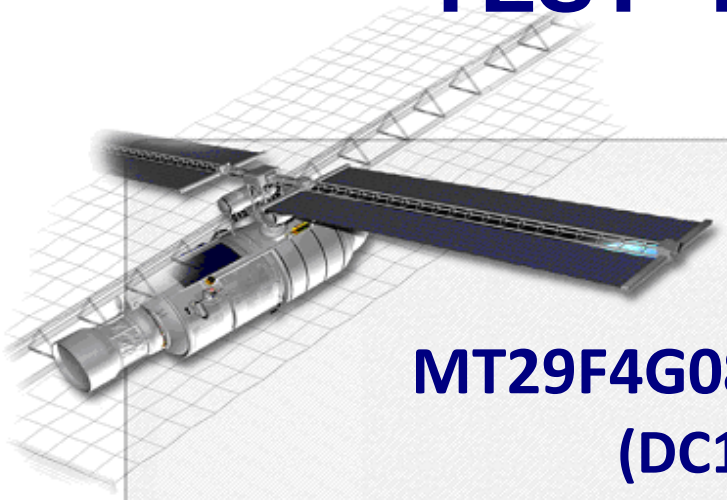
TOTAL IONIZING DOSE TEST REPORT



MT29F4G08ABADAWP
(DC1350)
4Gb, x8 NAND Flash Memory
From
Micron

TRAD/TE/MT29F4G08ABADAWP/1350/ESA/LG/1409		Labège, 24 June 2015
Tests & radiations afaq ISO 9001 Qualité AFNOR CERTIFICATION		TRAD, Bât Gallium 907, Voie l'Occitane - 31670 LABEGE France ☏: 05 61 00 95 60 Fax: 05 61 00 95 61 Email: trad@trad.fr Web Site: www.trad.fr SIRET 397 862 038 00056 - TVA FR59397862038
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Revision: 0		
To: **ESA** **Marc POIZAT**		Project/Program: Ref:

CONTENTS

FIGURES

1. INTRODUCTION

This report describes the testing and characterization of the **MT29F4G08ABADAWP** manufactured by **Micron**. Irradiations began on 23 January 2015 and ended on 31 March 2015.

2. DOCUMENTS

2.1. Applicable documents

- Financial and technical proposal: TRAD/P/ESA/AO7751/AV/130214 Rev.0
- Irradiation test plan: ITP/TRA/TE/MT29F4G08ABADA/TSOP-48/MIC/130814

2.2. Reference documents

- Basic specification: ESCC N°22900 Issue 4 of October 2010
- Data-sheet: Datasheet from Micron N°09005aef83b25735 Rev N of 10/2012

3. PART INFORMATION

3.1. Identification

Part designation	MT29F4G08ABADAWP
Manufacturer	Micron
Part function	4Gb, x8 NAND Flash Memory

3.2. Procurement information

Package	TSOP-48
Date code	1350
Number of tested parts	10 irradiated samples + 1 reference sample

3.3. Sample pictures

3.3.1. External view

Figure 1: Package marking

3.3.2. Internal view

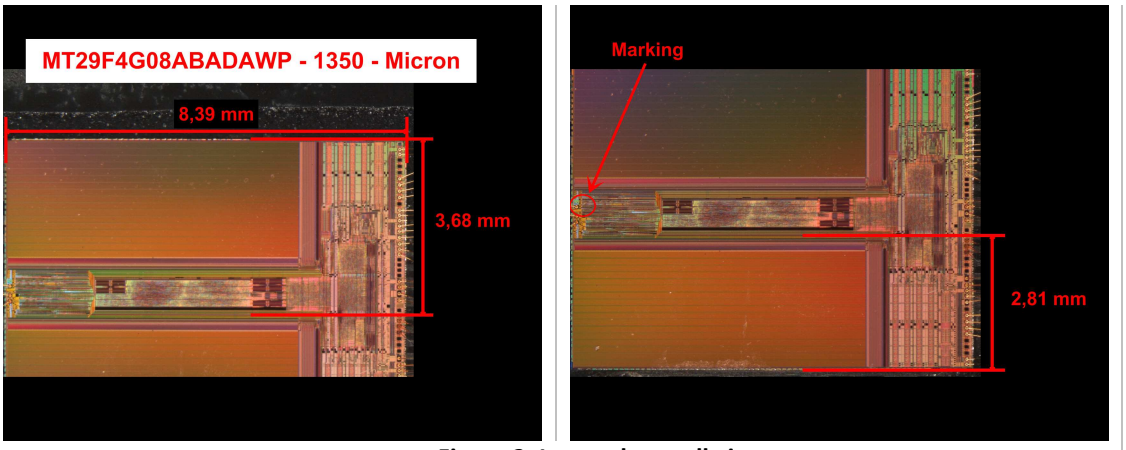


Figure 2: Internal overall view

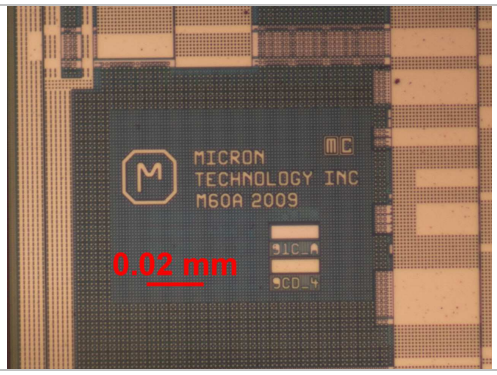


Figure 3: Die marking

4. DOSIMETRY AND IRRADIATION FACILITY

4.1. Irradiation facility

Irradiation source	^{60}Co
Source location	U.C.L (Louvain-la-Neuve)
Irradiation equipment	GIF
Dosimetry equipment	PTW Ionization chamber

4.2. Irradiation time log

Total dose limit (krad(Si))	100			
Levels for measurements (krad(Si))	0	36	68	100
Dose rate (rad(Si)/h)	65			

5. BIAS SETUP

All irradiated components are biased under the following conditions. One component is not irradiated to act as a *REFERENCE*. All the parameters specified in the applicable ITP are measured on the *REFERENCE* and irradiated components.

5.1. Parts distribution

Serial number	Reference	Samples irradiated									
TRAD mark	1	2	3	4	5	6	7	8	9	10	11
Bias mode	REF	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF

5.2. Bias condition

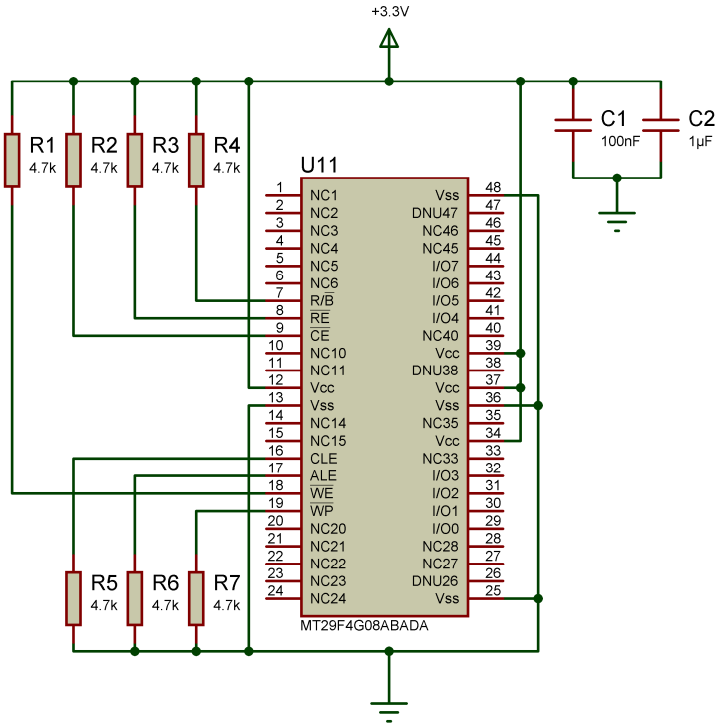


Figure 4: Bias Condition

5.3. Bias equipment identification

Bias board	TRAD/CP1/E/MT29/ZIP48/CS/1407
Equipment	AR-69

6. TEST SETUP

6.1. Test parameters

Parameters	Symbols	Test conditions
Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V, unless otherwise specified		
Block 0 Functionality Check	**Chk_B_Zero_Func**	Functional Test
Sequential READ current	**Sequential READ Icc**	tRC = 20ns, CE# = Vil, Iout = 0mA
PROGRAM current	**Program Icc**	
ERASE current	**Erase Icc**	
RESET current	**Reset Icc**	
Standby current (TTL)	**Isb1**	CE# = Vih
Low level input leakage current	**Ilil**	Vin = 0V
High level input leakage current	**Ilih**	Vin = Vcc
Output high voltage	**Voh**	Ioh = -400µA
Output low voltage	**Vol**	Iol = 2.1mA
RE# access time	**tREA**	

6.2. Test equipment identification

Test board	TRAD/CT1/E/BTMS/ZIP48/LS/1408
Equipment	SM-91
Test program	MT29F4G08_TE_1314_MU_V10.mttx

7. NON CONFORMANCE

Test and measurement conditions were nominal.

8. RESULTS

8.1. Presentation of the results

For each parameter:
- The measurements performed at each irradiation step are registered in a table.
- Drifts between each measurement step and the "0" krad(Si) step are computed.

NB : * For the **CTR** and the **Hfe** parameters, the formula used is :

$$Drift = \frac{1}{measurement(Xkrad(Si))} - \frac{1}{measurement(0krad(Si))}$$

* For the **other measurements**, the formula used is:

$$Drift = measurement(Xkrad(Si)) - measurement(0krad(Si))$$

Where *X* stands for each measurement step.

8.1.1. Technical comments

Part N°9 is not measurable at 100 krad(Si) dose level.
All other parts parameters are within specifications at total dose level.

9. CONCLUSION

The total dose steady-state irradiation test using gamma rays from Cobalt 60 source has been carried out on **10 MT29F4G08ABADAWP**, a **4Gb, x8 NAND Flash Memory** from **Micron** up to **100 krad(Si)** at low dose rate (65 rad(Si)/h).

Hereunder our comments:

Failure observed on part number 9 at total 100 krad(Si) dose level.
No failure observed on other parts at total dose level.

10. APPENDIX 1 MEASURED PARAMETERS

Contents :

1. Chk_B_Zero_Func

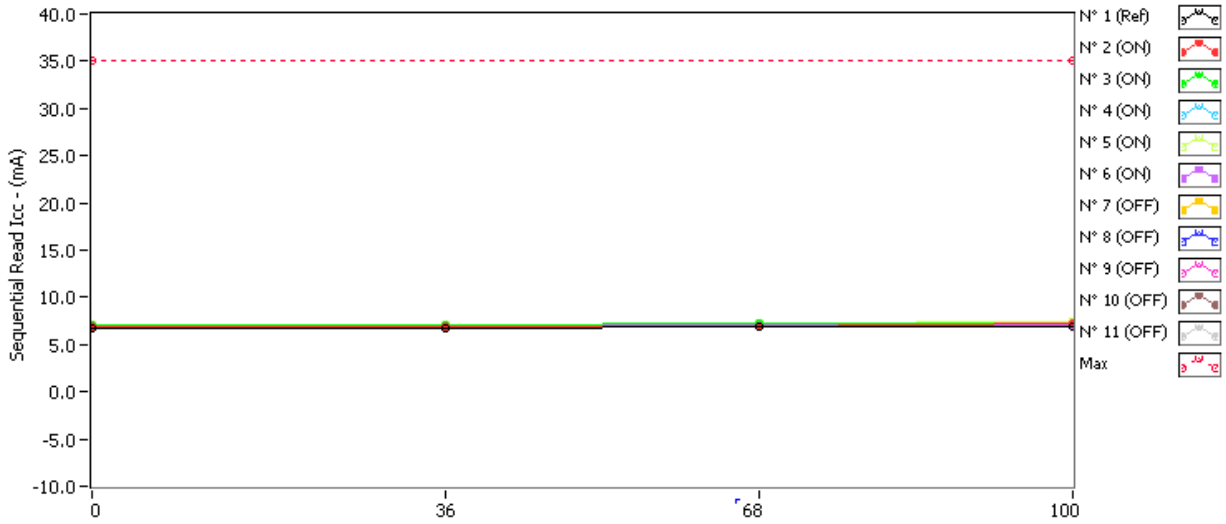
Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V, Functional Test

Chk_B_Zero_Func . (-)

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	PASS	PASS	PASS	PASS
N° 2 (ON)	PASS	PASS	PASS	PASS
N° 3 (ON)	PASS	PASS	PASS	PASS
N° 4 (ON)	PASS	PASS	PASS	PASS
N° 5 (ON)	PASS	PASS	PASS	PASS
N° 6 (ON)	PASS	PASS	PASS	PASS
N° 7 (OFF)	PASS	PASS	PASS	PASS
N° 8 (OFF)	PASS	PASS	PASS	PASS
N° 9 (OFF)	PASS	PASS	PASS	FAIL
N° 10 (OFF)	PASS	PASS	PASS	PASS
N° 11 (OFF)	PASS	PASS	PASS	PASS

2. Sequential Read Icc

Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V, tRC = 20ns, CE# = Vil, Iout = 0mA



Sequential Read Icc . (mA) **Max = 35.0**

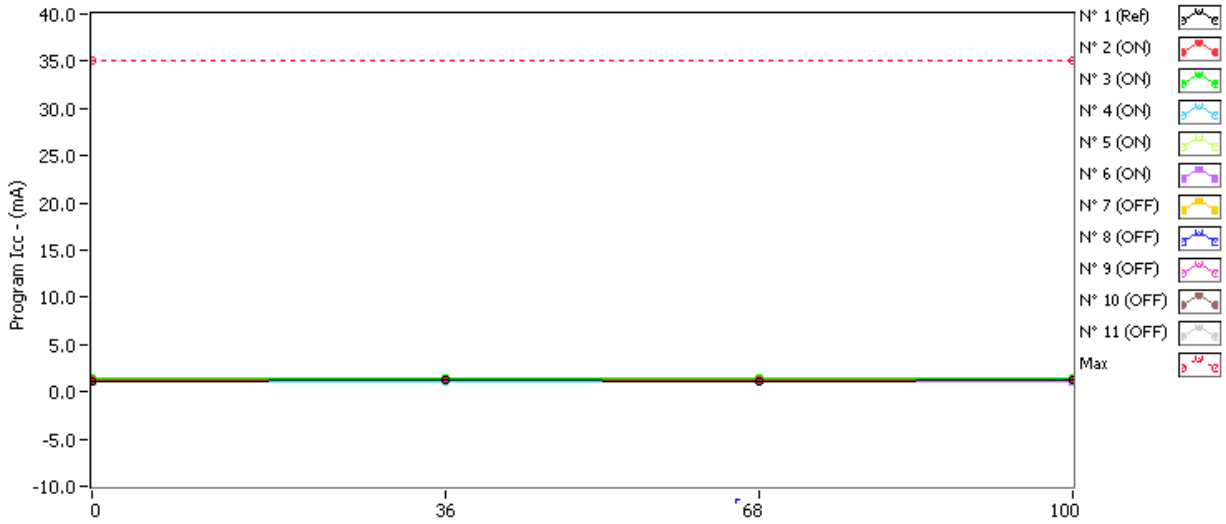
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	6.775	6.775	6.836	6.958
N° 2 (ON)	6.897	6.958	6.958	7.263
N° 3 (ON)	7.019	7.141	7.324	7.263
N° 4 (ON)	6.775	6.714	6.897	6.897
N° 5 (ON)	7.080	7.141	7.263	7.385
N° 6 (ON)	6.958	6.897	7.019	7.019
N° 7 (OFF)	6.958	7.080	7.202	7.202
N° 8 (OFF)	7.019	7.019	7.202	7.324
N° 9 (OFF)	6.897	6.958	7.019	Not Measurable
N° 10 (OFF)	6.958	6.897	7.141	7.202
N° 11 (OFF)	6.775	6.836	7.019	7.019

Delta [Sequential Read Icc]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	0.000E+0	6.100E-2	1.831E-1
N° 2 (ON)	---	6.100E-2	6.100E-2	3.662E-1
N° 3 (ON)	---	1.221E-1	3.052E-1	2.442E-1
N° 4 (ON)	---	-6.100E-2	1.221E-1	1.221E-1
N° 5 (ON)	---	6.100E-2	1.831E-1	3.052E-1
N° 6 (ON)	---	-6.100E-2	6.100E-2	6.100E-2
N° 7 (OFF)	---	1.221E-1	2.441E-1	2.441E-1
N° 8 (OFF)	---	0.000E+0	1.831E-1	3.052E-1
N° 9 (OFF)	---	6.100E-2	1.220E-1	NaN
N° 10 (OFF)	---	-6.100E-2	1.831E-1	2.441E-1
N° 11 (OFF)	---	6.100E-2	2.441E-1	2.441E-1
Average (ON)	---	2.442E-2	1.465E-1	2.197E-1
s (ON)	---	8.187E-2	1.022E-1	1.266E-1
Average+3s (ON)	---	2.700E-1	4.529E-1	5.995E-1
Average-3s (ON)	---	-2.212E-1	-1.600E-1	-1.600E-1
Average (OFF)	---	3.662E-2	1.953E-1	2.594E-1
s (OFF)	---	6.958E-2	5.107E-2	3.055E-2
Average+3s (OFF)	---	2.454E-1	3.485E-1	3.510E-1
Average-3s (OFF)	---	-1.721E-1	4.206E-2	1.677E-1

3. Program Icc

Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V



Program Icc . (mA) **Max = 35.0**

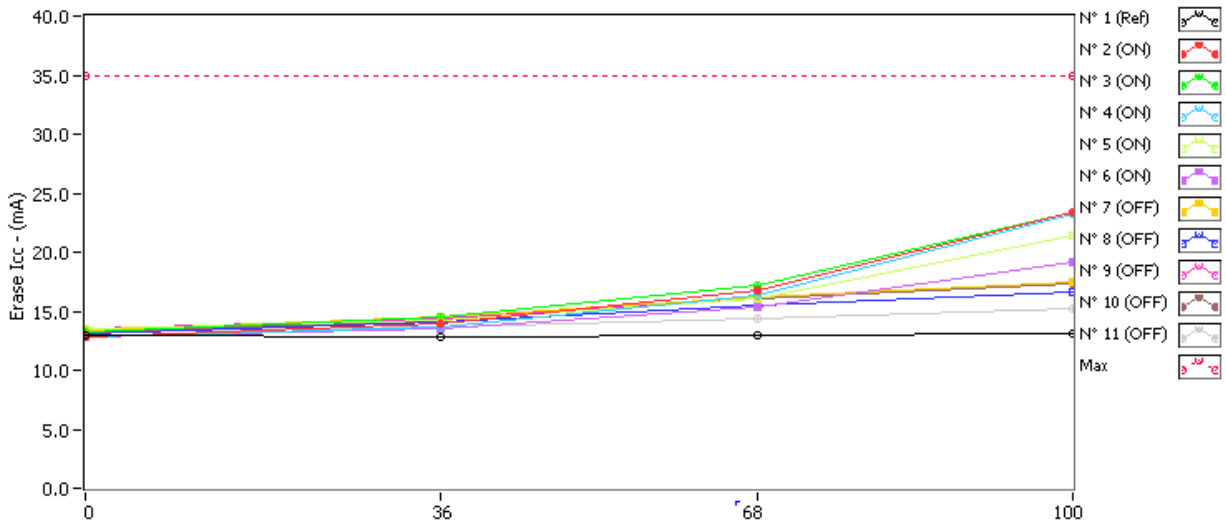
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	1.099	1.221	1.099	1.282
N° 2 (ON)	1.282	1.343	1.282	1.343
N° 3 (ON)	1.404	1.404	1.404	1.404
N° 4 (ON)	1.221	1.099	1.221	1.221
N° 5 (ON)	1.404	1.404	1.526	1.465
N° 6 (ON)	1.160	1.221	1.221	1.099
N° 7 (OFF)	1.343	1.343	1.404	1.343
N° 8 (OFF)	1.282	1.465	1.465	1.404
N° 9 (OFF)	1.221	1.221	1.282	Not Measurable
N° 10 (OFF)	1.404	1.343	1.404	1.282
N° 11 (OFF)	1.221	1.221	1.160	1.099

