TOTAL DOSE RADIATION TEST REPORT

ESA study: "Survey of Critical Components for 150 kRad Power Systems"

ESTEC Contract N° 22831/09/NL/AF refers

Contract extension up to 400 kRad as per CCN: ATGSP-CN-0004 IS. 3

Final Report

Part Type : 2N3637

Package : TO-39

Description : PNP Medium Power Transistors

Manufacturer : Microsemi Corporation

Alter Technology Purchase Order N° ATGSP-TL-09-JC-CO-9 dated 11/27/2009

Alter Technology Project Manager: David NUNEZ

Hirex reference :	HRX/TID/1010	Issue : 01	Date :	January 25th, 2012
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CHANGE RECORD

ISSUE	DATE	PAGE	DESCRIPTION OF CHANGES
01	January 25th, 2012	All	Original Issue

TOTAL DOSE RADIATION TEST REPORT
on
Microsemi Corporation
2N3637
PNP Medium Power Transistors

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1 Introduction

In the scope of the ESA study: “Survey of Critical Components for 150 kRad Power Systems”, a total dose characterization test of the Microsemi Corporation 2N3637, PNP Medium Power Transistors has been performed with an accumulated dose of about 396 Krad(Si) at different dose rates of 36, 100 and 300 rad(Si)/hour, in response to Alter Technology purchase order reference ATGSP-TL-09-JC-CO-9.

An Interim report, HRX/TID/0924 Issue 01, corresponding to the irradiation up to 163 Krad(Si) steps has been already provided.

The purpose of this test was to evaluate total dose withstanding of this component, to investigate its suitability for being used in space applications. This test was conducted on samples provided by Alter Technology.
Test has been performed in accordance with Hirex Engineering Radiation Test Plan HRX/ SPE/0228 issue 2 dated 09/08/2010.

A complete set of electrical measurements together with graphical representation of measured parameters with respect to total dose received, are provided for all samples.

2 Applicable and Reference Documents

2.1 Applicable Documents

- Hirex Engineering Radiation Test Plan: HRX/ SPE/0228 issue 2 dated 09/08/2010
- Alter Technology Group Proposal: ATGSP-OF-648/2009 Issue 1
- Minutes of Meeting: MM-SRP-ATG-0001 dated 29/10/2009
- Hirex specification: Total Ionizing dose test general procedure.
- MIL detail specification: MIL-PRF-19500/357K

2.2 Reference Documents

- Microsemi Corporation datasheet: T4-LDS-0065 Rev.2 (100377)

3 Test Samples

13 samples of the 2N3637 device were tested (6 ON + 6 OFF + 1 control sample).

12 samples (including the 6 samples already submitted to protons test: see report HRX/TID/0923) have been biased according to the flow diagram given in Figure 1.

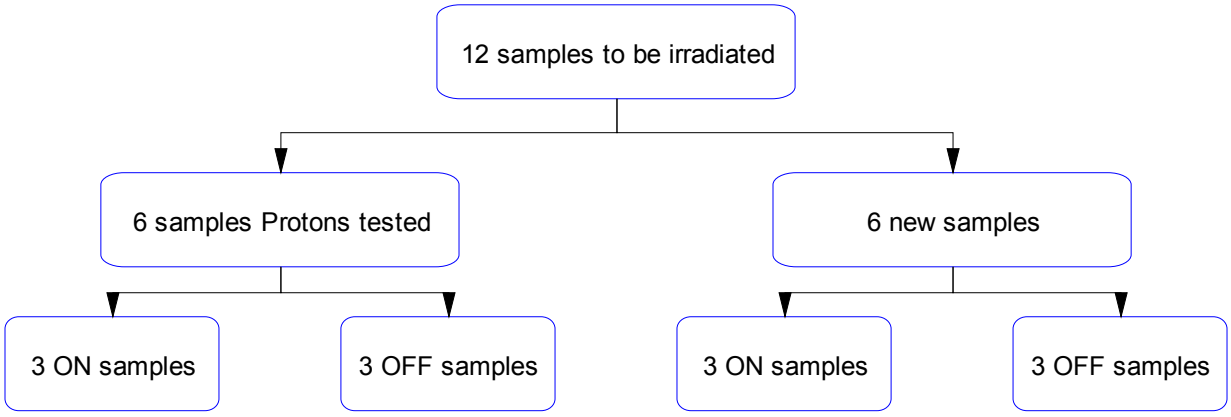


Figure 1 : Samples bias flow diagram

Samples were allocated into the bias conditions during exposures and annealing as provided in the following table. The different samples groups are also identified for easier plots reading.

SN attributed by Hirex	Samples Allocation	Samples Group Naming
1	Control sample	REF
2	Biased ON	ON_PROTON
3	Biased ON	ON_PROTON
4	Biased ON	ON_PROTON
5	Biased OFF	OFF_PROTON
6	Biased OFF	OFF_PROTON
7	Biased OFF	OFF_PROTON
8	Biased ON	ON_TID
9	Biased ON	ON_TID
10	Biased ON	ON_TID
11	Biased OFF	OFF_TID
12	Biased OFF	OFF_TID
13	Biased OFF	OFF_TID

Identification of the 2N3637 is given below:

Part Number: F2N3637

Top Marking: MSC MSF2N3637 SAMPLE serial

Bottom Marking: -

Date Code: -

4 Experimental Conditions

4.1 Radiation Source Dose Rate and Annealing

The dose exposures were performed at UCL in Louvain (Belgium). In this irradiation facility, a Cobalt 60 source is used with the possibility to vary the dose rate by simply adjusting the distance to the source.
During the dose exposures, devices under test have been irradiated in an ambient temperature of 24°C ±6°C.

The dose received by the devices has been controlled by the measurement of one Alanine pellet dosimeter placed onto the bias board.

Resulting test conditions are provided below.

Irradiation Steps requested	Pellet dosimetry data	Dose rate	Annealing steps	Temperature
kRad	kRad	Rad/h	Hours	°C
0	0			
10	8.1	36		Room
20	22.5	36		Room
50	53.1	36		Room
100	108.9	36		Room
150	162.9	100 [1]		Room
200	204.3	300 [2]		Room
250	255.6	300 [2]		Room
300	305.1	300 [2]		Room
350	351	300 [2]		Room
400	396	300 [2]		Room
-	-	-	24	Room
-	-	-	168	100°C

Note [1]: Due to the maintenance period planned at UCL at the end of December and in order to perform subsequent requested exposures steps up to 400 Krad(Si), the dose rate of several steps have been changed, in agreement with ESA, from 36 rad(Si)/h to 100 rad(Si)/h and from 100 rad(Si)/h to 300 rad(Si)/h as indicated.

4.2 Bias during Dose Exposures and Measurements conditions

4.2.1 Bias conditions

During exposures test board allowed to bias 6 samples in accordance with the electrical circuit provided in Figure 2.
6 other samples were biased OFF with all pins connected to ground.

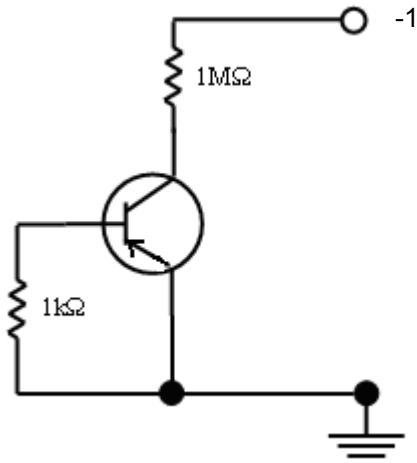


Figure 2 : Bias Conditions during Irradiation Exposures

4.2.2 Electrical Measurements

Electrical parameters test program principle for 2N3637 is provided in Figure 3.

A HP4142 DC tester and a network analyzer HP8714ES were used to perform required measurements.

A dedicated test fixture was designed to ensure proper measurement conditions. In addition a faraday cage was used to ensure optimum conditions for low level measurements.

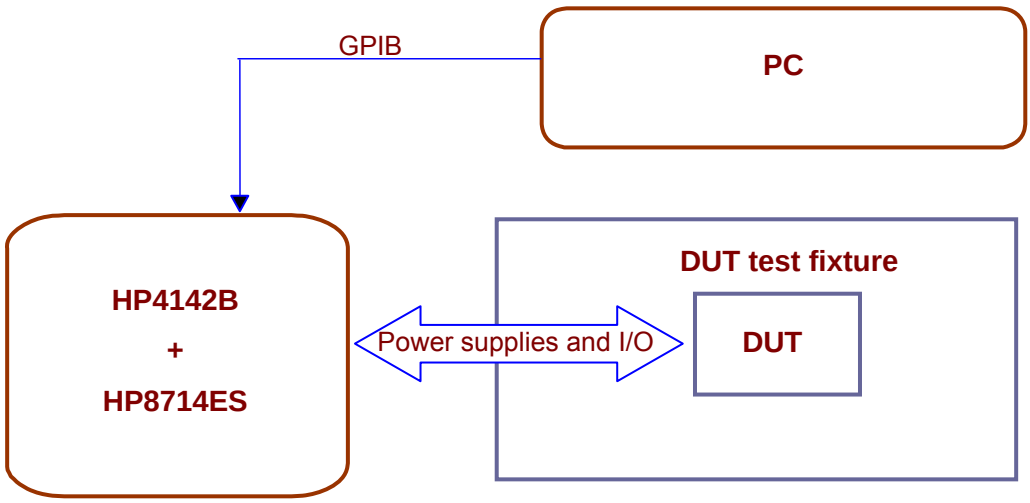


Figure 3 : 2N3637 test program principle

Electrical parameters test conditions and limits used for performing this test are given in Table 1.

Parameter	Description	Conditions	Limits		Unit
			Min	Max	
I_{CBO1}	Collector-Base cut-off current	V_{CB} = -175V	-10	-	µA
I_{CBO2}	Collector-Base cut-off current	V_{CB} = -100V	-100	-	nA
I_{EBO1}	Emitter-Base cut-off current	V_{EB} = -5V	-10	-	µA
I_{EBO2}	Emitter-Base cut-off current	V_{EB} = -3V	-50	-	nA
I_{CEO}	Collector-Emitter cut-off current	V_{CE} = -100V, Note 2	-10	-	µA
$V_{(BR)CEO}$	Collector-Emitter breakdown voltage	I_C = -10mA, Note 1	-	-175	V
$V_{CE(SAT)1}$	Collector-Emitter saturation voltage	I_C = -10mA, I_B = -1mA, Note 1	-0.3	-	V
$V_{CE(SAT)2}$	Collector-Emitter saturation voltage	I_C = -50mA, I_B = -5mA, Note 1	-0.6	-	V
$V_{BE(SAT)1}$	Base-Emitter saturation voltage	I_C = -10mA, I_B = -1mA, Note 1	-0.8	-	V
$V_{BE(SAT)2}$	Base-Emitter saturation voltage	I_C = -50mA, I_B = -5mA, Note 1	-0.9	-0.65	V
H_{FE1}	Forward-current transfer ratio	I_C = -100µA, V_{CE} = -10V, Note 1	55	-	-
H_{FE2}	Forward-current transfer ratio	I_C = -1mA, V_{CE} = -10V, Note 1	90	-	-
H_{FE3}	Forward-current transfer ratio	I_C = -10mA, V_{CE} = -10V, Note 1	100	-	-
H_{FE4}	Forward-current transfer ratio	I_C = -50mA, V_{CE} = -10V, Note 1	100	300	-
H_{FE5}	Forward-current transfer ratio	I_C = -150mA, V_{CE} = -10V, Note 1	60	-	-
F_T	Gain Bandwidth Product	I_C = -30mA, V_{CE} = -30V	200	850	MHz

Note 1: Pulse measurement: Pulse Width ≤ 300µs, duty cycle 1%.
Note 2: This parameter has been measured at Room temperature at all steps of testing, and also at 110°C at initial step and after Annealing. No limit applicable at 110°C.

Table 1 : Measured electrical parameters

5 Conclusion

A Total Ionizing Dose characterization test was carried out by Hirex Engineering under Alter Technology contract on the Microsemi Corporation 2N3637 PNP Medium Power Transistors in TO-39 package.

12 samples plus one control sample were used during testing. They were exposed to radiation using different dose rates of 36, 100 and 300rad(Si)/hour at room temperature.

Initial and final measurements on some parameters at Low and high temperatures are provided in Appendix 1.

A summary of failed parameters is provided in the following table. The behavior of each parameter is recorded for both biased On and biased Off samples of each group.
Parameters not listed remained within specification limits all along testing, or had no limits specified.
Detail test results are presented in next section.

Parameters	Failure Level between :		Annealing Recovery [Note 1]					Comments
			NA	No	Partial	Complete	Rebound	
HFE1	ON_PROTON samples	22.5 & 53.1 kRad(Si)				X		
	ON_TID samples	162.9 & 204.3 kRad(Si)				X		
	OFF_PROTON samples	22.5 & 53.1 kRad(Si)		X				
	OFF_TID samples	22.5 & 53.1 kRad(Si)		X				
HFE2	ON_PROTON samples	-		X				**[Note 2]**
	ON_TID samples	8.1 & 22.5 kRad(Si)		X				
	OFF_PROTON samples	0 & 8.1 kRad(Si)		X				
	OFF_TID samples	0 & 8.1 kRad(Si)		X				
HFE3	ON_PROTON samples	-		X				**[Note 2]**
	ON_TID samples	8.1 & 22.5 kRad(Si)		X				
	OFF_PROTON samples	0 & 8.1 kRad(Si)		X				
	OFF_TID samples	8.1 & 22.5 kRad(Si)		X				
HFE4	ON_PROTON samples	8.1 & 22.5 kRad(Si)		X				
	ON_TID samples	22.5 & 53.1 kRad(Si)		X				
	OFF_PROTON samples	0 & 8.1 kRad(Si)		X				
	OFF_TID samples	8.1 & 22.5 kRad(Si)		X				

[Note 1]: **NA** = Not applicable, **No:** means no sample has recovered, **Partial:** means at least one sample has recovered, **Complete:** means all samples have recovered, **Rebound**: means rebound has been observed on at least one sample.
[Note 2]: Most of samples failed after protons exposures were still failed at initial measurements of TID testing.

Table 2 : Summary of parameters failure levels

6 Test Results

Test results including tables and graphics are provided in this section for each measured parameter.

Statistics are provided separately for biased ON & biased OFF samples of each group.

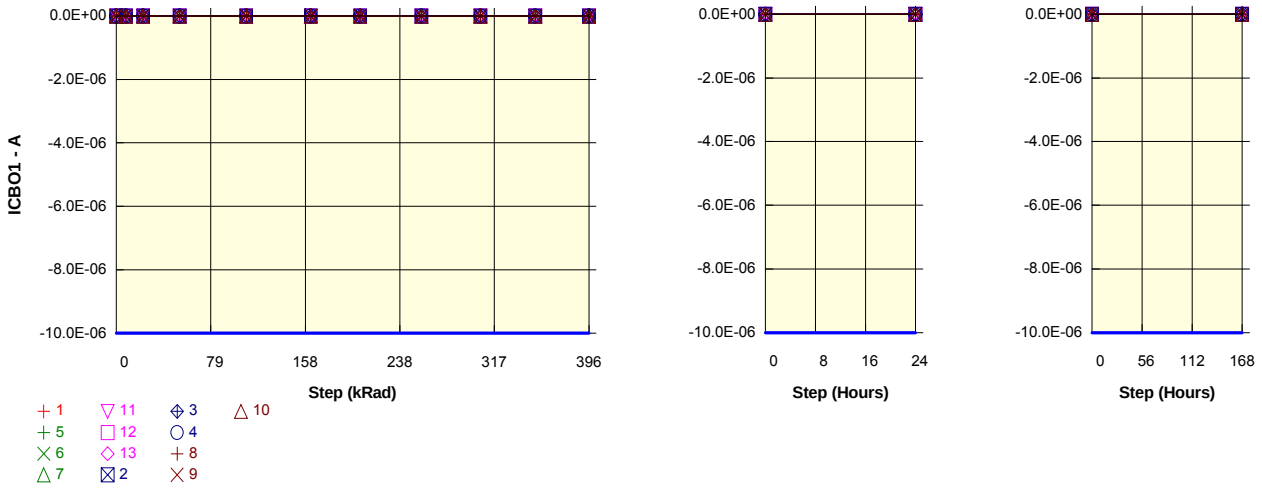
For each parameter, a drift calculation table is provided computing the drift between a given exposure step with respect to initial readings:

$$\Delta(\text{Parameter value}) = (\text{Parameter value}_{\text{POSTRAD}}) - (\text{Parameter value}_{\text{PRERAD}})$$

For the particular case of transistors, drift calculation table for Hfe parameters will refer to 1/Hfe:

$$\Delta(1/hFE) = (1/hFE_{POSTRAD}) - (1/hFE_{PRERAD})$$

Parameter : Collector-Base cut-off current : ICBO1
Test conditions : Vcb = -175V
Unit : A
Spec Limit Min : -10.0E-06
Spec limits are represented in bold lines on the graphic.



Measurements

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-1.2E-09	-1.1E-09	-389.9E-12	-705.0E-12	-398.4E-12	-504.6E-12	-561.9E-12	-426.5E-12	-482.9E-12	-421.1E-12	-7.2E-09	-521.8E-12	-1.4E-09
ON_PROTON samples													
2	-1.3E-09	-3.1E-09	-962.2E-12	-1.7E-09	-1.2E-09	-1.5E-09	-2.8E-09	-818.2E-12	-1.3E-09	-1.2E-09	-1.2E-09	-2.2E-09	-2.8E-09
3	-1.3E-09	-1.6E-09	-1.2E-09	-2.1E-09	-1.6E-09	-1.8E-09	-2.3E-09	-1.9E-09	-1.4E-09	-1.6E-09	-1.2E-09	-3.1E-09	-1.7E-09
4	-1.5E-09	-1.4E-09	-988.4E-12	-1.7E-09	-1.2E-09	-2.0E-09	-3.6E-09	-1.3E-09	-1.2E-09	-1.3E-09	-1.0E-09	-5.9E-09	-991.0E-12
Statistics													
Min	-1.5E-09	-3.1E-09	-1.2E-09	-2.1E-09	-1.6E-09	-2.0E-09	-3.6E-09	-1.9E-09	-1.4E-09	-1.6E-09	-1.2E-09	-5.9E-09	-2.8E-09
Max	-1.3E-09	-1.4E-09	-962.2E-12	-1.7E-09	-1.2E-09	-1.5E-09	-2.3E-09	-818.2E-12	-1.2E-09	-1.2E-09	-1.0E-09	-2.2E-09	-991.0E-12
Average	-1.3E-09	-2.0E-09	-1.1E-09	-1.9E-09	-1.3E-09	-1.8E-09	-2.9E-09	-1.4E-09	-1.3E-09	-1.3E-09	-1.2E-09	-3.7E-09	-1.9E-09
Sigma	114.4E-12	782.9E-12	127.5E-12	191.7E-12	213.1E-12	174.5E-12	536.8E-12	462.5E-12	93.8E-12	148.7E-12	79.0E-12	1.6E-09	756.7E-12

Drift Calculation

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-1.9E-09	291.2E-12	-487.0E-12	58.8E-12	-292.8E-12	-1.6E-09	435.2E-12	-799.9E-15	37.8E-12	57.4E-12	-984.4E-12	-1.6E-09
3	-	-294.2E-12	35.2E-12	-852.6E-12	-343.6E-12	-511.6E-12	-1.0E-09	-670.0E-12	-157.6E-12	-270.8E-12	56.2E-12	-1.8E-09	-457.0E-12
4	-	137.4E-12	519.8E-12	-204.8E-12	356.8E-12	-463.8E-12	-2.1E-09	166.2E-12	282.0E-12	248.2E-12	464.2E-12	-4.4E-09	517.2E-12
Average	-	-675.8E-12	282.1E-12	-514.8E-12	24.0E-12	-422.7E-12	-1.6E-09	-22.9E-12	41.2E-12	5.1E-12	192.6E-12	-2.4E-09	-506.6E-12
Sigma	-	863.0E-12	197.9E-12	265.2E-12	287.0E-12	93.9E-12	439.5E-12	470.6E-12	181.9E-12	213.1E-12	192.1E-12	1.4E-09	856.9E-12

Measurements

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-1.2E-09	-1.1E-09	-389.9E-12	-705.0E-12	-398.4E-12	-504.6E-12	-561.9E-12	-426.5E-12	-482.9E-12	-421.1E-12	-7.2E-09	-521.8E-12	-1.4E-09
ON_TID samples													
8	-918.6E-12	-1.6E-09	-1.3E-09	-2.2E-09	-1.5E-09	-2.2E-09	-2.6E-09	-1.0E-09	-1.5E-09	-1.5E-09	-1.4E-09	-2.1E-09	-950.6E-12
9	-574.7E-12	-832.4E-12	-1.5E-09	-2.3E-09	-1.6E-09	-2.6E-09	-4.1E-09	-7.2E-09	-1.6E-09	-1.8E-09	-1.4E-09	-2.0E-09	-11.8E-09
10	-577.3E-12	-1.8E-09	-1.2E-09	-2.1E-09	-1.4E-09	-2.2E-09	-2.4E-09	-1.1E-09	-1.3E-09	-1.3E-09	-1.3E-09	-2.4E-09	-2.4E-09
Statistics													
Min	-918.6E-12	-1.8E-09	-1.5E-09	-2.3E-09	-1.6E-09	-2.6E-09	-4.1E-09	-7.2E-09	-1.6E-09	-1.8E-09	-1.4E-09	-2.4E-09	-11.8E-09
Max	-574.7E-12	-832.4E-12	-1.2E-09	-2.1E-09	-1.4E-09	-2.2E-09	-2.4E-09	-1.0E-09	-1.3E-09	-1.3E-09	-1.3E-09	-2.0E-09	-950.6E-12
Average	-690.2E-12	-1.4E-09	-1.3E-09	-2.2E-09	-1.5E-09	-2.3E-09	-3.1E-09	-3.1E-09	-1.5E-09	-1.6E-09	-1.4E-09	-2.2E-09	-5.0E-09
Sigma	161.5E-12	422.5E-12	117.7E-12	92.6E-12	84.8E-12	212.8E-12	760.3E-12	2.9E-09	126.6E-12	194.3E-12	54.2E-12	133.5E-12	4.8E-09

Drift Calculation

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-667.8E-12	-363.8E-12	-1.3E-09	-563.2E-12	-1.2E-09	-1.7E-09	-115.2E-12	-605.6E-12	-592.4E-12	-474.2E-12	-1.2E-09	-32.0E-12
9	-	-257.7E-12	-924.5E-12	-1.8E-09	-1.0E-09	-2.0E-09	-3.5E-09	-6.6E-09	-1.0E-09	-1.2E-09	-854.3E-12	-1.5E-09	-11.2E-09
10	-	-1.2E-09	-648.9E-12	-1.6E-09	-793.3E-12	-1.6E-09	-1.8E-09	-520.1E-12	-733.3E-12	-765.3E-12	-722.9E-12	-1.8E-09	-1.8E-09
Average	-	-723.9E-12	-645.7E-12	-1.5E-09	-786.7E-12	-1.6E-09	-2.4E-09	-2.4E-09	-792.1E-12	-865.1E-12	-683.8E-12	-1.5E-09	-4.3E-09
Sigma	-	405.4E-12	228.9E-12	210.2E-12	179.8E-12	330.2E-12	837.3E-12	3.0E-09	181.1E-12	272.7E-12	157.6E-12	233.7E-12	4.9E-09

Measurements

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-1.2E-09	-1.1E-09	-389.9E-12	-705.0E-12	-398.4E-12	-504.6E-12	-561.9E-12	-426.5E-12	-482.9E-12	-421.1E-12	-7.2E-09	-521.8E-12	-1.4E-09
OFF_PROTON samples													
5	-1.4E-09	-1.5E-09	-1.2E-09	-1.7E-09	-1.4E-09	-2.0E-09	-1.8E-09	-1.0E-09	-1.3E-09	-2.2E-09	-1.5E-09	-2.2E-09	-11.1E-09
6	-1.5E-09	-1.4E-09	-1.1E-09	-2.1E-09	-1.2E-09	-2.2E-09	-1.5E-09	-2.0E-09	-1.3E-09	-1.1E-09	-1.3E-09	-1.9E-09	-2.7E-09
7	-1.3E-09	-2.0E-09	-2.0E-09	-1.7E-09	-3.2E-09	-3.3E-09	-3.7E-09	-2.2E-09	-2.9E-09	-3.4E-09	-3.1E-09	-3.9E-09	-3.4E-09
Statistics													
Min	-1.5E-09	-2.0E-09	-2.0E-09	-2.1E-09	-3.2E-09	-3.3E-09	-3.7E-09	-2.2E-09	-2.9E-09	-3.4E-09	-3.1E-09	-3.9E-09	-11.1E-09
Max	-1.3E-09	-1.4E-09	-1.1E-09	-1.7E-09	-1.2E-09	-2.0E-09	-1.5E-09	-1.0E-09	-1.3E-09	-1.1E-09	-1.3E-09	-1.9E-09	-2.7E-09
Average	-1.4E-09	-1.6E-09	-1.4E-09	-1.9E-09	-1.9E-09	-2.5E-09	-2.3E-09	-1.7E-09	-1.9E-09	-2.2E-09	-2.0E-09	-2.7E-09	-5.7E-09
Sigma	72.2E-12	266.8E-12	383.9E-12	191.7E-12	871.9E-12	590.1E-12	990.8E-12	523.0E-12	746.3E-12	950.6E-12	796.1E-12	899.0E-12	3.8E-09

Drift Calculation

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	-117.6E-12	187.8E-12	-360.0E-12	-58.8E-12	-571.6E-12	-392.6E-12	359.0E-12	63.2E-12	-794.2E-12	-160.8E-12	-813.6E-12	-9.7E-09
6	-	91.0E-12	311.6E-12	-674.2E-12	244.0E-12	-783.6E-12	-62.8E-12	-527.6E-12	129.4E-12	343.4E-12	166.2E-12	-392.2E-12	-1.2E-09
7	-	-705.2E-12	-701.2E-12	-431.0E-12	-1.9E-09	-2.0E-09	-2.5E-09	-951.8E-12	-1.6E-09	-2.2E-09	-1.8E-09	-2.6E-09	-2.1E-09
Average	-	-243.9E-12	-67.3E-12	-488.4E-12	-566.3E-12	-1.1E-09	-970.3E-12	-373.5E-12	-477.2E-12	-869.7E-12	-601.4E-12	-1.3E-09	-4.4E-09
Sigma	-	337.1E-12	451.1E-12	134.5E-12	940.0E-12	648.7E-12	1.1E-09	546.1E-12	811.5E-12	1.0E-09	864.7E-12	968.2E-12	3.8E-09

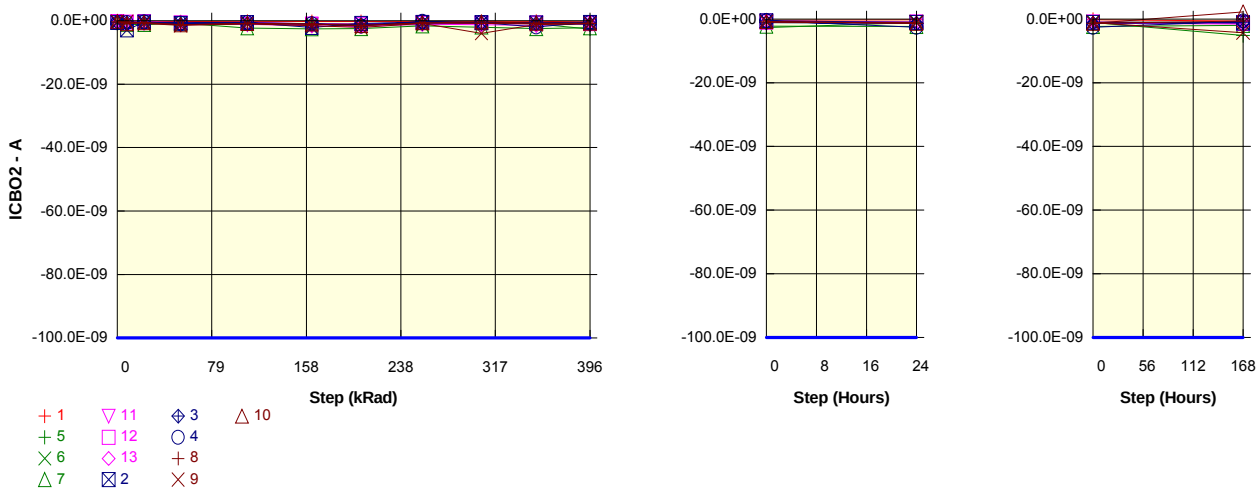
Measurements

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-1.2E-09	-1.1E-09	-389.9E-12	-705.0E-12	-398.4E-12	-504.6E-12	-561.9E-12	-426.5E-12	-482.9E-12	-421.1E-12	-7.2E-09	-521.8E-12	-1.4E-09
OFF_TID samples													
11	-619.7E-12	-1.1E-09	-914.2E-12	-1.5E-09	-1.1E-09	-2.2E-09	-2.0E-09	-1.4E-09	-1.7E-09	-1.3E-09	-871.8E-12	-1.8E-09	-1.9E-09
12	-643.3E-12	-1.5E-09	-499.8E-12	-1.3E-09	-989.0E-12	-2.1E-09	-2.1E-09	-748.0E-12	-1.1E-09	-1.2E-09	-815.8E-12	-1.4E-09	-3.0E-09
13	-626.7E-12	-2.3E-09	-1.4E-09	-2.1E-09	-1.6E-09	-2.9E-09	-3.1E-09	-2.8E-09	-10.7E-09	-2.1E-09	-1.4E-09	-4.2E-09	-3.2E-09
Statistics													
Min	-643.3E-12	-2.3E-09	-1.4E-09	-2.1E-09	-1.6E-09	-2.9E-09	-3.1E-09	-2.8E-09	-10.7E-09	-2.1E-09	-1.4E-09	-4.2E-09	-3.2E-09
Max	-619.7E-12	-1.1E-09	-499.8E-12	-1.3E-09	-989.0E-12	-2.1E-09	-2.0E-09	-748.0E-12	-1.1E-09	-1.2E-09	-815.8E-12	-1.4E-09	-1.9E-09
Average	-629.9E-12	-1.6E-09	-947.1E-12	-1.6E-09	-1.3E-09	-2.4E-09	-2.4E-09	-1.6E-09	-4.5E-09	-1.5E-09	-1.0E-09	-2.4E-09	-2.7E-09
Sigma	9.9E-12	496.2E-12	379.4E-12	323.1E-12	273.8E-12	338.7E-12	506.0E-12	832.4E-12	4.4E-09	396.9E-12	244.0E-12	1.2E-09	566.0E-12

