

RESEARCH TO DETERMINE FAILURE MODES FOR TRANSISTORS

CONTRACT #NAS 8-11059

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General Electric Company
Semiconductor Products Department
Syracuse, New York

Research to Determine Failure Modes for Transistors
Contract #NAS 8-11059 5th Quarterly Report
October - December 1964

Object

The object of this research is to study the effectiveness of screening transistors by stress and by non-destructive tests when applied to transistors manufactured to the same specification by three different processes.

The previous reports covered details of an initial step-stress experiment. A preliminary study of the effectiveness of using noise as a method of screening and a preliminary report covering partial details of the first 1,500 hours of a 3,000 hour life test.

This report shows the bulk of the data from a 3,000 hour life test of three separate processes to manufacture a transistor to the 2N718A specification.

Data in the form of computer calculated distributions for the complete test matrix consisting of:

- 3 - manufacturing processes
- 4 - stress screen conditions
- 10 - parameters
- 8 - test times
- 5 - Life test levels.

Engineering analysis of failures in the high stress screen on one process has been completed.

Abstract

A detailed analysis of failure modes has shown that planar transistors are subject to failures due to transient spikes. This failure mode causes serious damage if the transistor is not limited against thermal runaway.

This mode of failure is most prevalent among transistors which are considered least likely to have channeling modes of failure.

Preliminary computer readout of distribution of values is included with this report. This readout is not corrected for the combined effect of computer, data processing and automatic reading error.

The 250 readings on each transistor cause indicated failures to be several times actual.

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1.0 STATUS OF THE CONTRACT

1.1 Overall Status

The overall status of the contract as of 1 January 1965 is that all life tests have been completed on all lots. Final Phase II measurements are being made on all 800mw life tests.

Analysis is underway and has been completed for Process "A" on the high stress and moderate stress levels.

1.2 Work Remaining on the Contract

1.2.1 Analysis of Phase III life test data for centrifuge only lots and for the control lots in Process "A".

1.2.2 Analysis of Phase III for all lots in Process "B".

1.2.3 Analysis of Phase III for all lots in Process "C".

1.2.4 Centrifuge Phase IV in its entirety.

1.2.5 Analysis of Phase IV

1.2.6 Final analysis and report preparation

1.3 Extension Plans for the Contract

1.3.1 Design computer program to analyze all data to determine relation between noise tests and reliability.

1.3.2 Run and ~~ex~~ noise in relation to failures of the different major cl ~~ass~~ ations and determine the screening effectiveness of noise as a means of screening without life tests.

1.3.3 Use the computer program developed for noise readings to determine if application of screening to initial parameters other than noise will provide similar screening effectiveness.

1.3.4 Determine if noise tests made after the other screens for initial parameters will make a further improvement in reliability.

2.0 MAJOR PROBLEM AREAS IN PRESENT CONTRACT

2.1 Line Transients Plus Thermal Runaway

2.2 Failure Mode Description

One of the new failure mode problems facing the semiconductor industry is the effect of transient spikes which occur on power lines and are generated in other ways.

2.2 Failure Mode Description - Cont'd

Such transient spikes consist of very high peak voltages which appear on power lines due to the operation of various electrical equipment.

Transient spikes of much higher values also occur in every conductor during thunderstorm activities. The actual spike voltage is unknown but it is not unusual to observe arc over across several inches of space from an ungrounded conductor to a grounded conductor during thunderstorms.

Such arc over problems are of serious concern in Industrial Control Standards in N.E.M.A. activities. In this case semiconductor insulator spacing is much too small to meet the requirements for arc over protection.

The project engineer is serving at present on the task force to consider this problem.

In use most transistors must be protected from such high transient voltage spikes in a manner which limits the flow of current through the device to values which will not destroy the device.

Life test racks at General Electric were originally designed to permit thermal runaway when a momentary breakdown did occur. The philosophy was reasonable and though somewhat overcautious when applied to Germanium devices and to Alloy devices, it did guarantee a higher reliability.

The original argument was that a momentary breakdown indicates a defective transistor which should be eliminated.

During the change from alloy to planar construction the problem has developed due to the high impedance of the planar surfaces.

About the time of the start of this Life test, new test cards were introduced having a diode in the base as a protection against high reverse current in the base on a momentary overload.

Such cards were available in sufficient quantities to use at the higher levels with a delay of four weeks in getting the life test started.

The 500mw level was not expected to show problems without the diodes.

The analysis of data in relation to failure effects at the 500mw level failures compared to the failures at other power levels was conducted on Process "A" and covered in Section 3.0.

It is expected that the level of failures due to transient spikes is comparable in Process "B" and Process "C", but the level of miscellaneous failures at the 500mw level and the other levels is sufficiently higher and would be more likely to cancel the most valuable information.

2.3 Data Handling Problems

The data handling problem is very severe in this contract.

There are more than 250 readings, key punching or computer operations involved for each transistor on the test.

The 58 test lots show data assembled by the computer on approximately 10,000 separate sheets.

The percentage of error is reasonable, but the need for data handling reliability percentage is beyond the capability of either human operator or data processing equipment.

With the 250 operations per transistor an error rate of .008% would be required to hold to 2% errors in classification of a device as a failure.

A careful review of the data is required for a cross-check on each indicated failure. Computer system errors tend to show 2 to 5 times the number of failures which are unexplained.

There are only a few of the computer failures which can be identified and the ratio above probably is too low for a true picture of failures.

3.0 LIFE TEST RESULTS

3.1 High Stress Screen

3.1.1 Process "A"

Five lots were tested on the 3,000 hour life test from Process "A". The five lots were subjected to the power and temperature shown in the table.

Conditions for all lots were similar except that the 500mw had no reverse current protection in the base circuit, as explained in Section 2.

It was also found during the high stress experiment as reported in Quarterly Report #3, that a substantial number of units showed a shift in I_{CBO} after the temperature plus reverse voltage.

The units which did show this shift were divided with all units having a ("B" Class) shift of 1 micro-ampere or more sent to failure analysis. The units of the ("C" Class) 100nA to 100 micro-ampere, were divided and some included in the life test and some sent to failure analysis.

Units of the ("E" Class) 10nA to 100nA were included in the life test.

This division did provide the means of understanding the effect of decreasing the limits of leakage allowable.

This distinction ~~was~~ made only in the Process "A" units which shifted and completely recovered.

Some units which were shown to exceed initial limits on the beginning of the life test, were allowed to continue through the test.

Either type of unit is designated as screened out unit in the analysis.

3.1.1.1 Test Conditions High Stress Screen Life Test

Lot No.	419-201	419-202	419-203	419-204	419-205
No. in Lot	14	28	75	14	28
Acceptable	12	23	58	12	21
Screened Out	2	5	17	2	7
% Screened Out	14	18	23	14	25
Power in MW	800	700	*500	200	400
Temperature °C	25	25	25	150	150

*500mw test level was not protected by diode from transient triggered thermal runaway.

Test Limits Used to Define Failure

Test limits used for the classes of failure agree with the limits used in Quarterly Report #3, Page 11 reproduced here:

	G	E	C	B
I_{CEO}	10nA	10-100nA	100-1000nA	1 uA
I_{EBO}	10nA	10-100nA	100-1000nA	1 uA
* BV_{CEO}	40v	30-40v	20-30v	20v
BV_{CEO} % Shift	15%	25%	50%	50%
h_{FE}	40-120	35-40 & 120-150	28-35 150-180	28 or 180
h_{FE} % Shift	15%	15-25%	25-50%	50%
$V_{CE(SAT)}$	Not Used			
$V_{CE(SAT)}$ % Shift	15%	15-25%	25-50%	50%
$V_{BE(SAT)}$	Not Used			
$V_{BE(SAT)}$ % Shift	15%	15-25%	25-50%	50%

*The specification rates V_{CEO} as 32v maximum in the absolute limit. Test limits of BV_{CEO} are not given and the limit of 40 volts was chosen as representative of the entire distribution at the current chosen for the test.

3.1.1.2 Failures in Units Screened Out

This lot was tested as part of the full lot as reported on the distribution graphs (Figures 3.1.1.1 through 3.1.1.5).

Lot	419-201	202	203	204	205	Total
Good at End of Test	(G) (1)	(2)	(11)	(1)	(4)	(18)
Passes "E" Limit	(E) (0)	(2)	(2)	(0)	(0)	(4)
Passes "C" Limit	(C) 1	0	1	0	0	2
Fails (Bad)	(B) 0	1	0	1	1	3
Failures (B & C)	1	1	1	1	1	5

Numbers in () do not count as failures in (B+C)

3.1.1.3 Shifters in Units Screened Out

This table shows the units which shifted on any parameters in the units which were screened out.

	419-201	202	203	204	205	Total
15-25% Shift	(E) 0	0	(2)	0	0	(2)
25-50% Shift	(C) 0	0	0	0	0	0
Over 50% Shift	(B) 0	0	0	0	2	0
Shifters B+C	0	0	0	0	2	0

3.1.1.4 Screened Out Units which Responded to Life Test (Shifters & Failures to "E", "C", & "B" Limits)

Lot Number	419-201	202	203	204	205	Total
No. Screened Out	2	5	16	2	7	32
No. Responding	1	1	5	1	1	7
Failure Rate %						
Per "K" hours for						
3,000 hour test			10.4			7.3

This shows the percent of units which responded in some way to the life test to be 10.4%/K hours for the 500mw units but this is above the 7.3 %/K hours.

If we count only failures at the 500mw (C+B) level the percent is very low with one failure in each lot.

3.1.1.5 Failures in the Life Test Lot Which Were Accepted by the Screen

Lot Number	419-201	202	203	204	205	Total
Number in Lot	12	23	58	12	21	126
Failure "C"	0	0	0	2	1	3
Failure "B"	2	2	7	0	0	11
Number Failed	2	2	7	2	1	14
Percent Failed	16.7	8.7	12	16.7	4.8	11.1
%/K Hours	5.6	2.9	4	5.6	1.6	

3.1.1.6 Shifted in Life Test

	419-201	202	203	204	205	Total
Shifted 15 to 25%	0	0	(6)	(2)	(2)	(10)
Shift 25-50% "C"	0	0	9	3	3	15
Shift Over 50% "B"	0	0	3	0	3	6
C&B Limits						
Percent to C&B	0	0	20.6	25	29	8
Rate %/K Hours	0	0	6.9	8.3	9.7	2.7

3.1.1.7 Total Number of Units Which Showed Some Response to Life Test
"E", "C", & "B" Limit Failures Plus "E", "C", & "B" Limit Shifters

	419-201	202	203	204	205	Total
Failed E	0	0	2	1	1	4
C	0	0	0	2	1	3
B	2	2	7	0	0	11
Shift E	0	0	6	2	3	11
C	0	0	9	3	3	15
B	0	0	3	0	6	9
Number Responded	2/12	2/23	27/58	8/12	14/21	53/126
Percent Responded	16.7	8.7	46.5	66.7	66.7	42.1
Rate in %/K Hours	5.6	2.9	15.5	33.3	33.3	14.0

3.1.1.8 Characteristics of the Devices Screened From the 500mw Lot

This table shows the failure items in the life test history of the lot each item is listed in accordance with the method used in Report #3 and #4. See Quarterly Report #3, Page 10, reproduced below.

Failure Tabulation Code for Correlation Tables -

Failures shown in the correlation tables are indicated by a three part code which consists of the 3 number groups shown below.

	<u>First Group</u>	<u>Second Group</u>	<u>Third Group</u>
1	I _{CBO}	1 Initial Value	G - Good
2	I _{EBO}	2 After 1st Step	E - End of Life
9	BV _{CEO}	2S Shift on 1st Step	C - Catastrophic
13	h _{FE}	3 After 3rd Step	B - Bad
15	V _{CE(SAT)}	3S 3rd Step Shift	(limit passed)
16	V _{BE(SAT)}	4 After 4th Step	
660	Noise 100 μ 1MA	4S 4th Step Shift	
661	Noise 1000 μ 1MA		
662	Noise 1000 μ 30MA		
663	Noise 100KC 30MA		

In addition the second group is extended to include Steps 5 through 16 using 5S, 6S, etc. as the shift items for each step. Second group is extended as follows.

5 = 00 hours Phase III
 6 = 170 hours
 7 = 340 hours
 8 = 680 hours
 9 = 1,000 hours
 10 = 1,500 hours
 11 = 2,000 hours
 12 = 3,000 hours
 13 = 30KG Centrifuge Phase IV
 14 = 50Kg Centrifuge Phase IV
 15 = 90Kg Centrifuge Phase IV
 16 = 150KG Centrifuge Phase IV

3.1.1.9 Characteristics of the Transistor Screened from the 500mw Lot

Units Which Passed 500mw Tests

Unit No.	203	101			
A444	3	48	(1-2-E)		
A119	9	54	(1-2-E)	(9-3-E)	(9-4-E)
A364	31	78	(13-4S+E)		
A450	33	80	(13-4S+C)		
A122	35	83	(9-4-E)	(9-4S-E)	(13-2S+C)(13-3S+C) (13-4S+C)
A170	36	84	(9-3S-E)		
A261	53	102	(1-2-C)		
A430	57	106	(1-2-C)		
A438	58	107	(1-2-C)		
A542	61	110	(1-2-C)		
A344	66	115	(13-3S+E)	(13-4S+E)	

Units Which Showed "E" Limits on Life Test

A113	19	65	(13-4S+C)	(13-11-E)(13-12-E)
A543	51	100	(1-2-C)	(9-2-E) (9-4-E) (9-12-E)

Units Which Shifted "E" Limit on Life Test 15-25%

A149	27	73	(13-3S-E)	(15-9S+C)
A236	37	85	(9-3S-E)	(15-10S +E)

Units Which Failed Life Test

A-6	34	81	(1-2-E)	(13-4S-E)(9-11S-E) (9-12S-E) (13-11S+C)
			(13-12S+C)	

From the above table we can see that units which shifted in I_{CBO} after temperature pulse reverse voltage (1-2-E) or 1-2-C) did not fail life test or shift on life test unless some other shift occurred, also No. A543 and No. A-6.

FIGURE 3.1.1.10.1

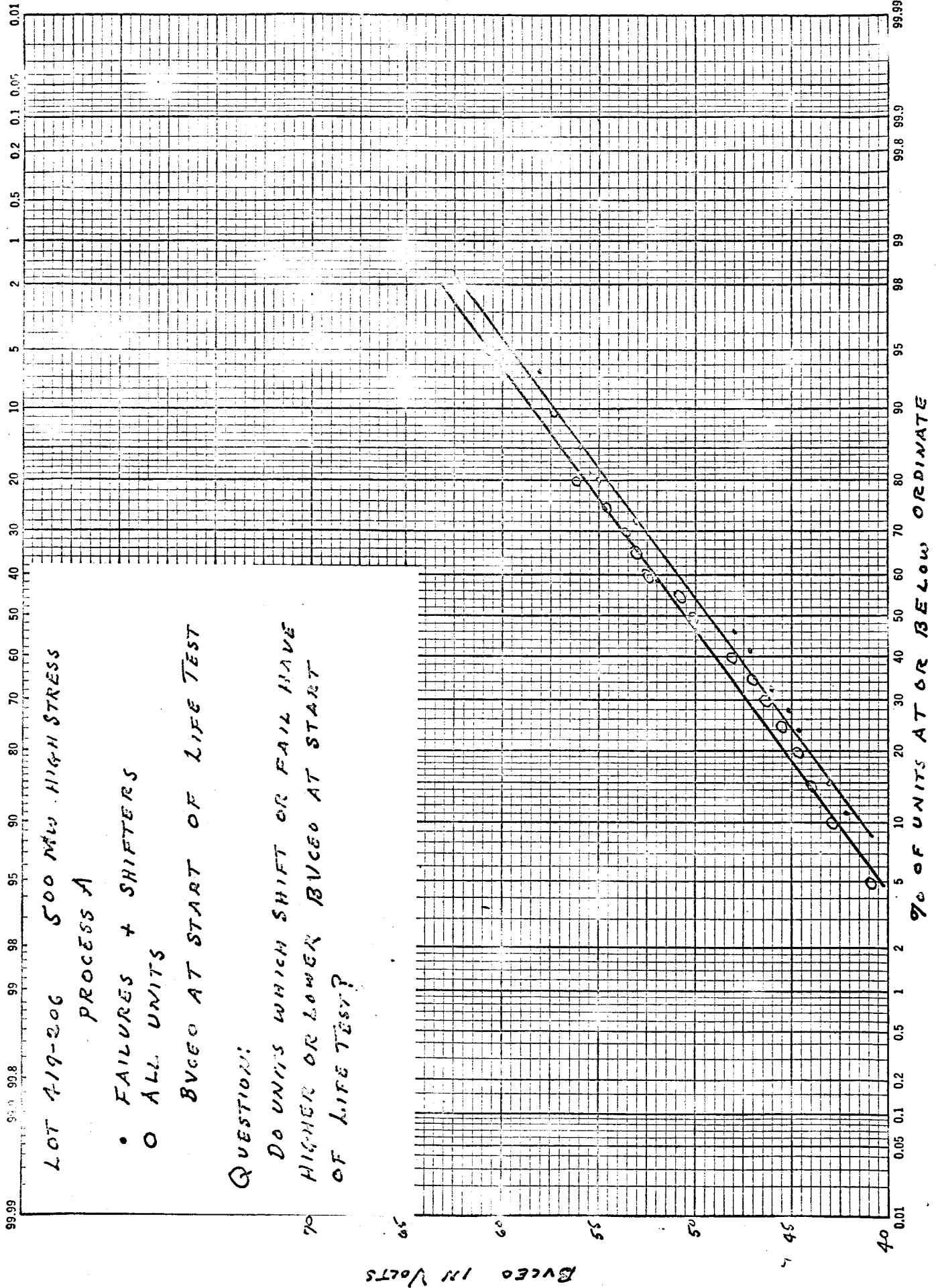


FIGURE 3.1.10.2

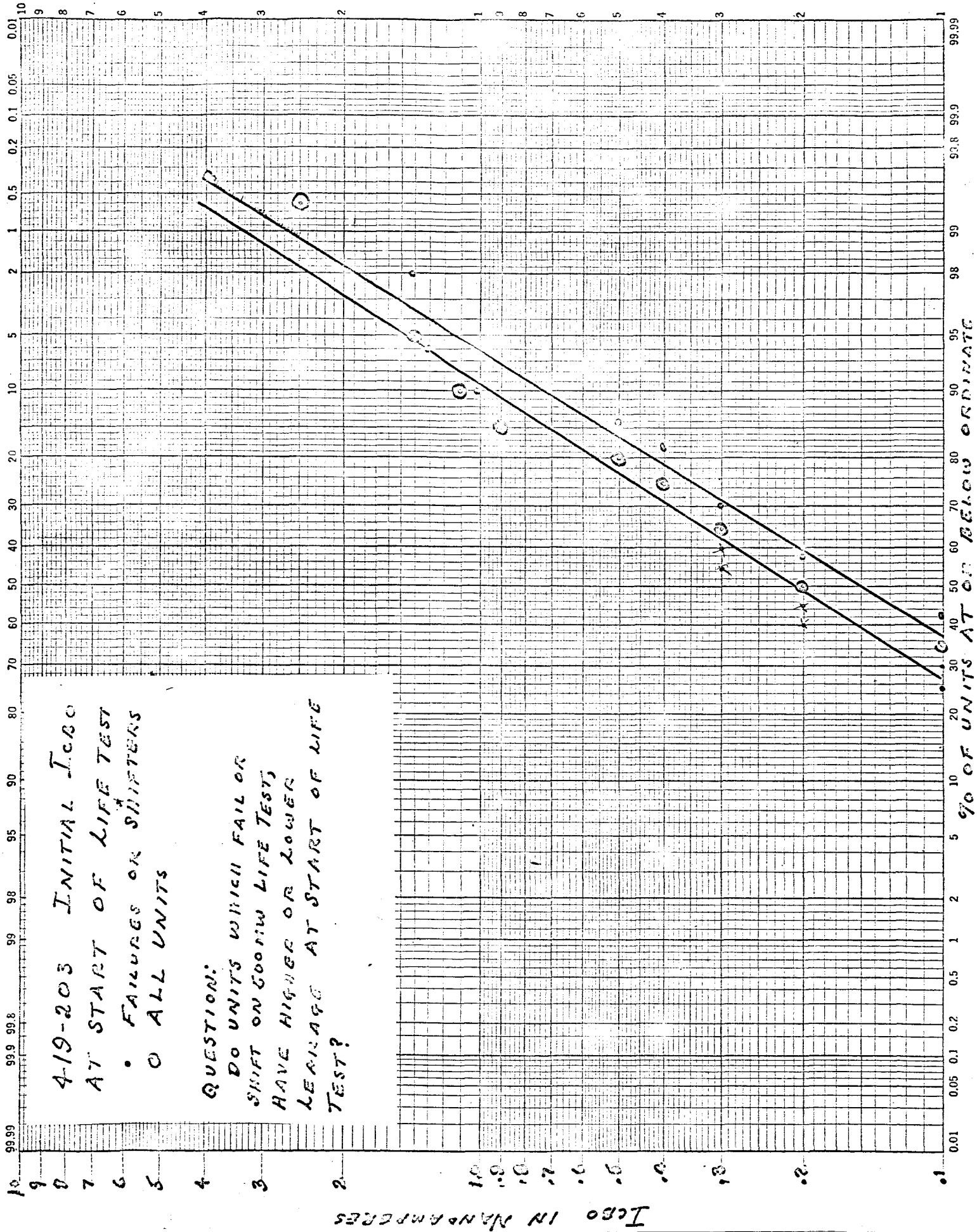
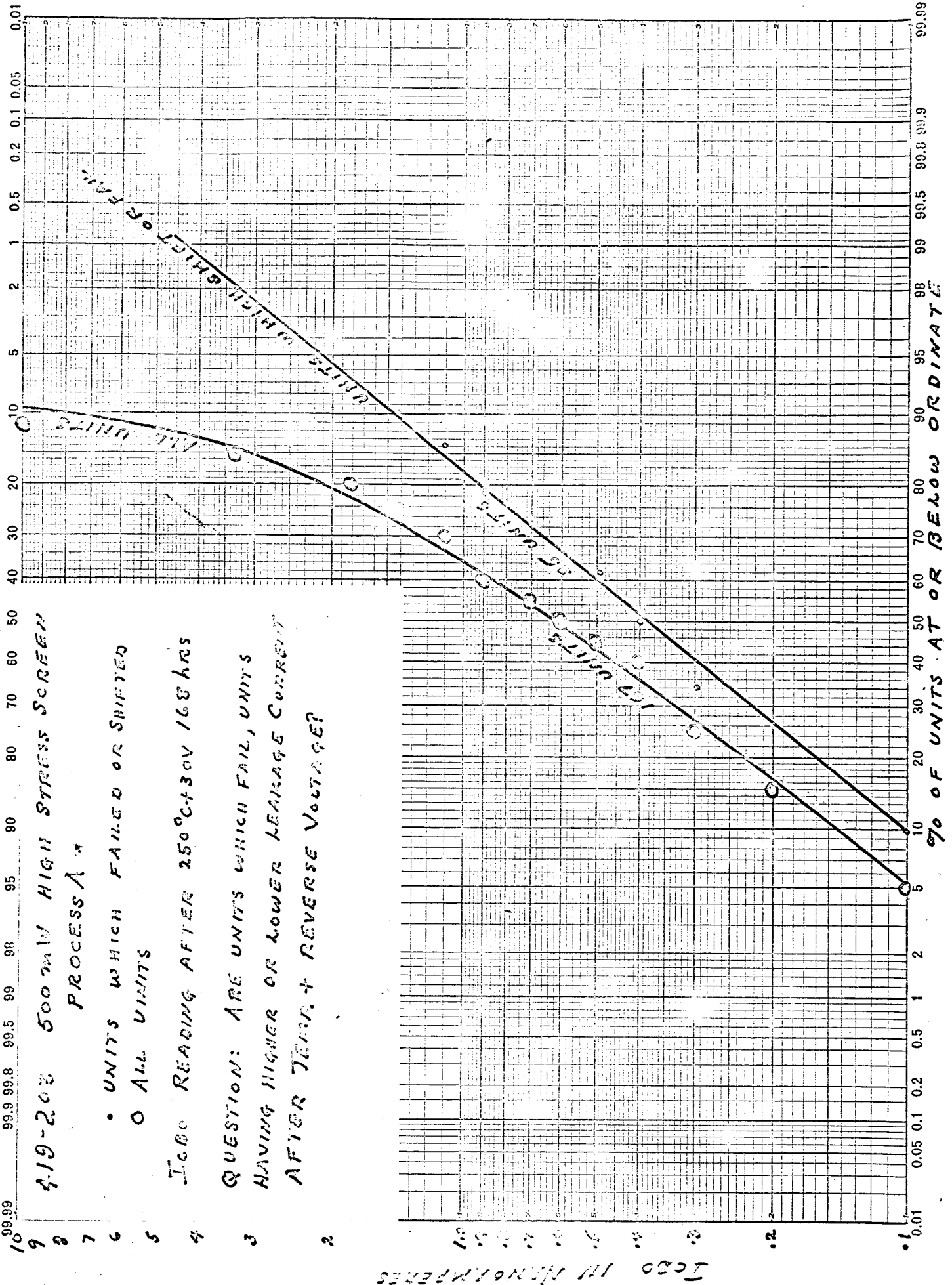


FIGURE 3.1.10.3

10



3.1.1.10 Failure Mechanisms

The above suggests that a different failure mechanism is involved in the 500mw failures than that which is expected in I_{CBO} shift.

Figure 3.1.1.10.1 shows a comparative distribution of the BV_{CEO} for all units in the lot and for the units which failed at 500mw. This shows a suggestion that the expected BV_{CEO} is a cause when units are selected on an initial test. The results of the graph could be obtained by chance alone and a relation is not clear. Figure 3.1.1.10.2 shows the relation between I_{CBO} measured initially and the distribution of units. The percentage accuracy of I_{CBO} is apparent in this and also there is a slight indication that I_{CBO} does enter into the problem but there is no clear evidence. Figure 3.1.1.10.3 shows the comparison when I_{CBO} is measured after the temperature plus reverse voltage.

This distribution chart shows that the units which failed had a substantially lower I_{CBO} after temperature plus reverse voltage.

This is a reversal of the results that commonly would be expected and justifies further exploration.

The lot investigated in this distribution includes both the units which would be screened out by temperature plus reverse voltage as well as those which would be accepted by the screen.

The shape of the distribution curve for the units which failed indicate that less than 0.1% of the units which failed would have a leakage above 10nA after temperature plus reverse voltage.

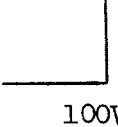
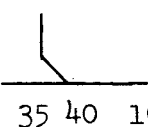
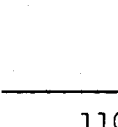
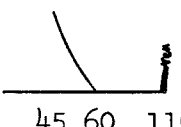
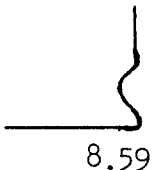
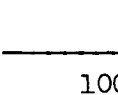
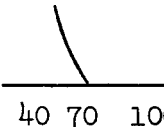
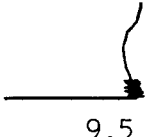
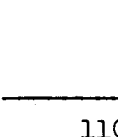
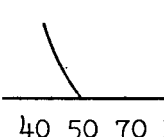
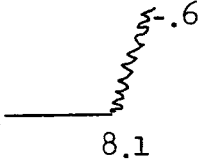
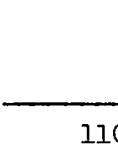
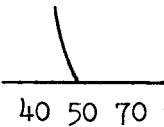
This indicates that the mechanism of failure by the 500mw test is directly opposite to failures by channeling.

The possibilities of this problem are further explored in Section 4.

3.1.1.11 Characteristics of the Devices Which were Screened Out of Life Test and Not Subjected to Life Test.

The following units were removed from the lot on Phase II and not subjected to Phase III.

Unit No	Phase III	Phase II
		101
A240	None	15 (1-2-B)
A285	None	45 (1-2-C)
A110	None	64 (1-2-B) (9-2S-C) (9-2S-E)
A186	None	74 (1-2-B) (9-2S-C)
A40	None	82 (2-3-13) (13-3-13) (13-3S-13) (16-3S-E)
A294	None	87 (2-1-C) (2-2-C) (2-3-B)
A192	None	135 (1-2-B) (9-2-B)

Unit	I_{EBO}	I_{CBO}	I_{CEO}	Notes
A240				Base Ring Melted in one spot
A285		Unit Blasted by Test 		Gold alloyed into silicon from base
A110				Gold alloyed into silicon at base
A186				Spot broken off AL base ring silicon
A192				Aluminum base ring melted in one spot
A40	Bad		Same as I_{CBO}	Out of alignment E-B junction too close to base aluminum ring
A294				Nothing visible

3.1.1.12 Truncation Screening

The theory of truncation screening as used in Quarterly Report #2, #3, and #4 is also shown in Technical Documentary Report RADC TDR-64-311 Rome Air Development Command.

Truncation screening is advanced as a means of detecting any condition which is out of normal.

3.1.1.12 Truncation Screening Cont'd

The theory as advanced in RADC or as used in the Quarterly Reports #2, #3, and #4 is that any out of normal condition within a device will cause one or more of the parameters to have a bi-model distribution. If such is true, eliminating the upper or lower percentiles of the distribution of same parameter, should improve reliability.

Paragraph 3.1.1.10 shows the difference in distribution of units which went through the high stress screen. In effect the percentage difference between failures and all units is very small when applied to I_{CBO} except I_{CBO} after temperature plus reverse voltage.

There may be an unjustified assumption in this reasoning because Lot 419-203 had the 7 units removed as bad prior to life test.

Figure 3.1.1.12.1 shows a comparison of units which either failed on the 500mw life tests or shifted more than 50%. The "B" level of failure and shifter is used for selection.

This shows that there is little difference between units which failed and all units.

The units which change in I_{CBO} due to temperature plus reverse voltage are clearly not the units which will fail.

The lot used in 3.1.1.12.1 includes all 500mw on the 4 lots for:

High Stress Screen	Lot 419-203
Moderate Stress Screen	419-208
Centrifuge Only	419-213
Control Lot	419-218

The above data indicates that the failure mode associated with 500mw failures is most likely to occur to the best units when judged by the high stress temperature plus reverse voltage.

Units which are most likely to form a channel are much less likely to fail due to the failure mode which is associated with the lack of diode protection against thermal runaway.

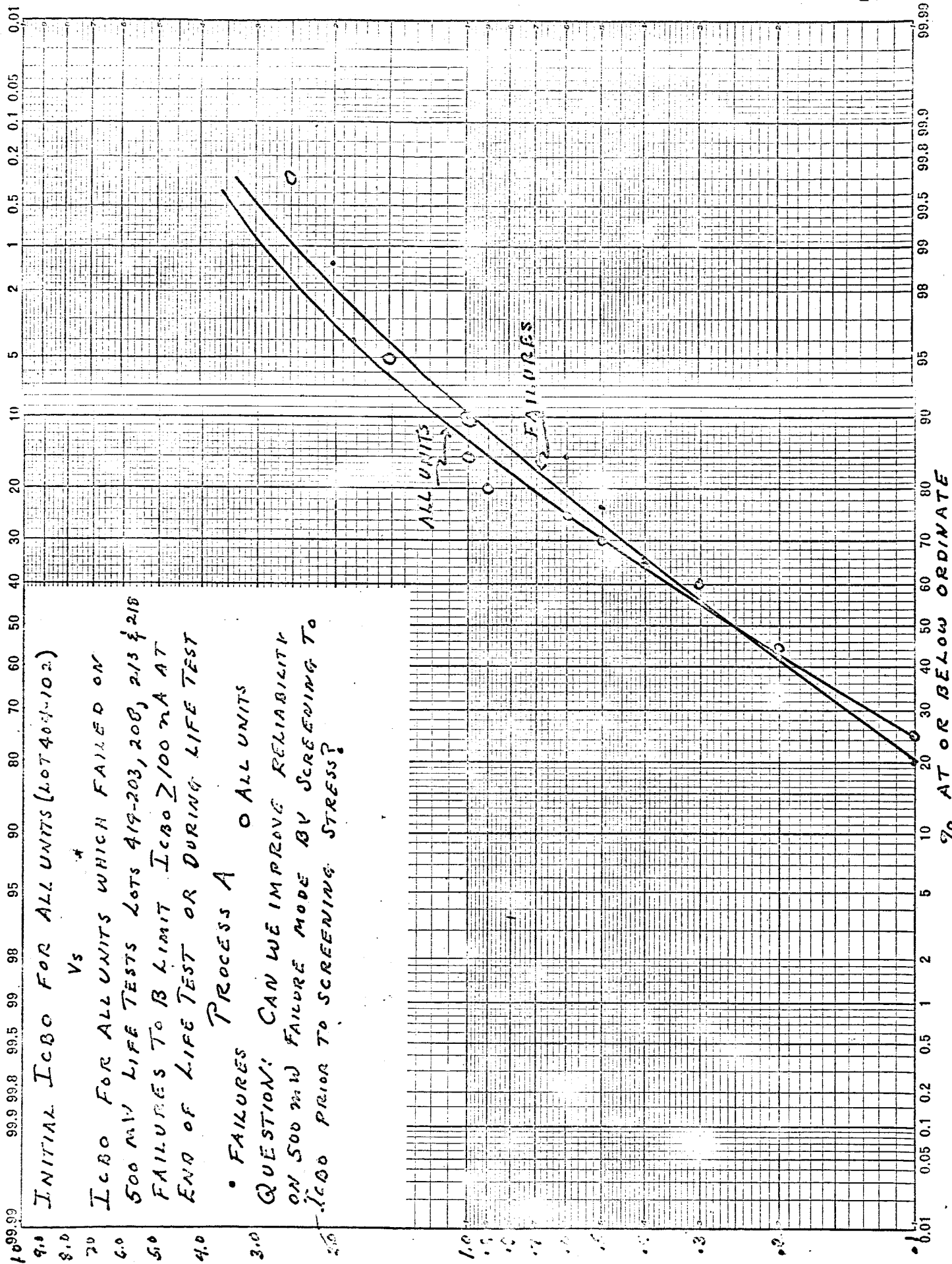
Truncation Screening to Other Parameters

Table 3.1.1.2 shows the effect of truncation screening when applied to the control lot, which showed 11 failures to the "C" and "B" levels during the 3,000 hours.

If screened to remove the upper limit of I_{CBO} equal to the upper 15th percentile of the entire distribution, there would be no significant improvement in reliability.

Similarly upper 15th percent are removed on other parameters produces no results lower limits also produce no significant results.

FIGURE 3.1.12.1



ICB0 IN 1000 HOURS

FIGURE 3.1.1.12.2
EFFECT OF SCREENING LOT 419-218 TO 15TH PERCENT POINTS
MEASURED AT START OF LIFE TEST

15

UNIT NO.	CLASS	1 I_{CBO}	2 I_{EBO}	3 BV_{CEO}	4 h_{FE} HIGH	5 LOW	6 $V_{CE(SAT)}$ HIGH	7 LOW	8 $V_{BE(SAT)}$ HIGH	9 LOW	REDUNDANT TRUNCATION SCREENING
1					G						
2	B		B				(B)		(B)		2-6-8 B
3											
4								G			
5			G								
6				G					(G)		3-9 G
7		G					(G)		(G)		1-6-9 G
8				G							
9								G	(G)		7-9 G
10											
11			G				(G)		(G)		2-6-8 G
12	B										
13	C				C						
14	C										
15											
16											
17											
18		G			(G)			(G)	(G)		1-4-7-9 G
19											
20	C										
21	B				B						
22		G		G							
23			G			(G)					
24	C			C				(C)			
25					G		(G)		(G)		4-6-8 G
26	E										
27							G				
28	C	C	(C)			(C)			(C)		1-2-5-8 G
29								G	(G)		7-8 G
30											
31	E										
32	B					B					
33	B	B								(B)	1-9 B
34											
35						G					
36	E	E									
37											
38	B			(B)		(B)					3-5 B
Total	38	32	33	33	34	33	32	33	33	32	28
B	6	5	5	5	5	4	5	6	5	5	3
C	5	4	4	4	4	4	5	4	4	4	4
E	3	2	3	3	3	3	3	3	3	3	3
G	24	21	21	21	22	22	19	20	21	20	17
% E+G	71	72	73	73	73.5	76	69	70	72	71.8	71

Table 3.1.1.12.2

The effect of truncation screening at the 15% point when truncation is applied to initial parameters. Measured at beginning of Life test Step 5.

This shows no correlation between initial parameters and failure when truncation is applied to either a single parameter or to two or more parameters.

FIGURE 3.1.1.12.3
SCREENING AFTER FIRST STEP (6) 419-218

UNIT NO.	CLASS	1 I_{CBO}	2 I_{EBO}	3 BV_{CEO}	4 h_{FE} HIGH	5 LOW	6 $V_{CE(SAT)}$ HIGH	7 LOW	8 $V_{BE(SAT)}$ HIGH	9 LOW	REDUNDANT TRUNCATION SCREENING
1											
2	B						B		(B)		6-9 B
3											
4								G		G	
5											
6				G							
7							G				
8				G							
9		G						G			1-7 G
10											
11											
12	B				B						
13	C	C	(C)		(C)						1-2-4 C
14	C									C	
15		G	(G)						(G)		1-2-8 G
16						G					
17											
18		G			(G)			(G)		(G)	4-7-9 G
19											
20	C										
21	B										
22				G						(G)	3-9 G
23						G					
24	C			C				(C)			3-7 C
25					G		(G)		(G)		4-6-8 G
26	E										
27			G		(G)		(G)				2-4-6 G
28	C	C							(C)		1-8 C
29								G	(G)		7-8 G
30							G				
31	E										
32	B					B					
33											
34											
35						G					
36	E										
37			G								
38	B			B		(B)					3-5 B
No.	38	33	34	33	33	33	33	33	33	34	26
B	6	6	6	5	5	4	5	6	5	6	4
C	5	3	4	4	4	5	5	4	4	4	2
E	3	3	3	3	3	3	3	3	3	3	3
G	24	21	21	21	21	21	20	20	21	21	17
E+G	71	73	71	73	73	73	70	70	73	71	77

When the units are studied on the basis of removing devices which are out of limits on 2 or more 15th percent points there is also no improvement

Figure 3.1.1.12.3 shows the same comparison when tests are taken after the first 168 hours of operation.

This table shows no effect of truncation screening. A 7% improvement does show in use of inclusion in 2 or more fringes as a screening limit. There is no common pattern for the improvement and no conclusions are possible.

Table 3.1.1.12.2 The effect of truncation screening at the 15% point when applied after the first life test.

This shows no significant improvement in screening to an individual parameter but some improvement when screening is done to redundant truncation.

The fact that truncation screening has little or no effect on reliability tends to confirm that these failures are not related to degradation processes but due to the transient spike condition.

3.1.1.13 Characteristics of Failures at 800mw 419-201

	III	II	No. in Lot =14
Unit No.	201-	101-	Screened out failure
A528	8	9	(2-3-C) did not recover (2-12-C)
			Life Test Failure Not Screened Out
A492	7	8	(9-11+B) (13-11-B) (16-11+B) Open on 12
A74	1	2	(13-7-B) (15-7-B) Recovered after 7
			Screened Out Good on Life Test
A286	14	16	(9-2S-E) Recovered and no further change
			A74 may be an intermittent condition

3.1.1.14 Characteristics of Failures at 700mw 419-202

			No. in Lot = 28
			Screened Out Units Good on Life Test
A417	18	2	(1-2-c) (1-10-E) (9-2S-E)
A583	2-	4	(1-2-E)
A355	27	11	(9-3-E) (9-4-E) (9-5-E)
A51	41	25	(13-2S-E)
			Failures
A479	29	13	Opened @ 1,000 hours
A388	26	20	Opened @ 1,500 hours
			Screened Out Failure
A412	28	12	(13-2S+C) (Opened at 8)
			All 3 Failures are definite failures

3.1.1.15 Characteristics of Failures at 200mw +150°C 419-204

			No. in Lot =14
			Screened out Good
Unit	204	10A	
A508	13	138	(13-2S-B) (13-3S-B) (13-4S-B)

Screened Out Failure

A589	14	139	(13-4S+E) (1-12-C) (9-12-B) (9-12S-B)(13-12S-B)
------	----	-----	---

In this case a shift in h_{FE} on centrifuge of 15 to 25% signaled a failure at 3,000 hours.

Life Test Failures

A529	5	129	(9-11+E) (9-12+E)
------	---	-----	-------------------

This would not be counted as a failure on normal end of life limits

A353	3	127	(13-12-C) (13-11S-C) (15-10S-B)
A419	4	128	(1-9-#) (1-10-E) (1-11-C) (1-12-C)

Unit A419 is the only unit found in this lot which fails on the leakage mode of failure that was expected in the development of this screen.

Life Test Shifters

A252	2	126	(13-11S-E) (13-12S-E)
A201	11	136	(13-11S-E) (13-12S-E)
A419	1	125	(1-10-E) (1-11-E) (1-12-E) (15-10S-C)
A170	10	134	(1-11S-C) (1-12S+C)
A472	12	137	(13-12-C)

3.1.1.16 Characteristics of Failures at 400mw + 150°C

Lot 419-205 Units in Test 22 Units Screened Out but good on Life Test

Unit	205	101	
A108	3	142	(13-4S+E)
A88	13	152	(13-4S+E)
A160	16	155	(13-3S+E) (13-4S+C)
A171	26	165	(1-2-B) (9-2-B) (9-2S-B)

Screened Out Failures

A154	27	166	(1-6-C) (1-7-C) (13-3S+E) (13-4S+C) (1-12+B)
------	----	-----	--

This unit shows results of the screen as a means of removing leakage type failures

Screened Out Shifter

A382	9	148	(1-2-C) (13-11S-B)
A123	25	164	(13-5-E) (Through 13-9-E) (15-9S-B)

Life Test Failure

A423	11	150	(1-8-E)
------	----	-----	---------

Life Test Shifter

A412	10	149	(15-8S-E)
A169	17	156	(15-8S-E)
A597	1	140	(15-8S+C)
A181	5	144	(15-8S-C)
A131	14	153	(15-8S+C)
A269	6	145	(13-11S+B)
A158	15	154	(15-8S+B)
A216	19	158	(16-9S-B)

The shifting which occurs on the 8th readout to $V_{CE(SAT)}$ only is a shift which tended to both higher and lower levels. This is not understood at present. The occurrence of so many shifters at one step only must have some significance.

It is possible that instrument trouble may be an explanation though problem is not observed in the other readings made at the same time.

Other possibilities are changes in period between oven and test and in the way the unit was cooled on removal from 150°C.

Casual examination of failures at all four 500mw life test conditions show that failure mode is similar percentage of failures and that shifting in characteristics is much more pronounced in the 500mw life tests than in other life tests which had diode protection.

Casual examination of the data shows that this condition is present in process "B" units though somewhat complicated by a larger number of failure modes which are active in the lots.

A more detailed study of these failures will be completed in later quarterly reports.

3.1.1.17 Conclusions Relating to Process "A"

Failures in Process "A" units were mainly due to a failure mode which is probably associated with a better surface.

Evidence in this experiment tends to confirm the hypothesis that: Transient spikes on power lines or connections can cause minute thermal runaway conditions which cause shifting of the device characteristics and also cause destruction in a large number.

The problem is expected to become more serious as surfaces are improved because the voltage drop across a high impedance is much greater than across low impedances.

4.0 COMPUTER ANALYSIS FOR PARAMETER DISTRIBUTION

The working copies of the computer analyzed data is attached for advance information. This data is subject to the usual types of computer - automation errors as follows and is being corrected as part of the engineering analysis now underway.

4.1 Computer Errors

The program written for the computer cannot recognize the differences between an empty test socket and an open transistor.