Delta [Program Icc]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	1.220E-1	0.000E+0	1.830E-1
N° 2 (ON)	---	6.100E-2	0.000E+0	6.100E-2
N° 3 (ON)	---	0.000E+0	0.000E+0	0.000E+0
N° 4 (ON)	---	-1.220E-1	0.000E+0	0.000E+0
N° 5 (ON)	---	0.000E+0	1.220E-1	6.100E-2
N° 6 (ON)	---	6.100E-2	6.100E-2	-6.100E-2
N° 7 (OFF)	---	0.000E+0	6.100E-2	0.000E+0
N° 8 (OFF)	---	1.830E-1	1.830E-1	1.220E-1
N° 9 (OFF)	---	0.000E+0	6.100E-2	NaN
N° 10 (OFF)	---	-6.100E-2	0.000E+0	-1.220E-1
N° 11 (OFF)	---	0.000E+0	-6.100E-2	-1.220E-1
Average (ON)	---	0.000E+0	3.660E-2	1.220E-2
s (ON)	---	7.471E-2	5.456E-2	5.104E-2
Average+3s (ON)	---	2.241E-1	2.003E-1	1.653E-1
Average-3s (ON)	---	-2.241E-1	-1.271E-1	-1.409E-1
Average (OFF)	---	2.440E-2	4.880E-2	-3.050E-2
s (OFF)	---	9.251E-2	9.048E-2	1.168E-1
Average+3s (OFF)	---	3.019E-1	3.202E-1	3.199E-1
Average-3s (OFF)	---	-2.531E-1	-2.226E-1	-3.809E-1

4. Erase Icc

Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V



Erase Icc . (mA) **Max = 35.0**

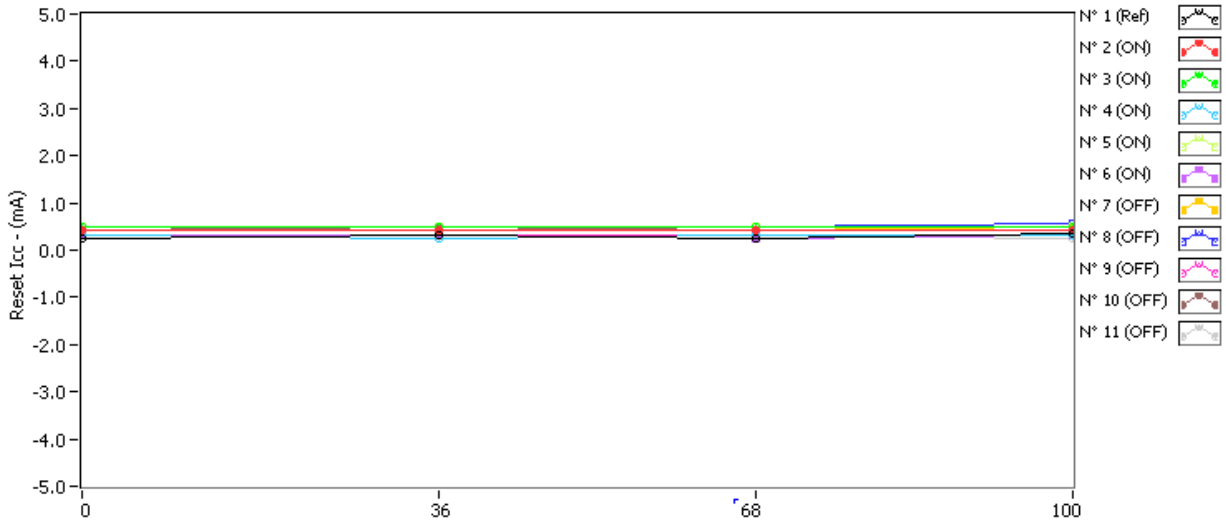
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	12.94	12.88	12.94	13.06
N° 2 (ON)	12.82	13.92	16.72	23.38
N° 3 (ON)	13.24	14.46	17.15	23.32
N° 4 (ON)	12.88	13.67	16.30	23.25
N° 5 (ON)	13.49	14.22	16.05	21.36
N° 6 (ON)	12.88	13.55	15.38	19.16
N° 7 (OFF)	13.43	14.53	16.17	17.39
N° 8 (OFF)	13.06	14.04	15.44	16.66
N° 9 (OFF)	13.49	14.40	16.05	Not Measurable
N° 10 (OFF)	13.31	14.16	15.99	17.27
N° 11 (OFF)	13.24	13.67	14.40	15.26

Delta [Erase Icc]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-6.100E-2	0.000E+0	1.230E-1
N° 2 (ON)	---	1.099E+0	3.907E+0	1.056E+1
N° 3 (ON)	---	1.220E+0	3.906E+0	1.007E+1
N° 4 (ON)	---	7.940E-1	3.418E+0	1.038E+1
N° 5 (ON)	---	7.320E-1	2.563E+0	7.873E+0
N° 6 (ON)	---	6.720E-1	2.503E+0	6.287E+0
N° 7 (OFF)	---	1.098E+0	2.746E+0	3.967E+0
N° 8 (OFF)	---	9.760E-1	2.380E+0	3.601E+0
N° 9 (OFF)	---	9.150E-1	2.563E+0	NaN
N° 10 (OFF)	---	8.540E-1	2.685E+0	3.967E+0
N° 11 (OFF)	---	4.270E-1	1.159E+0	2.014E+0
Average (ON)	---	9.034E-1	3.259E+0	9.033E+0
s (ON)	---	2.416E-1	6.928E-1	1.877E+0
Average+3s (ON)	---	1.628E+0	5.338E+0	1.466E+1
Average-3s (ON)	---	1.787E-1	1.181E+0	3.402E+0
Average (OFF)	---	8.540E-1	2.307E+0	3.387E+0
s (OFF)	---	2.552E-1	6.566E-1	9.316E-1
Average+3s (OFF)	---	1.620E+0	4.276E+0	6.182E+0
Average-3s (OFF)	---	8.846E-2	3.369E-1	5.924E-1

5. Reset Icc

Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V



Reset Icc . (mA)

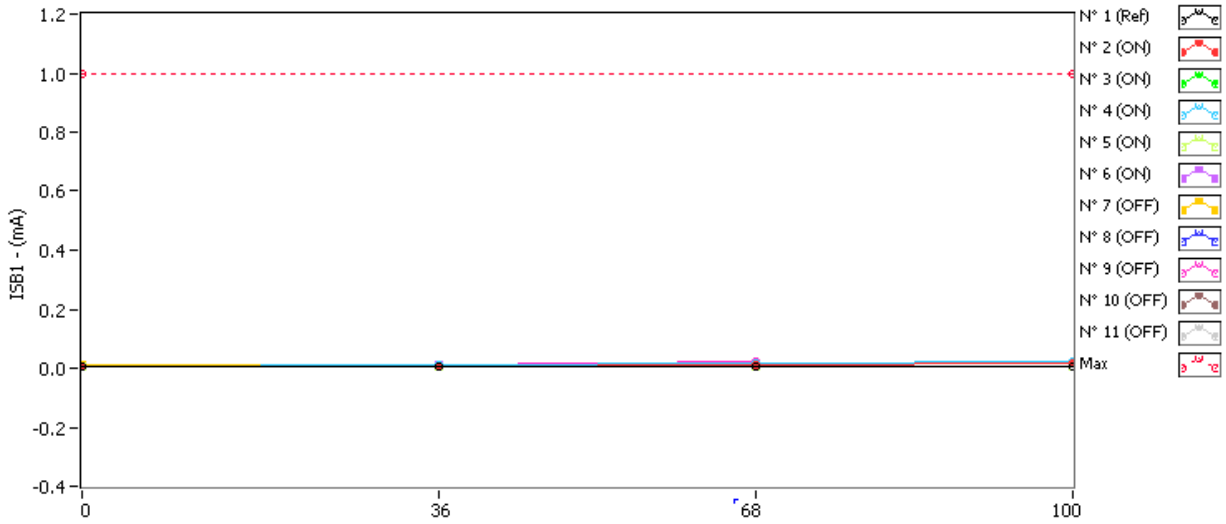
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.244	0.305	0.244	0.366
N° 2 (ON)	0.427	0.427	0.427	0.427
N° 3 (ON)	0.488	0.488	0.488	0.488
N° 4 (ON)	0.305	0.244	0.305	0.305
N° 5 (ON)	0.488	0.488	0.488	0.488
N° 6 (ON)	0.305	0.305	0.244	0.305
N° 7 (OFF)	0.427	0.427	0.427	0.488
N° 8 (OFF)	0.488	0.488	0.488	0.549
N° 9 (OFF)	0.305	0.305	0.305	Not Measurable
N° 10 (OFF)	0.427	0.488	0.427	0.427
N° 11 (OFF)	0.305	0.244	0.305	0.244

Delta [Reset Icc]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	6.104E-2	0.000E+0	1.221E-1
N° 2 (ON)	---	0.000E+0	0.000E+0	0.000E+0
N° 3 (ON)	---	0.000E+0	0.000E+0	0.000E+0
N° 4 (ON)	---	-6.104E-2	0.000E+0	0.000E+0
N° 5 (ON)	---	0.000E+0	0.000E+0	0.000E+0
N° 6 (ON)	---	0.000E+0	-6.104E-2	0.000E+0
N° 7 (OFF)	---	0.000E+0	0.000E+0	6.103E-2
N° 8 (OFF)	---	0.000E+0	0.000E+0	6.104E-2
N° 9 (OFF)	---	0.000E+0	0.000E+0	NaN
N° 10 (OFF)	---	6.103E-2	0.000E+0	0.000E+0
N° 11 (OFF)	---	-6.104E-2	0.000E+0	-6.104E-2
Average (ON)	---	-1.221E-2	-1.221E-2	0.000E+0
s (ON)	---	2.730E-2	2.730E-2	0.000E+0
Average+3s (ON)	---	6.969E-2	6.969E-2	0.000E+0
Average-3s (ON)	---	-9.410E-2	-9.410E-2	0.000E+0
Average (OFF)	---	-2.000E-6	0.000E+0	1.526E-2
s (OFF)	---	4.316E-2	0.000E+0	5.844E-2
Average+3s (OFF)	---	1.295E-1	0.000E+0	1.906E-1
Average-3s (OFF)	---	-1.295E-1	0.000E+0	-1.601E-1

6. ISB1

Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V, CE# = Vih



ISB1 . (mA) **Max = 1.0**

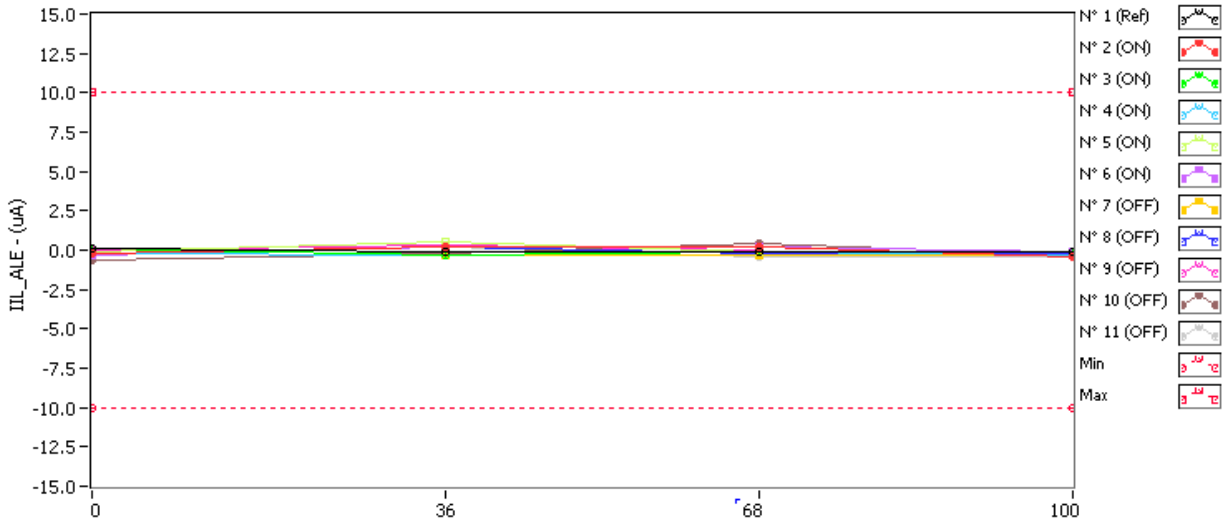
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	7.629E-3	7.629E-3	7.629E-3	7.629E-3
N° 2 (ON)	6.104E-3	7.629E-3	9.155E-3	1.526E-2
N° 3 (ON)	7.629E-3	7.629E-3	1.373E-2	1.831E-2
N° 4 (ON)	7.629E-3	1.221E-2	1.679E-2	1.984E-2
N° 5 (ON)	7.629E-3	7.629E-3	7.629E-3	7.629E-3
N° 6 (ON)	7.629E-3	9.155E-3	1.373E-2	1.679E-2
N° 7 (OFF)	9.155E-3	9.155E-3	1.221E-2	1.679E-2
N° 8 (OFF)	7.629E-3	7.629E-3	1.221E-2	1.526E-2
N° 9 (OFF)	7.629E-3	1.373E-2	1.984E-2	Not Measurable
N° 10 (OFF)	7.629E-3	7.629E-3	1.221E-2	1.526E-2
N° 11 (OFF)	9.155E-3	9.155E-3	1.526E-2	1.679E-2

Delta [ISB1]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	0.000E+0	0.000E+0	0.000E+0
N° 2 (ON)	---	1.526E-3	3.052E-3	9.156E-3
N° 3 (ON)	---	0.000E+0	6.104E-3	1.068E-2
N° 4 (ON)	---	4.578E-3	9.156E-3	1.221E-2
N° 5 (ON)	---	0.000E+0	0.000E+0	0.000E+0
N° 6 (ON)	---	1.526E-3	6.104E-3	9.156E-3
N° 7 (OFF)	---	0.000E+0	3.052E-3	7.630E-3
N° 8 (OFF)	---	0.000E+0	4.578E-3	7.630E-3
N° 9 (OFF)	---	6.104E-3	1.221E-2	NaN
N° 10 (OFF)	---	0.000E+0	4.578E-3	7.630E-3
N° 11 (OFF)	---	0.000E+0	6.104E-3	7.630E-3
Average (ON)	---	1.526E-3	4.883E-3	8.240E-3
s (ON)	---	1.869E-3	3.480E-3	4.777E-3
Average+3s (ON)	---	7.132E-3	1.532E-2	2.257E-2
Average-3s (ON)	---	-4.081E-3	-5.556E-3	-6.090E-3
Average (OFF)	---	1.221E-3	6.103E-3	7.630E-3
s (OFF)	---	2.730E-3	3.578E-3	5.774E-8
Average+3s (OFF)	---	9.410E-3	1.684E-2	7.630E-3
Average-3s (OFF)	---	-6.968E-3	-4.632E-3	7.629E-3

7. IIL_ALE

Ta = 25°C, Vcc = 3.3V, Vin = 0V



IIL_ALE . (uA) **Min = -10.0 Max = 10.0**

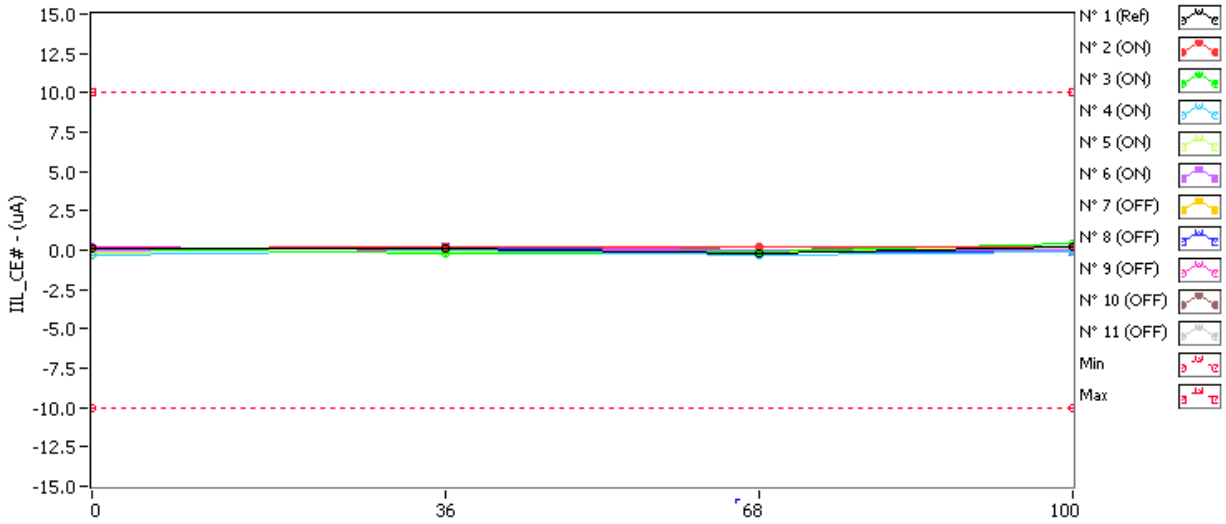
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.094	-0.135	-0.135	-0.059
N° 2 (ON)	-0.212	0.246	0.246	-0.440
N° 3 (ON)	0.094	-0.288	-0.059	-0.059
N° 4 (ON)	-0.212	-0.288	-0.135	-0.288
N° 5 (ON)	-0.059	0.551	-0.135	-0.364
N° 6 (ON)	-0.288	0.170	0.246	-0.135
N° 7 (OFF)	-0.212	-0.288	-0.288	-0.364
N° 8 (OFF)	-0.288	0.170	-0.212	-0.212
N° 9 (OFF)	0.017	0.323	0.017	Not Measurable
N° 10 (OFF)	-0.669	-0.212	0.399	-0.288
N° 11 (OFF)	-0.288	0.246	-0.440	-0.440

Delta [IIL_ALE]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-2.289E-1	-2.289E-1	-1.526E-1
N° 2 (ON)	---	4.578E-1	4.578E-1	-2.289E-1
N° 3 (ON)	---	-3.815E-1	-1.526E-1	-1.526E-1
N° 4 (ON)	---	-7.629E-2	7.630E-2	-7.629E-2
N° 5 (ON)	---	6.104E-1	-7.629E-2	-3.052E-1
N° 6 (ON)	---	4.578E-1	5.341E-1	1.526E-1
N° 7 (OFF)	---	-7.629E-2	-7.629E-2	-1.526E-1
N° 8 (OFF)	---	4.578E-1	7.629E-2	7.629E-2
N° 9 (OFF)	---	3.052E-1	0.000E+0	NaN
N° 10 (OFF)	---	4.578E-1	1.068E+0	3.815E-1
N° 11 (OFF)	---	5.341E-1	-1.526E-1	-1.526E-1
Average (ON)	---	2.136E-1	1.679E-1	-1.221E-1
s (ON)	---	4.227E-1	3.118E-1	1.756E-1
Average+3s (ON)	---	1.482E+0	1.103E+0	4.049E-1
Average-3s (ON)	---	-1.055E+0	-7.675E-1	-6.490E-1
Average (OFF)	---	3.357E-1	1.831E-1	3.814E-2
s (OFF)	---	2.449E-1	5.020E-1	2.530E-1
Average+3s (OFF)	---	1.070E+0	1.689E+0	7.973E-1
Average-3s (OFF)	---	-3.989E-1	-1.323E+0	-7.210E-1

