RIR's IN:- 73748/73749

RIR's OUT:- 73748/73749

PARTS HISTORY LOG

Radiation Testing

PROGRAMME:- XMM

PART TYPE:- UC1834J and UC1834L

RADIATION REPORT:- RD 218

IGG TASK NUMBER:- 1500

SUMMARY OF TEST RESULTS

The UC1834J samples both failed the electrical specification after a total dose of 50KRad(Si). One sample of UC1834L failed in a similar manner at 75 KRad(Si) where the other sample failed after 100KRad(Si).

NB:- Two of the UC1834L samples failed V_{os} and CMRR at the initial electrical measurement stage prior to any radiation exposure.

Radiation Report Number:- RD 218

Project:- XMM

Part Type:- UC1834J and UC1834L Date Codes:- 9210(DIL), 9208(LCC)

Manufacturer:- Unitrode/U IGG Task No:- 1500

Project Approval of Lot Traveller:-

Signed..... Date.....

Position.....

Serial Number Range:-

DIL- 255 through 257 (inclusive)
LCC- 34 through 203 (not inclusive)

I certify that the subject component has been tested in accordance with the following radiation specifications:-

Test Method - ESA/SCC22900 ISSUE- 4 DATE- Jan '95

Irradiation Test Plan- XM-PL-IGG-0057 ISSUE- 1 DATE- Dec '96

Closed/Approved NCR No:- N a/A

Approved Waiver No:- WAR N/A

Signed... P.A. Mussell... Date.. 6/3/97..

Upscreening Engineer

Signed... ... Date.. 6/3/97..

Upscreening Manager

RADIATION REPORT NUMBER:- RD 218 DATE:- 27.2.97

PROJECT:- XMM RIR's IN:- 73748/73749

PART NUMBER:- UC1834J and UC1834L MANUFACTURER:- Unitrode/U

PROCUREMENT LEVEL:- SAX-149-004-01B and ST2943

DATE CODES:- 9210(DIL), 9208(LCC)

TEST METHOD:- ESA/SCC22900 ISSUE- 4 DATE- Jan '95
TEST PLAN:- XM-PL-IGG-0057 ISSUE- 1 DATE- Dec '96
START QUANTITY:- 6

No.	Test (Sample Size)	XM-PL-IGG-0057 Test Method and Conditions		Date in	Qty in	Date out	Qty out	SIGNED Op/QA
1	Serialisation and Selection of Control Sample (100%)	Control Samples= DIL - SN255 LCC - SN34		27/1/97	6	27/1/97	4 + 2 CONTROL SAMPLES	IGG 16 CT
2	Initial Electrical Measurements (100% read and record)	Table A Testing at IGG J=DIL L=LCC	J	27/1/97	2	27/1/97	2	IGG 16 CT
			L	27/1/97	2	27/1/97	0	
3	Initial Electrical Measurements (100% read and record)	Table A Testing at ERA	J	29/1/97	2	29/1/97	2	IGG 16 CT
			L	29/1/97	2	29/1/97	0	
4	Set-up and apply Bias per Figure 1	Verify Bias Circuit and conditions (in-situ) for the 4 test samples	J	30/1/97	2	30/1/97	2	IGG 16 CT
			L	30/1/97	2	30/1/97	2	
5	Irradiation 1 (4 samples)	Dose=10kRADSi Rate= 10RADSi per second Time= 1000sec	J	30/1/97	2	30/1/97	2	IGG 16 CT
			L	30/1/97	2	30/1/97	2	
6	Interim 1 Electrical Measurements (100% read and record)	Table A. Bias to be maintained until testing is performed. Tdwell=10mins maximum	J	30/1/97	2	30/1/97	2	IGG 16 CT
			L	30/1/97	2	30/1/97	0	

Report No: RD 218	Part Type: UC1834 J and L	Date: 27.2.97

No.	Test (Sample Size)	XM-PL-IGG-0057 Test Method and Conditions		Date in	Qty in	Date out	Qty out	SIGNED Op/QA
7	Irradiation 2 (4 samples)	As Test 5	J	30/1/97	2	30/1/97	2	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	2	P&R
8	Interim 2 Electrical Measurements (100% read and record)	As Test 6	J	30/1/97	2	30/1/97	2	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	0	P&R
9	Irradiation 3 (4 samples)	As Test 5	J	30/1/97	2	30/1/97	2	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	2	P&R
10	Interim 3 Electrical Measurements (100% read and record)	As Test 6	J	30/1/97	2	30/1/97	2	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	0	P&R
11	Irradiation 4 (4 samples)	Dose=20kRADSi Rate= 10RADSi per second Time=2000secs	J	30/1/97	2	30/1/97	2	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	2	P&R
12	Interim 4 Electrical Measurements (100% read and record)	As Test 6	J	30/1/97	2	30/1/97	0	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	0	P&R
13	Irradiation 5 (4 samples)	Dose=25kRADSi Rate= 10RADSi per second Time=2500secs	J	30/1/97	2	30/1/97	2	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	2	P&R
14	Interim 5 Electrical Measurements (100% read and record)	As Test 6	J	30/1/97	2	30/1/97	0	P&R IGG 16 CT
			L	30/1/97	2	30/1/97	0	P&R

Report No: RD 218	Part Type: UC1834 J and L	Date: 27.2.97

No.	Test (Sample Size)	XM-PL-IGG-0057 Test Method and Conditions		Date in	Qty in	Date out	Qty out	SIGNED Op/QA
15	Irradiation 6 (4 samples)	As Test 13	J	30/1/97	2	30/1/97	2	IGG 16 CT
			L	30/1/97	2	30/1/97	2	
16	Final Electrical Measurements (100% read and record)	As Test 6 At ERA	J	30/1/97	2	30/1/97	0	IGG 16 CT
			L	30/1/97	2	30/1/97	0	
17	Annealing Test (4 samples)	24hr minimum at +25°C (record exact time)	J	30/1/97	2	31/1/97	2	IGG 16 CT
			L	30/1/97	2	31/1/97	2	
18	Post Annealing Electrical Measurements (100% read and record)	Table A	J	31/1/97	2	31/1/97	0	IGG 16 CT
			L	31/1/97	2	31/1/97	0	
19	Accelerated Aging under bias (4 samples)	168 hours at +100±5°C	J	31/1/97	2	7/2/97	2	IGG 16 CT
			L	31/1/97	2	7/2/97	2	
20	Post Aging Electrical Measurements (100% read and record)	Table A	J	7/2/97	2	7/2/97	2	IGG 16 CT
			L	7/2/97	2	7/2/97	1	
21	Test Report Collation					6/3/97		IGG 2 CT
22	Test Report Approval					6/3/97		IGG 2 CT
23	NOTES:-							

Report No: RD 218 Part Type: UC1834 J and L Date: 27.2.97

FAILURE LIST AND APPLICABLE NCR

Test No.	Serial Number(s)	Failed Parameter and Failure Mode	Applicable NCR
2	58, 203	FAIL V_{OS} AND CMRR.	–
12	256, 257 –	FAIL $+I_{BIAS}$, $-I_{BIAS}$, -2 V REF AND +1.5V REF.	–
14	203 –	FAILS $+I_{BIAS}$, $-I_{BIAS}$, -2 V REF AND +1.5 V REF.	–
16	58 .	FAILS $-I_{BIAS}$.	–
18	58	FAILS $+I_{BIAS}$.	–

Report No: RD 218 Part Type: UC1834 J and L Date: 27.2.97

TEST EQUIPMENT LIST

Item, Type Number and Serial Number	CT Inventory Number	Function	Calibration Due
Item: Radiation Source Type No: Cobalt 60 Serial No: N/A	ERA's Facility	Irradiation	1 / 1 /1998
Item: 5Z Type No: M3000 Serial No: 884769	CT339	ATE	28 / 3 /1997
Item: THURLBY Type No: PL320 Serial No: 2690623	CT288	PSU	22 / 4 /1997
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
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Item: Type No: Serial No:			/ /199