If a transistor opens during a test it will be recognized by the computer for ICBO or IEBO as a unit having very low leakage. The distribution is then calculated on the basis of the full number of units and the opened units as being very good. In practice the transistor may have progressively degraded in leakage, runaway and become open.

This makes the noticable changes in improvement of the high end of the distribution. Correction for this error is difficult and requires manual computations.

A second form of error is due to mis-registration of cards and other normal types of trouble. These normally show up in groups of four numbers out of line. The computer accepts the error and includes this in the computed data.

4.2 Other Errors

Each transistor requires a total of 250 readings, mechanical or manual and key punch operations. The combined error rate then necessary to provide a 1% indicated failure rate is .004%. This is much too low for human operators or present automatic equipment.

4.3 Correction Procedure

Many of the computer errors can be eliminated by examination because a typical computer error is large and frequently occurs in groups of four or more times. Other cross checks are made as part of determining failure mode for each failure.

4.4 Examination in detail of the data has been completed through lot 419-228. Failures due to computer error are approximately five times as frequent as actual device failures. This only proves that computer error rate is somewhat less than 250 times as good as the probably failure rate.

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C. MIN 3.67. MAX 96.47.

CELL NO.: 419201 NO. OF UNITS: 12

		ICBO (VCB - 60V) (Nanoamps)				
HRS.	Min	Init	168	340	680	1000
		0.2	0.5	1.1	2.1	4.1
5%	5%	0.2	0.6	1.1	2.1	4.1
10%	10%	0.2	0.6	1.1	2.1	4.1
25%	25%	0.3	0.7	1.2	2.2	4.2
50%	50%	0.4	1.1	0.5	0.5	0.3
75%	75%	1.3	2.0	1.4	1.3	1.0
90%	90%	1.5	2.3	1.7	1.5	1.2
95%	95%	1.5	2.3	1.7	1.5	1.2

		IEBO (VEB - 5V) (Nanoamps)				
HRS.	Min	Init	168	340	680	1000
		0.1	0.2	0.1	0.1	0.1
5%	5%	0.1	0.2	0.1	0.1	0.1
10%	10%	0.1	0.2	0.1	0.1	0.1
25%	25%	0.1	0.2	0.1	0.1	0.1
50%	50%	0.1	0.2	0.1	0.1	0.1
75%	75%	0.1	0.2	0.1	0.1	0.1
90%	90%	0.1	0.2	0.1	0.1	0.1
95%	95%	0.1	0.2	0.1	0.1	0.1

		BVCEO (IC - 0.1 ma) (Volts)				
HRS.	Min	Init	168	340	680	1000
		41	41	41	41	41
5%	5%	41	41	41	41	41
10%	10%	41	41	41	41	41
25%	25%	41	41	41	41	41
50%	50%	41	41	41	41	41
75%	75%	41	41	41	41	41
90%	90%	41	41	41	41	41
95%	95%	41	41	41	41	41

		BVCEO (% Change from Initial)				
HRS.	Min	Init	168	340	680	1000
		-	-3	-4	-3	-4
5%	5%	-	-3	-4	-3	-4
10%	10%	-	-3	-4	-3	-4
25%	25%	-	-3	-4	-3	-4
50%	50%	-	-3	-4	-3	-4
75%	75%	-	-3	-4	-3	-4
90%	90%	-	-3	-4	-3	-4
95%	95%	-	-3	-4	-3	-4

		VCE (SAT) (IC-50ma, IB-5 ma) (Mv.)				
HRS.	Min	Init	168	340	680	1000
		147	149	149	152	154
5%	5%	147	149	149	152	154
10%	10%	147	149	149	152	154
25%	25%	147	149	149	152	154
50%	50%	147	149	149	152	154
75%	75%	147	149	149	152	154
90%	90%	147	149	149	152	154
95%	95%	147	149	149	152	154

		VCE (SAT) (% Change from Initial)				
HRS.	Min	Init	168	340	680	1000
		-	-1	-4	-1	-1
5%	5%	-	-1	-4	-1	-1
10%	10%	-	-1	-4	-1	-1
25%	25%	-	-1	-4	-1	-1
50%	50%	-	-1	-4	-1	-1
75%	75%	-	-1	-4	-1	-1
90%	90%	-	-1	-4	-1	-1
95%	95%	-	-1	-4	-1	-1

		VBE (SAT) (IC-50 ma, IB-5 ma) (Mv.)				
HRS.	Min	Init	168	340	680	1000
		785	784	785	787	780
5%	5%	785	784	785	787	780
10%	10%	785	784	785	787	780
25%	25%	785	784	785	787	780
50%	50%	785	784	785	787	780
75%	75%	785	784	785	787	780
90%	90%	785	784	785	787	780
95%	95%	785	784	785	787	780

		VBE (SAT) (% Change from Initial)				
HRS.	Min	Init	168	340	680	1000
		-	-2	-2	-1	-2
5%	5%	-	-2	-2	-1	-2
10%	10%	-	-2	-2	-1	-2
25%	25%	-	-2	-2	-1	-2
50%	50%	-	-2	-2	-1	-2
75%	75%	-	-2	-2	-1	-2
90%	90%	-	-2	-2	-1	-2
95%	95%	-	-2	-2	-1	-2

		bFE (IC - 20 ma, VCE - 5V)				
HRS.	Min	Init	168	340	680	1000
		57	57	57	57	58
5%	5%	57	57	57	57	58
10%	10%	57	57	57	57	58
25%	25%	57	57	57	57	58
50%	50%	57	57	57	57	58
75%	75%	57	57	57	57	58
90%	90%	57	57	57	57	58
95%	95%	57	57	57	57	58

		bFE (% Change from Initial)				
HRS.	Min	Init	168	340	680	1000
		-	-3	-7	-4	-1
5%	5%	-	-3	-7	-4	-1
10%	10%	-	-3	-7	-4	-1
25%	25%	-	-3	-7	-4	-1
50%	50%	-	-3	-7	-4	-1
75%	75%	-	-3	-7	-4	-1
90%	90%	-	-3	-7	-4	-1
95%	95%	-	-3	-7	-4	-1

		bFE (IC - 20 ma, VCE - 5V)				
HRS.	Min	Init	168	340	680	1000
		57	57	57	57	58
5%	5%	57	57	57	57	58
10%	10%	57	57	57	57	58
25%	25%	57	57	57	57	58
50%	50%	57	57	57	57	58
75%	75%	57	57	57	57	58
90%	90%	57	57	57	57	58
95%	95%	57	57	57	57	58

		bFE (% Change from Initial)				
HRS.	Min	Init	168	340	680	1000
		-	-3	-7	-4	-1
5%	5%	-	-3	-7	-4	-1
10%	10%	-	-3	-7	-4	-1
25%	25%	-	-3	-7	-4	-1
50%	50%	-	-3	-7	-4	-1
75%	75%	-	-3	-7	-4	-1
90%	90%	-	-3	-7	-4	-1
95%	95%	-	-3	-7	-4	-1

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 700 mw, 30 V, 25°C. MIN 1.8% MAX 9.8.2%

CELL NO.: 419202 NO. OF UNITS: 28

HRS.	ICBO (V _{CB} - 60V)(Nanoamps)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	
5%	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	
10%	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	
25%	0.1	0.7	0.1	0.1	0.2	<0.1	0.2	0.5		
50%	0.3	1.0	0.4	0.3	0.4	0.3	0.6	0.7		
75%	1.0	1.9	1.3	1.2	1.3	0.9	2.4	1.4		
90%	1.4	2.7	2.6	2.1	2.6	1.8	7.9	2.6		
95%	2.1	2.0	4.0	4.5	6.7	25.3	20.8	22.0		
Max	2.3	3.2	4.6	6.4	8.9	44.4	31.0	36.9		

HRS.	IEBO (V _{EB} - 5V)(Nanoamps)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
5%	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
10%	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
25%	0.1	0.4	<0.1	0.1	<0.1	0.2	<0.1	0.2		
50%	0.3	0.5	<0.1	0.2	0.1	0.4	0.2	0.3		
75%	0.2	0.6	0.2	0.3	0.3	0.5	0.7	0.4		
90%	0.8	1.2	0.6	0.4	0.4	0.6	3.3	1.0		
95%	2.3	1.6	1.2	0.8	1.0	0.7	4.8	1.3		
Max	3.3	1.8	1.3	1.2	1.3	0.7	5.0	1.3		

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	39	39	40	39	40	38	37	35		
5%	40	40	40	40	40	39	38	37		
10%	42	42	43	42	42	41	41	41		
25%	45	45	45	45	45	45	45	45		
50%	47	47	46	47	47	47	47	47		
75%	52	52	52	52	53	53	55	55		
90%	57	56	56	57	54	54	58	58		
95%	59	58	58	58	58	58	58	58		
Max	60	60	60	60	60	60	60	60		

HRS.	BV _{CEO} (% Change from Initial)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	-	-2	-3	-2	-2	-5	-7	-10		
5%	-	-2	-3	-2	-2	-5	-7	-8		
10%	-	-2	-2	-2	-2	-3	-3	-3		
25%	-	-1	-1	-1	-1	-1	-1	-1		
50%	-	0	0	0	0	0	0	0		
75%	-	0	0	0	0	0	0	0		
90%	-	0	0	0	0	0	0	0		
95%	-	+2	+1	+2	+1	+2	+1	+2		
Max	-	+3	+1	+1	+1	+1	+1	+1		

HRS.	VCE(SAT)(I _C -50ma, I _B -5 ma)(Mv.)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	145	148	146	149	149	149	148	148		
5%	155	159	158	159	161	161	159	166		
10%	171	172	173	177	179	176	174	179		
25%	177	181	179	192	198	200	198	197		
50%	207	210	211	219	223	213	220	222		
75%	232	236	230	239	245	240	239	251		
90%	263	265	264	272	279	274	274	280		
95%	269	287	287	287	287	287	287	287		
Max	273	304	305	305	305	305	305	305		

HRS.	VCE(SAT)(% Change from Initial)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	-	-1	0	0	0	0	-1	-43		
5%	-	-1	0	0	0	0	-1	-51		
10%	-	0	0	0	0	0	0	0		
25%	-	+1	+1	+2	+2	+2	0	0		
50%	-	+2	+1	+3	+3	+3	+1	+1		
75%	-	+3	+3	+4	+5	+4	+3	+4		
90%	-	+5	+4	+4	+5	+5	+3	+4		
95%	-	+10	+10	+10	+10	+10	+10	+10		
Max	-	+11	+12	+12	+12	+12	+12	+12		

HRS.	VBE(SAT)(I _C -50 ma, I _B -5 ma)(Mv.)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	775	775	777	777	775	775	775	775		
5%	779	779	780	784	779	777	779	776		
10%	784	784	785	788	784	784	785	785		
25%	787	787	787	790	789	787	787	785		
50%	790	792	799	795	790	790	792	795		
75%	794	795	792	798	797	795	797	795		
90%	799	800	799	814	793	793	800	800		
95%	813	816	811	816	800	800	800	800		
Max	816	819	812	812	800	800	800	800		

HRS.	VBE(SAT)(% Change from Initial)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	-	-1	-1	0	-1	-1	-1	-1		
5%	-	-1	-1	0	-1	-1	-1	-1		
10%	-	0	-1	0	-1	-1	-1	-1		
25%	-	0	-1	0	-1	-1	-1	-1		
50%	-	0	-1	0	0	0	0	0		
75%	-	0	0	0	0	0	0	0		
90%	-	+1	0	+1	+1	+1	+1	+1		
95%	-	+2	+1	+2	+1	+2	+1	+2		
Max	-	+2	+1	+1	+1	+1	+1	+1		

HRS.	hFE (I _C - 20 ma, VCE - 5V)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	67	69	65	65	69	69	69	69		
5%	68	69	65	65	69	69	69	69		
10%	69	70	68	68	73	64	64	64		
25%	74	74	73	72	76	73	71	70		
50%	82	83	79	83	86	83	80	78		
75%	89	87	87	88	102	91	90	90		
90%	99	98	98	101	104	104	104	104		
95%	105	104	106	104	104	104	104	104		
Max	106	106	107	106	106	106	106	106		

HRS.	hFE (% Change from Initial)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	-	-9	-11	-76	-1	-77	-77	-77		
5%	-	-7	-10	-43	-1	-77	-77	-77		
10%	-	-4	-9	-2	0	-9	-75	-75		
25%	-	0	-5	-2	0	+1	-1	-1		
50%	-	+1	+1	-1	+2	+2	0	0		
75%	-	+3	+4	+3	+3	+6	-2	+3		
90%	-	+4	+6	+4	+4	+10	+10	+8		
95%	-	+6	+8	+6	+6	+16	+16	+19		
Max	-	+6	+8	+7	+9	+20	+19	+27		

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	39	39	40	39	40	38	37	35		
5%	40	40	40	40	40	39	38	37		
10%	42	42	43	42	42	41	41	41		
25%	45	45	45	45	45	45	45	45		
50%	47	47	46	47	47	47	47	47		
75%	52	52	52	52	53	53	55	55		
90%	57	56	56	57	54	54	58	58		
95%	59	58	58	58	58	58	58	58		
Max	60	60	60	60	60	60	60	60		

HRS.	BV _{CEO} (% Change from Initial)									
	Init	168	340	680	1000L	500L	2000L	3000L		
Min	-	-2	-3	-2	-2	-5	-7	-10		
5%	-	-2	-3	-2	-2	-5	-7	-8		
10%	-	-2	-2	-2	-2	-3	-3	-3		
25%	-	-1	-1	-1	-1	-1	-1	-1		
50%	-	0	0	0	0	0	0	0		
75%	-	0	0	0	0	0	0	0		
90%	-	0	0	0	0	0	0	0		
95%	-	+2	+1	+2	+1	+2	+1	+2		
Max	-	+3	+1	+1	+1	+1	+1	+1		

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419203 NO. OF UNITS: 75

HRS.	ICBO (V _{CB} - 60V)(Nanoamps)					
	Init	168	340	680	1000L	50020003000
Min	<0.1	<0.1	0.2	0.6	1.0	2.0
5%	<0.1	<0.1	0.5	0.8	1.0	2.0
10%	<0.1	<0.1	0.5	1.0	1.0	2.0
25%	0.1	0.1	0.6	1.0	0.1	0.1
50%	0.2	0.4	0.8	1.2	0.5	0.2
75%	0.4	0.6	1.0	1.7	0.7	0.7
90%	1.1	0.7	2.0	2.4	1.6	1.9
95%	1.4	1.1	2.5	3.3	2.1	2.7
Max	2.5	1.2	2.2	3.2	2.8	3.5

HRS.	IEBO (V _{EB} - 5V)(Nanoamps)					
	Init	168	340	680	1000L	50020003000
Min	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
5%	<0.1	<0.1	0.2	0.2	0.1	0.1
10%	<0.1	0.1	0.2	0.2	0.1	0.1
25%	<0.1	0.5	0.3	0.3	0.1	0.1
50%	<0.1	0.7	0.4	0.3	0.2	0.2
75%	0.2	0.7	0.6	0.5	0.4	0.4
90%	0.3	0.8	0.9	0.9	1.1	0.8
95%	0.6	0.9	1.1	1.1	1.2	1.1
Max	2.0	1.5	2.6	2.1	2.7	2.9

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)					
	Init	168	340	680	1000L	50020003000
Min	39	40	39	40	47	40
5%	41	41	41	41	42	42
10%	42	43	43	43	44	43
25%	45	45	46	46	47	46
50%	51	50	50	51	52	52
75%	54	54	54	54	58	58
90%	57	57	57	57	65	65
95%	61	60	60	61	60	60
Max	OPEN	64	64	64	OPEN	OPEN

HRS.	BV _{CEO} (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-96	-96	-96	-95	-95
5%	-	-1	-1	-1	-3	-3
10%	-	-1	-1	-1	-3	-3
25%	-	0	0	0	0	0
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	+3	+1	+1	+10	+10
95%	-	+2	+1	+2	+20	+18
Max	-	+8	+8	+8	+233	+233

HRS.	VCE(SAT)(I _C -50ma, I _B -5 ma)(Mv.)					
	Init	168	340	680	1000L	50020003000
Min	340	142	146	144	147	148
5%	157	160	157	159	160	157
10%	172	174	174	174	174	174
25%	196	202	203	200	204	204
50%	227	229	231	227	237	239
75%	265	269	270	270	287	292
90%	296	310	310	312	367	367
95%	353	356	350	359	385	367
Max	400	403	406	409	409	409

HRS.	VCE(SAT)(% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-1	-2	-2	-13	-10
5%	-	-1	-2	-1	0	-2
10%	-	0	-1	-1	0	-1
25%	-	+1	+1	0	+1	+1
50%	-	+2	+2	+1	+3	+3
75%	-	+3	+3	+2	+4	+5
90%	-	+5	+5	+5	+20	+23
95%	-	+6	+9	+14	+38	+38
Max	-	+9	+11	+14	+44	+44

HRS.	VBE(SAT)(I _C -50 ma, I _B -5 ma)(Mv.)					
	Init	168	340	680	1000L	50020003000
Min	003	779	772	772	780	780
5%	783	784	783	783	784	783
10%	785	784	786	786	786	786
25%	788	788	788	788	788	788
50%	790	791	793	793	794	793
75%	793	792	798	799	810	813
90%	795	808	807	808	817	822
95%	800	823	824	819	854	854
Max	848	831	829	833	854	854

HRS.	VBE(SAT)(% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-3	-3	-3	-3	-3
5%	-	-1	-1	-1	0	-1
10%	-	0	0	0	0	0
25%	-	0	0	0	0	0
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	+2	+2	+2	+3	+7
95%	-	+4	+4	+4	+20	+16
Max	-	8	8	8	20	20

HRS.	hFE (I _C - 20 ma, V _{CE} - 5V)					
	Init	168	340	680	1000L	50020003000
Min	51	48	41	41	20	20
5%	62	61	41	41	20	20
10%	69	65	64	65	51	53
25%	77	75	74	73	65	70
50%	86	83	84	82	76	79
75%	92	86	89	89	84	90
90%	99	97	97	99	99	99
95%	104	101	101	103	103	103
Max	119	116	116	116	118	121

HRS.	hFE (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-19	-17	-16	-28	-28
5%	-	-10	-33	-15	-23	-23
10%	-	-9	-9	-6	-28	-26
25%	-	-6	-4	-6	-20	-17
50%	-	-3	-1	-3	-9	-1
75%	-	0	0	-2	-1	0
90%	-	+1	+1	0	+1	+3
95%	-	+1	+2	+2	+3	+9
Max	-	+2	+7	+9	+24	+22

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)					
	Init	168	340	680	1000L	50020003000
Min	39	40	39	40	47	40
5%	41	41	41	41	42	42
10%	42	43	43	43	44	43
25%	45	45	46	46	47	46
50%	51	50	50	51	52	52
75%	54	54	54	54	58	58
90%	57	57	57	57	65	65
95%	61	60	60	61	60	60
Max	OPEN	64	64	64	OPEN	OPEN

HRS.	BV _{CEO} (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-96	-96	-96	-95	-95
5%	-	-1	-1	-1	-3	-3
10%	-	-1	-1	-1	-3	-3
25%	-	0	0	0	0	0
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	+3	+1	+1	+10	+10
95%	-	+2	+1	+2	+20	+18
Max	-	+8	+8	+8	+233	+233

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419204 NO. OF UNITS: 14

		ICBO (VCE - 60V)(Nanoamps)			
FRS.	Init	168	340	680	1000L50020003000
Min	0.1	0.4	0.1	0.1	0.1
5%	0.1	0.4	0.1	0.1	0.1
10%	0.1	0.5	0.1	0.1	0.1
25%	0.1	0.7	0.3	0.2	0.1
50%	0.2	0.8	0.4	0.6	0.3
75%	0.4	1.3	0.7	1.0	0.4
90%	0.8	3.0	3.2	5.1	14.6
95%	0.9	4.2	5.3	6.3	23.9
Max	0.9	7.2	5.3	6.3	23.9

		IEBO (VBE - 5V)(Nanoamps)			
FRS.	Init	168	340	680	1000L50020003000
Min	0.1	0.2	0.1	0.1	0.1
5%	0.1	0.2	0.1	0.1	0.1
10%	0.1	0.2	0.1	0.1	0.1
25%	0.1	0.4	0.1	0.1	0.1
50%	0.1	0.4	0.1	0.1	0.1
75%	0.1	0.5	0.1	0.2	0.4
90%	0.2	1.3	0.7	0.6	0.5
95%	0.2	2.0	1.1	0.9	0.5
Max	0.2	2.0	1.1	0.9	0.5

		BVCEO (IC - 0.1 ma)(Volts)			
FRS.	Init	168	340	680	1000L50020003000
Min	41	41	31	40	40
5%	41	41	31	40	40
10%	43	43	35	41	41
25%	47	46	43	46	45
50%	50	50	50	50	50
75%	54	55	55	53	52
90%	58	58	59	57	56
95%	59	60	60	59	58
Max	59	60	60	59	58

		BVCEO (% Change from Initial)			
FRS.	Init	168	340	680	1000L50020003000
Min	-	-4	-26	-6	-7
5%	-	-4	-26	-6	-7
10%	-	-4	-24	-6	-7
25%	-	-2	-8	-4	-6
50%	-	0	0	-2	-3
75%	-	+1	+2	0	0
90%	-	+9	+10	+6	+5
95%	-	+15	+13	+10	+9
Max	-	+15	+13	+10	+9

		VCE(SAT)(IC-50ma, IB-5 ma)(Mv.)			
FRS.	Init	168	340	680	1000L50020003000
Min	173	172	171	175	175
5%	173	172	171	175	175
10%	175	178	178	180	178
25%	190	194	192	190	189
50%	206	211	208	210	212
75%	245	247	252	248	244
90%	376	390	397	399	393
95%	396	405	408	410	407
Max	396	405	408	410	407

		VCE(SAT)(% Change from Initial)			
FRS.	Init	168	340	680	1000L50020003000
Min	-	-1	-1	0	-4
5%	-	-1	-1	0	-4
10%	-	-1	-1	0	-3
25%	-	+1	+1	+1	+1
50%	-	+2	+2	+2	+1
75%	-	+3	+4	+4	+4
90%	-	+5	+6	+10	+11
95%	-	+5	+8	+10	+13
Max	-	+5	+8	+10	+13

		VBE(SAT)(IC-50 ma, IB-5 ma)(Mv.)			
FRS.	Init	168	340	680	1000L50020003000
Min	784	782	781	785	785
5%	784	782	781	785	785
10%	784	784	783	785	787
25%	789	791	789	791	792
50%	791	795	791	795	796
75%	794	798	795	798	797
90%	795	806	797	815	804
95%	796	812	797	815	807
Max	796	812	797	815	807

		VBE(SAT)(% Change from Initial)			
FRS.	Init	168	340	680	1000L50020003000
Min	-	0	-1	-10	0
5%	-	0	-1	-10	0
10%	-	0	-1	-5	0
25%	-	0	0	0	0
50%	-	+1	0	+1	+1
75%	-	+1	0	+1	+1
90%	-	+2	+1	+3	+1
95%	-	+2	+1	+3	+1
Max	-	+2	+1	+3	+1

		hFE (IC - 20 ma, VCE - 5V)			
FRS.	Init	168	340	680	1000L50020003000
Min	64	58	64	53	63
5%	64	58	64	53	63
10%	73	60	65	60	67
25%	84	81	86	81	88
50%	89	89	88	84	93
75%	100	94	98	90	104
90%	106	97	103	100	109
95%	107	97	104	104	109
Max	107	97	104	104	109

		hFE (% Change from Initial)			
FRS.	Init	168	340	680	1000L50020003000
Min	-	-26	-21	-21	-16
5%	-	-26	-21	-21	-16
10%	-	-20	-17	-19	-12
25%	-	-8	-4	-14	-2
50%	-	-6	0	-8	+2
75%	-	-1	+3	-1	+10
90%	-	+6	+6	+5	+16
95%	-	+6	+7	+9	+16
Max	-	+6	+7	+9	+16

		hFE (% Change from Initial)			
FRS.	Init	168	340	680	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C. MIN. 1.8% MAX 98.2%.

CELL NO.: 419205 NO. OF UNITS: 28

HRS.	ICBO (VCB - 60V)(Nanoamps)					
	Init	168	340	680	1000L50020003000	
Min	<0.1	0.6	<1	<1	<1	<0.1
5%	<0.1	0.6	<1	<1	<1	<0.1
10%	<0.1	0.6	<1	<1	<1	<0.1
25%	<0.1	0.8	0.2	0.2	0.1	0.1
50%	0.2	0.9	0.5	0.4	0.3	0.3
75%	0.4	1.4	1.0	1.0	0.8	1.1
90%	0.9	13.5	2.0	1.5	1.8	1.9
95%	1.5	127.7	107.1	11.1	6.4	4.8
Max	2.0	142.4	196.6	18.6	10.1	7.3

HRS.	IEBO (V _{EB} - 5V)(Nanoamps)					
	Init	168	340	680	1000L50020003000	
Min	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
5%	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
10%	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
25%	<0.1	0.4	<0.1	<0.1	<0.1	0.2
50%	<0.1	0.5	0.1	0.1	0.2	0.2
75%	0.1	0.6	0.2	0.2	0.3	0.3
90%	0.2	0.7	0.4	0.3	0.4	0.4
95%	0.4	0.9	0.5	0.6	0.4	0.4
Max	0.5	1.0	0.5	0.6	0.4	0.4

HRS.	BVCEO (I _C - 0.1 ma)(Volts)					
	Init	168	340	680	1000L50020003000	
Min	41	41	41	41	41	41
5%	42	42	42	42	42	42
10%	44	44	44	44	44	44
25%	47	47	47	47	47	47
50%	51	51	51	51	51	51
75%	54	54	54	54	54	54
90%	58	58	58	58	58	58
95%	62	62	62	62	62	62
Max	64	64	64	64	64	64

HRS.	BVCEO (% Change from Initial)					
	Init	168	340	680	1000L50020003000	
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	0	0	0	0	0
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	0	0	0	0	0
95%	-	0	0	0	0	0
Max	-	0	0	0	0	0

HRS.	VCE(SAT)(IC-50ma, I _B -5 ma)(Mv.)					
	Init	168	340	680	1000L50020003000	
Min	150	152	155	157	154	157
5%	153	156	157	158	157	159
10%	171	174	175	179	178	178
25%	207	209	212	202	205	210
50%	230	241	245	233	246	246
75%	284	294	303	296	302	298
90%	406	423	431	418	430	427
95%	432	448	449	440	450	452
Max	437	451	453	442	453	453

HRS.	VCE(SAT) (% Change from Initial)					
	Init	168	340	680	1000L50020003000	
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	0	0	0	0	0
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	0	0	0	0	0
95%	-	0	0	0	0	0
Max	-	0	0	0	0	0

HRS.	VBE(SAT)(IC-50 ma, I _B -5 ma)(Mv.)					
	Init	168	340	680	1000L50020003000	
Min	779	775	784	774	776	776
5%	781	779	785	779	780	785
10%	785	784	788	785	785	785
25%	787	788	789	788	789	789
50%	793	793	796	794	797	794
75%	796	801	803	803	804	800
90%	800	808	810	809	806	805
95%	803	810	819	814	810	814
Max	805	810	819	814	812	817

HRS.	VBE(SAT) (% Change from Initial)					
	Init	168	340	680	1000L50020003000	
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	0	0	0	0	0
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	0	0	0	0	0
95%	-	0	0	0	0	0
Max	-	0	0	0	0	0

HRS.	hFE (IC - 20 ma, VCE - 5V)					
	Init	168	340	680	1000L50020003000	
Min	54	54	54	53	53	53
5%	56	56	56	55	55	56
10%	60	60	59	60	58	60
25%	74	75	72	74	71	74
50%	83	83	82	82	83	84
75%	90	88	89	87	88	89
90%	104	99	98	102	104	105
95%	118	115	114	120	117	121
Max	122	123	124	125	123	124

HRS.	hFE (% Change from Initial)					
	Init	168	340	680	1000L50020003000	
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	0	0	0	0	0
95%	-	0	0	0	0	0
Max	-	0	0	0	0	0

HRS.	hFE (IC - 20 ma, VCE - 5V)					
	Init	168	340	680	1000L50020003000	
Min	54	54	54	53	53	53
5%	56	56	56	55	55	56
10%	60	60	59	60	58	60
25%	74	75	72	74	71	74
50%	83	83	82	82	83	84
75%	90	88	89	87	88	89
90%	104	99	98	102	104	105
95%	118	115	114	120	117	121
Max	122	123	124	125	123	124

HRS.	hFE (% Change from Initial)					
	Init	168	340	680	1000L50020003000	
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	0	0	0	0	0
75%	-	0	0	0	0	0
90%	-	0	0	0	0	0
95%	-	0	0	0	0	0
Max	-	0	0	0	0	0

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C. Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITIONS:

800 mw, 30 V, 25°C. MIN. 3.6% MAX. 96.4%

CELL NO.: 419206 NO. OF UNITS: 14

FRS.	ICBO (V _{CB} - 60V) (Nanoamps)				
	Init	168	340	680	1000L50C20003000
Min	<0.1	<1	0.1	<1	<0.1
5%	<0.1	<1	0.1	<1	<0.1
10%	0.1	0.3	0.2	0.1	0.1
25%	0.1	0.5	0.2	0.2	0.1
50%	0.3	0.9	0.4	0.4	0.3
75%	0.5	1.9	1.7	1.5	1.2
90%	1.5	4.9	4.9	3.0	2.5
95%	2.0	6.9	6.9	3.7	2.5
Max	2.0	6.9	6.9	3.7	2.5

IEBO (V _{EB} - 5V) (Nanoamps)	Init	168	340	680	1000L50C20003000
	<0.1	0.2	<0.1	<0.1	<0.1
<0.1	0.2	<0.1	<0.1	<0.1	<0.1
<0.1	0.2	<0.1	<0.1	<0.1	<0.1
<0.1	0.3	<0.1	0.1	0.2	0.1
<0.1	0.4	<0.1	0.1	0.4	0.3
0.1	0.5	0.1	0.3	0.2	0.5
0.2	0.7	0.3	0.4	0.7	0.6
0.3	0.7	0.4	0.5	1.0	0.6
0.3	0.7	0.4	0.5	1.0	0.6

BVCE0 (I _C - 0.1 ma) (Volts)	Init	168	340	680	1000L50C20003000
	42	42	42	42	42
42	42	42	42	42	42
42	42	42	42	42	42
42	42	42	42	42	42
45	44	44	44	44	44
48	48	48	48	48	48
51	52	52	52	52	52
55	55	55	55	55	55
57	57	57	57	57	57
57	57	57	57	57	57

BVCE0 (% Change from Initial)	Init	168	340	680	1000L50C20003000
	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

VCE(SAT) (IC=50ma, IB=5 ma) (mv.)	1000L50C20003000				
	Init	168	340	680	1000L50C20003000
WRS.	038	151	158	153	153
Min	038	151	158	153	153
5%	038	151	158	153	153
10%	038	158	158	159	160
25%	162	167	168	167	169
50%	198	216	217	234	230
75%	247	248	249	253	256
90%	266	269	270	332	314
95%	281	284	287	419	88
Max	281	284	287	419	88

VCE(SAT) (% Change from Initial)	Init	168	340	680	1000L50C20003000
	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

V _{BE} (SAT) (I _C =50 ma, I _B =5 ma) (mV.)	Init	168	340	680	1000L50C20003000
	696	784	783	783	782
	696	784	783	783	782
	739	785	783	785	783
	783	787	785	787	785
	785	789	787	790	787
	788	792	790	794	791
	792	795	793	963	793
	792	794	795	1130	795
	792	794	795	795	795

VBE(SAT) (% Change from Initial)	Init	168	340	680	1000L50C20003000
	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

h _{FE} (I _C - 20 ma, V _{CE} - 5V)	FRS.				
	Init	168	340	680	1000L50C20003000
	67	68	64	20	20
5%	67	68	64	20	20
10%	68	68	64	44	20
25%	73	74	75	70	66
50%	88	89	91	87	85
75%	92	91	94	90	90
90%	98	97	100	99	99
95%	100	98	102	99	101
max	100	98	102	99	101

hFE (% Change from Initial)	Init	168	340	680	1000L50C20003000
	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

hFE (I _C - 20 ma, V _{CE} - 5V)	Init	168	340	680	1000L50C20003000
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20
67	68	64	20	20	20

hFE (% Change from Initial)	Init	168	340	680	1000L50C20003000
	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

PROCESS: A. PRE-SCREEN STRESS:

168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION:

700 mw, 30 V, 25°C.

MIN: 1.7%

MAX: 98.3%

CELL NO.: 419207 NO. OF UNITS: 29

HRS.	ICBO (VCB - 60V) (Nanoamps)				
	Init	168	340	680	1000L50020003000
Min	<0.1	0.5	<1	<1	<1
5%	<0.1	0.5	<1	<1	<1
10%	<0.1	0.6	<1	<1	<1
25%	0.1	0.7	0.1	0.1	0.1
50%	0.2	0.9	0.4	0.3	0.1
75%	0.9	1.7	1.1	1.1	0.7
90%	1.0	2.0	1.3	1.3	1.1
95%	1.9	2.9	2.3	2.2	1.9
Max	2.7	3.7	3.1	3.0	2.7

IEBO (VEB - 5V) (Nanoamps)					
	Init	168	340	680	1000L50020003000
<0.1	0.3	<0.1	<0.1	<0.1	0.1
<0.1	0.3	<0.1	<0.1	<0.1	0.2
<0.1	0.3	<0.1	<0.1	<0.1	0.3
<0.1	0.4	<0.1	<0.1	<0.1	0.4
<0.1	0.5	<0.1	0.2	0.1	0.4
0.1	0.6	<0.1	0.2	0.2	0.5
0.3	0.9	0.3	0.3	0.3	0.5
0.5	1.1	0.5	0.5	0.5	0.5
0.6	1.2	0.6	0.5	0.6	0.5

BVCEO (IC - 0.1 ma) (Volts)					
	Init	168	340	680	1000L50020003000
41	41	41	41	41	42
42	42	41	42	42	42
44	44	44	44	44	44
45	45	46	45	45	46
52	52	52	52	52	52
55	55	55	55	56	55
59	59	59	59	59	58
60	60	60	60	60	60
61	61	61	61	61	61

BVCEO (% Change from Initial)					
	Init	168	340	680	1000L50020003000
-	-	0	-2	-3	-4
-	-	0	-2	-2	-2
-	-	0	-1	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0

HRS.	VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50020003000
Min	169	170	173	173	173
5%	170	171	174	173	174
10%	174	175	175	176	175
25%	190	194	193	199	194
50%	219	223	224	227	220
75%	255	257	254	257	258
90%	316	326	324	325	327
95%	334	341	339	343	343
Max	339	346	343	347	344

VCE(SAT) (% Change from Initial)					
	Init	168	340	680	1000L50020003000
-	-	-2	-2	0	-1
-	-	-2	-2	0	-1
-	-	-1	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0

VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)					
	Init	168	340	680	1000L50020003000
783	779	780	779	777	780
783	781	781	781	779	781
783	781	783	784	780	783
785	785	785	786	785	786
786	787	787	787	786	787
790	791	790	791	790	791
794	795	797	797	797	797
797	796	800	798	796	798
798	796	803	799	796	798

VBE(SAT) (% Change from Initial)					
	Init	168	340	680	1000L50020003000
-	-	-1	-1	-1	-1
-	-	-1	-1	-1	-1
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	680	1000L50020003000
Min	62	60	63	63	63
5%	63	63	64	64	64
10%	67	66	67	66	67
25%	77	77	77	77	77
50%	84	83	84	85	83
75%	90	90	90	92	91
90%	98	94	92	99	99
95%	102	100	97	103	103
Max	105	105	99	106	105

hFE (% Change from Initial)					
	Init	168	340	680	1000L50020003000
-	-	-8	-23	-7	-2
-	-	-8	-19	-4	-2
-	-	-6	-7	-1	-1
-	-	-1	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0
-	-	0	0	0	0

hFE					
	Init	168	340	680	1000L50020003000
62	60	63	63	63	63
63	63	64	64	64	64
67	66	67	66	67	67
77	77	77	77	77	77
84	83	84	85	83	83
90	90	90	92	91	91
98	94	92	99	99	99
102	100	97	103	103	103
105	105	99	106	106	105

hFE					
	Init	168	340	680	1000L50020003000
62	60	63	63	63	63
63	63	64	64	64	64
67	66	67	66	67	67
77	77	77	77	77	77
84	83	84	85	83	83
90	90	90	92	91	91
98	94	92	99	99	99
102	100	97	103	103	103
105	105	99	106	106	105

PROCESS: A PRE-SCREEN STRESS:

168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION:

500 mw, 30 V, 25°C. MIN 0.6% MAX 99.4%

CELL NO.: 419208 NO. OF UNITS: 78

ERS.	ICBO (V _{CB} - 60V)(Nanamps)				
	Init	168	340	680	1000
Min	<0.1	<0.1	0.4	0.8	<1
5%	0.1	<0.1	0.4	0.9	<1
10%	0.1	<0.1	0.5	1.0	0.1
25%	0.2	0.1	0.7	1.1	0.3
50%	0.3	0.4	0.9	1.3	0.5
75%	0.9	0.6	1.5	1.8	1.3
90%	1.3	1.2	2.1	2.5	2.0
95%	2.4	2.3	3.4	3.4	3.9
Max	26.5	7.4	3.5	4.5	7.1

ERS.	IEBO (V _{EB} - 5V)(Nanamps)				
	Init	168	340	680	1000
Min	<0.1	<0.1	0.2	0.2	<0.1
5%	<0.1	<0.1	0.2	0.2	<0.1
10%	<0.1	<0.1	0.3	0.3	<0.1
25%	<0.1	0.3	0.4	0.4	0.1
50%	0.2	0.7	0.5	0.5	0.6
75%	0.4	0.8	1.0	0.8	1.4
90%	0.6	0.8	1.6	1.3	2.2
95%	2.2	1.4	3.7	3.0	4.6
Max	2.2	1.4	3.7	3.0	4.6

ERS.	BV _{CEO} (I _C - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	40	40	40	40	40
5%	42	41	42	42	42
10%	43	43	43	43	44
25%	45	45	45	46	47
50%	49	49	49	51	51
75%	53	53	53	57	58
90%	56	56	56	62	63
95%	57	58	58	65	65
Max	65	65	65	65	65

ERS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-1	-1	-1
5%	-	0	0	0	0
10%	-	0	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

ERS.	V _{CE} (SAT)(I _C -50ma, I _B -5 ma)(Mv.)				
	Init	168	340	680	1000
Min	0.09	145	146	145	143
5%	152	157	156	157	160
10%	167	168	169	169	169
25%	188	192	192	191	195
50%	218	220	220	219	224
75%	260	263	262	260	267
90%	286	287	287	284	285
95%	304	310	307	303	323
Max	329	332	330	327	327

ERS.	V _{CE} (SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-2	-3	-2	-5
5%	-	-1	-1	-1	-1
10%	-	0	0	-1	0
25%	-	0	0	0	0
50%	-	+1	+1	0	+2
75%	-	+2	+2	+1	+3
90%	-	+3	+3	+2	+6
95%	-	+3	+4	+3	+6
Max	-	+3	+4	+3	+6

ERS.	V _{BE} (SAT)(I _C -50 ma, I _B -5 ma)(Mv.)				
	Init	168	340	680	1000
Min	001	774	774	774	774
5%	776	776	779	780	779
10%	780	779	781	780	780
25%	783	783	786	787	785
50%	787	787	788	790	787
75%	790	788	792	793	793
90%	792	792	794	798	791
95%	793	794	798	807	806
Max	807	802	809	809	827

ERS.	V _{BE} (SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-1	-87	-99
5%	-	-1	0	0	0
10%	-	-1	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	+1	+1	+1	+1
Max	-	+1	+1	+1	+1

ERS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)				
	Init	168	340	680	1000
Min	53	54	52	52	20
5%	64	64	62	62	20
10%	68	65	64	64	57
25%	77	75	74	72	66
50%	87	82	83	80	79
75%	92	90	91	87	91
90%	97	96	96	91	95
95%	99	98	97	94	97
Max	103	102	102	96	101

ERS.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-19	-39	-38	-78
5%	-	-9	-8	-15	-74
10%	-	-7	-7	-13	-35
25%	-	-5	-3	-9	-14
50%	-	-2	-1	-3	-6
75%	-	0	-1	-2	-1
90%	-	+1	0	-1	0
95%	-	+1	0	-1	0
Max	-	+3	+3	+2	+4

ERS.	BV _{CEO} (I _C - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	40	40	40	40	40
5%	42	41	42	42	42
10%	43	43	43	43	44
25%	45	45	45	46	47
50%	49	49	49	51	51
75%	53	53	53	57	58
90%	56	56	56	62	63
95%	57	58	58	65	65
Max	65	65	65	65	65

ERS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-1	-1	-1
5%	-	0	0	0	0
10%	-	0	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C. MIN. 3.67% MAX. 96.4% CELL NO.: 419209 NO. OF UNITS: 14

ICBO (VCB - 60V)(Nanoamps)		IEBO (VEB - 5V)(Nanoamps)		BVCEO (IC - 0.1 ma)(Volts)		BVCEO (% Change from Initial) -				
HRs.	Init	168	340	680	1000L50020003000	Init	168	340	680	1000L50020003000
Min	0.1	0.6	0.1	0.1	0.1	42	42	42	42	42
5%	0.1	0.6	0.1	0.1	0.1	42	42	42	42	42
10%	0.1	0.6	0.1	0.1	0.1	42	42	42	42	42
25%	0.1	0.7	0.3	0.3	0.3	42	42	42	42	42
50%	0.3	0.7	0.5	0.4	0.3	42	42	42	42	42
75%	0.5	1.1	0.7	0.6	0.5	42	42	42	42	42
90%	1.3	17.1	16.7	14.8	14.3	42	42	42	42	42
95%	1.3	32.1	31.7	27.8	16.3	42	42	42	42	42
Max	1.3	32.1	31.7	27.8	16.3	42	42	42	42	42

VCE(SAT)(IC-50ma, IB-5 ma)(Mv.)						VCE(SAT)(% Change from Initial)						VBE(SAT)(IC-50 ma, IB-5 ma)(Mv.)						VBE(SAT)(% Change from Initial)					
FRS.	Init	168	340	680	1000L50020003000	Init	168	340	680	1000L50020003000	Init	168	340	680	1000L50020003000	Init	168	340	680	1000L50020003000			
Min	175	174	178	179	176	179	177				781	781	784	781	787	785	781	784	785	787	785		
5%	175	174	178	179	176	179	177	-	-	0	-2	-	-	0	-2	0	-	-	0	-	-		
10%	184	184	186	187	185	188	189	-	-	0	-2	-	-	0	-2	0	-	-	0	-	-		
25%	204	207	204	203	205	208	208	-	0	0	+1	0	+1	0	+1	+1	-	0	0	-	-		
50%	216	221	221	224	218	224	222	-	+2	+1	+2	0	+2	+2	+2	+2	-	0	0	0	0		
75%	265	269	266	268	262	269	270	-	+2	+2	+3	+1	+3	+3	+3	+3	-	0	0	+1	+1		
90%	316	349	349	349	352	351	352	-	+3	+3	+5	+6	+5	+4	+2	+2	-	+1	+1	+1	0		
95%	350	349	352	350	344	354	352	-	+3	+4	+5	+8	+6	+4	+5	+5	-	+1	+1	+1	0		
Max	350	349	351	350	344	354	352	-	+3	+4	+5	+8	+6	+4	+5	+5	-	+1	+1	+1	0		

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57	59	59	55	
Max	57	57	59	59	55	

hFE (IC - 20 ma, VCE - 5V)		hFE (% Change from Initial)				
hFE	Init	168	340	680	1000L50020003000	
Min	57	57	59	59	55	
5%	57	57	59	59	55	
10%	57	57	59	59	55	
25%	57	57	59	59	55	
50%	57	57	59	59	55	
75%	57	57	59	59	55	
90%	57	57	59	59	55	
95%	57	57</				

PROCESS: A PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C.