8. IIL_CE#

Ta = 25°C, Vcc = 3.3V, Vin = 0V



IIL_CE# . (uA) **Min = -10.0 Max = 10.0**

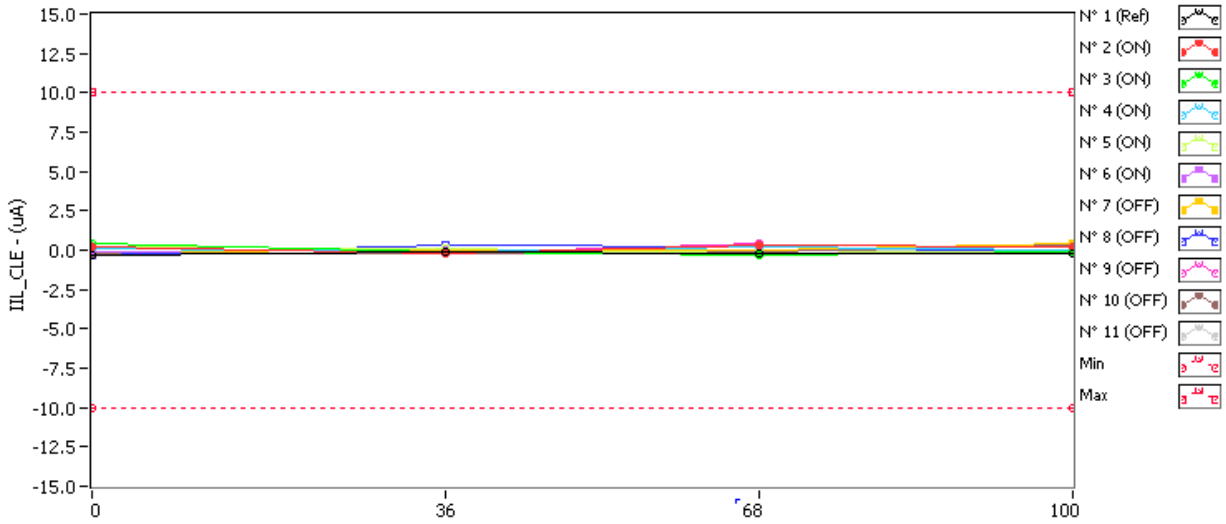
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.123	0.094	-0.212	0.170
N° 2 (ON)	0.094	0.170	0.170	0.170
N° 3 (ON)	0.094	-0.212	-0.135	0.399
N° 4 (ON)	-0.288	0.017	-0.288	-0.059
N° 5 (ON)	-0.212	-0.059	-0.059	0.170
N° 6 (ON)	0.017	-0.059	0.017	0.017
N° 7 (OFF)	0.017	-0.135	-0.059	0.246
N° 8 (OFF)	0.094	0.246	-0.059	-0.135
N° 9 (OFF)	0.170	0.017	0.246	Not Measurable
N° 10 (OFF)	0.094	-0.212	0.170	-0.059
N° 11 (OFF)	-0.059	0.170	0.246	0.094

Delta [IIL_CE#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-2.900E-2	-3.350E-1	4.700E-2
N° 2 (ON)	---	7.600E-2	7.600E-2	7.600E-2
N° 3 (ON)	---	-3.060E-1	-2.290E-1	3.050E-1
N° 4 (ON)	---	3.050E-1	0.000E+0	2.290E-1
N° 5 (ON)	---	1.530E-1	1.530E-1	3.820E-1
N° 6 (ON)	---	-7.600E-2	0.000E+0	0.000E+0
N° 7 (OFF)	---	-1.520E-1	-7.600E-2	2.290E-1
N° 8 (OFF)	---	1.520E-1	-1.530E-1	-2.290E-1
N° 9 (OFF)	---	-1.530E-1	7.600E-2	NaN
N° 10 (OFF)	---	-3.060E-1	7.600E-2	-1.530E-1
N° 11 (OFF)	---	2.290E-1	3.050E-1	1.530E-1
Average (ON)	---	3.040E-2	0.000E+0	1.984E-1
s (ON)	---	2.329E-1	1.429E-1	1.584E-1
Average+3s (ON)	---	7.292E-1	4.286E-1	6.736E-1
Average-3s (ON)	---	-6.684E-1	-4.286E-1	-2.768E-1
Average (OFF)	---	-4.600E-2	4.560E-2	-6.939E-18
s (OFF)	---	2.264E-1	1.756E-1	2.249E-1
Average+3s (OFF)	---	6.333E-1	5.725E-1	6.746E-1
Average-3s (OFF)	---	-7.253E-1	-4.813E-1	-6.746E-1

9. IIL_CLE

Ta = 25°C, Vcc = 3.3V, Vin = 0V



IIL_CLE . (uA) **Min = -10.0 Max = 10.0**

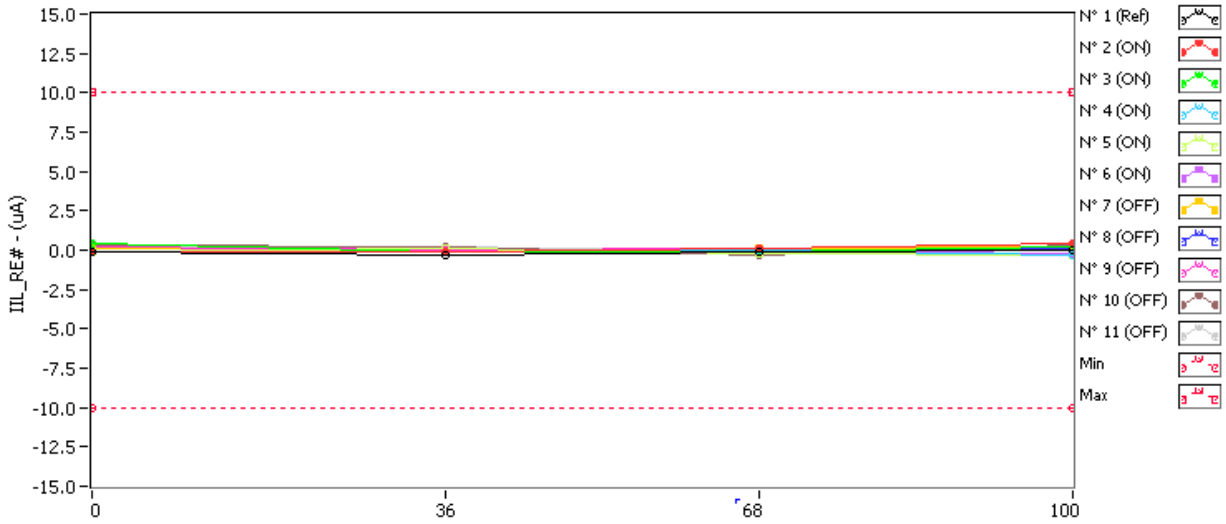
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	-0.364	-0.059	-0.212	-0.212
N° 2 (ON)	0.170	-0.212	0.323	0.170
N° 3 (ON)	0.475	-0.059	-0.288	-0.135
N° 4 (ON)	0.094	-0.059	0.170	0.017
N° 5 (ON)	0.170	0.094	-0.212	0.017
N° 6 (ON)	-0.059	0.094	-0.212	-0.059
N° 7 (OFF)	-0.135	0.017	0.017	0.475
N° 8 (OFF)	-0.288	0.323	0.246	-0.135
N° 9 (OFF)	0.246	-0.212	0.399	Not Measurable
N° 10 (OFF)	-0.212	-0.212	-0.059	0.323
N° 11 (OFF)	0.399	-0.059	0.017	-0.059

Delta [IIL_CLE]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	3.052E-1	1.526E-1	1.526E-1
N° 2 (ON)	---	-3.815E-1	1.526E-1	0.000E+0
N° 3 (ON)	---	-5.341E-1	-7.629E-1	-6.104E-1
N° 4 (ON)	---	-1.526E-1	7.629E-2	-7.629E-2
N° 5 (ON)	---	-7.629E-2	-3.815E-1	-1.526E-1
N° 6 (ON)	---	1.526E-1	-1.526E-1	0.000E+0
N° 7 (OFF)	---	1.526E-1	1.526E-1	6.104E-1
N° 8 (OFF)	---	6.103E-1	5.341E-1	1.526E-1
N° 9 (OFF)	---	-4.578E-1	1.526E-1	NaN
N° 10 (OFF)	---	0.000E+0	1.526E-1	5.341E-1
N° 11 (OFF)	---	-4.578E-1	-3.815E-1	-4.578E-1
Average (ON)	---	-1.984E-1	-2.136E-1	-1.678E-1
s (ON)	---	2.676E-1	3.714E-1	2.553E-1
Average+3s (ON)	---	6.044E-1	9.006E-1	5.981E-1
Average-3s (ON)	---	-1.001E+0	-1.328E+0	-9.338E-1
Average (OFF)	---	-3.052E-2	1.221E-1	2.098E-1
s (OFF)	---	4.501E-1	3.264E-1	4.880E-1
Average+3s (OFF)	---	1.320E+0	1.101E+0	1.674E+0
Average-3s (OFF)	---	-1.381E+0	-8.570E-1	-1.254E+0

10. IIL_RE#

Ta = 25°C, Vcc = 3.3V, Vin = 0V



IIL_RE# . (uA) **Min = -10.0 Max = 10.0**

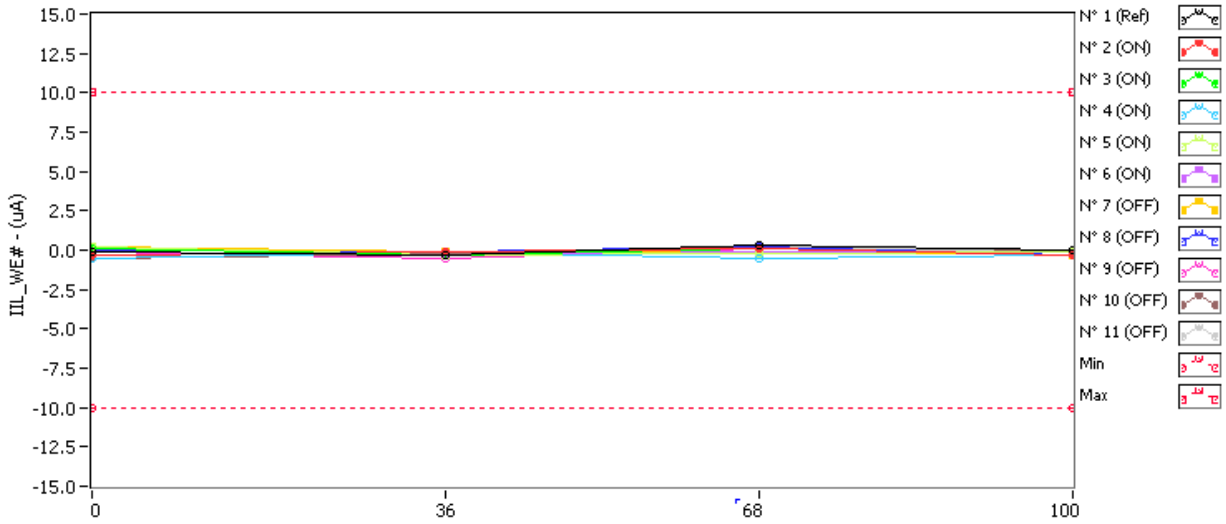
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	-0.135	-0.288	-0.059	0.017
N° 2 (ON)	-0.059	-0.135	0.094	0.399
N° 3 (ON)	0.475	-0.059	-0.059	0.170
N° 4 (ON)	-0.059	-0.135	0.017	-0.288
N° 5 (ON)	-0.135	0.094	-0.212	-0.288
N° 6 (ON)	-0.135	-0.135	0.017	-0.212
N° 7 (OFF)	0.094	-0.059	0.094	0.170
N° 8 (OFF)	-0.135	-0.059	-0.059	0.094
N° 9 (OFF)	0.170	0.017	0.094	Not Measurable
N° 10 (OFF)	0.323	0.170	-0.364	0.323
N° 11 (OFF)	0.170	0.246	-0.059	-0.364

Delta [IIL_RE#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-1.526E-1	7.629E-2	1.526E-1
N° 2 (ON)	---	-7.629E-2	1.526E-1	4.578E-1
N° 3 (ON)	---	-5.341E-1	-5.341E-1	-3.052E-1
N° 4 (ON)	---	-7.629E-2	7.629E-2	-2.289E-1
N° 5 (ON)	---	2.289E-1	-7.630E-2	-1.526E-1
N° 6 (ON)	---	0.000E+0	1.526E-1	-7.630E-2
N° 7 (OFF)	---	-1.526E-1	0.000E+0	7.629E-2
N° 8 (OFF)	---	7.629E-2	7.629E-2	2.289E-1
N° 9 (OFF)	---	-1.526E-1	-7.629E-2	NaN
N° 10 (OFF)	---	-1.526E-1	-6.866E-1	0.000E+0
N° 11 (OFF)	---	7.630E-2	-2.289E-1	-5.341E-1
Average (ON)	---	-9.155E-2	-4.578E-2	-6.104E-2
s (ON)	---	2.772E-1	2.885E-1	3.023E-1
Average+3s (ON)	---	7.400E-1	8.197E-1	8.459E-1
Average-3s (ON)	---	-9.231E-1	-9.113E-1	-9.679E-1
Average (OFF)	---	-6.103E-2	-1.831E-1	-5.722E-2
s (OFF)	---	1.254E-1	3.033E-1	3.318E-1
Average+3s (OFF)	---	3.151E-1	7.267E-1	9.383E-1
Average-3s (OFF)	---	-4.371E-1	-1.093E+0	-1.053E+0

11. IIL_WE#

Ta = 25°C, Vcc = 3.3V, Vin = 0V



IIL_WE# . (uA) **Min = -10.0 Max = 10.0**

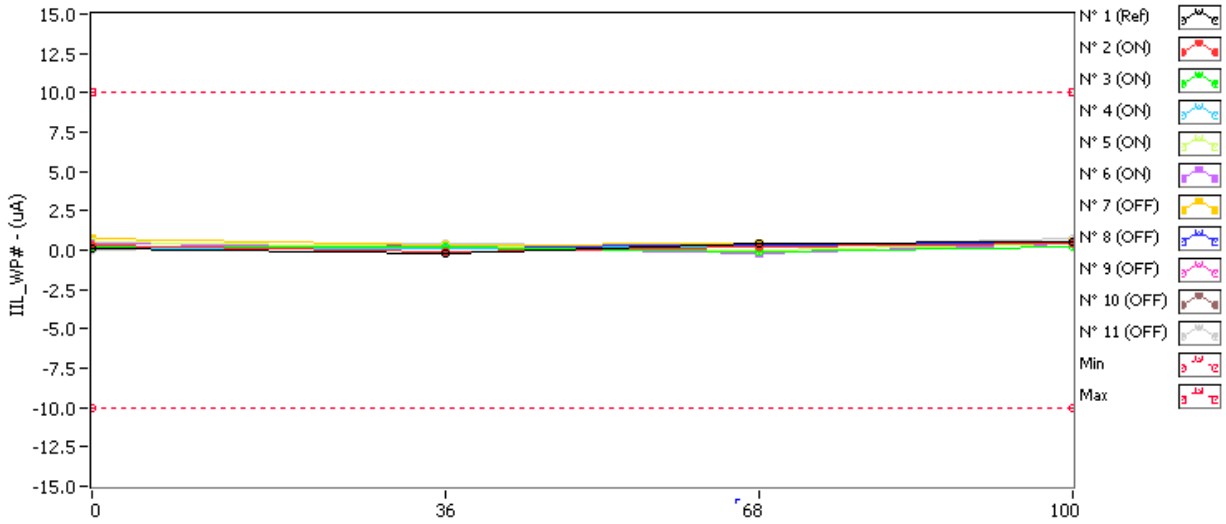
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	-0.059	-0.364	0.323	0.017
N° 2 (ON)	-0.288	-0.135	0.094	-0.288
N° 3 (ON)	0.094	-0.364	0.094	-0.288
N° 4 (ON)	-0.517	-0.059	-0.560	-0.364
N° 5 (ON)	0.246	-0.364	-0.212	-0.135
N° 6 (ON)	0.094	-0.288	-0.059	-0.059
N° 7 (OFF)	0.170	-0.059	-0.059	-0.288
N° 8 (OFF)	0.017	-0.135	0.170	-0.364
N° 9 (OFF)	-0.135	-0.517	0.094	Not Measurable
N° 10 (OFF)	-0.517	-0.212	-0.212	0.017
N° 11 (OFF)	0.017	-0.135	0.246	-0.135

Delta [IIL_WE#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-3.050E-1	3.820E-1	7.600E-2
N° 2 (ON)	---	1.530E-1	3.820E-1	0.000E+0
N° 3 (ON)	---	-4.580E-1	0.000E+0	-3.820E-1
N° 4 (ON)	---	4.580E-1	-4.300E-2	1.530E-1
N° 5 (ON)	---	-6.100E-1	-4.580E-1	-3.810E-1
N° 6 (ON)	---	-3.820E-1	-1.530E-1	-1.530E-1
N° 7 (OFF)	---	-2.290E-1	-2.290E-1	-4.580E-1
N° 8 (OFF)	---	-1.520E-1	1.530E-1	-3.810E-1
N° 9 (OFF)	---	-3.820E-1	2.290E-1	NaN
N° 10 (OFF)	---	3.050E-1	3.050E-1	5.340E-1
N° 11 (OFF)	---	-1.520E-1	2.290E-1	-1.520E-1
Average (ON)	---	-1.678E-1	-5.440E-2	-1.526E-1
s (ON)	---	4.528E-1	3.026E-1	2.353E-1
Average+3s (ON)	---	1.191E+0	8.533E-1	5.533E-1
Average-3s (ON)	---	-1.526E+0	-9.621E-1	-8.585E-1
Average (OFF)	---	-1.220E-1	1.374E-1	-1.142E-1
s (OFF)	---	2.565E-1	2.118E-1	4.513E-1
Average+3s (OFF)	---	6.475E-1	7.727E-1	1.240E+0
Average-3s (OFF)	---	-8.915E-1	-4.979E-1	-1.468E+0

12. IIL_WP#

Ta = 25°C, Vcc = 3.3V, Vin = 0V



IIL_WP# . (uA) **Min = -10.0 Max = 10.0**

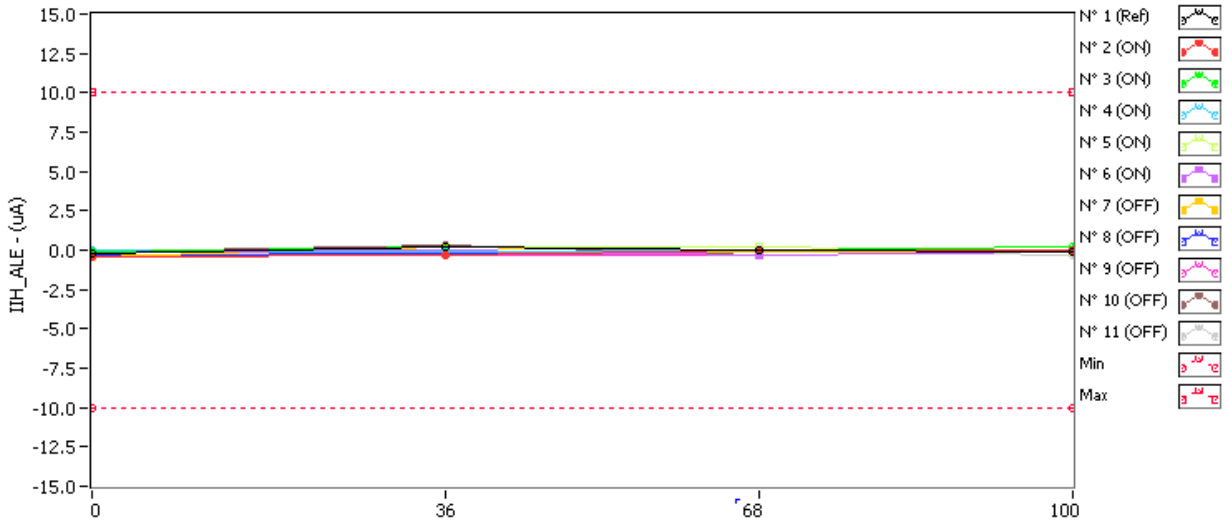
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.094	-0.212	0.399	0.551
N° 2 (ON)	0.323	-0.135	0.170	0.475
N° 3 (ON)	0.170	0.170	-0.059	0.246
N° 4 (ON)	0.094	0.094	0.246	0.399
N° 5 (ON)	0.551	0.246	0.017	0.475
N° 6 (ON)	0.399	0.170	-0.212	0.399
N° 7 (OFF)	0.704	0.323	0.475	0.551
N° 8 (OFF)	0.170	0.246	0.323	0.475
N° 9 (OFF)	0.094	0.246	-0.135	Not Measurable
N° 10 (OFF)	0.246	0.323	0.399	0.399
N° 11 (OFF)	0.017	0.399	0.170	0.704

