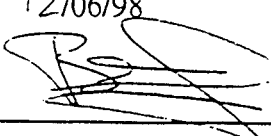
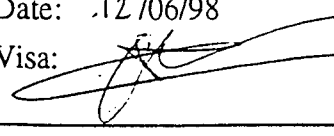
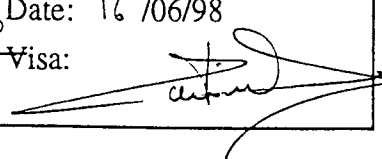


FILE: 20325

TOTAL DOSE STEADY-STATE IRRADIATION
 OF
UC1834L (3A9320)
 HIGH EFFICIENCY LINEAR REGULATOR
 from
UNITRODE

JE	HB	LB	AG	PH	CP
X					X
CLUSTER II		06 AUG 1998			FILE 240
					CHRONO 2583
JP	CE	MS	ESOC	JM	
				X	

Written by	Verified by	Approved by
Name: B. DOUCIN	Name: J. F OLIVE	Name: T. CARRIERE
Date: 12/06/98	Date: 12/06/98	Date: 16/06/98
Visa: 	Visa: 	Visa: 

CONTENTS

I. DOCUMENTATION 3

 I.1 APPLICABLE DOCUMENTS 3

 I.2 REFERENCE DOCUMENTS..... 3

II. TEST PLAN..... 4

 II.1 PARTS REFERENCES 4

 II.2 ELECTRICAL MEASUREMENTS 5

 II.3 EXPERIMENTAL CONDITIONS 7

III TEST REPORT..... 8

 III.1 EXPERIMENTAL CONDITIONS 8

 III.2 EXPERIMENTAL RESULTS 9

 III.2.1. *Parametric tests*..... 9

 III.2.2 *Post irradiation effects* 12

 III.2.3 *Problems encountered / Discussion* 12

IV CONCLUSIONS..... 13

ANNEX - Plot of tested parameters versus total dose and annealing

I. DOCUMENTATION**I.1 APPLICABLE DOCUMENTS**

I. PRO2. 001

MATRA Procedure for Total Dose Steady-State
Irradiation on Active Devices.**I.2 REFERENCE DOCUMENTS**

MIL STD 883 D, Method 1019-4 Steady State Irradiation Procedure.

ESA/SCC 22900-3

ESA Basic Specification For Total Dose
Steady-State Irradiation.

DOF/DEC/TP7.464

Irradiation Test Plan, based on detailed specification
referenced hereafter

ST-BAS-PS-2943-03

Detail Specification

II. TEST PLAN

II.1 PARTS REFERENCES

REFERENCES	
Type:	UC1834L
Manufacturer:	UNITRODE
Place:	USA
Packaging:	LCC 20 Pin
FUNCTION	
HIGH EFFICIENCY LINEAR REGULATOR	
TECHNOLOGY	
Silicon Monolithic BIPOLAR	
PARTS PROCUREMENT	
Origin:	MMS CPPA (MMS-UK)
Level:	QML V
Date Code:	3A9320
Lot number:	M31307
F. R.:	/
Number of Parts	6 (5 Irradiated + 1 ref)
DETAIL SPECIFICATION	
DOF/DEC/TP7.464	

II.2 ELECTRICAL MEASUREMENTS

TEST TYPE						
Type:	Remote electrical measurements done at room temperature					
TEST FACILITY						
Place:	MATRA VELIZY La SOURCE					
Material:	LTS2020 and Kheitley 2420 Sourcemeater.					
Calibration Date:	11/97 and 02/98					
TESTED PARAMETERS						
Parameter Name	Fig n°	Symbol	Test Conditions	Min	Max	Unit
Standby Supply Current	1	ICC	+V _{in} =+15V, -V _{in} =0V	-	7	mA
+1.5 Volt Reference						
Output Voltage	2	V _{ref1}	+V _{in} =+15V, -V _{in} =0V	1.485	1.515	V
Line Regulation	3	K _{li1}	+V _{in} =+5 to +35V, -V _{in} =0V	-	+10	mV
Load Regulation	4	K _{lo1}	+V _{in} =+15V, -V _{in} =0V I _{VREF} =0 to 2 mA	-	+10	mV
-2.0 Volt Reference						
Output Voltage (referenced to Vin+)	5	V _{ref2}	+V _{in} =+15V, -V _{in} =0V (referenced to V _{in} +))	-2.04	-1.96	V
Line Regulation	6	K _{li2}	+V _{in} =+5 to 35V, -V _{in} =0V	-	+15	mV
Error Amplifier Section						
Input Offset Voltage	7	V _{io}	+V _{in} =+15V, -V _{in} =0V, V _{cm} =1.5V	-6	+6	mV
Input Bias Current	8	I _{IB(plus)}	+V _{in} =+15V, -V _{in} =0V, V _{cm} =1.5V	-4.0	4.0	μA
Input Bias Current	9	I _{IB(minus)}	+V _{in} =+15V, -V _{in} =0V, V _{cm} =1.5V	-4.0	4.0	μA
Input Offset Current	10	I _{IO}	+V _{in} =+15V, -V _{in} =0V, V _{cm} =1.5V	-1.0	+1.0	μA
Small Signal Open Loop Gain	11	AVOL	+V _{in} =+15V, -V _{in} =0V, Output@Pin14, Pin12=Vin+	50	-	dB

TESTED PARAMETERS						
Parameter Name	Fig.n°	Symbol	Test Conditions	Min	Max	Unit
Driver Section						
Max. Output current	12	IOUT (max)	+V _{in} =+15V, -V _{in} =0V	200	-	dB
Saturation Voltage	13	VSAT	+V _{in} =+15V, -V _{in} =0V I _{out} =100 mA	-	1.2	V
Output Leakage Current	14	IOZL	+V _{in} =+15V, -V _{in} =0V	5e-05	-	A
Error Amplifier Section						
Fault alert Output Cur.	15	Ifault	+V _{in} =+15V, -V _{in} =0V	2		mA
Fault alert Saturation Voltage	16	Vsatfault	+V _{in} =+15V, -V _{in} =0V I _{out} =1 mA	-	0.5	mA
Crow Bar Gate Current	17	Icb	+V _{in} =+15V, -V _{in} =0V	-	-100	mA
Crow Bar Gate Current Leakage	18	Icb Leak	+V _{in} =+15V, -V _{in} =0V	-50	-	uA
Current Sense Amplifier Section						
Threshold voltage 1	19	Vth1	+V _{in} =+15V, -V _{in} =0V V _{cm} =0V	130	170	mV
Adj. Input Current	20	I _{adi}	+V _{in} =+15V, -V _{in} =0V, V _{pin 4} =0.5V	-10	10	uA
Sense Input Bias Current	21	Iscbias (plus) 1	+V _{in} =+15V, -V _{in} =0V V _{cm} =15V	-	200	uA
Sense Input Bias Current	22	Iscbias (plus) 2	+V _{in} =+15V, -V _{in} =0V V _{cm} =0V	-200	-	uA
Sense Input Bias Current	23	Iscbias (minus) 2	+V _{in} =+15V, -V _{in} =0V V _{cm} =15V	-	200	uA
Sense Input Bias Current	24	Iscbias (minus) 2	+V _{in} =+15V, -V _{in} =0V V _{cm} =0V	-200	-	uA
Functional Test	25	Delta Voutput	+V _{in} =+10V, -V _{in} =0V V _{ref} external	-	-	V
Functional test	26	Delta Voutput	+V _{in} =+10V, -V _{in} =0V V _{ref} Internal	-	-	V

Notes:

- All electrical measurements were made within one hour of termination of the irradiation step.
- Figure numbers refer to the figures showing variation of each parameter with total dose at the end of this document.

II.3 EXPERIMENTAL CONDITIONS

IRRADIATION FACILITY	
Place:	MATRA VELIZY (France)
Type:	Cobalt 60 Shepherd 484
Activity:	<9 Curies, calibrated 03/11/97
EXPOSURE TYPE	
Type:	Multiple Exposures
Steps:	0, 6, 13, 17, 22, 29, 38, 51 kRad[Si] + annealing @25°C&100°C
BIASING CONDITIONS	
COMMENTS	
<p>4 parts were biased in this mode during irradiation 1 part in Static Off mode with all pins connected to ground.</p>	

III TEST REPORT

III.1 EXPERIMENTAL CONDITIONS

PARTS IDENTIFICATION						
Manufacturer	ST-2943-03B					
Marking:	Δ xxx U3A9320 (xxx=part number)					
SERIAL N°	Sample Devices					Control
Manufacturer	362	364	365	366	367	361
Biasing Mode	On	On	On	On	Off	Unbias.

IRRADIATION TEST SEQUENCE						
Step n°	Date/Time IN Date/Time OUT	Description	Dose Rate kRad[Si]/h	Exp. Time (h)	Dose kRad[Si]	Total Dose kRad[Si]
-	17/03/98	Initial Elect. Measurements				
1 1a	17/03/98 20/03/98	Irradiation Electrical Meas.	0.095	64.8	6	6
2 2a	20/03/98 23/03/98	Irradiation Electrical Meas.	0.095	69.1	7	13
3 3a	23/03/98 25/03/98	Irradiation Electrical Meas.	0.095	45.8	4.4	17
4 4a	25/03/98 27/03/98	Irradiation Electrical Meas.	0.095	47.2	4.6	22
5 5a	27/03/98 30/03/98	Irradiation Electrical Meas.	0.095	74.2	7	29
6 6a	30/03/98 03/04/98	Irradiation Electrical Meas.	0.095	94	8.9	38
7 7a	03/04/97 09/04/98	Irradiation Electrical Meas.	0.095	140	13.2	51
8 8a	09/04/98 10/04/98	Irradiation Electrical Meas.		24h		
9 9a	10/04/98 17/04/98	Anneal@100°C Electrical Meas.		168h		

III.2 EXPERIMENTAL RESULTS

III.2.1. Parametric tests

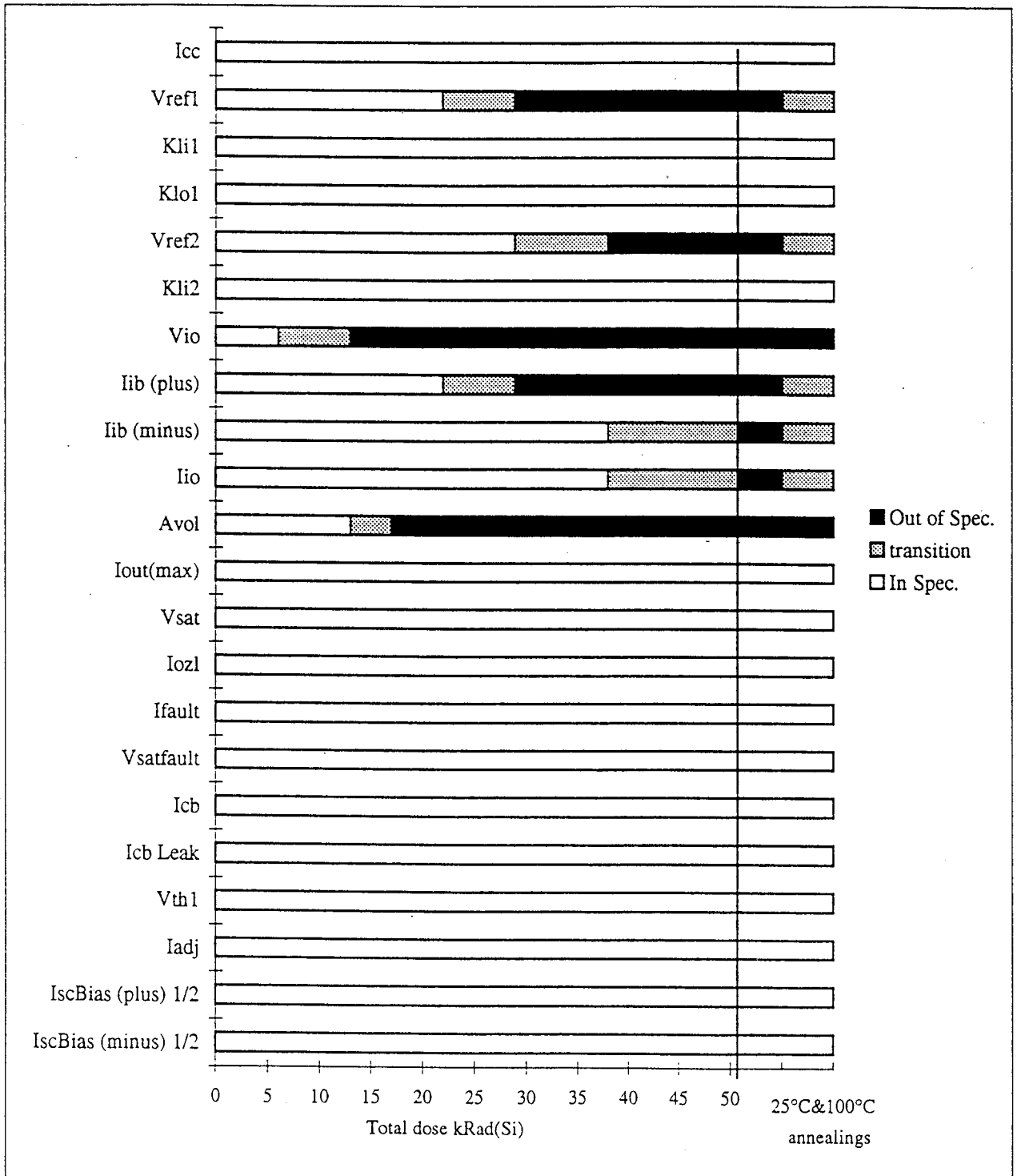
The evolution of each parameter as a function of the total dose is plotted at the end of the report. The last steps correspond to 25°C and 100°C post annealing measurements.

The following table summarizes the evolution of the measured parameters with irradiation and annealing.

