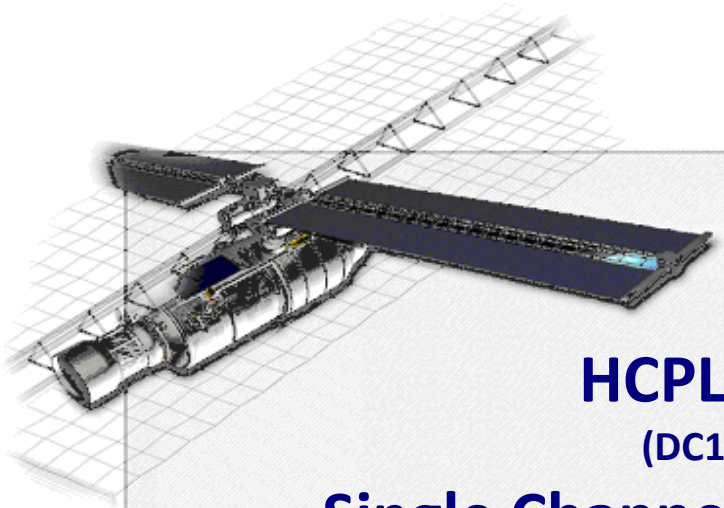
PROTONS DISPLACEMENT DAMAGE TEST REPORT



HCPL5701

(DC1116)

Single Channel Optocoupler

From

AVAGO

TRAD /TP/HCPL5701/xxx1/ESA/YP/1104		Labège, April 16th, 2012
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Issue : 0		
To: Marc POIZAT	Project/Program :	ESA Contract N°4000102571/10/NL/AF-Radiation Characterization of Laplace RH optocouplers, sensors and detectors

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1 INTRODUCTION

This report includes the test results of HCPL5701, a Single Channel Optocoupler from AVAGO to evaluate displacement damage effects under proton irradiation. During January and February 2012, TRAD characterized this device for proton sensitivity at the KVI Facility, in GRONINGEN, The Netherlands using their AGOR cyclotron.
The objectives of the test are:

- to detect and measure the degradation of device parameters as a function of proton fluence,
- to determine if device parameters are within specified limits after exposure to final level of proton fluence.

2 DOCUMENTS

2.1 Applicable Documents

AD	1.	ESA contract	N°4000102571/10/NL/AF-Radiation Characterization of Laplace RH optocouplers, sensors and detectors
AD	2.	Irradiation Test Plan	ITP-TP-HCPL5701-AVA-ESA-1119, Iss.4, 08/02/2012

2.2 Reference Documents

RD	1.	Datasheet HCPL5701	Hermetically Sealed, Low IF, Wide VCC, High Gain Optocouplers, Datasheet HCPL-5701 n°AV02-1766EN of february 26th, 2009 by Avago
RD	2.	AVAGO certificate of conformance dated 09/05/2011	

3 DEVICE INFORMATION

3.1 Device description

The HCPL5701 is a Single Channel hermetically High Gain Optocoupler containing a GaAsP light emitting diode which is optically coupled to an integrated high gain photon detector. The high gain output stage features an open collector output providing both lower saturation voltage and higher signaling speed than possible with conventional photo-Darlington optocouplers.
.

Type	HCPL5701 – 5962-8981001PC
Manufacturer	AVAGO
Function	Optocoupler
Package	DIP8
Date Code	1116
Lot :	HS111603D
LPN :	DS10741861
Sample size	46 parts (3x15 test parts + 1 control sample)

3.2 Procurement information

75 parts HCPL5701 were procured from AVAGO (through ACAL BFI, Germany) with full MIL-PRF-38534 Class Level H testing. Parts were delivered with a certificate of conformance [RD2].
The class H is identifiable by the digit 1 at the end of the part reference.

3.3 External view

Figure 1: package marking

Figure 2: package back side

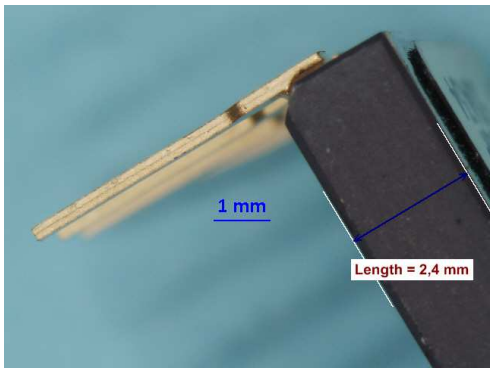


Figure 3: package view

3.4 Internal view

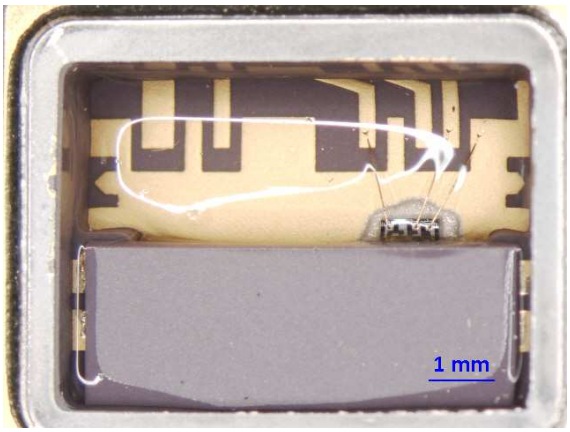


Figure 4: Internal overall view

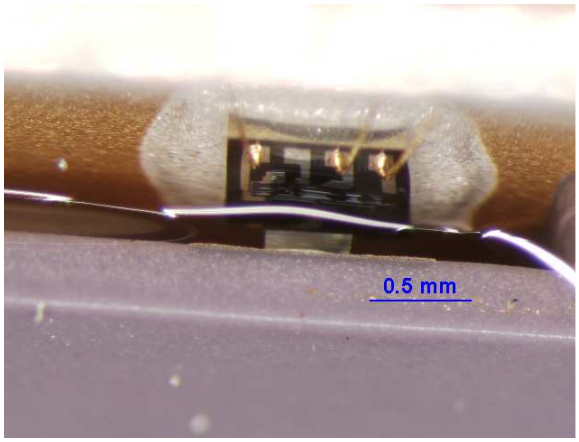


Figure 5: Internal view

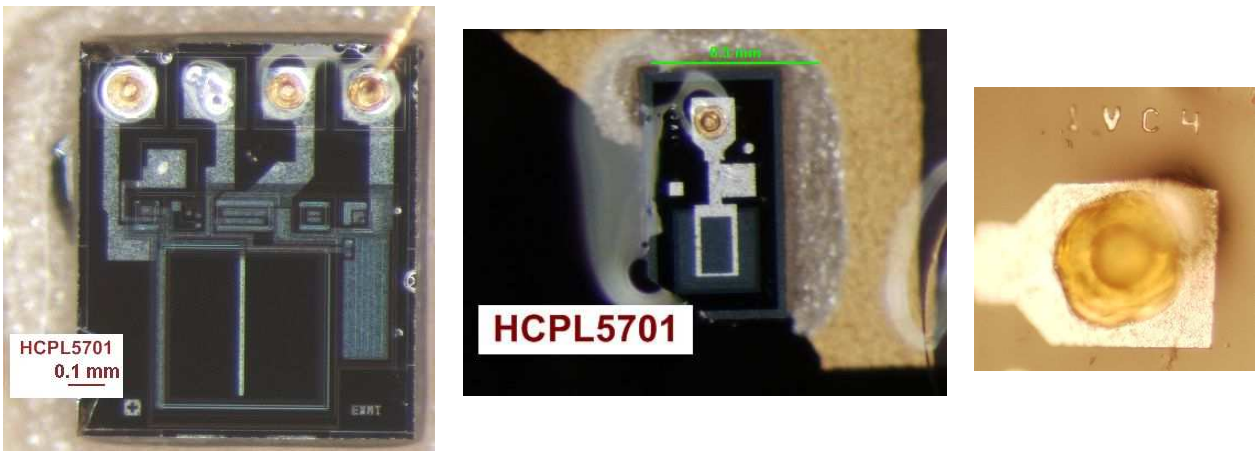


Figure 6: detail view of photodetector and LED

3.5 Serialization

Each part is serialized to enable pre and post test identification and comparison.

Serial Number			
P1 (30MeV)	P2 (60MeV)	P3 (190MeV)	Mode
1 (Control sample)			
2	2	2	Bias 1
3	3	3	Bias 1
4	4	4	Bias 1
5	5	5	Bias 1
6	6	6	Bias 1
7	7	7	Bias 2
8	8	8	Bias 2
9	9	9	Bias 2
10	10	10	Bias 2
11	11	11	Bias 2
12	12	12	Off
13	13	13	Off
14	14	14	Off
15	15	15	Off
16	16	16	Off

4 IRRADIATION MEANS AND CONDITIONS

4.1 AGORFIRM/KVI irradiation facility (The Nederlands)

AGORFIRM is a facility that uses a dedicated beam line of the AGOR cyclotron for irradiations with protons in air. The facility is available for radiation damage studies. The standard proton beams used for irradiations produced by this cyclotron have primary energies of 90, 150 and 190 MeV.
The standard irradiation field has a diameter of 70 mm and homogeneity of better than ± 3%.

Figure 7: samples installed for irradiation

4.2 Energy and Flux measurement

The energy resolution of the beam when leaving the cyclotron is typically better than 0.25%. However, at the DUT position the resolution is in the order of a few MeV due to scattering in air, the scatter system and, when used, the energy degrader.
The proton flux at the centre of the irradiation field is measured with a 10 mm diameter scintillator detector. During the irradiation, the flux is monitored with a Beam Intensity Monitor (BIM). Before an irradiation the BIM signal (in Monitor Units) is related to the scintillator signal to obtain the flux calibration in protons cm^{-2} per MU. This calibration is conducted for every field size and every energy used during an irradiation.

4.3 Experimental conditions

An Equivalent total fluence of 1E12 #/cm² of 10 MeV protons is required [AD2] for this TNID (Total Non-Ionizing Dose) evaluation test. Considering NIEL (Non Ionizing Energy Loss) value for 10 MeV protons (7.86E-03 MeV cm^2 g^{-1}), total fluence to be reached at each energy is:

30	MeV	8,22E+11 cm^{-2}
60	MeV	1,14E+12 cm^{-2}
190	MeV	1,91E+12 cm^{-2}

Five steps were defined to determine the component degradation under 30MeV, 60MeV, 190MeV proton irradiation. The test devices have been exposed to the following proton fluence levels:

p/cm2	1,70E+10	8,50E+10	1,70E+11	1,70E+12
Energy (MeV)	30	30	30	30
p/cm2	2,30E+10	1,15E+11	2,30E+11	1,14E+12
Energy (MeV)	60	60	60	60
p/cm2	4,00E+10	2,00E+11	4,00E+11	1,91E+12
Energy (MeV)	190	190	190	190

5 ELECTRICAL TESTS

Electrical parameters to be measured in pre and post exposure tests are described in the following table. Electrical tests are performed on each part using the test set-up hereunder. All required data are recorded for each device. Test conditions and limits are given in the applicable irradiation test plan [AD2] and shown hereafter.

5.1 Test set-up

TEST BOARD	TRAD/CT1/N/OPTO/ZIP14/BR/1109
TEST PROGRAM	HCPL5701_TP30MeV_XXX1_B1_V10.llb HCPL5701_TP60MeV_XXX1_B1_V10.llb HCPL5701_TP200MeV_XXX1_B1_V10.llb

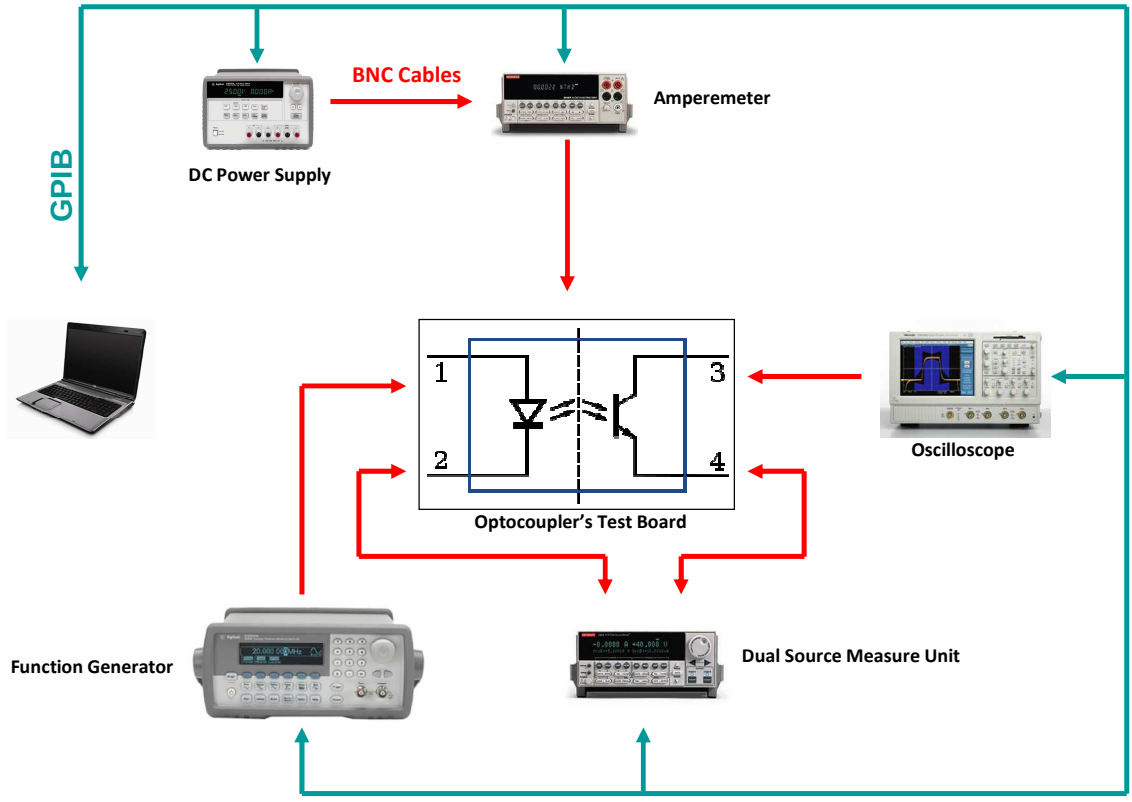


Figure 8: test principle

5.2 Test configuration

Samples were exposed to proton irradiation in three different modes - two on-modes (

Figure 9 and Figure 10) and one off-mode (all terminal leads short-circuited) –

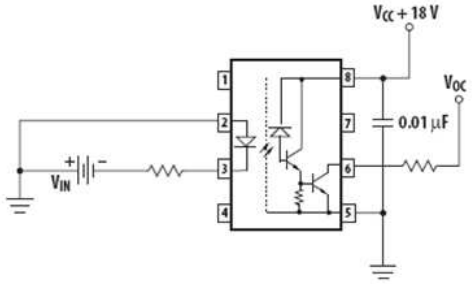


Figure 9: ON bias1

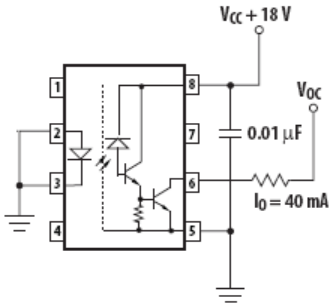


Figure 10: ON bias2

5.3 Electrical parameters

PARAMETER	SYMBOL	TEST CONDITION	MIN	MAX	UNIT
Logic Low Output Voltage	V_{OL1}	I_F=0.5mA, I_{OL}=1.5mA, V_{CC}=4.5 V		0.4	V
	V_{OL2}	I_F=1.6mA, I_{OL}=4.8mA, V_{CC}=4.5 V		0.4	V
	V_{OL3}	I_F=5mA, I_{OL}=10mA, V_{CC}=4.5 V		0.4	V
Logic High Output Current	I_{OH}	I_F=2µA, V_O=18V, V_{CC}=18V		250	µA
Logic Low Supply Current	I_{CCL}	I_F=1.6mA, V_{CC}=18V		2	mA
Logic High Supply Current	I_{CCH}	I_F=0mA, V_{CC}=18 V		20	µA
Input Forward Voltage	V_F	I_F=1.6 mA	1	1.7	V
Input Reverse Breakdown Voltage	B_{VR}	I_R=10µA	5		V
Propagation Delay Time to Logic Low at Output	t_{PHL1}	I_F=0.5mA, R_L=4.7kΩ, V_{CC}=5 V		100	µs
	t_{PHL2}	I_F=1.6mA, R_L=1.5kΩ, V_{CC}=5 V		30	µs
	t_{PHL3}	I_F=5mA, R_L=680Ω, V_{CC}=5 V		10	µs
Propagation Delay Time to Logic Low at Output	t_{PLH1}	I_F=0.5mA, R_L=4.7kΩ, V_{CC}=5 V		60	µs
	t_{PLH2}	I_F=1.6mA, R_L=1.5kΩ, V_{CC}=5 V		50	µs
	t_{PLH3}	I_F=5mA, R_L=680Ω, V_{CC}=5 V		30	µs
Current Transfer Ratio	CTR1	I_F=5mA, V_O=0.4V, V_{CC}=4.5V	200		%
	CTR2	I_F=0.5mA, V_O=0.4V, V_{CC}=5V			%
	CTR3	I_F=1mA, V_O=0.4V, V_{CC}=5V			%
	CTR4	I_F=5mA, V_O=0.4V, V_{CC}=5V			%
	CTR5	I_F=10mA, V_O=0.4V, V_{CC}=5V			%
	CTR6	I_F=5mA, V_O=0.4V, V_{CC}=18V			%

- (*)t_{PHL} propagation delay is measured from the 50% point on the rising edge of the input current pulse to the 1.5 V point on the falling edge of the output pulse. The t_{PLH} propagation delay is measured from the 50% point on the falling edge of the input current pulse to the 1.5 V point on the rising edge of the output pulse.
- Min/ Max values are those specified in the reference data-sheet [RD1].
- Test measurements are performed at 25°C ± 10°C.

6 TEST HISTORY

Test sequence and all required conditions were executed as described in the test plan.
No incident during the test was noticed.

7 SUMMARY RESULTS

7.1 30 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

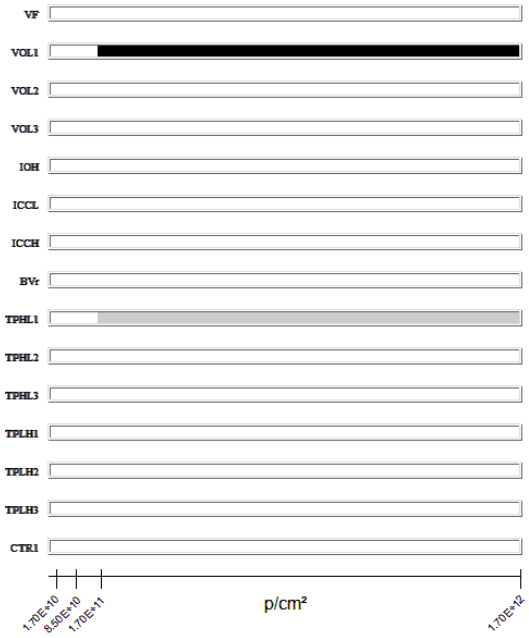


Figure 11: ON Bias 1 under 30 MeV protons

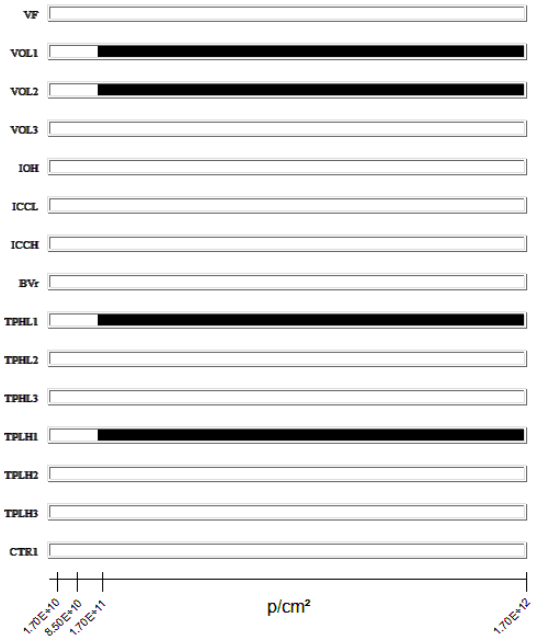
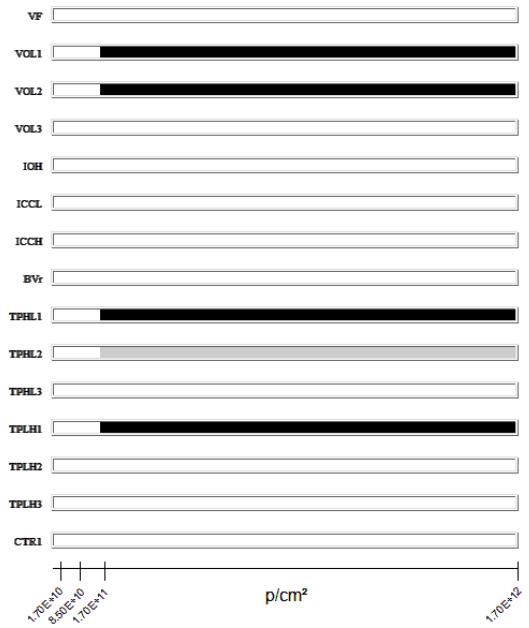


Figure 12: ON Bias 2 under 30 MeV protons



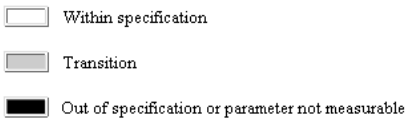


Figure 13: OFF Bias under 30 MeV protons

- **VOL1** is not measurable, whatever the Bias mode, at step 1.7E12.p/cm².
- **VOL2** is not measurable, in ON Bias2 and OFF condition, at step 1.7E12.p/cm².
- **TPHL1** is not measurable, in ON Bias2 and OFF condition, at step 1.7E12.p/cm² and out of specification at 9.22 E11.p/cm² by interpolation in ON Bias1 mode.

- **TPLH1** is not measurable, in ON Bias2 and OFF condition, at step 1.7E12.p/cm².
- For unbiased devices, **TPHL2** is out of specification at 1.61 E12.p/cm² by interpolation. However, as shown in the Figure hereunder, among the five devices tested with this configuration, only one device is out of specification at step 1.7 E12.p/cm².

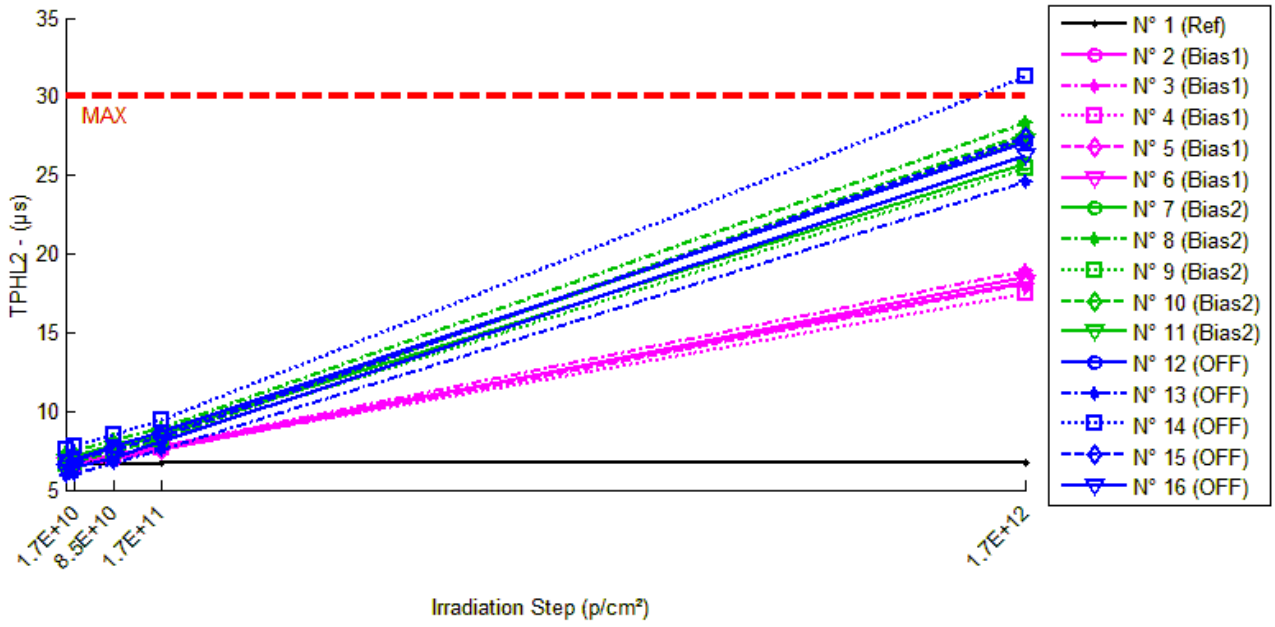


Figure 14: TPHL2 function 30 MeV proton irradiation step for each component

7.2 60 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

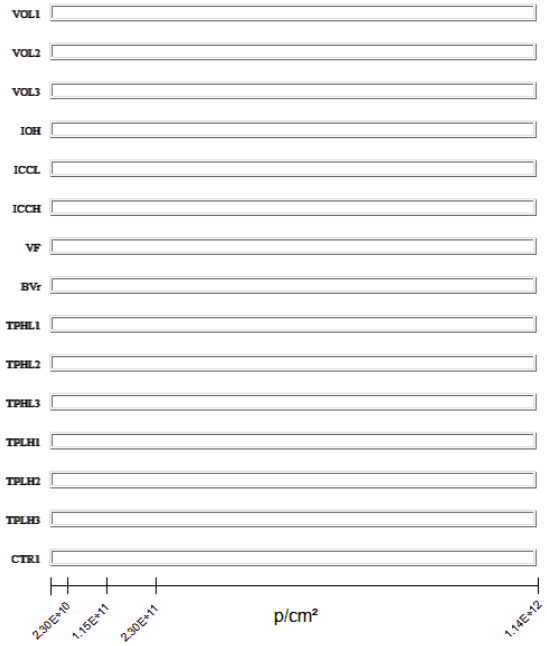


Figure 15: ON Bias 1 under 60 MeV protons

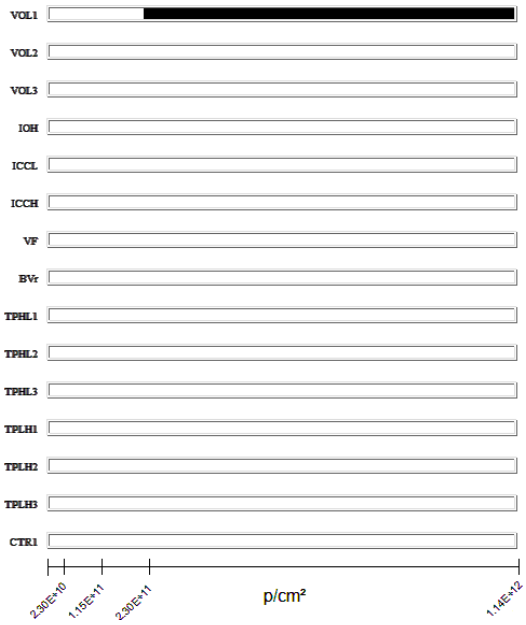
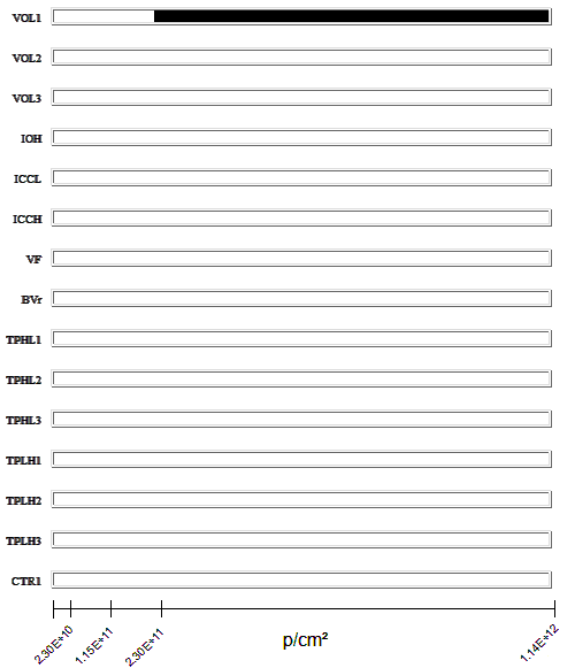


Figure 16: ON Bias 2 under 60 MeV protons



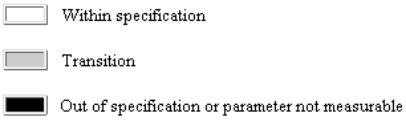


Figure 17: OFF Bias under 60 MeV protons

With the ON Bias1 condition, all parameters are within the specified values at step 1.14E12.p/cm². Figure 16 and Figure 17 show that, under ON Bias2 and OFF modes, **VOL1** is not measurable at step **1.14E12.p/cm².**

7.3 190 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

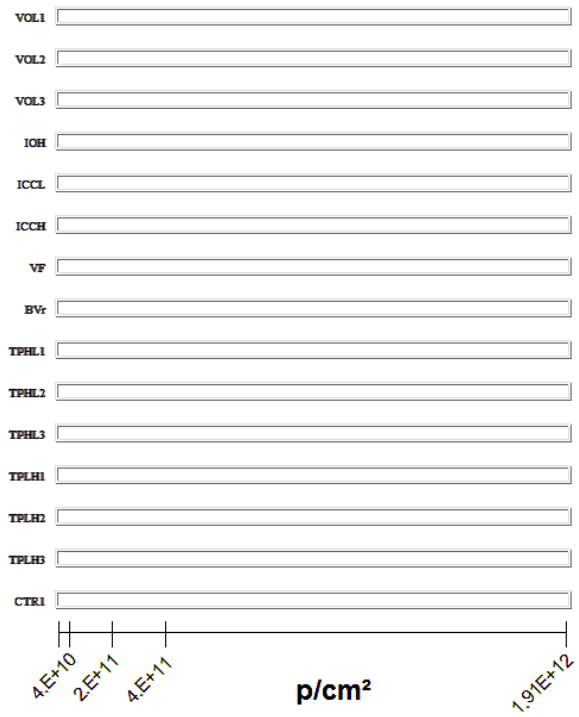


Figure 18: ON Bias 1 under 190 MeV protons

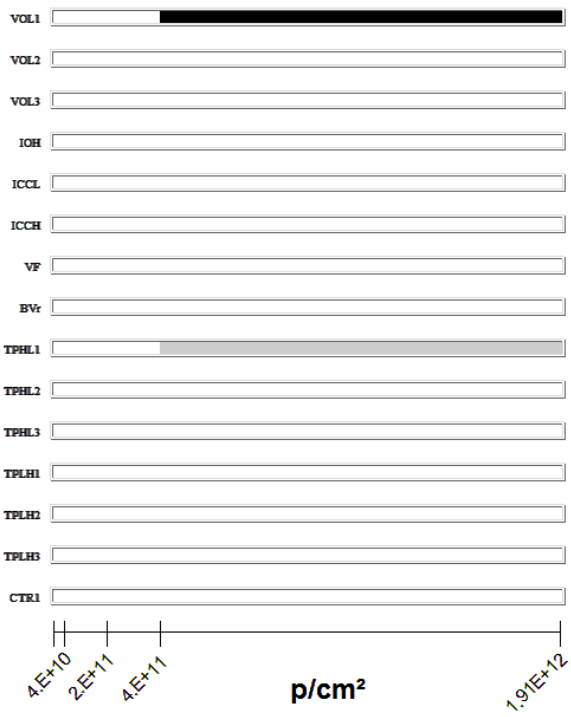
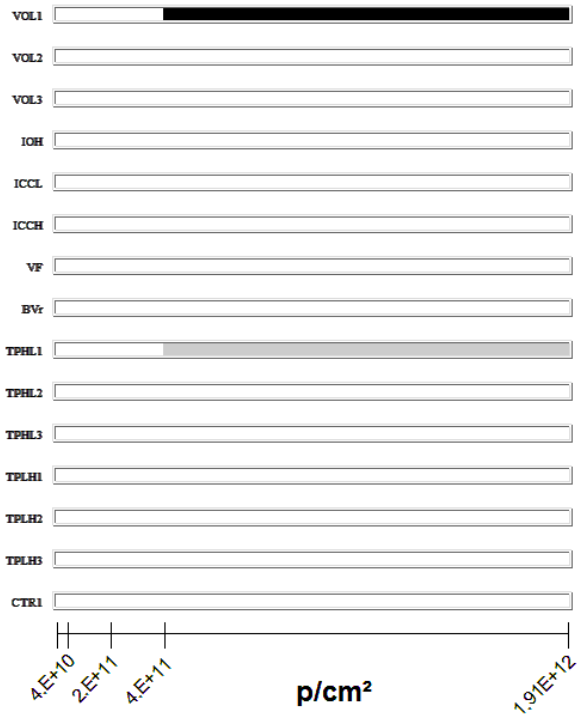


Figure 19: ON Bias 2 under 190 MeV protons



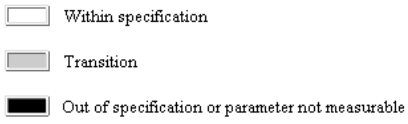


Figure 20: OFF Bias under 190 MeV protons

Under ON Bias1 condition (Figure 18), all parameters are within the specified values at step **1.14E12.p/cm². VOL1** is not measurable at step **1.91E12.p/cm²** (Figures 19 and 20) when parts are under ON Bias2 and OFF modes. **TPHL1** is out of specification at 1.77 E12.p/cm² by interpolation under ON Bias2 condition. **TPHL1** is out of specification at 1.61E12.p/cm² by interpolation in OFF mode.

8 CONCLUSION

Total fluence steady-state irradiation test using protons has been applied on HCPL5701, a High Gain Optocoupler from AVAGO:

- up to 1.7E+12 protons/cm², with an energy of 30 MeV
- up to 1,14E+12 protons/cm², with an energy of 60 MeV
- up to 1,91E+12 protons/cm², with an energy of 190 MeV

The results are:

- Under 30MeV proton Beam:

All devices are functional up to 1.7 E+11 protons/cm² total fluence level.
The parameter VOL1 is not measurable, whatever the Bias mode, at step 1.7E12.p/cm².
VOL2, TPLH1 and TPHL1 parameters are not measurable, in ON Bias2 and OFF conditions, at step 1.7E12.p/cm².

- TPLH1 is not measurable, in ON Bias2 and OFF conditions, at step 1.7E12.p/cm².
- TPHL1 is out of specification at 9.22 E11.p/cm² by interpolation in ON Bias1 mode.
- TPHL2 is out of specification at 1.61 E12.p/cm² by interpolation. However, only one device tested in OFF mode is out of specification at step 1.7 E12.p/cm².

In OFF mode and ON Bias2 configuration, parts are more sensitive to proton displacement damage.

- Under 60MeV proton Beam:

All devices are functional up to 1.14 E+12 protons/cm² total fluence level with the ON Bias1 configuration. All devices are functional up to 2.3 E+11 protons/cm² total fluence level with the ON Bias2 and OFF configuration.

- Under 190MeV proton Beam:

All devices are functional up to 1.91 E+12 protons/cm² total fluence level with the ON Bias1 configuration. All devices are functional up to 4 E+11 protons/cm² total fluence level with the ON Bias2 and OFF configurations.

In OFF mode and ON Bias2 configuration, parts are more sensitive to proton displacement damage.

Average drift current transfer ratio are represented in next Figures depending on proton energy, CTR configuration and Bias condition at final irradiation step.

- CTR5 configuration (IF=10mA, VO=0.4V, VCC=5V) exhibits the smallest average parameter drift whatever the Bias condition.
- Conversely, CRT2 configuration (IF=0.5mA, VO=0.4V, VCC=5V) exhibits the greater parameter degradation.
- ON Bias1 configuration is the least sensitive configuration for all CTR configuration. Conversely, the greater parameter degradation is observed on parts in OFF mode.

However, except for CTR2 configuration, whatever the proton energy, average CTR drifts are almost the same for ON Bias 2 and OFF configurations.
CTR1 (I_F=5mA, V_O=0.4V, V_{CC}=4.5V), which is the only CTR configuration subject to specification, is still above the specified value up to total fluence whatever the energy of proton beam used.

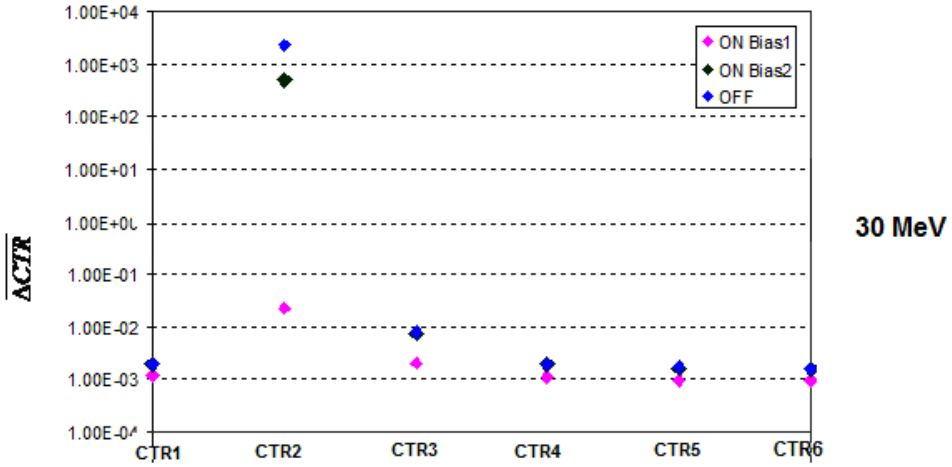


Figure 21: Average drift current transfer ratio under 30 MeV proton

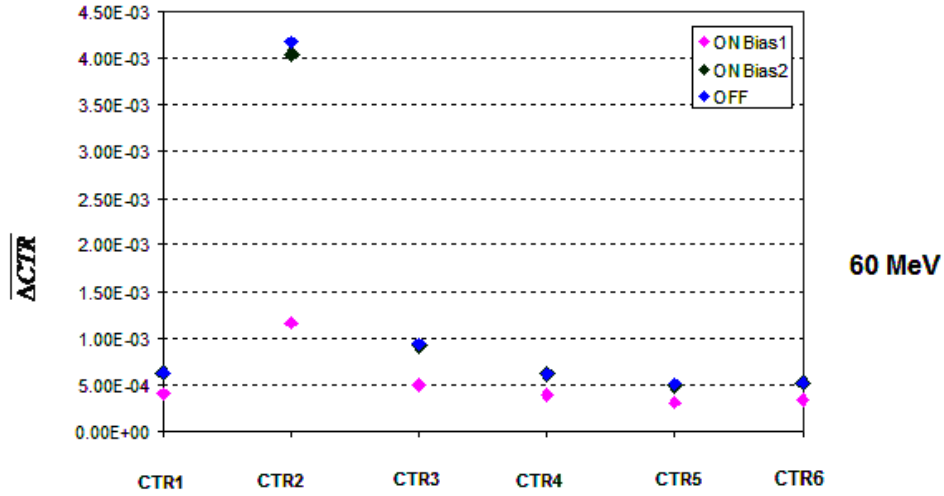


Figure 22: Average drift current transfer ratio under 60 MeV proton

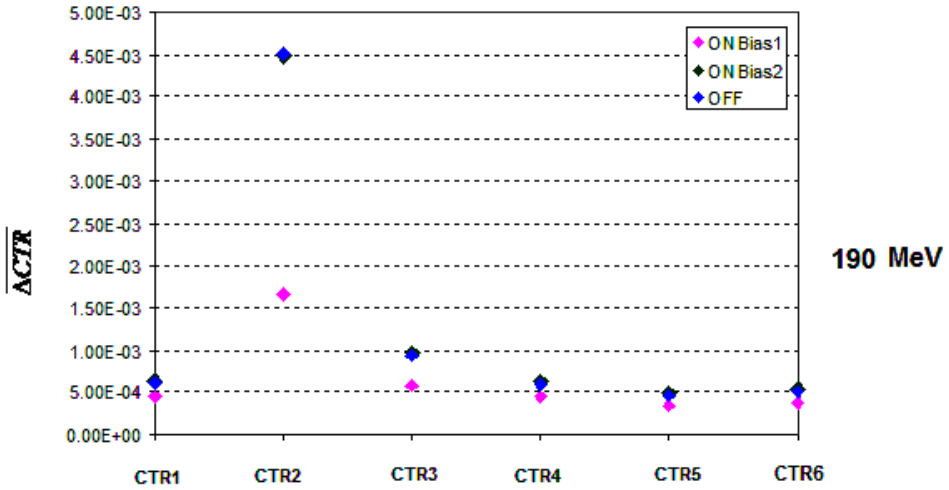


Figure 23: Average drift current transfer ratio under 190 MeV proton

9 DETAILED TESTS RESULTS

The pre and post radiation test results are shown graphically in the following pages:

- 30MeV: 9-2 to 9-41
- 60MeV: 10-2 to 10-41
- 190MeV: 11-2 to 11-41

The data is displayed in the following tables and graphs.

These graphs show parameter's shifts observed during the proton testing sequence. The Control sample results are shown on each graph (black curve).

When available in the device data-sheet/specification, the maximum/minimum/typical values are also shown (red dotted line).

The tables include drift calculation between each measurement step and the "0" proton/cm² step.

For CTR values, the formula used is:

$$\text{Drift} = \frac{1}{\text{measurement (X protons /cm}^2\text{)}} - \frac{1}{\text{measurement (0 proton /cm}^2\text{)}}$$

For the other measurements the formula used is:

Drift value= measurement (X protons/cm²) - measurement (0 proton/cm²)

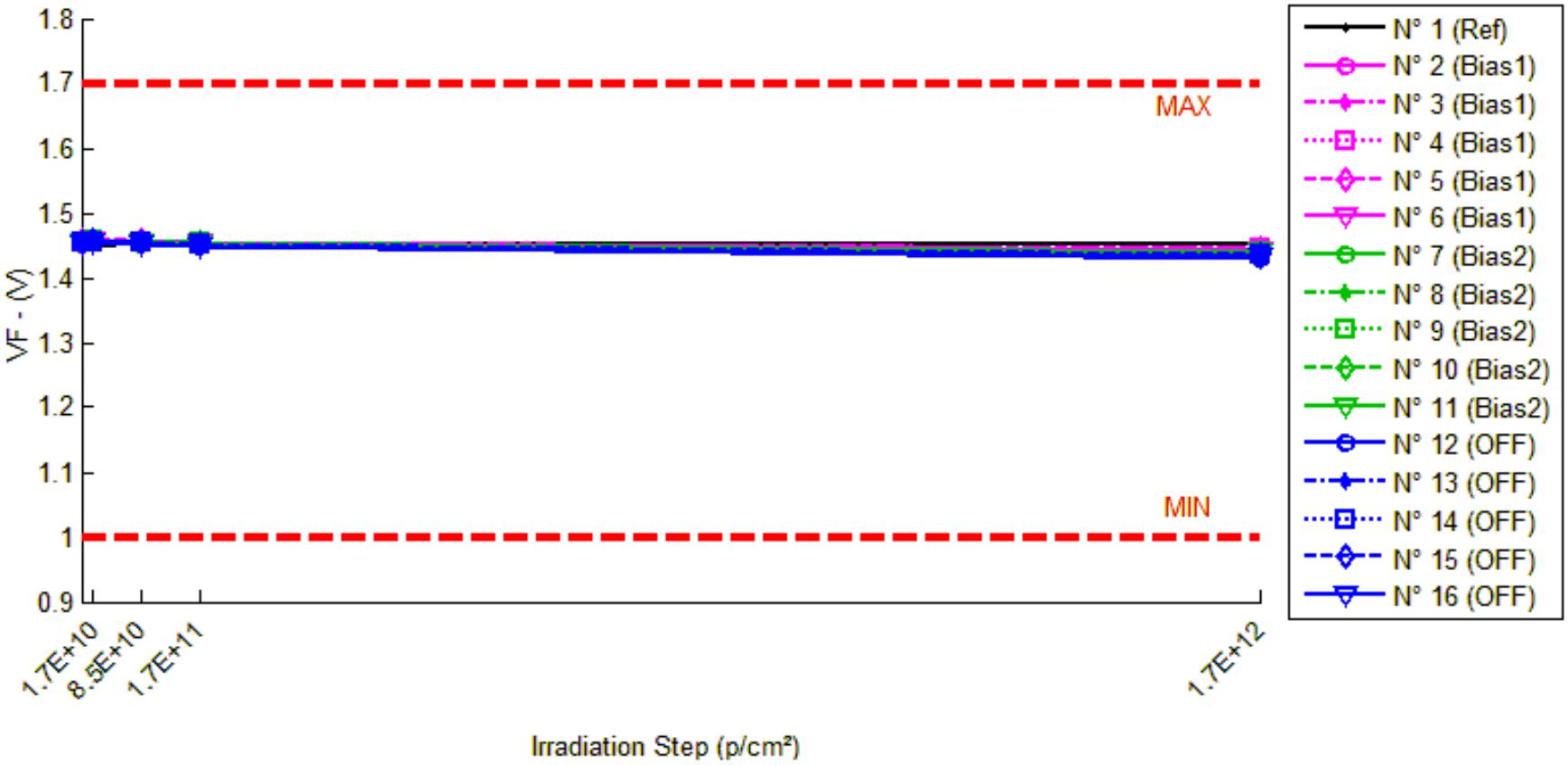
30 MeV proton / detailed results

CONTENTS

30 MeV proton / detailed results

1. VF

Ta=25°C; If=1.6mA



30 MeV proton / detailed results

VF . (V) **Min = 1.0 Max = 1.7**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1.455	1.450	1.454	1.455	1.453
N° 2 (Bias1)	1.453	1.455	1.456	1.455	1.442
N° 3 (Bias1)	1.456	1.456	1.456	1.456	1.444
N° 4 (Bias1)	1.455	1.457	1.456	1.455	1.444
N° 5 (Bias1)	1.457	1.458	1.457	1.456	1.444
N° 6 (Bias1)	1.455	1.457	1.456	1.454	1.443
N° 7 (Bias2)	1.455	1.455	1.451	1.453	1.437
N° 8 (Bias2)	1.454	1.455	1.453	1.452	1.436
N° 9 (Bias2)	1.455	1.457	1.454	1.454	1.438
N° 10 (Bias2)	1.455	1.457	1.455	1.454	1.438
N° 11 (Bias2)	1.455	1.456	1.455	1.452	1.438
N° 12 (OFF)	1.454	1.456	1.455	1.450	1.429
N° 13 (OFF)	1.454	1.456	1.454	1.451	1.433
N° 14 (OFF)	1.454	1.456	1.455	1.452	1.436
N° 15 (OFF)	1.456	1.457	1.456	1.453	1.437
N° 16 (OFF)	1.453	1.455	1.453	1.450	1.433

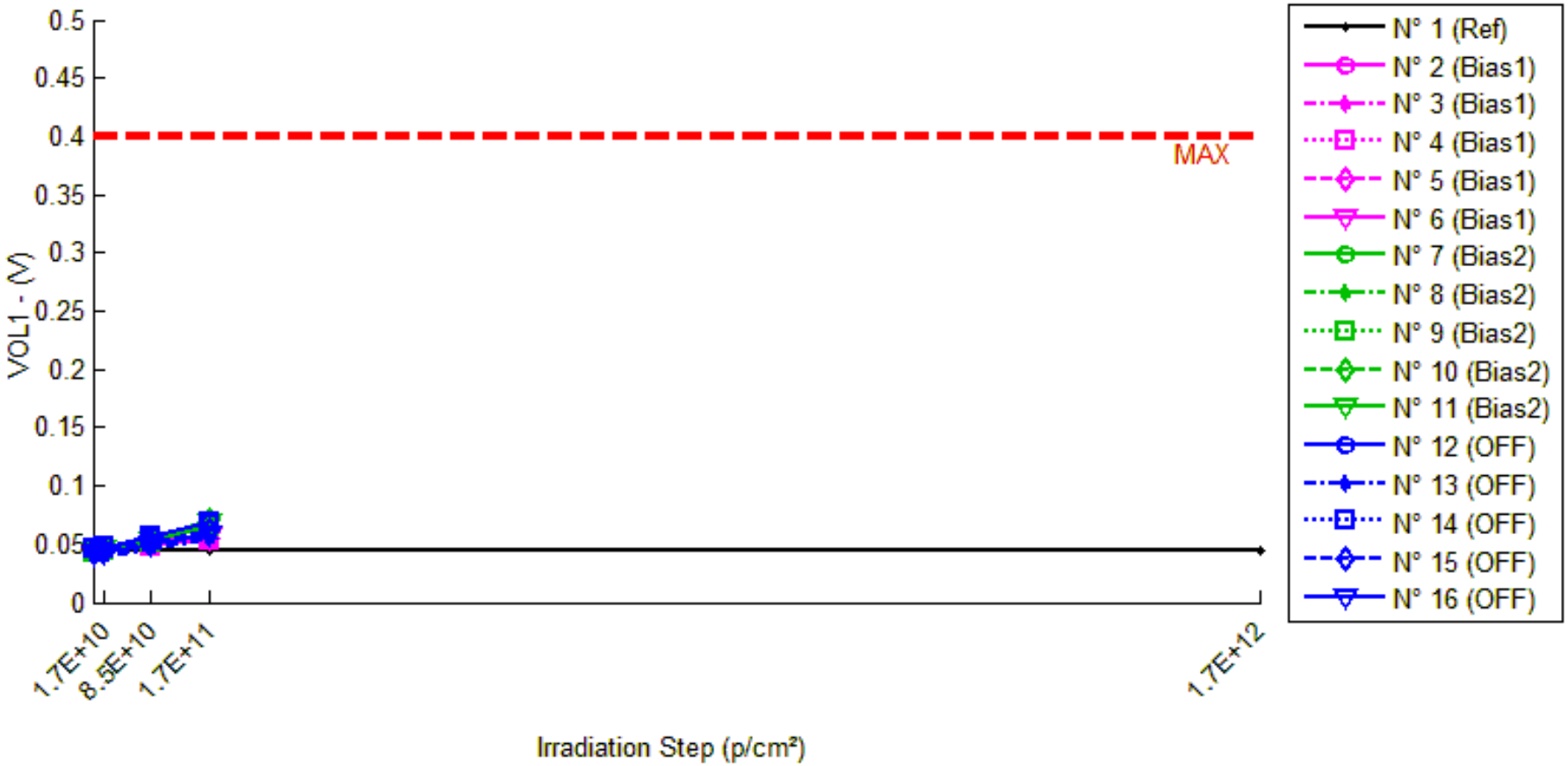
Delta [VF]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-4.659E-3	-1.970E-4	4.450E-4	-1.218E-3
N° 2 (Bias1)	---	1.303E-3	2.386E-3	1.821E-3	-1.151E-2
N° 3 (Bias1)	---	-6.800E-5	-6.030E-4	-2.780E-4	-1.242E-2
N° 4 (Bias1)	---	1.817E-3	1.363E-3	6.360E-4	-1.094E-2
N° 5 (Bias1)	---	1.090E-3	3.450E-4	-9.090E-4	-1.297E-2
N° 6 (Bias1)	---	1.910E-3	1.727E-3	-5.200E-4	-1.144E-2
N° 7 (Bias2)	---	-3.870E-4	-4.457E-3	-2.488E-3	-1.812E-2
N° 8 (Bias2)	---	4.170E-4	-9.430E-4	-1.879E-3	-1.794E-2
N° 9 (Bias2)	---	1.458E-3	-6.070E-4	-1.437E-3	-1.689E-2
N° 10 (Bias2)	---	2.177E-3	4.800E-4	-1.203E-3	-1.668E-2
N° 11 (Bias2)	---	1.000E-3	-2.410E-4	-2.654E-3	-1.722E-2
N° 12 (OFF)	---	2.030E-3	7.660E-4	-3.822E-3	-2.500E-2
N° 13 (OFF)	---	2.302E-3	4.150E-4	-3.290E-3	-2.060E-2
N° 14 (OFF)	---	2.448E-3	9.250E-4	-1.955E-3	-1.745E-2
N° 15 (OFF)	---	1.502E-3	1.790E-4	-2.171E-3	-1.845E-2
N° 16 (OFF)	---	2.737E-3	5.050E-4	-2.994E-3	-1.927E-2
Average (OFF)	---	1.210E-3	1.044E-3	1.500E-4	-1.186E-2
σ (OFF)	---	7.929E-4	1.180E-3	1.093E-3	8.195E-4
Average+3σ (OFF)	---	3.589E-3	4.584E-3	3.430E-3	-9.397E-3
Average-3σ (OFF)	---	-1.168E-3	-2.497E-3	-3.130E-3	-1.431E-2
Average (Bias1)	---	9.330E-4	-1.154E-3	-1.932E-3	-1.737E-2
σ (Bias1)	---	9.793E-4	1.921E-3	6.344E-4	6.359E-4
Average+3σ (Bias1)	---	3.871E-3	4.609E-3	-2.909E-5	-1.546E-2
Average-3σ (Bias1)	---	-2.005E-3	-6.916E-3	-3.835E-3	-1.928E-2
Average (Bias2)	---	2.204E-3	5.580E-4	-2.846E-3	-2.015E-2
σ (Bias2)	---	4.681E-4	2.936E-4	7.780E-4	2.941E-3
Average+3σ (Bias2)	---	3.608E-3	1.439E-3	-5.124E-4	-1.133E-2
Average-3σ (Bias2)	---	7.996E-4	-3.229E-4	-5.180E-3	-2.898E-2

30 MeV proton / detailed results

2. VOL1

Ta=25°C; If=0.5mA ; Iol = 1.5mA ; Vcc = 4.5V



30 MeV proton / detailed results

VOL1 . (V) **Max = 0.4**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.044	0.044	0.044	0.044	0.044
N° 2 (Bias1)	0.043	0.044	0.049	0.055	Not Measurable*
N° 3 (Bias1)	0.045	0.046	0.052	0.057	Not Measurable*
N° 4 (Bias1)	0.043	0.044	0.048	0.054	Not Measurable*
N° 5 (Bias1)	0.043	0.045	0.050	0.055	Not Measurable*
N° 6 (Bias1)	0.044	0.046	0.050	0.056	Not Measurable*
N° 7 (Bias2)	0.045	0.046	0.054	0.065	Not Measurable*
N° 8 (Bias2)	0.045	0.047	0.054	0.066	Not Measurable*
N° 9 (Bias2)	0.043	0.045	0.052	0.065	Not Measurable*
N° 10 (Bias2)	0.044	0.045	0.053	0.070	Not Measurable*
N° 11 (Bias2)	0.044	0.046	0.053	0.068	Not Measurable*
N° 12 (OFF)	0.045	0.047	0.056	0.068	Not Measurable*
N° 13 (OFF)	0.039	0.040	0.046	0.055	Not Measurable*
N° 14 (OFF)	0.046	0.048	0.056	0.069	Not Measurable*
N° 15 (OFF)	0.043	0.044	0.052	0.062	Not Measurable*
N° 16 (OFF)	0.041	0.042	0.049	0.059	Not Measurable*

* Not measurable with this test condition

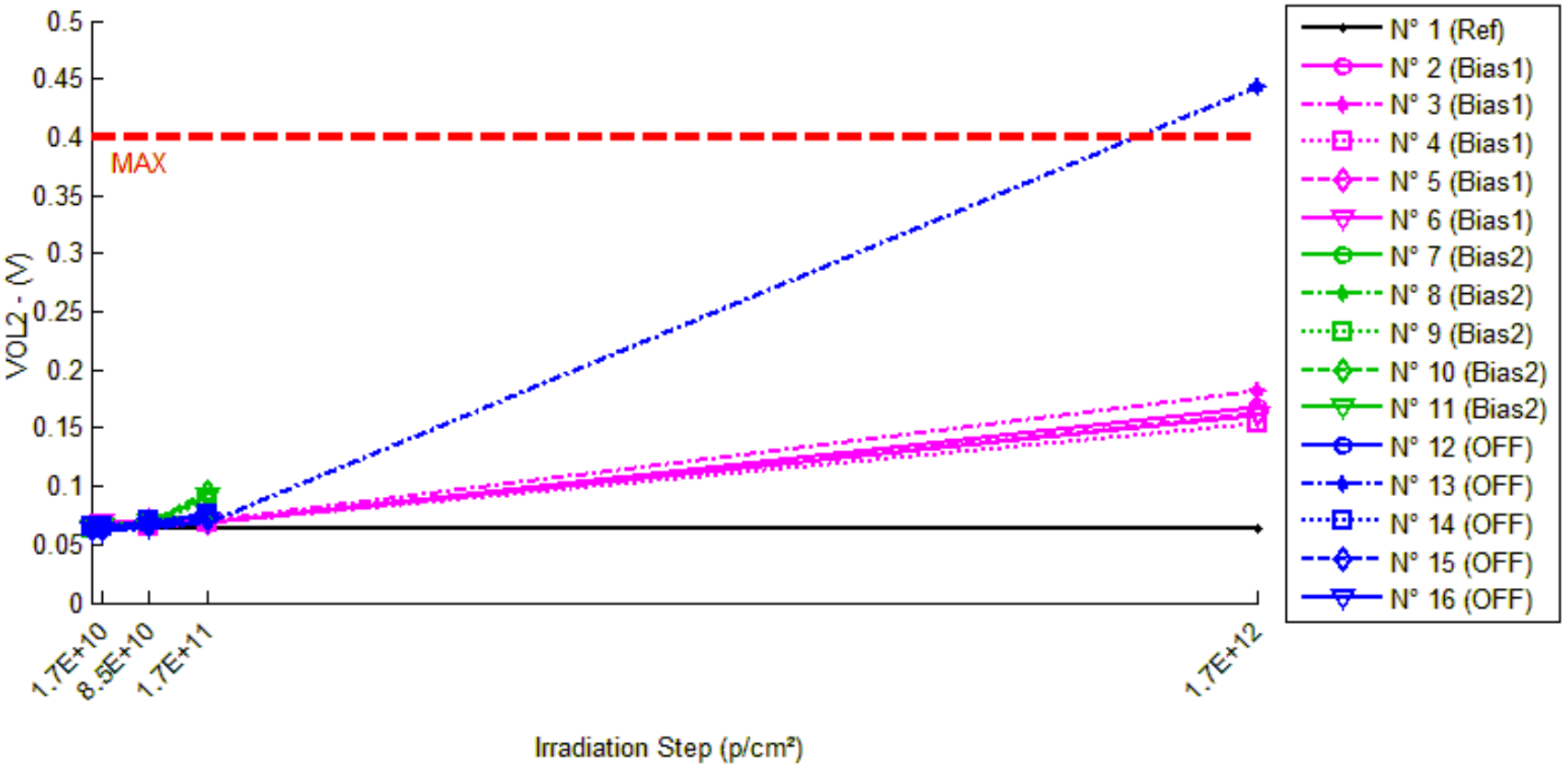
Delta [VOL1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	4.774E-4	3.075E-5	1.140E-5	9.366E-5
N° 2 (Bias1)	---	1.102E-3	5.393E-3	1.195E-2	NaN
N° 3 (Bias1)	---	9.936E-4	6.442E-3	1.209E-2	NaN
N° 4 (Bias1)	---	1.061E-3	4.921E-3	1.055E-2	NaN
N° 5 (Bias1)	---	1.501E-3	6.645E-3	1.128E-2	NaN
N° 6 (Bias1)	---	2.092E-3	5.836E-3	1.195E-2	NaN
N° 7 (Bias2)	---	1.430E-3	9.506E-3	1.997E-2	NaN
N° 8 (Bias2)	---	1.427E-3	9.264E-3	2.040E-2	NaN
N° 9 (Bias2)	---	1.410E-3	8.790E-3	2.199E-2	NaN
N° 10 (Bias2)	---	1.431E-3	9.738E-3	2.660E-2	NaN
N° 11 (Bias2)	---	1.514E-3	8.885E-3	2.429E-2	NaN
N° 12 (OFF)	---	1.606E-3	1.043E-2	2.286E-2	NaN
N° 13 (OFF)	---	1.246E-3	7.385E-3	1.632E-2	NaN
N° 14 (OFF)	---	1.570E-3	1.017E-2	2.312E-2	NaN
N° 15 (OFF)	---	1.370E-3	8.769E-3	1.928E-2	NaN
N° 16 (OFF)	---	1.576E-3	8.146E-3	1.873E-2	NaN
Average (OFF)	---	1.350E-3	5.848E-3	1.156E-2	NaN
σ (OFF)	---	4.599E-4	7.170E-4	6.487E-4	0.000E+0
Average+3σ (OFF)	---	2.730E-3	7.999E-3	1.351E-2	NaN
Average-3σ (OFF)	---	-2.955E-5	3.696E-3	9.619E-3	NaN
Average (Bias1)	---	1.442E-3	9.236E-3	2.265E-2	NaN
σ (Bias1)	---	4.074E-5	4.021E-4	2.781E-3	0.000E+0
Average+3σ (Bias1)	---	1.565E-3	1.044E-2	3.099E-2	NaN
Average-3σ (Bias1)	---	1.320E-3	8.030E-3	1.431E-2	NaN
Average (Bias2)	---	1.473E-3	8.979E-3	2.006E-2	NaN
σ (Bias2)	---	1.579E-4	1.303E-3	2.896E-3	0.000E+0
Average+3σ (Bias2)	---	1.947E-3	1.289E-2	2.875E-2	NaN
Average-3σ (Bias2)	---	9.998E-4	5.071E-3	1.137E-2	NaN

30 MeV proton / detailed results

3. VOL2

Ta=25°C; If=1.6mA ; Iol = 4.8mA ; Vcc = 4.5V



30 MeV proton / detailed results

VOL2 . (V) **Max = 0.4**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.063	0.064	0.063	0.063	0.063
N° 2 (Bias1)	0.063	0.064	0.066	0.068	0.168
N° 3 (Bias1)	0.064	0.065	0.069	0.070	0.182
N° 4 (Bias1)	0.063	0.065	0.066	0.069	0.155
N° 5 (Bias1)	0.063	0.065	0.071	0.069	0.163
N° 6 (Bias1)	0.064	0.068	0.068	0.069	0.162
N° 7 (Bias2)	0.064	0.065	0.070	0.075	Not Measurable*
N° 8 (Bias2)	0.064	0.065	0.069	0.075	Not Measurable*
N° 9 (Bias2)	0.064	0.065	0.070	0.087	Not Measurable*
N° 10 (Bias2)	0.063	0.064	0.069	0.095	Not Measurable*
N° 11 (Bias2)	0.064	0.065	0.069	0.091	Not Measurable*
N° 12 (OFF)	0.064	0.065	0.069	0.075	Not Measurable*
N° 13 (OFF)	0.060	0.061	0.064	0.069	0.443
N° 14 (OFF)	0.065	0.066	0.070	0.076	Not Measurable*
N° 15 (OFF)	0.063	0.064	0.068	0.073	Not Measurable*
N° 16 (OFF)	0.061	0.062	0.065	0.071	Not Measurable*