Drift Calculation

ICBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-464.3E-12	-294.5E-12	-857.1E-12	-515.9E-12	-1.6E-09	-1.4E-09	-819.3E-12	-1.1E-09	-728.3E-12	-252.1E-12	-1.1E-09	-1.3E-09
12	-	-879.1E-12	143.5E-12	-668.1E-12	-345.7E-12	-1.5E-09	-1.4E-09	-104.7E-12	-472.9E-12	-531.9E-12	-172.5E-12	-728.7E-12	-2.4E-09
13	-	-1.7E-09	-800.7E-12	-1.4E-09	-1.0E-09	-2.2E-09	-2.5E-09	-2.1E-09	-10.1E-09	-1.5E-09	-732.5E-12	-3.6E-09	-2.6E-09
Average	-	-1.0E-09	-317.2E-12	-987.6E-12	-621.3E-12	-1.8E-09	-1.8E-09	-1.0E-09	-3.9E-09	-907.9E-12	-385.7E-12	-1.8E-09	-2.1E-09
Sigma	-	494.9E-12	385.8E-12	327.4E-12	278.2E-12	342.0E-12	508.1E-12	837.8E-12	4.4E-09	401.0E-12	247.4E-12	1.3E-09	559.7E-12

Parameter : Collector-Base cut-off current : ICBO2
Test conditions : Vcb = -100
Unit : A
Spec Limit Min : -100.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-433.0E-12	-388.7E-12	-174.9E-12	-298.5E-12	-195.3E-12	-253.0E-12	-276.6E-12	-205.9E-12	-212.6E-12	-197.2E-12	-353.2E-12	-199.3E-12	-565.8E-12
ON_PROTON samples													
2	-503.3E-12	-2.9E-09	-400.7E-12	-805.9E-12	-626.3E-12	-2.1E-09	-874.6E-12	-470.6E-12	-623.1E-12	-636.7E-12	-497.2E-12	-1.0E-09	-1.2E-09
3	-521.5E-12	-729.2E-12	-595.2E-12	-1.2E-09	-931.2E-12	-1.1E-09	-1.3E-09	-777.6E-12	-730.0E-12	-871.6E-12	-1.1E-09	-1.4E-09	-961.6E-12
4	-739.2E-12	-548.4E-12	-404.0E-12	-762.4E-12	-583.5E-12	-930.6E-12	-1.7E-09	-199.6E-12	-602.1E-12	-2.0E-09	-489.0E-12	-2.5E-09	-575.2E-12
Statistics													
Min	-739.2E-12	-2.9E-09	-595.2E-12	-1.2E-09	-931.2E-12	-2.1E-09	-1.7E-09	-777.6E-12	-730.0E-12	-2.0E-09	-1.1E-09	-2.5E-09	-1.2E-09
Max	-503.3E-12	-548.4E-12	-400.7E-12	-762.4E-12	-583.5E-12	-930.6E-12	-874.6E-12	-199.6E-12	-602.1E-12	-636.7E-12	-489.0E-12	-1.0E-09	-575.2E-12
Average	-588.0E-12	-1.4E-09	-466.6E-12	-917.5E-12	-713.7E-12	-1.4E-09	-1.3E-09	-482.6E-12	-651.8E-12	-1.2E-09	-705.9E-12	-1.6E-09	-907.6E-12
Sigma	107.2E-12	1.1E-09	90.9E-12	189.4E-12	154.8E-12	540.7E-12	330.5E-12	236.1E-12	56.0E-12	574.3E-12	300.9E-12	652.7E-12	252.3E-12

Drift Calculation

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-2.4E-09	102.6E-12	-302.6E-12	-123.0E-12	-1.6E-09	-371.3E-12	32.7E-12	-119.8E-12	-133.3E-12	6.1E-12	-514.7E-12	-682.7E-12
3	-	-207.7E-12	-73.7E-12	-662.7E-12	-409.7E-12	-536.3E-12	-736.3E-12	-256.1E-12	-208.5E-12	-350.1E-12	-609.9E-12	-847.7E-12	-440.1E-12
4	-	190.8E-12	335.2E-12	-23.2E-12	155.7E-12	-191.4E-12	-944.6E-12	539.6E-12	137.1E-12	-1.2E-09	250.2E-12	-1.8E-09	164.0E-12
Average	-	-807.9E-12	121.4E-12	-329.5E-12	-125.7E-12	-786.8E-12	-684.1E-12	105.4E-12	-63.8E-12	-566.6E-12	-117.9E-12	-1.1E-09	-319.6E-12
Sigma	-	1.1E-09	167.5E-12	261.8E-12	230.8E-12	614.5E-12	237.0E-12	328.9E-12	146.6E-12	467.8E-12	361.9E-12	547.0E-12	356.0E-12

Measurements

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-433.0E-12	-388.7E-12	-174.9E-12	-298.5E-12	-195.3E-12	-253.0E-12	-276.6E-12	-205.9E-12	-212.6E-12	-197.2E-12	-353.2E-12	-199.3E-12	-565.8E-12
ON_TID samples													
8	-342.4E-12	-783.5E-12	-625.3E-12	-1.3E-09	-851.6E-12	-1.1E-09	-1.4E-09	-650.0E-12	-834.9E-12	-940.0E-12	-858.2E-12	-1.3E-09	-618.8E-12
9	-227.8E-12	-247.0E-12	-879.6E-12	-1.4E-09	-1.0E-09	-1.5E-09	-2.2E-09	-895.0E-12	-4.0E-09	-1.2E-09	-916.0E-12	-1.2E-09	-4.2E-09
10	-232.8E-12	-978.6E-12	-597.3E-12	-1.3E-09	-866.2E-12	-1.0E-09	-1.5E-09	-664.0E-12	-385.8E-12	-779.6E-12	-752.8E-12	-1.3E-09	2.3E-09
Statistics													
Min	-342.4E-12	-978.6E-12	-879.6E-12	-1.4E-09	-1.0E-09	-1.5E-09	-2.2E-09	-895.0E-12	-4.0E-09	-1.2E-09	-916.0E-12	-1.3E-09	-4.2E-09
Max	-227.8E-12	-247.0E-12	-597.3E-12	-1.3E-09	-851.6E-12	-1.0E-09	-1.4E-09	-650.0E-12	-385.8E-12	-779.6E-12	-752.8E-12	-1.2E-09	2.3E-09
Average	-267.7E-12	-669.7E-12	-700.7E-12	-1.3E-09	-916.7E-12	-1.2E-09	-1.7E-09	-736.3E-12	-1.7E-09	-967.5E-12	-842.3E-12	-1.2E-09	-851.9E-12
Sigma	52.9E-12	309.3E-12	127.0E-12	82.7E-12	82.0E-12	213.0E-12	321.1E-12	112.3E-12	1.6E-09	165.8E-12	67.6E-12	56.2E-12	2.7E-09

Drift Calculation

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-441.1E-12	-282.9E-12	-928.8E-12	-509.2E-12	-755.0E-12	-1.1E-09	-307.6E-12	-492.5E-12	-597.6E-12	-515.8E-12	-927.6E-12	-276.4E-12
9	-	-19.2E-12	-651.8E-12	-1.2E-09	-804.6E-12	-1.3E-09	-1.9E-09	-667.2E-12	-3.7E-09	-955.0E-12	-688.2E-12	-926.2E-12	-4.0E-09
10	-	-745.8E-12	-364.5E-12	-1.0E-09	-633.4E-12	-812.0E-12	-1.3E-09	-431.2E-12	-153.0E-12	-546.7E-12	-520.0E-12	-1.0E-09	2.5E-09
Average	-	-402.0E-12	-433.1E-12	-1.1E-09	-649.1E-12	-953.3E-12	-1.4E-09	-468.7E-12	-1.5E-09	-699.8E-12	-574.7E-12	-965.7E-12	-584.3E-12
Sigma	-	297.9E-12	158.2E-12	119.0E-12	121.1E-12	241.2E-12	356.7E-12	149.2E-12	1.6E-09	181.7E-12	80.3E-12	54.9E-12	2.7E-09

Measurements

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-433.0E-12	-388.7E-12	-174.9E-12	-298.5E-12	-195.3E-12	-253.0E-12	-276.6E-12	-205.9E-12	-212.6E-12	-197.2E-12	-353.2E-12	-199.3E-12	-565.8E-12
OFF_PROTON samples													
5	-565.9E-12	-678.2E-12	-503.0E-12	-805.9E-12	-821.8E-12	-896.6E-12	-925.0E-12	-574.4E-12	-690.9E-12	-1.1E-09	-2.6E-09	-1.0E-09	-5.1E-09
6	-641.7E-12	-592.2E-12	-466.7E-12	-1.2E-09	-604.1E-12	-1.1E-09	-818.6E-12	-1.4E-09	-687.1E-12	-675.6E-12	-746.2E-12	-868.4E-12	-1.1E-09
7	-521.5E-12	-1.1E-09	-1.2E-09	-762.4E-12	-2.3E-09	-2.5E-09	-2.5E-09	-1.6E-09	-2.0E-09	-2.5E-09	-2.2E-09	-2.3E-09	-2.0E-09
Statistics													
Min	-641.7E-12	-1.1E-09	-1.2E-09	-1.2E-09	-2.3E-09	-2.5E-09	-2.5E-09	-1.6E-09	-2.0E-09	-2.5E-09	-2.6E-09	-2.3E-09	-5.1E-09
Max	-521.5E-12	-592.2E-12	-466.7E-12	-762.4E-12	-604.1E-12	-896.6E-12	-818.6E-12	-574.4E-12	-687.1E-12	-675.6E-12	-746.2E-12	-868.4E-12	-1.1E-09
Average	-576.4E-12	-799.7E-12	-736.8E-12	-917.5E-12	-1.2E-09	-1.5E-09	-1.4E-09	-1.2E-09	-1.1E-09	-1.4E-09	-1.9E-09	-1.4E-09	-2.7E-09
Sigma	49.6E-12	235.3E-12	356.7E-12	189.4E-12	736.5E-12	733.2E-12	748.3E-12	447.5E-12	620.8E-12	779.5E-12	808.2E-12	652.7E-12	1.7E-09

Drift Calculation

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	-112.3E-12	63.0E-12	-240.0E-12	-255.9E-12	-330.7E-12	-359.1E-12	-8.5E-12	-125.0E-12	-489.1E-12	-2.1E-09	-482.1E-12	-4.5E-09
6	-	49.5E-12	175.1E-12	-542.5E-12	37.7E-12	-437.1E-12	-176.9E-12	-760.3E-12	-45.4E-12	-33.9E-12	-104.5E-12	-226.7E-12	-484.7E-12
7	-	-607.3E-12	-719.3E-12	-240.9E-12	-1.7E-09	-2.0E-09	-1.9E-09	-1.1E-09	-1.5E-09	-2.0E-09	-1.7E-09	-1.8E-09	-1.5E-09
Average	-	-223.4E-12	-160.4E-12	-341.1E-12	-653.5E-12	-927.1E-12	-823.7E-12	-619.4E-12	-551.6E-12	-829.2E-12	-1.3E-09	-840.4E-12	-2.2E-09
Sigma	-	279.4E-12	397.8E-12	142.4E-12	779.2E-12	769.4E-12	789.4E-12	452.3E-12	660.5E-12	824.0E-12	849.9E-12	695.2E-12	1.7E-09

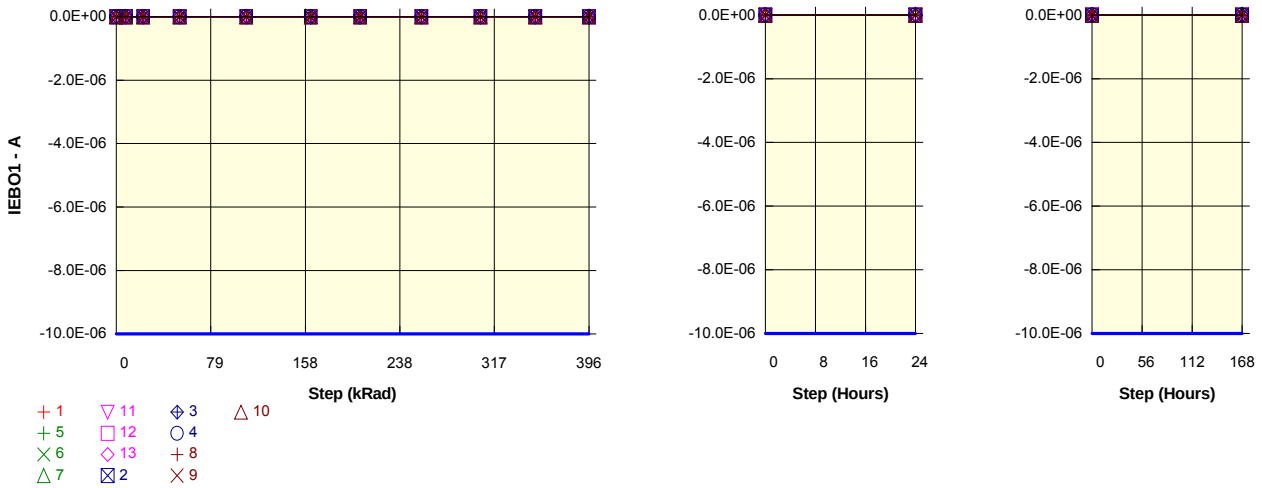
Measurements

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-433.0E-12	-388.7E-12	-174.9E-12	-298.5E-12	-195.3E-12	-253.0E-12	-276.6E-12	-205.9E-12	-212.6E-12	-197.2E-12	-353.2E-12	-199.3E-12	-565.8E-12
OFF_TID samples													
11	-257.8E-12	-563.0E-12	-401.4E-12	-745.5E-12	-1.2E-09	-1.2E-09	-1.3E-09	-830.6E-12	-887.2E-12	-893.2E-12	-583.7E-12	-950.0E-12	-1.1E-09
12	-277.9E-12	-450.0E-12	-271.4E-12	-634.7E-12	-547.4E-12	-977.0E-12	-1.0E-09	-512.8E-12	-635.3E-12	-708.6E-12	-934.2E-12	-924.6E-12	-1.4E-09
13	-255.9E-12	-1.0E-09	-806.5E-12	-1.3E-09	-1.1E-09	-1.7E-09	-1.8E-09	-1.1E-09	-1.3E-09	-1.5E-09	-925.2E-12	-1.3E-09	-1.6E-09
Statistics													
Min	-277.9E-12	-1.0E-09	-806.5E-12	-1.3E-09	-1.2E-09	-1.7E-09	-1.8E-09	-1.1E-09	-1.3E-09	-1.5E-09	-934.2E-12	-1.3E-09	-1.6E-09
Max	-255.9E-12	-450.0E-12	-271.4E-12	-634.7E-12	-547.4E-12	-977.0E-12	-1.0E-09	-512.8E-12	-635.3E-12	-708.6E-12	-583.7E-12	-924.6E-12	-1.1E-09
Average	-263.9E-12	-675.7E-12	-493.1E-12	-892.1E-12	-949.9E-12	-1.3E-09	-1.4E-09	-819.3E-12	-940.4E-12	-1.0E-09	-814.4E-12	-1.1E-09	-1.3E-09
Sigma	10.0E-12	243.6E-12	227.9E-12	289.2E-12	285.8E-12	279.3E-12	321.1E-12	245.7E-12	273.4E-12	333.0E-12	163.1E-12	174.5E-12	172.9E-12

Drift Calculation

ICBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-305.2E-12	-143.7E-12	-487.8E-12	-925.2E-12	-950.4E-12	-995.4E-12	-572.8E-12	-629.4E-12	-635.4E-12	-325.9E-12	-692.2E-12	-869.2E-12
12	-	-172.1E-12	6.6E-12	-356.7E-12	-269.5E-12	-699.1E-12	-747.1E-12	-234.9E-12	-357.4E-12	-430.7E-12	-656.3E-12	-646.7E-12	-1.1E-09
13	-	-758.1E-12	-550.5E-12	-1.0E-09	-863.3E-12	-1.4E-09	-1.5E-09	-858.5E-12	-1.0E-09	-1.2E-09	-669.3E-12	-1.1E-09	-1.3E-09
Average	-	-411.8E-12	-229.2E-12	-628.2E-12	-686.0E-12	-1.0E-09	-1.1E-09	-555.4E-12	-676.5E-12	-766.4E-12	-550.5E-12	-796.6E-12	-1.1E-09
Sigma	-	250.8E-12	235.3E-12	296.1E-12	295.6E-12	287.4E-12	328.9E-12	254.9E-12	281.7E-12	340.4E-12	158.9E-12	180.8E-12	173.5E-12

Parameter : Emitter-Base cut-off current : IEBO1
Test conditions : Veb = -5V
Unit : A
Spec Limit Min : -10.0E-06
Spec limits are represented in bold lines on the graphic.



Measurements

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-51.8E-12	-146.4E-12	-31.1E-12	-59.7E-12	-46.1E-12	-76.7E-12	-64.0E-12	-40.0E-12	-45.4E-12	-30.1E-12	-33.0E-12	-56.5E-12	-68.3E-12
ON_PROTON samples													
2	-79.7E-12	-83.7E-12	-59.8E-12	-134.3E-12	-123.6E-12	-96.0E-12	-152.5E-12	-108.1E-12	-139.3E-12	-128.7E-12	-102.7E-12	-168.0E-12	-105.6E-12
3	-88.8E-12	-148.6E-12	-71.3E-12	-150.5E-12	-141.4E-12	-230.6E-12	-161.4E-12	-118.1E-12	-145.3E-12	-155.7E-12	-169.3E-12	-152.0E-12	-113.0E-12
4	-90.7E-12	-149.0E-12	-70.8E-12	-163.2E-12	-131.4E-12	-245.0E-12	-352.8E-12	-95.9E-12	-150.5E-12	-160.0E-12	-131.1E-12	-214.8E-12	-125.0E-12
Statistics													
Min	-90.7E-12	-149.0E-12	-71.3E-12	-163.2E-12	-141.4E-12	-245.0E-12	-352.8E-12	-118.1E-12	-150.5E-12	-160.0E-12	-169.3E-12	-214.8E-12	-125.0E-12
Max	-79.7E-12	-83.7E-12	-59.8E-12	-134.3E-12	-123.6E-12	-96.0E-12	-152.5E-12	-95.9E-12	-139.3E-12	-128.7E-12	-102.7E-12	-152.0E-12	-105.6E-12
Average	-86.4E-12	-127.1E-12	-67.3E-12	-149.3E-12	-132.1E-12	-190.5E-12	-222.2E-12	-107.4E-12	-145.0E-12	-148.1E-12	-134.4E-12	-178.3E-12	-114.5E-12
Sigma	4.8E-12	30.7E-12	5.3E-12	11.8E-12	7.3E-12	67.1E-12	92.4E-12	9.1E-12	4.6E-12	13.9E-12	27.3E-12	26.6E-12	8.0E-12

Drift Calculation

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-4.0E-12	19.9E-12	-54.6E-12	-43.9E-12	-16.3E-12	-72.8E-12	-28.4E-12	-59.6E-12	-49.0E-12	-23.0E-12	-88.3E-12	-25.9E-12
3	-	-59.9E-12	17.4E-12	-61.7E-12	-52.6E-12	-141.8E-12	-72.7E-12	-29.3E-12	-56.5E-12	-67.0E-12	-80.5E-12	-63.2E-12	-24.2E-12
4	-	-58.4E-12	19.9E-12	-72.5E-12	-40.7E-12	-154.3E-12	-262.1E-12	-5.2E-12	-59.8E-12	-69.4E-12	-40.4E-12	-124.1E-12	-34.3E-12
Average	-	-40.8E-12	19.1E-12	-62.9E-12	-45.7E-12	-104.2E-12	-135.9E-12	-21.0E-12	-58.6E-12	-61.8E-12	-48.0E-12	-91.9E-12	-28.1E-12
Sigma	-	26.0E-12	1.2E-12	7.4E-12	5.0E-12	62.3E-12	89.3E-12	11.2E-12	1.5E-12	9.1E-12	24.1E-12	25.0E-12	4.4E-12

Measurements

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-51.8E-12	-146.4E-12	-31.1E-12	-59.7E-12	-46.1E-12	-76.7E-12	-64.0E-12	-40.0E-12	-45.4E-12	-30.1E-12	-33.0E-12	-56.5E-12	-68.3E-12
ON_TID samples													
8	-45.0E-12	-130.7E-12	-61.1E-12	-123.4E-12	-119.9E-12	-51.0E-12	-155.0E-12	-109.0E-12	-140.3E-12	-148.3E-12	-131.2E-12	-157.4E-12	-96.6E-12
9	-42.6E-12	-30.2E-12	-72.6E-12	-146.4E-12	-134.3E-12	-24.8E-12	-182.4E-12	-107.9E-12	-159.7E-12	-184.1E-12	-151.4E-12	-155.0E-12	-186.1E-12
10	-44.8E-12	-101.9E-12	-69.7E-12	-148.9E-12	-126.4E-12	-256.0E-12	-171.4E-12	-82.4E-12	-127.4E-12	-147.0E-12	-140.2E-12	-153.2E-12	-141.4E-12
Statistics													
Min	-45.0E-12	-130.7E-12	-72.6E-12	-148.9E-12	-134.3E-12	-256.0E-12	-182.4E-12	-109.0E-12	-159.7E-12	-184.1E-12	-151.4E-12	-157.4E-12	-186.1E-12
Max	-42.6E-12	-30.2E-12	-61.1E-12	-123.4E-12	-119.9E-12	-24.8E-12	-155.0E-12	-82.4E-12	-127.4E-12	-147.0E-12	-131.2E-12	-153.2E-12	-96.6E-12
Average	-44.1E-12	-87.6E-12	-67.8E-12	-139.6E-12	-126.9E-12	-110.6E-12	-169.6E-12	-99.8E-12	-142.5E-12	-159.8E-12	-140.9E-12	-155.2E-12	-141.4E-12
Sigma	1.1E-12	42.2E-12	4.9E-12	11.5E-12	5.9E-12	103.4E-12	11.3E-12	12.3E-12	13.3E-12	17.2E-12	8.2E-12	1.7E-12	36.5E-12

Drift Calculation

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-85.7E-12	-16.1E-12	-78.4E-12	-74.9E-12	-6.0E-12	-110.0E-12	-64.0E-12	-95.3E-12	-103.3E-12	-86.2E-12	-112.4E-12	-51.6E-12
9	-	12.4E-12	-30.0E-12	-103.8E-12	-91.7E-12	17.8E-12	-139.8E-12	-65.3E-12	-117.1E-12	-141.5E-12	-108.8E-12	-112.4E-12	-143.5E-12
10	-	-57.1E-12	-24.9E-12	-104.1E-12	-81.6E-12	-211.2E-12	-126.6E-12	-37.6E-12	-82.6E-12	-102.2E-12	-95.3E-12	-108.4E-12	-96.6E-12
Average	-	-43.5E-12	-23.7E-12	-95.4E-12	-82.8E-12	-66.5E-12	-125.5E-12	-55.6E-12	-98.3E-12	-115.7E-12	-96.8E-12	-111.1E-12	-97.2E-12
Sigma	-	41.2E-12	5.7E-12	12.1E-12	6.9E-12	102.8E-12	12.2E-12	12.8E-12	14.3E-12	18.2E-12	9.2E-12	1.9E-12	37.5E-12

Measurements

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-51.8E-12	-146.4E-12	-31.1E-12	-59.7E-12	-46.1E-12	-76.7E-12	-64.0E-12	-40.0E-12	-45.4E-12	-30.1E-12	-33.0E-12	-56.5E-12	-68.3E-12
OFF_PROTON samples													
5	-73.5E-12	-148.0E-12	-96.3E-12	-134.3E-12	-179.8E-12	-176.6E-12	-218.4E-12	-180.6E-12	-199.9E-12	-232.0E-12	-231.2E-12	-249.7E-12	-249.3E-12
6	-89.5E-12	-195.7E-12	-93.5E-12	-150.5E-12	-161.8E-12	-209.0E-12	-218.1E-12	-157.1E-12	-222.6E-12	-487.5E-12	-250.1E-12	-256.2E-12	-252.9E-12
7	-83.7E-12	-116.6E-12	-108.3E-12	-163.2E-12	-193.0E-12	-263.6E-12	-268.2E-12	-213.6E-12	-238.9E-12	-272.1E-12	-280.7E-12	-285.0E-12	-223.6E-12
Statistics													
Min	-89.5E-12	-195.7E-12	-108.3E-12	-163.2E-12	-193.0E-12	-263.6E-12	-268.2E-12	-213.6E-12	-238.9E-12	-487.5E-12	-280.7E-12	-285.0E-12	-252.9E-12
Max	-73.5E-12	-116.6E-12	-93.5E-12	-134.3E-12	-161.8E-12	-176.6E-12	-218.1E-12	-157.1E-12	-199.9E-12	-232.0E-12	-231.2E-12	-249.7E-12	-223.6E-12
Average	-82.2E-12	-153.4E-12	-99.4E-12	-149.3E-12	-178.2E-12	-216.4E-12	-234.9E-12	-183.8E-12	-220.5E-12	-330.5E-12	-254.0E-12	-263.6E-12	-241.9E-12
Sigma	6.6E-12	32.5E-12	6.4E-12	11.8E-12	12.8E-12	35.9E-12	23.6E-12	23.2E-12	16.0E-12	112.2E-12	20.4E-12	15.3E-12	13.0E-12

Drift Calculation

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	-74.5E-12	-22.8E-12	-60.8E-12	-106.4E-12	-103.1E-12	-145.0E-12	-107.1E-12	-126.5E-12	-158.5E-12	-157.7E-12	-176.3E-12	-175.8E-12
6	-	-106.2E-12	-4.0E-12	-61.0E-12	-72.3E-12	-119.4E-12	-128.5E-12	-67.6E-12	-133.1E-12	-398.0E-12	-160.6E-12	-166.7E-12	-163.4E-12
7	-	-32.9E-12	-24.6E-12	-79.5E-12	-109.3E-12	-179.9E-12	-184.5E-12	-129.9E-12	-155.2E-12	-188.4E-12	-197.0E-12	-201.3E-12	-139.9E-12
Average	-	-71.2E-12	-17.1E-12	-67.1E-12	-96.0E-12	-134.2E-12	-152.7E-12	-101.5E-12	-138.2E-12	-248.3E-12	-171.8E-12	-181.4E-12	-159.7E-12
Sigma	-	30.0E-12	9.3E-12	8.8E-12	16.8E-12	33.0E-12	23.5E-12	25.7E-12	12.3E-12	106.5E-12	17.9E-12	14.6E-12	14.9E-12

