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 : 2N2920A

Package : CCP-6

Description : NPN Small Signal, double matched transistors

Manufacturer : STMicroelectronics

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/1009	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
STMicroelectronics
2N2920A
NPN Small Signal, double matched 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 STMicroelectronics 2N2920A, NPN Small Signal, double matched transistors has been performed with an accumulated dose of about 426 Krad(Si) at different dose rates of 36, 100 & 300 rad(Si)/hour, in response to Alter Technology purchase order reference ATGSP-TL-09-JC-CO-9.

An Interim report, HRX/TID/0922 Issue 01, corresponding to the irradiation up to 159 Krad(Si) 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/0226 issue 3 dated 09/21/2010.

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/0226 issue 3 dated 09/21/2010
- Alter Technology Group Proposal: ATGSP-OF-648/2009 Issue 1
- Minutes of Meeting: MM-SRP-ATG-0001 dated 29/10/2009
- Hirex internal specification: Total Ionizing dose test general procedure.
- ESCC detail specification: 5207-002

2.2 Reference Documents

- STMicroelectronics datasheet: Doc ID 15383 Rev 2, January 2010

3 Test Samples

11 samples of the 2N2920A device were tested (6 ON + 4 OFF + 1 control sample).

10 samples (including the 3 samples already submitted to protons test: see report HRX/TID/0921) have been biased according to the flow diagram given in Figure 1.

Note: Protons sample size was changed since 3 protons irradiated parts were electrically damaged during TID initial measurements due to a tester VI failure.

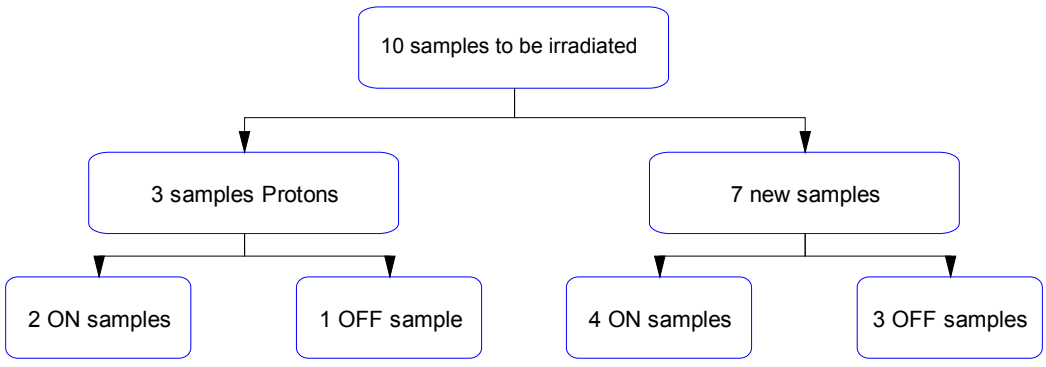


Figure 1 : Samples bias flow diagram

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 an easier plots reading.

SN attributed by Hirex	Samples Allocation	Samples Group Naming
17	Control sample	REF
2	Biased ON	ON_PROTON
3	Biased ON	ON_PROTON
8	Biased ON	ON_TID
9	Biased ON	ON_TID
10	Biased ON	ON_TID
11	Biased ON	ON_TID
12	Biased OFF	OFF_TID
13	Biased OFF	OFF_TID
14	Biased OFF	OFF_TID
16	Biased OFF	OFF_PROTON

Identification of the 2N2920A is given below:

Part Number: SOC2920A

Top Marking: none

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	11.7	36		Room
20	22.5	36		Room
50	56.7	36		Room
100	104.4	36		Room
150	159.3	100 [1]		Room
200	207	300 [1]		Room
250	245.7	300 [1]		Room
300	291.2	300 [1]		Room
350	333	300 [1]		Room
400	426.6	300 [1]		Room
			24	Room
			168	100

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 the last step has 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. 4 other samples were biased OFF with all pins connected to ground.

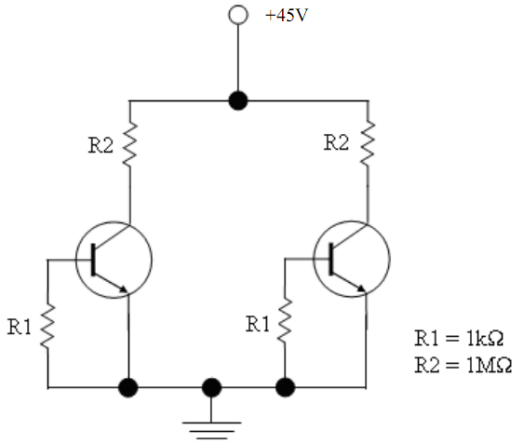


Figure 2 : Bias Conditions during Irradiation Exposures

4.2.2 Electrical Measurements

Electrical parameters test program principle for 2N2920A 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.

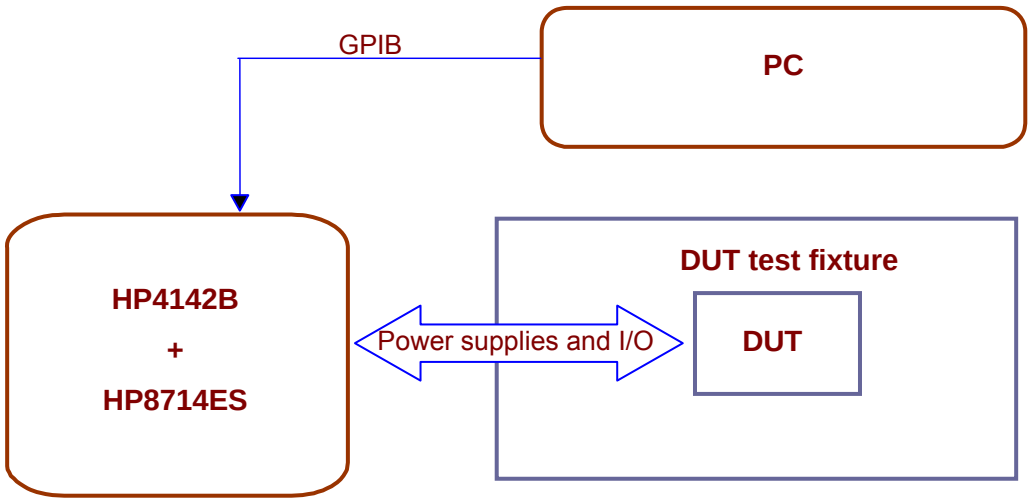


Figure 3 : 2N2920A test program principle

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

Parameter (Note 1)	Description	Conditions	Limit		unit
			Min	Max	
I_{CBO}	Collector-Base cut-off current	V_{CB} = 45V	-	2	nA
I_{EBO}	Emitter-Base cut-off current	V_{EB} = 5V	-	2	nA
I_{CEO}	Collector-Emitter cut-off current	V_{CE} = 5V	-	2	nA
$V_{(BR)CBO}$	Collector-Base breakdown voltage	I_C = 10µA	60	-	V
$V_{(BR)CEO}$	Collector-Emitter breakdown voltage	I_C = 10mA, Note 2	60	-	V
$V_{(BR)EBO}$	Emitter-Base breakdown voltage	I_E = 10µA	6	-	V
$V_{CE(SAT)}$	Collector-Emitter saturation voltage	I_C = 1mA, I_B = 0.1mA Note 2	-	0.35	V
H_{FE1}	DC current gain	I_C = 100µA, V_{CE} = 5V Note 2	225	-	-
H_{FE2}	DC current gain	I_C = 1mA, V_{CE} = 5V Note 2	300	-	-
H_{FE3}	DC current gain	I_C = 5mA, V_{CE} = 5V Note 2	300	-	-
H_{FE4}	DC current gain	I_C = 10mA, V_{CE} = 5V Note 2	300	-	-
H_{FE3-1}/H_{FE3-2}	Forward Current Transfer Ratio Comparison	I_C = 1mA, V_{CE} = 5V	0.8	1.2	-
H_{FE3-1}/H_{FE3-2}	Forward Current Transfer Ratio Comparison	I_C = 5mA, V_{CE} = 5V	0.8	1.2	-
H_{FE4-1}/H_{FE4-2}	Forward Current Transfer Ratio Comparison	I_C = 10mA, V_{CE} = 5V	0.8	1.2	-
$\Delta\lvert V_{BE1}-V_{BE2}\rvert$	Base-Emitter Voltage Differential	I_C = 1mA, V_{CE} = 5V		2	mV
$\Delta\lvert V_{BE1}-V_{BE2}\rvert$	Base-Emitter Voltage Differential	I_C = 5mA, V_{CE} = 5V		2	mV
$\Delta\lvert V_{BE1}-V_{BE2}\rvert$	Base-Emitter Voltage Differential	I_C = 10mA, V_{CE} = 5V		2	mV
F_T	Gain Bandwidth Product	I_C = 0.5mA, V_{CE} = 5V	60	-	MHz

Note 1: Parameters measured on each transistor (identified with: _1 and _2 respectively in results section).
Note 2: Pulse measurement: Pulse Width ≤300µs, Duty cycle 1%

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 STMicroelectronics 2N2920A NPN Small Signal, double matched transistors in CCP-6 package.

10 samples plus one control sample were used during testing. They were exposed to radiation using a dose rate of 36, 100 & 300 rad(Si)/hour at room temperature.

A summary of the 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_1	ON_PROTON samples	11.7 & 22.5 kRad(Si)		X				
	ON_TID samples	22.5 & 56.7 kRad(Si)		X				
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	OFF_TID samples	22.5 & 56.7 kRad(Si)		X				
HFE2_1	ON_PROTON samples	11.7 & 22.5 kRad(Si)		X				
	ON_TID samples	22.5 & 56.7 kRad(Si)		X				
	OFF_PROTON samples	11.7 & 22.5 kRad(Si)		X				
	OFF_TID samples	22.5 & 56.7 kRad(Si)		X				
HFE3_1	ON_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	ON_TID samples	22.5 & 56.7 kRad(Si)		X				
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	OFF_TID samples	56.7 & 104.4 kRad(Si)		X				
HFE4_1	ON_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	ON_TID samples	56.7 & 104.4 kRad(Si)		X				
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	OFF_TID samples	56.7 & 104.4 kRad(Si)			X			
FT_1	ON_PROTON samples	22.5 & 56.7 kRad(Si)		X				FT has significantly degraded after last annealing step.
	ON_TID samples	22.5 & 56.7 kRad(Si)		X				FT has significantly degraded after last annealing step.
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)		X				FT has significantly degraded after last annealing step.
	OFF_TID samples	22.5 & 56.7 kRad(Si)		X				FT has significantly degraded after last annealing step.
HFE1_2	ON_PROTON samples	11.7 & 22.5 kRad(Si)		X				
	ON_TID samples	22.5 & 56.7 kRad(Si)		X				
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	OFF_TID samples	22.5 & 56.7 kRad(Si)		X				

Parameters	Failure Level between :		Annealing Recovery [Note 1]					Comments
			NA	No	Partial	Complete	Rebound	
HFE2_2	ON_PROTON samples	11.7 & 22.5 kRad(Si)		X				
	ON_TID samples	22.5 & 56.7 kRad(Si)		X				
	OFF_PROTON samples	11.7 & 22.5 kRad(Si)		X				
	OFF_TID samples	22.5 & 56.7 kRad(Si)		X				
HFE3_2	ON_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	ON_TID samples	22.5 & 56.7 kRad(Si)		X				
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	OFF_TID samples	56.7 & 104.4 kRad(Si)		X				
HFE4_2	ON_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	ON_TID samples	56.7 & 104.4 kRad(Si)			X			
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)		X				
	OFF_TID samples	56.7 & 104.4 kRad(Si)			X			
FT_2	ON_PROTON samples	22.5 & 56.7 kRad(Si)			X			FT has significantly degraded after last annealing step.
	ON_TID samples	22.5 & 56.7 kRad(Si)			X			FT has significantly degraded after last annealing step.
	OFF_PROTON samples	22.5 & 56.7 kRad(Si)			X			FT has significantly degraded after last annealing step.
	OFF_TID samples	22.5 & 56.7 kRad(Si)			X			FT has significantly degraded after last annealing step.
d|VBE1-VBE2|1	ON_PROTON samples	22.5 & 56.7 kRad(Si)			X	X		
	ON_TID samples	0 & 11.7 kRad(Si)			X			
	OFF_PROTON samples	11.7 & 22.5 kRad(Si)			X	X		
	OFF_TID samples	0 & 11.7 kRad(Si)			X			
d|VBE1-VBE2|2	ON_PROTON samples	22.5 & 56.7 kRad(Si)			X			
	ON_TID samples	11.7 & 22.5 kRad(Si)			X			
	OFF_PROTON samples	0 & 11.7 kRad(Si)			X	X		
	OFF_TID samples	0 & 11.7 kRad(Si)		X	X			
d|VBE1-VBE2|3	ON_PROTON samples	56.7 & 104.4 kRad(Si)			X	X		
	ON_TID samples	11.7 & 22.5 kRad(Si)		X	X			
	OFF_PROTON samples	11.7 & 22.5 kRad(Si)			X	X		
	OFF_TID samples	0 & 11.7 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.

Table 2 : Summary of parameters failure levels

6 Test Results

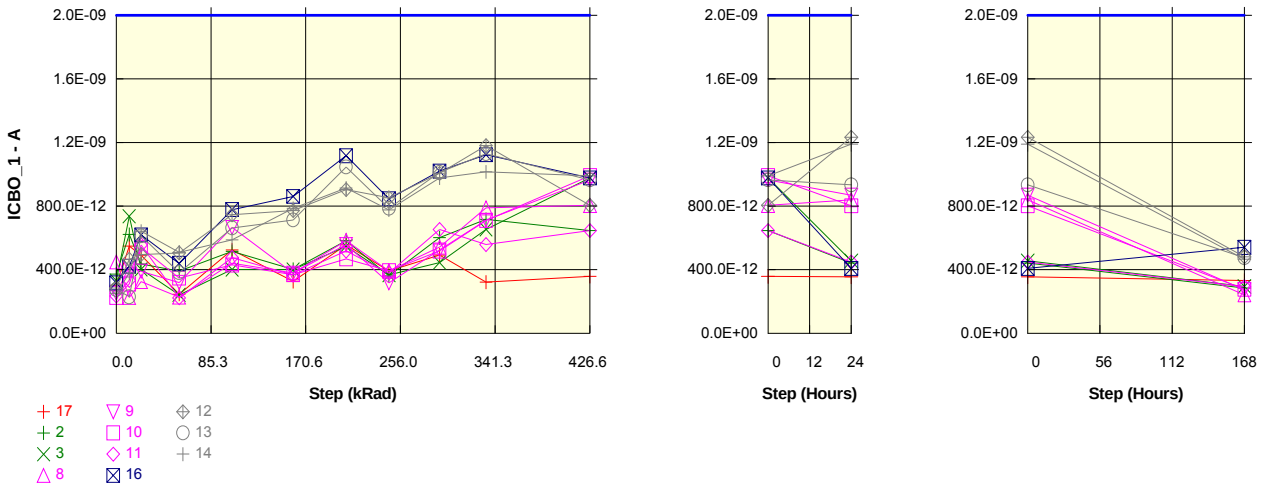
Test results including tables and graphics are provided in this section for each measured parameter.

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:

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

Parameter : Collector-Base cut-off current : ICBO_1
Test conditions : Vcb = 45V
Unit : A
Spec Limit Max : 2.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	301.8E-12	548.3E-12	490.4E-12	245.7E-12	524.1E-12	326.0E-12	556.4E-12	393.4E-12	492.9E-12	321.8E-12	357.9E-12	356.1E-12	332.0E-12
ON_PROTON samples													
2	373.2E-12	621.4E-12	435.4E-12	391.8E-12	515.0E-12	401.8E-12	583.4E-12	360.6E-12	601.3E-12	717.0E-12	646.2E-12	441.6E-12	284.6E-12
3	332.5E-12	736.6E-12	402.4E-12	241.8E-12	401.1E-12	401.2E-12	547.3E-12	366.6E-12	445.0E-12	654.0E-12	977.6E-12	456.0E-12	294.9E-12
Statistics													
Min	332.5E-12	621.4E-12	402.4E-12	241.8E-12	401.1E-12	401.2E-12	547.3E-12	360.6E-12	445.0E-12	654.0E-12	646.2E-12	441.6E-12	284.6E-12
Max	373.2E-12	736.6E-12	435.4E-12	391.8E-12	515.0E-12	401.8E-12	583.4E-12	366.6E-12	601.3E-12	717.0E-12	977.6E-12	456.0E-12	294.9E-12
Average	352.8E-12	679.0E-12	418.9E-12	316.8E-12	458.0E-12	401.5E-12	565.3E-12	363.6E-12	523.2E-12	685.5E-12	811.9E-12	448.8E-12	289.7E-12
Sigma	20.3E-12	57.6E-12	16.5E-12	75.0E-12	57.0E-12	330.0E-15	18.1E-12	3.0E-12	78.1E-12	31.5E-12	165.7E-12	7.2E-12	5.2E-12

Drift Calculation

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	248.2E-12	62.2E-12	18.7E-12	141.8E-12	28.7E-12	210.2E-12	-12.5E-12	228.1E-12	343.8E-12	273.0E-12	68.4E-12	-88.6E-12
3	-	404.1E-12	69.9E-12	-90.7E-12	68.6E-12	68.7E-12	214.8E-12	34.1E-12	112.6E-12	321.5E-12	645.1E-12	123.5E-12	-37.6E-12
Average	-	326.2E-12	66.1E-12	-36.0E-12	105.2E-12	48.7E-12	212.5E-12	10.8E-12	170.3E-12	332.7E-12	459.1E-12	96.0E-12	-63.1E-12
Sigma	-	77.9E-12	3.8E-12	54.7E-12	36.6E-12	20.0E-12	2.3E-12	23.3E-12	57.8E-12	11.2E-12	186.0E-12	27.5E-12	25.5E-12

Measurements

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	301.8E-12	548.3E-12	490.4E-12	245.7E-12	524.1E-12	326.0E-12	556.4E-12	393.4E-12	492.9E-12	321.8E-12	357.9E-12	356.1E-12	332.0E-12
ON_TID samples													
8	449.1E-12	226.2E-12	325.2E-12	227.1E-12	440.2E-12	379.9E-12	583.7E-12	392.4E-12	542.3E-12	788.4E-12	804.2E-12	840.0E-12	241.6E-12
9	252.4E-12	420.6E-12	390.2E-12	319.7E-12	666.0E-12	378.3E-12	558.0E-12	316.3E-12	523.6E-12	711.0E-12	964.6E-12	868.6E-12	274.0E-12
10	225.6E-12	310.4E-12	539.5E-12	347.0E-12	429.9E-12	368.2E-12	468.1E-12	393.4E-12	517.7E-12	709.8E-12	991.2E-12	801.8E-12	277.4E-12
11	234.8E-12	333.5E-12	556.1E-12	223.3E-12	476.9E-12	366.7E-12	517.7E-12	378.7E-12	653.4E-12	557.8E-12	646.2E-12	447.8E-12	293.8E-12
Statistics													
Min	225.6E-12	226.2E-12	325.2E-12	223.3E-12	429.9E-12	366.7E-12	468.1E-12	316.3E-12	517.7E-12	557.8E-12	646.2E-12	447.8E-12	241.6E-12
Max	449.1E-12	420.6E-12	556.1E-12	347.0E-12	666.0E-12	379.9E-12	583.7E-12	393.4E-12	653.4E-12	788.4E-12	991.2E-12	868.6E-12	293.8E-12
Average	290.5E-12	322.7E-12	452.7E-12	279.3E-12	503.2E-12	373.3E-12	531.9E-12	370.2E-12	559.2E-12	691.7E-12	851.5E-12	739.6E-12	271.7E-12
Sigma	92.1E-12	69.2E-12	98.0E-12	54.9E-12	95.6E-12	5.9E-12	43.7E-12	31.6E-12	55.1E-12	83.6E-12	138.5E-12	170.1E-12	18.9E-12

Drift Calculation

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-222.9E-12	-123.9E-12	-222.0E-12	-8.9E-12	-69.2E-12	134.6E-12	-56.7E-12	93.2E-12	339.3E-12	355.1E-12	390.9E-12	-207.5E-12
9	-	168.2E-12	137.8E-12	67.3E-12	413.6E-12	125.9E-12	305.6E-12	63.9E-12	271.2E-12	458.6E-12	712.2E-12	616.2E-12	21.6E-12
10	-	84.8E-12	313.9E-12	121.4E-12	204.4E-12	142.6E-12	242.5E-12	167.8E-12	292.1E-12	484.2E-12	765.6E-12	576.2E-12	51.8E-12
11	-	98.7E-12	321.3E-12	-11.5E-12	242.1E-12	131.9E-12	282.9E-12	143.9E-12	418.6E-12	323.0E-12	411.4E-12	213.0E-12	59.0E-12
Average	-	32.2E-12	162.3E-12	-11.2E-12	212.8E-12	82.8E-12	241.4E-12	79.7E-12	268.8E-12	401.3E-12	561.1E-12	449.1E-12	-18.8E-12
Sigma	-	150.6E-12	180.8E-12	130.6E-12	150.3E-12	88.0E-12	65.7E-12	87.7E-12	116.0E-12	70.9E-12	179.9E-12	160.6E-12	109.9E-12

Measurements

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	301.8E-12	548.3E-12	490.4E-12	245.7E-12	524.1E-12	326.0E-12	556.4E-12	393.4E-12	492.9E-12	321.8E-12	357.9E-12	356.1E-12	332.0E-12
OFF_PROTON samples													
16	316.7E-12	421.7E-12	618.9E-12	439.3E-12	777.7E-12	861.0E-12	1.1E-09	845.6E-12	1.0E-09	1.1E-09	977.6E-12	408.2E-12	540.5E-12
Statistics													
Min	316.7E-12	421.7E-12	618.9E-12	439.3E-12	777.7E-12	861.0E-12	1.1E-09	845.6E-12	1.0E-09	1.1E-09	977.6E-12	408.2E-12	540.5E-12
Max	316.7E-12	421.7E-12	618.9E-12	439.3E-12	777.7E-12	861.0E-12	1.1E-09	845.6E-12	1.0E-09	1.1E-09	977.6E-12	408.2E-12	540.5E-12
Average	316.7E-12	421.7E-12	618.9E-12	439.3E-12	777.7E-12	861.0E-12	1.1E-09	845.6E-12	1.0E-09	1.1E-09	977.6E-12	408.2E-12	540.5E-12
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	105.0E-12	302.1E-12	122.5E-12	461.0E-12	544.3E-12	800.3E-12	528.9E-12	703.9E-12	806.5E-12	660.9E-12	91.5E-12	223.8E-12
Average	-	105.0E-12	302.1E-12	122.5E-12	461.0E-12	544.3E-12	800.3E-12	528.9E-12	703.9E-12	806.5E-12	660.9E-12	91.5E-12	223.8E-12
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

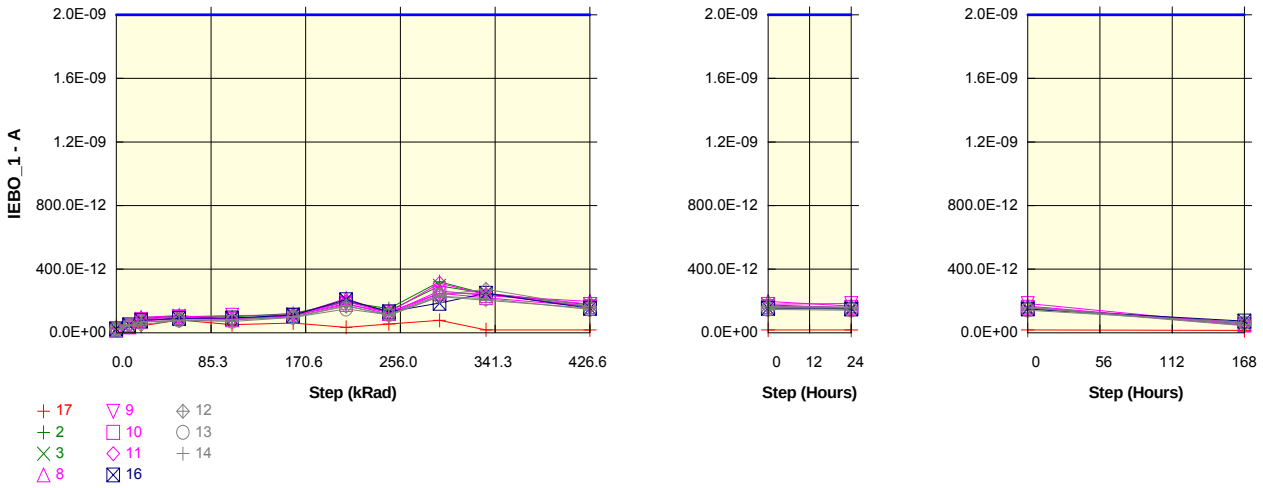
Measurements

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	301.8E-12	548.3E-12	490.4E-12	245.7E-12	524.1E-12	326.0E-12	556.4E-12	393.4E-12	492.9E-12	321.8E-12	357.9E-12	356.1E-12	332.0E-12
OFF_TID samples													
12	284.4E-12	465.4E-12	495.8E-12	505.6E-12	745.1E-12	771.8E-12	904.0E-12	852.2E-12	1.0E-09	1.2E-09	804.2E-12	1.2E-09	481.0E-12
13	275.8E-12	229.8E-12	613.4E-12	381.8E-12	662.8E-12	713.0E-12	1.0E-09	786.0E-12	1.0E-09	1.1E-09	964.6E-12	934.0E-12	475.4E-12
14	251.7E-12	378.2E-12	641.8E-12	510.1E-12	588.0E-12	786.0E-12	913.6E-12	775.4E-12	977.0E-12	1.0E-09	991.2E-12	1.2E-09	466.7E-12
Statistics													
Min	251.7E-12	229.8E-12	495.8E-12	381.8E-12	588.0E-12	713.0E-12	904.0E-12	775.4E-12	977.0E-12	1.0E-09	804.2E-12	934.0E-12	466.7E-12
Max	284.4E-12	465.4E-12	641.8E-12	510.1E-12	745.1E-12	786.0E-12	1.0E-09	852.2E-12	1.0E-09	1.2E-09	991.2E-12	1.2E-09	481.0E-12
Average	270.6E-12	357.8E-12	583.7E-12	465.8E-12	665.3E-12	756.9E-12	954.5E-12	804.5E-12	998.3E-12	1.1E-09	920.0E-12	1.1E-09	474.4E-12
Sigma	13.8E-12	97.3E-12	63.2E-12	59.5E-12	64.1E-12	31.6E-12	64.8E-12	34.0E-12	15.3E-12	69.0E-12	82.6E-12	131.5E-12	5.9E-12

Drift Calculation

ICBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	181.0E-12	211.4E-12	221.2E-12	460.7E-12	487.4E-12	619.6E-12	567.8E-12	721.8E-12	895.6E-12	519.8E-12	947.6E-12	196.6E-12
13	-	-46.0E-12	337.6E-12	106.0E-12	387.0E-12	437.2E-12	770.2E-12	510.2E-12	736.0E-12	853.4E-12	688.8E-12	658.2E-12	199.6E-12
14	-	126.5E-12	390.1E-12	258.4E-12	336.3E-12	534.3E-12	661.9E-12	523.7E-12	725.3E-12	763.3E-12	739.5E-12	937.1E-12	214.9E-12
Average	-	87.2E-12	313.0E-12	195.2E-12	394.7E-12	486.3E-12	683.9E-12	533.9E-12	727.7E-12	837.4E-12	649.4E-12	847.6E-12	203.7E-12
Sigma	-	96.7E-12	75.0E-12	64.9E-12	51.1E-12	39.6E-12	63.4E-12	24.6E-12	6.1E-12	55.2E-12	93.9E-12	134.0E-12	8.0E-12

Parameter : Emitter-Base cut-off current : IEBO_1
Test conditions : Veb = 5V
Unit : A
Spec Limit Max : 2.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	23.9E-12	44.4E-12	42.3E-12	80.2E-12	51.1E-12	62.1E-12	34.7E-12	56.0E-12	78.4E-12	18.9E-12	18.7E-12	17.8E-12	16.0E-12
ON_PROTON samples													
2	31.3E-12	34.2E-12	97.5E-12	102.1E-12	100.5E-12	121.4E-12	193.7E-12	151.7E-12	321.1E-12	244.2E-12	163.7E-12	148.8E-12	64.4E-12
3	25.4E-12	53.1E-12	88.1E-12	106.8E-12	84.6E-12	117.0E-12	199.1E-12	137.4E-12	295.4E-12	249.4E-12	175.3E-12	157.0E-12	54.9E-12
Statistics													
Min	25.4E-12	34.2E-12	88.1E-12	102.1E-12	84.6E-12	117.0E-12	193.7E-12	137.4E-12	295.4E-12	244.2E-12	163.7E-12	148.8E-12	54.9E-12
Max	31.3E-12	53.1E-12	97.5E-12	106.8E-12	100.5E-12	121.4E-12	199.1E-12	151.7E-12	321.1E-12	249.4E-12	175.3E-12	157.0E-12	64.4E-12
Average	28.3E-12	43.6E-12	92.8E-12	104.5E-12	92.6E-12	119.2E-12	196.4E-12	144.5E-12	308.2E-12	246.8E-12	169.5E-12	152.9E-12	59.6E-12
Sigma	2.9E-12	9.4E-12	4.7E-12	2.4E-12	8.0E-12	2.2E-12	2.7E-12	7.1E-12	12.8E-12	2.6E-12	5.8E-12	4.1E-12	4.8E-12

Drift Calculation

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	2.9E-12	66.2E-12	70.8E-12	69.3E-12	90.1E-12	162.5E-12	120.4E-12	289.8E-12	212.9E-12	132.5E-12	117.5E-12	33.1E-12
3	-	27.7E-12	62.7E-12	81.4E-12	59.2E-12	91.6E-12	173.7E-12	112.0E-12	270.0E-12	224.0E-12	149.9E-12	131.6E-12	29.5E-12
Average	-	15.3E-12	64.5E-12	76.1E-12	64.2E-12	90.9E-12	168.1E-12	116.2E-12	279.9E-12	218.5E-12	141.2E-12	124.5E-12	31.3E-12
Sigma	-	12.4E-12	1.8E-12	5.3E-12	5.0E-12	740.0E-15	5.6E-12	4.2E-12	9.9E-12	5.5E-12	8.7E-12	7.0E-12	1.8E-12

Measurements

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	23.9E-12	44.4E-12	42.3E-12	80.2E-12	51.1E-12	62.1E-12	34.7E-12	56.0E-12	78.4E-12	18.9E-12	18.7E-12	17.8E-12	16.0E-12
ON_TID samples													
8	36.5E-12	38.3E-12	95.6E-12	108.7E-12	82.7E-12	109.5E-12	215.0E-12	121.6E-12	263.1E-12	234.3E-12	196.5E-12	167.4E-12	51.5E-12
9	25.3E-12	41.9E-12	82.9E-12	100.6E-12	109.8E-12	111.4E-12	183.9E-12	116.8E-12	249.2E-12	248.4E-12	179.8E-12	183.6E-12	51.5E-12
10	15.3E-12	38.7E-12	70.6E-12	97.7E-12	85.9E-12	107.8E-12	178.9E-12	130.6E-12	248.4E-12	220.0E-12	164.2E-12	160.6E-12	48.8E-12
11	14.8E-12	45.4E-12	77.4E-12	85.8E-12	88.0E-12	111.9E-12	195.9E-12	129.0E-12	311.9E-12	240.2E-12	165.7E-12	158.1E-12	62.8E-12
Statistics													
Min	14.8E-12	38.3E-12	70.6E-12	85.8E-12	82.7E-12	107.8E-12	178.9E-12	116.8E-12	248.4E-12	220.0E-12	164.2E-12	158.1E-12	48.8E-12
Max	36.5E-12	45.4E-12	95.6E-12	108.7E-12	109.8E-12	111.9E-12	215.0E-12	130.6E-12	311.9E-12	248.4E-12	196.5E-12	183.6E-12	62.8E-12
Average	23.0E-12	41.1E-12	81.6E-12	98.2E-12	91.6E-12	110.2E-12	193.4E-12	124.5E-12	268.1E-12	235.7E-12	176.6E-12	167.4E-12	53.7E-12
Sigma	8.9E-12	2.8E-12	9.2E-12	8.2E-12	10.7E-12	1.6E-12	13.9E-12	5.6E-12	25.9E-12	10.4E-12	13.0E-12	9.9E-12	5.4E-12

Drift Calculation

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	1.8E-12	59.1E-12	72.2E-12	46.2E-12	73.0E-12	178.5E-12	85.2E-12	226.6E-12	197.8E-12	160.0E-12	131.0E-12	15.1E-12
9	-	16.5E-12	57.5E-12	75.3E-12	84.5E-12	86.1E-12	158.6E-12	91.5E-12	223.9E-12	223.0E-12	154.5E-12	158.2E-12	26.2E-12
10	-	23.4E-12	55.3E-12	82.4E-12	70.6E-12	92.5E-12	163.6E-12	115.3E-12	233.1E-12	204.7E-12	148.9E-12	145.3E-12	33.5E-12
11	-	30.6E-12	62.6E-12	71.0E-12	73.2E-12	97.1E-12	181.1E-12	114.2E-12	297.1E-12	225.4E-12	150.9E-12	143.3E-12	48.0E-12
Average	-	18.1E-12	58.6E-12	75.2E-12	68.6E-12	87.2E-12	170.5E-12	101.5E-12	245.2E-12	212.7E-12	153.6E-12	144.5E-12	30.7E-12
Sigma	-	10.6E-12	2.7E-12	4.4E-12	13.9E-12	9.1E-12	9.6E-12	13.4E-12	30.1E-12	11.8E-12	4.2E-12	9.7E-12	12.0E-12

Measurements

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	23.9E-12	44.4E-12	42.3E-12	80.2E-12	51.1E-12	62.1E-12	34.7E-12	56.0E-12	78.4E-12	18.9E-12	18.7E-12	17.8E-12	16.0E-12
OFF_PROTON samples													
16	23.0E-12	49.7E-12	78.4E-12	90.4E-12	92.9E-12	109.9E-12	208.5E-12	131.9E-12	186.7E-12	249.0E-12	154.1E-12	149.4E-12	73.5E-12
Statistics													
Min	23.0E-12	49.7E-12	78.4E-12	90.4E-12	92.9E-12	109.9E-12	208.5E-12	131.9E-12	186.7E-12	249.0E-12	154.1E-12	149.4E-12	73.5E-12
Max	23.0E-12	49.7E-12	78.4E-12	90.4E-12	92.9E-12	109.9E-12	208.5E-12	131.9E-12	186.7E-12	249.0E-12	154.1E-12	149.4E-12	73.5E-12
Average	23.0E-12	49.7E-12	78.4E-12	90.4E-12	92.9E-12	109.9E-12	208.5E-12	131.9E-12	186.7E-12	249.0E-12	154.1E-12	149.4E-12	73.5E-12
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	26.7E-12	55.4E-12	67.4E-12	69.9E-12	86.9E-12	185.6E-12	108.9E-12	163.7E-12	226.0E-12	131.1E-12	126.4E-12	50.5E-12
Average	-	26.7E-12	55.4E-12	67.4E-12	69.9E-12	86.9E-12	185.6E-12	108.9E-12	163.7E-12	226.0E-12	131.1E-12	126.4E-12	50.5E-12
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

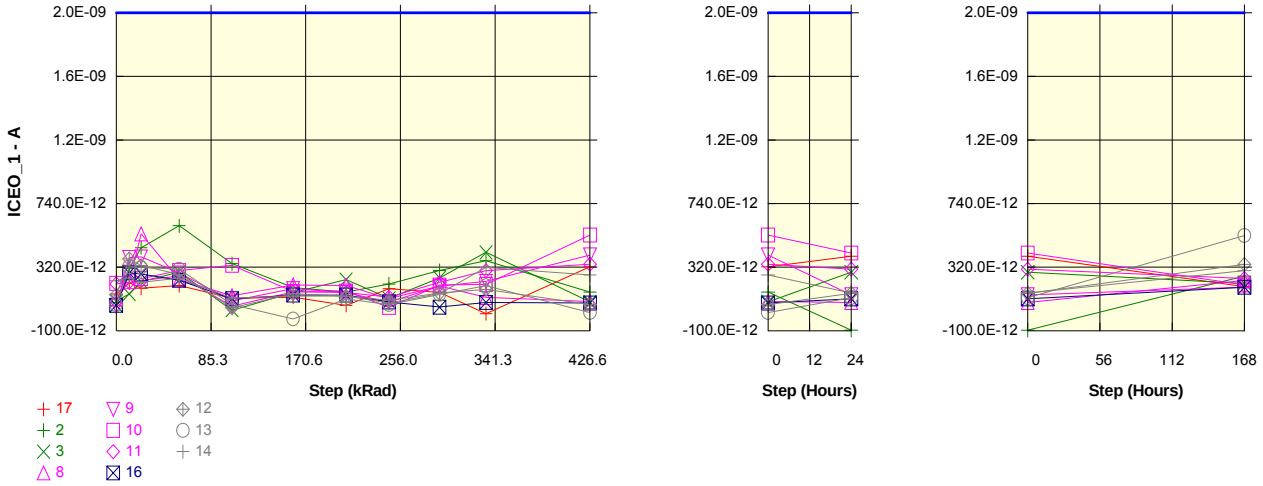
Measurements

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	23.9E-12	44.4E-12	42.3E-12	80.2E-12	51.1E-12	62.1E-12	34.7E-12	56.0E-12	78.4E-12	18.9E-12	18.7E-12	17.8E-12	16.0E-12
OFF_TID samples													
12	21.9E-12	45.3E-12	51.2E-12	78.6E-12	83.3E-12	97.3E-12	167.1E-12	115.4E-12	237.5E-12	273.3E-12	164.6E-12	160.9E-12	52.5E-12
13	23.7E-12	39.4E-12	70.7E-12	79.1E-12	71.6E-12	96.3E-12	149.0E-12	113.4E-12	229.4E-12	214.6E-12	146.9E-12	142.1E-12	62.6E-12
14	21.4E-12	52.1E-12	67.0E-12	75.5E-12	80.4E-12	99.9E-12	172.4E-12	109.8E-12	227.4E-12	203.6E-12	154.5E-12	156.9E-12	44.3E-12
Statistics													
Min	21.4E-12	39.4E-12	51.2E-12	75.5E-12	71.6E-12	96.3E-12	149.0E-12	109.8E-12	227.4E-12	203.6E-12	146.9E-12	142.1E-12	44.3E-12
Max	23.7E-12	52.1E-12	70.7E-12	79.1E-12	83.3E-12	99.9E-12	172.4E-12	115.4E-12	237.5E-12	273.3E-12	164.6E-12	160.9E-12	62.6E-12
Average	22.3E-12	45.6E-12	63.0E-12	77.7E-12	78.4E-12	97.8E-12	162.9E-12	112.9E-12	231.4E-12	230.5E-12	155.3E-12	153.3E-12	53.1E-12
Sigma	994.0E-15	5.2E-12	8.4E-12	1.6E-12	5.0E-12	1.5E-12	10.0E-12	2.3E-12	4.3E-12	30.6E-12	7.3E-12	8.1E-12	7.5E-12

Drift Calculation

IEBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	23.4E-12	29.3E-12	56.7E-12	61.4E-12	75.4E-12	145.2E-12	93.5E-12	215.6E-12	251.4E-12	142.7E-12	139.0E-12	30.6E-12
13	-	15.7E-12	47.0E-12	55.4E-12	47.9E-12	72.6E-12	125.3E-12	89.7E-12	205.7E-12	190.9E-12	123.2E-12	118.4E-12	38.9E-12
14	-	30.8E-12	45.6E-12	54.1E-12	59.0E-12	78.5E-12	151.1E-12	88.4E-12	206.1E-12	182.2E-12	133.1E-12	135.5E-12	22.9E-12
Average	-	23.3E-12	40.6E-12	55.4E-12	56.1E-12	75.5E-12	140.5E-12	90.6E-12	209.1E-12	208.1E-12	133.0E-12	131.0E-12	30.8E-12
Sigma	-	6.1E-12	8.0E-12	1.0E-12	5.9E-12	2.4E-12	11.0E-12	2.2E-12	4.6E-12	30.8E-12	8.0E-12	9.0E-12	6.5E-12

Parameter : Collector-Emitter cut-off current : ICEO_1
Test conditions : Vce = 5V
Unit : A
Spec Limit Max : 2.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	143.0E-12	216.8E-12	181.1E-12	199.4E-12	114.2E-12	122.2E-12	68.0E-12	178.0E-12	154.0E-12	13.6E-12	322.4E-12	392.4E-12	192.2E-12
ON_PROTON samples													
2	84.9E-12	311.0E-12	449.0E-12	593.2E-12	343.8E-12	186.0E-12	155.8E-12	208.6E-12	299.0E-12	362.0E-12	155.0E-12	-95.2E-12	261.2E-12
3	97.4E-12	143.8E-12	224.6E-12	288.8E-12	36.0E-12	152.4E-12	238.3E-12	113.7E-12	249.3E-12	418.0E-12	91.8E-12	286.6E-12	213.0E-12
Statistics													
Min	84.9E-12	143.8E-12	224.6E-12	288.8E-12	36.0E-12	152.4E-12	155.8E-12	113.7E-12	249.3E-12	362.0E-12	91.8E-12	-95.2E-12	213.0E-12
Max	97.4E-12	311.0E-12	449.0E-12	593.2E-12	343.8E-12	186.0E-12	238.3E-12	208.6E-12	299.0E-12	418.0E-12	155.0E-12	286.6E-12	261.2E-12
Average	91.1E-12	227.4E-12	336.8E-12	441.0E-12	189.9E-12	169.2E-12	197.0E-12	161.1E-12	274.1E-12	390.0E-12	123.4E-12	95.7E-12	237.1E-12
Sigma	6.2E-12	83.6E-12	112.2E-12	152.2E-12	153.9E-12	16.8E-12	41.3E-12	47.5E-12	24.8E-12	28.0E-12	31.6E-12	190.9E-12	24.1E-12

Drift Calculation

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	226.1E-12	364.0E-12	508.3E-12	258.9E-12	101.1E-12	70.8E-12	123.7E-12	214.1E-12	277.1E-12	70.1E-12	-180.1E-12	176.3E-12
3	-	46.4E-12	127.3E-12	191.4E-12	-61.4E-12	55.0E-12	141.0E-12	16.3E-12	151.9E-12	320.6E-12	-5.6E-12	189.2E-12	115.7E-12
Average	-	136.3E-12	245.7E-12	349.9E-12	98.8E-12	78.1E-12	105.9E-12	70.0E-12	183.0E-12	298.9E-12	32.3E-12	4.6E-12	146.0E-12
Sigma	-	89.8E-12	118.4E-12	158.4E-12	160.1E-12	23.0E-12	35.1E-12	53.7E-12	31.1E-12	21.8E-12	37.8E-12	184.7E-12	30.3E-12

