MetOp	TOTAL DOSE RADIATION TEST REPORT No. MO-RR-TLG-PM-0005	Issue: 1 Rev.: Date: 01/02/00 Page: 1/6

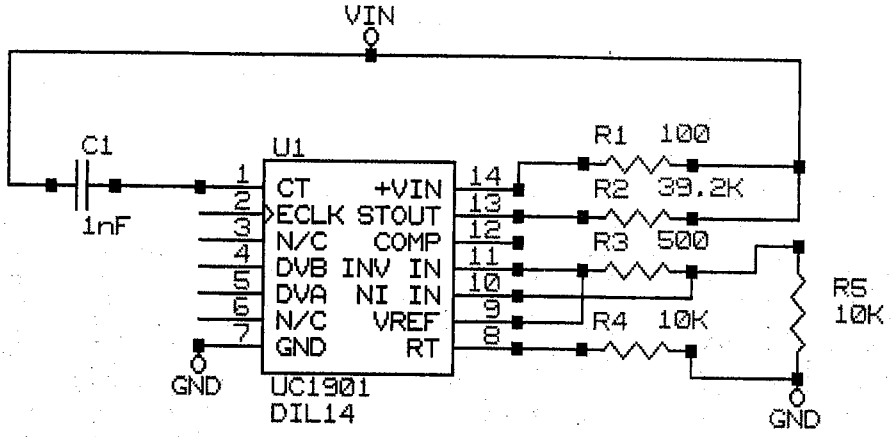
SCC Component No TPR0809301B		Component Designation: UC1901	Irradiation Spec. No.: SCC 22900 Iss.4
Gen. Spec.: SCC 9000 9C Det. Spec.: TPR-08-093 1A Amend.:		Evaluation: - Acceptance Diffusion: - Acceptance Lot: X	Project/Programme: METOP
Family: 08	Group: 16	Functional Assignment: ISOLATED FEEDBACK GENERATOR	Package: DIL-14
MFR. Name: UNITRODE Address: USA		Test House: TECNOLOGICA Address: MADRID (SPAIN)	Orig. house: TECNOLOGICA Address: SEVILLA (SPAIN)
Radiation Test Plan No.: MO-RP-TLG-PM-005		Sample Size: 6 Irradiation Devices: 5 Control Devices: 1	Date Code: 6A9849A Diffusion LOT: -- Wafer No.: --
Radiation Source: Cobalt-60 Facility Name: CIEMAT Address: MADRID (SPAIN)		Energy: 1.33/1.17 MeV Dose Rate: 290 rad(Si)/h	Date of Test: 16-11-99
Irradiation Conditions: Biased: X Unbiased: -- Test Circuit: Figure 1		Irradiation Measurements Interval: Remote test: -- In situ Test: X	Annealing Tests: 72h/25ºC Biased: X Unbiased: - Test Circuit: Figure 1

Electrical Measurements. Parameters Tested:

V_{REF}, K_{LINE}, K_{LOAD}, I_{SC}, V_{IO}, I_{+IB}, I_{-IB}, I_{IO}, CMRR, PSRR, V_{OUT1}, I_{sink1}, $I_{source1}$, G_V, V_{OUT2}, I_{Dsink}, $I_{Dsource}$, V_{ECTHL}, V_{ECTHH},, V_{sisat}, I_{SIO}, I_{slleak}, I_{CC}.

Prepared by: José M. Valverde Date: 01/02/00 Signature:	Approved by: Date: 01/02/00 Signature:

FIGURE 1.-RADIATION BIAS CIRCUIT



SUMMARY

Total dose steady-state irradiation test has been carried out on a ISOLATED FEEDBACK GENERATOR UC1901 from UNITRODE with date code 6A9849A.. The irradiated parts were labelled as follows: irradiated devices R2,..,R6= S/N 32 TO 35 and 37; R1= S/N 31 as control device.

DEVIATION TO PLAN

No measured parameters: input voltage window (V_{EAINV} & V_{EANINV}).

RESULTS

The next table shows a results resume of the irradiation test:

	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40 KRAD	ANN
REFERENCE SECTION								
V_{REF}	PASS	PASS	FAIL 3	FAIL 4	FAIL 4	FAIL 5	FAIL 5	FAIL 5
K_{LINE}	PASS	PASS	PASS	PASS	PASS	PASS	FAIL 3	FAIL 2
K_{LOAD}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I_{SC}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ERROR AMPLIFIER SECTION								
V_{IO} (Note 1)	PASS	FAIL 1	FAIL 2	FAIL 5	FAIL 5	FAIL 5	FAIL 5	FAIL 5
I_{+IB}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I_{-IB}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I_{IO}	PASS	PASS	PASS	PASS	PASS	PASS	FAIL 3	FAIL 1
CMMR	PASS	PASS	PASS	FAIL 1	FAIL 2	FAIL 3	FAIL 5	FAIL 5
PSRR	PASS	FAIL 1	FAIL 2	FAIL 4	FAIL 5	FAIL 5	FAIL 5	FAIL 5
V_{OUT1}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I_{sink1}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
$I_{source1}$	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
MODULATOR/DRIVER SECTION								
G_V	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
V_{OUT2}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I_{Dsink}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
$I_{Dsource}$	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
OSCILLATOR SECTION								
V_{ECTHL}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40 KRAD	ANN
V_{ECTHH}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
STATUS INDICATOR SECTION								
V_{sisat}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I_{SIO}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
$I_{silleak}$	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
GENERAL								
ICC	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Note 1: The input offset voltage of the error amplifier section has been measured with a common voltage of 1.5V, equal as in the detail specification, but forcing 1V at the output of the amplifier (the right output condition is 1.5V but this level voltage is out of the output range of this section).

CONCLUSION

The results indicate that:

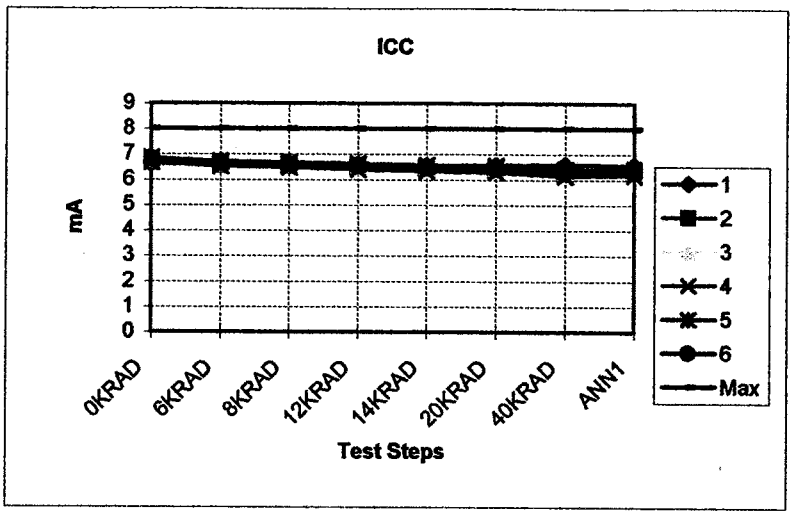
1. The electrical failures are located in the error amplifier and reference sections. The first failures appear at 6 Krad. The affected parameters are: V_{REF}, K_{LINE}, V_{IO}, I_{IO}, CMRR, PSRR.
2. The other parameters are inside the specified validity ranges in the irradiation plan.

