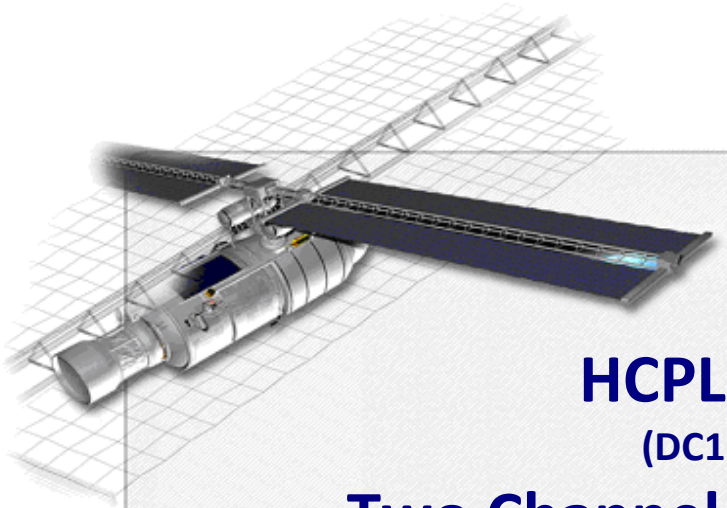
PROTONS DISPLACEMENT DAMAGE TEST REPORT



HCPL5431

(DC1116)

Two Channel Optocoupler

From

AVAGO

TRAD/TP/HCPL5431/XXX1/ESA/YP/1104		Labège, April 17, 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

TABLE OF CONTENT

LIST OF FIGURES

1 INTRODUCTION

This report includes the test results of HCPL5431, a Two 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- HCPL5431-MIC-ESA-1119, Iss.6, 08/02/2012

2.2 Reference Documents

RD	1.	Datasheet HCPL5431	Hermetically Sealed, Very High Speed, Logic Gate Optocouplers dated 21/06/2007
RD	2.	AVAGO certificate of conformance dated 09/05/2011	

3 DEVICE INFORMATION

3.1 Device description

The HCPL5431 is a hermetically sealed, Very High Speed Logic Gate optocoupler.
It is a two channel optocoupler with an AlGaAs light emitting diode coupled to an integrated high gain photon detector.

Type	HCPL5431 – 5962-8957101PC
Manufacturer	AVAGO
Function	Optocoupler
Package	DIP8
Inspection lot	HS1115111
Date Code	1116
Sample size	46 parts (3x15 test parts + 1 control sample)

3.2 Procurement information

75 parts HCPL5431 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 each reference.

3.3 External view

Figure 1: package marking

Figure 2: package back

3.4 Internal view

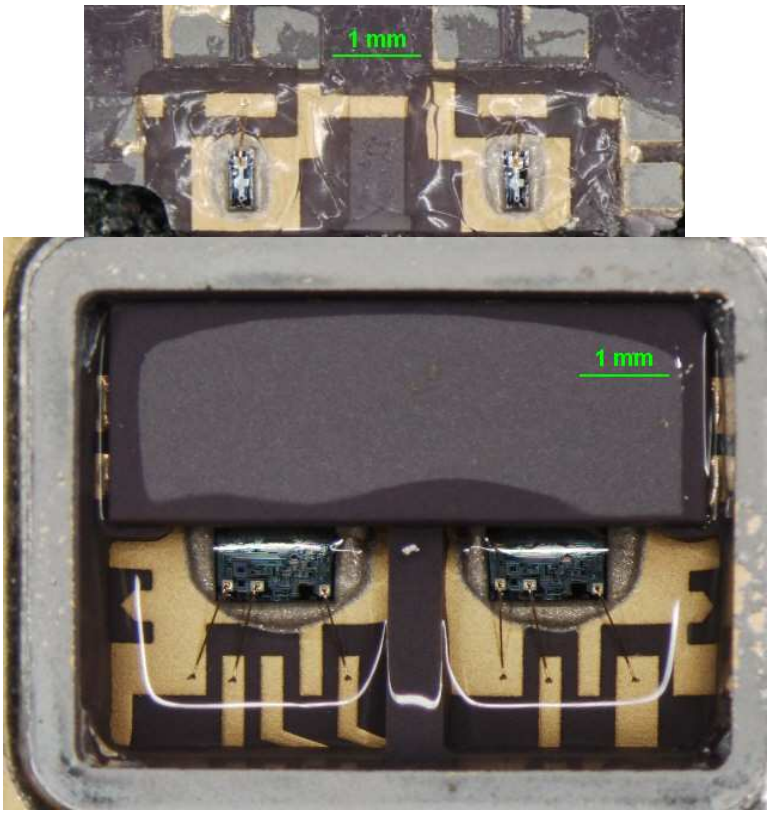


Figure 3: Internal general view

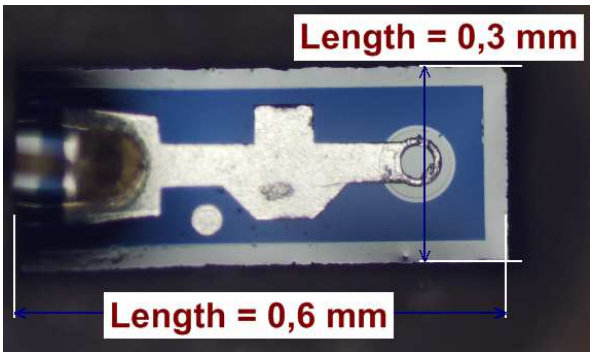


Figure 4: AlGaAs light emitting diode

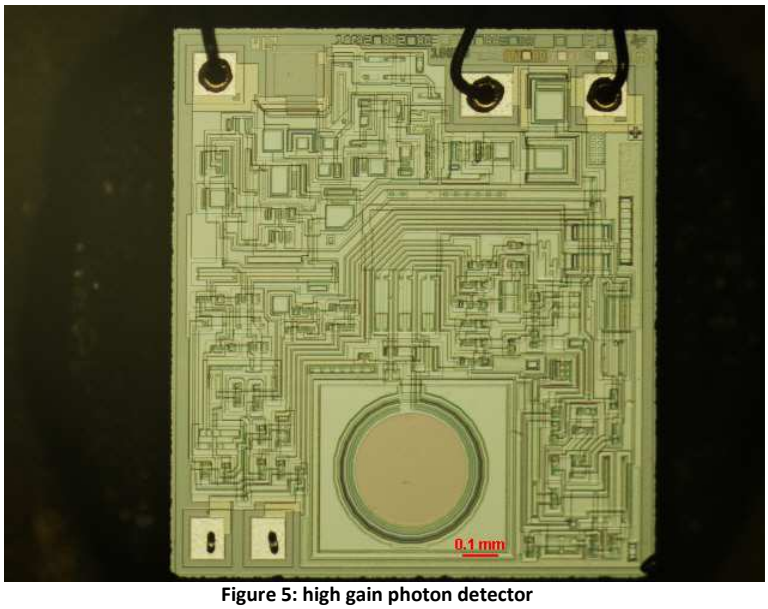


Figure 5: high gain photon detector

3.5 Serialization

Each part is serialized to enable pre and post test identification and comparison. Control part is identified N°1. The same control part has been used for the three test sequences.

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 6: 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 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/P/HCPL5431/DIL14/BR/1109
TEST PROGRAM	HCPL5431_TP30MeV_XXX1_B1_V10.llb HCPL5431_TP60MeV_XXX1_B1_V10.llb HCPL5431_TP200MeV_XXX1_B1_V10.llb

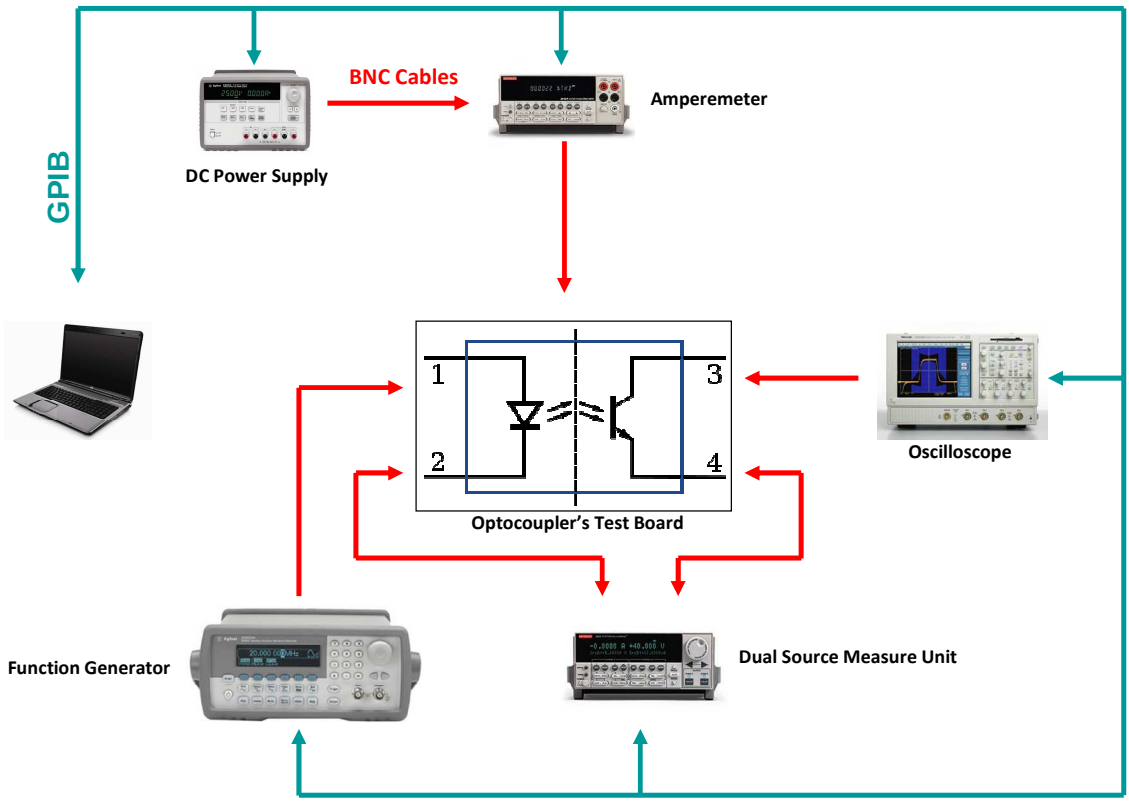


Figure 7: test principle

5.2 Test configuration

Samples were exposed to proton irradiation in three different modes - two on-modes (Figure 8 and Figure 9) and one off-mode (all terminal leads short-circuited) –

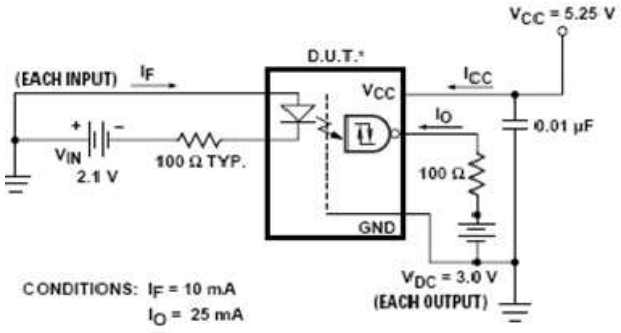


Figure 8: ON bias1

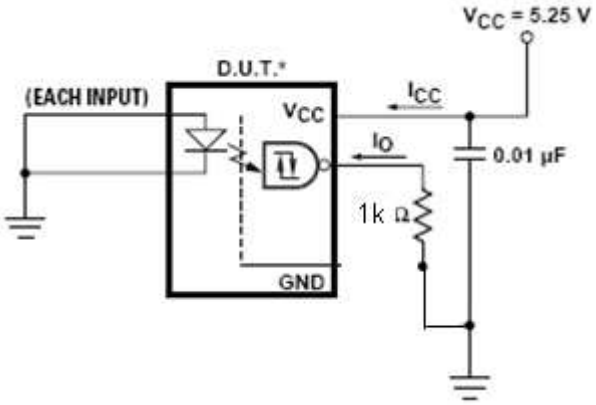


Figure 9: ON bias2

5.3 Electrical parameters

PARAMETER	SYMBOL	TEST CONDITION	MIN	MAX	UNIT
Low Level Output Voltage	V_{OL}	I_{OL} = 8.0 mA (5 TTL Loads)		0,5	V
High Level Output Voltage	V_{OH}	I_{OH} = -4.0 mA	2,4		V
Output Leakage Current	I_{OHH}	V_O = 5.25V, V_F = 0.7V		100	µA
Logic High Supply Current	I_{CCH}	V_{CC}=5.25V, Ve = 0V		52	mA
Logic Low Supply Current	I_{CCL}	V_{CC}=5.25V, Ve = 0V		52	mA
Input Forward Voltage	V_F	I_F = 10 mA	1	1,85	V
Input Reverse Breakdown Voltage	V_R	I_R = 10 µA	3		V
Propagation Delay Time Logic Low Output	t_{PHL}	note 1		60	ns
Propagation Delay Time Logic High Output	t_{PLH}	note 1		60	ns
Output Rise Time	tr*				ns
Output Fall Time	tf*				ns

(*) tr Typ. Value: 15 ns
(*) tf Typ. Value: 10 ns
Note 1: tPHL 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 tPLH 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 20°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.

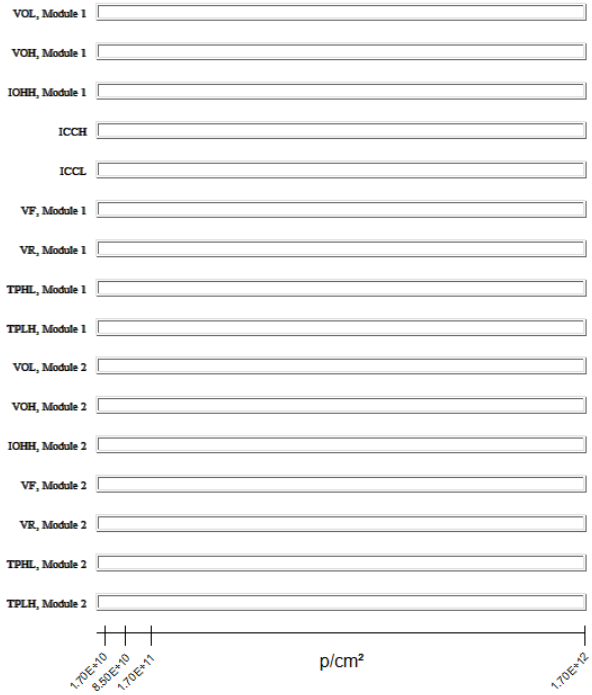


Figure 10: ON Bias 1 under 30 MeV protons

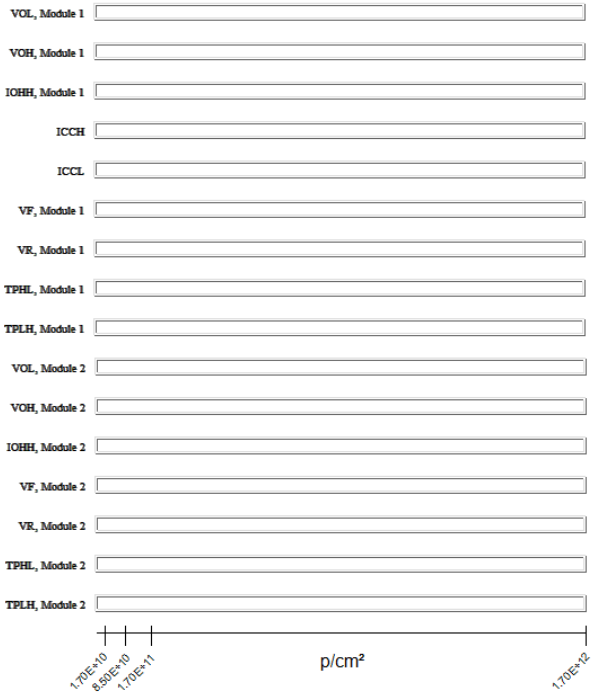
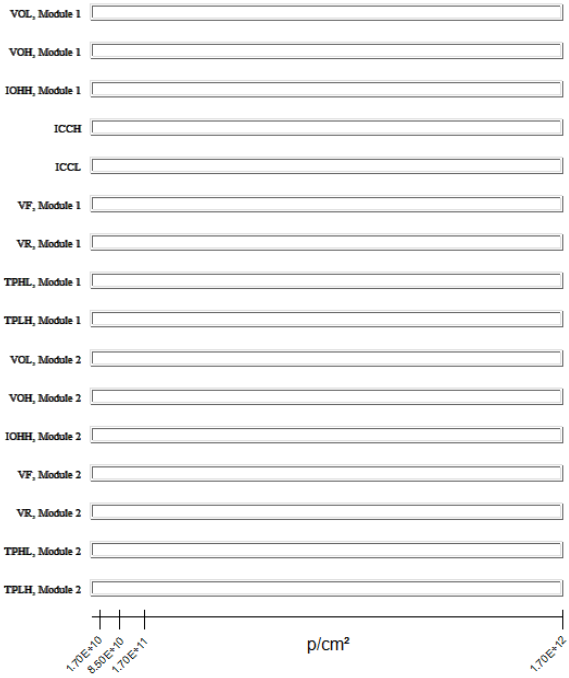


Figure 11: ON Bias 2 under 30 MeV protons



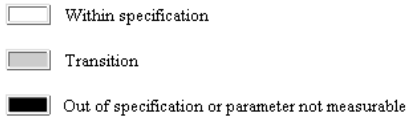


Figure 12: OFF Bias under 30 MeV protons

For all devices tested, whatever the bias condition, all parameters are functional up to a fluence of **1.7E12.p/cm².**

7.2 60 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

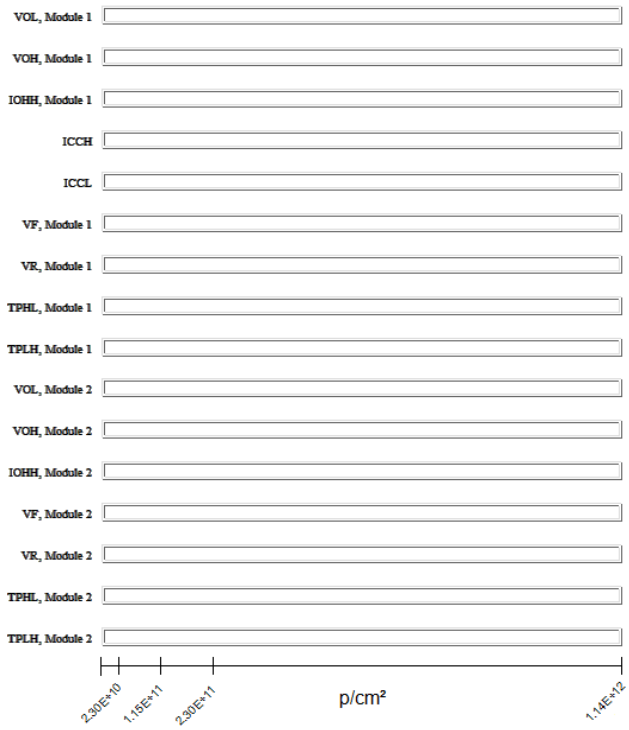


Figure 13: ON Bias 1 under 60 MeV protons

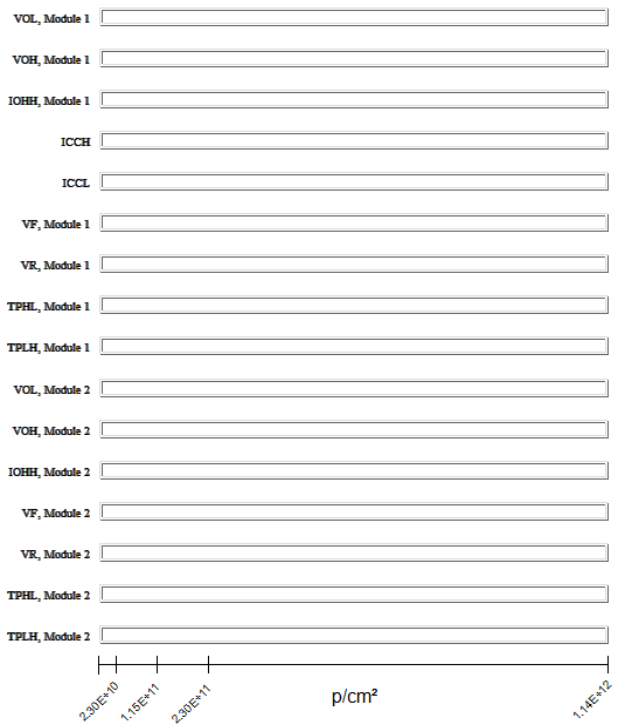
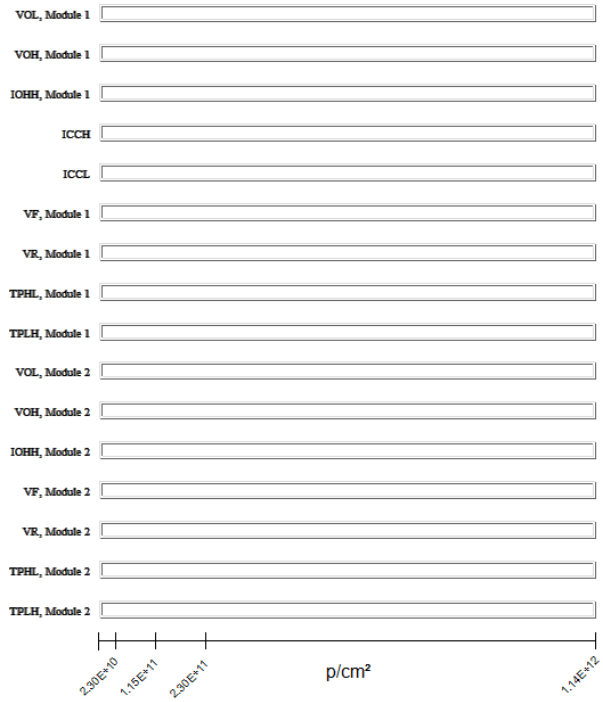


Figure 14: ON Bias 2 under 60 MeV protons



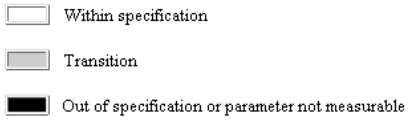


Figure 15: OFF Bias under 60 MeV protons

For all devices tested, whatever the bias condition, all parameters are functional up to a fluence of **1.14E12.p/cm².**

7.3 190 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

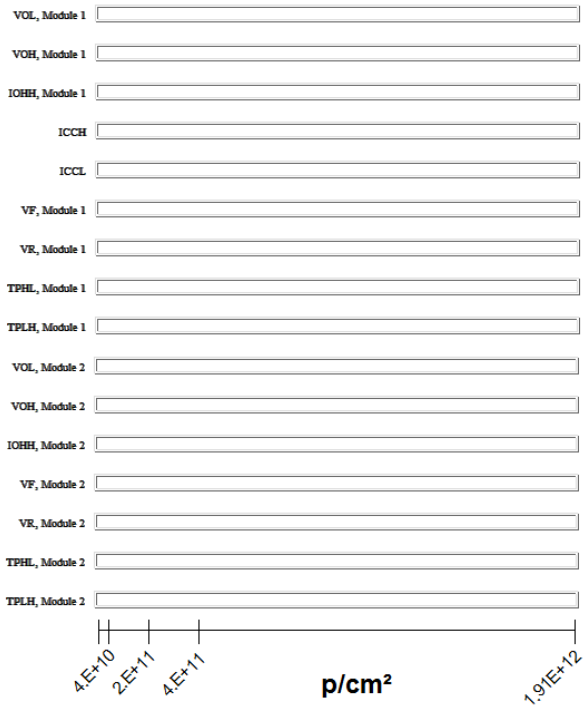


Figure 16: ON Bias 1 under 190 MeV protons

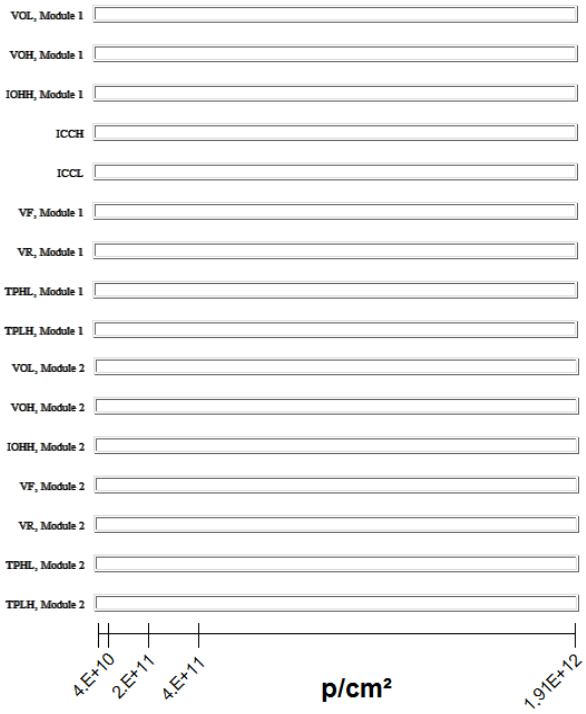


Figure 17: ON Bias 2 under 190 MeV protons

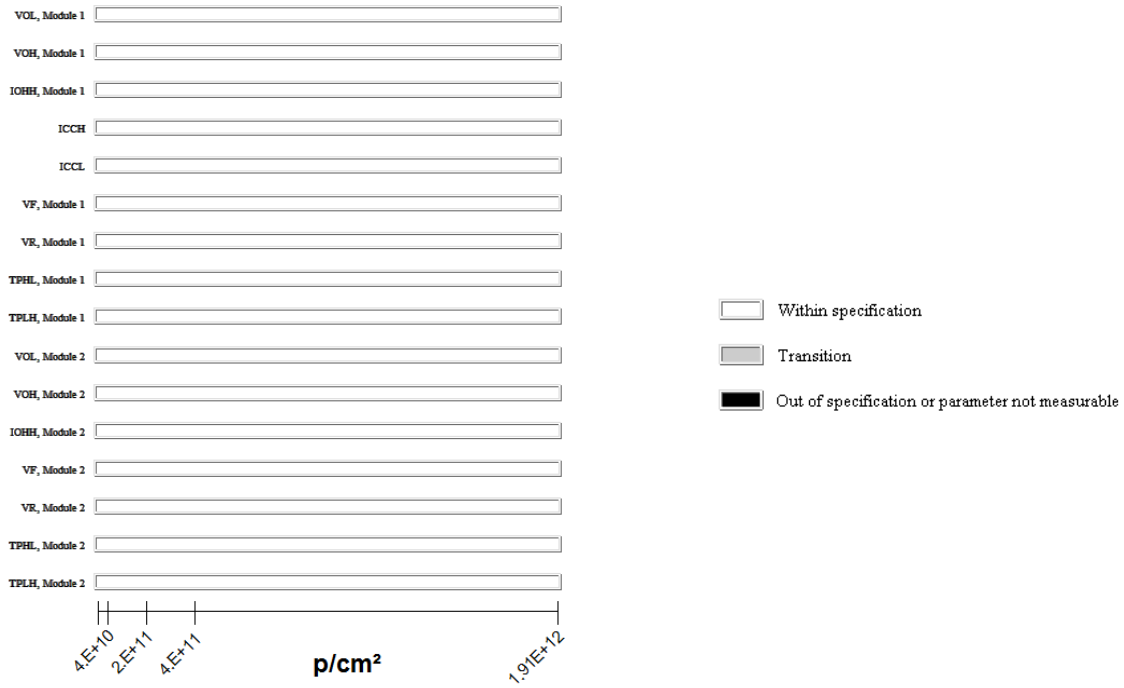


Figure 18: OFF Bias under 190 MeV protons

For all devices tested, whatever the bias condition, all parameters are functional up to a fluence of **1.91E12.p/cm².**

8 CONCLUSION

Total fluence steady-state irradiation test using protons has been applied on **HCPL5431** type**, Hermetically Sealed, Very High Speed, Logic Gate Optocouplers** 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 indicate that:

- Under 30MeV proton Beam:

All devices are functional up to 1.7 E+12 protons/cm² total fluence level.

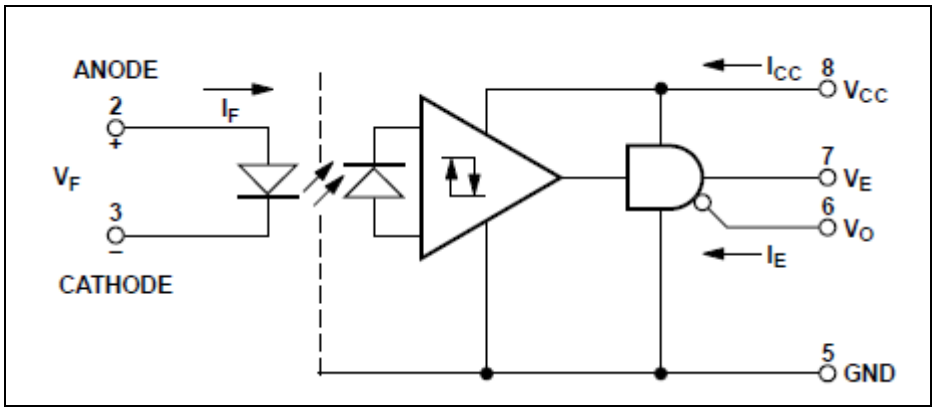
- Under 60MeV proton Beam:

All devices are functional up to 1.14 E+12 protons/cm² total fluence level.

- Under 60MeV proton Beam:

All devices are functional up to 1.91 E+12 protons/cm² total fluence level.

No CTR comparison is preformed due to the device technology.
Indeed each channel contains an AlGaAs light emitting diode which is optically coupled to an integrated high gain photon detector. Then contrary to the Input Diode current, the On state collector current cannot be measured.



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" protons/cm² step.

For CTR values, the formula used is:

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

For the other measurements the formula used is:

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

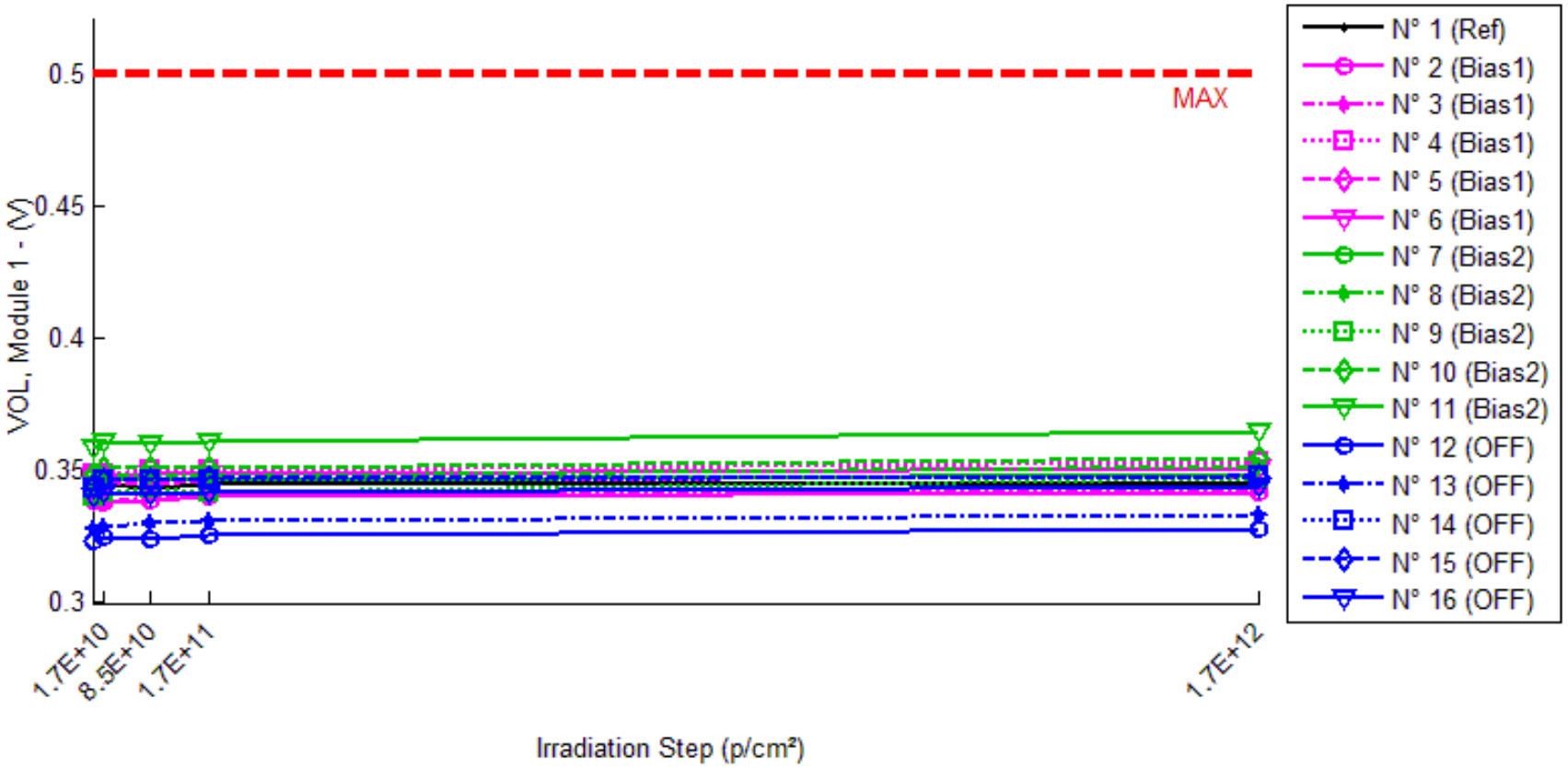
30 MeV proton / detailed results

CONTENTS

30 MeV proton / detailed results

1. VOL module 1

Ta = 25°C ; Iol = 8mA



30 MeV proton / detailed results

VOL, Module 1 . (V) **Max = 0.5**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.345	0.345	0.343	0.345	0.345
N° 2 (Bias1)	0.339	0.338	0.339	0.340	0.342
N° 3 (Bias1)	0.338	0.338	0.340	0.340	0.343
N° 4 (Bias1)	0.349	0.349	0.350	0.350	0.353
N° 5 (Bias1)	0.344	0.345	0.345	0.346	0.348
N° 6 (Bias1)	0.348	0.348	0.349	0.349	0.351
N° 7 (Bias2)	0.344	0.346	0.346	0.346	0.349
N° 8 (Bias2)	0.346	0.348	0.348	0.348	0.352
N° 9 (Bias2)	0.340	0.342	0.343	0.342	0.347
N° 10 (Bias2)	0.349	0.351	0.351	0.351	0.355
N° 11 (Bias2)	0.359	0.361	0.360	0.361	0.365
N° 12 (OFF)	0.323	0.325	0.324	0.326	0.328
N° 13 (OFF)	0.328	0.329	0.330	0.331	0.333
N° 14 (OFF)	0.343	0.346	0.346	0.346	0.348
N° 15 (OFF)	0.344	0.346	0.346	0.347	0.348
N° 16 (OFF)	0.340	0.342	0.341	0.342	0.344

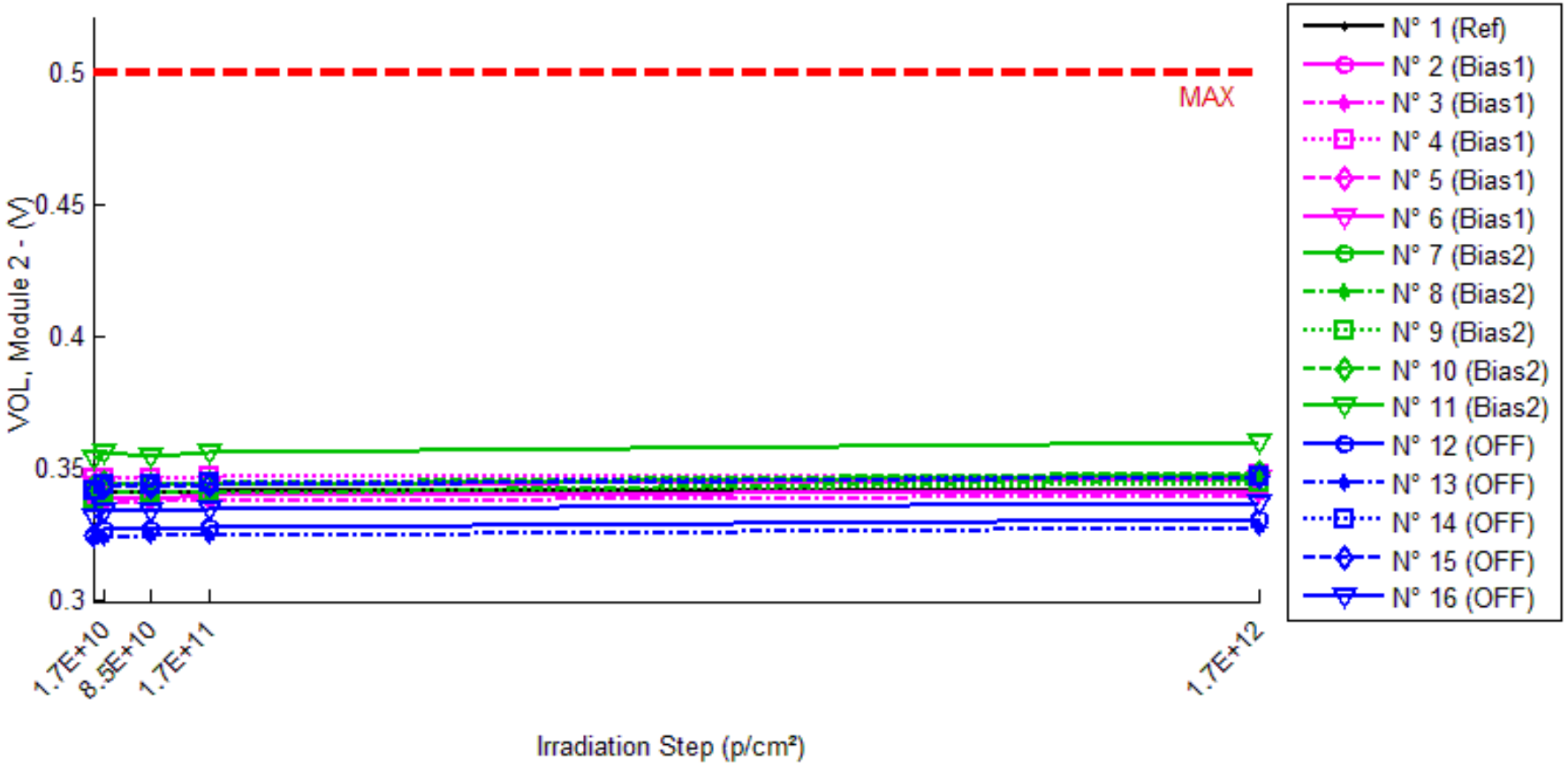
Delta [VOL, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-6.374E-4	-2.365E-3	-2.519E-4	-1.460E-5
N° 2 (Bias1)	---	-1.140E-3	9.920E-5	6.112E-4	2.618E-3
N° 3 (Bias1)	---	1.992E-4	1.594E-3	2.040E-3	4.498E-3
N° 4 (Bias1)	---	2.938E-4	7.349E-4	1.154E-3	3.585E-3
N° 5 (Bias1)	---	9.170E-4	5.379E-4	1.342E-3	3.922E-3
N° 6 (Bias1)	---	7.252E-4	1.226E-3	1.164E-3	3.302E-3
N° 7 (Bias2)	---	1.731E-3	1.923E-3	1.740E-3	4.756E-3
N° 8 (Bias2)	---	1.874E-3	1.976E-3	1.770E-3	6.587E-3
N° 9 (Bias2)	---	2.474E-3	2.631E-3	2.414E-3	7.374E-3
N° 10 (Bias2)	---	2.713E-3	2.244E-3	2.481E-3	6.101E-3
N° 11 (Bias2)	---	1.843E-3	1.431E-3	1.808E-3	6.060E-3
N° 12 (OFF)	---	2.571E-3	1.706E-3	3.513E-3	5.240E-3
N° 13 (OFF)	---	1.894E-3	2.061E-3	3.066E-3	5.600E-3
N° 14 (OFF)	---	2.660E-3	2.509E-3	3.038E-3	4.609E-3
N° 15 (OFF)	---	2.036E-3	1.768E-3	2.643E-3	4.068E-3
N° 16 (OFF)	---	1.806E-3	9.769E-4	2.351E-3	4.410E-3
Average (OFF)	---	1.990E-4	8.385E-4	1.262E-3	3.585E-3
σ (OFF)	---	8.055E-4	5.851E-4	5.141E-4	7.003E-4
Average+3σ (OFF)	---	2.615E-3	2.594E-3	2.805E-3	5.686E-3
Average-3σ (OFF)	---	-2.217E-3	-9.167E-4	-2.801E-4	1.484E-3
Average (Bias1)	---	2.127E-3	2.041E-3	2.043E-3	6.175E-3
σ (Bias1)	---	4.375E-4	4.413E-4	3.711E-4	9.541E-4
Average+3σ (Bias1)	---	3.440E-3	3.365E-3	3.156E-3	9.038E-3
Average-3σ (Bias1)	---	8.146E-4	7.169E-4	9.293E-4	3.313E-3
Average (Bias2)	---	2.193E-3	1.804E-3	2.922E-3	4.786E-3
σ (Bias2)	---	3.953E-4	5.607E-4	4.438E-4	6.240E-4
Average+3σ (Bias2)	---	3.379E-3	3.486E-3	4.254E-3	6.658E-3
Average-3σ (Bias2)	---	1.007E-3	1.220E-4	1.591E-3	2.913E-3

30 MeV proton / detailed results

2. VOL module 2

Ta = 25°C ; Iol = 8mA



30 MeV proton / detailed results

VOL, Module 2 . (V) **Max = 0.5**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.342	0.342	0.341	0.342	0.342
N° 2 (Bias1)	0.339	0.339	0.339	0.340	0.342
N° 3 (Bias1)	0.337	0.337	0.338	0.338	0.340
N° 4 (Bias1)	0.346	0.346	0.346	0.347	0.348
N° 5 (Bias1)	0.344	0.344	0.344	0.345	0.347
N° 6 (Bias1)	0.344	0.344	0.344	0.344	0.346
N° 7 (Bias2)	0.343	0.344	0.344	0.344	0.348
N° 8 (Bias2)	0.340	0.341	0.341	0.341	0.346
N° 9 (Bias2)	0.339	0.341	0.341	0.341	0.345
N° 10 (Bias2)	0.343	0.345	0.344	0.345	0.349
N° 11 (Bias2)	0.354	0.356	0.355	0.356	0.360
N° 12 (OFF)	0.325	0.327	0.327	0.328	0.331
N° 13 (OFF)	0.323	0.324	0.325	0.325	0.328
N° 14 (OFF)	0.342	0.344	0.344	0.345	0.347
N° 15 (OFF)	0.342	0.343	0.343	0.344	0.347
N° 16 (OFF)	0.332	0.334	0.334	0.335	0.337

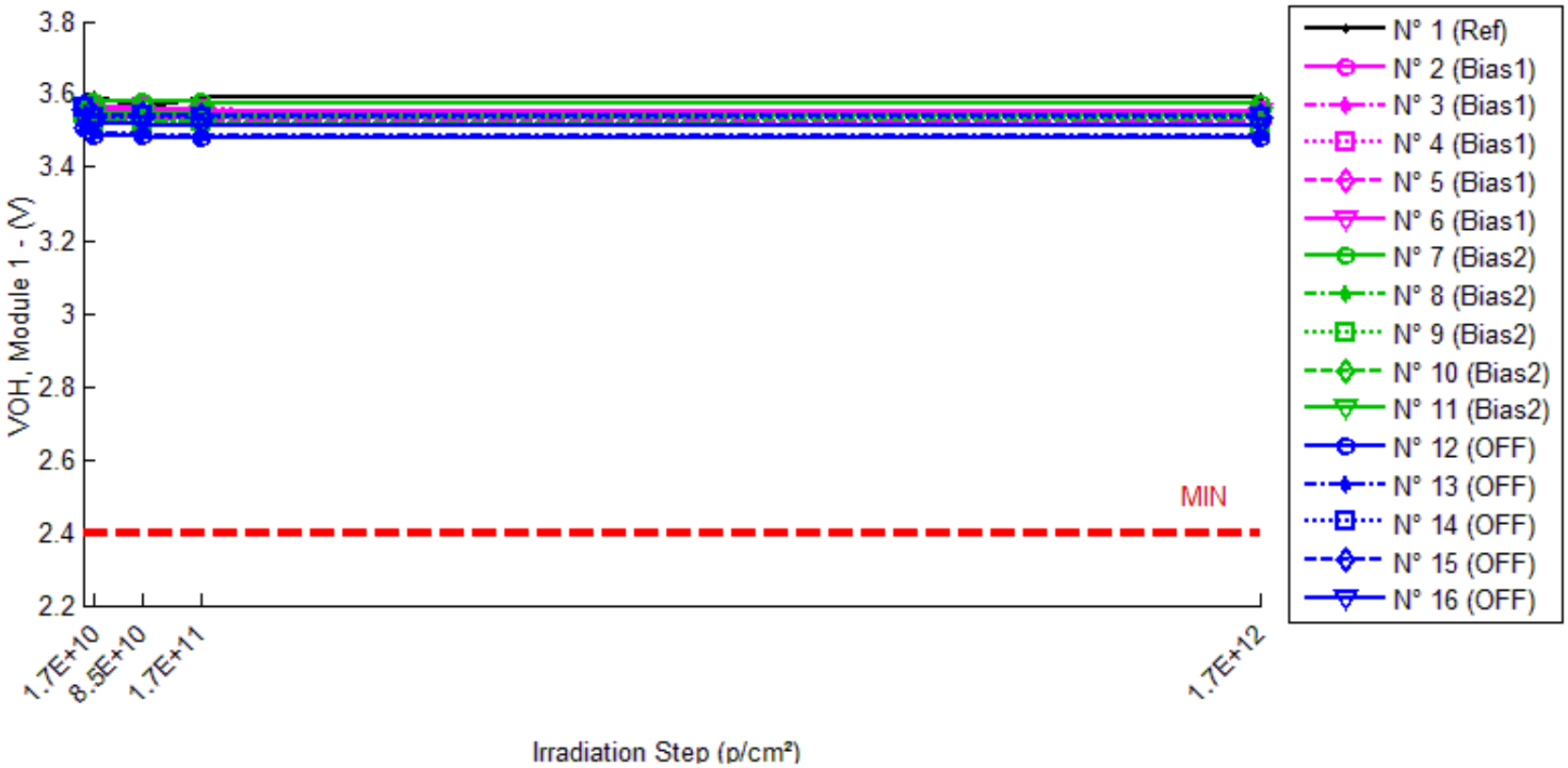
Delta [VOL, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-5.421E-4	-1.154E-3	-3.457E-4	-1.784E-4
N° 2 (Bias1)	---	-3.421E-4	-7.570E-5	5.556E-4	2.625E-3
N° 3 (Bias1)	---	6.560E-5	6.327E-4	6.928E-4	3.446E-3
N° 4 (Bias1)	---	9.000E-6	3.459E-4	7.262E-4	2.702E-3
N° 5 (Bias1)	---	-9.210E-5	2.377E-4	6.331E-4	3.125E-3
N° 6 (Bias1)	---	1.690E-4	5.812E-4	6.611E-4	2.779E-3
N° 7 (Bias2)	---	8.951E-4	1.367E-3	1.697E-3	4.912E-3
N° 8 (Bias2)	---	1.208E-3	1.655E-3	1.613E-3	6.078E-3
N° 9 (Bias2)	---	1.495E-3	1.888E-3	1.414E-3	6.214E-3
N° 10 (Bias2)	---	1.605E-3	1.431E-3	1.781E-3	5.539E-3
N° 11 (Bias2)	---	1.595E-3	1.237E-3	1.789E-3	5.527E-3
N° 12 (OFF)	---	1.905E-3	1.758E-3	2.875E-3	6.138E-3
N° 13 (OFF)	---	1.504E-3	1.895E-3	2.758E-3	5.385E-3
N° 14 (OFF)	---	1.882E-3	1.993E-3	2.738E-3	4.870E-3
N° 15 (OFF)	---	1.241E-3	1.717E-3	2.554E-3	4.944E-3
N° 16 (OFF)	---	1.576E-3	1.241E-3	2.141E-3	4.741E-3
Average (OFF)	---	-3.812E-5	3.444E-4	6.538E-4	2.936E-3
σ (OFF)	---	1.944E-4	2.859E-4	6.498E-5	3.436E-4
Average+3σ (OFF)	---	5.451E-4	1.202E-3	8.487E-4	3.966E-3
Average-3σ (OFF)	---	-6.214E-4	-5.135E-4	4.588E-4	1.905E-3
Average (Bias1)	---	1.360E-3	1.516E-3	1.659E-3	5.654E-3
σ (Bias1)	---	3.053E-4	2.574E-4	1.542E-4	5.177E-4
Average+3σ (Bias1)	---	2.276E-3	2.288E-3	2.122E-3	7.207E-3
Average-3σ (Bias1)	---	4.439E-4	7.437E-4	1.196E-3	4.101E-3
Average (Bias2)	---	1.622E-3	1.721E-3	2.613E-3	5.216E-3
σ (Bias2)	---	2.780E-4	2.900E-4	2.880E-4	5.695E-4
Average+3σ (Bias2)	---	2.456E-3	2.591E-3	3.477E-3	6.924E-3
Average-3σ (Bias2)	---	7.875E-4	8.506E-4	1.749E-3	3.507E-3

30 MeV proton / detailed results

3. VOH module 1

Ta = 25°C ; Ioh = -4mA



30 MeV proton / detailed results

VOH, Module 1 . (V) **Min = 2.4**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	3.592	3.595	3.564	3.593	3.592
N° 2 (Bias1)	3.555	3.561	3.554	3.552	3.543
N° 3 (Bias1)	3.544	3.543	3.537	3.535	3.525
N° 4 (Bias1)	3.565	3.564	3.562	3.560	3.551
N° 5 (Bias1)	3.537	3.533	3.535	3.531	3.519
N° 6 (Bias1)	3.567	3.564	3.562	3.561	3.552
N° 7 (Bias2)	3.563	3.582	3.581	3.582	3.576
N° 8 (Bias2)	3.544	3.524	3.524	3.526	3.513
N° 9 (Bias2)	3.548	3.526	3.525	3.527	3.515
N° 10 (Bias2)	3.560	3.537	3.539	3.539	3.530
N° 11 (Bias2)	3.568	3.549	3.550	3.549	3.539
N° 12 (OFF)	3.508	3.484	3.488	3.480	3.480
N° 13 (OFF)	3.512	3.491	3.490	3.486	3.485
N° 14 (OFF)	3.563	3.538	3.539	3.536	3.538
N° 15 (OFF)	3.567	3.544	3.545	3.541	3.542
N° 16 (OFF)	3.538	3.517	3.520	3.514	3.515

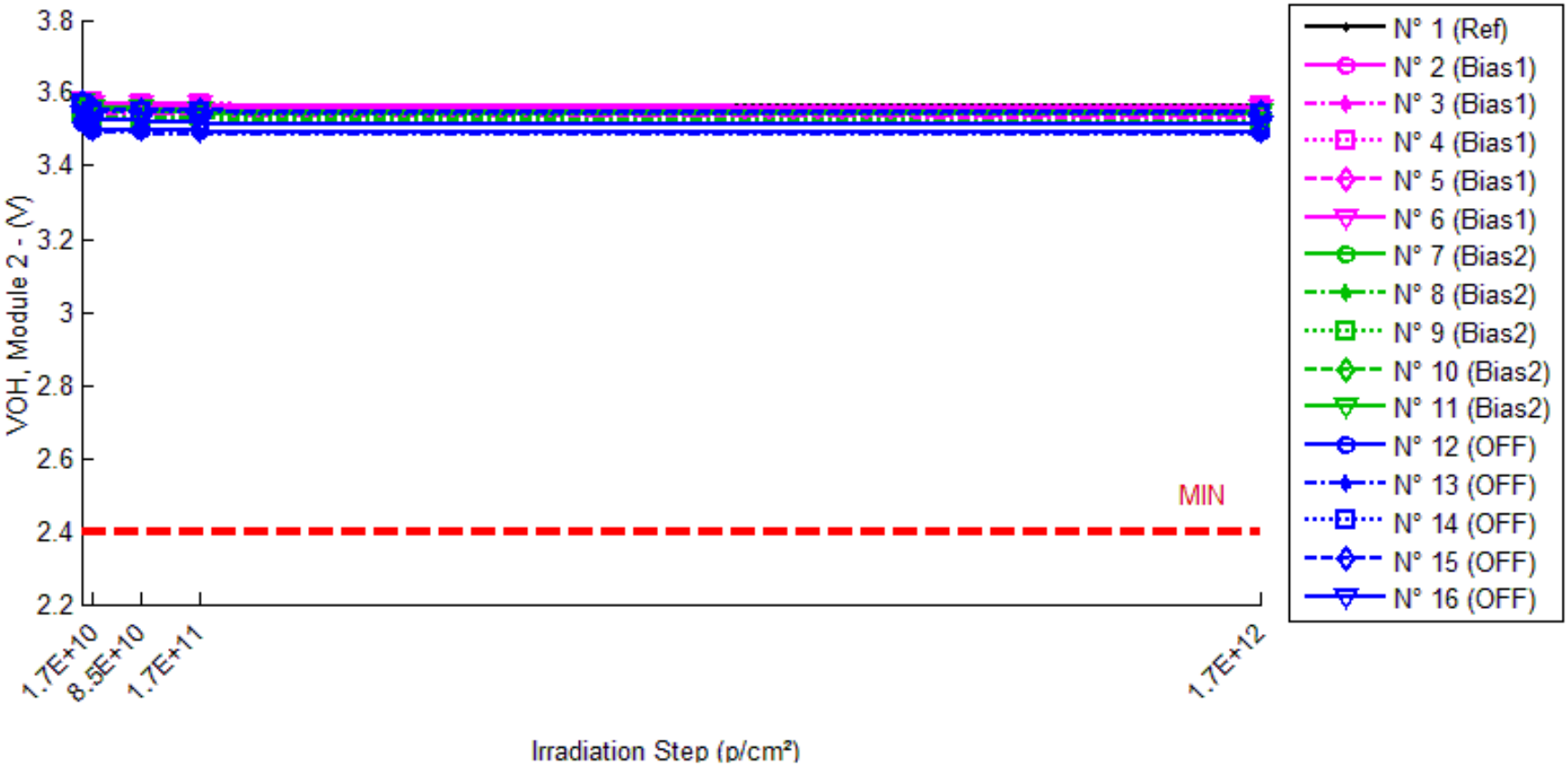
Delta [VOH, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.826E-3	-2.791E-2	1.015E-3	1.880E-4
N° 2 (Bias1)	---	5.763E-3	-3.410E-4	-2.710E-3	-1.177E-2
N° 3 (Bias1)	---	-8.670E-4	-7.076E-3	-8.636E-3	-1.871E-2
N° 4 (Bias1)	---	-5.340E-4	-2.931E-3	-4.918E-3	-1.406E-2
N° 5 (Bias1)	---	-4.121E-3	-2.514E-3	-6.628E-3	-1.787E-2
N° 6 (Bias1)	---	-3.028E-3	-4.832E-3	-5.678E-3	-1.498E-2
N° 7 (Bias2)	---	1.948E-2	1.805E-2	1.961E-2	1.316E-2
N° 8 (Bias2)	---	-1.906E-2	-1.991E-2	-1.803E-2	-3.047E-2
N° 9 (Bias2)	---	-2.200E-2	-2.300E-2	-2.115E-2	-3.347E-2
N° 10 (Bias2)	---	-2.282E-2	-2.162E-2	-2.168E-2	-3.060E-2
N° 11 (Bias2)	---	-1.914E-2	-1.811E-2	-1.900E-2	-2.821E-2
N° 12 (OFF)	---	-2.452E-2	-2.040E-2	-2.863E-2	-2.820E-2
N° 13 (OFF)	---	-2.127E-2	-2.184E-2	-2.622E-2	-2.714E-2
N° 14 (OFF)	---	-2.505E-2	-2.471E-2	-2.709E-2	-2.537E-2
N° 15 (OFF)	---	-2.252E-2	-2.158E-2	-2.565E-2	-2.436E-2
N° 16 (OFF)	---	-2.124E-2	-1.752E-2	-2.386E-2	-2.317E-2
Average (OFF)	---	-5.574E-4	-3.539E-3	-5.714E-3	-1.548E-2
σ (OFF)	---	3.836E-3	2.541E-3	2.181E-3	2.835E-3
Average+3σ (OFF)	---	1.095E-2	4.085E-3	8.299E-4	-6.974E-3
Average-3σ (OFF)	---	-1.206E-2	-1.116E-2	-1.226E-2	-2.399E-2
Average (Bias1)	---	-1.271E-2	-1.292E-2	-1.205E-2	-2.192E-2
σ (Bias1)	---	1.807E-2	1.741E-2	1.776E-2	1.970E-2
Average+3σ (Bias1)	---	4.151E-2	3.931E-2	4.123E-2	3.718E-2
Average-3σ (Bias1)	---	-6.693E-2	-6.514E-2	-6.533E-2	-8.101E-2
Average (Bias2)	---	-2.292E-2	-2.121E-2	-2.629E-2	-2.565E-2
σ (Bias2)	---	1.787E-3	2.602E-3	1.762E-3	2.036E-3
Average+3σ (Bias2)	---	-1.756E-2	-1.341E-2	-2.101E-2	-1.954E-2
Average-3σ (Bias2)	---	-2.828E-2	-2.902E-2	-3.157E-2	-3.176E-2

30 MeV proton / detailed results

4. VOH module 2

Ta = 25°C ; Ioh = -4mA



30 MeV proton / detailed results

VOH, Module 2 . (V) **Min = 2.4**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	3.561	3.563	3.566	3.562	3.562
N° 2 (Bias1)	3.565	3.566	3.565	3.562	3.554
N° 3 (Bias1)	3.547	3.546	3.543	3.544	3.533
N° 4 (Bias1)	3.573	3.573	3.572	3.570	3.562
N° 5 (Bias1)	3.548	3.548	3.546	3.544	3.534
N° 6 (Bias1)	3.573	3.572	3.571	3.570	3.561
N° 7 (Bias2)	3.568	3.553	3.551	3.550	3.544
N° 8 (Bias2)	3.547	3.530	3.528	3.530	3.519
N° 9 (Bias2)	3.550	3.533	3.531	3.534	3.521
N° 10 (Bias2)	3.567	3.549	3.550	3.549	3.540
N° 11 (Bias2)	3.574	3.556	3.557	3.555	3.546
N° 12 (OFF)	3.520	3.499	3.500	3.495	3.492
N° 13 (OFF)	3.512	3.493	3.492	3.488	3.484
N° 14 (OFF)	3.570	3.549	3.549	3.546	3.544
N° 15 (OFF)	3.574	3.556	3.554	3.551	3.549
N° 16 (OFF)	3.542	3.523	3.524	3.520	3.516