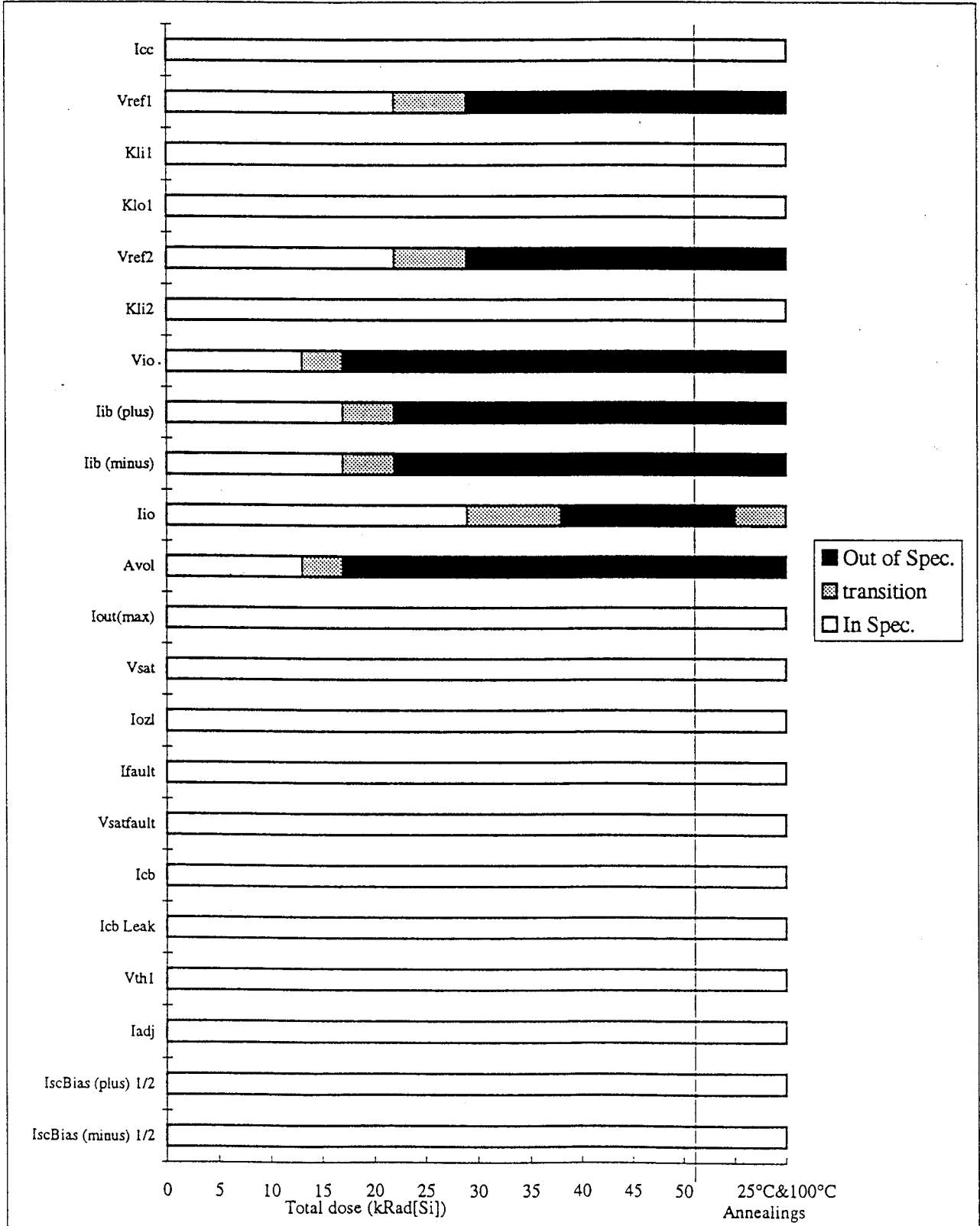
In the construction of these charts ,

- 1/ A parameter is considered to be out of specification if the parameter is measured out of specification on one or more devices and on one or more biasing conditions.
- 2/ A parameter is considered to be in specification only up to the last step for which all irradiated devices remain inside the parameter specification.
- 3/ The step during which a parameter goes out of specification is called transition step.

UC1834L. DC3A9320 Static ON MODE



UC1834L, DC3A9320, STATIC OFF MODE



III.2.2 Post irradiation effects

1st annealing step :

Temperature: 25°C.

Duration: 24h

Biasing: Parts biased as during irradiation.

Second annealing step :

Temperature: 100°C.

Duration: 168h

Biasing: Parts biased as during irradiation.

Important remark: 100°C annealing results shall not be taken into account in an attempt to predict the space dose rate behavior of parts * .

III.2.3 Problems encountered / Discussion

No specific problem was encountered during the irradiation

* "Hardness-Assurance and Testing Issues for Bipolar/BiCMOS Devices"
R. Nathan Nowlin, D.M. Fleetwood, R.D. Schrimpf, R.L. Pease, W.E. Combs
IEEE Transactions on Nuclear Science, Vol.40, N°6, p1686, December 1993

IV CONCLUSIONS

Total dose steady-state irradiation test using gamma rays from Cobalt 60 has been carried out on 5 (4 biased in static On mode and 1 in static Off mode) **High Efficiency Linear regulator UC1834L (DC3A9320A)** from **Unitrode**, up to 51 kRad at low dose rate (<0.36kRad/h).

The results indicate that :

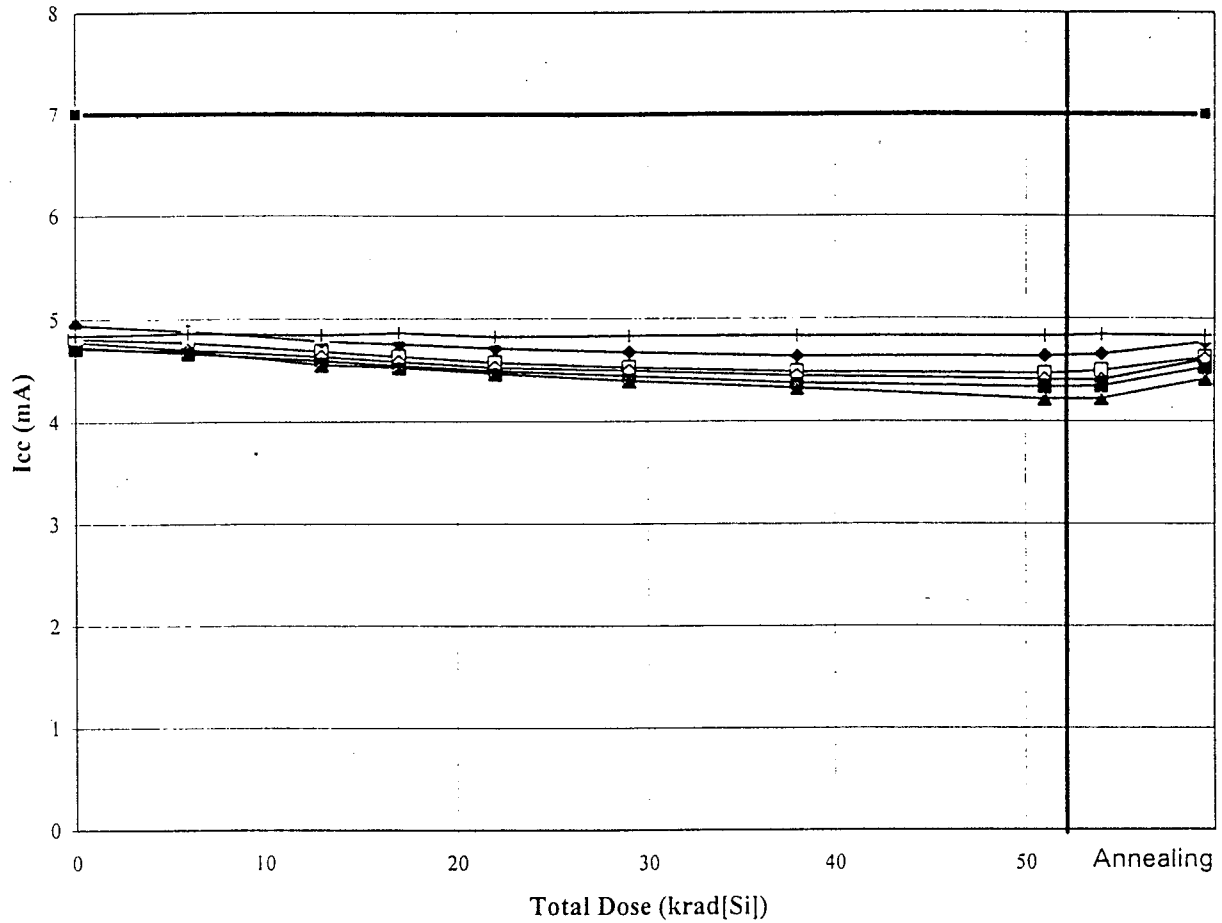
- All parts remain functional up to the last step (51 kRad) and after annealing
- All the parameters stay within specifications limits up to 10 kRad by interpolation from the figures.
- The first parameter which oversteps specification limits is **Vio**, in Static On Mode. Other sensitive parameters are **AVOL**, and **Iib**.
- The part biased Static Off mode exhibits a slightly higher sensitivity than parts in Static On Mode

The following table presents a comparison between this lot and other tested lots. This comparison shows that the tolerance of DC3A9320 is higher than three other previously tested Date Code.

DC	Tolerance	parameter	ref
3A9320	12 kRad	Avol	DAST/DTR/RP8.166
9529	10 kRad	Avol, Vth	Infoduc, 5042/1834TXT1
9614	4 kRad	Vio	DOF/DEC/RP7.295
/(New mask)*	25 kRad	Avol, Vref1, Vio	Infoduc, 5078/UC1834TXT

*UC1834JX-QM

Date:	mai-98			Figure	1
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer:	Unitrode	
Irradiation	Dose Rate: = <360 rad/h		Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter: Icc		Test conditions: Vin+ = 15V, Vin- = 0V		



Comments: The two last points correspond to post annealing measurements.

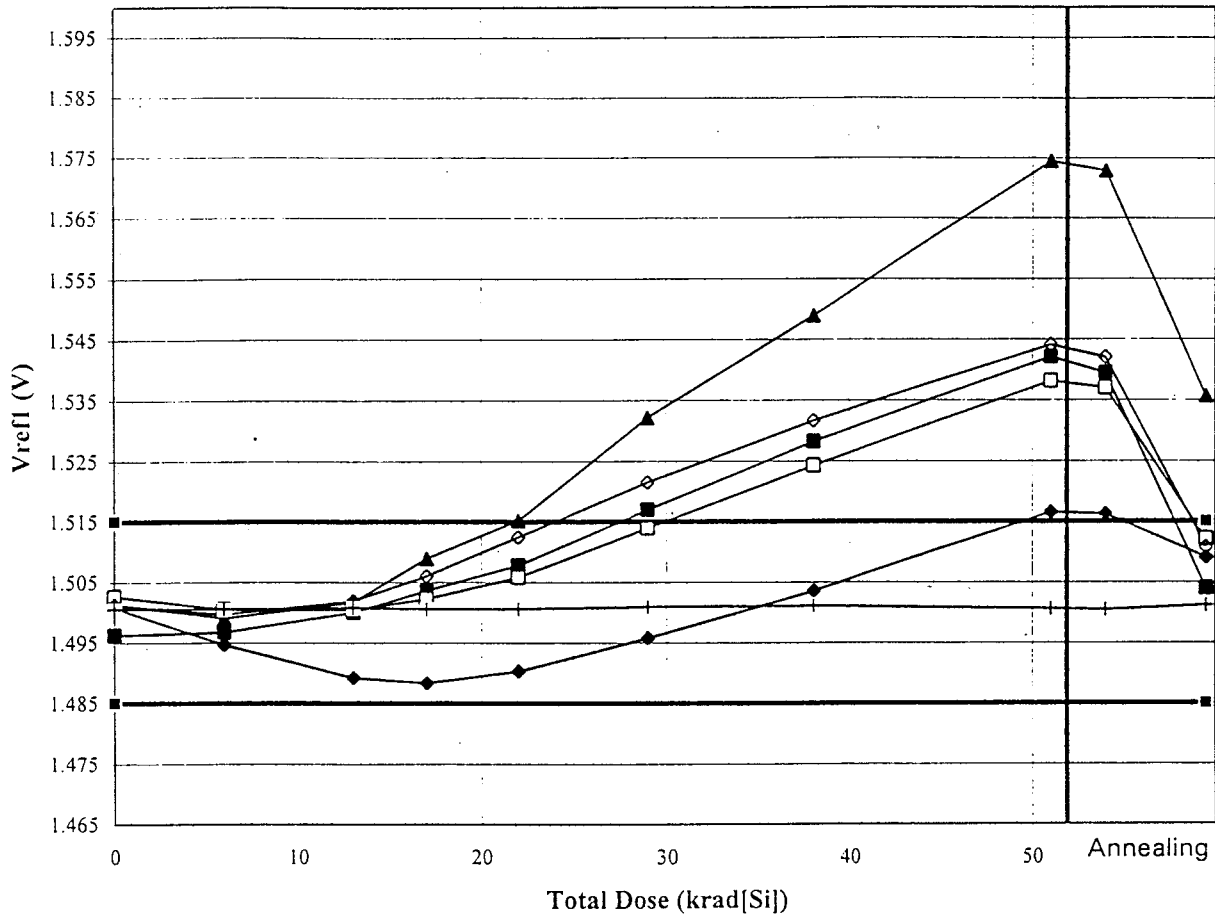
Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■—	4.73	4.66	4.59	4.54	4.49	4.44	4.37	4.33	4.34	4.52			
364 (On)	---○---	4.81	4.77	4.68	4.63	4.57	4.52	4.48	4.46	4.49	4.62			
365 (On)	◆---	4.94	4.88	4.78	4.75	4.71	4.67	4.63	4.63	4.65	4.77			
366 (On)	---□---	4.78	4.70	4.63	4.58	4.52	4.49	4.44	4.41	4.40	4.60			
367 (Off)	▲---	4.72	4.68	4.55	4.52	4.46	4.39	4.32	4.21	4.22	4.41			
	●---													

Mean(Ref)	---	4.84	4.86	4.84	4.86	4.82	4.83	4.83	4.83	4.84	4.83			
Spec(Max)	■---	7.00									7.00			

Total Dose Radiation Testing

MATRA MARCONI SPACE

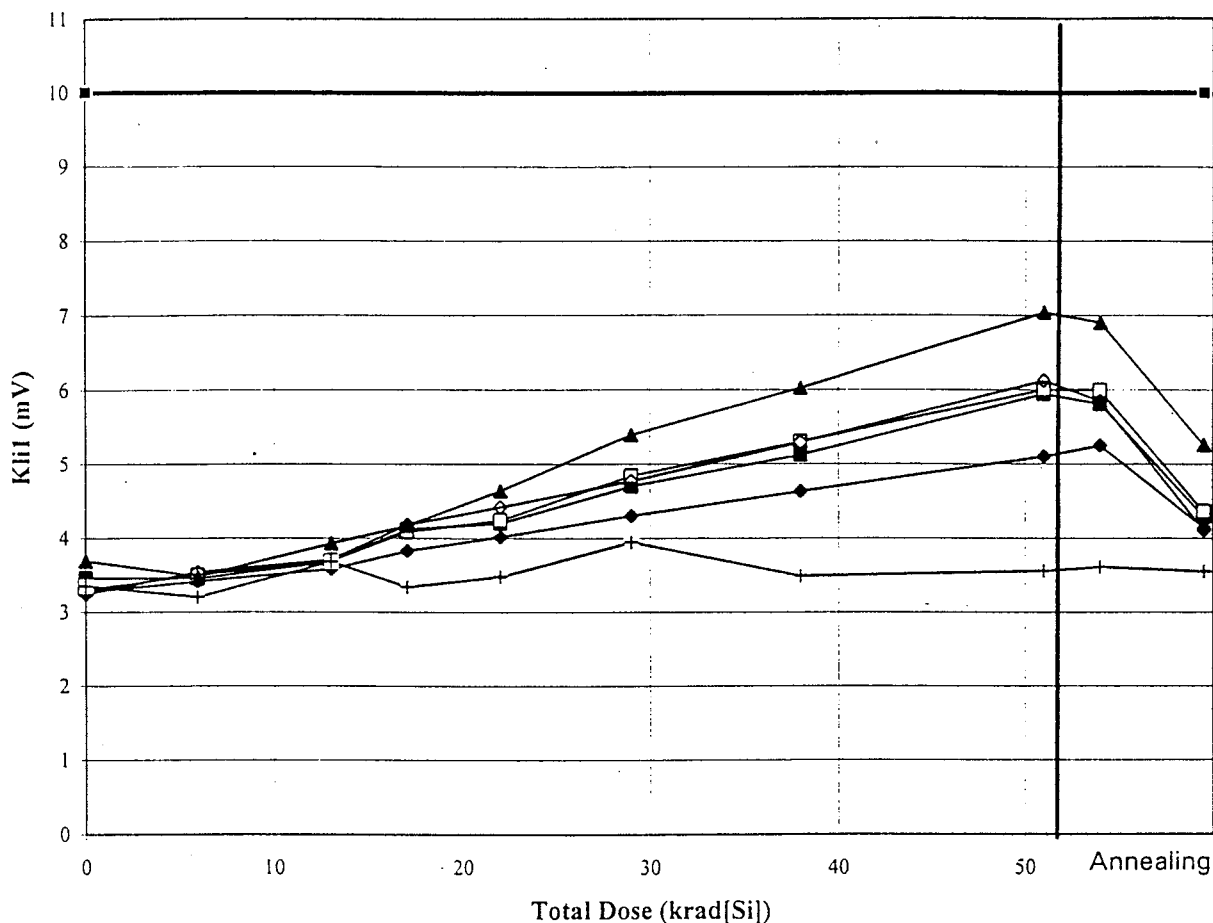
Date: mai-98		Figure 2	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = <360 rad/h	Irradiation Conditions: Static On (Sn 31 to 123). Off (Sn 124, 125)	
Test	Parameter: Vref1	Test conditions: Vin+ = 15V, Vin- = 0V	