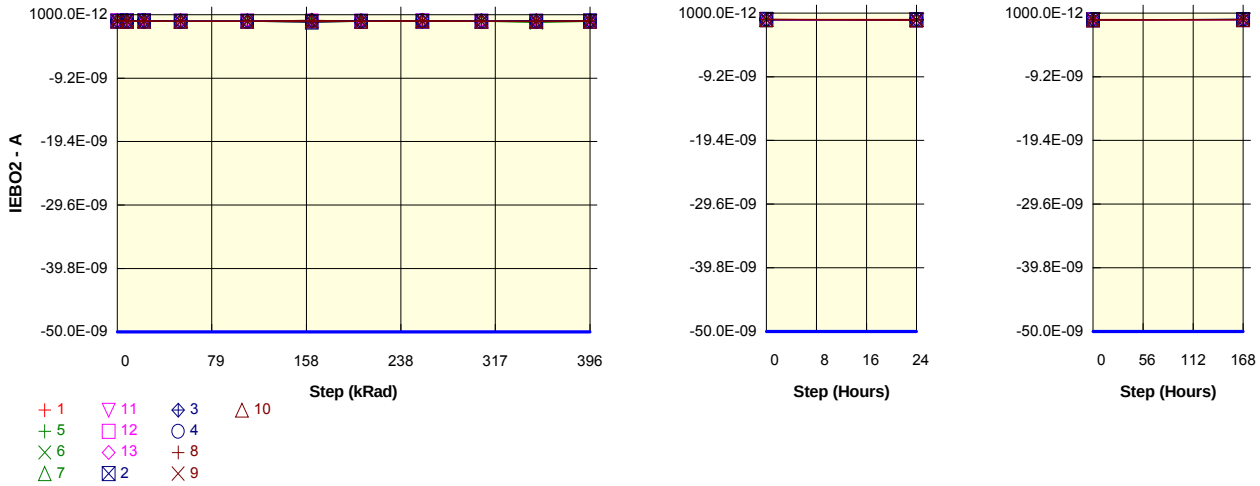
Measurements

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-51.8E-12	-146.4E-12	-31.1E-12	-59.7E-12	-46.1E-12	-76.7E-12	-64.0E-12	-40.0E-12	-45.4E-12	-30.1E-12	-33.0E-12	-56.5E-12	-68.3E-12
OFF_TID samples													
11	-43.1E-12	-203.4E-12	-85.7E-12	-162.6E-12	-178.0E-12	-185.6E-12	-310.8E-12	-309.9E-12	-210.6E-12	-236.2E-12	-193.4E-12	-259.7E-12	-197.4E-12
12	-44.3E-12	-133.7E-12	-74.8E-12	-143.0E-12	-154.1E-12	-204.5E-12	-221.2E-12	-166.7E-12	-206.4E-12	-225.8E-12	-182.9E-12	-264.4E-12	-213.8E-12
13	-54.5E-12	-121.0E-12	-105.3E-12	-187.1E-12	-189.4E-12	-200.0E-12	-275.7E-12	-209.1E-12	-252.6E-12	-302.7E-12	-332.9E-12	-278.6E-12	-273.3E-12
Statistics													
Min	-54.5E-12	-203.4E-12	-105.3E-12	-187.1E-12	-189.4E-12	-204.5E-12	-310.8E-12	-309.9E-12	-252.6E-12	-302.7E-12	-332.9E-12	-278.6E-12	-273.3E-12
Max	-43.1E-12	-121.0E-12	-74.8E-12	-143.0E-12	-154.1E-12	-185.6E-12	-221.2E-12	-166.7E-12	-206.4E-12	-225.8E-12	-182.9E-12	-259.7E-12	-197.4E-12
Average	-47.3E-12	-152.7E-12	-88.6E-12	-164.2E-12	-173.9E-12	-196.7E-12	-269.2E-12	-228.6E-12	-223.2E-12	-254.9E-12	-236.4E-12	-267.6E-12	-228.2E-12
Sigma	5.1E-12	36.2E-12	12.6E-12	18.0E-12	14.7E-12	8.1E-12	36.8E-12	60.1E-12	20.8E-12	34.1E-12	68.4E-12	8.0E-12	32.6E-12

Drift Calculation

IEBO1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-160.3E-12	-42.6E-12	-119.5E-12	-134.9E-12	-142.5E-12	-267.7E-12	-266.8E-12	-167.5E-12	-193.1E-12	-150.2E-12	-216.6E-12	-154.3E-12
12	-	-89.3E-12	-30.5E-12	-98.7E-12	-109.8E-12	-160.2E-12	-176.9E-12	-122.3E-12	-162.1E-12	-181.4E-12	-138.5E-12	-220.1E-12	-169.4E-12
13	-	-66.5E-12	-50.8E-12	-132.6E-12	-134.9E-12	-145.5E-12	-221.2E-12	-154.6E-12	-198.1E-12	-248.2E-12	-278.4E-12	-224.1E-12	-218.8E-12
Average	-	-105.4E-12	-41.3E-12	-116.9E-12	-126.5E-12	-149.4E-12	-221.9E-12	-181.2E-12	-175.9E-12	-207.6E-12	-189.1E-12	-220.2E-12	-180.9E-12
Sigma	-	39.9E-12	8.4E-12	14.0E-12	11.8E-12	7.7E-12	37.1E-12	61.9E-12	15.9E-12	29.1E-12	63.4E-12	3.1E-12	27.5E-12

Parameter : Emitter-Base cut-off current : IEBO2
Test conditions : Veb = -3V
Unit : A
Spec Limit Min : -50.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-10.6E-12	-57.7E-12	12.0E-12	-22.6E-12	-5.8E-12	5.3E-12	-6.5E-12	8.0E-12	-800.0E-15	22.1E-12	6.2E-12	-12.3E-12	-22.5E-12
ON_PROTON samples													
2	-19.1E-12	4.0E-12	6.9E-12	-36.1E-12	-29.1E-12	-197.4E-12	-38.3E-12	-18.3E-12	-31.7E-12	-13.3E-12	-6.2E-12	-59.4E-12	-14.2E-12
3	-20.7E-12	-35.0E-12	2.8E-12	-34.3E-12	-36.7E-12	54.4E-12	-41.8E-12	-44.9E-12	-33.7E-12	-27.1E-12	-55.8E-12	-57.7E-12	-9.4E-12
4	-27.1E-12	-35.1E-12	2.8E-12	-46.5E-12	-35.0E-12	15.0E-12	-20.4E-12	37.0E-12	-35.0E-12	-29.5E-12	-28.1E-12	-49.1E-12	-17.1E-12
Statistics													
Min	-27.1E-12	-35.1E-12	2.8E-12	-46.5E-12	-36.7E-12	-197.4E-12	-41.8E-12	-44.9E-12	-35.0E-12	-29.5E-12	-55.8E-12	-59.4E-12	-17.1E-12
Max	-19.1E-12	4.0E-12	6.9E-12	-34.3E-12	-29.1E-12	54.4E-12	-20.4E-12	37.0E-12	-31.7E-12	-13.3E-12	-6.2E-12	-49.1E-12	-9.4E-12
Average	-22.3E-12	-22.0E-12	4.2E-12	-39.0E-12	-33.6E-12	-42.7E-12	-33.5E-12	-8.7E-12	-33.5E-12	-23.3E-12	-30.0E-12	-55.4E-12	-13.6E-12
Sigma	3.5E-12	18.4E-12	1.9E-12	5.4E-12	3.2E-12	110.6E-12	9.4E-12	34.1E-12	1.4E-12	7.1E-12	20.3E-12	4.5E-12	3.2E-12

Drift Calculation

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	23.1E-12	26.0E-12	-17.0E-12	-10.1E-12	-178.3E-12	-19.2E-12	740.0E-15	-12.7E-12	5.7E-12	12.9E-12	-40.4E-12	4.9E-12
3	-	-14.3E-12	23.5E-12	-13.5E-12	-16.0E-12	75.1E-12	-21.1E-12	-24.1E-12	-13.0E-12	-6.4E-12	-35.1E-12	-37.0E-12	11.3E-12
4	-	-8.0E-12	29.9E-12	-19.4E-12	-7.8E-12	42.1E-12	6.7E-12	64.2E-12	-7.9E-12	-2.3E-12	-940.0E-15	-21.9E-12	10.0E-12
Average	-	286.7E-15	26.5E-12	-16.6E-12	-11.3E-12	-20.4E-12	-11.2E-12	13.6E-12	-11.2E-12	-986.7E-15	-7.7E-12	-33.1E-12	8.7E-12
Sigma	-	16.4E-12	2.7E-12	2.4E-12	3.4E-12	112.5E-12	12.7E-12	37.2E-12	2.3E-12	5.0E-12	20.2E-12	8.0E-12	2.8E-12

Measurements

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-10.6E-12	-57.7E-12	12.0E-12	-22.6E-12	-5.8E-12	5.3E-12	-6.5E-12	8.0E-12	-800.0E-15	22.1E-12	6.2E-12	-12.3E-12	-22.5E-12
ON_TID samples													
8	-13.3E-12	-42.0E-12	2.6E-12	-31.8E-12	-27.7E-12	-105.8E-12	-34.6E-12	-19.2E-12	-33.0E-12	-25.7E-12	-18.2E-12	-70.2E-12	1.4E-12
9	-12.2E-12	-89.8E-12	-2.2E-12	-35.7E-12	-36.9E-12	-142.8E-12	-49.8E-12	-52.1E-12	-39.6E-12	-43.5E-12	-26.6E-12	-93.0E-12	-31.4E-12
10	-5.7E-12	-44.3E-12	1.3E-12	-29.8E-12	-28.8E-12	110.8E-12	-35.9E-12	36.7E-12	-25.4E-12	-26.8E-12	-21.3E-12	-72.5E-12	-29.6E-12
Statistics													
Min	-13.3E-12	-89.8E-12	-2.2E-12	-35.7E-12	-36.9E-12	-142.8E-12	-49.8E-12	-52.1E-12	-39.6E-12	-43.5E-12	-26.6E-12	-93.0E-12	-31.4E-12
Max	-5.7E-12	-42.0E-12	2.6E-12	-29.8E-12	-27.7E-12	110.8E-12	-34.6E-12	36.7E-12	-25.4E-12	-25.7E-12	-18.2E-12	-70.2E-12	1.4E-12
Average	-10.4E-12	-58.7E-12	580.0E-15	-32.5E-12	-31.1E-12	-45.9E-12	-40.1E-12	-11.5E-12	-32.7E-12	-32.0E-12	-22.0E-12	-78.6E-12	-19.9E-12
Sigma	3.4E-12	22.0E-12	2.0E-12	2.4E-12	4.1E-12	111.9E-12	6.9E-12	36.6E-12	5.8E-12	8.1E-12	3.5E-12	10.3E-12	15.1E-12

Drift Calculation

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-28.8E-12	15.9E-12	-18.5E-12	-14.4E-12	-92.5E-12	-21.3E-12	-5.9E-12	-19.8E-12	-12.4E-12	-4.9E-12	-56.9E-12	14.7E-12
9	-	-77.6E-12	10.0E-12	-23.5E-12	-24.7E-12	-130.6E-12	-37.5E-12	-39.9E-12	-27.4E-12	-31.3E-12	-14.3E-12	-80.8E-12	-19.2E-12
10	-	-38.6E-12	7.0E-12	-24.1E-12	-23.1E-12	116.5E-12	-30.2E-12	42.4E-12	-19.7E-12	-21.1E-12	-15.6E-12	-66.8E-12	-23.9E-12
Average	-	-48.3E-12	11.0E-12	-22.1E-12	-20.7E-12	-35.5E-12	-29.7E-12	-1.1E-12	-22.3E-12	-21.6E-12	-11.6E-12	-68.2E-12	-9.5E-12
Sigma	-	21.1E-12	3.7E-12	2.5E-12	4.5E-12	108.6E-12	6.6E-12	33.7E-12	3.6E-12	7.7E-12	4.8E-12	9.8E-12	17.2E-12

Measurements

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-10.6E-12	-57.7E-12	12.0E-12	-22.6E-12	-5.8E-12	5.3E-12	-6.5E-12	8.0E-12	-800.0E-15	22.1E-12	6.2E-12	-12.3E-12	-22.5E-12
OFF_PROTON samples													
5	-20.3E-12	-46.0E-12	-9.8E-12	-36.1E-12	-51.5E-12	-96.6E-12	-60.7E-12	-42.6E-12	-53.7E-12	-55.0E-12	-66.7E-12	-75.3E-12	-51.8E-12
6	-24.2E-12	-40.5E-12	-9.4E-12	-34.3E-12	-45.8E-12	-45.7E-12	-62.3E-12	-78.0E-12	-58.3E-12	-253.3E-12	-71.2E-12	-58.2E-12	-60.9E-12
7	-19.7E-12	-28.4E-12	-21.4E-12	-46.5E-12	-62.0E-12	-159.7E-12	-78.7E-12	-23.9E-12	-72.4E-12	-75.7E-12	-88.5E-12	-96.9E-12	-61.9E-12
Statistics													
Min	-24.2E-12	-46.0E-12	-21.4E-12	-46.5E-12	-62.0E-12	-159.7E-12	-78.7E-12	-78.0E-12	-72.4E-12	-253.3E-12	-88.5E-12	-96.9E-12	-61.9E-12
Max	-19.7E-12	-28.4E-12	-9.4E-12	-34.3E-12	-45.8E-12	-45.7E-12	-60.7E-12	-23.9E-12	-53.7E-12	-55.0E-12	-66.7E-12	-58.2E-12	-51.8E-12
Average	-21.4E-12	-38.3E-12	-13.6E-12	-39.0E-12	-53.1E-12	-100.7E-12	-67.3E-12	-48.2E-12	-61.5E-12	-128.0E-12	-75.5E-12	-76.8E-12	-58.2E-12
Sigma	2.0E-12	7.4E-12	5.5E-12	5.4E-12	6.7E-12	46.6E-12	8.1E-12	22.4E-12	8.0E-12	89.0E-12	9.4E-12	15.9E-12	4.5E-12

Drift Calculation

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	-25.8E-12	10.4E-12	-15.9E-12	-31.2E-12	-76.3E-12	-40.4E-12	-22.4E-12	-33.4E-12	-34.7E-12	-46.5E-12	-55.1E-12	-31.5E-12
6	-	-16.3E-12	14.7E-12	-10.1E-12	-21.6E-12	-21.6E-12	-38.2E-12	-53.8E-12	-34.2E-12	-229.1E-12	-47.0E-12	-34.0E-12	-36.7E-12
7	-	-8.7E-12	-1.7E-12	-26.8E-12	-42.4E-12	-140.0E-12	-59.1E-12	-4.2E-12	-52.7E-12	-56.0E-12	-68.8E-12	-77.3E-12	-42.2E-12
Average	-	-16.9E-12	7.8E-12	-17.6E-12	-31.7E-12	-79.3E-12	-45.9E-12	-26.8E-12	-40.1E-12	-106.6E-12	-54.1E-12	-55.5E-12	-36.8E-12
Sigma	-	7.0E-12	7.0E-12	7.0E-12	8.5E-12	48.4E-12	9.4E-12	20.5E-12	8.9E-12	87.1E-12	10.4E-12	17.7E-12	4.4E-12

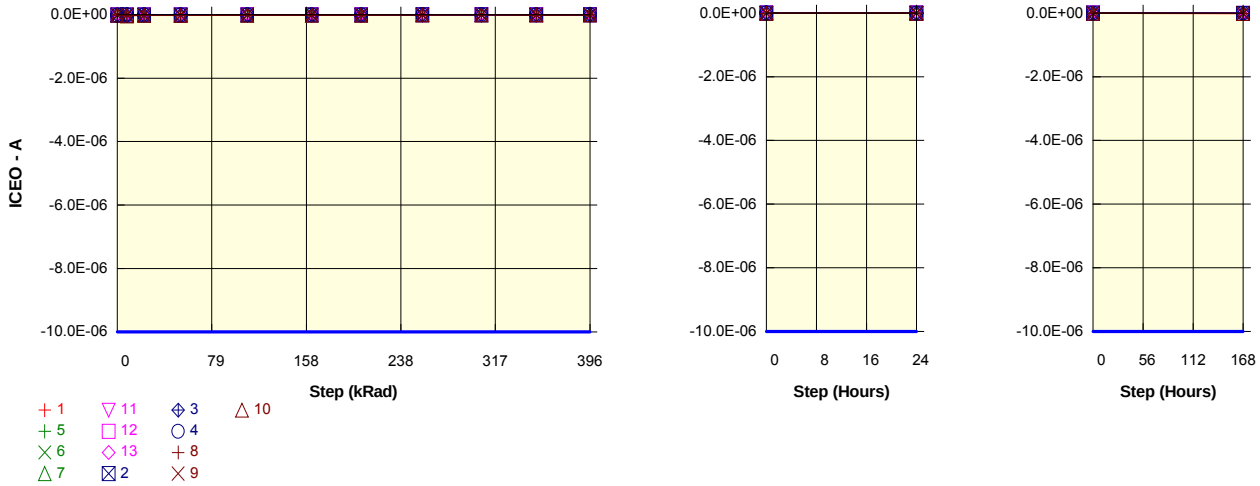
Measurements

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-10.6E-12	-57.7E-12	12.0E-12	-22.6E-12	-5.8E-12	5.3E-12	-6.5E-12	8.0E-12	-800.0E-15	22.1E-12	6.2E-12	-12.3E-12	-22.5E-12
OFF_TID samples													
11	-6.3E-12	-7.2E-12	-7.3E-12	-35.4E-12	-50.3E-12	-103.0E-12	-63.1E-12	8.8E-12	-66.0E-12	-58.1E-12	-52.0E-12	-55.2E-12	-45.4E-12
12	-9.6E-12	-34.0E-12	-1.9E-12	-29.7E-12	-39.2E-12	-1.4E-12	-55.3E-12	-40.4E-12	-54.2E-12	-55.1E-12	-46.6E-12	-90.6E-12	-45.5E-12
13	-14.0E-12	-60.9E-12	-17.6E-12	-45.9E-12	-58.2E-12	-70.9E-12	-82.1E-12	-21.5E-12	-76.4E-12	-85.8E-12	-83.8E-12	-66.4E-12	-58.4E-12
Statistics													
Min	-14.0E-12	-60.9E-12	-17.6E-12	-45.9E-12	-58.2E-12	-103.0E-12	-82.1E-12	-40.4E-12	-76.4E-12	-85.8E-12	-83.8E-12	-90.6E-12	-58.4E-12
Max	-6.3E-12	-7.2E-12	-1.9E-12	-29.7E-12	-39.2E-12	-1.4E-12	-55.3E-12	8.8E-12	-54.2E-12	-55.1E-12	-46.6E-12	-55.2E-12	-45.4E-12
Average	-10.0E-12	-34.1E-12	-8.9E-12	-37.0E-12	-49.2E-12	-58.4E-12	-66.8E-12	-17.7E-12	-65.5E-12	-66.3E-12	-60.8E-12	-70.7E-12	-49.8E-12
Sigma	3.2E-12	21.9E-12	6.5E-12	6.7E-12	7.8E-12	42.4E-12	11.3E-12	20.3E-12	9.1E-12	13.8E-12	16.4E-12	14.8E-12	6.1E-12

Drift Calculation

IEBO2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-960.0E-15	-1.1E-12	-29.1E-12	-44.1E-12	-96.7E-12	-56.9E-12	15.1E-12	-59.7E-12	-51.8E-12	-45.8E-12	-48.9E-12	-39.1E-12
12	-	-24.4E-12	7.7E-12	-20.1E-12	-29.6E-12	8.2E-12	-45.7E-12	-30.8E-12	-44.6E-12	-45.5E-12	-37.0E-12	-81.0E-12	-35.9E-12
13	-	-46.9E-12	-3.6E-12	-31.9E-12	-44.2E-12	-56.9E-12	-68.1E-12	-7.5E-12	-62.4E-12	-71.8E-12	-69.8E-12	-52.4E-12	-44.4E-12
Average	-	-24.1E-12	1.0E-12	-27.0E-12	-39.3E-12	-48.5E-12	-56.9E-12	-7.7E-12	-55.6E-12	-56.4E-12	-50.9E-12	-60.8E-12	-39.8E-12
Sigma	-	18.8E-12	4.9E-12	5.0E-12	6.9E-12	43.3E-12	9.2E-12	18.7E-12	7.8E-12	11.2E-12	13.9E-12	14.4E-12	3.5E-12

Parameter : Collector-Emitter cut-off current : ICEO
Test conditions : Vce = -100V
Unit : A
Spec Limit Min : -10.0E-06
Spec limits are represented in bold lines on the graphic.



Measurements

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-8.0E-09	-8.6E-09	-6.0E-09	-8.5E-09	-7.6E-09	-8.9E-09	-10.1E-09	-6.4E-09	-7.8E-09	-9.8E-09	-5.2E-09	-5.9E-09	-14.8E-09
ON_PROTON samples													
2	-7.4E-09	-9.0E-09	-4.7E-09	-9.6E-09	-5.0E-09	-5.9E-09	-5.5E-09	-2.6E-09	-2.4E-09	-4.3E-09	-1.7E-09	-2.9E-09	-7.6E-09
3	-8.2E-09	-15.6E-09	-9.0E-09	-16.3E-09	-9.0E-09	-5.8E-09	-8.6E-09	-3.8E-09	-3.3E-09	-7.0E-09	-2.7E-09	-4.2E-09	-8.2E-09
4	-16.0E-09	-6.1E-09	-4.7E-09	-7.2E-09	-3.7E-09	-4.5E-09	-5.5E-09	-1.9E-09	-1.9E-09	-3.8E-09	-1.5E-09	-4.1E-09	-5.3E-09
Statistics													
Min	-16.0E-09	-15.6E-09	-9.0E-09	-16.3E-09	-9.0E-09	-5.9E-09	-8.6E-09	-3.8E-09	-3.3E-09	-7.0E-09	-2.7E-09	-4.2E-09	-8.2E-09
Max	-7.4E-09	-6.1E-09	-4.7E-09	-7.2E-09	-3.7E-09	-4.5E-09	-5.5E-09	-1.9E-09	-1.9E-09	-3.8E-09	-1.5E-09	-2.9E-09	-5.3E-09
Average	-10.5E-09	-10.2E-09	-6.1E-09	-11.0E-09	-5.9E-09	-5.4E-09	-6.5E-09	-2.8E-09	-2.5E-09	-5.0E-09	-2.0E-09	-3.8E-09	-7.0E-09
Sigma	3.9E-09	4.0E-09	2.0E-09	3.9E-09	2.2E-09	669.1E-12	1.5E-09	776.9E-12	544.9E-12	1.4E-09	529.3E-12	592.8E-12	1.3E-09

Drift Calculation

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-1.6E-09	2.7E-09	-2.2E-09	2.3E-09	1.4E-09	1.9E-09	4.8E-09	4.9E-09	3.1E-09	5.6E-09	4.4E-09	-252.6E-12
3	-	-7.4E-09	-783.4E-12	-8.2E-09	-804.8E-12	2.3E-09	-410.4E-12	4.4E-09	4.9E-09	1.1E-09	5.5E-09	3.9E-09	-66.0E-12
4	-	9.9E-09	11.3E-09	8.8E-09	12.3E-09	11.6E-09	10.5E-09	14.1E-09	14.1E-09	12.2E-09	14.5E-09	11.9E-09	10.7E-09
Average	-	303.3E-12	4.4E-09	-516.1E-12	4.6E-09	5.1E-09	4.0E-09	7.7E-09	8.0E-09	5.5E-09	8.5E-09	6.8E-09	3.5E-09
Sigma	-	7.2E-09	5.1E-09	7.0E-09	5.6E-09	4.6E-09	4.7E-09	4.5E-09	4.3E-09	4.8E-09	4.2E-09	3.6E-09	5.1E-09

Measurements

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-8.0E-09	-8.6E-09	-6.0E-09	-8.5E-09	-7.6E-09	-8.9E-09	-10.1E-09	-6.4E-09	-7.8E-09	-9.8E-09	-5.2E-09	-5.9E-09	-14.8E-09
ON_TID samples													
8	-8.4E-09	-31.7E-09	-21.5E-09	-27.3E-09	-11.5E-09	-12.7E-09	-12.3E-09	-5.4E-09	-4.5E-09	-9.0E-09	-5.5E-09	-4.7E-09	-8.1E-09
9	-6.8E-09	-194.8E-12	-22.6E-09	-22.8E-09	-8.5E-09	-10.4E-09	-10.4E-09	-4.3E-09	-4.5E-09	-8.4E-09	-4.0E-09	-4.2E-09	-10.1E-09
10	-7.4E-09	-35.5E-09	-17.2E-09	-23.6E-09	-8.5E-09	-9.6E-09	-8.7E-09	-3.9E-09	-3.7E-09	-6.1E-09	-5.0E-09	-4.4E-09	-7.5E-09
Statistics													
Min	-8.4E-09	-35.5E-09	-22.6E-09	-27.3E-09	-11.5E-09	-12.7E-09	-12.3E-09	-5.4E-09	-4.5E-09	-9.0E-09	-5.5E-09	-4.7E-09	-10.1E-09
Max	-6.8E-09	-194.8E-12	-17.2E-09	-22.8E-09	-8.5E-09	-9.6E-09	-8.7E-09	-3.9E-09	-3.7E-09	-6.1E-09	-4.0E-09	-4.2E-09	-7.5E-09
Average	-7.6E-09	-22.5E-09	-20.4E-09	-24.6E-09	-9.5E-09	-10.9E-09	-10.5E-09	-4.5E-09	-4.2E-09	-7.8E-09	-4.8E-09	-4.4E-09	-8.6E-09
Sigma	651.8E-12	15.8E-09	2.4E-09	1.9E-09	1.4E-09	1.3E-09	1.5E-09	630.7E-12	364.8E-12	1.2E-09	599.9E-12	213.1E-12	1.1E-09

Drift Calculation

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-23.3E-09	-13.1E-09	-18.8E-09	-3.1E-09	-4.3E-09	-3.9E-09	3.0E-09	3.9E-09	-548.4E-12	2.9E-09	3.7E-09	291.8E-12
9	-	6.6E-09	-15.8E-09	-15.9E-09	-1.7E-09	-3.5E-09	-3.6E-09	2.5E-09	2.3E-09	-1.5E-09	2.8E-09	2.7E-09	-3.3E-09
10	-	-28.1E-09	-9.7E-09	-16.2E-09	-1.0E-09	-2.1E-09	-1.3E-09	3.6E-09	3.7E-09	1.4E-09	2.5E-09	3.1E-09	-93.6E-12
Average	-	-14.9E-09	-12.9E-09	-17.0E-09	-1.9E-09	-3.3E-09	-2.9E-09	3.0E-09	3.3E-09	-240.6E-12	2.7E-09	3.2E-09	-1.0E-09
Sigma	-	15.4E-09	2.5E-09	1.3E-09	854.8E-12	909.1E-12	1.2E-09	440.1E-12	699.7E-12	1.2E-09	192.7E-12	439.0E-12	1.6E-09

Measurements

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-8.0E-09	-8.6E-09	-6.0E-09	-8.5E-09	-7.6E-09	-8.9E-09	-10.1E-09	-6.4E-09	-7.8E-09	-9.8E-09	-5.2E-09	-5.9E-09	-14.8E-09
OFF_PROTON samples													
5	-7.7E-09	-8.6E-09	-5.1E-09	-9.6E-09	-3.0E-09	-2.4E-09	-2.0E-09	-1.1E-09	-1.1E-09	-1.8E-09	-1.7E-09	-1.6E-09	-6.4E-09
6	-11.1E-09	-7.6E-09	-5.3E-09	-16.3E-09	-2.1E-09	-2.6E-09	-1.8E-09	-1.3E-09	-1.1E-09	-1.3E-09	-1.1E-09	-1.3E-09	-3.1E-09
7	-7.3E-09	-30.6E-09	-19.1E-09	-7.2E-09	-11.0E-09	-8.7E-09	-8.4E-09	-3.7E-09	-3.7E-09	-5.8E-09	-3.7E-09	-4.2E-09	-10.4E-09
Statistics													
Min	-11.1E-09	-30.6E-09	-19.1E-09	-16.3E-09	-11.0E-09	-8.7E-09	-8.4E-09	-3.7E-09	-3.7E-09	-5.8E-09	-3.7E-09	-4.2E-09	-10.4E-09
Max	-7.3E-09	-7.6E-09	-5.1E-09	-7.2E-09	-2.1E-09	-2.4E-09	-1.8E-09	-1.1E-09	-1.1E-09	-1.3E-09	-1.1E-09	-1.3E-09	-3.1E-09
Average	-8.7E-09	-15.6E-09	-9.8E-09	-11.0E-09	-5.4E-09	-4.6E-09	-4.1E-09	-2.0E-09	-2.0E-09	-3.0E-09	-2.2E-09	-2.4E-09	-6.7E-09
Sigma	1.7E-09	10.6E-09	6.5E-09	3.9E-09	4.0E-09	2.9E-09	3.1E-09	1.2E-09	1.2E-09	2.0E-09	1.1E-09	1.3E-09	3.0E-09

Drift Calculation

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	-828.4E-12	2.6E-09	-1.8E-09	4.7E-09	5.3E-09	5.7E-09	6.7E-09	6.6E-09	5.9E-09	6.0E-09	6.2E-09	1.3E-09
6	-	3.4E-09	5.7E-09	-5.3E-09	8.9E-09	8.5E-09	9.3E-09	9.8E-09	9.9E-09	9.8E-09	10.0E-09	9.7E-09	7.9E-09
7	-	-23.3E-09	-11.8E-09	117.4E-12	-3.7E-09	-1.4E-09	-1.1E-09	3.6E-09	3.7E-09	1.5E-09	3.6E-09	3.2E-09	-3.1E-09
Average	-	-6.9E-09	-1.1E-09	-2.3E-09	3.3E-09	4.1E-09	4.6E-09	6.7E-09	6.7E-09	5.7E-09	6.5E-09	6.4E-09	2.0E-09
Sigma	-	11.7E-09	7.6E-09	2.2E-09	5.3E-09	4.1E-09	4.3E-09	2.5E-09	2.6E-09	3.4E-09	2.6E-09	2.7E-09	4.5E-09

