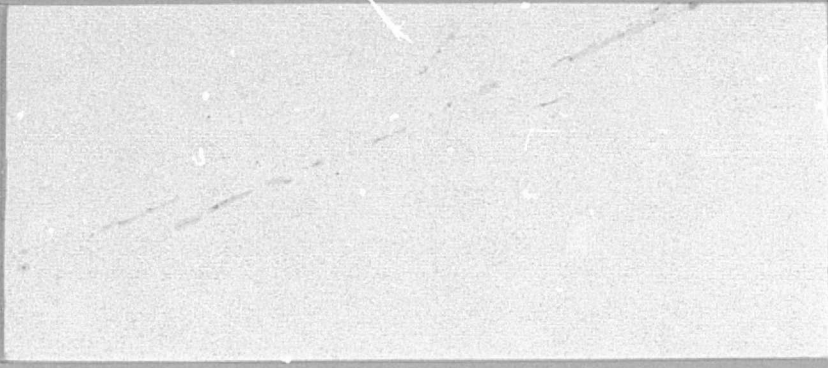


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PREPARED FOR

GEO. C. MARSHALL SPACE FLIGHT CENTER
MARSHALL SPACE FLIGHT CENTER, AL 35812

NASA TECHNICAL COR
FELMINIO VILLELLA
EC 43/BLDG 4487

BY JERRY L. BARTON

MOTOROLA INC.
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5005 EAST McDOWELL ROAD
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(NASA-CR-161234) TRANSISTOR SCREENING N79-24258
EVALUATION SJ6708H Final Report, Jul. 1976
- Nov. 1978 (Motorola, Inc.) 158 p
HC A08/MF A01 CACL 09A
G3/33 22175



FINAL REPORT

TRANSISTOR SCREENING EVALUATION

SJ6708H

CONTRACT NAS8-32087

JULY 1976 — NOVEMBER 1978

PREPARED FOR

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TABLE OF CONTENTS

SECTION A. NARRATIVE OUTLINE

- I. SCOPE OF WORK
- II. DEVICE DESCRIPTION
- III. TEST PLAN AND RESULTS
- IV. CONCLUSIONS
- V. RECOMMENDATIONS

SECTION B. CUSTOMER DATA SUMMARY AND X-RAY REPORTS

SECTION C. MOTOROLA DEVICE SPECIFICATION

SECTION D. FAILURE ANALYSIS REPORTS

SECTION E. TEST FACILITIES LIST

SECTION F. TEST MEASUREMENT DATA

SECTION A. NARRATIVE OUTLINE

- I. SCOPE OF WORK
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Scope of Work

Motorola contracted to screen 125 transistors capable of withstanding the high level inductive voltages obtained when switching inductive loads. The transistors were to be similar in performance to those delivered to Rockwell International for application in the SSME Spark Igniter System, i.e. Rockwell Specification RES1075.

Planned differences included a change in die bonding to comply with NASA's desire for hard solder die attachment which further necessitated a change in package to conform to the required die mounting system. Evaluation of the electrical performance and recommended changes were to be made during the preliminary build phase of the program.

Device Description

Die: NPN, double diffused-epitaxial collector;
glassivated mesa, 190 x 190 mils.
Package: TO-8, steel, molybdenum heat spreader,
gold plated, glass feed-thru's.
Construction: Gold eutectic die attachment,
10 mil Mag-Alum wires, ultrasonic
bonding on die, tweezer weld on posts.

Test Plan and Results

The Special Device Specification 48ARB64845A (SJ6708H) was written to provide internal Motorola control of processing and screening of devices in accordance with the NASA contract. A copy of this specification is included in Section C.

The sequence of testing and test result summary is contained in the Customer Data Summary Sheet in Section B. The documentation of data readouts is indexed and grouped in Section F.

Test equipment used in the testing and screening of these devices is listed in the Test Facility List of Section E.

The first problem encountered was an instability of the die after 100% high temperature reverse bias when 56 of 160 devices failed the electrical inspection (reference R.O. #10). The remaining 104 devices went to 100% Burn-In (49 devices were designated Group B-6 samples and 168 hr. endpoints were recorded on a separate tab run, i.e. R.O. #55). Nine devices failed after 168 hrs., eight in the standard 100% group and one in the B-6 group, but the remaining devices were stable thru the 2000 hr. B-6 test.

The second problem encountered was hermeticity failures (22 pcs) in the B-1 test sample. This sample had been submitted to Thermal Shock (Glass Strain) test and Terminal Strength test prior to the hermeticity test. These prior tests apparently damaged the glass to metal seals as indicated in the Failure Analysis Report PL-099 #034 contained in Section D. In order to determine the specific test causing the glass seal damage, a separate sample was run through B-1 again with a hermeticity check made after each mechanical test (see Pg. 10 Special Test in Customer Data Summary). The mechanical stress of the Terminal Strength test was determined to be the primary cause of seal failure.

A computer readout problem became evident in the final measurements of Group B testing. A number of devices showed low or no readings at all on BVCES, while the other measured parameters had normal values. An analysis of the Lorlin equipment showed a tendency for oscillations with these devices during the high voltage test resulting in low readings or no printout. All the BVCES failures were retested and observed on a curve tracer. Other than the tendency to oscillate at breakdown, the devices checked normal and within specification limits.

In Group B, subgroup VI, one device (S/N 21) showed no beta reading at 1500 hrs. The device beta measured 19.98 on verification test, a change of -5.6% from the initial reading. The device was sent to Failure Analysis for review. No evidence of a failure mechanism was found but the device was delidded and chemically etched during the analysis so it could not be returned for the last 500 hours of test. Since no problem was found in the device, we did not list it as a failure. There were sufficient spare devices in the test to maintain the correct sample size.

Conclusions:

Two major problems developed during the screening of the contract devices, (1) die instability, as evidenced by the high-temperature reverse-bias failures and (2) poor glass to metal seals in the mechanical package, as evidenced by the inability to pass the specified terminal strength test.

The mechanical package problems in screening surfaced again in subgroup I of qualification (Group B) testing. Oscillation problems at the computer caused a significant number of "bad" endpoint readings in other Group B subgroups but re-test and failure analysis indicates there were no subgroup failures.

The instability problem is a serious but not uncommon problem on high voltage devices. Significant improvements in lot to lot stability were achieved by the addition of glassivation to the exposed mesa junctions. This type glassivation was used on these contract devices to try to achieve maximum stability but as demonstrated in this effort, mesa glassivation alone is not always successful. Since the inception of this contract, considerable work has been in process on this problem due to similar failures on standard production lots. Our studies indicate that additional glassivation protection is needed over the basically planar emitter base junction. This technique has recently been incorporated into production with a marked improvement in the probability of die lot stability.

Another significant cause of instability in high-voltage die is the temperature effect on silicon resistivity. A number of theoretical and experimental studies have been published showing that resistivity peaks at a critical temperature for each doping concentration. Operation in the temperature region above the maximum resistivity can result in a run away condition. The maximum resistivity temperature for 50 ohm-cm material is about 160°C. The critical temperature decreases with increasing resistivity. The material used on this contract had resistivity in the range of 40 to 80 ohm-cm and the HTRB test temperature was run at 150°C. We believe that the high failure rate in HTRB can be, at least partially, attributed to the higher resistivity devices operating over their critical temperature.

The glass to metal seal problem is a vendor problem normally resolved by qualifying packages and vendors through Motorola's Manufacturing Engineering Department prior to a production commitment. At the time of this contract, Motorola did not have any production requirement for TO-8 hard-solder packages and therefore had no qualified vendors for such a package. The package used on this contract was obtained from the only available source of production TO-8 packages at that time. A full package qualification was not included or contemplated as part of this effort.

Recommendations:

As a result of this activity, Motorola recommends some changes in this device for future applications. The same mask and basic process design should be used but with lower resistivity material (25 to 40 ohm-cm) and the added protection of base/emitter passivation. This revised configuration has been submitted to extensive HTRB evaluation with good parametric stability results. Motorola is planning to use this revised die configuration to qualify the 2N6308 under MIL-S-19500/498. A major computer manufacturer is presently qualifying this die for their product line, and it is presently being used for a new procurement of the Rockwell International RES1075.

Motorola also recommends that future applications of this device be procured in a steel TO-3 package instead of the TO-8 package. If mounting space is a serious consideration, a steel TO-66 package would be our next recommendation. A production requirement for the TO-8 package would require an extensive qualification of packages and suppliers. The TO-8 package is not used extensively for silicon devices. The TO-3 package is the most widely used package in the transistor industry. It is continually tested for reliability through JAN products, high reliability specials and user reliability programs. This is also true of the TO-66 but to a less degree because it is used in smaller quantities. The computer and MIL product will be built in the TO-3 package. Due to prior design commitments, the Rockwell device is being made in a TO-8 package but a new package source was located for this build.

SECTION B. CUSTOMER DATA SUMMARY AND X-RAY REPORTS



MOTOROLA INC. Discrete Semiconductor Division

P.O. BOX 20906, PHOENIX, ARIZONA 85036

CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H P/N RES1075-01(1) Rev.A PL99.784 LA-1	SAMPLE PLAN			ACCEPTANCE DATA				REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	REJECT NO.	
LOT SIZE: 168 DATE CODE: 7733 RELEASED: 7/18/78 NOTE: Three (3) devices pulled for correlation in measurements, #149, 150, & 151. NOTE: 151 devices plus 17 (add-on) were processed as two groups and combined as follows: Internal Visual Insp. MIL-STD-750 Meth. 2072 Electrical Inspection	165		100%	7 6 1	BVCES #17,43,74,81,120,145 hFE3 #15			Done in Production Recorded R.O.#05
NOTE: Only five (5) rejects pulled at this time from Readout #05, S/N's: 17,43,74, 81, & 145. S/N's: 15 & 120 pulled after Readout #10. Thermal Shock (Temp. Cycling) MIL-STD-202 Meth. 107 Cond. C except 10 cycles t(extreme>15min.) Constant Acceleration MIL-STD-750 Meth. 2006 10,000G's YI Orientation only High Temp. Rev. Bias MIL-STD-750 Meth. 1039 Cond. A VCB=640V TA=150°C, t=48±4 hrs.	160		100%	0				
Electrical Inspection	160		100%	56 24 21 2 2 2 5	ICES1 ICES1Δ% hFE3 hFE3% #15 & 120 pulled at this ES/B			Recorded R.O.#10 & Go No Go time. Go No Go

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 2	SAMPLE PLAN			ACCEPTANCE DATA			REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	
NOTE: 49 devices pulled for Group B-6 and processed concurrently with Burn-In.							
Burn-In TJ=187.5±12.5°C t≥168 hrs. VCE≥20V adjust IC to maintain specified TJ	55		100%	<u>0</u>			
Post Burn-In Electrical Insp.	55		100%	<u>8</u>	hFE3% #89 ICESL #134 mech. #100 damaged #154,155,156,163 & 165		Recorded R.O.#15
NOTE: X-Ray processed in two groups with a total of 47 devices.							
X-Ray MIL-STD-750 Meth. 2076	42		100%	<u>2</u>	EM #77,104		Control #5410
X-Ray MIL-STD-750 Meth. 2076	5		100%	<u>0</u>			Control #5966
Hermetic Seal MIL-STD-750 Meth. 1071 Fine Leak Condition <u>G</u> or H Leak rate <u>1</u> X10 ⁻⁸ ATm cc/sec. Gross Leak Condition A,C,D,E, or <u>F</u>	45		100%	<u>9</u>	radiflo #76,82,85,116,135,137,138,139,146		
External Visual Insp. MIL-STD-750 Meth. 2071	36		100%	<u>0</u>			
NOTE: One (1) device lost, #70, 22 pulled for B-3 sample, 3 pulled for B-5 sample. Only 5 devices processed to Group A as follows:							
<u>GROUP A</u>							
Subgroup I Visual & Mechanical	5		100%	<u>0</u>			

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 3	SAMPLE PLAN			ACCEPTANCE DATA			REMARKS	
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.		REJECT NO.
Subgroup II Electrical Insp.	5		100%	<u>1</u>	IGEO #166			Go No Go
Subgroup III Electrical Insp.	4		100%	<u>0</u>				Go No Go
Subgroup IV Electrical Insp.	4		100%	<u>0</u>				Go No Go
Subgroup V Electrical Insp.	4		100%	<u>0</u>				Go No Go
<u>GROUP B</u> Initial Electrical	76			<u>5</u>	BVCES #5,27,31,36,41			Recorded R.O.#20
Subgroup I <u>1/</u> Physical Dimensions MIL-STD-750 Meth. 2066	20 total +2 spares			<u>22</u>		0	1	
Solderability MIL-STD-750 Meth. 2026 use of mildly activated flux is allowable (Superior 30 or equivalent)	5			<u>5</u>		0	1	
Resistance to Solvents MIL-STD-202 Meth. 215	2			<u>0</u>		0	1	
Thermal Shock (Temp. Cycling) MIL-STD-202 Meth. 107 Cond. C except 10 cycles t(extremes)=15min.	20+2 spares			<u>0</u>		0	1	
Thermal Shock (Glass Strain) MIL-STD-750 Meth. 1056 Condition B	20+2 spares			<u>0</u>		0	1	

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 4	SAMPLE PLAN			ACCEPTANCE DATA			REMARKS	
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.		REJECT NO.
Subgroup I (Continued)								
Terminal Strength (Tension) MIL-STD-750 Meth. 2036 Cond. A WT=10 lbs., t=15 sec.	20+2 spares			<u>0</u>		0	1	
Hermetic Seal MIL-STD-750 Meth. 1071 Fine Leak Condition G Leak Rate $\leq 1 \times 10^{-8}$ ATM cc/sec. Gross Leak Cond. A, B, C, D, or F	20+2 spares			<u>22</u>	radiflo	0	1	
				<u>not tested</u>				
				<u>not tested</u>				
				<u>not tested</u>				
1/ Used 5 units from B-6 & 17 units from B-7.								
Subgroup II <u>2/</u> Salt Atmosphere (Corrosion) MIL-STD-750 Meth. 1041	20			<u>0</u>		0	1	No Elect. End Points
2/ Used electrical rejects.								
Subgroup III <u>3/</u> Shock (Non-Oper.) MIL-STD-750 Meth. 2016 1,500G's t=0.5mSec. 5 blows each in X1, Y1, Y2, & Z1 direction (20 blows total)	20			<u>0</u> <u>0</u>		0	1	Recorded

SPD 1053 R-1 (9/68)



MOTOROLA INC. Discrete Semiconductor Division

P.O. BOX 20906, PHOENIX, ARIZONA 85036

CUSTOMER DATA SUMMARY SHEET

TEST SI6708H PL99.784 LA-1 Page 5	SAMPLE PLAN			ACCEPTANCE DATA				REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	REJECT NO.	
Subgroup III (Continued)								
Vib. Var. Frequency MIL-STD-750 Meth. 2056 Vibrational environment for 7.8 hrs. in each of X1, Y1, Z1 axis				0				
Constant Acceleration MIL-STD-750 Meth. 2006 20,000G's X1, Y1, Y2, & Z1 Directions				0				
Acoustic MIL-STD-810 Meth. 515.2 Field Acoustic environment at 174 db.				0				
End Points				0				R.O.#30
NOTE: Two (2) devices damaged on Shock Test, R.O.#30 (90 & 106), and replaced with 2 more units.								
3/ Used same units for Subgroups III & IV.								
Subgroup IV Safe Operating Area (Switching) MIL-STD-750 Meth. 3053 Cond. C (unclamped inductive load) Rs=0.1 Ω , tr=trf \leq 500 μ Sec. DC \leq 10%, TA=25 $^{\circ}$ C Test #1 tp \leq 5mSec. (vary to obtain IC) RBB1=10 Ω , VBB1=16V RBB2=0 Ω , VBB2=0 VCC=25V, IC=7.0A L=5mH (Super Electric Corp. Type S16884 in parallel or equivalent DC resistance \leq 0.1 Ω)	20			0		C	1	Recorded

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 Page 6 LA-1	SAMPLE PLAN			ACCEPTANCE DATA				REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	REJECT NO.	
Subgroup IV (Continued)				0				
Test #2 tp ₂ 5mSec. (vary to obtain IC) RBB1=100 _n , VBB2=10V RBB2=∞, VBB2=0 VCC=25V, IC=0.5A L=100mH (Two Triad C48U in series; 80mH winding & 20mH winding or equivalent; DC resistance <u>1.0 _n </u>)				0				
End Points				0				R.O.#35
Subgroup V <u>4/</u> High Temp. Life (Non-Oper.) MIL-STD-750 Meth. 1031 TA=200°C, t=1000 hrs. Total	20+3 spares			1		1	2	Recorded
High Temp. Life 0- 340 hrs. t=340 hrs.	20+3 spares			0				
Electrical Inspection (340 hrs.)	20+3 spares			1	BVCES #79			R.O.#40
High Temp. Life 340 - 670 hrs. t=330 hrs.	20+2 spares			0				
Electrical Inspection (670 hrs.)	20+2 spares			0				R.O.#45
High Temp. Life t70 - 1000 hrs. t=330 hrs.	20+2 spares			0				
Electrical Inspection (1000 hrs.)	20+2 spares			0				R.O.#50
<u>4/</u> Used units from B-3 plus spares.								

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 7	SAMPLE PLAN			ACCEPTANCE DATA				REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	REJECT NO.	
Subgroup VI Steady State Operation Life MIL-STD-750 Meth. 1026 VCE ₂ >20V TJ=187.5±12.5°C adjust IC to maintain specified TJ t=2000 hrs. total	40+4 spares			<u>5</u>		1	2	Recorded
Steady State Operating Life 0 - 168 hrs. t=168 hrs.	40+4 spares			<u>0</u>				
Electrical Inspection (168 Hrs.)	40+4 spares			<u>1</u>	ICES1 #61			R.O.#55
Steady State Operating Life 168 - 340 hrs. t=172 hrs.	40+3 spares			<u>0</u>				
Electrical Inspection (340 hrs.)	40+3 spares			<u>0</u>				R.O.#60
Steady State Operating Life 340 - 670 hrs. t=330 hrs.	40+3 spares			<u>0</u>				
Electrical Inspection (670 hrs.)	40+3 spares			<u>0</u>				R.O.#65
Steady State Operating Life 670 - 1000 hrs. t=330 hrs.	40+3 spares			<u>0</u>				
Electrical Inspection (1000 hrs.)	40+3 spares			<u>0</u>				R.O.#70
Steady State Operating Life 1000 - 1500 hrs. t=500 hrs.	40+3 spares			<u>0</u>				

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 8	SAMPLE PLAN			ACCEPTANCE DATA			REMARKS	
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.		REJECT NO.
Subgroup VI (Continued)								
Electrical Inspection (1500 hrs.)	40+3 spares			<u>0</u>	hFE3 #21*			R.O.#75
Steady State Operating Life 1500 - 2000 hrs. t=500 hrs.	40+2 spares			<u>0</u>	damaged #13**			
* See attached failure analysis report #PL099 & 32.								
** See attached failure analysis report #278.								
Electrical Inspection (2000 hrs.)	40+1 spares			<u>0</u> <u>8/</u> <u>1</u>	#69 (spare)			R.O.#80
Subgroup VII <u>5/</u> Power Cycle VCE=100V TA=25+3°C adjust PD to obtain TC=100°C or TC=75°C ton=toff=5min. 4000 cycles	15+2 spares			<u>0</u> <u>8/</u>		0	1	Recorded
Electrical Inspection (1000 cycles)	15+2 spares			<u>0</u> <u>8/</u>				R.O.#81
Power Cycle 1000 - 2000 cycles	15+1 spare			<u>0</u>				
Electrical Inspection (2000 cycles)	15+1 spare			<u>0</u>				R.O.#82
Power Cycle 2000 - 3000 cycles	15+1 spare			<u>0</u>				
Electrical Inspection (3000 cycles)	15+1 spare			<u>0</u>				R.O.#83
Power Cycle 3000 - 4000 cycles	15+1 spare			<u>0</u>				
Electrical Inspection (4000 cycles)	15+1 spare			<u>0</u> <u>8/</u>				R.O.#84

SFD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 9	SAMPLE PLAN			ACCEPTANCE DATA			REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	
Subgroup VII (Continued)							
Thermal Shock 6/ (Temp. Cycling) MIL-STD-202 Meth. 107 T (low)=-65°C T (high)=125°C 500 cycles	15+2 spares			0		0	1 Recorded
Thermal Shock (Temp. Cycling) 25 cycles	15+2 spares			0			
Electrical Inspection (25 cycles)	15+2 spares			0			R.O.#85
Thermal Shock (Temp. Cycling) 75 cycles	15+2 spares			0			
Electrical Inspection (75 cycles)	15+2 spares			0			R.O.#86
Thermal Shock (Temp. Cycling) 175 cycles	15+2 spares			0			
Electrical Inspection (175 cycles)	15+2 spares			0			R.O.#87
Thermal Shock (Temp. Cycling) 300 cycles	15+2 spares			0			
Electrical Inspection (300 cycles)	15+2 spares			0			R.O.#88
Thermal Shock (Temp. Cycling) 500 cycles	15+2 spares			0			
Electrical Inspection (500 cycles)	15+2 spares			0			R.O.#89

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 10	SAMPLE PLAN			ACCEPTANCE DATA			REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	
Subgroup VII (Continued)							
Vibration, Variable <u>7/</u> Frequency Test (Monitored) #71-123 MIL-STD-750 Meth. 2057 VCES=400V 120G's or 0.1 inch DA as applicable Sine wave 5 to 2000Hz in 7.5 minutes Return to 5Hz in 7.5 min. X1, Y1, Z1 orientation	15+2 spares			<u>0</u>		0	1
End Points	15+2 spares			<u>0</u>			R.O.#90
<u>5/</u> Used 17 good units For Power Cycle Test.							
<u>6/</u> Used 17 good units For Thermal Shock Test.							
<u>7/</u> Used 17 units from B-5 for Vibration, Variable Frequency Test.							
<u>8/</u> Data on these R.O. Nos. had oscillations problems. Units OK							
NOTE: 20 devices were submitted to a special test. These units consisted of units: S/N 132, 133, 142, 147, 148, 157, 158, 159, 164 plus 11 B-7 units from Variable Frequency test, S/N 71, 72, 73, 75, 86, 95, 105, 108, 123, 113, 114.							9 good Vibration
<u>Special Test</u>							
Hermetic Seal MIL-STD-750 Meth. 1071 Fine Leak Condition G Leak Rate 1×10^{-8} ATm cc/sec. Gross Leak Condition F	20		100%	<u>3</u>			
				3	#71, 132, 164		
				0			
Thermal Shock (Temp. Cycling) MIL-STD-202 Meth. 107 Cond. C except 10 cycles t(extremes)=15 minutes	17		100%	<u>0</u>			

SPD 1053 R-1 (9/68)



CUSTOMER DATA SUMMARY SHEET

TEST SJ6708H PL99.784 LA-1 Page 11	SAMPLE PLAN			ACCEPTANCE DATA				REMARKS
	SIZE	AQL LTPD	LEVEL	REJECTS FOUND	TYPE	ACCEP. NO.	REJECT NO.	
Hermetic Seal MIL-STD-750 Meth. 1071 Fine Leak Condition G Leak Rate $\leq 1 \times 10^{-8}$ ATm cc/sec. Gross Leak Condition F	17		100%	<u>2</u>				
Thermal Shock (Glass Strain) MIL-STD-750 Meth. 1056 Condition B	15		100%	<u>0</u>				
Hermetic Seal MIL-STD-750 Meth. 1071 Fine Leak Condition G Leak Rate $\leq 1 \times 10^{-8}$ ATm cc/sec. Gross Leak Condition F	15		100%	<u>0</u>				
Terminal Strength (Tension) MIL-STD-750 Meth. 2036 Condition A WT=10 lbs., t=15 seconds	15		100%	<u>0</u>				
Hermetic Seal MIL-STD-750 Meth. 1071 Fine Leak Condition C Leak Rate $\leq 1 \times 10^{-8}$ ATm cc/sec. Gross Leak Condition F	15		100%	<u>14</u>				
				14 ***	#72, 73, 75, 86, 98, 108, 123, 142, 147 148, 154, 157, 159, 224			
				0				

*** See attached failure analysis report #243.

SPD 1053 R-1 (9/88)

X-RAY SERIAL # TO UNIT SERIAL #
CROSS REFERENCE LIST

DEVICE Sj6708H	CHARGE NO.	LOT NO. 001	JOB NO.	CUSTOMER NASA
-------------------	------------	----------------	---------	------------------

X-RAY	DEVICE	X-RAY	DEVICE	X-RAY	DEVICE	X-RAY	DEVICE
1	157	31		61		91	
2	158	32		62		92	
3	159	33		63		93	
4	164	34		64		94	
5	166	35		65		95	
6		36		66		96	
7		37		67		97	
8		38		68		98	
9		39		69		99	
10		40		70		100	
11		41		71		101	
12		42		72		102	
13		43		73		103	
14		44		74		104	
15		45		75		105	
16		46		76		106	
17		47		77		107	
18		48		78		108	
19		49		79		109	
20		50		80		110	
21		51		81		111	
22		52		82		112	
23		53		83		113	
24		54		84		114	
25		55		85		115	
26		56		86		116	
27		57		87		117	
28		58		88		118	
29		59		89		119	
30		60		90		120	



MOTOROLA
Semiconductor
Products Inc.
A SUBSIDIARY OF MOTOROLA INC.

3005 EAST McDOWELL ROAD, PHOENIX, ARIZONA 85008

RADIOGRAPHIC CERTIFICATE OF COMPLIANCE

DATE 26 OCT. 1977

CUSTOMER

NASA

CUSTOMER P.O. NO. _____ QUAL _____ MOTOROLA F.O. NO. N/A
 CUSTOMER PT. NO. RES1075 MOTOROLA PT. NO. SJ6708-H
 X-RAY CONTROL NO. 5410 QUANTITY X-RAYED 42 LOT 901
 X-RAYED PER MLL. STD. 750, METHOD 2076.

DEFECT NUMBER REJECTED

QUANTITY REJECTED % OF TOTAL

EXTRANEIOUS MAT. (EM) - 7, 17.

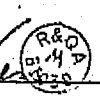
TOTAL ACCEPTED: 40

TOTAL REJECTED: 2

% REJECTED: _____

NOTE:

SEE ATTACHED CORRELATION SHEET
 FOR NUMBERING OF UNITS.

INTERPRETER: Louis H. Ahrens 

Louis H. Ahrens.

APPROVAL: Louis H. Ahrens 

Louis H. Ahrens.

DATE: 26 OCT. 1977

X-RAY SERIAL # TO UNIT SERIAL #
CROSS REFERENCE LIST

DEVICE <i>ST6708H</i>	CHARGE NO.	LOT NO. <i>001</i>	JOB NO. <i>5410</i>	CUSTOMER <i>770001</i>
--------------------------	------------	-----------------------	------------------------	---------------------------

X-RAY	DEVICE	X-RAY	DEVICE	X-RAY	DEVICE	X-RAY	DEVICE
1	<i>70</i>	31	<i>129</i>	61		91	
2	<i>71</i>	32	<i>130</i>	62		92	
3	<i>72</i>	33	<i>132</i>	63		93	
4	<i>73</i>	34	<i>133</i>	64		94	
5	<i>75</i>	35	<i>135</i>	65		95	
6	<i>76</i>	36	<i>137</i>	66		96	
7	<i>77</i> ✓	37	<i>138</i>	67		97	
8	<i>78</i>	38	<i>139</i>	68		98	
9	<i>79</i>	39	<i>142</i>	69		99	
10	<i>80</i>	40	<i>146</i>	70		100	
11	<i>82</i>	41	<i>147</i>	71		101	
12	<i>85</i>	42	<i>148</i>	72		102	
13	<i>86</i>	43		73		103	
14	<i>90</i>	44		74		104	
15	<i>92</i>	45		75		105	
16	<i>95</i>	46		76		106	
17	<i>104</i> ✓	47		77		107	
18	<i>105</i>	48		78		108	
19	<i>106</i>	49		79		109	
20	<i>108</i>	50		80		110	
21	<i>113</i>	51		81		111	
22	<i>114</i>	52		82		112	
23	<i>115</i>	53		83		113	
24	<i>116</i>	54		84		114	
25	<i>117</i>	55		85		115	
26	<i>118</i>	56		86		116	
27	<i>123</i>	57		87		117	
28	<i>124</i>	58		88		118	
29	<i>125</i>	59		89		119	
30	<i>127</i>	60		90		120	

SECTION C. MOTOROLA DEVICE SPECIFICATION



MOTOROLA INC.
Semiconductor
Products Division

**SPECIAL
DEVICE
SPECIFICATION**

SPD 10604 (7/74)

ISSUE: **E**

DEVICE	SJ6708H	DOC. NO.	48ARB64845A
		PAGE 1	OF 32

APPROVALS: ALL SIGNATURES ON FILE IN DOCUMENT CENTRAL

TITLE					DATE OF ORIGINAL ISSUE		MARKETER		
TRANSISTOR, SILICON POWER					11-9-76		MS Donnell		
CUSTOMER					WRITTEN BY		DATE		
NASA					W. F. Munzer		10-26-76		
CUST. LOC.					ACC'Y REVIEW		DATE		
MARSHALL SPACE FLT CENTER, ALA.					W. WEIKMEISTER		10-28-76		
SPECIFICATIONS			ISSUE	DATE	INCORP.	REF.	CODE	MANDATORY SOURCE	
RES1075 *			A	12-11-74	X		E	PL99.784	
*As modified per NASA ltr dated 3-31-77 filed with SAR ISSUE "A" this specification.									
OTHER								POLARITY	
Request #8-1-T-EC-06242								NPN	
Exhibit A			-	-	X		D	CONSTRUCTION	
Exhibit B			-	-	X		E		WT < 5 grams.
RC1075			D	-	X		**		
MIL-STD-130			Latest			X		LEAD MATERIAL	
MIL-STD-202								Type F per MIL-STD-1276	
MIL-STD-750								LEAD FINISH	
MIL-STD-810								SAME AS _____ EXCEPT FOR:	
MIL-STD-1276									
MIL-S-19491									
MIL-S-19500			Latest			X			
** VIBRATIONAL ENVIRONMENT ONLY									
CUST. PART NO.									
RES1075-01(1)									

DOC. NO. 48ARB64845A

DEVICE SJ6708H

DATA - SHIPPING INSTR. - GENERAL NOTES:

(See NOTES 4, 5, and 6.)