* Not measurable with this test condition

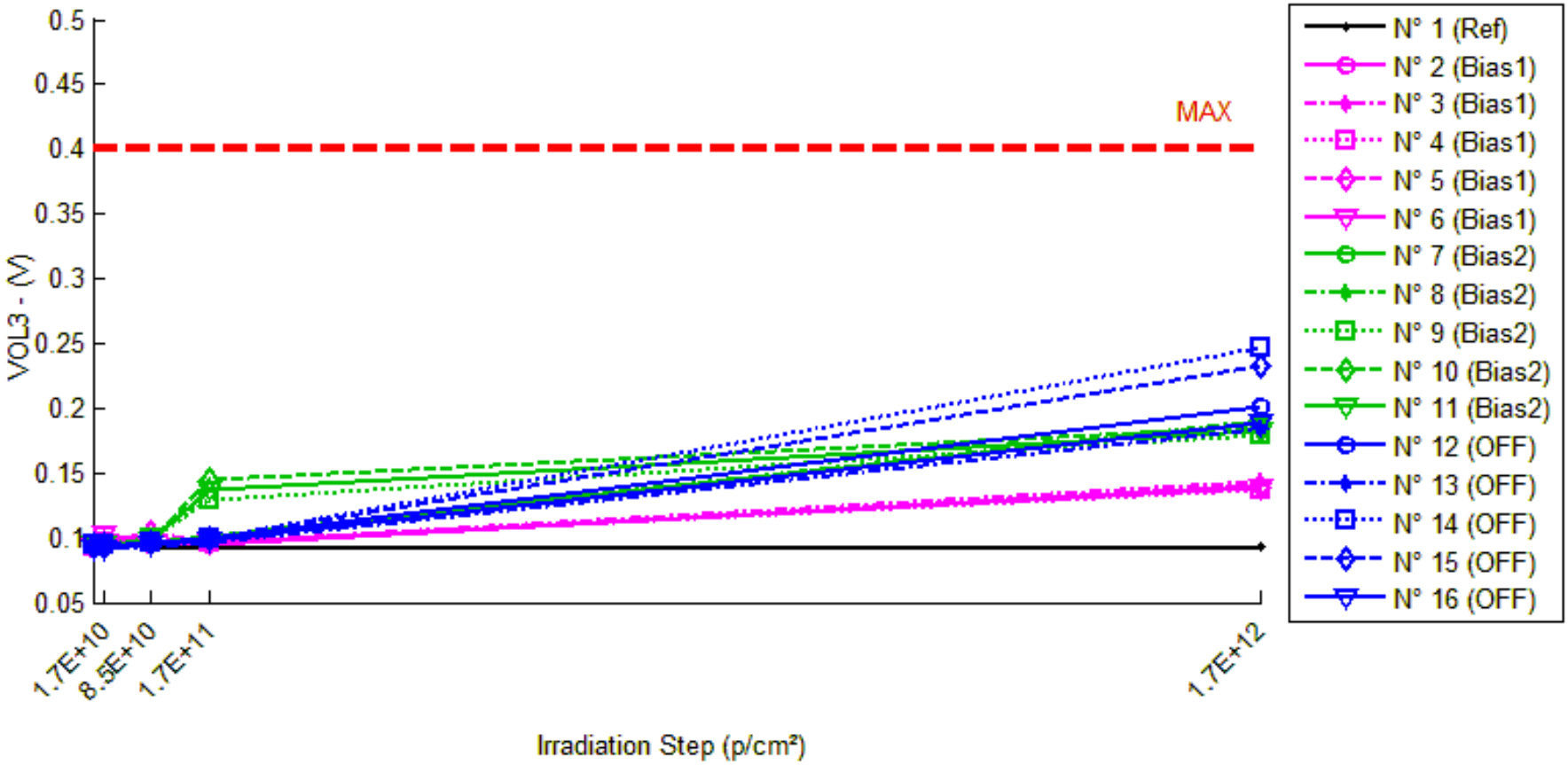
Delta [VOL2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	3.389E-4	-7.703E-5	-5.049E-4	7.564E-5
N° 2 (Bias1)	---	1.220E-3	3.179E-3	5.762E-3	1.055E-1
N° 3 (Bias1)	---	7.428E-4	5.467E-3	5.835E-3	1.177E-1
N° 4 (Bias1)	---	1.594E-3	2.892E-3	5.170E-3	9.197E-2
N° 5 (Bias1)	---	2.057E-3	7.376E-3	5.695E-3	1.001E-1
N° 6 (Bias1)	---	4.645E-3	4.212E-3	5.607E-3	9.848E-2
N° 7 (Bias2)	---	8.437E-4	5.249E-3	1.042E-2	NaN
N° 8 (Bias2)	---	8.290E-4	5.064E-3	1.076E-2	NaN
N° 9 (Bias2)	---	1.174E-3	6.058E-3	2.331E-2	NaN
N° 10 (Bias2)	---	9.760E-4	6.069E-3	3.169E-2	NaN
N° 11 (Bias2)	---	9.803E-4	5.346E-3	2.718E-2	NaN
N° 12 (OFF)	---	6.294E-4	4.971E-3	1.075E-2	NaN
N° 13 (OFF)	---	4.814E-4	3.880E-3	8.793E-3	3.830E-1
N° 14 (OFF)	---	9.051E-4	4.756E-3	1.073E-2	NaN
N° 15 (OFF)	---	5.897E-4	4.473E-3	9.948E-3	NaN
N° 16 (OFF)	---	7.794E-4	4.044E-3	9.415E-3	NaN
Average (OFF)	---	2.052E-3	4.625E-3	5.614E-3	1.027E-1
σ (OFF)	---	1.528E-3	1.840E-3	2.620E-4	9.636E-3
Average+3σ (OFF)	---	6.636E-3	1.015E-2	6.400E-3	1.316E-1
Average-3σ (OFF)	---	-2.533E-3	-8.951E-4	4.828E-3	7.383E-2
Average (Bias1)	---	9.606E-4	5.557E-3	2.067E-2	NaN
σ (Bias1)	---	1.390E-4	4.729E-4	9.672E-3	0.000E+0
Average+3σ (Bias1)	---	1.378E-3	6.976E-3	4.969E-2	NaN
Average-3σ (Bias1)	---	5.436E-4	4.138E-3	-8.343E-3	NaN
Average (Bias2)	---	6.770E-4	4.425E-3	9.927E-3	3.830E-1
σ (Bias2)	---	1.663E-4	4.615E-4	8.476E-4	NaN
Average+3σ (Bias2)	---	1.176E-3	5.809E-3	1.247E-2	NaN
Average-3σ (Bias2)	---	1.780E-4	3.040E-3	7.385E-3	NaN

30 MeV proton / detailed results

4. VOL3

Ta=25°C; If=5mA ; Iol = 10mA ; Vcc = 4.5V



30 MeV proton / detailed results

VOL3 . (V) **Max = 0.4**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.093	0.093	0.093	0.092	0.093
N° 2 (Bias1)	0.092	0.094	0.094	0.095	0.140
N° 3 (Bias1)	0.093	0.094	0.100	0.096	0.144
N° 4 (Bias1)	0.093	0.096	0.096	0.096	0.137
N° 5 (Bias1)	0.093	0.096	0.104	0.096	0.139
N° 6 (Bias1)	0.093	0.103	0.098	0.096	0.138
N° 7 (Bias2)	0.094	0.094	0.097	0.101	0.188
N° 8 (Bias2)	0.093	0.094	0.097	0.101	0.190
N° 9 (Bias2)	0.094	0.095	0.100	0.129	0.179
N° 10 (Bias2)	0.093	0.094	0.098	0.145	0.185
N° 11 (Bias2)	0.094	0.095	0.098	0.137	0.183
N° 12 (OFF)	0.093	0.093	0.096	0.100	0.202
N° 13 (OFF)	0.091	0.091	0.093	0.097	0.184
N° 14 (OFF)	0.094	0.095	0.097	0.100	0.246
N° 15 (OFF)	0.094	0.094	0.096	0.100	0.232
N° 16 (OFF)	0.092	0.092	0.094	0.098	0.188

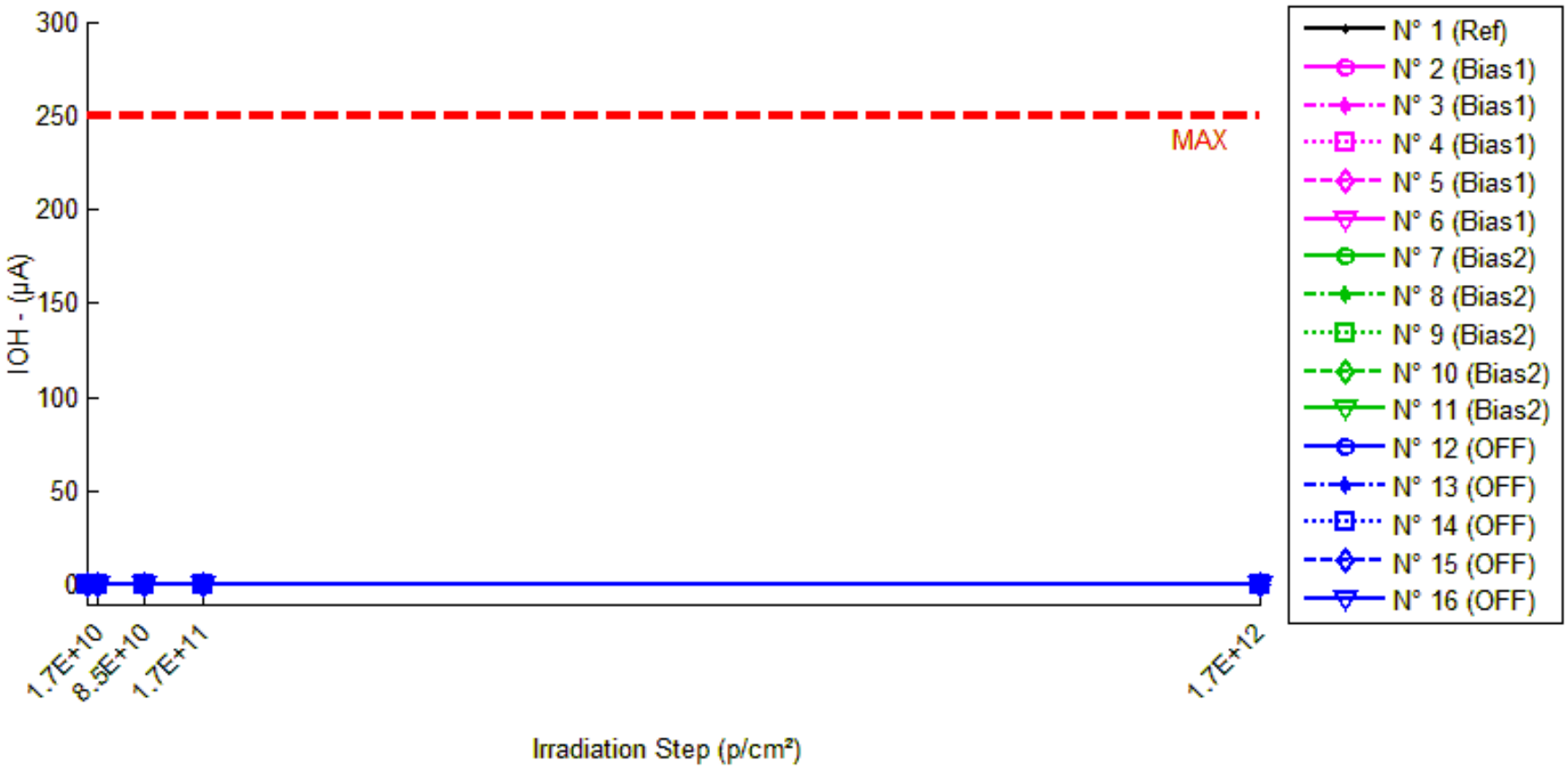
Delta [VOL3]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	3.017E-4	-2.116E-4	-1.167E-3	-4.573E-5
N° 2 (Bias1)	---	1.912E-3	2.463E-3	2.746E-3	4.786E-2
N° 3 (Bias1)	---	7.624E-4	7.290E-3	2.848E-3	5.053E-2
N° 4 (Bias1)	---	2.899E-3	2.189E-3	2.372E-3	4.387E-2
N° 5 (Bias1)	---	3.637E-3	1.170E-2	2.738E-3	4.666E-2
N° 6 (Bias1)	---	9.587E-3	4.804E-3	2.616E-3	4.522E-2
N° 7 (Bias2)	---	4.474E-4	3.574E-3	7.121E-3	9.471E-2
N° 8 (Bias2)	---	4.840E-4	3.610E-3	8.038E-3	9.646E-2
N° 9 (Bias2)	---	1.294E-3	6.155E-3	3.558E-2	8.538E-2
N° 10 (Bias2)	---	8.528E-4	5.454E-3	5.183E-2	9.159E-2
N° 11 (Bias2)	---	7.858E-4	4.404E-3	4.305E-2	8.893E-2
N° 12 (OFF)	---	-1.757E-4	2.551E-3	6.479E-3	1.087E-1
N° 13 (OFF)	---	-2.148E-4	1.859E-3	5.667E-3	9.226E-2
N° 14 (OFF)	---	5.677E-4	2.421E-3	6.237E-3	1.521E-1
N° 15 (OFF)	---	-5.498E-5	2.340E-3	6.350E-3	1.387E-1
N° 16 (OFF)	---	6.436E-5	2.008E-3	6.000E-3	9.616E-2
Average (OFF)	---	3.760E-3	5.689E-3	2.664E-3	4.683E-2
σ (OFF)	---	3.432E-3	3.940E-3	1.825E-4	2.557E-3
Average+3σ (OFF)	---	1.406E-2	1.751E-2	3.212E-3	5.450E-2
Average-3σ (OFF)	---	-6.536E-3	-6.133E-3	2.117E-3	3.916E-2
Average (Bias1)	---	7.727E-4	4.640E-3	2.912E-2	9.141E-2
σ (Bias1)	---	3.418E-4	1.141E-3	2.049E-2	4.443E-3
Average+3σ (Bias1)	---	1.798E-3	8.064E-3	9.060E-2	1.047E-1
Average-3σ (Bias1)	---	-2.526E-4	1.215E-3	-3.235E-2	7.809E-2
Average (Bias2)	---	3.733E-5	2.236E-3	6.147E-3	1.176E-1
σ (Bias2)	---	3.160E-4	2.908E-4	3.208E-4	2.652E-2
Average+3σ (Bias2)	---	9.854E-4	3.108E-3	7.109E-3	1.972E-1
Average-3σ (Bias2)	---	-9.108E-4	1.363E-3	5.184E-3	3.802E-2

30 MeV proton / detailed results

5. IOH

Ta=25°C; If=2µA; Vo=Vcc=18V



30 MeV proton / detailed results

IOH . (µA) **Max = 250.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	4.368E-4	4.270E-4	4.206E-4	4.602E-4	4.123E-4
N° 2 (Bias1)	5.219E-4	5.079E-4	5.484E-4	5.348E-4	5.442E-4
N° 3 (Bias1)	4.515E-4	4.361E-4	4.348E-4	4.580E-4	5.293E-4
N° 4 (Bias1)	4.384E-4	4.278E-4	4.362E-4	4.481E-4	5.073E-4
N° 5 (Bias1)	4.537E-4	4.284E-4	4.313E-4	4.550E-4	5.244E-4
N° 6 (Bias1)	4.519E-4	4.328E-4	4.354E-4	4.473E-4	5.112E-4
N° 7 (Bias2)	4.508E-4	3.924E-4	3.901E-4	3.912E-4	4.834E-4
N° 8 (Bias2)	4.101E-4	3.869E-4	4.112E-4	3.980E-4	4.784E-4
N° 9 (Bias2)	4.533E-4	4.004E-4	3.967E-4	4.089E-4	4.717E-4
N° 10 (Bias2)	4.514E-4	4.021E-4	4.053E-4	4.124E-4	4.645E-4
N° 11 (Bias2)	4.550E-4	4.026E-4	4.065E-4	4.134E-4	4.730E-4
N° 12 (OFF)	4.509E-4	4.154E-4	4.133E-4	4.264E-4	5.183E-4
N° 13 (OFF)	4.498E-4	4.203E-4	4.186E-4	4.333E-4	4.944E-4
N° 14 (OFF)	4.424E-4	4.363E-4	4.232E-4	4.336E-4	4.768E-4
N° 15 (OFF)	4.470E-4	4.252E-4	4.330E-4	4.430E-4	4.902E-4
N° 16 (OFF)	4.480E-4	4.322E-4	4.387E-4	4.516E-4	4.967E-4

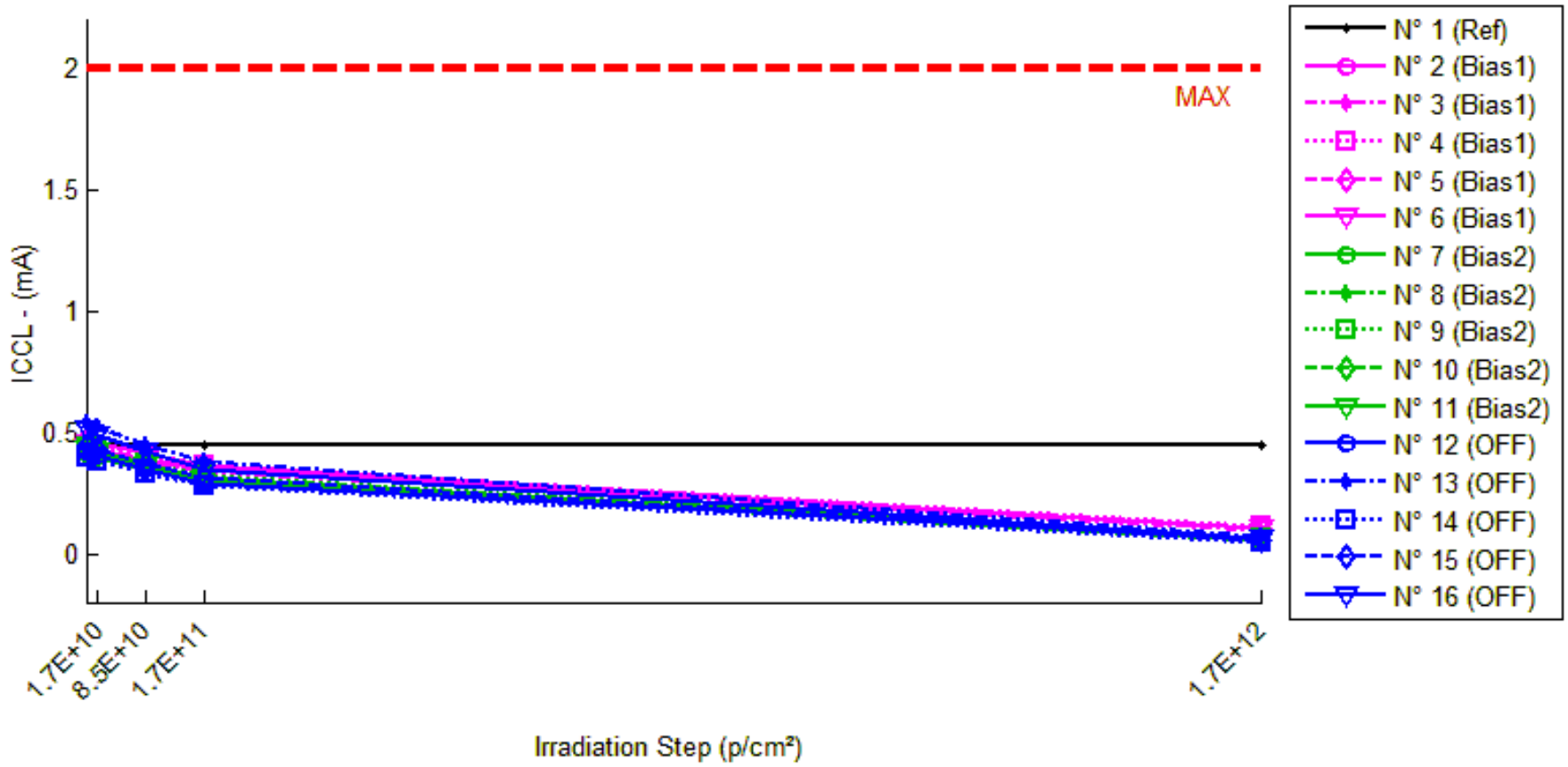
Delta [IOH]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-9.766E-6	-1.614E-5	2.339E-5	-2.452E-5
N° 2 (Bias1)	---	-1.400E-5	2.644E-5	1.291E-5	2.229E-5
N° 3 (Bias1)	---	-1.538E-5	-1.672E-5	6.495E-6	7.778E-5
N° 4 (Bias1)	---	-1.052E-5	-2.181E-6	9.721E-6	6.898E-5
N° 5 (Bias1)	---	-2.523E-5	-2.238E-5	1.381E-6	7.074E-5
N° 6 (Bias1)	---	-1.907E-5	-1.647E-5	-4.612E-6	5.926E-5
N° 7 (Bias2)	---	-5.839E-5	-6.065E-5	-5.956E-5	3.265E-5
N° 8 (Bias2)	---	-2.318E-5	1.127E-6	-1.212E-5	6.827E-5
N° 9 (Bias2)	---	-5.290E-5	-5.663E-5	-4.439E-5	1.835E-5
N° 10 (Bias2)	---	-4.929E-5	-4.602E-5	-3.898E-5	1.316E-5
N° 11 (Bias2)	---	-5.244E-5	-4.845E-5	-4.158E-5	1.798E-5
N° 12 (OFF)	---	-3.546E-5	-3.756E-5	-2.448E-5	6.743E-5
N° 13 (OFF)	---	-2.959E-5	-3.123E-5	-1.656E-5	4.459E-5
N° 14 (OFF)	---	-6.081E-6	-1.920E-5	-8.806E-6	3.440E-5
N° 15 (OFF)	---	-2.184E-5	-1.396E-5	-3.986E-6	4.321E-5
N° 16 (OFF)	---	-1.585E-5	-9.393E-6	3.515E-6	4.870E-5
Average (OFF)	---	-1.684E-5	-6.263E-6	5.178E-6	5.981E-5
σ (OFF)	---	5.602E-6	1.975E-5	6.935E-6	2.199E-5
Average+3σ (OFF)	---	-3.508E-8	5.298E-5	2.598E-5	1.258E-4
Average-3σ (OFF)	---	-3.365E-5	-6.551E-5	-1.563E-5	-6.163E-6
Average (Bias1)	---	-4.724E-5	-4.213E-5	-3.933E-5	3.008E-5
σ (Bias1)	---	1.384E-5	2.490E-5	1.718E-5	2.256E-5
Average+3σ (Bias1)	---	-5.716E-6	3.257E-5	1.221E-5	9.776E-5
Average-3σ (Bias1)	---	-8.876E-5	-1.168E-4	-9.086E-5	-3.759E-5
Average (Bias2)	---	-2.176E-5	-2.227E-5	-1.006E-5	4.766E-5
σ (Bias2)	---	1.151E-5	1.181E-5	1.087E-5	1.222E-5
Average+3σ (Bias2)	---	1.276E-5	1.317E-5	2.256E-5	8.431E-5
Average-3σ (Bias2)	---	-5.629E-5	-5.771E-5	-4.268E-5	1.102E-5

30 MeV proton / detailed results

6. ICCL

Ta=25°C; Vcc=18V; If=1.6mA



30 MeV proton / detailed results

ICCL . (mA) **Max = 2.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.450	0.446	0.450	0.447	0.449
N° 2 (Bias1)	0.469	0.456	0.412	0.365	0.102
N° 3 (Bias1)	0.429	0.418	0.381	0.341	0.096
N° 4 (Bias1)	0.452	0.443	0.405	0.363	0.111
N° 5 (Bias1)	0.442	0.430	0.392	0.350	0.104
N° 6 (Bias1)	0.437	0.427	0.388	0.346	0.104
N° 7 (Bias2)	0.415	0.401	0.346	0.299	0.059
N° 8 (Bias2)	0.415	0.401	0.350	0.301	0.058
N° 9 (Bias2)	0.442	0.428	0.371	0.321	0.064
N° 10 (Bias2)	0.447	0.431	0.367	0.312	0.059
N° 11 (Bias2)	0.434	0.419	0.364	0.312	0.060
N° 12 (OFF)	0.424	0.408	0.346	0.292	0.063
N° 13 (OFF)	0.543	0.522	0.447	0.378	0.070
N° 14 (OFF)	0.395	0.380	0.329	0.277	0.050
N° 15 (OFF)	0.449	0.433	0.371	0.315	0.059
N° 16 (OFF)	0.515	0.490	0.422	0.351	0.065

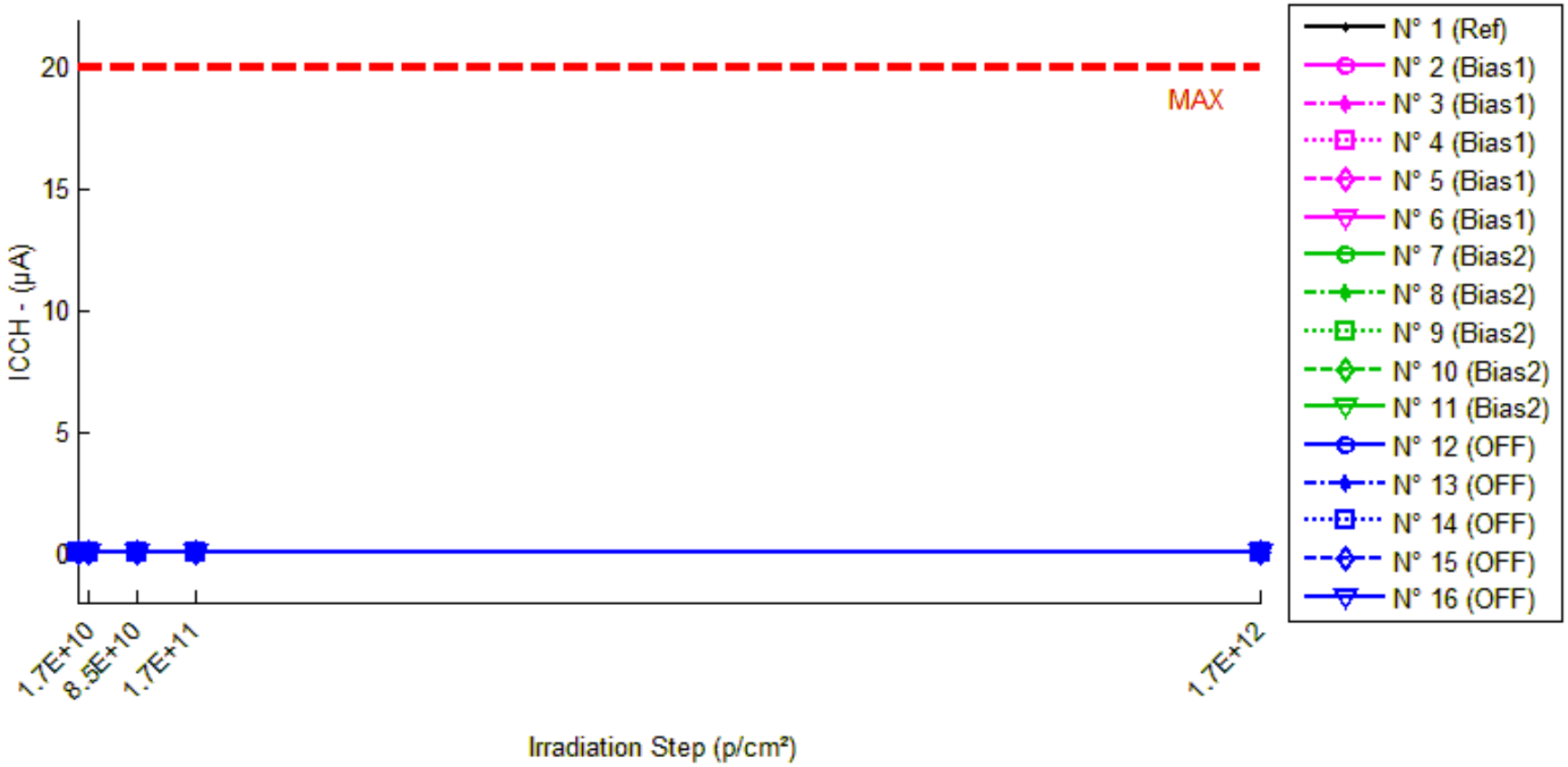
Delta [ICCL]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-4.162E-3	-3.290E-4	-2.975E-3	-6.410E-4
N° 2 (Bias1)	---	-1.218E-2	-5.641E-2	-1.040E-1	-3.665E-1
N° 3 (Bias1)	---	-1.083E-2	-4.834E-2	-8.860E-2	-3.333E-1
N° 4 (Bias1)	---	-8.746E-3	-4.654E-2	-8.874E-2	-3.411E-1
N° 5 (Bias1)	---	-1.232E-2	-5.063E-2	-9.206E-2	-3.385E-1
N° 6 (Bias1)	---	-9.843E-3	-4.916E-2	-9.131E-2	-3.335E-1
N° 7 (Bias2)	---	-1.362E-2	-6.822E-2	-1.154E-1	-3.558E-1
N° 8 (Bias2)	---	-1.365E-2	-6.515E-2	-1.140E-1	-3.566E-1
N° 9 (Bias2)	---	-1.409E-2	-7.033E-2	-1.208E-1	-3.777E-1
N° 10 (Bias2)	---	-1.583E-2	-8.070E-2	-1.350E-1	-3.887E-1
N° 11 (Bias2)	---	-1.526E-2	-7.041E-2	-1.222E-1	-3.744E-1
N° 12 (OFF)	---	-1.609E-2	-7.764E-2	-1.315E-1	-3.613E-1
N° 13 (OFF)	---	-2.138E-2	-9.603E-2	-1.653E-1	-4.733E-1
N° 14 (OFF)	---	-1.558E-2	-6.658E-2	-1.178E-1	-3.455E-1
N° 15 (OFF)	---	-1.673E-2	-7.868E-2	-1.340E-1	-3.905E-1
N° 16 (OFF)	---	-2.554E-2	-9.380E-2	-1.644E-1	-4.509E-1
Average (OFF)	---	-1.078E-2	-5.021E-2	-9.293E-2	-3.426E-1
σ (OFF)	---	1.528E-3	3.764E-3	6.353E-3	1.377E-2
Average+3σ (OFF)	---	-6.198E-3	-3.892E-2	-7.388E-2	-3.012E-1
Average-3σ (OFF)	---	-1.537E-2	-6.151E-2	-1.120E-1	-3.839E-1
Average (Bias1)	---	-1.449E-2	-7.096E-2	-1.215E-1	-3.706E-1
σ (Bias1)	---	1.002E-3	5.850E-3	8.309E-3	1.421E-2
Average+3σ (Bias1)	---	-1.148E-2	-5.341E-2	-9.658E-2	-3.280E-1
Average-3σ (Bias1)	---	-1.749E-2	-8.851E-2	-1.464E-1	-4.133E-1
Average (Bias2)	---	-1.907E-2	-8.255E-2	-1.426E-1	-4.043E-1
σ (Bias2)	---	4.294E-3	1.227E-2	2.123E-2	5.575E-2
Average+3σ (Bias2)	---	-6.185E-3	-4.573E-2	-7.891E-2	-2.371E-1
Average-3σ (Bias2)	---	-3.195E-2	-1.194E-1	-2.063E-1	-5.715E-1

30 MeV proton / detailed results

7. ICCH

Ta=25°C; Vcc=18V; If=0



30 MeV proton / detailed results

ICCH . (µA) **Max = 20.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.016	0.017	0.015	0.016	0.015
N° 2 (Bias1)	0.016	0.017	0.014	0.016	0.022
N° 3 (Bias1)	0.017	0.016	0.017	0.015	0.021
N° 4 (Bias1)	0.015	0.015	0.014	0.019	0.019
N° 5 (Bias1)	0.016	0.015	0.016	0.015	0.021
N° 6 (Bias1)	0.017	0.016	0.015	0.015	0.019
N° 7 (Bias2)	0.016	0.015	0.018	0.016	0.021
N° 8 (Bias2)	0.015	0.014	0.014	0.017	0.019
N° 9 (Bias2)	0.014	0.016	0.013	0.015	0.021
N° 10 (Bias2)	0.016	0.016	0.013	0.017	0.019
N° 11 (Bias2)	0.015	0.017	0.015	0.016	0.020
N° 12 (OFF)	0.017	0.017	0.016	0.016	0.021
N° 13 (OFF)	0.016	0.016	0.015	0.014	0.022
N° 14 (OFF)	0.016	0.015	0.016	0.014	0.017
N° 15 (OFF)	0.015	0.016	0.014	0.015	0.018
N° 16 (OFF)	0.016	0.017	0.016	0.016	0.019

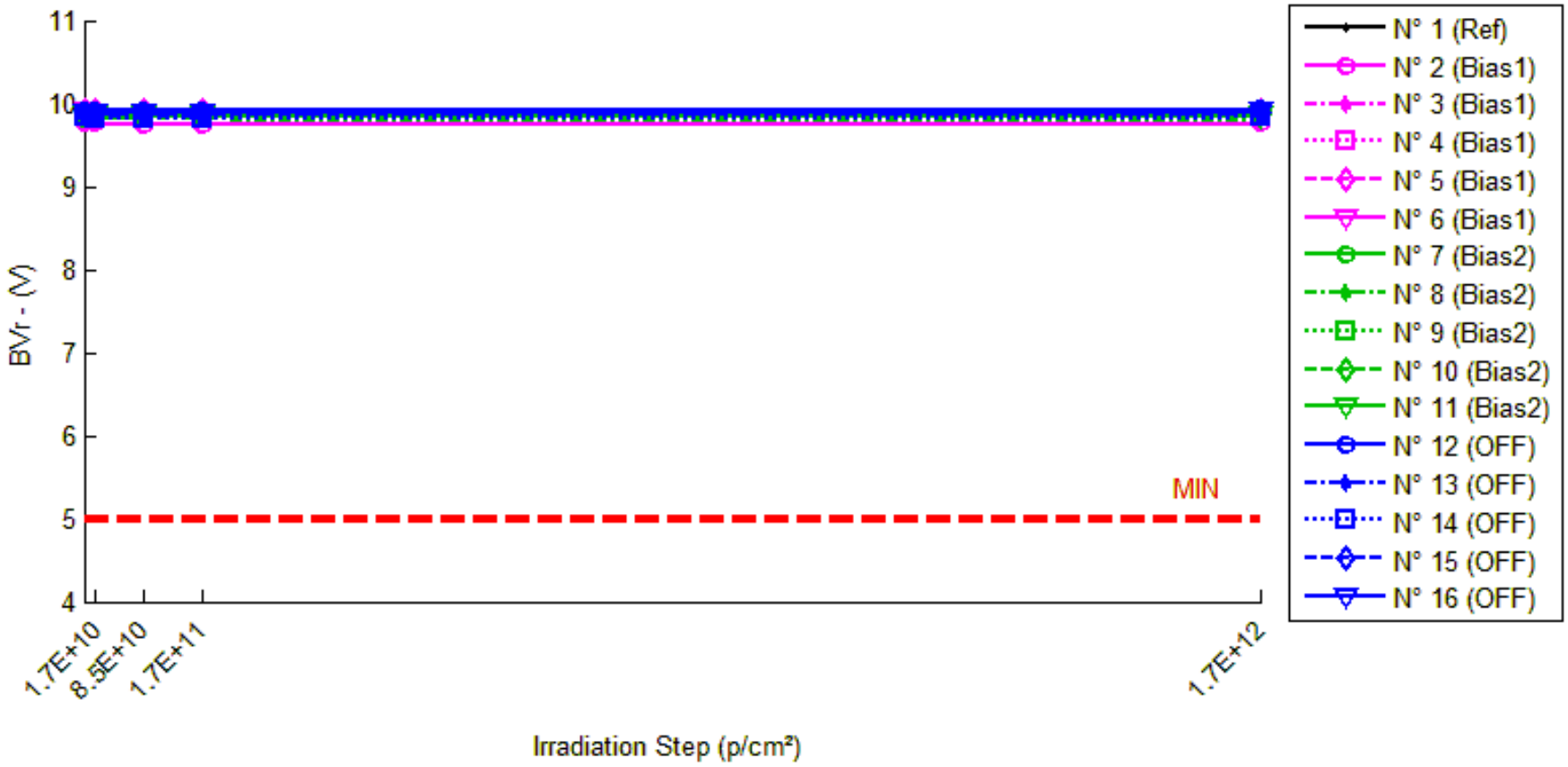
Delta [ICCH]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.190E-3	-8.600E-4	1.100E-4	-3.000E-4
N° 2 (Bias1)	---	1.440E-3	-1.320E-3	0.000E+0	5.990E-3
N° 3 (Bias1)	---	-1.270E-3	-1.000E-4	-1.700E-3	4.540E-3
N° 4 (Bias1)	---	3.700E-4	-6.400E-4	3.590E-3	4.220E-3
N° 5 (Bias1)	---	-1.610E-3	-5.600E-4	-9.900E-4	4.430E-3
N° 6 (Bias1)	---	-8.200E-4	-1.730E-3	-1.440E-3	2.620E-3
N° 7 (Bias2)	---	-5.300E-4	2.130E-3	6.000E-5	5.270E-3
N° 8 (Bias2)	---	-1.130E-3	-2.100E-4	2.250E-3	4.530E-3
N° 9 (Bias2)	---	2.200E-3	-2.700E-4	1.480E-3	7.020E-3
N° 10 (Bias2)	---	2.900E-4	-2.300E-3	1.290E-3	3.000E-3
N° 11 (Bias2)	---	2.300E-3	-1.000E-4	1.790E-3	5.050E-3
N° 12 (OFF)	---	2.800E-4	-4.900E-4	-4.300E-4	4.410E-3
N° 13 (OFF)	---	2.100E-4	-8.400E-4	-1.680E-3	5.910E-3
N° 14 (OFF)	---	-1.130E-3	-2.400E-4	-2.540E-3	1.210E-3
N° 15 (OFF)	---	1.270E-3	-9.900E-4	-5.600E-4	3.070E-3
N° 16 (OFF)	---	1.540E-3	3.500E-4	7.200E-4	3.300E-3
Average (OFF)	---	-3.780E-4	-8.700E-4	-1.080E-4	4.360E-3
σ (OFF)	---	1.262E-3	6.488E-4	2.166E-3	1.198E-3
Average+3σ (OFF)	---	3.409E-3	1.077E-3	6.391E-3	7.954E-3
Average-3σ (OFF)	---	-4.165E-3	-2.817E-3	-6.607E-3	7.658E-4
Average (Bias1)	---	6.260E-4	-1.500E-4	1.374E-3	4.974E-3
σ (Bias1)	---	1.566E-3	1.569E-3	8.193E-4	1.447E-3
Average+3σ (Bias1)	---	5.325E-3	4.556E-3	3.832E-3	9.315E-3
Average-3σ (Bias1)	---	-4.073E-3	-4.856E-3	-1.084E-3	6.335E-4
Average (Bias2)	---	4.340E-4	-4.420E-4	-8.980E-4	3.580E-3
σ (Bias2)	---	1.054E-3	5.313E-4	1.251E-3	1.737E-3
Average+3σ (Bias2)	---	3.595E-3	1.152E-3	2.855E-3	8.792E-3
Average-3σ (Bias2)	---	-2.727E-3	-2.036E-3	-4.651E-3	-1.632E-3

30 MeV proton / detailed results

8. BVr

Ta=25°C; Ir = 10µA



30 MeV proton / detailed results

BVr . (V) **Min = 5.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	9.868	9.878	9.868	9.864	9.871
N° 2 (Bias1)	9.761	9.759	9.755	9.756	9.763
N° 3 (Bias1)	9.830	9.831	9.830	9.829	9.839
N° 4 (Bias1)	9.880	9.877	9.877	9.877	9.884
N° 5 (Bias1)	9.910	9.909	9.909	9.910	9.918
N° 6 (Bias1)	9.866	9.862	9.861	9.864	9.867
N° 7 (Bias2)	9.828	9.829	9.835	9.830	9.843
N° 8 (Bias2)	9.818	9.818	9.819	9.818	9.795
N° 9 (Bias2)	9.844	9.841	9.843	9.842	9.847
N° 10 (Bias2)	9.863	9.859	9.859	9.861	9.862
N° 11 (Bias2)	9.877	9.875	9.875	9.877	9.877
N° 12 (OFF)	9.917	9.914	9.913	9.920	9.938
N° 13 (OFF)	9.855	9.851	9.851	9.857	9.864
N° 14 (OFF)	9.830	9.825	9.825	9.829	9.835
N° 15 (OFF)	9.877	9.875	9.874	9.877	9.882
N° 16 (OFF)	9.898	9.895	9.894	9.899	9.916

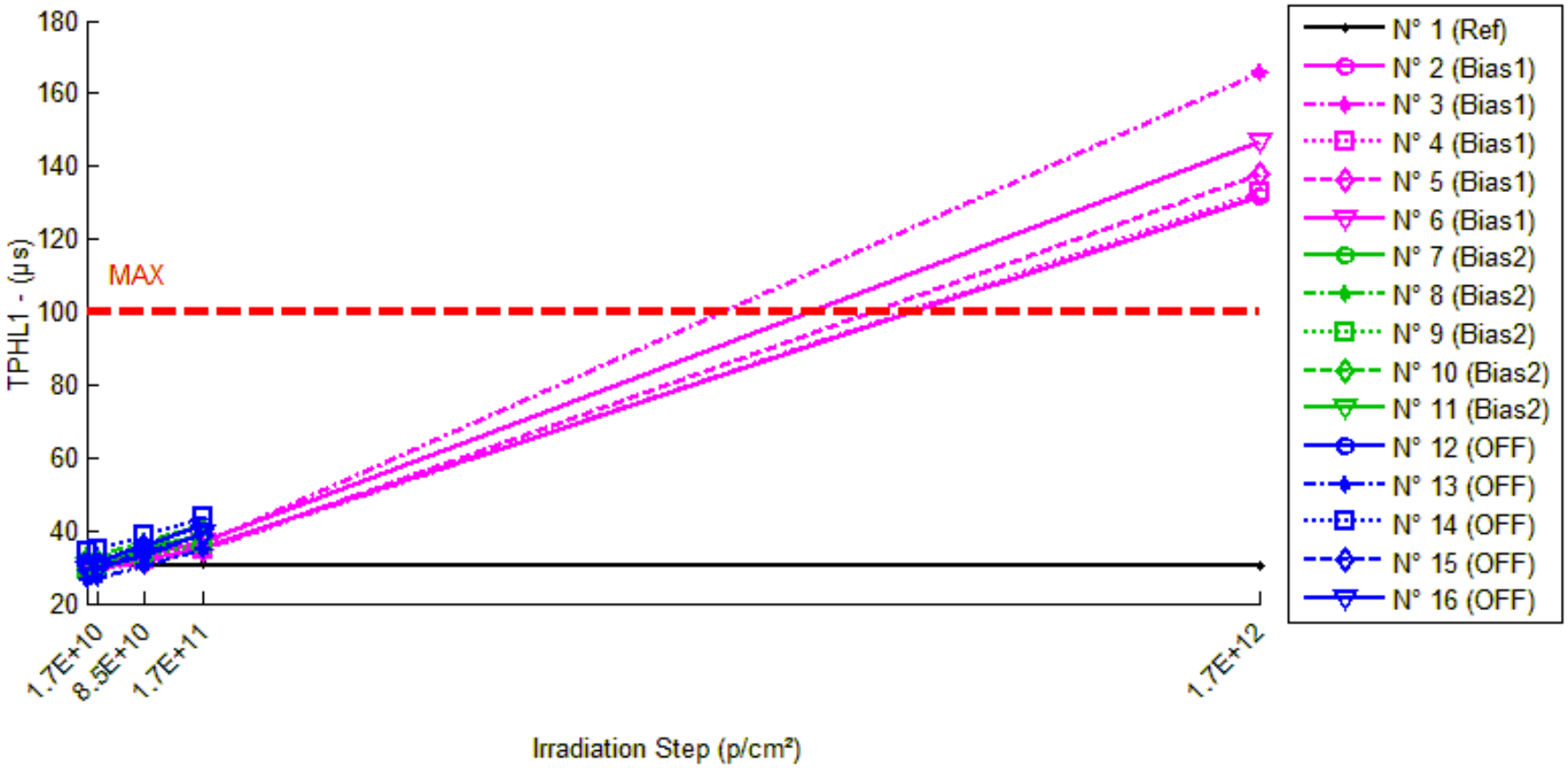
Delta [BVr]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.047E-2	2.900E-4	-3.984E-3	3.221E-3
N° 2 (Bias1)	---	-1.580E-3	-6.470E-3	-5.230E-3	2.275E-3
N° 3 (Bias1)	---	8.320E-4	-3.810E-4	-1.635E-3	8.673E-3
N° 4 (Bias1)	---	-3.053E-3	-3.184E-3	-3.016E-3	3.915E-3
N° 5 (Bias1)	---	-1.172E-3	-1.199E-3	-1.850E-4	8.545E-3
N° 6 (Bias1)	---	-3.745E-3	-5.263E-3	-1.935E-3	1.502E-3
N° 7 (Bias2)	---	1.449E-3	6.700E-3	1.917E-3	1.464E-2
N° 8 (Bias2)	---	-2.140E-4	2.960E-4	-2.390E-4	-2.297E-2
N° 9 (Bias2)	---	-2.372E-3	-1.142E-3	-2.075E-3	3.587E-3
N° 10 (Bias2)	---	-4.138E-3	-3.719E-3	-2.602E-3	-1.171E-3
N° 11 (Bias2)	---	-1.407E-3	-1.730E-3	9.720E-4	1.130E-4
N° 12 (OFF)	---	-3.372E-3	-4.389E-3	2.837E-3	2.101E-2
N° 13 (OFF)	---	-3.821E-3	-4.132E-3	1.756E-3	9.405E-3
N° 14 (OFF)	---	-4.261E-3	-4.700E-3	-1.129E-3	5.436E-3
N° 15 (OFF)	---	-2.515E-3	-3.508E-3	-6.740E-4	4.308E-3
N° 16 (OFF)	---	-2.842E-3	-3.852E-3	1.688E-3	1.839E-2
Average (OFF)	---	-1.744E-3	-3.299E-3	-2.400E-3	4.982E-3
σ (OFF)	---	1.782E-3	2.591E-3	1.877E-3	3.424E-3
Average+3σ (OFF)	---	3.604E-3	4.473E-3	3.232E-3	1.525E-2
Average-3σ (OFF)	---	-7.091E-3	-1.107E-2	-8.032E-3	-5.290E-3
Average (Bias1)	---	-1.336E-3	8.100E-5	-4.054E-4	-1.160E-3
σ (Bias1)	---	2.118E-3	3.971E-3	1.932E-3	1.369E-2
Average+3σ (Bias1)	---	5.018E-3	1.199E-2	5.391E-3	3.990E-2
Average-3σ (Bias1)	---	-7.691E-3	-1.183E-2	-6.202E-3	-4.222E-2
Average (Bias2)	---	-3.362E-3	-4.116E-3	8.956E-4	1.171E-2
σ (Bias2)	---	7.083E-4	4.624E-4	1.710E-3	7.594E-3
Average+3σ (Bias2)	---	-1.237E-3	-2.729E-3	6.026E-3	3.449E-2
Average-3σ (Bias2)	---	-5.487E-3	-5.503E-3	-4.235E-3	-1.107E-2

30 MeV proton / detailed results

9. TPHL1

Ta=25°C; If=0.5mA; RL = 4.7kOhms; Vcc=5V



30 MeV proton / detailed results

TPHL1 . (µs) **Max = 100.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	30.2	31.4	30.4	31.0	30.2
N° 2 (Bias1)	29.4	30.0	32.0	35.6	132.0
N° 3 (Bias1)	30.2	31.0	33.8	36.2	166.0
N° 4 (Bias1)	29.5	29.8	32.0	34.6	133.0
N° 5 (Bias1)	28.4	29.2	31.6	34.6	138.0
N° 6 (Bias1)	30.4	30.8	33.2	36.8	147.0
N° 7 (Bias2)	30.4	30.8	35.4	38.4	Not Measurable*
N° 8 (Bias2)	33.0	33.2	37.2	41.2	Not Measurable*
N° 9 (Bias2)	29.2	29.2	33.2	36.6	Not Measurable*
N° 10 (Bias2)	29.8	30.2	34.1	38.8	Not Measurable*
N° 11 (Bias2)	30.4	31.2	34.4	39.0	Not Measurable*
N° 12 (OFF)	31.2	31.6	35.8	41.6	Not Measurable*
N° 13 (OFF)	26.6	27.0	30.2	34.9	Not Measurable*
N° 14 (OFF)	34.0	34.6	38.8	43.6	Not Measurable*
N° 15 (OFF)	29.4	30.0	34.0	38.4	Not Measurable*
N° 16 (OFF)	29.0	30.0	33.2	39.4	Not Measurable*

* Not Measurable* with this test condition

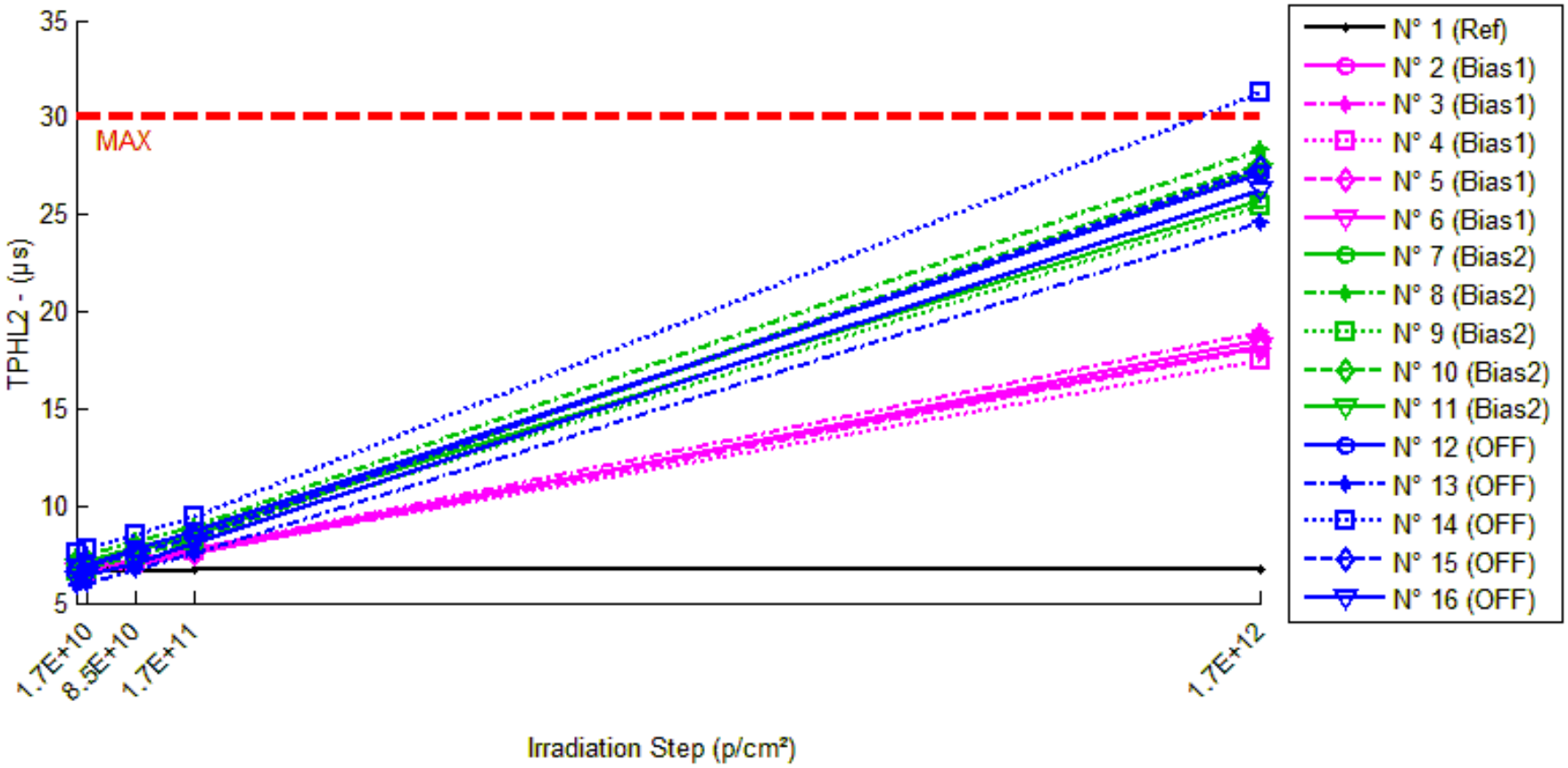
Delta [TPHL1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.200E+0	2.000E-1	8.000E-1	0.000E+0
N° 2 (Bias1)	---	6.000E-1	2.600E+0	6.200E+0	1.026E+2
N° 3 (Bias1)	---	8.000E-1	3.600E+0	6.000E+0	1.358E+2
N° 4 (Bias1)	---	3.000E-1	2.500E+0	5.100E+0	1.035E+2
N° 5 (Bias1)	---	8.000E-1	3.200E+0	6.200E+0	1.096E+2
N° 6 (Bias1)	---	4.000E-1	2.800E+0	6.400E+0	1.166E+2
N° 7 (Bias2)	---	4.000E-1	5.000E+0	8.000E+0	NaN
N° 8 (Bias2)	---	2.000E-1	4.200E+0	8.200E+0	NaN
N° 9 (Bias2)	---	0.000E+0	4.000E+0	7.400E+0	NaN
N° 10 (Bias2)	---	4.000E-1	4.300E+0	9.000E+0	NaN
N° 11 (Bias2)	---	8.000E-1	4.000E+0	8.600E+0	NaN
N° 12 (OFF)	---	4.000E-1	4.600E+0	1.040E+1	NaN
N° 13 (OFF)	---	4.000E-1	3.600E+0	8.300E+0	NaN
N° 14 (OFF)	---	6.000E-1	4.800E+0	9.600E+0	NaN
N° 15 (OFF)	---	6.000E-1	4.600E+0	9.000E+0	NaN
N° 16 (OFF)	---	1.000E+0	4.200E+0	1.040E+1	NaN
Average (OFF)	---	5.800E-1	2.940E+0	5.980E+0	1.136E+2
σ (OFF)	---	2.280E-1	4.561E-1	5.119E-1	1.361E+1
Average+3σ (OFF)	---	1.264E+0	4.308E+0	7.516E+0	1.544E+2
Average-3σ (OFF)	---	-1.041E-1	1.572E+0	4.444E+0	7.279E+1
Average (Bias1)	---	3.600E-1	4.300E+0	8.240E+0	NaN
σ (Bias1)	---	2.966E-1	4.123E-1	6.066E-1	0.000E+0
Average+3σ (Bias1)	---	1.250E+0	5.537E+0	1.006E+1	NaN
Average-3σ (Bias1)	---	-5.299E-1	3.063E+0	6.420E+0	NaN
Average (Bias2)	---	6.000E-1	4.360E+0	9.540E+0	NaN
σ (Bias2)	---	2.449E-1	4.775E-1	9.099E-1	0.000E+0
Average+3σ (Bias2)	---	1.335E+0	5.792E+0	1.227E+1	NaN
Average-3σ (Bias2)	---	-1.348E-1	2.928E+0	6.810E+0	NaN

30 MeV proton / detailed results

10.TPHL2

Ta=25°C; If=1.6mA; RL = 1.5kOhms; Vcc=5V



30 MeV proton / detailed results

TPHL2 . (µs) **Max = 30.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	6.64	6.80	6.66	6.72	6.68
N° 2 (Bias1)	6.40	6.52	6.96	7.60	18.50
N° 3 (Bias1)	6.66	6.82	7.28	7.82	19.00
N° 4 (Bias1)	6.60	6.68	7.10	7.62	17.45
N° 5 (Bias1)	6.44	6.60	7.06	7.60	18.10
N° 6 (Bias1)	6.66	6.76	7.24	7.82	18.20
N° 7 (Bias2)	7.00	7.16	7.92	8.56	25.70
N° 8 (Bias2)	7.32	7.48	8.16	8.92	28.40
N° 9 (Bias2)	6.66	6.76	7.48	8.16	25.40
N° 10 (Bias2)	6.58	6.72	7.48	8.30	27.60
N° 11 (Bias2)	6.82	6.98	7.66	8.48	27.20
N° 12 (OFF)	6.80	6.96	7.74	8.72	27.10
N° 13 (OFF)	5.90	6.04	6.72	7.54	24.60
N° 14 (OFF)	7.60	7.76	8.46	9.40	31.30
N° 15 (OFF)	6.72	6.90	7.60	8.40	27.40
N° 16 (OFF)	6.16	6.40	7.08	8.06	26.30

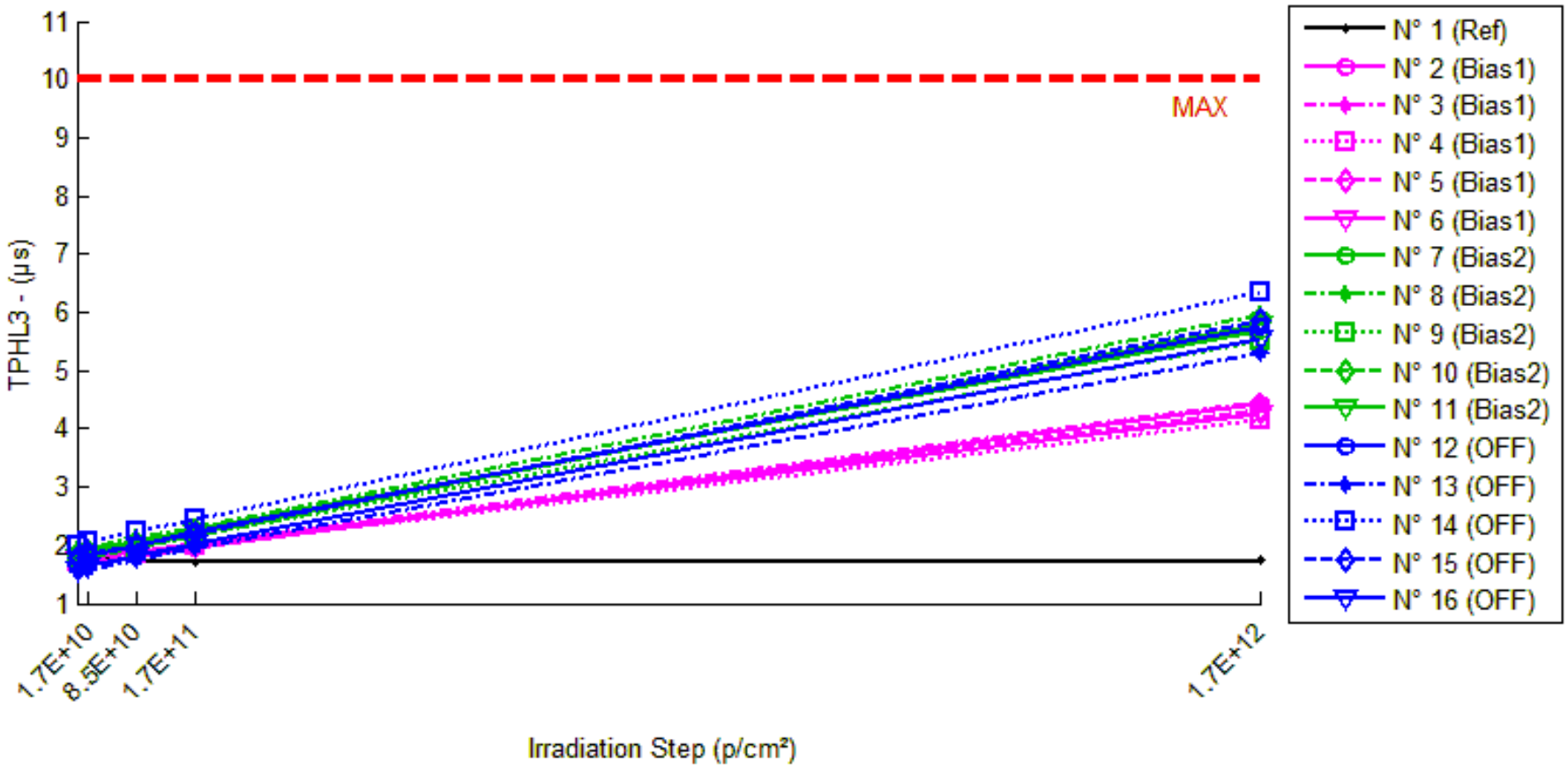
Delta [TPHL2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.600E-1	2.000E-2	8.000E-2	4.000E-2
N° 2 (Bias1)	---	1.200E-1	5.600E-1	1.200E+0	1.210E+1
N° 3 (Bias1)	---	1.600E-1	6.200E-1	1.160E+0	1.234E+1
N° 4 (Bias1)	---	8.000E-2	5.000E-1	1.020E+0	1.085E+1
N° 5 (Bias1)	---	1.600E-1	6.200E-1	1.160E+0	1.166E+1
N° 6 (Bias1)	---	1.000E-1	5.800E-1	1.160E+0	1.154E+1
N° 7 (Bias2)	---	1.600E-1	9.200E-1	1.560E+0	1.870E+1
N° 8 (Bias2)	---	1.600E-1	8.400E-1	1.600E+0	2.108E+1
N° 9 (Bias2)	---	1.000E-1	8.200E-1	1.500E+0	1.874E+1
N° 10 (Bias2)	---	1.400E-1	9.000E-1	1.720E+0	2.102E+1
N° 11 (Bias2)	---	1.600E-1	8.400E-1	1.660E+0	2.038E+1
N° 12 (OFF)	---	1.600E-1	9.400E-1	1.920E+0	2.030E+1
N° 13 (OFF)	---	1.400E-1	8.200E-1	1.640E+0	1.870E+1
N° 14 (OFF)	---	1.600E-1	8.600E-1	1.800E+0	2.370E+1
N° 15 (OFF)	---	1.800E-1	8.800E-1	1.680E+0	2.068E+1
N° 16 (OFF)	---	2.400E-1	9.200E-1	1.900E+0	2.014E+1
Average (OFF)	---	1.240E-1	5.760E-1	1.140E+0	1.170E+1
σ (OFF)	---	3.578E-2	4.980E-2	6.928E-2	5.743E-1
Average+3σ (OFF)	---	2.313E-1	7.254E-1	1.348E+0	1.342E+1
Average-3σ (OFF)	---	1.667E-2	4.266E-1	9.322E-1	9.975E+0
Average (Bias1)	---	1.440E-1	8.640E-1	1.608E+0	1.998E+1
σ (Bias1)	---	2.608E-2	4.336E-2	8.556E-2	1.186E+0
Average+3σ (Bias1)	---	2.222E-1	9.941E-1	1.865E+0	2.354E+1
Average-3σ (Bias1)	---	6.577E-2	7.339E-1	1.351E+0	1.643E+1
Average (Bias2)	---	1.760E-1	8.840E-1	1.788E+0	2.070E+1
σ (Bias2)	---	3.847E-2	4.775E-2	1.262E-1	1.835E+0
Average+3σ (Bias2)	---	2.914E-1	1.027E+0	2.167E+0	2.621E+1
Average-3σ (Bias2)	---	6.059E-2	7.408E-1	1.409E+0	1.520E+1

30 MeV proton / detailed results

11.TPHL3

Ta=25°C; If=5mA; RL = 680Ohms; Vcc=5V



30 MeV proton / detailed results

TPHL3 . (µs) **Max = 10.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1.74	1.75	1.74	1.72	1.74
N° 2 (Bias1)	1.66	1.69	1.82	1.97	4.42
N° 3 (Bias1)	1.74	1.78	1.90	2.03	4.45
N° 4 (Bias1)	1.73	1.77	1.87	2.00	4.16
N° 5 (Bias1)	1.72	1.75	1.88	2.01	4.33
N° 6 (Bias1)	1.74	1.78	1.89	2.02	4.26
N° 7 (Bias2)	1.86	1.91	2.08	2.26	5.69
N° 8 (Bias2)	1.92	1.96	2.13	2.32	5.96
N° 9 (Bias2)	1.77	1.80	1.97	2.15	5.52
N° 10 (Bias2)	1.73	1.78	1.96	2.16	5.84
N° 11 (Bias2)	1.79	1.84	2.01	2.20	5.78
N° 12 (OFF)	1.77	1.82	2.01	2.23	5.74
N° 13 (OFF)	1.55	1.59	1.76	1.95	5.32
N° 14 (OFF)	1.99	2.05	2.22	2.43	6.34
N° 15 (OFF)	1.78	1.84	2.01	2.21	5.85
N° 16 (OFF)	1.58	1.65	1.81	2.03	5.55

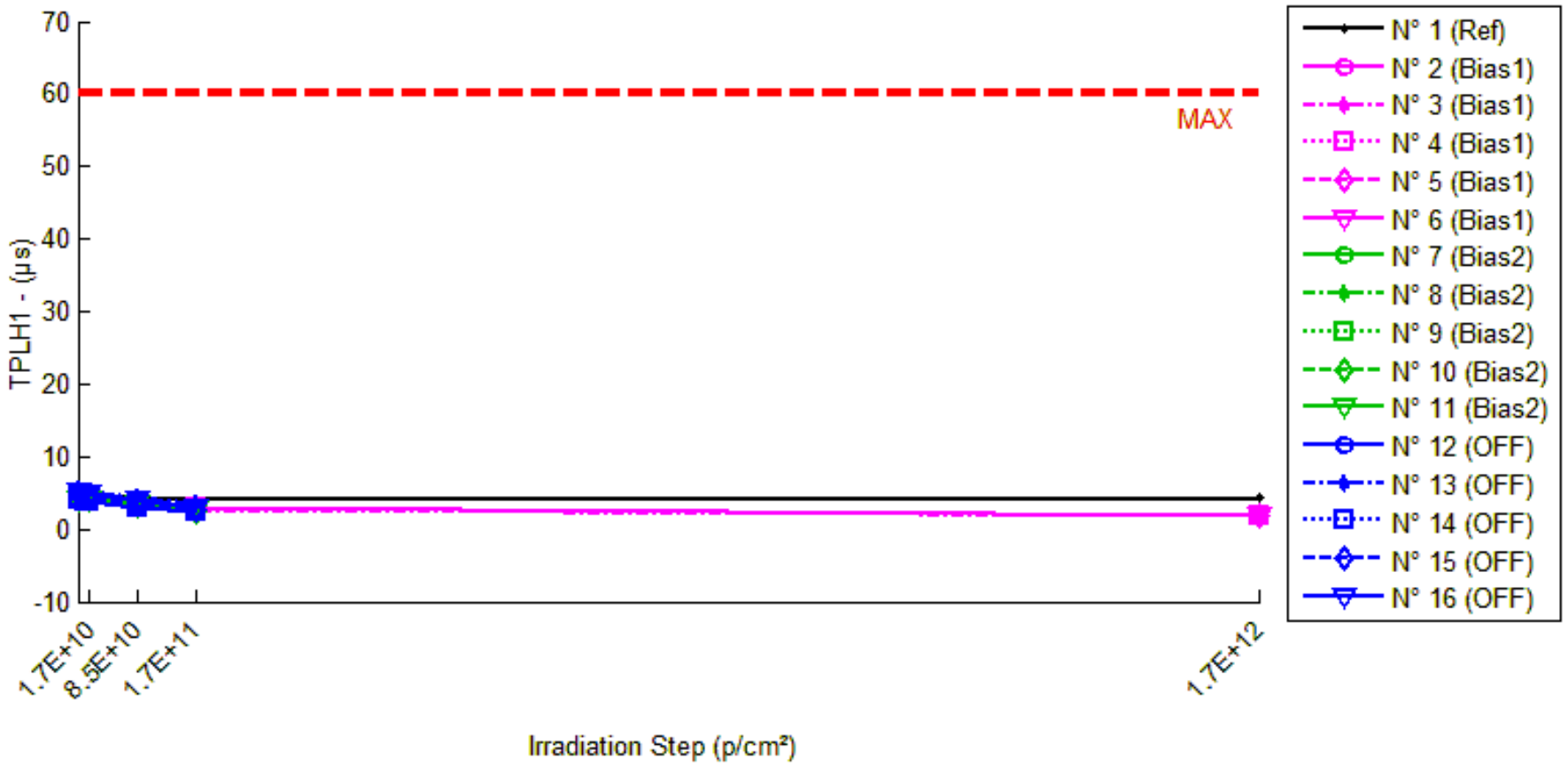
Delta [TPHL3]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.000E-2	0.000E+0	-2.000E-2	0.000E+0
N° 2 (Bias1)	---	3.000E-2	1.600E-1	3.100E-1	2.760E+0
N° 3 (Bias1)	---	4.000E-2	1.600E-1	2.900E-1	2.710E+0
N° 4 (Bias1)	---	4.000E-2	1.400E-1	2.700E-1	2.430E+0
N° 5 (Bias1)	---	3.000E-2	1.600E-1	2.900E-1	2.610E+0
N° 6 (Bias1)	---	4.000E-2	1.500E-1	2.800E-1	2.520E+0
N° 7 (Bias2)	---	5.000E-2	2.200E-1	4.000E-1	3.830E+0
N° 8 (Bias2)	---	4.000E-2	2.100E-1	4.000E-1	4.040E+0
N° 9 (Bias2)	---	3.000E-2	2.000E-1	3.800E-1	3.750E+0
N° 10 (Bias2)	---	5.000E-2	2.300E-1	4.300E-1	4.110E+0
N° 11 (Bias2)	---	5.000E-2	2.200E-1	4.100E-1	3.990E+0
N° 12 (OFF)	---	5.000E-2	2.400E-1	4.600E-1	3.970E+0
N° 13 (OFF)	---	4.000E-2	2.100E-1	4.000E-1	3.770E+0
N° 14 (OFF)	---	6.000E-2	2.300E-1	4.400E-1	4.350E+0
N° 15 (OFF)	---	6.000E-2	2.300E-1	4.300E-1	4.070E+0
N° 16 (OFF)	---	7.000E-2	2.300E-1	4.500E-1	3.970E+0
Average (OFF)	---	3.600E-2	1.540E-1	2.880E-1	2.606E+0
σ (OFF)	---	5.477E-3	8.944E-3	1.483E-2	1.350E-1
Average+3σ (OFF)	---	5.243E-2	1.808E-1	3.325E-1	3.011E+0
Average-3σ (OFF)	---	1.957E-2	1.272E-1	2.435E-1	2.201E+0
Average (Bias1)	---	4.400E-2	2.160E-1	4.040E-1	3.944E+0
σ (Bias1)	---	8.944E-3	1.140E-2	1.817E-2	1.496E-1
Average+3σ (Bias1)	---	7.083E-2	2.502E-1	4.585E-1	4.393E+0
Average-3σ (Bias1)	---	1.717E-2	1.818E-1	3.495E-1	3.495E+0
Average (Bias2)	---	5.600E-2	2.280E-1	4.360E-1	4.026E+0
σ (Bias2)	---	1.140E-2	1.095E-2	2.302E-2	2.114E-1
Average+3σ (Bias2)	---	9.021E-2	2.609E-1	5.051E-1	4.660E+0
Average-3σ (Bias2)	---	2.179E-2	1.951E-1	3.669E-1	3.392E+0