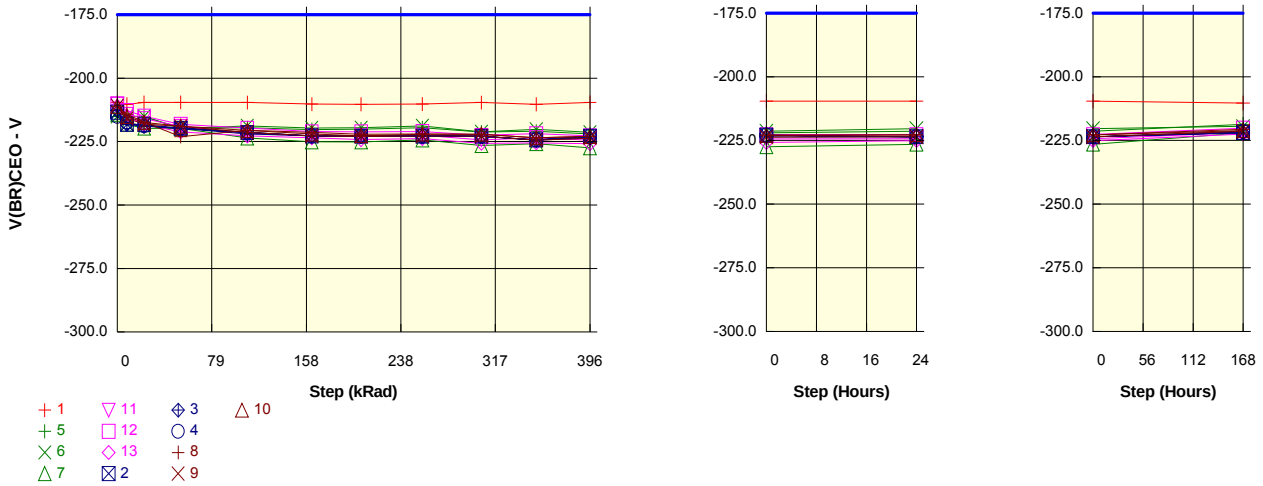
Measurements

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-8.0E-09	-8.6E-09	-6.0E-09	-8.5E-09	-7.6E-09	-8.9E-09	-10.1E-09	-6.4E-09	-7.8E-09	-9.8E-09	-5.2E-09	-5.9E-09	-14.8E-09
OFF_TID samples													
11	-8.3E-09	-14.1E-09	-6.3E-09	-5.6E-09	-2.7E-09	-2.6E-09	-3.0E-09	-975.0E-12	-1.5E-09	-1.6E-09	-818.9E-12	-1.7E-09	-4.2E-09
12	-8.8E-09	-9.5E-09	-4.4E-09	-4.2E-09	-1.9E-09	-2.1E-09	-2.1E-09	-885.0E-12	-1.0E-09	-1.3E-09	-774.8E-12	-1.2E-09	-3.9E-09
13	-10.7E-09	-21.1E-09	-12.9E-09	-8.2E-09	-3.3E-09	-3.9E-09	-3.9E-09	-1.7E-09	-2.0E-09	-2.7E-09	-1.2E-09	-1.9E-09	-5.3E-09
Statistics													
Min	-10.7E-09	-21.1E-09	-12.9E-09	-8.2E-09	-3.3E-09	-3.9E-09	-3.9E-09	-1.7E-09	-2.0E-09	-2.7E-09	-1.2E-09	-1.9E-09	-5.3E-09
Max	-8.3E-09	-9.5E-09	-4.4E-09	-4.2E-09	-1.9E-09	-2.1E-09	-2.1E-09	-885.0E-12	-1.0E-09	-1.3E-09	-774.8E-12	-1.2E-09	-3.9E-09
Average	-9.3E-09	-14.9E-09	-7.9E-09	-6.0E-09	-2.6E-09	-2.9E-09	-3.0E-09	-1.2E-09	-1.5E-09	-1.9E-09	-928.7E-12	-1.6E-09	-4.4E-09
Sigma	1.0E-09	4.8E-09	3.7E-09	1.7E-09	581.0E-12	782.9E-12	747.0E-12	379.8E-12	423.4E-12	610.0E-12	187.3E-12	313.0E-12	605.8E-12

Drift Calculation

ICEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-5.8E-09	2.0E-09	2.8E-09	5.6E-09	5.8E-09	5.4E-09	7.4E-09	6.8E-09	6.7E-09	7.5E-09	6.6E-09	4.2E-09
12	-	-662.6E-12	4.4E-09	4.6E-09	6.9E-09	6.7E-09	6.7E-09	7.9E-09	7.8E-09	7.5E-09	8.0E-09	7.7E-09	5.0E-09
13	-	-10.3E-09	-2.2E-09	2.5E-09	7.4E-09	6.8E-09	6.8E-09	9.0E-09	8.7E-09	8.0E-09	9.5E-09	8.8E-09	5.5E-09
Average	-	-5.6E-09	1.4E-09	3.3E-09	6.7E-09	6.4E-09	6.3E-09	8.1E-09	7.8E-09	7.4E-09	8.4E-09	7.7E-09	4.9E-09
Sigma	-	4.0E-09	2.7E-09	955.7E-12	776.2E-12	461.7E-12	660.9E-12	676.6E-12	761.4E-12	519.3E-12	853.5E-12	909.6E-12	526.6E-12

Parameter : Collector-Emitter breakdown voltage : V(BR)CEO
Test conditions : Ic = -10mA
Unit : V
Spec Limit Max : -175.0
Spec limits are represented in bold lines on the graphic.



Measurements

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-209.6	-210.3	-209.6	-209.6	-209.6	-210.3	-210.3	-210.2	-209.6	-210.3	-209.6	-209.6	-210.4
ON_PROTON samples													
2	-213.4	-218.1	-218.3	-219.7	-221.4	-222.7	-222.9	-222.9	-222.9	-224.3	-222.9	-223.5	-221.9
3	-212.7	-218.2	-218.9	-219.8	-222.0	-222.7	-222.9	-222.9	-222.9	-224.4	-223.6	-223.6	-221.9
4	-215.1	-217.4	-218.9	-219.8	-221.4	-222.7	-222.9	-222.8	-222.9	-224.3	-222.9	-223.5	-221.3
Statistics													
Min	-215.1	-218.2	-218.9	-219.8	-222.0	-222.7	-222.9	-222.9	-222.9	-224.4	-223.6	-223.6	-221.9
Max	-212.7	-217.4	-218.3	-219.7	-221.4	-222.7	-222.9	-222.8	-222.9	-224.3	-222.9	-223.5	-221.3
Average	-213.8	-217.9	-218.7	-219.7	-221.6	-222.7	-222.9	-222.8	-222.9	-224.3	-223.1	-223.5	-221.7
Sigma	1.0	0.4	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3

Drift Calculation

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-4.7E+00	-4.9E+00	-6.3E+00	-8.0E+00	-9.3E+00	-9.5E+00	-9.4E+00	-9.5E+00	-10.9E+00	-9.5E+00	-10.1E+00	-8.4E+00
3	-	-5.5E+00	-6.2E+00	-7.1E+00	-9.2E+00	-10.0E+00	-10.2E+00	-10.1E+00	-10.2E+00	-11.7E+00	-10.8E+00	-10.9E+00	-9.2E+00
4	-	-2.3E+00	-3.7E+00	-4.6E+00	-6.3E+00	-7.6E+00	-7.8E+00	-7.7E+00	-7.8E+00	-9.2E+00	-7.8E+00	-8.4E+00	-6.2E+00
Average	-	-4.2E+00	-4.9E+00	-6.0E+00	-7.8E+00	-9.0E+00	-9.1E+00	-9.1E+00	-9.1E+00	-10.6E+00	-9.4E+00	-9.8E+00	-8.0E+00
Sigma	-	1.4E+00	1.0E+00	1.0E+00	1.2E+00	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.2E+00	1.0E+00	1.3E+00

Measurements

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-209.6	-210.3	-209.6	-209.6	-209.6	-210.3	-210.3	-210.2	-209.6	-210.3	-209.6	-209.6	-210.4
ON_TID samples													
8	-211.1	-214.3	-217.3	-223.0	-220.5	-221.4	-222.1	-222.0	-222.1	-223.5	-222.9	-222.8	-220.6
9	-210.9	-215.9	-218.1	-219.0	-221.4	-222.7	-222.9	-222.8	-222.9	-224.4	-223.6	-223.6	-221.3
10	-211.1	-215.1	-217.4	-218.9	-220.6	-222.0	-222.7	-222.1	-222.1	-223.5	-222.9	-222.8	-221.1
Statistics													
Min	-211.1	-215.9	-218.1	-223.0	-221.4	-222.7	-222.9	-222.8	-222.9	-224.4	-223.6	-223.6	-221.3
Max	-210.9	-214.3	-217.3	-218.9	-220.5	-221.4	-222.1	-222.0	-222.1	-223.5	-222.9	-222.8	-220.6
Average	-211.0	-215.1	-217.6	-220.3	-220.8	-222.0	-222.6	-222.3	-222.4	-223.8	-223.2	-223.1	-221.0
Sigma	0.1	0.6	0.3	1.9	0.4	0.6	0.4	0.4	0.4	0.4	0.3	0.4	0.3

Drift Calculation

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-3.2E+00	-6.2E+00	-11.9E+00	-9.4E+00	-10.2E+00	-11.0E+00	-10.9E+00	-10.9E+00	-12.4E+00	-11.8E+00	-11.7E+00	-9.5E+00
9	-	-4.9E+00	-7.2E+00	-8.1E+00	-10.4E+00	-11.8E+00	-12.0E+00	-11.9E+00	-12.0E+00	-13.5E+00	-12.7E+00	-12.7E+00	-10.4E+00
10	-	-4.1E+00	-6.4E+00	-7.8E+00	-9.5E+00	-10.9E+00	-11.6E+00	-11.0E+00	-11.0E+00	-12.4E+00	-11.9E+00	-11.7E+00	-10.1E+00
Average	-	-4.1E+00	-6.6E+00	-9.3E+00	-9.8E+00	-11.0E+00	-11.5E+00	-11.3E+00	-11.3E+00	-12.8E+00	-12.1E+00	-12.0E+00	-10.0E+00
Sigma	-	718.5E-03	426.3E-03	1.9E+00	458.0E-03	642.5E-03	423.2E-03	453.7E-03	459.1E-03	503.4E-03	420.3E-03	457.6E-03	381.3E-03

Measurements

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-209.6	-210.3	-209.6	-209.6	-209.6	-210.3	-210.3	-210.2	-209.6	-210.3	-209.6	-209.6	-210.4
OFF_PROTON samples													
5	-215.1	-215.0	-215.2	-219.7	-219.5	-220.3	-220.1	-219.6	-221.2	-220.9	-222.0	-221.4	-218.7
6	-215.1	-215.0	-215.1	-219.8	-218.8	-219.6	-219.5	-218.8	-221.1	-220.2	-221.3	-220.4	-219.5
7	-214.3	-218.1	-219.7	-219.8	-223.6	-225.1	-225.1	-224.3	-226.6	-225.8	-227.5	-226.5	-222.0
Statistics													
Min	-215.1	-218.1	-219.7	-219.8	-223.6	-225.1	-225.1	-224.3	-226.6	-225.8	-227.5	-226.5	-222.0
Max	-214.3	-215.0	-215.1	-219.7	-218.8	-219.6	-219.5	-218.8	-221.1	-220.2	-221.3	-220.4	-218.7
Average	-214.8	-216.1	-216.7	-219.7	-220.7	-221.7	-221.6	-220.9	-223.0	-222.3	-223.6	-222.8	-220.1
Sigma	0.4	1.5	2.2	0.0	2.1	2.4	2.5	2.4	2.6	2.5	2.8	2.7	1.4

Drift Calculation

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	100.0E-03	-50.0E-03	-4.6E+00	-4.4E+00	-5.2E+00	-5.0E+00	-4.4E+00	-6.1E+00	-5.8E+00	-6.8E+00	-6.3E+00	-3.6E+00
6	-	60.0E-03	0.0E+00	-4.7E+00	-3.7E+00	-4.5E+00	-4.4E+00	-3.7E+00	-6.1E+00	-5.1E+00	-6.2E+00	-5.3E+00	-4.4E+00
7	-	-3.9E+00	-5.5E+00	-5.5E+00	-9.4E+00	-10.9E+00	-10.9E+00	-10.1E+00	-12.4E+00	-11.6E+00	-13.2E+00	-12.3E+00	-7.8E+00
Average	-	-1.2E+00	-1.8E+00	-4.9E+00	-5.8E+00	-6.9E+00	-6.8E+00	-6.1E+00	-8.2E+00	-7.5E+00	-8.8E+00	-7.9E+00	-5.2E+00
Sigma	-	1.9E+00	2.6E+00	420.6E-03	2.5E+00	2.8E+00	2.9E+00	2.8E+00	3.0E+00	2.9E+00	3.2E+00	3.1E+00	1.8E+00

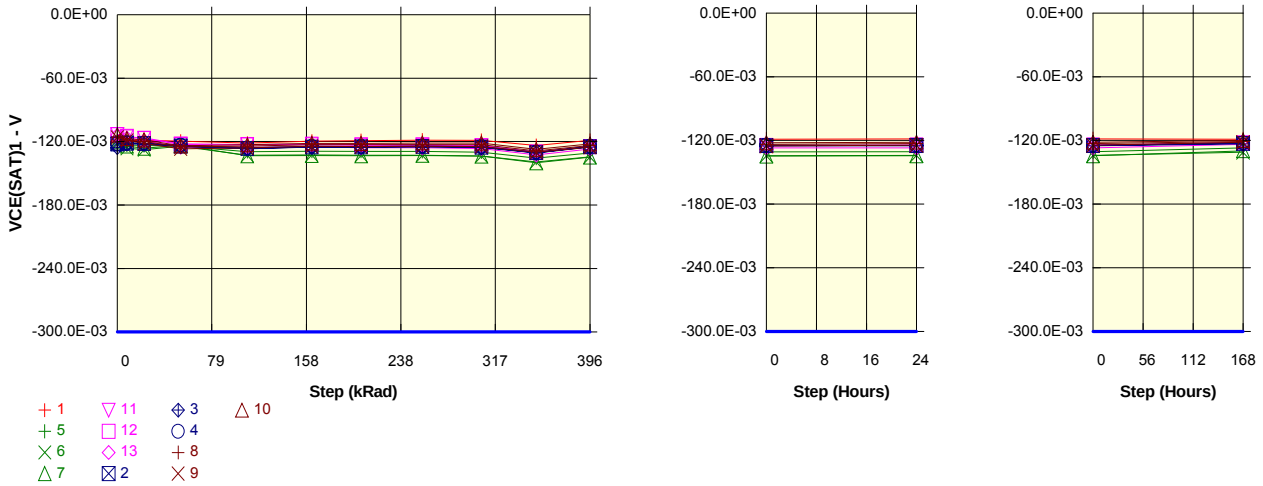
Measurements

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-209.6	-210.3	-209.6	-209.6	-209.6	-210.3	-210.3	-210.2	-209.6	-210.3	-209.6	-209.6	-210.4
OFF_TID samples													
11	-210.3	-214.2	-215.9	-219.0	-221.8	-222.8	-222.8	-222.5	-224.3	-223.5	-224.4	-224.3	-221.9
12	-210.1	-212.7	-215.0	-218.1	-219.7	-221.1	-221.1	-221.0	-222.6	-221.9	-222.7	-222.7	-220.2
13	-211.0	-215.0	-218.2	-221.2	-222.7	-223.5	-224.2	-223.8	-225.6	-225.4	-225.8	-225.0	-222.5
Statistics													
Min	-211.0	-215.0	-218.2	-221.2	-222.7	-223.5	-224.2	-223.8	-225.6	-225.4	-225.8	-225.0	-222.5
Max	-210.1	-212.7	-215.0	-218.1	-219.7	-221.1	-221.1	-221.0	-222.6	-221.9	-222.7	-222.7	-220.2
Average	-210.5	-214.0	-216.4	-219.5	-221.4	-222.5	-222.7	-222.4	-224.2	-223.6	-224.3	-224.0	-221.5
Sigma	0.4	0.9	1.3	1.3	1.3	1.0	1.3	1.2	1.3	1.5	1.3	1.0	1.0

Drift Calculation

V(BR)CEO	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-3.9E+00	-5.6E+00	-8.7E+00	-11.5E+00	-12.5E+00	-12.4E+00	-12.1E+00	-14.0E+00	-13.2E+00	-14.1E+00	-14.0E+00	-11.5E+00
12	-	-2.6E+00	-4.9E+00	-8.0E+00	-9.6E+00	-10.9E+00	-11.0E+00	-10.9E+00	-12.4E+00	-11.7E+00	-12.6E+00	-12.6E+00	-10.1E+00
13	-	-4.0E+00	-7.1E+00	-10.2E+00	-11.7E+00	-12.5E+00	-13.2E+00	-12.8E+00	-14.6E+00	-14.4E+00	-14.8E+00	-14.0E+00	-11.5E+00
Average	-	-3.5E+00	-5.9E+00	-9.0E+00	-10.9E+00	-12.0E+00	-12.2E+00	-11.9E+00	-13.7E+00	-13.1E+00	-13.8E+00	-13.5E+00	-11.0E+00
Sigma	-	630.0E-03	935.7E-03	894.4E-03	969.8E-03	714.2E-03	919.4E-03	802.7E-03	913.8E-03	1.1E+00	915.8E-03	681.2E-03	674.9E-03

Parameter : Collector-Emitter saturation voltage : VCE(SAT)1
Test conditions : Ic = -10mA ; Ib = -1mA
Unit : V
Spec Limit Min : -300.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-119.2E-03	-119.2E-03	-118.7E-03	-119.7E-03	-121.5E-03	-119.6E-03	-119.2E-03	-118.7E-03	-118.8E-03	-123.8E-03	-118.8E-03	-118.6E-03	-118.9E-03
ON_PROTON samples													
2	-122.2E-03	-121.4E-03	-121.8E-03	-124.2E-03	-126.4E-03	-125.1E-03	-125.0E-03	-124.6E-03	-125.2E-03	-130.5E-03	-124.8E-03	-124.7E-03	-122.8E-03
3	-125.7E-03	-122.1E-03	-122.4E-03	-124.6E-03	-126.8E-03	-125.3E-03	-125.4E-03	-125.0E-03	-125.6E-03	-131.0E-03	-125.3E-03	-125.0E-03	-123.2E-03
4	-121.9E-03	-121.5E-03	-121.6E-03	-123.4E-03	-125.9E-03	-124.4E-03	-124.7E-03	-124.2E-03	-124.7E-03	-130.2E-03	-124.5E-03	-124.6E-03	-122.3E-03
Statistics													
Min	-125.7E-03	-122.1E-03	-122.4E-03	-124.6E-03	-126.8E-03	-125.3E-03	-125.4E-03	-125.0E-03	-125.6E-03	-131.0E-03	-125.3E-03	-125.0E-03	-123.2E-03
Max	-121.9E-03	-121.4E-03	-121.6E-03	-123.4E-03	-125.9E-03	-124.4E-03	-124.7E-03	-124.2E-03	-124.7E-03	-130.2E-03	-124.5E-03	-124.6E-03	-122.3E-03
Average	-123.3E-03	-121.7E-03	-121.9E-03	-124.1E-03	-126.4E-03	-124.9E-03	-125.0E-03	-124.6E-03	-125.2E-03	-130.6E-03	-124.9E-03	-124.8E-03	-122.8E-03
Sigma	1.7E-03	311.6E-06	358.3E-06	495.7E-06	378.5E-06	389.6E-06	296.4E-06	327.1E-06	359.8E-06	311.6E-06	344.1E-06	142.4E-06	375.7E-06

Drift Calculation

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	760.0E-06	400.0E-06	-2.0E-03	-4.2E-03	-2.9E-03	-2.8E-03	-2.4E-03	-3.0E-03	-8.3E-03	-2.6E-03	-2.5E-03	-600.0E-06
3	-	3.6E-03	3.2E-03	1.1E-03	-1.1E-03	360.0E-06	280.0E-06	680.0E-06	80.0E-06	-5.3E-03	360.0E-06	720.0E-06	2.4E-03
4	-	440.0E-06	320.0E-06	-1.5E-03	-4.0E-03	-2.5E-03	-2.8E-03	-2.3E-03	-2.8E-03	-8.3E-03	-2.6E-03	-2.7E-03	-400.0E-06
Average	-	1.6E-03	1.3E-03	-786.7E-06	-3.1E-03	-1.7E-03	-1.7E-03	-1.3E-03	-1.9E-03	-7.3E-03	-1.6E-03	-1.5E-03	480.0E-06
Sigma	-	1.4E-03	1.4E-03	1.3E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.6E-03	1.4E-03

Measurements

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-119.2E-03	-119.2E-03	-118.7E-03	-119.7E-03	-121.5E-03	-119.6E-03	-119.2E-03	-118.7E-03	-118.8E-03	-123.8E-03	-118.8E-03	-118.6E-03	-118.9E-03
ON_TID samples													
8	-115.8E-03	-118.6E-03	-119.8E-03	-124.9E-03	-124.3E-03	-122.9E-03	-123.1E-03	-122.8E-03	-123.0E-03	-128.7E-03	-123.8E-03	-122.8E-03	-120.8E-03
9	-116.1E-03	-118.9E-03	-121.6E-03	-126.8E-03	-126.0E-03	-124.6E-03	-124.7E-03	-124.4E-03	-124.6E-03	-130.2E-03	-125.2E-03	-124.6E-03	-121.8E-03
10	-113.8E-03	-117.1E-03	-118.4E-03	-124.1E-03	-122.9E-03	-121.6E-03	-121.6E-03	-121.3E-03	-121.4E-03	-127.4E-03	-122.2E-03	-121.6E-03	-119.9E-03
Statistics													
Min	-116.1E-03	-118.9E-03	-121.6E-03	-126.8E-03	-126.0E-03	-124.6E-03	-124.7E-03	-124.4E-03	-124.6E-03	-130.2E-03	-125.2E-03	-124.6E-03	-121.8E-03
Max	-113.8E-03	-117.1E-03	-118.4E-03	-124.1E-03	-122.9E-03	-121.6E-03	-121.6E-03	-121.3E-03	-121.4E-03	-127.4E-03	-122.2E-03	-121.6E-03	-119.9E-03
Average	-115.2E-03	-118.2E-03	-119.9E-03	-125.2E-03	-124.4E-03	-123.0E-03	-123.1E-03	-122.9E-03	-123.0E-03	-128.8E-03	-123.7E-03	-123.0E-03	-120.8E-03
Sigma	989.2E-06	779.3E-06	1.3E-03	1.1E-03	1.3E-03	1.2E-03	1.3E-03	1.3E-03	1.3E-03	1.1E-03	1.3E-03	1.2E-03	767.6E-06

Drift Calculation

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-2.9E-03	-4.0E-03	-9.1E-03	-8.6E-03	-7.2E-03	-7.3E-03	-7.1E-03	-7.3E-03	-13.0E-03	-8.0E-03	-7.1E-03	-5.1E-03
9	-	-2.8E-03	-5.6E-03	-10.7E-03	-9.9E-03	-8.5E-03	-8.6E-03	-8.4E-03	-8.6E-03	-14.1E-03	-9.2E-03	-8.5E-03	-5.7E-03
10	-	-3.3E-03	-4.5E-03	-10.2E-03	-9.1E-03	-7.8E-03	-7.8E-03	-7.5E-03	-7.6E-03	-13.6E-03	-8.3E-03	-7.7E-03	-6.0E-03
Average	-	-3.0E-03	-4.7E-03	-10.0E-03	-9.2E-03	-7.8E-03	-7.9E-03	-7.6E-03	-7.8E-03	-13.5E-03	-8.5E-03	-7.8E-03	-5.6E-03
Sigma	-	210.0E-06	634.4E-06	656.7E-06	560.3E-06	539.6E-06	545.5E-06	534.7E-06	543.9E-06	457.6E-06	475.9E-06	589.1E-06	396.0E-06

Measurements

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-119.2E-03	-119.2E-03	-118.7E-03	-119.7E-03	-121.5E-03	-119.6E-03	-119.2E-03	-118.7E-03	-118.8E-03	-123.8E-03	-118.8E-03	-118.6E-03	-118.9E-03
OFF_PROTON samples													
5	-120.8E-03	-123.2E-03	-123.8E-03	-124.2E-03	-129.5E-03	-129.0E-03	-129.2E-03	-129.4E-03	-130.0E-03	-135.7E-03	-131.0E-03	-130.7E-03	-127.0E-03
6	-120.9E-03	-126.2E-03	-127.5E-03	-124.6E-03	-132.9E-03	-132.6E-03	-132.9E-03	-133.0E-03	-133.7E-03	-139.2E-03	-134.5E-03	-134.2E-03	-131.2E-03
7	-120.3E-03	-124.3E-03	-126.3E-03	-123.4E-03	-133.4E-03	-133.1E-03	-133.4E-03	-133.0E-03	-133.8E-03	-140.0E-03	-134.6E-03	-134.4E-03	-129.7E-03
Statistics													
Min	-120.9E-03	-126.2E-03	-127.5E-03	-124.6E-03	-133.4E-03	-133.1E-03	-133.4E-03	-133.0E-03	-133.8E-03	-140.0E-03	-134.6E-03	-134.4E-03	-131.2E-03
Max	-120.3E-03	-123.2E-03	-123.8E-03	-123.4E-03	-129.5E-03	-129.0E-03	-129.2E-03	-129.4E-03	-130.0E-03	-135.7E-03	-131.0E-03	-130.7E-03	-127.0E-03
Average	-120.7E-03	-124.6E-03	-125.9E-03	-124.1E-03	-131.9E-03	-131.6E-03	-131.8E-03	-131.8E-03	-132.5E-03	-138.3E-03	-133.4E-03	-133.1E-03	-129.3E-03
Sigma	273.9E-06	1.3E-03	1.6E-03	495.7E-06	1.7E-03	1.8E-03	1.9E-03	1.7E-03	1.8E-03	1.9E-03	1.7E-03	1.7E-03	1.7E-03

Drift Calculation

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	-2.3E-03	-2.9E-03	-3.3E-03	-8.6E-03	-8.2E-03	-8.4E-03	-8.6E-03	-9.2E-03	-14.9E-03	-10.1E-03	-9.8E-03	-6.2E-03
6	-	-5.4E-03	-6.6E-03	-3.7E-03	-12.0E-03	-11.7E-03	-12.0E-03	-12.1E-03	-12.8E-03	-18.3E-03	-13.6E-03	-13.4E-03	-10.3E-03
7	-	-4.0E-03	-6.0E-03	-3.1E-03	-13.1E-03	-12.8E-03	-13.1E-03	-12.8E-03	-13.5E-03	-19.8E-03	-14.3E-03	-14.1E-03	-9.4E-03
Average	-	-3.9E-03	-5.2E-03	-3.4E-03	-11.2E-03	-10.9E-03	-11.2E-03	-11.1E-03	-11.8E-03	-17.7E-03	-12.7E-03	-12.4E-03	-8.6E-03
Sigma	-	1.2E-03	1.6E-03	249.4E-06	1.9E-03	2.0E-03	2.0E-03	1.8E-03	1.9E-03	2.0E-03	1.8E-03	1.9E-03	1.8E-03

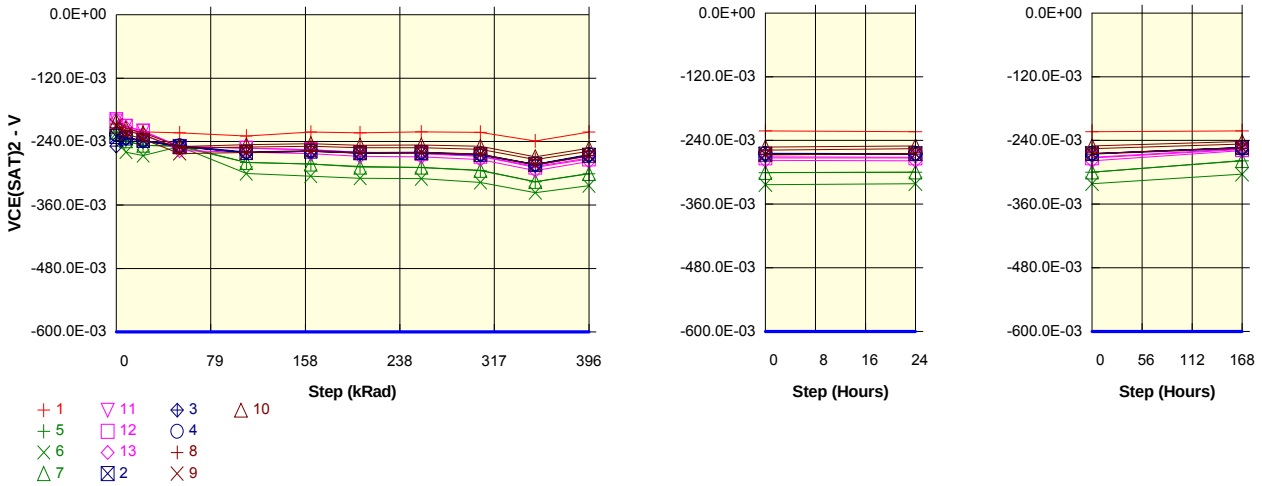
Measurements

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-119.2E-03	-119.2E-03	-118.7E-03	-119.7E-03	-121.5E-03	-119.6E-03	-119.2E-03	-118.7E-03	-118.8E-03	-123.8E-03	-118.8E-03	-118.6E-03	-118.9E-03
OFF_TID samples													
11	-113.1E-03	-115.1E-03	-117.0E-03	-122.6E-03	-123.2E-03	-123.0E-03	-123.4E-03	-123.5E-03	-124.2E-03	-130.1E-03	-124.7E-03	-124.8E-03	-122.5E-03
12	-113.5E-03	-115.5E-03	-116.7E-03	-122.1E-03	-122.6E-03	-122.4E-03	-122.8E-03	-122.9E-03	-123.8E-03	-129.8E-03	-124.8E-03	-124.3E-03	-122.3E-03
13	-113.9E-03	-116.7E-03	-119.2E-03	-125.2E-03	-125.6E-03	-125.0E-03	-125.7E-03	-125.7E-03	-126.4E-03	-132.7E-03	-126.9E-03	-127.0E-03	-123.8E-03
Statistics													
Min	-113.9E-03	-116.7E-03	-119.2E-03	-125.2E-03	-125.6E-03	-125.0E-03	-125.7E-03	-125.7E-03	-126.4E-03	-132.7E-03	-126.9E-03	-127.0E-03	-123.8E-03
Max	-113.1E-03	-115.1E-03	-116.7E-03	-122.1E-03	-122.6E-03	-122.4E-03	-122.8E-03	-122.9E-03	-123.8E-03	-129.8E-03	-124.7E-03	-124.3E-03	-122.3E-03
Average	-113.5E-03	-115.7E-03	-117.6E-03	-123.3E-03	-123.8E-03	-123.5E-03	-124.0E-03	-124.0E-03	-124.8E-03	-130.9E-03	-125.5E-03	-125.4E-03	-122.9E-03
Sigma	327.1E-06	679.9E-06	1.1E-03	1.3E-03	1.3E-03	1.1E-03	1.3E-03	1.2E-03	1.2E-03	1.3E-03	1.0E-03	1.2E-03	636.9E-06