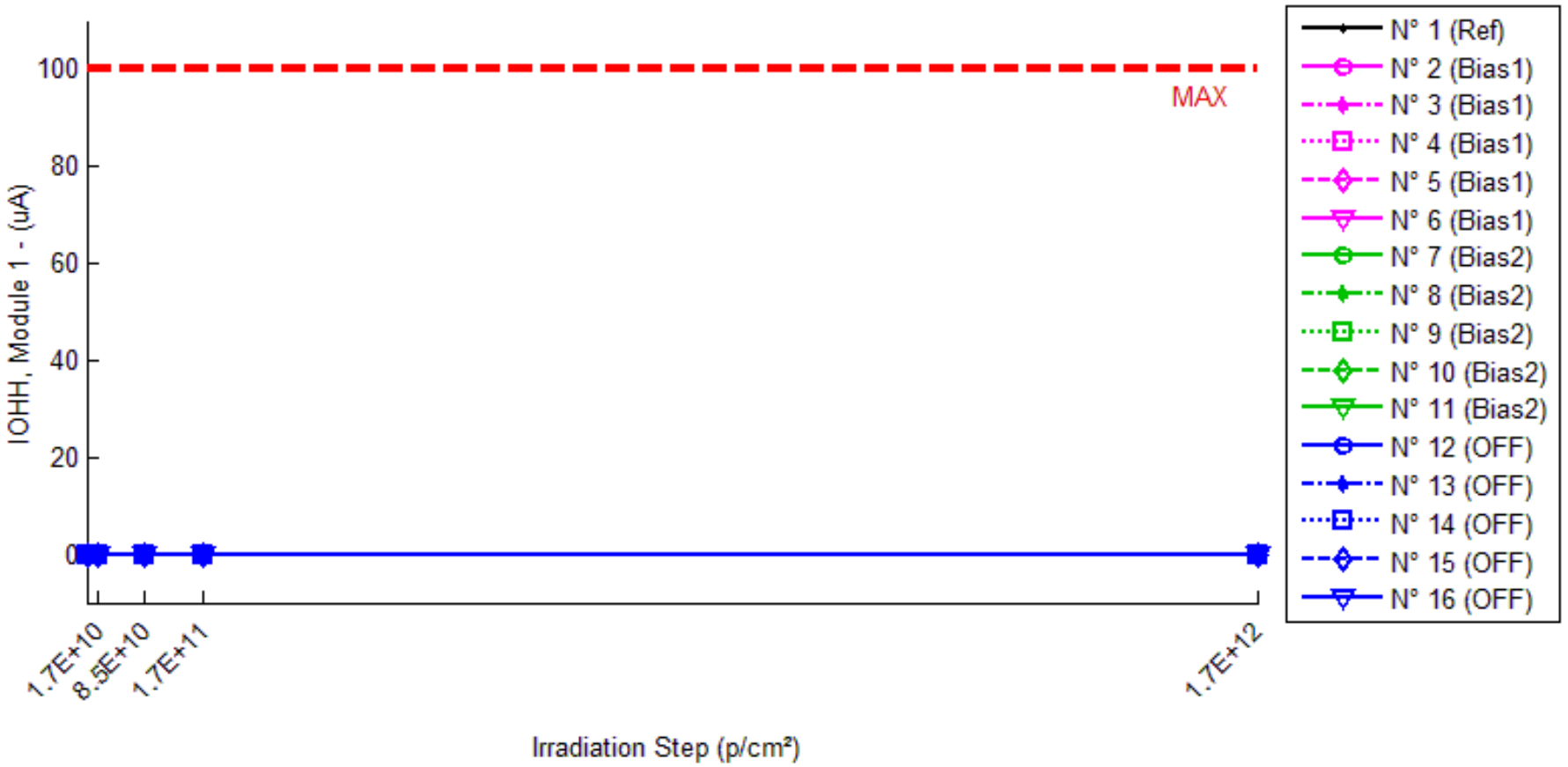
Delta [VOH, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.044E-3	4.783E-3	1.314E-3	7.800E-4
N° 2 (Bias1)	---	1.543E-3	1.250E-4	-2.748E-3	-1.039E-2
N° 3 (Bias1)	---	-6.100E-4	-3.571E-3	-3.286E-3	-1.412E-2
N° 4 (Bias1)	---	-3.250E-4	-1.695E-3	-3.196E-3	-1.184E-2
N° 5 (Bias1)	---	8.100E-5	-1.455E-3	-3.473E-3	-1.384E-2
N° 6 (Bias1)	---	-7.130E-4	-1.966E-3	-2.767E-3	-1.217E-2
N° 7 (Bias2)	---	-1.474E-2	-1.714E-2	-1.723E-2	-2.406E-2
N° 8 (Bias2)	---	-1.650E-2	-1.837E-2	-1.670E-2	-2.786E-2
N° 9 (Bias2)	---	-1.729E-2	-1.894E-2	-1.575E-2	-2.866E-2
N° 10 (Bias2)	---	-1.793E-2	-1.741E-2	-1.782E-2	-2.735E-2
N° 11 (Bias2)	---	-1.791E-2	-1.686E-2	-1.822E-2	-2.794E-2
N° 12 (OFF)	---	-2.063E-2	-1.965E-2	-2.461E-2	-2.760E-2
N° 13 (OFF)	---	-1.935E-2	-2.046E-2	-2.419E-2	-2.809E-2
N° 14 (OFF)	---	-2.050E-2	-2.086E-2	-2.361E-2	-2.561E-2
N° 15 (OFF)	---	-1.779E-2	-1.973E-2	-2.277E-2	-2.510E-2
N° 16 (OFF)	---	-1.905E-2	-1.800E-2	-2.198E-2	-2.561E-2
Average (OFF)	---	-4.800E-6	-1.712E-3	-3.094E-3	-1.248E-2
σ (OFF)	---	9.183E-4	1.319E-3	3.231E-4	1.534E-3
Average+3σ (OFF)	---	2.750E-3	2.245E-3	-2.125E-3	-7.873E-3
Average-3σ (OFF)	---	-2.760E-3	-5.670E-3	-4.063E-3	-1.708E-2
Average (Bias1)	---	-1.687E-2	-1.775E-2	-1.714E-2	-2.718E-2
σ (Bias1)	---	1.327E-3	8.772E-4	9.731E-4	1.804E-3
Average+3σ (Bias1)	---	-1.289E-2	-1.512E-2	-1.423E-2	-2.176E-2
Average-3σ (Bias1)	---	-2.085E-2	-2.038E-2	-2.006E-2	-3.259E-2
Average (Bias2)	---	-1.946E-2	-1.974E-2	-2.343E-2	-2.640E-2
σ (Bias2)	---	1.161E-3	1.096E-3	1.069E-3	1.345E-3
Average+3σ (Bias2)	---	-1.598E-2	-1.645E-2	-2.023E-2	-2.237E-2
Average-3σ (Bias2)	---	-2.295E-2	-2.303E-2	-2.664E-2	-3.044E-2

30 MeV proton / detailed results

5. IOHH module 1

Ta = 25°C ; Vo = 5.25V ; Vf = 0.7V



30 MeV proton / detailed results

IOHH, Module 1 . (uA) **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)	6.607E-4	7.179E-4	9.425E-4	6.655E-4	6.228E-4
N° 2 (Bias1)	6.176E-4	7.259E-4	6.163E-4	5.866E-4	6.451E-4
N° 3 (Bias1)	6.408E-4	6.207E-4	5.193E-4	5.140E-4	5.825E-4
N° 4 (Bias1)	7.731E-4	7.716E-4	7.324E-4	6.898E-4	7.549E-4
N° 5 (Bias1)	7.310E-4	6.290E-4	6.630E-4	6.138E-4	6.734E-4
N° 6 (Bias1)	7.471E-4	6.754E-4	6.526E-4	6.375E-4	6.988E-4
N° 7 (Bias2)	7.043E-4	5.467E-4	5.518E-4	5.977E-4	7.195E-4
N° 8 (Bias2)	6.351E-4	5.024E-4	5.369E-4	5.661E-4	5.811E-4
N° 9 (Bias2)	6.414E-4	4.621E-4	4.789E-4	5.131E-4	5.258E-4
N° 10 (Bias2)	7.852E-4	5.397E-4	6.115E-4	6.152E-4	6.634E-4
N° 11 (Bias2)	8.279E-4	6.654E-4	7.379E-4	7.214E-4	7.559E-4
N° 12 (OFF)	4.854E-4	3.428E-4	4.007E-4	3.291E-4	5.256E-4
N° 13 (OFF)	4.861E-4	3.760E-4	3.896E-4	3.520E-4	5.403E-4
N° 14 (OFF)	7.222E-4	4.909E-4	5.486E-4	5.138E-4	7.741E-4
N° 15 (OFF)	6.636E-4	5.146E-4	5.459E-4	4.898E-4	7.545E-4
N° 16 (OFF)	5.637E-4	4.457E-4	5.279E-4	4.315E-4	6.708E-4

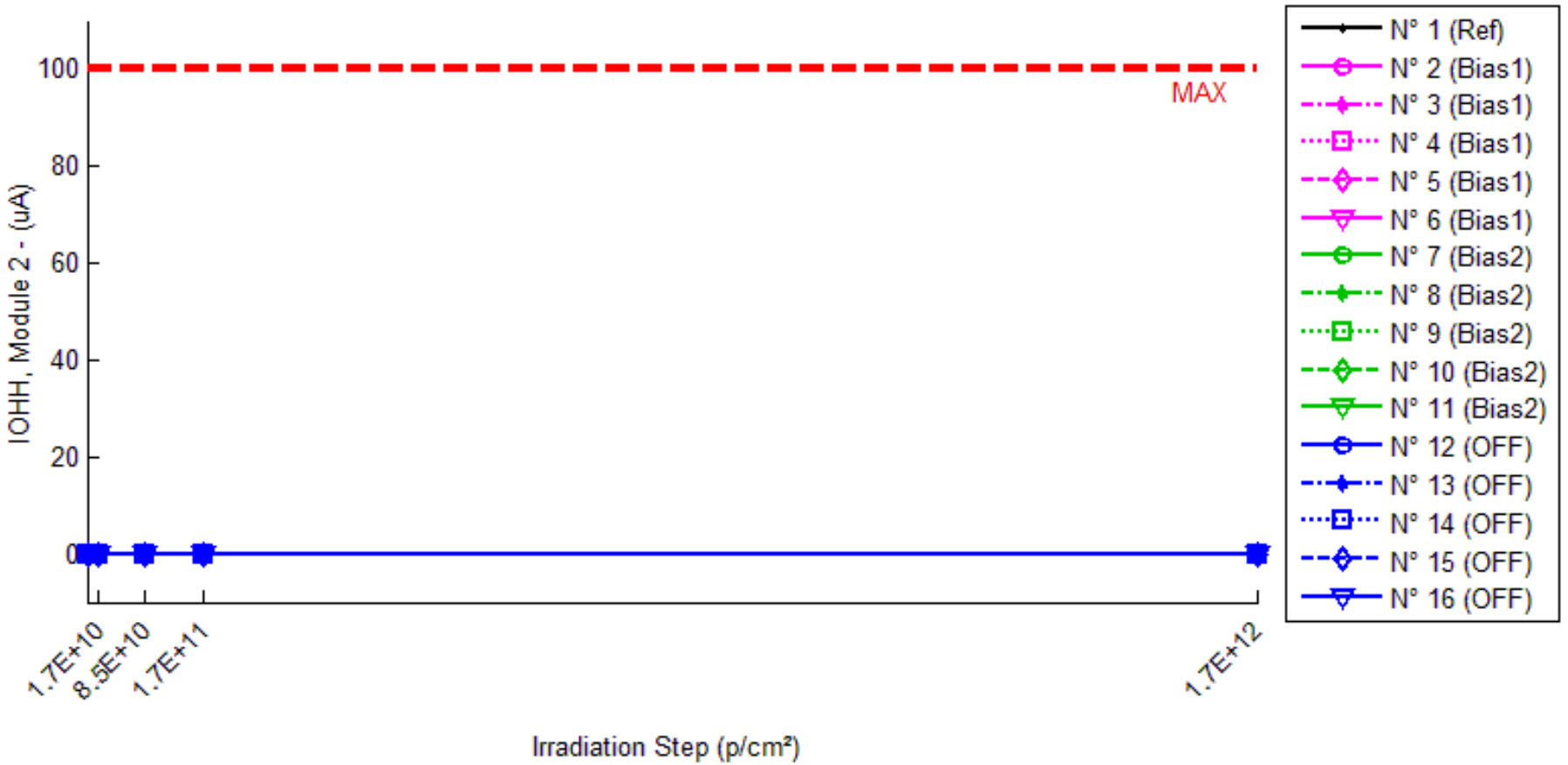
Delta [IOHH, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	5.729E-5	2.818E-4	4.815E-6	-3.789E-5
N° 2 (Bias1)	---	1.083E-4	-1.345E-6	-3.102E-5	2.749E-5
N° 3 (Bias1)	---	-2.008E-5	-1.215E-4	-1.267E-4	-5.821E-5
N° 4 (Bias1)	---	-1.514E-6	-4.070E-5	-8.332E-5	-1.823E-5
N° 5 (Bias1)	---	-1.020E-4	-6.807E-5	-1.172E-4	-5.759E-5
N° 6 (Bias1)	---	-7.167E-5	-9.451E-5	-1.096E-4	-4.832E-5
N° 7 (Bias2)	---	-1.576E-4	-1.526E-4	-1.066E-4	1.514E-5
N° 8 (Bias2)	---	-1.327E-4	-9.816E-5	-6.899E-5	-5.394E-5
N° 9 (Bias2)	---	-1.793E-4	-1.625E-4	-1.283E-4	-1.155E-4
N° 10 (Bias2)	---	-2.455E-4	-1.737E-4	-1.700E-4	-1.217E-4
N° 11 (Bias2)	---	-1.625E-4	-9.001E-5	-1.065E-4	-7.195E-5
N° 12 (OFF)	---	-1.426E-4	-8.471E-5	-1.563E-4	4.018E-5
N° 13 (OFF)	---	-1.100E-4	-9.645E-5	-1.341E-4	5.427E-5
N° 14 (OFF)	---	-2.313E-4	-1.736E-4	-2.084E-4	5.189E-5
N° 15 (OFF)	---	-1.490E-4	-1.177E-4	-1.737E-4	9.091E-5
N° 16 (OFF)	---	-1.179E-4	-3.579E-5	-1.322E-4	1.071E-4
Average (OFF)	---	-1.741E-5	-6.522E-5	-9.357E-5	-3.097E-5
σ (OFF)	---	8.086E-5	4.666E-5	3.851E-5	3.651E-5
Average+3σ (OFF)	---	2.252E-4	7.478E-5	2.197E-5	7.856E-5
Average-3σ (OFF)	---	-2.600E-4	-2.052E-4	-2.091E-4	-1.405E-4
Average (Bias1)	---	-1.755E-4	-1.354E-4	-1.161E-4	-6.961E-5
σ (Bias1)	---	4.252E-5	3.855E-5	3.692E-5	5.537E-5
Average+3σ (Bias1)	---	-4.795E-5	-1.975E-5	-5.310E-6	9.649E-5
Average-3σ (Bias1)	---	-3.031E-4	-2.510E-4	-2.269E-4	-2.357E-4
Average (Bias2)	---	-1.502E-4	-1.016E-4	-1.609E-4	6.887E-5
σ (Bias2)	---	4.820E-5	5.021E-5	3.157E-5	2.861E-5
Average+3σ (Bias2)	---	-5.593E-6	4.899E-5	-6.622E-5	1.547E-4
Average-3σ (Bias2)	---	-2.948E-4	-2.523E-4	-2.557E-4	-1.695E-5

30 MeV proton / detailed results

6. IOHH module 2

Ta = 25°C ; Vo = 5.25V ; Vf = 0.7V



30 MeV proton / detailed results

IOHH, Module 2 . (uA) **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)	9.518E-4	1.016E-3	1.124E-3	9.814E-4	9.615E-4
N° 2 (Bias1)	9.219E-4	9.575E-4	9.369E-4	8.685E-4	9.880E-4
N° 3 (Bias1)	8.255E-4	8.031E-4	7.552E-4	7.889E-4	8.603E-4
N° 4 (Bias1)	1.120E-3	1.104E-3	1.071E-3	1.047E-3	1.147E-3
N° 5 (Bias1)	9.322E-4	9.317E-4	8.970E-4	8.692E-4	9.899E-4
N° 6 (Bias1)	9.729E-4	9.477E-4	9.214E-4	9.368E-4	1.023E-3
N° 7 (Bias2)	9.753E-4	9.205E-4	9.021E-4	9.147E-4	1.083E-3
N° 8 (Bias2)	8.461E-4	7.524E-4	7.600E-4	8.211E-4	8.770E-4
N° 9 (Bias2)	8.283E-4	7.097E-4	7.183E-4	8.176E-4	8.198E-4
N° 10 (Bias2)	1.069E-3	9.089E-4	9.914E-4	9.994E-4	1.063E-3
N° 11 (Bias2)	1.270E-3	1.071E-3	1.205E-3	1.168E-3	1.220E-3
N° 12 (OFF)	6.606E-4	5.498E-4	5.929E-4	5.312E-4	7.304E-4
N° 13 (OFF)	6.146E-4	5.390E-4	5.449E-4	5.054E-4	7.125E-4
N° 14 (OFF)	9.690E-4	8.274E-4	8.494E-4	8.023E-4	1.079E-3
N° 15 (OFF)	9.326E-4	8.736E-4	8.600E-4	8.026E-4	1.047E-3
N° 16 (OFF)	7.557E-4	6.747E-4	7.393E-4	6.628E-4	8.814E-4

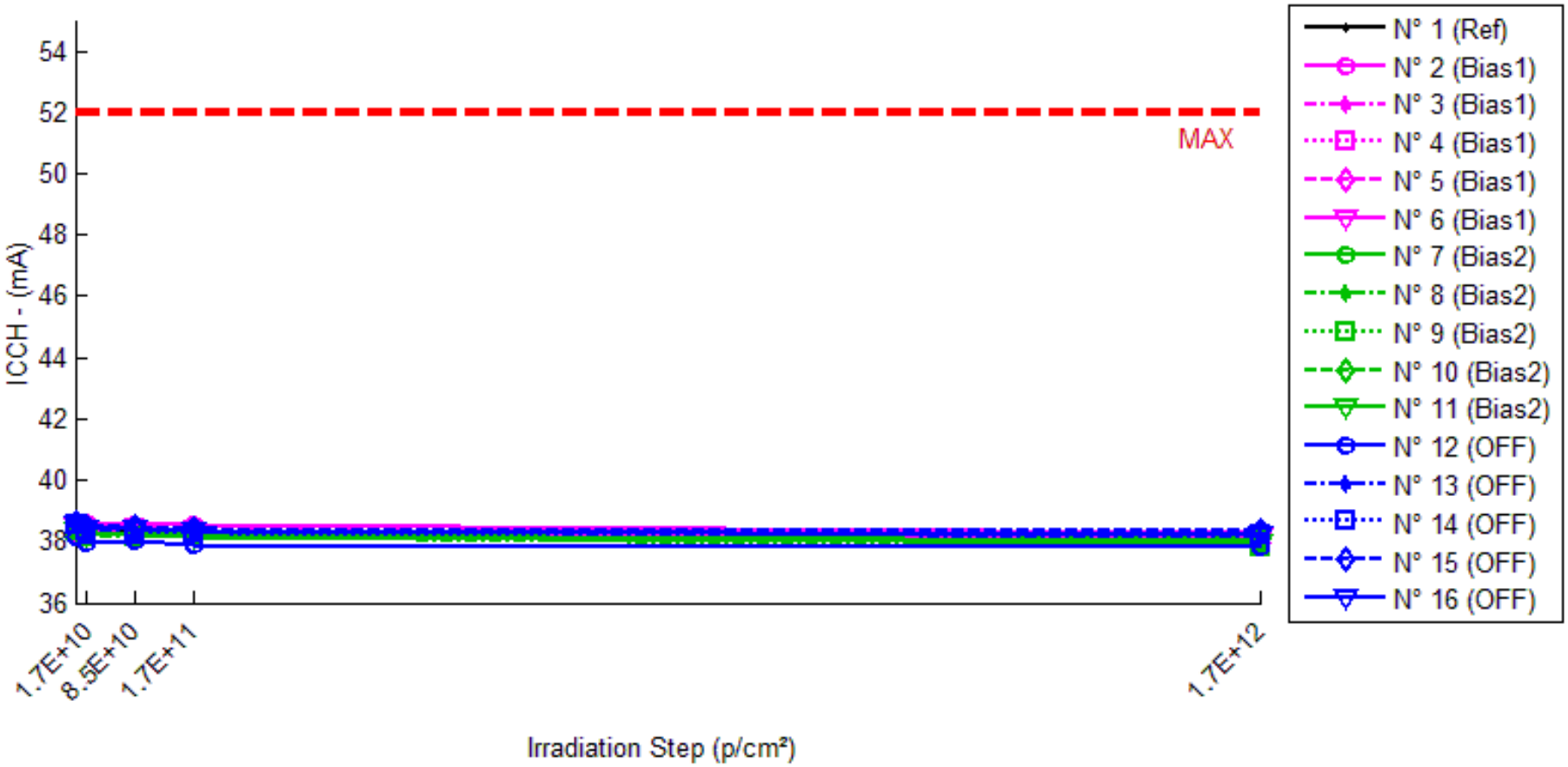
Delta [IOHH, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	6.395E-5	1.718E-4	2.967E-5	9.722E-6
N° 2 (Bias1)	---	3.562E-5	1.504E-5	-5.336E-5	6.613E-5
N° 3 (Bias1)	---	-2.234E-5	-7.025E-5	-3.655E-5	3.483E-5
N° 4 (Bias1)	---	-1.602E-5	-4.854E-5	-7.284E-5	2.711E-5
N° 5 (Bias1)	---	-5.510E-7	-3.525E-5	-6.304E-5	5.763E-5
N° 6 (Bias1)	---	-2.524E-5	-5.147E-5	-3.605E-5	4.996E-5
N° 7 (Bias2)	---	-5.484E-5	-7.324E-5	-6.063E-5	1.073E-4
N° 8 (Bias2)	---	-9.370E-5	-8.607E-5	-2.505E-5	3.091E-5
N° 9 (Bias2)	---	-1.186E-4	-1.100E-4	-1.063E-5	-8.492E-6
N° 10 (Bias2)	---	-1.606E-4	-7.810E-5	-7.009E-5	-6.675E-6
N° 11 (Bias2)	---	-1.983E-4	-6.505E-5	-1.019E-4	-5.021E-5
N° 12 (OFF)	---	-1.108E-4	-6.772E-5	-1.293E-4	6.987E-5
N° 13 (OFF)	---	-7.557E-5	-6.965E-5	-1.092E-4	9.795E-5
N° 14 (OFF)	---	-1.417E-4	-1.197E-4	-1.667E-4	1.102E-4
N° 15 (OFF)	---	-5.899E-5	-7.261E-5	-1.299E-4	1.146E-4
N° 16 (OFF)	---	-8.100E-5	-1.633E-5	-9.282E-5	1.257E-4
Average (OFF)	---	-5.706E-6	-3.809E-5	-5.237E-5	4.713E-5
σ (OFF)	---	2.499E-5	3.222E-5	1.621E-5	1.606E-5
Average+3σ (OFF)	---	6.927E-5	5.858E-5	-3.744E-6	9.530E-5
Average-3σ (OFF)	---	-8.069E-5	-1.348E-4	-1.010E-4	-1.039E-6
Average (Bias1)	---	-1.252E-4	-8.248E-5	-5.366E-5	1.456E-5
σ (Bias1)	---	5.608E-5	1.715E-5	3.645E-5	5.925E-5
Average+3σ (Bias1)	---	4.306E-5	-3.103E-5	5.570E-5	1.923E-4
Average-3σ (Bias1)	---	-2.934E-4	-1.339E-4	-1.630E-4	-1.632E-4
Average (Bias2)	---	-9.360E-5	-6.920E-5	-1.256E-4	1.037E-4
σ (Bias2)	---	3.274E-5	3.660E-5	2.769E-5	2.134E-5
Average+3σ (Bias2)	---	4.626E-6	4.059E-5	-4.254E-5	1.677E-4
Average-3σ (Bias2)	---	-1.918E-4	-1.790E-4	-2.087E-4	3.963E-5

30 MeV proton / detailed results

7. ICCH

Ta = 25°C ; Vcc = 5.25V ; Ve = 0V



30 MeV proton / detailed results

ICCH . (mA) **Max = 52.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	38.297	38.322	38.410	38.304	38.296
N° 2 (Bias1)	38.604	38.642	38.562	38.517	38.313
N° 3 (Bias1)	38.545	38.527	38.440	38.402	38.106
N° 4 (Bias1)	38.453	38.439	38.392	38.360	38.139
N° 5 (Bias1)	38.365	38.318	38.306	38.247	37.934
N° 6 (Bias1)	38.481	38.445	38.398	38.372	38.154
N° 7 (Bias2)	38.400	38.259	38.222	38.232	38.022
N° 8 (Bias2)	38.336	38.187	38.159	38.157	37.824
N° 9 (Bias2)	38.326	38.152	38.124	38.134	37.809
N° 10 (Bias2)	38.583	38.394	38.400	38.385	38.144
N° 11 (Bias2)	38.353	38.206	38.214	38.181	37.927
N° 12 (OFF)	38.168	37.983	38.008	37.916	37.828
N° 13 (OFF)	38.560	38.400	38.382	38.325	38.184
N° 14 (OFF)	38.526	38.325	38.318	38.280	38.241
N° 15 (OFF)	38.626	38.459	38.464	38.409	38.318
N° 16 (OFF)	38.560	38.406	38.431	38.352	38.245

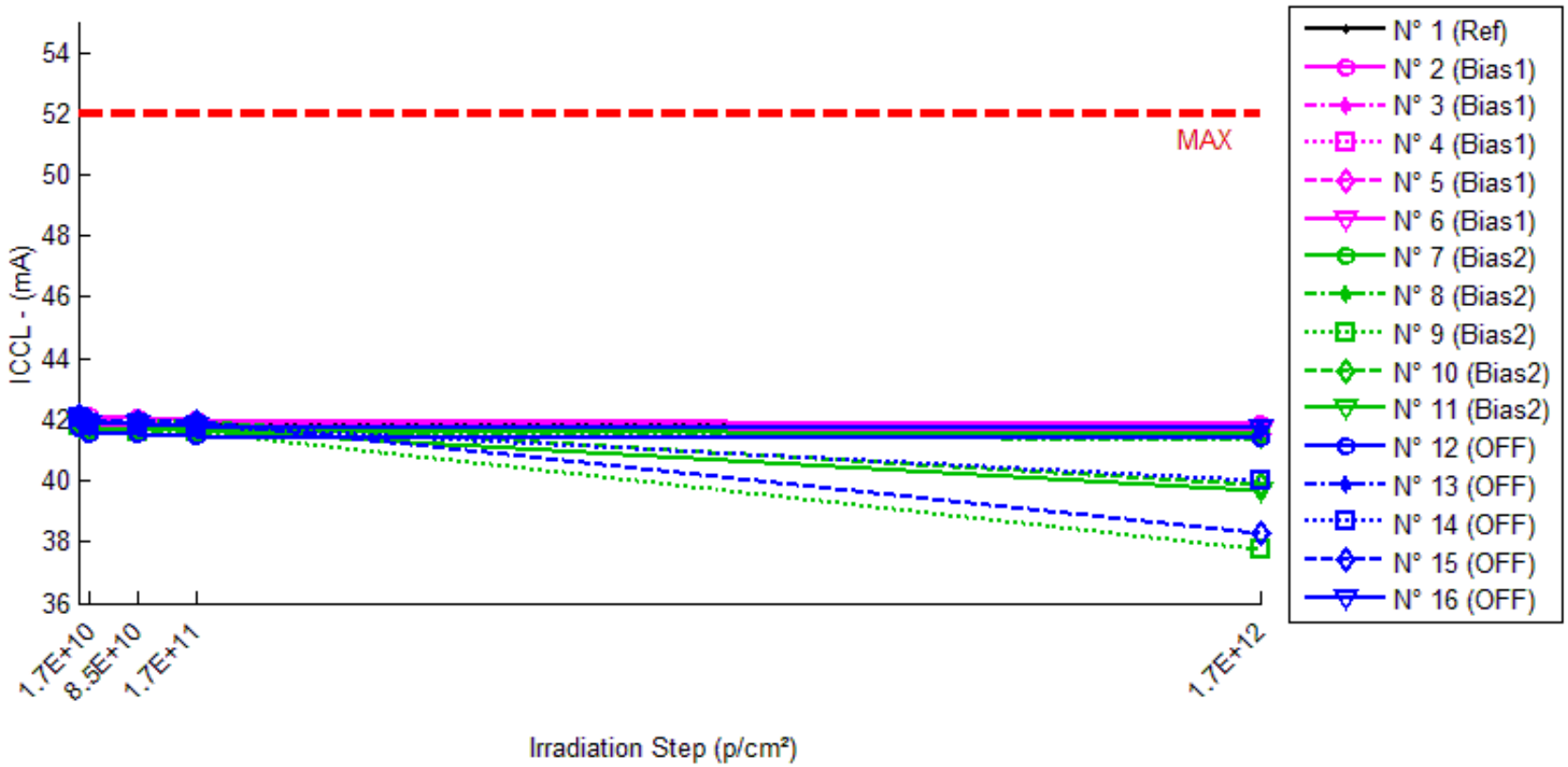
Delta [ICCH]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.547E-2	1.134E-1	7.650E-3	-8.100E-4
N° 2 (Bias1)	---	3.791E-2	-4.218E-2	-8.680E-2	-2.909E-1
N° 3 (Bias1)	---	-1.857E-2	-1.057E-1	-1.438E-1	-4.393E-1
N° 4 (Bias1)	---	-1.399E-2	-6.109E-2	-9.295E-2	-3.144E-1
N° 5 (Bias1)	---	-4.635E-2	-5.864E-2	-1.177E-1	-4.308E-1
N° 6 (Bias1)	---	-3.671E-2	-8.359E-2	-1.091E-1	-3.275E-1
N° 7 (Bias2)	---	-1.410E-1	-1.779E-1	-1.688E-1	-3.780E-1
N° 8 (Bias2)	---	-1.491E-1	-1.765E-1	-1.787E-1	-5.118E-1
N° 9 (Bias2)	---	-1.745E-1	-2.020E-1	-1.922E-1	-5.177E-1
N° 10 (Bias2)	---	-1.891E-1	-1.835E-1	-1.988E-1	-4.395E-1
N° 11 (Bias2)	---	-1.463E-1	-1.386E-1	-1.718E-1	-4.258E-1
N° 12 (OFF)	---	-1.851E-1	-1.602E-1	-2.525E-1	-3.407E-1
N° 13 (OFF)	---	-1.597E-1	-1.774E-1	-2.350E-1	-3.757E-1
N° 14 (OFF)	---	-2.015E-1	-2.081E-1	-2.466E-1	-2.851E-1
N° 15 (OFF)	---	-1.669E-1	-1.617E-1	-2.162E-1	-3.073E-1
N° 16 (OFF)	---	-1.541E-1	-1.294E-1	-2.081E-1	-3.155E-1
Average (OFF)	---	-1.554E-2	-7.023E-2	-1.101E-1	-3.606E-1
σ (OFF)	---	3.266E-2	2.469E-2	2.254E-2	6.930E-2
Average+3σ (OFF)	---	8.243E-2	3.848E-3	-4.246E-2	-1.527E-1
Average-3σ (OFF)	---	-1.135E-1	-1.443E-1	-1.777E-1	-5.685E-1
Average (Bias1)	---	-1.600E-1	-1.757E-1	-1.821E-1	-4.546E-1
σ (Bias1)	---	2.079E-2	2.310E-2	1.299E-2	5.953E-2
Average+3σ (Bias1)	---	-9.763E-2	-1.064E-1	-1.431E-1	-2.760E-1
Average-3σ (Bias1)	---	-2.224E-1	-2.450E-1	-2.210E-1	-6.331E-1
Average (Bias2)	---	-1.735E-1	-1.673E-1	-2.317E-1	-3.249E-1
σ (Bias2)	---	1.954E-2	2.866E-2	1.914E-2	3.470E-2
Average+3σ (Bias2)	---	-1.148E-1	-8.135E-2	-1.743E-1	-2.208E-1
Average-3σ (Bias2)	---	-2.321E-1	-2.533E-1	-2.891E-1	-4.289E-1

30 MeV proton / detailed results

8. ICCL

Ta = 25°C ; Vcc = 5.25V ; Ve = 0V ; If = 8mA



30 MeV proton / detailed results

ICCL . (mA) **Max = 52.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	41.768	41.790	41.873	41.774	41.761
N° 2 (Bias1)	42.082	42.112	42.044	42.010	41.865
N° 3 (Bias1)	42.063	42.044	41.968	41.937	41.708
N° 4 (Bias1)	41.890	41.875	41.836	41.809	41.636
N° 5 (Bias1)	41.843	41.799	41.792	41.743	41.496
N° 6 (Bias1)	41.884	41.849	41.808	41.792	41.640
N° 7 (Bias2)	41.827	41.666	41.641	41.660	41.516
N° 8 (Bias2)	41.772	41.610	41.588	41.600	41.348
N° 9 (Bias2)	41.818	41.633	41.608	41.625	37.782
N° 10 (Bias2)	42.093	41.891	41.902	41.895	39.895
N° 11 (Bias2)	41.829	41.666	41.680	41.655	39.672
N° 12 (OFF)	41.710	41.506	41.532	41.452	41.421
N° 13 (OFF)	42.046	41.867	41.861	41.813	41.748
N° 14 (OFF)	42.059	41.842	41.839	41.810	40.021
N° 15 (OFF)	42.130	41.945	41.954	41.909	38.252
N° 16 (OFF)	42.006	41.832	41.865	41.797	41.757

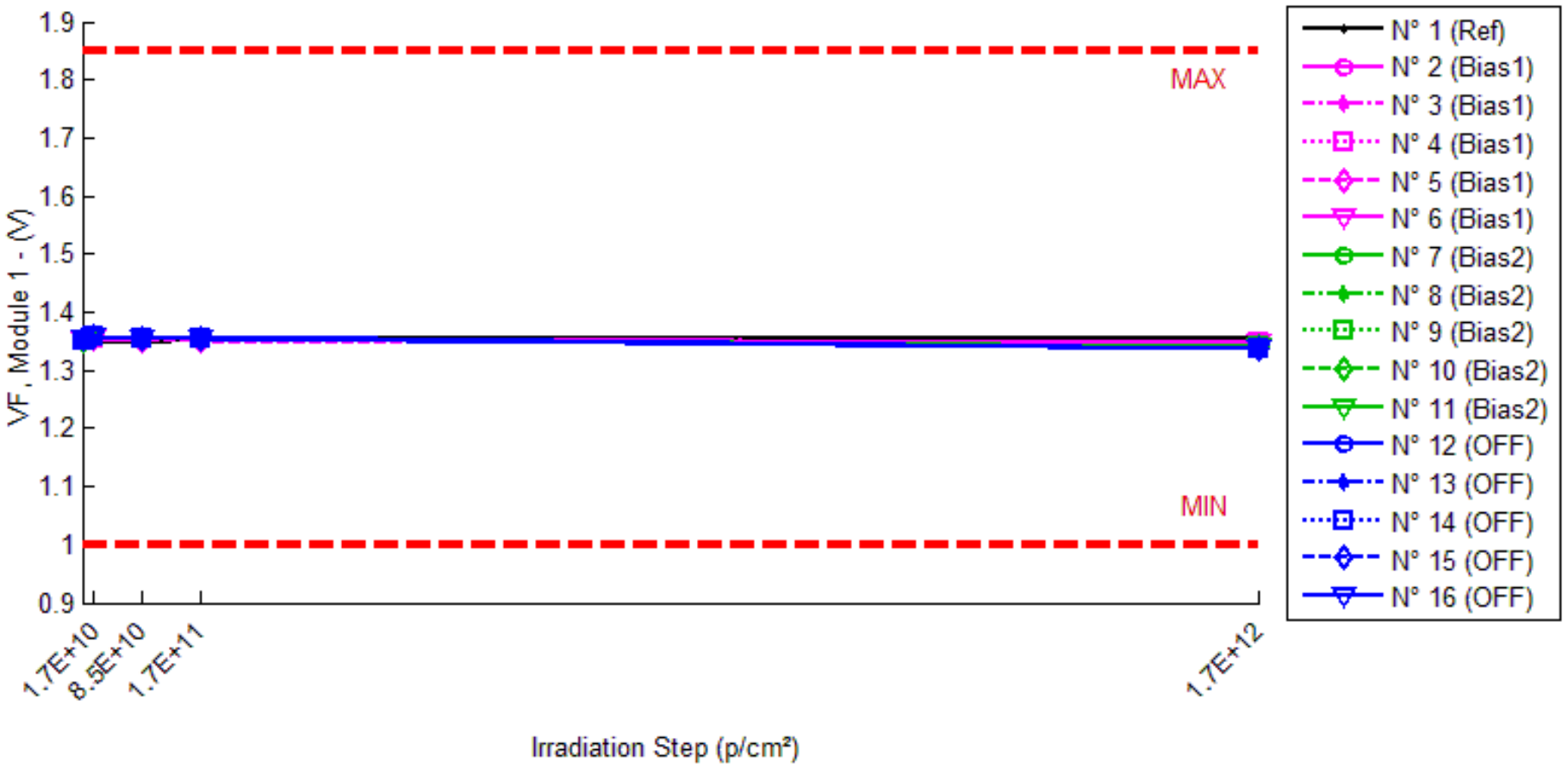
Delta [ICCL]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.248E-2	1.055E-1	6.400E-3	-7.050E-3
N° 2 (Bias1)	---	3.075E-2	-3.787E-2	-7.159E-2	-2.165E-1
N° 3 (Bias1)	---	-1.836E-2	-9.476E-2	-1.257E-1	-3.549E-1
N° 4 (Bias1)	---	-1.474E-2	-5.444E-2	-8.093E-2	-2.538E-1
N° 5 (Bias1)	---	-4.403E-2	-5.091E-2	-9.942E-2	-3.471E-1
N° 6 (Bias1)	---	-3.485E-2	-7.622E-2	-9.186E-2	-2.437E-1
N° 7 (Bias2)	---	-1.606E-1	-1.859E-1	-1.663E-1	-3.110E-1
N° 8 (Bias2)	---	-1.624E-1	-1.835E-1	-1.715E-1	-4.235E-1
N° 9 (Bias2)	---	-1.848E-1	-2.097E-1	-1.927E-1	-4.035E+0
N° 10 (Bias2)	---	-2.013E-1	-1.908E-1	-1.973E-1	-2.197E+0
N° 11 (Bias2)	---	-1.628E-1	-1.489E-1	-1.739E-1	-2.157E+0
N° 12 (OFF)	---	-2.039E-1	-1.777E-1	-2.578E-1	-2.882E-1
N° 13 (OFF)	---	-1.784E-1	-1.852E-1	-2.325E-1	-2.979E-1
N° 14 (OFF)	---	-2.169E-1	-2.202E-1	-2.493E-1	-2.038E+0
N° 15 (OFF)	---	-1.846E-1	-1.761E-1	-2.208E-1	-3.878E+0
N° 16 (OFF)	---	-1.743E-1	-1.417E-1	-2.088E-1	-2.491E-1
Average (OFF)	---	-1.625E-2	-6.284E-2	-9.390E-2	-2.832E-1
σ (OFF)	---	2.887E-2	2.255E-2	2.068E-2	6.343E-2
Average+3σ (OFF)	---	7.036E-2	4.815E-3	-3.185E-2	-9.291E-2
Average-3σ (OFF)	---	-1.028E-1	-1.305E-1	-1.559E-1	-4.735E-1
Average (Bias1)	---	-1.744E-1	-1.837E-1	-1.803E-1	-1.825E+0
σ (Bias1)	---	1.805E-2	2.205E-2	1.373E-2	1.532E+0
Average+3σ (Bias1)	---	-1.202E-1	-1.176E-1	-1.391E-1	2.772E+0
Average-3σ (Bias1)	---	-2.285E-1	-2.499E-1	-2.215E-1	-6.422E+0
Average (Bias2)	---	-1.916E-1	-1.802E-1	-2.339E-1	-1.350E+0
σ (Bias2)	---	1.811E-2	2.796E-2	2.008E-2	1.605E+0
Average+3σ (Bias2)	---	-1.373E-1	-9.631E-2	-1.736E-1	3.466E+0
Average-3σ (Bias2)	---	-2.460E-1	-2.641E-1	-2.941E-1	-6.167E+0

30 MeV proton / detailed results

9. VF module 1

Ta = 25°C ; If = 10mA



30 MeV proton / detailed results

VF, Module 1 . (V) **Min = 1.0 Max = 1.85**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1.354	1.352	1.347	1.353	1.353
N° 2 (Bias1)	1.356	1.352	1.355	1.355	1.348
N° 3 (Bias1)	1.351	1.351	1.354	1.354	1.346
N° 4 (Bias1)	1.352	1.353	1.353	1.353	1.346
N° 5 (Bias1)	1.350	1.353	1.351	1.352	1.345
N° 6 (Bias1)	1.352	1.354	1.354	1.354	1.347
N° 7 (Bias2)	1.352	1.356	1.355	1.353	1.339
N° 8 (Bias2)	1.354	1.357	1.356	1.354	1.342
N° 9 (Bias2)	1.352	1.357	1.356	1.354	1.342
N° 10 (Bias2)	1.352	1.358	1.355	1.354	1.342
N° 11 (Bias2)	1.354	1.357	1.355	1.355	1.342
N° 12 (OFF)	1.352	1.358	1.354	1.357	1.338
N° 13 (OFF)	1.353	1.356	1.355	1.356	1.338
N° 14 (OFF)	1.352	1.357	1.356	1.355	1.337
N° 15 (OFF)	1.353	1.357	1.355	1.356	1.337
N° 16 (OFF)	1.354	1.357	1.353	1.356	1.338

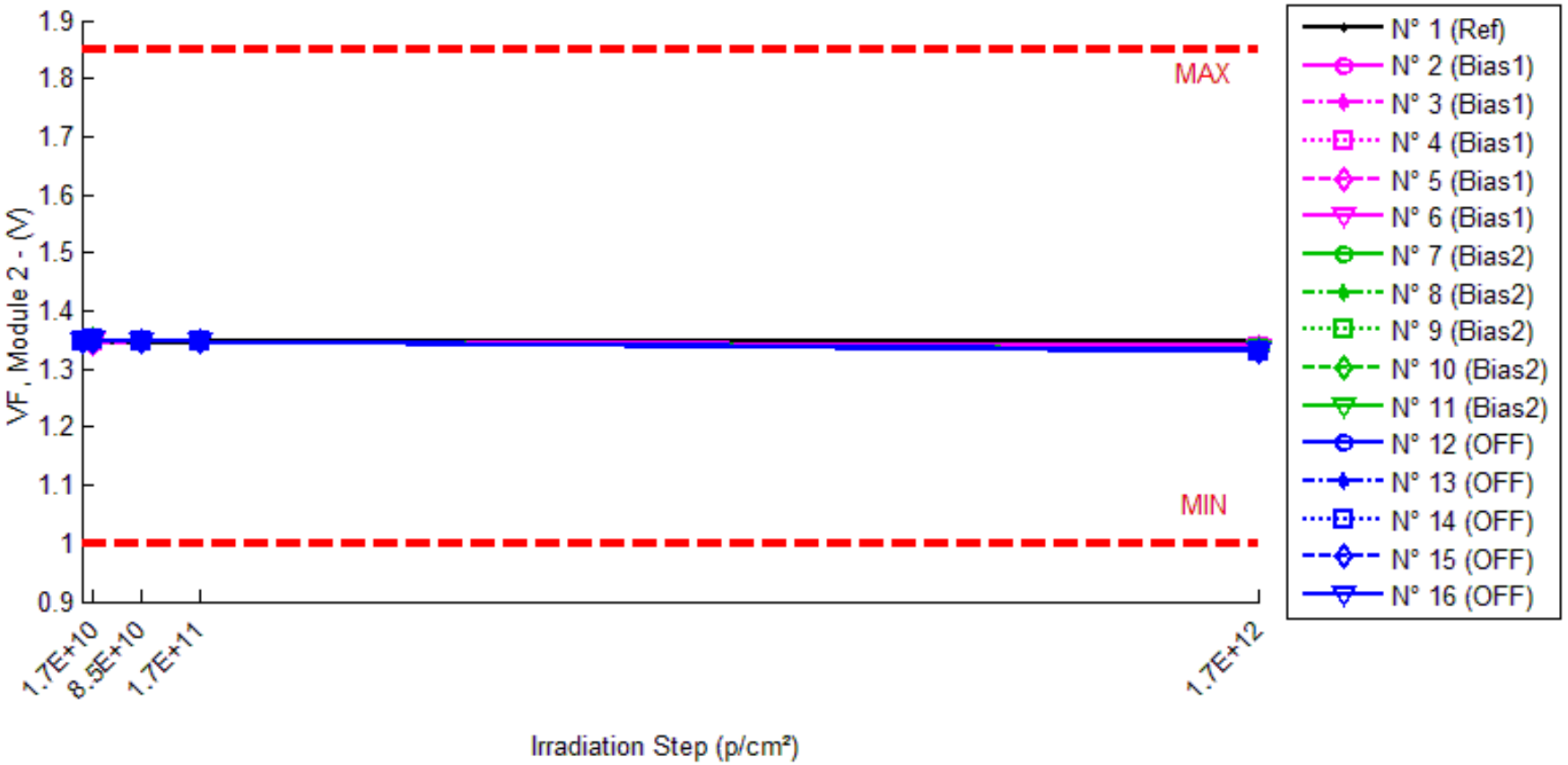
Delta [VF, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.769E-3	-6.751E-3	-6.710E-4	-2.380E-4
N° 2 (Bias1)	---	-3.687E-3	-8.920E-4	-4.010E-4	-7.748E-3
N° 3 (Bias1)	---	3.190E-4	3.167E-3	3.138E-3	-4.479E-3
N° 4 (Bias1)	---	2.320E-4	8.120E-4	1.038E-3	-6.058E-3
N° 5 (Bias1)	---	2.342E-3	4.810E-4	1.871E-3	-4.953E-3
N° 6 (Bias1)	---	1.710E-3	1.971E-3	1.505E-3	-5.610E-3
N° 7 (Bias2)	---	3.998E-3	3.017E-3	9.970E-4	-1.351E-2
N° 8 (Bias2)	---	3.649E-3	2.061E-3	-5.500E-5	-1.213E-2
N° 9 (Bias2)	---	5.480E-3	4.102E-3	1.818E-3	-9.666E-3
N° 10 (Bias2)	---	5.833E-3	3.398E-3	2.385E-3	-1.042E-2
N° 11 (Bias2)	---	3.633E-3	1.434E-3	7.660E-4	-1.181E-2
N° 12 (OFF)	---	5.067E-3	1.314E-3	4.193E-3	-1.416E-2
N° 13 (OFF)	---	3.335E-3	2.098E-3	2.776E-3	-1.492E-2
N° 14 (OFF)	---	5.628E-3	3.923E-3	3.776E-3	-1.451E-2
N° 15 (OFF)	---	4.032E-3	1.914E-3	2.582E-3	-1.604E-2
N° 16 (OFF)	---	3.210E-3	-6.190E-4	1.650E-3	-1.657E-2
Average (OFF)	---	1.832E-4	1.108E-3	1.430E-3	-5.770E-3
σ (OFF)	---	2.345E-3	1.538E-3	1.287E-3	1.260E-3
Average+3σ (OFF)	---	7.217E-3	5.723E-3	5.291E-3	-1.988E-3
Average-3σ (OFF)	---	-6.851E-3	-3.507E-3	-2.430E-3	-9.551E-3
Average (Bias1)	---	4.519E-3	2.802E-3	1.182E-3	-1.151E-2
σ (Bias1)	---	1.056E-3	1.062E-3	9.473E-4	1.503E-3
Average+3σ (Bias1)	---	7.688E-3	5.989E-3	4.024E-3	-6.997E-3
Average-3σ (Bias1)	---	1.350E-3	-3.838E-4	-1.660E-3	-1.602E-2
Average (Bias2)	---	4.254E-3	1.726E-3	2.995E-3	-1.524E-2
σ (Bias2)	---	1.064E-3	1.633E-3	1.009E-3	1.027E-3
Average+3σ (Bias2)	---	7.448E-3	6.626E-3	6.023E-3	-1.216E-2
Average-3σ (Bias2)	---	1.061E-3	-3.174E-3	-3.175E-5	-1.832E-2

30 MeV proton / detailed results

10.VF module 2

Ta = 25°C ; If = 10mA



30 MeV proton / detailed results

VF, Module 2 . (V) **Min = 1.0 Max = 1.85**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1.347	1.346	1.344	1.346	1.347
N° 2 (Bias1)	1.349	1.348	1.348	1.349	1.341
N° 3 (Bias1)	1.346	1.347	1.347	1.346	1.339
N° 4 (Bias1)	1.347	1.347	1.347	1.347	1.339
N° 5 (Bias1)	1.346	1.345	1.346	1.346	1.338
N° 6 (Bias1)	1.347	1.347	1.347	1.346	1.339
N° 7 (Bias2)	1.347	1.348	1.348	1.347	1.332
N° 8 (Bias2)	1.348	1.350	1.349	1.347	1.334
N° 9 (Bias2)	1.347	1.350	1.349	1.346	1.334
N° 10 (Bias2)	1.347	1.350	1.348	1.347	1.334
N° 11 (Bias2)	1.347	1.350	1.348	1.347	1.334
N° 12 (OFF)	1.348	1.350	1.348	1.349	1.333
N° 13 (OFF)	1.347	1.350	1.348	1.349	1.332
N° 14 (OFF)	1.347	1.350	1.348	1.348	1.332
N° 15 (OFF)	1.347	1.349	1.348	1.348	1.332
N° 16 (OFF)	1.348	1.350	1.348	1.349	1.332

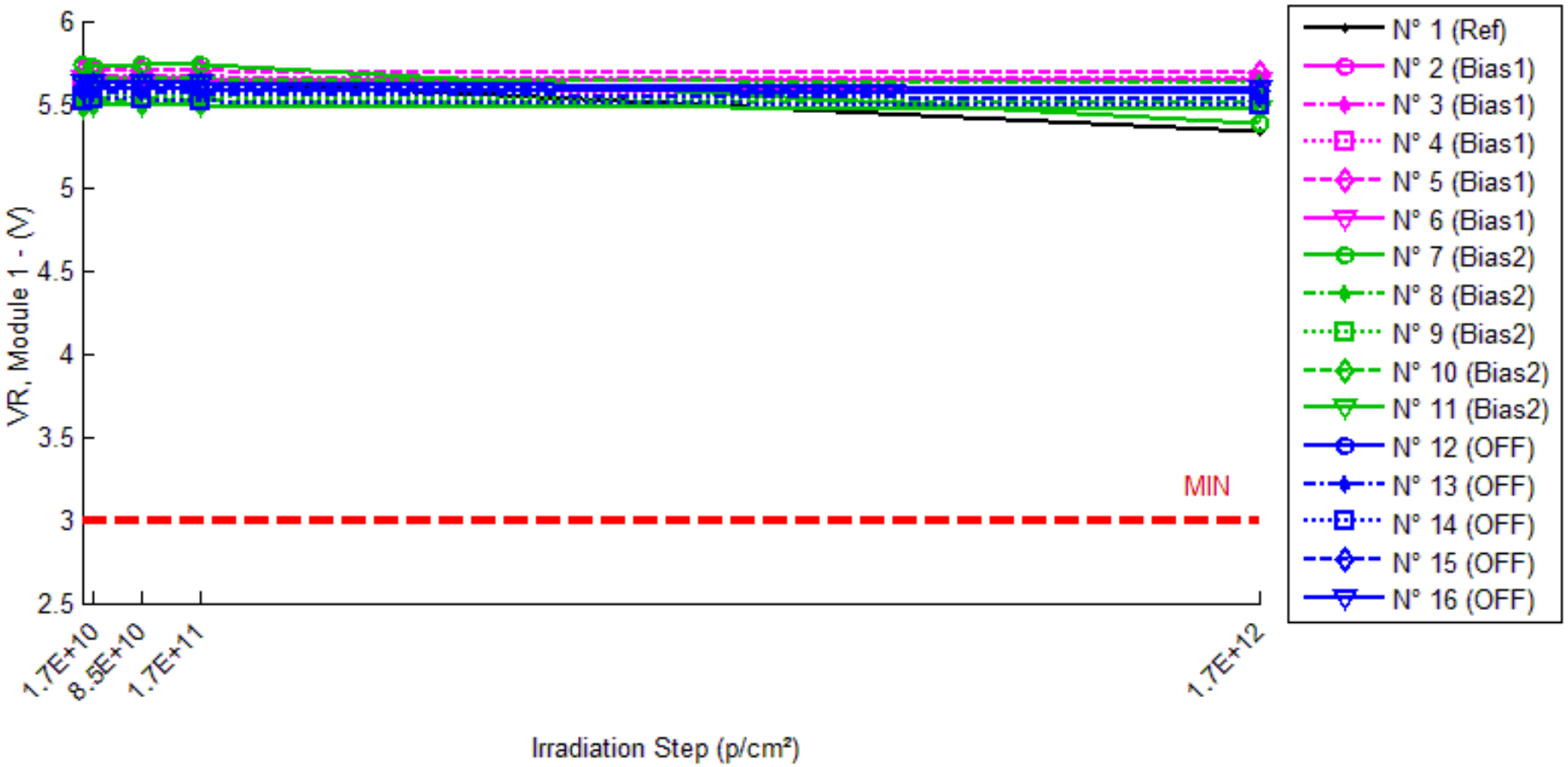
Delta [VF, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.163E-3	-2.652E-3	-6.840E-4	-4.940E-4
N° 2 (Bias1)	---	-1.097E-3	-1.037E-3	-3.370E-4	-8.261E-3
N° 3 (Bias1)	---	2.340E-4	1.057E-3	-1.510E-4	-7.472E-3
N° 4 (Bias1)	---	5.900E-5	3.600E-5	-1.060E-4	-8.023E-3
N° 5 (Bias1)	---	-2.280E-4	-1.020E-4	9.700E-5	-7.506E-3
N° 6 (Bias1)	---	2.840E-4	2.150E-4	-3.090E-4	-7.927E-3
N° 7 (Bias2)	---	1.263E-3	7.420E-4	-2.460E-4	-1.474E-2
N° 8 (Bias2)	---	2.188E-3	1.295E-3	-7.340E-4	-1.425E-2
N° 9 (Bias2)	---	2.792E-3	1.804E-3	-1.233E-3	-1.270E-2
N° 10 (Bias2)	---	3.111E-3	8.660E-4	-4.700E-5	-1.330E-2
N° 11 (Bias2)	---	3.110E-3	6.740E-4	2.560E-4	-1.269E-2
N° 12 (OFF)	---	2.877E-3	8.520E-4	1.919E-3	-1.438E-2
N° 13 (OFF)	---	2.169E-3	1.119E-3	1.385E-3	-1.538E-2
N° 14 (OFF)	---	2.998E-3	1.632E-3	1.520E-3	-1.485E-2
N° 15 (OFF)	---	1.333E-3	7.840E-4	1.000E-3	-1.586E-2
N° 16 (OFF)	---	1.992E-3	-3.050E-4	5.280E-4	-1.602E-2
Average (OFF)	---	-1.496E-4	3.380E-5	-1.612E-4	-7.838E-3
σ (OFF)	---	5.662E-4	7.491E-4	1.750E-4	3.410E-4
Average+3σ (OFF)	---	1.549E-3	2.281E-3	3.639E-4	-6.815E-3
Average-3σ (OFF)	---	-1.848E-3	-2.214E-3	-6.863E-4	-8.861E-3
Average (Bias1)	---	2.493E-3	1.076E-3	-4.008E-4	-1.354E-2
σ (Bias1)	---	7.839E-4	4.731E-4	5.882E-4	9.255E-4
Average+3σ (Bias1)	---	4.844E-3	2.495E-3	1.364E-3	-1.076E-2
Average-3σ (Bias1)	---	1.411E-4	-3.430E-4	-2.166E-3	-1.631E-2
Average (Bias2)	---	2.274E-3	8.164E-4	1.270E-3	-1.530E-2
σ (Bias2)	---	6.826E-4	7.100E-4	5.292E-4	6.878E-4
Average+3σ (Bias2)	---	4.322E-3	2.947E-3	2.858E-3	-1.323E-2
Average-3σ (Bias2)	---	2.260E-4	-1.314E-3	-3.173E-4	-1.736E-2

30 MeV proton / detailed results

11.VR module 1

Ta = 25°C ; Ir = 10µA



30 MeV proton / detailed results

VR, Module 1 . (V) **Min = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	5.635	5.634	5.628	5.635	5.332
N° 2 (Bias1)	5.592	5.588	5.591	5.592	5.578
N° 3 (Bias1)	5.663	5.664	5.666	5.666	5.648
N° 4 (Bias1)	5.575	5.575	5.576	5.576	5.562
N° 5 (Bias1)	5.701	5.703	5.702	5.703	5.691
N° 6 (Bias1)	5.655	5.656	5.656	5.655	5.641
N° 7 (Bias2)	5.735	5.728	5.738	5.734	5.387
N° 8 (Bias2)	5.647	5.651	5.650	5.647	5.625
N° 9 (Bias2)	5.546	5.551	5.548	5.545	5.527
N° 10 (Bias2)	5.522	5.528	5.524	5.523	5.503
N° 11 (Bias2)	5.487	5.491	5.488	5.488	5.468
N° 12 (OFF)	5.588	5.593	5.589	5.593	5.564
N° 13 (OFF)	5.561	5.564	5.563	5.563	5.534
N° 14 (OFF)	5.521	5.527	5.525	5.524	5.498
N° 15 (OFF)	5.609	5.613	5.611	5.612	5.578
N° 16 (OFF)	5.628	5.630	5.625	5.628	5.597

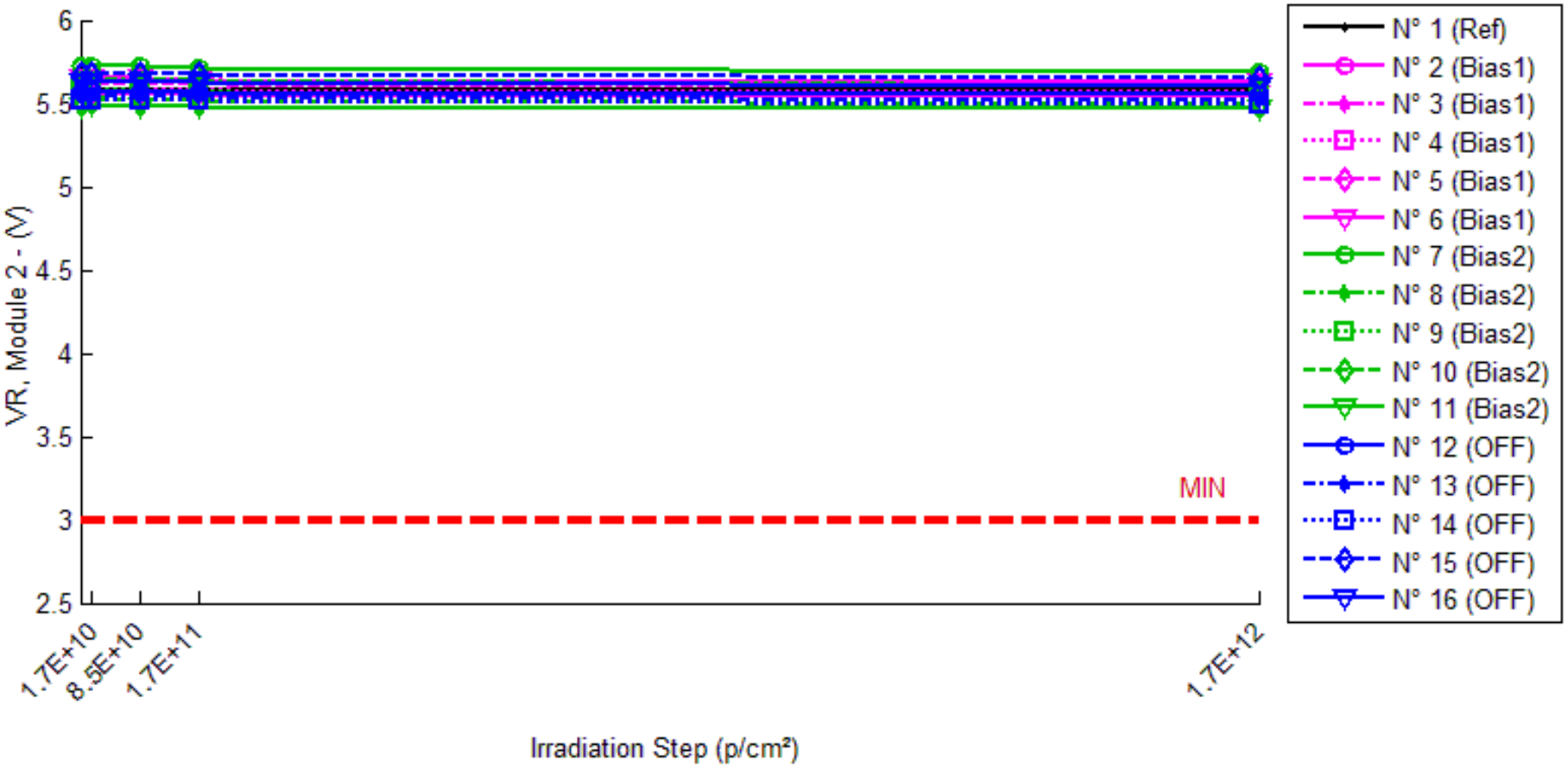
Delta [VR, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.621E-3	-7.509E-3	-2.360E-4	-3.033E-1
N° 2 (Bias1)	---	-4.315E-3	-1.310E-3	-3.680E-4	-1.469E-2
N° 3 (Bias1)	---	1.900E-4	3.004E-3	2.601E-3	-1.513E-2
N° 4 (Bias1)	---	-1.000E-6	4.170E-4	8.630E-4	-1.275E-2
N° 5 (Bias1)	---	2.422E-3	6.070E-4	2.030E-3	-1.042E-2
N° 6 (Bias1)	---	1.516E-3	1.842E-3	5.050E-4	-1.383E-2
N° 7 (Bias2)	---	-7.066E-3	2.725E-3	-1.071E-3	-3.477E-1
N° 8 (Bias2)	---	3.582E-3	2.592E-3	5.600E-5	-2.232E-2
N° 9 (Bias2)	---	5.837E-3	2.724E-3	-9.270E-4	-1.858E-2
N° 10 (Bias2)	---	5.399E-3	1.998E-3	1.109E-3	-1.874E-2
N° 11 (Bias2)	---	3.518E-3	8.860E-4	6.450E-4	-1.950E-2
N° 12 (OFF)	---	4.693E-3	5.220E-4	4.608E-3	-2.420E-2
N° 13 (OFF)	---	3.256E-3	1.758E-3	1.453E-3	-2.747E-2
N° 14 (OFF)	---	5.802E-3	3.985E-3	2.600E-3	-2.371E-2
N° 15 (OFF)	---	4.000E-3	1.749E-3	2.394E-3	-3.079E-2
N° 16 (OFF)	---	2.230E-3	-2.341E-3	6.370E-4	-3.054E-2
Average (OFF)	---	-3.760E-5	9.120E-4	1.126E-3	-1.337E-2
σ (OFF)	---	2.589E-3	1.621E-3	1.192E-3	1.881E-3
Average+3σ (OFF)	---	7.730E-3	5.776E-3	4.701E-3	-7.724E-3
Average-3σ (OFF)	---	-7.805E-3	-3.952E-3	-2.449E-3	-1.901E-2
Average (Bias1)	---	2.254E-3	2.185E-3	-3.760E-5	-8.537E-2
σ (Bias1)	---	5.314E-3	7.858E-4	9.550E-4	1.467E-1
Average+3σ (Bias1)	---	1.820E-2	4.543E-3	2.827E-3	3.546E-1
Average-3σ (Bias1)	---	-1.369E-2	-1.725E-4	-2.903E-3	-5.254E-1
Average (Bias2)	---	3.996E-3	1.135E-3	2.338E-3	-2.734E-2
σ (Bias2)	---	1.361E-3	2.310E-3	1.492E-3	3.359E-3
Average+3σ (Bias2)	---	8.080E-3	8.065E-3	6.814E-3	-1.727E-2
Average-3σ (Bias2)	---	-8.805E-5	-5.796E-3	-2.137E-3	-3.742E-2