ATTENTION HI-REL SCHEDULER: This specification is intended as a Part Qualification Program and not for furnishing Production Parts to the Customer's Specification. Following completion of the Program, all Test Samples and Test Data shall be sent to the Customer. A Final Report shall be prepared, customer approved, and distributed per NOTE 4.3 herein.



MOTOROLA INC.
Semiconductor
Products Division

ISSUE: E

TITLE: SJ6708H	48ARB64845A
	PAGE 2 OF

CUSTOMER APPROVAL DOCUMENT

THIS DOCUMENT 48ARB64845A IS SUBJECT TO REVIEW AND APPROVAL BY COGNIZANT CUSTOMER PERSONNEL.

Document Review Date: 11/23/76

Reviewed and approved by D. L. Valletta Title NASA TECHNICAL COR

DEVICE
SJ6708H

DOC. NO.
48ARB64845A

DISCRETE PROCESS FLOW

PAGE **3** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.		CASE NO.	
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
0.		PRODUCTION PROCESSING						
0.1		100% Internal Visual Inspection MIL-STD-750, Method 2072	C,CC,R					
0.2		Transfer Devices to Final Test						

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD



MOTOROLA INC.
Discrete Semiconductor Division

SPD 10602 (7/74)

ISSUE: **E**

DEVICE

SJ6708H

DOC. NO.

48ARB64845A

DISCRETE PROCESS FLOW

PAGE **4** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.			
STEP NO.	DGS CODE	OPERATION DESCRIPTION		PROC. CODES	DATE		VERIF.	COUNT	
					IN	OUT		IN	OUT
1.		FINAL TEST PROCESSING							
1.1		Select Devices per Source							
1.2		Electrical Test per TABLE I		M,G,R					
1.3		Transfer Devices to Q. A. Supply Q. A. a minimum of 20 electrical rejects, if available, for Group (B-2) tests. Use opens and shorts whenever possible. Package rejects separately from lot and tag as electrical rejects for Group B testing.							

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD

DEVICE: SJ6708H

PAGE **5** OF

DISCRETE PROCESS FLOW

PROCESSOR/EXT.		CONTROL NO.	HIGH LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.				
STEP NO.	DGS CODE	OPERATION DESCRIPTION			PROC. CODES	DATE		VERIF.	COUNT	
						IN	OUT		IN	OUT
2.		QUALITY ASSURANCE PROCESSING								
2.1		Sample Group A Inspection per TABLE I (Sample Size and Parameters at Q. A. Option).			M,G,R					
2.2		100% Processing (Mark and Serialize Devices)			C,S					
2.2.1		Electrical Test per TABLE II Limit 1			RR,R					
2.2.2		Thermal Shock (Temp. Cycling) MIL-STD-202, Method 107 Cond. C except 10 cycles t(extremes) ≥ 15 minutes								
2.2.3		Constant Acceleration MIL-STD-750, Method 2006 10,000G's, Y1 orientation only								
2.2.4		High Temperature Reverse Bias MIL-STD-750, Method 1039 Cond. A VCB = 640V, TA = 150°C t = 48 ± 4 hours								
2.2.5		Electrical Test per TABLE II Limit 2			RR,R					

C - CUSTOMER REQUIREMENT	D - DESTRUCTIVE TEST	M - MOTOROLA OPTIONAL REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.	G - GO - NO GO	R - REMOVE REJECTS
S - SUMMARY DATA (ATTRIBUTES) REQ.		RR - READ AND RECORD

DEVICE **SJ6708H**

DOC. NO. **48ARB64845A**

DISCRETE PROCESS FLOW

PAGE **6** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.2.6		Burn-IN <u>1/</u> VCE > 20V, TJ = 187.5 + 12.5°C, θJC = 7.0°C/W Adjust IC to maintain specified TJ t > 168 hours						
2.2.7		Electrical Test per TABLE III Limit 2 (Delta Calculations shall be performed with reference to data recorded at Step 2.2.1)	RR,R					
2.2.8		X-Ray Inspection MIL-STD-750, Method 2076	R					
2.2.9		Hermetic Seal MIL-STD-750, Method 1071						
2.2.9.1		Fine Leak Cond. G or H Leak Rate ≤ 1 X 10 ⁻⁸ Atm cc/Sec.	R					
2.2.9.2		Gross Leak Cond. A, C, D, E, or F	R					
2.2.10		External Visual Inspection MIL-STD-750, Method 2071	R					
		<u>1/</u> Perform the 2000-hr Oper. Life test (Step 2.4.6, Subgroup B-6) concurrently. Samples for B-6 do not have to go through Burn-In.						

C - CUSTOMER REQUIREMENT	D - DESTRUCTIVE TEST	M - MOTOROLA OPTIONAL REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.	G - GO - NO GO	R - REMOVE REJECTS
S - SUMMARY DATA (ATTRIBUTES) REQ.		RR - READ AND RECORD



MOTOROLA INC.
Semiconductor
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**DISCRETE
PROCESS
FLOW**

SPD 10603 (7/74)

ISSUE: **E**

DEVICE

SJG708H

DOC. NO.

48ARB64845A

PAGE **7** OF

PROCESSOR/EXT.	CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.

2.3 — Group A Inspection per TABLE I — 1/ (C,S,G,R)

2.3.5 (A-5) Elect. Test <u>2/</u>	2.3.6 (A-6) Elect. Test <u>2/</u>	2.3.7 (A-7) Elect. Test <u>2/</u>
--------------------------------------	--------------------------------------	--------------------------------------

2.3.1 (A-1) 100% Vis. & Mech. 3/

2.3.2 (A-2) 100% Elect. Test

2.3.3 (A-3) 100% Elect. Test

2.3.4 (A-4) 100% Elect. Test

1/ Following completion of Group A Inspection there must be a minimum of 125 acceptable devices.

2/ Measure the test parameters to a Lot Tolerance Percent Defective (LTPD) of 5%. If any measurement exceeds this LTPD, reject devices shall be replaced with good devices and all devices tested 100% for the failed parameter.

3/ Since test was performed at Step 2.2.10, it need not be repeated.

C — CUSTOMER REQUIREMENT CC — CERTIFICATE OF COMPLIANCE REQ. S — SUMMARY DATA (ATTRIBUTES) REQ.	D — DESTRUCTIVE TEST G — GO — NO GO	M — MOTOROLA OPTIONAL REQUIREMENT R — REMOVE REJECTS RR — READ AND RECORD
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MOTOROLA INC.
Semiconductor
Products Division

**DISCRETE
PROCESS
FLOW**

SPD 10603 (7/74)

DEVICE
SJ6708H

ISSUE: **E**

DOC. NO.
48ARB64845A

PAGE **9** OF

PROCESSOR/EXT.	CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.

2.4 — Group B Inspection — 1/ 2/ (C,S)

<p>2.4.1 (B-1)</p> <p>Elect. Test per TABLE IV (M,G,R) Phys. Dims. Solderability Resist Solv. Thermal Shock (Temp. Cycling) (Glass Strain) Term. Strength Hermetic Seal (Fine Leak) (Gross Leak) Moist. Resist Elect. Test per TABLE IV (RR,R)</p>	<p>2.4.2 (B-2)</p> <p>Elect. Rejects May Be Used</p> <p>Salt Atmos.</p>	<p>2.4.3 (B-3)</p> <p>Elect. Test per TABLE IV (M,G,R) Shock Vibr. Var. Freq. Const. Accel. Acoustic Elect. Test per TABLE IV (RR,R)</p>	<p>2.4.4 (B-4)</p> <p>Elect. Test per TABLE IV (M,G,R) Safe Oper. Area (Test #1) (Test #2) Elect. Test per TABLE IV (RR,R)</p>
--	---	--	--

<p>2.4.5 (B-5)</p> <p>Elect. Test per TABLE IV (RR,R) High Temp. Life (Non-Oper.) Elect. Readouts per TABLE IV at 340, 670, and 1000 hrs. (RR,R)</p>	<p>2.4.6 (B-6) <u>3/</u></p> <p>Elect. Test per TABLE IV (RR,R) Steady State Oper. Life Elect. Readouts per TABLE IV at 168, 340, 670, 1000, 1500, and 2000 hrs. (RR,R)</p>	<p>2.4.7 (B-7)</p> <p>Elect. Test per TABLE IV (RR,R)</p> <ol style="list-style-type: none"> Power Cycle Elect. Test per TABLE IV (RR,R) Ther. Shock (Temp. Cycling) Elect. Test per TABLE IV (RR,R) Vibr. Var. Freq. (Monitored) Elect. Test per TABLE IV (RR,R)
--	---	--

3/ Perform concurrently with Burn-In. (Step 2.2.6.)

2.5 Data Compilation and Review

2.6 Transfer to Shipping

3. SHIPPING PROCESSING

1/ A total of 125 Test Samples which passed Group A Inspection are required. Some Samples are used in multiple Subgroups. See Trip Ticket.

2/ All Test Samples shall be shipped to the customer.

C - CUSTOMER REQUIREMENT CC - CERTIFICATE OF COMPLIANCE REQ. S - SUMMARY DATA (ATTRIBUTES) REQ.	D - DESTRUCTIVE TEST G - GO - NO GO	M - MOTOROLA OPTIONAL REQUIREMENT R - REMOVE REJECTS RR - READ AND RECORD
---	--	---

DEVICE SJ6708H

DOC. NO. 48ARB64845A

DISCRETE PROCESS FLOW

PAGE 9 OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.1		(B-1) Sample Size = 20 Total Accept No. 0	C,S					
2.4.1.1		Electrical Test per TABLE IV, Limit 1	M,G,R					
2.4.1.2		Physical Dimensions Method 2066* Package per Page 1 Test 5-samples. No failures permitted.	R					
2.4.1.3		Solderability Method 2026* Use of mildly activated flux is allowable (Superior 30 or equivalent). Test 2-samples. No failures permitted.						
2.4.1.4		Resistance to Solvents MIL-STD-202, Method 215 All areas of the transistor body where markings has been applied shall be brushed. After testing, there shall be no evidence of mechanical damage to the device and markings shall remain legible. Test 2- samples. No failures permitted.						
		NOTE: Samples used in performing the above tests shall be combined with the untested samples and used in the subsequent tests. (20 samples total required).						
2.4.1.5		Thermal Shock (Temp. Cycling) MIL-STD-202, Method 107 Cond. C except 10 cycles t(extremes) = 15 minutes						

* Methods per MIL-STD-750

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD

DEVICE: **SJ6708H**

DOC. NO. **48ARB64845A**

DISCRETE PROCESS FLOW

PAGE **10** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.1		(B-1) (continued)						
2.4.1.6		Thermal Shock (Glass Strain) Method 1056*, Cond B						
2.4.1.7		Terminal Strength (Tension) Method 2036*, Cond. A WT = 10 lbs., t = 15 seconds.						
2.4.1.8		Hermetic Seal Method 1071*						
2.4.1.8.1		Fine Leak Cond. G or H Leak Rate $\leq 1 \times 10^{-8}$ Atm cc/Sec.	R					
2.4.1.8.2		Gross Leak Cond. A, B, C, D or F	R					
2.4.1.9		Moisture Resistance Method 1021* Omit initial conditioning						
2.4.1.10		Electrical Test per TABLE IV Limit 1	RR,R					
<p>NOTE: Test Samples which successfully pass this Subgroup shall be saved and used for tests in Subgroup (B-7), Step 2.4.7.</p>								
<p>* Methods per MIL-STD-750</p>								
<p>C - CUSTOMER REQUIREMENT CC - CERTIFICATE OF COMPLIANCE REQ. S - SUMMARY DATA (ATTRIBUTES) REQ.</p>			<p>D - DESTRUCTIVE TEST G - GO - NO GO</p>			<p>M - MOTOROLA OPTIONAL REQUIREMENT R - REMOVE REJECTS RR - READ AND RECORD</p>		

DEVICE

SJ6708H

DOC. NO.

48ARB64845A

DISCRETE PROCESS FLOW

PAGE **11** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.2		(B-2) <u>1/</u> Sample Size = 20 Total Accept No. = 0		C,S				
2.4.2.1		Salt Atmosphere (Corrosion) MIL-STD-750, Method 1041 <u>See NOTE 5.3 for Sample disposition.</u>		R				

1/ Electrical rjects may be used.

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD

DEVICE	SJ6708H	DOC. NO.	48ARB64845A
		PAGE	12 OF

DISCRETE PROCESS FLOW

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.3		(B-3) Sample Size = 20 Total Accept No. = 0		C,S				
2.4.3.1		Electrical Test per TABLE IV, Limit 1		M.G.R				
2.4.3.2		Shock (Non-Operating) Method 2016* 1500G's, t = 0.5mSec. 5 blows each in X1, Y1, Y2 and Z1 directions. (20 blows total)						
2.4.3.3		Vibration, Var. Freq. Method 2056* The transistors shall be exposed to the following vibrational environment a) Sinusoidal: (four one octave per minute sweeps) 5 to 25 Hz at 0.39 inch DA 25 to 180 Hz at 12G peak 180 to 315 Hz at 0.008 inch DA 315 to 2000 Hz at 40G peak b) Random: (apply for 7.8 hours) 20 to 1200 Hz at 0.3 (Grms) ² /Hz 1200 to 1400 Hz at 48db/octave rise 1400 to 2000 Hz at 3.5 (Grms) ² /Hz						

* Methods per MIL-STD-750

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD

DEVICE
SJ6708H

DOC. NO. **48ARB64845A**

DISCRETE PROCESS FLOW

PAGE **13** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.3		(B-3) (continued)						
2.4.3.4		Constant Acceleration MIL-STD-750, Method 2006 20,000G's X1, Y1, Y2 and Z1 directions						
2.4.3.5		Acoustic MIL-STD-810, Method 515.2 Field Acoustic environment at 174db.						
2.4.3.6		Electrical Test per TABLE IV, Limit 1	RR,R					

C - CUSTOMER REQUIREMENT	D - DESTRUCTIVE TEST	M - MOTOROLA OPTIONAL REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.	G - GO - NO GO	R - REMOVE REJECTS
S - SUMMARY DATA (ATTRIBUTES) REQ.		RR - READ AND RECORD

DEVICE SJ6708H

DOC. NO. 48ARB64845A

DISCRETE PROCESS FLOW

PAGE 14 OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.4		(B-4) Sample Size = 20 Total Accept No. = 0		C,S				
2.4.4.1		Electrical Test per TABLE IV, Limit 1		M,G,R				
2.4.4.2		Safe Operating Area (Switching) MIL-STD-750, Method 3053 Cond. C (Unclamped inductive load) Rs = 0.1Ω, tr = tf < 500nSec. DC ≤ 10%, TA = 25°C						
2.4.4.2.1		Test #1 tp ≈ 5mSec. (Vary to obtain IC) RBB1 = 100Ω, VBB1 = 16V RBB2 = ∞, VBB2 = 0 VCC = 25V, IC = 7.0A L = 5mH (Super Electric Corp. Type S16884 in parallel or equivalent; DC resistance ≤ 0.1Ω).						
2.4.4.2.2		Test #2 tp ≈ 5mSec. (Vary to obtain IC) RBB1 = 100Ω, VBB2 = 10V RBB2 = ∞, VBB2 = 0 VCC = 25V, IC = 0.5A L = 100mH (Two Triad C48U in series; 80mH winding and 20mH winding or equivalent; DC resistance ≤ 1.0Ω)						
2.4.4.3		Electrical Test per TABLE IV, Limit 1		RR,R				

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD

DISCRETE PROCESS FLOW

DEVICE
SJ6708H

PAGE **15** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.		CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION		PROC. CODES	DATE		VERIF.	COUNT	
					IN	OUT		IN	OUT
2.4.5		(B-5) Sample Size = 20 Total Accept No. = 1		C,S					
2.4.5.1		High Temperature Life (Non-Operating) MIL-STD-750, Method 1031 TA = 200°C, t = 1000 hrs Total							
2.4.5.1.1		Electrical Test per TABLE IV, Limit 1		RR,R					
2.4.5.1.2		0-340 hr. High Temp. Life t = 340 hours							
2.4.5.1.3		340 hour Electrical Readout per TABLE IV, Limit 2		RR,R					
2.4.5.1.4		340-670 hr. High Temp. Life t = 330 hrs.							
2.4.5.1.5		670 hour Electrical Readout per TABLE IV, Limit 2 (Delta calculations reference to values recorded at 0-hours).		RR,R					
2.4.5.1.6		670-1000 hr. High Temp. Life t = 330 hours							
2.4.5.1.7		1000 hour Electrical Readout per TABLE IV, Limit 2 (Delta calculations reference to values recorded at 0-hours).		RR,R					

C - CUSTOMER REQUIREMENT	D - DESTRUCTIVE TEST	M - MOTOROLA OPTIONAL REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.	G - GO - NO GO	R - REMOVE REJECTS
S - SUMMARY DATA (ATTRIBUTES) REQ.		RR - READ AND RECCRD

DEVICE

SJ6708H

DOC. NO.

48ARB64845A

DISCRETE PROCESS FLOW

PAGE 16 OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.6		(B-6) <u>1/</u> Sample Size = 40 Total Accept No. = 1		C,S				
2.4.6.1		Steady State Operation Life MIL-STD-750, Method 1026 VCE > 20V, TJ = 187.5 ± 12.5°C, ΘJC = 7.0°C/W Adjust IC to maintain specified TJ. t = 2000 hrs. Total						
2.4.6.1.1		Electrical Test per TABLE IV, Limit 1		RR,R				
2.4.6.1.2		0-168 hour Steady-State Oper. Life t = 168 hours						
2.4.6.1.3		Electrical Test per TABLE IV, Limit 2		RR,R				
2.4.6.1.4		168-340 hour Steady-State Operating Life t = 172 hours						
2.4.6.1.5		340 hour Electrical Readout per TABLE IV, Limit 2		RR,R				
2.4.6.1.6		340-670 hour Steady-State Operation Life t = 330 hours						
2.4.6.1.7		670 hour Electrical Readout per TABLE IV, Limit 2						
		<u>1/</u> Perform concurrently with Burn-In (Step 2.2.6).						

C - CUSTOMER REQUIREMENT	D - DESTRUCTIVE TEST	M - MOTOROLA OPTIONAL REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.	G - GO - NO GO	R - REMOVE REJECTS
S - SUMMARY DATA (ATTRIBUTES) REQ.		RR - READ AND RECORD

DEVICE

SJ6708H

DOC. NO.

48ARB64845A

DISCRETE PROCESS FLOW

PAGE **17** OF

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.6		(Continued)						
2.4.6.1.8		670-1000 hour Steady-State Operation Life t = 330 hours						
2.4.6.1.9		1000 hour Electrical Readout per TABLE IV, Limit 2 (Delta calculations reference to values recorded at 0-hours).	RR,R					
2.4.6.1.10		1000-1500 hour Steady-State Operation Life t = 500 hours						
2.4.6.1.11		1500 hour Electrical Readout per TABLE IV, Limit 2 (Delta Calculations reference to valued recorded at 0-hours).	RR,R					
2.4.6.1.12		1500-2000 hour Steady-State Operation Life t = 500 hours.						
2.4.6.1.13		2000 hour Electrical Readout per TABLE IV, Limit 2 (Delta Calculations reference to values recorded at 0-hours)	RR,R					

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD

DISCRETE PROCESS FLOW

PROCESSOR/EXT.		CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.		
STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.7		(B-7) Sample Size = 45 Total	C,S					
		NOTE: The Test Samples of this Subgroup shall include the Samples that successfully passed the tests of Subgroup (B-1).						
2.4.7.1		Electrical Test per TABLE IV, Limit 1	M,G,R					
2.4.7.2		Power Cycling Sample Size = 15 Accept No. = 0						
2.4.7.2.1		Select 15 samples from the Test Sample Lot and record the Device Serial Numbers						
2.4.7.2.2		Power Cycle Test VCE = 100V, TA = 25 + 3°C Adjust PD to obtain TC = 100°C or ΔTC = 75°C ton = toff = 5 minutes						
2.4.7.2.3		Electrical Test per TABLE IV, Limit 1 at 1000 cycle intervals. (One cycle is defined as 5 minutes "on", 5 minutes "off"). 4000 cycles required	RR,R					
2.4.7.3		Thermal Shock (Temp. Cycling) Sample Size = 15 Accept No. = 0						
2.4.7.3.1		Select 15 samples from the Test Sample Lot and record the Device Serial Numbers.						
2.4.7.3.2		Thermal Shock (Temp. Cycling) Test MIL-STD-202, Method 107 Test per FIGURE 4 T(low) = -65°C, T(high) = 125°C						
2.4.7.3.3		Electrical Test per TABLE IV Limit 1 at 25, 75, 175, 300, and 500 cycles.	RR,R					

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD

DEVICE: **SJ6708H**

DOC. NO. **48ARB64845A**

DISCRETE PROCESS FLOW

PAGE **19** OF

PROCESSOR/EXT.	CONTROL NO.	HIGH REL. LOT NO.	SOURCE TYPE NO.	CHARGE NO.	CASE NO.
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STEP NO.	DGS CODE	OPERATION DESCRIPTION	PROC. CODES	DATE		VERIF.	COUNT	
				IN	OUT		IN	OUT
2.4.7		(Continued)						
2.4.7.4		Vibration, Variable Frequency						
2.4.7.4.1		Select 15 samples from the Test Samples Lot and record the Device Serial Numbers Sample Size = 15 Accept No. = 0						
2.4.7.4.2		Vibration, Variable Frequency Test (Monitored) MIL-STD-750, Method 2057 VCES = 400V 120G's or 0.1 inch DA as applicable. Sine wave 5 to 2000Hz in 7.5 minutes. return to 5Hz in 7.5 minutes. X1, Y1, and Z1 orientations.						
2.4.7.4.3		Electrical Test per TABLE IV, Limit 1 following completion of testing in each orientation (X1, Y1, and Z1).	RR,R					

C - CUSTOMER REQUIREMENT
CC - CERTIFICATE OF COMPLIANCE REQ.
S - SUMMARY DATA (ATTRIBUTES) REQ.

D - DESTRUCTIVE TEST
G - GO - NO GO

M - MOTOROLA OPTIONAL REQUIREMENT
R - REMOVE REJECTS
RR - READ AND RECORD



TITLE: SJ6708H	48ARB64845A
	PAGE 20 OF

NOTES

- 4. DATA REQUIREMENTS:
 - 4.1 Motorola shall retain one copy of all data for a period of three years from date of P.O.
 - 4.2 Data to ship with Devices:
 - 4.2.1 C of C for internal Visual Inspection (Step 0.1)
 - 4.2.2 Summary Data for 100% Processing, Group A and B Inspections (Step 2.2, 2.3, and 2.4).
 - 4.2.3 All variables data and delta calculations for 100% Processing and Group B Inspections (Steps 2.2 and 2.4).
 - 4.3 Final Report
 - 4.3.1 Three draft copies of the Final Report shall be submitted to the Customer for approval prior to Final Printing and Distribution.
 - 4.3.2 The Final Report shall contain the following:
 - a) A detailed description fo each test setup with identification of critical test equipment, test circuit diagrams and procedures.
 - b) A narrative discussion of test results, conclusions, and recommendations.
 - c) Measurement data, and as applicable, Tables, Graphs, Diagrams, Sketches, Curves, Procedure Photographs and Drawings.
- As part of the Final Report, Motorola shall also complete and submit to MSFC Government Industry Data Exchange Program (GIDEP) Form 2:11-72.
- 4.3.3 Following approval of the Final Report by the Customer, 15 copies shall be sent per the distribution list furnished by the Customer.



NOTES (COntinued)

5. SHIPPING INSTRUCTIONS:

5.1 Customer Program Manager shall be notified prior to shipment of Test Samples (DD250 forms must be supplied).

5.2 Tray pack per MIL-S-19491, Level C.

5.3 Package Salt Atmosphere Test Samples separately and mark package "SALT ATMOSPHERE (Corrosion) TEST SAMPLES."

6. GENERAL NOTES:

6.1 Marking Instructions: Mark Devices with 04713, SJ6708H, Date Code per MIL-S-19500, RES1075-01(1), and Serial Number.

6.2 The following deviations to customer print Request # 8-1-T-EC-06242, Exhibit A, are authorized per TWX from H. Garrett, NASA to W. Albertin, Motorola, dated 7-18-77. (Copy of TWX on file with SAR for issue 0 of this specification.)

6.2.1 TABLE III, hFE4 shall be 7 min.

6.2.2 TABLE III, ES/B shall be 125 mJ min.

6.2.3 TABLE III, hFE1 shall be @ VCE = 3V.

6.2.4 FIGURE 3: changed resistor values for tf test only.

6.2.5 Burn-In and Operation Life shall be performed concurrently.

6.2.6 Revised FIGURE 2.

6.2.7 TABLE IV: Operation Life test samples (40) shall not include samples (20) that had Acoustic tests. A test to Burn-In end-points shall be performed after 168 hours of Operation Life test.



MOTOROLA INC.
Semiconductor
Products Division
GROUP A
INSPECTION
TABLE I

POLARITY
NPN

DEVICE

SJ6708H

DOC. NO.
48ARB64845A
PAGE 27 OF

SPD 10605 (7/74)

ISSUE 1

E

* PM < 300µSec., DC < 2%

CUSTOMER-
SOURCE INSPECTION
NOTIFY: GSI CSI
NAME EXT.
PREVIOUS TEST _____

TEST RECORDS
READ OUT GNG R&R
INIT. FINAL NDA RETEST
OFF LINE DATE _____
Q.A. ACC. REJ.

LOG# _____ CHG.# _____
CTL.# _____ PART CODE _____
LOT# _____ LOT QTY. _____
S.S. _____ LP NAME _____
S/N RANGE _____ THRU _____

TEST SEQUENCE STATION	SYMBOL METHOD MIL - STD. 750	CONDITIONS	SUB GRP.	LIMITS		UNITS	AQL OR LTPD.	TEST SAMPLE SIZE	ACC. ON	REJ. ON	NO. OF REJECTS	TEST OP
				MIN.	MAX.							TEST DATE
	Vis&Mech. 2071	TC = 25°C UNLESS OTHERWISE SPECIFIED	A-1				100%					
			A-2				100%					
	IEBO 3061D	VBE = 8.0V		-	1.0	mA						
	ICEO 3041D	VCE = 450V		-	0.5	mA						
	ICES1 3041C	VCE = 640V		-	50	µA						
	BVCEO 3011D	IC = 1.0mA		450	-	V						
	BVCES 3011C	IC = 0.1mA		800	-	V						
			A-3				100%					
	VBE(s)1 3066A*	IC = 8.0A, IB = 1.6A		-	2.5	V						
	VCE(s)1 3071*	IC = 8.0A, IB = 1.6A		-	5.0	V						
	VBE(s)2 3066A	IC = 1.0A, IB = 0.1A		-	0.8	V						
	VCE(s)2 3071	IC = 1.0A, IB = 0.1A		-	1.0	V						



MOTOROLA INC.
Semiconductor
Products Division

GROUP A
INSPECTION
TABLE 1

POLARITY
NPN

DEVICE

SJ6708H

DOC. NO.

48ARRB64845A

(Continued)

SPD 10605 (7/74)

ISSUE: E

1/ Sample Test LTPD = 5%. If any measurement exceeds the specified LTPD, replace rejects with good devices and perform that measurement on 100% of the devices.
* PW < 300uSec., DC < 2%

CUSTOMER-
SOURCE INSPECTION
NOTIFY: GSI CSI
NAME EXT.
PREVIOUS TEST _____

TEST RECORDS
READ OUT GNG R&R
INIT. FINAL NDA RETEST
OFF LINE DATE _____
Q.A. ACC. REJ.

LOG# _____ CHG.# _____
CTL.# _____ PART CODE _____
LOT# _____ LOT QTY. _____
S.S. _____ LP NAME _____
S/N RANGE _____ THRU _____

TEST SEQUENCE STATION	SYMBOL METHOD MIL - STD. 750	CONDITIONS	SUB GRP.	LIMITS		UNITS	AQL OR LTPD.	TEST SAMPLE SIZE	ACC. ON	REJ. ON	NO. OF REJECTS	TEST OP
				MIN.	MAX.							TEST DATE
		TC = 25°C UNLESS OTHERWISE SPECIFIED	A-4				100%					
	hFE1 3076*	VCE = 3.0V, IC = 3.0A		10	40	-						
	hFE2 3076*	VCE = 5.0V, IC = 8.0A		5	15	-						
	hFE3 3076	VCE = 1.0V, IC = 1.0A		20	60	-						
			A-5									
	hfe 3206	VCE = 5.0V, IC = 1.0A f = 1.0kHz		20	-	-	1/					
	ton 3251	See FIGURE 3		-	0.6	μS	1/					
	toff 3251	See FIGURE 3		-	5.0	μS	1/					
	tf 3251	See FIGURE 3		-	1.0	μS	1/					
	/hfe/ 3306	VCE = 10.0V, IC = 0.3A f = 1MHz		5	30	-	1/					
	Cobo 3236	VCB = 10.0V 100kHz < f < 1MHz		-	250	pF	1/					

1/ Delta calculations shall be performed with reference to data recorded at Step 2.2.1.
2/ May be Sample Tested LTPD = 5%. If any measurement exceeds the specified LTPD, perform that measurement on 100% of the devices in the lot.