Drift Calculation

VCE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-2.0E-03	-3.9E-03	-9.5E-03	-10.1E-03	-9.9E-03	-10.2E-03	-10.4E-03	-11.0E-03	-17.0E-03	-11.6E-03	-11.6E-03	-9.4E-03
12	-	-2.0E-03	-3.2E-03	-8.6E-03	-9.2E-03	-8.9E-03	-9.3E-03	-9.4E-03	-10.3E-03	-16.3E-03	-11.3E-03	-10.8E-03	-8.8E-03
13	-	-2.8E-03	-5.3E-03	-11.3E-03	-11.6E-03	-11.1E-03	-11.8E-03	-11.8E-03	-12.5E-03	-18.8E-03	-13.0E-03	-13.1E-03	-9.8E-03
Average	-	-2.2E-03	-4.1E-03	-9.8E-03	-10.3E-03	-10.0E-03	-10.5E-03	-10.5E-03	-11.3E-03	-17.3E-03	-12.0E-03	-11.9E-03	-9.4E-03
Sigma	-	368.1E-06	865.9E-06	1.1E-03	1.0E-03	916.2E-06	1.0E-03	984.3E-06	930.1E-06	1.0E-03	734.9E-06	959.1E-06	409.2E-06

Parameter : Collector-Emitter saturation voltage : VCE(SAT)2
Test conditions : Ic = -50mA ; Ib = -5mA
Unit : V
Spec Limit Min : -600.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-222.4E-03	-222.7E-03	-221.6E-03	-223.3E-03	-229.8E-03	-222.2E-03	-223.3E-03	-221.7E-03	-222.3E-03	-238.8E-03	-221.9E-03	-223.3E-03	-222.0E-03
ON_PROTON samples													
2	-230.4E-03	-233.5E-03	-237.9E-03	-249.6E-03	-260.8E-03	-258.0E-03	-261.5E-03	-260.6E-03	-264.6E-03	-283.0E-03	-265.6E-03	-264.9E-03	-253.6E-03
3	-248.6E-03	-234.4E-03	-239.4E-03	-249.6E-03	-261.4E-03	-258.3E-03	-262.0E-03	-261.3E-03	-265.2E-03	-284.5E-03	-266.4E-03	-265.7E-03	-255.1E-03
4	-226.7E-03	-232.4E-03	-237.6E-03	-247.6E-03	-259.6E-03	-257.4E-03	-260.4E-03	-260.1E-03	-263.6E-03	-283.2E-03	-264.5E-03	-264.8E-03	-253.0E-03
Statistics													
Min	-248.6E-03	-234.4E-03	-239.4E-03	-249.6E-03	-261.4E-03	-258.3E-03	-262.0E-03	-261.3E-03	-265.2E-03	-284.5E-03	-266.4E-03	-265.7E-03	-255.1E-03
Max	-226.7E-03	-232.4E-03	-237.6E-03	-247.6E-03	-259.6E-03	-257.4E-03	-260.4E-03	-260.1E-03	-263.6E-03	-283.0E-03	-264.5E-03	-264.8E-03	-253.0E-03
Average	-235.2E-03	-233.4E-03	-238.3E-03	-248.9E-03	-260.6E-03	-257.9E-03	-261.3E-03	-260.7E-03	-264.5E-03	-283.5E-03	-265.5E-03	-265.1E-03	-253.9E-03
Sigma	9.6E-03	850.0E-06	796.2E-06	952.4E-06	748.3E-06	389.6E-06	662.9E-06	474.4E-06	690.0E-06	663.2E-06	774.5E-06	420.0E-06	887.9E-06

Drift Calculation

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-3.1E-03	-7.6E-03	-19.3E-03	-30.4E-03	-27.7E-03	-31.1E-03	-30.3E-03	-34.2E-03	-52.6E-03	-35.3E-03	-34.6E-03	-23.2E-03
3	-	14.2E-03	9.2E-03	-1000.0E-06	-12.8E-03	-9.7E-03	-13.4E-03	-12.7E-03	-16.6E-03	-35.9E-03	-17.8E-03	-17.1E-03	-6.5E-03
4	-	-5.7E-03	-10.9E-03	-20.9E-03	-32.9E-03	-30.7E-03	-33.8E-03	-33.4E-03	-36.9E-03	-56.5E-03	-37.8E-03	-38.1E-03	-26.3E-03
Average	-	1.8E-03	-3.1E-03	-13.7E-03	-25.3E-03	-22.7E-03	-26.1E-03	-25.5E-03	-29.2E-03	-48.3E-03	-30.3E-03	-29.9E-03	-18.7E-03
Sigma	-	8.8E-03	8.8E-03	9.0E-03	9.0E-03	9.3E-03	9.0E-03	9.1E-03	9.0E-03	8.9E-03	8.9E-03	9.2E-03	8.7E-03

Measurements

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-222.4E-03	-222.7E-03	-221.6E-03	-223.3E-03	-229.8E-03	-222.2E-03	-223.3E-03	-221.7E-03	-222.3E-03	-238.8E-03	-221.9E-03	-223.3E-03	-222.0E-03
ON_TID samples													
8	-207.0E-03	-219.7E-03	-227.7E-03	-252.7E-03	-250.7E-03	-249.2E-03	-251.6E-03	-251.8E-03	-254.6E-03	-273.8E-03	-258.4E-03	-255.6E-03	-246.8E-03
9	-209.0E-03	-225.7E-03	-235.5E-03	-262.5E-03	-260.8E-03	-258.4E-03	-261.2E-03	-260.7E-03	-263.8E-03	-284.0E-03	-267.1E-03	-264.9E-03	-254.2E-03
10	-201.5E-03	-215.0E-03	-223.5E-03	-249.4E-03	-246.0E-03	-243.8E-03	-246.8E-03	-246.3E-03	-249.0E-03	-268.6E-03	-252.6E-03	-250.3E-03	-241.6E-03
Statistics													
Min	-209.0E-03	-225.7E-03	-235.5E-03	-262.5E-03	-260.8E-03	-258.4E-03	-261.2E-03	-260.7E-03	-263.8E-03	-284.0E-03	-267.1E-03	-264.9E-03	-254.2E-03
Max	-201.5E-03	-215.0E-03	-223.5E-03	-249.4E-03	-246.0E-03	-243.8E-03	-246.8E-03	-246.3E-03	-249.0E-03	-268.6E-03	-252.6E-03	-250.3E-03	-241.6E-03
Average	-205.8E-03	-220.1E-03	-228.9E-03	-254.9E-03	-252.5E-03	-250.5E-03	-253.2E-03	-252.9E-03	-255.8E-03	-275.5E-03	-259.3E-03	-256.9E-03	-247.5E-03
Sigma	3.2E-03	4.4E-03	5.0E-03	5.6E-03	6.2E-03	6.0E-03	6.0E-03	5.9E-03	6.1E-03	6.4E-03	6.0E-03	6.0E-03	5.1E-03

Drift Calculation

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-12.7E-03	-20.7E-03	-45.8E-03	-43.7E-03	-42.2E-03	-44.7E-03	-44.8E-03	-47.6E-03	-66.9E-03	-51.4E-03	-48.6E-03	-39.9E-03
9	-	-16.7E-03	-26.5E-03	-53.6E-03	-51.8E-03	-49.4E-03	-52.2E-03	-51.7E-03	-54.9E-03	-75.0E-03	-58.1E-03	-55.9E-03	-45.2E-03
10	-	-13.5E-03	-22.0E-03	-47.9E-03	-44.6E-03	-42.3E-03	-45.3E-03	-44.8E-03	-47.5E-03	-67.2E-03	-51.1E-03	-48.8E-03	-40.2E-03
Average	-	-14.3E-03	-23.1E-03	-49.1E-03	-46.7E-03	-44.7E-03	-47.4E-03	-47.1E-03	-50.0E-03	-69.7E-03	-53.5E-03	-51.1E-03	-41.7E-03
Sigma	-	1.7E-03	2.5E-03	3.3E-03	3.6E-03	3.4E-03	3.4E-03	3.3E-03	3.4E-03	3.8E-03	3.2E-03	3.4E-03	2.4E-03

Measurements

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-222.4E-03	-222.7E-03	-221.6E-03	-223.3E-03	-229.8E-03	-222.2E-03	-223.3E-03	-221.7E-03	-222.3E-03	-238.8E-03	-221.9E-03	-223.3E-03	-222.0E-03
OFF_PROTON samples													
5	-224.6E-03	-239.9E-03	-247.0E-03	-249.6E-03	-279.6E-03	-282.4E-03	-287.1E-03	-289.2E-03	-294.6E-03	-315.9E-03	-300.7E-03	-299.8E-03	-278.4E-03
6	-224.1E-03	-260.0E-03	-266.4E-03	-249.6E-03	-300.4E-03	-305.3E-03	-309.3E-03	-309.9E-03	-317.1E-03	-336.6E-03	-323.2E-03	-321.6E-03	-303.7E-03
7	-221.6E-03	-238.3E-03	-247.3E-03	-247.6E-03	-279.6E-03	-282.7E-03	-288.1E-03	-288.5E-03	-294.2E-03	-315.4E-03	-300.6E-03	-299.6E-03	-278.0E-03
Statistics													
Min	-224.6E-03	-260.0E-03	-266.4E-03	-249.6E-03	-300.4E-03	-305.3E-03	-309.3E-03	-309.9E-03	-317.1E-03	-336.6E-03	-323.2E-03	-321.6E-03	-303.7E-03
Max	-221.6E-03	-238.3E-03	-247.0E-03	-247.6E-03	-279.6E-03	-282.4E-03	-287.1E-03	-288.5E-03	-294.2E-03	-315.4E-03	-300.6E-03	-299.6E-03	-278.0E-03
Average	-223.4E-03	-246.1E-03	-253.6E-03	-248.9E-03	-286.6E-03	-290.1E-03	-294.8E-03	-295.9E-03	-302.0E-03	-322.7E-03	-308.1E-03	-307.0E-03	-286.7E-03
Sigma	1.3E-03	9.9E-03	9.1E-03	952.4E-06	9.8E-03	10.7E-03	10.2E-03	9.9E-03	10.7E-03	9.9E-03	10.6E-03	10.3E-03	12.0E-03

Drift Calculation

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	-15.4E-03	-22.5E-03	-25.1E-03	-55.1E-03	-57.8E-03	-62.6E-03	-64.6E-03	-70.0E-03	-91.4E-03	-76.1E-03	-75.2E-03	-53.8E-03
6	-	-35.9E-03	-42.4E-03	-25.5E-03	-76.3E-03	-81.2E-03	-85.2E-03	-85.8E-03	-93.0E-03	-112.6E-03	-99.1E-03	-97.5E-03	-79.6E-03
7	-	-16.7E-03	-25.7E-03	-26.0E-03	-58.0E-03	-61.1E-03	-66.5E-03	-66.9E-03	-72.6E-03	-93.8E-03	-79.0E-03	-78.0E-03	-56.4E-03
Average	-	-22.7E-03	-30.2E-03	-25.5E-03	-63.1E-03	-66.7E-03	-71.4E-03	-72.5E-03	-78.6E-03	-99.3E-03	-84.7E-03	-83.6E-03	-63.3E-03
Sigma	-	9.4E-03	8.7E-03	375.7E-06	9.4E-03	10.3E-03	9.9E-03	9.5E-03	10.3E-03	9.5E-03	10.2E-03	9.9E-03	11.6E-03

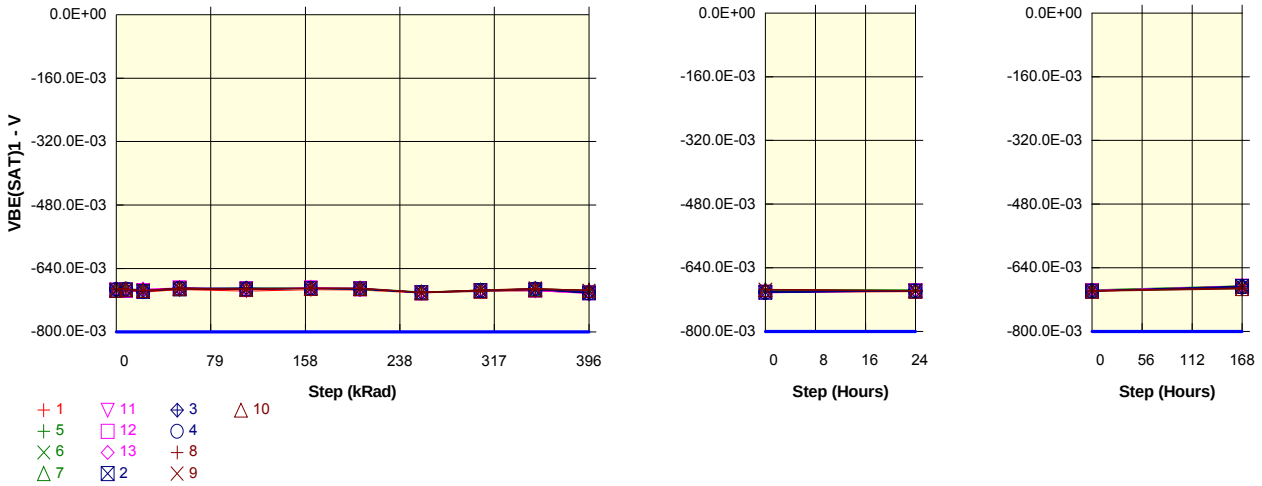
Measurements

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-222.4E-03	-222.7E-03	-221.6E-03	-223.3E-03	-229.8E-03	-222.2E-03	-223.3E-03	-221.7E-03	-222.3E-03	-238.8E-03	-221.9E-03	-223.3E-03	-222.0E-03
OFF_TID samples													
11	-198.7E-03	-210.6E-03	-220.1E-03	-249.7E-03	-252.7E-03	-255.4E-03	-260.4E-03	-262.0E-03	-267.3E-03	-287.2E-03	-270.9E-03	-272.0E-03	-255.4E-03
12	-201.2E-03	-211.7E-03	-220.2E-03	-249.0E-03	-252.4E-03	-255.2E-03	-260.6E-03	-262.5E-03	-267.8E-03	-288.5E-03	-272.8E-03	-273.0E-03	-257.4E-03
13	-199.0E-03	-213.4E-03	-225.8E-03	-257.3E-03	-260.2E-03	-262.8E-03	-267.7E-03	-268.7E-03	-274.0E-03	-294.9E-03	-277.7E-03	-278.3E-03	-259.4E-03
Statistics													
Min	-201.2E-03	-213.4E-03	-225.8E-03	-257.3E-03	-260.2E-03	-262.8E-03	-267.7E-03	-268.7E-03	-274.0E-03	-294.9E-03	-277.7E-03	-278.3E-03	-259.4E-03
Max	-198.7E-03	-210.6E-03	-220.1E-03	-249.0E-03	-252.4E-03	-255.2E-03	-260.4E-03	-262.0E-03	-267.3E-03	-287.2E-03	-270.9E-03	-272.0E-03	-255.4E-03
Average	-199.6E-03	-211.9E-03	-222.0E-03	-252.0E-03	-255.1E-03	-257.8E-03	-262.9E-03	-264.4E-03	-269.7E-03	-290.2E-03	-273.8E-03	-274.4E-03	-257.4E-03
Sigma	1.1E-03	1.2E-03	2.7E-03	3.8E-03	3.6E-03	3.5E-03	3.4E-03	3.0E-03	3.1E-03	3.4E-03	2.9E-03	2.8E-03	1.6E-03

Drift Calculation

VCE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	-11.9E-03	-21.4E-03	-51.0E-03	-54.0E-03	-56.7E-03	-61.7E-03	-63.3E-03	-68.6E-03	-88.4E-03	-72.2E-03	-73.2E-03	-56.7E-03
12	-	-10.5E-03	-19.0E-03	-47.9E-03	-51.2E-03	-54.0E-03	-59.4E-03	-61.4E-03	-66.7E-03	-87.4E-03	-71.6E-03	-71.8E-03	-56.2E-03
13	-	-14.4E-03	-26.8E-03	-58.3E-03	-61.2E-03	-63.8E-03	-68.7E-03	-69.7E-03	-75.0E-03	-95.9E-03	-78.7E-03	-79.3E-03	-60.4E-03
Average	-	-12.3E-03	-22.4E-03	-52.4E-03	-55.5E-03	-58.2E-03	-63.3E-03	-64.8E-03	-70.1E-03	-90.6E-03	-74.2E-03	-74.8E-03	-57.8E-03
Sigma	-	1.6E-03	3.3E-03	4.4E-03	4.2E-03	4.1E-03	3.9E-03	3.6E-03	3.6E-03	3.8E-03	3.2E-03	3.2E-03	1.9E-03

Parameter : Base-Emitter saturation voltage : VBE(SAT)1
Test conditions : Ic = -10mA ; Ib = -1mA
Unit : V
Spec Limit Min : -800.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-695.0E-03	-696.4E-03	-700.1E-03	-693.2E-03	-697.0E-03	-693.9E-03	-694.1E-03	-701.6E-03	-696.7E-03	-696.2E-03	-701.7E-03	-699.9E-03	-685.6E-03
ON_PROTON samples													
2	-695.5E-03	-694.0E-03	-697.8E-03	-691.7E-03	-692.0E-03	-690.5E-03	-691.4E-03	-701.1E-03	-695.4E-03	-693.7E-03	-701.4E-03	-698.7E-03	-686.7E-03
3	-693.7E-03	-693.0E-03	-695.6E-03	-689.6E-03	-689.2E-03	-691.2E-03	-691.2E-03	-700.6E-03	-695.1E-03	-691.7E-03	-700.6E-03	-698.2E-03	-687.3E-03
4	-692.7E-03	-692.5E-03	-697.3E-03	-690.2E-03	-692.3E-03	-690.5E-03	-691.9E-03	-701.3E-03	-695.7E-03	-692.1E-03	-702.3E-03	-698.4E-03	-689.1E-03
Statistics													
Min	-695.5E-03	-694.0E-03	-697.8E-03	-691.7E-03	-692.3E-03	-691.2E-03	-691.9E-03	-701.3E-03	-695.7E-03	-693.7E-03	-702.3E-03	-698.7E-03	-689.1E-03
Max	-692.7E-03	-692.5E-03	-695.6E-03	-689.6E-03	-689.2E-03	-690.5E-03	-691.2E-03	-700.6E-03	-695.1E-03	-691.7E-03	-700.6E-03	-698.2E-03	-686.7E-03
Average	-694.0E-03	-693.2E-03	-696.9E-03	-690.5E-03	-691.2E-03	-690.8E-03	-691.5E-03	-701.0E-03	-695.4E-03	-692.5E-03	-701.4E-03	-698.4E-03	-687.7E-03
Sigma	1.2E-03	610.1E-06	932.0E-06	905.9E-06	1.4E-03	339.4E-06	285.3E-06	267.3E-06	229.4E-06	882.6E-06	685.8E-06	212.5E-06	1.0E-03

Drift Calculation

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	1.6E-03	-2.2E-03	3.8E-03	3.5E-03	5.0E-03	4.1E-03	-5.6E-03	160.0E-06	1.8E-03	-5.9E-03	-3.2E-03	8.8E-03
3	-	680.0E-06	-1.9E-03	4.2E-03	4.6E-03	2.5E-03	2.5E-03	-6.9E-03	-1.4E-03	2.0E-03	-6.9E-03	-4.4E-03	6.4E-03
4	-	240.0E-06	-4.6E-03	2.5E-03	440.0E-06	2.2E-03	840.0E-06	-8.6E-03	-3.0E-03	640.0E-06	-9.6E-03	-5.7E-03	3.6E-03
Average	-	826.6E-06	-2.9E-03	3.5E-03	2.8E-03	3.2E-03	2.5E-03	-7.0E-03	-1.4E-03	1.5E-03	-7.5E-03	-4.4E-03	6.3E-03
Sigma	-	548.8E-06	1.2E-03	703.7E-06	1.7E-03	1.3E-03	1.3E-03	1.2E-03	1.3E-03	611.3E-06	1.5E-03	1.0E-03	2.1E-03

Measurements

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-695.0E-03	-696.4E-03	-700.1E-03	-693.2E-03	-697.0E-03	-693.9E-03	-694.1E-03	-701.6E-03	-696.7E-03	-696.2E-03	-701.7E-03	-699.9E-03	-685.6E-03
ON_TID samples													
8	-691.0E-03	-692.7E-03	-695.6E-03	-694.0E-03	-691.6E-03	-690.2E-03	-690.3E-03	-700.1E-03	-694.6E-03	-691.7E-03	-694.2E-03	-698.0E-03	-691.3E-03
9	-692.9E-03	-693.9E-03	-695.9E-03	-690.0E-03	-692.3E-03	-689.5E-03	-690.2E-03	-700.4E-03	-694.6E-03	-690.3E-03	-696.0E-03	-698.0E-03	-690.8E-03
10	-695.2E-03	-692.2E-03	-695.7E-03	-689.5E-03	-692.5E-03	-690.5E-03	-690.6E-03	-701.2E-03	-698.0E-03	-693.6E-03	-695.4E-03	-699.0E-03	-692.7E-03
Statistics													
Min	-695.2E-03	-693.9E-03	-695.9E-03	-694.0E-03	-692.5E-03	-690.5E-03	-690.6E-03	-701.2E-03	-698.0E-03	-693.6E-03	-696.0E-03	-699.0E-03	-692.7E-03
Max	-691.0E-03	-692.2E-03	-695.6E-03	-689.5E-03	-691.6E-03	-689.5E-03	-690.2E-03	-700.1E-03	-694.6E-03	-690.3E-03	-694.2E-03	-698.0E-03	-690.8E-03
Average	-693.1E-03	-692.9E-03	-695.7E-03	-691.1E-03	-692.1E-03	-690.1E-03	-690.3E-03	-700.5E-03	-695.8E-03	-691.9E-03	-695.2E-03	-698.3E-03	-691.6E-03
Sigma	1.7E-03	738.3E-06	130.6E-06	2.0E-03	401.4E-06	434.9E-06	167.6E-06	457.6E-06	1.6E-03	1.3E-03	742.1E-06	453.7E-06	802.9E-06

Drift Calculation

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-1.7E-03	-4.6E-03	-3.0E-03	-560.0E-06	800.0E-06	720.0E-06	-9.1E-03	-3.6E-03	-720.0E-06	-3.2E-03	-7.0E-03	-280.0E-06
9	-	-1000.0E-06	-3.0E-03	3.0E-03	600.0E-06	3.4E-03	2.8E-03	-7.4E-03	-1.7E-03	2.6E-03	-3.1E-03	-5.0E-03	2.1E-03
10	-	3.1E-03	-480.0E-06	5.8E-03	2.8E-03	4.7E-03	4.7E-03	-5.9E-03	-2.8E-03	1.7E-03	-120.0E-06	-3.7E-03	2.5E-03
Average	-	133.3E-06	-2.7E-03	1.9E-03	933.3E-06	3.0E-03	2.7E-03	-7.5E-03	-2.7E-03	1.2E-03	-2.2E-03	-5.3E-03	1.4E-03
Sigma	-	2.1E-03	1.7E-03	3.6E-03	1.4E-03	1.6E-03	1.6E-03	1.3E-03	770.4E-06	1.4E-03	1.4E-03	1.4E-03	1.2E-03

Measurements

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-695.0E-03	-696.4E-03	-700.1E-03	-693.2E-03	-697.0E-03	-693.9E-03	-694.1E-03	-701.6E-03	-696.7E-03	-696.2E-03	-701.7E-03	-699.9E-03	-685.6E-03
OFF_PROTON samples													
5	-693.2E-03	-690.9E-03	-693.9E-03	-691.7E-03	-689.3E-03	-688.8E-03	-692.8E-03	-700.6E-03	-696.9E-03	-693.4E-03	-697.0E-03	-698.3E-03	-692.6E-03
6	-693.3E-03	-694.1E-03	-695.1E-03	-689.6E-03	-692.9E-03	-690.1E-03	-692.2E-03	-700.8E-03	-695.6E-03	-695.4E-03	-696.2E-03	-697.1E-03	-686.3E-03
7	-692.9E-03	-694.2E-03	-695.0E-03	-690.2E-03	-691.9E-03	-688.4E-03	-690.0E-03	-699.2E-03	-695.0E-03	-691.0E-03	-694.7E-03	-695.9E-03	-685.5E-03
Statistics													
Min	-693.3E-03	-694.2E-03	-695.1E-03	-691.7E-03	-692.9E-03	-690.1E-03	-692.8E-03	-700.8E-03	-696.9E-03	-695.4E-03	-697.0E-03	-698.3E-03	-692.6E-03
Max	-692.9E-03	-690.9E-03	-693.9E-03	-689.6E-03	-689.3E-03	-688.4E-03	-690.0E-03	-699.2E-03	-695.0E-03	-691.0E-03	-694.7E-03	-695.9E-03	-685.5E-03
Average	-693.1E-03	-693.1E-03	-694.7E-03	-690.5E-03	-691.4E-03	-689.1E-03	-691.6E-03	-700.2E-03	-695.8E-03	-693.3E-03	-696.0E-03	-697.1E-03	-688.1E-03
Sigma	191.4E-06	1.5E-03	537.6E-06	905.9E-06	1.5E-03	734.9E-06	1.2E-03	674.3E-06	820.0E-06	1.8E-03	956.3E-06	963.5E-06	3.2E-03

Drift Calculation

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	2.3E-03	-680.0E-06	1.5E-03	3.9E-03	4.4E-03	480.0E-06	-7.3E-03	-3.7E-03	-200.0E-06	-3.8E-03	-5.0E-03	640.0E-06
6	-	-800.0E-06	-1.8E-03	3.8E-03	440.0E-06	3.2E-03	1.2E-03	-7.4E-03	-2.2E-03	-2.1E-03	-2.8E-03	-3.8E-03	7.0E-03
7	-	-1.4E-03	-2.2E-03	2.7E-03	1000.0E-06	4.5E-03	2.9E-03	-6.4E-03	-2.1E-03	1.8E-03	-1.8E-03	-3.0E-03	7.4E-03
Average	-	53.3E-06	-1.5E-03	2.7E-03	1.8E-03	4.0E-03	1.5E-03	-7.0E-03	-2.7E-03	-160.0E-06	-2.8E-03	-3.9E-03	5.0E-03
Sigma	-	1.6E-03	625.1E-06	914.7E-06	1.5E-03	594.2E-06	1.0E-03	483.3E-06	719.5E-06	1.6E-03	800.2E-06	827.1E-06	3.1E-03

