

ESA-QCA9947T-C

<i>Envisat-1</i>	TOTAL DOSE RADIATION TEST REPORT No. PO-TR-TLG-PL-2022	Issue: 1 Rev.: Date: 19/12/95 Date: Page: 1/17
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SCC Component No.: HUYTL05504B		Component Designation: OP400AY	Irradiation Spec. No.: PO-PL-TLG-PL-0500 Iss.2
Gen. Spec.: SCC 9000 8 Det. Spec.: HUY-SP-TL-055 1 Amend.:		Evaluation: - Acceptance Diffusion: - Acceptance Lot: X	Project/Programme: ENVISAT-1
Family: 08	Group: 09	Functional Assignment: BIPOLAR QUAD OP AMP	Package: DIL-14
Manuf.Name: ANALOG DEVICES Address: USA		Test House: TECNOLOGICA Address: MADRID (SPAIN)	Orig.house: TECNOLOGICA Address: SEVILLA (SPAIN)
Radiation Test Plan No.: PO-PL-TLG-PL-2022		Sample Size: 5 Irradiation Devices: 4 Control Devices: 1	Date Code: 9347 Diffusion LOT: A1671203 Wafer No.: 2
Radiation Source: Cobalt-60 Facility Name: CIEMAT Address: MADRID (SPAIN)		Energy: 1.33/1.17 MeV Dose Rate: 20 KRad(Si)/h	Date of Test: 12/95
Irradiation Conditions: Biased: X Unbiased: - Test Circuit: Figure 1		Irradiation Measurements Interval: Remote test: - In situ Test: X	Annealing Tests: 28h / 25°C 100 / 25°C Biased: X Unbiased: - Test Circuit: Figure 1

Electrical Measurements. Parameters Tested:

$V_{OS}, I_{OS}, I_{B+}, I_{B-}, CMRR, PSRR, A_{V01}, A_{V02}, V_{01}, V_{02}, ISY, SR+, SR-$

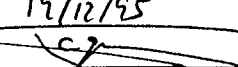

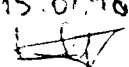
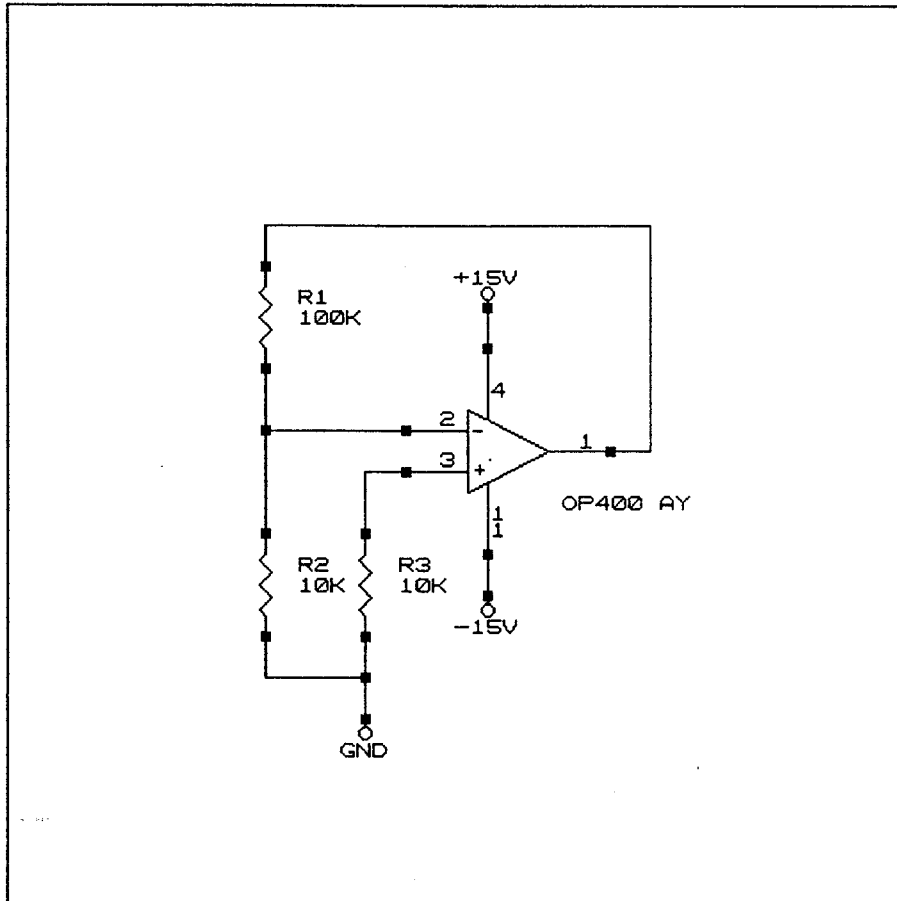
Irradiat. Respons.: J.A. VAQUERO Date: 19/12/95 Signature: 	Electr. Test Resp.: J.M. VALERDE Date: 4/01/96 Signature: 	Approved by QA: L. DE PABLO Date: 15.01.96 Signature: 
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FIGURE 1.-TEST CIRCUIT



SUMMARY

Total dose steady-state irradiation test has been carried out on **QUAD OPERATIONAL AMPLIFIER** from **ANALOG DEVICES FRANCE** with date code 9347. The irradiated parts were labelled as follows: R2 = S/N 76, R3 = S/N 77, R4 = S/N 78, R5 = S/N 79 irradiation devices and R1 = S/N 75 control device.

RESULTS

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

	00 KRAD	05 KRAD	05 KRAD (*)	10 KRAD	20 KRAD	30 KRAD	ANN 24	ANN 168
V_{OS}	PASS	PASS	PASS	PASS	PASS 6 FAIL 10	FAIL	PASS 1 FAIL 15	FAIL
I_{OS}	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL
I_{B+}	PASS	PASS	PASS	PASS	PASS	PASS 9 FAIL 7	PASS 8 FAIL 8	PASS 9 FAIL 5
I_{B-}	PASS	PASS	PASS	PASS	PASS 15 FAIL 1	FAIL	PASS 13 FAIL 3	PASS
CMRR	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
PSRR	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
A_{VO1}	PASS	PASS	PASS	PASS	PASS	PASS 3 FAIL 13	PASS 2 FAIL 14	PASS 3 FAIL 13
A_{VO2}	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
VO1	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
VO2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ISY	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SR+	PASS	PASS	PASS	PASS	PASS 14 FAIL 2	PASS 5 FAIL 11	PASS 4 FAIL 12	PASS 9 FAIL 7
SR-	PASS	PASS	PASS	PASS	PASS 13 FAIL 3	PASS 5 FAIL 11	PASS 15 FAIL 1	PASS 15 FAIL 1

(*) Measures at 5 Krad were repeated, because the irradiation was delayed due to equipment problems.

DEVIATIONS TO THE PLAN.

ISY and CMRR were not included in the test plan.

Due to an interruption of the irradiation test at 5 Krads first annealing were performed after 68h 35min and second annealing after 100h, 20min.

CONCLUSION

The results indicate that:

- All devices have the same behavior at all irradiation steps.
- V_{O1} and V_{O2} does not change during all the irradiation process.
- CMRR, PSRR and AVO2 change but remains under spec during all the irradiation test.
- V_{OS} increases during all the irradiation process and oversteps the maximum limit between 10 and 30 Krads. during the annealing the polarity changes suddently and fails exceeding the minumum limit.
- I_{IOs} has the same behavior as V_{OS} failing between 10 and 20 Krads
- I_{B+} and I_{B-} fail between 20 and 30 krads, the increase of I_{B-} is more abrupt but also the recovery during the annealing.
- A_{VO1} fails at 30 Krads and does not recover during the annealing.
- ISY is under limits during all the irradiation test but decreases abruptly from a typical value of 2mA to a final value about 0.5 mA
- SR+ and SR- fails at 20 Krads.