SCHEDULE

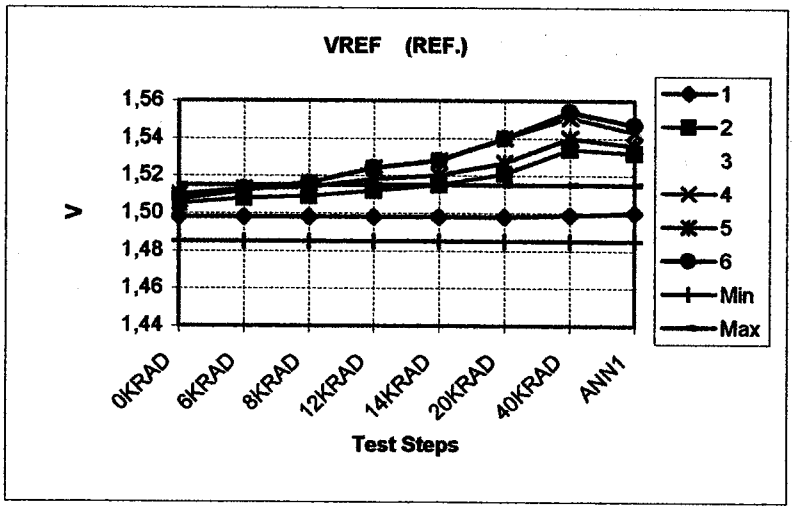
Test Step	Description	Result or Actual Test Condition	Time In	Time Out	Exposure
1	Sample serialization	CONTROL R1 IRR. DEVICES R2 to R6			
2	Initial Electrical Measurements	See 0 krad(Si) values in respective Parameter Data Tables	10:00 16/11	10:45 16/11	45min.
3	Set-up of Test	Bias circuit verified according to Fig. 1			
4	Irradiation Exposure	Total Dose: 6 Krad(Si) Cumulative Dose: 6 Krad(Si) Dose Rate: 290 Rad(Si)/h	10:50 16/11	07:35 17/11	20h 45min
5	Intermediate Electrical Measurements	See 6 krad(Si) values in respective Parameter Data Tables	07:45 17/11	08:15 17/11	30min.
6	Set-up of Test	Bias circuit verified according to Fig. 1			
7	Irradiation Exposure	Total Dose: 2 Krad(Si) Cumulative Dose: 8 Krad(Si) Dose Rate: 290 Rad(Si)/h	08:30 17/11	15:25 17/11	06h 55min
8	Intermediate Electrical Measurements	See 8 krad(Si) values in respective Parameter Data Tables	16:00 17/11	17:00 17/11	1h
9	Set-up of Test	Bias circuit verified according to Fig. 1			
10	Irradiation Exposure	Total Dose: 4 Krad(Si) Cumulative Dose: 12 Krad(Si) Dose Rate: 290 Rad(Si)/h	17:30 17/11	07:30 18/11	14h
11	Intermediate Electrical Measurements	See 12 krad(Si) values in respective Parameter Data Tables	07:45 18/11	08:15 18/11	30min.
12	Set-up of Test	Bias circuit verified according to Fig. 1			
13	Irradiation Exposure	Total Dose: 2 Krad(Si) Cumulative Dose: 14 Krad(Si) Dose Rate: 290 Rad(Si)/h	08:30 18/11	15:20 18/11	6h 50min
14	Intermediate Electrical Measurements	See 14 krad(Si) values in respective Parameter Data Tables	15:25 18/11	15:40 18/11	15min.

Test Step	Description	Result or Actual Test Condition	Time In	Time Out	Exposure
12	Set-up of Test	Bias circuit verified according to Fig. 1			
15	Irradiation Exposure	Total Dose: 6 Krad(Si) Cumulative Dose: 20 Krad(Si) Dose Rate: 290 Rad(Si)/h	15:45 18/11	12:25 19/11	20h 40min
16	Intermediate Electrical Measurements	See 20 krad(Si) values in respective Parameter Data Tables	12:30 19/11	13:00 19/11	30min.
12	Set-up of Test	Bias circuit verified according to Fig. 1			
15	Irradiation Exposure	Total Dose: 20 Krad(Si) Cumulative Dose: 40 Krad(Si) Dose Rate: 290 Rad(Si)/h	13:15 19/11	11:15 22/11	70h
16	Intermediate Electrical Measurements	See 40 krad(Si) values in respective Parameter Data Tables	11:30 22/11	12:00 22/11	30min.
12	Set-up of Test	Bias circuit verified according to Fig. 1			
17	Annealing 24h	Bias circuit verified according to Fig. 1. Temperature: 25 °C	12:15 22/11	12:15 22/11	24h
18	Electrical Measurements	See ANN values in respective parameter Data Tables	12:30 22/11	13:00 22/11	30min

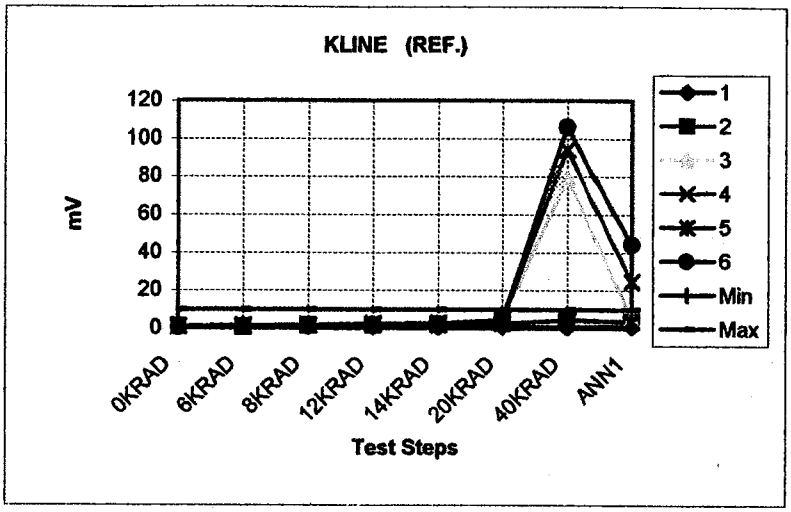
ELECTRICAL MEASUREMENT RESULTS



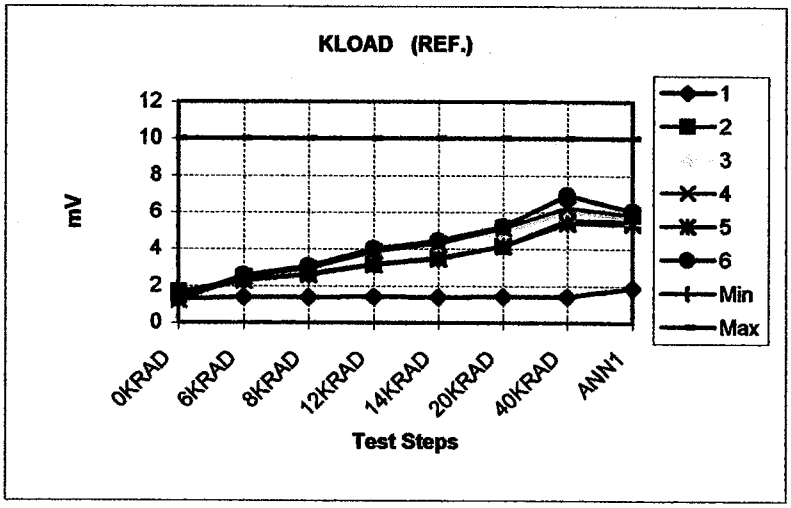
ICC	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	6,62	6,59	6,58	6,57	6,53	6,58	6,58	6,57
2	6,70	6,57	6,55	6,49	6,44	6,40	6,27	6,31
3	6,77	6,64	6,59	6,50	6,45	6,42	6,27	6,31
4	6,66	6,52	6,48	6,39	6,33	6,30	6,15	6,18
5	6,83	6,71	6,68	6,62	6,57	6,54	6,42	6,43
6	6,81	6,67	6,62	6,53	6,48	6,45	6,30	6,32
Max	8	8	8	8	8	8	8	8
Unit	mA	mA	mA	mA	mA	mA	mA	mA



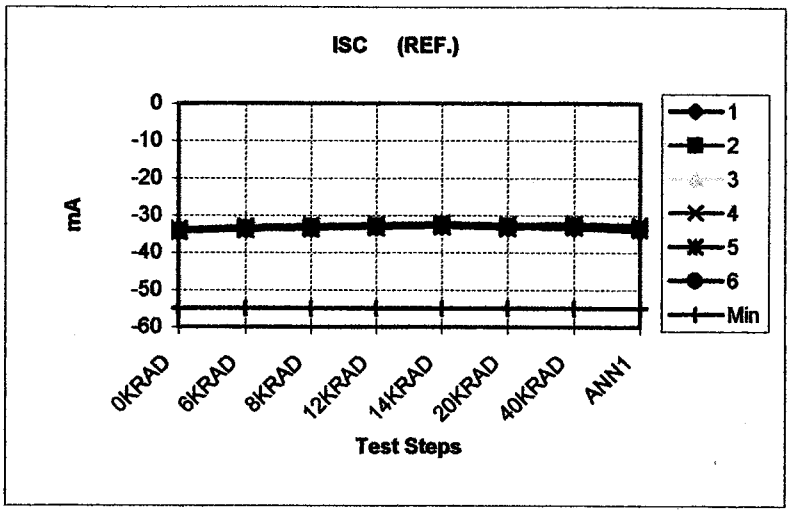
VREF	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	1,498	1,498	1,498	1,498	1,498	1,498	1,499	1,500
2	1,505	1,508	1,509	1,512	1,515	1,521	1,534	1,532
3	1,509	1,514	1,517	1,525	1,530	1,541	1,553	1,544
4	1,507	1,512	1,516	1,524	1,528	1,540	1,551	1,543
5	1,510	1,513	1,514	1,518	1,520	1,527	1,540	1,536
6	1,509	1,513	1,516	1,524	1,528	1,540	1,554	1,547
Min	1,485	1,485	1,485	1,485	1,485	1,485	1,485	1,485
Max	1,515	1,515	1,515	1,515	1,515	1,515	1,515	1,515
Unit	V	V	V	V	V	V	V	V