CELL NO.: 419210 NO. OF UNITS: 29

HRS.	ICBO (V _{CB} - 60V) (Nanoamps)				
	Init	168	340	680	1000L50020003000
Min	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.1	0.1	0.1	0.1
25%	0.2	0.2	0.2	0.2	0.1
50%	0.3	0.3	0.3	0.3	0.3
75%	0.6	1.2	0.7	0.6	0.4
90%	1.3	2.0	1.6	1.5	1.1
95%	2.0	4.6	2.1	5.7	1.6
Max	2.3	6.3	2.4	2.5	1.8

HRS.	IEBO (V _{EB} - 5V) (Nanoamps)				
	Init	168	340	680	1000L50020003000
Min	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.1	0.1	0.1	0.1
25%	0.1	0.1	0.1	0.1	0.1
50%	0.1	0.1	0.1	0.1	0.1
75%	0.1	0.1	0.1	0.1	0.1
90%	0.3	1.0	0.5	0.7	0.4
95%	0.6	1.2	0.8	1.0	0.5
Max	0.7	1.4	0.9	1.0	0.6

HRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	Init	168	340	680	1000L50020003000
Min	40	40	40	40	40
5%	41	41	41	41	41
10%	42	42	42	42	42
25%	48	49	49	48	48
50%	51	51	52	52	52
75%	53	53	53	53	53
90%	57	57	57	57	57
95%	58	59	59	60	60
Max	58	60	60	61	61

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	0	0	-1	-1
5%	-	0	0	-1	-1
10%	-	0	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

HRS.	VCE (SAT) (I _C - 50ma, I _B - 5 ma) (Mv.)				
	Init	168	340	680	1000L50020003000
Min	168	168	168	168	168
5%	169	171	171	171	171
10%	171	171	171	171	171
25%	194	194	194	194	194
50%	219	219	220	220	220
75%	247	250	249	250	250
90%	278	278	278	278	278
95%	297	301	299	302	298
Max	311	317	315	317	313

HRS.	VCE (SAT) (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-99	-2	-1	-1
5%	-	-51	-2	-1	-1
10%	-	-1	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

HRS.	VBE (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)				
	Init	168	340	680	1000L50020003000
Min	774	631	725	727	725
5%	777	701	726	727	725
10%	781	780	783	784	783
25%	784	784	786	787	786
50%	786	787	790	790	790
75%	788	790	791	791	791
90%	789	792	793	793	793
95%	792	794	796	796	796
Max	793	794	796	797	797

HRS.	VBE (SAT) (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-20	-1	-1	-1
5%	-	-10	-1	-1	-1
10%	-	0	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

HRS.	hFE (I _C - 20 ma, VCE - 5V)				
	Init	168	340	680	1000L50020003000
Min	62	62	62	62	62
5%	64	64	64	64	64
10%	66	65	65	65	65
25%	71	71	70	70	70
50%	83	80	79	80	81
75%	89	87	86	87	87
90%	98	96	95	97	95
95%	102	100	99	99	101
Max	102	101	101	101	102

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-10	-10	-8	-4
5%	-	-10	-10	-6	-4
10%	-	-7	-9	-3	-4
25%	-	-5	-6	-2	-4
50%	-	0	-1	-1	-4
75%	-	0	-1	-1	-3
90%	-	0	-1	-1	-3
95%	-	0	-1	-1	-3
Max	-	0	-1	-1	-3

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: A PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C.

CELL NO.: 419211 NO. OF UNITS: 7

		ICBO (VCB - 60V) (Nanoamps)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		0.1	0.5	0.1	0.1	0.1
Min		0.1	0.5	0.1	0.1	0.1
5%		0.1	0.5	0.1	0.1	0.1
10%		0.1	0.5	0.1	0.1	0.1
25%		0.1	0.5	0.1	0.1	0.1
50%		0.4	0.8	0.4	0.4	0.3
75%		0.7	1.0	0.8	0.5	0.5
90%		1.0	2.2	1.8	1.5	1.7
95%		1.9	2.2	1.8	1.5	1.7
Max		1.9	2.2	1.8	1.5	1.7

		IEBO (VEB - 5V) (Nanoamps)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		0.1	0.3	0.1	0.1	0.1
Min		0.1	0.3	0.1	0.1	0.1
5%		0.1	0.3	0.1	0.1	0.1
10%		0.1	0.3	0.1	0.1	0.1
25%		0.1	0.3	0.1	0.1	0.1
50%		0.1	0.3	0.1	0.1	0.1
75%		0.1	0.3	0.1	0.1	0.1
90%		0.3	0.6	0.1	0.3	0.2
95%		0.3	0.6	0.1	0.3	0.2
Max		0.3	0.6	0.1	0.3	0.2

		BVCEO (IC - 0.1 ma) (Volts)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		42	42	42	42	42
Min		42	42	42	42	42
5%		42	42	42	42	42
10%		42	42	42	42	42
25%		42	42	42	42	42
50%		44	43	43	44	44
75%		45	44	45	44	45
90%		55	55	55	55	55
95%		57	57	57	57	57
Max		57	57	57	57	57

		BVCEO (% Change from Initial)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-	-	-	-
Min		-	-	-	-	-
5%		-	-	-	-	-
10%		-	-	-	-	-
25%		-	-	-	-	-
50%		-	-	-	-	-
75%		-	-	-	-	-
90%		-	-	-	-	-
95%		-	-	-	-	-
Max		-	-	-	-	-

		VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		193	193	194	192	194
Min		193	193	194	192	194
5%		193	193	194	192	194
10%		193	193	194	192	194
25%		198	199	200	199	202
50%		231	233	231	234	236
75%		312	312	316	315	320
90%		344	343	346	346	350
95%		344	343	346	346	350
Max		344	343	346	346	350

		VCE(SAT) (% Change from Initial)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-	-	-	-
Min		-	-	-	-	-
5%		-	-	-	-	-
10%		-	-	-	-	-
25%		-	-	-	-	-
50%		-	-	-	-	-
75%		-	-	-	-	-
90%		-	-	-	-	-
95%		-	-	-	-	-
Max		-	-	-	-	-

		VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		788	786	787	790	785
Min		788	786	787	790	785
5%		788	786	787	790	785
10%		788	786	787	790	785
25%		791	790	790	790	786
50%		791	791	794	789	790
75%		800	797	801	802	795
90%		801	802	801	802	802
95%		801	802	801	802	802
Max		801	802	801	802	802

		VBE(SAT) (% Change from Initial)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-	-	-	-
Min		-	-	-	-	-
5%		-	-	-	-	-
10%		-	-	-	-	-
25%		-	-	-	-	-
50%		-	-	-	-	-
75%		-	-	-	-	-
90%		-	-	-	-	-
95%		-	-	-	-	-
Max		-	-	-	-	-

		hFE (IC - 20 ma, VCE - 5V)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		62	63	57	62	63
Min		62	63	57	62	63
5%		62	63	57	62	63
10%		62	63	57	62	63
25%		76	80	71	79	81
50%		90	91	77	87	91
75%		93	94	86	92	94
90%		101	101	101	101	101
95%		101	101	101	101	101
Max		101	101	101	101	101

		hFE (% Change from Initial)				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-	-	-	-
Min		-	-	-	-	-
5%		-	-	-	-	-
10%		-	-	-	-	-
25%		-	-	-	-	-
50%		-	-	-	-	-
75%		-	-	-	-	-
90%		-	-	-	-	-
95%		-	-	-	-	-
Max		-	-	-	-	-

		hFE				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-	-	-	-
Min		-	-	-	-	-
5%		-	-	-	-	-
10%		-	-	-	-	-
25%		-	-	-	-	-
50%		-	-	-	-	-
75%		-	-	-	-	-
90%		-	-	-	-	-
95%		-	-	-	-	-
Max		-	-	-	-	-

		hFE				
FRS.	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-	-	-	-
Min		-	-	-	-	-
5%		-	-	-	-	-
10%		-	-	-	-	-
25%		-	-	-	-	-
50%		-	-	-	-	-
75%		-	-	-	-	-
90%		-	-	-	-	-
95%		-	-	-	-	-
Max		-	-	-	-	-

PROCESS: A PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION:

700 mw, 30 V, 25°C.

CELL NO.: 419212 NO. OF UNITS: 16

HRS.	ICBO (V _{CB} - 60V) (Nanoamps)				
	Init	168	340	680	1000
Min	0.1	0.6	0.2	0.1	0.1
5%	0.1	0.6	0.2	0.1	0.1
10%	0.2	0.7	0.2	0.1	0.1
25%	0.3	0.8	0.2	0.1	0.1
50%	0.5	1.0	0.5	0.4	0.4
75%	1.1	1.4	0.9	0.9	1.1
90%	1.4	1.8	1.3	1.0	1.3
95%	1.4	1.9	1.4	1.0	1.3
Max	1.4	1.9	1.4	1.0	1.3

HRS.	IEBO (V _{EB} - 5V) (Nanoamps)				
	Init	168	340	680	1000
Min	0.1	0.3	0.1	0.1	0.1
5%	0.1	0.3	0.1	0.1	0.1
10%	0.1	0.3	0.1	0.1	0.1
25%	0.1	0.4	0.1	0.1	0.1
50%	0.1	0.4	0.1	0.1	0.1
75%	0.1	0.5	0.1	0.1	0.1
90%	0.1	0.6	0.1	0.1	0.1
95%	0.1	0.8	0.3	0.3	0.4
Max	0.9	1.0	0.4	0.4	0.5

HRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	Init	168	340	680	1000
Min	43	43	43	43	43
5%	43	43	43	43	43
10%	43	43	43	43	43
25%	43	43	43	43	43
50%	46	46	46	46	46
75%	48	48	48	48	48
90%	51	51	51	51	51
95%	54	53	53	53	54
Max	56	56	56	56	56

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-2	-2	-1
5%	-	-1	-2	-2	-1
10%	-	-1	-2	-2	-1
25%	-	-1	-1	0	0
50%	-	-1	-1	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

HRS.	V _{CE} (SAT) (I _C - 50ma, I _B - 5 ma) (Mv.)				
	Init	168	340	680	1000
Min	0.21	158	160	159	162
5%	0.21	158	160	159	162
10%	0.25	166	168	167	167
25%	173	202	205	209	207
50%	226	234	234	235	237
75%	257	260	260	262	261
90%	324	329	331	327	334
95%	360	365	367	366	369
Max	360	365	367	366	369

HRS.	V _{CE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000
Min	-	0	0	0	0
5%	-	0	0	0	0
10%	-	0	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

HRS.	V _{BE} (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)				
	Init	168	340	680	1000
Min	616	728	751	709	761
5%	616	728	751	709	761
10%	678	781	783	781	783
25%	781	785	785	787	786
50%	788	788	787	792	790
75%	793	791	790	796	790
90%	800	801	801	807	803
95%	801	802	802	808	805
Max	801	802	802	808	805

HRS.	V _{BE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	0	0	0
5%	-	-1	0	0	0
10%	-	0	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

HRS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)				
	Init	168	340	680	1000
Min	49	51	52	51	52
5%	49	51	52	51	52
10%	57	58	58	58	57
25%	71	75	75	73	74
50%	77	83	83	81	84
75%	87	93	93	91	92
90%	92	94	95	92	94
95%	94	95	95	94	95
Max	94	95	95	94	95

HRS.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	0	0	-2	-1
5%	-	0	0	-2	-1
10%	-	0	0	-2	-1
25%	-	0	0	-2	-1
50%	-	0	0	-2	-1
75%	-	0	0	-2	-1
90%	-	0	0	-2	-1
95%	-	0	0	-2	-1
Max	-	0	0	-2	-1

HRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	Init	168	340	680	1000
Min	43	43	43	43	43
5%	43	43	43	43	43
10%	43	43	43	43	43
25%	43	43	43	43	43
50%	46	46	46	46	46
75%	48	48	48	48	48
90%	51	51	51	51	51
95%	54	53	53	53	54
Max	56	56	56	56	56

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-2	-2	-1
5%	-	-1	-2	-2	-1
10%	-	-1	-2	-2	-1
25%	-	-1	-1	0	0
50%	-	-1	-1	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

PROCESS: A PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419243 NO. OF UNITS: 39

		ICBO (V _{CB} - 60V)(Nanoamps)			
HRS.	Init	168	340	680	1000L50020003000
		0.1	0.1	0.5	0.8
Min	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.1	0.1	0.1	0.1
25%	0.2	0.1	0.1	0.1	0.1
50%	0.4	0.4	0.4	0.4	0.4
75%	0.9	0.5	1.3	1.6	0.8
90%	1.3	0.7	2.1	2.0	1.3
95%	1.6	2.2	2.3	2.6	1.5
Max	1.8	4.1	4.0	3.3	3.4

		IEBO (V _{EB} - 5V)(Nanoamps)			
HRS.	Init	168	340	680	1000L50020003000
		0.1	0.1	0.4	0.3
Min	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.1	0.1	0.1	0.1
25%	0.1	0.1	0.1	0.1	0.1
50%	0.1	0.1	0.1	0.1	0.1
75%	0.1	0.1	0.1	0.1	0.1
90%	0.1	0.1	0.1	0.1	0.1
95%	0.1	0.1	0.1	0.1	0.1
Max	0.8	0.9	1.4	1.1	1.3

		BV _{CEO} (I _C - 0.1 ma)(Volts)			
HRS.	Init	168	340	680	1000L50020003000
		42	42	42	42
Min	42	42	42	42	42
5%	42	42	42	42	42
10%	42	42	42	42	42
25%	42	42	42	42	42
50%	42	42	42	42	42
75%	42	42	42	42	42
90%	42	42	42	42	42
95%	42	42	42	42	42
Max	64	63	63	63	63

		BV _{CPO} (% Change from Initial)			
HRS.	Init	168	340	680	1000L50020003000
		-12	-12	-12	-12
Min	-	-12	-12	-12	-12
5%	-	-12	-12	-12	-12
10%	-	-12	-12	-12	-12
25%	-	-12	-12	-12	-12
50%	-	-12	-12	-12	-12
75%	-	-12	-12	-12	-12
90%	-	-12	-12	-12	-12
95%	-	-12	-12	-12	-12
Max	-	-12	-12	-12	-12

		V _{CE} (SAT)(I _C -50ma, I _B -5 ma)(Mv.)			
HRS.	Init	168	340	680	1000L50020003000
		0.10	0.10	0.10	0.10
Min	0.10	0.10	0.10	0.10	0.10
5%	0.10	0.10	0.10	0.10	0.10
10%	0.10	0.10	0.10	0.10	0.10
25%	0.10	0.10	0.10	0.10	0.10
50%	0.10	0.10	0.10	0.10	0.10
75%	0.10	0.10	0.10	0.10	0.10
90%	0.10	0.10	0.10	0.10	0.10
95%	0.10	0.10	0.10	0.10	0.10
Max	0.10	0.10	0.10	0.10	0.10

		V _{CE} (SAT)(% Change from Initial)			
HRS.	Init	168	340	680	1000L50020003000
		-16	-15	-15	-16
Min	-	-16	-15	-15	-16
5%	-	-16	-15	-15	-16
10%	-	-16	-15	-15	-16
25%	-	-16	-15	-15	-16
50%	-	-16	-15	-15	-16
75%	-	-16	-15	-15	-16
90%	-	-16	-15	-15	-16
95%	-	-16	-15	-15	-16
Max	-	-16	-15	-15	-16

		V _{BE} (SAT)(I _C -50 ma, I _B -5 ma)(Mv.)			
HRS.	Init	168	340	680	1000L50020003000
		708	713	726	728
Min	708	713	726	728	728
5%	708	713	726	728	728
10%	708	713	726	728	728
25%	708	713	726	728	728
50%	708	713	726	728	728
75%	708	713	726	728	728
90%	708	713	726	728	728
95%	708	713	726	728	728
Max	810	814	805	807	804

		V _{BE} (SAT)(% Change from Initial)			
HRS.	Init	168	340	680	1000L50020003000
		-2	-2	-2	-2
Min	-	-2	-2	-2	-2
5%	-	-2	-2	-2	-2
10%	-	-2	-2	-2	-2
25%	-	-2	-2	-2	-2
50%	-	-2	-2	-2	-2
75%	-	-2	-2	-2	-2
90%	-	-2	-2	-2	-2
95%	-	-2	-2	-2	-2
Max	-	-2	-2	-2	-2

		h _{FE} (I _C - 20 ma, V _{CE} - 5V)			
HRS.	Init	168	340	680	1000L50020003000
		59	59	60	58
Min	59	59	59	60	58
5%	59	59	59	60	58
10%	59	59	59	60	58
25%	59	59	59	60	58
50%	59	59	59	60	58
75%	59	59	59	60	58
90%	59	59	59	60	58
95%	59	59	59	60	58
Max	99	106	106	103	101

		h _{FE} (% Change from Initial)			
HRS.	Init	168	340	680	1000L50020003000
		-35	-11	-13	-13
Min	-	-35	-11	-13	-13
5%	-	-35	-11	-13	-13
10%	-	-35	-11	-13	-13
25%	-	-35	-11	-13	-13
50%	-	-35	-11	-13	-13
75%	-	-35	-11	-13	-13
90%	-	-35	-11	-13	-13
95%	-	-35	-11	-13	-13
Max	-	-35	-11	-13	-13

		BV _E (SAT)(I _C -50 ma, I _B -5 ma)(Mv.)			
HRS.	Init	168	340	680	1000L50020003000
		708	713	726	728
Min	708	713	726	728	728
5%	708	713	726	728	728
10%	708	713	726	728	728
25%	708	713	726	728	728
50%	708	713	726	728	728
75%	708	713	726	728	728
90%	708	713	726	728	728
95%	708	713	726	728	728
Max	810	814	805	807	804

		BV _E (SAT)(% Change from Initial)			
HRS.	Init	168	340	680	1000L50020003000
		-2	-2	-2	-2
Min	-	-2	-2	-2	-2
5%	-	-2	-2	-2	-2
10%	-	-2	-2	-2	-2
25%	-	-2	-2	-2	-2
50%	-	-2	-2	-2	-2
75%	-	-2	-2	-2	-2
90%	-	-2	-2	-2	-2
95%	-	-2	-2	-2	-2
Max	-	-2	-2	-2	-2

PROCESS: A PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITIONS: 400 mw, 30 V, 150°C.

CELL NO.: 419214 NO. OF UNITS: 7

HRS.	ICBO (VCB - 60V) (Nanoamps)				
	Init	168	340	680	1000L50C20003000
Min	0.2	0.5	0.2	0.3	0.1
5%	0.2	0.5	0.2	0.3	0.1
10%	0.2	0.5	0.2	0.3	0.1
25%	0.3	0.7	0.3	0.3	0.2
50%	0.3	0.9	0.4	0.3	0.3
75%	0.4	0.9	0.7	0.6	0.5
90%	0.7	1.2	0.7	0.8	1.0
95%	0.7	1.2	0.7	0.8	1.0
Max	0.7	1.2	0.7	0.8	1.0

HRS.	IEBO (VEB - 5V) (Nanoamps)				
	Init	168	340	680	1000L50C20003000
Min	0.1	0.3	0.1	0.1	0.1
5%	0.1	0.3	0.1	0.1	0.1
10%	0.1	0.3	0.1	0.1	0.1
25%	0.1	0.4	0.1	0.1	0.1
50%	0.1	0.6	0.2	0.1	0.2
75%	0.2	0.6	0.3	0.4	0.3
90%	0.4	0.8	0.4	0.5	0.4
95%	0.4	0.8	0.4	0.5	0.4
Max	0.4	0.8	0.4	0.5	0.4

HRS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	680	1000L50C20003000
Min	43	43	42	43	43
5%	43	43	42	43	43
10%	43	43	42	43	43
25%	48	48	48	48	48
50%	51	51	51	51	51
75%	52	52	52	52	52
90%	57	57	57	57	57
95%	57	57	57	57	57
Max	57	57	57	57	57

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50C20003000
Min	164	166	162	166	165
5%	164	166	162	166	165
10%	164	166	162	166	165
25%	177	179	180	182	184
50%	229	231	232	234	230
75%	271	277	278	276	270
90%	324	327	328	327	328
95%	324	327	328	327	328
Max	324	327	328	327	328

HRS.	VCE(SAT) (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50C20003000
Min	783	782	787	787	779
5%	783	782	787	787	779
10%	783	782	787	787	779
25%	788	786	788	790	785
50%	792	787	793	793	792
75%	799	788	800	802	797
90%	812	813	810	813	802
95%	812	814	810	813	802
Max	812	813	810	813	802

HRS.	VBE(SAT) (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	680	1000L50C20003000
Min	69	69	65	61	67
5%	69	69	65	61	67
10%	69	69	65	61	67
25%	72	73	67	63	73
50%	74	78	72	69	77
75%	84	88	80	76	87
90%	85	91	81	77	89
95%	85	91	81	77	89
Max	85	91	81	77	89

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	BVCE (IC - 0.1 ma) (Volts)				
	Init	168	340	680	1000L50C20003000
Min	43	43	42	43	43
5%	43	43	42	43	43
10%	43	43	42	43	43
25%	48	48	48	48	48
50%	51	51	51	51	51
75%	52	52	52	52	52
90%	57	57	57	57	57
95%	57	57	57	57	57
Max	57	57	57	57	57

HRS.	BVCE (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: A PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C.

CELL NO.: 419215 NO. OF UNITS: 16

		ICBO (V _{CB} - 60V)(Nanoamps)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		0.1	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25%	0.3	0.9	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
50%	0.4	1.1	0.8	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
75%	1.2	1.7	1.3	1.2	1.1	0.8	1.0	1.1	1.1	1.1	1.1
90%	1.4	1.9	1.4	1.3	1.2	1.0	1.2	1.3	1.3	1.3	1.3
95%	1.5	2.0	1.4	1.3	1.2	1.0	1.3	1.4	1.4	1.4	1.4
Max	1.5	2.0	1.4	1.3	1.2	1.0	1.3	1.4	1.4	1.4	1.4

		IEBO (V _{EB} - 5V)(Nanoamps)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25%	0.1	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
50%	0.1	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75%	0.2	0.8	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
90%	0.3	1.0	0.6	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5
95%	0.4	0.8	0.4	0.3	0.5	0.6	0.7	0.6	0.6	0.6	0.6
Max	0.4	0.8	0.4	0.3	0.5	0.6	0.7	0.6	0.6	0.6	0.6

		BV _{CEO} (I _C - 0.1 ma)(Volts)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		38	38	38	37	38	37	38	37	37	37
5%	30	38	38	37	38	37	38	37	38	37	37
10%	40	40	40	40	40	40	40	40	40	40	40
25%	42	42	42	42	42	42	42	42	42	42	42
50%	47	46	46	47	47	47	47	47	46	47	47
75%	51	49	49	49	51	52	51	52	51	52	52
90%	55	55	55	55	55	55	55	55	55	55	55
95%	59	59	59	59	59	59	59	59	59	59	59
Max	59	59	59	59	59	59	59	59	59	59	59

		BV _{CEO} (% Change from Initial)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		-	-	-	-	-	-	-	-	-	-
5%	-	-	-	-	-	-	-	-	-	-	-
10%	-	-	-	-	-	-	-	-	-	-	-
25%	-	-	-	-	-	-	-	-	-	-	-
50%	-	-	-	-	-	-	-	-	-	-	-
75%	-	-	-	-	-	-	-	-	-	-	-
90%	-	-	-	-	-	-	-	-	-	-	-
95%	-	-	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	-	-

		V _{CE} (SAT)(I _C -50ma, I _B -5 ma)(Mv.)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		167	173	173	173	173	173	173	173	173	173
5%	167	173	173	173	173	173	173	173	173	173	173
10%	175	177	178	178	178	177	178	178	178	178	178
25%	188	187	184	184	188	187	185	187	185	187	187
50%	237	238	238	243	237	240	240	240	240	240	240
75%	257	251	252	266	258	259	254	260	254	260	260
90%	272	275	277	278	278	278	278	278	278	278	278
95%	273	280	278	278	278	278	278	278	278	278	278
Max	273	280	278	278	278	278	278	278	278	278	278

		V _{CE} (SAT)(% Change from Initial)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		-	-2	0	0	-1	-2	0	0	0	0
5%	-	-	-2	0	0	-1	-2	0	0	0	0
10%	-	-	-1	0	1	-1	-1	0	0	0	0
25%	-	0	1	1	2	-1	-1	1	1	1	1
50%	-	1	1	1	3	0	1	1	1	1	1
75%	-	1	2	2	4	1	1	1	1	1	1
90%	-	1	2	2	4	1	1	1	1	1	1
95%	-	1	2	2	4	1	1	1	1	1	1
Max	-	1	2	2	4	1	1	1	1	1	1

		V _{BE} (SAT)(I _C -50 ma, I _B -5 ma)(Mv.)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		784	784	784	784	784	784	784	784	784	784
5%	784	784	784	784	784	784	784	784	784	784	784
10%	786	786	786	786	786	786	786	786	786	786	786
25%	788	786	786	786	786	786	786	786	786	786	786
50%	790	790	790	790	790	790	790	790	790	790	790
75%	793	793	793	793	793	793	793	793	793	793	793
90%	833	845	845	845	845	845	845	845	845	845	845
95%	906	906	906	906	906	906	906	906	906	906	906
Max	906	906	906	906	906	906	906	906	906	906	906

		V _{BE} (SAT)(% Change from Initial)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		-	-2	-1	-1	0	-1	-1	-1	-1	-1
5%	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1
10%	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1
25%	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1
50%	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1
75%	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1
90%	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1
95%	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1
Max	-	-	-2	-1	-1	0	-1	-1	-1	-1	-1

		h _{FE} (I _C - 20 ma, V _{CE} - 5V)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		66	69	64	20	20	20	20	47	20	20
5%	66	69	64	20	20	20	20	20	47	20	20
10%	67	69	64	20	20	20	20	20	47	20	20
25%	73	74	70	71	69	67	67	67	71	70	70
50%	79	81	80	80	78	76	76	76	82	80	80
75%	91	94	85	85	80	77	76	76	83	83	83
90%	96	97	91	91	97	96	96	96	97	96	96
95%	97	98	91	91	97	96	96	96	97	97	97
Max	97	98	91	91	97	96	96	96	97	97	97

		h _{FE} (% Change from Initial)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		-	-2	-6	-79	-79	-79	-35	-79	-35	-79
5%	-	-	-2	-6	-79	-79	-79	-35	-79	-35	-79
10%	-	-	-1	-6	-79	-79	-79	-35	-79	-35	-79
25%	-	1	-5	-1	-4	-6	-6	-1	-1	-1	-1
50%	-	1	-5	-1	-4	-6	-6	-1	-1	-1	-1
75%	-	1	-5	-1	-4	-6	-6	-1	-1	-1	-1
90%	-	1	-5	-1	-4	-6	-6	-1	-1	-1	-1
95%	-	1	-5	-1	-4	-6	-6	-1	-1	-1	-1
Max	-	1	-5	-1	-4	-6	-6	-1	-1	-1	-1

		BV _{CEO} (% Change from Initial)									
HRS.	Min	Init	168	340	680	1000	1500	2000	3000		
		-	-	-	-	-	-	-	-	-	-
5%	-	-	-	-	-	-	-	-	-	-	-
10%	-	-	-	-	-	-	-	-	-	-	-
25%	-	-	-	-	-	-	-	-	-	-	-
50%	-	-	-	-	-	-	-	-	-	-	-
75%	-	-	-	-	-	-	-	-	-	-	-
90%	-	-	-	-	-	-	-	-	-	-	-
95%	-	-	-	-	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-	-	-	-	-

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PROCESS: A PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C.

CELL NO.: 419216 NO. OF UNITS: 7

HRS.	ICBO (VCB - 60V) (Nanoamps)				
	Init	168	340	680	1000L50C20003000
Min	0.3	0.6	0.2	0.1	0.1
5%	0.3	0.6	0.2	0.1	0.1
10%	0.3	0.6	0.2	0.1	0.1
25%	0.3	0.7	0.2	0.1	0.2
50%	0.4	1.1	0.6	0.3	0.1
75%	0.7	1.3	0.6	0.6	1.0
90%	1.1	1.5	1.1	2.0	1.5
95%	1.1	1.5	1.1	2.0	1.5
Max	1.1	1.5	1.1	2.0	1.5

HRS.	IEBO (VEB - 5V) (Nanocamps)				
	Init	168	340	680	1000L50C20003000
Min	0.1	0.3	0.1	0.1	0.1
5%	0.1	0.3	0.1	0.1	0.1
10%	0.1	0.3	0.1	0.1	0.1
25%	0.1	0.4	0.1	0.1	0.1
50%	0.1	0.5	0.1	0.1	0.1
75%	0.2	0.6	0.1	0.3	0.4
90%	0.4	1.1	0.5	1.0	0.5
95%	0.4	1.1	0.5	1.0	0.5
Max	0.4	1.1	0.5	1.0	0.5

HRS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	680	1000L50C20003000
Min	45	45	44	45	45
5%	45	45	44	45	45
10%	45	45	44	45	45
25%	45	45	44	45	45
50%	46	46	46	46	46
75%	52	52	52	52	52
90%	55	55	55	55	55
95%	56	56	56	56	56
Max	56	56	56	56	56

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	VCE (SAT) (IC-50ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50C20003000
Min	0.31	1.83	1.86	1.84	1.86
5%	0.31	1.83	1.86	1.84	1.86
10%	0.31	1.83	1.86	1.84	1.86
25%	1.82	2.00	2.00	2.00	2.00
50%	2.09	2.24	2.25	2.27	2.27
75%	3.13	3.13	3.13	3.16	3.16
90%	3.20	3.20	3.20	3.27	3.27
95%	3.20	3.20	3.20	3.27	3.27
Max	3.20	3.20	3.20	3.27	3.27

HRS.	VCE (SAT) (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	VBE (SAT) (IC-50 ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50C20003000
Min	704	785	787	786	786
5%	704	785	787	786	786
10%	704	785	787	786	786
25%	781	785	787	786	786
50%	787	789	789	789	789
75%	788	797	797	797	797
90%	790	799	799	799	799
95%	790	799	799	799	799
Max	790	799	799	799	799

HRS.	VBE (SAT) (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	680	1000L50C20003000
Min	74	74	74	74	74
5%	74	74	74	74	74
10%	74	74	74	74	74
25%	74	74	74	74	74
50%	78	78	78	78	78
75%	84	84	84	84	84
90%	85	85	85	85	85
95%	85	85	85	85	85
Max	85	85	85	85	85

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	680	1000L50C20003000
Min	45	45	44	45	45
5%	45	45	44	45	45
10%	45	45	44	45	45
25%	45	45	44	45	45
50%	46	46	46	46	46
75%	52	52	52	52	52
90%	55	55	55	55	55
95%	56	56	56	56	56
Max	56	56	56	56	56

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: A PRE-SCREEN STRESS:

None (Control).

OPERATING POWER CONDITION:

700 mw, 30 V, 25°C.

CELL NO.: 419217 NO. OF UNITS: 14

FRS.	ICBO (V _{CB} - 60V) (Nanoamps)				
	Init	168	340	680	1000
Min	0.3	0.6	0.1	0.1	0.1
5%	0.3	0.6	0.1	0.1	0.1
10%	0.3	0.7	0.1	0.1	0.1
25%	0.3	0.8	0.3	0.4	0.3
50%	0.4	0.9	0.4	0.5	0.4
75%	0.6	1.0	0.7	0.8	0.6
90%	1.7	3.6	2.7	4.4	4.3
95%	2.1	3.4	3.5	5.7	5.5
Max	2.1	3.4	3.5	5.7	5.5

FRS.	IEBO (V _{EB} - 5V) (Nanoamps)				
	Init	168	340	680	1000
Min	0.1	0.3	0.1	0.1	0.1
5%	0.1	0.3	0.1	0.1	0.1
10%	0.1	0.4	0.1	0.1	0.1
25%	0.1	0.4	0.1	0.1	0.1
50%	0.1	0.7	0.1	0.2	0.1
75%	0.2	0.8	0.1	0.3	0.2
90%	0.4	0.9	0.4	0.3	0.4
95%	0.4	0.9	0.4	0.3	0.4
Max	0.4	0.9	0.4	0.3	0.4

FRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	Init	168	340	680	1000
Min	44	44	44	44	44
5%	44	44	44	44	44
10%	44	44	44	44	44
25%	45	45	45	45	45
50%	49	49	49	49	49
75%	54	53	54	54	53
90%	61	66	60	61	61
95%	62	70	68	62	62
Max	62	70	68	62	62

FRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-2	-2	-2	-2
5%	-	-2	-2	-2	-2
10%	-	-2	-2	-2	-2
25%	-	-1	-1	-1	-1
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	+7	0	+1	+2
95%	-	+17	0	+2	+3
Max	-	+17	0	+2	+3

FRS.	V _{CE} (SAT) (I _C - 50ma, I _B - 5 ma) (Mv.)				
	Init	168	340	680	1000
Min	0.49	1.74	1.71	1.74	1.73
5%	0.49	1.74	1.71	1.74	1.73
10%	1.09	1.76	1.71	1.75	1.76
25%	1.84	1.95	1.96	1.97	1.94
50%	1.97	2.11	2.12	2.15	2.14
75%	2.32	2.41	2.42	2.44	2.43
90%	2.52	2.60	2.61	2.65	2.64
95%	2.66	2.72	2.73	2.78	2.77
Max	2.66	2.72	2.73	2.78	2.77

FRS.	V _{CE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-1	-1	-1
5%	-	-1	-1	-1	-1
10%	-	-1	-1	-1	-1
25%	-	+2	+1	+3	+2
50%	-	+3	+3	+4	+3
75%	-	+3	+4	+4	+3
90%	-	+20	+20	+20	+20
95%	-	+40	+40	+40	+40
Max	-	+40	+40	+40	+40

FRS.	V _{BE} (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)				
	Init	168	340	680	1000
Min	695	777	777	777	777
5%	695	777	777	777	777
10%	736	777	777	777	777
25%	784	784	784	784	784
50%	788	787	787	787	787
75%	790	788	787	787	787
90%	793	791	790	792	790
95%	795	791	791	793	790
Max	795	791	791	793	790

FRS.	V _{BE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-1	-1	-1
5%	-	-1	-1	-1	-1
10%	-	-1	-1	-1	-1
25%	-	-1	-1	-1	-1
50%	-	0	-1	-1	-1
75%	-	0	0	0	0
90%	-	+7	+7	+7	+7
95%	-	+13	+13	+13	+13
Max	-	+13	+13	+13	+13

FRS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)				
	Init	168	340	680	1000
Min	65	66	67	66	66
5%	65	66	67	66	66
10%	66	66	67	67	66
25%	67	69	69	69	68
50%	81	80	86	85	87
75%	88	89	90	89	89
90%	89	92	92	91	93
95%	90	92	93	92	93
Max	90	92	93	92	93

FRS.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-8	+1	0	-2
5%	-	-8	+1	0	-2
10%	-	-5	+1	0	-2
25%	-	+1	+1	+1	+1
50%	-	+2	+2	+2	+1
75%	-	+3	+5	+4	+6
90%	-	+5	+8	+7	+9
95%	-	+5	+10	+9	+10
Max	-	+5	+10	+9	+10

FRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	Init	168	340	680	1000
Min	44	44	44	44	44
5%	44	44	44	44	44
10%	44	44	44	44	44
25%	45	45	45	45	45
50%	49	49	49	49	49
75%	54	53	54	54	53
90%	61	66	60	61	61
95%	62	70	68	62	62
Max	62	70	68	62	62

FRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-2	-2	-2	-2
5%	-	-2	-2	-2	-2
10%	-	-2	-2	-2	-2
25%	-	-1	-1	-1	-1
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	+7	+7	+7	+7
95%	-	+13	+13	+13	+13
Max	-	+13	+13	+13	+13

PROCESS: A PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419218 NO. OF UNITS: 38

HRS.	ICBO (VCB - 60V) (Nanoamps)				
	Init	168	340	680	1000L50020003000
Min	0.1	<0.1	0.5	0.8	<0.1
5%	0.1	<0.1	0.6	0.9	<0.1
10%	0.2	<0.1	0.6	1.0	<0.1
25%	0.2	0.3	0.7	1.0	0.2
50%	0.4	0.5	0.9	1.2	0.3
75%	0.6	0.6	1.5	1.6	0.7
90%	1.2	0.7	1.9	2.1	1.3
95%	1.4	1.7	2.1	2.4	1.5
Max	1.7	2.5	2.5	2.9	2.4

HRS.	IEBO (VEB - 5V) (Nanoamps)				
	Init	168	340	680	1000L50020003000
Min	<0.1	<0.1	0.1	<0.1	<0.1
5%	<0.1	<0.1	0.3	<0.1	<0.1
10%	<0.1	<0.1	0.3	<0.1	<0.1
25%	<0.1	0.5	0.4	0.3	0.1
50%	<0.1	0.7	0.5	0.3	0.2
75%	0.1	0.7	0.7	0.4	0.3
90%	0.5	0.9	0.8	0.7	0.6
95%	1.1	0.9	1.2	1.0	0.7
Max	1.5	0.9	1.8	1.5	1.6

HRS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	680	1000L50020003000
Min	42	42	41	42	42
5%	43	43	43	42	43
10%	44	44	43	44	44
25%	44	44	44	44	44
50%	50	49	50	50	52
75%	56	53	55	56	58
90%	58	58	58	58	66
95%	58	57	59	59	99
Max	59	59	60	61	115

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-4	-6	-8	-9
5%	-	-3	-1	-1	-1
10%	-	-1	0	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	+1	0	+1	+2
Max	-	+1	+3	+5	+12

HRS.	VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50020003000
Min	145	147	148	147	147
5%	154	156	156	154	152
10%	164	169	170	169	171
25%	181	184	184	185	191
50%	201	202	204	206	212
75%	235	238	240	250	278
90%	291	289	294	299	309
95%	303	305	305	323	323
Max	320	328	330	331	331

HRS.	VCE(SAT) (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-1	0	-2	-1
5%	-	-1	0	-1	0
10%	-	-1	+1	-1	0
25%	-	0	+1	0	+1
50%	-	+1	+2	+1	+2
75%	-	+2	+3	+2	+4
90%	-	+3	+3	+3	+6
95%	-	+3	+4	+6	+6
Max	-	+4	+5	+6	+6

HRS.	VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50020003000
Min	777	777	773	780	780
5%	781	781	780	780	783
10%	783	782	781	783	784
25%	785	786	784	787	785
50%	787	788	786	791	790
75%	790	792	788	793	792
90%	795	796	793	797	797
95%	810	810	819	820	819
Max	820	826	823	828	830

HRS.	VBE(SAT) (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-1	-1	-1	-1
5%	-	-1	-1	0	-6
10%	-	0	-1	0	0
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	+1	0	+1	+1
95%	-	+1	0	+1	+2
Max	-	+1	+1	+1	+2

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	680	1000L50020003000
Min	49	48	50	0.5	20
5%	59	62	63	0.6	20
10%	67	65	69	0.6	20
25%	72	71	75	0.7	65
50%	83	85	83	0.8	75
75%	89	91	93	0.9	87
90%	93	96	99	0.9	93
95%	98	98	99	0.9	97
Max	100	101	102	10	101

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-15	-15	-92	-78
5%	-	-10	-10	-93	-77
10%	-	-7	-4	-91	-61
25%	-	-2	-1	-90	-17
50%	-	0	+2	-90	-5
75%	-	+3	+6	-90	0
90%	-	+6	+8	-90	+6
95%	-	+9	+10	-90	+8
Max	-	+32	+24	-87	+22

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	680	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: A PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419219 NO. OF UNITS: 7

HRS.	ICBO (V _{CB} - 60V) (Nanamps)									
	Init	168	340	680	1000L	5002000	3000			
Min	0.2	0.7	0.1	0.3	0.2	0.1	0.1	0.2		
5%	0.2	0.7	0.1	0.3	0.2	0.1	0.1	0.2		
10%	0.2	0.7	0.1	0.3	0.2	0.1	0.1	0.2		
25%	0.2	0.9	0.2	0.3	0.2	0.2	0.1	0.2		
50%	0.4	1.2	0.4	0.4	0.4	0.3	0.3	0.4		
75%	0.6	1.4	0.6	0.5	0.5	0.3	0.8	0.7		
90%	0.8	3.0	0.8	1.0	1.4	1.3	1.7	1.7		
95%	0.8	3.0	0.8	1.0	1.4	1.3	1.7	1.7		
Max	0.8	3.0	0.8	1.0	1.4	1.3	1.7	1.7		

HRS.	IEBO (V _{EB} - 5V) (Nanamps)									
	Init	168	340	680	1000L	5002000	3000			
Min	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1		
5%	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1		
10%	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1		
25%	0.1	0.5	0.1	0.1	0.1	0.2	0.1	0.1		
50%	0.2	0.6	0.1	0.1	0.1	0.2	0.1	0.1		
75%	0.2	0.7	0.2	0.4	1.4	0.4	0.2	0.3		
90%	1.6	2.2	1.2	1.9	3.1	1.3	1.4	1.4		
95%	1.6	2.2	1.2	1.9	3.1	1.3	1.4	1.4		
Max	1.6	2.2	1.2	1.9	3.1	1.3	1.4	1.4		

HRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)									
	Init	168	340	680	1000L	5002000	3000			
Min	47	47	47	47	47	47	47	47		
5%	47	47	47	47	47	47	47	47		
10%	47	47	47	47	47	47	47	47		
25%	48	48	48	48	48	48	48	48		
50%	50	50	50	50	50	50	50	50		
75%	55	55	55	56	56	57	57	57		
90%	58	57	58	58	57	57	57	57		
95%	58	57	58	58	57	57	57	57		
Max	58	57	58	58	57	57	57	57		

HRS.	BV _{CEO} (% Change from Initial)									
	Init	168	340	680	1000L	5002000	3000			
Min	-	-1	-22	-1	-1	-1	-1	-1		
5%	-	-1	-22	-1	-1	-1	-1	-1		
10%	-	-1	-22	-1	-1	-1	-1	-1		
25%	-	-1	-21	0	0	0	0	0		
50%	-	0	0	0	0	0	0	0		
75%	-	0	0	0	0	0	0	0		
90%	-	0	0	0	0	0	0	0		
95%	-	0	0	0	0	0	0	0		
Max	-	0	0	0	0	0	0	0		

HRS.	V _{CE} (SAT) (I _C -50ma, I _B -5 ma) (Mv.)									
	Init	168	340	680	1000L	5002000	3000			
Min	133	132	134	130	132	132	130	127		
5%	133	132	134	130	132	132	130	127		
10%	133	132	134	130	132	132	130	127		
25%	153	156	155	157	152	154	156	174		
50%	196	199	196	198	197	199	202	199		
75%	216	219	218	218	215	217	220	219		
90%	289	293	289	290	286	293	290	288		
95%	289	293	289	290	286	293	290	288		
Max	289	293	289	290	286	293	290	288		

HRS.	V _{CE} (SAT) (% Change from Initial)									
	Init	168	340	680	1000L	5002000	3000			
Min	-	-1	0	-2	-1	-1	-2	-5		
5%	-	-1	0	-2	-1	-1	-2	-5		
10%	-	-1	0	-2	-1	-1	-2	-5		
25%	-	0	0	0	-1	0	0	-1		
50%	-	4	0	0	0	0	0	0		
75%	-	2	2	1	1	0	1	2		
90%	-	2	2	1	1	1	2	3		
95%	-	2	2	1	1	1	2	3		
Max	-	2	2	1	1	1	2	3		

HRS.	V _{BE} (SAT) (I _C -50 ma, I _B -5 ma) (Mv.)									
	Init	168	340	680	1000L	5002000	3000			
Min	778	779	782	780	780	774	776	776		
5%	778	779	782	780	780	774	776	776		
10%	778	779	782	780	780	774	776	776		
25%	780	781	783	784	782	778	777	777		
50%	786	787	790	788	787	792	785	784		
75%	791	790	789	793	792	794	790	785		
90%	793	796	794	796	794	795	792	791		
95%	793	796	794	796	794	795	792	791		
Max	793	796	794	796	794	795	792	791		

HRS.	V _{BE} (SAT) (% Change from Initial)									
	Init	168	340	680	1000L	5002000	3000			
Min	-	-1	0	0	0	0	-36	-1		
5%	-	-1	0	0	0	0	-36	-1		
10%	-	-1	0	0	0	0	-36	-1		
25%	-	0	0	0	0	0	0	0		
50%	-	0	0	0	0	0	0	0		
75%	-	0	0	0	0	0	0	0		
90%	-	0	0	0	0	0	0	0		
95%	-	0	0	0	0	0	0	0		
Max	-	0	0	0	0	0	0	0		

HRS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)									
	Init	168	340	680	1000L	5002000	3000			
Min	56	57	56	54	55	56	57	52		
5%	56	57	56	54	55	56	57	52		
10%	56	57	56	54	55	56	57	52		
25%	63	63	63	60	61	62	63	56		
50%	77	82	84	78	79	81	82	73		
75%	81	85	85	80	82	83	84	91		
90%	91	92	91	87	89	91	91	54		
95%	91	92	91	87	89	91	91	54		
Max	91	92	91	87	89	91	91	54		

HRS.	h _{FE} (% Change from Initial)									
	Init	168	340	680	1000L	5002000	3000			
Min	-	0	0	-5	-3	-1	0	-72		
5%	-	0	0	-5	-3	-1	0	-72		
10%	-	0	0	-5	-3	-1	0	-72		
25%	-	0	0	-5	-3	-1	0	-72		
50%	-	0	0	-4	-3	-1	0	0		
75%	-	0	0	-4	-3	-1	0	0		
90%	-	0	0	-4	-3	-1	0	0		
95%	-	0	0	-4	-3	-1	0	0		
Max	-	0	0	-4	-3	-1	0	0		

HRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)									
	Init	168	340	680	1000L	5002000	3000			
Min	47	47	47	47	47	47	47	47		
5%	47	47	47	47	47	47	47	47		
10%	47	47	47	47	47	47	47	47		
25%	48	48	48	48	48	48	48	48		
50%	50	50	50	50	50	50	50	50		
75%	55	55	55	56	56	57	57	57		
90%	58	57	58	58	57	57	57	57		
95%	58	57	58	58	57	57	57	57		
Max	58	57	58	58	57	57	57	57		

HRS.	BV _{CEO} (% Change from Initial)									
	Init	168	340	680	1000L	5002000	3000			
Min	-	-1	-22	-1	-1	-1	-1	-1		
5%	-	-1	-22	-1	-1	-1	-1	-1		
10%	-	-1	-22	-1	-1	-1	-1	-1		
25%	-	-1	-21	0	0	0	0	0		
50%	-	0	0	0	0	0	0	0		
75%	-	0	0	0	0	0	0	0		
90%	-	0	0	0	0	0	0	0		
95%	-	0	0	0	0	0	0	0		
Max	-	0	0	0	0	0	0	0		

PROCESS: A FREE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C.