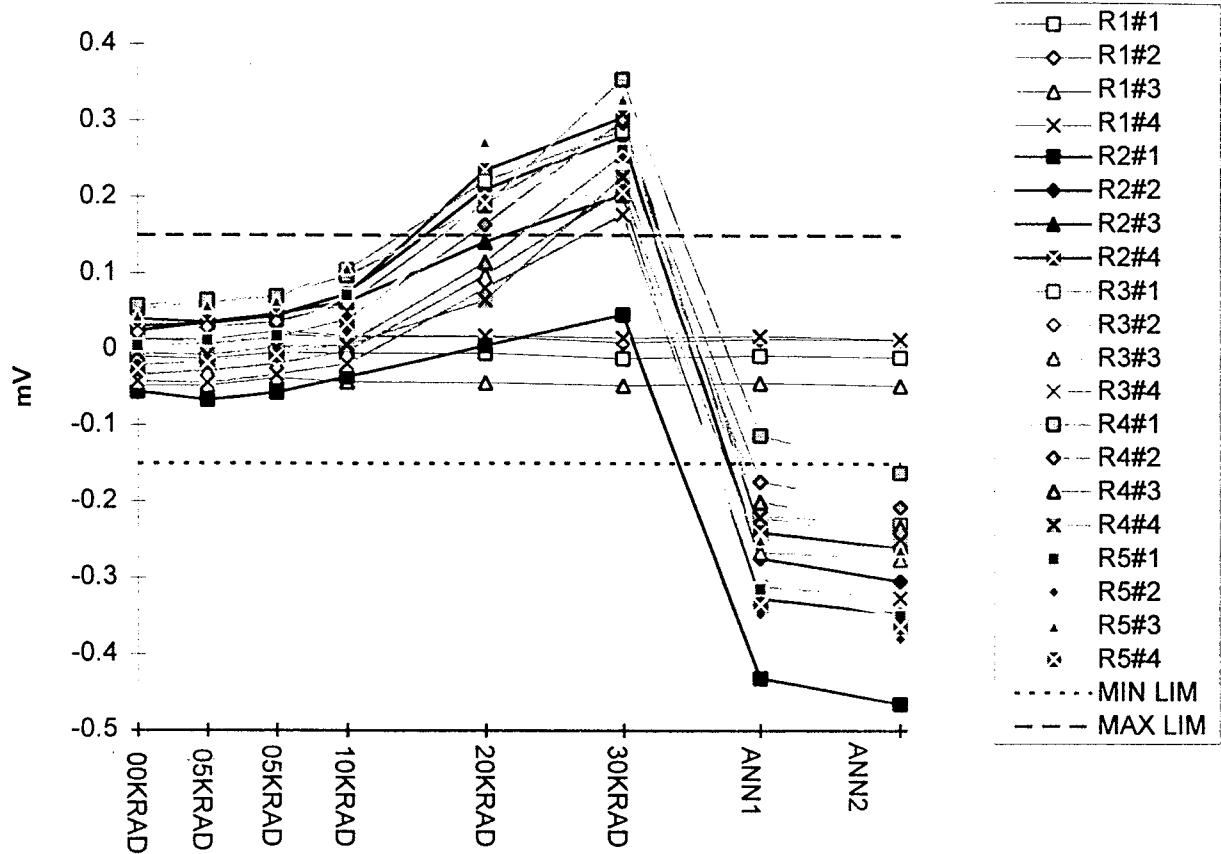
SCHEDULE

Test Step	Description	Result or Actual Test Condition	Time In	Time Out	Exposure
1	Sample serialization	CONTROL R1 IRR. DEVICES R2, R3, R4, R5.			
2	Initial Electrical Measurements	See 0 krad(Si) values in respective Parameter Data Tables Temperature: 23.1 °C (average) Humidity: 56.1%	10:45 16/11	11:00 16/11	15 min.
3	Set-up of Test	Bias circuit verified according to Fig. 1			
4	Irradiation Exposure	Total Dose: 4.759 Krad(Si) Cumulative Dose: 4.759 Krad(Si) Dose Rate: 19.035 Krad(Si)/h Temperature: 20.1 °C (average)	12:20 16/11	12:35 16/11	15 min.
5	Intermediate Electrical Measurements	See first 05 krad(Si) values in respective Parameter Data Tables Temperature: 23.3 °C (average) Humidity: 51.7%	12:55 16/11	13:30 16/11	35 min.
6	delay time due to equipment problems		13:30 16/11	09:00 17/11	19 h. 30min
7	Intermediate Electrical Measurements	See second 05 krad(Si) values in respective Parameter Data Tables Temperature: 21.9 °C (average) Humidity: 51.0%	09:00 17/11	09:20 17/11	20 min.
8	Set-up of Test	Bias circuit verified according to Fig. 1			
9	Irradiation Exposure	Total Dose: 4.759 Krad(Si) Cumulative Dose: 9.517 Krad(Si) Dose Rate: 19.035 Krad(Si)/h Temperature: 22.0 °C (average)	09:30 17/11	09:45 17/11	15 min.
10	Intermediate Electrical Measurements	See 10 krad(Si) values in respective Parameter Data Tables Temperature: 22.0 °C (average) Humidity: 50.3%	09:50 17/11	10:00 17/11	10 min.

Envisat-1**TOTAL DOSE RADIATION
TEST REPORT
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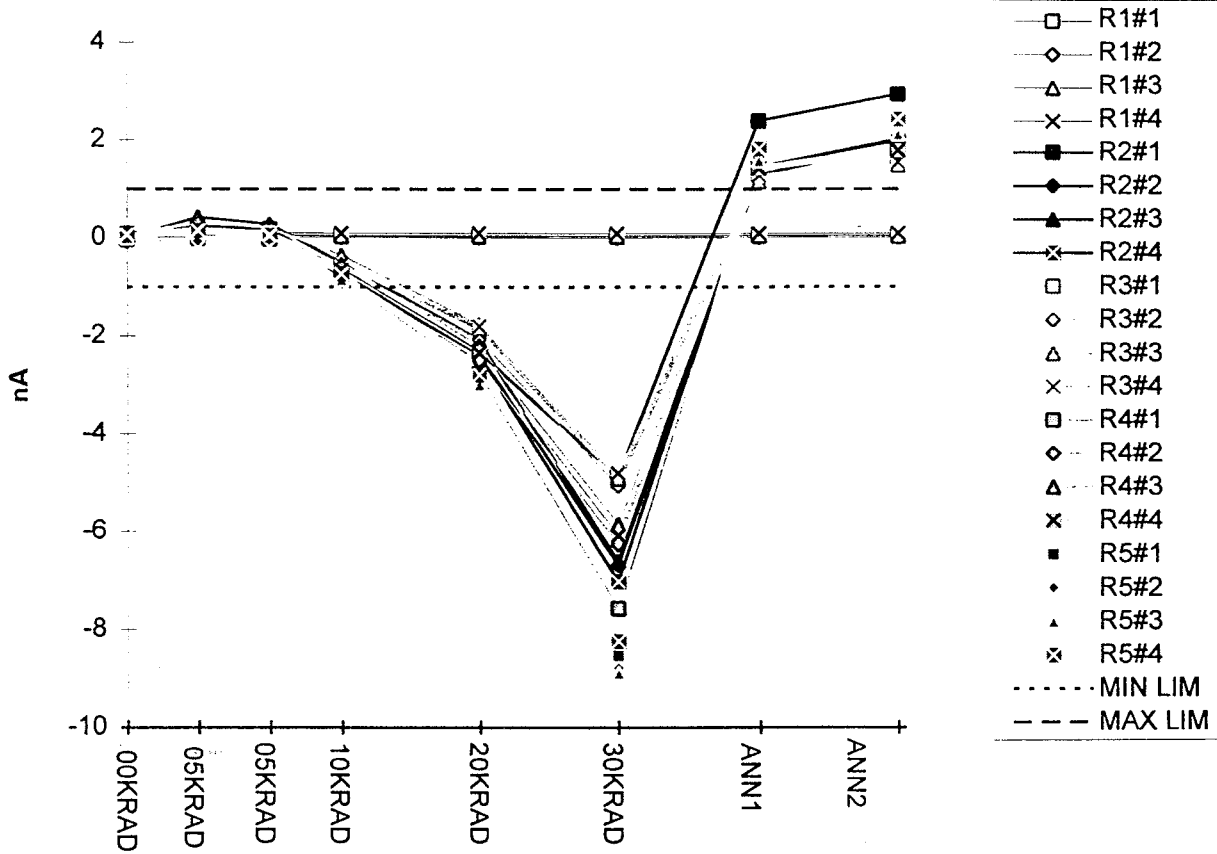
Test Step	Description	Result or Actual Test Condition	Time In	Time Out	Exposure
11	Set-up of Test	Bias circuit verified according to Fig. 1			
12	Irradiation Exposure	Total Dose: 9.517 Krad(Si) Cumulative Dose: 19.035 Krad(Si) Dose Rate: 19.035 Krad(Si)/h Temperature: 21.0°C (average)	10:05 17/11	10:35 17/11	30 min.
13	Intermediate Electrical Measurements	See 20 krad(Si) values in respective Parameter Data Tables Temperature: 22.0 °C (average) Humidity: 48.8%	10:40 17/11	11:00 17/11	20 min.
14	Set-up of Test	Bias circuit verified according to Fig. 1			
15	Irradiation Exposure	Total Dose: 9.517 Krad(Si) Cumulative Dose: 28.552 Krad(Si) Dose Rate: 19.035 Krad(Si)/h Temperature: 20.6°C (average)	11:15 17/11	11:45 17/11	30 min.
16	Intermediate Electrical Measurements	See 30 krad(Si) values in respective Parameter Data Tables Temperature: 22.3 °C (average) Humidity: 48.7%	11:50 17/11	12:00 17/11	10 min.
17	Annealing	Bias circuit verified according to Fig. 1 Temperature: 22.8 °C (average)	12:10 17/11	08:45 20/10	68 h, 35 min.
18	Electrical Measurements	See Ann1 values in respective parameter Data Tables Temperature: 20.4 °C Humidity: 52.5%	08:50 20/11	09:10 20/11	20 min.
19	Accelerated Ageing	Bias circuit verified according to Fig. 1 Temperature: 20.9 °C	09:20 20/11	13:40 24/11	100 h, 20 min.
20	Final Electrical Measurements	See Ann2 values in respective parameter Data Tables Temperature: 24.4 °C Humidity: 33.8 %	13:45 24/11	15:30 24/11	45 min.