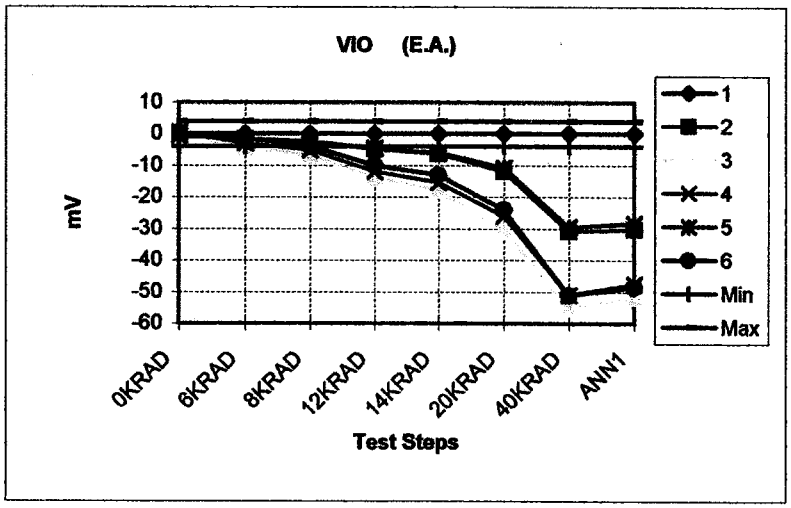
KLINE	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	0,875	1,090	1,065	1,085	0,940	1,095	0,980	1,035
2	1,145	0,430	1,680	1,735	1,905	2,620	4,455	3,770
3	0,860	1,380	1,645	2,395	2,690	4,120	78,975	5,455
4	1,005	1,300	1,795	2,450	2,795	4,435	94,180	24,650
5	1,175	1,350	1,500	1,875	2,055	2,780	4,225	3,630
6	0,465	0,995	1,200	1,985	2,345	4,010	106,055	44,215
Min	-10	-10	-10	-10	-10	-10	-10	-10
Max	10	10	10	10	10	10	10	10
Unit	mV	mV	mV	mV	mV	mV	mV	mV



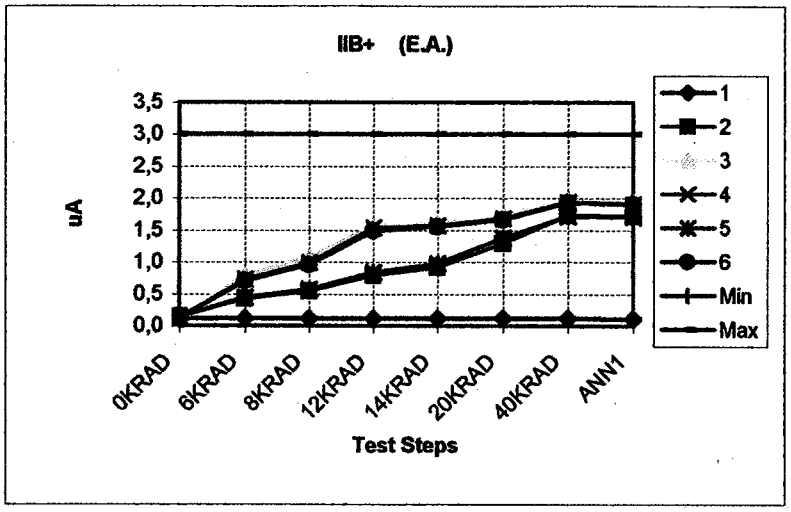
KLOAD	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	1,305	1,380	1,385	1,405	1,375	1,410	1,420	1,880
2	1,665	2,325	2,650	3,175	3,505	4,160	5,565	5,510
3	1,325	2,475	2,935	3,915	4,290	4,915	5,960	5,730
4	1,200	2,480	2,930	3,860	4,305	5,135	6,225	5,870
5	1,505	2,290	2,590	3,135	3,455	4,140	5,385	5,355
6	1,335	2,560	3,045	4,000	4,430	5,210	6,925	6,060
Min	-10	-10	-10	-10	-10	-10	-10	-10
Max	10	10	10	10	10	10	10	10
Unit	mV	mV	mV	mV	mV	mV	mV	mV



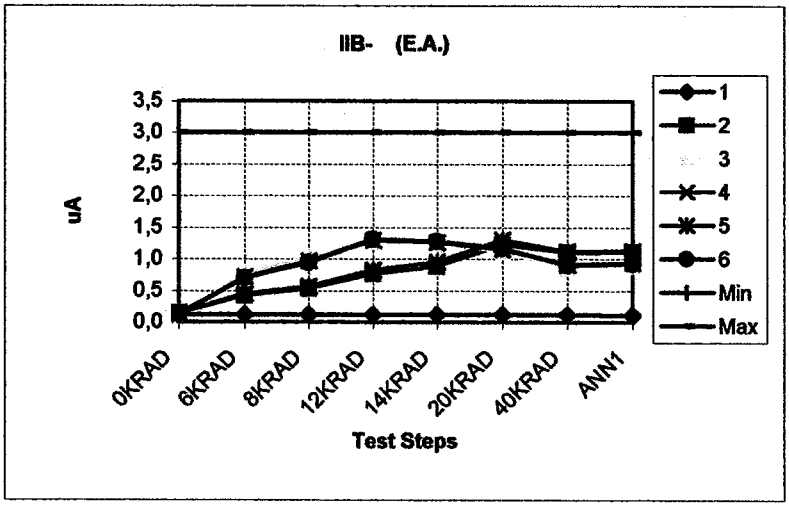
ISC	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	-33,81	-33,52	-33,48	-33,24	-33,00	-33,38	-33,45	-34,13
2	-34,16	-33,61	-33,42	-33,05	-32,80	-33,06	-32,85	-33,62
3	-33,90	-33,20	-32,93	-32,55	-32,38	-32,65	-32,46	-33,04
4	-33,60	-32,87	-32,63	-32,28	-32,03	-32,27	-32,14	-32,66
5	-34,53	-33,86	-33,61	-33,28	-33,05	-33,42	-33,22	-33,81
6	-34,15	-33,39	-33,08	-32,87	-32,51	-32,86	-32,69	-33,27
Min	-55	-55	-55	-55	-55	-55	-55	-55
Unit	mA	mA	mA	mA	mA	mA	mA	mA



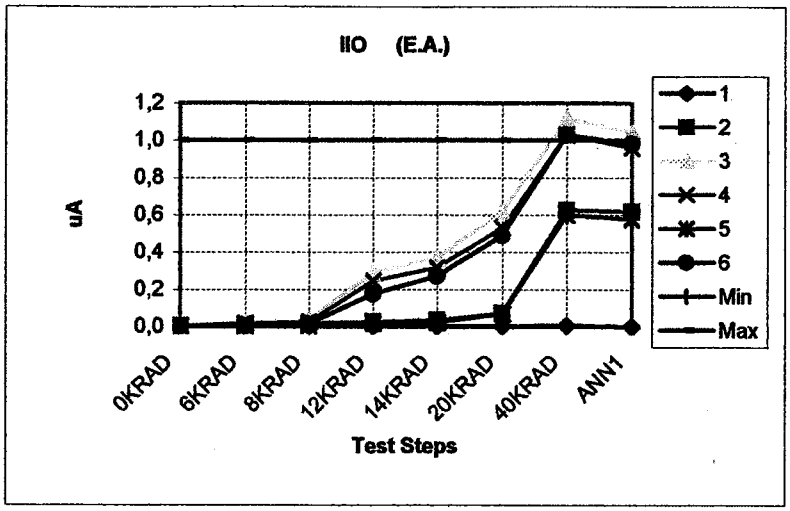
VIO	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	0,021	0,037	0,039	0,051	0,058	0,045	0,047	0,093
2	-0,013	-1,641	-2,515	-4,797	-6,396	-11,944	-30,908	-30,202
3	-0,445	-4,114	-6,997	-13,921	-17,918	-30,473	-55,413	-51,742
4	0,506	-2,983	-5,119	-11,836	-15,339	-26,083	-51,010	-47,498
5	-0,666	-1,606	-2,389	-4,643	-5,979	-10,622	-29,535	-28,378
6	0,441	-1,493	-3,872	-9,985	-13,122	-24,017	-51,123	-48,567
Min	-4	-4	-4	-4	-4	-4	-4	-4
Max	4	4	4	4	4	4	4	4
Unit	mV	mV	mV	mV	mV	mV	mV	mV