Delta [IIL_WP#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-3.052E-1	3.052E-1	4.578E-1
N° 2 (ON)	---	-4.578E-1	-1.526E-1	1.526E-1
N° 3 (ON)	---	0.000E+0	-2.289E-1	7.630E-2
N° 4 (ON)	---	0.000E+0	1.526E-1	3.052E-1
N° 5 (ON)	---	-3.052E-1	-5.341E-1	-7.629E-2
N° 6 (ON)	---	-2.289E-1	-6.103E-1	0.000E+0
N° 7 (OFF)	---	-3.815E-1	-2.289E-1	-1.526E-1
N° 8 (OFF)	---	7.630E-2	1.526E-1	3.052E-1
N° 9 (OFF)	---	1.526E-1	-2.289E-1	NaN
N° 10 (OFF)	---	7.629E-2	1.526E-1	1.526E-1
N° 11 (OFF)	---	3.815E-1	1.526E-1	6.866E-1
Average (ON)	---	-1.984E-1	-2.747E-1	9.155E-2
s (ON)	---	1.989E-1	3.080E-1	1.468E-1
Average+3s (ON)	---	3.985E-1	6.494E-1	5.318E-1
Average-3s (ON)	---	-7.952E-1	-1.199E+0	-3.487E-1
Average (OFF)	---	6.104E-2	-4.000E-7	2.480E-1
s (OFF)	---	2.772E-1	2.089E-1	3.489E-1
Average+3s (OFF)	---	8.926E-1	6.268E-1	1.295E+0
Average-3s (OFF)	---	-7.705E-1	-6.268E-1	-7.988E-1

13. IIH_ALE

Ta = 25°C, Vcc = 3.3V, Vin = Vcc



IIH_ALE . (uA) **Min = -10.0 Max = 10.0**

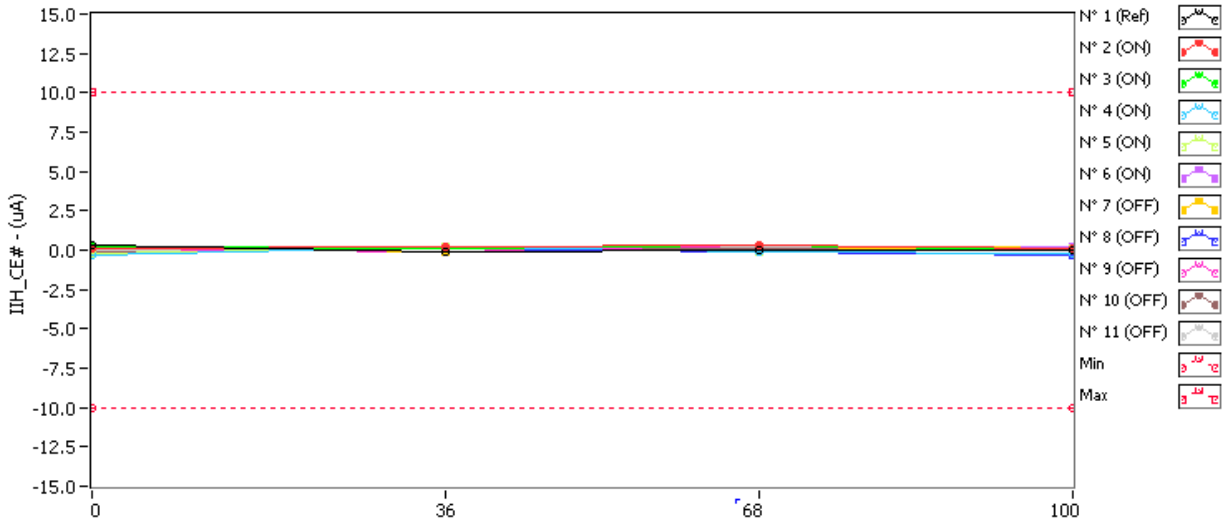
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	-0.212	0.246	0.017	-0.135
N° 2 (ON)	-0.440	-0.288	0.017	0.017
N° 3 (ON)	-0.059	0.246	0.017	0.170
N° 4 (ON)	0.017	-0.135	0.017	-0.059
N° 5 (ON)	-0.212	0.246	0.170	-0.059
N° 6 (ON)	-0.059	0.017	-0.288	-0.135
N° 7 (OFF)	-0.440	0.246	-0.059	-0.135
N° 8 (OFF)	-0.364	-0.212	-0.135	-0.059
N° 9 (OFF)	0.017	-0.288	-0.364	Not Measurable
N° 10 (OFF)	-0.059	0.323	-0.288	-0.059
N° 11 (OFF)	-0.288	-0.135	0.017	-0.288

Delta [IIH_ALE]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	4.578E-1	2.289E-1	7.630E-2
N° 2 (ON)	---	1.526E-1	4.578E-1	4.578E-1
N° 3 (ON)	---	3.052E-1	7.629E-2	2.289E-1
N° 4 (ON)	---	-1.526E-1	0.000E+0	-7.629E-2
N° 5 (ON)	---	4.578E-1	3.815E-1	1.526E-1
N° 6 (ON)	---	7.629E-2	-2.289E-1	-7.629E-2
N° 7 (OFF)	---	6.866E-1	3.815E-1	3.052E-1
N° 8 (OFF)	---	1.526E-1	2.289E-1	3.052E-1
N° 9 (OFF)	---	-3.052E-1	-3.815E-1	NaN
N° 10 (OFF)	---	3.815E-1	-2.289E-1	0.000E+0
N° 11 (OFF)	---	1.526E-1	3.052E-1	0.000E+0
Average (ON)	---	1.678E-1	1.373E-1	1.373E-1
s (ON)	---	2.314E-1	2.824E-1	2.250E-1
Average+3s (ON)	---	8.621E-1	9.845E-1	8.124E-1
Average-3s (ON)	---	-5.264E-1	-7.098E-1	-5.378E-1
Average (OFF)	---	2.136E-1	6.104E-2	1.526E-1
s (OFF)	---	3.635E-1	3.429E-1	1.762E-1
Average+3s (OFF)	---	1.304E+0	1.090E+0	6.812E-1
Average-3s (OFF)	---	-8.769E-1	-9.677E-1	-3.760E-1

14. IIH_CE#

Ta = 25°C, Vcc = 3.3V, Vin = Vcc



IIH_CE# . (uA) **Min = -10.0 Max = 10.0**

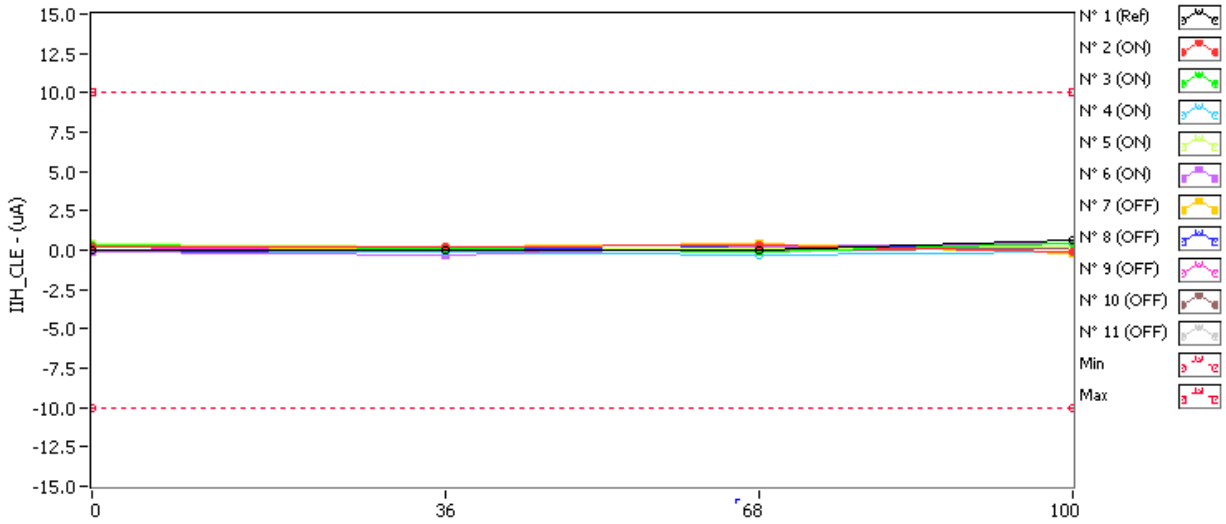
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.323	-0.059	0.017	0.017
N° 2 (ON)	0.094	0.170	0.323	0.094
N° 3 (ON)	0.170	0.094	0.323	0.017
N° 4 (ON)	-0.364	0.170	-0.135	-0.212
N° 5 (ON)	-0.212	0.170	-0.059	0.094
N° 6 (ON)	0.170	0.170	-0.059	0.246
N° 7 (OFF)	0.170	-0.135	0.017	0.246
N° 8 (OFF)	0.246	0.094	-0.059	-0.364
N° 9 (OFF)	0.094	-0.059	0.323	Not Measurable
N° 10 (OFF)	-0.059	0.094	0.094	0.170
N° 11 (OFF)	0.017	0.170	0.170	0.170

Delta [IIH_CE#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-3.815E-1	-3.052E-1	-3.052E-1
N° 2 (ON)	---	7.629E-2	2.289E-1	0.000E+0
N° 3 (ON)	---	-7.629E-2	1.526E-1	-1.526E-1
N° 4 (ON)	---	5.341E-1	2.289E-1	1.526E-1
N° 5 (ON)	---	3.815E-1	1.526E-1	3.052E-1
N° 6 (ON)	---	0.000E+0	-2.289E-1	7.630E-2
N° 7 (OFF)	---	-3.052E-1	-1.526E-1	7.630E-2
N° 8 (OFF)	---	-1.526E-1	-3.052E-1	-6.104E-1
N° 9 (OFF)	---	-1.526E-1	2.289E-1	NaN
N° 10 (OFF)	---	1.526E-1	1.526E-1	2.289E-1
N° 11 (OFF)	---	1.526E-1	1.526E-1	1.526E-1
Average (ON)	---	1.831E-1	1.068E-1	7.630E-2
s (ON)	---	2.621E-1	1.915E-1	1.706E-1
Average+3s (ON)	---	9.693E-1	6.813E-1	5.881E-1
Average-3s (ON)	---	-6.031E-1	-4.677E-1	-4.355E-1
Average (OFF)	---	-6.104E-2	1.526E-2	-3.815E-2
s (OFF)	---	2.047E-1	2.314E-1	3.865E-1
Average+3s (OFF)	---	5.531E-1	7.095E-1	1.121E+0
Average-3s (OFF)	---	-6.752E-1	-6.790E-1	-1.198E+0

15. IIH_CLE

Ta = 25°C, Vcc = 3.3V, Vin = Vcc



IIH_CLE . (uA) **Min = -10.0 Max = 10.0**

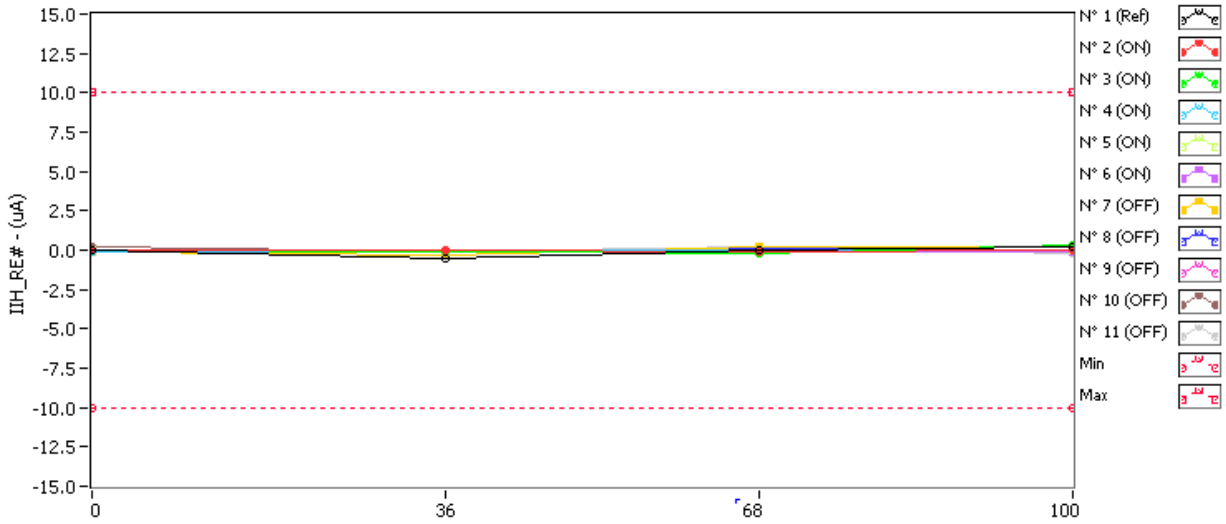
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.017	0.017	0.017	0.628
N° 2 (ON)	0.170	0.170	0.323	-0.059
N° 3 (ON)	0.323	0.094	-0.059	0.399
N° 4 (ON)	0.017	-0.059	-0.364	-0.059
N° 5 (ON)	0.475	0.246	0.094	0.246
N° 6 (ON)	-0.059	-0.288	0.170	0.399
N° 7 (OFF)	-0.135	0.246	0.475	-0.212
N° 8 (OFF)	-0.059	0.017	0.170	0.170
N° 9 (OFF)	0.170	-0.135	0.017	Not Measurable
N° 10 (OFF)	0.323	-0.135	0.017	0.094
N° 11 (OFF)	0.017	0.094	-0.135	0.246

Delta [IIH_CLE]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	0.000E+0	0.000E+0	6.104E-1
N° 2 (ON)	---	0.000E+0	1.526E-1	-2.289E-1
N° 3 (ON)	---	-2.289E-1	-3.815E-1	7.629E-2
N° 4 (ON)	---	-7.629E-2	-3.815E-1	-7.629E-2
N° 5 (ON)	---	-2.289E-1	-3.815E-1	-2.289E-1
N° 6 (ON)	---	-2.289E-1	2.289E-1	4.578E-1
N° 7 (OFF)	---	3.815E-1	6.104E-1	-7.630E-2
N° 8 (OFF)	---	7.629E-2	2.289E-1	2.289E-1
N° 9 (OFF)	---	-3.052E-1	-1.526E-1	NaN
N° 10 (OFF)	---	-4.578E-1	-3.052E-1	-2.289E-1
N° 11 (OFF)	---	7.629E-2	-1.526E-1	2.289E-1
Average (ON)	---	-1.526E-1	-1.526E-1	-8.000E-7
s (ON)	---	1.079E-1	3.146E-1	2.855E-1
Average+3s (ON)	---	1.711E-1	7.911E-1	8.564E-1
Average-3s (ON)	---	-4.763E-1	-1.096E+0	-8.564E-1
Average (OFF)	---	-4.577E-2	4.578E-2	3.815E-2
s (OFF)	---	3.352E-1	3.722E-1	2.289E-1
Average+3s (OFF)	---	9.597E-1	1.162E+0	7.248E-1
Average-3s (OFF)	---	-1.051E+0	-1.071E+0	-6.485E-1

16. IIH_RE#

Ta = 25°C, Vcc = 3.3V, Vin = Vcc



IIH_RE# . (uA) **Min = -10.0 Max = 10.0**

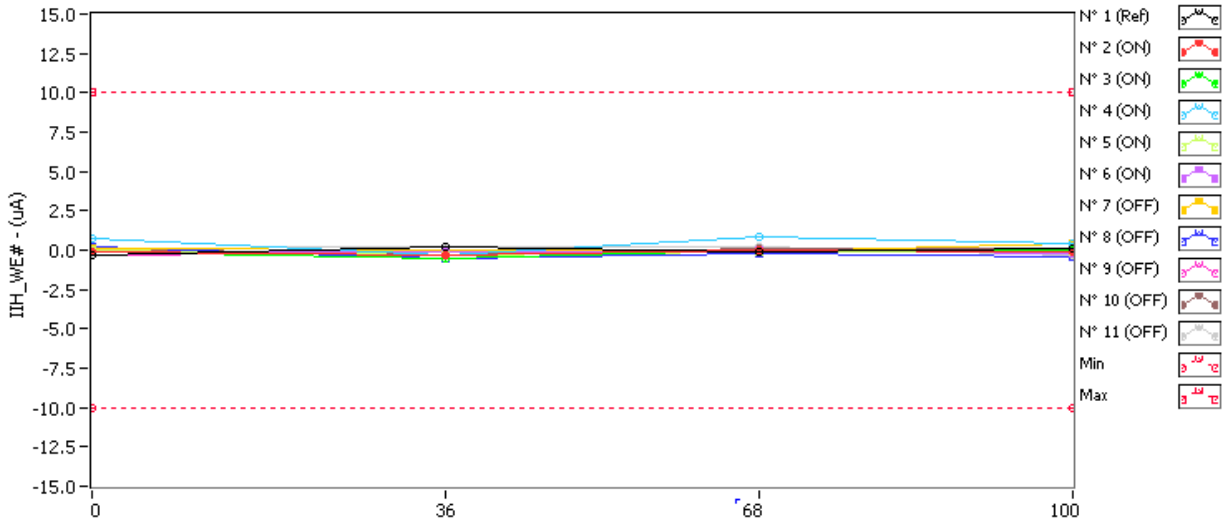
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.017	-0.517	0.017	0.170
N° 2 (ON)	0.017	0.017	-0.135	0.017
N° 3 (ON)	0.017	-0.059	-0.212	0.323
N° 4 (ON)	-0.059	-0.135	0.017	0.017
N° 5 (ON)	0.017	-0.135	0.017	0.017
N° 6 (ON)	0.017	-0.059	0.017	-0.135
N° 7 (OFF)	-0.135	-0.364	0.170	0.170
N° 8 (OFF)	-0.059	-0.135	0.094	0.170
N° 9 (OFF)	-0.059	-0.135	0.094	Not Measurable
N° 10 (OFF)	0.246	-0.059	0.094	0.246
N° 11 (OFF)	0.017	-0.059	0.246	-0.212

Delta [IIH_RE#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-5.341E-1	0.000E+0	1.526E-1
N° 2 (ON)	---	0.000E+0	-1.526E-1	0.000E+0
N° 3 (ON)	---	-7.629E-2	-2.289E-1	3.052E-1
N° 4 (ON)	---	-7.629E-2	7.629E-2	7.629E-2
N° 5 (ON)	---	-1.526E-1	0.000E+0	0.000E+0
N° 6 (ON)	---	-7.629E-2	0.000E+0	-1.526E-1
N° 7 (OFF)	---	-2.289E-1	3.052E-1	3.052E-1
N° 8 (OFF)	---	-7.629E-2	1.526E-1	2.289E-1
N° 9 (OFF)	---	-7.629E-2	1.526E-1	NaN
N° 10 (OFF)	---	-3.052E-1	-1.526E-1	0.000E+0
N° 11 (OFF)	---	-7.629E-2	2.289E-1	-2.289E-1
Average (ON)	---	-7.629E-2	-6.103E-2	4.578E-2
s (ON)	---	5.395E-2	1.254E-1	1.672E-1
Average+3s (ON)	---	8.555E-2	3.151E-1	5.472E-1
Average-3s (ON)	---	-2.381E-1	-4.371E-1	-4.557E-1
Average (OFF)	---	-1.526E-1	1.373E-1	7.629E-2
s (OFF)	---	1.079E-1	1.740E-1	2.413E-1
Average+3s (OFF)	---	1.711E-1	6.593E-1	8.001E-1
Average-3s (OFF)	---	-4.763E-1	-3.846E-1	-6.475E-1