VOS

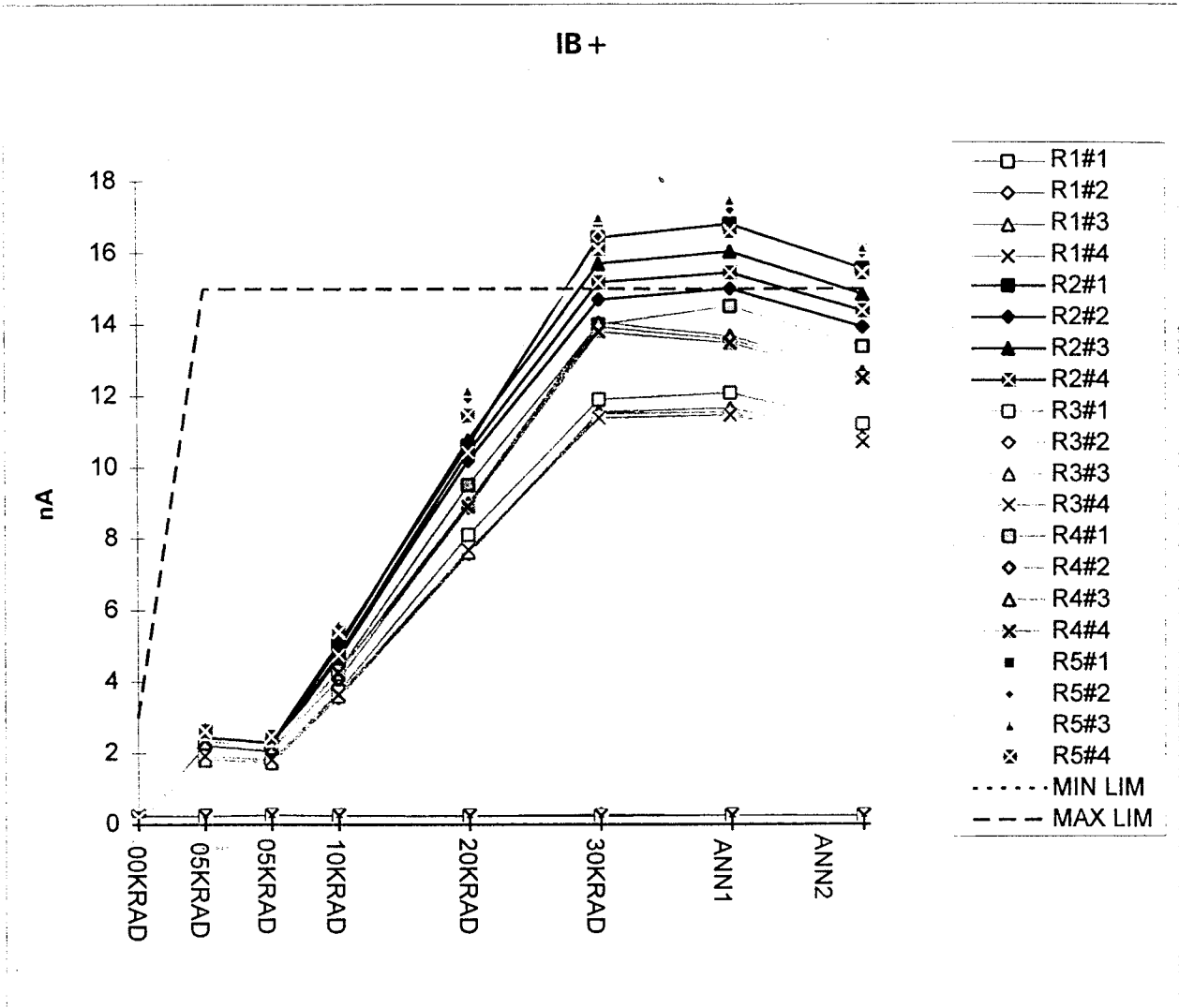


VOS	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	-0.01	-0.012	-0.004	-0.005	-0.005	-0.012	-0.008	-0.01
R1#2	0.013	0.011	0.019	0.017	0.017	0.009	0.014	0.013
R1#3	-0.048	-0.048	-0.038	-0.043	-0.044	-0.048	-0.044	-0.048
R1#4	0.014	0.013	0.024	0.018	0.018	0.015	0.018	0.014
R2#1	-0.056	-0.067	-0.057	-0.036	0.005	0.046	-0.431	-0.465
R2#2	0.031	0.034	0.044	0.073	0.21	0.279	-0.274	-0.304
R2#3	0.04	0.036	0.047	0.063	0.141	0.203	-0.327	-0.347
R2#4	0.025	0.035	0.045	0.073	0.235	0.304	-0.24	-0.261
R3#1	0.053	0.062	0.069	0.105	0.221	0.287	-0.218	-0.23
R3#2	0.022	0.029	0.036	0.06	0.192	0.297	-0.222	-0.24
R3#3	-0.033	-0.028	-0.019	-0.002	0.098	0.209	-0.266	-0.275
R3#4	-0.042	-0.044	-0.033	-0.019	0.081	0.177	-0.311	-0.326
R4#1	0.058	0.065	0.07	0.097	0.189	0.354	-0.113	-0.162
R4#2	0.006	0.007	0.016	0.04	0.164	0.301	-0.174	-0.207
R4#3	-0.021	-0.016	-0.007	0.008	0.115	0.256	-0.2	-0.233
R4#4	-0.005	-0.007	0.003	0.006	0.065	0.227	-0.22	-0.25
R5#1	0.005	0.012	0.018	0.072	0.196	0.262	-0.314	-0.349
R5#2	-0.027	-0.02	-0.014	0.023	0.199	0.253	-0.347	-0.379
R5#3	0.044	0.058	0.064	0.107	0.273	0.329	-0.249	-0.262
R5#4	-0.027	-0.018	-0.008	0.034	0.192	0.206	-0.335	-0.363
MIN LIM	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15
MAX LIM	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

