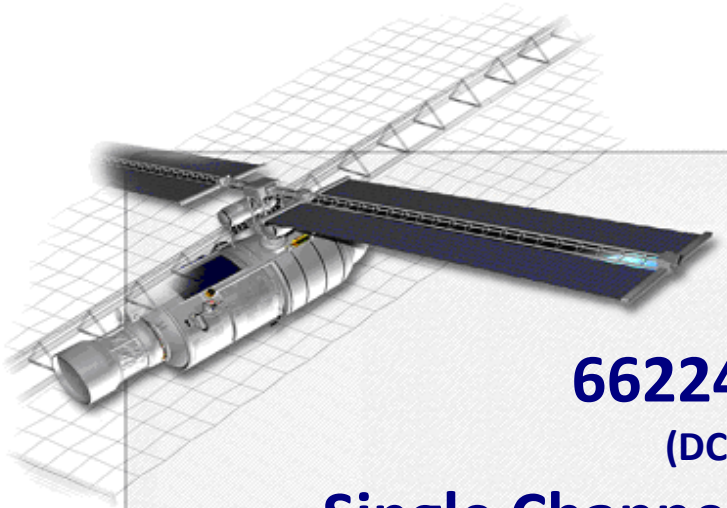
PROTONS DISPLACEMENT DAMAGE TEST REPORT



66224-105

(DC1111)

Single Channel Optocoupler From MICROPAC

TRAD/TP/66224/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

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1 INTRODUCTION

This report includes the test results of 66224-105, a Single Channel Optocoupler from MICROPAC 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-66224-MIC-ESA-1119, Iss.3, 08/02/2012

2.2 Reference Documents

RD	3.	Datasheet 66224	PROTON RADIATION TOLERANT OPTOCOUPLER (Single Channel, Electrically Similar to 4N49) dated 29/09/2010
RD	4.	MICROPAC certificate of traceability and conformance dated 25/07/2011	

3 DEVICE INFORMATION

3.1 Device description

The 66224 device is a single channel (electrically similar to 4N49) optocoupler (850 nm LED, “40 x 40” phototransistor) encapsulated in a hermetically sealed 6 pin leadless chip carrier (LCC). It contains an 850nm LED optically coupled to a silicon planar phototransistor.
This product has been designed to be more tolerant to proton radiation.

Type	66224-105
Manufacturer	MICROPAC
Function	Optocoupler
Package	LCC6
Date Code	1111
Sample size	46 parts (45 test parts + 1 control sample)

3.2 Procurement information

75 parts reference 66224-105 were delivered by MICROPAC through the French distributor ISOTOPE ELECTRONICS.
Their quality level defined by the 105 extension number which corresponds to a commercial standard operating in the temperature range of -55° to +125°C and screened to JANTXV level by the manufacturer prior delivery. Parts were delivered separated in two lots from two different date-codes (25 pcs DC1038 and 53 pcs DC1111) and together with a Certificate of Conformance [RD2]. Only parts from DC1111 were used for this irradiation test sequence.

3.3 External view

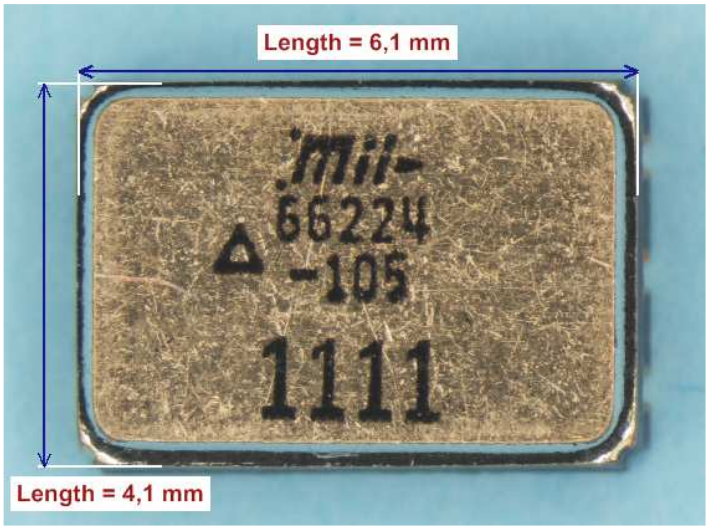


Figure 1: package marking

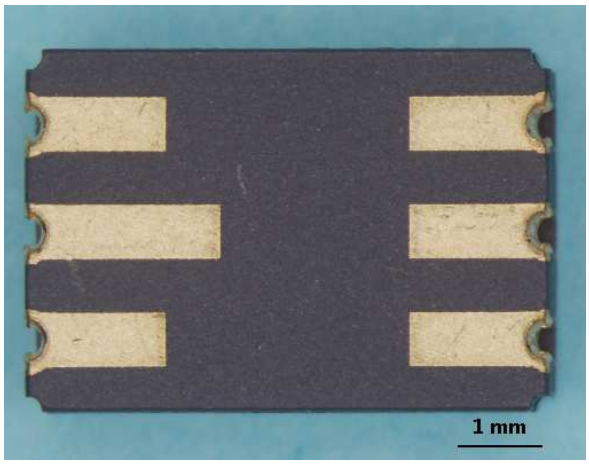


Figure 2: package back

3.4 Internal view

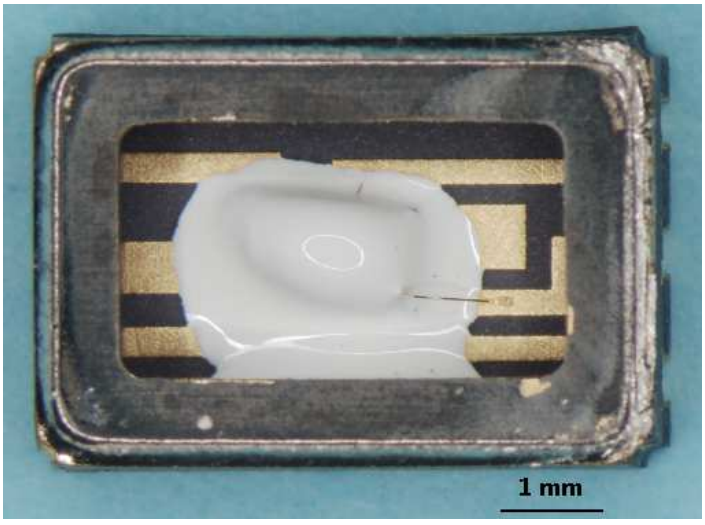


Figure 3: Internal general view

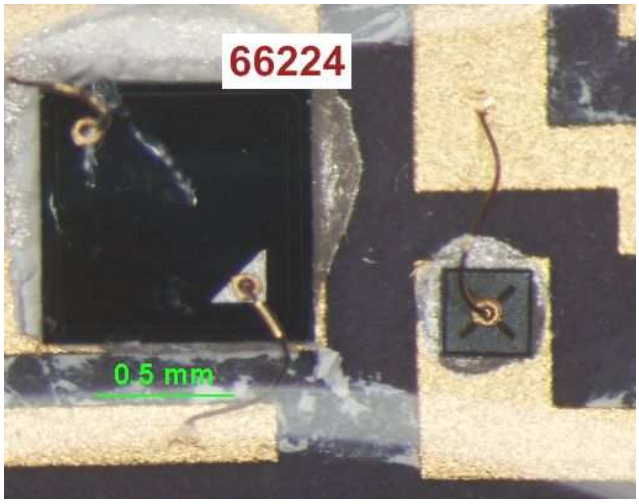


Figure 4: photodetector and LED view

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 5: 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/N/OPTO/ZIP14/BR/1109
TEST PROGRAM	66224_TP30MeV_XXX1_B1_V10.llb 66224_TP60MeV_XXX1_B1_V10.llb 66224_TP200MeV_XXX1_B1_V10.llb

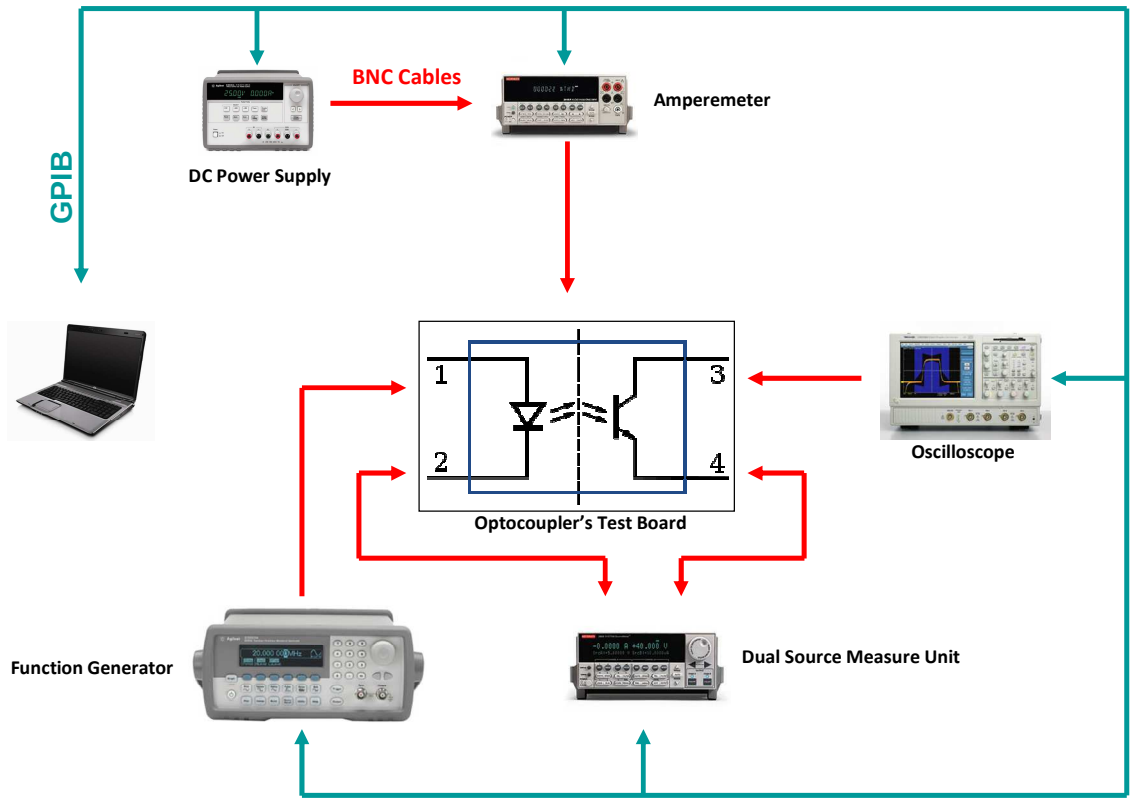


Figure 6: test principle

5.2 Test configuration

Samples were exposed to proton irradiation in three different modes - two on-modes (Figure 7 and Figure 8) and one off-mode (all terminal leads short-circuited) –

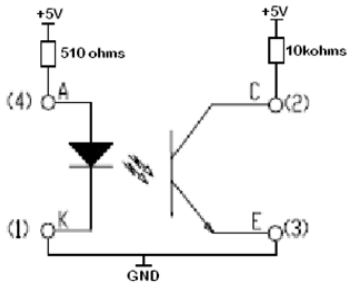


Figure 7: ON bias1

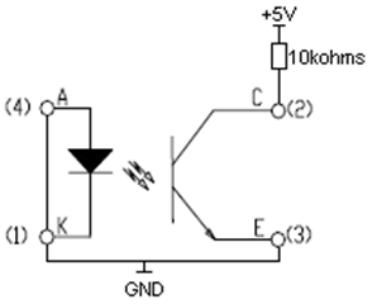


Figure 8: ON bias2

5.3 Electrical parameters

PARAMETER	SYMBOL	TEST CONDITION	MIN	MAX	UNIT
Input Diode Static Reverse Current	I_R	V_R = 6 V		8	µA
Input Diode Static Forward Voltage	V_F	I_F = 10 mA		1,6	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 100 µA, I_B = 0, I_F = 0	45		V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1 mA, I_B = 0, I_F = 0	40		V
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	I_C = 0 mA, I_E = 100 µA, I_F = 0	5		V
Off-State Collector Current	I_{CEO}	V_{CE} = 20 V, I_F = 0 mA, I_B = 0		100	nA
On State Collector Current	$I_{C(ON)}$	V_{CE} = 5 V, I_F = 1 mA, I_B=0 *	2		mA
Rise Time- Phototransistor Operation	tr1	V_{CC}=10V,I_F=5mA, R_L=100Ω, I_B=0		25	µs
Fall Time-Phototransistor Operation	tf1	V_{CC}=10V,I_F=5mA, R_L=100Ω, I_B=0		25	µs
Rise Time-Photodiode Operation	tr2	V_{CC}=10V,I_F=5mA, R_L=100Ω, I_E=0		3	µs
Fall Time-Photodiode Operation	tf2	V_{CC}=10V,I_F=5mA, R_L=100Ω, I_E=0		3	µs
Current Transfer Ratio	CTR1	V_{CE} = 5V, I_F = 1mA	200		%
	CTR2	V_{CE} = 5V, I_F = 2mA			%
	CTR3	V_{CE} = 5V, I_F = 10mA			%
	CTR4	V_{CE} = 5V, I_F = 50mA			%
	CTR5	V_{CE} = 30V, I_F = 5mA			%
Input Diode Reverse Recovery Time	Trr	If=5mA,RL=100Ohms,Irec=10% Irm			ns

(*)This parameter must be measured using pulse techniques (tW = 100 µs duty cycle < 1%).
Min/ Max values are those specified in the reference data-sheet [RD1].
Test measurements are performed at 25°C ± 10°C.

6 TEST HISTORY

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

7 SUMMARY RESULTS

7.1 30 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

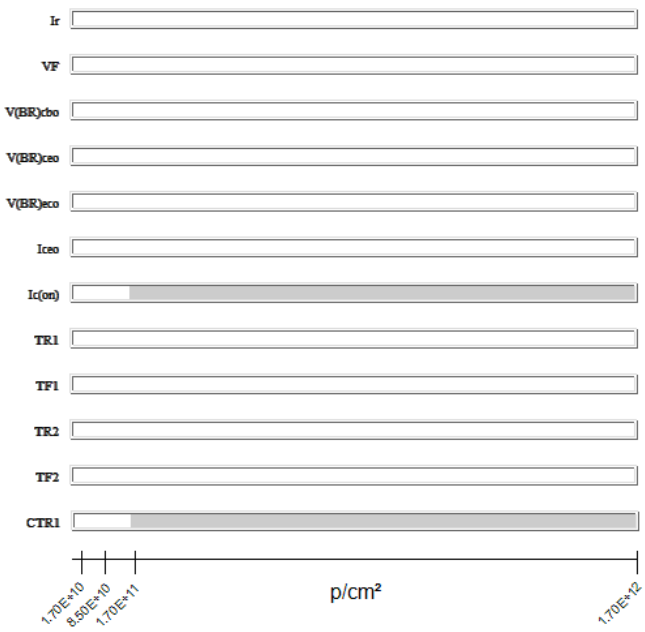


Figure 9: ON Bias 1 under 30 MeV protons

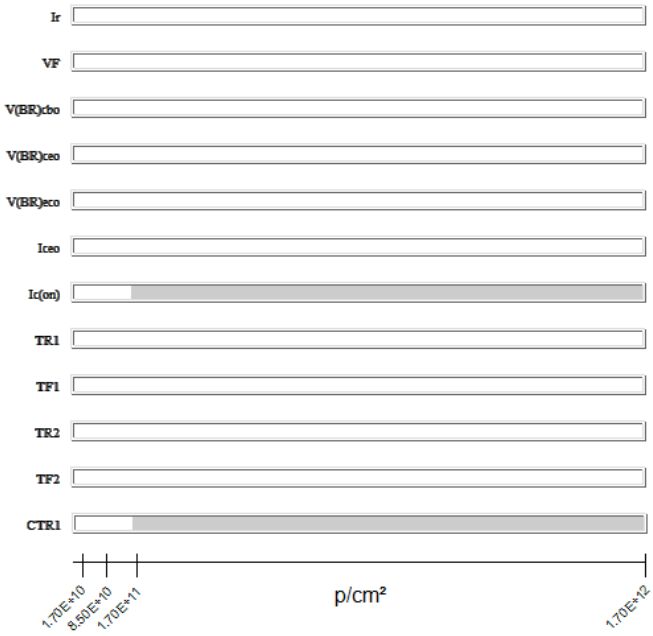


Figure 10: ON Bias 2 under 30 MeV protons

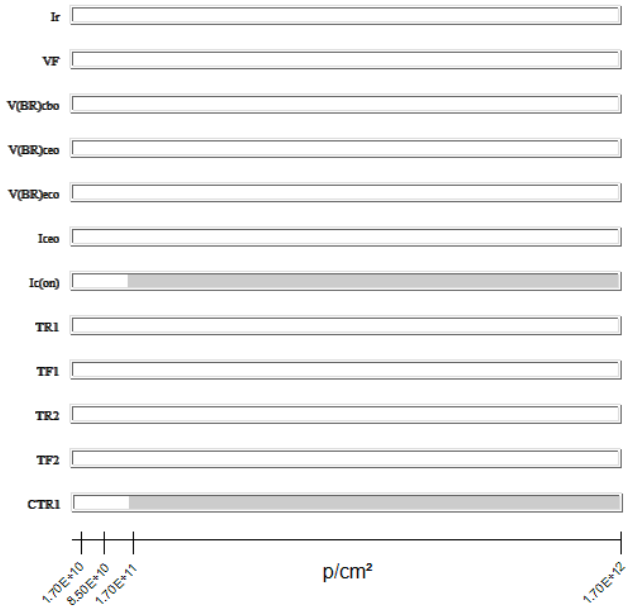
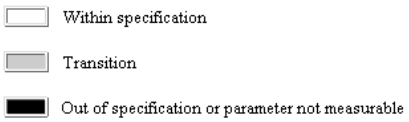


Figure 11: OFF Bias under 30 MeV protons



In the ON Bias1 condition

- Ic(on) is out of specification at 1.43E12.p/cm² by interpolation
- CTR1 is out of specification at 1.45E12.p/cm² by interpolation.

In ON Bias2 condition

- Ic(on) is out of specification at 1.49E12.p/cm² by interpolation
- CTR1 is out of specification at 1.51E12.p/cm² by interpolation.

As shown in the Figure hereunder for all devices tested and whatever the bias condition**, Ic(on)** is out of specification at step **1.7 E12.p/cm².**

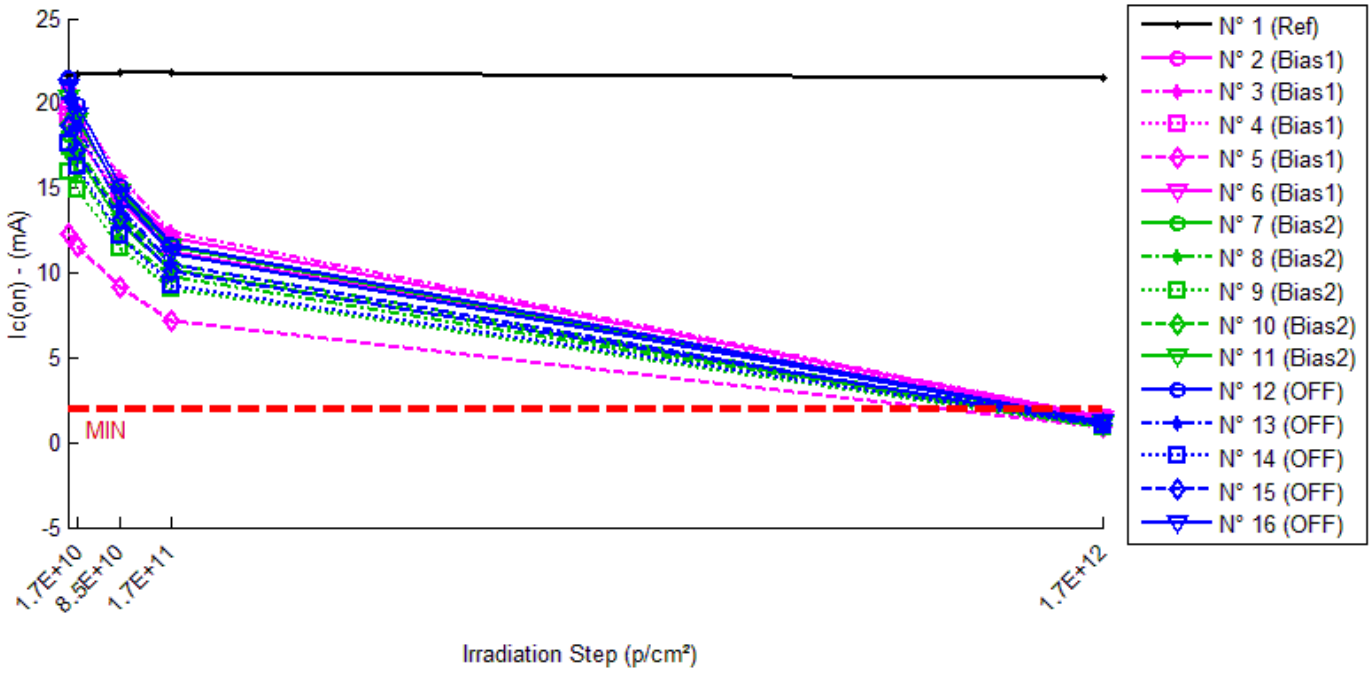


Figure 12: Ic(on) function 30 MeV proton irradiation steps

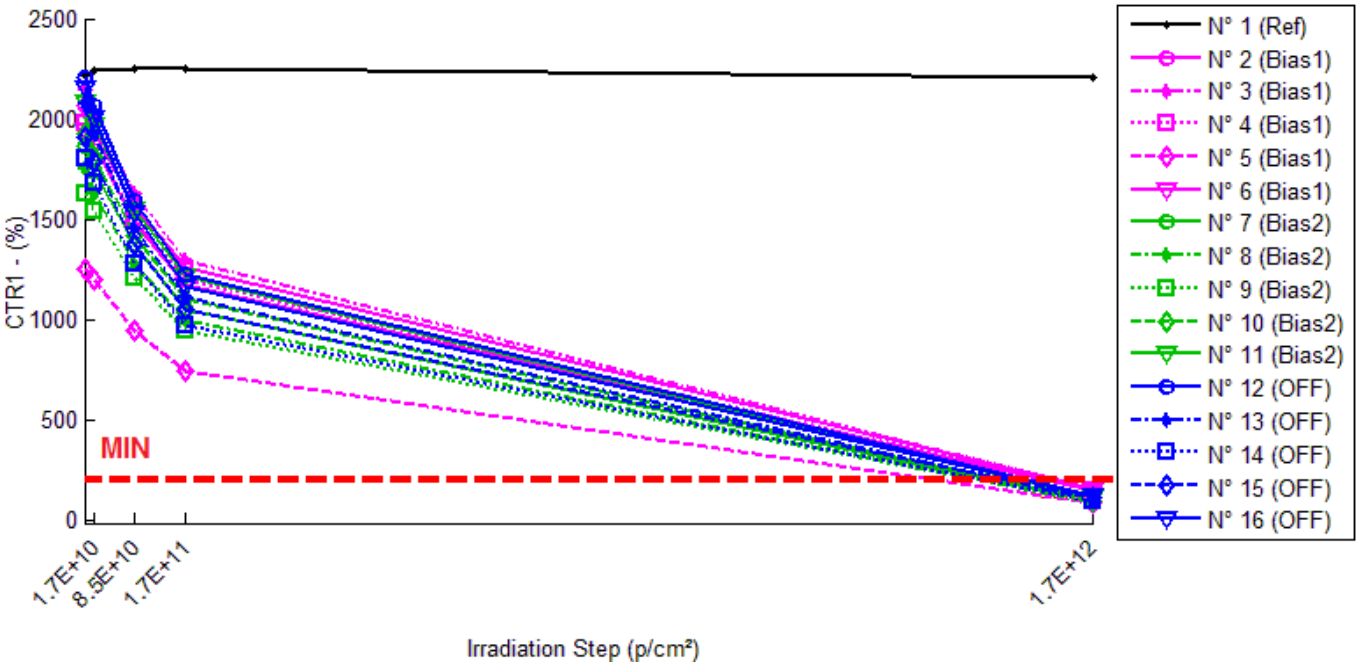


Figure 13: Ic(on) function 30 MeV proton irradiation steps

60 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

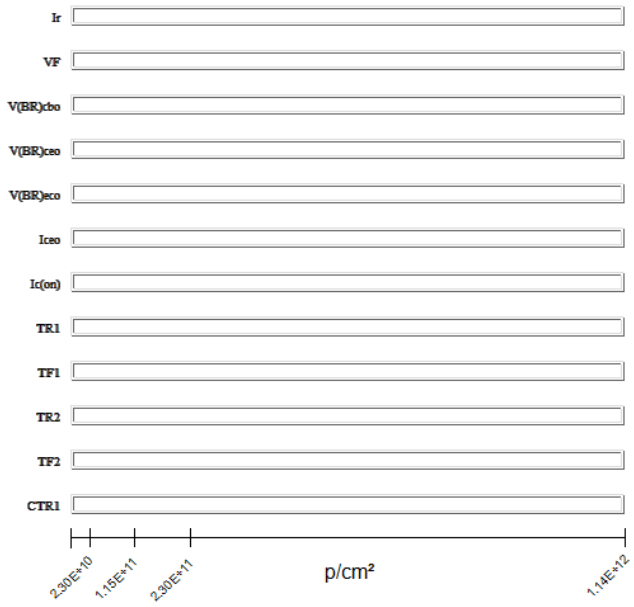


Figure 14: ON Bias 1 under 60 MeV protons

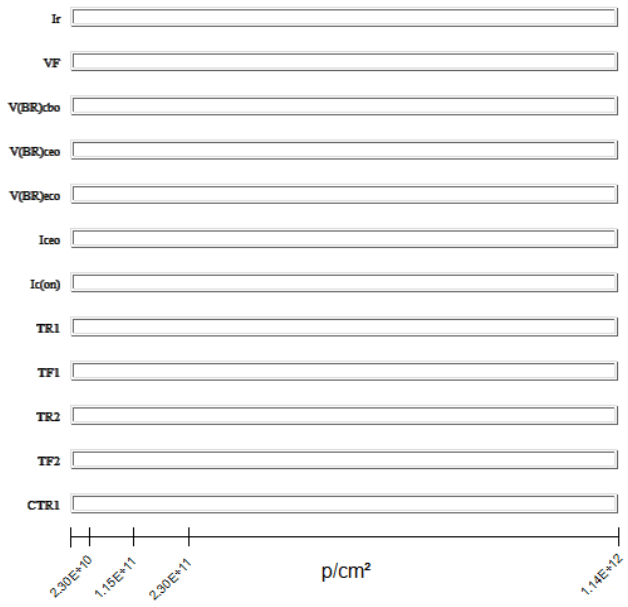


Figure 15: ON Bias 2 under 60 MeV protons

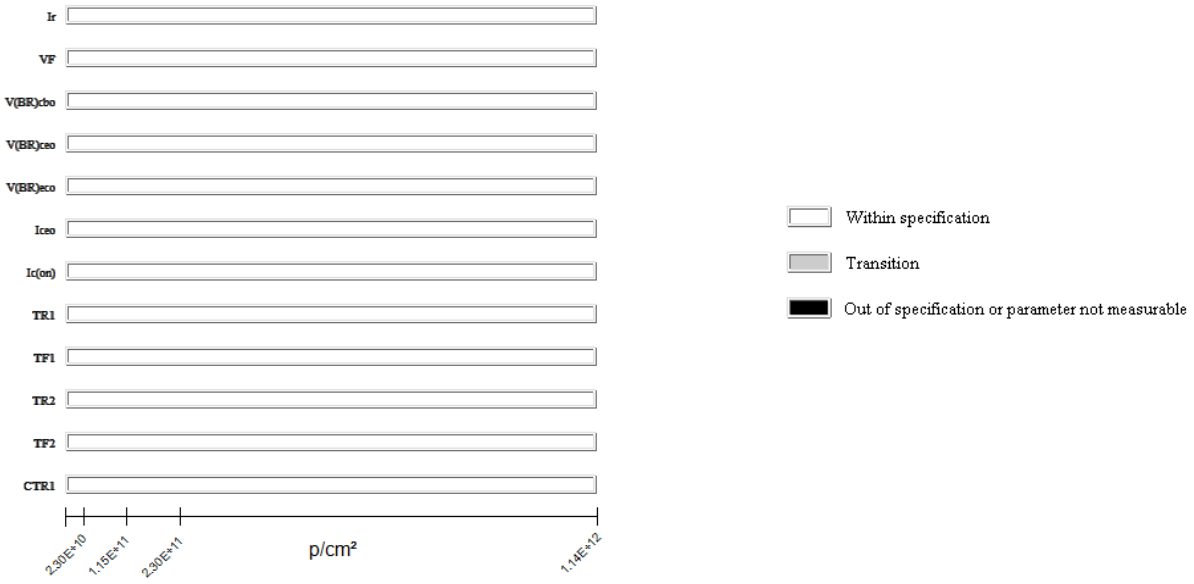


Figure 16: OFF Bias under 60 MeV protons

For all devices tested, whatever the bias condition, all parameters are functional at step **1.14E12.p/cm².**

7.2 190 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

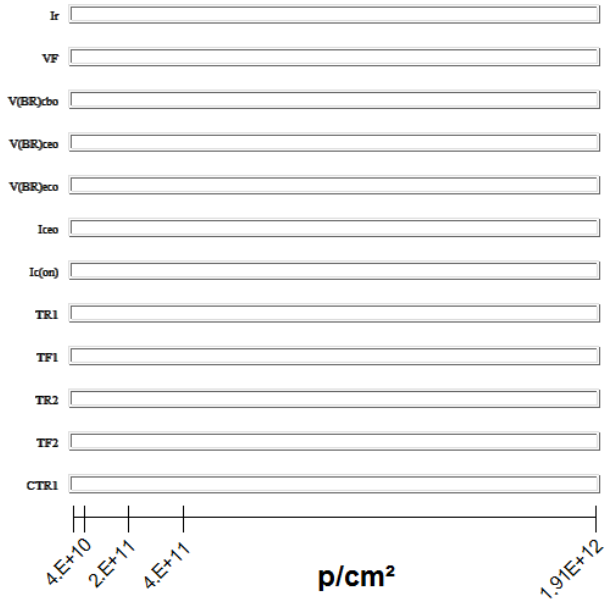


Figure 17: ON Bias 1 under 190 MeV protons

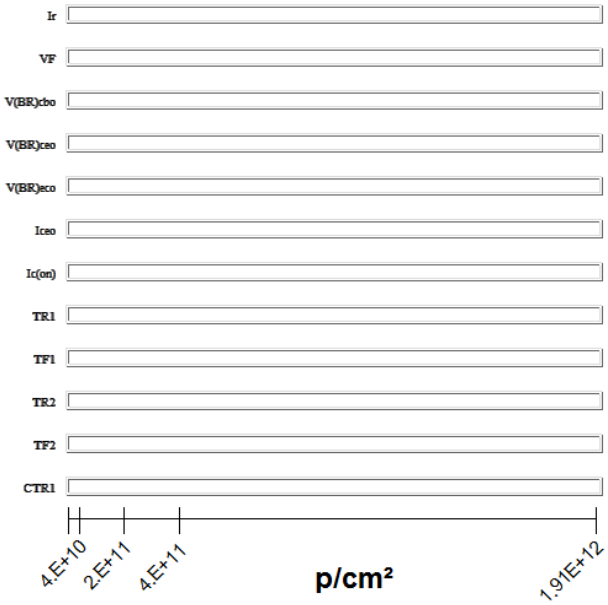


Figure 18: ON Bias 2 under 190 MeV protons

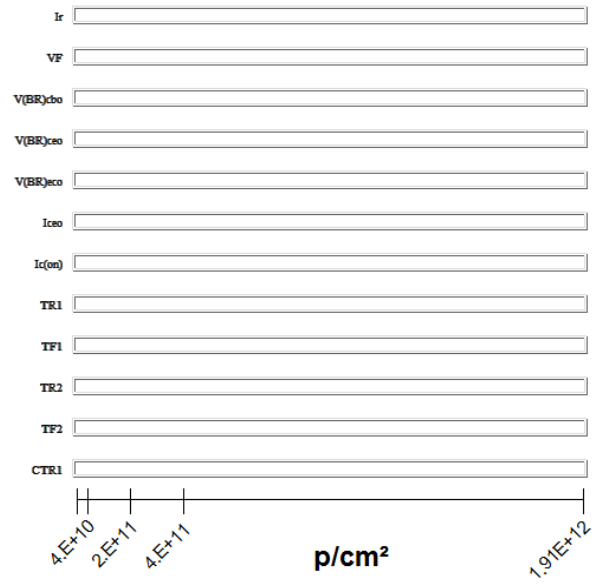
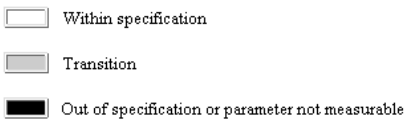


Figure 19: OFF Bias under 190 MeV protons



For all devices tested, whatever the bias condition, all parameters are functional at step **1.91E12.p/cm².**

8 CONCLUSION

Total fluence steady-state irradiation test using protons has been applied on **66224,** a **Single Channel Optocoupler** from **MICROPAC:**

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

The results are:

- Under 30MeV proton Beam:

All devices are functional up to 1.7 E+11 protons/cm² total fluence level.

- Under 60MeV proton Beam:

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

- Under 190MeV proton Beam:

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

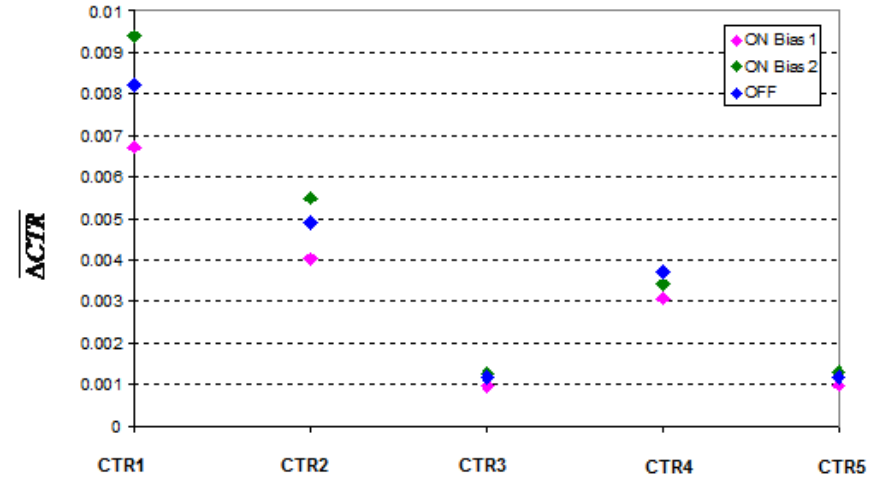
CTR3 configuration (V_{CE} = 5V, I_F = 10mA) exhibits the smallest average parameter drift whatever the Bias condition. Conversely, CRT1 configuration (Vce = 5V; If = 1 mA) exhibits the greater parameter degradation.

ON Bias1 configuration is the least sensitive configuration for all CTR configuration.

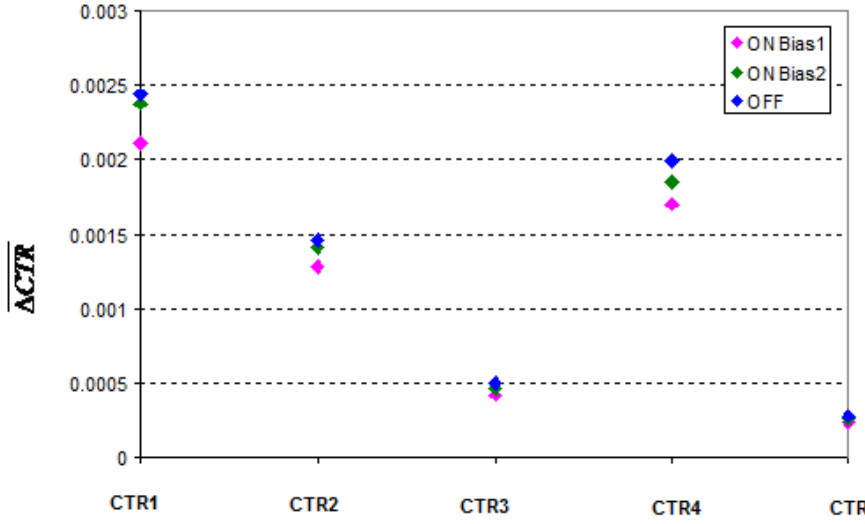
However, in OFF mode all CTR configurations exhibit the greater parameter degradation under 60 and 190 MeV protons. CTR4 configuration is also the most sensitive configuration under 30 MeV protons.
In ON Bias2 configuration and under 30 MeV protons, CTR1, CTR2, CTR3 and CTR5 exhibit the greater parameter degradation.

CTR1 (V_{CE} = 5V, I_F = 1mA), which is the only CTR configuration for which specification limit is indicated in the data-sheet, is functional up to total fluence under 60 MeV and 190 MeV protons.
CTR1 is out of specification at step 1.7E12p/cm² under 30MeV protons.

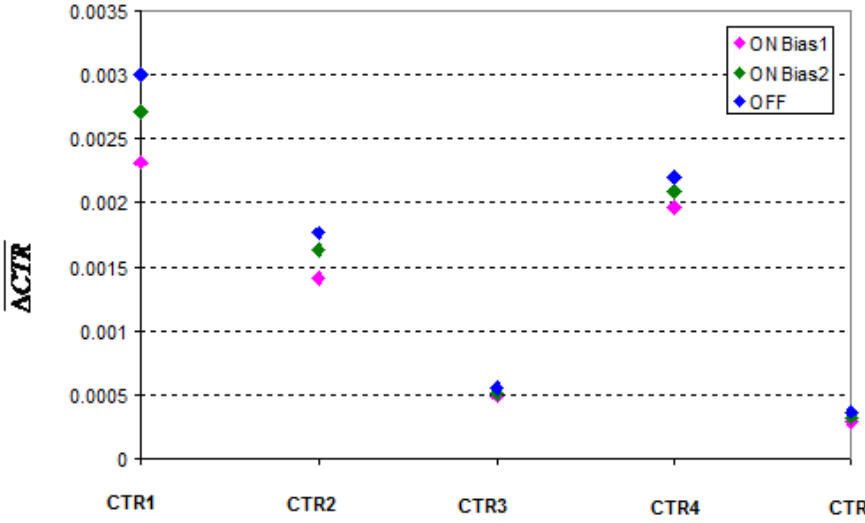
Average drift current transfer ratio are represented in next Figure depending on proton energy, CTR configuration and Bias condition at final irradiation step.



30 MeV



60 MeV



190 MeV

9 DETAILED TESTS RESULTS

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

- 30MeV: 9-2 to 9-35
- 60MeV: 10-2 to 10-35
- 190MeV: 11-2 to 11-35

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)

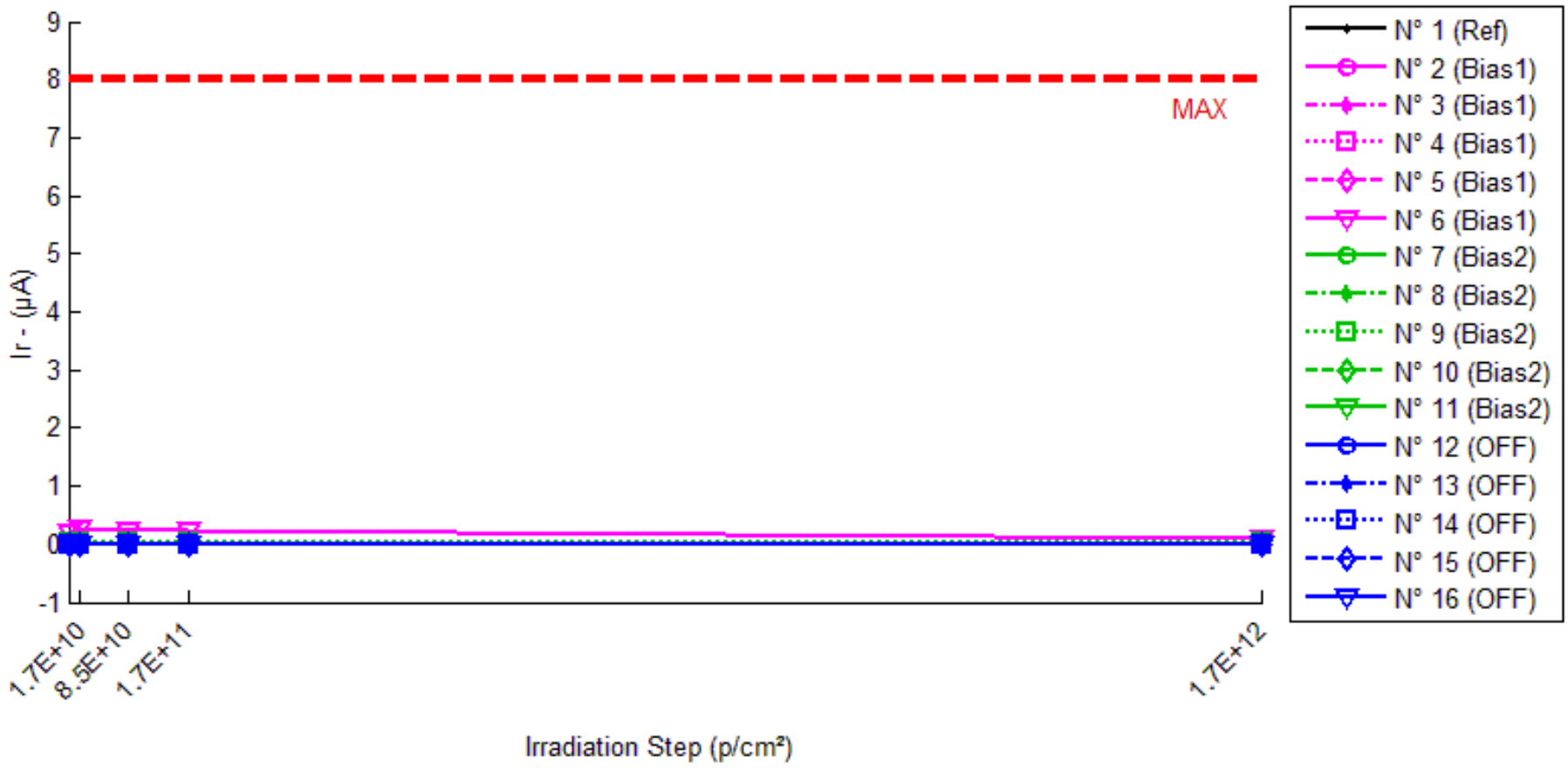
30 MeV proton / detailed results

CONTENTS

30 MeV proton / detailed results

1. Ir

Ta=25°C; Vr=6V



30 MeV proton / detailed results

Ir . (µA) **Max = 8.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	4.817E-3	5.973E-3	5.875E-3	5.325E-3	5.881E-3
N° 2 (Bias1)	9.147E-5	2.339E-4	4.202E-4	5.096E-4	3.301E-3
N° 3 (Bias1)	8.514E-5	2.025E-4	3.990E-4	5.024E-4	3.151E-3
N° 4 (Bias1)	3.187E-4	3.596E-4	4.843E-4	5.519E-4	3.030E-3
N° 5 (Bias1)	1.023E-4	2.309E-4	3.718E-4	4.987E-4	2.992E-3
N° 6 (Bias1)	2.086E-1	2.606E-1	2.535E-1	2.215E-1	8.927E-2
N° 7 (Bias2)	9.843E-5	1.548E-4	4.202E-4	5.616E-4	5.464E-3
N° 8 (Bias2)	9.055E-5	1.700E-4	3.756E-4	5.045E-4	5.863E-3
N° 9 (Bias2)	4.201E-2	4.483E-2	3.479E-2	3.938E-2	4.337E-2
N° 10 (Bias2)	1.284E-4	3.345E-4	5.676E-4	7.423E-4	5.601E-3
N° 11 (Bias2)	1.778E-4	2.263E-4	4.652E-4	5.680E-4	5.147E-3
N° 12 (OFF)	1.023E-4	1.419E-4	4.721E-4	6.621E-4	3.770E-3
N° 13 (OFF)	9.198E-5	2.020E-4	4.784E-4	6.471E-4	3.888E-3
N° 14 (OFF)	8.447E-5	1.491E-4	2.879E-4	5.508E-4	3.523E-3
N° 15 (OFF)	9.613E-5	1.903E-4	4.104E-4	6.577E-4	3.809E-3
N° 16 (OFF)	1.034E-4	1.917E-4	3.769E-4	5.752E-4	3.204E-3

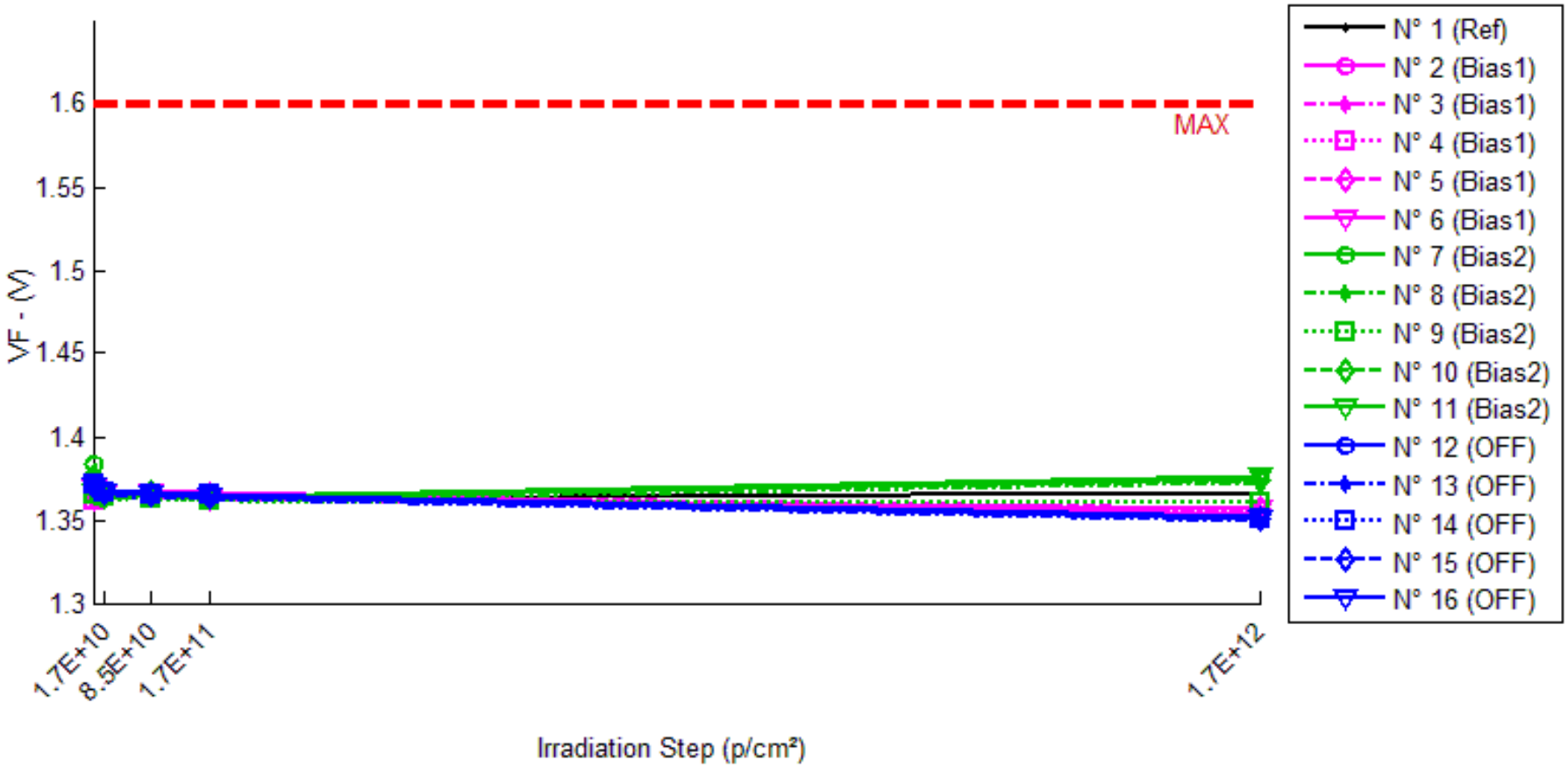
Delta [Ir]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.156E-3	1.058E-3	5.078E-4	1.064E-3
N° 2 (Bias1)	---	1.424E-4	3.288E-4	4.181E-4	3.210E-3
N° 3 (Bias1)	---	1.173E-4	3.138E-4	4.172E-4	3.066E-3
N° 4 (Bias1)	---	4.091E-5	1.656E-4	2.331E-4	2.711E-3
N° 5 (Bias1)	---	1.286E-4	2.695E-4	3.964E-4	2.889E-3
N° 6 (Bias1)	---	5.198E-2	4.486E-2	1.291E-2	-1.193E-1
N° 7 (Bias2)	---	5.633E-5	3.217E-4	4.631E-4	5.366E-3
N° 8 (Bias2)	---	7.942E-5	2.850E-4	4.139E-4	5.772E-3
N° 9 (Bias2)	---	2.822E-3	-7.225E-3	-2.630E-3	1.354E-3
N° 10 (Bias2)	---	2.062E-4	4.393E-4	6.139E-4	5.473E-3
N° 11 (Bias2)	---	4.845E-5	2.874E-4	3.902E-4	4.969E-3
N° 12 (OFF)	---	3.957E-5	3.698E-4	5.598E-4	3.668E-3
N° 13 (OFF)	---	1.100E-4	3.864E-4	5.551E-4	3.796E-3
N° 14 (OFF)	---	6.459E-5	2.034E-4	4.664E-4	3.438E-3
N° 15 (OFF)	---	9.418E-5	3.143E-4	5.616E-4	3.713E-3
N° 16 (OFF)	---	8.835E-5	2.736E-4	4.719E-4	3.101E-3
Average (OFF)	---	1.048E-2	9.189E-3	2.875E-3	-2.149E-2
σ (OFF)	---	2.320E-2	1.994E-2	5.610E-3	5.469E-2
Average+3σ (OFF)	---	8.008E-2	6.902E-2	1.971E-2	1.426E-1
Average-3σ (OFF)	---	-5.912E-2	-5.064E-2	-1.396E-2	-1.856E-1
Average (Bias1)	---	6.424E-4	-1.178E-3	-1.497E-4	4.587E-3
σ (Bias1)	---	1.220E-3	3.381E-3	1.389E-3	1.830E-3
Average+3σ (Bias1)	---	4.302E-3	8.964E-3	4.017E-3	1.008E-2
Average-3σ (Bias1)	---	-3.018E-3	-1.132E-2	-4.317E-3	-9.025E-4
Average (Bias2)	---	7.933E-5	3.095E-4	5.230E-4	3.543E-3
σ (Bias2)	---	2.757E-5	7.437E-5	4.924E-5	2.808E-4
Average+3σ (Bias2)	---	1.620E-4	5.326E-4	6.707E-4	4.386E-3
Average-3σ (Bias2)	---	-3.369E-6	8.639E-5	3.752E-4	2.701E-3

30 MeV proton / detailed results

2. VF

Ta=25°C; If=10mA



30 MeV proton / detailed results

VF . (V) **Max = 1.6**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1.365	1.367	1.368	1.361	1.362
N° 2 (Bias1)	1.399	1.376	1.370	1.366	1.360
N° 3 (Bias1)	1.373	1.393	1.375	1.367	1.356
N° 4 (Bias1)	1.375	1.396	1.368	1.368	1.357
N° 5 (Bias1)	1.382	1.395	1.371	1.369	1.360
N° 6 (Bias1)	1.382	1.375	1.372	1.365	1.360
N° 7 (Bias2)	1.381	1.376	1.367	1.365	1.355
N° 8 (Bias2)	1.389	1.367	1.366	1.363	1.357
N° 9 (Bias2)	1.385	1.371	1.367	1.365	1.355
N° 10 (Bias2)	1.379	1.367	1.365	1.365	1.356
N° 11 (Bias2)	1.375	1.370	1.367	1.367	1.358
N° 12 (OFF)	1.394	1.366	1.365	1.376	1.357
N° 13 (OFF)	1.388	1.365	1.364	1.394	1.359
N° 14 (OFF)	1.381	1.366	1.379	1.363	1.354
N° 15 (OFF)	1.385	1.369	1.368	1.367	1.360
N° 16 (OFF)	1.400	1.381	1.370	1.367	1.355

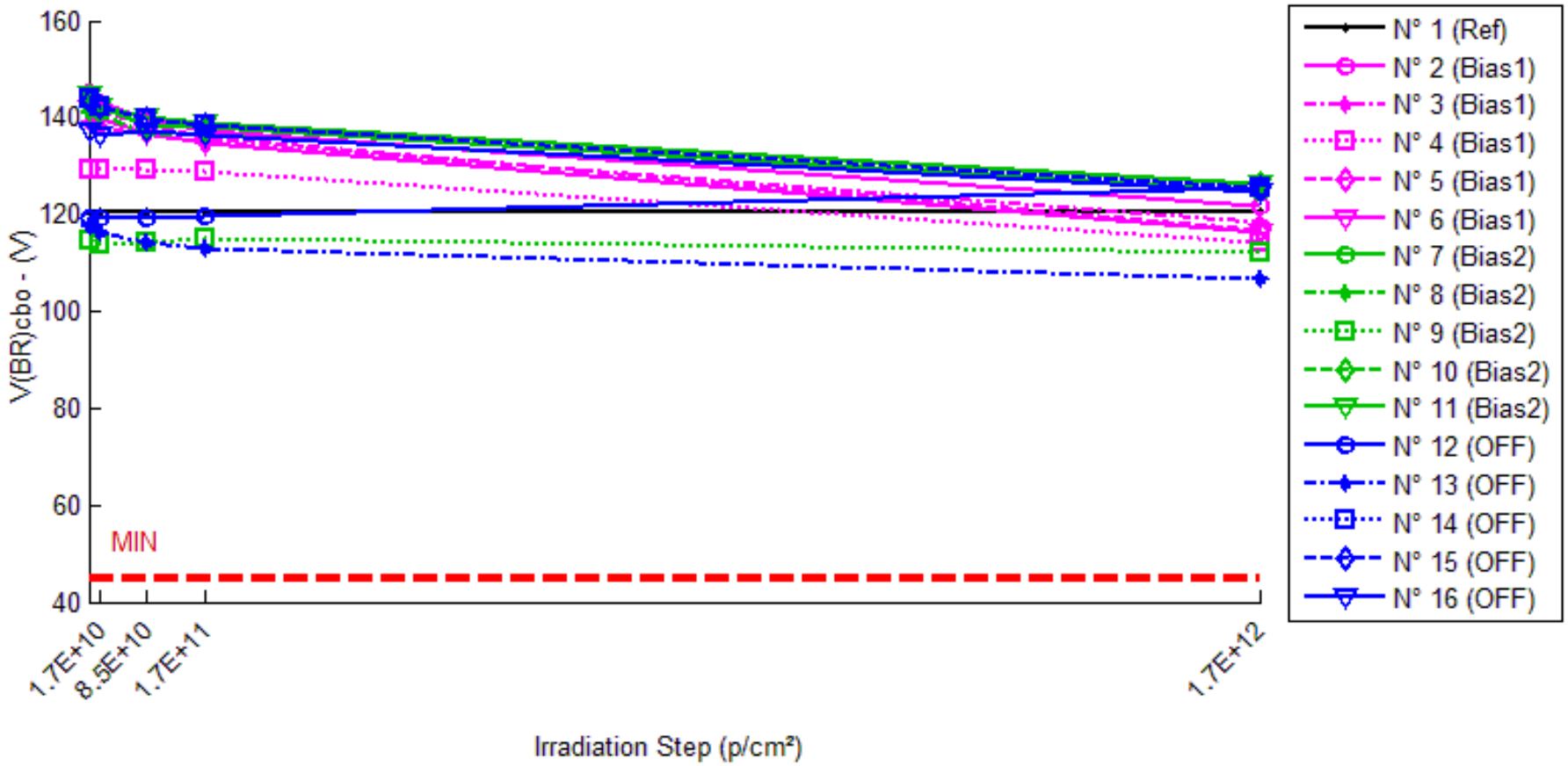
Delta [VF]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.558E-3	3.219E-3	-3.830E-3	-3.268E-3
N° 2 (Bias1)	---	-2.314E-2	-2.831E-2	-3.316E-2	-3.874E-2
N° 3 (Bias1)	---	2.044E-2	1.605E-3	-6.177E-3	-1.682E-2
N° 4 (Bias1)	---	2.070E-2	-7.107E-3	-7.315E-3	-1.796E-2
N° 5 (Bias1)	---	1.351E-2	-1.061E-2	-1.300E-2	-2.197E-2
N° 6 (Bias1)	---	-6.808E-3	-1.013E-2	-1.692E-2	-2.212E-2
N° 7 (Bias2)	---	-4.732E-3	-1.374E-2	-1.611E-2	-2.553E-2
N° 8 (Bias2)	---	-2.181E-2	-2.290E-2	-2.578E-2	-3.230E-2
N° 9 (Bias2)	---	-1.455E-2	-1.805E-2	-1.987E-2	-3.035E-2
N° 10 (Bias2)	---	-1.153E-2	-1.394E-2	-1.404E-2	-2.280E-2
N° 11 (Bias2)	---	-5.669E-3	-8.342E-3	-8.548E-3	-1.749E-2
N° 12 (OFF)	---	-2.867E-2	-2.924E-2	-1.829E-2	-3.733E-2
N° 13 (OFF)	---	-2.326E-2	-2.427E-2	5.793E-3	-2.983E-2
N° 14 (OFF)	---	-1.529E-2	-1.856E-3	-1.792E-2	-2.670E-2
N° 15 (OFF)	---	-1.625E-2	-1.744E-2	-1.829E-2	-2.598E-2
N° 16 (OFF)	---	-1.948E-2	-3.080E-2	-3.354E-2	-4.551E-2
Average (OFF)	---	4.939E-3	-1.091E-2	-1.532E-2	-2.352E-2
s (OFF)	---	1.929E-2	1.089E-2	1.089E-2	8.829E-3
Average+3s (OFF)	---	6.281E-2	2.177E-2	1.734E-2	2.965E-3
Average-3s (OFF)	---	-5.293E-2	-4.359E-2	-4.797E-2	-5.001E-2
Average (Bias1)	---	-1.166E-2	-1.540E-2	-1.687E-2	-2.570E-2
s (Bias1)	---	6.988E-3	5.432E-3	6.445E-3	5.935E-3
Average+3s (Bias1)	---	9.305E-3	8.993E-4	2.467E-3	-7.891E-3
Average-3s (Bias1)	---	-3.262E-2	-3.169E-2	-3.620E-2	-4.350E-2
Average (Bias2)	---	-2.059E-2	-2.072E-2	-1.645E-2	-3.307E-2
s (Bias2)	---	5.490E-3	1.176E-2	1.410E-2	8.282E-3
Average+3s (Bias2)	---	-4.122E-3	1.456E-2	2.586E-2	-8.223E-3
Average-3s (Bias2)	---	-3.706E-2	-5.600E-2	-5.876E-2	-5.792E-2