LOG# _____ CHG.# _____
 CTL.# _____ PART CODE _____
 LOT# _____ LOT QTY. _____
 S.S. _____ SUB. GRP. _____
 S/N RANGE _____ THRU _____
 LTPD/AQL _____ ACC. _____ REJ. _____
 L.P. NAME _____

WARNING

COMPLETE MEASUREMENTS

BY _____ DATE _____ TIME _____

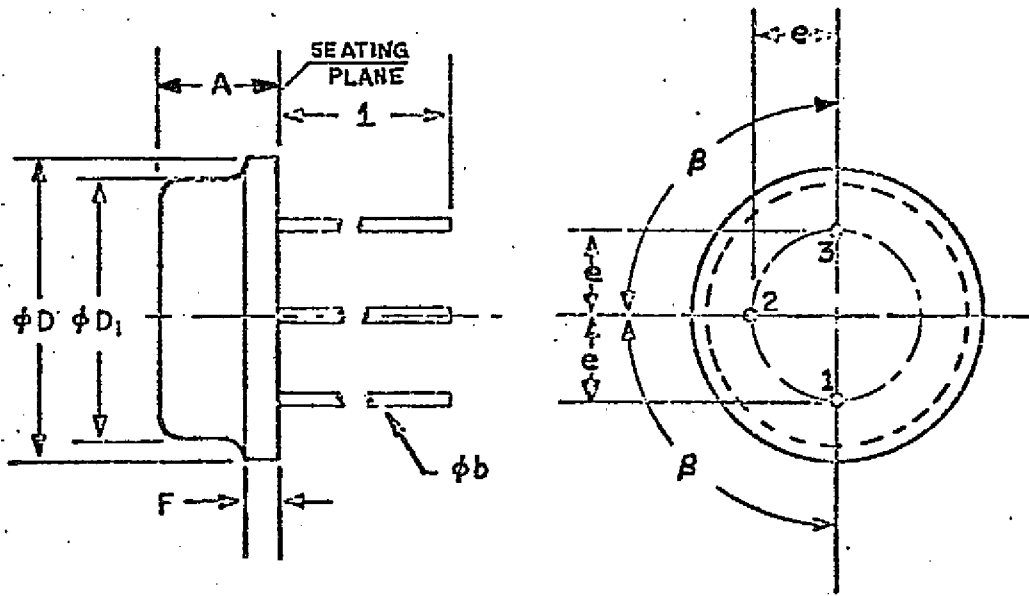
Q.A. ACC. REJ.

CUSTOMER _____

SOURCE INSPECTION
 NOTIFY: GSI CSI
 NAME _____ EXT. _____

PREVIOUS TEST _____

TEST SEQUENCE	SYMBOL METHOD	CONDITIONS	INITIAL 1 LIMITS		END POINTS 2 LIMITS		SUNITS	TEST RECORDS			
			MIN	MAX	MIN	MAX		READ OUT	GNG	RR	
	ICES1 3041C	VCE = 640V	-	-	-	50	μA				RO CDE LIMITS OFF DATE DATE OPER- ATOR NO. OF REJECTS
	ΔICES 1	(Whichever is greater)	-	-	-	100% or + 20	μA	of initial reading			DATE OPER- ATOR NO. OF REJECTS
	VCE(s)2 3071 2/	IC = 1.0A, IB = 0.1A	-	-	-	1.0	V				DATE OPER- ATOR NO. OF REJECTS
	hFE3 3076	VCE = 1.0V, IC = 1.0A	-	-	20	60	-				DATE OPER- ATOR NO. OF REJECTS
	ΔhFE3		-	-	-	+ 20%		of initial reading			DATE OPER- ATOR NO. OF REJECTS
	hFE4 3076 2/	VCE = 1.0V, IC = 1.0A TC = -65°C	-	-	7	-	-				DATE OPER- ATOR NO. OF REJECTS
	ICES2 3041C	VCE = 640V TC = 150°C	-	-	-	2.5	mA				DATE OPER- ATOR NO. OF REJECTS
	tf 3251	See FIGURE 3	-	-	-	1.0	μS				DATE OPER- ATOR NO. OF REJECTS

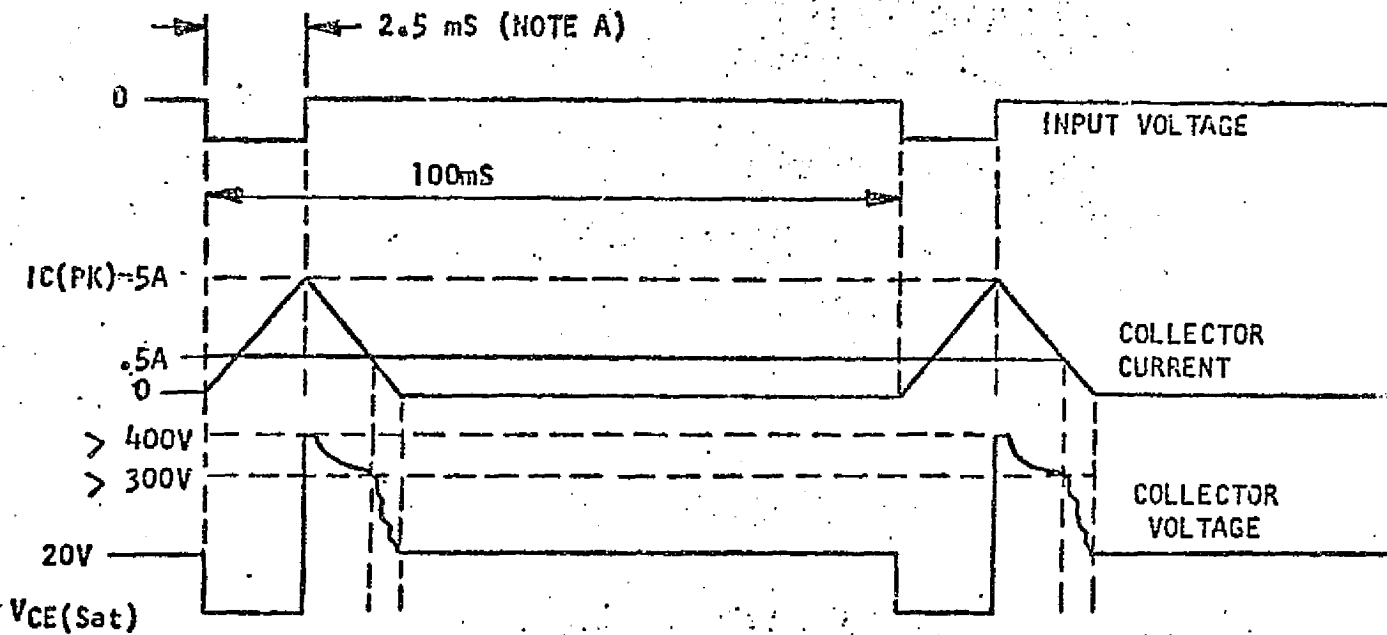
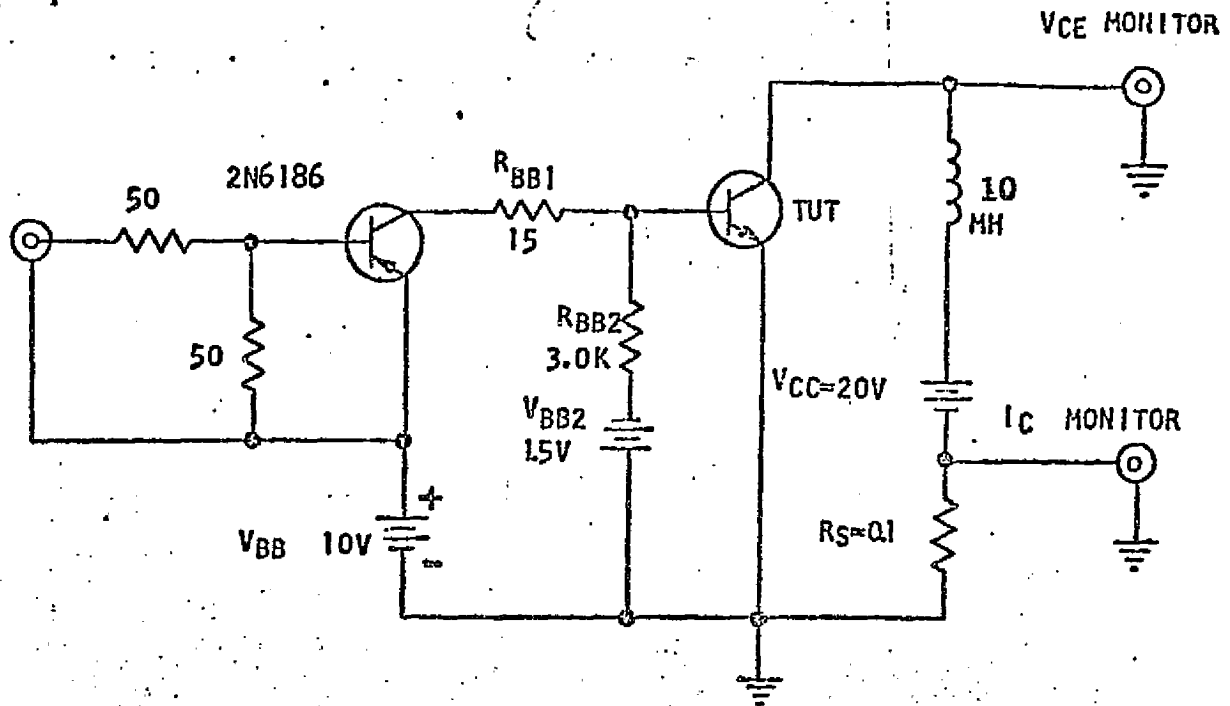


SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.270	.330	6.86	8.38	
ϕb	.027	.033	.686	.838	1
ϕD	.550	.650	13.97	16.51	
ϕD_1	.444	.524	11.28	13.31	
e	.136	.146	3.45	3.71	
F		.115		2.92	
1	.360	.440	9.14	11.18	1
β	90° NOMINAL				

NOTES:

1. THREE LEADS.

FIGURE 1. PACKAGE OUTLINE.



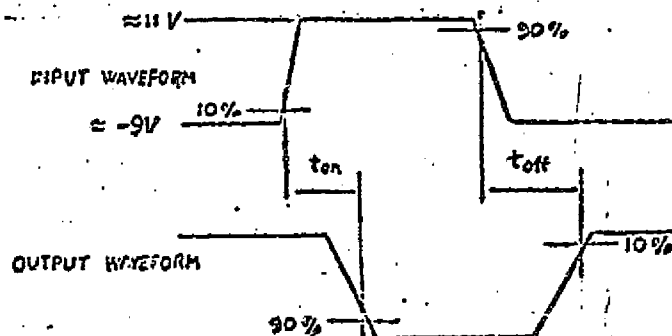
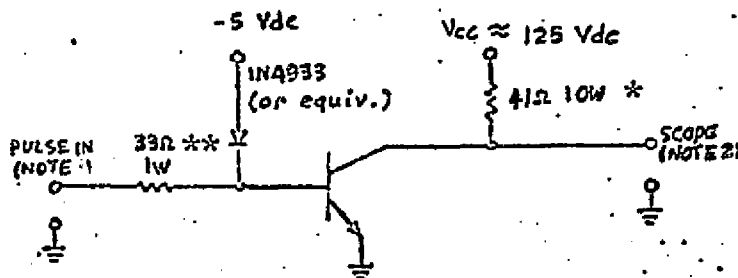
NOTE A: INPUT PULSE WIDTH IS INCREASED
UNTIL I_C (PK)=5A

FIGURE 2

SECOND BREAKDOWN ENERGY TEST CIRCUIT AND WAVEFORMS



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NOTES:

- The rise time (t_r) and fall time (t_f) of the applied pulse shall be each ≤ 20 ns; duty cycle $\leq 1\%$; generator source impedance shall be 50Ω ; pulse width = 30 μ s.
- Output sampling oscilloscope: $Z_{in} \geq 20 \text{ k}\Omega$, $C_{in} \leq 50 \text{ pF}$; rise time ≤ 20

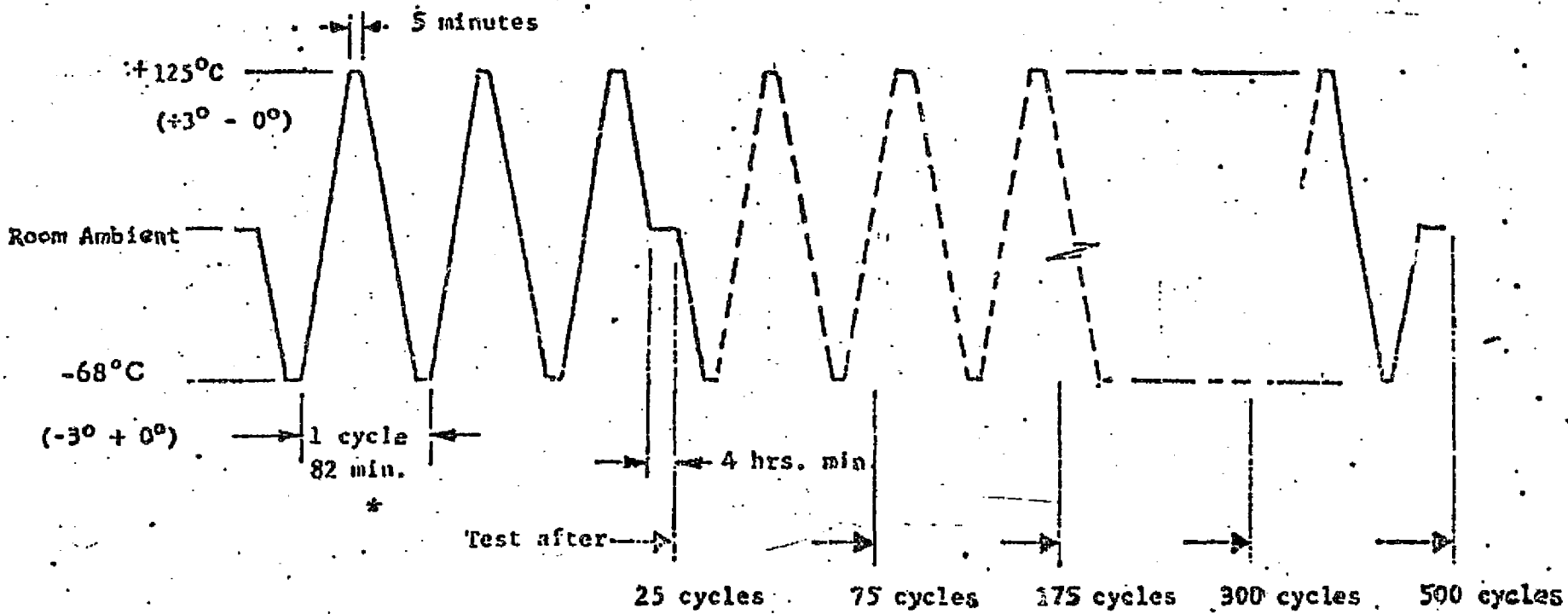
TEST CONDITIONS:

Turn-on Time
VCC 125Vdc
IC = 3.0A
IB1 = 0.3A

Turn-off Time
VCC 125Vdc
IC = 3.0A
IB1 = 0.3A
-IB2 = 0.3A

Fall Time
VCC 125Vdc
IC = 1.0A
IB1 = IB2 = 0.1A
* use 120 ohms, 5W (tf only)
** use 100 ohms, 1W (tf only)

FIGURE 3. PULSE RESPONSE TEST CIRCUIT AND CONDITIONS.



*About five degrees per minute

FIGURE 4. THERMAL TEST PROFILE.

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TITLE:	SJ6708H
ISSUE:	E
48ARB64845A	
PAGE 3 / OF	



MOTOROLA INC.
Semiconductor
Products Division

REVISION SHEET

SPD 1324 R-5 (7/74)

DEVICE

SJ6708H

DOC. NO.

48ARB64845A

PAGE 32 OF 32

REV. LTR. & RELEASE DATE	DESCRIPTION OF REVISION	ORDERS IN PROC. AFFECTED	WHSE. STOCK AFFECTED	WRITER & DATE	ACC'Y REVIEW & DATE
A 5-6-77	Exchanged "Signed" Customer Approval page 2 contained herein. Step 2.4.4.2.1 test condition IC was IC = 8.0A. toff was 3.0uSec. max. in TABLE I. Added NASA letter reference which modified Customer specification RES1075.	YES	NO	wfm 5-5-77	H. LOEB 5-6-77
B 6-11-77	Added NOTE 6.2. Added flagnote to steps 2.2.6 & 2.4.6. Deleted boxed notes on sub-groups B-3 & B-6. Added 168 hr. readout to B-6. TABLE I:hFE1 was @ VCE = 1V. TABLES I & III:hFE4 was 10 min. TABLES I & II: ES/B was 30mJ min. Added tf note to FIGURE 3. Revised FIGURE 2.	YES	NO	JDG 8-1-77	D.E. 8-1-77
C 9-22-77	TABLE IV, VCE(s)2 condition was: IC=1.0A, IB=1.0A. (Typo error only)	NO	NO	W.W. 9-22-77	D.E. 9-22-77
D 10-8-77	Added $\theta_{JC} = 7.0^{\circ}\text{C/W}$ to Steps 2.2.6 and 2.4.6.1. Step 2.4.6.1.3 was per TABLE III, Limit 2 and Step 2.4.6.1.5 was TABLE III, Limit(to correct typo).	NO	NO	wfm 10-7-77	H. LOEB 10-7-77
E 11-14-77	Revised Step 2.4.3.3. TABLE III: ICES1 was at 60V. Added Customer Print RC1075.	YES	NO	M. LOEB 11-14-77	H.F.M. 11-14-77

SECTION D. FAILURE ANALYSIS REPORTS



PRODUCT ANALYSIS REPORT

#243

REPORT NO. PL-099*034

SFC TR-2 (4/74)		REFERENCE	DEVICE TYPE	LOT NUMBER	CUSTOMER PART NUMBER
PREPARED FOR		-	SJ6708H	-	-
ROCKETDYNE (NASA)		POINT OF FAILURE Hermetic Seal (AXX)			
(UNKN)		REASON FOR REJECTION Non-hermetic			
REQUESTOR Don Brothers		TYPE OF REQUEST <input checked="" type="checkbox"/> FIELD <input type="checkbox"/> HI REL QA <input type="checkbox"/> RELIABILITY <input type="checkbox"/> RMR <input type="checkbox"/> OTHER			
TOTAL FAILURES	QUANTITY RECEIVED	LOT SIZE	SAMPLE SIZE	ACCEPTANCE LIMIT	
8	8	-	-	-	
PRODUCT CODE	DATE CODE(S)	SERIAL NUMBER(S)			
AACA/Loc.B	7733	-			

BACKGROUND:

Eight transistors in a flangeless TO-66 package (TO-8) with three 0.030" leads approximately 0.5" long were submitted for analysis because of hermeticity problems. The transistors contain a 5 RV 190 mil² chip mounted on a molybdenum heat spreader approximately 0.008" thick. Connections are of aluminum wire, 10 mils in diameter. All transistors have multiple bends in all three leads. These transistors were to find application in the Space Shuttle.

INVESTIGATION:

A cursory visual examination with a 10X lens revealed severe damage to the glass to metal seal in all transistors. They were subjected to a gross leak test utilizing dye penetrant and experienced 100% failure. A closer examination of the devices with the scanning electron microscope (Photos 1-5) demonstrated severe damage to the glass-to-metal seals. The quality of the glass in the feed throughs seemed to be normal. All leads exhibited movement with respect to the seal glass (Photo 4) in a direction away from the header, indicating damage was almost certainly induced by a pull on the lead. Checking of the lot history of these devices revealed they did experience a pull test according to MIL-STD-740, method 2036, where a 10 lb weight is suspended from the package for 15 seconds. Reports also indicate that 100% failure of a 20 piece sample of these parts, subjected to hermeticity checking did occur after lead tensioning test.

CAUSE:

Insufficient metal-to-glass seal integrity resulted in poor resistance to the lead tensioning test, cracking the glass, and causing failure of the devices to remain hermetic.

RECOMMENDATION:

This TO-8 package is not recommended for devices intended for use in the aerospace environment.

ANALYSIS PERFORMED BY

REPORT APPROVED BY

S.W. Lee

21 Nov 78

J. B. ...

21 Nov. 78

PREPARED FOR
ROCKETDYNE (NASA)

REFERENCE

-

DEVICE TYPE

SJ6708H

LOT NUMBER

-

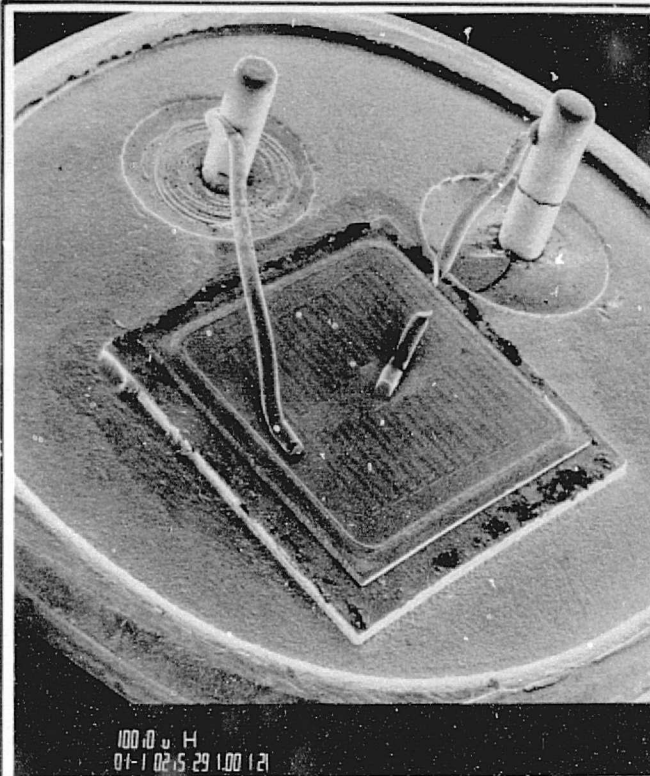


Photo 1. 10X

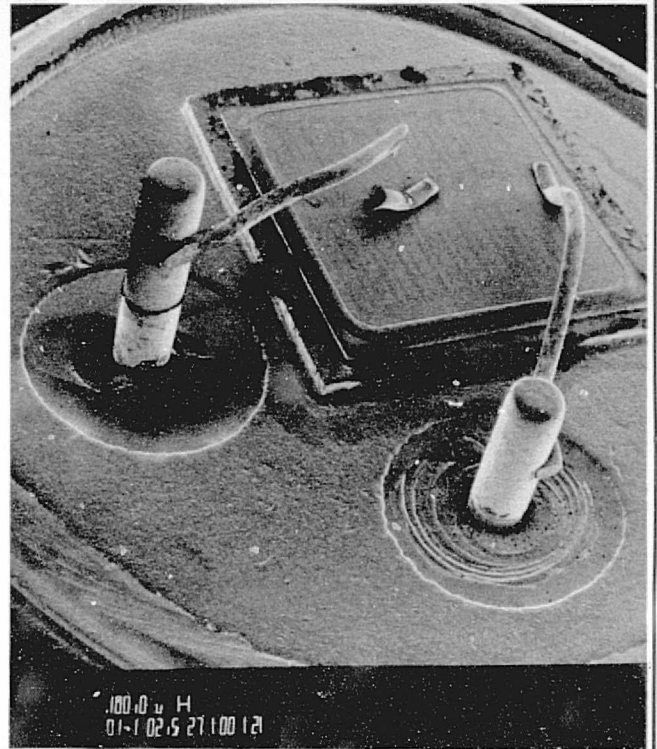


Photo 2. 10X

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Photos 1 - 6 SEM views of damaged glass in transistor Ser 035. The damage seen here is typical of all samples. The emitter wire has been cut to allow the emitter post to be pushed up. This transistor and all samples presented for analysis were gross leak rejects. Note cracking and spalling of glass.

PRODUCT ANALYSIS REPORT NUMBER

PL-099*034

PAGE

OF

PREPARED FOR
ROCKETDYNE (NASA)

REFERENCE
-

DEVICE TYPE
SJ6708H

LOT NUMBER
-

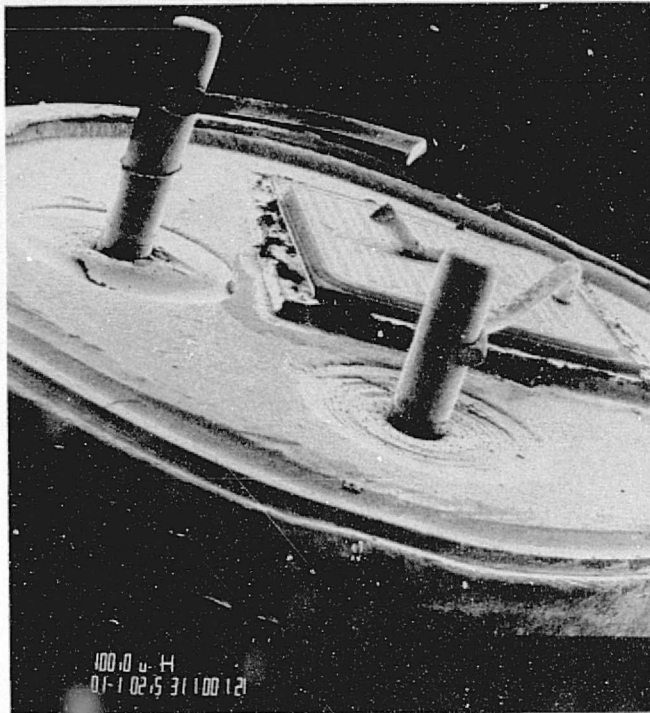
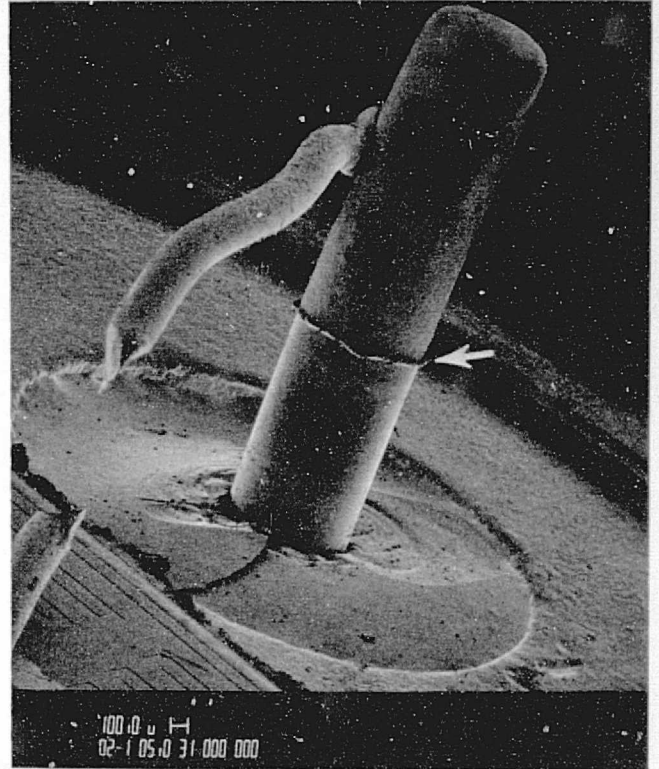


Photo 3. 10X



Close-up of emitter post. Note pushing of gold plating into tiny rolls, indicating tension applied to leads caused them to move within the glass.

Photo 4

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P.O. BOX 2953, PHOENIX, ARIZONA 85036

PRODUCT ANALYSIS REPORT NUMBER	
PL-099*034	PAGE OF

PREPARED FOR ROCKETDYNE (NASA)	REFERENCE -	DEVICE TYPE SJ6708H	LOT NUMBER -
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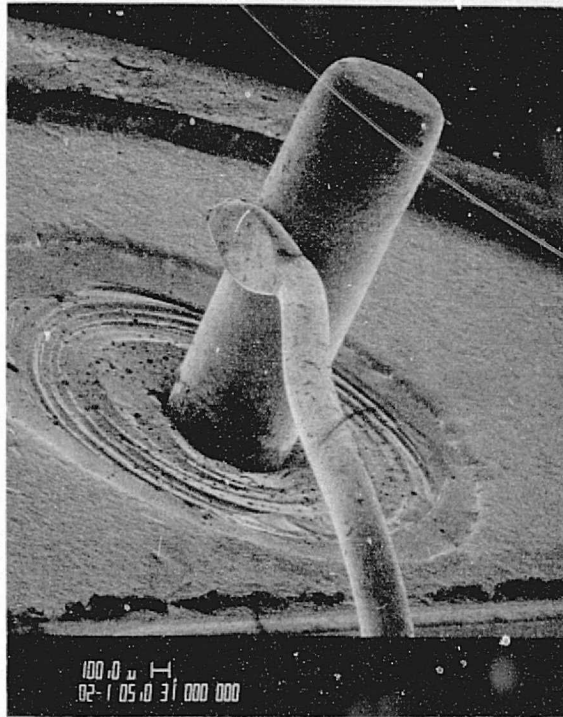


Photo 5 - Close-up of base post.

