

# ESA-QCA9919T-C

<b>Envisat-1</b>	<b>TOTAL DOSE RADIATION TEST REPORT</b> No. PO-TR-TLG-PL-2031	Issue: 1 Rev.: Date: 19/03/96 Page: 1/11
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SCC Component No.: <b>920900602B</b>		Component Designation: <b>54AC521 FP</b>	Irradiation Spec. No.: <b>PO-PL-TLG-PL-0500 Iss.2</b>
Gen. Spec.: <b>SCC 9000 8D</b> Det. Spec.: <b>SCC 9209/006 Iss.1</b> Amend.: <b>DCR 23718</b>		Evaluation: - Acceptance Diffusion: - Acceptance Lot: <b>X</b>	Project/Programme: <b>ENVISAT-1</b>
Family: <b>08</b>	Group: <b>03</b>	Functional Assignment: <b>8-BIT IDENTITY COMPARATOR</b>	Package: <b>FP-20</b>
Manuf. Name: <b>MOTOROLA</b> Address: <b>FRANCE</b>		Test House: <b>TECNOLOGICA</b> Address: <b>MADRID (SPAIN)</b>	Orig. house: <b>TECNOLOGICA</b> Address: <b>SEVILLA (SPAIN)</b>
Radiation Test Plan No.: <b>PO-PL-TLG-PL-2031</b>		Sample Size: <b>5</b> Irradiation Devices: <b>4</b> Control Devices: <b>1</b>	Date Code: <b>9544</b> Diffusion LOT: <b>AH2003XNE</b> Wafer No.: <b>6</b>
Radiation Source: <b>Cobalt-60</b> Facility Name: <b>CIEMAT</b> Address: <b>MADRID (SPAIN)</b>		Energy: <b>1.33/1.17 MeV</b> Dose Rate: <b>402.6 Rad(Si)/h</b>	Date of Test: <b>03/96</b>
Irradiation Conditions: Biased: <b>Y</b> Unbiased: - Test Circuit: <b>Figure 1</b>		Irradiation Measurements Interval: Remote test: - In situ Test: <b>X</b>	Annealing Tests: <b>24h / 25°C</b> Ageing: <b>168h / 100°C</b> Biased: <b>X</b> Unbiased: - Test Circuit: <b>Figure 1</b>

**Electrical Measurements. Parameters Tested:**

**FT<sub>1</sub> , FT<sub>2</sub> , FT<sub>3</sub> , IDD , VOL<sub>s</sub> , VOH<sub>s</sub> , VIL , VIH .**

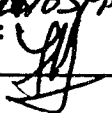
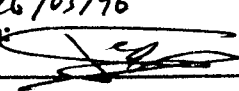
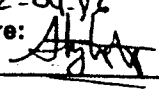
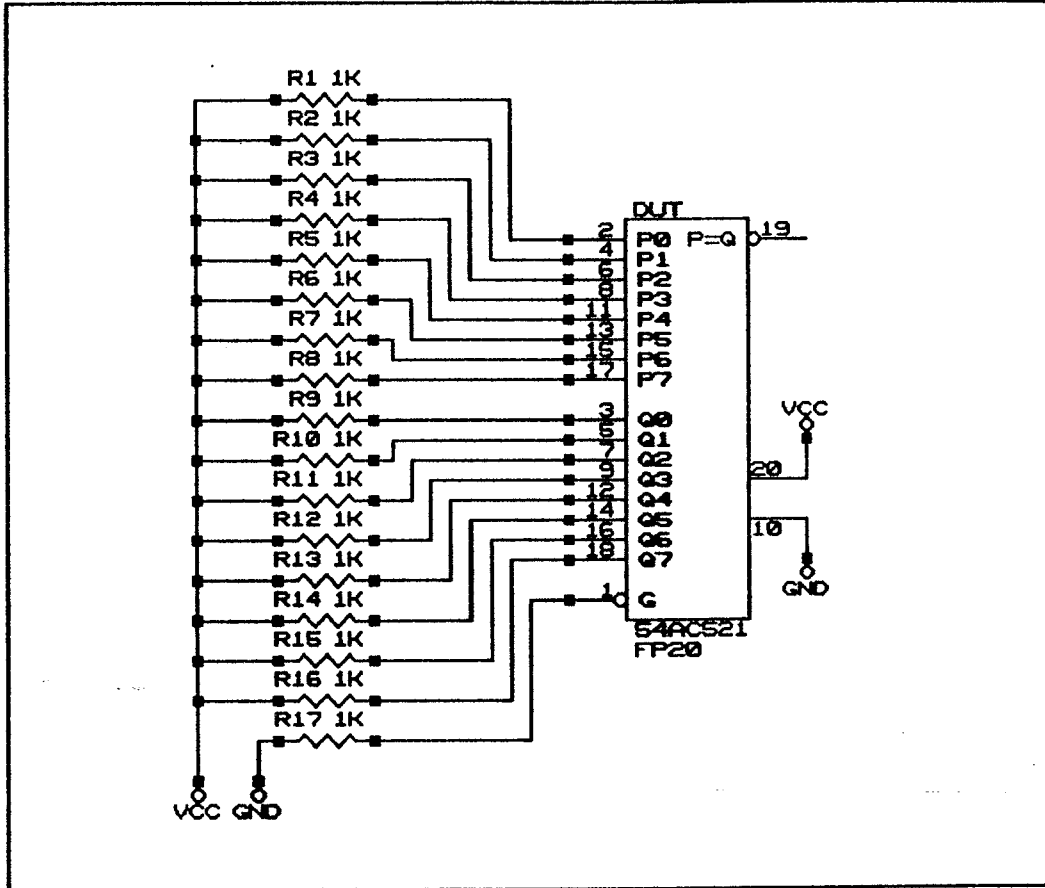
Irradiat. Respons.: <b>J.H. VALERDE</b> Date: <b>19/03/96</b> Signature: 	Electr. Test Resp.: <b>J.A. VALERDE</b> Date: <b>26/03/96</b> Signature: 	Approved by QA: <b>S. MAYORRINO</b> Date: <b>02-04-96</b> Signature: 
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FIGURE 1.-TEST CIRCUIT



