

TOTAL DOSE RADIATION TEST REPORT

Part Type : M29F016B

2M x 8-Bit Flash Memory

Package : TSOP- 40

Manufacturer: ST Microelectronics

Report Reference : ESA_QCA0315T_C

Issue : 01

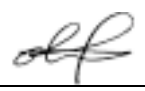
Date : July 23rd 2003

ESA Contract No 13528/99/NL/MV COO-13 dated 11/10/02

European Space Agency Contract Report

The work described in this report was done under ESA contract.
Responsibility for the contents resides in the author or organization that prepared it

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Hirex reference :	HRX/TID/0201	Issue : 01	Date :	July 23 rd 2003
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HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

CHANGE RECORD

Issue	Date	Page	DESCRIPTION OF CHANGES
01	July 23rd 2003	All	Original Issue.

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

TOTAL DOSE RADIATION TEST REPORT

on

ST Microelectronics M29F016B 2M x 8-Bit Flash Memory

TABLE OF CONTENTS

1	Abstract	4
2	Introduction	5
3	Applicable and Reference Documents	5
3.1	APPLICABLE DOCUMENTS	5
3.2	REFERENCE DOCUMENTS	5
4	Test Samples	5
5	Experimental Conditions	6
5.1	RADIATION SOURCE DOSE RATE AND ANNEALING	6
5.2	BIAS DURING DOSE EXPOSURES AND MEASUREMENTS CONDITIONS	6
5.2.1	Bias conditions	6
5.2.2	Electrical Measurements	7
5.2.3	Electrical Test sequence organisation	9
6	Conclusion	10
7	Test Results	11
List of figures:		
	Figure 1 : Bias Conditions during Irradiation Exposures and Annealing steps	6
	Figure 2 : M29F016B test program principle	7
	Figure 3 : Electrical measurements test sequence	9
List of Tables		
	Table 1: Measured electrical parameters	8
	Electrical tests results	12-107

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

1 Abstract

Under ESA Contract No 13528/99/NL/MV COO-13 dated 11/10/02 covering "Radiation Evaluation of COTS Semiconductor Components: "Radiation evaluation of parts for new VME design", Flash Memories from AMD and STMicroelectronics were radiation assessed.

Results from these assessments covering Single Event Effects on AMD Am29F016D and Am29F032B can be found in ESA-QCA0211S_C and on STMicroelectronics on M29F016B and M29F032D in ESA_QCA0212S_C.

Here Total Ionizing Dose effects (TID) will be reported for ST Microelectronics M29F016B.

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

2 Introduction

A Total Ionizing Dose (TID) evaluation test of the ST Microelectronics M29F016B 2M x 8-Bit Flash Memory has been performed with an accumulated dose of about 20 Krad(Si) at an average dose rate of 300 rad(Si)/hour, in response to ESA Contract No 13528/99/NL/MV COO-13 dated 11/10/02.

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 ESA.

Test has been performed in accordance with Hirex total dose irradiation test plan reference: TDP n° 0080 issue 01 dated 03/06/2003.

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

3 Applicable and Reference Documents

3.1 Applicable Documents

- Hirex Total Dose Irradiation Test Plan TDP n° 0080 issue 01 dated 03/06/2003.
- Hirex proposal: HRX/PRO/0509 dated 16/09/2002.

3.2 Reference Documents

- Datasheet from ST dated March 2000.

4 Test Samples

5 samples of the M29F016B device were tested (4 ON + 1 control sample).

TID Serial Number	Allocation
Ref. 11	Control
12	Bias ON
13	Bias ON
14	Bias ON
16	Bias ON

Identification of the M29F016B is given below:

Part Number: M29F016B

Top Marking: M29F016B 70N1
588MF 0052
SINGAPORE

Date Code: 0052

Project: NA

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

5 Experimental Conditions

5.1 Radiation Source Dose Rate and Annealing

The dose exposures were performed at CERT-ONERA. 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. The irradiation conditions used for this test are provided in the following table:

Irradiation Steps	Dose rate	Annealing steps	Temperature
krads	krads/h	hours	°C
0			
5	0,30		25
12	0,30		25
20	0,30		25
		24	25
		168	100

5.2 Bias during Dose Exposures and Measurements conditions

5.2.1 Bias conditions

During exposures dedicated test board was used mounted on a special board-holder made for irradiation. The test board allowed to bias the devices in accordance with the electrical circuit provided in Figure 1.

During annealing steps the same stress conditions were applied at 25°C and 100°C.

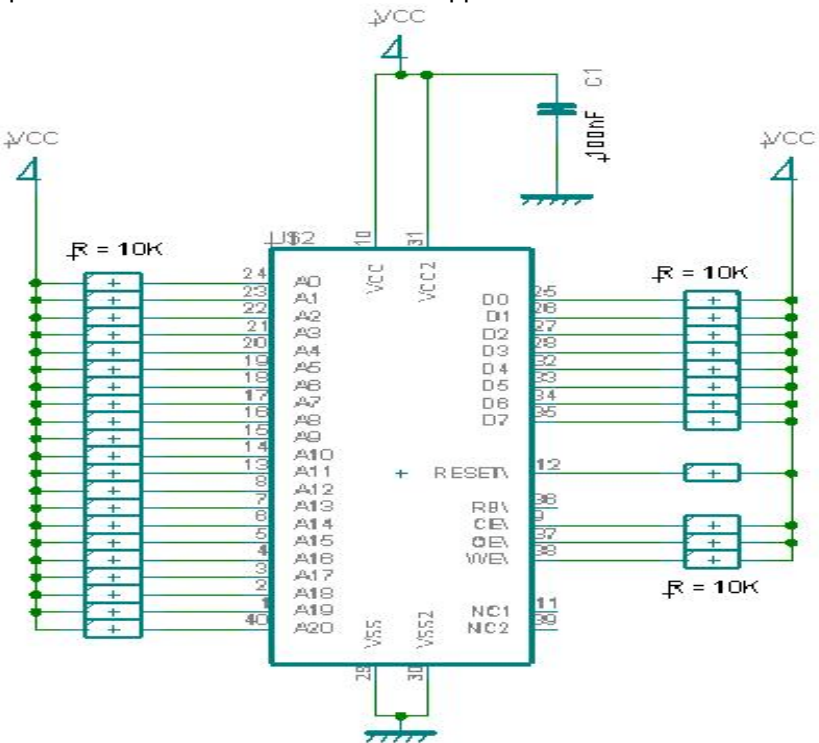


Figure 1 : Bias Conditions during Irradiation Exposures and Annealing steps

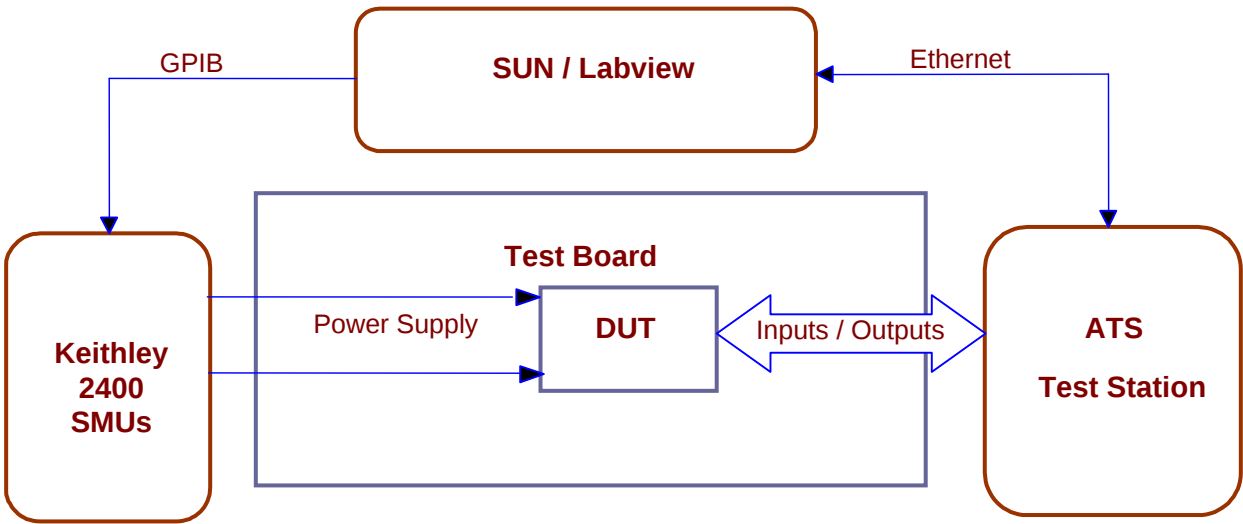
HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

5.2.2 Electrical Measurements

Electrical parameters test program principle for M29F016B is provided in Figure 2.

The test Setup for this DUT includes an IMS ATS Test Station, a SUN workstation, a DC test system Keithley 2400 and a dedicated test fixture board.

Figure 2 : M29F016B test program principle



HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Electrical parameters test conditions and limits used for performing this test are given in the following tables.

Electrical Parameters to be tested					
Parameter Description	Symbol	Test Condition	Min.	Max.	Unit
Functional Test (Write & Read)	FT_00	Patterns : 00 ; $V_{IN} = V_{IL}$ or V_{IH}	-	-	-
Functional Test (Erase & Read)	FT_FF	Patterns : FF ; $V_{IN} = V_{IL}$ or V_{IH}	-	-	-
Retention Test (Read then Write)	FT_Ret	Patterns : 00; $V_{IN} = V_{IL}$ or V_{IH} (Note 1)	-	-	-
Input Leakage Current	I_{LI}	$V_{IN} = V_{CC}$ or Gnd	-1	1	μA
Supply Current (Read)	I_{CC1}	$E^* = V_{IL}$, $G^* = V_{IH}$, $f = 6MHz$	-	20	mA
Supply Current (Program/Erase)	I_{CC4}	Program/Erase Controller Active	-	20	mA
Input Low Voltage	V_{IL}	Guaranteed by functional tests	0.8	-	V
Input High Voltage	V_{IH}	Guaranteed by functional tests	-	2	V
Output Low Voltage	V_{OL}	$I_{OL} = 5.8mA$	-	0.45	V
Output High Voltage	V_{OH1}	$I_{OH} = -2.5mA$	2.4	-	V
	V_{OH2}	$I_{OH} = -100\mu A$	$V_{CC}-0.4$	-	V
Address Valid to Next Address Valid (Read Mode)	t_{AVAV}	$E^* = V_{IL}$, $G^* = V_{IL}$	-	70	ns
Address Valid to Output Valid	t_{AVQV}	$E^* = V_{IL}$, $G^* = V_{IL}$	-	70	ns
Chip Enable Low to Output Valid	t_{ELQV}	$G^* = V_{IL}$	-	0	ns
Output Enable Low to Output Valid	t_{GLQV}	$E^* = V_{IL}$	-	30	ns
Output Enable High to Output HiZ	t_{GHQZ}	$E^* = V_{IL}$	-	20	ns
Chip Enable High to Output HiZ	t_{EHQZ}	$G^* = V_{IL}$	-	20	ns
Address Valid to Next Address Valid (Write Mode)	t_{AVAV}	-	-	70	ns
Address Valid to Write Enable Low	t_{AVWL}	-	-	0	ns
Write Enable Low to Address Transition	t_{WLAX}	-	-	45	ns
Input Valid to Write Enable High	t_{DVWH}	-	-	30	ns
Write Enable High to Input Transition	t_{WHDX}	-	-	0	ns
Chip Enable Low to Write Enable Low	t_{ELWL}	-	-	0	ns
Write Enable High to Chip Enable High	t_{WHEH}	-	-	0	ns
Write Enable Low to Write Enable High	t_{WLWH}	-	-	45	ns
Write Enable High to Write Enable Low	t_{WHWL}	-	-	20	ns

Note 1: This test consists in Writing 00 at exposure Step S-1 and Reading memory content at exposure Step S.

Table 1: Measured electrical parameters

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

5.2.3 Electrical measurements test sequence

The test sequence organisation applied for each memory at any electrical measurement steps after exposures and annealing is provided in figure 3.

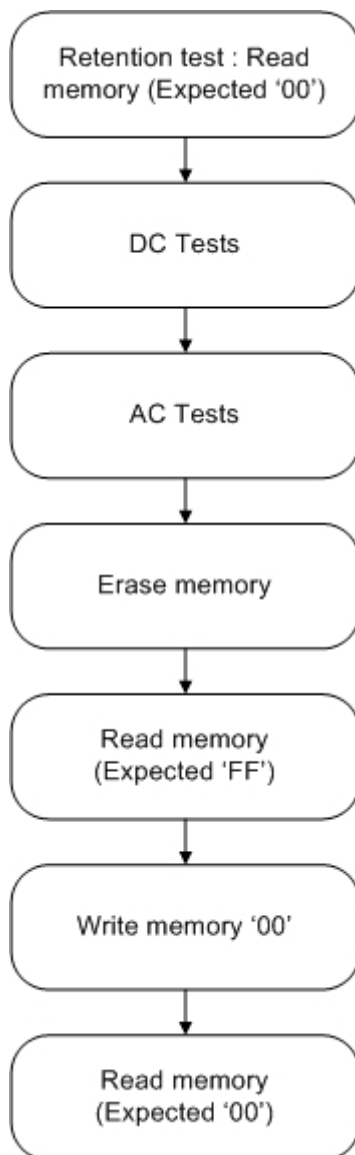


Figure 3 : Electrical measurements test sequence

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

6 Conclusion

A Total Ionizing Dose (TID) evaluation test was carried out by Hirex Engineering under ESA contract on the ST Microelectronics M29F016B 2M x 8-Bit Flash Memory in TSOP-40 package.

4 samples plus one control sample were used during testing. They were exposed to radiation using a Co-60 source at an average dose rate of 300 rad(Si)/hour at room temperature.

Functionality of the memories was lost at 20Krad(Si) step. Thus, writing into and reading from the memory became impossible.

It should be noted that a partial recovery (on two samples) of this functionality was observed after the last annealing step.

However for the retention test, all samples remained non-functional after annealing.

The most affected parameter was I_{CC2} (standby current) at 20Krad(Si). This parameter has completely recovered after annealing.

In correlation with functional failures observed, some parameters were found out of specification limits, in particular: Output low and high voltages (V_{oh} , V_{ol}) and most of the timing parameters.

All other parameters remained within specification limits all along testing.

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

7 Test Results

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

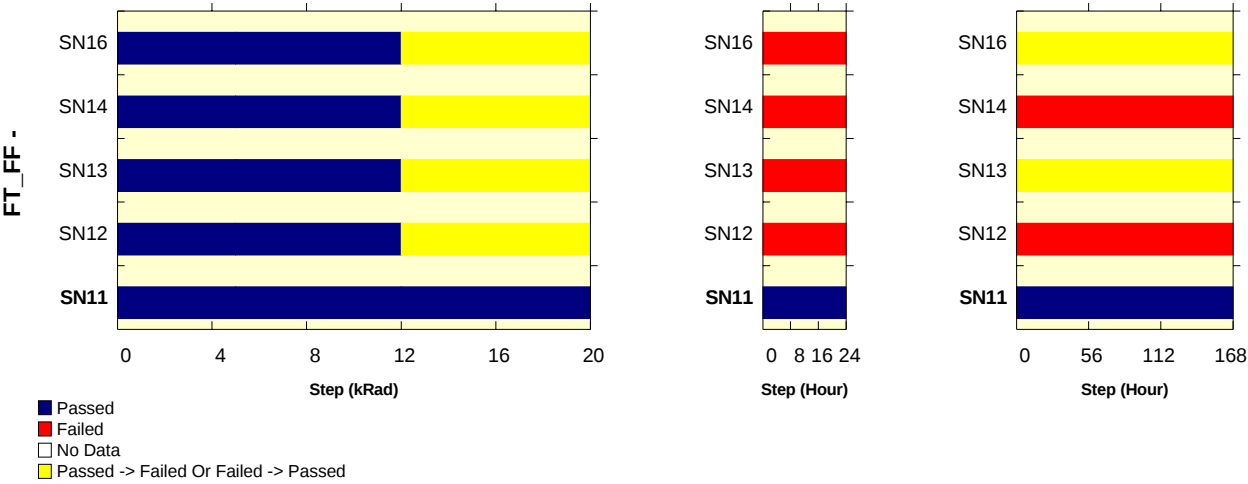
Note on tables and graphics:

In some cases, it may appear missing points in tables and graphs; this situation corresponds to a failure corresponding to an out of range measurement.

I_{LIL} data has been inverted for a better visibility with log plots.

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
 Parameter : Functional Test : FT_FF
 Pattern = FF. Vin = Vil or Vih
 Unit :
 No spec limit applicable.



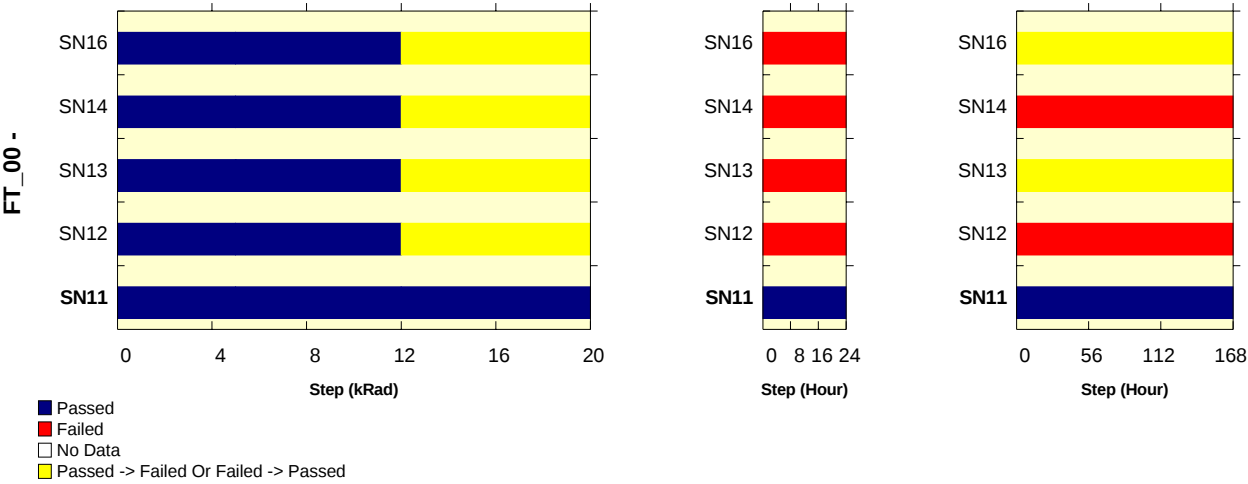
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	FAIL
SN13	PASS	PASS	PASS	FAIL
SN14	PASS	PASS	PASS	FAIL
SN16	PASS	PASS	PASS	FAIL

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	PASS	PASS
SN12	FAIL	FAIL
SN13	FAIL	FAIL
SN14	FAIL	FAIL
SN16	FAIL	FAIL

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	PASS	PASS
SN12	FAIL	FAIL
SN13	FAIL	PASS
SN14	FAIL	FAIL
SN16	FAIL	PASS

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
 Parameter : Functional Test : FT_00
 Pattern = 00. Vin = Vil or Vih
 Unit :
 No spec limit applicable.



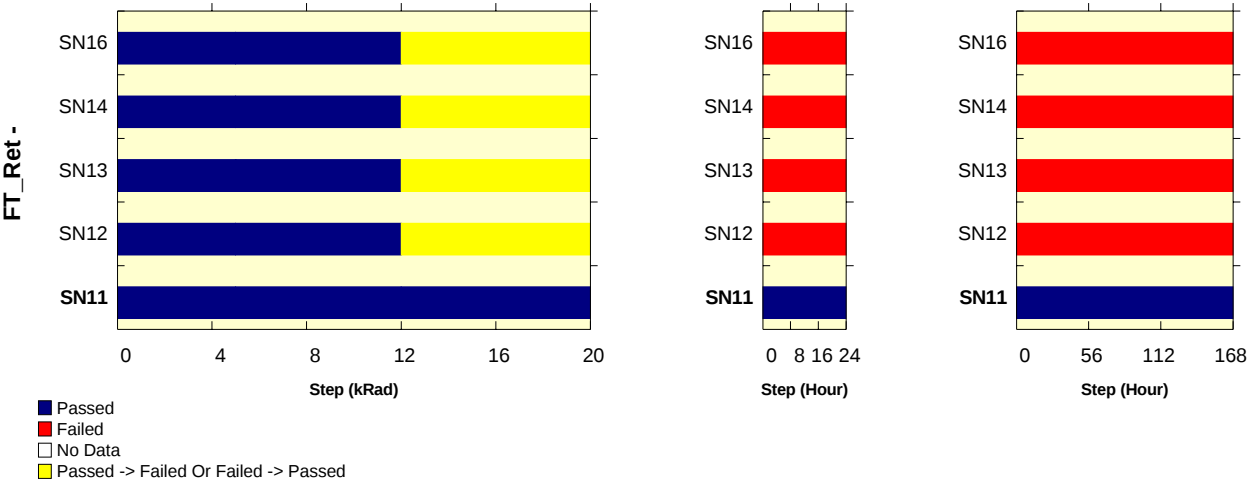
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	FAIL
SN13	PASS	PASS	PASS	FAIL
SN14	PASS	PASS	PASS	FAIL
SN16	PASS	PASS	PASS	FAIL

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	PASS	PASS
SN12	FAIL	FAIL
SN13	FAIL	FAIL
SN14	FAIL	FAIL
SN16	FAIL	FAIL

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	PASS	PASS
SN12	FAIL	FAIL
SN13	FAIL	PASS
SN14	FAIL	FAIL
SN16	FAIL	PASS

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Functional Test : FT_Ret
 Retention Test. Pattern = 00. Vin = Vil or Vih
 Unit :
 No spec limit applicable.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	FAIL
SN13	PASS	PASS	PASS	FAIL
SN14	PASS	PASS	PASS	FAIL
SN16	PASS	PASS	PASS	FAIL

Test TST002 : Annealing 24h

	0 Hour	24 Hour
SN11	PASS	PASS
SN12	FAIL	FAIL
SN13	FAIL	FAIL
SN14	FAIL	FAIL
SN16	FAIL	FAIL

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	PASS	PASS
SN12	FAIL	FAIL
SN13	FAIL	FAIL
SN14	FAIL	FAIL
SN16	FAIL	FAIL

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID

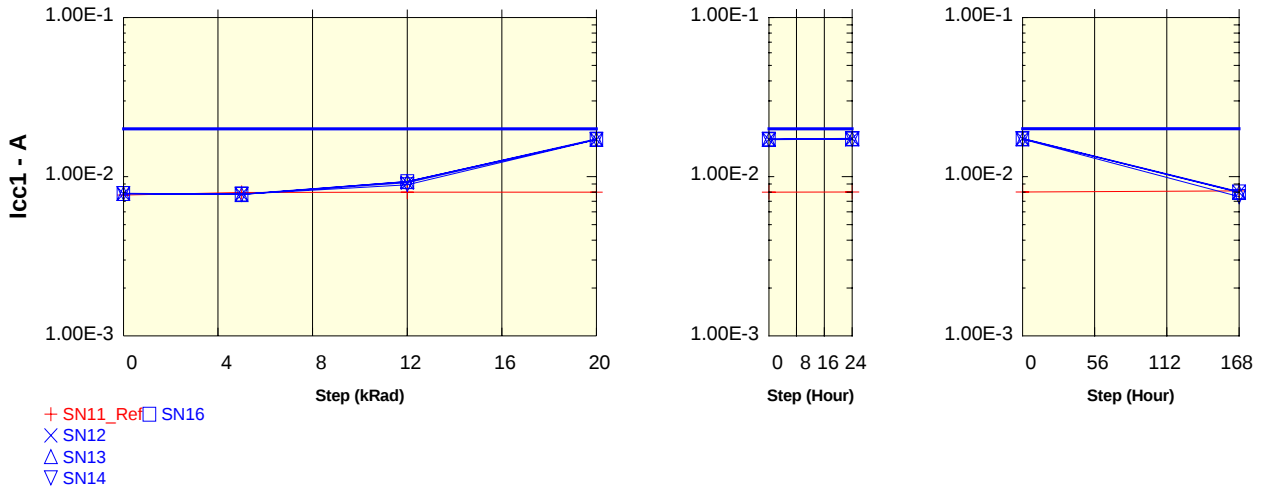
Parameter : Supply Current (Read) : Icc1

E* = Vil. G* = Vih. f = 6MHz

Unit : A

Spec Limit Max : 2.00E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	5 kRad	12 kRad	20 kRad
SN11	7.66E-3	7.96E-3	8.00E-3	8.00E-3
SN12	7.81E-3	7.76E-3	9.16E-3	1.71E-2
SN13	7.85E-3	7.73E-3	9.33E-3	1.71E-2
SN14	7.86E-3	7.75E-3	8.92E-3	1.71E-2
SN16	7.84E-3	7.77E-3	9.32E-3	1.72E-2
Statistics				
Min	7.81E-3	7.73E-3	8.92E-3	1.71E-2
Max	7.86E-3	7.77E-3	9.33E-3	1.72E-2
Mean	7.84E-3	7.75E-3	9.18E-3	1.71E-2
Sigma	2.01E-5	1.65E-5	1.93E-4	6.86E-5

Test TST002 : Annealing 24h

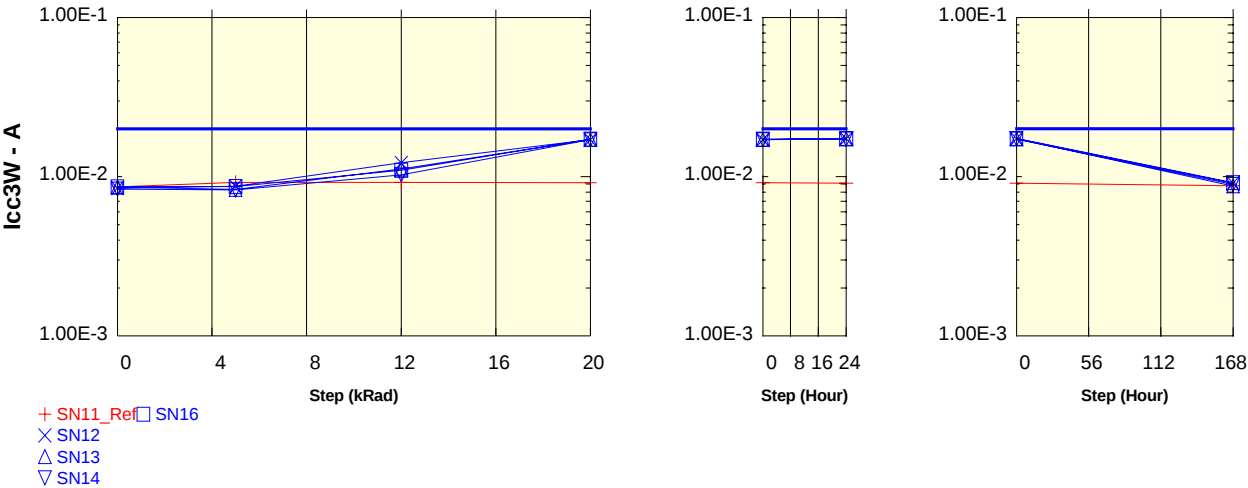
	0 Hour	24 Hour
SN11	8.00E-3	8.02E-3
SN12	1.71E-2	1.74E-2
SN13	1.71E-2	1.73E-2
SN14	1.71E-2	1.72E-2
SN16	1.72E-2	1.74E-2
Statistics		
Min	1.71E-2	1.72E-2
Max	1.72E-2	1.74E-2
Mean	1.71E-2	1.73E-2
Sigma	6.86E-5	8.13E-5

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	8.02E-3	8.14E-3
SN12	1.74E-2	7.98E-3
SN13	1.73E-2	7.95E-3
SN14	1.72E-2	7.49E-3
SN16	1.74E-2	8.03E-3
Statistics		
Min	1.72E-2	7.49E-3
Max	1.74E-2	8.03E-3
Mean	1.73E-2	7.86E-3
Sigma	8.13E-5	2.50E-4

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Supply Current (Program) : Icc3W
 Program Controller Active
 Unit : A
 Spec Limit Max : 2.00E-2
 Spec limits are represented in bold lines on the graphic.