30 MeV proton / detailed results

12.VR module 2

Ta = 25°C ; Ir = 10µA



30 MeV proton / detailed results

VR, Module 2 . (V) **Min = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	5.585	5.584	5.582	5.584	5.585
N° 2 (Bias1)	5.555	5.554	5.553	5.554	5.541
N° 3 (Bias1)	5.638	5.638	5.639	5.638	5.622
N° 4 (Bias1)	5.586	5.585	5.585	5.584	5.566
N° 5 (Bias1)	5.619	5.619	5.619	5.619	5.602
N° 6 (Bias1)	5.648	5.648	5.647	5.646	5.627
N° 7 (Bias2)	5.721	5.721	5.721	5.718	5.693
N° 8 (Bias2)	5.642	5.643	5.642	5.640	5.609
N° 9 (Bias2)	5.576	5.578	5.576	5.571	5.553
N° 10 (Bias2)	5.515	5.517	5.514	5.513	5.488
N° 11 (Bias2)	5.486	5.489	5.486	5.486	5.465
N° 12 (OFF)	5.572	5.574	5.571	5.573	5.550
N° 13 (OFF)	5.539	5.541	5.539	5.540	5.514
N° 14 (OFF)	5.520	5.521	5.520	5.518	5.494
N° 15 (OFF)	5.676	5.676	5.676	5.676	5.649
N° 16 (OFF)	5.630	5.631	5.628	5.630	5.604

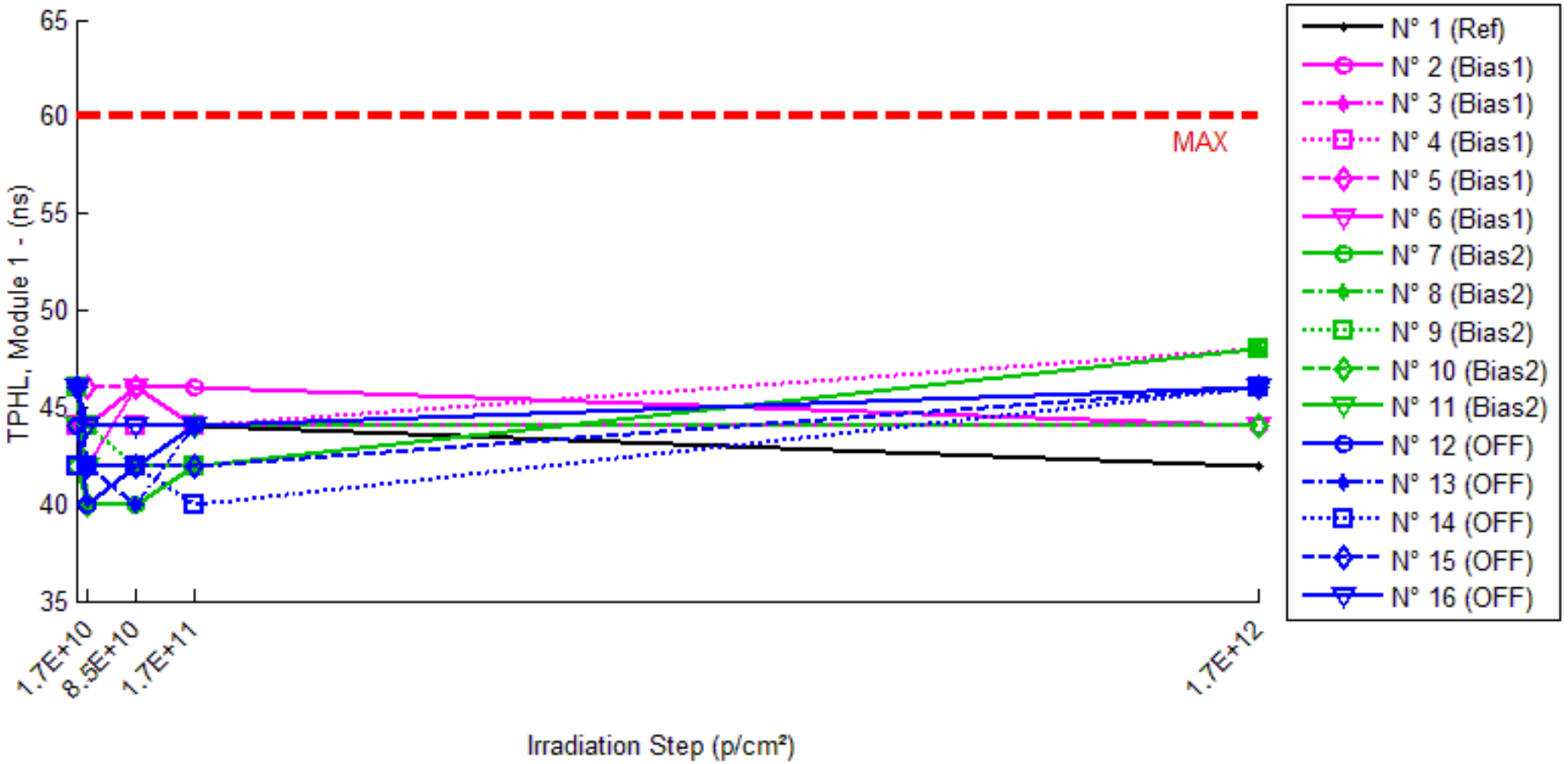
Delta [VR, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.240E-3	-3.272E-3	-6.340E-4	-2.590E-4
N° 2 (Bias1)	---	-1.022E-3	-2.176E-3	-1.391E-3	-1.443E-2
N° 3 (Bias1)	---	3.180E-4	8.950E-4	-2.780E-4	-1.597E-2
N° 4 (Bias1)	---	-2.530E-4	-3.630E-4	-1.366E-3	-1.933E-2
N° 5 (Bias1)	---	1.300E-5	-5.500E-5	5.000E-6	-1.770E-2
N° 6 (Bias1)	---	1.170E-4	-3.540E-4	-1.192E-3	-2.031E-2
N° 7 (Bias2)	---	2.330E-4	2.170E-4	-2.571E-3	-2.754E-2
N° 8 (Bias2)	---	9.450E-4	1.100E-4	-2.526E-3	-3.315E-2
N° 9 (Bias2)	---	1.952E-3	1.800E-5	-4.481E-3	-2.307E-2
N° 10 (Bias2)	---	1.991E-3	-6.990E-4	-1.916E-3	-2.651E-2
N° 11 (Bias2)	---	2.573E-3	-7.950E-4	-7.130E-4	-2.093E-2
N° 12 (OFF)	---	2.297E-3	-1.013E-3	1.225E-3	-2.188E-2
N° 13 (OFF)	---	1.350E-3	-1.820E-4	5.350E-4	-2.582E-2
N° 14 (OFF)	---	1.508E-3	8.900E-5	-1.388E-3	-2.559E-2
N° 15 (OFF)	---	-1.000E-6	3.000E-5	-1.000E-4	-2.684E-2
N° 16 (OFF)	---	9.430E-4	-1.423E-3	5.030E-4	-2.544E-2
Average (OFF)	---	-1.654E-4	-4.106E-4	-8.444E-4	-1.755E-2
σ (OFF)	---	5.212E-4	1.113E-3	6.584E-4	2.398E-3
Average+3σ (OFF)	---	1.398E-3	2.928E-3	1.131E-3	-1.035E-2
Average-3σ (OFF)	---	-1.729E-3	-3.749E-3	-2.820E-3	-2.474E-2
Average (Bias1)	---	1.539E-3	-2.298E-4	-2.441E-3	-2.624E-2
σ (Bias1)	---	9.357E-4	4.786E-4	1.364E-3	4.682E-3
Average+3σ (Bias1)	---	4.346E-3	1.206E-3	1.652E-3	-1.220E-2
Average-3σ (Bias1)	---	-1.268E-3	-1.665E-3	-6.535E-3	-4.029E-2
Average (Bias2)	---	1.219E-3	-4.998E-4	1.550E-4	-2.511E-2
σ (Bias2)	---	8.407E-4	6.790E-4	9.819E-4	1.889E-3
Average+3σ (Bias2)	---	3.742E-3	1.537E-3	3.101E-3	-1.945E-2
Average-3σ (Bias2)	---	-1.303E-3	-2.537E-3	-2.791E-3	-3.078E-2

30 MeV proton / detailed results

13.TPHL module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TPHL, Module 1 . (ns) **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)	44	42	42	44	42
N° 2 (Bias1)	44	44	46	46	44
N° 3 (Bias1)	44	42	42	44	46
N° 4 (Bias1)	44	44	44	44	48
N° 5 (Bias1)	46	46	46	44	46
N° 6 (Bias1)	44	42	46	44	44
N° 7 (Bias2)	42	40	40	42	48
N° 8 (Bias2)	46	40	42	42	48
N° 9 (Bias2)	46	44	42	42	48
N° 10 (Bias2)	46	40	42	44	44
N° 11 (Bias2)	44	42	42	44	46
N° 12 (OFF)	44	40	42	44	46
N° 13 (OFF)	46	42	40	44	46
N° 14 (OFF)	42	42	42	40	46
N° 15 (OFF)	46	42	42	42	46
N° 16 (OFF)	46	44	44	44	46

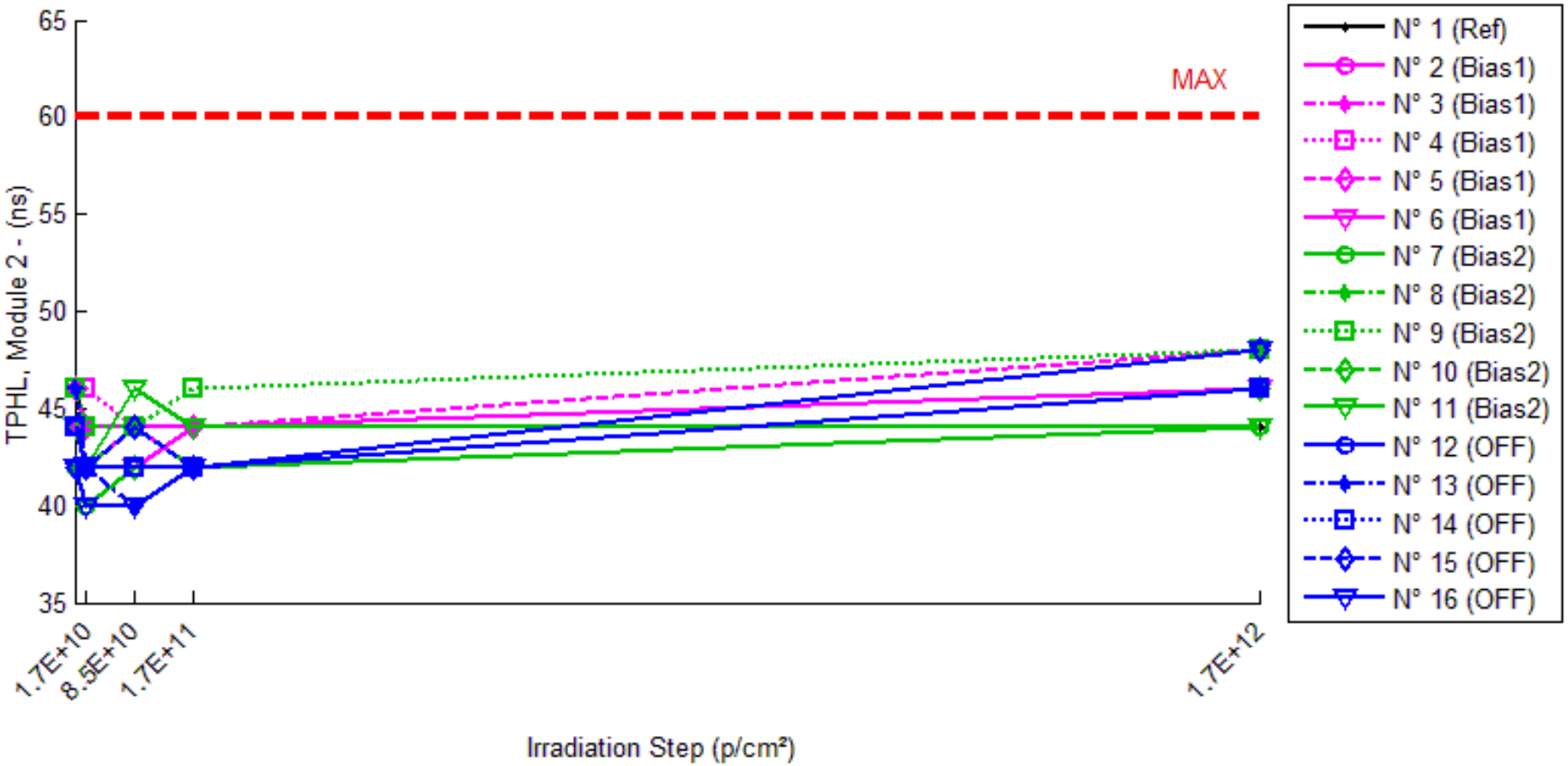
Delta [TPHL, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 2 (Bias1)	---	0.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 3 (Bias1)	---	-2.000E+0	-2.000E+0	0.000E+0	2.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	4.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 6 (Bias1)	---	-2.000E+0	2.000E+0	0.000E+0	0.000E+0
N° 7 (Bias2)	---	-2.000E+0	-2.000E+0	0.000E+0	6.000E+0
N° 8 (Bias2)	---	-6.000E+0	-4.000E+0	-4.000E+0	2.000E+0
N° 9 (Bias2)	---	-2.000E+0	-4.000E+0	-4.000E+0	2.000E+0
N° 10 (Bias2)	---	-6.000E+0	-4.000E+0	-2.000E+0	-2.000E+0
N° 11 (Bias2)	---	-2.000E+0	-2.000E+0	0.000E+0	2.000E+0
N° 12 (OFF)	---	-4.000E+0	-2.000E+0	0.000E+0	2.000E+0
N° 13 (OFF)	---	-4.000E+0	-6.000E+0	-2.000E+0	0.000E+0
N° 14 (OFF)	---	0.000E+0	0.000E+0	-2.000E+0	4.000E+0
N° 15 (OFF)	---	-4.000E+0	-4.000E+0	-4.000E+0	0.000E+0
N° 16 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
Average (OFF)	---	-8.000E-1	4.000E-1	0.000E+0	1.200E+0
σ (OFF)	---	1.095E+0	1.673E+0	1.414E+0	1.789E+0
Average+3σ (OFF)	---	2.486E+0	5.420E+0	4.243E+0	6.567E+0
Average-3σ (OFF)	---	-4.086E+0	-4.620E+0	-4.243E+0	-4.167E+0
Average (Bias1)	---	-3.600E+0	-3.200E+0	-2.000E+0	2.000E+0
σ (Bias1)	---	2.191E+0	1.095E+0	2.000E+0	2.828E+0
Average+3σ (Bias1)	---	2.973E+0	8.634E-2	4.000E+0	1.049E+1
Average-3σ (Bias1)	---	-1.017E+1	-6.486E+0	-8.000E+0	-6.485E+0
Average (Bias2)	---	-2.800E+0	-2.800E+0	-2.000E+0	1.200E+0
σ (Bias2)	---	1.789E+0	2.280E+0	1.414E+0	1.789E+0
Average+3σ (Bias2)	---	2.567E+0	4.041E+0	2.243E+0	6.567E+0
Average-3σ (Bias2)	---	-8.167E+0	-9.641E+0	-6.243E+0	-4.167E+0

30 MeV proton / detailed results

14.TPHL module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TPHL, Module 2 . (ns) **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)	46	44	44	44	44
N° 2 (Bias1)	44	42	44	42	46
N° 3 (Bias1)	44	44	44	44	46
N° 4 (Bias1)	46	46	44	46	48
N° 5 (Bias1)	46	44	44	44	48
N° 6 (Bias1)	42	42	42	44	46
N° 7 (Bias2)	42	40	42	42	44
N° 8 (Bias2)	42	42	44	42	48
N° 9 (Bias2)	46	44	44	46	48
N° 10 (Bias2)	42	42	42	42	46
N° 11 (Bias2)	44	42	46	44	44
N° 12 (OFF)	44	42	42	42	46
N° 13 (OFF)	46	42	40	42	46
N° 14 (OFF)	44	42	42	42	46
N° 15 (OFF)	42	42	44	42	48
N° 16 (OFF)	42	40	40	42	48

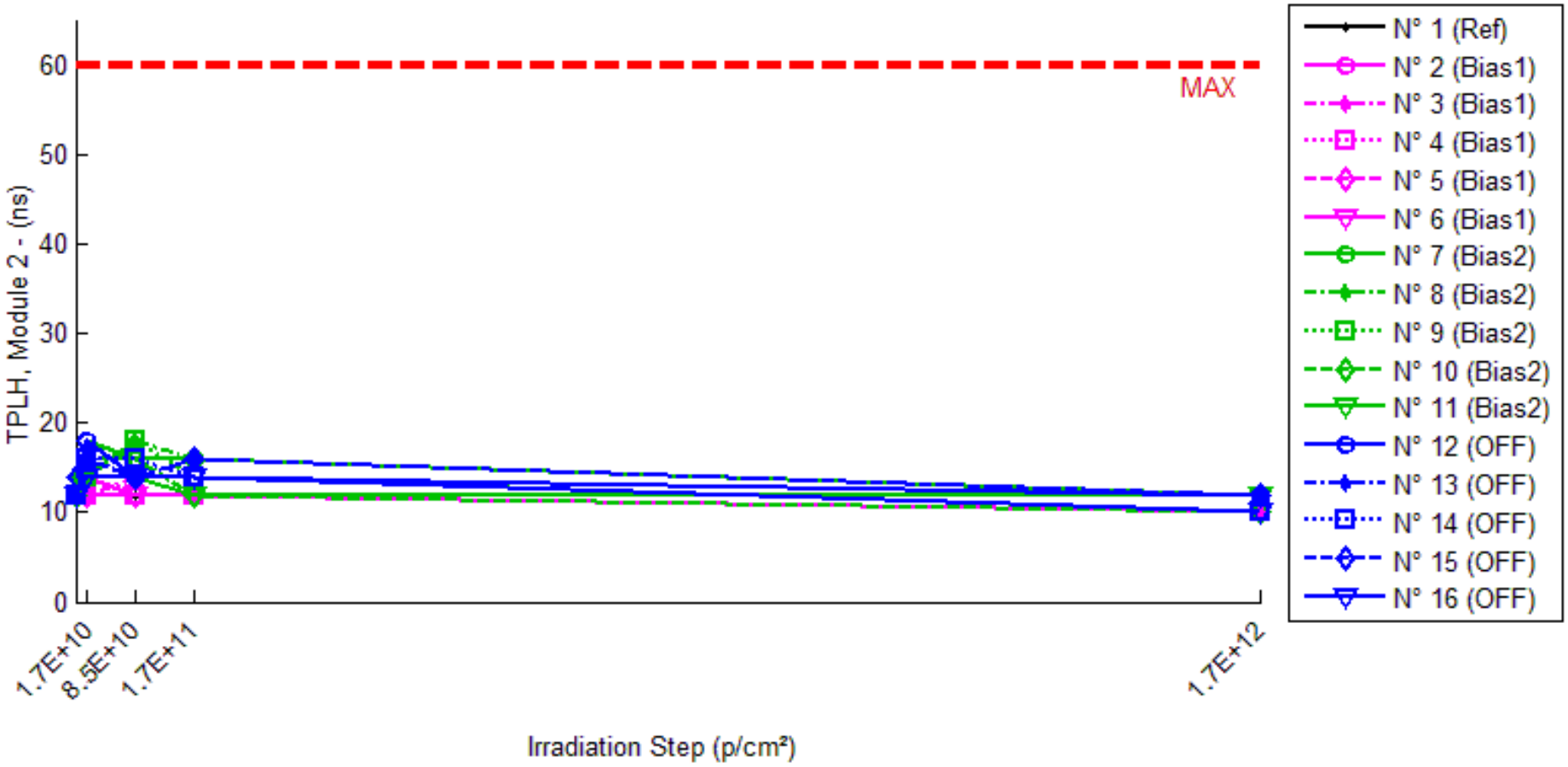
Delta [TPHL, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 2 (Bias1)	---	-2.000E+0	0.000E+0	-2.000E+0	2.000E+0
N° 3 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 4 (Bias1)	---	0.000E+0	-2.000E+0	0.000E+0	2.000E+0
N° 5 (Bias1)	---	-2.000E+0	-2.000E+0	-2.000E+0	2.000E+0
N° 6 (Bias1)	---	0.000E+0	0.000E+0	2.000E+0	4.000E+0
N° 7 (Bias2)	---	-2.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 8 (Bias2)	---	0.000E+0	2.000E+0	0.000E+0	6.000E+0
N° 9 (Bias2)	---	-2.000E+0	-2.000E+0	0.000E+0	2.000E+0
N° 10 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	4.000E+0
N° 11 (Bias2)	---	-2.000E+0	2.000E+0	0.000E+0	0.000E+0
N° 12 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	2.000E+0
N° 13 (OFF)	---	-4.000E+0	-6.000E+0	-4.000E+0	0.000E+0
N° 14 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	2.000E+0
N° 15 (OFF)	---	0.000E+0	2.000E+0	0.000E+0	6.000E+0
N° 16 (OFF)	---	-2.000E+0	-2.000E+0	0.000E+0	6.000E+0
Average (OFF)	---	-8.000E-1	-8.000E-1	-4.000E-1	2.400E+0
σ (OFF)	---	1.095E+0	1.095E+0	1.673E+0	8.944E-1
Average+3σ (OFF)	---	2.486E+0	2.486E+0	4.620E+0	5.083E+0
Average-3σ (OFF)	---	-4.086E+0	-4.086E+0	-5.420E+0	-2.833E-1
Average (Bias1)	---	-1.200E+0	4.000E-1	0.000E+0	2.800E+0
σ (Bias1)	---	1.095E+0	1.673E+0	0.000E+0	2.280E+0
Average+3σ (Bias1)	---	2.086E+0	5.420E+0	0.000E+0	9.641E+0
Average-3σ (Bias1)	---	-4.486E+0	-4.620E+0	0.000E+0	-4.041E+0
Average (Bias2)	---	-2.000E+0	-2.000E+0	-1.600E+0	3.200E+0
σ (Bias2)	---	1.414E+0	2.828E+0	1.673E+0	2.683E+0
Average+3σ (Bias2)	---	2.243E+0	6.485E+0	3.420E+0	1.125E+1
Average-3σ (Bias2)	---	-6.243E+0	-1.049E+1	-6.620E+0	-4.850E+0

30 MeV proton / detailed results

15.TPLH module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TPLH, Module 1 . (ns) **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)	12	12	12	14	12
N° 2 (Bias1)	12	12	12	10	10
N° 3 (Bias1)	12	12	12	12	10
N° 4 (Bias1)	10	12	12	12	8
N° 5 (Bias1)	10	12	12	10	8
N° 6 (Bias1)	12	14	12	12	10
N° 7 (Bias2)	14	14	16	14	10
N° 8 (Bias2)	12	14	16	14	10
N° 9 (Bias2)	12	14	12	14	10
N° 10 (Bias2)	10	14	14	12	12
N° 11 (Bias2)	10	14	14	12	12
N° 12 (OFF)	12	14	14	14	12
N° 13 (OFF)	12	16	14	12	12
N° 14 (OFF)	12	14	16	16	12
N° 15 (OFF)	12	14	14	16	12
N° 16 (OFF)	12	16	14	12	12

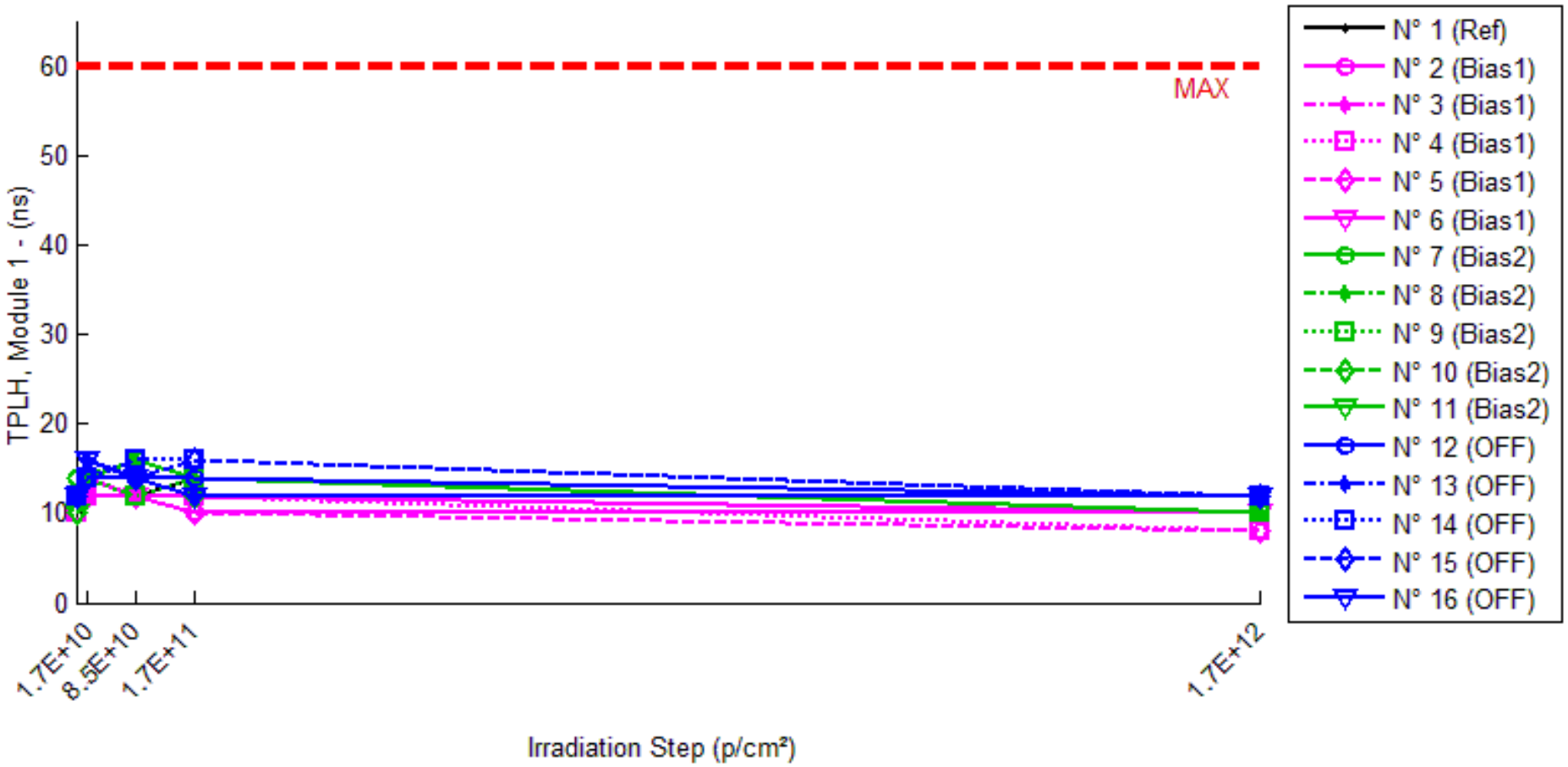
Delta [TPLH, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	0.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 3 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 4 (Bias1)	---	2.000E+0	2.000E+0	2.000E+0	-2.000E+0
N° 5 (Bias1)	---	2.000E+0	2.000E+0	0.000E+0	-2.000E+0
N° 6 (Bias1)	---	2.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 7 (Bias2)	---	0.000E+0	2.000E+0	0.000E+0	-4.000E+0
N° 8 (Bias2)	---	2.000E+0	4.000E+0	2.000E+0	-2.000E+0
N° 9 (Bias2)	---	2.000E+0	0.000E+0	2.000E+0	-2.000E+0
N° 10 (Bias2)	---	4.000E+0	4.000E+0	2.000E+0	2.000E+0
N° 11 (Bias2)	---	4.000E+0	4.000E+0	2.000E+0	2.000E+0
N° 12 (OFF)	---	2.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 13 (OFF)	---	4.000E+0	2.000E+0	0.000E+0	0.000E+0
N° 14 (OFF)	---	2.000E+0	4.000E+0	4.000E+0	0.000E+0
N° 15 (OFF)	---	2.000E+0	2.000E+0	4.000E+0	0.000E+0
N° 16 (OFF)	---	4.000E+0	2.000E+0	0.000E+0	0.000E+0
Average (OFF)	---	1.200E+0	8.000E-1	0.000E+0	-2.000E+0
σ (OFF)	---	1.095E+0	1.095E+0	1.414E+0	0.000E+0
Average+3σ (OFF)	---	4.486E+0	4.086E+0	4.243E+0	-2.000E+0
Average-3σ (OFF)	---	-2.086E+0	-2.486E+0	-4.243E+0	-2.000E+0
Average (Bias1)	---	2.400E+0	2.800E+0	1.600E+0	-8.000E-1
σ (Bias1)	---	1.673E+0	1.789E+0	8.944E-1	2.683E+0
Average+3σ (Bias1)	---	7.420E+0	8.167E+0	4.283E+0	7.250E+0
Average-3σ (Bias1)	---	-2.620E+0	-2.567E+0	-1.083E+0	-8.850E+0
Average (Bias2)	---	2.800E+0	2.400E+0	2.000E+0	0.000E+0
σ (Bias2)	---	1.095E+0	8.944E-1	2.000E+0	0.000E+0
Average+3σ (Bias2)	---	6.086E+0	5.083E+0	8.000E+0	0.000E+0
Average-3σ (Bias2)	---	-4.863E-1	-2.833E-1	-4.000E+0	0.000E+0

30 MeV proton / detailed results

16.TPLH module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TPLH, Module 2 . (ns) **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)	12	14	12	12	12
N° 2 (Bias1)	12	12	12	12	10
N° 3 (Bias1)	12	12	14	12	10
N° 4 (Bias1)	12	12	12	12	10
N° 5 (Bias1)	12	12	12	12	10
N° 6 (Bias1)	12	14	12	12	10
N° 7 (Bias2)	12	18	16	16	12
N° 8 (Bias2)	14	14	18	16	12
N° 9 (Bias2)	12	14	18	14	10
N° 10 (Bias2)	12	16	16	12	10
N° 11 (Bias2)	12	14	14	12	12
N° 12 (OFF)	12	18	14	14	12
N° 13 (OFF)	12	16	14	16	12
N° 14 (OFF)	12	16	16	14	10
N° 15 (OFF)	14	16	14	16	12
N° 16 (OFF)	12	14	14	14	10

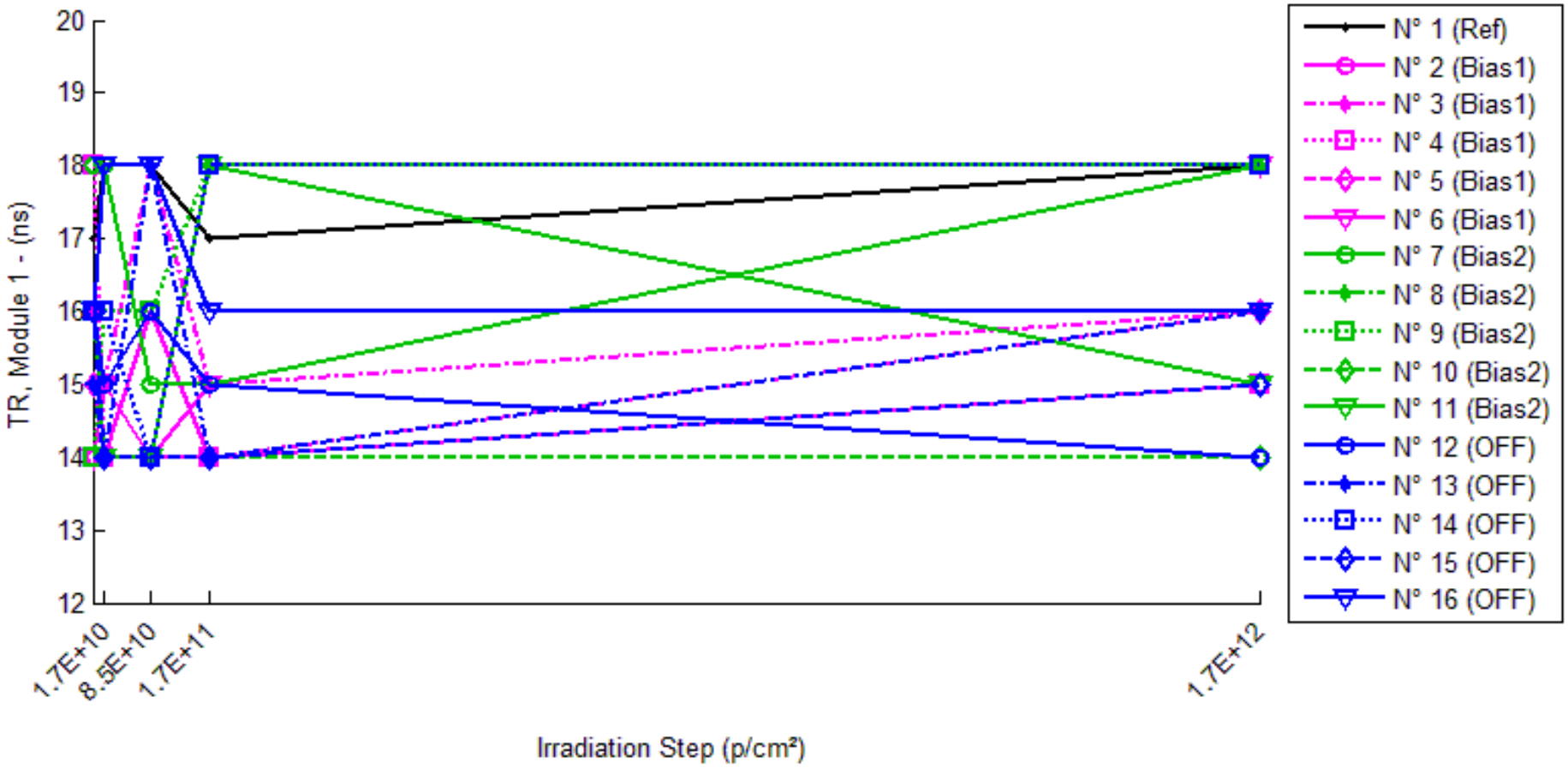
Delta [TPLH, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 3 (Bias1)	---	0.000E+0	2.000E+0	0.000E+0	-2.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 6 (Bias1)	---	2.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 7 (Bias2)	---	6.000E+0	4.000E+0	4.000E+0	0.000E+0
N° 8 (Bias2)	---	0.000E+0	4.000E+0	2.000E+0	-2.000E+0
N° 9 (Bias2)	---	2.000E+0	6.000E+0	2.000E+0	-2.000E+0
N° 10 (Bias2)	---	4.000E+0	4.000E+0	0.000E+0	-2.000E+0
N° 11 (Bias2)	---	2.000E+0	2.000E+0	0.000E+0	0.000E+0
N° 12 (OFF)	---	6.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 13 (OFF)	---	4.000E+0	2.000E+0	4.000E+0	0.000E+0
N° 14 (OFF)	---	4.000E+0	4.000E+0	2.000E+0	-2.000E+0
N° 15 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	-2.000E+0
N° 16 (OFF)	---	2.000E+0	2.000E+0	2.000E+0	-2.000E+0
Average (OFF)	---	4.000E-1	4.000E-1	0.000E+0	-2.000E+0
σ (OFF)	---	8.944E-1	8.944E-1	0.000E+0	0.000E+0
Average+3σ (OFF)	---	3.083E+0	3.083E+0	0.000E+0	-2.000E+0
Average-3σ (OFF)	---	-2.283E+0	-2.283E+0	0.000E+0	-2.000E+0
Average (Bias1)	---	2.800E+0	4.000E+0	1.600E+0	-1.200E+0
σ (Bias1)	---	2.280E+0	1.414E+0	1.673E+0	1.095E+0
Average+3σ (Bias1)	---	9.641E+0	8.243E+0	6.620E+0	2.086E+0
Average-3σ (Bias1)	---	-4.041E+0	-2.426E-1	-3.420E+0	-4.486E+0
Average (Bias2)	---	3.600E+0	2.000E+0	2.400E+0	-1.200E+0
σ (Bias2)	---	1.673E+0	1.414E+0	8.944E-1	1.095E+0
Average+3σ (Bias2)	---	8.620E+0	6.243E+0	5.083E+0	2.086E+0
Average-3σ (Bias2)	---	-1.420E+0	-2.243E+0	-2.833E-1	-4.486E+0

30 MeV proton / detailed results

17.TR module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TR, Module 1 . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	17	18	18	17	18
N° 2 (Bias1)	14	14	16	14	15
N° 3 (Bias1)	16	15	18	15	16
N° 4 (Bias1)	18	14	14	14	15
N° 5 (Bias1)	15	14	14	14	16
N° 6 (Bias1)	14	15	14	15	18
N° 7 (Bias2)	18	18	15	15	18
N° 8 (Bias2)	15	14	14	18	18
N° 9 (Bias2)	14	16	16	18	18
N° 10 (Bias2)	16	14	14	14	14
N° 11 (Bias2)	16	14	14	18	15
N° 12 (OFF)	16	15	16	15	14
N° 13 (OFF)	15	14	18	14	16
N° 14 (OFF)	16	16	14	18	18
N° 15 (OFF)	16	14	14	14	15
N° 16 (OFF)	16	18	18	16	16

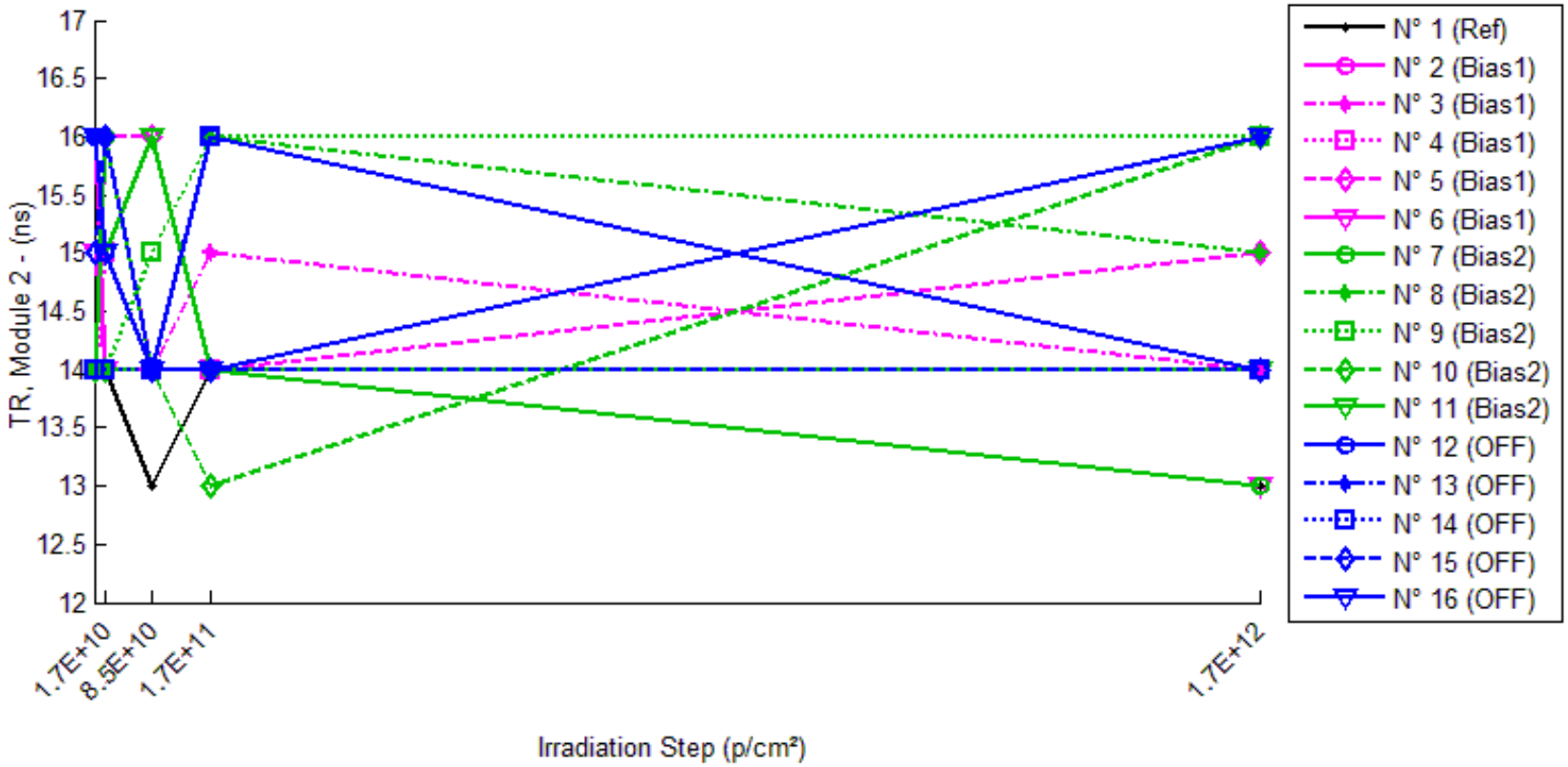
Delta [TR, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.000E+0	1.000E+0	0.000E+0	1.000E+0
N° 2 (Bias1)	---	0.000E+0	2.000E+0	0.000E+0	1.000E+0
N° 3 (Bias1)	---	-1.000E+0	2.000E+0	-1.000E+0	0.000E+0
N° 4 (Bias1)	---	-4.000E+0	-4.000E+0	-4.000E+0	-3.000E+0
N° 5 (Bias1)	---	-1.000E+0	-1.000E+0	-1.000E+0	1.000E+0
N° 6 (Bias1)	---	1.000E+0	0.000E+0	1.000E+0	4.000E+0
N° 7 (Bias2)	---	0.000E+0	-3.000E+0	-3.000E+0	0.000E+0
N° 8 (Bias2)	---	-1.000E+0	-1.000E+0	3.000E+0	3.000E+0
N° 9 (Bias2)	---	2.000E+0	2.000E+0	4.000E+0	4.000E+0
N° 10 (Bias2)	---	-2.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 11 (Bias2)	---	-2.000E+0	-2.000E+0	2.000E+0	-1.000E+0
N° 12 (OFF)	---	-1.000E+0	0.000E+0	-1.000E+0	-2.000E+0
N° 13 (OFF)	---	-1.000E+0	3.000E+0	-1.000E+0	1.000E+0
N° 14 (OFF)	---	0.000E+0	-2.000E+0	2.000E+0	2.000E+0
N° 15 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	-1.000E+0
N° 16 (OFF)	---	2.000E+0	2.000E+0	0.000E+0	0.000E+0
Average (OFF)	---	-1.000E+0	-2.000E-1	-1.000E+0	6.000E-1
σ (OFF)	---	1.871E+0	2.490E+0	1.871E+0	2.510E+0
Average+3σ (OFF)	---	4.612E+0	7.270E+0	4.612E+0	8.130E+0
Average-3σ (OFF)	---	-6.612E+0	-7.670E+0	-6.612E+0	-6.930E+0
Average (Bias1)	---	-6.000E-1	-1.200E+0	8.000E-1	8.000E-1
σ (Bias1)	---	1.673E+0	1.924E+0	3.114E+0	2.588E+0
Average+3σ (Bias1)	---	4.420E+0	4.571E+0	1.014E+1	8.565E+0
Average-3σ (Bias1)	---	-5.620E+0	-6.971E+0	-8.543E+0	-6.965E+0
Average (Bias2)	---	-4.000E-1	2.000E-1	-4.000E-1	0.000E+0
σ (Bias2)	---	1.517E+0	2.280E+0	1.517E+0	1.581E+0
Average+3σ (Bias2)	---	4.150E+0	7.041E+0	4.150E+0	4.743E+0
Average-3σ (Bias2)	---	-4.950E+0	-6.641E+0	-4.950E+0	-4.743E+0

30 MeV proton / detailed results

18.TR module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TR, Module 2 . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	14	14	13	14	13
N° 2 (Bias1)	16	14	14	16	14
N° 3 (Bias1)	14	16	14	15	14
N° 4 (Bias1)	14	15	14	14	14
N° 5 (Bias1)	14	16	16	14	15
N° 6 (Bias1)	15	14	14	14	13
N° 7 (Bias2)	14	16	14	14	13
N° 8 (Bias2)	14	14	14	16	15
N° 9 (Bias2)	14	14	15	16	16
N° 10 (Bias2)	14	14	14	13	16
N° 11 (Bias2)	16	15	16	14	14
N° 12 (OFF)	16	15	14	16	14
N° 13 (OFF)	16	16	14	14	16
N° 14 (OFF)	14	14	14	16	14
N° 15 (OFF)	15	16	14	14	14
N° 16 (OFF)	16	15	14	14	16

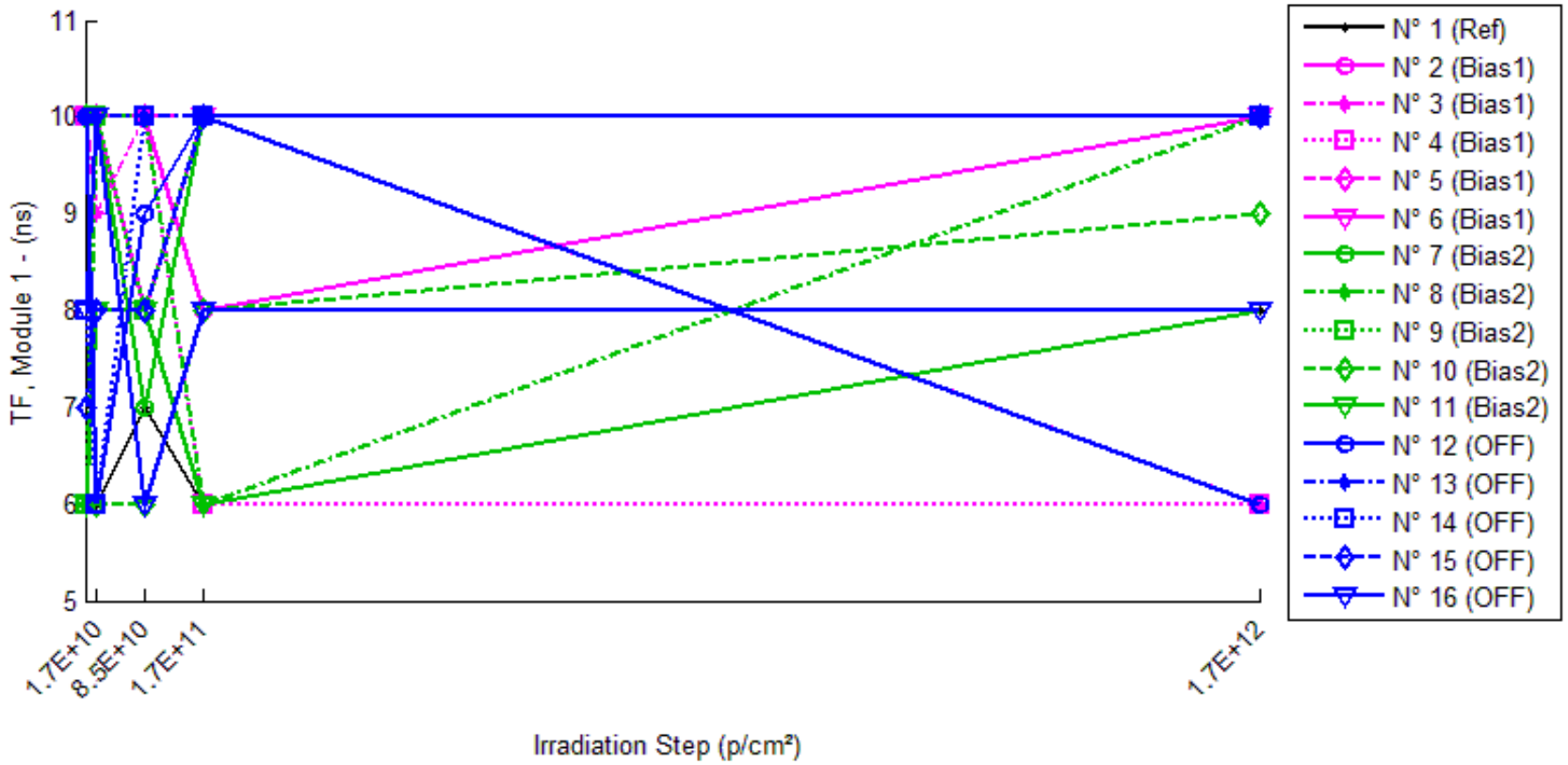
Delta [TR, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-1.000E+0	0.000E+0	-1.000E+0
N° 2 (Bias1)	---	-2.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 3 (Bias1)	---	2.000E+0	0.000E+0	1.000E+0	0.000E+0
N° 4 (Bias1)	---	1.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 5 (Bias1)	---	2.000E+0	2.000E+0	0.000E+0	1.000E+0
N° 6 (Bias1)	---	-1.000E+0	-1.000E+0	-1.000E+0	-2.000E+0
N° 7 (Bias2)	---	2.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 8 (Bias2)	---	0.000E+0	0.000E+0	2.000E+0	1.000E+0
N° 9 (Bias2)	---	0.000E+0	1.000E+0	2.000E+0	2.000E+0
N° 10 (Bias2)	---	0.000E+0	0.000E+0	-1.000E+0	2.000E+0
N° 11 (Bias2)	---	-1.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 12 (OFF)	---	-1.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 13 (OFF)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 14 (OFF)	---	0.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 15 (OFF)	---	1.000E+0	-1.000E+0	-1.000E+0	-1.000E+0
N° 16 (OFF)	---	-1.000E+0	-2.000E+0	-2.000E+0	0.000E+0
Average (OFF)	---	4.000E-1	-2.000E-1	0.000E+0	-6.000E-1
σ (OFF)	---	1.817E+0	1.483E+0	7.071E-1	1.342E+0
Average+3σ (OFF)	---	5.850E+0	4.250E+0	2.121E+0	3.425E+0
Average-3σ (OFF)	---	-5.050E+0	-4.650E+0	-2.121E+0	-4.625E+0
Average (Bias1)	---	2.000E-1	2.000E-1	2.000E-1	4.000E-1
σ (Bias1)	---	1.095E+0	4.472E-1	1.789E+0	1.817E+0
Average+3σ (Bias1)	---	3.486E+0	1.542E+0	5.567E+0	5.850E+0
Average-3σ (Bias1)	---	-3.086E+0	-1.142E+0	-5.167E+0	-5.050E+0
Average (Bias2)	---	-2.000E-1	-1.400E+0	-6.000E-1	-6.000E-1
σ (Bias2)	---	8.367E-1	8.944E-1	1.673E+0	8.944E-1
Average+3σ (Bias2)	---	2.310E+0	1.283E+0	4.420E+0	2.083E+0
Average-3σ (Bias2)	---	-2.710E+0	-4.083E+0	-5.620E+0	-3.283E+0

30 MeV proton / detailed results

19.TF module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TF, Module 1 . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	6	6	7	6	8
N° 2 (Bias1)	10	10	10	8	10
N° 3 (Bias1)	10	9	10	10	6
N° 4 (Bias1)	10	10	10	6	6
N° 5 (Bias1)	10	10	10	10	10
N° 6 (Bias1)	10	10	8	10	10
N° 7 (Bias2)	10	10	7	10	6
N° 8 (Bias2)	6	10	10	6	10
N° 9 (Bias2)	6	10	8	10	10
N° 10 (Bias2)	10	6	6	8	9
N° 11 (Bias2)	6	8	8	6	8
N° 12 (OFF)	10	6	9	10	6
N° 13 (OFF)	10	10	10	10	10
N° 14 (OFF)	8	6	10	10	10
N° 15 (OFF)	7	8	8	10	10
N° 16 (OFF)	8	10	6	8	8

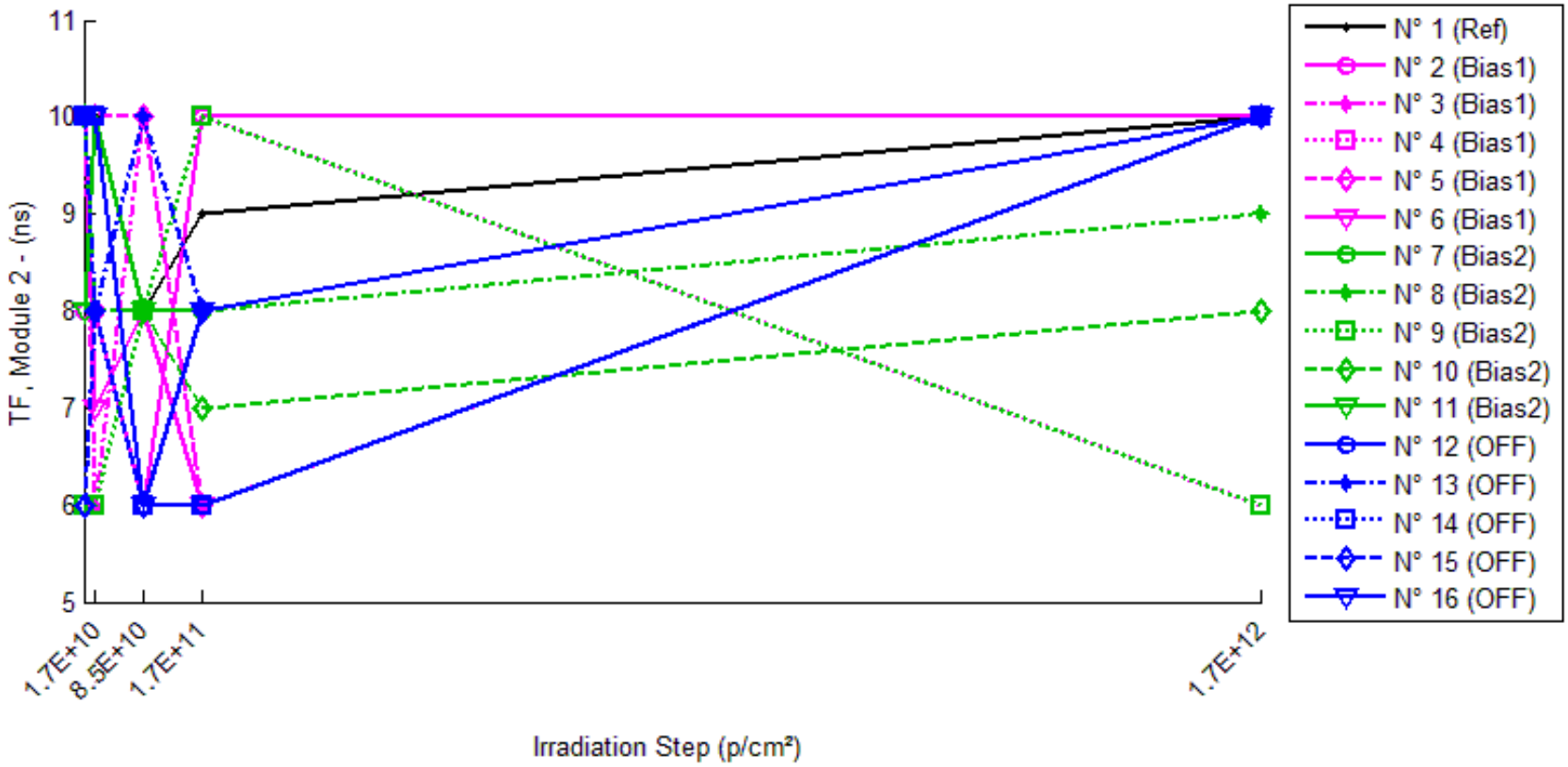
Delta [TF, Module 1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	0.000E+0	1.000E+0	0.000E+0	2.000E+0
N° 2 (Bias1)	---	0.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 3 (Bias1)	---	-1.000E+0	0.000E+0	0.000E+0	-4.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	-4.000E+0	-4.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 6 (Bias1)	---	0.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 7 (Bias2)	---	0.000E+0	-3.000E+0	0.000E+0	-4.000E+0
N° 8 (Bias2)	---	4.000E+0	4.000E+0	0.000E+0	4.000E+0
N° 9 (Bias2)	---	4.000E+0	2.000E+0	4.000E+0	4.000E+0
N° 10 (Bias2)	---	-4.000E+0	-4.000E+0	-2.000E+0	-1.000E+0
N° 11 (Bias2)	---	2.000E+0	2.000E+0	0.000E+0	2.000E+0
N° 12 (OFF)	---	-4.000E+0	-1.000E+0	0.000E+0	-4.000E+0
N° 13 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 14 (OFF)	---	-2.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 15 (OFF)	---	1.000E+0	1.000E+0	3.000E+0	3.000E+0
N° 16 (OFF)	---	2.000E+0	-2.000E+0	0.000E+0	0.000E+0
Average (OFF)	---	-2.000E-1	-4.000E-1	-1.200E+0	-1.600E+0
σ (OFF)	---	4.472E-1	8.944E-1	1.789E+0	2.191E+0
Average+3σ (OFF)	---	1.142E+0	2.283E+0	4.167E+0	4.973E+0
Average-3σ (OFF)	---	-1.542E+0	-3.083E+0	-6.567E+0	-8.173E+0
Average (Bias1)	---	1.200E+0	2.000E-1	4.000E-1	1.000E+0
σ (Bias1)	---	3.347E+0	3.493E+0	2.191E+0	3.464E+0
Average+3σ (Bias1)	---	1.124E+1	1.068E+1	6.973E+0	1.139E+1
Average-3σ (Bias1)	---	-8.840E+0	-1.028E+1	-6.173E+0	-9.392E+0
Average (Bias2)	---	-6.000E-1	0.000E+0	1.000E+0	2.000E-1
σ (Bias2)	---	2.408E+0	1.581E+0	1.414E+0	2.683E+0
Average+3σ (Bias2)	---	6.625E+0	4.743E+0	5.243E+0	8.250E+0
Average-3σ (Bias2)	---	-7.825E+0	-4.743E+0	-3.243E+0	-7.850E+0

30 MeV proton / detailed results

20.TF module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



30 MeV proton / detailed results

TF, Module 2 . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	10	10	8	9	10
N° 2 (Bias1)	8	8	6	10	10
N° 3 (Bias1)	10	6	10	6	10
N° 4 (Bias1)	10	10	6	10	6
N° 5 (Bias1)	10	10	10	6	10
N° 6 (Bias1)	10	7	8	6	10
N° 7 (Bias2)	10	10	8	8	10
N° 8 (Bias2)	10	8	8	8	9
N° 9 (Bias2)	6	6	8	10	6
N° 10 (Bias2)	10	8	8	7	8
N° 11 (Bias2)	8	10	8	8	10
N° 12 (OFF)	10	10	6	6	10
N° 13 (OFF)	10	8	10	8	10
N° 14 (OFF)	10	10	6	6	10
N° 15 (OFF)	6	8	6	8	10
N° 16 (OFF)	10	10	6	8	10

Delta [TF, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-2.000E+0	-1.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	-2.000E+0	2.000E+0	2.000E+0
N° 3 (Bias1)	---	-4.000E+0	0.000E+0	-4.000E+0	0.000E+0
N° 4 (Bias1)	---	0.000E+0	-4.000E+0	0.000E+0	-4.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	-4.000E+0	0.000E+0
N° 6 (Bias1)	---	-3.000E+0	-2.000E+0	-4.000E+0	0.000E+0
N° 7 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 8 (Bias2)	---	-2.000E+0	-2.000E+0	-2.000E+0	-1.000E+0
N° 9 (Bias2)	---	0.000E+0	2.000E+0	4.000E+0	0.000E+0
N° 10 (Bias2)	---	-2.000E+0	-2.000E+0	-3.000E+0	-2.000E+0
N° 11 (Bias2)	---	2.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 12 (OFF)	---	0.000E+0	-4.000E+0	-4.000E+0	0.000E+0
N° 13 (OFF)	---	-2.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 14 (OFF)	---	0.000E+0	-4.000E+0	-4.000E+0	0.000E+0
N° 15 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	4.000E+0
N° 16 (OFF)	---	0.000E+0	-4.000E+0	-2.000E+0	0.000E+0
Average (OFF)	---	-1.400E+0	-1.600E+0	-2.000E+0	-4.000E-1
σ (OFF)	---	1.949E+0	1.673E+0	2.828E+0	2.191E+0
Average+3σ (OFF)	---	4.448E+0	3.420E+0	6.485E+0	6.173E+0
Average-3σ (OFF)	---	-7.248E+0	-6.620E+0	-1.049E+1	-6.973E+0
Average (Bias1)	---	-4.000E-1	-8.000E-1	-6.000E-1	-2.000E-1
σ (Bias1)	---	1.673E+0	1.789E+0	2.793E+0	1.483E+0
Average+3σ (Bias1)	---	4.620E+0	4.567E+0	7.779E+0	4.250E+0
Average-3σ (Bias1)	---	-5.420E+0	-6.167E+0	-8.979E+0	-4.650E+0
Average (Bias2)	---	0.000E+0	-2.400E+0	-2.000E+0	8.000E-1
σ (Bias2)	---	1.414E+0	2.191E+0	2.449E+0	1.789E+0
Average+3σ (Bias2)	---	4.243E+0	4.173E+0	5.348E+0	6.167E+0
Average-3σ (Bias2)	---	-4.243E+0	-8.973E+0	-9.348E+0	-4.567E+0