Note concentric spalling of glass, indicative of lead movement within seal area. All remnants of the meniscus are missing. (20X)

PRODUCT ANALYSIS REPORT

SPD 3547 R-2 (4/74)

#278

REPORT NO. PL-099*031

PREPARED FOR		REFERENCE DS5238	DEVICE TYPE SJ6708H	LOT NUMBER LA 1	CUSTOMER PART NUMBER
NATIONAL AERONAUTICS & SPACE ADMIN.		POINT OF FAILURE Unloading after 2000 hrs. op life (JAA)			
		REASON FOR REJECTION Life Lab N.O.D.			
REQUESTOR June C.		TYPE OF REQUEST <input type="checkbox"/> FIELD <input checked="" type="checkbox"/> HiREL QA <input type="checkbox"/> RELIABILITY <input type="checkbox"/> RMR <input type="checkbox"/> OTHER			
TOTAL FAILURES 2	QUANTITY RECEIVED 1	LOT SIZE 8	SAMPLE SIZE 41	ACCEPTANCE LIMIT -	
PRODUCT CODE AACA/Loc. B	DATE CODE(S) 7733	SERIAL NUMBER(S) 13			

Device #13 was submitted on a N.O.D. following unloading. A preliminary electrical check proved the device to be good. A subsequent electrical check in the unloading area again proved the device to be good.

Cause for the N.O.D. at unloading is unknown at this time.

ANALYSIS PERFORMED BY <u>Best Dickman</u> 4-11-78	REPORT APPROVED BY <u>JW Lee</u> 11 APR 78
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PRODUCT ANALYSIS REPORT

#318

REPORT NO. PL-099*032

PD 3547 R-2 (4/74)		REFERENCE		DEVICE TYPE	LOT NUMBER	CUSTOMER PART NUMBER
PREPARED FOR		BS5238		SJ 6708 H	LA 1	-
NATIONAL AERONAUTICS & SPACE ADMIN.		POINT OF FAILURE				
		2000 hr burn-in				
REQUESTOR June C.		REASON FOR REJECTION				
		#21 N.O.D. (E-B short) #4 & #69 limit reject				
TYPE OF REQUEST		<input type="checkbox"/> FIELD <input checked="" type="checkbox"/> REL QA <input type="checkbox"/> RELIABILITY <input type="checkbox"/> RMR <input type="checkbox"/> OTHER				
TOTAL FAILURES	QUANTITY RECEIVED	LOT SIZE	SAMPLE SIZE		ACCEPTANCE LIMIT	
2	3	-	40 + 1		-	
PRODUCT CODE	DATE CODE(S)	SERIAL NUMBER(S)				
AACA/Loc. B	7733	4, 21, 69				

BACKGROUND:

Three units were submitted after 2000 hours of op life testing. Unit 21 was reported as an E-B short at unloading. Units 4 and 69 were limit rejects on the post 2000 hour read out.

INVESTIGATION:

A parameter check found unit #4 to be good while units 21 and 69 were marginally low on hFE₃ (19.6, 19.4 - min 20).

Microscopic inspection of #21 after delidding and chemical etching disclosed no evidence of a failure mechanism that would cause an E-B short.

No further analysis was performed on unit #69.

CAUSE:

Unit #4 was found to be good.

Units 21 and 69 were marginally out of spec. and the failure mechanism is unknown at the present time.

ANALYSIS PERFORMED BY

Best Dickerson

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REPORT APPROVED BY

La Lee

11 APR 78

SECTION E. TEST FACILITIES LIST

TEST FACILITIES LIST

MIL-STD-750 TEST METHOD	TEST STATION IDENTITY	MANUFACTURER	TYPE OR MODEL	ASSET NO.	PARAMETER
<u>ELECTRICAL</u>					
3061	99Q232*	Lorlin	Impact 100	153426	IEBO
3041	99Q232	Lorlin	Impact 100	153426	ICEO
3041	99Q232	Lorlin	Impact 100	153426	ICES1
3011	99Q232	Lorlin	Impact 100	153426	BVCEO
3011	99Q232	Lorlin	Impact 100	153426	BVCES
3066	99Q232	Lorlin	Impact 100	153426	VBE(S)1
3071	99Q232	Lorlin	Impact 100	153426	VCE(S)1
3066	99Q232	Lorlin	Impact 100	153426	VBE(S)2
3071	99Q232	Lorlin	Impact 100	153426	VCE(S)2
3076	99Q232	Lorlin	Impact 100	153426	hFE1
3076	99Q232	Lorlin	Impact 100	153426	hFE2
3076	99Q232	Lorlin	Impact 100	153426	hFE3
3076	99Q232	Lorlin	Impact 100	153426	hFE4
3206	99Q005 (Curve Tracer)	Tektronix	576	172120	hfe
3251	QC0308 (Plug-In)	Tektronix	82	079182	ton, toff & tf
3251	QC0449 (Oscilloscope)	Tektronix	585	53855	"
3251	QC1203 (Generator)	Hewlett Packard	214A	129526	"
3306	QC0336 (Generator)	Hewlett Packard	606A	154038	"
3236	99Q223 (Capacitance Limit Bridge)	Boonton	77B-S1	84160	Cobo
3151	99Q228 (Thermal Resistance Tester)	Motorola	HO-01	82278	θJC
3053	QC0449 (See Figure 2)	Tektronix	585	53855	ES/B
* Lorlin Multi Parameter Tester.					

TEST FACILITIES LIST

MIL-STD-750 TEST METHOD	TEST STATION IDENTITY		MANUFACTURER	TYPE OR MODEL	ASSET NO.	
<u>DIMENSIONAL</u>						
2066	Guage		Motorola	66CSB54061	#8	
2066	Calipers		Brown & Sharpe	579-1	4-542	
<u>ENVIRONMENTAL</u>						
MIL-STD-202 Method 107	Temp. Chamber		Blue M	WSP-109B-3	126676	
2006	Centrisafe		Triotech	G385-1B	142814	
1071	Bomb Station		Isovac	MKIV	144030	
2026	Solder Dip		Motorola	- - - -	996931	
1056	Thermal Shock		Thermal Dynamics	2103	177630	
2036	Tension Tester		Hunter	CTM	82286	
1021	Moist. Resist.		Blue M	FR366PB	87004	
1041	Salt Chamber		Associated	SS-3-4	65536	
2016	Shock		Avco	SM005-2	78361	
2056	Vibration		Ling	CP5/6	70933	
2057	Vibration		Ling	CP5/6	70933	
<u>LIFE TESTS</u>						
1031	LT-2 (High Temp. Chambers)		Blue M	POM-24	38907	
1026	LT-1 (Life Test Racks)		Motorola	C (Blue)	- - - -	

SECTION F. TEST MEASUREMENT DATA

READOUT INDEX

100% Processing

R.O. #05	100%	Initial Electrical Inspection
#10	100%	Electrical Inspection, Post Shock, Constant Acceleration and HTRB. Pre-Burn In.
#15	100%	Post Burn-In Electrical.

Group B

Sub Group I - IV	#20	76 pc.	Group "B" initial Electrical.
	#30	20 pc.	B-III End Pts.
	#35	20 pc.	B-IV End Pts.

Sub Group V	#40	20 + 3	High Temp. Life, 340 hrs.
	#45	20 + 2	High Temp. Life, 670 hrs.
	#50	20 + 2	High Temp. Life, 1000 hrs.

Sub Group VI	#55	40 + 4	Steady State Operating Life Electrical Inspection, 168 hrs.
	#60	40 + 3	Steady State Operating Life, 340 hrs.
	#65	40 + 3	Steady State Operating Life, 670 hrs.
	#70	40 + 3	Steady State Operating Life, 1000 hrs.
	#75	40 + 3	Steady State Operating Life, 1500 hrs.
	#80	40 + 1	Steady State Operating Life, 2000 hrs.

Readout Index Continued

Sub group VII	#81	15 + 2	Electrical Inspection, Post Power Cycling, 1000 cycles.
	#82	15 + 1	Power Cycling, 2000 cycles.
	#83	15 + 1	Power Cycling, 3000 cycles.
	#84	15 + 1	Power Cycling, 4000 cycles.
	#85	15 + 2	Electrical Inspection, Post Thermal Shock, 25 cycles.
	#86	15 + 2	Thermal Shock, 75 cycles.
	#87	15 + 2	Thermal Shock, 175 cycles.
	#88	15 + 2	Thermal Shock, 300 cycles.
	#89	15 + 2	Thermal Shock, 500 cycles.
	#90	15 + 2	Sub group VII End points.

DEVICE = SJ6708H CONTROL # = 055236 SAMPLE SIZE = 165
 LOT = 001 # REJECTS = 7
 READOUT = 05 % REJECTED = 4.24 %
 PRIOR = NONE
 TST Cmpl = 02/20/78

DESCRIPTION = NPN PL-99.784
 TEMP CYC CONST ACCEL
 HIGH TEMP REVERSE BIAS 48 HOURS
 INITIAL TEST 2

PARAMETER CONDITIONS	PARM #	TRST #	LIMITS	# FAILURES	REJECT CRITERIA	MEAN	3 STD DEV
ICES 1	001	001	MIN = MAX = 50.0A	0 0	ELECT READING	1.2267391 UA	10.972451 UA
BVCE0	002	002	MIN = MAX = 450. V	0 0	ELECT READING	514.4060 V	80.34104 V
BVCE5	003	003	MIN = MAX = 86. V	0 0	ELECT READING	921.5663 V	163.84707 V
VCE5 2	004	004	MIN = MAX = 1. V	0 0	ELECT READING	134.46104 MV	60.12247 MV
HFE 3	005	005	MIN = MAX = 20. 60.	1 0	ELECT READING	29.752166	12.681394

ORIGINAL TEST IS
 OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 05

UNIT	ICES 1	BVCED	BVCES	VCES 2	HFE 3
000001	644.0 NA	505. V	901.0 V	125.5 MV	31.0
000002	1.0010 UA	545. V	859.5 V	185.0 MV	21.6
000003	416.0 NA	510. V	880.5 V	129.5 MV	25.3
000004	478.5 NA	490. V	863.5 V	123.5 MV	32.8
000005	1.2745 UA	540. V	983.5 V	176.0 MV	28.4
000006	365.0 NA	530. V	984.5 V	122.5 MV	34.5
000007	461.5 NA	510. V	907.5 V	116.0 MV	35.6
000008	2.0045 UA	520. V	909.5 V	188.5 MV	25.4
000009	1.7515 UA	500. V	934.5 V	133.5 MV	31.9
000010	402.5 NA	550. V	977.5 V	193.0 MV	22.0
000011	485.0 NA	510. V	875.5 V	155.5 MV	26.5
000012	722.5 NA	550. V	974.5 V	157.0 MV	29.2
000013	1.4935 UA	490. V	879.5 V	136.5 MV	30.8
000014	423.5 NA	490. V	883.5 V	115.0 MV	33.8
000015R	434.5 NA	490. V	910.0 V	130.5 MV	4.88
000016	385.0 NA	540. V	1.0330 KV	125.0 MV	32.5
000017R	42.55 UA	520. V	682.0 V*	105.0 MV	23.0
000018	427.0 NA	500. V	946.0 V	115.0 MV	34.4
000019	346.5 NA	540. V	1.0135 KV	127.0 MV	33.3
000020	1.2135 UA	530. V	975.5 V	115.0 MV	34.1
000021	297.0 NA	530. V	943.0 V	129.5 MV	25.5
000022	650.5 NA	500. V	893.5 V	122.5 MV	34.9
000023	543.5 NA	490. V	903.5 V	130.0 MV	31.5
000024	914.0 NA	550. V	923.5 V	169.0 MV	23.3
000025	399.0 NA	540. V	972.5 V	147.5 MV	31.5
000026	373.5 NA	540. V	929.5 V	151.5 MV	27.9
000027	511.0 NA	490. V	883.0 V	111.0 MV	34.5
000028	410.5 NA	550. V	956.5 V	145.5 MV	24.3
000029	1.7915 UA	580. V	895.5 V	147.0 MV	21.8
000030	414.5 NA	540. V	1.0250 KV	125.5 MV	32.9
000031	741.5 NA	540. V	911.5 V	122.5 MV	33.3
000032	356.0 NA	530. V	935.5 V	147.0 MV	22.1
000033	1.9335 UA	490. V	849.5 V	166.0 MV	26.7
000034	1.7010 UA	510. V	952.5 V	137.0 MV	31.3
000035	297.0 NA	540. V	996.5 V	132.0 MV	26.1
000036	1.3755 UA	490. V	858.5 V	158.0 MV	27.0
000037	357.5 NA	520. V	970.5 V	115.0 MV	34.9
000038	278.5 NA	550. V	953.5 V	142.0 MV	24.5
000039	512.5 NA	510. V	895.5 V	128.0 MV	29.9
000040	511.5 NA	490. V	875.5 V	113.5 MV	34.9
000041	447.5 NA	490. V	896.0 V	121.5 MV	26.6
000042	353.0 NA	530. V	933.0 V	130.5 MV	23.0
000043R	17.515 UA	500. V	794.5 V*	141.5 MV	28.5
000044	582.5 NA	490. V	919.5 V	111.5 MV	38.4
000045	852.5 NA	530. V	800.5 V	139.0 MV	26.9
000046	478.5 NA	490. V	870.5 V	132.0 MV	26.4
000047	557.0 NA	590. V	992.0 V	125.0 MV	35.3
000048	379.0 NA	530. V	968.0 V	123.5 MV	32.2
000049	2.400 UA	490. V	931.5 V	145.0 MV	31.4
000050	434.5 NA	490. V	671.5 V	125.5 MV	31.0

ORIGINAL PAGE IS
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DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 05

UNIT	ICES 1	BVCE0	BVCE5	VCE5 2	HFE 3
000051	465.5 NA	500. V	839.5 V	124.5 MV	31.9
000052	453.0 NA	505. V	961.5 V	112.0 MV	30.1
000053	429.5 NA	520. V	923.0 V	119.0 MV	33.1
000054	358.5 NA	460. V	868.5 V	121.0 MV	24.5
000055	292.5 NA	540. V	983.5 V	132.5 MV	24.8
000056	420.0 NA	510. V	996.0 V	114.0 MV	36.4
000057	352.0 NA	530. V	930.0 V	129.0 MV	26.6
000058	411.0 NA	490. V	925.0 V	112.5 MV	36.6
000059	498.5 NA	520. V	1.0050 KV	120.5 MV	36.1
000060	425.0 NA	540. V	1.0345 KV	132.0 MV	32.7
000061	502.0 NA	490. V	901.5 V	130.5 MV	32.4
000062	1.1990 UA	490. V	814.5 V	135.0 MV	27.9
000063	445.5 NA	550. V	975.5 V	165.5 MV	26.8
000064	368.0 NA	530. V	961.5 V	121.0 MV	34.1
000065	5.740 UA	505. V	896.0 V	166.0 MV	29.5
000066	333.5 NA	550. V	1.0390 KV	128.0 MV	31.8
000067	781.0 NA	510. V	814.0 V	115.5 MV	35.5
000068	421.0 NA	490. V	926.0 V	113.5 MV	35.1
000069	276.5 NA	540. V	979.5 V	135.0 MV	25.5
000070	439.5 NA	480. V	892.5 V	129.0 MV	31.9
000071	436.5 NA	520. V	904.0 V	114.5 MV	35.6
000072	365.0 NA	550. V	981.5 V	139.0 MV	29.9
000073	414.5 NA	540. V	967.5 V	140.5 MV	31.7
000074R	468.5 NA	490. V	743.5 V*	126.0 MV	28.5
000075	377.0 NA	520. V	930.0 V	128.5 MV	25.6
000076	404.5 NA	500. V	920.5 V	113.5 MV	34.5
000077	389.0 NA	540. V	890.5 V	160.0 MV	26.9
000078	482.0 NA	510. V	903.5 V	112.0 MV	34.4
000079	640.5 NA	510. V	866.5 V	132.5 MV	29.9
000080	379.5 NA	505. V	912.0 V	114.0 MV	34.1
000081R	6.020 UA	510. V	794.5 V*	169.5 MV	25.3
000082	1.6745 UA	500. V	951.5 V	136.0 MV	31.3
000083	456.5 NA	540. V	873.5 V	139.0 MV	24.3
000084	473.5 NA	490. V	881.5 V	113.0 MV	35.8
000085	412.5 NA	490. V	939.0 V	113.5 MV	36.1
000086	529.0 NA	530. V	999.0 V	119.5 MV	33.0
000087	834.0 NA	500. V	855.5 V	135.0 MV	29.4
000088	932.0 NA	505. V	913.5 V	160.5 MV	28.2
000089	602.5 NA	530. V	990.0 V	126.5 MV	27.8
000090	320.0 NA	560. V	923.5 V	144.5 MV	23.8
000091	346.5 NA	560. V	942.5 V	150.0 MV	23.1
000092	446.5 NA	520. V	988.0 V	114.5 MV	36.1
000093	459.0 NA	550. V	851.5 V	166.5 MV	21.6
000094	524.5 NA	540. V	934.0 V	150.0 MV	24.3
000095	2.020 UA	540. V	937.5 V	164.0 MV	27.0
000096	417.0 NA	520. V	963.5 V	149.0 MV	21.5
000097	463.0 NA	490. V	895.0 V	120.5 MV	26.1
000098	3.305 UA	500. V	881.0 V	156.5 MV	25.4
000099	781.0 NA	530. V	967.5 V	149.5 MV	31.1
000100	370.5 NA	540. V	940.5 V	124.0 MV	26.9

DEVICE = SJ6708H

CONTROL # = 055238
 LOT = 001
 READOUT = 05

UNIT	ICES 1	BVCED	BVCES	VCE5 2	HFE 3
000101	368.5 NA	540. V	1.0065 KV	122.0 MV	33.2
000102	932.0 NA	540. V	980.0 V	212.0 MV	21.5
000103	414.5 NA	510. V	947.0 V	142.0 MV	24.0
000104	1.0505 UA	520. V	922.0 V	128.0 MV	33.0
000105	4.525 UA	500. V	901.0 V	165.0 MV	30.6
000106	432.5 NA	510. V	975.5 V	191.0 MV	28.9
000107	429.0 NA	505. V	819.5 V	123.0 MV	27.4
000108	524.5 NA	500. V	911.0 V	123.5 MV	30.1
000109	377.0 NA	540. V	915.5 V	135.5 MV	25.6
000110	937.0 NA	520. V	831.5 V	121.8 MV	26.9
000111	636.5 NA	520. V	1.0040 KV	122.5 MV	28.2
000112	696.5 NA	510. V	961.0 V	134.0 MV	30.3
000113	821.0 NA	500. V	914.0 V	138.0 MV	31.9
000114	530.5 NA	510. V	913.5 V	117.0 MV	34.6
000115	402.5 NA	510. V	871.5 V	125.5 MV	26.6
000116	417.0 NA	490. V	884.0 V	122.0 MV	25.1
000117	376.5 NA	530. V	963.5 V	120.0 MV	34.2
000118	644.0 NA	500. V	843.5 V	132.5 MV	29.6
000119	317.0 NA	520. V	925.0 V	128.0 MV	23.9
000120R	381.0 NA	510. V	0. MV*	130.5 MV	24.6
000121	1.3015 UA	490. V	861.5 V	185.0 MV	14.2
000122	296.0 NA	540. V	991.5 V	136.5 MV	24.7
000123	1.1225 UA	540. V	975.5 V	181.5 MV	28.3
000124	4.030 UA	500. V	909.5 V	156.2 MV	11.6
000125	426.5 NA	500. V	869.5 V	125.0 MV	31.6
000126	501.5 NA	540. V	863.5 V	150.0 MV	22.8
000127	417.0 NA	490. V	912.5 V	114.0 MV	35.0
000128	372.5 NA	510. V	969.0 V	134.0 MV	22.9
000129	929.0 NA	490. V	940.5 V	141.5 MV	31.7
000130	357.5 NA	550. V	1.0015 KV	134.0 MV	31.5
000131	5.660 UA	510. V	900.5 V	165.0 MV	26.9
000132	480.0 NA	510. V	921.0 V	123.5 MV	30.4
000133	5.700 UA	510. V	921.0 V	155.5 MV	30.9
000134	725.0 NA	520. V	982.5 V	124.5 MV	25.3
000135	490.0 NA	490. V	845.5 V	123.5 MV	30.4
000136	567.0 NA	530. V	901.0 V	136.0 MV	22.3
000137	714.0 NA	500. V	946.5 V	160.5 MV	24.0
000138	453.5 NA	520. V	906.5 V	143.0 MV	30.0
000139	365.0 NA	520. V	986.5 V	129.0 MV	32.6
000140	325.0 NA	520. V	867.0 V	119.0 MV	28.7
000141	414.5 NA	530. V	1.0175 KV	120.0 MV	33.2
000142	394.0 NA	520. V	991.5 V	118.0 MV	35.2
000143	1.0690 UA	540. V	953.0 V	176.0 MV	21.3
000144	343.5 NA	560. V	1.0110 KV	143.0 MV	24.0
000145R	7.680 UA	500. V	784.0 V	126.0 MV	31.0
000146	653.0 NA	540. V	1.0255 KV	122.5 MV	34.1
000147	429.0 NA	530. V	911.5 V	120.5 MV	33.4
000148	457.0 NA	520. V	850.5 V	122.5 MV	27.4
000152	500.5 NA	460. V	809.5 V	124.0 MV	32.4
000153	453.0 NA	470. V	969.5 V	128.5 MV	33.0

ORIGINAL
 OF POOR QUALITY
 IS

DEVICE = SJ670RH

CONTROL # = 058238
LOT = 001
READOUT = 05

UNIT	ICES 1	EVCE0	EVCE5	VCE5 2	HFE 3
000154	468.5 NA	470. V	854.5 V	110.0 MV	34.5
000155	501.5 NA	470. V	851.0 V	118.5 MV	28.5
000156	500.5 NA	465. V	835.0 V	116.0 MV	32.5
000157	560.5 NA	470. V	836.5 V	121.0 MV	31.0
000158	646.5 NA	465. V	808.5 V	119.5 MV	30.2
000159	438.5 NA	470. V	891.5 V	110.5 MV	34.1
000160	706.0 NA	468. V	868.5 V	120.5 MV	32.2
000161	2.125 UA	465. V	844.5 V	130.0 MV	28.1
000162	520.0 NA	475. V	928.5 V	110.5 MV	37.0
000163	469.0 NA	470. V	846.5 V	108.5 MV	33.1
000164	470.5 NA	472. V	908.0 V	110.5 MV	25.0
000165	662.5 NA	475. V	849.5 V	123.0 MV	31.2
000166	1.2290 UA	460. V	819.0 V	117.5 MV	30.2
000167	569.0 NA	462. V	868.0 V	112.5 MV	33.2
000168	5.600 UA	475. V	885.0 V	140.5 MV	28.5

ORIGINAL PAGE IS
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DEVICE = SJ6700H

CONTROL # = 085238

LOT = 001

READOUT = 05

REJECT LIST

000015 000017 000043 000074 000081 000120 000145

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 160

LOT = 001

REJECTS = 51

READOUT = 10

% REJECTED = 31.88 %

PRIOR = 05

TST CMPL = 03/15/78

DESCRIPTION =
 NPR PL-99.784
 TEMP CYC CONST ACCEL
 HIGH TEMP REVERSE BIAS 48 HOURS
 END POINTS TABLE 2

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES1	001	001	MIN = MAX = 50. UA	0 24	ELECT READING	MEAN = 7.876647 UA 3 STD DEV = 34.20247 UA	
ICES1 (D)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 45	DELTA DEPENDENT CODE 1	MEAN = 2.711894 UA 3 STD DEV = 14.633700 UA	CALC # = 21
ICES1 (%)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 101	% DELTA DEPENDENT CODE 3	MEAN = 26.268256 % 3 STD DEV = 110.06872 %	CALC # = 22
BVCE0	002	002	MIN = MAX =	0 0	ELECT READING	MEAN = 541.0061 V 3 STD DEV = 431.7094 V	
BVCE5	003	003	MIN = MAX =	0 0	ELECT READING	MEAN = 854.0749 V 3 STD DEV = 406.0124 V	
VCES 2	004	004	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 139.78147 MV 3 STD DEV = 61.82649 MV	
HFES	005	005	MIN = 20. MAX = 60.	15 0	ELECT READING	MEAN = 27.633450 3 STD DEV = 11.456213	
HFES (%)	005	005	PARM # 1 = 005 PARM # 2 = 005 MIN = -20. % MAX = 20. %	15 1	% DELTA	MEAN = -8.222183 % 3 STD DEV = 14.550642 %	CALC # = 22

ORIGINAL PAGE IS
 OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 10

UNIT	ICES1	ICES1(0)	ICES1(X)	BVCE0	BVCE5	VCE5 2	HFE3
000001	2.020 UA	1.3760 UA	213.00 X*	500. V	908.5 V	133.5 MV	27.9
000002R	109.60 UA*	168.5390 UA*	15.800 KX*	780. V	500.0 V	189.5 MV	16.03 *
000003	1.9720 UA	1.5560 UA	374.00 X*	500. V	791.5 V	133.0 MV	24.1
000004	14.160 UA	13.6815 UA	2.8500 KX*	800. V	893.0 V	128.5 MV	27.5
000005	17.760 UA	16.4855 UA	1.2900 KX*	520. V	747.5 V	176.5 MV	27.7
000006R	36.80 UA	36.4350 UA*	9.9800 KX*	535. V	1.0075 KV	125.0 MV	30.2
000007	496.5 NA	35.0 NA	7.5800 X	500. V	967.5 V	122.0 MV	33.1
000008	4.350 UA	2.3455 UA	117.00 X*	505. V	859.5 V	199.0 MV	23.3
000009	1.4035 UA	-348.0 NA	-19.800 X	490. V	949.5 V	140.0 MV	30.0
000010R	256.0 UA*	255.5975 UA*	63.500 KX*	675. V	567.5 V	187.5 MV	19.15 *
000011	922.5 NA	437.5 NA	90.200 X	500. V	937.5 V	162.5 MV	25.2
000012	1.520 UA	829.5 NA	114.00 X*	535. V	943.5 V	166.0 MV	27.5
000013	1.5905 UA	397.0 NA	26.500 X	480. V	903.5 V	154.0 MV	24.9
000014	545.0 NA	121.5 NA	28.600 X	475. V	815.5 V	116.5 MV	31.8
000015R	1.4020 UA	967.5 NA	222.00 X*	485. V	831.5 V	138.0 MV	29.2
000016	410.0 NA	25.0 NA	6.4900 X	530. V	1.0175 KV	131.0 MV	30.0
000018	589.5 NA	162.5 NA	38.000 X	490. V	955.5 V	120.5 MV	32.2
000019	503.5 NA	157.0 NA	45.300 X	525. V	959.5 V	130.5 MV	31.7
000020	1.2155 UA	0. PA	0. PX	515. V	935.5 V	125.5 MV	31.7
000021	587.0 NA	290.0 NA	97.600 X	510. V	863.5 V	133.0 MV	24.3
000022R	27.10 UA	26.4495 UA*	4.0600 KX*	475. V	858.0 V	119.5 MV	32.8
000023	1.2590 UA	715.5 NA	131.00 X*	480. V	899.5 V	136.0 MV	29.5
000024R	82.40 UA*	81.4860 UA*	8.9100 KX*	520. V	660.5 V	181.5 MV	21.1
000025	612.5 NA	213.5 NA	53.500 X	530. V	943.5 V	145.0 MV	19.9
000026	943.0 NA	569.5 NA	152.00 X*	535. V	911.5 V	157.0 MV	26.0
000027	781.0 NA	270.0 NA	52.800 X	480. V	791.5 V	116.0 MV	31.9
000028R	44.80 UA	44.3895 UA*	10.800 KX*	950. V	917.0 V	154.5 MV	19.32 *
000029R	57.40 UA*	55.6085 UA*	3.1000 KX*	900. V	787.5 V	164.0 MV	16.26 *
000030	548.0 NA	133.5 NA	32.200 X	530. V	975.5 V	131.5 MV	30.8
000031	13.560 UA	12.8185 UA	1.7200 KX*	525. V	715.5 V	129.0 MV	31.6
000032R	30.75 UA	30.5940 UA*	8.5300 KX*	535. V	719.5 V	153.5 MV	21.1
000033	5.605 UA	3.6715 UA	169.00 X*	475. V	843.5 V	169.5 MV	26.4
000034	1.3725 UA	-328.5 NA	-19.300 X	495. V	954.5 V	141.5 MV	30.0
000035	480.0 NA	183.0 NA	61.600 X	525. V	831.5 V	138.0 MV	24.5
000036	8.255 UA	6.8795 UA	500.00 X*	480. V	767.5 V	164.0 MV	25.6
000037R	57.60 UA*	57.2425 UA*	16.000 KX*	510. V	845.5 V	121.5 MV	32.9
000038	906.0 NA	627.5 NA	225.00 X*	540. V	879.5 V	153.0 MV	27.8
000039R	362.5 NA	-150.0 NA	-29.200 X	500. V	959.5 V	145.5 MV	23.2
000040	640.5 NA	129.0 NA	25.200 X	480. V	847.5 V	121.5 MV	32.3
000041	409.0 NA	-36.5 NA	-8.6000 X	480. V	900.0 V	126.5 MV	24.0
000042	474.5 NA	121.5 NA	34.400 X	515. V	927.5 V	156.5 MV	23.7
000044R	202.0 UA*	201.4175 UA*	34.500 KX*	670. V	570.5 V	113.5 MV	21.0
000045R	34.00 UA	33.1475 UA*	3.6800 KX*	485. V	859.5 V	153.5 MV	21.2
000046	539.5 NA	61.0 NA	12.700 X	480. V	807.5 V	139.0 MV	24.8
000047R	28.15 UA	27.5930 UA*	4.9500 KX*	485. V	843.0 V	133.0 MV	33.3
000048	406.5 NA	27.5 NA	7.2500 X	520. V	895.5 V	131.5 MV	29.8
000049	1.3715 UA	-1.3285 UA	-55.300 X	480. V	943.5 V	152.0 MV	30.2
000050	578.0 NA	143.5 NA	33.000 X	485. V	927.5 V	131.0 MV	29.7
000051	458.0 NA	-27.5 NA	-5.6500 X	485. V	944.5 V	130.5 MV	30.2
000052	395.0 NA	-58.0 NA	-12.600 X	495. V	927.5 V	118.5 MV	32.8