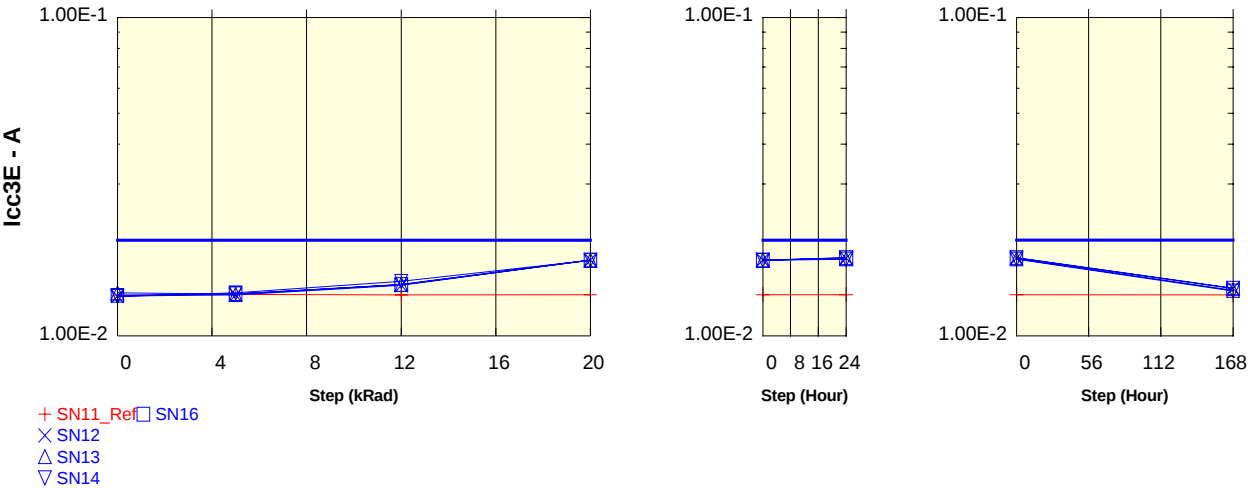
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	8.65E-3	9.21E-3	9.21E-3	9.19E-3
SN12	8.47E-3	8.72E-3	1.22E-2	1.71E-2
SN13	8.59E-3	8.31E-3	1.12E-2	1.71E-2
SN14	8.36E-3	8.26E-3	1.03E-2	1.71E-2
SN16	8.66E-3	8.68E-3	1.10E-2	1.72E-2
Statistics				
Min	8.36E-3	8.26E-3	1.03E-2	1.71E-2
Max	8.66E-3	8.72E-3	1.22E-2	1.72E-2
Mean	8.52E-3	8.49E-3	1.12E-2	1.71E-2
Sigma	1.33E-4	2.40E-4	8.12E-4	6.86E-5

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	9.19E-3	9.12E-3
SN12	1.71E-2	1.73E-2
SN13	1.71E-2	1.72E-2
SN14	1.71E-2	1.72E-2
SN16	1.72E-2	1.74E-2
Statistics		
Min	1.71E-2	1.72E-2
Max	1.72E-2	1.74E-2
Mean	1.71E-2	1.73E-2
Sigma	6.86E-5	8.05E-5

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	9.12E-3	8.77E-3
SN12	1.73E-2	9.12E-3
SN13	1.72E-2	8.75E-3
SN14	1.72E-2	8.94E-3
SN16	1.74E-2	9.18E-3
Statistics		
Min	1.72E-2	8.75E-3
Max	1.74E-2	9.18E-3
Mean	1.73E-2	9.00E-3
Sigma	8.05E-5	1.91E-4

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Supply Current (Erase) : Icc3E
 Erase Controller Active
 Unit : A
 Spec Limit Max : 2.00E-2
 Spec limits are represented in bold lines on the graphic.



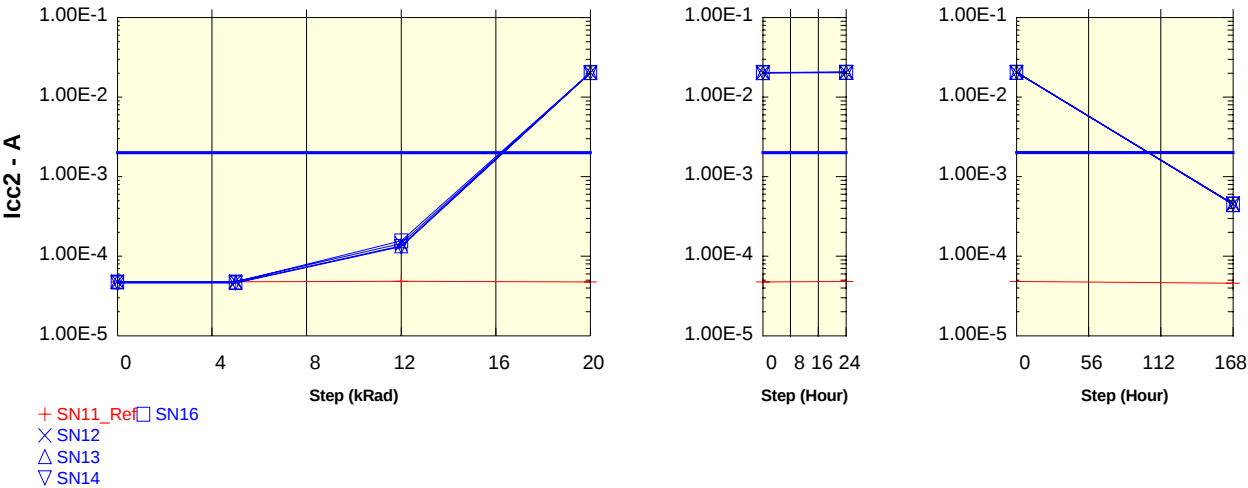
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.34E-2	1.35E-2	1.34E-2	1.35E-2
SN12	1.33E-2	1.34E-2	1.44E-2	1.73E-2
SN13	1.36E-2	1.35E-2	1.45E-2	1.73E-2
SN14	1.33E-2	1.37E-2	1.48E-2	1.73E-2
SN16	1.34E-2	1.35E-2	1.45E-2	1.73E-2
Statistics				
Min	1.33E-2	1.34E-2	1.44E-2	1.73E-2
Max	1.36E-2	1.37E-2	1.48E-2	1.73E-2
Mean	1.34E-2	1.35E-2	1.46E-2	1.73E-2
Sigma	1.55E-4	8.63E-5	1.88E-4	2.49E-5

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.35E-2	1.35E-2
SN12	1.73E-2	1.76E-2
SN13	1.73E-2	1.75E-2
SN14	1.73E-2	1.74E-2
SN16	1.73E-2	1.76E-2
Statistics		
Min	1.73E-2	1.74E-2
Max	1.73E-2	1.76E-2
Mean	1.73E-2	1.75E-2
Sigma	2.49E-5	9.00E-5

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.35E-2	1.34E-2
SN12	1.76E-2	1.41E-2
SN13	1.75E-2	1.39E-2
SN14	1.74E-2	1.38E-2
SN16	1.76E-2	1.41E-2
Statistics		
Min	1.74E-2	1.38E-2
Max	1.76E-2	1.41E-2
Mean	1.75E-2	1.40E-2
Sigma	9.00E-5	1.40E-4

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
 Parameter : Standby Current TTL : Icc2
 E* = Vih
 Unit : A
 Spec Limit Max : 2.00E-3
 Spec limits are represented in bold lines on the graphic.



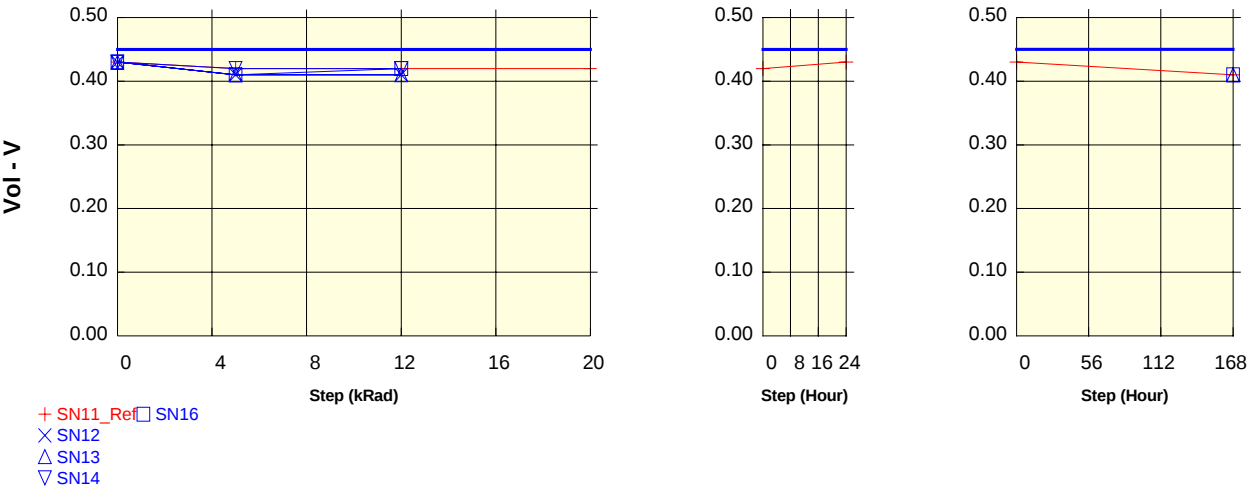
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.75E-5	4.79E-5	4.85E-5	4.76E-5
SN12	4.77E-5	4.81E-5	1.45E-4	2.03E-2
SN13	4.84E-5	4.66E-5	1.36E-4	2.03E-2
SN14	4.61E-5	4.61E-5	1.32E-4	2.02E-2
SN16	4.74E-5	4.75E-5	1.56E-4	2.04E-2
Statistics				
Min	4.61E-5	4.61E-5	1.32E-4	2.02E-2
Max	4.84E-5	4.81E-5	1.56E-4	2.04E-2
Mean	4.74E-5	4.71E-5	1.42E-4	2.03E-2
Sigma	9.47E-7	9.03E-7	1.08E-5	8.93E-5

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.76E-5	4.83E-5
SN12	2.03E-2	2.05E-2
SN13	2.03E-2	2.04E-2
SN14	2.02E-2	2.04E-2
SN16	2.04E-2	2.06E-2
Statistics		
Min	2.02E-2	2.04E-2
Max	2.04E-2	2.06E-2
Mean	2.03E-2	2.05E-2
Sigma	8.93E-5	1.01E-4

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.83E-5	4.58E-5
SN12	2.05E-2	4.54E-4
SN13	2.04E-2	4.46E-4
SN14	2.04E-2	4.55E-4
SN16	2.06E-2	4.48E-4
Statistics		
Min	2.04E-2	4.46E-4
Max	2.06E-2	4.55E-4
Mean	2.05E-2	4.51E-4
Sigma	1.01E-4	4.37E-6

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output Low Voltage : VoIDQ7
Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



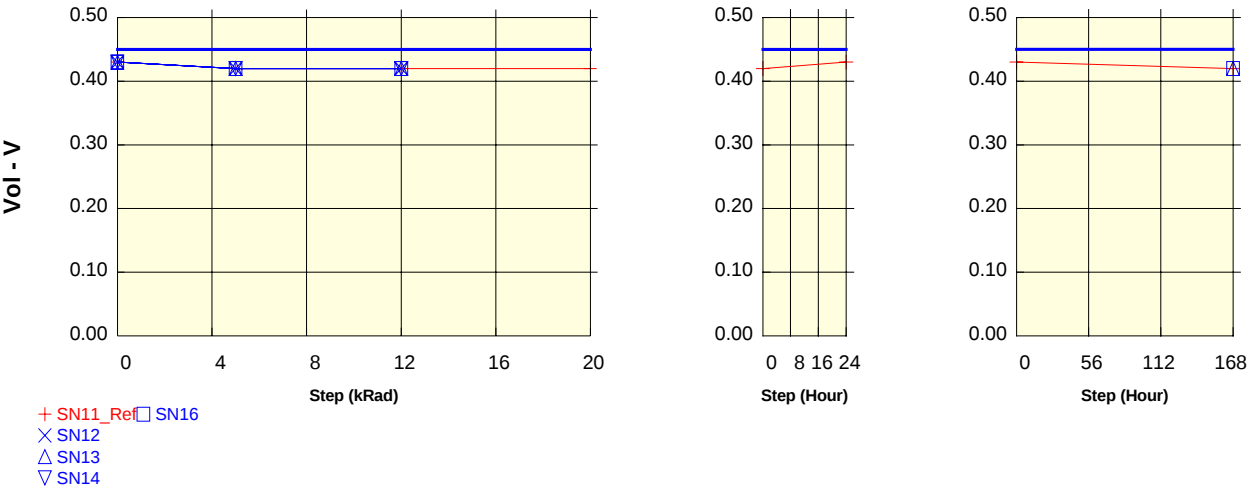
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.43	0.42	0.42	0.42
SN12	0.43	0.41	0.41	
SN13	0.43	0.41	0.41	
SN14	0.43	0.42	0.42	
SN16	0.43	0.41	0.42	
Statistics				
Min	0.43	0.41	0.41	0.00
Max	0.43	0.42	0.42	0.00
Mean	0.43	0.41	0.42	0.00
Sigma	0.00	0.00	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	0.42	0.43
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	0.43	0.41
SN12		
SN13		0.41
SN14		
SN16		0.41
Statistics		
Min	0.00	0.00
Max	0.00	0.41
Mean	0.00	0.21
Sigma	0.00	0.24

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
Parameter : Output Low Voltage : VoIDQ6
Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.43	0.42	0.42	0.42
SN12	0.43	0.42	0.42	
SN13	0.43	0.42	0.42	
SN14	0.43	0.42	0.42	
SN16	0.43	0.42	0.42	
Statistics				
Min	0.43	0.42	0.42	0.00
Max	0.43	0.42	0.42	0.00
Mean	0.43	0.42	0.42	0.00
Sigma	0.00	0.00	0.00	0.00

Test TST002 : Annealing 24h

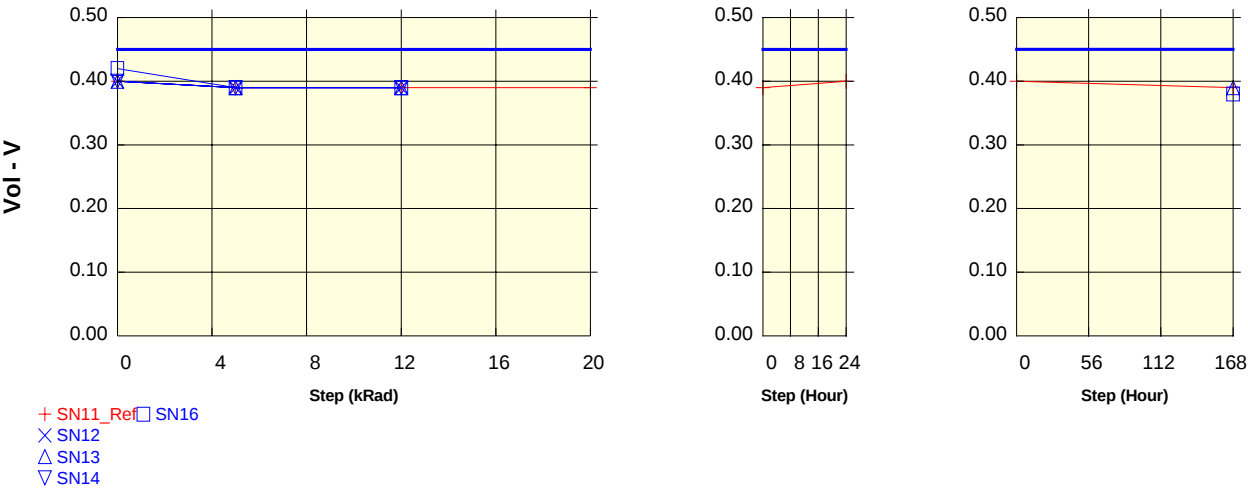
	0 Hour	24 Hour
SN11	0.42	0.43
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	0.43	0.42
SN12		
SN13		0.42
SN14		
SN16		0.42
Statistics		
Min	0.00	0.00
Max	0.00	0.42
Mean	0.00	0.21
Sigma	0.00	0.24

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
Parameter : Output Low Voltage : VoIDQ5
Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.40	0.39	0.39	0.39
SN12	0.40	0.39	0.39	
SN13	0.40	0.39	0.39	
SN14	0.40	0.39	0.39	
SN16	0.42	0.39	0.39	
Statistics				
Min	0.40	0.39	0.39	0.00
Max	0.42	0.39	0.39	0.00
Mean	0.41	0.39	0.39	0.00
Sigma	0.01	0.00	0.00	0.00

Test TST002 : Annealing 24h

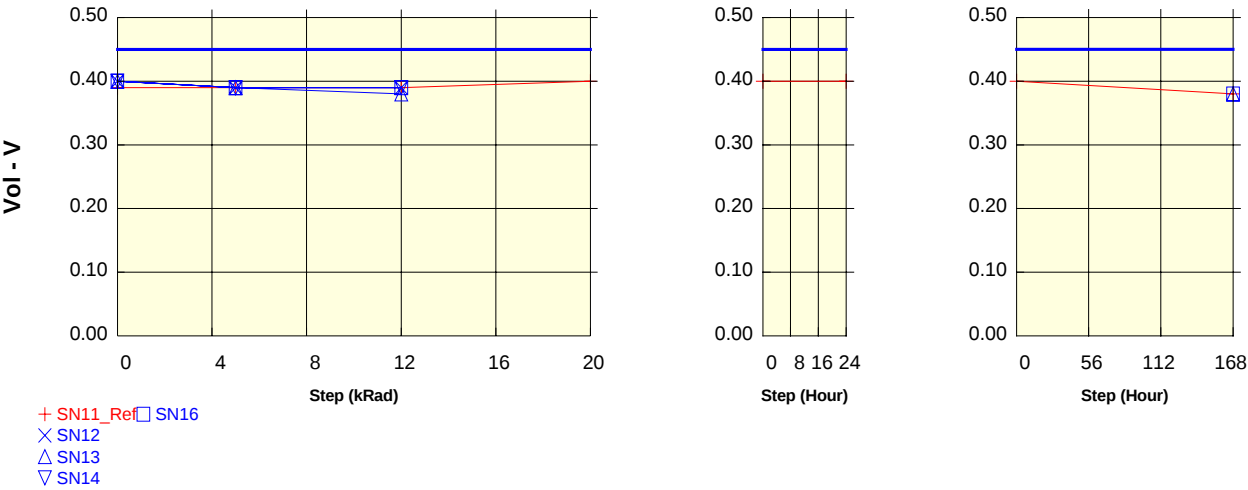
	0 Hour	24 Hour
SN11	0.39	0.40
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	0.40	0.39
SN12		
SN13		0.39
SN14		
SN16		0.38
Statistics		
Min	0.00	0.00
Max	0.00	0.39
Mean	0.00	0.19
Sigma	0.00	0.22

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
Parameter : Output Low Voltage : VoIDQ4
Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.39	0.39	0.39	0.40
SN12	0.40	0.39	0.39	
SN13	0.40	0.39	0.38	
SN14	0.40	0.39	0.39	
SN16	0.40	0.39	0.39	
Statistics				
Min	0.40	0.39	0.38	0.00
Max	0.40	0.39	0.39	0.00
Mean	0.40	0.39	0.39	0.00
Sigma	0.00	0.00	0.00	0.00

Test TST002 : Annealing 24h

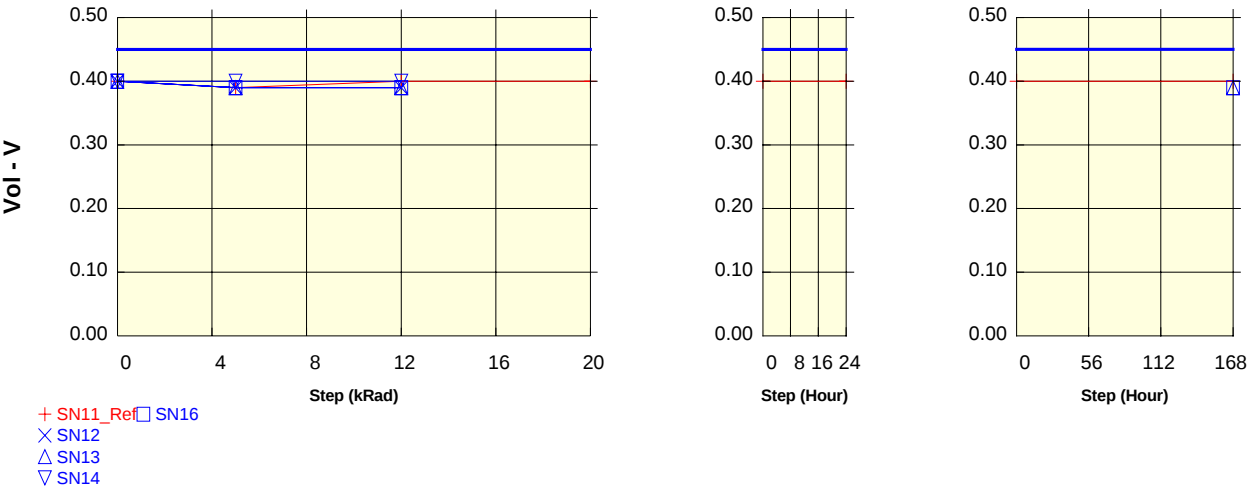
	0 Hour	24 Hour
SN11	0.40	0.40
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	0.40	0.38
SN12		
SN13		0.38
SN14		
SN16		0.38
Statistics		
Min	0.00	0.00
Max	0.00	0.38
Mean	0.00	0.19
Sigma	0.00	0.22

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output Low Voltage : VoIDQ3
Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.40	0.39	0.40	0.40
SN12	0.40	0.39	0.39	
SN13	0.40	0.39	0.39	
SN14	0.40	0.40	0.40	
SN16	0.40	0.39	0.39	
Statistics				
Min	0.40	0.39	0.39	0.00
Max	0.40	0.40	0.40	0.00
Mean	0.40	0.39	0.39	0.00
Sigma	0.00	0.00	0.00	0.00

Test TST002 : Annealing 24h

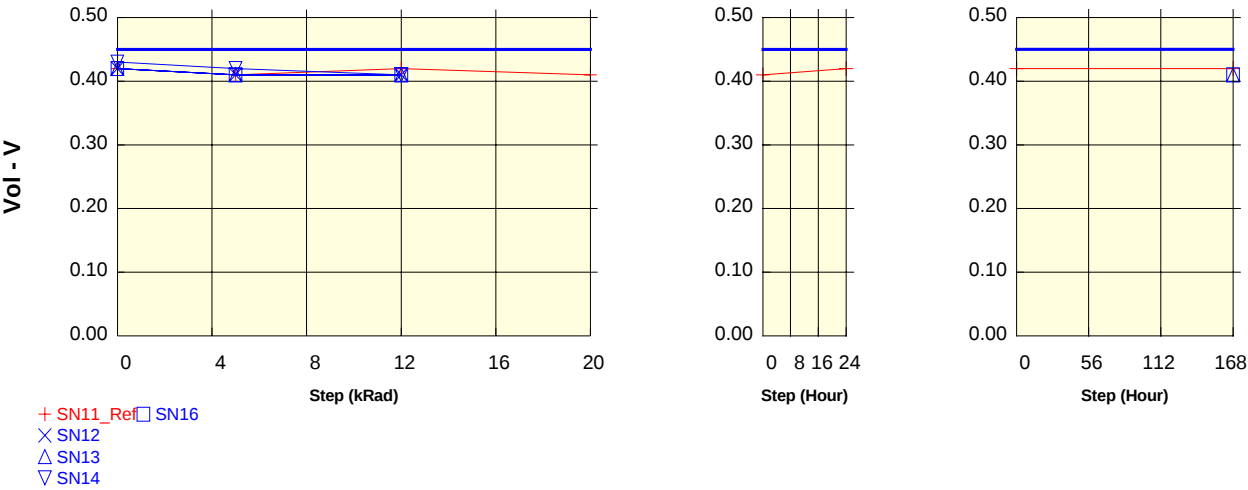
	0 Hour	24 Hour
SN11	0.40	0.40
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	0.40	0.40
SN12		
SN13		0.39
SN14		
SN16		0.39
Statistics		
Min	0.00	0.00
Max	0.00	0.39
Mean	0.00	0.20
Sigma	0.00	0.23

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output Low Voltage : VoIDQ2
Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



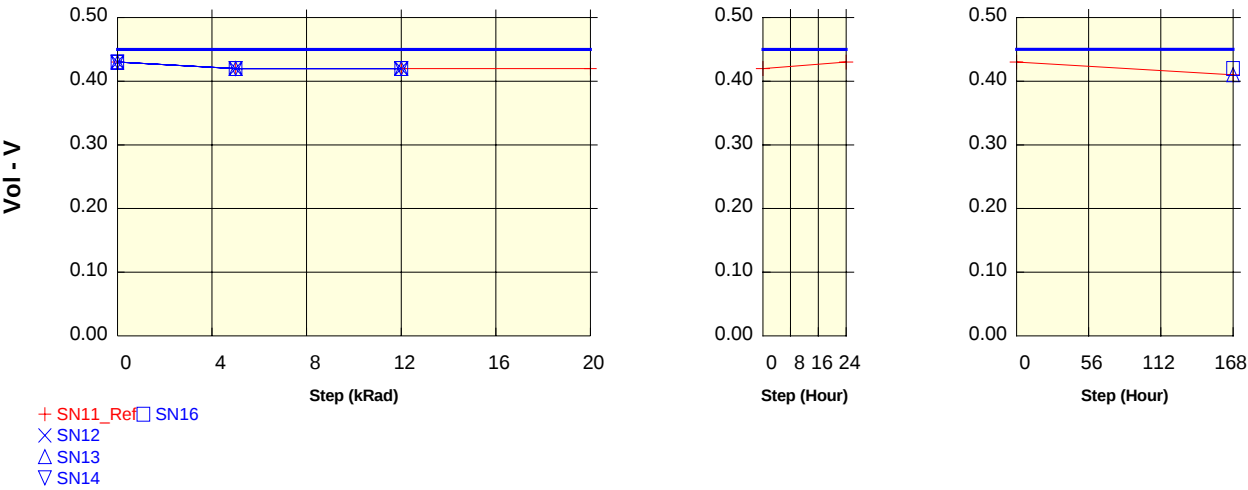
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.42	0.41	0.42	0.41
SN12	0.42	0.41	0.41	
SN13	0.42	0.41	0.41	
SN14	0.43	0.42	0.41	
SN16	0.42	0.41	0.41	
Statistics				
Min	0.42	0.41	0.41	0.00
Max	0.43	0.42	0.41	0.00
Mean	0.42	0.41	0.41	0.00
Sigma	0.01	0.00	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	0.41	0.42
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	0.42	0.42
SN12		
SN13		0.41
SN14		
SN16		0.41
Statistics		
Min	0.00	0.00
Max	0.00	0.41
Mean	0.00	0.21
Sigma	0.00	0.24

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output Low Voltage : VoIDQ1
 Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



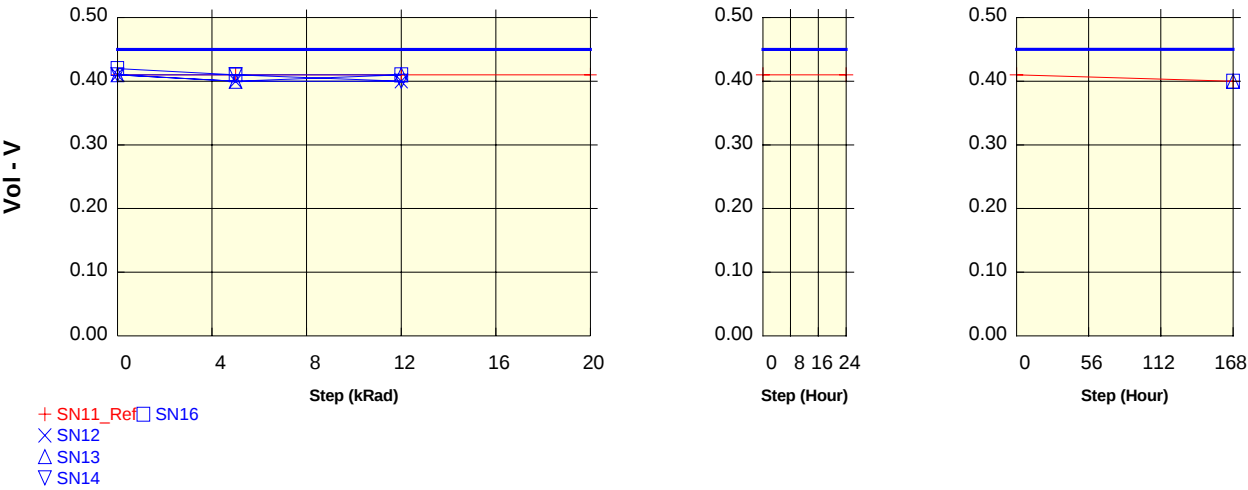
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.43	0.42	0.42	0.42
SN12	0.43	0.42	0.42	
SN13	0.43	0.42	0.42	
SN14	0.43	0.42	0.42	
SN16	0.43	0.42	0.42	
Statistics				
Min	0.43	0.42	0.42	0.00
Max	0.43	0.42	0.42	0.00
Mean	0.43	0.42	0.42	0.00
Sigma	0.00	0.00	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	0.42	0.43
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	0.43	0.41
SN12		
SN13		0.41
SN14		
SN16		0.42
Statistics		
Min	0.00	0.00
Max	0.00	0.42
Mean	0.00	0.21
Sigma	0.00	0.24