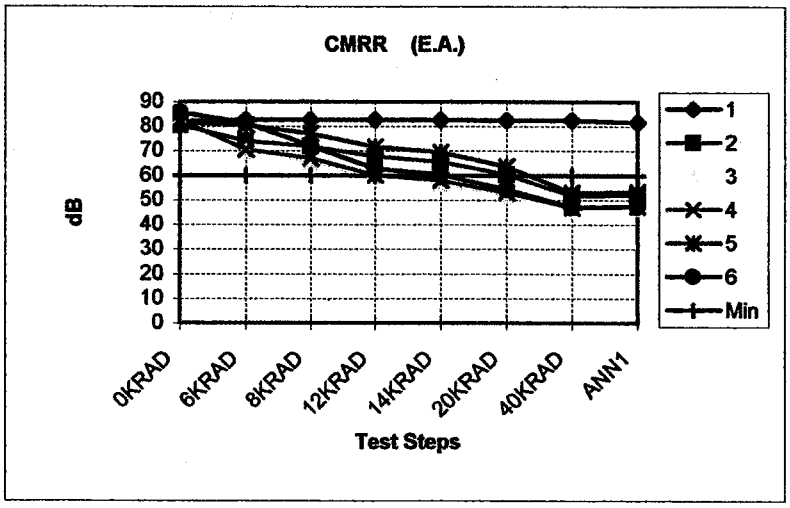
IIB+	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	0,118	0,119	0,119	0,119	0,119	0,119	0,120	0,112
2	0,151	0,433	0,543	0,791	0,916	1,298	1,733	1,727
3	0,132	0,791	1,071	1,562	1,602	1,728	1,978	1,941
4	0,110	0,735	0,993	1,542	1,577	1,684	1,934	1,898
5	0,145	0,449	0,571	0,839	0,975	1,377	1,719	1,707
6	0,125	0,704	0,955	1,491	1,554	1,663	1,935	1,909
Min	-3	-3	-3	-3	-3	-3	-3	-3
Max	3	3	3	3	3	3	3	3
Unit	uA	uA	uA	uA	uA	uA	uA	uA



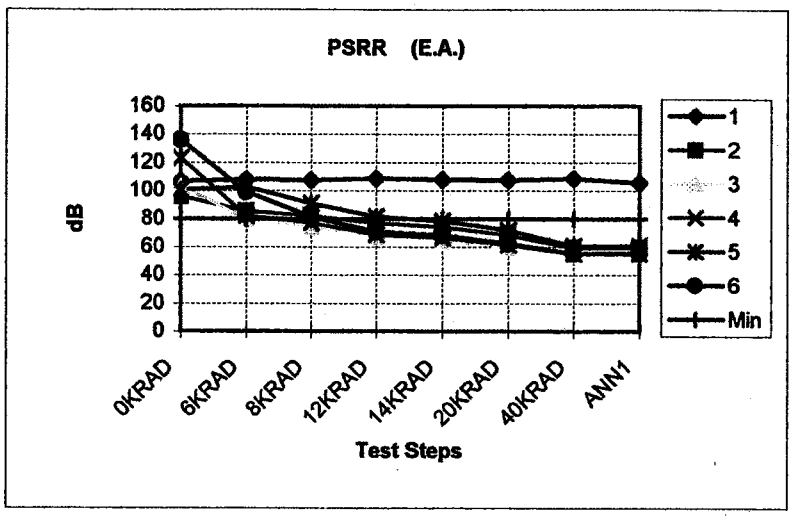
IIB-	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	0,115	0,116	0,116	0,116	0,116	0,116	0,114	0,111
2	0,147	0,422	0,528	0,764	0,880	1,226	1,106	1,111
3	0,130	0,772	1,034	1,274	1,235	1,109	0,861	0,896
4	0,108	0,719	0,966	1,295	1,260	1,152	0,905	0,939
5	0,142	0,447	0,565	0,823	0,953	1,307	1,119	1,130
6	0,123	0,701	0,940	1,314	1,283	1,173	0,904	0,928
Min	-3	-3	-3	-3	-3	-3	-3	-3
Max	3	3	3	3	3	3	3	3
Unit	uA	uA	uA	uA	uA	uA	uA	uA



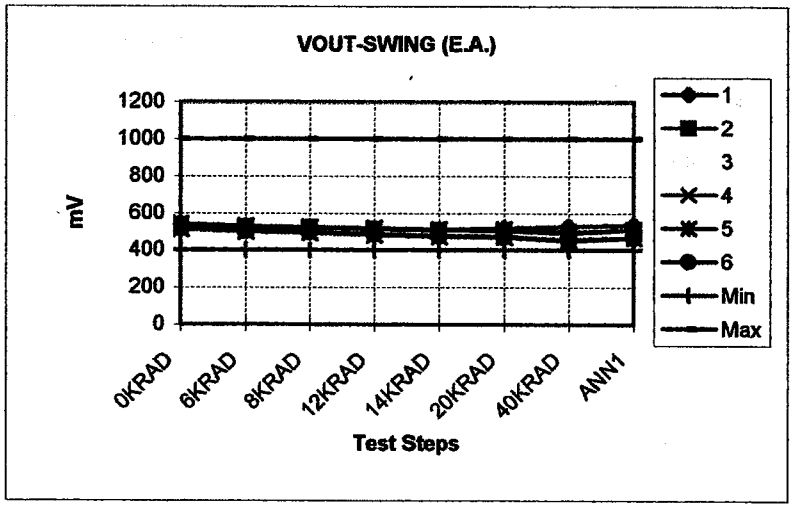
IIO	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	0,003	0,003	0,002	0,002	0,003	0,003	0,006	0,001
2	0,004	0,011	0,016	0,027	0,036	0,071	0,627	0,616
3	0,003	0,019	0,037	0,288	0,368	0,619	1,117	1,044
4	0,002	0,017	0,027	0,246	0,316	0,531	1,029	0,960
5	0,003	0,003	0,006	0,016	0,022	0,070	0,600	0,577
6	0,002	0,002	0,015	0,177	0,272	0,490	1,031	0,981
Min	-1	-1	-1	-1	-1	-1	-1	-1
Max	1	1	1	1	1	1	1	1
Unit	uA	uA	uA	uA	uA	uA	uA	uA



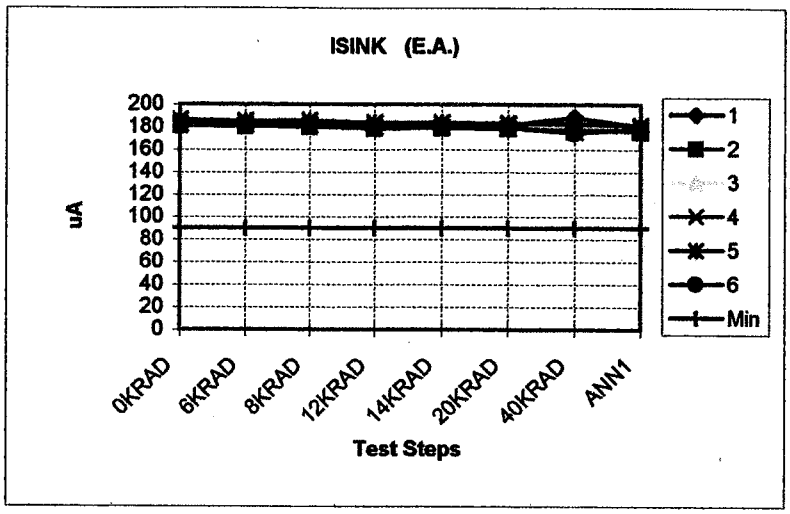
CMRR	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	82,1	82,6	82,6	82,6	82,5	82,5	82,5	81,6
2	80,6	74,1	71,9	67,8	65,5	60,3	51,8	51,9
3	82,9	70,1	65,4	59,3	56,8	51,6	46,1	46,6
4	82,4	70,5	67,1	60,1	57,9	53,0	46,9	47,4
5	81,7	80,5	77,1	71,5	69,5	63,7	53,0	53,2
6	85,7	81,4	72,0	62,7	60,3	54,2	47,1	47,5
Min	60	60	60	60	60	60	60	60
Unit	dB	dB	dB	dB	dB	dB	dB	dB