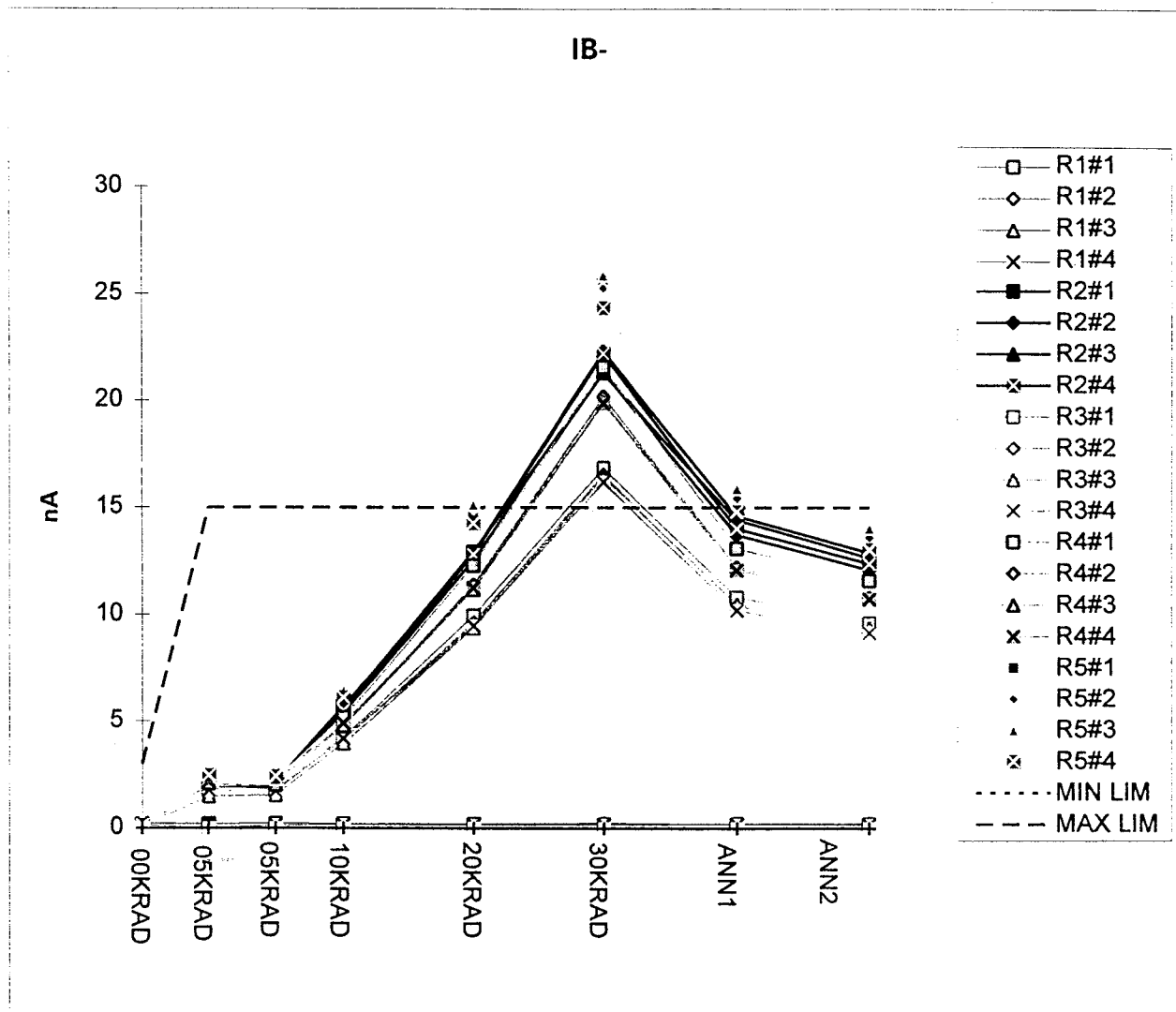
IOS



IOS	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	0.055	0.045	0.057	0.052	0.049	0.049	0.055	0.055
R1#2	0.008	0	0.015	0.012	0.008	0.003	0.015	0.008
R1#3	0.03	0.052	0.052	0.04	0.039	0.031	0.049	0.03
R1#4	0.09	0.221	0.113	0.101	0.096	0.091	0.091	0.09
R2#1	0.021	0.243	0.186	-0.654	-2.32	-4.88	2.388	2.925
R2#2	-0.007	-0.015	-0.02	-0.751	-2.34	-6.684	1.295	1.861
R2#3	-0.008	0.426	0.283	-0.51	-2.08	-6.606	1.448	1.979
R2#4	0.095	0.17	0.078	-0.769	-2.382	-7.017	1.442	2.016
R3#1	0	0.087	0.057	-0.548	-1.86	-4.968	1.282	1.614
R3#2	-0.077	-0.047	-0.055	-0.598	-2.075	-5.073	1.169	1.57
R3#3	0.057	0.333	0.204	-0.354	-1.765	-4.921	1.154	1.484
R3#4	0.047	0.173	0.097	-0.534	-1.804	-4.819	1.273	1.543
R4#1	-0.032	-0.015	-0.021	-0.859	-2.772	-7.567	1.433	1.797
R4#2	-0.028	-0.024	0.003	-0.731	-2.526	-6.268	1.387	1.737
R4#3	0.019	0.193	0.122	-0.544	-2.195	-5.865	1.46	1.848
R4#4	0.085	0.197	0.077	-0.662	-2.349	-6.082	1.416	1.782
R5#1	0.041	0.1	0.095	-0.933	-2.815	-8.531	1.706	2.425
R5#2	0.008	-0.066	-0.05	-0.939	-3.041	-8.786	1.762	2.37
R5#3	-0.001	0.155	0.073	-0.844	-2.984	-8.881	1.583	2.116
R5#4	0.065	0.148	0.051	-0.732	-2.79	-8.237	1.815	2.421
MIN LIM	-1	-1	-1	-1	-1	-1	-1	-1
MAX LIM	1	1	1	1	1	1	1	1

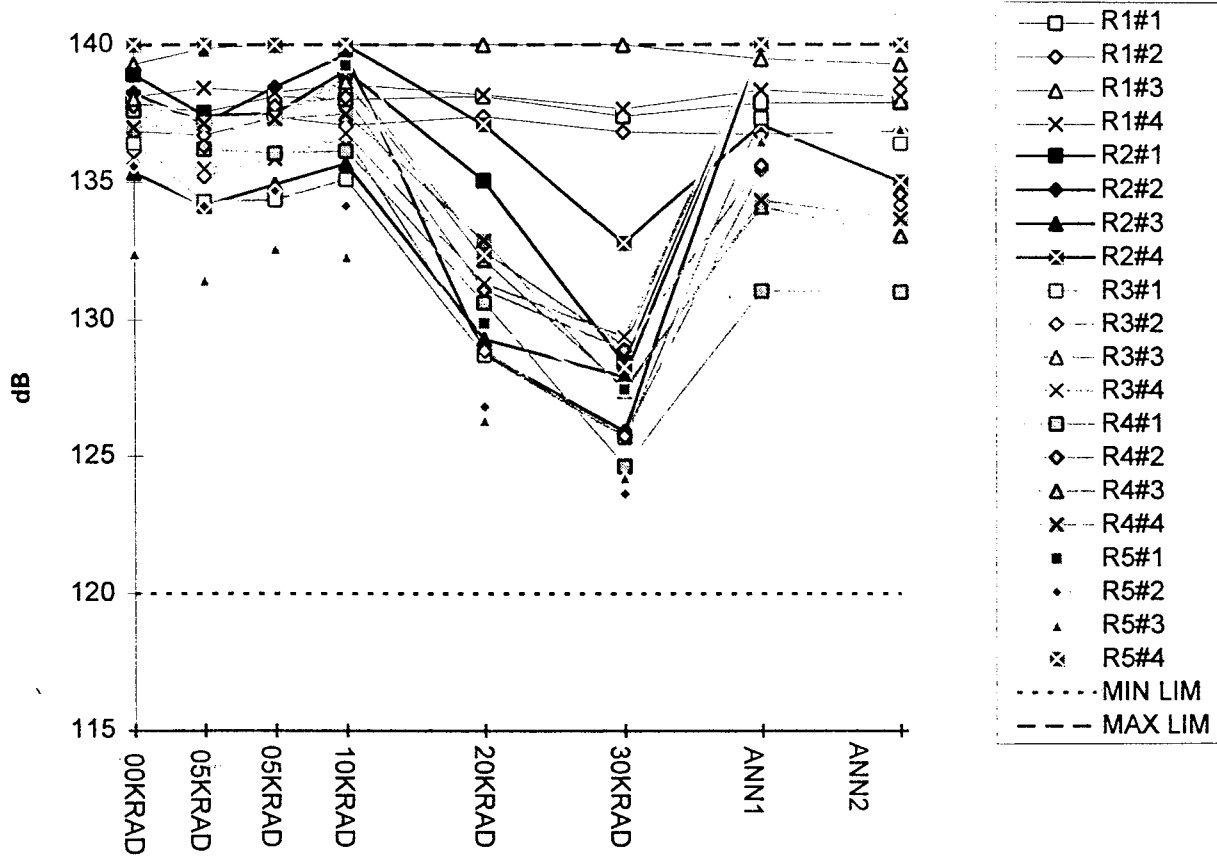


IB +	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	0.246	0.24	0.263	0.248	0.243	0.238	0.256	0.246
R1#2	0.227	0.217	0.242	0.228	0.221	0.217	0.239	0.227
R1#3	0.254	0.247	0.274	0.257	0.256	0.283	0.262	0.254
R1#4	0.247	0.224	0.257	0.249	0.243	0.243	0.256	0.247
R2#1	0.189	2.448	2.29	5.048	10.613	16.427	16.806	15.564
R2#2	0.14	2.238	2.065	4.681	10.183	14.694	15.012	13.934
R2#3	0.249	2.298	2.203	4.955	10.761	15.703	16.039	14.851
R2#4	0.225	2.251	2.101	4.744	10.418	15.185	15.454	14.383
R3#1	0.139	1.918	1.807	3.742	8.099	11.899	12.09	11.222
R3#2	0.09	1.84	1.702	3.55	7.56	11.486	11.555	10.741
R3#3	0.151	1.812	1.738	3.615	7.614	11.551	11.662	10.876
R3#4	0.258	1.921	1.822	3.651	7.676	11.377	11.473	10.704
R4#1	0.105	2.378	2.216	4.327	9.505	14.003	14.518	13.383
R4#2	0.101	2.273	2.095	4.079	8.862	13.935	13.59	12.538
R4#3	0.171	2.294	2.152	4.248	8.981	14.061	13.692	12.655
R4#4	0.198	2.38	2.22	4.259	8.892	13.8	13.487	12.494
R5#1	0.087	2.55	2.368	5.393	11.965	16.867	17.335	16.121
R5#2	0.16	2.591	2.419	5.42	11.916	16.465	17.195	15.965
R5#3	0.298	2.763	2.582	5.617	12.16	17	17.478	16.168
R5#4	0.199	2.619	2.469	5.387	11.462	16.119	16.616	15.449
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MAX LIM	3	15	15	15	15	15	15	15