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
Parameter : Output Low Voltage : VoIDQ0
Iol = 5.8mA
 Unit : V
 Spec Limit Max : 0.45
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	0.41	0.41	0.41	0.41
SN12	0.41	0.40	0.40	
SN13	0.41	0.40	0.41	
SN14	0.41	0.41	0.40	
SN16	0.42	0.41	0.41	
Statistics				
Min	0.41	0.40	0.40	0.00
Max	0.42	0.41	0.41	0.00
Mean	0.41	0.41	0.41	0.00
Sigma	0.01	0.01	0.01	0.00

Test TST002 : Annealing 24h

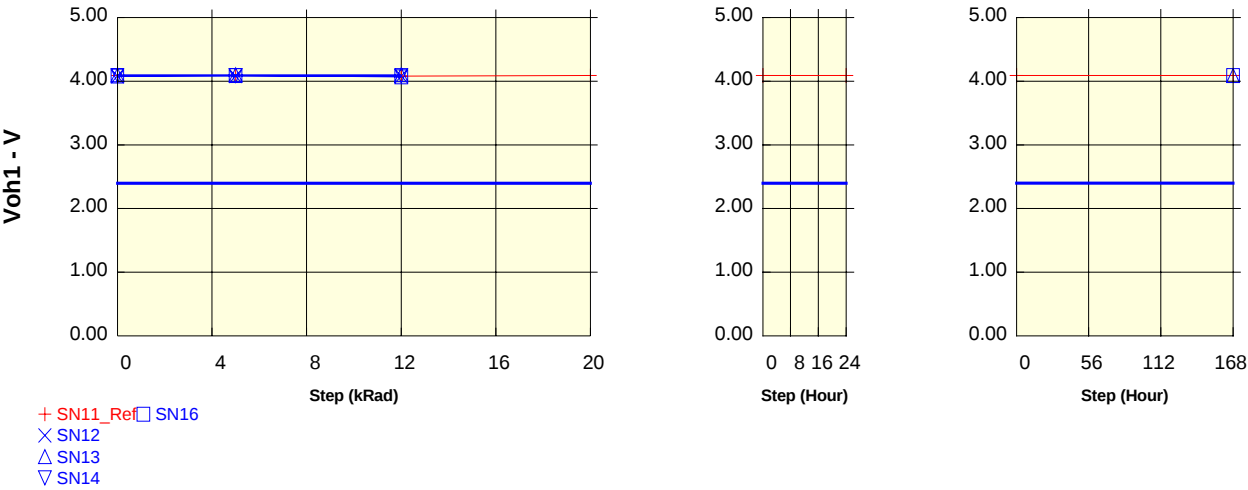
	0 Hour	24 Hour
SN11	0.41	0.41
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	0.41	0.40
SN12		
SN13		0.40
SN14		
SN16		0.40
Statistics		
Min	0.00	0.00
Max	0.00	0.40
Mean	0.00	0.20
Sigma	0.00	0.23

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
 Parameter : Output High Voltage : Voh1DQ7
 Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



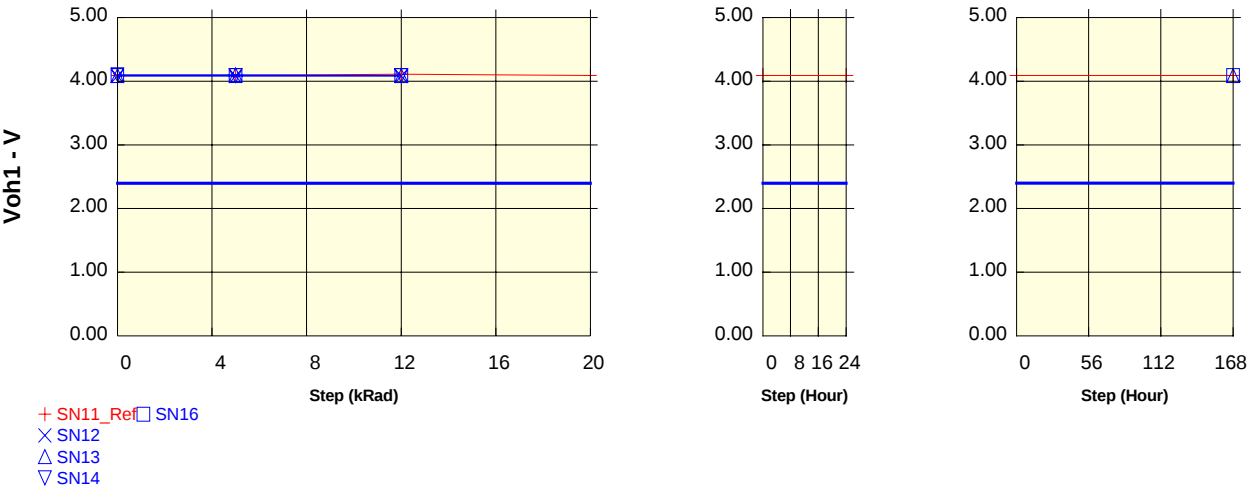
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.09	4.09	4.08	4.09
SN12	4.08	4.08	4.08	
SN13	4.10	4.10	4.10	
SN14	4.09	4.09	4.09	
SN16	4.08	4.09	4.07	
Statistics				
Min	4.08	4.08	4.07	0.00
Max	4.10	4.10	4.10	0.00
Mean	4.09	4.09	4.09	0.00
Sigma	0.01	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.09	4.09
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.09	4.09
SN12		
SN13		4.09
SN14		
SN16		4.09
Statistics		
Min	0.00	0.00
Max	0.00	4.09
Mean	0.00	2.05
Sigma	0.00	2.36

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh1DQ6
 Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



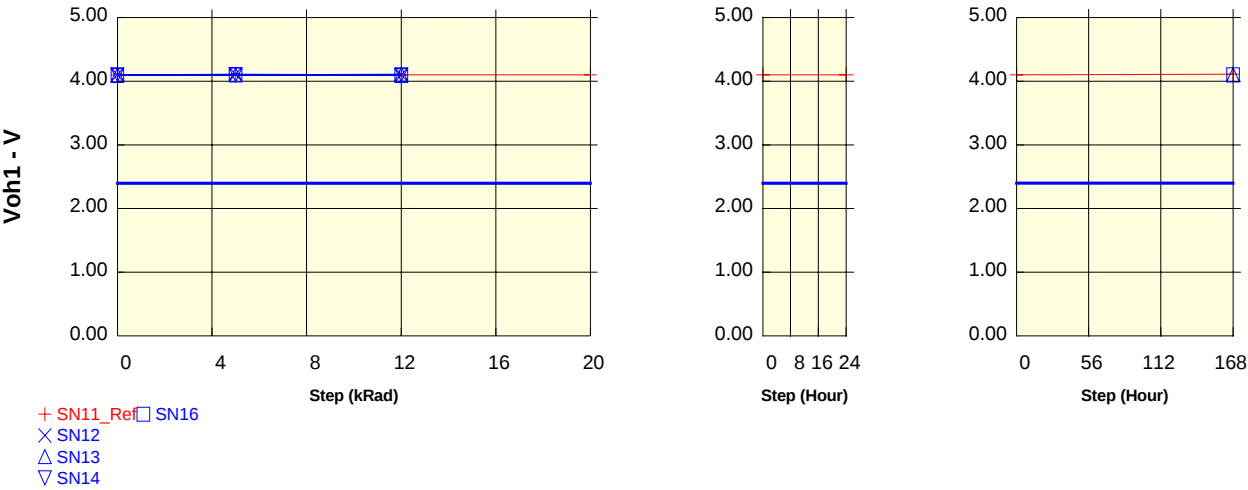
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.09	4.09	4.11	4.09
SN12	4.08	4.08	4.08	
SN13	4.09	4.10	4.09	
SN14	4.10	4.09	4.09	
SN16	4.09	4.09	4.09	
Statistics				
Min	4.08	4.08	4.08	0.00
Max	4.10	4.10	4.09	0.00
Mean	4.09	4.09	4.09	0.00
Sigma	0.01	0.01	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.09	4.09
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.09	4.09
SN12		
SN13		4.09
SN14		
SN16		4.09
Statistics		
Min	0.00	0.00
Max	0.00	4.09
Mean	0.00	2.05
Sigma	0.00	2.36

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output High Voltage : Voh1DQ5
Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



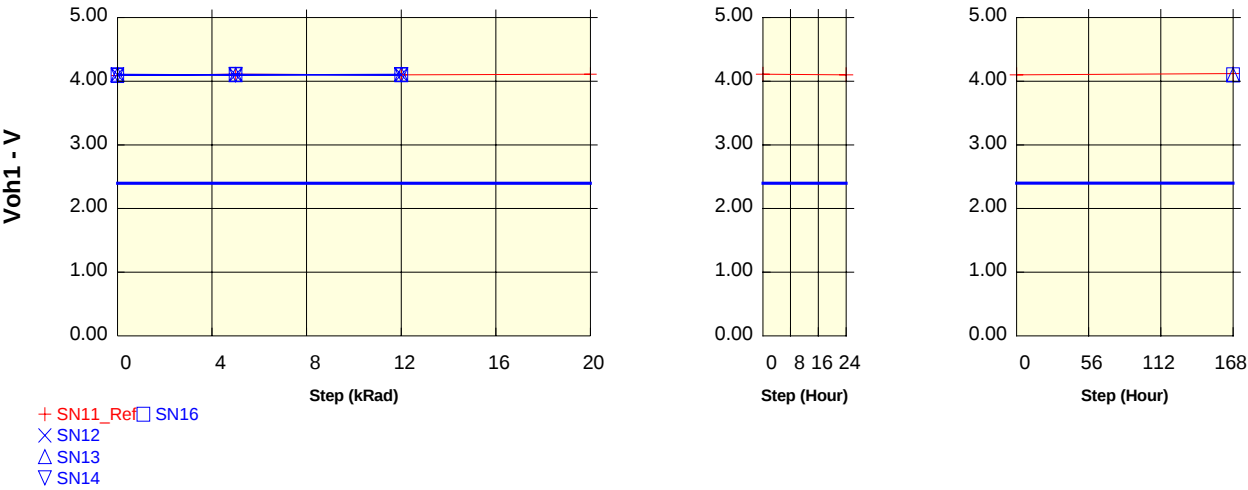
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.10	4.10	4.10	4.10
SN12	4.10	4.11	4.10	
SN13	4.10	4.10	4.11	
SN14	4.10	4.10	4.10	
SN16	4.09	4.10	4.09	
Statistics				
Min	4.09	4.10	4.09	0.00
Max	4.10	4.11	4.11	0.00
Mean	4.10	4.10	4.10	0.00
Sigma	0.00	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.10	4.10
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.10	4.11
SN12		
SN13		4.10
SN14		
SN16		4.10
Statistics		
Min	0.00	0.00
Max	0.00	4.10
Mean	0.00	2.05
Sigma	0.00	2.37

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh1DQ4
 Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



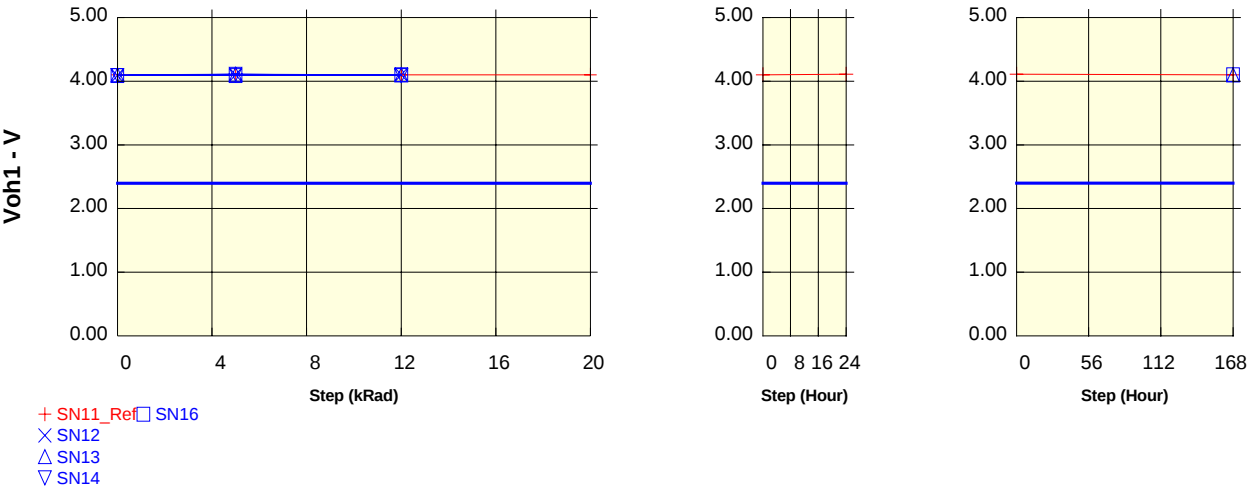
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.09	4.11	4.10	4.11
SN12	4.10	4.10	4.10	
SN13	4.11	4.10	4.11	
SN14	4.10	4.10	4.10	
SN16	4.09	4.11	4.10	
Statistics				
Min	4.09	4.10	4.10	0.00
Max	4.11	4.11	4.11	0.00
Mean	4.10	4.10	4.10	0.00
Sigma	0.01	0.00	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.11	4.10
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.10	4.12
SN12		
SN13		4.10
SN14		
SN16		4.10
Statistics		
Min	0.00	0.00
Max	0.00	4.10
Mean	0.00	2.05
Sigma	0.00	2.37

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output High Voltage : Voh1DQ3
Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



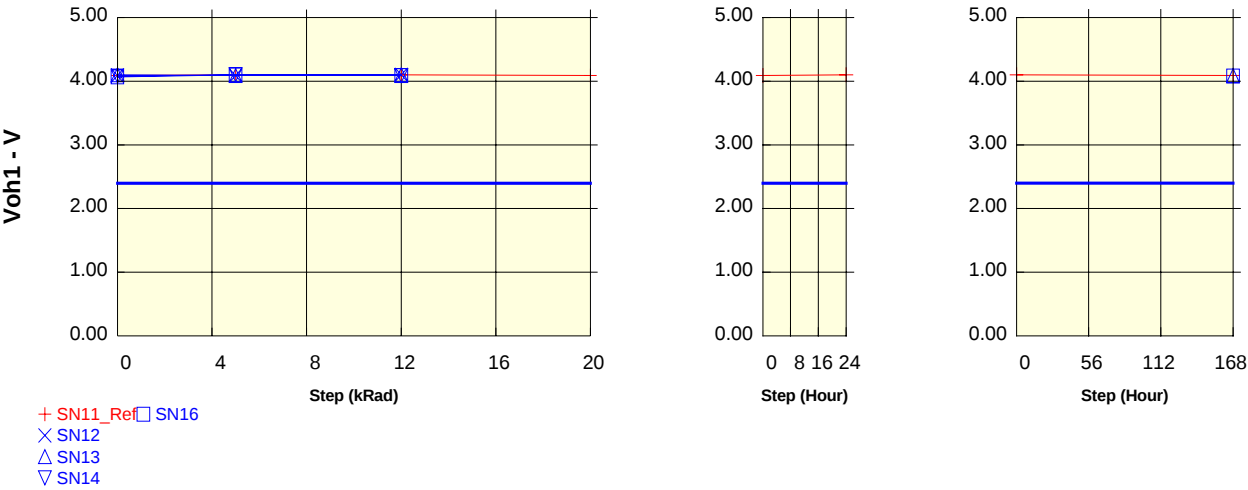
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.10	4.09	4.10	4.10
SN12	4.09	4.10	4.10	
SN13	4.10	4.11	4.10	
SN14	4.09	4.11	4.09	
SN16	4.09	4.09	4.10	
Statistics				
Min	4.09	4.09	4.09	0.00
Max	4.10	4.11	4.10	0.00
Mean	4.09	4.10	4.10	0.00
Sigma	0.01	0.01	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.10	4.11
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.11	4.10
SN12		
SN13		4.10
SN14		
SN16		4.10
Statistics		
Min	0.00	0.00
Max	0.00	4.10
Mean	0.00	2.05
Sigma	0.00	2.37

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh1DQ2
 Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



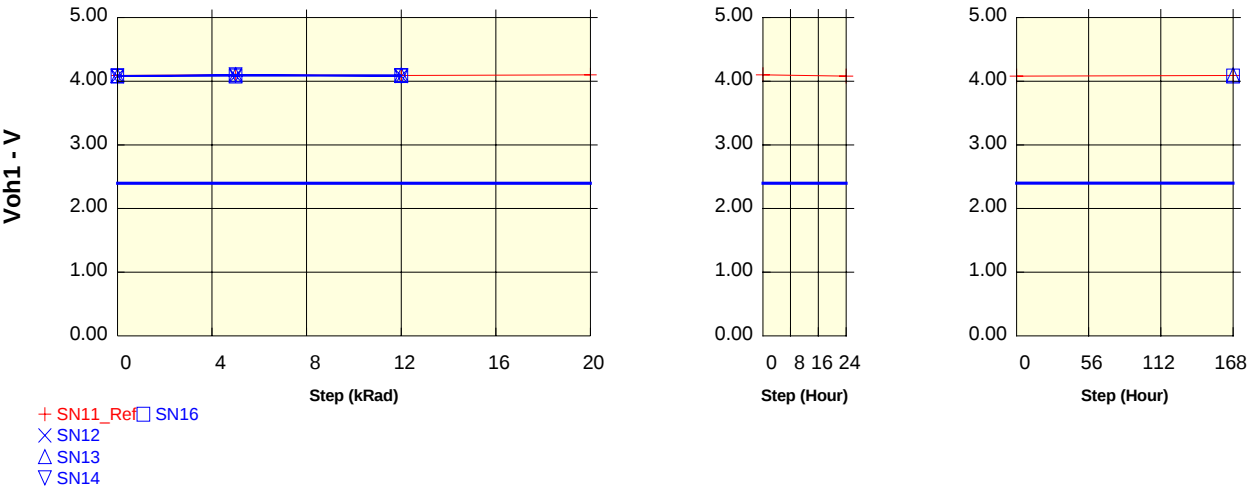
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.09	4.10	4.10	4.09
SN12	4.09	4.09	4.10	
SN13	4.10	4.09	4.10	
SN14	4.08	4.10	4.09	
SN16	4.07	4.10	4.09	
Statistics				
Min	4.07	4.09	4.09	0.00
Max	4.10	4.10	4.10	0.00
Mean	4.09	4.10	4.10	0.00
Sigma	0.01	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.09	4.10
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.10	4.09
SN12		
SN13		4.09
SN14		
SN16		4.08
Statistics		
Min	0.00	0.00
Max	0.00	4.09
Mean	0.00	2.04
Sigma	0.00	2.36

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh1DQ1
 Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



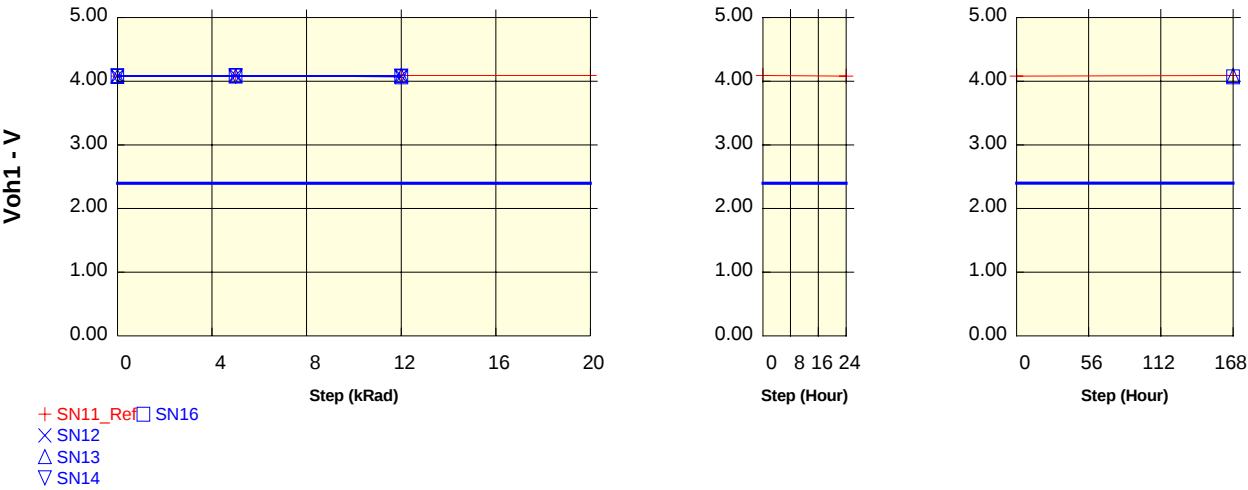
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.09	4.10	4.09	4.10
SN12	4.08	4.09	4.08	
SN13	4.09	4.10	4.10	
SN14	4.08	4.10	4.08	
SN16	4.08	4.08	4.09	
Statistics				
Min	4.08	4.08	4.08	0.00
Max	4.09	4.10	4.10	0.00
Mean	4.08	4.09	4.09	0.00
Sigma	0.01	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.10	4.08
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.08	4.09
SN12		
SN13		4.10
SN14		
SN16		4.08
Statistics		
Min	0.00	0.00
Max	0.00	4.10
Mean	0.00	2.05
Sigma	0.00	2.36

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh1DQ0
 Ioh = -2.5mA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 2.40
 Spec limits are represented in bold lines on the graphic.



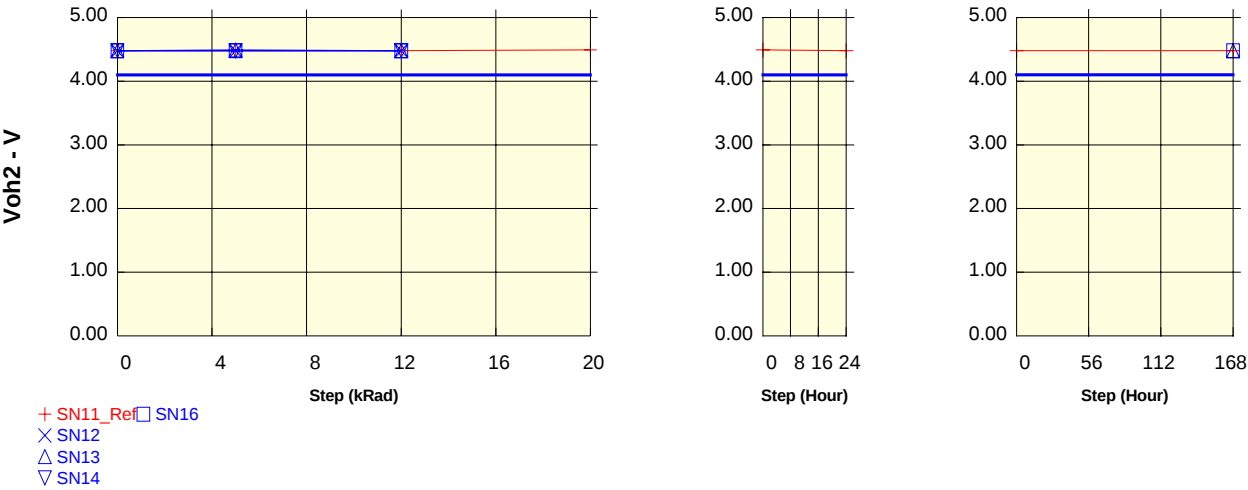
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.08	4.08	4.09	4.09
SN12	4.08	4.09	4.08	
SN13	4.08	4.08	4.09	
SN14	4.08	4.08	4.08	
SN16	4.08	4.09	4.07	
Statistics				
Min	4.08	4.08	4.07	0.00
Max	4.08	4.09	4.09	0.00
Mean	4.08	4.09	4.08	0.00
Sigma	0.00	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.09	4.08
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.08	4.09
SN12		
SN13		4.09
SN14		
SN16		4.07
Statistics		
Min	0.00	0.00
Max	0.00	4.09
Mean	0.00	2.04
Sigma	0.00	2.36

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh2DQ7
 Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



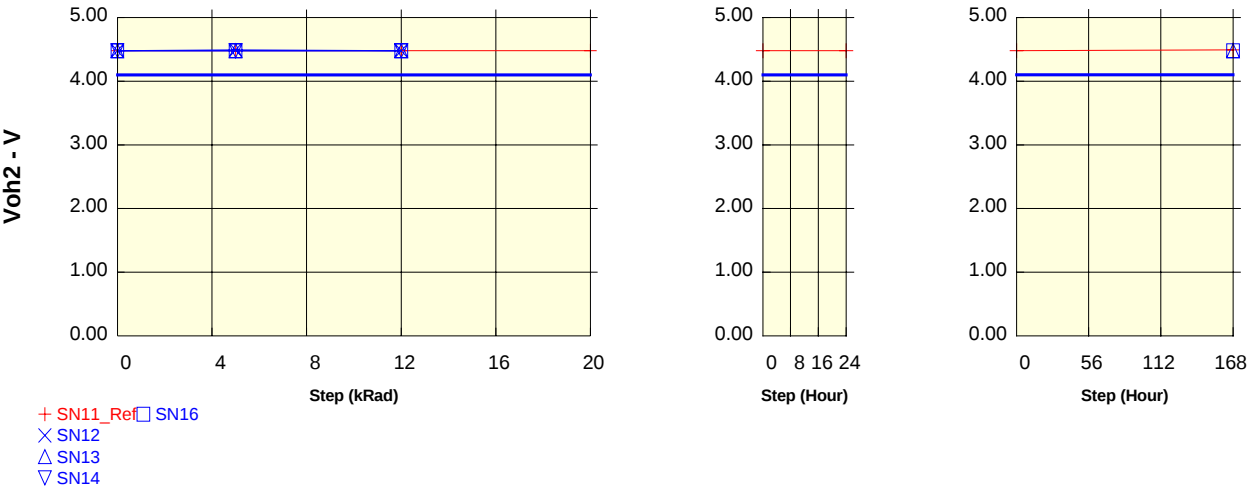
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.48	4.48	4.48	4.49
SN12	4.48	4.48	4.48	
SN13	4.48	4.49	4.48	
SN14	4.48	4.48	4.48	
SN16	4.48	4.48	4.48	
Statistics				
Min	4.48	4.48	4.48	0.00
Max	4.48	4.49	4.48	0.00
Mean	4.48	4.48	4.48	0.00
Sigma	0.00	0.01	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.49	4.48
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.48	4.48
SN12		
SN13		4.48
SN14		
SN16		4.48
Statistics		
Min	0.00	0.00
Max	0.00	4.48
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh2DQ6
 Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



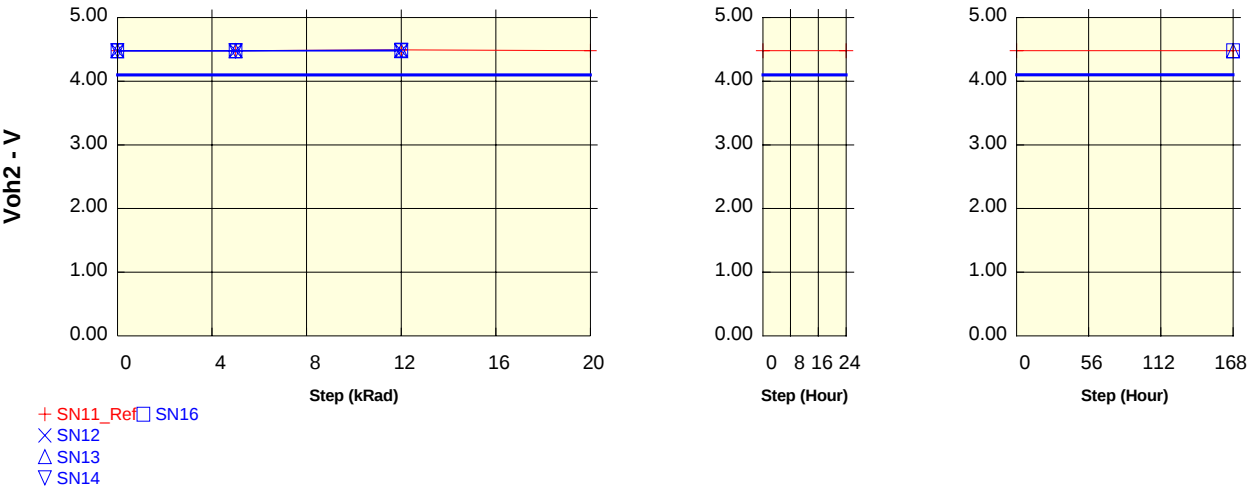
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.48	4.48	4.48	4.48
SN12	4.48	4.49	4.48	
SN13	4.48	4.48	4.48	
SN14	4.48	4.48	4.48	
SN16	4.48	4.48	4.48	
Statistics				
Min	4.48	4.48	4.48	0.00
Max	4.48	4.49	4.48	0.00
Mean	4.48	4.48	4.48	0.00
Sigma	0.00	0.01	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.48	4.48
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.48	4.49
SN12		
SN13		4.48
SN14		
SN16		4.48
Statistics		
Min	0.00	0.00
Max	0.00	4.48
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh2DQ5
 Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