30 MeV proton / detailed results

3. V(BR)cbo

Ta=25°C; Ic=100µA; Ib=0; If=0



30 MeV proton / detailed results

V(BR)cbo . (V) **Min = 45.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	120.28	120.29	120.28	120.28	120.28
N° 2 (Bias1)	119.07	119.08	119.12	119.26	125.74
N° 3 (Bias1)	131.12	131.12	131.16	131.30	126.07
N° 4 (Bias1)	120.67	120.81	122.73	133.13	124.53
N° 5 (Bias1)	114.42	112.74	110.68	109.02	104.66
N° 6 (Bias1)	132.91	131.01	127.97	125.60	118.04
N° 7 (Bias2)	143.76	144.26	139.66	138.42	133.10
N° 8 (Bias2)	116.32	116.29	115.92	116.14	115.66
N° 9 (Bias2)	119.03	119.02	119.09	119.15	123.81
N° 10 (Bias2)	142.91	141.53	139.99	138.49	130.82
N° 11 (Bias2)	136.44	136.49	135.82	134.75	128.63
N° 12 (OFF)	123.76	122.72	121.47	120.65	117.07
N° 13 (OFF)	127.84	138.63	136.00	134.26	127.94
N° 14 (OFF)	126.57	126.57	126.72	127.27	130.69
N° 15 (OFF)	120.89	120.91	121.02	121.40	129.80
N° 16 (OFF)	142.44	140.58	138.49	137.19	130.52

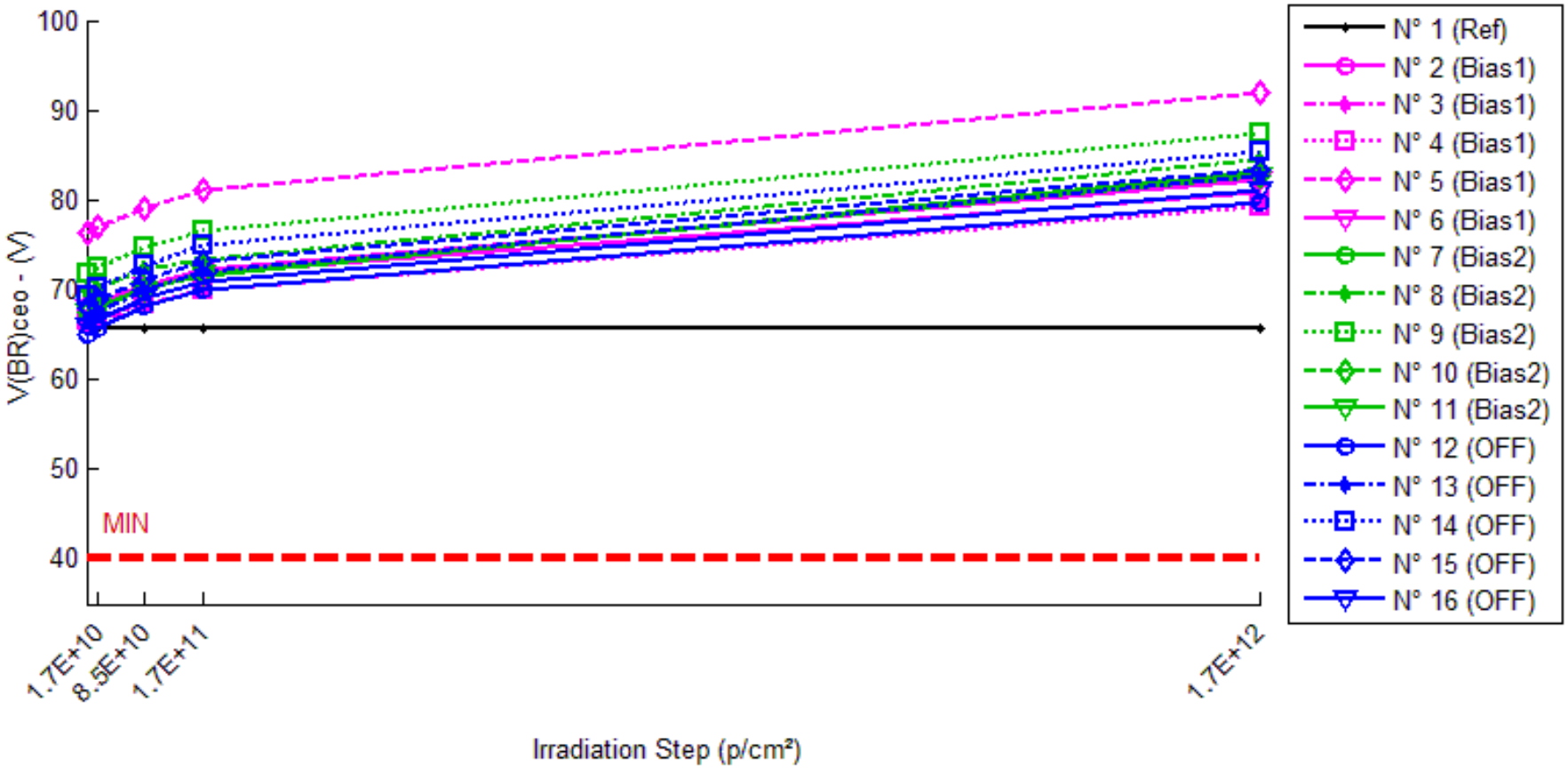
Delta [V(BR)cbo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.240E-2	-1.900E-3	2.800E-3	6.000E-3
N° 2 (Bias1)	---	8.600E-3	5.250E-2	1.892E-1	6.670E+0
N° 3 (Bias1)	---	2.500E-3	3.960E-2	1.813E-1	-5.051E+0
N° 4 (Bias1)	---	1.407E-1	2.061E+0	1.246E+1	3.863E+0
N° 5 (Bias1)	---	-1.686E+0	-3.739E+0	-5.400E+0	-9.761E+0
N° 6 (Bias1)	---	-1.904E+0	-4.939E+0	-7.310E+0	-1.487E+1
N° 7 (Bias2)	---	5.020E-1	-4.097E+0	-5.343E+0	-1.067E+1
N° 8 (Bias2)	---	-2.490E-2	-3.951E-1	-1.825E-1	-6.548E-1
N° 9 (Bias2)	---	-1.210E-2	5.780E-2	1.148E-1	4.773E+0
N° 10 (Bias2)	---	-1.380E+0	-2.923E+0	-4.421E+0	-1.209E+1
N° 11 (Bias2)	---	4.190E-2	-6.271E-1	-1.696E+0	-7.816E+0
N° 12 (OFF)	---	-1.043E+0	-2.293E+0	-3.115E+0	-6.696E+0
N° 13 (OFF)	---	1.079E+1	8.159E+0	6.420E+0	1.006E-1
N° 14 (OFF)	---	7.100E-3	1.518E-1	7.060E-1	4.124E+0
N° 15 (OFF)	---	1.950E-2	1.253E-1	5.118E-1	8.913E+0
N° 16 (OFF)	---	-1.867E+0	-3.952E+0	-5.258E+0	-1.193E+1
Average (OFF)	---	-6.877E-1	-1.305E+0	2.462E-2	-3.830E+0
s (OFF)	---	1.015E+0	2.920E+0	7.713E+0	9.055E+0
Average+3s (OFF)	---	2.358E+0	7.456E+0	2.316E+1	2.333E+1
Average-3s (OFF)	---	-3.734E+0	-1.007E+1	-2.311E+1	-3.099E+1
Average (Bias1)	---	-1.745E-1	-1.597E+0	-2.306E+0	-5.291E+0
s (Bias1)	---	7.080E-1	1.812E+0	2.472E+0	7.147E+0
Average+3s (Bias1)	---	1.950E+0	3.839E+0	5.110E+0	1.615E+1
Average-3s (Bias1)	---	-2.299E+0	-7.033E+0	-9.722E+0	-2.673E+1
Average (Bias2)	---	1.582E+0	4.382E-1	-1.472E-1	-1.097E+0
s (Bias2)	---	5.209E+0	4.651E+0	4.450E+0	8.331E+0
Average+3s (Bias2)	---	1.721E+1	1.439E+1	1.320E+1	2.389E+1
Average-3s (Bias2)	---	-1.404E+1	-1.351E+1	-1.350E+1	-2.609E+1

30 MeV proton / detailed results

4. V(BR)ceo

Ta=25°C; Ic=1mA; Ib=0; If=0



30 MeV proton / detailed results

V(BR)ceo . (V) **Min = 40.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	65.93	65.90	65.92	65.91	66.01
N° 2 (Bias1)	65.20	65.70	67.28	68.76	73.78
N° 3 (Bias1)	66.75	67.04	68.21	69.39	74.24
N° 4 (Bias1)	65.42	65.96	67.47	68.87	73.67
N° 5 (Bias1)	70.91	71.26	72.50	73.88	78.70
N° 6 (Bias1)	70.46	70.91	72.11	73.35	77.73
N° 7 (Bias2)	69.16	69.12	70.84	72.51	78.06
N° 8 (Bias2)	70.46	70.43	71.68	72.86	77.93
N° 9 (Bias2)	68.16	68.22	72.11	74.14	79.25
N° 10 (Bias2)	66.47	66.49	68.65	70.51	76.35
N° 11 (Bias2)	66.22	66.18	68.19	70.01	75.95
N° 12 (OFF)	64.96	65.61	67.88	69.61	75.02
N° 13 (OFF)	66.20	66.70	68.94	70.80	76.39
N° 14 (OFF)	66.21	66.88	69.24	71.21	76.86
N° 15 (OFF)	65.14	65.85	68.24	70.13	75.49
N° 16 (OFF)	69.08	69.66	71.81	73.74	79.55

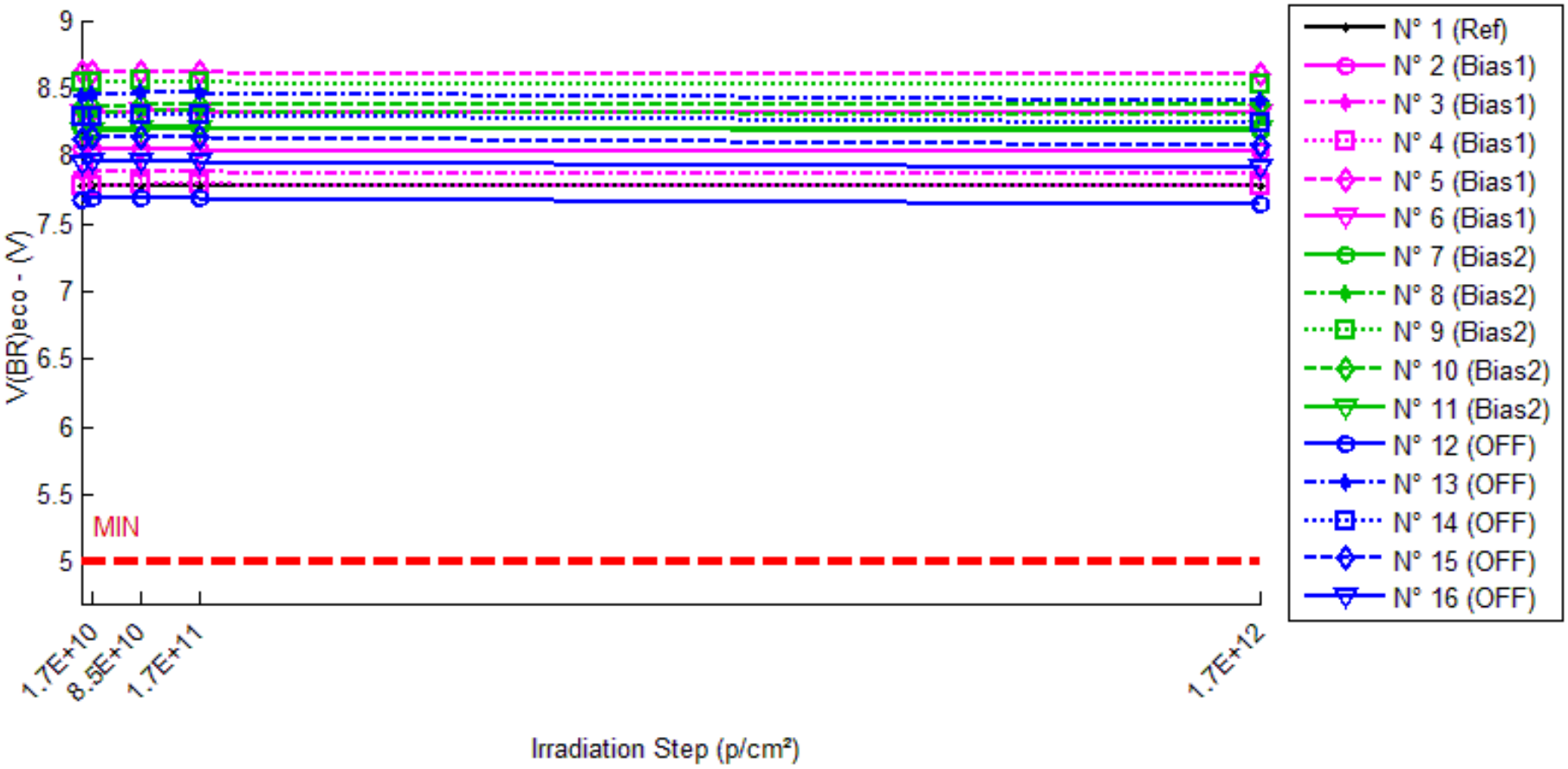
Delta [V(BR)ceo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.930E-2	-2.800E-3	-1.668E-2	8.557E-2
N° 2 (Bias1)	---	5.006E-1	2.078E+0	3.562E+0	8.577E+0
N° 3 (Bias1)	---	2.874E-1	1.457E+0	2.637E+0	7.482E+0
N° 4 (Bias1)	---	5.404E-1	2.052E+0	3.449E+0	8.253E+0
N° 5 (Bias1)	---	3.474E-1	1.586E+0	2.970E+0	7.789E+0
N° 6 (Bias1)	---	4.498E-1	1.657E+0	2.894E+0	7.276E+0
N° 7 (Bias2)	---	-3.378E-2	1.680E+0	3.355E+0	8.904E+0
N° 8 (Bias2)	---	-3.165E-2	1.219E+0	2.399E+0	7.473E+0
N° 9 (Bias2)	---	5.761E-2	3.945E+0	5.973E+0	1.108E+1
N° 10 (Bias2)	---	1.681E-2	2.179E+0	4.037E+0	9.883E+0
N° 11 (Bias2)	---	-3.991E-2	1.973E+0	3.786E+0	9.728E+0
N° 12 (OFF)	---	6.565E-1	2.918E+0	4.652E+0	1.007E+1
N° 13 (OFF)	---	5.002E-1	2.735E+0	4.596E+0	1.019E+1
N° 14 (OFF)	---	6.699E-1	3.036E+0	5.001E+0	1.065E+1
N° 15 (OFF)	---	7.065E-1	3.104E+0	4.988E+0	1.035E+1
N° 16 (OFF)	---	5.891E-1	2.737E+0	4.664E+0	1.048E+1
Average (OFF)	---	4.251E-1	1.766E+0	3.102E+0	7.875E+0
s (OFF)	---	1.056E-1	2.824E-1	3.903E-1	5.376E-1
Average+3s (OFF)	---	7.419E-1	2.613E+0	4.273E+0	9.488E+0
Average-3s (OFF)	---	1.083E-1	9.187E-1	1.932E+0	6.262E+0
Average (Bias1)	---	-6.184E-3	2.199E+0	3.910E+0	9.414E+0
s (Bias1)	---	4.227E-2	1.040E+0	1.311E+0	1.335E+0
Average+3s (Bias1)	---	1.206E-1	5.321E+0	7.844E+0	1.342E+1
Average-3s (Bias1)	---	-1.330E-1	-9.222E-1	-2.409E-2	5.409E+0
Average (Bias2)	---	6.244E-1	2.906E+0	4.780E+0	1.034E+1
s (Bias2)	---	8.143E-2	1.686E-1	1.975E-1	2.297E-1
Average+3s (Bias2)	---	8.687E-1	3.412E+0	5.373E+0	1.103E+1
Average-3s (Bias2)	---	3.801E-1	2.400E+0	4.188E+0	9.656E+0

30 MeV proton / detailed results

5. V(BR)eco

Ta=25°C; Ic=0; Ie=100µA; If=0



30 MeV proton / detailed results

V(BR)eco . (V) **Min = 5.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	7.779	7.779	7.777	7.778	7.778
N° 2 (Bias1)	7.688	7.694	7.699	7.700	7.694
N° 3 (Bias1)	7.789	7.802	7.807	7.810	7.804
N° 4 (Bias1)	7.802	7.811	7.817	7.818	7.813
N° 5 (Bias1)	7.799	7.800	7.802	7.804	7.812
N° 6 (Bias1)	8.183	8.190	8.196	8.199	8.195
N° 7 (Bias2)	8.486	8.487	8.492	8.495	8.500
N° 8 (Bias2)	8.400	8.401	8.422	8.422	8.412
N° 9 (Bias2)	7.677	7.678	7.690	7.691	7.679
N° 10 (Bias2)	8.240	8.241	8.251	8.253	8.245
N° 11 (Bias2)	7.921	7.922	7.934	7.934	7.925
N° 12 (OFF)	7.689	7.696	7.700	7.699	7.682
N° 13 (OFF)	7.980	7.987	7.993	7.993	7.974
N° 14 (OFF)	7.927	7.936	7.942	7.942	7.927
N° 15 (OFF)	7.734	7.744	7.751	7.751	7.734
N° 16 (OFF)	8.238	8.237	8.241	8.241	8.233

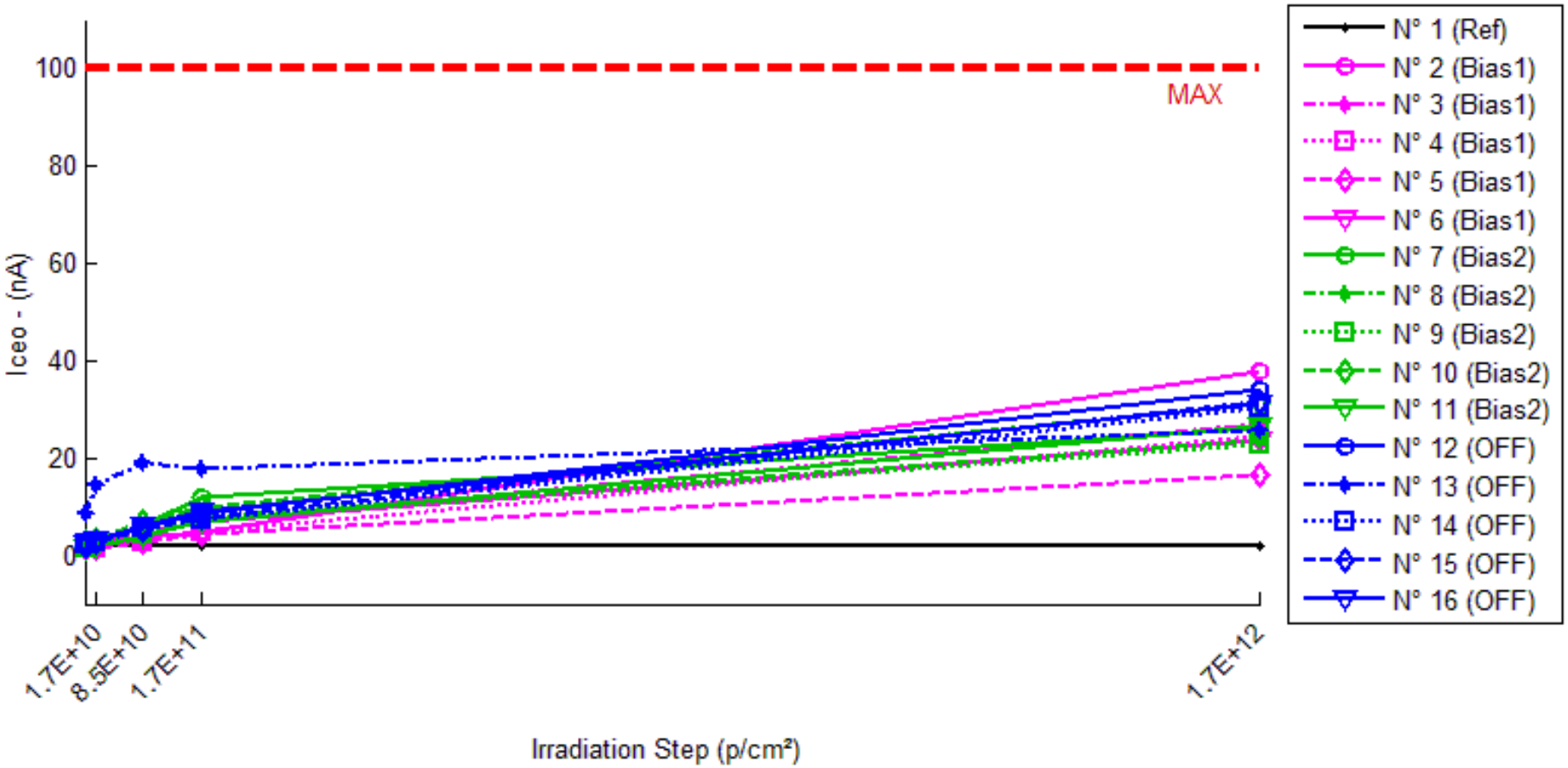
Delta [V(BR)eco]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	5.820E-4	-1.598E-3	-6.870E-4	-1.185E-3
N° 2 (Bias1)	---	6.018E-3	1.106E-2	1.215E-2	6.381E-3
N° 3 (Bias1)	---	1.313E-2	1.857E-2	2.082E-2	1.528E-2
N° 4 (Bias1)	---	9.202E-3	1.514E-2	1.667E-2	1.131E-2
N° 5 (Bias1)	---	8.460E-4	3.512E-3	5.235E-3	1.344E-2
N° 6 (Bias1)	---	7.431E-3	1.364E-2	1.612E-2	1.167E-2
N° 7 (Bias2)	---	1.461E-3	5.795E-3	9.652E-3	1.410E-2
N° 8 (Bias2)	---	1.004E-3	2.173E-2	2.230E-2	1.219E-2
N° 9 (Bias2)	---	1.294E-3	1.312E-2	1.351E-2	2.081E-3
N° 10 (Bias2)	---	8.010E-4	1.174E-2	1.338E-2	5.333E-3
N° 11 (Bias2)	---	9.990E-4	1.253E-2	1.269E-2	3.958E-3
N° 12 (OFF)	---	6.881E-3	1.082E-2	1.056E-2	-6.706E-3
N° 13 (OFF)	---	7.205E-3	1.324E-2	1.317E-2	-6.402E-3
N° 14 (OFF)	---	8.759E-3	1.527E-2	1.508E-2	3.110E-4
N° 15 (OFF)	---	1.054E-2	1.747E-2	1.678E-2	6.750E-4
N° 16 (OFF)	---	-6.650E-4	2.851E-3	3.577E-3	-4.211E-3
Average (OFF)	---	7.325E-3	1.239E-2	1.420E-2	1.162E-2
s (OFF)	---	4.497E-3	5.654E-3	5.878E-3	3.327E-3
Average+3s (OFF)	---	2.082E-2	2.935E-2	3.183E-2	2.160E-2
Average-3s (OFF)	---	-6.166E-3	-4.576E-3	-3.435E-3	1.635E-3
Average (Bias1)	---	1.112E-3	1.298E-2	1.431E-2	7.532E-3
s (Bias1)	---	2.627E-4	5.699E-3	4.734E-3	5.295E-3
Average+3s (Bias1)	---	1.900E-3	3.008E-2	2.851E-2	2.342E-2
Average-3s (Bias1)	---	3.237E-4	-4.114E-3	1.037E-4	-8.351E-3
Average (Bias2)	---	6.545E-3	1.193E-2	1.183E-2	-3.267E-3
s (Bias2)	---	4.284E-3	5.639E-3	5.162E-3	3.567E-3
Average+3s (Bias2)	---	1.940E-2	2.885E-2	2.732E-2	7.434E-3
Average-3s (Bias2)	---	-6.309E-3	-4.988E-3	-3.652E-3	-1.397E-2

30 MeV proton / detailed results

6. Iceo

Ta=25°C; Vce=20V; If=0; Ib=0



30 MeV proton / detailed results

Iceo . (nA) **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)	1.243	1.263	1.451	1.429	1.262
N° 2 (Bias1)	2.189	2.622	3.132	7.263	23.483
N° 3 (Bias1)	0.718	0.896	1.822	3.351	12.573
N° 4 (Bias1)	2.251	2.288	3.948	5.954	21.009
N° 5 (Bias1)	0.896	1.012	2.018	3.236	12.849
N° 6 (Bias1)	0.525	0.572	1.112	1.963	10.164
N° 7 (Bias2)	0.920	0.896	2.204	4.423	23.913
N° 8 (Bias2)	0.545	0.513	0.995	2.153	10.917
N° 9 (Bias2)	1.150	1.215	1.680	2.552	8.796
N° 10 (Bias2)	5.280	5.025	7.575	10.415	28.401
N° 11 (Bias2)	2.271	2.310	4.880	8.621	24.912
N° 12 (OFF)	1.874	2.458	4.840	7.692	26.221
N° 13 (OFF)	1.990	2.736	4.930	7.017	22.049
N° 14 (OFF)	2.214	3.061	5.062	9.689	21.740
N° 15 (OFF)	1.804	2.452	4.425	8.212	22.027
N° 16 (OFF)	1.391	1.999	3.846	5.763	19.364

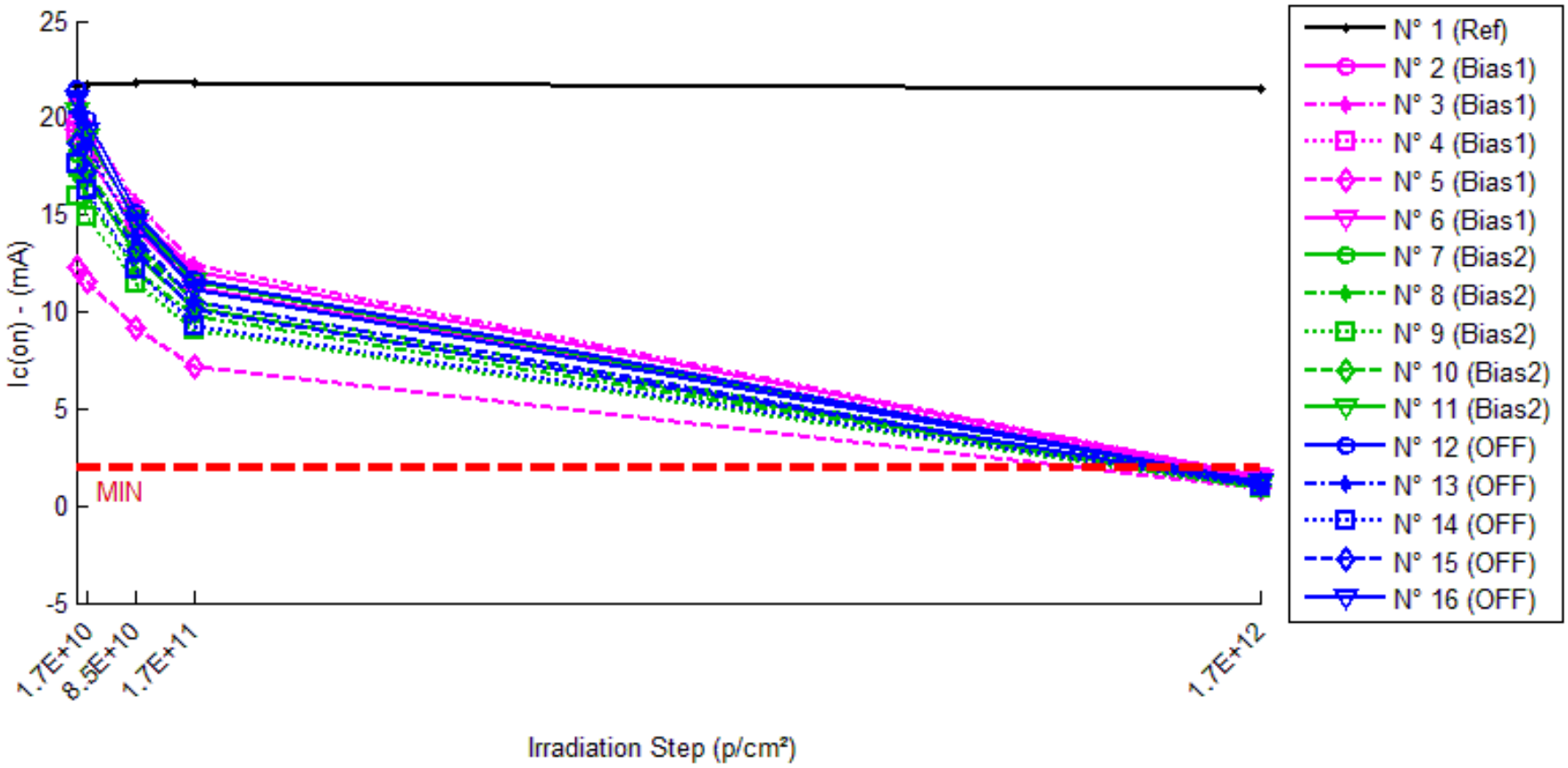
Delta [Iceo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.062E-2	2.085E-1	1.860E-1	1.895E-2
N° 2 (Bias1)	---	4.329E-1	9.430E-1	5.074E+0	2.129E+1
N° 3 (Bias1)	---	1.782E-1	1.104E+0	2.633E+0	1.185E+1
N° 4 (Bias1)	---	3.755E-2	1.697E+0	3.703E+0	1.876E+1
N° 5 (Bias1)	---	1.168E-1	1.122E+0	2.341E+0	1.195E+1
N° 6 (Bias1)	---	4.682E-2	5.865E-1	1.437E+0	9.639E+0
N° 7 (Bias2)	---	-2.422E-2	1.284E+0	3.503E+0	2.299E+1
N° 8 (Bias2)	---	-3.118E-2	4.503E-1	1.608E+0	1.037E+1
N° 9 (Bias2)	---	6.568E-2	5.307E-1	1.402E+0	7.646E+0
N° 10 (Bias2)	---	-2.551E-1	2.294E+0	5.134E+0	2.312E+1
N° 11 (Bias2)	---	3.856E-2	2.608E+0	6.349E+0	2.264E+1
N° 12 (OFF)	---	5.840E-1	2.966E+0	5.818E+0	2.435E+1
N° 13 (OFF)	---	7.456E-1	2.940E+0	5.027E+0	2.006E+1
N° 14 (OFF)	---	8.472E-1	2.848E+0	7.475E+0	1.953E+1
N° 15 (OFF)	---	6.482E-1	2.621E+0	6.408E+0	2.022E+1
N° 16 (OFF)	---	6.084E-1	2.456E+0	4.372E+0	1.797E+1
Average (OFF)	---	1.624E-1	1.091E+0	3.038E+0	1.470E+1
s (OFF)	---	1.616E-1	4.015E-1	1.396E+0	5.030E+0
Average+3s (OFF)	---	6.472E-1	2.295E+0	7.226E+0	2.979E+1
Average-3s (OFF)	---	-3.223E-1	-1.140E-1	-1.151E+0	-3.893E-1
Average (Bias1)	---	-4.126E-2	1.434E+0	3.599E+0	1.735E+1
s (Bias1)	---	1.264E-1	9.906E-1	2.163E+0	7.681E+0
Average+3s (Bias1)	---	3.380E-1	4.405E+0	1.009E+1	4.040E+1
Average-3s (Bias1)	---	-4.205E-1	-1.538E+0	-2.891E+0	-5.688E+0
Average (Bias2)	---	6.867E-1	2.766E+0	5.820E+0	2.043E+1
s (Bias2)	---	1.088E-1	2.204E-1	1.205E+0	2.365E+0
Average+3s (Bias2)	---	1.013E+0	3.427E+0	9.436E+0	2.752E+1
Average-3s (Bias2)	---	3.601E-1	2.105E+0	2.204E+0	1.333E+1

30 MeV proton / detailed results

7. Ic(on)

Ta=25°C; If=1mA; Ib=0



30 MeV proton / detailed results

Ic(on) . (mA) **Min = 2.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	21.329	21.256	20.939	21.026	21.112
N° 2 (Bias1)	16.495	15.466	12.395	9.876	3.185
N° 3 (Bias1)	20.512	19.709	16.569	13.748	4.963
N° 4 (Bias1)	19.072	18.357	14.889	12.075	4.152
N° 5 (Bias1)	14.759	13.888	11.553	9.316	3.169
N° 6 (Bias1)	16.150	15.870	12.293	9.868	3.282
N° 7 (Bias2)	16.591	17.431	13.366	10.451	3.152
N° 8 (Bias2)	15.459	15.651	12.696	10.107	3.030
N° 9 (Bias2)	21.647	21.841	16.250	12.120	3.274
N° 10 (Bias2)	19.482	19.634	15.189	11.684	3.362
N° 11 (Bias2)	21.340	21.367	16.813	13.041	3.816
N° 12 (OFF)	21.787	20.575	16.059	12.610	3.927
N° 13 (OFF)	20.694	19.561	15.198	11.892	3.588
N° 14 (OFF)	20.529	19.219	18.325	11.325	3.471
N° 15 (OFF)	18.713	17.463	11.305	10.108	3.028
N° 16 (OFF)	16.493	12.798	12.121	9.259	2.743

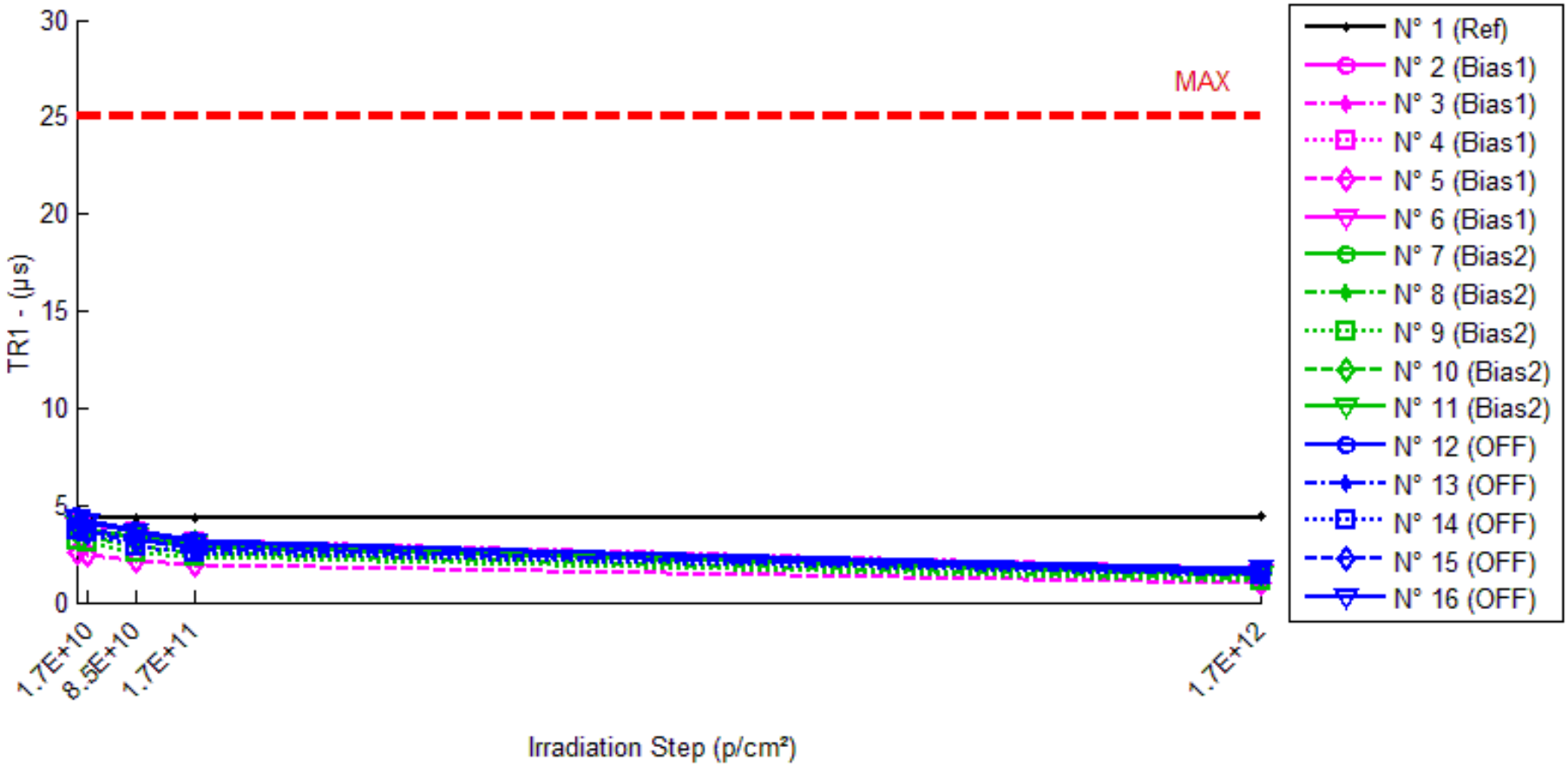
Delta [Ic(on)]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-7.286E-2	-3.896E-1	-3.023E-1	-2.169E-1
N° 2 (Bias1)	---	-1.029E+0	-4.100E+0	-6.619E+0	-1.331E+1
N° 3 (Bias1)	---	-8.029E-1	-3.943E+0	-6.764E+0	-1.555E+1
N° 4 (Bias1)	---	-7.152E-1	-4.183E+0	-6.996E+0	-1.492E+1
N° 5 (Bias1)	---	-8.716E-1	-3.207E+0	-5.444E+0	-1.159E+1
N° 6 (Bias1)	---	-2.796E-1	-3.857E+0	-6.282E+0	-1.287E+1
N° 7 (Bias2)	---	8.403E-1	-3.225E+0	-6.140E+0	-1.344E+1
N° 8 (Bias2)	---	1.914E-1	-2.763E+0	-5.353E+0	-1.243E+1
N° 9 (Bias2)	---	1.940E-1	-5.397E+0	-9.527E+0	-1.837E+1
N° 10 (Bias2)	---	1.516E-1	-4.293E+0	-7.798E+0	-1.612E+1
N° 11 (Bias2)	---	2.680E-2	-4.527E+0	-8.299E+0	-1.752E+1
N° 12 (OFF)	---	-1.211E+0	-5.728E+0	-9.177E+0	-1.786E+1
N° 13 (OFF)	---	-1.133E+0	-5.496E+0	-8.802E+0	-1.711E+1
N° 14 (OFF)	---	-1.310E+0	-2.205E+0	-9.205E+0	-1.706E+1
N° 15 (OFF)	---	-1.250E+0	-7.408E+0	-8.606E+0	-1.569E+1
N° 16 (OFF)	---	-3.695E+0	-4.372E+0	-7.234E+0	-1.375E+1
Average (OFF)	---	-7.396E-1	-3.858E+0	-6.421E+0	-1.365E+1
s (OFF)	---	2.816E-1	3.858E-1	6.046E-1	1.596E+0
Average+3s (OFF)	---	1.051E-1	-2.701E+0	-4.607E+0	-8.859E+0
Average-3s (OFF)	---	-1.584E+0	-5.015E+0	-8.235E+0	-1.844E+1
Average (Bias1)	---	2.808E-1	-4.041E+0	-7.423E+0	-1.558E+1
s (Bias1)	---	3.201E-1	1.053E+0	1.678E+0	2.568E+0
Average+3s (Bias1)	---	1.241E+0	-8.812E-1	-2.388E+0	-7.873E+0
Average-3s (Bias1)	---	-6.794E-1	-7.201E+0	-1.246E+1	-2.328E+1
Average (Bias2)	---	-1.720E+0	-5.042E+0	-8.605E+0	-1.629E+1
s (Bias2)	---	1.106E+0	1.922E+0	8.067E-1	1.623E+0
Average+3s (Bias2)	---	1.598E+0	7.241E-1	-6.184E+0	-1.142E+1
Average-3s (Bias2)	---	-5.038E+0	-1.081E+1	-1.102E+1	-2.116E+1

30 MeV proton / detailed results

8. TR1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



30 MeV proton / detailed results

TR1 . (µs) **Max = 25.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	4.36	4.32	4.44	4.36	4.32
N° 2 (Bias1)	4.44	4.28	3.80	3.36	2.40
N° 3 (Bias1)	3.80	3.68	3.28	3.12	2.24
N° 4 (Bias1)	4.44	4.20	3.88	3.40	2.56
N° 5 (Bias1)	3.40	3.12	2.96	2.64	1.96
N° 6 (Bias1)	3.40	3.20	2.96	2.64	1.92
N° 7 (Bias2)	3.56	3.52	3.24	2.84	1.92
N° 8 (Bias2)	3.04	2.96	2.76	2.52	1.72
N° 9 (Bias2)	4.32	4.40	3.56	3.12	2.08
N° 10 (Bias2)	3.92	3.96	3.52	3.24	2.16
N° 11 (Bias2)	4.28	4.32	3.64	3.40	2.24
N° 12 (OFF)	4.56	4.44	3.80	3.32	2.36
N° 13 (OFF)	4.36	4.00	3.64	3.24	2.16
N° 14 (OFF)	4.28	3.96	3.56	3.12	2.08
N° 15 (OFF)	4.32	4.16	3.48	3.16	2.12
N° 16 (OFF)	3.76	3.44	3.12	2.76	1.84

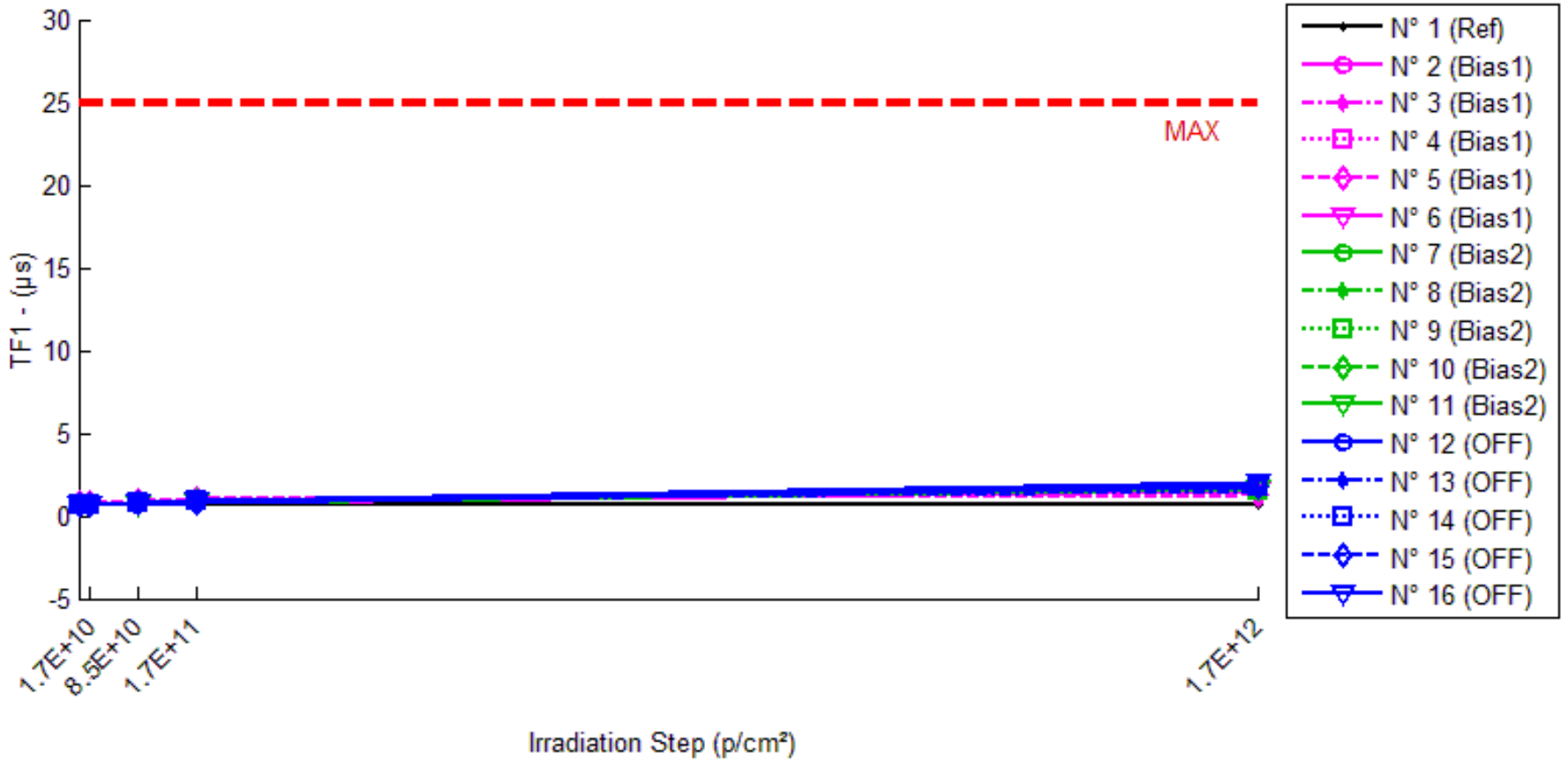
Delta [TR1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	8.000E-2	0.000E+0	-4.000E-2
N° 2 (Bias1)	---	-1.600E-1	-6.400E-1	-1.080E+0	-2.040E+0
N° 3 (Bias1)	---	-1.200E-1	-5.200E-1	-6.800E-1	-1.560E+0
N° 4 (Bias1)	---	-2.400E-1	-5.600E-1	-1.040E+0	-1.880E+0
N° 5 (Bias1)	---	-2.800E-1	-4.400E-1	-7.600E-1	-1.440E+0
N° 6 (Bias1)	---	-2.000E-1	-4.400E-1	-7.600E-1	-1.480E+0
N° 7 (Bias2)	---	-4.000E-2	-3.200E-1	-7.200E-1	-1.640E+0
N° 8 (Bias2)	---	-8.000E-2	-2.800E-1	-5.200E-1	-1.320E+0
N° 9 (Bias2)	---	8.000E-2	-7.600E-1	-1.200E+0	-2.240E+0
N° 10 (Bias2)	---	4.000E-2	-4.000E-1	-6.800E-1	-1.760E+0
N° 11 (Bias2)	---	4.000E-2	-6.400E-1	-8.800E-1	-2.040E+0
N° 12 (OFF)	---	-1.200E-1	-7.600E-1	-1.240E+0	-2.200E+0
N° 13 (OFF)	---	-3.600E-1	-7.200E-1	-1.120E+0	-2.200E+0
N° 14 (OFF)	---	-3.200E-1	-7.200E-1	-1.160E+0	-2.200E+0
N° 15 (OFF)	---	-1.600E-1	-8.400E-1	-1.160E+0	-2.200E+0
N° 16 (OFF)	---	-3.200E-1	-6.400E-1	-1.000E+0	-1.920E+0
Average (OFF)	---	-2.000E-1	-5.200E-1	-8.640E-1	-1.680E+0
s (OFF)	---	6.325E-2	8.485E-2	1.824E-1	2.653E-1
Average+3s (OFF)	---	-1.026E-2	-2.654E-1	-3.167E-1	-8.840E-1
Average-3s (OFF)	---	-3.897E-1	-7.746E-1	-1.411E+0	-2.476E+0
Average (Bias1)	---	8.000E-3	-4.800E-1	-8.000E-1	-1.800E+0
s (Bias1)	---	6.573E-2	2.098E-1	2.577E-1	3.567E-1
Average+3s (Bias1)	---	2.052E-1	1.493E-1	-2.695E-2	-7.300E-1
Average-3s (Bias1)	---	-1.892E-1	-1.109E+0	-1.573E+0	-2.870E+0
Average (Bias2)	---	-2.560E-1	-7.360E-1	-1.136E+0	-2.144E+0
s (Bias2)	---	1.081E-1	7.266E-2	8.764E-2	1.252E-1
Average+3s (Bias2)	---	6.822E-2	-5.180E-1	-8.731E-1	-1.768E+0
Average-3s (Bias2)	---	-5.802E-1	-9.540E-1	-1.399E+0	-2.520E+0

30 MeV proton / detailed results

9. TF1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



30 MeV proton / detailed results

TF1 . (µs) **Max = 25.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.64	0.68	0.72	0.64	0.68
N° 2 (Bias1)	0.84	0.88	1.00	1.16	2.16
N° 3 (Bias1)	0.64	0.64	0.68	0.76	1.52
N° 4 (Bias1)	0.72	0.72	0.84	0.88	1.88
N° 5 (Bias1)	0.76	1.44	0.88	1.00	1.84
N° 6 (Bias1)	0.68	0.68	0.76	0.88	1.76
N° 7 (Bias2)	0.76	0.68	0.80	0.92	1.72
N° 8 (Bias2)	0.68	0.68	0.76	0.88	1.52
N° 9 (Bias2)	0.64	0.68	0.72	0.80	1.88
N° 10 (Bias2)	0.68	0.68	0.76	0.84	1.92
N° 11 (Bias2)	0.64	0.64	0.72	0.76	1.72
N° 12 (OFF)	0.64	0.64	0.76	0.80	1.84
N° 13 (OFF)	0.68	0.68	0.72	0.84	1.76
N° 14 (OFF)	0.68	0.68	0.64	0.88	1.80
N° 15 (OFF)	0.72	0.76	1.12	1.00	1.92
N° 16 (OFF)	0.72	0.92	0.84	0.96	1.80

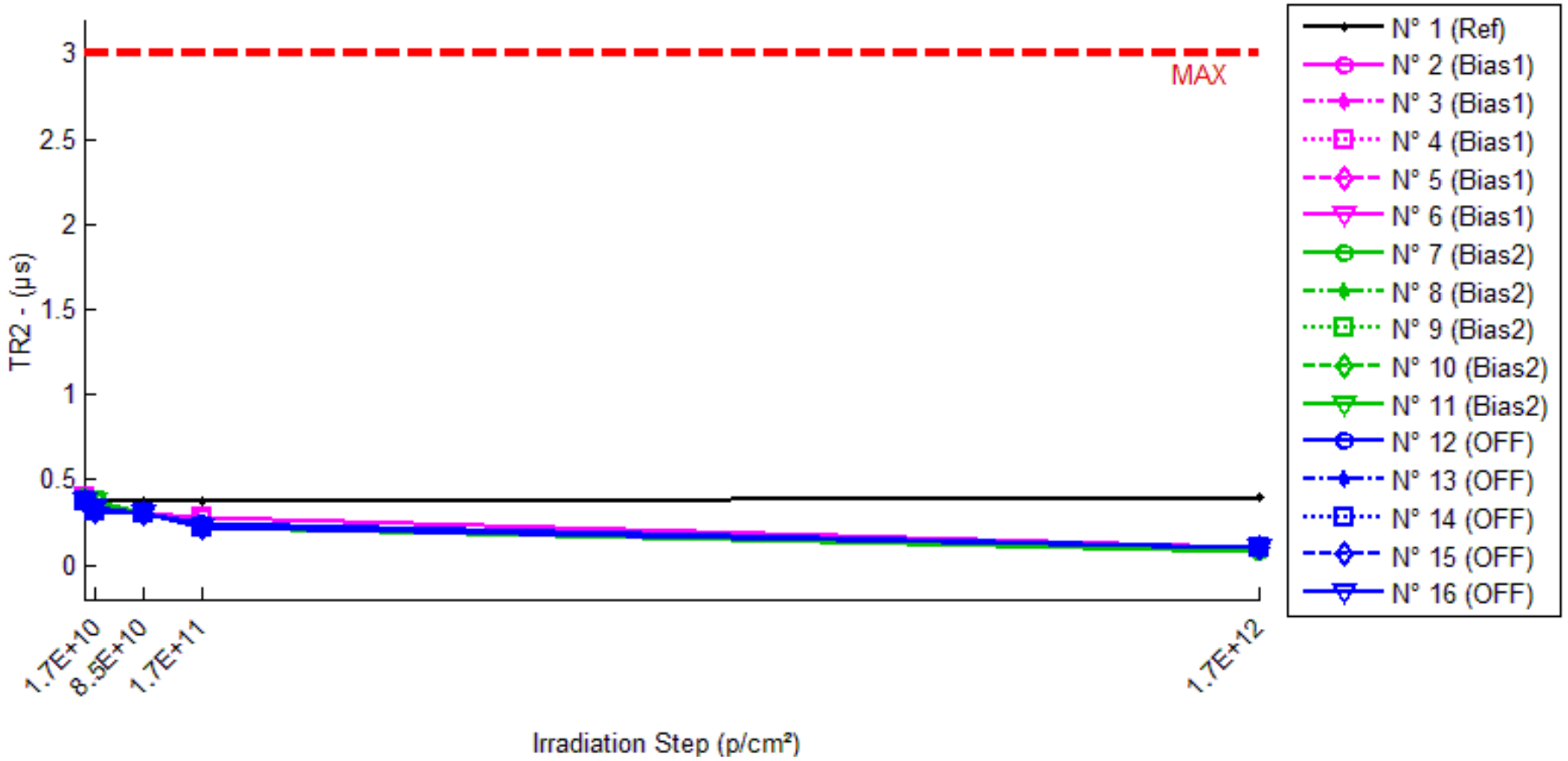
Delta [TF1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	4.000E-2	8.000E-2	0.000E+0	4.000E-2
N° 2 (Bias1)	---	4.000E-2	1.600E-1	3.200E-1	1.320E+0
N° 3 (Bias1)	---	0.000E+0	4.000E-2	1.200E-1	8.800E-1
N° 4 (Bias1)	---	0.000E+0	1.200E-1	1.600E-1	1.160E+0
N° 5 (Bias1)	---	6.800E-1	1.200E-1	2.400E-1	1.080E+0
N° 6 (Bias1)	---	0.000E+0	8.000E-2	2.000E-1	1.080E+0
N° 7 (Bias2)	---	-8.000E-2	4.000E-2	1.600E-1	9.600E-1
N° 8 (Bias2)	---	0.000E+0	8.000E-2	2.000E-1	8.400E-1
N° 9 (Bias2)	---	4.000E-2	8.000E-2	1.600E-1	1.240E+0
N° 10 (Bias2)	---	0.000E+0	8.000E-2	1.600E-1	1.240E+0
N° 11 (Bias2)	---	0.000E+0	8.000E-2	1.200E-1	1.080E+0
N° 12 (OFF)	---	0.000E+0	1.200E-1	1.600E-1	1.200E+0
N° 13 (OFF)	---	0.000E+0	4.000E-2	1.600E-1	1.080E+0
N° 14 (OFF)	---	0.000E+0	-4.000E-2	2.000E-1	1.120E+0
N° 15 (OFF)	---	4.000E-2	4.000E-1	2.800E-1	1.200E+0
N° 16 (OFF)	---	2.000E-1	1.200E-1	2.400E-1	1.080E+0
Average (OFF)	---	1.440E-1	1.040E-1	2.080E-1	1.104E+0
s (OFF)	---	3.001E-1	4.561E-2	7.694E-2	1.590E-1
Average+3s (OFF)	---	1.044E+0	2.408E-1	4.388E-1	1.581E+0
Average-3s (OFF)	---	-7.564E-1	-3.282E-2	-2.282E-2	6.270E-1
Average (Bias1)	---	-8.000E-3	7.200E-2	1.600E-1	1.072E+0
s (Bias1)	---	4.382E-2	1.789E-2	2.828E-2	1.753E-1
Average+3s (Bias1)	---	1.235E-1	1.257E-1	2.449E-1	1.598E+0
Average-3s (Bias1)	---	-1.395E-1	1.833E-2	7.515E-2	5.462E-1
Average (Bias2)	---	4.800E-2	1.280E-1	2.080E-1	1.136E+0
s (Bias2)	---	8.672E-2	1.659E-1	5.215E-2	6.066E-2
Average+3s (Bias2)	---	3.082E-1	6.257E-1	3.645E-1	1.318E+0
Average-3s (Bias2)	---	-2.122E-1	-3.697E-1	5.154E-2	9.540E-1