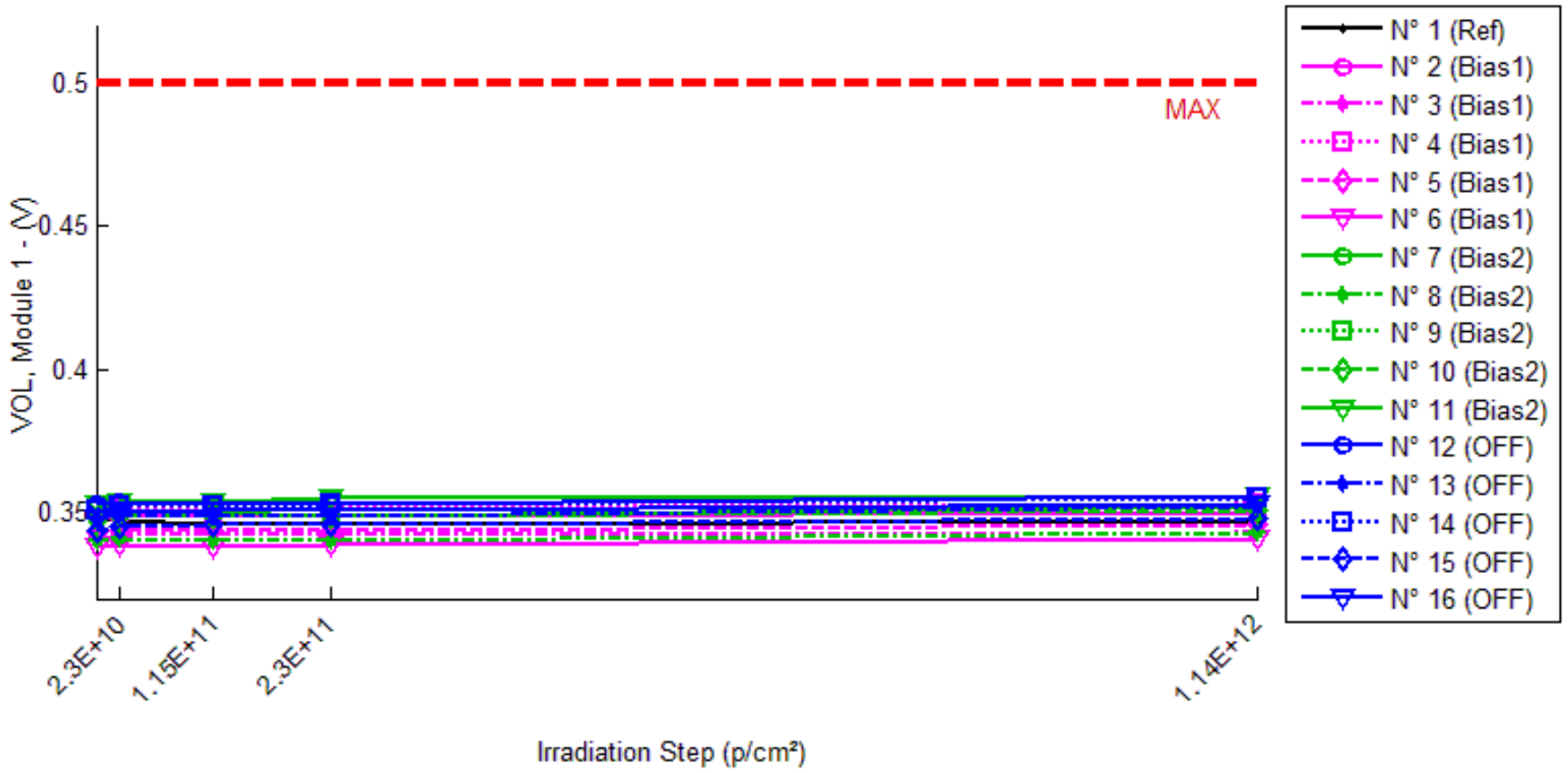
60 MeV proton / detailed results

CONTENTS

60 MeV proton / detailed results

1. VOL module 1

Ta = 25°C ; Iol = 8mA



60 MeV proton / detailed results

VOL, Module 1 . (V) **Max = 0.5**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	0.347	0.347	0.346	0.346	0.347
N° 2 (Bias1)	0.349	0.349	0.349	0.349	0.350
N° 3 (Bias1)	0.341	0.342	0.342	0.342	0.343
N° 4 (Bias1)	0.351	0.351	0.352	0.352	0.353
N° 5 (Bias1)	0.343	0.344	0.344	0.344	0.346
N° 6 (Bias1)	0.338	0.339	0.338	0.339	0.341
N° 7 (Bias2)	0.348	0.350	0.350	0.349	0.352
N° 8 (Bias2)	0.340	0.341	0.340	0.340	0.343
N° 9 (Bias2)	0.352	0.353	0.353	0.353	0.355
N° 10 (Bias2)	0.348	0.349	0.349	0.349	0.351
N° 11 (Bias2)	0.353	0.354	0.354	0.355	0.356
N° 12 (OFF)	0.353	0.354	0.353	0.353	0.356
N° 13 (OFF)	0.348	0.349	0.349	0.349	0.352
N° 14 (OFF)	0.351	0.352	0.352	0.353	0.355
N° 15 (OFF)	0.344	0.345	0.346	0.346	0.348
N° 16 (OFF)	0.348	0.350	0.351	0.351	0.353

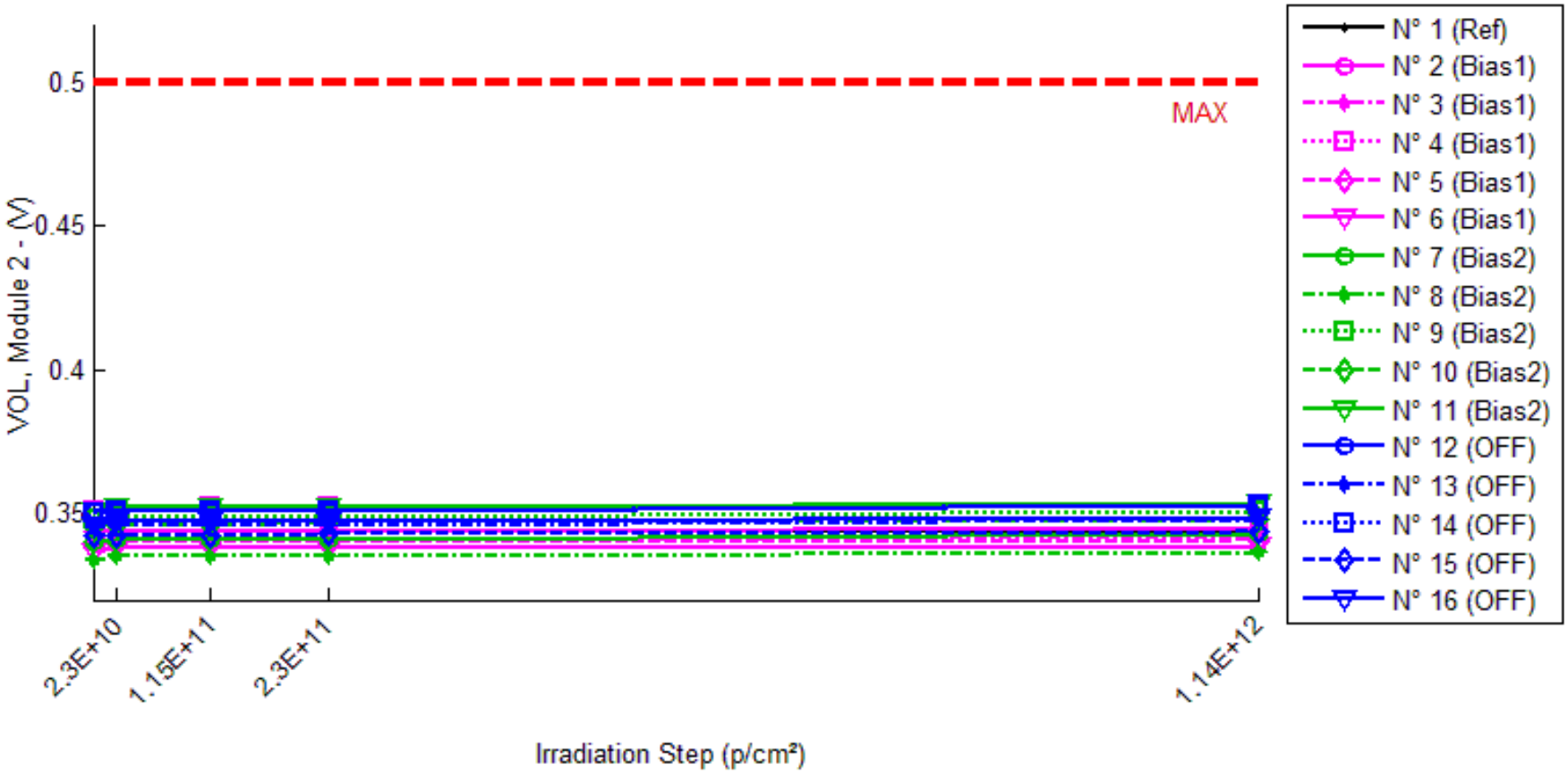
Delta [VOL, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-5.440E-5	-4.427E-4	-9.484E-4	3.228E-4
N° 2 (Bias1)	---	1.767E-4	3.810E-4	3.741E-4	1.448E-3
N° 3 (Bias1)	---	4.759E-4	7.402E-4	1.073E-3	2.059E-3
N° 4 (Bias1)	---	-3.741E-4	7.232E-4	8.486E-4	1.779E-3
N° 5 (Bias1)	---	4.678E-4	3.979E-4	7.578E-4	2.728E-3
N° 6 (Bias1)	---	7.416E-4	4.760E-4	6.658E-4	2.586E-3
N° 7 (Bias2)	---	1.340E-3	1.445E-3	5.338E-4	3.623E-3
N° 8 (Bias2)	---	9.021E-4	5.362E-4	4.128E-4	3.488E-3
N° 9 (Bias2)	---	1.663E-3	1.004E-3	1.590E-3	3.623E-3
N° 10 (Bias2)	---	8.594E-4	1.117E-3	1.240E-3	3.301E-3
N° 11 (Bias2)	---	1.506E-3	1.205E-3	2.219E-3	3.621E-3
N° 12 (OFF)	---	1.091E-3	5.038E-4	5.134E-4	3.277E-3
N° 13 (OFF)	---	9.890E-4	1.491E-3	1.574E-3	4.044E-3
N° 14 (OFF)	---	1.603E-3	1.815E-3	2.234E-3	4.039E-3
N° 15 (OFF)	---	1.577E-3	1.824E-3	2.440E-3	4.069E-3
N° 16 (OFF)	---	1.978E-3	2.444E-3	2.638E-3	4.590E-3
Average (OFF)	---	2.976E-4	5.437E-4	7.439E-4	2.120E-3
σ (OFF)	---	4.254E-4	1.755E-4	2.562E-4	5.383E-4
Average+3σ (OFF)	---	1.574E-3	1.070E-3	1.512E-3	3.735E-3
Average-3σ (OFF)	---	-9.785E-4	1.728E-5	-2.462E-5	5.050E-4
Average (Bias1)	---	1.254E-3	1.061E-3	1.199E-3	3.531E-3
σ (Bias1)	---	3.599E-4	3.354E-4	7.510E-4	1.410E-4
Average+3σ (Bias1)	---	2.334E-3	2.068E-3	3.452E-3	3.954E-3
Average-3σ (Bias1)	---	1.745E-4	5.518E-5	-1.054E-3	3.108E-3
Average (Bias2)	---	1.448E-3	1.616E-3	1.880E-3	4.004E-3
σ (Bias2)	---	4.063E-4	7.107E-4	8.624E-4	4.686E-4
Average+3σ (Bias2)	---	2.666E-3	3.748E-3	4.467E-3	5.410E-3
Average-3σ (Bias2)	---	2.288E-4	-5.166E-4	-7.073E-4	2.598E-3

60 MeV proton / detailed results

2. VOL module 2

Ta = 25°C ; Iol = 8mA



60 MeV proton / detailed results

VOL, Module 2 . (V) **Max = 0.5**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	0.344	0.344	0.344	0.344	0.344
N° 2 (Bias1)	0.344	0.344	0.344	0.344	0.345
N° 3 (Bias1)	0.341	0.341	0.341	0.341	0.342
N° 4 (Bias1)	0.351	0.351	0.352	0.352	0.353
N° 5 (Bias1)	0.340	0.340	0.340	0.340	0.341
N° 6 (Bias1)	0.337	0.338	0.338	0.338	0.339
N° 7 (Bias2)	0.340	0.341	0.341	0.341	0.343
N° 8 (Bias2)	0.334	0.335	0.335	0.335	0.337
N° 9 (Bias2)	0.348	0.349	0.349	0.349	0.351
N° 10 (Bias2)	0.345	0.346	0.346	0.347	0.348
N° 11 (Bias2)	0.351	0.352	0.352	0.352	0.354
N° 12 (OFF)	0.351	0.351	0.351	0.351	0.353
N° 13 (OFF)	0.345	0.346	0.346	0.346	0.348
N° 14 (OFF)	0.350	0.351	0.351	0.351	0.353
N° 15 (OFF)	0.342	0.342	0.342	0.343	0.344
N° 16 (OFF)	0.346	0.347	0.347	0.347	0.349

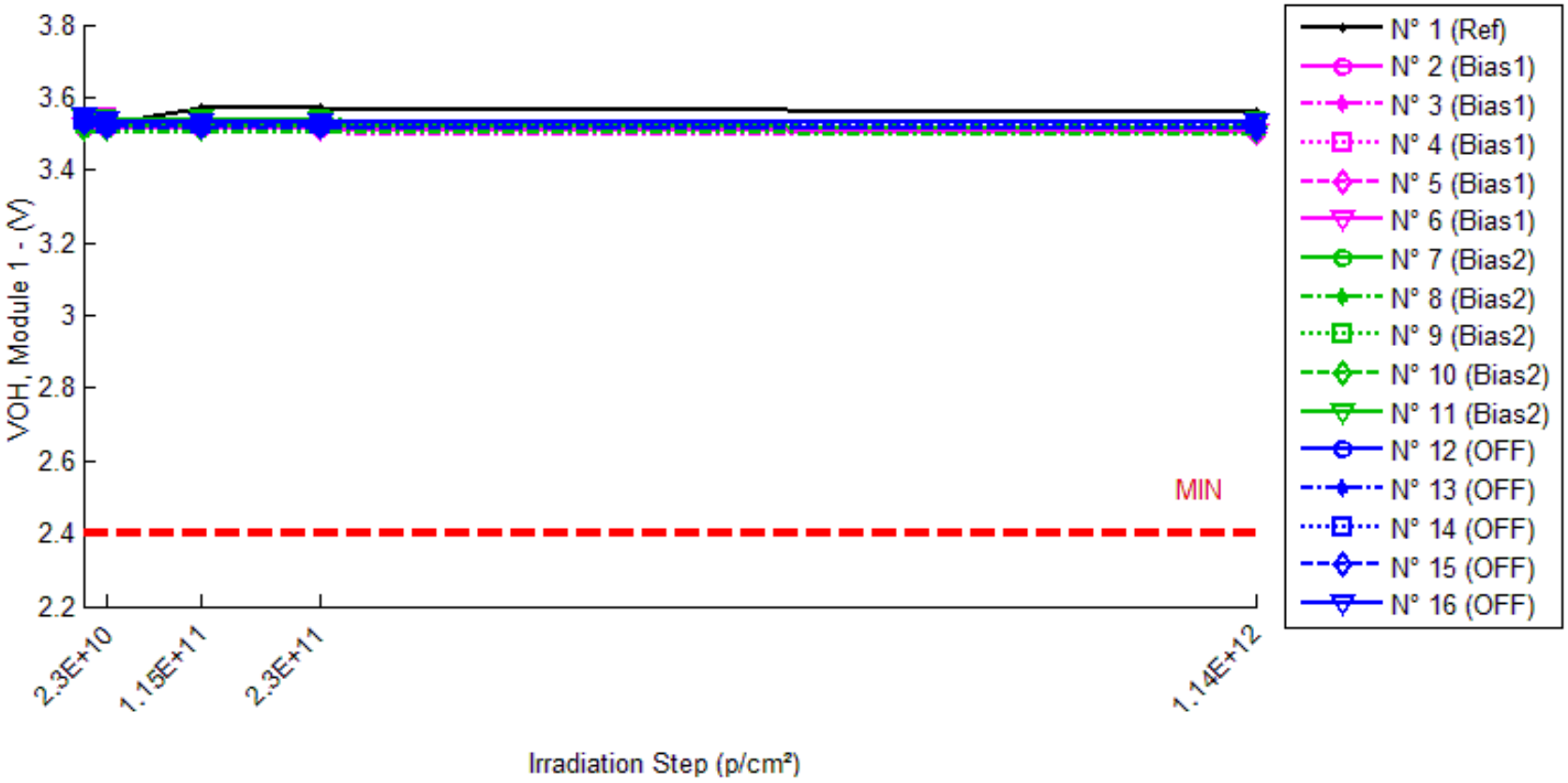
Delta [VOL, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-5.450E-5	-7.100E-5	-2.280E-5	-3.730E-5
N° 2 (Bias1)	---	1.141E-4	3.575E-4	1.671E-4	1.057E-3
N° 3 (Bias1)	---	1.768E-4	3.939E-4	4.351E-4	1.560E-3
N° 4 (Bias1)	---	1.026E-4	5.657E-4	6.278E-4	1.301E-3
N° 5 (Bias1)	---	3.543E-4	4.780E-4	4.799E-4	1.150E-3
N° 6 (Bias1)	---	4.890E-4	5.587E-4	5.852E-4	1.513E-3
N° 7 (Bias2)	---	6.207E-4	1.074E-3	7.653E-4	3.118E-3
N° 8 (Bias2)	---	7.073E-4	6.506E-4	6.941E-4	2.624E-3
N° 9 (Bias2)	---	1.075E-3	7.690E-4	1.230E-3	3.095E-3
N° 10 (Bias2)	---	7.817E-4	8.386E-4	1.148E-3	2.892E-3
N° 11 (Bias2)	---	1.029E-3	7.936E-4	1.329E-3	2.834E-3
N° 12 (OFF)	---	5.400E-5	2.373E-4	2.537E-4	2.302E-3
N° 13 (OFF)	---	1.981E-4	5.447E-4	7.488E-4	2.887E-3
N° 14 (OFF)	---	4.268E-4	6.196E-4	8.931E-4	2.509E-3
N° 15 (OFF)	---	4.976E-4	6.561E-4	9.602E-4	2.115E-3
N° 16 (OFF)	---	7.365E-4	9.401E-4	1.064E-3	2.907E-3
Average (OFF)	---	2.474E-4	4.708E-4	4.590E-4	1.316E-3
σ (OFF)	---	1.685E-4	9.425E-5	1.807E-4	2.197E-4
Average+3σ (OFF)	---	7.527E-4	7.535E-4	1.001E-3	1.975E-3
Average-3σ (OFF)	---	-2.580E-4	1.880E-4	-8.313E-5	6.571E-4
Average (Bias1)	---	8.427E-4	8.252E-4	1.033E-3	2.913E-3
σ (Bias1)	---	2.000E-4	1.556E-4	2.855E-4	2.030E-4
Average+3σ (Bias1)	---	1.443E-3	1.292E-3	1.890E-3	3.522E-3
Average-3σ (Bias1)	---	2.428E-4	3.584E-4	1.768E-4	2.303E-3
Average (Bias2)	---	3.826E-4	5.996E-4	7.839E-4	2.544E-3
σ (Bias2)	---	2.657E-4	2.519E-4	3.177E-4	3.512E-4
Average+3σ (Bias2)	---	1.180E-3	1.355E-3	1.737E-3	3.598E-3
Average-3σ (Bias2)	---	-4.146E-4	-1.561E-4	-1.691E-4	1.490E-3

60 MeV proton / detailed results

3. VOH module 1

Ta = 25°C ; Ioh = -4mA



60 MeV proton / detailed results

VOH, Module 1 . (V) **Min = 2.4**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	3.565	3.528	3.569	3.571	3.562
N° 2 (Bias1)	3.514	3.514	3.514	3.515	3.506
N° 3 (Bias1)	3.508	3.506	3.506	3.505	3.496
N° 4 (Bias1)	3.540	3.542	3.538	3.539	3.530
N° 5 (Bias1)	3.520	3.519	3.520	3.519	3.506
N° 6 (Bias1)	3.518	3.516	3.518	3.518	3.505
N° 7 (Bias2)	3.521	3.519	3.519	3.524	3.513
N° 8 (Bias2)	3.504	3.504	3.505	3.507	3.497
N° 9 (Bias2)	3.539	3.536	3.539	3.538	3.532
N° 10 (Bias2)	3.525	3.524	3.523	3.523	3.518
N° 11 (Bias2)	3.541	3.538	3.540	3.537	3.532
N° 12 (OFF)	3.539	3.529	3.534	3.534	3.529
N° 13 (OFF)	3.524	3.515	3.514	3.515	3.512
N° 14 (OFF)	3.537	3.524	3.525	3.523	3.523
N° 15 (OFF)	3.532	3.520	3.520	3.518	3.517
N° 16 (OFF)	3.549	3.535	3.534	3.533	3.532

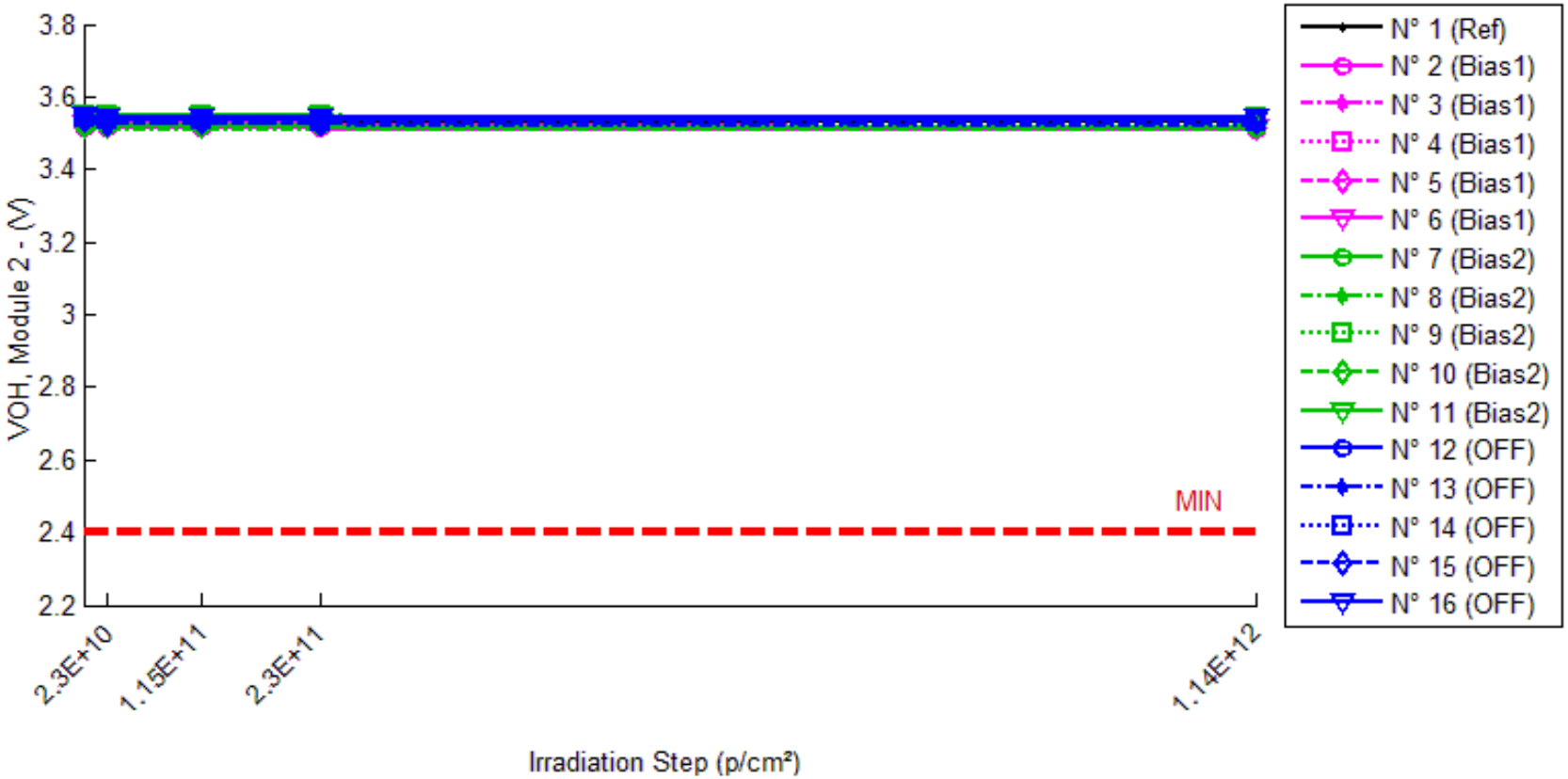
Delta [VOH, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-3.787E-2	3.243E-3	5.877E-3	-3.411E-3
N° 2 (Bias1)	---	-4.370E-4	-2.900E-5	1.069E-3	-8.169E-3
N° 3 (Bias1)	---	-1.821E-3	-1.911E-3	-2.723E-3	-1.166E-2
N° 4 (Bias1)	---	1.540E-3	-1.999E-3	-1.612E-3	-1.037E-2
N° 5 (Bias1)	---	-1.348E-3	-2.030E-4	-1.102E-3	-1.409E-2
N° 6 (Bias1)	---	-2.453E-3	-6.950E-4	-6.330E-4	-1.351E-2
N° 7 (Bias2)	---	-1.457E-3	-1.765E-3	3.380E-3	-7.322E-3
N° 8 (Bias2)	---	-4.500E-5	1.490E-3	2.981E-3	-6.386E-3
N° 9 (Bias2)	---	-2.970E-3	-5.900E-5	-1.434E-3	-7.302E-3
N° 10 (Bias2)	---	-2.290E-4	-1.253E-3	-1.045E-3	-6.539E-3
N° 11 (Bias2)	---	-3.067E-3	-1.420E-3	-4.893E-3	-9.636E-3
N° 12 (OFF)	---	-1.003E-2	-5.427E-3	-5.807E-3	-1.001E-2
N° 13 (OFF)	---	-9.402E-3	-9.875E-3	-9.715E-3	-1.228E-2
N° 14 (OFF)	---	-1.228E-2	-1.205E-2	-1.378E-2	-1.401E-2
N° 15 (OFF)	---	-1.242E-2	-1.220E-2	-1.435E-2	-1.546E-2
N° 16 (OFF)	---	-1.449E-2	-1.562E-2	-1.595E-2	-1.726E-2
Average (OFF)	---	-9.038E-4	-9.674E-4	-1.000E-3	-1.156E-2
σ (OFF)	---	1.552E-3	9.346E-4	1.394E-3	2.403E-3
Average+3σ (OFF)	---	3.751E-3	1.836E-3	3.181E-3	-4.349E-3
Average-3σ (OFF)	---	-5.558E-3	-3.771E-3	-5.181E-3	-1.877E-2
Average (Bias1)	---	-1.554E-3	-6.014E-4	-2.022E-4	-7.437E-3
σ (Bias1)	---	1.444E-3	1.334E-3	3.435E-3	1.302E-3
Average+3σ (Bias1)	---	2.777E-3	3.400E-3	1.010E-2	-3.532E-3
Average-3σ (Bias1)	---	-5.885E-3	-4.603E-3	-1.051E-2	-1.134E-2
Average (Bias2)	---	-1.173E-2	-1.103E-2	-1.192E-2	-1.380E-2
σ (Bias2)	---	2.042E-3	3.749E-3	4.120E-3	2.801E-3
Average+3σ (Bias2)	---	-5.598E-3	2.124E-4	4.368E-4	-5.398E-3
Average-3σ (Bias2)	---	-1.785E-2	-2.228E-2	-2.428E-2	-2.221E-2

60 MeV proton / detailed results

4. VOH module 2

Ta = 25°C ; Ioh = -4mA



60 MeV proton / detailed results

VOH, Module 2 . (V) **Min = 2.4**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	3.534	3.534	3.536	3.536	3.532
N° 2 (Bias1)	3.513	3.512	3.513	3.514	3.507
N° 3 (Bias1)	3.518	3.516	3.517	3.517	3.509
N° 4 (Bias1)	3.547	3.546	3.546	3.546	3.539
N° 5 (Bias1)	3.524	3.523	3.523	3.523	3.516
N° 6 (Bias1)	3.525	3.524	3.524	3.525	3.516
N° 7 (Bias2)	3.519	3.521	3.519	3.522	3.514
N° 8 (Bias2)	3.510	3.511	3.511	3.512	3.507
N° 9 (Bias2)	3.548	3.547	3.548	3.547	3.542
N° 10 (Bias2)	3.531	3.532	3.532	3.531	3.526
N° 11 (Bias2)	3.548	3.547	3.548	3.546	3.541
N° 12 (OFF)	3.544	3.539	3.540	3.539	3.537
N° 13 (OFF)	3.530	3.523	3.524	3.524	3.522
N° 14 (OFF)	3.543	3.535	3.535	3.534	3.534
N° 15 (OFF)	3.536	3.528	3.529	3.527	3.529
N° 16 (OFF)	3.551	3.541	3.542	3.541	3.541

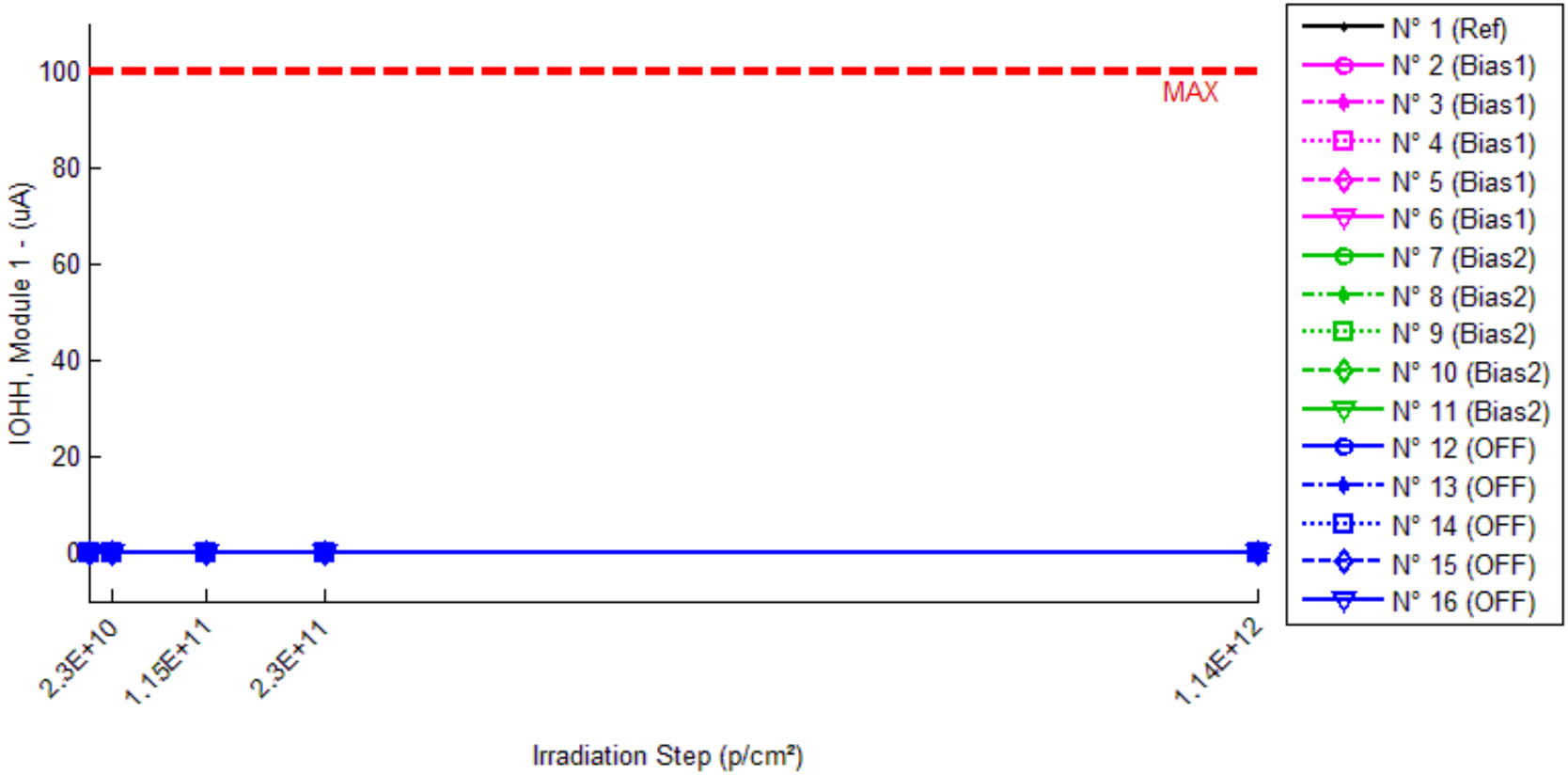
Delta [VOH, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	2.140E-4	1.594E-3	1.538E-3	-2.303E-3
N° 2 (Bias1)	---	-7.140E-4	-3.360E-4	1.049E-3	-6.207E-3
N° 3 (Bias1)	---	-1.178E-3	-7.300E-4	-7.630E-4	-8.174E-3
N° 4 (Bias1)	---	-5.010E-4	-1.220E-3	-8.440E-4	-7.432E-3
N° 5 (Bias1)	---	-1.249E-3	-7.700E-4	-4.350E-4	-7.871E-3
N° 6 (Bias1)	---	-1.199E-3	-7.550E-4	-2.530E-4	-8.750E-3
N° 7 (Bias2)	---	1.939E-3	-2.990E-4	2.137E-3	-5.434E-3
N° 8 (Bias2)	---	8.050E-4	1.047E-3	1.595E-3	-3.511E-3
N° 9 (Bias2)	---	-8.730E-4	2.000E-4	-4.730E-4	-5.942E-3
N° 10 (Bias2)	---	4.380E-4	2.080E-4	2.100E-5	-5.122E-3
N° 11 (Bias2)	---	-8.190E-4	-3.600E-5	-1.561E-3	-6.268E-3
N° 12 (OFF)	---	-5.762E-3	-4.677E-3	-4.939E-3	-6.851E-3
N° 13 (OFF)	---	-6.390E-3	-5.888E-3	-6.130E-3	-8.057E-3
N° 14 (OFF)	---	-7.923E-3	-7.229E-3	-8.442E-3	-8.401E-3
N° 15 (OFF)	---	-8.225E-3	-7.363E-3	-8.657E-3	-7.255E-3
N° 16 (OFF)	---	-9.614E-3	-9.109E-3	-9.541E-3	-1.003E-2
Average (OFF)	---	-9.682E-4	-7.622E-4	-2.492E-4	-7.687E-3
σ (OFF)	---	3.388E-4	3.132E-4	7.645E-4	9.561E-4
Average+3σ (OFF)	---	4.807E-5	1.774E-4	2.044E-3	-4.819E-3
Average-3σ (OFF)	---	-1.984E-3	-1.702E-3	-2.543E-3	-1.056E-2
Average (Bias1)	---	2.980E-4	2.240E-4	3.438E-4	-5.255E-3
σ (Bias1)	---	1.182E-3	5.048E-4	1.515E-3	1.071E-3
Average+3σ (Bias1)	---	3.844E-3	1.738E-3	4.889E-3	-2.042E-3
Average-3σ (Bias1)	---	-3.248E-3	-1.290E-3	-4.201E-3	-8.469E-3
Average (Bias2)	---	-7.583E-3	-6.853E-3	-7.542E-3	-8.120E-3
σ (Bias2)	---	1.532E-3	1.670E-3	1.925E-3	1.236E-3
Average+3σ (Bias2)	---	-2.986E-3	-1.843E-3	-1.768E-3	-4.412E-3
Average-3σ (Bias2)	---	-1.218E-2	-1.186E-2	-1.332E-2	-1.183E-2

60 MeV proton / detailed results

5. IOHH module 1

Ta = 25°C ; Vo = 5.25V ; Vf = 0.7V



60 MeV proton / detailed results

IOHH, Module 1 . (uA) **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)	5.442E-4	5.593E-4	5.712E-4	6.217E-4	5.203E-4
N° 2 (Bias1)	5.460E-4	5.398E-4	5.418E-4	5.559E-4	5.887E-4
N° 3 (Bias1)	4.776E-4	4.509E-4	4.512E-4	4.412E-4	4.781E-4
N° 4 (Bias1)	6.672E-4	7.011E-4	6.119E-4	6.195E-4	6.855E-4
N° 5 (Bias1)	5.765E-4	5.474E-4	5.668E-4	5.597E-4	5.238E-4
N° 6 (Bias1)	4.757E-4	4.333E-4	4.621E-4	4.666E-4	4.285E-4
N° 7 (Bias2)	5.944E-4	4.815E-4	4.927E-4	5.986E-4	5.236E-4
N° 8 (Bias2)	4.737E-4	4.200E-4	4.632E-4	4.931E-4	4.435E-4
N° 9 (Bias2)	6.642E-4	5.206E-4	5.983E-4	5.731E-4	5.592E-4
N° 10 (Bias2)	5.708E-4	4.938E-4	4.929E-4	5.012E-4	5.090E-4
N° 11 (Bias2)	7.404E-4	5.782E-4	6.349E-4	5.623E-4	5.763E-4
N° 12 (OFF)	6.165E-4	5.509E-4	6.127E-4	6.323E-4	5.429E-4
N° 13 (OFF)	5.631E-4	4.998E-4	4.828E-4	5.043E-4	4.721E-4
N° 14 (OFF)	7.013E-4	5.589E-4	5.540E-4	5.322E-4	5.379E-4
N° 15 (OFF)	6.212E-4	4.984E-4	4.952E-4	4.745E-4	4.667E-4
N° 16 (OFF)	7.642E-4	5.675E-4	5.405E-4	5.479E-4	5.242E-4

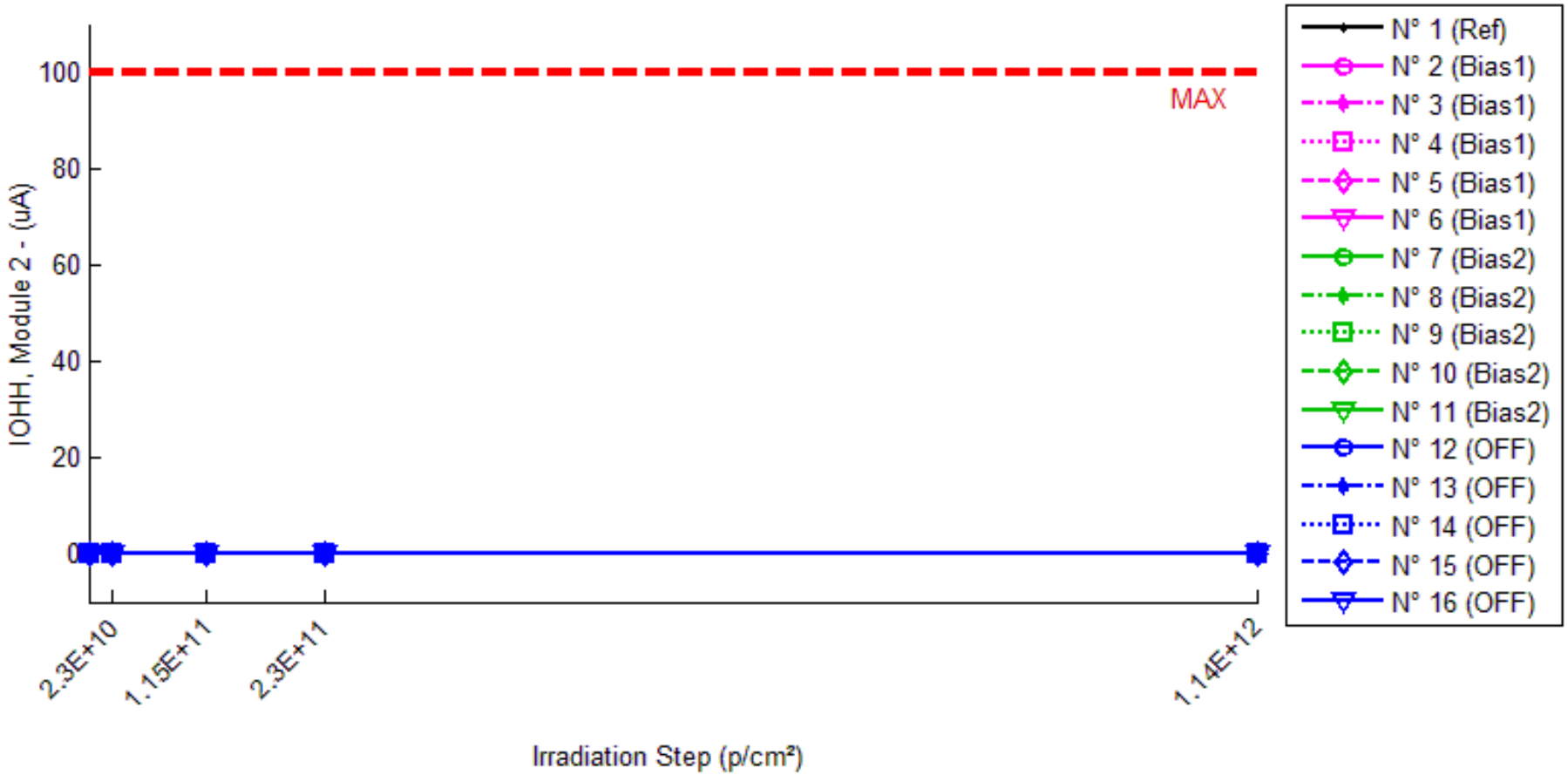
Delta [IOHH, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	1.513E-5	2.703E-5	7.750E-5	-2.393E-5
N° 2 (Bias1)	---	-6.118E-6	-4.191E-6	9.977E-6	4.275E-5
N° 3 (Bias1)	---	-2.666E-5	-2.636E-5	-3.638E-5	5.030E-7
N° 4 (Bias1)	---	3.387E-5	-5.528E-5	-4.774E-5	1.827E-5
N° 5 (Bias1)	---	-2.905E-5	-9.682E-6	-1.677E-5	-5.269E-5
N° 6 (Bias1)	---	-4.246E-5	-1.366E-5	-9.179E-6	-4.724E-5
N° 7 (Bias2)	---	-1.129E-4	-1.018E-4	4.152E-6	-7.087E-5
N° 8 (Bias2)	---	-5.369E-5	-1.052E-5	1.945E-5	-3.021E-5
N° 9 (Bias2)	---	-1.436E-4	-6.593E-5	-9.108E-5	-1.049E-4
N° 10 (Bias2)	---	-7.699E-5	-7.783E-5	-6.957E-5	-6.178E-5
N° 11 (Bias2)	---	-1.622E-4	-1.055E-4	-1.780E-4	-1.641E-4
N° 12 (OFF)	---	-6.551E-5	-3.772E-6	1.589E-5	-7.356E-5
N° 13 (OFF)	---	-6.325E-5	-8.027E-5	-5.880E-5	-9.095E-5
N° 14 (OFF)	---	-1.424E-4	-1.473E-4	-1.692E-4	-1.635E-4
N° 15 (OFF)	---	-1.228E-4	-1.260E-4	-1.467E-4	-1.546E-4
N° 16 (OFF)	---	-1.967E-4	-2.237E-4	-2.164E-4	-2.400E-4
Average (OFF)	---	-1.408E-5	-2.184E-5	-2.002E-5	-7.678E-6
σ (OFF)	---	2.979E-5	2.040E-5	2.272E-5	4.146E-5
Average+3σ (OFF)	---	7.529E-5	3.937E-5	4.813E-5	1.167E-4
Average-3σ (OFF)	---	-1.035E-4	-8.305E-5	-8.816E-5	-1.320E-4
Average (Bias1)	---	-1.099E-4	-7.232E-5	-6.302E-5	-8.639E-5
σ (Bias1)	---	4.506E-5	3.828E-5	7.965E-5	5.097E-5
Average+3σ (Bias1)	---	2.531E-5	4.252E-5	1.759E-4	6.651E-5
Average-3σ (Bias1)	---	-2.451E-4	-1.872E-4	-3.020E-4	-2.393E-4
Average (Bias2)	---	-1.181E-4	-1.162E-4	-1.150E-4	-1.445E-4
σ (Bias2)	---	5.605E-5	8.149E-5	9.287E-5	6.612E-5
Average+3σ (Bias2)	---	5.000E-5	1.282E-4	1.636E-4	5.385E-5
Average-3σ (Bias2)	---	-2.863E-4	-3.607E-4	-3.936E-4	-3.429E-4

60 MeV proton / detailed results

6. IOHH module 2

Ta = 25°C ; Vo = 5.25V ; Vf = 0.7V



60 MeV proton / detailed results

IOHH, Module 2 . (uA) **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)	7.902E-4	7.938E-4	7.945E-4	7.849E-4	8.081E-4
N° 2 (Bias1)	7.075E-4	6.929E-4	6.897E-4	7.162E-4	8.218E-4
N° 3 (Bias1)	6.723E-4	6.421E-4	6.564E-4	6.626E-4	7.583E-4
N° 4 (Bias1)	9.516E-4	9.332E-4	9.048E-4	8.976E-4	1.060E-3
N° 5 (Bias1)	7.927E-4	7.335E-4	7.401E-4	7.613E-4	8.859E-4
N° 6 (Bias1)	6.322E-4	6.134E-4	6.189E-4	6.355E-4	7.090E-4
N° 7 (Bias2)	8.635E-4	7.302E-4	6.935E-4	7.733E-4	7.270E-4
N° 8 (Bias2)	7.295E-4	6.467E-4	6.803E-4	6.966E-4	7.271E-4
N° 9 (Bias2)	1.005E-3	8.391E-4	9.112E-4	8.984E-4	8.914E-4
N° 10 (Bias2)	8.710E-4	7.632E-4	7.895E-4	7.899E-4	8.070E-4
N° 11 (Bias2)	1.053E-3	8.849E-4	9.458E-4	8.953E-4	9.101E-4
N° 12 (OFF)	8.551E-4	8.632E-4	8.847E-4	9.170E-4	8.516E-4
N° 13 (OFF)	7.815E-4	7.675E-4	7.639E-4	7.926E-4	7.620E-4
N° 14 (OFF)	9.310E-4	8.618E-4	8.764E-4	8.655E-4	8.788E-4
N° 15 (OFF)	8.154E-4	7.655E-4	7.817E-4	7.689E-4	8.266E-4
N° 16 (OFF)	9.393E-4	8.418E-4	8.423E-4	8.623E-4	8.526E-4

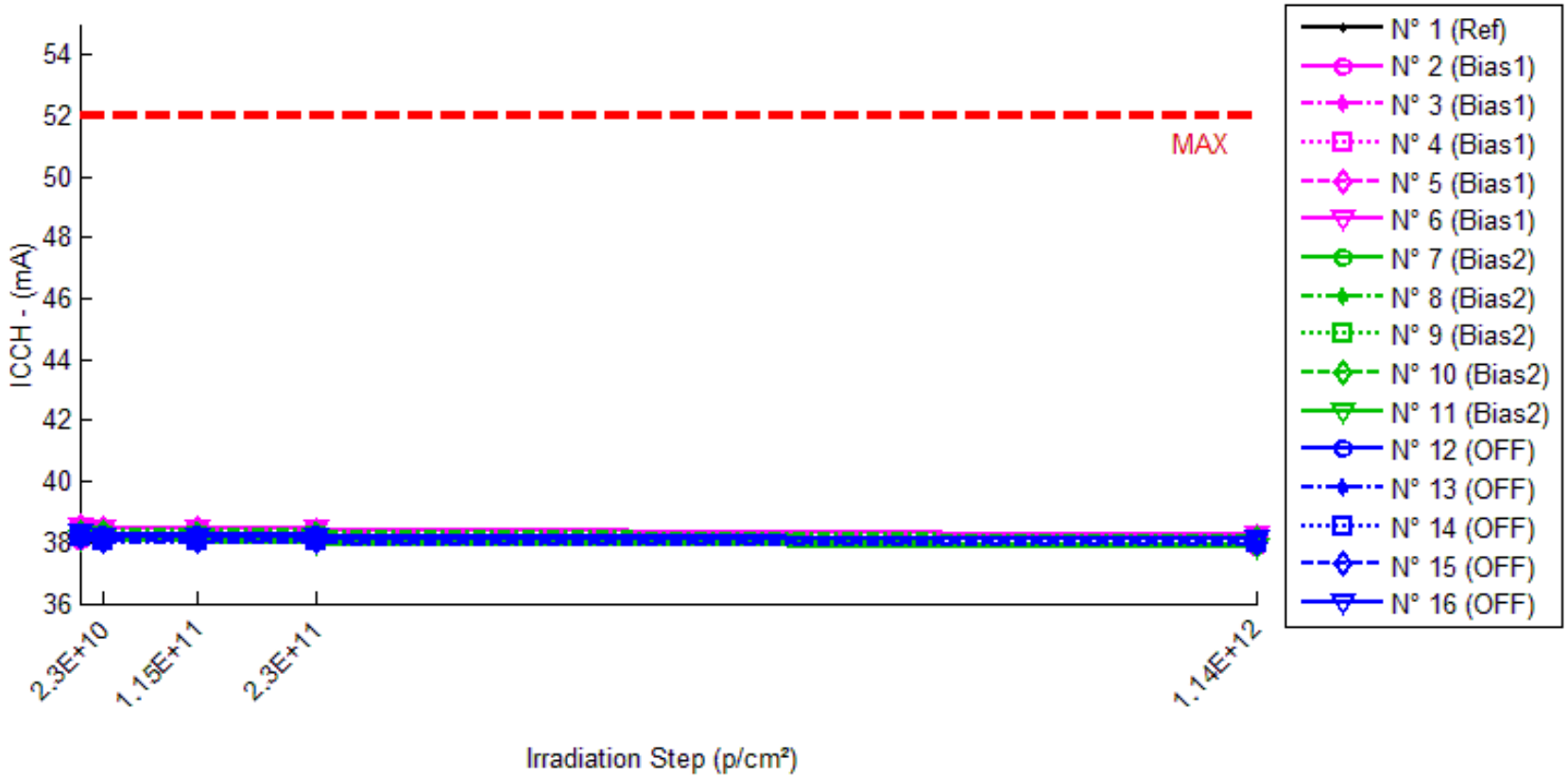
Delta [IOHH, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	3.607E-6	4.234E-6	-5.363E-6	1.790E-5
N° 2 (Bias1)	---	-1.467E-5	-1.785E-5	8.635E-6	1.143E-4
N° 3 (Bias1)	---	-3.022E-5	-1.589E-5	-9.724E-6	8.605E-5
N° 4 (Bias1)	---	-1.836E-5	-4.677E-5	-5.398E-5	1.082E-4
N° 5 (Bias1)	---	-5.922E-5	-5.260E-5	-3.144E-5	9.313E-5
N° 6 (Bias1)	---	-1.873E-5	-1.329E-5	3.311E-6	7.687E-5
N° 7 (Bias2)	---	-1.333E-4	-1.700E-4	-9.015E-5	-1.365E-4
N° 8 (Bias2)	---	-8.278E-5	-4.916E-5	-3.294E-5	-2.424E-6
N° 9 (Bias2)	---	-1.663E-4	-9.418E-5	-1.070E-4	-1.140E-4
N° 10 (Bias2)	---	-1.078E-4	-8.156E-5	-8.114E-5	-6.404E-5
N° 11 (Bias2)	---	-1.684E-4	-1.075E-4	-1.581E-4	-1.432E-4
N° 12 (OFF)	---	8.090E-6	2.959E-5	6.191E-5	-3.559E-6
N° 13 (OFF)	---	-1.396E-5	-1.752E-5	1.115E-5	-1.949E-5
N° 14 (OFF)	---	-6.920E-5	-5.461E-5	-6.543E-5	-5.222E-5
N° 15 (OFF)	---	-4.988E-5	-3.370E-5	-4.656E-5	1.120E-5
N° 16 (OFF)	---	-9.749E-5	-9.694E-5	-7.699E-5	-8.667E-5
Average (OFF)	---	-2.824E-5	-2.928E-5	-1.664E-5	9.571E-5
σ (OFF)	---	1.828E-5	1.881E-5	2.597E-5	1.546E-5
Average+3σ (OFF)	---	2.659E-5	2.716E-5	6.128E-5	1.421E-4
Average-3σ (OFF)	---	-8.307E-5	-8.572E-5	-9.456E-5	4.933E-5
Average (Bias1)	---	-1.317E-4	-1.005E-4	-9.385E-5	-9.202E-5
σ (Bias1)	---	3.712E-5	4.446E-5	4.522E-5	5.892E-5
Average+3σ (Bias1)	---	-2.035E-5	3.291E-5	4.181E-5	8.475E-5
Average-3σ (Bias1)	---	-2.431E-4	-2.339E-4	-2.295E-4	-2.688E-4
Average (Bias2)	---	-4.449E-5	-3.464E-5	-2.318E-5	-3.015E-5
σ (Bias2)	---	4.227E-5	4.664E-5	5.841E-5	3.941E-5
Average+3σ (Bias2)	---	8.231E-5	1.053E-4	1.520E-4	8.808E-5
Average-3σ (Bias2)	---	-1.713E-4	-1.746E-4	-1.984E-4	-1.484E-4

60 MeV proton / detailed results

7. ICCH

Ta = 25°C ; Vcc = 5.25V ; Ve = 0V



60 MeV proton / detailed results

ICCH . (mA) **Max = 52.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	38.113	38.125	38.138	38.163	38.091
N° 2 (Bias1)	38.085	38.067	38.050	38.039	37.881
N° 3 (Bias1)	38.163	38.131	38.100	38.068	37.883
N° 4 (Bias1)	38.378	38.372	38.310	38.293	38.172
N° 5 (Bias1)	38.504	38.471	38.451	38.420	38.207
N° 6 (Bias1)	38.529	38.477	38.471	38.454	38.269
N° 7 (Bias2)	38.181	38.135	38.109	38.142	37.912
N° 8 (Bias2)	38.412	38.377	38.373	38.370	38.190
N° 9 (Bias2)	38.252	38.188	38.200	38.174	38.039
N° 10 (Bias2)	38.329	38.292	38.264	38.246	38.122
N° 11 (Bias2)	38.089	38.029	38.029	37.974	37.862
N° 12 (OFF)	38.323	38.232	38.266	38.249	38.150
N° 13 (OFF)	38.113	38.035	38.016	38.013	37.913
N° 14 (OFF)	38.198	38.086	38.074	38.047	37.998
N° 15 (OFF)	38.177	38.064	38.055	38.023	37.976
N° 16 (OFF)	38.335	38.205	38.183	38.170	38.132

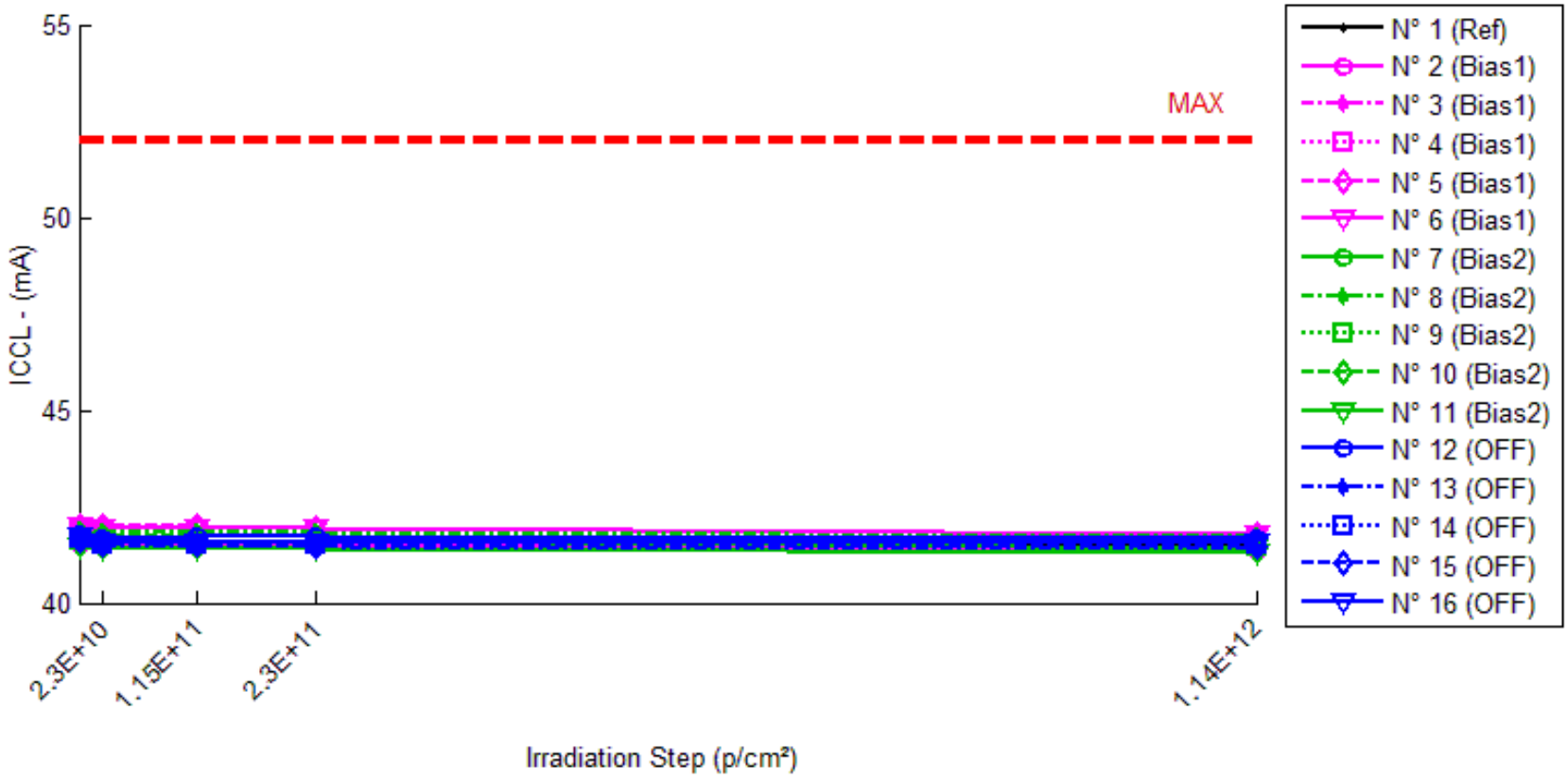
Delta [ICCH]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	1.205E-2	2.518E-2	5.009E-2	-2.188E-2
N° 2 (Bias1)	---	-1.862E-2	-3.538E-2	-4.618E-2	-2.042E-1
N° 3 (Bias1)	---	-3.207E-2	-6.327E-2	-9.494E-2	-2.799E-1
N° 4 (Bias1)	---	-5.330E-3	-6.774E-2	-8.413E-2	-2.051E-1
N° 5 (Bias1)	---	-3.357E-2	-5.323E-2	-8.442E-2	-2.973E-1
N° 6 (Bias1)	---	-5.242E-2	-5.888E-2	-7.561E-2	-2.610E-1
N° 7 (Bias2)	---	-4.604E-2	-7.174E-2	-3.962E-2	-2.688E-1
N° 8 (Bias2)	---	-3.451E-2	-3.900E-2	-4.151E-2	-2.219E-1
N° 9 (Bias2)	---	-6.399E-2	-5.220E-2	-7.886E-2	-2.135E-1
N° 10 (Bias2)	---	-3.750E-2	-6.514E-2	-8.341E-2	-2.069E-1
N° 11 (Bias2)	---	-6.014E-2	-6.014E-2	-1.155E-1	-2.279E-1
N° 12 (OFF)	---	-9.082E-2	-5.687E-2	-7.421E-2	-1.735E-1
N° 13 (OFF)	---	-7.827E-2	-9.735E-2	-1.007E-1	-2.001E-1
N° 14 (OFF)	---	-1.117E-1	-1.236E-1	-1.509E-1	-2.001E-1
N° 15 (OFF)	---	-1.137E-1	-1.227E-1	-1.545E-1	-2.018E-1
N° 16 (OFF)	---	-1.304E-1	-1.527E-1	-1.650E-1	-2.032E-1
Average (OFF)	---	-2.840E-2	-5.570E-2	-7.706E-2	-2.495E-1
σ (OFF)	---	1.764E-2	1.256E-2	1.857E-2	4.291E-2
Average+3σ (OFF)	---	2.453E-2	-1.801E-2	-2.134E-2	-1.208E-1
Average-3σ (OFF)	---	-8.133E-2	-9.339E-2	-1.328E-1	-3.782E-1
Average (Bias1)	---	-4.844E-2	-5.764E-2	-7.179E-2	-2.278E-1
σ (Bias1)	---	1.321E-2	1.263E-2	3.182E-2	2.428E-2
Average+3σ (Bias1)	---	-8.801E-3	-1.975E-2	2.368E-2	-1.550E-1
Average-3σ (Bias1)	---	-8.807E-2	-9.554E-2	-1.673E-1	-3.006E-1
Average (Bias2)	---	-1.050E-1	-1.106E-1	-1.291E-1	-1.957E-1
σ (Bias2)	---	2.049E-2	3.589E-2	3.945E-2	1.251E-2
Average+3σ (Bias2)	---	-4.350E-2	-2.964E-3	-1.069E-2	-1.582E-1
Average-3σ (Bias2)	---	-1.664E-1	-2.183E-1	-2.474E-1	-2.332E-1