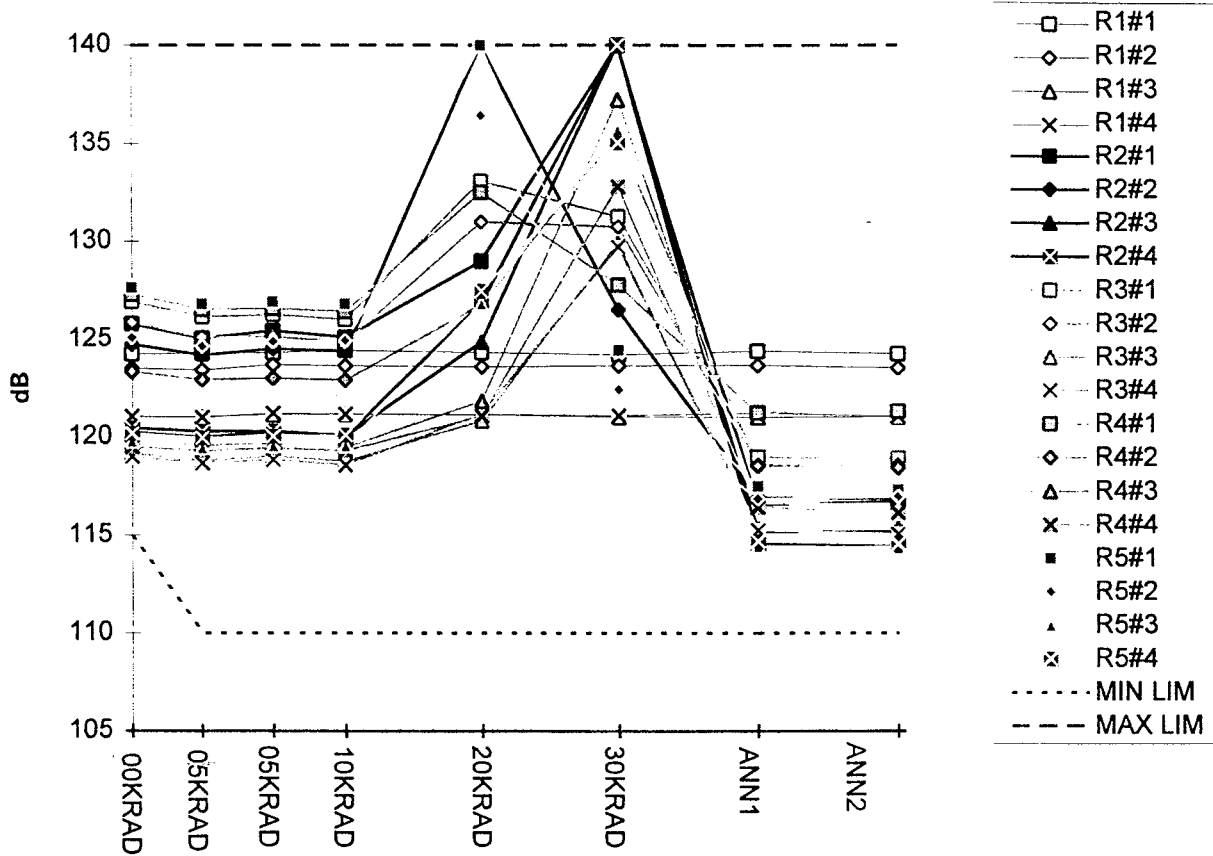
IB-	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	0.191	0.195	0.206	0.196	0.194	0.189	0.201	0.191
R1#2	0.219	0.217	0.227	0.216	0.213	0.214	0.224	0.219
R1#3	0.224	0.195	0.222	0.217	0.217	0.252	0.213	0.224
R1#4	0.157	0.003	0.144	0.148	0.147	0.152	0.165	0.157
R2#1	0.168	2.205	2.104	5.702	12.933	21.307	14.418	12.639
R2#2	0.147	2.253	2.085	5.432	12.523	21.378	13.717	12.073
R2#3	0.257	1.872	1.92	5.465	12.841	22.309	14.591	12.872
R2#4	0.13	2.081	2.023	5.513	12.8	22.202	14.012	12.367
R3#1	0.139	1.831	1.75	4.29	9.959	16.867	10.808	9.608
R3#2	0.167	1.887	1.757	4.148	9.635	16.559	10.386	9.171
R3#3	0.094	1.479	1.534	3.969	9.379	16.472	10.508	9.392
R3#4	0.211	1.748	1.725	4.185	9.48	16.196	10.2	9.161
R4#1	0.137	2.393	2.237	5.186	12.277	21.57	13.085	11.586
R4#2	0.129	2.297	2.092	4.81	11.388	20.203	12.203	10.801
R4#3	0.152	2.101	2.03	4.792	11.176	19.926	12.232	10.807
R4#4	0.113	2.183	2.143	4.921	11.241	19.882	12.071	10.712
R5#1	0.046	2.45	2.273	6.326	14.78	25.398	15.629	13.696
R5#2	0.152	2.657	2.469	6.359	14.957	25.251	15.433	13.595
R5#3	0.299	2.608	2.509	6.461	15.144	25.881	15.895	14.052
R5#4	0.134	2.471	2.418	6.119	14.252	24.356	14.801	13.028
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MAX LIM	3	15	15	15	15	15	15	15

CMRR



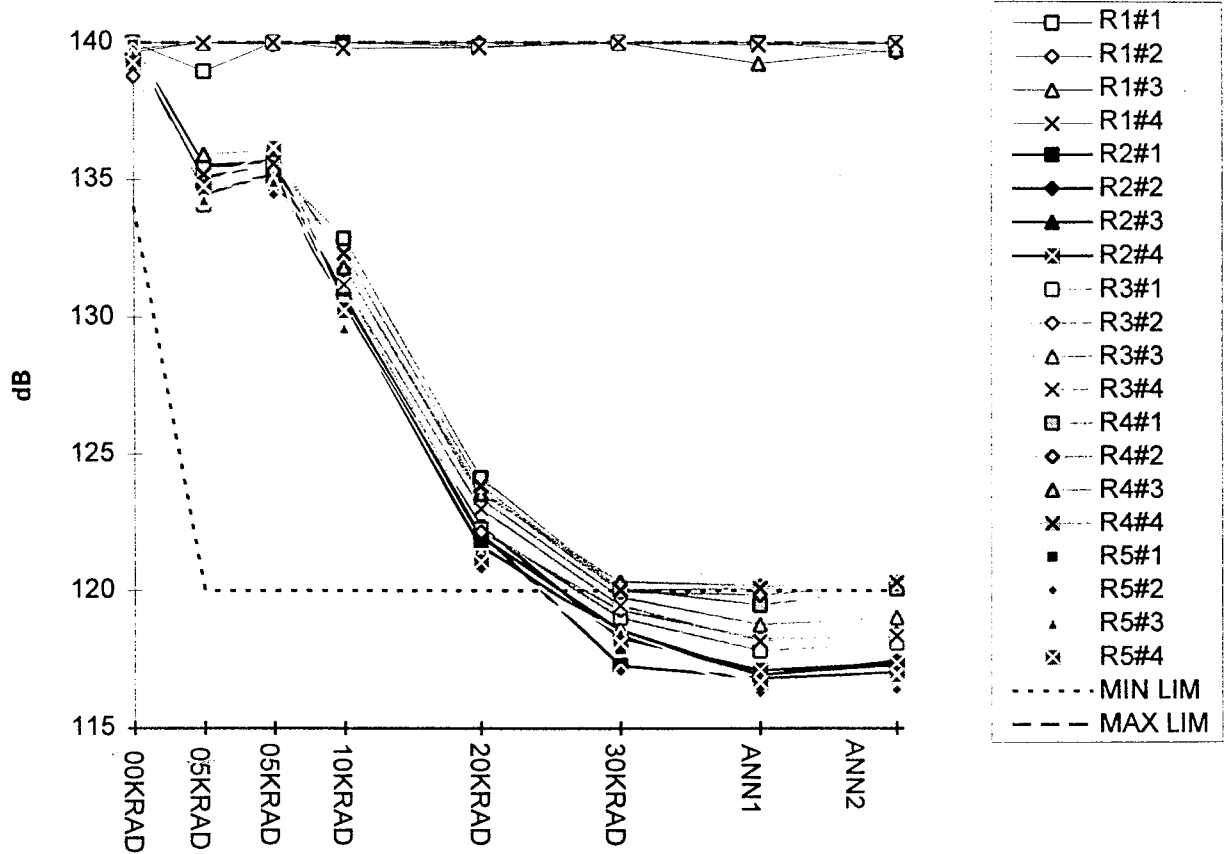
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R1#2	136.843	136.709	137.352	137.07	137.391	136.82	136.737	136.843
R1#3	139.292	139.874	140	140	140	140	139.473	139.292
R1#4	138.105	138.423	138.262	138.564	138.175	137.669	138.34	138.105
R2#1	138.912	137.431	137.506	139.055	135.063	128.413	140	140
R2#2	138.246	137.142	138.462	139.633	128.762	125.899	140	140
R2#3	135.356	134.169	134.939	135.668	129.271	127.902	140	140
R2#4	140	140	140	140	137.099	132.794	137.084	135.025
R3#1	136.407	134.304	134.374	135.112	128.687	125.688	137.322	136.403
R3#2	136.975	135.212	135.908	136.6	128.842	125.722	135.459	134.173
R3#3	137.86	137.239	137.386	138.847	132.495	129.037	140	137.961
R3#4	135.887	135.491	135.845	136.783	131.334	129.363	140	138.604
R4#1	137.613	136.193	136.051	136.132	130.611	124.627	131.044	131.018
R4#2	137.777	136.31	137.772	138.083	131.092	128.892	135.607	134.576
R4#3	138.04	137.347	137.352	138.65	132.19	127.496	134.114	133.067
R4#4	136.994	137.132	137.302	137.476	132.885	127.349	134.356	133.676
R5#1	140	139.755	140	139.249	129.874	127.437	140	140
R5#2	135.583	134.138	134.688	134.149	126.807	123.62	140	140
R5#3	132.43	131.458	132.615	132.311	126.325	124.226	136.501	136.951
R5#4	140	140	140	140	132.366	128.241	140	140
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MAX LIM	140	140	140	140	140	140	140	140