RADIATION TEST SUMMARY

PART TYPE : UC1834

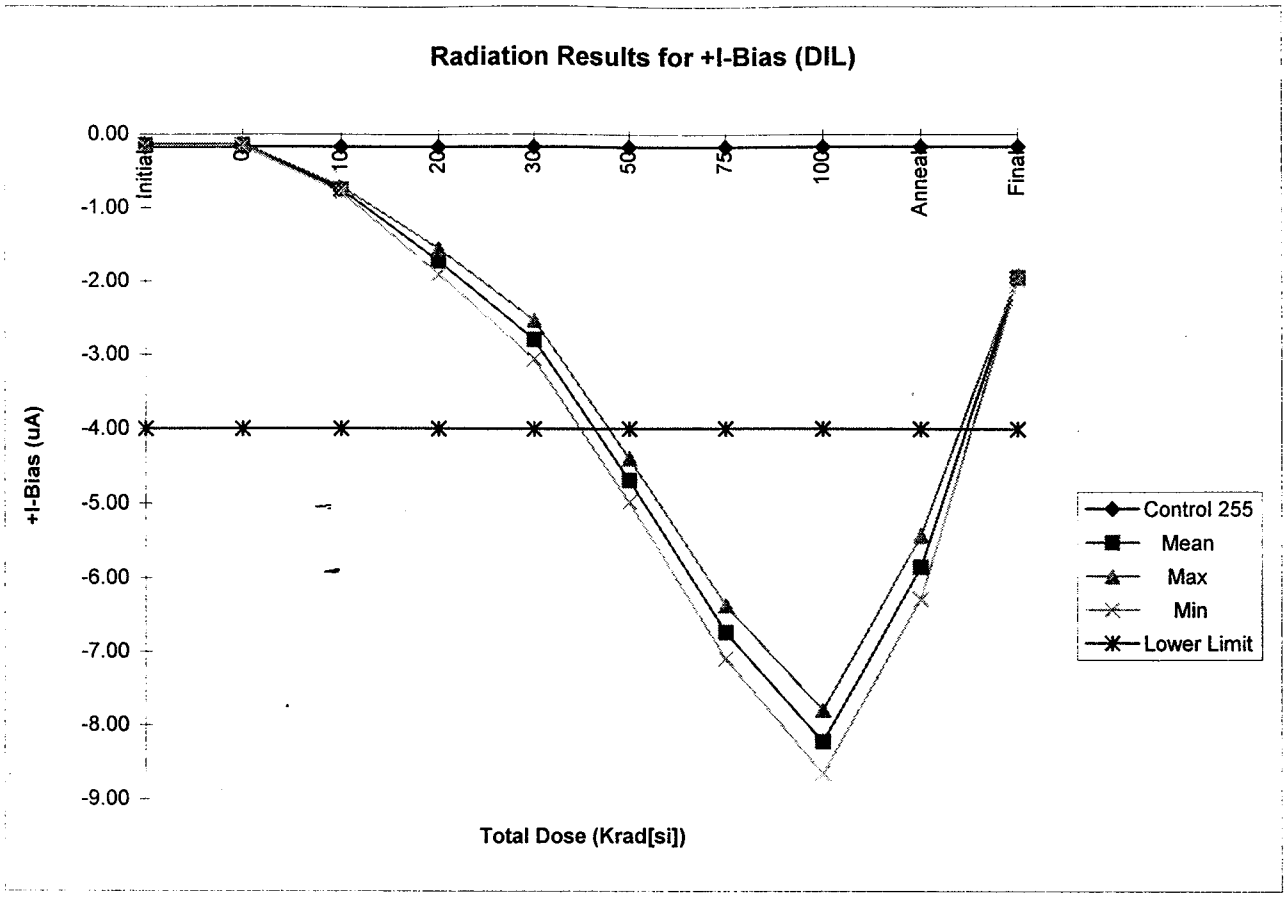
DESCRIPTION : LINEAR REGULATOR

REPORT NO. : RD 218

PARAMETERS PLOTTED :

+I-BIAS
-I-BIAS
-2V REF
+1.5V REF
V-FT
I-IN

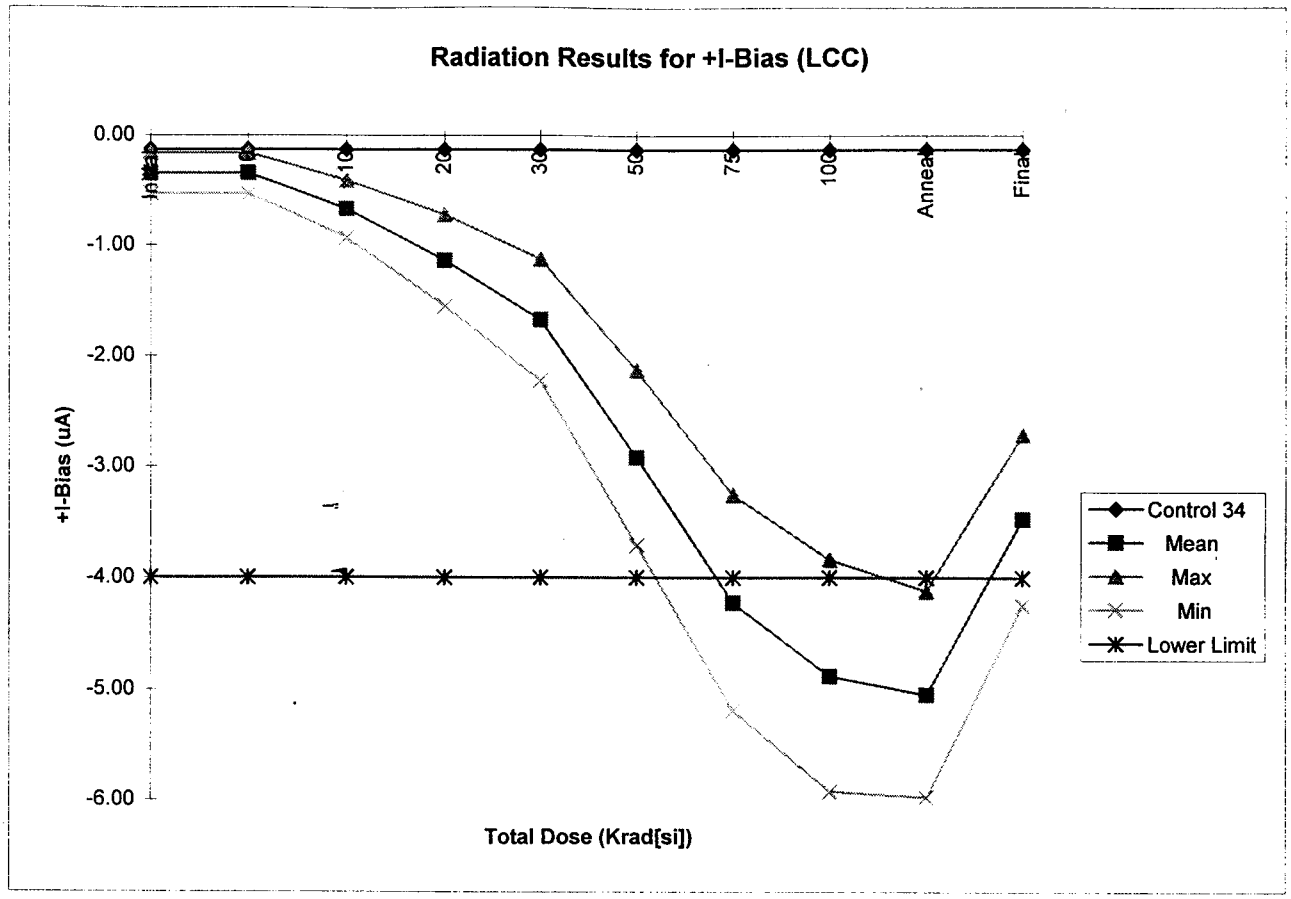
NOTE : The results for the remaining parameters showed no significant change and hence plots were not considered necessary.



Dose (Krad)	Control 255	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-0.17	-0.15	-0.13	-0.16	-4	-	0.02
0	-0.17	-0.15	-0.13	-0.16	-4	-	0.02
10	-0.17	-0.75	-0.71	-0.79	-4	-	0.06
20	-0.17	-1.73	-1.55	-1.90	-4	-	0.25
30	-0.17	-2.80	-2.53	-3.06	-4	-	0.37
50	-0.17	-4.70	-4.40	-4.99	-4	-	0.42
75	-0.17	-6.74	-6.37	-7.10	-4	-	0.52
100	-0.17	-8.22	-7.79	-8.65	-4	-	0.61
Anneal	-0.17	-5.86	-5.43	-6.28	-4	-	0.60
Final	-0.17	-1.95	-1.92	-1.98	-4	-	0.04