CELL NO.: 419220 NO. OF UNITS: 14

		ICBO (VCE - 60V)(Nanoamps)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		0.1	0.6	0.1	0.2	0.1	0.1
5%	5%	0.1	0.6	0.1	0.2	0.1	0.1
10%	10%	0.1	0.6	0.1	0.2	0.1	0.1
25%	25%	0.2	0.8	0.4	0.3	0.3	0.3
50%	50%	0.5	1.0	0.5	0.6	0.5	0.3
75%	75%	0.9	1.5	0.8	0.8	0.9	0.5
90%	90%	1.5	1.9	1.4	1.7	1.3	1.1
95%	95%	1.7	2.1	1.7	2.0	1.6	1.4
Max	Max	1.7	2.1	1.7	2.0	1.6	1.4

		IEBO (VEB - 5V)(Nanoamps)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		0.1	0.3	0.1	0.1	0.1	0.1
5%	5%	0.1	0.3	0.1	0.1	0.1	0.1
10%	10%	0.1	0.3	0.1	0.1	0.1	0.1
25%	25%	0.1	0.5	0.1	0.1	0.1	0.1
50%	50%	0.1	0.7	0.3	0.3	0.1	0.1
75%	75%	0.2	0.8	0.3	0.3	0.2	0.1
90%	90%	0.3	1.2	0.9	0.6	1.3	1.0
95%	95%	0.3	1.4	1.2	0.6	1.6	1.5
Max	Max	0.3	1.4	1.2	0.6	1.6	1.5

		BVCEO (IC - 0.1 ma)(Volts)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		46	46	47	46	46	46
5%	5%	46	46	47	46	46	46
10%	10%	47	46	47	47	46	46
25%	25%	48	48	48	48	48	48
50%	50%	50	50	50	50	50	50
75%	75%	56	55	56	56	56	56
90%	90%	60	60	60	60	60	60
95%	95%	62	62	62	62	62	62
Max	Max	62	62	62	62	62	62

		BVCEO (% Change from Initial)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		-	0	0	-1	-1	0
5%	5%	-	0	0	-1	-1	0
10%	10%	-	0	0	-1	-1	0
25%	25%	-	0	0	-1	-1	0
50%	50%	-	0	0	0	0	0
75%	75%	-	0	0	0	0	0
90%	90%	-	0	0	0	0	0
95%	95%	-	0	0	0	0	0
Max	Max	-	0	0	0	0	0

		VCE(SAT)(IC-50ma, IB-5 ma)(Mv.)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		167	163	162	159	161	163
5%	5%	167	163	162	159	161	163
10%	10%	169	168	168	166	166	166
25%	25%	180	183	183	181	184	183
50%	50%	206	208	209	212	207	212
75%	75%	290	294	293	296	289	293
90%	90%	412	417	417	422	411	418
95%	95%	414	419	420	424	414	421
Max	Max	414	419	420	424	414	421

		VCE(SAT)(% Change from Initial)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-2	-3	-5	-4	-2
5%	5%	-	-2	-3	-5	-4	-2
10%	10%	-	-2	-3	-5	-4	-2
25%	25%	-	0	0	+1	-1	0
50%	50%	-	+1	+1	+2	0	+2
75%	75%	-	+1	+2	+3	0	+3
90%	90%	-	+3	+3	+4	+1	+3
95%	95%	-	+3	+3	+4	+1	+3
Max	Max	-	+3	+3	+4	+1	+3

		VBE(SAT)(IC-50 ma, IB-5 ma)(Mv.)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		698	698	698	698	698	698
5%	5%	698	698	698	698	698	698
10%	10%	741	741	741	741	741	741
25%	25%	785	785	785	785	785	785
50%	50%	786	786	786	786	786	786
75%	75%	795	795	795	795	795	795
90%	90%	801	801	801	801	801	801
95%	95%	802	802	802	802	802	802
Max	Max	802	802	802	802	802	802

		VBE(SAT)(% Change from Initial)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-19	0	0	0	-1
5%	5%	-	-19	0	0	0	-1
10%	10%	-	-10	0	0	0	-1
25%	25%	-	0	0	0	0	-1
50%	50%	-	0	0	0	0	0
75%	75%	-	0	0	0	0	0
90%	90%	-	0	0	0	0	0
95%	95%	-	0	0	0	0	0
Max	Max	-	0	0	0	0	0

		hFE (IC - 20 ma, VCE - 5V)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		57	59	56	59	57	59
5%	5%	57	59	56	59	57	59
10%	10%	63	64	61	64	63	64
25%	25%	74	76	72	76	74	76
50%	50%	78	83	77	83	81	83
75%	75%	83	88	87	86	87	87
90%	90%	93	92	89	91	90	91
95%	95%	99	94	89	94	91	94
Max	Max	99	94	89	94	91	94

		hFE (% Change from Initial)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-9	-10	-10	-11	-10
5%	5%	-	-9	-10	-10	-11	-10
10%	10%	-	-4	-8	-5	-7	-5
25%	25%	-	+1	-5	+1	-1	+1
50%	50%	-	+3	-2	+4	+1	+4
75%	75%	-	+7	+1	+7	+5	+7
90%	90%	-	+13	+1	+12	+11	+13
95%	95%	-	+15	+11	+14	+12	+15
Max	Max	-	+15	+11	+14	+12	+15

		hFE (% Change from Initial)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-9	-10	-10	-11	-10
5%	5%	-	-9	-10	-10	-11	-10
10%	10%	-	-4	-8	-5	-7	-5
25%	25%	-	+1	-5	+1	-1	+1
50%	50%	-	+3	-2	+4	+1	+4
75%	75%	-	+7	+1	+7	+5	+7
90%	90%	-	+13	+1	+12	+11	+13
95%	95%	-	+15	+11	+14	+12	+15
Max	Max	-	+15	+11	+14	+12	+15

		BVCEO (% Change from Initial)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		-	0	0	-1	-1	0
5%	5%	-	0	0	-1	-1	0
10%	10%	-	0	0	-1	-1	0
25%	25%	-	0	0	-1	-1	0
50%	50%	-	0	0	0	0	0
75%	75%	-	0	0	0	0	0
90%	90%	-	0	0	0	0	0
95%	95%	-	0	0	0	0	0
Max	Max	-	0	0	0	0	0

		VBE(SAT)(% Change from Initial)					
HRS.	Min	Init	168	340	680	1000L50020003000	1000L50020003000
		-	-19	0	0	0	-1
5%	5%	-	-19	0	0	0	-1
10%	10%	-	-10	0	0	0	-1
25%	25%	-	0	0	0	0	-1
50%	50%	-	0	0	0	0	0
75%	75%	-	0	0	0	0	0
90%	90%	-	0	0	0	0	0
95%	95%	-	0	0	0	0	0
Max	Max	-	0	0	0	0	0

PROCESS: 3 PRE-SCREEN STRESS: 153 HRS. OF 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 800 mW, 30 V, 25°C.

CELL NO.: 419221 NO. OF UNITS: 13

HRS.	IC60 (VCE - 60V) (Nanoamps)				
	Init	168	340	580	1000
Min	0.1	0.6	0.3	0.1	1.0
5%	0.1	0.6	0.3	0.1	1.0
10%	0.1	0.6	0.3	0.1	1.0
25%	0.1	0.6	0.3	0.1	1.0
50%	0.1	0.6	0.3	0.1	1.0
75%	0.1	0.6	0.3	0.1	1.0
90%	0.1	0.6	0.3	0.1	1.0
95%	0.1	0.6	0.3	0.1	1.0
Max	0.1	0.6	0.3	0.1	1.0

HRS.	IEBO (VEB - 5V) (Nanoamps)				
	Init	168	340	580	1000
Min	0.1	0.4	0.4	0.1	0.3
5%	0.1	0.4	0.4	0.1	0.3
10%	0.1	0.4	0.4	0.1	0.3
25%	0.1	0.4	0.4	0.1	0.3
50%	0.1	0.4	0.4	0.1	0.3
75%	0.1	0.4	0.4	0.1	0.3
90%	0.1	0.4	0.4	0.1	0.3
95%	0.1	0.4	0.4	0.1	0.3
Max	0.1	0.4	0.4	0.1	0.3

HRS.	BVCE0 (IC - 0.1 ma) (Volts)				
	Init	168	340	580	1000
Min	61	60	60	60	63
5%	61	60	60	60	63
10%	62	61	61	61	63
25%	65	63	63	63	64
50%	67	66	66	67	66
75%	75	73	70	78	74
90%	80	78	79	80	81
95%	80	78	80	80	81
Max	80	78	80	80	81

HRS.	BVCE0 (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-5	-5	-3	-3
5%	-	-5	-5	-3	-3
10%	-	-5	-5	-3	-3
25%	-	-5	-5	-3	-3
50%	-	-5	-5	-3	-3
75%	-	-5	-5	-3	-3
90%	-	-5	-5	-3	-3
95%	-	-5	-5	-3	-3
Max	-	-5	-5	-3	-3

HRS.	VCE (SAT) (IC-50 ma, IB-5 ma) (mV.)				
	Init	168	340	580	1000
Min	100	99	99	99	99
5%	100	99	99	99	99
10%	101	99	99	99	99
25%	102	99	99	99	99
50%	104	101	101	101	101
75%	108	111	114	131	113
90%	121	147	149	149	144
95%	122	148	163	163	144
Max	122	148	163	163	144

HRS.	VCE (SAT) (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-16	-15	-12	-5
5%	-	-16	-15	-12	-5
10%	-	-12	-13	-9	-5
25%	-	-5	-7	-3	-5
50%	-	-3	-3	-1	-2
75%	-	-2	0	21	22
90%	-	56	42	49	45
95%	-	92	40	40	45
Max	-	97	40	40	45

HRS.	VBE (SAT) (IC-50 ma, IB-5 ma) (mV.)				
	Init	168	340	580	1000
Min	786	785	780	780	783
5%	786	785	780	780	783
10%	786	786	781	782	783
25%	795	793	789	790	784
50%	802	799	799	799	796
75%	804	803	803	824	799
90%	812	832	850	809	809
95%	813	800	866	809	809
Max	813	800	866	809	809

HRS.	VBE (SAT) (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-1	-2	-2	-2
5%	-	-1	-2	-2	-2
10%	-	-1	-2	-2	-2
25%	-	-1	-2	-2	-2
50%	-	-1	0	-1	-1
75%	-	0	0	0	0
90%	-	0	0	0	0
95%	-	0	0	0	0
Max	-	0	0	0	0

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	580	1000
Min	37	20	67	20	68
5%	37	20	67	20	68
10%	68	40	68	20	68
25%	17	75	74	70	82
50%	92	96	92	96	99
75%	110	108	109	115	113
90%	151	119	151	159	122
95%	174	121	179	185	122
Max	174	121	179	185	122

HRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-89	-7	-77	-1
5%	-	-89	-7	-77	-1
10%	-	-54	-6	-77	-1
25%	-	22	-5	0	22
50%	-	22	-2	22	22
75%	-	22	22	22	22
90%	-	22	22	22	22
95%	-	22	22	22	22
Max	-	22	22	22	22

HRS.	BVCE0 (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: B PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OF RATING POWER CONDITION: 700 mw, 30 V, 25°C. MIN 1.8% MAX 96.4 CELL NO.: 419222 NO. OF UNITS: 20

HRS.	ICEO (VCE - 60V)(Nanamps)				
	Init	168	340	680	1000
Min	<0.1	0.5	0.1	<0.1	<0.1
50	<0.1	0.5	0.1	<0.1	0.6
100	<0.1	0.5	0.2	0.2	0.1
250	0.1	0.9	0.5	0.3	1.0
500	0.4	1.4	0.9	0.7	1.4
750	1.3	2.4	2.2	1.9	1.6
900	6.9	17.0	12.6	31.0	2.8
950	557.8	94.2	322.1	628.7	1416.4
Max	>14.1	123.1	631.8	1231.1	2314.5

HRS.	IEBO (VEB - 5V)(Nanamps)				
	Init	168	340	680	1000
Min	<0.1	0.2	<0.1	<0.1	<0.1
50	<0.1	0.2	<0.1	<0.1	0.1
100	<0.1	0.3	<0.1	0.1	0.4
250	0.1	0.4	<0.1	0.1	0.6
500	0.3	1.0	0.6	0.6	1.1
750	11.3	2.3	2.1	2.6	2.2
900	75.0	109.3	122.1	138.3	242.0
950	>14.1	123.1	631.8	1231.1	2314.5

HRS.	BV _{CEO} (IC - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	38	56	56	56	56
50	48	57	57	57	57
100	60	59	59	59	59
250	64	62	61	61	61
500	73	73	73	74	74
750	78	83	81	86	87
900	85	99	89	87	85
950	86	116	115	115	125
Max	87	127	128	128	129

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-21	-21	-21	-21
50	-	-18	-18	-17	-19
100	-	-12	-12	-12	-11
250	-	-3	-4	-5	-6
500	-	-1	-2	0	-1
750	-	0	0	+2	+2
900	-	+13	+12	+24	+23
950	-	+125	+122	+123	+128
Max	-	+166	+159	+129	+174

HRS.	VCE(SAT)(IC-50ma, IB-5 ma)(Mv.)				
	Init	168	340	680	1000
Min	000	085	087	087	082
50	040	086	087	087	081
100	069	087	087	087	087
250	093	091	091	092	092
500	102	099	097	102	101
750	109	105	106	114	114
900	123	118	115	115	116
950	134	139	139	139	130
Max	140	147	148	148	132

HRS.	VCE(SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-14	-13	-10	-9
50	-	-13	-12	-10	-9
100	-	-10	-10	-8	-11
250	-	-5	-5	-4	-3
500	-	-2	-2	-1	0
750	-	+1	+1	+4	+5
900	-	+4	+5	8	8
950	-	5502	5502	5502	5502
Max	-	5502	5502	5502	5502

HRS.	VBE(SAT)(IC-50 ma, IB-5 ma)(Mv.)				
	Init	168	340	680	1000
Min	784	784	784	784	784
50	784	784	784	784	784
100	788	788	788	788	788
250	793	788	790	790	790
500	799	797	795	799	799
750	802	800	801	805	805
900	804	812	812	812	812
950	817	819	816	816	816
Max	824	831	826	826	815

HRS.	VBE(SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-2	-2	-2
50	-	-1	-2	-2	-2
100	-	-1	-1	-1	-1
250	-	0	-1	-1	-1
500	-	0	0	0	0
750	-	0	0	0	0
900	-	0	+1	+1	+1
950	-	+1	+1	+1	+1
Max	-	+1	+1	+1	+1

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	680	1000
Min	49	54	54	54	54
50	50	56	59	59	59
100	56	60	62	62	62
250	86	83	84	86	86
500	99	98	99	99	99
750	109	106	112	119	117
900	118	158	162	167	163
950	128	175	180	178	193
Max	131	185	189	187	186

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-22	-23	-28	-27
50	-	-18	-18	-28	-28
100	-	-12	-12	-25	-25
250	-	-1	0	-5	-1
500	-	+2	+5	+5	+3
750	-	+11	+15	+18	+14
900	-	+32	+42	+53	+43
950	-	+52	+57	+58	+56
Max	-	+55	+61	+56	+57

HRS.	BV _{CEO} (IC - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	38	56	56	56	56
50	48	57	57	57	57
100	60	59	59	59	59
250	64	62	61	61	61
500	73	73	73	74	74
750	78	83	81	86	87
900	85	99	89	87	85
950	86	116	115	115	125
Max	87	127	128	128	129

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-21	-21	-21	-21
50	-	-18	-18	-17	-19
100	-	-12	-12	-12	-11
250	-	-3	-4	-5	-6
500	-	-1	-2	0	-1
750	-	0	0	+2	+2
900	-	+13	+12	+24	+23
950	-	+125	+122	+123	+128
Max	-	+166	+159	+129	+174

PROCESS: B PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419223 NO. OF UNITS: 69

HRS.	ICBO (VCB - 60V) (Nanamps)									
	Init	168	340	680	1000	1500	2000	3000		
50	0.1	0.6	0.7	0.1	0.1	0.1	0.1	0.2		
100	0.2	0.8	1.1	0.4	0.3	0.1	0.1	0.3		
150	0.3	1.1	1.3	0.5	0.4	0.2	0.1	0.4		
200	0.7	1.3	1.6	0.8	0.7	0.5	0.5	0.7		
250	1.0	1.9	2.2	1.6	1.3	1.1	1.1	1.4		
300	2.5	3.6	3.4	3.0	2.7	2.5	2.4	3.0		
350	3.2	4.6	4.5	2.8	2.5	3.3	3.6	5.1		
400	4.4	9.1	7.1	3.3	3.2	2.1	2.4	3.3		
450	13.3	00	00	00	00	00	00	00		

HRS.	IEBO (VEB - 5V) (Nanamps)									
	Init	168	340	680	1000	1500	2000	3000		
50	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1		
100	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1		
150	0.1	0.6	0.3	0.1	0.1	0.1	0.1	0.1		
200	0.1	0.7	0.4	0.2	0.1	0.1	0.1	0.3		
250	0.4	1.1	0.7	0.6	0.5	0.4	0.3	0.7		
300	2.1	2.5	2.3	2.2	1.9	1.5	1.5	2.0		
350	10.7	13.7	10.5	9.0	8.1	4.0	3.9	6.1		
400	29.8	20.2	17.2	10.2	18.1	16.8	16.6	12.8		
450	241.2	208.0	196.4	171.7	208.6	212.9	222.9	326.9		

HRS.	BVCEO (IC - 0.1 ma) (Volts)									
	Init	168	340	680	1000	1500	2000	3000		
50	58	08	09	21	06	01	24	52		
100	63	61	61	60	58	22	59	60		
150	65	64	64	63	63	61	63	63		
200	69	66	66	66	66	66	66	66		
250	73	72	71	71	71	71	71	71		
300	79	78	78	78	78	78	79	80		
350	84	85	85	85	85	84	90	90		
400	86	89	98	89	96	00	00	00		
450	106	114	00	111	00	00	00	00		

HRS.	BVCEO (% Change from Initial)									
	Init	168	340	680	1000	1500	2000	3000		
50	-	-90	-88	-74	-93	-90	-70	-25		
100	-	-11	-13	-13	-18	-73	-20	-19		
150	-	-3	-3	-5	-10	-17	-10	-11		
200	-	-1	0	-1	-3	-3	-3	-3		
250	-	0	0	0	0	0	0	0		
300	-	0	0	0	0	0	0	0		
350	-	+1	+1	+1	+2	+5	+4	+23		
400	-	+3	+30	+3	+4	+87	+153	+126		
450	-	+55	+131	+50	+48	+277	+460	+446		

HRS.	VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)									
	Init	168	340	680	1000	1500	2000	3000		
50	016	078	077	022	015	078	077	025		
100	091	090	093	090	092	091	091	090		
150	092	093	093	092	092	093	093	091		
200	098	096	097	098	100	097	097	098		
250	104	103	103	104	105	105	103	104		
300	112	109	110	113	114	113	113	115		
350	123	118	120	119	120	134	00	00		
400	130	134	125	125	126	00	00	00		
450	147	152	00	165	00	00	00	00		

HRS.	VCE(SAT) (% Change from Initial)									
	Init	168	340	680	1000	1500	2000	3000		
50	-	-31	-29	-29	-87	-36	-38	-26		
100	-	-9	-9	-11	-10	-10	-12	-13		
150	-	-5	-5	-6	-4	-7	-7	-6		
200	-	-4	-3	-3	-3	-3	-3	-4		
250	-	-2	-1	0	+1	0	-2	-1		
300	-	+1	+1	+3	+4	+3	0	+3		
350	-	+2	+4	+5	+7	+0	874	890		
400	-	+4	+5	+8	+11	944	956	962		
450	-	+544	00	+563	+525	923	923	00		

HRS.	VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)									
	Init	168	340	680	1000	1500	2000	3000		
50	717	612	284	283	215	276	281	225		
100	786	281	285	283	280	280	284	281		
150	787	283	286	285	284	283	285	283		
200	790	287	289	288	289	286	289	287		
250	795	292	295	292	293	290	293	293		
300	800	296	299	297	298	297	299	299		
350	808	301	305	302	305	304	300	300		
400	810	307	310	308	314	300	300	300		
450	900	328	00	343	00	00	00	00		

HRS.	VBE(SAT) (% Change from Initial)									
	Init	168	340	680	1000	1500	2000	3000		
50	-	-23	-12	-12	-13	-13	-13	-13		
100	-	-3	-1	-1	-1	-2	-1	-2		
150	-	-1	-1	-1	-1	-1	-1	-1		
200	-	-1	0	-1	0	-1	-1	-1		
250	-	0	0	0	0	0	0	0		
300	-	0	0	0	0	0	0	0		
350	-	0	0	0	+1	+1	+1	+1		
400	-	0	+1	+1	+1	+1	+1	+1		
450	-	+9	+161	+10	+9	+128	+178	+178		

HRS.	hFE (IC - 20 ma, VCE - 5V)									
	Init	168	340	680	1000	1500	2000	3000		
50	55	72	20	69	20	20	20	20		
100	70	74	23	75	71	20	20	20		
150	75	76	77	78	74	22	20	20		
200	86	86	83	85	85	84	83	82		
250	99	99	95	99	97	97	98	97		
300	109	111	106	111	111	113	112	113		
350	115	117	115	121	117	124	123	122		
400	121	130	126	140	142	143	141	143		
450	153	147	153	153	148	155	153	152		

HRS.	hFE (% Change from Initial)									
	Init	168	340	680	1000	1500	2000	3000		
50	-	-7	-81	-10	-80	-83	-83	-83		
100	-	-5	-11	-9	-9	-80	-82	-82		
150	-	-4	-8	-6	-6	-3	-74	-74		
200	-	-2	-5	-7	-3	0	-1	0		
250	-	0	-1	0	0	+1	+1	+1		
300	-	+2	+1	+3	+1	+5	+5	+7		
350	-	+8	+6	+11	+10	+17	+19	+18		
400	-	+16	+13	+21	+26	+31	+37	+34		
450	-	+34	+27	+40	+43	+43	+40	+43		

HRS.	BVCE (IC - 0.1 ma) (Volts)									
	Init	168	340	680	1000	1500	2000	3000		
50	58	08	09	21	06	01	24	52		
100	63	61	61	60	58	22	59	60		
150	65	64	64	63	63	61	63	63		
200	69	66	66	66	66	66	66	66		
250	73	72	71	71	71	71	71	71		
300	79	78	78	78	78	78	79	80		
350	84	85	85	85	85	84	90	90		
400	86	89	98	89	96	00	00	00		
450	106	114	00	111	00	00	00	00		

HRS.	VBE(SAT) (% Change from Initial)									
	Init	168	340	680	1000	1500	2000	3000		
50	-	-23	-12	-12	-13	-13	-13	-13		
100	-	-3	-1	-1	-1	-2	-1	-2		
150	-	-1	-1	-1	-1	-1	-1	-1		
200	-	-1	0	-1	0	-1	-1	-1		
250	-	0	0	0	0	0	0	0		
300	-	0	0	0	0	0	0	0		
350	-	0	0	0	+1	+1	+1	+1		
400	-	0	+1	+1	+1	+1	+1	+1		
450	-	+9	+161	+10	+9	+128	+178	+178		

PROCESS: 8 PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419224 NO. OF UNITS: 13

		ICEO (V _{CB} - 60V)(Nanoamps)					
		Init	168	340	580	1000	1500
Min	0.1	1.2	0.7	0.5	0.5	0.5	0.5
5%	0.1	1.2	0.7	0.5	0.5	0.5	0.5
10%	0.2	1.2	0.7	0.5	0.5	0.5	0.5
25%	0.5	1.5	1.1	0.9	0.8	0.8	0.8
50%	0.8	1.8	1.5	1.2	1.0	1.0	1.2
75%	1.5	2.5	2.1	1.7	1.6	1.4	1.5
90%	2.3	3.1	3.8	3.2	2.8	2.0	3.6
95%	2.5	3.3	4.6	2.5	2.5	2.2	4.2
Max	2.5	3.2	4.6	2.5	2.5	2.2	4.2

		IEBO (V _{EB} - 5V)(Nanoamps)					
		Init	168	340	580	1000	1500
Min	0.1	0.9	0.4	0.3	0.3	0.1	0.1
5%	0.1	0.9	0.4	0.3	0.3	0.1	0.1
10%	0.1	0.9	0.4	0.3	0.3	0.1	0.1
25%	0.3	1.5	1.0	0.9	0.6	0.6	1.0
50%	1.8	3.1	2.2	2.1	1.8	1.7	2.3
75%	4.1	5.3	4.7	4.8	4.9	5.3	7.1
90%	5.9	8.4	7.1	7.1	7.4	7.8	9.7
95%	6.0	9.1	7.9	7.5	8.0	8.4	10.4
Max	6.0	9.1	7.9	7.5	8.0	8.4	10.4

		BV _{CEO} (I _C - 0.1 ma)(Volts)					
		Init	168	340	580	1000	1500
Min	62	62	63	63	62	62	61
5%	62	62	63	63	62	62	61
10%	63	63	63	63	63	63	62
25%	67	64	64	64	63	63	64
50%	72	73	73	73	73	73	73
75%	80	80	80	80	80	80	80
90%	82	82	82	82	82	82	82
95%	83	83	83	83	83	83	83
Max	83	83	83	83	83	83	83

		BV _{CEO} (% Change from Initial)					
		Init	168	340	580	1000	1500
Min	-	-	-8	-7	-9	-9	-14
5%	-	-	-8	-7	-9	-9	-14
10%	-	-	-5	-7	-9	-8	-12
25%	-	-	-1	-1	-1	-2	-1
50%	-	-	0	0	0	0	0
75%	-	-	0	0	0	0	0
90%	-	-	0	0	0	0	0
95%	-	-	0	0	0	0	0
Max	-	-	0	0	0	0	0

		V _{CE} (SAT)(I _C -50ma, I _B -5 ma)(Mv.)					
		Init	168	340	580	1000	1500
Min	108	084	088	083	086	087	087
5%	108	084	088	083	086	087	087
10%	108	088	080	088	088	089	082
25%	117	103	101	101	100	102	099
50%	119	104	105	105	105	106	104
75%	135	123	123	123	117	120	118
90%	148	130	131	131	130	133	129
95%	150	132	132	132	131	133	130
Max	150	132	132	132	131	133	130

		V _{CE} (SAT)(% Change from Initial)					
		Init	168	340	580	1000	1500
Min	-	-	-23	-19	-22	-21	-23
5%	-	-	-23	-19	-22	-21	-23
10%	-	-	-24	-18	-20	-20	-22
25%	-	-	-15	-14	-15	-17	-17
50%	-	-	-13	-12	-13	-15	-15
75%	-	-	-9	-10	-9	-12	-9
90%	-	-	-6	-9	-7	-9	-8
95%	-	-	-6	-9	-7	-9	-8
Max	-	-	-6	-9	-7	-9	-8

		V _{BE} (SAT)(% Change from Initial)					
		Init	168	340	580	1000	1500
Min	-	-	-2	-3	-2	-2	-3
5%	-	-	-2	-3	-2	-2	-3
10%	-	-	-2	-3	-2	-2	-3
25%	-	-	-2	-2	-2	-2	-2
50%	-	-	-2	-2	-2	-2	-2
75%	-	-	-1	-1	-1	-1	-2
90%	-	-	-1	0	0	0	0
95%	-	-	-1	0	0	0	0
Max	-	-	-1	0	0	0	0

		h _{FE} (I _C - 20 ma, V _{CE} - 5V)					
		Init	168	340	580	1000	1500
Min	61	61	62	58	60	61	60
5%	61	61	62	58	60	61	60
10%	67	66	68	63	66	67	60
25%	82	85	87	82	86	87	87
50%	99	94	100	89	97	98	100
75%	112	108	107	105	109	110	111
90%	130	129	145	145	153	128	153
95%	137	137	159	168	171	212	210
Max	137	137	159	168	171	212	210

		h _{FE} (% Change from Initial)					
		Init	168	340	580	1000	1500
Min	-	-	-10	-5	-14	-3	-2
5%	-	-	-10	-5	-14	-3	-2
10%	-	-	-9	-4	-14	-3	-2
25%	-	-	-5	+1	-9	-2	-1
50%	-	-	-1	+1	-5	-2	-1
75%	-	-	+2	+3	-1	+3	+5
90%	-	-	+4	+13	+14	+19	+31
95%	-	-	+4	+16	+13	+25	+55
Max	-	-	+4	+16	+13	+25	+55

		V _{BE} (SAT)(% Change from Initial)					
		Init	168	340	580	1000	1500
Min	-	-	-	-	-	-	-
5%	-	-	-	-	-	-	-
10%	-	-	-	-	-	-	-
25%	-	-	-	-	-	-	-
50%	-	-	-	-	-	-	-
75%	-	-	-	-	-	-	-
90%	-	-	-	-	-	-	-
95%	-	-	-	-	-	-	-
Max	-	-	-	-	-	-	-

PROCESS: 6 PRE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C.

CELL NO.: 419225 NO. OF UNITS: 28

VCE0 (VCE - 60V) (Microamps)									
Unit	168	340	580	1000	500	2000	3000		
168	0.3	0.6	0.5	0.3	0.2	0.2	0.4		
340	0.3	0.7	0.5	0.4	0.2	0.2	0.4		
580	0.4	0.9	0.7	0.5	0.3	0.3	0.5		
1000	1.1	1.5	1.2	1.1	0.7	0.5	0.6		
500	2.0	2.7	2.4	2.0	1.8	1.3	2.3		
2000	3.1	3.6	3.4	2.7	2.5	2.7	3.2		
3000	3.7	25.7	21.9	6.1	14.5	4.5	5.2		
168	18.6	194.9	211.2	190.3	135.3	91.5	68.4		
340	30.0	199.9	359.4	329.7	221.4	151.7	109.3		

IEBO (VEB - 5V) (Microamps)									
Unit	168	340	580	1000	500	2000	3000		
168	0.1	0.5	0.4	0.1	0.1	0.1	0.1		
340	0.1	0.5	0.4	0.1	0.1	0.1	0.1		
580	0.1	0.6	0.1	0.1	0.1	0.1	0.1		
1000	0.1	0.7	0.3	0.2	0.1	0.1	0.1		
500	0.4	1.3	0.8	0.6	0.3	0.5	1.0		
2000	2.7	3.7	2.9	2.8	2.3	2.6	3.5		
3000	4.6	5.1	5.1	5.3	4.0	4.9	5.4		
168	9.8	18.6	17.9	14.9	8.8	9.8	11.6		
340	13.5	22.2	22.1	15.3	12.3	13.5	16.3		

BVCE0 (IC - 0.1 ma) (Volts)									
Unit	168	340	580	1000	500	2000	3000		
168	59	59	58	58	58	58	57		
340	59	59	59	59	58	58	58		
580	61	61	61	61	60	61	61		
1000	64	64	64	64	64	64	64		
500	71	71	71	71	71	71	71		
2000	79	80	80	80	80	80	79		
3000	86	86	86	86	85	86	85		
168	87	86	86	86	86	87	86		
340	87	86	87	87	87	87	87		

BVCE0 (% Change from Initial)									
Unit	168	340	580	1000	500	2000	3000		
168	-1	-1	-2	-3	-3	-3	-3		
340	-1	-3	-2	-3	-3	-3	-3		
580	0	0	0	0	-2	-1	-1		
1000	0	0	0	0	0	0	0		
500	0	0	0	0	0	0	0		
2000	+2	+1	+1	+1	+1	+1	+1		
3000	+6	+6	+5	+6	+5	+5	+5		
168	+7	+7	+1	+7	+6	+6	+6		

VCE (SAT) (IC-50 ma, IB-5 ma) (Mv.)									
Unit	168	340	580	1000	500	2000	3000		
168	110	088	093	092	091	092	091		
340	112	090	093	093	091	093	091		
580	115	095	097	096	094	095	095		
1000	119	101	101	101	100	100	100		
500	128	108	107	107	108	107	108		
2000	141	123	123	124	123	125	123		
3000	150	130	129	130	126	130	127		
168	152	136	134	136	134	134	132		
340	153	137	134	139	135	135	133		

VCE (SAT) (% Change from Initial)									
Unit	168	340	580	1000	500	2000	3000		
168	-27	-24	-23	-24	-23	-24	-25		
340	-25	-24	-23	-24	-21	-23	-24		
580	-18	-18	-19	-20	-19	-20	-21		
1000	-17	-17	-16	-16	-16	-16	-17		
500	-14	-15	-13	-15	-14	-15	-15		
2000	-13	-12	-12	-14	-12	-13	-13		
3000	-11	-11	-9	-13	-9	-13	-11		
168	-8	-9	-6	+27	-8	-9	-8		
340	-6	-8	-5	+27	-8	-9	-8		

VBE (SAT) (IC-50 ma, IB-5 ma) (Mv.)									
Unit	168	340	580	1000	500	2000	3000		
168	794	778	779	780	785	782	781		
340	795	776	780	781	785	782	781		
580	798	788	782	785	785	783	782		
1000	802	784	786	787	788	784	784		
500	809	791	792	795	795	794	792		
2000	818	802	802	804	804	803	801		
3000	828	809	812	815	816	815	811		
168	839	819	821	824	823	818	818		
340	846	824	824	824	824	822	824		

VBE (SAT) (% Change from Initial)									
Unit	168	340	580	1000	500	2000	3000		
168	-4	-4	-3	-3	-4	-4	-4		
340	-4	-4	-3	-3	-4	-4	-4		
580	-3	-3	-3	-3	-3	-3	-3		
1000	-3	-2	-2	-2	-2	-2	-2		
500	-2	-2	-2	-2	-2	-2	-2		
2000	-2	-2	-2	-2	-2	-2	-2		
3000	-2	-2	-2	-2	-2	-2	-2		
168	-1	-1	-1	-1	-1	-1	-1		
340	-1	-1	-1	-1	-1	-1	-1		

hFE (IC - 20 ma, VCE - 5V)									
Unit	168	340	580	1000	500	2000	3000		
168	64	65	64	61	63	64	64		
340	65	65	64	61	64	65	65		
580	66	67	68	65	66	67	68		
1000	85	84	83	79	82	83	83		
500	98	98	98	92	96	98	98		
2000	112	108	107	100	110	110	111		
3000	118	115	114	107	117	119	119		
168	125	116	120	112	120	124	123		
340	129	117	123	115	121	127	125		

hFE (% Change from Initial)									
Unit	168	340	580	1000	500	2000	3000		
168	-14	-12	-16	-9	-7	-7	-8		
340	-11	-11	-16	-8	-7	-6	-7		
580	-7	-9	-14	-5	-5	-4	-5		
1000	-5	-4	-11	-3	-3	-2	-1		
500	-1	-1	-7	-3	-1	-1	0		
2000	0	0	-5	-1	0	0	0		
3000	+1	0	-3	+1	+2	+2	+3		
168	+2	+3	-2	+4	+5	+6	+8		
340	+2	+3	-2	+6	+7	+8	+11		

BVCE0 (% Change from Initial)									
Unit	168	340	580	1000	500	2000	3000		
168	-1	-1	-2	-3	-3	-3	-3		
340	-1	-3	-2	-3	-3	-3	-3		
580	0	0	0	0	-2	-1	-1		
1000	0	0	0	0	0	0	0		
500	0	0	0	0	0	0	0		
2000	+2	+1	+1	+1	+1	+1	+1		
3000	+6	+6	+5	+6	+5	+5	+5		
168	+7	+7	+1	+7	+6	+6	+6		

PROCESS: 3 PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C. Stabilization Bake - 25 Kg Centrifuge.

CELL NO.: 419226 NO. OF UNITS: 14

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C.

HRS.	ICEO (VCB - 60V) (Nanoamps)									
	Init	168	340	680	1000	1500	2000	3000		
Min	0.2	0.9	0.3	0.2	0.3	0.1	0.1	0.1	0.6	
5%	0.2	0.9	0.3	0.2	0.3	0.1	0.1	0.1	0.6	
10%	0.3	0.9	0.3	0.2	0.3	0.1	0.1	0.1	0.6	
25%	0.9	1.6	0.9	0.7	0.9	0.3	0.4	0.7		
50%	1.5	1.8	1.2	1.0	1.2	1.0	1.0	1.0		
75%	3.5	4.1	3.8	3.2	3.5	3.3	1.7	1.3		
90%	4.6	4.9	4.4	5.0	4.2	3.5	3.2	3.2		
95%	4.6	5.0	4.4	5.0	4.2	3.7	3.7	3.6		
Max	4.6	5.0	4.4	5.0	4.2	3.7	3.7	3.6		

IEBO (VEB - 5V) (Nanoamps)									
Init	168	340	680	1000	1500	2000	3000		
0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.7	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1
0.3	1.2	0.5	0.3	0.5	0.3	0.5	0.4		
1.7	2.7	2.3	1.2	2.3	1.1	1.9	1.1		
13.9	14.0	14.8	10.3	13.5	13.3	13.1	13.4		
22.0	14.1	16.6	12.8	14.0	13.8	12.3	13.9		
22.0	14.1	16.6	12.8	14.0	13.8	12.3	13.9		

BVCEO (IC - 0.1 ma) (Volts)									
Init	168	340	680	1000	1500	2000	3000		
60	60	60	59	59	59	59	60		
60	60	60	59	59	59	59	60		
63	62	62	63	63	61	61	61		
69	69	68	68	68	66	66	66		
73	73	72	72	72	70	70	70		
81	85	84	83	83	79	79	86		
91	91	90	92	92	84	84	707		
92	91	91	92	92	80	80	80		
92	91	91	92	92	80	80	80		

BVCEO (% Change from Initial)									
Init	168	340	680	1000	1500	2000	3000		
-	-3	-4	-4	-4	-4	-4	-12	-11	
-	-3	-4	-4	-4	-4	-4	-12	-11	
-	-3	-4	-3	-3	-5	-5	-12	-11	
-	-2	-2	-2	-2	-3	-3	-5	-4	
-	-1	-2	-1	-1	-2	-2	-3	-1	
-	0	0	-1	0	-1	-1	-2	-2	
-	+6	+5	+7	+6	+5	+5	+8	+7	
-	+6	+5	+8	+8	+6	+6	+8	+7	
-	+6	+5	+8	+8	+6	+6	+8	+7	

VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)									
Init	168	340	680	1000	1500	2000	3000		
106	89	88	91	90	90	92	102		
106	89	88	90	90	90	93	102		
107	91	89	90	90	92	93	103		
115	98	98	99	97	101	99	105		
122	104	101	114	104	104	107	111		
137	131	128	124	121	125	126	129		
152	128	128	130	127	128	130	130		
165	128	128	130	129	130	130	130		
155	128	128	130	129	130	130	130		

VCE(SAT) (% Change from Initial)									
Init	168	340	680	1000	1500	2000	3000		
-	-19	-19	-19	-20	-19	-19	-17		
-	-19	-19	-19	-20	-19	-19	-17		
-	-18	-19	-18	-19	-19	-19	-17		
-	-16	-17	-16	-17	-16	-16	-13		
-	-15	-16	-14	-14	-14	-14	-7		
-	-13	-13	-10	-13	-11	-10	+6		
-	-10	-11	-7	-10	-10	-10	+3		
-	-9	-10	-5	-9	-9	-9	+4		
-	-9	-10	-5	-9	-9	-9	+4		

VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)									
Init	168	340	680	1000	1500	2000	3000		
794	782	783	786	780	780	784	796		
794	782	783	786	780	780	784	796		
795	783	784	787	782	780	784	798		
800	785	785	789	785	784	786	805		
804	791	791	794	789	789	795	810		
811	796	795	796	796	797	801	812		
816	800	800	801	799	799	800	800		
816	802	800	802	799	800	800	800		
816	802	800	802	799	800	800	800		

VBE(SAT) (% Change from Initial)									
Init	168	340	680	1000	1500	2000	3000		
-	-2	-2	-2	-2	-2	-2	-2		
-	-2	-2	-2	-2	-2	-2	-2		
-	-2	-2	-2	-2	-2	-2	-2		
-	-2	-2	-2	-2	-2	-2	-2		
-	-2	-2	-2	-2	-2	-2	-2		
-	-1	-1	-1	-1	-1	-1	-1		
-	-1	-1	-1	-1	-1	-1	-1		
-	-1	-1	-1	-1	-1	-1	-1		
-	-1	-1	-1	-1	-1	-1	-1		

hFE (IC - 20 ma, VCE - 5V)									
Init	168	340	680	1000	1500	2000	3000		
61	63	63	62	63	63	60	20		
61	63	63	62	63	63	60	20		
65	67	68	66	67	67	65	20		
77	78	79	77	78	78	74	60		
94	96	91	96	96	100	97	89		
98	101	103	100	103	108	112	114		
104	111	113	112	113	116	124	129		
105	112	115	114	115	119	132	137		
105	112	115	114	115	119	132	137		

hFE (% Change from Initial)									
Init	168	340	680	1000	1500	2000	3000		
-	-8	-7	-10	-9	-6	-8	-8		
-	-8	-7	-10	-9	-6	-8	-8		
-	-5	-7	-6	-5	-3	-5	-10		
-	+1	+1	0	+1	+2	-1	-3		
-	+4	+5	+2	+4	+8	+6	-2		
-	+6	+7	+5	+6	+11	+14	+18		
-	+8	+10	+9	+10	+15	+30	+61		
-	+9	+11	+11	+11	+16	+39	+85		
-	+9	+11	+11	+11	+16	+39	+85		

VBE(SAT) (% Change from Initial)									
Init	168	340	680	1000	1500	2000	3000		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-		

PROCESS: B PRE-SCREEN STRESS:

168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION:

700 mw, 30 V, 25°C.