**SUMMARY**

Total dose steady-state irradiation test has been carried out on 8-BIT IDENTITY COMPARATOR from **MOTOROLA** with date code 9544. The irradiated parts were labelled as follows: R2 = S/N 2, R3 = S/N 3, R4 = S/N 4, R5 = S/N 5 irradiation devices and R1 = S/N 1 control device.

**RESULTS**

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

	<b>0 KRAD</b>	<b>10 KRAD</b>	<b>20 KRAD</b>	<b>30 KRAD</b>	<b>ANN 168</b>
<b>FCT<sub>1</sub></b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>FCT<sub>2</sub></b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>FCT<sub>3</sub></b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>IDD(Patt.1)</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>IDD(Patt.2)</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>VOL5</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>VOH5</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>VIL</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>
<b>VIH</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>

**CONCLUSION**

All parameters remain under specification.

**Envisat-1****TOTAL DOSE RADIATION  
TEST REPORT  
No. PO-TR-TLG-PL-2031**Issue: 1 Rev.:  
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Page: 4/11**SCHEDULE**

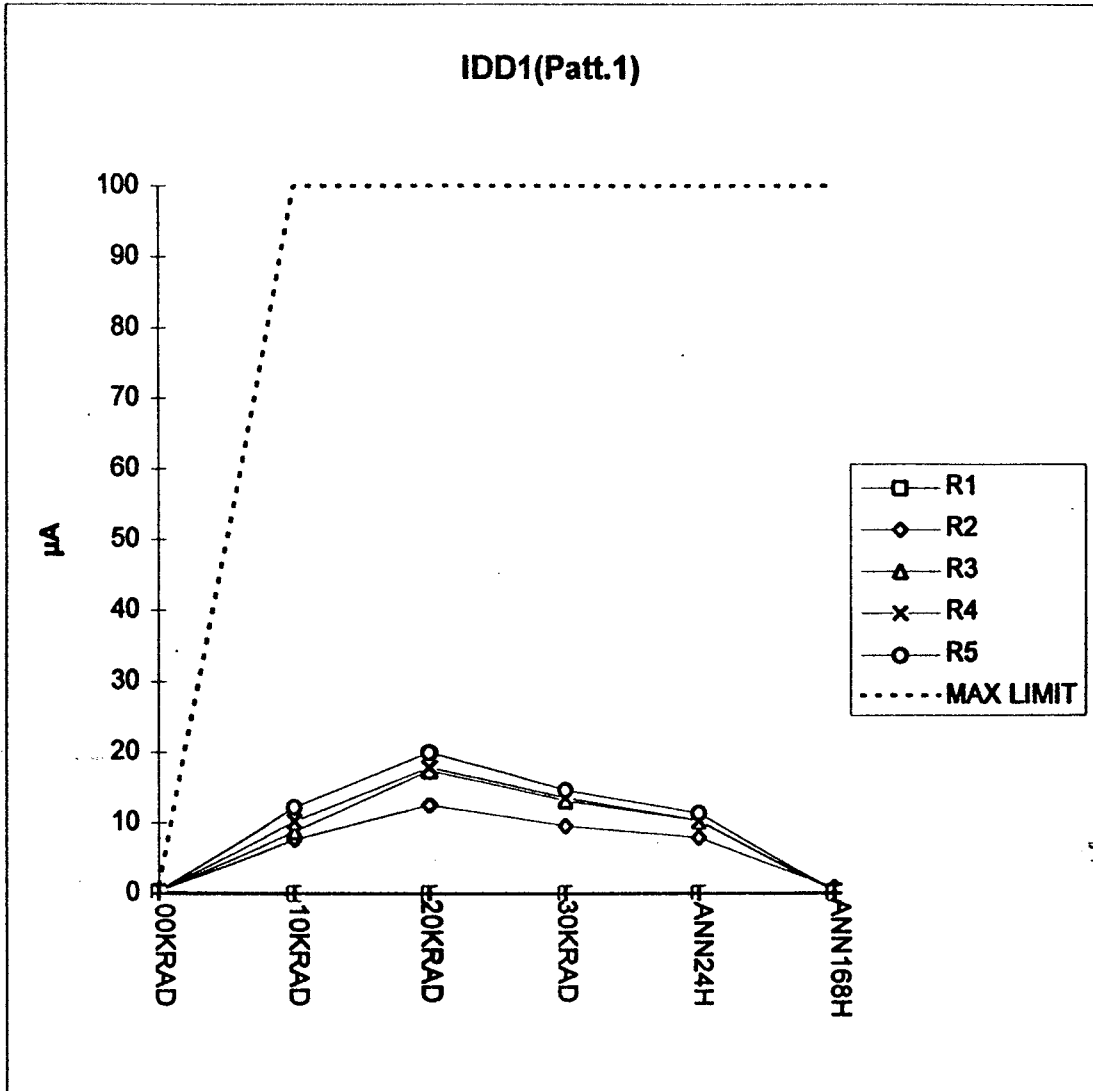
Test Step	Description	Result or Actual Test Condition	Time In	Time Out	Exposure