Lot size for statistics : 2 devices

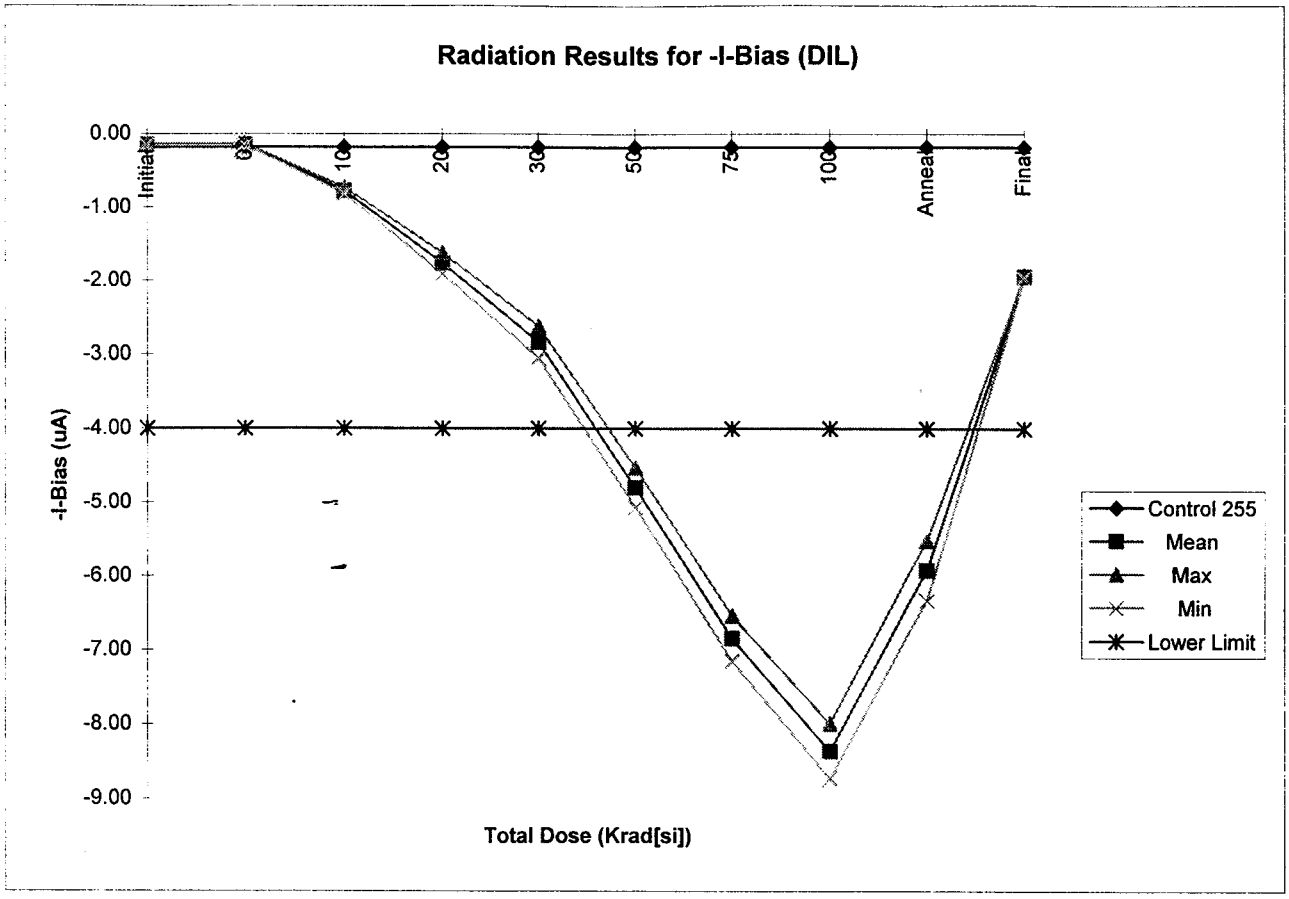
RD 218 Date code 9210



Dose (Krad)	Control 34	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-0.13	-0.35	-0.16	-0.53	-4	-	0.26
0	-0.13	-0.35	-0.16	-0.53	-4	-	0.26
10	-0.13	-0.67	-0.41	-0.93	-4	-	0.37
20	-0.13	-1.14	-0.72	-1.55	-4	-	0.59
30	-0.13	-1.67	-1.12	-2.22	-4	-	0.78
50	-0.13	-2.92	-2.13	-3.71	-4	-	1.12
75	-0.13	-4.23	-3.26	-5.19	-4	-	1.36
100	-0.13	-4.88	-3.84	-5.92	-4	-	1.47
Anneal	-0.13	-5.05	-4.12	-5.97	-4	-	1.31
Final	-0.13	-3.48	-2.71	-4.24	-4	-	1.08

Lot size for statistics : 2 devices

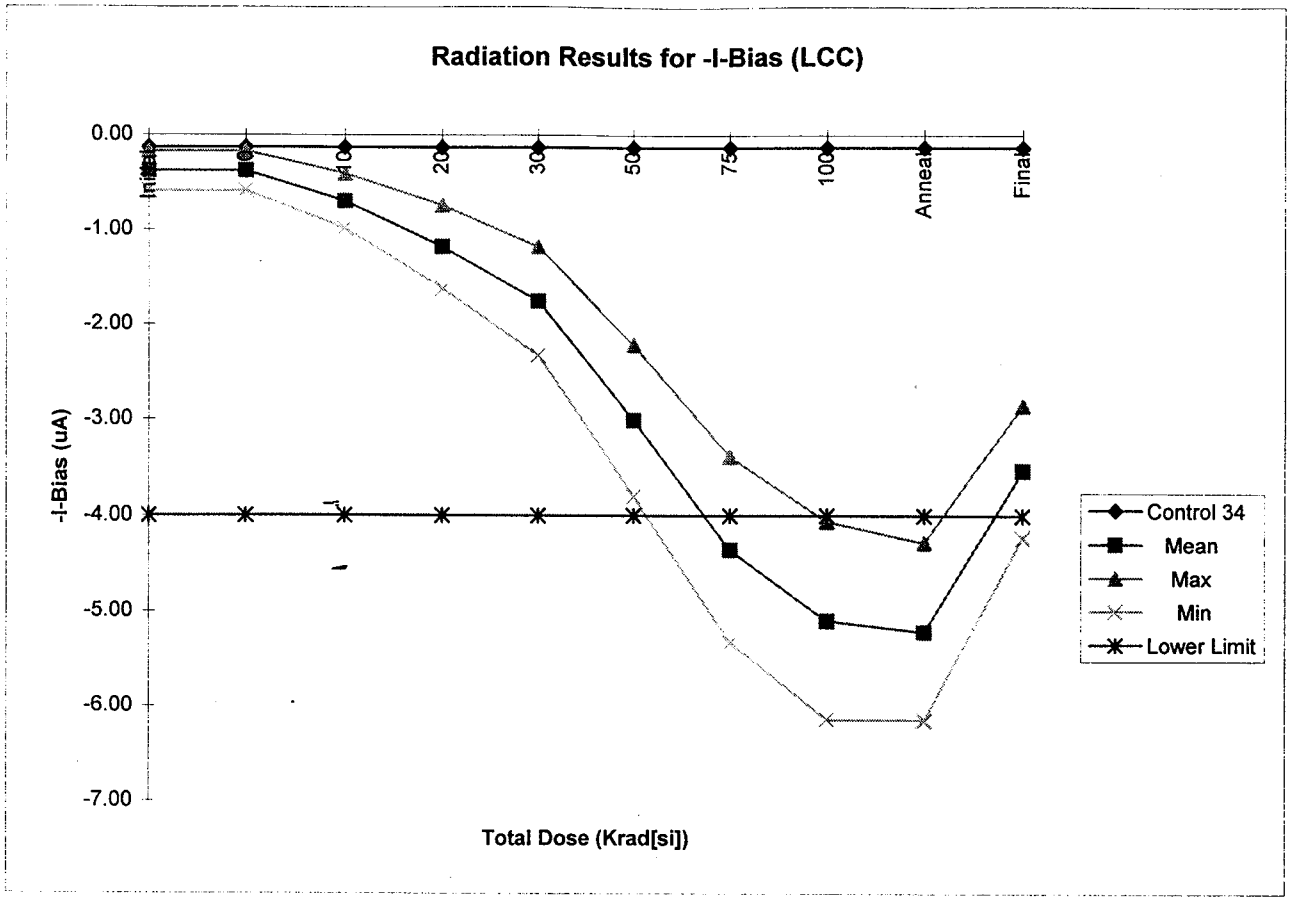
RD 218 Date code 9208



Dose (Krad)	Control 255	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-0.18	-0.15	-0.14	-0.16	-4	-	0.01
0	-0.18	-0.15	-0.14	-0.16	-4	-	0.01
10	-0.18	-0.78	-0.73	-0.82	-4	-	0.06
20	-0.18	-1.77	-1.62	-1.91	-4	-	0.21
30	-0.18	-2.84	-2.62	-3.05	-4	-	0.30
50	-0.18	-4.80	-4.53	-5.07	-4	-	0.38
75	-0.18	-6.85	-6.54	-7.15	-4	-	0.43
100	-0.18	-8.36	-7.99	-8.73	-4	-	0.52
Anneal	-0.18	-5.93	-5.52	-6.33	-4	-	0.57
Final	-0.18	-1.94	-1.92	-1.96	-4	-	0.03