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DEVICE = SJ6705H

CONTROL # = 052250

LOT = 001

READOUT = 10

UNIT	ICCS1	ICCS1(D)	ICCS1(X)	BVCCO	BVCCS	VCES 2	HFCS
00053	831.5 NA	402.0 NA	95.500 X	510. V	895.5 V	125.0 MW	30.9
00054	402.5 NA	48.0 NA	13.500 X	470. V	827.5 V	127.5 MW	30.2
00055	301.0 NA	62.5 NA	23.400 X	525. V	823.5 V	140.0 MW	23.9
00056	1.2480 UA	828.0 NA	197.00 X	500. V	855.5 V	119.0 MW	33.9
00057	105.280 UA*	105.280 MA*	29.950 KX*	510. V	629.5 V	138.0 MW	24.0
00058	1.755 MA*	1.75589 MA*	431.700 KX*	520. V	58.5 V	118.0 MW	29.2
00059	31.20 UA	30.8015 UA*	6.1700 KX*	518. V	976.5 V	124.5 MW	30.4
00060	7.680 UA	7.5550 UA*	1.7000 KX*	530. V	919.5 V	129.5 MW	30.3
00061	822.0 NA	271.0 NA	42.000 X	475. V	895.5 V	137.0 MW	20.8
00062	42.40 UA	2.9495 UA*	5.4300 KX*	880. V	825.0 V	142.0 MW	21.8
00063	32.35 UA	2.9495 UA*	662.00 KX*	540. V	831.5 V	173.5 MW	25.0
00064	908.5 NA	524.5 NA	145.00 X	520. V	967.0 V	124.0 MW	31.7
00065	4.810 UA	-1.230 UA	-21.400 X	500. V	843.5 V	121.0 MW	28.4
00066	4.810 UA	154.100 NA	87.000 X	535. V	1.6075 V	135.5 MW	29.4
00067	1.4605 UA	679.5 NA	87.000 X	500. V	807.5 V	122.0 MW	33.4
00068	389.5 NA	-21.5 NA	-7.4800 X	460. V	919.5 V	119.0 MW	33.1
00069	530.5 NA	254.0 NA	91.800 X	530. V	903.5 V	142.5 MW	23.8
00070	3.910 UA	2.6705 UA	659.00 X	475. V	827.5 V	133.5 MW	23.9
00071	5.210 UA	4.6725 UA	1.1100 KX*	500. V	902.0 V	120.0 MW	22.9
00072	613.5 NA	248.5 NA	68.000 X	540. V	975.5 V	146.5 MW	27.9
00073	704.0 NA	69.800 X	69.800 X	525. V	863.5 V	147.0 MW	29.6
00075	1.2800 UA	903.0 NA	339.00 X	505. V	831.5 V	134.0 MW	24.1
00076	421.0 NA	16.5 NA	4.0700 X	485. V	939.5 V	119.5 MW	32.5
00077	1.6080 UA	1.2190 UA	312.00 X	525. V	947.5 V	169.0 MW	28.9
00078	491.5 NA	89.5 NA	22.200 X	500. V	951.5 V	123.0 MW	22.3
00079	2.305 UA	1.6145 UA	233.00 X	510. V	855.5 V	140.0 MW	27.2
00080	1.7995 UA	1.4200 UA	274.00 X	495. V	925.0 V	120.0 MW	21.6
00082	2.650 UA	955.5 NA	57.500 X	495. V	934.0 V	140.0 MW	29.9
00083	28.880 UA*	28.2495 UA*	6.2900 KX*	635. V	828.5 V	144.5 MW	20.3
00084	51.20 UA*	50.2245 UA*	10.500 KX*	700. V	859.5 V	118.0 MW	27.6
00085	15.695 UA	15.4825 UA*	3.7500 KX*	630. V	959.5 V	116.0 MW	29.8
00086	1.0785 UA	151.00 X	151.00 X	515. V	915.5 V	126.0 MW	30.0
00087	16.415 UA	17.5810 UA	2.1000 KX*	800. V	692.5 V	140.5 MW	22.6
00088	6.245 UA	5.3130 UA	570.00 X	500. V	791.5 V	181.0 MW	22.3
00089	11.920 UA	11.3175 UA	1.6700 KX*	500. V	983.5 V	139.5 MW	22.9
00090	1.4075 UA	1.0675 UA	215.00 X	545. V	927.5 V	158.5 MW	22.1
00091	108.80 UA*	108.4595 UA*	31.800 KX*	455. V	629.0 V	159.5 MW	21.2
00092	1.960 UA	1.5335 UA	343.00 X	500. V	871.5 V	181.0 MW	33.4
00093	57.60 UA*	57.1410 UA*	12.400 KX*	770. V	705.5 V	164.0 MW	17.66
00094	70.40 UA*	69.9455 UA*	15.300 KX*	720. V	679.5 V	152.0 MW	20.2
00095	30.690 UA	4.670 UA	241.00 X	990. V	957.5 V	189.5 MW	22.1
00096	30.80 UA	29.4830 UA*	7.0900 KX*	870. V	821.5 V	139.5 MW	17.51
00097	26.80 UA	26.3070 UA*	5.6800 KX*	620. V	869.5 V	125.5 MW	22.6
00098	11.575 UA	8.270 UA	250.00 X	900. V	922.0 V	164.5 MW	18.48
00099	51.20 UA*	50.4190 UA*	6.4500 KX*	800. V	766.5 V	150.0 MW	26.0
00100	10.880 UA	10.4795 UA	2.8200 KX*	520. V	960.0 V	133.5 MW	24.3
00101	1.0765 UA	208.0 NA	192.00 X	530. V	927.5 V	129.0 MW	30.9
00102	153.60 UA*	152.5680 UA*	16.300 KX*	680. V	599.5 V	211.5 MW	18.05
00103	192.0 UA*	191.5680 UA*	56.200 KX*	420. V	542.5 V	150.0 MW	22.9
00104	1.6000 UA	249.5 NA	52.300 X	510. V	787.5 V	122.5 MW	32.9

DEVICE = SJ6708H

CONTROL # = DS5238

LOT = 001

READOUT = 10

UNIT	ICES1	ICES1(D)	ICES1(X)	BVCED	BVCES	VCES 2	HFE3
000105	2.145 UA	-2.380 UA	-52.500 %	490. V	931.0 V	168.5 MV	29.9
000106	2.165 UA	1.7325 UA	400.00 K%	535. V	855.5 V	199.0 MV	22.5
000107R	60.80 UA*	60.3710 UA*	14.000 K%	490. V	665.5 V	130.5 MV	26.0
000108	518.5 NA	-76.0 NA	-12.700 %	485. V	917.5 V	128.0 MV	28.4
000109R	140.4230 UA*	140.4230 UA*	37.200 K%	525. V	620.0 V	141.5 MV	23.8
000110R	24.90 UA	23.9630 UA*	2.5500 K%	460. V	915.0 V	130.5 MV	25.3
000111	3.705 UA	3.0665 UA	480.00 K%	260. V	995.0 V	128.5 MV	25.6
000112R	76.80 UA*	76.1095 UA*	11.000 K%	460. V	859.5 V	141.5 MV	23.5
000113	776.0 NA	-45.0 NA	-5.4800 %	485. V	931.5 V	133.0 MV	30.3
000114	506.0 NA	-24.5 NA	-4.6100 %	500. V	971.5 V	121.0 MV	32.1
000115	406.5 NA	4.0 NA	993.00 M%	495. V	887.5 V	131.0 MV	24.5
000116	450.0 NA	33.0 NA	7.9100 %	480. V	882.5 V	120.5 MV	23.7
000117	7.895 UA	7.1165 UA	1.9800 K%	520. V	975.5 V	126.0 MV	29.9
000118	1.0225 UA	3.45 NA	57.700 %	495. V	914.5 V	143.0 MV	26.2
000119R	70.40 UA*	70.0830 UA*	22.100 K%	505. V	663.5 V	133.5 MV	22.8
000120	379.0 NA	-2.0 NA	-524.00 M%	505. V	911.5 V	134.0 MV	23.6
000121R	30.00 UA	28.6985 UA*	2.2000 K%	800. V	800.0 V	192.0 MV	19.78 *
000122R	40.80 UA	40.5040 UA*	13.600 K%	940. V	938.5 V	142.5 MV	19.98 *
000123	3.285 UA	2.1625 UA	192.00 %	525. V	941.5 V	180.5 MV	27.1
000124	2.650 UA	-1.380 UA	-34.200 %	485. V	920.0 V	163.5 MV	30.1
000125	1.1610 UA	734.5 NA	172.00 %	495. V	927.5 V	130.5 MV	30.0
000126R	331.0 UA*	330.9985 UA*	65.900 K%	675. V	425.5 V	155.5 MV	18.74 *
000127	5.160 UA	4.7430 UA	1.1300 K%	475. V	887.5 V	121.5 MV	32.5
000128R	20.80 UA	20.4215 UA*	5.3900 K%	525. V	971.5 V	143.5 MV	20.4
000129	1.2900 UA	361.0 NA	38.800 %	480. V	935.5 V	145.5 MV	30.0
000130	1.1065 UA	749.0 NA	289.00 %	540. V	935.5 V	140.5 MV	29.1
000131R	18.690 UA	13.030 UA	230.00 %	950. V	866.5 V	177.5 MV	17.88 *
000132	18.740 UA	18.2600 UA	3.8000 K%	460. V	912.0 V	131.0 MV	26.3
000133	3.585 UA	-115. NA	-3.1000 %	500. V	857.5 V	159.0 MV	29.6
000134	20.40 UA	19.6750 UA	2.7100 K%	500. V	768.0 V	133.0 MV	24.4
000135	1.2695 UA	779.5 NA	159.00 %	480. V	861.5 V	128.5 MV	29.0
000136R	28.00 UA	27.4930 UA*	5.4200 K%	900. V	893.5 V	139.0 MV	26.3
000137	17.370 UA	16.6560 UA	2.3300 K%	510. V	960.0 V	172.5 MV	20.1
000138	2.325 UA	1.8715 UA	412.00 %	515. V	949.5 V	153.0 MV	26.2
000139	632.0 NA	267.0 NA	73.100 %	515. V	1.0075 KV	134.0 MV	30.4
000140R	24.00 UA	23.6060 UA*	5.9900 K%	480. V	929.0 V	128.5 MV	25.0
000141R	63.40 UA*	62.9855 UA*	15.100 K%	505. V	767.5 V	126.0 MV	30.0
000142	565.5 NA	171.5 NA	43.500 %	515. V	999.5 V	123.5 MV	32.8
000143R	676.0 UA*	674.9310 UA*	63.100 K%	540. V	150.5 V	179.5 MV	10.63 *
000144R	51.20 UA*	50.8565 UA*	14.800 K%	880. V	733.5 V	155.5 MV	19.62 *
000146	745.0 NA	92.0 NA	14.000 %	520. V	991.5 V	129.5 MV	31.7
000147	1.5975 UA	1.1685 UA	272.00 %	520. V	943.5 V	126.0 MV	30.6
000148	1.5660 UA	1.1110 UA	243.00 %	508. V	795.5 V	130.0 MV	25.7
000152	17.40 UA	16.9395 UA	3.5800 K%	510. V	935.0 V	143.5 MV	27.5
000153R	71.10 UA*	70.6370 UA*	15.200 K%	540. V	758.5 V	127.0 MV	29.3
000154	684.0 NA	215.5 NA	45.900 %	470. V	899.5 V	115.5 MV	33.1
000155	754.0 NA	282.5 NA	20.300 %	480. V	871.5 V	128.5 MV	24.9
000156	11.300 UA	10.7995 UA	2.1500 K%	470. V	806.0 V	119.5 MV	31.9
000157	1.1355 UA	575.0 NA	102.00 %	470. V	876.5 V	124.5 MV	30.7
000158	1.3220 UA	675.5 NA	104.00 %	460. V	835.5 V	123.0 MV	28.9

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 10

UNIT	ICES1	ICES1(D)	ICES1(%)	BVCED	BVCES	VCES 2	HFE3
000159	8.260 UA	7.8215 UA	1.7800 KX*	470. V	903.5 V	110.0 MV	32.6
000160R	33.60 UA	32.8940 UA*	4.6500 KX*	560. V	862.0 V	119.0 MV	28.7
000161R	37.55 UA	35.425 UA*	1.6600 KX*	0. V	806.5 V	130.5 MV	23.2
000162	914.0 NA	394.0 NA	75.700 %	0. V	949.5 V	114.5 MV	35.5
000163	745.0 NA	256.0 NA	52.300 %	470. V	887.5 V	113.0 MV	31.2
000164	730.0 NA	259.5 NA	55.100 %	480. V	921.0 V	112.5 MV	33.4
000165	7.740 UA	7.0775 UA	1.0600 KX*	480. V	881.5 V	125.5 MV	29.8
000166	9.630 UA	8.4010 UA	683.00 X*	460. V	848.0 V	117.0 MV	27.3
000167R	33.60 UA	33.0310 UA*	5.8000 KX*	800. V	775.5 V	112.5 MV	28.1
000168R	30.40 UA	24.800 UA*	442.00 X*	820. V	829.5 V	154.5 MV	20.8

DEVICE = SJ6708H

CONTROL # = QSB238

LOT = 001

READOUT = 10

UNIT	HFE3(%)
000001	-10.000 %
000002R	-23.000 %*
000003	-4.7400 %
000004	-16.100 %
000005	-2.4600 %
000006R	-12.400 %
000007	-7.0200 %
000008	-8.2600 %
000009	-3.9500 %
000010R	-12.900 %
000011	-4.9000 %
000012	-5.8200 %
000013	-19.100 %
000014	-3.9100 %
000015R	498.00 %*
000016	-7.6900 %
000018	-6.3500 %
000019	-4.8000 %
000020	-7.0300 %
000021	-4.7000 %
000022R	-6.0100 %
000023	-6.3400 %
000024R	-9.4400 %
000025	-5.0700 %
000026	-6.8100 %
000027	-7.5300 %
000028R	-20.400 %*
000029R	-21.100 %*
000030	-6.5800 %
000031	-5.1000 %
000032R	-4.5200 %
000033	-1.1200 %
000034	-4.1500 %
000035	-6.1300 %
000036	-5.1800 %
000037R	-5.7500 %
000038	13.400 %
000039R	-22.400 %*
000040	-7.4400 %
000041	-6.2500 %
000042	-3.2000 %
000044R	-19.200 %
000045R	-21.100 %*
000046	-6.0600 %
000047R	-3.6600 %
000048	-7.4500 %
000049	-3.8200 %
000050	-4.1900 %
000051	-5.3200 %
000052	-6.5500 %

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 10

UNIT	HFE3(%)	
000053	-6.6400	X
000054	-5.3000	X
000055	-6.0400	X
000056	-6.8600	X
000057R	-7.5100	X
000058R	-20.6800	X*
000059R	-18.7000	X*
000060	-7.3300	X
000061	-7.6300	X
000062R	-21.8000	X*
000063	-6.7100	X
000064	-7.0300	X
000065	-3.7200	X
000066	-6.2800	X
000067	-6.9100	X
000068	-5.6900	X
000069	-6.6600	X
000070	-3.1300	X
000071	-7.5800	X
000072	-6.6800	X
000073	-6.6200	X
000075	-3.8500	X
000076	-8.7900	X
000077	-7.4300	X
000078	-6.1900	X
000079	-6.4300	X
000080	-7.3300	X
000082	-4.5700	X
000083R	-16.4000	X
000084R	-22.9000	X*
000085	-17.4000	X
000086	-9.0900	X
000087R	-23.1000	X*
000088R	-20.9600	X*
000089	-17.6000	X
000090	-7.1400	X
000091R	-8.2200	X
000092	-7.4700	X
000093R	-18.2000	X
000094R	-16.3000	X
000095	-18.1000	X
000096R	-18.5000	X
000097R	-13.4000	X
000098R	-28.6000	X*
000099R	-16.3000	X
000100	-5.6600	X
000101	-6.9200	X
000102R	-16.0000	X
000103R	-6.6600	X
000104	-6.0000	X

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DEVICE = SJ6708H

CONTROL # = 05523H
LOT = 001
READOUT = 10

UNIT	HFE3(%)	
000105	-2.2800	X
000106	-5.8500	X
000107R	-3.1000	X
000108	-5.6400	X
000109R	-7.7500	X
000110R	-12.400	X
000111	-9.2100	X
000112R	-22.400	X*
000113	-5.6100	X
000114	-7.2200	X
000115	-5.0300	X
000116	-5.5700	X
000117	-12.500	X
000118	-11.400	X
000119R	-4.6000	X
000120	-4.8300	X
000121R	-18.200	X
000122R	-19.100	X
000123	-4.2400	X
000124	-4.7400	X
000125	-5.0000	X
000126R	-17.800	X
000127	-9.7200	X
000128R	-10.900	X
000129	-5.3600	X
000130	-7.0200	X
000131R	-33.500	X*
000132	-13.400	X
000133	-4.2000	X
000134	-16.700	X
000135	-4.6000	X
000136R	-21.000	X*
000137	-16.200	X
000138	-12.600	X
000139	-6.7400	X
000140R	-12.800	X
000141R	-9.6300	X
000142	-6.8100	X
000143R	-12.500	X
000144R	-18.200	X
000146	-7.0300	X
000147	-6.3800	X
000148	-6.2000	X
000152	-15.100	X
000153R	-11.200	X
000154	-4.0500	X
000155	-13.500	X
000156	-3.0300	X
000157	-967.00	MX
000158	-4.3000	X

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 10

UNIT	HFE3(%)
000159	-4.3900 %
000160R	-10.800 %
000161R	-17.400 %
000162	-4.0500 %
000163	-5.7400 %
000164	-4.5700 %
000165	-5.0900 %
000166	-10.100 %
000167R	-15.600 %
000168R	-27.000 %

DEVICE = SJ6708H

CONTROL # = 05238

LOT = 001

READDUT = 10

REJECT LIST

000002	000006	000010	000015	000022	000024	000028	000029	000032	000037	000039	000044	000045
000047	000057	000058	000059	000062	000083	000084	000087	000088	000091	000093	000094	000096
000097	000098	000099	000102	000103	000107	000109	000110	000112	000119	000121	000122	000126
000128	000131	000136	000140	000141	000143	000144	000153	000160	000161	000167	000168	

DEVICE = SJ6708H

CONTROL # = DS8238

LOT = 001

READOUT = 10

REJECT LIST

ELECTRICAL REJECTS

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000002	ICES1	2	HFE3	2						
000010	ICES1	2	HFE3	2						
000024	ICES1	2								
000028	HFE3	2								
000029	ICES1	2	HFE3	2						
000037	ICES1	2								
000044	ICES1	2								
000057	ICES1	2								
000058	ICES1	2								
000064	ICES1	2								
000091	ICES1	2								
000093	ICES1	2	HFE3	3						
000094	ICES1	2								
000096	HFE3	2								
000098	HFE3	2								
000099	ICES1	2								
000102	ICES1	2	HFE3	3						
000103	ICES1	2								
000107	ICES1	4								
000109	ICES1	4								
000112	ICES1	4								
000119	ICES1	4								
000121	HFE3	4								
000122	HFE3	4								
000126	ICES1	4	HFE3	4						
000131	HFE3	4								
000141	ICES1	4								
000143	ICES1	4	HFE3	4						
000144	ICES1	4	HFE3	4						
000153	ICES1	4								

DELTA REJECTS

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000002	ICES1	2								
000006	ICES1	2								
000010	ICES1	2								
000022	ICES1	2								
000024	ICES1	2								
000028	ICES1	2								
000029	ICES1	2								
000032	ICES1	2								
000037	ICES1	2								
000044	ICES1	2								
000045	ICES1	2								
000047	ICES1	2								
000057	ICES1	2								
000058	ICES1	2								
000059	ICES1	2								
000062	ICES1	2								
000083	ICES1	2								
000084	ICES1	2								
000091	ICES1	2								

ORIGINAL PAGE IS
OF POOR QUALITY.

DEVICE = SJ6708H

CONTROL # = 050230
 LOT = 001
 READDUT = 10

REJECT LIST

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000093	ICES1	3								
000094	ICES1	3								
000096	ICES1	3								
000097	ICES1	3								
000099	ICES1	3								
000102	ICES1	3								
000103	ICES1	3								
000107	ICES1	4								
000109	ICES1	4								
000110	ICES1	4								
000112	ICES1	4								
000119	ICES1	4								
000121	ICES1	4								
000122	ICES1	4								
000126	ICES1	4								
000128	ICES1	4								
000136	ICES1	4								
000140	ICES1	4								
000141	ICES1	4								
000143	ICES1	4								
000144	ICES1	4								
000153	ICES1	4								
000160	ICES1	5								
000161	ICES1	5								
000167	ICES1	5								
000168	ICES1	5								

PERCENT DELTA REJECTS

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000002	ICES1	6	HFE3	6						
000006	ICES1	6								
000010	ICES1	6								
000015	HFE3	6								
000022	ICES1	6								
000024	ICES1	6								
000028	ICES1	6	HFE3	6						
000029	ICES1	6	HFE3	6						
000032	ICES1	6								
000037	ICES1	6								
000039	HFE3	6								
000044	ICES1	6								
000045	ICES1	6	HFE3	6						
000047	ICES1	6								
000057	ICES1	6								
000058	ICES1	7	HFE3	7						
000059	ICES1	7								
000062	ICES1	7	HFE3	7						
000063	ICES1	7								
000064	ICES1	7	HFE3	7						
000087	HFE3	7								
000088	HFE3	7								
000091	ICES1	5								

ORIGINAL PAGE IS
 OF POOR QUALITY.

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 10

REJECT LIST

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000093	ICES1	3								
000094	ICES1	3								
000096	ICES1	3								
000097	ICES1	3								
000098	HFE3	7								
000099	ICES1	3								
000102	ICES1	3								
000103	ICES1	3								
000107	ICES1	4								
000109	ICES1	4								
000110	ICES1	4								
000112	ICES1	4	HFE3	8						
000119	ICES1	4								
000121	ICES1	4								
000122	ICES1	4								
000126	ICES1	4								
000128	ICES1	4								
000131	HFE3	8								
000136	ICES1	4	HFE3	8						
000140	ICES1	4								
000141	ICES1	4								
000143	ICES1	4								
000144	ICES1	4								
000153	ICES1	4								
000160	ICES1	5								
000161	ICES1	5								
000167	ICES1	5								
000168	ICES1	5	HFE3	9						

DEVICE = SJ6708H

CONTROL # = DS5238

SAMPLE SIZE = 50

LOT = 001

REJECTS = 6

READOUT = 15

% REJECTED = 14.55 %

PRIOR = 05

TST CMPL = 04/13/78

DESCRIPTION =

NPN PL-99.784
BURN-IN TJ 187.5 DEG C
168 HOURS TABLE 3ORIGINAL PAGE IS
OF FOUR QUALITY

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES1	001	001	MIN = MAX = 50. UA	0 1	ELECT READING	MEAN = 1.6886743 UA 3 STD DEV = 7.449702 UA	
ICES1 (D)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 1	DELTA DEPENDENT CODE 1	CALC # = 21 MEAN = 915.1987 NA 3 STD DEV = 7.238653 UA	
ICES1 (%)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 15	% DELTA DEPENDENT CODE 3	CALC # = 22 MEAN = 12.672760 % 3 STD DEV = 96.33563 %	
VCES 2	002	002	MIN = MAX = 1. V	0 1	ELECT READING	MEAN = 134.39766 MV 3 STD DEV = 55.26873 MV	
ICES 2	003	005	MIN = MAX = 2.5 M	0 6	ELECT READING	MEAN = 239.73511 U 3 STD DEV = 487.0726 U	
HFE 4	004	004	MIN = MAX = 7.	0 1	ELECT READING	MEAN = 11.689181 3 STD DEV = 5.502648	
HFE3	005	003	MIN = 20. MAX = 60.	0 1	ELECT READING	MEAN = 27.305480 3 STD DEV = 9.428051	
HFE3 (%)	005	003	PARM # 1 = 005 PARM # 2 = 005 MIN = -20. % MAX = 20. %	1 1	% DELTA	CALC # = 22 MEAN = -12.094210 % 3 STD DEV = 11.677136 %	

QACS0505

MEASUREMENTS COVER SHEET

DATE 04/13/76

PAGE 2

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 15

PARAMETER CONDITIONS PARM # TEST # LIMITS # FAILURES REJECT CRITERIA

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA
TF	006	006	MIN = MAX = 1. US	0 1	ELECT READING MEAN = 356.5720 NS 3 STD DEV = 172.57538 NS

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 0S5238

LOT = 001

READOUT = 15

UNIT	ICES1	ICES1(D)	ICES1(X)	VCS 2	ICES 2	HFE 4	HFE3
000070	565.0 NA	125.5 NA	28.55500 X	132.5 MV	292.5 U	12.11	29.9
000071	474.0 NA	37.5 NA	8.60000 X	120.5 MV	281.0 U	12.29	31.6
000072	836.5 NA	471.5 NA	129.1700 X*	147.0 MV	10.240 U	14.79	27.2
000073	421.0 NA	6.5 NA	1.568100 X	139.5 MV	242.0 U	11.42	28.5
000075	350.5 NA	-26.5 NA	-7.02900 X	136.0 MV	245.5 U	7.77	22.9
000076	447.5 NA	43.0 NA	10.63000 X	117.5 MV	289.0 U	12.09	32.1
000077	450.5 NA	61.5 NA	15.80900 X	162.0 MV	192.00 N	10.82	24.0
000078	514.5 NA	112.5 NA	27.98500 X	119.5 MV	233.0 U	14.01	29.1
000079	756.0 NA	65.5 NA	9.49200 X	150.0 MV	320.0 U	11.22	26.2
000080	1.1650 UA	785.5 NA	206.9800 X*	116.5 MV	267.0 U	11.09	28.1
000082	2.180 UA	505.5 NA	30.19700 X	136.5 MV	283.0 U	11.00	29.0
000085	858.0 NA	445.5 NA	108.0000 X*	118.0 MV	318.5 U	11.45	29.5
000086	548.5 NA	119.5 NA	27.85500 X	127.0 MV	306.5 U	10.97	28.5
000089R	8.760 UA	8.1575 UA	1.353900 KX*	144.0 MV	868.0 U	8.00	22.2
000090	384.0 NA	44.0 NA	12.94100 X	140.5 MV	19.05 U	9.07	20.8
000092	528.5 NA	82.0 NA	18.36500 X	117.0 MV	278.5 U	11.53	30.3
000095	1.4680 UA	-552.0 NA	-27.32600 X	188.0 MV	342.5 U	9.44	22.5
000100R	7.505 UA	7.2245 UA	1.949900 KX*		17.45 U	*	*
000104	1.4720 UA	421.5 NA	40.1400 X	121.0 MV	352.5 U	13.35	32.2
000105	3.190 UA	-1.335 UA	-29.50200 X	167.5 MV	9.55 U	10.66	28.8
000106	2.395 UA	1.9625 UA	453.700 X*	184.5 MV	12.75 U	11.06	21.1
000108	469.0 NA	-123.5 NA	-21.11000 X	128.5 MV	273.0 U	11.32	27.7
000113	701.5 NA	-119.5 NA	-14.55500 X	133.5 MV	255.5 U	11.17	29.2
000114	485.0 NA	-45.5 NA	-8.58400 X	116.5 MV	198.40 N	11.29	30.1
000115	357.0 NA	-45.5 NA	-11.30400 X	122.5 MV	242.0 U	9.39	23.9
000116	347.5 NA	-69.5 NA	-16.66600 X	133.0 MV	255.5 U	7.06	21.6
000117	2.265 UA	1.8865 UA	498.400 X*	128.0 MV	203.20 N	13.35	29.2
000118	645.5 NA	-2.5 NA	-385.800 MX	133.5 MV	256.0 U	13.34	24.2
000123	2.060 UA	937.5 NA	83.5500 X	181.5 MV	371.0 U	10.15	27.0
000124	2.780 UA	-1.250 UA	-31.01700 X	162.0 MV	23.40 U	10.75	29.2
000125	1.2000 UA	773.5 NA	181.3500 X*	125.0 MV	205.5 U	13.77	26.8
000127	557.0 NA	140.0 NA	33.5700 X	119.0 MV	221.0 U	13.83	28.9
000129	725.5 NA	-203.5 NA	-21.90500 X	145.0 MV	236.0 U	14.38	28.5
000130	2.095 UA	1.7375 UA	486.000 X*	138.5 MV	242.0 U	15.13	28.5
000132	2.560 UA	2.0800 UA	433.300 X*	132.0 MV	261.5 U	12.89	25.7
000133	6.070 UA	2.370 UA	64.0500 X	158.5 MV	329.0 U	14.02	28.8
000134R	472.0 UA*	471.2750 UA*	65.0000 KX*	127.0 MV	345.00 M *	10.48	25.1
000135	628.5 NA	138.5 NA	28.26500 X	124.0 MV	2.0475 U	12.24	27.1
000137	14.555 UA	13.8410 UA	1.938500 KX*	163.5 MV	448.0 U	10.26	20.1
000138	869.0 NA	415.5 NA	91.7200 X	155.5 MV	278.5 U	12.02	25.0
000139	338.5 NA	-26.5 NA	-7.26000 X	131.5 MV	306.0 U	14.18	29.1
000142	489.0 NA	95.0 NA	24.11100 X	123.0 MV	246.5 U	14.81	31.9
000146	493.0 NA	-160.0 NA	-24.50200 X	124.0 MV	244.5 U	14.40	30.0
000147	367.5 NA	-61.5 NA	-14.33500 X	119.5 MV	242.0 U	12.85	27.5
000148	473.0 NA	16.0 NA	3.50100 X	124.0 MV	274.0 U	12.52	22.7
000154R	423.5 NA	-45.0 NA	-9.61500 X	112.5 MV	99.9 M *	13.06	31.4
000155R	535.5 NA	34.0 NA	6.78600 X	130.5 MV	99.9 M *	9.49	23.1
000156R	976.5 NA	470.0 NA	94.0000 X	122.5 MV	99.9 M *	11.90	29.5
000157	1.4145 UA	854.0 NA	152.3600 X*	125.5 MV	178.0 U	10.89	27.7
000158	1.1040 UA	457.5 NA	70.6200 X	127.5 MV	218.0 U	10.33	26.8