1	Sample serialization	CONTROL R1 IRR. DEVICES R2, R3, R4, R5.			
2	Initial Electrical Measurements	See 0 krad(Si) values in respective Parameter Data Tables Temperature: 24.8°C (average)			
3	Set-up of Test	Bias circuit verified according to Fig. 1			
4	Irradiation Exposure	Total Dose: 9,244 rad(Si) Cumulative Dose: 9,244 rad(Si) Dose Rate: 401.9 rad(Si)/h Temperature: 22.5 °C (average)	16:05 04/03	14:20 05/03	23 h
5	Intermediate Electrical Measurements	See 10 krad(Si) values in respective Parameter Data Tables Temperature: 27.0 °C (average)	15:05 05/03	15:45 05/03	40 min
6	Set-up of Test	Bias circuit verified according to Fig. 1			
7	Irradiation Exposure	Total Dose: 9,244 rad(Si) Cumulative Dose: 18,488 rad(Si) Dose Rate: 401.9 rad(Si)/h Temperature: 21.3 °C (average)	16:00 05/03	15:00 06/03	23 h
8	Intermediate Electrical Measurements	See 20 krad(Si) values in respective Parameter Data Tables Temperature: 27.3 °C (average)	15:05 06/03	15:40 06/03	35 min
9	Set-up of Test	Bias circuit verified according to Fig. 1			
10	Irradiation Exposure	Total Dose: 9,209 rad(Si) Cumulative Dose: 27,698 rad(Si) Dose Rate: 400.4 rad(Si)/h Temperature: 23.6 °C (average)	15:45 06/03	14:45 07/03	23 h
11	Intermediate Electrical Measurements	See 30 krad(Si) values in respective Parameter Data Tables Temperature: 26.6°C (average)	14:50 07/03	15:30 07/03	40 min