60 MeV proton / detailed results

8. ICCL

Ta = 25°C ; Vcc = 5.25V ; Ve = 0V ; If = 8mA



60 MeV proton / detailed results

ICCL . (mA) **Max = 52.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	41.552	41.562	41.578	41.602	41.525
N° 2 (Bias1)	41.522	41.504	41.496	41.494	41.367
N° 3 (Bias1)	41.613	41.582	41.560	41.538	41.377
N° 4 (Bias1)	41.812	41.804	41.752	41.744	41.653
N° 5 (Bias1)	42.018	41.984	41.971	41.946	41.765
N° 6 (Bias1)	42.018	41.966	41.966	41.956	41.803
N° 7 (Bias2)	41.614	41.582	41.563	41.602	41.422
N° 8 (Bias2)	41.873	41.853	41.855	41.858	41.712
N° 9 (Bias2)	41.616	41.565	41.580	41.562	41.467
N° 10 (Bias2)	41.774	41.747	41.723	41.714	41.630
N° 11 (Bias2)	41.468	41.422	41.429	41.386	41.314
N° 12 (OFF)	41.792	41.694	41.737	41.728	41.676
N° 13 (OFF)	41.533	41.446	41.438	41.440	41.386
N° 14 (OFF)	41.650	41.533	41.530	41.512	41.505
N° 15 (OFF)	41.624	41.505	41.506	41.484	41.484
N° 16 (OFF)	41.728	41.593	41.580	41.575	41.575

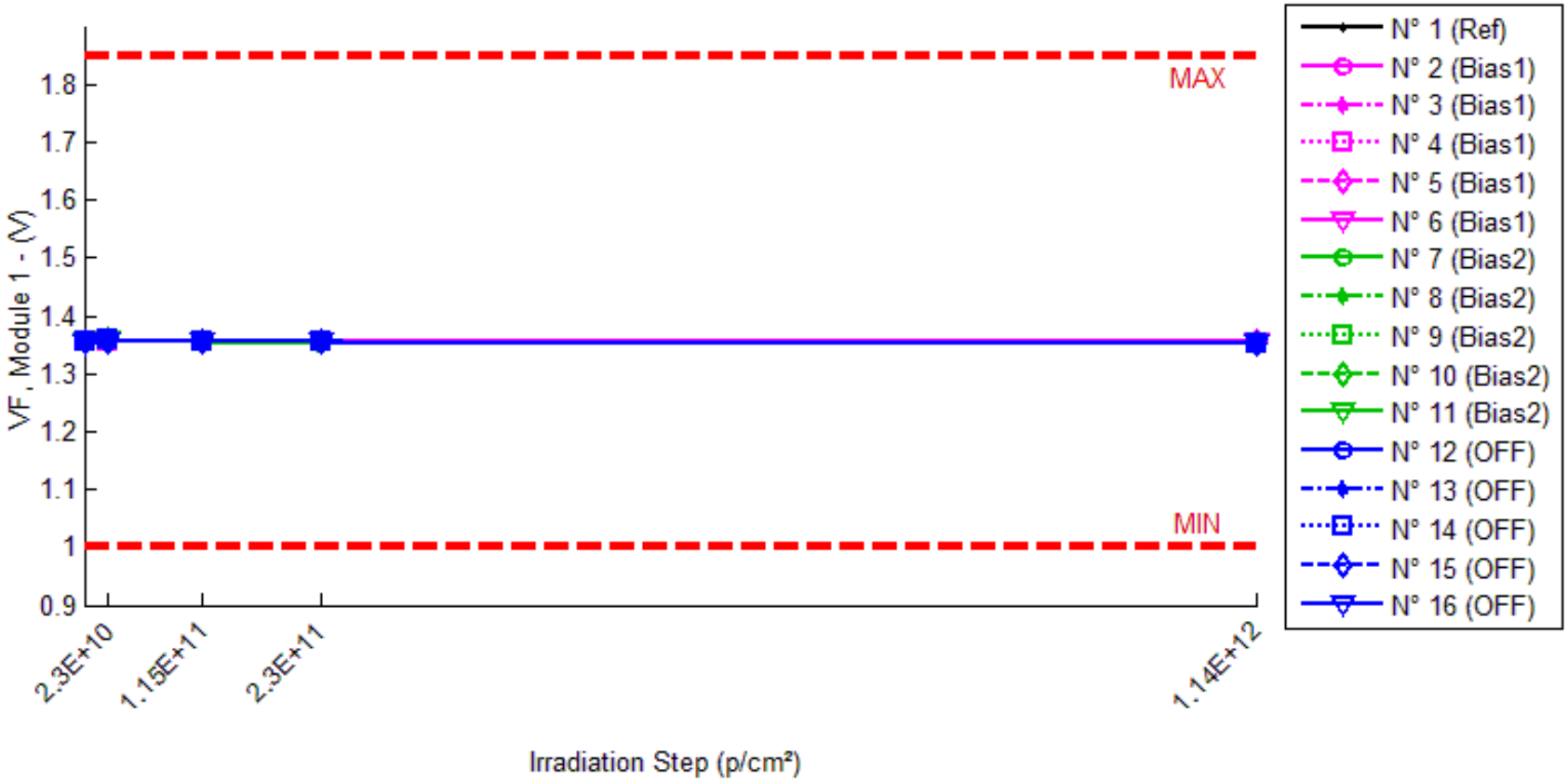
Delta [ICCL]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	9.810E-3	2.551E-2	4.943E-2	-2.745E-2
N° 2 (Bias1)	---	-1.822E-2	-2.579E-2	-2.739E-2	-1.547E-1
N° 3 (Bias1)	---	-3.089E-2	-5.324E-2	-7.493E-2	-2.356E-1
N° 4 (Bias1)	---	-7.930E-3	-5.982E-2	-6.774E-2	-1.590E-1
N° 5 (Bias1)	---	-3.452E-2	-4.721E-2	-7.169E-2	-2.533E-1
N° 6 (Bias1)	---	-5.200E-2	-5.202E-2	-6.143E-2	-2.146E-1
N° 7 (Bias2)	---	-3.220E-2	-5.061E-2	-1.159E-2	-1.921E-1
N° 8 (Bias2)	---	-2.074E-2	-1.856E-2	-1.493E-2	-1.614E-1
N° 9 (Bias2)	---	-5.088E-2	-3.585E-2	-5.413E-2	-1.495E-1
N° 10 (Bias2)	---	-2.715E-2	-5.039E-2	-5.950E-2	-1.440E-1
N° 11 (Bias2)	---	-4.595E-2	-3.946E-2	-8.259E-2	-1.541E-1
N° 12 (OFF)	---	-9.852E-2	-5.554E-2	-6.438E-2	-1.162E-1
N° 13 (OFF)	---	-8.662E-2	-9.534E-2	-9.336E-2	-1.474E-1
N° 14 (OFF)	---	-1.171E-1	-1.199E-1	-1.379E-1	-1.453E-1
N° 15 (OFF)	---	-1.188E-1	-1.178E-1	-1.405E-1	-1.405E-1
N° 16 (OFF)	---	-1.358E-1	-1.485E-1	-1.529E-1	-1.537E-1
Average (OFF)	---	-2.871E-2	-4.762E-2	-6.064E-2	-2.034E-1
σ (OFF)	---	1.675E-2	1.300E-2	1.925E-2	4.471E-2
Average+3σ (OFF)	---	2.155E-2	-8.602E-3	-2.873E-3	-6.929E-2
Average-3σ (OFF)	---	-7.897E-2	-8.663E-2	-1.184E-1	-3.376E-1
Average (Bias1)	---	-3.538E-2	-3.897E-2	-4.455E-2	-1.602E-1
σ (Bias1)	---	1.269E-2	1.316E-2	3.052E-2	1.891E-2
Average+3σ (Bias1)	---	2.686E-3	4.976E-4	4.701E-2	-1.035E-1
Average-3σ (Bias1)	---	-7.345E-2	-7.845E-2	-1.361E-1	-2.170E-1
Average (Bias2)	---	-1.114E-1	-1.074E-1	-1.178E-1	-1.406E-1
σ (Bias2)	---	1.912E-2	3.461E-2	3.742E-2	1.446E-2
Average+3σ (Bias2)	---	-5.401E-2	-3.597E-3	-5.549E-3	-9.723E-2
Average-3σ (Bias2)	---	-1.687E-1	-2.113E-1	-2.300E-1	-1.840E-1

60 MeV proton / detailed results

9. VF module 1

Ta = 25°C ; If = 10mA



60 MeV proton / detailed results

VF, Module 1 . (V) **Min = 1.0 Max = 1.85**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1.356	1.355	1.355	1.354	1.357
N° 2 (Bias1)	1.356	1.356	1.356	1.355	1.351
N° 3 (Bias1)	1.356	1.357	1.357	1.357	1.353
N° 4 (Bias1)	1.356	1.355	1.357	1.357	1.353
N° 5 (Bias1)	1.356	1.356	1.355	1.356	1.354
N° 6 (Bias1)	1.356	1.358	1.356	1.356	1.354
N° 7 (Bias2)	1.355	1.358	1.357	1.353	1.351
N° 8 (Bias2)	1.357	1.359	1.356	1.355	1.352
N° 9 (Bias2)	1.355	1.359	1.356	1.356	1.352
N° 10 (Bias2)	1.356	1.358	1.357	1.356	1.351
N° 11 (Bias2)	1.354	1.358	1.356	1.357	1.352
N° 12 (OFF)	1.357	1.359	1.356	1.355	1.352
N° 13 (OFF)	1.355	1.357	1.357	1.356	1.352
N° 14 (OFF)	1.354	1.358	1.357	1.357	1.352
N° 15 (OFF)	1.354	1.357	1.357	1.357	1.352
N° 16 (OFF)	1.353	1.357	1.357	1.357	1.352

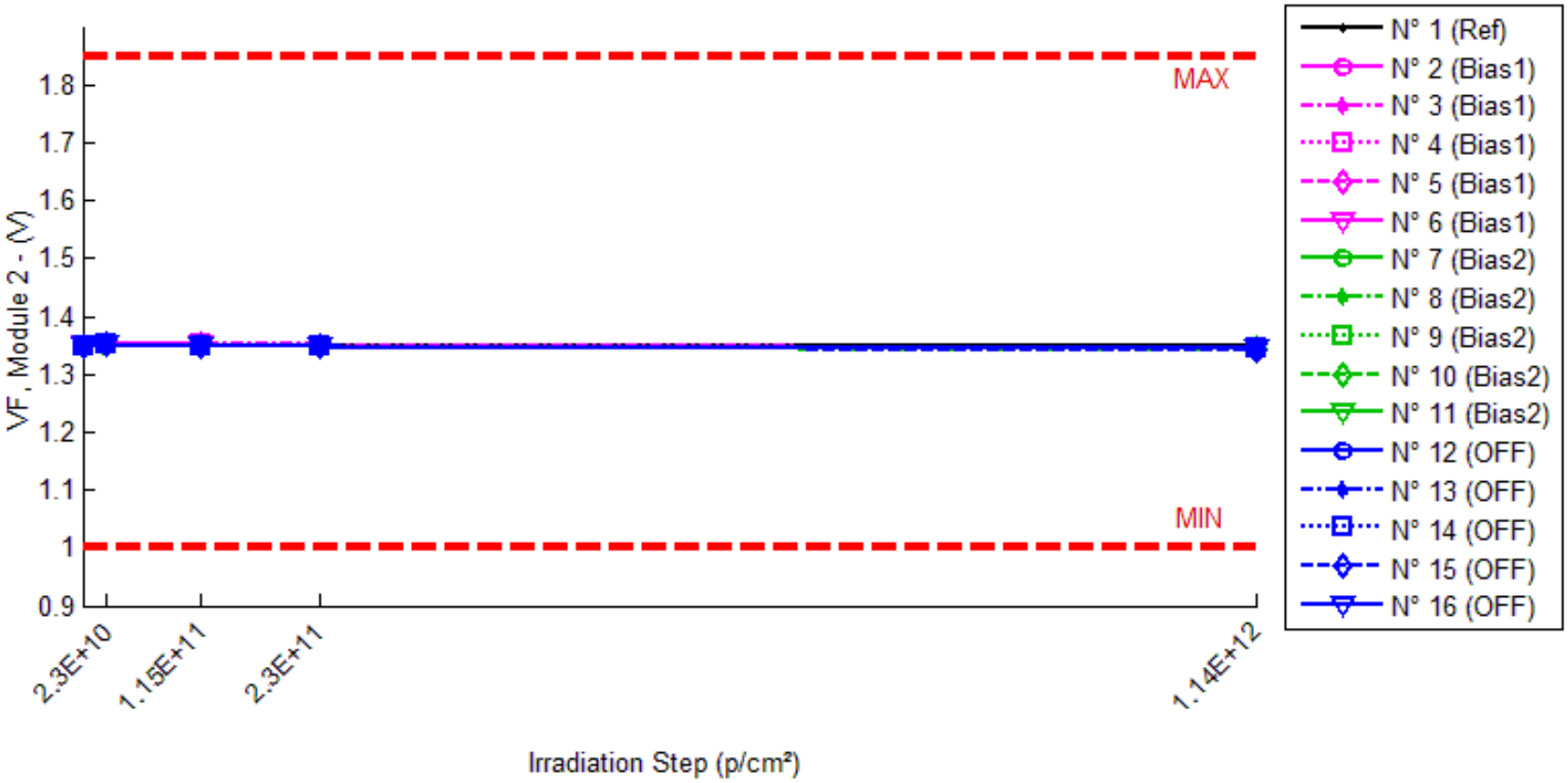
Delta [VF, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-7.380E-4	-1.135E-3	-2.608E-3	5.360E-4
N° 2 (Bias1)	---	2.800E-5	-3.460E-4	-1.218E-3	-4.917E-3
N° 3 (Bias1)	---	8.690E-4	8.270E-4	8.680E-4	-2.701E-3
N° 4 (Bias1)	---	-1.224E-3	7.550E-4	7.100E-5	-3.470E-3
N° 5 (Bias1)	---	6.930E-4	-2.850E-4	-2.240E-4	-1.470E-3
N° 6 (Bias1)	---	1.566E-3	-9.000E-6	-4.840E-4	-2.017E-3
N° 7 (Bias2)	---	3.193E-3	2.066E-3	-1.946E-3	-4.119E-3
N° 8 (Bias2)	---	2.176E-3	-2.520E-4	-1.951E-3	-5.090E-3
N° 9 (Bias2)	---	3.643E-3	7.080E-4	7.710E-4	-3.667E-3
N° 10 (Bias2)	---	2.010E-3	1.387E-3	3.780E-4	-4.954E-3
N° 11 (Bias2)	---	3.644E-3	1.610E-3	2.874E-3	-2.660E-3
N° 12 (OFF)	---	2.094E-3	-7.070E-4	-1.934E-3	-4.586E-3
N° 13 (OFF)	---	1.978E-3	1.947E-3	4.920E-4	-3.342E-3
N° 14 (OFF)	---	3.660E-3	3.082E-3	2.897E-3	-2.038E-3
N° 15 (OFF)	---	3.576E-3	3.034E-3	3.138E-3	-1.678E-3
N° 16 (OFF)	---	4.660E-3	4.882E-3	3.998E-3	-2.900E-4
Average (OFF)	---	3.864E-4	1.884E-4	-1.974E-4	-2.915E-3
σ (OFF)	---	1.054E-3	5.651E-4	7.635E-4	1.347E-3
Average+3σ (OFF)	---	3.547E-3	1.884E-3	2.093E-3	1.126E-3
Average-3σ (OFF)	---	-2.774E-3	-1.507E-3	-2.488E-3	-6.956E-3
Average (Bias1)	---	2.933E-3	1.104E-3	2.520E-5	-4.098E-3
σ (Bias1)	---	7.909E-4	9.024E-4	2.036E-3	9.963E-4
Average+3σ (Bias1)	---	5.306E-3	3.811E-3	6.134E-3	-1.109E-3
Average-3σ (Bias1)	---	5.604E-4	-1.603E-3	-6.084E-3	-7.087E-3
Average (Bias2)	---	3.194E-3	2.448E-3	1.718E-3	-2.387E-3
σ (Bias2)	---	1.140E-3	2.054E-3	2.421E-3	1.641E-3
Average+3σ (Bias2)	---	6.614E-3	8.609E-3	8.981E-3	2.536E-3
Average-3σ (Bias2)	---	-2.272E-4	-3.714E-3	-5.545E-3	-7.309E-3

60 MeV proton / detailed results

10.VF module 2

Ta = 25°C ; If = 10mA



60 MeV proton / detailed results

VF, Module 2 . (V) **Min = 1.0 Max = 1.85**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1.350	1.350	1.350	1.350	1.350
N° 2 (Bias1)	1.351	1.351	1.351	1.350	1.345
N° 3 (Bias1)	1.351	1.351	1.351	1.351	1.346
N° 4 (Bias1)	1.350	1.351	1.351	1.350	1.345
N° 5 (Bias1)	1.350	1.351	1.351	1.350	1.345
N° 6 (Bias1)	1.351	1.352	1.351	1.350	1.346
N° 7 (Bias2)	1.349	1.350	1.350	1.348	1.344
N° 8 (Bias2)	1.350	1.352	1.350	1.349	1.343
N° 9 (Bias2)	1.349	1.351	1.349	1.349	1.344
N° 10 (Bias2)	1.350	1.351	1.350	1.350	1.344
N° 11 (Bias2)	1.349	1.351	1.350	1.350	1.344
N° 12 (OFF)	1.351	1.351	1.350	1.349	1.345
N° 13 (OFF)	1.351	1.351	1.350	1.349	1.345
N° 14 (OFF)	1.350	1.351	1.350	1.350	1.344
N° 15 (OFF)	1.350	1.351	1.350	1.349	1.343
N° 16 (OFF)	1.349	1.351	1.350	1.349	1.344

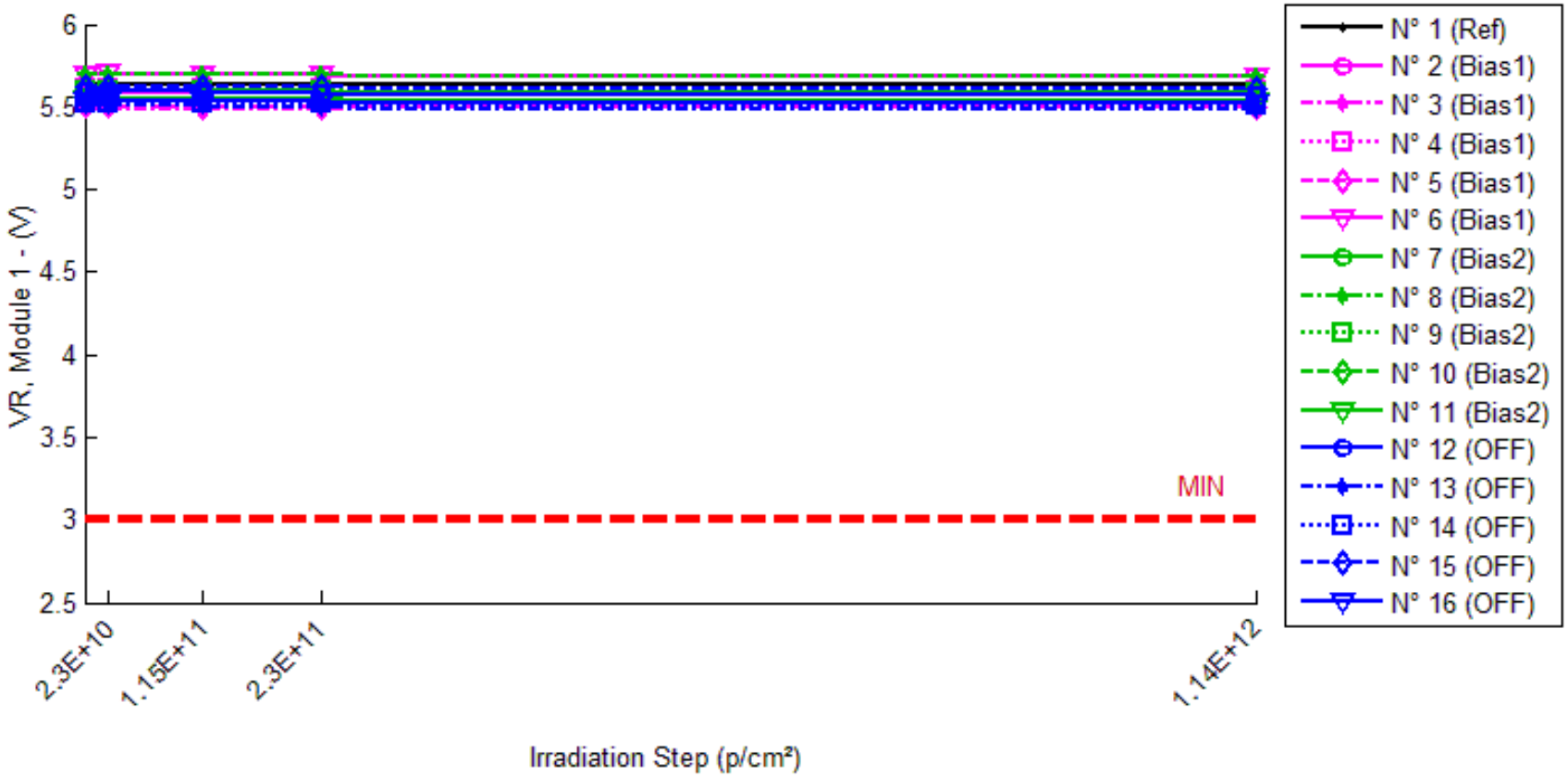
Delta [VF, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-1.560E-4	-2.320E-4	5.100E-5	9.300E-5
N° 2 (Bias1)	---	2.180E-4	-1.140E-4	-1.107E-3	-5.729E-3
N° 3 (Bias1)	---	4.820E-4	4.900E-5	-4.320E-4	-4.831E-3
N° 4 (Bias1)	---	9.100E-5	3.940E-4	-2.730E-4	-5.117E-3
N° 5 (Bias1)	---	7.020E-4	1.100E-4	-6.430E-4	-5.369E-3
N° 6 (Bias1)	---	7.430E-4	8.000E-5	-6.570E-4	-4.734E-3
N° 7 (Bias2)	---	9.330E-4	1.097E-3	-1.117E-3	-5.526E-3
N° 8 (Bias2)	---	1.534E-3	-2.900E-5	-1.130E-3	-7.340E-3
N° 9 (Bias2)	---	2.275E-3	5.130E-4	1.030E-4	-5.288E-3
N° 10 (Bias2)	---	1.537E-3	6.570E-4	-4.000E-6	-5.646E-3
N° 11 (Bias2)	---	2.304E-3	7.640E-4	9.250E-4	-4.830E-3
N° 12 (OFF)	---	-4.030E-4	-1.124E-3	-2.299E-3	-6.318E-3
N° 13 (OFF)	---	1.470E-4	-2.590E-4	-1.437E-3	-5.996E-3
N° 14 (OFF)	---	9.140E-4	3.410E-4	-7.700E-5	-5.498E-3
N° 15 (OFF)	---	8.750E-4	8.200E-5	-4.200E-4	-6.713E-3
N° 16 (OFF)	---	1.436E-3	8.830E-4	1.550E-4	-4.833E-3
Average (OFF)	---	4.472E-4	1.038E-4	-6.224E-4	-5.156E-3
σ (OFF)	---	2.885E-4	1.839E-4	3.142E-4	4.059E-4
Average+3σ (OFF)	---	1.313E-3	6.555E-4	3.201E-4	-3.938E-3
Average-3σ (OFF)	---	-4.184E-4	-4.479E-4	-1.565E-3	-6.374E-3
Average (Bias1)	---	1.717E-3	6.004E-4	-2.446E-4	-5.726E-3
σ (Bias1)	---	5.780E-4	4.124E-4	8.792E-4	9.547E-4
Average+3σ (Bias1)	---	3.451E-3	1.838E-3	2.393E-3	-2.862E-3
Average-3σ (Bias1)	---	-1.749E-5	-6.369E-4	-2.882E-3	-8.590E-3
Average (Bias2)	---	5.938E-4	-1.540E-5	-8.156E-4	-5.872E-3
σ (Bias2)	---	7.218E-4	7.470E-4	1.028E-3	7.316E-4
Average+3σ (Bias2)	---	2.759E-3	2.226E-3	2.270E-3	-3.677E-3
Average-3σ (Bias2)	---	-1.572E-3	-2.256E-3	-3.901E-3	-8.066E-3

60 MeV proton / detailed results

11.VR module 1

Ta = 25°C ; Ir = 10µA



60 MeV proton / detailed results

VR, Module 1 . (V) **Min = 3.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	5.638	5.637	5.637	5.636	5.639
N° 2 (Bias1)	5.588	5.588	5.587	5.586	5.576
N° 3 (Bias1)	5.490	5.491	5.491	5.490	5.481
N° 4 (Bias1)	5.609	5.608	5.609	5.607	5.596
N° 5 (Bias1)	5.504	5.504	5.503	5.502	5.494
N° 6 (Bias1)	5.702	5.703	5.700	5.698	5.689
N° 7 (Bias2)	5.600	5.604	5.602	5.595	5.587
N° 8 (Bias2)	5.698	5.701	5.697	5.694	5.681
N° 9 (Bias2)	5.597	5.602	5.597	5.598	5.583
N° 10 (Bias2)	5.549	5.552	5.551	5.548	5.532
N° 11 (Bias2)	5.543	5.548	5.544	5.546	5.532
N° 12 (OFF)	5.592	5.594	5.591	5.588	5.576
N° 13 (OFF)	5.504	5.506	5.506	5.503	5.490
N° 14 (OFF)	5.516	5.520	5.519	5.518	5.504
N° 15 (OFF)	5.619	5.622	5.621	5.620	5.606
N° 16 (OFF)	5.532	5.538	5.537	5.535	5.522

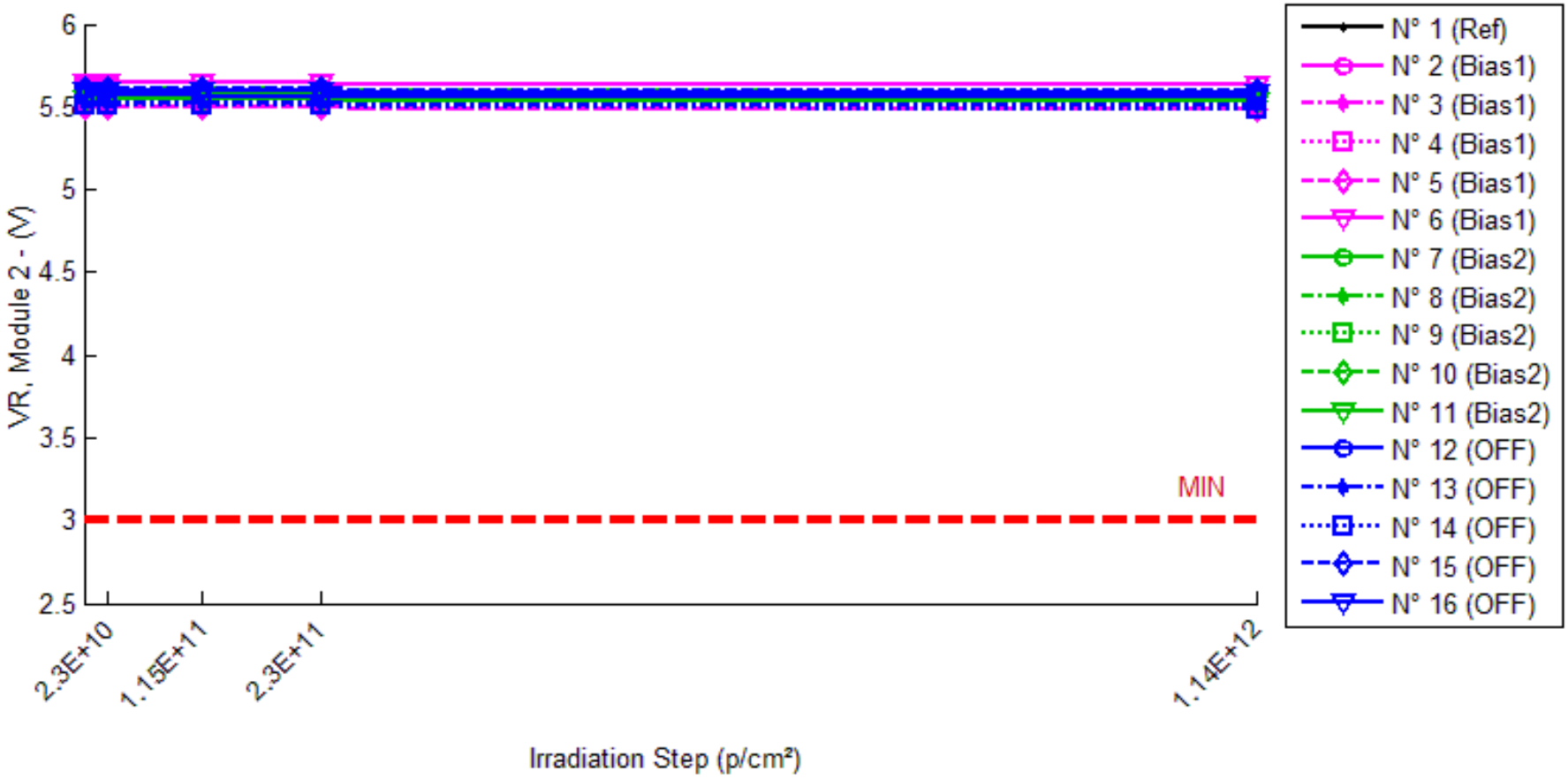
Delta [VR, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-7.020E-4	-1.040E-3	-2.468E-3	4.710E-4
N° 2 (Bias1)	---	1.450E-4	-9.420E-4	-2.732E-3	-1.212E-2
N° 3 (Bias1)	---	1.171E-3	7.330E-4	-2.010E-4	-8.854E-3
N° 4 (Bias1)	---	-1.186E-3	2.970E-4	-1.272E-3	-1.260E-2
N° 5 (Bias1)	---	1.070E-4	-1.135E-3	-2.044E-3	-1.009E-2
N° 6 (Bias1)	---	1.572E-3	-1.571E-3	-3.669E-3	-1.226E-2
N° 7 (Bias2)	---	4.264E-3	2.004E-3	-4.303E-3	-1.260E-2
N° 8 (Bias2)	---	3.017E-3	-1.439E-3	-4.325E-3	-1.665E-2
N° 9 (Bias2)	---	4.809E-3	1.620E-4	8.430E-4	-1.412E-2
N° 10 (Bias2)	---	2.783E-3	1.205E-3	-1.503E-3	-1.745E-2
N° 11 (Bias2)	---	4.826E-3	7.250E-4	2.640E-3	-1.114E-2
N° 12 (OFF)	---	2.146E-3	-1.301E-3	-3.862E-3	-1.573E-2
N° 13 (OFF)	---	2.208E-3	1.606E-3	-9.960E-4	-1.343E-2
N° 14 (OFF)	---	4.213E-3	3.011E-3	1.997E-3	-1.206E-2
N° 15 (OFF)	---	3.749E-3	2.947E-3	1.247E-3	-1.264E-2
N° 16 (OFF)	---	5.484E-3	4.610E-3	2.765E-3	-1.044E-2
Average (OFF)	---	3.618E-4	-5.236E-4	-1.984E-3	-1.119E-2
σ (OFF)	---	1.076E-3	9.872E-4	1.331E-3	1.632E-3
Average+3σ (OFF)	---	3.588E-3	2.438E-3	2.010E-3	-6.289E-3
Average-3σ (OFF)	---	-2.865E-3	-3.485E-3	-5.977E-3	-1.608E-2
Average (Bias1)	---	3.940E-3	5.314E-4	-1.330E-3	-1.439E-2
σ (Bias1)	---	9.792E-4	1.292E-3	3.095E-3	2.661E-3
Average+3σ (Bias1)	---	6.878E-3	4.408E-3	7.956E-3	-6.408E-3
Average-3σ (Bias1)	---	1.002E-3	-3.345E-3	-1.062E-2	-2.237E-2
Average (Bias2)	---	3.560E-3	2.175E-3	2.302E-4	-1.286E-2
σ (Bias2)	---	1.413E-3	2.215E-3	2.685E-3	1.945E-3
Average+3σ (Bias2)	---	7.800E-3	8.821E-3	8.284E-3	-7.027E-3
Average-3σ (Bias2)	---	-6.803E-4	-4.471E-3	-7.824E-3	-1.869E-2

60 MeV proton / detailed results

12.VR module 2

Ta = 25°C ; Ir = 10µA



60 MeV proton / detailed results

VR, Module 2 . (V) **Min = 3.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	5.588	5.588	5.588	5.589	5.588
N° 2 (Bias1)	5.593	5.593	5.592	5.590	5.577
N° 3 (Bias1)	5.504	5.504	5.503	5.500	5.490
N° 4 (Bias1)	5.603	5.603	5.602	5.600	5.587
N° 5 (Bias1)	5.501	5.501	5.500	5.497	5.484
N° 6 (Bias1)	5.647	5.647	5.646	5.642	5.628
N° 7 (Bias2)	5.591	5.592	5.592	5.590	5.574
N° 8 (Bias2)	5.611	5.613	5.611	5.609	5.589
N° 9 (Bias2)	5.567	5.571	5.568	5.567	5.552
N° 10 (Bias2)	5.553	5.555	5.553	5.552	5.535
N° 11 (Bias2)	5.545	5.548	5.546	5.545	5.530
N° 12 (OFF)	5.572	5.571	5.570	5.565	5.555
N° 13 (OFF)	5.522	5.522	5.521	5.517	5.505
N° 14 (OFF)	5.506	5.507	5.506	5.504	5.484
N° 15 (OFF)	5.613	5.614	5.612	5.610	5.592
N° 16 (OFF)	5.601	5.602	5.600	5.597	5.586

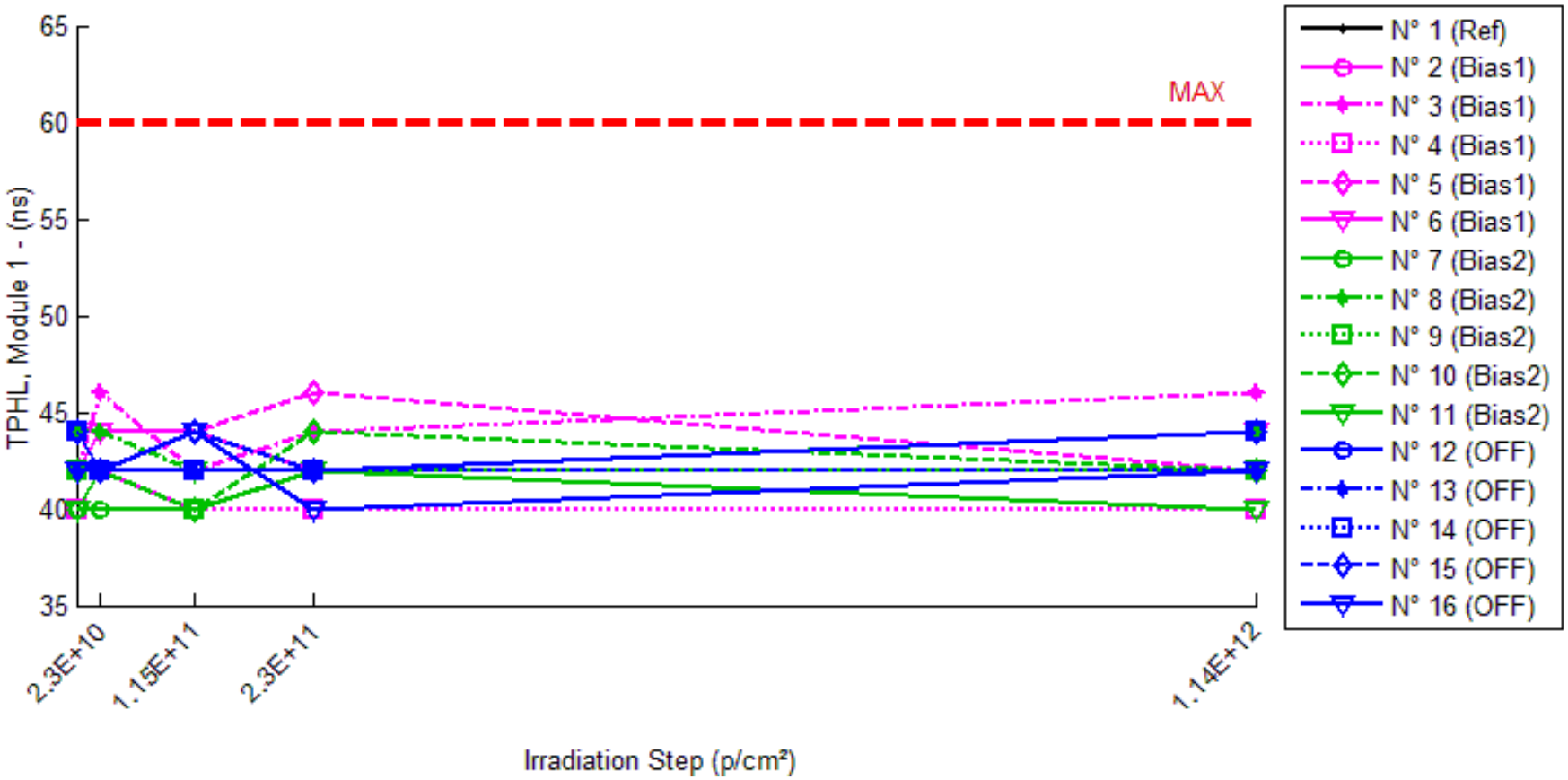
Delta [VR, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-7.200E-5	-6.300E-5	2.080E-4	-7.920E-4
N° 2 (Bias1)	---	1.840E-4	-5.240E-4	-2.933E-3	-1.603E-2
N° 3 (Bias1)	---	1.930E-4	-1.307E-3	-3.398E-3	-1.409E-2
N° 4 (Bias1)	---	1.050E-4	-2.910E-4	-2.522E-3	-1.526E-2
N° 5 (Bias1)	---	3.340E-4	-1.170E-3	-4.208E-3	-1.721E-2
N° 6 (Bias1)	---	1.140E-4	-9.880E-4	-4.777E-3	-1.898E-2
N° 7 (Bias2)	---	5.230E-4	5.760E-4	-1.800E-3	-1.775E-2
N° 8 (Bias2)	---	2.011E-3	-7.720E-4	-2.895E-3	-2.244E-2
N° 9 (Bias2)	---	3.679E-3	7.290E-4	-6.740E-4	-1.516E-2
N° 10 (Bias2)	---	2.480E-3	5.420E-4	-1.415E-3	-1.812E-2
N° 11 (Bias2)	---	3.494E-3	8.220E-4	8.500E-5	-1.464E-2
N° 12 (OFF)	---	-6.000E-4	-1.522E-3	-7.275E-3	-1.725E-2
N° 13 (OFF)	---	-8.100E-5	-1.107E-3	-4.152E-3	-1.669E-2
N° 14 (OFF)	---	1.044E-3	-4.460E-4	-2.178E-3	-2.203E-2
N° 15 (OFF)	---	8.520E-4	-6.660E-4	-2.820E-3	-2.120E-2
N° 16 (OFF)	---	1.033E-3	-1.186E-3	-4.716E-3	-1.533E-2
Average (OFF)	---	1.860E-4	-8.560E-4	-3.568E-3	-1.631E-2
σ (OFF)	---	9.179E-5	4.327E-4	9.216E-4	1.872E-3
Average+3σ (OFF)	---	4.614E-4	4.421E-4	-8.027E-4	-1.070E-2
Average-3σ (OFF)	---	-8.937E-5	-2.154E-3	-6.332E-3	-2.193E-2
Average (Bias1)	---	2.437E-3	3.794E-4	-1.340E-3	-1.762E-2
σ (Bias1)	---	1.275E-3	6.536E-4	1.130E-3	3.100E-3
Average+3σ (Bias1)	---	6.264E-3	2.340E-3	2.051E-3	-8.319E-3
Average-3σ (Bias1)	---	-1.389E-3	-1.581E-3	-4.730E-3	-2.692E-2
Average (Bias2)	---	4.496E-4	-9.854E-4	-4.228E-3	-1.850E-2
σ (Bias2)	---	7.481E-4	4.289E-4	1.982E-3	2.942E-3
Average+3σ (Bias2)	---	2.694E-3	3.014E-4	1.718E-3	-9.676E-3
Average-3σ (Bias2)	---	-1.795E-3	-2.272E-3	-1.017E-2	-2.733E-2

60 MeV proton / detailed results

13.TPHL module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TPHL, Module 1 . (ns) **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)	42	42	42	42	42
N° 2 (Bias1)	40	42	40	42	42
N° 3 (Bias1)	42	46	42	44	46
N° 4 (Bias1)	40	42	40	40	40
N° 5 (Bias1)	42	42	44	46	42
N° 6 (Bias1)	42	44	44	42	44
N° 7 (Bias2)	40	40	40	42	42
N° 8 (Bias2)	44	44	42	42	44
N° 9 (Bias2)	42	42	40	42	42
N° 10 (Bias2)	42	42	40	44	42
N° 11 (Bias2)	40	42	42	42	40
N° 12 (OFF)	44	42	42	42	44
N° 13 (OFF)	42	42	42	42	42
N° 14 (OFF)	44	42	42	42	44
N° 15 (OFF)	44	42	44	42	44
N° 16 (OFF)	42	42	44	40	42

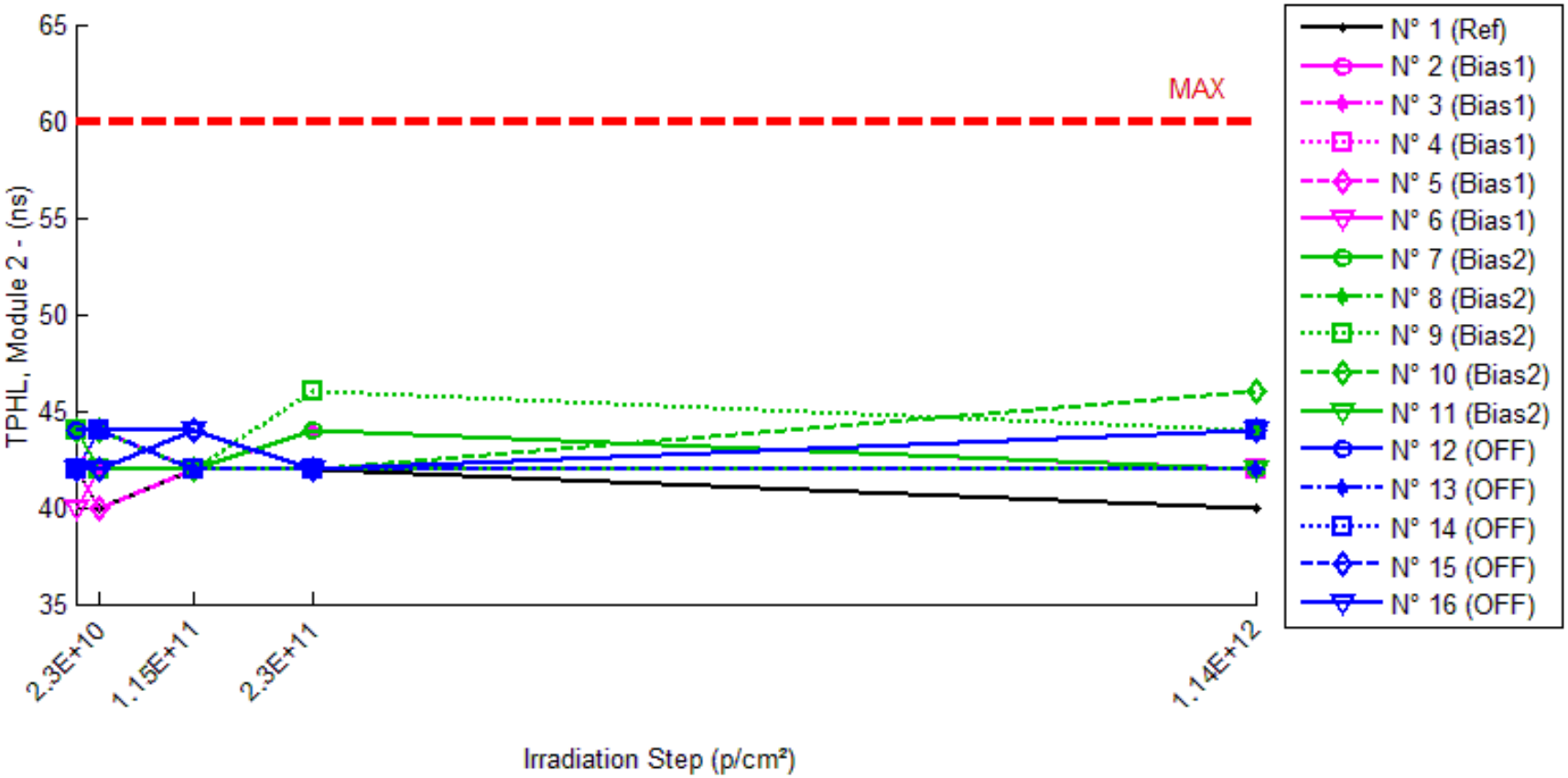
Delta [TPHL, Module 1]

	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	0.000E+0	0.000E+0	0.000E+0
N° 2 (Bias1)	---	2.000E+0	0.000E+0	2.000E+0	2.000E+0
N° 3 (Bias1)	---	4.000E+0	0.000E+0	2.000E+0	4.000E+0
N° 4 (Bias1)	---	2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 5 (Bias1)	---	0.000E+0	2.000E+0	4.000E+0	0.000E+0
N° 6 (Bias1)	---	2.000E+0	2.000E+0	0.000E+0	2.000E+0
N° 7 (Bias2)	---	0.000E+0	0.000E+0	2.000E+0	2.000E+0
N° 8 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 9 (Bias2)	---	0.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 10 (Bias2)	---	0.000E+0	-2.000E+0	2.000E+0	0.000E+0
N° 11 (Bias2)	---	2.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 12 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 13 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 14 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 15 (OFF)	---	-2.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 16 (OFF)	---	0.000E+0	2.000E+0	-2.000E+0	0.000E+0
Average (OFF)	---	2.000E+0	8.000E-1	1.600E+0	1.600E+0
σ (OFF)	---	1.414E+0	1.095E+0	1.673E+0	1.673E+0
Average+3σ (OFF)	---	6.243E+0	4.086E+0	6.620E+0	6.620E+0
Average-3σ (OFF)	---	-2.243E+0	-2.486E+0	-3.420E+0	-3.420E+0
Average (Bias1)	---	4.000E-1	-8.000E-1	8.000E-1	4.000E-1
σ (Bias1)	---	8.944E-1	1.789E+0	1.789E+0	8.944E-1
Average+3σ (Bias1)	---	3.083E+0	4.567E+0	6.167E+0	3.083E+0
Average-3σ (Bias1)	---	-2.283E+0	-6.167E+0	-4.567E+0	-2.283E+0
Average (Bias2)	---	-1.200E+0	-4.000E-1	-1.600E+0	0.000E+0
σ (Bias2)	---	1.095E+0	1.673E+0	8.944E-1	0.000E+0
Average+3σ (Bias2)	---	2.086E+0	4.620E+0	1.083E+0	0.000E+0
Average-3σ (Bias2)	---	-4.486E+0	-5.420E+0	-4.283E+0	0.000E+0

60 MeV proton / detailed results

14.TPHL module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TPHL, Module 2 . (ns) **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)	42	40	42	42	40
N° 2 (Bias1)	42	44	42	42	44
N° 3 (Bias1)	42	42	42	44	42
N° 4 (Bias1)	42	42	42	42	42
N° 5 (Bias1)	42	40	42	42	44
N° 6 (Bias1)	40	42	42	42	44
N° 7 (Bias2)	44	42	42	44	42
N° 8 (Bias2)	44	44	42	42	44
N° 9 (Bias2)	44	42	42	46	44
N° 10 (Bias2)	44	44	42	42	46
N° 11 (Bias2)	42	42	42	42	42
N° 12 (OFF)	44	44	44	42	44
N° 13 (OFF)	42	44	42	42	42
N° 14 (OFF)	42	44	42	42	44
N° 15 (OFF)	42	42	44	42	44
N° 16 (OFF)	42	42	44	42	44

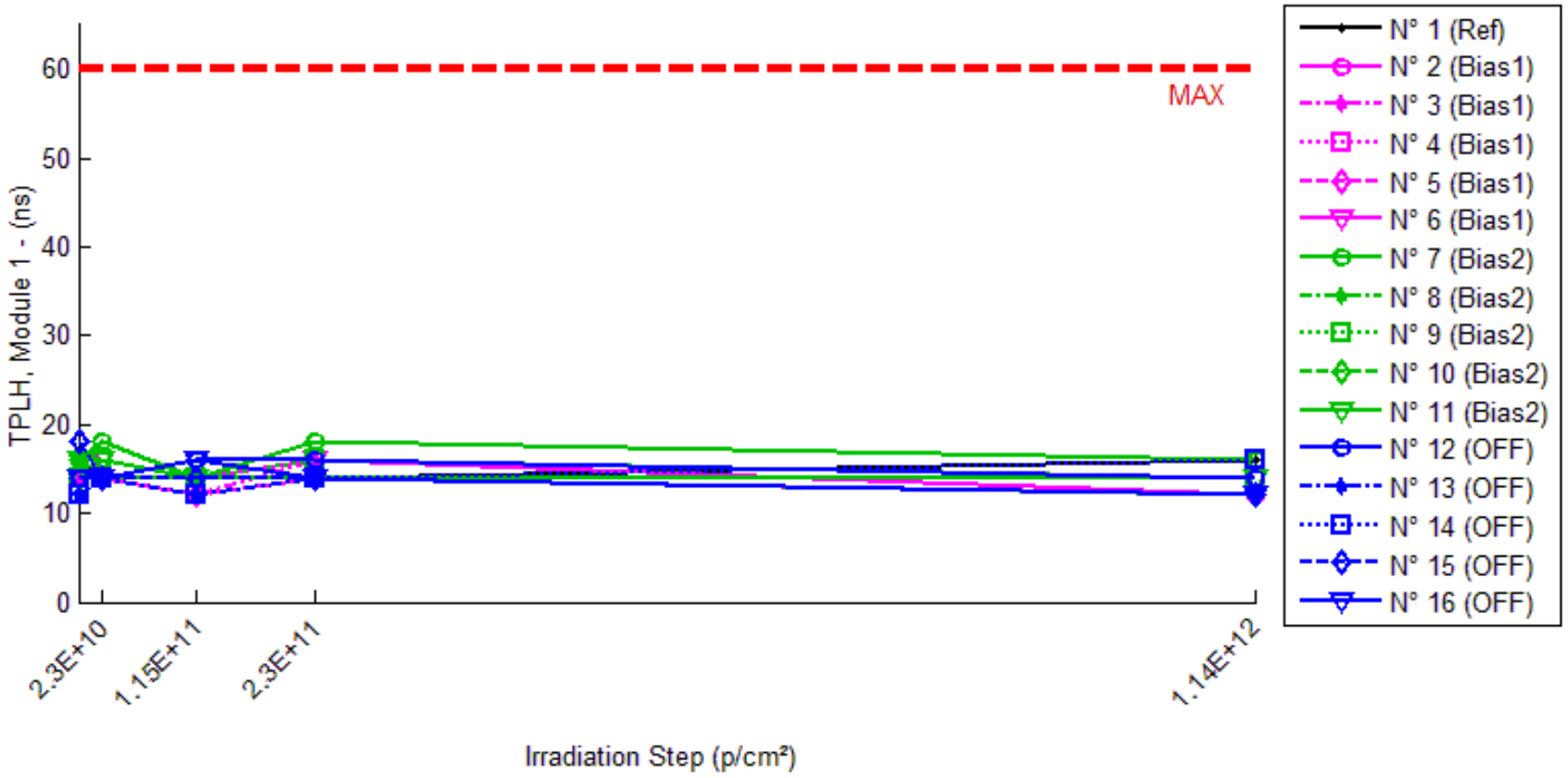
Delta [TPHL, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 2 (Bias1)	---	2.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 3 (Bias1)	---	0.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 5 (Bias1)	---	-2.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 6 (Bias1)	---	2.000E+0	2.000E+0	2.000E+0	4.000E+0
N° 7 (Bias2)	---	-2.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 8 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 9 (Bias2)	---	-2.000E+0	-2.000E+0	2.000E+0	0.000E+0
N° 10 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	2.000E+0
N° 11 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 12 (OFF)	---	0.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 13 (OFF)	---	2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 14 (OFF)	---	2.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 15 (OFF)	---	0.000E+0	2.000E+0	0.000E+0	2.000E+0
N° 16 (OFF)	---	0.000E+0	2.000E+0	0.000E+0	2.000E+0
Average (OFF)	---	4.000E-1	4.000E-1	8.000E-1	1.600E+0
σ (OFF)	---	1.673E+0	8.944E-1	1.095E+0	1.673E+0
Average+3σ (OFF)	---	5.420E+0	3.083E+0	4.086E+0	6.620E+0
Average-3σ (OFF)	---	-4.620E+0	-2.283E+0	-2.486E+0	-3.420E+0
Average (Bias1)	---	-8.000E-1	-1.600E+0	-4.000E-1	0.000E+0
σ (Bias1)	---	1.095E+0	8.944E-1	1.673E+0	1.414E+0
Average+3σ (Bias1)	---	2.486E+0	1.083E+0	4.620E+0	4.243E+0
Average-3σ (Bias1)	---	-4.086E+0	-4.283E+0	-5.420E+0	-4.243E+0
Average (Bias2)	---	8.000E-1	8.000E-1	-4.000E-1	1.200E+0
σ (Bias2)	---	1.095E+0	1.095E+0	8.944E-1	1.095E+0
Average+3σ (Bias2)	---	4.086E+0	4.086E+0	2.283E+0	4.486E+0
Average-3σ (Bias2)	---	-2.486E+0	-2.486E+0	-3.083E+0	-2.086E+0

60 MeV proton / detailed results

15.TPLH module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TPLH, Module 1 . (ns) **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)	16	14	14	14	16
N° 2 (Bias1)	16	16	14	16	12
N° 3 (Bias1)	14	14	12	16	12
N° 4 (Bias1)	14	14	14	16	14
N° 5 (Bias1)	14	14	12	14	12
N° 6 (Bias1)	14	14	16	16	12
N° 7 (Bias2)	16	18	14	18	16
N° 8 (Bias2)	16	14	14	14	12
N° 9 (Bias2)	14	16	14	16	14
N° 10 (Bias2)	14	14	14	14	12
N° 11 (Bias2)	16	16	14	14	14
N° 12 (OFF)	14	14	16	16	14
N° 13 (OFF)	12	14	12	14	12
N° 14 (OFF)	12	14	12	14	16
N° 15 (OFF)	18	14	14	14	12
N° 16 (OFF)	14	14	16	14	12

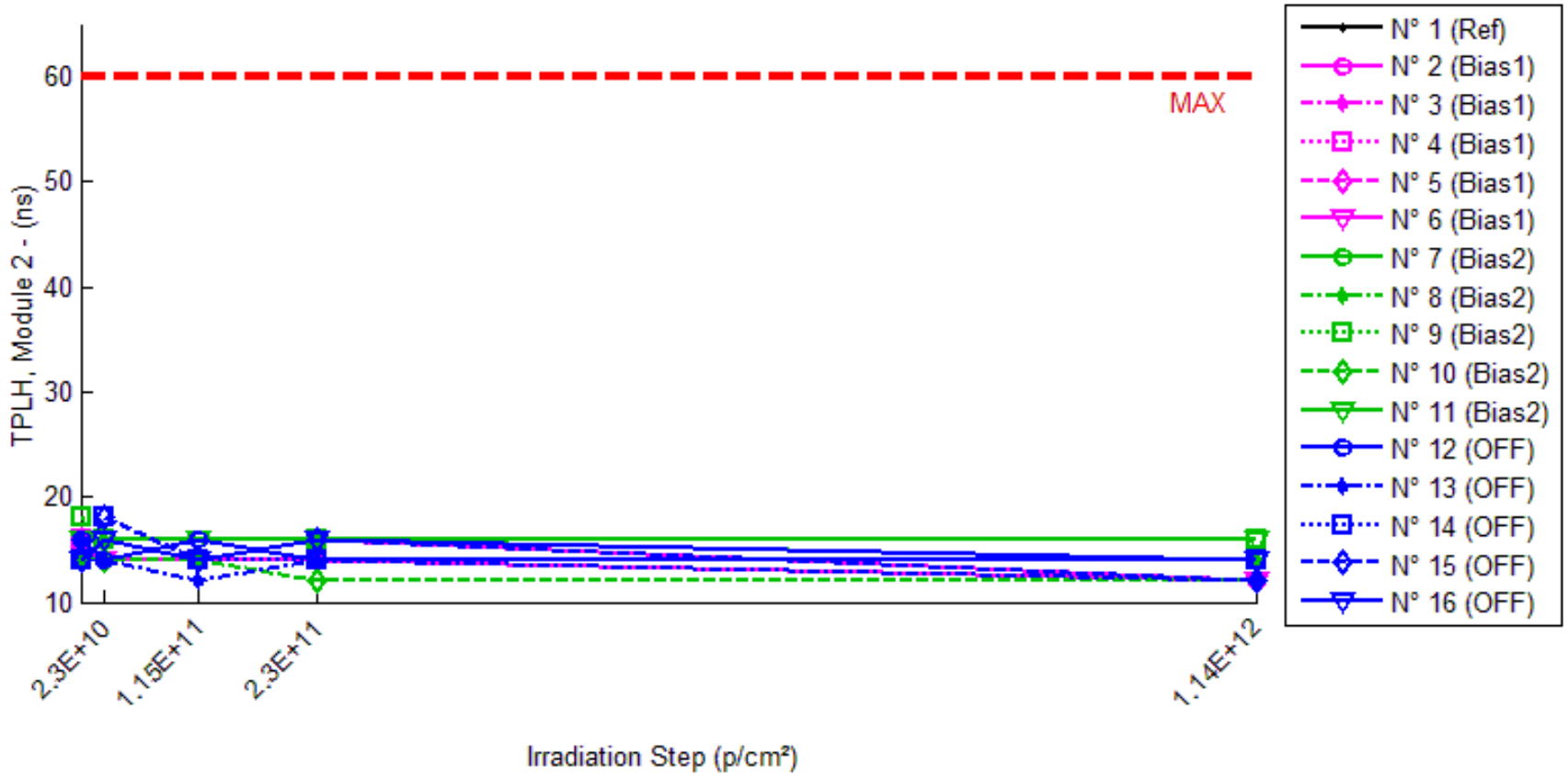
Delta [TPLH, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	-2.000E+0	0.000E+0	-4.000E+0
N° 3 (Bias1)	---	0.000E+0	-2.000E+0	2.000E+0	-2.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 5 (Bias1)	---	0.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 6 (Bias1)	---	0.000E+0	2.000E+0	2.000E+0	-2.000E+0
N° 7 (Bias2)	---	2.000E+0	-2.000E+0	2.000E+0	0.000E+0
N° 8 (Bias2)	---	-2.000E+0	-2.000E+0	-2.000E+0	-4.000E+0
N° 9 (Bias2)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 10 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 11 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 12 (OFF)	---	0.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 13 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 14 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	4.000E+0
N° 15 (OFF)	---	-4.000E+0	-4.000E+0	-4.000E+0	-6.000E+0
N° 16 (OFF)	---	0.000E+0	2.000E+0	0.000E+0	-2.000E+0
Average (OFF)	---	0.000E+0	-8.000E-1	1.200E+0	-2.000E+0
σ (OFF)	---	0.000E+0	1.789E+0	1.095E+0	1.414E+0
Average+3σ (OFF)	---	0.000E+0	4.567E+0	4.486E+0	2.243E+0
Average-3σ (OFF)	---	0.000E+0	-6.167E+0	-2.086E+0	-6.243E+0
Average (Bias1)	---	4.000E-1	-1.200E+0	0.000E+0	-1.600E+0
σ (Bias1)	---	1.673E+0	1.095E+0	2.000E+0	1.673E+0
Average+3σ (Bias1)	---	5.420E+0	2.086E+0	6.000E+0	3.420E+0
Average-3σ (Bias1)	---	-4.620E+0	-4.486E+0	-6.000E+0	-6.620E+0
Average (Bias2)	---	0.000E+0	0.000E+0	4.000E-1	-8.000E-1
σ (Bias2)	---	2.449E+0	2.449E+0	2.608E+0	3.633E+0
Average+3σ (Bias2)	---	7.348E+0	7.348E+0	8.223E+0	1.010E+1
Average-3σ (Bias2)	---	-7.348E+0	-7.348E+0	-7.423E+0	-1.170E+1

60 MeV proton / detailed results

16.TPLH module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TPLH, Module 2 . (ns) **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)	16	14	14	16	14
N° 2 (Bias1)	16	14	16	16	12
N° 3 (Bias1)	14	16	14	16	14
N° 4 (Bias1)	16	16	14	14	14
N° 5 (Bias1)	16	14	14	14	12
N° 6 (Bias1)	16	14	16	16	12
N° 7 (Bias2)	14	14	16	14	14
N° 8 (Bias2)	14	16	14	16	14
N° 9 (Bias2)	18	16	14	16	16
N° 10 (Bias2)	14	14	14	12	12
N° 11 (Bias2)	16	16	16	16	16
N° 12 (OFF)	16	14	16	14	14
N° 13 (OFF)	16	14	12	14	12
N° 14 (OFF)	14	18	14	14	14
N° 15 (OFF)	14	18	14	16	12
N° 16 (OFF)	14	16	14	16	14