30 MeV proton / detailed results

10.TR2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



30 MeV proton / detailed results

TR2 . (µs) **Max = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.40	0.38	0.36	0.38	0.38
N° 2 (Bias1)	0.36	0.38	0.32	0.26	0.10
N° 3 (Bias1)	0.42	0.40	0.32	0.30	0.14
N° 4 (Bias1)	0.40	0.38	0.32	0.26	0.10
N° 5 (Bias1)	0.36	0.34	0.32	0.26	0.16
N° 6 (Bias1)	0.40	0.36	0.30	0.24	0.28
N° 7 (Bias2)	0.42	0.42	0.34	0.30	0.16
N° 8 (Bias2)	0.40	0.42	0.34	0.26	0.10
N° 9 (Bias2)	0.38	0.38	0.32	0.14	0.10
N° 10 (Bias2)	0.36	0.36	0.30	0.18	0.10
N° 11 (Bias2)	0.38	0.38	0.30	0.26	0.10
N° 12 (OFF)	0.32	0.34	0.32	0.24	0.22
N° 13 (OFF)	0.40	0.36	0.30	0.24	0.10
N° 14 (OFF)	0.40	0.34	0.30	0.30	0.10
N° 15 (OFF)	0.40	0.36	0.30	0.24	0.10
N° 16 (OFF)	0.38	0.36	0.30	0.28	0.10

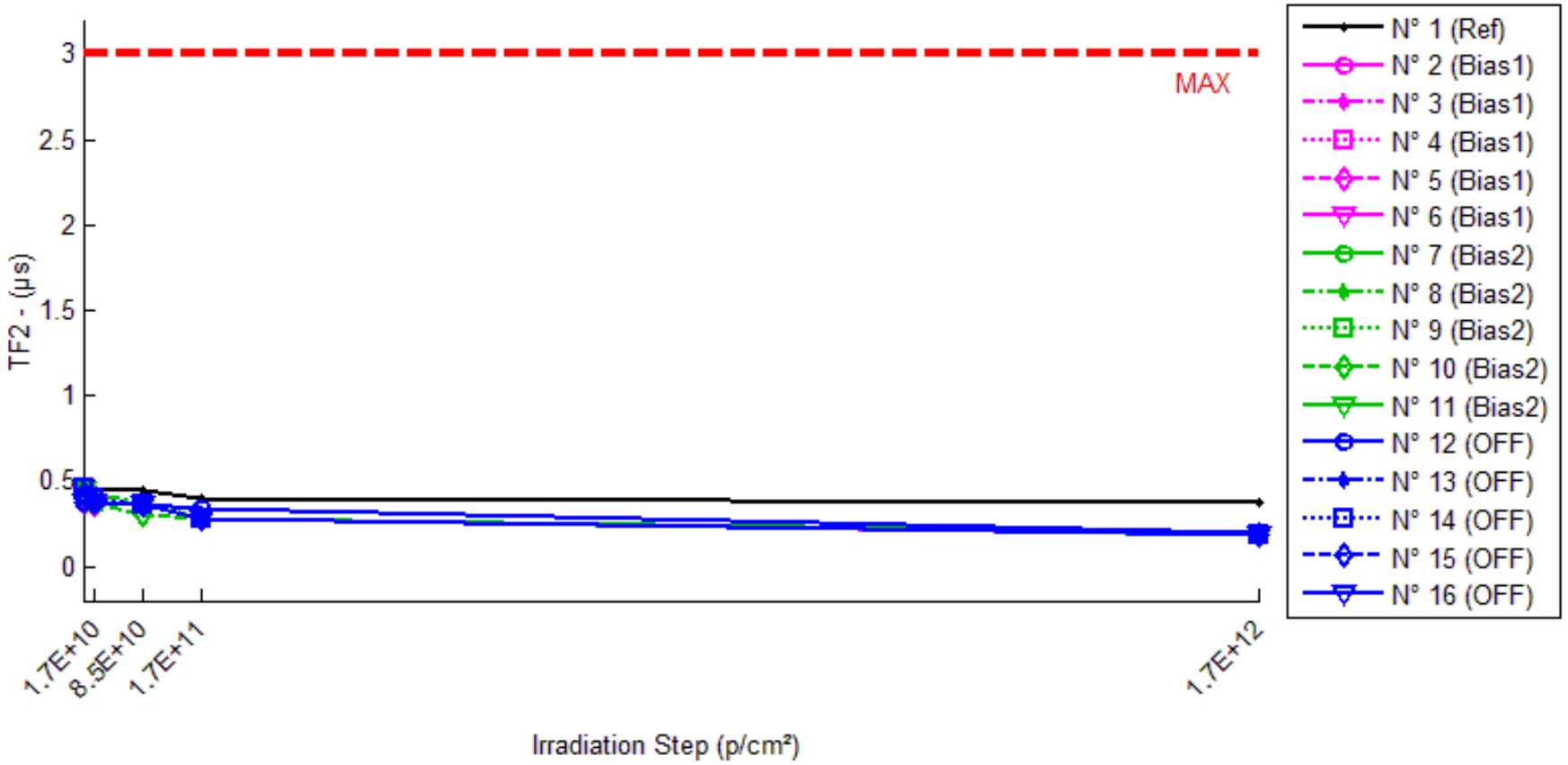
Delta [TR2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.000E-2	-4.000E-2	-2.000E-2	-2.000E-2
N° 2 (Bias1)	---	2.000E-2	-4.000E-2	-1.000E-1	-2.600E-1
N° 3 (Bias1)	---	-2.000E-2	-1.000E-1	-1.200E-1	-2.800E-1
N° 4 (Bias1)	---	-2.000E-2	-8.000E-2	-1.400E-1	-3.000E-1
N° 5 (Bias1)	---	-2.000E-2	-4.000E-2	-1.000E-1	-2.000E-1
N° 6 (Bias1)	---	-4.000E-2	-1.000E-1	-1.600E-1	-1.200E-1
N° 7 (Bias2)	---	0.000E+0	-8.000E-2	-1.200E-1	-2.600E-1
N° 8 (Bias2)	---	2.000E-2	-6.000E-2	-1.400E-1	-3.000E-1
N° 9 (Bias2)	---	0.000E+0	-6.000E-2	-2.400E-1	-2.800E-1
N° 10 (Bias2)	---	0.000E+0	-6.000E-2	-1.800E-1	-2.600E-1
N° 11 (Bias2)	---	0.000E+0	-8.000E-2	-1.200E-1	-2.800E-1
N° 12 (OFF)	---	2.000E-2	0.000E+0	-8.000E-2	-1.000E-1
N° 13 (OFF)	---	-4.000E-2	-1.000E-1	-1.600E-1	-3.000E-1
N° 14 (OFF)	---	-6.000E-2	-1.000E-1	-1.000E-1	-3.000E-1
N° 15 (OFF)	---	-4.000E-2	-1.000E-1	-1.600E-1	-3.000E-1
N° 16 (OFF)	---	-2.000E-2	-8.000E-2	-1.000E-1	-2.800E-1
Average (OFF)	---	-1.600E-2	-7.200E-2	-1.240E-1	-2.320E-1
s (OFF)	---	2.191E-2	3.033E-2	2.608E-2	7.294E-2
Average+3s (OFF)	---	4.973E-2	1.899E-2	-4.577E-2	-1.319E-2
Average-3s (OFF)	---	-8.173E-2	-1.630E-1	-2.022E-1	-4.508E-1
Average (Bias1)	---	4.000E-3	-6.800E-2	-1.600E-1	-2.760E-1
s (Bias1)	---	8.944E-3	1.095E-2	5.099E-2	1.673E-2
Average+3s (Bias1)	---	3.083E-2	-3.514E-2	-7.029E-3	-2.258E-1
Average-3s (Bias1)	---	-2.283E-2	-1.009E-1	-3.130E-1	-3.262E-1
Average (Bias2)	---	-2.800E-2	-7.600E-2	-1.200E-1	-2.560E-1
s (Bias2)	---	3.033E-2	4.336E-2	3.742E-2	8.764E-2
Average+3s (Bias2)	---	6.299E-2	5.408E-2	-7.750E-3	6.907E-3
Average-3s (Bias2)	---	-1.190E-1	-2.061E-1	-2.322E-1	-5.189E-1

30 MeV proton / detailed results

11.TF2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



30 MeV proton / detailed results

TF2 . (µs) **Max = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.42	0.40	0.44	0.40	0.38
N° 2 (Bias1)	0.42	0.38	0.38	0.36	0.28
N° 3 (Bias1)	0.42	0.38	0.36	0.32	0.22
N° 4 (Bias1)	0.38	0.40	0.36	0.34	0.22
N° 5 (Bias1)	0.42	0.44	0.36	0.34	0.26
N° 6 (Bias1)	0.42	0.38	0.34	0.30	0.30
N° 7 (Bias2)	0.44	0.44	0.38	0.36	0.22
N° 8 (Bias2)	0.46	0.44	0.38	0.34	0.22
N° 9 (Bias2)	0.42	0.42	0.36	0.14	0.22
N° 10 (Bias2)	0.38	0.40	0.36	0.20	0.28
N° 11 (Bias2)	0.40	0.40	0.36	0.34	0.22
N° 12 (OFF)	0.34	0.36	0.36	0.30	0.28
N° 13 (OFF)	0.42	0.38	0.34	0.28	0.22
N° 14 (OFF)	0.40	0.38	0.36	0.32	0.22
N° 15 (OFF)	0.42	0.38	0.34	0.30	0.22
N° 16 (OFF)	0.38	0.40	0.36	0.32	0.22

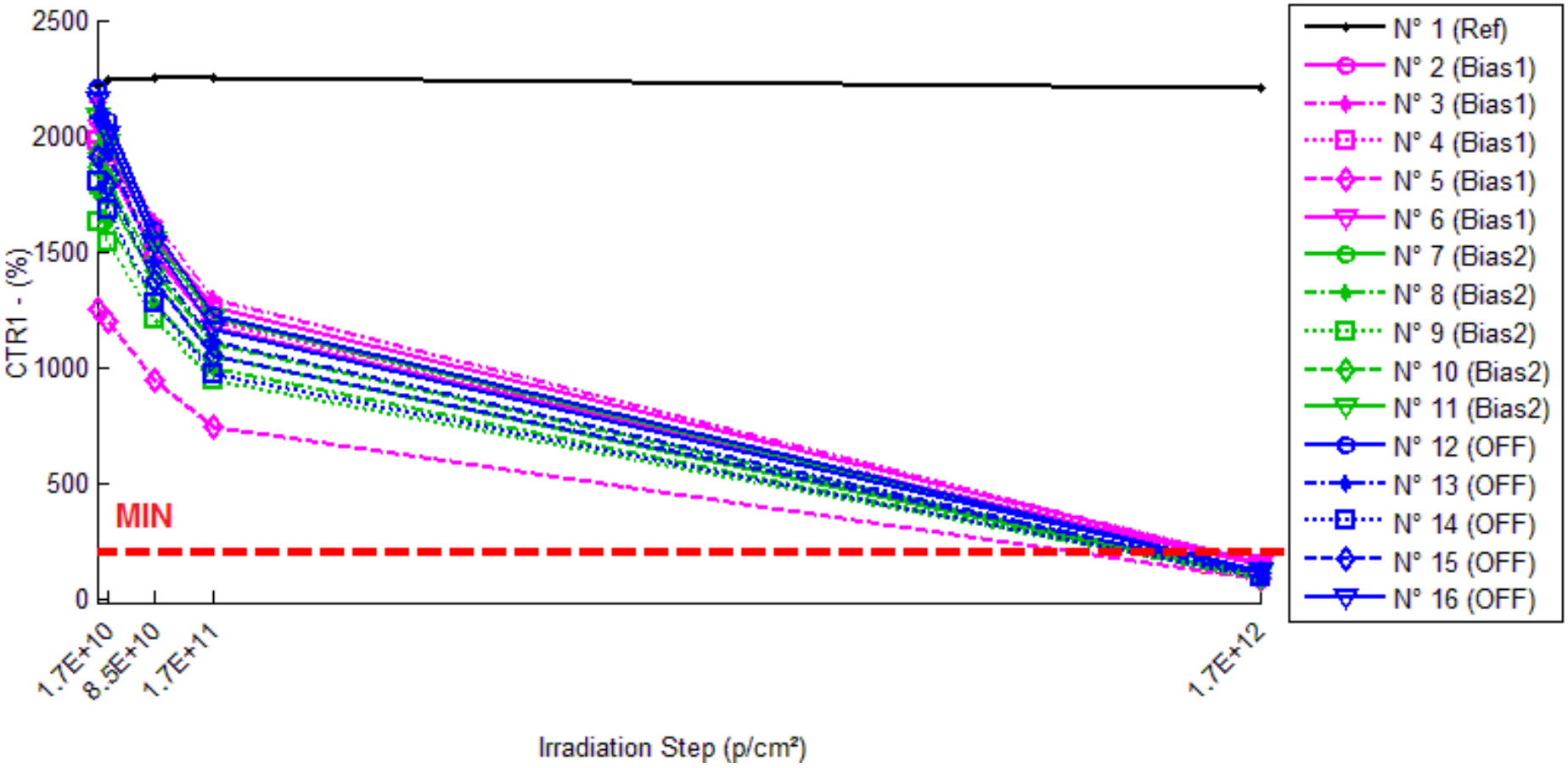
Delta [TF2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.000E-2	2.000E-2	-2.000E-2	-4.000E-2
N° 2 (Bias1)	---	-4.000E-2	-4.000E-2	-6.000E-2	-1.400E-1
N° 3 (Bias1)	---	-4.000E-2	-6.000E-2	-1.000E-1	-2.000E-1
N° 4 (Bias1)	---	2.000E-2	-2.000E-2	-4.000E-2	-1.600E-1
N° 5 (Bias1)	---	2.000E-2	-6.000E-2	-8.000E-2	-1.600E-1
N° 6 (Bias1)	---	-4.000E-2	-8.000E-2	-1.200E-1	-1.200E-1
N° 7 (Bias2)	---	0.000E+0	-6.000E-2	-8.000E-2	-2.200E-1
N° 8 (Bias2)	---	-2.000E-2	-8.000E-2	-1.200E-1	-2.400E-1
N° 9 (Bias2)	---	0.000E+0	-6.000E-2	-2.800E-1	-2.000E-1
N° 10 (Bias2)	---	2.000E-2	-2.000E-2	-1.800E-1	-1.000E-1
N° 11 (Bias2)	---	0.000E+0	-4.000E-2	-6.000E-2	-1.800E-1
N° 12 (OFF)	---	2.000E-2	2.000E-2	-4.000E-2	-6.000E-2
N° 13 (OFF)	---	-4.000E-2	-8.000E-2	-1.400E-1	-2.000E-1
N° 14 (OFF)	---	-2.000E-2	-4.000E-2	-8.000E-2	-1.800E-1
N° 15 (OFF)	---	-4.000E-2	-8.000E-2	-1.200E-1	-2.000E-1
N° 16 (OFF)	---	2.000E-2	-2.000E-2	-6.000E-2	-1.600E-1
Average (OFF)	---	-1.600E-2	-5.200E-2	-8.000E-2	-1.560E-1
s (OFF)	---	3.286E-2	2.280E-2	3.162E-2	2.966E-2
Average+3s (OFF)	---	8.259E-2	1.641E-2	1.487E-2	-6.701E-2
Average-3s (OFF)	---	-1.146E-1	-1.204E-1	-1.749E-1	-2.450E-1
Average (Bias1)	---	0.000E+0	-5.200E-2	-1.440E-1	-1.880E-1
s (Bias1)	---	1.414E-2	2.280E-2	8.877E-2	5.404E-2
Average+3s (Bias1)	---	4.243E-2	1.641E-2	1.223E-1	-2.589E-2
Average-3s (Bias1)	---	-4.243E-2	-1.204E-1	-4.103E-1	-3.501E-1
Average (Bias2)	---	-1.200E-2	-4.000E-2	-8.800E-2	-1.600E-1
s (Bias2)	---	3.033E-2	4.243E-2	4.147E-2	5.831E-2
Average+3s (Bias2)	---	7.899E-2	8.728E-2	3.642E-2	1.493E-2
Average-3s (Bias2)	---	-1.030E-1	-1.673E-1	-2.124E-1	-3.349E-1

30 MeV proton / detailed results

12.CTR1

Ta=25°C; Vce=5V; If=1mA



30 MeV proton / detailed results

CTR1 . (%) **Min : 200**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	2181.04	2186.45	2100.72	2144.64	2141.62
N° 2 (Bias1)	1686.79	1586.03	1281.34	1013.99	326.12
N° 3 (Bias1)	2093.95	2025.71	1700.52	1426.55	512.22
N° 4 (Bias1)	1934.69	1882.88	1536.65	1251.75	426.61
N° 5 (Bias1)	1506.55	1395.66	1191.89	961.12	325.90
N° 6 (Bias1)	1656.08	1642.84	1273.47	1020.02	338.51
N° 7 (Bias2)	1694.23	1784.33	1395.08	1103.45	320.62
N° 8 (Bias2)	1582.69	1609.99	1326.33	1054.72	319.50
N° 9 (Bias2)	2208.82	2237.14	1668.32	1240.08	335.59
N° 10 (Bias2)	1997.47	2014.25	1594.69	1232.40	354.93
N° 11 (Bias2)	2192.05	2190.19	1759.65	1366.04	402.26
N° 12 (OFF)	2221.85	2136.80	1680.93	1318.66	404.59
N° 13 (OFF)	2116.37	2020.65	1589.75	1239.59	369.50
N° 14 (OFF)	2098.52	1989.37	1922.41	1180.62	358.74
N° 15 (OFF)	1914.67	1808.24	1372.01	1052.92	311.84
N° 16 (OFF)	1685.86	1378.98	1268.00	962.66	282.98

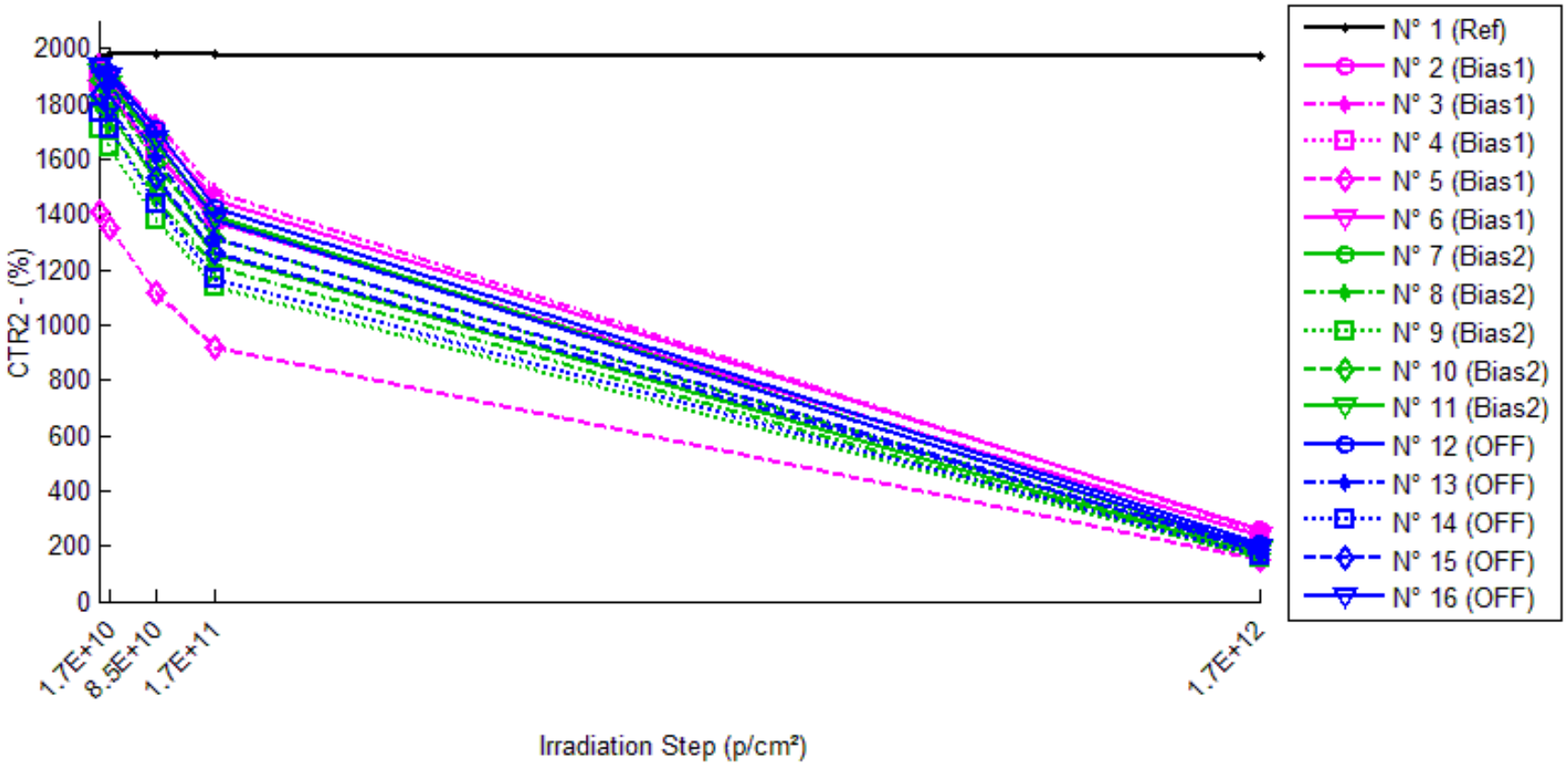
1/Delta [CTR1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.134E-6	1.753E-5	7.781E-6	8.438E-6
N° 2 (Bias1)	---	3.766E-5	1.876E-4	3.934E-4	2.474E-3
N° 3 (Bias1)	---	1.609E-5	1.105E-4	2.234E-4	1.475E-3
N° 4 (Bias1)	---	1.422E-5	1.339E-4	2.820E-4	1.827E-3
N° 5 (Bias1)	---	5.274E-5	1.752E-4	3.767E-4	2.405E-3
N° 6 (Bias1)	---	4.869E-6	1.814E-4	3.765E-4	2.350E-3
N° 7 (Bias2)	---	-2.981E-5	1.266E-4	3.160E-4	2.529E-3
N° 8 (Bias2)	---	-1.071E-5	1.221E-4	3.163E-4	2.498E-3
N° 9 (Bias2)	---	-5.733E-6	1.467E-4	3.537E-4	2.527E-3
N° 10 (Bias2)	---	-4.171E-6	1.265E-4	3.108E-4	2.317E-3
N° 11 (Bias2)	---	3.883E-7	1.121E-4	2.758E-4	2.030E-3
N° 12 (OFF)	---	1.791E-5	1.448E-4	3.083E-4	2.022E-3
N° 13 (OFF)	---	2.238E-5	1.565E-4	3.342E-4	2.234E-3
N° 14 (OFF)	---	2.615E-5	4.365E-5	3.705E-4	2.311E-3
N° 15 (OFF)	---	3.074E-5	2.066E-4	4.275E-4	2.685E-3
N° 16 (OFF)	---	1.320E-4	1.955E-4	4.456E-4	2.941E-3
Average (OFF)	---	2.512E-5	1.577E-4	3.304E-4	2.106E-3
s (OFF)	---	1.956E-5	3.376E-5	7.420E-5	4.360E-4
Average+3s (OFF)	---	8.380E-5	2.590E-4	5.530E-4	3.414E-3
Average-3s (OFF)	---	-3.356E-5	5.644E-5	1.078E-4	7.982E-4
Average (Bias1)	---	-1.001E-5	1.268E-4	3.145E-4	2.380E-3
s (Bias1)	---	1.176E-5	1.258E-5	2.760E-5	2.147E-4
Average+3s (Bias1)	---	2.526E-5	1.645E-4	3.973E-4	3.024E-3
Average-3s (Bias1)	---	-4.528E-5	8.904E-5	2.317E-4	1.736E-3
Average (Bias2)	---	4.584E-5	1.494E-4	3.772E-4	2.438E-3
s (Bias2)	---	4.840E-5	6.451E-5	5.884E-5	3.690E-4
Average+3s (Bias2)	---	1.910E-4	3.429E-4	5.537E-4	3.545E-3
Average-3s (Bias2)	---	-9.936E-5	-4.411E-5	2.007E-4	1.331E-3

30 MeV proton / detailed results

13.CTR2

Ta=25°C; Vce=5V; If=2mA



30 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1968.06	1958.54	1931.71	1921.13	1961.68
N° 2 (Bias1)	1737.87	1665.20	1434.71	1195.55	478.04
N° 3 (Bias1)	1937.53	1875.99	1759.12	1557.49	695.18
N° 4 (Bias1)	1870.12	1837.86	1653.11	1432.19	608.67
N° 5 (Bias1)	1630.01	1550.36	1371.85	1151.61	478.91
N° 6 (Bias1)	1768.06	1745.83	1487.10	1251.41	508.21
N° 7 (Bias2)	1739.32	1799.05	1527.98	1282.18	474.55
N° 8 (Bias2)	1663.83	1676.70	1460.82	1232.64	464.57
N° 9 (Bias2)	1966.86	1975.29	1796.28	1501.19	544.06
N° 10 (Bias2)	1914.02	1920.11	1708.48	1425.84	520.87
N° 11 (Bias2)	1967.05	1972.04	1818.89	1555.47	585.03
N° 12 (OFF)	1891.06	1873.55	1724.62	1484.93	580.31
N° 13 (OFF)	1938.01	1907.82	1713.81	1446.40	545.75
N° 14 (OFF)	1932.84	1898.33	1912.05	1385.08	523.69
N° 15 (OFF)	1858.56	1810.83	1563.48	1263.39	465.46
N° 16 (OFF)	1754.17	1495.94	1443.34	1165.34	425.09

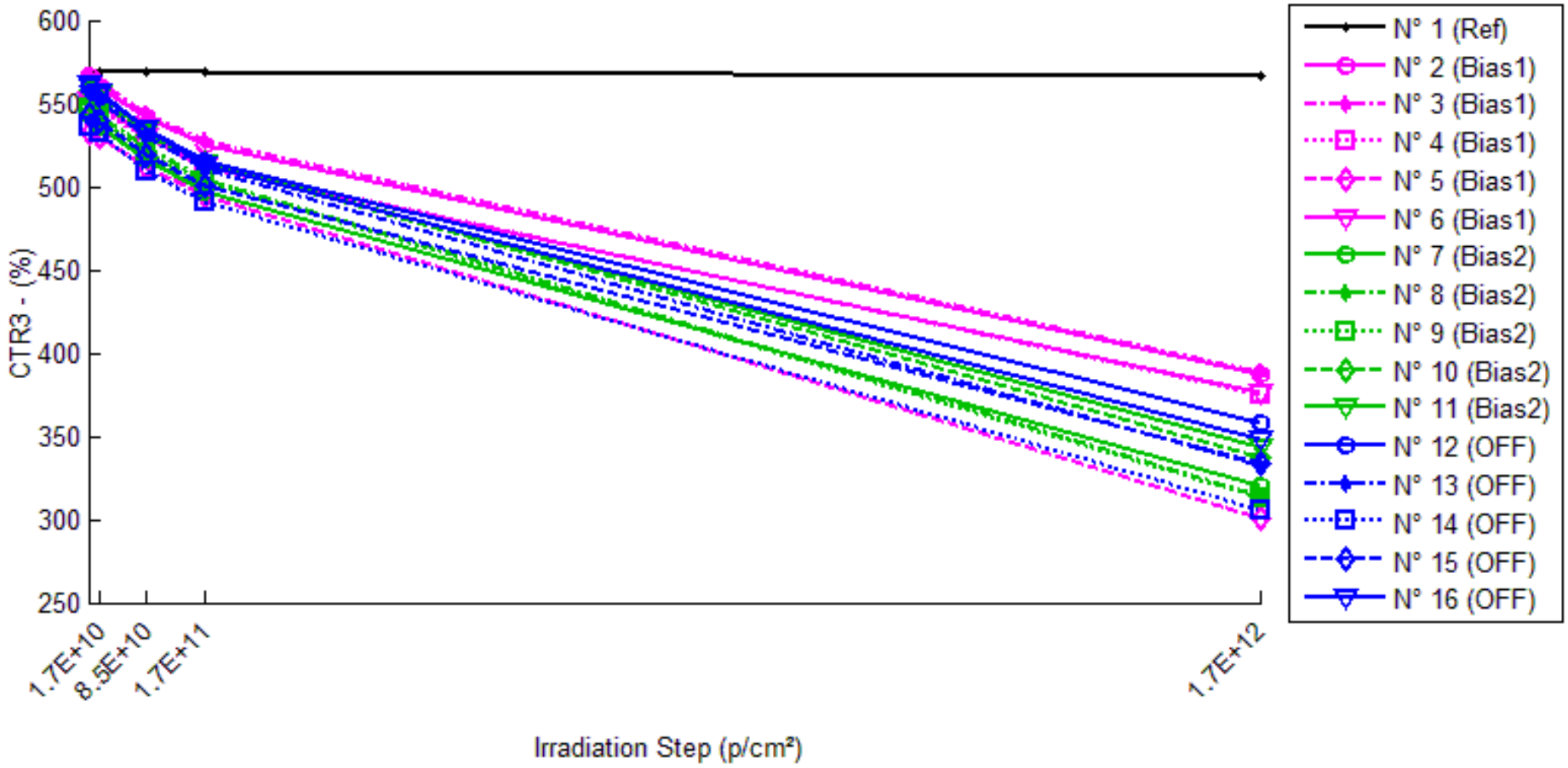
1/Delta [CTR2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.469E-6	9.562E-6	1.241E-5	1.653E-6
N° 2 (Bias1)	---	2.511E-5	1.216E-4	2.610E-4	1.516E-3
N° 3 (Bias1)	---	1.693E-5	5.235E-5	1.259E-4	9.224E-4
N° 4 (Bias1)	---	9.385E-6	7.020E-5	1.635E-4	1.108E-3
N° 5 (Bias1)	---	3.152E-5	1.154E-4	2.549E-4	1.475E-3
N° 6 (Bias1)	---	7.200E-6	1.069E-4	2.335E-4	1.402E-3
N° 7 (Bias2)	---	-1.909E-5	7.952E-5	2.050E-4	1.532E-3
N° 8 (Bias2)	---	-4.612E-6	8.353E-5	2.102E-4	1.552E-3
N° 9 (Bias2)	---	-2.170E-6	4.828E-5	1.577E-4	1.330E-3
N° 10 (Bias2)	---	-1.657E-6	6.285E-5	1.789E-4	1.397E-3
N° 11 (Bias2)	---	-1.288E-6	4.141E-5	1.345E-4	1.201E-3
N° 12 (OFF)	---	4.942E-6	5.103E-5	1.446E-4	1.194E-3
N° 13 (OFF)	---	8.165E-6	6.750E-5	1.754E-4	1.316E-3
N° 14 (OFF)	---	9.404E-6	5.623E-6	2.046E-4	1.392E-3
N° 15 (OFF)	---	1.418E-5	1.016E-4	2.535E-4	1.610E-3
N° 16 (OFF)	---	9.841E-5	1.228E-4	2.880E-4	1.782E-3
Average (OFF)	---	1.803E-5	9.329E-5	2.078E-4	1.285E-3
s (OFF)	---	1.031E-5	3.035E-5	5.994E-5	2.579E-4
Average+3s (OFF)	---	4.896E-5	1.844E-4	3.876E-4	2.058E-3
Average-3s (OFF)	---	-1.291E-5	2.223E-6	2.795E-5	5.111E-4
Average (Bias1)	---	-5.763E-6	6.312E-5	1.773E-4	1.402E-3
s (Bias1)	---	7.561E-6	1.855E-5	3.189E-5	1.458E-4
Average+3s (Bias1)	---	1.692E-5	1.188E-4	2.729E-4	1.840E-3
Average-3s (Bias1)	---	-2.845E-5	7.455E-6	8.159E-5	9.649E-4
Average (Bias2)	---	2.702E-5	6.969E-5	2.132E-4	1.459E-3
s (Bias2)	---	4.004E-5	4.552E-5	5.794E-5	2.357E-4
Average+3s (Bias2)	---	1.472E-4	2.063E-4	3.871E-4	2.166E-3
Average-3s (Bias2)	---	-9.311E-5	-6.688E-5	3.939E-5	7.519E-4

30 MeV proton / detailed results

14.CTR3

Ta=25°C; Vce=5V; If=10mA



30 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	567.16	563.46	558.01	556.09	567.26
N° 2 (Bias1)	530.65	519.30	504.97	483.12	433.57
N° 3 (Bias1)	567.63	550.84	544.44	523.22	464.80
N° 4 (Bias1)	547.37	539.57	520.03	503.98	446.75
N° 5 (Bias1)	540.26	523.34	515.14	492.08	438.54
N° 6 (Bias1)	547.53	539.80	524.78	500.39	445.61
N° 7 (Bias2)	548.06	555.59	531.83	512.27	435.54
N° 8 (Bias2)	546.27	547.77	531.76	513.95	438.95
N° 9 (Bias2)	569.94	571.50	549.79	529.09	448.88
N° 10 (Bias2)	561.45	562.49	542.82	523.27	446.53
N° 11 (Bias2)	571.88	572.68	552.62	532.21	450.55
N° 12 (OFF)	544.80	540.87	521.95	504.60	427.65
N° 13 (OFF)	564.03	559.05	540.58	522.37	442.19
N° 14 (OFF)	562.74	557.58	554.50	518.72	442.70
N° 15 (OFF)	546.19	540.88	508.44	504.43	431.28
N° 16 (OFF)	541.48	516.49	519.77	500.67	423.72

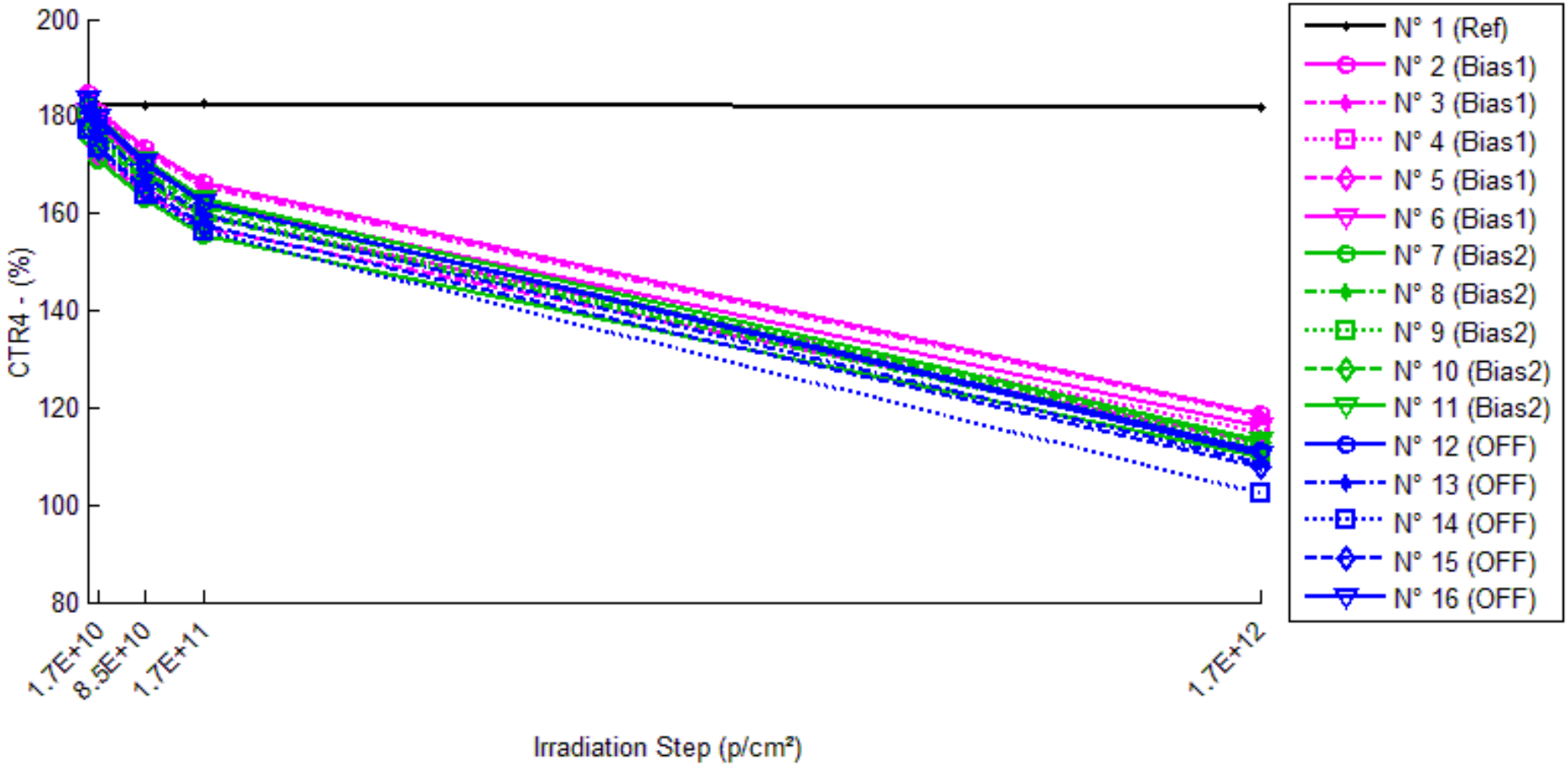
1/Delta [CTR3]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.159E-5	2.892E-5	3.511E-5	-2.878E-7
N° 2 (Bias1)	---	4.119E-5	9.583E-5	1.854E-4	4.220E-4
N° 3 (Bias1)	---	5.369E-5	7.502E-5	1.495E-4	3.897E-4
N° 4 (Bias1)	---	2.641E-5	9.607E-5	1.573E-4	4.115E-4
N° 5 (Bias1)	---	5.983E-5	9.028E-5	1.812E-4	4.293E-4
N° 6 (Bias1)	---	2.614E-5	7.917E-5	1.720E-4	4.177E-4
N° 7 (Bias2)	---	-2.472E-5	5.566E-5	1.275E-4	4.714E-4
N° 8 (Bias2)	---	-5.007E-6	4.997E-5	1.151E-4	4.476E-4
N° 9 (Bias2)	---	-4.785E-6	6.431E-5	1.355E-4	4.732E-4
N° 10 (Bias2)	---	-3.315E-6	6.111E-5	1.299E-4	4.584E-4
N° 11 (Bias2)	---	-2.434E-6	6.094E-5	1.303E-4	4.709E-4
N° 12 (OFF)	---	1.335E-5	8.035E-5	1.462E-4	5.029E-4
N° 13 (OFF)	---	1.580E-5	7.689E-5	1.414E-4	4.885E-4
N° 14 (OFF)	---	1.648E-5	2.641E-5	1.508E-4	4.819E-4
N° 15 (OFF)	---	1.797E-5	1.359E-4	1.516E-4	4.879E-4
N° 16 (OFF)	---	8.936E-5	7.712E-5	1.505E-4	5.132E-4
Average (OFF)	---	4.145E-5	8.727E-5	1.691E-4	4.140E-4
s (OFF)	---	1.540E-5	9.686E-6	1.537E-5	1.506E-5
Average+3s (OFF)	---	8.764E-5	1.163E-4	2.152E-4	4.592E-4
Average-3s (OFF)	---	-4.737E-6	5.821E-5	1.230E-4	3.689E-4
Average (Bias1)	---	-8.052E-6	5.840E-5	1.277E-4	4.643E-4
s (Bias1)	---	9.379E-6	5.640E-6	7.595E-6	1.105E-5
Average+3s (Bias1)	---	2.008E-5	7.532E-5	1.505E-4	4.974E-4
Average-3s (Bias1)	---	-3.619E-5	4.148E-5	1.049E-4	4.311E-4
Average (Bias2)	---	3.059E-5	7.934E-5	1.481E-4	4.949E-4
s (Bias2)	---	3.290E-5	3.878E-5	4.290E-6	1.284E-5
Average+3s (Bias2)	---	1.293E-4	1.957E-4	1.610E-4	5.334E-4
Average-3s (Bias2)	---	-6.810E-5	-3.700E-5	1.352E-4	4.564E-4

30 MeV proton / detailed results

15.CTR4

Ta=25°C; Vce=5V; If=50mA



30 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	181.96	180.66	177.73	179.54	182.18
N° 2 (Bias1)	164.83	160.95	154.73	147.82	127.74
N° 3 (Bias1)	182.93	178.90	173.47	166.08	141.66
N° 4 (Bias1)	174.74	171.53	164.28	157.81	134.52
N° 5 (Bias1)	173.46	169.39	163.49	156.77	133.78
N° 6 (Bias1)	176.07	170.13	166.59	158.23	134.96
N° 7 (Bias2)	176.07	176.13	169.08	161.52	132.59
N° 8 (Bias2)	173.55	173.91	167.43	160.59	132.84
N° 9 (Bias2)	185.28	185.65	176.55	168.19	137.57
N° 10 (Bias2)	179.30	179.58	171.46	163.70	134.18
N° 11 (Bias2)	185.63	185.95	177.36	169.06	137.38
N° 12 (OFF)	176.39	174.41	166.61	159.38	130.08
N° 13 (OFF)	182.59	180.36	172.41	164.85	134.36
N° 14 (OFF)	181.40	179.08	171.88	163.13	133.49
N° 15 (OFF)	172.68	170.46	162.59	155.91	128.53
N° 16 (OFF)	174.24	170.53	164.71	157.46	128.91

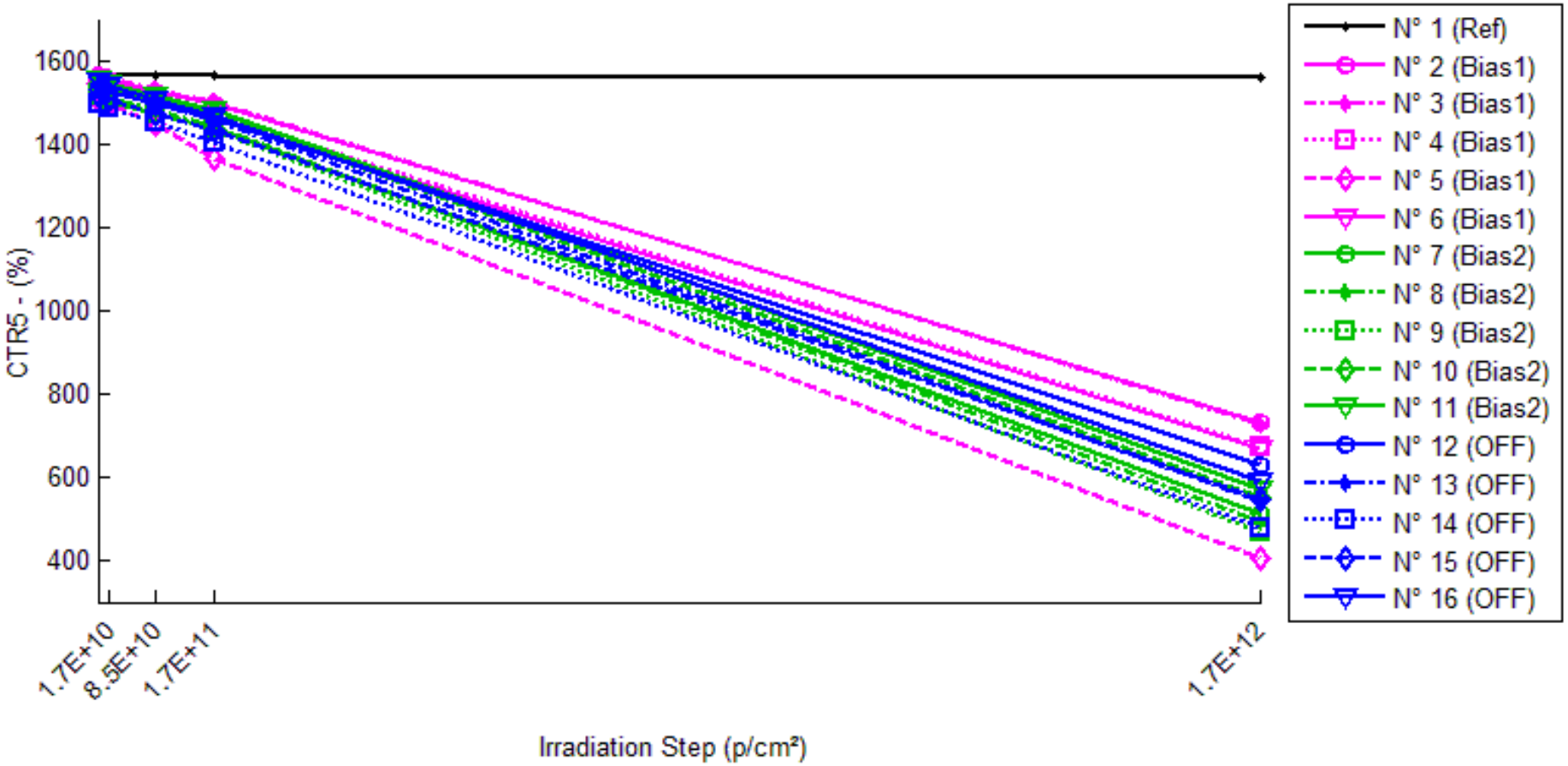
1/Delta [CTR4]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	3.949E-5	1.308E-4	7.411E-5	-6.754E-6
N° 2 (Bias1)	---	1.466E-4	3.963E-4	6.982E-4	1.762E-3
N° 3 (Bias1)	---	1.232E-4	2.981E-4	5.548E-4	1.593E-3
N° 4 (Bias1)	---	1.070E-4	3.644E-4	6.140E-4	1.711E-3
N° 5 (Bias1)	---	1.385E-4	3.517E-4	6.140E-4	1.710E-3
N° 6 (Bias1)	---	1.985E-4	3.233E-4	6.404E-4	1.730E-3
N° 7 (Bias2)	---	-1.738E-6	2.347E-4	5.117E-4	1.863E-3
N° 8 (Bias2)	---	-1.175E-5	2.107E-4	4.649E-4	1.766E-3
N° 9 (Bias2)	---	-1.093E-5	2.667E-4	5.484E-4	1.872E-3
N° 10 (Bias2)	---	-8.774E-6	2.550E-4	5.315E-4	1.875E-3
N° 11 (Bias2)	---	-9.088E-6	2.513E-4	5.280E-4	1.892E-3
N° 12 (OFF)	---	6.432E-5	3.328E-4	6.049E-4	2.018E-3
N° 13 (OFF)	---	6.792E-5	3.235E-4	5.896E-4	1.966E-3
N° 14 (OFF)	---	7.149E-5	3.054E-4	6.177E-4	1.979E-3
N° 15 (OFF)	---	7.522E-5	3.593E-4	6.229E-4	1.989E-3
N° 16 (OFF)	---	1.249E-4	3.318E-4	6.113E-4	2.018E-3
Average (OFF)	---	1.428E-4	3.467E-4	6.243E-4	1.701E-3
s (OFF)	---	3.465E-5	3.777E-5	5.189E-5	6.414E-5
Average+3s (OFF)	---	2.467E-4	4.600E-4	7.800E-4	1.894E-3
Average-3s (OFF)	---	3.880E-5	2.334E-4	4.686E-4	1.509E-3
Average (Bias1)	---	-8.454E-6	2.437E-4	5.169E-4	1.854E-3
s (Bias1)	---	3.954E-6	2.168E-5	3.186E-5	5.004E-5
Average+3s (Bias1)	---	3.409E-6	3.087E-4	6.125E-4	2.004E-3
Average-3s (Bias1)	---	-2.032E-5	1.786E-4	4.213E-4	1.703E-3
Average (Bias2)	---	8.076E-5	3.306E-4	6.093E-4	1.994E-3
s (Bias2)	---	2.499E-5	1.946E-5	1.291E-5	2.353E-5
Average+3s (Bias2)	---	1.557E-4	3.890E-4	6.480E-4	2.064E-3
Average-3s (Bias2)	---	5.802E-6	2.722E-4	5.706E-4	1.923E-3

30 MeV proton / detailed results

16.CTR5

Ta=25°C; Vce=30V; If=5mA



30 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1563.02	1565.12	1559.43	1560.43	1561.87
N° 2 (Bias1)	1521.45	1514.72	1485.76	1448.58	1044.00
N° 3 (Bias1)	1547.63	1544.68	1522.18	1495.24	1247.69
N° 4 (Bias1)	1527.23	1528.24	1500.71	1472.09	1197.14
N° 5 (Bias1)	1520.18	1514.64	1484.51	1442.85	1036.02
N° 6 (Bias1)	1527.77	1531.32	1496.64	1464.62	1130.63
N° 7 (Bias2)	1524.14	1536.62	1500.58	1457.45	1004.90
N° 8 (Bias2)	1510.96	1514.10	1489.45	1449.14	1006.81
N° 9 (Bias2)	1560.91	1562.57	1530.48	1494.46	1181.24
N° 10 (Bias2)	1542.50	1543.61	1515.75	1481.28	1120.28
N° 11 (Bias2)	1561.37	1562.90	1536.56	1504.28	1201.31
N° 12 (OFF)	1519.45	1514.15	1486.97	1456.09	1155.86
N° 13 (OFF)	1558.26	1551.24	1525.11	1494.29	1148.01
N° 14 (OFF)	1540.71	1534.32	1547.44	1469.65	1099.86
N° 15 (OFF)	1514.96	1507.51	1501.09	1438.88	1021.53
N° 16 (OFF)	1507.97	1499.91	1472.87	1431.90	954.69

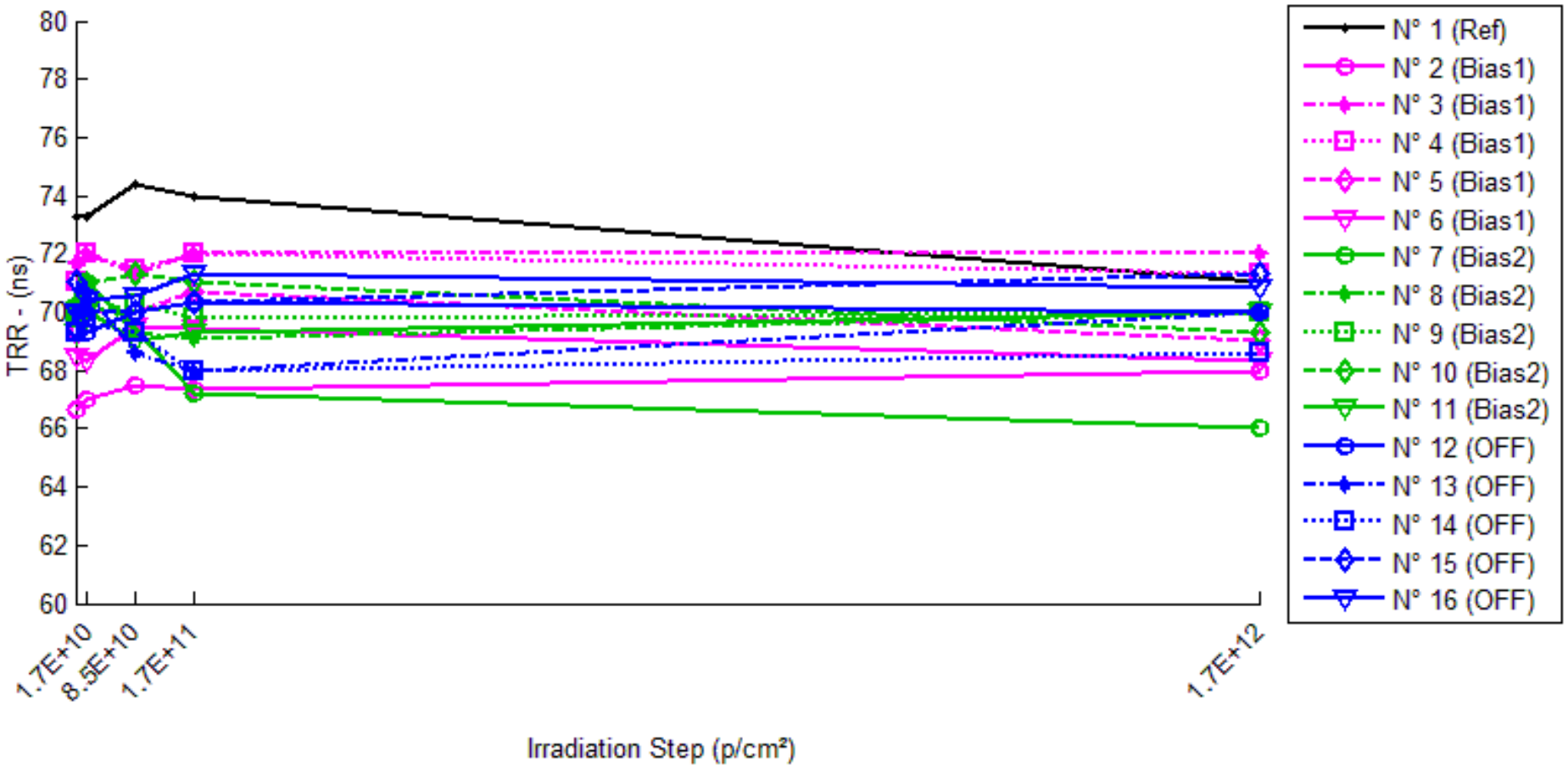
1/Delta [CTR5]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-8.564E-7	1.475E-6	1.065E-6	4.711E-7
N° 2 (Bias1)	---	2.918E-6	1.579E-5	3.306E-5	3.006E-4
N° 3 (Bias1)	---	1.235E-6	1.080E-5	2.264E-5	1.553E-4
N° 4 (Bias1)	---	-4.315E-7	1.157E-5	2.453E-5	1.805E-4
N° 5 (Bias1)	---	2.405E-6	1.580E-5	3.525E-5	3.074E-4
N° 6 (Bias1)	---	-1.517E-6	1.362E-5	2.822E-5	2.299E-4
N° 7 (Bias2)	---	-5.327E-6	1.030E-5	3.002E-5	3.390E-4
N° 8 (Bias2)	---	-1.374E-6	9.555E-6	2.823E-5	3.314E-4
N° 9 (Bias2)	---	-6.810E-7	1.274E-5	2.848E-5	2.059E-4
N° 10 (Bias2)	---	-4.649E-7	1.144E-5	2.680E-5	2.443E-4
N° 11 (Bias2)	---	-6.282E-7	1.034E-5	2.430E-5	1.920E-4
N° 12 (OFF)	---	2.301E-6	1.437E-5	2.864E-5	2.070E-4
N° 13 (OFF)	---	2.903E-6	1.395E-5	2.747E-5	2.293E-4
N° 14 (OFF)	---	2.701E-6	-2.824E-6	3.138E-5	2.602E-4
N° 15 (OFF)	---	3.261E-6	6.100E-6	3.490E-5	3.188E-4
N° 16 (OFF)	---	3.567E-6	1.580E-5	3.523E-5	3.843E-4
Average (OFF)	---	9.219E-7	1.352E-5	2.874E-5	2.348E-4
s (OFF)	---	1.875E-6	2.320E-6	5.391E-6	6.871E-5
Average+3s (OFF)	---	6.547E-6	2.048E-5	4.492E-5	4.409E-4
Average-3s (OFF)	---	-4.703E-6	6.557E-6	1.257E-5	2.863E-5
Average (Bias1)	---	-1.695E-6	1.088E-5	2.757E-5	2.625E-4
s (Bias1)	---	2.060E-6	1.239E-6	2.154E-6	6.912E-5
Average+3s (Bias1)	---	4.484E-6	1.459E-5	3.403E-5	4.699E-4
Average-3s (Bias1)	---	-7.874E-6	7.159E-6	2.111E-5	5.517E-5
Average (Bias2)	---	2.947E-6	9.481E-6	3.152E-5	2.799E-4
s (Bias2)	---	4.906E-7	7.854E-6	3.532E-6	7.190E-5
Average+3s (Bias2)	---	4.418E-6	3.304E-5	4.212E-5	4.956E-4
Average-3s (Bias2)	---	1.475E-6	-1.408E-5	2.093E-5	6.423E-5