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C				
362 (On)	■	1.496	1.497	1.500	1.504	1.508	1.517	1.528	1.542	1.539	1.504				
364 (On)	◆	1.503	1.500	1.500	1.502	1.506	1.514	1.524	1.538	1.537	1.512				
365 (On)	◇	1.501	1.495	1.489	1.488	1.490	1.496	1.504	1.517	1.516	1.509				
366 (On)	△	1.501	1.500	1.502	1.506	1.512	1.522	1.532	1.544	1.542	1.511				
367 (Off)	▲	1.501	1.499	1.502	1.509	1.515	1.532	1.549	1.574	1.573	1.536				
Mean(Ref)		1.501	1.501	1.501	1.501	1.501	1.501	1.501	1.501	1.500	1.501				
Spec(Min)		1.485									1.485				
Spec(Max)		1.515									1.515				

Date: mai-98		Figure 3	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = <360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: KII1	Test conditions: Vin+ =5V to 35V, Vin- =0V	



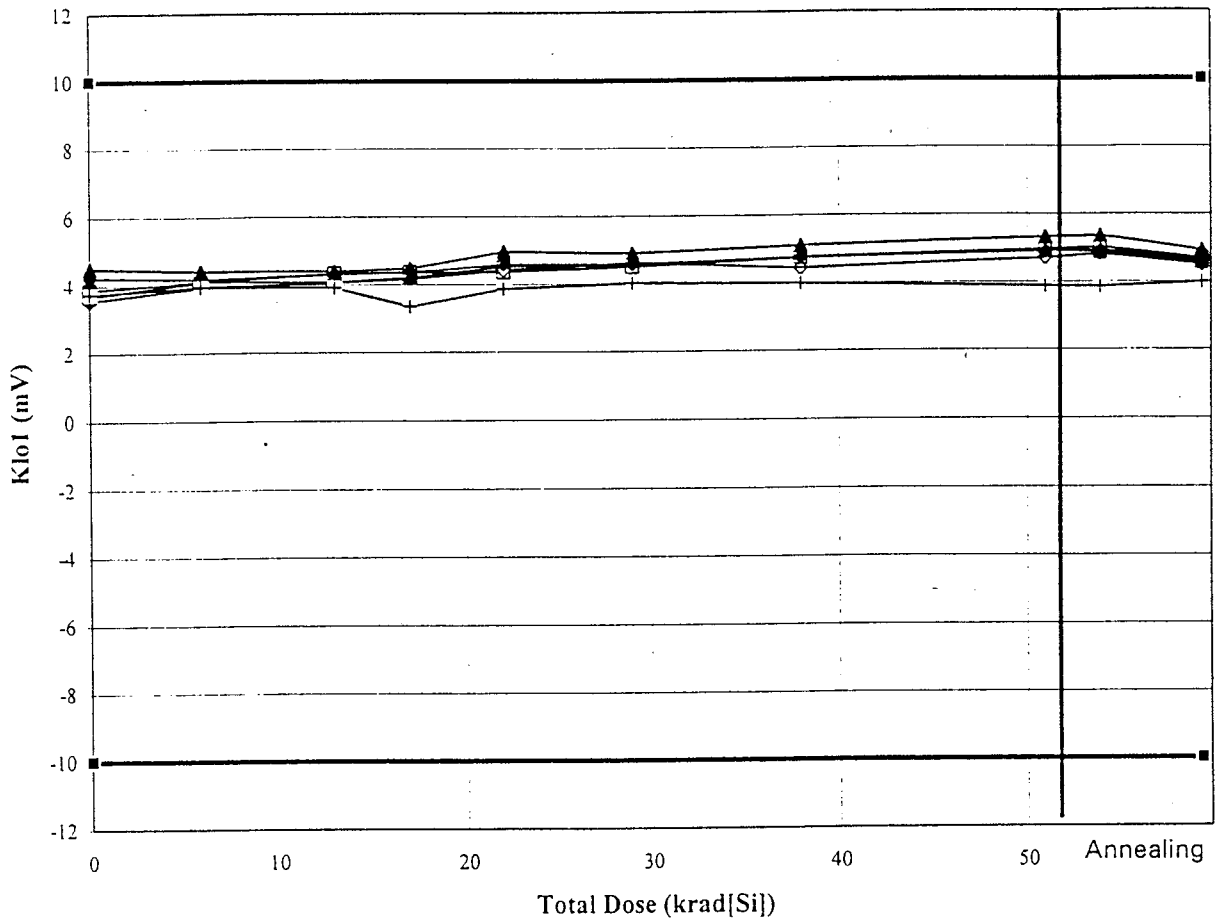
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	3.46	3.45	3.68	4.12	4.20	4.70	5.12	5.94	5.81	4.29			
364 (On)	○	3.30	3.50	3.69	4.09	4.24	4.84	5.30	6.00	5.99	4.36			
365 (On)	◆	3.27	3.41	3.58	3.83	4.02	4.30	4.63	5.10	5.25	4.14			
366 (On)	○	3.24	3.54	3.71	4.18	4.42	4.77	5.29	6.12	5.85	4.11			
367 (Off)	▲	3.69	3.48	3.93	4.17	4.64	5.39	6.02	7.04	6.90	5.26			
	○													
	●													
	○													
	+													
	x													
Mean(Ref)		3.35	3.20	3.68	3.34	3.48	3.95	3.49	3.56	3.61	3.55			
Spec(Max)	■	10.00									10.00			

Total Dose Radiation Testing

MATRA MARCONI SPACE

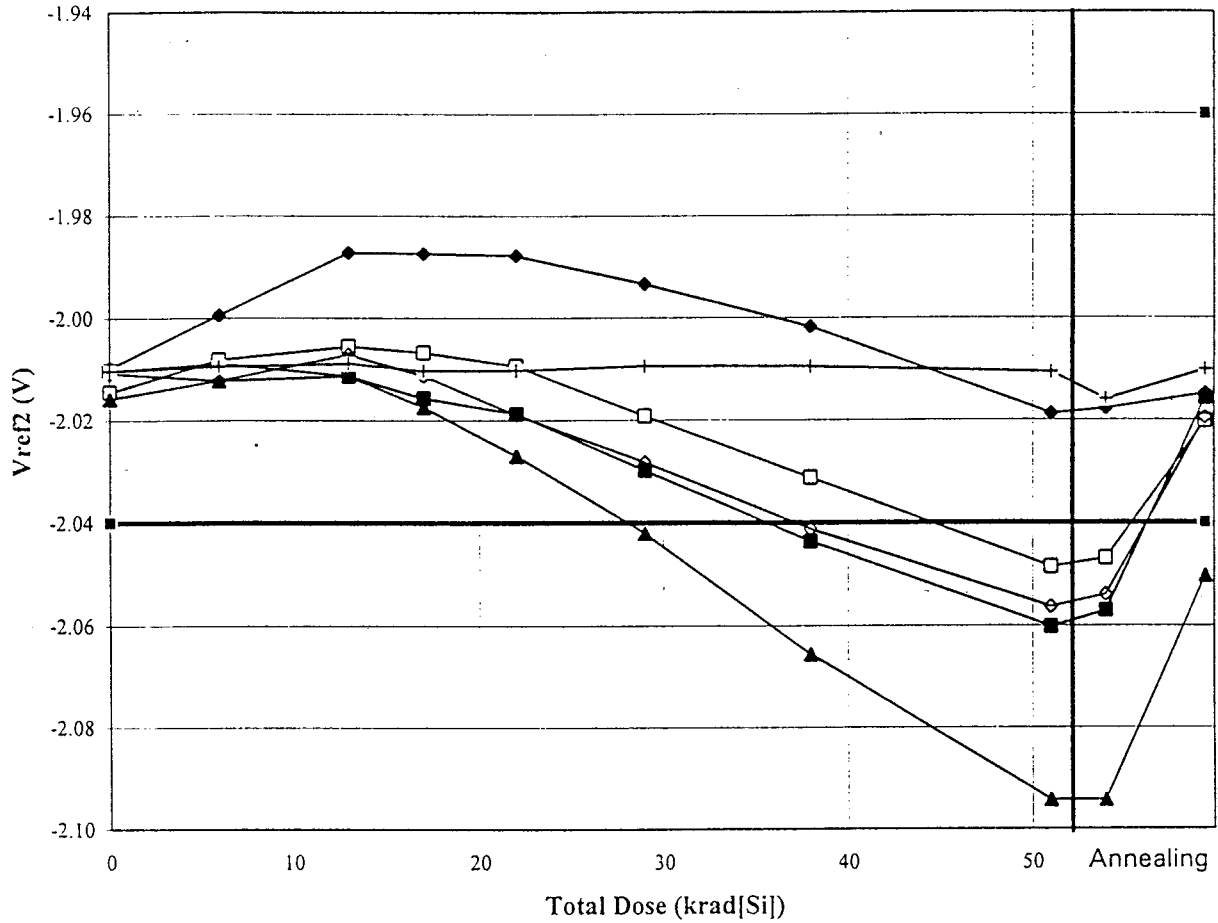
Date:	mai-98			Figure	4	
Component	Type:	UC1834L	Date Code:	3A9320	Manufacturer:	Unitrode
Irradiation	Dose Rate:	= < 360 rad/h	Irradiation Conditions:	Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter:	KLO1	Test conditions:	Vin+ = 15V, Vin- = 0V, Ivref = 0mA to 2mA		



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	3.86	4.10	4.07	4.20	4.51	4.55	4.73	4.93	4.86	4.57			
364 (On)	—	3.68	4.09	4.32	4.35	4.35	4.49	4.74	4.95	5.02	4.68			
365 (On)	◆	4.23	4.17	4.30	4.36	4.58	4.57	4.74	4.89	4.92	4.63			
366 (On)	—	3.55	3.92	4.06	4.16	4.41	4.62	4.43	4.69	4.81	4.49			
367 (Off)	▲	4.49	4.41	4.39	4.47	4.95	4.89	5.09	5.31	5.35	4.92			
	—													
	●													
	○													
	—													
	—													
Mean(Ref)	—	3.74	3.94	3.91	3.35	3.85	4.02	3.98	3.86	3.84	3.99			
Spec(Min)	■	-10										-10		
Spec(Max)	■	10										10		

Date: mai-98		Figure 5		
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode	
Irradiation	Dose Rate: = < 360 rad/h		Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: Vref2	Test conditions: Vin+ = 15V, Vin- = 0V, (referenced to Vin+)		



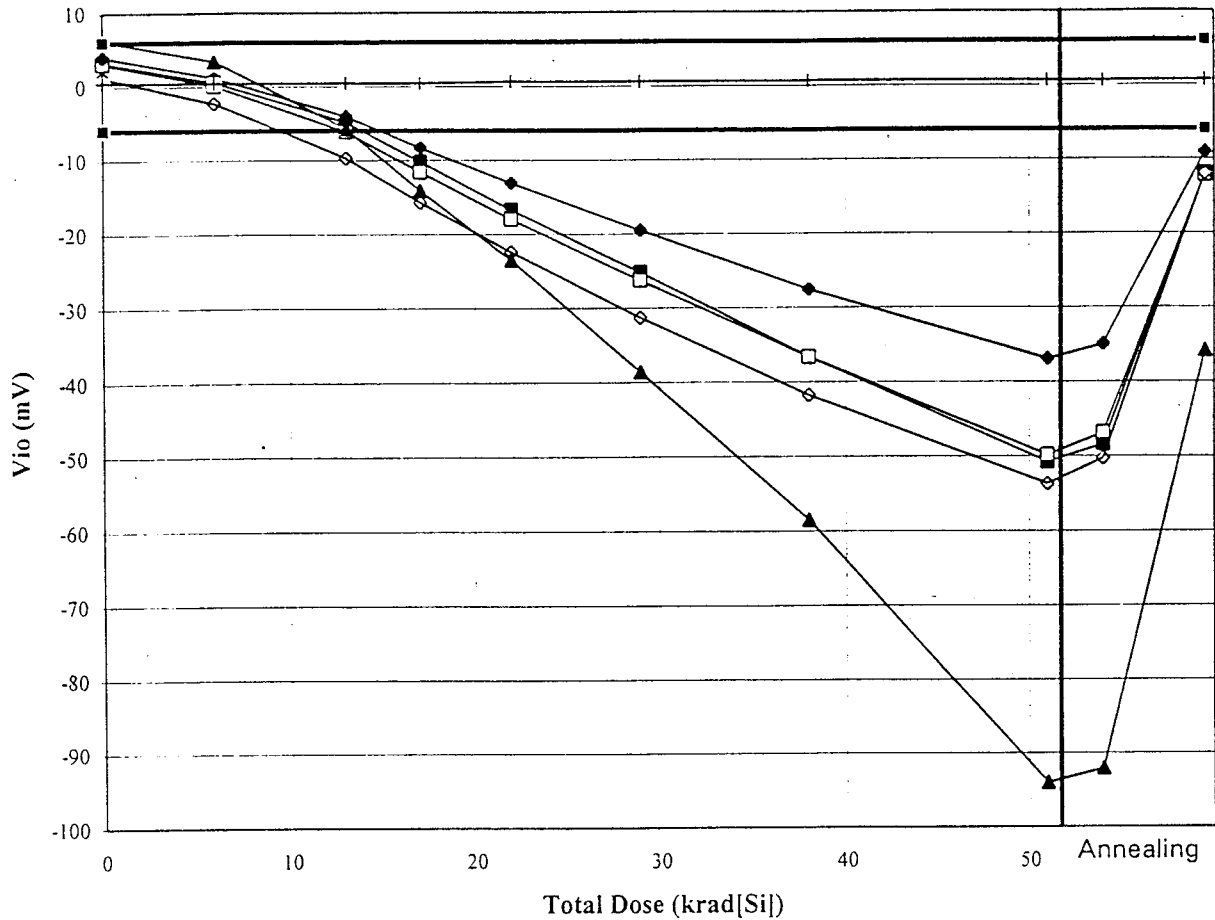
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	-2.010	-2.009	-2.011	-2.016	-2.019	-2.030	-2.044	-2.060	-2.057	-2.016			
364 (On)	◆	-2.015	-2.008	-2.006	-2.007	-2.010	-2.019	-2.031	-2.049	-2.047	-2.020			
365 (On)	▲	-2.010	-2.000	-1.987	-1.987	-1.988	-1.993	-2.002	-2.019	-2.018	-2.015			
366 (On)	●	-2.011	-2.012	-2.007	-2.011	-2.019	-2.028	-2.041	-2.056	-2.054	-2.020			
367 (Off)	▼	-2.016	-2.012	-2.011	-2.018	-2.027	-2.042	-2.066	-2.094	-2.094	-2.050			
Mean(Ref)		-2.010	-2.010	-2.009	-2.010	-2.010	-2.010	-2.010	-2.011	-2.016	-2.010			
Spec(Min)		-2.04									-2.04			
Spec(Max)		-1.96									-1.96			