30 MeV proton / detailed results

12.TPLH1

Ta=25°C; If=0.5mA; RL = 4.7kOhms; Vcc=5V



30 MeV proton / detailed results

TPLH1 . (µs) **Max = 60.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	4.40	4.30	4.40	4.20	4.30
N° 2 (Bias1)	4.20	4.15	3.60	3.05	1.90
N° 3 (Bias1)	3.90	3.80	3.50	2.80	1.80
N° 4 (Bias1)	4.35	4.30	3.80	3.10	1.80
N° 5 (Bias1)	4.05	4.00	3.60	2.90	1.80
N° 6 (Bias1)	4.10	4.20	3.60	2.90	1.80
N° 7 (Bias2)	3.95	4.00	3.20	2.50	Not Measurable*
N° 8 (Bias2)	4.20	4.20	3.40	2.60	Not Measurable*
N° 9 (Bias2)	4.30	4.25	3.50	2.80	Not Measurable*
N° 10 (Bias2)	4.10	4.10	3.30	2.50	Not Measurable*
N° 11 (Bias2)	4.20	4.10	3.40	2.70	Not Measurable*
N° 12 (OFF)	3.90	3.80	2.90	2.30	Not Measurable*
N° 13 (OFF)	5.40	5.20	4.40	3.45	Not Measurable*
N° 14 (OFF)	4.10	3.90	3.10	2.30	Not Measurable*
N° 15 (OFF)	4.60	4.30	3.50	2.70	Not Measurable*
N° 16 (OFF)	5.10	4.90	4.10	3.10	Not Measurable*

* Not Measurable* with this test condition

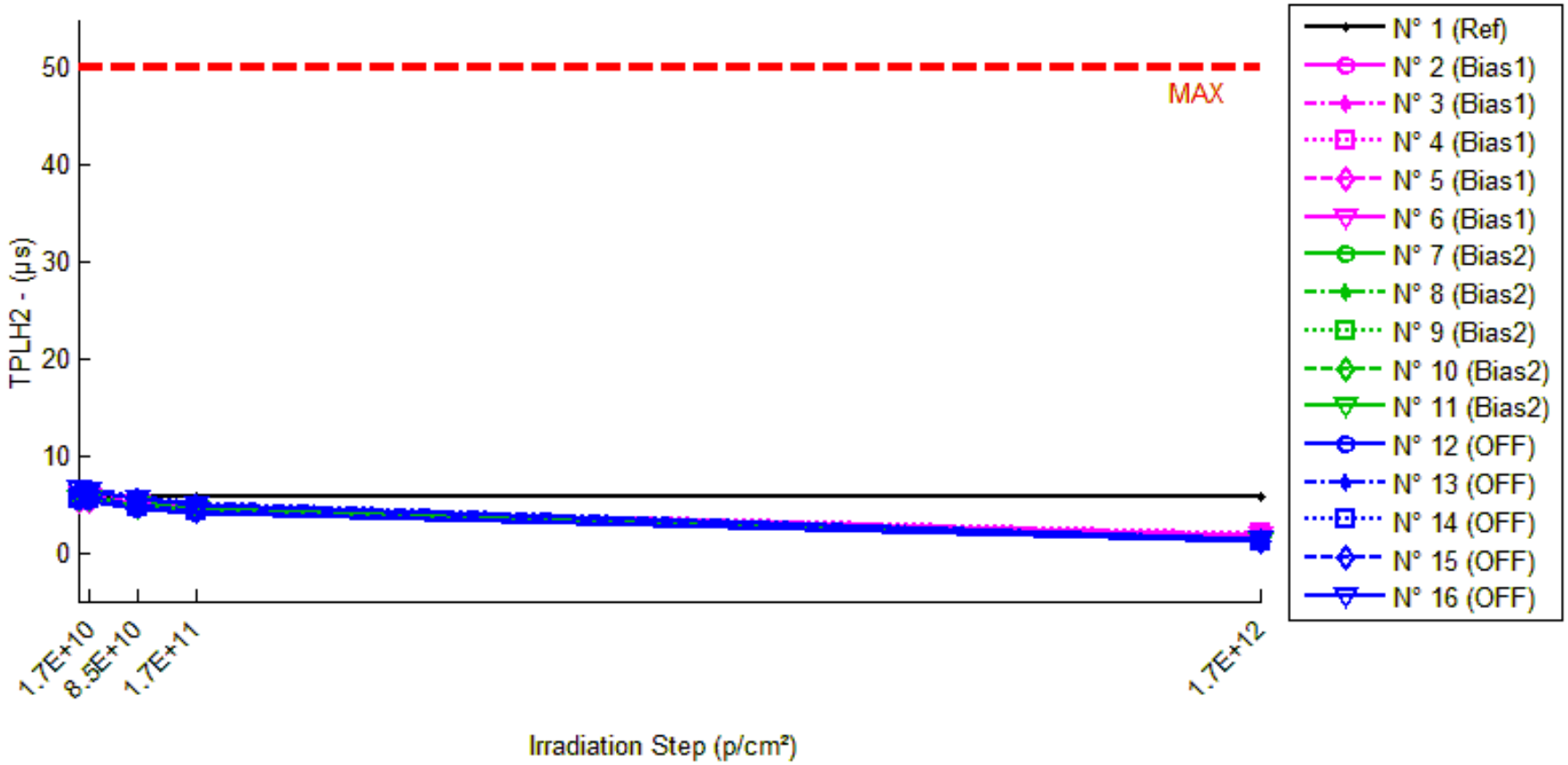
Delta [TPLH1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.000E-1	0.000E+0	-2.000E-1	-1.000E-1
N° 2 (Bias1)	---	-5.000E-2	-6.000E-1	-1.150E+0	-2.300E+0
N° 3 (Bias1)	---	-1.000E-1	-4.000E-1	-1.100E+0	-2.100E+0
N° 4 (Bias1)	---	-5.000E-2	-5.500E-1	-1.250E+0	-2.550E+0
N° 5 (Bias1)	---	-5.000E-2	-4.500E-1	-1.150E+0	-2.250E+0
N° 6 (Bias1)	---	1.000E-1	-5.000E-1	-1.200E+0	-2.300E+0
N° 7 (Bias2)	---	5.000E-2	-7.500E-1	-1.450E+0	NaN
N° 8 (Bias2)	---	0.000E+0	-8.000E-1	-1.600E+0	NaN
N° 9 (Bias2)	---	-5.000E-2	-8.000E-1	-1.500E+0	NaN
N° 10 (Bias2)	---	0.000E+0	-8.000E-1	-1.600E+0	NaN
N° 11 (Bias2)	---	-1.000E-1	-8.000E-1	-1.500E+0	NaN
N° 12 (OFF)	---	-1.000E-1	-1.000E+0	-1.600E+0	NaN
N° 13 (OFF)	---	-2.000E-1	-1.000E+0	-1.950E+0	NaN
N° 14 (OFF)	---	-2.000E-1	-1.000E+0	-1.800E+0	NaN
N° 15 (OFF)	---	-3.000E-1	-1.100E+0	-1.900E+0	NaN
N° 16 (OFF)	---	-2.000E-1	-1.000E+0	-2.000E+0	NaN
Average (OFF)	---	-3.000E-2	-5.000E-1	-1.170E+0	-2.300E+0
σ (OFF)	---	7.583E-2	7.906E-2	5.701E-2	1.620E-1
Average+3σ (OFF)	---	1.975E-1	-2.628E-1	-9.990E-1	-1.814E+0
Average-3σ (OFF)	---	-2.575E-1	-7.372E-1	-1.341E+0	-2.786E+0
Average (Bias1)	---	-2.000E-2	-7.900E-1	-1.530E+0	NaN
σ (Bias1)	---	5.701E-2	2.236E-2	6.708E-2	0.000E+0
Average+3σ (Bias1)	---	1.510E-1	-7.229E-1	-1.329E+0	NaN
Average-3σ (Bias1)	---	-1.910E-1	-8.571E-1	-1.731E+0	NaN
Average (Bias2)	---	-2.000E-1	-1.020E+0	-1.850E+0	NaN
σ (Bias2)	---	7.071E-2	4.472E-2	1.581E-1	0.000E+0
Average+3σ (Bias2)	---	1.213E-2	-8.858E-1	-1.376E+0	NaN
Average-3σ (Bias2)	---	-4.121E-1	-1.154E+0	-2.324E+0	NaN

30 MeV proton / detailed results

13.TPLH2

Ta=25°C; If=1.6mA; RL = 1.5kOhms; Vcc=5V



30 MeV proton / detailed results

TPLH2 . (µs) **Max = 50.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	5.70	5.90	5.80	5.80	5.75
N° 2 (Bias1)	5.65	5.60	5.20	4.70	1.80
N° 3 (Bias1)	5.30	5.30	5.00	4.50	1.60
N° 4 (Bias1)	5.70	5.80	5.30	4.80	1.90
N° 5 (Bias1)	5.40	5.40	5.10	4.60	1.70
N° 6 (Bias1)	5.50	5.70	5.20	4.60	1.80
N° 7 (Bias2)	5.40	5.40	4.80	4.20	1.10
N° 8 (Bias2)	5.80	5.65	5.10	4.50	1.20
N° 9 (Bias2)	5.65	5.60	5.00	4.40	1.20
N° 10 (Bias2)	5.50	5.50	4.80	4.30	1.15
N° 11 (Bias2)	5.65	5.60	5.00	4.45	1.20
N° 12 (OFF)	5.40	5.25	4.55	4.10	1.20
N° 13 (OFF)	6.70	6.50	5.70	5.10	1.30
N° 14 (OFF)	5.60	5.50	4.80	4.20	1.10
N° 15 (OFF)	5.90	5.70	5.00	4.40	1.20
N° 16 (OFF)	6.50	6.30	5.65	4.90	1.30

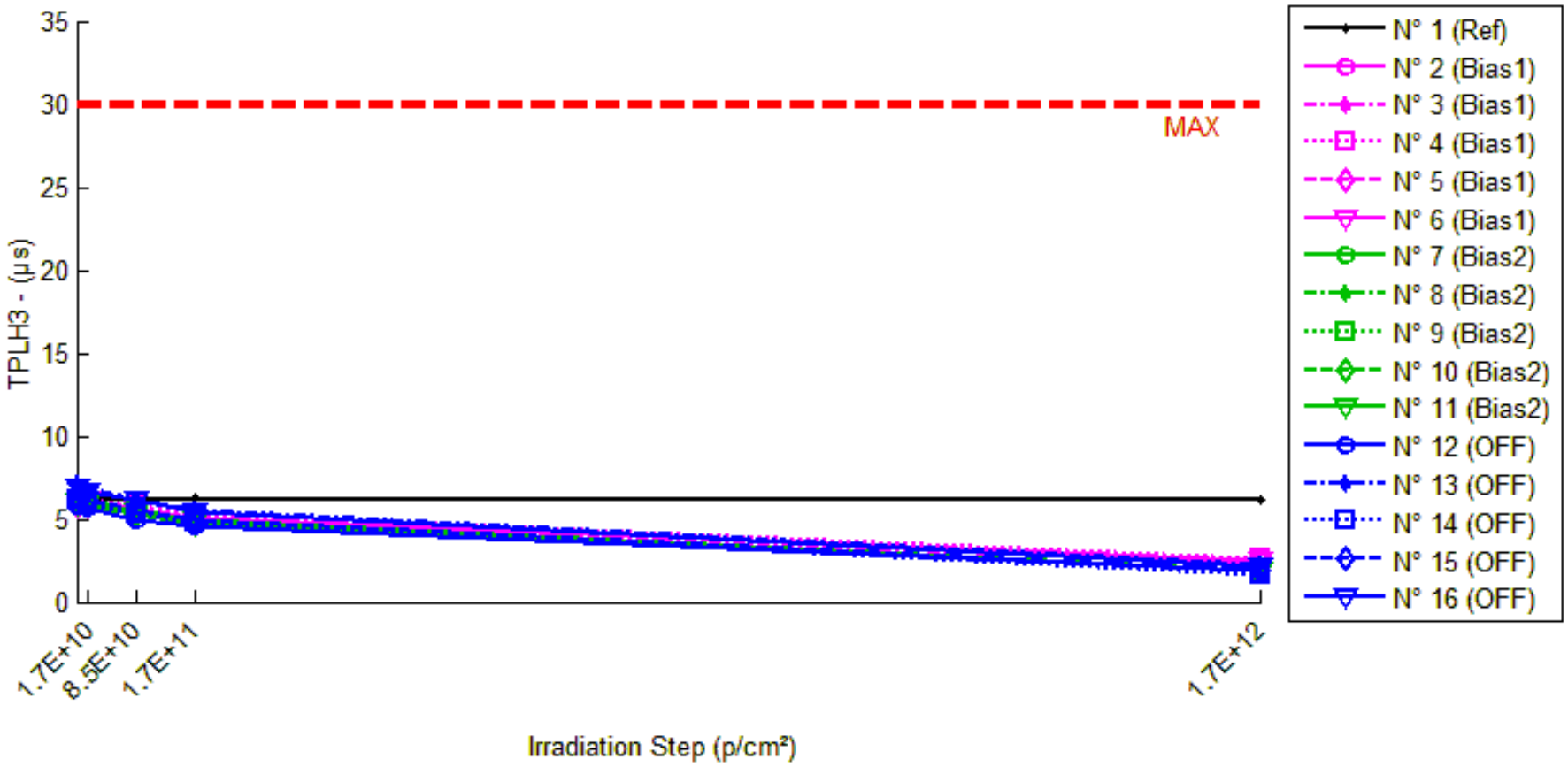
Delta [TPLH2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.000E-1	1.000E-1	1.000E-1	5.000E-2
N° 2 (Bias1)	---	-5.000E-2	-4.500E-1	-9.500E-1	-3.850E+0
N° 3 (Bias1)	---	0.000E+0	-3.000E-1	-8.000E-1	-3.700E+0
N° 4 (Bias1)	---	1.000E-1	-4.000E-1	-9.000E-1	-3.800E+0
N° 5 (Bias1)	---	0.000E+0	-3.000E-1	-8.000E-1	-3.700E+0
N° 6 (Bias1)	---	2.000E-1	-3.000E-1	-9.000E-1	-3.700E+0
N° 7 (Bias2)	---	0.000E+0	-6.000E-1	-1.200E+0	-4.300E+0
N° 8 (Bias2)	---	-1.500E-1	-7.000E-1	-1.300E+0	-4.600E+0
N° 9 (Bias2)	---	-5.000E-2	-6.500E-1	-1.250E+0	-4.450E+0
N° 10 (Bias2)	---	0.000E+0	-7.000E-1	-1.200E+0	-4.350E+0
N° 11 (Bias2)	---	-5.000E-2	-6.500E-1	-1.200E+0	-4.450E+0
N° 12 (OFF)	---	-1.500E-1	-8.500E-1	-1.300E+0	-4.200E+0
N° 13 (OFF)	---	-2.000E-1	-1.000E+0	-1.600E+0	-5.400E+0
N° 14 (OFF)	---	-1.000E-1	-8.000E-1	-1.400E+0	-4.500E+0
N° 15 (OFF)	---	-2.000E-1	-9.000E-1	-1.500E+0	-4.700E+0
N° 16 (OFF)	---	-2.000E-1	-8.500E-1	-1.600E+0	-5.200E+0
Average (OFF)	---	5.000E-2	-3.500E-1	-8.700E-1	-3.750E+0
σ (OFF)	---	1.000E-1	7.071E-2	6.708E-2	7.071E-2
Average+3σ (OFF)	---	3.500E-1	-1.379E-1	-6.688E-1	-3.538E+0
Average-3σ (OFF)	---	-2.500E-1	-5.621E-1	-1.071E+0	-3.962E+0
Average (Bias1)	---	-5.000E-2	-6.600E-1	-1.230E+0	-4.430E+0
σ (Bias1)	---	6.124E-2	4.183E-2	4.472E-2	1.151E-1
Average+3σ (Bias1)	---	1.337E-1	-5.345E-1	-1.096E+0	-4.085E+0
Average-3σ (Bias1)	---	-2.337E-1	-7.855E-1	-1.364E+0	-4.775E+0
Average (Bias2)	---	-1.700E-1	-8.800E-1	-1.480E+0	-4.800E+0
σ (Bias2)	---	4.472E-2	7.583E-2	1.304E-1	4.950E-1
Average+3σ (Bias2)	---	-3.584E-2	-6.525E-1	-1.089E+0	-3.315E+0
Average-3σ (Bias2)	---	-3.042E-1	-1.107E+0	-1.871E+0	-6.285E+0

30 MeV proton / detailed results

14.TPLH3

Ta=25°C; If=5mA; RL = 680Ohms; Vcc=5V



30 MeV proton / detailed results

TPLH3 . (µs) **Max = 30.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	6.10	6.30	6.20	6.25	6.20
N° 2 (Bias1)	6.00	6.00	5.60	5.10	2.55
N° 3 (Bias1)	5.70	5.70	5.50	4.90	2.30
N° 4 (Bias1)	6.10	6.20	5.80	5.30	2.60
N° 5 (Bias1)	5.80	5.80	5.50	5.05	2.50
N° 6 (Bias1)	6.00	6.10	5.60	5.10	2.50
N° 7 (Bias2)	5.80	5.80	5.30	4.70	1.90
N° 8 (Bias2)	6.20	6.10	5.60	5.00	1.90
N° 9 (Bias2)	6.10	6.00	5.40	4.90	1.90
N° 10 (Bias2)	5.90	5.90	5.30	4.75	1.85
N° 11 (Bias2)	6.05	6.00	5.45	4.90	1.90
N° 12 (OFF)	5.80	5.70	5.00	4.60	1.90
N° 13 (OFF)	7.10	6.90	6.10	5.50	2.20
N° 14 (OFF)	6.10	5.90	5.30	4.80	1.70
N° 15 (OFF)	6.30	6.10	5.50	4.90	1.90
N° 16 (OFF)	6.90	6.70	6.10	5.40	2.10

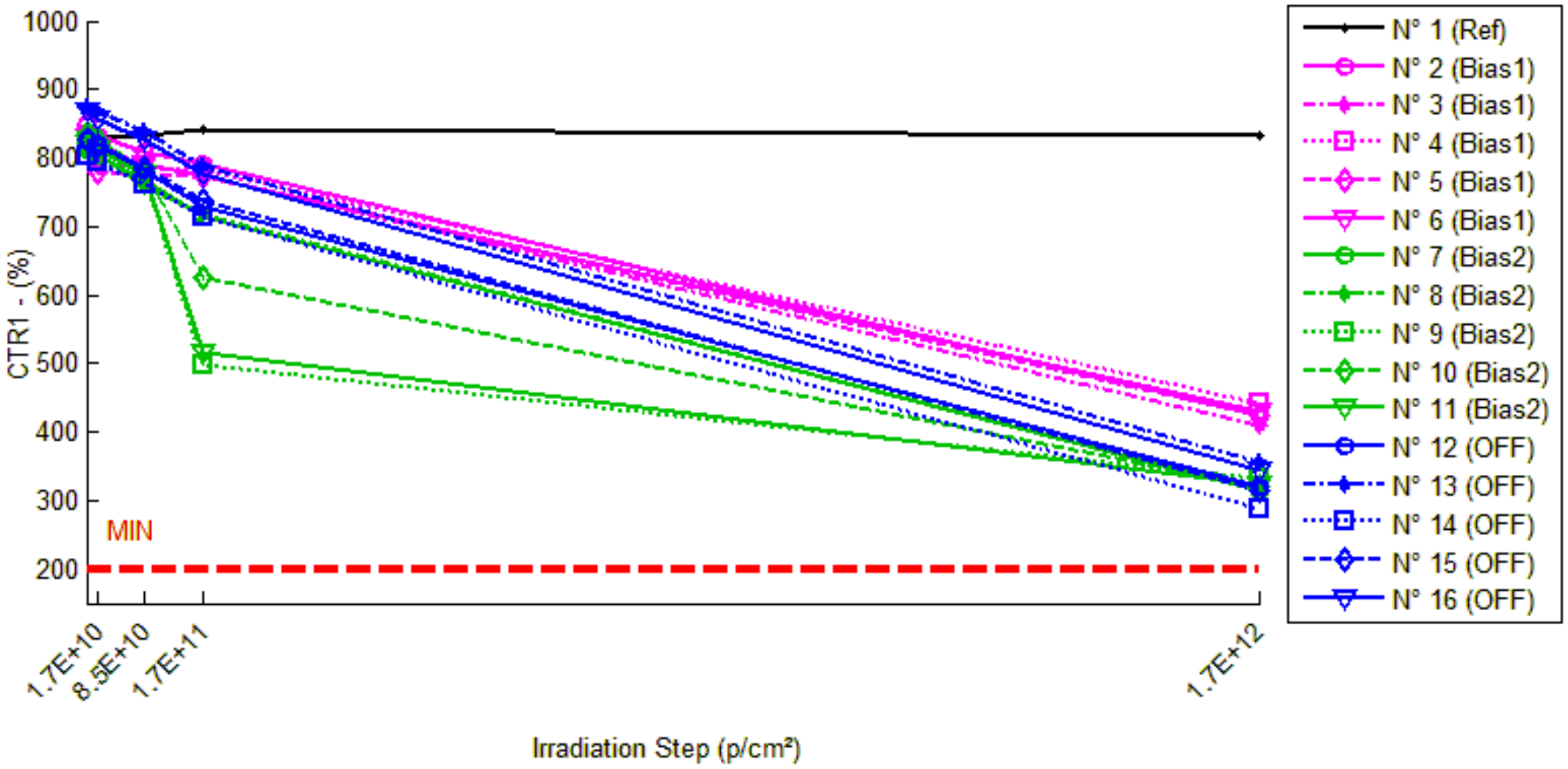
Delta [TPLH3]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.000E-1	1.000E-1	1.500E-1	1.000E-1
N° 2 (Bias1)	---	0.000E+0	-4.000E-1	-9.000E-1	-3.450E+0
N° 3 (Bias1)	---	0.000E+0	-2.000E-1	-8.000E-1	-3.400E+0
N° 4 (Bias1)	---	1.000E-1	-3.000E-1	-8.000E-1	-3.500E+0
N° 5 (Bias1)	---	0.000E+0	-3.000E-1	-7.500E-1	-3.300E+0
N° 6 (Bias1)	---	1.000E-1	-4.000E-1	-9.000E-1	-3.500E+0
N° 7 (Bias2)	---	0.000E+0	-5.000E-1	-1.100E+0	-3.900E+0
N° 8 (Bias2)	---	-1.000E-1	-6.000E-1	-1.200E+0	-4.300E+0
N° 9 (Bias2)	---	-1.000E-1	-7.000E-1	-1.200E+0	-4.200E+0
N° 10 (Bias2)	---	0.000E+0	-6.000E-1	-1.150E+0	-4.050E+0
N° 11 (Bias2)	---	-5.000E-2	-6.000E-1	-1.150E+0	-4.150E+0
N° 12 (OFF)	---	-1.000E-1	-8.000E-1	-1.200E+0	-3.900E+0
N° 13 (OFF)	---	-2.000E-1	-1.000E+0	-1.600E+0	-4.900E+0
N° 14 (OFF)	---	-2.000E-1	-8.000E-1	-1.300E+0	-4.400E+0
N° 15 (OFF)	---	-2.000E-1	-8.000E-1	-1.400E+0	-4.400E+0
N° 16 (OFF)	---	-2.000E-1	-8.000E-1	-1.500E+0	-4.800E+0
Average (OFF)	---	4.000E-2	-3.200E-1	-8.300E-1	-3.430E+0
σ (OFF)	---	5.477E-2	8.367E-2	6.708E-2	8.367E-2
Average+3σ (OFF)	---	2.043E-1	-6.900E-2	-6.288E-1	-3.179E+0
Average-3σ (OFF)	---	-1.243E-1	-5.710E-1	-1.031E+0	-3.681E+0
Average (Bias1)	---	-5.000E-2	-6.000E-1	-1.160E+0	-4.120E+0
σ (Bias1)	---	5.000E-2	7.071E-2	4.183E-2	1.525E-1
Average+3σ (Bias1)	---	1.000E-1	-3.879E-1	-1.035E+0	-3.663E+0
Average-3σ (Bias1)	---	-2.000E-1	-8.121E-1	-1.285E+0	-4.577E+0
Average (Bias2)	---	-1.800E-1	-8.400E-1	-1.400E+0	-4.480E+0
σ (Bias2)	---	4.472E-2	8.944E-2	1.581E-1	3.962E-1
Average+3σ (Bias2)	---	-4.584E-2	-5.717E-1	-9.257E-1	-3.291E+0
Average-3σ (Bias2)	---	-3.142E-1	-1.108E+0	-1.874E+0	-5.669E+0

30 MeV proton / detailed results

15.CTR1

Ta=25°C; If=5mA; Vo=0.4V; Vcc=4.5V



30 MeV proton / detailed results

CTR1 . (%) **Min = 200.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	836.16	828.99	834.13	842.86	834.07
N° 2 (Bias1)	851.61	832.28	808.73	792.41	425.41
N° 3 (Bias1)	829.99	816.57	792.68	772.62	410.24
N° 4 (Bias1)	832.87	796.29	782.65	782.39	441.46
N° 5 (Bias1)	830.62	780.27	775.04	774.11	424.97
N° 6 (Bias1)	829.51	808.73	792.01	774.51	429.85
N° 7 (Bias2)	812.34	803.33	768.29	715.02	314.21
N° 8 (Bias2)	816.23	805.77	758.59	717.52	313.54
N° 9 (Bias2)	823.55	813.00	777.07	499.30	330.99
N° 10 (Bias2)	836.06	826.31	781.91	625.84	319.81
N° 11 (Bias2)	821.13	812.20	776.30	516.56	323.05
N° 12 (OFF)	827.03	820.67	782.37	730.36	320.36
N° 13 (OFF)	875.02	869.16	838.19	786.81	354.80
N° 14 (OFF)	803.23	794.67	761.63	714.69	286.25
N° 15 (OFF)	826.47	818.70	785.40	736.56	314.70
N° 16 (OFF)	867.32	856.33	827.77	775.69	343.98

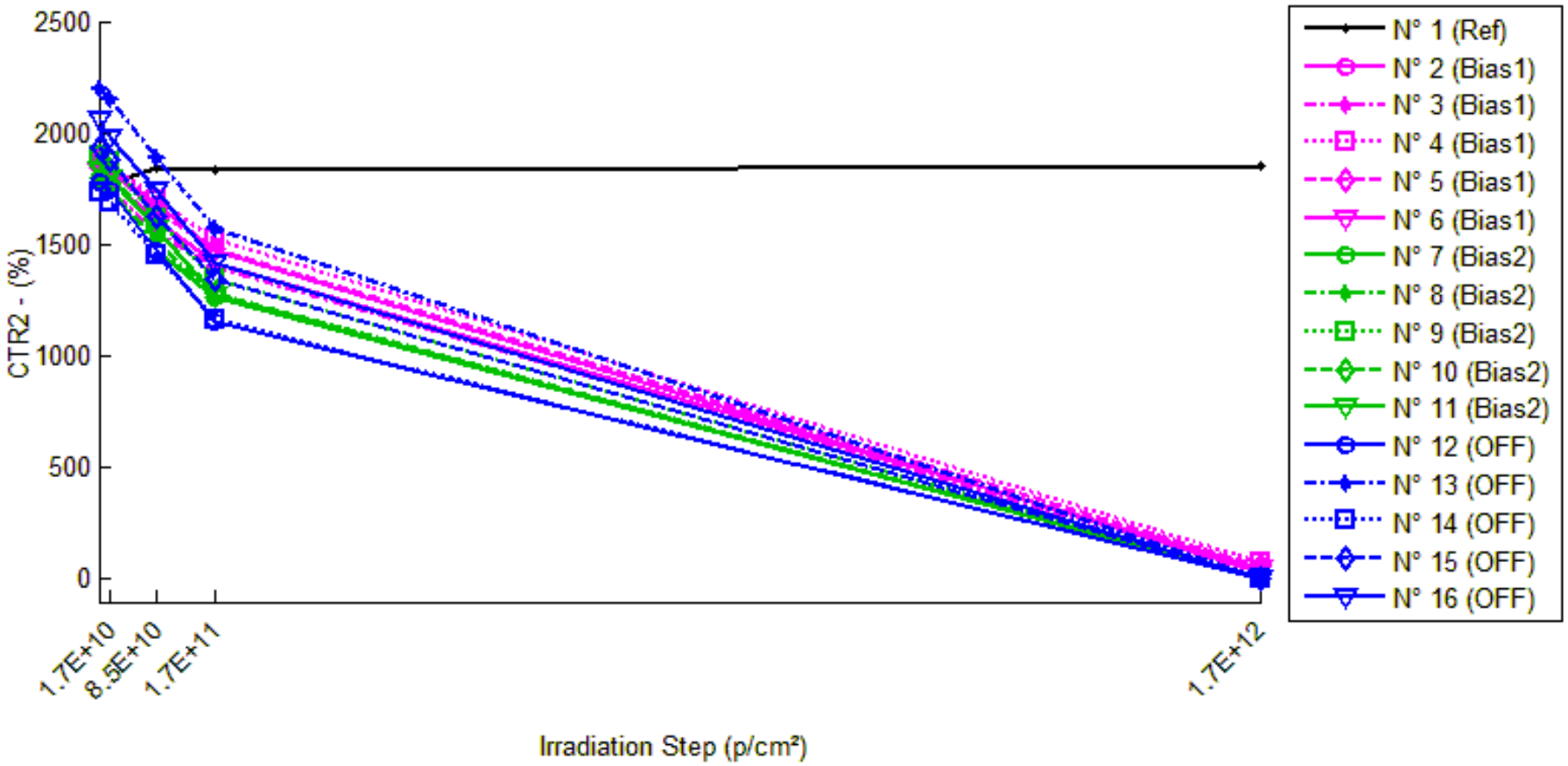
1/Delta [CTR1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.034E-5	2.911E-6	-9.507E-6	2.997E-6
N° 2 (Bias1)	---	2.727E-5	6.226E-5	8.773E-5	1.176E-3
N° 3 (Bias1)	---	1.980E-5	5.671E-5	8.946E-5	1.233E-3
N° 4 (Bias1)	---	5.516E-5	7.704E-5	7.747E-5	1.065E-3
N° 5 (Bias1)	---	7.769E-5	8.634E-5	8.789E-5	1.149E-3
N° 6 (Bias1)	---	3.098E-5	5.708E-5	8.561E-5	1.121E-3
N° 7 (Bias2)	---	1.381E-5	7.058E-5	1.676E-4	1.952E-3
N° 8 (Bias2)	---	1.590E-5	9.309E-5	1.685E-4	1.964E-3
N° 9 (Bias2)	---	1.576E-5	7.263E-5	7.885E-4	1.807E-3
N° 10 (Bias2)	---	1.411E-5	8.283E-5	4.018E-4	1.931E-3
N° 11 (Bias2)	---	1.339E-5	7.033E-5	7.180E-4	1.878E-3
N° 12 (OFF)	---	9.371E-6	6.902E-5	1.600E-4	1.912E-3
N° 13 (OFF)	---	7.705E-6	5.022E-5	1.281E-4	1.676E-3
N° 14 (OFF)	---	1.341E-5	6.800E-5	1.542E-4	2.248E-3
N° 15 (OFF)	---	1.148E-5	6.327E-5	1.477E-4	1.968E-3
N° 16 (OFF)	---	1.480E-5	5.509E-5	1.362E-4	1.754E-3
Average (OFF)	---	4.218E-5	6.789E-5	8.563E-5	1.149E-3
σ (OFF)	---	2.386E-5	1.321E-5	4.765E-6	6.264E-5
Average+3σ (OFF)	---	1.138E-4	1.075E-4	9.992E-5	1.337E-3
Average-3σ (OFF)	---	-2.941E-5	2.827E-5	7.134E-5	9.608E-4
Average (Bias1)	---	1.459E-5	7.789E-5	4.489E-4	1.906E-3
σ (Bias1)	---	1.159E-6	9.922E-6	2.949E-4	6.459E-5
Average+3σ (Bias1)	---	1.807E-5	1.077E-4	1.333E-3	2.100E-3
Average-3σ (Bias1)	---	1.112E-5	4.813E-5	-4.357E-4	1.712E-3
Average (Bias2)	---	1.135E-5	6.112E-5	1.453E-4	1.912E-3
σ (Bias2)	---	2.887E-6	8.211E-6	1.305E-5	2.220E-4
Average+3σ (Bias2)	---	2.002E-5	8.575E-5	1.844E-4	2.578E-3
Average-3σ (Bias2)	---	2.691E-6	3.649E-5	1.061E-4	1.246E-3

30 MeV proton / detailed results

16.CTR2

Ta=25°C; If=0.5mA; Vo=0.4V; Vcc=5V



30 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1861.748	1770.790	1839.209	1833.875	1854.069
N° 2 (Bias1)	1873.468	1838.225	1677.894	1473.948	32.926
N° 3 (Bias1)	1793.107	1742.469	1553.401	1403.718	27.257
N° 4 (Bias1)	1895.419	1868.155	1699.361	1522.202	74.581
N° 5 (Bias1)	1886.933	1832.895	1656.206	1481.108	57.358
N° 6 (Bias1)	1823.203	1792.007	1607.026	1414.867	50.624
N° 7 (Bias2)	1796.721	1751.749	1470.494	1266.330	0.003
N° 8 (Bias2)	1783.196	1744.926	1513.994	1262.310	0.001
N° 9 (Bias2)	1894.258	1871.368	1617.000	1341.587	0.013
N° 10 (Bias2)	1854.850	1837.919	1564.708	1279.381	0.002
N° 11 (Bias2)	1838.278	1801.638	1570.890	1275.927	0.003
N° 12 (OFF)	1776.357	1739.861	1470.660	1154.727	0.001
N° 13 (OFF)	2200.394	2154.792	1884.464	1571.091	0.022
N° 14 (OFF)	1732.203	1690.070	1449.314	1160.384	0.000
N° 15 (OFF)	1930.609	1879.331	1623.954	1349.213	0.002
N° 16 (OFF)	2058.706	1983.114	1742.939	1417.463	0.003

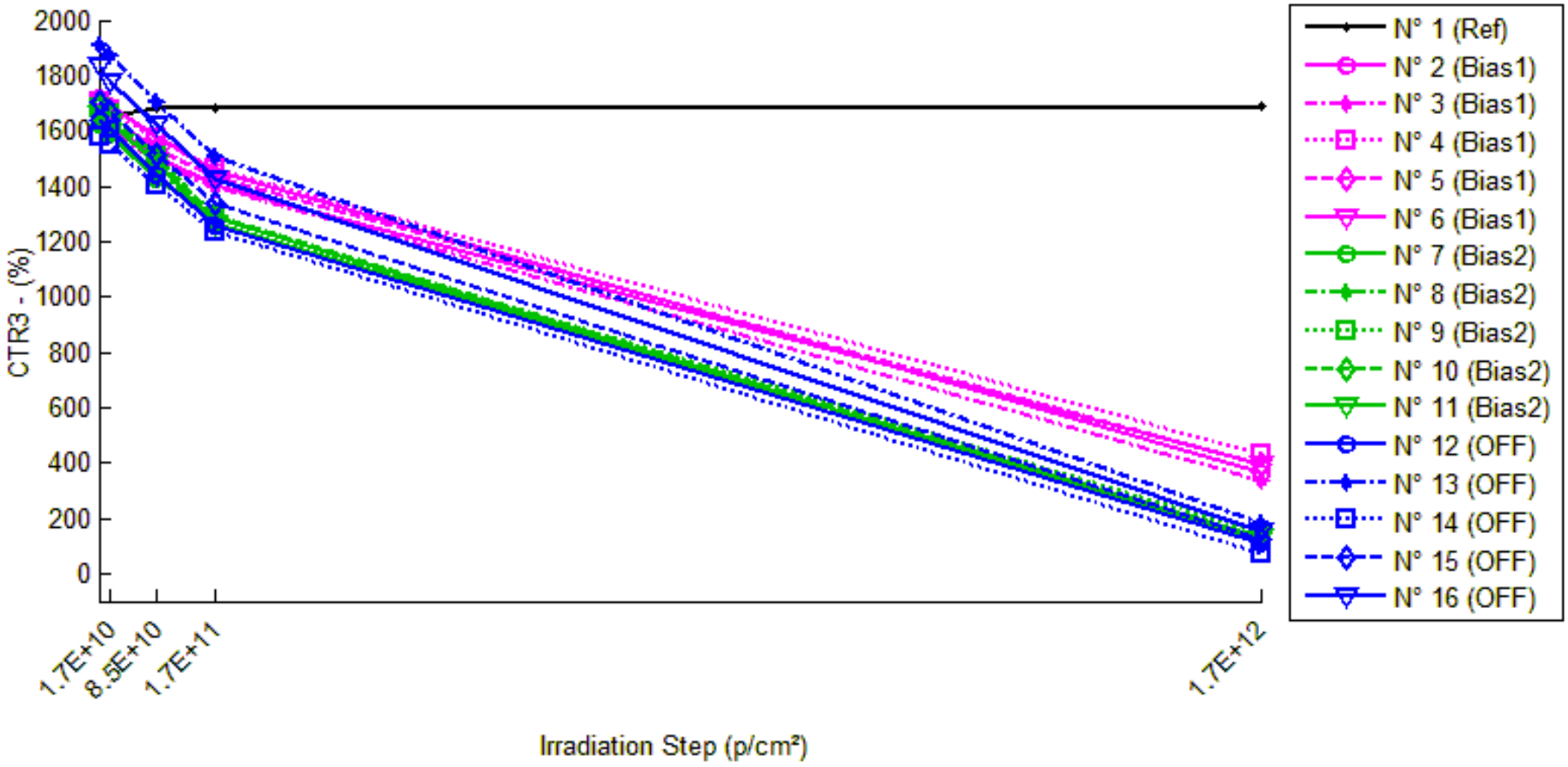
1/Delta [CTR2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.759E-5	6.582E-6	8.164E-6	2.225E-6
N° 2 (Bias1)	---	1.023E-5	6.222E-5	1.447E-4	2.984E-2
N° 3 (Bias1)	---	1.621E-5	8.606E-5	1.547E-4	3.613E-2
N° 4 (Bias1)	---	7.700E-6	6.087E-5	1.294E-4	1.288E-2
N° 5 (Bias1)	---	1.562E-5	7.383E-5	1.452E-4	1.690E-2
N° 6 (Bias1)	---	9.548E-6	7.378E-5	1.583E-4	1.920E-2
N° 7 (Bias2)	---	1.429E-5	1.235E-4	2.331E-4	3.601E+2
N° 8 (Bias2)	---	1.230E-5	9.971E-5	2.314E-4	1.197E+3
N° 9 (Bias2)	---	6.457E-6	9.052E-5	2.175E-4	7.764E+1
N° 10 (Bias2)	---	4.966E-6	9.997E-5	2.425E-4	5.283E+2
N° 11 (Bias2)	---	1.106E-5	9.259E-5	2.398E-4	3.156E+2
N° 12 (OFF)	---	1.181E-5	1.170E-4	3.031E-4	1.481E+3
N° 13 (OFF)	---	9.618E-6	7.619E-5	1.820E-4	4.472E+1
N° 14 (OFF)	---	1.439E-5	1.127E-4	2.845E-4	9.150E+3
N° 15 (OFF)	---	1.413E-5	9.781E-5	2.232E-4	5.914E+2
N° 16 (OFF)	---	1.852E-5	8.800E-5	2.197E-4	3.395E+2
Average (OFF)	---	1.186E-5	7.135E-5	1.464E-4	2.299E-2
σ (OFF)	---	3.820E-6	1.027E-5	1.124E-5	9.658E-3
Average+3σ (OFF)	---	2.332E-5	1.022E-4	1.802E-4	5.197E-2
Average-3σ (OFF)	---	4.029E-7	4.055E-5	1.127E-4	-5.983E-3
Average (Bias1)	---	9.815E-6	1.013E-4	2.329E-4	4.958E+2
σ (Bias1)	---	3.954E-6	1.311E-5	9.739E-6	4.240E+2
Average+3σ (Bias1)	---	2.168E-5	1.406E-4	2.621E-4	1.768E+3
Average-3σ (Bias1)	---	-2.046E-6	6.191E-5	2.036E-4	-7.761E+2
Average (Bias2)	---	1.369E-5	9.834E-5	2.425E-4	2.321E+3
σ (Bias2)	---	3.320E-6	1.697E-5	4.994E-5	3.855E+3
Average+3σ (Bias2)	---	2.365E-5	1.493E-4	3.923E-4	1.389E+4
Average-3σ (Bias2)	---	3.733E-6	4.742E-5	9.269E-5	-9.243E+3

30 MeV proton / detailed results

17.CTR3

Ta=25°C; If=1mA; Vo=0.4V; Vcc=5V



30 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1691.00	1652.19	1680.45	1679.08	1686.51
N° 2 (Bias1)	1716.72	1688.47	1578.79	1452.46	363.30
N° 3 (Bias1)	1647.75	1612.95	1481.87	1396.65	333.80
N° 4 (Bias1)	1700.50	1672.59	1570.88	1459.31	430.11
N° 5 (Bias1)	1689.40	1645.30	1533.09	1432.28	391.94
N° 6 (Bias1)	1661.84	1626.04	1504.71	1407.16	391.55
N° 7 (Bias2)	1620.70	1586.99	1427.90	1288.80	117.46
N° 8 (Bias2)	1618.09	1588.43	1446.33	1290.23	108.31
N° 9 (Bias2)	1682.66	1659.69	1507.05	1285.79	148.58
N° 10 (Bias2)	1686.92	1662.22	1493.30	1296.97	119.58
N° 11 (Bias2)	1656.63	1628.49	1483.19	1261.98	128.28
N° 12 (OFF)	1635.81	1605.93	1441.15	1257.20	111.79
N° 13 (OFF)	1905.76	1870.87	1700.15	1504.62	185.06
N° 14 (OFF)	1579.55	1547.22	1406.12	1233.20	72.82
N° 15 (OFF)	1704.94	1667.65	1511.52	1340.61	125.50
N° 16 (OFF)	1831.89	1780.42	1626.61	1427.71	150.76

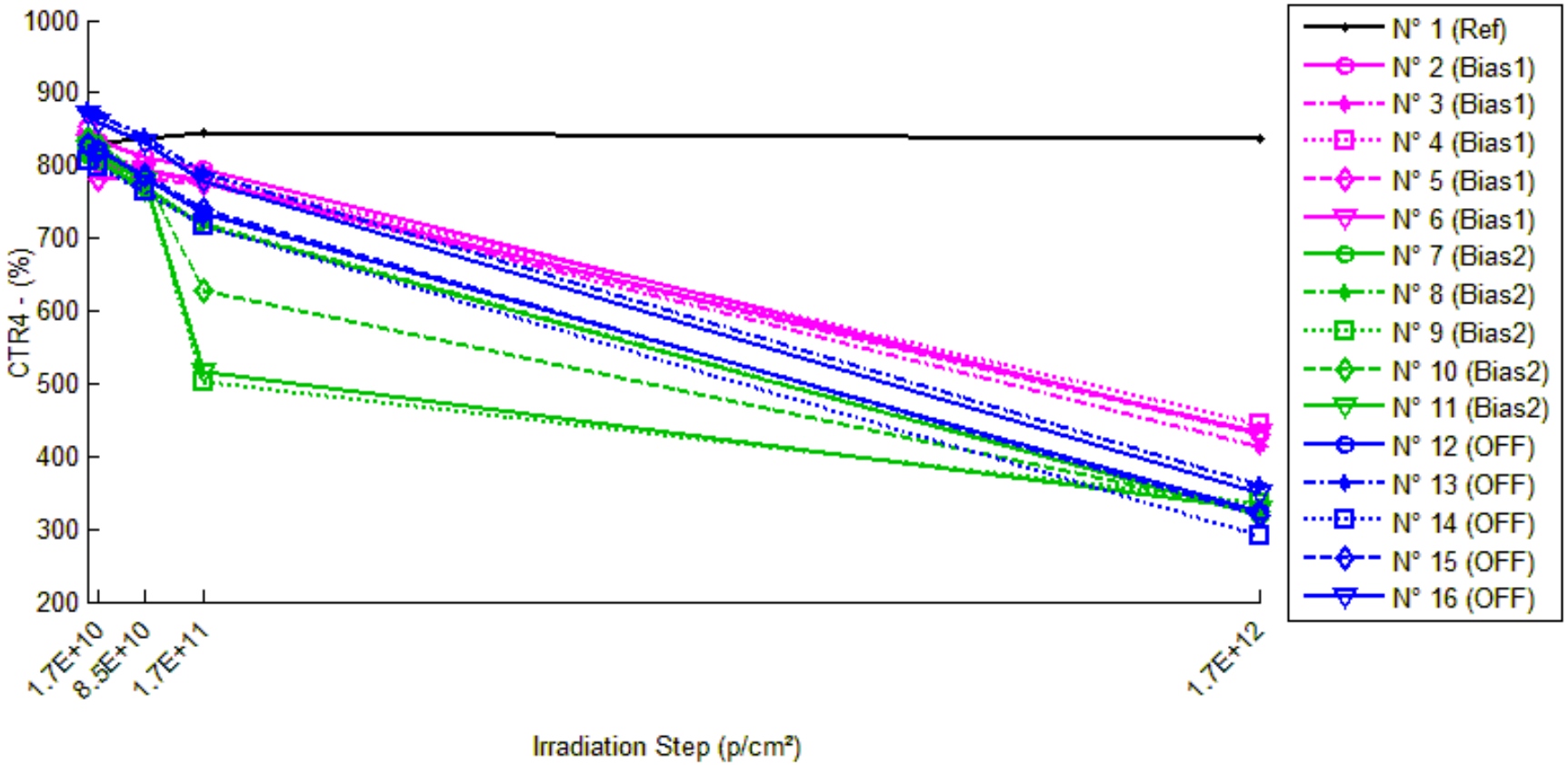
1/Delta [CTR3]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.389E-5	3.713E-6	4.197E-6	1.576E-6
N° 2 (Bias1)	---	9.749E-6	5.089E-5	1.060E-4	2.170E-3
N° 3 (Bias1)	---	1.309E-5	6.793E-5	1.091E-4	2.389E-3
N° 4 (Bias1)	---	9.812E-6	4.852E-5	9.719E-5	1.737E-3
N° 5 (Bias1)	---	1.587E-5	6.035E-5	1.063E-4	1.960E-3
N° 6 (Bias1)	---	1.325E-5	6.283E-5	1.089E-4	1.952E-3
N° 7 (Bias2)	---	1.311E-5	8.331E-5	1.589E-4	7.896E-3
N° 8 (Bias2)	---	1.154E-5	7.339E-5	1.570E-4	8.615E-3
N° 9 (Bias2)	---	8.225E-6	6.925E-5	1.834E-4	6.136E-3
N° 10 (Bias2)	---	8.809E-6	7.686E-5	1.782E-4	7.770E-3
N° 11 (Bias2)	---	1.043E-5	7.059E-5	1.888E-4	7.192E-3
N° 12 (OFF)	---	1.137E-5	8.257E-5	1.841E-4	8.334E-3
N° 13 (OFF)	---	9.785E-6	6.346E-5	1.399E-4	4.879E-3
N° 14 (OFF)	---	1.323E-5	7.808E-5	1.778E-4	1.310E-2
N° 15 (OFF)	---	1.311E-5	7.506E-5	1.594E-4	7.381E-3
N° 16 (OFF)	---	1.578E-5	6.889E-5	1.545E-4	6.087E-3
Average (OFF)	---	1.235E-5	5.811E-5	1.055E-4	2.042E-3
σ (OFF)	---	2.594E-6	8.183E-6	4.860E-6	2.473E-4
Average+3σ (OFF)	---	2.014E-5	8.266E-5	1.201E-4	2.783E-3
Average-3σ (OFF)	---	4.571E-6	3.356E-5	9.091E-5	1.300E-3
Average (Bias1)	---	1.042E-5	7.468E-5	1.733E-4	7.522E-3
σ (Bias1)	---	1.992E-6	5.639E-6	1.447E-5	9.254E-4
Average+3σ (Bias1)	---	1.640E-5	9.160E-5	2.167E-4	1.030E-2
Average-3σ (Bias1)	---	4.444E-6	5.776E-5	1.299E-4	4.746E-3
Average (Bias2)	---	1.266E-5	7.361E-5	1.631E-4	7.956E-3
σ (Bias2)	---	2.246E-6	7.545E-6	1.791E-5	3.158E-3
Average+3σ (Bias2)	---	1.939E-5	9.625E-5	2.169E-4	1.743E-2
Average-3σ (Bias2)	---	5.918E-6	5.098E-5	1.094E-4	-1.518E-3

30 MeV proton / detailed results

18.CTR4

Ta=25°C; If=5mA; Vo=0.4V; Vcc=5V



30 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	838.24	831.01	836.21	845.03	836.22
N° 2 (Bias1)	853.69	834.26	811.02	795.23	429.29
N° 3 (Bias1)	832.08	818.58	796.01	775.24	413.86
N° 4 (Bias1)	834.82	797.91	787.55	784.85	445.08
N° 5 (Bias1)	832.82	782.16	780.79	776.88	428.69
N° 6 (Bias1)	831.60	801.19	794.87	777.13	433.48
N° 7 (Bias2)	814.38	805.52	770.80	717.58	318.20
N° 8 (Bias2)	818.36	808.04	761.44	720.12	317.67
N° 9 (Bias2)	825.48	815.04	779.51	501.53	335.18
N° 10 (Bias2)	838.26	828.67	784.56	627.87	324.16
N° 11 (Bias2)	823.13	814.41	778.71	517.59	327.19
N° 12 (OFF)	829.20	822.99	785.13	733.48	323.79
N° 13 (OFF)	876.86	871.17	840.72	789.49	359.20
N° 14 (OFF)	805.32	796.92	764.22	717.64	289.83
N° 15 (OFF)	828.43	820.85	787.92	739.31	318.76
N° 16 (OFF)	869.22	858.46	830.34	778.54	348.57

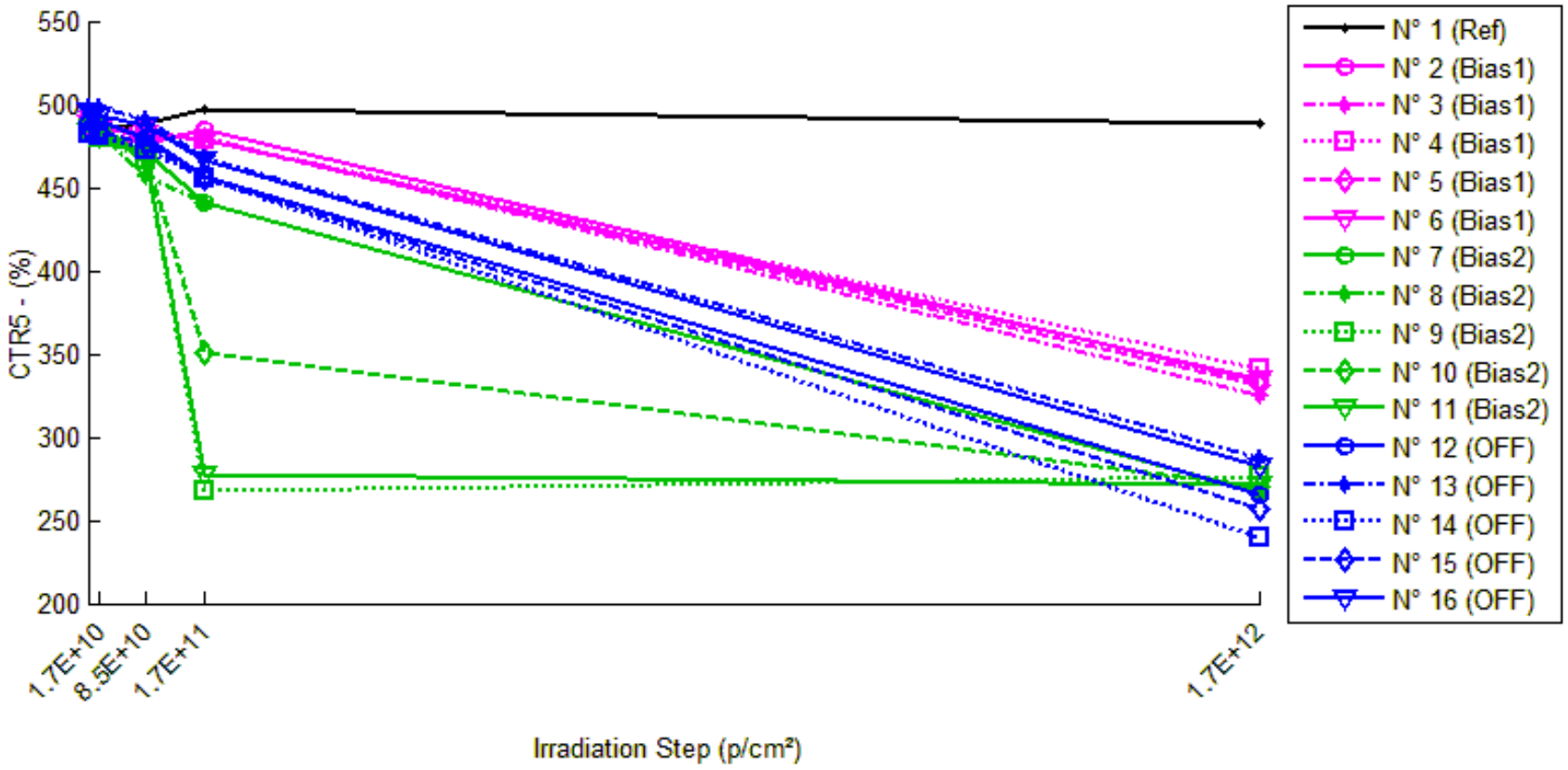
1/Delta [CTR4]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.038E-5	2.896E-6	-9.586E-6	2.882E-6
N° 2 (Bias1)	---	2.728E-5	6.163E-5	8.611E-5	1.158E-3
N° 3 (Bias1)	---	1.982E-5	5.446E-5	8.812E-5	1.214E-3
N° 4 (Bias1)	---	5.541E-5	7.190E-5	7.627E-5	1.049E-3
N° 5 (Bias1)	---	7.777E-5	8.001E-5	8.646E-5	1.132E-3
N° 6 (Bias1)	---	4.564E-5	5.557E-5	8.428E-5	1.104E-3
N° 7 (Bias2)	---	1.351E-5	6.943E-5	1.656E-4	1.915E-3
N° 8 (Bias2)	---	1.561E-5	9.135E-5	1.667E-4	1.926E-3
N° 9 (Bias2)	---	1.552E-5	7.144E-5	7.825E-4	1.772E-3
N° 10 (Bias2)	---	1.381E-5	8.165E-5	3.997E-4	1.892E-3
N° 11 (Bias2)	---	1.301E-5	6.930E-5	7.172E-4	1.841E-3
N° 12 (OFF)	---	9.100E-6	6.769E-5	1.574E-4	1.882E-3
N° 13 (OFF)	---	7.449E-6	4.902E-5	1.262E-4	1.644E-3
N° 14 (OFF)	---	1.309E-5	6.678E-5	1.517E-4	2.209E-3
N° 15 (OFF)	---	1.115E-5	6.206E-5	1.455E-4	1.930E-3
N° 16 (OFF)	---	1.442E-5	5.387E-5	1.340E-4	1.718E-3
Average (OFF)	---	4.519E-5	6.471E-5	8.425E-5	1.132E-3
σ (OFF)	---	2.308E-5	1.100E-5	4.665E-6	6.152E-5
Average+3σ (OFF)	---	1.144E-4	9.772E-5	9.824E-5	1.316E-3
Average-3σ (OFF)	---	-2.405E-5	3.171E-5	7.025E-5	9.470E-4
Average (Bias1)	---	1.429E-5	7.663E-5	4.463E-4	1.869E-3
σ (Bias1)	---	1.197E-6	9.674E-6	2.939E-4	6.329E-5
Average+3σ (Bias1)	---	1.788E-5	1.057E-4	1.328E-3	2.059E-3
Average-3σ (Bias1)	---	1.070E-5	4.761E-5	-4.353E-4	1.679E-3
Average (Bias2)	---	1.104E-5	5.989E-5	1.430E-4	1.877E-3
σ (Bias2)	---	2.841E-6	8.176E-6	1.277E-5	2.193E-4
Average+3σ (Bias2)	---	1.956E-5	8.442E-5	1.813E-4	2.535E-3
Average-3σ (Bias2)	---	2.517E-6	3.536E-5	1.047E-4	1.219E-3

30 MeV proton / detailed results

19.CTR5

Ta=25°C; If=10mA; Vo=0.4V; Vcc=5V



30 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	489.97	484.36	488.13	496.71	488.29
N° 2 (Bias1)	496.31	482.20	476.53	485.25	333.62
N° 3 (Bias1)	490.56	481.51	480.08	479.29	324.48
N° 4 (Bias1)	487.45	486.25	485.30	478.51	341.10
N° 5 (Bias1)	489.90	486.24	482.55	479.13	331.20
N° 6 (Bias1)	488.59	485.17	481.88	478.48	335.03
N° 7 (Bias2)	484.81	482.05	471.88	440.77	266.12
N° 8 (Bias2)	486.62	482.30	456.78	440.59	266.37
N° 9 (Bias2)	484.27	479.37	466.15	267.25	276.46
N° 10 (Bias2)	490.86	487.79	469.37	350.66	270.23
N° 11 (Bias2)	483.47	480.75	468.16	277.32	271.89
N° 12 (OFF)	489.36	489.97	479.81	457.30	265.06
N° 13 (OFF)	497.86	497.57	490.79	467.96	286.82
N° 14 (OFF)	482.46	481.06	473.04	455.88	240.04
N° 15 (OFF)	484.67	483.97	476.05	454.89	257.14
N° 16 (OFF)	495.73	493.38	487.76	466.39	282.48

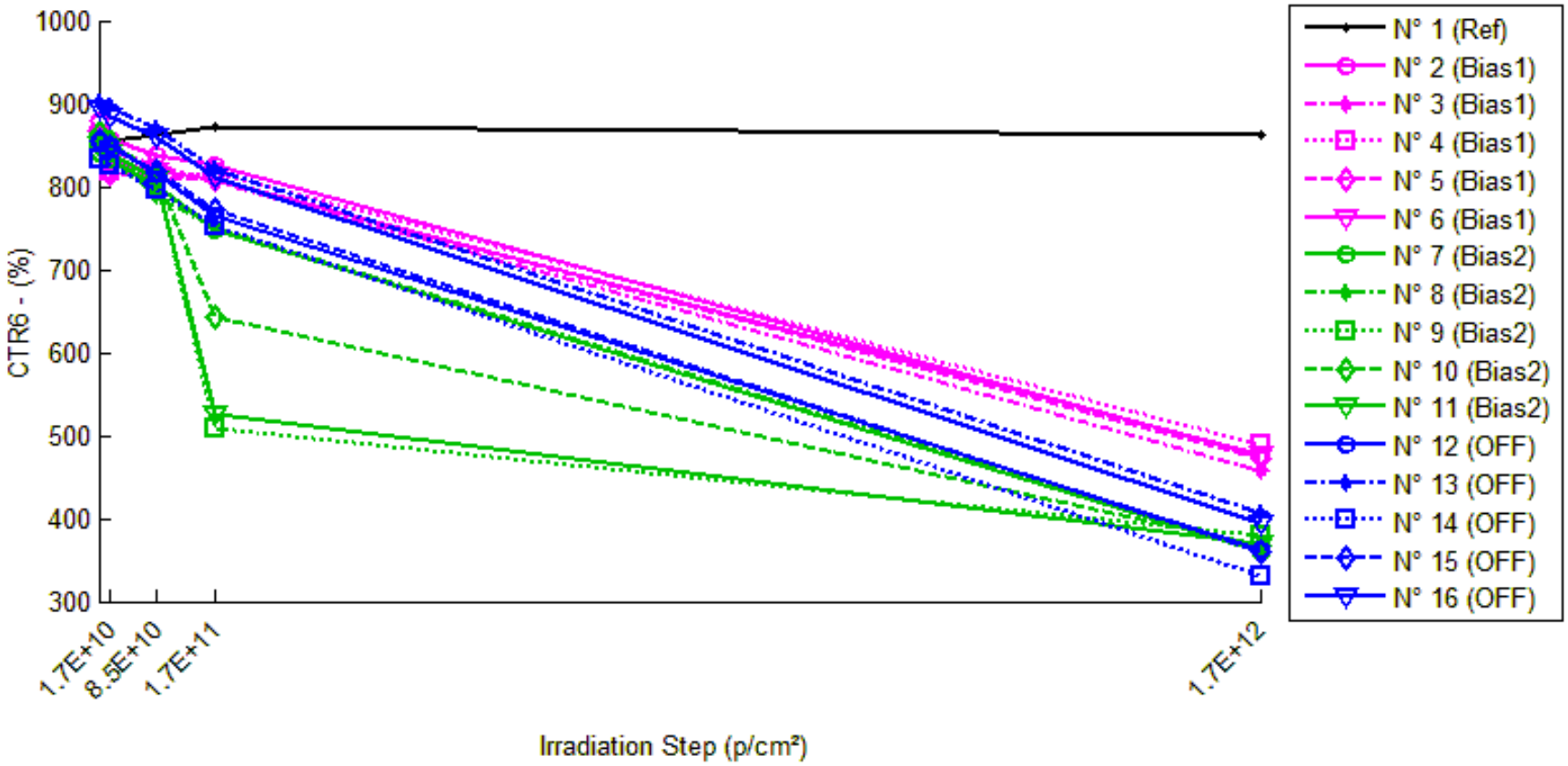
1/Delta [CTR5]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.364E-5	7.693E-6	-2.769E-5	7.022E-6
N° 2 (Bias1)	---	5.896E-5	8.363E-5	4.592E-5	9.826E-4
N° 3 (Bias1)	---	3.831E-5	4.450E-5	4.793E-5	1.043E-3
N° 4 (Bias1)	---	5.063E-6	9.089E-6	3.833E-5	8.802E-4
N° 5 (Bias1)	---	1.536E-5	3.109E-5	4.588E-5	9.781E-4
N° 6 (Bias1)	---	1.443E-5	2.850E-5	4.325E-5	9.381E-4
N° 7 (Bias2)	---	1.181E-5	5.652E-5	2.061E-4	1.695E-3
N° 8 (Bias2)	---	1.841E-5	1.342E-4	2.147E-4	1.699E-3
N° 9 (Bias2)	---	2.111E-5	8.027E-5	1.677E-3	1.552E-3
N° 10 (Bias2)	---	1.282E-5	9.327E-5	8.145E-4	1.663E-3
N° 11 (Bias2)	---	1.170E-5	6.764E-5	1.538E-3	1.610E-3
N° 12 (OFF)	---	-2.544E-6	4.067E-5	1.433E-4	1.729E-3
N° 13 (OFF)	---	1.171E-6	2.893E-5	1.283E-4	1.478E-3
N° 14 (OFF)	---	6.032E-6	4.128E-5	1.208E-4	2.093E-3
N° 15 (OFF)	---	2.984E-6	3.736E-5	1.351E-4	1.826E-3
N° 16 (OFF)	---	9.608E-6	3.296E-5	1.269E-4	1.523E-3
Average (OFF)	---	2.643E-5	3.936E-5	4.426E-5	9.645E-4
σ (OFF)	---	2.192E-5	2.779E-5	3.712E-6	6.028E-5
Average+3σ (OFF)	---	9.219E-5	1.227E-4	5.540E-5	1.145E-3
Average-3σ (OFF)	---	-3.934E-5	-4.401E-5	3.313E-5	7.836E-4
Average (Bias1)	---	1.517E-5	8.639E-5	8.899E-4	1.644E-3
σ (Bias1)	---	4.317E-6	3.008E-5	7.014E-4	6.252E-5
Average+3σ (Bias1)	---	2.812E-5	1.766E-4	2.994E-3	1.831E-3
Average-3σ (Bias1)	---	2.218E-6	-3.846E-6	-1.214E-3	1.456E-3
Average (Bias2)	---	3.450E-6	3.624E-5	1.309E-4	1.730E-3
σ (Bias2)	---	4.635E-6	5.253E-6	8.571E-6	2.488E-4
Average+3σ (Bias2)	---	1.736E-5	5.200E-5	1.566E-4	2.476E-3
Average-3σ (Bias2)	---	-1.045E-5	2.048E-5	1.052E-4	9.834E-4