30 MeV proton / detailed results

17.TRR

Ta=25°C; If=5mA; RL=100Ohms; Irec = 10% Irm



30 MeV proton / detailed results

TRR . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	95.68	96.04	97.34	96.71	97.50
N° 2 (Bias1)	93.85	93.41	95.29	94.79	93.92
N° 3 (Bias1)	94.60	92.50	96.21	95.39	93.18
N° 4 (Bias1)	95.01	93.01	94.61	94.00	92.25
N° 5 (Bias1)	92.83	94.70	97.52	93.75	93.83
N° 6 (Bias1)	97.60	94.77	92.35	94.66	93.92
N° 7 (Bias2)	95.59	95.90	93.33	93.07	94.84
N° 8 (Bias2)	94.74	96.30	94.12	94.59	94.48
N° 9 (Bias2)	95.02	93.69	92.83	97.80	94.81
N° 10 (Bias2)	95.40	93.62	97.01	95.02	94.18
N° 11 (Bias2)	95.24	95.04	94.56	93.44	93.33
N° 12 (OFF)	92.91	92.12	93.92	93.07	94.74
N° 13 (OFF)	94.64	93.98	96.36	95.93	93.15
N° 14 (OFF)	96.00	93.24	94.74	96.13	92.53
N° 15 (OFF)	95.40	91.29	95.84	95.41	92.00
N° 16 (OFF)	96.30	93.41	93.21	96.75	94.55

Delta [TRR]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	3.606E-1	1.659E+0	1.034E+0	1.823E+0
N° 2 (Bias1)	---	-4.396E-1	1.448E+0	9.455E-1	7.650E-2
N° 3 (Bias1)	---	-2.100E+0	1.608E+0	7.896E-1	-1.419E+0
N° 4 (Bias1)	---	-2.002E+0	-4.073E-1	-1.013E+0	-2.767E+0
N° 5 (Bias1)	---	1.871E+0	4.692E+0	9.213E-1	9.985E-1
N° 6 (Bias1)	---	-2.839E+0	-5.252E+0	-2.948E+0	-3.682E+0
N° 7 (Bias2)	---	3.134E-1	-2.255E+0	-2.519E+0	-7.508E-1
N° 8 (Bias2)	---	1.559E+0	-6.192E-1	-1.423E-1	-2.617E-1
N° 9 (Bias2)	---	-1.330E+0	-2.189E+0	2.778E+0	-2.189E-1
N° 10 (Bias2)	---	-1.785E+0	1.608E+0	-3.815E-1	-1.222E+0
N° 11 (Bias2)	---	-2.026E-1	-6.754E-1	-1.795E+0	-1.905E+0
N° 12 (OFF)	---	-7.972E-1	1.009E+0	1.559E-1	1.823E+0
N° 13 (OFF)	---	-6.579E-1	1.721E+0	1.285E+0	-1.494E+0
N° 14 (OFF)	---	-2.762E+0	-1.263E+0	1.326E-1	-3.473E+0
N° 15 (OFF)	---	-4.110E+0	4.489E-1	1.041E-2	-3.396E+0
N° 16 (OFF)	---	-2.890E+0	-3.084E+0	4.499E-1	-1.751E+0
Average (OFF)	---	-1.102E+0	4.178E-1	-2.610E-1	-1.359E+0
s (OFF)	---	1.878E+0	3.660E+0	1.714E+0	1.937E+0
Average+3s (OFF)	---	4.531E+0	1.140E+1	4.880E+0	4.451E+0
Average-3s (OFF)	---	-6.735E+0	-1.056E+1	-5.402E+0	-7.168E+0
Average (Bias1)	---	-2.891E-1	-8.262E-1	-4.120E-1	-8.717E-1
s (Bias1)	---	1.333E+0	1.572E+0	2.037E+0	7.077E-1
Average+3s (Bias1)	---	3.711E+0	3.891E+0	5.700E+0	1.251E+0
Average-3s (Bias1)	---	-4.289E+0	-5.543E+0	-6.524E+0	-2.995E+0
Average (Bias2)	---	-2.243E+0	-2.336E-1	4.067E-1	-1.658E+0
s (Bias2)	---	1.481E+0	1.937E+0	5.167E-1	2.149E+0
Average+3s (Bias2)	---	2.200E+0	5.578E+0	1.957E+0	4.789E+0
Average-3s (Bias2)	---	-6.686E+0	-6.046E+0	-1.143E+0	-8.105E+0

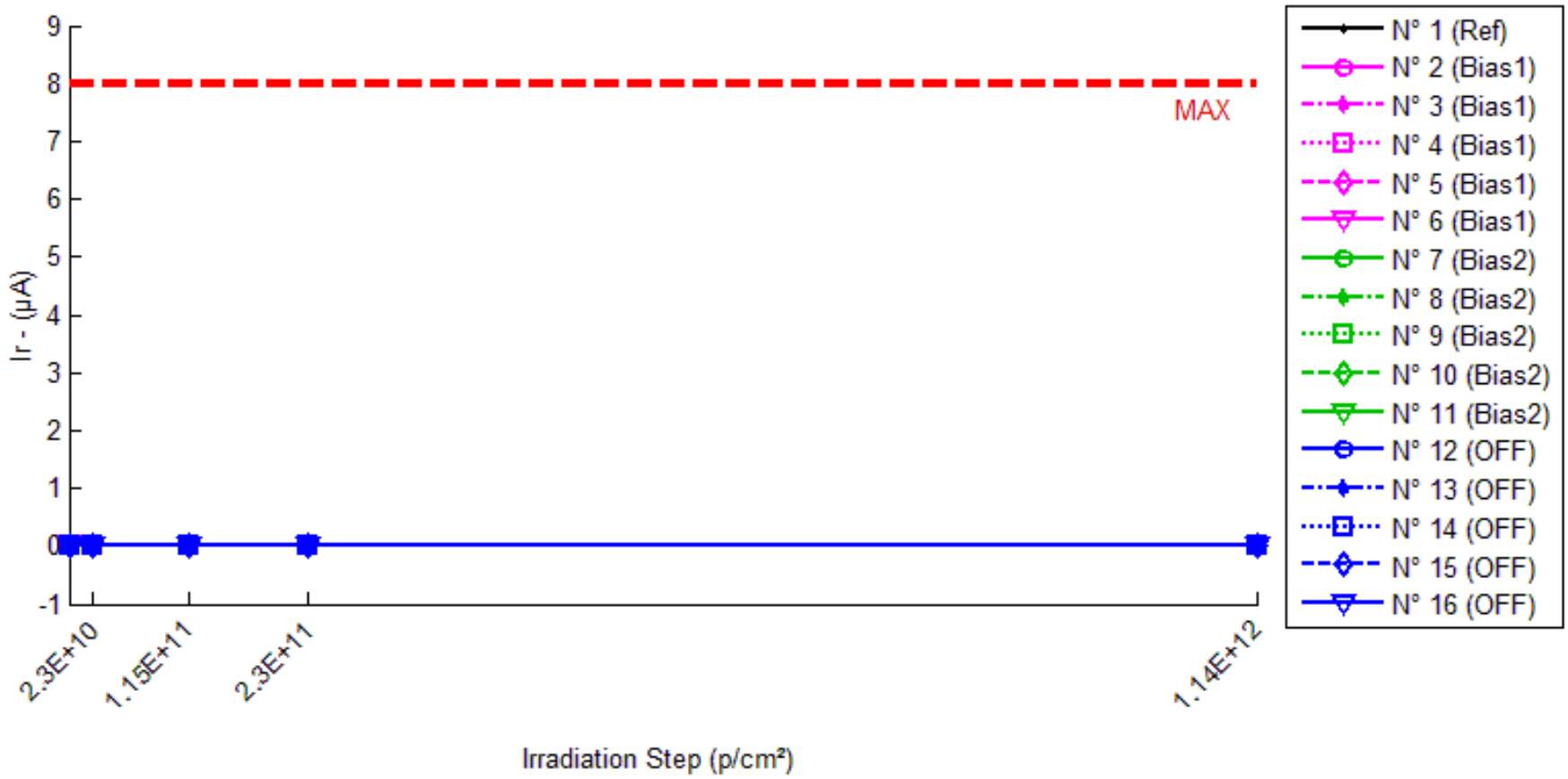
60 MeV proton / detailed results

CONTENTS

60 MeV proton / detailed results

1. Ir

Ta=25°C; Vr=6V



60 MeV proton / detailed results

Ir . (µA) **Max = 8.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	5.350E-3	5.315E-3	5.022E-3	5.199E-3	5.400E-3
N° 2 (Bias1)	4.185E-5	2.008E-4	3.760E-4	5.384E-4	1.834E-3
N° 3 (Bias1)	4.298E-5	2.054E-4	4.390E-4	5.349E-4	1.745E-3
N° 4 (Bias1)	1.274E-4	2.069E-4	3.783E-4	5.416E-4	1.970E-3
N° 5 (Bias1)	1.553E-4	3.130E-4	4.585E-4	6.235E-4	1.961E-3
N° 6 (Bias1)	3.342E-2	2.675E-2	2.322E-2	2.337E-2	2.559E-2
N° 7 (Bias2)	2.810E-5	4.373E-5	3.092E-4	5.772E-4	2.526E-3
N° 8 (Bias2)	3.346E-5	4.767E-5	3.717E-4	6.175E-4	2.893E-3
N° 9 (Bias2)	8.945E-4	8.658E-4	1.330E-3	1.586E-3	3.171E-3
N° 10 (Bias2)	4.030E-5	5.937E-5	4.963E-4	8.331E-4	4.041E-3
N° 11 (Bias2)	1.663E-4	1.833E-4	5.046E-4	7.525E-4	3.349E-3
N° 12 (OFF)	2.160E-5	7.932E-5	3.135E-4	5.870E-4	1.881E-3
N° 13 (OFF)	2.705E-5	9.851E-5	3.067E-4	5.956E-4	2.487E-3
N° 14 (OFF)	3.091E-4	4.142E-4	6.279E-4	8.396E-4	2.361E-3
N° 15 (OFF)	3.422E-5	1.299E-4	3.891E-4	7.628E-4	2.222E-3
N° 16 (OFF)	3.493E-5	1.206E-4	4.442E-4	7.711E-4	2.311E-3

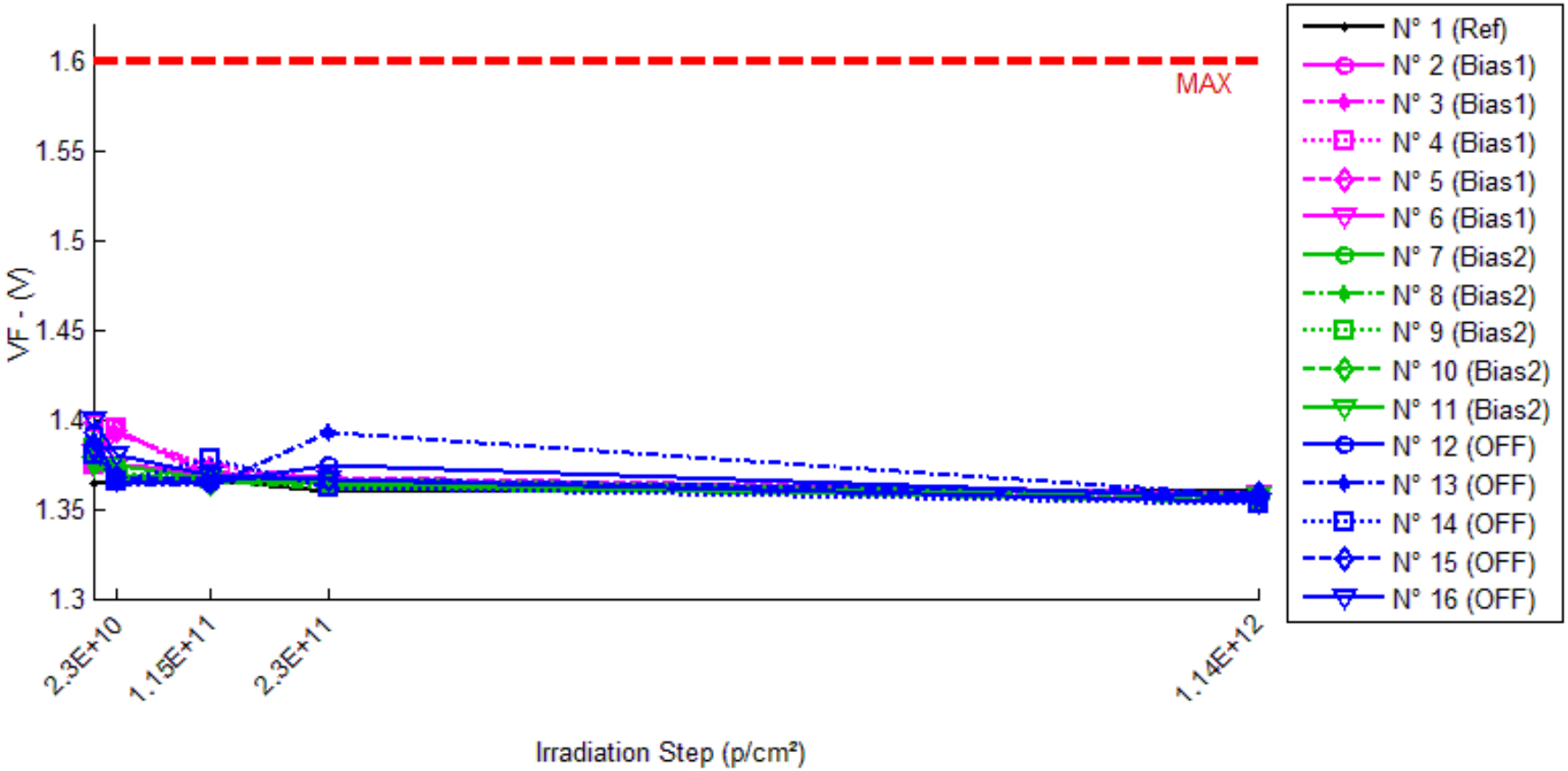
Delta [Ir]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	-3.459E-5	-3.279E-4	-1.509E-4	4.974E-5
N° 2 (Bias1)	---	1.589E-4	3.341E-4	4.965E-4	1.792E-3
N° 3 (Bias1)	---	1.624E-4	3.960E-4	4.919E-4	1.702E-3
N° 4 (Bias1)	---	7.956E-5	2.510E-4	4.143E-4	1.843E-3
N° 5 (Bias1)	---	1.577E-4	3.033E-4	4.682E-4	1.806E-3
N° 6 (Bias1)	---	-6.676E-3	-1.020E-2	-1.006E-2	-7.830E-3
N° 7 (Bias2)	---	1.563E-5	2.811E-4	5.491E-4	2.498E-3
N° 8 (Bias2)	---	1.421E-5	3.382E-4	5.840E-4	2.859E-3
N° 9 (Bias2)	---	-2.871E-5	4.354E-4	6.917E-4	2.276E-3
N° 10 (Bias2)	---	1.907E-5	4.560E-4	7.928E-4	4.001E-3
N° 11 (Bias2)	---	1.702E-5	3.383E-4	5.862E-4	3.183E-3
N° 12 (OFF)	---	5.772E-5	2.919E-4	5.654E-4	1.860E-3
N° 13 (OFF)	---	7.146E-5	2.797E-4	5.686E-4	2.460E-3
N° 14 (OFF)	---	1.051E-4	3.188E-4	5.304E-4	2.052E-3
N° 15 (OFF)	---	9.573E-5	3.549E-4	7.286E-4	2.188E-3
N° 16 (OFF)	---	8.571E-5	4.093E-4	7.361E-4	2.276E-3
Average (OFF)	---	-1.223E-3	-1.783E-3	-1.637E-3	-1.374E-4
σ (OFF)	---	3.048E-3	4.706E-3	4.706E-3	4.301E-3
Average+3σ (OFF)	---	7.921E-3	1.233E-2	1.248E-2	1.277E-2
Average-3σ (OFF)	---	-1.037E-2	-1.590E-2	-1.576E-2	-1.304E-2
Average (Bias1)	---	7.444E-6	3.698E-4	6.408E-4	2.963E-3
σ (Bias1)	---	2.029E-5	7.348E-5	1.004E-4	6.752E-4
Average+3σ (Bias1)	---	6.832E-5	5.902E-4	9.420E-4	4.989E-3
Average-3σ (Bias1)	---	-5.343E-5	1.493E-4	3.396E-4	9.380E-4
Average (Bias2)	---	8.314E-5	3.309E-4	6.258E-4	2.167E-3
σ (Bias2)	---	1.890E-5	5.246E-5	9.843E-5	2.268E-4
Average+3σ (Bias2)	---	1.399E-4	4.883E-4	9.211E-4	2.847E-3
Average-3σ (Bias2)	---	2.643E-5	1.735E-4	3.305E-4	1.487E-3

60 MeV proton / detailed results

2. VF

Ta=25°C; If=10mA



60 MeV proton / detailed results

VF . (V) **Max = 1.6**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	1.365	1.367	1.368	1.361	1.362
N° 2 (Bias1)	1.399	1.376	1.370	1.366	1.360
N° 3 (Bias1)	1.373	1.393	1.375	1.367	1.356
N° 4 (Bias1)	1.375	1.396	1.368	1.368	1.357
N° 5 (Bias1)	1.382	1.395	1.371	1.369	1.360
N° 6 (Bias1)	1.382	1.375	1.372	1.365	1.360
N° 7 (Bias2)	1.381	1.376	1.367	1.365	1.355
N° 8 (Bias2)	1.389	1.367	1.366	1.363	1.357
N° 9 (Bias2)	1.385	1.371	1.367	1.365	1.355
N° 10 (Bias2)	1.379	1.367	1.365	1.365	1.356
N° 11 (Bias2)	1.375	1.370	1.367	1.367	1.358
N° 12 (OFF)	1.394	1.366	1.365	1.376	1.357
N° 13 (OFF)	1.388	1.365	1.364	1.394	1.359
N° 14 (OFF)	1.381	1.366	1.379	1.363	1.354
N° 15 (OFF)	1.385	1.369	1.368	1.367	1.360
N° 16 (OFF)	1.400	1.381	1.370	1.367	1.355

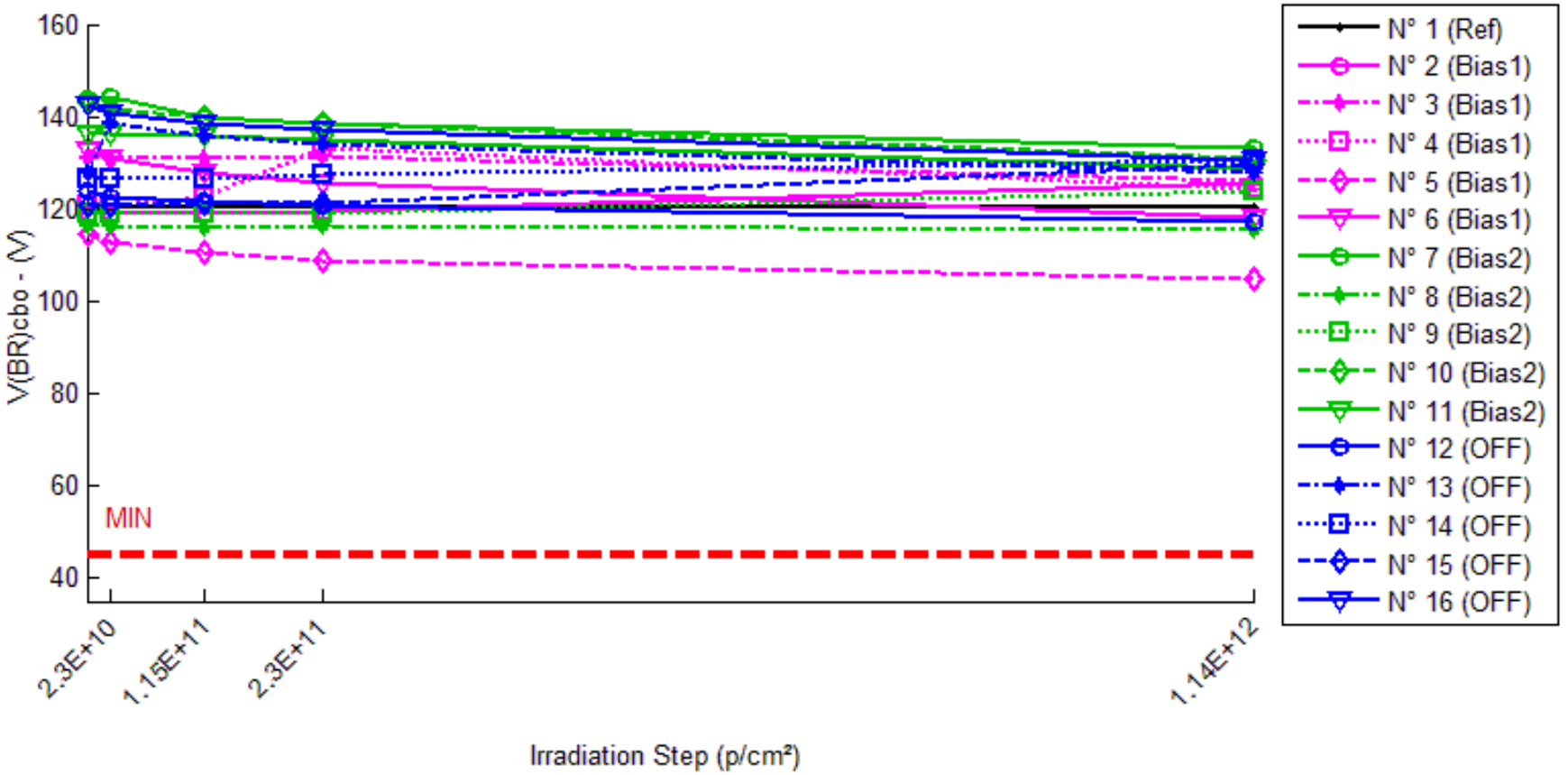
Delta [VF]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	2.558E-3	3.219E-3	-3.830E-3	-3.268E-3
N° 2 (Bias1)	---	-2.314E-2	-2.831E-2	-3.316E-2	-3.874E-2
N° 3 (Bias1)	---	2.044E-2	1.605E-3	-6.177E-3	-1.682E-2
N° 4 (Bias1)	---	2.070E-2	-7.107E-3	-7.315E-3	-1.796E-2
N° 5 (Bias1)	---	1.351E-2	-1.061E-2	-1.300E-2	-2.197E-2
N° 6 (Bias1)	---	-6.808E-3	-1.013E-2	-1.692E-2	-2.212E-2
N° 7 (Bias2)	---	-4.732E-3	-1.374E-2	-1.611E-2	-2.553E-2
N° 8 (Bias2)	---	-2.181E-2	-2.290E-2	-2.578E-2	-3.230E-2
N° 9 (Bias2)	---	-1.455E-2	-1.805E-2	-1.987E-2	-3.035E-2
N° 10 (Bias2)	---	-1.153E-2	-1.394E-2	-1.404E-2	-2.280E-2
N° 11 (Bias2)	---	-5.669E-3	-8.342E-3	-8.548E-3	-1.749E-2
N° 12 (OFF)	---	-2.867E-2	-2.924E-2	-1.829E-2	-3.733E-2
N° 13 (OFF)	---	-2.326E-2	-2.427E-2	5.793E-3	-2.983E-2
N° 14 (OFF)	---	-1.529E-2	-1.856E-3	-1.792E-2	-2.670E-2
N° 15 (OFF)	---	-1.625E-2	-1.744E-2	-1.829E-2	-2.598E-2
N° 16 (OFF)	---	-1.948E-2	-3.080E-2	-3.354E-2	-4.551E-2
Average (OFF)	---	4.939E-3	-1.091E-2	-1.532E-2	-2.352E-2
σ (OFF)	---	1.929E-2	1.089E-2	1.089E-2	8.829E-3
Average+3σ (OFF)	---	6.281E-2	2.177E-2	1.734E-2	2.965E-3
Average-3σ (OFF)	---	-5.293E-2	-4.359E-2	-4.797E-2	-5.001E-2
Average (Bias1)	---	-1.166E-2	-1.540E-2	-1.687E-2	-2.570E-2
σ (Bias1)	---	6.988E-3	5.432E-3	6.445E-3	5.935E-3
Average+3σ (Bias1)	---	9.305E-3	8.993E-4	2.467E-3	-7.891E-3
Average-3σ (Bias1)	---	-3.262E-2	-3.169E-2	-3.620E-2	-4.350E-2
Average (Bias2)	---	-2.059E-2	-2.072E-2	-1.645E-2	-3.307E-2
σ (Bias2)	---	5.490E-3	1.176E-2	1.410E-2	8.282E-3
Average+3σ (Bias2)	---	-4.122E-3	1.456E-2	2.586E-2	-8.223E-3
Average-3σ (Bias2)	---	-3.706E-2	-5.600E-2	-5.876E-2	-5.792E-2

60 MeV proton / detailed results

3. V(BR)cbo

Ta=25°C; Ic=100µA; Ib=0; If=0



60 MeV proton / detailed results

V(BR)cbo . (V) **Min = 45.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	120.28	120.29	120.28	120.28	120.28
N° 2 (Bias1)	119.07	119.08	119.12	119.26	125.74
N° 3 (Bias1)	131.12	131.12	131.16	131.30	126.07
N° 4 (Bias1)	120.67	120.81	122.73	133.13	124.53
N° 5 (Bias1)	114.42	112.74	110.68	109.02	104.66
N° 6 (Bias1)	132.91	131.01	127.97	125.60	118.04
N° 7 (Bias2)	143.76	144.26	139.66	138.42	133.10
N° 8 (Bias2)	116.32	116.29	115.92	116.14	115.66
N° 9 (Bias2)	119.03	119.02	119.09	119.15	123.81
N° 10 (Bias2)	142.91	141.53	139.99	138.49	130.82
N° 11 (Bias2)	136.44	136.49	135.82	134.75	128.63
N° 12 (OFF)	123.76	122.72	121.47	120.65	117.07
N° 13 (OFF)	127.84	138.63	136.00	134.26	127.94
N° 14 (OFF)	126.57	126.57	126.72	127.27	130.69
N° 15 (OFF)	120.89	120.91	121.02	121.40	129.80
N° 16 (OFF)	142.44	140.58	138.49	137.19	130.52

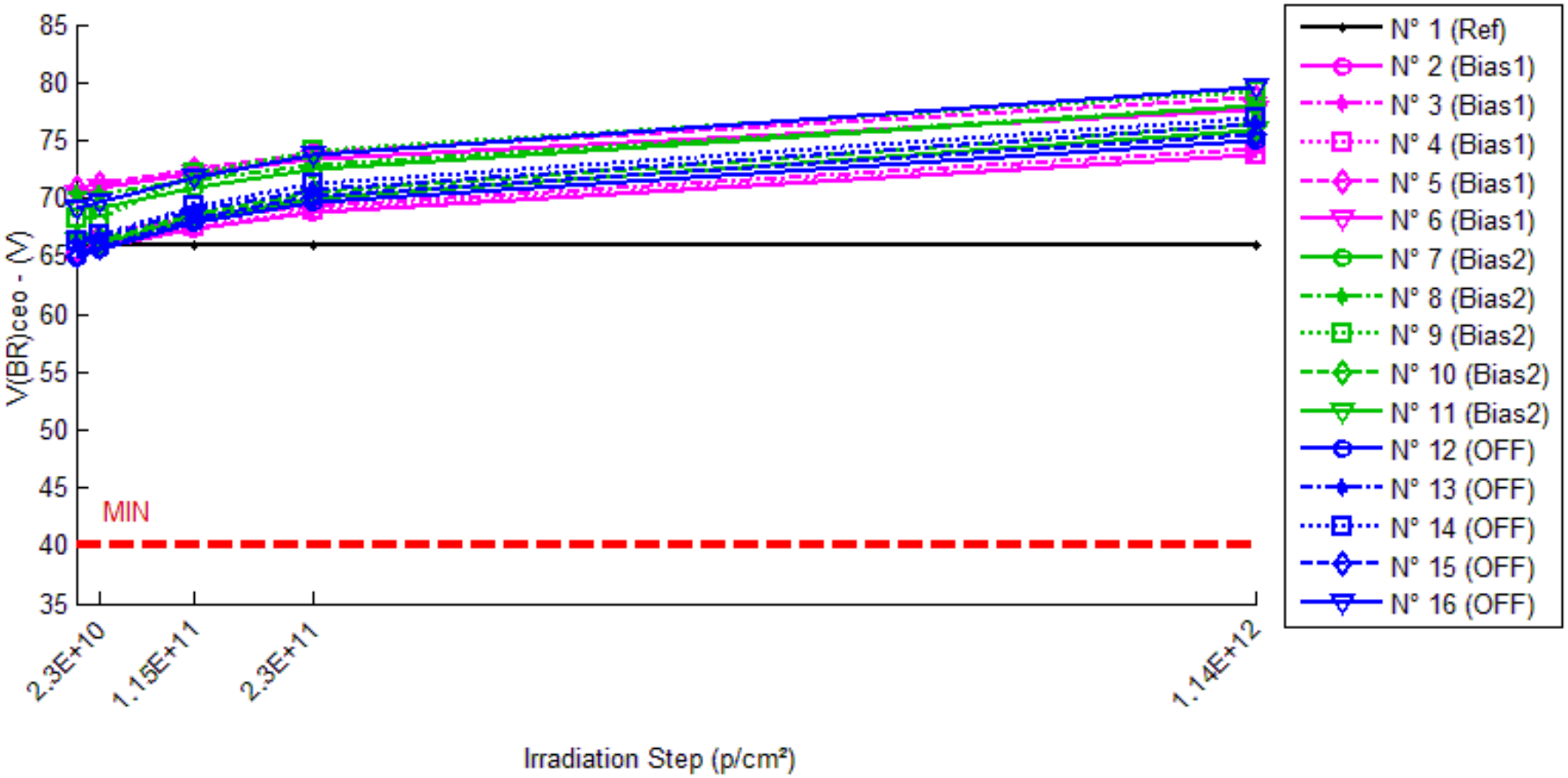
Delta [V(BR)cbo]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.14E12.p/cm²
N° 1 (Ref)	---	1.240E-2	-1.900E-3	2.800E-3	6.000E-3
N° 2 (Bias1)	---	8.600E-3	5.250E-2	1.892E-1	6.670E+0
N° 3 (Bias1)	---	2.500E-3	3.960E-2	1.813E-1	-5.051E+0
N° 4 (Bias1)	---	1.407E-1	2.061E+0	1.246E+1	3.863E+0
N° 5 (Bias1)	---	-1.686E+0	-3.739E+0	-5.400E+0	-9.761E+0
N° 6 (Bias1)	---	-1.904E+0	-4.939E+0	-7.310E+0	-1.487E+1
N° 7 (Bias2)	---	5.020E-1	-4.097E+0	-5.343E+0	-1.067E+1
N° 8 (Bias2)	---	-2.490E-2	-3.951E-1	-1.825E-1	-6.548E-1
N° 9 (Bias2)	---	-1.210E-2	5.780E-2	1.148E-1	4.773E+0
N° 10 (Bias2)	---	-1.380E+0	-2.923E+0	-4.421E+0	-1.209E+1
N° 11 (Bias2)	---	4.190E-2	-6.271E-1	-1.696E+0	-7.816E+0
N° 12 (OFF)	---	-1.043E+0	-2.293E+0	-3.115E+0	-6.696E+0
N° 13 (OFF)	---	1.079E+1	8.159E+0	6.420E+0	1.006E-1
N° 14 (OFF)	---	7.100E-3	1.518E-1	7.060E-1	4.124E+0
N° 15 (OFF)	---	1.950E-2	1.253E-1	5.118E-1	8.913E+0
N° 16 (OFF)	---	-1.867E+0	-3.952E+0	-5.258E+0	-1.193E+1
Average (OFF)	---	-6.877E-1	-1.305E+0	2.462E-2	-3.830E+0
σ (OFF)	---	1.015E+0	2.920E+0	7.713E+0	9.055E+0
Average+3σ (OFF)	---	2.358E+0	7.456E+0	2.316E+1	2.333E+1
Average-3σ (OFF)	---	-3.734E+0	-1.007E+1	-2.311E+1	-3.099E+1
Average (Bias1)	---	-1.745E-1	-1.597E+0	-2.306E+0	-5.291E+0
σ (Bias1)	---	7.080E-1	1.812E+0	2.472E+0	7.147E+0
Average+3σ (Bias1)	---	1.950E+0	3.839E+0	5.110E+0	1.615E+1
Average-3σ (Bias1)	---	-2.299E+0	-7.033E+0	-9.722E+0	-2.673E+1
Average (Bias2)	---	1.582E+0	4.382E-1	-1.472E-1	-1.097E+0
σ (Bias2)	---	5.209E+0	4.651E+0	4.450E+0	8.331E+0
Average+3σ (Bias2)	---	1.721E+1	1.439E+1	1.320E+1	2.389E+1
Average-3σ (Bias2)	---	-1.404E+1	-1.351E+1	-1.350E+1	-2.609E+1

60 MeV proton / detailed results

4. V(BR)ceo

Ta=25°C; Ic=1mA; Ib=0; If=0



60 MeV proton / detailed results

V(BR)ceo . (V) **Min = 40.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	65.93	65.90	65.92	65.91	66.01
N° 2 (Bias1)	65.20	65.70	67.28	68.76	73.78
N° 3 (Bias1)	66.75	67.04	68.21	69.39	74.24
N° 4 (Bias1)	65.42	65.96	67.47	68.87	73.67
N° 5 (Bias1)	70.91	71.26	72.50	73.88	78.70
N° 6 (Bias1)	70.46	70.91	72.11	73.35	77.73
N° 7 (Bias2)	69.16	69.12	70.84	72.51	78.06
N° 8 (Bias2)	70.46	70.43	71.68	72.86	77.93
N° 9 (Bias2)	68.16	68.22	72.11	74.14	79.25
N° 10 (Bias2)	66.47	66.49	68.65	70.51	76.35
N° 11 (Bias2)	66.22	66.18	68.19	70.01	75.95
N° 12 (OFF)	64.96	65.61	67.88	69.61	75.02
N° 13 (OFF)	66.20	66.70	68.94	70.80	76.39
N° 14 (OFF)	66.21	66.88	69.24	71.21	76.86
N° 15 (OFF)	65.14	65.85	68.24	70.13	75.49
N° 16 (OFF)	69.08	69.66	71.81	73.74	79.55

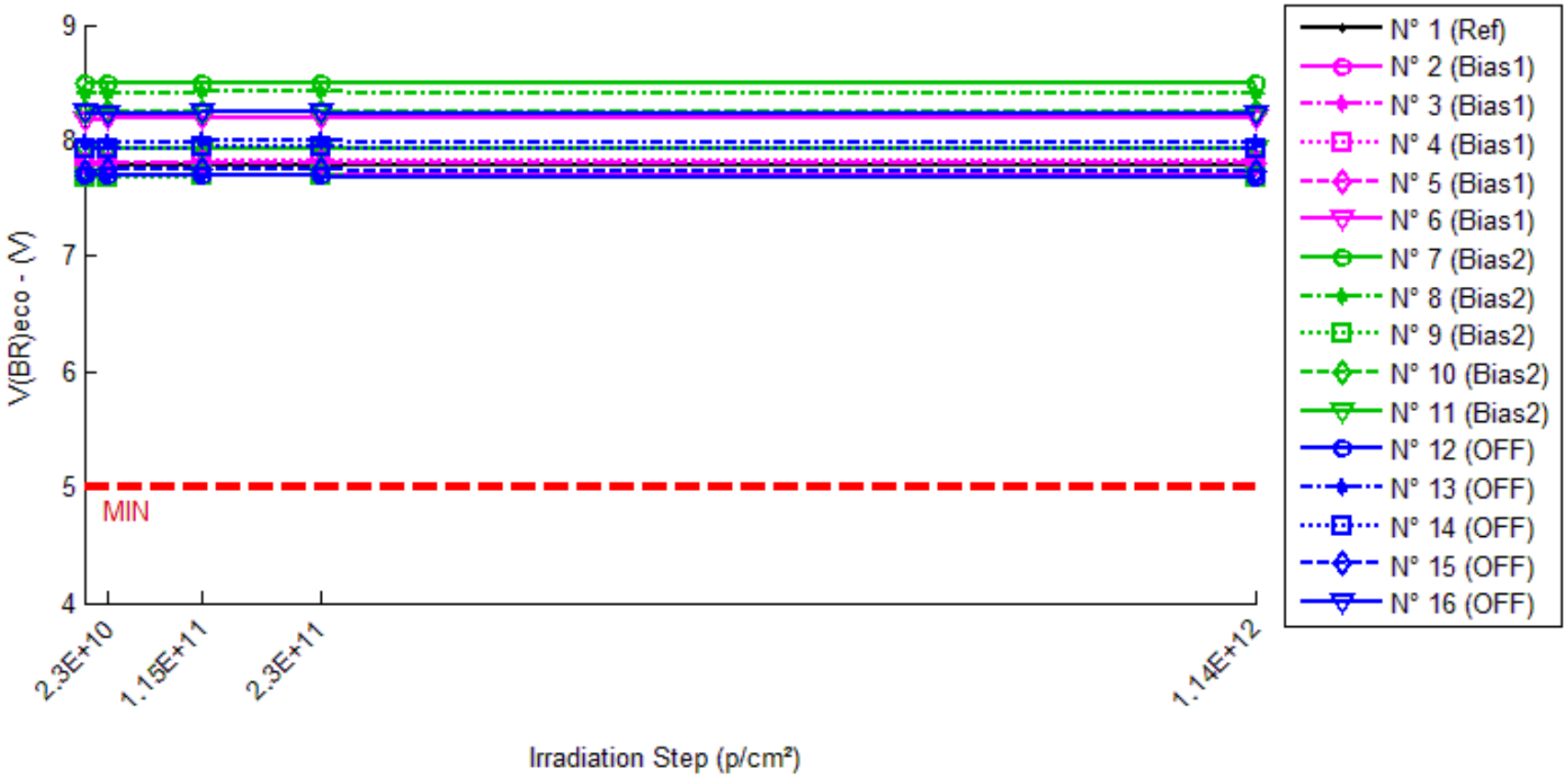
Delta [V(BR)ceo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.930E-2	-2.800E-3	-1.668E-2	8.557E-2
N° 2 (Bias1)	---	5.006E-1	2.078E+0	3.562E+0	8.577E+0
N° 3 (Bias1)	---	2.874E-1	1.457E+0	2.637E+0	7.482E+0
N° 4 (Bias1)	---	5.404E-1	2.052E+0	3.449E+0	8.253E+0
N° 5 (Bias1)	---	3.474E-1	1.586E+0	2.970E+0	7.789E+0
N° 6 (Bias1)	---	4.498E-1	1.657E+0	2.894E+0	7.276E+0
N° 7 (Bias2)	---	-3.378E-2	1.680E+0	3.355E+0	8.904E+0
N° 8 (Bias2)	---	-3.165E-2	1.219E+0	2.399E+0	7.473E+0
N° 9 (Bias2)	---	5.761E-2	3.945E+0	5.973E+0	1.108E+1
N° 10 (Bias2)	---	1.681E-2	2.179E+0	4.037E+0	9.883E+0
N° 11 (Bias2)	---	-3.991E-2	1.973E+0	3.786E+0	9.728E+0
N° 12 (OFF)	---	6.565E-1	2.918E+0	4.652E+0	1.007E+1
N° 13 (OFF)	---	5.002E-1	2.735E+0	4.596E+0	1.019E+1
N° 14 (OFF)	---	6.699E-1	3.036E+0	5.001E+0	1.065E+1
N° 15 (OFF)	---	7.065E-1	3.104E+0	4.988E+0	1.035E+1
N° 16 (OFF)	---	5.891E-1	2.737E+0	4.664E+0	1.048E+1
Average (OFF)	---	4.251E-1	1.766E+0	3.102E+0	7.875E+0
s (OFF)	---	1.056E-1	2.824E-1	3.903E-1	5.376E-1
Average+3s (OFF)	---	7.419E-1	2.613E+0	4.273E+0	9.488E+0
Average-3s (OFF)	---	1.083E-1	9.187E-1	1.932E+0	6.262E+0
Average (Bias1)	---	-6.184E-3	2.199E+0	3.910E+0	9.414E+0
s (Bias1)	---	4.227E-2	1.040E+0	1.311E+0	1.335E+0
Average+3s (Bias1)	---	1.206E-1	5.321E+0	7.844E+0	1.342E+1
Average-3s (Bias1)	---	-1.330E-1	-9.222E-1	-2.409E-2	5.409E+0
Average (Bias2)	---	6.244E-1	2.906E+0	4.780E+0	1.034E+1
s (Bias2)	---	8.143E-2	1.686E-1	1.975E-1	2.297E-1
Average+3s (Bias2)	---	8.687E-1	3.412E+0	5.373E+0	1.103E+1
Average-3s (Bias2)	---	3.801E-1	2.400E+0	4.188E+0	9.656E+0

60 MeV proton / detailed results

5. V(BR)eco

Ta=25°C; Ic=0; Ie=100µA; If=0



60 MeV proton / detailed results

V(BR)eco . (V) **Min = 5.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	7.779	7.779	7.777	7.778	7.778
N° 2 (Bias1)	7.688	7.694	7.699	7.700	7.694
N° 3 (Bias1)	7.789	7.802	7.807	7.810	7.804
N° 4 (Bias1)	7.802	7.811	7.817	7.818	7.813
N° 5 (Bias1)	7.799	7.800	7.802	7.804	7.812
N° 6 (Bias1)	8.183	8.190	8.196	8.199	8.195
N° 7 (Bias2)	8.486	8.487	8.492	8.495	8.500
N° 8 (Bias2)	8.400	8.401	8.422	8.422	8.412
N° 9 (Bias2)	7.677	7.678	7.690	7.691	7.679
N° 10 (Bias2)	8.240	8.241	8.251	8.253	8.245
N° 11 (Bias2)	7.921	7.922	7.934	7.934	7.925
N° 12 (OFF)	7.689	7.696	7.700	7.699	7.682
N° 13 (OFF)	7.980	7.987	7.993	7.993	7.974
N° 14 (OFF)	7.927	7.936	7.942	7.942	7.927
N° 15 (OFF)	7.734	7.744	7.751	7.751	7.734
N° 16 (OFF)	8.238	8.237	8.241	8.241	8.233

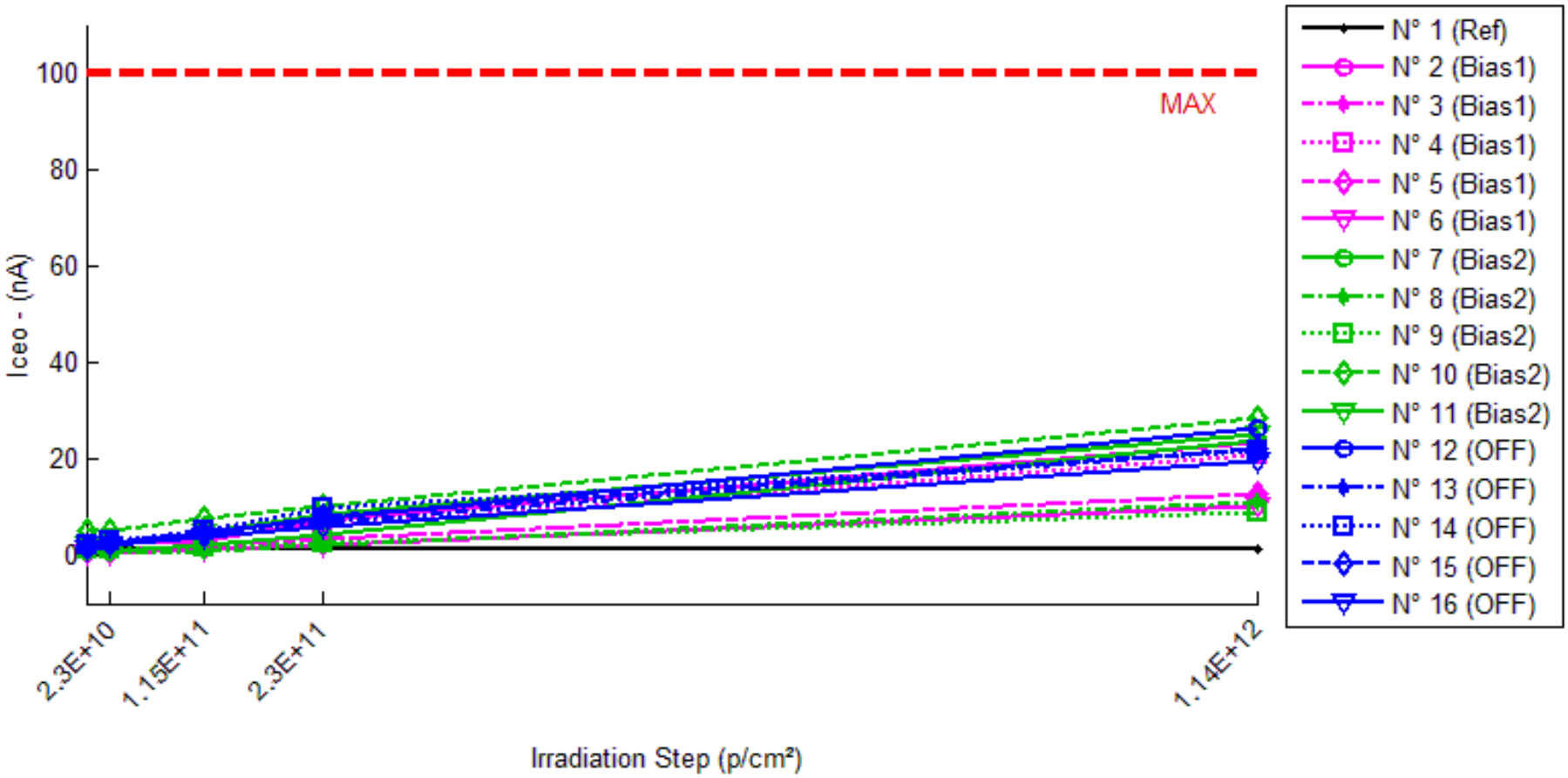
Delta [V(BR)eco]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	5.820E-4	-1.598E-3	-6.870E-4	-1.185E-3
N° 2 (Bias1)	---	6.018E-3	1.106E-2	1.215E-2	6.381E-3
N° 3 (Bias1)	---	1.313E-2	1.857E-2	2.082E-2	1.528E-2
N° 4 (Bias1)	---	9.202E-3	1.514E-2	1.667E-2	1.131E-2
N° 5 (Bias1)	---	8.460E-4	3.512E-3	5.235E-3	1.344E-2
N° 6 (Bias1)	---	7.431E-3	1.364E-2	1.612E-2	1.167E-2
N° 7 (Bias2)	---	1.461E-3	5.795E-3	9.652E-3	1.410E-2
N° 8 (Bias2)	---	1.004E-3	2.173E-2	2.230E-2	1.219E-2
N° 9 (Bias2)	---	1.294E-3	1.312E-2	1.351E-2	2.081E-3
N° 10 (Bias2)	---	8.010E-4	1.174E-2	1.338E-2	5.333E-3
N° 11 (Bias2)	---	9.990E-4	1.253E-2	1.269E-2	3.958E-3
N° 12 (OFF)	---	6.881E-3	1.082E-2	1.056E-2	-6.706E-3
N° 13 (OFF)	---	7.205E-3	1.324E-2	1.317E-2	-6.402E-3
N° 14 (OFF)	---	8.759E-3	1.527E-2	1.508E-2	3.110E-4
N° 15 (OFF)	---	1.054E-2	1.747E-2	1.678E-2	6.750E-4
N° 16 (OFF)	---	-6.650E-4	2.851E-3	3.577E-3	-4.211E-3
Average (OFF)	---	7.325E-3	1.239E-2	1.420E-2	1.162E-2
s (OFF)	---	4.497E-3	5.654E-3	5.878E-3	3.327E-3
Average+3s (OFF)	---	2.082E-2	2.935E-2	3.183E-2	2.160E-2
Average-3s (OFF)	---	-6.166E-3	-4.576E-3	-3.435E-3	1.635E-3
Average (Bias1)	---	1.112E-3	1.298E-2	1.431E-2	7.532E-3
s (Bias1)	---	2.627E-4	5.699E-3	4.734E-3	5.295E-3
Average+3s (Bias1)	---	1.900E-3	3.008E-2	2.851E-2	2.342E-2
Average-3s (Bias1)	---	3.237E-4	-4.114E-3	1.037E-4	-8.351E-3
Average (Bias2)	---	6.545E-3	1.193E-2	1.183E-2	-3.267E-3
s (Bias2)	---	4.284E-3	5.639E-3	5.162E-3	3.567E-3
Average+3s (Bias2)	---	1.940E-2	2.885E-2	2.732E-2	7.434E-3
Average-3s (Bias2)	---	-6.309E-3	-4.988E-3	-3.652E-3	-1.397E-2

60 MeV proton / detailed results

6. Iceo

Ta=25°C; Vce=20V; If=0; Ib=0



60 MeV proton / detailed results

Iceo . (nA) **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)	1.243	1.263	1.451	1.429	1.262
N° 2 (Bias1)	2.189	2.622	3.132	7.263	23.483
N° 3 (Bias1)	0.718	0.896	1.822	3.351	12.573
N° 4 (Bias1)	2.251	2.288	3.948	5.954	21.009
N° 5 (Bias1)	0.896	1.012	2.018	3.236	12.849
N° 6 (Bias1)	0.525	0.572	1.112	1.963	10.164
N° 7 (Bias2)	0.920	0.896	2.204	4.423	23.913
N° 8 (Bias2)	0.545	0.513	0.995	2.153	10.917
N° 9 (Bias2)	1.150	1.215	1.680	2.552	8.796
N° 10 (Bias2)	5.280	5.025	7.575	10.415	28.401
N° 11 (Bias2)	2.271	2.310	4.880	8.621	24.912
N° 12 (OFF)	1.874	2.458	4.840	7.692	26.221
N° 13 (OFF)	1.990	2.736	4.930	7.017	22.049
N° 14 (OFF)	2.214	3.061	5.062	9.689	21.740
N° 15 (OFF)	1.804	2.452	4.425	8.212	22.027
N° 16 (OFF)	1.391	1.999	3.846	5.763	19.364