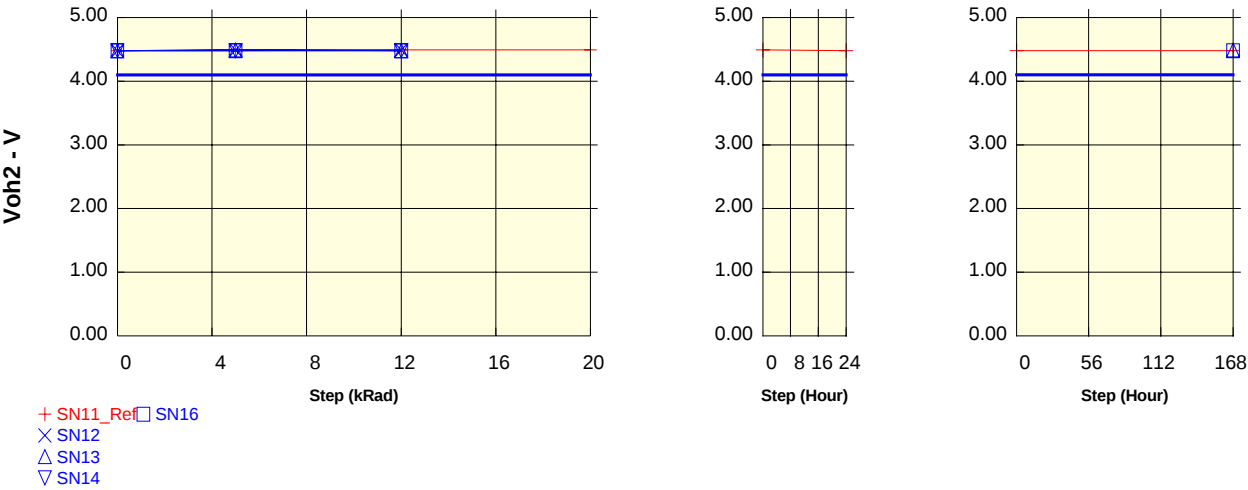
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.48	4.48	4.49	4.48
SN12	4.48	4.48	4.48	
SN13	4.48	4.48	4.48	
SN14	4.48	4.48	4.48	
SN16	4.48	4.48	4.49	
Statistics				
Min	4.48	4.48	4.48	0.00
Max	4.48	4.48	4.49	0.00
Mean	4.48	4.48	4.48	0.00
Sigma	0.00	0.00	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.48	4.48
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.48	4.48
SN12		
SN13		4.48
SN14		
SN16		4.48
Statistics		
Min	0.00	0.00
Max	0.00	4.48
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh2DQ4
 Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



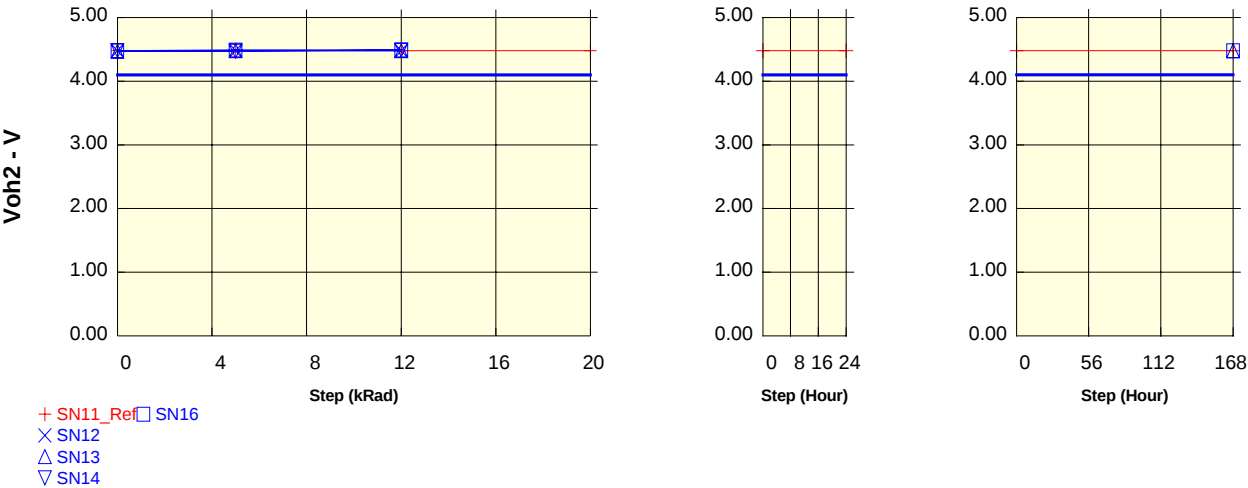
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.48	4.48	4.49	4.49
SN12	4.48	4.49	4.49	
SN13	4.48	4.49	4.48	
SN14	4.48	4.48	4.48	
SN16	4.48	4.48	4.48	
Statistics				
Min	4.48	4.48	4.48	0.00
Max	4.48	4.49	4.49	0.00
Mean	4.48	4.49	4.48	0.00
Sigma	0.00	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.49	4.48
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.48	4.48
SN12		
SN13		4.49
SN14		
SN16		4.48
Statistics		
Min	0.00	0.00
Max	0.00	4.49
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh2DQ3
 Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



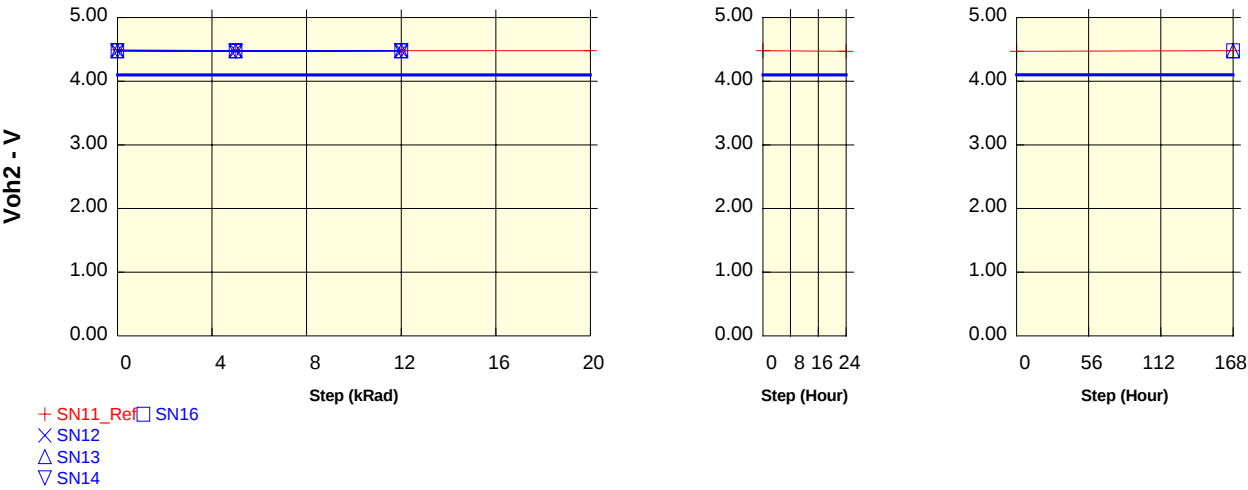
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.48	4.48	4.48	4.48
SN12	4.48	4.48	4.48	
SN13	4.47	4.48	4.48	
SN14	4.48	4.47	4.49	
SN16	4.48	4.49	4.49	
Statistics				
Min	4.47	4.47	4.48	0.00
Max	4.48	4.49	4.49	0.00
Mean	4.48	4.48	4.49	0.00
Sigma	0.01	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.48	4.48
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.48	4.48
SN12		
SN13		4.48
SN14		
SN16		4.48
Statistics		
Min	0.00	0.00
Max	0.00	4.48
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh2DQ2
 Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



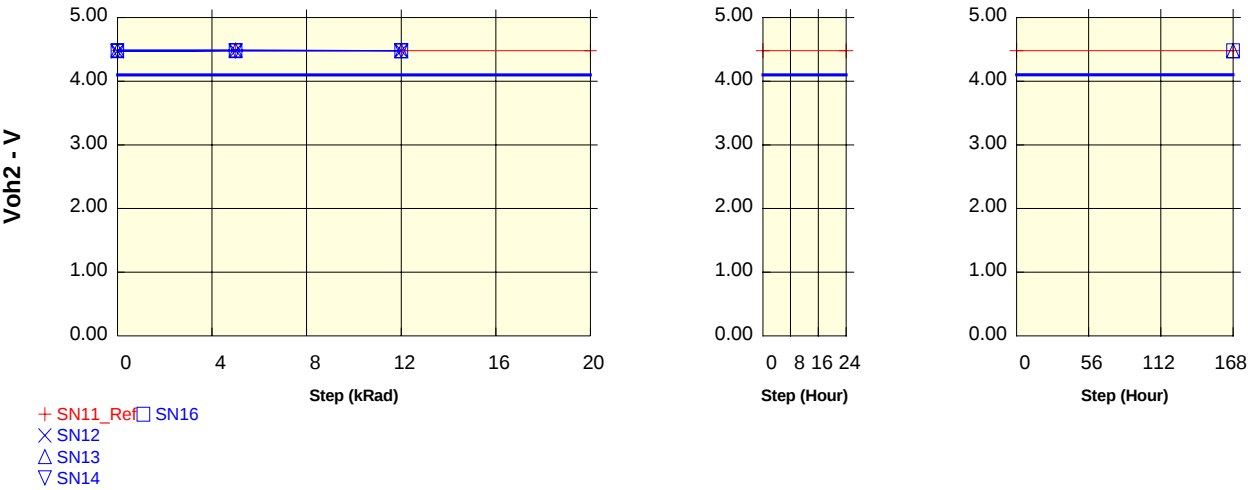
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.49	4.48	4.48	4.48
SN12	4.48	4.48	4.48	
SN13	4.48	4.48	4.48	
SN14	4.48	4.47	4.48	
SN16	4.48	4.48	4.48	
Statistics				
Min	4.48	4.47	4.48	0.00
Max	4.48	4.48	4.48	0.00
Mean	4.48	4.48	4.48	0.00
Sigma	0.00	0.01	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.48	4.47
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.47	4.48
SN12		
SN13		4.48
SN14		
SN16		4.48
Statistics		
Min	0.00	0.00
Max	0.00	4.48
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Output High Voltage : Voh2DQ1
 Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



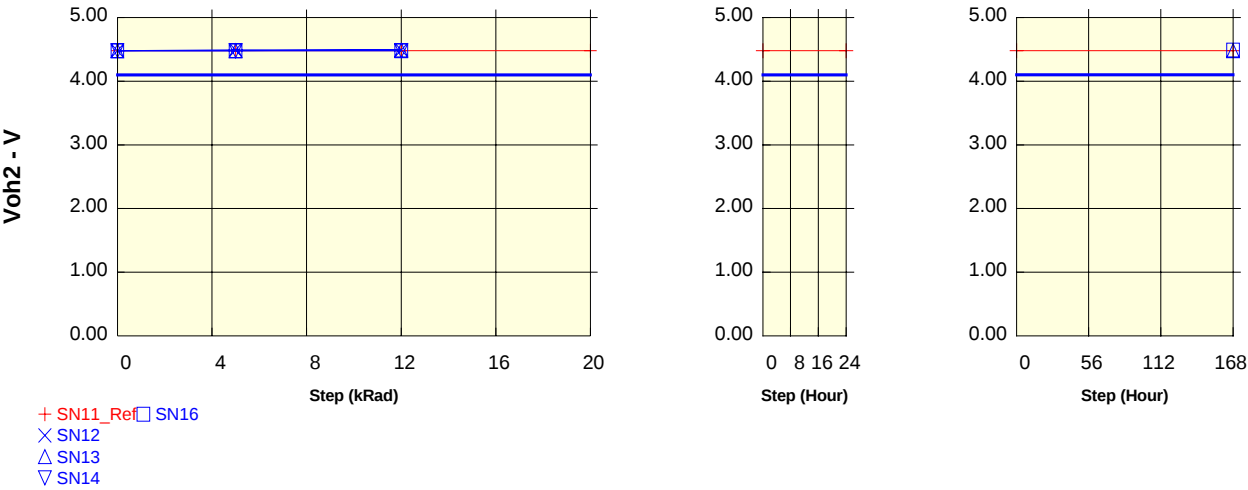
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.48	4.48	4.48	4.48
SN12	4.47	4.48	4.48	
SN13	4.49	4.49	4.48	
SN14	4.47	4.48	4.48	
SN16	4.48	4.48	4.48	
Statistics				
Min	4.47	4.48	4.48	0.00
Max	4.49	4.49	4.48	0.00
Mean	4.48	4.48	4.48	0.00
Sigma	0.01	0.01	0.00	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.48	4.48
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.48	4.48
SN12		
SN13		4.48
SN14		
SN16		4.48
Statistics		
Min	0.00	0.00
Max	0.00	4.48
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output High Voltage : Voh2DQ0
Ioh = -100µA. Vcc = VccMin
 Unit : V
 Spec Limit Min : 4.10
 Spec limits are represented in bold lines on the graphic.



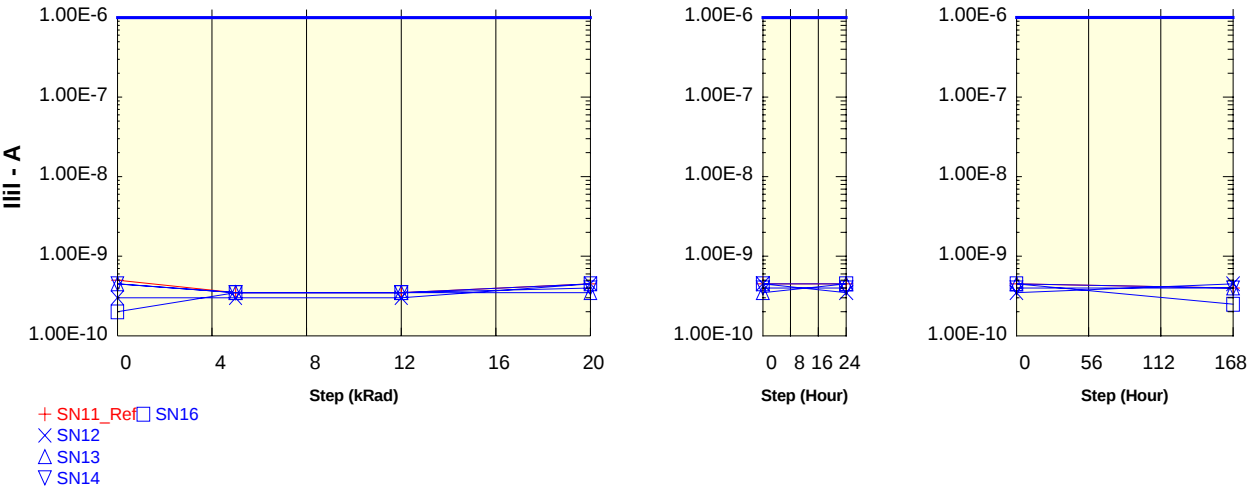
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.48	4.48	4.48	4.48
SN12	4.48	4.49	4.49	
SN13	4.48	4.48	4.49	
SN14	4.48	4.48	4.48	
SN16	4.48	4.48	4.48	
Statistics				
Min	4.48	4.48	4.48	0.00
Max	4.48	4.49	4.49	0.00
Mean	4.48	4.48	4.49	0.00
Sigma	0.00	0.01	0.01	0.00

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.48	4.48
SN12		
SN13		
SN14		
SN16		
Statistics		
Min	0.00	0.00
Max	0.00	0.00
Mean	0.00	0.00
Sigma	0.00	0.00

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.48	4.48
SN12		
SN13		4.48
SN14		
SN16		4.49
Statistics		
Min	0.00	0.00
Max	0.00	4.49
Mean	0.00	2.24
Sigma	0.00	2.59

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A20
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



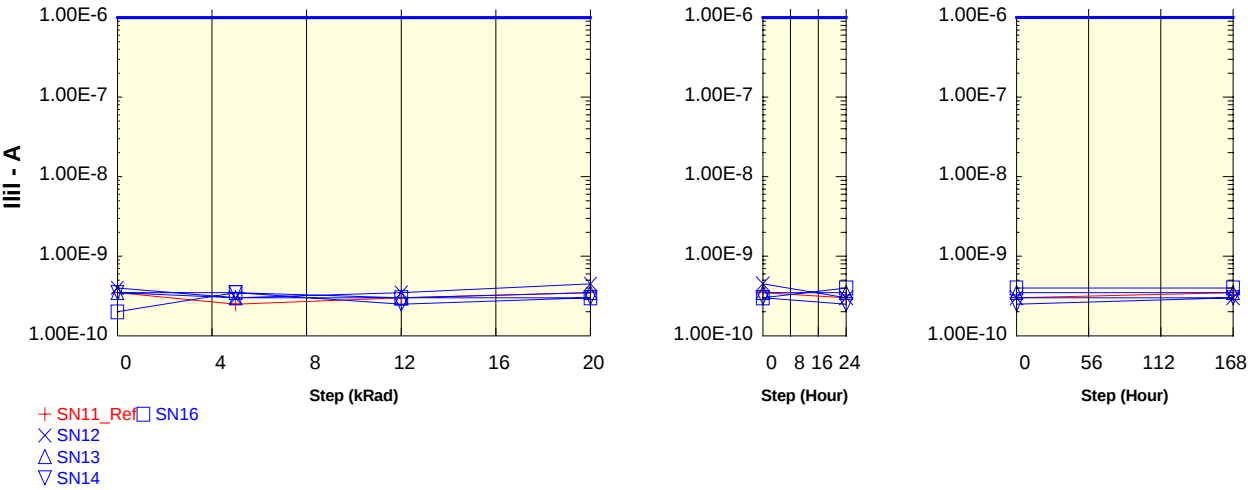
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	5.00E-10	3.50E-10	3.50E-10	4.50E-10
SN12	3.00E-10	3.00E-10	3.00E-10	4.50E-10
SN13	4.50E-10	3.50E-10	3.50E-10	3.50E-10
SN14	4.50E-10	3.50E-10	3.50E-10	4.00E-10
SN16	2.00E-10	3.50E-10	3.50E-10	4.50E-10
Statistics				
Min	2.00E-10	3.00E-10	3.00E-10	3.50E-10
Max	4.50E-10	3.50E-10	3.50E-10	4.50E-10
Mean	3.50E-10	3.38E-10	3.38E-10	4.13E-10
Sigma	1.22E-10	2.50E-11	2.50E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.50E-10	4.50E-10
SN12	4.50E-10	3.50E-10
SN13	3.50E-10	4.50E-10
SN14	4.00E-10	4.00E-10
SN16	4.50E-10	4.50E-10
Statistics		
Min	3.50E-10	3.50E-10
Max	4.50E-10	4.50E-10
Mean	4.13E-10	4.13E-10
Sigma	4.79E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.50E-10	4.00E-10
SN12	3.50E-10	4.50E-10
SN13	4.50E-10	4.00E-10
SN14	4.00E-10	4.00E-10
SN16	4.50E-10	2.50E-10
Statistics		
Min	3.50E-10	2.50E-10
Max	4.50E-10	4.50E-10
Mean	4.13E-10	3.75E-10
Sigma	4.79E-11	8.66E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A19
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



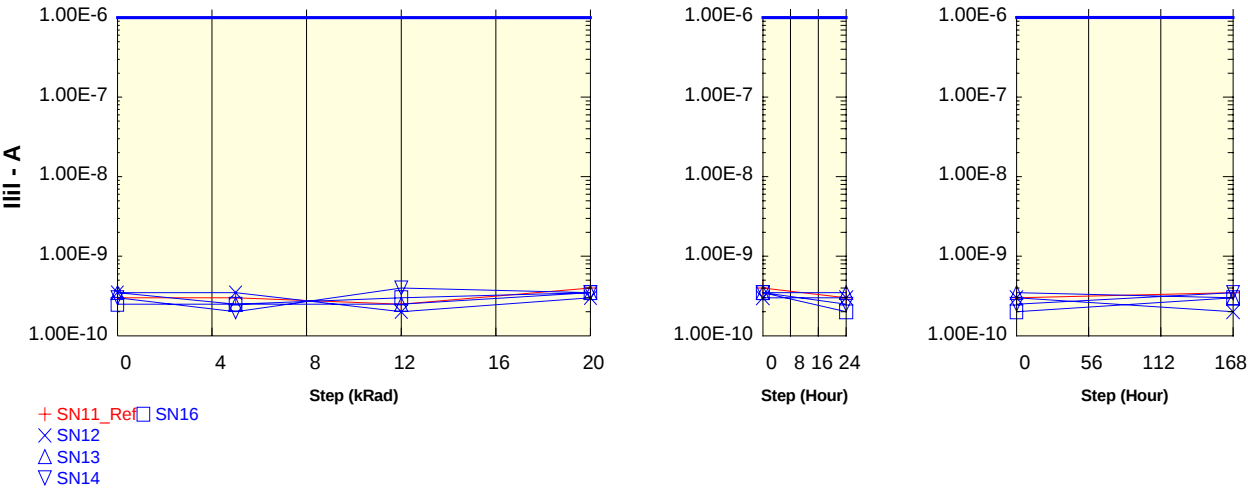
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.50E-10	2.50E-10	3.00E-10	3.50E-10
SN12	4.00E-10	3.00E-10	3.50E-10	4.50E-10
SN13	3.50E-10	3.00E-10	3.00E-10	3.50E-10
SN14	3.50E-10	3.50E-10	2.50E-10	3.00E-10
SN16	2.00E-10	3.50E-10	3.00E-10	3.00E-10
Statistics				
Min	2.00E-10	3.00E-10	2.50E-10	3.00E-10
Max	4.00E-10	3.50E-10	3.50E-10	4.50E-10
Mean	3.25E-10	3.25E-10	3.00E-10	3.50E-10
Sigma	8.66E-11	2.89E-11	4.08E-11	7.07E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.50E-10	3.00E-10
SN12	4.50E-10	3.00E-10
SN13	3.50E-10	3.50E-10
SN14	3.00E-10	2.50E-10
SN16	3.00E-10	4.00E-10
Statistics		
Min	3.00E-10	2.50E-10
Max	4.50E-10	4.00E-10
Mean	3.50E-10	3.25E-10
Sigma	7.07E-11	6.45E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	3.50E-10
SN12	3.00E-10	3.00E-10
SN13	3.50E-10	3.50E-10
SN14	2.50E-10	3.00E-10
SN16	4.00E-10	4.00E-10
Statistics		
Min	2.50E-10	3.00E-10
Max	4.00E-10	4.00E-10
Mean	3.25E-10	3.38E-10
Sigma	6.45E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A18
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



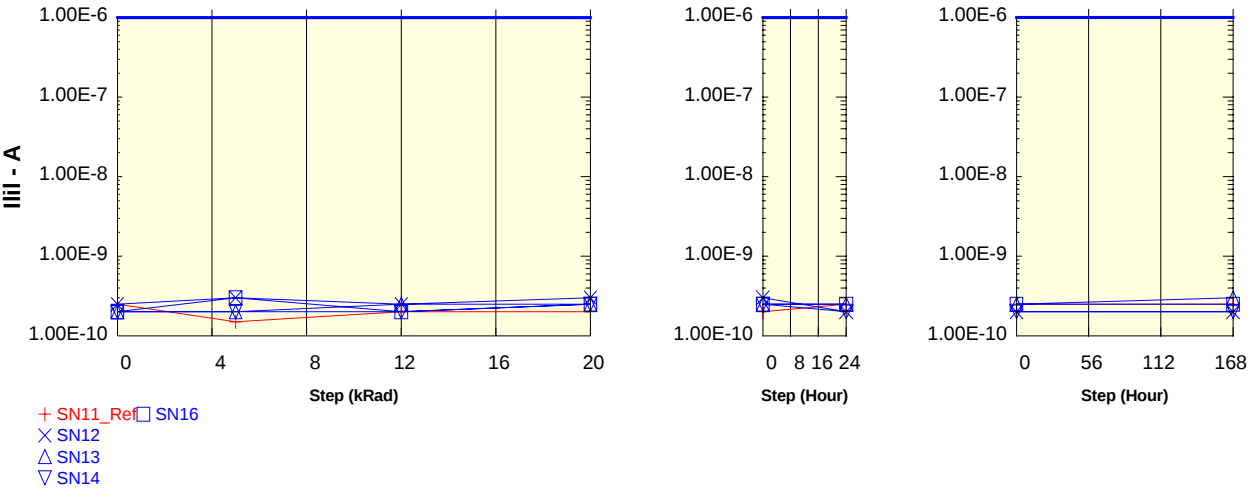
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	3.00E-10	2.50E-10	4.00E-10
SN12	3.50E-10	3.50E-10	2.00E-10	3.00E-10
SN13	3.50E-10	2.50E-10	2.50E-10	3.50E-10
SN14	3.00E-10	2.00E-10	4.00E-10	3.50E-10
SN16	2.50E-10	2.50E-10	3.00E-10	3.50E-10
Statistics				
Min	2.50E-10	2.00E-10	2.00E-10	3.00E-10
Max	3.50E-10	3.50E-10	4.00E-10	3.50E-10
Mean	3.13E-10	2.63E-10	2.88E-10	3.38E-10
Sigma	4.79E-11	6.29E-11	8.54E-11	2.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.00E-10	3.00E-10
SN12	3.00E-10	3.00E-10
SN13	3.50E-10	3.50E-10
SN14	3.50E-10	2.50E-10
SN16	3.50E-10	2.00E-10
Statistics		
Min	3.00E-10	2.00E-10
Max	3.50E-10	3.50E-10
Mean	3.38E-10	2.75E-10
Sigma	2.50E-11	6.45E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	3.50E-10
SN12	3.00E-10	2.00E-10
SN13	3.50E-10	3.00E-10
SN14	2.50E-10	3.50E-10
SN16	2.00E-10	3.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.50E-10	3.50E-10
Mean	2.75E-10	2.88E-10
Sigma	6.45E-11	6.29E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{il}A17
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



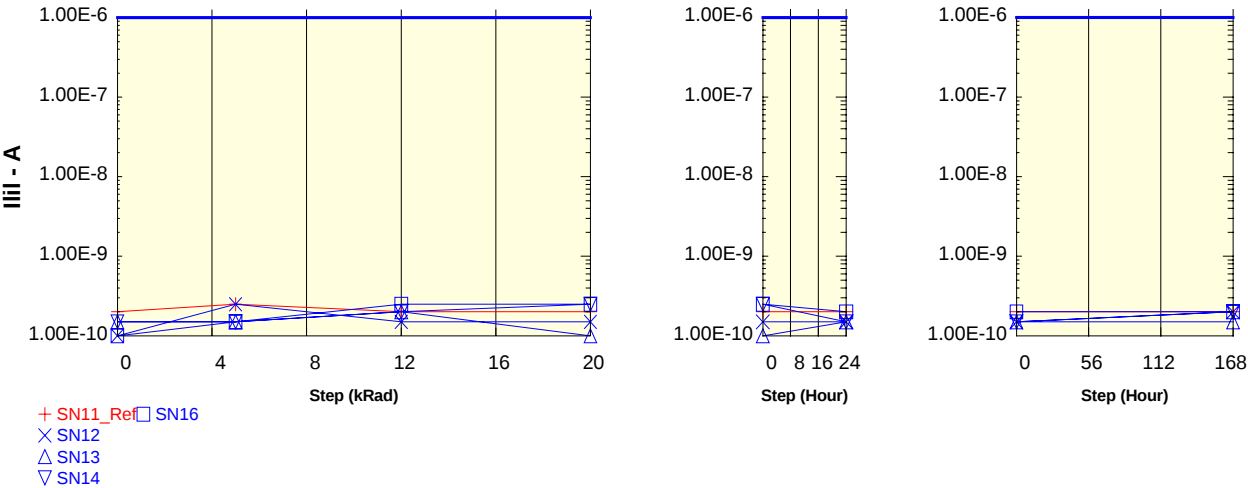
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	1.50E-10	2.00E-10	2.00E-10
SN12	2.50E-10	3.00E-10	2.50E-10	3.00E-10
SN13	2.00E-10	2.00E-10	2.50E-10	2.50E-10
SN14	2.00E-10	2.00E-10	2.00E-10	2.50E-10
SN16	2.00E-10	3.00E-10	2.00E-10	2.50E-10
Statistics				
Min	2.00E-10	2.00E-10	2.00E-10	2.50E-10
Max	2.50E-10	3.00E-10	2.50E-10	3.00E-10
Mean	2.13E-10	2.50E-10	2.25E-10	2.63E-10
Sigma	2.50E-11	5.77E-11	2.89E-11	2.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	2.50E-10
SN12	3.00E-10	2.00E-10
SN13	2.50E-10	2.50E-10
SN14	2.50E-10	2.00E-10
SN16	2.50E-10	2.50E-10
Statistics		
Min	2.50E-10	2.00E-10
Max	3.00E-10	2.50E-10
Mean	2.63E-10	2.25E-10
Sigma	2.50E-11	2.89E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.50E-10	2.50E-10
SN12	2.00E-10	2.00E-10
SN13	2.50E-10	3.00E-10
SN14	2.00E-10	2.00E-10
SN16	2.50E-10	2.50E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	2.50E-10	3.00E-10
Mean	2.25E-10	2.38E-10
Sigma	2.89E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A16
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