Total Dose Radiation Testing

MATRA MARCONI SPACE

Date:	mai-98			Figure	7
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode		
Irradiation	Dose Rate: = <360 rad/h		Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter: Vio		Test conditions: Vin+ = 15V, Vin- = 0V		



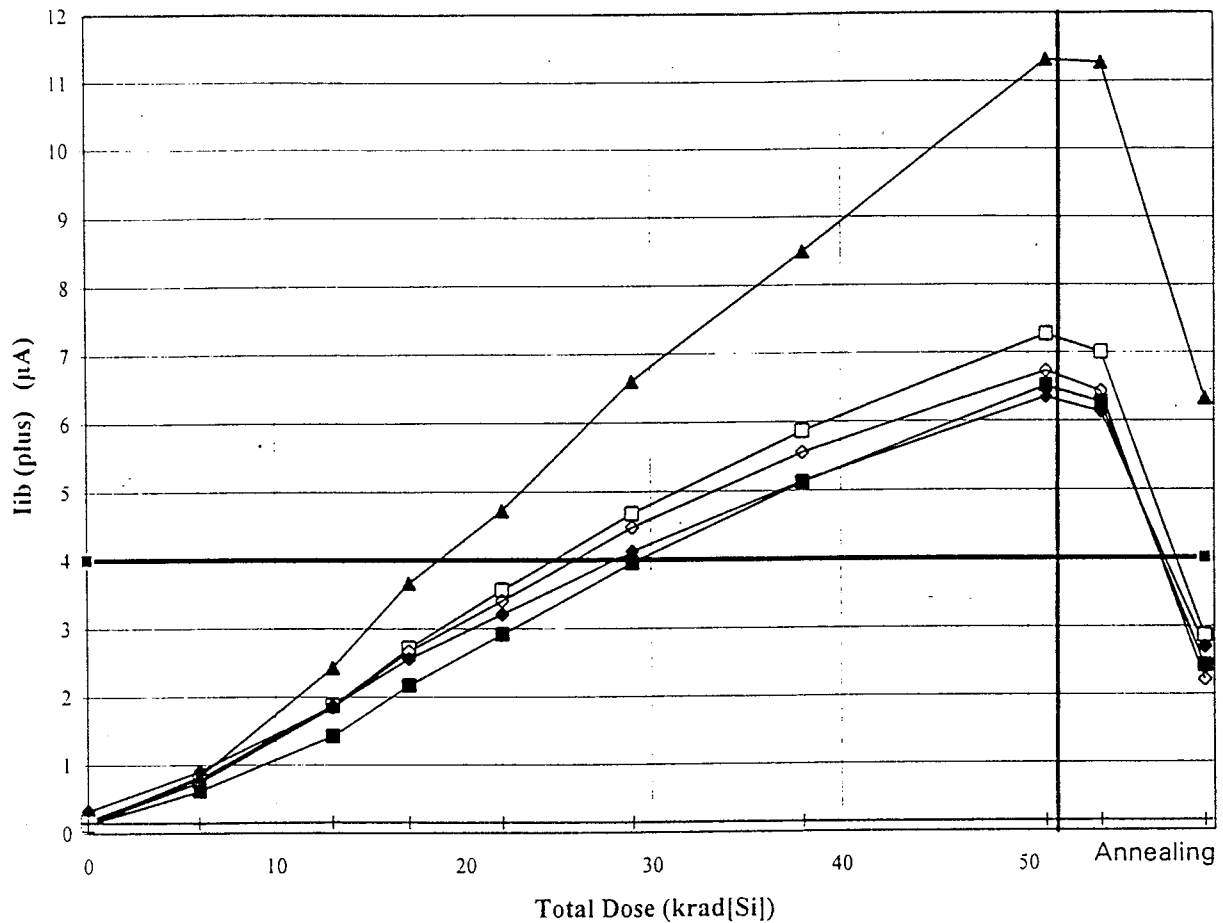
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C				
362 (On)	■	3.22	0.6	-4.9	-10.2	-16.7	-25.2	-36.7	-50.8	-48.4	-12.0				
364 (On)	□	3.07	0.1	-6.2	-11.6	-18.0	-26.3	-36.7	-49.9	-46.9	-12.2				
365 (On)	◆	3.99	1.2	-4.1	-8.3	-13.1	-19.5	-27.6	-37.0	-35.0	-9.1				
366 (On)	◇	1.23	-2.3	-9.7	-15.7	-22.4	-31.3	-41.8	-53.7	-50.3	-12.0				
367 (Off)	▲	6.21	3.4	-5.8	-14.1	-23.5	-38.6	-58.5	-94.0	-92.1	-35.8				
Mean(Ref)		0.46	0.42	0.46	0.44	0.64	0.61	0.63	0.66	0.56	0.62				
Spec(Min)	■	-6									-6				
Spec(Max)	■	6									6				

Total Dose Radiation Testing

MATRA MARCONI SPACE

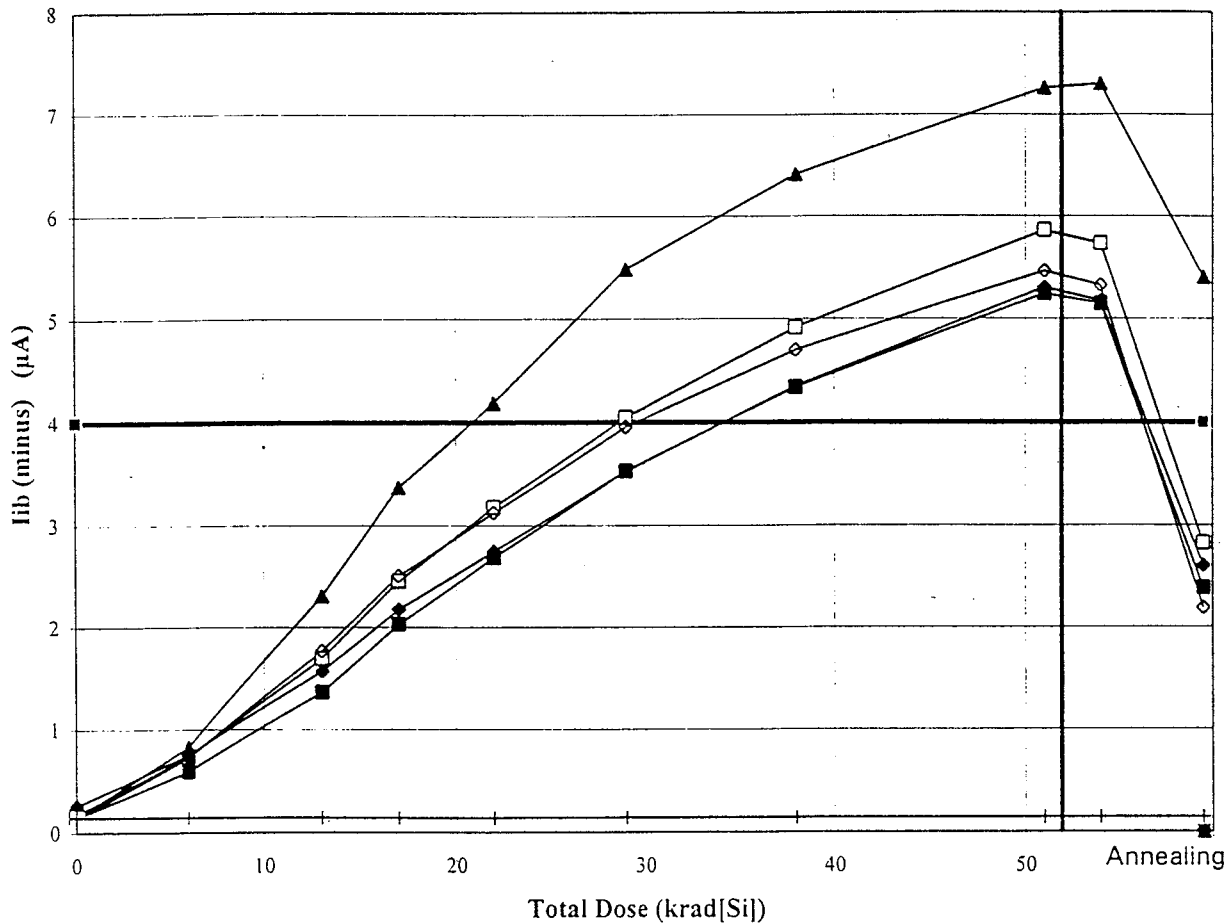
Date: mai-98		Figure 8	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = < 360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: lib (plus)	Test conditions: Vin+ = 15V, Vin- = 0V	



Comments: The two last points correspond to post annealing measurements.

Dose (krad(Si))		0	6	13	17	22	29	38	51	25°C	100°C				
362 (On)	■	0.14	0.61	1.42	2.16	2.91	3.95	5.12	6.51	6.27	2.42				
364 (On)	●	0.19	0.79	1.87	2.72	3.57	4.68	5.86	7.27	7.00	2.86				
365 (On)	◆	0.33	0.90	1.86	2.56	3.21	4.12	5.14	6.35	6.13	2.70				
366 (On)	▲	0.15	0.74	1.84	2.67	3.41	4.48	5.55	6.73	6.43	2.21				
367 (Off)	▼	0.15	0.83	2.42	3.66	4.72	6.60	8.49	11.32	11.27	6.33				
Mean(Ref)		0.15	0.14	0.16	0.15	0.15	0.15	0.15	0.14	0.15	0.15				
Spec(Max)	■	4.00									4.00				

Date:	mai-98		Figure	9
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode	
Irradiation	Dose Rate: = < 360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter: lib (minus)	Test conditions: Vin+ = 15V, Vin- = 0V		



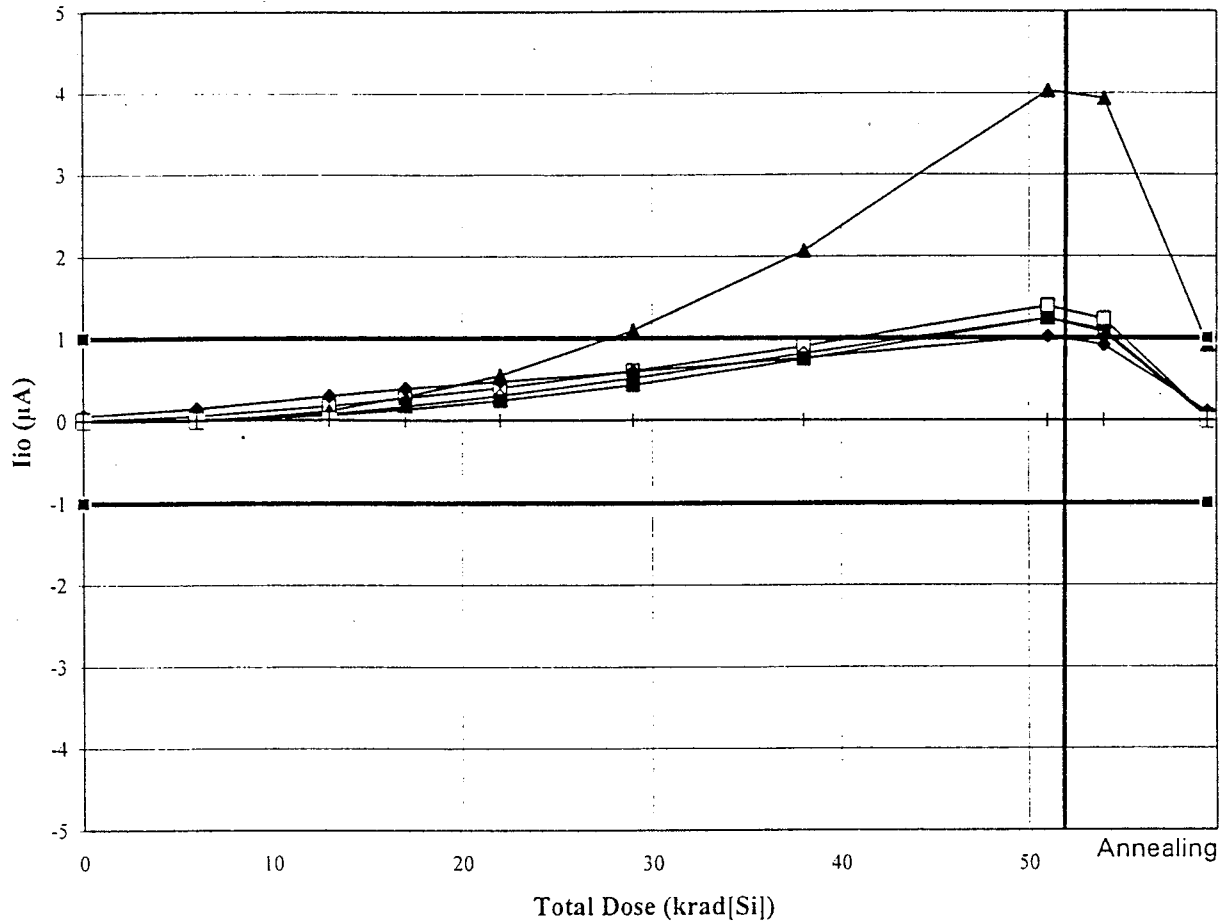
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	0.14	0.59	1.36	2.03	2.68	3.53	4.34	5.24	5.14	2.38			
364 (On)	●	0.18	0.73	1.69	2.45	3.18	4.04	4.91	5.86	5.73	2.83			
365 (On)	◆	0.26	0.75	1.57	2.18	2.74	3.53	4.35	5.30	5.17	2.60			
366 (On)	□	0.14	0.73	1.76	2.50	3.12	3.96	4.70	5.46	5.32	2.19			
367 (Off)	▲	0.15	0.83	2.30	3.37	4.18	5.48	6.41	7.26	7.30	5.40			
Mean(Ref)		0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14			
Spec(Max)		4.00									4.00			

Total Dose Radiation Testing

MATRA MARCONI SPACE

Date:	mai-98			Figure	10	
Component	Type:	UC1834L	Date Code:	3A9320	Manufacturer:	Unitrode
Irradiation	Dose Rate:	= < 360 rad/h	Irradiation Conditions:			Static On (Sn 362 to 366). Off (Sn 367)
Test	Parameter:	lio	Test conditions:			Vin+ = 15V, Vin- = 0V