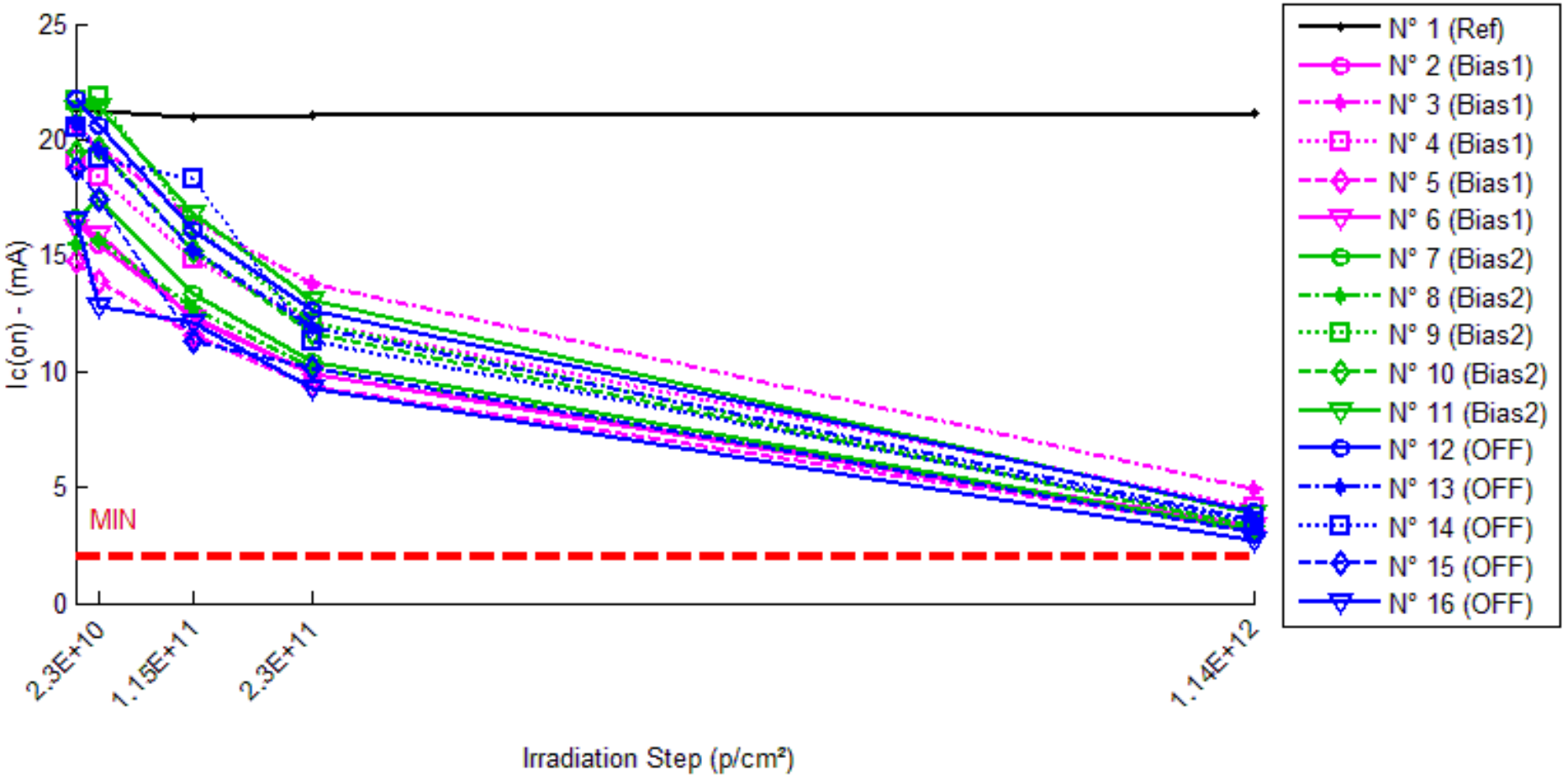
Delta [Iceo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.062E-2	2.085E-1	1.860E-1	1.895E-2
N° 2 (Bias1)	---	4.329E-1	9.430E-1	5.074E+0	2.129E+1
N° 3 (Bias1)	---	1.782E-1	1.104E+0	2.633E+0	1.185E+1
N° 4 (Bias1)	---	3.755E-2	1.697E+0	3.703E+0	1.876E+1
N° 5 (Bias1)	---	1.168E-1	1.122E+0	2.341E+0	1.195E+1
N° 6 (Bias1)	---	4.682E-2	5.865E-1	1.437E+0	9.639E+0
N° 7 (Bias2)	---	-2.422E-2	1.284E+0	3.503E+0	2.299E+1
N° 8 (Bias2)	---	-3.118E-2	4.503E-1	1.608E+0	1.037E+1
N° 9 (Bias2)	---	6.568E-2	5.307E-1	1.402E+0	7.646E+0
N° 10 (Bias2)	---	-2.551E-1	2.294E+0	5.134E+0	2.312E+1
N° 11 (Bias2)	---	3.856E-2	2.608E+0	6.349E+0	2.264E+1
N° 12 (OFF)	---	5.840E-1	2.966E+0	5.818E+0	2.435E+1
N° 13 (OFF)	---	7.456E-1	2.940E+0	5.027E+0	2.006E+1
N° 14 (OFF)	---	8.472E-1	2.848E+0	7.475E+0	1.953E+1
N° 15 (OFF)	---	6.482E-1	2.621E+0	6.408E+0	2.022E+1
N° 16 (OFF)	---	6.084E-1	2.456E+0	4.372E+0	1.797E+1
Average (OFF)	---	1.624E-1	1.091E+0	3.038E+0	1.470E+1
s (OFF)	---	1.616E-1	4.015E-1	1.396E+0	5.030E+0
Average+3s (OFF)	---	6.472E-1	2.295E+0	7.226E+0	2.979E+1
Average-3s (OFF)	---	-3.223E-1	-1.140E-1	-1.151E+0	-3.893E-1
Average (Bias1)	---	-4.126E-2	1.434E+0	3.599E+0	1.735E+1
s (Bias1)	---	1.264E-1	9.906E-1	2.163E+0	7.681E+0
Average+3s (Bias1)	---	3.380E-1	4.405E+0	1.009E+1	4.040E+1
Average-3s (Bias1)	---	-4.205E-1	-1.538E+0	-2.891E+0	-5.688E+0
Average (Bias2)	---	6.867E-1	2.766E+0	5.820E+0	2.043E+1
s (Bias2)	---	1.088E-1	2.204E-1	1.205E+0	2.365E+0
Average+3s (Bias2)	---	1.013E+0	3.427E+0	9.436E+0	2.752E+1
Average-3s (Bias2)	---	3.601E-1	2.105E+0	2.204E+0	1.333E+1

60 MeV proton / detailed results

7. Ic(on)

Ta=25°C; If=1mA; Ib=0



60 MeV proton / detailed results

Ic(on) . (mA) **Min = 2.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	21.329	21.256	20.939	21.026	21.112
N° 2 (Bias1)	16.495	15.466	12.395	9.876	3.185
N° 3 (Bias1)	20.512	19.709	16.569	13.748	4.963
N° 4 (Bias1)	19.072	18.357	14.889	12.075	4.152
N° 5 (Bias1)	14.759	13.888	11.553	9.316	3.169
N° 6 (Bias1)	16.150	15.870	12.293	9.868	3.282
N° 7 (Bias2)	16.591	17.431	13.366	10.451	3.152
N° 8 (Bias2)	15.459	15.651	12.696	10.107	3.030
N° 9 (Bias2)	21.647	21.841	16.250	12.120	3.274
N° 10 (Bias2)	19.482	19.634	15.189	11.684	3.362
N° 11 (Bias2)	21.340	21.367	16.813	13.041	3.816
N° 12 (OFF)	21.787	20.575	16.059	12.610	3.927
N° 13 (OFF)	20.694	19.561	15.198	11.892	3.588
N° 14 (OFF)	20.529	19.219	18.325	11.325	3.471
N° 15 (OFF)	18.713	17.463	11.305	10.108	3.028
N° 16 (OFF)	16.493	12.798	12.121	9.259	2.743

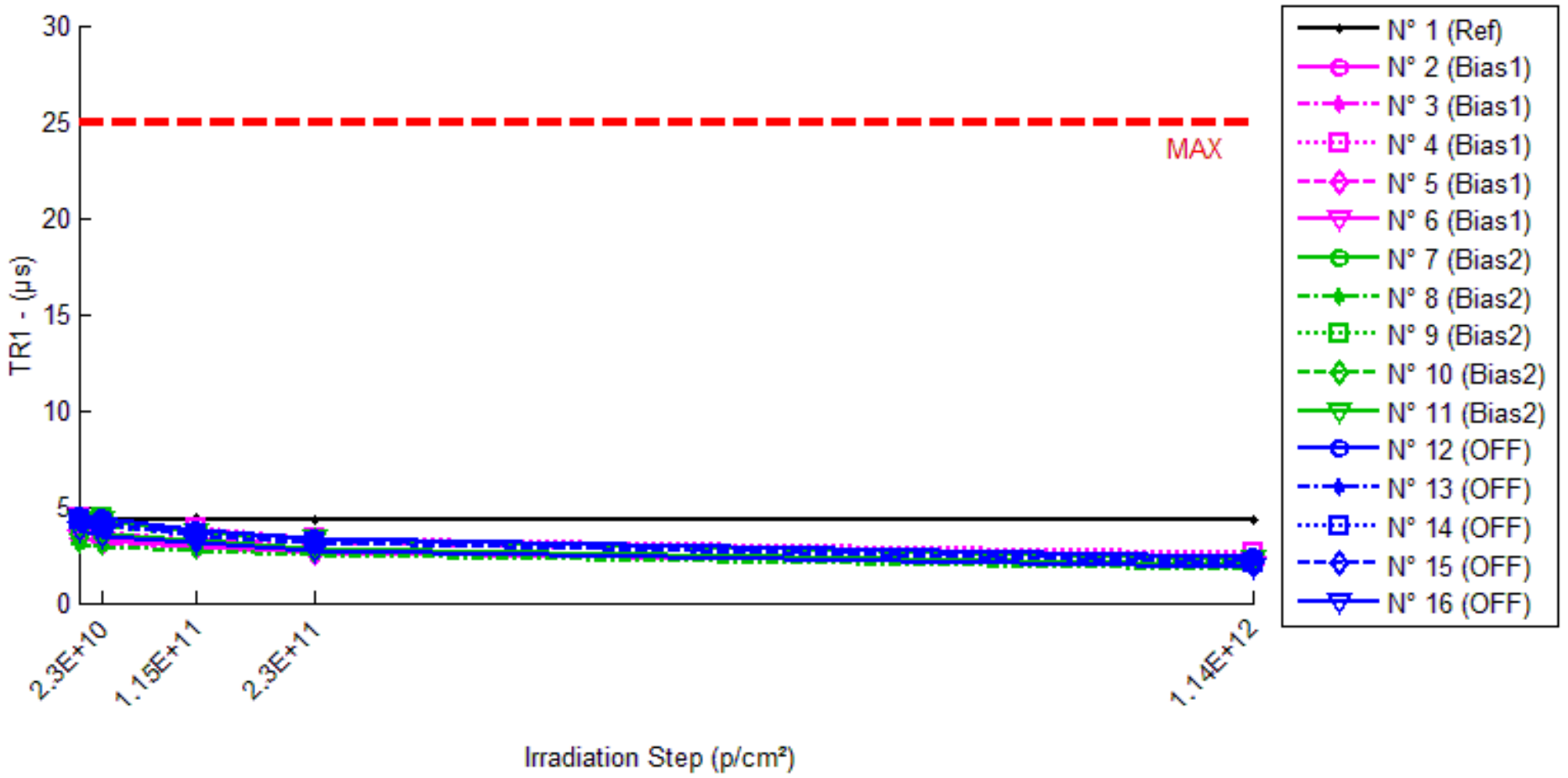
Delta [Ic(on)]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-7.286E-2	-3.896E-1	-3.023E-1	-2.169E-1
N° 2 (Bias1)	---	-1.029E+0	-4.100E+0	-6.619E+0	-1.331E+1
N° 3 (Bias1)	---	-8.029E-1	-3.943E+0	-6.764E+0	-1.555E+1
N° 4 (Bias1)	---	-7.152E-1	-4.183E+0	-6.996E+0	-1.492E+1
N° 5 (Bias1)	---	-8.716E-1	-3.207E+0	-5.444E+0	-1.159E+1
N° 6 (Bias1)	---	-2.796E-1	-3.857E+0	-6.282E+0	-1.287E+1
N° 7 (Bias2)	---	8.403E-1	-3.225E+0	-6.140E+0	-1.344E+1
N° 8 (Bias2)	---	1.914E-1	-2.763E+0	-5.353E+0	-1.243E+1
N° 9 (Bias2)	---	1.940E-1	-5.397E+0	-9.527E+0	-1.837E+1
N° 10 (Bias2)	---	1.516E-1	-4.293E+0	-7.798E+0	-1.612E+1
N° 11 (Bias2)	---	2.680E-2	-4.527E+0	-8.299E+0	-1.752E+1
N° 12 (OFF)	---	-1.211E+0	-5.728E+0	-9.177E+0	-1.786E+1
N° 13 (OFF)	---	-1.133E+0	-5.496E+0	-8.802E+0	-1.711E+1
N° 14 (OFF)	---	-1.310E+0	-2.205E+0	-9.205E+0	-1.706E+1
N° 15 (OFF)	---	-1.250E+0	-7.408E+0	-8.606E+0	-1.569E+1
N° 16 (OFF)	---	-3.695E+0	-4.372E+0	-7.234E+0	-1.375E+1
Average (OFF)	---	-7.396E-1	-3.858E+0	-6.421E+0	-1.365E+1
s (OFF)	---	2.816E-1	3.858E-1	6.046E-1	1.596E+0
Average+3s (OFF)	---	1.051E-1	-2.701E+0	-4.607E+0	-8.859E+0
Average-3s (OFF)	---	-1.584E+0	-5.015E+0	-8.235E+0	-1.844E+1
Average (Bias1)	---	2.808E-1	-4.041E+0	-7.423E+0	-1.558E+1
s (Bias1)	---	3.201E-1	1.053E+0	1.678E+0	2.568E+0
Average+3s (Bias1)	---	1.241E+0	-8.812E-1	-2.388E+0	-7.873E+0
Average-3s (Bias1)	---	-6.794E-1	-7.201E+0	-1.246E+1	-2.328E+1
Average (Bias2)	---	-1.720E+0	-5.042E+0	-8.605E+0	-1.629E+1
s (Bias2)	---	1.106E+0	1.922E+0	8.067E-1	1.623E+0
Average+3s (Bias2)	---	1.598E+0	7.241E-1	-6.184E+0	-1.142E+1
Average-3s (Bias2)	---	-5.038E+0	-1.081E+1	-1.102E+1	-2.116E+1

60 MeV proton / detailed results

8. TR1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



60 MeV proton / detailed results

TR1 . (µs) **Max = 25.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	4.36	4.32	4.44	4.36	4.32
N° 2 (Bias1)	4.44	4.28	3.80	3.36	2.40
N° 3 (Bias1)	3.80	3.68	3.28	3.12	2.24
N° 4 (Bias1)	4.44	4.20	3.88	3.40	2.56
N° 5 (Bias1)	3.40	3.12	2.96	2.64	1.96
N° 6 (Bias1)	3.40	3.20	2.96	2.64	1.92
N° 7 (Bias2)	3.56	3.52	3.24	2.84	1.92
N° 8 (Bias2)	3.04	2.96	2.76	2.52	1.72
N° 9 (Bias2)	4.32	4.40	3.56	3.12	2.08
N° 10 (Bias2)	3.92	3.96	3.52	3.24	2.16
N° 11 (Bias2)	4.28	4.32	3.64	3.40	2.24
N° 12 (OFF)	4.56	4.44	3.80	3.32	2.36
N° 13 (OFF)	4.36	4.00	3.64	3.24	2.16
N° 14 (OFF)	4.28	3.96	3.56	3.12	2.08
N° 15 (OFF)	4.32	4.16	3.48	3.16	2.12
N° 16 (OFF)	3.76	3.44	3.12	2.76	1.84

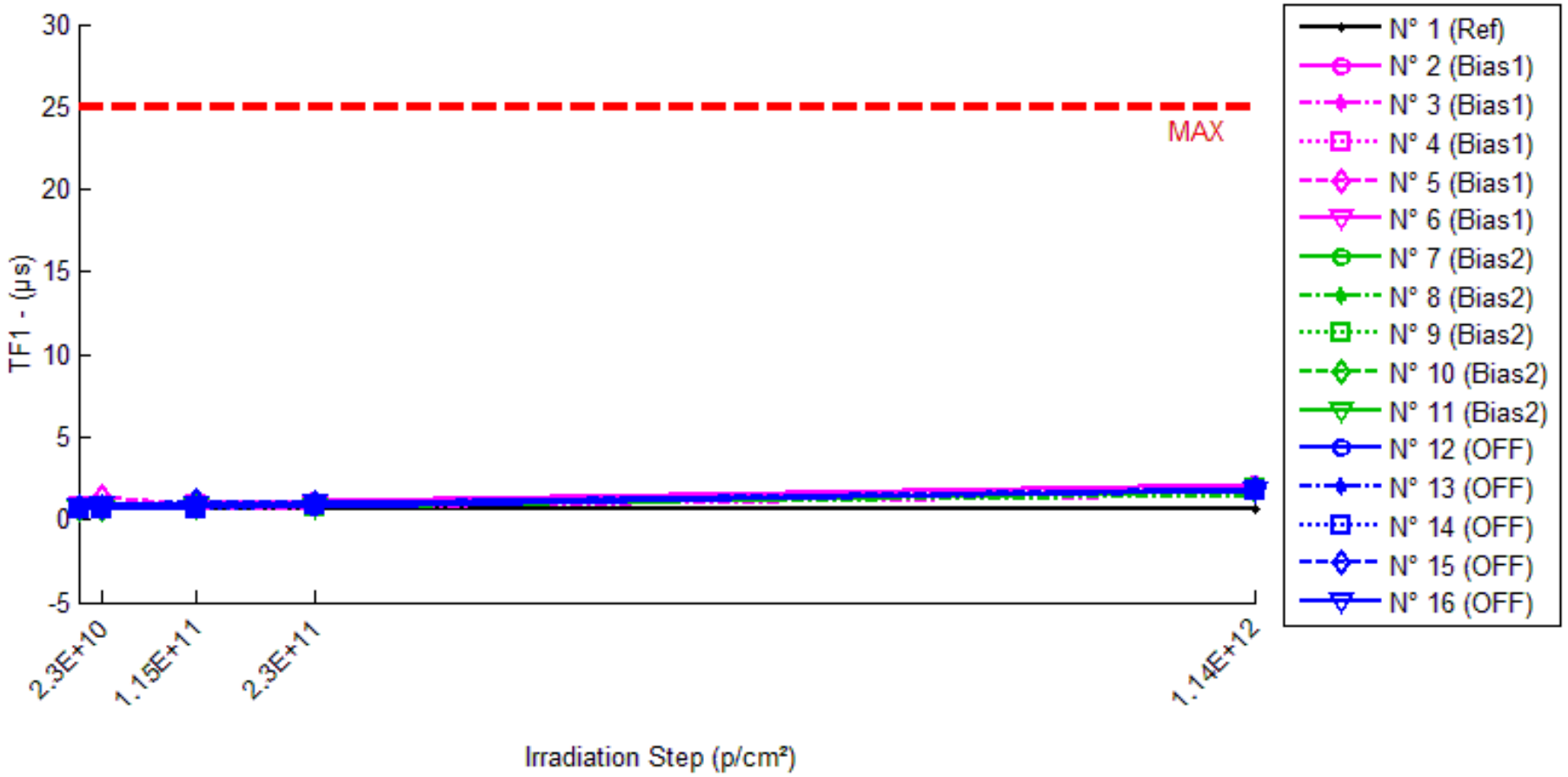
Delta [TR1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	8.000E-2	0.000E+0	-4.000E-2
N° 2 (Bias1)	---	-1.600E-1	-6.400E-1	-1.080E+0	-2.040E+0
N° 3 (Bias1)	---	-1.200E-1	-5.200E-1	-6.800E-1	-1.560E+0
N° 4 (Bias1)	---	-2.400E-1	-5.600E-1	-1.040E+0	-1.880E+0
N° 5 (Bias1)	---	-2.800E-1	-4.400E-1	-7.600E-1	-1.440E+0
N° 6 (Bias1)	---	-2.000E-1	-4.400E-1	-7.600E-1	-1.480E+0
N° 7 (Bias2)	---	-4.000E-2	-3.200E-1	-7.200E-1	-1.640E+0
N° 8 (Bias2)	---	-8.000E-2	-2.800E-1	-5.200E-1	-1.320E+0
N° 9 (Bias2)	---	8.000E-2	-7.600E-1	-1.200E+0	-2.240E+0
N° 10 (Bias2)	---	4.000E-2	-4.000E-1	-6.800E-1	-1.760E+0
N° 11 (Bias2)	---	4.000E-2	-6.400E-1	-8.800E-1	-2.040E+0
N° 12 (OFF)	---	-1.200E-1	-7.600E-1	-1.240E+0	-2.200E+0
N° 13 (OFF)	---	-3.600E-1	-7.200E-1	-1.120E+0	-2.200E+0
N° 14 (OFF)	---	-3.200E-1	-7.200E-1	-1.160E+0	-2.200E+0
N° 15 (OFF)	---	-1.600E-1	-8.400E-1	-1.160E+0	-2.200E+0
N° 16 (OFF)	---	-3.200E-1	-6.400E-1	-1.000E+0	-1.920E+0
Average (OFF)	---	-2.000E-1	-5.200E-1	-8.640E-1	-1.680E+0
s (OFF)	---	6.325E-2	8.485E-2	1.824E-1	2.653E-1
Average+3s (OFF)	---	-1.026E-2	-2.654E-1	-3.167E-1	-8.840E-1
Average-3s (OFF)	---	-3.897E-1	-7.746E-1	-1.411E+0	-2.476E+0
Average (Bias1)	---	8.000E-3	-4.800E-1	-8.000E-1	-1.800E+0
s (Bias1)	---	6.573E-2	2.098E-1	2.577E-1	3.567E-1
Average+3s (Bias1)	---	2.052E-1	1.493E-1	-2.695E-2	-7.300E-1
Average-3s (Bias1)	---	-1.892E-1	-1.109E+0	-1.573E+0	-2.870E+0
Average (Bias2)	---	-2.560E-1	-7.360E-1	-1.136E+0	-2.144E+0
s (Bias2)	---	1.081E-1	7.266E-2	8.764E-2	1.252E-1
Average+3s (Bias2)	---	6.822E-2	-5.180E-1	-8.731E-1	-1.768E+0
Average-3s (Bias2)	---	-5.802E-1	-9.540E-1	-1.399E+0	-2.520E+0

60 MeV proton / detailed results

9. TF1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



60 MeV proton / detailed results

TF1 . (µs) **Max = 25.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.64	0.68	0.72	0.64	0.68
N° 2 (Bias1)	0.84	0.88	1.00	1.16	2.16
N° 3 (Bias1)	0.64	0.64	0.68	0.76	1.52
N° 4 (Bias1)	0.72	0.72	0.84	0.88	1.88
N° 5 (Bias1)	0.76	1.44	0.88	1.00	1.84
N° 6 (Bias1)	0.68	0.68	0.76	0.88	1.76
N° 7 (Bias2)	0.76	0.68	0.80	0.92	1.72
N° 8 (Bias2)	0.68	0.68	0.76	0.88	1.52
N° 9 (Bias2)	0.64	0.68	0.72	0.80	1.88
N° 10 (Bias2)	0.68	0.68	0.76	0.84	1.92
N° 11 (Bias2)	0.64	0.64	0.72	0.76	1.72
N° 12 (OFF)	0.64	0.64	0.76	0.80	1.84
N° 13 (OFF)	0.68	0.68	0.72	0.84	1.76
N° 14 (OFF)	0.68	0.68	0.64	0.88	1.80
N° 15 (OFF)	0.72	0.76	1.12	1.00	1.92
N° 16 (OFF)	0.72	0.92	0.84	0.96	1.80

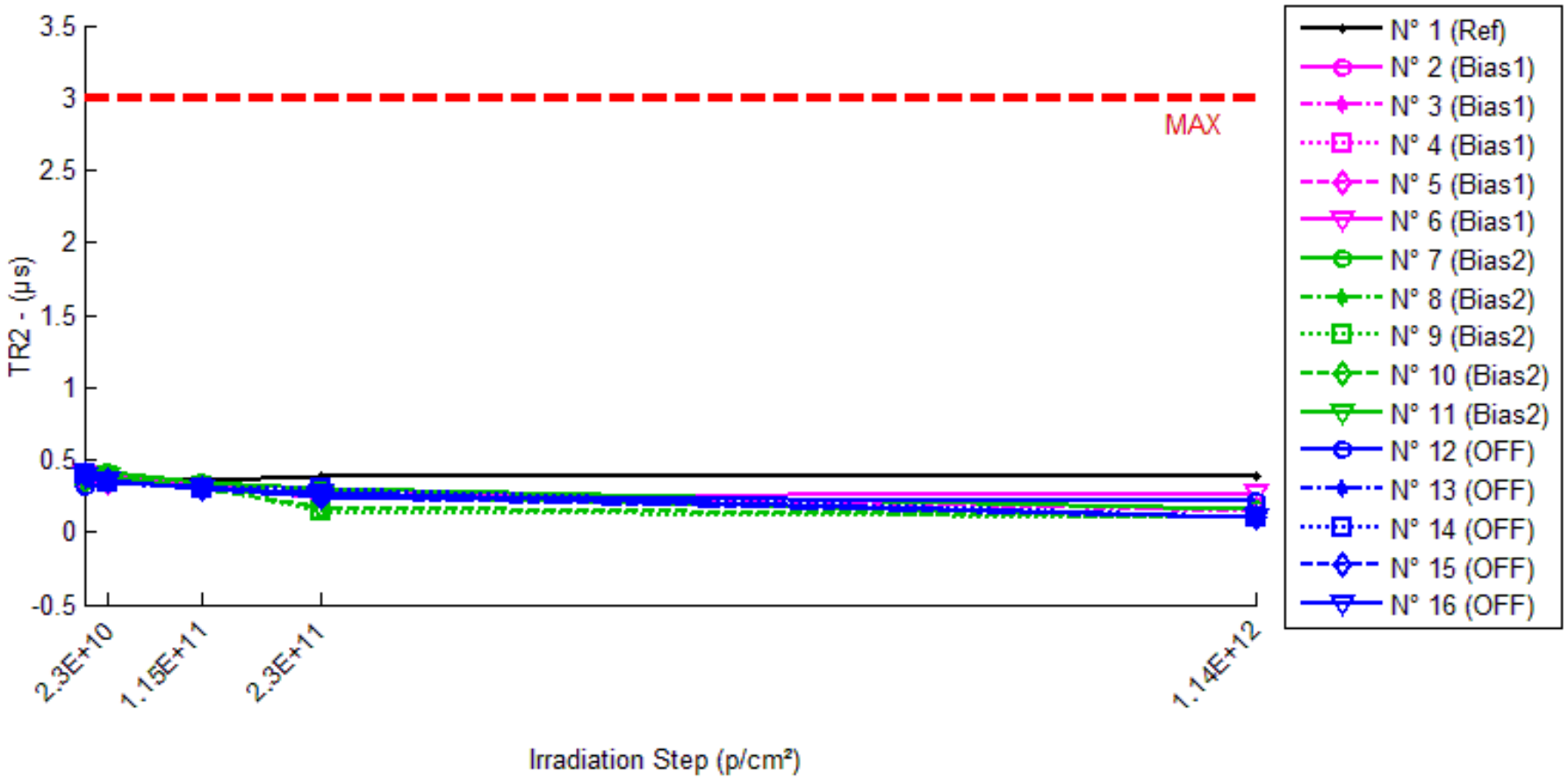
Delta [TF1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	4.000E-2	8.000E-2	0.000E+0	4.000E-2
N° 2 (Bias1)	---	4.000E-2	1.600E-1	3.200E-1	1.320E+0
N° 3 (Bias1)	---	0.000E+0	4.000E-2	1.200E-1	8.800E-1
N° 4 (Bias1)	---	0.000E+0	1.200E-1	1.600E-1	1.160E+0
N° 5 (Bias1)	---	6.800E-1	1.200E-1	2.400E-1	1.080E+0
N° 6 (Bias1)	---	0.000E+0	8.000E-2	2.000E-1	1.080E+0
N° 7 (Bias2)	---	-8.000E-2	4.000E-2	1.600E-1	9.600E-1
N° 8 (Bias2)	---	0.000E+0	8.000E-2	2.000E-1	8.400E-1
N° 9 (Bias2)	---	4.000E-2	8.000E-2	1.600E-1	1.240E+0
N° 10 (Bias2)	---	0.000E+0	8.000E-2	1.600E-1	1.240E+0
N° 11 (Bias2)	---	0.000E+0	8.000E-2	1.200E-1	1.080E+0
N° 12 (OFF)	---	0.000E+0	1.200E-1	1.600E-1	1.200E+0
N° 13 (OFF)	---	0.000E+0	4.000E-2	1.600E-1	1.080E+0
N° 14 (OFF)	---	0.000E+0	-4.000E-2	2.000E-1	1.120E+0
N° 15 (OFF)	---	4.000E-2	4.000E-1	2.800E-1	1.200E+0
N° 16 (OFF)	---	2.000E-1	1.200E-1	2.400E-1	1.080E+0
Average (OFF)	---	1.440E-1	1.040E-1	2.080E-1	1.104E+0
s (OFF)	---	3.001E-1	4.561E-2	7.694E-2	1.590E-1
Average+3s (OFF)	---	1.044E+0	2.408E-1	4.388E-1	1.581E+0
Average-3s (OFF)	---	-7.564E-1	-3.282E-2	-2.282E-2	6.270E-1
Average (Bias1)	---	-8.000E-3	7.200E-2	1.600E-1	1.072E+0
s (Bias1)	---	4.382E-2	1.789E-2	2.828E-2	1.753E-1
Average+3s (Bias1)	---	1.235E-1	1.257E-1	2.449E-1	1.598E+0
Average-3s (Bias1)	---	-1.395E-1	1.833E-2	7.515E-2	5.462E-1
Average (Bias2)	---	4.800E-2	1.280E-1	2.080E-1	1.136E+0
s (Bias2)	---	8.672E-2	1.659E-1	5.215E-2	6.066E-2
Average+3s (Bias2)	---	3.082E-1	6.257E-1	3.645E-1	1.318E+0
Average-3s (Bias2)	---	-2.122E-1	-3.697E-1	5.154E-2	9.540E-1

60 MeV proton / detailed results

10.TR2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



60 MeV proton / detailed results

TR2 . (µs) **Max = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.40	0.38	0.36	0.38	0.38
N° 2 (Bias1)	0.36	0.38	0.32	0.26	0.10
N° 3 (Bias1)	0.42	0.40	0.32	0.30	0.14
N° 4 (Bias1)	0.40	0.38	0.32	0.26	0.10
N° 5 (Bias1)	0.36	0.34	0.32	0.26	0.16
N° 6 (Bias1)	0.40	0.36	0.30	0.24	0.28
N° 7 (Bias2)	0.42	0.42	0.34	0.30	0.16
N° 8 (Bias2)	0.40	0.42	0.34	0.26	0.10
N° 9 (Bias2)	0.38	0.38	0.32	0.14	0.10
N° 10 (Bias2)	0.36	0.36	0.30	0.18	0.10
N° 11 (Bias2)	0.38	0.38	0.30	0.26	0.10
N° 12 (OFF)	0.32	0.34	0.32	0.24	0.22
N° 13 (OFF)	0.40	0.36	0.30	0.24	0.10
N° 14 (OFF)	0.40	0.34	0.30	0.30	0.10
N° 15 (OFF)	0.40	0.36	0.30	0.24	0.10
N° 16 (OFF)	0.38	0.36	0.30	0.28	0.10

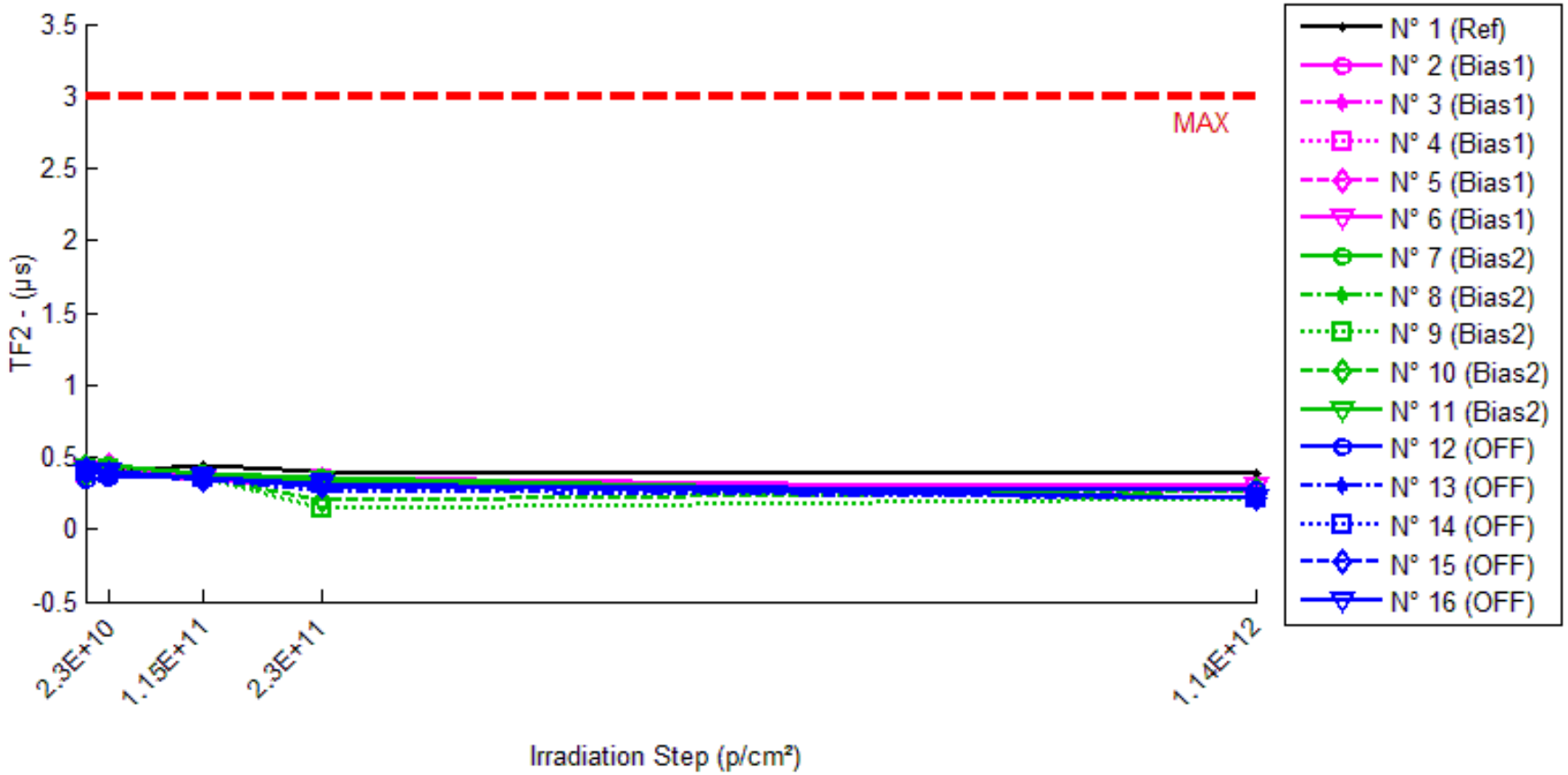
Delta [TR2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.000E-2	-4.000E-2	-2.000E-2	-2.000E-2
N° 2 (Bias1)	---	2.000E-2	-4.000E-2	-1.000E-1	-2.600E-1
N° 3 (Bias1)	---	-2.000E-2	-1.000E-1	-1.200E-1	-2.800E-1
N° 4 (Bias1)	---	-2.000E-2	-8.000E-2	-1.400E-1	-3.000E-1
N° 5 (Bias1)	---	-2.000E-2	-4.000E-2	-1.000E-1	-2.000E-1
N° 6 (Bias1)	---	-4.000E-2	-1.000E-1	-1.600E-1	-1.200E-1
N° 7 (Bias2)	---	0.000E+0	-8.000E-2	-1.200E-1	-2.600E-1
N° 8 (Bias2)	---	2.000E-2	-6.000E-2	-1.400E-1	-3.000E-1
N° 9 (Bias2)	---	0.000E+0	-6.000E-2	-2.400E-1	-2.800E-1
N° 10 (Bias2)	---	0.000E+0	-6.000E-2	-1.800E-1	-2.600E-1
N° 11 (Bias2)	---	0.000E+0	-8.000E-2	-1.200E-1	-2.800E-1
N° 12 (OFF)	---	2.000E-2	0.000E+0	-8.000E-2	-1.000E-1
N° 13 (OFF)	---	-4.000E-2	-1.000E-1	-1.600E-1	-3.000E-1
N° 14 (OFF)	---	-6.000E-2	-1.000E-1	-1.000E-1	-3.000E-1
N° 15 (OFF)	---	-4.000E-2	-1.000E-1	-1.600E-1	-3.000E-1
N° 16 (OFF)	---	-2.000E-2	-8.000E-2	-1.000E-1	-2.800E-1
Average (OFF)	---	-1.600E-2	-7.200E-2	-1.240E-1	-2.320E-1
s (OFF)	---	2.191E-2	3.033E-2	2.608E-2	7.294E-2
Average+3s (OFF)	---	4.973E-2	1.899E-2	-4.577E-2	-1.319E-2
Average-3s (OFF)	---	-8.173E-2	-1.630E-1	-2.022E-1	-4.508E-1
Average (Bias1)	---	4.000E-3	-6.800E-2	-1.600E-1	-2.760E-1
s (Bias1)	---	8.944E-3	1.095E-2	5.099E-2	1.673E-2
Average+3s (Bias1)	---	3.083E-2	-3.514E-2	-7.029E-3	-2.258E-1
Average-3s (Bias1)	---	-2.283E-2	-1.009E-1	-3.130E-1	-3.262E-1
Average (Bias2)	---	-2.800E-2	-7.600E-2	-1.200E-1	-2.560E-1
s (Bias2)	---	3.033E-2	4.336E-2	3.742E-2	8.764E-2
Average+3s (Bias2)	---	6.299E-2	5.408E-2	-7.750E-3	6.907E-3
Average-3s (Bias2)	---	-1.190E-1	-2.061E-1	-2.322E-1	-5.189E-1

60 MeV proton / detailed results

11.TF2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



60 MeV proton / detailed results

TF2 . (µs) **Max = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.42	0.40	0.44	0.40	0.38
N° 2 (Bias1)	0.42	0.38	0.38	0.36	0.28
N° 3 (Bias1)	0.42	0.38	0.36	0.32	0.22
N° 4 (Bias1)	0.38	0.40	0.36	0.34	0.22
N° 5 (Bias1)	0.42	0.44	0.36	0.34	0.26
N° 6 (Bias1)	0.42	0.38	0.34	0.30	0.30
N° 7 (Bias2)	0.44	0.44	0.38	0.36	0.22
N° 8 (Bias2)	0.46	0.44	0.38	0.34	0.22
N° 9 (Bias2)	0.42	0.42	0.36	0.14	0.22
N° 10 (Bias2)	0.38	0.40	0.36	0.20	0.28
N° 11 (Bias2)	0.40	0.40	0.36	0.34	0.22
N° 12 (OFF)	0.34	0.36	0.36	0.30	0.28
N° 13 (OFF)	0.42	0.38	0.34	0.28	0.22
N° 14 (OFF)	0.40	0.38	0.36	0.32	0.22
N° 15 (OFF)	0.42	0.38	0.34	0.30	0.22
N° 16 (OFF)	0.38	0.40	0.36	0.32	0.22

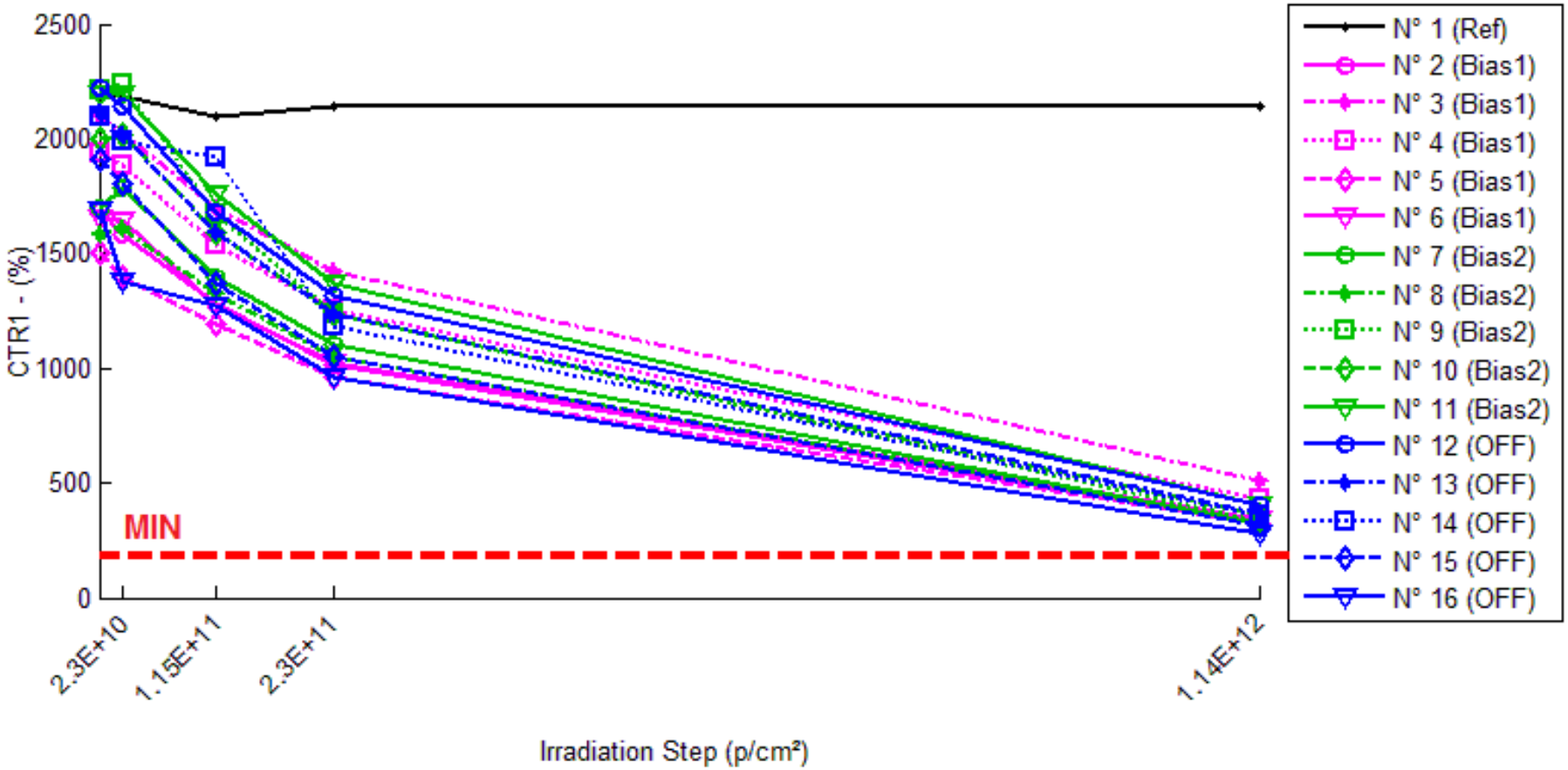
Delta [TF2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-2.000E-2	2.000E-2	-2.000E-2	-4.000E-2
N° 2 (Bias1)	---	-4.000E-2	-4.000E-2	-6.000E-2	-1.400E-1
N° 3 (Bias1)	---	-4.000E-2	-6.000E-2	-1.000E-1	-2.000E-1
N° 4 (Bias1)	---	2.000E-2	-2.000E-2	-4.000E-2	-1.600E-1
N° 5 (Bias1)	---	2.000E-2	-6.000E-2	-8.000E-2	-1.600E-1
N° 6 (Bias1)	---	-4.000E-2	-8.000E-2	-1.200E-1	-1.200E-1
N° 7 (Bias2)	---	0.000E+0	-6.000E-2	-8.000E-2	-2.200E-1
N° 8 (Bias2)	---	-2.000E-2	-8.000E-2	-1.200E-1	-2.400E-1
N° 9 (Bias2)	---	0.000E+0	-6.000E-2	-2.800E-1	-2.000E-1
N° 10 (Bias2)	---	2.000E-2	-2.000E-2	-1.800E-1	-1.000E-1
N° 11 (Bias2)	---	0.000E+0	-4.000E-2	-6.000E-2	-1.800E-1
N° 12 (OFF)	---	2.000E-2	2.000E-2	-4.000E-2	-6.000E-2
N° 13 (OFF)	---	-4.000E-2	-8.000E-2	-1.400E-1	-2.000E-1
N° 14 (OFF)	---	-2.000E-2	-4.000E-2	-8.000E-2	-1.800E-1
N° 15 (OFF)	---	-4.000E-2	-8.000E-2	-1.200E-1	-2.000E-1
N° 16 (OFF)	---	2.000E-2	-2.000E-2	-6.000E-2	-1.600E-1
Average (OFF)	---	-1.600E-2	-5.200E-2	-8.000E-2	-1.560E-1
s (OFF)	---	3.286E-2	2.280E-2	3.162E-2	2.966E-2
Average+3s (OFF)	---	8.259E-2	1.641E-2	1.487E-2	-6.701E-2
Average-3s (OFF)	---	-1.146E-1	-1.204E-1	-1.749E-1	-2.450E-1
Average (Bias1)	---	0.000E+0	-5.200E-2	-1.440E-1	-1.880E-1
s (Bias1)	---	1.414E-2	2.280E-2	8.877E-2	5.404E-2
Average+3s (Bias1)	---	4.243E-2	1.641E-2	1.223E-1	-2.589E-2
Average-3s (Bias1)	---	-4.243E-2	-1.204E-1	-4.103E-1	-3.501E-1
Average (Bias2)	---	-1.200E-2	-4.000E-2	-8.800E-2	-1.600E-1
s (Bias2)	---	3.033E-2	4.243E-2	4.147E-2	5.831E-2
Average+3s (Bias2)	---	7.899E-2	8.728E-2	3.642E-2	1.493E-2
Average-3s (Bias2)	---	-1.030E-1	-1.673E-1	-2.124E-1	-3.349E-1

60 MeV proton / detailed results

12.CTR1

Ta=25°C; Vce=5V; If=1mA



60 MeV proton / detailed results

CTR1 . (%) **Min : 200**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	2181.04	2186.45	2100.72	2144.64	2141.62
N° 2 (Bias1)	1686.79	1586.03	1281.34	1013.99	326.12
N° 3 (Bias1)	2093.95	2025.71	1700.52	1426.55	512.22
N° 4 (Bias1)	1934.69	1882.88	1536.65	1251.75	426.61
N° 5 (Bias1)	1506.55	1395.66	1191.89	961.12	325.90
N° 6 (Bias1)	1656.08	1642.84	1273.47	1020.02	338.51
N° 7 (Bias2)	1694.23	1784.33	1395.08	1103.45	320.62
N° 8 (Bias2)	1582.69	1609.99	1326.33	1054.72	319.50
N° 9 (Bias2)	2208.82	2237.14	1668.32	1240.08	335.59
N° 10 (Bias2)	1997.47	2014.25	1594.69	1232.40	354.93
N° 11 (Bias2)	2192.05	2190.19	1759.65	1366.04	402.26
N° 12 (OFF)	2221.85	2136.80	1680.93	1318.66	404.59
N° 13 (OFF)	2116.37	2020.65	1589.75	1239.59	369.50
N° 14 (OFF)	2098.52	1989.37	1922.41	1180.62	358.74
N° 15 (OFF)	1914.67	1808.24	1372.01	1052.92	311.84
N° 16 (OFF)	1685.86	1378.98	1268.00	962.66	282.98

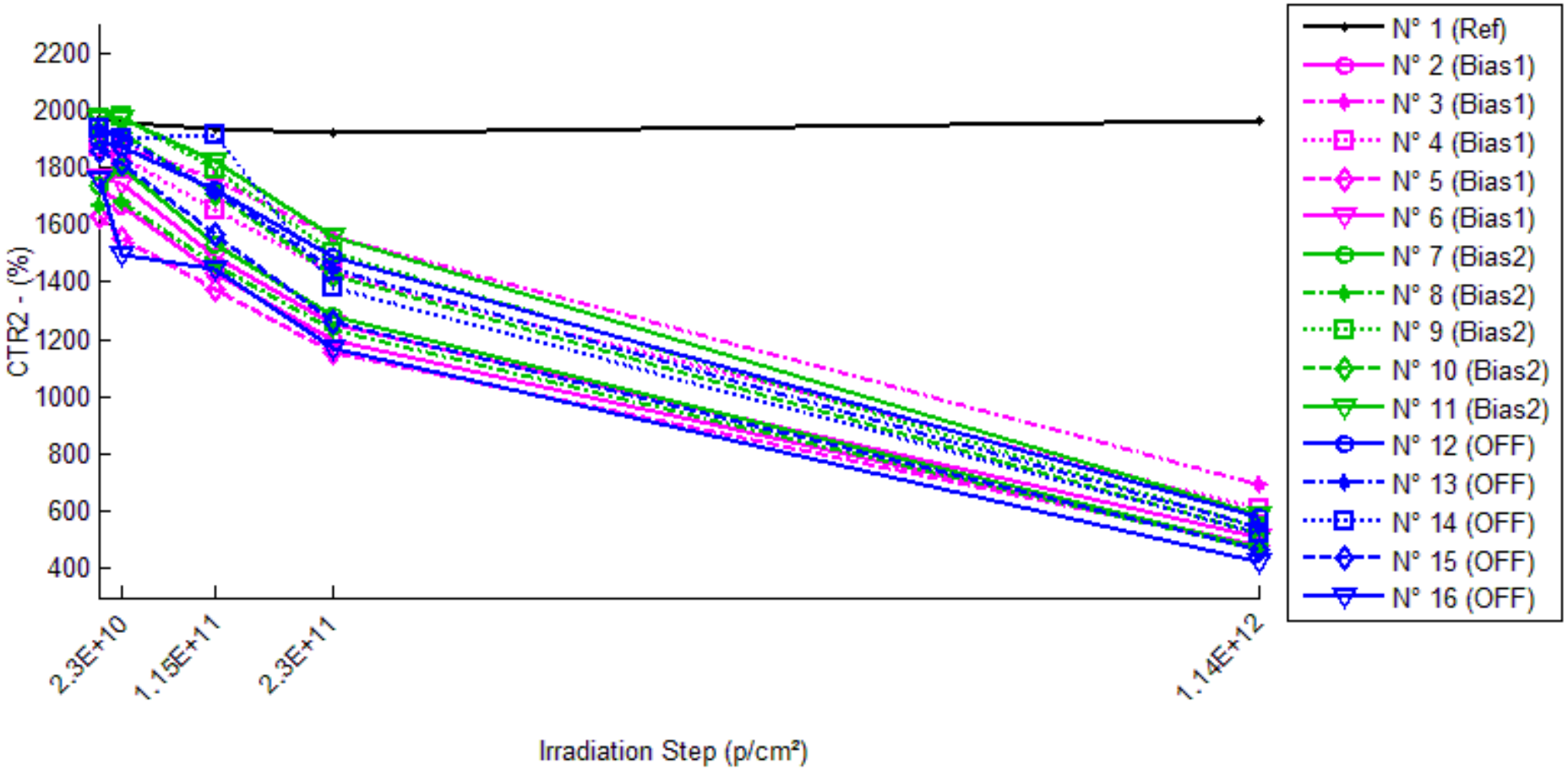
1/Delta [CTR1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.134E-6	1.753E-5	7.781E-6	8.438E-6
N° 2 (Bias1)	---	3.766E-5	1.876E-4	3.934E-4	2.474E-3
N° 3 (Bias1)	---	1.609E-5	1.105E-4	2.234E-4	1.475E-3
N° 4 (Bias1)	---	1.422E-5	1.339E-4	2.820E-4	1.827E-3
N° 5 (Bias1)	---	5.274E-5	1.752E-4	3.767E-4	2.405E-3
N° 6 (Bias1)	---	4.869E-6	1.814E-4	3.765E-4	2.350E-3
N° 7 (Bias2)	---	-2.981E-5	1.266E-4	3.160E-4	2.529E-3
N° 8 (Bias2)	---	-1.071E-5	1.221E-4	3.163E-4	2.498E-3
N° 9 (Bias2)	---	-5.733E-6	1.467E-4	3.537E-4	2.527E-3
N° 10 (Bias2)	---	-4.171E-6	1.265E-4	3.108E-4	2.317E-3
N° 11 (Bias2)	---	3.883E-7	1.121E-4	2.758E-4	2.030E-3
N° 12 (OFF)	---	1.791E-5	1.448E-4	3.083E-4	2.022E-3
N° 13 (OFF)	---	2.238E-5	1.565E-4	3.342E-4	2.234E-3
N° 14 (OFF)	---	2.615E-5	4.365E-5	3.705E-4	2.311E-3
N° 15 (OFF)	---	3.074E-5	2.066E-4	4.275E-4	2.685E-3
N° 16 (OFF)	---	1.320E-4	1.955E-4	4.456E-4	2.941E-3
Average (OFF)	---	2.512E-5	1.577E-4	3.304E-4	2.106E-3
s (OFF)	---	1.956E-5	3.376E-5	7.420E-5	4.360E-4
Average+3s (OFF)	---	8.380E-5	2.590E-4	5.530E-4	3.414E-3
Average-3s (OFF)	---	-3.356E-5	5.644E-5	1.078E-4	7.982E-4
Average (Bias1)	---	-1.001E-5	1.268E-4	3.145E-4	2.380E-3
s (Bias1)	---	1.176E-5	1.258E-5	2.760E-5	2.147E-4
Average+3s (Bias1)	---	2.526E-5	1.645E-4	3.973E-4	3.024E-3
Average-3s (Bias1)	---	-4.528E-5	8.904E-5	2.317E-4	1.736E-3
Average (Bias2)	---	4.584E-5	1.494E-4	3.772E-4	2.438E-3
s (Bias2)	---	4.840E-5	6.451E-5	5.884E-5	3.690E-4
Average+3s (Bias2)	---	1.910E-4	3.429E-4	5.537E-4	3.545E-3
Average-3s (Bias2)	---	-9.936E-5	-4.411E-5	2.007E-4	1.331E-3

60 MeV proton / detailed results

13.CTR2

Ta=25°C; Vce=5V; If=2mA



60 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1968.06	1958.54	1931.71	1921.13	1961.68
N° 2 (Bias1)	1737.87	1665.20	1434.71	1195.55	478.04
N° 3 (Bias1)	1937.53	1875.99	1759.12	1557.49	695.18
N° 4 (Bias1)	1870.12	1837.86	1653.11	1432.19	608.67
N° 5 (Bias1)	1630.01	1550.36	1371.85	1151.61	478.91
N° 6 (Bias1)	1768.06	1745.83	1487.10	1251.41	508.21
N° 7 (Bias2)	1739.32	1799.05	1527.98	1282.18	474.55
N° 8 (Bias2)	1663.83	1676.70	1460.82	1232.64	464.57
N° 9 (Bias2)	1966.86	1975.29	1796.28	1501.19	544.06
N° 10 (Bias2)	1914.02	1920.11	1708.48	1425.84	520.87
N° 11 (Bias2)	1967.05	1972.04	1818.89	1555.47	585.03
N° 12 (OFF)	1891.06	1873.55	1724.62	1484.93	580.31
N° 13 (OFF)	1938.01	1907.82	1713.81	1446.40	545.75
N° 14 (OFF)	1932.84	1898.33	1912.05	1385.08	523.69
N° 15 (OFF)	1858.56	1810.83	1563.48	1263.39	465.46
N° 16 (OFF)	1754.17	1495.94	1443.34	1165.34	425.09