Lot size for statistics : 2 devices

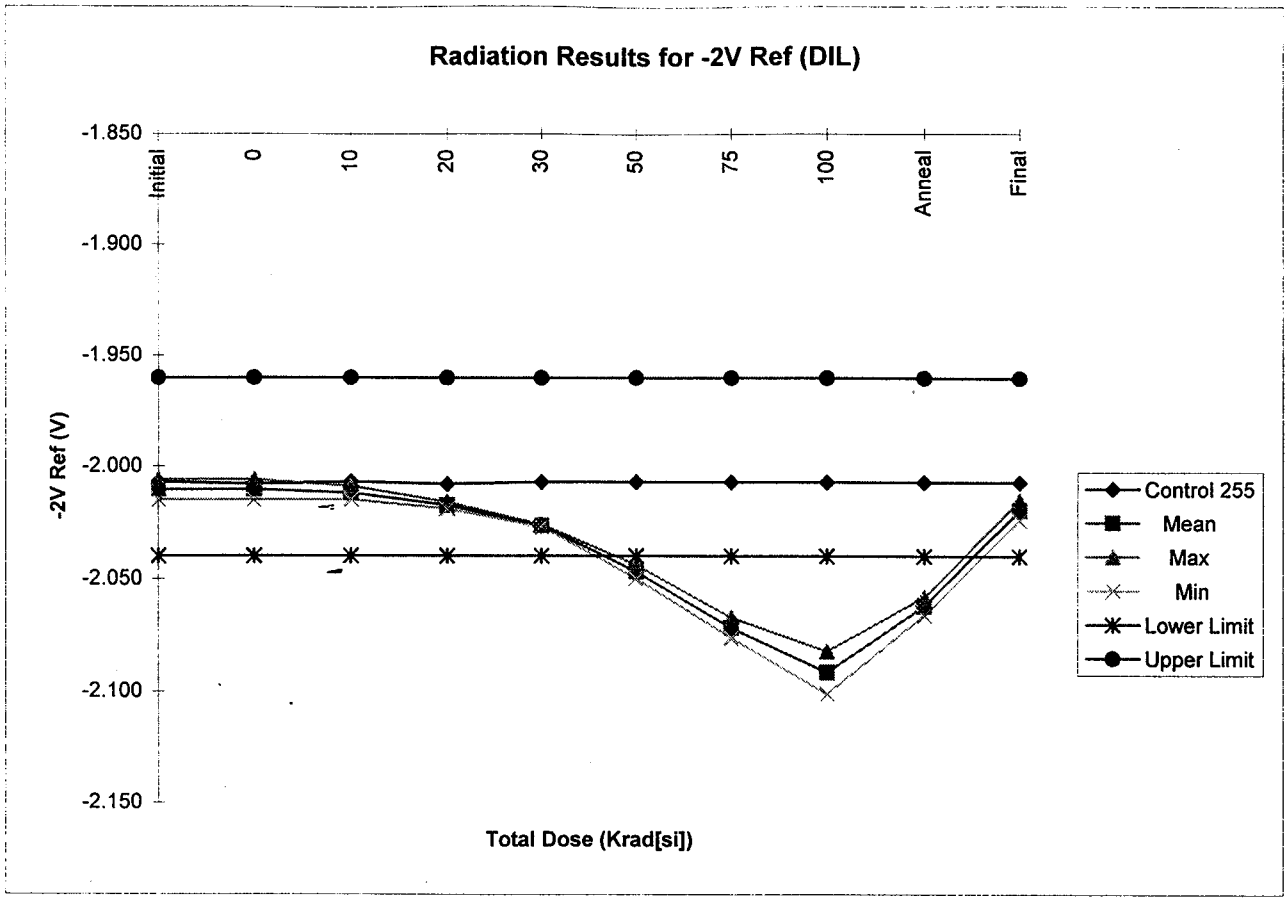
RD 218 Date code 9210



Dose (Krad)	Control 34	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-0.13	-0.38	-0.17	-0.59	-4	-	0.30
0	-0.13	-0.38	-0.17	-0.59	-4	-	0.30
10	-0.13	-0.70	-0.41	-0.99	-4	-	0.41
20	-0.13	-1.18	-0.74	-1.62	-4	-	0.62
30	-0.13	-1.76	-1.18	-2.33	-4	-	0.81
50	-0.13	-3.01	-2.22	-3.80	-4	-	1.12
75	-0.13	-4.36	-3.39	-5.32	-4	-	1.36
100	-0.13	-5.10	-4.06	-6.14	-4	-	1.47
Anneal	-0.13	-5.22	-4.28	-6.15	-4	-	1.32
Final	-0.13	-3.54	-2.85	-4.22	-4	-	0.97

Lot size for statistics : 2 devices

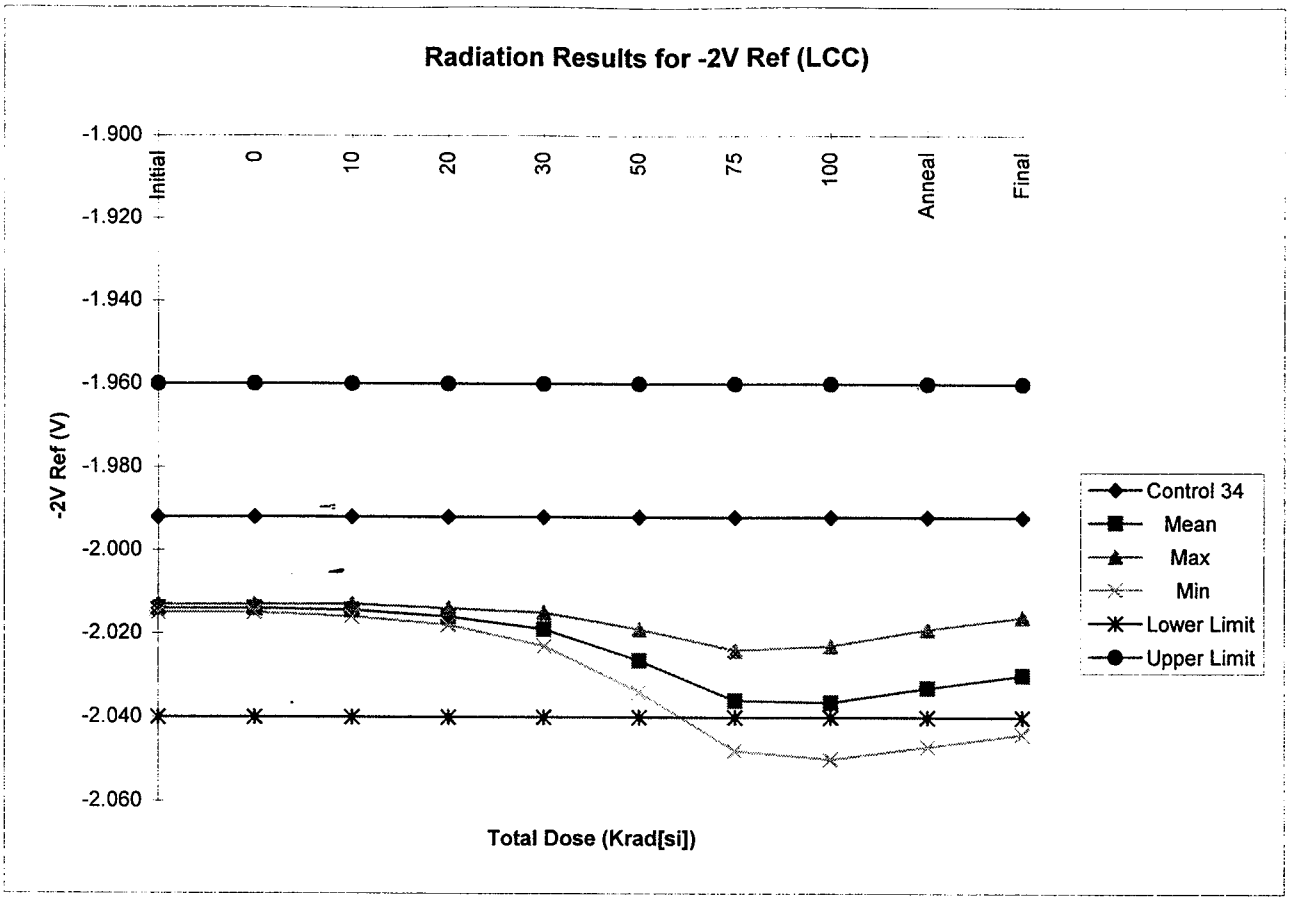
RD 218 Date code 9208



Dose (Krad)	Control 255	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(V)	(V)	(V)	(V)	(V)	(V)	
Initial	-2.007	-2.011	-2.006	-2.015	-2.04	-1.96	0.006
0	-2.008	-2.011	-2.006	-2.015	-2.04	-1.96	0.006
10	-2.007	-2.012	-2.009	-2.015	-2.04	-1.96	0.004
20	-2.008	-2.018	-2.016	-2.019	-2.04	-1.96	0.002
30	-2.007	-2.027	-2.026	-2.027	-2.04	-1.96	0.001
50	-2.007	-2.047	-2.044	-2.050	-2.04	-1.96	0.004
75	-2.007	-2.072	-2.067	-2.076	-2.04	-1.96	0.006
100	-2.007	-2.092	-2.082	-2.101	-2.04	-1.96	0.013
Anneal	-2.007	-2.062	-2.058	-2.066	-2.04	-1.96	0.006
Final	-2.007	-2.020	-2.015	-2.024	-2.04	-1.96	0.006