PSRR



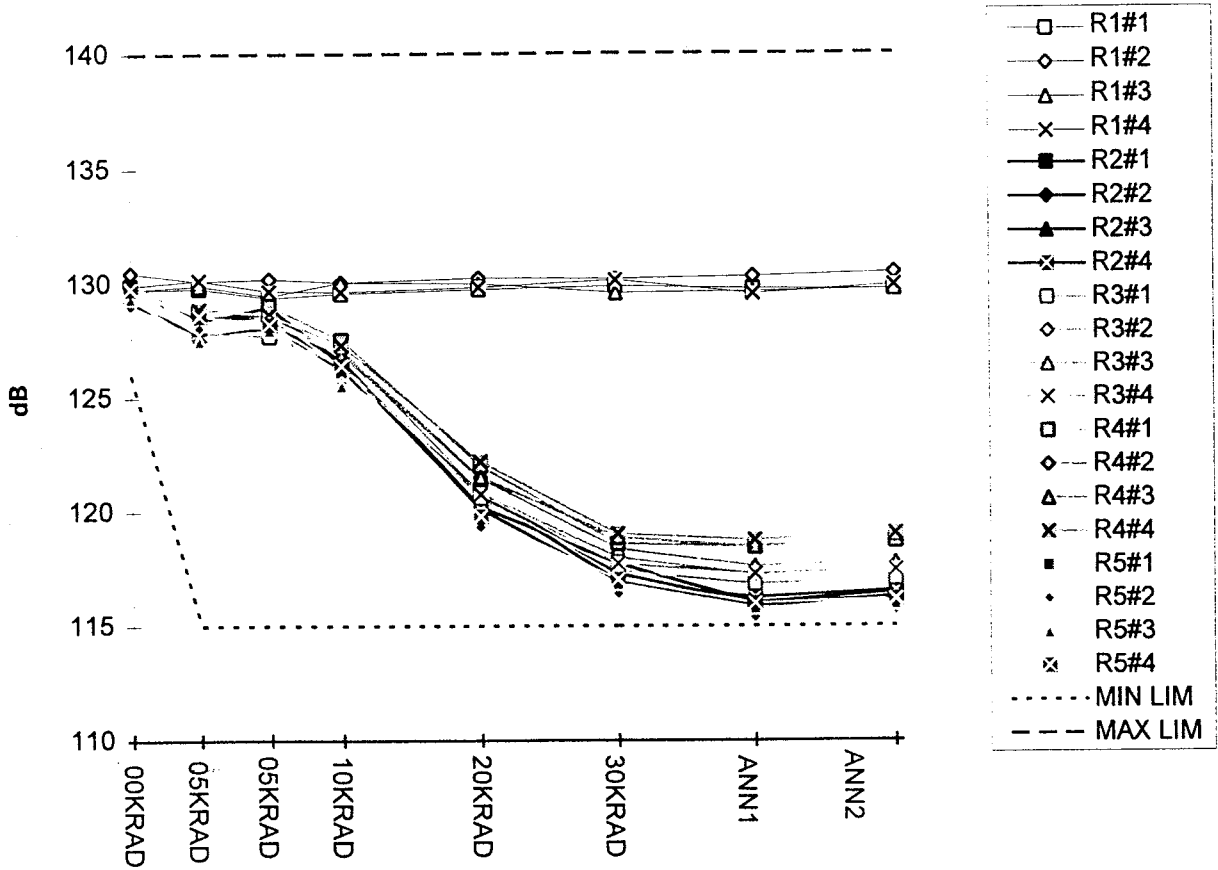
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R1#1	124.241	124.265	124.308	124.423	124.308	124.204	124.398	124.241
R1#2	123.513	123.423	123.693	123.649	123.583	123.631	123.666	123.513
R1#3	121.025	121.032	121.143	121.183	121.107	121.015	120.989	121.025
R1#4	121.048	120.999	121.203	121.16	121.147	121.078	121.206	121.048
R2#1	125.796	125.047	125.444	125.109	128.994	140	116.564	116.723
R2#2	124.741	124.19	124.505	124.394	140	126.503	116.907	116.887
R2#3	120.232	119.96	120.265	120.067	124.877	140	114.518	114.548
R2#4	120.464	120.274	120.3	120.055	126.827	140	115.196	115.157
R3#1	126.929	126.161	126.279	126.032	133.086	131.256	118.969	118.918
R3#2	125.871	125.119	125.13	124.867	130.975	130.742	118.572	118.577
R3#3	119.17	118.811	119.023	118.758	120.813	129.897	115.352	115.36
R3#4	118.982	118.664	118.847	118.56	121.176	129.7	115.254	115.063
R4#1	127.297	126.54	126.583	126.442	132.493	127.78	121.236	121.303
R4#2	123.329	122.918	123.008	122.91	126.795	135.425	118.523	118.428
R4#3	119.707	119.598	119.648	119.458	121.827	137.244	116.61	116.601
R4#4	119.499	119.305	119.429	119.305	121.055	132.791	116.434	116.143
R5#1	127.653	126.814	126.923	126.833	140	124.423	117.508	117.325
R5#2	125.083	124.642	124.877	124.928	136.44	122.41	116.867	116.966
R5#3	119.783	119.467	119.565	119.557	126.827	135.739	114.448	114.348
R5#4	120.184	119.954	120.032	120.09	127.466	135.041	114.689	114.546
MIN LIM	115	110	110	110	110	110	110	110
MAX LIM	140	140	140	140	140	140	140	140