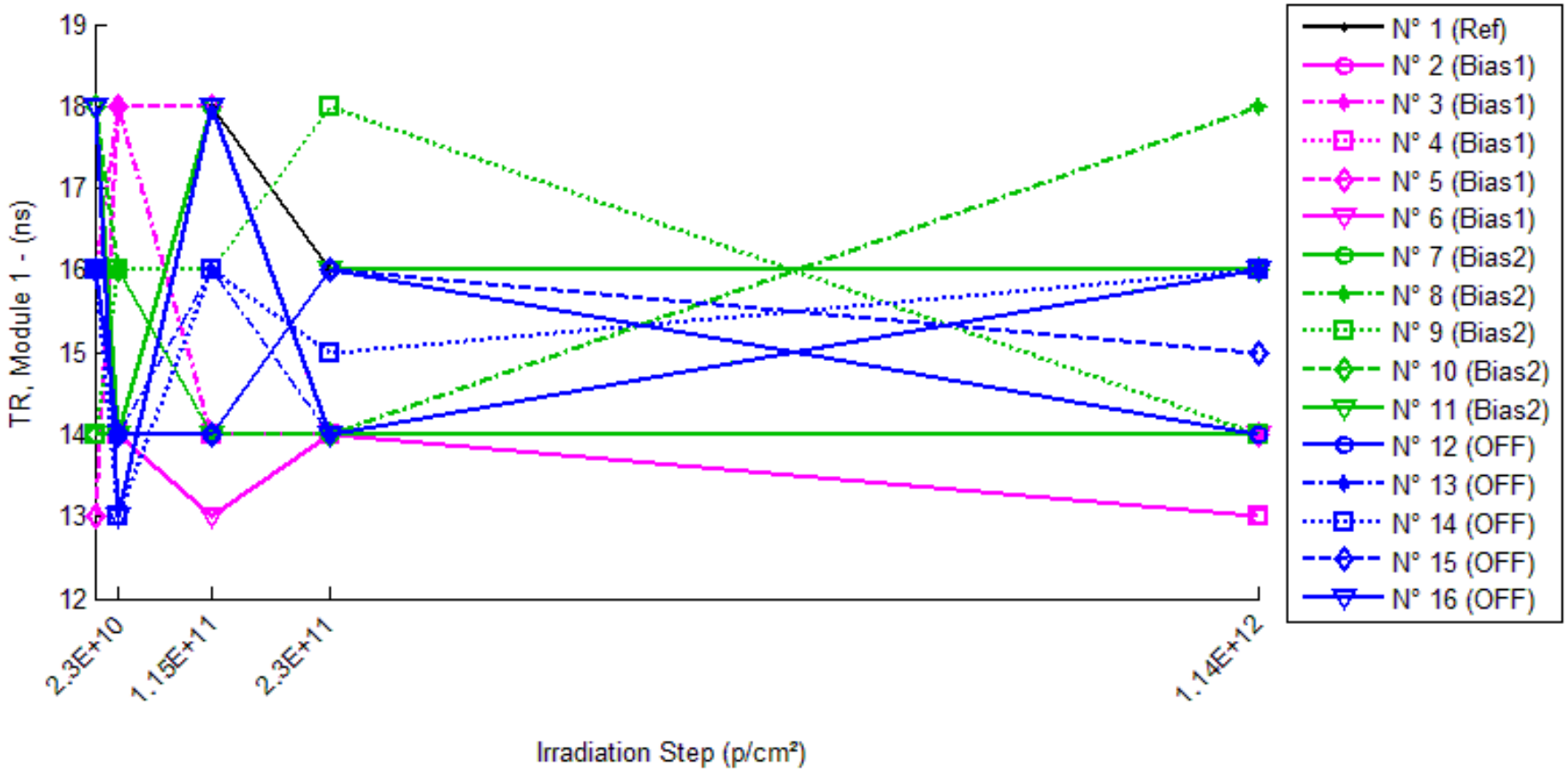
Delta [TPLH, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 2 (Bias1)	---	-2.000E+0	0.000E+0	0.000E+0	-4.000E+0
N° 3 (Bias1)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 4 (Bias1)	---	0.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 5 (Bias1)	---	-2.000E+0	-2.000E+0	-2.000E+0	-4.000E+0
N° 6 (Bias1)	---	-2.000E+0	0.000E+0	0.000E+0	-4.000E+0
N° 7 (Bias2)	---	0.000E+0	2.000E+0	0.000E+0	0.000E+0
N° 8 (Bias2)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 9 (Bias2)	---	-2.000E+0	-4.000E+0	-2.000E+0	-2.000E+0
N° 10 (Bias2)	---	0.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 11 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 12 (OFF)	---	-2.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 13 (OFF)	---	-2.000E+0	-4.000E+0	-2.000E+0	-4.000E+0
N° 14 (OFF)	---	4.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 15 (OFF)	---	4.000E+0	0.000E+0	2.000E+0	-2.000E+0
N° 16 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
Average (OFF)	---	-8.000E-1	-8.000E-1	-4.000E-1	-2.800E+0
σ (OFF)	---	1.789E+0	1.095E+0	1.673E+0	1.789E+0
Average+3σ (OFF)	---	4.567E+0	2.486E+0	4.620E+0	2.567E+0
Average-3σ (OFF)	---	-6.167E+0	-4.086E+0	-5.420E+0	-8.167E+0
Average (Bias1)	---	0.000E+0	-4.000E-1	-4.000E-1	-8.000E-1
σ (Bias1)	---	1.414E+0	2.191E+0	1.673E+0	1.095E+0
Average+3σ (Bias1)	---	4.243E+0	6.173E+0	4.620E+0	2.486E+0
Average-3σ (Bias1)	---	-4.243E+0	-6.973E+0	-5.420E+0	-4.086E+0
Average (Bias2)	---	1.200E+0	-8.000E-1	0.000E+0	-1.600E+0
σ (Bias2)	---	3.033E+0	1.789E+0	2.000E+0	1.673E+0
Average+3σ (Bias2)	---	1.030E+1	4.567E+0	6.000E+0	3.420E+0
Average-3σ (Bias2)	---	-7.899E+0	-6.167E+0	-6.000E+0	-6.620E+0

60 MeV proton / detailed results

17.TR module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TR, Module 1 . (ns)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	16	14	18	16	14
N° 2 (Bias1)	16	14	14	14	13
N° 3 (Bias1)	16	18	14	14	14
N° 4 (Bias1)	14	14	14	14	13
N° 5 (Bias1)	13	18	18	14	14
N° 6 (Bias1)	18	14	13	14	14
N° 7 (Bias2)	14	14	18	14	14
N° 8 (Bias2)	16	16	14	14	18
N° 9 (Bias2)	14	16	16	18	14
N° 10 (Bias2)	18	16	14	14	16
N° 11 (Bias2)	18	14	14	16	16
N° 12 (OFF)	16	14	14	16	14
N° 13 (OFF)	16	14	16	14	16
N° 14 (OFF)	16	13	16	15	16
N° 15 (OFF)	16	14	14	16	15
N° 16 (OFF)	18	13	18	14	16

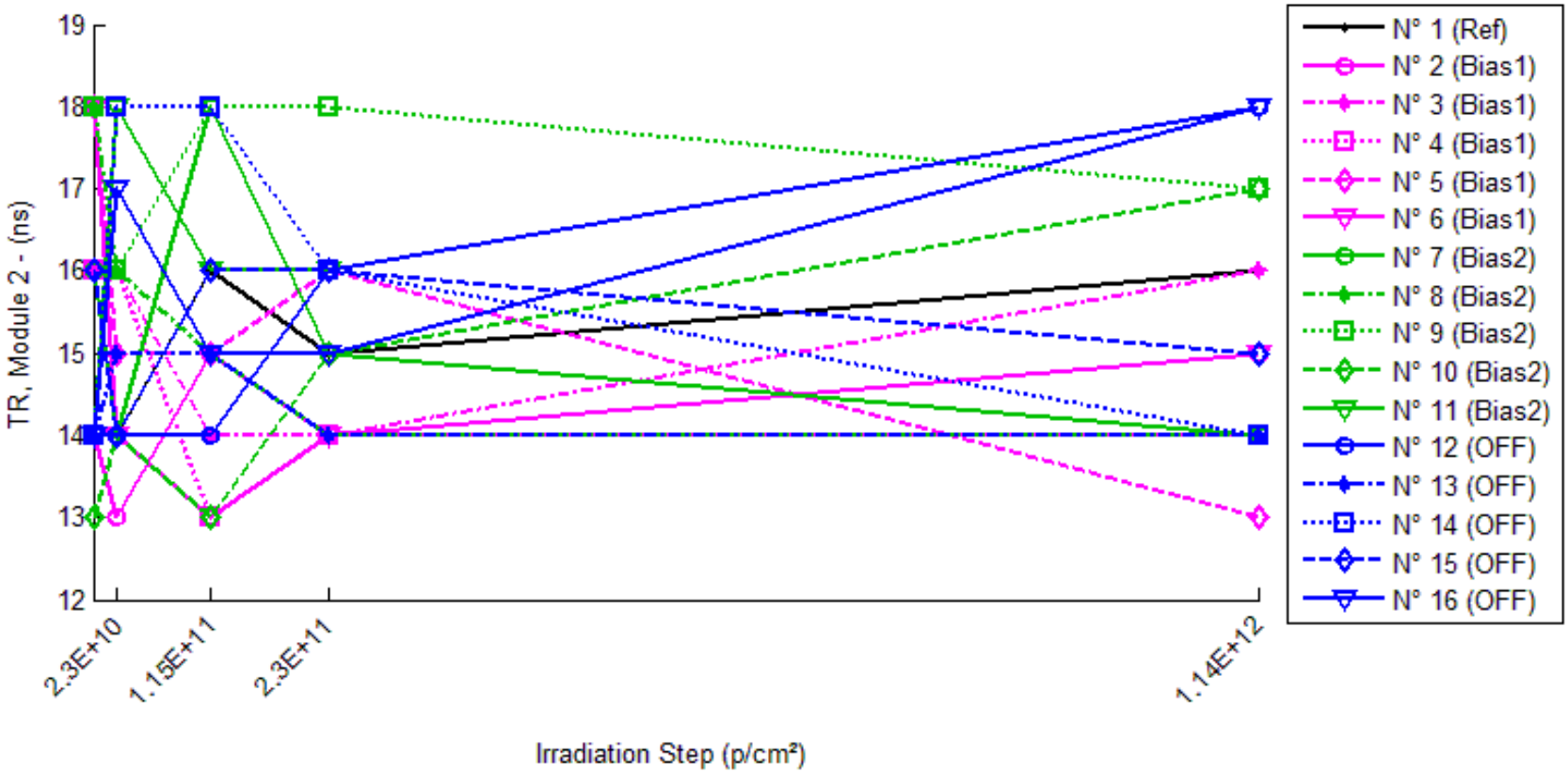
Delta [TR, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	2.000E+0	0.000E+0	-2.000E+0
N° 2 (Bias1)	---	-2.000E+0	-2.000E+0	-2.000E+0	-3.000E+0
N° 3 (Bias1)	---	2.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 5 (Bias1)	---	5.000E+0	5.000E+0	1.000E+0	1.000E+0
N° 6 (Bias1)	---	-4.000E+0	-5.000E+0	-4.000E+0	-4.000E+0
N° 7 (Bias2)	---	0.000E+0	4.000E+0	0.000E+0	0.000E+0
N° 8 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	2.000E+0
N° 9 (Bias2)	---	2.000E+0	2.000E+0	4.000E+0	0.000E+0
N° 10 (Bias2)	---	-2.000E+0	-4.000E+0	-4.000E+0	-2.000E+0
N° 11 (Bias2)	---	-4.000E+0	-4.000E+0	-2.000E+0	-2.000E+0
N° 12 (OFF)	---	-2.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 13 (OFF)	---	-2.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 14 (OFF)	---	-3.000E+0	0.000E+0	-1.000E+0	0.000E+0
N° 15 (OFF)	---	-2.000E+0	-2.000E+0	0.000E+0	-1.000E+0
N° 16 (OFF)	---	-5.000E+0	0.000E+0	-4.000E+0	-2.000E+0
Average (OFF)	---	2.000E-1	-8.000E-1	-1.400E+0	-1.800E+0
σ (OFF)	---	3.493E+0	3.701E+0	1.949E+0	1.924E+0
Average+3σ (OFF)	---	1.068E+1	1.030E+1	4.448E+0	3.971E+0
Average-3σ (OFF)	---	-1.028E+1	-1.190E+1	-7.248E+0	-7.571E+0
Average (Bias1)	---	-8.000E-1	-8.000E-1	-8.000E-1	-4.000E-1
σ (Bias1)	---	2.280E+0	3.633E+0	3.033E+0	1.673E+0
Average+3σ (Bias1)	---	6.041E+0	1.010E+1	8.299E+0	4.620E+0
Average-3σ (Bias1)	---	-7.641E+0	-1.170E+1	-9.899E+0	-5.420E+0
Average (Bias2)	---	-2.800E+0	-8.000E-1	-1.400E+0	-1.000E+0
σ (Bias2)	---	1.304E+0	1.095E+0	1.673E+0	1.000E+0
Average+3σ (Bias2)	---	1.112E+0	2.486E+0	3.620E+0	2.000E+0
Average-3σ (Bias2)	---	-6.712E+0	-4.086E+0	-6.420E+0	-4.000E+0

60 MeV proton / detailed results

18.TR module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TR, Module 2 . (ns)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	14	14	16	15	16
N° 2 (Bias1)	14	13	15	14	15
N° 3 (Bias1)	16	16	14	14	16
N° 4 (Bias1)	16	16	13	14	14
N° 5 (Bias1)	18	15	15	16	13
N° 6 (Bias1)	18	14	13	14	15
N° 7 (Bias2)	16	14	18	15	14
N° 8 (Bias2)	18	16	15	14	14
N° 9 (Bias2)	18	16	18	18	17
N° 10 (Bias2)	13	14	13	15	17
N° 11 (Bias2)	14	18	16	16	18
N° 12 (OFF)	14	14	14	16	18
N° 13 (OFF)	14	15	15	14	14
N° 14 (OFF)	14	18	18	16	14
N° 15 (OFF)	16	14	16	16	15
N° 16 (OFF)	14	17	15	15	18

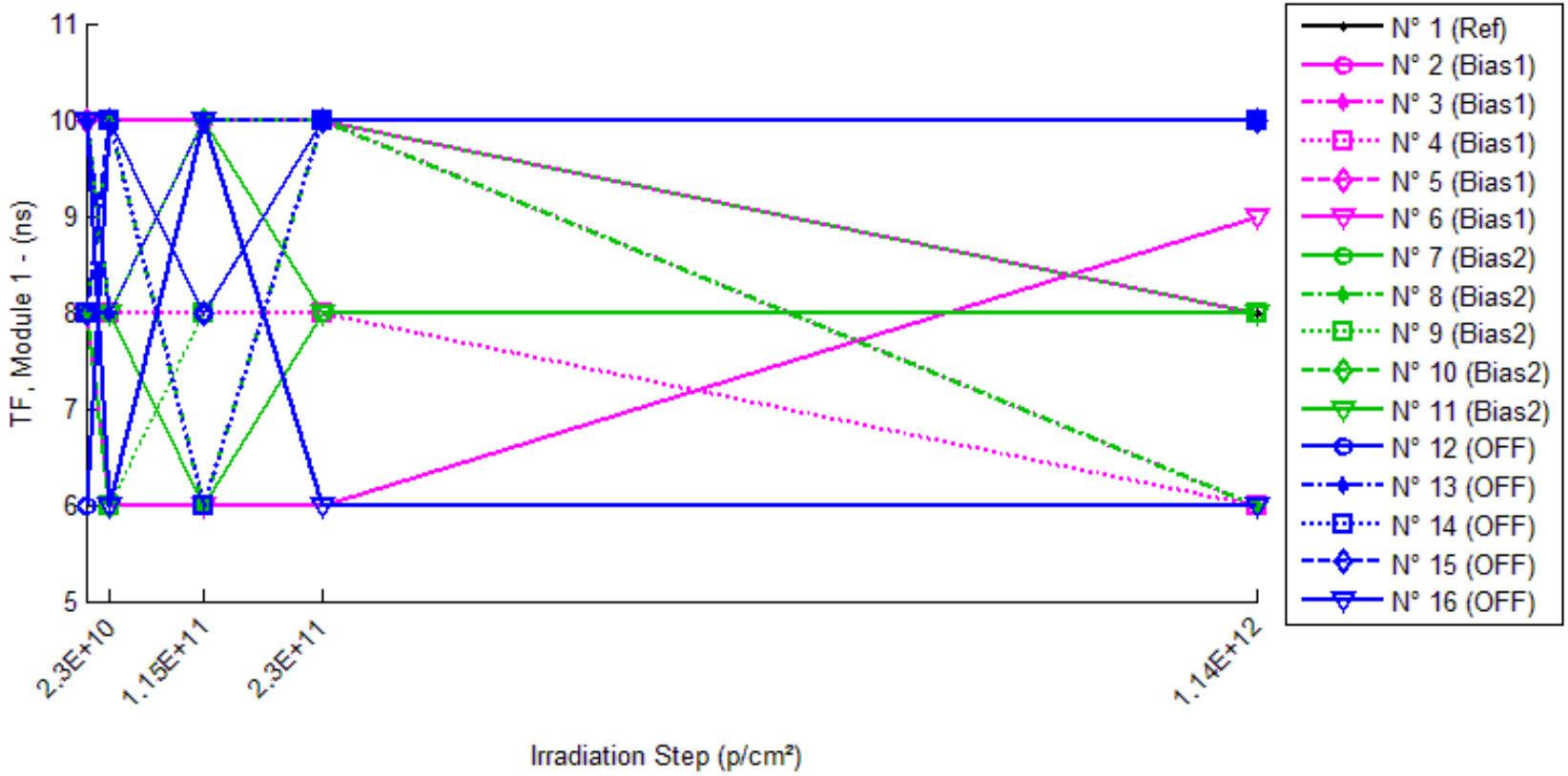
Delta [TR, Module 2]

	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	2.000E+0	1.000E+0	2.000E+0
N° 2 (Bias1)	---	-1.000E+0	1.000E+0	0.000E+0	1.000E+0
N° 3 (Bias1)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 4 (Bias1)	---	0.000E+0	-3.000E+0	-2.000E+0	-2.000E+0
N° 5 (Bias1)	---	-3.000E+0	-3.000E+0	-2.000E+0	-5.000E+0
N° 6 (Bias1)	---	-4.000E+0	-5.000E+0	-4.000E+0	-3.000E+0
N° 7 (Bias2)	---	-2.000E+0	2.000E+0	-1.000E+0	-2.000E+0
N° 8 (Bias2)	---	-2.000E+0	-3.000E+0	-4.000E+0	-4.000E+0
N° 9 (Bias2)	---	-2.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 10 (Bias2)	---	1.000E+0	0.000E+0	2.000E+0	4.000E+0
N° 11 (Bias2)	---	4.000E+0	2.000E+0	2.000E+0	4.000E+0
N° 12 (OFF)	---	0.000E+0	0.000E+0	2.000E+0	4.000E+0
N° 13 (OFF)	---	1.000E+0	1.000E+0	0.000E+0	0.000E+0
N° 14 (OFF)	---	4.000E+0	4.000E+0	2.000E+0	0.000E+0
N° 15 (OFF)	---	-2.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 16 (OFF)	---	3.000E+0	1.000E+0	1.000E+0	4.000E+0
Average (OFF)	---	-1.600E+0	-2.400E+0	-2.000E+0	-1.800E+0
σ (OFF)	---	1.817E+0	2.191E+0	1.414E+0	2.387E+0
Average+3σ (OFF)	---	3.850E+0	4.173E+0	2.243E+0	5.362E+0
Average-3σ (OFF)	---	-7.050E+0	-8.973E+0	-6.243E+0	-8.962E+0
Average (Bias1)	---	-2.000E-1	2.000E-1	-2.000E-1	2.000E-1
σ (Bias1)	---	2.683E+0	2.049E+0	2.490E+0	3.633E+0
Average+3σ (Bias1)	---	7.850E+0	6.348E+0	7.270E+0	1.110E+1
Average-3σ (Bias1)	---	-8.250E+0	-5.948E+0	-7.670E+0	-1.070E+1
Average (Bias2)	---	1.200E+0	1.200E+0	1.000E+0	1.400E+0
σ (Bias2)	---	2.387E+0	1.643E+0	1.000E+0	2.408E+0
Average+3σ (Bias2)	---	8.362E+0	6.130E+0	4.000E+0	8.625E+0
Average-3σ (Bias2)	---	-5.962E+0	-3.730E+0	-2.000E+0	-5.825E+0

60 MeV proton / detailed results

19.TF module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TF, Module 1 . (ns)

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

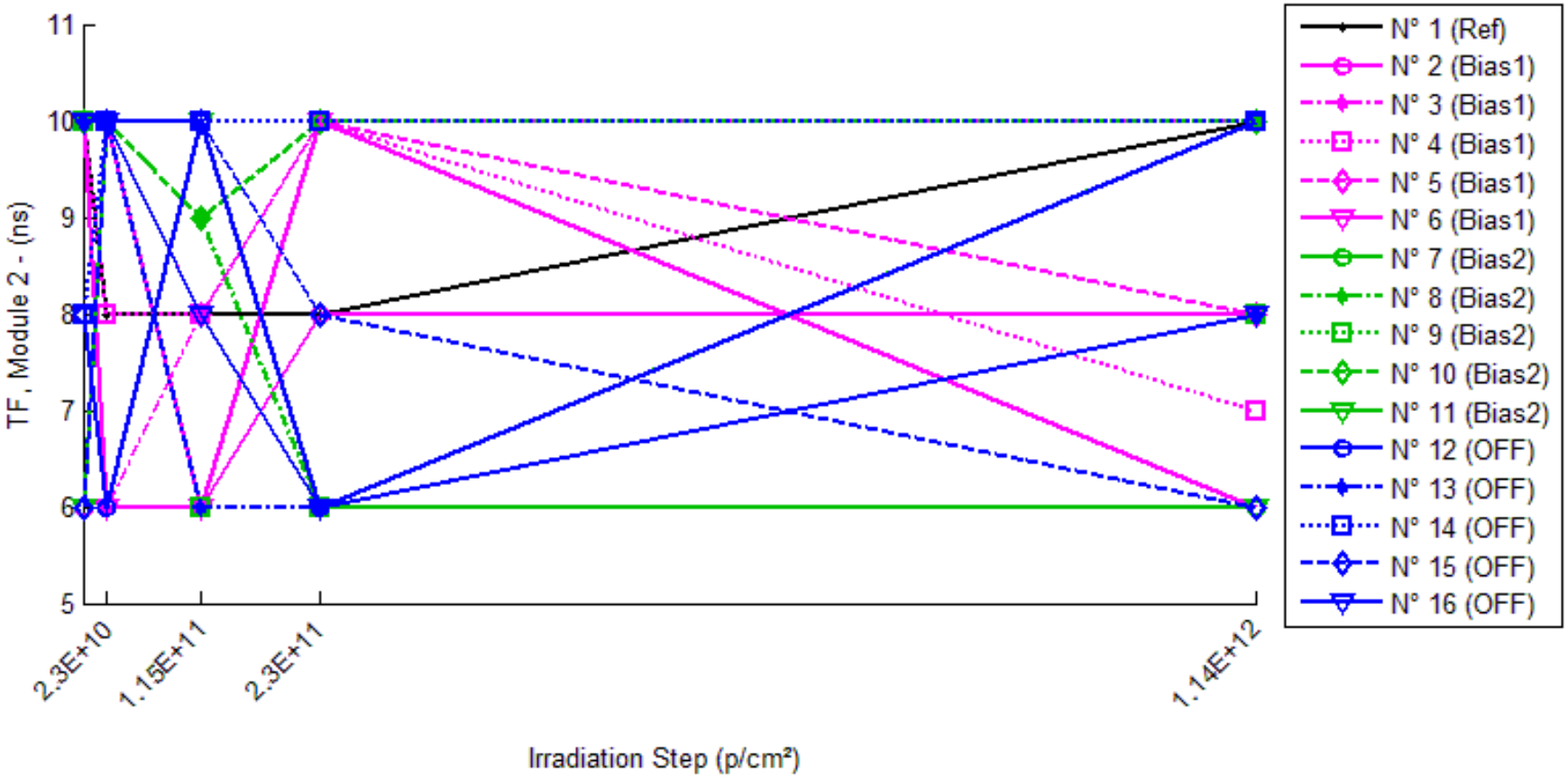
Delta [TF, Module 1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 2 (Bias1)	---	4.000E+0	4.000E+0	4.000E+0	2.000E+0
N° 3 (Bias1)	---	-2.000E+0	0.000E+0	0.000E+0	-4.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 6 (Bias1)	---	-2.000E+0	-2.000E+0	-2.000E+0	1.000E+0
N° 7 (Bias2)	---	0.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 8 (Bias2)	---	2.000E+0	-2.000E+0	2.000E+0	-2.000E+0
N° 9 (Bias2)	---	-2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 10 (Bias2)	---	-2.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 11 (Bias2)	---	-2.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 12 (OFF)	---	4.000E+0	2.000E+0	4.000E+0	4.000E+0
N° 13 (OFF)	---	-2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 14 (OFF)	---	2.000E+0	-2.000E+0	2.000E+0	2.000E+0
N° 15 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	2.000E+0
N° 16 (OFF)	---	-4.000E+0	0.000E+0	-4.000E+0	-4.000E+0
Average (OFF)	---	0.000E+0	4.000E-1	4.000E-1	-6.000E-1
σ (OFF)	---	2.449E+0	2.191E+0	2.191E+0	2.408E+0
Average+3σ (OFF)	---	7.348E+0	6.973E+0	6.973E+0	6.625E+0
Average-3σ (OFF)	---	-7.348E+0	-6.173E+0	-6.173E+0	-7.825E+0
Average (Bias1)	---	-8.000E-1	-4.000E-1	8.000E-1	-4.000E-1
σ (Bias1)	---	1.789E+0	1.673E+0	1.789E+0	1.673E+0
Average+3σ (Bias1)	---	4.567E+0	4.620E+0	6.167E+0	4.620E+0
Average-3σ (Bias1)	---	-6.167E+0	-5.420E+0	-4.567E+0	-5.420E+0
Average (Bias2)	---	4.000E-1	0.000E+0	8.000E-1	8.000E-1
σ (Bias2)	---	3.286E+0	1.414E+0	3.033E+0	3.033E+0
Average+3σ (Bias2)	---	1.026E+1	4.243E+0	9.899E+0	9.899E+0
Average-3σ (Bias2)	---	-9.459E+0	-4.243E+0	-8.299E+0	-8.299E+0

60 MeV proton / detailed results

20.TF module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



60 MeV proton / detailed results

TF, Module 2 . (ns)

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

Delta [TF, Module 2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 2 (Bias1)	---	4.000E+0	0.000E+0	2.000E+0	2.000E+0
N° 3 (Bias1)	---	-4.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 4 (Bias1)	---	-2.000E+0	-2.000E+0	0.000E+0	-3.000E+0
N° 5 (Bias1)	---	0.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 6 (Bias1)	---	-4.000E+0	-4.000E+0	0.000E+0	-4.000E+0
N° 7 (Bias2)	---	-2.000E+0	2.000E+0	-2.000E+0	-2.000E+0
N° 8 (Bias2)	---	0.000E+0	-1.000E+0	-4.000E+0	0.000E+0
N° 9 (Bias2)	---	0.000E+0	-4.000E+0	-4.000E+0	-2.000E+0
N° 10 (Bias2)	---	0.000E+0	-1.000E+0	0.000E+0	0.000E+0
N° 11 (Bias2)	---	4.000E+0	4.000E+0	0.000E+0	0.000E+0
N° 12 (OFF)	---	-2.000E+0	2.000E+0	-2.000E+0	2.000E+0
N° 13 (OFF)	---	0.000E+0	-4.000E+0	-4.000E+0	-2.000E+0
N° 14 (OFF)	---	2.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 15 (OFF)	---	4.000E+0	4.000E+0	2.000E+0	0.000E+0
N° 16 (OFF)	---	0.000E+0	-2.000E+0	-4.000E+0	-2.000E+0
Average (OFF)	---	-1.200E+0	-2.000E+0	4.000E-1	-1.400E+0
σ (OFF)	---	3.347E+0	1.414E+0	8.944E-1	2.408E+0
Average+3σ (OFF)	---	8.840E+0	2.243E+0	3.083E+0	5.825E+0
Average-3σ (OFF)	---	-1.124E+1	-6.243E+0	-2.283E+0	-8.625E+0
Average (Bias1)	---	4.000E-1	0.000E+0	-2.000E+0	-8.000E-1
σ (Bias1)	---	2.191E+0	3.082E+0	2.000E+0	1.095E+0
Average+3σ (Bias1)	---	6.973E+0	9.247E+0	4.000E+0	2.486E+0
Average-3σ (Bias1)	---	-6.173E+0	-9.247E+0	-8.000E+0	-4.086E+0
Average (Bias2)	---	8.000E-1	4.000E-1	-1.200E+0	0.000E+0
σ (Bias2)	---	2.280E+0	3.286E+0	3.033E+0	2.000E+0
Average+3σ (Bias2)	---	7.641E+0	1.026E+1	7.899E+0	6.000E+0
Average-3σ (Bias2)	---	-6.041E+0	-9.459E+0	-1.030E+1	-6.000E+0

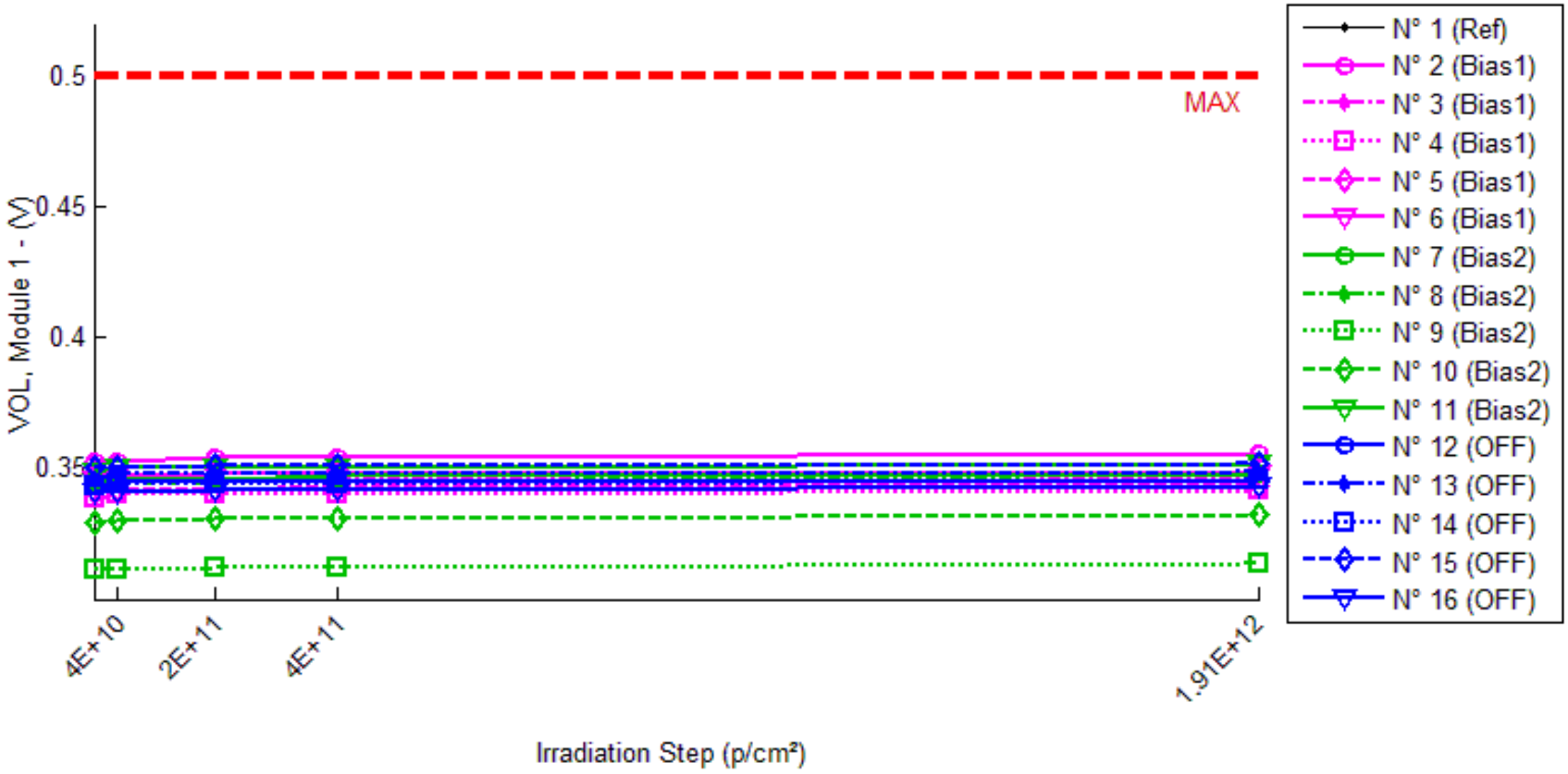
190 MeV proton / detailed results

CONTENTS

190 MeV proton / detailed results

1. VOL module 1

Ta = 25°C ; Iol = 8mA



190 MeV proton / detailed results

VOL, Module 1 . (V) **Max = 0.5**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.346	0.346	0.345	0.345	0.346
N° 2 (Bias1)	0.353	0.353	0.354	0.354	0.356
N° 3 (Bias1)	0.345	0.345	0.346	0.346	0.347
N° 4 (Bias1)	0.339	0.340	0.340	0.340	0.342
N° 5 (Bias1)	0.341	0.342	0.342	0.343	0.343
N° 6 (Bias1)	0.346	0.347	0.348	0.348	0.348
N° 7 (Bias2)	0.346	0.346	0.346	0.347	0.348
N° 8 (Bias2)	0.344	0.344	0.345	0.345	0.348
N° 9 (Bias2)	0.311	0.311	0.312	0.312	0.314
N° 10 (Bias2)	0.329	0.330	0.331	0.331	0.332
N° 11 (Bias2)	0.349	0.350	0.350	0.350	0.352
N° 12 (OFF)	0.343	0.345	0.345	0.345	0.346
N° 13 (OFF)	0.346	0.348	0.348	0.348	0.349
N° 14 (OFF)	0.343	0.344	0.344	0.344	0.346
N° 15 (OFF)	0.350	0.350	0.351	0.351	0.352
N° 16 (OFF)	0.341	0.341	0.342	0.342	0.343

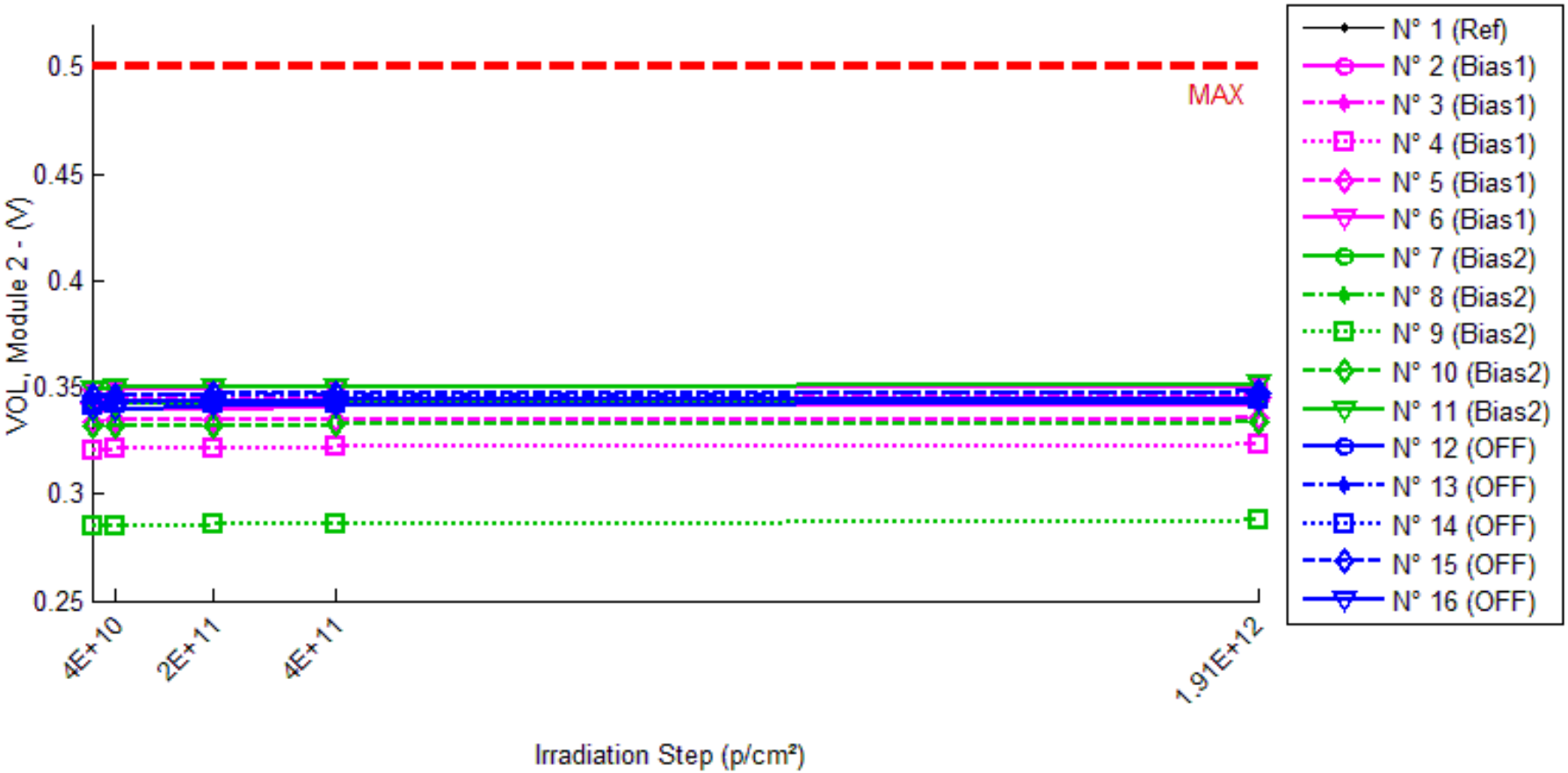
Delta [VOL, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	5.510E-5	-1.087E-3	-8.161E-4	-5.760E-5
N° 2 (Bias1)	---	-4.420E-4	3.339E-4	1.642E-4	2.498E-3
N° 3 (Bias1)	---	3.462E-4	8.768E-4	9.722E-4	2.394E-3
N° 4 (Bias1)	---	9.725E-4	1.211E-3	1.500E-3	2.789E-3
N° 5 (Bias1)	---	1.145E-3	1.438E-3	1.616E-3	2.282E-3
N° 6 (Bias1)	---	1.270E-3	1.497E-3	1.578E-3	2.418E-3
N° 7 (Bias2)	---	-8.282E-4	-3.250E-5	2.232E-4	1.813E-3
N° 8 (Bias2)	---	-6.530E-5	5.522E-4	7.830E-4	3.206E-3
N° 9 (Bias2)	---	4.936E-4	9.168E-4	1.206E-3	3.104E-3
N° 10 (Bias2)	---	8.102E-4	1.112E-3	1.332E-3	3.049E-3
N° 11 (Bias2)	---	8.238E-4	8.332E-4	1.226E-3	2.674E-3
N° 12 (OFF)	---	1.588E-3	1.766E-3	1.702E-3	3.111E-3
N° 13 (OFF)	---	1.552E-3	1.745E-3	1.988E-3	3.177E-3
N° 14 (OFF)	---	1.138E-3	1.365E-3	1.617E-3	2.888E-3
N° 15 (OFF)	---	7.494E-4	1.122E-3	1.114E-3	2.830E-3
N° 16 (OFF)	---	8.454E-4	1.144E-3	1.389E-3	2.865E-3
Average (Bias1)	---	6.583E-4	1.071E-3	1.166E-3	2.476E-3
σ (Bias1)	---	7.102E-4	4.787E-4	6.174E-4	1.910E-4
Average+3σ (Bias1)	---	2.789E-3	2.507E-3	3.018E-3	3.049E-3
Average-3σ (Bias1)	---	-1.472E-3	-3.647E-4	-6.862E-4	1.903E-3
Average (Bias2)	---	2.468E-4	6.763E-4	9.540E-4	2.769E-3
σ (Bias2)	---	7.008E-4	4.444E-4	4.592E-4	5.710E-4
Average+3σ (Bias2)	---	2.349E-3	2.010E-3	2.332E-3	4.482E-3
Average-3σ (Bias2)	---	-1.855E-3	-6.569E-4	-4.236E-4	1.056E-3
Average (OFF)	---	1.175E-3	1.428E-3	1.562E-3	2.974E-3
σ (OFF)	---	3.887E-4	3.135E-4	3.295E-4	1.581E-4
Average+3σ (OFF)	---	2.341E-3	2.369E-3	2.550E-3	3.449E-3
Average-3σ (OFF)	---	8.706E-6	4.879E-4	5.736E-4	2.500E-3

190 MeV proton / detailed results

2. VOL module 2

Ta = 25°C ; Iol = 8mA



190 MeV proton / detailed results

VOL, Module 2 . (V) **Max = 0.5**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.342	0.343	0.343	0.343	0.343
N° 2 (Bias1)	0.349	0.349	0.350	0.350	0.351
N° 3 (Bias1)	0.344	0.344	0.345	0.345	0.346
N° 4 (Bias1)	0.320	0.321	0.321	0.322	0.323
N° 5 (Bias1)	0.334	0.335	0.335	0.335	0.336
N° 6 (Bias1)	0.339	0.340	0.340	0.341	0.341
N° 7 (Bias2)	0.342	0.342	0.343	0.343	0.344
N° 8 (Bias2)	0.340	0.340	0.341	0.341	0.343
N° 9 (Bias2)	0.285	0.285	0.286	0.286	0.288
N° 10 (Bias2)	0.332	0.332	0.332	0.333	0.334
N° 11 (Bias2)	0.349	0.350	0.350	0.350	0.352
N° 12 (OFF)	0.342	0.343	0.343	0.344	0.345
N° 13 (OFF)	0.345	0.346	0.346	0.346	0.348
N° 14 (OFF)	0.341	0.342	0.342	0.342	0.344
N° 15 (OFF)	0.346	0.346	0.347	0.347	0.348
N° 16 (OFF)	0.340	0.340	0.341	0.341	0.343

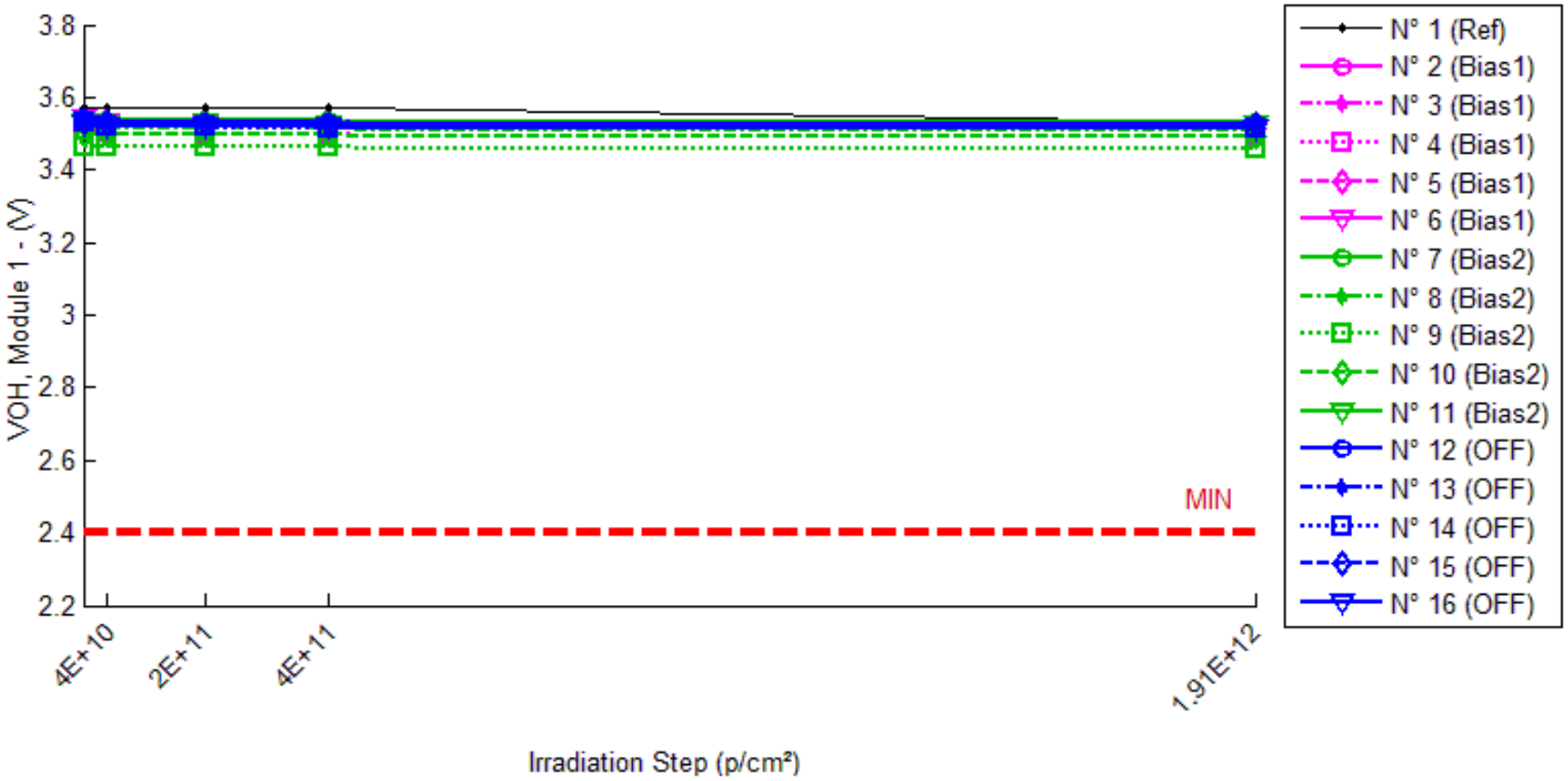
Delta [VOL, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	4.584E-4	2.840E-5	2.825E-4	4.033E-4
N° 2 (Bias1)	---	2.297E-4	8.837E-4	5.964E-4	2.273E-3
N° 3 (Bias1)	---	-2.850E-5	8.010E-4	9.937E-4	2.078E-3
N° 4 (Bias1)	---	5.146E-4	9.304E-4	1.233E-3	2.441E-3
N° 5 (Bias1)	---	8.084E-4	1.177E-3	1.441E-3	2.297E-3
N° 6 (Bias1)	---	9.021E-4	1.224E-3	1.426E-3	2.153E-3
N° 7 (Bias2)	---	-5.270E-5	4.322E-4	3.267E-4	2.186E-3
N° 8 (Bias2)	---	1.862E-4	5.848E-4	7.819E-4	2.669E-3
N° 9 (Bias2)	---	2.356E-4	5.624E-4	8.761E-4	2.947E-3
N° 10 (Bias2)	---	5.427E-4	7.371E-4	9.634E-4	2.686E-3
N° 11 (Bias2)	---	5.010E-4	5.153E-4	8.097E-4	2.573E-3
N° 12 (OFF)	---	1.128E-3	1.079E-3	1.512E-3	2.696E-3
N° 13 (OFF)	---	1.095E-3	1.385E-3	1.503E-3	3.193E-3
N° 14 (OFF)	---	9.303E-4	1.340E-3	1.351E-3	2.756E-3
N° 15 (OFF)	---	6.086E-4	9.639E-4	9.839E-4	2.502E-3
N° 16 (OFF)	---	5.382E-4	7.984E-4	1.141E-3	2.916E-3
Average (Bias1)	---	4.853E-4	1.003E-3	1.138E-3	2.248E-3
σ (Bias1)	---	3.900E-4	1.866E-4	3.528E-4	1.399E-4
Average+3σ (Bias1)	---	1.655E-3	1.563E-3	2.196E-3	2.668E-3
Average-3σ (Bias1)	---	-6.846E-4	4.434E-4	7.961E-5	1.829E-3
Average (Bias2)	---	2.826E-4	5.664E-4	7.516E-4	2.612E-3
σ (Bias2)	---	2.446E-4	1.119E-4	2.476E-4	2.756E-4
Average+3σ (Bias2)	---	1.016E-3	9.022E-4	1.494E-3	3.439E-3
Average-3σ (Bias2)	---	-4.512E-4	2.306E-4	8.805E-6	1.786E-3
Average (OFF)	---	8.599E-4	1.113E-3	1.298E-3	2.812E-3
σ (OFF)	---	2.732E-4	2.490E-4	2.313E-4	2.593E-4
Average+3σ (OFF)	---	1.679E-3	1.860E-3	1.992E-3	3.590E-3
Average-3σ (OFF)	---	4.045E-5	3.663E-4	6.042E-4	2.035E-3

190 MeV proton / detailed results

3. VOH module 1

Ta = 25°C ; Ioh = -4mA



190 MeV proton / detailed results

VOH, Module 1 . (V) **Min = 2.4**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	3.573	3.572	3.572	3.571	3.530
N° 2 (Bias1)	3.532	3.533	3.525	3.525	3.515
N° 3 (Bias1)	3.541	3.540	3.533	3.533	3.525
N° 4 (Bias1)	3.510	3.506	3.500	3.499	3.493
N° 5 (Bias1)	3.530	3.525	3.519	3.518	3.515
N° 6 (Bias1)	3.540	3.534	3.528	3.528	3.524
N° 7 (Bias2)	3.534	3.537	3.535	3.535	3.532
N° 8 (Bias2)	3.514	3.515	3.513	3.513	3.507
N° 9 (Bias2)	3.464	3.462	3.462	3.461	3.456
N° 10 (Bias2)	3.500	3.497	3.496	3.496	3.493
N° 11 (Bias2)	3.531	3.528	3.529	3.528	3.525
N° 12 (OFF)	3.544	3.532	3.531	3.532	3.528
N° 13 (OFF)	3.544	3.532	3.532	3.531	3.527
N° 14 (OFF)	3.529	3.519	3.518	3.517	3.513
N° 15 (OFF)	3.538	3.529	3.528	3.528	3.524
N° 16 (OFF)	3.528	3.519	3.519	3.518	3.514

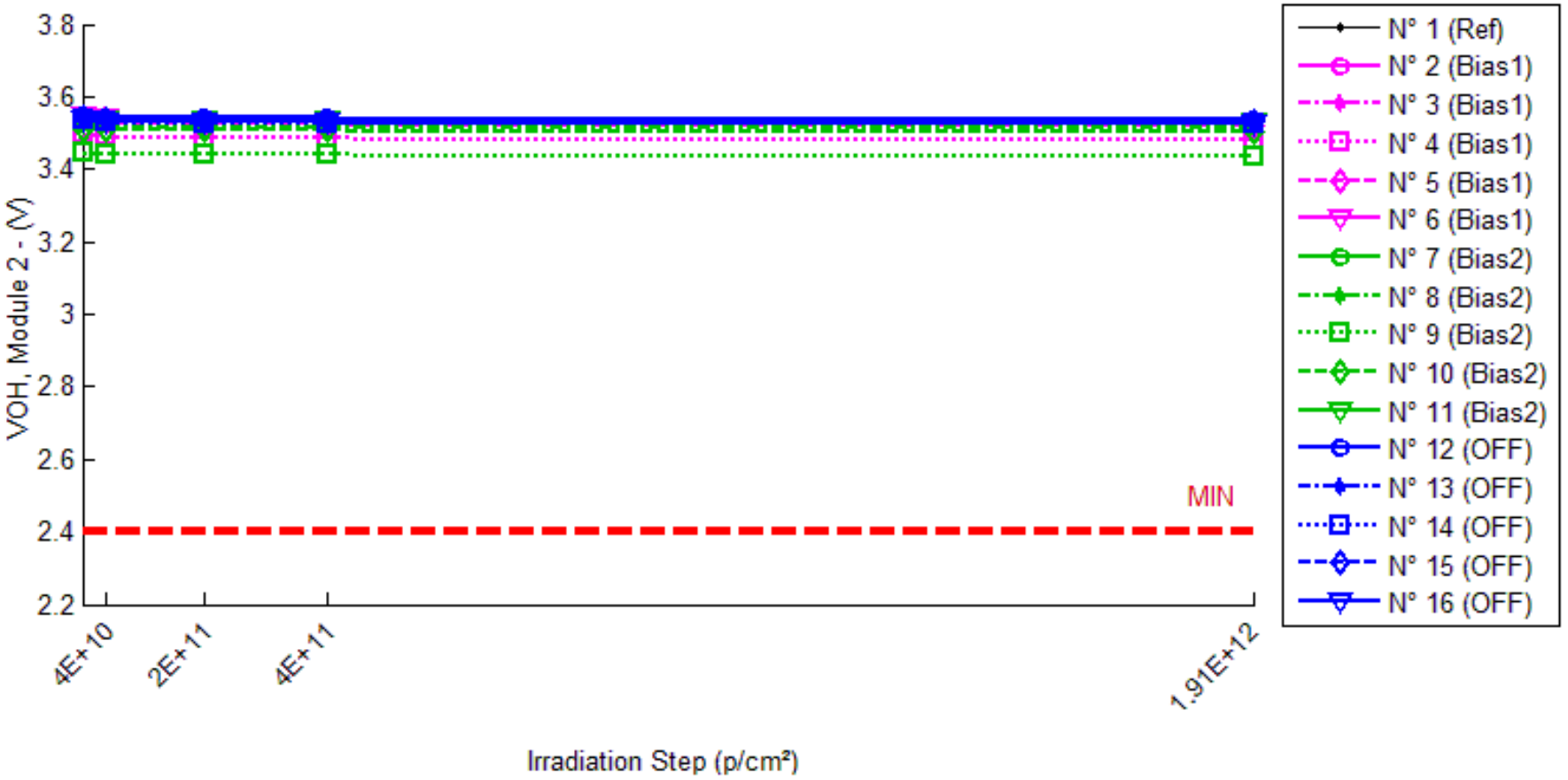
Delta [VOH, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.404E-3	-8.350E-4	-2.102E-3	-4.352E-2
N° 2 (Bias1)	---	1.243E-3	-7.420E-3	-6.672E-3	-1.708E-2
N° 3 (Bias1)	---	-1.403E-3	-8.659E-3	-8.629E-3	-1.631E-2
N° 4 (Bias1)	---	-4.484E-3	-1.004E-2	-1.107E-2	-1.716E-2
N° 5 (Bias1)	---	-5.363E-3	-1.109E-2	-1.171E-2	-1.509E-2
N° 6 (Bias1)	---	-5.529E-3	-1.168E-2	-1.181E-2	-1.581E-2
N° 7 (Bias2)	---	3.340E-3	1.184E-3	4.940E-4	-2.312E-3
N° 8 (Bias2)	---	1.220E-3	-5.720E-4	-8.850E-4	-6.532E-3
N° 9 (Bias2)	---	-2.222E-3	-2.882E-3	-3.420E-3	-8.326E-3
N° 10 (Bias2)	---	-3.253E-3	-3.334E-3	-4.018E-3	-6.609E-3
N° 11 (Bias2)	---	-3.482E-3	-2.384E-3	-3.789E-3	-6.379E-3
N° 12 (OFF)	---	-1.219E-2	-1.314E-2	-1.212E-2	-1.656E-2
N° 13 (OFF)	---	-1.187E-2	-1.256E-2	-1.334E-2	-1.746E-2
N° 14 (OFF)	---	-1.004E-2	-1.060E-2	-1.142E-2	-1.561E-2
N° 15 (OFF)	---	-8.396E-3	-9.730E-3	-9.588E-3	-1.371E-2
N° 16 (OFF)	---	-9.028E-3	-9.646E-3	-1.011E-2	-1.473E-2
Average (Bias1)	---	-3.107E-3	-9.778E-3	-9.977E-3	-1.629E-2
σ (Bias1)	---	2.944E-3	1.748E-3	2.252E-3	8.714E-4
Average+3σ (Bias1)	---	5.726E-3	-4.534E-3	-3.221E-3	-1.368E-2
Average-3σ (Bias1)	---	-1.194E-2	-1.502E-2	-1.673E-2	-1.890E-2
Average (Bias2)	---	-8.794E-4	-1.598E-3	-2.324E-3	-6.032E-3
σ (Bias2)	---	3.017E-3	1.876E-3	2.014E-3	2.225E-3
Average+3σ (Bias2)	---	8.173E-3	4.029E-3	3.719E-3	6.437E-4
Average-3σ (Bias2)	---	-9.932E-3	-7.225E-3	-8.366E-3	-1.271E-2
Average (OFF)	---	-1.031E-2	-1.113E-2	-1.131E-2	-1.561E-2
σ (OFF)	---	1.686E-3	1.622E-3	1.515E-3	1.478E-3
Average+3σ (OFF)	---	-5.247E-3	-6.268E-3	-6.771E-3	-1.118E-2
Average-3σ (OFF)	---	-1.536E-2	-1.600E-2	-1.586E-2	-2.005E-2

190 MeV proton / detailed results

4. VOH module 2

Ta = 25°C ; Ioh = -4mA



190 MeV proton / detailed results

VOH, Module 2 . (V) **Min = 2.4**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	3.543	3.540	3.538	3.537	3.536
N° 2 (Bias1)	3.543	3.542	3.534	3.535	3.528
N° 3 (Bias1)	3.548	3.548	3.540	3.539	3.535
N° 4 (Bias1)	3.496	3.493	3.487	3.486	3.480
N° 5 (Bias1)	3.535	3.531	3.525	3.524	3.521
N° 6 (Bias1)	3.546	3.542	3.537	3.536	3.533
N° 7 (Bias2)	3.542	3.542	3.541	3.542	3.538
N° 8 (Bias2)	3.518	3.518	3.517	3.517	3.513
N° 9 (Bias2)	3.444	3.443	3.443	3.442	3.438
N° 10 (Bias2)	3.510	3.508	3.508	3.507	3.504
N° 11 (Bias2)	3.538	3.536	3.537	3.536	3.534
N° 12 (OFF)	3.551	3.541	3.541	3.540	3.537
N° 13 (OFF)	3.549	3.540	3.539	3.539	3.533
N° 14 (OFF)	3.538	3.529	3.528	3.527	3.523
N° 15 (OFF)	3.543	3.536	3.534	3.534	3.529
N° 16 (OFF)	3.539	3.531	3.530	3.530	3.525

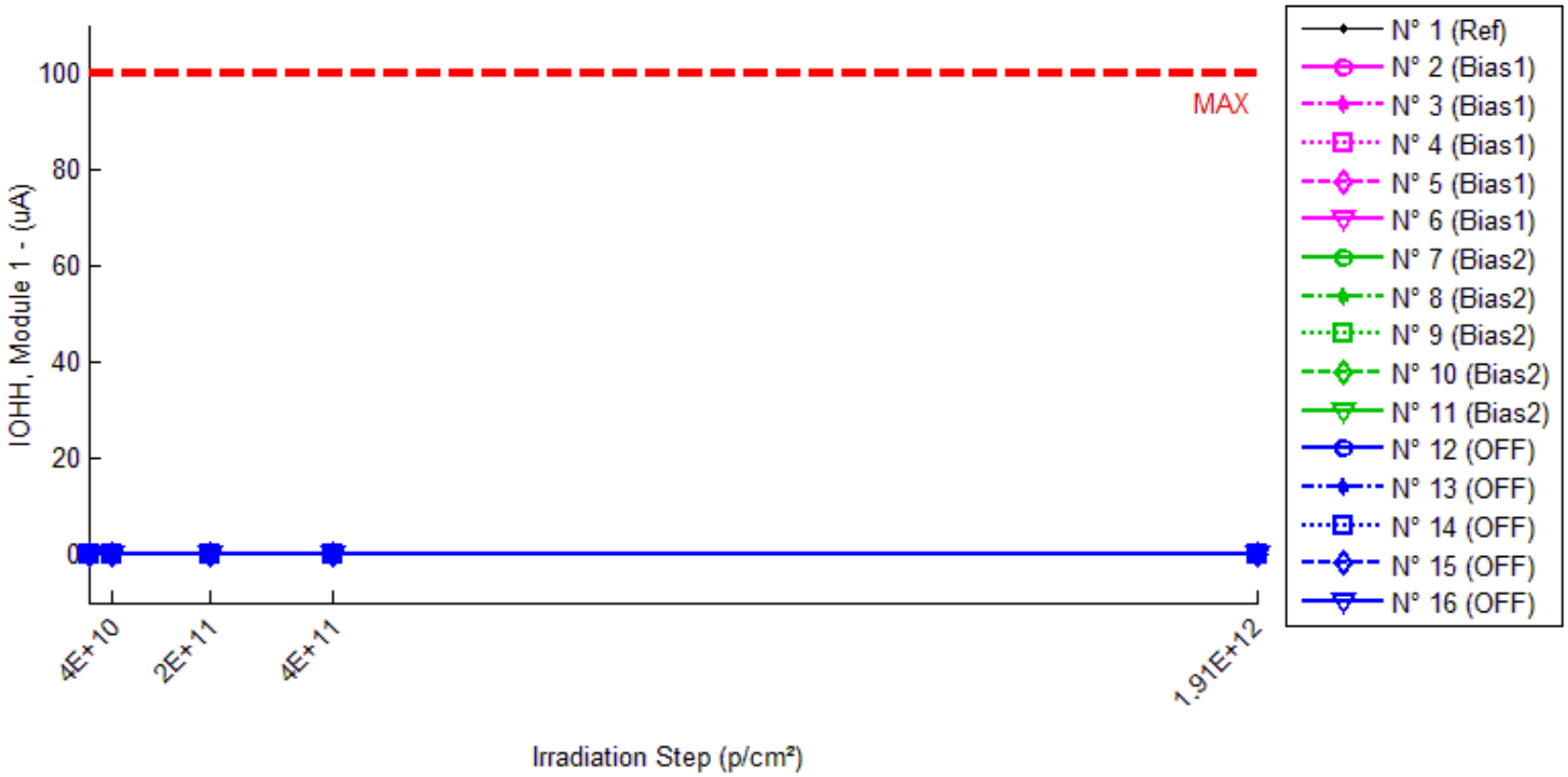
Delta [VOH, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-3.106E-3	-5.300E-3	-6.584E-3	-6.936E-3
N° 2 (Bias1)	---	-9.830E-4	-8.702E-3	-7.461E-3	-1.444E-2
N° 3 (Bias1)	---	-1.930E-4	-8.010E-3	-8.771E-3	-1.332E-2
N° 4 (Bias1)	---	-3.018E-3	-9.264E-3	-9.959E-3	-1.551E-2
N° 5 (Bias1)	---	-3.585E-3	-9.495E-3	-1.025E-2	-1.369E-2
N° 6 (Bias1)	---	-3.911E-3	-9.643E-3	-1.023E-2	-1.375E-2
N° 7 (Bias2)	---	5.650E-4	-4.320E-4	7.010E-4	-3.079E-3
N° 8 (Bias2)	---	-1.390E-4	-7.280E-4	-9.870E-4	-4.964E-3
N° 9 (Bias2)	---	-1.409E-3	-1.715E-3	-2.365E-3	-6.268E-3
N° 10 (Bias2)	---	-2.008E-3	-1.777E-3	-2.430E-3	-5.194E-3
N° 11 (Bias2)	---	-2.019E-3	-1.178E-3	-2.022E-3	-4.704E-3
N° 12 (OFF)	---	-1.010E-2	-9.732E-3	-1.111E-2	-1.397E-2
N° 13 (OFF)	---	-9.475E-3	-1.042E-2	-1.056E-2	-1.559E-2
N° 14 (OFF)	---	-8.697E-3	-9.859E-3	-1.043E-2	-1.506E-2
N° 15 (OFF)	---	-7.619E-3	-9.275E-3	-9.346E-3	-1.450E-2
N° 16 (OFF)	---	-7.335E-3	-8.265E-3	-9.038E-3	-1.380E-2
Average (Bias1)	---	-2.338E-3	-9.023E-3	-9.333E-3	-1.414E-2
σ (Bias1)	---	1.653E-3	6.698E-4	1.209E-3	8.616E-4
Average+3σ (Bias1)	---	2.621E-3	-7.013E-3	-5.705E-3	-1.156E-2
Average-3σ (Bias1)	---	-7.297E-3	-1.103E-2	-1.296E-2	-1.673E-2
Average (Bias2)	---	-1.002E-3	-1.166E-3	-1.421E-3	-4.842E-3
σ (Bias2)	---	1.163E-3	5.928E-4	1.319E-3	1.151E-3
Average+3σ (Bias2)	---	2.488E-3	6.123E-4	2.537E-3	-1.389E-3
Average-3σ (Bias2)	---	-4.492E-3	-2.944E-3	-5.378E-3	-8.295E-3
Average (OFF)	---	-8.645E-3	-9.510E-3	-1.010E-2	-1.458E-2
σ (OFF)	---	1.180E-3	8.072E-4	8.718E-4	7.491E-4
Average+3σ (OFF)	---	-5.105E-3	-7.089E-3	-7.481E-3	-1.234E-2
Average-3σ (OFF)	---	-1.218E-2	-1.193E-2	-1.271E-2	-1.683E-2