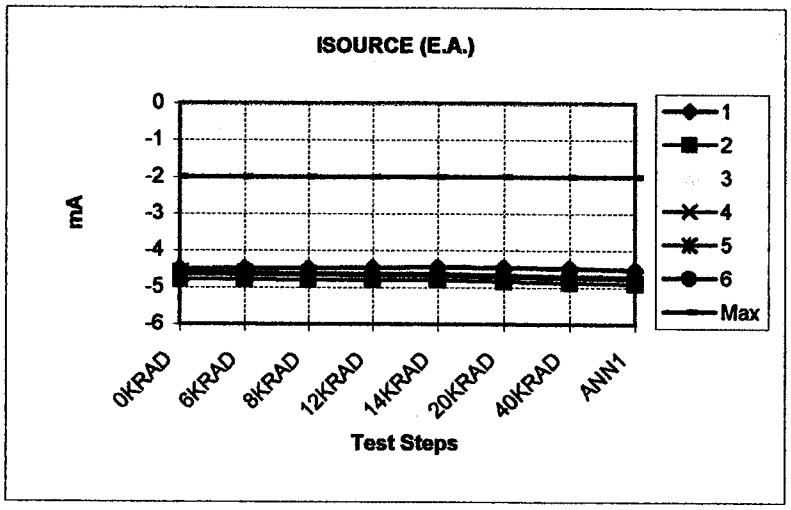
PSRR	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	106,5	107,6	107,5	108,6	107,7	107,1	108,5	105,2
2	95,7	85,2	82,1	76,8	74,0	68,3	59,3	59,4
3	103,0	79,8	74,0	67,3	64,7	59,6	54,2	54,5
4	123,1	82,0	77,2	68,8	66,5	61,3	55,2	55,6
5	100,3	102,5	90,9	81,4	78,4	71,8	60,7	60,8
6	135,9	98,8	81,2	70,8	68,3	62,3	55,2	55,4
Min	80	80	80	80	80	80	80	80
Unit	dB	dB	dB	dB	dB	dB	dB	dB



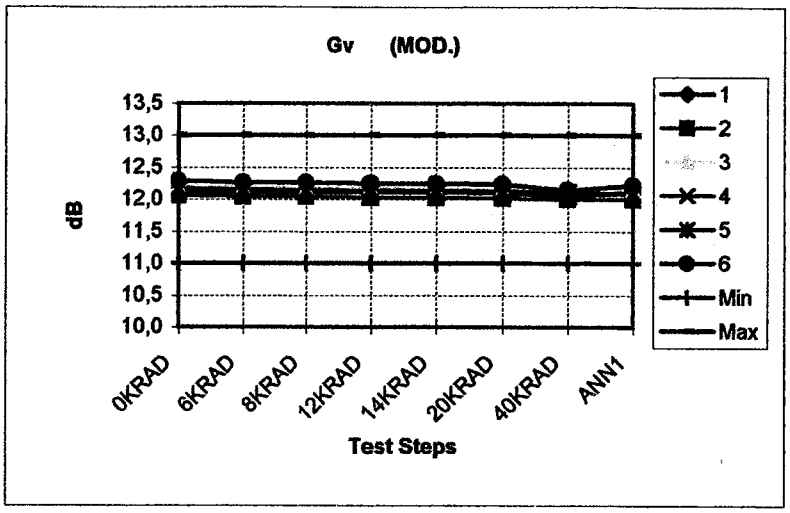
VOUT-SWING	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	525,1	520,2	519,1	515,6	510,5	517,3	526,5	535,5
2	535,5	524,0	520,3	512,5	505,8	504,8	488,5	508,9
3	521,4	507,2	501,3	491,3	484,6	479,1	461,8	476,6
4	514,1	499,3	493,3	482,1	473,5	468,6	451,1	466,0
5	541,7	529,6	524,9	517,9	511,4	512,4	498,6	508,6
6	519,2	504,1	497,3	487,7	478,3	473,1	451,7	467,4
Min	400	400	400	400	400	400	400	400
Max	1000	1000	1000	1000	1000	1000	1000	1000
Unit	mV	mV	mV	mV	mV	mV	mV	mV



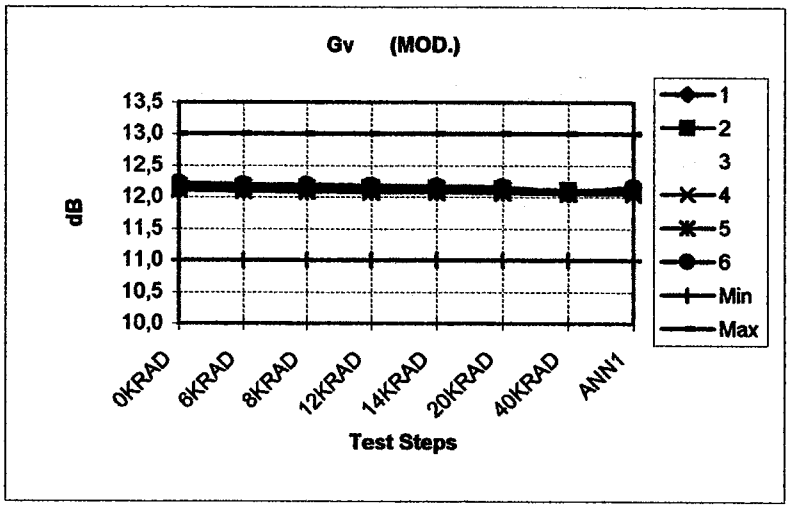
ISINK	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	181,1	181,7	181,7	181,1	181,2	181,8	188,5	180,3
2	180,8	180,2	180,0	178,7	179,2	178,6	178,7	175,4
3	185,0	184,0	184,3	182,3	182,9	181,9	179,9	180,4
4	182,5	181,6	182,1	180,1	180,1	179,2	175,8	177,4
5	185,9	185,3	185,8	183,7	184,0	183,3	183,1	181,6
6	183,9	182,8	183,0	181,1	181,6	180,5	174,8	178,9
Min	90	90	90	90	90	90	90	90
Unit	uA	uA	uA	uA	uA	uA	uA	uA



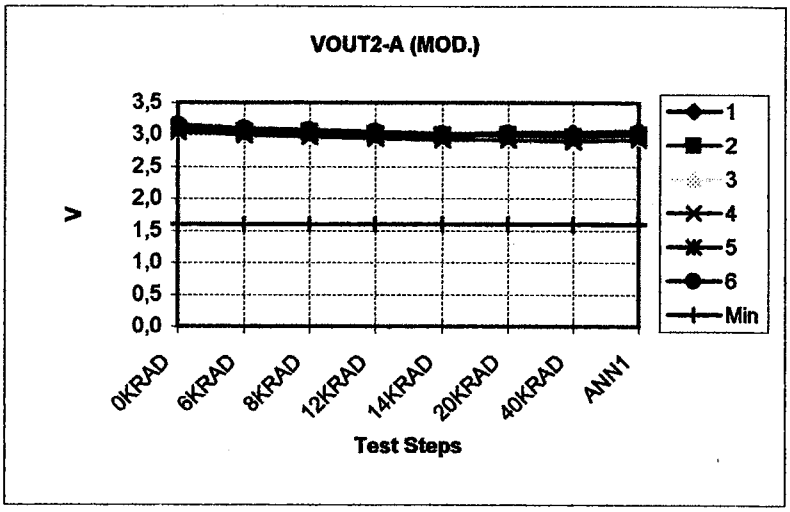
ISOURCE	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	-4,50	-4,48	-4,48	-4,47	-4,46	-4,48	-4,49	-4,53
2	-4,79	-4,79	-4,80	-4,80	-4,80	-4,84	-4,87	-4,91
3	-4,59	-4,61	-4,61	-4,63	-4,63	-4,68	-4,70	-4,73
4	-4,58	-4,60	-4,61	-4,63	-4,63	-4,68	-4,70	-4,72
5	-4,64	-4,65	-4,65	-4,66	-4,65	-4,70	-4,72	-4,74
6	-4,63	-4,65	-4,65	-4,68	-4,67	-4,73	-4,74	-4,78
Max	-2	-2	-2	-2	-2	-2	-2	-2
Unit	mA	mA	mA	mA	mA	mA	mA	mA