30 MeV proton / detailed results

20.CTR6

Ta=25°C; If=5mA; Vo=0.4V; Vcc=18V



30 MeV proton / detailed results

CTR6 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	864.03	856.02	861.71	871.88	861.72
N° 2 (Bias1)	878.59	857.78	836.85	826.20	473.36
N° 3 (Bias1)	857.92	843.79	824.81	806.45	456.51
N° 4 (Bias1)	860.19	819.11	811.87	815.85	490.07
N° 5 (Bias1)	859.15	815.79	809.96	808.62	471.90
N° 6 (Bias1)	857.51	829.68	818.28	808.71	476.92
N° 7 (Bias2)	841.43	833.25	801.28	747.77	360.52
N° 8 (Bias2)	846.07	836.28	789.86	750.36	361.56
N° 9 (Bias2)	851.32	841.18	808.05	507.93	379.55
N° 10 (Bias2)	863.87	855.14	812.99	642.83	366.90
N° 11 (Bias2)	848.81	840.93	807.65	524.56	370.19
N° 12 (OFF)	855.24	850.49	816.12	765.51	362.36
N° 13 (OFF)	900.77	896.41	869.98	820.22	406.26
N° 14 (OFF)	833.43	826.11	796.36	751.58	329.30
N° 15 (OFF)	854.39	848.05	818.61	771.44	360.39
N° 16 (OFF)	893.28	883.93	859.88	810.12	394.09

1/Delta [CTR6]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.083E-5	3.116E-6	-1.042E-5	3.103E-6
N° 2 (Bias1)	---	2.761E-5	5.677E-5	7.217E-5	9.744E-4
N° 3 (Bias1)	---	1.952E-5	4.679E-5	7.439E-5	1.025E-3
N° 4 (Bias1)	---	5.830E-5	6.919E-5	6.318E-5	8.780E-4
N° 5 (Bias1)	---	6.186E-5	7.069E-5	7.273E-5	9.552E-4
N° 6 (Bias1)	---	3.912E-5	5.591E-5	7.037E-5	9.306E-4
N° 7 (Bias2)	---	1.167E-5	5.955E-5	1.489E-4	1.585E-3
N° 8 (Bias2)	---	1.384E-5	8.411E-5	1.508E-4	1.584E-3
N° 9 (Bias2)	---	1.416E-5	6.290E-5	7.941E-4	1.460E-3
N° 10 (Bias2)	---	1.182E-5	7.245E-5	3.980E-4	1.568E-3
N° 11 (Bias2)	---	1.104E-5	6.004E-5	7.282E-4	1.523E-3
N° 12 (OFF)	---	6.530E-6	5.605E-5	1.371E-4	1.590E-3
N° 13 (OFF)	---	5.400E-6	3.929E-5	1.090E-4	1.351E-3
N° 14 (OFF)	---	1.063E-5	5.585E-5	1.307E-4	1.837E-3
N° 15 (OFF)	---	8.750E-6	5.116E-5	1.259E-4	1.604E-3
N° 16 (OFF)	---	1.184E-5	4.348E-5	1.149E-4	1.418E-3
Average (OFF)	---	4.128E-5	5.987E-5	7.057E-5	9.526E-4
σ (OFF)	---	1.856E-5	1.000E-5	4.373E-6	5.422E-5
Average+3σ (OFF)	---	9.698E-5	8.988E-5	8.369E-5	1.115E-3
Average-3σ (OFF)	---	-1.441E-5	2.986E-5	5.745E-5	7.899E-4
Average (Bias1)	---	1.250E-5	6.781E-5	4.440E-4	1.544E-3
σ (Bias1)	---	1.399E-6	1.049E-5	3.077E-4	5.327E-5
Average+3σ (Bias1)	---	1.670E-5	9.927E-5	1.367E-3	1.704E-3
Average-3σ (Bias1)	---	8.306E-6	3.635E-5	-4.789E-4	1.384E-3
Average (Bias2)	---	8.631E-6	4.917E-5	1.235E-4	1.560E-3
σ (Bias2)	---	2.701E-6	7.514E-6	1.145E-5	1.893E-4
Average+3σ (Bias2)	---	1.673E-5	7.171E-5	1.578E-4	2.128E-3
Average-3σ (Bias2)	---	5.281E-7	2.662E-5	8.917E-5	9.924E-4

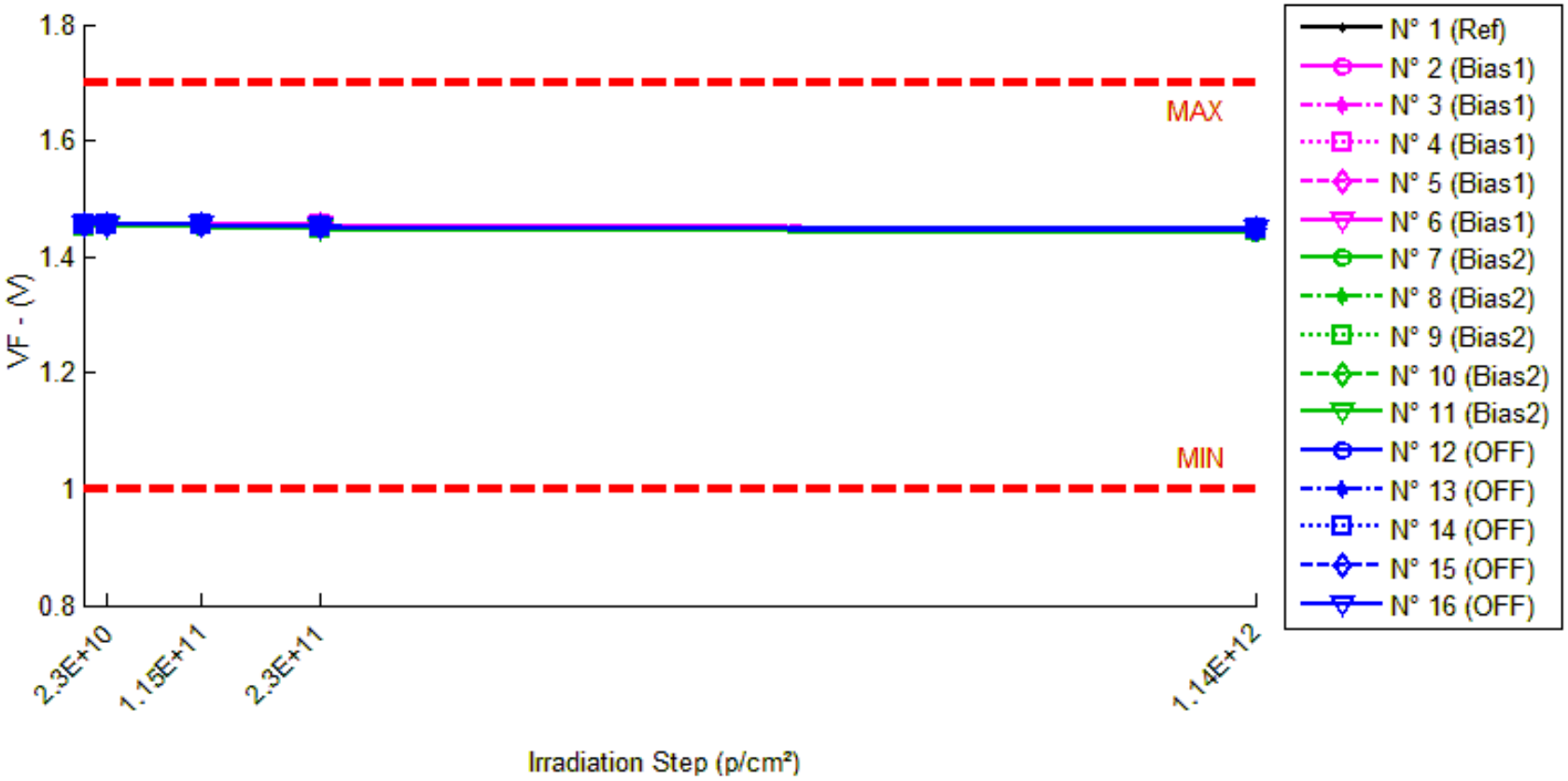
60 MeV proton / detailed results

CONTENTS

60 MeV proton / detailed results

1. VF

Ta=25°C; If=1.6mA



60 MeV proton / detailed results

VF . (V) **Min = 1.0 Max = 1.7**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1.454	1.453	1.452	1.451	1.448
N° 2 (Bias1)	1.454	1.455	1.456	1.454	1.447
N° 3 (Bias1)	1.456	1.456	1.456	1.455	1.448
N° 4 (Bias1)	1.455	1.456	1.455	1.454	1.450
N° 5 (Bias1)	1.455	1.455	1.455	1.454	1.448
N° 6 (Bias1)	1.456	1.456	1.456	1.455	1.449
N° 7 (Bias2)	1.454	1.454	1.451	1.447	1.442
N° 8 (Bias2)	1.454	1.454	1.454	1.448	1.447
N° 9 (Bias2)	1.453	1.454	1.454	1.447	1.446
N° 10 (Bias2)	1.455	1.455	1.455	1.451	1.447
N° 11 (Bias2)	1.454	1.453	1.454	1.450	1.447
N° 12 (OFF)	1.454	1.456	1.455	1.451	1.446
N° 13 (OFF)	1.456	1.456	1.455	1.453	1.446
N° 14 (OFF)	1.456	1.455	1.457	1.453	1.448
N° 15 (OFF)	1.455	1.455	1.455	1.453	1.448
N° 16 (OFF)	1.455	1.455	1.454	1.453	1.447

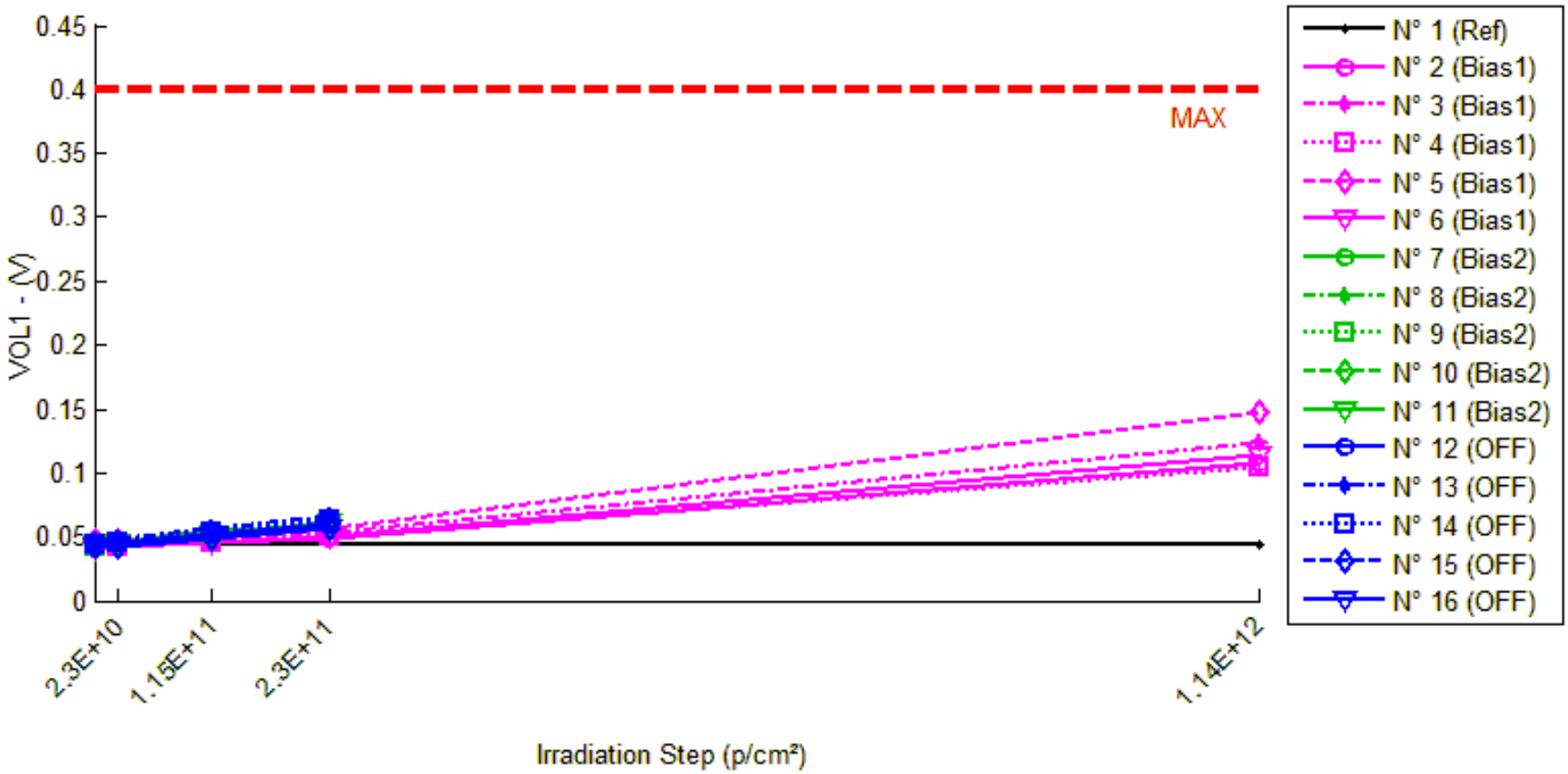
Delta [VF]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-1.559E-3	-2.098E-3	-3.178E-3	-6.351E-3
N° 2 (Bias1)	---	1.447E-3	1.822E-3	5.100E-4	-6.552E-3
N° 3 (Bias1)	---	-4.140E-4	-7.680E-4	-1.954E-3	-8.935E-3
N° 4 (Bias1)	---	7.850E-4	-1.080E-4	-1.641E-3	-5.270E-3
N° 5 (Bias1)	---	8.270E-4	6.080E-4	-3.360E-4	-6.695E-3
N° 6 (Bias1)	---	3.010E-4	-1.540E-4	-9.030E-4	-7.416E-3
N° 7 (Bias2)	---	-4.410E-4	-3.155E-3	-7.320E-3	-1.219E-2
N° 8 (Bias2)	---	2.720E-4	-9.900E-5	-6.173E-3	-7.282E-3
N° 9 (Bias2)	---	6.140E-4	1.900E-4	-6.032E-3	-7.020E-3
N° 10 (Bias2)	---	-5.200E-4	-6.980E-4	-4.331E-3	-7.934E-3
N° 11 (Bias2)	---	-2.460E-4	3.970E-4	-3.806E-3	-6.674E-3
N° 12 (OFF)	---	1.912E-3	1.123E-3	-2.952E-3	-7.775E-3
N° 13 (OFF)	---	-5.520E-4	-1.209E-3	-3.412E-3	-1.057E-2
N° 14 (OFF)	---	-7.660E-4	3.310E-4	-3.270E-3	-8.457E-3
N° 15 (OFF)	---	3.400E-5	-8.700E-5	-2.407E-3	-7.586E-3
N° 16 (OFF)	---	-2.920E-4	-8.590E-4	-2.744E-3	-7.981E-3
Average (OFF)	---	5.892E-4	2.800E-4	-8.648E-4	-6.974E-3
σ (OFF)	---	6.929E-4	9.903E-4	9.950E-4	1.342E-3
Average+3σ (OFF)	---	2.668E-3	3.251E-3	2.120E-3	-2.949E-3
Average-3σ (OFF)	---	-1.489E-3	-2.691E-3	-3.850E-3	-1.100E-2
Average (Bias1)	---	-6.420E-5	-6.730E-4	-5.532E-3	-8.220E-3
σ (Bias1)	---	4.888E-4	1.447E-3	1.439E-3	2.267E-3
Average+3σ (Bias1)	---	1.402E-3	3.669E-3	-1.216E-3	-1.419E-3
Average-3σ (Bias1)	---	-1.531E-3	-5.015E-3	-9.848E-3	-1.502E-2
Average (Bias2)	---	6.720E-5	-1.402E-4	-2.957E-3	-8.474E-3
σ (Bias2)	---	1.074E-3	9.327E-4	4.040E-4	1.216E-3
Average+3σ (Bias2)	---	3.288E-3	2.658E-3	-1.745E-3	-4.826E-3
Average-3σ (Bias2)	---	-3.154E-3	-2.938E-3	-4.169E-3	-1.212E-2

60 MeV proton / detailed results

2. VOL1

Ta=25°C; If=0.5mA ; Iol = 1.5mA ; Vcc = 4.5V



60 MeV proton / detailed results

VOL1 . (V) **Max = 0.4**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	0.043	0.044	0.044	0.044	0.044
N° 2 (Bias1)	0.041	0.042	0.045	0.049	0.107
N° 3 (Bias1)	0.043	0.044	0.048	0.053	0.124
N° 4 (Bias1)	0.042	0.043	0.046	0.050	0.104
N° 5 (Bias1)	0.047	0.047	0.052	0.057	0.147
N° 6 (Bias1)	0.041	0.042	0.046	0.050	0.114
N° 7 (Bias2)	0.044	0.045	0.055	0.059	Not Measurable*
N° 8 (Bias2)	0.043	0.045	0.052	0.059	Not Measurable*
N° 9 (Bias2)	0.043	0.045	0.052	0.062	Not Measurable*
N° 10 (Bias2)	0.043	0.045	0.050	0.060	Not Measurable*
N° 11 (Bias2)	0.044	0.046	0.052	0.062	Not Measurable*
N° 12 (OFF)	0.045	0.046	0.052	0.060	Not Measurable*
N° 13 (OFF)	0.047	0.048	0.056	0.066	Not Measurable*
N° 14 (OFF)	0.044	0.046	0.053	0.063	Not Measurable*
N° 15 (OFF)	0.042	0.043	0.049	0.057	Not Measurable*
N° 16 (OFF)	0.042	0.043	0.049	0.056	Not Measurable*

***le courant If est trop faible pour faire basculer la sortie à un état bas.**

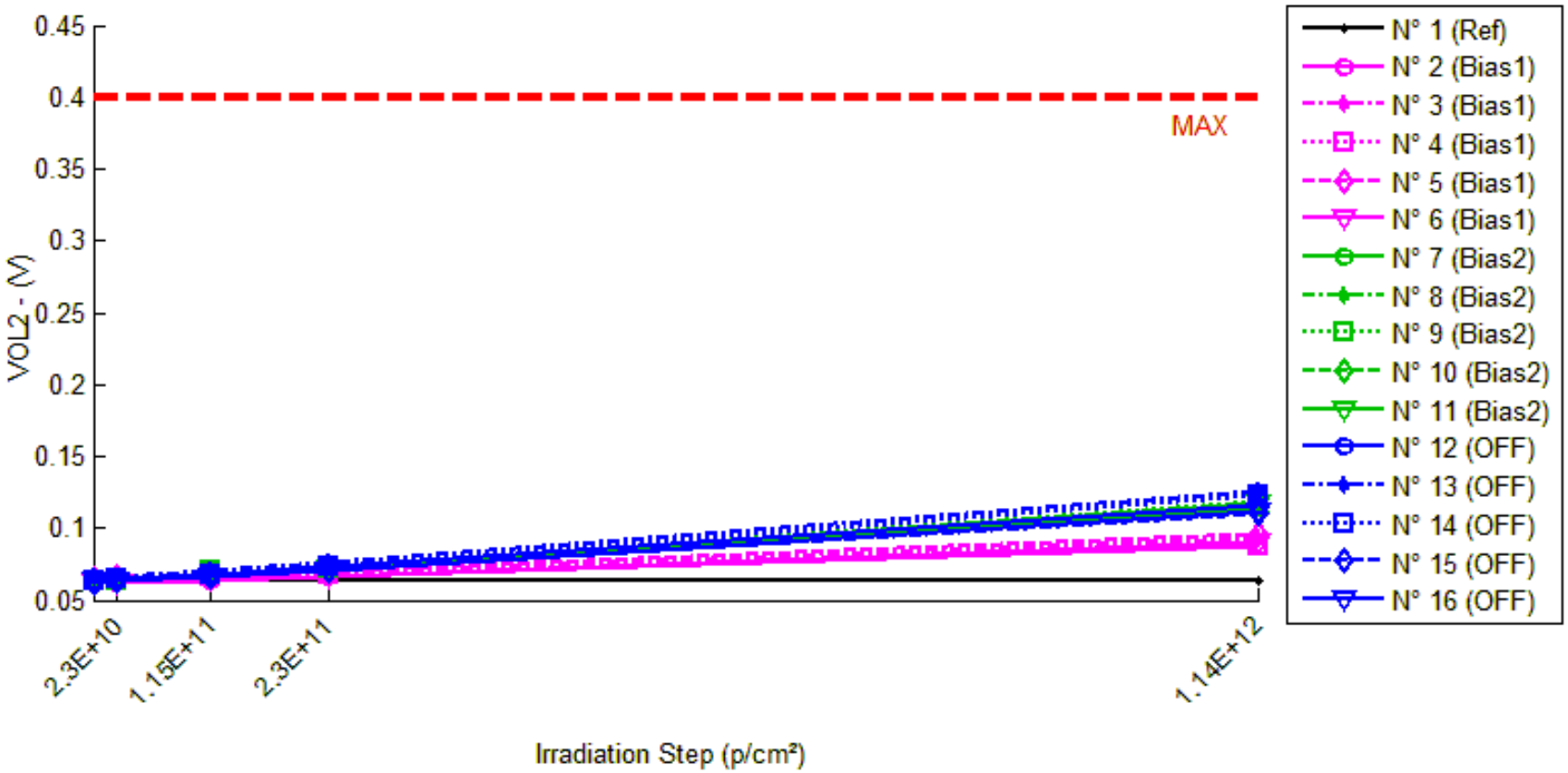
Delta [VOL1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	7.231E-5	1.261E-4	2.119E-4	4.896E-4
N° 2 (Bias1)	---	5.539E-4	3.651E-3	8.272E-3	6.565E-2
N° 3 (Bias1)	---	8.374E-4	4.538E-3	9.948E-3	8.112E-2
N° 4 (Bias1)	---	7.036E-4	4.269E-3	8.476E-3	6.251E-2
N° 5 (Bias1)	---	8.969E-4	5.022E-3	1.094E-2	1.007E-1
N° 6 (Bias1)	---	7.248E-4	4.460E-3	9.186E-3	7.270E-2
N° 7 (Bias2)	---	1.599E-3	1.115E-2	1.501E-2	NaN
N° 8 (Bias2)	---	1.464E-3	8.231E-3	1.528E-2	NaN
N° 9 (Bias2)	---	1.309E-3	8.970E-3	1.826E-2	NaN
N° 10 (Bias2)	---	1.459E-3	7.211E-3	1.643E-2	NaN
N° 11 (Bias2)	---	1.648E-3	8.105E-3	1.829E-2	NaN
N° 12 (OFF)	---	9.881E-4	7.098E-3	1.587E-2	NaN
N° 13 (OFF)	---	1.821E-3	9.157E-3	1.982E-2	NaN
N° 14 (OFF)	---	1.693E-3	8.607E-3	1.915E-2	NaN
N° 15 (OFF)	---	1.134E-3	6.705E-3	1.494E-2	NaN
N° 16 (OFF)	---	1.123E-3	6.810E-3	1.468E-2	NaN
Average (OFF)	---	7.433E-4	4.388E-3	9.365E-3	7.654E-2
σ (OFF)	---	1.325E-4	4.969E-4	1.101E-3	1.530E-2
Average+3σ (OFF)	---	1.141E-3	5.879E-3	1.267E-2	1.225E-1
Average-3σ (OFF)	---	3.458E-4	2.898E-3	6.063E-3	3.063E-2
Average (Bias1)	---	1.496E-3	8.734E-3	1.666E-2	NaN
σ (Bias1)	---	1.332E-4	1.490E-3	1.573E-3	0.000E+0
Average+3σ (Bias1)	---	1.895E-3	1.321E-2	2.137E-2	NaN
Average-3σ (Bias1)	---	1.096E-3	4.263E-3	1.194E-2	NaN
Average (Bias2)	---	1.352E-3	7.675E-3	1.689E-2	NaN
σ (Bias2)	---	3.769E-4	1.128E-3	2.417E-3	0.000E+0
Average+3σ (Bias2)	---	2.482E-3	1.106E-2	2.414E-2	NaN
Average-3σ (Bias2)	---	2.211E-4	4.292E-3	9.642E-3	NaN

60 MeV proton / detailed results

3. VOL2

Ta=25°C; If=1.6mA ; Iol = 4.8mA ; Vcc = 4.5V



60 MeV proton / detailed results

VOL2 . (V) **Max = 0.4**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	0.063	0.063	0.063	0.064	0.063
N° 2 (Bias1)	0.062	0.062	0.064	0.067	0.088
N° 3 (Bias1)	0.063	0.064	0.067	0.069	0.093
N° 4 (Bias1)	0.063	0.063	0.066	0.068	0.088
N° 5 (Bias1)	0.065	0.066	0.068	0.071	0.096
N° 6 (Bias1)	0.062	0.062	0.065	0.067	0.090
N° 7 (Bias2)	0.064	0.065	0.068	0.071	0.114
N° 8 (Bias2)	0.063	0.064	0.068	0.071	0.116
N° 9 (Bias2)	0.063	0.063	0.070	0.072	0.119
N° 10 (Bias2)	0.063	0.064	0.067	0.072	0.112
N° 11 (Bias2)	0.063	0.064	0.067	0.072	0.117
N° 12 (OFF)	0.064	0.065	0.068	0.073	0.116
N° 13 (OFF)	0.066	0.067	0.070	0.076	0.126
N° 14 (OFF)	0.064	0.065	0.068	0.074	0.123
N° 15 (OFF)	0.062	0.063	0.066	0.070	0.110
N° 16 (OFF)	0.063	0.063	0.066	0.071	0.111

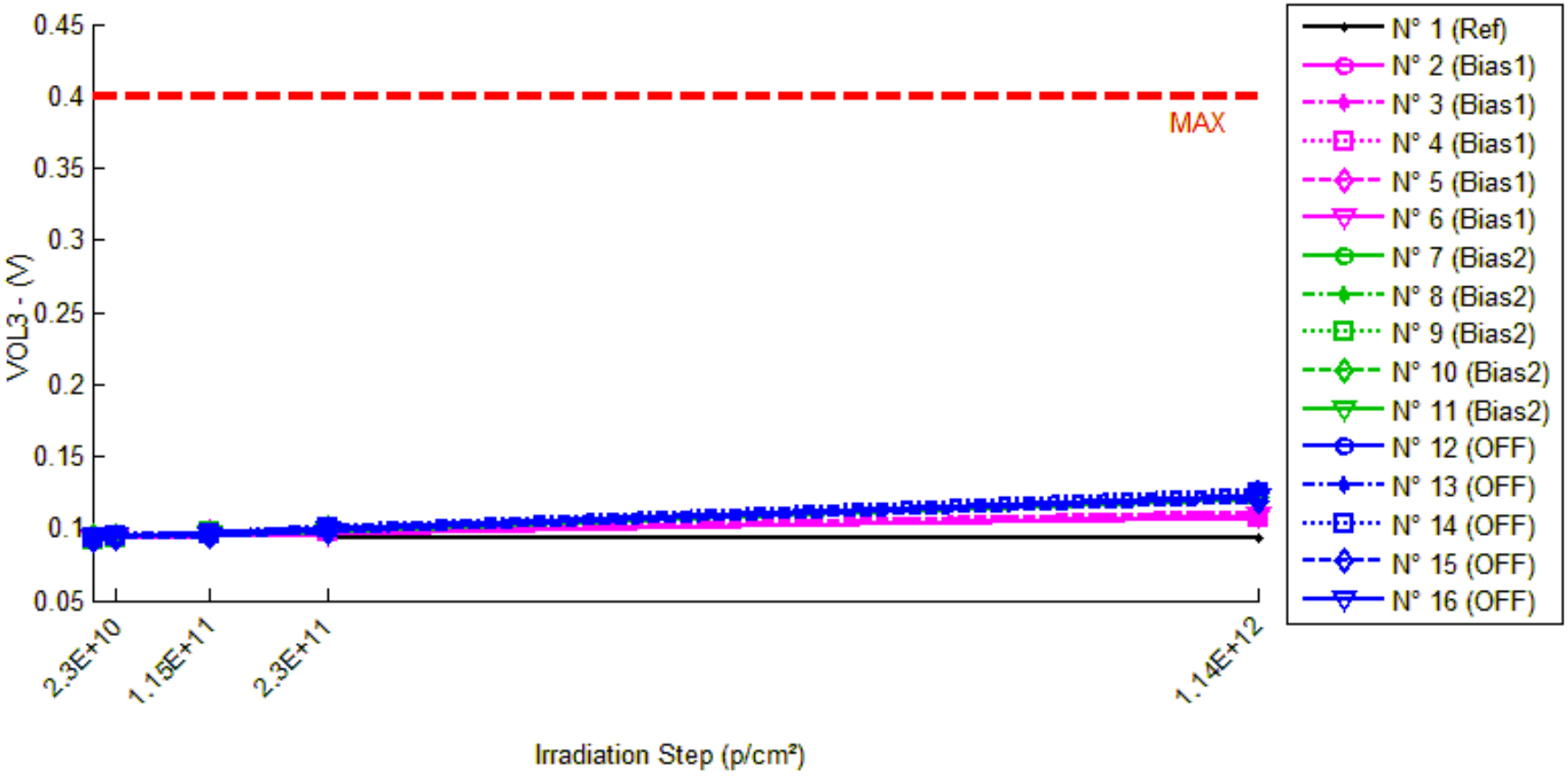
Delta [VOL2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	4.825E-4	6.415E-4	8.538E-4	5.795E-4
N° 2 (Bias1)	---	6.230E-4	2.332E-3	4.946E-3	2.637E-2
N° 3 (Bias1)	---	8.197E-4	3.314E-3	5.752E-3	2.989E-2
N° 4 (Bias1)	---	6.612E-4	3.035E-3	5.147E-3	2.570E-2
N° 5 (Bias1)	---	7.312E-4	3.257E-3	5.901E-3	3.090E-2
N° 6 (Bias1)	---	7.566E-4	3.038E-3	5.524E-3	2.873E-2
N° 7 (Bias2)	---	9.253E-4	4.624E-3	7.520E-3	4.971E-2
N° 8 (Bias2)	---	6.542E-4	4.401E-3	7.905E-3	5.240E-2
N° 9 (Bias2)	---	6.760E-4	7.781E-3	9.433E-3	5.651E-2
N° 10 (Bias2)	---	8.152E-4	3.805E-3	9.025E-3	4.869E-2
N° 11 (Bias2)	---	9.098E-4	4.062E-3	8.534E-3	5.397E-2
N° 12 (OFF)	---	5.194E-4	3.500E-3	8.291E-3	5.127E-2
N° 13 (OFF)	---	8.819E-4	4.333E-3	9.762E-3	6.001E-2
N° 14 (OFF)	---	8.586E-4	4.194E-3	9.546E-3	5.891E-2
N° 15 (OFF)	---	6.214E-4	3.457E-3	8.059E-3	4.741E-2
N° 16 (OFF)	---	6.408E-4	3.535E-3	8.066E-3	4.878E-2
Average (OFF)	---	7.183E-4	2.995E-3	5.454E-3	2.832E-2
σ (OFF)	---	7.786E-5	3.917E-4	4.016E-4	2.235E-3
Average+3σ (OFF)	---	9.519E-4	4.170E-3	6.659E-3	3.502E-2
Average-3σ (OFF)	---	4.848E-4	1.820E-3	4.249E-3	2.161E-2
Average (Bias1)	---	7.961E-4	4.935E-3	8.483E-3	5.225E-2
σ (Bias1)	---	1.270E-4	1.622E-3	7.845E-4	3.170E-3
Average+3σ (Bias1)	---	1.177E-3	9.799E-3	1.084E-2	6.177E-2
Average-3σ (Bias1)	---	4.150E-4	6.979E-5	6.130E-3	4.274E-2
Average (Bias2)	---	7.044E-4	3.804E-3	8.745E-3	5.328E-2
σ (Bias2)	---	1.585E-4	4.235E-4	8.389E-4	5.826E-3
Average+3σ (Bias2)	---	1.180E-3	5.074E-3	1.126E-2	7.075E-2
Average-3σ (Bias2)	---	2.290E-4	2.533E-3	6.228E-3	3.580E-2

60 MeV proton / detailed results

4. VOL3

Ta=25°C; If=5mA ; Iol = 10mA ; Vcc = 4.5V



60 MeV proton / detailed results

VOL3 . (V) **Max = 0.4**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	0.093	0.094	0.094	0.094	0.093
N° 2 (Bias1)	0.092	0.093	0.095	0.097	0.108
N° 3 (Bias1)	0.094	0.095	0.097	0.098	0.111
N° 4 (Bias1)	0.093	0.094	0.096	0.097	0.108
N° 5 (Bias1)	0.094	0.095	0.098	0.099	0.112
N° 6 (Bias1)	0.092	0.093	0.095	0.096	0.109
N° 7 (Bias2)	0.094	0.095	0.097	0.099	0.120
N° 8 (Bias2)	0.094	0.094	0.098	0.099	0.122
N° 9 (Bias2)	0.092	0.093	0.098	0.100	0.123
N° 10 (Bias2)	0.094	0.094	0.096	0.101	0.121
N° 11 (Bias2)	0.093	0.094	0.096	0.098	0.122
N° 12 (OFF)	0.095	0.095	0.097	0.101	0.123
N° 13 (OFF)	0.095	0.096	0.098	0.102	0.127
N° 14 (OFF)	0.093	0.094	0.096	0.100	0.124
N° 15 (OFF)	0.092	0.093	0.094	0.098	0.119
N° 16 (OFF)	0.093	0.094	0.095	0.099	0.121

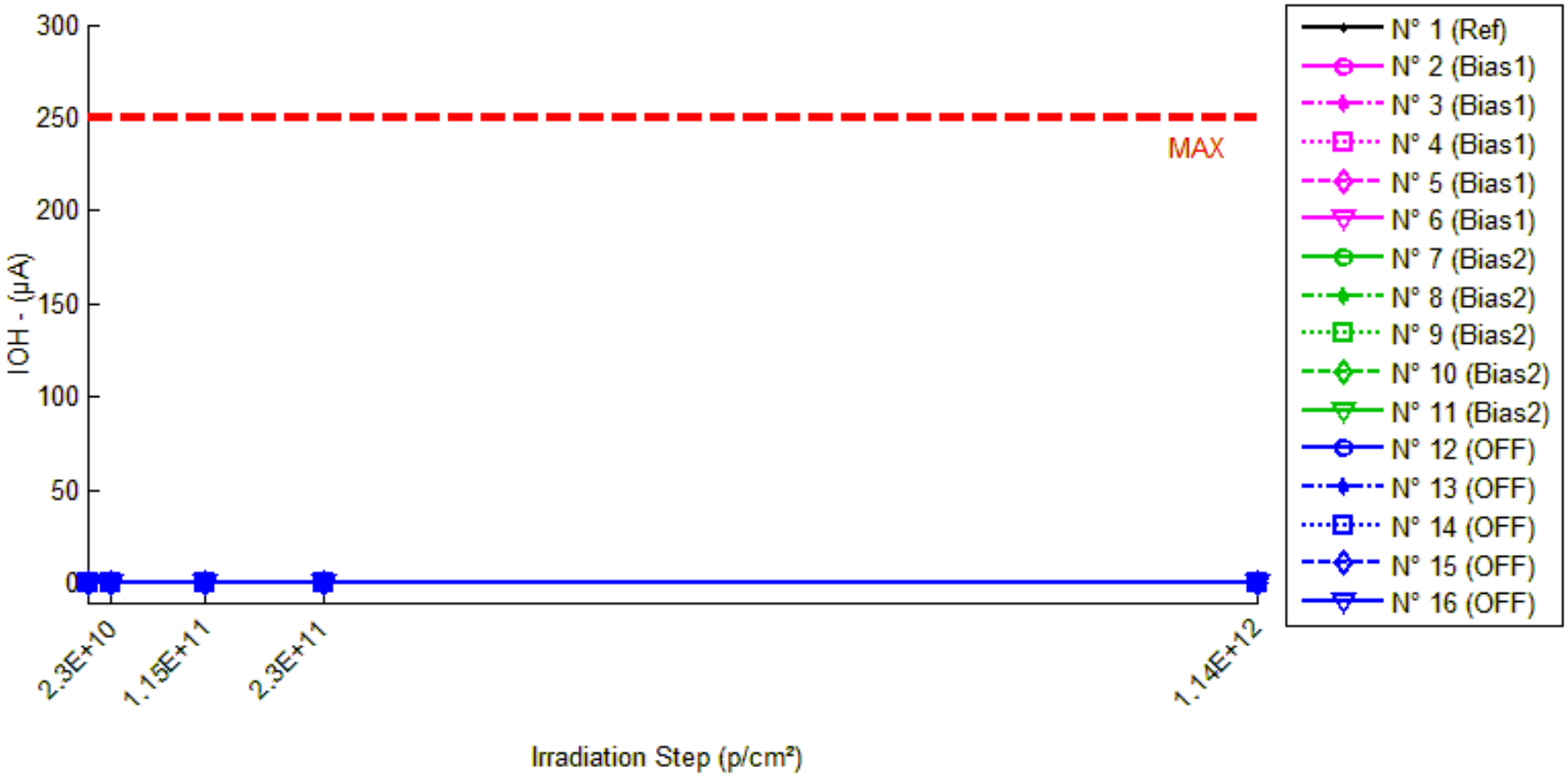
Delta [VOL3]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	9.454E-4	1.223E-3	1.636E-3	7.229E-4
N° 2 (Bias1)	---	9.098E-4	2.089E-3	4.055E-3	1.545E-2
N° 3 (Bias1)	---	1.105E-3	3.482E-3	4.673E-3	1.740E-2
N° 4 (Bias1)	---	8.908E-4	3.147E-3	4.269E-3	1.517E-2
N° 5 (Bias1)	---	8.965E-4	3.159E-3	4.541E-3	1.749E-2
N° 6 (Bias1)	---	9.422E-4	3.000E-3	4.468E-3	1.686E-2
N° 7 (Bias2)	---	8.404E-4	3.028E-3	5.158E-3	2.647E-2
N° 8 (Bias2)	---	4.299E-4	4.555E-3	5.915E-3	2.893E-2
N° 9 (Bias2)	---	4.097E-4	5.060E-3	7.289E-3	3.026E-2
N° 10 (Bias2)	---	4.883E-4	2.501E-3	7.477E-3	2.691E-2
N° 11 (Bias2)	---	7.589E-4	2.709E-3	5.365E-3	2.885E-2
N° 12 (OFF)	---	3.130E-4	2.106E-3	6.238E-3	2.823E-2
N° 13 (OFF)	---	5.775E-4	2.633E-3	6.949E-3	3.167E-2
N° 14 (OFF)	---	5.595E-4	2.477E-3	6.798E-3	3.087E-2
N° 15 (OFF)	---	4.342E-4	2.128E-3	5.998E-3	2.651E-2
N° 16 (OFF)	---	4.483E-4	2.181E-3	6.029E-3	2.759E-2
Average (OFF)	---	9.489E-4	2.975E-3	4.401E-3	1.647E-2
σ (OFF)	---	8.973E-5	5.257E-4	2.425E-4	1.094E-3
Average+3σ (OFF)	---	1.218E-3	4.553E-3	5.129E-3	1.975E-2
Average-3σ (OFF)	---	6.798E-4	1.398E-3	3.674E-3	1.319E-2
Average (Bias1)	---	5.854E-4	3.570E-3	6.241E-3	2.828E-2
σ (Bias1)	---	1.998E-4	1.158E-3	1.081E-3	1.567E-3
Average+3σ (Bias1)	---	1.185E-3	7.046E-3	9.484E-3	3.299E-2
Average-3σ (Bias1)	---	-1.383E-5	9.524E-5	2.998E-3	2.358E-2
Average (Bias2)	---	4.665E-4	2.305E-3	6.402E-3	2.897E-2
σ (Bias2)	---	1.071E-4	2.362E-4	4.429E-4	2.203E-3
Average+3σ (Bias2)	---	7.879E-4	3.014E-3	7.731E-3	3.558E-2
Average-3σ (Bias2)	---	1.452E-4	1.596E-3	5.074E-3	2.236E-2

60 MeV proton / detailed results

5. IOH

Ta=25°C; If=2µA; Vo=Vcc=18V



60 MeV proton / detailed results

IOH . (µA) **Max = 250.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1.865E-4	1.985E-4	2.031E-4	1.967E-4	1.951E-4
N° 2 (Bias1)	1.853E-4	2.013E-4	1.953E-4	2.061E-4	2.400E-4
N° 3 (Bias1)	1.868E-4	2.015E-4	2.049E-4	2.152E-4	2.386E-4
N° 4 (Bias1)	1.871E-4	2.034E-4	2.100E-4	2.121E-4	2.774E-4
N° 5 (Bias1)	1.763E-4	1.988E-4	2.056E-4	2.093E-4	2.358E-4
N° 6 (Bias1)	1.853E-4	2.021E-4	2.072E-4	2.111E-4	2.365E-4
N° 7 (Bias2)	2.040E-4	1.877E-4	1.936E-4	2.055E-4	2.399E-4
N° 8 (Bias2)	2.023E-4	1.892E-4	1.910E-4	2.048E-4	2.303E-4
N° 9 (Bias2)	2.044E-4	1.891E-4	1.947E-4	2.045E-4	2.282E-4
N° 10 (Bias2)	2.040E-4	1.952E-4	1.968E-4	2.045E-4	2.320E-4
N° 11 (Bias2)	2.040E-4	1.923E-4	1.931E-4	2.085E-4	2.228E-4
N° 12 (OFF)	2.045E-4	2.043E-4	2.413E-4	2.049E-4	2.286E-4
N° 13 (OFF)	2.034E-4	2.060E-4	2.012E-4	2.052E-4	2.367E-4
N° 14 (OFF)	2.067E-4	2.058E-4	1.972E-4	2.065E-4	2.303E-4
N° 15 (OFF)	2.029E-4	1.963E-4	2.049E-4	2.041E-4	2.301E-4
N° 16 (OFF)	2.077E-4	2.054E-4	2.051E-4	2.067E-4	2.203E-4

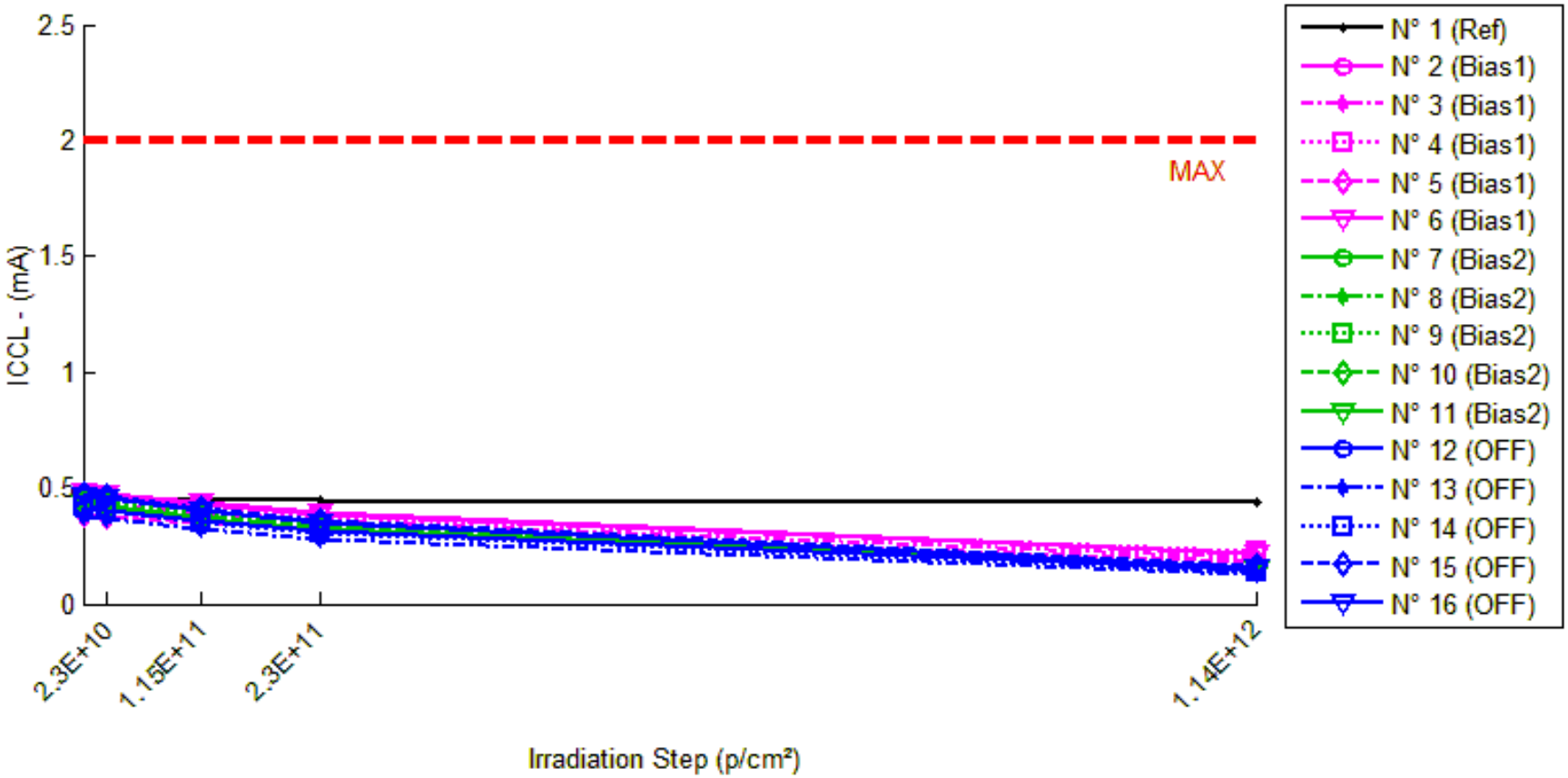
Delta [IOH]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	1.198E-5	1.659E-5	1.018E-5	8.631E-6
N° 2 (Bias1)	---	1.601E-5	1.001E-5	2.078E-5	5.465E-5
N° 3 (Bias1)	---	1.471E-5	1.814E-5	2.841E-5	5.176E-5
N° 4 (Bias1)	---	1.634E-5	2.288E-5	2.506E-5	9.028E-5
N° 5 (Bias1)	---	2.250E-5	2.929E-5	3.298E-5	5.947E-5
N° 6 (Bias1)	---	1.680E-5	2.196E-5	2.581E-5	5.126E-5
N° 7 (Bias2)	---	-1.634E-5	-1.043E-5	1.510E-6	3.593E-5
N° 8 (Bias2)	---	-1.312E-5	-1.131E-5	2.516E-6	2.805E-5
N° 9 (Bias2)	---	-1.525E-5	-9.678E-6	1.276E-7	2.385E-5
N° 10 (Bias2)	---	-8.799E-6	-7.248E-6	4.624E-7	2.800E-5
N° 11 (Bias2)	---	-1.173E-5	-1.089E-5	4.444E-6	1.874E-5
N° 12 (OFF)	---	-2.516E-7	3.676E-5	3.792E-7	2.410E-5
N° 13 (OFF)	---	2.598E-6	-2.179E-6	1.846E-6	3.328E-5
N° 14 (OFF)	---	-9.224E-7	-9.556E-6	-2.495E-7	2.352E-5
N° 15 (OFF)	---	-6.664E-6	1.970E-6	1.134E-6	2.716E-5
N° 16 (OFF)	---	-2.306E-6	-2.682E-6	-1.088E-6	1.258E-5
Average (OFF)	---	1.727E-5	2.046E-5	2.661E-5	6.148E-5
σ (OFF)	---	3.026E-6	7.082E-6	4.495E-6	1.642E-5
Average+3σ (OFF)	---	2.635E-5	4.170E-5	4.010E-5	1.108E-4
Average-3σ (OFF)	---	8.195E-6	-7.884E-7	1.313E-5	1.221E-5
Average (Bias1)	---	-1.305E-5	-9.913E-6	1.812E-6	2.691E-5
σ (Bias1)	---	2.979E-6	1.609E-6	1.745E-6	6.322E-6
Average+3σ (Bias1)	---	-4.110E-6	-5.088E-6	7.046E-6	4.588E-5
Average-3σ (Bias1)	---	-2.199E-5	-1.474E-5	-3.422E-6	7.949E-6
Average (Bias2)	---	-1.509E-6	4.862E-6	4.044E-7	2.413E-5
σ (Bias2)	---	3.391E-6	1.830E-5	1.147E-6	7.530E-6
Average+3σ (Bias2)	---	8.665E-6	5.977E-5	3.846E-6	4.672E-5
Average-3σ (Bias2)	---	-1.168E-5	-5.005E-5	-3.038E-6	1.538E-6

60 MeV proton / detailed results

6. ICCL

Ta=25°C; Vcc=18V; If=1.6mA



60 MeV proton / detailed results

ICCL . (mA) **Max = 2.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	0.444	0.447	0.446	0.446	0.442
N° 2 (Bias1)	0.463	0.459	0.426	0.389	0.220
N° 3 (Bias1)	0.437	0.430	0.398	0.361	0.202
N° 4 (Bias1)	0.445	0.439	0.408	0.376	0.223
N° 5 (Bias1)	0.385	0.379	0.353	0.322	0.185
N° 6 (Bias1)	0.485	0.477	0.438	0.397	0.217
N° 7 (Bias2)	0.417	0.403	0.358	0.320	0.146
N° 8 (Bias2)	0.440	0.424	0.379	0.331	0.150
N° 9 (Bias2)	0.456	0.440	0.385	0.329	0.141
N° 10 (Bias2)	0.437	0.421	0.377	0.330	0.156
N° 11 (Bias2)	0.434	0.418	0.371	0.319	0.142
N° 12 (OFF)	0.413	0.404	0.363	0.319	0.148
N° 13 (OFF)	0.379	0.366	0.325	0.283	0.129
N° 14 (OFF)	0.417	0.402	0.353	0.305	0.136
N° 15 (OFF)	0.475	0.462	0.411	0.358	0.165
N° 16 (OFF)	0.468	0.454	0.402	0.352	0.159

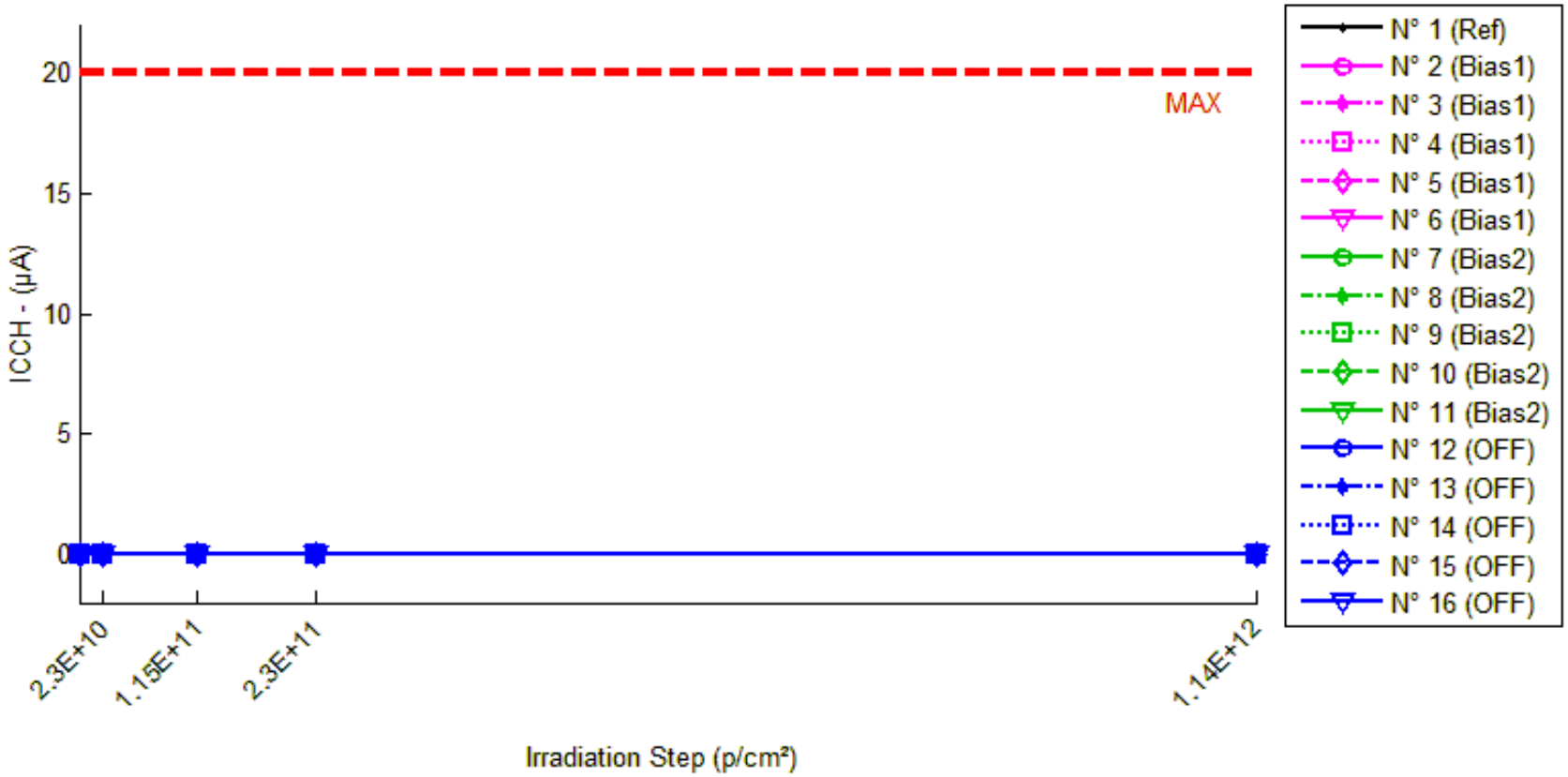
Delta [ICCL]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	3.252E-3	2.785E-3	1.991E-3	-1.564E-3
N° 2 (Bias1)	---	-4.966E-3	-3.707E-2	-7.424E-2	-2.431E-1
N° 3 (Bias1)	---	-7.368E-3	-3.923E-2	-7.568E-2	-2.350E-1
N° 4 (Bias1)	---	-5.148E-3	-3.654E-2	-6.906E-2	-2.219E-1
N° 5 (Bias1)	---	-5.909E-3	-3.247E-2	-6.297E-2	-1.999E-1
N° 6 (Bias1)	---	-8.787E-3	-4.734E-2	-8.806E-2	-2.686E-1
N° 7 (Bias2)	---	-1.408E-2	-5.973E-2	-9.686E-2	-2.710E-1
N° 8 (Bias2)	---	-1.527E-2	-6.111E-2	-1.092E-1	-2.902E-1
N° 9 (Bias2)	---	-1.591E-2	-7.144E-2	-1.272E-1	-3.157E-1
N° 10 (Bias2)	---	-1.598E-2	-5.984E-2	-1.069E-1	-2.806E-1
N° 11 (Bias2)	---	-1.519E-2	-6.275E-2	-1.142E-1	-2.916E-1
N° 12 (OFF)	---	-8.613E-3	-5.019E-2	-9.351E-2	-2.647E-1
N° 13 (OFF)	---	-1.328E-2	-5.365E-2	-9.575E-2	-2.496E-1
N° 14 (OFF)	---	-1.459E-2	-6.336E-2	-1.112E-1	-2.808E-1
N° 15 (OFF)	---	-1.262E-2	-6.355E-2	-1.169E-1	-3.094E-1
N° 16 (OFF)	---	-1.339E-2	-6.623E-2	-1.158E-1	-3.092E-1
Average (OFF)	---	-6.436E-3	-3.853E-2	-7.400E-2	-2.337E-1
σ (OFF)	---	1.620E-3	5.498E-3	9.310E-3	2.545E-2
Average+3σ (OFF)	---	-1.577E-3	-2.203E-2	-4.607E-2	-1.574E-1
Average-3σ (OFF)	---	-1.129E-2	-5.502E-2	-1.019E-1	-3.101E-1
Average (Bias1)	---	-1.529E-2	-6.297E-2	-1.109E-1	-2.898E-1
σ (Bias1)	---	7.660E-4	4.886E-3	1.108E-2	1.667E-2
Average+3σ (Bias1)	---	-1.299E-2	-4.832E-2	-7.761E-2	-2.398E-1
Average-3σ (Bias1)	---	-1.758E-2	-7.763E-2	-1.441E-1	-3.398E-1
Average (Bias2)	---	-1.250E-2	-5.940E-2	-1.066E-1	-2.827E-1
σ (Bias2)	---	2.285E-3	7.025E-3	1.118E-2	2.665E-2
Average+3σ (Bias2)	---	-5.644E-3	-3.832E-2	-7.307E-2	-2.028E-1
Average-3σ (Bias2)	---	-1.935E-2	-8.047E-2	-1.402E-1	-3.627E-1

60 MeV proton / detailed results

7. ICCH

Ta=25°C; Vcc=18V; If=0



60 MeV proton / detailed results

ICCH . (µA) **Max = 20.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	0.015	0.015	0.016	0.015	0.016
N° 2 (Bias1)	0.015	0.016	0.016	0.015	0.017
N° 3 (Bias1)	0.015	0.016	0.015	0.015	0.021
N° 4 (Bias1)	0.014	0.015	0.015	0.015	0.016
N° 5 (Bias1)	0.014	0.014	0.016	0.015	0.021
N° 6 (Bias1)	0.015	0.015	0.016	0.017	0.015
N° 7 (Bias2)	0.016	0.016	0.015	0.016	0.020
N° 8 (Bias2)	0.015	0.015	0.016	0.015	0.020
N° 9 (Bias2)	0.014	0.016	0.014	0.014	0.021
N° 10 (Bias2)	0.014	0.016	0.014	0.016	0.021
N° 11 (Bias2)	0.015	0.015	0.015	0.015	0.019
N° 12 (OFF)	0.015	0.015	0.015	0.014	0.020
N° 13 (OFF)	0.014	0.014	0.015	0.015	0.021
N° 14 (OFF)	0.016	0.016	0.014	0.016	0.019
N° 15 (OFF)	0.015	0.016	0.015	0.015	0.020
N° 16 (OFF)	0.016	0.015	0.014	0.015	0.020

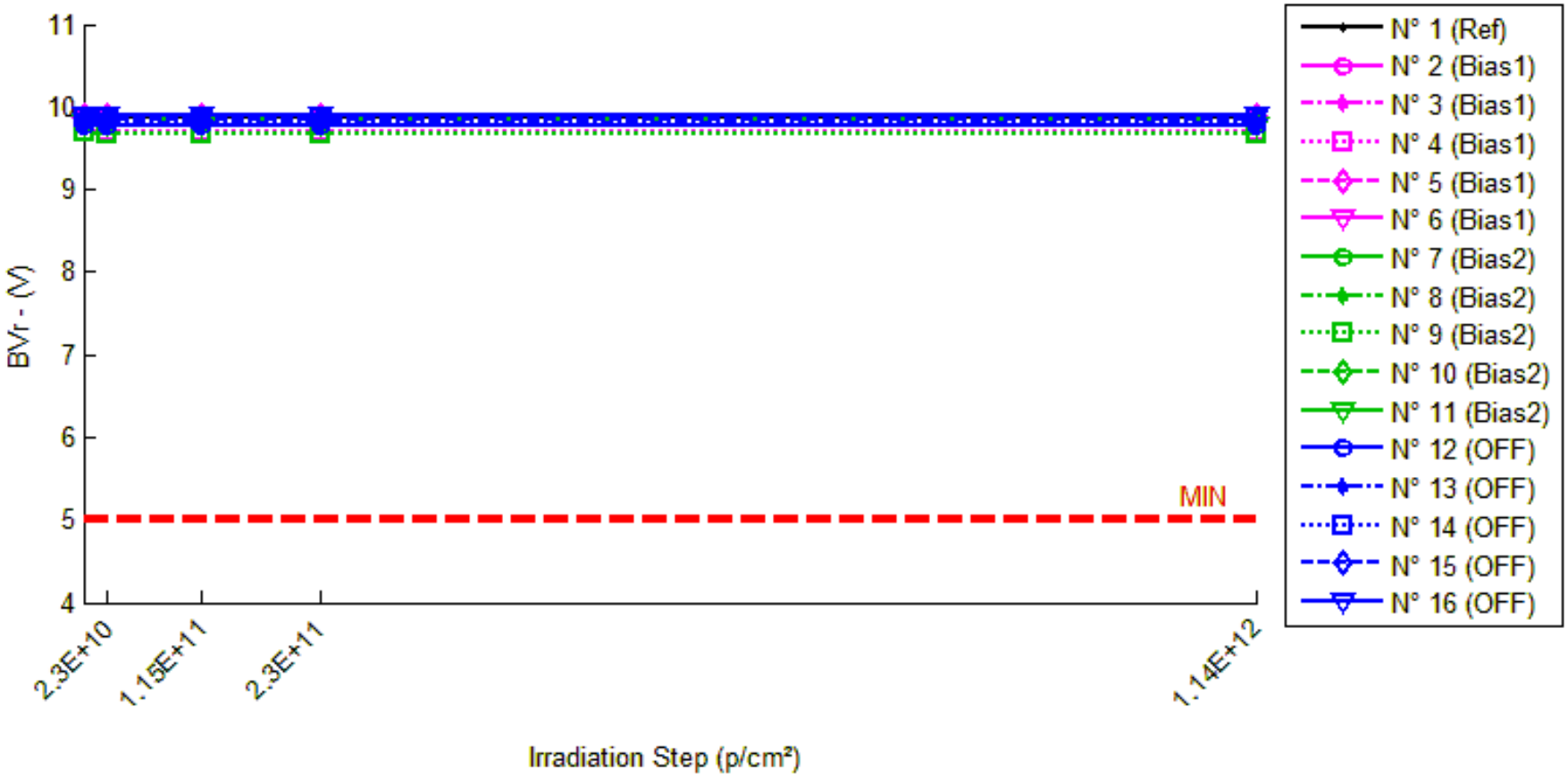
Delta [ICCH]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-2.400E-4	4.100E-4	-6.400E-4	6.400E-4
N° 2 (Bias1)	---	1.260E-3	1.280E-3	-1.800E-4	2.080E-3
N° 3 (Bias1)	---	1.250E-3	5.600E-4	-8.000E-5	6.180E-3
N° 4 (Bias1)	---	4.700E-4	3.100E-4	4.700E-4	1.250E-3
N° 5 (Bias1)	---	-2.000E-5	1.380E-3	7.800E-4	6.830E-3
N° 6 (Bias1)	---	-6.000E-5	7.400E-4	2.090E-3	-4.000E-5
N° 7 (Bias2)	---	2.700E-4	-8.200E-4	4.500E-4	4.470E-3
N° 8 (Bias2)	---	1.200E-4	1.640E-3	4.700E-4	5.000E-3
N° 9 (Bias2)	---	2.590E-3	0.000E+0	3.300E-4	6.920E-3
N° 10 (Bias2)	---	1.390E-3	-3.100E-4	1.290E-3	7.000E-3
N° 11 (Bias2)	---	9.100E-4	6.000E-5	3.900E-4	4.950E-3
N° 12 (OFF)	---	5.100E-4	4.300E-4	-4.300E-4	5.480E-3
N° 13 (OFF)	---	-1.100E-4	5.100E-4	1.170E-3	6.460E-3
N° 14 (OFF)	---	2.000E-5	-1.990E-3	-1.600E-4	2.800E-3
N° 15 (OFF)	---	2.100E-4	-3.300E-4	-2.800E-4	4.810E-3
N° 16 (OFF)	---	-4.300E-4	-1.660E-3	-5.700E-4	4.500E-3
Average (OFF)	---	5.800E-4	8.540E-4	6.160E-4	3.260E-3
σ (OFF)	---	6.506E-4	4.619E-4	9.136E-4	3.066E-3
Average+3σ (OFF)	---	2.532E-3	2.240E-3	3.357E-3	1.246E-2
Average-3σ (OFF)	---	-1.372E-3	-5.318E-4	-2.125E-3	-5.937E-3
Average (Bias1)	---	1.056E-3	1.140E-4	5.860E-4	5.668E-3
σ (Bias1)	---	9.975E-4	9.215E-4	3.973E-4	1.198E-3
Average+3σ (Bias1)	---	4.048E-3	2.879E-3	1.778E-3	9.261E-3
Average-3σ (Bias1)	---	-1.936E-3	-2.651E-3	-6.060E-4	2.075E-3
Average (Bias2)	---	4.000E-5	-6.080E-4	-5.400E-5	4.810E-3
σ (Bias2)	---	3.513E-4	1.164E-3	7.014E-4	1.352E-3
Average+3σ (Bias2)	---	1.094E-3	2.885E-3	2.050E-3	8.865E-3
Average-3σ (Bias2)	---	-1.014E-3	-4.101E-3	-2.158E-3	7.551E-4