Measurements

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	143.0E-12	216.8E-12	181.1E-12	199.4E-12	114.2E-12	122.2E-12	68.0E-12	178.0E-12	154.0E-12	13.6E-12	322.4E-12	392.4E-12	192.2E-12
ON_TID samples													
8	111.9E-12	224.4E-12	540.2E-12	236.3E-12	130.4E-12	202.4E-12	199.7E-12	112.9E-12	196.2E-12	120.0E-12	92.8E-12	86.9E-12	231.7E-12
9	62.9E-12	383.8E-12	387.6E-12	282.0E-12	97.4E-12	178.7E-12	152.6E-12	89.1E-12	194.0E-12	226.0E-12	400.6E-12	137.6E-12	188.3E-12
10	213.0E-12	287.8E-12	244.8E-12	298.4E-12	332.0E-12	159.2E-12	162.7E-12	53.8E-12	201.4E-12	205.9E-12	532.0E-12	413.8E-12	203.2E-12
11	210.3E-12	222.0E-12	230.8E-12	262.4E-12	63.2E-12	156.8E-12	153.8E-12	122.1E-12	219.6E-12	298.0E-12	339.8E-12	307.0E-12	246.0E-12
Statistics													
Min	62.9E-12	222.0E-12	230.8E-12	236.3E-12	63.2E-12	156.8E-12	152.6E-12	53.8E-12	194.0E-12	120.0E-12	92.8E-12	86.9E-12	188.3E-12
Max	213.0E-12	383.8E-12	540.2E-12	298.4E-12	332.0E-12	202.4E-12	199.7E-12	122.1E-12	219.6E-12	298.0E-12	532.0E-12	413.8E-12	246.0E-12
Average	149.5E-12	279.5E-12	350.8E-12	269.8E-12	155.8E-12	174.3E-12	167.2E-12	94.5E-12	202.8E-12	212.5E-12	341.3E-12	236.3E-12	217.3E-12
Sigma	64.5E-12	65.7E-12	125.4E-12	23.1E-12	104.5E-12	18.3E-12	19.1E-12	26.4E-12	10.1E-12	63.4E-12	159.4E-12	130.9E-12	22.8E-12

Drift Calculation

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	112.5E-12	428.3E-12	124.4E-12	18.5E-12	90.5E-12	87.7E-12	1.0E-12	84.3E-12	8.1E-12	-19.1E-12	-25.0E-12	119.8E-12
9	-	320.9E-12	324.7E-12	219.1E-12	34.5E-12	115.8E-12	89.7E-12	26.2E-12	131.0E-12	163.1E-12	337.7E-12	74.7E-12	125.4E-12
10	-	74.8E-12	31.8E-12	85.4E-12	119.0E-12	-53.8E-12	-50.3E-12	-159.2E-12	-11.6E-12	-7.1E-12	319.0E-12	200.8E-12	-9.8E-12
11	-	11.7E-12	20.5E-12	52.1E-12	-147.1E-12	-53.4E-12	-56.4E-12	-88.1E-12	9.3E-12	87.7E-12	129.5E-12	96.7E-12	35.7E-12
Average	-	130.0E-12	201.3E-12	120.3E-12	6.2E-12	24.7E-12	17.7E-12	-55.0E-12	53.3E-12	63.0E-12	191.8E-12	86.8E-12	67.8E-12
Sigma	-	115.9E-12	179.0E-12	62.5E-12	96.4E-12	78.9E-12	71.1E-12	73.6E-12	57.3E-12	68.1E-12	146.5E-12	80.2E-12	57.2E-12

Measurements

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	143.0E-12	216.8E-12	181.1E-12	199.4E-12	114.2E-12	122.2E-12	68.0E-12	178.0E-12	154.0E-12	13.6E-12	322.4E-12	392.4E-12	192.2E-12
OFF_PROTON samples													
16	68.1E-12	282.4E-12	275.3E-12	233.8E-12	112.0E-12	136.2E-12	135.7E-12	90.5E-12	56.6E-12	87.6E-12	83.7E-12	110.8E-12	187.6E-12
Statistics													
Min	68.1E-12	282.4E-12	275.3E-12	233.8E-12	112.0E-12	136.2E-12	135.7E-12	90.5E-12	56.6E-12	87.6E-12	83.7E-12	110.8E-12	187.6E-12
Max	68.1E-12	282.4E-12	275.3E-12	233.8E-12	112.0E-12	136.2E-12	135.7E-12	90.5E-12	56.6E-12	87.6E-12	83.7E-12	110.8E-12	187.6E-12
Average	68.1E-12	282.4E-12	275.3E-12	233.8E-12	112.0E-12	136.2E-12	135.7E-12	90.5E-12	56.6E-12	87.6E-12	83.7E-12	110.8E-12	187.6E-12
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	214.3E-12	207.3E-12	165.7E-12	43.9E-12	68.2E-12	67.7E-12	22.4E-12	-11.5E-12	19.5E-12	15.7E-12	42.8E-12	119.5E-12
Average	-	214.3E-12	207.3E-12	165.7E-12	43.9E-12	68.2E-12	67.7E-12	22.4E-12	-11.5E-12	19.5E-12	15.7E-12	42.8E-12	119.5E-12
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

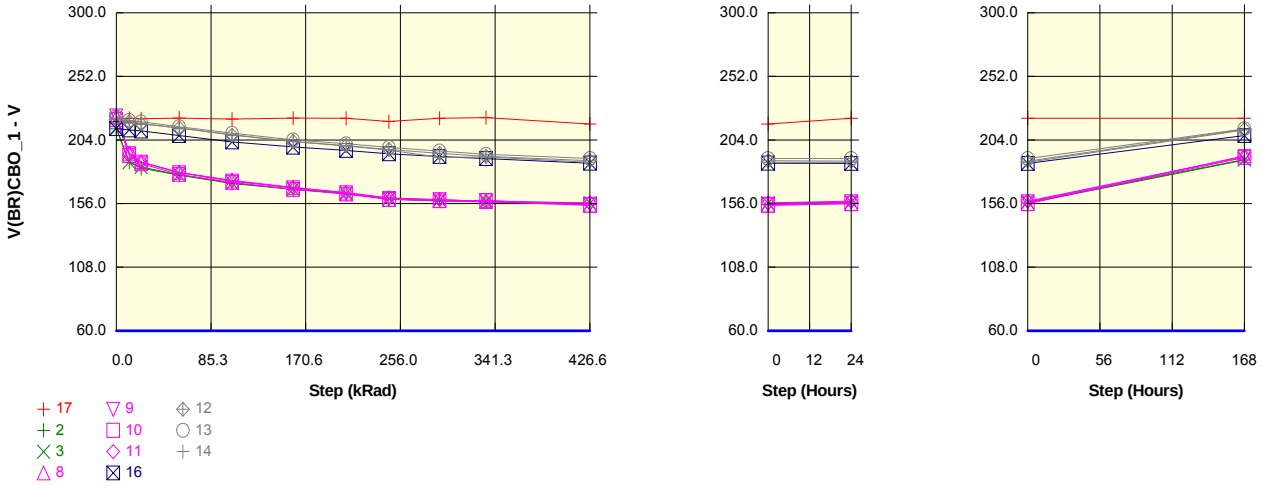
Measurements

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	143.0E-12	216.8E-12	181.1E-12	199.4E-12	114.2E-12	122.2E-12	68.0E-12	178.0E-12	154.0E-12	13.6E-12	322.4E-12	392.4E-12	192.2E-12
OFF_TID samples													
12	137.1E-12	374.2E-12	330.5E-12	271.5E-12	53.0E-12	145.0E-12	127.2E-12	101.6E-12	148.4E-12	173.2E-12	74.2E-12	147.3E-12	338.3E-12
13	72.3E-12	322.8E-12	318.5E-12	305.8E-12	73.4E-12	-21.8E-12	109.7E-12	73.8E-12	140.3E-12	197.4E-12	20.5E-12	119.4E-12	529.5E-12
14	230.4E-12	248.0E-12	220.2E-12	247.6E-12	115.7E-12	129.2E-12	129.7E-12	81.9E-12	146.5E-12	318.6E-12	268.0E-12	149.6E-12	297.7E-12
Statistics													
Min	72.3E-12	248.0E-12	220.2E-12	247.6E-12	53.0E-12	-21.8E-12	109.7E-12	73.8E-12	140.3E-12	173.2E-12	20.5E-12	119.4E-12	297.7E-12
Max	230.4E-12	374.2E-12	330.5E-12	305.8E-12	115.7E-12	145.0E-12	129.7E-12	101.6E-12	148.4E-12	318.6E-12	268.0E-12	149.6E-12	529.5E-12
Average	146.6E-12	315.0E-12	289.7E-12	275.0E-12	80.7E-12	84.1E-12	122.2E-12	85.8E-12	145.1E-12	229.7E-12	120.9E-12	138.7E-12	388.5E-12
Sigma	64.9E-12	51.8E-12	49.4E-12	23.9E-12	26.1E-12	75.2E-12	8.9E-12	11.7E-12	3.5E-12	63.6E-12	106.3E-12	13.7E-12	101.0E-12

Drift Calculation

ICEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	237.1E-12	193.4E-12	134.4E-12	-84.1E-12	7.9E-12	-9.8E-12	-35.4E-12	11.4E-12	36.1E-12	-62.9E-12	10.2E-12	201.2E-12
13	-	250.5E-12	246.2E-12	233.5E-12	1.1E-12	-94.2E-12	37.4E-12	1.5E-12	68.0E-12	125.1E-12	-51.8E-12	47.1E-12	457.1E-12
14	-	17.6E-12	-10.2E-12	17.2E-12	-114.7E-12	-101.2E-12	-100.7E-12	-148.5E-12	-83.9E-12	88.2E-12	37.6E-12	-80.8E-12	67.3E-12
Average	-	168.4E-12	143.1E-12	128.4E-12	-65.9E-12	-62.5E-12	-24.4E-12	-60.8E-12	-1.5E-12	83.1E-12	-25.7E-12	-7.9E-12	241.9E-12
Sigma	-	106.8E-12	110.5E-12	88.4E-12	49.0E-12	49.9E-12	57.3E-12	63.8E-12	62.7E-12	36.5E-12	45.0E-12	53.8E-12	161.7E-12

Parameter : Collector-Base breakdown voltage : V(BR)CBO_1
Test conditions : Ic = 10µA
Unit : V
Spec Limit Min : 60.0
Spec limits are represented in bold lines on the graphic.



Measurements

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	219.7	220.3	220.0	220.6	219.8	220.5	220.3	217.9	220.4	220.9	216.1	220.4	220.4
ON_PROTON samples													
2	212.5	187.2	182.6	177.5	171.1	166.8	163.4	159.3	157.9	157.3	155.4	156.5	188.8
3	212.9	187.3	183.8	177.6	171.6	167.0	163.8	159.8	158.7	157.9	156.2	157.2	189.3
Statistics													
Min	212.5	187.2	182.6	177.5	171.1	166.8	163.4	159.3	157.9	157.3	155.4	156.5	188.8
Max	212.9	187.3	183.8	177.6	171.6	167.0	163.8	159.8	158.7	157.9	156.2	157.2	189.3
Average	212.7	187.2	183.2	177.5	171.3	166.9	163.6	159.5	158.3	157.6	155.8	156.8	189.0
Sigma	0.2	0.0	0.6	0.1	0.2	0.1	0.2	0.2	0.4	0.3	0.4	0.4	0.2

Drift Calculation

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-25.3E+00	-29.9E+00	-35.0E+00	-41.4E+00	-45.6E+00	-49.0E+00	-53.2E+00	-54.5E+00	-55.1E+00	-57.0E+00	-56.0E+00	-23.6E+00
3	-	-25.6E+00	-29.1E+00	-35.3E+00	-41.3E+00	-45.9E+00	-49.1E+00	-53.1E+00	-54.1E+00	-54.9E+00	-56.6E+00	-55.7E+00	-23.6E+00
Average	-	-25.4E+00	-29.5E+00	-35.1E+00	-41.3E+00	-45.8E+00	-49.1E+00	-53.1E+00	-54.3E+00	-55.0E+00	-56.8E+00	-55.8E+00	-23.6E+00
Sigma	-	150.0E-03	385.0E-03	125.0E-03	20.0E-03	110.0E-03	35.0E-03	45.0E-03	195.0E-03	95.0E-03	200.0E-03	170.0E-03	20.0E-03

Measurements

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	219.7	220.3	220.0	220.6	219.8	220.5	220.3	217.9	220.4	220.9	216.1	220.4	220.4
ON_TID samples													
8	221.5	194.0	187.3	179.6	173.1	168.0	163.9	159.3	158.2	157.5	154.7	155.9	192.0
9	222.1	193.7	187.3	179.4	172.9	168.0	164.0	159.7	158.9	158.0	155.4	157.3	191.5
10	219.4	192.4	186.1	178.0	172.0	166.7	163.1	159.1	158.1	158.4	154.9	156.2	190.8
11	222.1	193.6	187.2	179.3	173.5	168.1	164.4	160.3	159.1	157.5	156.5	157.9	191.6
Statistics													
Min	219.4	192.4	186.1	178.0	172.0	166.7	163.1	159.1	158.1	157.5	154.7	155.9	190.8
Max	222.1	194.0	187.3	179.6	173.5	168.1	164.4	160.3	159.1	158.4	156.5	157.9	192.0
Average	221.3	193.4	187.0	179.1	172.9	167.7	163.9	159.6	158.6	157.9	155.4	156.8	191.5
Sigma	1.1	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.4	0.4	0.7	0.8	0.4

Drift Calculation

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-27.5E+00	-34.2E+00	-41.9E+00	-48.4E+00	-53.5E+00	-57.6E+00	-62.2E+00	-63.3E+00	-64.0E+00	-66.8E+00	-65.6E+00	-29.5E+00
9	-	-28.4E+00	-34.8E+00	-42.7E+00	-49.2E+00	-54.2E+00	-58.1E+00	-62.4E+00	-63.2E+00	-64.2E+00	-66.7E+00	-64.8E+00	-30.6E+00
10	-	-27.0E+00	-33.3E+00	-41.4E+00	-47.4E+00	-52.7E+00	-56.3E+00	-60.3E+00	-61.3E+00	-61.0E+00	-64.5E+00	-63.2E+00	-28.6E+00
11	-	-28.5E+00	-35.0E+00	-42.8E+00	-48.6E+00	-54.0E+00	-57.8E+00	-61.8E+00	-63.1E+00	-64.6E+00	-65.6E+00	-64.3E+00	-30.6E+00
Average	-	-27.9E+00	-34.3E+00	-42.2E+00	-48.4E+00	-53.6E+00	-57.4E+00	-61.7E+00	-62.7E+00	-63.4E+00	-65.9E+00	-64.5E+00	-29.8E+00
Sigma	-	628.6E-03	638.3E-03	595.2E-03	668.3E-03	572.7E-03	694.5E-03	826.3E-03	835.5E-03	1.4E+00	940.8E-03	858.7E-03	842.5E-03

Measurements

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	219.7	220.3	220.0	220.6	219.8	220.5	220.3	217.9	220.4	220.9	216.1	220.4	220.4
OFF_PROTON samples													
16	212.7	211.6	210.8	207.4	202.5	198.7	196.1	193.6	191.5	190.0	186.5	186.3	207.4
Statistics													
Min	212.7	211.6	210.8	207.4	202.5	198.7	196.1	193.6	191.5	190.0	186.5	186.3	207.4
Max	212.7	211.6	210.8	207.4	202.5	198.7	196.1	193.6	191.5	190.0	186.5	186.3	207.4
Average	212.7	211.6	210.8	207.4	202.5	198.7	196.1	193.6	191.5	190.0	186.5	186.3	207.4
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	-1.1E+00	-1.9E+00	-5.4E+00	-10.2E+00	-14.0E+00	-16.6E+00	-19.1E+00	-21.2E+00	-22.7E+00	-26.2E+00	-26.4E+00	-5.3E+00
Average	-	-1.1E+00	-1.9E+00	-5.4E+00	-10.2E+00	-14.0E+00	-16.6E+00	-19.1E+00	-21.2E+00	-22.7E+00	-26.2E+00	-26.4E+00	-5.3E+00
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

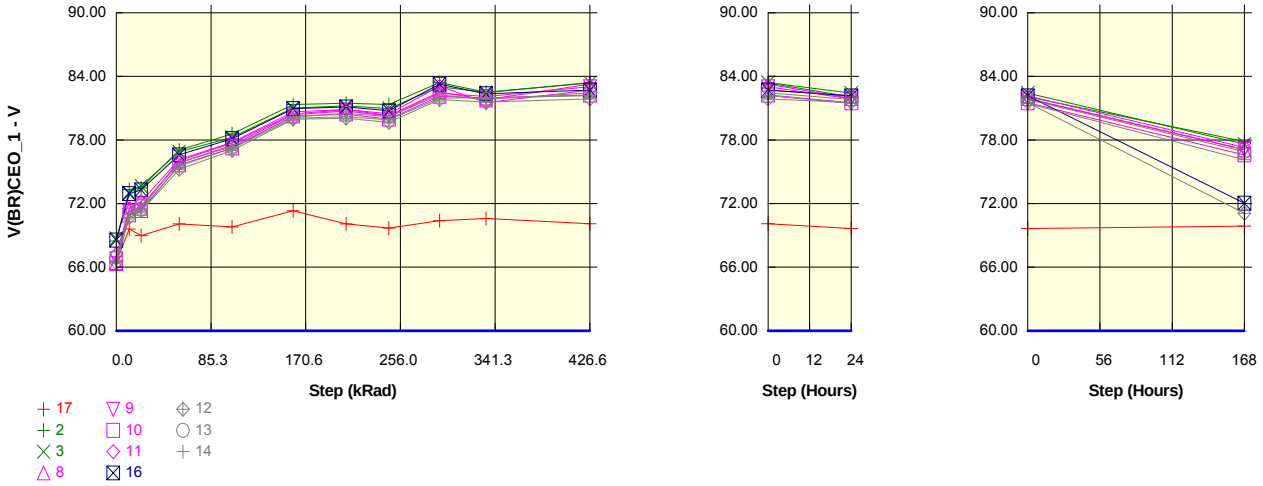
Measurements

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	219.7	220.3	220.0	220.6	219.8	220.5	220.3	217.9	220.4	220.9	216.1	220.4	220.4
OFF_TID samples													
12	219.8	217.8	216.2	213.1	207.7	203.0	199.8	196.9	193.9	191.6	188.3	188.1	212.0
13	221.8	218.8	217.7	214.0	209.1	204.1	201.1	198.3	195.7	193.2	190.0	190.0	212.5
14	219.7	218.4	216.4	213.0	208.1	202.7	199.5	196.4	191.0	191.1	187.3	187.2	211.6
Statistics													
Min	219.7	217.8	216.2	213.0	207.7	202.7	199.5	196.4	191.0	191.1	187.3	187.2	211.6
Max	221.8	218.8	217.7	214.0	209.1	204.1	201.1	198.3	195.7	193.2	190.0	190.0	212.5
Average	220.4	218.3	216.8	213.4	208.3	203.2	200.1	197.2	193.5	192.0	188.5	188.4	212.0
Sigma	1.0	0.4	0.7	0.4	0.6	0.6	0.7	0.8	1.9	0.9	1.2	1.2	0.4

Drift Calculation

V(BR)CBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	-2.0E+00	-3.6E+00	-6.7E+00	-12.1E+00	-16.8E+00	-20.0E+00	-22.9E+00	-25.9E+00	-28.2E+00	-31.5E+00	-31.7E+00	-7.8E+00
13	-	-3.0E+00	-4.1E+00	-7.8E+00	-12.7E+00	-17.7E+00	-20.7E+00	-23.5E+00	-26.1E+00	-28.6E+00	-31.8E+00	-31.8E+00	-9.4E+00
14	-	-1.4E+00	-3.3E+00	-6.8E+00	-11.6E+00	-17.1E+00	-20.3E+00	-23.4E+00	-28.7E+00	-28.6E+00	-32.5E+00	-32.5E+00	-8.1E+00
Average	-	-2.1E+00	-3.7E+00	-7.1E+00	-12.1E+00	-17.2E+00	-20.3E+00	-23.2E+00	-26.9E+00	-28.5E+00	-31.9E+00	-32.0E+00	-8.4E+00
Sigma	-	681.2E-03	335.1E-03	524.8E-03	422.0E-03	389.6E-03	282.9E-03	250.0E-03	1.3E+00	198.2E-03	416.7E-03	366.4E-03	671.5E-03

Parameter : Collecor-Emitter breakdown voltage : V(BR)CEO_1
Test conditions : Ic = 10mA
Unit : V
Spec Limit Min : 60.00
Spec limits are represented in bold lines on the graphic.



Measurements

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.52	69.60	68.97	70.09	69.81	71.32	70.08	69.69	70.40	70.60	70.12	69.65	69.86
ON_PROTON samples													
2	68.46	73.32	73.48	77.05	78.58	81.34	81.47	81.33	83.42	82.50	83.37	82.08	77.87
3	68.71	73.03	73.66	76.89	78.26	81.02	81.21	80.98	83.03	82.49	83.42	82.42	77.59
Statistics													
Min	68.46	73.03	73.48	76.89	78.26	81.02	81.21	80.98	83.03	82.49	83.37	82.08	77.59
Max	68.71	73.32	73.66	77.05	78.58	81.34	81.47	81.33	83.42	82.50	83.42	82.42	77.87
Average	68.58	73.17	73.57	76.97	78.42	81.18	81.34	81.16	83.22	82.50	83.39	82.25	77.73
Sigma	0.13	0.14	0.09	0.08	0.16	0.16	0.13	0.17	0.20	0.00	0.02	0.17	0.14

Drift Calculation

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	4.9E+00	5.0E+00	8.6E+00	10.1E+00	12.9E+00	13.0E+00	12.9E+00	15.0E+00	14.0E+00	14.9E+00	13.6E+00	9.4E+00
3	-	4.3E+00	5.0E+00	8.2E+00	9.6E+00	12.3E+00	12.5E+00	12.3E+00	14.3E+00	13.8E+00	14.7E+00	13.7E+00	8.9E+00
Average	-	4.6E+00	5.0E+00	8.4E+00	9.8E+00	12.6E+00	12.8E+00	12.6E+00	14.6E+00	13.9E+00	14.8E+00	13.7E+00	9.2E+00
Sigma	-	270.0E-03	32.0E-03	206.0E-03	288.0E-03	288.0E-03	254.0E-03	301.0E-03	322.0E-03	130.0E-03	103.0E-03	44.0E-03	266.0E-03

Measurements

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.52	69.60	68.97	70.09	69.81	71.32	70.08	69.69	70.40	70.60	70.12	69.65	69.86
ON_TID samples													
8	66.43	71.36	71.56	76.04	77.70	80.46	80.86	80.30	82.54	81.79	83.27	81.92	77.08
9	66.80	71.26	71.79	75.85	77.50	80.39	80.73	80.25	82.41	82.09	83.02	81.88	77.09
10	66.34	70.93	71.34	75.64	77.24	80.26	80.44	79.97	82.13	81.96	82.24	81.51	76.59
11	67.22	71.53	72.20	76.16	77.78	80.65	80.90	80.48	83.06	81.54	82.70	82.15	77.31
Statistics													
Min	66.34	70.93	71.34	75.64	77.24	80.26	80.44	79.97	82.13	81.54	82.24	81.51	76.59
Max	67.22	71.53	72.20	76.16	77.78	80.65	80.90	80.48	83.06	82.09	83.27	82.15	77.31
Average	66.70	71.27	71.72	75.92	77.56	80.44	80.73	80.25	82.53	81.85	82.81	81.87	77.02
Sigma	0.35	0.22	0.32	0.20	0.21	0.14	0.18	0.18	0.34	0.20	0.39	0.23	0.26

Drift Calculation

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	4.9E+00	5.1E+00	9.6E+00	11.3E+00	14.0E+00	14.4E+00	13.9E+00	16.1E+00	15.4E+00	16.8E+00	15.5E+00	10.6E+00
9	-	4.5E+00	5.0E+00	9.1E+00	10.7E+00	13.6E+00	13.9E+00	13.5E+00	15.6E+00	15.3E+00	16.2E+00	15.1E+00	10.3E+00
10	-	4.6E+00	5.0E+00	9.3E+00	10.9E+00	13.9E+00	14.1E+00	13.6E+00	15.8E+00	15.6E+00	15.9E+00	15.2E+00	10.2E+00
11	-	4.3E+00	5.0E+00	8.9E+00	10.6E+00	13.4E+00	13.7E+00	13.3E+00	15.8E+00	14.3E+00	15.5E+00	14.9E+00	10.1E+00
Average	-	4.6E+00	5.0E+00	9.2E+00	10.9E+00	13.7E+00	14.0E+00	13.6E+00	15.8E+00	15.1E+00	16.1E+00	15.2E+00	10.3E+00
Sigma	-	228.2E-03	57.9E-03	255.0E-03	264.3E-03	240.7E-03	273.9E-03	223.7E-03	176.6E-03	490.7E-03	497.4E-03	203.2E-03	204.4E-03

Measurements

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.52	69.60	68.97	70.09	69.81	71.32	70.08	69.69	70.40	70.60	70.12	69.65	69.86
OFF_PROTON samples													
16	68.56	72.94	73.30	76.60	78.12	80.96	81.12	80.75	83.27	82.36	82.71	82.16	72.03
Statistics													
Min	68.56	72.94	73.30	76.60	78.12	80.96	81.12	80.75	83.27	82.36	82.71	82.16	72.03
Max	68.56	72.94	73.30	76.60	78.12	80.96	81.12	80.75	83.27	82.36	82.71	82.16	72.03
Average	68.56	72.94	73.30	76.60	78.12	80.96	81.12	80.75	83.27	82.36	82.71	82.16	72.03
Sigma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drift Calculation

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	4.4E+00	4.7E+00	8.0E+00	9.6E+00	12.4E+00	12.6E+00	12.2E+00	14.7E+00	13.8E+00	14.2E+00	13.6E+00	3.5E+00
Average	-	4.4E+00	4.7E+00	8.0E+00	9.6E+00	12.4E+00	12.6E+00	12.2E+00	14.7E+00	13.8E+00	14.2E+00	13.6E+00	3.5E+00
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

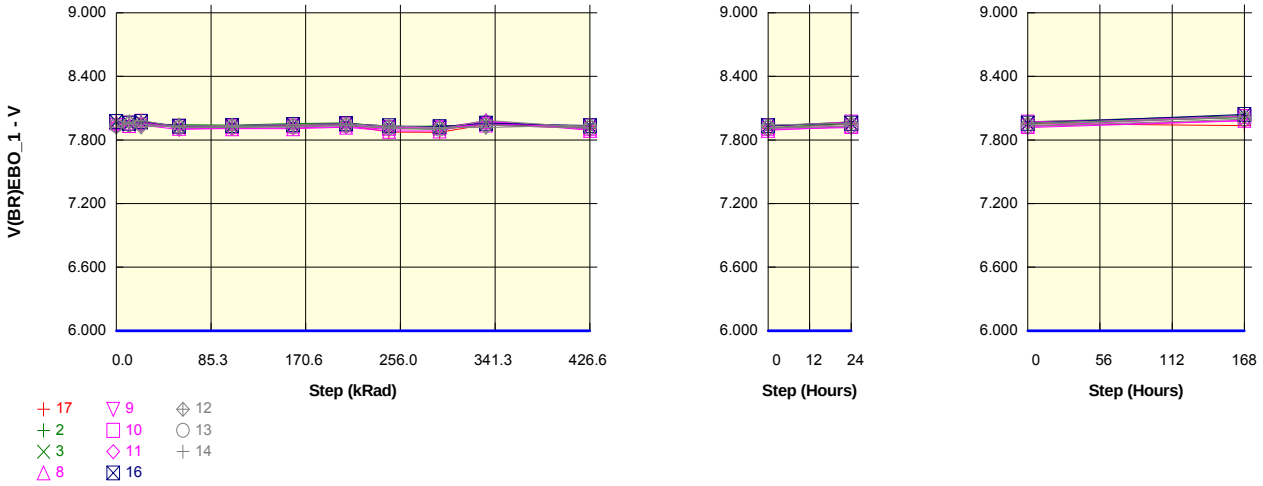
Measurements

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.52	69.60	68.97	70.09	69.81	71.32	70.08	69.69	70.40	70.60	70.12	69.65	69.86
OFF_TID samples													
12	66.42	70.67	71.29	75.22	77.01	79.95	80.04	79.66	81.81	81.58	81.88	81.54	71.08
13	66.94	71.14	71.74	75.86	77.38	80.18	80.51	80.20	82.25	81.84	82.45	81.82	76.89
14	66.48	70.98	71.42	75.57	77.22	80.04	80.20	79.89	81.94	82.00	82.18	81.45	76.13
Statistics													
Min	66.42	70.67	71.29	75.22	77.01	79.95	80.04	79.66	81.81	81.58	81.88	81.45	71.08
Max	66.94	71.14	71.74	75.86	77.38	80.18	80.51	80.20	82.25	82.00	82.45	81.82	76.89
Average	66.61	70.93	71.48	75.55	77.20	80.06	80.25	79.92	82.00	81.80	82.17	81.60	74.70
Sigma	0.23	0.19	0.19	0.26	0.15	0.09	0.19	0.22	0.18	0.17	0.23	0.16	2.58

Drift Calculation

V(BR)CEO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	4.3E+00	4.9E+00	8.8E+00	10.6E+00	13.5E+00	13.6E+00	13.2E+00	15.4E+00	15.2E+00	15.5E+00	15.1E+00	4.7E+00
13	-	4.2E+00	4.8E+00	8.9E+00	10.4E+00	13.2E+00	13.6E+00	13.3E+00	15.3E+00	14.9E+00	15.5E+00	14.9E+00	10.0E+00
14	-	4.5E+00	4.9E+00	9.1E+00	10.7E+00	13.6E+00	13.7E+00	13.4E+00	15.5E+00	15.5E+00	15.7E+00	15.0E+00	9.7E+00
Average	-	4.3E+00	4.9E+00	8.9E+00	10.6E+00	13.4E+00	13.6E+00	13.3E+00	15.4E+00	15.2E+00	15.6E+00	15.0E+00	8.1E+00
Sigma	-	129.0E-03	55.6E-03	114.9E-03	122.5E-03	143.6E-03	59.5E-03	74.8E-03	60.5E-03	251.0E-03	101.2E-03	100.7E-03	2.4E+00

Parameter : Emitter-Base breakdown voltage : V(BR)EBO_1
Test conditions : Ie = 10µA
Unit : V
Spec Limit Min : 6.000
Spec limits are represented in bold lines on the graphic.



Measurements

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.967	7.938	7.964	7.928	7.916	7.939	7.942	7.874	7.873	7.946	7.909	7.955	7.935
ON_PROTON samples													
2	7.952	7.962	7.947	7.944	7.939	7.954	7.962	7.924	7.933	7.946	7.931	7.972	8.031
3	7.973	7.947	7.967	7.921	7.920	7.932	7.942	7.908	7.902	7.947	7.916	7.958	8.011
Statistics													
Min	7.952	7.947	7.947	7.921	7.920	7.932	7.942	7.908	7.902	7.946	7.916	7.958	8.011
Max	7.973	7.962	7.967	7.944	7.939	7.954	7.962	7.924	7.933	7.947	7.931	7.972	8.031
Average	7.962	7.955	7.957	7.932	7.930	7.943	7.952	7.916	7.917	7.947	7.923	7.965	8.021
Sigma	0.011	0.008	0.010	0.011	0.009	0.011	0.010	0.008	0.015	0.001	0.008	0.007	0.010

Drift Calculation

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	10.8E-03	-4.8E-03	-8.0E-03	-12.4E-03	2.8E-03	10.0E-03	-28.0E-03	-18.8E-03	-5.6E-03	-20.8E-03	20.8E-03	79.6E-03
3	-	-26.0E-03	-5.6E-03	-52.0E-03	-52.4E-03	-40.4E-03	-30.8E-03	-64.4E-03	-70.8E-03	-25.6E-03	-57.2E-03	-15.2E-03	38.4E-03
Average	-	-7.6E-03	-5.2E-03	-30.0E-03	-32.4E-03	-18.8E-03	-10.4E-03	-46.2E-03	-44.8E-03	-15.6E-03	-39.0E-03	2.8E-03	59.0E-03
Sigma	-	18.4E-03	400.1E-06	22.0E-03	20.0E-03	21.6E-03	20.4E-03	18.2E-03	26.0E-03	10.0E-03	18.2E-03	18.0E-03	20.6E-03

Measurements

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.967	7.938	7.964	7.928	7.916	7.939	7.942	7.874	7.873	7.946	7.909	7.955	7.935
ON_TID samples													
8	7.963	7.936	7.970	7.910	7.906	7.907	7.920	7.883	7.885	7.973	7.892	7.926	7.986
9	7.937	7.957	7.944	7.924	7.936	7.943	7.954	7.920	7.910	7.952	7.932	7.970	8.020
10	7.974	7.957	7.977	7.928	7.926	7.931	7.943	7.910	7.914	7.940	7.909	7.933	8.022
11	7.932	7.935	7.940	7.900	7.910	7.914	7.926	7.901	7.914	7.980	7.898	7.918	7.981
Statistics													
Min	7.932	7.935	7.940	7.900	7.906	7.907	7.920	7.883	7.885	7.940	7.892	7.918	7.981
Max	7.974	7.957	7.977	7.928	7.936	7.943	7.954	7.920	7.914	7.980	7.932	7.970	8.022
Average	7.952	7.946	7.958	7.915	7.919	7.924	7.936	7.904	7.906	7.961	7.908	7.937	8.002
Sigma	0.018	0.011	0.016	0.011	0.012	0.014	0.013	0.014	0.012	0.016	0.015	0.020	0.019

Drift Calculation

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-27.2E-03	7.2E-03	-52.8E-03	-56.4E-03	-56.0E-03	-42.8E-03	-80.0E-03	-77.6E-03	10.4E-03	-71.2E-03	-36.4E-03	23.2E-03
9	-	20.0E-03	6.8E-03	-13.6E-03	-1.2E-03	5.6E-03	16.8E-03	-16.8E-03	-27.2E-03	14.8E-03	-5.2E-03	32.4E-03	82.4E-03
10	-	-17.6E-03	2.8E-03	-46.4E-03	-48.4E-03	-43.2E-03	-31.6E-03	-64.0E-03	-60.0E-03	-34.0E-03	-65.2E-03	-41.6E-03	47.2E-03
11	-	3.6E-03	8.8E-03	-32.0E-03	-22.0E-03	-17.2E-03	-5.6E-03	-30.8E-03	-17.2E-03	48.0E-03	-34.0E-03	-13.2E-03	49.6E-03
Average	-	-5.3E-03	6.4E-03	-36.2E-03	-32.0E-03	-27.7E-03	-15.8E-03	-47.9E-03	-45.5E-03	9.8E-03	-43.9E-03	-14.7E-03	50.6E-03
Sigma	-	18.4E-03	2.2E-03	15.1E-03	21.9E-03	23.8E-03	23.2E-03	25.2E-03	24.4E-03	29.2E-03	26.4E-03	29.2E-03	21.1E-03

Measurements

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.967	7.938	7.964	7.928	7.916	7.939	7.942	7.874	7.873	7.946	7.909	7.955	7.935
OFF_PROTON samples													
16	7.973	7.958	7.974	7.931	7.936	7.944	7.954	7.934	7.925	7.958	7.934	7.958	8.040
Statistics													
Min	7.973	7.958	7.974	7.931	7.936	7.944	7.954	7.934	7.925	7.958	7.934	7.958	8.040
Max	7.973	7.958	7.974	7.931	7.936	7.944	7.954	7.934	7.925	7.958	7.934	7.958	8.040
Average	7.973	7.958	7.974	7.931	7.936	7.944	7.954	7.934	7.925	7.958	7.934	7.958	8.040
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Drift Calculation

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	-15.6E-03	400.1E-06	-42.4E-03	-37.2E-03	-28.8E-03	-19.2E-03	-39.6E-03	-48.0E-03	-14.8E-03	-38.8E-03	-15.2E-03	67.2E-03
Average	-	-15.6E-03	400.1E-06	-42.4E-03	-37.2E-03	-28.8E-03	-19.2E-03	-39.6E-03	-48.0E-03	-14.8E-03	-38.8E-03	-15.2E-03	67.2E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

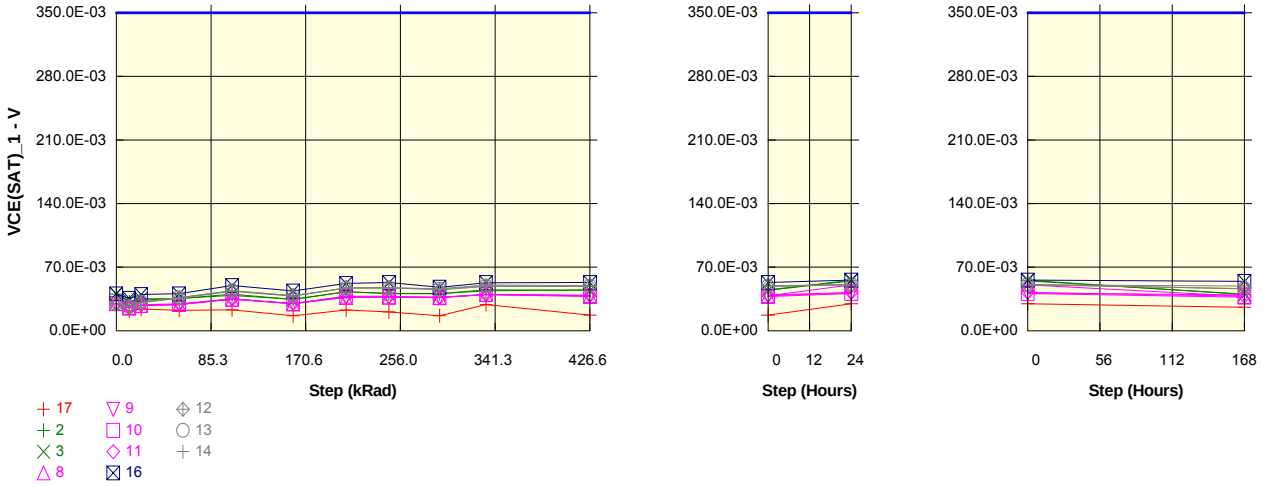
Measurements

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.967	7.938	7.964	7.928	7.916	7.939	7.942	7.874	7.873	7.946	7.909	7.955	7.935
OFF_TID samples													
12	7.920	7.970	7.924	7.933	7.938	7.944	7.952	7.932	7.917	7.918	7.941	7.959	8.016
13	7.936	7.946	7.950	7.916	7.918	7.923	7.936	7.912	7.900	7.940	7.910	7.930	7.996
14	7.987	7.953	7.984	7.920	7.927	7.930	7.938	7.917	7.904	7.984	7.917	7.947	8.016
Statistics													
Min	7.920	7.946	7.924	7.916	7.918	7.923	7.936	7.912	7.900	7.918	7.910	7.930	7.996
Max	7.987	7.970	7.984	7.933	7.938	7.944	7.952	7.932	7.917	7.984	7.941	7.959	8.016
Average	7.947	7.956	7.953	7.923	7.928	7.932	7.942	7.920	7.907	7.947	7.923	7.945	8.009
Sigma	0.029	0.010	0.025	0.007	0.008	0.009	0.007	0.009	0.007	0.028	0.013	0.012	0.010

Drift Calculation

V(BR)EBO_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	50.4E-03	3.6E-03	13.2E-03	18.4E-03	24.0E-03	31.6E-03	12.4E-03	-2.8E-03	-2.0E-03	20.8E-03	38.8E-03	95.6E-03
13	-	10.0E-03	14.4E-03	-19.2E-03	-17.6E-03	-12.4E-03	400.1E-06	-23.6E-03	-35.6E-03	4.0E-03	-25.6E-03	-6.0E-03	60.0E-03
14	-	-34.0E-03	-2.8E-03	-67.2E-03	-60.0E-03	-57.2E-03	-48.8E-03	-70.0E-03	-83.2E-03	-2.4E-03	-69.6E-03	-40.0E-03	29.2E-03
Average	-	8.8E-03	5.1E-03	-24.4E-03	-19.7E-03	-15.2E-03	-5.6E-03	-27.1E-03	-40.5E-03	-133.4E-06	-24.8E-03	-2.4E-03	61.6E-03
Sigma	-	34.5E-03	7.1E-03	33.0E-03	32.0E-03	33.2E-03	33.1E-03	33.7E-03	33.0E-03	2.9E-03	36.9E-03	32.3E-03	27.1E-03

Parameter : Collector-Emitter saturation oltage : VCE(SAT)_1
Test conditions : Ic = 1mA ; ib = 100µA
Unit : V
Spec Limit Max : 350.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.6E-03	21.7E-03	23.8E-03	22.6E-03	23.2E-03	16.5E-03	22.9E-03	20.8E-03	16.6E-03	29.0E-03	17.3E-03	29.7E-03	26.0E-03
ON_PROTON samples													
2	40.3E-03	31.9E-03	33.8E-03	35.7E-03	38.9E-03	34.7E-03	43.0E-03	40.7E-03	40.8E-03	44.1E-03	45.0E-03	55.6E-03	39.9E-03
3	40.5E-03	33.0E-03	35.2E-03	35.5E-03	40.3E-03	34.4E-03	43.0E-03	41.4E-03	40.7E-03	45.1E-03	44.5E-03	55.0E-03	40.3E-03
Statistics													
Min	40.3E-03	31.9E-03	33.8E-03	35.5E-03	38.9E-03	34.4E-03	43.0E-03	40.7E-03	40.7E-03	44.1E-03	44.5E-03	55.0E-03	39.9E-03
Max	40.5E-03	33.0E-03	35.2E-03	35.7E-03	40.3E-03	34.7E-03	43.0E-03	41.4E-03	40.8E-03	45.1E-03	45.0E-03	55.6E-03	40.3E-03
Average	40.4E-03	32.5E-03	34.5E-03	35.6E-03	39.6E-03	34.5E-03	43.0E-03	41.0E-03	40.8E-03	44.6E-03	44.8E-03	55.3E-03	40.1E-03
Sigma	80.0E-06	540.0E-06	740.0E-06	100.0E-06	680.0E-06	180.0E-06	20.0E-06	340.0E-06	40.0E-06	520.0E-06	260.0E-06	320.0E-06	200.0E-06

Drift Calculation

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-8.4E-03	-6.6E-03	-4.6E-03	-1.4E-03	-5.6E-03	2.6E-03	360.0E-06	480.0E-06	3.8E-03	4.7E-03	15.3E-03	-400.0E-06
3	-	-7.5E-03	-5.2E-03	-5.0E-03	-200.0E-06	-6.1E-03	2.5E-03	880.0E-06	240.0E-06	4.6E-03	4.0E-03	14.5E-03	-160.0E-06
Average	-	-7.9E-03	-5.9E-03	-4.8E-03	-800.0E-06	-5.9E-03	2.6E-03	620.0E-06	360.0E-06	4.2E-03	4.4E-03	14.9E-03	-280.0E-06
Sigma	-	460.0E-06	660.0E-06	180.0E-06	600.0E-06	260.0E-06	60.0E-06	260.0E-06	120.0E-06	440.0E-06	340.0E-06	400.0E-06	120.0E-06