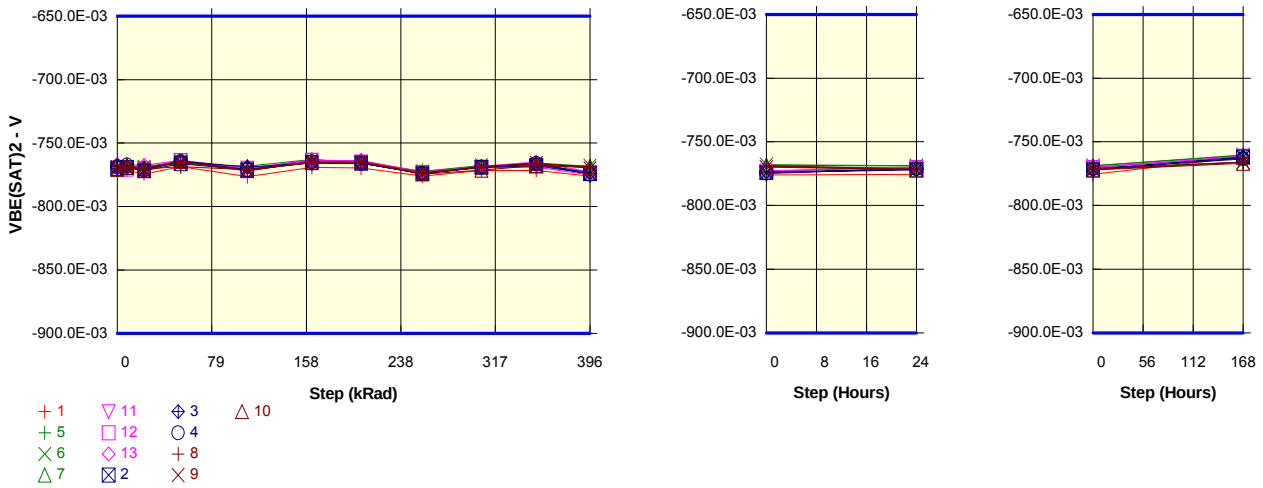
Measurements

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-695.0E-03	-696.4E-03	-700.1E-03	-693.2E-03	-697.0E-03	-693.9E-03	-694.1E-03	-701.6E-03	-696.7E-03	-696.2E-03	-701.7E-03	-699.9E-03	-685.6E-03
OFF_TID samples													
11	-694.5E-03	-694.4E-03	-695.4E-03	-688.8E-03	-691.0E-03	-688.8E-03	-691.1E-03	-700.5E-03	-696.5E-03	-695.6E-03	-703.4E-03	-697.6E-03	-686.3E-03
12	-694.6E-03	-695.8E-03	-697.1E-03	-689.6E-03	-693.3E-03	-689.6E-03	-691.8E-03	-701.1E-03	-696.2E-03	-694.5E-03	-701.0E-03	-697.8E-03	-687.2E-03
13	-691.2E-03	-694.6E-03	-692.4E-03	-689.2E-03	-693.9E-03	-689.7E-03	-689.9E-03	-700.5E-03	-695.6E-03	-691.0E-03	-700.8E-03	-697.2E-03	-688.2E-03
Statistics													
Min	-694.6E-03	-695.8E-03	-697.1E-03	-689.6E-03	-693.9E-03	-689.7E-03	-691.8E-03	-701.1E-03	-696.5E-03	-695.6E-03	-703.4E-03	-697.8E-03	-688.2E-03
Max	-691.2E-03	-694.4E-03	-692.4E-03	-688.8E-03	-691.0E-03	-688.8E-03	-689.9E-03	-700.5E-03	-695.6E-03	-691.0E-03	-700.8E-03	-697.2E-03	-686.3E-03
Average	-693.4E-03	-694.9E-03	-695.0E-03	-689.2E-03	-692.7E-03	-689.4E-03	-690.9E-03	-700.7E-03	-696.1E-03	-693.7E-03	-701.7E-03	-697.5E-03	-687.2E-03
Sigma	1.6E-03	641.9E-06	2.0E-03	328.8E-06	1.2E-03	401.3E-06	777.2E-06	273.9E-06	399.1E-06	1.9E-03	1.2E-03	264.0E-06	751.4E-06

Drift Calculation

VBE(SAT)1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	120.0E-06	-960.0E-06	5.6E-03	3.4E-03	5.7E-03	3.4E-03	-6.0E-03	-2.0E-03	-1.1E-03	-9.0E-03	-3.1E-03	8.2E-03
12	-	-1.2E-03	-2.5E-03	5.0E-03	1.3E-03	5.0E-03	2.8E-03	-6.5E-03	-1.6E-03	120.0E-06	-6.4E-03	-3.2E-03	7.4E-03
13	-	-3.4E-03	-1.2E-03	2.0E-03	-2.7E-03	1.5E-03	1.3E-03	-9.3E-03	-4.4E-03	160.0E-06	-9.6E-03	-6.0E-03	3.0E-03
Average	-	-1.5E-03	-1.6E-03	4.2E-03	680.0E-06	4.1E-03	2.5E-03	-7.3E-03	-2.7E-03	-280.0E-06	-8.3E-03	-4.1E-03	6.2E-03
Sigma	-	1.5E-03	685.9E-06	1.6E-03	2.5E-03	1.8E-03	878.8E-06	1.5E-03	1.2E-03	594.2E-06	1.4E-03	1.3E-03	2.3E-03

Parameter : Base-Emitter saturation voltage : VBE(SAT)2
Test conditions : Ic = -50mA ; Ib = -5mA
Unit : V
Spec Limit Min : -900.0E-03
Spec Limit Max : -650.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-770.1E-03	-771.2E-03	-774.4E-03	-768.6E-03	-776.5E-03	-769.2E-03	-769.7E-03	-776.0E-03	-771.6E-03	-771.5E-03	-776.0E-03	-775.5E-03	-762.1E-03
ON_PROTON samples													
2	-770.0E-03	-769.4E-03	-771.8E-03	-766.2E-03	-771.2E-03	-765.4E-03	-765.9E-03	-774.2E-03	-769.1E-03	-768.0E-03	-774.1E-03	-772.0E-03	-762.0E-03
3	-768.3E-03	-768.4E-03	-770.1E-03	-764.4E-03	-768.8E-03	-765.8E-03	-765.7E-03	-774.1E-03	-768.9E-03	-766.3E-03	-773.6E-03	-771.6E-03	-762.4E-03
4	-768.6E-03	-767.3E-03	-771.1E-03	-764.4E-03	-770.9E-03	-764.8E-03	-765.9E-03	-774.0E-03	-768.9E-03	-766.1E-03	-774.5E-03	-771.2E-03	-763.4E-03
Statistics													
Min	-770.0E-03	-769.4E-03	-771.8E-03	-766.2E-03	-771.2E-03	-765.8E-03	-765.9E-03	-774.2E-03	-769.1E-03	-768.0E-03	-774.5E-03	-772.0E-03	-763.4E-03
Max	-768.3E-03	-767.3E-03	-770.1E-03	-764.4E-03	-768.8E-03	-764.8E-03	-765.7E-03	-774.0E-03	-768.9E-03	-766.1E-03	-773.6E-03	-771.2E-03	-762.0E-03
Average	-768.9E-03	-768.4E-03	-771.0E-03	-765.0E-03	-770.3E-03	-765.3E-03	-765.8E-03	-774.1E-03	-769.0E-03	-766.8E-03	-774.1E-03	-771.6E-03	-762.6E-03
Sigma	723.2E-06	834.2E-06	705.3E-06	848.5E-06	1.1E-03	425.0E-06	75.4E-06	82.2E-06	105.0E-06	861.8E-06	359.8E-06	310.4E-06	575.4E-06

Drift Calculation

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	600.0E-06	-1.8E-03	3.7E-03	-1.2E-03	4.6E-03	4.1E-03	-4.2E-03	840.0E-06	2.0E-03	-4.1E-03	-2.0E-03	7.9E-03
3	-	-120.0E-06	-1.8E-03	3.9E-03	-440.0E-06	2.5E-03	2.6E-03	-5.8E-03	-600.0E-06	2.0E-03	-5.3E-03	-3.3E-03	5.9E-03
4	-	1.2E-03	-2.5E-03	4.1E-03	-2.3E-03	3.8E-03	2.7E-03	-5.4E-03	-320.0E-06	2.5E-03	-5.9E-03	-2.6E-03	5.2E-03
Average	-	573.3E-06	-2.0E-03	3.9E-03	-1.3E-03	3.6E-03	3.1E-03	-5.1E-03	-26.7E-06	2.2E-03	-5.1E-03	-2.6E-03	6.3E-03
Sigma	-	555.5E-06	341.0E-06	164.4E-06	772.2E-06	871.7E-06	679.6E-06	666.9E-06	623.4E-06	228.6E-06	745.0E-06	522.5E-06	1.2E-03

Measurements

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-770.1E-03	-771.2E-03	-774.4E-03	-768.6E-03	-776.5E-03	-769.2E-03	-769.7E-03	-776.0E-03	-771.6E-03	-771.5E-03	-776.0E-03	-775.5E-03	-762.1E-03
ON_TID samples													
8	-767.4E-03	-768.5E-03	-770.6E-03	-768.5E-03	-771.0E-03	-765.4E-03	-765.0E-03	-773.7E-03	-768.6E-03	-766.5E-03	-768.6E-03	-771.6E-03	-766.1E-03
9	-769.2E-03	-769.7E-03	-770.8E-03	-765.2E-03	-771.8E-03	-764.7E-03	-765.3E-03	-774.1E-03	-768.9E-03	-765.5E-03	-769.9E-03	-771.7E-03	-765.9E-03
10	-770.8E-03	-767.7E-03	-770.4E-03	-764.4E-03	-771.6E-03	-765.1E-03	-765.2E-03	-774.4E-03	-771.4E-03	-767.8E-03	-769.2E-03	-772.2E-03	-767.0E-03
Statistics													
Min	-770.8E-03	-769.7E-03	-770.8E-03	-768.5E-03	-771.8E-03	-765.4E-03	-765.3E-03	-774.4E-03	-771.4E-03	-767.8E-03	-769.9E-03	-772.2E-03	-767.0E-03
Max	-767.4E-03	-767.7E-03	-770.4E-03	-764.4E-03	-771.0E-03	-764.7E-03	-765.0E-03	-773.7E-03	-768.6E-03	-765.5E-03	-768.6E-03	-771.6E-03	-765.9E-03
Average	-769.1E-03	-768.6E-03	-770.6E-03	-766.0E-03	-771.5E-03	-765.1E-03	-765.2E-03	-774.1E-03	-769.6E-03	-766.6E-03	-769.2E-03	-771.8E-03	-766.3E-03
Sigma	1.4E-03	839.3E-06	196.9E-06	1.8E-03	353.3E-06	264.0E-06	98.0E-06	294.5E-06	1.3E-03	916.2E-06	540.9E-06	296.3E-06	469.1E-06

Drift Calculation

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-1.1E-03	-3.2E-03	-1.1E-03	-3.6E-03	2.0E-03	2.3E-03	-6.4E-03	-1.2E-03	839.9E-06	-1.2E-03	-4.2E-03	1.3E-03
9	-	-520.0E-06	-1.6E-03	4.0E-03	-2.6E-03	4.5E-03	3.9E-03	-4.9E-03	320.0E-06	3.7E-03	-720.0E-06	-2.5E-03	3.3E-03
10	-	3.1E-03	440.0E-06	6.4E-03	-800.0E-06	5.7E-03	5.6E-03	-3.6E-03	-640.0E-06	3.0E-03	1.6E-03	-1.4E-03	3.8E-03
Average	-	493.3E-06	-1.5E-03	3.1E-03	-2.4E-03	4.1E-03	4.0E-03	-5.0E-03	-506.7E-06	2.5E-03	-106.7E-06	-2.7E-03	2.8E-03
Sigma	-	1.9E-03	1.5E-03	3.1E-03	1.2E-03	1.5E-03	1.4E-03	1.1E-03	627.7E-06	1.2E-03	1.3E-03	1.1E-03	1.1E-03

Measurements

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-770.1E-03	-771.2E-03	-774.4E-03	-768.6E-03	-776.5E-03	-769.2E-03	-769.7E-03	-776.0E-03	-771.6E-03	-771.5E-03	-776.0E-03	-775.5E-03	-762.1E-03
OFF_PROTON samples													
5	-768.4E-03	-766.2E-03	-768.3E-03	-766.2E-03	-768.2E-03	-762.9E-03	-765.9E-03	-772.8E-03	-769.2E-03	-766.7E-03	-769.4E-03	-770.4E-03	-766.0E-03
6	-768.9E-03	-768.7E-03	-768.7E-03	-764.4E-03	-770.4E-03	-763.4E-03	-764.9E-03	-772.4E-03	-767.6E-03	-767.9E-03	-767.9E-03	-768.7E-03	-760.3E-03
7	-768.1E-03	-769.3E-03	-769.9E-03	-764.4E-03	-771.2E-03	-763.4E-03	-764.4E-03	-772.4E-03	-768.4E-03	-765.6E-03	-768.3E-03	-769.0E-03	-760.7E-03
Statistics													
Min	-768.9E-03	-769.3E-03	-769.9E-03	-766.2E-03	-771.2E-03	-763.4E-03	-765.9E-03	-772.8E-03	-769.2E-03	-767.9E-03	-769.4E-03	-770.4E-03	-766.0E-03
Max	-768.1E-03	-766.2E-03	-768.3E-03	-764.4E-03	-768.2E-03	-762.9E-03	-764.4E-03	-772.4E-03	-767.6E-03	-765.6E-03	-767.9E-03	-768.7E-03	-760.3E-03
Average	-768.5E-03	-768.1E-03	-769.0E-03	-765.0E-03	-769.9E-03	-763.2E-03	-765.1E-03	-772.5E-03	-768.4E-03	-766.7E-03	-768.5E-03	-769.4E-03	-762.3E-03
Sigma	311.6E-06	1.3E-03	674.9E-06	848.5E-06	1.3E-03	226.3E-06	630.8E-06	226.3E-06	685.9E-06	930.9E-06	648.5E-06	746.9E-06	2.6E-03

Drift Calculation

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	2.2E-03	160.0E-06	2.2E-03	240.0E-06	5.6E-03	2.5E-03	-4.4E-03	-800.0E-06	1.7E-03	-1000.0E-06	-2.0E-03	2.5E-03
6	-	200.0E-06	160.0E-06	4.4E-03	-1.6E-03	5.5E-03	4.0E-03	-3.5E-03	1.3E-03	1000.0E-06	960.0E-06	160.0E-06	8.6E-03
7	-	-1.2E-03	-1.8E-03	3.7E-03	-3.0E-03	4.8E-03	3.7E-03	-4.2E-03	-280.0E-06	2.5E-03	-160.0E-06	-920.0E-06	7.4E-03
Average	-	413.3E-06	-480.0E-06	3.4E-03	-1.5E-03	5.3E-03	3.4E-03	-4.0E-03	80.0E-06	1.7E-03	-66.7E-06	-920.0E-06	6.1E-03
Sigma	-	1.4E-03	905.1E-06	930.1E-06	1.3E-03	368.1E-06	629.9E-06	401.3E-06	902.2E-06	620.8E-06	802.9E-06	881.8E-06	2.6E-03

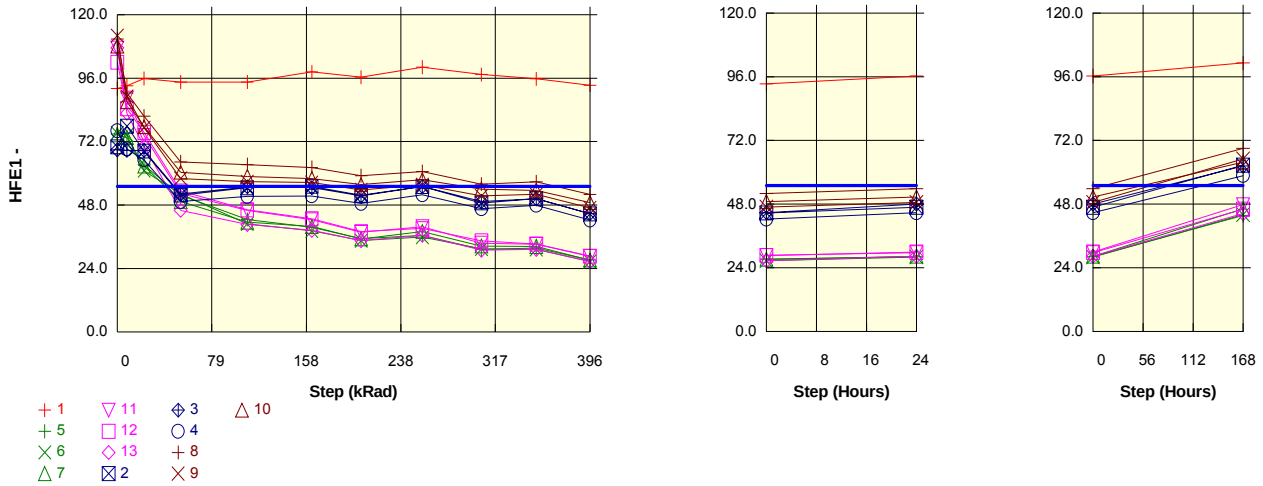
Measurements

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	-770.1E-03	-771.2E-03	-774.4E-03	-768.6E-03	-776.5E-03	-769.2E-03	-769.7E-03	-776.0E-03	-771.6E-03	-771.5E-03	-776.0E-03	-775.5E-03	-762.1E-03
OFF_TID samples													
11	-769.8E-03	-769.8E-03	-770.0E-03	-763.6E-03	-769.9E-03	-763.4E-03	-764.9E-03	-773.2E-03	-769.5E-03	-769.0E-03	-775.2E-03	-770.2E-03	-761.3E-03
12	-769.9E-03	-770.6E-03	-771.1E-03	-764.0E-03	-771.8E-03	-763.6E-03	-765.2E-03	-773.4E-03	-768.9E-03	-767.7E-03	-773.0E-03	-770.2E-03	-761.5E-03
13	-767.0E-03	-769.6E-03	-767.6E-03	-763.6E-03	-772.3E-03	-763.9E-03	-763.7E-03	-773.0E-03	-768.3E-03	-764.9E-03	-772.9E-03	-769.9E-03	-762.4E-03
Statistics													
Min	-769.9E-03	-770.6E-03	-771.1E-03	-764.0E-03	-772.3E-03	-763.9E-03	-765.2E-03	-773.4E-03	-769.5E-03	-769.0E-03	-775.2E-03	-770.2E-03	-762.4E-03
Max	-767.0E-03	-769.6E-03	-767.6E-03	-763.6E-03	-769.9E-03	-763.4E-03	-763.7E-03	-773.0E-03	-768.3E-03	-764.9E-03	-772.9E-03	-769.9E-03	-761.3E-03
Average	-768.9E-03	-770.0E-03	-769.6E-03	-763.7E-03	-771.3E-03	-763.6E-03	-764.6E-03	-773.2E-03	-768.9E-03	-767.2E-03	-773.7E-03	-770.1E-03	-761.7E-03
Sigma	1.4E-03	420.0E-06	1.5E-03	179.9E-06	1.0E-03	228.6E-06	654.3E-06	164.4E-06	489.9E-06	1.7E-03	1.1E-03	154.4E-06	450.6E-06

Drift Calculation

VBE(SAT)2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	80.0E-06	-160.0E-06	6.3E-03	-40.0E-06	6.5E-03	4.9E-03	-3.4E-03	320.0E-06	880.0E-06	-5.4E-03	-400.0E-06	8.5E-03
12	-	-640.0E-06	-1.2E-03	6.0E-03	-1.8E-03	6.3E-03	4.7E-03	-3.5E-03	1000.0E-06	2.2E-03	-3.0E-03	-240.0E-06	8.4E-03
13	-	-2.6E-03	-600.0E-06	3.4E-03	-5.3E-03	3.0E-03	3.2E-03	-6.0E-03	-1.4E-03	2.0E-03	-5.9E-03	-2.9E-03	4.6E-03
Average	-	-1.1E-03	-653.3E-06	5.2E-03	-2.4E-03	5.3E-03	4.3E-03	-4.3E-03	-13.3E-06	1.7E-03	-4.8E-03	-1.2E-03	7.2E-03
Sigma	-	1.2E-03	426.3E-06	1.3E-03	2.2E-03	1.6E-03	741.9E-06	1.2E-03	991.9E-06	588.2E-06	1.2E-03	1.2E-03	1.8E-03

Parameter : Forward-current transfer ratio : HFE1
Test conditions : Ic = -100µA ; Vce = -10V
Unit :
Spec Limit Min : 55.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	92.0	93.1	95.9	94.5	94.5	98.4	96.4	100.2	97.4	95.7	93.3	96.3	101.2
ON_PROTON samples													
2	70.0	77.8	68.4	51.7	54.5	55.1	51.6	55.0	48.8	50.5	44.6	46.8	62.7
3	68.8	68.7	68.6	52.2	54.9	54.6	51.5	55.0	49.3	50.4	44.8	48.0	62.4
4	76.1	69.2	65.1	49.3	51.3	51.4	48.6	51.9	46.6	47.9	42.3	44.8	58.8
Statistics													
Min	68.8	68.7	65.1	49.3	51.3	51.4	48.6	51.9	46.6	47.9	42.3	44.8	58.8
Max	76.1	77.8	68.6	52.2	54.9	55.1	51.6	55.0	49.3	50.5	44.8	48.0	62.7
Average	71.7	71.9	67.4	51.1	53.6	53.7	50.6	54.0	48.2	49.6	43.9	46.5	61.3
Sigma	3.2	4.2	1.6	1.3	1.6	1.6	1.4	1.5	1.2	1.2	1.1	1.3	1.8

Drift Calculation

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-1.4E-03	335.0E-06	5.1E-03	4.1E-03	3.9E-03	5.1E-03	3.9E-03	6.2E-03	5.5E-03	8.1E-03	7.1E-03	1.7E-03
3	-	28.8E-06	47.3E-06	4.6E-03	3.7E-03	3.8E-03	4.9E-03	3.7E-03	5.7E-03	5.3E-03	7.8E-03	6.3E-03	1.5E-03
4	-	1.3E-03	2.2E-03	7.1E-03	6.4E-03	6.3E-03	7.4E-03	6.1E-03	8.3E-03	7.7E-03	10.5E-03	9.2E-03	3.9E-03
Average	-	-32.1E-06	870.2E-06	5.6E-03	4.7E-03	4.7E-03	5.8E-03	4.6E-03	6.8E-03	6.2E-03	8.8E-03	7.5E-03	2.4E-03
Sigma	-	1.1E-03	967.4E-06	1.1E-03	1.2E-03	1.2E-03	1.2E-03	1.1E-03	1.1E-03	1.1E-03	1.2E-03	1.2E-03	1.1E-03

Measurements

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	92.0	93.1	95.9	94.5	94.5	98.4	96.4	100.2	97.4	95.7	93.3	96.3	101.2
ON_TID samples													
8	110.9	90.3	81.6	64.3	63.3	62.2	59.1	60.6	55.9	56.7	52.0	53.8	68.9
9	112.1	89.1	77.3	58.0	56.8	56.5	53.7	55.7	51.4	52.1	46.9	48.7	65.0
10	108.1	87.1	77.6	60.4	58.8	58.0	55.7	57.6	54.0	53.5	48.9	50.7	63.8
Statistics													
Min	108.1	87.1	77.3	58.0	56.8	56.5	53.7	55.7	51.4	52.1	46.9	48.7	63.8
Max	112.1	90.3	81.6	64.3	63.3	62.2	59.1	60.6	55.9	56.7	52.0	53.8	68.9
Average	110.4	88.9	78.8	60.9	59.7	58.9	56.2	58.0	53.8	54.1	49.3	51.1	65.9
Sigma	1.7	1.3	2.0	2.6	2.7	2.4	2.2	2.0	1.8	2.0	2.1	2.1	2.2

Drift Calculation

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	2.1E-03	3.2E-03	6.5E-03	6.8E-03	7.1E-03	7.9E-03	7.5E-03	8.9E-03	8.6E-03	10.2E-03	9.6E-03	5.5E-03
9	-	2.3E-03	4.0E-03	8.3E-03	8.7E-03	8.8E-03	9.7E-03	9.0E-03	10.5E-03	10.3E-03	12.4E-03	11.6E-03	6.5E-03
10	-	2.2E-03	3.6E-03	7.3E-03	7.7E-03	8.0E-03	8.7E-03	8.1E-03	9.3E-03	9.4E-03	11.2E-03	10.5E-03	6.4E-03
Average	-	2.2E-03	3.6E-03	7.4E-03	7.7E-03	7.9E-03	8.8E-03	8.2E-03	9.6E-03	9.4E-03	11.3E-03	10.6E-03	6.1E-03
Sigma	-	105.0E-06	323.5E-06	728.7E-06	770.5E-06	699.9E-06	738.7E-06	639.7E-06	705.3E-06	687.9E-06	894.5E-06	847.9E-06	452.3E-06

Measurements

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	92.0	93.1	95.9	94.5	94.5	98.4	96.4	100.2	97.4	95.7	93.3	96.3	101.2
OFF_PROTON samples													
5	74.9	71.2	63.1	51.7	42.6	39.6	35.2	36.6	31.2	31.7	27.2	28.1	43.8
6	75.2	74.5	61.0	52.2	40.8	38.2	34.5	35.9	31.4	31.2	26.6	28.0	44.0
7	74.6	73.6	62.8	49.3	41.5	39.8	35.2	38.0	32.5	32.3	27.2	28.3	46.1
Statistics													
Min	74.6	71.2	61.0	49.3	40.8	38.2	34.5	35.9	31.2	31.2	26.6	28.0	43.8
Max	75.2	74.5	63.1	52.2	42.6	39.8	35.2	38.0	32.5	32.3	27.2	28.3	46.1
Average	74.9	73.1	62.3	51.1	41.6	39.2	35.0	36.8	31.7	31.7	27.0	28.2	44.7
Sigma	0.3	1.4	0.9	1.3	0.7	0.7	0.3	0.9	0.5	0.5	0.3	0.1	1.1

Drift Calculation

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	690.3E-06	2.5E-03	6.0E-03	10.1E-03	11.9E-03	15.0E-03	14.0E-03	18.7E-03	18.2E-03	23.4E-03	22.2E-03	9.5E-03
6	-	136.1E-06	3.1E-03	5.9E-03	11.2E-03	12.9E-03	15.7E-03	14.6E-03	18.6E-03	18.8E-03	24.2E-03	22.4E-03	9.4E-03
7	-	184.3E-06	2.5E-03	6.9E-03	10.7E-03	11.7E-03	15.0E-03	12.9E-03	17.4E-03	17.5E-03	23.4E-03	21.9E-03	8.3E-03
Average	-	336.9E-06	2.7E-03	6.2E-03	10.7E-03	12.2E-03	15.2E-03	13.8E-03	18.2E-03	18.2E-03	23.7E-03	22.2E-03	9.1E-03
Sigma	-	250.7E-06	282.8E-06	449.9E-06	429.7E-06	517.1E-06	304.4E-06	691.8E-06	575.6E-06	504.1E-06	394.9E-06	181.2E-06	560.8E-06

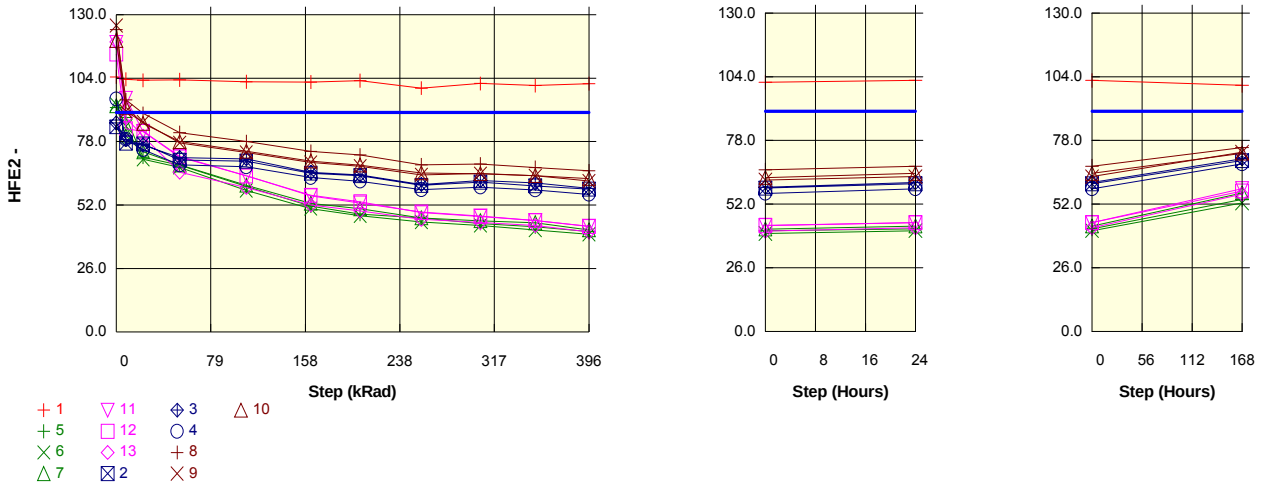
Measurements

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	92.0	93.1	95.9	94.5	94.5	98.4	96.4	100.2	97.4	95.7	93.3	96.3	101.2
OFF_TID samples													
11	107.4	88.5	74.3	52.4	46.0	42.4	37.7	39.8	33.5	33.1	28.6	29.9	47.8
12	102.0	84.4	75.5	53.3	46.2	42.8	37.9	39.1	34.5	33.3	28.6	29.7	46.1
13	107.5	82.7	70.3	46.0	40.6	38.4	34.6	36.6	30.9	31.2	26.6	28.4	44.4
Statistics													
Min	102.0	82.7	70.3	46.0	40.6	38.4	34.6	36.6	30.9	31.2	26.6	28.4	44.4
Max	107.5	88.5	75.5	53.3	46.2	42.8	37.9	39.8	34.5	33.3	28.6	29.9	47.8
Average	105.6	85.2	73.4	50.6	44.3	41.2	36.7	38.5	33.0	32.5	27.9	29.3	46.1
Sigma	2.6	2.4	2.2	3.2	2.6	2.0	1.5	1.4	1.5	1.0	0.9	0.7	1.4