60 MeV proton / detailed results

8. BVr

Ta=25°C; Ir = 10µA



60 MeV proton / detailed results

BVr . (V) **Min = 5.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	9.859	9.870	9.872	9.874	9.879
N° 2 (Bias1)	9.888	9.887	9.885	9.886	9.886
N° 3 (Bias1)	9.866	9.869	9.870	9.871	9.874
N° 4 (Bias1)	9.695	9.696	9.696	9.698	9.695
N° 5 (Bias1)	9.895	9.896	9.895	9.896	9.898
N° 6 (Bias1)	9.771	9.773	9.775	9.774	9.773
N° 7 (Bias2)	9.766	9.765	9.768	9.772	9.761
N° 8 (Bias2)	9.848	9.846	9.844	9.848	9.845
N° 9 (Bias2)	9.688	9.684	9.683	9.684	9.681
N° 10 (Bias2)	9.840	9.839	9.837	9.843	9.840
N° 11 (Bias2)	9.785	9.784	9.780	9.787	9.778
N° 12 (OFF)	9.768	9.763	9.762	9.768	9.764
N° 13 (OFF)	9.807	9.808	9.806	9.808	9.813
N° 14 (OFF)	9.861	9.862	9.857	9.861	9.860
N° 15 (OFF)	9.844	9.843	9.841	9.843	9.845
N° 16 (OFF)	9.900	9.900	9.898	9.899	9.894

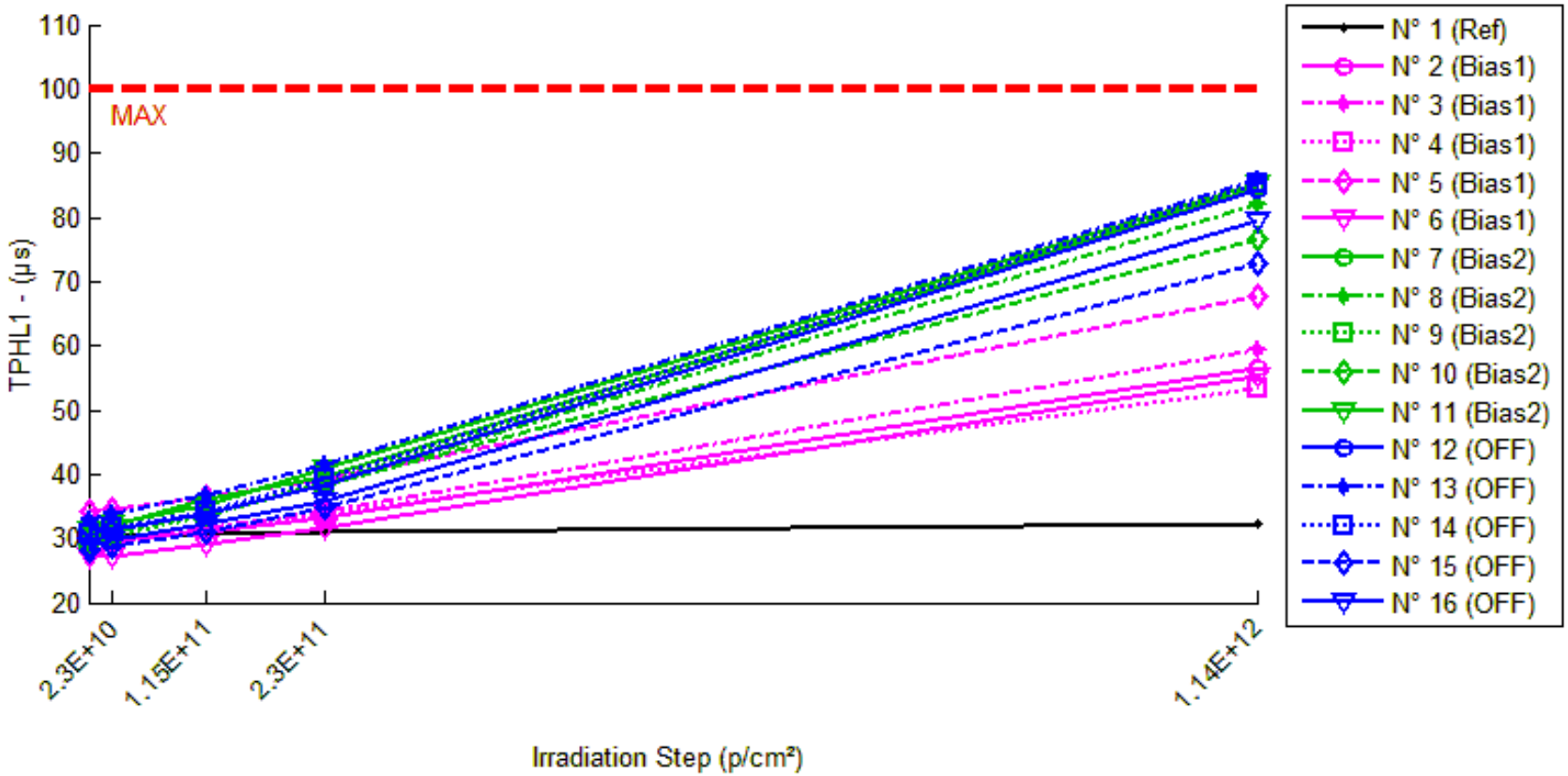
Delta [BVr]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	1.107E-2	1.296E-2	1.467E-2	2.018E-2
N° 2 (Bias1)	---	-4.820E-4	-2.888E-3	-1.545E-3	-1.369E-3
N° 3 (Bias1)	---	2.737E-3	3.292E-3	4.439E-3	7.945E-3
N° 4 (Bias1)	---	6.170E-4	9.480E-4	3.011E-3	-2.810E-4
N° 5 (Bias1)	---	8.550E-4	-1.110E-4	6.910E-4	2.323E-3
N° 6 (Bias1)	---	1.562E-3	3.302E-3	2.625E-3	2.009E-3
N° 7 (Bias2)	---	-1.343E-3	1.809E-3	5.370E-3	-5.499E-3
N° 8 (Bias2)	---	-2.696E-3	-4.125E-3	-8.750E-4	-3.670E-3
N° 9 (Bias2)	---	-3.843E-3	-4.791E-3	-3.171E-3	-6.255E-3
N° 10 (Bias2)	---	-1.030E-3	-2.886E-3	3.015E-3	4.790E-4
N° 11 (Bias2)	---	-1.419E-3	-4.888E-3	1.620E-3	-6.689E-3
N° 12 (OFF)	---	-4.385E-3	-5.344E-3	2.070E-4	-4.072E-3
N° 13 (OFF)	---	6.330E-4	-8.960E-4	1.171E-3	6.284E-3
N° 14 (OFF)	---	7.030E-4	-4.050E-3	-2.950E-4	-1.002E-3
N° 15 (OFF)	---	-4.810E-4	-3.207E-3	-9.850E-4	8.370E-4
N° 16 (OFF)	---	3.280E-4	-2.016E-3	-1.012E-3	-5.741E-3
Average (OFF)	---	1.058E-3	9.086E-4	1.844E-3	2.125E-3
σ (OFF)	---	1.192E-3	2.592E-3	2.320E-3	3.603E-3
Average+3σ (OFF)	---	4.633E-3	8.683E-3	8.803E-3	1.293E-2
Average-3σ (OFF)	---	-2.517E-3	-6.866E-3	-5.114E-3	-8.683E-3
Average (Bias1)	---	-2.066E-3	-2.976E-3	1.192E-3	-4.327E-3
σ (Bias1)	---	1.180E-3	2.792E-3	3.327E-3	2.924E-3
Average+3σ (Bias1)	---	1.474E-3	5.399E-3	1.117E-2	4.445E-3
Average-3σ (Bias1)	---	-5.606E-3	-1.135E-2	-8.789E-3	-1.310E-2
Average (Bias2)	---	-6.404E-4	-3.103E-3	-1.828E-4	-7.388E-4
σ (Bias2)	---	2.145E-3	1.731E-3	9.122E-4	4.691E-3
Average+3σ (Bias2)	---	5.796E-3	2.090E-3	2.554E-3	1.333E-2
Average-3σ (Bias2)	---	-7.077E-3	-8.295E-3	-2.919E-3	-1.481E-2

60 MeV proton / detailed results

9. TPHL1

Ta=25°C; If=0.5mA; RL = 4.7kOhms; Vcc=5V



60 MeV proton / detailed results

TPHL1 . (µs) **Max = 100.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	31.4	30.4	30.8	31.0	32.4
N° 2 (Bias1)	30.0	29.6	31.0	33.4	56.6
N° 3 (Bias1)	29.4	29.7	31.8	34.2	59.4
N° 4 (Bias1)	29.4	29.4	31.4	33.8	53.4
N° 5 (Bias1)	34.2	34.4	36.4	39.3	67.6
N° 6 (Bias1)	27.2	27.2	29.2	31.6	55.4
N° 7 (Bias2)	30.4	32.0	36.0	39.6	84.6
N° 8 (Bias2)	30.2	31.2	34.0	38.2	82.2
N° 9 (Bias2)	29.4	30.4	33.6	38.6	85.2
N° 10 (Bias2)	29.6	31.0	33.8	38.2	76.6
N° 11 (Bias2)	31.2	32.4	35.2	40.8	85.4
N° 12 (OFF)	31.5	31.4	34.0	38.4	84.4
N° 13 (OFF)	33.0	33.8	36.8	41.4	85.8
N° 14 (OFF)	30.6	31.6	34.2	39.2	85.4
N° 15 (OFF)	28.2	28.8	31.0	34.8	72.8
N° 16 (OFF)	28.8	29.6	32.2	35.8	79.4

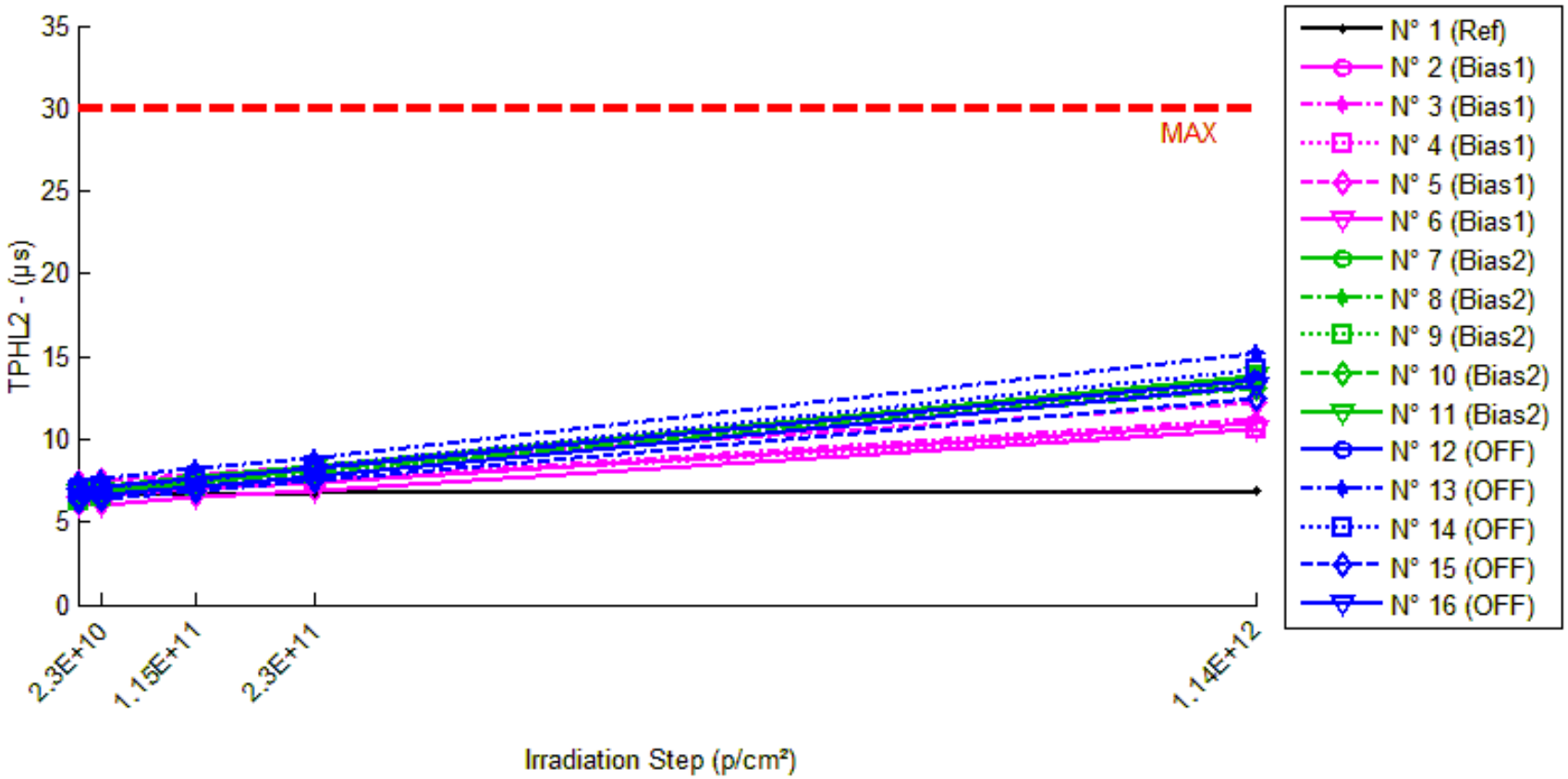
Delta [TPHL1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-1.000E+0	-6.000E-1	-4.000E-1	1.000E+0
N° 2 (Bias1)	---	-4.000E-1	1.000E+0	3.400E+0	2.660E+1
N° 3 (Bias1)	---	3.000E-1	2.400E+0	4.800E+0	3.000E+1
N° 4 (Bias1)	---	0.000E+0	2.000E+0	4.400E+0	2.400E+1
N° 5 (Bias1)	---	2.000E-1	2.200E+0	5.100E+0	3.340E+1
N° 6 (Bias1)	---	0.000E+0	2.000E+0	4.400E+0	2.820E+1
N° 7 (Bias2)	---	1.600E+0	5.600E+0	9.200E+0	5.420E+1
N° 8 (Bias2)	---	1.000E+0	3.800E+0	8.000E+0	5.200E+1
N° 9 (Bias2)	---	1.000E+0	4.200E+0	9.200E+0	5.580E+1
N° 10 (Bias2)	---	1.400E+0	4.200E+0	8.600E+0	4.700E+1
N° 11 (Bias2)	---	1.200E+0	4.000E+0	9.600E+0	5.420E+1
N° 12 (OFF)	---	-1.000E-1	2.500E+0	6.900E+0	5.290E+1
N° 13 (OFF)	---	8.000E-1	3.800E+0	8.400E+0	5.280E+1
N° 14 (OFF)	---	1.000E+0	3.600E+0	8.600E+0	5.480E+1
N° 15 (OFF)	---	6.000E-1	2.800E+0	6.600E+0	4.460E+1
N° 16 (OFF)	---	8.000E-1	3.400E+0	7.000E+0	5.060E+1
Average (OFF)	---	2.000E-2	1.920E+0	4.420E+0	2.844E+1
σ (OFF)	---	2.683E-1	5.404E-1	6.419E-1	3.542E+0
Average+3σ (OFF)	---	8.250E-1	3.541E+0	6.346E+0	3.907E+1
Average-3σ (OFF)	---	-7.850E-1	2.989E-1	2.494E+0	1.781E+1
Average (Bias1)	---	1.240E+0	4.360E+0	8.920E+0	5.264E+1
σ (Bias1)	---	2.608E-1	7.127E-1	6.261E-1	3.430E+0
Average+3σ (Bias1)	---	2.022E+0	6.498E+0	1.080E+1	6.293E+1
Average-3σ (Bias1)	---	4.577E-1	2.222E+0	7.042E+0	4.235E+1
Average (Bias2)	---	6.200E-1	3.220E+0	7.500E+0	5.114E+1
σ (Bias2)	---	4.266E-1	5.495E-1	9.274E-1	3.947E+0
Average+3σ (Bias2)	---	1.900E+0	4.869E+0	1.028E+1	6.298E+1
Average-3σ (Bias2)	---	-6.598E-1	1.571E+0	4.718E+0	3.930E+1

60 MeV proton / detailed results

10.TPHL2

Ta=25°C; If=1.6mA; RL = 1.5kOhms; Vcc=5V



60 MeV proton / detailed results

TPHL2 . (µs) **Max = 30.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	6.70	6.66	6.68	6.72	6.84
N° 2 (Bias1)	6.60	6.66	6.96	7.44	10.96
N° 3 (Bias1)	6.58	6.70	7.06	7.52	11.20
N° 4 (Bias1)	6.68	6.72	7.12	7.52	10.66
N° 5 (Bias1)	7.44	7.52	7.88	8.40	12.28
N° 6 (Bias1)	6.00	6.08	6.48	6.92	10.60
N° 7 (Bias2)	6.92	7.08	7.72	8.32	13.70
N° 8 (Bias2)	6.68	6.84	7.40	8.04	13.36
N° 9 (Bias2)	6.32	6.48	7.08	7.88	13.84
N° 10 (Bias2)	6.70	6.88	7.36	8.10	13.12
N° 11 (Bias2)	6.72	6.92	7.44	8.24	13.82
N° 12 (OFF)	7.04	7.10	7.58	8.24	13.60
N° 13 (OFF)	7.48	7.64	8.20	8.90	15.18
N° 14 (OFF)	6.88	7.08	7.56	8.36	14.24
N° 15 (OFF)	6.32	6.42	6.84	7.48	12.48
N° 16 (OFF)	6.46	6.58	7.12	7.72	13.18

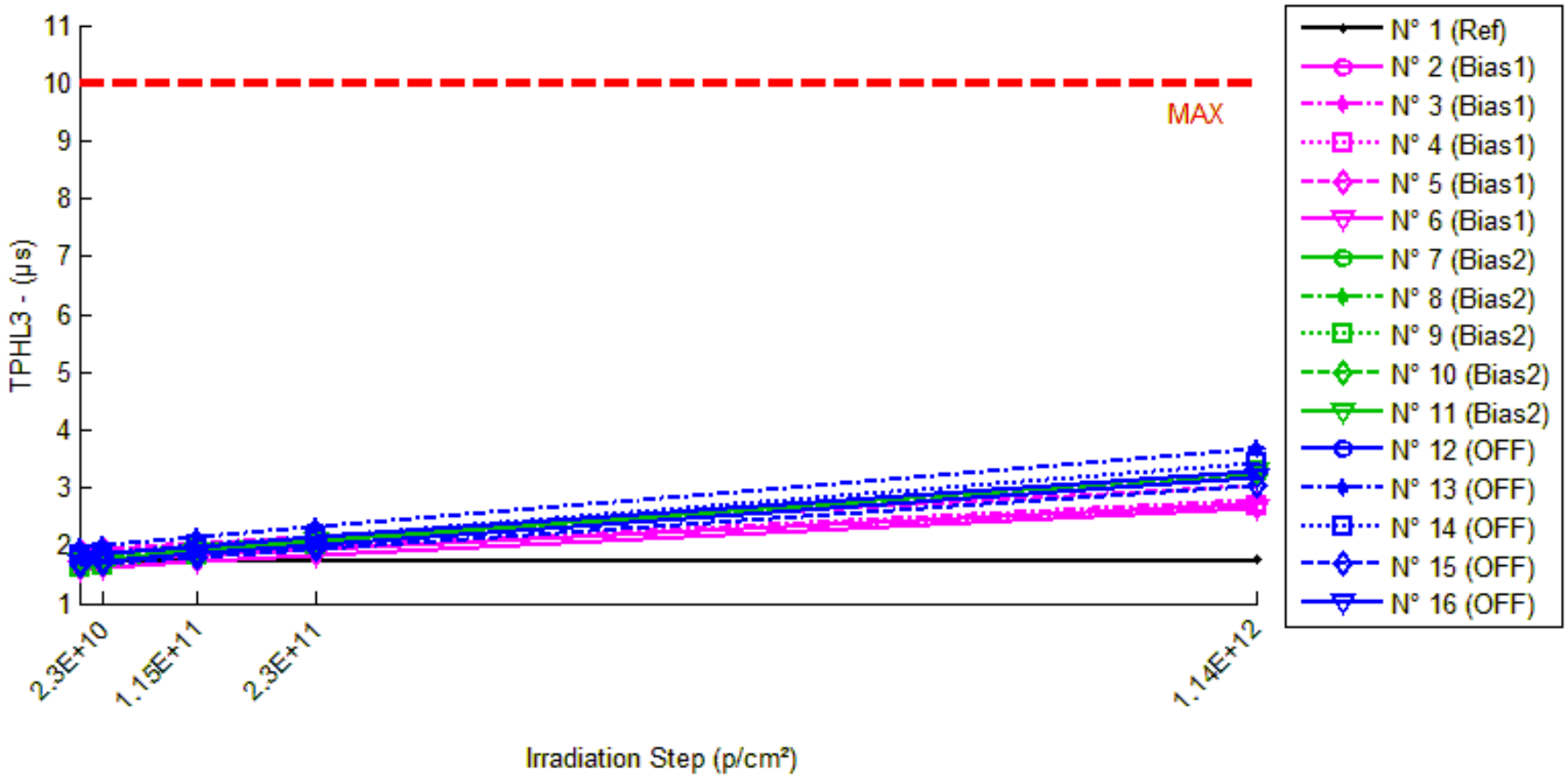
Delta [TPHL2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	-2.000E-2	2.000E-2	1.400E-1
N° 2 (Bias1)	---	6.000E-2	3.600E-1	8.400E-1	4.360E+0
N° 3 (Bias1)	---	1.200E-1	4.800E-1	9.400E-1	4.620E+0
N° 4 (Bias1)	---	4.000E-2	4.400E-1	8.400E-1	3.980E+0
N° 5 (Bias1)	---	8.000E-2	4.400E-1	9.600E-1	4.840E+0
N° 6 (Bias1)	---	8.000E-2	4.800E-1	9.200E-1	4.600E+0
N° 7 (Bias2)	---	1.600E-1	8.000E-1	1.400E+0	6.780E+0
N° 8 (Bias2)	---	1.600E-1	7.200E-1	1.360E+0	6.680E+0
N° 9 (Bias2)	---	1.600E-1	7.600E-1	1.560E+0	7.520E+0
N° 10 (Bias2)	---	1.800E-1	6.600E-1	1.400E+0	6.420E+0
N° 11 (Bias2)	---	2.000E-1	7.200E-1	1.520E+0	7.100E+0
N° 12 (OFF)	---	6.000E-2	5.400E-1	1.200E+0	6.560E+0
N° 13 (OFF)	---	1.600E-1	7.200E-1	1.420E+0	7.700E+0
N° 14 (OFF)	---	2.000E-1	6.800E-1	1.480E+0	7.360E+0
N° 15 (OFF)	---	1.000E-1	5.200E-1	1.160E+0	6.160E+0
N° 16 (OFF)	---	1.200E-1	6.600E-1	1.260E+0	6.720E+0
Average (OFF)	---	7.600E-2	4.400E-1	9.000E-1	4.480E+0
σ (OFF)	---	2.966E-2	4.899E-2	5.657E-2	3.271E-1
Average+3σ (OFF)	---	1.650E-1	5.870E-1	1.070E+0	5.461E+0
Average-3σ (OFF)	---	-1.299E-2	2.930E-1	7.303E-1	3.499E+0
Average (Bias1)	---	1.720E-1	7.320E-1	1.448E+0	6.900E+0
σ (Bias1)	---	1.789E-2	5.215E-2	8.672E-2	4.236E-1
Average+3σ (Bias1)	---	2.257E-1	8.885E-1	1.708E+0	8.171E+0
Average-3σ (Bias1)	---	1.183E-1	5.755E-1	1.188E+0	5.629E+0
Average (Bias2)	---	1.280E-1	6.240E-1	1.304E+0	6.900E+0
σ (Bias2)	---	5.404E-2	8.877E-2	1.396E-1	6.219E-1
Average+3σ (Bias2)	---	2.901E-1	8.903E-1	1.723E+0	8.766E+0
Average-3σ (Bias2)	---	-3.411E-2	3.577E-1	8.853E-1	5.034E+0

60 MeV proton / detailed results

11.TPHL3

Ta=25°C; If=5mA; RL = 680Ohms; Vcc=5V



60 MeV proton / detailed results

TPHL3 . (µs) **Max = 10.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1.72	1.73	1.73	1.73	1.75
N° 2 (Bias1)	1.73	1.75	1.83	1.94	2.73
N° 3 (Bias1)	1.73	1.77	1.86	1.97	2.79
N° 4 (Bias1)	1.77	1.79	1.89	1.98	2.70
N° 5 (Bias1)	1.92	1.95	2.03	2.16	3.03
N° 6 (Bias1)	1.58	1.61	1.71	1.82	2.66
N° 7 (Bias2)	1.81	1.85	2.00	2.13	3.29
N° 8 (Bias2)	1.74	1.77	1.91	2.05	3.23
N° 9 (Bias2)	1.63	1.67	1.82	2.00	3.30
N° 10 (Bias2)	1.76	1.80	1.92	2.07	3.20
N° 11 (Bias2)	1.73	1.77	1.91	2.07	3.29
N° 12 (OFF)	1.86	1.88	1.99	2.14	3.28
N° 13 (OFF)	1.98	2.02	2.15	2.32	3.67
N° 14 (OFF)	1.82	1.86	2.00	2.17	3.44
N° 15 (OFF)	1.65	1.68	1.79	1.93	3.05
N° 16 (OFF)	1.70	1.73	1.86	2.01	3.18

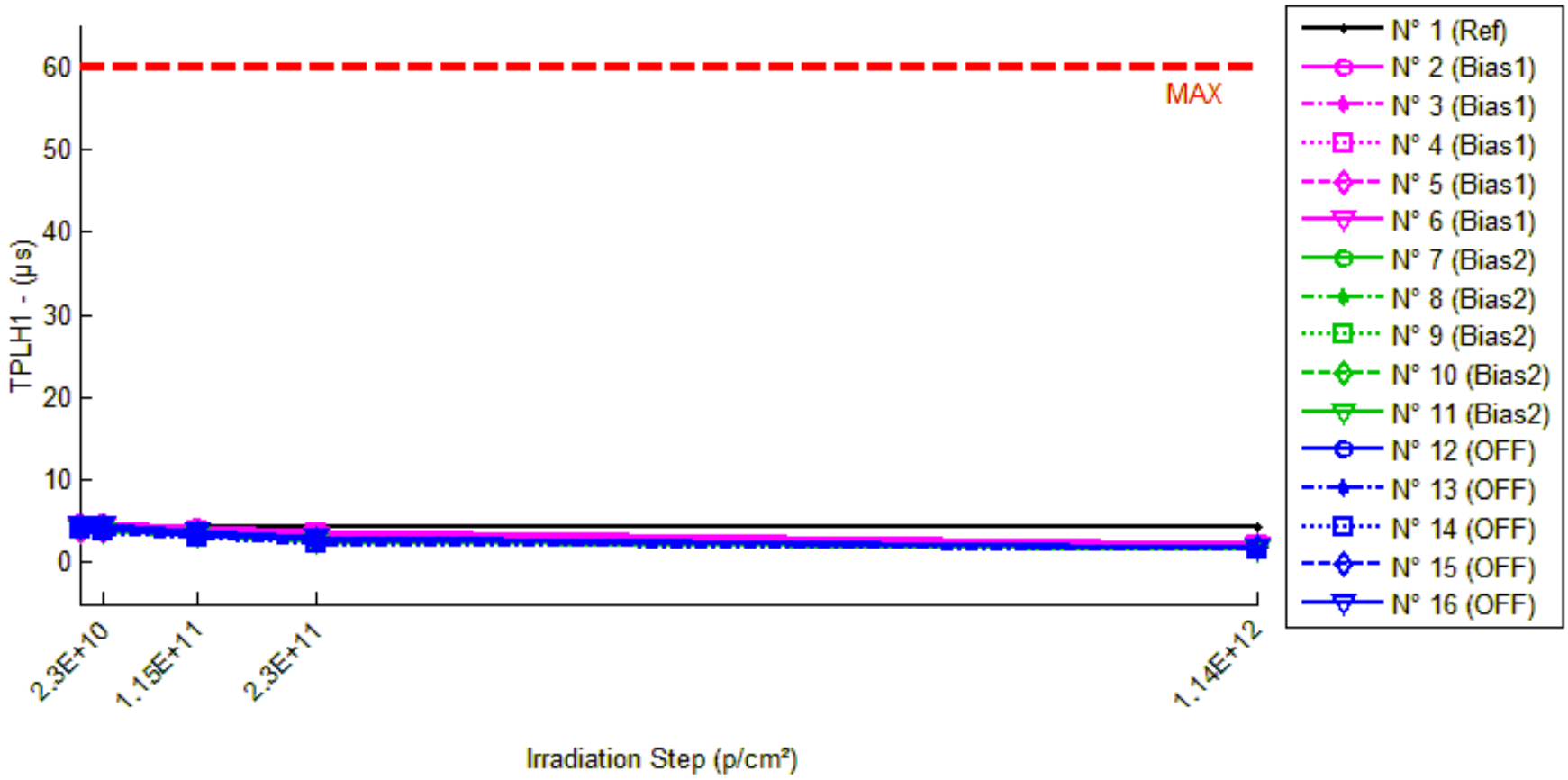
Delta [TPHL3]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	1.000E-2	1.000E-2	1.000E-2	3.000E-2
N° 2 (Bias1)	---	2.000E-2	1.000E-1	2.100E-1	1.000E+0
N° 3 (Bias1)	---	4.000E-2	1.300E-1	2.400E-1	1.060E+0
N° 4 (Bias1)	---	2.000E-2	1.200E-1	2.100E-1	9.300E-1
N° 5 (Bias1)	---	3.000E-2	1.100E-1	2.400E-1	1.110E+0
N° 6 (Bias1)	---	3.000E-2	1.300E-1	2.400E-1	1.080E+0
N° 7 (Bias2)	---	4.000E-2	1.900E-1	3.200E-1	1.480E+0
N° 8 (Bias2)	---	3.000E-2	1.700E-1	3.100E-1	1.490E+0
N° 9 (Bias2)	---	4.000E-2	1.900E-1	3.700E-1	1.670E+0
N° 10 (Bias2)	---	4.000E-2	1.600E-1	3.100E-1	1.440E+0
N° 11 (Bias2)	---	4.000E-2	1.800E-1	3.400E-1	1.560E+0
N° 12 (OFF)	---	2.000E-2	1.300E-1	2.800E-1	1.420E+0
N° 13 (OFF)	---	4.000E-2	1.700E-1	3.400E-1	1.690E+0
N° 14 (OFF)	---	4.000E-2	1.800E-1	3.500E-1	1.620E+0
N° 15 (OFF)	---	3.000E-2	1.400E-1	2.800E-1	1.400E+0
N° 16 (OFF)	---	3.000E-2	1.600E-1	3.100E-1	1.480E+0
Average (OFF)	---	2.800E-2	1.180E-1	2.280E-1	1.036E+0
σ (OFF)	---	8.367E-3	1.304E-2	1.643E-2	7.162E-2
Average+3σ (OFF)	---	5.310E-2	1.571E-1	2.773E-1	1.251E+0
Average-3σ (OFF)	---	2.900E-3	7.888E-2	1.787E-1	8.211E-1
Average (Bias1)	---	3.800E-2	1.780E-1	3.300E-1	1.528E+0
σ (Bias1)	---	4.472E-3	1.304E-2	2.550E-2	9.039E-2
Average+3σ (Bias1)	---	5.142E-2	2.171E-1	4.065E-1	1.799E+0
Average-3σ (Bias1)	---	2.458E-2	1.389E-1	2.535E-1	1.257E+0
Average (Bias2)	---	3.200E-2	1.560E-1	3.120E-1	1.522E+0
σ (Bias2)	---	8.367E-3	2.074E-2	3.271E-2	1.274E-1
Average+3σ (Bias2)	---	5.710E-2	2.182E-1	4.101E-1	1.904E+0
Average-3σ (Bias2)	---	6.900E-3	9.379E-2	2.139E-1	1.140E+0

60 MeV proton / detailed results

12.TPLH1

Ta=25°C; If=0.5mA; RL = 4.7kOhms; Vcc=5V



60 MeV proton / detailed results

TPLH1 . (µs) **Max = 60.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	4.2	4.3	4.3	4.3	4.2
N° 2 (Bias1)	4.7	4.7	4.3	3.7	2.2
N° 3 (Bias1)	4.2	4.1	3.7	3.2	2.1
N° 4 (Bias1)	4.4	4.4	3.9	3.5	2.1
N° 5 (Bias1)	3.8	3.8	3.4	2.9	2.1
N° 6 (Bias1)	4.3	4.2	3.8	3.4	2.1
N° 7 (Bias2)	4.2	3.9	3.7	2.7	1.9
N° 8 (Bias2)	4.3	4.0	3.8	2.8	1.8
N° 9 (Bias2)	4.1	3.9	3.4	2.6	1.7
N° 10 (Bias2)	4.3	4.0	3.4	2.8	1.9
N° 11 (Bias2)	4.1	3.9	3.2	2.5	1.7
N° 12 (OFF)	4.1	4.0	3.4	2.7	1.8
N° 13 (OFF)	3.8	3.6	3.0	2.3	1.6
N° 14 (OFF)	4.0	3.8	3.1	2.4	1.6
N° 15 (OFF)	4.4	4.3	3.6	2.9	1.8
N° 16 (OFF)	4.6	4.5	3.8	3.0	1.8

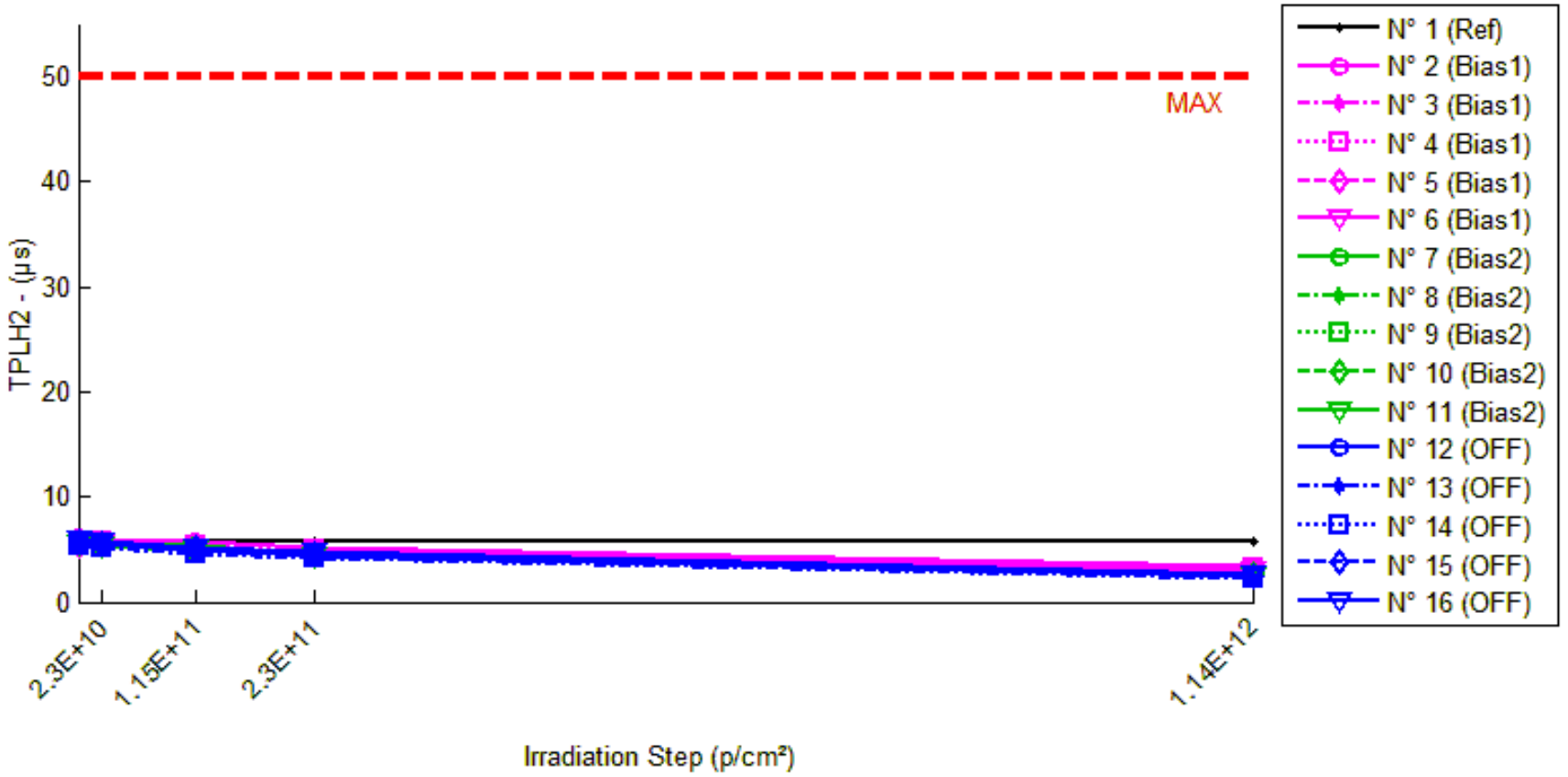
Delta [TPLH1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	1.000E-1	1.000E-1	1.000E-1	5.000E-2
N° 2 (Bias1)	---	-5.000E-2	-4.000E-1	-1.000E+0	-2.500E+0
N° 3 (Bias1)	---	-1.000E-1	-5.000E-1	-1.000E+0	-2.100E+0
N° 4 (Bias1)	---	0.000E+0	-5.000E-1	-9.500E-1	-2.300E+0
N° 5 (Bias1)	---	-5.000E-2	-4.000E-1	-9.000E-1	-1.700E+0
N° 6 (Bias1)	---	-5.000E-2	-5.000E-1	-9.500E-1	-2.200E+0
N° 7 (Bias2)	---	-2.500E-1	-4.500E-1	-1.450E+0	-2.250E+0
N° 8 (Bias2)	---	-3.000E-1	-5.500E-1	-1.500E+0	-2.500E+0
N° 9 (Bias2)	---	-2.000E-1	-7.000E-1	-1.500E+0	-2.400E+0
N° 10 (Bias2)	---	-3.000E-1	-9.000E-1	-1.500E+0	-2.400E+0
N° 11 (Bias2)	---	-2.000E-1	-9.000E-1	-1.600E+0	-2.400E+0
N° 12 (OFF)	---	-1.000E-1	-7.000E-1	-1.400E+0	-2.300E+0
N° 13 (OFF)	---	-2.000E-1	-8.000E-1	-1.500E+0	-2.200E+0
N° 14 (OFF)	---	-2.000E-1	-9.000E-1	-1.600E+0	-2.400E+0
N° 15 (OFF)	---	-1.000E-1	-8.000E-1	-1.500E+0	-2.600E+0
N° 16 (OFF)	---	-1.000E-1	-8.000E-1	-1.550E+0	-2.800E+0
Average (OFF)	---	-5.000E-2	-4.600E-1	-9.600E-1	-2.160E+0
σ (OFF)	---	3.536E-2	5.477E-2	4.183E-2	2.966E-1
Average+3σ (OFF)	---	5.607E-2	-2.957E-1	-8.345E-1	-1.270E+0
Average-3σ (OFF)	---	-1.561E-1	-6.243E-1	-1.085E+0	-3.050E+0
Average (Bias1)	---	-2.500E-1	-7.000E-1	-1.510E+0	-2.390E+0
σ (Bias1)	---	5.000E-2	2.031E-1	5.477E-2	8.944E-2
Average+3σ (Bias1)	---	-1.000E-1	-9.070E-2	-1.346E+0	-2.122E+0
Average-3σ (Bias1)	---	-4.000E-1	-1.309E+0	-1.674E+0	-2.658E+0
Average (Bias2)	---	-1.400E-1	-8.000E-1	-1.510E+0	-2.460E+0
σ (Bias2)	---	5.477E-2	7.071E-2	7.416E-2	2.408E-1
Average+3σ (Bias2)	---	2.432E-2	-5.879E-1	-1.288E+0	-1.738E+0
Average-3σ (Bias2)	---	-3.043E-1	-1.012E+0	-1.732E+0	-3.182E+0

60 MeV proton / detailed results

13.TPLH2

Ta=25°C; If=1.6mA; RL = 1.5kOhms; Vcc=5V



60 MeV proton / detailed results

TPLH2 . (µs) **Max = 50.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	5.7	5.7	5.8	5.8	5.8
N° 2 (Bias1)	6.1	6.0	5.7	5.2	3.4
N° 3 (Bias1)	5.5	5.5	5.2	4.8	3.1
N° 4 (Bias1)	5.8	5.7	5.3	5.0	3.3
N° 5 (Bias1)	5.4	5.3	5.0	4.6	3.0
N° 6 (Bias1)	5.6	5.5	5.2	4.8	3.1
N° 7 (Bias2)	5.5	5.4	5.3	4.5	2.5
N° 8 (Bias2)	5.7	5.5	5.3	4.5	2.5
N° 9 (Bias2)	5.5	5.3	5.0	4.3	2.3
N° 10 (Bias2)	5.6	5.4	5.0	4.5	2.6
N° 11 (Bias2)	5.6	5.4	4.9	4.4	2.4
N° 12 (OFF)	5.6	5.5	5.0	4.4	2.4
N° 13 (OFF)	5.3	5.2	4.6	4.2	2.2
N° 14 (OFF)	5.4	5.2	4.6	4.1	2.2
N° 15 (OFF)	5.7	5.6	5.1	4.5	2.5
N° 16 (OFF)	6.0	5.8	5.2	4.7	2.6

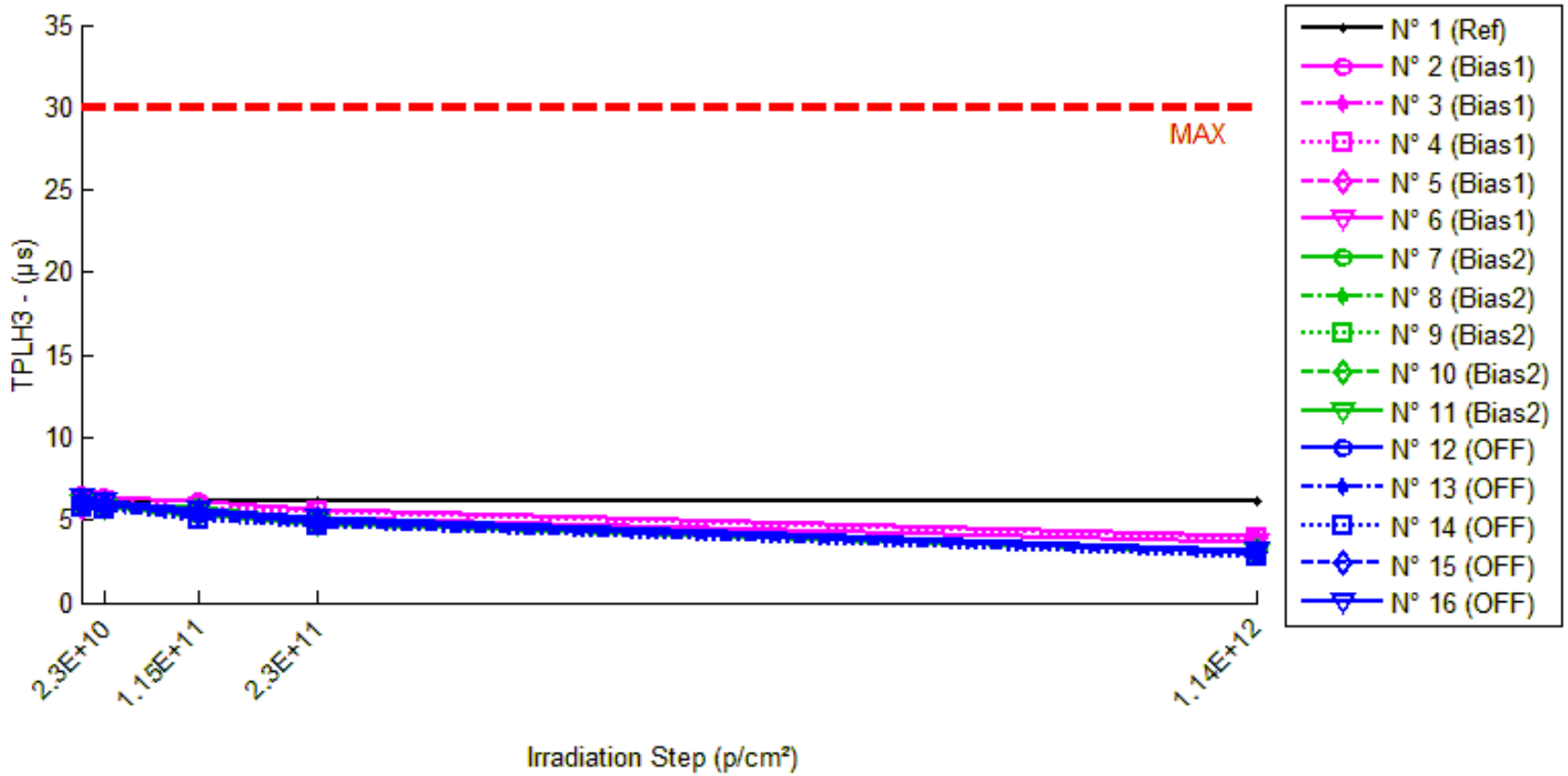
Delta [TPLH2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	0.000E+0	5.000E-2	5.000E-2	1.000E-1
N° 2 (Bias1)	---	-1.000E-1	-4.000E-1	-9.000E-1	-2.700E+0
N° 3 (Bias1)	---	-5.000E-2	-3.500E-1	-7.500E-1	-2.450E+0
N° 4 (Bias1)	---	-1.000E-1	-5.000E-1	-8.000E-1	-2.500E+0
N° 5 (Bias1)	---	-5.000E-2	-4.000E-1	-8.000E-1	-2.400E+0
N° 6 (Bias1)	---	-1.000E-1	-4.000E-1	-8.000E-1	-2.500E+0
N° 7 (Bias2)	---	-1.000E-1	-2.000E-1	-9.500E-1	-3.000E+0
N° 8 (Bias2)	---	-2.000E-1	-4.000E-1	-1.200E+0	-3.250E+0
N° 9 (Bias2)	---	-2.000E-1	-5.000E-1	-1.200E+0	-3.200E+0
N° 10 (Bias2)	---	-2.000E-1	-6.000E-1	-1.100E+0	-3.000E+0
N° 11 (Bias2)	---	-2.000E-1	-7.000E-1	-1.200E+0	-3.250E+0
N° 12 (OFF)	---	-1.000E-1	-6.500E-1	-1.200E+0	-3.200E+0
N° 13 (OFF)	---	-1.500E-1	-7.000E-1	-1.150E+0	-3.050E+0
N° 14 (OFF)	---	-1.500E-1	-8.000E-1	-1.300E+0	-3.200E+0
N° 15 (OFF)	---	-1.000E-1	-6.000E-1	-1.200E+0	-3.200E+0
N° 16 (OFF)	---	-2.000E-1	-8.000E-1	-1.300E+0	-3.400E+0
Average (OFF)	---	-8.000E-2	-4.100E-1	-8.100E-1	-2.510E+0
σ (OFF)	---	2.739E-2	5.477E-2	5.477E-2	1.140E-1
Average+3σ (OFF)	---	2.158E-3	-2.457E-1	-6.457E-1	-2.168E+0
Average-3σ (OFF)	---	-1.622E-1	-5.743E-1	-9.743E-1	-2.852E+0
Average (Bias1)	---	-1.800E-1	-4.800E-1	-1.130E+0	-3.140E+0
σ (Bias1)	---	4.472E-2	1.924E-1	1.095E-1	1.294E-1
Average+3σ (Bias1)	---	-4.584E-2	9.706E-2	-8.014E-1	-2.752E+0
Average-3σ (Bias1)	---	-3.142E-1	-1.057E+0	-1.459E+0	-3.528E+0
Average (Bias2)	---	-1.400E-1	-7.100E-1	-1.230E+0	-3.210E+0
σ (Bias2)	---	4.183E-2	8.944E-2	6.708E-2	1.245E-1
Average+3σ (Bias2)	---	-1.450E-2	-4.417E-1	-1.029E+0	-2.837E+0
Average-3σ (Bias2)	---	-2.655E-1	-9.783E-1	-1.431E+0	-3.583E+0

60 MeV proton / detailed results

14.TPLH3

Ta=25°C; If=5mA; RL = 680Ohms; Vcc=5V



60 MeV proton / detailed results

TPLH3 . (µs) **Max = 30.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	6.1	6.1	6.2	6.2	6.2
N° 2 (Bias1)	6.5	6.4	6.1	5.7	4.0
N° 3 (Bias1)	5.9	5.9	5.6	5.2	3.7
N° 4 (Bias1)	6.2	6.1	5.8	5.5	3.9
N° 5 (Bias1)	5.8	5.8	5.5	5.1	3.7
N° 6 (Bias1)	6.0	5.9	5.6	5.2	3.7
N° 7 (Bias2)	6.0	5.8	5.8	5.0	3.2
N° 8 (Bias2)	6.1	5.9	5.8	5.0	3.1
N° 9 (Bias2)	5.9	5.7	5.4	4.8	2.9
N° 10 (Bias2)	6.0	5.8	5.4	5.0	3.2
N° 11 (Bias2)	6.0	5.8	5.3	4.8	3.0
N° 12 (OFF)	6.0	5.9	5.4	4.9	3.1
N° 13 (OFF)	5.8	5.6	5.1	4.6	2.9
N° 14 (OFF)	5.8	5.7	5.0	4.6	2.8
N° 15 (OFF)	6.1	6.0	5.5	5.0	3.1
N° 16 (OFF)	6.4	6.2	5.7	5.1	3.2

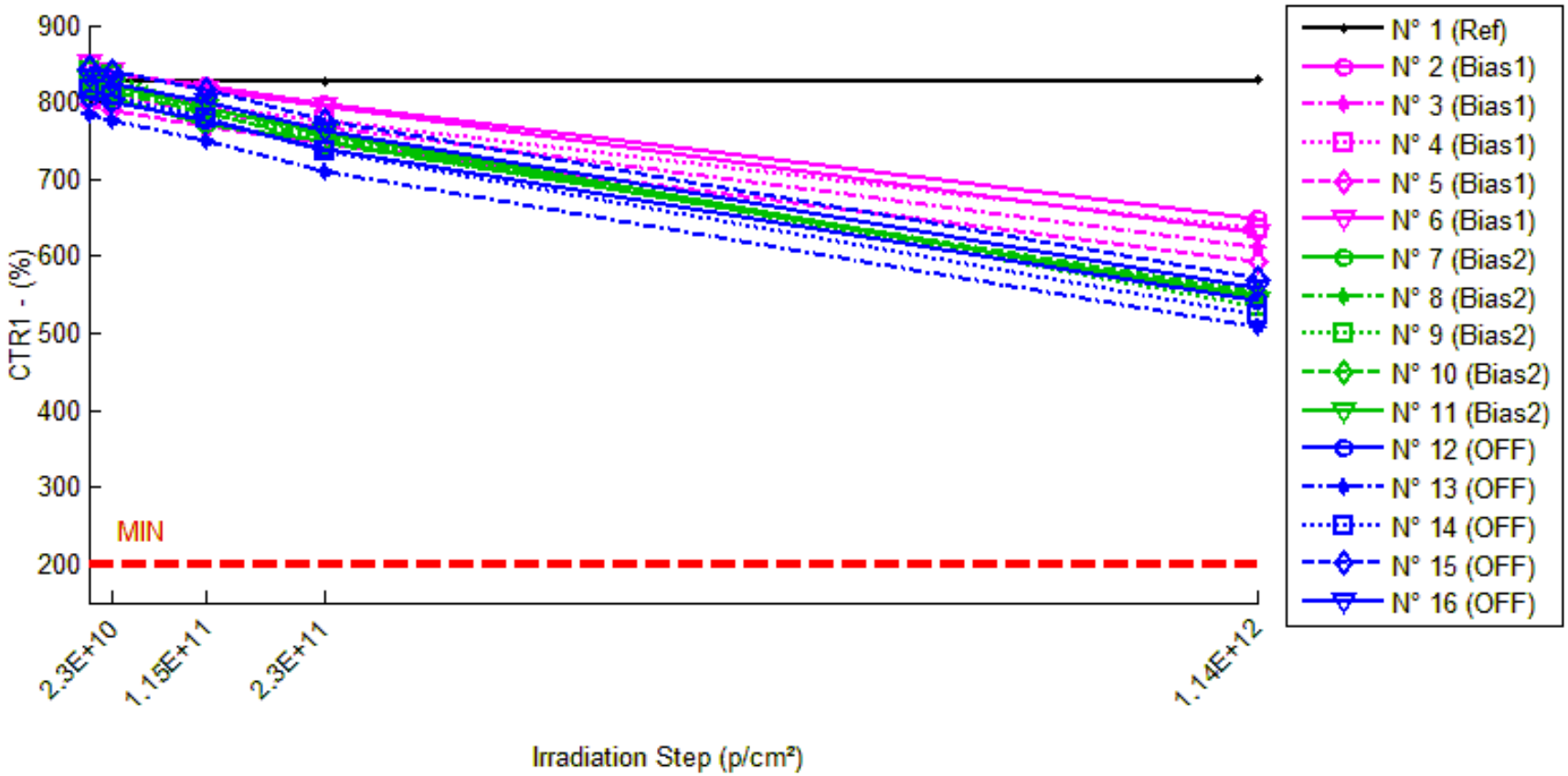
Delta [TPLH3]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	0.000E+0	1.000E-1	1.000E-1	1.000E-1
N° 2 (Bias1)	---	-1.000E-1	-4.000E-1	-8.000E-1	-2.500E+0
N° 3 (Bias1)	---	0.000E+0	-3.000E-1	-7.000E-1	-2.200E+0
N° 4 (Bias1)	---	-1.000E-1	-4.000E-1	-7.500E-1	-2.350E+0
N° 5 (Bias1)	---	-5.000E-2	-3.000E-1	-7.000E-1	-2.100E+0
N° 6 (Bias1)	---	-1.000E-1	-4.000E-1	-8.000E-1	-2.300E+0
N° 7 (Bias2)	---	-2.000E-1	-2.000E-1	-1.000E+0	-2.800E+0
N° 8 (Bias2)	---	-2.000E-1	-3.000E-1	-1.100E+0	-3.000E+0
N° 9 (Bias2)	---	-2.000E-1	-5.000E-1	-1.100E+0	-3.000E+0
N° 10 (Bias2)	---	-1.500E-1	-6.000E-1	-1.000E+0	-2.800E+0
N° 11 (Bias2)	---	-1.500E-1	-7.000E-1	-1.200E+0	-3.000E+0
N° 12 (OFF)	---	-1.000E-1	-6.000E-1	-1.100E+0	-2.900E+0
N° 13 (OFF)	---	-2.000E-1	-7.000E-1	-1.200E+0	-2.900E+0
N° 14 (OFF)	---	-1.000E-1	-7.500E-1	-1.200E+0	-3.000E+0
N° 15 (OFF)	---	-1.000E-1	-6.000E-1	-1.150E+0	-3.000E+0
N° 16 (OFF)	---	-2.000E-1	-7.000E-1	-1.300E+0	-3.200E+0
Average (OFF)	---	-7.000E-2	-3.600E-1	-7.500E-1	-2.290E+0
σ (OFF)	---	4.472E-2	5.477E-2	5.000E-2	1.517E-1
Average+3σ (OFF)	---	6.416E-2	-1.957E-1	-6.000E-1	-1.835E+0
Average-3σ (OFF)	---	-2.042E-1	-5.243E-1	-9.000E-1	-2.745E+0
Average (Bias1)	---	-1.800E-1	-4.600E-1	-1.080E+0	-2.920E+0
σ (Bias1)	---	2.739E-2	2.074E-1	8.367E-2	1.095E-1
Average+3σ (Bias1)	---	-9.784E-2	1.621E-1	-8.290E-1	-2.591E+0
Average-3σ (Bias1)	---	-2.622E-1	-1.082E+0	-1.331E+0	-3.249E+0
Average (Bias2)	---	-1.400E-1	-6.700E-1	-1.190E+0	-3.000E+0
σ (Bias2)	---	5.477E-2	6.708E-2	7.416E-2	1.225E-1
Average+3σ (Bias2)	---	2.432E-2	-4.688E-1	-9.675E-1	-2.633E+0
Average-3σ (Bias2)	---	-3.043E-1	-8.712E-1	-1.412E+0	-3.367E+0

60 MeV proton / detailed results

15.CTR1

Ta=25°C; If=5mA; Vo=0.4V; Vcc=4.5V



60 MeV proton / detailed results

CTR1 . (%) **Min = 200.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	833.82	829.23	827.78	825.76	830.42
N° 2 (Bias1)	845.29	837.59	820.31	796.93	647.74
N° 3 (Bias1)	819.75	811.54	788.24	767.26	611.61
N° 4 (Bias1)	825.01	818.13	795.93	777.19	636.34
N° 5 (Bias1)	797.44	790.64	767.98	746.03	593.46
N° 6 (Bias1)	849.95	841.24	817.29	794.33	631.10
N° 7 (Bias2)	813.77	804.93	770.08	750.10	547.74
N° 8 (Bias2)	824.74	817.59	783.15	755.63	544.94
N° 9 (Bias2)	841.21	833.94	791.70	758.33	534.17
N° 10 (Bias2)	819.84	812.47	787.34	747.96	554.16
N° 11 (Bias2)	829.75	820.65	793.01	759.20	543.39
N° 12 (OFF)	806.36	801.34	777.43	740.26	542.59
N° 13 (OFF)	784.72	776.92	749.57	710.20	506.65
N° 14 (OFF)	815.17	807.28	778.80	737.16	522.68
N° 15 (OFF)	845.84	839.84	815.32	776.10	572.55
N° 16 (OFF)	831.48	825.07	800.24	762.71	557.54

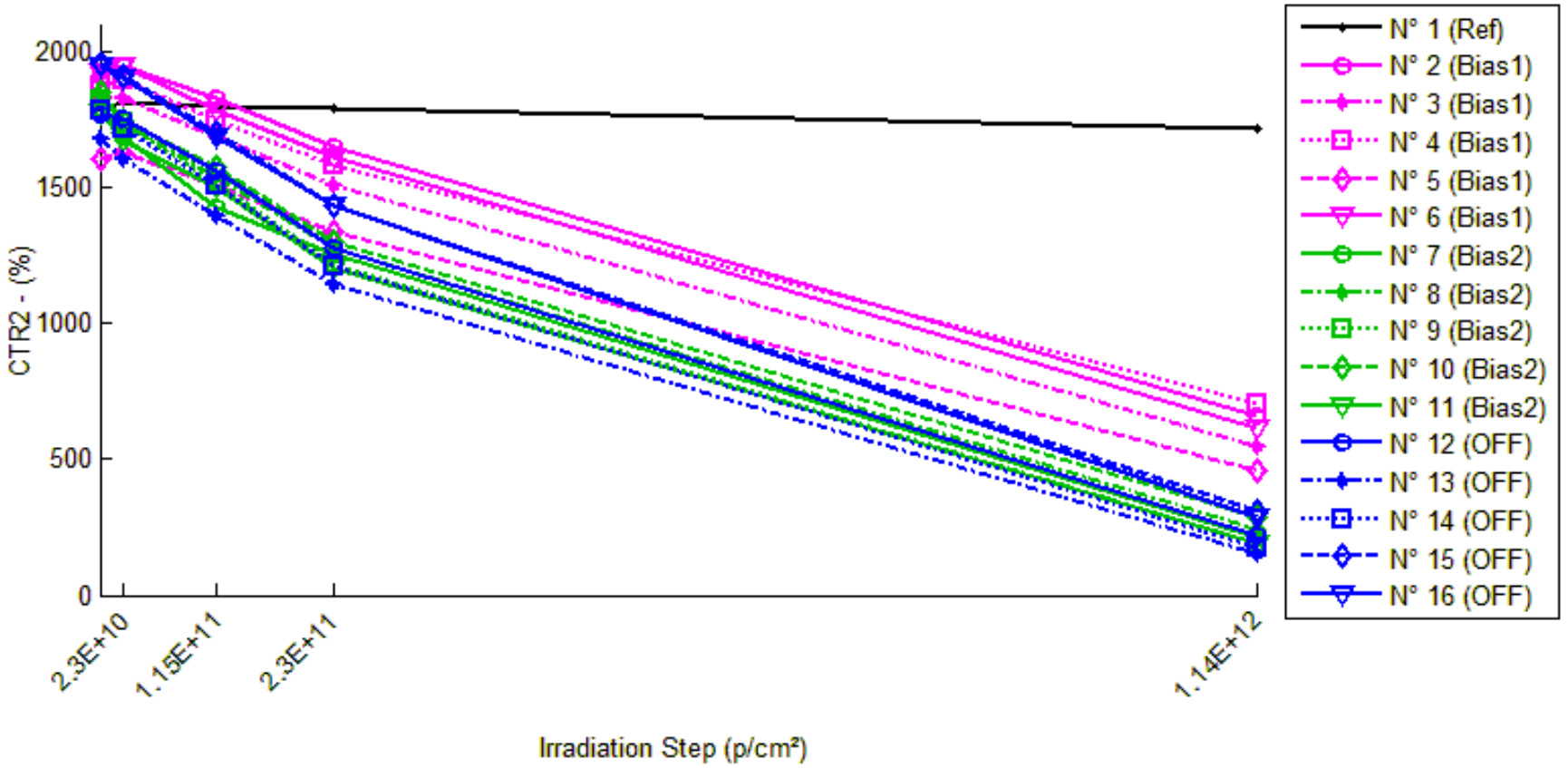
1/Delta [CTR1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	6.646E-6	8.754E-6	1.170E-5	4.917E-6
N° 2 (Bias1)	---	1.088E-5	3.604E-5	7.180E-5	3.608E-4
N° 3 (Bias1)	---	1.233E-5	4.877E-5	8.345E-5	4.152E-4
N° 4 (Bias1)	---	1.019E-5	4.428E-5	7.457E-5	3.594E-4
N° 5 (Bias1)	---	1.079E-5	4.810E-5	8.641E-5	4.310E-4
N° 6 (Bias1)	---	1.218E-5	4.701E-5	8.238E-5	4.080E-4
N° 7 (Bias2)	---	1.349E-5	6.972E-5	1.043E-4	5.968E-4
N° 8 (Bias2)	---	1.060E-5	6.439E-5	1.109E-4	6.226E-4
N° 9 (Bias2)	---	1.036E-5	7.433E-5	1.299E-4	6.833E-4
N° 10 (Bias2)	---	1.107E-5	5.035E-5	1.172E-4	5.848E-4
N° 11 (Bias2)	---	1.337E-5	5.585E-5	1.120E-4	6.351E-4
N° 12 (OFF)	---	7.759E-6	4.614E-5	1.107E-4	6.029E-4
N° 13 (OFF)	---	1.280E-5	5.976E-5	1.337E-4	6.994E-4
N° 14 (OFF)	---	1.199E-5	5.728E-5	1.298E-4	6.865E-4
N° 15 (OFF)	---	8.455E-6	4.426E-5	1.062E-4	5.643E-4
N° 16 (OFF)	---	9.335E-6	4.695E-5	1.084E-4	5.909E-4
Average (OFF)	---	1.128E-5	4.484E-5	7.972E-5	3.949E-4
σ (OFF)	---	9.373E-7	5.209E-6	6.225E-6	3.282E-5
Average+3σ (OFF)	---	1.409E-5	6.047E-5	9.840E-5	4.933E-4
Average-3σ (OFF)	---	8.464E-6	2.921E-5	6.105E-5	2.964E-4
Average (Bias1)	---	1.178E-5	6.293E-5	1.149E-4	6.245E-4
σ (Bias1)	---	1.531E-6	9.831E-6	9.585E-6	3.845E-5
Average+3σ (Bias1)	---	1.637E-5	9.242E-5	1.436E-4	7.399E-4
Average-3σ (Bias1)	---	7.187E-6	3.343E-5	8.611E-5	5.092E-4
Average (Bias2)	---	1.007E-5	5.088E-5	1.178E-4	6.288E-4
σ (Bias2)	---	2.214E-6	7.098E-6	1.294E-5	6.037E-5
Average+3σ (Bias2)	---	1.671E-5	7.217E-5	1.566E-4	8.099E-4
Average-3σ (Bias2)	---	3.426E-6	2.958E-5	7.898E-5	4.477E-4