Measurements

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.6E-03	21.7E-03	23.8E-03	22.6E-03	23.2E-03	16.5E-03	22.9E-03	20.8E-03	16.6E-03	29.0E-03	17.3E-03	29.7E-03	26.0E-03
ON_TID samples													
8	30.0E-03	25.7E-03	27.7E-03	29.0E-03	34.9E-03	29.8E-03	36.6E-03	37.2E-03	36.7E-03	40.1E-03	38.5E-03	50.6E-03	38.0E-03
9	30.2E-03	25.3E-03	27.8E-03	29.0E-03	34.7E-03	30.0E-03	37.2E-03	36.9E-03	36.8E-03	39.7E-03	38.4E-03	41.4E-03	39.6E-03
10	29.8E-03	25.0E-03	28.0E-03	28.9E-03	34.9E-03	29.6E-03	38.0E-03	36.8E-03	36.4E-03	39.9E-03	37.7E-03	41.0E-03	37.1E-03
11	30.2E-03	25.2E-03	28.6E-03	29.7E-03	35.1E-03	30.3E-03	38.1E-03	38.0E-03	36.8E-03	39.9E-03	39.3E-03	42.4E-03	38.0E-03
Statistics													
Min	29.8E-03	25.0E-03	27.7E-03	28.9E-03	34.7E-03	29.6E-03	36.6E-03	36.8E-03	36.4E-03	39.7E-03	37.7E-03	41.0E-03	37.1E-03
Max	30.2E-03	25.7E-03	28.6E-03	29.7E-03	35.1E-03	30.3E-03	38.1E-03	38.0E-03	36.8E-03	40.1E-03	39.3E-03	50.6E-03	39.6E-03
Average	30.1E-03	25.3E-03	28.0E-03	29.2E-03	34.9E-03	29.9E-03	37.5E-03	37.2E-03	36.7E-03	39.9E-03	38.5E-03	43.9E-03	38.2E-03
Sigma	157.5E-06	259.2E-06	356.7E-06	320.5E-06	142.8E-06	242.5E-06	603.6E-06	441.8E-06	133.8E-06	142.5E-06	566.7E-06	3.9E-03	909.1E-06

Drift Calculation

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-4.4E-03	-2.3E-03	-1.0E-03	4.8E-03	-240.0E-06	6.6E-03	7.2E-03	6.7E-03	10.1E-03	8.5E-03	20.6E-03	7.9E-03
9	-	-4.9E-03	-2.4E-03	-1.2E-03	4.5E-03	-160.0E-06	7.0E-03	6.7E-03	6.6E-03	9.5E-03	8.2E-03	11.2E-03	9.4E-03
10	-	-4.9E-03	-1.9E-03	-920.0E-06	5.0E-03	-200.0E-06	8.2E-03	7.0E-03	6.6E-03	10.0E-03	7.9E-03	11.2E-03	7.2E-03
11	-	-5.0E-03	-1.6E-03	-520.0E-06	4.9E-03	40.0E-06	7.8E-03	7.7E-03	6.5E-03	9.7E-03	9.1E-03	12.2E-03	7.8E-03
Average	-	-4.8E-03	-2.0E-03	-910.0E-06	4.8E-03	-140.0E-06	7.4E-03	7.2E-03	6.6E-03	9.8E-03	8.4E-03	13.8E-03	8.1E-03
Sigma	-	260.8E-06	316.2E-06	240.6E-06	188.7E-06	107.7E-06	639.0E-06	365.5E-06	59.2E-06	237.3E-06	436.8E-06	3.9E-03	802.5E-06

Measurements

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.6E-03	21.7E-03	23.8E-03	22.6E-03	23.2E-03	16.5E-03	22.9E-03	20.8E-03	16.6E-03	29.0E-03	17.3E-03	29.7E-03	26.0E-03
OFF_PROTON samples													
16	40.8E-03	35.5E-03	39.9E-03	40.7E-03	49.8E-03	43.7E-03	52.1E-03	53.1E-03	47.9E-03	53.0E-03	53.0E-03	55.8E-03	54.3E-03
Statistics													
Min	40.8E-03	35.5E-03	39.9E-03	40.7E-03	49.8E-03	43.7E-03	52.1E-03	53.1E-03	47.9E-03	53.0E-03	53.0E-03	55.8E-03	54.3E-03
Max	40.8E-03	35.5E-03	39.9E-03	40.7E-03	49.8E-03	43.7E-03	52.1E-03	53.1E-03	47.9E-03	53.0E-03	53.0E-03	55.8E-03	54.3E-03
Average	40.8E-03	35.5E-03	39.9E-03	40.7E-03	49.8E-03	43.7E-03	52.1E-03	53.1E-03	47.9E-03	53.0E-03	53.0E-03	55.8E-03	54.3E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	-5.2E-03	-840.0E-06	-80.0E-06	9.0E-03	2.9E-03	11.4E-03	12.3E-03	7.1E-03	12.2E-03	12.3E-03	15.1E-03	13.6E-03
Average	-	-5.2E-03	-840.0E-06	-80.0E-06	9.0E-03	2.9E-03	11.4E-03	12.3E-03	7.1E-03	12.2E-03	12.3E-03	15.1E-03	13.6E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

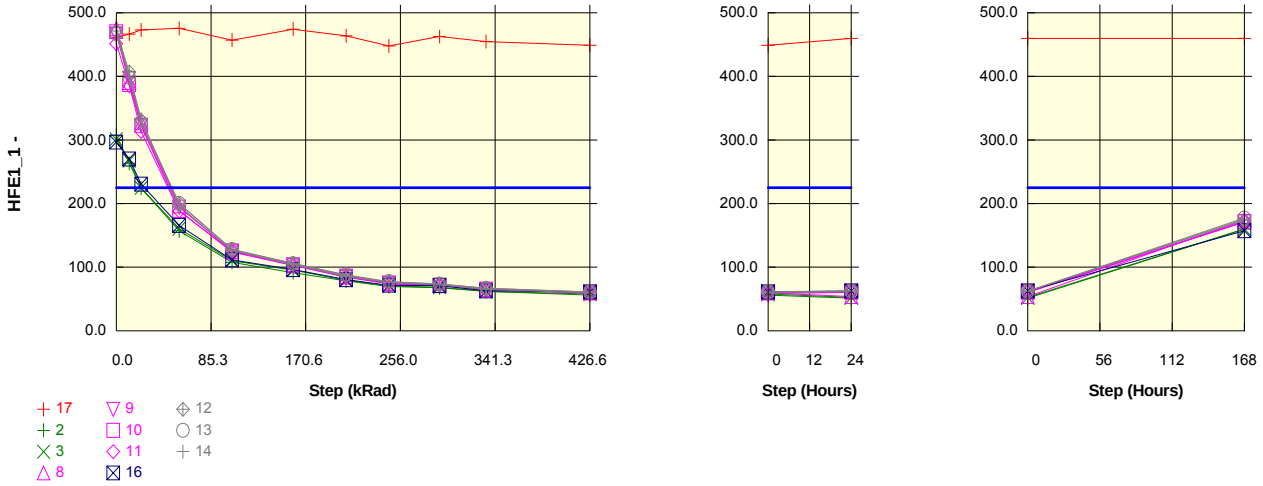
Measurements

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.6E-03	21.7E-03	23.8E-03	22.6E-03	23.2E-03	16.5E-03	22.9E-03	20.8E-03	16.6E-03	29.0E-03	17.3E-03	29.7E-03	26.0E-03
OFF_TID samples													
12	29.6E-03	27.0E-03	31.0E-03	35.7E-03	43.4E-03	38.0E-03	47.2E-03	47.3E-03	45.0E-03	48.7E-03	48.8E-03	50.6E-03	49.3E-03
13	29.9E-03	26.6E-03	31.6E-03	36.5E-03	44.1E-03	38.6E-03	47.1E-03	47.2E-03	46.0E-03	49.2E-03	49.2E-03	51.1E-03	46.1E-03
14	29.6E-03	26.7E-03	31.6E-03	36.6E-03	43.9E-03	38.8E-03	46.8E-03	47.5E-03	46.2E-03	50.2E-03	49.6E-03	50.6E-03	46.6E-03
Statistics													
Min	29.6E-03	26.6E-03	31.0E-03	35.7E-03	43.4E-03	38.0E-03	46.8E-03	47.2E-03	45.0E-03	48.7E-03	48.8E-03	50.6E-03	46.1E-03
Max	29.9E-03	27.0E-03	31.6E-03	36.6E-03	44.1E-03	38.8E-03	47.2E-03	47.5E-03	46.2E-03	50.2E-03	49.6E-03	51.1E-03	49.3E-03
Average	29.7E-03	26.8E-03	31.4E-03	36.2E-03	43.8E-03	38.5E-03	47.1E-03	47.3E-03	45.7E-03	49.4E-03	49.2E-03	50.8E-03	47.3E-03
Sigma	150.8E-06	172.8E-06	264.0E-06	397.3E-06	271.9E-06	315.0E-06	154.3E-06	130.6E-06	513.3E-06	630.8E-06	311.6E-06	255.1E-06	1.4E-03

Drift Calculation

VCE(SAT)_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	-2.5E-03	1.4E-03	6.1E-03	13.9E-03	8.5E-03	17.6E-03	17.8E-03	15.4E-03	19.2E-03	19.3E-03	21.0E-03	19.8E-03
13	-	-3.2E-03	1.7E-03	6.6E-03	14.2E-03	8.8E-03	17.2E-03	17.3E-03	16.1E-03	19.4E-03	19.3E-03	21.2E-03	16.2E-03
14	-	-2.8E-03	2.0E-03	7.0E-03	14.4E-03	9.2E-03	17.3E-03	17.9E-03	16.6E-03	20.7E-03	20.0E-03	21.0E-03	17.1E-03
Average	-	-2.9E-03	1.7E-03	6.6E-03	14.1E-03	8.8E-03	17.4E-03	17.7E-03	16.1E-03	19.7E-03	19.5E-03	21.1E-03	17.7E-03
Sigma	-	294.5E-06	229.4E-06	359.8E-06	199.6E-06	296.3E-06	179.9E-06	271.9E-06	475.9E-06	674.4E-06	358.3E-06	105.0E-06	1.5E-03

Parameter : DC current gain : HFE1_1
Test conditions : Ic = 100µA ; Vce = 5V
Unit :
Spec Limit Min : 225.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	461.5	466.5	473.2	475.4	457.0	474.3	463.7	447.7	462.6	454.8	448.8	459.6	459.8
ON_PROTON samples													
2	307.3	263.4	224.1	157.2	107.7	91.5	78.3	69.7	67.5	62.2	56.1	51.3	160.2
3	301.3	267.7	224.6	160.5	110.3	95.3	79.5	70.6	68.3	61.9	57.7	52.4	160.1
Statistics													
Min	301.3	263.4	224.1	157.2	107.7	91.5	78.3	69.7	67.5	61.9	56.1	51.3	160.1
Max	307.3	267.7	224.6	160.5	110.3	95.3	79.5	70.6	68.3	62.2	57.7	52.4	160.2
Average	304.3	265.5	224.3	158.9	109.0	93.4	78.9	70.1	67.9	62.0	56.9	51.8	160.2
Sigma	3.0	2.2	0.3	1.7	1.3	1.9	0.6	0.4	0.4	0.1	0.8	0.6	0.0

Drift Calculation

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	542.8E-06	1.2E-03	3.1E-03	6.0E-03	7.7E-03	9.5E-03	11.1E-03	11.6E-03	12.8E-03	14.6E-03	16.3E-03	3.0E-03
3	-	416.7E-06	1.1E-03	2.9E-03	5.7E-03	7.2E-03	9.3E-03	10.8E-03	11.3E-03	12.8E-03	14.0E-03	15.8E-03	2.9E-03
Average	-	479.8E-06	1.2E-03	3.0E-03	5.9E-03	7.4E-03	9.4E-03	11.0E-03	11.4E-03	12.8E-03	14.3E-03	16.0E-03	3.0E-03
Sigma	-	63.1E-06	37.7E-06	98.2E-06	142.5E-06	248.7E-06	134.4E-06	123.6E-06	116.6E-06	4.2E-06	283.4E-06	250.5E-06	30.9E-06

Measurements

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	461.5	466.5	473.2	475.4	457.0	474.3	463.7	447.7	462.6	454.8	448.8	459.6	459.8
ON_TID samples													
8	475.5	390.5	327.9	196.1	125.0	104.3	85.3	74.4	71.2	65.2	59.7	53.9	174.2
9	465.6	396.7	322.7	194.4	125.8	104.0	85.9	75.1	72.0	65.6	59.3	62.0	171.1
10	470.2	387.3	323.0	189.1	123.9	102.7	84.2	74.0	71.0	64.6	59.7	60.5	171.7
11	451.4	385.8	313.2	188.4	125.2	103.1	84.9	74.6	71.8	64.8	59.0	60.4	172.2
Statistics													
Min	451.4	385.8	313.2	188.4	123.9	102.7	84.2	74.0	71.0	64.6	59.0	53.9	171.1
Max	475.5	396.7	327.9	196.1	125.8	104.3	85.9	75.1	72.0	65.6	59.7	62.0	174.2
Average	465.7	390.1	321.7	192.0	124.9	103.5	85.1	74.5	71.5	65.1	59.4	59.2	172.3
Sigma	8.9	4.2	5.3	3.3	0.7	0.7	0.6	0.4	0.4	0.4	0.3	3.1	1.2

Drift Calculation

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	457.6E-06	946.8E-06	3.0E-03	5.9E-03	7.5E-03	9.6E-03	11.3E-03	11.9E-03	13.2E-03	14.7E-03	16.4E-03	3.6E-03
9	-	373.1E-06	950.9E-06	3.0E-03	5.8E-03	7.5E-03	9.5E-03	11.2E-03	11.7E-03	13.1E-03	14.7E-03	14.0E-03	3.7E-03
10	-	455.4E-06	969.4E-06	3.2E-03	5.9E-03	7.6E-03	9.8E-03	11.4E-03	12.0E-03	13.4E-03	14.6E-03	14.4E-03	3.7E-03
11	-	376.5E-06	977.9E-06	3.1E-03	5.8E-03	7.5E-03	9.6E-03	11.2E-03	11.7E-03	13.2E-03	14.7E-03	14.3E-03	3.6E-03
Average	-	415.6E-06	961.2E-06	3.1E-03	5.9E-03	7.5E-03	9.6E-03	11.3E-03	11.8E-03	13.2E-03	14.7E-03	14.8E-03	3.7E-03
Sigma	-	40.9E-06	12.9E-06	70.6E-06	70.2E-06	59.0E-06	95.8E-06	94.6E-06	111.8E-06	94.8E-06	39.7E-06	963.3E-06	45.0E-06

Measurements

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	461.5	466.5	473.2	475.4	457.0	474.3	463.7	447.7	462.6	454.8	448.8	459.6	459.8
OFF_PROTON samples													
16	296.6	270.2	230.6	165.7	111.7	96.2	80.4	71.7	71.0	62.8	61.4	62.7	157.4
Statistics													
Min	296.6	270.2	230.6	165.7	111.7	96.2	80.4	71.7	71.0	62.8	61.4	62.7	157.4
Max	296.6	270.2	230.6	165.7	111.7	96.2	80.4	71.7	71.0	62.8	61.4	62.7	157.4
Average	296.6	270.2	230.6	165.7	111.7	96.2	80.4	71.7	71.0	62.8	61.4	62.7	157.4
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	328.9E-06	964.7E-06	2.7E-03	5.6E-03	7.0E-03	9.1E-03	10.6E-03	10.7E-03	12.6E-03	12.9E-03	12.6E-03	3.0E-03
Average	-	328.9E-06	964.7E-06	2.7E-03	5.6E-03	7.0E-03	9.1E-03	10.6E-03	10.7E-03	12.6E-03	12.9E-03	12.6E-03	3.0E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	116.4E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00

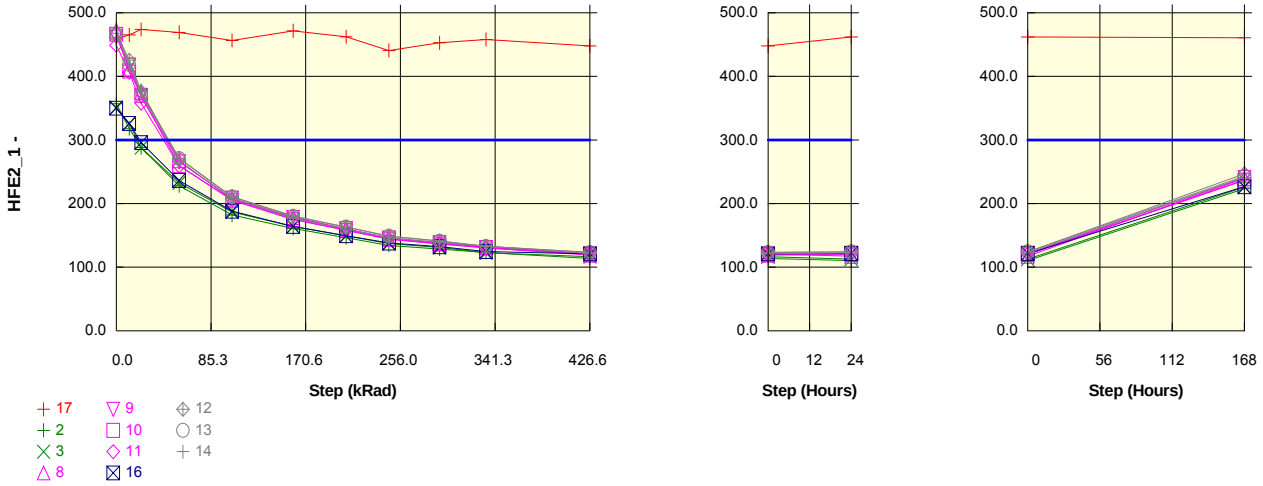
Measurements

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	461.5	466.5	473.2	475.4	457.0	474.3	463.7	447.7	462.6	454.8	448.8	459.6	459.8
OFF_TID samples													
12	471.2	406.7	331.1	199.9	127.6	106.0	87.2	77.0	73.3	66.8	60.8	62.5	173.7
13	467.6	398.8	327.3	200.2	128.1	105.6	88.2	77.4	73.6	66.9	61.1	62.3	177.4
14	478.2	397.7	332.6	194.8	126.3	103.9	85.5	75.8	72.3	65.2	59.7	61.8	175.7
Statistics													
Min	467.6	397.7	327.3	194.8	126.3	103.9	85.5	75.8	72.3	65.2	59.7	61.8	173.7
Max	478.2	406.7	332.6	200.2	128.1	106.0	88.2	77.4	73.6	66.9	61.1	62.5	177.4
Average	472.3	401.1	330.3	198.3	127.3	105.2	87.0	76.7	73.1	66.3	60.6	62.2	175.6
Sigma	4.4	4.0	2.2	2.5	0.7	0.9	1.1	0.7	0.5	0.8	0.6	0.3	1.5

Drift Calculation

HFE1_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	336.4E-06	898.5E-06	2.9E-03	5.7E-03	7.3E-03	9.3E-03	10.9E-03	11.5E-03	12.8E-03	14.3E-03	13.9E-03	3.6E-03
13	-	368.9E-06	916.3E-06	2.9E-03	5.7E-03	7.3E-03	9.2E-03	10.8E-03	11.4E-03	12.8E-03	14.2E-03	13.9E-03	3.5E-03
14	-	423.1E-06	915.1E-06	3.0E-03	5.8E-03	7.5E-03	9.6E-03	11.1E-03	11.7E-03	13.3E-03	14.7E-03	14.1E-03	3.6E-03
Average	-	376.1E-06	910.0E-06	2.9E-03	5.7E-03	7.4E-03	9.4E-03	10.9E-03	11.6E-03	13.0E-03	14.4E-03	14.0E-03	3.6E-03
Sigma	-	35.7E-06	8.1E-06	82.8E-06	66.0E-06	99.6E-06	163.5E-06	140.0E-06	122.2E-06	200.9E-06	186.8E-06	89.4E-06	58.6E-06

Parameter : DC current gain : HFE2_1
Test conditions : Ic = 1mA ; Vce = 5V
Unit :
Spec Limit Min : 300.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	458.8	465.0	473.8	469.2	456.5	471.7	462.3	440.8	452.8	458.0	447.9	461.9	460.8
ON_PROTON samples													
2	357.1	317.9	287.8	228.0	182.0	160.8	146.3	134.2	128.6	123.1	113.8	110.3	223.5
3	351.1	325.3	288.0	232.6	186.6	164.1	149.3	136.9	130.9	122.6	116.7	112.7	226.2
Statistics													
Min	351.1	317.9	287.8	228.0	182.0	160.8	146.3	134.2	128.6	122.6	113.8	110.3	223.5
Max	357.1	325.3	288.0	232.6	186.6	164.1	149.3	136.9	130.9	123.1	116.7	112.7	226.2
Average	354.1	321.6	287.9	230.3	184.3	162.5	147.8	135.6	129.8	122.9	115.3	111.5	224.8
Sigma	3.0	3.7	0.1	2.3	2.3	1.7	1.5	1.4	1.1	0.3	1.4	1.2	1.4

Drift Calculation

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	345.0E-06	673.7E-06	1.6E-03	2.7E-03	3.4E-03	4.0E-03	4.6E-03	5.0E-03	5.3E-03	6.0E-03	6.3E-03	1.7E-03
3	-	225.3E-06	623.7E-06	1.5E-03	2.5E-03	3.2E-03	3.8E-03	4.5E-03	4.8E-03	5.3E-03	5.7E-03	6.0E-03	1.6E-03
Average	-	285.1E-06	648.7E-06	1.5E-03	2.6E-03	3.3E-03	3.9E-03	4.6E-03	4.9E-03	5.3E-03	5.9E-03	6.1E-03	1.6E-03
Sigma	-	59.8E-06	25.0E-06	67.0E-06	91.7E-06	86.7E-06	92.8E-06	98.0E-06	90.4E-06	6.7E-06	130.4E-06	122.5E-06	51.3E-06

Measurements

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	458.8	465.0	473.8	469.2	456.5	471.7	462.3	440.8	452.8	458.0	447.9	461.9	460.8
ON_TID samples													
8	472.3	411.3	374.7	267.3	207.1	177.9	159.4	144.8	137.3	131.7	120.8	117.2	239.6
9	461.9	417.9	368.0	265.9	208.5	178.5	160.6	146.1	138.7	130.9	121.0	121.4	241.2
10	466.2	408.5	370.1	260.1	205.3	174.9	157.8	144.1	136.4	130.4	119.0	119.8	237.1
11	448.9	406.5	357.9	259.1	206.6	175.6	158.5	144.4	137.8	130.4	120.1	120.8	236.5
Statistics													
Min	448.9	406.5	357.9	259.1	205.3	174.9	157.8	144.1	136.4	130.4	119.0	117.2	236.5
Max	472.3	417.9	374.7	267.3	208.5	178.5	160.6	146.1	138.7	131.7	121.0	121.4	241.2
Average	462.3	411.0	367.7	263.1	206.8	176.7	159.1	144.8	137.5	130.8	120.2	119.8	238.6
Sigma	8.6	4.3	6.1	3.5	1.1	1.5	1.0	0.8	0.8	0.6	0.8	1.6	1.9

Drift Calculation

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	314.4E-06	551.4E-06	1.6E-03	2.7E-03	3.5E-03	4.2E-03	4.8E-03	5.2E-03	5.5E-03	6.2E-03	6.4E-03	2.1E-03
9	-	227.9E-06	552.6E-06	1.6E-03	2.6E-03	3.4E-03	4.1E-03	4.7E-03	5.0E-03	5.5E-03	6.1E-03	6.1E-03	2.0E-03
10	-	303.2E-06	556.6E-06	1.7E-03	2.7E-03	3.6E-03	4.2E-03	4.8E-03	5.2E-03	5.5E-03	6.3E-03	6.2E-03	2.1E-03
11	-	232.5E-06	566.3E-06	1.6E-03	2.6E-03	3.5E-03	4.1E-03	4.7E-03	5.0E-03	5.4E-03	6.1E-03	6.0E-03	2.0E-03
Average	-	269.5E-06	556.7E-06	1.6E-03	2.7E-03	3.5E-03	4.1E-03	4.7E-03	5.1E-03	5.5E-03	6.2E-03	6.2E-03	2.0E-03
Sigma	-	39.5E-06	5.8E-06	38.3E-06	48.9E-06	51.2E-06	52.7E-06	52.9E-06	69.2E-06	30.7E-06	64.7E-06	146.2E-06	37.9E-06

Measurements

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	458.8	465.0	473.8	469.2	456.5	471.7	462.3	440.8	452.8	458.0	447.9	461.9	460.8
OFF_PROTON samples													
16	349.9	325.9	295.9	236.2	188.2	164.3	149.5	138.0	132.2	124.6	120.9	121.7	226.6
Statistics													
Min	349.9	325.9	295.9	236.2	188.2	164.3	149.5	138.0	132.2	124.6	120.9	121.7	226.6
Max	349.9	325.9	295.9	236.2	188.2	164.3	149.5	138.0	132.2	124.6	120.9	121.7	226.6
Average	349.9	325.9	295.9	236.2	188.2	164.3	149.5	138.0	132.2	124.6	120.9	121.7	226.6
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	211.2E-06	522.1E-06	1.4E-03	2.5E-03	3.2E-03	3.8E-03	4.4E-03	4.7E-03	5.2E-03	5.4E-03	5.4E-03	1.6E-03
Average	-	211.2E-06	522.1E-06	1.4E-03	2.5E-03	3.2E-03	3.8E-03	4.4E-03	4.7E-03	5.2E-03	5.4E-03	5.4E-03	1.6E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

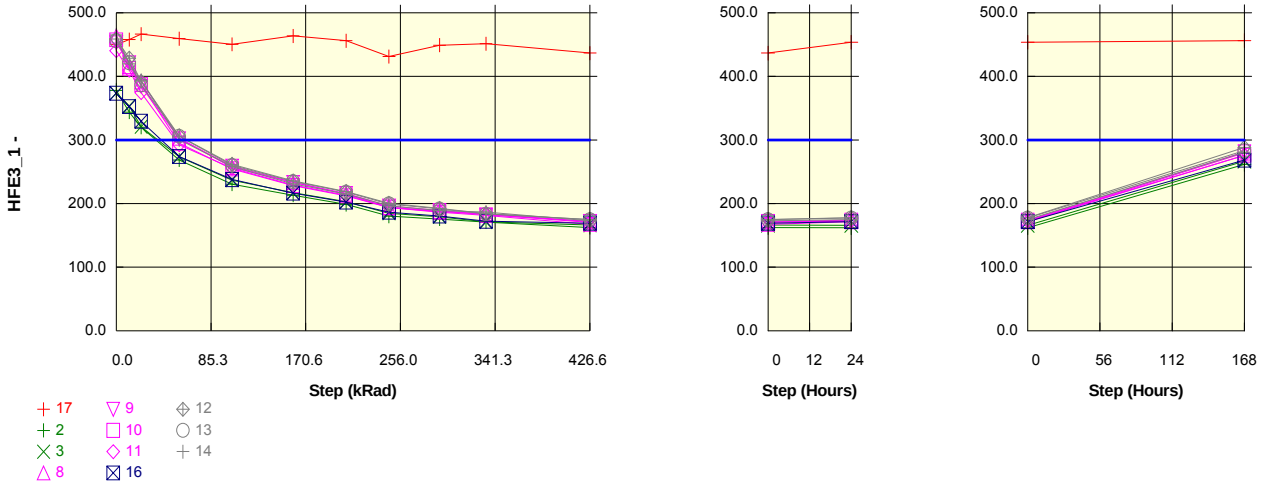
Measurements

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	458.8	465.0	473.8	469.2	456.5	471.7	462.3	440.8	452.8	458.0	447.9	461.9	460.8
OFF_TID samples													
12	467.6	425.6	376.3	271.1	211.1	180.7	162.9	148.9	140.9	132.8	123.2	124.2	247.1
13	464.6	418.9	371.2	271.1	210.6	179.7	163.3	148.7	140.9	132.7	123.4	124.2	243.1
14	474.4	417.1	377.8	265.5	208.4	176.8	160.1	146.2	138.8	133.0	121.4	122.3	241.3
Statistics													
Min	464.6	417.1	371.2	265.5	208.4	176.8	160.1	146.2	138.8	132.7	121.4	122.3	241.3
Max	474.4	425.6	377.8	271.1	211.1	180.7	163.3	148.9	140.9	133.0	123.4	124.2	247.1
Average	468.8	420.5	375.1	269.2	210.1	179.1	162.1	147.9	140.2	132.8	122.7	123.5	243.8
Sigma	4.1	3.6	2.8	2.6	1.2	1.6	1.5	1.2	1.0	0.1	0.9	0.9	2.4

Drift Calculation

HFE2_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	211.3E-06	518.9E-06	1.6E-03	2.6E-03	3.4E-03	4.0E-03	4.6E-03	5.0E-03	5.4E-03	6.0E-03	5.9E-03	1.9E-03
13	-	234.8E-06	541.1E-06	1.5E-03	2.6E-03	3.4E-03	4.0E-03	4.6E-03	4.9E-03	5.4E-03	6.0E-03	5.9E-03	2.0E-03
14	-	289.4E-06	538.6E-06	1.7E-03	2.7E-03	3.5E-03	4.1E-03	4.7E-03	5.1E-03	5.4E-03	6.1E-03	6.1E-03	2.0E-03
Average	-	245.2E-06	532.9E-06	1.6E-03	2.6E-03	3.5E-03	4.0E-03	4.6E-03	5.0E-03	5.4E-03	6.0E-03	6.0E-03	2.0E-03
Sigma	-	32.7E-06	9.9E-06	54.5E-06	43.8E-06	67.5E-06	74.1E-06	73.8E-06	69.6E-06	10.6E-06	77.7E-06	77.0E-06	52.3E-06

Parameter : DC current gain : HFE3_1
Test conditions : Ic = 5mA ; Vce = 5V
Unit :
Spec Limit Min : 300.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	449.9	457.9	466.5	459.3	450.4	463.6	456.0	431.2	449.0	451.4	436.5	453.6	456.2
ON_PROTON samples													
2	378.1	343.9	319.9	268.5	230.3	213.3	198.6	180.1	175.8	171.1	162.4	161.9	261.5
3	373.6	353.3	320.7	273.5	236.8	217.1	203.2	184.7	179.3	171.2	166.2	165.8	266.7
Statistics													
Min	373.6	343.9	319.9	268.5	230.3	213.3	198.6	180.1	175.8	171.1	162.4	161.9	261.5
Max	378.1	353.3	320.7	273.5	236.8	217.1	203.2	184.7	179.3	171.2	166.2	165.8	266.7
Average	375.9	348.6	320.3	271.0	233.6	215.2	200.9	182.4	177.5	171.2	164.3	163.9	264.1
Sigma	2.3	4.7	0.4	2.5	3.3	1.9	2.3	2.3	1.8	0.1	1.9	1.9	2.6

Drift Calculation

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	263.2E-06	481.1E-06	1.1E-03	1.7E-03	2.0E-03	2.4E-03	2.9E-03	3.0E-03	3.2E-03	3.5E-03	3.5E-03	1.2E-03
3	-	154.1E-06	441.1E-06	979.5E-06	1.5E-03	1.9E-03	2.2E-03	2.7E-03	2.9E-03	3.2E-03	3.3E-03	3.4E-03	1.1E-03
Average	-	208.6E-06	461.1E-06	1.0E-03	1.6E-03	2.0E-03	2.3E-03	2.8E-03	3.0E-03	3.2E-03	3.4E-03	3.4E-03	1.1E-03
Sigma	-	54.6E-06	20.0E-06	49.9E-06	75.6E-06	58.0E-06	72.6E-06	84.0E-06	72.7E-06	19.1E-06	86.1E-06	88.3E-06	52.9E-06

Measurements

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	449.9	457.9	466.5	459.3	450.4	463.6	456.0	431.2	449.0	451.4	436.5	453.6	456.2
ON_TID samples													
8	463.6	415.1	391.6	303.0	256.8	233.6	214.7	193.9	187.2	184.4	171.3	172.3	279.6
9	452.7	421.5	384.4	302.0	258.7	233.1	215.9	196.0	189.3	182.4	171.9	173.9	281.3
10	457.6	412.6	387.2	294.8	254.5	228.3	212.1	193.5	186.5	181.4	167.3	171.6	276.1
11	440.3	409.9	374.5	292.3	255.6	229.4	212.9	194.3	188.4	182.8	170.1	172.8	275.8
Statistics													
Min	440.3	409.9	374.5	292.3	254.5	228.3	212.1	193.5	186.5	181.4	167.3	171.6	275.8
Max	463.6	421.5	391.6	303.0	258.7	233.6	215.9	196.0	189.3	184.4	171.9	173.9	281.3
Average	453.5	414.7	384.4	298.0	256.4	231.1	213.9	194.5	187.9	182.8	170.1	172.7	278.2
Sigma	8.6	4.3	6.3	4.6	1.6	2.3	1.5	1.0	1.1	1.1	1.7	0.8	2.3

Drift Calculation

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	252.1E-06	396.5E-06	1.1E-03	1.7E-03	2.1E-03	2.5E-03	3.0E-03	3.2E-03	3.3E-03	3.7E-03	3.6E-03	1.4E-03
9	-	163.6E-06	392.0E-06	1.1E-03	1.7E-03	2.1E-03	2.4E-03	2.9E-03	3.1E-03	3.3E-03	3.6E-03	3.5E-03	1.3E-03
10	-	238.4E-06	397.2E-06	1.2E-03	1.7E-03	2.2E-03	2.5E-03	3.0E-03	3.2E-03	3.3E-03	3.8E-03	3.6E-03	1.4E-03
11	-	168.5E-06	399.2E-06	1.1E-03	1.6E-03	2.1E-03	2.4E-03	2.9E-03	3.0E-03	3.2E-03	3.6E-03	3.5E-03	1.4E-03
Average	-	205.6E-06	396.3E-06	1.2E-03	1.7E-03	2.1E-03	2.5E-03	2.9E-03	3.1E-03	3.3E-03	3.7E-03	3.6E-03	1.4E-03
Sigma	-	39.9E-06	2.6E-06	37.2E-06	46.0E-06	44.8E-06	46.8E-06	54.5E-06	64.1E-06	45.4E-06	74.7E-06	58.7E-06	39.2E-06

Measurements

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	449.9	457.9	466.5	459.3	450.4	463.6	456.0	431.2	449.0	451.4	436.5	453.6	456.2
OFF_PROTON samples													
16	373.4	352.4	329.4	274.0	237.8	216.4	202.3	186.5	180.4	172.2	169.3	171.7	268.5
Statistics													
Min	373.4	352.4	329.4	274.0	237.8	216.4	202.3	186.5	180.4	172.2	169.3	171.7	268.5
Max	373.4	352.4	329.4	274.0	237.8	216.4	202.3	186.5	180.4	172.2	169.3	171.7	268.5
Average	373.4	352.4	329.4	274.0	237.8	216.4	202.3	186.5	180.4	172.2	169.3	171.7	268.5
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	159.4E-06	357.5E-06	972.3E-06	1.5E-03	1.9E-03	2.3E-03	2.7E-03	2.9E-03	3.1E-03	3.2E-03	3.1E-03	1.0E-03
Average	-	159.4E-06	357.5E-06	972.3E-06	1.5E-03	1.9E-03	2.3E-03	2.7E-03	2.9E-03	3.1E-03	3.2E-03	3.1E-03	1.0E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

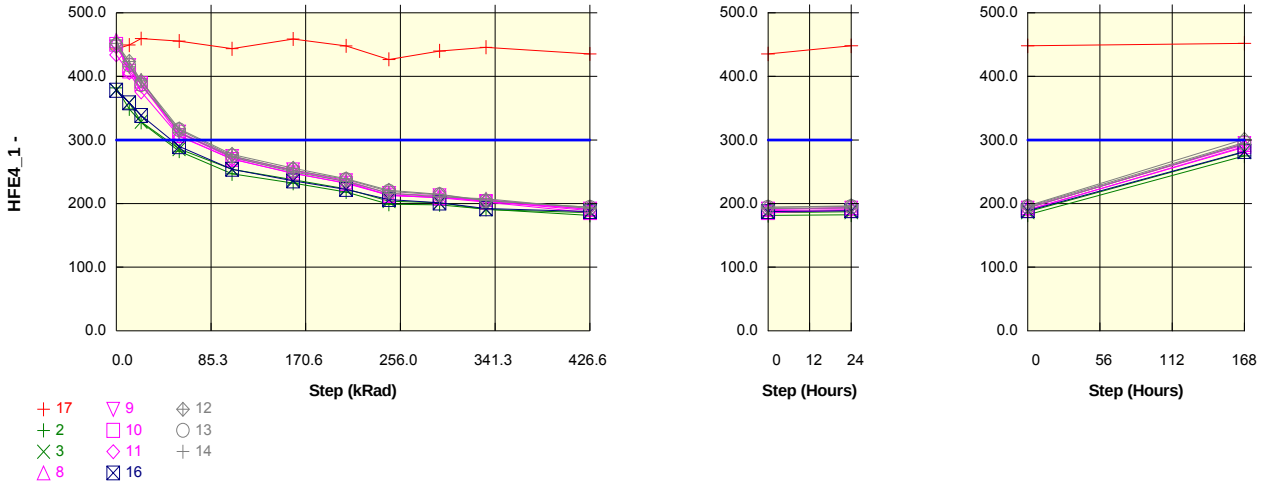
Measurements

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	449.9	457.9	466.5	459.3	450.4	463.6	456.0	431.2	449.0	451.4	436.5	453.6	456.2
OFF_TID samples													
12	458.7	428.5	392.4	306.4	261.8	235.7	219.0	200.5	192.5	184.3	175.0	177.8	288.4
13	456.0	421.4	386.3	306.0	260.2	234.5	218.0	199.6	191.7	183.6	174.9	177.3	283.2
14	465.3	419.9	393.8	300.5	258.1	231.1	215.2	196.6	189.0	186.8	172.7	174.8	280.7
Statistics													
Min	456.0	419.9	386.3	300.5	258.1	231.1	215.2	196.6	189.0	183.6	172.7	174.8	280.7
Max	465.3	428.5	393.8	306.4	261.8	235.7	219.0	200.5	192.5	186.8	175.0	177.8	288.4
Average	460.0	423.3	390.8	304.3	260.0	233.8	217.4	198.9	191.1	184.9	174.2	176.6	284.1
Sigma	3.9	3.8	3.2	2.7	1.5	1.9	1.6	1.6	1.5	1.4	1.1	1.3	3.2

Drift Calculation

HFE3_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	153.2E-06	368.4E-06	1.1E-03	1.6E-03	2.1E-03	2.4E-03	2.8E-03	3.0E-03	3.2E-03	3.5E-03	3.4E-03	1.3E-03
13	-	180.2E-06	395.6E-06	1.1E-03	1.7E-03	2.1E-03	2.4E-03	2.8E-03	3.0E-03	3.3E-03	3.5E-03	3.4E-03	1.3E-03
14	-	231.9E-06	390.3E-06	1.2E-03	1.7E-03	2.2E-03	2.5E-03	2.9E-03	3.1E-03	3.2E-03	3.6E-03	3.6E-03	1.4E-03
Average	-	188.5E-06	384.8E-06	1.1E-03	1.7E-03	2.1E-03	2.4E-03	2.9E-03	3.1E-03	3.2E-03	3.6E-03	3.5E-03	1.3E-03
Sigma	-	32.7E-06	11.8E-06	47.1E-06	38.5E-06	52.2E-06	51.3E-06	58.2E-06	58.2E-06	21.8E-06	52.9E-06	58.7E-06	52.1E-06

Parameter : DC current gain : HFE4_1
Test conditions : Ic = 10mA ; Vce = 5V
Unit :
Spec Limit Min : 300.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	443.1	449.2	459.4	455.6	443.4	458.8	447.9	426.7	440.0	445.9	435.3	448.1	452.0
ON_PROTON samples													
2	382.1	348.8	327.7	282.4	246.7	232.0	218.2	198.9	197.9	191.0	181.4	182.4	275.1
3	378.4	358.7	328.6	285.7	253.9	237.5	223.2	203.8	201.2	190.7	185.7	187.0	281.2
Statistics													
Min	378.4	348.8	327.7	282.4	246.7	232.0	218.2	198.9	197.9	190.7	181.4	182.4	275.1
Max	382.1	358.7	328.6	285.7	253.9	237.5	223.2	203.8	201.2	191.0	185.7	187.0	281.2
Average	380.3	353.8	328.2	284.1	250.3	234.8	220.7	201.4	199.6	190.8	183.6	184.7	278.1
Sigma	1.8	4.9	0.5	1.7	3.6	2.8	2.5	2.4	1.6	0.1	2.2	2.3	3.1

Drift Calculation

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	249.6E-06	434.5E-06	924.5E-06	1.4E-03	1.7E-03	2.0E-03	2.4E-03	2.4E-03	2.6E-03	2.9E-03	2.9E-03	1.0E-03
3	-	145.5E-06	400.3E-06	857.1E-06	1.3E-03	1.6E-03	1.8E-03	2.3E-03	2.3E-03	2.6E-03	2.7E-03	2.7E-03	913.7E-06
Average	-	197.6E-06	417.4E-06	890.8E-06	1.4E-03	1.6E-03	1.9E-03	2.3E-03	2.4E-03	2.6E-03	2.8E-03	2.8E-03	966.1E-06
Sigma	-	52.0E-06	17.1E-06	33.7E-06	69.8E-06	62.9E-06	64.5E-06	72.9E-06	53.9E-06	9.2E-06	76.9E-06	80.5E-06	52.4E-06

Measurements

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	443.1	449.2	459.4	455.6	443.4	458.8	447.9	426.7	440.0	445.9	435.3	448.1	452.0
ON_TID samples													
8	456.6	411.5	392.7	310.9	271.9	251.8	234.2	212.8	209.4	206.2	190.8	193.9	292.6
9	445.8	416.7	385.8	312.3	274.0	252.9	236.0	215.9	212.3	203.2	191.5	192.9	294.4
10	450.4	408.2	388.8	307.0	269.5	248.1	232.0	213.2	209.0	202.3	185.7	189.6	289.7
11	433.9	405.7	375.7	305.6	270.2	247.4	232.5	214.0	209.9	203.8	189.0	190.4	288.7
Statistics													
Min	433.9	405.7	375.7	305.6	269.5	247.4	232.0	212.8	209.0	202.3	185.7	189.6	288.7
Max	456.6	416.7	392.7	312.3	274.0	252.9	236.0	215.9	212.3	206.2	191.5	193.9	294.4
Average	446.7	410.5	385.7	309.0	271.4	250.0	233.7	214.0	210.2	203.9	189.2	191.7	291.3
Sigma	8.3	4.1	6.3	2.7	1.7	2.3	1.6	1.2	1.3	1.5	2.2	1.8	2.3

Drift Calculation

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	240.3E-06	356.2E-06	1.0E-03	1.5E-03	1.8E-03	2.1E-03	2.5E-03	2.6E-03	2.7E-03	3.1E-03	3.0E-03	1.2E-03
9	-	156.7E-06	348.9E-06	958.6E-06	1.4E-03	1.7E-03	2.0E-03	2.4E-03	2.5E-03	2.7E-03	3.0E-03	2.9E-03	1.2E-03
10	-	229.2E-06	351.7E-06	1.0E-03	1.5E-03	1.8E-03	2.1E-03	2.5E-03	2.6E-03	2.7E-03	3.2E-03	3.1E-03	1.2E-03
11	-	160.1E-06	357.4E-06	967.4E-06	1.4E-03	1.7E-03	2.0E-03	2.4E-03	2.5E-03	2.6E-03	3.0E-03	2.9E-03	1.2E-03
Average	-	196.6E-06	353.6E-06	997.3E-06	1.4E-03	1.8E-03	2.0E-03	2.4E-03	2.5E-03	2.7E-03	3.0E-03	3.0E-03	1.2E-03
Sigma	-	38.4E-06	3.4E-06	34.6E-06	43.9E-06	38.5E-06	45.3E-06	57.4E-06	55.9E-06	43.9E-06	74.7E-06	45.2E-06	36.5E-06

Measurements

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	443.1	449.2	459.4	455.6	443.4	458.8	447.9	426.7	440.0	445.9	435.3	448.1	452.0
OFF_PROTON samples													
16	378.3	358.2	338.7	289.6	253.9	235.6	222.2	206.3	201.1	192.1	187.5	188.7	282.0
Statistics													
Min	378.3	358.2	338.7	289.6	253.9	235.6	222.2	206.3	201.1	192.1	187.5	188.7	282.0
Max	378.3	358.2	338.7	289.6	253.9	235.6	222.2	206.3	201.1	192.1	187.5	188.7	282.0
Average	378.3	358.2	338.7	289.6	253.9	235.6	222.2	206.3	201.1	192.1	187.5	188.7	282.0
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	148.1E-06	309.2E-06	809.1E-06	1.3E-03	1.6E-03	1.9E-03	2.2E-03	2.3E-03	2.6E-03	2.7E-03	2.7E-03	902.6E-06
Average	-	148.1E-06	309.2E-06	809.1E-06	1.3E-03	1.6E-03	1.9E-03	2.2E-03	2.3E-03	2.6E-03	2.7E-03	2.7E-03	902.6E-06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

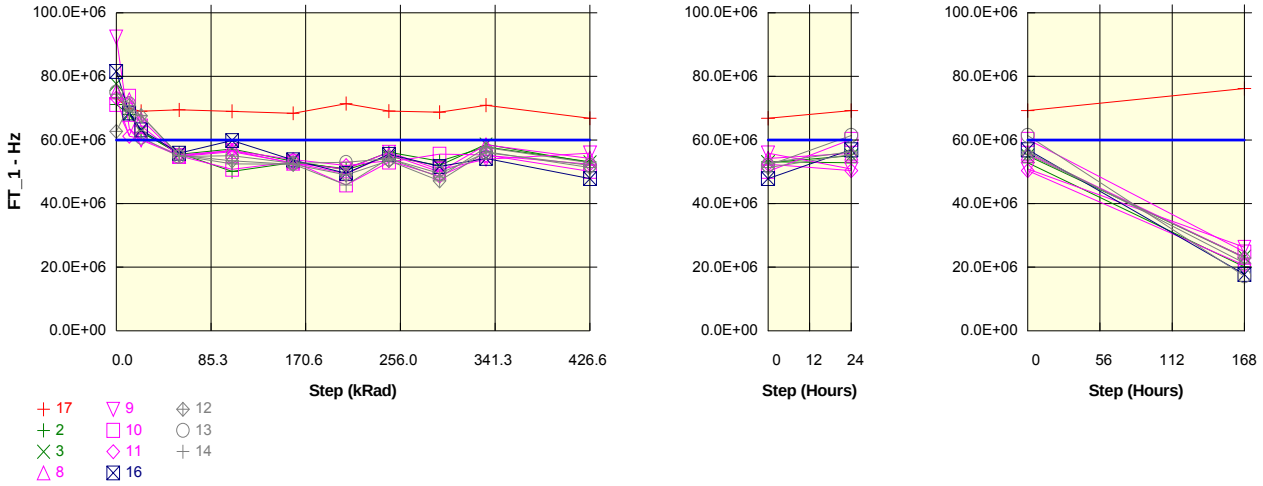
Measurements

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	443.1	449.2	459.4	455.6	443.4	458.8	447.9	426.7	440.0	445.9	435.3	448.1	452.0
OFF_TID samples													
12	451.8	423.5	392.9	317.4	277.3	255.6	239.0	221.0	214.6	204.7	194.5	196.6	301.1
13	448.7	418.0	386.8	316.2	275.1	252.5	237.9	219.3	213.9	204.4	194.3	195.3	296.2
14	457.3	415.0	394.4	311.4	273.0	249.6	234.6	216.4	210.7	207.6	192.2	193.1	294.2
Statistics													
Min	448.7	415.0	386.8	311.4	273.0	249.6	234.6	216.4	210.7	204.4	192.2	193.1	294.2
Max	457.3	423.5	394.4	317.4	277.3	255.6	239.0	221.0	214.6	207.6	194.5	196.6	301.1
Average	452.6	418.8	391.3	315.0	275.1	252.6	237.1	218.9	213.1	205.6	193.7	195.0	297.2
Sigma	3.6	3.5	3.3	2.6	1.7	2.4	1.9	1.9	1.7	1.5	1.0	1.4	2.9

Drift Calculation

HFE4_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	148.3E-06	332.3E-06	937.5E-06	1.4E-03	1.7E-03	2.0E-03	2.3E-03	2.4E-03	2.7E-03	2.9E-03	2.9E-03	1.1E-03
13	-	163.4E-06	356.5E-06	934.1E-06	1.4E-03	1.7E-03	2.0E-03	2.3E-03	2.4E-03	2.7E-03	2.9E-03	2.9E-03	1.1E-03
14	-	223.1E-06	349.0E-06	1.0E-03	1.5E-03	1.8E-03	2.1E-03	2.4E-03	2.6E-03	2.6E-03	3.0E-03	3.0E-03	1.2E-03
Average	-	178.3E-06	345.9E-06	965.2E-06	1.4E-03	1.8E-03	2.0E-03	2.4E-03	2.5E-03	2.7E-03	3.0E-03	2.9E-03	1.2E-03
Sigma	-	32.3E-06	10.1E-06	41.6E-06	36.0E-06	50.5E-06	48.4E-06	53.4E-06	53.2E-06	18.5E-06	43.8E-06	51.6E-06	43.4E-06

Parameter : Gain bandwidth product : FT_1
Test conditions : Ic = 500µA ; Vce = 5V
Unit : Hz
Spec Limit Min : 60.0E+06
Spec limits are represented in bold lines on the graphic.