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 15

UNIT	ICES1	ICES1(D)	ICES1(X)	VCES 2	ICES 2	HFE 4	HFE3
000159	3.450 UA	3.0115 UA	687.500 X*	114.0 MV	286. U	12.44	30.3
000163R	498.5 NA	9.5 NA	1.942700 X	119.5 MV	99.9 M *	10.42	28.2
000164	439.5 NA	-31.0 NA	-6.59500 X	114.5 MV	153. U *	12.50	32.0
000165R	622.5 NA	160.0 NA	24.15000 X	130.5 MV	99.9 M *	10.63	27.9
000166	4.650 UA	3.4210 UA	278.3500 X*	122.5 MV	710. U	9.60	25.3

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 15

UNIT	HFE3(%)	TF
000070	-6.26900 %	350. NS
000071	-11.23500 %	460. NS
000072	-9.03000 %	400. NS
000073	-10.09400 %	450. NS
000075	-10.54600 %	325. NS
000076	-6.95600 %	425. NS
000077	-10.78000 %	330. NS
000078	-15.40600 %	445. NS
000079	-12.37400 %	340. NS
000080	-17.59500 %	400. NS
000082	-7.34800 %	350. NS
000085	-18.28200 %	400. NS
000086	-13.63600 %	400. NS
000089R	-20.14300 %*	325. NS
000090	-12.60500 %	350. NS
000092	-16.06600 %	425. NS
000095	-16.66600 %	360. NS
000100R		999. S*
000104	-6.00000 %	350. NS
000105	-5.88200 %	350. NS
000106	-11.71500 %	325. NS
000108	-7.97300 %	300. NS
000113	-8.46300 %	350. NS
000114	-13.00500 %	440. NS
000115	-7.36400 %	350. NS
000116	-13.94400 %	300. NS
000117	-14.61900 %	450. NS
000118	-18.24300 %	340. NS
000123	-4.59300 %	330. NS
000124	-7.59400 %	325. NS
000125	-15.18900 %	400. NS
000127	-19.72200 %	350. NS
000129	-10.09400 %	350. NS
000130	-8.94500 %	450. NS
000132	-15.46000 %	320. NS
000133	-6.79600 %	375. NS
000134R	-14.33400 %	360. NS
000135	-10.85500 %	335. NS
000137	-16.25000 %	340. NS
000138	-16.66600 %	325. NS
000139	-10.73600 %	470. NS
000142	-9.37500 %	420. NS
000146	-12.02300 %	410. NS
000147	-17.66400 %	450. NS
000148	-17.15300 %	320. NS
000154R	-8.98500 %	320. NS
000155R	-19.79100 %	245. NS
000156R	-10.33400 %	300. NS
000157	-10.64500 %	280. NS
000158	-11.25800 %	250. NS

DEVICE = SJ6708H

CONTROL # = US5238
LOT = 001
READOUT = 15

UNIT	HFE3(%)	TF
000159	-11.14300 %	320. NS
000163R	-14.80300 %	280. NS
000164	-8.57100 %	320. NS
000165R	-11.14600 %	280. NS
000166	-16.77600 %	240. NS

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 15

REJECT LIST

000089 000100 000134 000154 000155 000156 000163 000165

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = US5238

LOT = 001

READOUT = 15

REJECT LIST

ELECTRICAL REJECTS

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000100	VCE5	2	3	HFE	4	3	HFE3	3	TF	5
000134	ICES	1	3	ICES	2	3				
000154	ICES	2	3							
000155	ICES	2	3							
000156	ICES	2	3							
000163	ICES	2	4							
000165	ICES	2	4							

DELTA REJECTS

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000134	ICES	1	3							

PERCENT DELTA REJECTS

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000089	HFE3		5							
000100	HFE3		5							
000134	ICES	1	3							

ORIGINAL PAGE IS
OF POOR QUALITY

e-2

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 76

LOT = 001

REJECTS = 5

READOUT = 20

X REJECTED = 6.58 X

PRIOR = NONE

TST CMPL = 04/05/78

DESCRIPTION = NPN PL-99.784
GROUP B INITIAL TABLE 4

PARAMETER	CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA	MEAN	3 STD DEV
ICES		001	001	MIN = MAX = 50. UA	0 0	ELECT READING	1.5803606 UA	0.332187 UA
BV CES		002	002	MIN = MAX = 800. V	5 0	ELECT READING	922.9436 V	157.80326 V
V CES 2		003	003	MIN = MAX = 1. V	0 0	ELECT READING	137.26275 MV	57.78476 MV
HFE 3		004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	28.290710	9.746618

ORIGINAL PAGE IS
OF POOR
QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 20

UNIT	ICES	BVCES	VCES 2	HFE 3
000001	2.530 UA	894.5 V	129.5 MV	27.9
000003	520.0 NA	805.5 V	130.5 MV	24.1
000004	18.400 UA	894.5 V	128.0 MV	27.7
000005R	7.600 UA	791.5 V*	182.5 MV	28.1
000007	609.0 NA	959.5 V	119.5 MV	33.2
000008	3.320 UA	871.5 V	196.0 MV	23.3
000009	2.585 UA	936.5 V	137.5 MV	30.7
000011	713.0 NA	939.5 V	158.0 MV	25.3
000012	1.3915 UA	943.5 V	162.0 MV	27.7
000013	2.035 UA	905.5 V	151.0 MV	24.9
000014	450.0 NA	815.5 V	115.0 MV	31.6
000016	536.5 NA	1.0045 KV	129.0 MV	30.7
000018	690.5 NA	952.5 V	119.0 MV	32.4
000019	596.5 NA	951.5 V	136.0 MV	31.4
000020	1.3105 UA	935.5 V	123.5 MV	31.7
000021	553.0 NA	871.5 V	132.0 MV	24.6
000023	1.0900 UA	919.5 V	136.5 MV	30.4
000025	768.0 NA	951.5 V	142.0 MV	30.3
000026	1.0660 UA	911.5 V	154.5 MV	26.1
000027F	512.5 NA	799.5 V*	116.5 MV	32.5
000030	800.0 NA	991.5 V	129.0 MV	31.2
000031H	15.130 UA	715.5 V*	127.0 MV	31.5
000033	4.160 UA	847.5 V	167.5 MV	26.5
000034	1.5690 UA	951.5 V	142.0 MV	30.1
000035	509.0 NA	831.5 V	137.5 MV	24.5
000036R	3.370 UA	799.5 V*	160.5 MV	26.5
000038	458.5 NA	967.5 V	142.0 MV	23.9
000040	726.5 NA	851.5 V	119.0 MV	33.1
000041R	475.0 NA	149.0 V*	124.5 MV	24.5
000042	514.0 NA	927.5 V	141.5 MV	23.9
000046	513.5 NA	815.5 V	136.5 MV	25.2
000048	578.5 NA	919.5 V	129.0 MV	30.4
000049	1.2740 UA	938.5 V	148.0 MV	30.4
000050	634.0 NA	924.0 V	137.5 MV	29.7
000051	481.0 NA	944.5 V	128.0 MV	30.5
000052	397.5 NA	931.5 V	118.0 MV	32.9
000053	1.3780 UA	911.5 V	125.0 MV	31.4
000054	461.0 NA	858.5 V	125.0 MV	23.5
000055	564.5 NA	831.5 V	137.5 MV	23.6
000056	1.3945 UA	887.5 V	116.0 MV	34.2
000060	1.0290 UA	945.5 V	127.5 MV	30.7
000061	1.4510 UA	875.5 V	136.0 MV	31.3
000063	3.015 UA	851.5 V	172.0 MV	25.3
000064	1.4385 UA	978.5 V	124.0 MV	32.1
000065	4.770 UA	671.5 V	177.5 MV	28.4
000066	406.5 NA	1.0045 KV	140.5 MV	29.6
000067	1.5030 UA	808.5 V	117.5 MV	33.7
000068	425.0 NA	923.5 V	115.5 MV	33.1
000069	602.0 NA	811.5 V	138.0 MV	24.1
000071	680.0 NA	907.5 V	117.5 MV	32.2

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 20

UNIT	ICES	BVCES	VCES 2	HFE 3
000072	516.5 NA	1.0075 KV	143.5 MV	27.4
000073	403.0 NA	1.0065 KV	135.5 MV	28.1
000075	346.5 NA	941.5 V	132.5 MV	28.9
000078	606.5 NA	970.5 V	117.0 MV	28.9
000079	807.5 NA	903.5 V	137.5 MV	26.4
000080	620.0 NA	965.5 V	114.0 MV	28.6
000086	606.5 NA	957.5 V	124.0 MV	28.9
000090	417.5 NA	983.5 V	145.5 MV	21.1
000092	745.0 NA	923.0 V	114.5 MV	30.7
000095	1.7340 UA	976.0 V	185.0 MV	22.5
000105	3.560 UA	910.5 V	164.0 MV	29.4
000106	936.0 NA	1.0250 KV	180.5 MV	21.2
000106	609.0 NA	910.5 V	125.0 MV	28.3
000113	850.5 NA	889.5 V	130.0 MV	29.5
000114	574.5 NA	940.5 V	113.5 MV	30.1
000115	347.0 NA	927.5 V	123.0 MV	23.7
000117	2.865 UA	1.0145 KV	123.0 MV	19.9
000118	677.0 NA	956.0 V	132.5 MV	24.8
000123	765.0 NA	1.0195 KV	181.0 MV	27.4
000124	1.560 UA	926.0 V	158.5 MV	29.0
000125	263.5 NA	942.5 V	123.0 MV	27.9
000126	677.0 NA	910.0 V	114.0 MV	30.0
000127	712.5 NA	905.0 V	144.0 MV	27.5
000128	427.5 NA	915.5 V	135.5 MV	27.6
000129	712.5 NA	905.0 V	144.0 MV	27.5
000130	427.5 NA	915.5 V	135.5 MV	27.6

DEVICE = SJ6708H

CONTROL # = 050238

LOT = 001

READOUT = 20

REJECT LIST

000005 000027 000031 000036 000041

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 20

REJECT LIST

ELECTRICAL REJECTS

UNIT	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE	PARAM	PAGE
000005	BVCES	2								
000027	BVCES	2								
000031	BVCES	2								
000036	BVCES	2								
000041	BVCES	2								

ORIGINAL PAGE 19
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055236

SAMPLE SIZE = 20

LOT = 001

REJECTS = 0

READOUT = 30

% REJECTED = .00 %

PRIOR = NONE

TST CMPL = 02/09/78

DESCRIPTION = NPN PL-99.784
 E-3 SHOCK VIB VAR FREQ
 CONSTANT ACCELERATION ACOUSTIC
 TABLE 4 LIMIT 1

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA	
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 1.1661722 UA 3 STD DEV = 2.9947786 UA
BVCES	002	002	MIN = MAX = 800. V	0 0	ELECT READING	MEAN = 946.7503 V 3 STD DEV = 123.09599 V
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 134.79965 MV 3 STD DEV = 63.57187 MV
HFE 3	004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	MEAN = 27.829940 3 STD DEV = 7.376669

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 30

UNIT	ICES 1	BVCES	VCES 2	HFC 3
000071	626.0 NA	904.0 V	119.0 MV	31.7
000072	522.0 NA	1.0055 KV	143.5 MV	27.3
000073	445.5 NA	1.0055 KV	135.5 MV	27.9
000075	473.0 NA	896.0 V	132.0 MV	23.4
000078	865.0 NA	973.0 V	117.0 MV	29.7
000079	884.5 NA	902.0 V	138.0 MV	26.5
000080	521.0 NA	967.5 V	113.5 MV	28.1
000092	829.5 NA	931.5 V	114.0 MV	30.8
000095	3.030 UA	975.5 V	185.0 MV	23.0
000096	679.5 NA	955.5 V	126.0 MV	29.2
000105	3.670 UA	909.5 V	164.0 MV	29.4
000108	634.0 NA	910.5 V	129.0 MV	28.3
000113	918.5 NA	887.5 V	130.0 MV	29.5
000114	619.0 NA	937.5 V	114.0 MV	30.0
000115	445.0 NA	927.5 V	120.0 MV	24.1
000117	3.070 UA	1.0115 KV	123.0 MV	29.9
000118	713.0 NA	947.5 V	131.5 MV	23.9
000123	875.0 NA	1.0215 KV	182.5 MV	27.5
000124	2.695 UA	907.5 V	160.0 MV	29.3
000125	808.0 NA	958.5 V	122.5 MV	27.1

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 20

LOT = 001

REJECTS = 0

READOUT = 35

% REJECTED = .00 %

PRIOR = NONE

TST CMPL = 12/14/77

DESCRIPTION = NPN PL-99.784
B-4 SAFE OPERATING AREA
TABLE 4 LIMIT 1

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN =	50. UA	0	ELECT READING	MEAN = 897.0237 MA
			MAX =				3 STD DEV = 2.2618778 UA
BVCS	002	002	MIN =	800. V	0	ELECT READING	MEAN = 959.5498 V
			MAX =				3 STD DEV = 131.34851 V
VCES 2	003	003	MIN =	1. V	0	ELECT READING	MEAN = 137.04967 MV
			MAX =				3 STD DEV = 69.39715 MV
HFE 3	004	004	MIN =	20.	0	ELECT READING	MEAN = 26.939941
			MAX =				3 STD DEV = 9.408920

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 35

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000071	634.0 NA	908.5 V	117.5 MV	32.1
000072	528.0 NA	1.0115 KV	143.5 MV	27.5
000073	453.5 NA	1.0035 KV	138.0 MV	28.3
000075	439.5 NA	945.0 V	133.0 MV	23.6
000076	563.5 NA	970.5 V	116.0 MV	28.8
000079	877.0 NA	903.5 V	137.5 MV	26.6
000080	539.5 NA	951.5 V	114.0 MV	28.1
000086	621.0 NA	955.5 V	124.0 MV	29.0
000090	341.5 NA	979.5 V	144.5 MV	20.7
000092	628.5 NA	930.0 V	114.0 MV	30.1
000095	1.4100 UA	967.5 V	185.5 MV	22.5
000105	3.360 UA	908.5 V	165.0 MV	29.0
000106	1.4400 UA	1.0220 KV	164.0 MV	21.1
000108	478.5 NA	896.0 V	124.0 MV	27.7
000113	677.5 NA	886.5 V	130.5 MV	29.1
000114	602.0 NA	941.5 V	113.0 MV	30.3
000115	345.0 NA	1.0235 KV	121.0 MV	23.7
000117	2.560 UA	1.0125 KV	123.5 MV	29.4
000118	717.5 NA	958.5 V	151.5 MV	24.2
000123	704.0 NA	1.0155 KV	181.0 MV	27.0

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 23

LOT = 001

REJECTS = 1

READOUT = 40

% REJECTED = 4.35 %

PRIOR = 20

TST CMPL = 04/05/78

DESCRIPTION = NPN PL-99.784
 B-5 HIGH TEMP LIFE TA_200 DEG C
 340 HOURS TABLE 4

PARAMETER	CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1		001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 894.7386 UA 3 STD DEV = 2.6684137 UA	
ICES 1 (D)		001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 0	DELTA DEPENDENT CODE 1	CALC # = 21 MEAN = -17.506581 UA 3 STD DEV = 1.6146186 UA	
ICES 1 (%)		001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 0	% DELTA DEPENDENT CODE 3	CALC # = 22 MEAN = -2.6594781 % 3 STD DEV = 98.50291 %	
BVCES		002	002	MIN = 800. V MAX =	1 0	ELECT READING	MEAN = 843.8636 V 3 STD DEV = 94.84684 V	
VCES 2		003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 132.15184 MV 3 STD DEV = 59.26340 MV	
HFE 3		004	004	MIN = 20. MAX = 60.	0 0	ELECT READING	MEAN = 28.060791 3 STD DEV = 7.506437	
HFE 3 (%)		004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	% DELTA	CALC # = 22 MEAN = 1.0756855 % 3 STD DEV = 10.009340 %	

ORIGINAL PAGE IS
 OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238
LUT = 001
READOUT = 40

UNIT	ICES 1	ICES 1(D)	ICES 1(X)	BVCES	VCES 2	HFE 3	HFE 3(X)
000071	410.0 NA	-270.0 NA	-39.7000 X	892.5 V	114.0 MV	31.6	-1.863300 X
000072	365.5 NA	-151.0 NA	-29.23500 X	847.5 V	140.5 MV	25.6	-2.919700 X
000073	400.5 NA	-2.5 NA	-620.300 MX	863.5 V	134.5 MV	28.0	-355.800 MX
000075	402.5 NA	56.0 NA	16.16100 X	823.5 V	128.5 MV	23.6	3.050700 X
000075	587.0 NA	-19.5 NA	-3.215100 X	845.5 V	114.0 MV	30.6	5.88200 X
000079R	740.5 NA	-67.0 NA	-8.36200 X	795.5 V*	135.0 MV	26.2	-757.500 MX
000080	591.5 NA	-34.5 NA	-5.51100 X	871.5 V	111.5 MV	30.3	5.94400 X
000086	442.5 NA	-164.0 NA	-27.04000 X	854.5 V	122.0 MV	28.2	-5.422100 X
000092	450.0 NA	-295.0 NA	-39.5900 X	877.5 V	117.0 MV	31.5	2.605800 X
000095	2.955 UA	1.2210 UA	71.4000 X	871.5 V	182.0 MV	23.4	2.631500 X
000105	3.470 UA	-90.0 NA	-2.528000 X	815.5 V	162.0 MV	29.4	0. MX
000108	555.0 NA	-54.0 NA	-8.86600 X	809.5 V	124.0 MV	27.4	-3.180200 X
000113	764.5 NA	-94.0 NA	-10.94900 X	806.5 V	128.5 MV	28.4	-3.72800 X
000114	580.5 NA	6.0 NA	1.044300 X	843.5 V	112.5 MV	31.3	3.98600 X
000115	328.0 NA	-19.0 NA	-5.47500 X	831.5 V	127.0 MV	23.1	-2.531600 X
000117	1.1585 UA	-1.6965 UA	-59.4200 X	935.5 V	119.0 MV	29.9	0. ML
000118	578.5 NA	-98.5 NA	-14.34900 X	807.5 V	131.5 MV	24.5	2.083300 X
000123	904.0 NA	139.0 NA	18.10900 X	823.5 V	177.5 MV	28.6	2.189700 X
000124	2.960 UA	1.400 UA	89.7400 X	847.5 V	156.5 MV	29.4	1.379300 X
000125	370.5 NA	107.0 NA	40.6000 X	831.5 V	121.0 MV	27.5	-1.433600 X
000127	549.5 NA	-163.0 NA	-22.87700 X	811.5 V	112.5 MV	30.3	10.18100 X
000129	618.0 NA	-94.5 NA	-13.06300 X	825.5 V	140.0 MV	28.1	2.181800 X
000130	397.0 NA	-30.5 NA	-7.14200 X	831.5 V	133.5 MV	28.1	1.811500 X

ORIGINAL PAGE IS
OF POOR
QUALITY

DEVICE = SJ6706H

CONTROL # = 055238
LOT = 001
READOUT = 40

REJECT LIST

000079

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H CONTROL # = C55238 SAMPLE SIZE = 22
 LCT = 001 # REJECTS = 0
 REACLT = 45 % REJECTED = .00 %
 PRICE = 20
 TST CMFL = 04/26/78

DESCRIPTION = NPN PL-55.784
 E-5 HIGH TEMP LIFE TA_200 DEG C
 670 HCLRS TAELE 4

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA	
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 1.0988596 UA 3 STD DEV = 4.381328 UA
ICES 1 (D)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 0	DELTA DEPENDENT CODE 1	CALC # = 21 MEAN = 181.77252 NA 3 STD DEV = 3.1355820 UA
ICES 1 (X)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 2	% DELTA DEPENDENT CODE 3	CALC # = 22 MEAN = -7.675933 % 3 STD DEV = 91.78752 %
BVCES	002	002	MIN = MAX = 800. V	0 0	ELECT READING	MEAN = 833.8635 V 3 STD DEV = 57.65245 V
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 132.47686 MV 3 STD DEV = 59.18470 MV
HFE 3	004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	MEAN = 28.186279 3 STD DEV = 7.474024
HFE 3 (X)	004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	% DELTA	CALC # = 22 MEAN = 1.3187670 % 3 STD DEV = 10.025571 %

ORIGINAL PART
 OF POOR QUALITY

DEVICE = SJ67CEH

CONTROL # = CSE238
 LCT = 001
 READCUT = 45

UNIT	ICES 1	ICES 1(D)	ICES 1(X)	EVCS	VCS 2	HFE 3	HFE 3(X)
000071	450. NA	-230.0 NA	-23.8200 X	863.5 V	115.5 MV	31.7	-1.552700 X
000072	400. NA	-116.5 NA	-22.55500 X	831.5 V	138.5 MV	26.8	-2.165700 X
000073	470. NA	67.0 NA	16.82500 X	847.5 V	136.5 MV	28.0	-3.55.200 MX
000075	340. NA	-6.5 NA	-1.875900 X	815.5 V	128.5 MV	23.4	2.163400 X
000078	435. NA	-171.5 NA	-26.27600 X	835.5 V	114.5 MV	30.3	4.84400 X
000080	430. NA	-196.0 NA	-31.30500 X	831.5 V	112.0 MV	30.0	4.89500 X
000086	475. NA	-131.5 NA	-21.68100 X	823.5 V	123.0 MV	27.3	-5.53600 X
000092	470. NA	-275.0 NA	-36.5100 X	831.5 V	112.0 MV	31.7	3.257300 X
000095	5.5 UA	3.7760 UA	219.0200 X*	863.5 V	182.0 MV	23.6	3.50800 X
000105	5. UA	1.440 UA	40.4400 X	840. V	161.0 MV	29.9	1.700800 X
000108	600. NA	-9.0 NA	-1.477800 X	830. V	125.5 MV	27.1	-4.24000 X
000113	880. NA	21.5 NA	2.805800 X	820. V	128.5 MV	28.9	-2.033800 X
000114	500. NA	-74.5 NA	-12.96700 X	840. V	114.5 MV	31.3	3.98600 X
000115	400. NA	53.0 NA	15.27300 X	823.5 V	129.0 MV	23.4	-1.265800 X
000117	770. NA	-2.065 UA	-73.1500 X	891.5 V	121.0 MV	30.0	234.400 MX
000118	680. NA	3.0 NA	443.100 MX	820. V	130.0 MV	24.9	3.75000 X
000123	870. NA	105.0 NA	13.72500 X	815.5 V	177.0 MV	28.3	3.28400 X
000124	3.5 UA	1.540 UA	124.3500 X*	823.5 V	157.0 MV	29.6	2.068500 X
000125	445. NA	181.5 NA	68.8800 X	850. V	121.5 MV	27.7	-716.800 MX
000127	420. NA	-262.5 NA	-41.0800 X	825. V	113.0 MV	26.9	8.72700 X
000129	780. NA	67.5 NA	5.48000 X	807.5 V	140.5 MV	26.8	4.72700 X
000130	360. NA	-67.5 NA	-15.76900 X	815.5 V	133.5 MV	27.5	-362.300 MX

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 22

LOT = 001

REJECTS = 0

READOUT = 50

% REJECTED = .00 %

PRIOR = 20

TST CMPL = 05/24/78

DESCRIPTION = NPN PL-96.784
1000 HOURS TABLE 4

PARAMETER	CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1		001	001	MIN = MAX =	0 0	ELECT READING	MEAN =	1.1995398 UA
				50. UA			3 STD DEV =	6.331744 UA
ICES 1 (D)		001	001	PARM # 1 = 001 MIN = MAX =	0 0	DELTA DEPENDENT CODE 1	MEAN =	282.45432 NA
				20. UA 20. UA			3 STD DEV =	5.547414 UA
ICES 1 (%)		001	001	PARM # 1 = 001 MIN = MAX =	0 2	% DELTA DEPENDENT CODE 3	MEAN =	-14.651146 %
				100. %			3 STD DEV =	79.39457 %
BVCES		002	002	MIN = MAX =	0 0	ELECT READING	MEAN =	822.9770 V
				800. V			3 STD DEV =	53.19712 V
VCES 2		003	003	MIN = MAX =	0 0	ELECT READING	MEAN =	132.22688 MV
				1. V			3 STD DEV =	61.61437 MV
HFE 3		004	004	MIN = MAX =	0 0	ELECT READING	MEAN =	27.704483
				20. 60.			3 STD DEV =	7.549638
HFE 3 (%)		004	004	PARM # 1 = 004 MIN = MAX =	0 0	% DELTA	MEAN =	-425.1390 %
				-20. % 20. %			3 STD DEV =	10.959042 %

ORIGINAL PAGE
OF POOR QUALITY

DEVICE = SJ5708H

CONTROL # = 055238

LQT = 001

READOUT = 50

UNIT	ICES 1	ICES 1(D)	ICES 1(%)	RVCS	VCS 2	HFE 3	HFE 3(%)
000071	500. NA	-180.0 NA	-26.47000 %	839.5 V	113.5 MV	31.2	-3.105500 X
000072	430. NA	-86.5 NA	-16.74700 %	823.5 V	140.0 MV	26.0	-5.10900 X
000073	430. NA	27.0 NA	6.59900 %	831.5 V	135.5 MV	27.9	-711.700 MX
000075	320. NA	-26.5 NA	-7.55800 %	805. V	129.5 MV	22.5	-1.746700 X
000078	440. NA	-166.5 NA	-27.45200 %	805. V	113.5 MV	29.9	3.46000 X
000080	470. NA	-156.0 NA	-24.92000 %	810.5 V	112.5 MV	29.2	2.097900 X
000086	410. NA	-126.5 NA	-32.35900 %	810.5 V	120.5 MV	27.4	-5.19000 X
000092	460. NA	-285.0 NA	-38.2500 X	811.5 V	111.0 MV	31.3	1.954300 X
000095	10. UA	8.2750 UA	480.000 %*	847.5 V	193.5 MV	23.4	2.631500 X
000105	3.8 UA	240. NA	6.74100 %	812.5 V	160.5 MV	29.9	1.700600 X
000108	530. NA	-79.0 NA	-12.97200 %	820. V	123.0 MV	26.2	-7.42000 X
000113	750. NA	-108.5 NA	-12.63500 %	810. V	128.0 MV	27.9	-5.42300 X
000114	460. NA	-114.5 NA	-19.93000 %	820. V	112.5 MV	30.7	1.993300 X
000115	350. NA	3.0 NA	864.500 MX	815.5 V	130.5 MV	22.6	-4.64100 X
000117	540. NA	-2.315 UA	-81.2200 %	853.5 V	122.5 MV	29.0	-3.01000 X
000118	540. NA	-37.0 NA	-5.46500 %	800. V	131.5 MV	25.0	4.16600 X
000123	800. NA	35.0 NA	4.57500 %	850. V	180.5 MV	27.4	0. MX
000124	3.2 UA	1.640 UA	105.1200 %*	815.5 V	155.0 MV	29.6	2.068900 X
000125	420. NA	156.5 NA	59.3900 %	820. V	121.0 MV	27.6	-1.075200 X
000127	390. NA	-322.5 NA	-45.2900 %	805. V	111.0 MV	29.4	6.90900 X
000129	700. NA	-12.5 NA	-1.754300 %	820. V	141.0 MV	28.3	2.909000 X
000130	350. NA	-77.5 NA	-8.12800 %	860. V	132.5 MV	27.1	-1.811500 X

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 44

LOT = 001

REJECTS = 1

READOUT = 55

% REJECTED = 2.27 %

PRIOR = 20

TST CMPL = 00/00/00

DESCRIPTION = NPN PL-99.784
 B-5 SS OPERATION LIFE TJ_187.5 DEG C
 168 HOURS TABLE 4

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN = MAX = 50. UA	0 1	ELECT READING	MEAN = 929.4145 NA 3 STD DEV = 2.2248368 UA	
ICES 1 (0)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 1	DELTA DEPENDENT CODE 1	MEAN = -669.9007 NA 3 STD DEV = 7.668341 UA	CALC # = 21
ICES 1 (2)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 3	% DELTA DEPENDENT CODE 3	MEAN = -19.484313 % 3 STD DEV = 151.47029 %	CALC # = 22
BVCES	002	002	MIN = 600. V MAX =	1 0	ELECT READING	MEAN = 941.1162 V 3 STD DEV = 154.76005 V	
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 135.06770 MV 3 STD DEV = 47.94356 MV	
HTE 3	004	004	MIN = 20. MAX = 60.	0 0	ELECT READING	MEAN = 27.261260 3 STD DEV = 10.609914	
HFE 3 (2)	004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	% DELTA	MEAN = -5.525446 % 3 STD DEV = 9.989178 %	CALC # = 22