Lot size for statistics : 2 devices

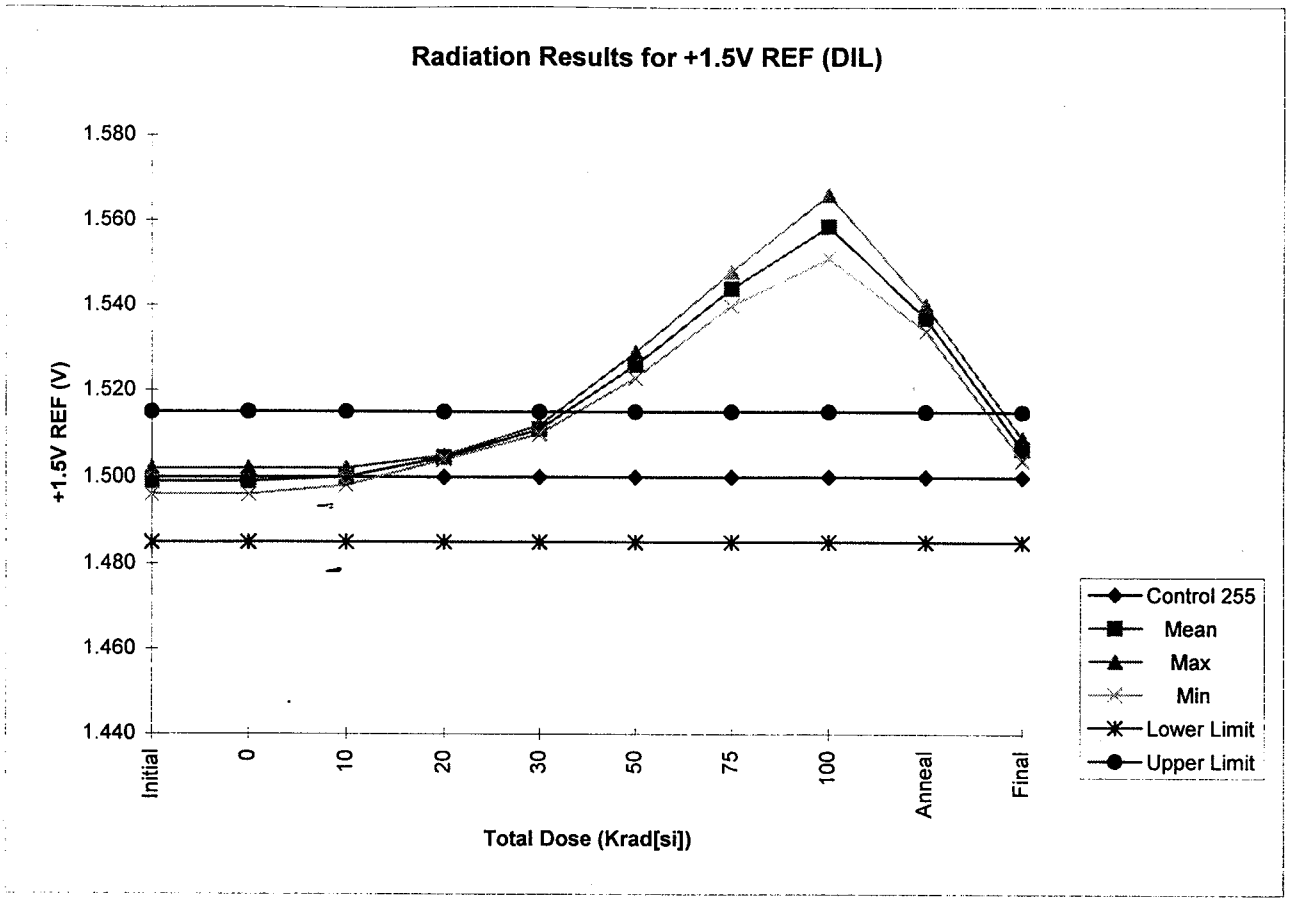
RD 218 Date code 9210



Dose (Krad)	Control 34	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(V)	(V)	(V)	(V)	(V)	(V)	
Initial	-1.992	-2.014	-2.013	-2.015	-2.04	-1.96	0.001
0	-1.992	-2.014	-2.013	-2.015	-2.04	-1.96	0.001
10	-1.992	-2.015	-2.013	-2.016	-2.04	-1.96	0.002
20	-1.992	-2.016	-2.014	-2.018	-2.04	-1.96	0.003
30	-1.992	-2.019	-2.015	-2.023	-2.04	-1.96	0.006
50	-1.992	-2.027	-2.019	-2.034	-2.04	-1.96	0.011
75	-1.992	-2.036	-2.024	-2.048	-2.04	-1.96	0.017
100	-1.992	-2.037	-2.023	-2.050	-2.04	-1.96	0.019
Anneal	-1.992	-2.033	-2.019	-2.047	-2.04	-1.96	0.020
Final	-1.992	-2.030	-2.016	-2.044	-2.04	-1.96	0.020

Lot size for statistics : 2 devices

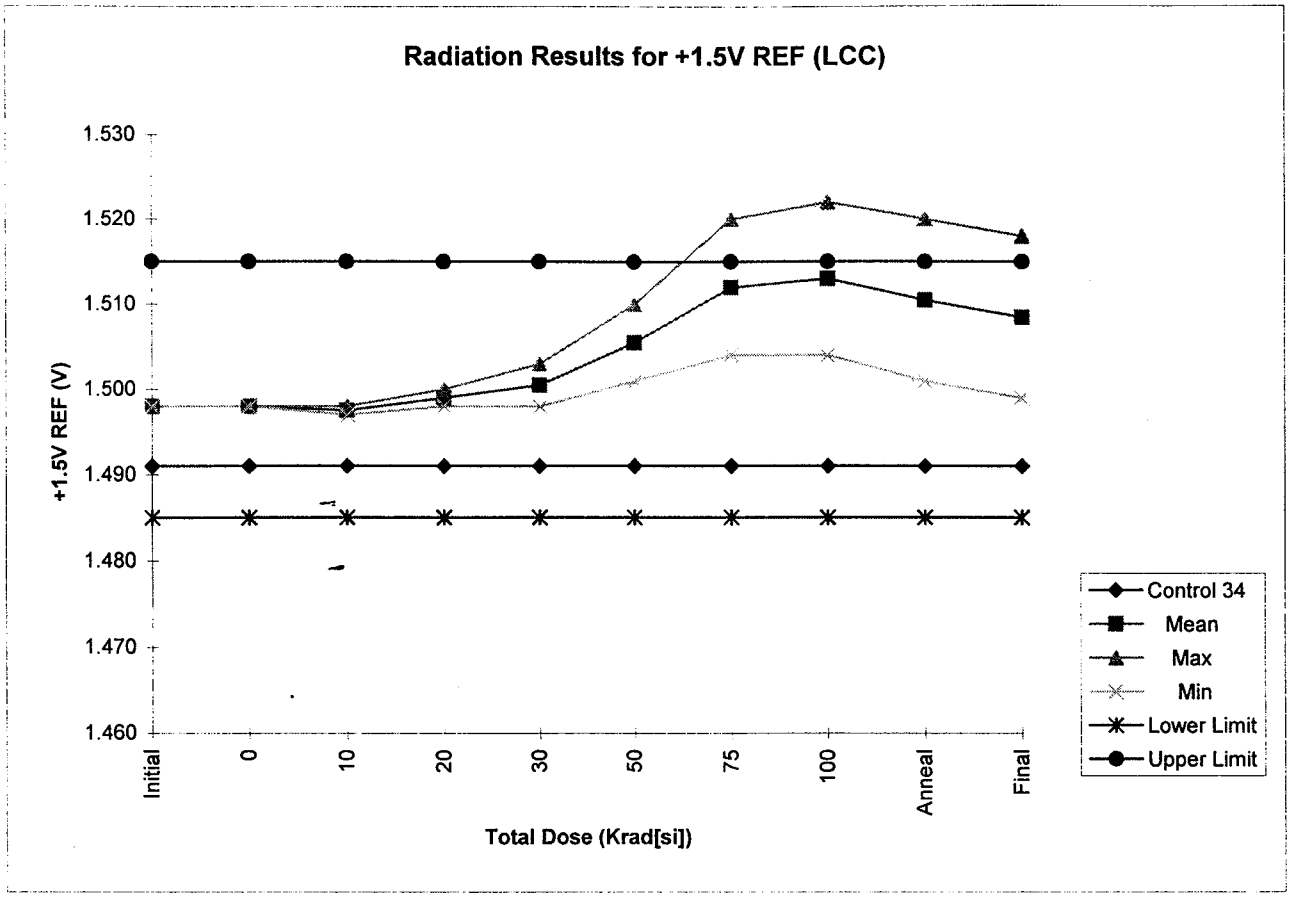
RD 218 Date code 9208



Dose (Krad)	Control 255	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(V)	(V)	(V)	(V)	(V)	(V)	
Initial	1.500	1.499	1.502	1.496	1.485	1.515	0.004
0	1.500	1.499	1.502	1.496	1.485	1.515	0.004
10	1.500	1.500	1.502	1.498	1.485	1.515	0.003
20	1.500	1.505	1.505	1.504	1.485	1.515	0.001
30	1.500	1.511	1.512	1.510	1.485	1.515	0.001
50	1.500	1.526	1.529	1.523	1.485	1.515	0.004
75	1.500	1.544	1.548	1.540	1.485	1.515	0.006
100	1.500	1.559	1.566	1.551	1.485	1.515	0.011
Anneal	1.500	1.537	1.540	1.534	1.485	1.515	0.004
Final	1.500	1.507	1.509	1.504	1.485	1.515	0.004