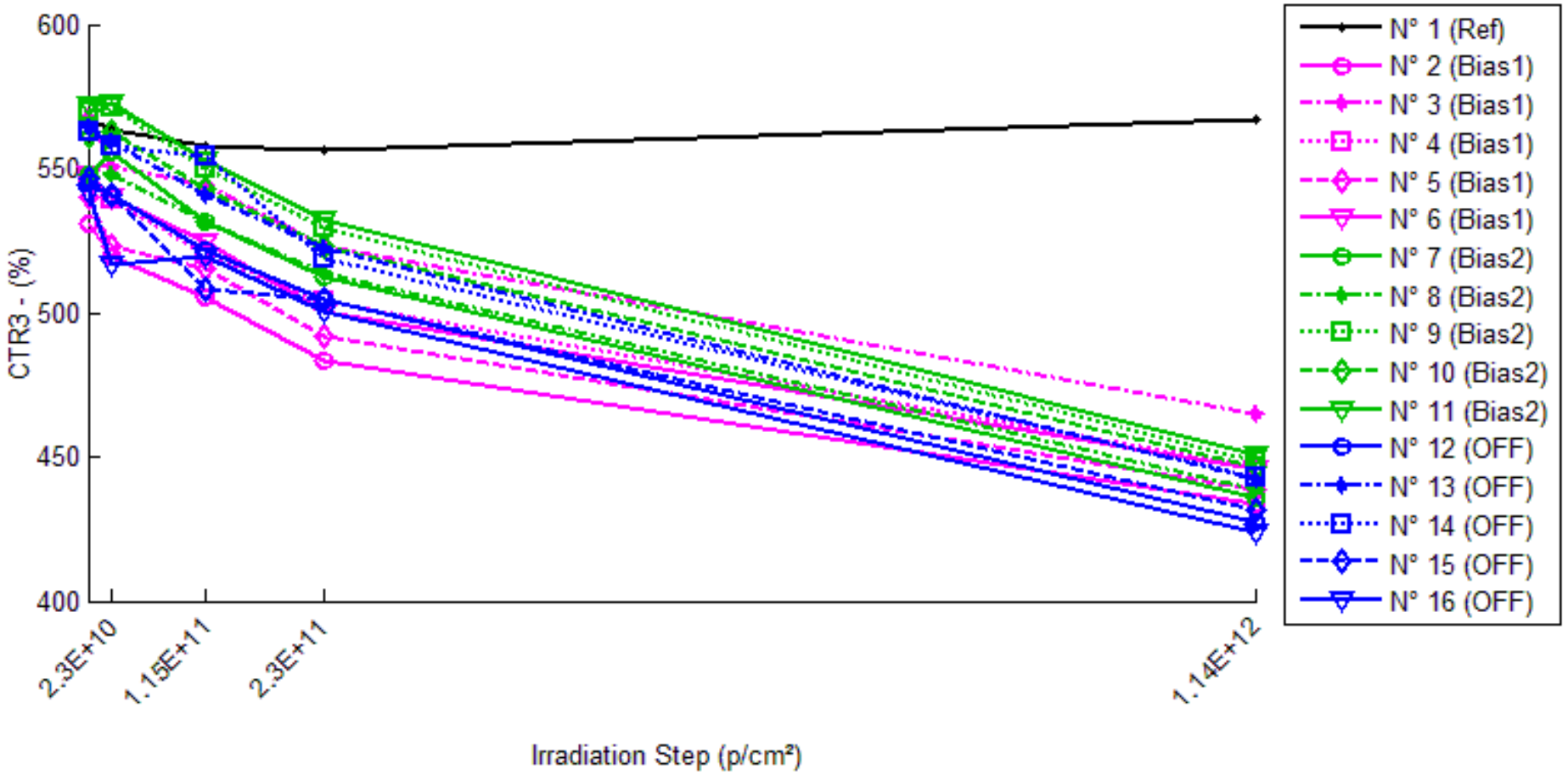
1/Delta [CTR2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.469E-6	9.562E-6	1.241E-5	1.653E-6
N° 2 (Bias1)	---	2.511E-5	1.216E-4	2.610E-4	1.516E-3
N° 3 (Bias1)	---	1.693E-5	5.235E-5	1.259E-4	9.224E-4
N° 4 (Bias1)	---	9.385E-6	7.020E-5	1.635E-4	1.108E-3
N° 5 (Bias1)	---	3.152E-5	1.154E-4	2.549E-4	1.475E-3
N° 6 (Bias1)	---	7.200E-6	1.069E-4	2.335E-4	1.402E-3
N° 7 (Bias2)	---	-1.909E-5	7.952E-5	2.050E-4	1.532E-3
N° 8 (Bias2)	---	-4.612E-6	8.353E-5	2.102E-4	1.552E-3
N° 9 (Bias2)	---	-2.170E-6	4.828E-5	1.577E-4	1.330E-3
N° 10 (Bias2)	---	-1.657E-6	6.285E-5	1.789E-4	1.397E-3
N° 11 (Bias2)	---	-1.288E-6	4.141E-5	1.345E-4	1.201E-3
N° 12 (OFF)	---	4.942E-6	5.103E-5	1.446E-4	1.194E-3
N° 13 (OFF)	---	8.165E-6	6.750E-5	1.754E-4	1.316E-3
N° 14 (OFF)	---	9.404E-6	5.623E-6	2.046E-4	1.392E-3
N° 15 (OFF)	---	1.418E-5	1.016E-4	2.535E-4	1.610E-3
N° 16 (OFF)	---	9.841E-5	1.228E-4	2.880E-4	1.782E-3
Average (OFF)	---	1.803E-5	9.329E-5	2.078E-4	1.285E-3
s (OFF)	---	1.031E-5	3.035E-5	5.994E-5	2.579E-4
Average+3s (OFF)	---	4.896E-5	1.844E-4	3.876E-4	2.058E-3
Average-3s (OFF)	---	-1.291E-5	2.223E-6	2.795E-5	5.111E-4
Average (Bias1)	---	-5.763E-6	6.312E-5	1.773E-4	1.402E-3
s (Bias1)	---	7.561E-6	1.855E-5	3.189E-5	1.458E-4
Average+3s (Bias1)	---	1.692E-5	1.188E-4	2.729E-4	1.840E-3
Average-3s (Bias1)	---	-2.845E-5	7.455E-6	8.159E-5	9.649E-4
Average (Bias2)	---	2.702E-5	6.969E-5	2.132E-4	1.459E-3
s (Bias2)	---	4.004E-5	4.552E-5	5.794E-5	2.357E-4
Average+3s (Bias2)	---	1.472E-4	2.063E-4	3.871E-4	2.166E-3
Average-3s (Bias2)	---	-9.311E-5	-6.688E-5	3.939E-5	7.519E-4

60 MeV proton / detailed results

14.CTR3

Ta=25°C; Vce=5V; If=10mA



60 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	567.16	563.46	558.01	556.09	567.26
N° 2 (Bias1)	530.65	519.30	504.97	483.12	433.57
N° 3 (Bias1)	567.63	550.84	544.44	523.22	464.80
N° 4 (Bias1)	547.37	539.57	520.03	503.98	446.75
N° 5 (Bias1)	540.26	523.34	515.14	492.08	438.54
N° 6 (Bias1)	547.53	539.80	524.78	500.39	445.61
N° 7 (Bias2)	548.06	555.59	531.83	512.27	435.54
N° 8 (Bias2)	546.27	547.77	531.76	513.95	438.95
N° 9 (Bias2)	569.94	571.50	549.79	529.09	448.88
N° 10 (Bias2)	561.45	562.49	542.82	523.27	446.53
N° 11 (Bias2)	571.88	572.68	552.62	532.21	450.55
N° 12 (OFF)	544.80	540.87	521.95	504.60	427.65
N° 13 (OFF)	564.03	559.05	540.58	522.37	442.19
N° 14 (OFF)	562.74	557.58	554.50	518.72	442.70
N° 15 (OFF)	546.19	540.88	508.44	504.43	431.28
N° 16 (OFF)	541.48	516.49	519.77	500.67	423.72

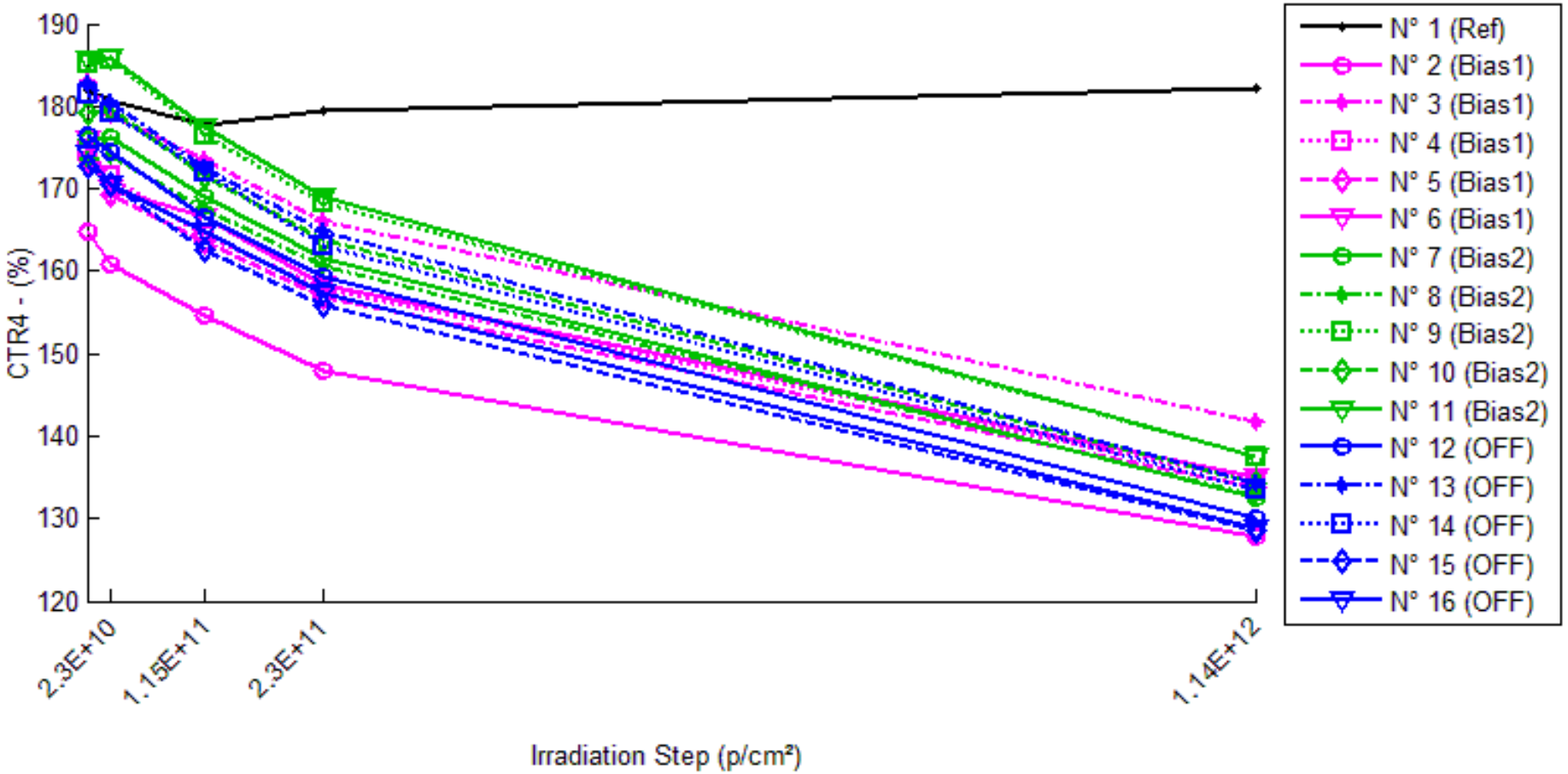
1/Delta [CTR3]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.159E-5	2.892E-5	3.511E-5	-2.878E-7
N° 2 (Bias1)	---	4.119E-5	9.583E-5	1.854E-4	4.220E-4
N° 3 (Bias1)	---	5.369E-5	7.502E-5	1.495E-4	3.897E-4
N° 4 (Bias1)	---	2.641E-5	9.607E-5	1.573E-4	4.115E-4
N° 5 (Bias1)	---	5.983E-5	9.028E-5	1.812E-4	4.293E-4
N° 6 (Bias1)	---	2.614E-5	7.917E-5	1.720E-4	4.177E-4
N° 7 (Bias2)	---	-2.472E-5	5.566E-5	1.275E-4	4.714E-4
N° 8 (Bias2)	---	-5.007E-6	4.997E-5	1.151E-4	4.476E-4
N° 9 (Bias2)	---	-4.785E-6	6.431E-5	1.355E-4	4.732E-4
N° 10 (Bias2)	---	-3.315E-6	6.111E-5	1.299E-4	4.584E-4
N° 11 (Bias2)	---	-2.434E-6	6.094E-5	1.303E-4	4.709E-4
N° 12 (OFF)	---	1.335E-5	8.035E-5	1.462E-4	5.029E-4
N° 13 (OFF)	---	1.580E-5	7.689E-5	1.414E-4	4.885E-4
N° 14 (OFF)	---	1.648E-5	2.641E-5	1.508E-4	4.819E-4
N° 15 (OFF)	---	1.797E-5	1.359E-4	1.516E-4	4.879E-4
N° 16 (OFF)	---	8.936E-5	7.712E-5	1.505E-4	5.132E-4
Average (OFF)	---	4.145E-5	8.727E-5	1.691E-4	4.140E-4
s (OFF)	---	1.540E-5	9.686E-6	1.537E-5	1.506E-5
Average+3s (OFF)	---	8.764E-5	1.163E-4	2.152E-4	4.592E-4
Average-3s (OFF)	---	-4.737E-6	5.821E-5	1.230E-4	3.689E-4
Average (Bias1)	---	-8.052E-6	5.840E-5	1.277E-4	4.643E-4
s (Bias1)	---	9.379E-6	5.640E-6	7.595E-6	1.105E-5
Average+3s (Bias1)	---	2.008E-5	7.532E-5	1.505E-4	4.974E-4
Average-3s (Bias1)	---	-3.619E-5	4.148E-5	1.049E-4	4.311E-4
Average (Bias2)	---	3.059E-5	7.934E-5	1.481E-4	4.949E-4
s (Bias2)	---	3.290E-5	3.878E-5	4.290E-6	1.284E-5
Average+3s (Bias2)	---	1.293E-4	1.957E-4	1.610E-4	5.334E-4
Average-3s (Bias2)	---	-6.810E-5	-3.700E-5	1.352E-4	4.564E-4

60 MeV proton / detailed results

15.CTR4

Ta=25°C; Vce=5V; If=50mA



60 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	181.96	180.66	177.73	179.54	182.18
N° 2 (Bias1)	164.83	160.95	154.73	147.82	127.74
N° 3 (Bias1)	182.93	178.90	173.47	166.08	141.66
N° 4 (Bias1)	174.74	171.53	164.28	157.81	134.52
N° 5 (Bias1)	173.46	169.39	163.49	156.77	133.78
N° 6 (Bias1)	176.07	170.13	166.59	158.23	134.96
N° 7 (Bias2)	176.07	176.13	169.08	161.52	132.59
N° 8 (Bias2)	173.55	173.91	167.43	160.59	132.84
N° 9 (Bias2)	185.28	185.65	176.55	168.19	137.57
N° 10 (Bias2)	179.30	179.58	171.46	163.70	134.18
N° 11 (Bias2)	185.63	185.95	177.36	169.06	137.38
N° 12 (OFF)	176.39	174.41	166.61	159.38	130.08
N° 13 (OFF)	182.59	180.36	172.41	164.85	134.36
N° 14 (OFF)	181.40	179.08	171.88	163.13	133.49
N° 15 (OFF)	172.68	170.46	162.59	155.91	128.53
N° 16 (OFF)	174.24	170.53	164.71	157.46	128.91

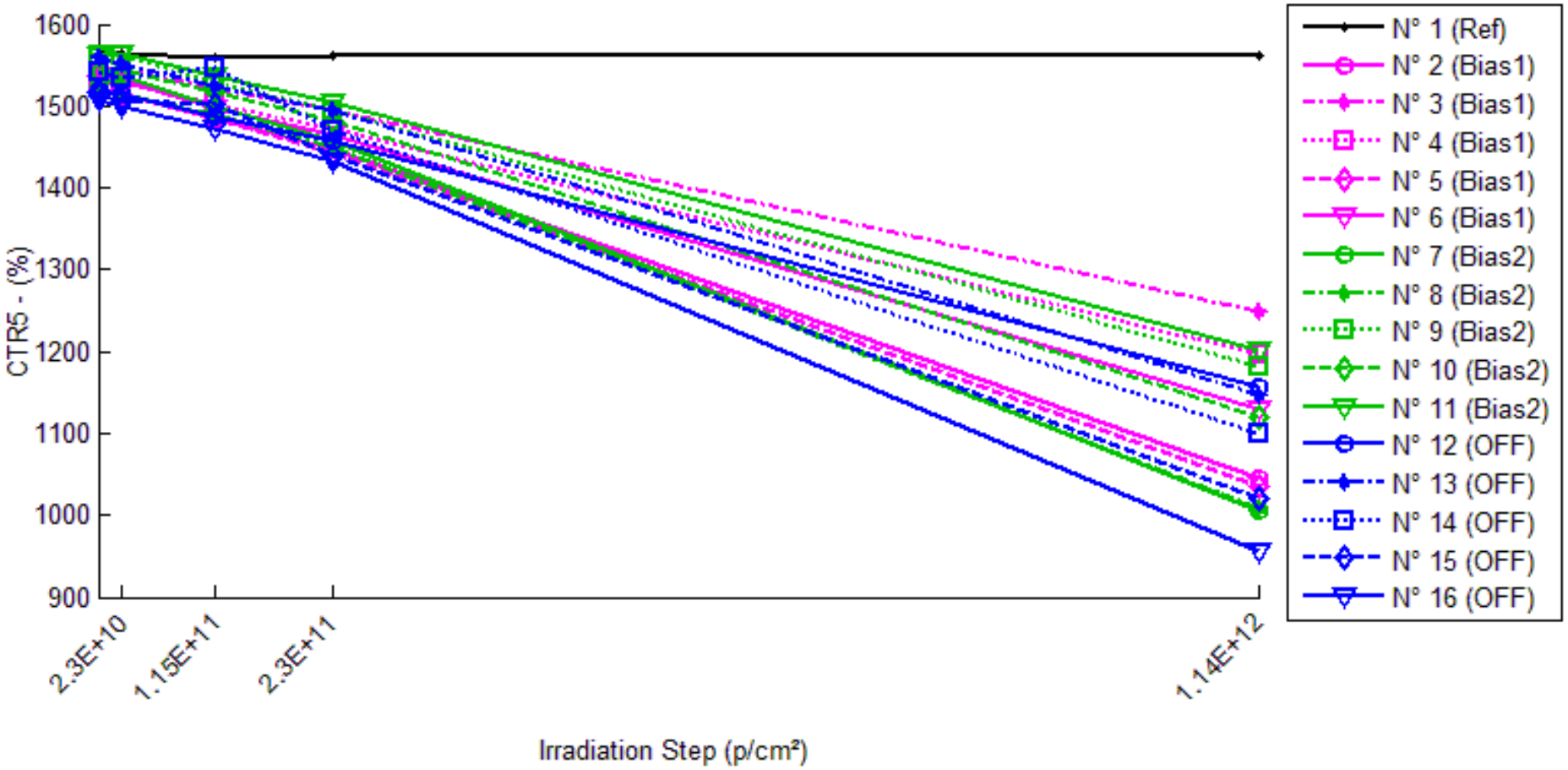
1/Delta [CTR4]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	3.949E-5	1.308E-4	7.411E-5	-6.754E-6
N° 2 (Bias1)	---	1.466E-4	3.963E-4	6.982E-4	1.762E-3
N° 3 (Bias1)	---	1.232E-4	2.981E-4	5.548E-4	1.593E-3
N° 4 (Bias1)	---	1.070E-4	3.644E-4	6.140E-4	1.711E-3
N° 5 (Bias1)	---	1.385E-4	3.517E-4	6.140E-4	1.710E-3
N° 6 (Bias1)	---	1.985E-4	3.233E-4	6.404E-4	1.730E-3
N° 7 (Bias2)	---	-1.738E-6	2.347E-4	5.117E-4	1.863E-3
N° 8 (Bias2)	---	-1.175E-5	2.107E-4	4.649E-4	1.766E-3
N° 9 (Bias2)	---	-1.093E-5	2.667E-4	5.484E-4	1.872E-3
N° 10 (Bias2)	---	-8.774E-6	2.550E-4	5.315E-4	1.875E-3
N° 11 (Bias2)	---	-9.088E-6	2.513E-4	5.280E-4	1.892E-3
N° 12 (OFF)	---	6.432E-5	3.328E-4	6.049E-4	2.018E-3
N° 13 (OFF)	---	6.792E-5	3.235E-4	5.896E-4	1.966E-3
N° 14 (OFF)	---	7.149E-5	3.054E-4	6.177E-4	1.979E-3
N° 15 (OFF)	---	7.522E-5	3.593E-4	6.229E-4	1.989E-3
N° 16 (OFF)	---	1.249E-4	3.318E-4	6.113E-4	2.018E-3
Average (OFF)	---	1.428E-4	3.467E-4	6.243E-4	1.701E-3
s (OFF)	---	3.465E-5	3.777E-5	5.189E-5	6.414E-5
Average+3s (OFF)	---	2.467E-4	4.600E-4	7.800E-4	1.894E-3
Average-3s (OFF)	---	3.880E-5	2.334E-4	4.686E-4	1.509E-3
Average (Bias1)	---	-8.454E-6	2.437E-4	5.169E-4	1.854E-3
s (Bias1)	---	3.954E-6	2.168E-5	3.186E-5	5.004E-5
Average+3s (Bias1)	---	3.409E-6	3.087E-4	6.125E-4	2.004E-3
Average-3s (Bias1)	---	-2.032E-5	1.786E-4	4.213E-4	1.703E-3
Average (Bias2)	---	8.076E-5	3.306E-4	6.093E-4	1.994E-3
s (Bias2)	---	2.499E-5	1.946E-5	1.291E-5	2.353E-5
Average+3s (Bias2)	---	1.557E-4	3.890E-4	6.480E-4	2.064E-3
Average-3s (Bias2)	---	5.802E-6	2.722E-4	5.706E-4	1.923E-3

60 MeV proton / detailed results

16.CTR5

Ta=25°C; Vce=30V; If=5mA



60 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1563.02	1565.12	1559.43	1560.43	1561.87
N° 2 (Bias1)	1521.45	1514.72	1485.76	1448.58	1044.00
N° 3 (Bias1)	1547.63	1544.68	1522.18	1495.24	1247.69
N° 4 (Bias1)	1527.23	1528.24	1500.71	1472.09	1197.14
N° 5 (Bias1)	1520.18	1514.64	1484.51	1442.85	1036.02
N° 6 (Bias1)	1527.77	1531.32	1496.64	1464.62	1130.63
N° 7 (Bias2)	1524.14	1536.62	1500.58	1457.45	1004.90
N° 8 (Bias2)	1510.96	1514.10	1489.45	1449.14	1006.81
N° 9 (Bias2)	1560.91	1562.57	1530.48	1494.46	1181.24
N° 10 (Bias2)	1542.50	1543.61	1515.75	1481.28	1120.28
N° 11 (Bias2)	1561.37	1562.90	1536.56	1504.28	1201.31
N° 12 (OFF)	1519.45	1514.15	1486.97	1456.09	1155.86
N° 13 (OFF)	1558.26	1551.24	1525.11	1494.29	1148.01
N° 14 (OFF)	1540.71	1534.32	1547.44	1469.65	1099.86
N° 15 (OFF)	1514.96	1507.51	1501.09	1438.88	1021.53
N° 16 (OFF)	1507.97	1499.91	1472.87	1431.90	954.69

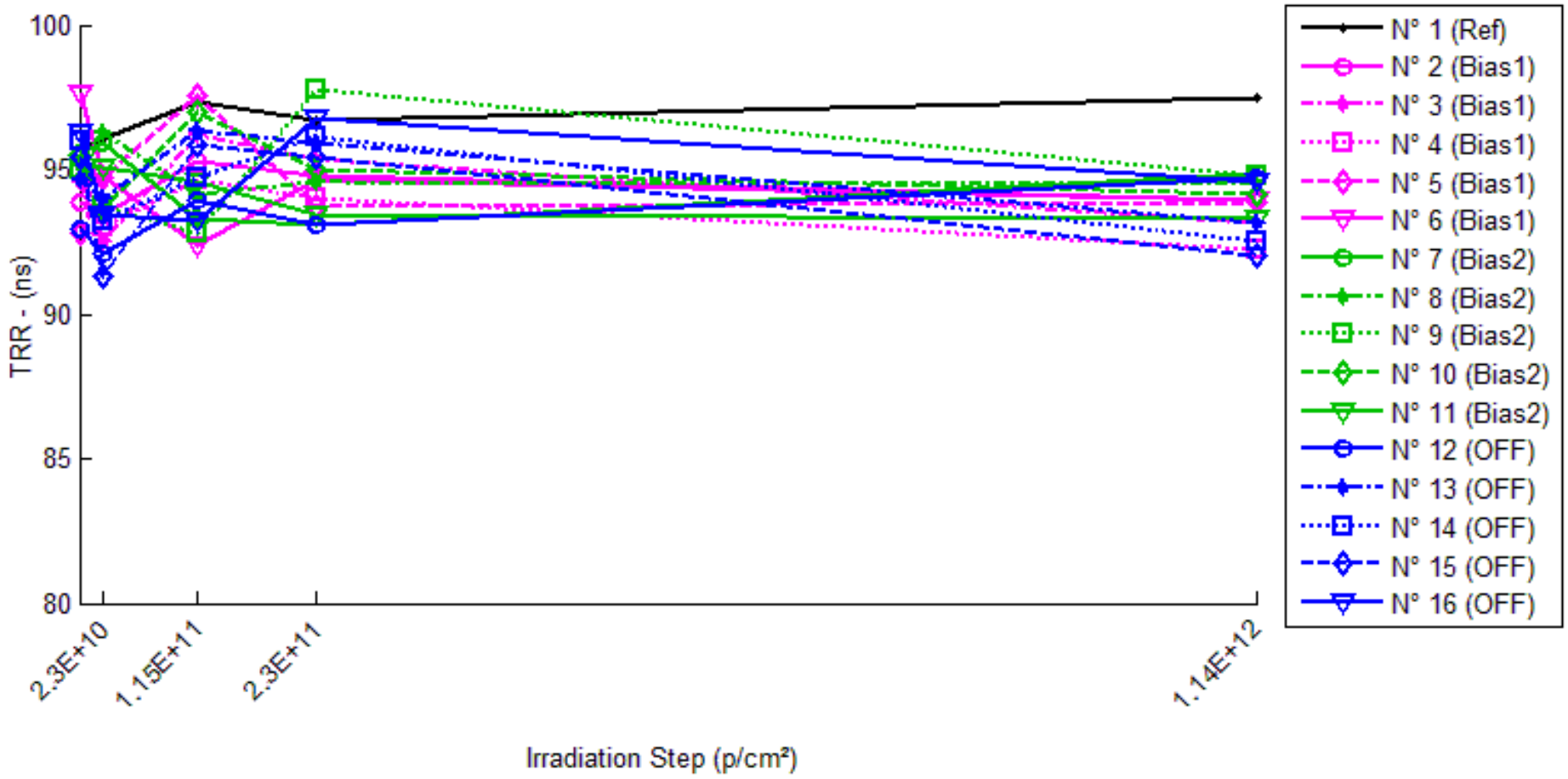
1/Delta [CTR5]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-8.564E-7	1.475E-6	1.065E-6	4.711E-7
N° 2 (Bias1)	---	2.918E-6	1.579E-5	3.306E-5	3.006E-4
N° 3 (Bias1)	---	1.235E-6	1.080E-5	2.264E-5	1.553E-4
N° 4 (Bias1)	---	-4.315E-7	1.157E-5	2.453E-5	1.805E-4
N° 5 (Bias1)	---	2.405E-6	1.580E-5	3.525E-5	3.074E-4
N° 6 (Bias1)	---	-1.517E-6	1.362E-5	2.822E-5	2.299E-4
N° 7 (Bias2)	---	-5.327E-6	1.030E-5	3.002E-5	3.390E-4
N° 8 (Bias2)	---	-1.374E-6	9.555E-6	2.823E-5	3.314E-4
N° 9 (Bias2)	---	-6.810E-7	1.274E-5	2.848E-5	2.059E-4
N° 10 (Bias2)	---	-4.649E-7	1.144E-5	2.680E-5	2.443E-4
N° 11 (Bias2)	---	-6.282E-7	1.034E-5	2.430E-5	1.920E-4
N° 12 (OFF)	---	2.301E-6	1.437E-5	2.864E-5	2.070E-4
N° 13 (OFF)	---	2.903E-6	1.395E-5	2.747E-5	2.293E-4
N° 14 (OFF)	---	2.701E-6	-2.824E-6	3.138E-5	2.602E-4
N° 15 (OFF)	---	3.261E-6	6.100E-6	3.490E-5	3.188E-4
N° 16 (OFF)	---	3.567E-6	1.580E-5	3.523E-5	3.843E-4
Average (OFF)	---	9.219E-7	1.352E-5	2.874E-5	2.348E-4
s (OFF)	---	1.875E-6	2.320E-6	5.391E-6	6.871E-5
Average+3s (OFF)	---	6.547E-6	2.048E-5	4.492E-5	4.409E-4
Average-3s (OFF)	---	-4.703E-6	6.557E-6	1.257E-5	2.863E-5
Average (Bias1)	---	-1.695E-6	1.088E-5	2.757E-5	2.625E-4
s (Bias1)	---	2.060E-6	1.239E-6	2.154E-6	6.912E-5
Average+3s (Bias1)	---	4.484E-6	1.459E-5	3.403E-5	4.699E-4
Average-3s (Bias1)	---	-7.874E-6	7.159E-6	2.111E-5	5.517E-5
Average (Bias2)	---	2.947E-6	9.481E-6	3.152E-5	2.799E-4
s (Bias2)	---	4.906E-7	7.854E-6	3.532E-6	7.190E-5
Average+3s (Bias2)	---	4.418E-6	3.304E-5	4.212E-5	4.956E-4
Average-3s (Bias2)	---	1.475E-6	-1.408E-5	2.093E-5	6.423E-5

60 MeV proton / detailed results

17.TRR

Ta=25°C; If=5mA; RL=100Ohms; Irec = 10% Irm



60 MeV proton / detailed results

TRR . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	95.68	96.04	97.34	96.71	97.50
N° 2 (Bias1)	93.85	93.41	95.29	94.79	93.92
N° 3 (Bias1)	94.60	92.50	96.21	95.39	93.18
N° 4 (Bias1)	95.01	93.01	94.61	94.00	92.25
N° 5 (Bias1)	92.83	94.70	97.52	93.75	93.83
N° 6 (Bias1)	97.60	94.77	92.35	94.66	93.92
N° 7 (Bias2)	95.59	95.90	93.33	93.07	94.84
N° 8 (Bias2)	94.74	96.30	94.12	94.59	94.48
N° 9 (Bias2)	95.02	93.69	92.83	97.80	94.81
N° 10 (Bias2)	95.40	93.62	97.01	95.02	94.18
N° 11 (Bias2)	95.24	95.04	94.56	93.44	93.33
N° 12 (OFF)	92.91	92.12	93.92	93.07	94.74
N° 13 (OFF)	94.64	93.98	96.36	95.93	93.15
N° 14 (OFF)	96.00	93.24	94.74	96.13	92.53
N° 15 (OFF)	95.40	91.29	95.84	95.41	92.00
N° 16 (OFF)	96.30	93.41	93.21	96.75	94.55

Delta [TRR]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	3.606E-1	1.659E+0	1.034E+0	1.823E+0
N° 2 (Bias1)	---	-4.396E-1	1.448E+0	9.455E-1	7.650E-2
N° 3 (Bias1)	---	-2.100E+0	1.608E+0	7.896E-1	-1.419E+0
N° 4 (Bias1)	---	-2.002E+0	-4.073E-1	-1.013E+0	-2.767E+0
N° 5 (Bias1)	---	1.871E+0	4.692E+0	9.213E-1	9.985E-1
N° 6 (Bias1)	---	-2.839E+0	-5.252E+0	-2.948E+0	-3.682E+0
N° 7 (Bias2)	---	3.134E-1	-2.255E+0	-2.519E+0	-7.508E-1
N° 8 (Bias2)	---	1.559E+0	-6.192E-1	-1.423E-1	-2.617E-1
N° 9 (Bias2)	---	-1.330E+0	-2.189E+0	2.778E+0	-2.189E-1
N° 10 (Bias2)	---	-1.785E+0	1.608E+0	-3.815E-1	-1.222E+0
N° 11 (Bias2)	---	-2.026E-1	-6.754E-1	-1.795E+0	-1.905E+0
N° 12 (OFF)	---	-7.972E-1	1.009E+0	1.559E-1	1.823E+0
N° 13 (OFF)	---	-6.579E-1	1.721E+0	1.285E+0	-1.494E+0
N° 14 (OFF)	---	-2.762E+0	-1.263E+0	1.326E-1	-3.473E+0
N° 15 (OFF)	---	-4.110E+0	4.489E-1	1.041E-2	-3.396E+0
N° 16 (OFF)	---	-2.890E+0	-3.084E+0	4.499E-1	-1.751E+0
Average (OFF)	---	-1.102E+0	4.178E-1	-2.610E-1	-1.359E+0
s (OFF)	---	1.878E+0	3.660E+0	1.714E+0	1.937E+0
Average+3s (OFF)	---	4.531E+0	1.140E+1	4.880E+0	4.451E+0
Average-3s (OFF)	---	-6.735E+0	-1.056E+1	-5.402E+0	-7.168E+0
Average (Bias1)	---	-2.891E-1	-8.262E-1	-4.120E-1	-8.717E-1
s (Bias1)	---	1.333E+0	1.572E+0	2.037E+0	7.077E-1
Average+3s (Bias1)	---	3.711E+0	3.891E+0	5.700E+0	1.251E+0
Average-3s (Bias1)	---	-4.289E+0	-5.543E+0	-6.524E+0	-2.995E+0
Average (Bias2)	---	-2.243E+0	-2.336E-1	4.067E-1	-1.658E+0
s (Bias2)	---	1.481E+0	1.937E+0	5.167E-1	2.149E+0
Average+3s (Bias2)	---	2.200E+0	5.578E+0	1.957E+0	4.789E+0
Average-3s (Bias2)	---	-6.686E+0	-6.046E+0	-1.143E+0	-8.105E+0

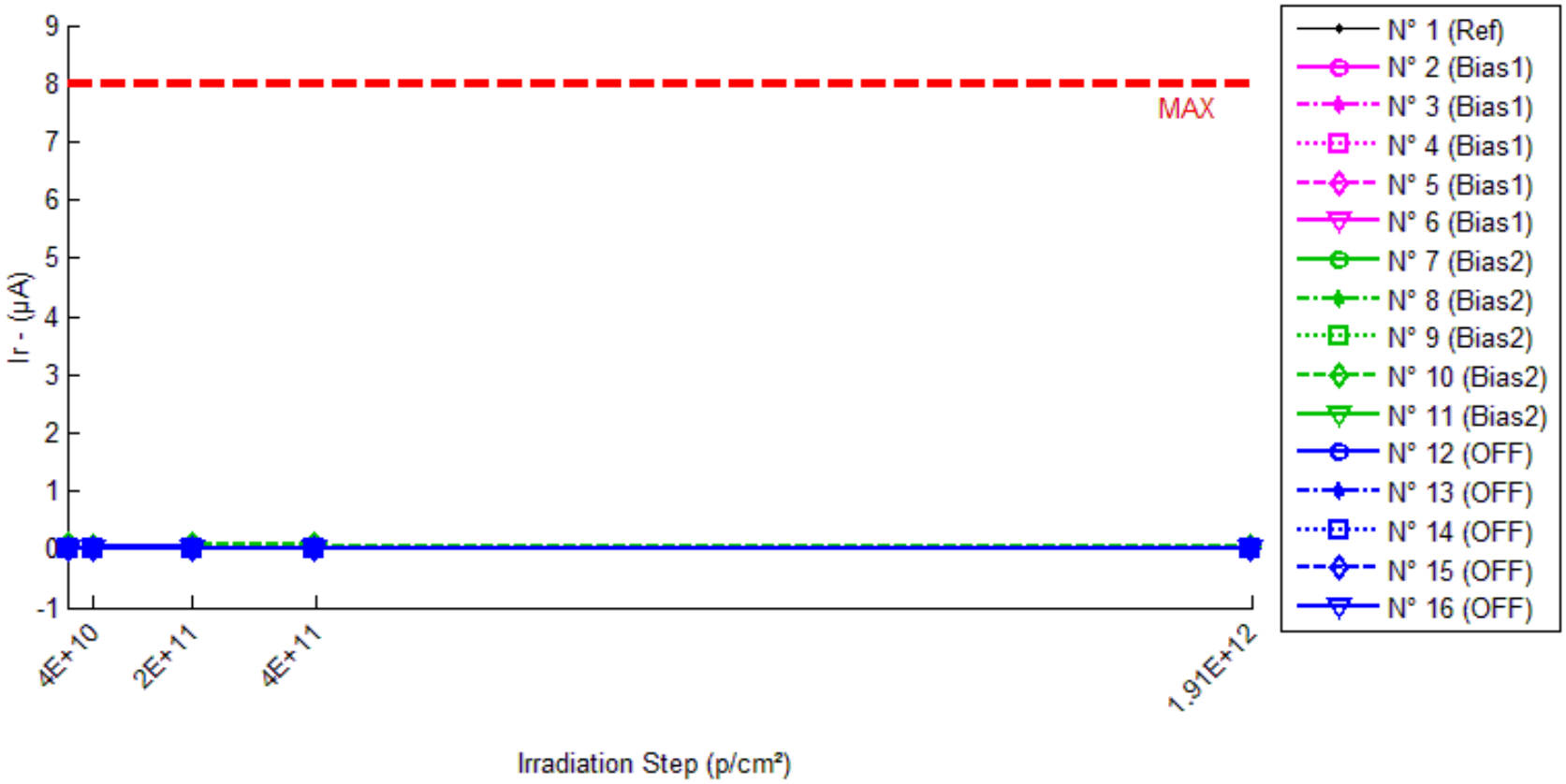
190 MeV proton / detailed results

CONTENTS

190 MeV proton / detailed results

1. Ir

Ta=25°C; Vr=6V



190 MeV proton / detailed results

Ir . (µA) **Max = 8.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	4.469E-3	4.757E-3	4.654E-3	4.898E-3	5.562E-3
N° 2 (Bias1)	3.190E-4	5.855E-4	8.973E-4	1.123E-3	2.882E-3
N° 3 (Bias1)	2.820E-4	5.525E-4	7.794E-4	1.052E-3	3.015E-3
N° 4 (Bias1)	3.886E-4	7.391E-4	9.534E-4	1.218E-3	3.930E-3
N° 5 (Bias1)	4.956E-4	8.166E-4	1.070E-3	1.243E-3	3.171E-3
N° 6 (Bias1)	2.640E-4	5.318E-4	7.505E-4	1.007E-3	2.939E-3
N° 7 (Bias2)	4.026E-4	5.060E-4	9.791E-4	1.267E-3	4.582E-3
N° 8 (Bias2)	2.706E-4	4.376E-4	9.371E-4	1.279E-3	4.511E-3
N° 9 (Bias2)	2.737E-4	4.731E-4	8.124E-4	1.350E-3	4.450E-3
N° 10 (Bias2)	7.410E-2	6.317E-2	7.435E-2	6.640E-2	5.872E-2
N° 11 (Bias2)	2.747E-4	4.746E-4	9.818E-4	1.283E-3	4.728E-3
N° 12 (OFF)	2.081E-2	3.201E-2	4.776E-2	2.721E-2	5.119E-2
N° 13 (OFF)	2.736E-4	4.201E-4	9.934E-4	1.352E-3	5.855E-3
N° 14 (OFF)	2.761E-4	5.363E-4	8.721E-4	1.205E-3	4.957E-3
N° 15 (OFF)	8.628E-3	4.548E-3	3.597E-3	3.860E-3	8.741E-3
N° 16 (OFF)	3.210E-4	6.276E-4	1.070E-3	1.240E-3	5.175E-3

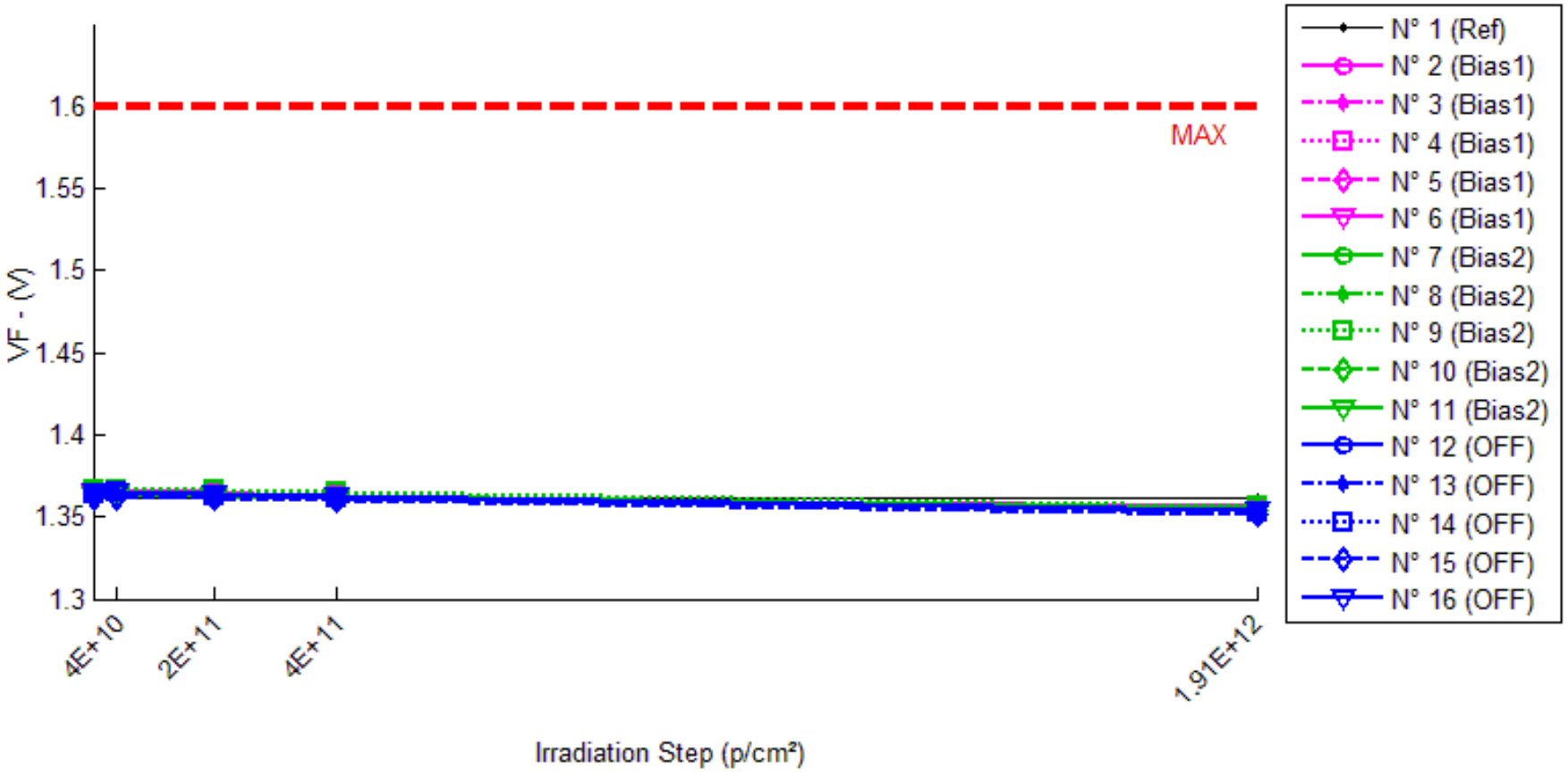
Delta [Ir]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.887E-4	1.854E-4	4.293E-4	1.093E-3
N° 2 (Bias1)	---	2.665E-4	5.783E-4	8.036E-4	2.563E-3
N° 3 (Bias1)	---	2.705E-4	4.974E-4	7.700E-4	2.733E-3
N° 4 (Bias1)	---	3.504E-4	5.647E-4	8.292E-4	3.541E-3
N° 5 (Bias1)	---	3.210E-4	5.740E-4	7.477E-4	2.675E-3
N° 6 (Bias1)	---	2.678E-4	4.865E-4	7.431E-4	2.675E-3
N° 7 (Bias2)	---	1.033E-4	5.765E-4	8.646E-4	4.180E-3
N° 8 (Bias2)	---	1.670E-4	6.665E-4	1.008E-3	4.241E-3
N° 9 (Bias2)	---	1.994E-4	5.387E-4	1.077E-3	4.176E-3
N° 10 (Bias2)	---	-1.092E-2	2.574E-4	-7.696E-3	-1.538E-2
N° 11 (Bias2)	---	1.999E-4	7.071E-4	1.008E-3	4.453E-3
N° 12 (OFF)	---	1.121E-2	2.696E-2	6.402E-3	3.039E-2
N° 13 (OFF)	---	1.465E-4	7.198E-4	1.078E-3	5.582E-3
N° 14 (OFF)	---	2.601E-4	5.960E-4	9.293E-4	4.681E-3
N° 15 (OFF)	---	-4.080E-3	-5.031E-3	-4.769E-3	1.130E-4
N° 16 (OFF)	---	3.066E-4	7.492E-4	9.191E-4	4.854E-3
Average (Bias1)	---	2.953E-4	5.402E-4	7.787E-4	2.837E-3
σ (Bias1)	---	3.841E-5	4.446E-5	3.702E-5	3.982E-4
Average+3σ (Bias1)	---	4.105E-4	6.736E-4	8.898E-4	4.032E-3
Average-3σ (Bias1)	---	1.800E-4	4.068E-4	6.677E-4	1.643E-3
Average (Bias2)	---	-2.051E-3	5.492E-4	-7.477E-4	3.347E-4
σ (Bias2)	---	4.960E-3	1.766E-4	3.885E-3	8.784E-3
Average+3σ (Bias2)	---	1.283E-2	1.079E-3	1.091E-2	2.669E-2
Average-3σ (Bias2)	---	-1.693E-2	1.947E-5	-1.240E-2	-2.602E-2
Average (OFF)	---	1.569E-3	4.798E-3	9.121E-4	9.124E-3
σ (OFF)	---	5.705E-3	1.263E-2	3.951E-3	1.208E-2
Average+3σ (OFF)	---	1.868E-2	4.270E-2	1.277E-2	4.537E-2
Average-3σ (OFF)	---	-1.555E-2	-3.310E-2	-1.094E-2	-2.712E-2

190 MeV proton / detailed results

2. VF

Ta=25°C; If=10mA



190 MeV proton / detailed results

VF . (V) **Max = 1.6**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1.362	1.362	1.362	1.361	1.361
N° 2 (Bias1)	1.366	1.367	1.365	1.362	1.357
N° 3 (Bias1)	1.364	1.364	1.363	1.362	1.355
N° 4 (Bias1)	1.365	1.366	1.365	1.364	1.357
N° 5 (Bias1)	1.363	1.364	1.363	1.362	1.354
N° 6 (Bias1)	1.364	1.365	1.364	1.362	1.354
N° 7 (Bias2)	1.363	1.364	1.364	1.363	1.355
N° 8 (Bias2)	1.364	1.365	1.364	1.363	1.355
N° 9 (Bias2)	1.366	1.367	1.366	1.365	1.357
N° 10 (Bias2)	1.363	1.364	1.363	1.361	1.354
N° 11 (Bias2)	1.363	1.364	1.363	1.361	1.354
N° 12 (OFF)	1.364	1.365	1.364	1.362	1.354
N° 13 (OFF)	1.363	1.364	1.362	1.361	1.352
N° 14 (OFF)	1.364	1.365	1.363	1.362	1.353
N° 15 (OFF)	1.362	1.362	1.361	1.360	1.352
N° 16 (OFF)	1.365	1.365	1.364	1.363	1.354

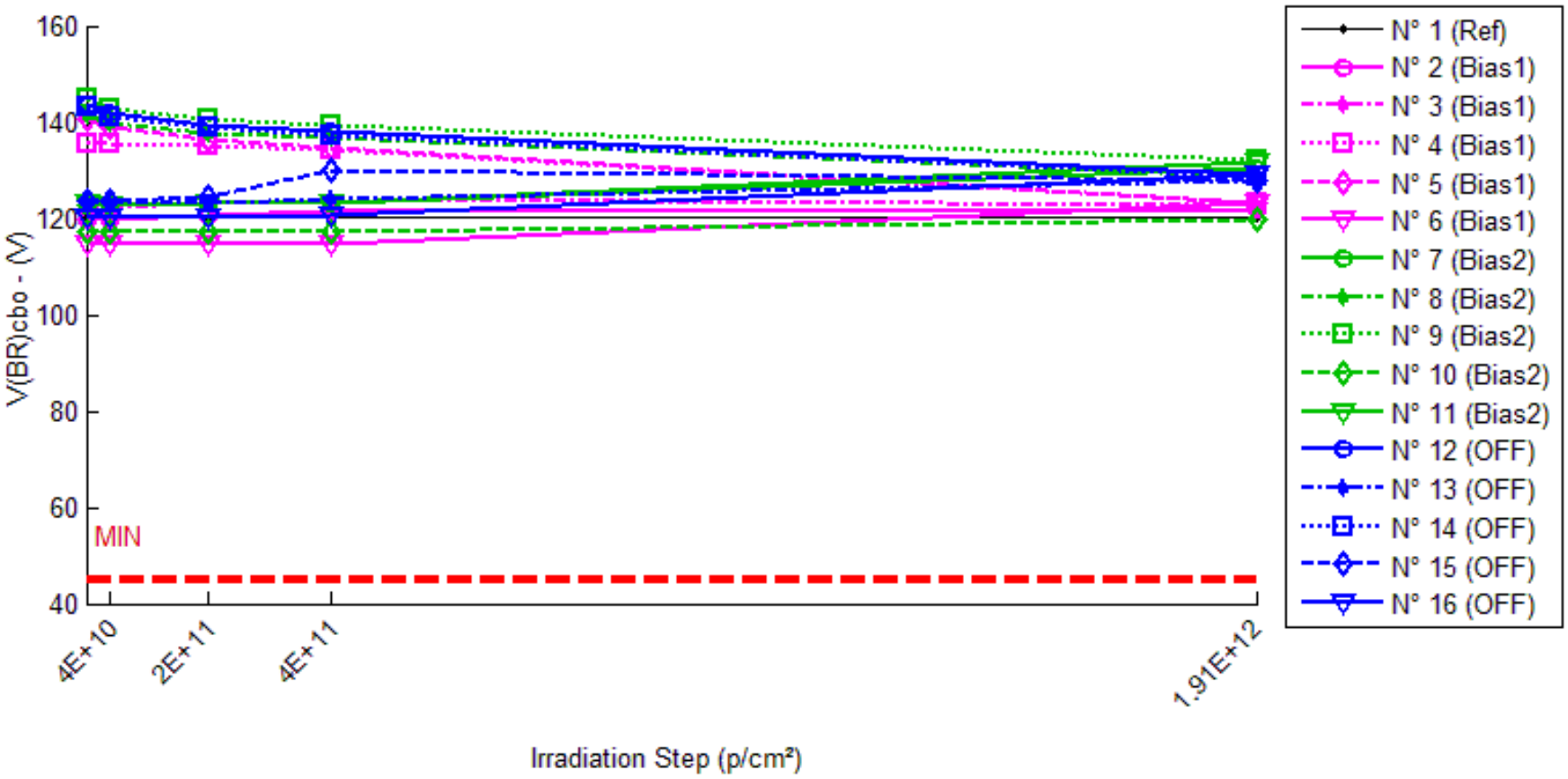
Delta [VF]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-6.350E-4	-9.100E-5	-1.276E-3	-8.630E-4
N° 2 (Bias1)	---	1.206E-3	-4.570E-4	-3.856E-3	-9.010E-3
N° 3 (Bias1)	---	8.220E-4	-2.230E-4	-1.295E-3	-9.000E-3
N° 4 (Bias1)	---	1.026E-3	-1.900E-4	-9.990E-4	-8.010E-3
N° 5 (Bias1)	---	9.310E-4	-3.110E-4	-1.239E-3	-8.798E-3
N° 6 (Bias1)	---	9.600E-4	-1.180E-4	-1.291E-3	-9.435E-3
N° 7 (Bias2)	---	1.267E-3	4.470E-4	-5.620E-4	-8.420E-3
N° 8 (Bias2)	---	7.800E-4	7.500E-5	-1.250E-3	-9.298E-3
N° 9 (Bias2)	---	9.720E-4	-9.000E-6	-1.236E-3	-9.388E-3
N° 10 (Bias2)	---	5.340E-4	-4.590E-4	-1.816E-3	-9.187E-3
N° 11 (Bias2)	---	8.390E-4	-6.170E-4	-2.027E-3	-9.272E-3
N° 12 (OFF)	---	1.054E-3	-5.250E-4	-1.764E-3	-9.747E-3
N° 13 (OFF)	---	1.488E-3	-2.980E-4	-1.285E-3	-1.100E-2
N° 14 (OFF)	---	1.504E-3	-5.670E-4	-1.388E-3	-1.027E-2
N° 15 (OFF)	---	2.520E-4	-4.570E-4	-1.444E-3	-9.825E-3
N° 16 (OFF)	---	7.110E-4	-6.780E-4	-1.394E-3	-1.015E-2
Average (Bias1)	---	9.890E-4	-2.598E-4	-1.736E-3	-8.851E-3
σ (Bias1)	---	1.419E-4	1.302E-4	1.191E-3	5.241E-4
Average+3σ (Bias1)	---	1.415E-3	1.309E-4	1.838E-3	-7.278E-3
Average-3σ (Bias1)	---	5.633E-4	-6.505E-4	-5.310E-3	-1.042E-2
Average (Bias2)	---	8.784E-4	-1.126E-4	-1.378E-3	-9.113E-3
σ (Bias2)	---	2.691E-4	4.282E-4	5.735E-4	3.940E-4
Average+3σ (Bias2)	---	1.686E-3	1.172E-3	3.422E-4	-7.931E-3
Average-3σ (Bias2)	---	7.116E-5	-1.397E-3	-3.099E-3	-1.029E-2
Average (OFF)	---	1.002E-3	-5.050E-4	-1.455E-3	-1.020E-2
σ (OFF)	---	5.334E-4	1.408E-4	1.821E-4	4.974E-4
Average+3σ (OFF)	---	2.602E-3	-8.253E-5	-9.086E-4	-8.705E-3
Average-3σ (OFF)	---	-5.984E-4	-9.275E-4	-2.001E-3	-1.169E-2

190 MeV proton / detailed results

3. V(BR)cbo

Ta=25°C; Ic=100µA; Ib=0; If=0



190 MeV proton / detailed results

V(BR)cbo . (V) **Min = 45.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	120.31	120.31	120.30	120.30	120.31
N° 2 (Bias1)	119.75	119.71	120.47	121.28	121.75
N° 3 (Bias1)	122.33	122.32	123.19	123.87	122.79
N° 4 (Bias1)	135.61	135.62	135.05	134.11	123.29
N° 5 (Bias1)	140.59	139.02	136.51	134.64	122.98
N° 6 (Bias1)	114.49	114.47	114.51	114.55	123.19
N° 7 (Bias2)	122.91	122.91	123.04	123.39	130.49
N° 8 (Bias2)	141.66	139.77	137.69	136.64	128.83
N° 9 (Bias2)	144.79	142.70	140.47	139.36	132.03
N° 10 (Bias2)	117.14	117.15	117.21	117.28	119.64
N° 11 (Bias2)	122.98	122.97	123.09	123.40	131.67
N° 12 (OFF)	143.45	141.85	139.53	138.11	129.34
N° 13 (OFF)	123.14	123.14	123.33	123.94	127.71
N° 14 (OFF)	143.03	141.20	138.83	137.29	128.85
N° 15 (OFF)	123.53	123.55	124.54	129.96	127.98
N° 16 (OFF)	120.27	120.27	120.34	120.47	129.11