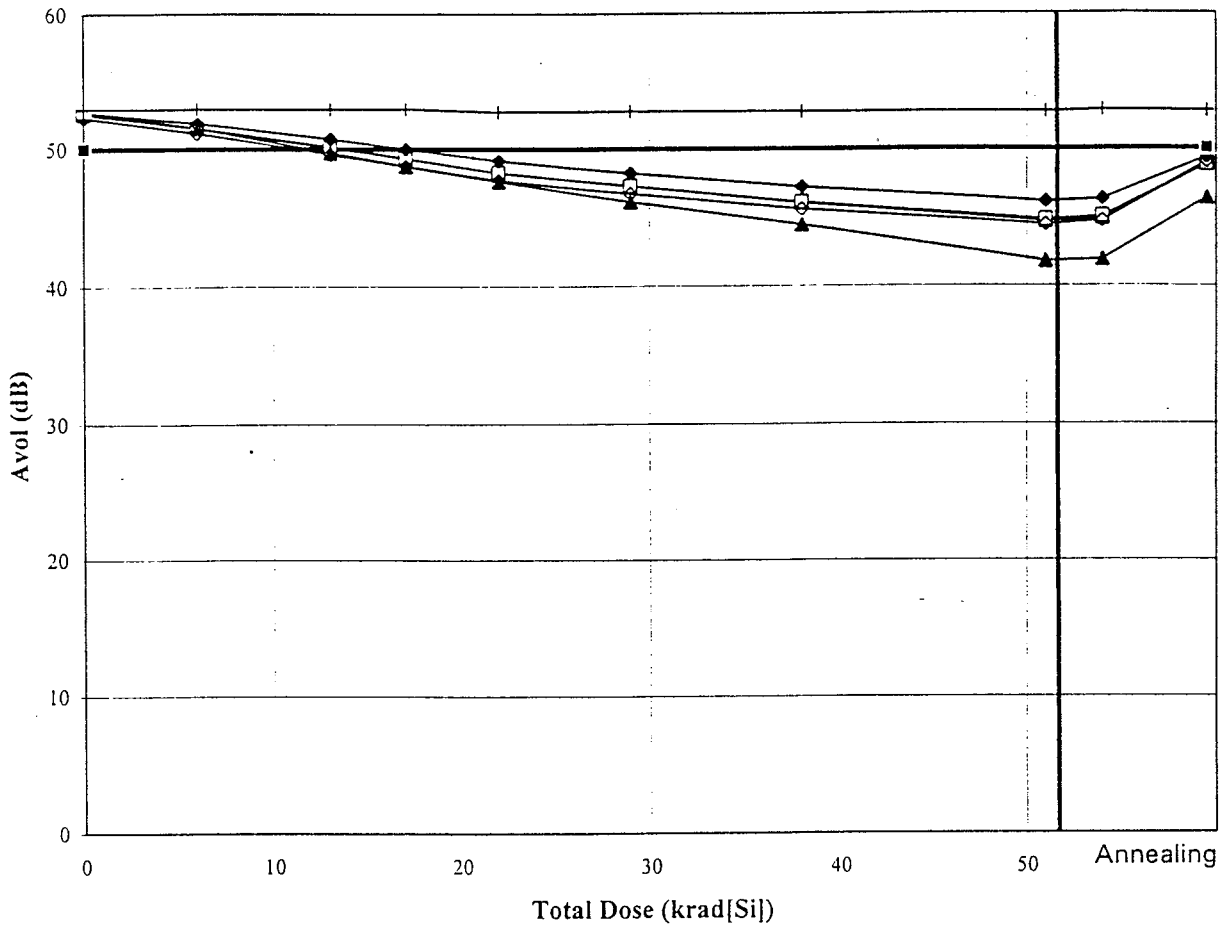
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■---	0.00	0.01	0.07	0.14	0.24	0.43	0.75	1.24	1.10	0.05			
364 (On)	●---	0.02	0.06	0.18	0.28	0.40	0.60	0.90	1.39	1.23	0.04			
365 (On)	◆---	0.06	0.15	0.30	0.39	0.47	0.60	0.76	1.02	0.92	0.11			
366 (On)	◊---	0.01	0.01	0.08	0.17	0.30	0.52	0.81	1.24	1.07	0.04			
367 (Off)	-▲---	0.00	0.00	0.12	0.29	0.55	1.10	2.07	4.03	3.93	0.92			

	●---													

Mean(Ref)	---	0.00	0.00	0.02	0.00	0.00	0.01	0.01	0.00	0.00	0.00			
Spec(Min)	■---	-1.00										-1.00		
Spec(Max)	■---	1.00										1.00		

Date: mai-98		Figure 11	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = <360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: Avol	Test conditions: Vin+ = 15V, Vin- = 0V	



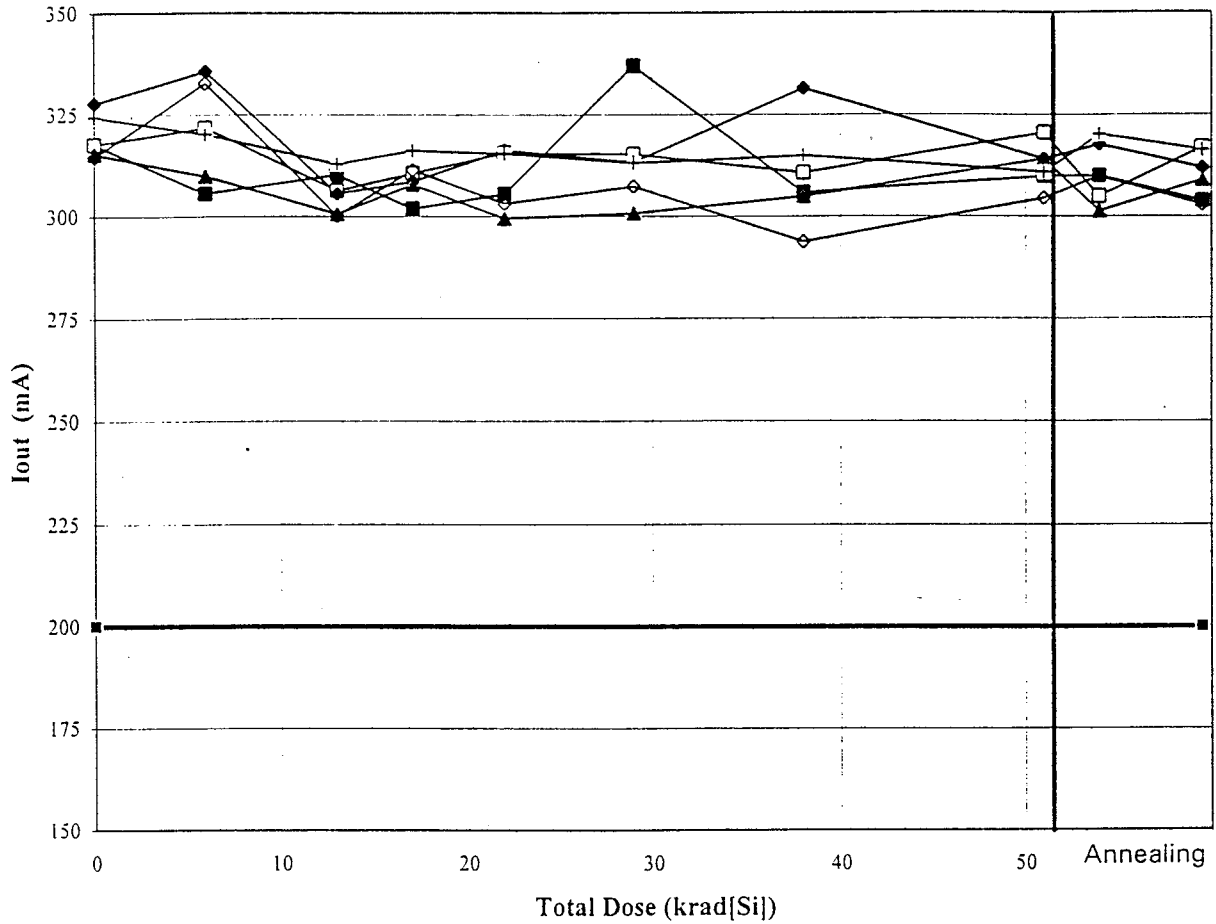
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	52.6	51.5	50.2	49.3	48.2	47.3	46.0	44.7	44.9	48.85			
364 (On)	□	52.6	51.5	50.1	49.3	48.3	47.3	46.1	44.8	45.0	48.82			
365 (On)	◆	52.7	51.9	50.7	50.0	49.1	48.2	47.2	46.1	46.3	49.36			
366 (On)	○	52.3	51.2	49.6	48.7	47.7	46.7	45.6	44.4	44.7	49.03			
367 (Off)	▲	52.8	51.6	49.7	48.7	47.6	46.1	44.4	41.8	41.9	46.38			
Mean(Ref)		52.9	53.0	52.9	53.0	52.8	52.8	52.8	52.7	52.9	52.78			
Spec(Min)		50.0									50.00			

Total Dose Radiation Testing

MATRA MARCONI SPACE

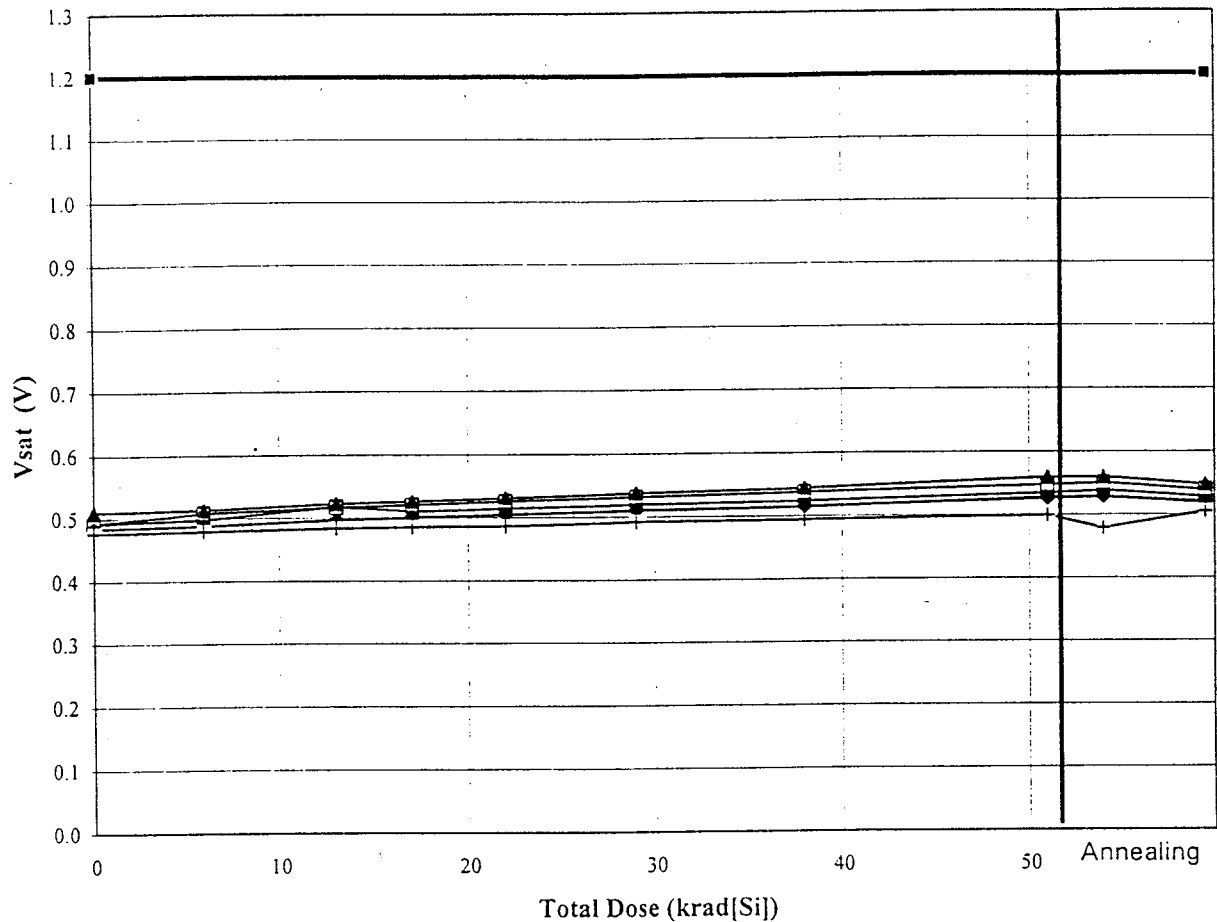
Date: mai-98		Figure 12	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = <360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: Iout (max)	Test conditions: Vin+ = 15V, Vin- = 0V	



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	318	306	310	302	305	337	306	310	310	304			
364 (On)	□	318	322	306	311	315	315	311	321	305	317			
365 (On)	◆	328	336	306	308	316	313	331	314	318	312			
366 (On)	◇	315	333	300	311	303	307	294	304	310	303			
367 (Off)	▲	315	310	301	308	299	301	305	314	301	309			
	●													
	○													
	△													
	○													
Mean(Ref)		324	320	313	316	315	313	315	311	320	316			
Spec(Min)	■	200									200			

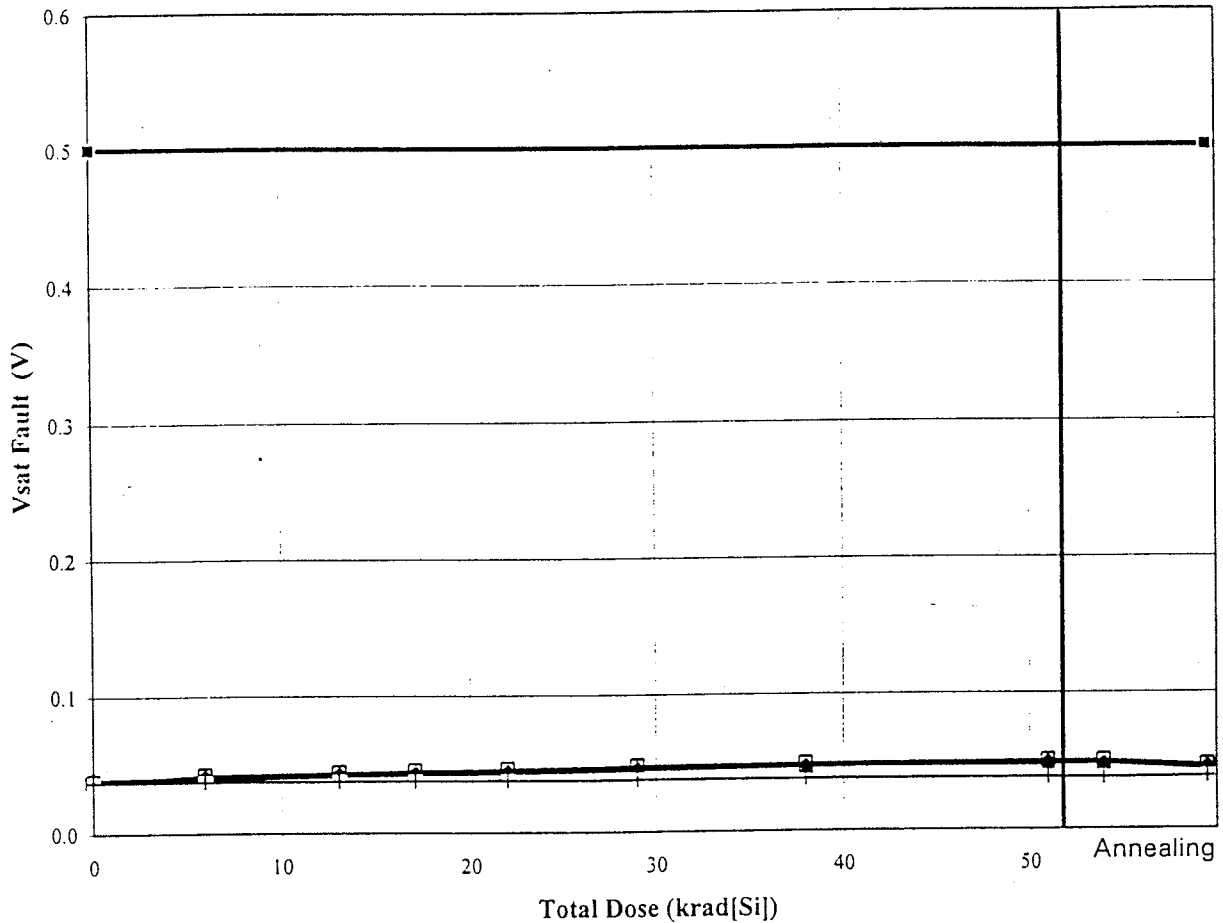
Date: mai-98		Figure 13	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = <360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: Vsat	Test conditions: Vin+ = 15V, Vin- = 0V, Iout = 100mA	