Lot size for statistics : 2 devices

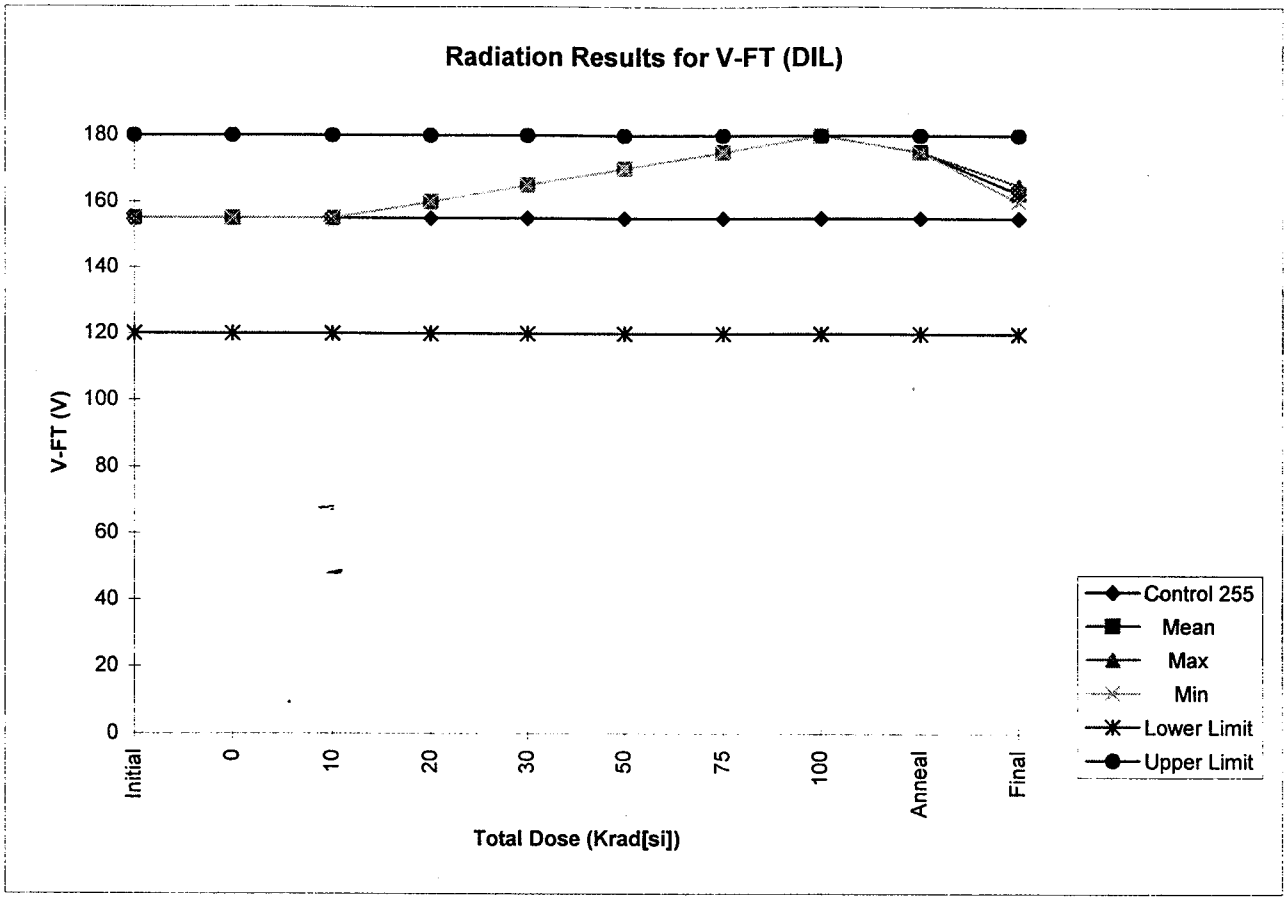
RD 218 Date code 9210



Dose (Krad)	Control 34	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(V)	(V)	(V)	(V)	(V)	(V)	
Initial	1.491	1.498	1.498	1.498	1.485	1.515	0.000
0	1.491	1.498	1.498	1.498	1.485	1.515	0.000
10	1.491	1.498	1.498	1.497	1.485	1.515	0.001
20	1.491	1.499	1.500	1.498	1.485	1.515	0.001
30	1.491	1.501	1.503	1.498	1.485	1.515	0.004
50	1.491	1.506	1.510	1.501	1.485	1.515	0.006
75	1.491	1.512	1.520	1.504	1.485	1.515	0.011
100	1.491	1.513	1.522	1.504	1.485	1.515	0.013
Anneal	1.491	1.511	1.520	1.501	1.485	1.515	0.013
Final	1.491	1.509	1.518	1.499	1.485	1.515	0.013

Lot size for statistics : 2 devices

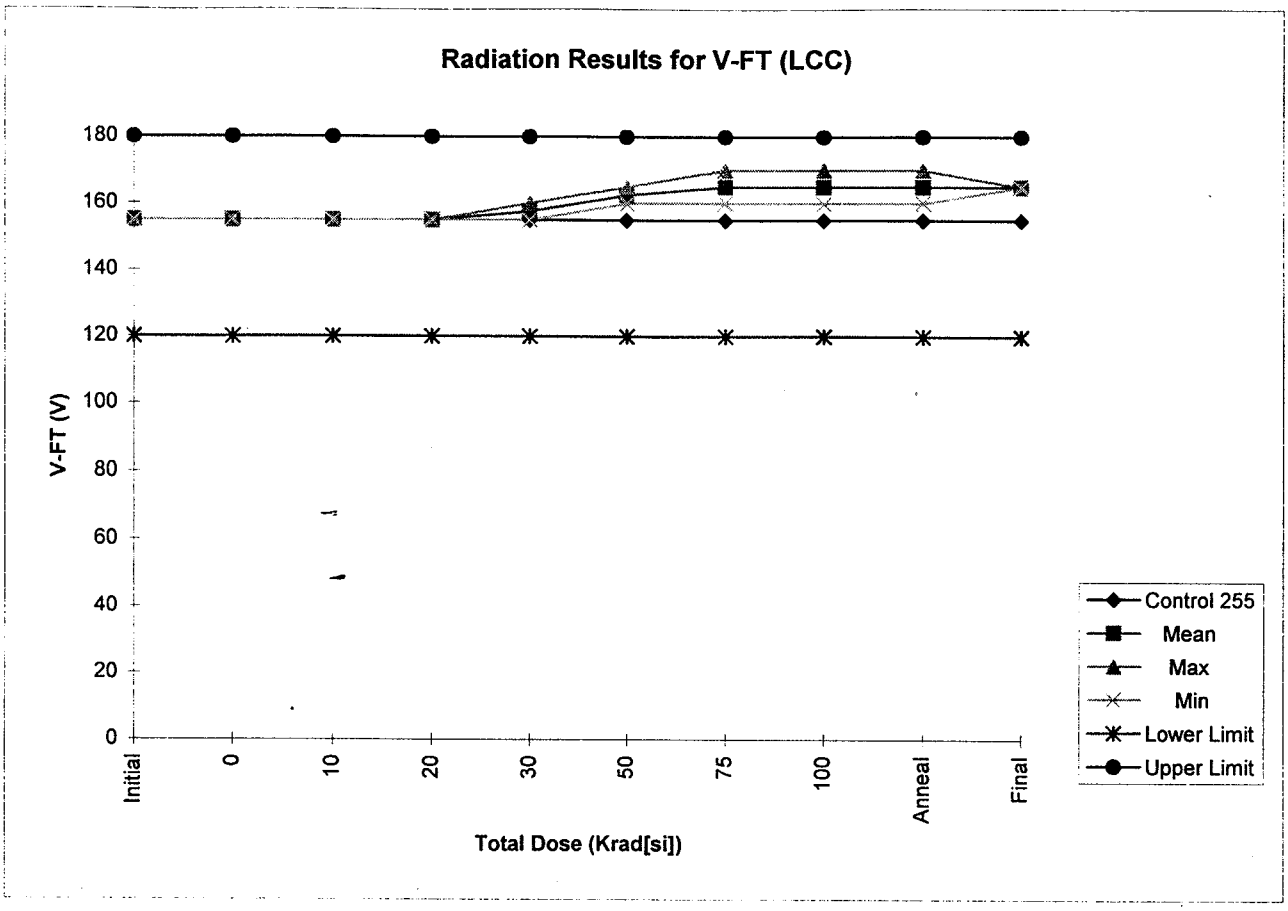
RD 218 Date code 9208



Dose (Krad)	Control 255	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(V)	(V)	(V)	(V)	(V)	(V)	
Initial	155	155	155	155	120	180	0.00
0	155	155	155	155	120	180	0.00
10	155	155	155	155	120	180	0.00
20	155	160	160	160	120	180	0.00
30	155	165	165	165	120	180	0.00
50	155	170	170	170	120	180	0.00
75	155	175	175	175	120	180	0.00
100	155	180	180	180	120	180	0.00
Anneal	155	175	175	175	120	180	0.00
Final	155	163	165	160	120	180	3.54