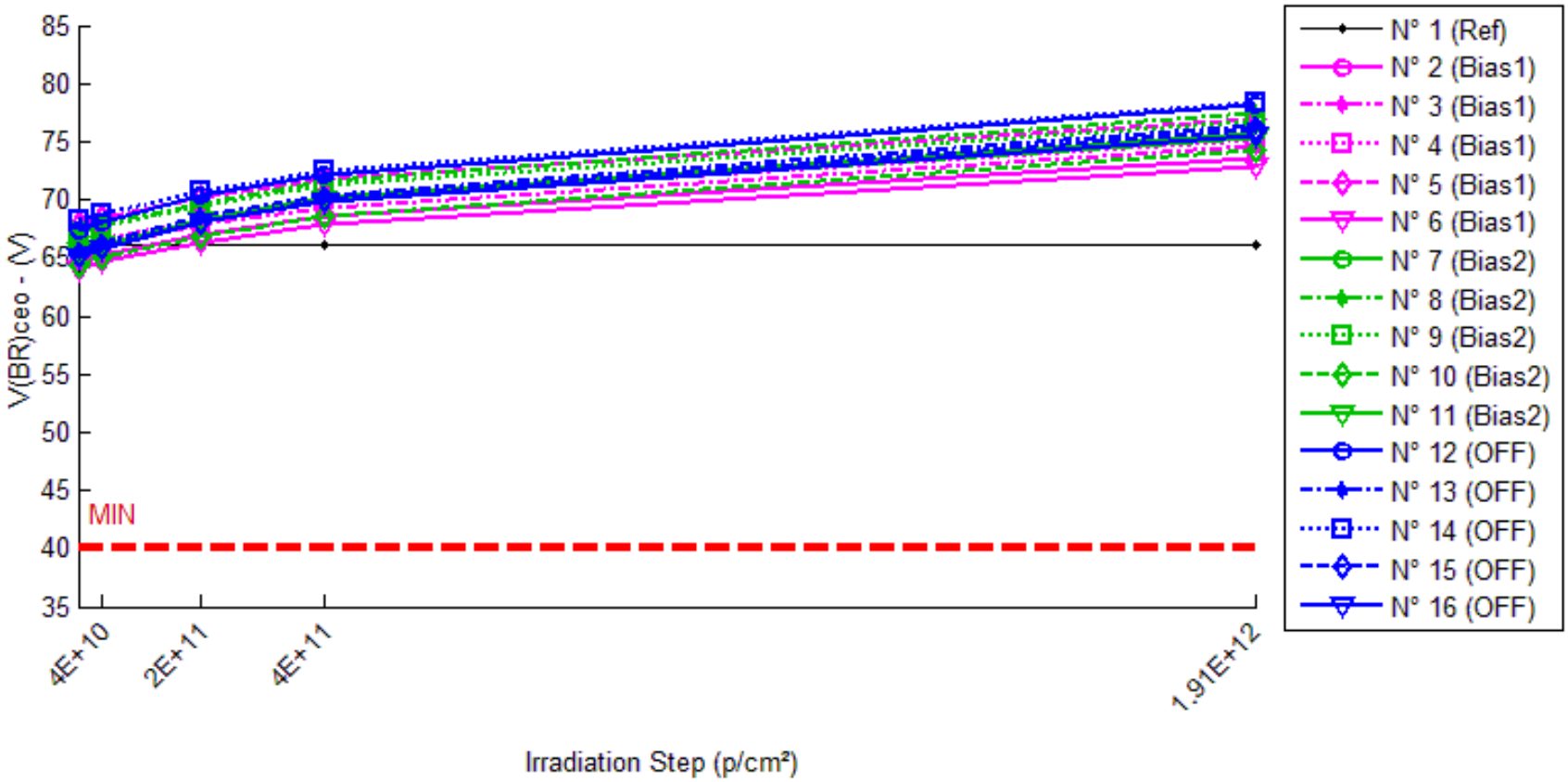
Delta [V(BR)cbo]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	8.000E-4	-2.500E-3	-7.000E-3	-1.000E-3
N° 2 (Bias1)	---	-3.810E-2	7.225E-1	1.532E+0	2.003E+0
N° 3 (Bias1)	---	-1.620E-2	8.526E-1	1.535E+0	4.595E-1
N° 4 (Bias1)	---	9.000E-3	-5.638E-1	-1.500E+0	-1.232E+1
N° 5 (Bias1)	---	-1.569E+0	-4.079E+0	-5.949E+0	-1.761E+1
N° 6 (Bias1)	---	-1.920E-2	2.670E-2	6.710E-2	8.702E+0
N° 7 (Bias2)	---	3.400E-3	1.311E-1	4.774E-1	7.580E+0
N° 8 (Bias2)	---	-1.890E+0	-3.970E+0	-5.016E+0	-1.282E+1
N° 9 (Bias2)	---	-2.090E+0	-4.319E+0	-5.428E+0	-1.276E+1
N° 10 (Bias2)	---	5.800E-3	6.720E-2	1.400E-1	2.492E+0
N° 11 (Bias2)	---	-1.020E-2	1.080E-1	4.148E-1	8.688E+0
N° 12 (OFF)	---	-1.603E+0	-3.915E+0	-5.335E+0	-1.411E+1
N° 13 (OFF)	---	2.700E-3	1.884E-1	8.053E-1	4.567E+0
N° 14 (OFF)	---	-1.828E+0	-4.200E+0	-5.738E+0	-1.418E+1
N° 15 (OFF)	---	1.950E-2	1.014E+0	6.429E+0	4.454E+0
N° 16 (OFF)	---	-7.100E-3	6.840E-2	1.947E-1	8.836E+0
Average (Bias1)	---	-3.267E-1	-6.082E-1	-8.629E-1	-3.753E+0
σ (Bias1)	---	6.946E-1	2.022E+0	3.107E+0	1.086E+1
Average+3σ (Bias1)	---	1.757E+0	5.458E+0	8.459E+0	2.881E+1
Average-3σ (Bias1)	---	-2.410E+0	-6.675E+0	-1.018E+1	-3.632E+1
Average (Bias2)	---	-7.962E-1	-1.597E+0	-1.882E+0	-1.365E+0
σ (Bias2)	---	1.092E+0	2.329E+0	3.055E+0	1.069E+1
Average+3σ (Bias2)	---	2.480E+0	5.392E+0	7.282E+0	3.071E+1
Average-3σ (Bias2)	---	-4.073E+0	-8.585E+0	-1.105E+1	-3.343E+1
Average (OFF)	---	-6.830E-1	-1.369E+0	-7.287E-1	-2.086E+0
σ (OFF)	---	9.455E-1	2.483E+0	5.018E+0	1.115E+1
Average+3σ (OFF)	---	2.154E+0	6.081E+0	1.433E+1	3.136E+1
Average-3σ (OFF)	---	-3.520E+0	-8.819E+0	-1.578E+1	-3.553E+1

190 MeV proton / detailed results

4. V(BR)ceo

Ta=25°C; Ic=1mA; Ib=0; If=0



190 MeV proton / detailed results

V(BR)ceo . (V) **Min = 40.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	66.16	66.14	66.11	66.13	66.15
N° 2 (Bias1)	64.78	65.27	67.01	68.55	73.58
N° 3 (Bias1)	65.39	65.97	67.83	69.32	74.62
N° 4 (Bias1)	66.13	66.59	68.33	70.10	75.21
N° 5 (Bias1)	67.86	68.38	70.11	71.79	76.92
N° 6 (Bias1)	64.07	64.62	66.32	67.91	72.80
N° 7 (Bias2)	65.46	66.13	68.19	70.11	75.67
N° 8 (Bias2)	67.24	67.85	69.72	71.67	77.45
N° 9 (Bias2)	67.26	67.73	69.52	71.27	76.76
N° 10 (Bias2)	64.31	64.97	66.87	68.68	74.28
N° 11 (Bias2)	65.57	66.18	68.22	70.03	75.41
N° 12 (OFF)	67.34	68.03	70.32	72.23	78.11
N° 13 (OFF)	65.59	66.28	68.56	70.37	76.44
N° 14 (OFF)	68.23	68.79	70.68	72.42	78.28
N° 15 (OFF)	65.25	65.99	68.13	69.96	76.02
N° 16 (OFF)	65.12	65.82	68.02	69.84	75.56

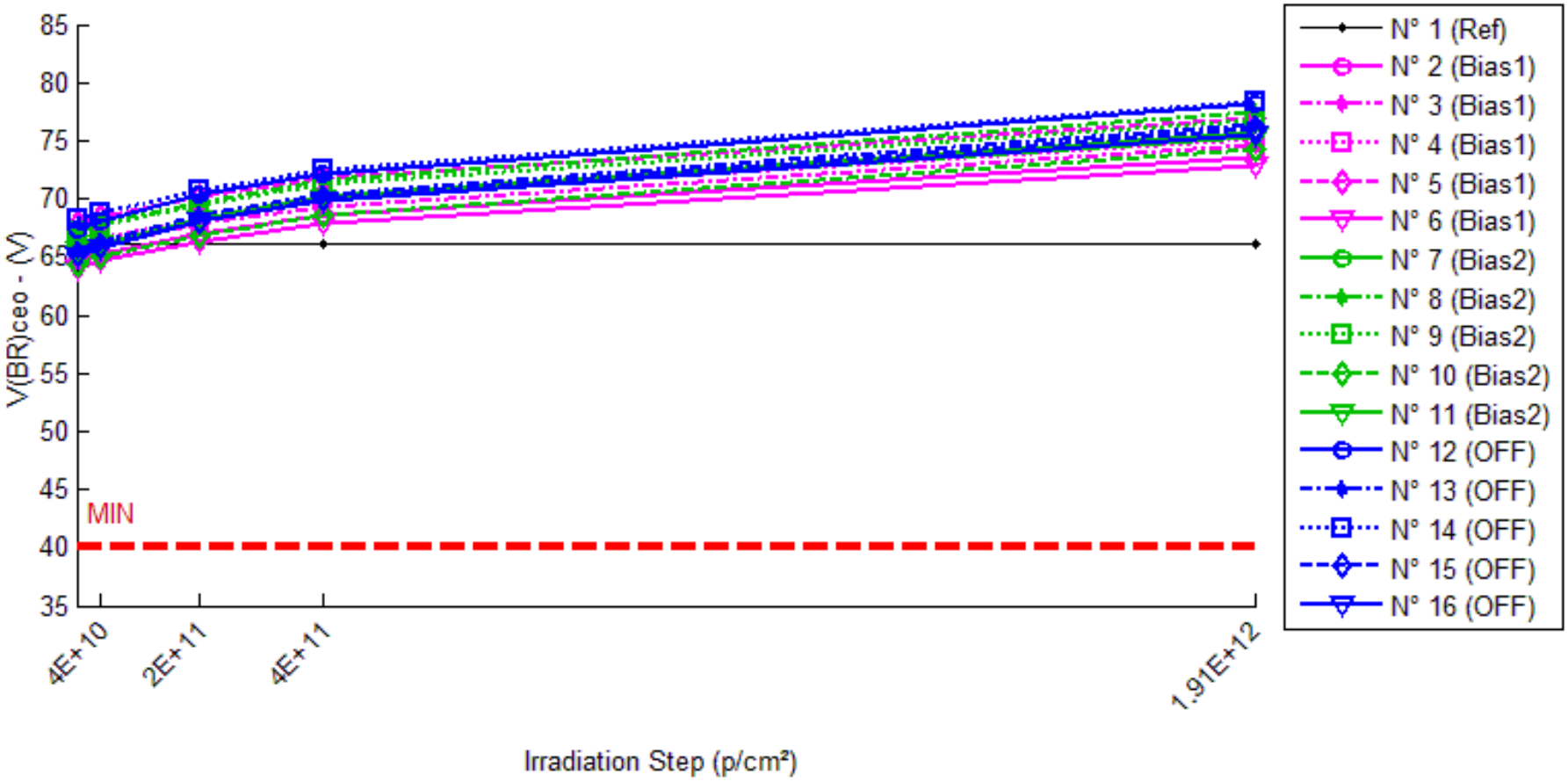
Delta [V(BR)ceo]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-2.470E-2	-4.997E-2	-3.074E-2	-1.372E-2
N° 2 (Bias1)	---	4.889E-1	2.230E+0	3.767E+0	8.803E+0
N° 3 (Bias1)	---	5.774E-1	2.441E+0	3.933E+0	9.227E+0
N° 4 (Bias1)	---	4.611E-1	2.196E+0	3.965E+0	9.082E+0
N° 5 (Bias1)	---	5.178E-1	2.243E+0	3.926E+0	9.057E+0
N° 6 (Bias1)	---	5.480E-1	2.247E+0	3.835E+0	8.730E+0
N° 7 (Bias2)	---	6.769E-1	2.738E+0	4.650E+0	1.022E+1
N° 8 (Bias2)	---	6.044E-1	2.479E+0	4.432E+0	1.021E+1
N° 9 (Bias2)	---	4.773E-1	2.269E+0	4.019E+0	9.508E+0
N° 10 (Bias2)	---	6.579E-1	2.562E+0	4.371E+0	9.971E+0
N° 11 (Bias2)	---	6.126E-1	2.644E+0	4.463E+0	9.840E+0
N° 12 (OFF)	---	6.938E-1	2.982E+0	4.889E+0	1.077E+1
N° 13 (OFF)	---	6.918E-1	2.967E+0	4.785E+0	1.085E+1
N° 14 (OFF)	---	5.555E-1	2.445E+0	4.189E+0	1.005E+1
N° 15 (OFF)	---	7.381E-1	2.873E+0	4.707E+0	1.077E+1
N° 16 (OFF)	---	7.010E-1	2.900E+0	4.720E+0	1.044E+1
Average (Bias1)	---	5.187E-1	2.272E+0	3.885E+0	8.980E+0
σ (Bias1)	---	4.613E-2	9.678E-2	8.189E-2	2.067E-1
Average+3σ (Bias1)	---	6.571E-1	2.562E+0	4.131E+0	9.600E+0
Average-3σ (Bias1)	---	3.803E-1	1.981E+0	3.639E+0	8.360E+0
Average (Bias2)	---	6.058E-1	2.538E+0	4.387E+0	9.949E+0
σ (Bias2)	---	7.798E-2	1.785E-1	2.303E-1	2.945E-1
Average+3σ (Bias2)	---	8.398E-1	3.074E+0	5.078E+0	1.083E+1
Average-3σ (Bias2)	---	3.719E-1	2.003E+0	3.696E+0	9.066E+0
Average (OFF)	---	6.760E-1	2.833E+0	4.658E+0	1.058E+1
σ (OFF)	---	6.992E-2	2.219E-1	2.721E-1	3.350E-1
Average+3σ (OFF)	---	8.858E-1	3.499E+0	5.474E+0	1.158E+1
Average-3σ (OFF)	---	4.663E-1	2.168E+0	3.842E+0	9.573E+0

190 MeV proton / detailed results

5. V(BR)eco

Ta=25°C; Ic=0; Ie=100µA; If=0



190 MeV proton / detailed results

V(BR)eco . (V) **Min = 5.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	7.78	7.78	7.78	7.78	7.78
N° 2 (Bias1)	7.66	7.67	7.67	7.67	7.67
N° 3 (Bias1)	7.85	7.85	7.86	7.86	7.86
N° 4 (Bias1)	7.80	7.80	7.81	7.81	7.80
N° 5 (Bias1)	8.10	8.10	8.11	8.11	8.10
N° 6 (Bias1)	7.49	7.50	7.51	7.51	7.50
N° 7 (Bias2)	7.85	7.87	7.87	7.88	7.87
N° 8 (Bias2)	8.29	8.30	8.31	8.31	8.30
N° 9 (Bias2)	8.46	8.46	8.47	8.47	8.47
N° 10 (Bias2)	7.54	7.54	7.54	7.54	7.53
N° 11 (Bias2)	7.88	7.89	7.89	7.89	7.89
N° 12 (OFF)	8.56	8.56	8.57	8.57	8.55
N° 13 (OFF)	7.76	7.77	7.77	7.77	7.76
N° 14 (OFF)	8.23	8.24	8.24	8.24	8.22
N° 15 (OFF)	7.94	7.94	7.95	7.95	7.94
N° 16 (OFF)	7.72	7.73	7.73	7.73	7.72

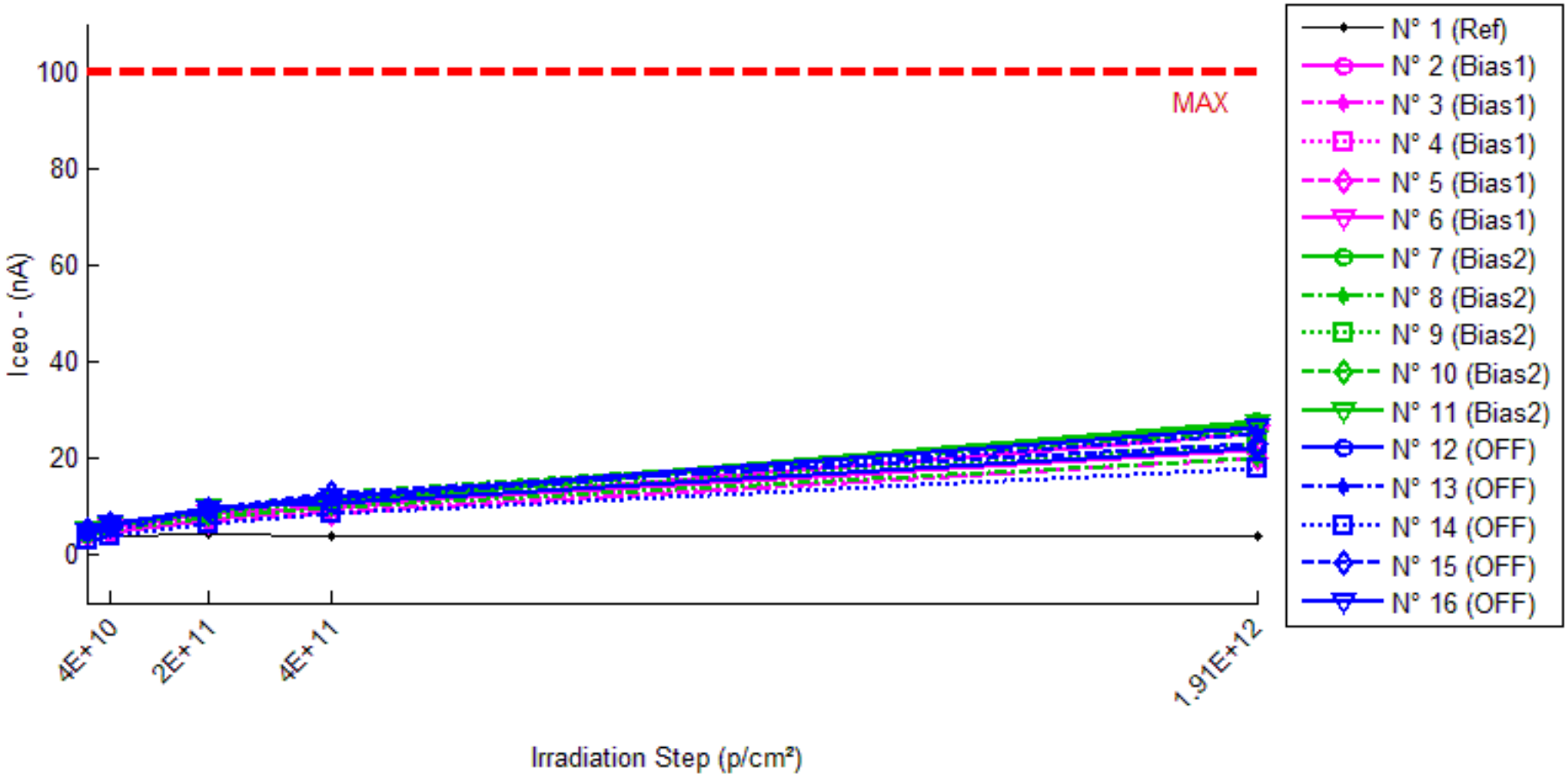
Delta [V(BR)eco]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-5.720E-4	-7.200E-5	-8.660E-4	-8.450E-4
N° 2 (Bias1)	---	5.609E-3	1.127E-2	1.037E-2	6.679E-3
N° 3 (Bias1)	---	7.428E-3	1.542E-2	1.646E-2	1.095E-2
N° 4 (Bias1)	---	4.242E-3	8.430E-3	9.018E-3	2.345E-3
N° 5 (Bias1)	---	4.663E-3	9.898E-3	1.084E-2	5.037E-3
N° 6 (Bias1)	---	8.636E-3	1.459E-2	1.505E-2	8.891E-3
N° 7 (Bias2)	---	1.179E-2	2.070E-2	2.135E-2	1.265E-2
N° 8 (Bias2)	---	7.491E-3	1.602E-2	1.693E-2	9.382E-3
N° 9 (Bias2)	---	8.131E-3	1.825E-2	1.971E-2	1.261E-2
N° 10 (Bias2)	---	4.714E-3	8.556E-3	7.856E-3	-1.785E-3
N° 11 (Bias2)	---	9.151E-3	1.670E-2	1.689E-2	8.546E-3
N° 12 (OFF)	---	4.525E-3	1.104E-2	9.487E-3	-6.391E-3
N° 13 (OFF)	---	6.655E-3	1.158E-2	1.131E-2	-5.363E-3
N° 14 (OFF)	---	7.396E-3	1.291E-2	1.304E-2	-4.082E-3
N° 15 (OFF)	---	5.263E-3	1.132E-2	1.165E-2	-3.407E-3
N° 16 (OFF)	---	8.756E-3	1.473E-2	1.480E-2	-1.280E-3
Average (Bias1)	---	6.116E-3	1.192E-2	1.235E-2	6.780E-3
σ (Bias1)	---	1.868E-3	3.004E-3	3.221E-3	3.337E-3
Average+3σ (Bias1)	---	1.172E-2	2.093E-2	2.201E-2	1.679E-2
Average-3σ (Bias1)	---	5.128E-4	2.911E-3	2.686E-3	-3.230E-3
Average (Bias2)	---	8.255E-3	1.605E-2	1.655E-2	8.281E-3
σ (Bias2)	---	2.570E-3	4.557E-3	5.217E-3	5.926E-3
Average+3σ (Bias2)	---	1.597E-2	2.972E-2	3.220E-2	2.606E-2
Average-3σ (Bias2)	---	5.437E-4	2.375E-3	8.965E-4	-9.497E-3
Average (OFF)	---	6.519E-3	1.232E-2	1.206E-2	-4.105E-3
σ (OFF)	---	1.684E-3	1.526E-3	1.988E-3	1.954E-3
Average+3σ (OFF)	---	1.157E-2	1.689E-2	1.802E-2	1.758E-3
Average-3σ (OFF)	---	1.467E-3	7.738E-3	6.095E-3	-9.967E-3

190 MeV proton / detailed results

6. Iceo

Ta=25°C; Vce=20V; If=0; Ib=0



190 MeV proton / detailed results

Iceo . (nA) **Max = 100.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	3.544	3.868	4.068	3.948	3.806
N° 2 (Bias1)	4.224	4.883	7.263	10.159	21.901
N° 3 (Bias1)	5.205	5.888	7.830	8.905	20.011
N° 4 (Bias1)	4.142	5.104	7.592	8.582	22.760
N° 5 (Bias1)	4.095	4.715	6.914	8.318	19.802
N° 6 (Bias1)	5.043	5.624	8.325	9.718	25.244
N° 7 (Bias2)	4.364	5.946	8.750	11.285	27.813
N° 8 (Bias2)	3.965	5.104	7.732	9.596	19.986
N° 9 (Bias2)	4.486	5.812	8.613	11.262	22.927
N° 10 (Bias2)	4.973	6.076	9.367	12.877	25.724
N° 11 (Bias2)	5.275	5.895	9.603	10.523	27.428
N° 12 (OFF)	4.886	6.022	9.635	10.838	22.016
N° 13 (OFF)	4.511	5.267	9.075	11.614	25.140
N° 14 (OFF)	2.937	3.640	6.368	8.708	18.028
N° 15 (OFF)	5.168	6.250	9.370	12.624	22.979
N° 16 (OFF)	4.516	6.216	9.382	11.751	26.220

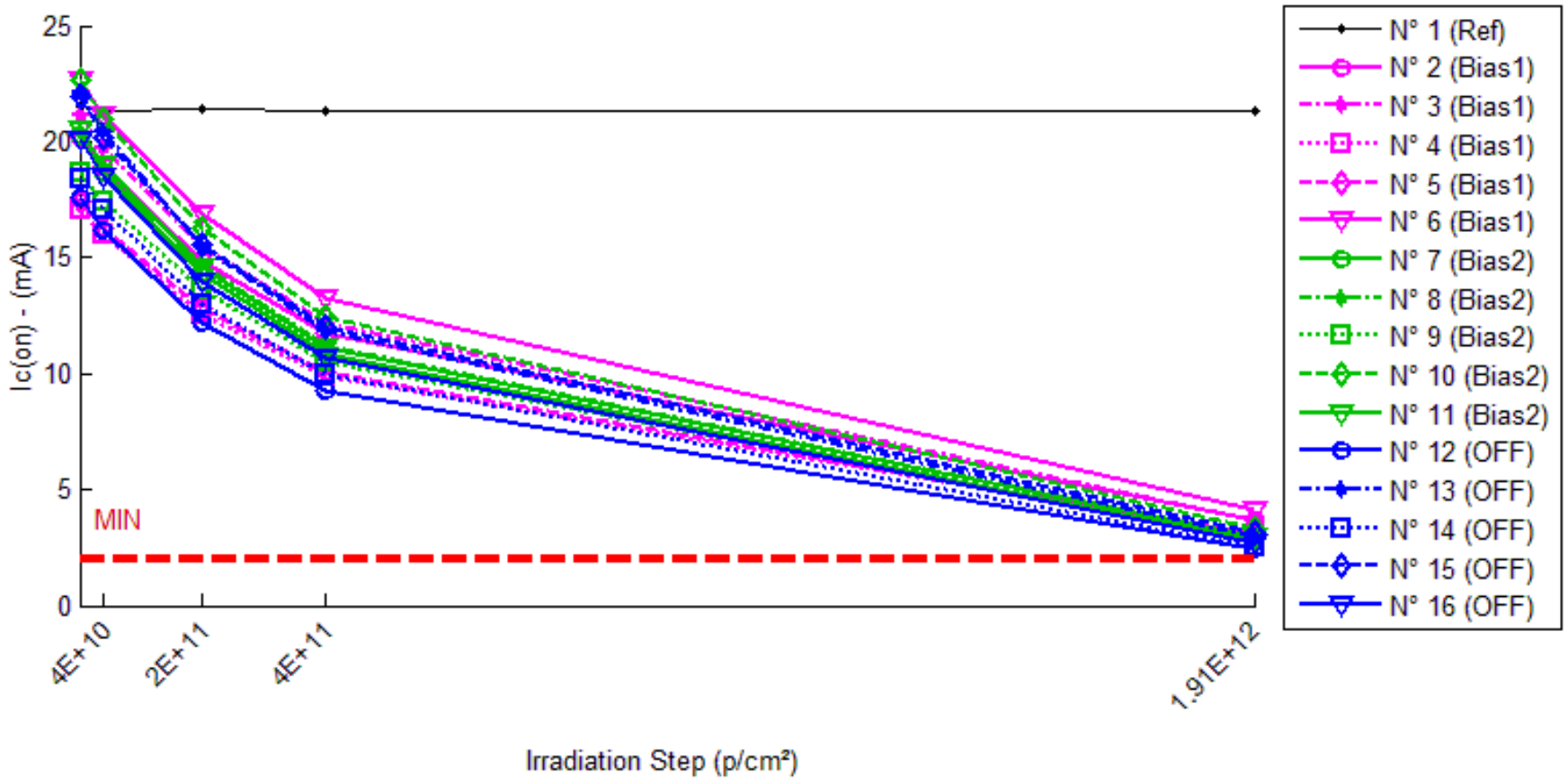
Delta [Iceo]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	3.241E-1	5.233E-1	4.037E-1	2.612E-1
N° 2 (Bias1)	---	6.599E-1	3.040E+0	5.936E+0	1.768E+1
N° 3 (Bias1)	---	6.829E-1	2.625E+0	3.700E+0	1.481E+1
N° 4 (Bias1)	---	9.621E-1	3.450E+0	4.439E+0	1.862E+1
N° 5 (Bias1)	---	6.198E-1	2.819E+0	4.223E+0	1.571E+1
N° 6 (Bias1)	---	5.815E-1	3.282E+0	4.675E+0	2.020E+1
N° 7 (Bias2)	---	1.582E+0	4.386E+0	6.921E+0	2.345E+1
N° 8 (Bias2)	---	1.139E+0	3.767E+0	5.631E+0	1.602E+1
N° 9 (Bias2)	---	1.327E+0	4.127E+0	6.776E+0	1.844E+1
N° 10 (Bias2)	---	1.103E+0	4.394E+0	7.904E+0	2.075E+1
N° 11 (Bias2)	---	6.205E-1	4.329E+0	5.248E+0	2.215E+1
N° 12 (OFF)	---	1.136E+0	4.749E+0	5.952E+0	1.713E+1
N° 13 (OFF)	---	7.565E-1	4.564E+0	7.103E+0	2.063E+1
N° 14 (OFF)	---	7.031E-1	3.431E+0	5.771E+0	1.509E+1
N° 15 (OFF)	---	1.082E+0	4.202E+0	7.455E+0	1.781E+1
N° 16 (OFF)	---	1.700E+0	4.866E+0	7.235E+0	2.170E+1
Average (Bias1)	---	7.012E-1	3.043E+0	4.595E+0	1.740E+1
σ (Bias1)	---	1.509E-1	3.344E-1	8.319E-1	2.179E+0
Average+3σ (Bias1)	---	1.154E+0	4.047E+0	7.090E+0	2.394E+1
Average-3σ (Bias1)	---	2.486E-1	2.040E+0	2.099E+0	1.086E+1
Average (Bias2)	---	1.154E+0	4.201E+0	6.496E+0	2.016E+1
σ (Bias2)	---	3.536E-1	2.654E-1	1.066E+0	2.967E+0
Average+3σ (Bias2)	---	2.215E+0	4.997E+0	9.694E+0	2.907E+1
Average-3σ (Bias2)	---	9.324E-2	3.404E+0	3.298E+0	1.126E+1
Average (OFF)	---	1.076E+0	4.362E+0	6.703E+0	1.847E+1
σ (OFF)	---	3.983E-1	5.781E-1	7.813E-1	2.682E+0
Average+3σ (OFF)	---	2.271E+0	6.097E+0	9.047E+0	2.652E+1
Average-3σ (OFF)	---	-1.195E-1	2.628E+0	4.360E+0	1.043E+1

190 MeV proton / detailed results

7. Ic(on)

Ta=25°C; If=1mA; Ib=0



190 MeV proton / detailed results

Ic(on) . (mA) **Min = 2.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	21.534	21.349	21.422	21.284	21.319
N° 2 (Bias1)	20.145	18.906	14.888	11.717	3.667
N° 3 (Bias1)	21.150	19.692	15.431	12.202	3.652
N° 4 (Bias1)	17.069	15.962	12.581	9.867	3.034
N° 5 (Bias1)	17.445	16.281	12.823	10.023	3.039
N° 6 (Bias1)	22.659	21.186	16.851	13.250	4.162
N° 7 (Bias2)	20.245	18.677	14.345	10.869	2.814
N° 8 (Bias2)	20.418	18.925	14.671	11.178	2.955
N° 9 (Bias2)	18.682	17.458	13.648	10.534	2.897
N° 10 (Bias2)	22.607	20.955	16.251	12.473	3.365
N° 11 (Bias2)	20.558	19.006	14.561	11.146	2.990
N° 12 (OFF)	17.578	16.145	12.180	9.266	2.396
N° 13 (OFF)	22.147	20.440	15.499	11.866	3.000
N° 14 (OFF)	18.430	17.040	12.958	9.946	2.498
N° 15 (OFF)	21.906	20.199	15.575	11.992	3.126
N° 16 (OFF)	20.055	18.481	14.000	10.714	2.734

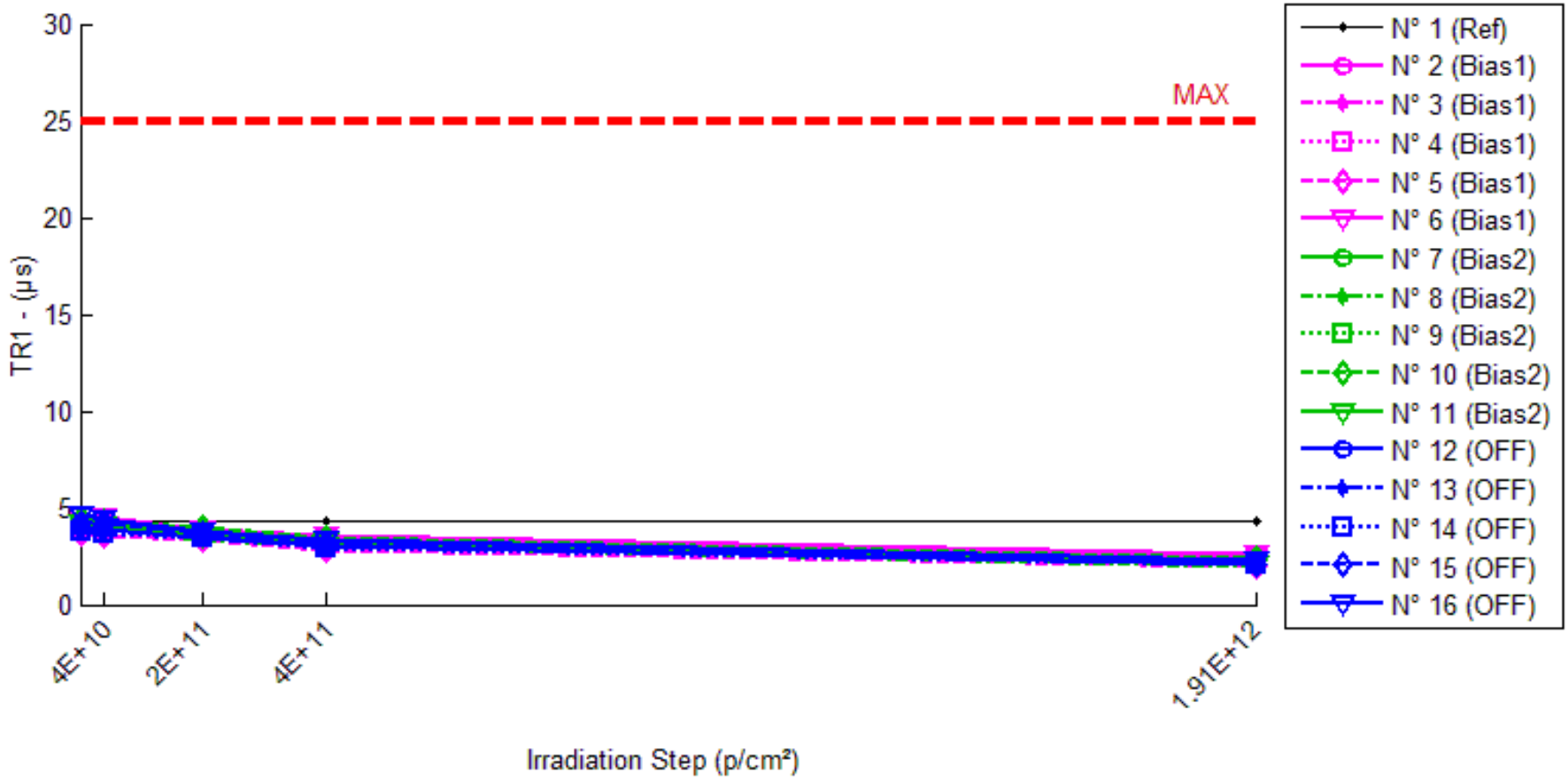
Delta [Ic(on)]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.852E-1	-1.124E-1	-2.501E-1	-2.152E-1
N° 2 (Bias1)	---	-1.240E+0	-5.257E+0	-8.428E+0	-1.648E+1
N° 3 (Bias1)	---	-1.458E+0	-5.718E+0	-8.948E+0	-1.750E+1
N° 4 (Bias1)	---	-1.107E+0	-4.488E+0	-7.202E+0	-1.403E+1
N° 5 (Bias1)	---	-1.164E+0	-4.622E+0	-7.422E+0	-1.441E+1
N° 6 (Bias1)	---	-1.473E+0	-5.808E+0	-9.409E+0	-1.850E+1
N° 7 (Bias2)	---	-1.568E+0	-5.900E+0	-9.376E+0	-1.743E+1
N° 8 (Bias2)	---	-1.493E+0	-5.748E+0	-9.240E+0	-1.746E+1
N° 9 (Bias2)	---	-1.224E+0	-5.034E+0	-8.149E+0	-1.578E+1
N° 10 (Bias2)	---	-1.652E+0	-6.356E+0	-1.013E+1	-1.924E+1
N° 11 (Bias2)	---	-1.552E+0	-5.997E+0	-9.412E+0	-1.757E+1
N° 12 (OFF)	---	-1.433E+0	-5.398E+0	-8.312E+0	-1.518E+1
N° 13 (OFF)	---	-1.707E+0	-6.648E+0	-1.028E+1	-1.915E+1
N° 14 (OFF)	---	-1.391E+0	-5.472E+0	-8.485E+0	-1.593E+1
N° 15 (OFF)	---	-1.707E+0	-6.331E+0	-9.913E+0	-1.878E+1
N° 16 (OFF)	---	-1.574E+0	-6.055E+0	-9.342E+0	-1.732E+1
Average (Bias1)	---	-1.288E+0	-5.179E+0	-8.282E+0	-1.618E+1
σ (Bias1)	---	1.687E-1	6.084E-1	9.541E-1	1.933E+0
Average+3σ (Bias1)	---	-7.823E-1	-3.354E+0	-5.419E+0	-1.038E+1
Average-3σ (Bias1)	---	-1.794E+0	-7.004E+0	-1.114E+1	-2.198E+1
Average (Bias2)	---	-1.498E+0	-5.807E+0	-9.262E+0	-1.750E+1
σ (Bias2)	---	1.632E-1	4.865E-1	7.135E-1	1.224E+0
Average+3σ (Bias2)	---	-1.008E+0	-4.348E+0	-7.122E+0	-1.383E+1
Average-3σ (Bias2)	---	-1.988E+0	-7.267E+0	-1.140E+1	-2.117E+1
Average (OFF)	---	-1.562E+0	-5.981E+0	-9.267E+0	-1.727E+1
σ (OFF)	---	1.485E-1	5.412E-1	8.627E-1	1.729E+0
Average+3σ (OFF)	---	-1.117E+0	-4.357E+0	-6.678E+0	-1.209E+1
Average-3σ (OFF)	---	-2.008E+0	-7.605E+0	-1.185E+1	-2.246E+1

190 MeV proton / detailed results

8. TR1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



190 MeV proton / detailed results

TR1 . (µs) **Max = 25.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	4.44	4.36	4.36	4.32	4.36
N° 2 (Bias1)	4.28	4.20	3.76	3.44	2.44
N° 3 (Bias1)	4.36	4.24	3.84	3.48	2.28
N° 4 (Bias1)	4.16	4.00	3.56	3.04	2.24
N° 5 (Bias1)	3.68	3.56	3.36	2.84	2.00
N° 6 (Bias1)	4.64	4.48	3.92	3.60	2.56
N° 7 (Bias2)	4.40	4.20	3.68	3.32	2.20
N° 8 (Bias2)	3.88	3.84	3.40	3.04	1.96
N° 9 (Bias2)	4.08	3.96	3.56	3.20	2.20
N° 10 (Bias2)	4.44	4.32	3.96	3.48	2.40
N° 11 (Bias2)	4.24	4.12	3.60	3.20	2.12
N° 12 (OFF)	4.00	3.88	3.44	3.00	2.04
N° 13 (OFF)	4.36	4.24	3.76	3.28	2.16
N° 14 (OFF)	3.80	3.64	3.44	2.92	2.04
N° 15 (OFF)	4.24	4.16	3.64	3.16	2.12
N° 16 (OFF)	4.60	4.44	3.76	3.36	2.32

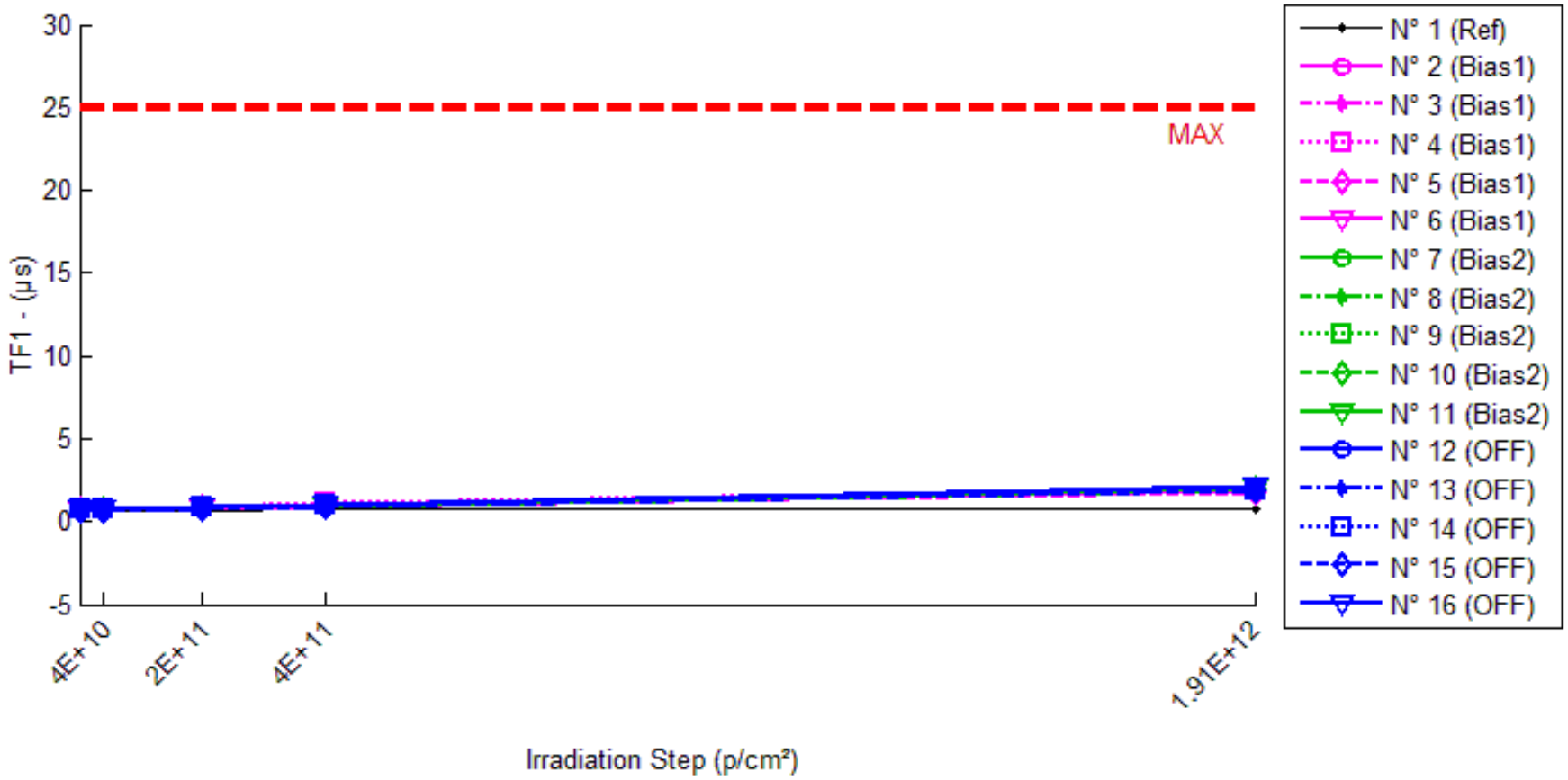
Delta [TR1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-8.000E-2	-8.000E-2	-1.200E-1	-8.000E-2
N° 2 (Bias1)	---	-8.000E-2	-5.200E-1	-8.400E-1	-1.840E+0
N° 3 (Bias1)	---	-1.200E-1	-5.200E-1	-8.800E-1	-2.080E+0
N° 4 (Bias1)	---	-1.600E-1	-6.000E-1	-1.120E+0	-1.920E+0
N° 5 (Bias1)	---	-1.200E-1	-3.200E-1	-8.400E-1	-1.680E+0
N° 6 (Bias1)	---	-1.600E-1	-7.200E-1	-1.040E+0	-2.080E+0
N° 7 (Bias2)	---	-2.000E-1	-7.200E-1	-1.080E+0	-2.200E+0
N° 8 (Bias2)	---	-4.000E-2	-4.800E-1	-8.400E-1	-1.920E+0
N° 9 (Bias2)	---	-1.200E-1	-5.200E-1	-8.800E-1	-1.880E+0
N° 10 (Bias2)	---	-1.200E-1	-4.800E-1	-9.600E-1	-2.040E+0
N° 11 (Bias2)	---	-1.200E-1	-6.400E-1	-1.040E+0	-2.120E+0
N° 12 (OFF)	---	-1.200E-1	-5.600E-1	-1.000E+0	-1.960E+0
N° 13 (OFF)	---	-1.200E-1	-6.000E-1	-1.080E+0	-2.200E+0
N° 14 (OFF)	---	-1.600E-1	-3.600E-1	-8.800E-1	-1.760E+0
N° 15 (OFF)	---	-8.000E-2	-6.000E-1	-1.080E+0	-2.120E+0
N° 16 (OFF)	---	-1.600E-1	-8.400E-1	-1.240E+0	-2.280E+0
Average (Bias1)	---	-1.280E-1	-5.360E-1	-9.440E-1	-1.920E+0
σ (Bias1)	---	3.347E-2	1.459E-1	1.284E-1	1.697E-1
Average+3σ (Bias1)	---	-2.760E-2	-9.837E-2	-5.589E-1	-1.411E+0
Average-3σ (Bias1)	---	-2.284E-1	-9.736E-1	-1.329E+0	-2.429E+0
Average (Bias2)	---	-1.200E-1	-5.680E-1	-9.600E-1	-2.032E+0
σ (Bias2)	---	5.657E-2	1.073E-1	1.020E-1	1.339E-1
Average+3σ (Bias2)	---	4.971E-2	-2.460E-1	-6.541E-1	-1.630E+0
Average-3σ (Bias2)	---	-2.897E-1	-8.900E-1	-1.266E+0	-2.434E+0
Average (OFF)	---	-1.280E-1	-5.920E-1	-1.056E+0	-2.064E+0
σ (OFF)	---	3.347E-2	1.706E-1	1.315E-1	2.071E-1
Average+3σ (OFF)	---	-2.760E-2	-8.006E-2	-6.616E-1	-1.443E+0
Average-3σ (OFF)	---	-2.284E-1	-1.104E+0	-1.450E+0	-2.685E+0

190 MeV proton / detailed results

9. TF1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



190 MeV proton / detailed results

TF1 . (µs) **Max = 25.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.72	0.68	0.68	0.72	0.72
N° 2 (Bias1)	0.72	0.72	0.80	0.92	1.88
N° 3 (Bias1)	0.72	0.72	0.80	0.92	1.88
N° 4 (Bias1)	0.80	0.80	0.92	1.12	2.04
N° 5 (Bias1)	0.72	0.76	0.84	0.96	1.80
N° 6 (Bias1)	0.64	0.72	0.72	0.84	2.04
N° 7 (Bias2)	0.72	0.76	0.84	1.00	2.00
N° 8 (Bias2)	0.64	0.72	0.76	0.88	1.88
N° 9 (Bias2)	0.72	0.76	0.84	0.96	2.00
N° 10 (Bias2)	0.64	0.72	0.72	0.84	2.00
N° 11 (Bias2)	0.72	0.72	0.84	0.92	2.04
N° 12 (OFF)	0.72	0.80	0.92	1.04	2.12
N° 13 (OFF)	0.64	0.68	0.72	0.84	2.00
N° 14 (OFF)	0.72	0.72	0.84	0.96	1.88
N° 15 (OFF)	0.64	0.64	0.72	0.84	1.88
N° 16 (OFF)	0.72	0.72	0.84	1.00	2.16

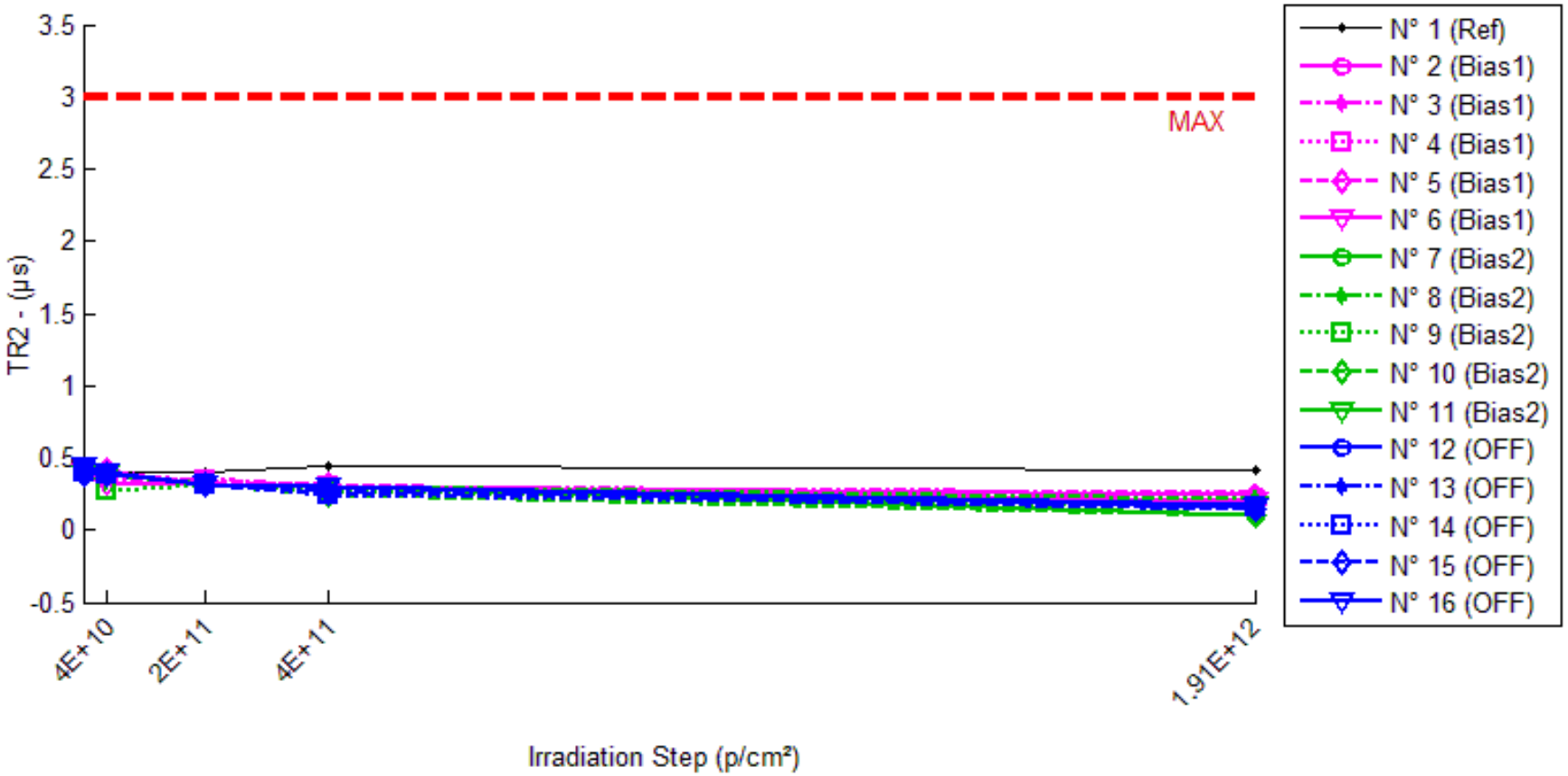
Delta [TF1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	-4.000E-2	0.000E+0	0.000E+0
N° 2 (Bias1)	---	0.000E+0	8.000E-2	2.000E-1	1.160E+0
N° 3 (Bias1)	---	0.000E+0	8.000E-2	2.000E-1	1.160E+0
N° 4 (Bias1)	---	0.000E+0	1.200E-1	3.200E-1	1.240E+0
N° 5 (Bias1)	---	4.000E-2	1.200E-1	2.400E-1	1.080E+0
N° 6 (Bias1)	---	8.000E-2	8.000E-2	2.000E-1	1.400E+0
N° 7 (Bias2)	---	4.000E-2	1.200E-1	2.800E-1	1.280E+0
N° 8 (Bias2)	---	8.000E-2	1.200E-1	2.400E-1	1.240E+0
N° 9 (Bias2)	---	4.000E-2	1.200E-1	2.400E-1	1.280E+0
N° 10 (Bias2)	---	8.000E-2	8.000E-2	2.000E-1	1.360E+0
N° 11 (Bias2)	---	0.000E+0	1.200E-1	2.000E-1	1.320E+0
N° 12 (OFF)	---	8.000E-2	2.000E-1	3.200E-1	1.400E+0
N° 13 (OFF)	---	4.000E-2	8.000E-2	2.000E-1	1.360E+0
N° 14 (OFF)	---	0.000E+0	1.200E-1	2.400E-1	1.160E+0
N° 15 (OFF)	---	0.000E+0	8.000E-2	2.000E-1	1.240E+0
N° 16 (OFF)	---	0.000E+0	1.200E-1	2.800E-1	1.440E+0
Average (Bias1)	---	2.400E-2	9.600E-2	2.320E-1	1.208E+0
σ (Bias1)	---	3.578E-2	2.191E-2	5.215E-2	1.213E-1
Average+3σ (Bias1)	---	1.313E-1	1.617E-1	3.885E-1	1.572E+0
Average-3σ (Bias1)	---	-8.333E-2	3.027E-2	7.554E-2	8.440E-1
Average (Bias2)	---	4.800E-2	1.120E-1	2.320E-1	1.296E+0
σ (Bias2)	---	3.347E-2	1.789E-2	3.347E-2	4.561E-2
Average+3σ (Bias2)	---	1.484E-1	1.657E-1	3.324E-1	1.433E+0
Average-3σ (Bias2)	---	-5.240E-2	5.833E-2	1.316E-1	1.159E+0
Average (OFF)	---	2.400E-2	1.200E-1	2.480E-1	1.320E+0
σ (OFF)	---	3.578E-2	4.899E-2	5.215E-2	1.166E-1
Average+3σ (OFF)	---	1.313E-1	2.670E-1	4.045E-1	1.670E+0
Average-3σ (OFF)	---	-8.333E-2	-2.697E-2	9.154E-2	9.701E-1

190 MeV proton / detailed results

10.TR2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



190 MeV proton / detailed results

TR2 . (µs) **Max = 3.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.42	0.40	0.40	0.44	0.42
N° 2 (Bias1)	0.40	0.38	0.32	0.30	0.24
N° 3 (Bias1)	0.42	0.34	0.36	0.30	0.26
N° 4 (Bias1)	0.40	0.38	0.34	0.30	0.16
N° 5 (Bias1)	0.38	0.42	0.32	0.32	0.18
N° 6 (Bias1)	0.40	0.32	0.32	0.30	0.20
N° 7 (Bias2)	0.42	0.38	0.32	0.30	0.10
N° 8 (Bias2)	0.40	0.40	0.32	0.30	0.22
N° 9 (Bias2)	0.40	0.28	0.32	0.28	0.16
N° 10 (Bias2)	0.38	0.38	0.32	0.24	0.10
N° 11 (Bias2)	0.38	0.38	0.32	0.30	0.18
N° 12 (OFF)	0.38	0.40	0.32	0.30	0.18
N° 13 (OFF)	0.40	0.38	0.32	0.28	0.16
N° 14 (OFF)	0.40	0.38	0.32	0.24	0.16
N° 15 (OFF)	0.38	0.38	0.32	0.26	0.14
N° 16 (OFF)	0.44	0.40	0.32	0.30	0.16