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	0.49	0.50	0.52	0.51	0.51	0.52	0.52	0.53	0.54	0.53			
364 (On)	—	0.49	0.51	0.52	0.52	0.53	0.53	0.54	0.55	0.55	0.54			
365 (On)	◆	0.48	0.49	0.50	0.50	0.50	0.51	0.51	0.53	0.53	0.52			
366 (On)	○	0.48	0.49	0.50	0.50	0.50	0.51	0.51	0.53	0.53	0.52			
367 (Off)	▲	0.51	0.51	0.52	0.53	0.53	0.54	0.54	0.56	0.56	0.55			
	●													
	○													
	—													
Mean(Ref)	—	0.48	0.48	0.48	0.49	0.49	0.49	0.49	0.50	0.48	0.50			
Spec(Max)	■	1.20									1.20			

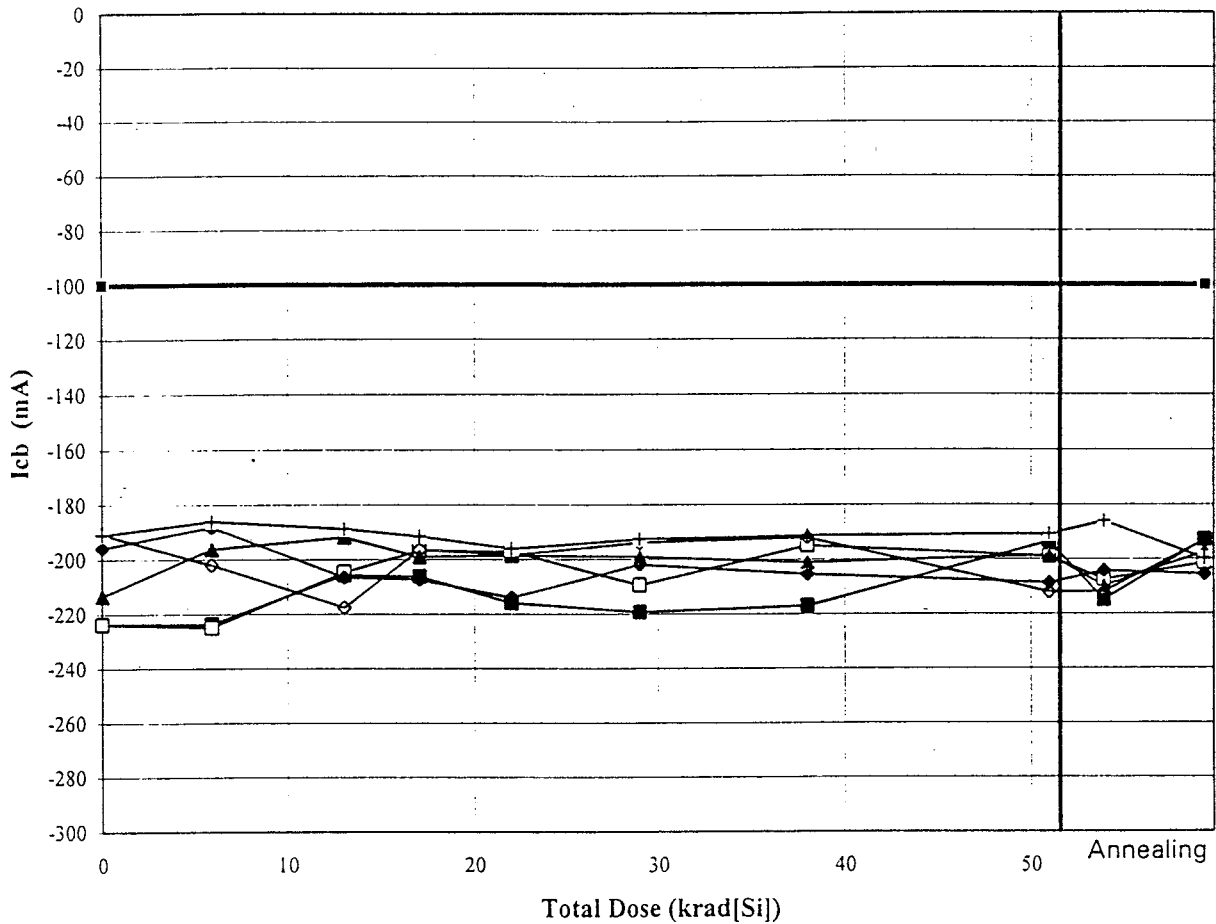
Date: mai-98		Figure 16	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = <360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: VsatFault	Test conditions: Vin+ = 15V, Vin- = 0V, Iout = 1mA	



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.04			
364 (On)	□	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05			
365 (On)	◆	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05			
366 (On)	◇	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04			
367 (Off)	▲	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05			
	△													
	●													
	○													
	○													
	○													
Mean(Ref)	---	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04			
Spec(Max)	■	0.50										0.50		

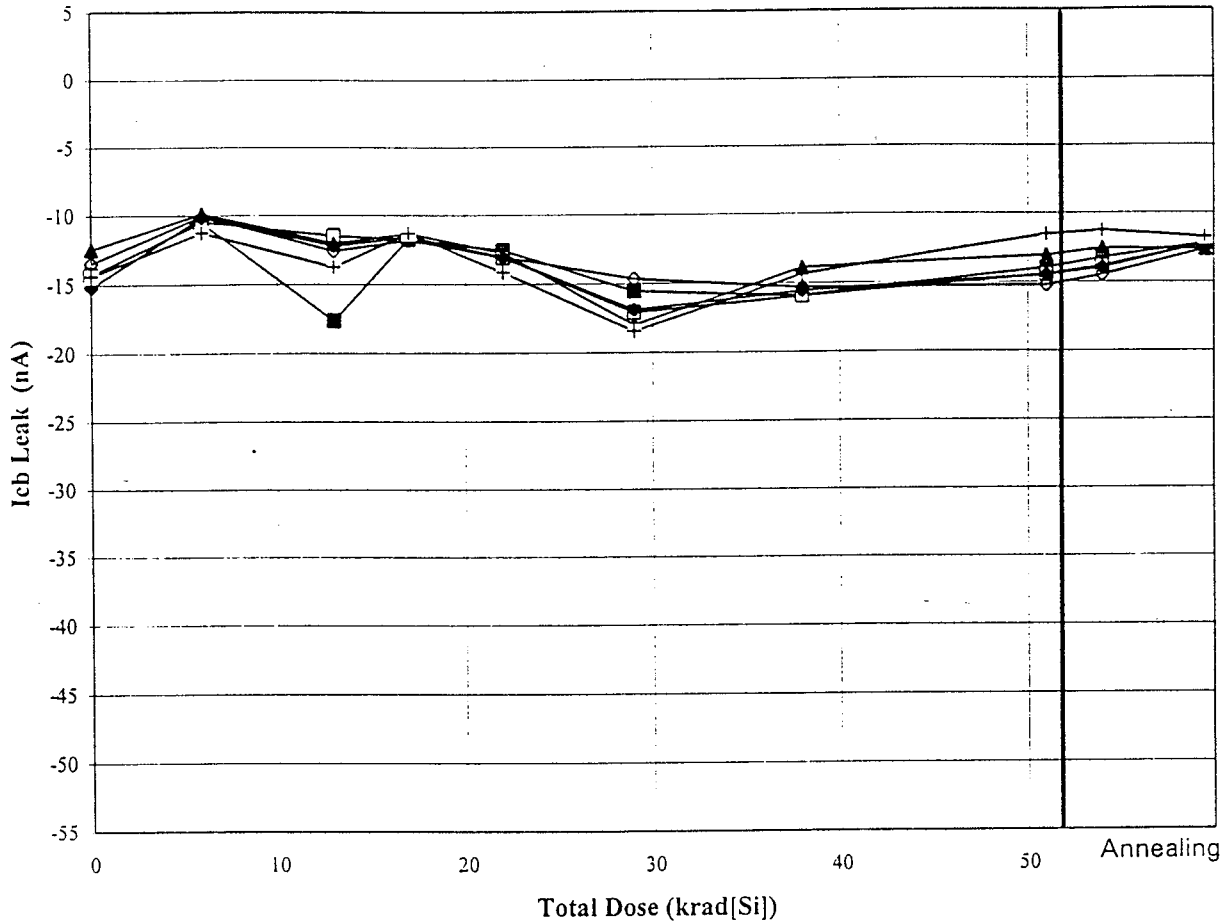
Date:	mai-98			Figure	17
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode		
Irradiation	Dose Rate: = <360 rad/h		Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter: Icb	Test conditions: Vin+ = 15V, Vin- = 0V			



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C				
362 (On)	■	-224	-224	-206	-206	-216	-219	-217	-193	-215	-193				
364 (On)	□	-224	-225	-205	-197	-197	-209	-195	-199	-207	-201				
365 (On)	◆	-196	-188	-207	-207	-214	-202	-205	-209	-204	-206				
366 (On)	◇	-191	-202	-218	-196	-198	-194	-192	-212	-212	-193				
367 (Off)	▲	-213	-196	-192	-199	-198	-199	-201	-199	-210	-197				
	○														
	●														
	○														
	▲														
	■														
Mean(Ref)		-191	-186	-189	-192	-196	-193	-191	-191	-186	-200				
Spec(Min)	■	-100									-100				

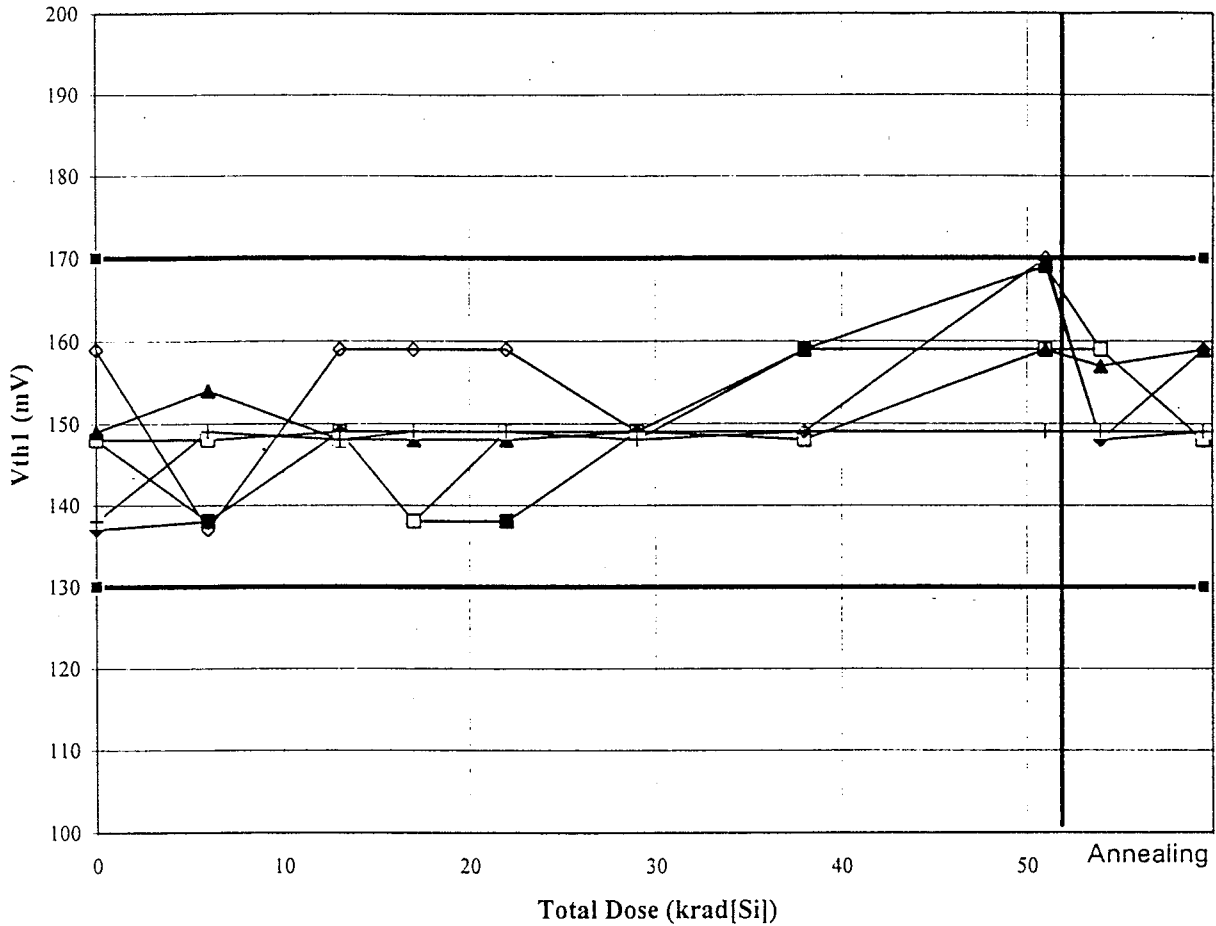
Date:	mai-98			Figure	18
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer:	Unitrode	
Irradiation	Dose Rate: = <360 rad/h		Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter: Icb Leak		Test conditions: Vin+ = 15V, Vin- = 0V		



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	-14.3	-10.5	-17.7	-11.8	-12.6	-15.6	-15.9	-14.0	-13.3	-12.2			
364 (On)	□	-14.3	-10.5	-11.5	-11.7	-13.1	-17.1	-16.0	-14.5	-13.9	-12.3			
365 (On)	◆	-15.2	-10.2	-12.3	-11.6	-13.0	-16.9	-15.6	-14.5	-14.0	-12.2			
366 (On)	○	-13.5	-10.1	-12.6	-11.8	-13.0	-14.7	-15.3	-15.3	-14.5	-12.6			
367 (Off)	▲	-12.5	-9.9	-12.0	-11.3	-12.8	-18.0	-13.9	-13.1	-12.6	-12.6			
	●													
	○													
	○													
	○													
Mean(Ref)		-14.4	-11.3	-13.8	-11.3	-14.2	-18.5	-14.4	-11.6	-11.3	-11.8			
Spec(Min)	■	-50μA												