Lot size for statistics : 2 devices

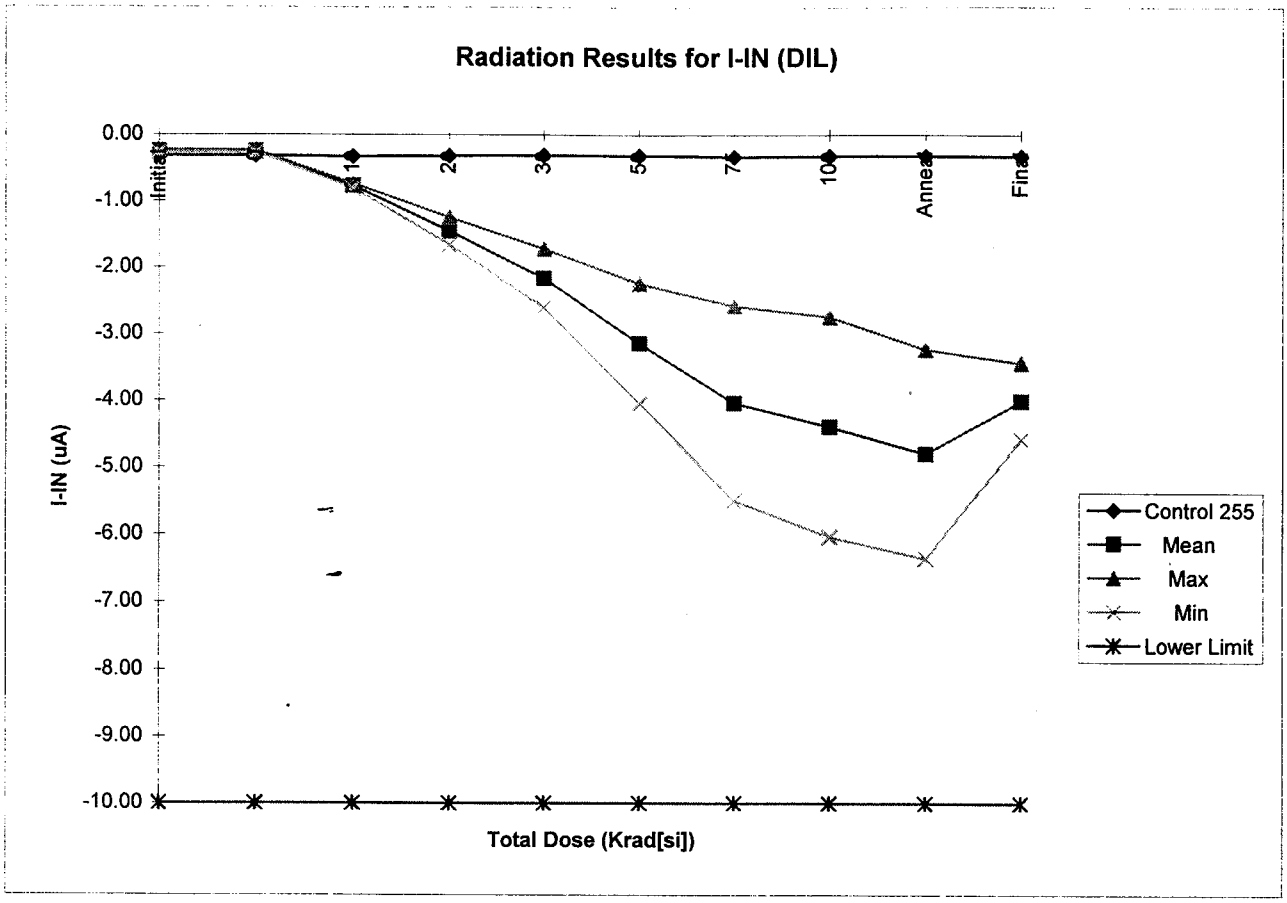
RD 218 Date code 9210



Dose (Krad)	Control 255	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(V)	(V)	(V)	(V)	(V)	(V)	
Initial	155	155	155	155	120	180	0.00
0	155	155	155	155	120	180	0.00
10	155	155	155	155	120	180	0.00
20	155	155	155	155	120	180	0.00
30	155	158	160	155	120	180	3.54
50	155	163	165	160	120	180	3.54
75	155	165	170	160	120	180	7.07
100	155	165	170	160	120	180	7.07
Anneal	155	165	170	160	120	180	7.07
Final	155	165	165	165	120	180	0.00

Lot size for statistics : 2 devices

RD 218 Date code 9208



Dose (Krad)	Control 255	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-0.32	-0.25	-0.23	-0.27	-10	-	0.03
0	-0.32	-0.26	-0.24	-0.27	-10	-	0.02
10	-0.33	-0.78	-0.74	-0.81	-10	-	0.05
20	-0.32	-1.46	-1.25	-1.66	-10	-	0.29
30	-0.31	-2.17	-1.72	-2.61	-10	-	0.63
50	-0.31	-3.15	-2.24	-4.05	-10	-	1.28
75	-0.33	-4.04	-2.58	-5.50	-10	-	2.06
100	-0.32	-4.40	-2.75	-6.04	-10	-	2.33
Anneal	-0.32	-4.80	-3.23	-6.36	-10	-	2.21
Final	-0.32	-4.01	-3.43	-4.58	-10	-	0.81

Lot size for statistics : 2 devices

RD 218 Date code 9210

XMM RD218	IRRADIATION TEST PLAN NO. XM-PL-IGG-0057 1	Issue No. 1 Date: December 1996 Page: 1/5 2

Component No. UC1834L-ST2943 UC1834J-SAX-149-004-01B 3	Component Designation: IC Linear Regulator Types: UC1834J-DIL & UC1834L-LCC 4	Irradiation Spec No. N/A Iss. Rev. 5

Specifications	Acceptance	Electrical Meas	Project/Programme
Generic ESA/SCC 9000 Iss. 9 Detail Unitrode Data Sheet 1995-96 6	Evaluation ___ Element ___ Diffusion ___ Lot X 7	In-situ ___ Remote X 8	XMM 9

Manufacturer: Unitrode Address: 7 Continental Boulevard Merrimack NH03054 10	Test Facility: ERA Address: Leatherhead SURREY 11	Originator: IGG CT Name: J. T. Arnold Telephone: 01329 829311 12

Radiation Source	Sample Size: 2	Exposure	Annealing Test	Radiation Level:
COBALT 60 13	Control Devices: 1 Each Package Type 14	Single ___ Multiple X 15	YES X NO ___ 16	10KRad(Si), 50KRad(Si) 20KRad(Si), 75KRad(Si) 30KRad(Si), 100KRad(Si) 17

Single Exposure
Dose [KRad(Si)]
Dose Rate [Rad(Si)/s]
Not Applicable
Exposure Time 18

Multiple Exposure: 19

Irradiation Steps	1	2	3	4	5	6
Dose [KRad(Si)]	10	10	10	20	25	25
Dose Rate [Rad(Si)/s]	10	10	10	10	10	10
Exposure Time(s)	1000	1000	1000	2000	2500	2500

Bias Requirements: During Exposure (for in-situ elec. measure):
During and after Exposure (for remote elec. measure): YES

Bias Conditions:
Test Circuits: The Electrical Bias circuit is given in Figure 1 herein.
Voltages: See Figure 1 Tolerance: See Figure 1

Shielding: Shielding is required to minimize dose enhancement effects caused by low energy, scattered radiation. The test specimens shall be enclosed in a Pb/Al container of Pb 1.5mm minimum, surrounding on inner shield of 0.7 to 1.0mm Al. 20

Irradiation Test Sequence 21

Test Step	Description	Requirements
1(A)	Serialisation Goods Receiving Inspection	If parts are not serialised, serialise them (permanently) sequentially from 1 to 6 inclusive. Goods Receiving Inspection shall consist of 100% Travel Visual, Visual Inspection and Electrical Measurements per Table A herein.
1(B)	Initial Electrical Measurements (at IGG)	Per Table A herein - Read and Record - 6 parts minimum at IGG.
2	Initial Electrical Measurements (at ERA)	Per Table A herein - Read and Record - 6 parts minimum at ERA.
3	Set-up of Test	Verify Bias circuit and Voltages (In-situ) for all 6 test samples.
4	Irradiation Exposure	Verify Radiation dose rate and position in the chamber to achieve required dose. Verify and witness duration of exposure to achieve required dose.