60 MeV proton / detailed results

16.CTR2

Ta=25°C; If=0.5mA; Vo=0.4V; Vcc=5V



60 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1787.91	1812.23	1796.66	1788.38	1719.17
N° 2 (Bias1)	1907.83	1950.91	1830.30	1652.33	659.40
N° 3 (Bias1)	1826.52	1827.29	1686.38	1505.92	548.32
N° 4 (Bias1)	1869.74	1895.14	1743.95	1581.48	701.79
N° 5 (Bias1)	1605.81	1629.51	1504.88	1338.12	459.05
N° 6 (Bias1)	1927.07	1946.55	1786.59	1614.83	611.63
N° 7 (Bias2)	1794.38	1690.15	1424.07	1253.56	212.02
N° 8 (Bias2)	1831.94	1742.24	1535.41	1276.59	241.72
N° 9 (Bias2)	1820.49	1741.14	1517.28	1219.86	187.18
N° 10 (Bias2)	1849.72	1746.87	1572.22	1301.62	284.99
N° 11 (Bias2)	1776.26	1672.39	1498.57	1202.97	188.98
N° 12 (OFF)	1767.70	1756.86	1557.02	1277.05	219.94
N° 13 (OFF)	1676.67	1604.38	1397.89	1143.97	151.67
N° 14 (OFF)	1784.71	1715.08	1506.37	1207.88	172.10
N° 15 (OFF)	1952.29	1907.44	1701.35	1431.27	308.52
N° 16 (OFF)	1949.99	1902.12	1683.16	1430.81	289.74

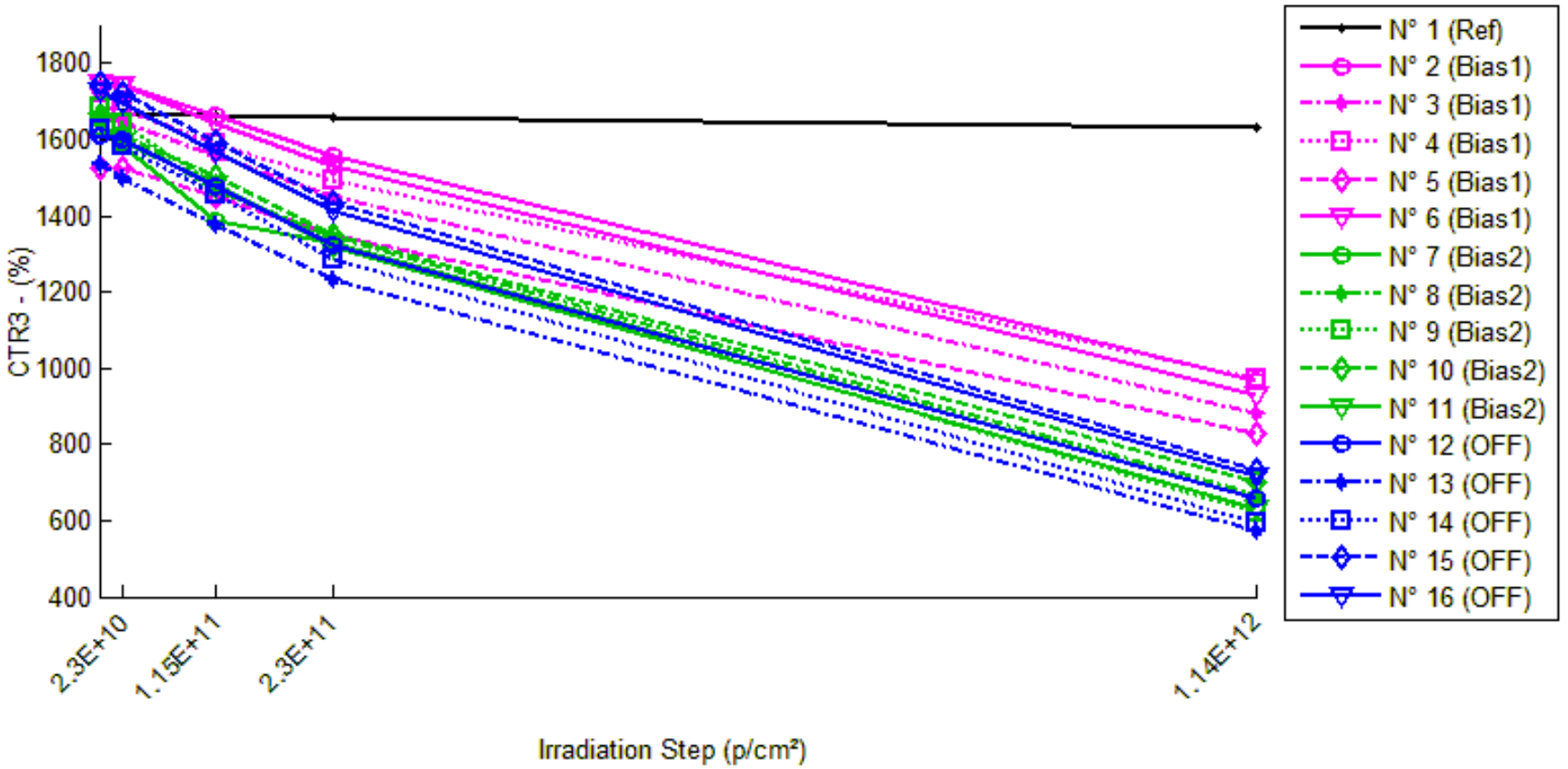
1/Delta [CTR2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-7.505E-6	-2.723E-6	-1.486E-7	2.236E-5
N° 2 (Bias1)	---	-1.157E-5	2.220E-5	8.105E-5	9.924E-4
N° 3 (Bias1)	---	-2.304E-7	4.550E-5	1.166E-4	1.276E-3
N° 4 (Bias1)	---	-7.166E-6	3.858E-5	9.749E-5	8.901E-4
N° 5 (Bias1)	---	-9.060E-6	4.176E-5	1.246E-4	1.556E-3
N° 6 (Bias1)	---	-5.192E-6	4.080E-5	1.003E-4	1.116E-3
N° 7 (Bias2)	---	3.437E-5	1.449E-4	2.404E-4	4.159E-3
N° 8 (Bias2)	---	2.810E-5	1.054E-4	2.375E-4	3.591E-3
N° 9 (Bias2)	---	2.503E-5	1.098E-4	2.705E-4	4.793E-3
N° 10 (Bias2)	---	3.183E-5	9.542E-5	2.276E-4	2.968E-3
N° 11 (Bias2)	---	3.497E-5	1.043E-4	2.683E-4	4.729E-3
N° 12 (OFF)	---	3.490E-6	7.655E-5	2.173E-4	3.981E-3
N° 13 (OFF)	---	2.687E-5	1.189E-4	2.777E-4	5.997E-3
N° 14 (OFF)	---	2.275E-5	1.035E-4	2.676E-4	5.250E-3
N° 15 (OFF)	---	1.204E-5	7.555E-5	1.865E-4	2.729E-3
N° 16 (OFF)	---	1.290E-5	8.130E-5	1.861E-4	2.939E-3
Average (OFF)	---	-6.645E-6	3.777E-5	1.040E-4	1.166E-3
σ (OFF)	---	4.291E-6	9.053E-6	1.706E-5	2.611E-4
Average+3σ (OFF)	---	6.229E-6	6.493E-5	1.552E-4	1.950E-3
Average-3σ (OFF)	---	-1.952E-5	1.061E-5	5.283E-5	3.827E-4
Average (Bias1)	---	3.086E-5	1.120E-4	2.489E-4	4.048E-3
σ (Bias1)	---	4.233E-6	1.914E-5	1.933E-5	7.755E-4
Average+3σ (Bias1)	---	4.356E-5	1.694E-4	3.069E-4	6.374E-3
Average-3σ (Bias1)	---	1.816E-5	5.455E-5	1.909E-4	1.722E-3
Average (Bias2)	---	1.561E-5	9.117E-5	2.270E-4	4.179E-3
σ (Bias2)	---	9.284E-6	1.923E-5	4.368E-5	1.426E-3
Average+3σ (Bias2)	---	4.346E-5	1.489E-4	3.581E-4	8.457E-3
Average-3σ (Bias2)	---	-1.224E-5	3.348E-5	9.600E-5	-9.834E-5

60 MeV proton / detailed results

17.CTR3

Ta=25°C; If=1mA; Vo=0.4V; Vcc=5V



60 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1657.86	1667.96	1662.93	1657.03	1632.67
N° 2 (Bias1)	1733.35	1742.27	1661.65	1554.67	969.05
N° 3 (Bias1)	1654.96	1646.15	1557.93	1450.89	883.45
N° 4 (Bias1)	1679.25	1681.33	1591.03	1494.22	971.28
N° 5 (Bias1)	1526.57	1527.15	1447.99	1350.29	825.80
N° 6 (Bias1)	1746.38	1741.54	1642.58	1531.65	926.86
N° 7 (Bias2)	1630.48	1581.61	1388.28	1325.75	656.63
N° 8 (Bias2)	1664.72	1616.38	1465.43	1341.81	668.34
N° 9 (Bias2)	1686.95	1642.17	1478.02	1329.62	618.98
N° 10 (Bias2)	1664.76	1610.44	1502.97	1351.19	702.15
N° 11 (Bias2)	1646.88	1593.71	1481.58	1315.44	630.93
N° 12 (OFF)	1610.33	1597.63	1479.42	1325.45	657.47
N° 13 (OFF)	1537.64	1498.74	1377.17	1232.15	572.26
N° 14 (OFF)	1623.63	1583.10	1455.22	1287.88	593.64
N° 15 (OFF)	1749.02	1720.70	1593.23	1432.01	732.82
N° 16 (OFF)	1728.62	1695.23	1565.62	1413.39	714.31

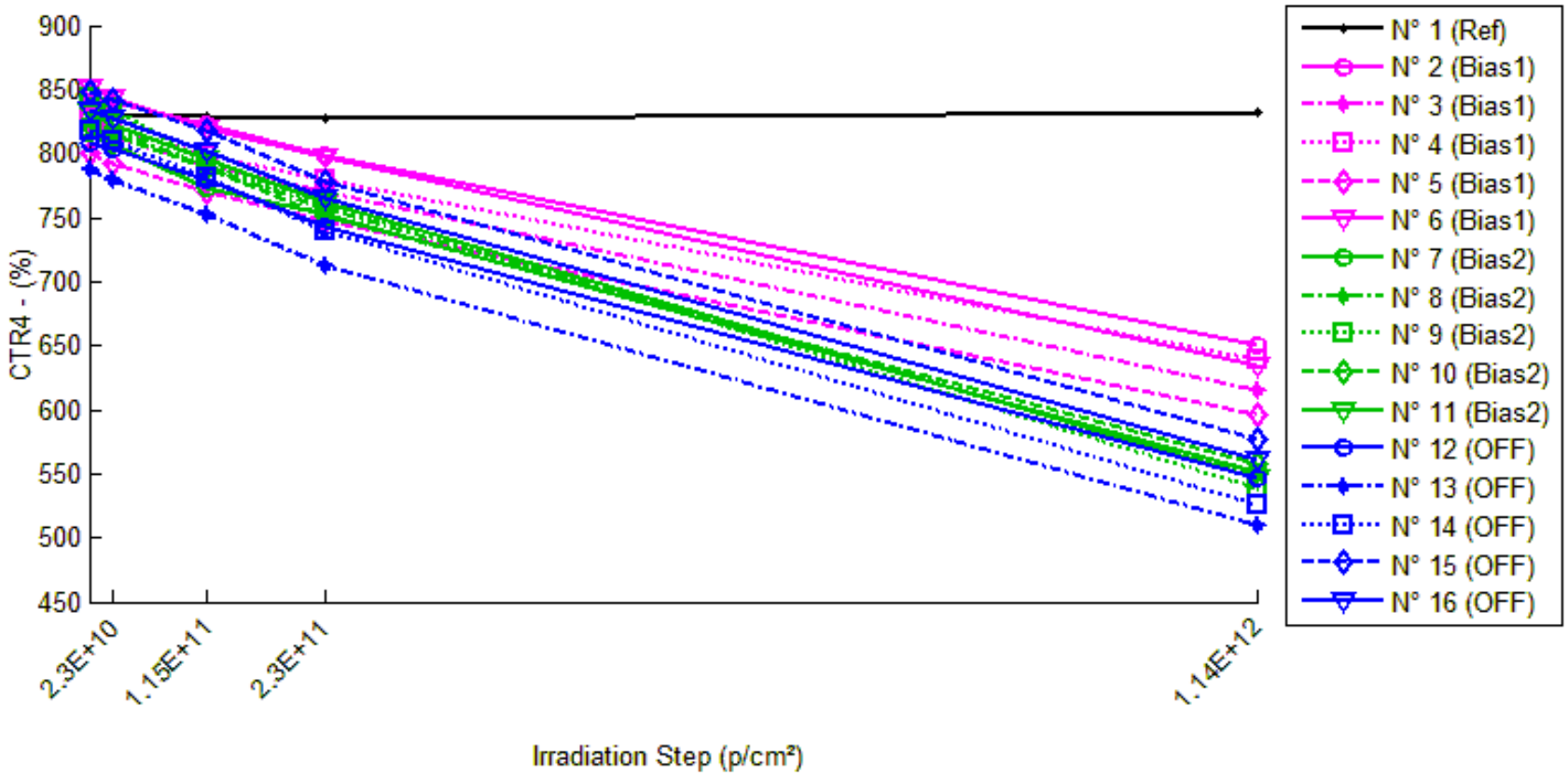
1/Delta [CTR3]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-3.652E-6	-1.838E-6	3.018E-7	9.308E-6
N° 2 (Bias1)	---	-2.956E-6	2.489E-5	6.630E-5	4.550E-4
N° 3 (Bias1)	---	3.232E-6	3.763E-5	8.499E-5	5.277E-4
N° 4 (Bias1)	---	-7.364E-7	3.302E-5	7.374E-5	4.341E-4
N° 5 (Bias1)	---	-2.505E-7	3.555E-5	8.552E-5	5.559E-4
N° 6 (Bias1)	---	1.594E-6	3.619E-5	8.028E-5	5.063E-4
N° 7 (Bias2)	---	1.895E-5	1.070E-4	1.410E-4	9.096E-4
N° 8 (Bias2)	---	1.796E-5	8.169E-5	1.446E-4	8.955E-4
N° 9 (Bias2)	---	1.616E-5	8.380E-5	1.593E-4	1.023E-3
N° 10 (Bias2)	---	2.026E-5	6.466E-5	1.394E-4	8.235E-4
N° 11 (Bias2)	---	2.026E-5	6.775E-5	1.530E-4	9.778E-4
N° 12 (OFF)	---	4.936E-6	5.495E-5	1.335E-4	9.000E-4
N° 13 (OFF)	---	1.688E-5	7.578E-5	1.612E-4	1.097E-3
N° 14 (OFF)	---	1.577E-5	7.128E-5	1.606E-4	1.069E-3
N° 15 (OFF)	---	9.408E-6	5.591E-5	1.266E-4	7.928E-4
N° 16 (OFF)	---	1.139E-5	6.023E-5	1.290E-4	8.215E-4
Average (OFF)	---	1.765E-7	3.346E-5	7.816E-5	4.958E-4
σ (OFF)	---	2.355E-6	5.069E-6	8.144E-6	5.053E-5
Average+3σ (OFF)	---	7.240E-6	4.866E-5	1.026E-4	6.474E-4
Average-3σ (OFF)	---	-6.887E-6	1.825E-5	5.373E-5	3.442E-4
Average (Bias1)	---	1.872E-5	8.098E-5	1.474E-4	9.258E-4
σ (Bias1)	---	1.725E-6	1.678E-5	8.462E-6	7.705E-5
Average+3σ (Bias1)	---	2.389E-5	1.313E-4	1.728E-4	1.157E-3
Average-3σ (Bias1)	---	1.355E-5	3.063E-5	1.221E-4	6.947E-4
Average (Bias2)	---	1.168E-5	6.363E-5	1.422E-4	9.360E-4
σ (Bias2)	---	4.859E-6	9.390E-6	1.728E-5	1.400E-4
Average+3σ (Bias2)	---	2.625E-5	9.180E-5	1.940E-4	1.356E-3
Average-3σ (Bias2)	---	-2.901E-6	3.546E-5	9.034E-5	5.159E-4

60 MeV proton / detailed results

18.CTR4

Ta=25°C; If=5mA; Vo=0.4V; Vcc=5V



60 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	835.81	831.11	829.74	827.64	832.40
N° 2 (Bias1)	847.11	839.39	822.19	799.09	650.95
N° 3 (Bias1)	821.63	813.35	790.25	769.48	614.76
N° 4 (Bias1)	826.97	820.13	797.98	779.38	639.58
N° 5 (Bias1)	799.52	792.72	770.09	748.27	596.40
N° 6 (Bias1)	851.91	843.24	819.37	796.64	634.44
N° 7 (Bias2)	815.72	806.93	773.66	752.49	551.41
N° 8 (Bias2)	826.59	819.51	789.53	757.97	548.85
N° 9 (Bias2)	843.12	835.94	792.42	760.93	537.96
N° 10 (Bias2)	821.68	814.45	789.61	750.52	557.86
N° 11 (Bias2)	831.61	822.62	795.18	761.74	547.32
N° 12 (OFF)	808.46	803.42	779.69	742.77	546.18
N° 13 (OFF)	786.87	779.03	752.05	712.85	510.42
N° 14 (OFF)	817.16	809.44	781.18	739.75	526.47
N° 15 (OFF)	847.77	841.72	817.54	778.51	576.26
N° 16 (OFF)	833.24	826.92	802.42	765.14	561.42

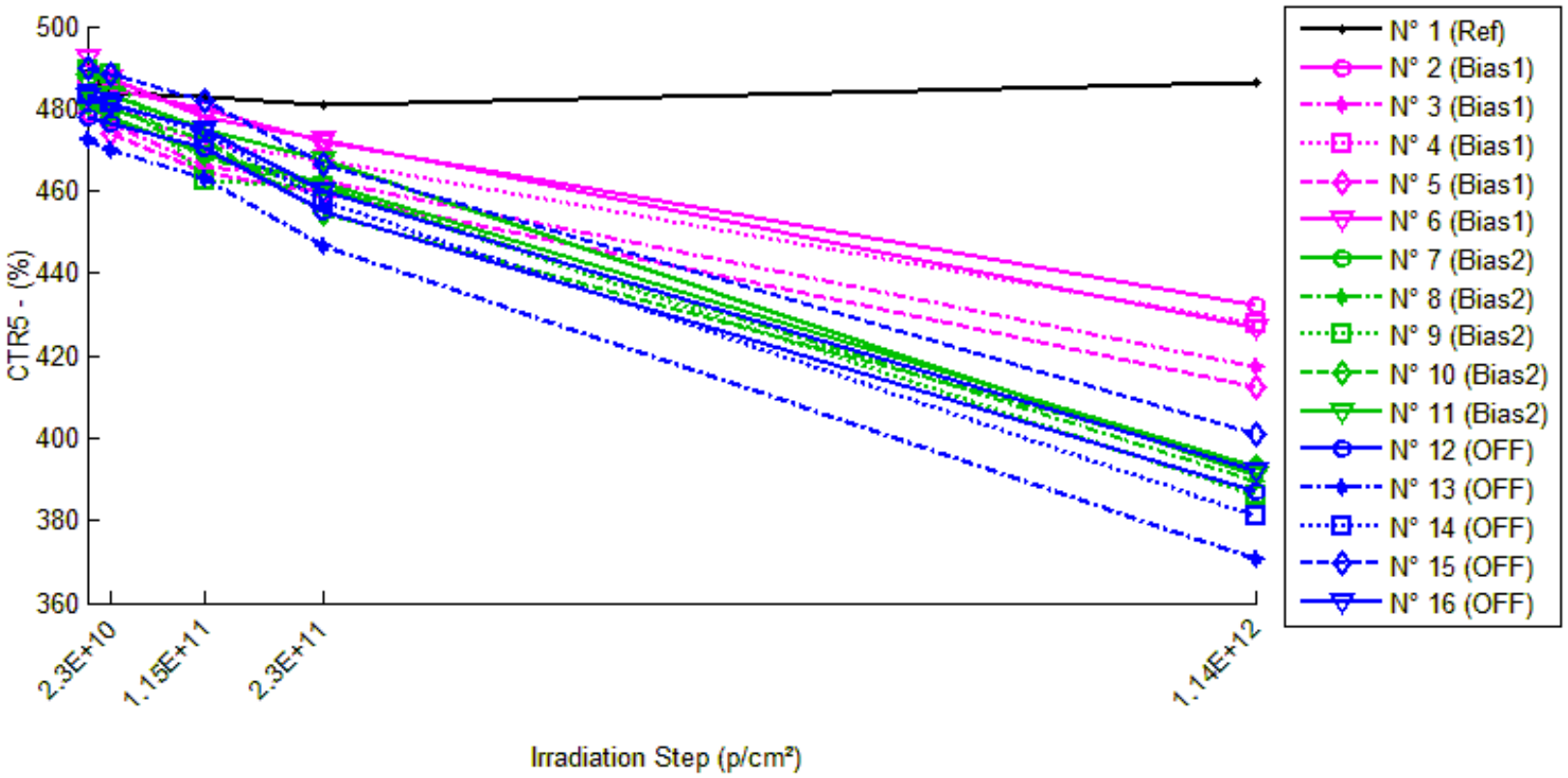
1/Delta [CTR4]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	6.762E-6	8.747E-6	1.180E-5	4.892E-6
N° 2 (Bias1)	---	1.086E-5	3.578E-5	7.094E-5	3.557E-4
N° 3 (Bias1)	---	1.240E-5	4.834E-5	8.249E-5	4.096E-4
N° 4 (Bias1)	---	1.009E-5	4.393E-5	7.384E-5	3.543E-4
N° 5 (Bias1)	---	1.073E-5	4.779E-5	8.567E-5	4.260E-4
N° 6 (Bias1)	---	1.208E-5	4.663E-5	8.144E-5	4.024E-4
N° 7 (Bias2)	---	1.335E-5	6.664E-5	1.030E-4	5.876E-4
N° 8 (Bias2)	---	1.045E-5	5.678E-5	1.095E-4	6.122E-4
N° 9 (Bias2)	---	1.018E-5	7.589E-5	1.281E-4	6.728E-4
N° 10 (Bias2)	---	1.081E-5	4.944E-5	1.154E-4	5.756E-4
N° 11 (Bias2)	---	1.314E-5	5.509E-5	1.103E-4	6.246E-4
N° 12 (OFF)	---	7.753E-6	4.564E-5	1.094E-4	5.940E-4
N° 13 (OFF)	---	1.279E-5	5.884E-5	1.320E-4	6.883E-4
N° 14 (OFF)	---	1.167E-5	5.636E-5	1.281E-4	6.757E-4
N° 15 (OFF)	---	8.477E-6	4.362E-5	1.049E-4	5.558E-4
N° 16 (OFF)	---	9.180E-6	4.609E-5	1.068E-4	5.811E-4
Average (OFF)	---	1.123E-5	4.449E-5	7.888E-5	3.896E-4
σ (OFF)	---	9.697E-7	5.157E-6	6.205E-6	3.270E-5
Average+3σ (OFF)	---	1.414E-5	5.996E-5	9.749E-5	4.877E-4
Average-3σ (OFF)	---	8.321E-6	2.902E-5	6.026E-5	2.915E-4
Average (Bias1)	---	1.158E-5	6.077E-5	1.133E-4	6.146E-4
σ (Bias1)	---	1.534E-6	1.048E-5	9.396E-6	3.790E-5
Average+3σ (Bias1)	---	1.618E-5	9.222E-5	1.415E-4	7.283E-4
Average-3σ (Bias1)	---	6.984E-6	2.931E-5	8.508E-5	5.009E-4
Average (Bias2)	---	9.973E-6	5.011E-5	1.162E-4	6.190E-4
σ (Bias2)	---	2.156E-6	6.957E-6	1.275E-5	5.934E-5
Average+3σ (Bias2)	---	1.644E-5	7.098E-5	1.545E-4	7.970E-4
Average-3σ (Bias2)	---	3.506E-6	2.924E-5	7.798E-5	4.409E-4

60 MeV proton / detailed results

19.CTR5

Ta=25°C; If=10mA; Vo=0.4V; Vcc=5V



60 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	488.73	483.90	482.73	480.97	486.48
N° 2 (Bias1)	490.09	484.67	479.71	472.01	432.15
N° 3 (Bias1)	481.63	476.20	466.23	462.34	417.54
N° 4 (Bias1)	485.77	480.87	471.32	467.58	428.01
N° 5 (Bias1)	478.98	474.05	464.45	459.60	412.50
N° 6 (Bias1)	492.44	487.12	477.91	472.56	426.91
N° 7 (Bias2)	481.05	477.80	468.82	462.11	392.96
N° 8 (Bias2)	483.40	482.06	468.11	461.22	389.53
N° 9 (Bias2)	489.53	488.15	462.58	461.05	386.29
N° 10 (Bias2)	481.33	479.95	472.33	454.36	392.78
N° 11 (Bias2)	486.43	483.58	474.96	467.24	390.79
N° 12 (OFF)	478.08	476.40	470.33	454.90	386.94
N° 13 (OFF)	472.30	470.10	462.78	446.45	370.91
N° 14 (OFF)	483.61	481.45	474.13	457.57	381.29
N° 15 (OFF)	489.97	488.12	482.02	466.35	400.91
N° 16 (OFF)	482.91	480.98	474.94	459.93	392.17

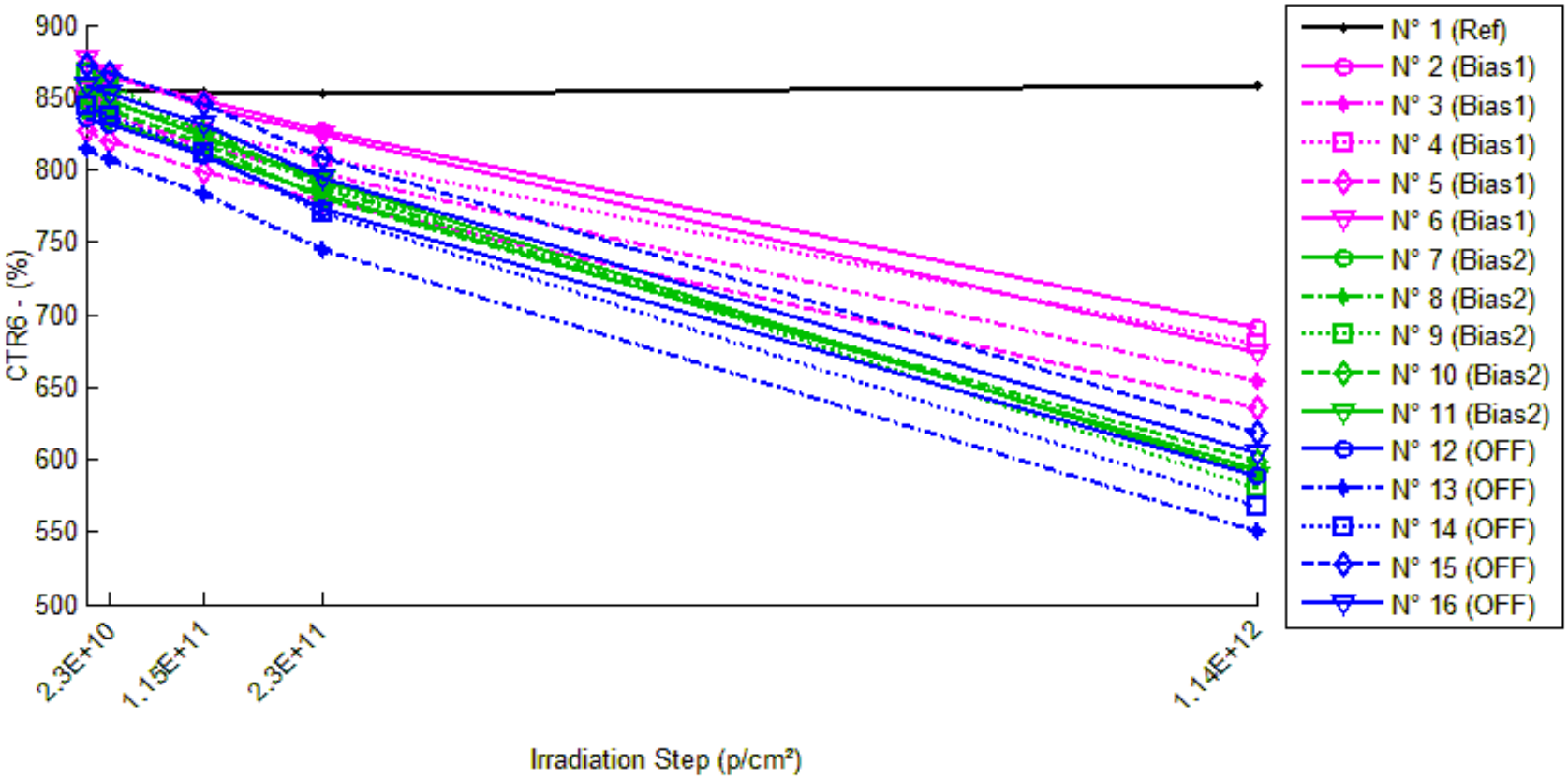
1/Delta [CTR5]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	2.043E-5	2.544E-5	3.301E-5	9.457E-6
N° 2 (Bias1)	---	2.284E-5	4.417E-5	7.814E-5	2.736E-4
N° 3 (Bias1)	---	2.369E-5	6.859E-5	8.664E-5	3.187E-4
N° 4 (Bias1)	---	2.096E-5	6.310E-5	8.008E-5	2.778E-4
N° 5 (Bias1)	---	2.169E-5	6.530E-5	8.803E-5	3.365E-4
N° 6 (Bias1)	---	2.220E-5	6.176E-5	8.546E-5	3.117E-4
N° 7 (Bias2)	---	1.417E-5	5.424E-5	8.521E-5	4.660E-4
N° 8 (Bias2)	---	5.743E-6	6.757E-5	9.947E-5	4.985E-4
N° 9 (Bias2)	---	5.780E-6	1.190E-4	1.262E-4	5.460E-4
N° 10 (Bias2)	---	5.941E-6	3.959E-5	1.233E-4	4.683E-4
N° 11 (Bias2)	---	1.211E-5	4.965E-5	8.441E-5	5.031E-4
N° 12 (OFF)	---	7.394E-6	3.449E-5	1.066E-4	4.927E-4
N° 13 (OFF)	---	9.928E-6	4.357E-5	1.226E-4	5.788E-4
N° 14 (OFF)	---	9.276E-6	4.133E-5	1.176E-4	5.549E-4
N° 15 (OFF)	---	7.723E-6	3.366E-5	1.034E-4	4.534E-4
N° 16 (OFF)	---	8.272E-6	3.472E-5	1.034E-4	4.791E-4
Average (OFF)	---	2.227E-5	6.058E-5	8.367E-5	3.037E-4
(OFF)	---	1.046E-6	9.533E-6	4.315E-6	2.711E-5
Average+3 (OFF)	---	2.541E-5	8.918E-5	9.661E-5	3.850E-4
Average-3 (OFF)	---	1.914E-5	3.198E-5	7.072E-5	2.223E-4
Average (Bias1)	---	8.749E-6	6.601E-5	1.037E-4	4.964E-4
(Bias1)	---	4.076E-6	3.128E-5	2.013E-5	3.247E-5
Average+3 (Bias1)	---	2.098E-5	1.598E-4	1.641E-4	5.938E-4
Average-3 (Bias1)	---	-3.478E-6	-2.782E-5	4.331E-5	3.990E-4
Average (Bias2)	---	8.519E-6	3.755E-5	1.107E-4	5.118E-4
(Bias2)	---	1.063E-6	4.555E-6	8.851E-6	5.289E-5
Average+3 (Bias2)	---	1.171E-5	5.122E-5	1.373E-4	6.705E-4
Average-3 (Bias2)	---	5.330E-6	2.389E-5	8.419E-5	3.531E-4

60 MeV proton / detailed results

20.CTR6

Ta=25°C; If=5mA; Vo=0.4V; Vcc=18V



60 MeV proton / detailed results

CTR6 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	861.49	855.92	854.37	852.00	857.74
N° 2 (Bias1)	872.27	864.00	848.46	826.89	691.14
N° 3 (Bias1)	847.17	838.48	816.14	797.80	654.05
N° 4 (Bias1)	853.48	846.16	824.84	808.28	679.29
N° 5 (Bias1)	827.08	819.95	797.98	778.14	635.42
N° 6 (Bias1)	876.09	867.10	844.40	823.93	673.37
N° 7 (Bias2)	841.75	833.46	811.81	782.62	592.87
N° 8 (Bias2)	851.80	845.64	828.14	787.89	591.01
N° 9 (Bias2)	867.18	861.09	821.85	789.91	579.47
N° 10 (Bias2)	847.10	840.66	817.93	779.80	599.12
N° 11 (Bias2)	856.63	848.38	823.17	792.63	589.12
N° 12 (OFF)	835.36	830.70	809.43	773.65	588.06
N° 13 (OFF)	814.52	807.42	782.65	744.47	550.82
N° 14 (OFF)	843.42	836.41	810.84	770.61	567.37
N° 15 (OFF)	872.23	866.80	845.30	807.85	618.66
N° 16 (OFF)	858.35	852.68	830.91	795.02	604.16

1/Delta [CTR6]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	7.553E-6	9.670E-6	1.293E-5	5.077E-6
N° 2 (Bias1)	---	1.098E-5	3.217E-5	6.292E-5	3.005E-4
N° 3 (Bias1)	---	1.223E-5	4.488E-5	7.305E-5	3.485E-4
N° 4 (Bias1)	---	1.014E-5	4.069E-5	6.553E-5	3.005E-4
N° 5 (Bias1)	---	1.052E-5	4.410E-5	7.605E-5	3.647E-4
N° 6 (Bias1)	---	1.184E-5	4.284E-5	7.227E-5	3.436E-4
N° 7 (Bias2)	---	1.182E-5	4.382E-5	8.975E-5	4.987E-4
N° 8 (Bias2)	---	8.547E-6	3.353E-5	9.523E-5	5.180E-4
N° 9 (Bias2)	---	8.165E-6	6.361E-5	1.128E-4	5.726E-4
N° 10 (Bias2)	---	9.042E-6	4.211E-5	1.019E-4	4.886E-4
N° 11 (Bias2)	---	1.136E-5	4.745E-5	9.425E-5	5.301E-4
N° 12 (OFF)	---	6.717E-6	3.834E-5	9.549E-5	5.034E-4
N° 13 (OFF)	---	1.081E-5	5.000E-5	1.155E-4	5.878E-4
N° 14 (OFF)	---	9.936E-6	4.763E-5	1.120E-4	5.769E-4
N° 15 (OFF)	---	7.181E-6	3.652E-5	9.136E-5	4.699E-4
N° 16 (OFF)	---	7.748E-6	3.847E-5	9.280E-5	4.902E-4
Average (OFF)	---	1.114E-5	4.094E-5	6.996E-5	3.316E-4
σ (OFF)	---	8.788E-7	5.148E-6	5.502E-6	2.944E-5
Average+3σ (OFF)	---	1.378E-5	5.638E-5	8.647E-5	4.199E-4
Average-3σ (OFF)	---	8.504E-6	2.549E-5	5.346E-5	2.432E-4
Average (Bias1)	---	9.786E-6	4.610E-5	9.879E-5	5.216E-4
σ (Bias1)	---	1.682E-6	1.104E-5	8.955E-6	3.276E-5
Average+3σ (Bias1)	---	1.483E-5	7.923E-5	1.257E-4	6.199E-4
Average-3σ (Bias1)	---	4.740E-6	1.298E-5	7.192E-5	4.233E-4
Average (Bias2)	---	8.477E-6	4.219E-5	1.014E-4	5.256E-4
σ (Bias2)	---	1.793E-6	6.152E-6	1.142E-5	5.325E-5
Average+3σ (Bias2)	---	1.386E-5	6.065E-5	1.357E-4	6.854E-4
Average-3σ (Bias2)	---	3.099E-6	2.374E-5	6.718E-5	3.659E-4

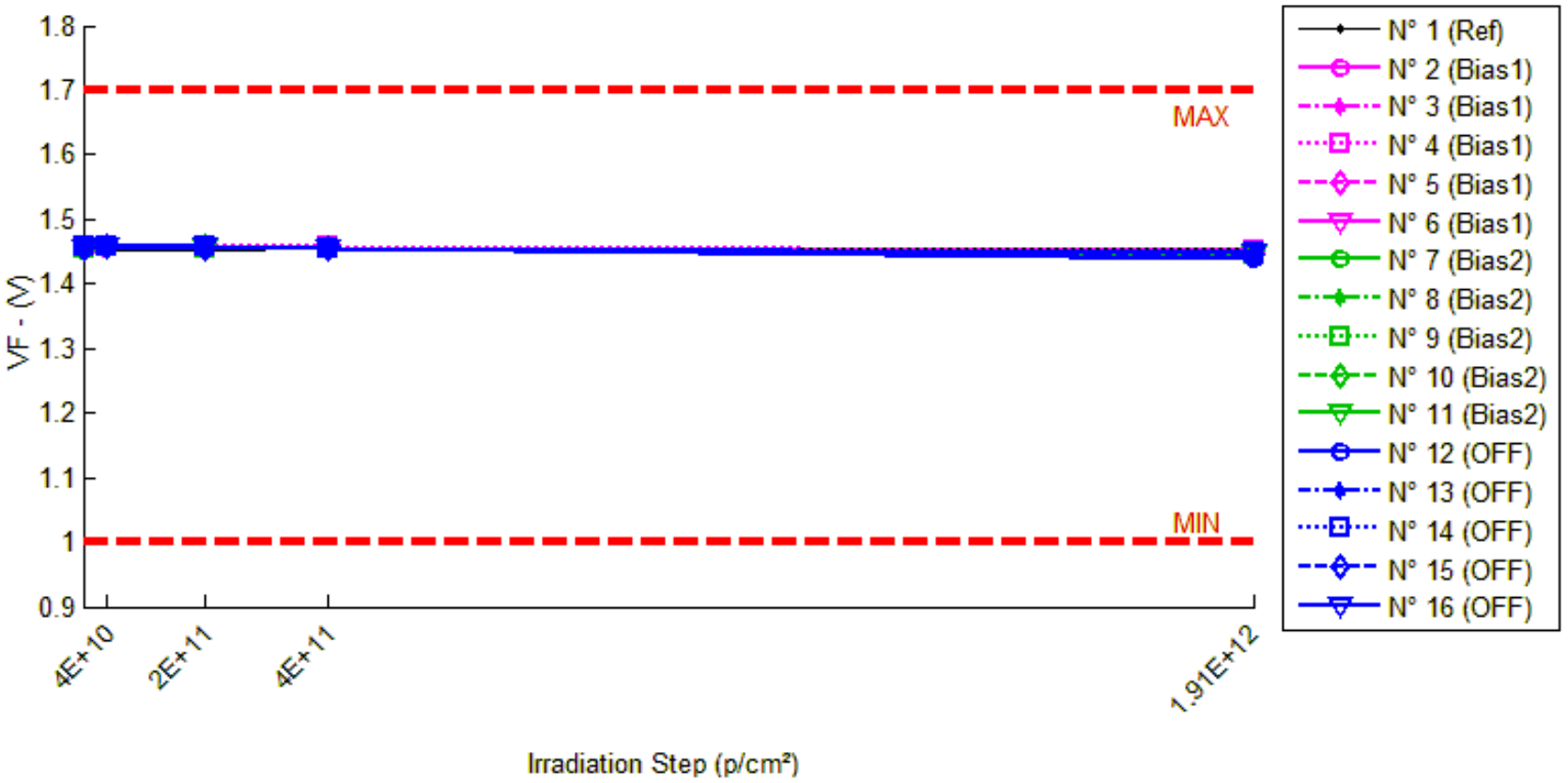
190 MeV proton / detailed results

CONTENTS

190 MeV proton / detailed results

1. VF

Ta=25°C; If=1.6mA



190 MeV proton / detailed results

VF . (V) **Min = 1.0 Max = 1.7**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1.451	1.452	1.453	1.455	1.454
N° 2 (Bias1)	1.452	1.456	1.456	1.456	1.449
N° 3 (Bias1)	1.450	1.456	1.456	1.456	1.446
N° 4 (Bias1)	1.455	1.458	1.457	1.457	1.451
N° 5 (Bias1)	1.454	1.457	1.457	1.456	1.450
N° 6 (Bias1)	1.454	1.457	1.456	1.455	1.449
N° 7 (Bias2)	1.453	1.460	1.457	1.456	1.447
N° 8 (Bias2)	1.453	1.457	1.456	1.454	1.444
N° 9 (Bias2)	1.455	1.459	1.456	1.455	1.445
N° 10 (Bias2)	1.456	1.459	1.458	1.456	1.446
N° 11 (Bias2)	1.455	1.458	1.456	1.455	1.446
N° 12 (OFF)	1.455	1.457	1.454	1.455	1.440
N° 13 (OFF)	1.455	1.458	1.456	1.455	1.446
N° 14 (OFF)	1.457	1.458	1.457	1.456	1.447
N° 15 (OFF)	1.454	1.458	1.455	1.454	1.446
N° 16 (OFF)	1.455	1.458	1.457	1.456	1.447

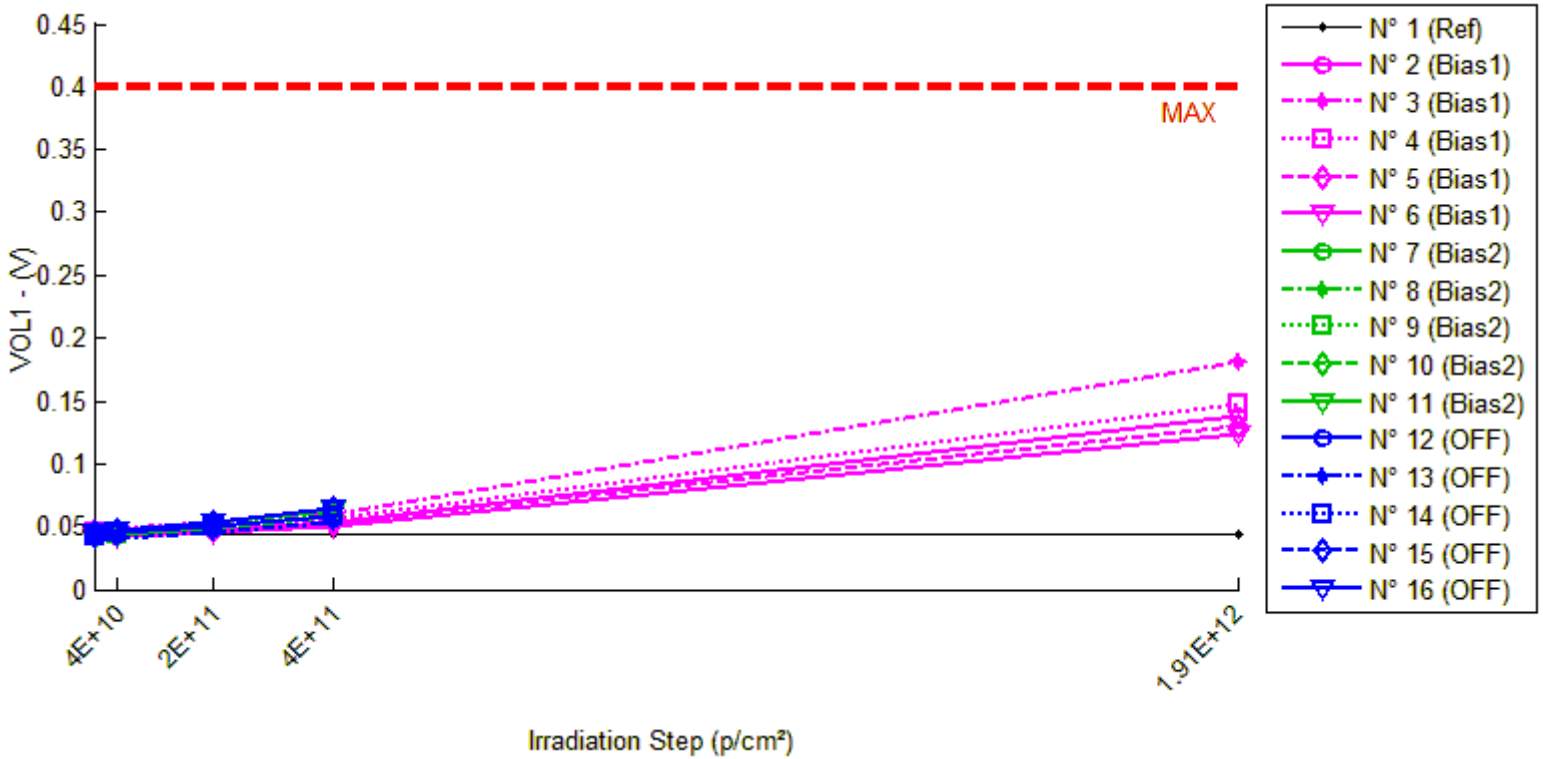
Delta [VF]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	1.592E-3	1.735E-3	3.839E-3	3.276E-3
N° 2 (Bias1)	---	3.904E-3	4.588E-3	4.505E-3	-2.377E-3
N° 3 (Bias1)	---	5.937E-3	6.642E-3	6.430E-3	-3.256E-3
N° 4 (Bias1)	---	3.259E-3	2.718E-3	2.289E-3	-4.113E-3
N° 5 (Bias1)	---	2.424E-3	2.796E-3	1.828E-3	-4.571E-3
N° 6 (Bias1)	---	2.300E-3	1.903E-3	5.140E-4	-5.706E-3
N° 7 (Bias2)	---	6.410E-3	4.075E-3	2.340E-3	-6.338E-3
N° 8 (Bias2)	---	4.491E-3	3.634E-3	1.481E-3	-8.501E-3
N° 9 (Bias2)	---	4.316E-3	1.821E-3	7.850E-4	-9.351E-3
N° 10 (Bias2)	---	3.190E-3	2.095E-3	-1.820E-4	-9.443E-3
N° 11 (Bias2)	---	2.967E-3	1.264E-3	-1.630E-4	-9.089E-3
N° 12 (OFF)	---	2.542E-3	-3.850E-4	4.000E-5	-1.488E-2
N° 13 (OFF)	---	2.769E-3	1.034E-3	-3.000E-5	-9.247E-3
N° 14 (OFF)	---	9.780E-4	6.230E-4	-3.840E-4	-9.289E-3
N° 15 (OFF)	---	3.211E-3	7.260E-4	-3.400E-5	-8.366E-3
N° 16 (OFF)	---	3.018E-3	1.986E-3	2.470E-4	-8.592E-3
Average (Bias1)	---	3.565E-3	3.729E-3	3.113E-3	-4.005E-3
σ (Bias1)	---	1.478E-3	1.901E-3	2.347E-3	1.269E-3
Average+3σ (Bias1)	---	7.999E-3	9.431E-3	1.015E-2	-1.990E-4
Average-3σ (Bias1)	---	-8.690E-4	-1.973E-3	-3.926E-3	-7.810E-3
Average (Bias2)	---	4.275E-3	2.578E-3	8.522E-4	-8.544E-3
σ (Bias2)	---	1.369E-3	1.213E-3	1.086E-3	1.287E-3
Average+3σ (Bias2)	---	8.381E-3	6.218E-3	4.109E-3	-4.684E-3
Average-3σ (Bias2)	---	1.683E-4	-1.062E-3	-2.404E-3	-1.241E-2
Average (OFF)	---	2.504E-3	7.968E-4	-3.220E-5	-1.007E-2
σ (OFF)	---	8.894E-4	8.518E-4	2.275E-4	2.716E-3
Average+3σ (OFF)	---	5.172E-3	3.352E-3	6.502E-4	-1.926E-3
Average-3σ (OFF)	---	-1.647E-4	-1.759E-3	-7.146E-4	-1.822E-2

190 MeV proton / detailed results

2. VOL1

Ta=25°C; If=0.5mA ; Iol = 1.5mA ; Vcc = 4.5V



190 MeV proton / detailed results

VOL1 . (V) **Max = 0.4**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.044	0.044	0.044	0.044	0.044
N° 2 (Bias1)	0.043	0.043	0.047	0.053	0.138
N° 3 (Bias1)	0.048	0.049	0.053	0.060	0.181
N° 4 (Bias1)	0.045	0.046	0.050	0.056	0.148
N° 5 (Bias1)	0.043	0.044	0.047	0.053	0.130
N° 6 (Bias1)	0.042	0.042	0.046	0.051	0.123
N° 7 (Bias2)	0.043	0.044	0.050	0.058	Not Measurable
N° 8 (Bias2)	0.042	0.043	0.049	0.058	Not Measurable
N° 9 (Bias2)	0.043	0.044	0.051	0.060	Not Measurable
N° 10 (Bias2)	0.043	0.044	0.050	0.058	Not Measurable
N° 11 (Bias2)	0.045	0.047	0.054	0.063	Not Measurable
N° 12 (OFF)	0.043	0.045	0.050	0.059	Not Measurable
N° 13 (OFF)	0.039	0.041	0.046	0.054	Not Measurable
N° 14 (OFF)	0.043	0.045	0.050	0.059	Not Measurable
N° 15 (OFF)	0.045	0.047	0.054	0.064	Not Measurable
N° 16 (OFF)	0.046	0.047	0.054	0.064	Not Measurable

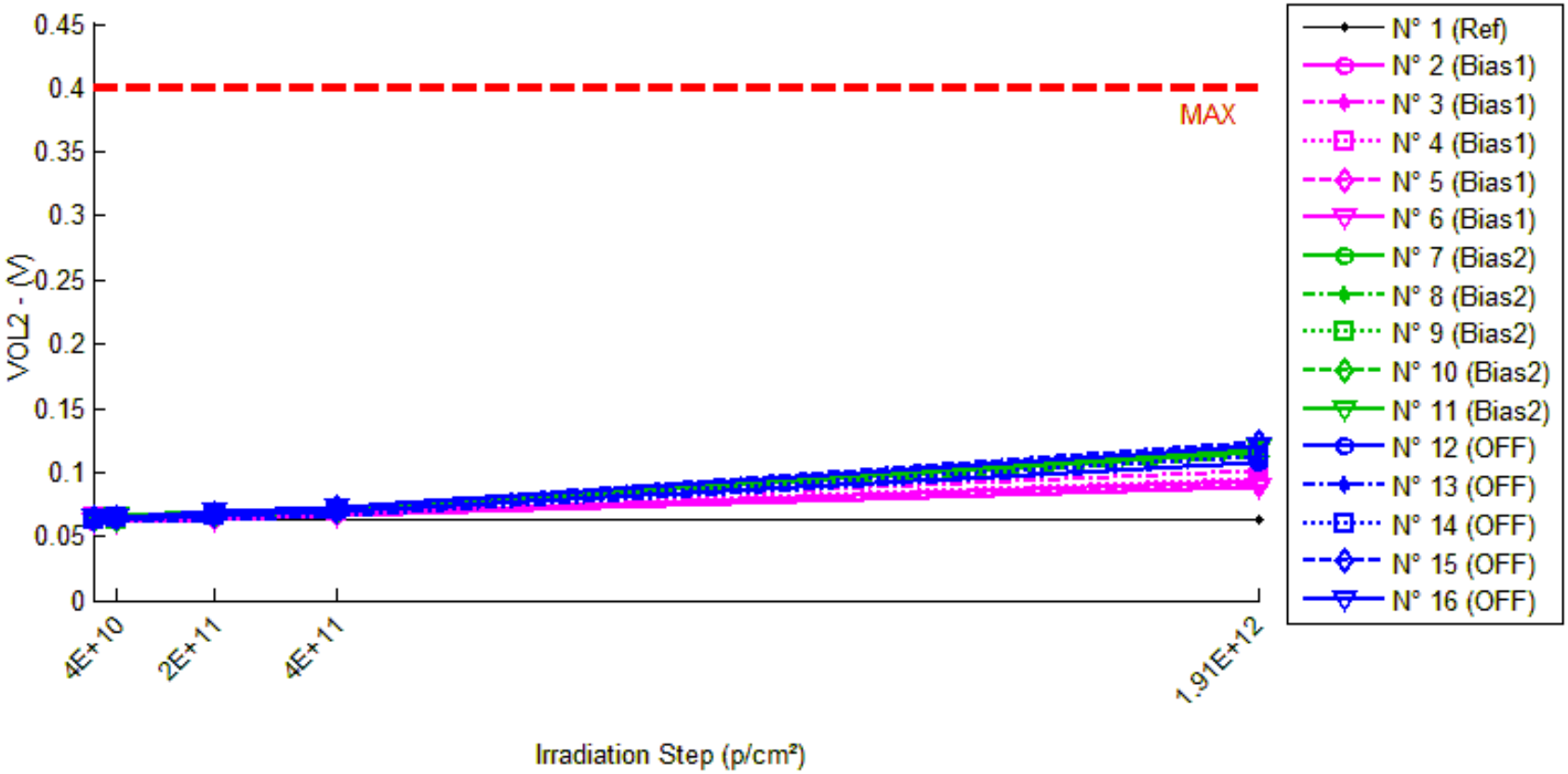
Delta [VOL1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-7.956E-5	-1.587E-4	-1.006E-4	-3.323E-4
N° 2 (Bias1)	---	8.400E-4	4.519E-3	1.008E-2	9.572E-2
N° 3 (Bias1)	---	8.151E-4	5.174E-3	1.178E-2	1.331E-1
N° 4 (Bias1)	---	8.660E-4	5.207E-3	1.118E-2	1.033E-1
N° 5 (Bias1)	---	9.311E-4	4.251E-3	9.427E-3	8.673E-2
N° 6 (Bias1)	---	8.646E-4	4.678E-3	9.701E-3	8.100E-2
N° 7 (Bias2)	---	1.093E-3	6.891E-3	1.509E-2	NaN
N° 8 (Bias2)	---	1.230E-3	7.417E-3	1.602E-2	NaN
N° 9 (Bias2)	---	1.234E-3	7.542E-3	1.648E-2	NaN
N° 10 (Bias2)	---	1.389E-3	7.357E-3	1.550E-2	NaN
N° 11 (Bias2)	---	1.410E-3	8.088E-3	1.750E-2	NaN
N° 12 (OFF)	---	1.465E-3	7.081E-3	1.566E-2	NaN
N° 13 (OFF)	---	1.561E-3	6.995E-3	1.492E-2	NaN
N° 14 (OFF)	---	1.648E-3	7.249E-3	1.578E-2	NaN
N° 15 (OFF)	---	1.549E-3	8.249E-3	1.903E-2	NaN
N° 16 (OFF)	---	1.639E-3	8.250E-3	1.848E-2	NaN
Average (Bias1)	---	8.634E-4	4.766E-3	1.043E-2	9.997E-2
σ (Bias1)	---	4.324E-5	4.168E-4	1.006E-3	2.037E-2
Average+3σ (Bias1)	---	9.931E-4	6.016E-3	1.345E-2	1.611E-1
Average-3σ (Bias1)	---	7.337E-4	3.515E-3	7.416E-3	3.886E-2
Average (Bias2)	---	1.271E-3	7.459E-3	1.612E-2	NaN
σ (Bias2)	---	1.304E-4	4.292E-4	9.344E-4	0.000E+0
Average+3σ (Bias2)	---	1.662E-3	8.747E-3	1.892E-2	NaN
Average-3σ (Bias2)	---	8.799E-4	6.172E-3	1.332E-2	NaN
Average (OFF)	---	1.572E-3	7.565E-3	1.678E-2	NaN
σ (OFF)	---	7.479E-5	6.317E-4	1.845E-3	0.000E+0
Average+3σ (OFF)	---	1.797E-3	9.460E-3	2.231E-2	NaN
Average-3σ (OFF)	---	1.348E-3	5.670E-3	1.124E-2	NaN

190 MeV proton / detailed results

3. VOL2

Ta=25°C; If=1.6mA ; Iol = 4.8mA ; Vcc = 4.5V



190 MeV proton / detailed results

VOL2 . (V) **Max = 0.4**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.063	0.063	0.063	0.063	0.063
N° 2 (Bias1)	0.062	0.063	0.065	0.068	0.094
N° 3 (Bias1)	0.066	0.066	0.068	0.071	0.101
N° 4 (Bias1)	0.065	0.065	0.067	0.070	0.095
N° 5 (Bias1)	0.063	0.063	0.065	0.068	0.092
N° 6 (Bias1)	0.061	0.061	0.063	0.066	0.089
N° 7 (Bias2)	0.063	0.064	0.067	0.071	0.115
N° 8 (Bias2)	0.062	0.063	0.066	0.070	0.113
N° 9 (Bias2)	0.063	0.063	0.067	0.071	0.117
N° 10 (Bias2)	0.063	0.063	0.066	0.070	0.113
N° 11 (Bias2)	0.065	0.066	0.069	0.073	0.119
N° 12 (OFF)	0.063	0.063	0.066	0.070	0.107
N° 13 (OFF)	0.060	0.061	0.063	0.067	0.107
N° 14 (OFF)	0.063	0.064	0.067	0.071	0.113
N° 15 (OFF)	0.065	0.065	0.068	0.073	0.123
N° 16 (OFF)	0.065	0.065	0.069	0.073	0.121

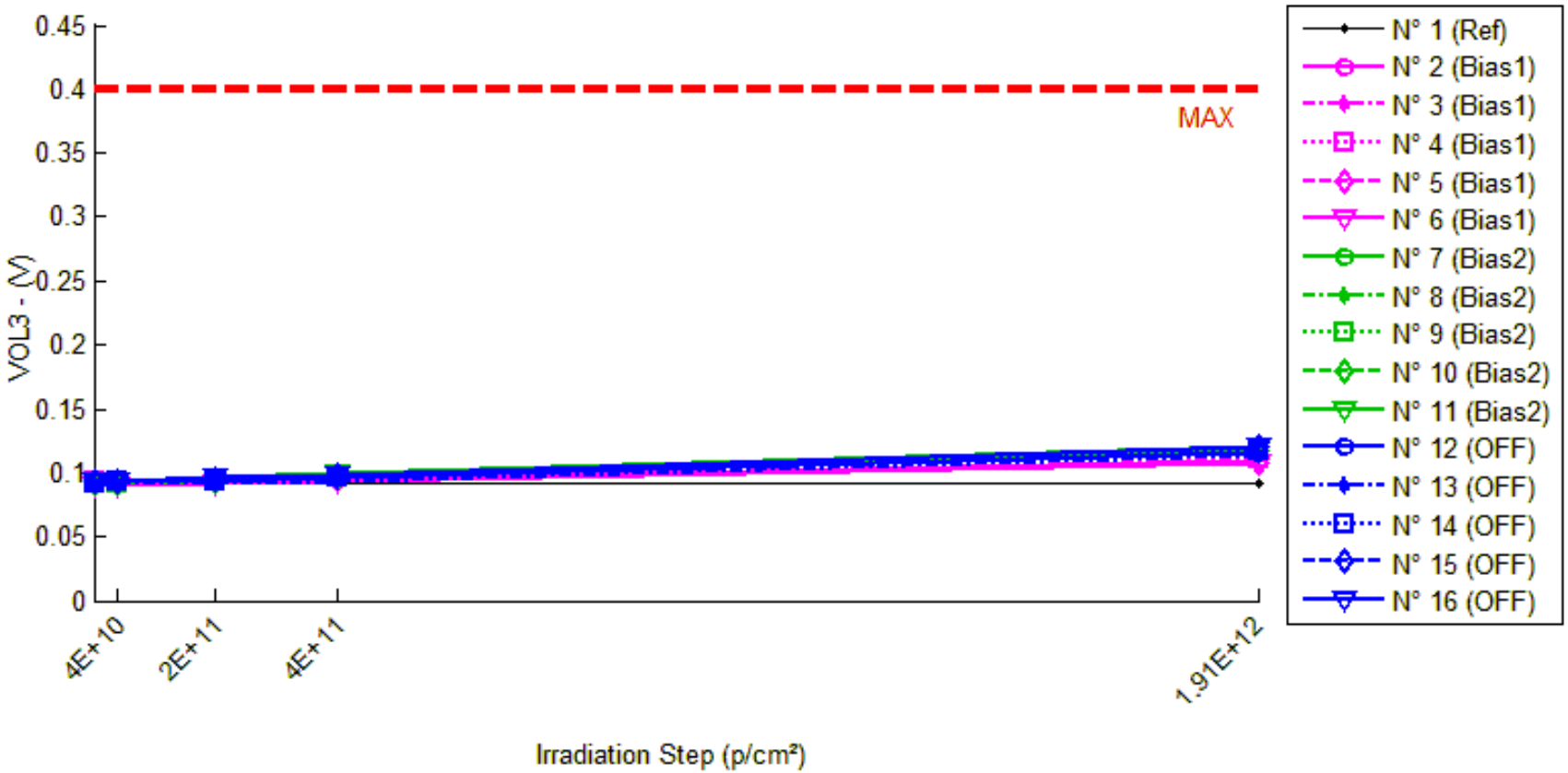
Delta [VOL2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.787E-5	-4.948E-5	-2.410E-4	-1.924E-4
N° 2 (Bias1)	---	3.437E-4	2.304E-3	5.158E-3	3.124E-2
N° 3 (Bias1)	---	1.877E-4	2.387E-3	5.458E-3	3.476E-2
N° 4 (Bias1)	---	3.447E-4	2.483E-3	5.284E-3	3.036E-2
N° 5 (Bias1)	---	3.976E-4	2.172E-3	4.757E-3	2.895E-2
N° 6 (Bias1)	---	3.596E-4	2.389E-3	4.978E-3	2.854E-2
N° 7 (Bias2)	---	3.201E-4	3.321E-3	7.190E-3	5.134E-2
N° 8 (Bias2)	---	4.796E-4	3.645E-3	7.655E-3	5.113E-2
N° 9 (Bias2)	---	4.776E-4	3.751E-3	7.814E-3	5.398E-2
N° 10 (Bias2)	---	5.383E-4	3.630E-3	7.537E-3	4.982E-2
N° 11 (Bias2)	---	5.555E-4	3.900E-3	8.066E-3	5.419E-2
N° 12 (OFF)	---	6.110E-4	3.386E-3	7.214E-3	4.405E-2
N° 13 (OFF)	---	7.136E-4	3.503E-3	7.235E-3	4.682E-2
N° 14 (OFF)	---	7.195E-4	3.546E-3	7.503E-3	4.995E-2
N° 15 (OFF)	---	5.595E-4	3.874E-3	8.375E-3	5.891E-2
N° 16 (OFF)	---	6.733E-4	3.849E-3	8.296E-3	5.603E-2
Average (Bias1)	---	3.267E-4	2.347E-3	5.127E-3	3.077E-2
σ (Bias1)	---	8.068E-5	1.165E-4	2.712E-4	2.478E-3
Average+3σ (Bias1)	---	5.687E-4	2.697E-3	5.941E-3	3.820E-2
Average-3σ (Bias1)	---	8.463E-5	1.998E-3	4.313E-3	2.334E-2
Average (Bias2)	---	4.742E-4	3.649E-3	7.653E-3	5.209E-2
σ (Bias2)	---	9.288E-5	2.129E-4	3.258E-4	1.912E-3
Average+3σ (Bias2)	---	7.529E-4	4.288E-3	8.630E-3	5.783E-2
Average-3σ (Bias2)	---	1.956E-4	3.010E-3	6.675E-3	4.636E-2
Average (OFF)	---	6.554E-4	3.632E-3	7.725E-3	5.115E-2
σ (OFF)	---	6.890E-5	2.180E-4	5.698E-4	6.218E-3
Average+3σ (OFF)	---	8.621E-4	4.285E-3	9.434E-3	6.981E-2
Average-3σ (OFF)	---	4.487E-4	2.978E-3	6.015E-3	3.250E-2

190 MeV proton / detailed results

4. VOL3

Ta=25°C; If=5mA ; Iol = 10mA ; Vcc = 4.5V



190 MeV proton / detailed results

VOL3 . (V) **Max = 0.4**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.092	0.092	0.092	0.092	0.092
N° 2 (Bias1)	0.092	0.092	0.093	0.095	0.109
N° 3 (Bias1)	0.094	0.094	0.095	0.097	0.113
N° 4 (Bias1)	0.094	0.094	0.095	0.097	0.111
N° 5 (Bias1)	0.092	0.092	0.093	0.095	0.108
N° 6 (Bias1)	0.090	0.090	0.092	0.093	0.107
N° 7 (Bias2)	0.093	0.093	0.095	0.097	0.118
N° 8 (Bias2)	0.092	0.092	0.094	0.096	0.118
N° 9 (Bias2)	0.092	0.092	0.094	0.097	0.119
N° 10 (Bias2)	0.092	0.092	0.094	0.096	0.117
N° 11 (Bias2)	0.094	0.094	0.096	0.099	0.121
N° 12 (OFF)	0.093	0.093	0.094	0.097	0.115
N° 13 (OFF)	0.090	0.091	0.092	0.094	0.114
N° 14 (OFF)	0.092	0.093	0.094	0.097	0.118
N° 15 (OFF)	0.093	0.093	0.095	0.098	0.121
N° 16 (OFF)	0.093	0.094	0.096	0.098	0.121