Drift Calculation

HFE1	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	2.0E-03	4.1E-03	9.8E-03	12.5E-03	14.3E-03	17.2E-03	15.8E-03	20.5E-03	20.9E-03	25.7E-03	24.2E-03	11.6E-03
12	-	2.0E-03	3.4E-03	9.0E-03	11.8E-03	13.5E-03	16.6E-03	15.8E-03	19.2E-03	20.2E-03	25.1E-03	23.8E-03	11.9E-03
13	-	2.8E-03	4.9E-03	12.4E-03	15.3E-03	16.7E-03	19.6E-03	18.1E-03	23.1E-03	22.8E-03	28.3E-03	25.9E-03	13.2E-03
Average	-	2.3E-03	4.2E-03	10.4E-03	13.2E-03	14.9E-03	17.8E-03	16.5E-03	20.9E-03	21.3E-03	26.4E-03	24.6E-03	12.2E-03
Sigma	-	364.0E-06	603.9E-06	1.5E-03	1.5E-03	1.4E-03	1.3E-03	1.1E-03	1.6E-03	1.1E-03	1.4E-03	919.2E-06	694.6E-06

Parameter : Forward-current transfer ratio : HFE2
Test conditions : Ic = -1mA ; Vce = -10V
Unit :
Spec Limit Min : 90.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	104.5	103.5	103.1	103.3	102.5	102.4	103.0	99.9	101.8	100.9	101.8	102.5	100.5
ON_PROTON samples													
2	84.1	77.4	77.0	70.4	70.0	65.1	64.0	60.0	61.4	59.9	58.5	60.3	69.7
3	85.6	78.9	76.6	71.4	70.9	65.4	64.4	60.4	62.0	61.1	58.9	60.8	70.5
4	95.5	79.0	74.7	68.4	67.6	63.2	61.8	58.3	59.3	58.2	56.4	58.2	68.4
Statistics													
Min	84.1	77.4	74.7	68.4	67.6	63.2	61.8	58.3	59.3	58.2	56.4	58.2	68.4
Max	95.5	79.0	77.0	71.4	70.9	65.4	64.4	60.4	62.0	61.1	58.9	60.8	70.5
Average	88.4	78.4	76.1	70.1	69.5	64.6	63.4	59.6	60.9	59.7	57.9	59.8	69.6
Sigma	5.0	0.7	1.0	1.3	1.4	0.9	1.2	0.9	1.1	1.2	1.1	1.1	0.9

Drift Calculation

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	1.0E-03	1.1E-03	2.3E-03	2.4E-03	3.5E-03	3.7E-03	4.8E-03	4.4E-03	4.8E-03	5.2E-03	4.7E-03	2.4E-03
3	-	1.0E-03	1.4E-03	2.3E-03	2.4E-03	3.6E-03	3.9E-03	4.9E-03	4.4E-03	4.7E-03	5.3E-03	4.8E-03	2.5E-03
4	-	2.2E-03	2.9E-03	4.1E-03	4.3E-03	5.3E-03	5.7E-03	6.7E-03	6.4E-03	6.7E-03	7.3E-03	6.7E-03	4.1E-03
Average	-	1.4E-03	1.8E-03	2.9E-03	3.0E-03	4.1E-03	4.4E-03	5.4E-03	5.1E-03	5.4E-03	5.9E-03	5.4E-03	3.0E-03
Sigma	-	554.3E-06	798.5E-06	860.0E-06	896.2E-06	845.2E-06	910.8E-06	879.6E-06	921.9E-06	923.2E-06	951.7E-06	929.7E-06	784.4E-06

Measurements

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	104.5	103.5	103.1	103.3	102.5	102.4	103.0	99.9	101.8	100.9	101.8	102.5	100.5
ON_TID samples													
8	124.0	95.1	89.6	81.7	78.0	74.0	72.5	68.5	68.8	67.4	66.0	67.5	75.1
9	125.6	90.4	86.0	77.5	73.5	69.4	67.9	64.4	64.9	64.0	61.9	63.2	73.2
10	119.5	92.1	85.5	78.0	74.1	70.0	68.4	65.2	64.9	64.1	62.9	64.6	72.8
Statistics													
Min	119.5	90.4	85.5	77.5	73.5	69.4	67.9	64.4	64.9	64.0	61.9	63.2	72.8
Max	125.6	95.1	89.6	81.7	78.0	74.0	72.5	68.5	68.8	67.4	66.0	67.5	75.1
Average	123.0	92.5	87.0	79.0	75.2	71.2	69.6	66.0	66.2	65.2	63.6	65.1	73.7
Sigma	2.6	1.9	1.8	1.9	2.0	2.0	2.1	1.8	1.8	1.6	1.7	1.8	1.0

Drift Calculation

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	2.4E-03	3.1E-03	4.2E-03	4.8E-03	5.4E-03	5.7E-03	6.5E-03	6.5E-03	6.8E-03	7.1E-03	6.7E-03	5.3E-03
9	-	3.1E-03	3.7E-03	4.9E-03	5.6E-03	6.4E-03	6.8E-03	7.6E-03	7.4E-03	7.7E-03	8.2E-03	7.9E-03	5.7E-03
10	-	2.5E-03	3.3E-03	4.5E-03	5.1E-03	5.9E-03	6.3E-03	7.0E-03	7.1E-03	7.2E-03	7.5E-03	7.1E-03	5.4E-03
Average	-	2.7E-03	3.4E-03	4.5E-03	5.2E-03	5.9E-03	6.3E-03	7.0E-03	7.0E-03	7.2E-03	7.6E-03	7.2E-03	5.4E-03
Sigma	-	294.7E-06	231.0E-06	315.3E-06	360.3E-06	403.8E-06	425.5E-06	419.6E-06	398.4E-06	361.8E-06	456.7E-06	461.3E-06	191.1E-06

Measurements

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	104.5	103.5	103.1	103.3	102.5	102.4	103.0	99.9	101.8	100.9	101.8	102.5	100.5
OFF_PROTON samples													
5	92.0	87.9	71.7	68.4	59.6	51.6	48.2	46.7	44.5	43.1	41.1	41.9	53.8
6	93.3	84.3	70.8	67.4	58.0	50.5	47.6	45.1	43.6	41.7	40.0	41.1	52.5
7	92.6	80.3	73.8	68.4	60.1	52.7	50.5	46.8	45.5	44.7	41.8	43.0	56.6
Statistics													
Min	92.0	80.3	70.8	67.4	58.0	50.5	47.6	45.1	43.6	41.7	40.0	41.1	52.5
Max	93.3	87.9	73.8	68.4	60.1	52.7	50.5	46.8	45.5	44.7	41.8	43.0	56.6
Average	92.6	84.2	72.1	68.1	59.2	51.6	48.8	46.2	44.5	43.2	41.0	42.0	54.3
Sigma	0.5	3.1	1.3	0.5	0.9	0.9	1.3	0.8	0.8	1.2	0.7	0.8	1.7

Drift Calculation

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	507.4E-06	3.1E-03	3.8E-03	5.9E-03	8.5E-03	9.9E-03	10.5E-03	11.6E-03	12.3E-03	13.5E-03	13.0E-03	7.7E-03
6	-	1.1E-03	3.4E-03	4.1E-03	6.5E-03	9.1E-03	10.3E-03	11.5E-03	12.2E-03	13.2E-03	14.3E-03	13.6E-03	8.3E-03
7	-	1.7E-03	2.8E-03	3.8E-03	5.8E-03	8.2E-03	9.0E-03	10.6E-03	11.2E-03	11.6E-03	13.1E-03	12.5E-03	6.9E-03
Average	-	1.1E-03	3.1E-03	3.9E-03	6.1E-03	8.6E-03	9.7E-03	10.9E-03	11.7E-03	12.4E-03	13.6E-03	13.0E-03	7.6E-03
Sigma	-	470.4E-06	266.4E-06	153.5E-06	310.2E-06	369.4E-06	537.2E-06	428.9E-06	422.8E-06	691.9E-06	488.9E-06	465.4E-06	596.6E-06

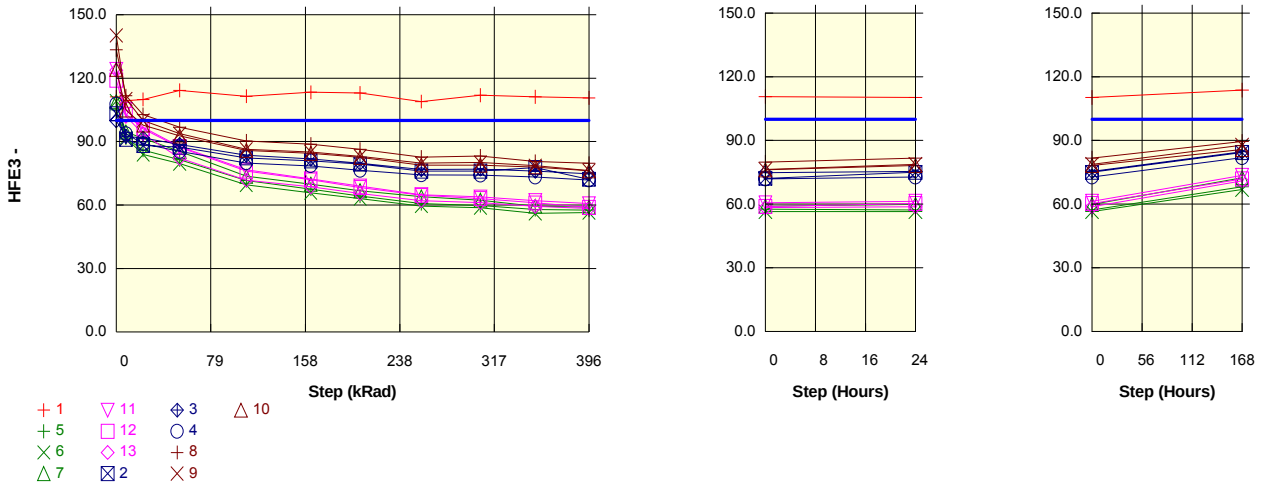
Measurements

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	104.5	103.5	103.1	103.3	102.5	102.4	103.0	99.9	101.8	100.9	101.8	102.5	100.5
OFF_TID samples													
11	118.6	95.7	82.1	71.6	64.1	55.8	52.8	49.1	47.5	45.7	43.3	44.4	58.3
12	113.8	83.2	82.2	72.0	63.9	56.0	53.3	48.9	47.3	45.6	43.2	44.4	57.4
13	118.9	87.9	80.2	65.5	59.2	52.1	49.6	46.2	44.8	43.6	41.0	42.3	56.1
Statistics													
Min	113.8	83.2	80.2	65.5	59.2	52.1	49.6	46.2	44.8	43.6	41.0	42.3	56.1
Max	118.9	95.7	82.2	72.0	64.1	56.0	53.3	49.1	47.5	45.7	43.3	44.4	58.3
Average	117.1	88.9	81.5	69.7	62.4	54.6	51.9	48.1	46.5	45.0	42.5	43.7	57.3
Sigma	2.3	5.2	0.9	3.0	2.3	1.8	1.7	1.3	1.2	0.9	1.1	1.0	0.9

Drift Calculation

HFE2	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	2.0E-03	3.7E-03	5.5E-03	7.2E-03	9.5E-03	10.5E-03	11.9E-03	12.6E-03	13.5E-03	14.6E-03	14.1E-03	8.7E-03
12	-	3.2E-03	3.4E-03	5.1E-03	6.9E-03	9.1E-03	10.0E-03	11.7E-03	12.4E-03	13.1E-03	14.4E-03	13.8E-03	8.7E-03
13	-	3.0E-03	4.1E-03	6.9E-03	8.5E-03	10.8E-03	11.8E-03	13.2E-03	13.9E-03	14.5E-03	16.0E-03	15.2E-03	9.4E-03
Average	-	2.7E-03	3.7E-03	5.8E-03	7.5E-03	9.8E-03	10.7E-03	12.3E-03	13.0E-03	13.7E-03	15.0E-03	14.4E-03	8.9E-03
Sigma	-	524.5E-06	279.7E-06	746.0E-06	699.3E-06	734.6E-06	751.1E-06	686.0E-06	676.6E-06	584.2E-06	695.8E-06	634.8E-06	350.6E-06

Parameter : Forward-current transfer ratio : HFE3
Test conditions : Ic = -10mA ; Vce = -10V
Unit :
Spec Limit Min : 100.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	111.1	109.4	110.0	114.2	111.5	113.3	113.0	108.9	111.9	111.2	110.7	110.3	113.7
ON_PROTON samples													
2	103.2	91.1	88.1	87.4	82.3	80.9	79.3	76.0	76.1	77.7	72.2	75.0	84.3
3	99.8	92.4	91.8	88.6	83.6	81.8	79.8	76.8	77.0	76.0	74.8	75.4	84.7
4	107.8	93.8	89.1	85.3	79.9	78.5	76.4	74.3	74.1	73.3	71.9	72.7	81.9
Statistics													
Min	99.8	91.1	88.1	85.3	79.9	78.5	76.4	74.3	74.1	73.3	71.9	72.7	81.9
Max	107.8	93.8	91.8	88.6	83.6	81.8	79.8	76.8	77.0	77.7	74.8	75.4	84.7
Average	103.6	92.4	89.6	87.1	81.9	80.4	78.5	75.7	75.7	75.7	72.9	74.4	83.6
Sigma	3.2	1.1	1.5	1.4	1.5	1.4	1.5	1.1	1.2	1.8	1.3	1.2	1.3

Drift Calculation

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	1.3E-03	1.7E-03	1.8E-03	2.5E-03	2.7E-03	2.9E-03	3.5E-03	3.5E-03	3.2E-03	4.2E-03	3.6E-03	2.2E-03
3	-	802.2E-06	881.7E-06	1.3E-03	1.9E-03	2.2E-03	2.5E-03	3.0E-03	3.0E-03	3.1E-03	3.4E-03	3.2E-03	1.8E-03
4	-	1.4E-03	1.9E-03	2.4E-03	3.2E-03	3.5E-03	3.8E-03	4.2E-03	4.2E-03	4.4E-03	4.6E-03	4.5E-03	2.9E-03
Average	-	1.2E-03	1.5E-03	1.8E-03	2.5E-03	2.8E-03	3.1E-03	3.5E-03	3.5E-03	3.6E-03	4.1E-03	3.8E-03	2.3E-03
Sigma	-	254.7E-06	450.5E-06	481.9E-06	527.1E-06	512.8E-06	540.3E-06	486.8E-06	511.9E-06	570.2E-06	527.4E-06	510.9E-06	475.3E-06

Measurements

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	111.1	109.4	110.0	114.2	111.5	113.3	113.0	108.9	111.9	111.2	110.7	110.3	113.7
ON_TID samples													
8	133.4	111.7	102.8	96.8	90.3	88.8	86.3	82.7	83.2	80.7	79.8	81.7	89.5
9	140.2	110.1	100.0	93.7	86.4	85.1	83.1	79.8	80.1	78.6	76.3	78.7	87.8
10	124.1	104.9	97.8	92.7	85.8	84.5	82.5	78.9	78.9	78.0	76.1	78.2	85.7
Statistics													
Min	124.1	104.9	97.8	92.7	85.8	84.5	82.5	78.9	78.9	78.0	76.1	78.2	85.7
Max	140.2	111.7	102.8	96.8	90.3	88.8	86.3	82.7	83.2	80.7	79.8	81.7	89.5
Average	132.6	108.9	100.2	94.4	87.5	86.1	84.0	80.5	80.7	79.1	77.4	79.5	87.7
Sigma	6.6	2.9	2.0	1.8	2.0	1.9	1.7	1.6	1.8	1.1	1.7	1.5	1.5

Drift Calculation

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	1.5E-03	2.2E-03	2.8E-03	3.6E-03	3.8E-03	4.1E-03	4.6E-03	4.5E-03	4.9E-03	5.0E-03	4.7E-03	3.7E-03
9	-	1.9E-03	2.9E-03	3.5E-03	4.4E-03	4.6E-03	4.9E-03	5.4E-03	5.4E-03	5.6E-03	6.0E-03	5.6E-03	4.3E-03
10	-	1.5E-03	2.2E-03	2.7E-03	3.6E-03	3.8E-03	4.1E-03	4.6E-03	4.6E-03	4.8E-03	5.1E-03	4.7E-03	3.6E-03
Average	-	1.6E-03	2.4E-03	3.0E-03	3.9E-03	4.1E-03	4.4E-03	4.9E-03	4.8E-03	5.1E-03	5.4E-03	5.0E-03	3.8E-03
Sigma	-	227.2E-06	313.4E-06	357.1E-06	403.3E-06	395.1E-06	390.5E-06	371.1E-06	370.8E-06	364.2E-06	429.4E-06	391.1E-06	292.6E-06

Measurements

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	111.1	109.4	110.0	114.2	111.5	113.3	113.0	108.9	111.9	111.2	110.7	110.3	113.7
OFF_PROTON samples													
5	105.1	91.7	86.0	81.4	71.6	67.5	64.2	60.7	59.8	57.8	57.6	57.2	68.2
6	109.1	91.6	83.9	79.6	69.6	65.8	63.0	59.6	58.7	56.0	56.4	56.4	66.8
7	108.9	94.5	91.5	85.3	73.6	69.8	66.7	63.9	62.3	59.4	59.0	59.8	72.4
Statistics													
Min	105.1	91.6	83.9	79.6	69.6	65.8	63.0	59.6	58.7	56.0	56.4	56.4	66.8
Max	109.1	94.5	91.5	85.3	73.6	69.8	66.7	63.9	62.3	59.4	59.0	59.8	72.4
Average	107.7	92.6	87.1	82.1	71.6	67.7	64.7	61.4	60.3	57.7	57.7	57.8	69.2
Sigma	1.9	1.3	3.2	2.4	1.6	1.7	1.5	1.9	1.5	1.4	1.1	1.5	2.4

Drift Calculation

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	1.4E-03	2.1E-03	2.8E-03	4.4E-03	5.3E-03	6.1E-03	7.0E-03	7.2E-03	7.8E-03	7.8E-03	8.0E-03	5.1E-03
6	-	1.7E-03	2.8E-03	3.4E-03	5.2E-03	6.0E-03	6.7E-03	7.6E-03	7.9E-03	8.7E-03	8.6E-03	8.6E-03	5.8E-03
7	-	1.4E-03	1.7E-03	2.5E-03	4.4E-03	5.1E-03	5.8E-03	6.5E-03	6.9E-03	7.7E-03	7.8E-03	7.5E-03	4.6E-03
Average	-	1.5E-03	2.2E-03	2.9E-03	4.7E-03	5.5E-03	6.2E-03	7.0E-03	7.3E-03	8.0E-03	8.1E-03	8.0E-03	5.2E-03
Sigma	-	164.6E-06	415.0E-06	359.6E-06	367.9E-06	389.4E-06	377.5E-06	476.0E-06	406.6E-06	462.3E-06	358.4E-06	424.2E-06	478.5E-06

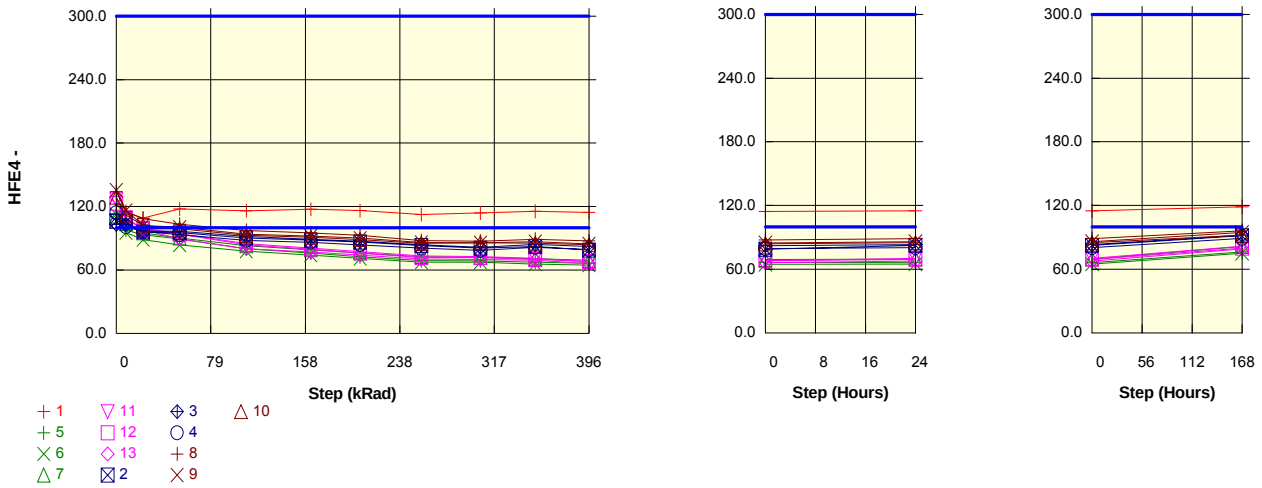
Measurements

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	111.1	109.4	110.0	114.2	111.5	113.3	113.0	108.9	111.9	111.2	110.7	110.3	113.7
OFF_TID samples													
11	124.2	105.2	96.8	87.7	76.7	72.4	69.0	64.9	63.8	62.0	60.6	61.3	73.5
12	119.1	103.0	96.0	87.2	76.0	71.9	68.3	64.5	63.1	61.0	58.9	60.3	71.8
13	123.8	102.0	93.7	82.1	71.8	68.6	65.4	62.1	61.1	59.4	58.3	58.8	71.0
Statistics													
Min	119.1	102.0	93.7	82.1	71.8	68.6	65.4	62.1	61.1	59.4	58.3	58.8	71.0
Max	124.2	105.2	96.8	87.7	76.7	72.4	69.0	64.9	63.8	62.0	60.6	61.3	73.5
Average	122.3	103.4	95.5	85.7	74.8	71.0	67.6	63.8	62.7	60.8	59.3	60.1	72.1
Sigma	2.3	1.4	1.3	2.5	2.2	1.7	1.5	1.2	1.1	1.1	1.0	1.0	1.0

Drift Calculation

HFE3	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	1.5E-03	2.3E-03	3.4E-03	5.0E-03	5.8E-03	6.4E-03	7.4E-03	7.6E-03	8.1E-03	8.4E-03	8.3E-03	5.5E-03
12	-	1.3E-03	2.0E-03	3.1E-03	4.8E-03	5.5E-03	6.3E-03	7.1E-03	7.4E-03	8.0E-03	8.6E-03	8.2E-03	5.5E-03
13	-	1.7E-03	2.6E-03	4.1E-03	5.9E-03	6.5E-03	7.2E-03	8.0E-03	8.3E-03	8.8E-03	9.1E-03	8.9E-03	6.0E-03
Average	-	1.5E-03	2.3E-03	3.5E-03	5.2E-03	5.9E-03	6.6E-03	7.5E-03	7.8E-03	8.3E-03	8.7E-03	8.5E-03	5.7E-03
Sigma	-	171.8E-06	236.4E-06	435.5E-06	473.1E-06	419.5E-06	409.5E-06	388.1E-06	356.5E-06	341.1E-06	266.6E-06	335.8E-06	219.0E-06

Parameter : Forward-current transfer ratio : HFE4
Test conditions : Ic = -50mA ; Vce = -10V
Unit :
Spec Limit Min : 100.0
Spec Limit Max : 300.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	113.5	114.1	109.0	117.7	116.1	117.4	116.1	112.4	113.9	115.4	114.4	115.1	118.8
ON_PROTON samples													
2	106.1	105.5	96.0	95.2	90.3	88.3	86.5	83.1	80.5	82.1	78.8	82.5	91.6
3	103.3	103.1	96.8	96.5	91.7	89.1	87.2	84.0	81.4	84.1	82.2	83.2	92.0
4	114.1	101.0	96.2	93.2	88.0	86.1	83.7	80.5	78.5	81.2	79.3	80.3	89.0
Statistics													
Min	103.3	101.0	96.0	93.2	88.0	86.1	83.7	80.5	78.5	81.2	78.8	80.3	89.0
Max	114.1	105.5	96.8	96.5	91.7	89.1	87.2	84.0	81.4	84.1	82.2	83.2	92.0
Average	107.8	103.2	96.4	95.0	90.0	87.8	85.8	82.5	80.2	82.5	80.1	82.0	90.8
Sigma	4.6	1.8	0.3	1.4	1.5	1.2	1.5	1.5	1.2	1.2	1.5	1.2	1.3

Drift Calculation

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	55.5E-06	987.9E-06	1.1E-03	1.7E-03	1.9E-03	2.1E-03	2.6E-03	3.0E-03	2.8E-03	3.3E-03	2.7E-03	1.5E-03
3	-	17.5E-06	642.6E-06	674.0E-06	1.2E-03	1.5E-03	1.8E-03	2.2E-03	2.6E-03	2.2E-03	2.5E-03	2.3E-03	1.2E-03
4	-	1.1E-03	1.6E-03	2.0E-03	2.6E-03	2.8E-03	3.2E-03	3.7E-03	4.0E-03	3.5E-03	3.8E-03	3.7E-03	2.5E-03
Average	-	405.0E-06	1.1E-03	1.2E-03	1.8E-03	2.1E-03	2.4E-03	2.8E-03	3.2E-03	2.8E-03	3.2E-03	2.9E-03	1.7E-03
Sigma	-	521.4E-06	408.8E-06	541.2E-06	575.2E-06	550.4E-06	594.7E-06	607.5E-06	579.0E-06	549.8E-06	559.8E-06	568.7E-06	547.3E-06

Measurements

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	113.5	114.1	109.0	117.7	116.1	117.4	116.1	112.4	113.9	115.4	114.4	115.1	118.8
ON_TID samples													
8	134.1	115.4	108.5	103.2	97.5	95.1	92.7	87.7	87.3	89.1	87.5	88.6	96.1
9	135.6	116.4	102.1	100.4	93.9	92.1	90.2	86.0	85.7	86.8	84.8	86.0	94.5
10	128.8	111.8	102.3	98.9	92.8	90.9	88.9	85.1	85.7	85.3	83.9	84.9	92.0
Statistics													
Min	128.8	111.8	102.1	98.9	92.8	90.9	88.9	85.1	85.7	85.3	83.9	84.9	92.0
Max	135.6	116.4	108.5	103.2	97.5	95.1	92.7	87.7	87.3	89.1	87.5	88.6	96.1
Average	132.8	114.5	104.3	100.8	94.7	92.7	90.6	86.3	86.3	87.1	85.4	86.5	94.2
Sigma	2.9	2.0	3.0	1.8	2.0	1.8	1.6	1.1	0.8	1.5	1.5	1.6	1.7

Drift Calculation

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	1.2E-03	1.8E-03	2.2E-03	2.8E-03	3.1E-03	3.3E-03	3.9E-03	4.0E-03	3.8E-03	4.0E-03	3.8E-03	2.9E-03
9	-	1.2E-03	2.4E-03	2.6E-03	3.3E-03	3.5E-03	3.7E-03	4.3E-03	4.3E-03	4.2E-03	4.4E-03	4.3E-03	3.2E-03
10	-	1.2E-03	2.0E-03	2.3E-03	3.0E-03	3.2E-03	3.5E-03	4.0E-03	3.9E-03	4.0E-03	4.1E-03	4.0E-03	3.1E-03
Average	-	1.2E-03	2.1E-03	2.4E-03	3.0E-03	3.3E-03	3.5E-03	4.1E-03	4.1E-03	4.0E-03	4.2E-03	4.0E-03	3.1E-03
Sigma	-	17.0E-06	275.7E-06	147.1E-06	194.5E-06	178.9E-06	159.1E-06	140.6E-06	164.4E-06	156.7E-06	186.9E-06	178.3E-06	105.8E-06

Measurements

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	113.5	114.1	109.0	117.7	116.1	117.4	116.1	112.4	113.9	115.4	114.4	115.1	118.8
OFF_PROTON samples													
5	112.4	97.6	93.2	89.2	80.0	75.9	72.5	68.8	68.6	67.3	66.3	66.1	76.2
6	112.5	95.3	88.7	83.5	77.8	74.0	70.9	67.2	67.4	65.5	64.5	64.9	74.9
7	110.9	103.8	95.0	90.2	82.7	79.0	76.0	72.5	71.8	70.6	69.0	69.5	81.3
Statistics													
Min	110.9	95.3	88.7	83.5	77.8	74.0	70.9	67.2	67.4	65.5	64.5	64.9	74.9
Max	112.5	103.8	95.0	90.2	82.7	79.0	76.0	72.5	71.8	70.6	69.0	69.5	81.3
Average	111.9	98.9	92.3	87.7	80.2	76.3	73.1	69.5	69.3	67.8	66.6	66.8	77.5
Sigma	0.7	3.6	2.7	2.9	2.0	2.0	2.1	2.2	1.9	2.1	1.9	2.0	2.8