17. IIH_WE#

Ta = 25°C, Vcc = 3.3V, Vin = Vcc



IIH_WE# . (uA) **Min = -10.0 Max = 10.0**

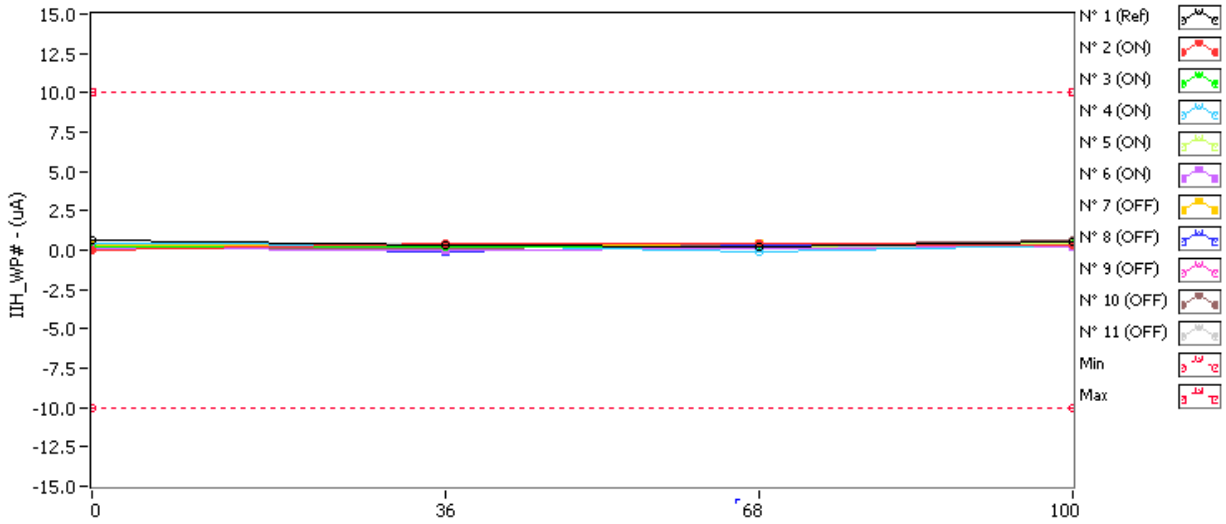
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	-0.288	0.170	-0.059	0.094
N° 2 (ON)	-0.059	-0.288	0.017	-0.059
N° 3 (ON)	-0.059	-0.517	0.017	0.017
N° 4 (ON)	0.780	-0.364	0.808	0.399
N° 5 (ON)	0.017	-0.364	-0.135	-0.135
N° 6 (ON)	-0.059	-0.135	0.017	-0.212
N° 7 (OFF)	0.094	0.017	-0.135	0.399
N° 8 (OFF)	0.170	-0.517	-0.212	-0.440
N° 9 (OFF)	-0.288	-0.059	0.017	Not Measurable
N° 10 (OFF)	0.094	-0.288	0.094	0.094
N° 11 (OFF)	0.094	0.170	0.246	-0.288

Delta [IIH_WE#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	4.580E-1	2.290E-1	3.820E-1
N° 2 (ON)	---	-2.290E-1	7.600E-2	0.000E+0
N° 3 (ON)	---	-4.580E-1	7.600E-2	7.600E-2
N° 4 (ON)	---	-1.144E+0	2.800E-2	-3.810E-1
N° 5 (ON)	---	-3.810E-1	-1.520E-1	-1.520E-1
N° 6 (ON)	---	-7.600E-2	7.600E-2	-1.530E-1
N° 7 (OFF)	---	-7.700E-2	-2.290E-1	3.050E-1
N° 8 (OFF)	---	-6.870E-1	-3.820E-1	-6.100E-1
N° 9 (OFF)	---	2.290E-1	3.050E-1	NaN
N° 10 (OFF)	---	-3.820E-1	0.000E+0	0.000E+0
N° 11 (OFF)	---	7.600E-2	1.520E-1	-3.820E-1
Average (ON)	---	-4.576E-1	2.080E-2	-1.220E-1
s (ON)	---	4.108E-1	9.881E-2	1.754E-1
Average+3s (ON)	---	7.747E-1	3.172E-1	4.041E-1
Average-3s (ON)	---	-1.690E+0	-2.756E-1	-6.481E-1
Average (OFF)	---	-1.682E-1	-3.080E-2	-1.717E-1
s (OFF)	---	3.676E-1	2.783E-1	4.054E-1
Average+3s (OFF)	---	9.347E-1	8.040E-1	1.044E+0
Average-3s (OFF)	---	-1.271E+0	-8.656E-1	-1.388E+0

18. IIH_WP#

Ta = 25°C, Vcc = 3.3V, Vin = Vcc



IIH_WP# . (uA) **Min = -10.0 Max = 10.0**

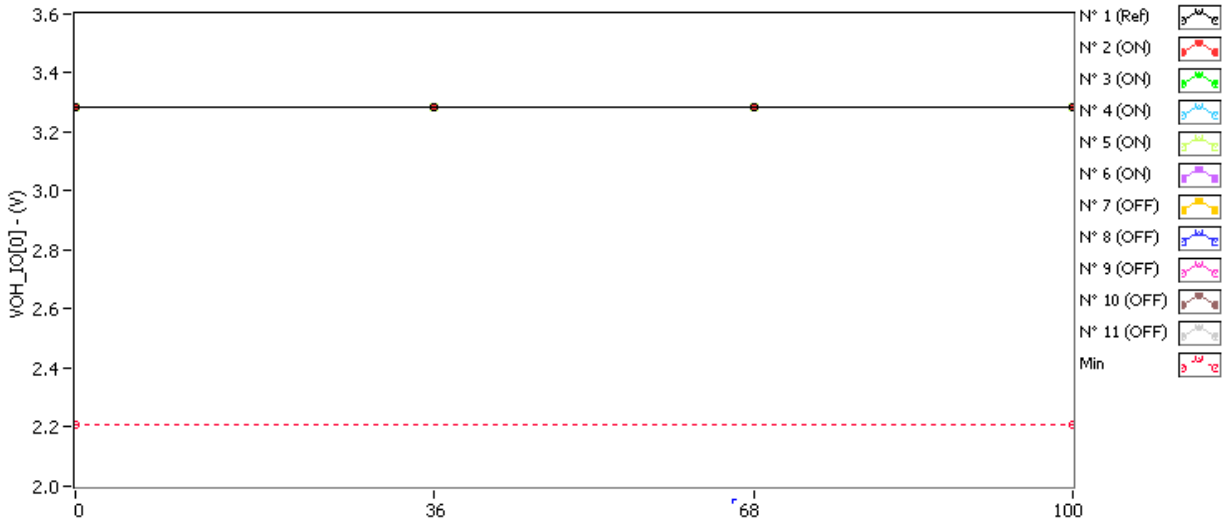
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.628	0.323	0.246	0.551
N° 2 (ON)	0.017	0.399	0.399	0.323
N° 3 (ON)	0.246	0.170	0.246	0.551
N° 4 (ON)	0.475	0.323	-0.059	0.323
N° 5 (ON)	0.246	0.323	0.246	0.399
N° 6 (ON)	0.094	0.017	0.094	0.246
N° 7 (OFF)	0.323	0.170	0.475	0.475
N° 8 (OFF)	0.170	-0.059	0.323	0.475
N° 9 (OFF)	0.399	0.170	0.246	Not Measurable
N° 10 (OFF)	0.246	0.094	0.323	0.628
N° 11 (OFF)	0.323	0.399	0.170	0.246

Delta [IIH_WP#]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-3.052E-1	-3.815E-1	-7.630E-2
N° 2 (ON)	---	3.815E-1	3.815E-1	3.052E-1
N° 3 (ON)	---	-7.630E-2	0.000E+0	3.052E-1
N° 4 (ON)	---	-1.526E-1	-5.341E-1	-1.526E-1
N° 5 (ON)	---	7.629E-2	0.000E+0	1.526E-1
N° 6 (ON)	---	-7.629E-2	0.000E+0	1.526E-1
N° 7 (OFF)	---	-1.526E-1	1.526E-1	1.526E-1
N° 8 (OFF)	---	-2.289E-1	1.526E-1	3.052E-1
N° 9 (OFF)	---	-2.289E-1	-1.526E-1	NaN
N° 10 (OFF)	---	-1.526E-1	7.629E-2	3.815E-1
N° 11 (OFF)	---	7.629E-2	-1.526E-1	-7.629E-2
Average (ON)	---	3.051E-2	-3.052E-2	1.526E-1
s (ON)	---	2.131E-1	3.264E-1	1.869E-1
Average+3s (ON)	---	6.697E-1	9.486E-1	7.132E-1
Average-3s (ON)	---	-6.087E-1	-1.010E+0	-4.081E-1
Average (OFF)	---	-1.373E-1	1.526E-2	1.907E-1
s (OFF)	---	1.254E-1	1.564E-1	2.019E-1
Average+3s (OFF)	---	2.388E-1	4.843E-1	7.963E-1
Average-3s (OFF)	---	-5.134E-1	-4.538E-1	-4.148E-1

19. VOH_IO[0]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[0] . (V) **Min = 2.211**

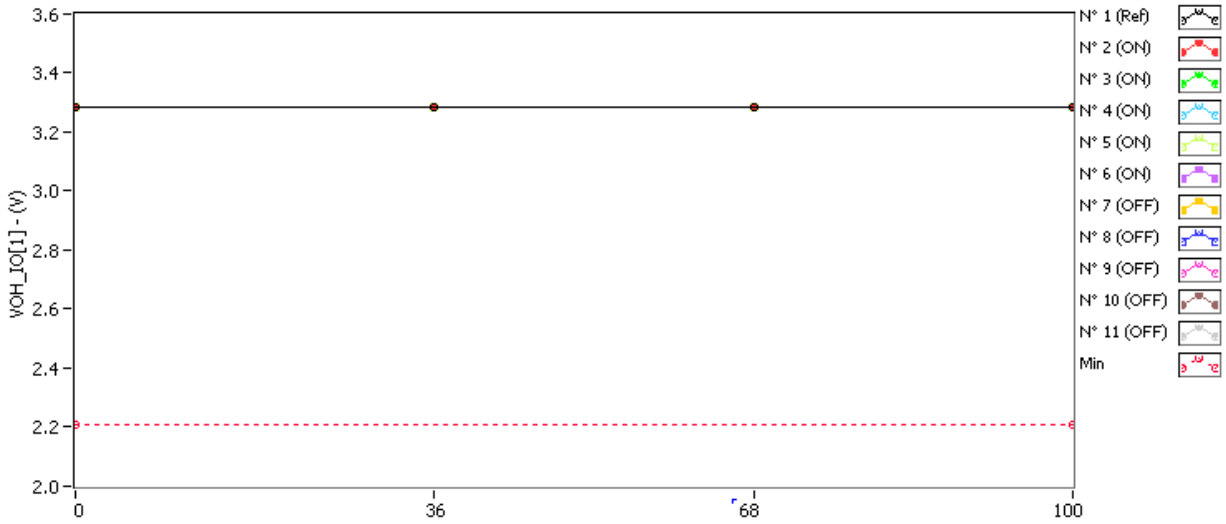
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.284	3.283	3.283	3.284
N° 2 (ON)	3.283	3.283	3.283	3.284
N° 3 (ON)	3.283	3.283	3.284	3.284
N° 4 (ON)	3.283	3.283	3.283	3.283
N° 5 (ON)	3.284	3.284	3.283	3.284
N° 6 (ON)	3.284	3.284	3.284	3.284
N° 7 (OFF)	3.283	3.283	3.283	3.283
N° 8 (OFF)	3.282	3.283	3.283	3.283
N° 9 (OFF)	3.283	3.283	3.284	Not Measurable
N° 10 (OFF)	3.283	3.283	3.283	3.283
N° 11 (OFF)	3.283	3.283	3.284	3.283

Delta [VOH_IO[0]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-1.200E-3	-7.000E-4	3.000E-4
N° 2 (ON)	---	0.000E+0	-4.000E-4	2.000E-4
N° 3 (ON)	---	6.000E-4	1.700E-3	1.400E-3
N° 4 (ON)	---	2.000E-4	6.000E-4	3.000E-4
N° 5 (ON)	---	-3.000E-4	-7.000E-4	2.000E-4
N° 6 (ON)	---	0.000E+0	0.000E+0	7.000E-4
N° 7 (OFF)	---	0.000E+0	3.000E-4	3.000E-4
N° 8 (OFF)	---	7.000E-4	6.000E-4	6.000E-4
N° 9 (OFF)	---	2.000E-4	1.100E-3	NaN
N° 10 (OFF)	---	-6.000E-4	-1.000E-4	-7.000E-4
N° 11 (OFF)	---	3.000E-4	6.000E-4	3.000E-4
Average (ON)	---	1.000E-4	2.400E-4	5.600E-4
s (ON)	---	3.317E-4	9.503E-4	5.128E-4
Average+3s (ON)	---	1.095E-3	3.091E-3	2.099E-3
Average-3s (ON)	---	-8.950E-4	-2.611E-3	-9.785E-4
Average (OFF)	---	1.200E-4	5.000E-4	1.250E-4
s (OFF)	---	4.764E-4	4.416E-4	5.679E-4
Average+3s (OFF)	---	1.549E-3	1.825E-3	1.829E-3
Average-3s (OFF)	---	-1.309E-3	-8.248E-4	-1.579E-3

20. VOH_IO[1]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[1] . (V) **Min = 2.211**

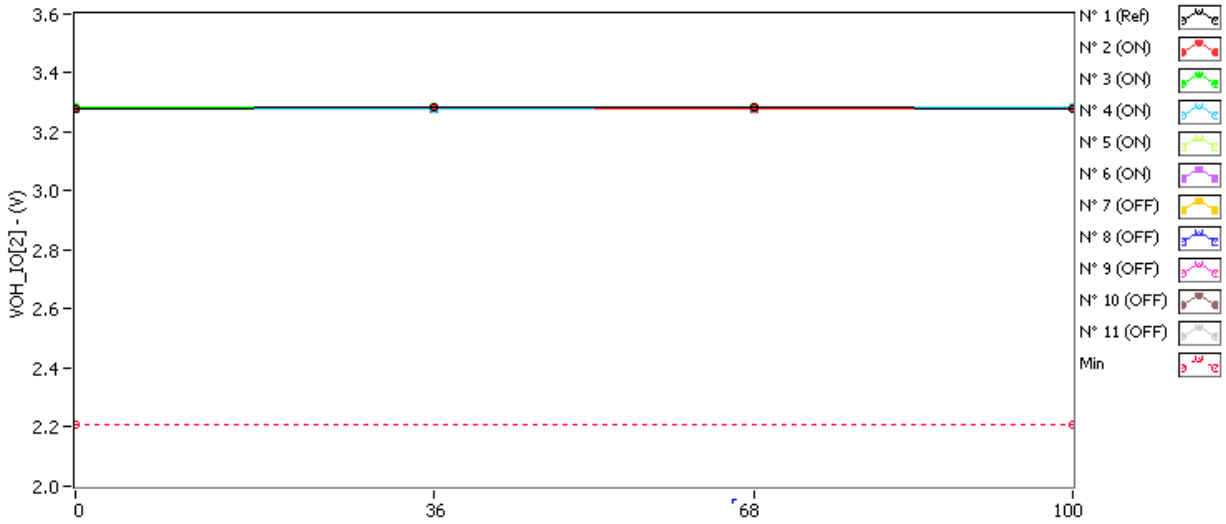
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.285	3.284	3.283	3.283
N° 2 (ON)	3.284	3.283	3.284	3.285
N° 3 (ON)	3.283	3.283	3.284	3.285
N° 4 (ON)	3.283	3.284	3.284	3.282
N° 5 (ON)	3.284	3.284	3.284	3.284
N° 6 (ON)	3.285	3.284	3.285	3.284
N° 7 (OFF)	3.284	3.285	3.284	3.284
N° 8 (OFF)	3.285	3.284	3.284	3.283
N° 9 (OFF)	3.284	3.284	3.283	Not Measurable
N° 10 (OFF)	3.283	3.283	3.284	3.284
N° 11 (OFF)	3.285	3.284	3.283	3.284

Delta [VOH_IO[1]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-9.000E-4	-1.300E-3	-1.200E-3
N° 2 (ON)	---	-1.500E-3	5.000E-4	8.000E-4
N° 3 (ON)	---	-5.000E-4	1.000E-3	1.500E-3
N° 4 (ON)	---	6.000E-4	7.000E-4	-1.400E-3
N° 5 (ON)	---	-5.000E-4	1.000E-4	0.000E+0
N° 6 (ON)	---	-3.000E-4	7.000E-4	-1.000E-3
N° 7 (OFF)	---	9.000E-4	4.000E-4	4.000E-4
N° 8 (OFF)	---	-4.000E-4	-7.000E-4	-1.200E-3
N° 9 (OFF)	---	0.000E+0	-1.000E-3	NaN
N° 10 (OFF)	---	8.000E-4	1.400E-3	1.400E-3
N° 11 (OFF)	---	-3.000E-4	-1.800E-3	-1.000E-4
Average (ON)	---	-4.400E-4	6.000E-4	-2.000E-5
s (ON)	---	7.470E-4	3.317E-4	1.209E-3
Average+3s (ON)	---	1.801E-3	1.595E-3	3.607E-3
Average-3s (ON)	---	-2.681E-3	-3.950E-4	-3.647E-3
Average (OFF)	---	2.000E-4	-3.400E-4	1.250E-4
s (OFF)	---	6.124E-4	1.252E-3	1.081E-3
Average+3s (OFF)	---	2.037E-3	3.417E-3	3.369E-3
Average-3s (OFF)	---	-1.637E-3	-4.097E-3	-3.119E-3

21. VOH_IO[2]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[2] . (V) **Min = 2.211**

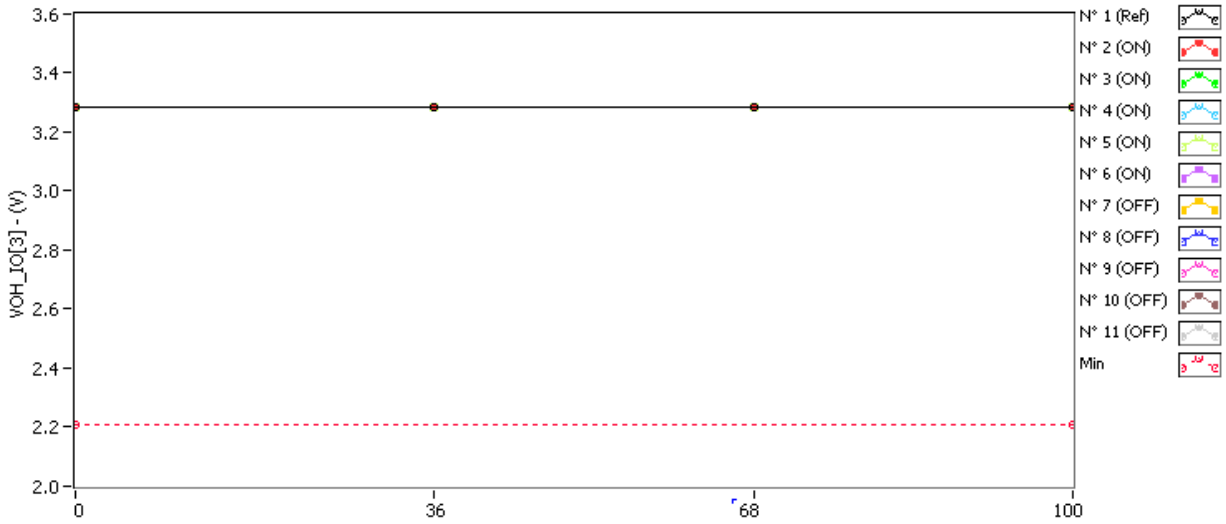
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.281	3.282	3.283	3.281
N° 2 (ON)	3.281	3.283	3.281	3.281
N° 3 (ON)	3.283	3.283	3.282	3.282
N° 4 (ON)	3.282	3.281	3.282	3.283
N° 5 (ON)	3.282	3.284	3.282	3.283
N° 6 (ON)	3.283	3.282	3.282	3.284
N° 7 (OFF)	3.283	3.282	3.282	3.283
N° 8 (OFF)	3.282	3.281	3.281	3.282
N° 9 (OFF)	3.281	3.281	3.282	Not Measurable
N° 10 (OFF)	3.283	3.282	3.281	3.281
N° 11 (OFF)	3.282	3.282	3.283	3.282