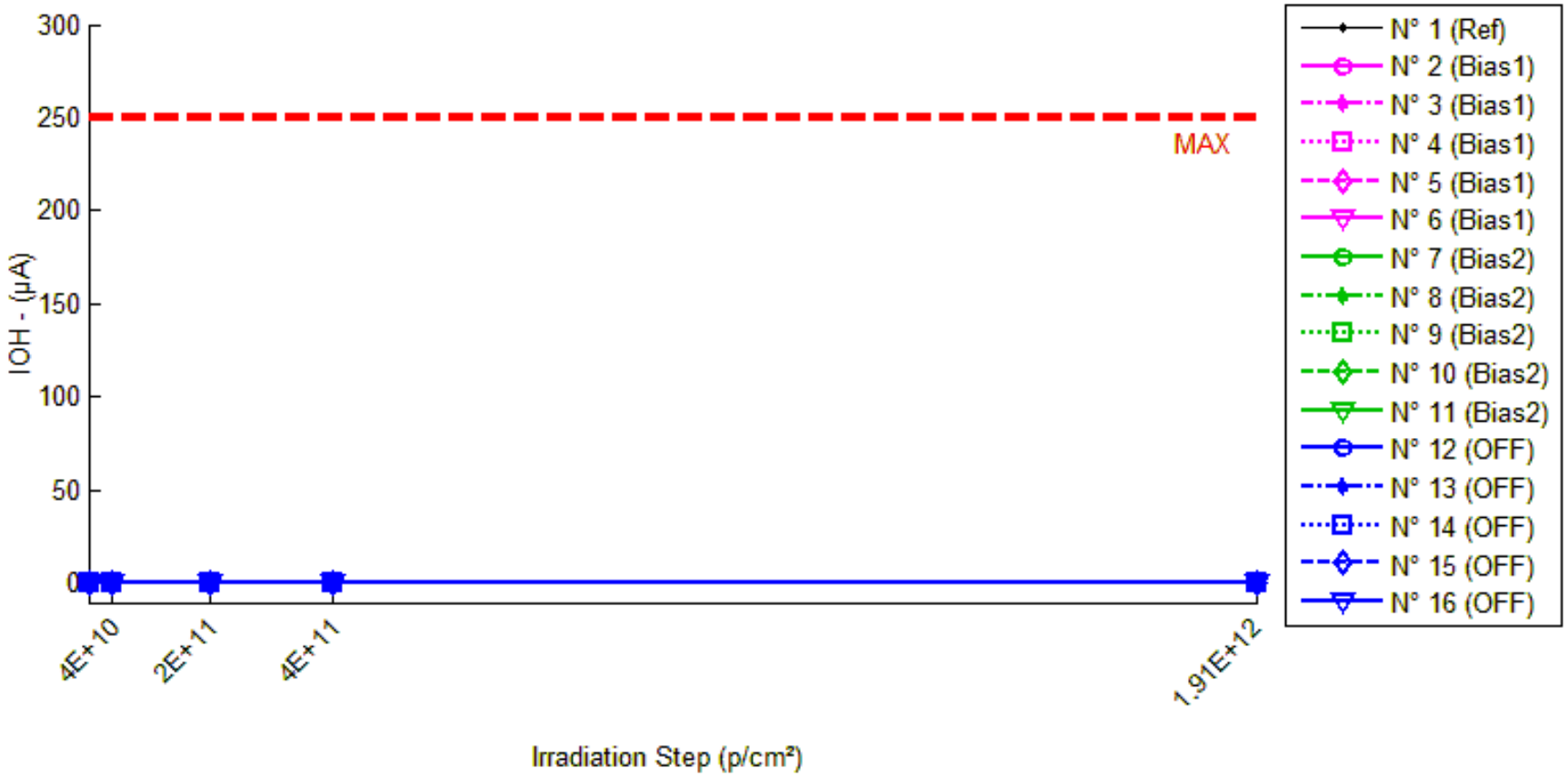
Delta [VOL3]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	7.100E-6	-1.213E-4	-3.398E-4	-2.625E-4
N° 2 (Bias1)	---	9.583E-5	1.313E-3	3.102E-3	1.759E-2
N° 3 (Bias1)	---	-1.521E-4	1.169E-3	3.017E-3	1.892E-2
N° 4 (Bias1)	---	9.419E-5	1.385E-3	3.060E-3	1.677E-2
N° 5 (Bias1)	---	1.871E-4	1.249E-3	2.856E-3	1.626E-2
N° 6 (Bias1)	---	1.594E-4	1.420E-3	3.064E-3	1.621E-2
N° 7 (Bias2)	---	-5.217E-5	1.809E-3	4.129E-3	2.527E-2
N° 8 (Bias2)	---	8.763E-5	2.034E-3	4.497E-3	2.584E-2
N° 9 (Bias2)	---	1.029E-4	2.147E-3	4.555E-3	2.699E-2
N° 10 (Bias2)	---	1.912E-4	2.150E-3	4.491E-3	2.546E-2
N° 11 (Bias2)	---	1.980E-4	2.207E-3	4.635E-3	2.681E-2
N° 12 (OFF)	---	1.563E-4	1.886E-3	4.030E-3	2.287E-2
N° 13 (OFF)	---	2.462E-4	1.948E-3	4.185E-3	2.380E-2
N° 14 (OFF)	---	3.347E-4	2.014E-3	4.373E-3	2.520E-2
N° 15 (OFF)	---	1.875E-4	2.179E-3	4.706E-3	2.771E-2
N° 16 (OFF)	---	2.569E-4	2.148E-3	4.726E-3	2.721E-2
Average (Bias1)	---	7.690E-5	1.307E-3	3.020E-3	1.715E-2
σ (Bias1)	---	1.342E-4	1.016E-4	9.626E-5	1.133E-3
Average+3σ (Bias1)	---	4.796E-4	1.612E-3	3.308E-3	2.055E-2
Average-3σ (Bias1)	---	-3.258E-4	1.002E-3	2.731E-3	1.375E-2
Average (Bias2)	---	1.055E-4	2.069E-3	4.461E-3	2.607E-2
σ (Bias2)	---	1.013E-4	1.584E-4	1.948E-4	7.850E-4
Average+3σ (Bias2)	---	4.095E-4	2.544E-3	5.046E-3	2.843E-2
Average-3σ (Bias2)	---	-1.985E-4	1.594E-3	3.877E-3	2.372E-2
Average (OFF)	---	2.363E-4	2.035E-3	4.404E-3	2.536E-2
σ (OFF)	---	6.888E-5	1.263E-4	3.098E-4	2.098E-3
Average+3σ (OFF)	---	4.429E-4	2.414E-3	5.333E-3	3.165E-2
Average-3σ (OFF)	---	2.967E-5	1.656E-3	3.475E-3	1.907E-2

190 MeV proton / detailed results

5. IOH

Ta=25°C; If=2µA; Vo=Vcc=18V



190 MeV proton / detailed results

IOH . (µA) **Max = 250.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.0011	0.0014	0.0014	0.0012	0.0022
N° 2 (Bias1)	0.0011	0.0013	0.0014	0.0013	0.0021
N° 3 (Bias1)	0.0011	0.0013	0.0014	0.0013	0.0024
N° 4 (Bias1)	0.0011	0.0013	0.0014	0.0013	0.0022
N° 5 (Bias1)	0.0011	0.0013	0.0014	0.0013	0.0025
N° 6 (Bias1)	0.0011	0.0012	0.0014	0.0013	0.0025
N° 7 (Bias2)	0.0011	0.0019	0.0020	0.0018	0.0030
N° 8 (Bias2)	0.0011	0.0020	0.0021	0.0020	0.0029
N° 9 (Bias2)	0.0011	0.0018	0.0028	0.0020	0.0028
N° 10 (Bias2)	0.0011	0.0021	0.0020	0.0020	0.0028
N° 11 (Bias2)	0.0011	0.0021	0.0021	0.0020	0.0028
N° 12 (OFF)	0.0011	0.0024	0.0022	0.0023	0.0020
N° 13 (OFF)	0.0011	0.0024	0.0022	0.0023	0.0019
N° 14 (OFF)	0.0011	0.0024	0.0022	0.0023	0.0019
N° 15 (OFF)	0.0011	0.0024	0.0022	0.0023	0.0019
N° 16 (OFF)	0.0011	0.0023	0.0022	0.0023	0.0019

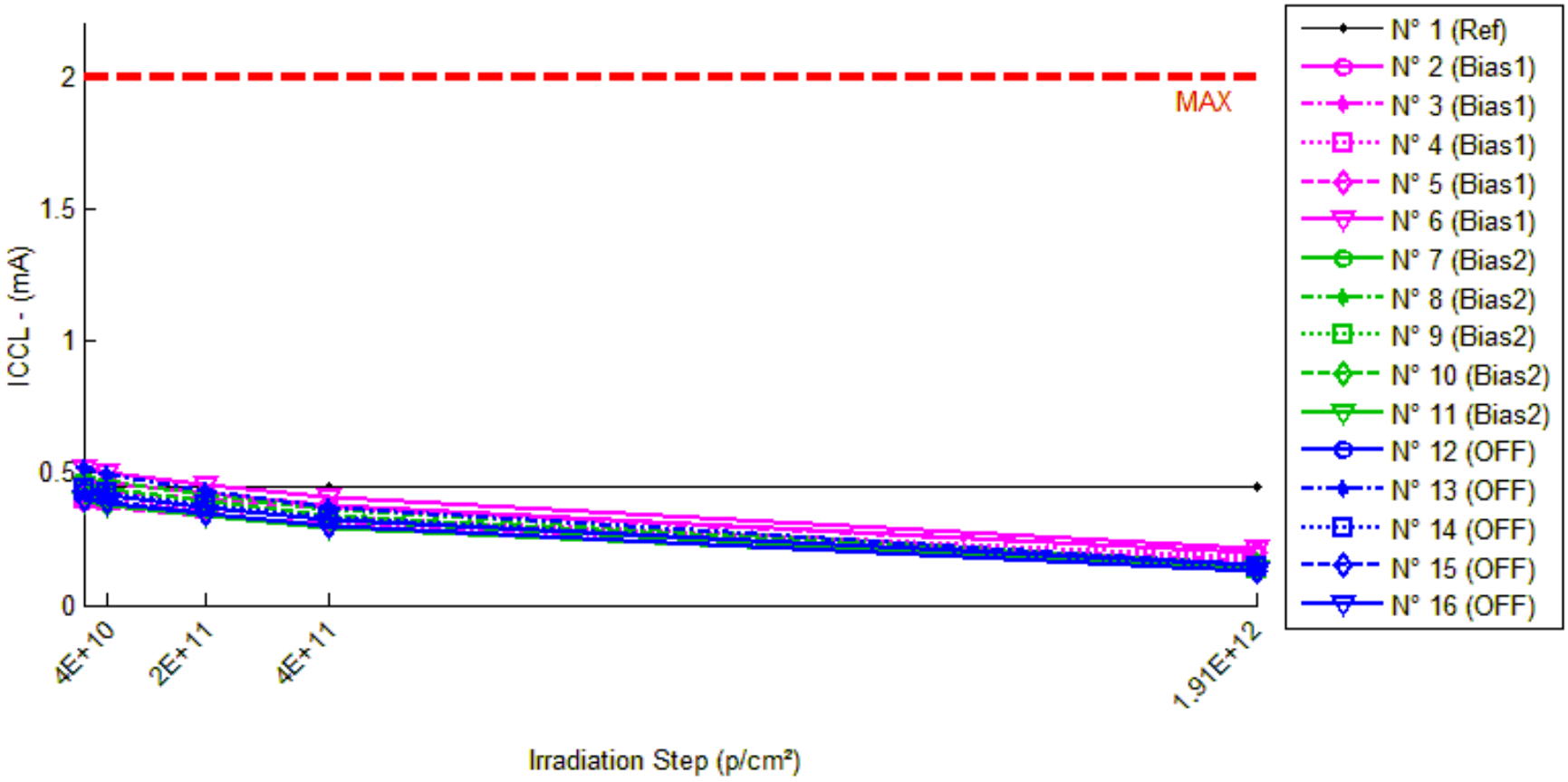
Delta [IOH]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.342E-4	2.699E-4	1.112E-4	1.123E-3
N° 2 (Bias1)	---	2.073E-4	2.532E-4	1.957E-4	9.585E-4
N° 3 (Bias1)	---	2.005E-4	2.582E-4	2.116E-4	1.273E-3
N° 4 (Bias1)	---	1.919E-4	2.465E-4	2.035E-4	1.038E-3
N° 5 (Bias1)	---	1.806E-4	2.599E-4	1.910E-4	1.343E-3
N° 6 (Bias1)	---	1.007E-4	2.292E-4	1.860E-4	1.349E-3
N° 7 (Bias2)	---	8.038E-4	9.143E-4	7.086E-4	1.907E-3
N° 8 (Bias2)	---	8.962E-4	9.804E-4	9.182E-4	1.759E-3
N° 9 (Bias2)	---	6.598E-4	1.700E-3	8.945E-4	1.732E-3
N° 10 (Bias2)	---	9.692E-4	9.160E-4	8.786E-4	1.673E-3
N° 11 (Bias2)	---	1.021E-3	9.636E-4	8.525E-4	1.647E-3
N° 12 (OFF)	---	1.257E-3	1.130E-3	1.215E-3	8.404E-4
N° 13 (OFF)	---	1.255E-3	1.092E-3	1.224E-3	8.181E-4
N° 14 (OFF)	---	1.342E-3	1.093E-3	1.229E-3	8.265E-4
N° 15 (OFF)	---	1.306E-3	1.069E-3	1.218E-3	7.874E-4
N° 16 (OFF)	---	1.241E-3	1.086E-3	1.237E-3	7.868E-4
Average (Bias1)	---	1.762E-4	2.494E-4	1.976E-4	1.192E-3
σ (Bias1)	---	4.336E-5	1.245E-5	1.014E-5	1.817E-4
Average+3σ (Bias1)	---	3.063E-4	2.867E-4	2.280E-4	1.738E-3
Average-3σ (Bias1)	---	4.612E-5	2.121E-4	1.671E-4	6.471E-4
Average (Bias2)	---	8.701E-4	1.095E-3	8.505E-4	1.744E-3
σ (Bias2)	---	1.432E-4	3.396E-4	8.287E-5	1.016E-4
Average+3σ (Bias2)	---	1.300E-3	2.114E-3	1.099E-3	2.049E-3
Average-3σ (Bias2)	---	4.406E-4	7.597E-5	6.019E-4	1.439E-3
Average (OFF)	---	1.280E-3	1.094E-3	1.225E-3	8.118E-4
σ (OFF)	---	4.234E-5	2.242E-5	8.900E-6	2.396E-5
Average+3σ (OFF)	---	1.407E-3	1.161E-3	1.251E-3	8.837E-4
Average-3σ (OFF)	---	1.153E-3	1.027E-3	1.198E-3	7.400E-4

190 MeV proton / detailed results

6. ICCL

Ta=25°C; Vcc=18V; If=1.6mA



190 MeV proton / detailed results

ICCL . (mA) **Max = 2.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.447	0.446	0.447	0.445	0.447
N° 2 (Bias1)	0.474	0.464	0.425	0.380	0.197
N° 3 (Bias1)	0.378	0.370	0.342	0.310	0.167
N° 4 (Bias1)	0.405	0.397	0.364	0.329	0.183
N° 5 (Bias1)	0.444	0.436	0.404	0.367	0.201
N° 6 (Bias1)	0.518	0.506	0.458	0.411	0.217
N° 7 (Bias2)	0.433	0.421	0.374	0.326	0.140
N° 8 (Bias2)	0.491	0.474	0.415	0.359	0.152
N° 9 (Bias2)	0.450	0.434	0.382	0.331	0.140
N° 10 (Bias2)	0.457	0.442	0.391	0.341	0.150
N° 11 (Bias2)	0.394	0.381	0.338	0.296	0.133
N° 12 (OFF)	0.431	0.416	0.372	0.324	0.152
N° 13 (OFF)	0.519	0.494	0.433	0.373	0.156
N° 14 (OFF)	0.439	0.423	0.377	0.329	0.147
N° 15 (OFF)	0.404	0.391	0.346	0.299	0.127
N° 16 (OFF)	0.401	0.386	0.344	0.299	0.132

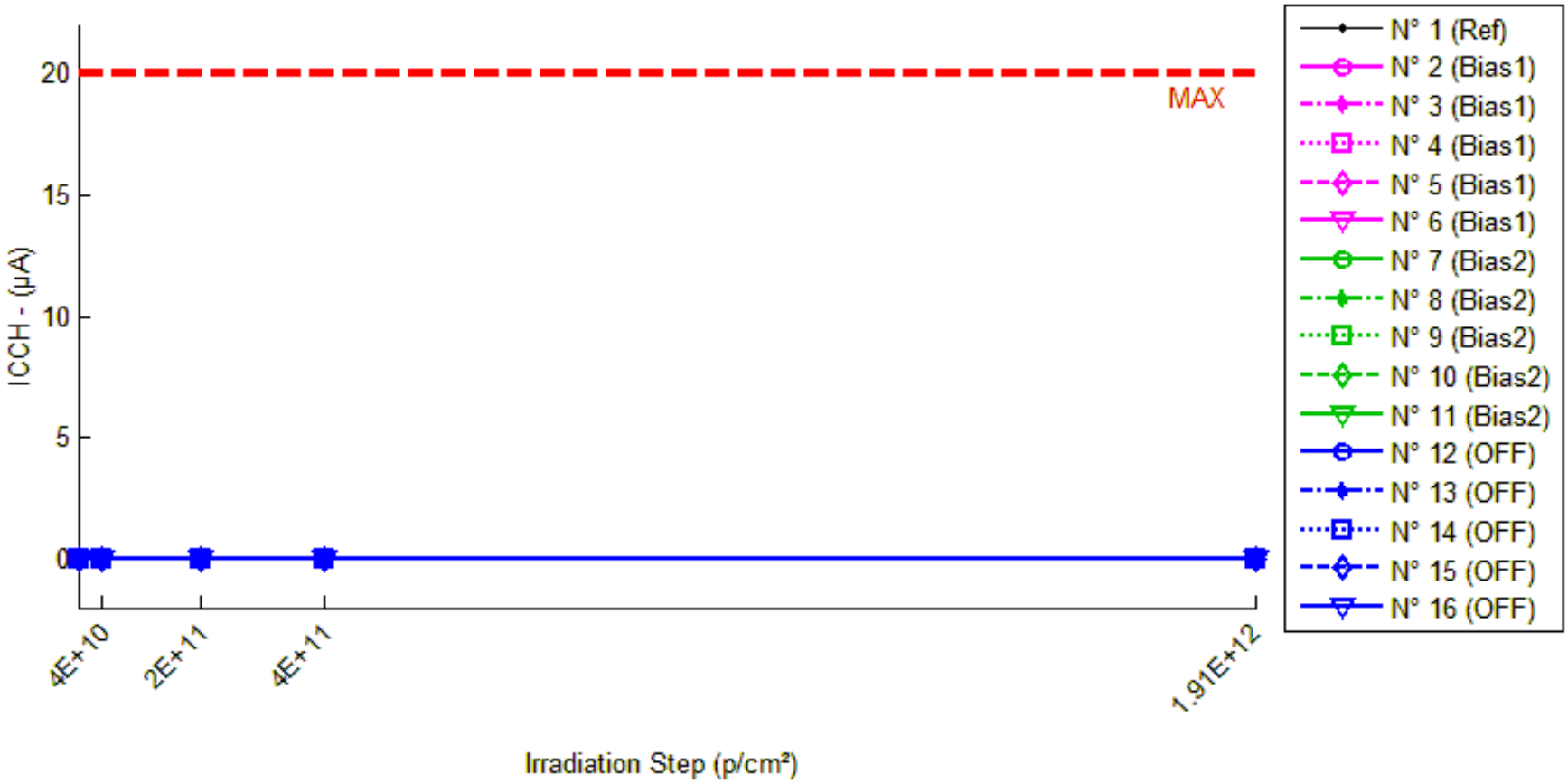
Delta [ICCL]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.257E-3	-6.993E-4	-2.317E-3	-4.460E-4
N° 2 (Bias1)	---	-1.018E-2	-4.961E-2	-9.457E-2	-2.776E-1
N° 3 (Bias1)	---	-7.141E-3	-3.535E-2	-6.716E-2	-2.106E-1
N° 4 (Bias1)	---	-7.819E-3	-4.093E-2	-7.570E-2	-2.219E-1
N° 5 (Bias1)	---	-8.884E-3	-4.080E-2	-7.714E-2	-2.435E-1
N° 6 (Bias1)	---	-1.150E-2	-5.983E-2	-1.070E-1	-3.013E-1
N° 7 (Bias2)	---	-1.176E-2	-5.844E-2	-1.071E-1	-2.931E-1
N° 8 (Bias2)	---	-1.683E-2	-7.623E-2	-1.315E-1	-3.393E-1
N° 9 (Bias2)	---	-1.562E-2	-6.771E-2	-1.186E-1	-3.092E-1
N° 10 (Bias2)	---	-1.501E-2	-6.596E-2	-1.165E-1	-3.076E-1
N° 11 (Bias2)	---	-1.262E-2	-5.605E-2	-9.763E-2	-2.607E-1
N° 12 (OFF)	---	-1.485E-2	-5.868E-2	-1.066E-1	-2.792E-1
N° 13 (OFF)	---	-2.462E-2	-8.591E-2	-1.460E-1	-3.631E-1
N° 14 (OFF)	---	-1.661E-2	-6.218E-2	-1.100E-1	-2.924E-1
N° 15 (OFF)	---	-1.303E-2	-5.806E-2	-1.048E-1	-2.765E-1
N° 16 (OFF)	---	-1.504E-2	-5.690E-2	-1.021E-1	-2.685E-1
Average (Bias1)	---	-9.105E-3	-4.531E-2	-8.431E-2	-2.509E-1
σ (Bias1)	---	1.765E-3	9.592E-3	1.611E-2	3.798E-2
Average+3σ (Bias1)	---	-3.810E-3	-1.653E-2	-3.599E-2	-1.370E-1
Average-3σ (Bias1)	---	-1.440E-2	-7.408E-2	-1.326E-1	-3.649E-1
Average (Bias2)	---	-1.437E-2	-6.488E-2	-1.143E-1	-3.020E-1
σ (Bias2)	---	2.116E-3	8.021E-3	1.273E-2	2.856E-2
Average+3σ (Bias2)	---	-8.020E-3	-4.082E-2	-7.607E-2	-2.163E-1
Average-3σ (Bias2)	---	-2.072E-2	-8.894E-2	-1.524E-1	-3.877E-1
Average (OFF)	---	-1.683E-2	-6.435E-2	-1.139E-1	-2.960E-1
σ (OFF)	---	4.537E-3	1.221E-2	1.817E-2	3.853E-2
Average+3σ (OFF)	---	-3.218E-3	-2.770E-2	-5.939E-2	-1.804E-1
Average-3σ (OFF)	---	-3.044E-2	-1.010E-1	-1.684E-1	-4.116E-1

190 MeV proton / detailed results

7. ICCH

Ta=25°C; Vcc=18V; If=0



190 MeV proton / detailed results

ICCH . (µA) **Max = 20.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.012	0.012	0.012	0.013	0.011
N° 2 (Bias1)	0.011	0.012	0.013	0.014	0.017
N° 3 (Bias1)	0.014	0.010	0.013	0.011	0.016
N° 4 (Bias1)	0.010	0.011	0.011	0.012	0.017
N° 5 (Bias1)	0.012	0.011	0.013	0.012	0.018
N° 6 (Bias1)	0.012	0.012	0.013	0.012	0.012
N° 7 (Bias2)	0.012	0.011	0.011	0.010	0.015
N° 8 (Bias2)	0.012	0.011	0.012	0.013	0.016
N° 9 (Bias2)	0.012	0.014	0.012	0.011	0.016
N° 10 (Bias2)	0.011	0.012	0.029	0.013	0.016
N° 11 (Bias2)	0.009	0.012	0.013	0.011	0.015
N° 12 (OFF)	0.012	0.011	0.011	0.012	0.016
N° 13 (OFF)	0.011	0.010	0.012	0.013	0.017
N° 14 (OFF)	0.012	0.011	0.013	0.013	0.014
N° 15 (OFF)	0.014	0.010	0.012	0.012	0.016
N° 16 (OFF)	0.012	0.012	0.012	0.012	0.017

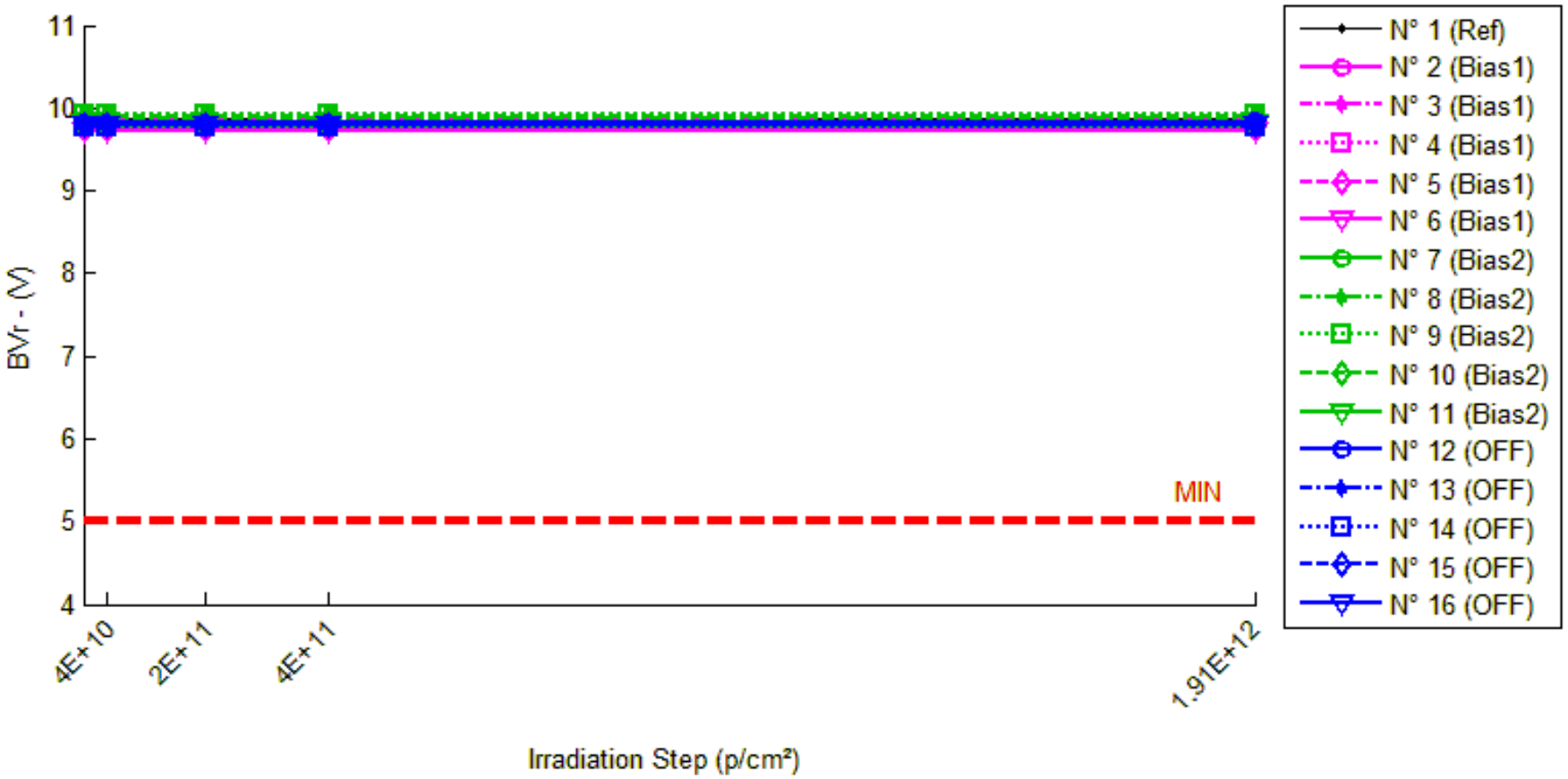
Delta [ICCH]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	3.500E-4	3.500E-4	6.200E-4	-1.110E-3
N° 2 (Bias1)	---	6.300E-4	1.760E-3	2.640E-3	5.950E-3
N° 3 (Bias1)	---	-3.250E-3	-1.700E-4	-2.750E-3	2.170E-3
N° 4 (Bias1)	---	4.100E-4	8.800E-4	1.870E-3	6.340E-3
N° 5 (Bias1)	---	-2.300E-4	1.060E-3	8.000E-4	6.250E-3
N° 6 (Bias1)	---	-6.200E-4	6.500E-4	-4.700E-4	1.000E-4
N° 7 (Bias2)	---	-8.900E-4	-1.240E-3	-1.770E-3	3.550E-3
N° 8 (Bias2)	---	-6.800E-4	-1.600E-4	1.210E-3	4.680E-3
N° 9 (Bias2)	---	1.620E-3	-4.000E-5	-9.000E-4	3.880E-3
N° 10 (Bias2)	---	8.000E-4	1.801E-2	1.970E-3	5.000E-3
N° 11 (Bias2)	---	2.440E-3	3.570E-3	2.110E-3	5.410E-3
N° 12 (OFF)	---	-1.750E-3	-1.340E-3	-5.000E-4	3.510E-3
N° 13 (OFF)	---	-5.800E-4	1.080E-3	2.460E-3	5.700E-3
N° 14 (OFF)	---	-7.800E-4	1.210E-3	6.700E-4	2.480E-3
N° 15 (OFF)	---	-3.260E-3	-1.910E-3	-2.150E-3	2.110E-3
N° 16 (OFF)	---	1.900E-4	-2.000E-5	1.300E-4	5.440E-3
Average (Bias1)	---	-6.120E-4	8.360E-4	4.180E-4	4.162E-3
σ (Bias1)	---	1.557E-3	6.987E-4	2.122E-3	2.862E-3
Average+3σ (Bias1)	---	4.058E-3	2.932E-3	6.785E-3	1.275E-2
Average-3σ (Bias1)	---	-5.282E-3	-1.260E-3	-5.949E-3	-4.425E-3
Average (Bias2)	---	6.580E-4	4.028E-3	5.240E-4	4.504E-3
σ (Bias2)	---	1.441E-3	8.024E-3	1.758E-3	7.742E-4
Average+3σ (Bias2)	---	4.981E-3	2.810E-2	5.799E-3	6.826E-3
Average-3σ (Bias2)	---	-3.665E-3	-2.004E-2	-4.751E-3	2.182E-3
Average (OFF)	---	-1.236E-3	-1.960E-4	1.220E-4	3.848E-3
σ (OFF)	---	1.326E-3	1.404E-3	1.682E-3	1.656E-3
Average+3σ (OFF)	---	2.742E-3	4.015E-3	5.168E-3	8.816E-3
Average-3σ (OFF)	---	-5.214E-3	-4.407E-3	-4.924E-3	-1.120E-3

190 MeV proton / detailed results

8. BVr

Ta=25°C; Ir = 10µA



190 MeV proton / detailed results

BVr . (V) **Min = 5.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	9.871	9.868	9.868	9.856	9.864
N° 2 (Bias1)	9.767	9.759	9.755	9.753	9.753
N° 3 (Bias1)	9.854	9.841	9.837	9.836	9.843
N° 4 (Bias1)	9.826	9.819	9.817	9.816	9.817
N° 5 (Bias1)	9.846	9.841	9.837	9.837	9.838
N° 6 (Bias1)	9.723	9.719	9.717	9.718	9.718
N° 7 (Bias2)	9.789	9.773	9.777	9.779	9.780
N° 8 (Bias2)	9.889	9.877	9.877	9.879	9.881
N° 9 (Bias2)	9.927	9.916	9.919	9.919	9.923
N° 10 (Bias2)	9.892	9.883	9.884	9.886	9.887
N° 11 (Bias2)	9.815	9.806	9.808	9.810	9.812
N° 12 (OFF)	9.823	9.816	9.821	9.818	9.834
N° 13 (OFF)	9.818	9.811	9.812	9.812	9.811
N° 14 (OFF)	9.777	9.774	9.772	9.773	9.777
N° 15 (OFF)	9.807	9.798	9.802	9.801	9.802
N° 16 (OFF)	9.794	9.787	9.786	9.792	9.794

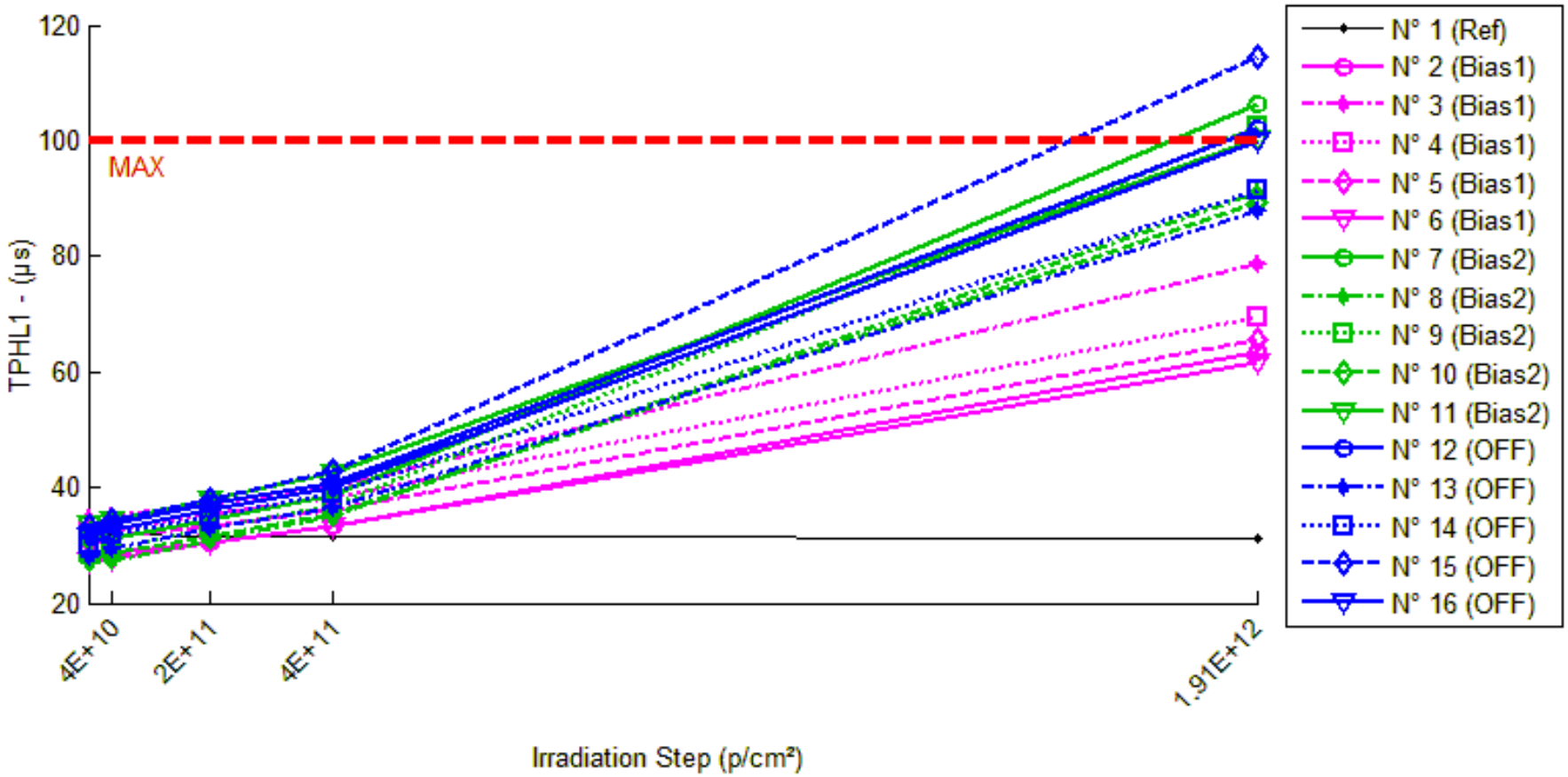
Delta [BVr]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-3.317E-3	-3.204E-3	-1.458E-2	-6.981E-3
N° 2 (Bias1)	---	-8.287E-3	-1.239E-2	-1.443E-2	-1.446E-2
N° 3 (Bias1)	---	-1.270E-2	-1.645E-2	-1.828E-2	-1.070E-2
N° 4 (Bias1)	---	-6.528E-3	-8.454E-3	-9.296E-3	-8.412E-3
N° 5 (Bias1)	---	-4.973E-3	-8.381E-3	-8.580E-3	-7.757E-3
N° 6 (Bias1)	---	-4.130E-3	-5.811E-3	-5.620E-3	-5.715E-3
N° 7 (Bias2)	---	-1.654E-2	-1.177E-2	-9.892E-3	-9.523E-3
N° 8 (Bias2)	---	-1.258E-2	-1.256E-2	-1.040E-2	-8.660E-3
N° 9 (Bias2)	---	-1.142E-2	-7.766E-3	-7.681E-3	-4.031E-3
N° 10 (Bias2)	---	-8.638E-3	-7.987E-3	-6.023E-3	-4.979E-3
N° 11 (Bias2)	---	-8.186E-3	-6.208E-3	-4.542E-3	-2.397E-3
N° 12 (OFF)	---	-6.538E-3	-2.251E-3	-5.053E-3	1.064E-2
N° 13 (OFF)	---	-7.497E-3	-6.456E-3	-6.131E-3	-7.189E-3
N° 14 (OFF)	---	-3.539E-3	-4.800E-3	-4.474E-3	-1.250E-4
N° 15 (OFF)	---	-8.162E-3	-4.941E-3	-5.257E-3	-4.177E-3
N° 16 (OFF)	---	-7.747E-3	-8.054E-3	-2.103E-3	9.000E-6
Average (Bias1)	---	-7.323E-3	-1.030E-2	-1.124E-2	-9.409E-3
σ (Bias1)	---	3.398E-3	4.166E-3	5.055E-3	3.337E-3
Average+3σ (Bias1)	---	2.870E-3	2.202E-3	3.923E-3	6.036E-4
Average-3σ (Bias1)	---	-1.752E-2	-2.280E-2	-2.641E-2	-1.942E-2
Average (Bias2)	---	-1.147E-2	-9.258E-3	-7.707E-3	-5.918E-3
σ (Bias2)	---	3.380E-3	2.755E-3	2.494E-3	3.056E-3
Average+3σ (Bias2)	---	-1.331E-3	-9.935E-4	-2.262E-4	3.250E-3
Average-3σ (Bias2)	---	-2.161E-2	-1.752E-2	-1.519E-2	-1.509E-2
Average (OFF)	---	-6.697E-3	-5.300E-3	-4.604E-3	-1.688E-4
σ (OFF)	---	1.863E-3	2.156E-3	1.519E-3	6.749E-3
Average+3σ (OFF)	---	-1.107E-3	1.168E-3	-4.606E-5	2.008E-2
Average-3σ (OFF)	---	-1.229E-2	-1.177E-2	-9.161E-3	-2.041E-2

190 MeV proton / detailed results

9. TPHL1

Ta=25°C; If=0.5mA; RL = 4.7kOhms; Vcc=5V



190 MeV proton / detailed results

TPHL1 . (µs) **Max = 100.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	31.20	31.80	31.60	31.60	31.20
N° 2 (Bias1)	28.00	28.60	30.60	33.40	63.60
N° 3 (Bias1)	34.80	35.00	37.20	40.10	78.60
N° 4 (Bias1)	32.10	32.60	35.40	38.40	69.60
N° 5 (Bias1)	30.60	31.60	33.40	36.20	65.60
N° 6 (Bias1)	27.20	27.80	30.60	33.40	61.80
N° 7 (Bias2)	31.00	31.20	34.40	38.60	106.40
N° 8 (Bias2)	27.00	27.40	30.80	35.00	91.20
N° 9 (Bias2)	28.80	29.40	33.00	36.80	102.60
N° 10 (Bias2)	27.60	28.80	31.40	35.40	89.20
N° 11 (Bias2)	33.60	34.40	38.00	42.40	100.40
N° 12 (OFF)	32.20	33.60	37.20	40.80	102.00
N° 13 (OFF)	28.00	29.40	32.80	36.60	88.00
N° 14 (OFF)	30.20	32.00	35.00	38.80	91.60
N° 15 (OFF)	33.20	34.20	38.00	42.80	114.40
N° 16 (OFF)	31.40	32.60	36.00	40.20	100.00

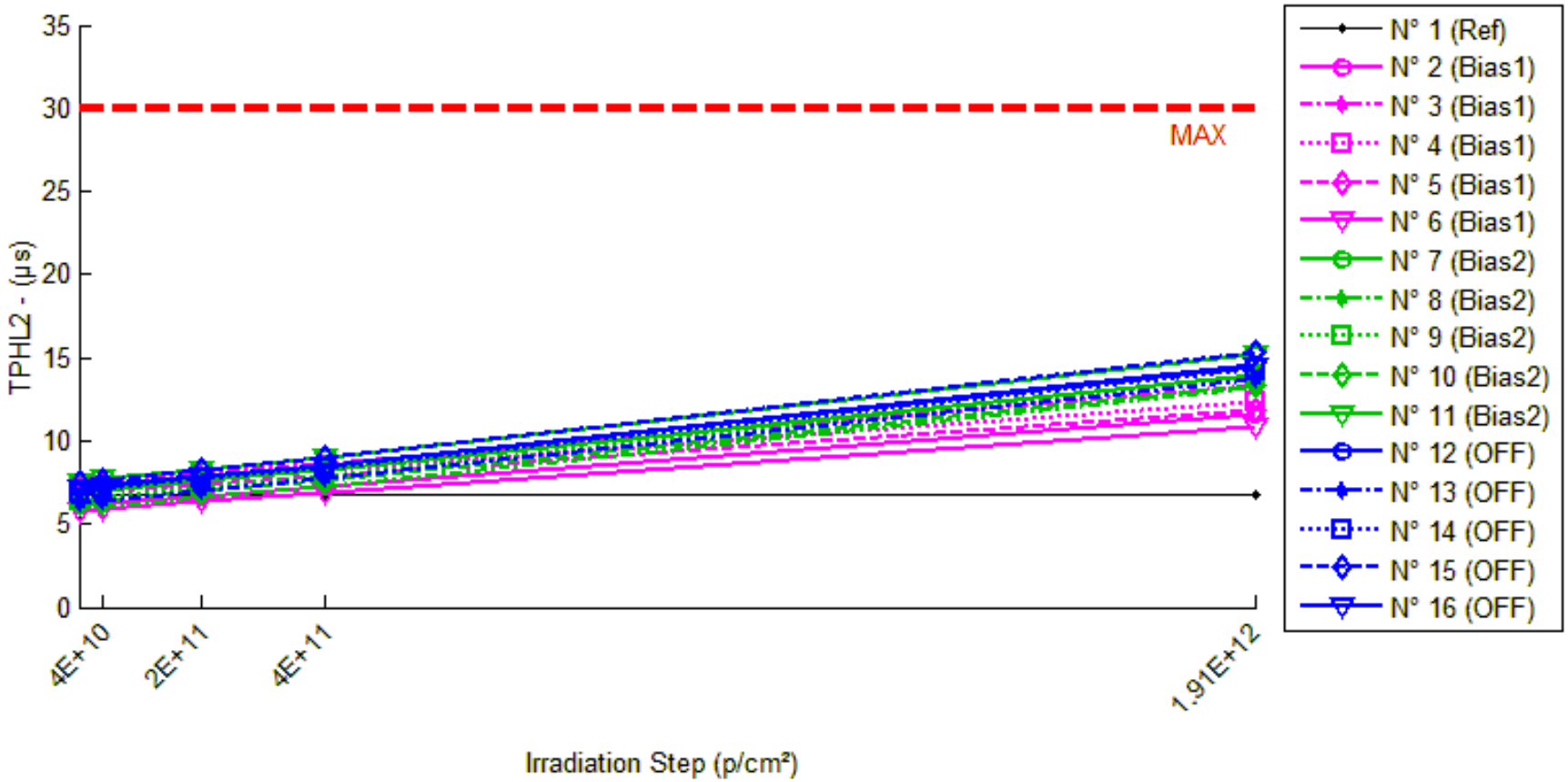
Delta [TPHL1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	6.000E-1	4.000E-1	4.000E-1	0.000E+0
N° 2 (Bias1)	---	6.000E-1	2.600E+0	5.400E+0	3.560E+1
N° 3 (Bias1)	---	2.000E-1	2.400E+0	5.300E+0	4.380E+1
N° 4 (Bias1)	---	5.000E-1	3.300E+0	6.300E+0	3.750E+1
N° 5 (Bias1)	---	1.000E+0	2.800E+0	5.600E+0	3.500E+1
N° 6 (Bias1)	---	6.000E-1	3.400E+0	6.200E+0	3.460E+1
N° 7 (Bias2)	---	2.000E-1	3.400E+0	7.600E+0	7.540E+1
N° 8 (Bias2)	---	4.000E-1	3.800E+0	8.000E+0	6.420E+1
N° 9 (Bias2)	---	6.000E-1	4.200E+0	8.000E+0	7.380E+1
N° 10 (Bias2)	---	1.200E+0	3.800E+0	7.800E+0	6.160E+1
N° 11 (Bias2)	---	8.000E-1	4.400E+0	8.800E+0	6.680E+1
N° 12 (OFF)	---	1.400E+0	5.000E+0	8.600E+0	6.980E+1
N° 13 (OFF)	---	1.400E+0	4.800E+0	8.600E+0	6.000E+1
N° 14 (OFF)	---	1.800E+0	4.800E+0	8.600E+0	6.140E+1
N° 15 (OFF)	---	1.000E+0	4.800E+0	9.600E+0	8.120E+1
N° 16 (OFF)	---	1.200E+0	4.600E+0	8.800E+0	6.860E+1
Average (Bias1)	---	5.800E-1	2.900E+0	5.760E+0	3.730E+1
σ (Bias1)	---	2.864E-1	4.359E-1	4.615E-1	3.800E+0
Average+3σ (Bias1)	---	1.439E+0	4.208E+0	7.145E+0	4.870E+1
Average-3σ (Bias1)	---	-2.791E-1	1.592E+0	4.375E+0	2.590E+1
Average (Bias2)	---	6.400E-1	3.920E+0	8.040E+0	6.836E+1
σ (Bias2)	---	3.847E-1	3.899E-1	4.561E-1	6.012E+0
Average+3σ (Bias2)	---	1.794E+0	5.090E+0	9.408E+0	8.640E+1
Average-3σ (Bias2)	---	-5.141E-1	2.750E+0	6.672E+0	5.032E+1
Average (OFF)	---	1.360E+0	4.800E+0	8.840E+0	6.820E+1
σ (OFF)	---	2.966E-1	1.414E-1	4.336E-1	8.444E+0
Average+3σ (OFF)	---	2.250E+0	5.224E+0	1.014E+1	9.353E+1
Average-3σ (OFF)	---	4.701E-1	4.376E+0	7.539E+0	4.287E+1

190 MeV proton / detailed results

10.TPHL2

Ta=25°C; If=1.6mA; RL = 1.5kOhms; Vcc=5V



190 MeV proton / detailed results

TPHL2 . (µs) **Max = 30.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	6.76	6.78	6.76	6.76	6.72
N° 2 (Bias1)	6.20	6.28	6.68	7.22	11.56
N° 3 (Bias1)	7.64	7.66	8.08	8.60	13.32
N° 4 (Bias1)	7.20	7.28	7.76	8.28	12.36
N° 5 (Bias1)	6.88	7.00	7.36	7.84	11.88
N° 6 (Bias1)	5.80	5.88	6.34	6.88	10.88
N° 7 (Bias2)	7.00	7.04	7.64	8.30	13.92
N° 8 (Bias2)	6.00	6.08	6.64	7.32	13.20
N° 9 (Bias2)	6.44	6.58	7.20	7.86	13.98
N° 10 (Bias2)	6.28	6.44	6.96	7.60	13.32
N° 11 (Bias2)	7.52	7.70	8.30	8.96	15.24
N° 12 (OFF)	7.18	7.36	7.94	8.54	14.56
N° 13 (OFF)	6.24	6.44	7.06	7.72	13.70
N° 14 (OFF)	6.94	7.16	7.70	8.36	14.30
N° 15 (OFF)	7.48	7.60	8.24	9.00	15.30
N° 16 (OFF)	7.12	7.28	7.84	8.52	14.52

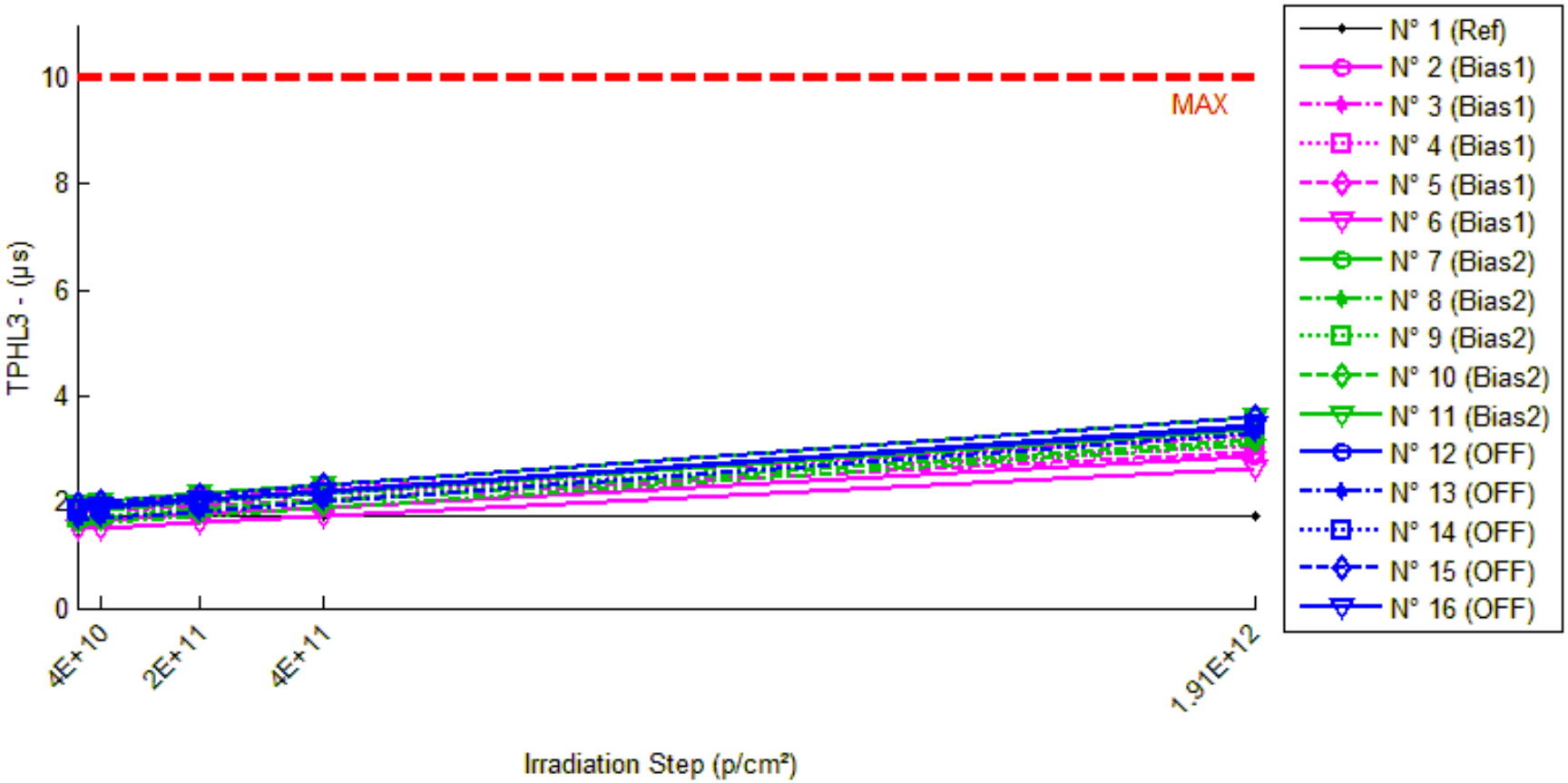
Delta [TPHL2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.000E-2	0.000E+0	0.000E+0	-4.000E-2
N° 2 (Bias1)	---	8.000E-2	4.800E-1	1.020E+0	5.360E+0
N° 3 (Bias1)	---	2.000E-2	4.400E-1	9.600E-1	5.680E+0
N° 4 (Bias1)	---	8.000E-2	5.600E-1	1.080E+0	5.160E+0
N° 5 (Bias1)	---	1.200E-1	4.800E-1	9.600E-1	5.000E+0
N° 6 (Bias1)	---	8.000E-2	5.400E-1	1.080E+0	5.080E+0
N° 7 (Bias2)	---	4.000E-2	6.400E-1	1.300E+0	6.920E+0
N° 8 (Bias2)	---	8.000E-2	6.400E-1	1.320E+0	7.200E+0
N° 9 (Bias2)	---	1.400E-1	7.600E-1	1.420E+0	7.540E+0
N° 10 (Bias2)	---	1.600E-1	6.800E-1	1.320E+0	7.040E+0
N° 11 (Bias2)	---	1.800E-1	7.800E-1	1.440E+0	7.720E+0
N° 12 (OFF)	---	1.800E-1	7.600E-1	1.360E+0	7.380E+0
N° 13 (OFF)	---	2.000E-1	8.200E-1	1.480E+0	7.460E+0
N° 14 (OFF)	---	2.200E-1	7.600E-1	1.420E+0	7.360E+0
N° 15 (OFF)	---	1.200E-1	7.600E-1	1.520E+0	7.820E+0
N° 16 (OFF)	---	1.600E-1	7.200E-1	1.400E+0	7.400E+0
Average (Bias1)	---	7.600E-2	5.000E-1	1.020E+0	5.256E+0
σ (Bias1)	---	3.578E-2	4.899E-2	6.000E-2	2.722E-1
Average+3σ (Bias1)	---	1.833E-1	6.470E-1	1.200E+0	6.073E+0
Average-3σ (Bias1)	---	-3.133E-2	3.530E-1	8.400E-1	4.439E+0
Average (Bias2)	---	1.200E-1	7.000E-1	1.360E+0	7.284E+0
σ (Bias2)	---	5.831E-2	6.633E-2	6.481E-2	3.372E-1
Average+3σ (Bias2)	---	2.949E-1	8.990E-1	1.554E+0	8.295E+0
Average-3σ (Bias2)	---	-5.493E-2	5.010E-1	1.166E+0	6.273E+0
Average (OFF)	---	1.760E-1	7.640E-1	1.436E+0	7.484E+0
σ (OFF)	---	3.847E-2	3.578E-2	6.387E-2	1.915E-1
Average+3σ (OFF)	---	2.914E-1	8.713E-1	1.628E+0	8.059E+0
Average-3σ (OFF)	---	6.059E-2	6.567E-1	1.244E+0	6.909E+0

190 MeV proton / detailed results

11.TPHL3

Ta=25°C; If=5mA; RL = 680Ohms; Vcc=5V



190 MeV proton / detailed results

TPHL3 . (µs) **Max = 10.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1.75	1.75	1.74	1.74	1.74
N° 2 (Bias1)	1.63	1.66	1.76	1.89	2.86
N° 3 (Bias1)	1.99	1.99	2.10	2.23	3.24
N° 4 (Bias1)	1.90	1.92	2.03	2.15	3.06
N° 5 (Bias1)	1.81	1.84	1.93	2.04	2.93
N° 6 (Bias1)	1.49	1.52	1.62	1.75	2.64
N° 7 (Bias2)	1.84	1.85	2.01	2.17	3.37
N° 8 (Bias2)	1.57	1.60	1.72	1.88	3.11
N° 9 (Bias2)	1.71	1.74	1.88	2.05	3.31
N° 10 (Bias2)	1.67	1.71	1.84	1.99	3.18
N° 11 (Bias2)	1.98	2.02	2.15	2.33	3.62
N° 12 (OFF)	1.88	1.91	2.05	2.19	3.41
N° 13 (OFF)	1.64	1.69	1.83	2.00	3.28
N° 14 (OFF)	1.85	1.89	2.02	2.18	3.44
N° 15 (OFF)	1.96	1.99	2.13	2.31	3.60
N° 16 (OFF)	1.88	1.92	2.04	2.21	3.46

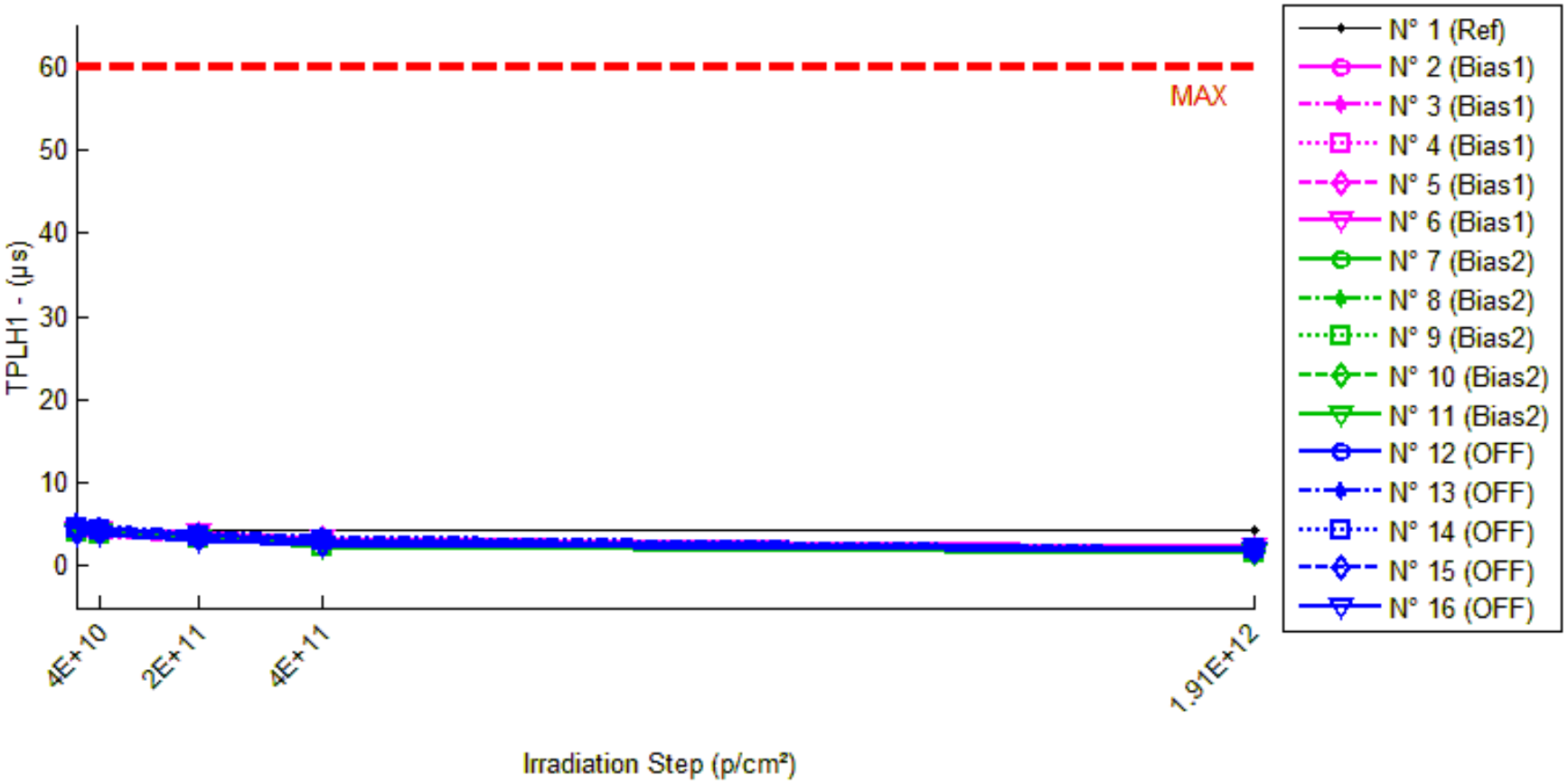
Delta [TPHL3]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-1.000E-2	-1.000E-2	-1.000E-2
N° 2 (Bias1)	---	3.000E-2	1.300E-1	2.600E-1	1.230E+0
N° 3 (Bias1)	---	0.000E+0	1.100E-1	2.400E-1	1.250E+0
N° 4 (Bias1)	---	2.000E-2	1.300E-1	2.500E-1	1.160E+0
N° 5 (Bias1)	---	3.000E-2	1.200E-1	2.300E-1	1.120E+0
N° 6 (Bias1)	---	3.000E-2	1.300E-1	2.600E-1	1.150E+0
N° 7 (Bias2)	---	1.000E-2	1.700E-1	3.300E-1	1.530E+0
N° 8 (Bias2)	---	3.000E-2	1.500E-1	3.100E-1	1.540E+0
N° 9 (Bias2)	---	3.000E-2	1.700E-1	3.400E-1	1.600E+0
N° 10 (Bias2)	---	4.000E-2	1.700E-1	3.200E-1	1.510E+0
N° 11 (Bias2)	---	4.000E-2	1.700E-1	3.500E-1	1.640E+0
N° 12 (OFF)	---	3.000E-2	1.700E-1	3.100E-1	1.530E+0
N° 13 (OFF)	---	5.000E-2	1.900E-1	3.600E-1	1.640E+0
N° 14 (OFF)	---	4.000E-2	1.700E-1	3.300E-1	1.590E+0
N° 15 (OFF)	---	3.000E-2	1.700E-1	3.500E-1	1.640E+0
N° 16 (OFF)	---	4.000E-2	1.600E-1	3.300E-1	1.580E+0
Average (Bias1)	---	2.200E-2	1.240E-1	2.480E-1	1.182E+0
σ (Bias1)	---	1.304E-2	8.944E-3	1.304E-2	5.541E-2
Average+3σ (Bias1)	---	6.112E-2	1.508E-1	2.871E-1	1.348E+0
Average-3σ (Bias1)	---	-1.712E-2	9.717E-2	2.089E-1	1.016E+0
Average (Bias2)	---	3.000E-2	1.660E-1	3.300E-1	1.564E+0
σ (Bias2)	---	1.225E-2	8.944E-3	1.581E-2	5.413E-2
Average+3σ (Bias2)	---	6.674E-2	1.928E-1	3.774E-1	1.726E+0
Average-3σ (Bias2)	---	-6.742E-3	1.392E-1	2.826E-1	1.402E+0
Average (OFF)	---	3.800E-2	1.720E-1	3.360E-1	1.596E+0
σ (OFF)	---	8.367E-3	1.095E-2	1.949E-2	4.615E-2
Average+3σ (OFF)	---	6.310E-2	2.049E-1	3.945E-1	1.734E+0
Average-3σ (OFF)	---	1.290E-2	1.391E-1	2.775E-1	1.458E+0

190 MeV proton / detailed results

12.TPLH1

Ta=25°C; If=0.5mA; RL = 4.7kOhms; Vcc=5V



190 MeV proton / detailed results

TPLH1 . (µs) **Max = 60.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	4.35	4.30	4.20	4.20	4.30
N° 2 (Bias1)	4.20	4.10	3.70	3.20	2.10
N° 3 (Bias1)	3.70	3.50	3.10	2.60	2.00
N° 4 (Bias1)	4.10	3.95	3.50	3.00	2.10
N° 5 (Bias1)	4.50	4.30	3.90	3.40	2.10
N° 6 (Bias1)	4.40	4.35	3.95	3.40	2.20
N° 7 (Bias2)	4.60	4.40	3.60	2.80	2.00
N° 8 (Bias2)	4.40	4.00	3.20	2.80	1.60
N° 9 (Bias2)	4.15	3.80	3.20	2.40	1.60
N° 10 (Bias2)	4.20	4.00	3.20	2.80	1.60
N° 11 (Bias2)	4.10	4.00	3.20	2.40	1.60
N° 12 (OFF)	4.65	4.50	3.70	3.10	2.00
N° 13 (OFF)	5.30	4.90	4.10	3.50	2.10
N° 14 (OFF)	4.50	4.30	3.60	3.00	2.10
N° 15 (OFF)	4.20	3.95	3.25	2.60	1.90
N° 16 (OFF)	3.80	3.70	3.00	2.50	1.90