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 55

UNIT	ICES 1	ICES 1(D)	ICES 1(%)	ICES	VCS 2	HFE 3	HFE 3(%)
000001	639.5 NA	-1.8905 UA	-74.700 X	912.5 V	128.0 MV	25.3	-9.3100 X
000003	256.0 NA	-264.0 NA	-50.700 X	889.0 V	128.5 MV	22.0	-8.7100 X
000004	2.075 UA	-16.325 UA	-88.700 X	921.5 V	126.5 MV	26.9	4.3300 X
000007	704.0 NA	95.0 NA	15.500 X	943.5 V	118.0 MV	32.4	-2.4000 X
000008	2.0475 UA	-1.2725 UA	-38.300 X	978.0 V	176.0 MV	22.1	-5.1500 X
000009	1.7920 UA	-793.0 NA	-30.600 X	943.5 V	132.5 MV	28.0	-8.7900 X
000011	764.0 NA	51.0 NA	7.1500 X	932.5 V	163.0 MV	23.6	-6.7100 X
000012	511.5 NA	-880.0 NA	-63.200 X	1.0335 KV	152.5 MV	25.5	-7.9400 X
000013	2.395 UA	360.0 NA	17.600 X	895.5 V	152.0 MV	24.6	-1.2000 X
000014	768.0 NA	318.0 NA	70.600 X	932.0 V	111.5 MV	29.0	-8.8000 X
000016	512.0 NA	-26.5 NA	-4.9200 X	991.0 V	131.5 MV	28.8	-6.1800 X
000018	640.0 NA	-50.5 NA	-7.3100 X	954.0 V	116.5 MV	31.2	-3.7000 X
000019	127.5 NA	-469.0 NA	-78.600 X	999.5 V	127.5 MV	31.4	0.0000 X
000020	1.5355 UA	225.0 NA	17.100 X	1.0190 KV	118.0 MV	28.9	-8.8300 X
000021	3.5 NA	-549.5 NA	-99.300 X	937.5 V	129.5 MV	22.1	-10.800 X
000023	327.5 NA	-762.5 NA	-69.900 X	921.5 V	131.0 MV	28.3	-6.9000 X
000025	768.0 NA	0.0 PA	0.0 PX	1.0240 KV	135.0 MV	27.7	-8.5800 X
000026	223.5 NA	-842.5 NA	-79.000 X	1.0230 KV	149.5 MV	23.7	-9.1900 X
000030	511.5 NA	-288.5 NA	-36.000 X	991.5 V	126.5 MV	29.2	-6.4100 X
000033	1.2800 UA	-2.8800 UA	-69.200 X	898.5 V	164.5 MV	25.8	-2.6400 X
000034	1.6640 UA	95.0 NA	6.0500 X	939.5 V	140.5 MV	29.1	-3.3200 X
000035	383.5 NA	-125.5 NA	-24.500 X	935.5 V	135.0 MV	22.1	-9.7900 X
000038	496.0 NA	-37.5 NA	8.1700 X	957.5 V	143.0 MV	27.4	-6.2700 X
000040	895.5 NA	169.0 NA	23.200 X	895.5 V	120.0 MV	31.0	-4.5100 X
000042	255.5 NA	-258.5 NA	-50.200 X	923.5 V	136.5 MV	20.5	-14.200 X
000046	2.0475 UA	1.5340 UA	298.00 X*	819.5 V	141.0 MV	23.8	-5.5500 X
000048	384.0 NA	-194.5 NA	-33.600 X	983.5 V	126.5 MV	27.7	-8.8800 X
000049	1.4075 UA	133.5 NA	10.400 X	919.5 V	151.0 MV	29.1	-4.2700 X
000050	511.5 NA	-122.5 NA	-19.300 X	903.5 V	129.0 MV	28.7	-3.3600 X
000051	256.5 NA	-224.5 NA	-46.600 X	914.5 V	128.0 MV	29.7	-2.6200 X
000052	767.5 NA	370.0 NA	93.000 X	898.5 V	118.0 MV	32.0	-2.7300 X
000053	2.800 UA	1.4220 UA	103.00 X*	925.5 V	132.0 MV	30.0	-4.6500 X
000054	127.5 NA	-331.5 NA	-72.300 X	834.5 V	130.0 MV	22.1	-5.9500 X
000055	1.0635 UA	499.0 NA	68.300 X	927.5 V	141.0 MV	22.3	-6.3000 X
000056	640.0 NA	-754.5 NA	-54.100 X	948.5 V	117.5 MV	32.8	-4.0900 X
000060	512.0 NA	-517.0 NA	-50.200 X	959.5 V	129.5 MV	29.3	-4.5600 X
000061R	54.15 UA*	52.6990 UA*	3.6300 KX*	780.0 V*	133.0 MV	30.4	-2.8700 X
000063	512.0 NA	-2.5030 UA	-83.000 X	1.6335 KV	173.0 MV	24.7	-2.3700 X
000064	384.0 NA	-1.0545 UA	-73.300 X	954.5 V	123.5 MV	30.7	-4.3600 X
000065	3.040 UA	-1.730 UA	-36.200 X	931.5 V	171.0 MV	28.1	-1.0500 X
000066	544.0 NA	137.5 NA	33.800 X	1.0055 KV	134.5 MV	28.4	-4.6900 X
000067	1.7280 UA	223.0 NA	14.800 X	816.0 V	118.0 MV	32.8	-2.6700 X
000068	767.5 NA	342.5 NA	80.500 X	937.5 V	111.0 MV	30.3	-9.2800 X
000069	896.0 NA	294.0 NA	18.800 X	925.5 V	142.5 MV	22.4	-7.0500 X

ORIGINAL PAGE OF POOR QUALITY

GAC50505

MEASUREMENTS READOUT DETAIL

DATE 12/22/77

PAGE 3

DEVICE = SJ6708H

CONTROL # = 052238
LOT = 001
READOUT = 55

REJECT LIST

000061

QAC5050

MEASUREMENTS READOUT DETAIL

DATE 12/22/77

PAGE 4

DEVICE = SJ6703H

CONTROL # = 055238

LOT = 001

READOUT = 55

REJECT LIST

ORIGINAL PAGE 11
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 55

REJECT LIST

DEVICE = SJ6708H

CONTROL # = DS5238
LOT = 001
READOUT = 55

REJECT LIST

ORIGINAL PAGE 100
BE POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 43

LOT = 001

REJECTS = 0

READOUT = 60

% REJECTED = .00 %

PRIOR = 20

TST CMPL = 00/00/00

DESCRIPTION = NPN PL-99.784
B-6 SS OPERATION LIFE TJ_187.5 DEG C
340 HOURS TABLE 4

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 1.0187141 UA 3 STD DEV = 2.6976258 UA	
ICES 1 (D)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 0	DELTA DEPENDENT CODE 1	MEAN = -580.5994 NA 3 STD DEV = 8.680022 UA	CALC # = 21
ICES 1 (X)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 5	% DELTA DEPENDENT CODE 3	MEAN = -26.607284 % 3 STD DEV = 104.51380 %	CALC # = 22
BVCES	002	002	MIN = 600. V MAX =	0 0	ELECT READING	MEAN = 935.6975 V 3 STD DEV = 149.24807 V	
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 133.09258 MV 3 STD DEV = 48.51396 MV	
HFE 3	004	004	MIN = 20. MAX = 60.	0 0	ELECT READING	MEAN = 26.967346 3 STD DEV = 10.732223	
HFE 3 (X)	004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	X DELTA	MEAN = -6.367243 % 3 STD DEV = 10.879139 %	CALC # = 22

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READDUT = 60

UNIT	ICES 1	ICES 1(D)	ICES 1(X)	BVCES	VCES 2	HFE 3	HFE 3(X)
000001	660.5 NA	-1.8695 UA	-73.800 X	938.5 V	129.5 MV	26.2	-6.0900 X
000003	3.170 UA	2.6500 UA	509.000 X*	847.5 V	129.5 MV	22.3	-7.4600 X
000004	681.0 NA	-17.7190 UA	-96.200 X	910.5 V	123.0 MV	28.6	3.2400 X
000007	555.0 NA	-54.0 NA	-8.8600 X	931.5 V	119.0 MV	32.6	-1.8000 X
000008	2.020 UA	-1.300 UA	-39.100 X	981.0 V	175.0 MV	22.1	-5.1500 X
000009	1.6065 UA	-978.5 NA	-37.800 X	925.5 V	133.0 MV	28.9	-5.8600 X
000011	591.0 NA	-122.0 NA	-17.100 X	917.0 V	162.5 MV	23.6	-6.7100 X
000012	1.6240 UA	252.5 NA	15.700 X	986.0 V	157.5 MV	24.9	-10.100 X
000013	1.6370 UA	-198.0 NA	-9.7200 X	908.5 V	140.0 MV	25.3	-6.4200 X
000014	4.805 UA	4.3550 UA	967.00 X*	859.5 V	113.0 MV	28.5	-10.300 X
000016	383.5 NA	-155.0 NA	-28.700 X	1.0150 KV	131.5 MV	29.2	-4.8800 X
000018	511.0 NA	-179.5 NA	-25.900 X	923.5 V	117.5 MV	31.5	-2.7700 X
000019	386.5 NA	-210.0 NA	-35.200 X	983.5 V	126.5 MV	30.8	-1.9100 X
000020	1.5205 UA	210.0 NA	16.000 X	989.5 V	117.5 MV	27.9	-11.900 X
000021	329.0 NA	-224.0 NA	-40.500 X	930.5 V	127.5 MV	21.6	-12.000 X
000023	784.5 NA	-303.5 NA	-28.000 X	907.5 V	130.0 MV	25.8	-5.2600 X
000025	741.0 NA	-27.0 NA	-3.5100 X	1.0265 KV	132.0 MV	28.1	-7.2600 X
000026	2.460 UA	1.3940 UA	130.00 X*	967.5 V	151.0 MV	23.3	-10.700 X
000030	486.5 NA	-313.5 NA	-39.100 X	1.0055 KV	125.0 MV	29.8	-4.4800 X
000033	1.1385 UA	-3.0215 UA	-72.600 X	899.5 V	162.5 MV	26.0	-1.8800 X
000034	1.4985 UA	-70.5 NA	-4.4900 X	925.5 V	141.0 MV	28.5	-5.3100 X
000035	61.5 NA	106.5 NA	20.900 X	923.5 V	135.5 MV	21.6	-11.800 X
000038	266.5 NA	-192.0 NA	-41.800 X	947.0 V	136.5 MV	22.0	-7.9400 X
000040	509.5 NA	-217.0 NA	-29.800 X	906.0 V	113.5 MV	31.2	-5.7400 X
000042	395.0 NA	-119.0 NA	-23.100 X	936.0 V	134.5 MV	20.4	-14.600 X
000046	434.0 NA	-79.5 NA	-15.400 X	868.5 V	125.5 MV	24.1	-4.3600 X
000048	393.0 NA	-185.5 NA	-32.000 X	983.5 V	126.5 MV	27.4	-9.8600 X
000049	1.5585 UA	284.5 NA	22.300 X	903.5 V	149.0 MV	25.6	-5.9200 X
000050	971.5 NA	337.5 NA	53.200 X	917.5 V	122.5 MV	28.4	-4.3700 X
000051	406.5 NA	-74.5 NA	-15.400 X	934.5 V	123.5 MV	29.3	-3.9300 X
000052	1.1745 UA	77.0 NA	195.00 X*	895.5 V	117.5 MV	31.5	-4.2500 X
000053	565.0 NA	-813.0 NA	-58.900 X	934.5 V	118.0 MV	28.4	-9.5500 X
000054	301.5 NA	-159.5 NA	-34.500 X	827.5 V	129.5 MV	21.4	-8.9300 X
000055	1.6035 UA	1.0390 UA	184.00 X*	919.5 V	141.5 MV	21.6	-9.2400 X
000056	552.0 NA	-842.5 NA	-60.400 X	938.5 V	116.5 MV	32.5	-4.9700 X
000060	411.5 NA	-617.5 NA	-60.000 X	1.0115 KV	124.5 MV	29.1	-5.2100 X
000063	489.0 NA	-2.5260 UA	-83.700 X	1.0315 KV	171.5 MV	24.7	-2.3700 X
000064	399.5 NA	-1.0390 UA	-72.200 X	949.5 V	122.0 MV	30.3	-5.6000 X
000065	2.510 UA	-2.260 UA	-47.300 X	933.0 V	168.5 MV	28.3	-352.00 MX
000066	480.0 NA	7.5 NA	18.000 X	1.0115 KV	133.5 MV	28.8	-3.3500 X
000067	993.0 NA	-512.0 NA	-34.000 X	816.0 V	119.0 MV	32.4	-3.8500 X
000068	682.0 NA	257.0 NA	60.400 X	920.5 V	112.5 MV	29.4	-11.900 X
000069	364.0 NA	-298.0 NA	-49.500 X	931.5 V	157.5 MV	21.5	-10.700 X

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 43

LOT = 001

REJECTS = 0

READOUT = 65

% REJECTED = 0.0 %

PRIOR = 20

TST CMPL = 12/12/77

DESCRIPTION = NPN PL-99.784
B-6 SS OPERATION LIFE TJ_187.5 DEG C
670 HOURS TABLE 4

PARAMETER CONDITIONS PARM # TEST # LIMITS # FAILURES REJECT CRITERIA

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA	MEAN	3 STD DEV
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	913.9377 NA	2.1849327 UA
ICES 1 (D)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 0	DELTA CALC # = 21 DEPENDENT CODE 1	MEAN = -685.3779 NA	3 STD DEV = 8.464044 UA
ICES 1 (X)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 5	% DELTA CALC # = 22 DEPENDENT CODE 3	MEAN = -31.308868 %	3 STD DEV = 100.56674 %
BVCS	002	002	MIN = MAX = 800. V	0 0	ELECT READING	MEAN = 931.5581 V	3 STD DEV = 158.18600 V
VCS 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 134.13912 MV	3 STD DEV = 48.46382 MV
HFE 3	004	004	MIN = 20. MAX = 60.	0 0	ELECT READING	MEAN = 26.385955	3 STD DEV = 10.445343
HFE 3 (X)	004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	% DELTA CALC # = 22	MEAN = -8.362752 %	3 STD DEV = 11.394787 %

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 65

UNIT	ICES 1	ICES 1(D)	ICES 1(%)	VCES	VCES 2	HFE 3	HFE 3(2)
000001	473.0 NA	-2.0570 UA	-81.300 %	939.0 V	131.5 MV	25.6	-8.2400 X
000003	277.5 NA	-242.5 NA	-48.600 %	889.5 V	128.5 MV	21.9	-9.1200 X
000004	456.0 NA	-17.9440 UA	-97.500 %	891.0 V	126.5 MV	27.3	-1.4400 X
000007	590.0 NA	81.0 NA	13.300 %	874.5 V	116.5 MV	31.0	-5.5200 X
000008	2.190 UA	-1.120 UA	-34.000 %	876.0 V	173.5 MV	22.4	-3.8600 X
000009	1.7835 UA	-801.5 NA	-31.000 %	910.5 V	135.0 MV	28.4	-7.4900 X
000011	586.0 NA	-127.0 NA	-17.800 %	877.0 V	158.5 MV	23.0	-6.7100 X
000012	758.5 NA	-633.0 NA	-45.400 %	1.0115 KV	159.0 MV	24.9	-10.100 X
000013	2.145 UA	110. NA	5.4000 %	879.5 V	145.5 MV	22.7	-8.8300 X
000014	1.3910 UA	941.0 NA	209.00 %*	805.5 V	113.0 MV	27.6	-13.200 X
000016	365.0 NA	-173.5 NA	-32.200 %	999.5 V	130.0 MV	28.2	-8.1400 X
000018	393.0 NA	-297.5 NA	-53.000 %	923.5 V	119.0 MV	30.4	-6.1700 X
000019	306.5 NA	-290.0 NA	-48.600 %	998.5 V	123.5 MV	29.3	-6.0500 X
000020	923.5 NA	-387.0 NA	-29.500 %	975.5 V	119.5 MV	26.4	-16.700 X
000021	411.5 NA	-141.5 NA	-25.500 %	909.0 V	132.5 MV	26.5	-17.300 X
000023	742.5 NA	-347.5 NA	-31.800 %	862.5 V	133.5 MV	28.0	-7.8900 X
000025	690.5 NA	-77.5 NA	-10.000 %	1.0035 KV	139.5 MV	26.4	-12.800 X
000026	342.5 NA	-723.5 NA	-67.800 %	1.0155 KV	149.5 MV	22.9	-12.200 X
000030	420.0 NA	-380.0 NA	-47.500 %	997.5 V	127.0 MV	28.8	-7.6900 X
000033	941.0 NA	-3.2190 UA	-77.300 %	903.5 V	164.5 MV	25.5	-3.7700 X
000034	1.4350 UA	-134.0 NA	-8.5400 %	923.5 V	141.5 MV	28.3	-5.9800 X
000035	1.2580 UA	749.0 NA	147.00 %*	894.5 V	140.0 MV	21.0	-14.200 X
000038	223.5 NA	-235.0 NA	-51.200 %	941.5 V	140.0 MV	21.1	-11.700 X
000040	463.5 NA	-263.0 NA	-36.200 %	904.0 V	114.0 MV	30.4	-8.1500 X
000042	326.5 NA	-187.5 NA	-36.400 %	932.0 V	136.0 MV	20.2	-15.400 X
000046	374.5 NA	-139.0 NA	-27.000 %	861.5 V	128.0 MV	23.6	-6.3400 X
000048	383.0 NA	-195.5 NA	-33.700 %	975.5 V	127.0 MV	27.4	-9.8600 X
000049	1.8865 UA	612.5 NA	48.000 %	901.5 V	149.5 MV	29.1	-6.2700 X
000050	786.5 NA	152.5 NA	24.000 %	915.5 V	124.0 MV	28.1	-5.3800 X
000051	417.0 NA	-64.0 NA	-13.300 %	929.5 V	126.5 MV	29.2	-4.2600 X
000052	2.980 UA	2.5825 UA	649.00 %*	855.5 V	119.0 MV	31.2	-5.1600 X
000053	2.360 UA	982.0 NA	71.200 %	948.5 V	122.0 MV	28.1	-10.500 X
000054	262.5 NA	-198.5 NA	-43.000 %	825.0 V	131.0 MV	21.1	-10.200 X
000055	1.1650 UA	600.5 NA	106.00 %*	919.5 V	143.5 MV	21.4	-10.000 X
000056	493.0 NA	-901.5 NA	-64.600 %	925.5 V	115.0 MV	32.2	-5.8400 X
000060	412.0 NA	-613.0 NA	-59.500 %	1.0055 KV	123.5 MV	28.3	-7.8100 X
000063	402.5 NA	-2.6125 UA	-86.600 %	1.0239 KV	174.0 MV	24.3	-3.9500 X
000064	1.2820 UA	-156.5 NA	-18.800 %	967.5 V	116.0 MV	30.1	-6.2300 X
000065	2.955 UA	-1.615 UA	-38.000 %	867.5 V	166.0 MV	27.5	-3.1600 X
000066	352.0 NA	-54.5 NA	-13.400 %	1.0035 KV	134.5 MV	28.0	-8.0400 X
000067	1.1725 UA	-332.5 NA	-22.000 %	816.0 V	115.0 MV	32.3	-4.1500 X
000068	1.2615 UA	836.5 NA	196.00 %*	915.5 V	115.5 MV	28.0	-14.300 X
000069	357.0 NA	-245.0 NA	-40.600 %	919.5 V	140.5 MV	21.1	-12.400 X

DEVICE = SJ6706H

CONTROL # = 055238

SAMPLE SIZE = 43

LOT = 001

REJECTS = 1

READOUT = 75

% REJECTED = 2.33 %

PRIOR = 20

TST Cmpl = 03/06/78

DESCRIPTION = NPN PL-99.784
 B-6 SS OPERATION LIFE TJ_187.5 DEG C
 1500 HOURS TABLE 4

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 1.0537960 UA 3 STD DEV = 2.7137521 UA	
ICES 1 (D)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 0	DELTA DEPENDENT CODE 1	CALC # = 21 MEAN = -545.5174 NA 3 STD DEV = 8.476748 UA	
ICES 1 (%)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 4	% DELTA DEPENDENT CODE 3	CALC # = 22 MEAN = -19.285446 % 3 STD DEV = 101.73367 %	
BVCES	002	002	MIN = 800. V MAX =	0 0	ELECT READING	MEAN = 940.5581 V 3 STD DEV = 155.79972 V	
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 133.69733 MV 3 STD DEV = 48.46556 MV	
HFE 3	004	004	MIN = 20. MAX = 60.	1 0	ELECT READING	MEAN = 26.435623 3 STD DEV = 9.657045	
HFE 3 (%)	004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	% DELTA	CALC # = 22 MEAN = -8.654001 % 3 STD DEV = 12.691145 %	

ORIGINAL PAGE IS
 OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 75

UNIT	ICES 1	ICES 1(D)	ICES 1(X)	BVCES	VCES 2	HFE 3	HFE 3(X)
000001	1.8785 UA	-651.5 NA	-25.75000 X	972.5 V	125.0 MV	27.0	-3.225800 X
000003	400.5 NA	-119.5 NA	-22.98000 X	905.0 V	126.5 MV	22.4	-7.05300 X
000004	751.0 NA	-17.6490 UA	-95.9100 X	903.5 V	132.0 MV	27.0	-2.527000 X
000007	896.0 NA	267.0 NA	47.1200 X	967.5 V	118.0 MV	29.9	-9.93900 X
000008	2.695 UA	-625. NA	-18.82500 X	943.5 V	175.0 MV	22.5	-4.29100 X
000009	2.970 UA	385. NA	14.89300 X	879.5 V	134.5 MV	28.7	-6.51400 X
000011	4.795 UA	4.0820 UA	572.500 X*	875.5 V	155.5 MV	24.3	-3.95200 X
000012	834.5 NA	-557.0 NA	-40.0400 X	1.0115 KV	158.0 MV	25.1	-9.38600 X
000013	1.9425 UA	-92.5 NA	-4.54500 X	921.5 V	145.0 MV	21.2	-14.85900 X
000014	1.1890 UA	739.0 NA	164.2200 X*	926.5 V	113.5 MV	29.4	-7.54700 X
000016	378.5 NA	-160.0 NA	-29.71200 X	1.0135 KV	130.5 MV	27.9	-9.12000 X
000018	525.5 NA	-165.0 NA	-23.59500 X	959.0 V	116.0 MV	30.3	-6.48100 X
000019	414.5 NA	-182.0 NA	-30.51100 X	1.0175 KV	123.5 MV	30.2	-3.82100 X
000020	1.8650 UA	554.5 NA	42.3200 X	927.5 V	122.0 MV	27.8	-12.30200 X
000021R	474.5 NA	-76.5 NA	-14.19500 X	916.5 V	137.0 MV	19.98	-19.43500 X
000023	601.0 NA	-489.0 NA	-44.8600 X	919.5 V	133.5 MV	28.3	-1.90700 X
000025	612.5 NA	-155.5 NA	-20.24700 X	1.0025 KV	139.5 MV	25.3	-16.50100 X
000026	914.0 NA	-152.0 NA	-14.25800 X	998.5 V	153.5 MV	22.4	-14.17600 X
000030	522.5 NA	-277.5 NA	-34.6800 X	1.0075 KV	126.0 MV	28.4	-8.97400 X
000033	1.0870 UA	-3.0730 UA	-73.5700 X	906.5 V	158.0 MV	26.0	-1.886700 X
000034	1.5620 UA	-7.0 NA	-446.100 M*	911.5 V	141.0 MV	28.4	-5.64700 X
000035	1.5405 UA	1.0315 UA	202.6500 X*	907.5 V	139.0 MV	20.5	-15.91800 X
000038	304.5 NA	-154.0 NA	-33.5800 X	946.5 V	139.5 MV	21.5	-10.04100 X
000040	521.5 NA	-205.0 NA	-28.23600 X	909.0 V	116.0 MV	30.5	-7.85400 X
000042	438.5 NA	-75.5 NA	-14.68800 X	933.5 V	135.0 MV	21.4	-10.46000 X
000046	478.5 NA	-35.0 NA	-6.82200 X	850.5 V	132.0 MV	23.4	-7.14200 X
000048	484.5 NA	-94.0 NA	-16.24800 X	881.5 V	130.0 MV	27.7	-8.88100 X
000049	1.4840 UA	210.0 NA	16.48300 X	914.5 V	150.0 MV	29.6	-2.631500 X
000050	734.5 NA	100.5 NA	15.85100 X	903.0 V	135.0 MV	27.9	-6.06000 X
000051	542.5 NA	61.5 NA	12.78500 X	940.5 V	126.0 MV	28.9	-5.24500 X
000052	594.0 NA	196.5 NA	49.4300 X	967.5 V	115.5 MV	29.0	-11.85400 X
000053	525.0 NA	-853.0 NA	-61.9000 X	971.5 V	120.0 MV	26.6	-15.28600 X
000054	427.0 NA	-34.0 NA	-7.37500 X	815.0 V	122.5 MV	21.5	-8.51000 X
000055	544.0 NA	-20.5 NA	-3.63400 X	942.5 V	135.5 MV	21.6	-9.24300 X
000056	527.5 NA	-867.0 NA	-62.1900 X	971.5 V	113.5 MV	29.4	-14.03500 X
000060	383.5 NA	-645.5 NA	-62.7300 X	1.0055 KV	125.0 MV	27.8	-9.44600 X
000063	470.5 NA	-2.5445 UA	-84.5300 X	1.0235 KV	173.0 MV	24.4	-3.55700 X
000064	986.5 NA	-452.0 NA	-31.43200 X	969.5 V	120.0 MV	29.3	-8.72200 X
000065	2.660 UA	-2.110 UA	-44.2300 X	879.5 V	168.5 MV	27.4	-3.52100 X
000066	429.0 NA	22.5 NA	5.54100 X	1.0305 KV	127.0 MV	28.0	-6.04000 X
000067	2.100 UA	595.0 NA	39.5300 X	816.0 V	111.5 MV	31.2	-7.41800 X
000068	1.4900 UA	1.0650 UA	250.5800 X*	939. V	112.0 MV	29.6	-10.77800 X
000069	338.5 NA	-263.5 NA	-43.7700 X	939.5 V	139.0 MV	20.5	-14.93700 X

DEVICE SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 43

LOT = 001

REJECTS = 0

READOUT = 70

% REJECTED = .00 %

PRIOR = 20

TST CMPL = 12/21/77

DESCRIPTION = NPN PL-99.784
2-6 SS OPERATION LIFE TJ_187.5 DEG C
1000 HOURS TABLE 4

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 1.2116915 UA 3 STD DEV = 4.449415 UA	
ICES 1 (D)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 0	DELTA DEPENDENT CODE 1	CALC # = 21 MEAN = -387.6210 NA 3 STD DEV = 9.325350 UA	
ICES 1 (X)	001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 0	% DELTA DEPENDENT CODE 3	CALC # = 22 MEAN = -27.739166 % 3 STD DEV = 92.47465 %	
BVCES	002	002	MIN = 800. V MAX =	0 0	ELECT READING	MEAN = 943.6276 V 3 STD DEV = 171.52876 V	
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 131.96468 MV 3 STD DEV = 48.92823 MV	
HFE 3	004	004	MIN = 20. MAX = 60.	0 0	ELECT READING	MEAN = 26.644104 3 STD DEV = 9.898175	
HFE 3 (Z)	004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	% DELTA	CALC # = 22 MEAN = -7.376805 % 3 STD DEV = 11.341157 %	

DEVICE = SJ6708H

CONTROL # = 055238

LDT = 001

READOUT = 70

UNIT	ICES 1	ICES 1(D)	ICES 1(%)	BVCES	VCES 2	HFE 3	HFE 3(X)
000001	2.160 UA	-370. NA	-14.500 %	970.0 V	122.0 MV	27.4	-1.7900 X
000003	332.0 NA	-188.0 NA	-36.100 %	909.0 V	124.0 MV	23.1	-4.1400 X
000004	1.0305 UA	-17.3695 UA	-94.360 %	890.5 V	126.5 MV	27.7	0. MCK
000007	621.0 NA	12.0 NA	1.9700 %	983.0 V	114.0 MV	30.8	-7.2200 X
000008	2.500 UA	-820. NA	-24.600 %	985.0 V	174.5 MV	22.6	-3.0000 X
000009	2.195 UA	-390. NA	-15.000 %	898.5 V	135.0 MV	28.7	-6.5100 X
000011	644.5 NA	-68.5 NA	-9.6000 %	893.5 V	156.5 MV	23.8	-5.9200 X
000012	829.0 NA	-562.5 NA	-40.400 %	991.5 V	158.0 MV	28.0	-9.7400 X
000013	1.8450 UA	-190.0 NA	-9.3300 %	930.0 V	138.0 MV	27.4	-10.000 X
000014	1.4935 UA	1.0435 UA	231.00 %*	921.5 V	112.5 MV	28.3	-11.000 X
000016	335.0 NA	-203.5 NA	-37.700 %	1.0075 KV	126.5 MV	28.4	-7.4900 X
000018	396.5 NA	-294.0 NA	-42.500 %	931.0 V	119.0 MV	30.3	-5.8600 X
000019	333.0 NA	-263.5 NA	-44.100 %	1.0240 KV	120.0 MV	30.7	-2.2200 X
000020	962.0 NA	-348.5 NA	-26.500 %	989.5 V	118.5 MV	27.5	-13.200 X
000021	1.1330 UA	580.0 NA	104.00 %*	903.0 V	134.5 MV	20.4	-17.700 X
000023	752.5 NA	-337.5 NA	-30.900 %	891.5 V	133.0 MV	23.2	-7.2300 X
000025	495.5 NA	-272.5 NA	-35.400 %	1.0490 KV	136.5 MV	27.0	-10.800 X
000026	350.5 NA	-715.5 NA	-67.100 %	1.0240 KV	148.5 MV	23.3	-10.700 X
000030	490.0 NA	-310.0 NA	-38.700 %	1.0315 KV	123.0 MV	28.8	-7.6900 X
000033	997.5 NA	-3.1625 UA	-76.000 %	914. V	155.5 MV	20.3	-754.00 MCK
000034	1.5200 UA	-49.0 NA	-3.1200 %	925.5 V	140.0 MV	28.4	-5.6400 X
000035	5.500 UA	4.9910 UA	980.00 %*	938.5 V	134.5 MV	21.3	-13.000 X
000038	237.0 NA	-221.5 NA	-48.300 %	959.0 V	134.5 MV	22.0	-7.9400 X
000040	437.5 NA	-289.0 NA	-39.700 %	912.0 V	115.5 MV	30.4	-8.1500 X
000042	457.0 NA	-57.0 NA	-11.000 %	942.0 V	131.0 MV	21.4	-10.400 X
000046	400.0 NA	-113.5 NA	-22.100 %	859.5 V	128.0 MV	23.5	-6.7400 X
000048	432.0 NA	-146.5 NA	-25.300 %	987.5 V	128.5 MV	27.7	-8.8800 X
000049	1.2690 UA	-1.0 NA	-392.00 %*	919.5 V	149.5 MV	29.9	-1.6400 X
000050	985.0 NA	351.0 NA	55.300 %	908.5 V	124.0 MV	28.4	-4.3700 X
000051	445.5 NA	-35.5 NA	-7.3800 %	931.0 V	127.0 MV	29.4	-3.6000 X
000052	566.5 NA	169.0 NA	42.500 %	973.5 V	112.5 MV	29.6	-10.000 X
000053	722.0 NA	-556.0 NA	-47.600 %	961.5 V	115.5 MV	28.7	-8.5900 X
000054	291.5 NA	-169.5 NA	-36.700 %	887.5 V	125.5 MV	21.9	-6.8000 X
000055	1.4615 UA	897.0 NA	156.00 %*	932.5 V	134.0 MV	21.6	-9.2400 X
000056	1.8290 UA	434.5 NA	31.100 %	965.0 V	109.5 MV	31.2	-8.7700 X
000060	365.5 NA	-663.5 NA	-64.400 %	1.0105 KV	122.0 MV	28.3	-7.8100 X
000063	386.5 NA	-2.6285 UA	-87.100 %	1.0295 KV	173.5 MV	24.4	-3.5500 X
000064	1.8085 UA	-430.0 NA	-29.800 %	988.5 V	118.5 MV	29.6	-7.7800 X
000065	2.480 UA	-2.290 UA	-48.000 %	882.5 V	169.0 MV	27.4	-3.5200 X
000066	356.0 NA	-50.5 NA	-12.400 %	1.0065 KV	133.0 MV	28.4	-4.6900 X
000067	1.0365 UA	-468.5 NA	-31.100 %	819.0 V	117.5 MV	31.7	-5.9300 X
000068	1.3005 UA	875.5 NA	206.00 %*	915.5 V	114.5 MV	28.7	-14.000 X
000069	8.720 UA	8.1180 UA	1.3400 %*	843.5 V	141.0 MV	20.9	-13.200 X

