.075	.11	.16	.16	.23		
030	.085	.115	.14	.195	.2	.2		
031	.055	.075	.075	.115	.125	.3		
032	.055	.055	.07	.105	.105	.195		
033	.055	.065	.085	.115	.115	.12		
034	.065	.085	.1	.125	.3	.22		
035	.035	.055	.055	.055	.075	.085		
036	.036	.045	.05	.055	.055	.14		
TEST DATE	2-28-77	3-14-77	5-6-77	5-31-77	6-16-77	6-28-77		
TEST BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

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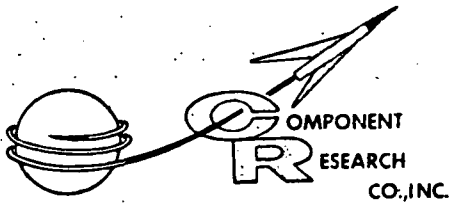
S/O - 704-35622

SHEET 181 OF 188

TEST: E.S.R.	LAB SUPVR. 	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A	ENGR. A.K.	CUST. P/N
TEST TEMP. 25°C	Q.A. Jill	PROD. NO. 0236G
TEST VOLT. N/A		P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C, 1 hr. per cycle		SPECIFICATION:
ACCEPTANCE LIMITS: There are no established E.S.R. limits for this test condition.		EQUIPMENT USED: E.S.R. Meter - Clark-Hess Model No. 273 ECN No. 1130 Cable assembly - Clark-Hess 27375 1130

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial E.S.R.	After 20 Cycles	After 140 Cycles	After 360 Cycles	After 380 Cycles	After 500 Cycles		
	2	2	2	2	2	2		
021	1.1	1.2	1.3	1.2	2.3	3.8		
022	1.3	1.5	1.7	2.4	3.1	4.5		
023	1.0	1.2	1.2	1.5	1.8	2.0		
024	1.4	1.4	1.7	2.6	2.5	5.5		
025	1.1	1.3	1.5	2.3	2.1	4.4		
026	1.1	1.2	1.4	1.8	2.4	2.4		
027	1.0	1.2	1.2	1.4	1.6	1.4		
029	1.3	1.5	1.9	2.6	3.4	3.3		
030	1.6	2.0	2.5	3.5	3.9	3.6		
031	1.1	1.3	1.4	2.0	2.8	4.4		
032	1.1	1.2	1.3	1.9	2.9	3.0		
033	1.2	1.3	1.4	2.0	2.1	2.6		
034	1.4	1.6	1.7	2.0	2.4	3.4		
035	1.0	1.1	1.0	1.2	1.4	1.3		
036	.9	1.0	1.0	1.3	1.5	2.2		
TEST DATE	2-25-77	3-10-77	5-4-77	5-27-77	6-14-77	6-29-77		
TEST BY								

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SHEET 182 OF 188

TEST E.S.R. @ 25°C	C.R.C. P/N M83421/01-1090R
	CUST P/N
TEST NO. XT-1218-A	PROD. NO. 0236G
	P/O NO. NAS8-32403

S/N	E.S.R. WITH THERMAL SHOCK (-55°C to +125°C)							
	Initial E.S.R.	After 20 Cycles	After 140 Cycles	After 260 Cycles	After 380 Cycles	After 500 Cycles		
037	1.2	1.4	1.6	2.3	2.7	3.8		
038	1.0	1.1	1.1	1.6	2.1	2.6		
039	1.3	1.4	1.7	2.9	3.3	4.2		
040	1.6	1.8	2.1	3.2	4.1	6.6		
041	1.0	1.2	1.4	2.3	2.4	3.7		
042	1.3	1.5	1.6	2.9	3.0	3.6		
043	1.2	1.3	1.4	1.8	1.9	1.7		
044	1.1	1.2	1.3	2.0	2.1	2.9		
045	1.2	1.4	1.6	2.3	2.8	2.9		
046	1.5	1.7	2.5	3.9	3.7	6.5		
047	1.0	1.2	1.2	1.5	1.4	1.3		
048	10.0	OPEN						
049	1.0	1.1	1.1	1.5	1.7	2.3		
050	1.1	1.2	1.2	1.7	1.9	1.9		
051	1.2	1.3	1.6	2.6	3.3	4.8		
TEST DATE	2-25-77	3-10-77	5-4-77	6-2-77	6-14-77	6-29-77		
TEST BY								

F-634-2



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GENERAL DATA SHEET

Customer's Name: NASA

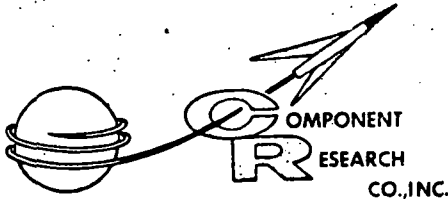
S/O - 704-35622

SHEET 183 OF 188

TEST: Seal Test (Fine Leak Test)		LAB SUPVR. 	C.R.C. P/N M83421/01-1090R
TEST NO. XT-1218-A		ENGR. 	CUST. P/N
TEST TEMP. 25°C		Q.A. 	PROD. NO. 0236G
TEST VOLT. N/A			P/O NO. NAS8-32403
SPECIAL NOTES: Normal Thermal Shock per TP-1006 (Air to Air) 500 Cycles -55°C to +125°C (1 hr. per cycle)		SPECIFICATION: MIL-C-83421, Para. 4.7.5	
ACCEPTANCE LIMITS: Leakage not to exceed 1×10^{-6} atm/cc/sec.		EQUIPMENT USED: Fine leak detector <u>Model No.</u> <u>ECN No.</u> DuPont-24-120B 651	