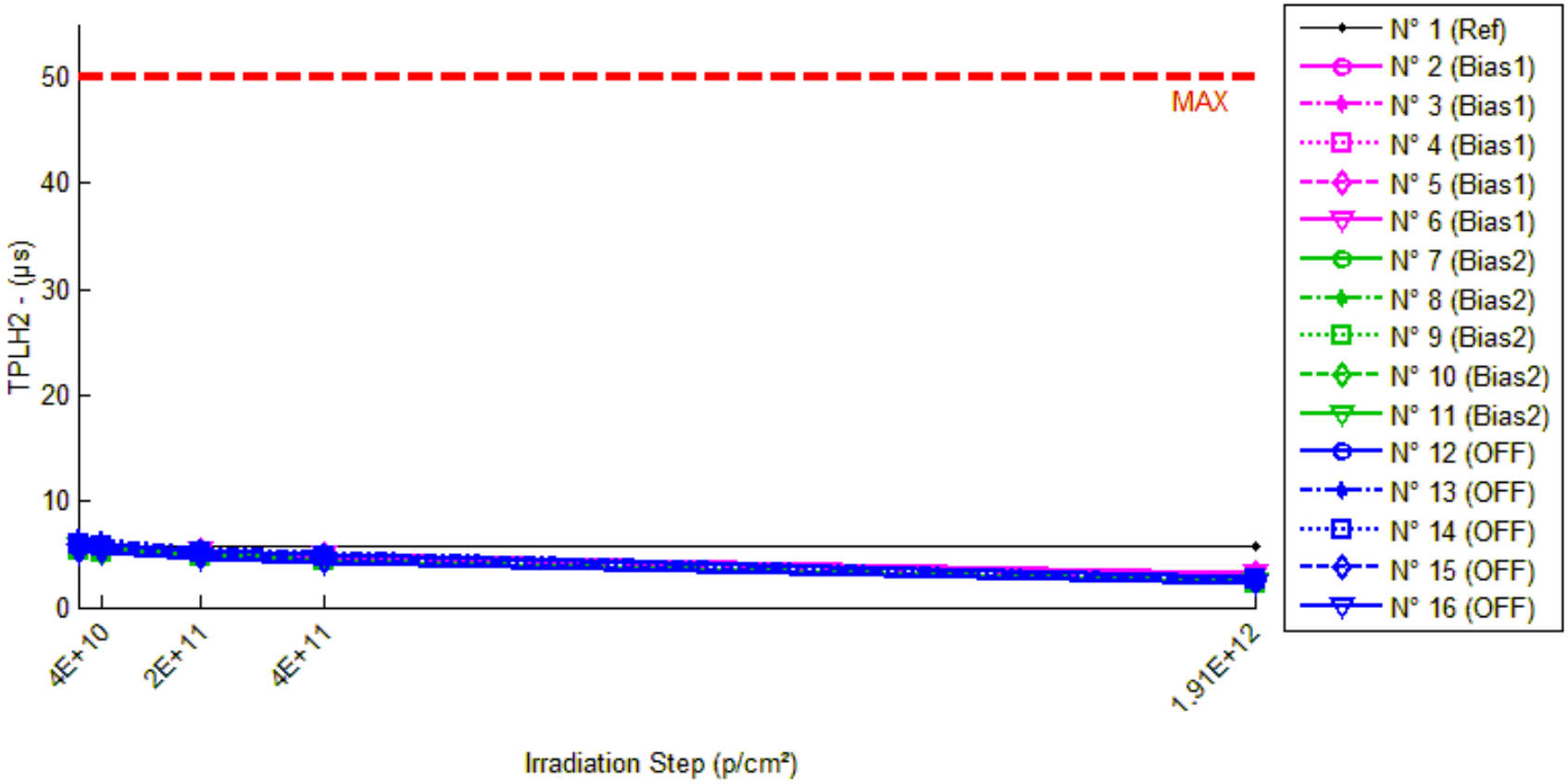
Delta [TPLH1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-5.000E-2	-1.500E-1	-1.500E-1	-5.000E-2
N° 2 (Bias1)	---	-1.000E-1	-5.000E-1	-1.000E+0	-2.100E+0
N° 3 (Bias1)	---	-2.000E-1	-6.000E-1	-1.100E+0	-1.700E+0
N° 4 (Bias1)	---	-1.500E-1	-6.000E-1	-1.100E+0	-2.000E+0
N° 5 (Bias1)	---	-2.000E-1	-6.000E-1	-1.100E+0	-2.400E+0
N° 6 (Bias1)	---	-5.000E-2	-4.500E-1	-1.000E+0	-2.200E+0
N° 7 (Bias2)	---	-2.000E-1	-1.000E+0	-1.800E+0	-2.600E+0
N° 8 (Bias2)	---	-4.000E-1	-1.200E+0	-1.600E+0	-2.800E+0
N° 9 (Bias2)	---	-3.500E-1	-9.500E-1	-1.750E+0	-2.550E+0
N° 10 (Bias2)	---	-2.000E-1	-1.000E+0	-1.400E+0	-2.600E+0
N° 11 (Bias2)	---	-1.000E-1	-9.000E-1	-1.700E+0	-2.500E+0
N° 12 (OFF)	---	-1.500E-1	-9.500E-1	-1.550E+0	-2.650E+0
N° 13 (OFF)	---	-4.000E-1	-1.200E+0	-1.800E+0	-3.200E+0
N° 14 (OFF)	---	-2.000E-1	-9.000E-1	-1.500E+0	-2.400E+0
N° 15 (OFF)	---	-2.500E-1	-9.500E-1	-1.600E+0	-2.300E+0
N° 16 (OFF)	---	-1.000E-1	-8.000E-1	-1.300E+0	-1.900E+0
Average (Bias1)	---	-1.400E-1	-5.500E-1	-1.060E+0	-2.080E+0
σ (Bias1)	---	6.519E-2	7.071E-2	5.477E-2	2.588E-1
Average+3σ (Bias1)	---	5.558E-2	-3.379E-1	-8.957E-1	-1.303E+0
Average-3σ (Bias1)	---	-3.356E-1	-7.621E-1	-1.224E+0	-2.857E+0
Average (Bias2)	---	-2.500E-1	-1.010E+0	-1.650E+0	-2.610E+0
σ (Bias2)	---	1.225E-1	1.140E-1	1.581E-1	1.140E-1
Average+3σ (Bias2)	---	1.174E-1	-6.679E-1	-1.176E+0	-2.268E+0
Average-3σ (Bias2)	---	-6.174E-1	-1.352E+0	-2.124E+0	-2.952E+0
Average (OFF)	---	-2.200E-1	-9.600E-1	-1.550E+0	-2.490E+0
σ (OFF)	---	1.151E-1	1.475E-1	1.803E-1	4.801E-1
Average+3σ (OFF)	---	1.253E-1	-5.176E-1	-1.009E+0	-1.050E+0
Average-3σ (OFF)	---	-5.653E-1	-1.402E+0	-2.091E+0	-3.930E+0

190 MeV proton / detailed results

13.TPLH2

Ta=25°C; If=1.6mA; RL = 1.5kOhms; Vcc=5V



190 MeV proton / detailed results

TPLH2 . (µs) **Max = 50.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	5.70	5.70	5.80	5.70	5.80
N° 2 (Bias1)	5.50	5.40	5.10	4.70	3.00
N° 3 (Bias1)	5.30	5.20	4.85	4.40	2.90
N° 4 (Bias1)	5.55	5.40	5.00	4.70	3.10
N° 5 (Bias1)	5.90	5.80	5.40	5.00	3.30
N° 6 (Bias1)	5.70	5.65	5.30	5.00	3.30
N° 7 (Bias2)	5.90	5.60	5.20	4.40	2.40
N° 8 (Bias2)	5.65	5.20	4.80	4.40	2.40
N° 9 (Bias2)	5.40	5.20	4.80	4.40	2.20
N° 10 (Bias2)	5.40	5.20	4.80	4.40	2.40
N° 11 (Bias2)	5.70	5.40	4.80	4.40	2.40
N° 12 (OFF)	6.10	6.00	5.40	4.90	2.80
N° 13 (OFF)	6.50	6.30	5.55	5.10	2.80
N° 14 (OFF)	5.90	5.70	5.20	4.70	2.70
N° 15 (OFF)	5.70	5.50	5.00	4.40	2.35
N° 16 (OFF)	5.25	5.20	4.65	4.20	2.30

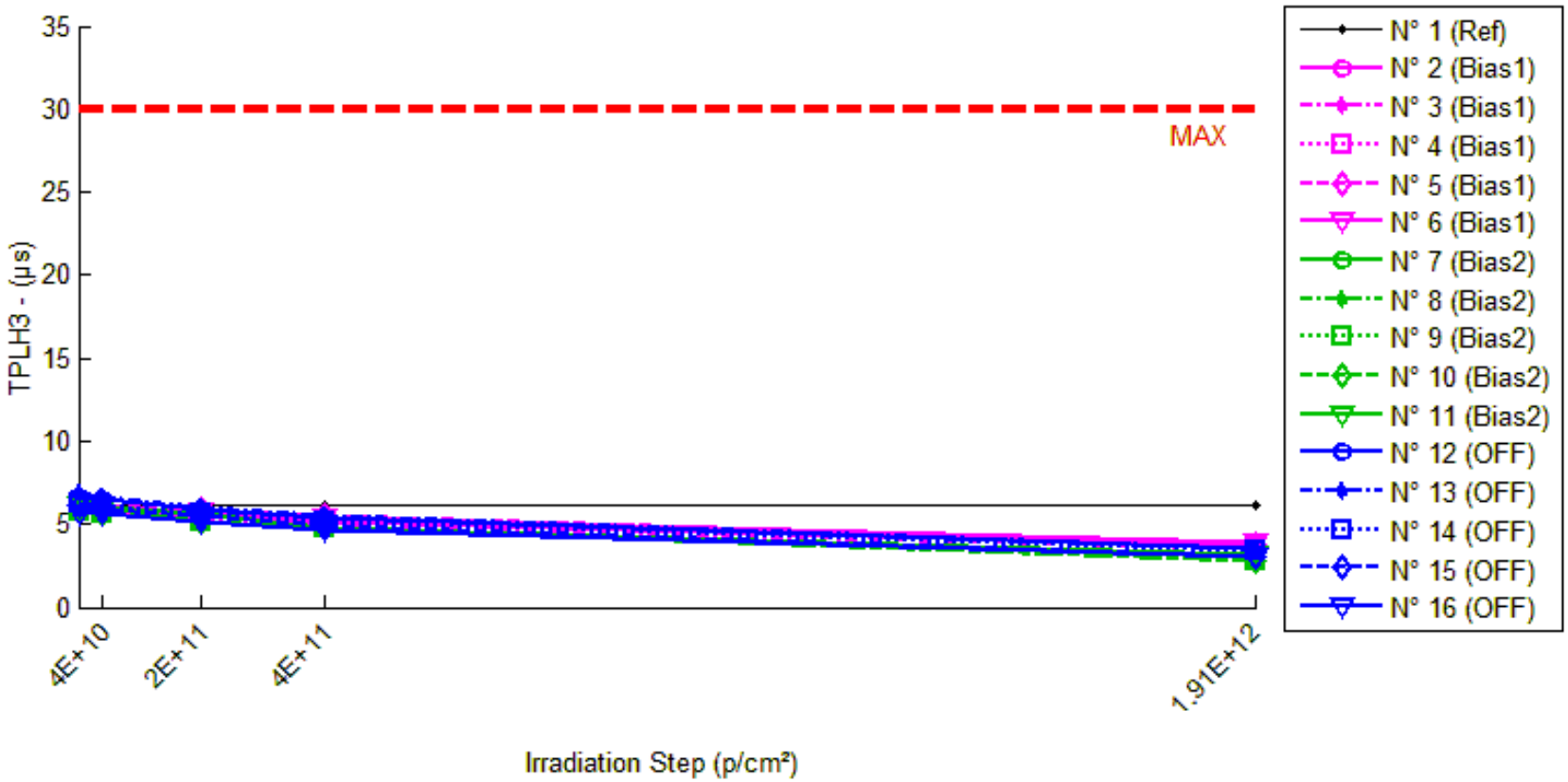
Delta [TPLH2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	1.000E-1	0.000E+0	1.000E-1
N° 2 (Bias1)	---	-1.000E-1	-4.000E-1	-8.000E-1	-2.500E+0
N° 3 (Bias1)	---	-1.000E-1	-4.500E-1	-9.000E-1	-2.400E+0
N° 4 (Bias1)	---	-1.500E-1	-5.500E-1	-8.500E-1	-2.450E+0
N° 5 (Bias1)	---	-1.000E-1	-5.000E-1	-9.000E-1	-2.600E+0
N° 6 (Bias1)	---	-5.000E-2	-4.000E-1	-7.000E-1	-2.400E+0
N° 7 (Bias2)	---	-3.000E-1	-7.000E-1	-1.500E+0	-3.500E+0
N° 8 (Bias2)	---	-4.500E-1	-8.500E-1	-1.250E+0	-3.250E+0
N° 9 (Bias2)	---	-2.000E-1	-6.000E-1	-1.000E+0	-3.200E+0
N° 10 (Bias2)	---	-2.000E-1	-6.000E-1	-1.000E+0	-3.000E+0
N° 11 (Bias2)	---	-3.000E-1	-9.000E-1	-1.300E+0	-3.300E+0
N° 12 (OFF)	---	-1.000E-1	-7.000E-1	-1.200E+0	-3.300E+0
N° 13 (OFF)	---	-2.000E-1	-9.500E-1	-1.400E+0	-3.700E+0
N° 14 (OFF)	---	-2.000E-1	-7.000E-1	-1.200E+0	-3.200E+0
N° 15 (OFF)	---	-2.000E-1	-7.000E-1	-1.300E+0	-3.350E+0
N° 16 (OFF)	---	-5.000E-2	-6.000E-1	-1.050E+0	-2.950E+0
Average (Bias1)	---	-1.000E-1	-4.600E-1	-8.300E-1	-2.470E+0
σ (Bias1)	---	3.536E-2	6.519E-2	8.367E-2	8.367E-2
Average+3σ (Bias1)	---	6.066E-3	-2.644E-1	-5.790E-1	-2.219E+0
Average-3σ (Bias1)	---	-2.061E-1	-6.556E-1	-1.081E+0	-2.721E+0
Average (Bias2)	---	-2.900E-1	-7.300E-1	-1.210E+0	-3.250E+0
σ (Bias2)	---	1.025E-1	1.396E-1	2.133E-1	1.803E-1
Average+3σ (Bias2)	---	1.741E-2	-3.111E-1	-5.701E-1	-2.709E+0
Average-3σ (Bias2)	---	-5.974E-1	-1.149E+0	-1.850E+0	-3.791E+0
Average (OFF)	---	-1.500E-1	-7.300E-1	-1.230E+0	-3.300E+0
σ (OFF)	---	7.071E-2	1.304E-1	1.304E-1	2.716E-1
Average+3σ (OFF)	---	6.213E-2	-3.388E-1	-8.388E-1	-2.485E+0
Average-3σ (OFF)	---	-3.621E-1	-1.121E+0	-1.621E+0	-4.115E+0

190 MeV proton / detailed results

14.TPLH3

Ta=25°C; If=5mA; RL = 680Ohms; Vcc=5V



190 MeV proton / detailed results

TPLH3 . (µs) **Max = 30.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	6.10	6.10	6.20	6.10	6.20
N° 2 (Bias1)	5.90	5.80	5.50	5.10	3.60
N° 3 (Bias1)	5.70	5.60	5.30	4.90	3.50
N° 4 (Bias1)	6.00	5.80	5.50	5.10	3.70
N° 5 (Bias1)	6.30	6.20	5.85	5.50	3.80
N° 6 (Bias1)	6.10	6.00	5.80	5.40	3.90
N° 7 (Bias2)	6.30	6.00	5.60	4.80	3.20
N° 8 (Bias2)	6.00	5.60	5.20	4.80	2.80
N° 9 (Bias2)	5.80	5.60	5.20	4.80	2.80
N° 10 (Bias2)	5.80	5.60	5.20	4.80	2.80
N° 11 (Bias2)	6.10	6.00	5.20	4.80	3.20
N° 12 (OFF)	6.50	6.50	5.85	5.40	3.50
N° 13 (OFF)	6.90	6.70	6.00	5.50	3.50
N° 14 (OFF)	6.30	6.20	5.70	5.20	3.40
N° 15 (OFF)	6.10	5.90	5.50	4.90	3.10
N° 16 (OFF)	5.70	5.60	5.10	4.70	3.00

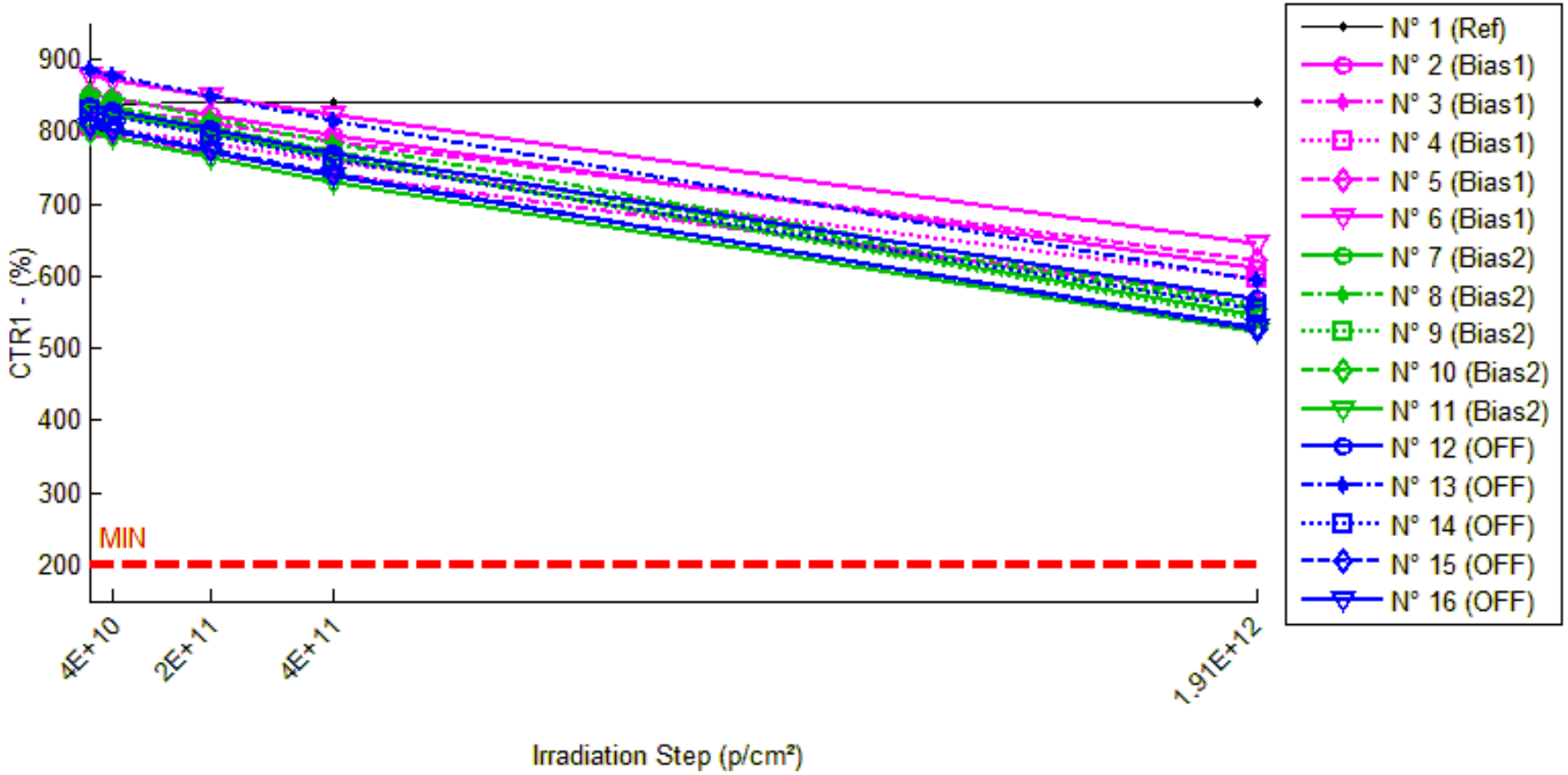
Delta [TPLH3]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	1.000E-1	0.000E+0	1.000E-1
N° 2 (Bias1)	---	-1.000E-1	-4.000E-1	-8.000E-1	-2.300E+0
N° 3 (Bias1)	---	-1.000E-1	-4.000E-1	-8.000E-1	-2.200E+0
N° 4 (Bias1)	---	-2.000E-1	-5.000E-1	-9.000E-1	-2.300E+0
N° 5 (Bias1)	---	-1.000E-1	-4.500E-1	-8.000E-1	-2.500E+0
N° 6 (Bias1)	---	-1.000E-1	-3.000E-1	-7.000E-1	-2.200E+0
N° 7 (Bias2)	---	-3.000E-1	-7.000E-1	-1.500E+0	-3.100E+0
N° 8 (Bias2)	---	-4.000E-1	-8.000E-1	-1.200E+0	-3.200E+0
N° 9 (Bias2)	---	-2.000E-1	-6.000E-1	-1.000E+0	-3.000E+0
N° 10 (Bias2)	---	-2.000E-1	-6.000E-1	-1.000E+0	-3.000E+0
N° 11 (Bias2)	---	-1.000E-1	-9.000E-1	-1.300E+0	-2.900E+0
N° 12 (OFF)	---	0.000E+0	-6.500E-1	-1.100E+0	-3.000E+0
N° 13 (OFF)	---	-2.000E-1	-9.000E-1	-1.400E+0	-3.400E+0
N° 14 (OFF)	---	-1.000E-1	-6.000E-1	-1.100E+0	-2.900E+0
N° 15 (OFF)	---	-2.000E-1	-6.000E-1	-1.200E+0	-3.000E+0
N° 16 (OFF)	---	-1.000E-1	-6.000E-1	-1.000E+0	-2.700E+0
Average (Bias1)	---	-1.200E-1	-4.100E-1	-8.000E-1	-2.300E+0
σ (Bias1)	---	4.472E-2	7.416E-2	7.071E-2	1.225E-1
Average+3σ (Bias1)	---	1.416E-2	-1.875E-1	-5.879E-1	-1.933E+0
Average-3σ (Bias1)	---	-2.542E-1	-6.325E-1	-1.012E+0	-2.667E+0
Average (Bias2)	---	-2.400E-1	-7.200E-1	-1.200E+0	-3.040E+0
σ (Bias2)	---	1.140E-1	1.304E-1	2.121E-1	1.140E-1
Average+3σ (Bias2)	---	1.021E-1	-3.288E-1	-5.636E-1	-2.698E+0
Average-3σ (Bias2)	---	-5.821E-1	-1.111E+0	-1.836E+0	-3.382E+0
Average (OFF)	---	-1.200E-1	-6.700E-1	-1.160E+0	-3.000E+0
σ (OFF)	---	8.367E-2	1.304E-1	1.517E-1	2.550E-1
Average+3σ (OFF)	---	1.310E-1	-2.788E-1	-7.050E-1	-2.235E+0
Average-3σ (OFF)	---	-3.710E-1	-1.061E+0	-1.615E+0	-3.765E+0

190 MeV proton / detailed results

15.CTR1

Ta=25°C; If=5mA; Vo=0.4V; Vcc=4.5V



190 MeV proton / detailed results

CTR1 . (%) **Min = 200.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	839.10	839.29	839.56	840.20	840.24
N° 2 (Bias1)	851.02	846.68	824.25	795.29	612.11
N° 3 (Bias1)	794.83	791.37	769.75	742.89	569.21
N° 4 (Bias1)	809.34	805.28	784.07	758.37	597.24
N° 5 (Bias1)	836.02	831.48	812.70	788.01	621.47
N° 6 (Bias1)	877.43	873.01	849.80	822.78	644.99
N° 7 (Bias2)	828.89	824.02	797.32	763.85	546.06
N° 8 (Bias2)	853.83	848.16	819.08	784.06	559.54
N° 9 (Bias2)	837.71	831.01	801.25	765.27	538.85
N° 10 (Bias2)	841.83	835.28	806.55	772.07	554.72
N° 11 (Bias2)	798.85	792.25	764.38	730.85	524.04
N° 12 (OFF)	835.46	829.22	803.61	771.26	568.76
N° 13 (OFF)	885.72	878.49	850.51	815.57	594.68
N° 14 (OFF)	828.74	821.31	795.27	761.80	555.15
N° 15 (OFF)	810.16	803.62	775.39	740.25	526.28
N° 16 (OFF)	807.75	800.21	772.74	737.72	528.55

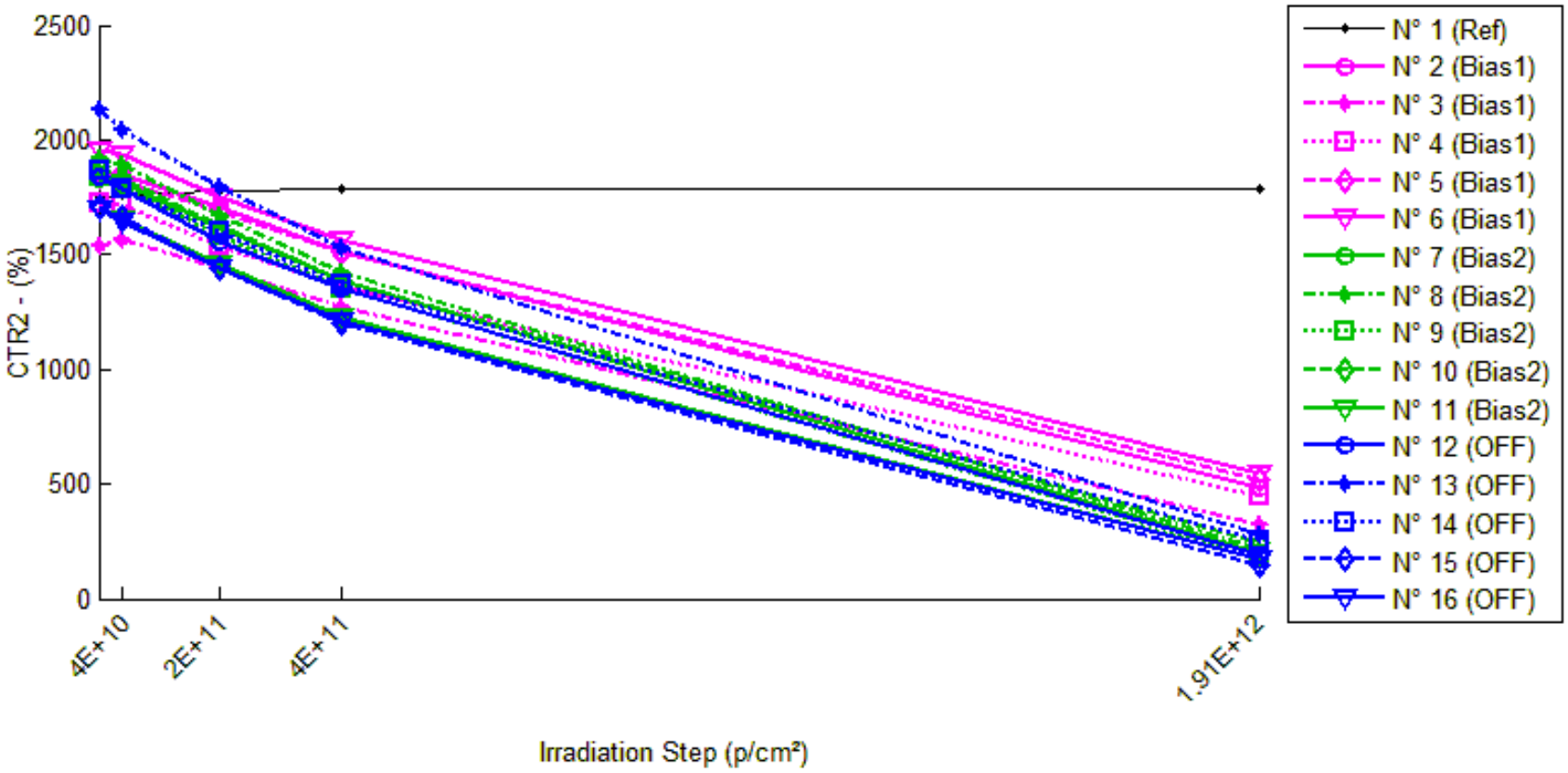
1/Delta [CTR1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-2.755E-7	-6.663E-7	-1.574E-6	-1.620E-6
N° 2 (Bias1)	---	6.022E-6	3.817E-5	8.234E-5	4.586E-4
N° 3 (Bias1)	---	5.490E-6	4.099E-5	8.796E-5	4.987E-4
N° 4 (Bias1)	---	6.226E-6	3.982E-5	8.304E-5	4.388E-4
N° 5 (Bias1)	---	6.540E-6	3.432E-5	7.288E-5	4.129E-4
N° 6 (Bias1)	---	5.774E-6	3.705E-5	7.571E-5	4.107E-4
N° 7 (Bias2)	---	7.127E-6	4.775E-5	1.027E-4	6.249E-4
N° 8 (Bias2)	---	7.819E-6	4.968E-5	1.042E-4	6.160E-4
N° 9 (Bias2)	---	9.616E-6	5.432E-5	1.130E-4	6.621E-4
N° 10 (Bias2)	---	9.324E-6	5.197E-5	1.073E-4	6.148E-4
N° 11 (Bias2)	---	1.044E-5	5.645E-5	1.165E-4	6.565E-4
N° 12 (OFF)	---	9.005E-6	4.744E-5	9.964E-5	5.612E-4
N° 13 (OFF)	---	9.295E-6	4.674E-5	9.711E-5	5.526E-4
N° 14 (OFF)	---	1.092E-5	5.079E-5	1.060E-4	5.947E-4
N° 15 (OFF)	---	1.005E-5	5.536E-5	1.166E-4	6.658E-4
N° 16 (OFF)	---	1.166E-5	5.609E-5	1.175E-4	6.540E-4
Average (Bias1)	---	6.011E-6	3.807E-5	8.038E-5	4.440E-4
σ (Bias1)	---	4.042E-7	2.581E-6	6.051E-6	3.641E-5
Average+3σ (Bias1)	---	7.223E-6	4.582E-5	9.854E-5	5.532E-4
Average-3σ (Bias1)	---	4.798E-6	3.033E-5	6.223E-5	3.347E-4
Average (Bias2)	---	8.865E-6	5.203E-5	1.087E-4	6.348E-4
σ (Bias2)	---	1.358E-6	3.483E-6	5.841E-6	2.272E-5
Average+3σ (Bias2)	---	1.294E-5	6.248E-5	1.263E-4	7.030E-4
Average-3σ (Bias2)	---	4.791E-6	4.158E-5	9.122E-5	5.667E-4
Average (OFF)	---	1.019E-5	5.128E-5	1.074E-4	6.056E-4
σ (OFF)	---	1.108E-6	4.340E-6	9.414E-6	5.211E-5
Average+3σ (OFF)	---	1.351E-5	6.430E-5	1.356E-4	7.620E-4
Average-3σ (OFF)	---	6.861E-6	3.826E-5	7.913E-5	4.493E-4

190 MeV proton / detailed results

16.CTR2

Ta=25°C; If=0.5mA; Vo=0.4V; Vcc=5V



190 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1750.43	1762.94	1774.08	1788.49	1789.16
N° 2 (Bias1)	1847.79	1846.05	1702.16	1515.46	482.30
N° 3 (Bias1)	1541.24	1561.97	1437.98	1269.13	324.72
N° 4 (Bias1)	1721.84	1715.41	1542.55	1364.19	447.63
N° 5 (Bias1)	1843.50	1819.62	1685.62	1514.36	515.36
N° 6 (Bias1)	1958.88	1934.27	1755.26	1566.86	549.33
N° 7 (Bias2)	1826.26	1813.79	1617.02	1384.31	197.25
N° 8 (Bias2)	1921.91	1889.03	1667.84	1424.92	218.99
N° 9 (Bias2)	1837.49	1801.59	1578.57	1347.66	180.22
N° 10 (Bias2)	1880.06	1828.32	1625.31	1389.72	241.55
N° 11 (Bias2)	1699.20	1654.89	1456.73	1231.19	171.23
N° 12 (OFF)	1838.32	1783.20	1559.36	1355.14	188.85
N° 13 (OFF)	2130.26	2046.36	1791.61	1529.50	282.10
N° 14 (OFF)	1867.05	1782.10	1599.89	1369.45	256.23
N° 15 (OFF)	1707.27	1663.64	1443.96	1201.33	145.78
N° 16 (OFF)	1697.12	1646.36	1441.71	1206.71	176.40

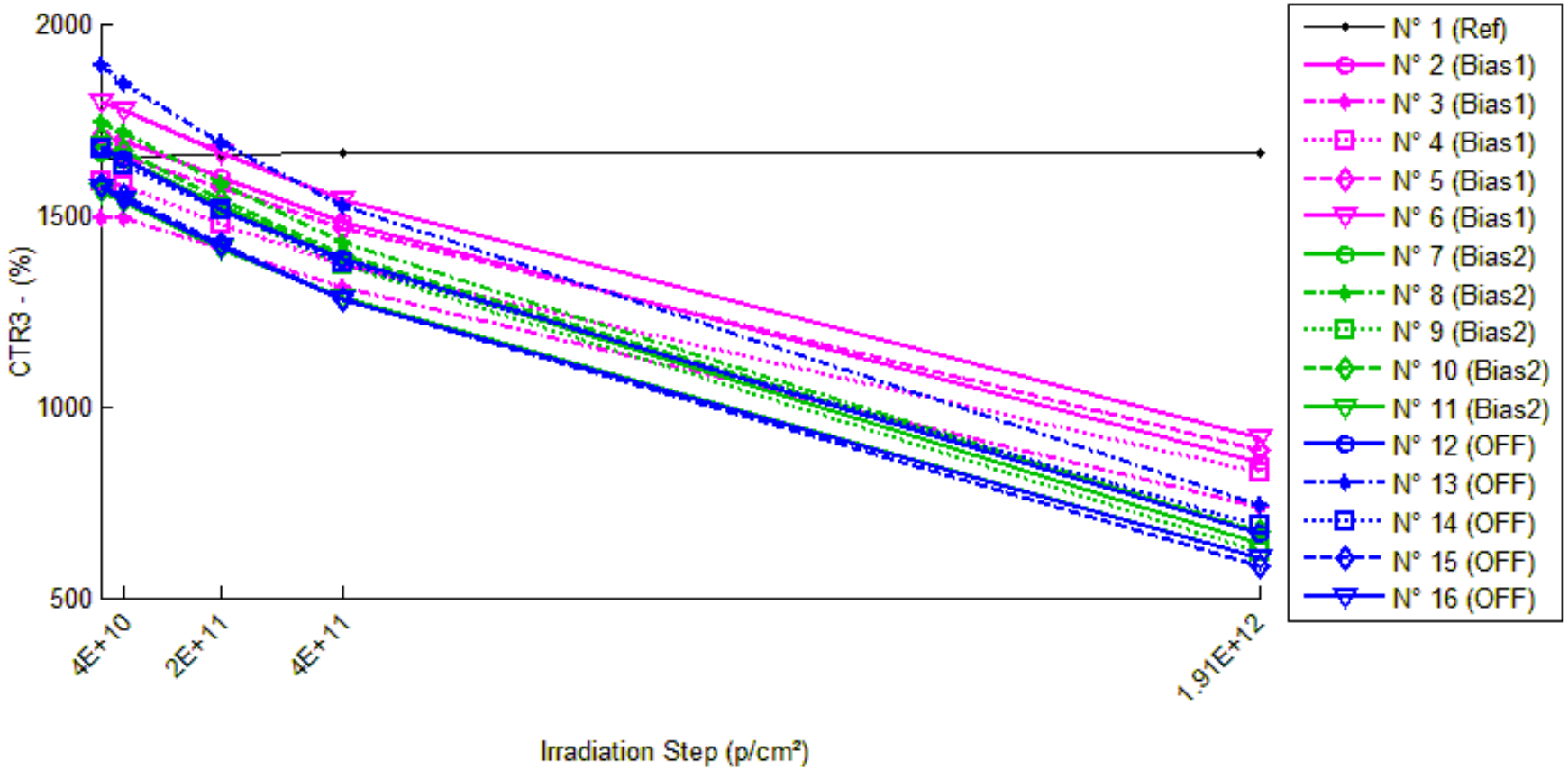
1/Delta [CTR2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-4.054E-6	-7.615E-6	-1.216E-5	-1.237E-5
N° 2 (Bias1)	---	5.107E-7	4.630E-5	1.187E-4	1.532E-3
N° 3 (Bias1)	---	-8.611E-6	4.659E-5	1.391E-4	2.431E-3
N° 4 (Bias1)	---	2.177E-6	6.750E-5	1.523E-4	1.653E-3
N° 5 (Bias1)	---	7.117E-6	5.081E-5	1.179E-4	1.398E-3
N° 6 (Bias1)	---	6.495E-6	5.922E-5	1.277E-4	1.310E-3
N° 7 (Bias2)	---	3.763E-6	7.085E-5	1.748E-4	4.522E-3
N° 8 (Bias2)	---	9.056E-6	7.926E-5	1.815E-4	4.046E-3
N° 9 (Bias2)	---	1.084E-5	8.926E-5	1.978E-4	5.005E-3
N° 10 (Bias2)	---	1.505E-5	8.337E-5	1.877E-4	3.608E-3
N° 11 (Bias2)	---	1.576E-5	9.795E-5	2.237E-4	5.252E-3
N° 12 (OFF)	---	1.681E-5	9.731E-5	1.940E-4	4.751E-3
N° 13 (OFF)	---	1.924E-5	8.873E-5	1.844E-4	3.075E-3
N° 14 (OFF)	---	2.553E-5	8.944E-5	1.946E-4	3.367E-3
N° 15 (OFF)	---	1.536E-5	1.068E-4	2.467E-4	6.274E-3
N° 16 (OFF)	---	1.817E-5	1.044E-4	2.395E-4	5.080E-3
Average (Bias1)	---	1.538E-6	5.408E-5	1.311E-4	1.665E-3
σ (Bias1)	---	6.328E-6	9.136E-6	1.459E-5	4.477E-4
Average+3σ (Bias1)	---	2.052E-5	8.149E-5	1.749E-4	3.008E-3
Average-3σ (Bias1)	---	-1.745E-5	2.668E-5	8.735E-5	3.218E-4
Average (Bias2)	---	1.089E-5	8.414E-5	1.931E-4	4.487E-3
σ (Bias2)	---	4.878E-6	1.022E-5	1.909E-5	6.747E-4
Average+3σ (Bias2)	---	2.553E-5	1.148E-4	2.504E-4	6.511E-3
Average-3σ (Bias2)	---	-3.739E-6	5.347E-5	1.358E-4	2.462E-3
Average (OFF)	---	1.902E-5	9.734E-5	2.118E-4	4.509E-3
σ (OFF)	---	3.919E-6	8.306E-6	2.893E-5	1.309E-3
Average+3σ (OFF)	---	3.078E-5	1.223E-4	2.986E-4	8.438E-3
Average-3σ (OFF)	---	7.268E-6	7.242E-5	1.250E-4	5.813E-4

190 MeV proton / detailed results

17.CTR3

Ta=25°C; If=1mA; Vo=0.4V; Vcc=5V



190 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1648.30	1651.65	1656.65	1661.88	1663.39
N° 2 (Bias1)	1707.08	1695.29	1600.02	1480.86	854.57
N° 3 (Bias1)	1490.57	1491.67	1410.36	1310.67	735.91
N° 4 (Bias1)	1587.46	1576.50	1478.54	1371.69	828.00
N° 5 (Bias1)	1674.33	1653.92	1571.97	1466.21	884.03
N° 6 (Bias1)	1793.52	1775.91	1660.56	1540.13	918.70
N° 7 (Bias2)	1662.00	1646.71	1526.27	1386.61	642.21
N° 8 (Bias2)	1744.67	1717.57	1581.03	1430.48	666.46
N° 9 (Bias2)	1676.19	1646.98	1513.39	1370.90	618.43
N° 10 (Bias2)	1698.70	1666.61	1541.22	1397.52	670.92
N° 11 (Bias2)	1560.43	1532.06	1414.85	1283.48	604.20
N° 12 (OFF)	1677.87	1643.71	1515.38	1386.65	667.03
N° 13 (OFF)	1890.21	1840.86	1688.21	1523.99	743.84
N° 14 (OFF)	1673.80	1627.87	1515.82	1376.44	689.10
N° 15 (OFF)	1575.98	1549.38	1422.46	1281.35	584.85
N° 16 (OFF)	1569.86	1537.48	1418.12	1280.02	602.61

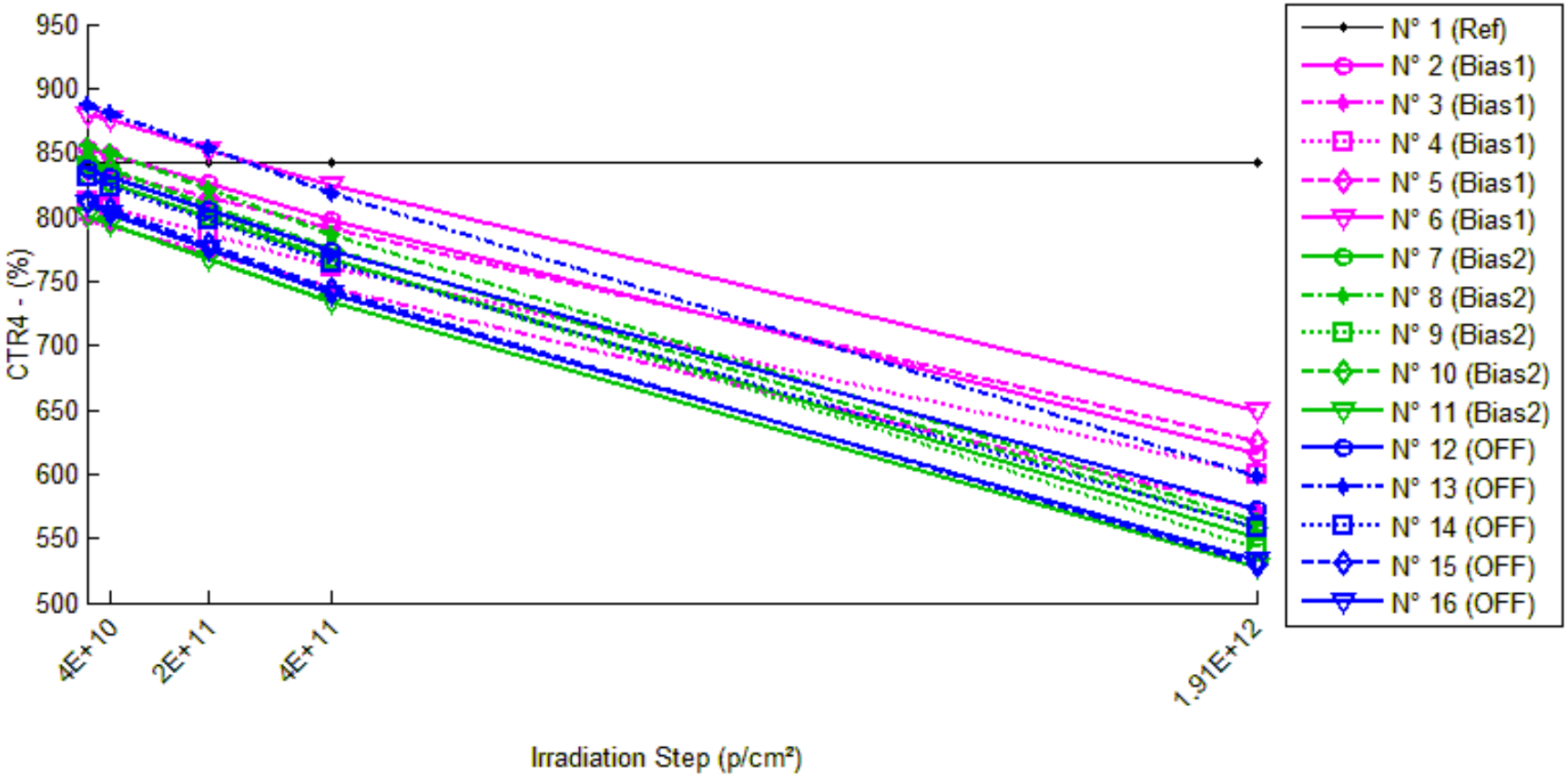
1/Delta [CTR3]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.231E-6	-3.058E-6	-4.956E-6	-5.503E-6
N° 2 (Bias1)	---	4.076E-6	3.920E-5	8.949E-5	5.844E-4
N° 3 (Bias1)	---	-4.956E-7	3.815E-5	9.208E-5	6.880E-4
N° 4 (Bias1)	---	4.379E-6	4.641E-5	9.909E-5	5.778E-4
N° 5 (Bias1)	---	7.370E-6	3.889E-5	8.478E-5	5.339E-4
N° 6 (Bias1)	---	5.530E-6	4.464E-5	9.173E-5	5.309E-4
N° 7 (Bias2)	---	5.585E-6	5.351E-5	1.195E-4	9.554E-4
N° 8 (Bias2)	---	9.043E-6	5.933E-5	1.259E-4	9.273E-4
N° 9 (Bias2)	---	1.058E-5	6.417E-5	1.329E-4	1.020E-3
N° 10 (Bias2)	---	1.134E-5	6.015E-5	1.269E-4	9.018E-4
N° 11 (Bias2)	---	1.187E-5	6.594E-5	1.383E-4	1.014E-3
N° 12 (OFF)	---	1.239E-5	6.391E-5	1.252E-4	9.032E-4
N° 13 (OFF)	---	1.418E-5	6.330E-5	1.271E-4	8.153E-4
N° 14 (OFF)	---	1.685E-5	6.226E-5	1.291E-4	8.537E-4
N° 15 (OFF)	---	1.089E-5	6.848E-5	1.459E-4	1.075E-3
N° 16 (OFF)	---	1.342E-5	6.816E-5	1.442E-4	1.022E-3
Average (Bias1)	---	4.172E-6	4.146E-5	9.144E-5	5.830E-4
σ (Bias1)	---	2.912E-6	3.784E-6	5.177E-6	6.358E-5
Average+3σ (Bias1)	---	1.291E-5	5.281E-5	1.070E-4	7.737E-4
Average-3σ (Bias1)	---	-4.563E-6	3.011E-5	7.590E-5	3.923E-4
Average (Bias2)	---	9.682E-6	6.062E-5	1.287E-4	9.638E-4
σ (Bias2)	---	2.525E-6	4.832E-6	7.160E-6	5.243E-5
Average+3σ (Bias2)	---	1.726E-5	7.512E-5	1.502E-4	1.121E-3
Average-3σ (Bias2)	---	2.106E-6	4.612E-5	1.072E-4	8.066E-4
Average (OFF)	---	1.355E-5	6.522E-5	1.343E-4	9.340E-4
σ (OFF)	---	2.221E-6	2.892E-6	9.943E-6	1.110E-4
Average+3σ (OFF)	---	2.021E-5	7.390E-5	1.641E-4	1.267E-3
Average-3σ (OFF)	---	6.883E-6	5.655E-5	1.045E-4	6.010E-4

190 MeV proton / detailed results

18.CTR4

Ta=25°C; If=5mA; Vo=0.4V; Vcc=5V



190 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	841.28	841.54	841.76	842.44	842.46
N° 2 (Bias1)	853.15	848.86	826.64	797.94	615.55
N° 3 (Bias1)	797.07	793.59	772.13	745.47	572.34
N° 4 (Bias1)	811.41	807.43	786.38	760.89	600.52
N° 5 (Bias1)	838.14	833.64	815.02	790.52	624.65
N° 6 (Bias1)	879.61	875.28	852.33	825.53	648.74
N° 7 (Bias2)	830.97	826.24	799.81	766.62	549.86
N° 8 (Bias2)	855.78	850.29	821.49	786.83	563.54
N° 9 (Bias2)	839.82	833.23	803.76	768.05	542.75
N° 10 (Bias2)	843.86	837.46	809.10	774.68	558.74
N° 11 (Bias2)	801.07	794.56	767.08	733.73	528.06
N° 12 (OFF)	837.64	831.51	806.14	774.12	572.51
N° 13 (OFF)	887.72	880.59	853.00	818.39	598.58
N° 14 (OFF)	831.01	823.70	797.82	764.69	558.52
N° 15 (OFF)	812.36	805.90	777.95	742.99	529.98
N° 16 (OFF)	809.90	802.40	775.17	740.44	532.04

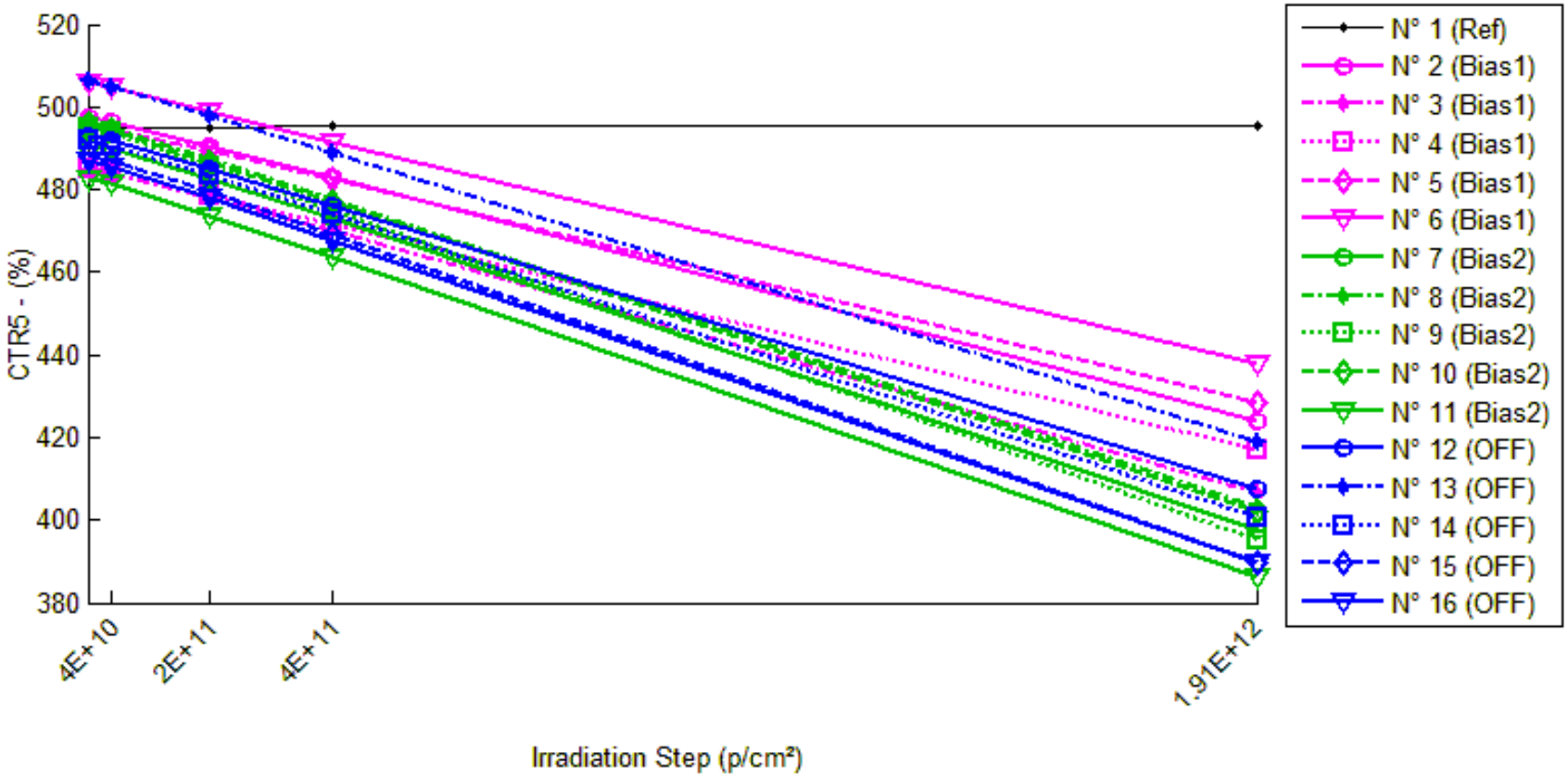
1/Delta [CTR4]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-3.548E-7	-6.770E-7	-1.629E-6	-1.655E-6
N° 2 (Bias1)	---	5.923E-6	3.758E-5	8.109E-5	4.524E-4
N° 3 (Bias1)	---	5.503E-6	4.054E-5	8.685E-5	4.926E-4
N° 4 (Bias1)	---	6.078E-6	3.922E-5	8.184E-5	4.328E-4
N° 5 (Bias1)	---	6.432E-6	3.384E-5	7.187E-5	4.078E-4
N° 6 (Bias1)	---	5.615E-6	3.639E-5	7.448E-5	4.046E-4
N° 7 (Bias2)	---	6.893E-6	4.689E-5	1.010E-4	6.152E-4
N° 8 (Bias2)	---	7.545E-6	4.877E-5	1.024E-4	6.060E-4
N° 9 (Bias2)	---	9.421E-6	5.342E-5	1.113E-4	6.517E-4
N° 10 (Bias2)	---	9.059E-6	5.092E-5	1.058E-4	6.047E-4
N° 11 (Bias2)	---	1.022E-5	5.531E-5	1.146E-4	6.454E-4
N° 12 (OFF)	---	8.797E-6	4.665E-5	9.796E-5	5.529E-4
N° 13 (OFF)	---	9.127E-6	4.585E-5	9.544E-5	5.441E-4
N° 14 (OFF)	---	1.067E-5	5.006E-5	1.044E-4	5.871E-4
N° 15 (OFF)	---	9.864E-6	5.444E-5	1.149E-4	6.559E-4
N° 16 (OFF)	---	1.153E-5	5.532E-5	1.158E-4	6.448E-4
Average (Bias1)	---	5.910E-6	3.752E-5	7.922E-5	4.380E-4
σ (Bias1)	---	3.720E-7	2.589E-6	6.021E-6	3.623E-5
Average+3σ (Bias1)	---	7.026E-6	4.528E-5	9.729E-5	5.467E-4
Average-3σ (Bias1)	---	4.795E-6	2.975E-5	6.116E-5	3.293E-4
Average (Bias2)	---	8.627E-6	5.106E-5	1.070E-4	6.246E-4
σ (Bias2)	---	1.371E-6	3.402E-6	5.789E-6	2.235E-5
Average+3σ (Bias2)	---	1.274E-5	6.126E-5	1.244E-4	6.917E-4
Average-3σ (Bias2)	---	4.514E-6	4.085E-5	8.965E-5	5.576E-4
Average (OFF)	---	9.997E-6	5.046E-5	1.057E-4	5.970E-4
σ (OFF)	---	1.119E-6	4.341E-6	9.413E-6	5.147E-5
Average+3σ (OFF)	---	1.335E-5	6.349E-5	1.339E-4	7.514E-4
Average-3σ (OFF)	---	6.640E-6	3.744E-5	7.746E-5	4.426E-4

190 MeV proton / detailed results

19.CTR5

Ta=25°C; If=10mA; Vo=0.4V; Vcc=5V



190 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	494.64	494.75	494.79	495.30	495.19
N° 2 (Bias1)	497.60	496.63	490.68	482.94	423.83
N° 3 (Bias1)	484.66	484.10	478.03	470.15	406.65
N° 4 (Bias1)	484.96	484.07	478.50	471.47	416.77
N° 5 (Bias1)	495.45	494.37	489.43	482.71	428.56
N° 6 (Bias1)	505.67	504.66	498.68	491.64	437.83
N° 7 (Bias2)	490.42	489.93	482.40	472.99	397.62
N° 8 (Bias2)	495.93	495.14	487.36	477.65	403.27
N° 9 (Bias2)	494.82	493.72	485.53	475.25	394.99
N° 10 (Bias2)	495.70	494.55	486.53	476.82	401.87
N° 11 (Bias2)	482.64	481.32	473.42	463.55	386.42
N° 12 (OFF)	492.97	491.84	485.01	476.23	407.69
N° 13 (OFF)	506.32	505.10	498.00	488.82	418.84
N° 14 (OFF)	491.98	490.47	483.51	474.01	400.55
N° 15 (OFF)	488.30	486.82	479.31	469.21	389.74
N° 16 (OFF)	487.12	485.44	477.93	467.70	389.53

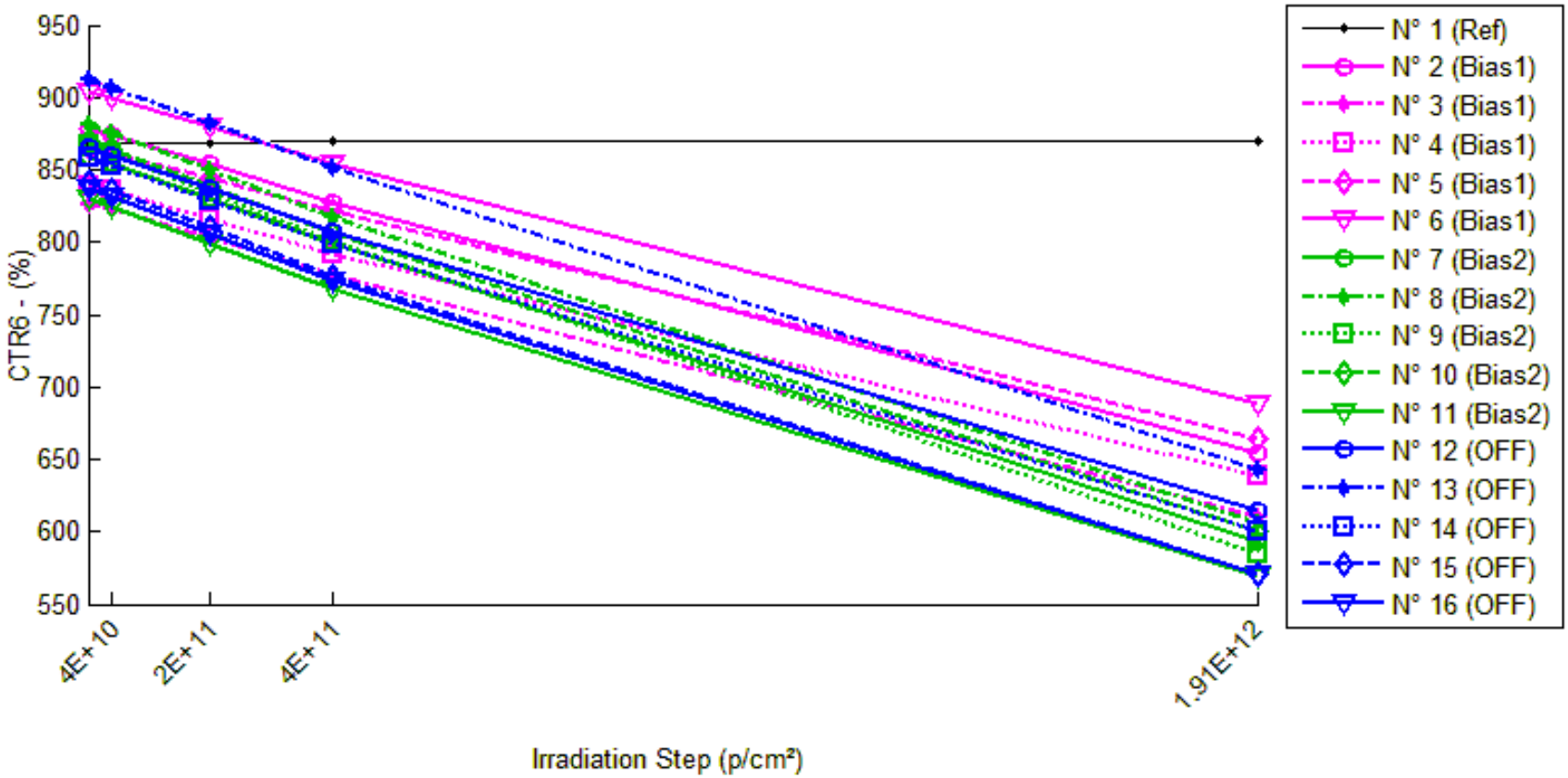
1/Delta [CTR5]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-4.352E-7	-6.174E-7	-2.700E-6	-2.223E-6
N° 2 (Bias1)	---	3.926E-6	2.832E-5	6.100E-5	3.498E-4
N° 3 (Bias1)	---	2.400E-6	2.860E-5	6.367E-5	3.958E-4
N° 4 (Bias1)	---	3.768E-6	2.783E-5	5.899E-5	3.374E-4
N° 5 (Bias1)	---	4.420E-6	2.484E-5	5.330E-5	3.150E-4
N° 6 (Bias1)	---	3.952E-6	2.773E-5	5.644E-5	3.064E-4
N° 7 (Bias2)	---	2.032E-6	3.392E-5	7.517E-5	4.759E-4
N° 8 (Bias2)	---	3.236E-6	3.548E-5	7.719E-5	4.633E-4
N° 9 (Bias2)	---	4.497E-6	3.869E-5	8.325E-5	5.108E-4
N° 10 (Bias2)	---	4.693E-6	3.801E-5	7.986E-5	4.710E-4
N° 11 (Bias2)	---	5.672E-6	4.034E-5	8.533E-5	5.159E-4
N° 12 (OFF)	---	4.664E-6	3.331E-5	7.130E-5	4.243E-4
N° 13 (OFF)	---	4.757E-6	3.298E-5	7.069E-5	4.125E-4
N° 14 (OFF)	---	6.265E-6	3.559E-5	7.704E-5	4.640E-4
N° 15 (OFF)	---	6.249E-6	3.844E-5	8.334E-5	5.179E-4
N° 16 (OFF)	---	7.106E-6	3.944E-5	8.522E-5	5.143E-4
Average (Bias1)	---	3.693E-6	2.747E-5	5.868E-5	3.409E-4
σ (Bias1)	---	7.627E-7	1.510E-6	4.010E-6	3.523E-5
Average+3σ (Bias1)	---	5.981E-6	3.200E-5	7.071E-5	4.466E-4
Average-3σ (Bias1)	---	1.405E-6	2.294E-5	4.665E-5	2.352E-4
Average (Bias2)	---	4.026E-6	3.729E-5	8.016E-5	4.874E-4
σ (Bias2)	---	1.412E-6	2.570E-6	4.187E-6	2.419E-5
Average+3σ (Bias2)	---	8.262E-6	4.500E-5	9.272E-5	5.599E-4
Average-3σ (Bias2)	---	-2.105E-7	2.958E-5	6.760E-5	4.148E-4
Average (OFF)	---	5.808E-6	3.595E-5	7.752E-5	4.666E-4
σ (OFF)	---	1.061E-6	2.926E-6	6.683E-6	4.906E-5
Average+3σ (OFF)	---	8.991E-6	4.473E-5	9.757E-5	6.138E-4
Average-3σ (OFF)	---	2.625E-6	2.717E-5	5.747E-5	3.194E-4

190 MeV proton / detailed results

20.CTR6

Ta=25°C; If=5mA; Vo=0.4V; Vcc=18V



190 MeV proton / detailed results

CTR6 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	868.02	868.28	868.48	869.25	869.22
N° 2 (Bias1)	878.37	874.66	854.25	827.69	654.11
N° 3 (Bias1)	825.68	822.65	802.57	777.42	610.49
N° 4 (Bias1)	839.07	835.46	815.94	792.09	638.97
N° 5 (Bias1)	865.98	861.90	844.86	822.20	664.69
N° 6 (Bias1)	904.09	900.23	879.27	854.71	688.24
N° 7 (Bias2)	858.62	854.78	830.59	799.61	592.64
N° 8 (Bias2)	880.54	875.99	849.83	817.90	605.99
N° 9 (Bias2)	866.51	860.89	833.85	800.47	584.55
N° 10 (Bias2)	869.98	864.40	838.46	806.41	599.86
N° 11 (Bias2)	830.09	824.30	798.81	767.35	569.76
N° 12 (OFF)	865.74	860.45	837.40	807.85	613.90
N° 13 (OFF)	912.93	906.91	882.32	850.81	643.03
N° 14 (OFF)	859.13	852.59	829.13	798.32	600.68
N° 15 (OFF)	841.15	835.39	809.59	776.76	570.43
N° 16 (OFF)	837.87	831.19	806.03	773.19	571.25

1/Delta [CTR6]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-3.450E-7	-6.102E-7	-1.629E-6	-1.597E-6
N° 2 (Bias1)	---	4.834E-6	3.215E-5	6.971E-5	3.903E-4
N° 3 (Bias1)	---	4.447E-6	3.487E-5	7.517E-5	4.269E-4
N° 4 (Bias1)	---	5.151E-6	3.379E-5	7.070E-5	3.732E-4
N° 5 (Bias1)	---	5.473E-6	2.888E-5	6.150E-5	3.497E-4
N° 6 (Bias1)	---	4.739E-6	3.122E-5	6.390E-5	3.469E-4
N° 7 (Bias2)	---	5.230E-6	3.930E-5	8.595E-5	5.227E-4
N° 8 (Bias2)	---	5.902E-6	4.105E-5	8.698E-5	5.145E-4
N° 9 (Bias2)	---	7.529E-6	4.521E-5	9.521E-5	5.567E-4
N° 10 (Bias2)	---	7.412E-6	4.320E-5	9.061E-5	5.176E-4
N° 11 (Bias2)	---	8.458E-6	4.717E-5	9.849E-5	5.504E-4
N° 12 (OFF)	---	7.097E-6	3.909E-5	8.277E-5	4.739E-4
N° 13 (OFF)	---	7.277E-6	3.801E-5	7.998E-5	4.598E-4
N° 14 (OFF)	---	8.938E-6	4.212E-5	8.867E-5	5.008E-4
N° 15 (OFF)	---	8.196E-6	4.634E-5	9.855E-5	5.642E-4
N° 16 (OFF)	---	9.594E-6	4.715E-5	9.984E-5	5.570E-4
Average (Bias1)	---	4.929E-6	3.218E-5	6.820E-5	3.774E-4
σ (Bias1)	---	3.947E-7	2.327E-6	5.489E-6	3.291E-5
Average+3σ (Bias1)	---	6.113E-6	3.916E-5	8.466E-5	4.761E-4
Average-3σ (Bias1)	---	3.744E-6	2.520E-5	5.173E-5	2.787E-4
Average (Bias2)	---	6.906E-6	4.318E-5	9.145E-5	5.324E-4
σ (Bias2)	---	1.310E-6	3.147E-6	5.354E-6	1.966E-5
Average+3σ (Bias2)	---	1.084E-5	5.263E-5	1.075E-4	5.914E-4
Average-3σ (Bias2)	---	2.975E-6	3.374E-5	7.539E-5	4.734E-4
Average (OFF)	---	8.220E-6	4.254E-5	8.996E-5	5.111E-4
σ (OFF)	---	1.067E-6	4.133E-6	9.006E-6	4.760E-5
Average+3σ (OFF)	---	1.142E-5	5.494E-5	1.170E-4	6.539E-4
Average-3σ (OFF)	---	5.020E-6	3.014E-5	6.295E-5	3.684E-4