Delta [VOH_IO[2]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	3.000E-4	1.100E-3	-1.000E-4
N° 2 (ON)	---	2.100E-3	-2.000E-4	-2.000E-4
N° 3 (ON)	---	0.000E+0	-1.300E-3	-1.700E-3
N° 4 (ON)	---	-2.000E-4	0.000E+0	1.800E-3
N° 5 (ON)	---	1.700E-3	4.000E-4	5.000E-4
N° 6 (ON)	---	-4.000E-4	-6.000E-4	9.000E-4
N° 7 (OFF)	---	-1.400E-3	-1.100E-3	-8.000E-4
N° 8 (OFF)	---	-6.000E-4	-5.000E-4	4.000E-4
N° 9 (OFF)	---	2.000E-4	1.300E-3	NaN
N° 10 (OFF)	---	-1.100E-3	-1.800E-3	-2.000E-3
N° 11 (OFF)	---	5.000E-4	1.600E-3	2.000E-4
Average (ON)	---	6.400E-4	-3.400E-4	2.600E-4
s (ON)	---	1.167E-3	6.465E-4	1.313E-3
Average+3s (ON)	---	4.142E-3	1.600E-3	4.198E-3
Average-3s (ON)	---	-2.862E-3	-2.280E-3	-3.678E-3
Average (OFF)	---	-4.800E-4	-1.000E-4	-5.500E-4
s (OFF)	---	8.167E-4	1.492E-3	1.100E-3
Average+3s (OFF)	---	1.970E-3	4.375E-3	2.750E-3
Average-3s (OFF)	---	-2.930E-3	-4.575E-3	-3.850E-3

22. VOH_IO[3]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[3] . (V) **Min = 2.211**

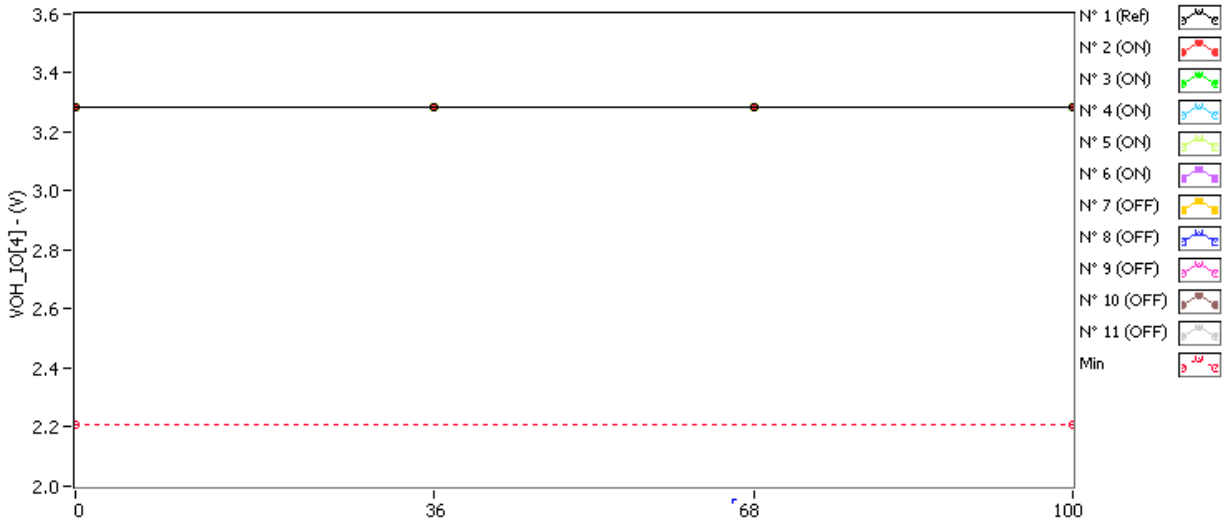
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.283	3.284	3.283	3.283
N° 2 (ON)	3.283	3.283	3.284	3.284
N° 3 (ON)	3.283	3.284	3.284	3.284
N° 4 (ON)	3.283	3.283	3.283	3.283
N° 5 (ON)	3.284	3.284	3.284	3.283
N° 6 (ON)	3.284	3.284	3.284	3.284
N° 7 (OFF)	3.283	3.284	3.284	3.283
N° 8 (OFF)	3.283	3.283	3.283	3.283
N° 9 (OFF)	3.283	3.283	3.283	Not Measurable
N° 10 (OFF)	3.283	3.283	3.284	3.282
N° 11 (OFF)	3.284	3.283	3.283	3.284

Delta [VOH_IO[3]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	5.000E-4	-4.000E-4	-4.000E-4
N° 2 (ON)	---	0.000E+0	7.000E-4	6.000E-4
N° 3 (ON)	---	8.000E-4	9.000E-4	6.000E-4
N° 4 (ON)	---	-3.000E-4	5.000E-4	2.000E-4
N° 5 (ON)	---	0.000E+0	-3.000E-4	-5.000E-4
N° 6 (ON)	---	2.000E-4	3.000E-4	-3.000E-4
N° 7 (OFF)	---	9.000E-4	3.000E-4	0.000E+0
N° 8 (OFF)	---	-1.000E-4	-4.000E-4	-6.000E-4
N° 9 (OFF)	---	2.000E-4	0.000E+0	NaN
N° 10 (OFF)	---	-5.000E-4	1.200E-3	-1.000E-3
N° 11 (OFF)	---	-4.000E-4	-6.000E-4	-1.000E-4
Average (ON)	---	1.400E-4	4.200E-4	1.200E-4
s (ON)	---	4.099E-4	4.604E-4	5.070E-4
Average+3s (ON)	---	1.370E-3	1.801E-3	1.641E-3
Average-3s (ON)	---	-1.090E-3	-9.613E-4	-1.401E-3
Average (OFF)	---	2.000E-5	1.000E-4	-4.250E-4
s (OFF)	---	5.630E-4	7.071E-4	4.646E-4
Average+3s (OFF)	---	1.709E-3	2.221E-3	9.687E-4
Average-3s (OFF)	---	-1.669E-3	-2.021E-3	-1.819E-3

23. VOH_IO[4]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[4] . (V) **Min = 2.211**

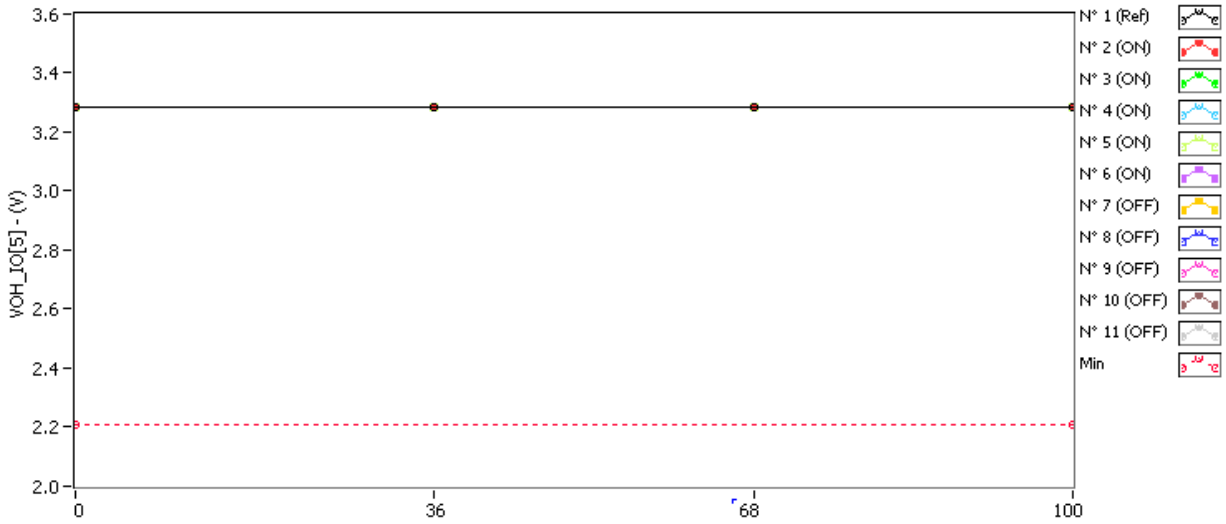
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.284	3.283	3.283	3.283
N° 2 (ON)	3.283	3.285	3.283	3.283
N° 3 (ON)	3.284	3.283	3.284	3.284
N° 4 (ON)	3.283	3.283	3.284	3.283
N° 5 (ON)	3.283	3.285	3.284	3.283
N° 6 (ON)	3.284	3.284	3.285	3.285
N° 7 (OFF)	3.284	3.283	3.285	3.283
N° 8 (OFF)	3.285	3.284	3.283	3.284
N° 9 (OFF)	3.282	3.284	3.283	Not Measurable
N° 10 (OFF)	3.284	3.283	3.284	3.284
N° 11 (OFF)	3.283	3.284	3.284	3.283

Delta [VOH_IO[4]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-1.400E-3	-1.700E-3	-1.700E-3
N° 2 (ON)	---	2.100E-3	4.000E-4	7.000E-4
N° 3 (ON)	---	-9.000E-4	2.000E-4	2.000E-4
N° 4 (ON)	---	3.000E-4	1.700E-3	2.000E-4
N° 5 (ON)	---	2.500E-3	1.700E-3	5.000E-4
N° 6 (ON)	---	-6.000E-4	9.000E-4	4.000E-4
N° 7 (OFF)	---	-1.700E-3	1.000E-4	-1.400E-3
N° 8 (OFF)	---	-9.000E-4	-1.600E-3	-6.000E-4
N° 9 (OFF)	---	2.200E-3	1.700E-3	NaN
N° 10 (OFF)	---	-1.400E-3	-9.000E-4	-6.000E-4
N° 11 (OFF)	---	1.200E-3	8.000E-4	-3.000E-4
Average (ON)	---	6.800E-4	9.800E-4	4.000E-4
s (ON)	---	1.550E-3	7.050E-4	2.121E-4
Average+3s (ON)	---	5.330E-3	3.095E-3	1.036E-3
Average-3s (ON)	---	-3.970E-3	-1.135E-3	-2.364E-4
Average (OFF)	---	-1.200E-4	2.000E-5	-7.250E-4
s (OFF)	---	1.722E-3	1.314E-3	4.717E-4
Average+3s (OFF)	---	5.047E-3	3.962E-3	6.901E-4
Average-3s (OFF)	---	-5.287E-3	-3.922E-3	-2.140E-3

24. VOH_IO[5]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[5] . (V) **Min = 2.211**

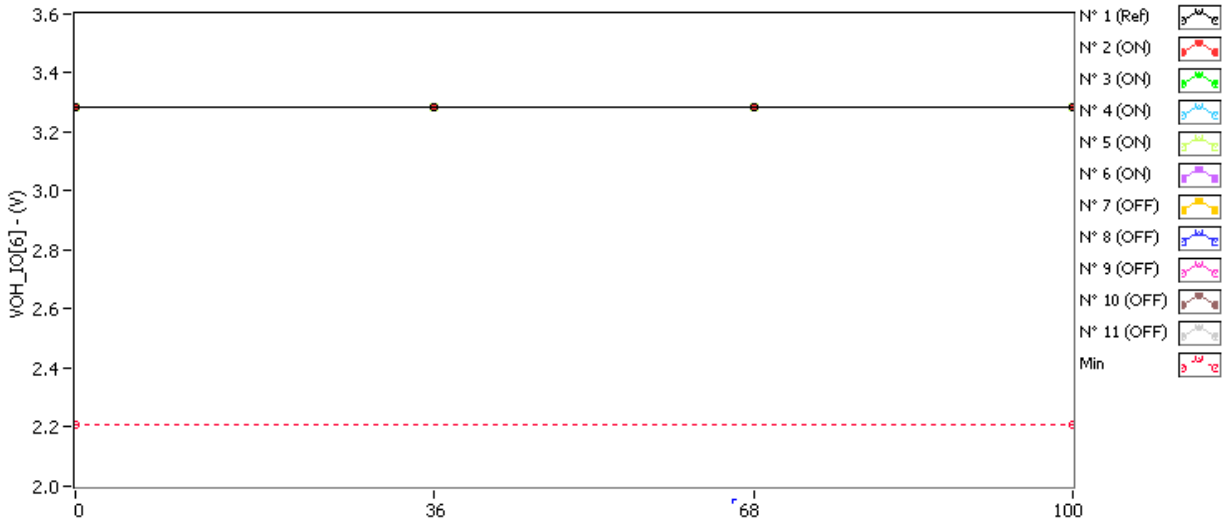
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.283	3.284	3.284	3.284
N° 2 (ON)	3.284	3.283	3.284	3.285
N° 3 (ON)	3.284	3.284	3.284	3.283
N° 4 (ON)	3.283	3.285	3.283	3.284
N° 5 (ON)	3.285	3.284	3.283	3.285
N° 6 (ON)	3.284	3.285	3.284	3.284
N° 7 (OFF)	3.284	3.285	3.284	3.285
N° 8 (OFF)	3.283	3.282	3.285	3.284
N° 9 (OFF)	3.284	3.283	3.284	Not Measurable
N° 10 (OFF)	3.283	3.284	3.285	3.283
N° 11 (OFF)	3.285	3.284	3.283	3.284

Delta [VOH_IO[5]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	1.200E-3	1.200E-3	1.100E-3
N° 2 (ON)	---	-1.500E-3	0.000E+0	8.000E-4
N° 3 (ON)	---	8.000E-4	8.000E-4	-3.000E-4
N° 4 (ON)	---	1.600E-3	-8.000E-4	1.200E-3
N° 5 (ON)	---	-8.000E-4	-1.500E-3	3.000E-4
N° 6 (ON)	---	6.000E-4	-5.000E-4	-5.000E-4
N° 7 (OFF)	---	6.000E-4	-3.000E-4	4.000E-4
N° 8 (OFF)	---	-7.000E-4	1.500E-3	6.000E-4
N° 9 (OFF)	---	-1.700E-3	-2.000E-4	NaN
N° 10 (OFF)	---	5.000E-4	1.500E-3	-3.000E-4
N° 11 (OFF)	---	-1.500E-3	-2.100E-3	-8.000E-4
Average (ON)	---	1.400E-4	-4.000E-4	3.000E-4
s (ON)	---	1.260E-3	8.631E-4	7.176E-4
Average+3s (ON)	---	3.920E-3	2.189E-3	2.453E-3
Average-3s (ON)	---	-3.640E-3	-2.989E-3	-1.853E-3
Average (OFF)	---	-5.600E-4	8.000E-5	-2.500E-5
s (OFF)	---	1.081E-3	1.501E-3	6.449E-4
Average+3s (OFF)	---	2.682E-3	4.582E-3	1.910E-3
Average-3s (OFF)	---	-3.802E-3	-4.422E-3	-1.960E-3

25. VOH_IO[6]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[6] . (V) **Min = 2.211**

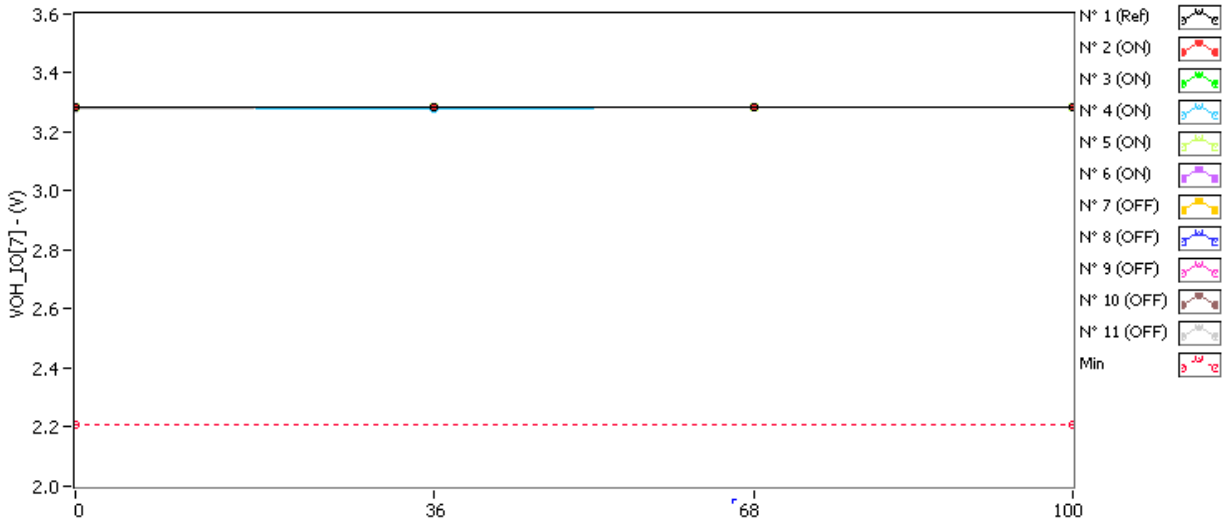
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.282	3.283	3.283	3.282
N° 2 (ON)	3.283	3.282	3.283	3.283
N° 3 (ON)	3.283	3.283	3.283	3.283
N° 4 (ON)	3.283	3.283	3.282	3.282
N° 5 (ON)	3.284	3.283	3.283	3.284
N° 6 (ON)	3.284	3.283	3.283	3.284
N° 7 (OFF)	3.284	3.283	3.282	3.284
N° 8 (OFF)	3.282	3.282	3.283	3.283
N° 9 (OFF)	3.283	3.283	3.283	Not Measurable
N° 10 (OFF)	3.282	3.283	3.282	3.283
N° 11 (OFF)	3.283	3.283	3.282	3.283

Delta [VOH_IO[6]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	4.000E-4	6.000E-4	-2.000E-4
N° 2 (ON)	---	-5.000E-4	2.000E-4	2.000E-4
N° 3 (ON)	---	-1.000E-4	-1.000E-4	0.000E+0
N° 4 (ON)	---	0.000E+0	-8.000E-4	-6.000E-4
N° 5 (ON)	---	-6.000E-4	-3.000E-4	3.000E-4
N° 6 (ON)	---	-8.000E-4	-1.100E-3	-5.000E-4
N° 7 (OFF)	---	-1.000E-3	-1.600E-3	0.000E+0
N° 8 (OFF)	---	3.000E-4	6.000E-4	1.200E-3
N° 9 (OFF)	---	-3.000E-4	1.000E-4	NaN
N° 10 (OFF)	---	1.500E-3	5.000E-4	1.200E-3
N° 11 (OFF)	---	-6.000E-4	-7.000E-4	-1.000E-4
Average (ON)	---	-4.000E-4	-4.200E-4	-1.200E-4
s (ON)	---	3.391E-4	5.263E-4	4.087E-4
Average+3s (ON)	---	6.173E-4	1.159E-3	1.106E-3
Average-3s (ON)	---	-1.417E-3	-1.999E-3	-1.346E-3
Average (OFF)	---	-2.000E-5	-2.200E-4	5.750E-4
s (OFF)	---	9.731E-4	9.257E-4	7.228E-4
Average+3s (OFF)	---	2.899E-3	2.557E-3	2.744E-3
Average-3s (OFF)	---	-2.939E-3	-2.997E-3	-1.594E-3

26. VOH_IO[7]

Ta = 25°C, Vcc = 3.3V, Ioh = -400µA



VOH_IO[7] . (V) **Min = 2.211**

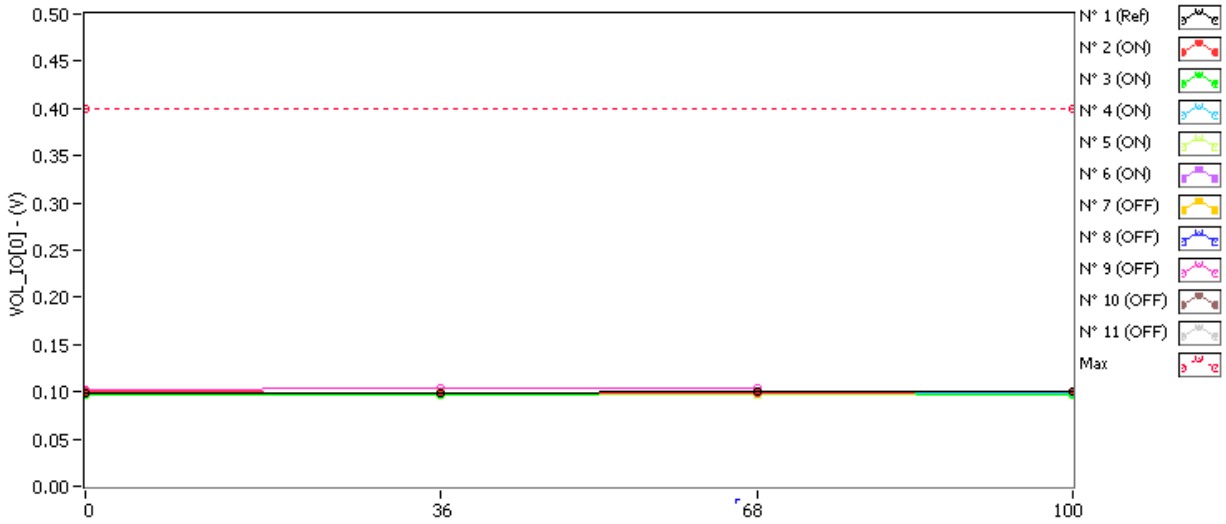
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	3.282	3.283	3.282	3.282
N° 2 (ON)	3.282	3.282	3.282	3.282
N° 3 (ON)	3.282	3.282	3.283	3.283
N° 4 (ON)	3.282	3.281	3.282	3.282
N° 5 (ON)	3.283	3.283	3.283	3.283
N° 6 (ON)	3.283	3.284	3.283	3.283
N° 7 (OFF)	3.283	3.282	3.282	3.283
N° 8 (OFF)	3.283	3.283	3.282	3.282
N° 9 (OFF)	3.282	3.282	3.282	Not Measurable
N° 10 (OFF)	3.282	3.281	3.283	3.282
N° 11 (OFF)	3.281	3.283	3.282	3.283