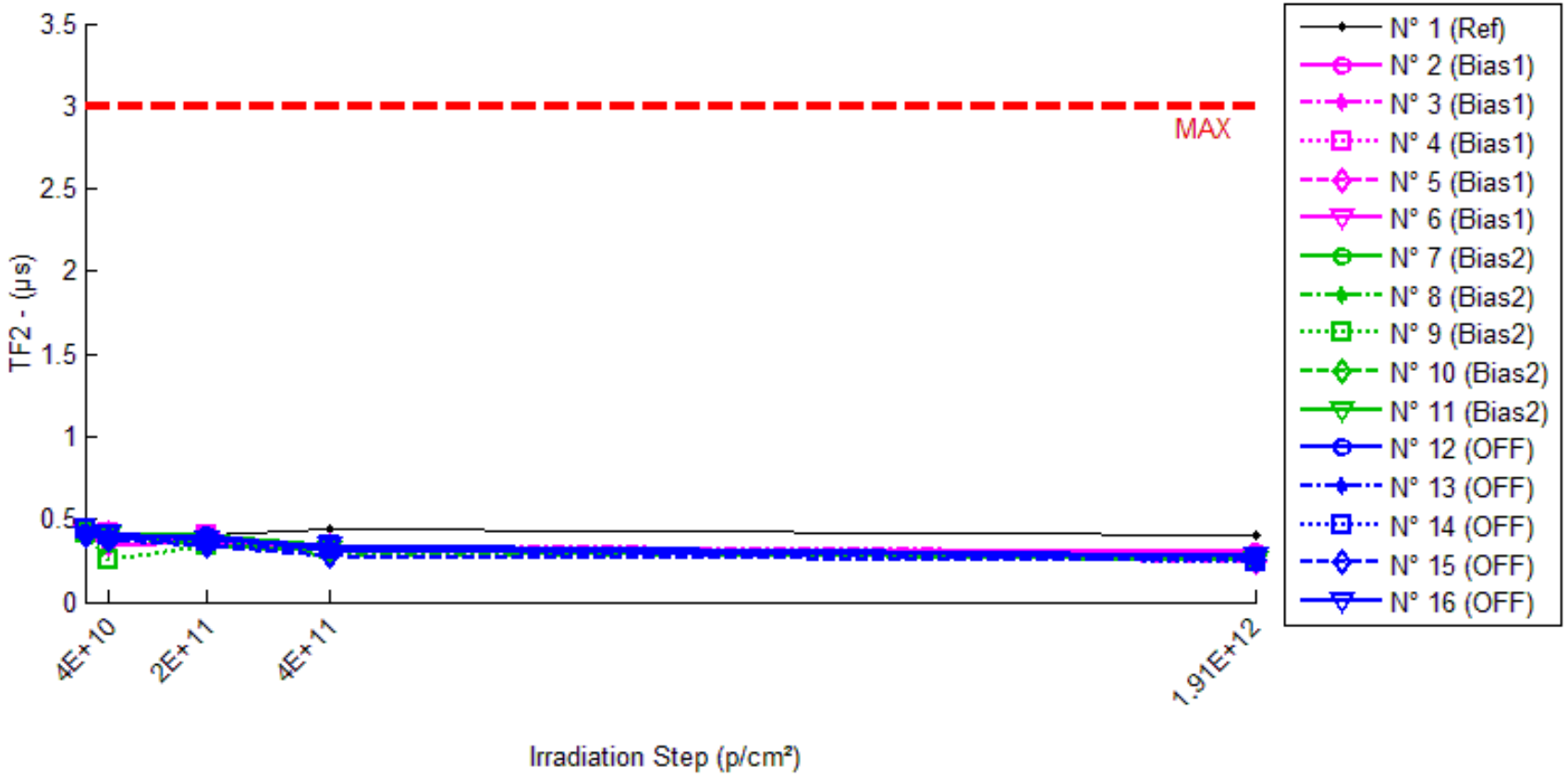
Delta [TR2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-2.000E-2	-2.000E-2	2.000E-2	0.000E+0
N° 2 (Bias1)	---	-2.000E-2	-8.000E-2	-1.000E-1	-1.600E-1
N° 3 (Bias1)	---	-8.000E-2	-6.000E-2	-1.200E-1	-1.600E-1
N° 4 (Bias1)	---	-2.000E-2	-6.000E-2	-1.000E-1	-2.400E-1
N° 5 (Bias1)	---	4.000E-2	-6.000E-2	-6.000E-2	-2.000E-1
N° 6 (Bias1)	---	-8.000E-2	-8.000E-2	-1.000E-1	-2.000E-1
N° 7 (Bias2)	---	-4.000E-2	-1.000E-1	-1.200E-1	-3.200E-1
N° 8 (Bias2)	---	0.000E+0	-8.000E-2	-1.000E-1	-1.800E-1
N° 9 (Bias2)	---	-1.200E-1	-8.000E-2	-1.200E-1	-2.400E-1
N° 10 (Bias2)	---	0.000E+0	-6.000E-2	-1.400E-1	-2.800E-1
N° 11 (Bias2)	---	0.000E+0	-6.000E-2	-8.000E-2	-2.000E-1
N° 12 (OFF)	---	2.000E-2	-6.000E-2	-8.000E-2	-2.000E-1
N° 13 (OFF)	---	-2.000E-2	-8.000E-2	-1.200E-1	-2.400E-1
N° 14 (OFF)	---	-2.000E-2	-8.000E-2	-1.600E-1	-2.400E-1
N° 15 (OFF)	---	0.000E+0	-6.000E-2	-1.200E-1	-2.400E-1
N° 16 (OFF)	---	-4.000E-2	-1.200E-1	-1.400E-1	-2.800E-1
Average (Bias1)	---	-3.200E-2	-6.800E-2	-9.600E-2	-1.920E-1
σ (Bias1)	---	5.020E-2	1.095E-2	2.191E-2	3.347E-2
Average+3σ (Bias1)	---	1.186E-1	-3.514E-2	-3.027E-2	-9.160E-2
Average-3σ (Bias1)	---	-1.826E-1	-1.009E-1	-1.617E-1	-2.924E-1
Average (Bias2)	---	-3.200E-2	-7.600E-2	-1.120E-1	-2.440E-1
σ (Bias2)	---	5.215E-2	1.673E-2	2.280E-2	5.727E-2
Average+3σ (Bias2)	---	1.245E-1	-2.580E-2	-4.359E-2	-7.219E-2
Average-3σ (Bias2)	---	-1.885E-1	-1.262E-1	-1.804E-1	-4.158E-1
Average (OFF)	---	-1.200E-2	-8.000E-2	-1.240E-1	-2.400E-1
σ (OFF)	---	2.280E-2	2.449E-2	2.966E-2	2.828E-2
Average+3σ (OFF)	---	5.641E-2	-6.515E-3	-3.501E-2	-1.551E-1
Average-3σ (OFF)	---	-8.041E-2	-1.535E-1	-2.130E-1	-3.249E-1

190 MeV proton / detailed results

11.TF2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



190 MeV proton / detailed results

TF2 . (µs) **Max = 3.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.42	0.42	0.40	0.44	0.40
N° 2 (Bias1)	0.40	0.40	0.34	0.32	0.30
N° 3 (Bias1)	0.40	0.36	0.38	0.34	0.30
N° 4 (Bias1)	0.42	0.42	0.40	0.32	0.26
N° 5 (Bias1)	0.40	0.42	0.34	0.34	0.24
N° 6 (Bias1)	0.42	0.34	0.36	0.32	0.26
N° 7 (Bias2)	0.42	0.42	0.40	0.34	0.26
N° 8 (Bias2)	0.42	0.40	0.36	0.28	0.28
N° 9 (Bias2)	0.42	0.26	0.34	0.32	0.26
N° 10 (Bias2)	0.42	0.38	0.34	0.32	0.26
N° 11 (Bias2)	0.40	0.40	0.34	0.32	0.26
N° 12 (OFF)	0.42	0.38	0.40	0.32	0.28
N° 13 (OFF)	0.40	0.40	0.34	0.32	0.26
N° 14 (OFF)	0.44	0.40	0.36	0.34	0.24
N° 15 (OFF)	0.40	0.38	0.34	0.28	0.26
N° 16 (OFF)	0.40	0.42	0.38	0.34	0.28

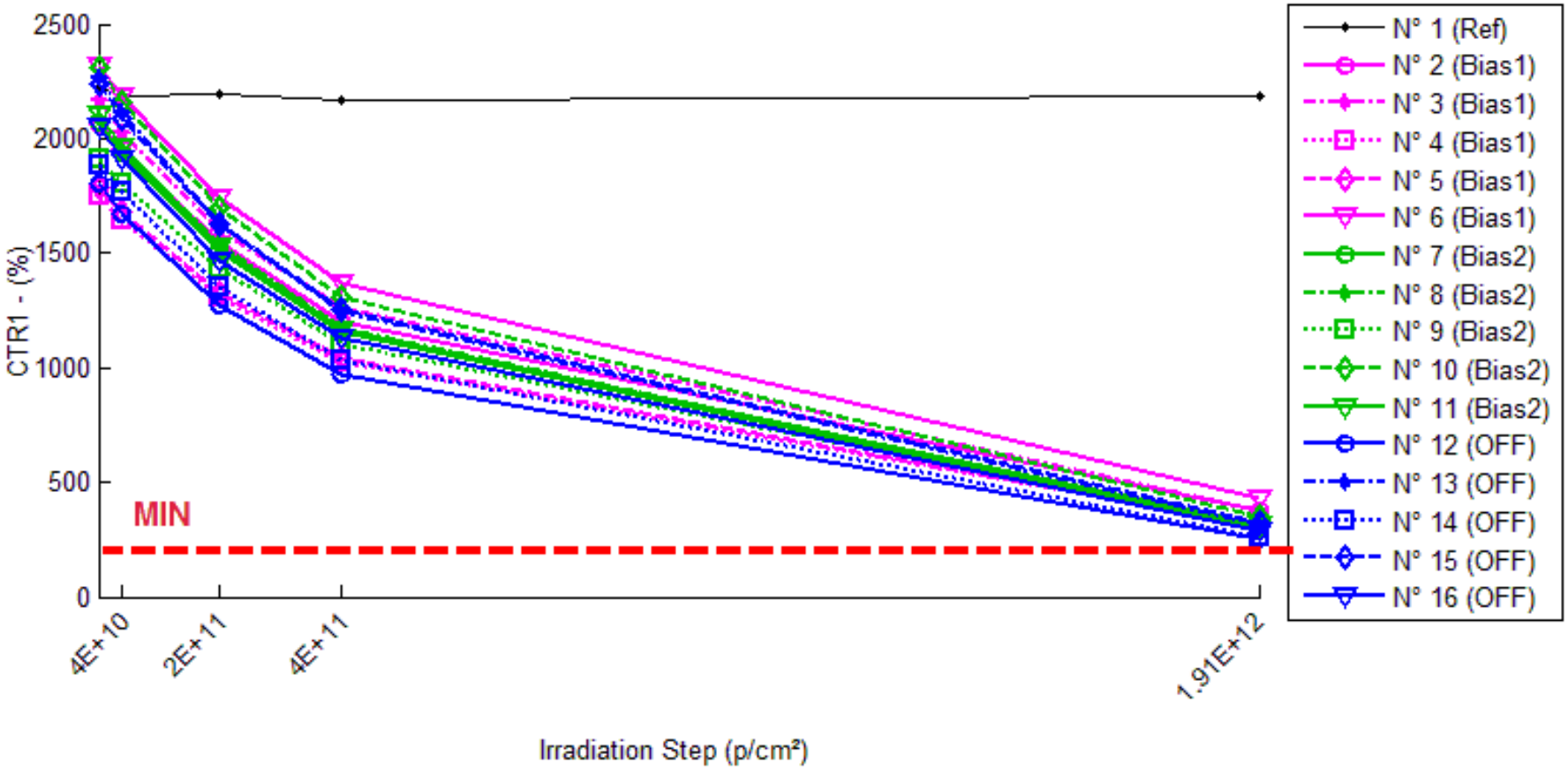
Delta [TF2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-2.000E-2	2.000E-2	-2.000E-2
N° 2 (Bias1)	---	0.000E+0	-6.000E-2	-8.000E-2	-1.000E-1
N° 3 (Bias1)	---	-4.000E-2	-2.000E-2	-6.000E-2	-1.000E-1
N° 4 (Bias1)	---	0.000E+0	-2.000E-2	-1.000E-1	-1.600E-1
N° 5 (Bias1)	---	2.000E-2	-6.000E-2	-6.000E-2	-1.600E-1
N° 6 (Bias1)	---	-8.000E-2	-6.000E-2	-1.000E-1	-1.600E-1
N° 7 (Bias2)	---	0.000E+0	-2.000E-2	-8.000E-2	-1.600E-1
N° 8 (Bias2)	---	-2.000E-2	-6.000E-2	-1.400E-1	-1.400E-1
N° 9 (Bias2)	---	-1.600E-1	-8.000E-2	-1.000E-1	-1.600E-1
N° 10 (Bias2)	---	-4.000E-2	-8.000E-2	-1.000E-1	-1.600E-1
N° 11 (Bias2)	---	0.000E+0	-6.000E-2	-8.000E-2	-1.400E-1
N° 12 (OFF)	---	-4.000E-2	-2.000E-2	-1.000E-1	-1.400E-1
N° 13 (OFF)	---	0.000E+0	-6.000E-2	-8.000E-2	-1.400E-1
N° 14 (OFF)	---	-4.000E-2	-8.000E-2	-1.000E-1	-2.000E-1
N° 15 (OFF)	---	-2.000E-2	-6.000E-2	-1.200E-1	-1.400E-1
N° 16 (OFF)	---	2.000E-2	-2.000E-2	-6.000E-2	-1.200E-1
Average (Bias1)	---	-2.000E-2	-4.400E-2	-8.000E-2	-1.360E-1
σ (Bias1)	---	4.000E-2	2.191E-2	2.000E-2	3.286E-2
Average+3σ (Bias1)	---	1.000E-1	2.173E-2	-2.000E-2	-3.741E-2
Average-3σ (Bias1)	---	-1.400E-1	-1.097E-1	-1.400E-1	-2.346E-1
Average (Bias2)	---	-4.400E-2	-6.000E-2	-1.000E-1	-1.520E-1
σ (Bias2)	---	6.693E-2	2.449E-2	2.449E-2	1.095E-2
Average+3σ (Bias2)	---	1.568E-1	1.348E-2	-2.652E-2	-1.191E-1
Average-3σ (Bias2)	---	-2.448E-1	-1.335E-1	-1.735E-1	-1.849E-1
Average (OFF)	---	-1.600E-2	-4.800E-2	-9.200E-2	-1.480E-1
σ (OFF)	---	2.608E-2	2.683E-2	2.280E-2	3.033E-2
Average+3σ (OFF)	---	6.223E-2	3.250E-2	-2.359E-2	-5.701E-2
Average-3σ (OFF)	---	-9.423E-2	-1.285E-1	-1.604E-1	-2.390E-1

190 MeV proton / detailed results

12.CTR1

Ta=25°C; Vce=5V; If=1mA



190 MeV proton / detailed results

CTR1 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	2223.34	2180.94	2193.15	2169.60	2188.43
N° 2 (Bias1)	2063.01	1957.77	1551.37	1202.15	376.20
N° 3 (Bias1)	2166.69	2028.60	1602.34	1259.63	375.09
N° 4 (Bias1)	1749.35	1643.31	1304.61	1020.06	312.08
N° 5 (Bias1)	1788.59	1676.16	1328.05	1040.67	312.07
N° 6 (Bias1)	2319.22	2180.87	1745.04	1372.84	426.06
N° 7 (Bias2)	2070.42	1933.49	1508.83	1154.03	295.46
N° 8 (Bias2)	2090.78	1956.23	1539.58	1171.73	310.12
N° 9 (Bias2)	1910.78	1801.99	1427.45	1101.41	302.94
N° 10 (Bias2)	2313.28	2162.64	1700.84	1304.24	352.39
N° 11 (Bias2)	2108.34	1967.59	1526.49	1165.90	313.28
N° 12 (OFF)	1799.67	1670.43	1275.23	966.91	254.29
N° 13 (OFF)	2268.24	2116.67	1625.70	1244.76	314.30
N° 14 (OFF)	1887.08	1764.67	1354.17	1035.52	262.14
N° 15 (OFF)	2242.46	2084.25	1629.92	1254.62	327.52
N° 16 (OFF)	2051.97	1907.32	1462.85	1129.96	285.92

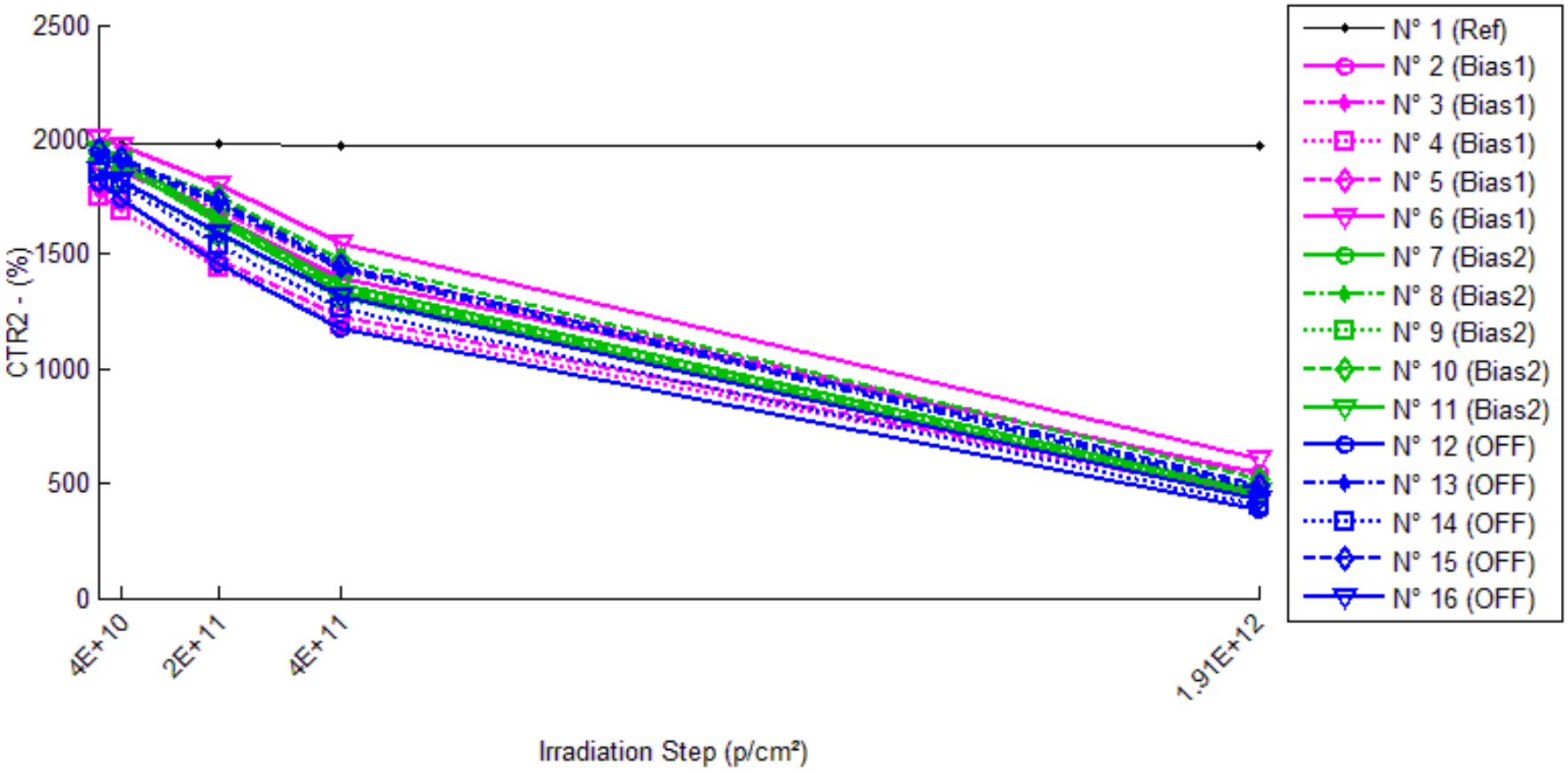
1/Delta [CTR1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	8.745E-6	6.191E-6	1.114E-5	7.175E-6
N° 2 (Bias1)	---	2.605E-5	1.599E-4	3.471E-4	2.173E-3
N° 3 (Bias1)	---	3.142E-5	1.626E-4	3.324E-4	2.205E-3
N° 4 (Bias1)	---	3.689E-5	1.949E-4	4.087E-4	2.633E-3
N° 5 (Bias1)	---	3.750E-5	1.939E-4	4.018E-4	2.645E-3
N° 6 (Bias1)	---	2.735E-5	1.419E-4	2.972E-4	1.916E-3
N° 7 (Bias2)	---	3.421E-5	1.798E-4	3.835E-4	2.902E-3
N° 8 (Bias2)	---	3.290E-5	1.712E-4	3.752E-4	2.746E-3
N° 9 (Bias2)	---	3.160E-5	1.772E-4	3.846E-4	2.778E-3
N° 10 (Bias2)	---	3.011E-5	1.557E-4	3.344E-4	2.405E-3
N° 11 (Bias2)	---	3.393E-5	1.808E-4	3.834E-4	2.718E-3
N° 12 (OFF)	---	4.299E-5	2.285E-4	4.786E-4	3.377E-3
N° 13 (OFF)	---	3.157E-5	1.742E-4	3.625E-4	2.741E-3
N° 14 (OFF)	---	3.676E-5	2.085E-4	4.358E-4	3.285E-3
N° 15 (OFF)	---	3.385E-5	1.676E-4	3.511E-4	2.607E-3
N° 16 (OFF)	---	3.696E-5	1.963E-4	3.977E-4	3.010E-3
Average (Bias1)	---	3.184E-5	1.706E-4	3.574E-4	2.314E-3
σ (Bias1)	---	5.275E-6	2.311E-5	4.732E-5	3.168E-4
Average+3σ (Bias1)	---	4.767E-5	2.399E-4	4.994E-4	3.265E-3
Average-3σ (Bias1)	---	1.602E-5	1.013E-4	2.155E-4	1.364E-3
Average (Bias2)	---	3.255E-5	1.729E-4	3.722E-4	2.710E-3
σ (Bias2)	---	1.705E-6	1.034E-5	2.146E-5	1.840E-4
Average+3σ (Bias2)	---	3.766E-5	2.040E-4	4.366E-4	3.262E-3
Average-3σ (Bias2)	---	2.743E-5	1.419E-4	3.079E-4	2.158E-3
Average (OFF)	---	3.643E-5	1.950E-4	4.051E-4	3.004E-3
σ (OFF)	---	4.293E-6	2.495E-5	5.273E-5	3.334E-4
Average+3σ (OFF)	---	4.930E-5	2.699E-4	5.633E-4	4.004E-3
Average-3σ (OFF)	---	2.355E-5	1.202E-4	2.469E-4	2.004E-3

190 MeV proton / detailed results

13.CTR2

Ta=25°C; Vce=5V; If=2mA



190 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1982.35	1977.48	1981.42	1976.27	1972.69
N° 2 (Bias1)	1902.58	1863.80	1659.27	1394.86	543.51
N° 3 (Bias1)	1920.85	1883.74	1692.81	1436.34	539.49
N° 4 (Bias1)	1751.35	1686.70	1438.48	1190.81	448.70
N° 5 (Bias1)	1793.21	1729.66	1475.13	1224.05	453.96
N° 6 (Bias1)	2005.97	1972.96	1806.61	1545.31	611.18
N° 7 (Bias2)	1934.45	1882.55	1634.27	1338.31	440.94
N° 8 (Bias2)	1921.91	1874.67	1649.59	1355.05	458.21
N° 9 (Bias2)	1877.44	1825.73	1580.19	1304.59	453.46
N° 10 (Bias2)	1949.78	1912.76	1751.68	1475.73	516.81
N° 11 (Bias2)	1956.37	1907.43	1660.95	1368.92	468.45
N° 12 (OFF)	1811.54	1741.56	1454.78	1174.03	389.10
N° 13 (OFF)	1931.45	1897.97	1711.99	1431.50	471.82
N° 14 (OFF)	1853.59	1800.11	1537.77	1260.43	406.56
N° 15 (OFF)	1955.39	1915.45	1729.15	1447.45	491.99
N° 16 (OFF)	1868.36	1824.16	1592.68	1318.91	432.42

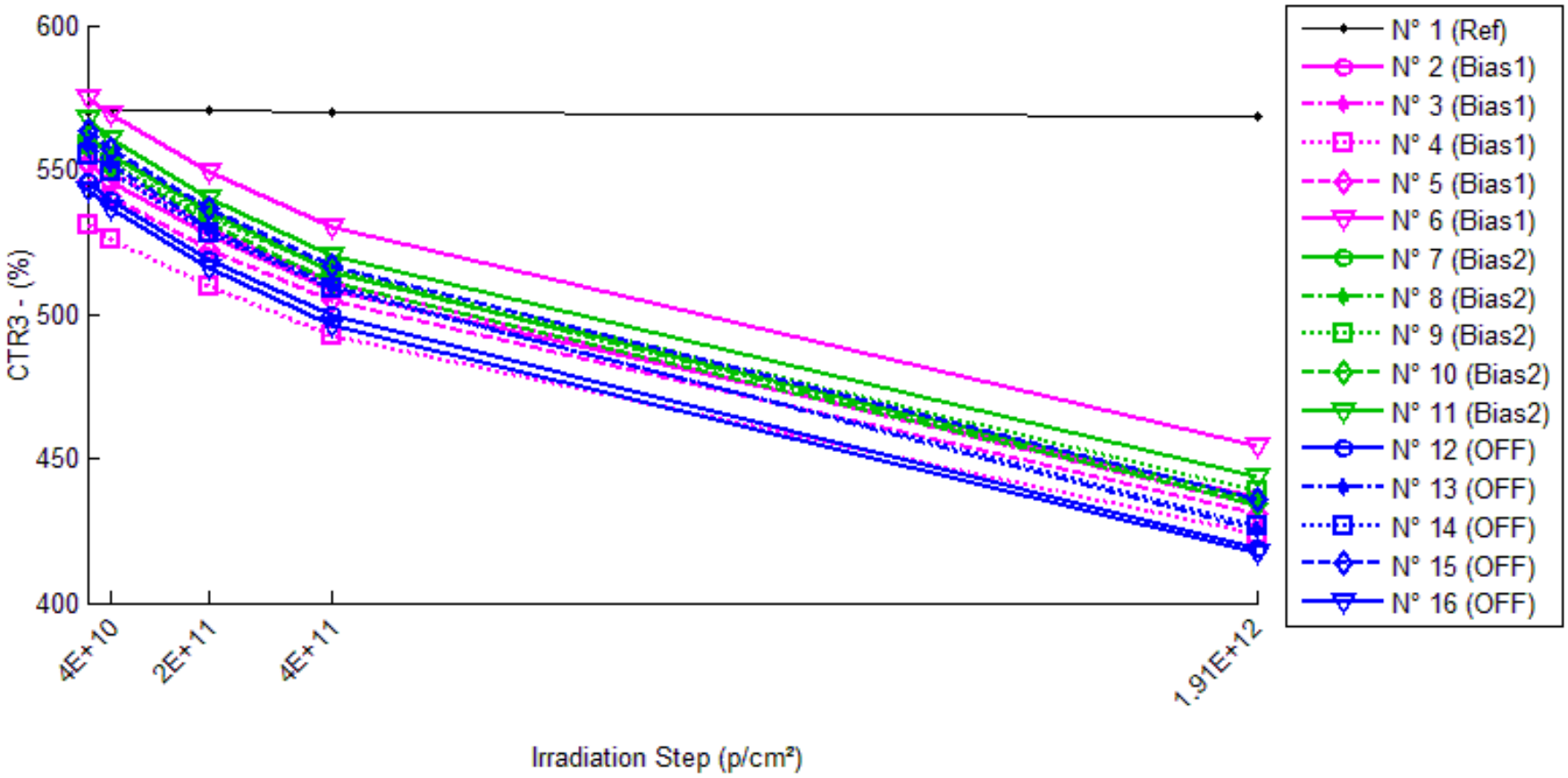
1/Delta [CTR2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	1.244E-6	2.383E-7	1.553E-6	2.471E-6
N° 2 (Bias1)	---	1.094E-5	7.707E-5	1.913E-4	1.314E-3
N° 3 (Bias1)	---	1.026E-5	7.013E-5	1.756E-4	1.333E-3
N° 4 (Bias1)	---	2.189E-5	1.242E-4	2.688E-4	1.658E-3
N° 5 (Bias1)	---	2.049E-5	1.202E-4	2.593E-4	1.645E-3
N° 6 (Bias1)	---	8.341E-6	5.501E-5	1.486E-4	1.138E-3
N° 7 (Bias2)	---	1.425E-5	9.495E-5	2.303E-4	1.751E-3
N° 8 (Bias2)	---	1.311E-5	8.590E-5	2.177E-4	1.662E-3
N° 9 (Bias2)	---	1.508E-5	1.002E-4	2.339E-4	1.673E-3
N° 10 (Bias2)	---	9.925E-6	5.800E-5	1.648E-4	1.422E-3
N° 11 (Bias2)	---	1.311E-5	9.092E-5	2.194E-4	1.624E-3
N° 12 (OFF)	---	2.218E-5	1.354E-4	2.998E-4	2.018E-3
N° 13 (OFF)	---	9.133E-6	6.637E-5	1.808E-4	1.602E-3
N° 14 (OFF)	---	1.603E-5	1.108E-4	2.539E-4	1.920E-3
N° 15 (OFF)	---	1.066E-5	6.691E-5	1.795E-4	1.521E-3
N° 16 (OFF)	---	1.297E-5	9.264E-5	2.230E-4	1.777E-3
Average (Bias1)	---	1.438E-5	8.933E-5	2.087E-4	1.418E-3
σ (Bias1)	---	6.305E-6	3.110E-5	5.286E-5	2.267E-4
Average+3σ (Bias1)	---	3.330E-5	1.826E-4	3.673E-4	2.098E-3
Average-3σ (Bias1)	---	-4.534E-6	-3.957E-6	5.014E-5	7.374E-4
Average (Bias2)	---	1.310E-5	8.599E-5	2.132E-4	1.626E-3
σ (Bias2)	---	1.958E-6	1.650E-5	2.795E-5	1.232E-4
Average+3σ (Bias2)	---	1.897E-5	1.355E-4	2.970E-4	1.996E-3
Average-3σ (Bias2)	---	7.223E-6	3.648E-5	1.293E-4	1.257E-3
Average (OFF)	---	1.419E-5	9.442E-5	2.274E-4	1.768E-3
σ (OFF)	---	5.165E-6	2.955E-5	5.105E-5	2.088E-4
Average+3σ (OFF)	---	2.969E-5	1.831E-4	3.805E-4	2.394E-3
Average-3σ (OFF)	---	-1.302E-6	5.778E-6	7.424E-5	1.141E-3

190 MeV proton / detailed results

14.CTR3

Ta=25°C; Vce=5V; If=10mA



190 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	569.83	570.33	570.83	570.02	568.69
N° 2 (Bias1)	552.03	545.74	526.96	508.35	436.29
N° 3 (Bias1)	555.47	549.55	529.72	511.12	433.52
N° 4 (Bias1)	531.04	526.22	509.31	492.46	423.52
N° 5 (Bias1)	546.20	541.01	522.56	504.37	430.78
N° 6 (Bias1)	574.65	568.81	549.38	530.22	454.03
N° 7 (Bias2)	561.99	555.13	535.49	514.19	435.86
N° 8 (Bias2)	561.93	555.02	535.06	514.26	433.96
N° 9 (Bias2)	558.22	552.29	533.84	515.01	438.71
N° 10 (Bias2)	558.48	551.41	531.50	510.99	434.08
N° 11 (Bias2)	567.50	560.73	540.33	520.54	443.30
N° 12 (OFF)	545.52	539.40	518.75	499.75	419.02
N° 13 (OFF)	558.37	552.03	529.62	509.36	425.31
N° 14 (OFF)	554.89	549.24	528.12	509.04	426.31
N° 15 (OFF)	563.75	556.81	536.74	517.02	435.51
N° 16 (OFF)	542.84	536.75	515.98	496.11	417.41

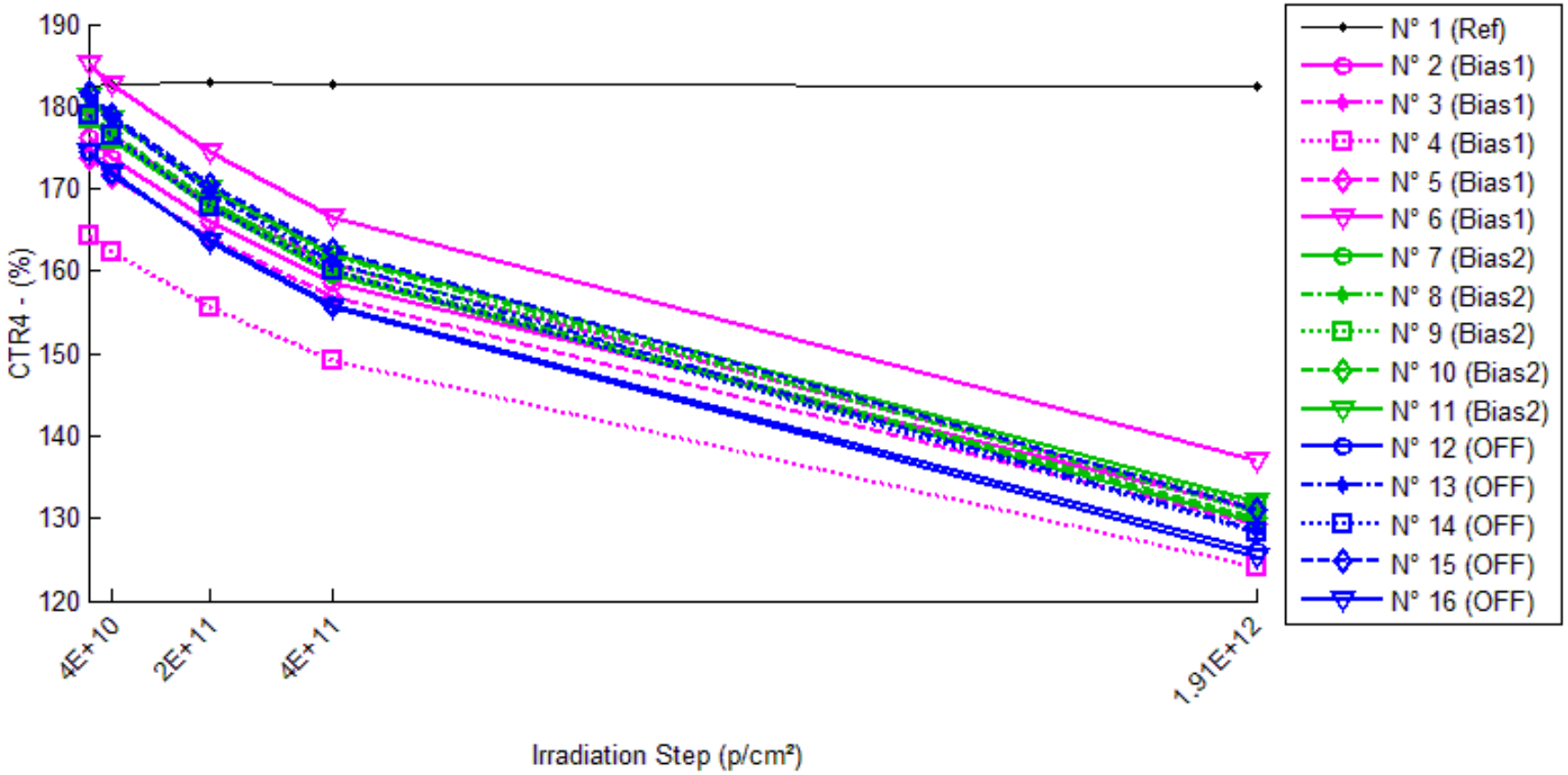
1/Delta [CTR3]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.515E-6	-3.053E-6	-5.656E-7	3.535E-6
N° 2 (Bias1)	---	2.086E-5	8.616E-5	1.556E-4	4.805E-4
N° 3 (Bias1)	---	1.938E-5	8.750E-5	1.562E-4	5.064E-4
N° 4 (Bias1)	---	1.725E-5	8.035E-5	1.476E-4	4.781E-4
N° 5 (Bias1)	---	1.755E-5	8.281E-5	1.518E-4	4.905E-4
N° 6 (Bias1)	---	1.786E-5	8.003E-5	1.458E-4	4.623E-4
N° 7 (Bias2)	---	2.200E-5	8.805E-5	1.654E-4	5.149E-4
N° 8 (Bias2)	---	2.214E-5	8.936E-5	1.650E-4	5.248E-4
N° 9 (Bias2)	---	1.923E-5	8.181E-5	1.503E-4	4.880E-4
N° 10 (Bias2)	---	2.293E-5	9.089E-5	1.664E-4	5.132E-4
N° 11 (Bias2)	---	2.128E-5	8.861E-5	1.590E-4	4.937E-4
N° 12 (OFF)	---	2.081E-5	9.459E-5	1.679E-4	5.534E-4
N° 13 (OFF)	---	2.058E-5	9.724E-5	1.723E-4	5.603E-4
N° 14 (OFF)	---	1.856E-5	9.136E-5	1.623E-4	5.436E-4
N° 15 (OFF)	---	2.211E-5	8.926E-5	1.603E-4	5.223E-4
N° 16 (OFF)	---	2.090E-5	9.589E-5	1.735E-4	5.536E-4
Average (Bias1)	---	1.858E-5	8.337E-5	1.514E-4	4.836E-4
σ (Bias1)	---	1.513E-6	3.372E-6	4.674E-6	1.629E-5
Average+3σ (Bias1)	---	2.312E-5	9.348E-5	1.654E-4	5.325E-4
Average-3σ (Bias1)	---	1.404E-5	7.325E-5	1.374E-4	4.347E-4
Average (Bias2)	---	2.151E-5	8.774E-5	1.612E-4	5.069E-4
σ (Bias2)	---	1.407E-6	3.482E-6	6.750E-6	1.544E-5
Average+3σ (Bias2)	---	2.573E-5	9.819E-5	1.815E-4	5.532E-4
Average-3σ (Bias2)	---	1.729E-5	7.730E-5	1.410E-4	4.606E-4
Average (OFF)	---	2.059E-5	9.367E-5	1.673E-4	5.466E-4
σ (OFF)	---	1.281E-6	3.293E-6	5.861E-6	1.485E-5
Average+3σ (OFF)	---	2.443E-5	1.035E-4	1.849E-4	5.912E-4
Average-3σ (OFF)	---	1.675E-5	8.379E-5	1.497E-4	5.021E-4

190 MeV proton / detailed results

15.CTR4

Ta=25°C; Vce=5V; If=50mA



190 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	182.54	182.66	182.82	182.65	182.35
N° 2 (Bias1)	176.14	173.65	165.94	158.63	131.13
N° 3 (Bias1)	179.01	176.50	168.25	160.74	131.21
N° 4 (Bias1)	164.31	162.35	155.64	149.18	124.13
N° 5 (Bias1)	173.66	171.43	163.94	156.78	129.31
N° 6 (Bias1)	185.17	182.66	174.37	166.51	137.04
N° 7 (Bias2)	178.78	175.97	167.80	159.52	129.52
N° 8 (Bias2)	181.18	178.49	170.05	161.77	130.71
N° 9 (Bias2)	178.36	176.04	168.39	160.86	131.50
N° 10 (Bias2)	179.54	176.79	168.46	160.18	130.00
N° 11 (Bias2)	181.08	178.37	169.98	162.06	131.92
N° 12 (OFF)	174.41	171.87	163.70	155.98	126.13
N° 13 (OFF)	181.28	178.60	169.41	161.15	128.67
N° 14 (OFF)	178.85	176.40	167.83	159.99	128.43
N° 15 (OFF)	181.57	178.87	170.54	162.57	130.94
N° 16 (OFF)	174.45	171.94	163.54	155.64	125.25

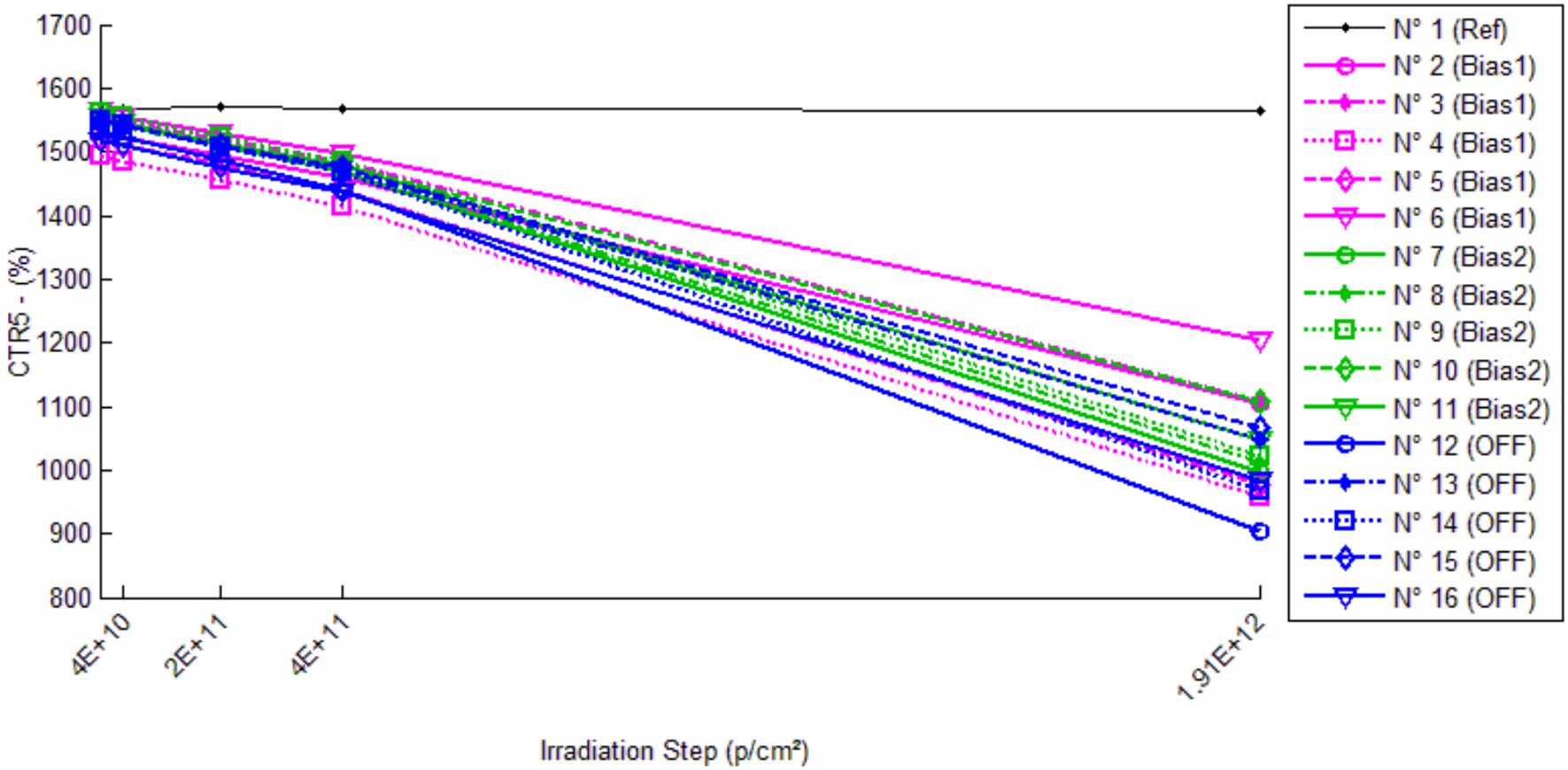
1/Delta [CTR4]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-3.773E-6	-8.441E-6	-3.269E-6	5.591E-6
N° 2 (Bias1)	---	8.134E-5	3.490E-4	6.266E-4	1.949E-3
N° 3 (Bias1)	---	7.944E-5	3.571E-4	6.351E-4	2.035E-3
N° 4 (Bias1)	---	7.331E-5	3.388E-4	6.171E-4	1.970E-3
N° 5 (Bias1)	---	7.495E-5	3.413E-4	6.201E-4	1.975E-3
N° 6 (Bias1)	---	7.411E-5	3.342E-4	6.052E-4	1.897E-3
N° 7 (Bias2)	---	8.943E-5	3.661E-4	6.755E-4	2.128E-3
N° 8 (Bias2)	---	8.330E-5	3.615E-4	6.626E-4	2.131E-3
N° 9 (Bias2)	---	7.377E-5	3.320E-4	6.101E-4	1.998E-3
N° 10 (Bias2)	---	8.642E-5	3.663E-4	6.731E-4	2.122E-3
N° 11 (Bias2)	---	8.387E-5	3.607E-4	6.482E-4	2.058E-3
N° 12 (OFF)	---	8.464E-5	3.751E-4	6.773E-4	2.195E-3
N° 13 (OFF)	---	8.285E-5	3.865E-4	6.890E-4	2.255E-3
N° 14 (OFF)	---	7.775E-5	3.671E-4	6.591E-4	2.195E-3
N° 15 (OFF)	---	8.320E-5	3.562E-4	6.438E-4	2.130E-3
N° 16 (OFF)	---	8.362E-5	3.825E-4	6.929E-4	2.252E-3
Average (Bias1)	---	7.663E-5	3.441E-4	6.208E-4	1.965E-3
σ (Bias1)	---	3.545E-6	9.005E-6	1.112E-5	4.983E-5
Average+3σ (Bias1)	---	8.727E-5	3.711E-4	6.542E-4	2.114E-3
Average-3σ (Bias1)	---	6.600E-5	3.171E-4	5.875E-4	1.815E-3
Average (Bias2)	---	8.336E-5	3.573E-4	6.539E-4	2.087E-3
σ (Bias2)	---	5.883E-6	1.440E-5	2.676E-5	5.838E-5
Average+3σ (Bias2)	---	1.010E-4	4.005E-4	7.342E-4	2.263E-3
Average-3σ (Bias2)	---	6.571E-5	3.141E-4	5.736E-4	1.912E-3
Average (OFF)	---	8.241E-5	3.735E-4	6.724E-4	2.205E-3
σ (OFF)	---	2.692E-6	1.218E-5	2.073E-5	5.163E-5
Average+3σ (OFF)	---	9.049E-5	4.100E-4	7.346E-4	2.360E-3
Average-3σ (OFF)	---	7.433E-5	3.370E-4	6.102E-4	2.050E-3

190 MeV proton / detailed results

16.CTR5

Ta=25°C; Vce=30V; If=5mA



190 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1567.05	1567.29	1569.76	1567.08	1564.63
N° 2 (Bias1)	1532.08	1522.69	1493.21	1458.09	1103.40
N° 3 (Bias1)	1558.38	1549.84	1518.93	1484.19	1107.69
N° 4 (Bias1)	1493.09	1485.65	1454.62	1412.93	957.77
N° 5 (Bias1)	1519.94	1511.69	1480.36	1439.71	975.56
N° 6 (Bias1)	1564.87	1556.28	1528.08	1496.18	1203.09
N° 7 (Bias2)	1550.48	1540.46	1510.74	1470.11	996.01
N° 8 (Bias2)	1548.44	1538.80	1509.08	1471.70	1011.84
N° 9 (Bias2)	1562.05	1554.48	1524.09	1485.98	1020.32
N° 10 (Bias2)	1552.69	1541.71	1513.04	1477.88	1107.72
N° 11 (Bias2)	1554.91	1545.30	1513.99	1476.80	1046.93
N° 12 (OFF)	1532.80	1523.11	1486.86	1441.23	904.91
N° 13 (OFF)	1549.79	1541.77	1508.12	1472.35	1047.02
N° 14 (OFF)	1548.83	1541.19	1507.72	1468.75	967.71
N° 15 (OFF)	1549.25	1540.61	1509.44	1474.37	1068.07
N° 16 (OFF)	1517.85	1510.43	1476.26	1437.57	984.91

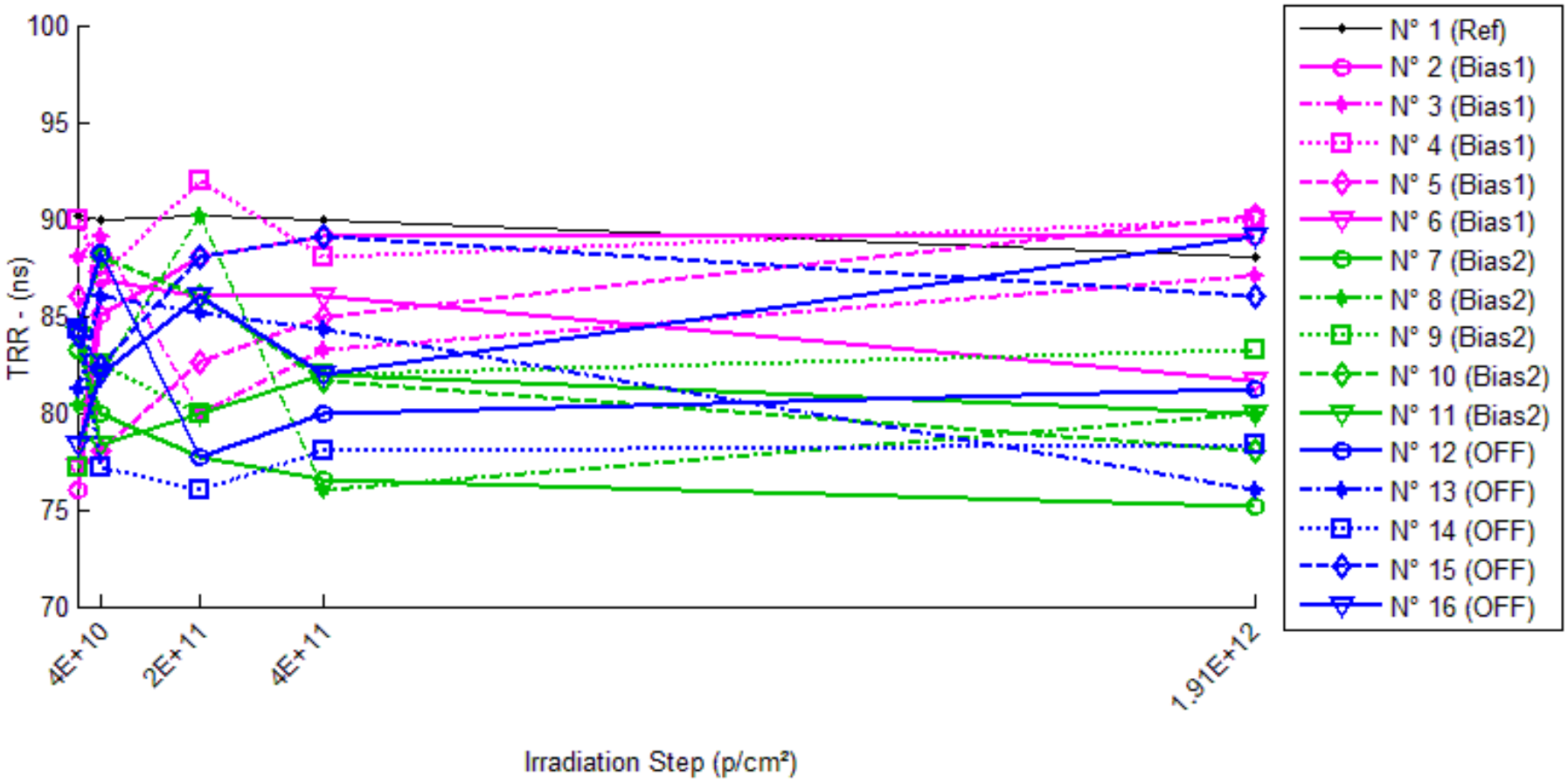
1/Delta [CTR5]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-9.975E-8	-1.101E-6	-1.344E-8	9.870E-7
N° 2 (Bias1)	---	4.025E-6	1.699E-5	3.312E-5	2.536E-4
N° 3 (Bias1)	---	3.538E-6	1.667E-5	3.208E-5	2.611E-4
N° 4 (Bias1)	---	3.355E-6	1.771E-5	3.800E-5	3.743E-4
N° 5 (Bias1)	---	3.590E-6	1.759E-5	3.667E-5	3.671E-4
N° 6 (Bias1)	---	3.525E-6	1.538E-5	2.933E-5	1.922E-4
N° 7 (Bias2)	---	4.193E-6	1.696E-5	3.526E-5	3.590E-4
N° 8 (Bias2)	---	4.046E-6	1.684E-5	3.367E-5	3.425E-4
N° 9 (Bias2)	---	3.118E-6	1.594E-5	3.277E-5	3.399E-4
N° 10 (Bias2)	---	4.587E-6	1.688E-5	3.260E-5	2.587E-4
N° 11 (Bias2)	---	4.000E-6	1.738E-5	3.401E-5	3.121E-4
N° 12 (OFF)	---	4.151E-6	2.016E-5	4.145E-5	4.527E-4
N° 13 (OFF)	---	3.354E-6	1.783E-5	3.394E-5	3.098E-4
N° 14 (OFF)	---	3.199E-6	1.760E-5	3.520E-5	3.877E-4
N° 15 (OFF)	---	3.617E-6	1.702E-5	3.278E-5	2.908E-4
N° 16 (OFF)	---	3.240E-6	1.856E-5	3.679E-5	3.565E-4
Average (Bias1)	---	3.606E-6	1.687E-5	3.384E-5	2.897E-4
σ (Bias1)	---	2.498E-7	9.339E-7	3.507E-6	7.873E-5
Average+3σ (Bias1)	---	4.356E-6	1.967E-5	4.436E-5	5.259E-4
Average-3σ (Bias1)	---	2.857E-6	1.407E-5	2.332E-5	5.346E-5
Average (Bias2)	---	3.989E-6	1.680E-5	3.366E-5	3.224E-4
σ (Bias2)	---	5.387E-7	5.261E-7	1.071E-6	3.942E-5
Average+3σ (Bias2)	---	5.605E-6	1.838E-5	3.688E-5	4.407E-4
Average-3σ (Bias2)	---	2.373E-6	1.522E-5	3.045E-5	2.042E-4
Average (OFF)	---	3.512E-6	1.823E-5	3.603E-5	3.595E-4
σ (OFF)	---	3.926E-7	1.208E-6	3.377E-6	6.457E-5
Average+3σ (OFF)	---	4.690E-6	2.186E-5	4.617E-5	5.532E-4
Average-3σ (OFF)	---	2.335E-6	1.461E-5	2.590E-5	1.658E-4

190 MeV proton / detailed results

17.TRR

Ta=25°C; If=5mA; RL=100Ohms; Irec = 10% Irm



190 MeV proton / detailed results

TRR . (ns)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	90.2	90.0	90.2	90.0	88.0
N° 2 (Bias1)	76.0	85.1	88.0	89.1	89.1
N° 3 (Bias1)	88.0	89.1	80.0	83.2	87.1
N° 4 (Bias1)	90.0	87.1	92.0	88.0	90.0
N° 5 (Bias1)	86.0	78.0	82.6	85.0	90.2
N° 6 (Bias1)	77.2	86.9	86.0	86.0	81.7
N° 7 (Bias2)	83.2	80.0	77.7	76.5	75.2
N° 8 (Bias2)	80.4	82.0	90.2	76.0	80.0
N° 9 (Bias2)	77.2	82.5	80.0	82.0	83.2
N° 10 (Bias2)	84.3	88.0	86.0	81.7	78.0
N° 11 (Bias2)	84.0	78.4	80.0	82.0	80.0
N° 12 (OFF)	84.3	88.2	77.7	80.0	81.2
N° 13 (OFF)	81.2	86.0	85.2	84.3	76.0
N° 14 (OFF)	84.3	77.2	76.0	78.0	78.4
N° 15 (OFF)	84.0	82.4	88.0	89.1	86.0
N° 16 (OFF)	78.3	82.0	86.0	82.0	89.1

Delta [TRR]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.961E-1	0.000E+0	-1.961E-1	-2.196E+0
N° 2 (Bias1)	---	9.149E+0	1.200E+1	1.311E+1	1.311E+1
N° 3 (Bias1)	---	1.109E+0	-8.000E+0	-4.832E+0	-8.713E-1
N° 4 (Bias1)	---	-2.871E+0	2.000E+0	-2.000E+0	0.000E+0
N° 5 (Bias1)	---	-7.950E+0	-3.306E+0	-9.504E-1	4.214E+0
N° 6 (Bias1)	---	9.658E+0	8.772E+0	8.772E+0	4.439E+0
N° 7 (Bias2)	---	-3.168E+0	-5.482E+0	-6.698E+0	-7.921E+0
N° 8 (Bias2)	---	1.608E+0	9.772E+0	-4.392E+0	-3.922E-1
N° 9 (Bias2)	---	5.272E+0	2.772E+0	4.772E+0	5.941E+0
N° 10 (Bias2)	---	3.702E+0	1.702E+0	-2.631E+0	-6.298E+0
N° 11 (Bias2)	---	-5.569E+0	-4.000E+0	-2.000E+0	-4.000E+0
N° 12 (OFF)	---	3.922E+0	-6.628E+0	-4.314E+0	-3.126E+0
N° 13 (OFF)	---	4.812E+0	4.058E+0	3.126E+0	-5.155E+0
N° 14 (OFF)	---	-7.070E+0	-8.264E+0	-6.298E+0	-5.866E+0
N° 15 (OFF)	---	-1.647E+0	4.000E+0	5.109E+0	2.000E+0
N° 16 (OFF)	---	3.667E+0	7.667E+0	3.667E+0	1.078E+1
Average (Bias1)	---	1.819E+0	2.293E+0	2.820E+0	4.178E+0
σ (Bias1)	---	7.634E+0	8.270E+0	7.702E+0	5.540E+0
Average+3σ (Bias1)	---	2.472E+1	2.710E+1	2.593E+1	2.080E+1
Average-3σ (Bias1)	---	-2.108E+1	-2.252E+1	-2.029E+1	-1.244E+1
Average (Bias2)	---	3.691E-1	9.528E-1	-2.190E+0	-2.534E+0
σ (Bias2)	---	4.595E+0	6.074E+0	4.297E+0	5.517E+0
Average+3σ (Bias2)	---	1.415E+1	1.918E+1	1.070E+1	1.402E+1
Average-3σ (Bias2)	---	-1.342E+1	-1.727E+1	-1.508E+1	-1.908E+1
Average (OFF)	---	7.367E-1	1.664E-1	2.580E-1	-2.742E-1
σ (OFF)	---	5.049E+0	7.130E+0	5.178E+0	6.901E+0
Average+3σ (OFF)	---	1.588E+1	2.156E+1	1.579E+1	2.043E+1
Average-3σ (OFF)	---	-1.441E+1	-2.122E+1	-1.528E+1	-2.098E+1