CELL NO.: 419227 NO. OF UNITS: 29

HRS.	ICBO (VCB - 60V) (Nanoamps)				
	Init	168	340	680	1000L50020003000
Min	0.1	0.8	0.2	0.2	0.4
5%	0.2	0.9	0.3	0.2	0.4
10%	0.4	0.9	0.4	0.3	0.5
25%	1.0	1.8	1.1	0.9	1.3
50%	2.2	3.4	2.8	1.8	2.0
75%	3.6	4.5	3.5	2.7	3.5
90%	4.7	5.1	4.4	3.8	4.5
95%	4.9	4.8	4.9	4.8	5.0
Max	5.0	4.4	4.2	3.9	4.8

HRS.	IEBO (VEB - 5V) (Nanoamps)				
	Init	168	340	680	1000L50020003000
Min	0.1	0.5	0.1	0.1	0.1
5%	0.1	0.6	0.1	0.1	0.1
10%	0.1	0.7	0.1	0.1	0.1
25%	0.1	0.8	0.2	0.2	0.2
50%	0.4	1.0	0.6	0.6	0.4
75%	1.3	2.0	1.7	1.9	1.3
90%	5.7	6.6	6.4	6.3	6.2
95%	14.9	11.2	12.1	15.6	12.8
Max	15.3	13.9	17.6	13.5	16.3

HRS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	680	1000L50020003000
Min	63	63	63	63	63
5%	64	63	63	63	63
10%	65	64	64	63	63
25%	68	68	68	67	67
50%	72	73	73	71	71
75%	79	80	80	78	78
90%	83	86	86	87	88
95%	88	88	88	88	88
Max	90	89	89	89	89

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-2	-2	-9	-30
5%	-	-2	-2	-56	-11
10%	-	-1	-2	-2	-5
25%	-	-1	-1	-2	-2
50%	-	0	-1	-1	-2
75%	-	+1	0	0	+1
90%	-	+4	+3	+3	+13
95%	-	+7	+7	+6	+7
Max	-	+8	+8	+7	+18

HRS.	VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50020003000
Min	0.08	0.02	0.04	0.08	0.04
5%	1.05	0.45	0.89	0.89	0.89
10%	1.12	0.42	0.95	0.93	0.93
25%	1.19	0.88	1.00	1.00	0.97
50%	1.26	1.05	1.06	1.06	1.06
75%	1.32	1.14	1.13	1.16	1.15
90%	1.39	1.19	1.19	1.27	1.23
95%	1.46	1.06	1.28	1.28	1.28
Max	1.51	1.00	1.28	1.28	1.28

HRS.	VCE(SAT) (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-98	-32	-32	-33
5%	-	-66	-26	-27	-26
10%	-	-21	-18	-19	-20
25%	-	-18	-17	-17	-18
50%	-	-16	-16	-14	-15
75%	-	-13	-14	-11	-12
90%	-	-11	-9	-7	-8
95%	-	362	-6	233	233
Max	-	2252	-4	2418	2418

HRS.	VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)				
	Init	168	340	680	1000L50020003000
Min	795	630	750	782	778
5%	796	704	780	782	778
10%	797	780	780	783	780
25%	800	784	785	784	783
50%	807	791	791	793	792
75%	814	796	797	799	797
90%	819	803	813	807	810
95%	831	803	807	800	800
Max	835	800	808	800	800

HRS.	VBE(SAT) (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-22	-5	-5	-5
5%	-	-14	-4	-4	-4
10%	-	-3	-3	-2	-3
25%	-	-2	-2	-2	-2
50%	-	-2	-2	-2	-2
75%	-	-2	-2	-2	-2
90%	-	-1	-1	-1	-1
95%	-	565	-1	1129	565
Max	-	1130	-1	1130	1130

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	680	1000L50020003000
Min	67	20	65	20	20
5%	69	44	69	20	20
10%	73	73	74	68	70
25%	85	84	85	82	85
50%	93	92	91	92	94
75%	102	99	101	103	103
90%	105	105	109	108	110
95%	109	106	112	112	115
Max	109	107	115	115	116

HRS.	hFE (% Change from Initial)				
	Init	168	340	680	1000L50020003000
Min	-	-81	-11	-81	-81
5%	-	-45	-11	-80	-80
10%	-	-8	-10	-8	-7
25%	-	-2	-4	-2	-1
50%	-	0	+2	+1	+2
75%	-	+2	+3	+5	+6
90%	-	+3	+7	+7	+10
95%	-	+5	+8	+9	+11
Max	-	+5	+8	+9	+11

HRS.	hFE				
	Init	168	340	680	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: B PRE-SCREEN STRESS:

168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION:

500 mw, 30 V, 25°C.

CELL NO.: 419228 NO. OF UNITS: 70

PERS.	VCE (VCE - 60V) (Nanoamps)					
	Init	168	340	680	1000L	50020003000
Min	0.2	0.9	1.3	0.4	0.3	0.3
5%	0.4	1.0	1.3	0.5	0.6	0.4
10%	0.5	1.2	1.5	0.7	0.7	0.6
25%	0.9	1.6	1.9	1.0	1.1	0.9
50%	2.1	3.4	3.3	2.3	2.5	2.3
75%	3.7	4.5	4.2	3.5	3.5	3.4
90%	4.1	5.0	4.6	3.9	4.0	4.2
95%	4.5	5.3	4.9	4.2	4.3	4.6
Max	5.8	6.5	6.2	5.0	5.1	5.6

PERS.	I _{CEO} (V _{CE} - 5V) (Nanoamps)					
	Init	168	340	680	1000L	50020003000
Min	0.1	0.5	0.3	0.1	0.1	0.1
5%	0.1	0.6	0.4	0.1	0.1	0.1
10%	0.1	0.6	0.5	0.1	0.1	0.1
25%	0.1	0.8	0.6	0.2	0.2	0.2
50%	0.4	1.1	0.8	0.5	0.5	0.5
75%	1.3	2.1	1.7	1.4	1.3	1.3
90%	3.1	4.1	3.5	2.9	3.4	3.1
95%	5.6	6.6	5.5	5.8	5.9	6.7
Max	14.6	12.2	10.7	10.8	10.8	12.3

PERS.	BV _{CEQ} (I _C - 0.1 ma) (Volts)					
	Init	168	340	680	1000L	50020003000
Min	60	60	60	60	60	60
5%	62	62	62	62	62	62
10%	65	65	66	66	66	65
25%	70	69	70	70	70	69
50%	73	73	73	73	73	73
75%	80	81	81	80	80	79
90%	85	85	86	85	85	85
95%	87	87	87	87	87	87
Max	89	89	89	89	89	89

PERS.	BV _{CEO} (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-5	-4	-4	-5	-4
5%	-	-1	-1	-1	-1	-1
10%	-	-1	-1	-1	-1	-1
25%	-	-1	-1	-1	-1	-1
50%	-	-1	-1	-1	-1	-1
75%	-	-1	-1	-1	-1	-1
90%	-	-1	-1	-1	-1	-1
95%	-	-1	-1	-1	-1	-1
Max	-	-1	-1	-1	-1	-1

PERS.	VCE(SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)					
	Init	168	340	680	1000L	50020003000
Min	0.85	0.88	0.90	0.86	0.88	0.86
5%	0.92	0.93	0.94	0.92	0.93	0.92
10%	0.94	0.96	0.99	0.97	0.97	0.94
25%	1.00	1.00	1.02	1.00	1.01	1.00
50%	1.05	1.05	1.07	1.07	1.06	1.05
75%	1.11	1.13	1.13	1.11	1.14	1.11
90%	1.24	1.25	1.28	1.27	1.27	1.28
95%	1.36	1.38	1.37	1.38	1.37	1.39
Max	1.44	1.45	1.43	1.44	1.43	1.44

PERS.	VCE(SAT) (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	-	-	-	-	-
75%	-	-	-	-	-	-
90%	-	-	-	-	-	-
95%	-	-	-	-	-	-
Max	-	-	-	-	-	-

PERS.	VBE(SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)					
	Init	168	340	680	1000L	50020003000
Min	791	791	784	783	780	777
5%	795	795	784	783	780	777
10%	798	784	784	783	780	777
25%	803	784	784	783	780	777
50%	807	784	784	783	780	777
75%	813	784	784	783	780	777
90%	822	784	784	783	780	777
95%	833	784	784	783	780	777
Max	921	784	784	783	780	777

PERS.	VBE(SAT) (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-15	-15	-25	-15	-15
5%	-	-4	-3	-5	-3	-4
10%	-	-3	-2	-3	-3	-3
25%	-	-2	-2	-2	-2	-2
50%	-	-2	-2	-2	-2	-2
75%	-	-2	-2	-2	-2	-2
90%	-	-2	-2	-2	-2	-2
95%	-	-1	-1	-1	-1	-1
Max	-	-1	-1	-1	-1	-1

PERS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)					
	Init	168	340	680	1000L	50020003000
Min	36	47	50	57	57	58
5%	58	58	57	59	60	58
10%	67	70	66	69	70	68
25%	84	85	83	83	84	83
50%	93	93	91	93	93	92
75%	101	101	96	100	99	102
90%	103	106	103	106	106	106
95%	105	108	105	108	107	109
Max	108	110	108	109	109	115

PERS.	h _{FE} (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-22	-22	-6	-9	-11
5%	-	-7	-10	-3	-8	-5
10%	-	-5	-9	-2	-7	-2
25%	-	-1	-6	-1	-3	0
50%	-	+1	-2	-1	-1	+1
75%	-	+1	0	0	+1	+3
90%	-	+6	+2	+6	+6	+7
95%	-	+8	+7	+8	+7	+11
Max	-	+25	+10	+10	+12	+12

PERS.	BV _{CEO} (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	-	-	-	-	-
75%	-	-	-	-	-	-
90%	-	-	-	-	-	-
95%	-	-	-	-	-	-
Max	-	-	-	-	-	-

PERS.	VBE(SAT) (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	-	-	-	-	-
75%	-	-	-	-	-	-
90%	-	-	-	-	-	-
95%	-	-	-	-	-	-
Max	-	-	-	-	-	-

PROCESS: 8 PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.
 OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419229 NO. OF UNITS: 14-

HRS.	VCE (VCE - 60V) (Nanocamp.)				
	Init	168	340	680	1000
Min	0.2	0.7	0.5	0.3	0.1
5%	0.2	0.7	0.5	0.3	0.1
10%	0.2	0.7	0.5	0.3	0.1
25%	0.4	1.1	0.6	0.3	0.1
50%	1.9	2.5	2.2	1.8	1.3
75%	4.4	4.6	4.2	3.9	3.1
90%	5.1	5.1	4.6	4.3	3.5
95%	5.4	5.3	4.6	4.5	4.2
Max	5.4	5.3	4.6	4.5	4.2

Init	IEBO (VBE - 5V) (Nanocamps)				
	168	340	680	1000	1500
0.1	0.6	0.1	0.2	0.1	0.1
0.1	0.6	0.1	0.2	0.1	0.1
0.1	0.6	0.2	0.2	0.1	0.1
0.1	0.9	0.3	0.3	0.1	0.1
0.1	1.1	0.5	0.5	0.3	0.2
1.1	2.0	1.4	1.2	0.8	1.2
5.5	6.9	6.0	5.6	4.9	5.1
5.7	7.5	6.6	6.0	5.3	5.7
5.7	7.5	6.6	6.0	5.3	5.7

Init	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	168	340	680	1000	1500
61	61	61	61	61	61
61	61	61	61	61	61
61	61	61	61	61	61
68	68	68	68	68	68
74	75	76	75	76	76
78	78	78	77	78	79
89	91	91	90	92	92
91	91	91	91	92	93
91	91	91	91	92	93

Init	BV _{CEO} (% Change from Initial)				
	168	340	680	1000	1500
-	-15	-12	-15	-9	-2
-	-15	-12	-15	-9	-2
-	-8	-7	-9	-6	-2
-	-1	-1	-2	-1	-1
-	0	-1	-1	-1	-1
-	0	0	0	0	0
-	+18	+19	+18	+21	+21
-	+36	+37	+35	+39	+41
-	+36	+37	+35	+39	+41

HRS.	VCE (SAT) (I _C - 50ma, I _B - 5 ma) (Mv.)				
	Init	168	340	680	1000
107	093	010	090	091	059
107	093	010	090	091	059
110	096	051	095	094	080
117	102	101	100	099	102
123	105	106	105	105	106
128	113	114	114	112	114
138	117	116	118	115	118
138	117	116	120	116	120
138	117	116	120	116	120

Init	VCE (SAT) (% Change from Initial)				
	168	340	680	1000	1500
-	-26	-22	-28	-27	-28
-	-26	-22	-28	-27	-28
-	-23	-24	-24	-24	-24
-	-18	-16	-16	-17	-17
-	-14	-14	-14	-15	-15
-	-10	-12	-10	-13	-13
-	-2	-1	-2	-3	-3
-	+6	+7	+6	+5	+7
-	+6	+7	+6	+5	+7

Init	VBE (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)				
	168	340	680	1000	1500
797	780	510	780	782	715
797	780	510	780	782	715
797	780	510	780	782	715
801	787	787	788	787	783
808	793	794	798	796	794
815	798	798	806	800	799
820	810	801	804	802	804
822	810	812	815	812	804
822	810	812	815	812	804

Init	VBE (SAT) (% Change from Initial)				
	168	340	680	1000	1500
-	-3	-36	-3	-3	-3
-	-3	-36	-3	-3	-3
-	-3	-36	-3	-3	-3
-	-2	-2	-2	-2	-2
-	-2	-2	-2	-2	-2
-	-1	-1	-1	-1	-1
-	-1	-1	-1	-1	-1
-	-1	-1	-1	-1	-1
-	-1	-1	-1	-1	-1

HRS.	hFE (I _C - 20 ma, VCE - 5V)				
	Init	168	340	680	1000
77	75	75	72	77	78
77	75	75	72	77	78
77	75	75	72	77	78
87	82	81	77	80	81
94	91	90	89	94	95
97	96	97	95	101	102
105	104	102	102	105	106
106	108	108	108	118	118
106	108	108	108	118	118

Init	hFE (% Change from Initial)				
	168	340	680	1000	1500
-	-15	-16	-21	-21	-19
-	-15	-16	-21	-21	-19
-	-11	-12	-13	-14	-11
-	-6	-7	-7	-8	-1
-	-1	-1	-5	+1	+6
-	+2	+3	-2	+3	+4
-	+5	+4	+1	+5	+6
-	+5	+4	+1	+5	+6
-	+5	+4	+1	+5	+6

Init	BV _{CEO} (% Change from Initial)				
	168	340	680	1000	1500
-	-15	-12	-15	-9	-2
-	-15	-12	-15	-9	-2
-	-8	-7	-9	-6	-2
-	-1	-1	-2	-1	-1
-	0	-1	-1	-1	-1
-	0	0	0	0	0
-	+18	+19	+18	+21	+21
-	+36	+37	+35	+39	+41
-	+36	+37	+35	+39	+41

PROCESS: 8 PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION:

200 mw, 30 V, 150°C.

CELL NO.: 419230 NO. OF UNITS: 29.

RES.	I _{CEO} (V _{CE} - 60V) (Microamps)				
	Init	168	340	680	1000L50C20003000
Min	0.4	0.8	0.6	0.5	0.3
5%	0.5	0.9	0.7	0.5	0.4
10%	0.6	1.2	0.8	0.5	0.4
25%	0.9	1.5	1.2	1.0	0.9
50%	1.4	2.0	1.7	1.6	1.3
75%	3.2	3.7	3.4	2.9	3.3
90%	3.8	4.3	4.6	5.0	4.3
95%	4.0	4.8	5.6	7.0	6.8
Max	4.8	5.0	6.1	7.9	9.0

RES.	I _{CEO} (V _{CE} - 5V) (Nanamps)				
	Init	168	340	680	1000L50C20003000
Min	0.1	0.6	0.1	0.1	0.1
5%	0.1	0.7	0.2	0.1	0.1
10%	0.1	0.8	0.3	0.3	0.1
25%	0.2	1.0	0.5	0.5	0.2
50%	1.3	1.9	1.5	1.6	1.2
75%	3.9	4.0	3.6	3.5	3.0
90%	10.9	13.2	8.6	8.1	7.3
95%	24.4	50.6	29.9	17.2	16.3
Max	25.6	78.3	25.2	24.6	21.3

RES.	I _{CEO} (I _C - 0.1 ma.) (Volts)				
	Init	168	340	680	1000L50C20003000
Min	59	60	60	59	60
5%	61	61	60	60	61
10%	65	64	62	62	63
25%	68	68	67	67	67
50%	74	74	74	74	74
75%	79	80	79	79	81
90%	85	85	85	85	85
95%	90	90	90	90	90
Max	94	95	95	95	95

RES.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-1	-19	-19	-19
5%	-	-	-1	-10	-11
10%	-	-	0	-1	-1
25%	-	-	0	0	0
50%	-	-	0	0	0
75%	-	-	0	0	0
90%	-	-	0	0	0
95%	-	-	0	0	0
Max	-	-	0	0	0

RES.	V _{BE} (SAT) (I _C - 20 ma., I _B - 5 ma.) (Mv.)				
	Init	168	340	680	1000L50C20003000
Min	105	83	87	85	84
5%	109	85	89	86	85
10%	119	92	99	100	99
25%	123	102	104	106	101
50%	130	109	111	113	108
75%	139	119	122	124	120
90%	158	138	138	143	139
95%	161	143	150	152	140
Max	162	144	154	154	141

RES.	V _{CE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-29	-27	-29	-30
5%	-	-26	-23	-24	-25
10%	-	-21	-18	-17	-19
25%	-	-18	-17	-15	-18
50%	-	-16	-14	-14	-16
75%	-	-12	-13	-11	-14
90%	-	-11	-12	-10	-12
95%	-	-11	-12	-10	-12
Max	-	-10	-10	-10	-10

RES.	V _{BE} (SAT) (I _C - 50 ma., I _B - 5 ma.) (Mv.)				
	Init	168	340	680	1000L50C20003000
Min	798	780	780	777	784
5%	799	781	782	780	784
10%	801	781	784	786	786
25%	805	786	787	790	791
50%	807	793	794	794	795
75%	815	797	798	800	800
90%	820	800	802	804	803
95%	827	809	808	808	809
Max	832	817	808	808	808

RES.	V _{BE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-4	-4	-4	-4
5%	-	-4	-4	-4	-4
10%	-	-3	-3	-3	-3
25%	-	-3	-3	-3	-3
50%	-	-3	-3	-3	-3
75%	-	-3	-3	-3	-3
90%	-	-3	-3	-3	-3
95%	-	-3	-3	-3	-3
Max	-	-3	-3	-3	-3

RES.	h _{FE} (I _C - 20 ma., V _{CE} - 5V)				
	Init	168	340	680	1000L50C20003000
Min	56	56	20	20	20
5%	57	58	38	38	38
10%	70	68	59	59	59
25%	75	76	77	76	75
50%	88	87	86	88	87
75%	97	97	95	97	96
90%	107	108	105	106	106
95%	108	109	107	108	107
Max	108	109	109	111	110

RES.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-5	-72	-72	-72
5%	-	-5	-41	-38	-40
10%	-	-4	-9	-3	-4
25%	-	-1	-4	-1	-2
50%	-	0	0	0	0
75%	-	+1	+1	+1	+1
90%	-	+2	+4	+4	+4
95%	-	+6	+8	+9	+6
Max	-	+8	+8	+9	+6

RES.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000L50C20003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: B PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C.

CELL NO.: 419231 NO. OF UNITS: 7

		ICB3 (VCB - 60V) (Nanoamps)			
		Init	168	340	580
Min	0.6	1.3	0.9	0.8	0.8
5%	0.6	1.3	0.9	0.8	0.8
10%	0.6	1.3	0.9	0.8	0.8
25%	1.6	1.9	1.7	0.9	1.3
50%	3.2	3.3	3.1	2.6	3.3
75%	3.6	3.8	4.3	3.0	3.7
90%	5.1	4.5	4.0	3.7	4.7
95%	5.1	4.5	4.0	3.7	4.7
Max	5.1	4.5	4.0	3.7	4.7

		IEB3 (VEB - 5V) (Nanoamps)			
		Init	168	340	580
Min	0.1	0.5	0.1	0.1	0.1
5%	0.1	0.5	0.1	0.1	0.1
10%	0.1	0.5	0.1	0.1	0.1
25%	0.1	0.5	0.1	0.1	0.1
50%	0.8	0.7	1.0	0.3	0.3
75%	1.2	2.4	1.5	1.9	1.5
90%	2.5	2.7	2.3	2.3	2.7
95%	2.5	2.7	2.3	2.3	2.7
Max	2.5	2.7	2.3	2.3	2.7

		BVCE0 (IC - 0.1 ma) (Volts)			
		Init	168	340	580
Min	64	63	63	63	63
5%	64	63	63	63	63
10%	64	63	63	63	63
25%	66	66	66	66	65
50%	73	71	71	71	70
75%	77	75	75	75	75
90%	81	77	77	80	77
95%	81	77	77	80	77
Max	81	77	77	80	77

		BVCE0 (% Change from Initial)			
		Init	168	340	580
Min	-	-	-8	-6	-6
5%	-	-	-8	-6	-6
10%	-	-	-8	-6	-6
25%	-	-	-4	-5	-2
50%	-	-	-2	-2	-2
75%	-	-	0	-1	-1
90%	-	-	+3	+2	+3
95%	-	-	+3	+2	+3
Max	-	-	+3	+2	+3

		VCE(SAT) (IC-50ma, IB-5 ma) (Mv.)			
		Init	168	340	580
Min	111	0.91	0.94	0.94	0.94
5%	111	0.91	0.94	0.94	0.94
10%	114	0.91	0.94	0.94	0.94
25%	114	0.95	0.97	0.97	0.95
50%	119	1.03	1.00	1.02	1.06
75%	129	1.13	1.15	1.20	1.16
90%	137	1.15	1.15	1.34	1.16
95%	137	1.15	1.15	1.34	1.16
Max	137	1.15	1.15	1.24	1.16

		VCE(SAT) (% Change from Initial)			
		Init	168	340	580
Min	-	-2.3	-2.1	-2.0	-2.0
5%	-	-2.3	-2.0	-2.0	-2.0
10%	-	-2.3	-2.0	-2.0	-2.0
25%	-	-1.6	-1.7	-1.4	-1.7
50%	-	-1.3	-1.3	-1.2	-1.2
75%	-	-1.3	-1.1	-1.1	-1.0
90%	-	-1.1	-1.1	-1.1	-1.1
95%	-	-1.1	-1.1	-1.1	-1.1
Max	-	-1.1	-1.1	-1.1	-1.1

		VBE(SAT) (IC-50 ma, IB-5 ma) (Mv.)			
		Init	168	340	580
Min	798	780	785	784	778
5%	798	780	785	784	778
10%	798	780	785	784	778
25%	799	785	788	788	783
50%	800	791	790	790	787
75%	808	798	797	800	797
90%	812	801	800	807	800
95%	812	801	800	807	800
Max	812	801	800	807	800

		VBE(SAT) (% Change from Initial)			
		Init	168	340	580
Min	-	-	-2	-3	-3
5%	-	-	-2	-2	-2
10%	-	-	-2	-2	-2
25%	-	-	-2	-2	-2
50%	-	-	-1	-1	-1
75%	-	-	-1	-1	-1
90%	-	-	-1	-1	-1
95%	-	-	-1	-1	-1
Max	-	-	-1	-1	-1

		hFE (IC - 20 ma, VCE - 5V)			
		Init	168	340	580
Min	82	78	79	77	74
5%	82	78	79	77	74
10%	82	78	79	77	74
25%	82	78	79	77	74
50%	100	108	103	109	110
75%	106	117	112	115	116
90%	107	117	113	117	116
95%	107	117	113	117	116
Max	107	117	113	117	116

		hFE (% Change from Initial)			
		Init	168	340	580
Min	-	-17	-17	-18	-21
5%	-	-17	-17	-18	-21
10%	-	-17	-17	-18	-21
25%	-	+3	+4	+2	+3
50%	-	+4	+2	+6	+6
75%	-	+10	+7	+8	+9
90%	-	+42	+36	+43	+41
95%	-	+42	+36	+43	+41
Max	-	+42	+36	+43	+41

		BVCE0 (IC - 0.1 ma) (Volts)			
		Init	168	340	580
Min	64	63	63	63	63
5%	64	63	63	63	63
10%	64	63	63	63	63
25%	66	66	66	66	65
50%	73	71	71	71	70
75%	77	75	75	75	75
90%	81	77	77	80	77
95%	81	77	77	80	77
Max	81	77	77	80	77

		BVCE0 (% Change from Initial)			
		Init	168	340	580
Min	-	-	-8	-6	-6
5%	-	-	-8	-6	-6
10%	-	-	-8	-6	-6
25%	-	-	-4	-5	-2
50%	-	-	-2	-2	-2
75%	-	-	0	-1	-1
90%	-	-	+3	+2	+3
95%	-	-	+3	+2	+3
Max	-	-	+3	+2	+3

PROCESS: B FAB-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION:

700 mw, 30 V, 25°C.

CELL NO.: 419232 NO. OF UNITS: 15

		I _{CB} (V _{CB} - 60V)(Nanoamps)						
T _{PS}	Min	168	340	680	1000	1500	2000	3000
		0.4	0.9	0.5	0.5	0.1	0.1	0.1
5%		0.4	0.9	0.5	0.5 <td>0.1</td> <td>0.1</td> <td>0.1</td>	0.1	0.1	0.1
10%		0.5	1.1	0.6	0.6	0.2	0.2	0.2
25%		0.8	1.6	1.2	1.0	0.5	0.5	0.5
50%		1.3	2.1	1.7	1.5	1.3	1.3	1.3
75%		2.6	3.2	3.0	2.7	2.8	6.1	14.3
90%		3.2	3.6	3.4	3.4	3.4	∞	∞
95%		3.3	3.9	3.6	3.6	3.6	∞	∞
99%		3.3	3.9	3.6	3.6	3.6	∞	∞

I _{EB0} (V _{EB} - 5V) (Nanamps)							
	Init	168	340	680	1000	1500	2000
3000	0.1	0.4	0.1	0.1	0.2	0.1	0.1
	0.1	0.4	0.1	0.1	0.2	0.1	0.1
	0.1	0.5	0.1	0.1	0.3	0.1	0.1
	0.2	0.7	0.3	0.2	0.3	0.2	0.2
	0.5	1.1	0.8	0.7	0.8	0.7	0.7
	1.7	2.1	4.3	2.8	2.6	0.0	24.3
4458	25.3	22.9	41.6	41.6	0.0	0.0	0.0
	31.8	30.5	0.0	0.0	0.0	0.0	0.0
	31.8	30.5	0.0	0.0	0.0	0.0	0.0

BV _{CEO} (I _C = 0.1 ma)(Volts)							
	168	340	680	1000	1500	2000	3000
Init	62	62	62	62	61	61	61
5%	62	62	62	62	61	61	61
10%	64	63	63	63	61	63	63
25%	65	66	65	65	65	65	63
50%	68	72	72	72	71	73	71
75%	79	84	85	85	88	104	84
90%	88	95	95	96	00	231	00
95%	90	103	104	105	00	237	00
99%	90	103	104	105	00	237	00

		BV _{CEO} (% Change from Initial)					
T _{PS}	Init	168	340	680	1000	1500	2000
		-2	-3	-3	-3	-9	-9
5%		-2	-3	-3	-3	-9	-9
10%		-2	-3	-3	-3	-9	-9
25%		-2	-3	-2	-3	-3	-7
50%		-1	-1	-1	-1	-4	-3
75%		0	0	0	0	0	0
90%		+1	+3	+2	+3	+5	+6
95%		+22	+29	+33	+36	+36	+36
99%		+34	+35	+36	+36	+36	+36

		V _{CE} (SAT) (I _C - 50 ma, I _B - 5 ma)(Mv.)					
T _{PS}	Init	168	340	680	1000	1500	2000
		104	089	088	090	086	010
5%		104	089	088	090	086	010
10%		106	090	089	093	090	010
25%		114	099	100	101	100	099
50%		126	104	104	104	107	109
75%		132	109	113	113	117	120
90%		141	118	117	120	0.0	0.0
95%		145	118	120	122	0.0	0.0
99%		143	118	120	122	0.0	0.0

		V _{CE} (SAT) (% Change from Initial)					
T _{PS}	Init	168	340	680	1000	1500	2000
		-2.5	-2.2	-2.1	-2.4	-2.2	-1.9
5%		-2.5	-2.2	-2.1	-2.4	-2.2	-1.9
10%		-2.4	-2.1	-1.9	-2.2	-2.1	-1.8
25%		-1.9	-1.9	-1.7	-1.6	-1.7	-1.7
50%		-1.7	-1.7	-1.5	-1.4	-1.4	-1.5
75%		-1.4	-1.3	-1.1	-1.1	-1.2	-1.1
90%		-1.0	-1.1	-0.8	-0.7	-0.7	-0.7
95%		-0.9	-1.1	-0.7	-0.7	-0.7	-0.7
99%		-0.9	-1.1	-0.7	-0.7	-0.7	-0.7

		V _{BE} (SAT) (% Change from Initial)					
T _{PS}	Init	168	340	680	1000	1500	2000
		-4	-3	-3	-3	-3	-3
5%		-4	-3	-3	-3	-3	-3
10%		-3	-3	-3	-3	-3	-3
25%		-2	-3	-3	-3	-3	-3
50%		-2	-2	-2	-2	-2	-2
75%		-1	-2	-2	-2	-2	-2
90%		+3	+3	+3	+3	+3	+3
95%		+10	+10	+10	+10	+10	+10
99%		+10	+10	+10	+10	+10	+10

		V _{BE} (SAT) (I _C - 50 ma, I _B - 5 ma)(Mv.)					
T _{PS}	Init	168	340	680	1000	1500	2000
		721	787	786	786	785	785
5%		721	787	786	786	785	785
10%		767	787	786	786	786	786
25%		804	791	790	793	788	788
50%		808	795	794	795	792	792
75%		810	796	794	795	795	795
90%		816	798	795	799	0.0	0.0
95%		817	799	795	802	0.0	0.0
99%		817	799	795	802	0.0	0.0

		h _{FE} (I _C - 20 ma, V _{CE} - 5V)					
T _{PS}	Init	168	340	680	1000	1500	2000
		76	58	57	61	20	20
5%		76	58	57	61	20	20
10%		78	68	68	66	20	20
25%		86	80	78	67	23	20
50%		93	90	91	94	95	82
75%		100	98	99	101	99	101
90%		106	102	104	109	109	109
95%		110	104	106	112	114	114
99%		110	104	106	112	114	114

		h _{FE} (% Change from Initial)					
T _{PS}	Init	168	340	680	1000	1500	2000
		-4.2	-4.3	-3.9	-7.7	-7.8	-8.2
5%		-4.2	-4.3	-3.9	-7.7	-7.8	-8.2
10%		-2.5	-2.6	-2.8	-7.6	-7.7	-7.7
25%		-3	-3	-5	-7.4	-7.5	-7.5
50%		-2	0	0	+2	+2	+2
75%		+1	+4	+3	+4	+6	+5
90%		+7	+9	+14	+16	+14	+15
95%		+11	+13	+16	+18	+22	+22
99%		+11	+13	+16	+18	+22	+22

		BV _{CEO} (% Change from Initial)					
T _{PS}	Init	168	340	680	1000	1500	2000
		-2	-3	-3	-3	-9	-9
5%		-2	-3	-3	-3	-9	-9
10%		-2	-3	-3	-3	-9	-9
25%		-2	-3	-2	-3	-3	-7
50%		-1	-1	-1	-1	-4	-3
75%		0	0	0	0	0	0
90%		+1	+3	+2	+3	+5	+6
95%		+22	+29	+33	+36	+36	+36
99%		+34	+35	+36	+36	+36	+36

		BV _{CEO} (I _C - 0.1 ma)(Volts)					
T _{PS}	Init	168	340	680	1000	1500	2000
		62	62	62	62	61	61
5%		62	62	62	62	61	61
10%		64	63	63	63	61	61
25%		65	66	65	65	65	63
50%		68	72	72	72	71	71
75%		79	84	85	85	88	84
90%		88	95	95	96	0.0	0.0
95%		90	103	104	105	0.0	0.0
99%		90	103	104	105	0.0	0.0

PROCESS: B FAE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419233 NO. OF UNITS: 40

HRS.	ICEO (V _{CB} - 60V)(Nanoamps)				
	Init	168	340	580	1000
Min	0.6	0.8	1.2	0.4	0.1
5%	0.5	0.9	1.5	0.5	0.3
10%	0.7	1.2	1.6	0.7	0.5
25%	1.0	1.6	1.8	1.3	0.9
50%	1.8	2.6	2.9	2.3	1.7
75%	3.7	4.3	4.2	3.9	3.0
90%	4.3	5.8	5.2	4.5	3.7
95%	4.8	12.8	9.5	12.7	52.6
Max	4.9	∞	∞	∞	∞

HRS.	IEBO (V _{EB} - 5V)(Nanoamps)				
	Init	168	340	580	1000
Min	<0.1	0.6	0.3	0.1	0.1
5%	<0.1	0.6	0.3	0.1	0.1
10%	<0.1	0.7	0.5	0.2	0.1
25%	0.1	0.9	0.6	0.4	0.1
50%	0.4	1.2	0.8	0.6	0.3
75%	0.8	1.7	1.4	1.3	1.0
90%	4.8	7.0	8.8	9.7	7.6
95%	9.1	12.3	12.7	14.1	11.6
Max	12.4	∞	∞	∞	∞

HRS.	BVCEO (I _C - 0.1 ma.)(Volts)				
	Init	168	340	580	1000
Min	60	0.5	0.6	0.8	1.4
5%	61	1.0	0.6	1.0	1.0
10%	63	1.2	0.7	1.2	1.2
25%	66	1.6	1.0	1.6	1.6
50%	73	2.2	1.2	2.2	2.2
75%	79	8.1	8.1	8.0	8.0
90%	86	8.8	8.8	8.8	8.8
95%	89	9.2	9.3	9.3	9.3
Max	89	12.3	12.5	12.2	12.3

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-93	-91	-87	-93
5%	-	-1	-1	-2	-2
10%	-	-1	-1	-1	-1
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	+4	+4	+4	+4
95%	-	+5	+5	+5	+5
Max	-	+40	+42	+39	+40

HRS.	VCE(SAT)(I _C 50ma, I _B 5 ma)(Mv.)				
	Init	168	340	580	1000
Min	104	0.94	0.83	0.83	0.83
5%	106	0.92	0.93	0.93	0.93
10%	116	0.95	0.97	0.96	0.97
25%	119	1.01	1.01	1.01	1.01
50%	126	1.08	1.08	1.08	1.08
75%	132	1.17	1.18	1.18	1.18
90%	151	1.28	1.27	1.27	1.27
95%	168	1.32	1.33	1.32	1.32
Max	160	1.43	1.39	1.39	1.39

HRS.	VCE(SAT)(% Change from Initial)				
	Init	168	340	580	1000
Min	-	-21	-21	-21	-21
5%	-	-21	-19	-20	-20
10%	-	-19	-18	-18	-18
25%	-	-17	-17	-16	-16
50%	-	-15	-15	-15	-15
75%	-	-11	-13	-11	-13
90%	-	-10	-9	-5	-7
95%	-	-8	-5	+10	+17
Max	-	-9	+11	+13	+14

HRS.	VBE(SAT)(I _C 50 ma, I _B 5 ma)(Mv.)				
	Init	168	340	580	1000
Min	714	280	281	310	283
5%	793	281	283	310	283
10%	799	283	285	310	283
25%	802	286	289	310	283
50%	805	291	294	310	283
75%	814	295	299	310	283
90%	824	302	305	310	283
95%	830	315	315	315	283
Max	844	311	315	315	283

HRS.	VBE(SAT)(% Change from Initial)				
	Init	168	340	580	1000
Min	-	-6	-6	-6	-6
5%	-	-4	-3	-6	-3
10%	-	-3	-2	-3	-3
25%	-	-2	-2	-2	-2
50%	-	-2	-2	-2	-2
75%	-	-2	-1	-2	-2
90%	-	-1	-1	-1	-1
95%	-	-1	0	+1	+2
Max	-	+11	+11	+11	+12

HRS.	hFE (I _C - 20 ma, VCE - 5V)				
	Init	168	340	580	1000
Min	69	20	61	62	23
5%	69	60	68	68	35
10%	75	74	73	73	20
25%	85	84	83	85	26
50%	90	93	91	91	93
75%	97	99	97	97	95
90%	99	103	100	100	101
95%	102	117	108	102	108
Max	103	110	109	108	107

HRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-22	-37	-36	-80
5%	-	-36	-8	-8	-72
10%	-	-6	-6	-5	-2
25%	-	-1	-3	-3	-1
50%	-	+2	-1	0	+4
75%	-	+6	+4	+3	+4
90%	-	+8	+7	+9	+6
95%	-	+12	+9	+11	+12
Max	-	+16	+15	+11	+14

HRS.	BVCE (I _C - 20 ma, VCE - 5V)				
	Init	168	340	580	1000
Min	69	20	61	62	23
5%	69	60	68	68	35
10%	75	74	73	73	20
25%	85	84	83	85	26
50%	90	93	91	91	93
75%	97	99	97	97	95
90%	99	103	100	100	101
95%	102	117	108	102	108
Max	103	110	109	108	107

HRS.	BVCE (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-93	-91	-87	-93
5%	-	-1	-1	-2	-2
10%	-	-1	-1	-1	-1
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	+4	+4	+4	+4
95%	-	+5	+5	+5	+5
Max	-	+40	+42	+39	+40

PROCESS: 5 PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419234 NO. OF UNITS: 7

		IC ₅₀ (V _{CE} - 60V)(Nanoamps)				IC ₅₀ (V _{BE} - 5V)(Nanoamps)				BV _{CEO} (I _C - 0.1 ma)(Volts)				BV _{CEO} (% Change from Initial)			
MRS.	Init	168	340	580	1000	1500	2000	3000	4000	168	340	580	1000	1500	2000	3000	4000
		0.5	1.0	0.3	0.7	0.3	0.4	0.3	0.3	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.1
5%	0.5	1.0	0.3	0.3	0.7	0.3	0.4	0.3	0.3	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.1
10%	0.5	1.0	0.3	0.3	0.7	0.3	0.4	0.3	0.3	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.1
25%	0.8	1.3	0.9	0.7	0.7	0.7	0.8	0.4	0.4	0.1	0.7	0.1	0.3	0.5	0.4	0.2	0.1
50%	1.5	1.9	1.6	1.3	1.2	1.2	1.3	1.3	1.3	0.4	1.0	0.4	0.5	0.0	0.4	0.2	0.5
75%	4.4	4.6	4.0	3.8	3.2	3.5	3.6	3.9	4.2	0.6	1.2	0.7	1.5	0.0	0.8	0.7	1.1
90%	4.8	4.7	4.5	4.0	3.5	3.6	3.7	4.2	4.2	1.5	1.8	1.7	1.5	0.0	0.9	1.2	1.3
95%	4.8	4.7	4.5	4.0	3.5	3.6	3.7	4.2	4.2	1.5	1.8	1.7	1.5	0.0	0.9	1.2	1.3
Max	4.8	4.7	4.5	4.0	3.5	3.6	3.7	4.2	4.2	1.5	1.8	1.7	1.5	0.0	0.9	1.2	1.3

		VCE(SAT)(IC-50ma, IB-5 ma)(mV.)							VCE(SAT)(% Change from Initial)							VBE(SAT)(IC-50 ma, IB-5 ma)(mV.)							VBE(SAT)(% Change from Initial)						
MRS.	Init	168	340	580	1000	1500	2000	3000	Init	168	340	580	1000	1500	2000	3000	Init	168	340	580	1000	1500	2000	3000					
		108	088	061	001	092	092	092	088	795	781	785	785	786	783	779	780	—	—2	—2	—2	—2	—2	—2	—3				
5%	108	088	061	001	092	092	092	090	088	795	781	785	785	786	783	779	780	—	—2	—2	—2	—2	—2	—2	—3				
10%	108	088	061	001	092	092	092	090	088	795	781	785	785	786	783	779	780	—	—2	—2	—2	—2	—2	—2	—3				
25%	113	099	092	095	098	095	093	090	090	800	783	786	785	786	783	787	782	—	—2	—2	—2	—2	—2	—2	—2				
50%	120	100	099	099	102	103	100	102	102	801	787	790	794	793	794	794	792	—	—2	—2	—1	—1	—1	—1					
75%	125	112	110	110	110	110	109	110	110	804	795	793	795	796	796	796	794	—	—2	—1	—1	—1	—1	—1					
90%	128	114	113	113	111	111	110	110	110	811	795	792	797	798	797	796	796	—	—1	—1	—1	—1	—1	—1					
95%	128	114	113	113	111	111	110	110	110	811	795	797	797	798	797	796	796	—	—1	—1	—1	—1	—1	—1					
Max	128	114	113	113	111	111	110	110	110	811	795	797	797	798	797	796	796	—	—1	—1	—1	—1	—1	—1					

hFE (Ic - 20 ma, VCE - 5V)														hFE (% Change from Initial)													
MRS.	Init	168	340	580	1000	1500	2000	3000	Init	168	340	580	1000	1500	2000	3000											
		83	82	76	77	79	81	81		85	-	-3	-10	-9	-7	-3	-4	0									
5%	83	82	76	77	79	81	81	85	-	-3	-10	-9	-7	-3	-4	0											
10%	83	82	76	77	79	81	81	85	-	-3	-10	-9	-7	-3	-4	0											
25%	84	82	76	77	79	81	81	85	-	-2	-5	-8	-6	-3	-3	+1											
50%	94	94	93	87	87	92	91	94	-	-1	-2	-7	-2	-2	+1	+7											
75%	99	98	97	94	100	105	102	114	-	0	-1	-3	+1	+5	+6	+13											
90%	103	101	98	100	105	105	113	128	-	0	-1	-3	+1	+11	+20	+36											
95%	103	101	98	100	105	105	113	128	-	0	-1	-3	+2	+11	+20	+36											
Max	103	101	98	100	105	105	113	128	-	0	-1	-3	+2	+11	+20	+36											

hFE (Ic - 20 ma, VCE - 5V)														hFE (% Change from Initial)													
MRS.	Init	168	340	580	1000	1500	2000	3000	Init	168	340	580	1000	1500	2000	3000											
		83	82	76	77	79	81	81		85	-	-3	-10	-9	-7	-3	-4	0									
5%	83	82	76	77	79	81	81	85	-	-3	-10	-9	-7	-3	-4	0											
10%	83	82	76	77	79	81	81	85	-	-3	-10	-9	-7	-3	-4	0											
25%	84	82	76	77	79	81	81	85	-	-2	-5	-8	-6	-3	-3	+1											
50%	94	94	93	87	87	92	91	94	-	-1	-2	-7	-2	-2	+1	+7											
75%	99	98	97	94	100	105	102	114	-	0	-1	-3	+1	+5	+6	+13											
90%	103	101	98	100	105	105	113	128	-	0	-1	-3	+1	+11	+20	+36											
95%	103	101	98	100	105	105	113	128	-	0	-1	-3	+2	+11	+20	+36											
Max	103	101	98	100	105	105	113	128	-	0	-1	-3	+2	+11	+20	+36											

PROCESS: B PAB-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITIONS:

200 mw, 30 V, 150°C.