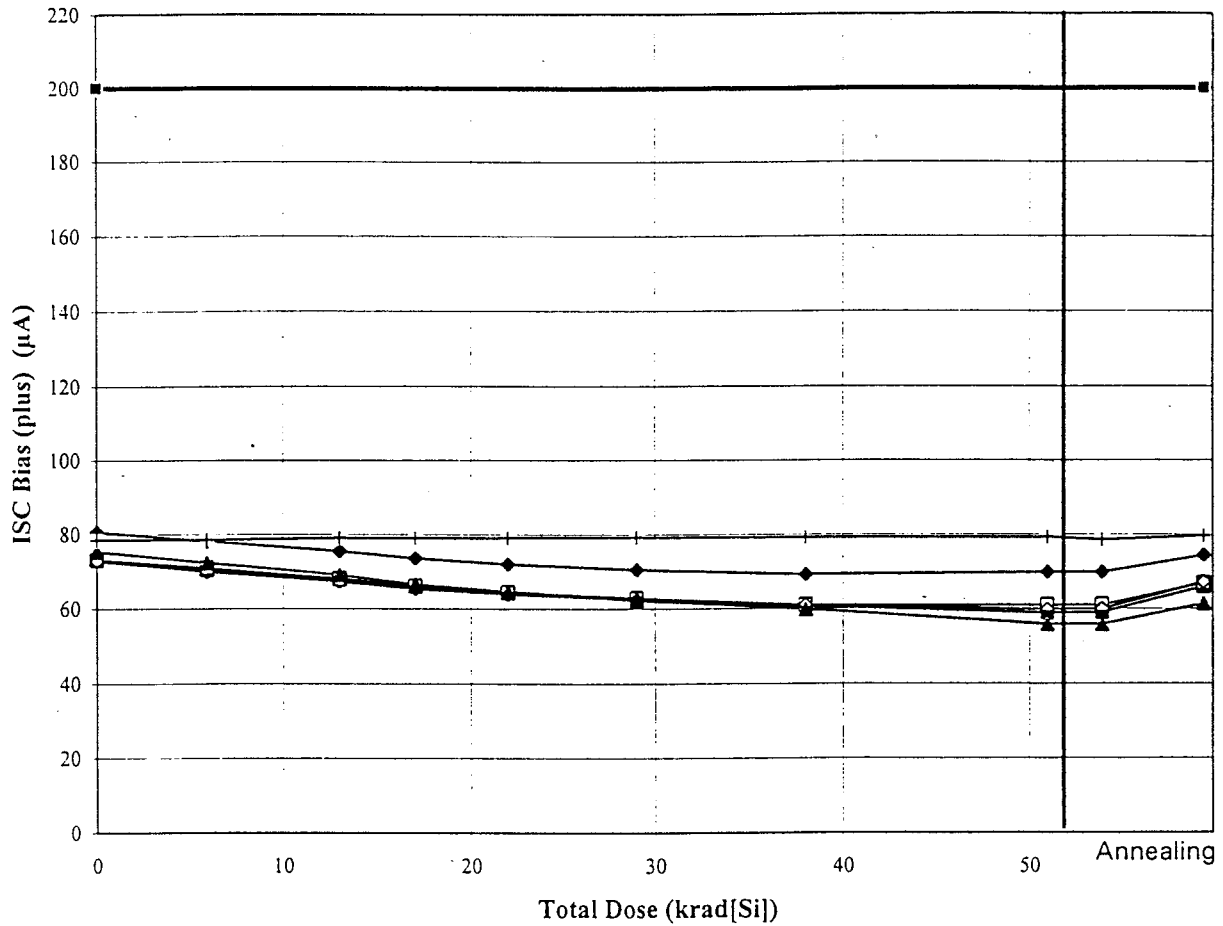
Date: mai-98		Figure 19	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: = < 360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: Vth1	Test conditions: Vin+ = 15V, Vin- = 0V, Vcm = 0V	



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	148	138	149	138	138	149	159	169	159	148			
364 (On)	□	148	148	149	138	149	149	148	159	159	148			
365 (On)	◆	137	138	149	149	149	148	159	169	148	149			
366 (On)	◇	159	137	159	159	159	149	149	170	148	159			
367 (Off)	▲	149	154	148	148	148	149	159	159	157	159			
	△													
	●													
	○													
	○													
	◀													
Mean(Ref)	—	138	149	148	149	149	148	149	149	149	149			
Spec(Min)	■	130									130			
Spec(Max)	■	170									170			

Date: mai-98		Figure 21	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: =<360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: IscBias (plus)	Test conditions: Vin+=15V, Vin-=0V, Vcm=15V	



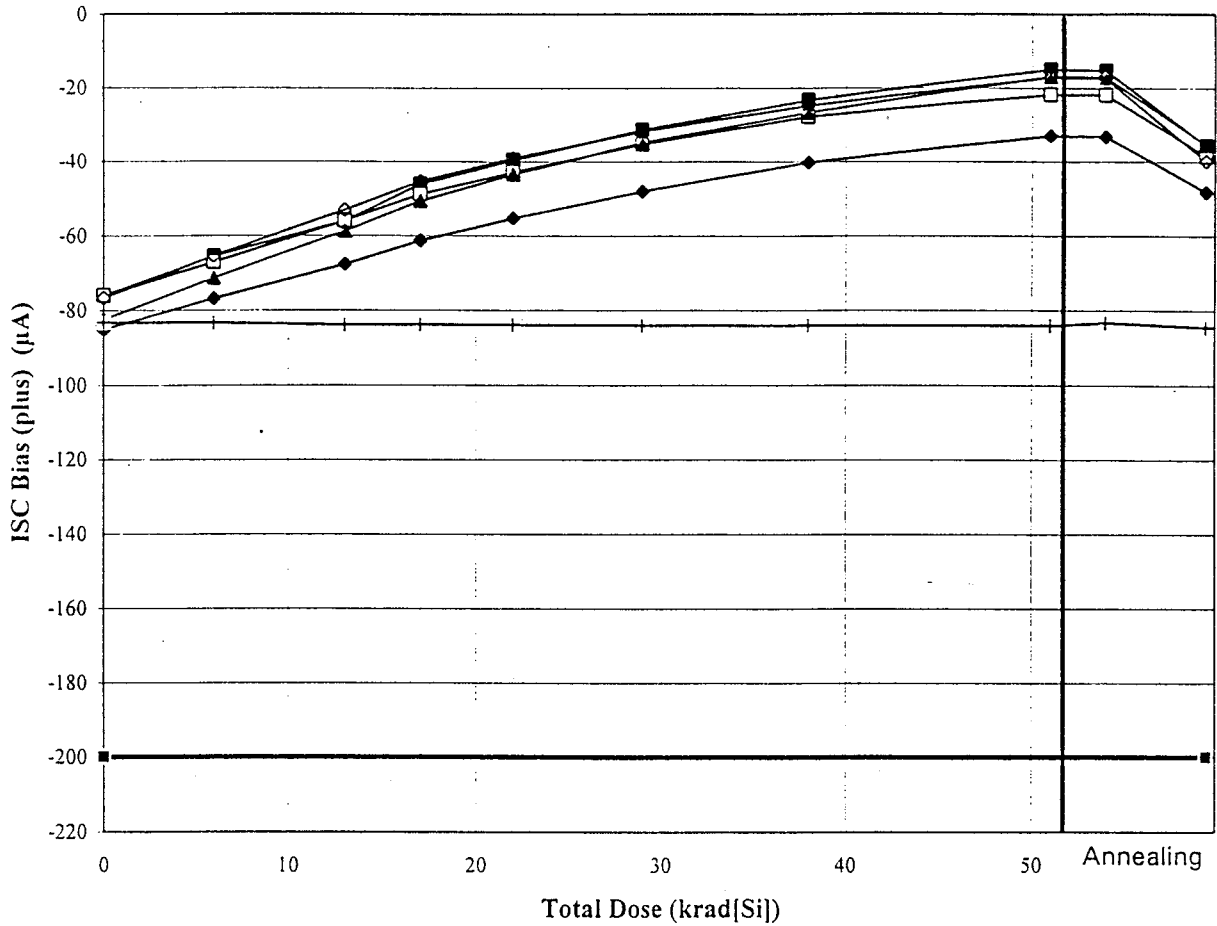
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	73.1	70.5	68.1	65.9	64.3	62.5	60.6	58.8	59.0	65.8			
364 (On)	□	73.1	70.9	67.9	66.0	64.3	62.8	61.0	60.9	60.9	66.8			
365 (On)	◆	80.6	78.1	75.4	73.6	72.0	70.5	69.2	69.8	69.8	74.4			
366 (On)	◇	72.9	69.9	67.2	65.2	63.9	62.4	60.9	59.7	59.9	67.1			
367 (Off)	▲	75.3	72.3	69.0	66.6	64.6	62.2	59.8	55.8	55.8	61.3			
	○													
	●													
	○													
	△													
	×													
Mean(Ref)	—	78.4	78.5	79.1	79.0	79.0	79.2	79.1	79.2	78.5	79.5			
Spec(Max)	■	200									200			

Total Dose Radiation Testing

MATRA MARCONI SPACE

Date:	mai-98		Figure	22
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode	
Irradiation	Dose Rate: = < 360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter: ISCBias (plus)	Test conditions: Vin+ = 15V, Vin- = 0V, Vcm = 0V		



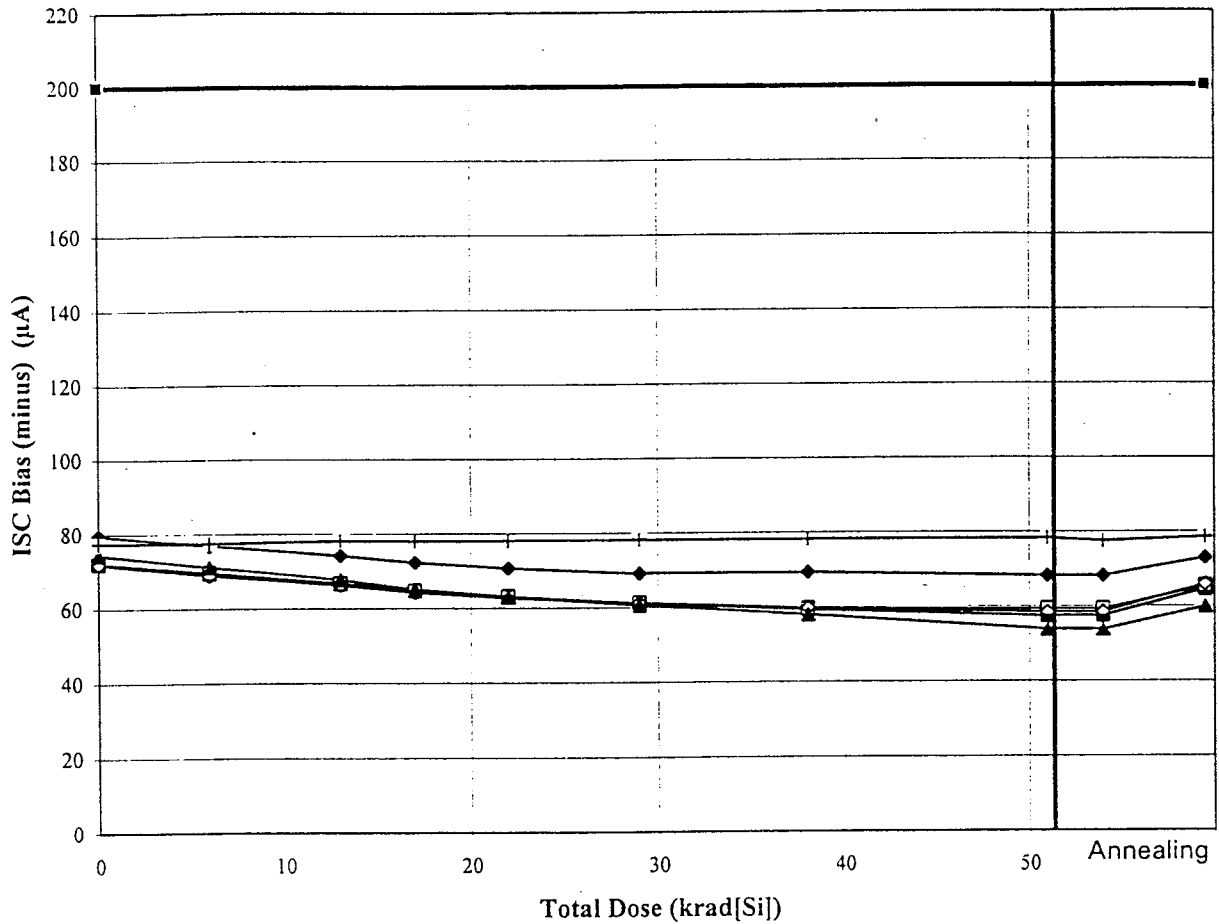
Comments: The two last points correspond to post annealing measurements.