190 MeV proton / detailed results

5. IOHH module 1

Ta = 25°C ; Vo = 5.25V ; Vf = 0.7V



190 MeV proton / detailed results

IOHH, Module 1 . (uA) **Max = 100.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	5.892E-4	5.675E-4	6.814E-4	6.166E-4	6.022E-4
N° 2 (Bias1)	6.459E-4	7.047E-4	6.324E-4	6.574E-4	5.688E-4
N° 3 (Bias1)	6.205E-4	5.946E-4	5.602E-4	5.773E-4	5.822E-4
N° 4 (Bias1)	5.448E-4	5.029E-4	4.811E-4	4.740E-4	4.929E-4
N° 5 (Bias1)	5.915E-4	5.130E-4	5.358E-4	5.033E-4	5.486E-4
N° 6 (Bias1)	6.583E-4	5.327E-4	5.465E-4	5.584E-4	5.890E-4
N° 7 (Bias2)	5.414E-4	6.250E-4	5.758E-4	5.767E-4	5.987E-4
N° 8 (Bias2)	5.445E-4	5.532E-4	5.210E-4	5.587E-4	5.254E-4
N° 9 (Bias2)	3.653E-4	3.864E-4	3.330E-4	3.430E-4	3.636E-4
N° 10 (Bias2)	4.491E-4	4.145E-4	4.129E-4	4.169E-4	4.370E-4
N° 11 (Bias2)	6.206E-4	5.617E-4	5.791E-4	5.649E-4	5.908E-4
N° 12 (OFF)	6.023E-4	4.792E-4	4.839E-4	4.968E-4	5.359E-4
N° 13 (OFF)	6.606E-4	5.216E-4	5.012E-4	5.431E-4	5.633E-4
N° 14 (OFF)	5.378E-4	4.567E-4	4.799E-4	4.816E-4	5.053E-4
N° 15 (OFF)	6.301E-4	5.680E-4	5.589E-4	5.828E-4	6.128E-4
N° 16 (OFF)	5.319E-4	4.732E-4	4.731E-4	4.883E-4	5.103E-4

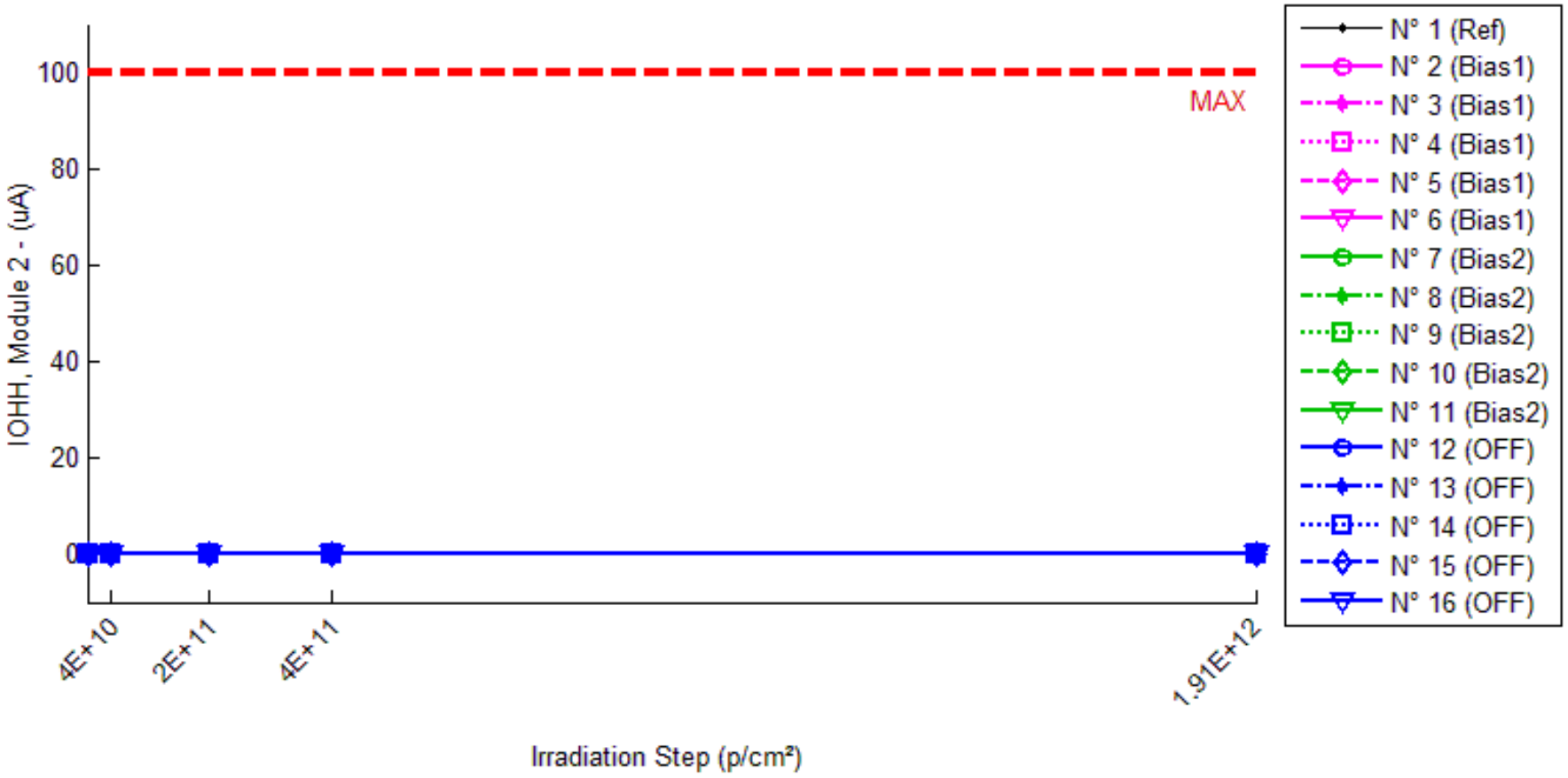
Delta [IOHH, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-2.167E-5	9.216E-5	2.740E-5	1.294E-5
N° 2 (Bias1)	---	5.880E-5	-1.350E-5	1.152E-5	-7.717E-5
N° 3 (Bias1)	---	-2.595E-5	-6.027E-5	-4.326E-5	-3.827E-5
N° 4 (Bias1)	---	-4.187E-5	-6.367E-5	-7.075E-5	-5.193E-5
N° 5 (Bias1)	---	-7.850E-5	-5.566E-5	-8.814E-5	-4.284E-5
N° 6 (Bias1)	---	-1.257E-4	-1.118E-4	-9.996E-5	-6.933E-5
N° 7 (Bias2)	---	8.357E-5	3.432E-5	3.529E-5	5.725E-5
N° 8 (Bias2)	---	8.675E-6	-2.351E-5	1.421E-5	-1.911E-5
N° 9 (Bias2)	---	2.112E-5	-3.236E-5	-2.234E-5	-1.761E-6
N° 10 (Bias2)	---	-3.458E-5	-3.621E-5	-3.219E-5	-1.211E-5
N° 11 (Bias2)	---	-5.897E-5	-4.153E-5	-5.570E-5	-2.988E-5
N° 12 (OFF)	---	-1.231E-4	-1.184E-4	-1.055E-4	-6.643E-5
N° 13 (OFF)	---	-1.390E-4	-1.594E-4	-1.175E-4	-9.724E-5
N° 14 (OFF)	---	-8.114E-5	-5.797E-5	-5.625E-5	-3.253E-5
N° 15 (OFF)	---	-6.203E-5	-7.121E-5	-4.728E-5	-1.727E-5
N° 16 (OFF)	---	-5.876E-5	-5.881E-5	-4.363E-5	-2.159E-5
Average (Bias1)	---	-4.264E-5	-6.099E-5	-5.812E-5	-5.591E-5
σ (Bias1)	---	6.846E-5	3.491E-5	4.439E-5	1.680E-5
Average+3σ (Bias1)	---	1.627E-4	4.375E-5	7.505E-5	-5.493E-6
Average-3σ (Bias1)	---	-2.480E-4	-1.657E-4	-1.913E-4	-1.063E-4
Average (Bias2)	---	3.964E-6	-1.986E-5	-1.215E-5	-1.124E-6
σ (Bias2)	---	5.500E-5	3.099E-5	3.656E-5	3.420E-5
Average+3σ (Bias2)	---	1.690E-4	7.312E-5	9.754E-5	1.015E-4
Average-3σ (Bias2)	---	-1.610E-4	-1.128E-4	-1.218E-4	-1.037E-4
Average (OFF)	---	-9.281E-5	-9.317E-5	-7.403E-5	-4.701E-5
σ (OFF)	---	3.639E-5	4.452E-5	3.476E-5	3.406E-5
Average+3σ (OFF)	---	1.634E-5	4.038E-5	3.026E-5	5.517E-5
Average-3σ (OFF)	---	-2.020E-4	-2.267E-4	-1.783E-4	-1.492E-4

190 MeV proton / detailed results

6. IOHH module 2

Ta = 25°C ; Vo = 5.25V ; Vf = 0.7V



190 MeV proton / detailed results

IOHH, Module 2 . (uA) **Max = 100.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	8.986E-4	8.278E-4	9.092E-4	8.567E-4	8.600E-4
N° 2 (Bias1)	9.906E-4	9.902E-4	9.154E-4	9.760E-4	9.626E-4
N° 3 (Bias1)	9.046E-4	9.248E-4	-1.974E-2	8.337E-4	8.563E-4
N° 4 (Bias1)	6.342E-4	6.006E-4	5.877E-4	5.826E-4	6.283E-4
N° 5 (Bias1)	7.965E-4	7.371E-4	7.324E-4	7.279E-4	7.763E-4
N° 6 (Bias1)	9.291E-4	8.396E-4	8.290E-4	8.130E-4	8.834E-4
N° 7 (Bias2)	8.097E-4	8.283E-4	8.016E-4	8.540E-4	8.750E-4
N° 8 (Bias2)	7.427E-4	7.435E-4	7.240E-4	7.375E-4	7.655E-4
N° 9 (Bias2)	3.630E-4	3.670E-4	3.558E-4	3.647E-4	4.149E-4
N° 10 (Bias2)	6.555E-4	6.293E-4	6.258E-4	6.276E-4	6.831E-4
N° 11 (Bias2)	9.208E-4	8.616E-4	8.814E-4	8.714E-4	9.058E-4
N° 12 (OFF)	9.084E-4	7.446E-4	7.874E-4	7.704E-4	8.472E-4
N° 13 (OFF)	9.289E-4	7.988E-4	7.706E-4	8.424E-4	8.514E-4
N° 14 (OFF)	8.347E-4	7.452E-4	7.396E-4	7.558E-4	7.834E-4
N° 15 (OFF)	9.384E-4	8.677E-4	8.506E-4	8.914E-4	8.921E-4
N° 16 (OFF)	8.269E-4	7.610E-4	7.666E-4	7.774E-4	7.968E-4

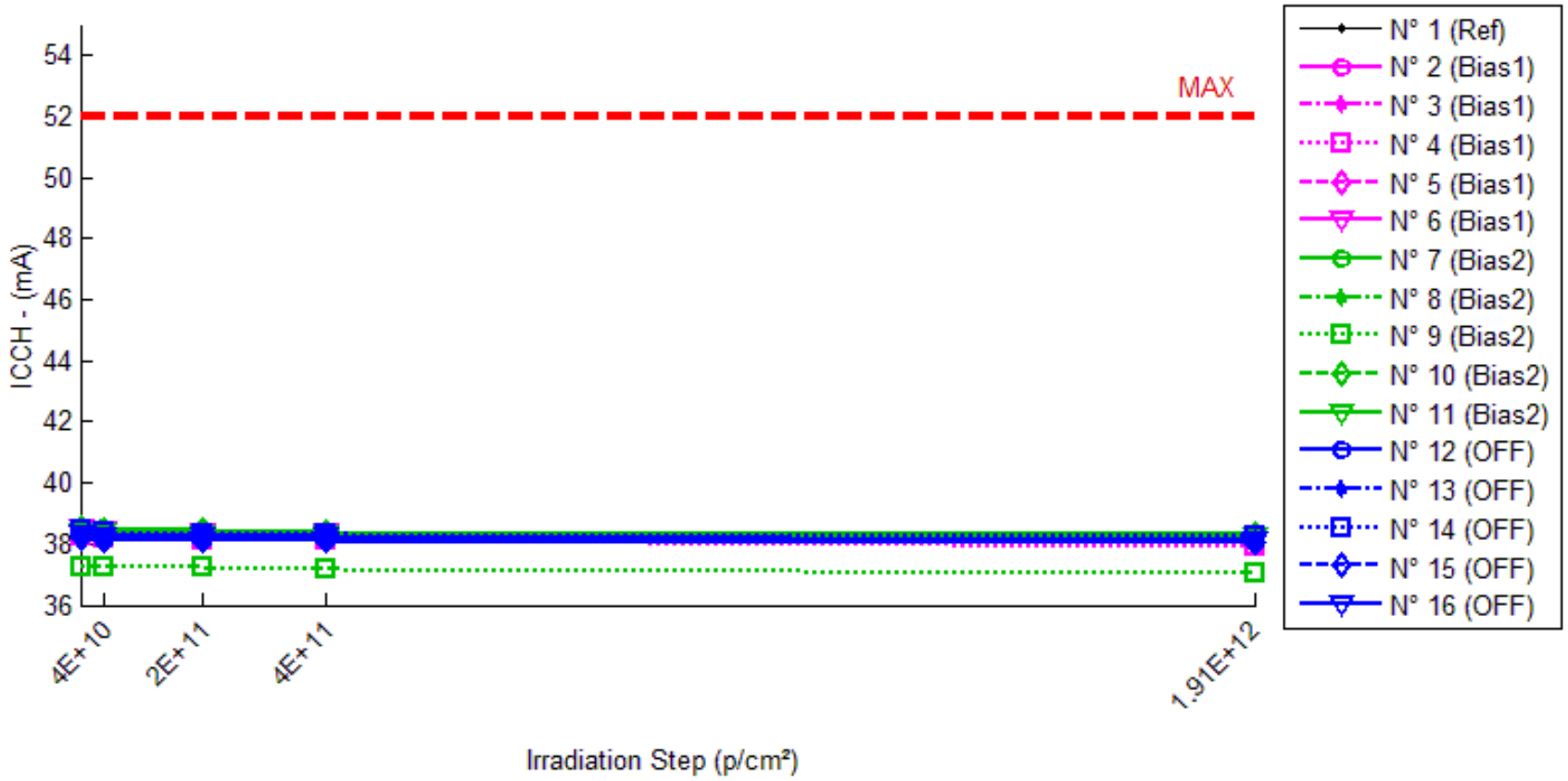
Delta [IOHH, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-7.080E-5	1.060E-5	-4.188E-5	-3.857E-5
N° 2 (Bias1)	---	-4.670E-7	-7.524E-5	-1.468E-5	-2.801E-5
N° 3 (Bias1)	---	2.024E-5	-2.065E-2	-7.092E-5	-4.833E-5
N° 4 (Bias1)	---	-3.358E-5	-4.648E-5	-5.160E-5	-5.874E-6
N° 5 (Bias1)	---	-5.944E-5	-6.413E-5	-6.866E-5	-2.021E-5
N° 6 (Bias1)	---	-8.953E-5	-1.001E-4	-1.161E-4	-4.573E-5
N° 7 (Bias2)	---	1.857E-5	-8.173E-6	4.426E-5	6.526E-5
N° 8 (Bias2)	---	7.950E-7	-1.869E-5	-5.156E-6	2.280E-5
N° 9 (Bias2)	---	3.981E-6	-7.251E-6	1.718E-6	5.189E-5
N° 10 (Bias2)	---	-2.615E-5	-2.963E-5	-2.783E-5	2.762E-5
N° 11 (Bias2)	---	-5.918E-5	-3.940E-5	-4.941E-5	-1.496E-5
N° 12 (OFF)	---	-1.638E-4	-1.210E-4	-1.380E-4	-6.120E-5
N° 13 (OFF)	---	-1.301E-4	-1.583E-4	-8.647E-5	-7.746E-5
N° 14 (OFF)	---	-8.957E-5	-9.510E-5	-7.889E-5	-5.130E-5
N° 15 (OFF)	---	-7.063E-5	-8.777E-5	-4.695E-5	-4.628E-5
N° 16 (OFF)	---	-6.598E-5	-6.032E-5	-4.955E-5	-3.018E-5
Average (Bias1)	---	-3.255E-5	-4.186E-3	-6.439E-5	-2.963E-5
σ (Bias1)	---	4.412E-5	9.201E-3	3.664E-5	1.778E-5
Average+3σ (Bias1)	---	9.980E-5	2.342E-2	4.553E-5	2.372E-5
Average-3σ (Bias1)	---	-1.649E-4	-3.179E-2	-1.743E-4	-8.298E-5
Average (Bias2)	---	-1.240E-5	-2.063E-5	-7.284E-6	3.052E-5
σ (Bias2)	---	3.074E-5	1.388E-5	3.514E-5	3.082E-5
Average+3σ (Bias2)	---	7.981E-5	2.103E-5	9.813E-5	1.230E-4
Average-3σ (Bias2)	---	-1.046E-4	-6.228E-5	-1.127E-4	-6.194E-5
Average (OFF)	---	-1.040E-4	-1.045E-4	-7.997E-5	-5.328E-5
σ (OFF)	---	4.191E-5	3.703E-5	3.683E-5	1.756E-5
Average+3σ (OFF)	---	2.170E-5	6.583E-6	3.051E-5	-5.951E-7
Average-3σ (OFF)	---	-2.297E-4	-2.156E-4	-1.904E-4	-1.060E-4

190 MeV proton / detailed results

7. ICCH

Ta = 25°C ; Vcc = 5.25V ; Ve = 0V



190 MeV proton / detailed results

ICCH . (mA) **Max = 52.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	38.164	38.151	38.175	38.160	38.138
N° 2 (Bias1)	38.401	38.399	38.308	38.284	38.058
N° 3 (Bias1)	38.308	38.281	38.196	38.180	38.023
N° 4 (Bias1)	38.272	38.218	38.152	38.120	37.942
N° 5 (Bias1)	38.541	38.474	38.400	38.372	38.276
N° 6 (Bias1)	38.525	38.451	38.387	38.368	38.266
N° 7 (Bias2)	38.480	38.493	38.441	38.425	38.339
N° 8 (Bias2)	38.371	38.368	38.324	38.297	38.121
N° 9 (Bias2)	37.278	37.244	37.219	37.199	37.049
N° 10 (Bias2)	38.529	38.476	38.445	38.420	38.312
N° 11 (Bias2)	38.415	38.368	38.356	38.329	38.236
N° 12 (OFF)	38.251	38.124	38.101	38.116	38.048
N° 13 (OFF)	38.321	38.199	38.178	38.156	38.063
N° 14 (OFF)	38.466	38.365	38.344	38.336	38.247
N° 15 (OFF)	38.219	38.137	38.114	38.105	38.034
N° 16 (OFF)	38.348	38.260	38.240	38.230	38.138

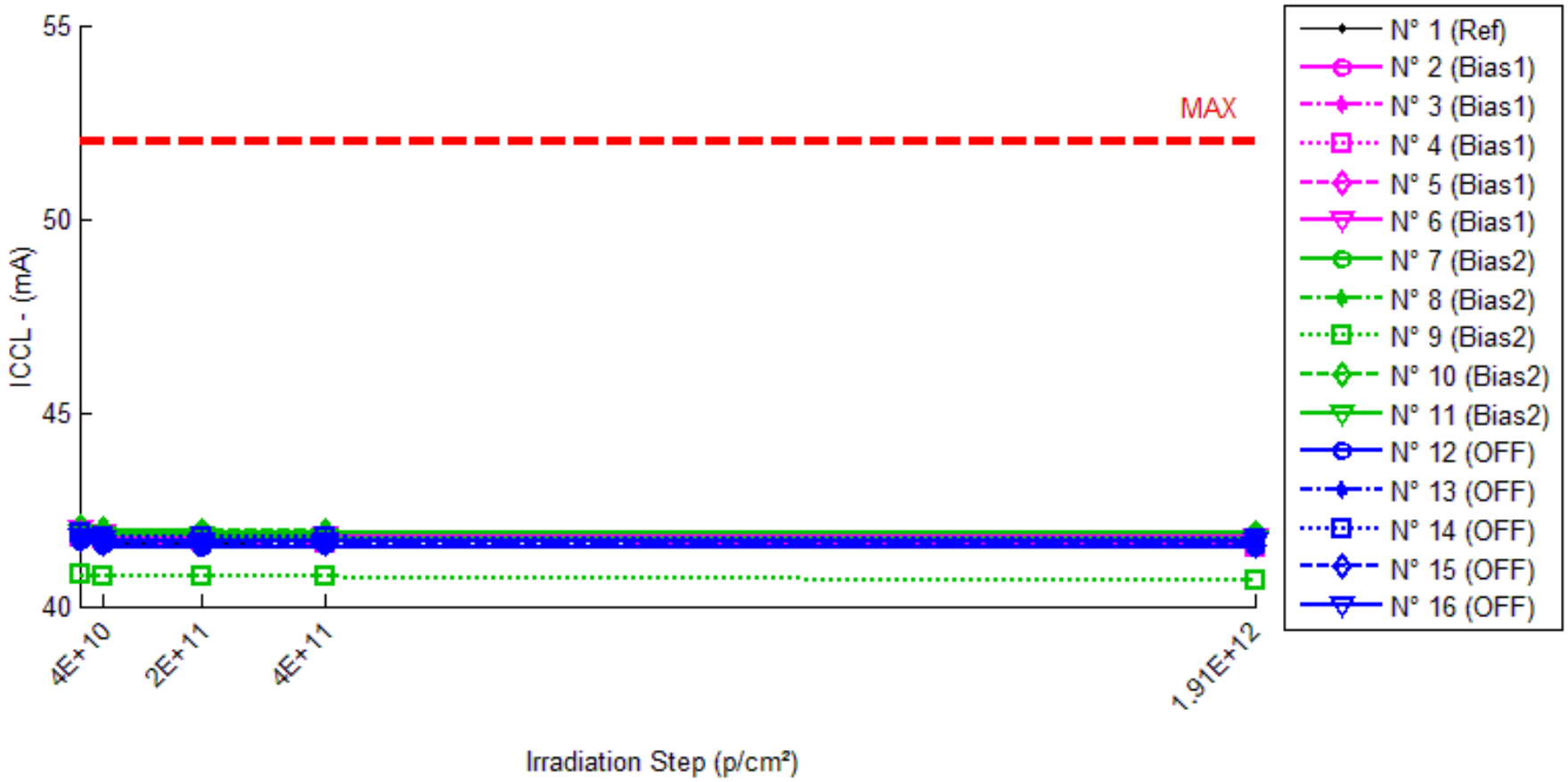
Delta [ICCH]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.248E-2	1.129E-2	-3.780E-3	-2.637E-2
N° 2 (Bias1)	---	-2.640E-3	-9.364E-2	-1.174E-1	-3.431E-1
N° 3 (Bias1)	---	-2.686E-2	-1.123E-1	-1.280E-1	-2.853E-1
N° 4 (Bias1)	---	-5.403E-2	-1.202E-1	-1.524E-1	-3.301E-1
N° 5 (Bias1)	---	-6.751E-2	-1.419E-1	-1.692E-1	-2.656E-1
N° 6 (Bias1)	---	-7.437E-2	-1.381E-1	-1.571E-1	-2.593E-1
N° 7 (Bias2)	---	1.349E-2	-3.866E-2	-5.440E-2	-1.410E-1
N° 8 (Bias2)	---	-2.340E-3	-4.683E-2	-7.354E-2	-2.496E-1
N° 9 (Bias2)	---	-3.395E-2	-5.952E-2	-7.932E-2	-2.296E-1
N° 10 (Bias2)	---	-5.278E-2	-8.400E-2	-1.090E-1	-2.170E-1
N° 11 (Bias2)	---	-4.683E-2	-5.862E-2	-8.645E-2	-1.793E-1
N° 12 (OFF)	---	-1.274E-1	-1.506E-1	-1.354E-1	-2.034E-1
N° 13 (OFF)	---	-1.225E-1	-1.429E-1	-1.648E-1	-2.584E-1
N° 14 (OFF)	---	-1.008E-1	-1.217E-1	-1.301E-1	-2.194E-1
N° 15 (OFF)	---	-8.229E-2	-1.050E-1	-1.139E-1	-1.850E-1
N° 16 (OFF)	---	-8.790E-2	-1.076E-1	-1.174E-1	-2.098E-1
Average (Bias1)	---	-4.508E-2	-1.212E-1	-1.448E-1	-2.967E-1
σ (Bias1)	---	2.989E-2	1.970E-2	2.146E-2	3.794E-2
Average+3σ (Bias1)	---	4.460E-2	-6.211E-2	-8.043E-2	-1.829E-1
Average-3σ (Bias1)	---	-1.348E-1	-1.803E-1	-2.092E-1	-4.105E-1
Average (Bias2)	---	-2.448E-2	-5.753E-2	-8.054E-2	-2.033E-1
σ (Bias2)	---	2.882E-2	1.715E-2	1.987E-2	4.325E-2
Average+3σ (Bias2)	---	6.197E-2	-6.078E-3	-2.094E-2	-7.357E-2
Average-3σ (Bias2)	---	-1.109E-1	-1.090E-1	-1.401E-1	-3.330E-1
Average (OFF)	---	-1.042E-1	-1.256E-1	-1.323E-1	-2.152E-1
σ (OFF)	---	2.018E-2	2.052E-2	2.017E-2	2.722E-2
Average+3σ (OFF)	---	-4.362E-2	-6.401E-2	-7.182E-2	-1.335E-1
Average-3σ (OFF)	---	-1.647E-1	-1.871E-1	-1.929E-1	-2.969E-1

190 MeV proton / detailed results

8. ICCL

Ta = 25°C ; Vcc = 5.25V ; Ve = 0V ; If = 8mA



190 MeV proton / detailed results

ICCL . (mA) **Max = 52.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	41.608	41.596	41.607	41.593	41.573
N° 2 (Bias1)	41.866	41.861	41.769	41.754	41.574
N° 3 (Bias1)	41.745	41.716	41.631	41.624	41.506
N° 4 (Bias1)	41.784	41.730	41.663	41.642	41.504
N° 5 (Bias1)	42.055	41.983	41.909	41.892	41.835
N° 6 (Bias1)	41.974	41.899	41.834	41.826	41.759
N° 7 (Bias2)	41.950	41.959	41.922	41.911	41.864
N° 8 (Bias2)	41.852	41.844	41.811	41.796	41.669
N° 9 (Bias2)	40.821	40.790	40.773	40.761	40.653
N° 10 (Bias2)	42.039	41.987	41.967	41.949	41.873
N° 11 (Bias2)	41.872	41.826	41.823	41.805	41.748
N° 12 (OFF)	41.686	41.556	41.539	41.556	41.525
N° 13 (OFF)	41.815	41.689	41.672	41.660	41.604
N° 14 (OFF)	41.910	41.802	41.791	41.790	41.750
N° 15 (OFF)	41.715	41.628	41.612	41.614	41.577
N° 16 (OFF)	41.804	41.712	41.699	41.697	41.650

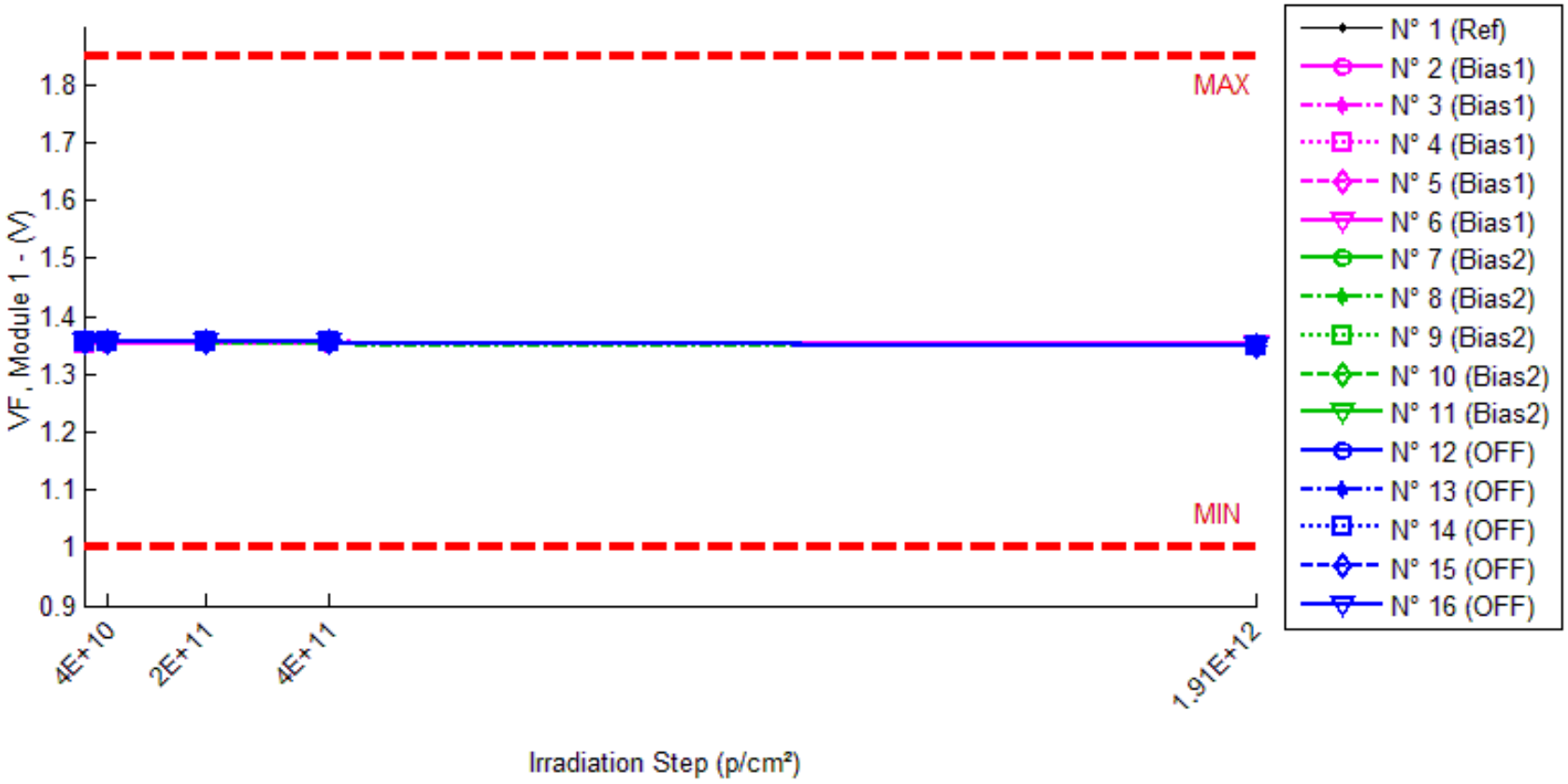
Delta [ICCL]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.155E-2	-3.400E-4	-1.447E-2	-3.420E-2
N° 2 (Bias1)	---	-4.980E-3	-9.659E-2	-1.120E-1	-2.919E-1
N° 3 (Bias1)	---	-2.892E-2	-1.138E-1	-1.212E-1	-2.386E-1
N° 4 (Bias1)	---	-5.388E-2	-1.211E-1	-1.420E-1	-2.797E-1
N° 5 (Bias1)	---	-7.186E-2	-1.454E-1	-1.633E-1	-2.196E-1
N° 6 (Bias1)	---	-7.475E-2	-1.397E-1	-1.477E-1	-2.149E-1
N° 7 (Bias2)	---	9.060E-3	-2.771E-2	-3.936E-2	-8.576E-2
N° 8 (Bias2)	---	-7.740E-3	-4.043E-2	-5.550E-2	-1.825E-1
N° 9 (Bias2)	---	-3.113E-2	-4.821E-2	-6.018E-2	-1.674E-1
N° 10 (Bias2)	---	-5.137E-2	-7.193E-2	-8.976E-2	-1.658E-1
N° 11 (Bias2)	---	-4.588E-2	-4.932E-2	-6.661E-2	-1.241E-1
N° 12 (OFF)	---	-1.300E-1	-1.473E-1	-1.296E-1	-1.611E-1
N° 13 (OFF)	---	-1.260E-1	-1.421E-1	-1.541E-1	-2.101E-1
N° 14 (OFF)	---	-1.079E-1	-1.187E-1	-1.194E-1	-1.599E-1
N° 15 (OFF)	---	-8.762E-2	-1.029E-1	-1.009E-1	-1.386E-1
N° 16 (OFF)	---	-9.110E-2	-1.041E-1	-1.066E-1	-1.536E-1
Average (Bias1)	---	-4.688E-2	-1.233E-1	-1.372E-1	-2.489E-1
σ (Bias1)	---	2.970E-2	1.979E-2	2.065E-2	3.507E-2
Average+3σ (Bias1)	---	4.222E-2	-6.395E-2	-7.528E-2	-1.437E-1
Average-3σ (Bias1)	---	-1.360E-1	-1.827E-1	-1.992E-1	-3.541E-1
Average (Bias2)	---	-2.541E-2	-4.752E-2	-6.228E-2	-1.451E-1
σ (Bias2)	---	2.562E-2	1.614E-2	1.837E-2	3.965E-2
Average+3σ (Bias2)	---	5.146E-2	9.063E-4	-7.177E-3	-2.618E-2
Average-3σ (Bias2)	---	-1.023E-1	-9.595E-2	-1.174E-1	-2.641E-1
Average (OFF)	---	-1.085E-1	-1.230E-1	-1.221E-1	-1.646E-1
σ (OFF)	---	1.941E-2	2.083E-2	2.110E-2	2.694E-2
Average+3σ (OFF)	---	-5.029E-2	-6.056E-2	-5.884E-2	-8.382E-2
Average-3σ (OFF)	---	-1.668E-1	-1.855E-1	-1.854E-1	-2.455E-1

190 MeV proton / detailed results

9. VF module 1

Ta = 25°C ; If = 10mA



190 MeV proton / detailed results

VF, Module 1 . (V) **Min = 1.0 Max = 1.85**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1.354	1.355	1.352	1.352	1.354
N° 2 (Bias1)	1.355	1.353	1.355	1.353	1.351
N° 3 (Bias1)	1.354	1.354	1.355	1.354	1.351
N° 4 (Bias1)	1.353	1.355	1.355	1.354	1.350
N° 5 (Bias1)	1.354	1.356	1.356	1.356	1.350
N° 6 (Bias1)	1.354	1.357	1.356	1.356	1.351
N° 7 (Bias2)	1.356	1.354	1.354	1.354	1.347
N° 8 (Bias2)	1.355	1.354	1.354	1.353	1.348
N° 9 (Bias2)	1.355	1.356	1.355	1.354	1.348
N° 10 (Bias2)	1.354	1.356	1.355	1.354	1.348
N° 11 (Bias2)	1.354	1.356	1.355	1.354	1.348
N° 12 (OFF)	1.355	1.358	1.357	1.355	1.349
N° 13 (OFF)	1.355	1.358	1.357	1.356	1.349
N° 14 (OFF)	1.355	1.357	1.356	1.355	1.348
N° 15 (OFF)	1.355	1.356	1.356	1.354	1.348
N° 16 (OFF)	1.355	1.357	1.356	1.354	1.348

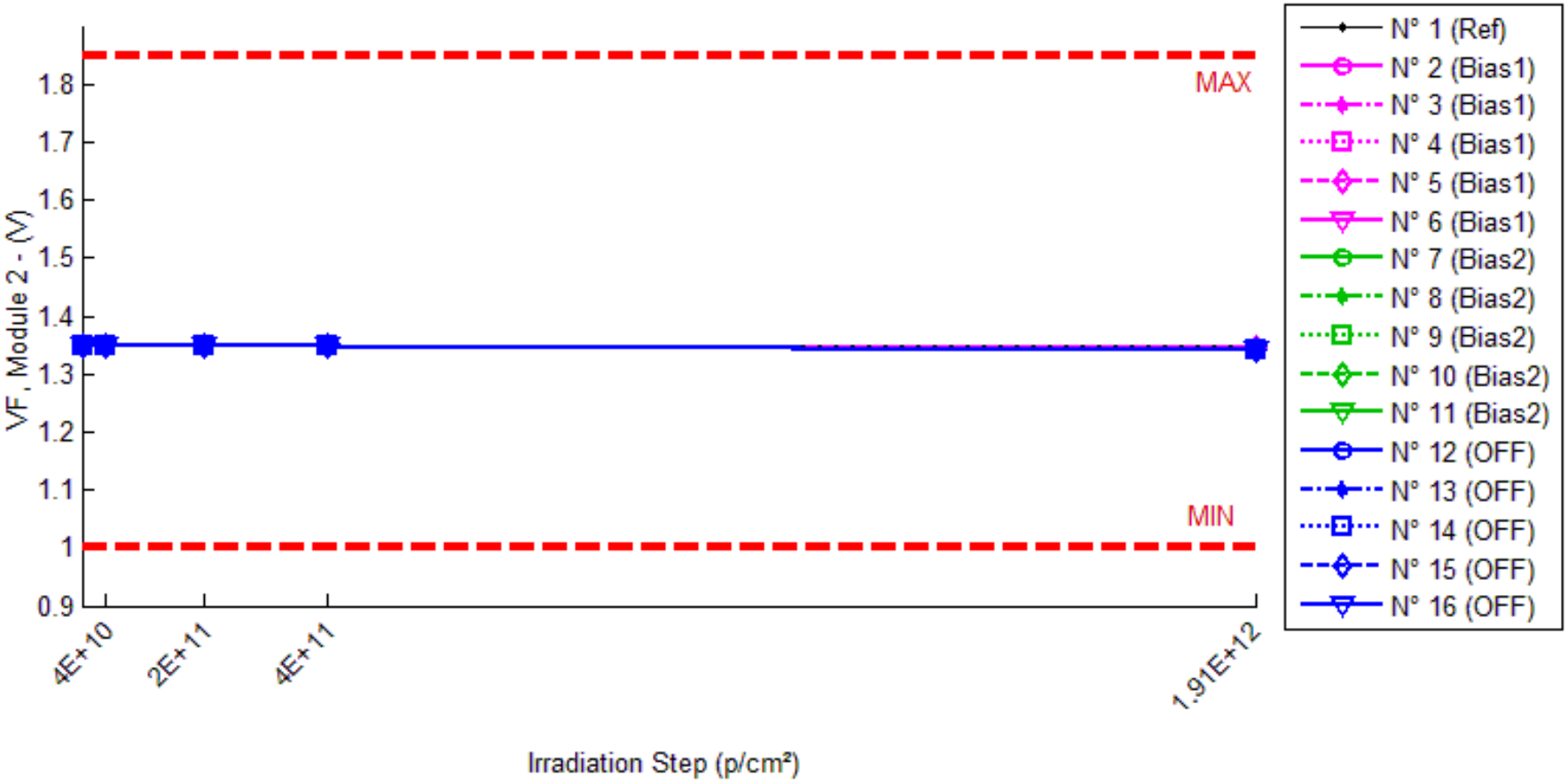
Delta [VF, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	3.140E-4	-2.784E-3	-2.068E-3	-7.100E-4
N° 2 (Bias1)	---	-1.385E-3	-2.850E-4	-1.954E-3	-3.466E-3
N° 3 (Bias1)	---	2.390E-4	6.580E-4	-5.100E-4	-3.407E-3
N° 4 (Bias1)	---	1.891E-3	1.421E-3	9.780E-4	-3.007E-3
N° 5 (Bias1)	---	2.336E-3	1.921E-3	1.481E-3	-3.721E-3
N° 6 (Bias1)	---	2.444E-3	2.153E-3	1.350E-3	-3.469E-3
N° 7 (Bias2)	---	-2.410E-3	-1.805E-3	-2.645E-3	-9.098E-3
N° 8 (Bias2)	---	-1.010E-3	-9.610E-4	-1.957E-3	-7.741E-3
N° 9 (Bias2)	---	8.190E-4	3.530E-4	-5.760E-4	-6.850E-3
N° 10 (Bias2)	---	1.550E-3	8.880E-4	-6.800E-5	-6.632E-3
N° 11 (Bias2)	---	1.738E-3	4.290E-4	-9.100E-5	-6.274E-3
N° 12 (OFF)	---	3.308E-3	2.469E-3	6.920E-4	-5.766E-3
N° 13 (OFF)	---	3.301E-3	2.166E-3	1.115E-3	-5.736E-3
N° 14 (OFF)	---	2.247E-3	8.780E-4	1.210E-4	-6.693E-3
N° 15 (OFF)	---	1.247E-3	6.300E-4	-9.580E-4	-7.617E-3
N° 16 (OFF)	---	1.665E-3	6.090E-4	-6.990E-4	-7.091E-3
Average (Bias1)	---	1.105E-3	1.174E-3	2.690E-4	-3.414E-3
σ (Bias1)	---	1.649E-3	9.965E-4	1.474E-3	2.577E-4
Average+3σ (Bias1)	---	6.052E-3	4.163E-3	4.691E-3	-2.641E-3
Average-3σ (Bias1)	---	-3.842E-3	-1.816E-3	-4.153E-3	-4.187E-3
Average (Bias2)	---	1.374E-4	-2.192E-4	-1.067E-3	-7.319E-3
σ (Bias2)	---	1.791E-3	1.122E-3	1.170E-3	1.132E-3
Average+3σ (Bias2)	---	5.510E-3	3.148E-3	2.442E-3	-3.923E-3
Average-3σ (Bias2)	---	-5.235E-3	-3.586E-3	-4.577E-3	-1.072E-2
Average (OFF)	---	2.354E-3	1.350E-3	5.420E-5	-6.581E-3
σ (OFF)	---	9.379E-4	8.956E-4	8.844E-4	8.253E-4
Average+3σ (OFF)	---	5.167E-3	4.037E-3	2.707E-3	-4.105E-3
Average-3σ (OFF)	---	-4.601E-4	-1.336E-3	-2.599E-3	-9.056E-3

190 MeV proton / detailed results

10.VF module 2

Ta = 25°C ; If = 10mA



190 MeV proton / detailed results

VF, Module 2 . (V) **Min = 1.0 Max = 1.85**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1.347	1.349	1.347	1.348	1.348
N° 2 (Bias1)	1.348	1.348	1.349	1.347	1.343
N° 3 (Bias1)	1.348	1.348	1.349	1.348	1.343
N° 4 (Bias1)	1.348	1.349	1.348	1.348	1.343
N° 5 (Bias1)	1.348	1.350	1.349	1.348	1.344
N° 6 (Bias1)	1.348	1.350	1.349	1.349	1.343
N° 7 (Bias2)	1.350	1.349	1.349	1.347	1.341
N° 8 (Bias2)	1.349	1.349	1.348	1.347	1.341
N° 9 (Bias2)	1.349	1.349	1.349	1.348	1.341
N° 10 (Bias2)	1.349	1.350	1.349	1.348	1.341
N° 11 (Bias2)	1.348	1.349	1.348	1.347	1.340
N° 12 (OFF)	1.348	1.351	1.349	1.349	1.341
N° 13 (OFF)	1.349	1.351	1.350	1.349	1.342
N° 14 (OFF)	1.348	1.350	1.349	1.348	1.341
N° 15 (OFF)	1.349	1.350	1.349	1.348	1.341
N° 16 (OFF)	1.348	1.349	1.348	1.347	1.341

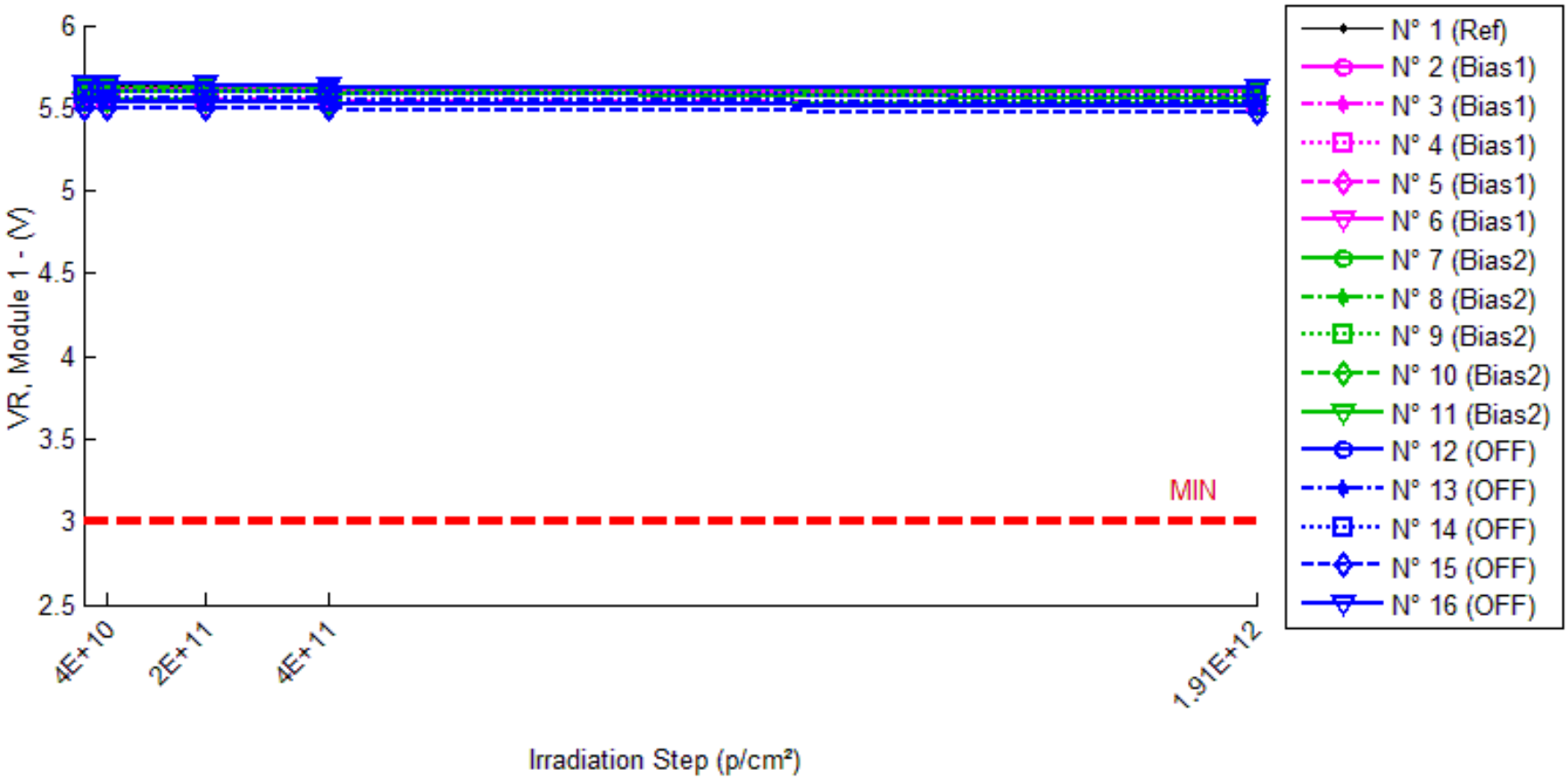
Delta [VF, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	1.302E-3	-9.100E-5	5.730E-4	8.720E-4
N° 2 (Bias1)	---	9.000E-6	5.070E-4	-1.375E-3	-4.848E-3
N° 3 (Bias1)	---	-5.300E-4	3.310E-4	-3.350E-4	-5.055E-3
N° 4 (Bias1)	---	1.079E-3	8.110E-4	3.180E-4	-4.212E-3
N° 5 (Bias1)	---	1.334E-3	6.830E-4	1.330E-4	-4.463E-3
N° 6 (Bias1)	---	1.495E-3	1.100E-3	5.580E-4	-4.641E-3
N° 7 (Bias2)	---	-6.320E-4	-9.940E-4	-2.791E-3	-8.806E-3
N° 8 (Bias2)	---	-1.850E-4	-8.860E-4	-1.981E-3	-8.131E-3
N° 9 (Bias2)	---	3.700E-4	-2.690E-4	-1.292E-3	-7.878E-3
N° 10 (Bias2)	---	8.560E-4	-8.700E-5	-8.910E-4	-8.238E-3
N° 11 (Bias2)	---	8.660E-4	-3.810E-4	-1.215E-3	-8.026E-3
N° 12 (OFF)	---	2.359E-3	7.710E-4	1.680E-4	-7.094E-3
N° 13 (OFF)	---	2.061E-3	1.111E-3	-1.810E-4	-6.872E-3
N° 14 (OFF)	---	1.492E-3	7.680E-4	-3.320E-4	-6.974E-3
N° 15 (OFF)	---	9.050E-4	2.590E-4	-1.174E-3	-7.322E-3
N° 16 (OFF)	---	7.730E-4	-2.970E-4	-1.266E-3	-7.803E-3
Average (Bias1)	---	6.774E-4	6.864E-4	-1.402E-4	-4.644E-3
σ (Bias1)	---	8.896E-4	2.937E-4	7.640E-4	3.278E-4
Average+3σ (Bias1)	---	3.346E-3	1.568E-3	2.152E-3	-3.660E-3
Average-3σ (Bias1)	---	-1.991E-3	-1.948E-4	-2.432E-3	-5.627E-3
Average (Bias2)	---	2.550E-4	-5.234E-4	-1.634E-3	-8.216E-3
σ (Bias2)	---	6.573E-4	3.964E-4	7.589E-4	3.557E-4
Average+3σ (Bias2)	---	2.227E-3	6.657E-4	6.427E-4	-7.149E-3
Average-3σ (Bias2)	---	-1.717E-3	-1.712E-3	-3.911E-3	-9.283E-3
Average (OFF)	---	1.518E-3	5.224E-4	-5.570E-4	-7.213E-3
σ (OFF)	---	6.953E-4	5.499E-4	6.327E-4	3.700E-4
Average+3σ (OFF)	---	3.604E-3	2.172E-3	1.341E-3	-6.103E-3
Average-3σ (OFF)	---	-5.678E-4	-1.127E-3	-2.455E-3	-8.323E-3

190 MeV proton / detailed results

11.VR module 1

Ta = 25°C ; Ir = 10µA



190 MeV proton / detailed results

VR, Module 1 . (V) **Min = 3.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	5.637	5.638	5.634	5.636	5.637
N° 2 (Bias1)	5.617	5.615	5.616	5.612	5.601
N° 3 (Bias1)	5.597	5.597	5.597	5.595	5.580
N° 4 (Bias1)	5.554	5.556	5.555	5.553	5.538
N° 5 (Bias1)	5.542	5.545	5.543	5.541	5.527
N° 6 (Bias1)	5.533	5.536	5.535	5.533	5.519
N° 7 (Bias2)	5.600	5.596	5.595	5.593	5.564
N° 8 (Bias2)	5.626	5.624	5.623	5.619	5.591
N° 9 (Bias2)	5.618	5.619	5.617	5.615	5.591
N° 10 (Bias2)	5.545	5.547	5.545	5.539	5.516
N° 11 (Bias2)	5.544	5.546	5.543	5.538	5.519
N° 12 (OFF)	5.537	5.541	5.538	5.534	5.509
N° 13 (OFF)	5.558	5.563	5.560	5.556	5.532
N° 14 (OFF)	5.596	5.599	5.595	5.592	5.569
N° 15 (OFF)	5.501	5.501	5.498	5.492	5.469
N° 16 (OFF)	5.642	5.644	5.642	5.638	5.616

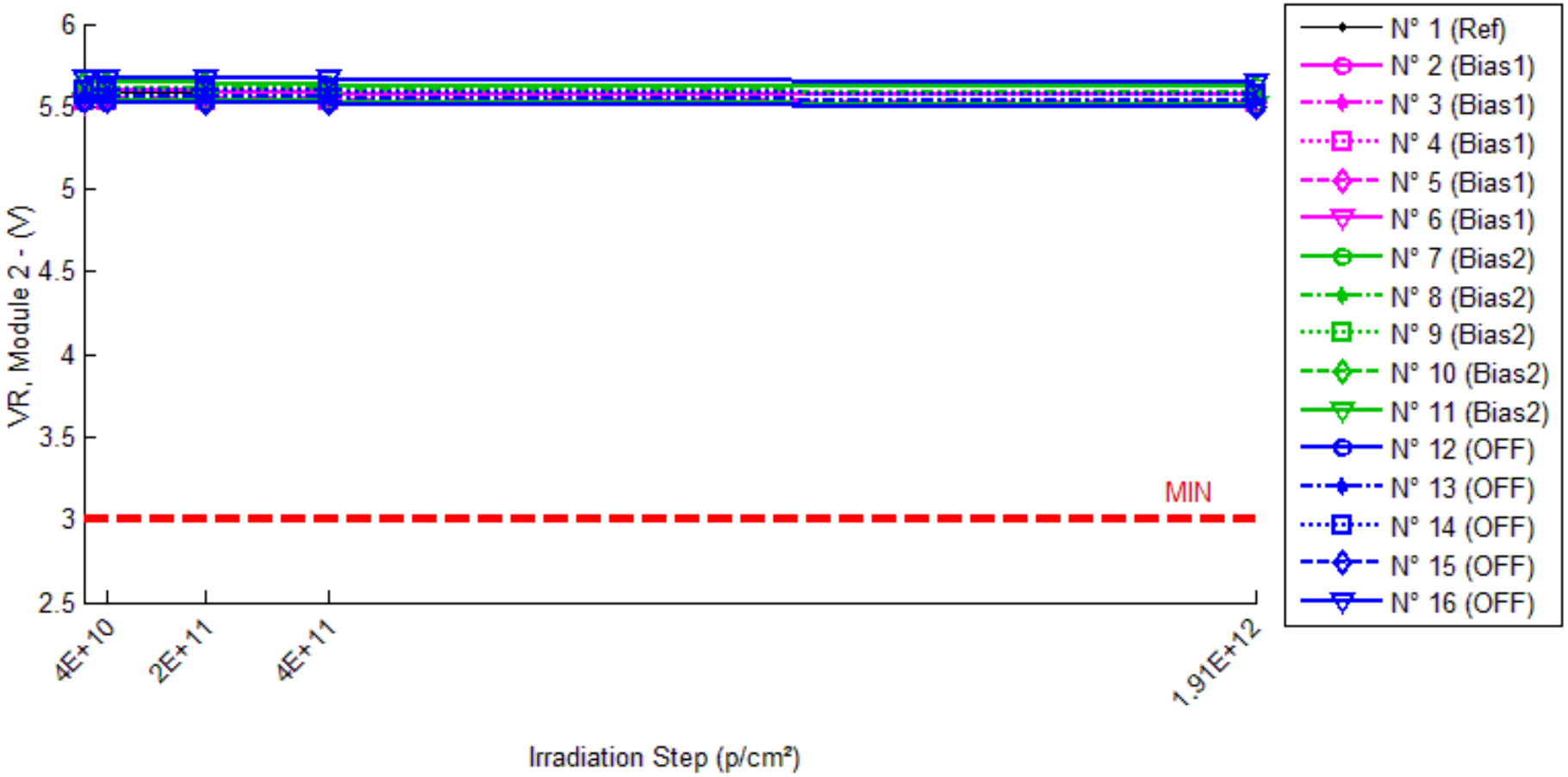
Delta [VR, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	5.570E-4	-2.990E-3	-1.794E-3	-5.300E-4
N° 2 (Bias1)	---	-2.003E-3	-1.429E-3	-5.622E-3	-1.615E-2
N° 3 (Bias1)	---	-6.300E-5	-7.870E-4	-2.584E-3	-1.764E-2
N° 4 (Bias1)	---	1.594E-3	5.000E-4	-1.419E-3	-1.614E-2
N° 5 (Bias1)	---	2.780E-3	6.190E-4	-8.340E-4	-1.508E-2
N° 6 (Bias1)	---	2.850E-3	2.013E-3	-2.440E-4	-1.457E-2
N° 7 (Bias2)	---	-4.273E-3	-4.841E-3	-6.845E-3	-3.603E-2
N° 8 (Bias2)	---	-1.700E-3	-3.151E-3	-6.651E-3	-3.498E-2
N° 9 (Bias2)	---	9.830E-4	-1.051E-3	-3.574E-3	-2.700E-2
N° 10 (Bias2)	---	1.697E-3	4.140E-4	-5.966E-3	-2.839E-2
N° 11 (Bias2)	---	2.085E-3	-8.300E-4	-5.652E-3	-2.503E-2
N° 12 (OFF)	---	3.876E-3	1.150E-3	-2.590E-3	-2.770E-2
N° 13 (OFF)	---	4.237E-3	1.082E-3	-2.236E-3	-2.635E-2
N° 14 (OFF)	---	3.435E-3	-4.670E-4	-3.934E-3	-2.736E-2
N° 15 (OFF)	---	4.490E-4	-2.183E-3	-9.003E-3	-3.176E-2
N° 16 (OFF)	---	2.117E-3	4.110E-4	-4.077E-3	-2.588E-2
Average (Bias1)	---	1.032E-3	1.832E-4	-2.141E-3	-1.592E-2
σ (Bias1)	---	2.067E-3	1.340E-3	2.130E-3	1.182E-3
Average+3σ (Bias1)	---	7.232E-3	4.202E-3	4.248E-3	-1.237E-2
Average-3σ (Bias1)	---	-5.169E-3	-3.836E-3	-8.530E-3	-1.946E-2
Average (Bias2)	---	-2.416E-4	-1.892E-3	-5.738E-3	-3.029E-2
σ (Bias2)	---	2.695E-3	2.088E-3	1.304E-3	4.927E-3
Average+3σ (Bias2)	---	7.843E-3	4.371E-3	-1.826E-3	-1.550E-2
Average-3σ (Bias2)	---	-8.326E-3	-8.155E-3	-9.649E-3	-4.507E-2
Average (OFF)	---	2.823E-3	-1.400E-6	-4.368E-3	-2.781E-2
σ (OFF)	---	1.551E-3	1.383E-3	2.714E-3	2.327E-3
Average+3σ (OFF)	---	7.475E-3	4.146E-3	3.774E-3	-2.082E-2
Average-3σ (OFF)	---	-1.829E-3	-4.149E-3	-1.251E-2	-3.479E-2