***Envisat-1***

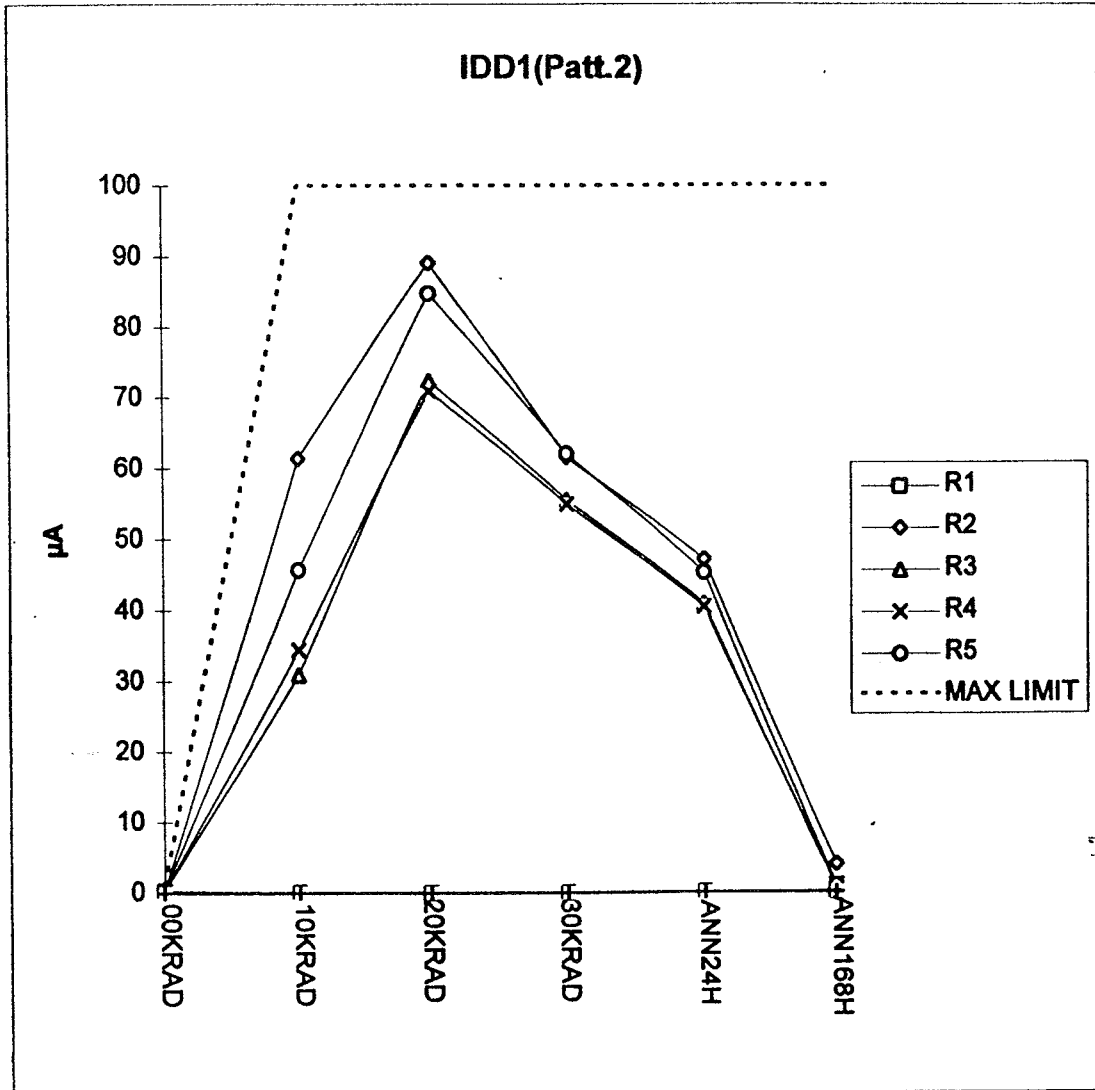
**TOTAL DOSE RADIATION  
TEST REPORT  
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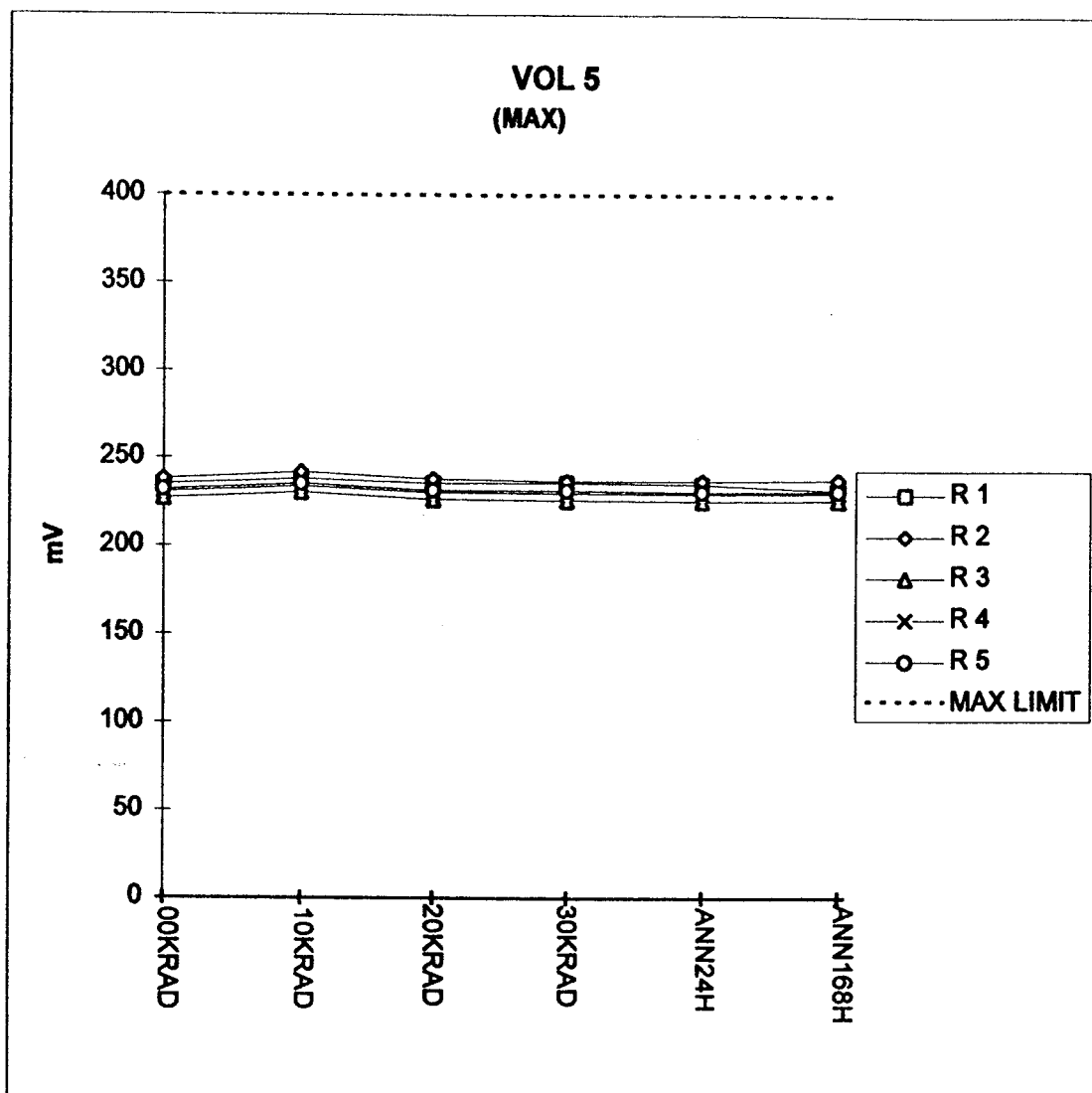
<b>Test Step</b>	<b>Description</b>	<b>Result or Actual Test Condition</b>	<b>Time In</b>	<b>Time Out</b>	<b>Exposure</b>
<b>12</b>	<b>Annealing</b>	<b>Bias circuit verified according to Fig. 1 Temperature: 15.2°C (average)</b>	<b>15:35 07/03</b>	<b>13:35 08/03</b>	<b>22 h</b>
<b>13</b>	<b>Electrical Measurements</b>	<b>See ANN24H values in respective Parameter Data Tables Temperature: 25.0°C (average)</b>	<b>13:40 08/03</b>	<b>14:15 08/96</b>	<b>35 min</b>
<b>14</b>	<b>Accelerated Ageing</b>	<b>Bias circuit verified according to Fig. 1 Temperature: 100°C</b>	<b>14:20 08/03</b>	<b>13:20 15/03</b>	<b>167 h.</b>
<b>15</b>	<b>Final Electrical Measurements</b>	<b>See ANN168h values in respective parameter Data Tables</b>	<b>13:25 15/03</b>	<b>14:00 15/03</b>	<b>35 min</b>