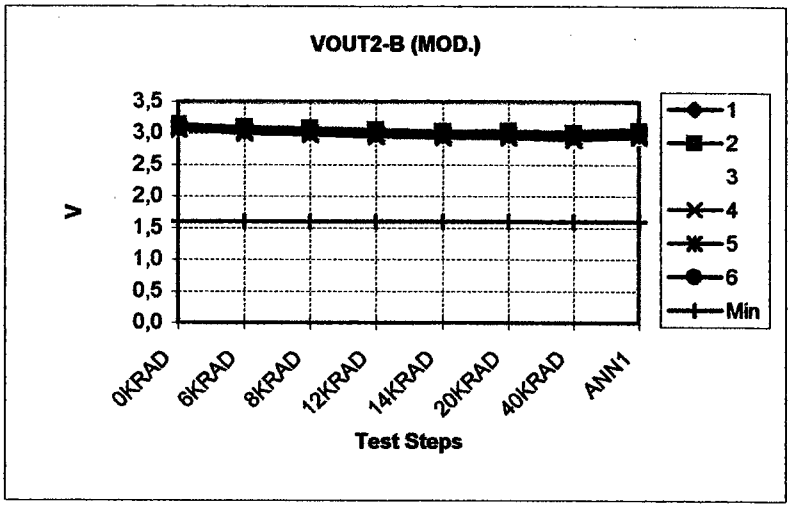
Gv (OUT A)	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	12,1	12,1	12,1	12,1	12,1	12,1	12,1	12,1
2	12,1	12,0	12,0	12,0	12,0	12,0	12,0	12,0
3	12,2	12,2	12,2	12,2	12,2	12,1	12,1	12,2
4	12,2	12,1	12,1	12,1	12,1	12,1	12,0	12,1
5	12,2	12,2	12,1	12,1	12,1	12,1	12,1	12,1
6	12,3	12,3	12,3	12,3	12,3	12,2	12,1	12,2
Min	11	11	11	11	11	11	11	11
Max	13	13	13	13	13	13	13	13
Unit	dB	dB	dB	dB	dB	dB	dB	dB



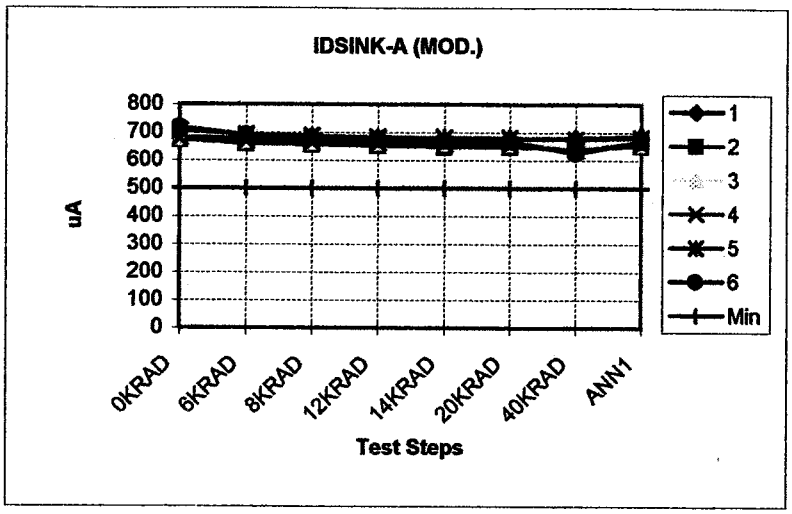
Gv (OUT B)	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	12,1	12,1	12,1	12,1	12,1	12,1	12,1	12,1
2	12,2	12,2	12,2	12,1	12,1	12,1	12,1	12,1
3	12,2	12,1	12,1	12,1	12,1	12,1	12,1	12,1
4	12,2	12,2	12,1	12,1	12,1	12,1	12,1	12,1
5	12,1	12,1	12,1	12,1	12,1	12,1	12,1	12,1
6	12,2	12,2	12,2	12,2	12,2	12,2	12,1	12,2
Min	11	11	11	11	11	11	11	11
Max	13	13	13	13	13	13	13	13
Unit	dB	dB	dB	dB	dB	dB	dB	dB



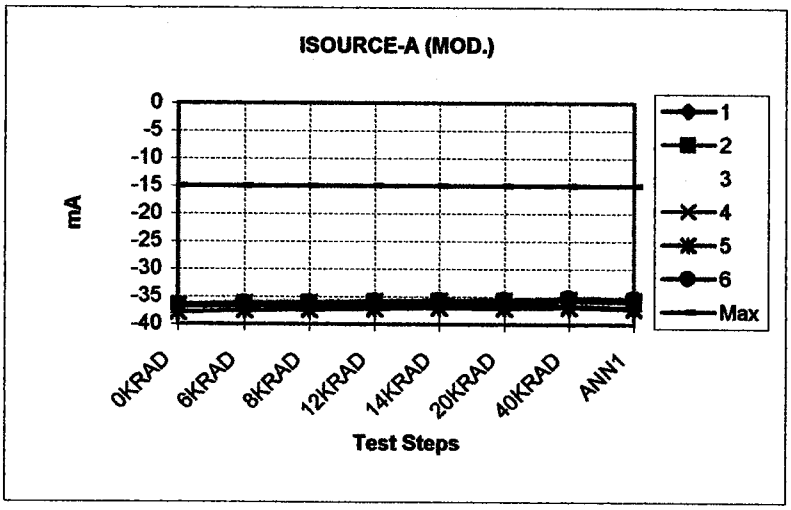
VOUT2-A	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	3,06	3,04	3,04	3,02	3,01	3,03	3,03	3,06
2	3,10	3,06	3,04	3,02	3,00	3,00	2,97	3,01
3	3,07	3,01	2,99	2,96	2,94	2,95	2,91	2,96
4	3,05	2,99	2,97	2,94	2,92	2,92	2,89	2,93
5	3,09	3,05	3,03	3,01	2,99	3,00	2,97	3,00
6	3,16	3,10	3,07	3,05	3,02	3,02	2,98	3,03
Min	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6
Unit	V	V	V	V	V	V	V	V



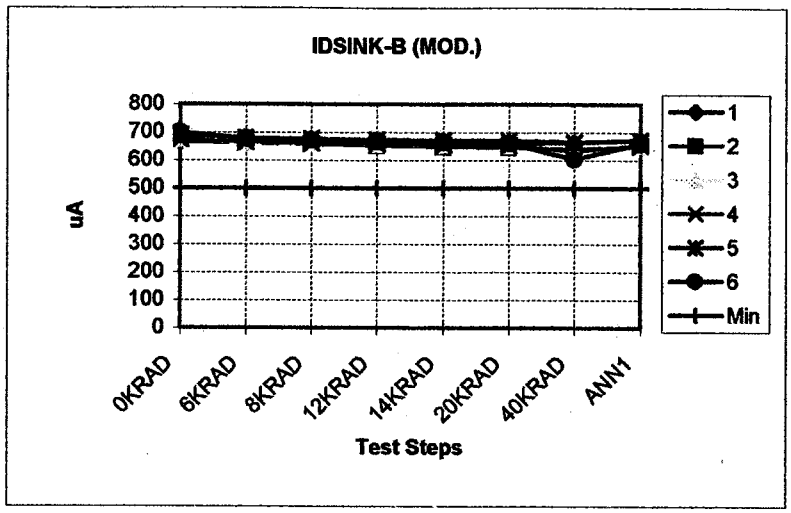
VOUT2-B	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	3,06	3,04	3,03	3,02	3,00	3,03	3,02	3,06
2	3,14	3,09	3,08	3,05	3,03	3,04	3,00	3,04
3	3,06	3,00	2,98	2,95	2,93	2,93	2,90	2,95
4	3,05	3,00	2,98	2,95	2,92	2,92	2,90	2,94
5	3,07	3,03	3,01	2,99	2,97	2,98	2,95	2,98
6	3,13	3,07	3,05	3,02	2,99	3,00	2,96	3,00
Min	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6
Unit	V	V	V	V	V	V	V	V