190 MeV proton / detailed results

12.VR module 2

Ta = 25°C ; Ir = 10µA



190 MeV proton / detailed results

VR, Module 2 . (V) **Min = 3.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	5.586	5.587	5.586	5.587	5.587
N° 2 (Bias1)	5.595	5.595	5.593	5.589	5.577
N° 3 (Bias1)	5.600	5.600	5.601	5.598	5.581
N° 4 (Bias1)	5.540	5.540	5.539	5.538	5.522
N° 5 (Bias1)	5.548	5.549	5.547	5.545	5.523
N° 6 (Bias1)	5.528	5.530	5.529	5.527	5.511
N° 7 (Bias2)	5.645	5.644	5.642	5.638	5.616
N° 8 (Bias2)	5.611	5.611	5.608	5.603	5.584
N° 9 (Bias2)	5.601	5.601	5.599	5.595	5.571
N° 10 (Bias2)	5.535	5.535	5.534	5.532	5.500
N° 11 (Bias2)	5.539	5.540	5.536	5.531	5.505
N° 12 (OFF)	5.520	5.524	5.521	5.518	5.496
N° 13 (OFF)	5.555	5.558	5.556	5.555	5.532
N° 14 (OFF)	5.596	5.598	5.596	5.593	5.568
N° 15 (OFF)	5.529	5.530	5.528	5.524	5.503
N° 16 (OFF)	5.671	5.672	5.669	5.665	5.643

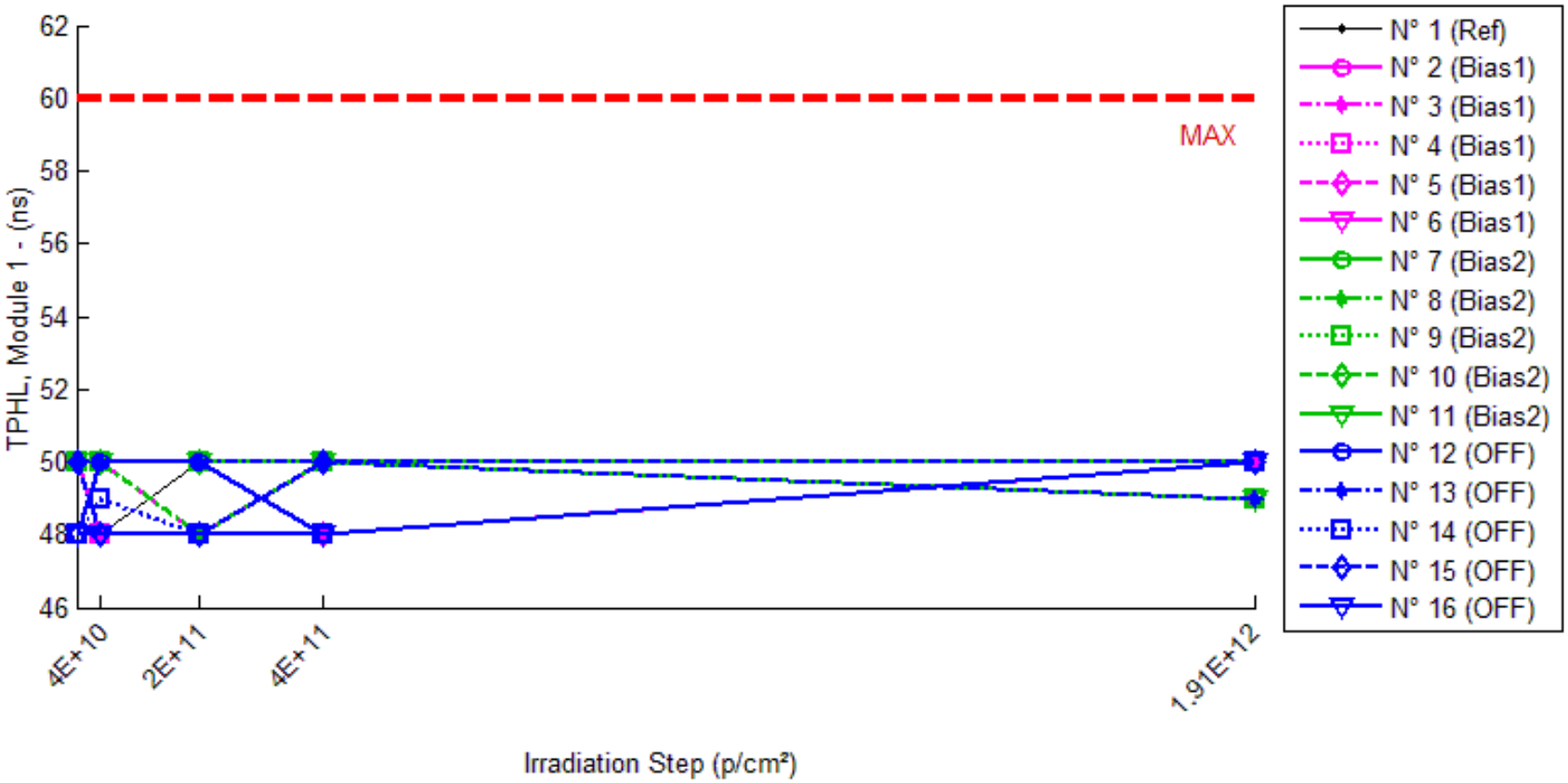
Delta [VR, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	1.817E-3	1.590E-4	1.290E-3	1.367E-3
N° 2 (Bias1)	---	-7.020E-4	-2.637E-3	-6.871E-3	-1.819E-2
N° 3 (Bias1)	---	-3.220E-4	4.150E-4	-2.476E-3	-1.965E-2
N° 4 (Bias1)	---	5.660E-4	-1.324E-3	-1.920E-3	-1.776E-2
N° 5 (Bias1)	---	1.004E-3	-9.140E-4	-2.384E-3	-2.431E-2
N° 6 (Bias1)	---	2.092E-3	1.057E-3	-4.380E-4	-1.694E-2
N° 7 (Bias2)	---	-6.970E-4	-2.641E-3	-6.583E-3	-2.831E-2
N° 8 (Bias2)	---	-5.380E-4	-3.461E-3	-7.912E-3	-2.759E-2
N° 9 (Bias2)	---	1.700E-4	-2.292E-3	-5.924E-3	-3.025E-2
N° 10 (Bias2)	---	3.550E-4	-8.870E-4	-2.723E-3	-3.504E-2
N° 11 (Bias2)	---	7.050E-4	-2.976E-3	-8.183E-3	-3.451E-2
N° 12 (OFF)	---	3.388E-3	1.213E-3	-1.846E-3	-2.396E-2
N° 13 (OFF)	---	2.856E-3	1.150E-3	-7.090E-4	-2.314E-2
N° 14 (OFF)	---	1.480E-3	2.250E-4	-3.617E-3	-2.780E-2
N° 15 (OFF)	---	1.024E-3	-1.324E-3	-5.096E-3	-2.613E-2
N° 16 (OFF)	---	5.860E-4	-2.367E-3	-6.300E-3	-2.816E-2
Average (Bias1)	---	5.276E-4	-6.806E-4	-2.818E-3	-1.937E-2
σ (Bias1)	---	1.108E-3	1.459E-3	2.408E-3	2.934E-3
Average+3σ (Bias1)	---	3.851E-3	3.697E-3	4.408E-3	-1.057E-2
Average-3σ (Bias1)	---	-2.796E-3	-5.058E-3	-1.004E-2	-2.817E-2
Average (Bias2)	---	-1.000E-6	-2.451E-3	-6.265E-3	-3.114E-2
σ (Bias2)	---	5.973E-4	9.751E-4	2.188E-3	3.464E-3
Average+3σ (Bias2)	---	1.791E-3	4.739E-4	2.999E-4	-2.075E-2
Average-3σ (Bias2)	---	-1.793E-3	-5.377E-3	-1.283E-2	-4.153E-2
Average (OFF)	---	1.867E-3	-2.206E-4	-3.514E-3	-2.584E-2
σ (OFF)	---	1.203E-3	1.578E-3	2.287E-3	2.244E-3
Average+3σ (OFF)	---	5.477E-3	4.513E-3	3.348E-3	-1.911E-2
Average-3σ (OFF)	---	-1.743E-3	-4.954E-3	-1.038E-2	-3.257E-2

190 MeV proton / detailed results

13.TPHL module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TPHL, Module 1 . (ns) **Max = 60.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	50.0	48.0	50.0	50.0	50.0
N° 2 (Bias1)	50.0	48.0	48.0	50.0	49.0
N° 3 (Bias1)	50.0	48.0	48.0	48.0	50.0
N° 4 (Bias1)	48.0	48.0	48.0	48.0	50.0
N° 5 (Bias1)	50.0	50.0	48.0	48.0	50.0
N° 6 (Bias1)	48.0	48.0	48.0	50.0	50.0
N° 7 (Bias2)	50.0	50.0	50.0	50.0	50.0
N° 8 (Bias2)	50.0	50.0	48.0	50.0	49.0
N° 9 (Bias2)	50.0	50.0	50.0	50.0	49.0
N° 10 (Bias2)	50.0	50.0	50.0	50.0	50.0
N° 11 (Bias2)	48.0	50.0	50.0	50.0	49.0
N° 12 (OFF)	48.0	50.0	50.0	48.0	50.0
N° 13 (OFF)	50.0	50.0	50.0	50.0	49.0
N° 14 (OFF)	48.0	49.0	48.0	48.0	50.0
N° 15 (OFF)	50.0	48.0	48.0	50.0	50.0
N° 16 (OFF)	48.0	48.0	48.0	48.0	50.0

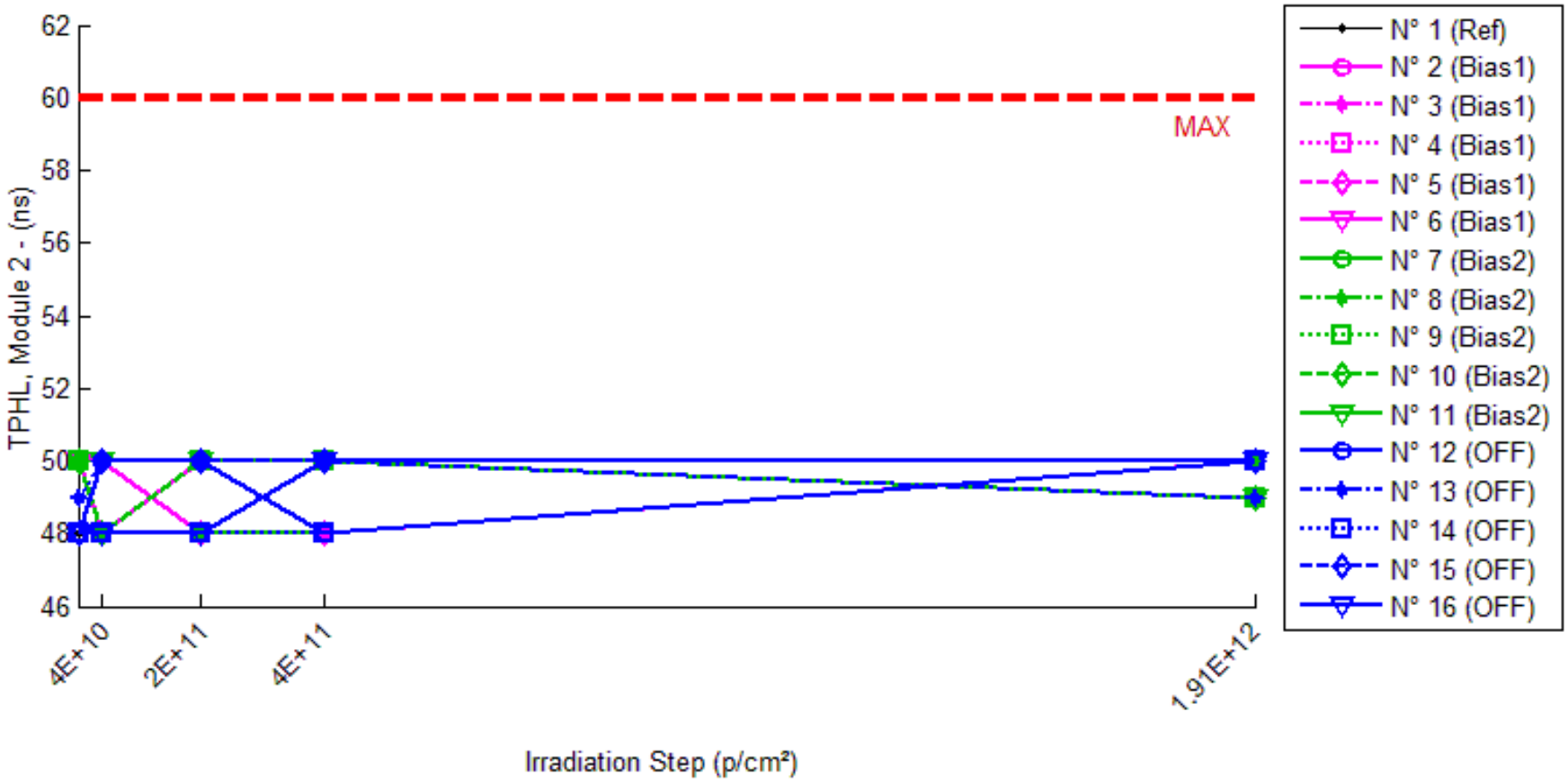
Delta [TPHL, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 2 (Bias1)	---	-2.000E+0	-2.000E+0	0.000E+0	-1.000E+0
N° 3 (Bias1)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 5 (Bias1)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 6 (Bias1)	---	0.000E+0	0.000E+0	2.000E+0	2.000E+0
N° 7 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 8 (Bias2)	---	0.000E+0	-2.000E+0	0.000E+0	-1.000E+0
N° 9 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 10 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 11 (Bias2)	---	2.000E+0	2.000E+0	2.000E+0	1.000E+0
N° 12 (OFF)	---	2.000E+0	2.000E+0	0.000E+0	2.000E+0
N° 13 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 14 (OFF)	---	1.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 15 (OFF)	---	-2.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 16 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	2.000E+0
Average (Bias1)	---	-8.000E-1	-1.200E+0	-4.000E-1	6.000E-1
σ (Bias1)	---	1.095E+0	1.095E+0	1.673E+0	1.342E+0
Average+3σ (Bias1)	---	2.486E+0	2.086E+0	4.620E+0	4.625E+0
Average-3σ (Bias1)	---	-4.086E+0	-4.486E+0	-5.420E+0	-3.425E+0
Average (Bias2)	---	4.000E-1	0.000E+0	4.000E-1	-2.000E-1
σ (Bias2)	---	8.944E-1	1.414E+0	8.944E-1	8.367E-1
Average+3σ (Bias2)	---	3.083E+0	4.243E+0	3.083E+0	2.310E+0
Average-3σ (Bias2)	---	-2.283E+0	-4.243E+0	-2.283E+0	-2.710E+0
Average (OFF)	---	2.000E-1	0.000E+0	0.000E+0	1.000E+0
σ (OFF)	---	1.483E+0	1.414E+0	0.000E+0	1.414E+0
Average+3σ (OFF)	---	4.650E+0	4.243E+0	0.000E+0	5.243E+0
Average-3σ (OFF)	---	-4.250E+0	-4.243E+0	0.000E+0	-3.243E+0

190 MeV proton / detailed results

14.TPHL module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TPHL, Module 2 . (ns) **Max = 60.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	48.0	48.0	48.0	50.0	49.0
N° 2 (Bias1)	50.0	50.0	48.0	50.0	50.0
N° 3 (Bias1)	50.0	48.0	50.0	48.0	50.0
N° 4 (Bias1)	50.0	48.0	50.0	50.0	50.0
N° 5 (Bias1)	48.0	48.0	48.0	48.0	50.0
N° 6 (Bias1)	50.0	48.0	50.0	50.0	50.0
N° 7 (Bias2)	48.0	48.0	48.0	48.0	50.0
N° 8 (Bias2)	50.0	48.0	48.0	50.0	50.0
N° 9 (Bias2)	50.0	48.0	50.0	50.0	49.0
N° 10 (Bias2)	50.0	48.0	50.0	50.0	49.0
N° 11 (Bias2)	48.0	50.0	50.0	50.0	49.0
N° 12 (OFF)	48.0	50.0	50.0	48.0	50.0
N° 13 (OFF)	49.0	50.0	50.0	50.0	49.0
N° 14 (OFF)	48.0	48.0	48.0	48.0	50.0
N° 15 (OFF)	48.0	50.0	50.0	50.0	50.0
N° 16 (OFF)	48.0	48.0	48.0	50.0	50.0

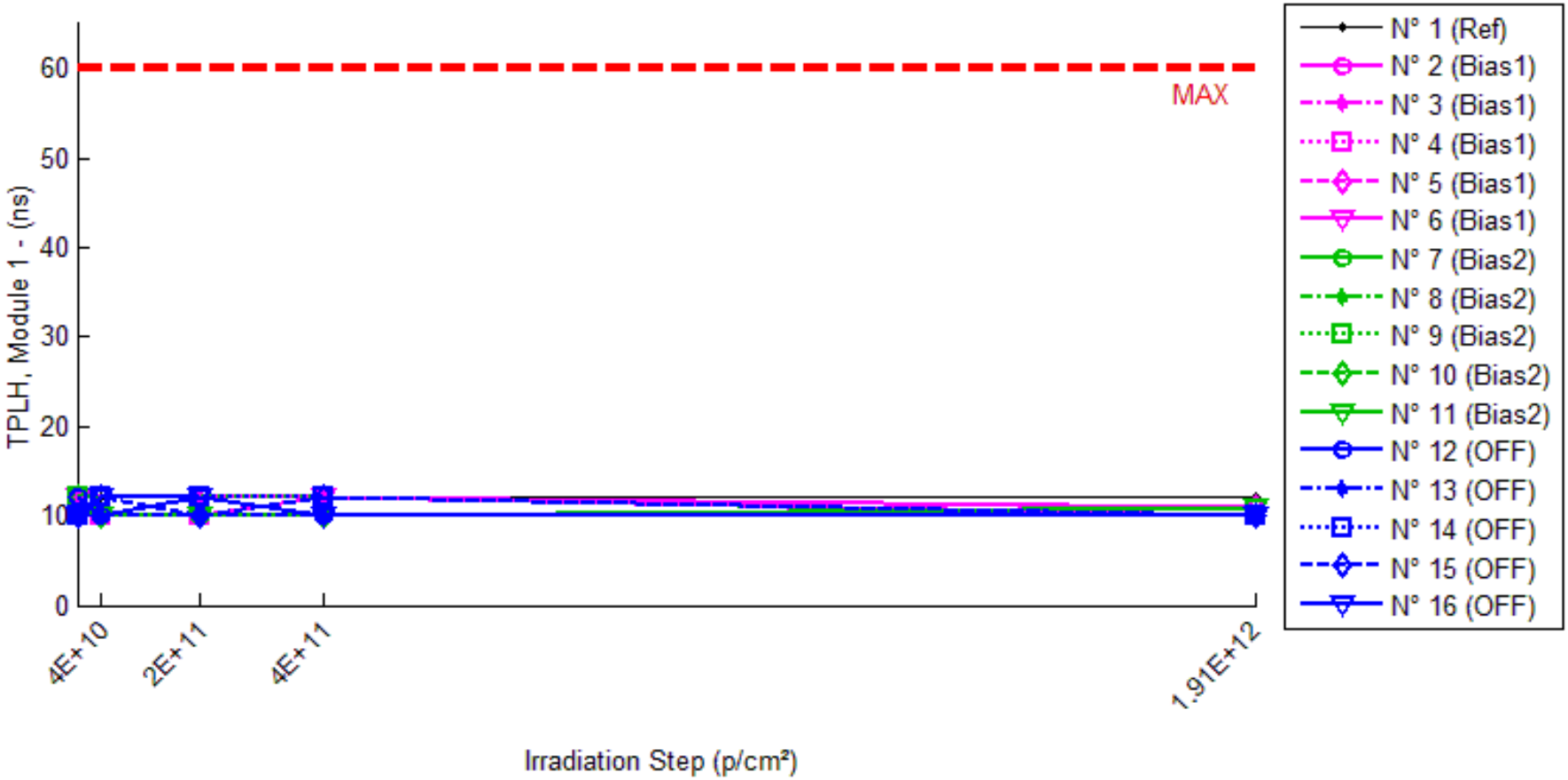
Delta [TPHL, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	0.000E+0	2.000E+0	1.000E+0
N° 2 (Bias1)	---	0.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 3 (Bias1)	---	-2.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 4 (Bias1)	---	-2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 6 (Bias1)	---	-2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 7 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 8 (Bias2)	---	-2.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 9 (Bias2)	---	-2.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 10 (Bias2)	---	-2.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 11 (Bias2)	---	2.000E+0	2.000E+0	2.000E+0	1.000E+0
N° 12 (OFF)	---	2.000E+0	2.000E+0	0.000E+0	2.000E+0
N° 13 (OFF)	---	1.000E+0	1.000E+0	1.000E+0	0.000E+0
N° 14 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 15 (OFF)	---	2.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 16 (OFF)	---	0.000E+0	0.000E+0	2.000E+0	2.000E+0
Average (Bias1)	---	-1.200E+0	-4.000E-1	-4.000E-1	4.000E-1
σ (Bias1)	---	1.095E+0	8.944E-1	8.944E-1	8.944E-1
Average+3σ (Bias1)	---	2.086E+0	2.283E+0	2.283E+0	3.083E+0
Average-3σ (Bias1)	---	-4.486E+0	-3.083E+0	-3.083E+0	-2.283E+0
Average (Bias2)	---	-8.000E-1	0.000E+0	4.000E-1	2.000E-1
σ (Bias2)	---	1.789E+0	1.414E+0	8.944E-1	1.304E+0
Average+3σ (Bias2)	---	4.567E+0	4.243E+0	3.083E+0	4.112E+0
Average-3σ (Bias2)	---	-6.167E+0	-4.243E+0	-2.283E+0	-3.712E+0
Average (OFF)	---	1.000E+0	1.000E+0	1.000E+0	1.600E+0
σ (OFF)	---	1.000E+0	1.000E+0	1.000E+0	8.944E-1
Average+3σ (OFF)	---	4.000E+0	4.000E+0	4.000E+0	4.283E+0
Average-3σ (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	-1.083E+0

190 MeV proton / detailed results

15.TPLH module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TPLH, Module 1 . (ns) **Max = 60.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	12.0	12.0	12.0	12.0	12.0
N° 2 (Bias1)	12.0	12.0	12.0	12.0	10.0
N° 3 (Bias1)	12.0	10.0	12.0	12.0	10.0
N° 4 (Bias1)	10.0	10.0	10.0	12.0	10.0
N° 5 (Bias1)	10.0	10.0	10.0	10.0	11.0
N° 6 (Bias1)	12.0	10.0	10.0	12.0	11.0
N° 7 (Bias2)	10.0	10.0	10.0	10.0	10.0
N° 8 (Bias2)	10.0	10.0	10.0	10.0	10.0
N° 9 (Bias2)	12.0	12.0	12.0	12.0	10.0
N° 10 (Bias2)	12.0	10.0	10.0	10.0	10.0
N° 11 (Bias2)	10.0	10.0	10.0	10.0	11.0
N° 12 (OFF)	12.0	10.0	12.0	10.0	10.0
N° 13 (OFF)	10.0	10.0	10.0	10.0	10.0
N° 14 (OFF)	10.0	12.0	12.0	12.0	10.0
N° 15 (OFF)	10.0	12.0	10.0	12.0	10.0
N° 16 (OFF)	10.0	12.0	12.0	10.0	10.0

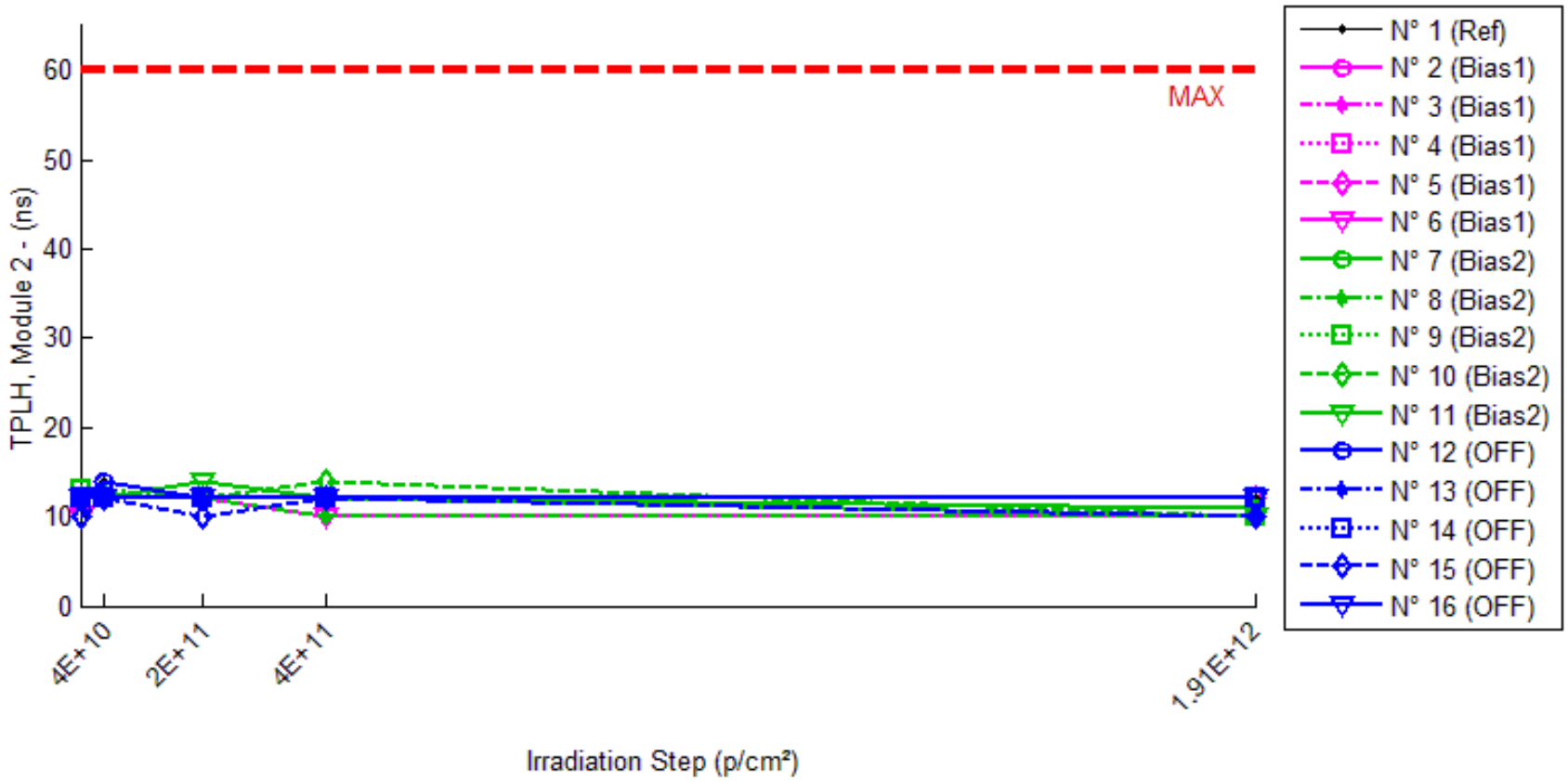
Delta [TPLH, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 3 (Bias1)	---	-2.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	1.000E+0
N° 6 (Bias1)	---	-2.000E+0	-2.000E+0	0.000E+0	-1.000E+0
N° 7 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 8 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 9 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 10 (Bias2)	---	-2.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 11 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	1.000E+0
N° 12 (OFF)	---	-2.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 13 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 14 (OFF)	---	2.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 15 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 16 (OFF)	---	2.000E+0	2.000E+0	0.000E+0	0.000E+0
Average (Bias1)	---	-8.000E-1	-4.000E-1	4.000E-1	-8.000E-1
σ (Bias1)	---	1.095E+0	8.944E-1	8.944E-1	1.304E+0
Average+3σ (Bias1)	---	2.486E+0	2.283E+0	3.083E+0	3.112E+0
Average-3σ (Bias1)	---	-4.086E+0	-3.083E+0	-2.283E+0	-4.712E+0
Average (Bias2)	---	-4.000E-1	-4.000E-1	-4.000E-1	-6.000E-1
σ (Bias2)	---	8.944E-1	8.944E-1	8.944E-1	1.342E+0
Average+3σ (Bias2)	---	2.283E+0	2.283E+0	2.283E+0	3.425E+0
Average-3σ (Bias2)	---	-3.083E+0	-3.083E+0	-3.083E+0	-4.625E+0
Average (OFF)	---	8.000E-1	8.000E-1	4.000E-1	-4.000E-1
σ (OFF)	---	1.789E+0	1.095E+0	1.673E+0	8.944E-1
Average+3σ (OFF)	---	6.167E+0	4.086E+0	5.420E+0	2.283E+0
Average-3σ (OFF)	---	-4.567E+0	-2.486E+0	-4.620E+0	-3.083E+0

190 MeV proton / detailed results

16.TPLH module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TPLH, Module 2 . (ns) **Max = 60.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	12.0	14.0	12.0	12.0	12.0
N° 2 (Bias1)	12.0	12.0	12.0	12.0	10.0
N° 3 (Bias1)	12.0	12.0	12.0	10.0	10.0
N° 4 (Bias1)	12.0	12.0	12.0	12.0	10.0
N° 5 (Bias1)	12.0	12.0	12.0	12.0	12.0
N° 6 (Bias1)	10.0	12.0	12.0	10.0	10.0
N° 7 (Bias2)	12.0	12.0	12.0	12.0	11.0
N° 8 (Bias2)	12.0	13.0	12.0	10.0	10.0
N° 9 (Bias2)	13.0	12.0	12.0	12.0	10.0
N° 10 (Bias2)	12.0	12.0	12.0	14.0	10.0
N° 11 (Bias2)	12.0	12.0	14.0	12.0	10.0
N° 12 (OFF)	12.0	14.0	12.0	12.0	12.0
N° 13 (OFF)	12.0	12.0	12.0	12.0	10.0
N° 14 (OFF)	12.0	12.0	12.0	12.0	12.0
N° 15 (OFF)	10.0	12.0	10.0	12.0	10.0
N° 16 (OFF)	12.0	12.0	12.0	12.0	12.0

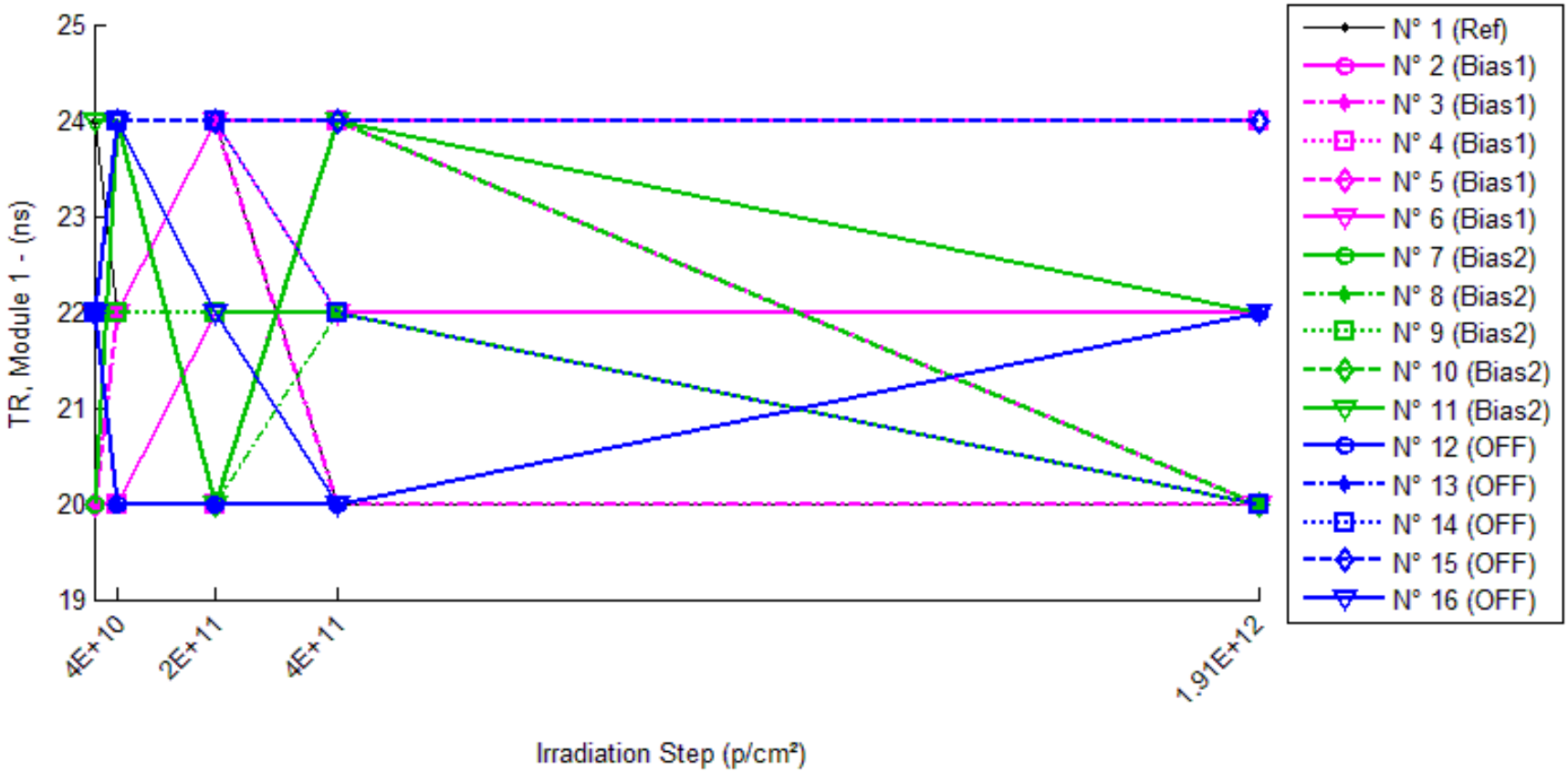
Delta [TPLH, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 3 (Bias1)	---	0.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 4 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 6 (Bias1)	---	2.000E+0	2.000E+0	0.000E+0	0.000E+0
N° 7 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	-1.000E+0
N° 8 (Bias2)	---	1.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 9 (Bias2)	---	-1.000E+0	-1.000E+0	-1.000E+0	-3.000E+0
N° 10 (Bias2)	---	0.000E+0	0.000E+0	2.000E+0	-2.000E+0
N° 11 (Bias2)	---	0.000E+0	2.000E+0	0.000E+0	-2.000E+0
N° 12 (OFF)	---	2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 13 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 14 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 15 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 16 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
Average (Bias1)	---	4.000E-1	4.000E-1	-4.000E-1	-1.200E+0
σ (Bias1)	---	8.944E-1	8.944E-1	8.944E-1	1.095E+0
Average+3σ (Bias1)	---	3.083E+0	3.083E+0	2.283E+0	2.086E+0
Average-3σ (Bias1)	---	-2.283E+0	-2.283E+0	-3.083E+0	-4.486E+0
Average (Bias2)	---	0.000E+0	2.000E-1	-2.000E-1	-2.000E+0
σ (Bias2)	---	7.071E-1	1.095E+0	1.483E+0	7.071E-1
Average+3σ (Bias2)	---	2.121E+0	3.486E+0	4.250E+0	1.213E-1
Average-3σ (Bias2)	---	-2.121E+0	-3.086E+0	-4.650E+0	-4.121E+0
Average (OFF)	---	8.000E-1	0.000E+0	4.000E-1	-4.000E-1
σ (OFF)	---	1.095E+0	0.000E+0	8.944E-1	8.944E-1
Average+3σ (OFF)	---	4.086E+0	0.000E+0	3.083E+0	2.283E+0
Average-3σ (OFF)	---	-2.486E+0	0.000E+0	-2.283E+0	-3.083E+0

190 MeV proton / detailed results

17.TR module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TR, Module 1 . (ns)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	24.0	22.0	24.0	20.0	20.0
N° 2 (Bias1)	20.0	20.0	22.0	22.0	22.0
N° 3 (Bias1)	20.0	22.0	24.0	20.0	20.0
N° 4 (Bias1)	22.0	20.0	20.0	24.0	24.0
N° 5 (Bias1)	20.0	22.0	24.0	24.0	20.0
N° 6 (Bias1)	22.0	22.0	24.0	22.0	20.0
N° 7 (Bias2)	20.0	24.0	22.0	22.0	20.0
N° 8 (Bias2)	22.0	20.0	20.0	22.0	20.0
N° 9 (Bias2)	22.0	22.0	22.0	22.0	20.0
N° 10 (Bias2)	22.0	24.0	20.0	24.0	20.0
N° 11 (Bias2)	24.0	24.0	20.0	24.0	22.0
N° 12 (OFF)	22.0	20.0	20.0	20.0	22.0
N° 13 (OFF)	22.0	20.0	20.0	20.0	22.0
N° 14 (OFF)	22.0	24.0	24.0	22.0	20.0
N° 15 (OFF)	22.0	24.0	24.0	24.0	24.0
N° 16 (OFF)	22.0	24.0	22.0	20.0	22.0

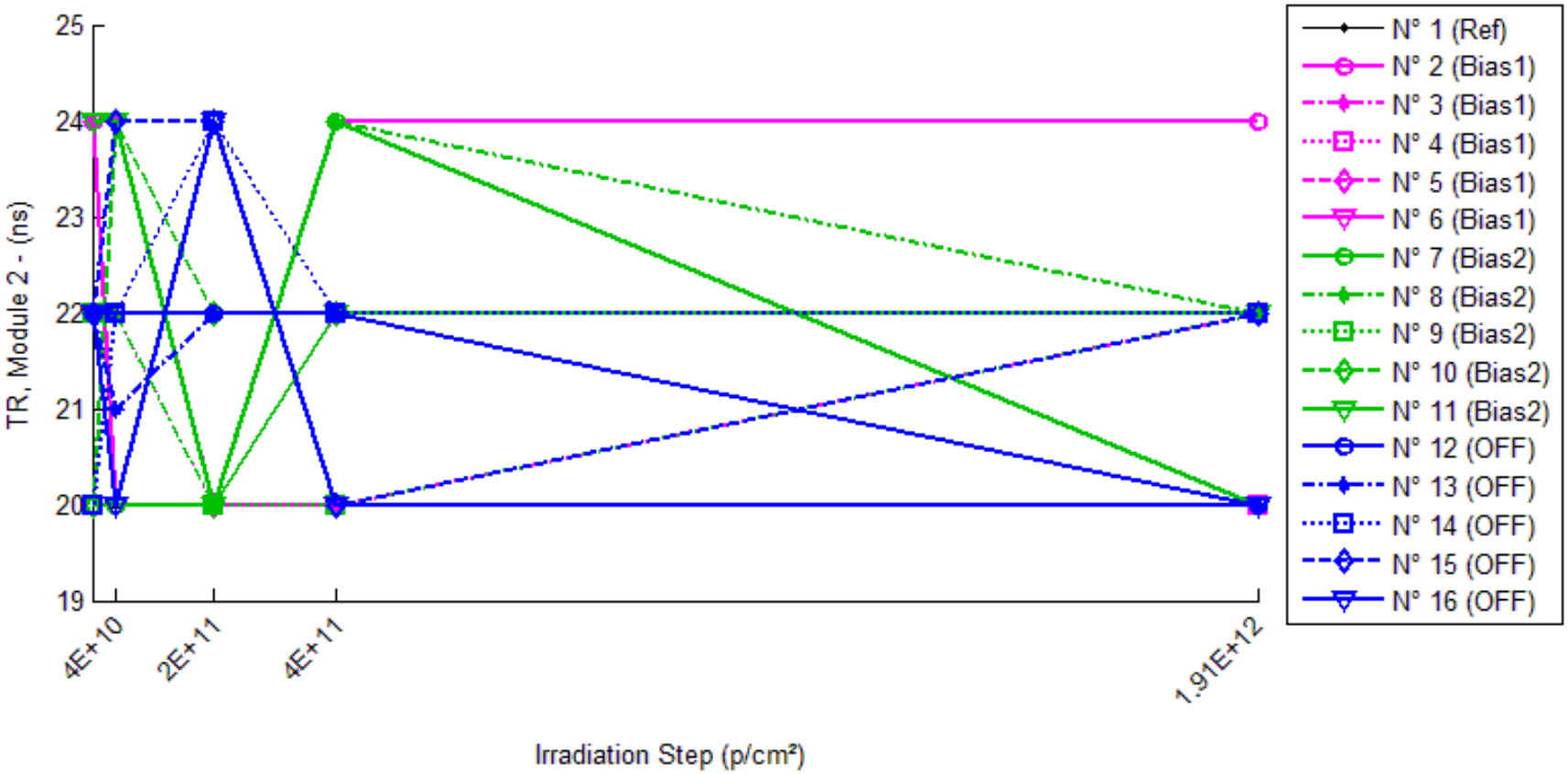
Delta [TR, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-2.000E+0	0.000E+0	-4.000E+0	-4.000E+0
N° 2 (Bias1)	---	0.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 3 (Bias1)	---	2.000E+0	4.000E+0	0.000E+0	0.000E+0
N° 4 (Bias1)	---	-2.000E+0	-2.000E+0	2.000E+0	2.000E+0
N° 5 (Bias1)	---	2.000E+0	4.000E+0	4.000E+0	0.000E+0
N° 6 (Bias1)	---	0.000E+0	2.000E+0	0.000E+0	-2.000E+0
N° 7 (Bias2)	---	4.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 8 (Bias2)	---	-2.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 9 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 10 (Bias2)	---	2.000E+0	-2.000E+0	2.000E+0	-2.000E+0
N° 11 (Bias2)	---	0.000E+0	-4.000E+0	0.000E+0	-2.000E+0
N° 12 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 13 (OFF)	---	-2.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 14 (OFF)	---	2.000E+0	2.000E+0	0.000E+0	-2.000E+0
N° 15 (OFF)	---	2.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 16 (OFF)	---	2.000E+0	0.000E+0	-2.000E+0	0.000E+0
Average (Bias1)	---	4.000E-1	2.000E+0	1.600E+0	4.000E-1
σ (Bias1)	---	1.673E+0	2.449E+0	1.673E+0	1.673E+0
Average+3σ (Bias1)	---	5.420E+0	9.348E+0	6.620E+0	5.420E+0
Average-3σ (Bias1)	---	-4.620E+0	-5.348E+0	-3.420E+0	-4.620E+0
Average (Bias2)	---	8.000E-1	-1.200E+0	8.000E-1	-1.600E+0
σ (Bias2)	---	2.280E+0	2.280E+0	1.095E+0	8.944E-1
Average+3σ (Bias2)	---	7.641E+0	5.641E+0	4.086E+0	1.083E+0
Average-3σ (Bias2)	---	-6.041E+0	-8.041E+0	-2.486E+0	-4.283E+0
Average (OFF)	---	4.000E-1	0.000E+0	-8.000E-1	0.000E+0
σ (OFF)	---	2.191E+0	2.000E+0	1.789E+0	1.414E+0
Average+3σ (OFF)	---	6.973E+0	6.000E+0	4.567E+0	4.243E+0
Average-3σ (OFF)	---	-6.173E+0	-6.000E+0	-6.167E+0	-4.243E+0

190 MeV proton / detailed results

18.TR module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TR, Module 2 . (ns)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	24.0	20.0	20.0	24.0	20.0
N° 2 (Bias1)	24.0	20.0	20.0	24.0	24.0
N° 3 (Bias1)	24.0	24.0	20.0	20.0	22.0
N° 4 (Bias1)	20.0	22.0	20.0	20.0	20.0
N° 5 (Bias1)	22.0	24.0	20.0	22.0	22.0
N° 6 (Bias1)	22.0	20.0	20.0	20.0	20.0
N° 7 (Bias2)	20.0	20.0	20.0	24.0	20.0
N° 8 (Bias2)	22.0	22.0	20.0	24.0	22.0
N° 9 (Bias2)	22.0	22.0	20.0	20.0	22.0
N° 10 (Bias2)	20.0	24.0	22.0	22.0	22.0
N° 11 (Bias2)	24.0	24.0	20.0	22.0	22.0
N° 12 (OFF)	22.0	22.0	22.0	22.0	20.0
N° 13 (OFF)	22.0	21.0	22.0	22.0	20.0
N° 14 (OFF)	20.0	22.0	24.0	22.0	22.0
N° 15 (OFF)	22.0	24.0	24.0	20.0	22.0
N° 16 (OFF)	22.0	20.0	24.0	20.0	20.0

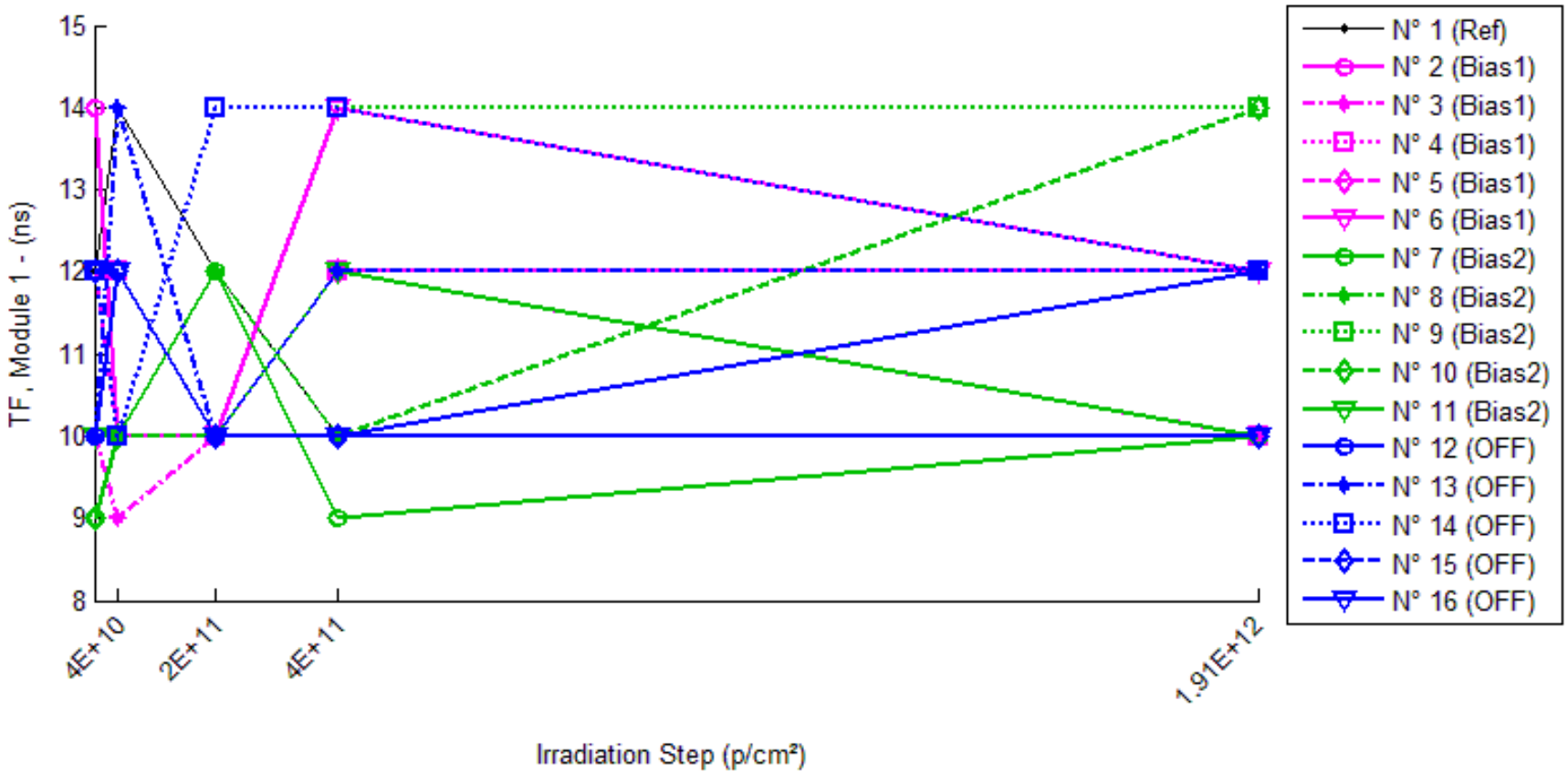
Delta [TR, Module 2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-4.000E+0	-4.000E+0	0.000E+0	-4.000E+0
N° 2 (Bias1)	---	-4.000E+0	-4.000E+0	0.000E+0	0.000E+0
N° 3 (Bias1)	---	0.000E+0	-4.000E+0	-4.000E+0	-2.000E+0
N° 4 (Bias1)	---	2.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 5 (Bias1)	---	2.000E+0	-2.000E+0	0.000E+0	0.000E+0
N° 6 (Bias1)	---	-2.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 7 (Bias2)	---	0.000E+0	0.000E+0	4.000E+0	0.000E+0
N° 8 (Bias2)	---	0.000E+0	-2.000E+0	2.000E+0	0.000E+0
N° 9 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 10 (Bias2)	---	4.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 11 (Bias2)	---	0.000E+0	-4.000E+0	-2.000E+0	-2.000E+0
N° 12 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 13 (OFF)	---	-1.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 14 (OFF)	---	2.000E+0	4.000E+0	2.000E+0	2.000E+0
N° 15 (OFF)	---	2.000E+0	2.000E+0	-2.000E+0	0.000E+0
N° 16 (OFF)	---	-2.000E+0	2.000E+0	-2.000E+0	-2.000E+0
Average (Bias1)	---	-4.000E-1	-2.400E+0	-1.200E+0	-8.000E-1
σ (Bias1)	---	2.608E+0	1.673E+0	1.789E+0	1.095E+0
Average+3σ (Bias1)	---	7.423E+0	2.620E+0	4.167E+0	2.486E+0
Average-3σ (Bias1)	---	-8.223E+0	-7.420E+0	-6.567E+0	-4.086E+0
Average (Bias2)	---	8.000E-1	-1.200E+0	8.000E-1	0.000E+0
σ (Bias2)	---	1.789E+0	2.280E+0	2.683E+0	1.414E+0
Average+3σ (Bias2)	---	6.167E+0	5.641E+0	8.850E+0	4.243E+0
Average-3σ (Bias2)	---	-4.567E+0	-8.041E+0	-7.250E+0	-4.243E+0
Average (OFF)	---	2.000E-1	1.600E+0	-4.000E-1	-8.000E-1
σ (OFF)	---	1.789E+0	1.673E+0	1.673E+0	1.789E+0
Average+3σ (OFF)	---	5.567E+0	6.620E+0	4.620E+0	4.567E+0
Average-3σ (OFF)	---	-5.167E+0	-3.420E+0	-5.420E+0	-6.167E+0

190 MeV proton / detailed results

19.TF module 1

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TF, Module 1 . (ns)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	12.0	14.0	12.0	10.0	10.0
N° 2 (Bias1)	14.0	10.0	10.0	12.0	12.0
N° 3 (Bias1)	10.0	9.0	10.0	10.0	10.0
N° 4 (Bias1)	12.0	12.0	10.0	12.0	10.0
N° 5 (Bias1)	12.0	10.0	10.0	12.0	10.0
N° 6 (Bias1)	10.0	12.0	10.0	14.0	12.0
N° 7 (Bias2)	9.0	10.0	12.0	9.0	10.0
N° 8 (Bias2)	10.0	10.0	12.0	10.0	12.0
N° 9 (Bias2)	12.0	10.0	14.0	14.0	14.0
N° 10 (Bias2)	9.0	10.0	10.0	10.0	14.0
N° 11 (Bias2)	10.0	12.0	10.0	12.0	10.0
N° 12 (OFF)	10.0	12.0	10.0	10.0	12.0
N° 13 (OFF)	10.0	14.0	10.0	12.0	12.0
N° 14 (OFF)	12.0	10.0	14.0	14.0	12.0
N° 15 (OFF)	12.0	12.0	10.0	10.0	10.0
N° 16 (OFF)	12.0	12.0	10.0	10.0	10.0

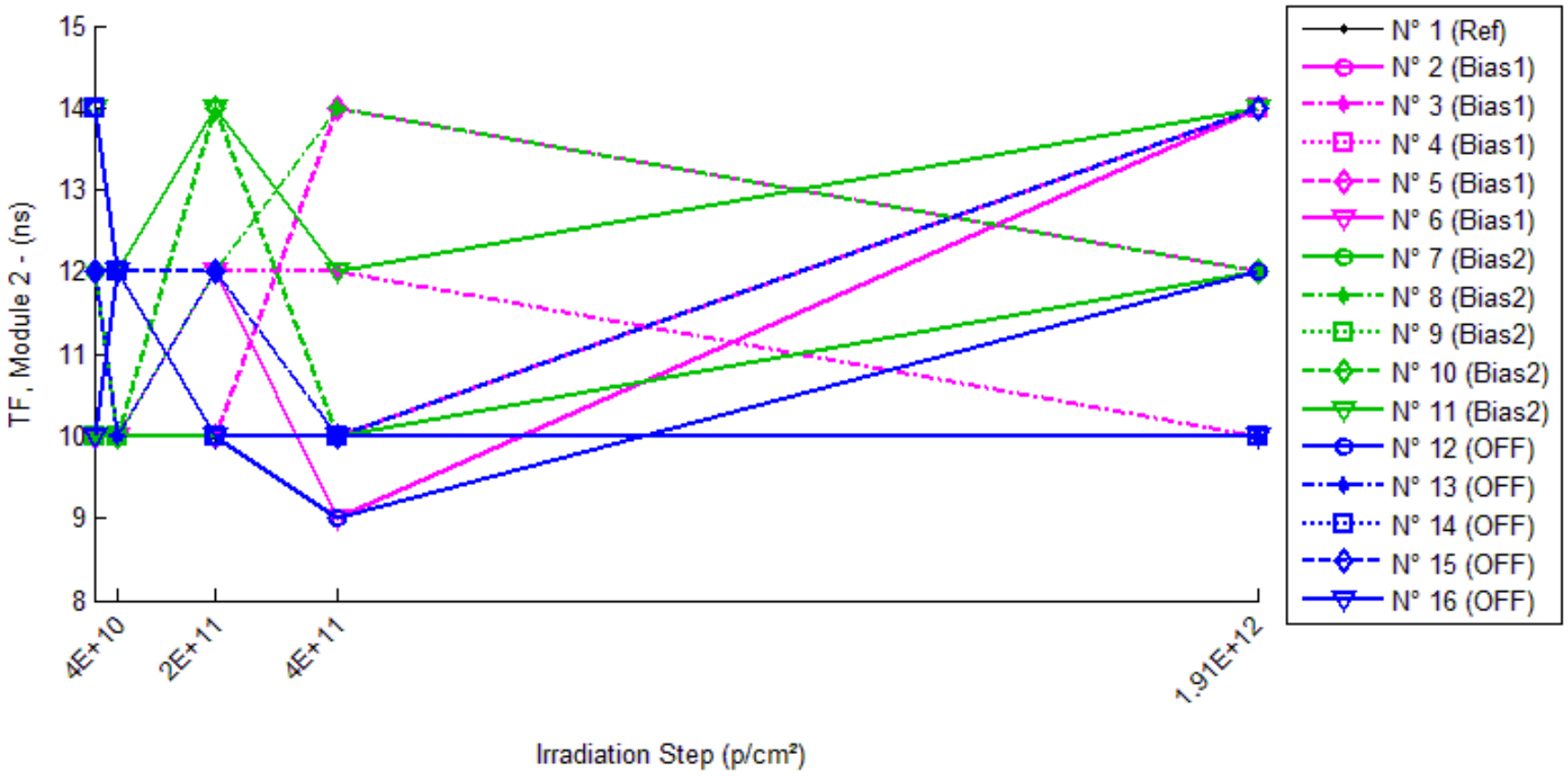
Delta [TF, Module 1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.000E+0	0.000E+0	-2.000E+0	-2.000E+0
N° 2 (Bias1)	---	-4.000E+0	-4.000E+0	-2.000E+0	-2.000E+0
N° 3 (Bias1)	---	-1.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 4 (Bias1)	---	0.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 5 (Bias1)	---	-2.000E+0	-2.000E+0	0.000E+0	-2.000E+0
N° 6 (Bias1)	---	2.000E+0	0.000E+0	4.000E+0	2.000E+0
N° 7 (Bias2)	---	1.000E+0	3.000E+0	0.000E+0	1.000E+0
N° 8 (Bias2)	---	0.000E+0	2.000E+0	0.000E+0	2.000E+0
N° 9 (Bias2)	---	-2.000E+0	2.000E+0	2.000E+0	2.000E+0
N° 10 (Bias2)	---	1.000E+0	1.000E+0	1.000E+0	5.000E+0
N° 11 (Bias2)	---	2.000E+0	0.000E+0	2.000E+0	0.000E+0
N° 12 (OFF)	---	2.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 13 (OFF)	---	4.000E+0	0.000E+0	2.000E+0	2.000E+0
N° 14 (OFF)	---	-2.000E+0	2.000E+0	2.000E+0	0.000E+0
N° 15 (OFF)	---	0.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
N° 16 (OFF)	---	0.000E+0	-2.000E+0	-2.000E+0	-2.000E+0
Average (Bias1)	---	-1.000E+0	-1.600E+0	4.000E-1	-8.000E-1
σ (Bias1)	---	2.236E+0	1.673E+0	2.191E+0	1.789E+0
Average+3σ (Bias1)	---	5.708E+0	3.420E+0	6.973E+0	4.567E+0
Average-3σ (Bias1)	---	-7.708E+0	-6.620E+0	-6.173E+0	-6.167E+0
Average (Bias2)	---	4.000E-1	1.600E+0	1.000E+0	2.000E+0
σ (Bias2)	---	1.517E+0	1.140E+0	1.000E+0	1.871E+0
Average+3σ (Bias2)	---	4.950E+0	5.021E+0	4.000E+0	7.612E+0
Average-3σ (Bias2)	---	-4.150E+0	-1.821E+0	-2.000E+0	-3.612E+0
Average (OFF)	---	8.000E-1	-4.000E-1	0.000E+0	0.000E+0
σ (OFF)	---	2.280E+0	1.673E+0	2.000E+0	2.000E+0
Average+3σ (OFF)	---	7.641E+0	4.620E+0	6.000E+0	6.000E+0
Average-3σ (OFF)	---	-6.041E+0	-5.420E+0	-6.000E+0	-6.000E+0

190 MeV proton / detailed results

20.TF module 2

Ta = 25°C ; Vcc = 5V ; If = 8mA



190 MeV proton / detailed results

TF, Module 2 . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	10	10	8	9	10
N° 2 (Bias1)	8	8	6	10	10
N° 3 (Bias1)	10	6	10	6	10
N° 4 (Bias1)	10	10	6	10	6
N° 5 (Bias1)	10	10	10	6	10
N° 6 (Bias1)	10	7	8	6	10
N° 7 (Bias2)	10	10	8	8	10
N° 8 (Bias2)	10	8	8	8	9
N° 9 (Bias2)	6	6	8	10	6
N° 10 (Bias2)	10	8	8	7	8
N° 11 (Bias2)	8	10	8	8	10
N° 12 (OFF)	10	10	6	6	10
N° 13 (OFF)	10	8	10	8	10
N° 14 (OFF)	10	10	6	6	10
N° 15 (OFF)	6	8	6	8	10
N° 16 (OFF)	10	10	6	8	10

Delta [TF, Module 2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-2.000E+0	-1.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	-2.000E+0	2.000E+0	2.000E+0
N° 3 (Bias1)	---	-4.000E+0	0.000E+0	-4.000E+0	0.000E+0
N° 4 (Bias1)	---	0.000E+0	-4.000E+0	0.000E+0	-4.000E+0
N° 5 (Bias1)	---	0.000E+0	0.000E+0	-4.000E+0	0.000E+0
N° 6 (Bias1)	---	-3.000E+0	-2.000E+0	-4.000E+0	0.000E+0
N° 7 (Bias2)	---	0.000E+0	-2.000E+0	-2.000E+0	0.000E+0
N° 8 (Bias2)	---	-2.000E+0	-2.000E+0	-2.000E+0	-1.000E+0
N° 9 (Bias2)	---	0.000E+0	2.000E+0	4.000E+0	0.000E+0
N° 10 (Bias2)	---	-2.000E+0	-2.000E+0	-3.000E+0	-2.000E+0
N° 11 (Bias2)	---	2.000E+0	0.000E+0	0.000E+0	2.000E+0
N° 12 (OFF)	---	0.000E+0	-4.000E+0	-4.000E+0	0.000E+0
N° 13 (OFF)	---	-2.000E+0	0.000E+0	-2.000E+0	0.000E+0
N° 14 (OFF)	---	0.000E+0	-4.000E+0	-4.000E+0	0.000E+0
N° 15 (OFF)	---	2.000E+0	0.000E+0	2.000E+0	4.000E+0
N° 16 (OFF)	---	0.000E+0	-4.000E+0	-2.000E+0	0.000E+0
Average (OFF)	---	-1.400E+0	-1.600E+0	-2.000E+0	-4.000E-1
σ (OFF)	---	1.949E+0	1.673E+0	2.828E+0	2.191E+0
Average+3σ (OFF)	---	4.448E+0	3.420E+0	6.485E+0	6.173E+0
Average-3σ (OFF)	---	-7.248E+0	-6.620E+0	-1.049E+1	-6.973E+0
Average (Bias1)	---	-4.000E-1	-8.000E-1	-6.000E-1	-2.000E-1
σ (Bias1)	---	1.673E+0	1.789E+0	2.793E+0	1.483E+0
Average+3σ (Bias1)	---	4.620E+0	4.567E+0	7.779E+0	4.250E+0
Average-3σ (Bias1)	---	-5.420E+0	-6.167E+0	-8.979E+0	-4.650E+0
Average (Bias2)	---	0.000E+0	-2.400E+0	-2.000E+0	8.000E-1
σ (Bias2)	---	1.414E+0	2.191E+0	2.449E+0	1.789E+0
Average+3σ (Bias2)	---	4.243E+0	4.173E+0	5.348E+0	6.167E+0
Average-3σ (Bias2)	---	-4.243E+0	-8.973E+0	-9.348E+0	-4.567E+0