AVO1



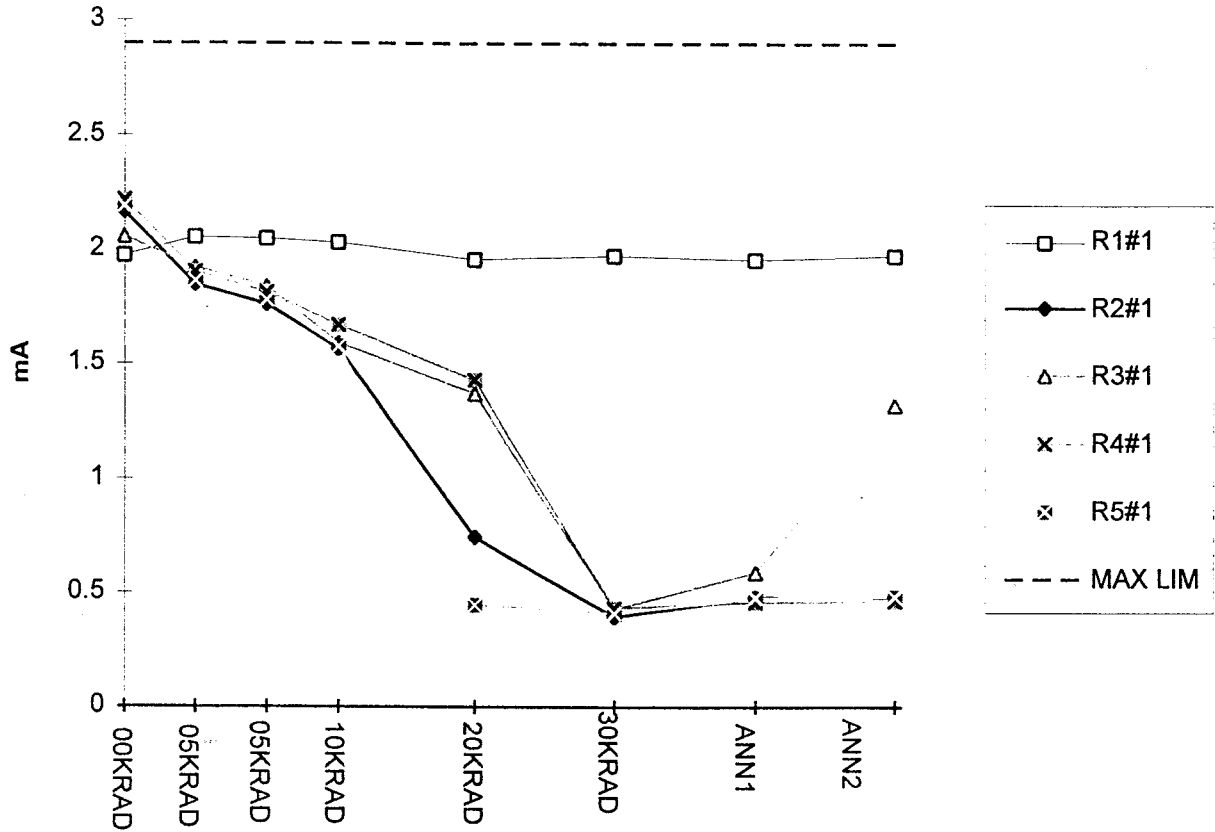
AVO1	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	140	138.956	140	140	139.856	140	140	140
R1#2	139.653	140	139.92	140	140	140	140	139.653
R1#3	139.754	140	140	140	140	140	139.238	139.754
R1#4	140	140	140	139.793	139.817	140	139.904	140
R2#1	140	135.534	135.641	130.771	122.087	117.272	116.817	117.036
R2#2	140	134.455	135.222	130.256	121.621	118.373	116.948	117.313
R2#3	140	135.052	135.611	130.697	121.952	118.562	116.938	117.456
R2#4	139.944	135.386	135.719	130.455	122.346	118.274	117.111	117.366
R3#1	139.508	134.076	135.007	130.536	122.256	119.018	117.81	118.09
R3#2	138.786	134.903	135.016	131.152	122.152	119.281	118.243	118.447
R3#3	139.638	134.691	134.859	131.816	123.356	119.757	118.763	119.029
R3#4	139.312	134.442	135.803	131.181	122.992	119.464	118.15	118.354
R4#1	139.77	135.396	135.429	132.853	124.129	120.062	119.468	120.071
R4#2	139.622	134.731	135.264	131.713	123.689	119.949	119.829	120.25
R4#3	139.976	135.928	136.075	131.809	123.544	120.321	120.169	120.324
R4#4	140	135.195	135.582	132.322	123.831	120.018	120.078	120.294
R5#1	139.912	134.324	134.6	130.338	121.281	117.894	116.45	116.723
R5#2	139.739	134.241	134.45	129.461	120.777	117.09	116.302	116.41
R5#3	139.569	134.274	134.935	129.596	121.249	118.476	116.693	116.922
R5#4	139.268	134.748	136.152	130.227	121.046	118.105	116.666	116.966
MIN LIM	134	120	120	120	120	120	120	120
MAX LIM	140	140	140	140	140	140	140	140

AVO2

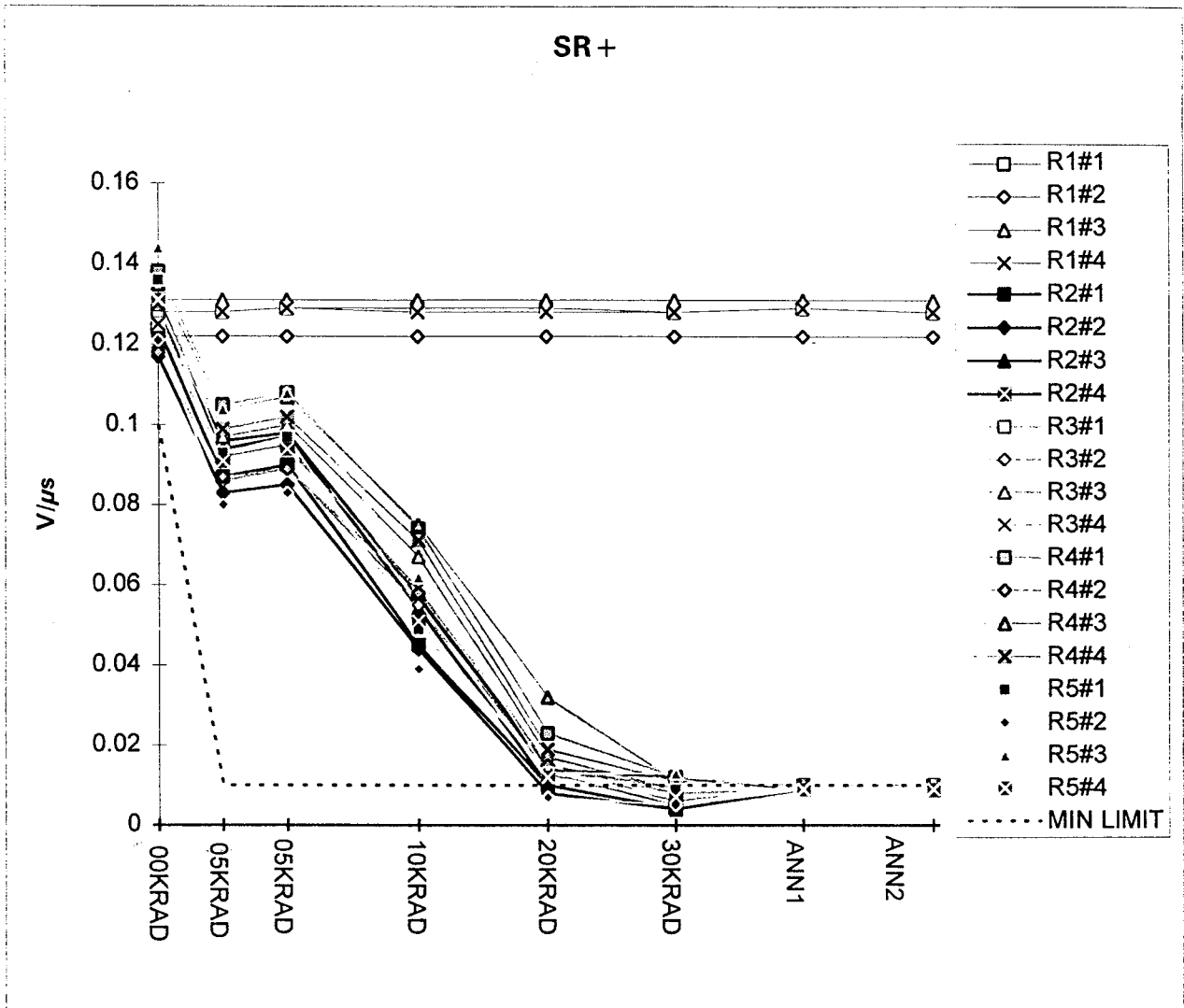


AVO2	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	129.745	129.8	129.385	129.586	129.745	129.877	129.777	129.745
R1#2	130.487	130.131	130.209	130.072	130.251	130.196	130.322	130.487
R1#3	129.762	129.93	129.449	130.07	129.993	129.581	129.654	129.762
R1#4	129.93	130.168	129.681	129.654	129.842	130.144	129.547	129.93
R2#1	129.54	128.398	128.511	126.236	120.826	117.264	116.009	116.206
R2#2	129.234	127.821	128.088	126.198	120.788	116.93	115.847	116.27
R2#3	129.927	128.507	128.697	126.618	120.212	117.712	116.004	116.465
R2#4	129.925	128.301	129.011	126.493	120.119	116.849	116.249	116.535
R3#1	129.552	127.861	127.701	126.534	120.604	117.408	116.817	117.033
R3#2	129.879	128.385	128.457	127.107	120.807	117.986	117.253	117.494
R3#3	129.75	128.197	128.324	126.927	121.429	118.359	117.613	117.765
R3#4	129.77	127.784	128.239	126.362	120.761	117.711	117.279	117.431
R4#1	129.952	128.816	129.066	127.548	121.998	118.599	118.445	118.702
R4#2	129.625	128.36	128.453	127.08	121.499	118.851	118.451	119.025
R4#3	129.674	128.125	128.573	126.882	121.518	118.885	118.471	119.024
R4#4	129.849	128.905	128.649	127.314	122.204	119.015	118.75	119.037
R5#1	129.584	128.245	128.078	126.14	119.834	116.674	115.464	115.827
R5#2	129.669	128.086	128.299	125.664	119.324	116.395	115.372	115.663
R5#3	129.408	127.518	127.981	125.537	119.802	116.85	115.781	115.949
R5#4	129.817	128.614	128.239	126.421	119.793	117.023	115.986	116.152
MIN LIM	126	115	115	115	115	115	115	115
MAX LIM	140	140	140	140	140	140	140	140