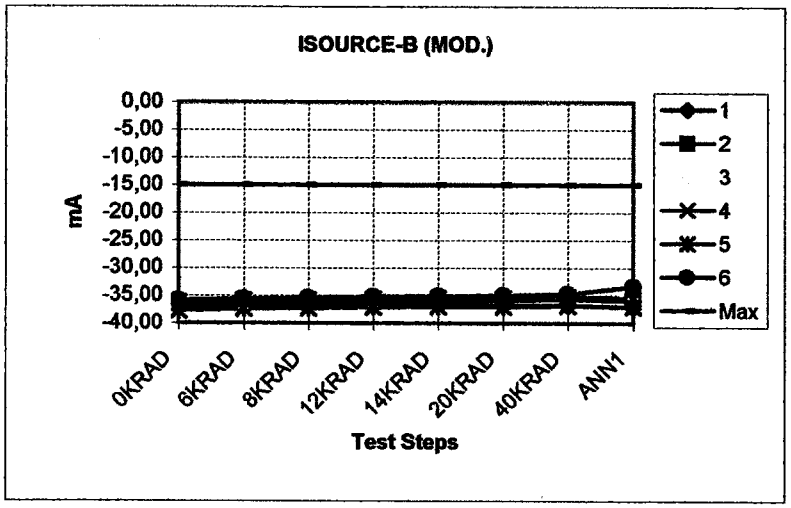
IDSINK-A	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	680,8	678,3	677,8	676,2	674,7	677,4	679,3	687,0
2	672,5	659,5	656,2	651,0	648,5	647,9	642,9	651,9
3	681,5	669,8	666,3	662,6	660,8	658,9	645,3	660,2
4	679,1	668,7	666,0	662,1	660,0	657,4	636,7	657,4
5	705,5	691,8	687,7	683,2	681,2	680,9	675,5	681,6
6	718,1	690,8	682,8	676,0	671,5	669,7	625,4	668,5
Min	500	500	500	500	500	500	500	500
Max	2000	2000	2000	2000	2000	2000	2000	2000
Unit	uA	uA	uA	uA	uA	uA	uA	uA



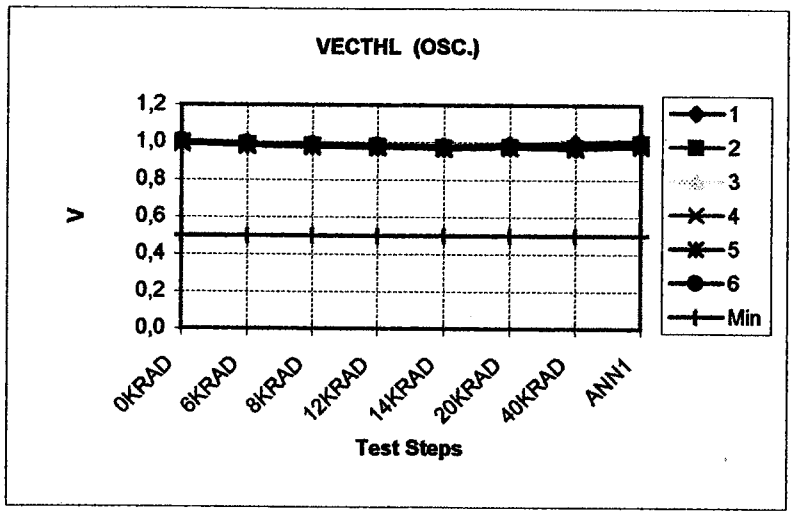
ISOURCE-A	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	-36,85	-36,74	-36,72	-36,60	-36,45	-36,67	-36,60	-37,00
2	-36,73	-36,45	-36,34	-36,16	-36,00	-36,05	-35,79	-36,10
3	-36,18	-35,87	-35,75	-35,53	-35,41	-35,36	-35,02	-35,23
4	-36,51	-36,18	-36,05	-35,87	-35,72	-35,72	-35,49	-35,70
5	-37,85	-37,53	-37,38	-37,21	-37,06	-37,16	-36,91	-37,19
6	-36,49	-36,15	-36,01	-35,84	-35,68	-35,62	-35,31	-35,38
Min	-50	-50	-50	-50	-50	-50	-50	-50
Max	-15	-15	-15	-15	-15	-15	-15	-15
Unit	mA	mA	mA	mA	mA	mA	mA	mA



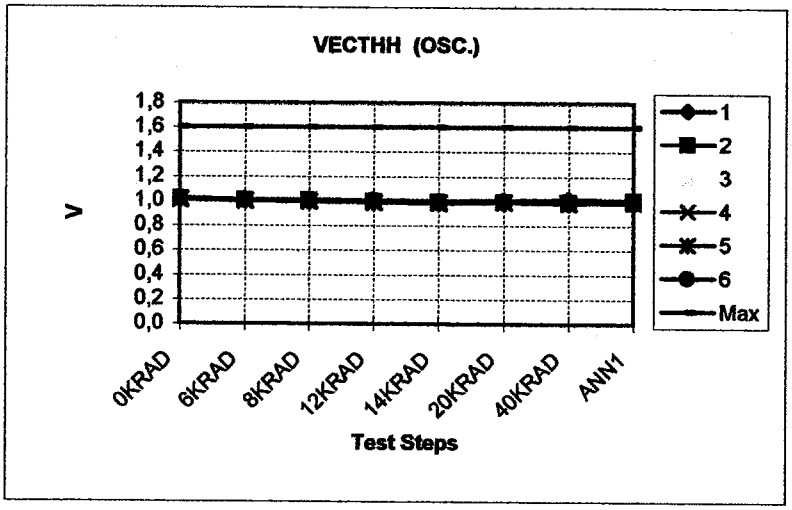
IDSINK-B	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	664,5	662,8	662,5	660,9	658,9	662,0	664,0	671,0
2	678,3	662,1	657,6	651,0	647,4	646,8	641,1	649,9
3	672,3	662,0	658,9	655,0	653,4	651,5	637,0	651,8
4	675,6	665,5	662,5	658,9	656,3	653,8	632,0	653,0
5	690,0	679,6	676,4	672,7	670,7	670,4	665,5	670,9
6	699,9	678,4	672,4	667,5	664,5	662,4	604,7	660,5
Min	500	500	500	500	500	500	500	500
Unit	uA	uA	uA	uA	uA	uA	uA	uA



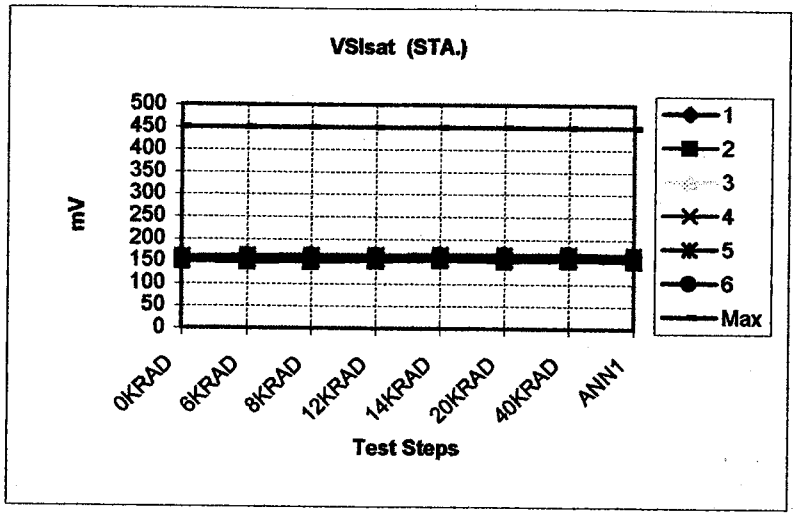
ISOURCE-B	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	-36,92	-36,83	-36,80	-36,69	-36,55	-36,75	-36,71	-37,08
2	-36,68	-36,41	-36,29	-36,10	-35,96	-35,97	-35,67	-35,98
3	-36,23	-35,93	-35,81	-35,59	-35,49	-35,37	-35,01	-35,21
4	-36,25	-35,91	-35,80	-35,60	-35,46	-35,44	-35,19	-35,39
5	-37,76	-37,44	-37,30	-37,12	-36,98	-37,04	-36,78	-37,03
6	-35,88	-35,55	-35,42	-35,24	-35,10	-35,00	-34,68	-33,39
Max	-15	-15	-15	-15	-15	-15	-15	-15
Unit	mA	mA	mA	mA	mA	mA	mA	mA