IDD1(Patt.1)	00KRAD	10KRAD	20KRAD	30KRAD	ANN24H	ANN168H
R1	0.305	0.019	0.065	0.063	0.049	0.021
R2	0.336	7.642	12.577	9.602	7.923	0.838
R3	0.328	8.792	17.447	13.188	10.301	0.339
R4	0.336	10.219	17.883	13.605	10.344	0.361
R5	0.330	12.250	20.002	14.705	11.383	0.416
MAX LIMIT	1	100	100	100	100	100

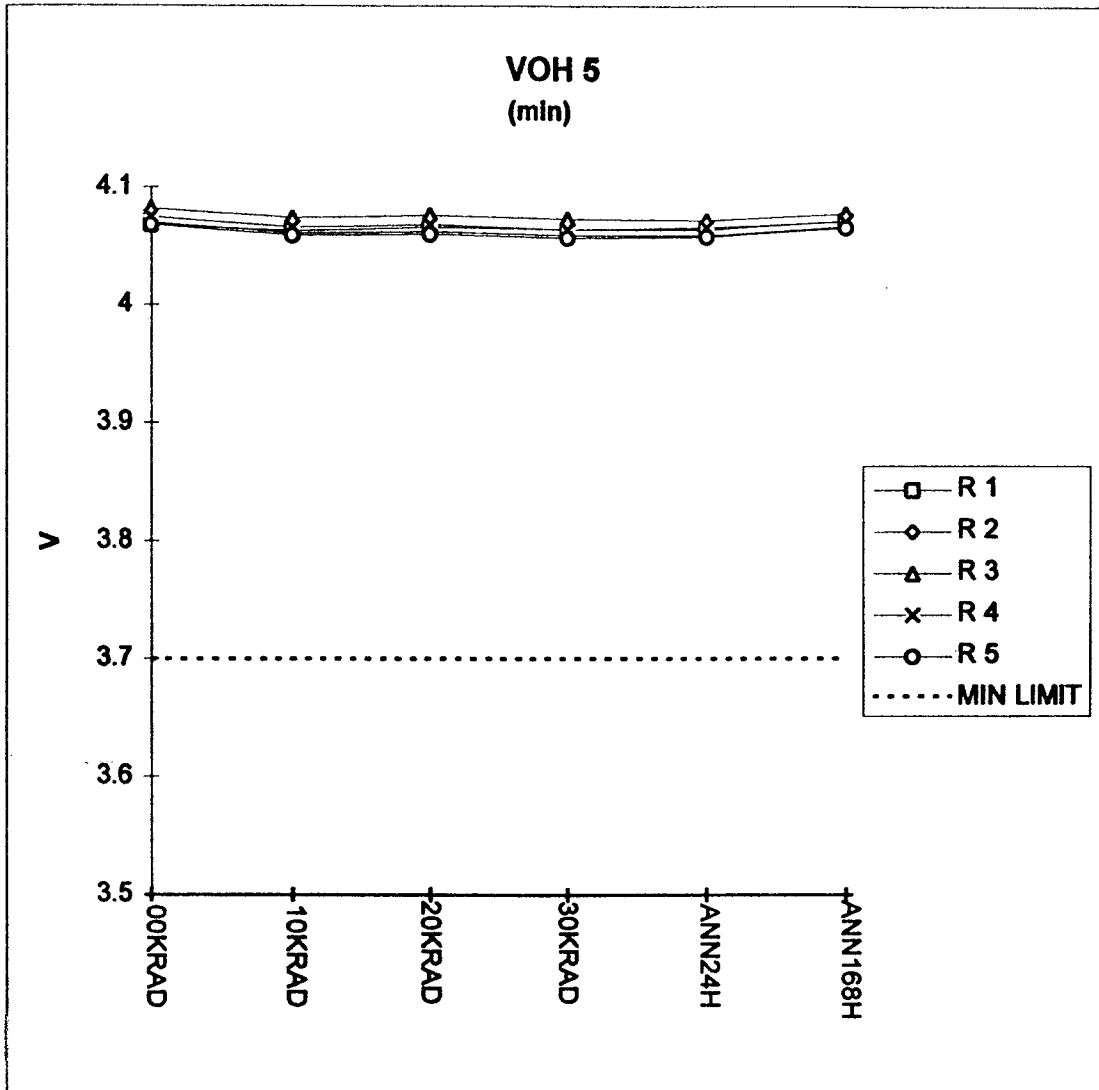


IDD1(Patt.2)	00KRAD	10KRAD	20KRAD	30KRAD	ANN24H	ANN168H
R1	0.301	0.085	0.004	0.013	0.043	0.011
R2	0.324	61.398	89.074	61.559	47.096	3.909
R3	0.307	30.943	72.404	55.512	40.848	0.659
R4	0.321	34.431	70.919	54.912	40.416	1.009
R5	0.306	45.671	84.770	62.054	45.219	0.868
MAX LIMIT	1	100	100	100	100	100