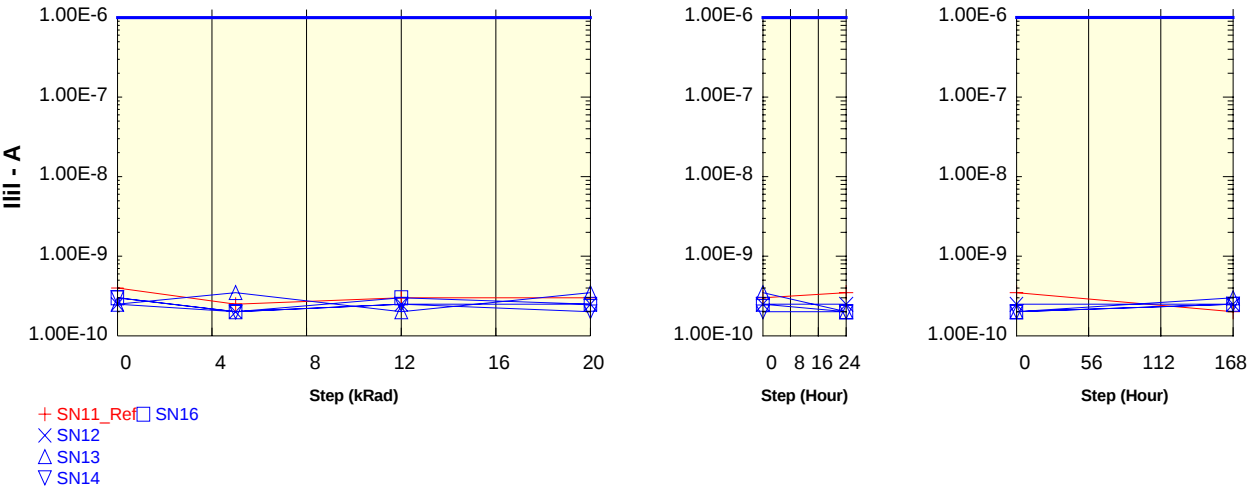
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	2.50E-10	2.00E-10	2.00E-10
SN12	1.00E-10	2.50E-10	1.50E-10	1.50E-10
SN13	1.50E-10	1.50E-10	2.00E-10	1.00E-10
SN14	1.50E-10	1.50E-10	2.00E-10	2.50E-10
SN16	1.00E-10	1.50E-10	2.50E-10	2.50E-10
Statistics				
Min	1.00E-10	1.50E-10	1.50E-10	1.00E-10
Max	1.50E-10	2.50E-10	2.50E-10	2.50E-10
Mean	1.25E-10	1.75E-10	2.00E-10	1.88E-10
Sigma	2.89E-11	5.00E-11	4.08E-11	7.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	2.00E-10
SN12	1.50E-10	1.50E-10
SN13	1.00E-10	1.50E-10
SN14	2.50E-10	1.50E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	1.00E-10	1.50E-10
Max	2.50E-10	2.00E-10
Mean	1.88E-10	1.63E-10
Sigma	7.50E-11	2.50E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.00E-10
SN12	1.50E-10	2.00E-10
SN13	1.50E-10	1.50E-10
SN14	1.50E-10	2.00E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.00E-10	2.00E-10
Mean	1.63E-10	1.88E-10
Sigma	2.50E-11	2.50E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{il}A15
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



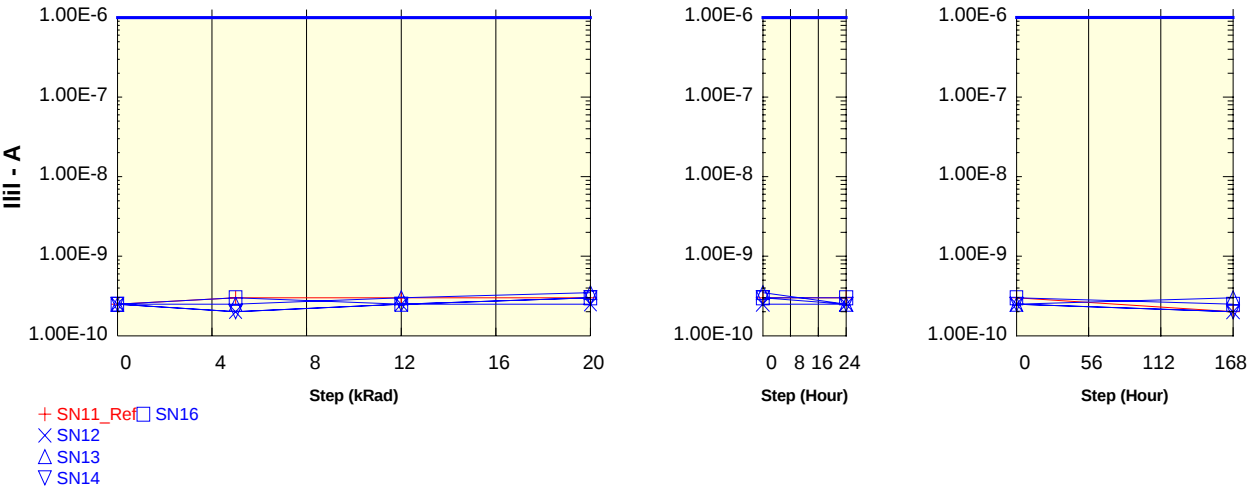
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.00E-10	2.50E-10	3.00E-10	3.00E-10
SN12	2.50E-10	2.00E-10	2.50E-10	2.50E-10
SN13	2.50E-10	3.50E-10	2.00E-10	3.50E-10
SN14	3.00E-10	2.00E-10	2.50E-10	2.00E-10
SN16	3.00E-10	2.00E-10	3.00E-10	2.50E-10
Statistics				
Min	2.50E-10	2.00E-10	2.00E-10	2.00E-10
Max	3.00E-10	3.50E-10	3.00E-10	3.50E-10
Mean	2.75E-10	2.38E-10	2.50E-10	2.63E-10
Sigma	2.89E-11	7.50E-11	4.08E-11	6.29E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	3.50E-10
SN12	2.50E-10	2.50E-10
SN13	3.50E-10	2.00E-10
SN14	2.00E-10	2.00E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.50E-10	2.50E-10
Mean	2.63E-10	2.13E-10
Sigma	6.29E-11	2.50E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.50E-10	2.00E-10
SN12	2.50E-10	2.50E-10
SN13	2.00E-10	3.00E-10
SN14	2.00E-10	2.50E-10
SN16	2.00E-10	2.50E-10
Statistics		
Min	2.00E-10	2.50E-10
Max	2.50E-10	3.00E-10
Mean	2.13E-10	2.63E-10
Sigma	2.50E-11	2.50E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A14
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



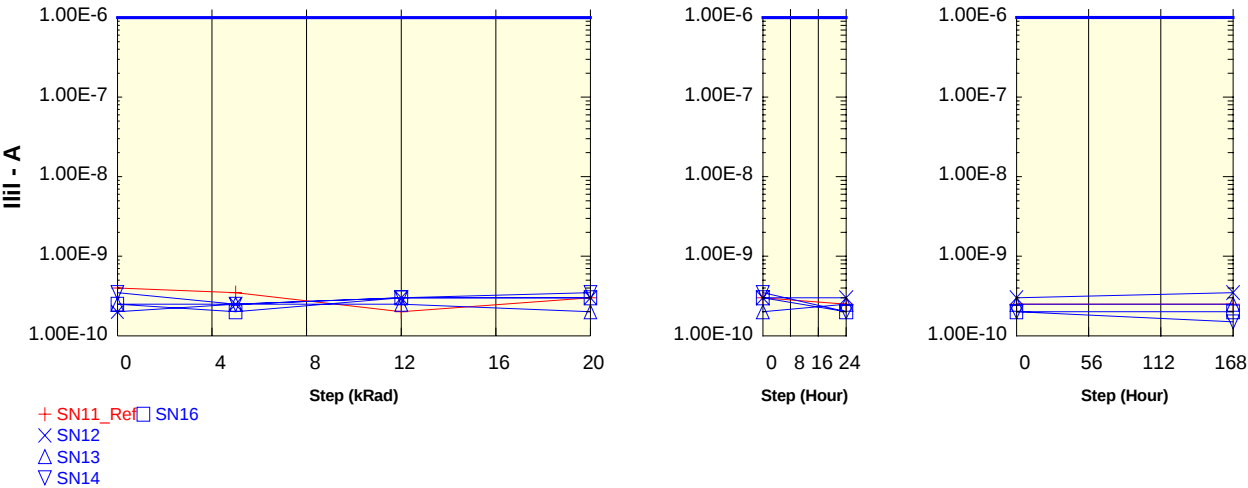
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	3.00E-10	3.00E-10	3.00E-10
SN12	2.50E-10	2.00E-10	2.50E-10	2.50E-10
SN13	2.50E-10	2.50E-10	3.00E-10	3.50E-10
SN14	2.50E-10	2.00E-10	2.50E-10	3.00E-10
SN16	2.50E-10	3.00E-10	2.50E-10	3.00E-10
Statistics				
Min	2.50E-10	2.00E-10	2.50E-10	2.50E-10
Max	2.50E-10	3.00E-10	3.00E-10	3.50E-10
Mean	2.50E-10	2.38E-10	2.63E-10	3.00E-10
Sigma	0.00E+0	4.79E-11	2.50E-11	4.08E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	3.00E-10
SN12	2.50E-10	2.50E-10
SN13	3.50E-10	2.50E-10
SN14	3.00E-10	2.50E-10
SN16	3.00E-10	3.00E-10
Statistics		
Min	2.50E-10	2.50E-10
Max	3.50E-10	3.00E-10
Mean	3.00E-10	2.63E-10
Sigma	4.08E-11	2.50E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	2.00E-10
SN12	2.50E-10	2.00E-10
SN13	2.50E-10	3.00E-10
SN14	2.50E-10	2.00E-10
SN16	3.00E-10	2.50E-10
Statistics		
Min	2.50E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.63E-10	2.38E-10
Sigma	2.50E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{il}A13
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



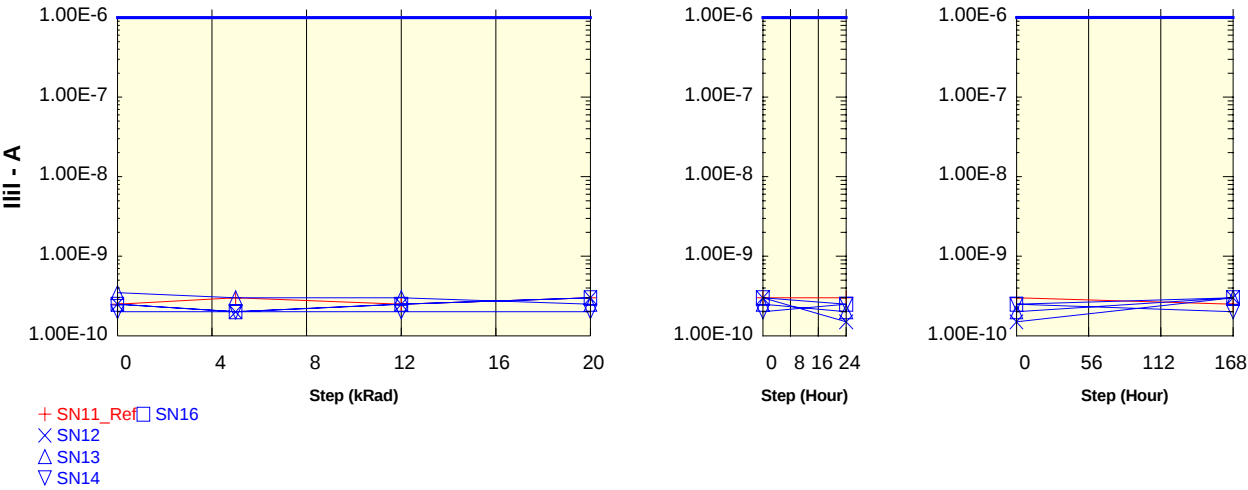
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.00E-10	3.50E-10	2.00E-10	3.00E-10
SN12	2.00E-10	2.50E-10	3.00E-10	3.00E-10
SN13	2.50E-10	2.50E-10	2.50E-10	2.00E-10
SN14	3.50E-10	2.50E-10	3.00E-10	3.50E-10
SN16	2.50E-10	2.00E-10	3.00E-10	3.00E-10
Statistics				
Min	2.00E-10	2.00E-10	2.50E-10	2.00E-10
Max	3.50E-10	2.50E-10	3.00E-10	3.50E-10
Mean	2.63E-10	2.38E-10	2.88E-10	2.88E-10
Sigma	6.29E-11	2.50E-11	2.50E-11	6.29E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	2.50E-10
SN12	3.00E-10	3.00E-10
SN13	2.00E-10	2.50E-10
SN14	3.50E-10	2.00E-10
SN16	3.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.50E-10	3.00E-10
Mean	2.88E-10	2.38E-10
Sigma	6.29E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.50E-10	2.50E-10
SN12	3.00E-10	3.50E-10
SN13	2.50E-10	2.50E-10
SN14	2.00E-10	1.50E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.00E-10	3.50E-10
Mean	2.38E-10	2.38E-10
Sigma	4.79E-11	8.54E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A12
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



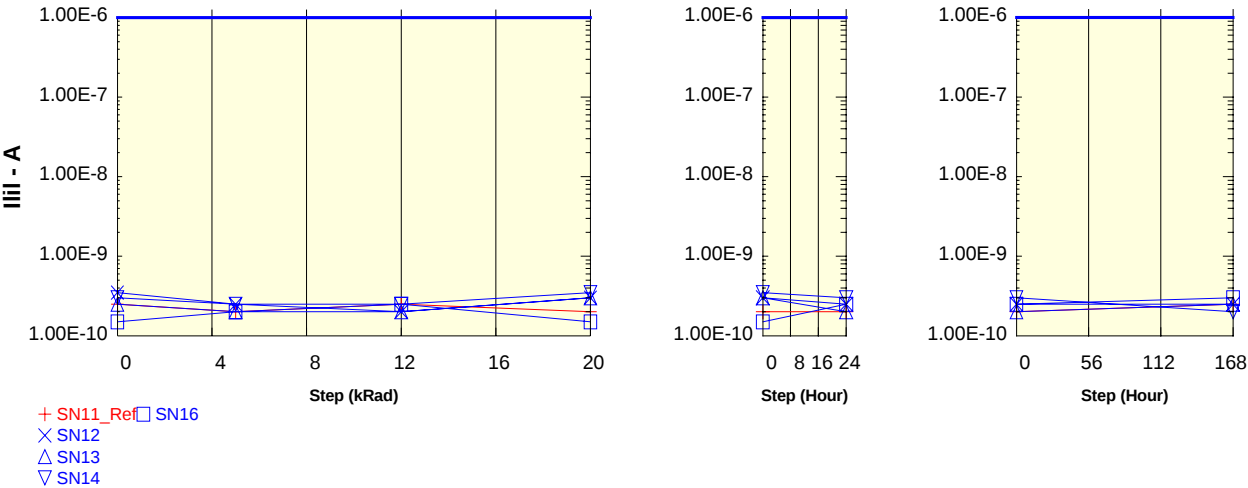
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	3.00E-10	2.50E-10	3.00E-10
SN12	2.50E-10	2.00E-10	2.50E-10	3.00E-10
SN13	3.50E-10	3.00E-10	3.00E-10	2.50E-10
SN14	2.00E-10	2.00E-10	2.00E-10	2.00E-10
SN16	2.50E-10	2.00E-10	2.50E-10	3.00E-10
Statistics				
Min	2.00E-10	2.00E-10	2.00E-10	2.00E-10
Max	3.50E-10	3.00E-10	3.00E-10	3.00E-10
Mean	2.63E-10	2.25E-10	2.50E-10	2.63E-10
Sigma	6.29E-11	5.00E-11	4.08E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	3.00E-10
SN12	3.00E-10	1.50E-10
SN13	2.50E-10	2.00E-10
SN14	2.00E-10	2.50E-10
SN16	3.00E-10	2.50E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.00E-10	2.50E-10
Mean	2.63E-10	2.13E-10
Sigma	4.79E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	2.50E-10
SN12	1.50E-10	3.00E-10
SN13	2.00E-10	3.00E-10
SN14	2.50E-10	2.00E-10
SN16	2.50E-10	3.00E-10
Statistics		
Min	1.50E-10	2.00E-10
Max	2.50E-10	3.00E-10
Mean	2.13E-10	2.75E-10
Sigma	4.79E-11	5.00E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{il}A11
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



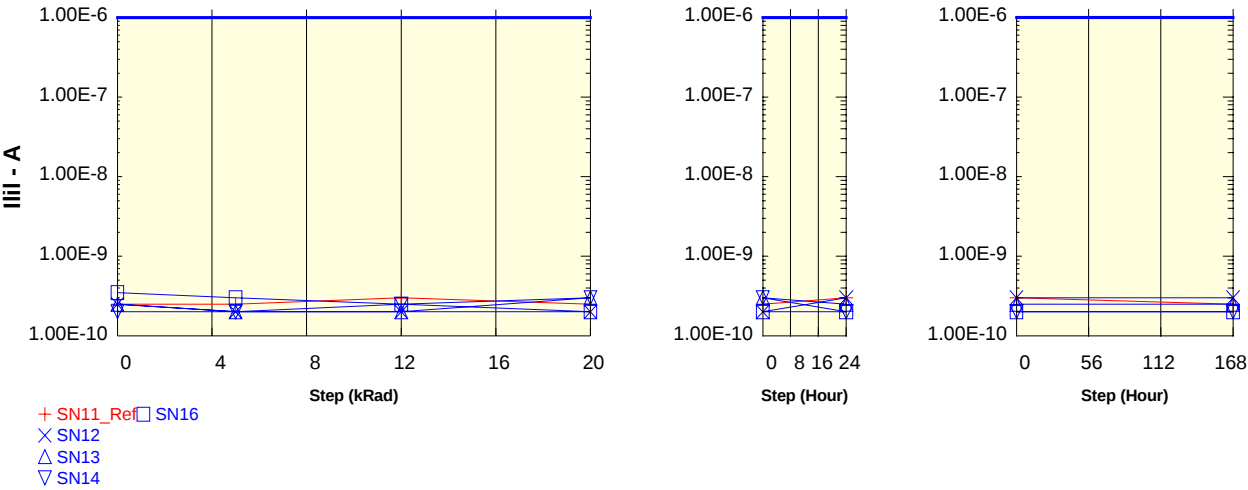
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	2.00E-10	2.50E-10	2.00E-10
SN12	3.50E-10	2.50E-10	2.00E-10	3.00E-10
SN13	2.50E-10	2.00E-10	2.00E-10	3.00E-10
SN14	3.00E-10	2.50E-10	2.50E-10	3.50E-10
SN16	1.50E-10	2.00E-10	2.50E-10	1.50E-10
Statistics				
Min	1.50E-10	2.00E-10	2.00E-10	1.50E-10
Max	3.50E-10	2.50E-10	2.50E-10	3.50E-10
Mean	2.63E-10	2.25E-10	2.25E-10	2.75E-10
Sigma	8.54E-11	2.89E-11	2.89E-11	8.66E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	2.00E-10
SN12	3.00E-10	2.50E-10
SN13	3.00E-10	2.00E-10
SN14	3.50E-10	3.00E-10
SN16	1.50E-10	2.50E-10
Statistics		
Min	1.50E-10	2.00E-10
Max	3.50E-10	3.00E-10
Mean	2.75E-10	2.50E-10
Sigma	8.66E-11	4.08E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.50E-10
SN12	2.50E-10	2.50E-10
SN13	2.00E-10	2.50E-10
SN14	3.00E-10	2.00E-10
SN16	2.50E-10	3.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.50E-10	2.50E-10
Sigma	4.08E-11	4.08E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A10
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



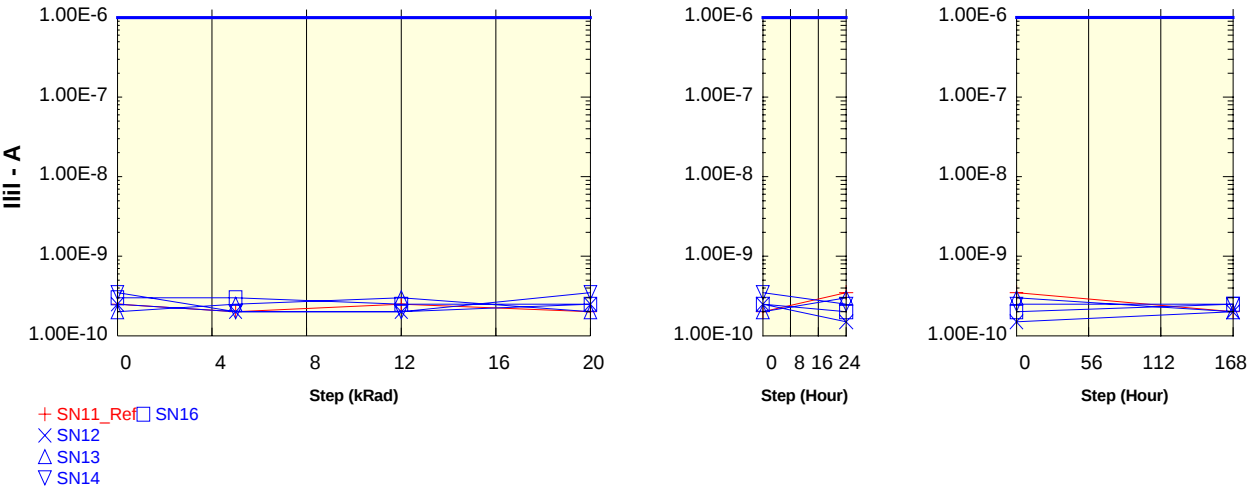
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	2.50E-10	3.00E-10	2.50E-10
SN12	2.50E-10	2.00E-10	2.00E-10	2.00E-10
SN13	2.50E-10	2.00E-10	2.00E-10	3.00E-10
SN14	2.00E-10	2.00E-10	2.50E-10	3.00E-10
SN16	3.50E-10	3.00E-10	2.50E-10	2.00E-10
Statistics				
Min	2.00E-10	2.00E-10	2.00E-10	2.00E-10
Max	3.50E-10	3.00E-10	2.50E-10	3.00E-10
Mean	2.63E-10	2.25E-10	2.25E-10	2.50E-10
Sigma	6.29E-11	5.00E-11	2.89E-11	5.77E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.50E-10	3.00E-10
SN12	2.00E-10	3.00E-10
SN13	3.00E-10	2.50E-10
SN14	3.00E-10	2.00E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.50E-10	2.38E-10
Sigma	5.77E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	2.50E-10
SN12	3.00E-10	3.00E-10
SN13	2.50E-10	2.50E-10
SN14	2.00E-10	2.00E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.38E-10	2.38E-10
Sigma	4.79E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{liA}9
V_{in} = Gnd. V_{cc} = V_{ccMax}
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



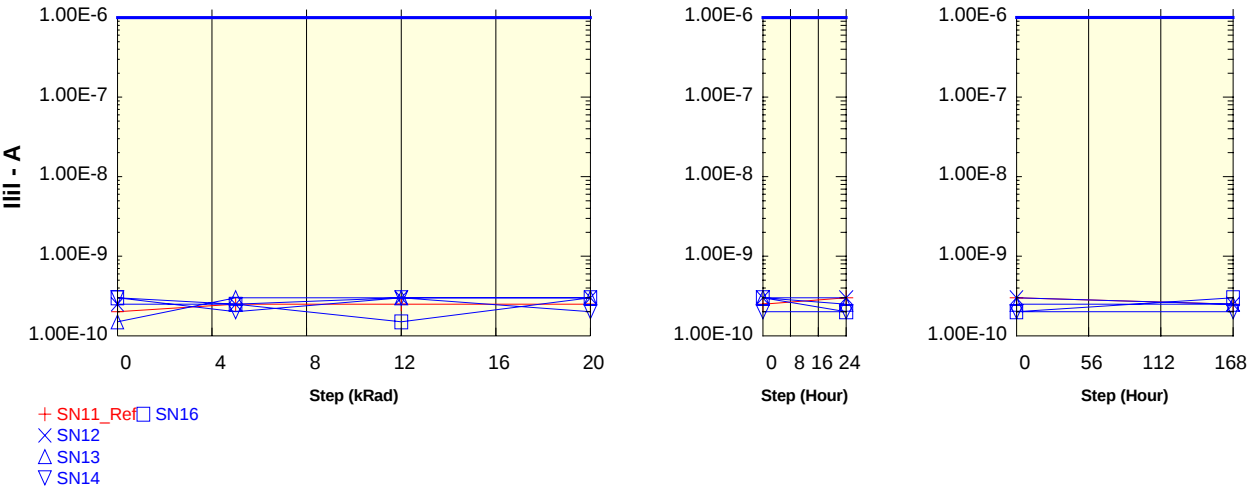
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	2.00E-10	2.50E-10	2.00E-10
SN12	2.50E-10	2.00E-10	2.00E-10	2.50E-10
SN13	2.00E-10	2.50E-10	3.00E-10	2.00E-10
SN14	3.50E-10	2.00E-10	2.00E-10	3.50E-10
SN16	3.00E-10	3.00E-10	2.50E-10	2.50E-10
Statistics				
Min	2.00E-10	2.00E-10	2.00E-10	2.00E-10
Max	3.50E-10	3.00E-10	3.00E-10	3.50E-10
Mean	2.75E-10	2.38E-10	2.38E-10	2.63E-10
Sigma	6.45E-11	4.79E-11	4.79E-11	6.29E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	3.50E-10
SN12	2.50E-10	1.50E-10
SN13	2.00E-10	3.00E-10
SN14	3.50E-10	2.50E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.50E-10	3.00E-10
Mean	2.63E-10	2.25E-10
Sigma	6.29E-11	6.45E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.50E-10	2.00E-10
SN12	1.50E-10	2.00E-10
SN13	3.00E-10	2.00E-10
SN14	2.50E-10	2.50E-10
SN16	2.00E-10	2.50E-10
Statistics		
Min	1.50E-10	2.00E-10
Max	3.00E-10	2.50E-10
Mean	2.25E-10	2.25E-10
Sigma	6.45E-11	2.89E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A8
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