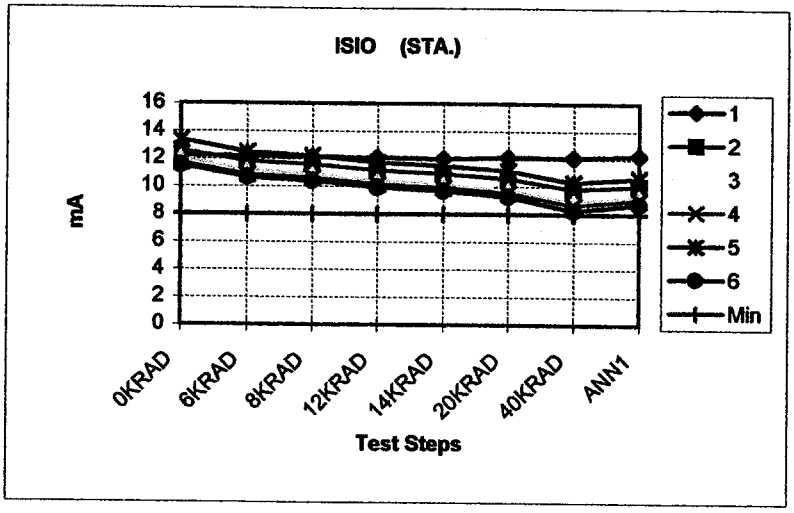
VECTHL	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	1,00	0,99	0,99	0,99	0,98	0,99	1,00	1,01
2	1,00	0,99	0,98	0,98	0,97	0,98	0,97	0,99
3	1,00	0,99	0,98	0,98	0,97	0,98	0,97	0,98
4	1,00	0,99	0,98	0,98	0,97	0,97	0,97	0,98
5	0,99	0,98	0,98	0,97	0,97	0,97	0,97	0,98
6	1,01	0,99	0,99	0,98	0,98	0,98	0,98	0,99
Min	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Unit	V	V	V	V	V	V	V	V



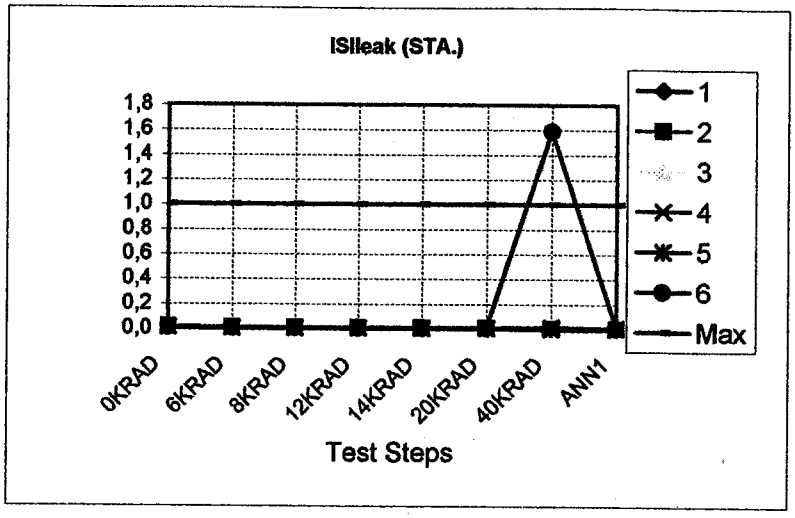
VECTHH	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	1,02	1,01	1,01	1,01	1,00	1,00	1,01	1,01
2	1,01	1,00	1,00	0,99	0,99	0,99	0,99	1,00
3	1,02	1,00	1,00	0,99	0,99	0,99	0,99	1,00
4	1,02	1,00	1,00	1,00	0,99	0,99	0,99	1,00
5	1,01	1,00	0,99	0,99	0,98	0,99	0,98	0,99
6	1,02	1,01	1,00	1,00	0,99	1,00	0,99	0,99
Min	0	0	0	0	0	0	0	0
Max	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6
Unit	V	V	V	V	V	V	V	V



VSIsat	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	155,6	155,4	155,4	156,2	158,6	155,9	158,4	156,6
2	148,9	148,2	149,0	150,5	152,6	150,8	152,7	152,0
3	159,3	161,5	162,3	163,7	164,5	163,8	166,0	163,8
4	159,6	162,0	162,7	164,0	165,1	164,7	166,3	164,4
5	151,2	153,3	154,1	154,9	155,9	154,9	155,9	154,2
6	159,4	161,9	162,9	163,8	165,2	164,4	166,1	164,9
Min	0	0	0	0	0	0	0	0
Max	450	450	450	450	450	450	450	450
Unit	mV	mV	mV	mV	mV	mV	mV	mV



ISIO	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	12,22	12,14	12,12	12,07	12,00	12,10	12,06	12,24
2	12,57	11,81	11,58	11,15	10,93	10,57	9,80	10,05
3	12,02	11,16	10,89	10,41	10,19	9,78	8,93	9,29
4	11,69	10,86	10,60	10,16	9,93	9,53	8,64	9,03
5	13,36	12,48	12,21	11,75	11,50	11,14	10,31	10,60
6	11,50	10,64	10,37	9,92	9,68	9,28	8,28	8,74
Min	8	8	8	8	8	8	8	8
Max	20	20	20	20	20	20	20	20
Unit	mA	mA	mA	mA	mA	mA	mA	mA



ISIleak	0KRAD	6KRAD	8KRAD	12KRAD	14KRAD	20KRAD	40KRAD	ANN1
1	0,014	0,008	0,008	0,007	0,008	0,008	-0,004	-0,003
2	0,014	0,007	0,008	0,007	0,008	0,008	0,006	-0,002
3	0,014	0,008	0,008	0,007	0,008	0,008	0,006	0,008
4	0,014	0,007	0,008	0,008	0,008	0,008	0,018	0,008
5	0,014	0,008	0,008	0,007	0,008	0,008	0,006	0,007
6	0,014	0,008	0,008	0,007	0,009	0,008	1,587	0,007
Min	0	0	0	0	0	0	0	0
Max	1	1	1	1	1	1	1	1
Unit	uA	uA	uA	uA	uA	uA	uA	uA

DOSIMETRY

MetOp	TOTAL DOSE RADIATION TEST REPORT No. MO-RR-TLG-PM-0005	Issue: 1 Rev.: Date: 01/02/00 ANNEX II

User:Tecnológica S.A.
Ref.: Tecnológica
Date: 17/11/99

REQUIREMENTS

Krad(Si)/h	Rad(Si)/min	R/min
0.280	4.67	5.39

CORRECTIONS

Presion (mm)	706
Temperature (ºC)	22.4
Probe Position	0.95
Final Equip. reading (R/min)	4.08

FRICKE DOSIMETRY

Irradiation time (h)	69
Spectrometer temp.(ºC)	18.8
Coeficiente de ex. Molar	2181
Factor de conversión	28794.18

Dosimeter	Fricke Reading	Rad (Fricke)	Rad (Fricke)/min	R/min	Rad(Si)/ min	Krad(Si)/h
D-1	0.762	21941.17	5.30	5.46	4.72	0.28
D-2	0.779	22430.67	5.42	5.59	4.84	0.29
D-3	0.793	22833.78	5.52	5.69	4.92	0.30
PROBE				5.36	4.64	0.28
D-4	0.796	22920.17	5.54	5.71	4.94	0.30
D-5	0.793	22833.78	5.52	5.69	4.92	0.30
D-6	0.789	22718.61	5.49	5.66	4.90	0.29

DOSE RATE (AVERAGE): D2-D5

Rad(Si)/min	4.85
Rad(Si)/h	0.29
Non Uniformity (%)	6.19