Delta [VOH_IO[7]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	1.000E-3	-3.000E-4	-1.000E-4
N° 2 (ON)	---	-2.000E-4	5.000E-4	1.000E-4
N° 3 (ON)	---	-4.000E-4	4.000E-4	9.000E-4
N° 4 (ON)	---	-9.000E-4	-3.000E-4	-5.000E-4
N° 5 (ON)	---	-2.000E-4	-5.000E-4	-2.000E-4
N° 6 (ON)	---	7.000E-4	-2.000E-4	-6.000E-4
N° 7 (OFF)	---	-5.000E-4	-5.000E-4	2.000E-4
N° 8 (OFF)	---	0.000E+0	-1.000E-4	-1.000E-4
N° 9 (OFF)	---	-2.000E-4	1.000E-4	NaN
N° 10 (OFF)	---	-8.000E-4	8.000E-4	2.000E-4
N° 11 (OFF)	---	1.100E-3	8.000E-4	1.100E-3
Average (ON)	---	-2.000E-4	-2.000E-5	-6.000E-5
s (ON)	---	5.788E-4	4.438E-4	6.025E-4
Average+3s (ON)	---	1.536E-3	1.312E-3	1.747E-3
Average-3s (ON)	---	-1.936E-3	-1.352E-3	-1.867E-3
Average (OFF)	---	-8.000E-5	2.200E-4	3.500E-4
s (OFF)	---	7.259E-4	5.718E-4	5.196E-4
Average+3s (OFF)	---	2.098E-3	1.936E-3	1.909E-3
Average-3s (OFF)	---	-2.258E-3	-1.496E-3	-1.209E-3

27. VOL_IO[0]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[0] . (V) **Max = 0.4**

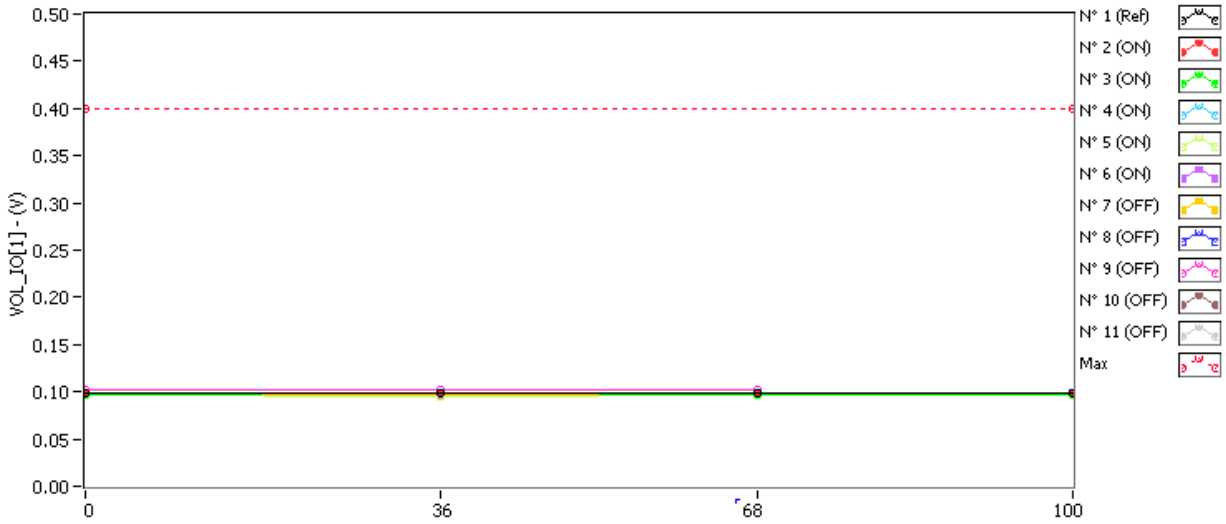
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.099	0.098	0.100	0.100
N° 2 (ON)	0.100	0.099	0.099	0.100
N° 3 (ON)	0.098	0.097	0.098	0.097
N° 4 (ON)	0.098	0.099	0.099	0.099
N° 5 (ON)	0.097	0.097	0.097	0.097
N° 6 (ON)	0.098	0.097	0.097	0.098
N° 7 (OFF)	0.098	0.098	0.098	0.098
N° 8 (OFF)	0.099	0.099	0.099	0.098
N° 9 (OFF)	0.103	0.103	0.103	Not Measurable
N° 10 (OFF)	0.099	0.099	0.099	0.100
N° 11 (OFF)	0.099	0.099	0.098	0.099

Delta [VOL_IO[0]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-4.580E-4	7.630E-4	1.218E-3
N° 2 (ON)	---	-4.580E-4	-1.530E-4	1.530E-4
N° 3 (ON)	---	-3.050E-4	6.100E-4	-3.050E-4
N° 4 (ON)	---	7.630E-4	1.068E-3	4.570E-4
N° 5 (ON)	---	-4.580E-4	-3.050E-4	-3.050E-4
N° 6 (ON)	---	-4.570E-4	-6.100E-4	1.530E-4
N° 7 (OFF)	---	-1.530E-4	-1.530E-4	-3.050E-4
N° 8 (OFF)	---	-1.530E-4	-3.050E-4	-7.630E-4
N° 9 (OFF)	---	7.600E-4	6.100E-4	NaN
N° 10 (OFF)	---	0.000E+0	0.000E+0	9.150E-4
N° 11 (OFF)	---	1.520E-4	-6.110E-4	-1.530E-4
Average (ON)	---	-1.830E-4	1.220E-4	3.060E-5
s (ON)	---	5.329E-4	6.941E-4	3.305E-4
Average+3s (ON)	---	1.416E-3	2.204E-3	1.022E-3
Average-3s (ON)	---	-1.782E-3	-1.960E-3	-9.610E-4
Average (OFF)	---	1.212E-4	-9.180E-5	-7.650E-5
s (OFF)	---	3.788E-4	4.527E-4	7.100E-4
Average+3s (OFF)	---	1.258E-3	1.266E-3	2.054E-3
Average-3s (OFF)	---	-1.015E-3	-1.450E-3	-2.207E-3

28. VOL_IO[1]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[1] . (V) **Max = 0.4**

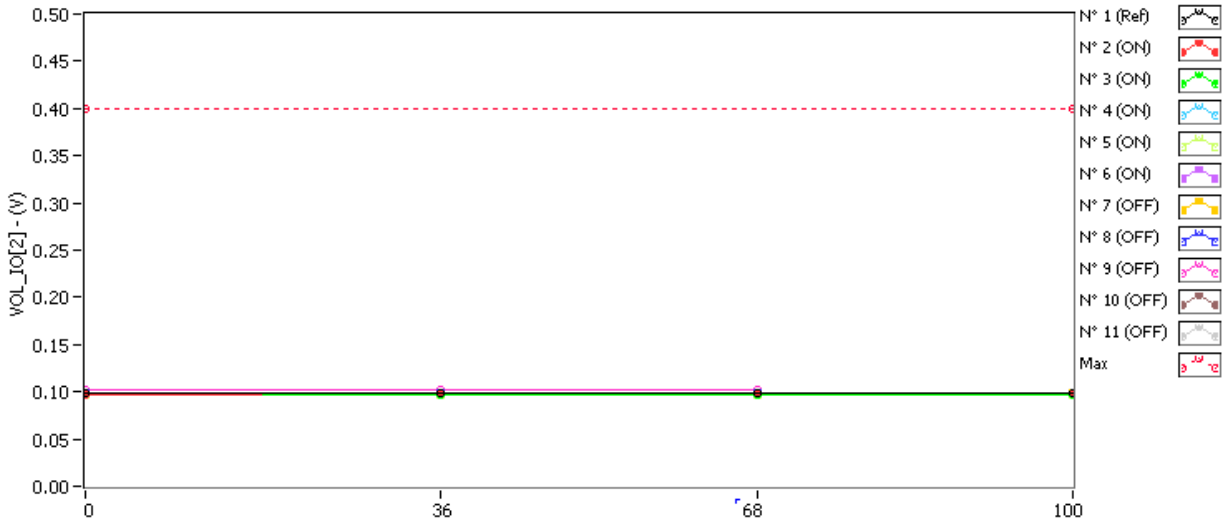
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.098	0.098	0.099	0.099
N° 2 (ON)	0.099	0.099	0.099	0.099
N° 3 (ON)	0.097	0.098	0.097	0.098
N° 4 (ON)	0.098	0.099	0.098	0.099
N° 5 (ON)	0.096	0.096	0.096	0.096
N° 6 (ON)	0.096	0.096	0.097	0.096
N° 7 (OFF)	0.097	0.097	0.097	0.097
N° 8 (OFF)	0.098	0.098	0.099	0.098
N° 9 (OFF)	0.102	0.102	0.102	Not Measurable
N° 10 (OFF)	0.098	0.099	0.099	0.099
N° 11 (OFF)	0.098	0.098	0.098	0.098

Delta [VOL_IO[1]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	1.530E-4	3.050E-4	7.630E-4
N° 2 (ON)	---	-3.060E-4	-1.530E-4	3.050E-4
N° 3 (ON)	---	6.100E-4	-1.530E-4	3.050E-4
N° 4 (ON)	---	4.570E-4	-1.530E-4	7.630E-4
N° 5 (ON)	---	-1.520E-4	0.000E+0	4.580E-4
N° 6 (ON)	---	-6.100E-4	4.580E-4	-4.580E-4
N° 7 (OFF)	---	1.530E-4	1.530E-4	-4.580E-4
N° 8 (OFF)	---	3.050E-4	1.068E-3	7.630E-4
N° 9 (OFF)	---	4.600E-4	3.100E-4	NaN
N° 10 (OFF)	---	4.570E-4	6.100E-4	7.630E-4
N° 11 (OFF)	---	1.530E-4	4.580E-4	4.580E-4
Average (ON)	---	-2.000E-7	-2.000E-7	2.746E-4
s (ON)	---	5.172E-4	2.646E-4	4.502E-4
Average+3s (ON)	---	1.551E-3	7.935E-4	1.625E-3
Average-3s (ON)	---	-1.552E-3	-7.939E-4	-1.076E-3
Average (OFF)	---	3.056E-4	5.198E-4	3.815E-4
s (OFF)	---	1.528E-4	3.504E-4	5.778E-4
Average+3s (OFF)	---	7.639E-4	1.571E-3	2.115E-3
Average-3s (OFF)	---	-1.527E-4	-5.313E-4	-1.352E-3

29. VOL_IO[2]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[2] . (V) **Max = 0.4**

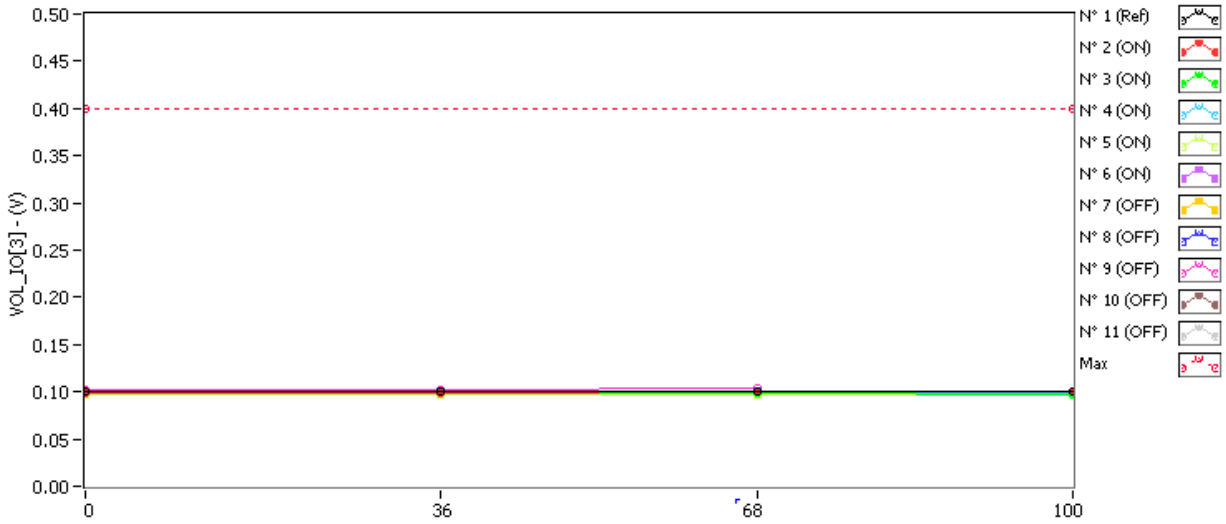
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.099	0.098	0.099	0.099
N° 2 (ON)	0.098	0.098	0.098	0.098
N° 3 (ON)	0.098	0.096	0.097	0.097
N° 4 (ON)	0.098	0.098	0.098	0.098
N° 5 (ON)	0.096	0.096	0.096	0.096
N° 6 (ON)	0.096	0.096	0.096	0.097
N° 7 (OFF)	0.097	0.097	0.098	0.098
N° 8 (OFF)	0.098	0.098	0.098	0.098
N° 9 (OFF)	0.102	0.102	0.103	Not Measurable
N° 10 (OFF)	0.098	0.099	0.099	0.099
N° 11 (OFF)	0.098	0.098	0.098	0.098

Delta [VOL_IO[2]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-3.050E-4	1.530E-4	3.060E-4
N° 2 (ON)	---	1.530E-4	4.580E-4	4.580E-4
N° 3 (ON)	---	-1.068E-3	-1.520E-4	-3.050E-4
N° 4 (ON)	---	4.580E-4	6.100E-4	0.000E+0
N° 5 (ON)	---	0.000E+0	3.050E-4	0.000E+0
N° 6 (ON)	---	3.060E-4	3.060E-4	1.221E-3
N° 7 (OFF)	---	1.530E-4	4.580E-4	7.630E-4
N° 8 (OFF)	---	1.530E-4	3.050E-4	0.000E+0
N° 9 (OFF)	---	-4.600E-4	3.100E-4	NaN
N° 10 (OFF)	---	6.100E-4	4.570E-4	1.068E-3
N° 11 (OFF)	---	3.050E-4	-1.530E-4	4.580E-4
Average (ON)	---	-3.020E-5	3.054E-4	2.748E-4
s (ON)	---	6.047E-4	2.852E-4	5.950E-4
Average+3s (ON)	---	1.784E-3	1.161E-3	2.060E-3
Average-3s (ON)	---	-1.844E-3	-5.501E-4	-1.510E-3
Average (OFF)	---	1.522E-4	2.754E-4	5.722E-4
s (OFF)	---	3.898E-4	2.510E-4	4.556E-4
Average+3s (OFF)	---	1.322E-3	1.028E-3	1.939E-3
Average-3s (OFF)	---	-1.017E-3	-4.775E-4	-7.945E-4

30. VOL_IO[3]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[3] . (V) **Max = 0.4**

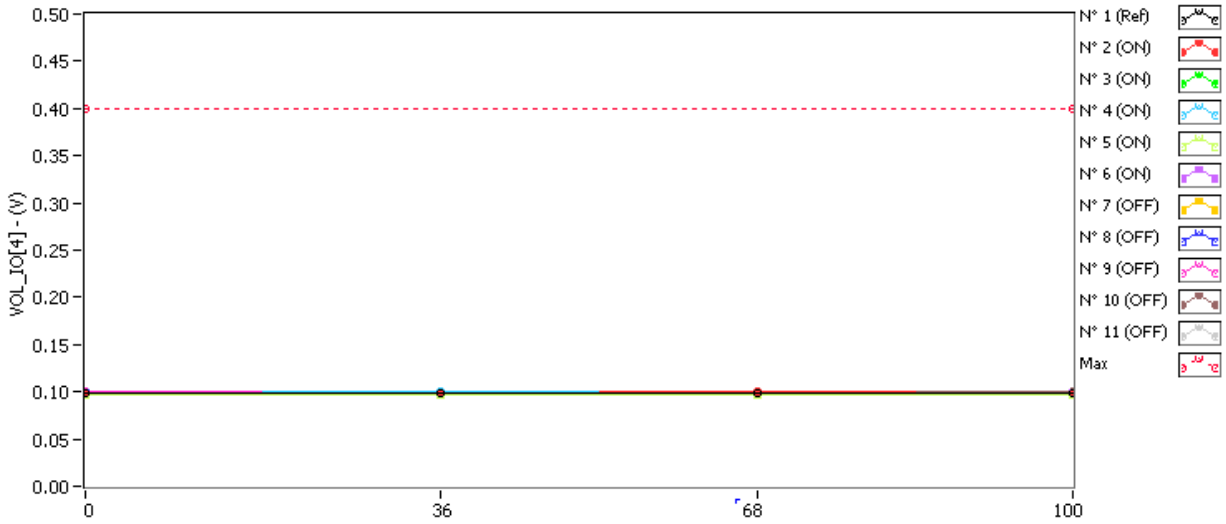
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.100	0.100	0.100	0.100
N° 2 (ON)	0.099	0.099	0.100	0.100
N° 3 (ON)	0.098	0.098	0.098	0.098
N° 4 (ON)	0.098	0.098	0.100	0.099
N° 5 (ON)	0.097	0.097	0.098	0.097
N° 6 (ON)	0.097	0.098	0.097	0.098
N° 7 (OFF)	0.098	0.098	0.098	0.099
N° 8 (OFF)	0.099	0.100	0.100	0.099
N° 9 (OFF)	0.103	0.103	0.103	Not Measurable
N° 10 (OFF)	0.099	0.100	0.100	0.100
N° 11 (OFF)	0.099	0.099	0.100	0.099

Delta [VOL_IO[3]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	3.030E-4	1.530E-4	1.530E-4
N° 2 (ON)	---	0.000E+0	6.100E-4	1.218E-3
N° 3 (ON)	---	-4.580E-4	0.000E+0	-7.630E-4
N° 4 (ON)	---	-1.530E-4	1.373E-3	1.520E-4
N° 5 (ON)	---	3.050E-4	4.570E-4	-3.060E-4
N° 6 (ON)	---	3.050E-4	-1.530E-4	3.050E-4
N° 7 (OFF)	---	4.570E-4	1.520E-4	7.620E-4
N° 8 (OFF)	---	7.630E-4	4.580E-4	1.530E-4
N° 9 (OFF)	---	1.600E-4	6.100E-4	NaN
N° 10 (OFF)	---	6.110E-4	4.580E-4	7.610E-4
N° 11 (OFF)	---	3.050E-4	1.066E-3	-1.520E-4
Average (ON)	---	-2.000E-7	4.574E-4	1.212E-4
s (ON)	---	3.237E-4	6.007E-4	7.420E-4
Average+3s (ON)	---	9.710E-4	2.260E-3	2.347E-3
Average-3s (ON)	---	-9.714E-4	-1.345E-3	-2.105E-3
Average (OFF)	---	4.592E-4	5.488E-4	3.810E-4
s (OFF)	---	2.391E-4	3.336E-4	4.567E-4
Average+3s (OFF)	---	1.176E-3	1.550E-3	1.751E-3
Average-3s (OFF)	---	-2.580E-4	-4.520E-4	-9.890E-4