Irradiation Test Sequence (Cont.) 21

Test Step	Description	Requirements
5	Intermediate Electrical Measurements	Bias to be maintained until test is performed. Test per Table A herein - Read and Record - 6 parts. Test to be performed immediately upon removal from chamber (less than 10 mins interval). Upon completion of test devices to be replaced in bias circuit (4 parts) and returned to chamber. Maximum interval between two consecutive exposures to be (30 mins).
6 to 21	Repeat Set-up/Exposure/Test sequence up to Total Dose of 100KRad(Si) as per Plan above	Repeat Step 3, 4, 5 for a total of 6 cycles up to the total dose of 100KRad(Si) at dose 10,20,30,50,75, and 100KRad(Si)
22	Annealing	To be 24 hours at +25°C under Figure 1 Bias.
23	Post Anneal Electrical Measurements	Per Table A herein - Read and Record - 6 parts.
24	Accelerated ageing under Bias	Bake at 100°C under Figure 1 Bias conditions for 168 hours.
25	Final Electrical Measurements	Per Table A herein - Read and Record - 6 parts.
26	Total Dose Irradiation Test Report	ESA/SCC 22900.

Remarks 22

1. Performed for the purposes of correlation.
2. The set-up/exposure/test sequence shall be stopped for any device that exhibits repeated functional failure.

TABLE A - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE -T_{amb} = +25 ±5°C BEFORE, AT INTERMEDIATE POINTS, AND ON COMPLETION OF IRRADIATION

NO.	CHARACTERISTICS	SYMBOL	TEST CONDITIONS	LIMITS MIN.	LIMITS MAX.	UNIT
TURN-ON CHARACTERISTICS						
1	Supply Current	I_{CC}	V_{IN} = 15V	-	7.0	mA
ERROR AMPLIFIER SECTION						
2	Input Offset Voltage	V_{OS}	V_{IN} = 15V, V_{CM} = 1.5V	-	6.0	mV
3	Input Bias Current	$+I_{BIAS}$	V_{IN} = 15V, V_{CM} = 1.5V	-	-4.0	µA
4	Input Bias Current	$-I_{BIAS}$	V_{IN} = 15V, V_{CM} = 1.5V	-	-4.0	µA
5	Input Offset Current	I_{OS}	V_{IN} = 15V, V_{CM} = 1.5V	-	1.0	µA
6	Small Signal Open Loop Gain	A_{VS}	V_{IN} = 15V, $V_{CM(MAX)}$ = 2.5V, $V_{CM(MIN)}$ = 1.7V	50	-	dB
7	Power Supply Rejection Ratio	PSRR	$V_{IN(MIN)}$ = 5V, $V_{IN(MAX)}$ = 35V, V_{CM} = 1.5V	70	-	dB
8	Common Mode Rejection Ratio	CMRR	$V_{CM(MIN)}$ = 0.5V, $V_{CM(MAX)}$ = 33V, V_{IN} = 35V	60	-	dB
-2.0 VOLT REFERENCE						
9	Output Voltage	REF-	V_{IN} = 15V	-2.040	-1.96	V
10	Line Regulation	V_{REG-}	$V_{IN(MIN)}$ = 5V, $V_{IN(MAX)}$ = 35V	-	15	mV
+1.5 VOLT REFERENCE						
11	Output Voltage	REF+	V_{IN} = 15V	1.485	1.515	V
12	Line Regulation	V_{REG+}	$V_{IN(MIN)}$ = 5V, $V_{IN(MAX)}$ = 35V, I_{REF} = 0V	-	10	mV
13	Load Regulation	V_{LREG}	V_{IN} = 15V, REF $I_{-OUT(MIN)}$ = 0mA, REF $I_{-OUT(MAX)}$ = 2mA	-	10	mV
CURRENT SENSE AMPLIFIER SECTION						
14	Threshold Voltage	V_{TH}	V_{IN} = 15V, V_{CM2} = 0V, V_{CM1} = 15V	-	170	mV
15	Threshold Supply Sensitivity	V_{SEN}	$V_{IN(MIN)}$ = 5V, $V_{IN(MAX)}$ = 35V, V_{CM} = 0V	-	-0.3	%/V
16	Adj Input Current	I_{IN}	V_{IN} = 15V, $V_{INTHRESHOLD}$ = 0.5V	-	-10	µA
17	Sense Input Bias Current	IICO+	V_{IN} = 15V, V_{CM} = 0V	-	-200	µA
18	Sense Input Bias Current	IIC17+	V_{IN} = 15V, V_{CM} = ~~17V~~ 15V Bysca	-	200	µA
FAULT AMPLIFIER SECTION						
19	Fault Threshold	V_{FT}	V_{IN} = 15V, V_{CM} = 1.5V	120	180	mV
20	Common Mode Sensitivity	CMS	V_{IN} = 35V, V_{CM1} = 1.5V, V_{CM2} = 33V	-	-0.8	%/V
21	Supply Sensitivity	SS	$V_{IN(MIN)}$ = 5V, $V_{IN(MAX)}$ = 35V V_{CM} = 1.5V	-	-1.0	%/V

TABLE A - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE -T_{amb} = +25 ±5°C BEFORE, AT INTERMEDIATE POINTS, AND ON COMPLETION OF IRRADIATION

NO.	CHARACTERISTICS	SYMBOL	TEST CONDITIONS	LIMITS		UNIT	
				MIN.	MAX.		
FAULT AMPLIFIER SECTION							
22	Fault Alert Output Current	I_{OFA}	V_{IN} = 15V	2	-	mA	✓
23	Fault Alert Saturation Voltage	V_{SATFA}	V_{IN} = 15V, I_{OUT} = 1.0mA	-	0.5	V	✓
24	O.V. Latch Output Current	I_{OLATOV}	V_{IN} = 15V	2.0	-	mA	✓
25	O.V. Latch Saturation Voltage	V_{SATOV}	V_{IN} = 15V, I_{OUT} = 1.0mA	-	1.3	V	✓
26	O.V. Latch Output Reset Voltage	$V_{\overline{OROV}}$	V_{IN} = 15V	0.3	0.6	V	✓
27	Crowbar Gate Current	I_{CG}	V_{IN} = 15V	-100	-	mA	✓
28	Crowbar Gate Leakage Current	I_{CGL}	V_{IN} = 35V, CROWBAR V_{IN} = 0V	-	-50	µA	✓
DRIVER SECTION							
30	Shutdown Input Current	I_{SD}	V_{IN} = 15V, $V_{INDRIVER}$ = 15V $V_{INS/DOWN}$ = 0V	-	-150	µA	✓
31	Output Leakage Current	I_{OL}	V_{IN} = 15V, $V_{INDRIVER}$ = 35V	-	50	µA	✓
32	Saturation Voltage	V_{SAT}	V_{IN} = 15V, I_{OUT} = 100mA	-	1.2	V	

FIGURE 1(a) - ELECTRICAL CIRCUIT FOR IRRADIATION

(DIL 16 PIN PACKAGE)

TOP VIEW

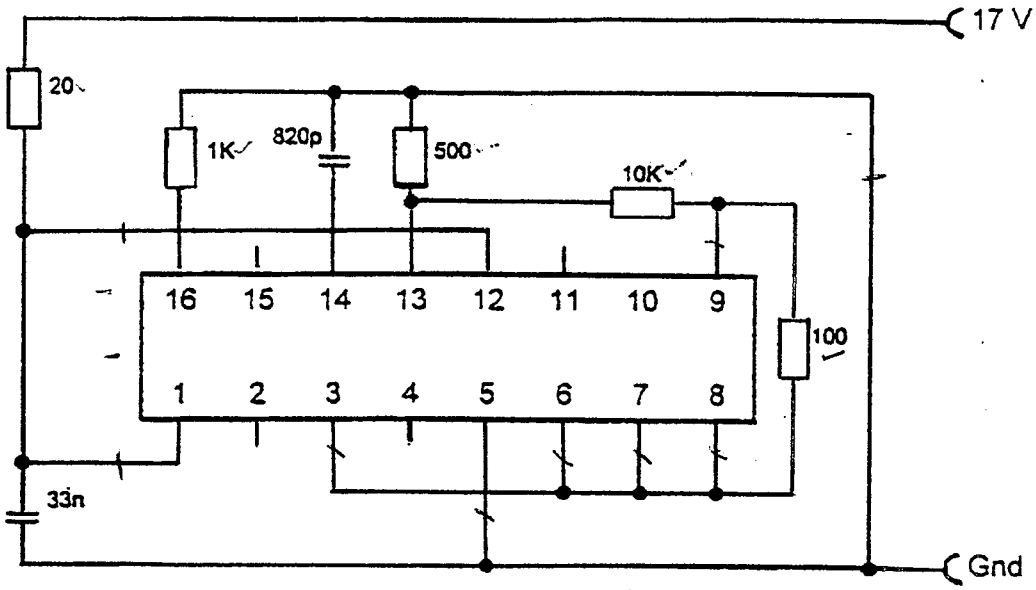


FIGURE 1(b) ELECTRICAL CIRCUIT FOR IRRADIATION

(LCC 20 PIN PACKAGE)

TOP VIEW