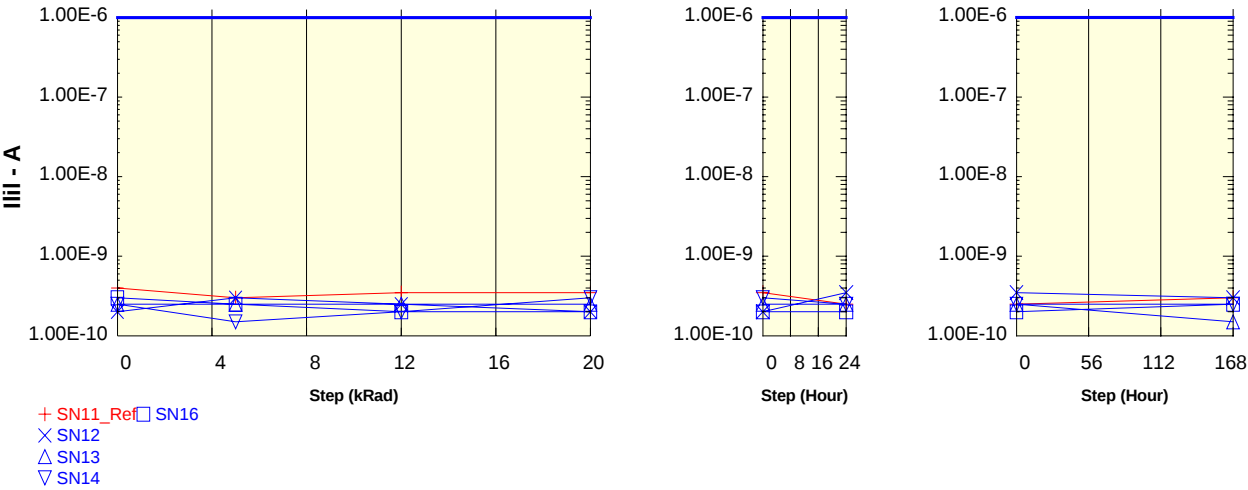
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	2.50E-10	2.50E-10	2.50E-10
SN12	2.50E-10	2.50E-10	3.00E-10	3.00E-10
SN13	1.50E-10	3.00E-10	3.00E-10	3.00E-10
SN14	3.00E-10	2.00E-10	3.00E-10	2.00E-10
SN16	3.00E-10	2.50E-10	1.50E-10	3.00E-10
Statistics				
Min	1.50E-10	2.00E-10	1.50E-10	2.00E-10
Max	3.00E-10	3.00E-10	3.00E-10	3.00E-10
Mean	2.50E-10	2.50E-10	2.63E-10	2.75E-10
Sigma	7.07E-11	4.08E-11	7.50E-11	5.00E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.50E-10	3.00E-10
SN12	3.00E-10	3.00E-10
SN13	3.00E-10	2.50E-10
SN14	2.00E-10	2.00E-10
SN16	3.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.75E-10	2.38E-10
Sigma	5.00E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	2.50E-10
SN12	3.00E-10	2.50E-10
SN13	2.50E-10	2.50E-10
SN14	2.00E-10	2.00E-10
SN16	2.00E-10	3.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.38E-10	2.50E-10
Sigma	4.79E-11	4.08E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{liA7}
V_{in} = Gnd. V_{cc} = V_{ccMax}
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



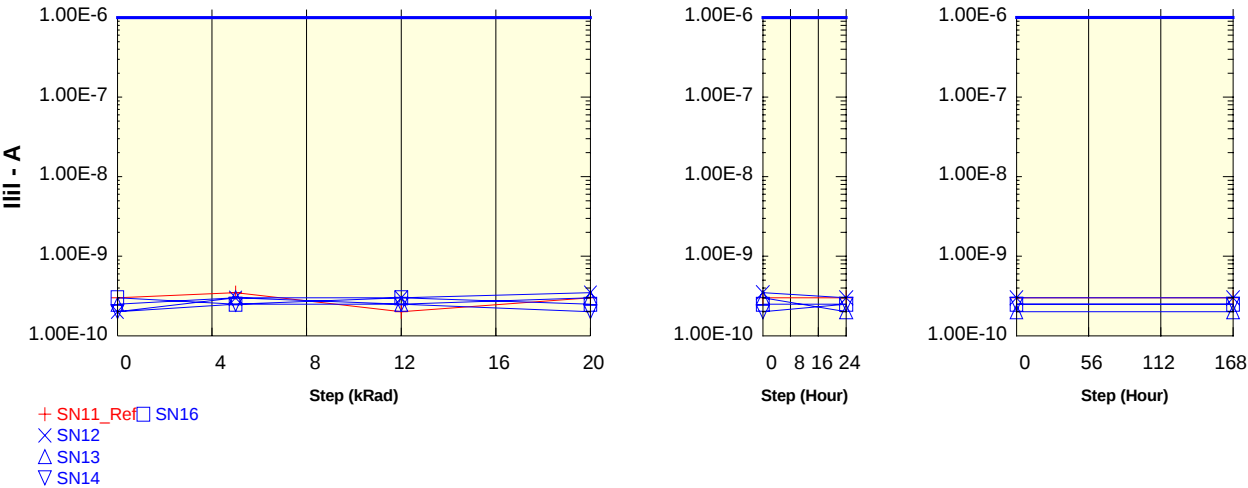
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.00E-10	3.00E-10	3.50E-10	3.50E-10
SN12	2.00E-10	3.00E-10	2.50E-10	2.00E-10
SN13	2.50E-10	2.50E-10	2.50E-10	2.50E-10
SN14	2.50E-10	1.50E-10	2.00E-10	3.00E-10
SN16	3.00E-10	2.50E-10	2.00E-10	2.00E-10
Statistics				
Min	2.00E-10	1.50E-10	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10	2.50E-10	3.00E-10
Mean	2.50E-10	2.38E-10	2.25E-10	2.38E-10
Sigma	4.08E-11	6.29E-11	2.89E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.50E-10	2.50E-10
SN12	2.00E-10	3.50E-10
SN13	2.50E-10	2.50E-10
SN14	3.00E-10	2.50E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.50E-10
Mean	2.38E-10	2.63E-10
Sigma	4.79E-11	6.29E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.50E-10	3.00E-10
SN12	3.50E-10	3.00E-10
SN13	2.50E-10	1.50E-10
SN14	2.50E-10	2.50E-10
SN16	2.00E-10	2.50E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.50E-10	3.00E-10
Mean	2.63E-10	2.38E-10
Sigma	6.29E-11	6.29E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{liA6}
V_{in} = Gnd. V_{cc} = V_{ccMax}
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



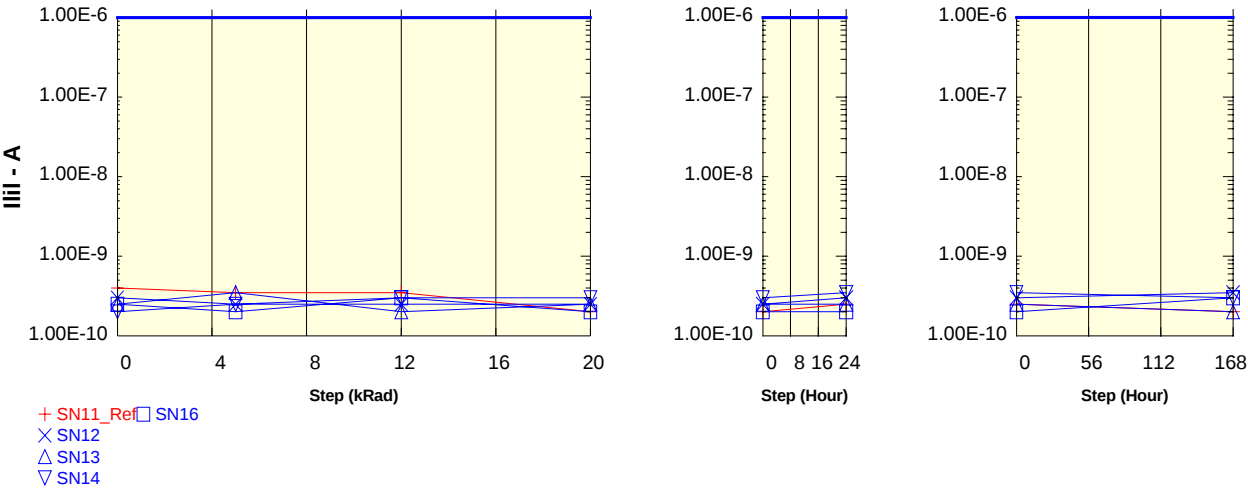
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	3.50E-10	2.00E-10	3.00E-10
SN12	2.00E-10	3.00E-10	3.00E-10	3.50E-10
SN13	2.50E-10	3.00E-10	2.50E-10	3.00E-10
SN14	2.00E-10	2.50E-10	2.50E-10	2.00E-10
SN16	3.00E-10	2.50E-10	3.00E-10	2.50E-10
Statistics				
Min	2.00E-10	2.50E-10	2.50E-10	2.00E-10
Max	3.00E-10	3.00E-10	3.00E-10	3.50E-10
Mean	2.38E-10	2.75E-10	2.75E-10	2.75E-10
Sigma	4.79E-11	2.89E-11	2.89E-11	6.45E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	3.00E-10
SN12	3.50E-10	3.00E-10
SN13	3.00E-10	2.00E-10
SN14	2.00E-10	2.50E-10
SN16	2.50E-10	2.50E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.50E-10	3.00E-10
Mean	2.75E-10	2.50E-10
Sigma	6.45E-11	4.08E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	3.00E-10
SN12	3.00E-10	3.00E-10
SN13	2.00E-10	2.00E-10
SN14	2.50E-10	2.50E-10
SN16	2.50E-10	2.50E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.50E-10	2.50E-10
Sigma	4.08E-11	4.08E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A5
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



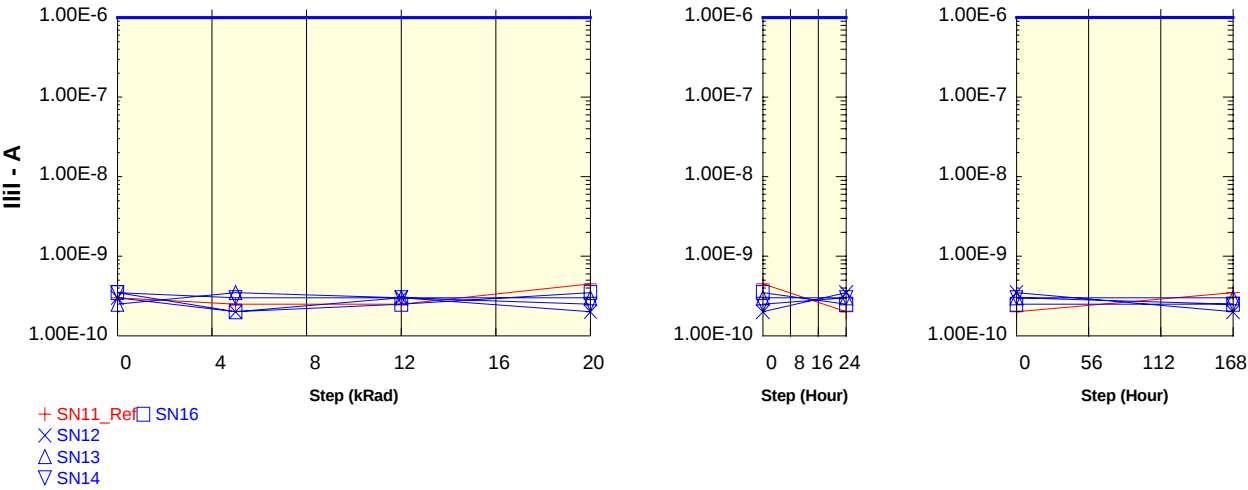
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.00E-10	3.50E-10	3.50E-10	2.00E-10
SN12	3.00E-10	2.50E-10	2.50E-10	2.50E-10
SN13	2.50E-10	3.50E-10	2.00E-10	2.50E-10
SN14	2.00E-10	2.50E-10	3.00E-10	3.00E-10
SN16	2.50E-10	2.00E-10	3.00E-10	2.00E-10
Statistics				
Min	2.00E-10	2.00E-10	2.00E-10	2.00E-10
Max	3.00E-10	3.50E-10	3.00E-10	3.00E-10
Mean	2.50E-10	2.63E-10	2.63E-10	2.50E-10
Sigma	4.08E-11	6.29E-11	4.79E-11	4.08E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	2.50E-10
SN12	2.50E-10	3.00E-10
SN13	2.50E-10	2.50E-10
SN14	3.00E-10	3.50E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.50E-10
Mean	2.50E-10	2.75E-10
Sigma	4.08E-11	6.45E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.50E-10	2.00E-10
SN12	3.00E-10	3.50E-10
SN13	2.50E-10	2.00E-10
SN14	3.50E-10	3.00E-10
SN16	2.00E-10	3.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.50E-10	3.50E-10
Mean	2.75E-10	2.88E-10
Sigma	6.45E-11	6.29E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A4
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	2.50E-10	2.50E-10	4.50E-10
SN12	3.00E-10	2.00E-10	3.00E-10	2.00E-10
SN13	2.50E-10	3.50E-10	3.00E-10	3.00E-10
SN14	3.50E-10	3.00E-10	3.00E-10	2.50E-10
SN16	3.50E-10	2.00E-10	2.50E-10	3.50E-10
Statistics				
Min	2.50E-10	2.00E-10	2.50E-10	2.00E-10
Max	3.50E-10	3.50E-10	3.00E-10	3.50E-10
Mean	3.13E-10	2.63E-10	2.88E-10	2.75E-10
Sigma	4.79E-11	7.50E-11	2.50E-11	6.45E-11

Test TST002 : Annealing 24h

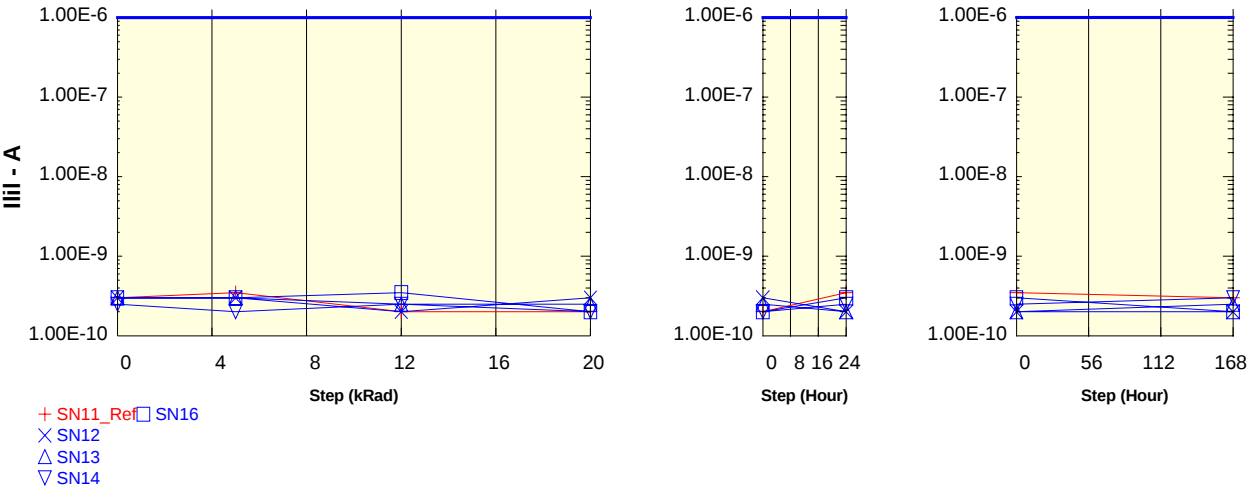
	0 Hour	24 Hour
SN11	4.50E-10	2.00E-10
SN12	2.00E-10	3.50E-10
SN13	3.00E-10	3.00E-10
SN14	2.50E-10	3.00E-10
SN16	3.50E-10	2.50E-10
Statistics		
Min	2.00E-10	2.50E-10
Max	3.50E-10	3.50E-10
Mean	2.75E-10	3.00E-10
Sigma	6.45E-11	4.08E-11

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	2.00E-10	3.50E-10
SN12	3.50E-10	2.00E-10
SN13	3.00E-10	3.00E-10
SN14	3.00E-10	2.50E-10
SN16	2.50E-10	2.50E-10
Statistics		
Min	2.50E-10	2.00E-10
Max	3.50E-10	3.00E-10
Mean	3.00E-10	2.50E-10
Sigma	4.08E-11	4.08E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A3
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



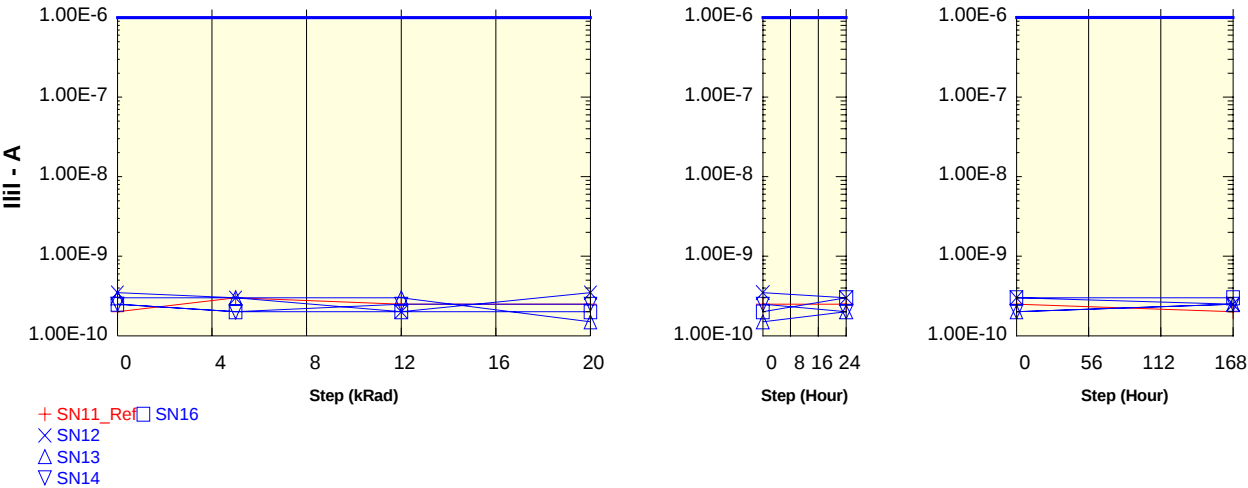
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	3.50E-10	2.00E-10	2.00E-10
SN12	3.00E-10	3.00E-10	2.00E-10	3.00E-10
SN13	3.00E-10	3.00E-10	2.50E-10	2.50E-10
SN14	2.50E-10	2.00E-10	2.50E-10	2.00E-10
SN16	3.00E-10	3.00E-10	3.50E-10	2.00E-10
Statistics				
Min	2.50E-10	2.00E-10	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10	3.50E-10	3.00E-10
Mean	2.88E-10	2.75E-10	2.63E-10	2.38E-10
Sigma	2.50E-11	5.00E-11	6.29E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	3.50E-10
SN12	3.00E-10	2.00E-10
SN13	2.50E-10	2.00E-10
SN14	2.00E-10	2.50E-10
SN16	2.00E-10	3.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.38E-10	2.38E-10
Sigma	4.79E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.50E-10	3.00E-10
SN12	2.00E-10	2.00E-10
SN13	2.00E-10	2.50E-10
SN14	2.50E-10	3.00E-10
SN16	3.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.38E-10	2.38E-10
Sigma	4.79E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{liA2}
V_{in} = Gnd. V_{cc} = V_{ccMax}
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



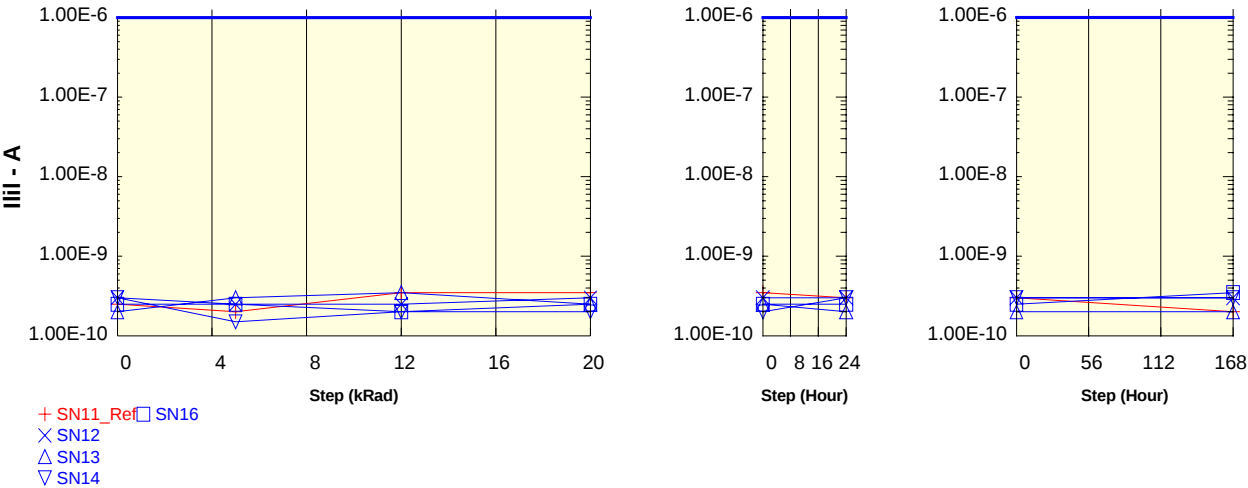
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	3.00E-10	2.50E-10	2.50E-10
SN12	3.50E-10	3.00E-10	2.00E-10	3.50E-10
SN13	3.00E-10	3.00E-10	3.00E-10	1.50E-10
SN14	2.50E-10	2.00E-10	2.50E-10	2.50E-10
SN16	2.50E-10	2.00E-10	2.00E-10	2.00E-10
Statistics				
Min	2.50E-10	2.00E-10	2.00E-10	1.50E-10
Max	3.50E-10	3.00E-10	3.00E-10	3.50E-10
Mean	2.88E-10	2.50E-10	2.38E-10	2.38E-10
Sigma	4.79E-11	5.77E-11	4.79E-11	8.54E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.50E-10	2.50E-10
SN12	3.50E-10	3.00E-10
SN13	1.50E-10	2.00E-10
SN14	2.50E-10	2.00E-10
SN16	2.00E-10	3.00E-10
Statistics		
Min	1.50E-10	2.00E-10
Max	3.50E-10	3.00E-10
Mean	2.38E-10	2.50E-10
Sigma	8.54E-11	5.77E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.50E-10	2.00E-10
SN12	3.00E-10	2.50E-10
SN13	2.00E-10	2.50E-10
SN14	2.00E-10	2.50E-10
SN16	3.00E-10	3.00E-10
Statistics		
Min	2.00E-10	2.50E-10
Max	3.00E-10	3.00E-10
Mean	2.50E-10	2.63E-10
Sigma	5.77E-11	2.50E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{li}A1
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



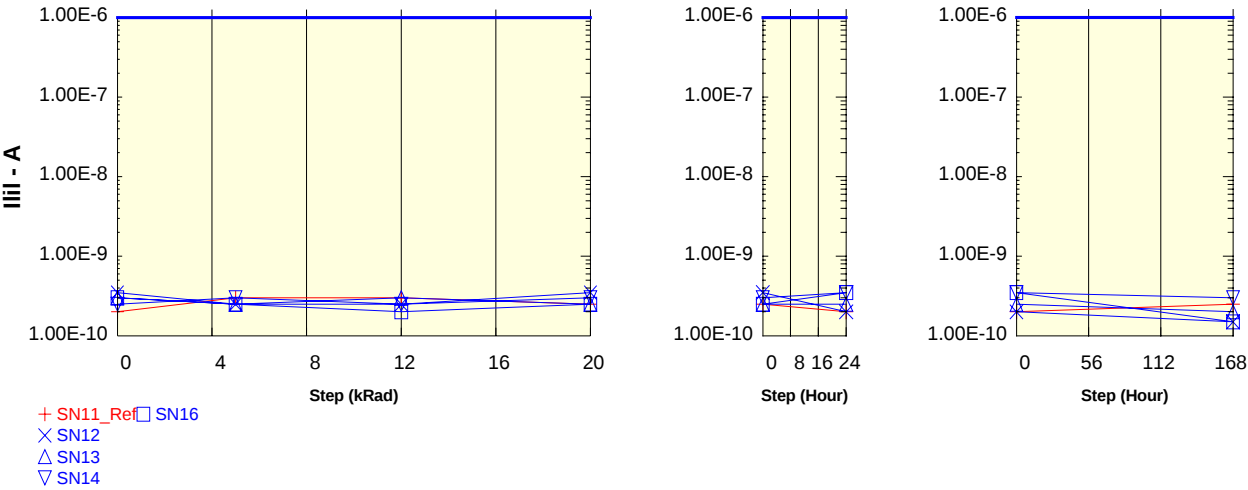
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	2.00E-10	3.50E-10	3.50E-10
SN12	3.00E-10	2.50E-10	2.50E-10	3.00E-10
SN13	2.00E-10	3.00E-10	3.50E-10	2.50E-10
SN14	3.00E-10	1.50E-10	2.00E-10	2.00E-10
SN16	2.50E-10	2.50E-10	2.00E-10	2.50E-10
Statistics				
Min	2.00E-10	1.50E-10	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10	3.50E-10	3.00E-10
Mean	2.63E-10	2.38E-10	2.50E-10	2.50E-10
Sigma	4.79E-11	6.29E-11	7.07E-11	4.08E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.50E-10	3.00E-10
SN12	3.00E-10	3.00E-10
SN13	2.50E-10	2.00E-10
SN14	2.00E-10	3.00E-10
SN16	2.50E-10	2.50E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.00E-10
Mean	2.50E-10	2.63E-10
Sigma	4.08E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	2.00E-10
SN12	3.00E-10	3.00E-10
SN13	2.00E-10	2.00E-10
SN14	3.00E-10	3.00E-10
SN16	2.50E-10	3.50E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.00E-10	3.50E-10
Mean	2.63E-10	2.88E-10
Sigma	4.79E-11	6.29E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{liA}0
V_{in} = Gnd. V_{cc} = V_{ccMax}
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



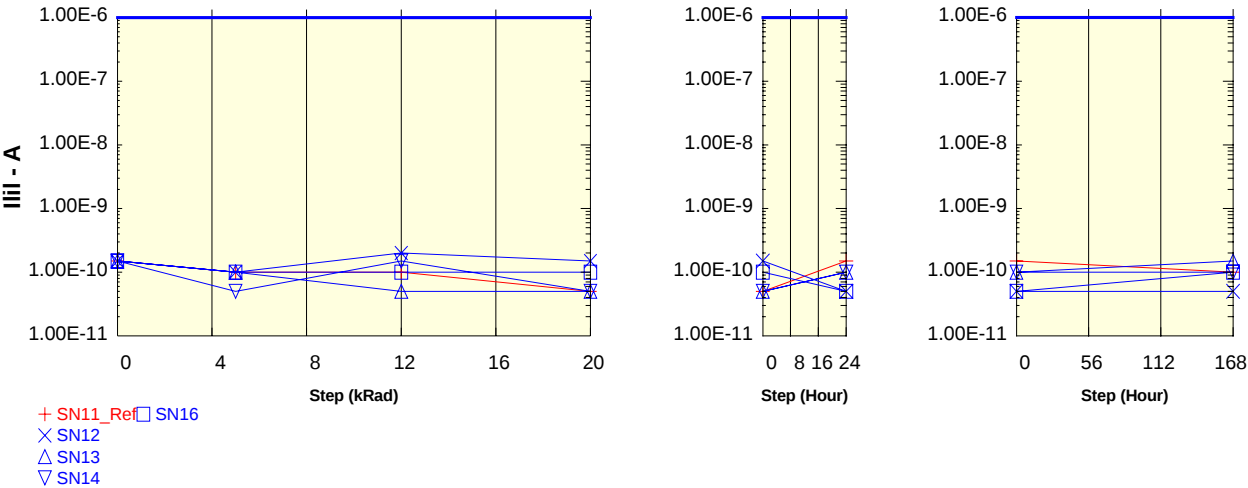
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	3.00E-10	3.00E-10	2.50E-10
SN12	3.50E-10	2.50E-10	2.50E-10	3.50E-10
SN13	3.00E-10	2.50E-10	3.00E-10	2.50E-10
SN14	2.50E-10	3.00E-10	2.50E-10	3.00E-10
SN16	3.00E-10	2.50E-10	2.00E-10	2.50E-10
Statistics				
Min	2.50E-10	2.50E-10	2.00E-10	2.50E-10
Max	3.50E-10	3.00E-10	3.00E-10	3.50E-10
Mean	3.00E-10	2.63E-10	2.50E-10	2.88E-10
Sigma	4.08E-11	2.50E-11	4.08E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.50E-10	2.00E-10
SN12	3.50E-10	2.00E-10
SN13	2.50E-10	2.50E-10
SN14	3.00E-10	3.50E-10
SN16	2.50E-10	3.50E-10
Statistics		
Min	2.50E-10	2.00E-10
Max	3.50E-10	3.50E-10
Mean	2.88E-10	2.88E-10
Sigma	4.79E-11	7.50E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.50E-10
SN12	2.00E-10	1.50E-10
SN13	2.50E-10	2.00E-10
SN14	3.50E-10	3.00E-10
SN16	3.50E-10	1.50E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.50E-10	3.00E-10
Mean	2.88E-10	2.00E-10
Sigma	7.50E-11	7.07E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{il}/RST
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.50E-10	1.00E-10	1.00E-10	5.00E-11
SN12	1.50E-10	1.00E-10	2.00E-10	1.50E-10
SN13	1.50E-10	1.00E-10	5.00E-11	5.00E-11
SN14	1.50E-10	5.00E-11	1.50E-10	5.00E-11
SN16	1.50E-10	1.00E-10	1.00E-10	1.00E-10
Statistics				
Min	1.50E-10	5.00E-11	5.00E-11	5.00E-11
Max	1.50E-10	1.00E-10	2.00E-10	1.50E-10
Mean	1.50E-10	8.75E-11	1.25E-10	8.75E-11
Sigma	0.00E+0	2.50E-11	6.45E-11	4.79E-11