Measurements

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	73.2E+06	69.8E+06	69.1E+06	69.5E+06	69.0E+06	68.4E+06	71.4E+06	69.1E+06	68.8E+06	70.9E+06	66.8E+06	69.3E+06	76.2E+06
ON_PROTON samples													
2	71.1E+06	68.1E+06	62.4E+06	55.9E+06	50.1E+06	52.9E+06	50.9E+06	56.2E+06	53.4E+06	57.8E+06	53.2E+06	52.8E+06	20.2E+06
3	77.7E+06	68.1E+06	62.7E+06	55.5E+06	57.2E+06	53.3E+06	50.6E+06	54.8E+06	51.9E+06	58.6E+06	52.9E+06	55.1E+06	23.2E+06
Statistics													
Min	71.1E+06	68.1E+06	62.4E+06	55.5E+06	50.1E+06	52.9E+06	50.6E+06	54.8E+06	51.9E+06	57.8E+06	52.9E+06	52.8E+06	20.2E+06
Max	77.7E+06	68.1E+06	62.7E+06	55.9E+06	57.2E+06	53.3E+06	50.9E+06	56.2E+06	53.4E+06	58.6E+06	53.2E+06	55.1E+06	23.2E+06
Average	74.4E+06	68.1E+06	62.6E+06	55.7E+06	53.6E+06	53.1E+06	50.8E+06	55.5E+06	52.7E+06	58.2E+06	53.0E+06	54.0E+06	21.7E+06
Sigma	3.3E+06	15.7E+03	129.6E+03	198.8E+03	3.5E+06	171.2E+03	181.1E+03	689.8E+03	709.2E+03	382.1E+03	116.0E+03	1.1E+06	1.5E+06

Drift Calculation

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-3.1E+06	-8.7E+06	-15.2E+06	-21.0E+06	-18.2E+06	-20.2E+06	-15.0E+06	-17.8E+06	-13.3E+06	-18.0E+06	-18.3E+06	-51.0E+06
3	-	-9.6E+06	-15.0E+06	-22.2E+06	-20.5E+06	-24.4E+06	-27.1E+06	-22.9E+06	-25.7E+06	-19.1E+06	-24.7E+06	-22.6E+06	-54.5E+06
Average	-	-6.3E+06	-11.8E+06	-18.7E+06	-20.8E+06	-21.3E+06	-23.6E+06	-18.9E+06	-21.7E+06	-16.2E+06	-21.3E+06	-20.4E+06	-52.7E+06
Sigma	-	3.3E+06	3.1E+06	3.5E+06	269.0E+03	3.1E+06	3.5E+06	4.0E+06	4.0E+06	2.9E+06	3.4E+06	2.2E+06	1.8E+06

Measurements

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	73.2E+06	69.8E+06	69.1E+06	69.5E+06	69.0E+06	68.4E+06	71.4E+06	69.1E+06	68.8E+06	70.9E+06	66.8E+06	69.3E+06	76.2E+06
ON_TID samples													
8	75.2E+06	72.6E+06	66.5E+06	54.8E+06	56.3E+06	52.8E+06	49.4E+06	55.4E+06	49.9E+06	58.5E+06	54.2E+06	55.8E+06	23.1E+06
9	92.3E+06	63.7E+06	60.0E+06	55.0E+06	56.7E+06	52.7E+06	50.8E+06	56.1E+06	50.7E+06	54.0E+06	55.9E+06	50.9E+06	26.2E+06
10	71.2E+06	73.7E+06	64.4E+06	55.0E+06	50.8E+06	53.2E+06	45.9E+06	53.1E+06	55.5E+06	55.3E+06	50.1E+06	60.2E+06	24.8E+06
11	73.2E+06	61.2E+06	60.4E+06	55.3E+06	56.7E+06	53.8E+06	52.0E+06	53.5E+06	48.6E+06	55.2E+06	52.4E+06	50.4E+06	20.7E+06
Statistics													
Min	71.2E+06	61.2E+06	60.0E+06	54.8E+06	50.8E+06	52.7E+06	45.9E+06	53.1E+06	48.6E+06	54.0E+06	50.1E+06	50.4E+06	20.7E+06
Max	92.3E+06	73.7E+06	66.5E+06	55.3E+06	56.7E+06	53.8E+06	52.0E+06	56.1E+06	55.5E+06	58.5E+06	55.9E+06	60.2E+06	26.2E+06
Average	78.0E+06	67.8E+06	62.8E+06	55.0E+06	55.1E+06	53.1E+06	49.5E+06	54.5E+06	51.2E+06	55.7E+06	53.2E+06	54.3E+06	23.7E+06
Sigma	8.4E+06	5.5E+06	2.7E+06	181.2E+03	2.5E+06	452.8E+03	2.3E+06	1.3E+06	2.6E+06	1.7E+06	2.1E+06	4.0E+06	2.1E+06

Drift Calculation

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-2.5E+06	-8.6E+06	-20.3E+06	-18.9E+06	-22.4E+06	-25.7E+06	-19.7E+06	-25.2E+06	-16.7E+06	-20.9E+06	-19.4E+06	-52.0E+06
9	-	-28.7E+06	-32.3E+06	-37.3E+06	-35.7E+06	-39.7E+06	-41.5E+06	-36.2E+06	-41.6E+06	-38.4E+06	-36.5E+06	-41.4E+06	-66.1E+06
10	-	2.6E+06	-6.8E+06	-16.2E+06	-20.4E+06	-18.0E+06	-25.3E+06	-18.1E+06	-15.6E+06	-15.9E+06	-21.0E+06	-11.0E+06	-46.3E+06
11	-	-12.0E+06	-12.8E+06	-17.9E+06	-16.5E+06	-19.4E+06	-21.2E+06	-19.7E+06	-24.6E+06	-18.0E+06	-20.8E+06	-22.8E+06	-52.6E+06
Average	-	-10.2E+06	-15.1E+06	-22.9E+06	-22.9E+06	-24.9E+06	-28.4E+06	-23.4E+06	-26.8E+06	-22.3E+06	-24.8E+06	-23.6E+06	-54.3E+06
Sigma	-	11.9E+06	10.2E+06	8.4E+06	7.5E+06	8.7E+06	7.7E+06	7.4E+06	9.4E+06	9.4E+06	6.7E+06	11.1E+06	7.3E+06

Measurements

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	73.2E+06	69.8E+06	69.1E+06	69.5E+06	69.0E+06	68.4E+06	71.4E+06	69.1E+06	68.8E+06	70.9E+06	66.8E+06	69.3E+06	76.2E+06
OFF_PROTON samples													
16	81.6E+06	68.5E+06	63.2E+06	55.9E+06	59.8E+06	53.7E+06	49.5E+06	55.5E+06	51.7E+06	54.2E+06	47.9E+06	56.9E+06	17.8E+06
Statistics													
Min	81.6E+06	68.5E+06	63.2E+06	55.9E+06	59.8E+06	53.7E+06	49.5E+06	55.5E+06	51.7E+06	54.2E+06	47.9E+06	56.9E+06	17.8E+06
Max	81.6E+06	68.5E+06	63.2E+06	55.9E+06	59.8E+06	53.7E+06	49.5E+06	55.5E+06	51.7E+06	54.2E+06	47.9E+06	56.9E+06	17.8E+06
Average	81.6E+06	68.5E+06	63.2E+06	55.9E+06	59.8E+06	53.7E+06	49.5E+06	55.5E+06	51.7E+06	54.2E+06	47.9E+06	56.9E+06	17.8E+06
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	-13.1E+06	-18.4E+06	-25.7E+06	-21.7E+06	-27.8E+06	-32.0E+06	-26.1E+06	-29.9E+06	-27.3E+06	-33.7E+06	-24.6E+06	-63.8E+06
Average	-	-13.1E+06	-18.4E+06	-25.7E+06	-21.7E+06	-27.8E+06	-32.0E+06	-26.1E+06	-29.9E+06	-27.3E+06	-33.7E+06	-24.6E+06	-63.8E+06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

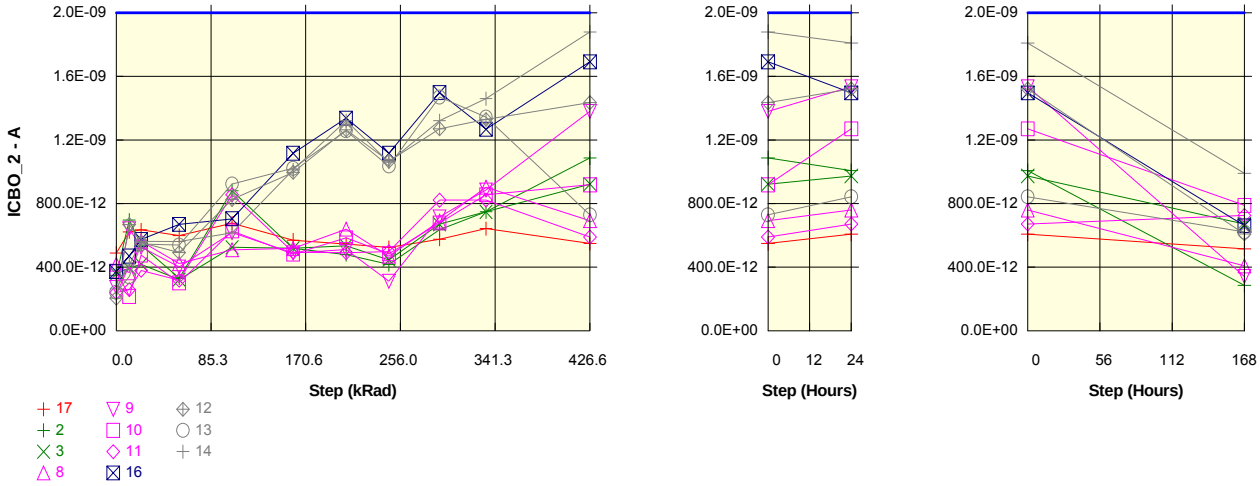
Measurements

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	73.2E+06	69.8E+06	69.1E+06	69.5E+06	69.0E+06	68.4E+06	71.4E+06	69.1E+06	68.8E+06	70.9E+06	66.8E+06	69.3E+06	76.2E+06
OFF_TID samples													
12	62.7E+06	70.9E+06	67.6E+06	55.2E+06	53.4E+06	52.3E+06	49.0E+06	53.5E+06	47.1E+06	56.3E+06	51.3E+06	55.5E+06	23.0E+06
13	75.1E+06	71.4E+06	60.9E+06	54.8E+06	55.1E+06	52.7E+06	53.0E+06	54.1E+06	49.4E+06	56.0E+06	52.1E+06	61.4E+06	17.2E+06
14	74.4E+06	69.1E+06	67.7E+06	55.1E+06	52.5E+06	52.4E+06	45.9E+06	54.2E+06	48.3E+06	57.6E+06	52.8E+06	56.3E+06	21.3E+06
Statistics													
Min	62.7E+06	69.1E+06	60.9E+06	54.8E+06	52.5E+06	52.3E+06	45.9E+06	53.5E+06	47.1E+06	56.0E+06	51.3E+06	55.5E+06	17.2E+06
Max	75.1E+06	71.4E+06	67.7E+06	55.2E+06	55.1E+06	52.7E+06	53.0E+06	54.2E+06	49.4E+06	57.6E+06	52.8E+06	61.4E+06	23.0E+06
Average	70.7E+06	70.5E+06	65.4E+06	55.1E+06	53.7E+06	52.5E+06	49.3E+06	54.0E+06	48.3E+06	56.6E+06	52.1E+06	57.7E+06	20.5E+06
Sigma	5.7E+06	978.0E+03	3.2E+06	176.4E+03	1.1E+06	147.9E+03	2.9E+06	314.7E+03	944.2E+03	689.6E+03	597.4E+03	2.6E+06	2.4E+06

Drift Calculation

FT_1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	8.2E+06	4.9E+06	-7.4E+06	-9.3E+06	-10.4E+06	-13.7E+06	-9.2E+06	-15.5E+06	-6.4E+06	-11.3E+06	-7.2E+06	-39.7E+06
13	-	-3.6E+06	-14.2E+06	-20.2E+06	-20.0E+06	-22.4E+06	-22.1E+06	-20.9E+06	-25.6E+06	-19.0E+06	-23.0E+06	-13.6E+06	-57.9E+06
14	-	-5.2E+06	-6.6E+06	-19.3E+06	-21.9E+06	-22.0E+06	-28.5E+06	-20.2E+06	-26.0E+06	-16.8E+06	-21.6E+06	-18.1E+06	-53.1E+06
Average	-	-214.6E+03	-5.3E+06	-15.6E+06	-17.1E+06	-18.2E+06	-21.4E+06	-16.8E+06	-22.4E+06	-14.1E+06	-18.6E+06	-13.0E+06	-50.2E+06
Sigma	-	6.0E+06	7.9E+06	5.8E+06	5.5E+06	5.6E+06	6.1E+06	5.4E+06	4.9E+06	5.5E+06	5.2E+06	4.5E+06	7.7E+06

Parameter : Collector-Base cut-off current : ICBO_2
Test conditions : Vcb = 45V
Unit : A
Spec Limit Max : 2.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	488.9E-12	621.8E-12	634.5E-12	599.5E-12	677.0E-12	570.4E-12	544.8E-12	523.8E-12	575.8E-12	643.2E-12	550.0E-12	607.9E-12	515.0E-12
ON_PROTON samples													
2	350.1E-12	696.8E-12	537.6E-12	331.4E-12	881.4E-12	518.7E-12	479.2E-12	416.6E-12	635.6E-12	748.2E-12	1.1E-09	1.0E-09	285.8E-12
3	356.9E-12	395.4E-12	417.6E-12	321.6E-12	524.7E-12	519.3E-12	534.3E-12	446.2E-12	670.4E-12	748.2E-12	921.8E-12	974.0E-12	670.6E-12
Statistics													
Min	350.1E-12	395.4E-12	417.6E-12	321.6E-12	524.7E-12	518.7E-12	479.2E-12	416.6E-12	635.6E-12	748.2E-12	921.8E-12	974.0E-12	285.8E-12
Max	356.9E-12	696.8E-12	537.6E-12	331.4E-12	881.4E-12	519.3E-12	534.3E-12	446.2E-12	670.4E-12	748.2E-12	1.1E-09	1.0E-09	670.6E-12
Average	353.5E-12	546.1E-12	477.6E-12	326.5E-12	703.0E-12	519.0E-12	506.8E-12	431.4E-12	653.0E-12	748.2E-12	1.0E-09	990.9E-12	478.2E-12
Sigma	3.4E-12	150.7E-12	60.0E-12	4.9E-12	178.3E-12	290.0E-15	27.5E-12	14.8E-12	17.4E-12	0.0E+00	82.3E-12	16.9E-12	192.4E-12

Drift Calculation

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	346.7E-12	187.5E-12	-18.7E-12	531.3E-12	168.6E-12	129.1E-12	66.5E-12	285.5E-12	398.1E-12	736.3E-12	657.7E-12	-64.3E-12
3	-	38.5E-12	60.7E-12	-35.3E-12	167.8E-12	162.4E-12	177.4E-12	89.3E-12	313.5E-12	391.3E-12	564.9E-12	617.1E-12	313.7E-12
Average	-	192.6E-12	124.1E-12	-27.0E-12	349.5E-12	165.5E-12	153.3E-12	77.9E-12	299.5E-12	394.7E-12	650.6E-12	637.4E-12	124.7E-12
Sigma	-	154.1E-12	63.4E-12	8.3E-12	181.7E-12	3.1E-12	24.1E-12	11.4E-12	14.0E-12	3.4E-12	85.7E-12	20.3E-12	189.0E-12

Measurements

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	488.9E-12	621.8E-12	634.5E-12	599.5E-12	677.0E-12	570.4E-12	544.8E-12	523.8E-12	575.8E-12	643.2E-12	550.0E-12	607.9E-12	515.0E-12
ON_TID samples													
8	418.6E-12	365.2E-12	563.2E-12	422.6E-12	509.4E-12	517.9E-12	639.2E-12	469.0E-12	689.4E-12	902.8E-12	692.4E-12	759.4E-12	408.2E-12
9	273.4E-12	641.4E-12	526.2E-12	401.2E-12	617.6E-12	490.0E-12	510.6E-12	311.6E-12	716.8E-12	885.6E-12	1.4E-09	1.5E-09	341.5E-12
10	375.6E-12	216.4E-12	476.4E-12	301.7E-12	628.2E-12	482.3E-12	584.4E-12	484.0E-12	678.2E-12	855.2E-12	918.0E-12	1.3E-09	788.4E-12
11	240.8E-12	259.0E-12	379.8E-12	317.9E-12	855.4E-12	493.7E-12	491.0E-12	497.6E-12	821.4E-12	822.0E-12	590.0E-12	670.9E-12	726.0E-12
Statistics													
Min	240.8E-12	216.4E-12	379.8E-12	301.7E-12	509.4E-12	482.3E-12	491.0E-12	311.6E-12	678.2E-12	822.0E-12	590.0E-12	670.9E-12	341.5E-12
Max	418.6E-12	641.4E-12	563.2E-12	422.6E-12	855.4E-12	517.9E-12	639.2E-12	497.6E-12	821.4E-12	902.8E-12	1.4E-09	1.5E-09	788.4E-12
Average	327.1E-12	370.5E-12	486.4E-12	360.8E-12	652.6E-12	496.0E-12	556.3E-12	440.6E-12	726.4E-12	866.4E-12	895.0E-12	1.1E-09	566.0E-12
Sigma	72.6E-12	165.5E-12	68.8E-12	51.9E-12	126.0E-12	13.3E-12	59.2E-12	75.1E-12	56.6E-12	30.8E-12	303.9E-12	357.5E-12	193.9E-12

Drift Calculation

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-53.4E-12	144.6E-12	4.0E-12	90.8E-12	99.3E-12	220.6E-12	50.4E-12	270.8E-12	484.2E-12	273.8E-12	340.8E-12	-10.4E-12
9	-	368.0E-12	252.8E-12	127.8E-12	344.2E-12	216.6E-12	237.2E-12	38.2E-12	443.4E-12	612.2E-12	1.1E-09	1.3E-09	68.1E-12
10	-	-159.2E-12	100.8E-12	-73.9E-12	252.6E-12	106.7E-12	208.8E-12	108.4E-12	302.6E-12	479.6E-12	542.4E-12	894.6E-12	412.8E-12
11	-	18.2E-12	139.0E-12	77.1E-12	614.6E-12	252.9E-12	250.2E-12	256.8E-12	580.6E-12	581.2E-12	349.2E-12	430.1E-12	485.2E-12
Average	-	43.4E-12	159.3E-12	33.7E-12	325.5E-12	168.9E-12	229.2E-12	113.5E-12	399.4E-12	539.3E-12	567.9E-12	731.7E-12	238.9E-12
Sigma	-	197.7E-12	56.6E-12	76.2E-12	190.0E-12	67.2E-12	15.8E-12	86.9E-12	123.2E-12	58.5E-12	325.9E-12	371.0E-12	213.5E-12

Measurements

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	488.9E-12	621.8E-12	634.5E-12	599.5E-12	677.0E-12	570.4E-12	544.8E-12	523.8E-12	575.8E-12	643.2E-12	550.0E-12	607.9E-12	515.0E-12
OFF_PROTON samples													
16	372.7E-12	470.4E-12	574.0E-12	669.2E-12	704.6E-12	1.1E-09	1.3E-09	1.1E-09	1.5E-09	1.3E-09	1.7E-09	1.5E-09	660.8E-12
Statistics													
Min	372.7E-12	470.4E-12	574.0E-12	669.2E-12	704.6E-12	1.1E-09	1.3E-09	1.1E-09	1.5E-09	1.3E-09	1.7E-09	1.5E-09	660.8E-12
Max	372.7E-12	470.4E-12	574.0E-12	669.2E-12	704.6E-12	1.1E-09	1.3E-09	1.1E-09	1.5E-09	1.3E-09	1.7E-09	1.5E-09	660.8E-12
Average	372.7E-12	470.4E-12	574.0E-12	669.2E-12	704.6E-12	1.1E-09	1.3E-09	1.1E-09	1.5E-09	1.3E-09	1.7E-09	1.5E-09	660.8E-12
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	97.7E-12	201.3E-12	296.5E-12	331.8E-12	743.5E-12	964.7E-12	743.9E-12	1.1E-09	895.5E-12	1.3E-09	1.1E-09	288.1E-12
Average	-	97.7E-12	201.3E-12	296.5E-12	331.8E-12	743.5E-12	964.7E-12	743.9E-12	1.1E-09	895.5E-12	1.3E-09	1.1E-09	288.1E-12
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

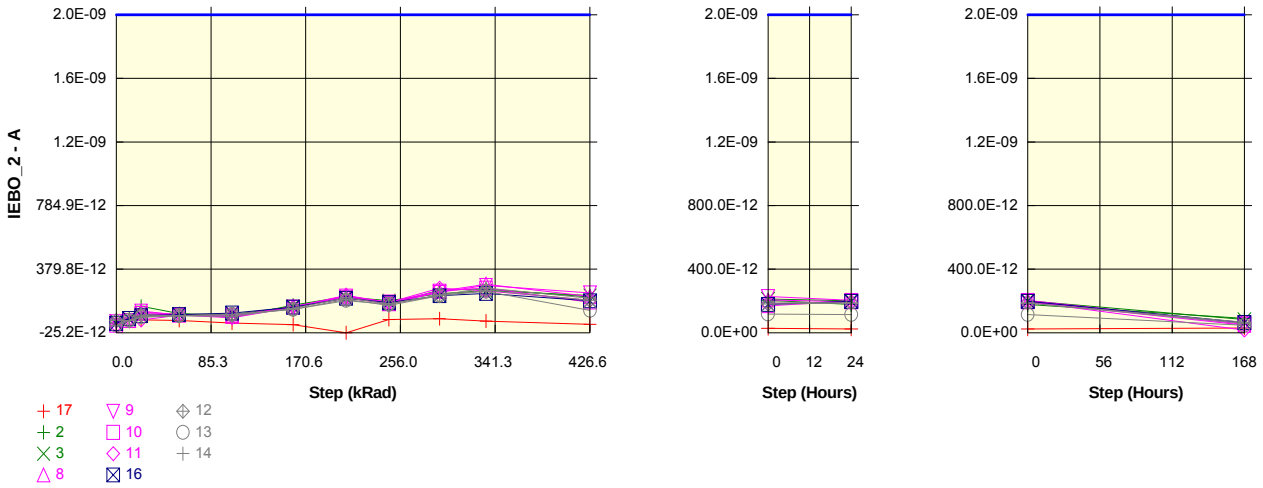
Measurements

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	488.9E-12	621.8E-12	634.5E-12	599.5E-12	677.0E-12	570.4E-12	544.8E-12	523.8E-12	575.8E-12	643.2E-12	550.0E-12	607.9E-12	515.0E-12
OFF_TID samples													
12	205.1E-12	668.4E-12	554.1E-12	492.2E-12	825.8E-12	997.0E-12	1.3E-09	1.1E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	609.5E-12
13	242.3E-12	340.8E-12	545.8E-12	539.1E-12	923.6E-12	1.0E-09	1.3E-09	1.0E-09	1.5E-09	1.3E-09	729.2E-12	842.7E-12	621.2E-12
14	263.4E-12	415.0E-12	563.0E-12	560.7E-12	616.2E-12	1.0E-09	1.3E-09	1.1E-09	1.3E-09	1.5E-09	1.9E-09	1.8E-09	990.0E-12
Statistics													
Min	205.1E-12	340.8E-12	545.8E-12	492.2E-12	616.2E-12	997.0E-12	1.3E-09	1.0E-09	1.3E-09	1.3E-09	729.2E-12	842.7E-12	609.5E-12
Max	263.4E-12	668.4E-12	563.0E-12	560.7E-12	923.6E-12	1.0E-09	1.3E-09	1.1E-09	1.5E-09	1.5E-09	1.9E-09	1.8E-09	990.0E-12
Average	236.9E-12	474.7E-12	554.3E-12	530.7E-12	788.5E-12	1.0E-09	1.3E-09	1.1E-09	1.4E-09	1.4E-09	1.3E-09	1.4E-09	740.2E-12
Sigma	24.1E-12	140.3E-12	7.0E-12	28.6E-12	128.2E-12	10.1E-12	28.9E-12	13.2E-12	84.5E-12	58.3E-12	473.8E-12	405.5E-12	176.7E-12

Drift Calculation

ICBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	463.3E-12	349.0E-12	287.1E-12	620.7E-12	791.9E-12	1.1E-09	861.3E-12	1.1E-09	1.1E-09	1.2E-09	1.3E-09	404.4E-12
13	-	98.5E-12	303.5E-12	296.8E-12	681.3E-12	779.3E-12	1.0E-09	793.3E-12	1.2E-09	1.1E-09	486.9E-12	600.4E-12	378.9E-12
14	-	151.6E-12	299.6E-12	297.3E-12	352.8E-12	748.4E-12	1.1E-09	796.4E-12	1.1E-09	1.2E-09	1.6E-09	1.5E-09	726.6E-12
Average	-	237.8E-12	317.4E-12	293.7E-12	551.6E-12	773.2E-12	1.0E-09	817.0E-12	1.1E-09	1.1E-09	1.1E-09	1.2E-09	503.3E-12
Sigma	-	160.9E-12	22.4E-12	4.7E-12	142.7E-12	18.3E-12	20.6E-12	31.4E-12	78.1E-12	40.3E-12	468.8E-12	402.9E-12	158.2E-12

Parameter : Emitter-Base cut-off current : IEBO_2
Test conditions : Veb = 5V
Unit : A
Spec Limit Max : 2.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	36.0E-12	56.7E-12	57.0E-12	53.4E-12	37.3E-12	27.4E-12	-25.2E-12	59.5E-12	64.8E-12	49.1E-12	28.8E-12	24.2E-12	29.9E-12
ON_PROTON samples													
2	34.8E-12	63.7E-12	143.0E-12	97.1E-12	72.7E-12	150.2E-12	206.7E-12	157.0E-12	247.8E-12	252.9E-12	204.0E-12	177.8E-12	89.9E-12
3	49.9E-12	59.3E-12	92.6E-12	95.1E-12	89.5E-12	142.6E-12	202.0E-12	179.6E-12	223.4E-12	243.7E-12	212.3E-12	201.8E-12	82.9E-12
Statistics													
Min	34.8E-12	59.3E-12	92.6E-12	95.1E-12	72.7E-12	142.6E-12	202.0E-12	157.0E-12	223.4E-12	243.7E-12	204.0E-12	177.8E-12	82.9E-12
Max	49.9E-12	63.7E-12	143.0E-12	97.1E-12	89.5E-12	150.2E-12	206.7E-12	179.6E-12	247.8E-12	252.9E-12	212.3E-12	201.8E-12	89.9E-12
Average	42.3E-12	61.5E-12	117.8E-12	96.1E-12	81.1E-12	146.4E-12	204.4E-12	168.3E-12	235.6E-12	248.3E-12	208.1E-12	189.8E-12	86.4E-12
Sigma	7.6E-12	2.2E-12	25.2E-12	990.0E-15	8.4E-12	3.8E-12	2.4E-12	11.3E-12	12.2E-12	4.6E-12	4.2E-12	12.0E-12	3.5E-12

Drift Calculation

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	28.9E-12	108.2E-12	62.3E-12	37.9E-12	115.4E-12	172.0E-12	122.3E-12	213.0E-12	218.2E-12	169.2E-12	143.0E-12	55.1E-12
3	-	9.4E-12	42.7E-12	45.2E-12	39.7E-12	92.7E-12	152.1E-12	129.7E-12	173.5E-12	193.8E-12	162.4E-12	152.0E-12	33.0E-12
Average	-	19.1E-12	75.5E-12	53.8E-12	38.8E-12	104.1E-12	162.1E-12	126.0E-12	193.3E-12	206.0E-12	165.8E-12	147.5E-12	44.1E-12
Sigma	-	9.8E-12	32.8E-12	8.5E-12	860.0E-15	11.4E-12	9.9E-12	3.7E-12	19.7E-12	12.2E-12	3.4E-12	4.5E-12	11.1E-12

Measurements

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	36.0E-12	56.7E-12	57.0E-12	53.4E-12	37.3E-12	27.4E-12	-25.2E-12	59.5E-12	64.8E-12	49.1E-12	28.8E-12	24.2E-12	29.9E-12
ON_TID samples													
8	34.3E-12	53.7E-12	107.2E-12	89.6E-12	79.8E-12	142.0E-12	203.7E-12	160.4E-12	240.0E-12	283.9E-12	206.7E-12	194.3E-12	48.2E-12
9	45.4E-12	53.2E-12	112.3E-12	88.1E-12	70.8E-12	136.9E-12	196.6E-12	161.3E-12	231.8E-12	276.3E-12	228.4E-12	203.4E-12	52.3E-12
10	23.0E-12	52.8E-12	97.8E-12	87.2E-12	86.6E-12	137.8E-12	209.4E-12	170.2E-12	240.9E-12	260.4E-12	169.7E-12	198.5E-12	61.0E-12
11	20.7E-12	50.8E-12	56.3E-12	86.5E-12	78.8E-12	139.3E-12	214.2E-12	166.3E-12	258.5E-12	241.1E-12	183.1E-12	195.7E-12	17.2E-12
Statistics													
Min	20.7E-12	50.8E-12	56.3E-12	86.5E-12	70.8E-12	136.9E-12	196.6E-12	160.4E-12	231.8E-12	241.1E-12	169.7E-12	194.3E-12	17.2E-12
Max	45.4E-12	53.7E-12	112.3E-12	89.6E-12	86.6E-12	142.0E-12	214.2E-12	170.2E-12	258.5E-12	283.9E-12	228.4E-12	203.4E-12	61.0E-12
Average	30.8E-12	52.6E-12	93.4E-12	87.8E-12	79.0E-12	139.0E-12	206.0E-12	164.5E-12	242.8E-12	265.4E-12	197.0E-12	198.0E-12	44.7E-12
Sigma	9.8E-12	1.1E-12	22.0E-12	1.2E-12	5.6E-12	1.9E-12	6.5E-12	4.0E-12	9.7E-12	16.4E-12	22.5E-12	3.5E-12	16.5E-12

Drift Calculation

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	19.3E-12	72.9E-12	55.3E-12	45.5E-12	107.6E-12	169.3E-12	126.1E-12	205.7E-12	249.5E-12	172.4E-12	160.0E-12	13.9E-12
9	-	7.9E-12	66.9E-12	42.7E-12	25.5E-12	91.6E-12	151.3E-12	115.9E-12	186.5E-12	231.0E-12	183.1E-12	158.1E-12	6.9E-12
10	-	29.9E-12	74.8E-12	64.2E-12	63.7E-12	114.8E-12	186.4E-12	147.2E-12	218.0E-12	237.4E-12	146.8E-12	175.5E-12	38.1E-12
11	-	30.0E-12	35.6E-12	65.7E-12	58.1E-12	118.6E-12	193.5E-12	145.5E-12	237.8E-12	220.3E-12	162.4E-12	175.0E-12	-3.5E-12
Average	-	21.8E-12	62.6E-12	57.0E-12	48.2E-12	108.2E-12	175.1E-12	133.7E-12	212.0E-12	234.6E-12	166.2E-12	167.1E-12	13.8E-12
Sigma	-	9.1E-12	15.8E-12	9.2E-12	14.7E-12	10.3E-12	16.3E-12	13.2E-12	18.7E-12	10.6E-12	13.4E-12	8.1E-12	15.3E-12

Measurements

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	36.0E-12	56.7E-12	57.0E-12	53.4E-12	37.3E-12	27.4E-12	-25.2E-12	59.5E-12	64.8E-12	49.1E-12	28.8E-12	24.2E-12	29.9E-12
OFF_PROTON samples													
16	35.4E-12	66.0E-12	83.6E-12	91.1E-12	100.1E-12	138.1E-12	194.8E-12	166.4E-12	210.8E-12	225.1E-12	178.7E-12	198.1E-12	64.9E-12
Statistics													
Min	35.4E-12	66.0E-12	83.6E-12	91.1E-12	100.1E-12	138.1E-12	194.8E-12	166.4E-12	210.8E-12	225.1E-12	178.7E-12	198.1E-12	64.9E-12
Max	35.4E-12	66.0E-12	83.6E-12	91.1E-12	100.1E-12	138.1E-12	194.8E-12	166.4E-12	210.8E-12	225.1E-12	178.7E-12	198.1E-12	64.9E-12
Average	35.4E-12	66.0E-12	83.6E-12	91.1E-12	100.1E-12	138.1E-12	194.8E-12	166.4E-12	210.8E-12	225.1E-12	178.7E-12	198.1E-12	64.9E-12
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	30.6E-12	48.2E-12	55.7E-12	64.6E-12	102.6E-12	159.4E-12	131.0E-12	175.4E-12	189.7E-12	143.3E-12	162.7E-12	29.5E-12
Average	-	30.6E-12	48.2E-12	55.7E-12	64.6E-12	102.6E-12	159.4E-12	131.0E-12	175.4E-12	189.7E-12	143.3E-12	162.7E-12	29.5E-12
Sigma	-	433.7E-21	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

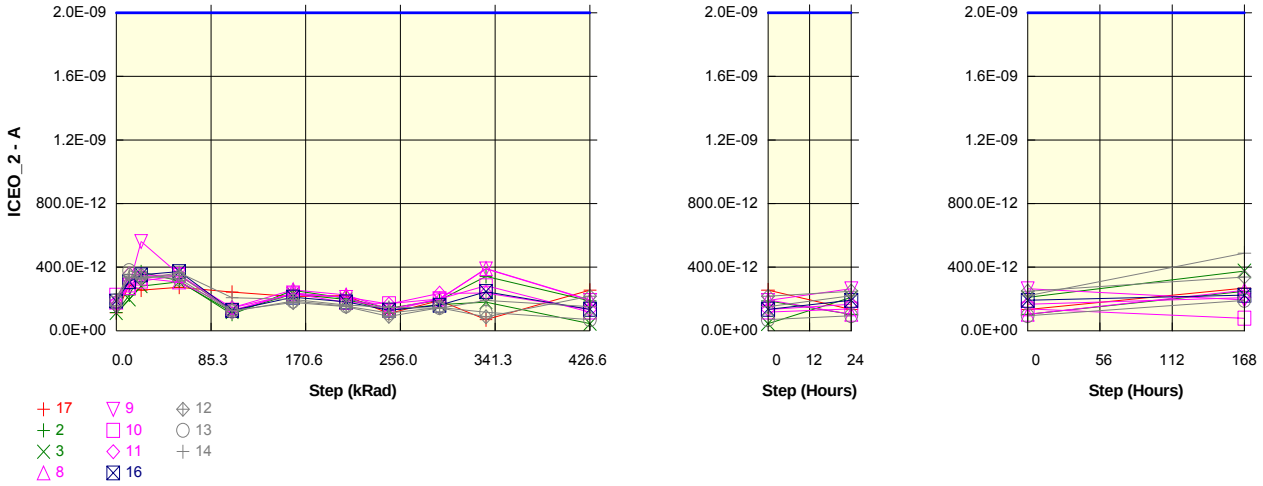
Measurements

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	36.0E-12	56.7E-12	57.0E-12	53.4E-12	37.3E-12	27.4E-12	-25.2E-12	59.5E-12	64.8E-12	49.1E-12	28.8E-12	24.2E-12	29.9E-12
OFF_TID samples													
12	53.6E-12	53.0E-12	86.0E-12	83.1E-12	90.7E-12	122.5E-12	186.8E-12	150.1E-12	210.8E-12	246.4E-12	180.9E-12	187.4E-12	58.1E-12
13	23.3E-12	54.3E-12	77.3E-12	84.1E-12	91.4E-12	124.3E-12	180.7E-12	157.2E-12	212.9E-12	238.8E-12	117.8E-12	115.0E-12	46.7E-12
14	20.2E-12	53.3E-12	74.3E-12	83.1E-12	79.5E-12	129.9E-12	198.0E-12	159.0E-12	215.6E-12	260.0E-12	194.5E-12	187.5E-12	66.5E-12
Statistics													
Min	20.2E-12	53.0E-12	74.3E-12	83.1E-12	79.5E-12	122.5E-12	180.7E-12	150.1E-12	210.8E-12	238.8E-12	117.8E-12	115.0E-12	46.7E-12
Max	53.6E-12	54.3E-12	86.0E-12	84.1E-12	91.4E-12	129.9E-12	198.0E-12	159.0E-12	215.6E-12	260.0E-12	194.5E-12	187.5E-12	66.5E-12
Average	32.4E-12	53.5E-12	79.2E-12	83.4E-12	87.2E-12	125.6E-12	188.5E-12	155.4E-12	213.1E-12	248.4E-12	164.4E-12	163.3E-12	57.1E-12
Sigma	15.1E-12	555.5E-15	5.0E-12	471.7E-15	5.4E-12	3.1E-12	7.2E-12	3.8E-12	2.0E-12	8.8E-12	33.4E-12	34.2E-12	8.1E-12

Drift Calculation

IEBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	-540.0E-15	32.4E-12	29.5E-12	37.2E-12	69.0E-12	133.2E-12	96.6E-12	157.2E-12	192.8E-12	127.3E-12	133.8E-12	4.6E-12
13	-	31.0E-12	54.1E-12	60.8E-12	68.1E-12	101.0E-12	157.5E-12	133.9E-12	189.6E-12	215.5E-12	94.5E-12	91.7E-12	23.4E-12
14	-	33.1E-12	54.0E-12	62.8E-12	59.3E-12	109.7E-12	177.8E-12	138.8E-12	195.4E-12	239.7E-12	174.3E-12	167.3E-12	46.3E-12
Average	-	21.2E-12	46.8E-12	51.1E-12	54.8E-12	93.2E-12	156.1E-12	123.1E-12	180.7E-12	216.0E-12	132.0E-12	130.9E-12	24.8E-12
Sigma	-	15.4E-12	10.2E-12	15.2E-12	13.0E-12	17.5E-12	18.2E-12	18.8E-12	16.8E-12	19.2E-12	32.8E-12	30.9E-12	17.1E-12

Parameter : Collector-Emitter cut-off current : ICEO_2
Test conditions : Vce = 5V
Unit : A
Spec Limit Max : 2.0E-09
Spec limits are represented in bold lines on the graphic.