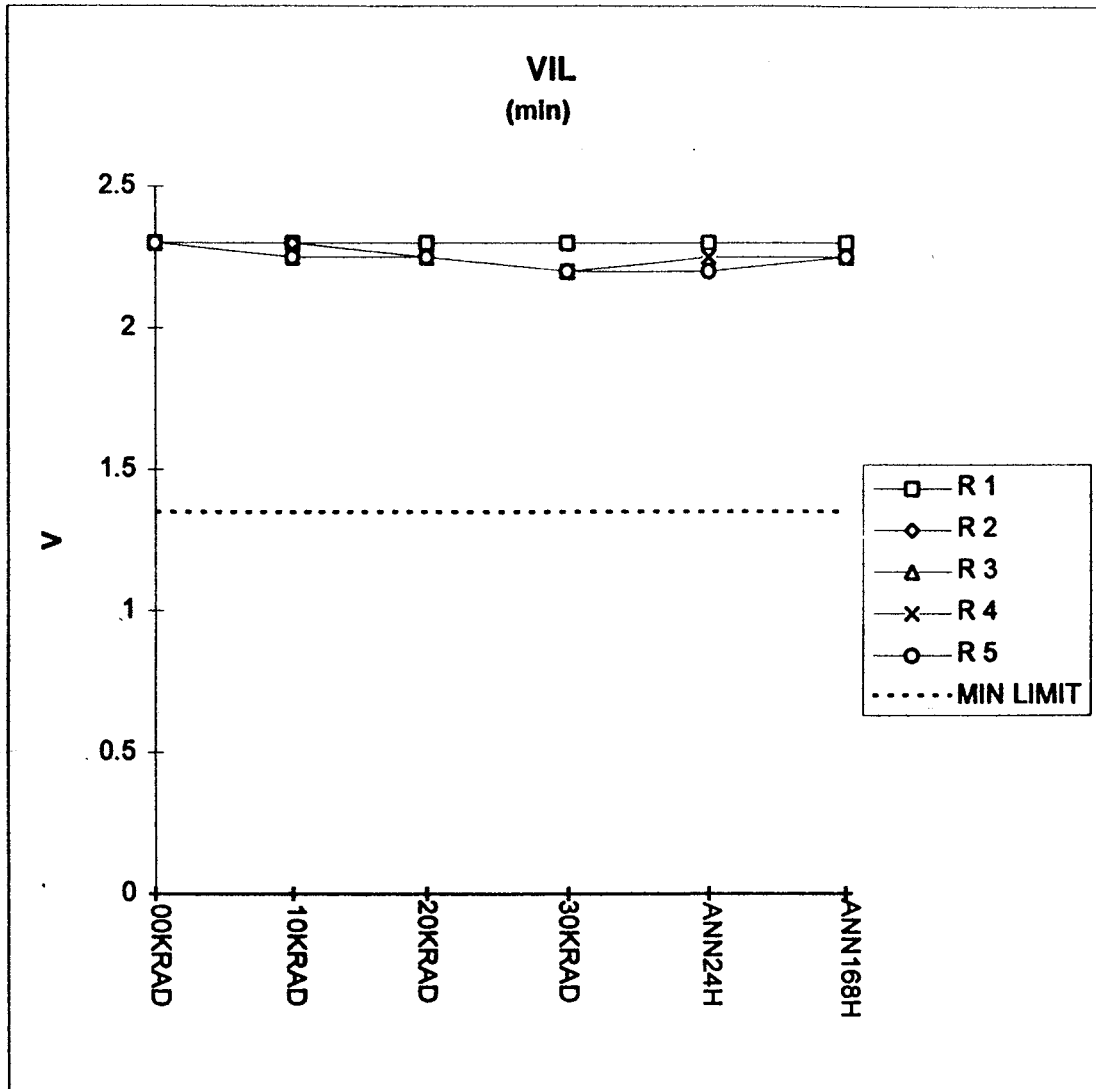


VOL 5		00KRAD	10KRAD	20KRAD	30KRAD	ANN24H	ANN168H
R 1	min	235.105	238.240	235.740	236.045	235.100	231.600
	MAX	235.105	238.240	235.740	236.045	235.100	231.600
R 2	min	238.060	241.970	238.015	237.020	236.950	237.450
	MAX	238.060	241.970	238.015	237.020	236.950	237.450
R 3	min	227.135	230.580	226.550	226.135	225.750	226.100
	MAX	227.135	230.580	226.550	226.135	225.750	226.100
R 4	min	230.795	234.015	230.390	230.155	229.600	230.000
	MAX	230.795	234.015	230.390	230.155	229.600	230.000
R 5	min	231.960	235.405	231.730	231.685	230.800	231.150
	MAX	231.960	235.405	231.730	231.685	230.800	231.150
MAX LIMIT		400	400	400	400	400	400