Test TST002 : Annealing 24h

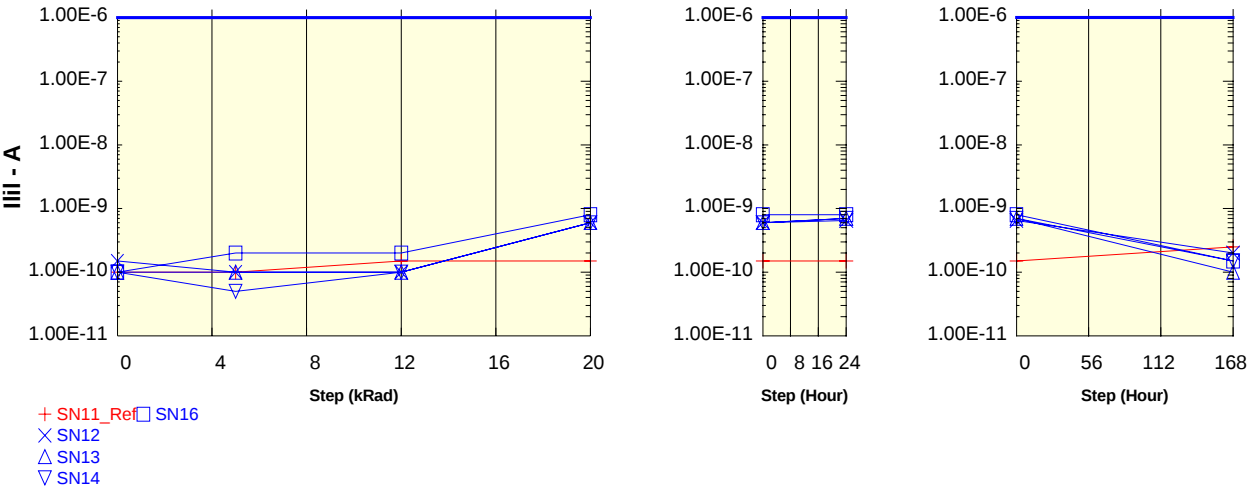
	0 Hour	24 Hour
SN11	5.00E-11	1.50E-10
SN12	1.50E-10	5.00E-11
SN13	5.00E-11	1.00E-10
SN14	5.00E-11	1.00E-10
SN16	1.00E-10	5.00E-11
Statistics		
Min	5.00E-11	5.00E-11
Max	1.50E-10	1.00E-10
Mean	8.75E-11	7.50E-11
Sigma	4.79E-11	2.89E-11

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	1.50E-10	1.00E-10
SN12	5.00E-11	5.00E-11
SN13	1.00E-10	1.50E-10
SN14	1.00E-10	1.00E-10
SN16	5.00E-11	1.00E-10
Statistics		
Min	5.00E-11	5.00E-11
Max	1.00E-10	1.50E-10
Mean	7.50E-11	1.00E-10
Sigma	2.89E-11	4.08E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{il}/CE
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.00E-10	1.00E-10	1.50E-10	1.50E-10
SN12	1.50E-10	1.00E-10	1.00E-10	6.00E-10
SN13	1.00E-10	1.00E-10	1.00E-10	6.00E-10
SN14	1.00E-10	5.00E-11	1.00E-10	6.00E-10
SN16	1.00E-10	2.00E-10	2.00E-10	8.00E-10
Statistics				
Min	1.00E-10	5.00E-11	1.00E-10	6.00E-10
Max	1.50E-10	2.00E-10	2.00E-10	8.00E-10
Mean	1.13E-10	1.13E-10	1.25E-10	6.50E-10
Sigma	2.50E-11	6.29E-11	5.00E-11	1.00E-10

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.50E-10	1.50E-10
SN12	6.00E-10	6.50E-10
SN13	6.00E-10	7.00E-10
SN14	6.00E-10	7.00E-10
SN16	8.00E-10	8.00E-10
Statistics		
Min	6.00E-10	6.50E-10
Max	8.00E-10	8.00E-10
Mean	6.50E-10	7.13E-10
Sigma	1.00E-10	6.29E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.50E-10	2.50E-10
SN12	6.50E-10	2.00E-10
SN13	7.00E-10	1.00E-10
SN14	7.00E-10	1.50E-10
SN16	8.00E-10	1.50E-10
Statistics		
Min	6.50E-10	1.00E-10
Max	8.00E-10	2.00E-10
Mean	7.13E-10	1.50E-10
Sigma	6.29E-11	4.08E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID

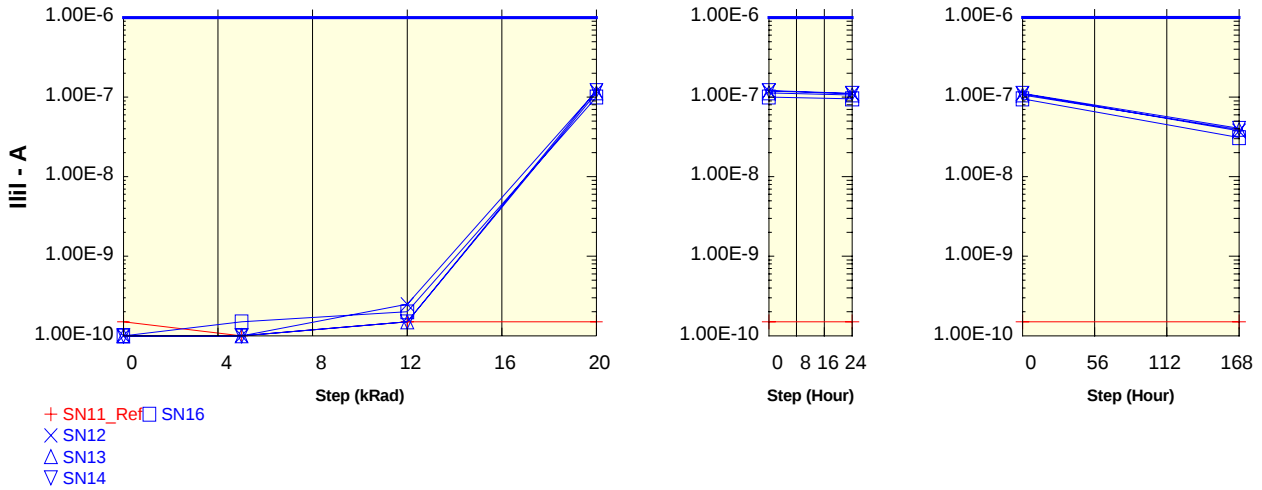
Parameter : Input Leakage Current Low : I_{il}/OE

V_{in} = Gnd. V_{cc} = V_{cc}Max

Unit : A

Spec Limit Max : 1.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.50E-10	1.00E-10	1.50E-10	1.50E-10
SN12	1.00E-10	1.00E-10	2.50E-10	1.19E-7
SN13	1.00E-10	1.00E-10	1.50E-10	1.13E-7
SN14	1.00E-10	1.00E-10	1.50E-10	1.21E-7
SN16	1.00E-10	1.50E-10	2.00E-10	1.01E-7
Statistics				
Min	1.00E-10	1.00E-10	1.50E-10	1.01E-7
Max	1.00E-10	1.50E-10	2.50E-10	1.21E-7
Mean	1.00E-10	1.13E-10	1.88E-10	1.13E-7
Sigma	0.00E+0	2.50E-11	4.79E-11	9.23E-9

Test TST002 : Annealing 24h

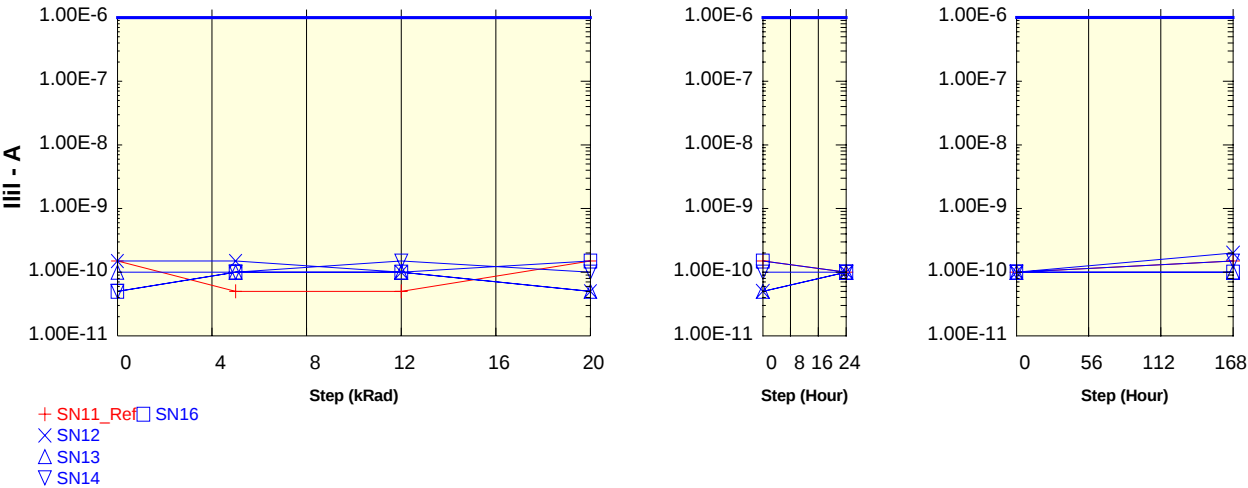
	0 Hour	24 Hour
SN11	1.50E-10	1.50E-10
SN12	1.19E-7	1.11E-7
SN13	1.13E-7	1.07E-7
SN14	1.21E-7	1.12E-7
SN16	1.01E-7	9.55E-8
Statistics		
Min	1.01E-7	9.55E-8
Max	1.21E-7	1.12E-7
Mean	1.13E-7	1.06E-7
Sigma	9.23E-9	7.43E-9

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	1.50E-10	1.50E-10
SN12	1.11E-7	3.76E-8
SN13	1.07E-7	3.92E-8
SN14	1.12E-7	4.07E-8
SN16	9.55E-8	3.11E-8
Statistics		
Min	9.55E-8	3.11E-8
Max	1.12E-7	4.07E-8
Mean	1.06E-7	3.71E-8
Sigma	7.43E-9	4.24E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current Low : I_{il}/WE
V_{in} = Gnd. V_{cc} = V_{cc}Max
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



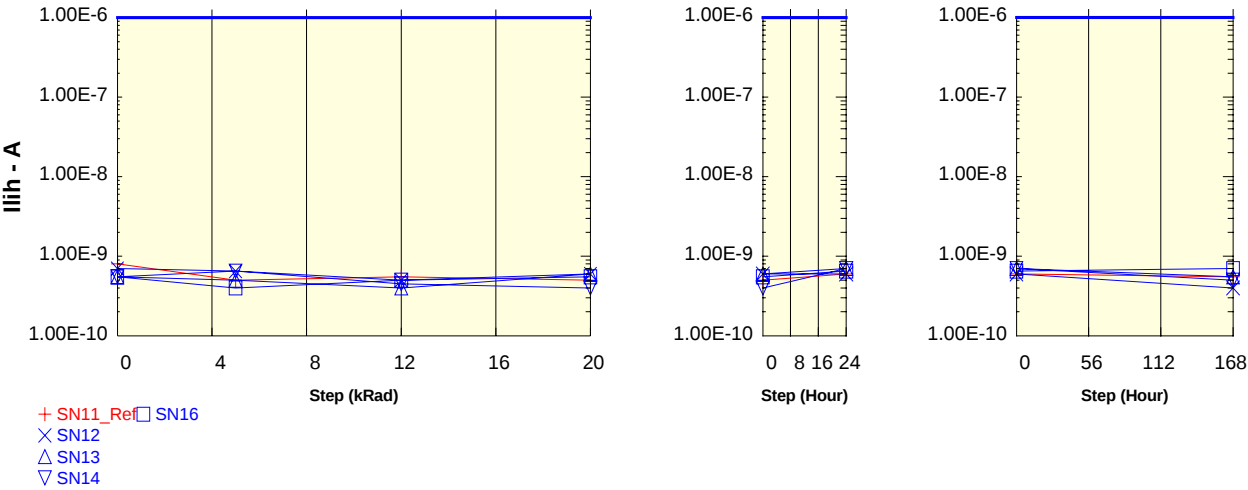
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.50E-10	5.00E-11	5.00E-11	1.50E-10
SN12	1.50E-10	1.50E-10	1.00E-10	5.00E-11
SN13	1.00E-10	1.00E-10	1.00E-10	5.00E-11
SN14	5.00E-11	1.00E-10	1.50E-10	1.00E-10
SN16	5.00E-11	1.00E-10	1.00E-10	1.50E-10
Statistics				
Min	5.00E-11	1.00E-10	1.00E-10	5.00E-11
Max	1.50E-10	1.50E-10	1.50E-10	1.50E-10
Mean	8.75E-11	1.13E-10	1.13E-10	8.75E-11
Sigma	4.79E-11	2.50E-11	2.50E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.50E-10	1.00E-10
SN12	5.00E-11	1.00E-10
SN13	5.00E-11	1.00E-10
SN14	1.00E-10	1.00E-10
SN16	1.50E-10	1.00E-10
Statistics		
Min	5.00E-11	1.00E-10
Max	1.50E-10	1.00E-10
Mean	8.75E-11	1.00E-10
Sigma	4.79E-11	0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.00E-10	1.50E-10
SN12	1.00E-10	2.00E-10
SN13	1.00E-10	1.00E-10
SN14	1.00E-10	1.50E-10
SN16	1.00E-10	1.00E-10
Statistics		
Min	1.00E-10	1.00E-10
Max	1.00E-10	2.00E-10
Mean	1.00E-10	1.38E-10
Sigma	0.00E+0	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA20
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



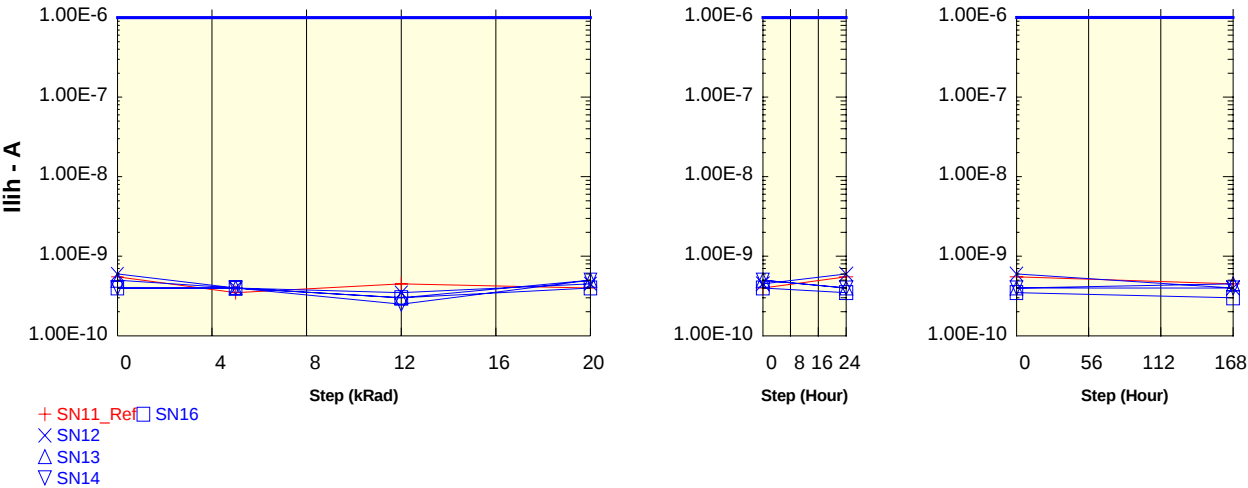
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	8.00E-10	5.00E-10	5.50E-10	5.00E-10
SN12	7.00E-10	6.50E-10	5.00E-10	6.00E-10
SN13	5.50E-10	5.00E-10	4.00E-10	6.00E-10
SN14	5.50E-10	6.50E-10	4.50E-10	4.00E-10
SN16	5.50E-10	4.00E-10	5.00E-10	5.50E-10
Statistics				
Min	5.50E-10	4.00E-10	4.00E-10	4.00E-10
Max	7.00E-10	6.50E-10	5.00E-10	6.00E-10
Mean	5.88E-10	5.50E-10	4.63E-10	5.38E-10
Sigma	7.50E-11	1.22E-10	4.79E-11	9.46E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	5.00E-10	6.00E-10
SN12	6.00E-10	6.00E-10
SN13	6.00E-10	7.00E-10
SN14	4.00E-10	7.00E-10
SN16	5.50E-10	6.50E-10
Statistics		
Min	4.00E-10	6.00E-10
Max	6.00E-10	7.00E-10
Mean	5.38E-10	6.63E-10
Sigma	9.46E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	6.00E-10	5.50E-10
SN12	6.00E-10	4.00E-10
SN13	7.00E-10	5.50E-10
SN14	7.00E-10	5.00E-10
SN16	6.50E-10	7.00E-10
Statistics		
Min	6.00E-10	4.00E-10
Max	7.00E-10	7.00E-10
Mean	6.63E-10	5.38E-10
Sigma	4.79E-11	1.25E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA19
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



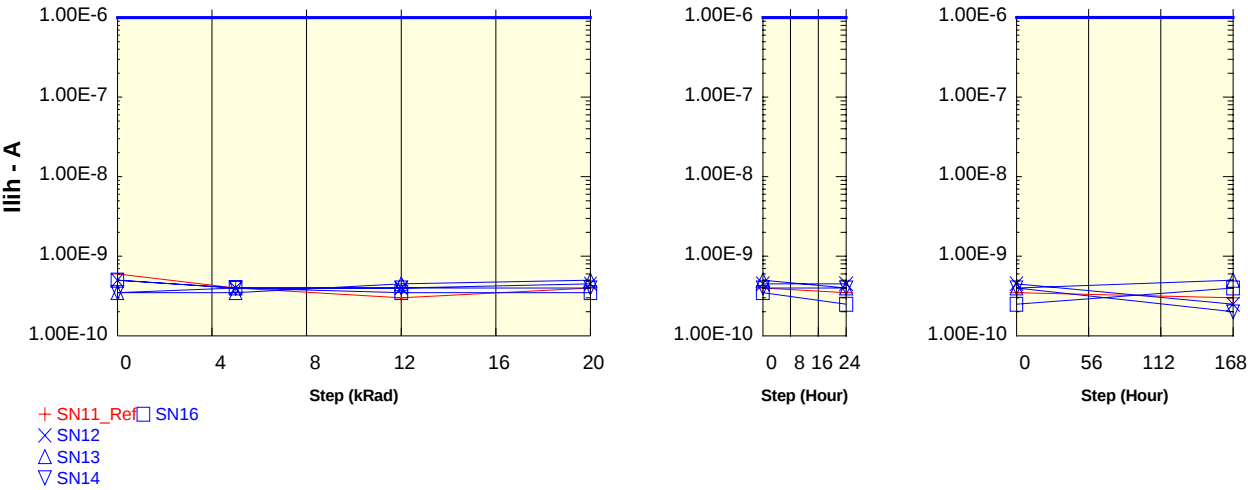
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	5.50E-10	3.50E-10	4.50E-10	4.00E-10
SN12	6.00E-10	4.00E-10	3.50E-10	4.50E-10
SN13	5.00E-10	4.00E-10	3.00E-10	5.00E-10
SN14	4.00E-10	4.00E-10	2.50E-10	5.00E-10
SN16	4.00E-10	4.00E-10	3.00E-10	4.00E-10
Statistics				
Min	4.00E-10	4.00E-10	2.50E-10	4.00E-10
Max	6.00E-10	4.00E-10	3.50E-10	5.00E-10
Mean	4.75E-10	4.00E-10	3.00E-10	4.63E-10
Sigma	9.57E-11	0.00E+0	4.08E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.00E-10	5.50E-10
SN12	4.50E-10	6.00E-10
SN13	5.00E-10	4.00E-10
SN14	5.00E-10	4.00E-10
SN16	4.00E-10	3.50E-10
Statistics		
Min	4.00E-10	3.50E-10
Max	5.00E-10	6.00E-10
Mean	4.63E-10	4.38E-10
Sigma	4.79E-11	1.11E-10

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	5.50E-10	4.50E-10
SN12	6.00E-10	4.00E-10
SN13	4.00E-10	4.50E-10
SN14	4.00E-10	4.00E-10
SN16	3.50E-10	3.00E-10
Statistics		
Min	3.50E-10	3.00E-10
Max	6.00E-10	4.50E-10
Mean	4.38E-10	3.88E-10
Sigma	1.11E-10	6.29E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA18
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



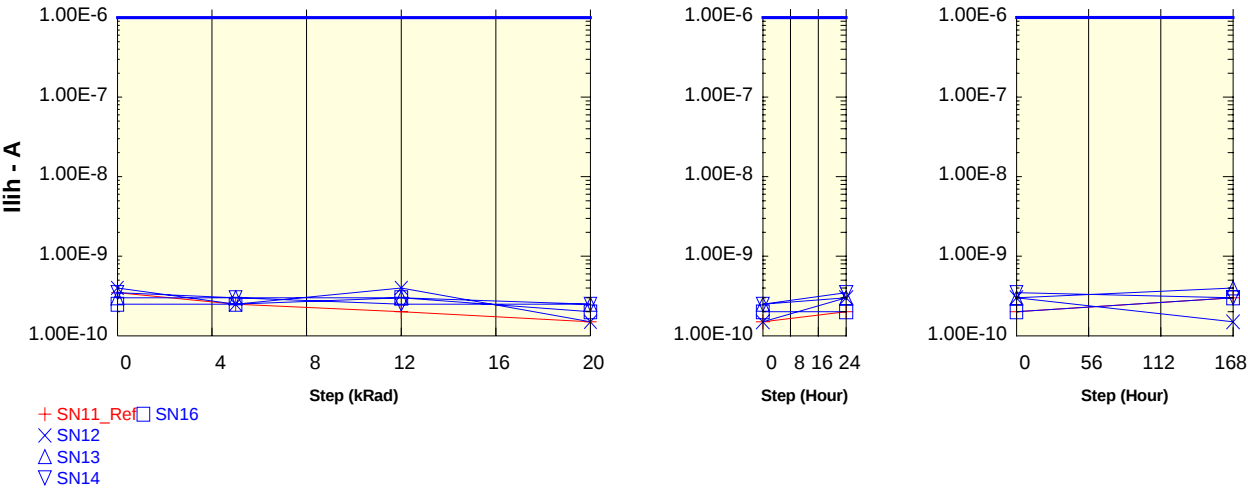
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	6.00E-10	4.00E-10	3.00E-10	4.00E-10
SN12	5.00E-10	4.00E-10	4.00E-10	4.50E-10
SN13	3.50E-10	3.50E-10	4.50E-10	5.00E-10
SN14	3.50E-10	4.00E-10	4.00E-10	4.00E-10
SN16	5.00E-10	4.00E-10	3.50E-10	3.50E-10
Statistics				
Min	3.50E-10	3.50E-10	3.50E-10	3.50E-10
Max	5.00E-10	4.00E-10	4.50E-10	5.00E-10
Mean	4.25E-10	3.88E-10	4.00E-10	4.25E-10
Sigma	8.66E-11	2.50E-11	4.08E-11	6.45E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.00E-10	3.50E-10
SN12	4.50E-10	4.50E-10
SN13	5.00E-10	4.00E-10
SN14	4.00E-10	4.00E-10
SN16	3.50E-10	2.50E-10
Statistics		
Min	3.50E-10	2.50E-10
Max	5.00E-10	4.50E-10
Mean	4.25E-10	3.75E-10
Sigma	6.45E-11	8.66E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.50E-10	3.00E-10
SN12	4.50E-10	2.50E-10
SN13	4.00E-10	5.00E-10
SN14	4.00E-10	2.00E-10
SN16	2.50E-10	4.00E-10
Statistics		
Min	2.50E-10	2.00E-10
Max	4.50E-10	5.00E-10
Mean	3.75E-10	3.38E-10
Sigma	8.66E-11	1.38E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA17
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



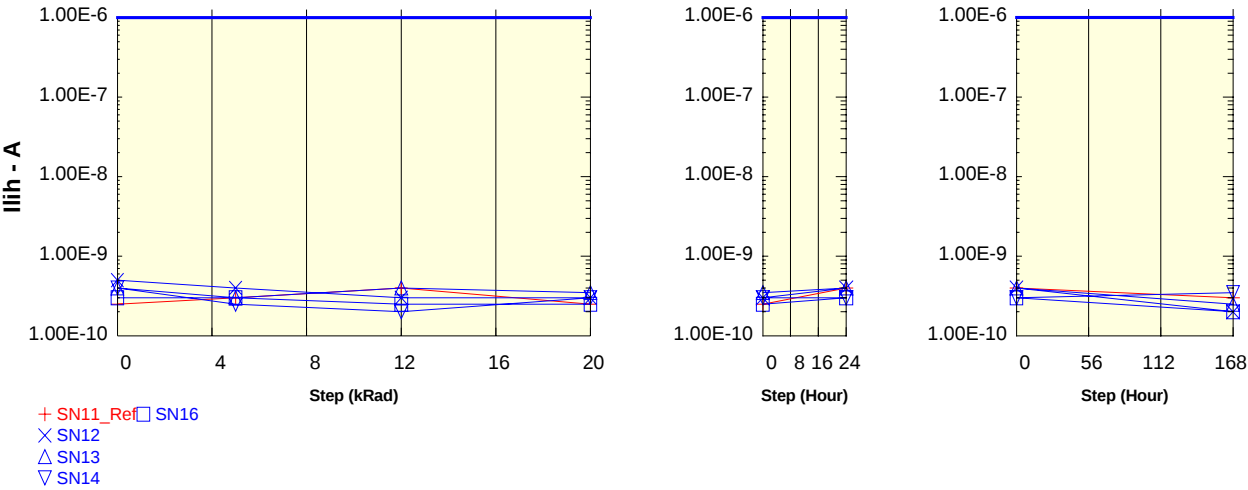
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.50E-10	2.50E-10	2.00E-10	1.50E-10
SN12	4.00E-10	2.50E-10	4.00E-10	1.50E-10
SN13	3.00E-10	3.00E-10	3.00E-10	2.50E-10
SN14	3.50E-10	3.00E-10	2.50E-10	2.50E-10
SN16	2.50E-10	2.50E-10	3.00E-10	2.00E-10
Statistics				
Min	2.50E-10	2.50E-10	2.50E-10	1.50E-10
Max	4.00E-10	3.00E-10	4.00E-10	2.50E-10
Mean	3.25E-10	2.75E-10	3.13E-10	2.13E-10
Sigma	6.45E-11	2.89E-11	6.29E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.50E-10	2.00E-10
SN12	1.50E-10	3.00E-10
SN13	2.50E-10	3.00E-10
SN14	2.50E-10	3.50E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	1.50E-10	2.00E-10
Max	2.50E-10	3.50E-10
Mean	2.13E-10	2.88E-10
Sigma	4.79E-11	6.29E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	3.00E-10
SN12	3.00E-10	1.50E-10
SN13	3.00E-10	4.00E-10
SN14	3.50E-10	3.00E-10
SN16	2.00E-10	3.00E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.50E-10	4.00E-10
Mean	2.88E-10	2.88E-10
Sigma	6.29E-11	1.03E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA16
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