Measurements

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	112.8E-12	289.6E-12	256.5E-12	273.2E-12	243.1E-12	215.9E-12	221.2E-12	109.3E-12	189.6E-12	70.0E-12	256.0E-12	133.8E-12	268.3E-12
ON_PROTON samples													
2	115.3E-12	225.6E-12	370.3E-12	313.4E-12	103.8E-12	254.6E-12	203.5E-12	142.4E-12	192.6E-12	342.2E-12	189.0E-12	102.8E-12	249.4E-12
3	112.5E-12	197.8E-12	280.6E-12	307.8E-12	117.6E-12	231.9E-12	196.8E-12	129.9E-12	165.9E-12	179.6E-12	45.0E-12	210.2E-12	375.8E-12
Statistics													
Min	112.5E-12	197.8E-12	280.6E-12	307.8E-12	103.8E-12	231.9E-12	196.8E-12	129.9E-12	165.9E-12	179.6E-12	45.0E-12	102.8E-12	249.4E-12
Max	115.3E-12	225.6E-12	370.3E-12	313.4E-12	117.6E-12	254.6E-12	203.5E-12	142.4E-12	192.6E-12	342.2E-12	189.0E-12	210.2E-12	375.8E-12
Average	113.9E-12	211.7E-12	325.5E-12	310.6E-12	110.7E-12	243.2E-12	200.1E-12	136.2E-12	179.2E-12	260.9E-12	117.0E-12	156.5E-12	312.6E-12
Sigma	1.4E-12	13.9E-12	44.9E-12	2.8E-12	6.9E-12	11.4E-12	3.4E-12	6.2E-12	13.4E-12	81.3E-12	72.0E-12	53.7E-12	63.2E-12

Drift Calculation

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	110.3E-12	255.0E-12	198.1E-12	-11.5E-12	139.3E-12	88.2E-12	27.1E-12	77.3E-12	226.9E-12	73.7E-12	-12.5E-12	134.1E-12
3	-	85.3E-12	168.1E-12	195.3E-12	5.0E-12	119.4E-12	84.2E-12	17.4E-12	53.3E-12	67.1E-12	-67.5E-12	97.7E-12	263.3E-12
Average	-	97.8E-12	211.6E-12	196.7E-12	-3.2E-12	129.3E-12	86.2E-12	22.2E-12	65.3E-12	147.0E-12	3.1E-12	42.6E-12	198.7E-12
Sigma	-	12.5E-12	43.5E-12	1.4E-12	8.3E-12	10.0E-12	2.0E-12	4.8E-12	12.0E-12	79.9E-12	70.6E-12	55.1E-12	64.6E-12

Measurements

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	112.8E-12	289.6E-12	256.5E-12	273.2E-12	243.1E-12	215.9E-12	221.2E-12	109.3E-12	189.6E-12	70.0E-12	256.0E-12	133.8E-12	268.3E-12
ON_TID samples													
8	179.8E-12	288.8E-12	330.8E-12	306.7E-12	145.7E-12	258.1E-12	225.7E-12	136.8E-12	200.0E-12	390.8E-12	194.1E-12	103.9E-12	254.9E-12
9	150.3E-12	287.8E-12	561.5E-12	353.3E-12	123.3E-12	238.7E-12	209.9E-12	125.1E-12	199.3E-12	389.6E-12	190.6E-12	264.4E-12	193.4E-12
10	223.3E-12	271.6E-12	312.1E-12	348.5E-12	129.8E-12	232.7E-12	178.1E-12	170.9E-12	200.2E-12	283.2E-12	117.6E-12	138.0E-12	79.4E-12
11	182.3E-12	355.6E-12	349.7E-12	350.3E-12	145.0E-12	229.4E-12	212.7E-12	167.5E-12	236.3E-12	236.6E-12	134.0E-12	166.4E-12	208.4E-12
Statistics													
Min	150.3E-12	271.6E-12	312.1E-12	306.7E-12	123.3E-12	229.4E-12	178.1E-12	125.1E-12	199.3E-12	236.6E-12	117.6E-12	103.9E-12	79.4E-12
Max	223.3E-12	355.6E-12	561.5E-12	353.3E-12	145.7E-12	258.1E-12	225.7E-12	170.9E-12	236.3E-12	390.8E-12	194.1E-12	264.4E-12	254.9E-12
Average	183.9E-12	300.9E-12	388.5E-12	339.7E-12	136.0E-12	239.7E-12	206.6E-12	150.1E-12	208.9E-12	325.0E-12	159.1E-12	168.2E-12	184.0E-12
Sigma	26.0E-12	32.3E-12	100.8E-12	19.1E-12	9.7E-12	11.1E-12	17.5E-12	19.6E-12	15.8E-12	67.2E-12	33.8E-12	59.8E-12	64.5E-12

Drift Calculation

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	109.0E-12	151.1E-12	126.9E-12	-34.1E-12	78.3E-12	45.9E-12	-42.9E-12	20.3E-12	211.0E-12	14.3E-12	-75.9E-12	75.1E-12
9	-	137.5E-12	411.3E-12	203.0E-12	-27.0E-12	88.4E-12	59.6E-12	-25.2E-12	49.0E-12	239.3E-12	40.4E-12	114.1E-12	43.1E-12
10	-	48.3E-12	88.7E-12	125.2E-12	-93.5E-12	9.3E-12	-45.2E-12	-52.5E-12	-23.2E-12	59.9E-12	-105.8E-12	-85.3E-12	-143.9E-12
11	-	173.3E-12	167.4E-12	168.0E-12	-37.3E-12	47.1E-12	30.4E-12	-14.8E-12	54.0E-12	54.3E-12	-48.3E-12	-15.9E-12	26.1E-12
Average	-	117.0E-12	204.6E-12	155.8E-12	-48.0E-12	55.8E-12	22.7E-12	-33.8E-12	25.0E-12	141.1E-12	-24.8E-12	-15.7E-12	95.0E-15
Sigma	-	45.8E-12	122.9E-12	32.2E-12	26.6E-12	30.8E-12	40.5E-12	14.7E-12	30.6E-12	84.7E-12	56.8E-12	79.6E-12	85.0E-12

Measurements

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	112.8E-12	289.6E-12	256.5E-12	273.2E-12	243.1E-12	215.9E-12	221.2E-12	109.3E-12	189.6E-12	70.0E-12	256.0E-12	133.8E-12	268.3E-12
OFF_PROTON samples													
16	187.0E-12	310.0E-12	352.1E-12	372.3E-12	127.6E-12	211.8E-12	182.0E-12	129.9E-12	160.9E-12	246.4E-12	135.2E-12	192.0E-12	223.6E-12
Statistics													
Min	187.0E-12	310.0E-12	352.1E-12	372.3E-12	127.6E-12	211.8E-12	182.0E-12	129.9E-12	160.9E-12	246.4E-12	135.2E-12	192.0E-12	223.6E-12
Max	187.0E-12	310.0E-12	352.1E-12	372.3E-12	127.6E-12	211.8E-12	182.0E-12	129.9E-12	160.9E-12	246.4E-12	135.2E-12	192.0E-12	223.6E-12
Average	187.0E-12	310.0E-12	352.1E-12	372.3E-12	127.6E-12	211.8E-12	182.0E-12	129.9E-12	160.9E-12	246.4E-12	135.2E-12	192.0E-12	223.6E-12
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	123.0E-12	165.1E-12	185.2E-12	-59.4E-12	24.8E-12	-5.0E-12	-57.1E-12	-26.1E-12	59.4E-12	-51.8E-12	4.9E-12	36.6E-12
Average	-	123.0E-12	165.1E-12	185.2E-12	-59.4E-12	24.8E-12	-5.0E-12	-57.1E-12	-26.1E-12	59.4E-12	-51.8E-12	4.9E-12	36.6E-12
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

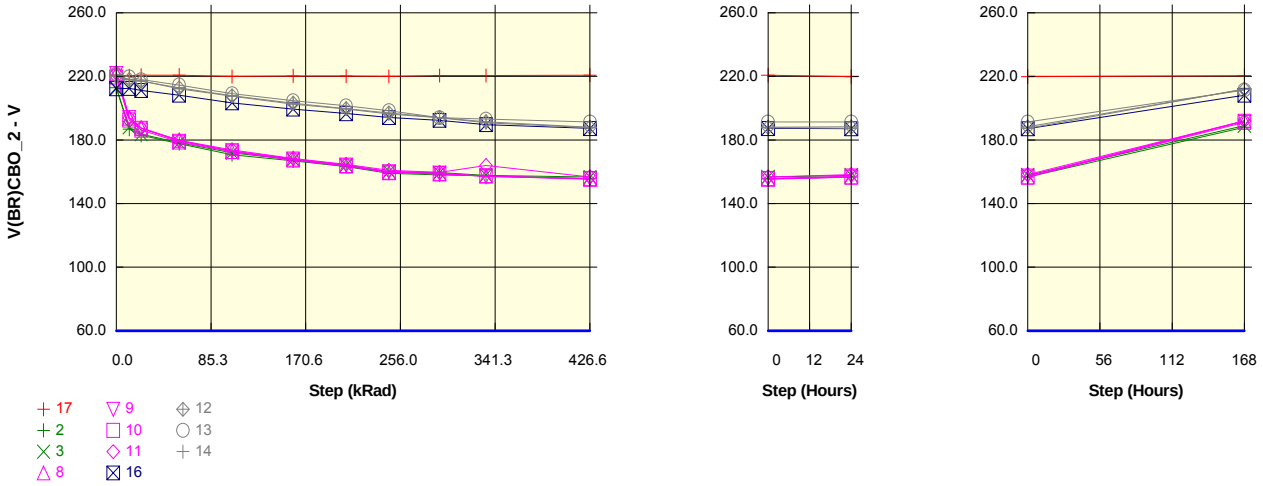
Measurements

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	112.8E-12	289.6E-12	256.5E-12	273.2E-12	243.1E-12	215.9E-12	221.2E-12	109.3E-12	189.6E-12	70.0E-12	256.0E-12	133.8E-12	268.3E-12
OFF_TID samples													
12	159.0E-12	355.4E-12	334.5E-12	348.4E-12	128.5E-12	178.0E-12	152.3E-12	90.4E-12	145.7E-12	88.0E-12	217.2E-12	249.2E-12	338.7E-12
13	190.5E-12	379.4E-12	344.0E-12	327.0E-12	122.6E-12	186.4E-12	155.3E-12	112.1E-12	146.3E-12	115.6E-12	69.6E-12	94.3E-12	190.6E-12
14	214.9E-12	337.2E-12	325.4E-12	365.9E-12	207.8E-12	196.8E-12	163.0E-12	147.8E-12	142.7E-12	190.6E-12	152.0E-12	219.8E-12	488.2E-12
Statistics													
Min	159.0E-12	337.2E-12	325.4E-12	327.0E-12	122.6E-12	178.0E-12	152.3E-12	90.4E-12	142.7E-12	88.0E-12	69.6E-12	94.3E-12	190.6E-12
Max	214.9E-12	379.4E-12	344.0E-12	365.9E-12	207.8E-12	196.8E-12	163.0E-12	147.8E-12	146.3E-12	190.6E-12	217.2E-12	249.2E-12	488.2E-12
Average	188.1E-12	357.3E-12	334.6E-12	347.1E-12	153.0E-12	187.1E-12	156.9E-12	116.7E-12	144.9E-12	131.4E-12	146.3E-12	187.8E-12	339.2E-12
Sigma	22.9E-12	17.3E-12	7.6E-12	15.9E-12	38.9E-12	7.7E-12	4.5E-12	23.7E-12	1.6E-12	43.4E-12	60.4E-12	67.2E-12	121.5E-12

Drift Calculation

ICEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	196.4E-12	175.5E-12	189.4E-12	-30.5E-12	19.0E-12	-6.7E-12	-68.6E-12	-13.3E-12	-71.0E-12	58.2E-12	90.2E-12	179.7E-12
13	-	188.9E-12	153.5E-12	136.5E-12	-67.9E-12	-4.1E-12	-35.2E-12	-78.5E-12	-44.3E-12	-74.9E-12	-121.0E-12	-96.2E-12	100.0E-15
14	-	122.3E-12	110.5E-12	151.0E-12	-7.1E-12	-18.1E-12	-51.8E-12	-67.1E-12	-72.2E-12	-24.3E-12	-62.8E-12	4.9E-12	273.3E-12
Average	-	169.2E-12	146.5E-12	159.0E-12	-35.2E-12	-1.1E-12	-31.3E-12	-71.4E-12	-43.3E-12	-56.7E-12	-41.9E-12	-340.0E-15	151.0E-12
Sigma	-	33.3E-12	27.0E-12	22.3E-12	25.1E-12	15.3E-12	18.6E-12	5.1E-12	24.0E-12	23.0E-12	74.6E-12	76.2E-12	113.4E-12

Parameter : Collector-Base breakdown voltage : V(BR)CBO_2
Test conditions : Ic = 10µA
Unit : V
Spec Limit Min : 60.0
Spec limits are represented in bold lines on the graphic.



Measurements

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	220.8	220.4	220.7	220.7	219.9	220.3	220.2	220.0	220.6	220.6	220.8	219.9	220.4
ON_PROTON samples													
2	213.0	186.8	182.9	177.7	170.8	166.8	163.3	159.1	158.1	157.5	155.6	156.8	188.0
3	212.9	187.9	183.6	178.2	171.9	167.6	164.1	160.1	159.5	157.8	156.7	157.8	189.0
Statistics													
Min	212.9	186.8	182.9	177.7	170.8	166.8	163.3	159.1	158.1	157.5	155.6	156.8	188.0
Max	213.0	187.9	183.6	178.2	171.9	167.6	164.1	160.1	159.5	157.8	156.7	157.8	189.0
Average	212.9	187.3	183.3	178.0	171.4	167.2	163.7	159.6	158.8	157.6	156.1	157.3	188.5
Sigma	0.0	0.5	0.3	0.3	0.6	0.4	0.4	0.5	0.7	0.2	0.6	0.5	0.5

Drift Calculation

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-26.2E+00	-30.0E+00	-35.3E+00	-42.2E+00	-46.2E+00	-49.7E+00	-53.9E+00	-54.9E+00	-55.5E+00	-57.4E+00	-56.2E+00	-25.0E+00
3	-	-25.0E+00	-29.3E+00	-34.7E+00	-41.0E+00	-45.3E+00	-48.8E+00	-52.8E+00	-53.4E+00	-55.1E+00	-56.2E+00	-55.1E+00	-23.9E+00
Average	-	-25.6E+00	-29.7E+00	-35.0E+00	-41.6E+00	-45.7E+00	-49.2E+00	-53.3E+00	-54.2E+00	-55.3E+00	-56.8E+00	-55.6E+00	-24.4E+00
Sigma	-	570.0E-03	385.0E-03	330.0E-03	615.0E-03	465.0E-03	460.0E-03	540.0E-03	745.0E-03	200.0E-03	600.0E-03	540.0E-03	555.0E-03

Measurements

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	220.8	220.4	220.7	220.7	219.9	220.3	220.2	220.0	220.6	220.6	220.8	219.9	220.4
ON_TID samples													
8	221.9	193.7	187.5	179.8	172.8	167.9	163.9	159.4	158.6	157.2	155.3	156.6	191.9
9	221.8	194.1	187.4	179.2	173.2	168.1	164.3	160.1	159.1	157.0	155.8	157.4	191.9
10	219.6	192.5	186.2	178.6	172.6	167.3	163.6	159.7	158.8	157.5	155.6	156.7	191.2
11	222.0	193.9	187.6	179.8	173.8	168.5	164.7	160.9	159.6	164.0	156.8	158.2	192.1
Statistics													
Min	219.6	192.5	186.2	178.6	172.6	167.3	163.6	159.4	158.6	157.0	155.3	156.6	191.2
Max	222.0	194.1	187.6	179.8	173.8	168.5	164.7	160.9	159.6	164.0	156.8	158.2	192.1
Average	221.3	193.6	187.2	179.3	173.1	168.0	164.1	160.0	159.1	158.9	155.9	157.2	191.8
Sigma	1.0	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.4	2.9	0.6	0.6	0.4

Drift Calculation

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-28.2E+00	-34.4E+00	-42.1E+00	-49.1E+00	-54.1E+00	-58.0E+00	-62.5E+00	-63.3E+00	-64.7E+00	-66.6E+00	-65.3E+00	-30.0E+00
9	-	-27.7E+00	-34.4E+00	-42.6E+00	-48.5E+00	-53.6E+00	-57.5E+00	-61.7E+00	-62.6E+00	-64.8E+00	-65.9E+00	-64.4E+00	-29.8E+00
10	-	-27.1E+00	-33.4E+00	-40.9E+00	-47.0E+00	-52.3E+00	-56.0E+00	-59.9E+00	-60.8E+00	-62.1E+00	-63.9E+00	-62.9E+00	-28.4E+00
11	-	-28.0E+00	-34.4E+00	-42.2E+00	-48.2E+00	-53.5E+00	-57.3E+00	-61.1E+00	-62.4E+00	-58.0E+00	-65.2E+00	-63.7E+00	-29.9E+00
Average	-	-27.7E+00	-34.1E+00	-42.0E+00	-48.2E+00	-53.3E+00	-57.2E+00	-61.3E+00	-62.3E+00	-62.4E+00	-65.4E+00	-64.1E+00	-29.5E+00
Sigma	-	425.6E-03	446.9E-03	609.1E-03	782.8E-03	659.2E-03	748.0E-03	950.3E-03	919.2E-03	2.8E+00	996.7E-03	876.5E-03	645.8E-03

Measurements

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	220.8	220.4	220.7	220.7	219.9	220.3	220.2	220.0	220.6	220.6	220.8	219.9	220.4
OFF_PROTON samples													
16	212.3	212.4	211.2	208.2	203.3	199.4	196.6	194.2	192.3	189.6	187.3	187.1	208.2
Statistics													
Min	212.3	212.4	211.2	208.2	203.3	199.4	196.6	194.2	192.3	189.6	187.3	187.1	208.2
Max	212.3	212.4	211.2	208.2	203.3	199.4	196.6	194.2	192.3	189.6	187.3	187.1	208.2
Average	212.3	212.4	211.2	208.2	203.3	199.4	196.6	194.2	192.3	189.6	187.3	187.1	208.2
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	200.0E-03	-1.1E+00	-4.0E+00	-8.9E+00	-12.9E+00	-15.6E+00	-18.1E+00	-19.9E+00	-22.6E+00	-25.0E+00	-25.1E+00	-4.1E+00
Average	-	200.0E-03	-1.1E+00	-4.0E+00	-8.9E+00	-12.9E+00	-15.6E+00	-18.1E+00	-19.9E+00	-22.6E+00	-25.0E+00	-25.1E+00	-4.1E+00
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

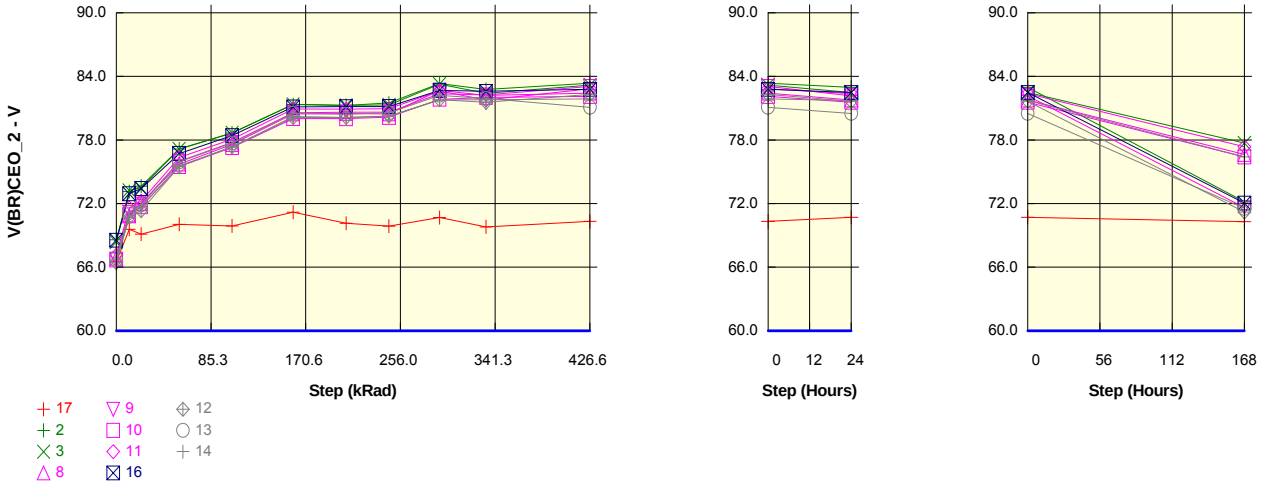
Measurements

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	220.8	220.4	220.7	220.7	219.9	220.3	220.2	220.0	220.6	220.6	220.8	219.9	220.4
OFF_TID samples													
12	220.1	218.1	216.9	212.8	207.9	203.2	199.7	197.0	194.1	191.5	188.1	188.2	211.9
13	221.4	219.6	218.0	214.6	209.1	204.7	201.5	198.4	194.0	193.2	191.3	191.3	211.4
14	220.8	217.8	217.3	212.3	207.6	202.6	199.6	196.4	193.9	190.8	187.7	187.3	212.1
Statistics													
Min	220.1	217.8	216.9	212.3	207.6	202.6	199.6	196.4	193.9	190.8	187.7	187.3	211.4
Max	221.4	219.6	218.0	214.6	209.1	204.7	201.5	198.4	194.1	193.2	191.3	191.3	212.1
Average	220.7	218.5	217.4	213.2	208.2	203.5	200.3	197.3	194.0	191.8	189.0	188.9	211.8
Sigma	0.5	0.8	0.4	1.0	0.7	0.9	0.9	0.8	0.1	1.0	1.6	1.7	0.3

Drift Calculation

V(BR)CBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	-2.0E+00	-3.2E+00	-7.3E+00	-12.2E+00	-16.9E+00	-20.3E+00	-23.1E+00	-25.9E+00	-28.5E+00	-32.0E+00	-31.8E+00	-8.1E+00
13	-	-1.7E+00	-3.4E+00	-6.8E+00	-12.2E+00	-16.7E+00	-19.8E+00	-22.9E+00	-27.4E+00	-28.2E+00	-30.1E+00	-30.1E+00	-10.0E+00
14	-	-3.0E+00	-3.5E+00	-8.5E+00	-13.2E+00	-18.2E+00	-21.2E+00	-24.4E+00	-26.9E+00	-30.0E+00	-33.1E+00	-33.5E+00	-8.7E+00
Average	-	-2.2E+00	-3.3E+00	-7.5E+00	-12.6E+00	-17.3E+00	-20.5E+00	-23.5E+00	-26.7E+00	-28.9E+00	-31.7E+00	-31.8E+00	-8.9E+00
Sigma	-	530.8E-03	140.8E-03	741.7E-03	476.4E-03	692.2E-03	587.3E-03	657.7E-03	584.5E-03	777.7E-03	1.3E+00	1.4E+00	760.8E-03

Parameter : Collecor-Emitter breakdown voltage : V(BR)CEO_2
Test conditions : Ic = 10mA
Unit : V
Spec Limit Min : 60.0
Spec limits are represented in bold lines on the graphic.



Measurements

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.5	69.6	69.1	70.0	69.9	71.2	70.1	69.9	70.7	69.8	70.3	70.7	70.3
ON_PROTON samples													
2	68.6	73.1	73.7	77.2	78.7	81.3	81.3	81.5	83.3	82.8	83.4	83.0	72.2
3	68.4	73.3	73.5	77.2	78.7	81.4	81.3	81.3	83.3	82.4	83.2	82.5	77.7
Statistics													
Min	68.4	73.1	73.5	77.2	78.7	81.3	81.3	81.3	83.3	82.4	83.2	82.5	72.2
Max	68.6	73.3	73.7	77.2	78.7	81.4	81.3	81.5	83.3	82.8	83.4	83.0	77.7
Average	68.5	73.2	73.6	77.2	78.7	81.3	81.3	81.4	83.3	82.6	83.3	82.7	74.9
Sigma	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.2	2.8

Drift Calculation

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	4.5E+00	5.1E+00	8.6E+00	10.1E+00	12.7E+00	12.7E+00	12.9E+00	14.7E+00	14.2E+00	14.8E+00	14.4E+00	3.6E+00
3	-	4.9E+00	5.1E+00	8.8E+00	10.3E+00	13.0E+00	12.9E+00	12.9E+00	14.9E+00	14.0E+00	14.8E+00	14.1E+00	9.3E+00
Average	-	4.7E+00	5.1E+00	8.7E+00	10.2E+00	12.9E+00	12.8E+00	12.9E+00	14.8E+00	14.1E+00	14.8E+00	14.2E+00	6.5E+00
Sigma	-	174.0E-03	24.0E-03	112.0E-03	114.0E-03	124.0E-03	118.0E-03	22.0E-03	87.0E-03	78.0E-03	22.0E-03	123.0E-03	2.9E+00

Measurements

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.5	69.6	69.1	70.0	69.9	71.2	70.1	69.9	70.7	69.8	70.3	70.7	70.3
ON_TID samples													
8	66.9	70.8	72.0	75.7	77.6	80.5	80.5	80.5	82.7	82.2	82.4	81.8	76.6
9	66.7	71.2	71.9	76.0	77.8	80.6	80.6	80.6	82.4	82.2	83.0	82.2	71.6
10	66.7	70.9	71.7	75.5	77.3	80.0	80.0	80.1	81.8	82.0	82.1	81.6	76.4
11	67.1	71.6	72.2	76.4	78.1	80.9	80.9	81.0	82.6	81.8	82.8	82.4	77.4
Statistics													
Min	66.7	70.8	71.7	75.5	77.3	80.0	80.0	80.1	81.8	81.8	82.1	81.6	71.6
Max	67.1	71.6	72.2	76.4	78.1	80.9	80.9	81.0	82.7	82.2	83.0	82.4	77.4
Average	66.9	71.1	72.0	75.9	77.7	80.5	80.5	80.5	82.4	82.1	82.6	82.0	75.5
Sigma	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.3	2.3

Drift Calculation

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	4.0E+00	5.2E+00	8.9E+00	10.7E+00	13.6E+00	13.7E+00	13.6E+00	15.8E+00	15.4E+00	15.6E+00	14.9E+00	9.8E+00
9	-	4.4E+00	5.2E+00	9.2E+00	11.0E+00	13.8E+00	13.9E+00	13.9E+00	15.6E+00	15.5E+00	16.3E+00	15.4E+00	4.9E+00
10	-	4.3E+00	5.0E+00	8.8E+00	10.6E+00	13.3E+00	13.3E+00	13.5E+00	15.2E+00	15.3E+00	15.4E+00	14.9E+00	9.7E+00
11	-	4.4E+00	5.1E+00	9.2E+00	10.9E+00	13.8E+00	13.8E+00	13.8E+00	15.5E+00	14.6E+00	15.7E+00	15.2E+00	10.2E+00
Average	-	4.3E+00	5.1E+00	9.0E+00	10.8E+00	13.6E+00	13.7E+00	13.7E+00	15.5E+00	15.2E+00	15.7E+00	15.1E+00	8.6E+00
Sigma	-	179.5E-03	67.8E-03	191.9E-03	166.5E-03	191.0E-03	200.5E-03	165.0E-03	239.1E-03	341.6E-03	330.5E-03	216.9E-03	2.2E+00

Measurements

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.5	69.6	69.1	70.0	69.9	71.2	70.1	69.9	70.7	69.8	70.3	70.7	70.3
OFF_PROTON samples													
16	68.6	72.9	73.4	76.7	78.4	81.1	81.1	81.2	82.7	82.6	82.8	82.5	72.1
Statistics													
Min	68.6	72.9	73.4	76.7	78.4	81.1	81.1	81.2	82.7	82.6	82.8	82.5	72.1
Max	68.6	72.9	73.4	76.7	78.4	81.1	81.1	81.2	82.7	82.6	82.8	82.5	72.1
Average	68.6	72.9	73.4	76.7	78.4	81.1	81.1	81.2	82.7	82.6	82.8	82.5	72.1
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	4.4E+00	4.9E+00	8.2E+00	9.9E+00	12.6E+00	12.6E+00	12.6E+00	14.1E+00	14.0E+00	14.2E+00	13.9E+00	3.5E+00
Average	-	4.4E+00	4.9E+00	8.2E+00	9.9E+00	12.6E+00	12.6E+00	12.6E+00	14.1E+00	14.0E+00	14.2E+00	13.9E+00	3.5E+00
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

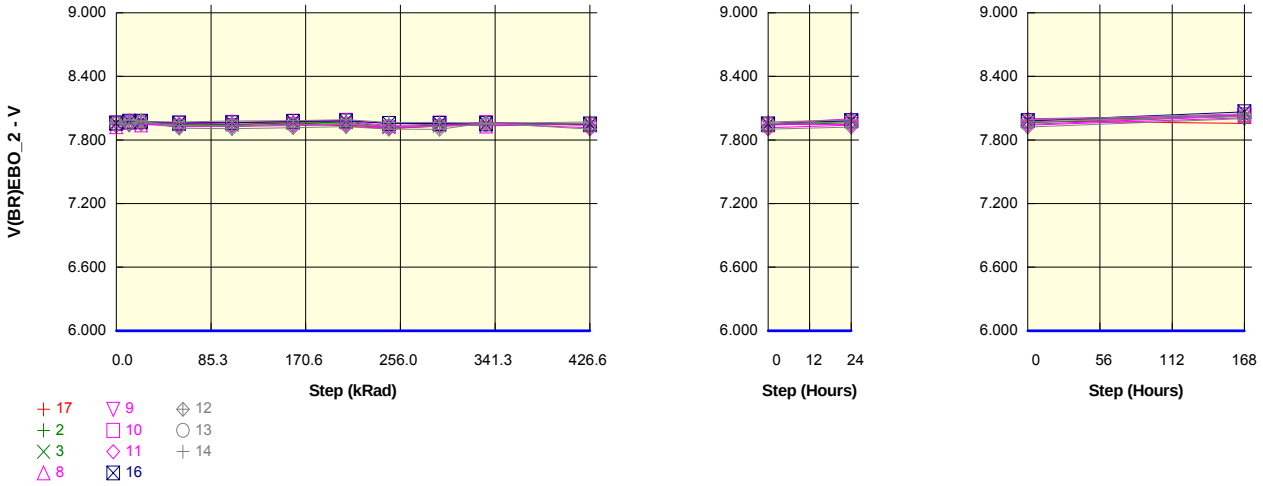
Measurements

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	66.5	69.6	69.1	70.0	69.9	71.2	70.1	69.9	70.7	69.8	70.3	70.7	70.3
OFF_TID samples													
12	66.4	70.7	71.3	75.5	77.4	80.1	80.1	80.2	81.8	81.5	82.3	81.7	71.2
13	66.9	71.2	71.9	75.9	77.7	80.5	80.4	80.6	82.2	81.9	81.1	80.5	71.5
14	66.8	70.7	71.7	75.6	77.3	80.2	80.1	80.2	81.8	81.8	81.9	81.7	76.4
Statistics													
Min	66.4	70.7	71.3	75.5	77.3	80.1	80.1	80.2	81.8	81.5	81.1	80.5	71.2
Max	66.9	71.2	71.9	75.9	77.7	80.5	80.4	80.6	82.2	81.9	82.3	81.7	76.4
Average	66.7	70.9	71.6	75.7	77.5	80.3	80.2	80.3	81.9	81.8	81.8	81.3	73.1
Sigma	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.5	0.6	2.4

Drift Calculation

V(BR)CEO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	4.3E+00	4.9E+00	9.0E+00	11.0E+00	13.7E+00	13.7E+00	13.8E+00	15.4E+00	15.1E+00	15.9E+00	15.2E+00	4.8E+00
13	-	4.3E+00	5.0E+00	9.1E+00	10.8E+00	13.6E+00	13.6E+00	13.7E+00	15.3E+00	15.0E+00	14.2E+00	13.6E+00	4.7E+00
14	-	4.0E+00	5.0E+00	8.8E+00	10.6E+00	13.5E+00	13.4E+00	13.5E+00	15.0E+00	15.0E+00	15.1E+00	15.0E+00	9.7E+00
Average	-	4.2E+00	5.0E+00	9.0E+00	10.8E+00	13.6E+00	13.5E+00	13.7E+00	15.2E+00	15.1E+00	15.1E+00	14.6E+00	6.4E+00
Sigma	-	150.9E-03	38.1E-03	115.1E-03	162.9E-03	95.1E-03	132.5E-03	132.7E-03	158.5E-03	41.4E-03	680.5E-03	704.1E-03	2.3E+00

Parameter : Emitter-Base breakdown voltage : V(BR)EBO_2
Test conditions : Ie = 10µA
Unit : V
Spec Limit Min : 6.000
Spec limits are represented in bold lines on the graphic.



Measurements

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.947	7.960	7.964	7.956	7.945	7.966	7.932	7.906	7.934	7.942	7.943	7.978	7.957
ON_PROTON samples													
2	7.970	7.956	7.963	7.945	7.927	7.953	7.954	7.915	7.940	7.968	7.939	7.964	8.027
3	7.956	7.970	7.957	7.950	7.945	7.961	7.968	7.924	7.939	7.944	7.947	7.985	8.022
Statistics													
Min	7.956	7.956	7.957	7.945	7.927	7.953	7.954	7.915	7.939	7.944	7.939	7.964	8.022
Max	7.970	7.970	7.963	7.950	7.945	7.961	7.968	7.924	7.940	7.968	7.947	7.985	8.027
Average	7.963	7.963	7.960	7.948	7.936	7.957	7.961	7.919	7.940	7.956	7.943	7.975	8.025
Sigma	0.007	0.007	0.003	0.002	0.009	0.004	0.007	0.005	0.001	0.012	0.004	0.011	0.003

Drift Calculation

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-14.0E-03	-7.2E-03	-24.8E-03	-43.2E-03	-17.2E-03	-16.4E-03	-55.2E-03	-29.6E-03	-2.4E-03	-30.8E-03	-6.0E-03	57.2E-03
3	-	14.8E-03	1.2E-03	-5.6E-03	-10.4E-03	5.2E-03	12.0E-03	-31.6E-03	-16.4E-03	-11.2E-03	-8.4E-03	29.6E-03	66.4E-03
Average	-	400.1E-06	-3.0E-03	-15.2E-03	-26.8E-03	-6.0E-03	-2.2E-03	-43.4E-03	-23.0E-03	-6.8E-03	-19.6E-03	11.8E-03	61.8E-03
Sigma	-	14.4E-03	4.2E-03	9.6E-03	16.4E-03	11.2E-03	14.2E-03	11.8E-03	6.6E-03	4.4E-03	11.2E-03	17.8E-03	4.6E-03

Measurements

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.947	7.960	7.964	7.956	7.945	7.966	7.932	7.906	7.934	7.942	7.943	7.978	7.957
ON_TID samples													
8	7.925	7.972	7.942	7.957	7.961	7.972	7.976	7.934	7.951	7.933	7.954	8.000	8.032
9	7.952	7.952	7.968	7.928	7.936	7.945	7.947	7.912	7.928	7.966	7.946	7.947	8.027
10	7.958	7.966	7.972	7.959	7.968	7.977	7.986	7.955	7.961	7.959	7.942	7.983	8.039
11	7.933	7.948	7.951	7.924	7.930	7.936	7.942	7.918	7.933	7.952	7.915	7.939	8.010
Statistics													
Min	7.925	7.948	7.942	7.924	7.930	7.936	7.942	7.912	7.928	7.933	7.915	7.939	8.010
Max	7.958	7.972	7.972	7.959	7.968	7.977	7.986	7.955	7.961	7.966	7.954	8.000	8.039
Average	7.942	7.959	7.958	7.942	7.948	7.958	7.963	7.930	7.943	7.952	7.939	7.967	8.027
Sigma	0.014	0.010	0.012	0.016	0.016	0.018	0.019	0.017	0.013	0.012	0.015	0.025	0.011

Drift Calculation

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	46.4E-03	16.4E-03	31.6E-03	35.6E-03	47.2E-03	51.2E-03	9.2E-03	26.0E-03	7.6E-03	28.8E-03	74.4E-03	107.2E-03
9	-	-400.1E-06	15.6E-03	-24.0E-03	-16.4E-03	-7.2E-03	-5.6E-03	-40.4E-03	-24.0E-03	13.2E-03	-6.4E-03	-5.2E-03	74.8E-03
10	-	8.0E-03	13.6E-03	1.2E-03	9.6E-03	19.2E-03	28.0E-03	-2.8E-03	2.8E-03	799.7E-06	-16.0E-03	24.8E-03	80.8E-03
11	-	14.8E-03	18.0E-03	-8.8E-03	-3.2E-03	2.8E-03	9.6E-03	-15.2E-03	400.1E-06	19.6E-03	-17.6E-03	6.4E-03	76.8E-03
Average	-	17.2E-03	15.9E-03	-119.2E-09	6.4E-03	15.5E-03	20.8E-03	-12.3E-03	1.3E-03	10.3E-03	-2.8E-03	25.1E-03	84.9E-03
Sigma	-	17.7E-03	1.6E-03	20.3E-03	19.2E-03	20.6E-03	21.2E-03	18.4E-03	17.7E-03	6.9E-03	18.7E-03	30.4E-03	13.1E-03

Measurements

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.947	7.960	7.964	7.956	7.945	7.966	7.932	7.906	7.934	7.942	7.943	7.978	7.957
OFF_PROTON samples													
16	7.961	7.977	7.977	7.960	7.964	7.974	7.981	7.957	7.955	7.954	7.952	7.981	8.065
Statistics													
Min	7.961	7.977	7.977	7.960	7.964	7.974	7.981	7.957	7.955	7.954	7.952	7.981	8.065
Max	7.961	7.977	7.977	7.960	7.964	7.974	7.981	7.957	7.955	7.954	7.952	7.981	8.065
Average	7.961	7.977	7.977	7.960	7.964	7.974	7.981	7.957	7.955	7.954	7.952	7.981	8.065
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Drift Calculation

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	16.0E-03	16.4E-03	-400.1E-06	2.8E-03	13.2E-03	20.0E-03	-4.0E-03	-5.6E-03	-7.2E-03	-8.8E-03	20.4E-03	104.4E-03
Average	-	16.0E-03	16.4E-03	-400.1E-06	2.8E-03	13.2E-03	20.0E-03	-4.0E-03	-5.6E-03	-7.2E-03	-8.8E-03	20.4E-03	104.4E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	82.3E-12	0.0E+00	0.0E+00	0.0E+00

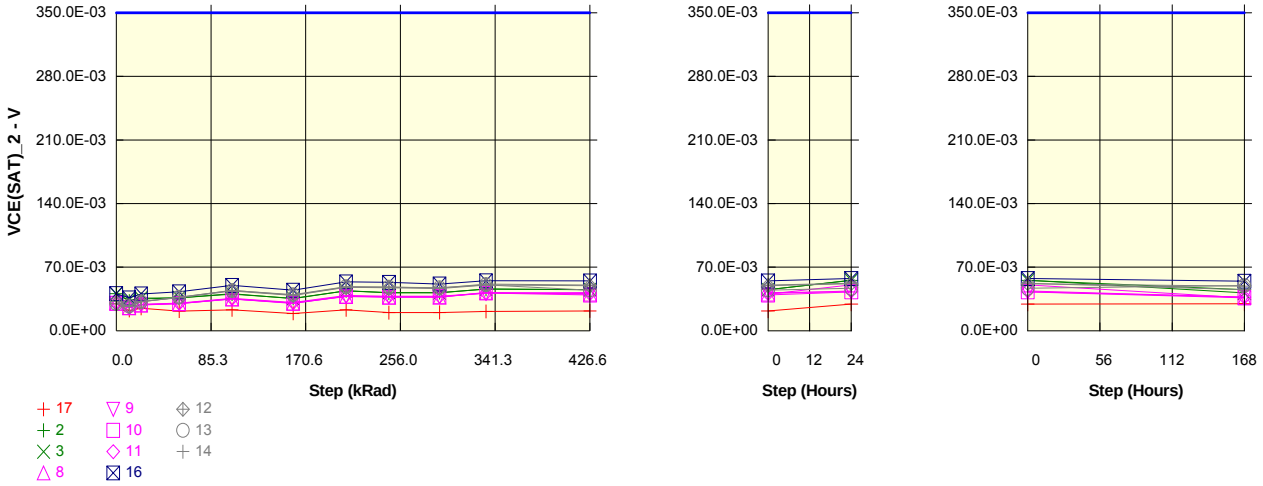
Measurements

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	7.947	7.960	7.964	7.956	7.945	7.966	7.932	7.906	7.934	7.942	7.943	7.978	7.957
OFF_TID samples													
12	7.962	7.941	7.982	7.912	7.908	7.916	7.926	7.902	7.902	7.962	7.903	7.922	8.002
13	7.951	7.961	7.961	7.937	7.933	7.940	7.950	7.928	7.929	7.943	7.954	7.970	8.024
14	7.960	7.990	7.971	7.969	7.978	7.982	7.992	7.966	7.965	7.956	7.970	7.990	8.048
Statistics													
Min	7.951	7.941	7.961	7.912	7.908	7.916	7.926	7.902	7.902	7.943	7.903	7.922	8.002
Max	7.962	7.990	7.982	7.969	7.978	7.982	7.992	7.966	7.965	7.962	7.970	7.990	8.048
Average	7.958	7.964	7.971	7.939	7.940	7.946	7.956	7.932	7.932	7.954	7.943	7.961	8.025
Sigma	0.005	0.020	0.008	0.023	0.029	0.028	0.027	0.026	0.026	0.008	0.029	0.028	0.019

Drift Calculation

V(BR)EBO_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	-20.4E-03	20.4E-03	-49.6E-03	-53.6E-03	-46.0E-03	-36.0E-03	-59.6E-03	-60.0E-03	400.1E-06	-58.4E-03	-39.6E-03	40.4E-03
13	-	10.0E-03	10.4E-03	-13.6E-03	-17.6E-03	-10.4E-03	-1.2E-03	-22.4E-03	-22.0E-03	-7.6E-03	3.6E-03	19.6E-03	72.8E-03
14	-	29.6E-03	10.8E-03	8.4E-03	17.2E-03	22.0E-03	31.2E-03	5.2E-03	4.4E-03	-4.0E-03	9.6E-03	29.2E-03	88.0E-03
Average	-	6.4E-03	13.9E-03	-18.3E-03	-18.0E-03	-11.5E-03	-2.0E-03	-25.6E-03	-25.9E-03	-3.7E-03	-15.1E-03	3.1E-03	67.1E-03
Sigma	-	20.6E-03	4.6E-03	23.9E-03	28.9E-03	27.8E-03	27.4E-03	26.6E-03	26.4E-03	3.3E-03	30.7E-03	30.4E-03	19.9E-03