CELL NO.: 419235 NO. OF UNITS: 15

MRS.	ICBO (V _{CS} - 60V) (Microamps)				
	Init	168	340	580	1000
Min	0.6	1.4	1.0	0.8	0.7
50	0.6	1.4	1.0	0.8	0.7
100	0.7	1.4	1.0	0.9	0.8
250	1.3	1.7	1.3	1.2	1.0
500	2.0	2.5	2.3	2.3	1.7
750	3.8	3.8	3.8	3.0	3.3
900	4.5	14.9	12.5	6.4	12.5
950	4.9	30.1	28.2	15.6	14.1
Max	4.9	30.1	28.2	15.6	14.1

MRS.	IEBO (V _{EB} - 5V) (Microamps)				
	Init	168	340	580	1000
Min	0.1	0.8	0.2	0.3	0.1
50	0.1	0.8	0.2	0.3	0.1
100	0.1	0.8	0.2	0.3	0.1
250	0.2	0.8	0.3	0.4	0.1
500	0.3	1.0	0.5	0.5	0.1
750	0.7	1.5	1.1	1.3	0.9
900	9.1	7.0	6.4	5.3	4.3
950	12.2	7.8	7.9	7.4	6.1
Max	12.2	7.8	7.9	7.4	6.1

MRS.	BVCFD (IC - 0.1 ma) (Volts)				
	Init	168	340	580	1000
Min	61	61	61	61	61
50	61	61	61	61	61
100	63	63	63	63	63
250	68	68	68	68	68
500	73	74	74	74	73
750	80	81	82	82	83
900	86	86	86	86	86
950	89	89	89	89	89
Max	89	89	89	89	89

MRS.	BVCFD (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-3	-4	-5	-8
50	-	-3	-4	-5	-8
100	-	-1	-2	-3	-6
250	-	0	0	0	-1
500	-	0	0	0	0
750	-	0	0	0	0
900	-	0	0	0	0
950	-	0	0	0	0
Max	-	0	0	0	0

MRS.	VCE(SAT) (IC - 20 ma, I _B - 5 ma) (mv.)				
	Init	168	340	580	1000
Min	102	088	087	087	086
50	102	088	087	087	086
100	104	089	089	089	088
250	109	096	092	094	093
500	123	102	105	116	102
750	126	109	108	108	107
900	137	121	119	122	119
950	154	134	133	133	133
Max	154	134	133	133	133

MRS.	VCE(SAT) (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-22	-20	-19	-19
50	-	-22	-20	-19	-19
100	-	-19	-18	-18	-18
250	-	-15	-17	-15	-15
500	-	-14	-14	-13	-14
750	-	-13	-13	-11	-13
900	-	-11	-11	-8	-11
950	-	-10	-10	-7	-10
Max	-	-10	-10	-7	-10

MRS.	VBE(SAT) (IC - 50 ma, I _B - 5 ma) (mv.)				
	Init	168	340	580	1000
Min	793	591	780	780	785
50	793	591	780	780	785
100	794	591	780	780	785
250	795	591	780	780	785
500	800	591	780	780	785
750	803	591	780	780	785
900	816	591	780	780	785
950	823	591	780	780	785
Max	823	591	780	780	785

MRS.	VBE(SAT) (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-24	-3	-3	-3
50	-	-24	-3	-3	-3
100	-	-11	-2	-2	-2
250	-	-2	-2	-2	-2
500	-	-2	-2	-2	-2
750	-	-2	-2	-2	-2
900	-	-2	-2	-2	-2
950	-	-2	-2	-2	-2
Max	-	-2	-2	-2	-2

MRS.	hFE (IC - 20 ma, V _{CE} - 5V)				
	Init	168	340	580	1000
Min	69	72	76	77	76
50	69	72	76	77	76
100	78	79	83	82	82
250	81	91	90	93	91
500	92	93	94	96	95
750	96	96	97	99	96
900	98	102	98	101	101
950	101	103	98	102	101
Max	101	103	98	102	101

MRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-3	-10	-2	-5
50	-	-3	-10	-2	-5
100	-	-2	-6	-1	-4
250	-	0	-3	+1	-1
500	-	+1	+3	+5	+3
750	-	+4	+7	+7	+6
900	-	+7	+8	+11	+10
950	-	+8	+9	+12	+10
Max	-	+8	+9	+12	+10

MRS.	BVCFD (IC - 0.1 ma, V _{CE} - 5V)				
	Init	168	340	580	1000
Min	61	61	61	61	61
50	61	61	61	61	61
100	63	63	63	63	63
250	68	68	68	68	68
500	73	74	74	74	73
750	80	81	82	82	83
900	86	86	86	86	86
950	89	89	89	89	89
Max	89	89	89	89	89

MRS.	BVCFD (% Change from Initial)				
	Init	168	340	580	1000
Min	-	-3	-4	-5	-8
50	-	-3	-4	-5	-8
100	-	-1	-2	-3	-6
250	-	0	0	0	-1
500	-	0	0	0	0
750	-	0	0	0	0
900	-	0	0	0	0
950	-	0	0	0	0
Max	-	0	0	0	0

PROCESS: 8 PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C.

CELL NO.: 419236 NO. OF UNITS: 7

HRS.	IC _{BO} (V _{CB} - 60V)(Nanoamps)				
	Init	168	340	680	1000
Min	0.7	1.0	1.8	4.1	0.1
5%	0.7	1.0	1.8	4.1	0.1
10%	0.7	1.0	1.8	4.1	0.1
25%	0.9	1.4	2.7	8.4	0.7
50%	2.6	3.3	3.5	2.4	1.9
75%	3.9	3.7	3.9	2.9	3.1
90%	4.0	3.8	4.1	3.0	3.5
95%	4.0	3.8	4.1	3.0	3.5
Max	4.0	3.8	4.1	3.0	3.5

HRS.	IC _{BO} (V _{CB} - 5V)(Nanoamps)				
	Init	168	340	680	1000
Min	0.1	0.3	0.5	0.1	0.1
5%	0.1	0.3	0.5	0.1	0.1
10%	0.1	0.3	0.5	0.1	0.1
25%	0.1	0.3	0.5	0.1	0.1
50%	0.1	0.5	0.8	0.1	0.2
75%	0.5	1.8	1.0	0.5	0.4
90%	2.0	2.2	2.5	2.1	2.2
95%	5.0	6.4	7.9	5.3	6.6
Max	5.0	6.4	7.9	5.3	6.6

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	68	66	66	66	66
5%	68	66	66	66	66
10%	68	66	66	66	66
25%	70	69	69	69	69
50%	72	73	73	73	73
75%	77	76	76	76	76
90%	88	92	92	92	92
95%	88	92	92	92	92
Max	88	92	92	92	92

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-3	-4	-4	-4
5%	-	-3	-4	-4	-4
10%	-	-3	-4	-4	-4
25%	-	-2	-1	-1	-2
50%	-	-1	0	-1	-1
75%	-	0	+4	+8	+10
90%	-	+4	+4	+4	+4
95%	-	+4	+4	+4	+4
Max	-	+4	+4	+4	+4

HRS.	V _{CE} (SAT)(I _C -50ma, I _B -5 ma)(Mv.)				
	Init	168	340	680	1000
Min	120	103	103	103	103
5%	120	103	103	103	103
10%	120	103	103	103	103
25%	123	105	109	110	110
50%	124	109	113	112	111
75%	134	114	117	119	120
90%	135	118	120	120	120
95%	135	118	120	120	120
Max	135	118	120	120	120

HRS.	V _{CE} (SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-21	-19	-19	-16
5%	-	-21	-19	-19	-16
10%	-	-21	-19	-19	-16
25%	-	-15	-14	-13	-14
50%	-	-12	-11	-11	-10
75%	-	-11	-9	-10	-7
90%	-	-11	-9	-10	-7
95%	-	-11	-9	-10	-7
Max	-	-11	-9	-10	-7

HRS.	V _{BE} (SAT)(I _C -50 ma, I _B -5 ma)(Mv.)				
	Init	168	340	680	1000
Min	797	754	756	799	784
5%	797	754	756	799	784
10%	797	754	756	799	784
25%	800	780	780	780	780
50%	802	791	796	796	796
75%	806	799	803	803	803
90%	821	814	814	814	814
95%	821	814	814	814	814
Max	821	814	814	814	814

HRS.	V _{BE} (SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-2	-2	-2	-3
5%	-	-2	-2	-2	-3
10%	-	-2	-2	-2	-3
25%	-	-2	-2	-2	-3
50%	-	-2	-2	-2	-3
75%	-	-2	-2	-2	-3
90%	-	-2	-2	-2	-3
95%	-	-2	-2	-2	-3
Max	-	-2	-2	-2	-3

HRS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)				
	Init	168	340	680	1000
Min	69	71	20	20	20
5%	69	71	20	20	20
10%	69	71	20	20	20
25%	76	81	20	20	20
50%	85	87	20	20	20
75%	95	101	102	106	107
90%	100	104	106	107	108
95%	100	104	106	107	108
Max	100	104	106	107	108

HRS.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-4	-4	-4	-4
5%	-	-4	-4	-4	-4
10%	-	-4	-4	-4	-4
25%	-	+3	+3	+3	+3
50%	-	+4	+4	+4	+4
75%	-	+6	+7	+7	+7
90%	-	+12	+17	+17	+17
95%	-	+12	+17	+17	+17
Max	-	+12	+17	+17	+17

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	68	66	66	66	66
5%	68	66	66	66	66
10%	68	66	66	66	66
25%	70	69	69	69	69
50%	72	73	73	73	73
75%	77	76	76	76	76
90%	88	92	92	92	92
95%	88	92	92	92	92
Max	88	92	92	92	92

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-3	-4	-4	-4
5%	-	-3	-4	-4	-4
10%	-	-3	-4	-4	-4
25%	-	-2	-1	-1	-2
50%	-	-1	0	-1	-1
75%	-	0	+4	+8	+10
90%	-	+4	+4	+4	+4
95%	-	+4	+4	+4	+4
Max	-	+4	+4	+4	+4

PROCESS: 8 PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 700 mw, 30 V, 25°C.

CELL NO.: 419237 NO. OF UNITS: 14

		ICEO (V _{CB} - 60V) (Nanoamps)				IEBO (V _{EB} - 5V) (Nanoamps)				BV _{CEO} (I _C - 0.1 ma) (Volts)				BV _{CFO} (% Change from Initial)			
HRS.	Min	168	340	680	1000	168	340	680	1000	168	340	680	1000	Init	168	340	680
5%	0.4	1.4	0.8	0.3	1.0	0.3	0.3	0.3	1.0	6.4	6.3	6.3	6.2	-	-2	-2	-3
10%	0.4	1.4	0.8	0.3	1.0	0.3	0.3	0.3	1.0	6.4	6.3	6.3	6.2	-	-2	-2	-3
25%	0.5	1.4	0.8	0.3	1.0	0.3	0.3	0.3	1.0	6.6	6.5	6.5	6.4	-	-2	-2	-3
50%	1.4	2.1	1.6	1.4	1.3	0.6	0.7	0.7	0.7	6.8	6.7	6.8	6.7	-	-1	-2	-1
75%	3.0	4.1	3.4	3.0	3.7	2.1	2.1	2.1	1.9	7.3	7.3	7.3	7.2	-	0	0	-1
90%	4.9	4.5	4.7	4.3	3.8	4.2	4.2	4.2	4.3	8.0	8.2	8.3	8.5	-	+1	+2	+1
95%	5.4	9.1	5.9	4.8	6.8	5.2	5.2	5.2	5.2	8.6	9.0	9.0	9.1	-	+9	+9	+10
Max	5.4	9.1	5.9	4.8	6.8	5.2	5.2	5.2	5.2	8.6	9.3	9.0	9.1	-	+9	+11	+13

		VCE (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)				VCE (SAT) (% Change from Initial)				VBE (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)				VBE (SAT) (% Change from Initial)			
HRS.	Min	168	340	680	1000	168	340	680	1000	168	340	680	1000	Init	168	340	680
5%	110	094	096	096	098	-2	-1	-1	-1	788	775	775	777	-	-2	-3	-3
10%	110	094	096	096	098	-2	-1	-1	-1	788	775	775	777	-	-2	-3	-3
25%	112	095	096	098	098	-2	-1	-1	-1	788	775	775	777	-	-2	-3	-3
50%	118	097	099	100	100	-17	-17	-15	-14	795	785	785	787	-	-2	-2	-2
75%	128	110	108	111	110	-14	-14	-13	-13	805	789	789	791	-	-2	-2	-2
90%	131	116	115	116	115	-12	-12	-12	-11	815	803	803	802	-	-1	-1	-1
95%	153	134	133	134	134	-11	-11	-9	-9	826	812	812	813	-	-1	-1	-1
Max	168	148	148	147	149	-10	-9	-8	-8	830	817	817	816	-	-1	-1	-1

		hFE (I _C - 20 ma, V _{CE} - 5V)				hFE (% Change from Initial)				hFE (% Change from Initial)			
HRS.	Min	168	340	680	1000	168	340	680	1000	168	340	680	1000
5%	64	65	63	64	66	-6	-15	-8	-8	-	-	-	-
10%	64	65	63	64	66	-6	-15	-8	-8	-	-	-	-
25%	65	68	68	69	70	-4	-11	-7	-6	-	-	-	-
50%	77	72	76	76	77	0	+0	-1	0	-	-	-	-
75%	89	88	89	86	87	+3	+4	+4	+3	-	-	-	-
90%	94	101	102	103	108	+8	+11	+8	+9	-	-	-	-
95%	101	110	112	112	114	+14	+17	+17	+16	-	-	-	-
Max	105	111	114	115	115	+14	+18	+19	+16	-	-	-	-

PROCESS: 8 PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419230 NO. OF UNITS: 37

HRS.	ICEO (VCB - 60V) (Nanamps)					
	Init	168	340	580	1000	1500
Min	0.2	0.4	1.3	0.2	0.3	0.1
5%	0.4	0.4	1.4	0.6	0.5	0.4
10%	0.7	0.5	1.6	0.8	0.7	0.5
25%	1.0	1.2	1.8	1.0	1.0	0.8
50%	1.5	1.8	2.3	1.6	1.5	1.3
75%	3.1	4.0	3.9	3.6	3.3	3.4
90%	4.4	6.1	6.5	5.0	4.7	4.3
95%	5.0	11.0	11.5	10.3	10.3	10.3
Max	5.6	11.0	11.5	10.3	10.3	10.3

HRS.	IEBO (VEB - 5V) (Nanamps)					
	Init	168	340	580	1000	1500
Min	0.1	0.3	0.2	0.1	0.1	0.1
5%	0.1	0.4	0.3	0.1	0.1	0.1
10%	0.1	0.5	0.3	0.2	0.1	0.1
25%	0.1	0.8	0.6	0.3	0.1	0.1
50%	0.4	1.0	0.8	0.6	0.4	0.3
75%	1.5	2.1	1.8	1.5	1.5	1.6
90%	3.5	4.2	3.5	3.2	3.0	3.3
95%	4.0	4.4	4.5	3.6	3.5	3.5
Max	4.1	4.7	4.5	4.2	4.7	3.9

HRS.	BVCEO (IC - 0.1 ma) (Volts)					
	Init	168	340	580	1000	1500
Min	61	58	58	57	57	57
5%	61	61	61	60	61	61
10%	64	62	62	62	61	62
25%	68	67	67	66	67	67
50%	72	72	72	71	72	72
75%	80	79	80	80	80	80
90%	85	85	85	85	85	85
95%	89	89	89	89	89	89
Max	90	90	90	90	90	90

HRS.	BVCEO (% Change from Initial)					
	Init	168	340	580	1000	1500
Min	-	-24	-23	-24	-25	-24
5%	-	-20	-10	-14	-5	-9
10%	-	-2	-1	-1	-1	-3
25%	-	0	0	0	0	-1
50%	-	0	0	0	0	0
75%	-	+2	+1	+1	+1	+1
90%	-	+15	+2	+2	+2	+2
95%	-	+29	+4	+3	+3	+2
Max	-	-	-	-	-	-

HRS.	VCE(SAT) (IC - 50 ma, IB - 5 ma) (mv.)					
	Init	168	340	580	1000	1500
Min	0.99	0.83	0.73	0.79	0.80	0.77
5%	1.01	0.89	0.85	0.87	0.85	0.83
10%	1.20	0.94	0.93	0.92	0.92	0.90
25%	1.21	1.05	1.05	1.03	1.04	1.03
50%	1.29	1.11	1.13	1.13	1.13	1.10
75%	1.36	1.20	1.18	1.20	1.19	1.18
90%	1.41	1.20	1.28	1.27	1.26	1.29
95%	1.49	1.43	1.46	1.31	1.32	1.34
Max	1.61	1.72	1.72	1.40	1.36	1.36

HRS.	VCE(SAT) (% Change from Initial)					
	Init	168	340	580	1000	1500
Min	-	-21	-26	-21	-19	-21
5%	-	-21	-19	-20	-19	-20
10%	-	-18	-18	-18	-18	-20
25%	-	-15	-15	-15	-15	-17
50%	-	-13	-14	-13	-13	-14
75%	-	-10	-12	-12	-11	-13
90%	-	-5	-10	-10	-9	-10
95%	-	+12	+20	-7	-8	+20
Max	-	+24	+24	-6	-7	+24

HRS.	VBE(SAT) (IC - 50 ma, IB - 5 ma) (mv.)					
	Init	168	340	580	1000	1500
Min	7.94	7.12	7.80	7.80	7.79	7.77
5%	7.95	7.17	7.84	7.80	7.79	7.77
10%	7.97	7.32	7.85	7.83	7.82	7.80
25%	8.03	7.84	7.88	7.85	7.83	7.83
50%	8.07	7.91	7.94	7.92	7.94	7.92
75%	8.11	7.96	7.97	7.96	7.97	7.93
90%	8.16	8.00	8.03	8.00	8.00	7.98
95%	8.22	8.04	8.04	8.06	8.05	8.05
Max	8.51	8.68	8.68	8.30	8.25	8.25

HRS.	VBE(SAT) (% Change from Initial)					
	Init	168	340	580	1000	1500
Min	-	-14	-2	-3	-3	-3
5%	-	-11	-2	-3	-2	-3
10%	-	-10	-2	-2	-2	-3
25%	-	-2	-2	-2	-2	-3
50%	-	-2	-2	-2	-2	-3
75%	-	-2	-1	-2	-2	-3
90%	-	-1	-1	-1	-1	-1
95%	-	0	+14	-1	-1	-1
Max	-	+1	+14	-1	-1	-1

HRS.	hFE (IC - 20 ma, VCE - 5V)					
	Init	168	340	580	1000	1500
Min	61	61	20	25	25	20
5%	64	64	56	56	56	57
10%	76	75	72	71	71	71
25%	83	84	81	83	82	83
50%	89	93	88	93	90	93
75%	100	102	98	102	101	102
90%	101	106	101	107	105	106
95%	103	110	109	110	107	110
Max	105	113	110	114	111	114

HRS.	hFE (% Change from Initial)					
	Init	168	340	580	1000	1500
Min	-	-7	-29	-25	-25	-29
5%	-	-6	-15	-12	-12	-12
10%	-	-4	-6	-3	-4	-4
25%	-	-1	-3	-1	-2	-1
50%	-	+2	-1	+3	0	+3
75%	-	+4	0	+5	+4	+6
90%	-	+7	+4	+7	+6	+8
95%	-	+10	+6	+10	+9	+11
Max	-	+12	+8	+12	+10	+15

HRS.	BVCE(SAT) (% Change from Initial)					
	Init	168	340	580	1000	1500
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	-	-	-	-	-
75%	-	-	-	-	-	-
90%	-	-	-	-	-	-
95%	-	-	-	-	-	-
Max	-	-	-	-	-	-

PROCESS: B FAB-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 400 mW, 30 V, 150°C.

CELL NO.: 419239 NO. OF UNITS: 7

		I _{CEO} (V _{CE} = 60V) (Nanamps)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	0.2	0.9	0.3	0.4	0.2	0.3
5	0.2	0.9	0.3	0.4	0.2	0.3
10	0.2	0.9	0.3	0.4	0.2	0.3
25	0.6	1.3	0.7	0.7	0.6	0.6
50	1.1	2.0	1.4	1.3	1.2	1.2
75	3.7	4.2	3.6	3.4	3.1	3.0
90	4.3	5.0	4.4	4.3	3.6	3.4
95	4.3	5.0	4.2	4.3	3.6	3.4
97	4.3	5.0	4.2	4.3	3.6	3.4

		I _{CEO} (V _{BE} = 5V) (Nanamps)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	0.1	0.5	0.1	0.1	0.1	0.1
5	0.1	0.5	0.1	0.1	0.1	0.1
10	0.1	0.5	0.1	0.1	0.1	0.1
25	0.1	0.7	0.1	0.1	0.1	0.1
50	0.1	0.9	0.2	0.3	0.3	0.3
75	0.3	1.1	0.9	0.7	0.5	0.5
90	1.5	2.6	2.3	1.7	0.9	1.3
95	1.5	2.6	2.3	1.7	0.9	1.3
97	1.5	2.6	2.3	1.7	0.9	1.3

		BV _{CEO} (I _C = 0.1 mA) (Volts)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	62	61	61	61	61	61
5	62	61	61	61	61	61
10	62	61	61	61	61	61
25	63	63	63	63	63	63
50	74	77	73	72	72	72
75	81	80	80	86	85	83
90	86	86	86	86	86	86
95	86	86	86	86	86	86
97	86	86	86	86	86	86

		BV _{CEO} (% Change from Initial)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	-	-	-	-	-	-
5	-	-	-	-	-	-
10	-	-	-	-	-	-
25	-	-	-	-	-	-
50	-	-	-	-	-	-
75	-	-	-	-	-	-
90	-	-	-	-	-	-
95	-	-	-	-	-	-
97	-	-	-	-	-	-

		V _{CE} (SAT) (I _C = 50 mA, I _B = 5 mA) (mV.)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	111	093	093	094	093	093
5	111	093	093	094	093	093
10	111	093	093	094	093	093
25	114	098	099	095	097	097
50	118	102	100	102	106	105
75	122	112	107	111	112	113
90	131	149	115	115	115	115
95	131	149	115	115	115	115
97	131	149	115	115	115	115

		V _{CE} (SAT) (% Change from Initial)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	-	-16	-16	-17	-16	-16
5	-	-16	-16	-17	-16	-16
10	-	-16	-16	-17	-16	-16
25	-	-15	-15	-16	-16	-16
50	-	-15	-13	-15	-15	-14
75	-	-12	-12	-12	-9	-11
90	-	-64	-12	867	867	867
95	-	-64	-12	867	867	867
97	-	-64	-12	867	867	867

		V _{BE} (SAT) (I _C = 50 mA, I _B = 5 mA) (mV.)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	800	779	785	784	786	786
5	800	779	785	784	786	786
10	800	779	785	784	786	786
25	801	782	786	786	789	787
50	802	791	799	795	797	798
75	809	797	795	813	802	803
90	813	115	799	800	800	797
95	813	115	799	800	800	797
97	813	115	799	800	800	797

		V _{BE} (SAT) (% Change from Initial)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	-	-3	-3	-2	-2	-3
5	-	-3	-3	-2	-2	-3
10	-	-3	-3	-2	-2	-3
25	-	-2	-2	-2	-2	-2
50	-	-2	-2	-1	-1	-2
75	-	-1	-1	-1	-1	-2
90	-	-44	-1	1148	1148	1148
95	-	-44	-1	1148	1148	1148
97	-	-44	-1	1148	1148	1148

		h _{FE} (I _C = 20 mA, V _{CE} = 5V)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	61	60	61	19	20	20
5	61	60	61	19	20	20
10	61	60	61	19	20	20
25	92	90	99	59	60	62
50	103	96	101	98	102	104
75	105	100	104	102	104	104
90	111	103	110	105	108	108
95	111	103	110	105	108	108
97	111	103	110	105	108	108

		h _{FE} (% Change from Initial)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	-	-8	-3	-82	-81	-81
5	-	-8	-3	-82	-81	-81
10	-	-8	-3	-82	-81	-81
25	-	-7	-3	-7	-4	-3
50	-	-3	-1	-4	-3	0
75	-	-2	0	-1	-1	-1
90	-	-2	+1	0	+3	+1
95	-	-2	+1	0	+3	+1
97	-	-2	+1	0	+3	+1

		h _{FE} (% Change from Initial)				
SPS.	Init	168	340	580	1000	1500
		3000	3000	3000	3000	3000
1	-	-	-	-	-	-
5	-	-	-	-	-	-
10	-	-	-	-	-	-
25	-	-	-	-	-	-
50	-	-	-	-	-	-
75	-	-	-	-	-	-
90	-	-	-	-	-	-
95	-	-	-	-	-	-
97	-	-	-	-	-	-

PROCESS: B PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C.

CELL NO.: 419240 NO. OF UNITS: 14.

SRS.	IC50 (VCE - 60V) (micrometers)				
	Init	168	340	580	1000L50020003000
Min	0.3	0.9	0.5	0.6	0.4
5%	0.3	0.9	0.5	0.6	0.4
10%	0.4	1.1	0.7	0.6	0.5
25%	1.0	1.4	1.2	1.1	1.0
50%	1.2	1.9	1.9	1.8	1.7
75%	2.4	3.4	3.4	3.3	3.2
90%	3.5	4.3	4.3	4.2	4.1
95%	3.8	4.5	4.5	4.4	4.3
Max	3.8	4.5	4.5	4.4	4.3

SRS.	I2B0 (VEB - 5V) (micrometers)				
	Init	168	340	580	1000L50020003000
Min	0.1	0.5	0.1	0.1	0.1
5%	0.1	0.5	0.1	0.1	0.1
10%	0.1	0.6	0.1	0.1	0.1
25%	0.1	0.8	0.2	0.2	0.2
50%	0.7	1.5	0.8	0.7	0.7
75%	2.8	3.5	2.8	2.5	2.6
90%	27.9	22.7	24.5	28.2	24.3
95%	48.9	42.1	40.5	46.9	42.7
Max	48.9	42.1	40.5	46.9	42.7

SRS.	BVCF0 (IC - 0.1 ma) (Volts)				
	Init	168	340	580	1000L50020003000
Min	50	50	50	50	50
5%	50	50	50	50	50
10%	56	55	56	55	55
25%	64	64	64	64	64
50%	73	73	73	73	73
75%	82	82	82	82	82
90%	86	89	90	90	90
95%	89	90	90	90	90
Max	89	90	90	90	90

SRS.	BVCF0 (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-1	-1	-1	-1
5%	-	-1	-1	-1	-1
10%	-	-1	-1	-1	-1
25%	-	0	0	0	0
50%	-	0	0	0	0
75%	-	+1	+1	+1	+1
90%	-	+4	+5	+5	+5
95%	-	+7	+8	+8	+8
Max	-	+7	+8	+8	+8

SRS.	VCE(SAT) (IC-50ma, IB-5 ma) (mv.)				
	Unit	168	340	580	1000L50020003000
Min	100	884	883	884	883
5%	100	884	883	884	883
10%	103	886	888	887	887
25%	115	899	100	101	997
50%	126	109	109	111	109
75%	130	117	118	118	120
90%	147	133	131	137	134
95%	153	143	139	148	141
Max	153	143	139	148	141

SRS.	VCE(SAT) (% Change from Initial)				
	Unit	168	340	580	1000L50020003000
Min	-	-17	-17	-17	-17
5%	-	-17	-17	-17	-17
10%	-	-17	-17	-17	-17
25%	-	-16	-15	-15	-15
50%	-	-12	-11	-12	-13
75%	-	-10	-9	-9	-11
90%	-	-8	-9	-5	-7
95%	-	-7	-8	-3	-7
Max	-	-7	-8	-3	-7

SRS.	VBE(SAT) (IC-50 ma, IB-5 ma) (mv.)				
	Unit	168	340	580	1000L50020003000
Min	787	637	787	783	783
5%	787	637	787	783	783
10%	791	711	782	784	786
25%	800	785	785	789	787
50%	805	790	793	794	791
75%	810	796	797	798	798
90%	828	815	815	814	816
95%	829	818	815	818	817
Max	829	818	815	818	817

SRS.	VBE(SAT) (% Change from Initial)				
	Unit	168	340	580	1000L50020003000
Min	-	-20	-3	-2	-2
5%	-	-20	-3	-2	-2
10%	-	-11	-3	-2	-2
25%	-	-2	-2	-2	-2
50%	-	-2	-1	-2	-2
75%	-	-1	-1	-1	-1
90%	-	-1	-1	-1	-1
95%	-	0	0	0	0
Max	-	0	0	0	0

SRS.	hFE (IC - 20 ma, VCE - 5V)				
	Unit	168	340	580	1000L50020003000
Min	57	56	55	55	54
5%	57	56	55	55	54
10%	60	58	59	58	58
25%	78	78	76	78	77
50%	92	90	89	90	90
75%	97	94	95	96	93
90%	106	104	105	104	105
95%	103	107	105	106	104
Max	106	107	104	106	104

SRS.	hFE (% Change from Initial)				
	Unit	168	340	580	1000L50020003000
Min	-	-7	-8	-7	-6
5%	-	-7	-8	-7	-6
10%	-	-7	-8	-7	-6
25%	-	-6	-4	-3	-4
50%	-	-2	-3	-2	-2
75%	-	-1	-2	-1	-1
90%	-	+1	-1	-1	+1
95%	-	+2	-1	+1	+1
Max	-	+2	-1	+1	+1

SRS.	BVCF0 (% Change from Initial)				
	Unit	168	340	580	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: C FAE-SCREEN STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 700 mw, 30 V, 25°C.

CELL NO.: 419241 NO. OF UNITS: 6

HRS.	IC _{EO} (V _{CB} - 60V)(Nanoamps)				
	Init	168	340	680	1000
Min	0.2	1.1	0.6	0.4	0.8
5%	0.2	1.1	0.6	0.4	0.8
10%	0.2	1.1	0.6	0.4	0.8
25%	0.2	1.1	0.6	0.4	0.8
50%	0.2	1.1	0.6	0.4	0.8
75%	0.2	1.1	0.6	0.4	0.8
90%	0.2	1.1	0.6	0.4	0.8
95%	0.2	1.1	0.6	0.4	0.8
Max	0.2	1.1	0.6	0.4	0.8

HRS.	I _{EBO} (V _{EB} - 5V)(Nanoamps)				
	Init	168	340	680	1000
Min	0.7	1.0	0.6	0.3	0.1
5%	0.7	1.0	0.6	0.3	0.1
10%	0.7	1.0	0.6	0.3	0.1
25%	0.7	1.0	0.6	0.3	0.1
50%	0.7	1.0	0.6	0.3	0.1
75%	0.7	1.0	0.6	0.3	0.1
90%	0.7	1.0	0.6	0.3	0.1
95%	0.7	1.0	0.6	0.3	0.1
Max	0.7	1.0	0.6	0.3	0.1

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	1	86	86	86	86
5%	1	86	86	86	86
10%	1	86	86	86	86
25%	1	86	86	86	86
50%	1	86	86	86	86
75%	1	86	86	86	86
90%	1	86	86	86	86
95%	1	86	86	86	86
Max	1	86	86	86	86

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-1	-1	-1
5%	-	-1	-1	-1	-1
10%	-	-1	-1	-1	-1
25%	-	-1	-1	-1	-1
50%	-	-1	-1	-1	-1
75%	-	-1	-1	-1	-1
90%	-	-1	-1	-1	-1
95%	-	-1	-1	-1	-1
Max	-	-1	-1	-1	-1

HRS.	V _{BE} (SAT)(I _C - 50 ma, I _B - 5 ma)(Mv.)				
	Init	168	340	680	1000
Min	110	105	103	110	110
5%	110	105	103	110	110
10%	110	105	103	110	110
25%	110	105	103	110	110
50%	110	105	103	110	110
75%	110	105	103	110	110
90%	110	105	103	110	110
95%	110	105	103	110	110
Max	110	105	103	110	110

HRS.	V _{CE} (SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-12	-89	-13	-13
5%	-	-12	-89	-13	-13
10%	-	-12	-89	-13	-13
25%	-	-12	-89	-13	-13
50%	-	-12	-89	-13	-13
75%	-	-12	-89	-13	-13
90%	-	-12	-89	-13	-13
95%	-	-12	-89	-13	-13
Max	-	-12	-89	-13	-13

HRS.	V _{BE} (SAT)(I _C - 50 ma, I _B - 5 ma)(Mv.)				
	Init	168	340	680	1000
Min	791	776	700	777	776
5%	791	776	700	777	776
10%	791	776	700	777	776
25%	791	776	700	777	776
50%	791	776	700	777	776
75%	791	776	700	777	776
90%	791	776	700	777	776
95%	791	776	700	777	776
Max	791	776	700	777	776

HRS.	V _{BE} (SAT)(% Change from Initial)				
	Init	168	340	680	1000
Min	-	-2	-12	-2	-2
5%	-	-2	-12	-2	-2
10%	-	-2	-12	-2	-2
25%	-	-2	-12	-2	-2
50%	-	-2	-12	-2	-2
75%	-	-2	-12	-2	-2
90%	-	-2	-12	-2	-2
95%	-	-2	-12	-2	-2
Max	-	-2	-12	-2	-2

HRS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)				
	Init	168	340	680	1000
Min	51	46	46	46	46
5%	51	46	46	46	46
10%	51	46	46	46	46
25%	51	46	46	46	46
50%	51	46	46	46	46
75%	51	46	46	46	46
90%	51	46	46	46	46
95%	51	46	46	46	46
Max	51	46	46	46	46

HRS.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-10	-17	-12	-11
5%	-	-10	-17	-12	-11
10%	-	-10	-17	-12	-11
25%	-	-10	-17	-12	-11
50%	-	-10	-17	-12	-11
75%	-	-10	-17	-12	-11
90%	-	-10	-17	-12	-11
95%	-	-10	-17	-12	-11
Max	-	-10	-17	-12	-11

HRS.	BV _{CEO} (I _C - 0.1 ma)(Volts)				
	Init	168	340	680	1000
Min	1	86	86	86	86
5%	1	86	86	86	86
10%	1	86	86	86	86
25%	1	86	86	86	86
50%	1	86	86	86	86
75%	1	86	86	86	86
90%	1	86	86	86	86
95%	1	86	86	86	86
Max	1	86	86	86	86

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-1	-1	-1	-1
5%	-	-1	-1	-1	-1
10%	-	-1	-1	-1	-1
25%	-	-1	-1	-1	-1
50%	-	-1	-1	-1	-1
75%	-	-1	-1	-1	-1
90%	-	-1	-1	-1	-1
95%	-	-1	-1	-1	-1
Max	-	-1	-1	-1	-1

PROCESS: C PRE-SCREEN STRESS:

168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION:

500 mw, 30 V, 25°C.

CELL NO.: 419242 NO. OF UNITS: 16.

HRS.	IC50 (VCE - 60V) (Nanoamps)				
	Init	168	340	580	1000L50020003000
Min	40.1	0.7	1.0	0.5	0.5
5%	40.1	0.7	1.0	0.5	0.5
10%	40.1	0.7	1.0	0.5	0.5
25%	40.1	0.7	1.0	0.5	0.5
50%	40.1	0.7	1.0	0.5	0.5
75%	40.1	0.7	1.0	0.5	0.5
90%	40.1	0.7	1.0	0.5	0.5
95%	40.1	0.7	1.0	0.5	0.5
Max	40.1	0.7	1.0	0.5	0.5

HRS.	IEBO (VBE - 5V) (Nanoamps)				
	Init	168	340	580	1000L50020003000
Min	0.3	0.4	0.3	0.1	0.1
5%	0.3	0.4	0.3	0.1	0.1
10%	0.3	0.4	0.3	0.1	0.1
25%	0.3	0.4	0.3	0.1	0.1
50%	0.3	0.4	0.3	0.1	0.1
75%	0.3	0.4	0.3	0.1	0.1
90%	0.3	0.4	0.3	0.1	0.1
95%	0.3	0.4	0.3	0.1	0.1
Max	0.3	0.4	0.3	0.1	0.1

HRS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	580	1000L50020003000
Min	45	61	61	61	61
5%	45	61	61	61	61
10%	45	61	61	61	61
25%	45	61	61	61	61
50%	45	61	61	61	61
75%	45	61	61	61	61
90%	45	61	61	61	61
95%	45	61	61	61	61
Max	45	61	61	61	61

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

HRS.	VCE (SAT) (IC - 50 ma, IB - 5 ma) (Mv.)				
	Init	168	340	580	1000L50020003000
Min	103	0.26	0.90	0.93	0.90
5%	103	0.26	0.90	0.93	0.90
10%	103	0.26	0.90	0.93	0.90
25%	103	0.26	0.90	0.93	0.90
50%	103	0.26	0.90	0.93	0.90
75%	103	0.26	0.90	0.93	0.90
90%	103	0.26	0.90	0.93	0.90
95%	103	0.26	0.90	0.93	0.90
Max	103	0.26	0.90	0.93	0.90

HRS.	VCE (SAT) (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-82	-18	-19	-25
5%	-	-82	-18	-19	-25
10%	-	-82	-18	-19	-25
25%	-	-82	-18	-19	-25
50%	-	-82	-18	-19	-25
75%	-	-82	-18	-19	-25
90%	-	-82	-18	-19	-25
95%	-	-82	-18	-19	-25
Max	-	-82	-18	-19	-25

HRS.	VBE (SAT) (IC - 50 ma, IB - 5 ma) (Mv.)				
	Init	168	340	580	1000L50020003000
Min	778	693	767	765	767
5%	778	693	767	765	767
10%	778	693	767	765	767
25%	778	693	767	765	767
50%	778	693	767	765	767
75%	778	693	767	765	767
90%	778	693	767	765	767
95%	778	693	767	765	767
Max	778	693	767	765	767

HRS.	VBE (SAT) (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-13	-2	-4	-7
5%	-	-13	-2	-4	-7
10%	-	-13	-2	-4	-7
25%	-	-13	-2	-4	-7
50%	-	-13	-2	-4	-7
75%	-	-13	-2	-4	-7
90%	-	-13	-2	-4	-7
95%	-	-13	-2	-4	-7
Max	-	-13	-2	-4	-7

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	580	1000L50020003000
Min	49	48	47	49	48
5%	49	48	47	49	48
10%	49	48	47	49	48
25%	49	48	47	49	48
50%	49	48	47	49	48
75%	49	48	47	49	48
90%	49	48	47	49	48
95%	49	48	47	49	48
Max	49	48	47	49	48

HRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-3	-10	-3	-4
5%	-	-3	-10	-3	-4
10%	-	-3	-10	-3	-4
25%	-	-3	-10	-3	-4
50%	-	-3	-10	-3	-4
75%	-	-3	-10	-3	-4
90%	-	-3	-10	-3	-4
95%	-	-3	-10	-3	-4
Max	-	-3	-10	-3	-4

HRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: C PRE-SCREEN. STRESS: 168 Hrs. of 250°C/30V - 300°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C.