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 41

LOT = 601

REJECTS = 2

READOUT = 80

% REJECTED = 4.88 %

PRIOR = 20

TST CMPL = 03/10/78

DESCRIPTION = NPN PL-99.784
B-6 SS OPERATION LIFE TJ_187.5 DEG C
2000 HOURS TABLE 4

PARAMETER	CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA	MEAN	3 STD DEV
ICES 1		001	001	MIN = MAX = 50. UA	0 0	ELECT READING	1.0000676 UA	2.5479894 UA
ICES 1 (D)		001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = -20. UA MAX = 20. UA	0 0	DELTA DEPENDENT CODE 1 CALC # = 21	-614.1386 MA	7.834583 UA
ICES 1 (X)		001	001	PARM # 1 = 001 PARM # 2 = 001 MIN = MAX = 100. %	0 4	% DELTA DEPENDENT CODE 3 CALC # = 22	-22.981582 %	113.15384 %
BVCES		002	002	MIN = MAX = 800. V	1 0	ELECT READING	943.9873 V	162.20993 V
VCES 2		003	003	MIN = MAX = 1. V	0 0	ELECT READING	133.48734 MV	49.16884 MV
HFE 3		004	004	MIN = MAX = 20. 60.	1 0	ELECT READING	26.314910	9.071491
HFE 3 (X)		004	004	PARM # 1 = 004 PARM # 2 = 004 MIN = -20. % MAX = 20. %	0 0	% DELTA CALC # = 22	-9.630936 %	13.707444 %

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = DS5238
LOT = 001
READOUT = 80

UNIT	ICES 1	ICES 1(D)	ICES 1(X)	BVCES	VCES 2	HFE 3	HFE 3(X)
000001	1.1895 UA	-1.3405 UA	-52.900 X	962.5 V	124.5 MV	26.2	-6.0900 X
000003	347.0 NA	-173.0 NA	-33.200 X	901.5 V	130.0 MV	21.7	-9.9500 X
00004R	4.095 UA	-14.305 UA	-77.700 X	795.5 V*	124.5 MV	28.7	3.6100 X
000007	770.5 NA	161.5 NA	26.500 X	973.0 V	116.5 MV	29.2	-12.000 X
000008	3.220 UA	-120. NA	-3.6100 X	977.0 V	176.0 MV	22.2	-4.7200 X
000009	1.6360 UA	-949.0 NA	-36.700 X	902.5 V	136.5 MV	28.3	-7.8100 X
000011	2.515 UA	1.8020 UA	252.00 X*	895.5 V	157.5 MV	23.3	-7.9000 X
000012	776.0 NA	-615.5 NA	-44.200 X	1.0350 KV	154.5 MV	26.1	-5.7700 X
000014	865.0 NA	415.0 NA	92.200 X	931.5 V	111.5 MV	28.9	-9.1100 X
000016	353.0 NA	-185.5 NA	-34.400 X	1.0055 KV	131.5 MV	27.4	-16.700 X
000018	474.5 NA	-216.0 NA	-31.200 X	968.0 V	115.5 MV	28.8	-11.100 X
000019	512.0 NA	-84.5 NA	-14.100 X	1.0195 KV	124.5 MV	29.8	-5.0900 X
000020	1.5405 UA	230.0 NA	17.500 X	1.0080 KV	117.5 MV	29.1	-8.2000 X
000023	557.5 NA	-532.5 NA	-48.800 X	925.5 V	132.5 MV	27.5	-9.5300 X
000025	2.490 UA	1.7220 UA	224.00 X*	945.0 V	144.0 MV	24.8	-18.100 X
000026	397.5 NA	-668.5 NA	-62.700 X	1.0195 KV	153.5 MV	22.1	-15.300 X
000030	457.0 NA	-343.0 NA	-42.800 X	1.0075 KV	125.5 MV	27.8	-10.800 X
000033	1.1080 UA	-3.0520 UA	-73.300 X	911.5 V	157.5 MV	25.3	-4.5200 X
000034	1.5385 UA	-30.5 NA	-1.9400 X	891.5 V	138.0 MV	29.2	-2.9900 X
000035	1.1290 UA	620.0 NA	121.00 X*	887.0 V	141.0 MV	20.2	-17.500 X
000038	453.0 NA	-5.5 NA	-1.1900 X	945.5 V	138.5 MV	21.1	-11.700 X
000040	712.0 NA	-14.5 NA	-1.9900 X	930.0 V	114.0 MV	30.2	-8.7600 X
000042	640.0 NA	126.0 NA	24.500 X	935.5 V	136.0 MV	21.3	-10.800 X
000046	461.0 NA	-52.5 NA	-10.200 X	860.0 V	129.5 MV	23.1	-8.3300 X
000048	445.5 NA	-133.0 NA	-22.900 X	979.5 V	126.5 MV	27.4	-9.8500 X
000049	1.6750 UA	401.0 NA	31.400 X	875.5 V	146.5 MV	29.1	-4.2700 X
000050	574.5 NA	-59.5 NA	-9.3800 X	901.0 V	126.5 MV	27.4	-7.7400 X
000051	525.5 NA	44.5 NA	9.2500 X	944.5 V	127.0 MV	28.3	-7.2100 X
000052	602.0 NA	204.5 NA	51.400 X	941.5 V	116.5 MV	29.0	-11.800 X
000053	690.0 NA	-685.0 NA	-49.900 X	959.0 V	120.5 MV	26.5	-15.600 X
000054	421.5 NA	-39.5 NA	-8.5600 X	814.0 V	128.0 MV	20.4	-13.100 X
000055	342.0 NA	-222.5 NA	-39.400 X	953.5 V	137.0 MV	21.1	-11.300 X
000056	393.0 NA	-1.0015 UA	-71.800 X	955.0 V	117.5 MV	27.4	-19.800 X
000060	362.0 NA	-657.0 NA	-64.800 X	999.5 V	128.0 MV	27.5	-10.400 X
000063	453.5 NA	-2.5615 UA	-84.900 X	1.0225 KV	174.5 MV	24.2	-4.3400 X
000064	626.0 NA	-812.5 NA	-56.400 X	981.0 V	120.0 MV	28.8	-10.200 X
000065	2.445 UA	-2.325 UA	-48.700 X	890.5 V	168.0 MV	27.1	-4.5700 X
000066	365.5 NA	-41.0 NA	-10.000 X	1.0240 KV	130.0 MV	27.2	-8.7200 X
000067	1.0775 UA	-427.5 NA	-28.400 X	815.5 V	117.0 MV	29.9	-11.200 X
000068	1.408 UA	983.0 NA	231.00 X*	937.5 V	113.5 MV	29.	-13.100 X
000069R	379.0 NA	-223.0 NA	-37.000 X	927.5 V	143.5 MV	19.64 *	-18.500 X

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 80

REJECT LIST

000004 000069

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = S36708H

CONTROL # = 055238

SAMPLE SIZE = 17

LOT = 001

REJECTS = 1

READOUT = 81

% REJECTED = 5.88 %

PRIOR = NONE

1ST CMPL = 04/07/78

DESCRIPTION = NPN PL-99.784
B-7 POWER CYCLING
1000 CYCLES

PARAMETER	CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1		001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 2.7644092 UA 3 STD DEV = 18.320264 UA	
RVCS		002	002	MIN = MAX = 800. V	1 0	ELECT READING	MEAN = 968.7187 V 3 STD DEV = 144.55943 V	
VCS 2		003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 136.02918 MV 3 STD DEV = 53.38771 MV	
HFE 3		004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	MEAN = 26.282302 3 STD DEV = 7.732818	

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 81

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000001	1.2820 UA	968.5 V	125.5 MV	26.3
000003	336.5 NA	963.5 V	129.0 MV	21.8
000007	395.0 NA	991.5 V	117.0 MV	29.0
000008	2.085 UA	979.5 V	177.5 MV	22.0
000009	1.2745 UA	923.0 V	134.5 MV	28.3
000011	1.3440 UA	918.5 V	157.0 MV	23.7
000012	736.0 NA	1.0900 KV	154.5 MV	26.1
000014	666.0 NA	927.5 V	112.0 MV	28.7
000016	314.0 NA	1.0115 KV	130.5 MV	27.5
000018	409.0 NA	968.5 V	117.0 MV	26.7
000019	385.0 NA	1.0185 KV	125.5 MV	29.4
000020	1.1700 UA	1.0320 KV	118.5 MV	28.7
000023	754.5 NA	919.0 V	132.0 MV	27.3
000025R	26.05 UA	773.5 V*	141.5 MV	24.9
000026	8.435 UA	890.5 V	154.0 MV	21.7
000030	376.0 NA	1.0265 KV	127.5 MV	27.7
000033	982.5 NA	911.0 V	159.0 MV	25.0

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 81

REJECT LIST

000225

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 16

LGT = 001

REJECTS = 0

READOUT = 82

% REJECTED = .00 %

PRIOR = NONE

TST CMPL = 05/15/78

DESCRIPTION = NPN PL-99.784
B-7 POWER CYCLING
2000 CYCLES

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 1.399370 UA 3 STD DEV = 7.063003 UA	
BVCES	002	002	MIN = MAX = 800. V	0 0	ELECT READING	MEAN = 964.2167 V 3 STD DEV = 152.00779 V	
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 136.59346 MV 3 STD DEV = 54.06278 MV	
HFE 3	004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	MEAN = 26.524948 3 STD DEV = 7.981698	

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

LOT = 001

READOUT = 82

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000001	1.6 UA	962.5 V	125.5 MV	26.5
000003	420. NA	912.5 V	129.5 MV	22.1
000007	440. NA	993.5 V	119.0 MV	29.4
000008	2.9 UA	981.0 V	178.0 MV	22.0
000009	2.1 UA	918.5 V	134.5 MV	28.5
000011	7. UA	917.5 V	158.5 MV	23.6
000012	960. NA	1.0515 KV	155.0 MV	26.3
000014	980. NA	931.5 V	114.5 MV	29.1
000016	350. NA	1.0065 KV	133.5 MV	27.5
000018	460. NA	970.5 V	118.5 MV	29.0
000019	360. NA	1.0210 KV	125.5 MV	29.3
000020	1.4 UA	1.0365 KV	119.0 MV	28.7
000023	820. NA	910.5 V	131.5 MV	27.5
000026	8.6 UA	887.5 V	155.5 MV	21.9
000030	400. NA	1.0145 KV	129.0 MV	27.9
000033	1.6 UA	912.0 V	158.5 MV	25.1

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 16

LOT = 001

REJECTS = 0

READCUT = 83

% REJECTED = .00 %

PRIOR = NCNE

TST CMPL = 06/16/78

DESCRIPTION = NPN PL-99.784
B-7 POWER CYCLING
3000 CYCLES

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 1.4223721 UA 3 STD DEV = 4.875165 UA	
BVCS	002	002	MIN = MAX = 800. V	0 0	ELECT READING	MEAN = 975.7500 V 3 STD DEV = 287.73022 V	
VCS 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 141.96048 MV 3 STD DEV = 58.61491 MV	
HFE 3	004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	MEAN = 26.274948 3 STD DEV = 7.955882	

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DEVICE = SJ6706H

CONTROL # = 0S5238

LOT = 001

READOUT = 83

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000001	1.5 UA	960. V	138.0 MV	26.1
000003	420. NA	904.3 V	132.0 MV	21.6
000007	430. NA	1.000 KV	120.0 MV	29.4
000008	2.4 UA	980.0 V	187.0 MV	21.7
000009	1.5 UA	930.5 V	136.0 MV	27.9
000011	5. UA	917.0 V	158.0 MV	23.4
000012	800. NA	1.309 KV	166.0 MV	25.9
000014	800. NA	910. V	123.0 MV	28.8
000016	320. NA	1.0075 KV	134.5 MV	27.3
000018	390. NA	944.0 V	116.5 MV	28.6
000019	350. NA	1.020 KV	134.5 MV	28.9
000020	1.4 UA	1.022 KV	120.0 MV	28.4
000023	800. NA	905.5 V	142.5 MV	27.5
000026	6. UA	879.5 V	157.0 MV	21.9
000030	420. NA	1.0195 KV	137.0 MV	27.9
000033	1.3 UA	912.0 V	169.5 MV	25.1

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DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 16

LOT = 001

REJECTS = 7

READOUT = 94

% REJECTED = 43.75 %

PRIOR = NONE

YST CMPL = 07/18/78

DESCRIPTION = NPN PL-99.784
B-7 POWER CYCLING
4000 CYCLES

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING	MEAN = 3.1587442 UA 3 STD DEV = 21.475396 UA	
BVCES	002	002	MIN = MAX = 800. V	6 1	ELECT READING	MEAN = 947.1110 V 3 STD DEV = 120.04216 V	
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING	MEAN = 136.74968 MV 3 STD DEV = 54.33976 MV	
HFE 3	004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	MEAN = 26.631210 3 STD DEV = 8.130867	

ORIGINAL PAGE 15
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 84

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000001	1.5 UA	968.0 V	130.0 MV	26.3
000003	400. NA	916.0 V	129.0 MV	22.1
000007	800. NA	985.5 V	118.0 MV	29.4
000008	2.3 UA	981.5 V	178.5 MV	21.9
000009	1.2 UA	930.5 V	136.5 MV	28.3
000011R	30. UA	645.0 V*	156.0 MV	23.9
000012R	770. NA	*	157.5 MV	26.2
000014R	750. NA	0. MV*	114.5 MV	29.0
000016	370. NA	1.0115 KV	134.5 MV	27.6
000018R	450. NA	0. MV*	119.5 MV	29.2
000019R	390. NA	0. MV*	123.5 MV	29.9
000020R	1.2 UA	0. MV*	119.0 MV	28.6
000023	530. NA	939.5 V	130.5 MV	27.7
000026	8.0 UA	878.5 V	155.5 MV	21.9
000030R	380. NA	0. MV*	127.0 MV	28.6
000033	1.5 UA	913.0 V	158.5 MV	26.5

DEVICE = SJ6708H

CONTROL # = 055238
LOT = 001
READOUT = 84

REJECT LIST

000011 000012 000014 000018 000019 000020 000030

ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 17

LOT = 001

REJECTS = 0

READOUT = 85

% REJECTED = .00 %

PRIOR = NONE

TST CMPL = 03/27/78

DESCRIPTION = NPN PL-99.784
B-7 POWER CYCLE THERMAL SHOCK
25 CYCLES

PARAMETER CONDITIONS PARM # TEST # LIMITS # FAILURES REJECT CRITERIA

ICES 1

001

001

MIN =
MAX = 50. UA0
0

ELECT READING

MEAN = 650.4112 UA
3 STD DEV = 1.0317507 UA

BVCS

002

002

MIN =
MAX = 600. V0
0

ELECT READING

MEAN = 939.0000 V
3 STD DEV = 152.33679 V

VCS 2

003

003

MIN =
MAX = 1. V0
0

ELECT READING

MEAN = 130.58793 MV
3 STD DEV = 41.02011 MV

MFE 3

004

004

MIN =
MAX = 20.
60.0
0

ELECT READING

MEAN = 26.417587
3 STD DEV = 10.810658ORIGINAL PAGE IS
OF POOR QUALITY

DEVICE = SJ670BH

CONTROL # = 055238
LOT = 001
READDUT = 85

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000034	1.5245 UA	893.5 V	137.5 MV	30.0
000035	481.0 NA	891.5 V	138.0 MV	20.7
000036	489.0 NA	964.5 V	135.5 MV	22.0
000040	762.0 NA	934.5 V	114.0 MV	31.3
000042	573.5 NA	937.0 V	131.5 MV	21.9
000046	516.0 NA	864.5 V	119.5 MV	25.9
000048	480.5 NA	983.5 V	128.0 MV	26.4
000049	1.6055 UA	856.5 V	148.0 MV	29.6
000050	489.0 NA	927.5 V	125.5 MV	28.0
000051	614.5 NA	958.5 V	124.5 MV	29.5
000052	585.0 NA	960.0 V	114.0 MV	30.4
000053	530.0 NA	984.5 V	119.0 MV	27.5
000054	400.5 NA	827.0 V	125.5 MV	21.1
000055	405.5 NA	957.0 V	134.0 MV	21.9
000056	521.0 NA	959.5 V	117.5 MV	28.8
000060	491.5 NA	1.0035 KV	125.5 MV	26.9
000063	564.0 NA	1.0295 KV	172.5 MV	25.2

ORIGINAL PAGE 19
 BE POOR QUALITY

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 17

LOT = 001

REJECTS = 0

READOUT = 86

% REJECTED = .00 %

PRIOR = NONE

TST CMPL = 04/05/78

DESCRIPTION = NPN PL-99,784
B-7 POWER CYCLE THERMAL SHOCK
75 CYCLES

PARAMETER	CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA	MEAN	3 STD DEV
ICES 1		001	001	MIN = MAX = 50. UA	0 0	ELECT READING	536.9701 MA	1.0648491 UA
BWES		002	002	MIN = MAX = 800. V	0 0	ELECT READING	938.7351 V	151.49812 V
VDES 2		003	003	MIN = MAX = 1. V	0 0	ELECT READING	130.67620 MV	40.80827 MV
HFE 3		004	004	MIN = MAX = 20. 60.	0 0	ELECT READING	25.952896	10.347897

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DEVICE = SJ6708H

CONTROL # = 05E238
LOT = 001
READOUT = 86

UNIT	ICES 1	BVCES	VCS 2	HFE 3
000034	1.2570 UA	894.5 V	135.5 MV	29.3
000035	429.0 NA	895.5 V	137.5 MV	20.8
000038	373.5 NA	964.5 V	137.5 MV	21.6
000040	514.5 NA	930.0 V	114.5 MV	30.3
000042	439.5 NA	936.5 V	134.0 MV	21.5
000046	418.0 NA	863.0 V	127.0 MV	23.6
000048	353.0 NA	985.5 V	128.0 MV	27.9
000049	1.6210 UA	882.5 V	145.5 MV	29.4
000050	442.5 NA	926.0 V	124.0 MV	27.9
000051	432.0 NA	955.5 V	124.5 MV	28.7
000052	527.0 NA	967.5 V	115.0 MV	30.2
000053	420.0 NA	982.0 V	121.5 MV	27.0
000054	315.0 NA	829.5 V	126.0 MV	20.7
000055	392.0 NA	958.5 V	134.0 MV	27.0
000056	345.0 NA	958.0 V	118.0 MV	27.9
000060	328.0 NA	1.0025 KV	125.0 MV	26.6
000063	421.5 NA	1.0270 KV	174.0 MV	24.6

DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 17

LOT = 001

REJECTS = 0

READOUT = 87

X REJECTED = .00 %

PRIOR = NONE

TST CMPL = 04/12/78

DESCRIPTION = NPN PL-99.784
 B-7 POWER CYCLE THERMAL SHOCK
 175 CYCLES

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN =	50. UA	0	ELECT READING	MEAN = 517.9406 NA
			MAX =				3 STD DEV = 1.0895319 UA
BVCS	002	002	MIN =	800. V	0	ELECT READING	MEAN = 958.0881 V
			MAX =				3 STD DEV = 163.25038 V
VCES 2	003	003	MIN =	1. V	0	ELECT READING	MEAN = 130.97023 MV
			MAX =				3 STD DEV = 38.59139 MV
HFE 3	004	004	MIN =	20.	0	ELECT READING	MEAN = 25.776397
			MAX =				3 STD DEV = 10.423547

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DEVICE = SJ6706H

CONTROL # = 0S5238

LOT = 001

READOUT = 83

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000001	1.5 UA	960. V	138.0 MV	26.1
000003	420. NA	904.5 V	132.0 MV	21.6
000007	430. NA	1.000 KV	120.0 MV	29.4
000008	2.4 UA	980.0 V	167.0 MV	21.7
000009	1.5 UA	930.5 V	136.0 MV	27.9
000011	5. UA	917.0 V	158.0 MV	25.4
000012	800. NA	1.309 KV	166.0 MV	25.9
000014	800. NA	910. V	123.0 MV	28.8
000016	320. NA	1.0075 KV	124.5 MV	27.3
000018	390. NA	944.0 V	116.5 MV	28.6
000019	350. NA	1.020 KV	134.5 MV	28.9
000020	1.4 UA	1.022 KV	120.0 MV	28.4
000023	800. NA	905.5 V	142.5 MV	27.5
000026	6. UA	879.5 V	157.0 MV	21.9
000030	420. NA	1.0195 KV	137.0 MV	27.9
000033	1.3 UA	912.0 V	169.5 MV	25.1

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CACS0505 MEASUREMENTS COVER SHEET

DATE 04/27/78 PAGE 1

DEVICE = SJ6708H

CONTROL # = CS5233

SAMPLE SIZE = 17

LOT = 001

REJECTS = 0

READOUT = 88

% REJECTED = .00 %

PRICE = NONE

TST CNFL = 04/26/78

DESCRIPTION = NPN PL-99.784
B-7 POWER CYCLE THERMAL SHOCK
300 CYCLES

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA
ICES 1	001	001	MIN = MAX = 50. UA	0 0	ELECT READING MEAN = 803.8231 NA 3 STD DEV = 1.9281624 UA
BVCES	002	002	MIN = MAX = 800. V	0 0	ELECT READING MEAN = 942.2616 V 3 STD DEV = 166.98463 V
VCES 2	003	003	MIN = MAX = 1. V	0 0	ELECT READING MEAN = 130.62315 MV 3 STD DEV = 40.80089 MV
HFE 3	004	004	MIN = MAX = 20. 60.	0 0	ELECT READING MEAN = 26.235229 3 STD DEV = 10.475486

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DEVICE = SJ67CEH

CENTREL # = CS5238

LCT = 001

READCLT = 68

UNIT	ICES 1	EVCS	VCS 2	HFE 3
000034	2.1 UA	502.5 V	137.0 MV	30.0
000035	520. NA	508.5 V	139.5 MV	30.0
000038	350. NA	555.0 V	147.0 MV	30.0
000040	620. NA	525.5 V	143.5 MV	30.0
000042	430. NA	543.5 V	133.5 MV	21.0
000046	475. NA	565.0 V	128.0 MV	24.0
000048	1.7 UA	1.0065 KV	127.5 MV	28.4
000049	2.3 UA	575.5 V	145.5 MV	29.5
000050	560. NA	516.0 V	125.5 MV	28.0
000051	575. NA	557.0 V	124.5 MV	28.5
000052	1.6 UA	572.0 V	115.5 MV	28.8
000053	475. NA	565.5 V	120.5 MV	27.0
000054	380. NA	531.5 V	126.0 MV	27.0
000055	320. NA	557.5 V	126.5 MV	21.5
000056	430. NA	555.5 V	116.0 MV	28.2
000060	350. NA	1.0055 KV	125.5 MV	28.8
000063	480. NA	1.0300 KV	172.5 MV	25.0

ORIGINAL PAGE IS
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DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 17

LOT = 001

REJECTS = 0

READOUT = 89

% REJECTED = .00 %

PRIOR = NONE

TST CMPL = 05/15/78

DESCRIPTION = NPN PL-99.784
 B-7 POWER CYCLE THERMAL SHOCK
 5 00 CYCLES

PARAMETER CONDITIONS PARM # TEST # LIMITS # FAILURES REJECT CRITERIA

PARAMETER CONDITIONS	PARM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA	MEAN	3 STD DEV
ICES 1	001	001	MIN =	50. UA	0	ELECT READING	761.7642 NA
			MAX =				
BVCS	002	002	MIN =	800. V	0	ELECT READING	941.2058 V
			MAX =				
VCES 2	003	003	MIN =	1. V	0	ELECT READING	130.08791 MV
			MAX =				
HFE 3	004	004	MIN =	20.	0	ELECT READING	26.088195
			MAX =				

DEVICE = SJ6708H

CONTROL # = 055236

LOT = 001

READOUT = 89

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000034	2.5 UA	899.5 V	137.5 MV	29.8
000035	480. NA	907.5 V	137.0 MV	21.1
000038	350. NA	968.5 V	136.0 MV	21.7
000040	570. NA	925.0 V	116.0 MV	30.4
000042	400. NA	941.5 V	131.0 MV	21.7
000046	440. NA	863.0 V	127.0 MV	23.5
000048	1.16 UA	1.0035 KV	126.5 MV	27.9
000049	2.5 UA	881.5 V	145.0 MV	29.7
000050	540. NA	917.0 V	124.0 MV	28.0
000051	510. NA	957.0 V	123.5 MV	28.9
000052	1.20 UA	972.5 V	115.5 MV	30.0
000053	430. NA	985.0 V	119.0 MV	27.2
000054	350. NA	831.5 V	125.5 MV	21.0
000055	340. NA	957.0 V	134.5 MV	21.5
000056	390. NA	959.5 V	118.0 MV	28.1
000060	330. NA	1.0075 KV	124.5 MV	28.1
000063	460. NA	1.0235 KV	171.0 MV	24.9

ORIGINAL PAGE IS
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DEVICE = SJ6708H

CONTROL # = 055238

SAMPLE SIZE = 17

LOT = 001

REJECTS = 0

READOUT = 90

% REJECTED = .00 %

PRIOR = NONE

TST CMPL = 07/01/78

DESCRIPTION = NPN PL-99.784
 B-7 POWER CYCLE THERMAL SHOCK
 VIBRATION VARIABLE FREQUENCY
 TABLE 4 LIMIT 1

PARAMETER CONDITIONS	PARAM #	TEST #	LIMITS	# FAILURES	REJECT CRITERIA		
ICES 1	001	001	MIN =	50. UA	0	ELECT READING	MEAN = 1.0841140 UA 3 STD DEV = 5.732714 UA
			MAX =				
BVCS	002	002	MIN =	800. V	0	ELECT READING	MEAN = 626.8823 V 3 STD DEV = 66.01277 V
			MAX =				
VCS 2	003	003	MIN =	1. V	0	ELECT READING	MEAN = 133.73494 MV 3 STD DEV = 62.39303 MV
			MAX =				
HFE 3	004	004	MIN =	20.	0	ELECT READING	MEAN = 27.447006 3 STD DEV = 8.228665
			MAX =				

DEVICE = SJ6708H

CONTROL # = DS5238

LOT = 001

READOUT = 90

UNIT	ICES 1	BVCES	VCES 2	HFE 3
000071	460. NA	851.5 V	116.0 MV	30.9
000072	420. NA	827.5 V	140.5 MV	25.9
000073	380. NA	847.5 V	135.5 MV	27.7
000075	340. NA	807.5 V	132.0 MV	22.4
000078	410. NA	821.0 V	116.0 MV	29.8
000080	420. NA	876.0 V	117.5 MV	29.6
000086	380. NA	815.5 V	122.5 MV	27.3
000092	410. NA	815.0 V	114.0 MV	31.2
000095	8.2 UA	847.5 V	183.5 MV	23.7
000105	3.4 UA	812.5 V	162.5 MV	29.6
000108	460. NA	807.5 V	126.0 MV	26.6
000113	640. NA	810.5 V	131.5 MV	28.1
000114	420. NA	807.5 V	114.0 MV	30.4
000115	320. NA	815.5 V	130.5 MV	22.7
000117	550. NA	869.5 V	121.3 MV	28.9
000118	560. NA	805.5 V	132.5 MV	24.2
000123	660. NA	819.5 V	178.0 MV	27.6

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