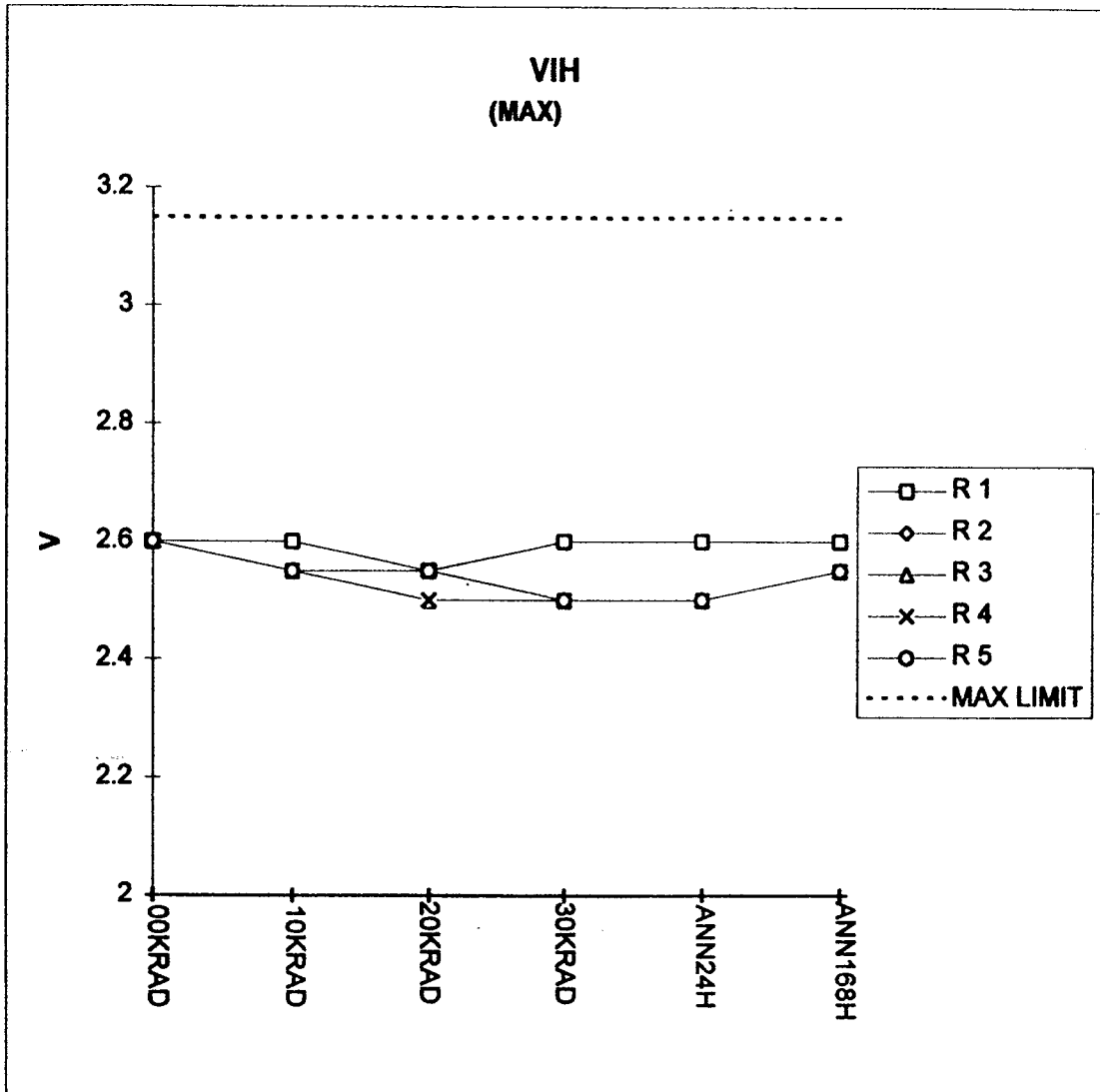




VOH 5		00KRAD	10KRAD	20KRAD	30KRAD	ANN24H	ANN168H
R 1	min	4.068	4.063	4.066	4.064	4.064	4.072
	MAX	4.068	4.063	4.066	4.064	4.064	4.072
R 2	min	4.070	4.061	4.062	4.059	4.059	4.067
	MAX	4.070	4.061	4.062	4.059	4.059	4.067
R 3	min	4.082	4.074	4.076	4.073	4.072	4.078
	MAX	4.082	4.074	4.076	4.073	4.072	4.078
R 4	min	4.075	4.066	4.068	4.064	4.066	4.071
	MAX	4.075	4.066	4.068	4.064	4.066	4.071
R 5	min	4.068	4.059	4.06	4.057	4.058	4.066
	MAX	4.068	4.059	4.06	4.057	4.058	4.066
MIN LIMIT		3.7	3.7	3.7	3.7	3.7	3.7



VIL		00KRAD	10KRAD	20KRAD	30KRAD	ANN24H	ANN168H
R 1	min	2.3	2.30	2.30	2.30	2.30	2.30
	MAX	2.35	2.35	2.35	2.35	2.40	2.35
R 2	min	2.30	2.30	2.25	2.20	2.25	2.25
	MAX	2.40	2.35	2.30	2.30	2.30	2.30
R 3	min	2.30	2.25	2.25	2.20	2.25	2.25
	MAX	2.35	2.30	2.30	2.25	2.30	2.30
R 4	min	2.30	2.25	2.25	2.20	2.25	2.25
	MAX	2.35	2.35	2.30	2.25	2.30	2.30
R 5	min	2.30	2.25	2.25	2.20	2.20	2.25
	MAX	2.35	2.30	2.30	2.25	2.30	2.30
MIN LIMIT		1.35	1.35	1.35	1.35	1.35	1.35



VIH		00KRAD	10KRAD	20KRAD	30KRAD	ANN24H	ANN168H
R 1	min	2.50	2.50	2.45	2.45	2.50	2.50
	MAX	2.60	2.60	2.55	2.60	2.60	2.60
R 2	min	2.50	2.45	2.40	2.40	2.45	2.45
	MAX	2.60	2.55	2.55	2.50	2.50	2.55
R 3	min	2.45	2.40	2.40	2.40	2.40	2.40
	MAX	2.60	2.55	2.50	2.50	2.50	2.55
R 4	min	2.45	2.45	2.40	2.40	2.40	2.45
	MAX	2.60	2.55	2.50	2.50	2.50	2.55
R 5	min	2.45	2.40	2.40	2.35	2.40	2.45
	MAX	2.60	2.55	2.55	2.50	2.50	2.55
MAX LIMIT		3.15	3.15	3.15	3.15	3.15	3.15