CELL NO.: 419243 NO. OF UNITS: 6

HRS.	IC ₅₀ (V _{CE} - 60V) (Microamps)					
	Init	168	340	680	1000	1500
Min	0.3	0.3	0.1	0.5	104	0.3
5%	0.3	0.3	0.1	0.5	104	0.3
10%	0.3	0.3	0.1	0.5	104	0.3
25%	0.3	0.3	0.1	0.5	104	0.3
50%	0.3	0.3	0.1	0.5	104	0.3
75%	0.3	0.3	0.1	0.5	104	0.3
90%	0.3	0.3	0.1	0.5	104	0.3
95%	0.3	0.3	0.1	0.5	104	0.3
Max	0.3	0.3	0.1	0.5	104	0.3

HRS.	IEEO (V _{BE} - 5V) (Microamps)					
	Init	168	340	680	1000	1500
Min	10.1	0.6	0.6	0.5	0.8	0.3
5%	10.1	0.6	0.6	0.5	0.8	0.3
10%	10.1	0.6	0.6	0.5	0.8	0.3
25%	10.1	0.6	0.6	0.5	0.8	0.3
50%	10.1	0.6	0.6	0.5	0.8	0.3
75%	10.1	0.6	0.6	0.5	0.8	0.3
90%	10.1	0.6	0.6	0.5	0.8	0.3
95%	10.1	0.6	0.6	0.5	0.8	0.3
Max	10.1	0.6	0.6	0.5	0.8	0.3

HRS.	BV _{CEO} (I _C - 0.1 ma.) (Volts)					
	Init	168	340	680	1000	1500
Min	43	56	60	48	42	45
5%	43	56	60	48	42	45
10%	43	56	60	48	42	45
25%	43	56	60	48	42	45
50%	43	56	60	48	42	45
75%	43	56	60	48	42	45
90%	43	56	60	48	42	45
95%	43	56	60	48	42	45
Max	43	56	60	48	42	45

HRS.	BV _{CEO} (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-4	+1	0	-3	0
5%	-	-4	+1	0	-3	0
10%	-	-4	+1	0	-3	0
25%	-	-4	+1	0	-3	0
50%	-	-4	+1	0	-3	0
75%	-	-4	+1	0	-3	0
90%	-	-4	+1	0	-3	0
95%	-	-4	+1	0	-3	0
Max	-	-4	+1	0	-3	0

HRS.	V _{CE} (SAT) (I _C - 50 ma, I _B - 5 ma.) (mV.)					
	Init	168	340	680	1000	1500
Min	108	095	093	094	094	095
5%	108	095	093	094	094	095
10%	108	095	093	094	094	095
25%	108	095	093	094	094	095
50%	108	095	093	094	094	095
75%	108	095	093	094	094	095
90%	108	095	093	094	094	095
95%	108	095	093	094	094	095
Max	108	095	093	094	094	095

HRS.	V _{CE} (SAT) (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-14	-14	-13	-14	-12
5%	-	-14	-14	-13	-14	-12
10%	-	-14	-14	-13	-14	-12
25%	-	-14	-14	-13	-14	-12
50%	-	-14	-14	-13	-14	-12
75%	-	-14	-14	-13	-14	-12
90%	-	-14	-14	-13	-14	-12
95%	-	-14	-14	-13	-14	-12
Max	-	-14	-14	-13	-14	-12

HRS.	V _{BE} (SAT) (I _C - 50 ma, I _B - 5 ma.) (mV.)					
	Init	168	340	680	1000	1500
Min	786	771	773	775	775	775
5%	786	771	773	775	775	775
10%	786	771	773	775	775	775
25%	786	771	773	775	775	775
50%	786	771	773	775	775	775
75%	786	771	773	775	775	775
90%	786	771	773	775	775	775
95%	786	771	773	775	775	775
Max	786	771	773	775	775	775

HRS.	V _{BE} (SAT) (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-2	-2	-2	-2	-2
5%	-	-2	-2	-2	-2	-2
10%	-	-2	-2	-2	-2	-2
25%	-	-2	-2	-2	-2	-2
50%	-	-2	-2	-2	-2	-2
75%	-	-2	-2	-2	-2	-2
90%	-	-2	-2	-2	-2	-2
95%	-	-2	-2	-2	-2	-2
Max	-	-2	-2	-2	-2	-2

HRS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)					
	Init	168	340	680	1000	1500
Min	43	43	37	32	31	31
5%	43	43	37	32	31	31
10%	43	43	37	32	31	31
25%	43	43	37	32	31	31
50%	43	43	37	32	31	31
75%	43	43	37	32	31	31
90%	43	43	37	32	31	31
95%	43	43	37	32	31	31
Max	43	43	37	32	31	31

HRS.	h _{FE} (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-7	-13	-15	-16	-17
5%	-	-7	-13	-15	-16	-17
10%	-	-7	-13	-15	-16	-17
25%	-	-7	-13	-15	-16	-17
50%	-	-7	-13	-15	-16	-17
75%	-	-7	-13	-15	-16	-17
90%	-	-7	-13	-15	-16	-17
95%	-	-7	-13	-15	-16	-17
Max	-	-7	-13	-15	-16	-17

HRS.	BV _{BE} (I _C - 20 ma, V _{CE} - 5V)					
	Init	168	340	680	1000	1500
Min	43	43	37	32	31	31
5%	43	43	37	32	31	31
10%	43	43	37	32	31	31
25%	43	43	37	32	31	31
50%	43	43	37	32	31	31
75%	43	43	37	32	31	31
90%	43	43	37	32	31	31
95%	43	43	37	32	31	31
Max	43	43	37	32	31	31

PROCESS: C PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C. Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C. CELL NO.: 419244 NO. OF UNITS: 14

ICBO (V _{CB} - 60V) (Nanoamps)		IEBO (V _{EB} - 5V) (Nanoamps)		BV _{CEO} (I _C - 0.1 ma) (Volts)		BV _{CEO} (% Change from Initial)	
Min	Max	Min	Max	Min	Max	Min	Max
Init	168	Init	168	Init	168	Init	168
50	50	50	50	50	50	50	50
100	100	100	100	100	100	100	100
200	200	200	200	200	200	200	200
300	300	300	300	300	300	300	300
400	400	400	400	400	400	400	400
500	500	500	500	500	500	500	500
600	600	600	600	600	600	600	600
700	700	700	700	700	700	700	700
800	800	800	800	800	800	800	800
900	900	900	900	900	900	900	900
1000	1000	1000	1000	1000	1000	1000	1000
1100	1100	1100	1100	1100	1100	1100	1100
1200	1200	1200	1200	1200	1200	1200	1200
1300	1300	1300	1300	1300	1300	1300	1300
1400	1400	1400	1400	1400	1400	1400	1400
1500	1500	1500	1500	1500	1500	1500	1500
1600	1600	1600	1600	1600	1600	1600	1600
1700	1700	1700	1700	1700	1700	1700	1700
1800	1800	1800	1800	1800	1800	1800	1800
1900	1900	1900	1900	1900	1900	1900	1900
2000	2000	2000	2000	2000	2000	2000	2000

VCE (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)		VCE (SAT) (% Change from Initial)		VBE (SAT) (I _C - 50 ma, I _B - 5 ma) (Mv.)		VBE (SAT) (% Change from Initial)	
Min	Max	Min	Max	Min	Max	Min	Max
Init	168	Init	168	Init	168	Init	168
50	50	50	50	50	50	50	50
100	100	100	100	100	100	100	100
200	200	200	200	200	200	200	200
300	300	300	300	300	300	300	300
400	400	400	400	400	400	400	400
500	500	500	500	500	500	500	500
600	600	600	600	600	600	600	600
700	700	700	700	700	700	700	700
800	800	800	800	800	800	800	800
900	900	900	900	900	900	900	900
1000	1000	1000	1000	1000	1000	1000	1000
1100	1100	1100	1100	1100	1100	1100	1100
1200	1200	1200	1200	1200	1200	1200	1200
1300	1300	1300	1300	1300	1300	1300	1300
1400	1400	1400	1400	1400	1400	1400	1400
1500	1500	1500	1500	1500	1500	1500	1500
1600	1600	1600	1600	1600	1600	1600	1600
1700	1700	1700	1700	1700	1700	1700	1700
1800	1800	1800	1800	1800	1800	1800	1800
1900	1900	1900	1900	1900	1900	1900	1900
2000	2000	2000	2000	2000	2000	2000	2000

h _{FE} (I _C - 20 ma, V _{CE} - 5V)		h _{FE} (% Change from Initial)	
Min	Max	Min	Max
Init	168	Init	168
50	50	50	50
100	100	100	100
200	200	200	200
300	300	300	300
400	400	400	400
500	500	500	500
600	600	600	600
700	700	700	700
800	800	800	800
900	900	900	900
1000	1000	1000	1000
1100	1100	1100	1100
1200	1200	1200	1200
1300	1300	1300	1300
1400	1400	1400	1400
1500	1500	1500	1500
1600	1600	1600	1600
1700	1700	1700	1700
1800	1800	1800	1800
1900	1900	1900	1900
2000	2000	2000	2000

PROCESS: C PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 700 mw, 30 V, 25°C. CELL NO.: 419245 NO. OF UNITS: 28

HRS.	ICEO (V _{CE} = 60V) (Nanoamps)					
	Init	168	340	680	1000	1500
Min	0.1	0.4	0.1	0.1	0.1	0.1
5%	0.1	0.5	0.1	0.1	0.1	0.1
10%	0.1	0.6	0.2	0.1	0.1	0.3
25%	0.1	0.7	0.2	0.1	0.1	0.4
50%	0.1	0.9	0.5	0.3	0.4	1.0
75%	0.2	1.4	1.2	1.2	1.5	3.3
90%	0.6	3.6	3.1	4.4	5.5	5.8
95%	8.0	6.5	6.2	13.4	14.8	15.0
Max	14.0	7.0	6.8	14.5	15.0	15.3

HRS.	IEBO (V _{EB} = 5V) (Nanoamps)					
	Init	168	340	680	1000	1500
Min	0.1	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.2	0.1	0.1	0.1	0.1
10%	0.1	0.3	0.1	0.1	0.1	0.1
25%	0.1	0.5	0.1	0.1	0.1	0.3
50%	0.3	0.7	0.3	0.3	0.5	0.6
75%	2.2	2.0	2.3	3.3	2.8	3.3
90%	6.3	7.0	7.2	9.4	9.1	15.9
95%	9.2	9.9	16.1	26.2	36.3	31.1
Max	9.6	11.3	22.0	39.0	54.5	34.3

HRS.	BV _{CEO} (I _C = 0.1 ma) (Volts)					
	Init	168	340	680	1000	1500
Min	56	13	57	57	56	0.9
5%	57	33	57	57	57	0.5
10%	58	57	58	58	58	5.1
25%	69	67	70	70	70	6.6
50%	80	79	80	79	79	8.0
75%	101	101	114	116	116	10.6
90%	148	148	149	147	147	14.7
95%	150	157	130	177	178	18.2
Max	160	159	130	193	195	20.6

HRS.	BV _{CEO} (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-90	-4	-5	-5	-96
5%	-	-51	-4	-5	-5	-99
10%	-	-2	-3	-4	-4	-99
25%	-	-1	-2	-2	-2	-3
50%	-	-1	-1	-1	-1	-1
75%	-	+2	+9	+6	+6	+7
90%	-	+12	+23	+21	+20	+25
95%	-	+28	+32	+25	+26	+31
Max	-	+30	+37	+25	+26	+33

HRS.	VCE (SAT) (I _C = 50 ma, I _B = 5 ma) (mv.)					
	Init	168	340	680	1000	1500
Min	103	080	082	080	084	080
5%	103	081	082	081	084	081
10%	104	085	084	085	087	087
25%	114	095	094	096	094	094
50%	125	105	106	106	106	105
75%	139	125	121	120	120	119
90%	152	130	130	134	132	131
95%	167	153	149	150	154	153
Max	171	153	149	152	154	153

HRS.	VCE (SAT) (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-23	-21	-23	-21	-22
5%	-	-21	-21	-21	-21	-22
10%	-	-20	-21	-20	-18	-20
25%	-	-18	-19	-17	-17	-19
50%	-	-15	-16	-15	-14	-16
75%	-	-11	-12	-12	-11	-13
90%	-	-9	-7	-8	-7	-7
95%	-	-6	-6	-6	-5	-6
Max	-	-6	-6	-5	-5	-6

HRS.	VBE (SAT) (I _C = 50 ma, I _B = 5 ma) (mv.)					
	Init	168	340	680	1000	1500
Min	775	759	758	765	756	757
5%	777	761	760	765	760	760
10%	781	766	763	767	765	765
25%	785	771	770	775	778	779
50%	794	777	777	779	775	776
75%	802	785	785	786	780	780
90%	809	794	799	796	791	791
95%	818	803	801	805	804	810
Max	823	807	807	807	800	800

HRS.	VBE (SAT) (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-3	-3	-3	-4	-3
5%	-	-3	-3	-3	-4	-3
10%	-	-3	-3	-3	-3	-3
25%	-	-2	-3	-2	-3	-3
50%	-	-1	-2	-2	-2	-2
75%	-	-1	-1	-1	-1	-1
90%	-	0	+5	0	0	0
95%	-	0	+9	0	0	0
Max	-	0	+9	0	0	0

HRS.	hFE (I _C = 20 ma, V _{CE} = 5V)					
	Init	168	340	680	1000	1500
Min	55	56	50	56	57	44
5%	56	57	56	57	58	50
10%	59	60	57	60	61	57
25%	68	68	63	67	68	63
50%	90	89	81	87	88	87
75%	110	110	103	109	111	109
90%	132	134	120	133	136	134
95%	136	137	134	134	138	136
Max	139	139	137	135	140	137

HRS.	hFE (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-9	-8	-7	-7	-38
5%	-	-8	-5	-6	-6	-36
10%	-	-2	-1	-4	-3	-19
25%	-	0	-9	-2	0	-2
50%	-	+1	-5	-1	+1	+1
75%	-	+2	0	0	+3	+3
90%	-	+2	+1	+2	+4	+6
95%	-	+4	+4	+3	+5	+9
Max	-	+4	+4	+3	+5	+9

HRS.	BV _{BE} (% Change from Initial)					
	Init	168	340	680	1000	1500
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	-	-	-	-	-
75%	-	-	-	-	-	-
90%	-	-	-	-	-	-
95%	-	-	-	-	-	-
Max	-	-	-	-	-	-

168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

PROCESS: C PRE-SCREEN STRESS:

OPERATING POWER CONDITION:

500 mw, 30 V, 25°C.

CELL NO.: 419246 NO. OF UNITS: 79

HRS.	IC50 (V _{CB} - 60V)(Nanoamps)				
	Init	168	340	580	1000L50020003000
5	0.1	0.3	0.7	4.1	4.1
10	0.1	0.4	0.8	4.1	4.1
15	0.1	0.4	1.0	4.1	4.1
20	0.1	0.5	1.0	4.2	4.1
25	0.1	0.7	1.3	4.4	4.3
30	0.2	1.2	1.9	1.1	1.4
35	0.6	4.0	5.4	5.9	13.0
40	2.3	23.7	22.2	31.3	45.3
45	7.6	58.1	74.1	95.0	129.245

HRS.	IEBO (V _{EB} - 5V)(Nanoamps)				
	Init	168	340	580	1000L50020003000
5	0.1	0.2	0.2	0.1	0.1
10	0.1	0.2	0.2	0.1	0.1
15	0.1	0.3	0.3	0.1	0.1
20	0.2	0.4	0.5	0.2	0.2
25	0.5	1.0	1.0	0.8	0.7
30	2.3	2.9	2.4	2.6	2.7
35	4.0	5.0	4.6	4.5	6.6
40	6.2	7.4	7.5	7.5	9.9
45	7.5	11.2	11.1	12.0	12.4

HRS.	BVCF0 (I _C - 0.1 ma)(Volts)				
	Init	168	340	580	1000L50020003000
5	56	55	56	55	56
10	59	59	59	59	60
15	64	64	64	64	64
20	72	72	72	72	72
25	80	79	80	79	79
30	97	102	104	103	104
35	126	136	136	137	135
40	139	149	141	141	140
45	155	154	154	155	159

HRS.	BVCF0 (% Change from Initial)				
	Init	168	340	580	1000L50020003000
5	-	-13	-14	-14	-20
10	-	-2	-2	-2	-5
15	-	-1	-1	-2	-2
20	-	-1	-1	-1	-1
25	-	0	0	0	0
30	-	0	0	0	0
35	-	+2	+3	+7	+7
40	-	+11	+13	+11	+11
45	-	+20	+16	+24	+21

HRS.	VCE(SAT)(I _C -50ma, I _B -5 ma)(Mv.)				
	Init	168	340	580	1000L50020003000
5	090	081	080	012	012
10	105	084	086	085	084
15	106	087	087	087	087
20	113	094	094	095	095
25	122	101	103	103	103
30	134	114	115	116	117
35	152	132	135	136	136
40	159	138	147	140	140
45	320	145	207	150	150

HRS.	VCE(SAT)(% Change from Initial)				
	Init	168	340	580	1000L50020003000
5	-	-56	-41	-99	-98
10	-	-21	-21	-22	-21
15	-	-20	-20	-19	-20
20	-	-19	-18	-17	-17
25	-	-16	-16	-14	-14
30	-	-13	-13	-11	-12
35	-	-10	-10	-8	-9
40	-	-9	-7	-6	-5
45	-	-7	+154	-6	-5

HRS.	VBE(SAT)(I _C -50 ma, I _B -5 ma)(Mv.)				
	Init	168	340	580	1000L50020003000
5	758	622	622	757	757
10	777	760	758	763	763
15	783	764	765	766	763
20	787	768	769	770	768
25	794	775	775	777	774
30	802	783	780	783	783
35	811	793	794	796	792
40	823	799	796	800	797
45	955	820	819	823	819

HRS.	VBE(SAT)(% Change from Initial)				
	Init	168	340	580	1000L50020003000
5	-	-21	-13	-19	-20
10	-	-4	-4	-3	-4
15	-	-3	-3	-3	-3
20	-	-3	-3	-3	-3
25	-	-2	-2	-2	-2
30	-	-2	-2	-2	-2
35	-	-1	-1	-1	-1
40	-	-1	-1	-1	-1
45	-	0	0	0	0

HRS.	hFE (I _C - 20 ma, VCE - 5V)				
	Init	168	340	580	1000L50020003000
5	53	53	53	53	53
10	57	57	56	57	57
15	60	61	61	60	62
20	74	72	71	73	75
25	84	84	82	85	87
30	102	103	101	102	105
35	121	121	120	121	124
40	133	132	130	128	134
45	139	141	139	134	141

HRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000L50020003000
5	-	-10	-13	-11	-7
10	-	-7	-9	-9	-2
15	-	-4	-7	-8	-1
20	-	0	-3	-2	0
25	-	+1	0	0	+2
30	-	+2	+1	+1	+3
35	-	+3	+1	+3	+6
40	-	+4	+4	+9	+11
45	-	+7	+7	+7	+7

HRS.	hFE (I _C - 20 ma, VCE - 5V)				
	Init	168	340	580	1000L50020003000
5	53	53	53	53	53
10	57	57	56	57	57
15	60	61	61	60	62
20	74	72	71	73	75
25	84	84	82	85	87
30	102	103	101	102	105
35	121	121	120	121	124
40	133	132	130	128	134
45	139	141	139	134	141

HRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000L50020003000
5	-	-10	-13	-11	-7
10	-	-7	-9	-9	-2
15	-	-4	-7	-8	-1
20	-	0	-3	-2	0
25	-	+1	0	0	+2
30	-	+2	+1	+1	+3
35	-	+3	+1	+3	+6
40	-	+4	+4	+9	+11
45	-	+7	+7	+7	+7

PROCESS: C PRE-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419247 NO. OF UNITS: 14.

ICEO (VCB - 60V) (nanamps)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	0.1	0.4	0.1	0.1	0.2	0.1	0.1	0.1	0.1
5%	0.1	0.4	0.1	0.1	0.2	0.1	0.1	0.1	0.1
10%	0.1	0.5	0.2	0.2	0.3	0.2	0.1	0.1	0.1
25%	0.1	0.7	0.6	0.5	0.6	0.3	0.2	0.1	0.1
50%	0.4	1.3	2.4	4.6	22.9	3.9	2.3	0.4	0.4
75%	0.4	4.1	28.0	175.2	00	00	40.2	155.4	0.4
90%	0.8	236.2	00	00	00	00	00	34.7	0.4
95%	0.9	412.0	00	00	00	00	00	45.8	0.4
Max	0.9	412.0	00	00	00	00	00	45.8	0.4

IEBO (VEB - 5V) (nanamps)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25%	0.2	0.5	0.1	0.4	0.1	0.1	0.1	0.1	0.1
50%	0.4	0.9	0.7	1.3	0.6	0.7	0.5	0.4	0.4
75%	1.2	2.3	4.0	4.5	4.7	5.2	3.7	4.9	0.4
90%	5.7	6.6	8.7	50.5	101.9	812.1	61.9	34.5	0.4
95%	7.3	8.5	8.9	00	00	00	113.0	68.5	0.4
Max	7.3	8.5	8.9	00	00	00	113.0	68.5	0.4

BVCEO (IC - 0.1 ma.) (Volts)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	57	0.2	0.0	0.1	0.1	0.0	0.6	8.7	0.2
5%	57	0.2	0.0	0.1	0.1	0.0	0.6	8.7	0.2
10%	60	0.2	0.3	0.2	0.2	0.1	0.2	9.1	0.2
25%	65	7.1	6.9	6.8	6.8	0.9	8.5	10.8	0.2
50%	76	8.8	8.2	8.9	9.0	9.0	11.1	12.2	0.2
75%	92	10.6	10.4	10.9	11.2	11.1	00	00	0.2
90%	107	12.7	12.8	13.2	13.3	13.4	00	00	0.2
95%	111	14.2	14.3	14.5	14.8	14.9	00	00	0.2
Max	111	14.2	14.3	14.5	14.8	14.9	00	00	0.2

BVCEO (% Change from Initial)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	-	-97	-99	-99	-99	-99	-99	-99	-97
5%	-	-97	-99	-99	-99	-99	-99	-99	-97
10%	-	-50	-95	-98	-97	-99	-91	-91	-50
25%	-	-1	-3	-16	-2	-80	0	0	-1
50%	-	+7	+8	+14	+10	+5	+29	+53	+7
75%	-	+14	+12	+36	+26	+24	+36	+36	+14
90%	-	+58	+64	+78	+68	+68	+56	+56	+58
95%	-	+90	+92	+95	+99	+100	+100	+100	+90
Max	-	+90	+92	+95	+99	+100	+100	+100	+90

VCE (SAT) (IC-50 ma, IB-5 ma.) (Mv.)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	776	646	738	749	742	701	619	766	776
5%	776	646	738	749	742	701	619	766	776
10%	778	696	751	754	755	720	692	767	778
25%	782	767	768	770	769	764	769	770	782
50%	792	781	780	778	781	773	790	792	792
75%	806	787	789	791	793	787	00	00	806
90%	811	791	794	795	798	794	00	00	811
95%	813	792	795	797	798	797	00	00	813
Max	813	792	795	797	798	797	00	00	813

VCE (SAT) (% Change from Initial)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	-	-20	-19	-33	-21	-35	-93	-21	-20
5%	-	-20	-19	-33	-21	-35	-93	-21	-20
10%	-	-19	-19	-27	-19	-32	-56	-18	-19
25%	-	-17	-16	-16	-17	-16	-14	-15	-17
50%	-	-15	-15	-11	-14	-15	-4	-4	-15
75%	-	-13	-8	-3	-7	-8	25.0	25.0	-13
90%	-	-7	4.2	3.1	4.2	4.2	9.4	9.4	-7
95%	-	-5	4.2	3.1	4.2	4.2	9.4	9.4	-5
Max	-	-5	4.2	3.1	4.2	4.2	9.4	9.4	-5

VCE (SAT) (IC-50 ma, IB-5 ma.) (Mv.)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	101	084	088	090	088	019	007	088	101
5%	101	084	088	090	088	019	007	088	101
10%	103	085	088	091	088	053	044	089	103
25%	107	093	096	097	097	091	102	099	107
50%	125	105	115	115	114	107	123	125	125
75%	137	121	134	127	128	128	00	00	137
90%	150	138	147	148	146	146	00	00	150
95%	150	130	130	130	130	130	00	00	150
Max	150	130	130	130	130	130	00	00	150

VCE (SAT) (% Change from Initial)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	-	-20	-19	-33	-21	-35	-93	-21	-20
5%	-	-20	-19	-33	-21	-35	-93	-21	-20
10%	-	-19	-19	-27	-19	-32	-56	-18	-19
25%	-	-17	-16	-16	-17	-16	-14	-15	-17
50%	-	-15	-15	-11	-14	-15	-4	-4	-15
75%	-	-13	-8	-3	-7	-8	25.0	25.0	-13
90%	-	-7	4.2	3.1	4.2	4.2	9.4	9.4	-7
95%	-	-5	4.2	3.1	4.2	4.2	9.4	9.4	-5
Max	-	-5	4.2	3.1	4.2	4.2	9.4	9.4	-5

hFE (IC - 20 ma, VCE - 5V)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	59	20	20	19	20	20	20	20	59
5%	59	20	20	19	20	20	20	20	59
10%	60	39	39	33	27	30	20	20	60
25%	63	60	60	56	54	60	20	20	63
50%	104	93	84	76	78	93	58	45	104
75%	118	115	112	101	105	114	126	84	118
90%	121	120	121	109	117	124	149	111	121
95%	122	121	122	111	119	124	156	116	122
Max	122	121	122	111	119	124	156	116	122

hFE (% Change from Initial)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	-	-83	-82	-84	-82	-82	-83	-83	-83
5%	-	-83	-82	-84	-82	-82	-83	-83	-83
10%	-	-43	-51	-72	-71	-74	-83	-83	-43
25%	-	-3	-11	-47	-24	-11	-81	-81	-3
50%	-	-1	-1	-10	-4	-1	-12	-34	-1
75%	-	+1	0	+7	-3	+1	+16	-7	+1
90%	-	+2	0	+5	+1	+2	+49	-4	+2
95%	-	+2	0	+5	+3	+50	+30	-2	+2
Max	-	+2	0	+5	+3	+50	+30	-2	+2

VBE (SAT) (% Change from Initial)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	-	-20	-6	-5	-5	-1	-2	-1	-20
5%	-	-20	-6	-5	-5	-1	-2	-1	-20
10%	-	-12	-5	-5	-4	-3	-2	-2	-12
25%	-	-3	-3	-3	-3	-3	-2	-2	-3
50%	-	-2	-2	-2	-2	-2	-1	-1	-2
75%	-	-2	-2	-2	-2	-2	-1	-1	-2
90%	-	-1	0	+1	0	-2	182	182	-1
95%	-	0	+1	+1	+1	-1	118	118	0
Max	-	0	+1	+1	+1	-1	118	118	0

VBE (SAT) (IC-50 ma, IB-5 ma.) (Mv.)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	776	646	738	749	742	701	619	766	776
5%	776	646	738	749	742	701	619	766	776
10%	778	696	751	754	755	720	692	767	778
25%	782	767	768	770	769	764	769	770	782
50%	792	781	780	778	781	773	790	792	792
75%	806	787	789	791	793	787	00	00	806
90%	811	791	794	795	798	794	00	00	811
95%	813	792	795	797	798	797	00	00	813
Max	813	792	795	797	798	797	00	00	813

VBE (SAT) (% Change from Initial)									
SPS.	Init	168	340	680	1000	1500	2000	3000	
Min	-	-20	-6	-5	-5	-1	-2	-1	-20
5%	-	-20	-6	-5	-5	-1	-2	-1	-20
10%	-	-12	-5	-5	-4	-3	-2	-2	-12
25%	-	-3	-3	-3	-3	-3	-2	-2	-3
50%	-	-2	-2	-2	-2	-2	-1	-1	-2
75%	-	-2	-2	-2	-2	-2	-1	-1	-2
90%	-	-1	0	+1	0	-2	182	182	-1
95%	-	0	+1	+1	+1	-1	118	118	0
Max	-	0	+1	+1	+1	-1	118	118	0

PROCESS: C FR3-SCREEN STRESS: 168 Hrs. of 200°C/30V - 200°C Stabilization Bake - 25 Kg Centrifuge.

OPERATING POWER CONDITION: 200 mw, 30 V, 150°C.

CELL NO.: 419248 NO. OF UNITS: 28

RES.	ICDO (VCE - 60V)(Nanamps)				
	Init	168	340	580	1000/500/2000/3000
Min	0.1	0.2	0.1	0.1	0.1
5%	0.1	0.3	0.1	0.1	0.1
10%	0.1	0.5	0.1	0.1	0.1
25%	0.1	0.7	0.1	0.1	0.1
50%	0.2	0.9	0.4	0.5	0.3
75%	0.4	1.4	1.6	1.5	1.5
90%	2.0	22.2	56.3	45.2	122.8
95%	24.3	39.6	132.9	137.1	255.9
MAX	34.3	44.1	169.6	205.0	414.4

RES.	IEBO (VEB - 5V)(Nanamps)				
	Init	168	340	580	1000/500/2000/3000
Min	0.1	0.2	0.1	0.1	0.1
5%	0.1	0.2	0.1	0.1	0.1
10%	0.1	0.3	0.1	0.1	0.1
25%	0.1	0.4	0.1	0.1	0.1
50%	0.4	1.1	0.5	0.7	0.5
75%	0.8	3.0	2.7	2.8	2.1
90%	3.8	4.2	5.7	5.6	5.5
95%	6.5	2.8	8.9	10.3	12.5
MAX	7.4	8.1	9.6	12.4	16.9

RES.	BVCO (IC - 0.1 ma)(Volts)				
	Init	168	340	580	1000/500/2000/3000
Min	56	59	56	56	55
5%	57	60	57	57	57
10%	61	63	61	60	60
25%	67	69	68	67	67
50%	81	87	81	84	80
75%	101	110	101	101	101
90%	129	234	124	117	131
95%	132	00	143	145	149
MAX	132	00	153	156	160

RES.	BVCO (% Change from Initial)				
	Init	168	340	580	1000/500/2000/3000
Min	-	-10	-7	-14	-2
5%	-	-6	-4	-8	-2
10%	-	-1	-1	-1	-2
25%	-	0	0	-1	-1
50%	-	0	0	0	0
75%	-	0	0	0	0
90%	-	455	413	49	45
95%	-	457	418	427	418
MAX	-	465	419	431	425

RES.	VBE(SAT)(IC=50ma, IB=5 ma)(mv.)				
	Init	168	340	580	1000/500/2000/3000
Min	0.91	0.00	0.84	0.83	0.83
5%	0.95	0.36	0.86	0.85	0.85
10%	1.03	0.89	0.88	0.90	0.89
25%	1.11	0.93	0.96	0.95	0.94
50%	1.23	1.06	1.05	1.05	1.04
75%	1.33	1.27	1.16	1.16	1.16
90%	1.55	370	134	134	133
95%	1.61	2445	502	135	26
MAX	1.66	2449	808	136	210

RES.	VCE(SAT)(% Change from Initial)				
	Init	168	340	580	1000/500/2000/3000
Min	-	-100	-25	-23	-24
5%	-	-65	-23	-21	-21
10%	-	-21	-20	-19	-20
25%	-	-17	-17	-16	-17
50%	-	-14	-14	-14	-14
75%	-	-12	-12	-12	-12
90%	-	-12	-12	-12	-12
95%	-	-12	-12	-12	-12
MAX	-	-12	-12	-12	-12

RES.	VBE(SAT)(IC=50 ma, IB=5 ma)(mv.)				
	Init	168	340	580	1000/500/2000/3000
Min	764	400	761	764	765
5%	769	497	761	764	766
10%	778	228	764	767	768
25%	786	768	769	769	769
50%	797	772	778	779	780
75%	803	774	785	784	787
90%	810	784	813	792	795
95%	843	818	1490	816	820
MAX	860	823	2377	820	824

RES.	VBE(SAT)(% Change from Initial)				
	Init	168	340	580	1000/500/2000/3000
Min	-	-49	-4	-5	-4
5%	-	-37	-4	-4	-4
10%	-	-8	-3	-3	-3
25%	-	-3	-3	-3	-3
50%	-	-2	-2	-2	-2
75%	-	-2	-2	-2	-2
90%	-	-2	-2	-2	-2
95%	-	-2	-2	-2	-2
MAX	-	-2	-2	-2	-2

RES.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	580	1000/500/2000/3000
Min	53	50	52	19	20
5%	55	34	54	33	53
10%	60	56	60	57	59
25%	70	66	69	66	68
50%	89	85	87	83	88
75%	104	103	104	100	103
90%	116	117	115	111	113
95%	123	123	122	118	119
MAX	127	127	126	123	123

RES.	hFE (% Change from Initial)				
	Init	168	340	580	1000/500/2000/3000
Min	-	-78	-9	-68	-13
5%	-	-46	-7	-42	-9
10%	-	-5	-2	-11	-4
25%	-	-2	-2	-6	-4
50%	-	-1	-1	-5	-3
75%	-	0	0	-4	-1
90%	-	+1	+2	-2	+3
95%	-	+2	+2	-1	+3
MAX	-	+2	+2	-1	+3

RES.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	580	1000/500/2000/3000
Min	53	50	52	19	20
5%	55	34	54	33	53
10%	60	56	60	57	59
25%	70	66	69	66	68
50%	89	85	87	83	88
75%	104	103	104	100	103
90%	116	117	115	111	113
95%	123	123	122	118	119
MAX	127	127	126	123	123

RES.	hFE (% Change from Initial)				
	Init	168	340	580	1000/500/2000/3000
Min	-	-78	-9	-68	-13
5%	-	-46	-7	-42	-9
10%	-	-5	-2	-11	-4
25%	-	-2	-2	-6	-4
50%	-	-1	-1	-5	-3
75%	-	0	0	-4	-1
90%	-	+1	+2	-2	+3
95%	-	+2	+2	-1	+3
MAX	-	+2	+2	-1	+3

PROCESS: C PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C.

CELL NO.: 419249 NO. OF UNITS: 10.

HRS.	ICBO (VCB - 60V)(Nanoamps)				
	Init	168	340	580	1000L50020003000
Min	0.1	0.5	0.1	0.1	0.1
5%	0.1	0.5	0.1	0.1	0.1
10%	0.1	0.5	0.1	0.1	0.1
25%	0.2	0.6	0.2	0.2	0.2
50%	0.3	1.2	0.6	0.6	0.6
75%	0.4	5.8	1.5	1.4	1.7
90%	0.5	6.0	1.5	1.4	1.7
95%	0.5	6.0	1.5	1.4	1.7
Max	0.5	6.0	1.5	1.4	1.7

HRS.	IEBO (VEB - 5V)(Nanoamps)				
	Init	168	340	580	1000L50020003000
Min	0.1	0.5	0.1	0.1	0.1
5%	0.1	0.5	0.1	0.1	0.1
10%	0.1	0.5	0.1	0.1	0.1
25%	0.2	0.6	0.2	0.2	0.2
50%	0.5	1.2	0.6	0.6	0.6
75%	0.4	5.8	1.5	1.4	1.7
90%	0.5	6.0	1.5	1.4	1.7
95%	0.5	6.0	1.5	1.4	1.7
Max	0.5	6.0	1.5	1.4	1.7

HRS.	BVCEO (IC - 0.1 ma)(Volts)				
	Init	168	340	580	1000L50020003000
Min	72	72	71	71	71
5%	72	72	71	71	71
10%	72	72	71	71	71
25%	84	93	93	93	93
50%	101	103	104	104	104
75%	129	139	138	138	138
90%	148	145	146	146	146
95%	148	145	146	146	146
Max	148	145	146	146	146

HRS.	BVCEO (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-14	-5	-2	-3
5%	-	-14	-5	-2	-3
10%	-	-14	-5	-2	-3
25%	-	-1	-2	-1	-1
50%	-	0	-1	-1	-1
75%	-	1	1	1	1
90%	-	1	1	1	1
95%	-	1	1	1	1
Max	-	1	1	1	1

HRS.	VCE(SAT)(IC-50ma, IB-5 ma)(Mv.)				
	Init	168	340	580	1000L50020003000
Min	101	101	101	101	101
5%	101	101	101	101	101
10%	101	101	101	101	101
25%	101	101	101	101	101
50%	101	101	101	101	101
75%	101	101	101	101	101
90%	101	101	101	101	101
95%	101	101	101	101	101
Max	101	101	101	101	101

HRS.	VCE(SAT)(% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-86	-19	-18	-18
5%	-	-86	-19	-18	-18
10%	-	-86	-19	-18	-18
25%	-	-16	-14	-14	-14
50%	-	-13	-11	-11	-11
75%	-	-11	-9	-9	-9
90%	-	-9	-6	-6	-6
95%	-	-9	-6	-6	-6
Max	-	-9	-6	-6	-6

HRS.	VBE(SAT)(IC-50 ma, IB-5 ma)(Mv.)				
	Init	168	340	580	1000L50020003000
Min	770	694	722	765	767
5%	770	694	722	765	767
10%	780	702	722	766	767
25%	788	723	727	778	778
50%	800	783	785	784	784
75%	802	789	789	790	790
90%	807	791	792	790	790
95%	807	791	792	790	790
Max	807	791	792	790	790

HRS.	VBE(SAT)(% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-11	-3	-3	-3
5%	-	-11	-3	-3	-3
10%	-	-10	-3	-3	-3
25%	-	-2	-2	-2	-2
50%	-	-2	-2	-2	-2
75%	-	-2	-2	-2	-2
90%	-	-2	-2	-2	-2
95%	-	-2	-2	-2	-2
Max	-	-2	-2	-2	-2

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	580	1000L50020003000
Min	49	50	49	50	51
5%	49	50	49	50	51
10%	50	50	50	50	51
25%	61	61	62	63	63
50%	77	78	78	78	78
75%	88	88	88	88	88
90%	100	100	100	100	100
95%	100	100	100	100	100
Max	100	100	100	100	100

HRS.	hFE (% Change from Initial)				
	Init	168	340	580	1000L50020003000
Min	-	-4	-10	-1	0
5%	-	-4	-10	-1	0
10%	-	-4	-10	-1	0
25%	-	-1	-7	0	1
50%	-	1	-6	1	1
75%	-	1	-6	1	1
90%	-	1	-6	1	1
95%	-	1	-6	1	1
Max	-	1	-6	1	1

HRS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	580	1000L50020003000
Min	49	50	49	50	51
5%	49	50	49	50	51
10%	50	50	50	50	51
25%	61	61	62	63	63
50%	77	78	78	78	78
75%	88	88	88	88	88
90%	100	100	100	100	100
95%	100	100	100	100	100
Max	100	100	100	100	100

PROCESS: C PHE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 700 mw, 30 V, 25°C.

CELL NO.: 419250 NO. OF UNITS: 20

		ICBO (VCB - 60V) (Nanoamps)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	0.1	0.6	4.1	4.1	0.1	0.3	0.1	0.3			
5%	0.1	0.6	4.1	4.1	0.1	0.3	0.1	0.3			
10%	0.1	0.6	4.1	4.1	0.1	0.3	0.1	0.3			
25%	0.1	0.7	0.1	0.1	0.2	1.0	0.1	0.7			
50%	0.1	0.8	0.2	0.3	0.3	1.3	0.4	1.1			
75%	0.1	1.2	0.5	2.3	0.8	2.5	2.3	3.8			
90%	0.2	2.3	3.2	7.0	2.2	3.9	1.8	4.8			
95%	1.2	30.6	6.9	10.3	9.4	6.2	1.9	1.9			
Max	1.3	32.1	7.1	10.5	9.5	6.3	7.0	0.0			

		IEBO (VEB - 5V) (Nanoamps)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	0.1	0.4	4.1	4.1	0.1	0.2	0.1	0.1			
5%	0.1	0.4	4.1	4.1	0.1	0.2	0.1	0.1			
10%	0.1	0.4	4.1	4.1	0.1	0.2	0.1	0.1			
25%	0.1	0.7	0.2	0.3	0.3	0.7	0.3	0.4			
50%	0.1	1.4	0.5	0.5	0.7	1.3	0.8	1.3			
75%	3.3	4.3	3.0	3.4	3.3	3.7	3.2	3.6			
90%	6.2	7.0	5.1	5.3	5.3	6.8	6.3	6.6			
95%	6.4	7.5	6.3	6.4	6.3	7.7	7.4	7.7			
Max	6.4	7.5	6.4	6.5	6.3	7.7	7.5	7.7			

		BVCEO (IC - 0.1 ma) (Volts)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	62	61	61	61	60	62	61	62			
5%	62	61	61	61	60	62	61	62			
10%	63	64	63	63	63	63	61	61			
25%	73	73	73	72	72	73	71	70			
50%	88	87	86	86	87	86	87	88			
75%	105	109	109	109	111	111	110	108			
90%	137	134	135	135	158	135	156	155			
95%	148	160	159	159	158	159	168	158			
Max	148	161	161	160	159	159	159	159			

		BVCEO (% Change from Initial)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	-	-17	-30	-34	-34	-36	-36	-36			
5%	-	-16	-29	-32	-32	-36	-36	-36			
10%	-	-2	-3	-3	-3	-3	-3	-3			
25%	-	-1	-2	-3	-3	-3	-4	-4			
50%	-	-1	-1	-1	-1	-1	-2	-2			
75%	-	+3	+4	+4	+4	+4	+7	+7			
90%	-	+9	+9	+9	+9	+9	+10	+10			
95%	-	+23	+26	+26	+26	+26	+27	+27			
Max	-	+24	+27	+26	+27	+27	+27	+27			

		VCE (SAT) (IC-50ma, IB-5 ma) (Mv.)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	102	089	085	087	090	087	090	087			
5%	102	089	085	087	090	087	090	087			
10%	105	089	088	092	090	089	090	091			
25%	115	097	098	101	101	100	100	100			
50%	129	113	113	113	114	113	110	113			
75%	140	124	123	123	127	123	128	131			
90%	150	132	131	134	139	131	139	152			
95%	154	135	136	136	150	137	150	150			
Max	154	135	136	136	150	137	150	150			

		VCE (SAT) (% Change from Initial)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	-	-19	-19	-17	-17	-17	-17	-18			
5%	-	-19	-19	-17	-17	-17	-17	-18			
10%	-	-17	-17	-16	-16	-16	-19	-17			
25%	-	-15	-15	-13	-14	-15	-15	-15			
50%	-	-13	-13	-12	-12	-13	-12	-12			
75%	-	-11	-12	-9	-10	-11	-9	-10			
90%	-	-9	-10	-8	-8	-10	-8	-10			
95%	-	-9	-8	-7	-7	-8	-8	-8			
Max	-	-9	-8	-7	-7	-8	-8	-8			

		VBE (SAT) (IC-50 ma, IB-5 ma) (Mv.)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	777	761	763	760	760	769	764	761			
5%	777	761	763	760	760	769	764	761			
10%	783	761	763	765	763	765	766	761			
25%	788	768	769	771	766	770	768	768			
50%	799	781	779	780	779	781	781	779			
75%	807	789	785	785	787	789	790	791			
90%	814	792	794	796	793	793	793	793			
95%	816	792	796	799	793	797	793	793			
Max	816	792	796	799	793	797	793	793			

		VBE (SAT) (% Change from Initial)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	-	-4	-3	-3	-4	-3	-4	-4			
5%	-	-4	-3	-3	-4	-3	-4	-4			
10%	-	-3	-3	-3	-3	-3	-3	-3			
25%	-	-3	-3	-3	-3	-3	-3	-3			
50%	-	-3	-3	-3	-3	-3	-3	-3			
75%	-	-2	-2	-2	-2	-2	-2	-2			
90%	-	-2	-2	-2	-2	-2	-2	-2			
95%	-	-1	-1	-1	-1	-1	-1	-1			
Max	-	-1	-1	-1	-1	-1	-1	-1			

		hFE (IC - 20 ma, VCE - 5V)									
MRS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	48	49	48	48	20	20	20	20			
5%	48	49	48	48	21	20	20	21			
10%	50	51	50	49	48	23	48	48			
25%	58	59	58	59	58	57	57	58			
50%	96	94	89	97	98	93	89	94			
75%	106	106	109	109	110	108	110	109			
90%	122	113	116	122	124	123	121	121			
95%	125	124	125	128	130	128	127	128			
Max	125	124	125	128	130	128	128	128			

hFE (% Change from Initial)								
Init	168	340	580	1000	1500	2000	3000	
-	-19	-11	-1	-66	-81	-79	-66	
-	-18	-11	-1	-63	-81	-78	-65	
-	-8	-9	-1	0	-2	-60	-6	
-	-1	-4	-1	0	-1	-32	-1	
-	+1	+1	+1	+2	0	0	0	
-	+2	+3	+2	+3	+3	+3	+3	
-	+2	+3	+2	+4	+3	+3	+4	
-	+4	+2	+5	+6	+5	+5	+4	
-	+4	+1	+5	+6	+5	+5	+4	

PROCESS: C PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419251 NO. OF UNITS: 52.