Drift Calculation

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	1.4E-03	1.8E-03	2.3E-03	3.6E-03	4.3E-03	4.9E-03	5.6E-03	5.7E-03	6.0E-03	6.2E-03	6.2E-03	4.2E-03
6	-	1.6E-03	2.4E-03	3.1E-03	4.0E-03	4.6E-03	5.2E-03	6.0E-03	6.0E-03	6.4E-03	6.6E-03	6.5E-03	4.5E-03
7	-	621.8E-06	1.5E-03	2.1E-03	3.1E-03	3.6E-03	4.1E-03	4.8E-03	4.9E-03	5.1E-03	5.5E-03	5.4E-03	3.3E-03
Average	-	1.2E-03	1.9E-03	2.5E-03	3.5E-03	4.2E-03	4.7E-03	5.5E-03	5.5E-03	5.8E-03	6.1E-03	6.0E-03	4.0E-03
Sigma	-	417.1E-06	361.1E-06	429.4E-06	369.5E-06	403.8E-06	452.5E-06	510.0E-06	445.0E-06	507.3E-06	472.4E-06	488.7E-06	508.4E-06

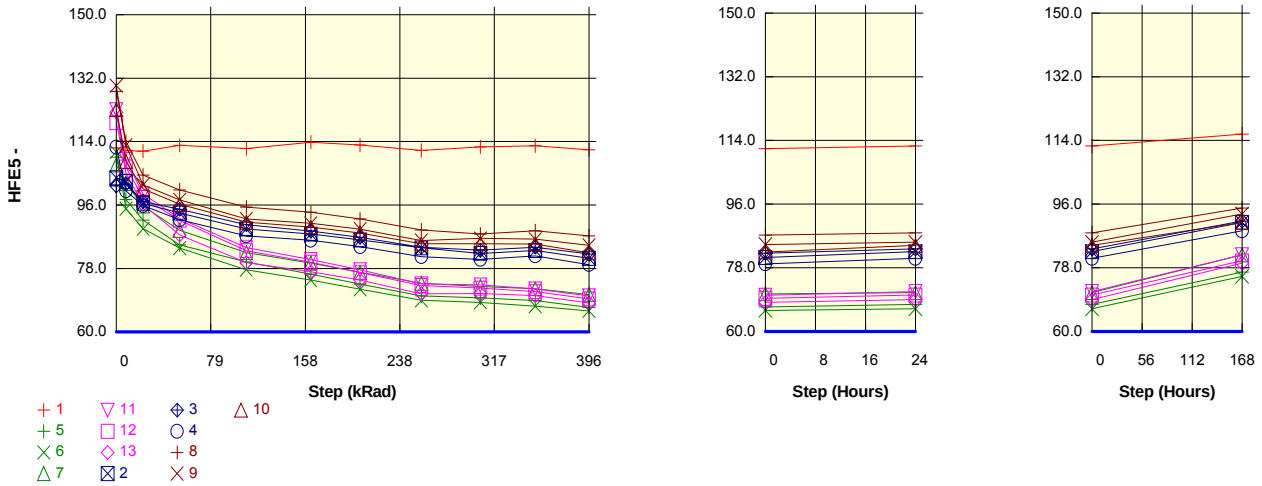
Measurements

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	113.5	114.1	109.0	117.7	116.1	117.4	116.1	112.4	113.9	115.4	114.4	115.1	118.8
OFF_TID samples													
11	126.5	107.8	99.4	94.4	84.8	80.5	77.2	73.1	72.6	70.8	68.0	70.1	81.6
12	123.1	109.5	98.4	93.8	83.9	79.7	76.1	71.7	71.8	69.9	68.0	69.2	79.8
13	128.5	108.9	98.2	89.4	80.2	76.9	74.1	70.3	70.0	69.1	66.1	67.6	79.1
Statistics													
Min	123.1	107.8	98.2	89.4	80.2	76.9	74.1	70.3	70.0	69.1	66.1	67.6	79.1
Max	128.5	109.5	99.4	94.4	84.8	80.5	77.2	73.1	72.6	70.8	68.0	70.1	81.6
Average	126.0	108.7	98.7	92.5	82.9	79.0	75.8	71.7	71.4	69.9	67.3	69.0	80.2
Sigma	2.2	0.7	0.5	2.3	2.0	1.5	1.3	1.1	1.1	0.7	0.9	1.1	1.1

Drift Calculation

HFE4	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	1.4E-03	2.2E-03	2.7E-03	3.9E-03	4.5E-03	5.0E-03	5.8E-03	5.9E-03	6.2E-03	6.8E-03	6.4E-03	4.3E-03
12	-	1.0E-03	2.0E-03	2.5E-03	3.8E-03	4.4E-03	5.0E-03	5.8E-03	5.8E-03	6.2E-03	6.6E-03	6.3E-03	4.4E-03
13	-	1.4E-03	2.4E-03	3.4E-03	4.7E-03	5.2E-03	5.7E-03	6.4E-03	6.5E-03	6.7E-03	7.4E-03	7.0E-03	4.9E-03
Average	-	1.3E-03	2.2E-03	2.9E-03	4.1E-03	4.7E-03	5.3E-03	6.0E-03	6.1E-03	6.4E-03	6.9E-03	6.6E-03	4.5E-03
Sigma	-	177.5E-06	151.9E-06	381.5E-06	401.2E-06	351.7E-06	323.3E-06	303.1E-06	310.5E-06	236.4E-06	324.2E-06	321.9E-06	226.0E-06

Parameter : Forward-current transfer ratio : HFE5
Test conditions : Ic = -150mA ; Vce = -10V
Unit :
Spec Limit Min : 60.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	112.2	111.5	111.3	112.9	112.0	113.8	113.0	111.5	112.5	112.8	111.7	112.4	115.8
ON_PROTON samples													
2	103.7	102.7	96.5	93.7	89.2	87.7	86.1	83.8	82.3	83.1	80.9	82.5	90.9
3	101.4	102.0	97.0	94.8	90.5	88.6	86.8	84.0	83.2	84.1	82.1	83.3	91.2
4	112.4	100.0	95.8	91.8	87.2	86.0	84.2	81.3	80.6	81.6	79.1	80.6	88.4
Statistics													
Min	101.4	100.0	95.8	91.8	87.2	86.0	84.2	81.3	80.6	81.6	79.1	80.6	88.4
Max	112.4	102.7	97.0	94.8	90.5	88.6	86.8	84.0	83.2	84.1	82.1	83.3	91.2
Average	105.8	101.6	96.4	93.5	89.0	87.4	85.7	83.1	82.0	82.9	80.7	82.2	90.2
Sigma	4.7	1.1	0.5	1.2	1.3	1.1	1.1	1.2	1.1	1.0	1.2	1.1	1.2

Drift Calculation

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	96.9E-06	720.1E-06	1.0E-03	1.6E-03	1.8E-03	2.0E-03	2.3E-03	2.5E-03	2.4E-03	2.7E-03	2.5E-03	1.4E-03
3	-	-55.8E-06	447.0E-06	685.0E-06	1.2E-03	1.4E-03	1.7E-03	2.0E-03	2.2E-03	2.0E-03	2.3E-03	2.1E-03	1.1E-03
4	-	1.1E-03	1.5E-03	2.0E-03	2.6E-03	2.7E-03	3.0E-03	3.4E-03	3.5E-03	3.4E-03	3.8E-03	3.5E-03	2.4E-03
Average	-	381.6E-06	901.9E-06	1.2E-03	1.8E-03	2.0E-03	2.2E-03	2.6E-03	2.7E-03	2.6E-03	2.9E-03	2.7E-03	1.6E-03
Sigma	-	514.4E-06	463.9E-06	554.9E-06	583.4E-06	556.7E-06	567.5E-06	589.8E-06	573.2E-06	560.9E-06	604.3E-06	581.6E-06	566.3E-06

Measurements

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	112.2	111.5	111.3	112.9	112.0	113.8	113.0	111.5	112.5	112.8	111.7	112.4	115.8
ON_TID samples													
8	128.3	114.1	104.5	100.3	95.4	93.9	92.0	88.9	87.8	88.7	87.2	87.8	94.8
9	129.9	113.0	101.8	97.5	92.0	90.8	89.1	85.9	86.5	86.3	84.6	85.2	93.2
10	123.1	108.4	100.6	96.2	91.1	89.7	88.1	85.0	85.0	85.0	82.5	84.3	90.9
Statistics													
Min	123.1	108.4	100.6	96.2	91.1	89.7	88.1	85.0	85.0	85.0	82.5	84.3	90.9
Max	129.9	114.1	104.5	100.3	95.4	93.9	92.0	88.9	87.8	88.7	87.2	87.8	94.8
Average	127.1	111.8	102.3	98.0	92.8	91.5	89.7	86.6	86.4	86.6	84.8	85.8	93.0
Sigma	2.9	2.5	1.6	1.7	1.8	1.8	1.7	1.7	1.1	1.5	2.0	1.5	1.6

Drift Calculation

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	969.9E-06	1.8E-03	2.2E-03	2.7E-03	2.9E-03	3.1E-03	3.4E-03	3.6E-03	3.5E-03	3.7E-03	3.6E-03	2.7E-03
9	-	1.2E-03	2.1E-03	2.6E-03	3.2E-03	3.3E-03	3.5E-03	3.9E-03	3.9E-03	3.9E-03	4.1E-03	4.0E-03	3.0E-03
10	-	1.1E-03	1.8E-03	2.3E-03	2.9E-03	3.0E-03	3.2E-03	3.6E-03	3.6E-03	3.6E-03	4.0E-03	3.7E-03	2.9E-03
Average	-	1.1E-03	1.9E-03	2.3E-03	2.9E-03	3.1E-03	3.3E-03	3.7E-03	3.7E-03	3.7E-03	3.9E-03	3.8E-03	2.9E-03
Sigma	-	76.5E-06	157.5E-06	162.8E-06	198.1E-06	191.2E-06	185.6E-06	202.7E-06	115.2E-06	168.5E-06	193.6E-06	185.4E-06	114.5E-06

Measurements

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	112.2	111.5	111.3	112.9	112.0	113.8	113.0	111.5	112.5	112.8	111.7	112.4	115.8
OFF_PROTON samples													
5	109.6	97.5	91.7	84.7	79.8	76.4	73.5	70.2	69.6	68.9	67.0	67.6	76.8
6	111.1	94.9	89.3	83.8	77.6	74.7	72.1	69.0	68.4	67.3	66.0	66.4	75.5
7	107.4	102.1	95.7	88.8	82.5	79.5	76.9	73.8	72.9	72.2	70.6	70.9	81.7
Statistics													
Min	107.4	94.9	89.3	83.8	77.6	74.7	72.1	69.0	68.4	67.3	66.0	66.4	75.5
Max	111.1	102.1	95.7	88.8	82.5	79.5	76.9	73.8	72.9	72.2	70.6	70.9	81.7
Average	109.4	98.2	92.2	85.8	80.0	76.9	74.2	71.0	70.3	69.5	67.8	68.3	78.0
Sigma	1.5	3.0	2.7	2.2	2.0	2.0	2.0	2.1	1.9	2.1	2.0	1.9	2.6

Drift Calculation

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	1.1E-03	1.8E-03	2.7E-03	3.4E-03	4.0E-03	4.5E-03	5.1E-03	5.2E-03	5.4E-03	5.8E-03	5.7E-03	3.9E-03
6	-	1.5E-03	2.2E-03	2.9E-03	3.9E-03	4.4E-03	4.9E-03	5.5E-03	5.6E-03	5.9E-03	6.2E-03	6.1E-03	4.2E-03
7	-	479.7E-06	1.1E-03	1.9E-03	2.8E-03	3.3E-03	3.7E-03	4.2E-03	4.4E-03	4.5E-03	4.8E-03	4.8E-03	2.9E-03
Average	-	1.0E-03	1.7E-03	2.5E-03	3.4E-03	3.9E-03	4.3E-03	5.0E-03	5.1E-03	5.3E-03	5.6E-03	5.5E-03	3.7E-03
Sigma	-	434.2E-06	437.3E-06	417.6E-06	436.7E-06	464.0E-06	491.4E-06	529.6E-06	503.6E-06	548.4E-06	554.3E-06	536.2E-06	552.9E-06

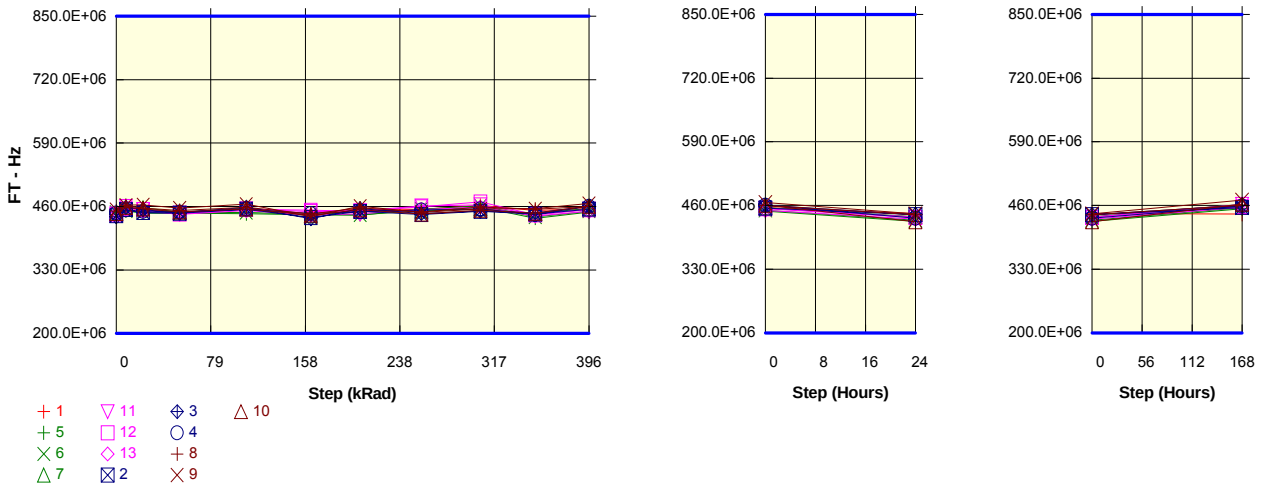
Measurements

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	112.2	111.5	111.3	112.9	112.0	113.8	113.0	111.5	112.5	112.8	111.7	112.4	115.8
OFF_TID samples													
11	123.0	108.9	99.1	92.2	83.9	80.5	77.6	73.6	73.3	72.2	70.2	71.3	81.7
12	119.3	106.8	98.1	91.7	83.1	79.8	76.8	73.2	72.4	71.4	69.4	70.3	79.9
13	122.4	105.0	96.1	87.5	79.7	77.0	74.7	70.8	70.9	70.3	68.2	68.9	79.3
Statistics													
Min	119.3	105.0	96.1	87.5	79.7	77.0	74.7	70.8	70.9	70.3	68.2	68.9	79.3
Max	123.0	108.9	99.1	92.2	83.9	80.5	77.6	73.6	73.3	72.2	70.2	71.3	81.7
Average	121.6	106.9	97.8	90.5	82.2	79.1	76.4	72.6	72.2	71.3	69.2	70.2	80.3
Sigma	1.6	1.6	1.3	2.1	1.8	1.5	1.2	1.2	1.0	0.8	0.8	1.0	1.0

Drift Calculation

HFE5	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	1.1E-03	2.0E-03	2.7E-03	3.8E-03	4.3E-03	4.8E-03	5.5E-03	5.5E-03	5.7E-03	6.1E-03	5.9E-03	4.1E-03
12	-	986.6E-06	1.8E-03	2.5E-03	3.7E-03	4.2E-03	4.6E-03	5.3E-03	5.4E-03	5.6E-03	6.0E-03	5.8E-03	4.1E-03
13	-	1.3E-03	2.2E-03	3.3E-03	4.4E-03	4.8E-03	5.2E-03	5.9E-03	5.9E-03	6.1E-03	6.5E-03	6.3E-03	4.4E-03
Average	-	1.1E-03	2.0E-03	2.8E-03	3.9E-03	4.4E-03	4.9E-03	5.6E-03	5.6E-03	5.8E-03	6.2E-03	6.0E-03	4.2E-03
Sigma	-	157.0E-06	174.9E-06	308.2E-06	312.8E-06	280.6E-06	247.1E-06	279.2E-06	225.9E-06	187.3E-06	198.1E-06	216.8E-06	151.0E-06

Parameter : Gain bandwidth product : FT
Test conditions : Ic = -30mA ; Vce = -30V
Unit : Hz
Spec Limit Min : 200.0E+06
Spec Limit Max : 850.0E+06
Spec limits are represented in bold lines on the graphic.



Measurements

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	443.9E+06	456.5E+06	453.3E+06	446.9E+06	453.2E+06	446.0E+06	455.1E+06	453.8E+06	462.5E+06	452.0E+06	455.9E+06	443.3E+06	442.4E+06
ON_PROTON samples													
2	441.1E+06	453.6E+06	447.6E+06	446.4E+06	454.8E+06	437.5E+06	449.9E+06	443.4E+06	449.9E+06	444.7E+06	454.4E+06	441.3E+06	455.9E+06
3	439.1E+06	458.2E+06	453.5E+06	447.2E+06	458.4E+06	435.2E+06	455.5E+06	445.6E+06	450.7E+06	447.0E+06	460.9E+06	441.2E+06	460.0E+06
4	447.2E+06	452.7E+06	449.8E+06	448.5E+06	454.8E+06	445.7E+06	449.7E+06	453.0E+06	455.0E+06	443.7E+06	460.6E+06	434.1E+06	458.9E+06
Statistics													
Min	439.1E+06	452.7E+06	447.6E+06	446.4E+06	454.8E+06	435.2E+06	449.7E+06	443.4E+06	449.9E+06	443.7E+06	454.4E+06	434.1E+06	455.9E+06
Max	447.2E+06	458.2E+06	453.5E+06	448.5E+06	458.4E+06	445.7E+06	455.5E+06	453.0E+06	455.0E+06	447.0E+06	460.9E+06	441.3E+06	460.0E+06
Average	442.5E+06	454.9E+06	450.3E+06	447.4E+06	456.0E+06	439.5E+06	451.7E+06	447.3E+06	451.9E+06	445.1E+06	458.6E+06	438.9E+06	458.3E+06
Sigma	3.4E+06	2.4E+06	2.4E+06	891.7E+03	1.7E+06	4.5E+06	2.7E+06	4.1E+06	2.2E+06	1.4E+06	3.0E+06	3.4E+06	1.8E+06

Drift Calculation

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	12.6E+06	6.5E+06	5.3E+06	13.7E+06	-3.5E+06	8.8E+06	2.3E+06	8.8E+06	3.7E+06	13.3E+06	245.9E+03	14.8E+06
3	-	19.1E+06	14.4E+06	8.1E+06	19.2E+06	-3.9E+06	16.4E+06	6.4E+06	11.6E+06	7.9E+06	21.7E+06	2.1E+06	20.9E+06
4	-	5.5E+06	2.6E+06	1.3E+06	7.6E+06	-1.5E+06	2.5E+06	5.8E+06	7.8E+06	-3.5E+06	13.4E+06	-13.1E+06	11.7E+06
Average	-	12.4E+06	7.8E+06	4.9E+06	13.5E+06	-3.0E+06	9.2E+06	4.9E+06	9.4E+06	2.7E+06	16.1E+06	-3.6E+06	15.8E+06
Sigma	-	5.6E+06	4.9E+06	2.8E+06	4.8E+06	1.0E+06	5.7E+06	1.8E+06	1.6E+06	4.7E+06	3.9E+06	6.8E+06	3.8E+06

Measurements

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	443.9E+06	456.5E+06	453.3E+06	446.9E+06	453.2E+06	446.0E+06	455.1E+06	453.8E+06	462.5E+06	452.0E+06	455.9E+06	443.3E+06	442.4E+06
ON_TID samples													
8	450.6E+06	461.8E+06	456.7E+06	452.1E+06	458.7E+06	444.5E+06	457.1E+06	448.2E+06	459.1E+06	454.6E+06	460.0E+06	440.9E+06	460.4E+06
9	453.7E+06	462.6E+06	463.6E+06	456.9E+06	464.8E+06	439.0E+06	460.6E+06	447.8E+06	454.9E+06	455.4E+06	466.2E+06	443.2E+06	471.1E+06
10	445.6E+06	458.2E+06	455.1E+06	449.0E+06	454.9E+06	442.1E+06	453.3E+06	444.4E+06	452.5E+06	446.3E+06	460.5E+06	427.0E+06	462.6E+06
Statistics													
Min	445.6E+06	458.2E+06	455.1E+06	449.0E+06	454.9E+06	439.0E+06	453.3E+06	444.4E+06	452.5E+06	446.3E+06	460.0E+06	427.0E+06	460.4E+06
Max	453.7E+06	462.6E+06	463.6E+06	456.9E+06	464.8E+06	444.5E+06	460.6E+06	448.2E+06	459.1E+06	455.4E+06	466.2E+06	443.2E+06	471.1E+06
Average	450.0E+06	460.9E+06	458.4E+06	452.6E+06	459.5E+06	441.9E+06	457.0E+06	446.8E+06	455.5E+06	452.1E+06	462.2E+06	437.0E+06	464.7E+06
Sigma	3.4E+06	1.9E+06	3.7E+06	3.3E+06	4.1E+06	2.2E+06	3.0E+06	1.7E+06	2.7E+06	4.1E+06	2.8E+06	7.1E+06	4.6E+06

Drift Calculation

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	11.2E+06	6.1E+06	1.5E+06	8.1E+06	-6.1E+06	6.5E+06	-2.4E+06	8.5E+06	4.0E+06	9.4E+06	-9.7E+06	9.8E+06
9	-	8.9E+06	9.8E+06	3.1E+06	11.1E+06	-14.7E+06	6.8E+06	-5.9E+06	1.2E+06	1.7E+06	12.4E+06	-10.6E+06	17.3E+06
10	-	12.7E+06	9.5E+06	3.4E+06	9.3E+06	-3.5E+06	7.8E+06	-1.1E+06	6.9E+06	718.7E+03	14.9E+06	-18.5E+06	17.1E+06
Average	-	10.9E+06	8.5E+06	2.7E+06	9.5E+06	-8.1E+06	7.0E+06	-3.1E+06	5.5E+06	2.1E+06	12.3E+06	-12.9E+06	14.7E+06
Sigma	-	1.6E+06	1.7E+06	862.7E+03	1.2E+06	4.8E+06	539.6E+03	2.0E+06	3.2E+06	1.4E+06	2.2E+06	4.0E+06	3.5E+06

Measurements

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	443.9E+06	456.5E+06	453.3E+06	446.9E+06	453.2E+06	446.0E+06	455.1E+06	453.8E+06	462.5E+06	452.0E+06	455.9E+06	443.3E+06	442.4E+06
OFF_PROTON samples													
5	447.7E+06	451.0E+06	446.5E+06	446.4E+06	445.1E+06	443.0E+06	443.2E+06	452.0E+06	459.1E+06	436.0E+06	448.5E+06	427.5E+06	453.5E+06
6	447.9E+06	451.1E+06	447.8E+06	447.2E+06	448.0E+06	443.6E+06	442.7E+06	454.5E+06	461.6E+06	438.3E+06	450.3E+06	429.6E+06	455.7E+06
7	446.7E+06	460.5E+06	457.2E+06	448.5E+06	456.8E+06	441.2E+06	451.1E+06	450.8E+06	455.3E+06	446.1E+06	455.8E+06	437.0E+06	462.2E+06
Statistics													
Min	446.7E+06	451.0E+06	446.5E+06	446.4E+06	445.1E+06	441.2E+06	442.7E+06	450.8E+06	455.3E+06	436.0E+06	448.5E+06	427.5E+06	453.5E+06
Max	447.9E+06	460.5E+06	457.2E+06	448.5E+06	456.8E+06	443.6E+06	451.1E+06	454.5E+06	461.6E+06	446.1E+06	455.8E+06	437.0E+06	462.2E+06
Average	447.4E+06	454.2E+06	450.5E+06	447.4E+06	450.0E+06	442.6E+06	445.7E+06	452.4E+06	458.7E+06	440.1E+06	451.6E+06	431.4E+06	457.2E+06
Sigma	540.6E+03	4.4E+06	4.8E+06	891.7E+03	4.9E+06	1.0E+06	3.9E+06	1.5E+06	2.6E+06	4.3E+06	3.1E+06	4.1E+06	3.7E+06

Drift Calculation

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_PROTON samples													
5	-	3.3E+06	-1.2E+06	-1.3E+06	-2.6E+06	-4.7E+06	-4.5E+06	4.2E+06	11.4E+06	-11.7E+06	835.2E+03	-20.2E+06	5.8E+06
6	-	3.2E+06	-103.1E+03	-721.4E+03	103.1E+03	-4.3E+06	-5.2E+06	6.5E+06	13.7E+06	-9.6E+06	2.4E+06	-18.3E+06	7.8E+06
7	-	13.8E+06	10.5E+06	1.9E+06	10.1E+06	-5.5E+06	4.4E+06	4.1E+06	8.6E+06	-616.7E+03	9.1E+06	-9.7E+06	15.5E+06
Average	-	6.8E+06	3.1E+06	-68.1E+03	2.5E+06	-4.8E+06	-1.8E+06	5.0E+06	11.2E+06	-7.3E+06	4.1E+06	-16.1E+06	9.7E+06
Sigma	-	5.0E+06	5.3E+06	1.4E+06	5.4E+06	502.2E+03	4.4E+06	1.1E+06	2.1E+06	4.8E+06	3.6E+06	4.6E+06	4.2E+06

Measurements

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
1_REF	443.9E+06	456.5E+06	453.3E+06	446.9E+06	453.2E+06	446.0E+06	455.1E+06	453.8E+06	462.5E+06	452.0E+06	455.9E+06	443.3E+06	442.4E+06
OFF_TID samples													
11	444.5E+06	460.2E+06	453.5E+06	447.2E+06	455.1E+06	449.7E+06	451.1E+06	461.3E+06	463.4E+06	442.9E+06	454.8E+06	436.2E+06	462.3E+06
12	443.0E+06	455.0E+06	454.4E+06	444.4E+06	454.4E+06	452.3E+06	450.1E+06	459.4E+06	469.6E+06	442.9E+06	453.5E+06	435.2E+06	457.7E+06
13	444.2E+06	453.3E+06	450.5E+06	443.9E+06	451.9E+06	442.1E+06	445.1E+06	453.6E+06	459.0E+06	440.5E+06	450.1E+06	431.8E+06	456.2E+06
Statistics													
Min	443.0E+06	453.3E+06	450.5E+06	443.9E+06	451.9E+06	442.1E+06	445.1E+06	453.6E+06	459.0E+06	440.5E+06	450.1E+06	431.8E+06	456.2E+06
Max	444.5E+06	460.2E+06	454.4E+06	447.2E+06	455.1E+06	452.3E+06	451.1E+06	461.3E+06	469.6E+06	442.9E+06	454.8E+06	436.2E+06	462.3E+06
Average	443.9E+06	456.2E+06	452.8E+06	445.2E+06	453.8E+06	448.0E+06	448.8E+06	458.1E+06	464.0E+06	442.1E+06	452.8E+06	434.4E+06	458.7E+06
Sigma	662.1E+03	2.9E+06	1.7E+06	1.4E+06	1.4E+06	4.3E+06	2.6E+06	3.3E+06	4.3E+06	1.2E+06	2.0E+06	1.9E+06	2.6E+06

Drift Calculation

FT	0 kRad	8.1 kRad	22.5 kRad	53.1 kRad	108.9 kRad	162.9 kRad	204.3 kRad	255.6 kRad	305.1 kRad	351 kRad	396 kRad	24 Hours	168 Hours
OFF_TID samples													
11	-	15.6E+06	9.0E+06	2.7E+06	10.6E+06	5.1E+06	6.6E+06	16.8E+06	18.9E+06	-1.6E+06	10.3E+06	-8.3E+06	17.8E+06
12	-	12.0E+06	11.4E+06	1.4E+06	11.4E+06	9.3E+06	7.1E+06	16.4E+06	26.6E+06	-102.0E+03	10.5E+06	-7.8E+06	14.7E+06
13	-	9.1E+06	6.3E+06	-306.7E+03	7.6E+06	-2.1E+06	921.6E+03	9.4E+06	14.8E+06	-3.8E+06	5.9E+06	-12.4E+06	12.0E+06
Average	-	12.2E+06	8.9E+06	1.3E+06	9.9E+06	4.1E+06	4.9E+06	14.2E+06	20.1E+06	-1.8E+06	8.9E+06	-9.5E+06	14.8E+06
Sigma	-	2.7E+06	2.1E+06	1.2E+06	1.6E+06	4.7E+06	2.8E+06	3.4E+06	4.9E+06	1.5E+06	2.1E+06	2.1E+06	2.4E+06

Appendix 1: Temperature measurements

SN	Temp [°C]	Iceo [A]
spec min	-	
spec max	-	
1_Ref	Room	-8.0E-09
8	110	-2.47E-6
9	110	-4.98E-6
10	110	-2.61E-6
11	110	-1.08E-6
12	110	-3.17E-6
13	110	-2.67E-6

Table 3 : Initial measurements at High temperature on TID Samples

SN	Temp [°C]	Iceo [A]
spec min	-	-
spec max	-	-
1_Ref	Room	-14.8E-09
8	110	-18.76E-6
9	110	-18.91E-6
10	110	-16.02E-6
11	110	-12.45E-6
12	110	-10.23E-6
13	110	-15.58E-6

Table 4 : Final measurements at High temperature on TID Samples