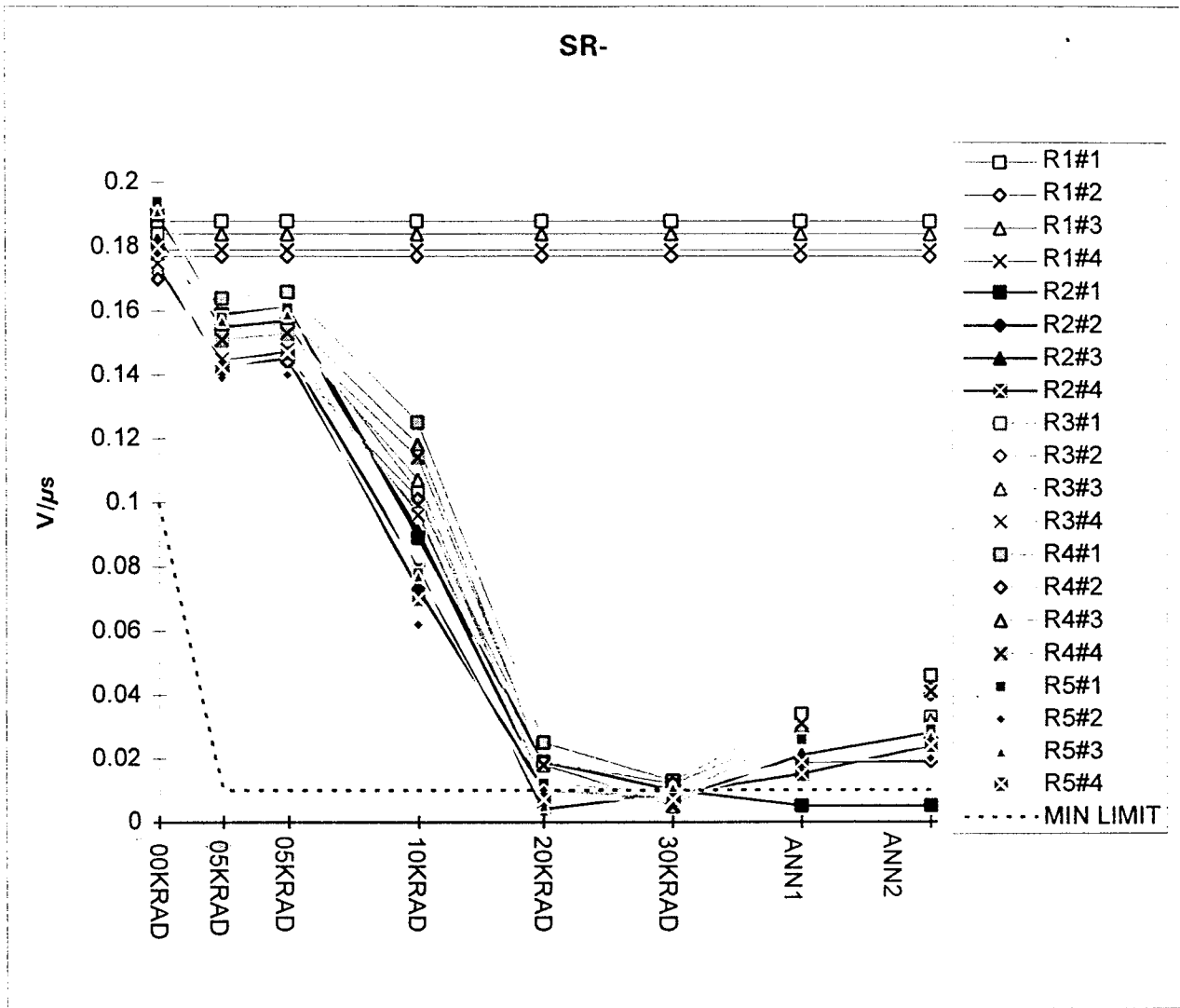
ISY



ISY	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	1.975	2.055	2.047	2.031	1.957	1.973	1.957	1.975
R2#1	2.165	1.847	1.76	1.566	0.744	0.395	0.48	0.482
R3#1	2.057	1.924	1.84	1.591	1.37	0.429	0.59	1.321
R4#1	2.218	1.903	1.814	1.669	1.429	0.433	0.46	0.463
R5#1	2.191	1.863	1.779	1.575	0.447	0.41	0.479	0.483
MAX LIM	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9



SR +	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	0.128	0.128	0.129	0.129	0.129	0.128	0.129	0.128
R1#2	0.122	0.122	0.122	0.122	0.122	0.122	0.122	0.122
R1#3	0.131	0.131	0.131	0.131	0.131	0.131	0.131	0.131
R1#4	0.128	0.128	0.129	0.128	0.128	0.128	0.129	0.128
R2#1	0.124	0.087	0.09	0.045	0.01	0.004	0.009	0.009
R2#2	0.117	0.083	0.085	0.044	0.008	0.004	0.009	0.009
R2#3	0.128	0.094	0.097	0.054	0.01	0.004	0.009	0.009
R2#4	0.131	0.096	0.098	0.057	0.014	0.012	0.009	0.009
R3#1	0.128	0.092	0.095	0.058	0.015	0.009	0.009	0.01
R3#2	0.119	0.086	0.089	0.055	0.013	0.005	0.009	0.01
R3#3	0.13	0.097	0.1	0.067	0.017	0.009	0.009	0.01
R3#4	0.125	0.091	0.094	0.059	0.015	0.008	0.009	0.01
R4#1	0.138	0.105	0.108	0.074	0.023	0.012	0.01	0.01
R4#2	0.118	0.087	0.089	0.058	0.015	0.006	0.01	0.01
R4#3	0.135	0.104	0.107	0.075	0.032	0.011	0.01	0.01
R4#4	0.13	0.099	0.102	0.071	0.019	0.011	0.01	0.01
R5#1	0.136	0.093	0.097	0.049	0.013	0.009	0.009	0.009
R5#2	0.121	0.08	0.083	0.039	0.007	0.005	0.009	0.009
R5#3	0.144	0.104	0.108	0.062	0.013	0.013	0.009	0.01
R5#4	0.131	0.091	0.094	0.051	0.012	0.007	0.009	0.009
MIN LIMIT	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01



SR-	00KRAD	05KRAD	05KRAD	10KRAD	20KRAD	30KRAD	ANN1	ANN2
R1#1	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188
R1#2	0.177	0.177	0.177	0.177	0.177	0.177	0.177	0.177
R1#3	0.184	0.184	0.184	0.184	0.184	0.184	0.184	0.184
R1#4	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179
R2#1	0.19	0.159	0.161	0.089	0.019	0.01	0.005	0.005
R2#2	0.174	0.143	0.145	0.073	0.01	0.007	0.019	0.019
R2#3	0.183	0.155	0.157	0.091	0.01	0.007	0.021	0.028
R2#4	0.175	0.145	0.147	0.079	0.004	0.009	0.015	0.024
R3#1	0.184	0.154	0.156	0.103	0.012	0.009	0.026	0.033
R3#2	0.172	0.143	0.146	0.097	0.01	0.007	0.027	0.03
R3#3	0.178	0.151	0.153	0.107	0.01	0.008	0.028	0.032
R3#4	0.175	0.145	0.148	0.096	0.01	0.007	0.026	0.029
R4#1	0.193	0.164	0.166	0.125	0.025	0.013	0.034	0.046
R4#2	0.17	0.141	0.144	0.101	0.019	0.012	0.029	0.04
R4#3	0.182	0.156	0.158	0.118	0.018	0.005	0.03	0.042
R4#4	0.178	0.151	0.153	0.114	0.018	0.005	0.031	0.041
R5#1	0.194	0.158	0.161	0.078	0.012	0.008	0.026	0.029
R5#2	0.178	0.139	0.14	0.062	0.01	0.01	0.019	0.02
R5#3	0.191	0.157	0.159	0.077	0.005	0.011	0.019	0.027
R5#4	0.18	0.142	0.147	0.07	0.007	0.007	0.019	0.024
MIN LIMIT	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Envisat-1	TOTAL DOSE RADIATION TEST REPORT	Issue: 1 Rev.:
	No. PO-TR-TLG-PL-2022	Date: 19/12/95 ANNEX I

DOSIMETRIA

TASA DE DOSIS		
rad(Si)/h	rad(Si)/min.	R/min
20000	333.3	385.36
Corrección por posicionamiento	5%	366.09
corrección por temperatura	19°	370

TIEMPO DE IRRADIACION	45 min.
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	Rad(F)	R	Rad(Si)	Rad(Si)/min
0.502	13832	14261	12336	274.12
0.565	15568	16051	13884	308.53
0.578	15927	16420	14203	315.62
0.580	15982	16477	14252	316.72
0.568	15652	16136	13958	310.17
0.500	13778	14204	12287	273.03

TASA DE DOSIS MEDIA	
Rad(Si)/h	Rad(Si)/h
317.26	19035