Parameter : Collector-Emitter saturation oltage : VCE(SAT)_2
Test conditions : Ic = 1mA ; ib = 100µA
Unit : V
Spec Limit Max : 350.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.8E-03	22.5E-03	24.8E-03	21.7E-03	23.2E-03	19.2E-03	23.2E-03	20.0E-03	20.2E-03	21.4E-03	22.0E-03	29.5E-03	29.6E-03
ON_PROTON samples													
2	40.9E-03	32.6E-03	35.0E-03	36.1E-03	40.2E-03	35.6E-03	44.2E-03	41.7E-03	42.0E-03	45.8E-03	45.3E-03	55.3E-03	45.2E-03
3	40.6E-03	33.8E-03	36.0E-03	36.3E-03	40.9E-03	35.6E-03	44.2E-03	42.1E-03	41.8E-03	46.1E-03	45.2E-03	55.6E-03	41.9E-03
Statistics													
Min	40.6E-03	32.6E-03	35.0E-03	36.1E-03	40.2E-03	35.6E-03	44.2E-03	41.7E-03	41.8E-03	45.8E-03	45.2E-03	55.3E-03	41.9E-03
Max	40.9E-03	33.8E-03	36.0E-03	36.3E-03	40.9E-03	35.6E-03	44.2E-03	42.1E-03	42.0E-03	46.1E-03	45.3E-03	55.6E-03	45.2E-03
Average	40.7E-03	33.2E-03	35.5E-03	36.2E-03	40.6E-03	35.6E-03	44.2E-03	41.9E-03	41.9E-03	45.9E-03	45.3E-03	55.4E-03	43.6E-03
Sigma	160.0E-06	580.0E-06	500.0E-06	80.0E-06	320.0E-06	20.0E-06	0.0E+00	220.0E-06	120.0E-06	160.0E-06	60.0E-06	160.0E-06	1.7E-03

Drift Calculation

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-8.2E-03	-5.9E-03	-4.8E-03	-640.0E-06	-5.3E-03	3.3E-03	800.0E-06	1.1E-03	4.9E-03	4.4E-03	14.4E-03	4.4E-03
3	-	-6.8E-03	-4.6E-03	-4.3E-03	320.0E-06	-5.0E-03	3.6E-03	1.6E-03	1.2E-03	5.5E-03	4.6E-03	15.0E-03	1.3E-03
Average	-	-7.5E-03	-5.2E-03	-4.5E-03	-160.0E-06	-5.1E-03	3.4E-03	1.2E-03	1.2E-03	5.2E-03	4.5E-03	14.7E-03	2.8E-03
Sigma	-	740.0E-06	660.0E-06	240.0E-06	480.0E-06	140.0E-06	160.0E-06	380.0E-06	40.0E-06	320.0E-06	100.0E-06	320.0E-06	1.5E-03

Measurements

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.8E-03	22.5E-03	24.8E-03	21.7E-03	23.2E-03	19.2E-03	23.2E-03	20.0E-03	20.2E-03	21.4E-03	22.0E-03	29.5E-03	29.6E-03
ON_TID samples													
8	30.6E-03	25.4E-03	28.5E-03	29.9E-03	35.0E-03	30.5E-03	37.8E-03	37.1E-03	37.1E-03	42.4E-03	40.2E-03	50.5E-03	36.3E-03
9	30.2E-03	25.7E-03	28.7E-03	30.2E-03	35.2E-03	30.6E-03	37.9E-03	37.5E-03	37.4E-03	41.5E-03	42.0E-03	43.1E-03	37.2E-03
10	30.2E-03	25.5E-03	28.6E-03	29.8E-03	35.0E-03	30.2E-03	38.2E-03	37.2E-03	37.4E-03	41.5E-03	39.4E-03	42.8E-03	36.2E-03
11	30.7E-03	25.6E-03	29.3E-03	30.5E-03	35.8E-03	31.1E-03	38.9E-03	38.1E-03	38.1E-03	41.5E-03	41.0E-03	43.9E-03	37.0E-03
Statistics													
Min	30.2E-03	25.4E-03	28.5E-03	29.8E-03	35.0E-03	30.2E-03	37.8E-03	37.1E-03	37.1E-03	41.5E-03	39.4E-03	42.8E-03	36.2E-03
Max	30.7E-03	25.7E-03	29.3E-03	30.5E-03	35.8E-03	31.1E-03	38.9E-03	38.1E-03	38.1E-03	42.4E-03	42.0E-03	50.5E-03	37.2E-03
Average	30.4E-03	25.5E-03	28.8E-03	30.1E-03	35.2E-03	30.6E-03	38.2E-03	37.5E-03	37.5E-03	41.7E-03	40.7E-03	45.1E-03	36.7E-03
Sigma	220.9E-06	95.4E-06	299.8E-06	274.8E-06	312.9E-06	315.0E-06	433.6E-06	409.4E-06	365.9E-06	375.6E-06	948.5E-06	3.2E-03	426.1E-06

Drift Calculation

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-5.2E-03	-2.1E-03	-760.0E-06	4.4E-03	-120.0E-06	7.2E-03	6.4E-03	6.4E-03	11.7E-03	9.6E-03	19.9E-03	5.6E-03
9	-	-4.6E-03	-1.6E-03	-40.0E-06	4.9E-03	360.0E-06	7.6E-03	7.2E-03	7.2E-03	11.2E-03	11.7E-03	12.8E-03	7.0E-03
10	-	-4.7E-03	-1.6E-03	-360.0E-06	4.8E-03	0.0E+00	8.0E-03	7.0E-03	7.2E-03	11.3E-03	9.2E-03	12.6E-03	6.0E-03
11	-	-5.1E-03	-1.4E-03	-160.0E-06	5.1E-03	400.0E-06	8.2E-03	7.4E-03	7.4E-03	10.8E-03	10.4E-03	13.2E-03	6.3E-03
Average	-	-4.9E-03	-1.7E-03	-330.0E-06	4.8E-03	160.0E-06	7.8E-03	7.0E-03	7.0E-03	11.3E-03	10.2E-03	14.6E-03	6.2E-03
Sigma	-	259.8E-06	270.4E-06	273.3E-06	267.4E-06	224.5E-06	386.8E-06	375.8E-06	363.7E-06	326.6E-06	961.0E-06	3.0E-03	480.8E-06

Measurements

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.8E-03	22.5E-03	24.8E-03	21.7E-03	23.2E-03	19.2E-03	23.2E-03	20.0E-03	20.2E-03	21.4E-03	22.0E-03	29.5E-03	29.6E-03
OFF_PROTON samples													
16	40.8E-03	36.2E-03	40.6E-03	43.0E-03	50.0E-03	44.7E-03	53.9E-03	53.3E-03	51.4E-03	55.1E-03	54.8E-03	57.6E-03	54.6E-03
Statistics													
Min	40.8E-03	36.2E-03	40.6E-03	43.0E-03	50.0E-03	44.7E-03	53.9E-03	53.3E-03	51.4E-03	55.1E-03	54.8E-03	57.6E-03	54.6E-03
Max	40.8E-03	36.2E-03	40.6E-03	43.0E-03	50.0E-03	44.7E-03	53.9E-03	53.3E-03	51.4E-03	55.1E-03	54.8E-03	57.6E-03	54.6E-03
Average	40.8E-03	36.2E-03	40.6E-03	43.0E-03	50.0E-03	44.7E-03	53.9E-03	53.3E-03	51.4E-03	55.1E-03	54.8E-03	57.6E-03	54.6E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	-4.6E-03	-200.0E-06	2.2E-03	9.2E-03	3.9E-03	13.1E-03	12.5E-03	10.6E-03	14.3E-03	14.0E-03	16.8E-03	13.8E-03
Average	-	-4.6E-03	-200.0E-06	2.2E-03	9.2E-03	3.9E-03	13.1E-03	12.5E-03	10.6E-03	14.3E-03	14.0E-03	16.8E-03	13.8E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

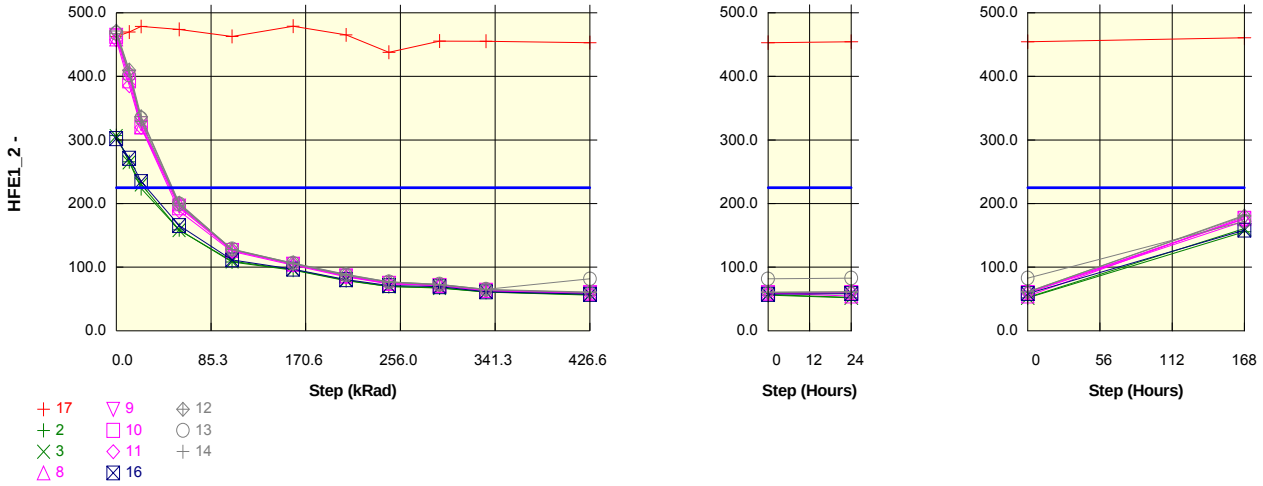
Measurements

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	29.8E-03	22.5E-03	24.8E-03	21.7E-03	23.2E-03	19.2E-03	23.2E-03	20.0E-03	20.2E-03	21.4E-03	22.0E-03	29.5E-03	29.6E-03
OFF_TID samples													
12	29.8E-03	26.9E-03	32.1E-03	36.4E-03	43.8E-03	38.9E-03	47.8E-03	47.4E-03	46.7E-03	50.4E-03	49.6E-03	52.0E-03	49.1E-03
13	30.0E-03	27.2E-03	31.9E-03	37.0E-03	44.2E-03	39.8E-03	48.5E-03	48.1E-03	47.2E-03	50.6E-03	44.9E-03	46.8E-03	49.8E-03
14	32.1E-03	26.6E-03	32.3E-03	36.6E-03	44.5E-03	39.2E-03	48.2E-03	48.0E-03	47.1E-03	51.4E-03	50.4E-03	52.2E-03	45.2E-03
Statistics													
Min	29.8E-03	26.6E-03	31.9E-03	36.4E-03	43.8E-03	38.9E-03	47.8E-03	47.4E-03	46.7E-03	50.4E-03	44.9E-03	46.8E-03	45.2E-03
Max	32.1E-03	27.2E-03	32.3E-03	37.0E-03	44.5E-03	39.8E-03	48.5E-03	48.1E-03	47.2E-03	51.4E-03	50.4E-03	52.2E-03	49.8E-03
Average	30.6E-03	26.9E-03	32.1E-03	36.7E-03	44.2E-03	39.3E-03	48.2E-03	47.8E-03	47.0E-03	50.8E-03	48.3E-03	50.3E-03	48.0E-03
Sigma	1.0E-03	262.0E-06	147.3E-06	214.2E-06	264.0E-06	346.2E-06	281.6E-06	284.7E-06	228.6E-06	426.2E-06	2.4E-03	2.5E-03	2.0E-03

Drift Calculation

VCE(SAT)_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	-2.9E-03	2.4E-03	6.7E-03	14.1E-03	9.2E-03	18.0E-03	17.7E-03	16.9E-03	20.6E-03	19.8E-03	22.2E-03	19.3E-03
13	-	-2.7E-03	2.0E-03	7.0E-03	14.3E-03	9.8E-03	18.5E-03	18.1E-03	17.2E-03	20.7E-03	15.0E-03	16.8E-03	19.8E-03
14	-	-5.5E-03	200.0E-06	4.6E-03	12.4E-03	7.2E-03	16.2E-03	15.9E-03	15.0E-03	19.3E-03	18.4E-03	20.2E-03	13.2E-03
Average	-	-3.7E-03	1.5E-03	6.1E-03	13.6E-03	8.7E-03	17.6E-03	17.2E-03	16.4E-03	20.2E-03	17.7E-03	19.7E-03	17.4E-03
Sigma	-	1.3E-03	938.3E-06	1.1E-03	843.1E-06	1.1E-03	1.0E-03	950.5E-06	970.5E-06	631.9E-06	2.0E-03	2.2E-03	3.0E-03

Parameter : DC current gain : HFE1_2
Test conditions : Ic = 100µA ; Vce = 5V
Unit :
Spec Limit Min : 225.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	469.7	478.4	473.9	462.7	478.9	465.1	437.9	455.5	455.1	453.0	454.5	460.8
ON_PROTON samples													
2	306.9	265.7	223.7	158.8	108.3	95.2	78.8	69.6	67.4	60.6	56.2	51.9	155.9
3	306.1	264.8	230.3	158.4	109.3	96.2	79.4	69.8	67.5	61.3	56.8	52.4	160.9
Statistics													
Min	306.1	264.8	223.7	158.4	108.3	95.2	78.8	69.6	67.4	60.6	56.2	51.9	155.9
Max	306.9	265.7	230.3	158.8	109.3	96.2	79.4	69.8	67.5	61.3	56.8	52.4	160.9
Average	306.5	265.3	227.0	158.6	108.8	95.7	79.1	69.7	67.4	60.9	56.5	52.1	158.4
Sigma	0.4	0.4	3.3	0.2	0.5	0.5	0.3	0.1	0.0	0.3	0.3	0.3	2.5

Drift Calculation

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	505.2E-06	1.2E-03	3.0E-03	6.0E-03	7.2E-03	9.4E-03	11.1E-03	11.6E-03	13.2E-03	14.5E-03	16.0E-03	3.2E-03
3	-	509.4E-06	1.1E-03	3.0E-03	5.9E-03	7.1E-03	9.3E-03	11.1E-03	11.6E-03	13.1E-03	14.3E-03	15.8E-03	2.9E-03
Average	-	507.3E-06	1.1E-03	3.0E-03	5.9E-03	7.2E-03	9.4E-03	11.1E-03	11.6E-03	13.1E-03	14.4E-03	15.9E-03	3.1E-03
Sigma	-	2.1E-06	67.8E-06	4.6E-06	46.8E-06	55.1E-06	52.1E-06	25.5E-06	13.1E-06	93.1E-06	97.3E-06	102.7E-06	104.9E-06

Measurements

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	469.7	478.4	473.9	462.7	478.9	465.1	437.9	455.5	455.1	453.0	454.5	460.8
ON_TID samples													
8	458.7	406.5	321.0	199.5	127.0	105.8	86.4	75.0	71.6	63.4	59.3	54.8	178.9
9	464.7	398.7	325.7	195.9	126.2	105.0	85.7	74.6	71.5	63.9	59.7	60.4	176.8
10	462.6	392.9	320.4	193.6	126.6	104.4	86.3	74.8	71.3	63.4	59.2	60.0	176.0
11	457.5	385.5	319.7	188.2	124.8	103.2	84.8	73.9	71.2	62.7	58.9	59.6	172.3
Statistics													
Min	457.5	385.5	319.7	188.2	124.8	103.2	84.8	73.9	71.2	62.7	58.9	54.8	172.3
Max	464.7	406.5	325.7	199.5	127.0	105.8	86.4	75.0	71.6	63.9	59.7	60.4	178.9
Average	460.9	395.9	321.7	194.3	126.1	104.6	85.8	74.6	71.4	63.3	59.3	58.7	176.0
Sigma	2.9	7.7	2.3	4.1	0.8	0.9	0.6	0.4	0.1	0.5	0.3	2.3	2.4

Drift Calculation

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	279.8E-06	935.0E-06	2.8E-03	5.7E-03	7.3E-03	9.4E-03	11.2E-03	11.8E-03	13.6E-03	14.7E-03	16.1E-03	3.4E-03
9	-	356.6E-06	918.8E-06	3.0E-03	5.8E-03	7.4E-03	9.5E-03	11.3E-03	11.8E-03	13.5E-03	14.6E-03	14.4E-03	3.5E-03
10	-	383.7E-06	959.4E-06	3.0E-03	5.7E-03	7.4E-03	9.4E-03	11.2E-03	11.9E-03	13.6E-03	14.7E-03	14.5E-03	3.5E-03
11	-	408.2E-06	941.8E-06	3.1E-03	5.8E-03	7.5E-03	9.6E-03	11.4E-03	11.9E-03	13.8E-03	14.8E-03	14.6E-03	3.6E-03
Average	-	357.1E-06	938.7E-06	3.0E-03	5.8E-03	7.4E-03	9.5E-03	11.2E-03	11.8E-03	13.6E-03	14.7E-03	14.9E-03	3.5E-03
Sigma	-	48.2E-06	14.6E-06	105.5E-06	48.1E-06	83.6E-06	82.7E-06	72.1E-06	29.2E-06	102.8E-06	72.8E-06	684.9E-06	73.7E-06

Measurements

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	469.7	478.4	473.9	462.7	478.9	465.1	437.9	455.5	455.1	453.0	454.5	460.8
OFF_PROTON samples													
16	302.1	271.1	234.7	165.4	111.5	96.9	80.4	71.1	69.3	61.4	57.4	58.3	158.3
Statistics													
Min	302.1	271.1	234.7	165.4	111.5	96.9	80.4	71.1	69.3	61.4	57.4	58.3	158.3
Max	302.1	271.1	234.7	165.4	111.5	96.9	80.4	71.1	69.3	61.4	57.4	58.3	158.3
Average	302.1	271.1	234.7	165.4	111.5	96.9	80.4	71.1	69.3	61.4	57.4	58.3	158.3
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	378.4E-06	951.8E-06	2.7E-03	5.7E-03	7.0E-03	9.1E-03	10.8E-03	11.1E-03	13.0E-03	14.1E-03	13.8E-03	3.0E-03
Average	-	378.4E-06	951.8E-06	2.7E-03	5.7E-03	7.0E-03	9.1E-03	10.8E-03	11.1E-03	13.0E-03	14.1E-03	13.8E-03	3.0E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

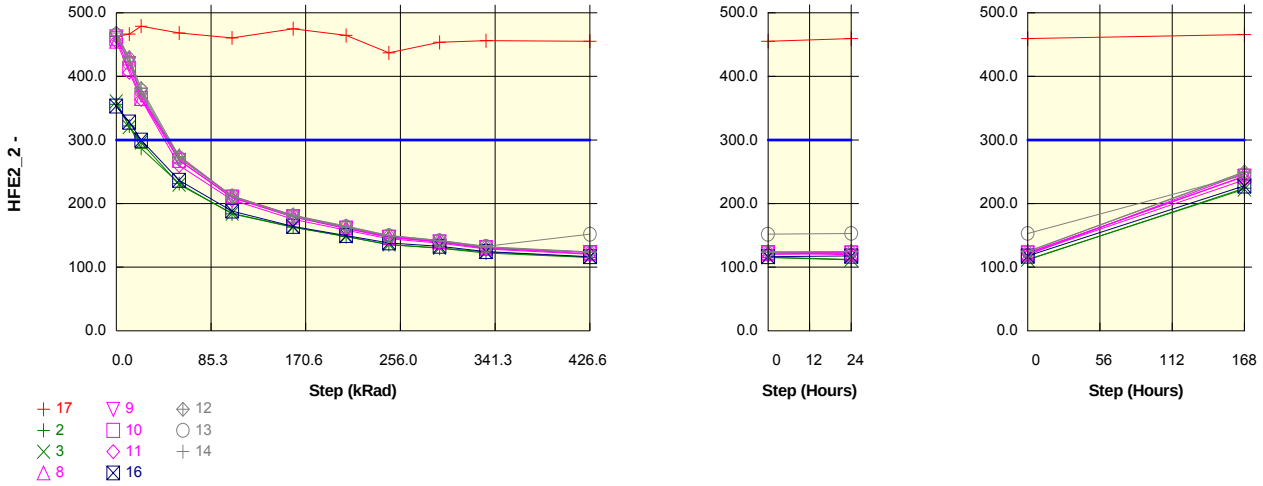
Measurements

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	469.7	478.4	473.9	462.7	478.9	465.1	437.9	455.5	455.1	453.0	454.5	460.8
OFF_TID samples													
12	471.2	409.8	336.5	200.8	127.8	106.7	88.8	77.0	72.9	64.9	60.8	61.5	180.4
13	467.9	402.1	334.0	199.5	128.6	106.3	88.2	76.9	73.1	65.2	81.6	82.9	172.2
14	467.4	409.1	329.1	197.6	127.8	105.0	87.1	76.1	72.4	64.5	60.0	61.3	181.6
Statistics													
Min	467.4	402.1	329.1	197.6	127.8	105.0	87.1	76.1	72.4	64.5	60.0	61.3	172.2
Max	471.2	409.8	336.5	200.8	128.6	106.7	88.8	77.0	73.1	65.2	81.6	82.9	181.6
Average	468.8	407.0	333.2	199.3	128.1	106.0	88.0	76.7	72.8	64.9	67.5	68.5	178.1
Sigma	1.7	3.5	3.0	1.3	0.4	0.7	0.7	0.4	0.3	0.3	10.0	10.1	4.2

Drift Calculation

HFE1_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	318.3E-06	850.1E-06	2.9E-03	5.7E-03	7.3E-03	9.1E-03	10.9E-03	11.6E-03	13.3E-03	14.3E-03	14.1E-03	3.4E-03
13	-	349.5E-06	856.5E-06	2.9E-03	5.6E-03	7.3E-03	9.2E-03	10.9E-03	11.6E-03	13.2E-03	10.1E-03	9.9E-03	3.7E-03
14	-	304.6E-06	898.7E-06	2.9E-03	5.7E-03	7.4E-03	9.3E-03	11.0E-03	11.7E-03	13.4E-03	14.5E-03	14.2E-03	3.4E-03
Average	-	324.1E-06	868.4E-06	2.9E-03	5.7E-03	7.3E-03	9.2E-03	10.9E-03	11.6E-03	13.3E-03	13.0E-03	12.8E-03	3.5E-03
Sigma	-	18.8E-06	21.6E-06	26.6E-06	25.8E-06	60.0E-06	85.9E-06	58.0E-06	47.1E-06	72.9E-06	2.0E-03	2.0E-03	132.1E-06

Parameter : DC current gain : HFE2_2
Test conditions : Ic = 1mA ; Vce = 5V
Unit :
Spec Limit Min : 300.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	466.6	479.0	468.3	460.4	475.0	464.3	437.0	453.5	456.0	455.2	459.3	465.8
ON_PROTON samples													
2	356.1	322.1	286.9	231.5	183.9	162.6	148.1	135.3	129.8	122.3	115.1	111.6	224.1
3	360.5	320.3	296.2	229.8	184.6	163.1	148.3	135.8	130.3	123.7	115.9	112.1	222.7
Statistics													
Min	356.1	320.3	286.9	229.8	183.9	162.6	148.1	135.3	129.8	122.3	115.1	111.6	222.7
Max	360.5	322.1	296.2	231.5	184.6	163.1	148.3	135.8	130.3	123.7	115.9	112.1	224.1
Average	358.3	321.2	291.5	230.6	184.2	162.8	148.2	135.6	130.1	123.0	115.5	111.9	223.4
Sigma	2.2	0.9	4.7	0.8	0.4	0.2	0.1	0.3	0.3	0.7	0.4	0.3	0.7

Drift Calculation

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	296.8E-06	678.1E-06	1.5E-03	2.6E-03	3.3E-03	3.9E-03	4.6E-03	4.9E-03	5.4E-03	5.9E-03	6.2E-03	1.7E-03
3	-	348.2E-06	602.4E-06	1.6E-03	2.6E-03	3.4E-03	4.0E-03	4.6E-03	4.9E-03	5.3E-03	5.9E-03	6.1E-03	1.7E-03
Average	-	322.5E-06	640.2E-06	1.5E-03	2.6E-03	3.4E-03	4.0E-03	4.6E-03	4.9E-03	5.3E-03	5.9E-03	6.1E-03	1.7E-03
Sigma	-	25.7E-06	37.9E-06	32.8E-06	6.4E-06	9.1E-06	11.4E-06	2.4E-06	709.7E-09	31.5E-06	16.1E-06	4.5E-06	31.0E-06

Measurements

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	466.6	479.0	468.3	460.4	475.0	464.3	437.0	453.5	456.0	455.2	459.3	465.8
ON_TID samples													
8	455.4	429.1	365.2	274.8	211.8	181.7	162.8	148.0	140.6	129.5	123.2	119.5	247.5
9	462.2	420.0	370.6	268.2	209.3	179.3	161.0	146.9	139.6	130.7	123.3	122.6	242.7
10	459.3	412.0	365.1	267.8	210.3	178.8	161.6	147.1	139.7	130.2	121.1	122.3	243.3
11	454.9	406.5	363.9	259.7	206.0	175.3	158.3	144.5	137.6	128.5	120.0	120.9	237.3
Statistics													
Min	454.9	406.5	363.9	259.7	206.0	175.3	158.3	144.5	137.6	128.5	120.0	119.5	237.3
Max	462.2	429.1	370.6	274.8	211.8	181.7	162.8	148.0	140.6	130.7	123.3	122.6	247.5
Average	457.9	416.9	366.2	267.6	209.3	178.8	160.9	146.6	139.4	129.7	121.9	121.3	242.7
Sigma	3.0	8.5	2.6	5.3	2.2	2.3	1.6	1.3	1.1	0.8	1.4	1.2	3.6

Drift Calculation

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	134.6E-06	541.8E-06	1.4E-03	2.5E-03	3.3E-03	3.9E-03	4.6E-03	4.9E-03	5.5E-03	5.9E-03	6.2E-03	1.8E-03
9	-	217.1E-06	535.0E-06	1.6E-03	2.6E-03	3.4E-03	4.0E-03	4.6E-03	5.0E-03	5.5E-03	5.9E-03	6.0E-03	2.0E-03
10	-	249.8E-06	561.5E-06	1.6E-03	2.6E-03	3.4E-03	4.0E-03	4.6E-03	5.0E-03	5.5E-03	6.1E-03	6.0E-03	1.9E-03
11	-	261.8E-06	549.9E-06	1.7E-03	2.7E-03	3.5E-03	4.1E-03	4.7E-03	5.1E-03	5.6E-03	6.1E-03	6.1E-03	2.0E-03
Average	-	215.8E-06	547.1E-06	1.6E-03	2.6E-03	3.4E-03	4.0E-03	4.6E-03	5.0E-03	5.5E-03	6.0E-03	6.1E-03	1.9E-03
Sigma	-	49.6E-06	9.9E-06	74.2E-06	48.7E-06	69.8E-06	62.3E-06	57.9E-06	54.5E-06	36.4E-06	89.5E-06	71.3E-06	61.3E-06

Measurements

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	466.6	479.0	468.3	460.4	475.0	464.3	437.0	453.5	456.0	455.2	459.3	465.8
OFF_PROTON samples													
16	353.3	328.2	299.7	236.6	188.2	164.2	149.7	138.3	132.8	124.6	116.6	117.5	227.8
Statistics													
Min	353.3	328.2	299.7	236.6	188.2	164.2	149.7	138.3	132.8	124.6	116.6	117.5	227.8
Max	353.3	328.2	299.7	236.6	188.2	164.2	149.7	138.3	132.8	124.6	116.6	117.5	227.8
Average	353.3	328.2	299.7	236.6	188.2	164.2	149.7	138.3	132.8	124.6	116.6	117.5	227.8
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	216.3E-06	506.1E-06	1.4E-03	2.5E-03	3.3E-03	3.8E-03	4.4E-03	4.7E-03	5.2E-03	5.7E-03	5.7E-03	1.6E-03
Average	-	216.3E-06	506.1E-06	1.4E-03	2.5E-03	3.3E-03	3.8E-03	4.4E-03	4.7E-03	5.2E-03	5.7E-03	5.7E-03	1.6E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

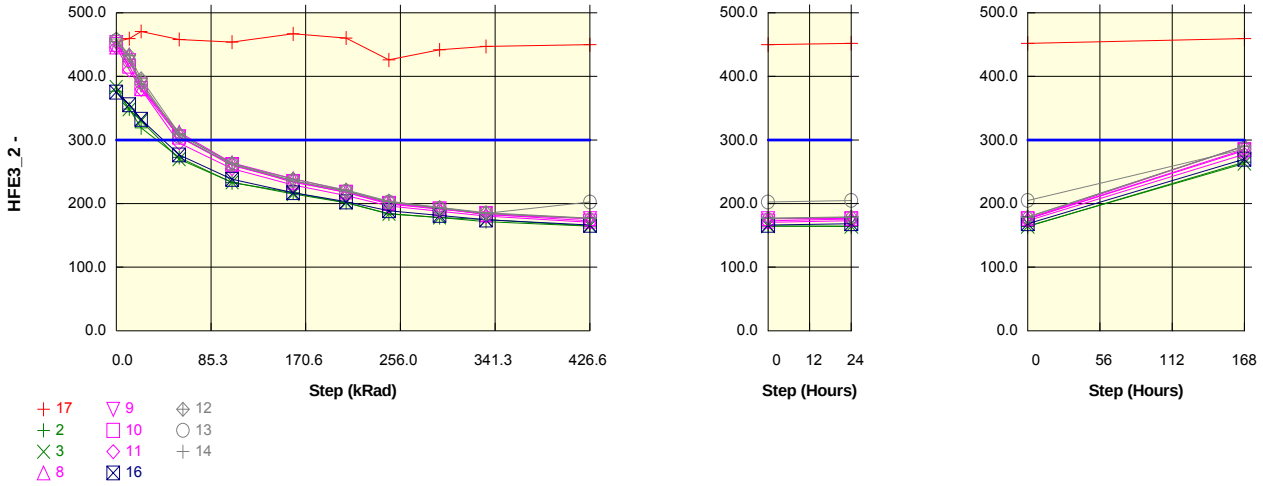
Measurements

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	462.6	466.6	479.0	468.3	460.4	475.0	464.3	437.0	453.5	456.0	455.2	459.3	465.8
OFF_TID samples													
12	468.0	429.4	380.8	274.1	211.8	181.8	164.8	150.1	142.0	132.6	124.0	124.9	250.2
13	465.0	421.4	377.0	271.5	211.5	180.4	163.5	149.4	141.7	132.7	151.7	153.0	244.8
14	464.2	429.0	372.5	271.9	212.0	179.8	163.0	149.2	141.5	131.2	123.5	124.3	249.0
Statistics													
Min	464.2	421.4	372.5	271.5	211.5	179.8	163.0	149.2	141.5	131.2	123.5	124.3	244.8
Max	468.0	429.4	380.8	274.1	212.0	181.8	164.8	150.1	142.0	132.7	151.7	153.0	250.2
Average	465.7	426.6	376.8	272.5	211.8	180.7	163.8	149.6	141.7	132.1	133.1	134.1	248.0
Sigma	1.7	3.7	3.4	1.1	0.2	0.9	0.8	0.4	0.2	0.7	13.2	13.4	2.3

Drift Calculation

HFE2_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	192.3E-06	489.2E-06	1.5E-03	2.6E-03	3.4E-03	3.9E-03	4.5E-03	4.9E-03	5.4E-03	5.9E-03	5.9E-03	1.9E-03
13	-	222.2E-06	501.7E-06	1.5E-03	2.6E-03	3.4E-03	4.0E-03	4.5E-03	4.9E-03	5.4E-03	4.4E-03	4.4E-03	1.9E-03
14	-	176.7E-06	530.7E-06	1.5E-03	2.6E-03	3.4E-03	4.0E-03	4.5E-03	4.9E-03	5.5E-03	5.9E-03	5.9E-03	1.9E-03
Average	-	197.1E-06	507.2E-06	1.5E-03	2.6E-03	3.4E-03	4.0E-03	4.5E-03	4.9E-03	5.4E-03	5.4E-03	5.4E-03	1.9E-03
Sigma	-	18.9E-06	17.4E-06	8.6E-06	8.9E-06	19.2E-06	20.8E-06	9.7E-06	2.9E-06	34.9E-06	705.3E-06	703.7E-06	34.3E-06

Parameter : DC current gain : HFE3_2
Test conditions : Ic = 5mA ; Vce = 5V
Unit :
Spec Limit Min : 300.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	454.4	459.2	470.6	458.0	453.8	466.9	460.2	425.8	441.7	447.0	449.8	451.8	459.3
ON_PROTON samples													
2	376.7	349.0	319.0	272.4	232.8	216.9	201.4	183.5	178.1	171.8	164.6	164.1	265.3
3	383.3	348.1	329.9	269.8	233.6	215.1	201.3	184.2	178.1	174.7	165.0	164.4	263.3
Statistics													
Min	376.7	348.1	319.0	269.8	232.8	215.1	201.3	183.5	178.1	171.8	164.6	164.1	263.3
Max	383.3	349.0	329.9	272.4	233.6	216.9	201.4	184.2	178.1	174.7	165.0	164.4	265.3
Average	380.0	348.5	324.4	271.1	233.2	216.0	201.4	183.9	178.1	173.3	164.8	164.3	264.3
Sigma	3.3	0.4	5.5	1.3	0.4	0.9	0.0	0.4	0.0	1.5	0.2	0.1	1.0

Drift Calculation

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	210.9E-06	480.7E-06	1.0E-03	1.6E-03	2.0E-03	2.3E-03	2.8E-03	3.0E-03	3.2E-03	3.4E-03	3.4E-03	1.1E-03
3	-	264.1E-06	422.1E-06	1.1E-03	1.7E-03	2.0E-03	2.4E-03	2.8E-03	3.0E-03	3.1E-03	3.5E-03	3.5E-03	1.2E-03
Average	-	237.5E-06	451.4E-06	1.1E-03	1.7E-03	2.0E-03	2.3E-03	2.8E-03	3.0E-03	3.1E-03	3.4E-03	3.5E-03	1.2E-03
Sigma	-	26.6E-06	29.3E-06	40.5E-06	15.5E-06	42.2E-06	23.8E-06	12.4E-06	22.0E-06	26.3E-06	16.5E-06	18.2E-06	37.2E-06

Measurements

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	454.4	459.2	470.6	458.0	453.8	466.9	460.2	425.8	441.7	447.0	449.8	451.8	459.3
ON_TID samples													
8	446.1	433.7	380.7	312.1	263.9	238.9	220.1	201.2	193.1	182.3	176.4	176.7	290.4
9	453.0	424.5	386.4	304.8	259.8	234.8	217.3	199.2	191.2	184.6	176.3	176.1	283.4
10	450.2	416.1	381.0	304.6	261.5	233.8	218.1	200.3	191.8	183.4	172.6	176.0	285.2
11	445.5	410.1	379.6	295.3	255.0	229.2	212.8	196.1	187.9	180.2	170.5	173.1	277.4
Statistics													
Min	445.5	410.1	379.6	295.3	255.0	229.2	212.8	196.1	187.9	180.2	170.5	173.1	277.4
Max	453.0	433.7	386.4	312.1	263.9	238.9	220.1	201.2	193.1	184.6	176.4	176.7	290.4
Average	448.7	421.1	382.0	304.2	260.0	234.2	217.1	199.2	191.0	182.6	174.0	175.5	284.1
Sigma	3.1	8.9	2.6	6.0	3.3	3.5	2.7	1.9	1.9	1.6	2.5	1.4	4.6

Drift Calculation

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	64.1E-06	384.9E-06	962.4E-06	1.5E-03	1.9E-03	2.3E-03	2.7E-03	2.9E-03	3.2E-03	3.4E-03	3.4E-03	1.2E-03
9	-	148.0E-06	380.4E-06	1.1E-03	1.6E-03	2.1E-03	2.4E-03	2.8E-03	3.0E-03	3.2E-03	3.5E-03	3.5E-03	1.3E-03
10	-	182.1E-06	403.1E-06	1.1E-03	1.6E-03	2.1E-03	2.4E-03	2.8E-03	3.0E-03	3.2E-03	3.6E-03	3.5E-03	1.3E-03
11	-	193.9E-06	389.5E-06	1.1E-03	1.7E-03	2.1E-03	2.5E-03	2.9E-03	3.1E-03	3.3E-03	3.6E-03	3.5E-03	1.4E-03
Average	-	147.0E-06	389.5E-06	1.1E-03	1.6E-03	2.0E-03	2.4E-03	2.8E-03	3.0E-03	3.2E-03	3.5E-03	3.5E-03	1.3E-03
Sigma	-	50.8E-06	8.5E-06	64.0E-06	48.3E-06	62.9E-06	55.6E-06	46.7E-06	50.8E-06	35.1E-06	77.9E-06	41.2E-06	58.2E-06

Measurements

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	454.4	459.2	470.6	458.0	453.8	466.9	460.2	425.8	441.7	447.0	449.8	451.8	459.3
OFF_PROTON samples													
16	375.3	355.6	332.4	276.4	238.2	217.0	202.9	188.7	181.4	174.5	166.1	168.6	269.9
Statistics													
Min	375.3	355.6	332.4	276.4	238.2	217.0	202.9	188.7	181.4	174.5	166.1	168.6	269.9
Max	375.3	355.6	332.4	276.4	238.2	217.0	202.9	188.7	181.4	174.5	166.1	168.6	269.9
Average	375.3	355.6	332.4	276.4	238.2	217.0	202.9	188.7	181.4	174.5	166.1	168.6	269.9
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	147.6E-06	343.8E-06	952.7E-06	1.5E-03	1.9E-03	2.3E-03	2.6E-03	2.8E-03	3.1E-03	3.4E-03	3.3E-03	1.0E-03
Average	-	147.6E-06	343.8E-06	952.7E-06	1.5E-03	1.9E-03	2.3E-03	2.6E-03	2.8E-03	3.1E-03	3.4E-03	3.3E-03	1.0E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

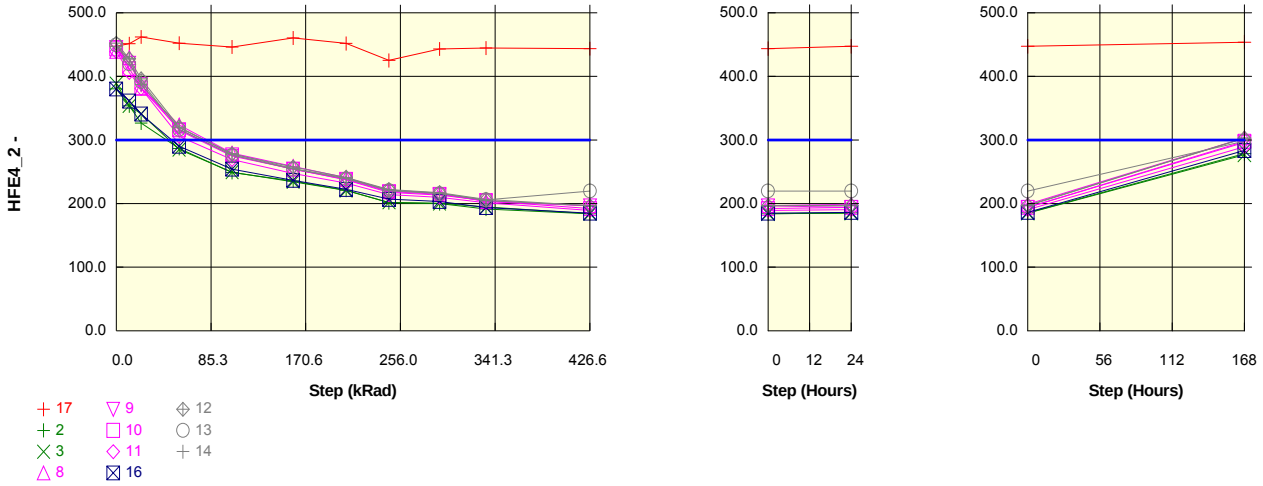
Measurements

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	454.4	459.2	470.6	458.0	453.8	466.9	460.2	425.8	441.7	447.0	449.8	451.8	459.3
OFF_TID samples													
12	458.7	433.0	396.2	309.9	262.9	238.6	221.2	203.8	193.8	185.7	176.9	179.2	290.2
13	456.5	424.6	391.4	305.8	261.4	236.0	219.1	202.3	192.5	184.8	202.6	205.0	285.7
14	454.7	432.3	386.9	308.3	263.4	235.3	219.9	202.9	193.6	184.1	176.6	178.4	290.4
Statistics													
Min	454.7	424.6	386.9	305.8	261.4	235.3	219.1	202.3	192.5	184.1	176.6	178.4	285.7
Max	458.7	433.0	396.2	309.9	263.4	238.6	221.2	203.8	193.8	185.7	202.6	205.0	290.4
Average	456.7	430.0	391.5	308.0	262.6	236.6	220.1	203.0	193.3	184.9	185.4	187.5	288.8
Sigma	1.7	3.8	3.8	1.7	0.8	1.4	0.9	0.6	0.6	0.7	12.2	12.3	2.2

Drift Calculation

HFE3_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	129.4E-06	343.9E-06	1.0E-03	1.6E-03	2.0E-03	2.3E-03	2.7E-03	3.0E-03	3.2E-03	3.5E-03	3.4E-03	1.3E-03
13	-	164.6E-06	364.2E-06	1.1E-03	1.6E-03	2.0E-03	2.4E-03	2.8E-03	3.0E-03	3.2E-03	2.7E-03	2.7E-03	1.3E-03
14	-	114.2E-06	385.4E-06	1.0E-03	1.6E-03	2.1E-03	2.3E-03	2.7E-03	3.0E-03	3.2E-03	3.5E-03	3.4E-03	1.2E-03
Average	-	136.1E-06	364.5E-06	1.1E-03	1.6E-03	2.0E-03	2.4E-03	2.7E-03	3.0E-03	3.2E-03	3.2E-03	3.2E-03	1.3E-03
Sigma	-	21.1E-06	16.9E-06	16.0E-06	15.8E-06	18.2E-06	14.2E-06	11.3E-06	15.4E-06	11.3E-06	340.1E-06	336.9E-06	27.2E-06

Parameter : DC current gain : HFE4_2
Test conditions : Ic = 10mA ; Vce = 5V
Unit :
Spec Limit Min : 300.0
Spec limits are represented in bold lines on the graphic.