Dose (krad(Si))		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	-76.0	-65.5	-56.1	-46.1	-39.5	-31.4	-23.3	-14.9	-15.3	-35.6			
364 (On)	□	-76.0	-67.1	-56.0	-48.8	-42.8	-35.3	-27.8	-21.7	-21.9	-38.5			
365 (On)	◆	-85.1	-76.9	-67.7	-61.3	-55.3	-48.0	-40.3	-33.0	-33.2	-48.1			
366 (On)	—	-76.7	-65.4	-53.0	-45.3	-39.0	-31.8	-24.8	-17.1	-17.5	-39.8			
367 (Off)	▲	-82.5	-71.4	-58.8	-50.6	-43.4	-34.8	-26.7	-16.9	-17.1	-35.3			
	●													
	○													
	—													
	—													
Mean(Ref)		-83.2	-83.3	-84.0	-83.9	-83.9	-84.1	-84.1	-84.2	-83.3	-84.5			
Spec(Min)	■	-200									-200			

Total Dose Radiation Testing

MATRA MARCONI SPACE

Date:	mai-98			Figure	23
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer:	Unitrode	
Irradiation	Dose Rate: =<360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)			
Test	Parameter: ISCBias (minus)	Test conditions: Vin+=15V, Vin-=0V, Vcm=15V			



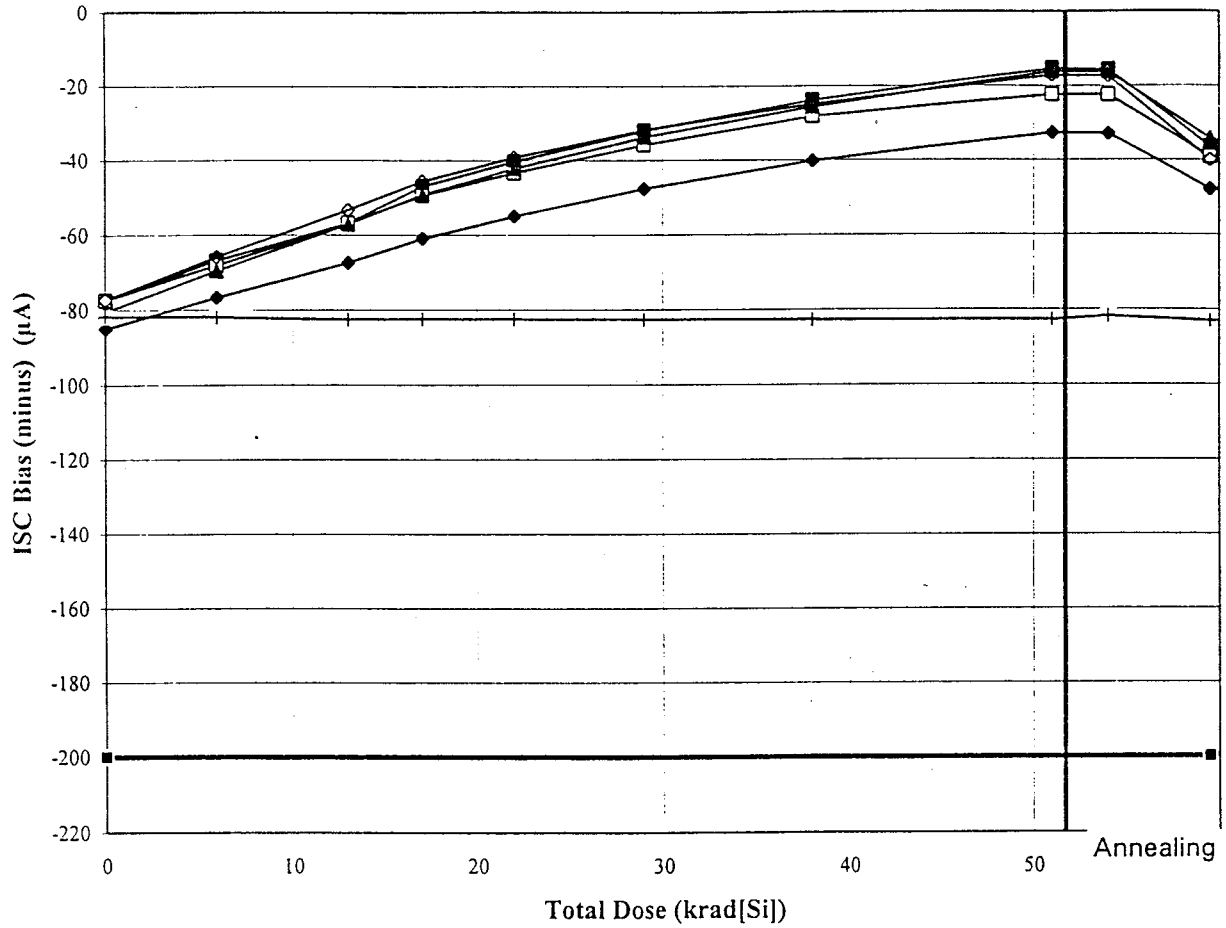
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C				
362 (On)	■	72.1	69.5	66.7	64.7	63.0	61.2	59.2	57.3	57.4	64.5				
364 (On)	□	72.1	69.6	66.5	64.6	62.9	61.2	59.4	59.2	59.2	65.3				
365 (On)	◆	79.5	76.9	74.1	72.2	70.6	69.1	69.2	68.1	68.1	72.9				
366 (On)	◇	71.9	68.8	66.1	64.1	62.6	61.2	59.6	58.3	58.4	65.9				
367 (Off)	▲	74.4	71.1	67.7	65.1	63.0	60.5	57.9	53.8	53.8	59.8				
	○														
	●														
	○														
	□														
	▲														
Mean(Ref)		77.4	77.5	78.1	77.9	78.0	78.2	78.1	78.2	77.5	78.5				
Spec(Max)	■	200									200				

Total Dose Radiation Testing

MATRA MARCONI SPACE

Date:	mai-98			Figure	24
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode		
Irradiation	Dose Rate: = < 360 rad/h		Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter: ISCBias (minus)	Test conditions: Vin+ = 15V, Vin- = 0V, Vcm = 0V			



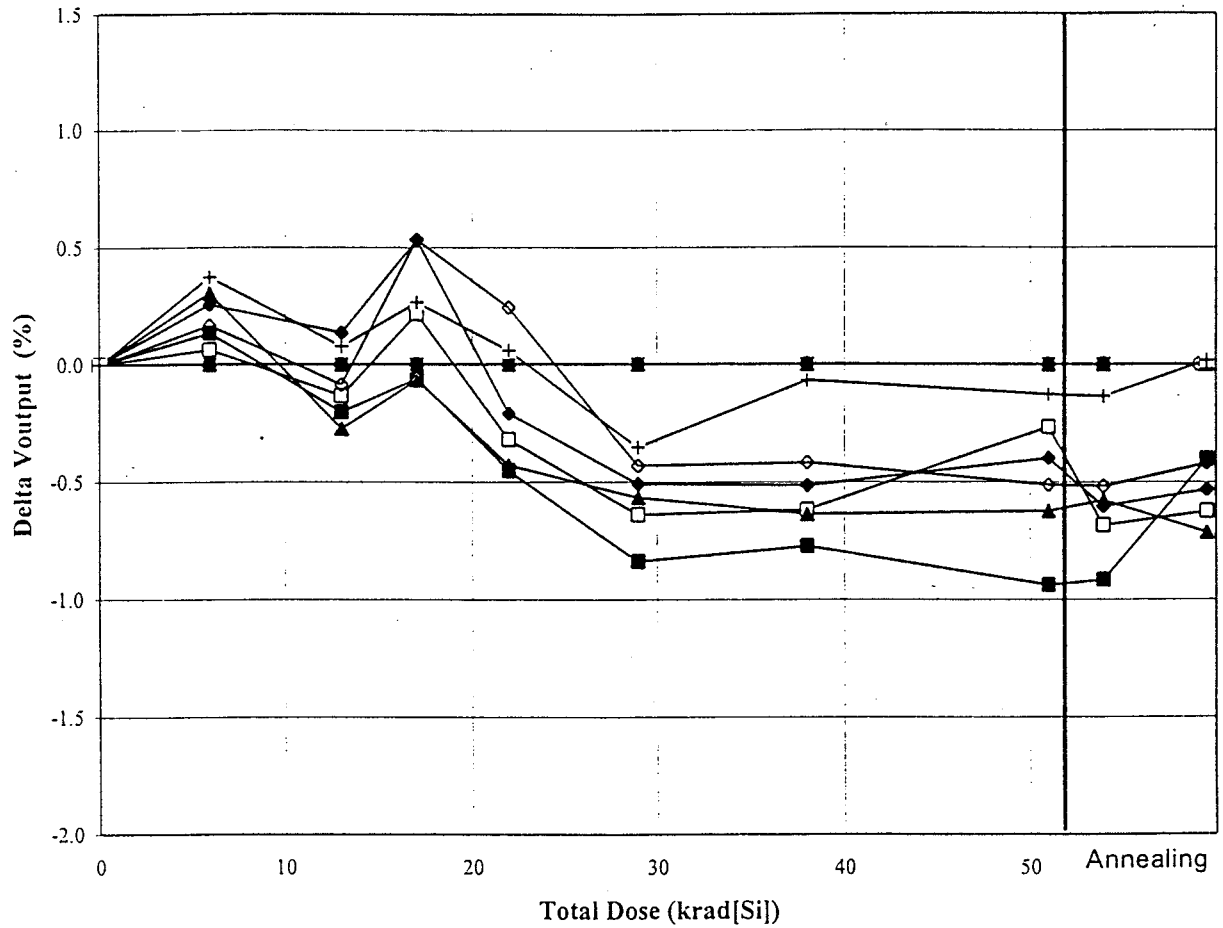
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■	-77.5	-66.8	-56.9	-46.9	-40.3	-32.0	-23.9	-15.4	-15.8	-36.3			
364 (On)	□	-77.5	-68.1	-56.8	-49.5	-43.4	-35.8	-28.3	-22.4	-22.5	-39.2			
365 (On)	◆	-85.0	-76.7	-67.4	-61.0	-55.0	-47.7	-40.2	-32.7	-32.9	-47.8			
366 (On)	◇	-77.3	-65.8	-53.3	-45.5	-39.2	-31.9	-24.9	-17.2	-17.5	-39.9			
367 (Off)	▲	-80.5	-69.6	-57.2	-49.2	-42.2	-33.7	-25.7	-16.2	-16.4	-34.2			
	●													
	○													
	△													
	◊													
Mean(Ref)		-81.8	-81.9	-82.6	-82.5	-82.6	-82.7	-82.7	-82.8	-81.9	-83.1			
Spec(Min)		-200									-200			

Total Dose Radiation Testing

MATRA MARCONI SPACE

Date:	mai-98			Figure	25	
Component	Type:	UC1834L	Date Code:	3A9320	Manufacturer:	Unitrode
Irradiation	Dose Rate:	= <360 rad/h	Irradiation Conditions:	Static On (Sn 362 to 366). Off (Sn 367)		
Test	Parameter:	Delta Voutput	Test conditions:	Vin+ = 10V, Vin- = 0V, Vref external		



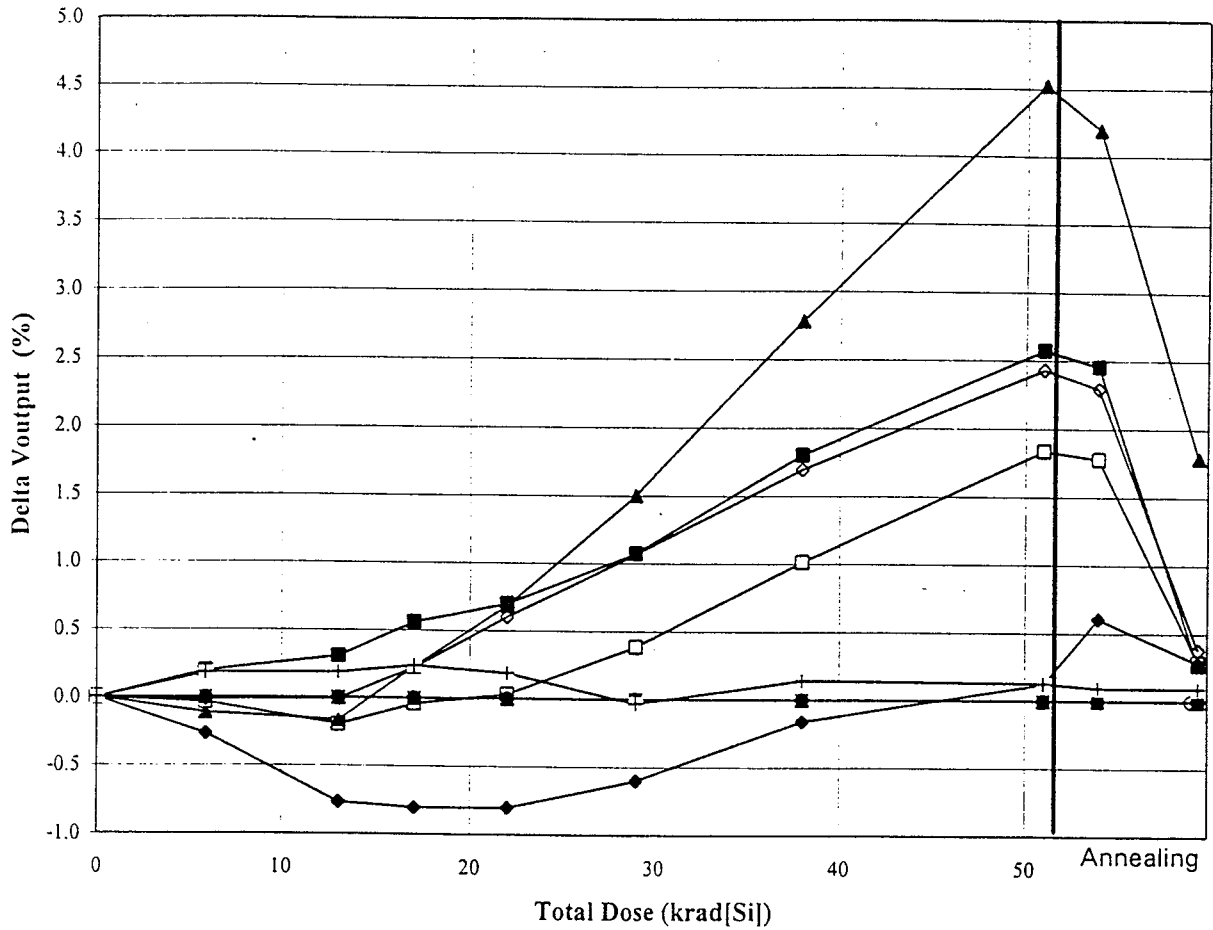
Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■		0.13	-0.20	-0.06	-0.45	-0.84	-0.77	-0.94	-0.92	-0.40			
364 (On)	□		0.06	-0.13	0.22	-0.32	-0.64	-0.62	-0.27	-0.68	-0.62			
365 (On)	◆		0.25	0.13	0.53	-0.21	-0.51	-0.52	-0.40	-0.60	-0.53			
366 (On)	◇		0.17	-0.09	0.53	0.24	-0.43	-0.42	-0.51	-0.52	-0.42			
367 (Off)	▲		0.30	-0.27	-0.07	-0.43	-0.57	-0.64	-0.62	-0.58	-0.71			
	●													
	○													
	—													
Mean(Ref)	—		0.37	0.08	0.27	0.06	-0.35	-0.07	-0.13	-0.14	0.02			

Total Dose Radiation Testing

MATRA MARCONI SPACE

Date: mai-98		Figure 26	
Component	Type: UC1834L	Date Code: 3A9320	Manufacturer: Unitrode
Irradiation	Dose Rate: =<360 rad/h	Irradiation Conditions: Static On (Sn 362 to 366). Off (Sn 367)	
Test	Parameter: Delta Voutput	Test conditions: Vin+=10V, Vin-=0V, Vref internal	



Comments: The two last points correspond to post annealing measurements.

Dose (krad[Si])		0	6	13	17	22	29	38	51	25°C	100°C			
362 (On)	■		0.19	0.31	0.56	0.70	1.07	1.80	2.57	2.46	0.27			
364 (On)	□		-0.04	-0.20	-0.04	0.03	0.39	1.01	1.83	1.78	0.29			
365 (On)	◆		-0.27	-0.77	-0.80	-0.80	-0.60	-0.16	0.12	0.61	0.28			
366 (On)	○		-0.02	-0.01	0.23	0.60	1.07	1.69	2.43	2.29	0.38			
367 (Off)	▲		-0.11	-0.17	0.23	0.69	1.50	2.78	4.52	4.20	1.79			
	●													
	○													
	□													
	▲													
Mean(Ref)			0.18	0.19	0.24	0.19	-0.03	0.14	0.13	0.09	0.09			

Emetteur	: Ph. DOS SANTOS
Direction ou service	: DTR
Référence	: DAST/DTR/NI 8.224
Date	: 16-06-98
Objet	: Report diffusion

Destinataires : A. STOREY (MMS-UK)
L. GIRALDOU (MMS-Toulouse)

Please find hereafter a copy of the RVT report for UC1834L (3A9320) from UNITRODE.

Reference report : DAST/DTR/RP8.166

Best regards,

PDS

Lindenberg
Günther
Tiemann
LFB.