S/N	Initial		After 20 cycles		After 140 cycles		After 260 cycles		After 380 cycles		After 500 cycles	
	1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}		1×10^{-6}	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
021	✓		✓		✓		✓		✓		✓	
022	↑		↑		↑		↑		↑		✓	
023												✓
024											✓	
025											↓	
026											↓	
027											↓	
029											✓	
030											✓	
031											✓	
032											✓	
033											✓	
034											✓	
035	↓		↓		↓		↓		↓		↓	
036	✓		✓		✓		✓		✓		✓	
TEST DATE	2-28-77		3-16-77		5-10-77		6-2-77		6-15-77		7-1-77	
TEST BY												

F-634-1



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GENERAL DATA SHEET

Customer's Name: NASA

S/O - 704-35622

SHEET 184 OF 188

TEST Seal Test (Fine Leak Test)													C.R.C. P/N M83421/01-1090 R					
TEST NO. XT-1218-A													CUST P/N					
													PROD. NO. 0236G					
													P/O NO. NAS8-32403					
S/N	Initial		After 20		After 140		After 260		After 380		After 500							
	1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶		1X10 ⁻⁶							
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail						
037	/		/		/		/		/		/							
038	/		/		/		/		/		/							
039																		
040																		
041																		
042																		
043																		
044																		
045																		
046																		
047																		
048																		
049																		
050	/		/		/		/		/		/							
051	/		/		/		/		/		/							
TEST DATE	2-28-77		3-16-77		5-10-77		6-2-77		6-15-77		7-1-77							
TEST BY																		

F-634-2

VI. FAILURE ANALYSIS

Out of the one hundred fifty (150) capacitors subjected to 500 thermal shock cycles one (1) capacitor was cited as a failure. This capacitor (M83421/01-1090R serial no. 048) was found to have an initial Dissipation Factor measurement at 1 KHz of .1% @25°C. This measurement was within the limit of .15%, set forth in MIL-C-83421/1. An initial Dissipation Factor reading at 10 KHz @25°C, however, measured .3% and an initial Equivalent Series Resistance reading measured ten (10) ohms. These two initial readings revealed that the capacitor possessed terminations of poor quality. Due to a technician's error this unsuitable capacitor was not excluded from the test. The inclusion of this initially defective capacitor demonstrated that measuring Dissipation Factor of capacitors at 1 KHz is not a sufficient test when attempting to determine termination quality.

One capacitor (M83421/01-1186R serial no. 117) fell out of specification after twenty (20) cycles by exhibiting a low Insulation Resistance. Upon conclusion of the thermal shock testing, the capacitor was dissected for analysis. It was revealed that the capacitor had undergone excessive heating during induction soldering of the end seals to the case. This caused a melting of the polycarbonate film and subsequent weakening of the dielectric.

VII. CONCLUSIONS AND RECOMMENDATIONS

Subjecting metallized polycarbonate film capacitors to 500 thermal shock cycles, whether they be normal or accelerated cycles, is indeed a rigorous test procedure. Normally, capacitors of this type are expected to survive five (5) and sometimes ten (10) thermal shock cycles.

To ensure that capacitors are capable of withstanding shock cycling, proper screening methods must be used. Dissipation Factor and Equivalent Series Resistance measurements are taken to determine the quality of capacitor end terminations. Standard procedure as is specified in MIL-C-83421/1 is to take Dissipation Factor readings only at 1 KHz. The occurrence in this program of a capacitor which measured within specification at 1 KHz, but exhibited a poor Dissipation Factor at 10 KHz, and had a low Equivalent Series Resistance and which subsequently opened, demonstrates that Dissipation Factor readings at 1 KHz do not represent an adequate screening process.

In order to properly screen capacitors for thermal shock cycling all capacitors were one hundred (100%) percent tested for Equivalent Series Resistance. All capacitors were measured for Dissipation Factor at both one (1) and ten (10) KHz. A four terminal bridge system was used at high and low temperatures to compensate for test lead lengths present between environmental chambers and the impedance comparator.

For optimal capacitor performance under thermal shock stress it is recommended that the above testing method be instituted.

The results of this program demonstrate that by implementing certain design modifications the thermal properties of metallized polycarbonate film capacitors can be greatly improved. The success of this program has brought about the introduction of a capacitor which far exceeds present state-of-the-art capabilities.

VIII. ACKNOWLEDGMENTS

Mr. David Kellerman was instrumental in the design of this research project. He participated in supervising and establishing design solutions and testing criteria. Mr. John Conklin, as program manager at Component Research Co., organized all research and testing activities. Sylvia Fiacre supervised all documentation.

END

DATE

DCT 24, 1979

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