Measurements

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	447.7	451.4	461.9	452.1	446.2	460.4	451.8	425.1	443.2	444.5	443.5	447.4	453.7
ON_PROTON samples													
2	380.5	353.8	326.5	286.5	248.7	235.5	221.1	201.4	200.0	191.4	184.0	185.2	278.5
3	388.8	353.5	341.2	285.0	249.5	234.3	220.5	202.0	200.3	194.7	184.1	185.1	276.7
Statistics													
Min	380.5	353.5	326.5	285.0	248.7	234.3	220.5	201.4	200.0	191.4	184.0	185.1	276.7
Max	388.8	353.8	341.2	286.5	249.5	235.5	221.1	202.0	200.3	194.7	184.1	185.2	278.5
Average	384.6	353.7	333.8	285.8	249.1	234.9	220.8	201.7	200.1	193.0	184.0	185.2	277.6
Sigma	4.1	0.1	7.3	0.8	0.4	0.6	0.3	0.3	0.2	1.6	0.1	0.0	0.9

Drift Calculation

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	198.0E-06	434.5E-06	861.7E-06	1.4E-03	1.6E-03	1.9E-03	2.3E-03	2.4E-03	2.6E-03	2.8E-03	2.8E-03	962.8E-06
3	-	256.4E-06	358.9E-06	936.6E-06	1.4E-03	1.7E-03	2.0E-03	2.4E-03	2.4E-03	2.6E-03	2.9E-03	2.8E-03	1.0E-03
Average	-	227.2E-06	396.7E-06	899.1E-06	1.4E-03	1.7E-03	1.9E-03	2.4E-03	2.4E-03	2.6E-03	2.8E-03	2.8E-03	1.0E-03
Sigma	-	29.2E-06	37.8E-06	37.5E-06	21.7E-06	38.6E-06	33.9E-06	21.3E-06	23.4E-06	16.1E-06	26.2E-06	29.3E-06	39.4E-06

Measurements

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	447.7	451.4	461.9	452.1	446.2	460.4	451.8	425.1	443.2	444.5	443.5	447.4	453.7
ON_TID samples													
8	439.5	429.7	381.3	323.7	279.3	258.5	240.8	220.1	216.5	203.2	197.0	199.1	303.2
9	445.4	420.6	387.1	315.1	274.7	254.5	237.2	217.7	213.5	204.5	196.4	193.9	296.4
10	443.2	412.2	381.9	316.4	276.7	253.8	238.1	218.7	214.4	204.1	192.2	194.0	297.8
11	438.8	406.1	380.8	305.7	269.2	247.4	232.1	214.0	209.8	201.2	189.4	190.4	289.4
Statistics													
Min	438.8	406.1	380.8	305.7	269.2	247.4	232.1	214.0	209.8	201.2	189.4	190.4	289.4
Max	445.4	429.7	387.1	323.7	279.3	258.5	240.8	220.1	216.5	204.5	197.0	199.1	303.2
Average	441.8	417.2	382.8	315.2	275.0	253.5	237.0	217.6	213.6	203.2	193.8	194.4	296.7
Sigma	2.7	8.9	2.5	6.4	3.7	4.0	3.1	2.3	2.4	1.3	3.1	3.1	4.9

Drift Calculation

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	51.9E-06	347.2E-06	814.4E-06	1.3E-03	1.6E-03	1.9E-03	2.3E-03	2.3E-03	2.6E-03	2.8E-03	2.7E-03	1.0E-03
9	-	132.6E-06	338.5E-06	928.8E-06	1.4E-03	1.7E-03	2.0E-03	2.3E-03	2.4E-03	2.6E-03	2.8E-03	2.9E-03	1.1E-03
10	-	169.9E-06	362.3E-06	904.8E-06	1.4E-03	1.7E-03	1.9E-03	2.3E-03	2.4E-03	2.6E-03	2.9E-03	2.9E-03	1.1E-03
11	-	183.3E-06	346.9E-06	992.0E-06	1.4E-03	1.8E-03	2.0E-03	2.4E-03	2.5E-03	2.7E-03	3.0E-03	3.0E-03	1.2E-03
Average	-	134.4E-06	348.7E-06	910.0E-06	1.4E-03	1.7E-03	2.0E-03	2.3E-03	2.4E-03	2.7E-03	2.9E-03	2.9E-03	1.1E-03
Sigma	-	51.1E-06	8.6E-06	63.7E-06	48.1E-06	60.2E-06	54.4E-06	46.4E-06	51.8E-06	20.2E-06	78.6E-06	83.0E-06	56.0E-06

Measurements

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	447.7	451.4	461.9	452.1	446.2	460.4	451.8	425.1	443.2	444.5	443.5	447.4	453.7
OFF_PROTON samples													
16	380.2	361.4	340.7	290.1	254.3	236.5	222.4	206.8	203.5	193.8	185.1	186.2	283.5
Statistics													
Min	380.2	361.4	340.7	290.1	254.3	236.5	222.4	206.8	203.5	193.8	185.1	186.2	283.5
Max	380.2	361.4	340.7	290.1	254.3	236.5	222.4	206.8	203.5	193.8	185.1	186.2	283.5
Average	380.2	361.4	340.7	290.1	254.3	236.5	222.4	206.8	203.5	193.8	185.1	186.2	283.5
Sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Drift Calculation

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	136.7E-06	305.0E-06	816.7E-06	1.3E-03	1.6E-03	1.9E-03	2.2E-03	2.3E-03	2.5E-03	2.8E-03	2.7E-03	896.4E-06
Average	-	136.7E-06	305.0E-06	816.7E-06	1.3E-03	1.6E-03	1.9E-03	2.2E-03	2.3E-03	2.5E-03	2.8E-03	2.7E-03	896.4E-06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

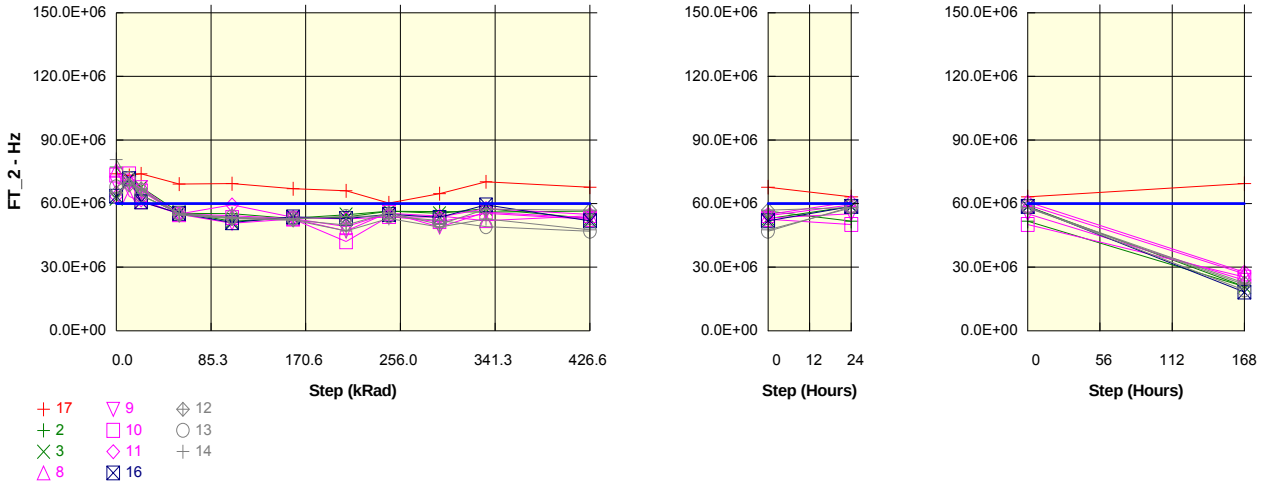
Measurements

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	447.7	451.4	461.9	452.1	446.2	460.4	451.8	425.1	443.2	444.5	443.5	447.4	453.7
OFF_TID samples													
12	452.1	427.7	396.2	320.6	278.0	257.6	241.3	222.0	217.1	206.7	196.9	197.5	302.8
13	449.4	419.9	391.8	316.6	276.0	254.4	238.9	220.4	215.6	206.0	219.7	219.7	298.2
14	447.3	427.5	387.4	319.3	278.5	255.2	240.0	221.5	216.3	204.3	196.8	196.5	303.1
Statistics													
Min	447.3	419.9	387.4	316.6	276.0	254.4	238.9	220.4	215.6	204.3	196.8	196.5	298.2
Max	452.1	427.7	396.2	320.6	278.5	257.6	241.3	222.0	217.1	206.7	219.7	219.7	303.1
Average	449.6	425.0	391.8	318.8	277.5	255.7	240.1	221.3	216.3	205.6	204.5	204.6	301.4
Sigma	1.9	3.6	3.6	1.6	1.1	1.4	1.0	0.7	0.6	1.0	10.8	10.7	2.2

Drift Calculation

HFE4_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	126.0E-06	312.2E-06	907.6E-06	1.4E-03	1.7E-03	1.9E-03	2.3E-03	2.4E-03	2.6E-03	2.9E-03	2.9E-03	1.1E-03
13	-	156.0E-06	327.2E-06	932.8E-06	1.4E-03	1.7E-03	2.0E-03	2.3E-03	2.4E-03	2.6E-03	2.3E-03	2.3E-03	1.1E-03
14	-	103.7E-06	345.7E-06	896.3E-06	1.4E-03	1.7E-03	1.9E-03	2.3E-03	2.4E-03	2.7E-03	2.8E-03	2.9E-03	1.1E-03
Average	-	128.6E-06	328.4E-06	912.2E-06	1.4E-03	1.7E-03	1.9E-03	2.3E-03	2.4E-03	2.6E-03	2.7E-03	2.7E-03	1.1E-03
Sigma	-	21.4E-06	13.7E-06	15.3E-06	18.1E-06	15.2E-06	13.8E-06	13.1E-06	11.5E-06	15.4E-06	250.5E-06	247.7E-06	26.3E-06

Parameter : Gain bandwidth product : FT_2
Test conditions : Ic = 500µA ; Vce = 5V
Unit : Hz
Spec Limit Min : 60.0E+06
Spec limits are represented in bold lines on the graphic.



Measurements

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	74.1E+06	73.3E+06	74.1E+06	69.2E+06	69.4E+06	67.0E+06	66.0E+06	60.3E+06	64.6E+06	70.3E+06	67.7E+06	63.1E+06	69.4E+06
ON_PROTON samples													
2	77.3E+06	69.0E+06	63.9E+06	55.4E+06	55.2E+06	52.9E+06	53.6E+06	56.3E+06	56.3E+06	56.1E+06	56.4E+06	51.7E+06	20.8E+06
3	62.4E+06	71.3E+06	67.7E+06	55.9E+06	51.8E+06	53.1E+06	54.8E+06	56.5E+06	55.4E+06	57.6E+06	52.9E+06	58.6E+06	20.9E+06
Statistics													
Min	62.4E+06	69.0E+06	63.9E+06	55.4E+06	51.8E+06	52.9E+06	53.6E+06	56.3E+06	55.4E+06	56.1E+06	52.9E+06	51.7E+06	20.8E+06
Max	77.3E+06	71.3E+06	67.7E+06	55.9E+06	55.2E+06	53.1E+06	54.8E+06	56.5E+06	56.3E+06	57.6E+06	56.4E+06	58.6E+06	20.9E+06
Average	69.8E+06	70.2E+06	65.8E+06	55.6E+06	53.5E+06	53.0E+06	54.2E+06	56.4E+06	55.8E+06	56.8E+06	54.7E+06	55.2E+06	20.9E+06
Sigma	7.4E+06	1.1E+06	1.9E+06	236.9E+03	1.7E+06	134.3E+03	580.2E+03	84.4E+03	437.1E+03	765.7E+03	1.8E+06	3.5E+06	69.7E+03

Drift Calculation

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-8.2E+06	-13.3E+06	-21.9E+06	-22.0E+06	-24.4E+06	-23.6E+06	-20.9E+06	-21.0E+06	-21.2E+06	-20.8E+06	-25.5E+06	-56.5E+06
3	-	8.9E+06	5.3E+06	-6.5E+06	-10.6E+06	-9.2E+06	-7.6E+06	-5.9E+06	-7.0E+06	-4.8E+06	-9.5E+06	-3.7E+06	-41.4E+06
Average	-	358.9E+03	-4.0E+06	-14.2E+06	-16.3E+06	-16.8E+06	-15.6E+06	-13.4E+06	-14.0E+06	-13.0E+06	-15.2E+06	-14.6E+06	-48.9E+06
Sigma	-	8.6E+06	9.3E+06	7.7E+06	5.7E+06	7.6E+06	8.0E+06	7.5E+06	7.0E+06	8.2E+06	5.6E+06	10.9E+06	7.5E+06

Measurements

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	74.1E+06	73.3E+06	74.1E+06	69.2E+06	69.4E+06	67.0E+06	66.0E+06	60.3E+06	64.6E+06	70.3E+06	67.7E+06	63.1E+06	69.4E+06
ON_TID samples													
8	75.8E+06	63.3E+06	60.9E+06	55.2E+06	54.3E+06	52.9E+06	49.1E+06	55.4E+06	54.0E+06	52.0E+06	54.4E+06	59.4E+06	26.8E+06
9	69.6E+06	69.3E+06	67.5E+06	54.9E+06	50.8E+06	52.8E+06	47.0E+06	55.9E+06	48.9E+06	55.9E+06	53.2E+06	55.2E+06	23.8E+06
10	73.5E+06	74.1E+06	66.0E+06	54.8E+06	53.4E+06	52.7E+06	42.1E+06	53.9E+06	51.5E+06	55.4E+06	52.5E+06	50.1E+06	25.3E+06
11	63.3E+06	69.9E+06	61.8E+06	55.1E+06	59.3E+06	53.5E+06	52.8E+06	53.7E+06	53.6E+06	57.7E+06	54.9E+06	60.8E+06	27.6E+06
Statistics													
Min	63.3E+06	63.3E+06	60.9E+06	54.8E+06	50.8E+06	52.7E+06	42.1E+06	53.7E+06	48.9E+06	52.0E+06	52.5E+06	50.1E+06	23.8E+06
Max	75.8E+06	74.1E+06	67.5E+06	55.2E+06	59.3E+06	53.5E+06	52.8E+06	55.9E+06	54.0E+06	57.7E+06	54.9E+06	60.8E+06	27.6E+06
Average	70.5E+06	69.1E+06	64.0E+06	55.0E+06	54.4E+06	53.0E+06	47.8E+06	54.7E+06	52.0E+06	55.2E+06	53.7E+06	56.4E+06	25.9E+06
Sigma	4.7E+06	3.8E+06	2.8E+06	160.1E+03	3.1E+06	317.3E+03	3.9E+06	933.0E+03	2.0E+06	2.1E+06	916.6E+03	4.1E+06	1.4E+06

Drift Calculation

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	-12.4E+06	-14.9E+06	-20.6E+06	-21.5E+06	-22.9E+06	-26.7E+06	-20.4E+06	-21.7E+06	-23.8E+06	-21.4E+06	-16.4E+06	-49.0E+06
9	-	-271.9E+03	-2.1E+06	-14.7E+06	-18.8E+06	-16.8E+06	-22.6E+06	-13.7E+06	-20.7E+06	-13.7E+06	-16.4E+06	-14.4E+06	-45.8E+06
10	-	594.4E+03	-7.5E+06	-18.7E+06	-20.1E+06	-20.8E+06	-31.4E+06	-19.6E+06	-22.0E+06	-18.1E+06	-20.9E+06	-23.3E+06	-48.1E+06
11	-	6.5E+06	-1.6E+06	-8.3E+06	-4.0E+06	-9.8E+06	-10.5E+06	-9.6E+06	-9.7E+06	-5.7E+06	-8.5E+06	-2.6E+06	-35.7E+06
Average	-	-1.4E+06	-6.5E+06	-15.5E+06	-16.1E+06	-17.6E+06	-22.8E+06	-15.8E+06	-18.5E+06	-15.3E+06	-16.8E+06	-14.2E+06	-44.6E+06
Sigma	-	6.9E+06	5.4E+06	4.7E+06	7.0E+06	5.0E+06	7.7E+06	4.4E+06	5.1E+06	6.6E+06	5.2E+06	7.5E+06	5.3E+06

Measurements

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	74.1E+06	73.3E+06	74.1E+06	69.2E+06	69.4E+06	67.0E+06	66.0E+06	60.3E+06	64.6E+06	70.3E+06	67.7E+06	63.1E+06	69.4E+06
OFF_PROTON samples													
16	63.5E+06	71.8E+06	60.9E+06	55.4E+06	51.0E+06	53.7E+06	53.0E+06	54.9E+06	53.6E+06	59.4E+06	51.9E+06	58.7E+06	18.2E+06
Statistics													
Min	63.5E+06	71.8E+06	60.9E+06	55.4E+06	51.0E+06	53.7E+06	53.0E+06	54.9E+06	53.6E+06	59.4E+06	51.9E+06	58.7E+06	18.2E+06
Max	63.5E+06	71.8E+06	60.9E+06	55.4E+06	51.0E+06	53.7E+06	53.0E+06	54.9E+06	53.6E+06	59.4E+06	51.9E+06	58.7E+06	18.2E+06
Average	63.5E+06	71.8E+06	60.9E+06	55.4E+06	51.0E+06	53.7E+06	53.0E+06	54.9E+06	53.6E+06	59.4E+06	51.9E+06	58.7E+06	18.2E+06
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	8.3E+06	-2.6E+06	-8.1E+06	-12.4E+06	-9.7E+06	-10.5E+06	-8.5E+06	-9.9E+06	-4.1E+06	-11.6E+06	-4.8E+06	-45.3E+06
Average	-	8.3E+06	-2.6E+06	-8.1E+06	-12.4E+06	-9.7E+06	-10.5E+06	-8.5E+06	-9.9E+06	-4.1E+06	-11.6E+06	-4.8E+06	-45.3E+06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

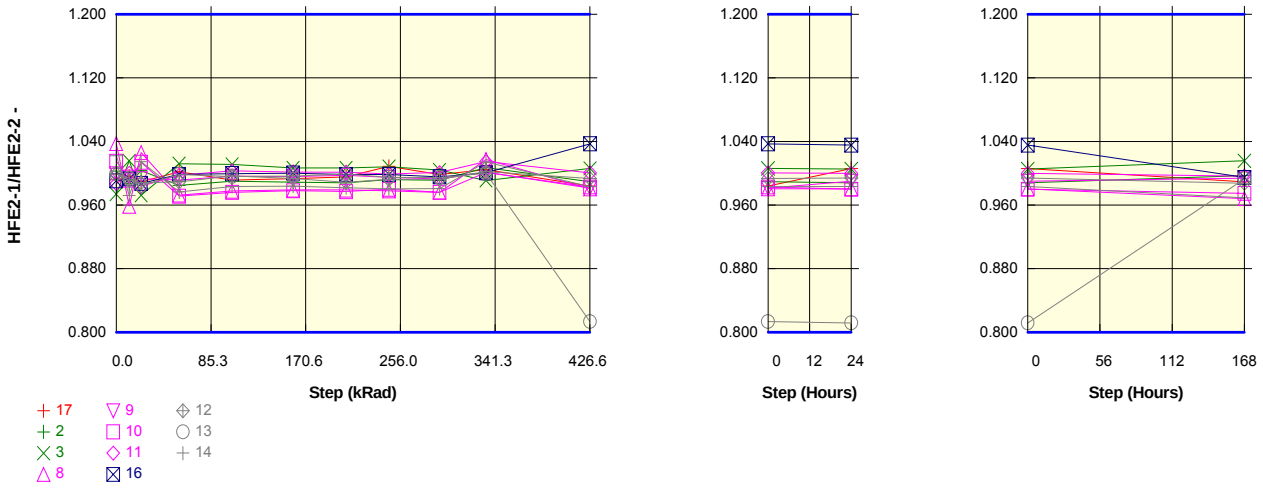
Measurements

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	74.1E+06	73.3E+06	74.1E+06	69.2E+06	69.4E+06	67.0E+06	66.0E+06	60.3E+06	64.6E+06	70.3E+06	67.7E+06	63.1E+06	69.4E+06
OFF_TID samples													
12	65.1E+06	68.8E+06	67.0E+06	54.6E+06	52.9E+06	52.3E+06	49.9E+06	55.6E+06	50.2E+06	57.3E+06	56.9E+06	58.1E+06	22.6E+06
13	67.8E+06	71.7E+06	63.9E+06	55.4E+06	53.6E+06	52.9E+06	54.0E+06	54.1E+06	52.0E+06	49.1E+06	46.9E+06	58.5E+06	19.2E+06
14	80.8E+06	70.1E+06	66.4E+06	54.9E+06	53.3E+06	52.2E+06	47.1E+06	53.0E+06	48.9E+06	52.8E+06	47.6E+06	58.0E+06	21.8E+06
Statistics													
Min	65.1E+06	68.8E+06	63.9E+06	54.6E+06	52.9E+06	52.2E+06	47.1E+06	53.0E+06	48.9E+06	49.1E+06	46.9E+06	58.0E+06	19.2E+06
Max	80.8E+06	71.7E+06	67.0E+06	55.4E+06	53.6E+06	52.9E+06	54.0E+06	55.6E+06	52.0E+06	57.3E+06	56.9E+06	58.5E+06	22.6E+06
Average	71.3E+06	70.2E+06	65.8E+06	55.0E+06	53.2E+06	52.5E+06	50.3E+06	54.3E+06	50.4E+06	53.1E+06	50.5E+06	58.2E+06	21.2E+06
Sigma	6.8E+06	1.2E+06	1.3E+06	329.8E+03	302.0E+03	303.1E+03	2.8E+06	1.0E+06	1.3E+06	3.4E+06	4.6E+06	231.9E+03	1.4E+06

Drift Calculation

FT_2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	3.7E+06	1.9E+06	-10.5E+06	-12.3E+06	-12.8E+06	-15.2E+06	-9.5E+06	-14.9E+06	-7.8E+06	-8.2E+06	-7.0E+06	-42.5E+06
13	-	3.9E+06	-3.9E+06	-12.4E+06	-14.3E+06	-15.0E+06	-13.9E+06	-13.7E+06	-15.8E+06	-18.8E+06	-20.9E+06	-9.3E+06	-48.6E+06
14	-	-10.7E+06	-14.4E+06	-25.9E+06	-27.5E+06	-28.6E+06	-33.7E+06	-27.8E+06	-31.9E+06	-28.0E+06	-33.2E+06	-22.8E+06	-59.0E+06
Average	-	-1.0E+06	-5.4E+06	-16.3E+06	-18.0E+06	-18.8E+06	-20.9E+06	-17.0E+06	-20.9E+06	-18.2E+06	-20.8E+06	-13.0E+06	-50.1E+06
Sigma	-	6.8E+06	6.7E+06	6.9E+06	6.8E+06	7.0E+06	9.1E+06	7.8E+06	7.8E+06	8.3E+06	10.2E+06	7.0E+06	6.8E+06

Parameter : Forward current transer ratio comparison : HFE2-1/HFE2-2
Test conditions : Ic = 1mA ; Vce = 5V
Unit :
Spec Limit Min : 0.800
Spec Limit Max : 1.200
Spec limits are represented in bold lines on the graphic.



Measurements

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.992	0.997	0.989	1.002	0.991	0.993	0.996	1.009	0.999	1.004	0.984	1.006	0.989
ON_PROTON samples													
2	1.003	0.987	1.003	0.985	0.990	0.989	0.988	0.992	0.991	1.007	0.989	0.988	0.997
3	0.974	1.016	0.972	1.012	1.011	1.007	1.007	1.008	1.004	0.991	1.006	1.005	1.016
Statistics													
Min	0.974	0.987	0.972	0.985	0.990	0.989	0.988	0.992	0.991	0.991	0.989	0.988	0.997
Max	1.003	1.016	1.003	1.012	1.011	1.007	1.007	1.008	1.004	1.007	1.006	1.005	1.016
Average	0.988	1.001	0.988	0.999	1.001	0.998	0.997	1.000	0.998	0.999	0.998	0.997	1.006
Sigma	0.014	0.014	0.016	0.014	0.011	0.009	0.009	0.008	0.006	0.008	0.008	0.009	0.009

Drift Calculation

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	15.8E-03	-766.9E-06	17.9E-03	12.7E-03	13.8E-03	14.8E-03	10.5E-03	11.6E-03	-4.4E-03	13.4E-03	14.7E-03	5.6E-03
3	-	-42.4E-03	1.5E-03	-38.8E-03	-37.9E-03	-33.6E-03	-33.5E-03	-35.1E-03	-31.0E-03	-17.8E-03	-33.1E-03	-32.1E-03	-42.4E-03
Average	-	-13.3E-03	375.3E-06	-10.5E-03	-12.6E-03	-9.9E-03	-9.4E-03	-12.3E-03	-9.7E-03	-11.1E-03	-9.8E-03	-8.7E-03	-18.4E-03
Sigma	-	29.1E-03	1.1E-03	28.3E-03	25.3E-03	23.7E-03	24.1E-03	22.8E-03	21.3E-03	6.7E-03	23.2E-03	23.4E-03	24.0E-03

Measurements

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.992	0.997	0.989	1.002	0.991	0.993	0.996	1.009	0.999	1.004	0.984	1.006	0.989
ON_TID samples													
8	1.037	0.959	1.026	0.973	0.978	0.979	0.979	0.978	0.976	1.017	0.981	0.980	0.968
9	0.999	0.995	0.993	0.991	0.996	0.996	0.997	0.995	0.993	1.001	0.981	0.990	0.994
10	1.015	0.991	1.014	0.971	0.976	0.978	0.977	0.980	0.976	1.001	0.983	0.980	0.975
11	0.987	1.000	0.984	0.998	1.003	1.002	1.001	0.999	1.001	1.015	1.000	1.000	0.997
Statistics													
Min	0.987	0.959	0.984	0.971	0.976	0.978	0.977	0.978	0.976	1.001	0.981	0.980	0.968
Max	1.037	1.000	1.026	0.998	1.003	1.002	1.001	0.999	1.001	1.017	1.000	1.000	0.997
Average	1.010	0.986	1.004	0.983	0.988	0.989	0.989	0.988	0.987	1.009	0.986	0.988	0.983
Sigma	0.019	0.016	0.017	0.012	0.012	0.010	0.011	0.009	0.011	0.008	0.008	0.008	0.012

Drift Calculation

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	79.2E-03	10.6E-03	64.1E-03	58.9E-03	57.3E-03	57.4E-03	58.6E-03	60.5E-03	18.9E-03	55.8E-03	56.0E-03	68.8E-03
9	-	4.5E-03	6.4E-03	8.0E-03	3.2E-03	3.7E-03	2.0E-03	4.5E-03	6.6E-03	-1.7E-03	18.4E-03	9.6E-03	5.6E-03
10	-	23.5E-03	1.2E-03	44.4E-03	39.4E-03	37.1E-03	38.3E-03	35.3E-03	39.1E-03	13.7E-03	32.2E-03	35.2E-03	40.7E-03
11	-	-13.3E-03	3.3E-03	-11.0E-03	-16.2E-03	-15.0E-03	-14.7E-03	-12.4E-03	-14.3E-03	-27.9E-03	-13.7E-03	-13.2E-03	-9.8E-03
Average	-	23.5E-03	5.4E-03	26.4E-03	21.3E-03	20.8E-03	20.8E-03	21.5E-03	23.0E-03	749.0E-06	23.2E-03	21.9E-03	26.3E-03
Sigma	-	34.7E-03	3.5E-03	29.5E-03	29.5E-03	28.2E-03	28.5E-03	27.4E-03	28.8E-03	18.2E-03	25.2E-03	26.1E-03	30.6E-03

Measurements

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.992	0.997	0.989	1.002	0.991	0.993	0.996	1.009	0.999	1.004	0.984	1.006	0.989
OFF_PROTON samples													
16	0.991	0.993	0.987	0.999	1.000	1.000	0.999	0.998	0.996	1.001	1.037	1.035	0.995
Statistics													
Min	0.991	0.993	0.987	0.999	1.000	1.000	0.999	0.998	0.996	1.001	1.037	1.035	0.995
Max	0.991	0.993	0.987	0.999	1.000	1.000	0.999	0.998	0.996	1.001	1.037	1.035	0.995
Average	0.991	0.993	0.987	0.999	1.000	1.000	0.999	0.998	0.996	1.001	1.037	1.035	0.995
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Drift Calculation

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	-2.4E-03	3.3E-03	-8.1E-03	-9.2E-03	-9.7E-03	-8.1E-03	-7.9E-03	-5.1E-03	-10.1E-03	-45.3E-03	-43.7E-03	-4.3E-03
Average	-	-2.4E-03	3.3E-03	-8.1E-03	-9.2E-03	-9.7E-03	-8.1E-03	-7.9E-03	-5.1E-03	-10.1E-03	-45.3E-03	-43.7E-03	-4.3E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

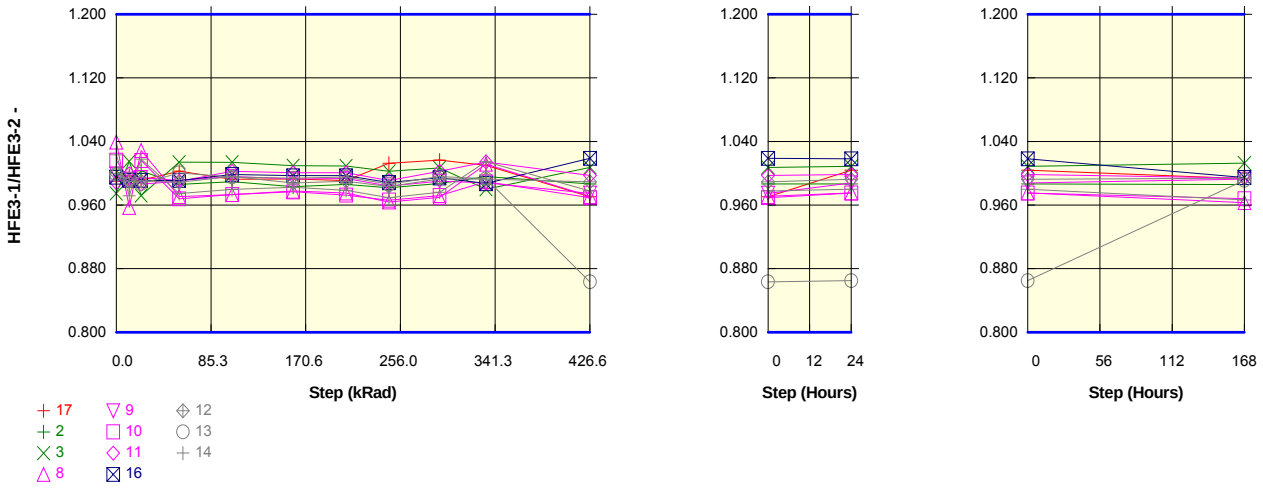
Measurements

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.992	0.997	0.989	1.002	0.991	0.993	0.996	1.009	0.999	1.004	0.984	1.006	0.989
OFF_TID samples													
12	0.999	0.991	0.988	0.989	0.997	0.993	0.988	0.992	0.992	1.002	0.994	0.994	0.987
13	0.999	0.994	0.985	0.998	0.996	0.996	0.999	0.995	0.995	1.000	0.813	0.812	0.993
14	1.022	0.972	1.014	0.976	0.983	0.984	0.982	0.980	0.981	1.014	0.983	0.983	0.969
Statistics													
Min	0.999	0.972	0.985	0.976	0.983	0.984	0.982	0.980	0.981	1.000	0.813	0.812	0.969
Max	1.022	0.994	1.014	0.998	0.997	0.996	0.999	0.995	0.995	1.014	0.994	0.994	0.993
Average	1.007	0.986	0.996	0.988	0.992	0.991	0.990	0.989	0.989	1.005	0.930	0.930	0.983
Sigma	0.011	0.010	0.013	0.009	0.006	0.005	0.007	0.006	0.006	0.006	0.083	0.083	0.010

Drift Calculation

HFE2-1/HFE2-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	8.0E-03	11.1E-03	10.1E-03	2.5E-03	5.6E-03	10.7E-03	6.9E-03	6.7E-03	-3.1E-03	5.6E-03	5.0E-03	11.7E-03
13	-	5.2E-03	14.7E-03	623.3E-06	3.2E-03	2.7E-03	119.4E-09	4.1E-03	4.4E-03	-900.0E-06	228.4E-03	230.9E-03	6.2E-03
14	-	50.0E-03	7.2E-03	45.6E-03	38.4E-03	38.0E-03	40.0E-03	41.5E-03	41.1E-03	7.5E-03	38.5E-03	38.4E-03	53.4E-03
Average	-	21.1E-03	11.0E-03	18.8E-03	14.7E-03	15.4E-03	16.9E-03	17.5E-03	17.4E-03	1.2E-03	90.8E-03	91.4E-03	23.8E-03
Sigma	-	20.5E-03	3.1E-03	19.4E-03	16.8E-03	16.0E-03	16.9E-03	17.0E-03	16.8E-03	4.6E-03	98.2E-03	99.5E-03	21.0E-03

Parameter : Forward current transer ratio comparison : HFE3-1/HFE3-2
Test conditions : Ic = 5mA ; Vce = 5V
Unit :
Spec Limit Min : 0.800
Spec Limit Max : 1.200
Spec limits are represented in bold lines on the graphic.



Measurements

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.997	0.991	1.003	0.992	0.993	0.991	1.013	1.017	1.010	0.970	1.004	0.993
ON_PROTON samples													
2	1.004	0.985	1.003	0.986	0.989	0.983	0.986	0.982	0.987	0.996	0.987	0.987	0.986
3	0.975	1.015	0.972	1.014	1.014	1.010	1.009	1.002	1.007	0.980	1.007	1.009	1.013
Statistics													
Min	0.975	0.985	0.972	0.986	0.989	0.983	0.986	0.982	0.987	0.980	0.987	0.987	0.986
Max	1.004	1.015	1.003	1.014	1.014	1.010	1.009	1.002	1.007	0.996	1.007	1.009	1.013
Average	0.989	1.000	0.988	1.000	1.002	0.996	0.998	0.992	0.997	0.988	0.997	0.998	0.999
Sigma	0.015	0.015	0.015	0.014	0.012	0.013	0.012	0.010	0.010	0.008	0.010	0.011	0.014

Drift Calculation

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	18.5E-03	715.8E-06	18.0E-03	14.5E-03	20.9E-03	17.9E-03	22.5E-03	16.8E-03	7.9E-03	17.3E-03	17.3E-03	18.2E-03
3	-	-40.7E-03	2.7E-03	-39.7E-03	-39.6E-03	-35.4E-03	-35.0E-03	-28.4E-03	-32.8E-03	-5.7E-03	-33.4E-03	-34.6E-03	-38.7E-03
Average	-	-11.1E-03	1.7E-03	-10.8E-03	-12.6E-03	-7.3E-03	-8.5E-03	-3.0E-03	-8.0E-03	1.1E-03	-8.0E-03	-8.6E-03	-10.3E-03
Sigma	-	29.6E-03	968.2E-06	28.8E-03	27.0E-03	28.1E-03	26.5E-03	25.4E-03	24.8E-03	6.8E-03	25.4E-03	26.0E-03	28.4E-03

Measurements

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.997	0.991	1.003	0.992	0.993	0.991	1.013	1.017	1.010	0.970	1.004	0.993
ON_TID samples													
8	1.039	0.957	1.029	0.971	0.973	0.978	0.975	0.964	0.970	1.012	0.971	0.975	0.963
9	0.999	0.993	0.995	0.991	0.996	0.993	0.994	0.984	0.990	0.988	0.975	0.988	0.993
10	1.016	0.992	1.016	0.968	0.973	0.977	0.973	0.966	0.972	0.989	0.969	0.975	0.968
11	0.988	0.999	0.986	0.990	1.002	1.001	1.001	0.991	1.002	1.014	0.997	0.998	0.994
Statistics													
Min	0.988	0.957	0.986	0.968	0.973	0.977	0.973	0.964	0.970	0.988	0.969	0.975	0.963
Max	1.039	0.999	1.029	0.991	1.002	1.001	1.001	0.991	1.002	1.014	0.997	0.998	0.994
Average	1.011	0.985	1.007	0.980	0.986	0.987	0.985	0.976	0.984	1.001	0.978	0.984	0.979
Sigma	0.019	0.017	0.017	0.011	0.013	0.010	0.012	0.012	0.014	0.012	0.011	0.010	0.014

Drift Calculation

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	82.6E-03	10.0E-03	67.8E-03	65.4E-03	60.8E-03	63.2E-03	75.3E-03	69.2E-03	26.3E-03	67.7E-03	63.2E-03	76.2E-03
9	-	6.6E-03	4.4E-03	8.6E-03	3.3E-03	6.4E-03	5.8E-03	15.6E-03	9.3E-03	11.5E-03	25.1E-03	11.7E-03	6.7E-03
10	-	24.6E-03	223.2E-06	49.3E-03	43.6E-03	39.9E-03	44.3E-03	51.1E-03	44.9E-03	26.8E-03	47.6E-03	41.5E-03	49.0E-03
11	-	-11.4E-03	1.9E-03	-1.6E-03	-14.3E-03	-12.7E-03	-12.6E-03	-2.8E-03	-14.4E-03	-26.1E-03	-9.2E-03	-10.4E-03	-5.9E-03
Average	-	25.6E-03	4.1E-03	31.0E-03	24.5E-03	23.6E-03	25.2E-03	34.8E-03	27.3E-03	9.6E-03	32.8E-03	26.5E-03	31.5E-03
Sigma	-	35.3E-03	3.7E-03	28.5E-03	31.6E-03	28.5E-03	30.1E-03	30.4E-03	32.1E-03	21.5E-03	28.6E-03	28.1E-03	32.9E-03

Measurements

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.997	0.991	1.003	0.992	0.993	0.991	1.013	1.017	1.010	0.970	1.004	0.993
OFF_PROTON samples													
16	0.995	0.991	0.991	0.991	0.998	0.997	0.997	0.988	0.994	0.987	1.019	1.018	0.995
Statistics													
Min	0.995	0.991	0.991	0.991	0.998	0.997	0.997	0.988	0.994	0.987	1.019	1.018	0.995
Max	0.995	0.991	0.991	0.991	0.998	0.997	0.997	0.988	0.994	0.987	1.019	1.018	0.995
Average	0.995	0.991	0.991	0.991	0.998	0.997	0.997	0.988	0.994	0.987	1.019	1.018	0.995
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Drift Calculation

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	3.9E-03	4.0E-03	4.1E-03	-3.3E-03	-1.9E-03	-1.8E-03	7.0E-03	878.0E-06	8.2E-03	-23.4E-03	-22.9E-03	388.2E-06
Average	-	3.9E-03	4.0E-03	4.1E-03	-3.3E-03	-1.9E-03	-1.8E-03	7.0E-03	878.0E-06	8.2E-03	-23.4E-03	-22.9E-03	388.2E-06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

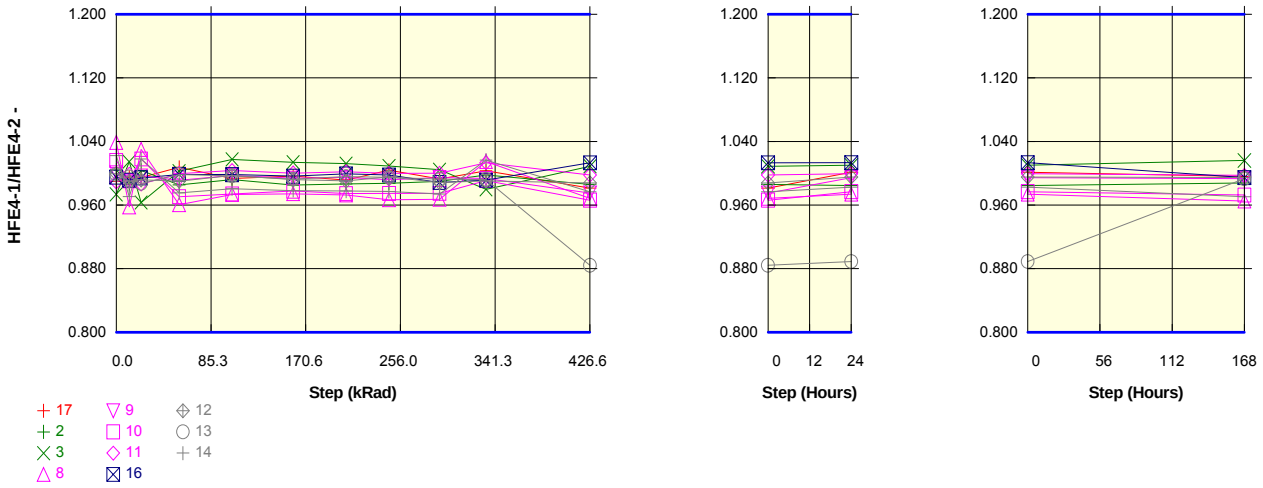
Measurements

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.997	0.991	1.003	0.992	0.993	0.991	1.013	1.017	1.010	0.970	1.004	0.993
OFF_TID samples													
12	1.000	0.990	0.990	0.989	0.996	0.988	0.990	0.983	0.993	0.993	0.989	0.992	0.994
13	0.999	0.992	0.987	1.001	0.995	0.994	0.995	0.986	0.996	0.993	0.863	0.865	0.991
14	1.023	0.972	1.018	0.975	0.980	0.982	0.978	0.969	0.976	1.015	0.978	0.980	0.966
Statistics													
Min	0.999	0.972	0.987	0.975	0.980	0.982	0.978	0.969	0.976	0.993	0.863	0.865	0.966
Max	1.023	0.992	1.018	1.001	0.996	0.994	0.995	0.986	0.996	1.015	0.989	0.992	0.994
Average	1.007	0.984	0.998	0.988	0.990	0.988	0.988	0.980	0.988	1.000	0.943	0.946	0.984
Sigma	0.011	0.009	0.014	0.011	0.008	0.005	0.007	0.007	0.009	0.010	0.057	0.057	0.012

Drift Calculation

HFE3-1/HFE3-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	10.3E-03	9.7E-03	11.1E-03	4.0E-03	12.4E-03	9.9E-03	16.7E-03	6.8E-03	7.3E-03	10.9E-03	7.6E-03	6.0E-03
13	-	6.5E-03	12.1E-03	-1.7E-03	3.6E-03	5.1E-03	3.6E-03	12.8E-03	2.9E-03	5.6E-03	157.1E-03	155.0E-03	7.8E-03
14	-	52.0E-03	5.3E-03	48.8E-03	43.5E-03	40.7E-03	44.7E-03	54.4E-03	47.0E-03	8.3E-03	45.6E-03	43.2E-03	57.6E-03
Average	-	23.0E-03	9.0E-03	19.4E-03	17.0E-03	19.4E-03	19.4E-03	28.0E-03	18.9E-03	7.1E-03	71.2E-03	68.6E-03	23.8E-03
Sigma	-	20.6E-03	2.8E-03	21.4E-03	18.7E-03	15.4E-03	18.1E-03	18.8E-03	19.9E-03	1.1E-03	62.4E-03	62.8E-03	23.9E-03

Parameter : Forward current transer ratio comparison : HFE4-1/HFE4-2
Test conditions : Ic = 10mA ; Vce = 5V
Unit :
Spec Limit Min : 0.800
Spec Limit Max : 1.200
Spec limits are represented in bold lines on the graphic.