31. VOL_IO[4]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[4] . (V) **Max = 0.4**

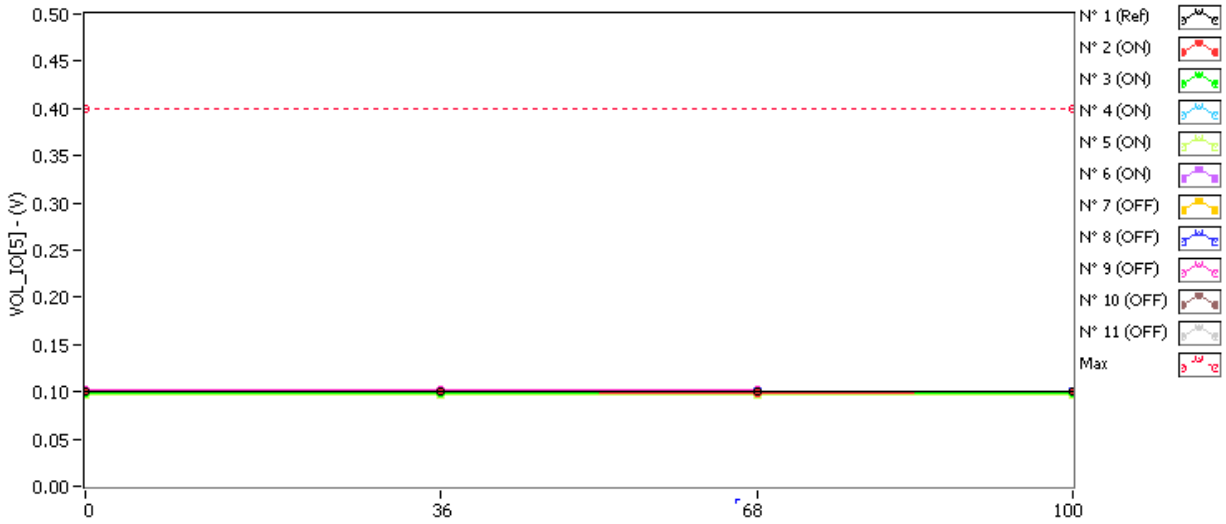
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.099	0.099	0.099	0.099
N° 2 (ON)	0.099	0.099	0.100	0.099
N° 3 (ON)	0.098	0.098	0.098	0.098
N° 4 (ON)	0.099	0.100	0.100	0.099
N° 5 (ON)	0.096	0.097	0.097	0.097
N° 6 (ON)	0.097	0.098	0.098	0.098
N° 7 (OFF)	0.097	0.098	0.098	0.099
N° 8 (OFF)	0.098	0.099	0.098	0.098
N° 9 (OFF)	0.100	0.100	0.101	Not Measurable
N° 10 (OFF)	0.099	0.099	0.099	0.100
N° 11 (OFF)	0.098	0.098	0.098	0.098

Delta [VOL_IO[4]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-3.050E-4	1.520E-4	1.520E-4
N° 2 (ON)	---	1.530E-4	9.160E-4	6.110E-4
N° 3 (ON)	---	-4.570E-4	1.530E-4	-4.570E-4
N° 4 (ON)	---	4.580E-4	4.580E-4	-1.520E-4
N° 5 (ON)	---	6.110E-4	4.580E-4	7.630E-4
N° 6 (ON)	---	6.100E-4	3.050E-4	6.100E-4
N° 7 (OFF)	---	1.520E-4	1.068E-3	1.220E-3
N° 8 (OFF)	---	1.520E-4	0.000E+0	0.000E+0
N° 9 (OFF)	---	1.500E-4	4.600E-4	NaN
N° 10 (OFF)	---	1.530E-4	3.050E-4	7.630E-4
N° 11 (OFF)	---	-1.530E-4	1.520E-4	3.050E-4
Average (ON)	---	2.750E-4	4.580E-4	2.750E-4
s (ON)	---	4.498E-4	2.856E-4	5.435E-4
Average+3s (ON)	---	1.624E-3	1.315E-3	1.905E-3
Average-3s (ON)	---	-1.074E-3	-3.987E-4	-1.355E-3
Average (OFF)	---	9.080E-5	3.970E-4	5.720E-4
s (OFF)	---	1.363E-4	4.124E-4	5.338E-4
Average+3s (OFF)	---	4.997E-4	1.634E-3	2.173E-3
Average-3s (OFF)	---	-3.181E-4	-8.402E-4	-1.029E-3

32. VOL_IO[5]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[5] . (V) **Max = 0.4**

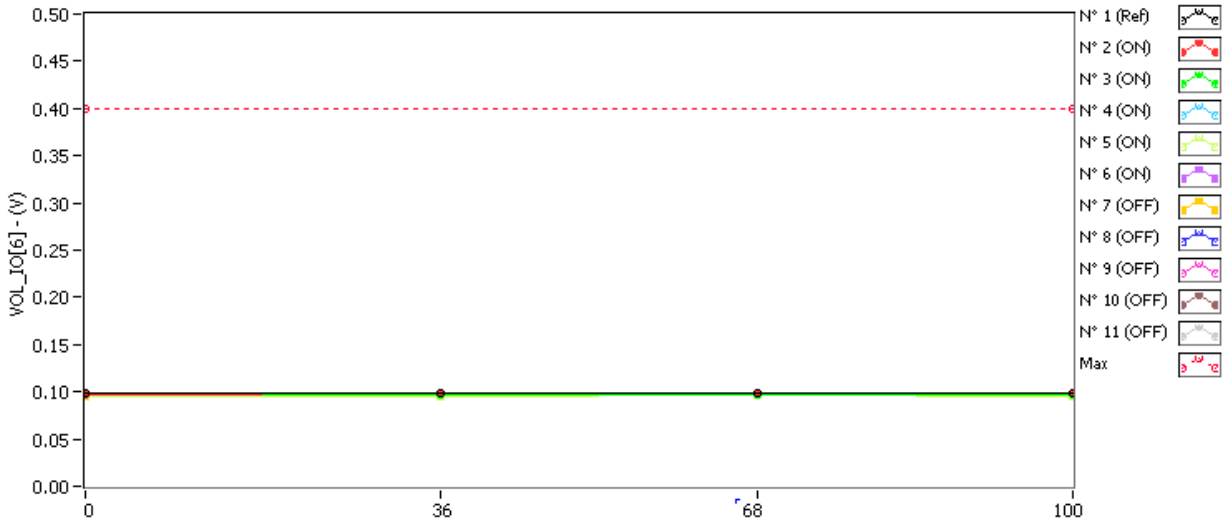
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.100	0.100	0.100	0.100
N° 2 (ON)	0.100	0.100	0.099	0.100
N° 3 (ON)	0.098	0.099	0.098	0.099
N° 4 (ON)	0.100	0.101	0.100	0.100
N° 5 (ON)	0.098	0.097	0.098	0.098
N° 6 (ON)	0.098	0.098	0.099	0.098
N° 7 (OFF)	0.099	0.099	0.099	0.098
N° 8 (OFF)	0.099	0.099	0.100	0.100
N° 9 (OFF)	0.102	0.102	0.101	Not Measurable
N° 10 (OFF)	0.100	0.100	0.100	0.100
N° 11 (OFF)	0.099	0.100	0.100	0.099

Delta [VOL_IO[5]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	-1.520E-4	0.000E+0	6.130E-4
N° 2 (ON)	---	3.050E-4	-4.580E-4	6.050E-4
N° 3 (ON)	---	9.150E-4	3.050E-4	1.068E-3
N° 4 (ON)	---	1.070E-3	0.000E+0	1.500E-4
N° 5 (ON)	---	-4.580E-4	0.000E+0	-1.530E-4
N° 6 (ON)	---	1.520E-4	1.068E-3	4.570E-4
N° 7 (OFF)	---	-3.050E-4	1.520E-4	-7.630E-4
N° 8 (OFF)	---	1.530E-4	9.160E-4	1.216E-3
N° 9 (OFF)	---	-1.500E-4	-3.100E-4	NaN
N° 10 (OFF)	---	0.000E+0	-1.530E-4	-1.530E-4
N° 11 (OFF)	---	6.110E-4	3.060E-4	0.000E+0
Average (ON)	---	3.968E-4	1.830E-4	4.254E-4
s (ON)	---	6.166E-4	5.648E-4	4.628E-4
Average+3s (ON)	---	2.247E-3	1.877E-3	1.814E-3
Average-3s (ON)	---	-1.453E-3	-1.511E-3	-9.629E-4
Average (OFF)	---	6.180E-5	1.822E-4	7.500E-5
s (OFF)	---	3.511E-4	4.768E-4	8.290E-4
Average+3s (OFF)	---	1.115E-3	1.613E-3	2.562E-3
Average-3s (OFF)	---	-9.916E-4	-1.248E-3	-2.412E-3

33. VOL_IO[6]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[6] . (V) **Max = 0.4**

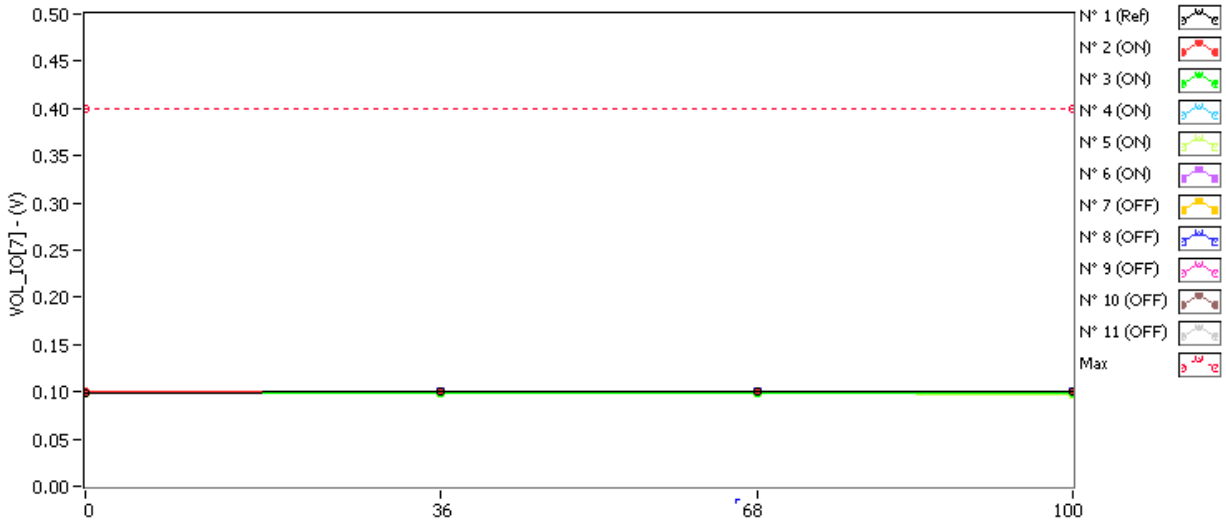
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.098	0.098	0.099	0.098
N° 2 (ON)	0.097	0.098	0.099	0.098
N° 3 (ON)	0.097	0.096	0.097	0.097
N° 4 (ON)	0.098	0.098	0.098	0.098
N° 5 (ON)	0.095	0.095	0.096	0.096
N° 6 (ON)	0.096	0.096	0.097	0.097
N° 7 (OFF)	0.096	0.097	0.097	0.097
N° 8 (OFF)	0.097	0.098	0.098	0.098
N° 9 (OFF)	0.099	0.099	0.099	Not Measurable
N° 10 (OFF)	0.098	0.099	0.099	0.098
N° 11 (OFF)	0.098	0.097	0.097	0.098

Delta [VOL_IO[6]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	1.520E-4	7.620E-4	4.570E-4
N° 2 (ON)	---	7.630E-4	1.525E-3	1.220E-3
N° 3 (ON)	---	-1.530E-4	3.050E-4	7.630E-4
N° 4 (ON)	---	1.520E-4	1.520E-4	-3.050E-4
N° 5 (ON)	---	0.000E+0	7.630E-4	3.050E-4
N° 6 (ON)	---	0.000E+0	6.100E-4	9.160E-4
N° 7 (OFF)	---	1.530E-4	1.530E-4	7.630E-4
N° 8 (OFF)	---	1.520E-4	1.520E-4	1.520E-4
N° 9 (OFF)	---	-3.050E-4	0.000E+0	NaN
N° 10 (OFF)	---	6.100E-4	4.570E-4	3.050E-4
N° 11 (OFF)	---	-4.580E-4	-4.580E-4	3.050E-4
Average (ON)	---	1.524E-4	6.710E-4	5.798E-4
s (ON)	---	3.580E-4	5.350E-4	5.947E-4
Average+3s (ON)	---	1.226E-3	2.276E-3	2.364E-3
Average-3s (ON)	---	-9.215E-4	-9.339E-4	-1.204E-3
Average (OFF)	---	3.040E-5	6.080E-5	3.812E-4
s (OFF)	---	4.233E-4	3.342E-4	2.645E-4
Average+3s (OFF)	---	1.300E-3	1.063E-3	1.175E-3
Average-3s (OFF)	---	-1.240E-3	-9.417E-4	-4.123E-4

34. VOL_IO[7]

Ta = 25°C, Vcc = 3.3V, Iol = 2.1mA



VOL_IO[7] . (V) **Max = 0.4**

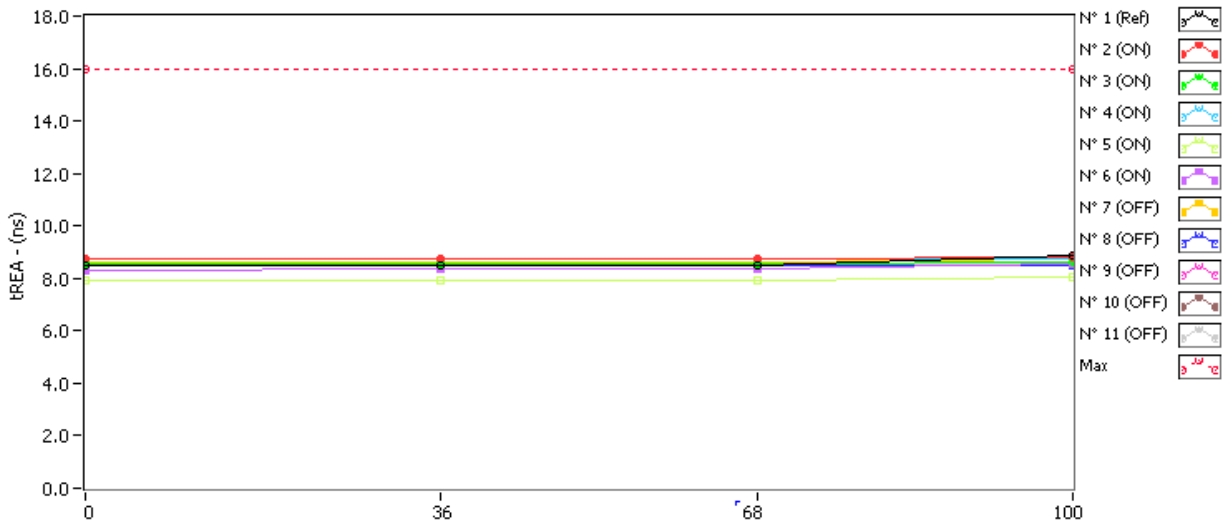
	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	0.099	0.100	0.100	0.100
N° 2 (ON)	0.100	0.100	0.100	0.100
N° 3 (ON)	0.099	0.098	0.098	0.099
N° 4 (ON)	0.101	0.100	0.101	0.100
N° 5 (ON)	0.098	0.098	0.098	0.097
N° 6 (ON)	0.098	0.099	0.098	0.099
N° 7 (OFF)	0.099	0.099	0.099	0.099
N° 8 (OFF)	0.099	0.100	0.100	0.100
N° 9 (OFF)	0.101	0.101	0.101	Not Measurable
N° 10 (OFF)	0.100	0.100	0.100	0.100
N° 11 (OFF)	0.100	0.100	0.100	0.100

Delta [VOL_IO[7]]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	4.580E-4	3.060E-4	7.610E-4
N° 2 (ON)	---	9.180E-4	3.050E-4	6.080E-4
N° 3 (ON)	---	-1.520E-4	-1.520E-4	0.000E+0
N° 4 (ON)	---	-1.500E-4	3.100E-4	-6.100E-4
N° 5 (ON)	---	3.050E-4	1.520E-4	-4.580E-4
N° 6 (ON)	---	1.520E-4	-6.100E-4	3.050E-4
N° 7 (OFF)	---	-4.580E-4	0.000E+0	-3.050E-4
N° 8 (OFF)	---	9.160E-4	1.216E-3	1.066E-3
N° 9 (OFF)	---	4.600E-4	0.000E+0	NaN
N° 10 (OFF)	---	-3.030E-4	0.000E+0	3.100E-4
N° 11 (OFF)	---	-1.530E-4	4.550E-4	4.550E-4
Average (ON)	---	2.146E-4	1.000E-6	-3.100E-5
s (ON)	---	4.399E-4	3.897E-4	5.098E-4
Average+3s (ON)	---	1.534E-3	1.170E-3	1.499E-3
Average-3s (ON)	---	-1.105E-3	-1.168E-3	-1.561E-3
Average (OFF)	---	9.240E-5	3.342E-4	3.815E-4
s (OFF)	---	5.773E-4	5.309E-4	5.628E-4
Average+3s (OFF)	---	1.824E-3	1.927E-3	2.070E-3
Average-3s (OFF)	---	-1.639E-3	-1.258E-3	-1.307E-3

35. tREA

Ta = 25°C, Vcc = 3.3V, Vih = 2.64V, Vil = 0.66V



tREA . (ns) **Max = 16.0**

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	8.510	8.510	8.510	8.862
N° 2 (ON)	8.744	8.744	8.744	8.803
N° 3 (ON)	8.569	8.569	8.569	8.627
N° 4 (ON)	8.744	8.744	8.744	8.744
N° 5 (ON)	7.924	7.924	7.924	8.041
N° 6 (ON)	8.334	8.393	8.393	8.569
N° 7 (OFF)	8.627	8.627	8.627	8.744
N° 8 (OFF)	8.569	8.510	8.510	8.510
N° 9 (OFF)	8.744	8.744	8.744	Not Measurable
N° 10 (OFF)	8.569	8.627	8.627	8.744
N° 11 (OFF)	8.510	8.569	8.569	8.569

Delta [tREA]

	0krad(Si)	36krad(Si)	68krad(Si)	100krad(Si)
N° 1 (Ref)	---	0.000E+0	0.000E+0	3.516E-1
N° 2 (ON)	---	0.000E+0	0.000E+0	5.860E-2
N° 3 (ON)	---	0.000E+0	0.000E+0	5.860E-2
N° 4 (ON)	---	0.000E+0	0.000E+0	0.000E+0
N° 5 (ON)	---	0.000E+0	0.000E+0	1.171E-1
N° 6 (ON)	---	5.860E-2	5.860E-2	2.344E-1
N° 7 (OFF)	---	0.000E+0	0.000E+0	1.172E-1
N° 8 (OFF)	---	-5.860E-2	-5.860E-2	-5.860E-2
N° 9 (OFF)	---	0.000E+0	0.000E+0	NaN
N° 10 (OFF)	---	5.860E-2	5.860E-2	1.758E-1
N° 11 (OFF)	---	5.860E-2	5.860E-2	5.860E-2
Average (ON)	---	1.172E-2	1.172E-2	9.374E-2
s (ON)	---	2.621E-2	2.621E-2	8.886E-2
Average+3s (ON)	---	9.034E-2	9.034E-2	3.603E-1
Average-3s (ON)	---	-6.690E-2	-6.690E-2	-1.729E-1
Average (OFF)	---	1.172E-2	1.172E-2	7.325E-2
s (OFF)	---	4.903E-2	4.903E-2	1.001E-1
Average+3s (OFF)	---	1.588E-1	1.588E-1	3.735E-1
Average-3s (OFF)	---	-1.354E-1	-1.354E-1	-2.270E-1