HRS.	VCE (VCE - 60V) (Nanoamps)					
	Init	168	340	680	1000L	50020003000
Min	0.1	0.2	0.8	0.1	0.1	0.1
5%	0.1	0.3	0.9	0.2	0.1	0.3
10%	0.1	0.4	0.9	0.2	0.1	0.3
25%	0.1	0.5	1.0	0.3	0.2	0.5
50%	0.1	0.7	1.3	0.5	0.3	0.8
75%	0.3	1.2	2.2	1.0	0.7	1.4
90%	1.8	3.4	5.1	3.2	2.3	2.9
95%	3.4	5.7	7.8	4.5	2.6	3.9
Max	6.3	6.9	13.5	16.0	11.5	22.7

HRS.	VCE (VCE - 5V) (Nanoamps)					
	Init	168	340	680	1000L	50020003000
Min	0.1	0.1	0.2	0.1	0.1	0.1
5%	0.1	0.2	0.2	0.1	0.1	0.1
10%	0.1	0.2	0.2	0.1	0.1	0.1
25%	0.1	0.4	0.3	0.2	0.1	0.1
50%	0.4	0.9	0.8	0.8	0.6	0.3
75%	2.2	2.4	2.3	2.4	2.3	1.8
90%	5.3	5.8	5.7	5.7	5.5	5.4
95%	6.7	7.4	7.2	7.2	6.4	6.7
Max	6.7	7.5	8.0	8.2	7.0	7.5

HRS.	BVCE (IC - 0.1 ma) (Volts)					
	Init	168	340	680	1000L	50020003000
Min	55	53	53	53	53	53
5%	58	57	57	57	57	57
10%	60	59	59	59	59	59
25%	68	69	68	68	68	68
50%	83	83	83	83	83	83
75%	108	108	108	108	108	108
90%	129	140	139	140	140	141
95%	151	152	152	151	153	153
Max	167	173	172	171	170	170

HRS.	BVCE (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-4	-4	-6	-7	-8
5%	-	-3	-3	-5	-6	-7
10%	-	-2	-3	-4	-5	-4
25%	-	-1	-2	-2	-2	-2
50%	-	-1	-1	-1	-1	-1
75%	-	0	0	0	0	0
90%	-	+5	+7	+10	+10	+13
95%	-	+13	+11	+20	+30	+37
Max	-	+12	+12	+17	+47	+61

HRS.	VCE (SAT) (IC - 50ma, IB - 5 ma) (Mv.)					
	Init	168	340	680	1000L	50020003000
Min	92	81	80	80	80	80
5%	102	82	85	82	84	86
10%	105	87	89	89	89	89
25%	114	94	95	96	95	96
50%	123	104	105	107	107	106
75%	135	116	115	117	118	117
90%	146	124	127	128	129	128
95%	170	137	138	137	137	136
Max	265	170	167	169	167	167

HRS.	VCE (SAT) (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-8	-1	-8	-9	-6
5%	-	-36	-20	-34	-33	-19
10%	-	-20	-19	-18	-17	-17
25%	-	-18	-16	-15	-15	-16
50%	-	-16	-14	-14	-13	-14
75%	-	-13	-13	-12	-11	-11
90%	-	-10	-12	-11	-8	-9
95%	-	-10	-10	-10	-8	-9
Max	-	-6	-8	-5	-7	-7

HRS.	VBE (SAT) (IC - 50 ma, IB - 5 ma) (Mv.)					
	Init	168	340	680	1000L	50020003000
Min	774	618	623	698	599	649
5%	779	735	723	759	760	758
10%	782	759	744	763	763	761
25%	792	768	771	769	770	769
50%	797	777	777	777	777	777
75%	804	783	783	784	783	783
90%	815	791	793	794	793	793
95%	835	796	798	799	797	798
Max	908	840	843	843	843	840

HRS.	VBE (SAT) (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-23	-15	-14	-24	-15
5%	-	-13	-3	-7	-7	-4
10%	-	-4	-3	-3	-3	-4
25%	-	-3	-3	-3	-3	-3
50%	-	-3	-3	-2	-3	-3
75%	-	-3	-2	-2	-2	-3
90%	-	-2	-2	-2	-2	-2
95%	-	-2	-2	-2	-2	-2
Max	-	-2	-1	-1	-1	-2

HRS.	hFE (IC - 20 ma, VCE - 5V)					
	Init	168	340	680	1000L	50020003000
Min	48	49	49	49	50	49
5%	54	54	52	53	54	52
10%	59	59	58	55	60	57
25%	70	70	69	68	71	69
50%	86	85	82	85	86	84
75%	108	106	106	108	109	107
90%	124	123	122	121	126	123
95%	134	131	126	128	133	131
Max	140	141	138	137	139	135

HRS.	hFE (% Change from Initial)					
	Init	168	340	680	1000L	50020003000
Min	-	-16	-12	-13	-3	-19
5%	-	-7	-10	-9	-2	-3
10%	-	-4	-9	-7	-1	-4
25%	-	-1	-5	-4	-1	-3
50%	-	+1	-1	-2	0	+1
75%	-	+1	0	0	+1	+3
90%	-	+3	+2	+3	+5	+6
95%	-	+6	+4	+4	+6	+7
Max	-	+13	+5	+5	+6	+8

HRS.	hFE					
	Init	168	340	680	1000L	50020003000
Min						
5%						
10%						
25%						
50%						
75%						
90%						
95%						
Max						

PROCESS: C PRE-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419252 NO. OF UNITS: 10

		IC _Q (V _{CE} = 60V) (Nanoamps)				
ERS.	Unit	168	340	580	1000	1500
Min	0.1	0.7	0.2	0.1	0.2	0.5
5%	0.1	0.7	0.2	0.1	0.2	0.5
10%	0.1	0.7	0.2	0.1	0.2	0.5
25%	0.1	0.8	0.3	0.2	0.4	0.6
50%	0.1	1.1	0.8	0.7	0.7	1.1
75%	0.1	4.28	9.21	12.1	14.2	8.1
90%	0.6	7.42	9.67	9.42	9.12	9.64
95%	0.7	8.136	00	00	00	00
Max	0.7	8.136	00	00	00	00

		I _{EB} (V _{EB} = 5V) (Nanoamps)				
ERS.	Unit	168	340	580	1000	1500
Min	0.1	0.3	0.1	0.1	0.1	0.1
5%	0.1	0.3	0.1	0.1	0.1	0.1
10%	0.1	0.3	0.1	0.1	0.1	0.1
25%	0.2	0.7	0.2	0.4	0.2	0.2
50%	1.1	1.6	2.4	2.4	1.8	2.2
75%	4.9	4.6	6.1	5.8	5.3	5.3
90%	7.9	6.6	15.1	4.24	16.6	4.68
95%	8.2	6.6	16.1	4.62	18.9	4.68
Max	8.2	6.6	16.1	4.62	18.9	4.68

		BV _{CEO} (I _C = 0.1 ma) (Volts)				
ERS.	Unit	168	340	580	1000	1500
Min	52	51	51	11	12	51
5%	52	51	51	11	12	51
10%	53	52	52	15	16	51
25%	61	52	59	56	56	59
50%	74	74	67	67	67	78
75%	84	82	91	92	92	112
90%	149	141	145	145	145	915
95%	155	147	151	151	150	151
Max	155	147	151	151	150	151

		BV _{CEO} (% Change from Initial)				
ERS.	Unit	168	340	580	1000	1500
Min	-	-10	-27	-87	-85	-58
5%	-	-10	-27	-87	-85	-58
10%	-	-10	-27	-87	-85	-58
25%	-	-6	-4	-4	-4	-4
50%	-	-2	-2	-2	-2	-2
75%	-	0	0	0	0	0
90%	-	+6	+36	+31	+33	+35
95%	-	+6	+36	+31	+33	+35
Max	-	+6	+36	+31	+33	+35

		V _{CE} (SAT) (I _C = 50ma, I _B = 5 ma) (mv.)				
ERS.	Unit	168	340	580	1000	1500
Min	102	086	089	088	087	090
5%	102	086	089	088	087	090
10%	102	086	089	088	087	090
25%	106	093	092	093	092	094
50%	107	099	097	100	098	101
75%	155	136	139	139	135	136
90%	173	165	162	154	152	156
95%	174	167	163	160	153	157
Max	174	167	163	160	153	157

		V _{CE} (SAT) (% Change from Initial)				
ERS.	Unit	168	340	580	1000	1500
Min	-	-18	-15	-18	-16	-16
5%	-	-18	-15	-18	-16	-16
10%	-	-18	-15	-18	-16	-16
25%	-	-14	-13	-11	-12	-14
50%	-	-10	-12	-10	-12	-14
75%	-	-7	-8	-8	-10	-8
90%	-	-3	-6	-2	-5	-3
95%	-	-3	-6	-1	-5	-2
Max	-	-3	-6	-1	-5	-2

		V _{BE} (SAT) (I _C = 50 ma, I _B = 5 ma) (mv.)				
ERS.	Unit	168	340	580	1000	1500
Min	773	738	760	763	764	763
5%	773	738	760	763	764	763
10%	774	759	761	764	765	763
25%	781	770	770	773	767	770
50%	784	773	777	776	776	775
75%	813	796	798	800	801	799
90%	851	843	840	837	835	832
95%	854	846	843	840	838	835
Max	854	846	843	840	838	835

		V _{BE} (SAT) (% Change from Initial)				
ERS.	Unit	168	340	580	1000	1500
Min	-	-3	-2	-2	-2	-2
5%	-	-3	-2	-2	-2	-2
10%	-	-3	-2	-2	-2	-2
25%	-	-2	-2	-2	-2	-2
50%	-	-2	-2	-2	-2	-2
75%	-	-1	-1	-1	-1	-1
90%	-	0	0	0	0	0
95%	-	0	0	0	0	0
Max	-	0	0	0	0	0

		h _{FE} (I _C = 20 ma, V _{CE} = 5V)				
ERS.	Unit	168	340	580	1000	1500
Min	54	54	54	52	53	53
5%	54	54	54	52	53	53
10%	55	55	55	52	54	54
25%	71	71	71	63	69	68
50%	96	98	95	83	84	85
75%	101	104	102	90	100	102
90%	114	114	114	97	111	113
95%	115	115	116	98	112	114
Max	115	115	116	98	112	114

		h _{FE} (% Change from Initial)				
ERS.	Unit	168	340	580	1000	1500
Min	-	-1	-1	-1	-2	-2
5%	-	-1	-1	-1	-2	-2
10%	-	-1	-1	-1	-2	-2
25%	-	+1	0	-13	-3	-1
50%	-	+1	+1	-10	-2	0
75%	-	+3	+3	-8	0	+3
90%	-	+4	+4	-4	+2	+5
95%	-	+4	+4	-4	+2	+5
Max	-	+4	+4	-4	+2	+5

		BV _{CEO} (% Change from Initial)				
ERS.	Unit	168	340	580	1000	1500
Min	-	-	-	-	-	-
5%	-	-	-	-	-	-
10%	-	-	-	-	-	-
25%	-	-	-	-	-	-
50%	-	-	-	-	-	-
75%	-	-	-	-	-	-
90%	-	-	-	-	-	-
95%	-	-	-	-	-	-
Max	-	-	-	-	-	-

PROCESS: C PHB-SCREEN STRESS: 25 Kg Centrifuge Only.

OPERATING POWER CONDITION:

200 mw, 30 V, 150°C.

CELL NO.: 419253 NO. OF UNITS: 20

		VCE (VCE = 60V) (Microamps)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1			
5%	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1			
10%	0.1	0.7	0.1	0.2	0.1	0.1	0.1	0.1			
25%	0.1	0.8	0.3	0.3	0.2	0.1	0.1	0.1			
50%	0.2	1.3	0.6	0.5	0.5	0.2	0.2	0.3			
75%	0.4	1.7	1.7	1.4	1.1	1.2	0.8	0.9			
90%	2.3	9.0	8.4	4.8	3.3	3.9	3.8	5.6			
95%	3.4	9.5	9.5	9.5	9.5	6.2	6.4	3.2			
MAX	3.4	∞	∞	∞	∞	6.3	6.2	3.2			

		I _{CEO} (V _{CE} = 5V) (Microamps)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1			
5%	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1			
10%	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1			
25%	0.2	0.5	0.1	0.2	0.2	0.2	0.3	0.1			
50%	0.5	1.1	0.7	0.7	0.5	0.5	0.5	0.6			
75%	2.3	3.3	2.5	2.7	2.3	1.6	1.3	1.7			
90%	4.9	7.6	4.7	4.9	4.2	4.6	5.1	7.0			
95%	6.7	11.3	7.5	7.4	6.3	6.5	6.5	11.3			
MAX	6.8	11.3	7.6	7.5	6.3	6.6	6.6	11.3			

		BV _{CEO} (I _C = 0.1 ma) (Volts)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	59	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
5%	59	0.4	0.4	0.4	0.4	0.4	0.4	0.4			
10%	63	0.4	0.4	0.4	0.4	0.4	0.4	0.4			
25%	70	0.7	0.7	0.7	0.7	0.7	0.7	0.7			
50%	75	0.7	0.7	0.7	0.7	0.7	0.7	0.7			
75%	85	0.8	0.8	0.8	0.8	0.8	0.8	0.8			
90%	114	1.8	1.3	1.3	1.3	1.3	1.3	1.3			
95%	139	1.5	1.9	1.3	1.3	1.3	1.3	1.3			
MAX	139	1.5	1.9	1.3	1.3	1.3	1.3	1.3			

		BV _{CEO} (% Change from Initial)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	-	-99	-99	-99	-10	-11	-11	-42			
5%	-	-94	-94	-94	-87	-11	-11	-41			
10%	-	-7	-7	-38	-38	-9	-13	-11			
25%	-	-4	-5	-7	-8	-5	-7	-8			
50%	-	-1	-2	-2	-2	-2	-2	-2			
75%	-	0	0	-1	0	0	0	0			
90%	-	123	123	160	159	160	160	163			
95%	-	142	142	164	166	166	166	166			
MAX	-	142	142	164	166	166	166	166			

		VCE (SAT) (I _C = 50 ma, I _B = 5 ma) (Mv.)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	0.08	0.75	0.74	0.70	0.73	0.76	0.76	0.74			
5%	0.13	0.75	0.75	0.71	0.73	0.76	0.76	0.74			
10%	102	0.84	0.84	0.84	0.84	0.84	0.84	0.84			
25%	104	0.87	0.89	0.90	0.87	0.90	0.89	0.89			
50%	119	0.88	0.88	0.88	0.88	0.88	0.88	0.88			
75%	138	1.22	1.22	1.26	1.20	1.28	1.24	1.25			
90%	151	1.31	1.32	1.33	1.29	1.35	1.35	1.33			
95%	159	1.34	1.32	1.35	1.31	1.36	1.36	1.36			
MAX	159	1.34	1.32	1.35	1.31	1.36	1.36	1.36			

		VCE (SAT) (% Change from Initial)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	-	-30	-26	-23	-31	-26	-26	-26			
5%	-	-30	-26	-23	-31	-26	-26	-26			
10%	-	-21	-22	-20	-25	-19	-19	-20			
25%	-	-18	-18	-16	-19	-17	-17	-18			
50%	-	-16	-14	-13	-14	-13	-14	-14			
75%	-	-11	-11	-9	-11	-9	-11	-11			
90%	-	-9	-9	-6	-10	-6	-6	-6			
95%	-	124	124	124	124	124	124	124			
MAX	-	124	124	124	124	124	124	124			

		VBE (SAT) (I _C = 50 ma, I _B = 5 ma) (Mv.)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	705	782	759	760	754	760	756	714			
5%	709	782	759	760	754	760	756	716			
10%	782	782	782	782	782	782	782	782			
25%	784	786	784	786	786	786	786	786			
50%	799	798	794	795	798	798	798	798			
75%	810	798	794	795	798	798	798	798			
90%	814	798	794	795	798	798	798	798			
95%	818	801	795	794	798	798	798	798			
MAX	818	801	795	794	798	798	798	798			

		VBE (SAT) (% Change from Initial)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	-	-5	-5	-4	-4	-4	-4	-4			
5%	-	-5	-5	-4	-4	-4	-4	-4			
10%	-	-3	-4	-4	-4	-4	-4	-4			
25%	-	-3	-3	-3	-3	-3	-3	-3			
50%	-	-2	-2	-2	-2	-2	-2	-2			
75%	-	-2	-2	-2	-2	-2	-2	-2			
90%	-	-1	-2	-2	-2	-2	-2	-2			
95%	-	148	148	148	148	148	148	148			
MAX	-	148	148	148	148	148	148	148			

		h _{FE} (I _C = 20 ma, V _{CE} = 5V)									
SPS.	Init	168	340	580	1000	1500	2000	3000			
		168	340	580	1000	1500	2000	3000			
Min	51	51	51	51	51	51	51	51			
5%	51	51	51	51	51	51	51	51			
10%	52	53	53	53	53	53	53	53			
25%	63	60	63	59	57	58	58	58			
50%	102	102	103	104	100	95	95	95			
75%	116	117	118	115	117	118	118	118			
90%	124	124	124	124	124	124	124	124			
95%	125	126	125	127	123	128	128	128			
MAX	125	126	125	127	123	128	128	128			

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PROCESS: C PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 800 mw, 30 V, 25°C.

CELL NO.: 419254 NO. OF UNITS: 10

		ICBO (V _{CB} ~ 60V) (Nanoamps)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.1	0.1	0.1	0.1
25%	0.1	0.1	0.1	0.1	0.1
50%	0.1	0.1	0.1	0.1	0.1
75%	0.1	0.1	0.1	0.1	0.1
90%	0.1	0.1	0.1	0.1	0.1
95%	0.1	0.1	0.1	0.1	0.1
Max	0.1	0.1	0.1	0.1	0.1

		IEBO (V _{EB} ~ 5V) (Nanoamps)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	0.1	0.1	0.1	0.1	0.1
5%	0.1	0.1	0.1	0.1	0.1
10%	0.1	0.1	0.1	0.1	0.1
25%	0.1	0.1	0.1	0.1	0.1
50%	0.1	0.1	0.1	0.1	0.1
75%	0.1	0.1	0.1	0.1	0.1
90%	0.1	0.1	0.1	0.1	0.1
95%	0.1	0.1	0.1	0.1	0.1
Max	0.1	0.1	0.1	0.1	0.1

		BV _{CEO} (I _C ~ 0.1 ma) (Volts)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	62	61	62	62	61
5%	62	61	62	62	61
10%	62	61	62	62	61
25%	62	61	62	62	61
50%	62	61	62	62	61
75%	62	61	62	62	61
90%	62	61	62	62	61
95%	62	61	62	62	61
Max	62	61	62	62	61

		BV _{CEO} (% Change from Initial)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	-	-49	-28	-2	-2
5%	-	-49	-28	-2	-2
10%	-	-49	-28	-2	-2
25%	-	-49	-28	-2	-2
50%	-	-49	-28	-2	-2
75%	-	-49	-28	-2	-2
90%	-	-49	-28	-2	-2
95%	-	-49	-28	-2	-2
Max	-	-49	-28	-2	-2

		VCE (SAT) (I _C ~ 50ma, I _B ~ 5 ma) (Mv.)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	102	103	103	103	103
5%	102	103	103	103	103
10%	102	103	103	103	103
25%	102	103	103	103	103
50%	102	103	103	103	103
75%	102	103	103	103	103
90%	102	103	103	103	103
95%	102	103	103	103	103
Max	102	103	103	103	103

		VCE (SAT) (% Change from Initial)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	-	-19	-17	-18	-15
5%	-	-19	-17	-18	-15
10%	-	-19	-17	-18	-15
25%	-	-19	-17	-18	-15
50%	-	-19	-17	-18	-15
75%	-	-19	-17	-18	-15
90%	-	-19	-17	-18	-15
95%	-	-19	-17	-18	-15
Max	-	-19	-17	-18	-15

		VBE (SAT) (I _C ~ 50 ma, I _B ~ 5 ma) (Mv.)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	783	764	763	765	765
5%	783	764	763	765	765
10%	783	764	763	765	765
25%	783	764	763	765	765
50%	783	764	763	765	765
75%	783	764	763	765	765
90%	783	764	763	765	765
95%	783	764	763	765	765
Max	783	764	763	765	765

		VBE (SAT) (% Change from Initial)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	-	-3	-3	-3	-3
5%	-	-3	-3	-3	-3
10%	-	-3	-3	-3	-3
25%	-	-3	-3	-3	-3
50%	-	-3	-3	-3	-3
75%	-	-3	-3	-3	-3
90%	-	-3	-3	-3	-3
95%	-	-3	-3	-3	-3
Max	-	-3	-3	-3	-3

		h _{FE} (I _C ~ 20 ma, VCE ~ 5V)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	51	53	43	49	51
5%	51	53	43	49	51
10%	51	53	43	49	51
25%	51	53	43	49	51
50%	51	53	43	49	51
75%	51	53	43	49	51
90%	51	53	43	49	51
95%	51	53	43	49	51
Max	51	53	43	49	51

		h _{FE} (% Change from Initial)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	-	-30	-53	-28	-30
5%	-	-30	-53	-28	-30
10%	-	-30	-53	-28	-30
25%	-	-30	-53	-28	-30
50%	-	-30	-53	-28	-30
75%	-	-30	-53	-28	-30
90%	-	-30	-53	-28	-30
95%	-	-30	-53	-28	-30
Max	-	-30	-53	-28	-30

		h _{FE} (% Change from Initial)			
RES.	Init	168	340	680	1000L50020003000
		168	340	680	1000L50020003000
Min	-	-	-	-	-
5%	-	-	-	-	-
10%	-	-	-	-	-
25%	-	-	-	-	-
50%	-	-	-	-	-
75%	-	-	-	-	-
90%	-	-	-	-	-
95%	-	-	-	-	-
Max	-	-	-	-	-

PROCESS: C PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 700 mw, 30 V, 25°C.

CELL NO.: 419255 NO. OF UNITS: 20

HRS.	IC _{EO} (V _{CE} - 60V) (Nanoamps)				
	Init	168	340	680	1000
Min	0.1	0.4	0.1	0.1	0.1
5%	0.1	0.4	0.1	0.1	0.1
10%	0.1	0.6	0.1	0.1	0.1
25%	0.1	0.7	0.1	0.1	0.1
50%	0.1	0.9	0.3	0.4	0.4
75%	0.2	1.7	1.3	2.2	2.5
90%	0.5	20.2	174.4	96.4	81.3
95%	1.2	99.9	608.8	433.2	358.1
Max	1.2	6228	6000	6000	6000

HRS.	IEBO (V _{EB} - 5V) (Nanoamps)				
	Init	168	340	680	1000
Min	0.1	0.3	0.1	0.1	0.1
5%	0.1	0.3	0.1	0.1	0.1
10%	0.1	0.3	0.1	0.1	0.1
25%	0.3	0.6	0.2	0.3	0.4
50%	1.1	1.7	1.1	1.1	1.2
75%	2.5	2.9	2.3	2.3	2.5
90%	3.9	4.9	4.0	3.9	3.9
95%	5.4	6.1	5.6	5.3	5.5
Max	5.5	6.2	5.7	5.4	5.6

HRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	Init	168	340	680	1000
Min	61	61	61	60	60
5%	62	61	61	60	60
10%	63	63	63	63	63
25%	68	67	67	68	68
50%	78	77	76	76	76
75%	101	106	97	96	97
90%	119	91	110	110	109
95%	142	86	138	131	117
Max	144	86	140	132	118

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-24	-10	-11	-15
5%	-	-23	-10	-11	-15
10%	-	-9	-8	-8	-11
25%	-	-5	-4	-7	-7
50%	-	-1	-1	-2	-2
75%	-	0	0	-1	-1
90%	-	+82	0	+1	+6
95%	-	+108	+1	+4	+10
Max	-	+109	+1	+4	+10

HRS.	V _{CE} (SAT) (I _C - 50ma, I _B - 5 ma) (mv.)				
	Init	168	340	680	1000
Min	996	920	877	887	889
5%	996	923	887	887	889
10%	103	884	888	890	892
25%	109	893	893	895	896
50%	122	101	103	103	105
75%	127	115	115	117	119
90%	142	146	119	124	123
95%	162	938	148	152	149
Max	163	980	150	153	150

HRS.	V _{CE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-83	-22	-22	-20
5%	-	-80	-22	-22	-20
10%	-	-21	-21	-21	-20
25%	-	-18	-17	-16	-14
50%	-	-13	-13	-12	-11
75%	-	-9	-9	-7	-7
90%	-	-6	-6	-2	-5
95%	-	+655	-5	-1	-4
Max	-	+690	-5	-1	-4

HRS.	V _{BE} (SAT) (I _C - 50 ma, I _B - 5 ma) (mv.)				
	Init	168	340	680	1000
Min	777	258	262	260	259
5%	777	258	262	260	259
10%	779	260	269	263	260
25%	783	267	270	269	268
50%	794	277	273	273	270
75%	800	286	281	283	278
90%	813	298	291	298	296
95%	823	299	297	296	294
Max	823	299	297	296	294

HRS.	V _{BE} (SAT) (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-4	-4	-4	-4
5%	-	-4	-4	-4	-4
10%	-	-4	-3	-3	-4
25%	-	-3	-3	-3	-3
50%	-	-2	-2	-2	-2
75%	-	-2	-2	-2	-2
90%	-	+13	-2	-1	-2
95%	-	+14	-1	0	-1
Max	-	+14	-1	0	-1

HRS.	h _{FE} (I _C - 20 ma, V _{CE} - 5V)				
	Init	168	340	680	1000
Min	36	49	48	48	20
5%	36	49	49	49	20
10%	48	58	58	58	28
25%	64	67	65	69	56
50%	84	85	84	87	88
75%	91	92	100	95	104
90%	118	119	115	121	123
95%	126	123	122	126	128
Max	126	123	122	126	128

HRS.	h _{FE} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-6	-9	-3	-25
5%	-	-6	-9	-3	-25
10%	-	-5	-6	0	-44
25%	-	-2	-3	0	-26
50%	-	+2	+2	+2	+8
75%	-	+3	+4	+5	+7
90%	-	+7	+14	+11	+19
95%	-	+120	+131	+146	+149
Max	-	+126	+137	+153	+156

HRS.	BV _{CEO} (I _C - 0.1 ma) (Volts)				
	Init	168	340	680	1000
Min	61	61	61	60	60
5%	62	61	61	60	60
10%	63	63	63	63	63
25%	68	67	67	68	68
50%	78	77	76	76	76
75%	101	106	97	96	97
90%	119	91	110	110	109
95%	142	86	138	131	117
Max	144	86	140	132	118

HRS.	BV _{CEO} (% Change from Initial)				
	Init	168	340	680	1000
Min	-	-24	-10	-11	-15
5%	-	-23	-10	-11	-15
10%	-	-9	-8	-8	-11
25%	-	-5	-4	-7	-7
50%	-	-1	-1	-2	-2
75%	-	0	0	-1	-1
90%	-	+82	0	+1	+6
95%	-	+108	+1	+4	+10
Max	-	+109	+1	+4	+10

PROCESS: C PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 500 mw, 30 V, 25°C.

CELL NO.: 419256 NO. OF UNITS: 55

IS.	ICBO (VCB - 60V) (Nanoamps)				
	Init	168	340	580	1000
1	0.1	0.4	0.2	0.1	0.1
2	0.1	0.5	0.8	0.1	0.1
3	0.1	0.5	1.0	0.1	0.1
4	0.1	0.7	1.0	0.3	0.1
5	0.1	0.9	1.3	0.5	0.6
6	0.4	1.7	1.7	1.2	1.3
7	0.6	3.4	4.3	3.2	3.4
8	1.1	10.7	21.7	21.7	21.7
9	1.2	00	00	00	00

IS.	IEBO (VEB - 5V) (Nanoamps)				
	Init	168	340	580	1000
1	0.1	0.1	0.2	0.1	0.1
2	0.1	0.2	0.3	0.1	0.1
3	0.1	0.3	0.3	0.1	0.1
4	0.2	0.4	0.5	0.1	0.1
5	0.5	1.2	0.9	0.6	0.6
6	1.6	2.5	2.5	1.9	2.3
7	5.1	6.5	6.0	5.9	5.7
8	7.1	8.1	7.5	7.5	7.3
9	7.2	12.5	14.1	16.5	17.5

IS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	580	1000
1	53	04	52	01	01
2	58	53	54	45	54
3	63	61	61	59	61
4	71	70	71	71	71
5	78	82	80	81	80
6	97	99	99	99	99
7	130	133	132	131	133
8	149	143	143	141	140
9	156	153	147	145	144

IS.	BVCEO (% Change from Initial)				
	Init	168	340	580	1000
1	-	-94	-45	-99	-77
2	-	-5	-6	-44	-11
3	-	-3	-3	-6	-7
4	-	-1	-1	-2	-3
5	-	-1	-1	-1	-1
6	-	0	0	0	0
7	-	+4	+10	+14	+10
8	-	+18	+20	+28	+32
9	-	+26	+23	+51	+47

IS.	VCE(SAT) (IC-50ma, IB-5 ma) (mv.)				
	Init	168	340	580	1000
1	103	83	85	85	84
2	105	87	87	89	87
3	107	89	89	89	89
4	112	94	96	98	96
5	122	104	105	107	106
6	136	116	117	117	117
7	148	132	133	133	133
8	157	135	141	144	144
9	203	147	147	152	152

IS.	VCE(SAT) (% Change from Initial)				
	Init	168	340	580	1000
1	-	-52	-32	-48	-48
2	-	-24	-20	-23	-23
3	-	-19	-17	-18	-18
4	-	-17	-15	-15	-15
5	-	-14	-14	-13	-13
6	-	-11	-11	-9	-9
7	-	-9	-9	-8	-8
8	-	-9	-7	-3	-4
9	-	-7	+10	+8	+15

IS.	VBE(SAT) (IC-50 ma, IB-5 ma) (mv.)				
	Init	168	340	580	1000
1	718	616	010	760	756
2	782	759	760	762	760
3	785	764	766	766	765
4	789	769	769	769	769
5	797	775	777	777	776
6	803	785	785	783	784
7	811	790	794	795	791
8	821	798	797	797	797
9	956	813	814	813	813

IS.	VBE(SAT) (% Change from Initial)				
	Init	168	340	580	1000
1	-	-25	-99	-19	-19
2	-	-9	-3	-4	-4
3	-	-3	-3	-3	-3
4	-	-3	-3	-3	-3
5	-	-2	-2	-2	-2
6	-	-2	-2	-2	-2
7	-	-2	-2	-2	-2
8	-	-2	-2	-2	-2
9	-	-2	-1	+1	+1

IS.	hFE (IC - 20 ma, VCE - 5V)				
	Init	168	340	580	1000
1	52	53	20	53	53
2	56	57	55	57	57
3	60	63	60	63	63
4	68	71	70	68	71
5	79	87	80	82	82
6	102	100	95	101	101
7	119	115	111	116	117
8	126	126	128	128	127
9	140	141	139	141	141

IS.	hFE (% Change from Initial)				
	Init	168	340	580	1000
1	-	-31	-84	-48	-36
2	-	-6	-42	-12	-10
3	-	-3	-11	-3	-1
4	-	0	-6	-1	0
5	-	+2	+1	+1	+2
6	-	+3	+3	+6	+7
7	-	+8	+30	+9	+11
8	-	+11	+100	+107	+113
9	-	+114	+140	+141	+141

IS.	BVCEO (IC - 0.1 ma) (Volts)				
	Init	168	340	580	1000
1	53	04	52	01	01
2	58	53	54	45	54
3	63	61	61	59	61
4	71	70	71	71	71
5	78	82	80	81	80
6	97	99	99	99	99
7	130	133	132	131	133
8	149	143	143	141	140
9	156	153	147	145	144

IS.	BVCEO (% Change from Initial)				
	Init	168	340	580	1000
1	-	-94	-45	-99	-77
2	-	-5	-6	-44	-11
3	-	-3	-3	-6	-7
4	-	-1	-1	-2	-3
5	-	-1	-1	-1	-1
6	-	0	0	0	0
7	-	+4	+10	+14	+10
8	-	+18	+20	+28	+32
9	-	+26	+23	+51	+47

PROCESS: C PRE-SCREEN STRESS: None (Control).

OPERATING POWER CONDITION: 400 mw, 30 V, 150°C.

CELL NO.: 419257 NO. OF UNITS: 10

		ICEO (V _{CE} - 60V) (Nanamps)				
RS.	Init	168	340	580	1000L	50020003000
4in	0.1	0.6	0.2	0.1	0.1	0.1
5%	0.1	0.6	0.2	0.1	0.1	0.1
10%	0.1	0.6	0.2	0.1	0.1	0.1
20%	0.1	0.8	0.4	0.2	0.1	0.2
30%	0.3	1.0	0.5	0.2	0.2	0.3
40%	0.4	1.2	0.5	0.2	0.2	0.3
50%	0.4	1.2	0.5	0.2	0.2	0.3
60%	0.4	1.2	0.5	0.2	0.2	0.3
70%	0.4	1.2	0.5	0.2	0.2	0.3
80%	0.4	1.2	0.5	0.2	0.2	0.3
90%	0.4	1.2	0.5	0.2	0.2	0.3
Max	1.0	1.2	0.5	0.2	0.2	0.3

		IEBO (V _{EB} - 5V) (Nanamps)				
RS.	Init	168	340	580	1000L	50020003000
4in	0.1	0.7	0.2	0.2	0.1	0.6
5%	0.1	0.7	0.2	0.2	0.1	0.6
10%	0.1	0.7	0.2	0.2	0.1	0.6
20%	0.2	1.3	0.9	0.7	0.3	0.6
30%	1.6	2.6	3.2	3.6	4.4	3.5
40%	4.7	6.0	5.8	7.4	25.2	32.0
50%	7.1	4.8	8.7	9.1	7.9	19.4
60%	7.2	32.9	8.6	1.0	0.0	35.9
70%	7.2	52.9	8.6	1.0	0.0	35.9
80%	7.2	52.9	8.6	1.0	0.0	35.9
90%	7.2	52.9	8.6	1.0	0.0	35.9
Max	7.2	52.9	8.6	1.0	0.0	35.9

		BV _{CEO} (I _C - 0.1 ma) (Volts)				
RS.	Init	168	340	580	1000L	50020003000
4in	71	0.7	0.7	0.7	2.2	6.7
5%	71	0.7	0.7	0.7	2.2	6.7
10%	72	1.0	1.3	1.3	2.7	6.8
20%	84	6.3	2.4	7.5	7.5	8.0
30%	91	3.4	2.8	8.7	8.8	9.6
40%	113	4.5	1.4	9.6	11.7	14.2
50%	147	11.2	1.6	15.3	17.6	17.6
60%	151	11.3	1.6	15.8	17.7	17.8
70%	151	11.3	1.6	15.8	17.7	17.8
80%	151	11.3	1.6	15.8	17.7	17.8
90%	151	11.3	1.6	15.8	17.7	17.8
Max	151	11.3	1.6	15.8	17.7	17.8

		BV _{CEO} (% Change from Initial)				
RS.	Init	168	340	580	1000L	50020003000
4in	-	-96	-95	-95	-85	-12
5%	-	-96	-95	-95	-85	-12
10%	-	-96	-95	-95	-85	-12
20%	-	-96	-95	-95	-85	-12
30%	-	-96	-95	-95	-85	-12
40%	-	-96	-95	-95	-85	-12
50%	-	-96	-95	-95	-85	-12
60%	-	-96	-95	-95	-85	-12
70%	-	-96	-95	-95	-85	-12
80%	-	-96	-95	-95	-85	-12
90%	-	-96	-95	-95	-85	-12
Max	-	-96	-95	-95	-85	-12

		VCE(SAT) (I _C -50ma, I _B -5 ma) (Mv.)				
RS.	Init	168	340	580	1000L	50020003000
4in	100	0.04	0.19	0.95	0.91	0.88
5%	100	0.04	0.19	0.95	0.91	0.88
10%	101	0.13	0.90	0.95	0.92	0.89
20%	110	0.97	0.96	0.99	0.98	0.95
30%	122	1.06	1.07	1.09	1.05	1.04
40%	133	1.16	1.20	1.21	1.19	1.16
50%	139	1.31	1.28	1.32	1.32	1.33
60%	139	1.31	1.29	1.33	1.33	1.34
70%	139	1.31	1.29	1.33	1.33	1.34
80%	139	1.31	1.29	1.33	1.33	1.34
90%	139	1.31	1.29	1.33	1.33	1.34
Max	139	1.31	1.29	1.33	1.33	1.34

		VCE(SAT) (% Change from Initial)				
RS.	Init	168	340	580	1000L	50020003000
4in	-	-96	-16	-13	-14	-13
5%	-	-96	-16	-13	-14	-13
10%	-	-96	-16	-13	-14	-13
20%	-	-96	-16	-13	-14	-13
30%	-	-96	-16	-13	-14	-13
40%	-	-96	-16	-13	-14	-13
50%	-	-96	-16	-13	-14	-13
60%	-	-96	-16	-13	-14	-13
70%	-	-96	-16	-13	-14	-13
80%	-	-96	-16	-13	-14	-13
90%	-	-96	-16	-13	-14	-13
Max	-	-96	-16	-13	-14	-13

		VBE(SAT) (I _C -50 ma, I _B -5 ma) (Mv.)				
RS.	Init	168	340	580	1000L	50020003000
4in	779	6.18	2.66	2.69	2.68	2.65
5%	779	6.18	2.66	2.69	2.68	2.65
10%	779	6.18	2.66	2.69	2.68	2.65
20%	783	2.21	2.22	2.24	2.23	2.28
30%	796	2.80	2.80	2.80	2.82	2.82
40%	799	2.84	2.85	2.85	2.87	2.87
50%	805	2.94	2.96	2.96	2.97	2.98
60%	805	2.94	2.96	2.96	2.97	2.98
70%	805	2.94	2.96	2.96	2.97	2.98
80%	805	2.94	2.96	2.96	2.97	2.98
90%	805	2.94	2.96	2.96	2.97	2.98
Max	805	2.94	2.96	2.96	2.97	2.98

		VBE(SAT) (% Change from Initial)				
RS.	Init	168	340	580	1000L	50020003000
4in	-	-21	-2	-3	-2	-3
5%	-	-21	-2	-3	-2	-3
10%	-	-21	-2	-3	-2	-3
20%	-	-21	-2	-3	-2	-3
30%	-	-21	-2	-3	-2	-3
40%	-	-21	-2	-3	-2	-3
50%	-	-21	-2	-3	-2	-3
60%	-	-21	-2	-3	-2	-3
70%	-	-21	-2	-3	-2	-3
80%	-	-21	-2	-3	-2	-3
90%	-	-21	-2	-3	-2	-3
Max	-	-21	-2	-3	-2	-3

		hFE (I _C - 20 ma, V _{CE} - 5V)				
RS.	Init	168	340	580	1000L	50020003000
4in	41	4.9	4.0	3.2	3.2	3.3
5%	41	4.9	4.0	3.2	3.2	3.3
10%	41	4.9	4.0	3.2	3.2	3.3
20%	42	5.0	4.1	3.3	3.3	3.3
30%	63	6.5	5.6	5.0	4.9	4.6
40%	81	8.2	7.7	7.0	8.2	8.7
50%	111	11.3	10.6	10.1	11.0	10.9
60%	129	13.0	12.4	12.0	12.7	13.2
70%	131	13.1	12.6	12.1	12.8	13.1
80%	131	13.1	12.6	12.1	12.8	13.1
90%	131	13.1	12.6	12.1	12.8	13.1
Max	131	13.1	12.6	12.1	12.8	13.1

		hFE (% Change from Initial)				
RS.	Init	168	340	580	1000L	50020003000
4in	-	-6	-24	-40	-42	-46
5%	-	-6	-24	-40	-42	-46
10%	-	-6	-24	-40	-42	-46
20%	-	-6	-24	-40	-42	-46
30%	-	-6	-24	-40	-42	-46
40%	-	-6	-24	-40	-42	-46
50%	-	-6	-24	-40	-42	-46
60%	-	-6	-24	-40	-42	-46
70%	-	-6	-24	-40	-42	-46
80%	-	-6	-24	-40	-42	-46
90%	-	-6	-24	-40	-42	-46
Max	-	-6	-24	-40	-42	-46

		BV _{CEO} (I _C - 0.1 ma) (Volts)				
RS.	Init	168	340	580	1000L	50020003000
4in	71	0.7	0.7	0.7	2.2	6.7
5%	71	0.7	0.7	0.7	2.2	6.7
10%	72	1.0	1.3	1.3	2.7	6.8
20%	84	6.3	2.4	7.5	7.5	8.0
30%	91	3.4	2.8	8.7	8.8	9.6
40%	113	4.5	1.4	9.6	11.7	14.2
50%	147	11.2	1.6	15.3	17.6	17.6
60%	151	11.3	1.6	15.8	17.7	17.8
70%	151	11.3	1.6	15.8	17.7	17.8
80%	151	11.3	1.6	15.8	17.7	17.8
90%	151	11.3	1.6	15.8	17.7	17.8
Max	151	11.3	1.6	15.8	17.7	17.8

		BV _{CEO} (% Change from Initial)				
RS.	Init	168	340	580	1000L	50020003000
4in	-	-96	-95	-95	-85	-12
5%	-	-96	-95	-95	-85	-12
10%	-	-96	-95	-95	-85	-12
20%	-	-96	-95	-95	-85	-12
30%	-	-96	-95	-95	-85	-12
40%	-	-96	-95	-95	-85	-12
50%	-	-96	-95	-95	-85	-12
60%	-	-96	-95	-95	-85	-12
70%	-	-96	-95	-95	-85	-12
80%	-	-96	-95	-95	-85	-12
90%	-	-96	-95	-95	-85	-12
Max	-	-96	-95	-95	-85	-12

OPERATING POWER CONDITION:

200 mV, 30 V, 150°C.

CELL NO.: 419258 NO. OF UNITS: 19

		ICB2 (V _{CB} = 60V) (nanosec)					
TRF.	Unit	109	340	1009	1009	1009	1009
100	0.1	0.4	0.1	0.1	0.1	0.1	0.1
25	0.1	0.4	0.1	0.1	0.1	0.1	0.1
100	0.1	0.4	0.1	0.1	0.1	0.1	0.1
25	0.1	0.4	0.1	0.1	0.1	0.1	0.1
20	0.2	0.9	0.5	0.5	0.5	0.5	0.5
15	0.6	1.5	1.5	1.5	1.5	1.5	1.5
90	1.9	23.1	2.9	4.4	8.0	2.1	3.0
25	5.8	70.0	5.4	8.0	8.0	8.0	8.0
25	5.8	70.0	5.4	8.0	8.0	8.0	8.0

LEGO (VEB - 5V) (Random)						
Unit	168	340	680	10000	50000	30000
0.1	0.4	0.1	0.1	0.1	0.1	0.1
0.1	0.4	0.1	0.1	0.1	0.1	0.1
0.1	0.4	0.1	0.1	0.1	0.1	0.1
0.3	0.6	0.1	0.1	0.1	0.1	0.3
0.9	1.9	1.3	1.1	0.8	0.8	1.1
4.6	5.1	4.0	3.5	2.9	4.7	4.6
6.9	7.8	7.1	7.4	6.9	7.0	8.3
7.8	8.0	7.5	7.6	7.5	7.7	9.9
7.8	8.0	7.5	7.6	7.5	7.7	9.9

B ^v FeO (I _C ~ 0.1 mμ)(Volts)				
Unit	168	340	680	1000
63	62	62	66	02 01 01 01
63	62	62	66	02 01 01 01
68	65	65	62	61 62 61
71	70	70	69	68 67 68 67
79	74	77	73	73 73 73 72
100	84	89	82	82 85 84 86
133	117	126	126	125 125 126 125
137	134	131	129	127 126 126 127
137	134	131	129	127 126 126 127

BVCTO (% Change from Initial)	10000150002000030000				
	168	340	520	694	868
—	-42	-40	-94	-98	-100
—	-47	-40	-94	-98	-100
—	-6	-7	-40	-42	-36
—	-3	-4	-6	-7	-7
—	-1	-2	-2	-3	-3
—	0	0	-1	-1	-1
—	0	0	0	0	0
—	+1	+1	0	0	0
—	+1	+1	0	0	0

VCE(SAF) (IC-500A, I _B =5 ma.) (H.V.)								
FREQ.	Init	168	340	560	1000	1500	2000	3000
107	014	091	093	092	090	093	088	
107	014	091	093	092	090	093	088	
109	091	093	093	093	092	094	082	
114	095	095	099	097	093	102	097	
119	113	103	104	101	102	103	103	
135	114	110	114	113	113	113	112	
144	128	123	125	123	125	130	125	
154	114	115	135	132	131	144	135	
154	134	135	135	132	131	144	135	

VCE (SAT) (% Change from Initial)							
Unit	163	340	680	1000	1500	2000	3000
—	-88	-24	-24	-25	-25	-24	-26
—	-88	-24	-24	-25	-25	-24	-26
—	-24	-22	-22	-23	-24	-22	-22
—	-17	-18	-16	-17	-18	-16	-17
—	-15	-15	-13	-15	-15	-13	-12
—	-11	-12	-11	-14	-13	-10	-13
—	-8	-8	-8	-11	-11	-8	-8
—	-7	-4	-6	-6	-8	-4	-4
—	-7	-4	-6	-6	-8	-4	-4

Unit	168	340	590	1000	1500	2000	3000
782	698	767	765	770	789	762	767
782	698	767	765	770	789	762	767
784	766	770	767	770	785	764	765
787	770	773	770	775	767	770	768
793	775	777	777	777	773	773	773
799	783	787	784	784	787	779	778
803	786	787	785	786	783	780	778
811	786	787	785	787	784	779	779
811	786	787	785	787	784	779	779

V _{BE} (SAT)(% Change from Initial)				
Init	168	340	680	1000
—	-72	-44	-4	-5
—	-72	-4	-4	-5
—	-4	-3	-3	-4
—	-4	-3	-2	-3
—	-1	-2	-2	-2
—	-2	-2	-1	-2
—	-1	-1	-1	-2
—	0	0	0	-1
—	0	0	0	-1

hrs.	hFE (IC - 20 uA, VCE - 5V)				
	Init	168	3140	380	1000
10	35	54	54	52	53
15	35	54	54	52	53
20	34	54	55	52	54
25	38	60	60	57	59
30	80	80	79	76	77
75	104	102	104	104	107
90	120	116	114	110	111
95	120	121	120	114	122
Max	120	121	120	114	126

hFE (% Change from Initial)				
Init	163	340	680	1000
—	-7	-14	-9	-6
—	-7	-14	-9	-6
—	-3	-7	-8	-5
—	-1	-1	-6	-3
—	0	+1	-5	-2
—	+2	+2	-1	+2
—	+39	+41	+36	+55
—	+56	+56	+49	+58
—	+56	+56	+49	+58

[illegible][illegible]