Measurements

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.995	0.995	1.008	0.994	0.996	0.991	1.004	0.993	1.003	0.981	1.001	0.996
ON_PROTON samples													
2	1.004	0.986	1.004	0.985	0.992	0.985	0.987	0.988	0.990	0.998	0.986	0.985	0.988
3	0.973	1.015	0.963	1.003	1.018	1.014	1.012	1.009	1.004	0.980	1.009	1.010	1.016
Statistics													
Min	0.973	0.986	0.963	0.985	0.992	0.985	0.987	0.988	0.990	0.980	0.986	0.985	0.988
Max	1.004	1.015	1.004	1.003	1.018	1.014	1.012	1.009	1.004	0.998	1.009	1.010	1.016
Average	0.989	1.000	0.983	0.994	1.005	0.999	0.999	0.998	0.997	0.989	0.997	0.997	1.002
Sigma	0.015	0.014	0.020	0.009	0.013	0.014	0.013	0.011	0.007	0.009	0.011	0.013	0.014

Drift Calculation

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	18.6E-03	620.2E-06	19.1E-03	12.3E-03	19.3E-03	17.8E-03	16.8E-03	14.6E-03	6.3E-03	18.4E-03	19.8E-03	16.6E-03
3	-	-41.7E-03	10.8E-03	-30.0E-03	-44.6E-03	-40.9E-03	-39.3E-03	-36.3E-03	-31.6E-03	-6.6E-03	-36.1E-03	-37.3E-03	-43.3E-03
Average	-	-11.5E-03	5.7E-03	-5.4E-03	-16.1E-03	-10.8E-03	-10.7E-03	-9.8E-03	-8.5E-03	-139.0E-06	-8.8E-03	-8.8E-03	-13.3E-03
Sigma	-	30.1E-03	5.1E-03	24.5E-03	28.4E-03	30.1E-03	28.5E-03	26.6E-03	23.1E-03	6.5E-03	27.3E-03	28.6E-03	30.0E-03

Measurements

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.995	0.995	1.008	0.994	0.996	0.991	1.004	0.993	1.003	0.981	1.001	0.996
ON_TID samples													
8	1.039	0.958	1.030	0.961	0.973	0.974	0.973	0.967	0.967	1.015	0.968	0.974	0.965
9	1.001	0.991	0.997	0.991	0.997	0.994	0.995	0.992	0.995	0.993	0.975	0.995	0.993
10	1.016	0.990	1.018	0.971	0.974	0.978	0.974	0.975	0.975	0.991	0.966	0.977	0.973
11	0.989	0.999	0.986	1.000	1.004	1.000	1.002	1.000	1.000	1.013	0.998	1.000	0.998
Statistics													
Min	0.989	0.958	0.986	0.961	0.973	0.974	0.973	0.967	0.967	0.991	0.966	0.974	0.965
Max	1.039	0.999	1.030	1.000	1.004	1.000	1.002	1.000	1.000	1.015	0.998	1.000	0.998
Average	1.011	0.984	1.008	0.980	0.987	0.986	0.986	0.983	0.984	1.003	0.977	0.986	0.982
Sigma	0.019	0.016	0.017	0.016	0.014	0.011	0.013	0.013	0.014	0.011	0.012	0.011	0.014

Drift Calculation

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	81.8E-03	8.4E-03	78.6E-03	64.8E-03	63.9E-03	65.6E-03	71.9E-03	71.2E-03	22.8E-03	70.1E-03	64.5E-03	73.8E-03
9	-	10.2E-03	4.1E-03	9.6E-03	3.3E-03	6.9E-03	5.8E-03	9.0E-03	6.2E-03	7.3E-03	26.2E-03	6.2E-03	7.7E-03
10	-	25.5E-03	-1.9E-03	46.2E-03	42.5E-03	38.7E-03	42.1E-03	41.8E-03	41.7E-03	25.0E-03	50.7E-03	39.4E-03	43.9E-03
11	-	-10.2E-03	2.5E-03	-10.9E-03	-14.8E-03	-11.5E-03	-13.0E-03	-11.1E-03	-11.3E-03	-24.2E-03	-9.0E-03	-10.9E-03	-8.8E-03
Average	-	26.8E-03	3.3E-03	30.9E-03	24.0E-03	24.5E-03	25.1E-03	27.9E-03	26.9E-03	7.7E-03	34.5E-03	24.8E-03	29.1E-03
Sigma	-	34.2E-03	3.7E-03	34.3E-03	31.4E-03	29.0E-03	30.6E-03	31.7E-03	31.9E-03	19.7E-03	29.5E-03	29.2E-03	32.1E-03

Measurements

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.995	0.995	1.008	0.994	0.996	0.991	1.004	0.993	1.003	0.981	1.001	0.996
OFF_PROTON samples													
16	0.995	0.991	0.994	0.998	0.998	0.996	0.999	0.998	0.988	0.991	1.013	1.013	0.995
Statistics													
Min	0.995	0.991	0.994	0.998	0.998	0.996	0.999	0.998	0.988	0.991	1.013	1.013	0.995
Max	0.995	0.991	0.994	0.998	0.998	0.996	0.999	0.998	0.988	0.991	1.013	1.013	0.995
Average	0.995	0.991	0.994	0.998	0.998	0.996	0.999	0.998	0.988	0.991	1.013	1.013	0.995
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Drift Calculation

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	3.8E-03	935.4E-06	-3.4E-03	-3.2E-03	-1.3E-03	-4.1E-03	-2.7E-03	6.8E-03	3.7E-03	-17.8E-03	-18.0E-03	498.8E-06
Average	-	3.8E-03	935.4E-06	-3.4E-03	-3.2E-03	-1.3E-03	-4.1E-03	-2.7E-03	6.8E-03	3.7E-03	-17.8E-03	-18.0E-03	498.8E-06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

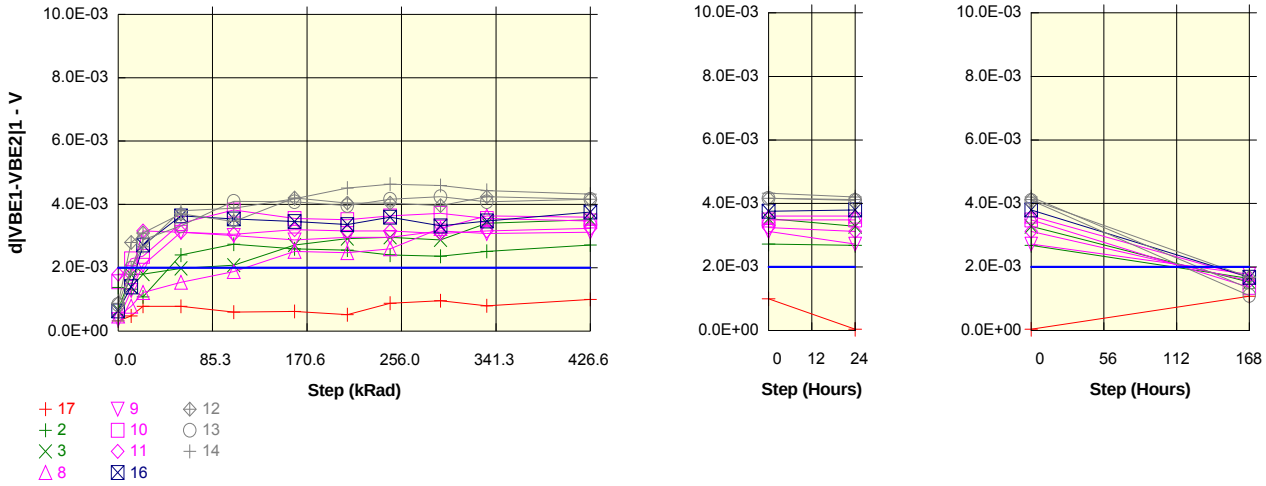
Measurements

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	0.990	0.995	0.995	1.008	0.994	0.996	0.991	1.004	0.993	1.003	0.981	1.001	0.996
OFF_TID samples													
12	1.000	0.990	0.992	0.990	0.997	0.992	0.990	0.995	0.988	0.990	0.988	0.995	0.995
13	0.998	0.995	0.987	0.998	0.997	0.993	0.996	0.995	0.993	0.992	0.884	0.889	0.993
14	1.022	0.971	1.018	0.975	0.980	0.978	0.978	0.977	0.974	1.016	0.977	0.983	0.970
Statistics													
Min	0.998	0.971	0.987	0.975	0.980	0.978	0.978	0.977	0.974	0.990	0.884	0.889	0.970
Max	1.022	0.995	1.018	0.998	0.997	0.993	0.996	0.995	0.993	1.016	0.988	0.995	0.995
Average	1.007	0.985	0.999	0.988	0.991	0.988	0.988	0.989	0.985	1.000	0.950	0.956	0.986
Sigma	0.011	0.011	0.014	0.010	0.008	0.007	0.008	0.008	0.008	0.012	0.046	0.047	0.011

Drift Calculation

HFE4-1/HFE4-2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	9.5E-03	7.9E-03	9.5E-03	2.3E-03	7.4E-03	9.4E-03	4.1E-03	11.4E-03	9.4E-03	11.8E-03	4.2E-03	5.0E-03
13	-	3.0E-03	11.3E-03	-53.2E-06	1.6E-03	5.9E-03	2.7E-03	3.5E-03	5.9E-03	6.3E-03	129.3E-03	123.3E-03	5.3E-03
14	-	52.0E-03	4.2E-03	47.1E-03	41.8E-03	44.1E-03	44.8E-03	45.2E-03	48.5E-03	5.7E-03	45.5E-03	39.5E-03	52.2E-03
Average	-	21.5E-03	7.8E-03	18.8E-03	15.2E-03	19.1E-03	18.9E-03	17.6E-03	21.9E-03	7.1E-03	62.2E-03	55.7E-03	20.8E-03
Sigma	-	21.7E-03	2.9E-03	20.3E-03	18.8E-03	17.6E-03	18.5E-03	19.5E-03	18.9E-03	1.6E-03	49.4E-03	50.0E-03	22.2E-03

Parameter : Base-Emitter voltage differential : d|VBE1-VBE2|1
Test conditions : Ic = 1mA ; Vce = 5V
Unit : V
Spec Limit Max : 2.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	320.0E-06	480.0E-06	780.0E-06	780.0E-06	600.0E-06	620.0E-06	520.0E-06	880.0E-06	960.0E-06	800.3E-06	1.0E-03	40.0E-06	1.1E-03
ON_PROTON samples													
2	1.4E-03	1.3E-03	1.1E-03	2.4E-03	2.7E-03	2.6E-03	2.6E-03	2.4E-03	2.4E-03	2.5E-03	2.7E-03	2.7E-03	1.6E-03
3	680.0E-06	1.8E-03	1.8E-03	2.0E-03	2.1E-03	2.7E-03	2.9E-03	3.0E-03	2.9E-03	3.4E-03	3.5E-03	3.3E-03	1.5E-03
Statistics													
Min	680.0E-06	1.3E-03	1.1E-03	2.0E-03	2.1E-03	2.6E-03	2.6E-03	2.4E-03	2.4E-03	2.5E-03	2.7E-03	2.7E-03	1.5E-03
Max	1.4E-03	1.8E-03	1.8E-03	2.4E-03	2.7E-03	2.7E-03	2.9E-03	3.0E-03	2.9E-03	3.4E-03	3.5E-03	3.3E-03	1.6E-03
Average	1.0E-03	1.6E-03	1.4E-03	2.2E-03	2.4E-03	2.7E-03	2.7E-03	2.7E-03	2.6E-03	3.0E-03	3.1E-03	3.0E-03	1.6E-03
Sigma	350.0E-06	230.0E-06	360.0E-06	210.0E-06	330.0E-06	60.0E-06	180.0E-06	280.0E-06	260.0E-06	440.0E-06	400.0E-06	300.0E-06	60.0E-06

Drift Calculation

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	-60.0E-06	-300.0E-06	1.0E-03	1.4E-03	1.2E-03	1.2E-03	1.0E-03	980.0E-06	1.1E-03	1.3E-03	1.3E-03	259.9E-06
3	-	1.1E-03	1.1E-03	1.3E-03	1.4E-03	2.0E-03	2.2E-03	2.3E-03	2.2E-03	2.7E-03	2.8E-03	2.6E-03	840.0E-06
Average	-	520.0E-06	410.0E-06	1.2E-03	1.4E-03	1.6E-03	1.7E-03	1.6E-03	1.6E-03	1.9E-03	2.1E-03	1.9E-03	550.0E-06
Sigma	-	580.0E-06	710.0E-06	140.0E-06	20.0E-06	410.0E-06	530.0E-06	630.0E-06	610.0E-06	790.0E-06	750.0E-06	650.0E-06	290.0E-06

Measurements

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	320.0E-06	480.0E-06	780.0E-06	780.0E-06	600.0E-06	620.0E-06	520.0E-06	880.0E-06	960.0E-06	800.3E-06	1.0E-03	40.0E-06	1.1E-03
ON_TID samples													
8	480.0E-06	780.0E-06	1.2E-03	1.5E-03	1.9E-03	2.5E-03	2.5E-03	2.6E-03	3.2E-03	3.6E-03	3.6E-03	3.6E-03	1.7E-03
9	360.0E-06	1.3E-03	2.1E-03	3.1E-03	3.0E-03	2.9E-03	3.0E-03	3.0E-03	3.2E-03	3.1E-03	3.1E-03	2.7E-03	1.8E-03
10	1.6E-03	2.3E-03	2.4E-03	3.4E-03	3.8E-03	3.6E-03	3.5E-03	3.6E-03	3.7E-03	3.6E-03	3.5E-03	3.5E-03	1.4E-03
11	1.8E-03	1.8E-03	3.2E-03	3.1E-03	3.1E-03	3.2E-03	3.2E-03	3.2E-03	3.1E-03	3.2E-03	3.2E-03	3.1E-03	1.6E-03
Statistics													
Min	360.0E-06	780.0E-06	1.2E-03	1.5E-03	1.9E-03	2.5E-03	2.5E-03	2.6E-03	3.1E-03	3.1E-03	3.1E-03	2.7E-03	1.4E-03
Max	1.8E-03	2.3E-03	3.2E-03	3.4E-03	3.8E-03	3.6E-03	3.5E-03	3.6E-03	3.7E-03	3.6E-03	3.6E-03	3.6E-03	1.8E-03
Average	1.0E-03	1.5E-03	2.2E-03	2.8E-03	2.9E-03	3.0E-03	3.0E-03	3.1E-03	3.3E-03	3.4E-03	3.4E-03	3.2E-03	1.6E-03
Sigma	637.1E-06	561.3E-06	693.2E-06	733.5E-06	692.6E-06	384.7E-06	375.6E-06	375.6E-06	249.0E-06	243.3E-06	189.7E-06	343.3E-06	154.1E-06

Drift Calculation

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	300.0E-06	740.0E-06	1.1E-03	1.4E-03	2.0E-03	2.0E-03	2.1E-03	2.8E-03	3.2E-03	3.1E-03	3.1E-03	1.2E-03
9	-	920.1E-06	1.7E-03	2.8E-03	2.7E-03	2.5E-03	2.6E-03	2.6E-03	2.8E-03	2.7E-03	2.8E-03	2.4E-03	1.4E-03
10	-	720.0E-06	800.0E-06	1.8E-03	2.3E-03	2.0E-03	2.0E-03	2.1E-03	2.2E-03	2.0E-03	1.9E-03	1.9E-03	-200.0E-06
11	-	0.0E+00	1.4E-03	1.3E-03	1.3E-03	1.4E-03	1.4E-03	1.4E-03	1.3E-03	1.4E-03	1.4E-03	1.3E-03	-240.0E-06
Average	-	485.0E-06	1.2E-03	1.7E-03	1.9E-03	2.0E-03	2.0E-03	2.0E-03	2.3E-03	2.3E-03	2.3E-03	2.2E-03	543.0E-06
Sigma	-	358.4E-06	406.1E-06	649.8E-06	584.5E-06	397.4E-06	438.7E-06	442.7E-06	614.7E-06	687.3E-06	664.8E-06	656.4E-06	766.8E-06

Measurements

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	320.0E-06	480.0E-06	780.0E-06	780.0E-06	600.0E-06	620.0E-06	520.0E-06	880.0E-06	960.0E-06	800.3E-06	1.0E-03	40.0E-06	1.1E-03
OFF_PROTON samples													
16	640.0E-06	1.4E-03	2.7E-03	3.6E-03	3.5E-03	3.5E-03	3.4E-03	3.6E-03	3.3E-03	3.5E-03	3.8E-03	3.8E-03	1.7E-03
Statistics													
Min	640.0E-06	1.4E-03	2.7E-03	3.6E-03	3.5E-03	3.5E-03	3.4E-03	3.6E-03	3.3E-03	3.5E-03	3.8E-03	3.8E-03	1.7E-03
Max	640.0E-06	1.4E-03	2.7E-03	3.6E-03	3.5E-03	3.5E-03	3.4E-03	3.6E-03	3.3E-03	3.5E-03	3.8E-03	3.8E-03	1.7E-03
Average	640.0E-06	1.4E-03	2.7E-03	3.6E-03	3.5E-03	3.5E-03	3.4E-03	3.6E-03	3.3E-03	3.5E-03	3.8E-03	3.8E-03	1.7E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	760.0E-06	2.1E-03	3.0E-03	2.9E-03	2.8E-03	2.7E-03	3.0E-03	2.7E-03	2.8E-03	3.1E-03	3.2E-03	1.0E-03
Average	-	760.0E-06	2.1E-03	3.0E-03	2.9E-03	2.8E-03	2.7E-03	3.0E-03	2.7E-03	2.8E-03	3.1E-03	3.2E-03	1.0E-03
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

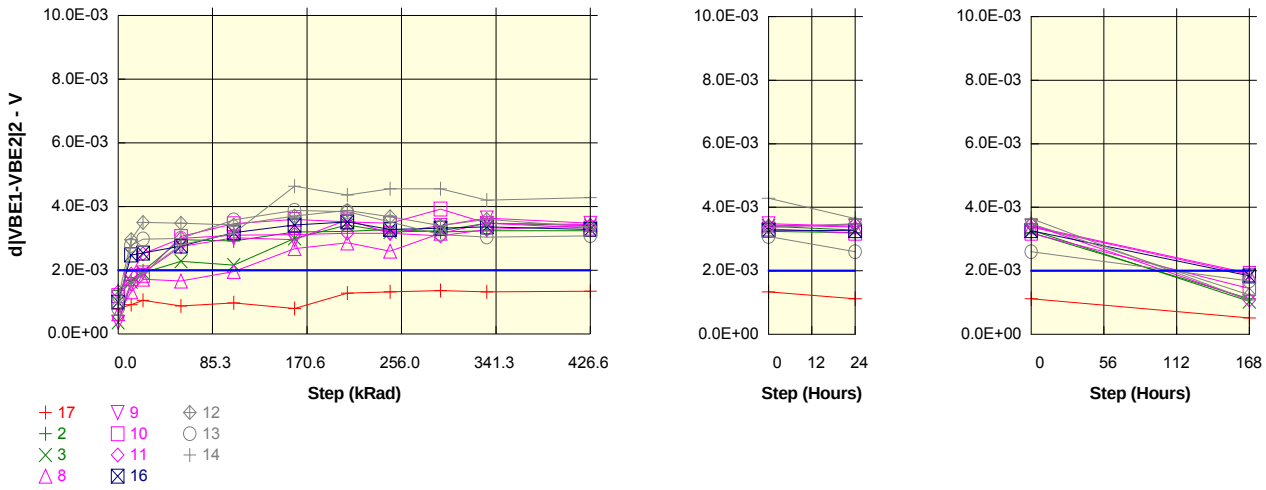
Measurements

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	320.0E-06	480.0E-06	780.0E-06	780.0E-06	600.0E-06	620.0E-06	520.0E-06	880.0E-06	960.0E-06	800.3E-06	1.0E-03	40.0E-06	1.1E-03
OFF_TID samples													
12	879.9E-06	2.8E-03	3.1E-03	3.7E-03	3.5E-03	4.2E-03	4.0E-03	4.0E-03	4.0E-03	4.2E-03	4.2E-03	4.1E-03	1.7E-03
13	840.0E-06	2.0E-03	2.9E-03	3.3E-03	4.1E-03	4.1E-03	4.0E-03	4.2E-03	4.2E-03	4.1E-03	4.2E-03	4.1E-03	1.1E-03
14	320.0E-06	2.0E-03	2.7E-03	3.8E-03	3.9E-03	4.2E-03	4.5E-03	4.6E-03	4.6E-03	4.4E-03	4.3E-03	4.2E-03	1.3E-03
Statistics													
Min	320.0E-06	2.0E-03	2.7E-03	3.3E-03	3.5E-03	4.1E-03	4.0E-03	4.0E-03	4.0E-03	4.1E-03	4.2E-03	4.1E-03	1.1E-03
Max	879.9E-06	2.8E-03	3.1E-03	3.8E-03	4.1E-03	4.2E-03	4.5E-03	4.6E-03	4.6E-03	4.4E-03	4.3E-03	4.2E-03	1.7E-03
Average	680.0E-06	2.3E-03	2.9E-03	3.6E-03	3.8E-03	4.2E-03	4.2E-03	4.3E-03	4.3E-03	4.3E-03	4.2E-03	4.1E-03	1.4E-03
Sigma	255.1E-06	386.5E-06	179.6E-06	206.8E-06	265.5E-06	52.5E-06	247.3E-06	259.2E-06	261.9E-06	147.3E-06	75.4E-06	43.2E-06	237.6E-06

Drift Calculation

d|VBE1-VBE2|1	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	1.9E-03	2.2E-03	2.8E-03	2.6E-03	3.3E-03	3.2E-03	3.2E-03	3.1E-03	3.4E-03	3.3E-03	3.2E-03	800.1E-06
13	-	1.1E-03	2.0E-03	2.5E-03	3.3E-03	3.2E-03	3.1E-03	3.3E-03	3.4E-03	3.2E-03	3.3E-03	3.3E-03	264.0E-06
14	-	1.7E-03	2.3E-03	3.5E-03	3.6E-03	3.9E-03	4.2E-03	4.3E-03	4.3E-03	4.1E-03	4.0E-03	3.9E-03	1.0E-03
Average	-	1.6E-03	2.2E-03	2.9E-03	3.1E-03	3.5E-03	3.5E-03	3.6E-03	3.6E-03	3.6E-03	3.5E-03	3.5E-03	688.0E-06
Sigma	-	324.3E-06	123.3E-06	415.2E-06	409.9E-06	275.4E-06	500.0E-06	513.3E-06	507.4E-06	389.7E-06	330.4E-06	297.1E-06	310.8E-06

Parameter : Base-Emitter voltage differential : d|VBE1-VBE2|2
Test conditions : Ic = 5mA ; Vce = 5V
Unit : V
Spec Limit Max : 2.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	800.0E-06	920.0E-06	1.1E-03	880.0E-06	980.0E-06	800.0E-06	1.3E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03	1.1E-03	516.0E-06
ON_PROTON samples													
2	1.4E-03	1.7E-03	2.0E-03	3.0E-03	2.9E-03	3.2E-03	3.2E-03	3.3E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	1.1E-03
3	360.0E-06	1.6E-03	1.9E-03	2.3E-03	2.2E-03	3.0E-03	3.4E-03	3.2E-03	3.2E-03	3.5E-03	3.4E-03	3.3E-03	1.0E-03
Statistics													
Min	360.0E-06	1.6E-03	1.9E-03	2.3E-03	2.2E-03	3.0E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	1.0E-03
Max	1.4E-03	1.7E-03	2.0E-03	3.0E-03	2.9E-03	3.2E-03	3.4E-03	3.3E-03	3.2E-03	3.5E-03	3.4E-03	3.3E-03	1.1E-03
Average	860.0E-06	1.7E-03	1.9E-03	2.6E-03	2.5E-03	3.1E-03	3.3E-03	3.2E-03	3.2E-03	3.4E-03	3.3E-03	3.2E-03	1.1E-03
Sigma	500.0E-06	20.0E-06	30.0E-06	340.0E-06	380.0E-06	100.0E-06	100.0E-06	40.0E-06	20.0E-06	120.0E-06	80.0E-06	40.0E-06	40.0E-06

Drift Calculation

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	320.0E-06	620.0E-06	1.6E-03	1.6E-03	1.8E-03	1.9E-03	1.9E-03	1.8E-03	1.9E-03	1.9E-03	1.8E-03	-240.0E-06
3	-	1.3E-03	1.6E-03	1.9E-03	1.8E-03	2.6E-03	3.1E-03	2.8E-03	2.9E-03	3.1E-03	3.0E-03	2.9E-03	680.0E-06
Average	-	800.0E-06	1.1E-03	1.8E-03	1.7E-03	2.2E-03	2.5E-03	2.4E-03	2.4E-03	2.5E-03	2.5E-03	2.4E-03	220.0E-06
Sigma	-	480.0E-06	470.0E-06	160.0E-06	120.0E-06	400.0E-06	600.0E-06	460.0E-06	520.0E-06	620.0E-06	580.0E-06	540.0E-06	460.0E-06

Measurements

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	800.0E-06	920.0E-06	1.1E-03	880.0E-06	980.0E-06	800.0E-06	1.3E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03	1.1E-03	516.0E-06
ON_TID samples													
8	640.0E-06	1.3E-03	1.7E-03	1.7E-03	2.0E-03	2.7E-03	2.9E-03	2.6E-03	3.2E-03	3.5E-03	3.4E-03	3.4E-03	1.9E-03
9	360.0E-06	1.6E-03	1.9E-03	2.7E-03	3.0E-03	3.0E-03	3.6E-03	3.2E-03	3.4E-03	3.6E-03	3.5E-03	3.4E-03	1.9E-03
10	1.2E-03	1.7E-03	1.8E-03	3.1E-03	3.5E-03	3.6E-03	3.5E-03	3.5E-03	3.9E-03	3.5E-03	3.3E-03	3.2E-03	1.4E-03
11	1.3E-03	1.9E-03	2.5E-03	3.0E-03	3.1E-03	3.1E-03	3.2E-03	3.2E-03	3.1E-03	3.3E-03	3.4E-03	3.5E-03	1.1E-03
Statistics													
Min	360.0E-06	1.3E-03	1.7E-03	1.7E-03	2.0E-03	2.7E-03	2.9E-03	2.6E-03	3.1E-03	3.3E-03	3.3E-03	3.2E-03	1.1E-03
Max	1.3E-03	1.9E-03	2.5E-03	3.1E-03	3.5E-03	3.6E-03	3.6E-03	3.5E-03	3.9E-03	3.6E-03	3.5E-03	3.5E-03	1.9E-03
Average	880.0E-06	1.6E-03	2.0E-03	2.6E-03	2.9E-03	3.1E-03	3.3E-03	3.1E-03	3.4E-03	3.5E-03	3.4E-03	3.4E-03	1.6E-03
Sigma	395.0E-06	209.4E-06	308.5E-06	564.3E-06	559.2E-06	333.9E-06	290.9E-06	316.9E-06	327.9E-06	127.7E-06	59.2E-06	105.2E-06	344.7E-06

Drift Calculation

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	680.1E-06	1.1E-03	1.0E-03	1.3E-03	2.0E-03	2.2E-03	2.0E-03	2.5E-03	2.8E-03	2.8E-03	2.7E-03	1.2E-03
9	-	1.2E-03	1.6E-03	2.4E-03	2.7E-03	2.6E-03	3.2E-03	2.8E-03	3.0E-03	3.3E-03	3.1E-03	3.0E-03	1.6E-03
10	-	540.0E-06	640.0E-06	1.9E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.7E-03	2.3E-03	2.1E-03	2.0E-03	240.0E-06
11	-	560.0E-06	1.2E-03	1.7E-03	1.8E-03	1.8E-03	1.8E-03	1.8E-03	1.8E-03	2.0E-03	2.1E-03	2.1E-03	-240.0E-06
Average	-	745.0E-06	1.1E-03	1.7E-03	2.0E-03	2.2E-03	2.4E-03	2.2E-03	2.5E-03	2.6E-03	2.5E-03	2.5E-03	700.0E-06
Sigma	-	268.1E-06	328.6E-06	486.3E-06	503.4E-06	310.3E-06	506.1E-06	371.5E-06	471.1E-06	507.8E-06	444.9E-06	432.1E-06	729.1E-06

Measurements

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	800.0E-06	920.0E-06	1.1E-03	880.0E-06	980.0E-06	800.0E-06	1.3E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03	1.1E-03	516.0E-06
OFF_PROTON samples													
16	1000.0E-06	2.5E-03	2.5E-03	2.8E-03	3.2E-03	3.4E-03	3.5E-03	3.3E-03	3.3E-03	3.4E-03	3.3E-03	3.3E-03	1.8E-03
Statistics													
Min	1000.0E-06	2.5E-03	2.5E-03	2.8E-03	3.2E-03	3.4E-03	3.5E-03	3.3E-03	3.3E-03	3.4E-03	3.3E-03	3.3E-03	1.8E-03
Max	1000.0E-06	2.5E-03	2.5E-03	2.8E-03	3.2E-03	3.4E-03	3.5E-03	3.3E-03	3.3E-03	3.4E-03	3.3E-03	3.3E-03	1.8E-03
Average	1000.0E-06	2.5E-03	2.5E-03	2.8E-03	3.2E-03	3.4E-03	3.5E-03	3.3E-03	3.3E-03	3.4E-03	3.3E-03	3.3E-03	1.8E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	1.5E-03	1.5E-03	1.8E-03	2.2E-03	2.4E-03	2.5E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	840.0E-06
Average	-	1.5E-03	1.5E-03	1.8E-03	2.2E-03	2.4E-03	2.5E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	840.0E-06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

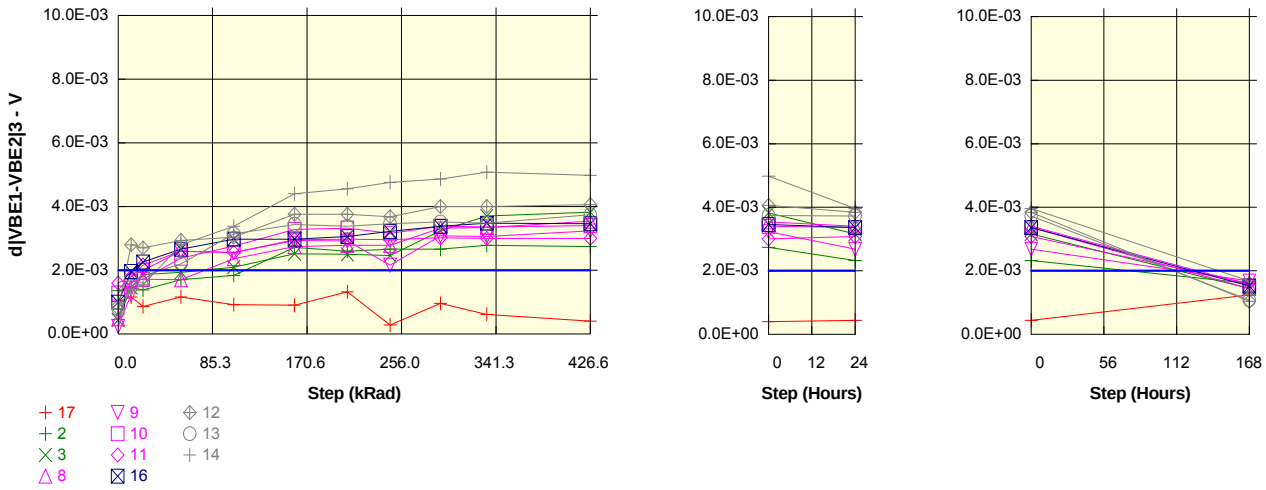
Measurements

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	800.0E-06	920.0E-06	1.1E-03	880.0E-06	980.0E-06	800.0E-06	1.3E-03	1.3E-03	1.4E-03	1.3E-03	1.3E-03	1.1E-03	516.0E-06
OFF_TID samples													
12	1.1E-03	3.0E-03	3.5E-03	3.5E-03	3.4E-03	3.7E-03	3.9E-03	3.7E-03	3.4E-03	3.6E-03	3.4E-03	3.5E-03	1.2E-03
13	800.0E-06	2.8E-03	3.0E-03	3.0E-03	3.6E-03	3.9E-03	3.8E-03	3.5E-03	3.1E-03	3.0E-03	3.1E-03	2.6E-03	1.7E-03
14	600.0E-06	1.6E-03	1.9E-03	2.8E-03	3.2E-03	4.6E-03	4.4E-03	4.6E-03	4.6E-03	4.2E-03	4.3E-03	3.6E-03	1.1E-03
Statistics													
Min	600.0E-06	1.6E-03	1.9E-03	2.8E-03	3.2E-03	3.7E-03	3.8E-03	3.5E-03	3.1E-03	3.0E-03	3.1E-03	2.6E-03	1.1E-03
Max	1.1E-03	3.0E-03	3.5E-03	3.5E-03	3.6E-03	4.6E-03	4.4E-03	4.6E-03	4.6E-03	4.2E-03	4.3E-03	3.6E-03	1.7E-03
Average	840.0E-06	2.4E-03	2.8E-03	3.1E-03	3.4E-03	4.1E-03	4.0E-03	3.9E-03	3.7E-03	3.6E-03	3.6E-03	3.2E-03	1.3E-03
Sigma	214.2E-06	603.2E-06	657.5E-06	285.3E-06	173.1E-06	407.4E-06	236.3E-06	457.2E-06	623.4E-06	473.7E-06	512.6E-06	457.2E-06	253.7E-06

Drift Calculation

d|VBE1-VBE2|2	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	1.8E-03	2.4E-03	2.4E-03	2.3E-03	2.6E-03	2.8E-03	2.6E-03	2.3E-03	2.5E-03	2.2E-03	2.4E-03	120.0E-06
13	-	2.0E-03	2.2E-03	2.2E-03	2.8E-03	3.1E-03	3.0E-03	2.7E-03	2.3E-03	2.2E-03	2.3E-03	1.8E-03	880.0E-06
14	-	1000.0E-06	1.3E-03	2.2E-03	2.6E-03	4.0E-03	3.8E-03	4.0E-03	4.0E-03	3.6E-03	3.7E-03	3.0E-03	480.1E-06
Average	-	1.6E-03	2.0E-03	2.3E-03	2.5E-03	3.2E-03	3.2E-03	3.1E-03	2.9E-03	2.8E-03	2.7E-03	2.4E-03	493.4E-06
Sigma	-	432.8E-06	459.8E-06	75.4E-06	196.2E-06	605.9E-06	421.3E-06	625.7E-06	782.7E-06	592.7E-06	669.6E-06	507.0E-06	310.4E-06

Parameter : Base-Emitter voltage differential : d|VBE1-VBE2|3
Test conditions : Ic = 10mA ; Vce = 5V
Unit : V
Spec Limit Max : 2.0E-03
Spec limits are represented in bold lines on the graphic.



Measurements

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	1.0E-03	1.2E-03	860.0E-06	1.2E-03	920.0E-06	900.0E-06	1.3E-03	280.0E-06	960.1E-06	616.0E-06	400.0E-06	440.0E-06	1.2E-03
ON_PROTON samples													
2	1.4E-03	1.5E-03	1.4E-03	1.7E-03	1.8E-03	2.7E-03	2.6E-03	2.7E-03	2.7E-03	2.8E-03	2.7E-03	2.3E-03	1.6E-03
3	440.0E-06	1.5E-03	1.9E-03	1.9E-03	2.1E-03	2.5E-03	2.5E-03	2.5E-03	3.2E-03	3.7E-03	3.8E-03	3.2E-03	1.4E-03
Statistics													
Min	440.0E-06	1.5E-03	1.4E-03	1.7E-03	1.8E-03	2.5E-03	2.5E-03	2.5E-03	2.7E-03	2.8E-03	2.7E-03	2.3E-03	1.4E-03
Max	1.4E-03	1.5E-03	1.9E-03	1.9E-03	2.1E-03	2.7E-03	2.6E-03	2.7E-03	3.2E-03	3.7E-03	3.8E-03	3.2E-03	1.6E-03
Average	900.0E-06	1.5E-03	1.6E-03	1.8E-03	2.0E-03	2.6E-03	2.6E-03	2.6E-03	2.9E-03	3.2E-03	3.3E-03	2.7E-03	1.5E-03
Sigma	460.0E-06	0.0E+00	240.0E-06	120.0E-06	130.0E-06	100.0E-06	50.0E-06	100.0E-06	290.0E-06	460.0E-06	540.0E-06	420.0E-06	80.0E-06

Drift Calculation

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_PROTON samples													
2	-	100.0E-06	20.0E-06	340.0E-06	480.0E-06	1.4E-03	1.2E-03	1.3E-03	1.3E-03	1.4E-03	1.4E-03	960.0E-06	240.0E-06
3	-	1.0E-03	1.4E-03	1.5E-03	1.7E-03	2.1E-03	2.1E-03	2.0E-03	2.8E-03	3.3E-03	3.4E-03	2.7E-03	1000.0E-06
Average	-	560.0E-06	720.0E-06	920.0E-06	1.1E-03	1.7E-03	1.7E-03	1.7E-03	2.0E-03	2.3E-03	2.4E-03	1.8E-03	620.0E-06
Sigma	-	460.0E-06	700.0E-06	580.0E-06	590.0E-06	360.0E-06	410.0E-06	360.0E-06	750.0E-06	920.0E-06	1.0E-03	880.0E-06	380.0E-06

Measurements

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	1.0E-03	1.2E-03	860.0E-06	1.2E-03	920.0E-06	900.0E-06	1.3E-03	280.0E-06	960.1E-06	616.0E-06	400.0E-06	440.0E-06	1.2E-03
ON_TID samples													
8	480.0E-06	1.7E-03	1.7E-03	1.7E-03	2.4E-03	2.7E-03	2.8E-03	2.8E-03	3.3E-03	3.3E-03	3.5E-03	3.4E-03	1.6E-03
9	240.0E-06	1.2E-03	2.0E-03	2.6E-03	2.6E-03	2.9E-03	2.9E-03	2.2E-03	3.1E-03	3.1E-03	3.2E-03	2.7E-03	1.7E-03
10	1.3E-03	1.6E-03	1.7E-03	2.4E-03	2.8E-03	3.3E-03	3.3E-03	3.2E-03	3.4E-03	3.4E-03	3.4E-03	3.4E-03	1.4E-03
11	1.6E-03	1.8E-03	2.2E-03	2.6E-03	2.6E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.1E-03	1.6E-03
Statistics													
Min	240.0E-06	1.2E-03	1.7E-03	1.7E-03	2.4E-03	2.7E-03	2.8E-03	2.2E-03	3.0E-03	3.0E-03	3.0E-03	2.7E-03	1.4E-03
Max	1.6E-03	1.8E-03	2.2E-03	2.6E-03	2.8E-03	3.3E-03	3.3E-03	3.2E-03	3.4E-03	3.4E-03	3.5E-03	3.4E-03	1.7E-03
Average	900.0E-06	1.6E-03	1.9E-03	2.3E-03	2.6E-03	3.0E-03	3.0E-03	2.8E-03	3.2E-03	3.2E-03	3.3E-03	3.1E-03	1.6E-03
Sigma	558.2E-06	212.8E-06	188.7E-06	369.1E-06	141.4E-06	193.4E-06	198.5E-06	374.3E-06	153.0E-06	161.5E-06	201.0E-06	287.6E-06	86.6E-06

Drift Calculation

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
ON_TID samples													
8	-	1.2E-03	1.2E-03	1.2E-03	1.9E-03	2.3E-03	2.3E-03	2.3E-03	2.8E-03	2.9E-03	3.1E-03	2.9E-03	1.1E-03
9	-	1.0E-03	1.8E-03	2.4E-03	2.3E-03	2.7E-03	2.7E-03	1.9E-03	2.8E-03	2.8E-03	3.0E-03	2.4E-03	1.4E-03
10	-	360.0E-06	440.0E-06	1.1E-03	1.5E-03	2.0E-03	2.0E-03	1.9E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	160.0E-06
11	-	200.0E-06	560.0E-06	1000.0E-06	959.9E-06	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.5E-03	-25.7E-09
Average	-	695.0E-06	1.0E-03	1.4E-03	1.7E-03	2.1E-03	2.1E-03	1.9E-03	2.3E-03	2.3E-03	2.4E-03	2.2E-03	670.0E-06
Sigma	-	426.0E-06	534.5E-06	548.3E-06	501.6E-06	485.2E-06	473.9E-06	334.5E-06	591.1E-06	600.5E-06	683.6E-06	525.7E-06	606.2E-06

Measurements

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	1.0E-03	1.2E-03	860.0E-06	1.2E-03	920.0E-06	900.0E-06	1.3E-03	280.0E-06	960.1E-06	616.0E-06	400.0E-06	440.0E-06	1.2E-03
OFF_PROTON samples													
16	1000.0E-06	2.0E-03	2.3E-03	2.7E-03	3.0E-03	3.0E-03	3.1E-03	3.2E-03	3.4E-03	3.5E-03	3.5E-03	3.4E-03	1.5E-03
Statistics													
Min	1000.0E-06	2.0E-03	2.3E-03	2.7E-03	3.0E-03	3.0E-03	3.1E-03	3.2E-03	3.4E-03	3.5E-03	3.5E-03	3.4E-03	1.5E-03
Max	1000.0E-06	2.0E-03	2.3E-03	2.7E-03	3.0E-03	3.0E-03	3.1E-03	3.2E-03	3.4E-03	3.5E-03	3.5E-03	3.4E-03	1.5E-03
Average	1000.0E-06	2.0E-03	2.3E-03	2.7E-03	3.0E-03	3.0E-03	3.1E-03	3.2E-03	3.4E-03	3.5E-03	3.5E-03	3.4E-03	1.5E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Drift Calculation

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_PROTON samples													
16	-	960.0E-06	1.3E-03	1.7E-03	2.0E-03	2.0E-03	2.1E-03	2.2E-03	2.4E-03	2.5E-03	2.5E-03	2.4E-03	520.0E-06
Average	-	960.0E-06	1.3E-03	1.7E-03	2.0E-03	2.0E-03	2.1E-03	2.2E-03	2.4E-03	2.5E-03	2.5E-03	2.4E-03	520.0E-06
Sigma	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Measurements

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
17_REF	1.0E-03	1.2E-03	860.0E-06	1.2E-03	920.0E-06	900.0E-06	1.3E-03	280.0E-06	960.1E-06	616.0E-06	400.0E-06	440.0E-06	1.2E-03
OFF_TID samples													
12	800.0E-06	2.8E-03	2.7E-03	2.9E-03	3.0E-03	3.8E-03	3.8E-03	3.7E-03	4.0E-03	4.0E-03	4.1E-03	3.8E-03	1.0E-03
13	800.0E-06	1.5E-03	1.8E-03	2.2E-03	3.1E-03	3.4E-03	3.4E-03	3.5E-03	3.5E-03	3.5E-03	3.7E-03	3.7E-03	1.1E-03
14	600.0E-06	1.4E-03	1.5E-03	2.8E-03	3.4E-03	4.4E-03	4.6E-03	4.8E-03	4.9E-03	5.1E-03	5.0E-03	4.0E-03	1.7E-03
Statistics													
Min	600.0E-06	1.4E-03	1.5E-03	2.2E-03	3.0E-03	3.4E-03	3.4E-03	3.5E-03	3.5E-03	3.5E-03	3.7E-03	3.7E-03	1.0E-03
Max	800.0E-06	2.8E-03	2.7E-03	2.9E-03	3.4E-03	4.4E-03	4.6E-03	4.8E-03	4.9E-03	5.1E-03	5.0E-03	4.0E-03	1.7E-03
Average	733.3E-06	1.9E-03	2.0E-03	2.6E-03	3.2E-03	3.9E-03	3.9E-03	4.0E-03	4.1E-03	4.2E-03	4.3E-03	3.8E-03	1.3E-03
Sigma	94.3E-06	641.9E-06	494.2E-06	321.0E-06	142.7E-06	399.1E-06	491.8E-06	568.1E-06	554.3E-06	666.4E-06	525.6E-06	98.0E-06	292.7E-06

Drift Calculation

d|VBE1-VBE2|3	0 kRad	11.7 kRad	22.5 kRad	56.7 kRad	104.4 kRad	159.3 kRad	207 kRad	245.7 kRad	291.2 kRad	333 kRad	426.6 kRad	24 Hours	168 Hours
OFF_TID samples													
12	-	2.0E-03	1.9E-03	2.1E-03	2.2E-03	3.0E-03	3.0E-03	2.9E-03	3.2E-03	3.2E-03	3.3E-03	3.0E-03	239.9E-06
13	-	680.0E-06	1.0E-03	1.4E-03	2.3E-03	2.6E-03	2.6E-03	2.7E-03	2.7E-03	2.7E-03	2.9E-03	2.9E-03	280.0E-06
14	-	800.1E-06	940.0E-06	2.2E-03	2.8E-03	3.8E-03	4.0E-03	4.2E-03	4.3E-03	4.5E-03	4.4E-03	3.4E-03	1.1E-03
Average	-	1.2E-03	1.3E-03	1.9E-03	2.5E-03	3.1E-03	3.2E-03	3.2E-03	3.4E-03	3.5E-03	3.5E-03	3.1E-03	533.3E-06
Sigma	-	596.0E-06	434.9E-06	363.8E-06	234.6E-06	489.2E-06	582.0E-06	661.4E-06	643.4E-06	756.4E-06	617.4E-06	185.7E-06	386.9E-06