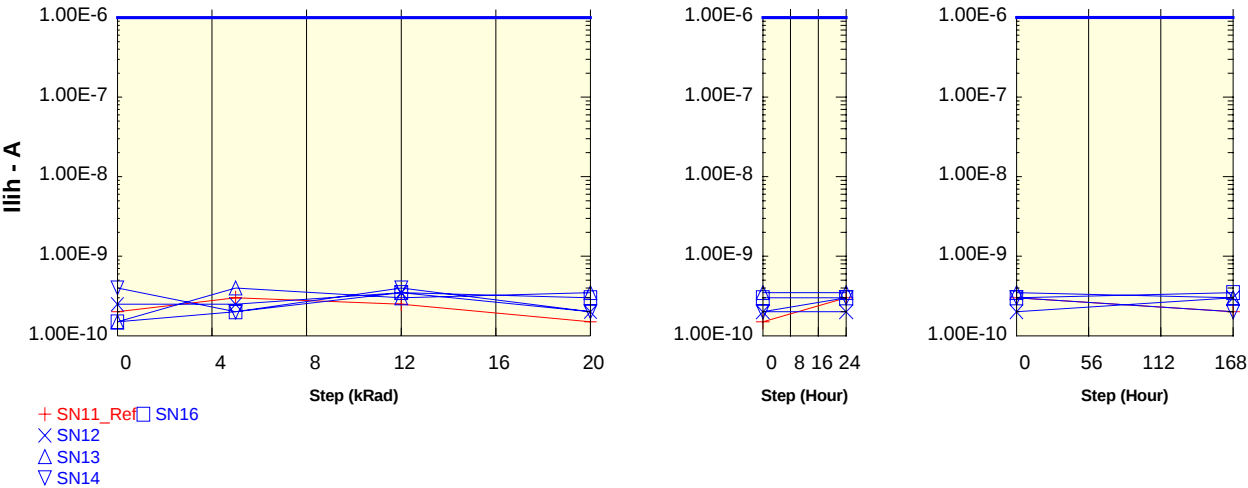
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	3.00E-10	4.00E-10	2.50E-10
SN12	5.00E-10	4.00E-10	3.00E-10	3.00E-10
SN13	4.00E-10	3.00E-10	4.00E-10	3.50E-10
SN14	4.00E-10	2.50E-10	2.00E-10	3.00E-10
SN16	3.00E-10	3.00E-10	2.50E-10	2.50E-10
Statistics				
Min	3.00E-10	2.50E-10	2.00E-10	2.50E-10
Max	5.00E-10	4.00E-10	4.00E-10	3.50E-10
Mean	4.00E-10	3.13E-10	2.88E-10	3.00E-10
Sigma	8.16E-11	6.29E-11	8.54E-11	4.08E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.50E-10	4.00E-10
SN12	3.00E-10	4.00E-10
SN13	3.50E-10	4.00E-10
SN14	3.00E-10	3.00E-10
SN16	2.50E-10	3.00E-10
Statistics		
Min	2.50E-10	3.00E-10
Max	3.50E-10	4.00E-10
Mean	3.00E-10	3.50E-10
Sigma	4.08E-11	5.77E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.00E-10	3.00E-10
SN12	4.00E-10	2.00E-10
SN13	4.00E-10	2.50E-10
SN14	3.00E-10	3.50E-10
SN16	3.00E-10	2.00E-10
Statistics		
Min	3.00E-10	2.00E-10
Max	4.00E-10	3.50E-10
Mean	3.50E-10	2.50E-10
Sigma	5.77E-11	7.07E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA15
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



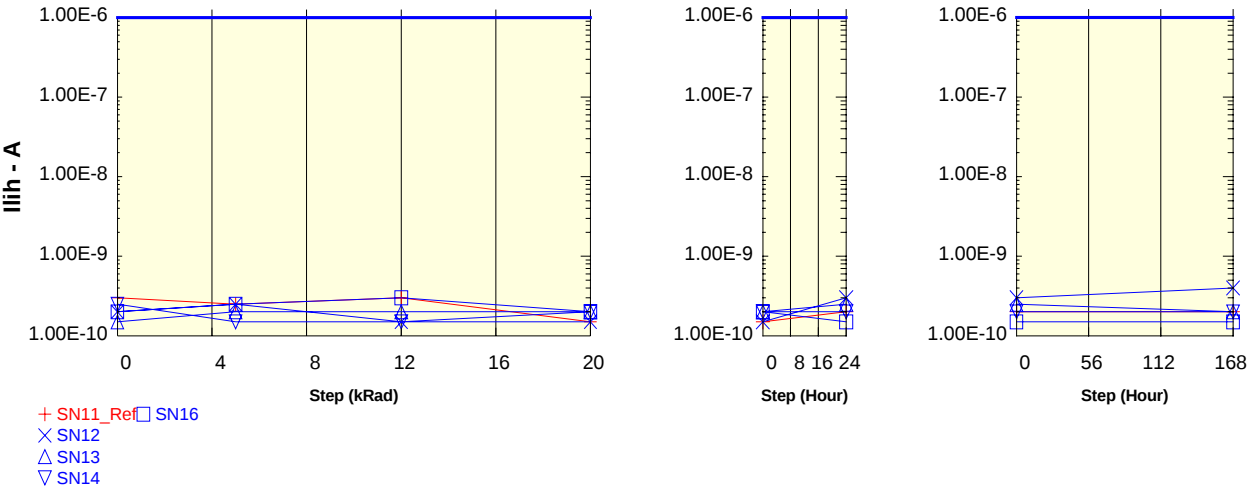
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	3.00E-10	2.50E-10	1.50E-10
SN12	2.50E-10	2.50E-10	3.50E-10	2.00E-10
SN13	1.50E-10	4.00E-10	3.00E-10	3.50E-10
SN14	4.00E-10	2.00E-10	4.00E-10	2.00E-10
SN16	1.50E-10	2.00E-10	3.50E-10	3.00E-10
Statistics				
Min	1.50E-10	2.00E-10	3.00E-10	2.00E-10
Max	4.00E-10	4.00E-10	4.00E-10	3.50E-10
Mean	2.38E-10	2.63E-10	3.50E-10	2.63E-10
Sigma	1.18E-10	9.46E-11	4.08E-11	7.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.50E-10	3.00E-10
SN12	2.00E-10	2.00E-10
SN13	3.50E-10	3.50E-10
SN14	2.00E-10	3.00E-10
SN16	3.00E-10	3.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.50E-10	3.50E-10
Mean	2.63E-10	2.88E-10
Sigma	7.50E-11	6.29E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	2.00E-10
SN12	2.00E-10	3.00E-10
SN13	3.50E-10	3.00E-10
SN14	3.00E-10	2.00E-10
SN16	3.00E-10	3.50E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	3.50E-10	3.50E-10
Mean	2.88E-10	2.88E-10
Sigma	6.29E-11	6.29E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA14
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



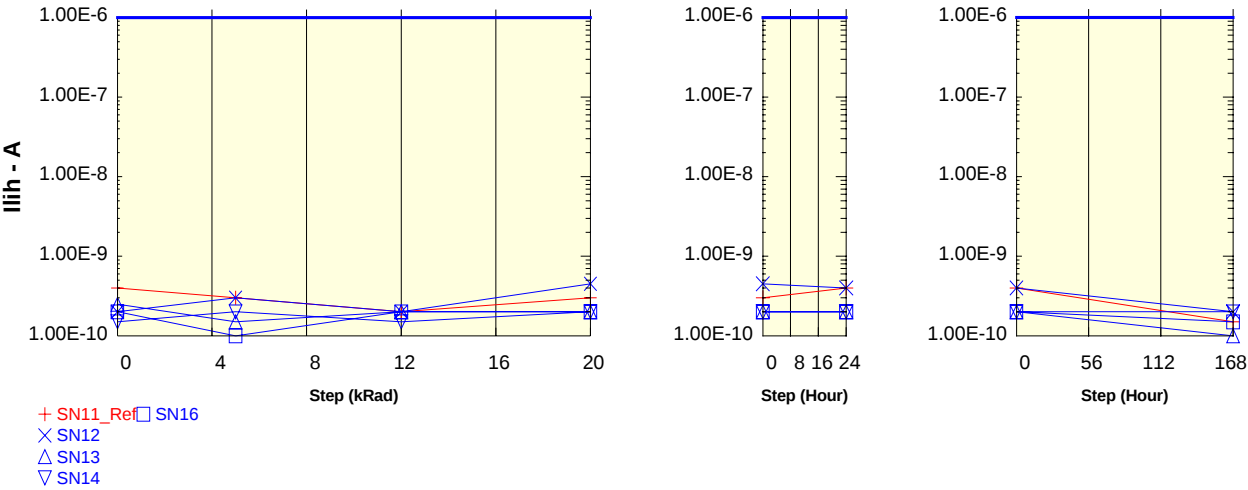
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	2.50E-10	3.00E-10	1.50E-10
SN12	2.00E-10	2.50E-10	1.50E-10	1.50E-10
SN13	1.50E-10	2.00E-10	2.00E-10	2.00E-10
SN14	2.50E-10	1.50E-10	1.50E-10	2.00E-10
SN16	2.00E-10	2.50E-10	3.00E-10	2.00E-10
Statistics				
Min	1.50E-10	1.50E-10	1.50E-10	1.50E-10
Max	2.50E-10	2.50E-10	3.00E-10	2.00E-10
Mean	2.00E-10	2.13E-10	2.00E-10	1.88E-10
Sigma	4.08E-11	4.79E-11	7.07E-11	2.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.50E-10	2.00E-10
SN12	1.50E-10	3.00E-10
SN13	2.00E-10	2.50E-10
SN14	2.00E-10	2.00E-10
SN16	2.00E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.00E-10	3.00E-10
Mean	1.88E-10	2.25E-10
Sigma	2.50E-11	6.45E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.00E-10
SN12	3.00E-10	4.00E-10
SN13	2.50E-10	2.00E-10
SN14	2.00E-10	2.00E-10
SN16	1.50E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	3.00E-10	4.00E-10
Mean	2.25E-10	2.38E-10
Sigma	6.45E-11	1.11E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA13
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



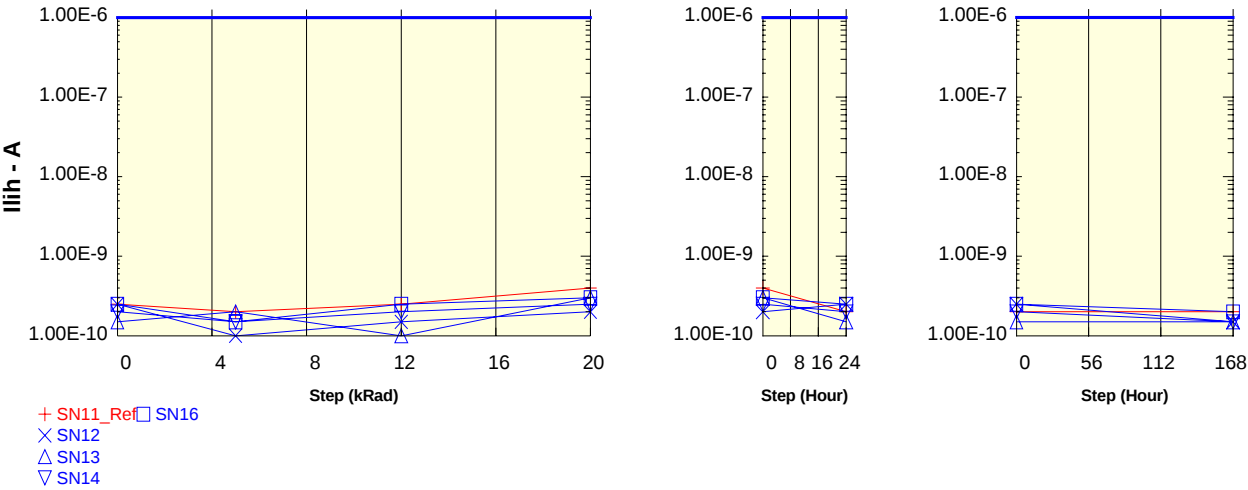
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.00E-10	3.00E-10	2.00E-10	3.00E-10
SN12	2.00E-10	3.00E-10	2.00E-10	4.50E-10
SN13	2.50E-10	1.50E-10	2.00E-10	2.00E-10
SN14	1.50E-10	2.00E-10	1.50E-10	2.00E-10
SN16	2.00E-10	1.00E-10	2.00E-10	2.00E-10
Statistics				
Min	1.50E-10	1.00E-10	1.50E-10	2.00E-10
Max	2.50E-10	3.00E-10	2.00E-10	4.50E-10
Mean	2.00E-10	1.88E-10	1.88E-10	2.63E-10
Sigma	4.08E-11	8.54E-11	2.50E-11	1.25E-10

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	4.00E-10
SN12	4.50E-10	4.00E-10
SN13	2.00E-10	2.00E-10
SN14	2.00E-10	2.00E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	4.50E-10	4.00E-10
Mean	2.63E-10	2.50E-10
Sigma	1.25E-10	1.00E-10

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	4.00E-10	1.50E-10
SN12	4.00E-10	2.00E-10
SN13	2.00E-10	1.00E-10
SN14	2.00E-10	2.00E-10
SN16	2.00E-10	1.50E-10
Statistics		
Min	2.00E-10	1.00E-10
Max	4.00E-10	2.00E-10
Mean	2.50E-10	1.63E-10
Sigma	1.00E-10	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA12
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



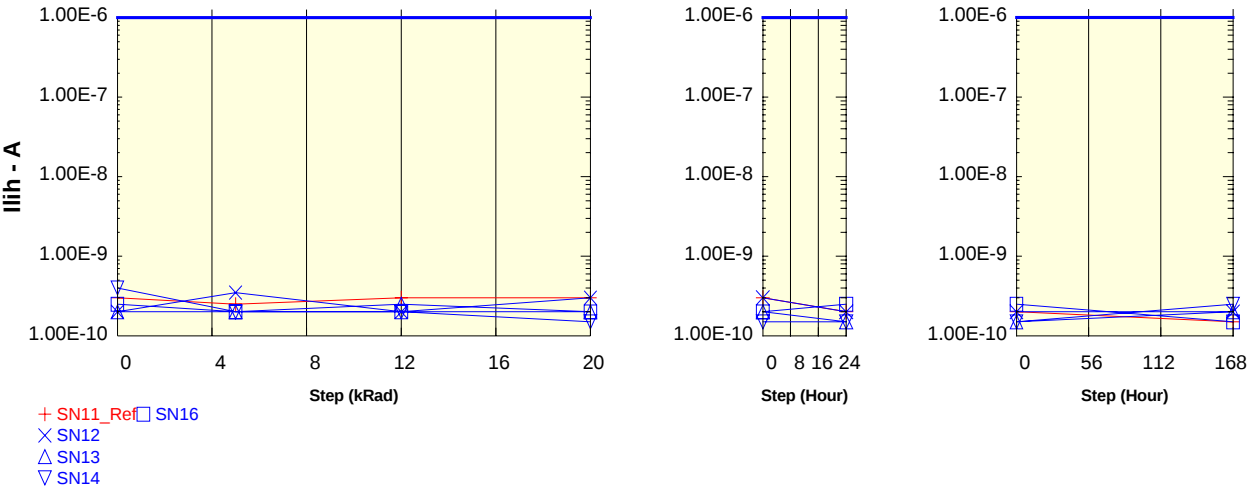
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	2.00E-10	2.50E-10	4.00E-10
SN12	2.50E-10	1.00E-10	1.50E-10	2.00E-10
SN13	1.50E-10	2.00E-10	1.00E-10	3.00E-10
SN14	2.00E-10	1.50E-10	2.00E-10	2.50E-10
SN16	2.50E-10	1.50E-10	2.50E-10	3.00E-10
Statistics				
Min	1.50E-10	1.00E-10	1.00E-10	2.00E-10
Max	2.50E-10	2.00E-10	2.50E-10	3.00E-10
Mean	2.13E-10	1.50E-10	1.75E-10	2.63E-10
Sigma	4.79E-11	4.08E-11	6.45E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.00E-10	2.00E-10
SN12	2.00E-10	2.50E-10
SN13	3.00E-10	1.50E-10
SN14	2.50E-10	2.00E-10
SN16	3.00E-10	2.50E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.00E-10	2.50E-10
Mean	2.63E-10	2.13E-10
Sigma	4.79E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.00E-10
SN12	2.50E-10	1.50E-10
SN13	1.50E-10	1.50E-10
SN14	2.00E-10	1.50E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.50E-10	2.00E-10
Mean	2.13E-10	1.63E-10
Sigma	4.79E-11	2.50E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA11
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



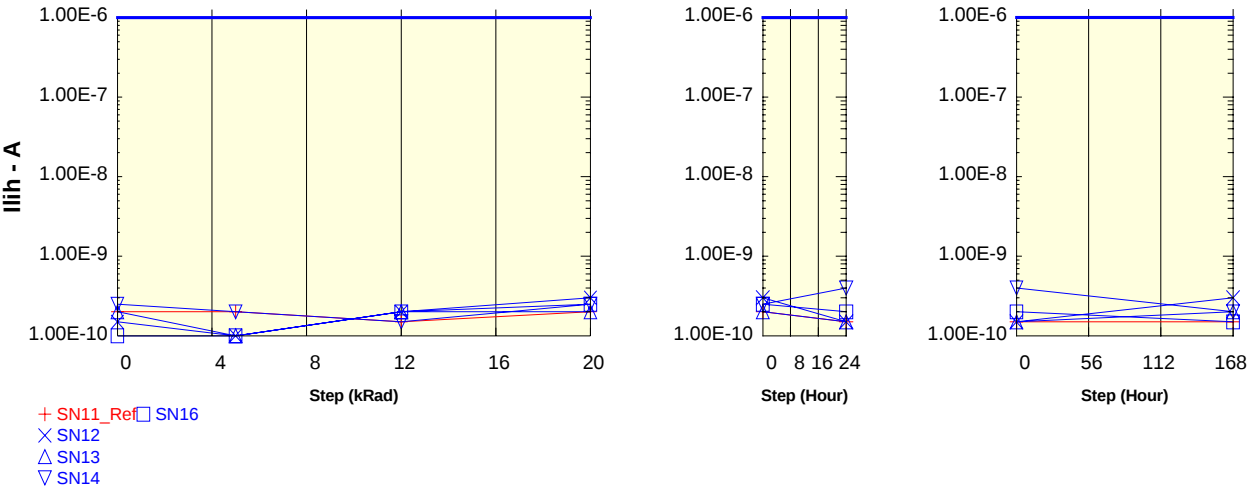
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	2.50E-10	3.00E-10	3.00E-10
SN12	2.00E-10	3.50E-10	2.00E-10	3.00E-10
SN13	2.00E-10	2.00E-10	2.50E-10	2.00E-10
SN14	4.00E-10	2.00E-10	2.00E-10	1.50E-10
SN16	2.50E-10	2.00E-10	2.00E-10	2.00E-10
Statistics				
Min	2.00E-10	2.00E-10	2.00E-10	1.50E-10
Max	4.00E-10	3.50E-10	2.50E-10	3.00E-10
Mean	2.63E-10	2.38E-10	2.13E-10	2.13E-10
Sigma	9.46E-11	7.50E-11	2.50E-11	6.29E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	2.00E-10
SN12	3.00E-10	2.00E-10
SN13	2.00E-10	1.50E-10
SN14	1.50E-10	1.50E-10
SN16	2.00E-10	2.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	3.00E-10	2.50E-10
Mean	2.13E-10	1.88E-10
Sigma	6.29E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	1.50E-10
SN12	2.00E-10	2.00E-10
SN13	1.50E-10	2.00E-10
SN14	1.50E-10	2.50E-10
SN16	2.50E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.50E-10	2.50E-10
Mean	1.88E-10	2.00E-10
Sigma	4.79E-11	4.08E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA10
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



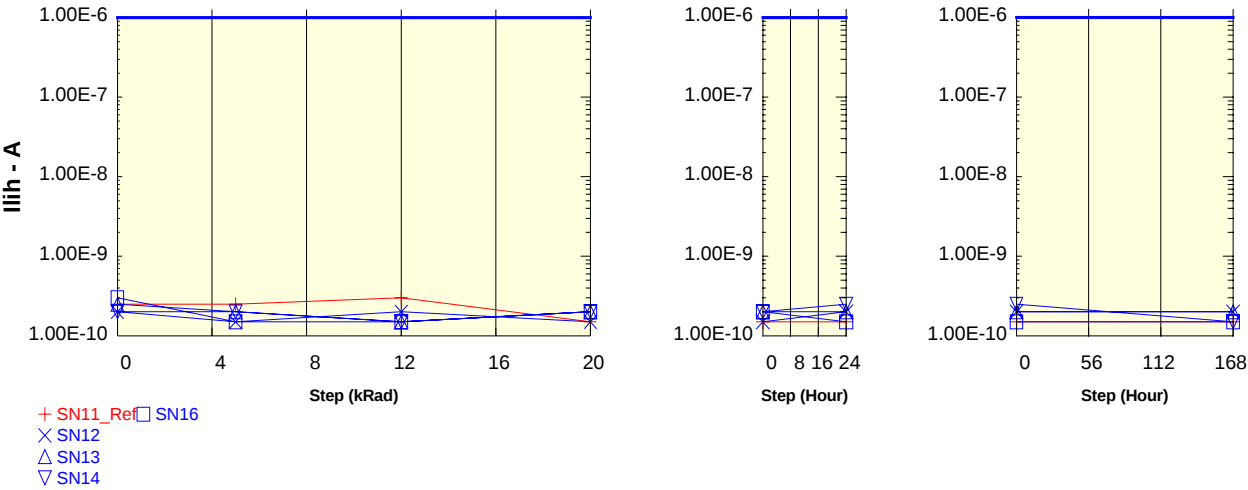
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	2.00E-10	1.50E-10	2.00E-10
SN12	1.50E-10	1.00E-10	2.00E-10	3.00E-10
SN13	2.00E-10	1.00E-10	2.00E-10	2.00E-10
SN14	2.50E-10	2.00E-10	1.50E-10	2.50E-10
SN16	1.00E-10	1.00E-10	2.00E-10	2.50E-10
Statistics				
Min	1.00E-10	1.00E-10	1.50E-10	2.00E-10
Max	2.50E-10	2.00E-10	2.00E-10	3.00E-10
Mean	1.75E-10	1.25E-10	1.88E-10	2.50E-10
Sigma	6.45E-11	5.00E-11	2.50E-11	4.08E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	1.50E-10
SN12	3.00E-10	1.50E-10
SN13	2.00E-10	1.50E-10
SN14	2.50E-10	4.00E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	3.00E-10	4.00E-10
Mean	2.50E-10	2.25E-10
Sigma	4.08E-11	1.19E-10

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.50E-10	1.50E-10
SN12	1.50E-10	3.00E-10
SN13	1.50E-10	2.00E-10
SN14	4.00E-10	2.00E-10
SN16	2.00E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	4.00E-10	3.00E-10
Mean	2.25E-10	2.13E-10
Sigma	1.19E-10	6.29E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA9
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



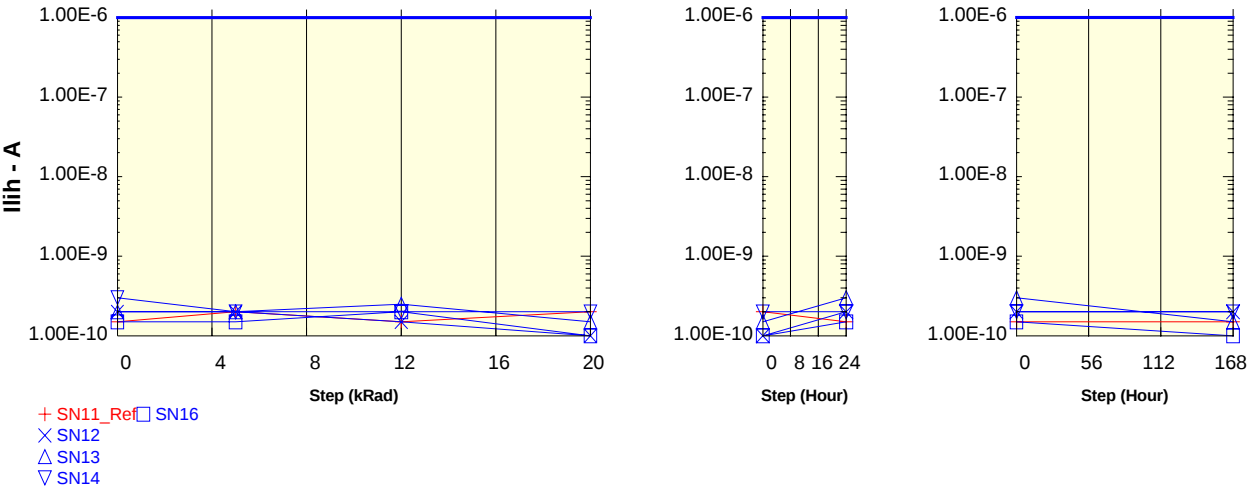
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.50E-10	2.50E-10	3.00E-10	1.50E-10
SN12	2.00E-10	1.50E-10	2.00E-10	1.50E-10
SN13	2.50E-10	2.00E-10	1.50E-10	2.00E-10
SN14	2.00E-10	2.00E-10	1.50E-10	2.00E-10
SN16	3.00E-10	1.50E-10	1.50E-10	2.00E-10
Statistics				
Min	2.00E-10	1.50E-10	1.50E-10	1.50E-10
Max	3.00E-10	2.00E-10	2.00E-10	2.00E-10
Mean	2.38E-10	1.75E-10	1.63E-10	1.88E-10
Sigma	4.79E-11	2.89E-11	2.50E-11	2.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.50E-10	1.50E-10
SN12	1.50E-10	2.00E-10
SN13	2.00E-10	2.00E-10
SN14	2.00E-10	2.50E-10
SN16	2.00E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.00E-10	2.50E-10
Mean	1.88E-10	2.00E-10
Sigma	2.50E-11	4.08E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.50E-10	1.50E-10
SN12	2.00E-10	2.00E-10
SN13	2.00E-10	2.00E-10
SN14	2.50E-10	1.50E-10
SN16	1.50E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.50E-10	2.00E-10
Mean	2.00E-10	1.75E-10
Sigma	4.08E-11	2.89E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA8
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



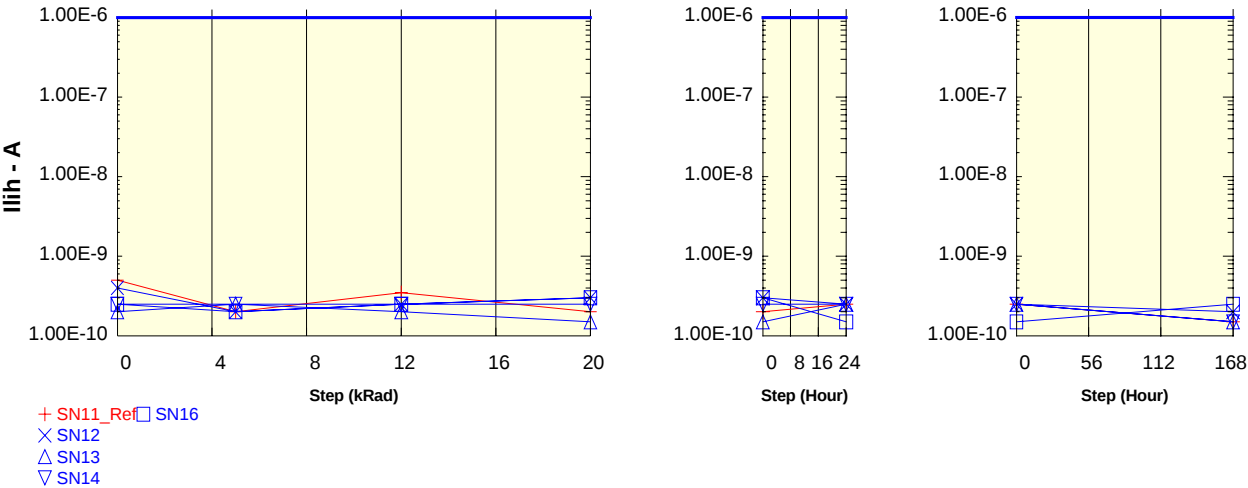
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.50E-10	2.00E-10	1.50E-10	2.00E-10
SN12	2.00E-10	2.00E-10	1.50E-10	1.00E-10
SN13	2.00E-10	2.00E-10	2.50E-10	1.50E-10
SN14	3.00E-10	2.00E-10	2.00E-10	2.00E-10
SN16	1.50E-10	1.50E-10	2.00E-10	1.00E-10
Statistics				
Min	1.50E-10	1.50E-10	1.50E-10	1.00E-10
Max	3.00E-10	2.00E-10	2.50E-10	2.00E-10
Mean	2.13E-10	1.88E-10	2.00E-10	1.38E-10
Sigma	6.29E-11	2.50E-11	4.08E-11	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	1.50E-10
SN12	1.00E-10	2.00E-10
SN13	1.50E-10	3.00E-10
SN14	2.00E-10	2.00E-10
SN16	1.00E-10	1.50E-10
Statistics		
Min	1.00E-10	1.50E-10
Max	2.00E-10	3.00E-10
Mean	1.38E-10	2.13E-10
Sigma	4.79E-11	6.29E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.50E-10	1.50E-10
SN12	2.00E-10	2.00E-10
SN13	3.00E-10	1.50E-10
SN14	2.00E-10	2.00E-10
SN16	1.50E-10	1.00E-10
Statistics		
Min	1.50E-10	1.00E-10
Max	3.00E-10	2.00E-10
Mean	2.13E-10	1.63E-10
Sigma	6.29E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA7
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



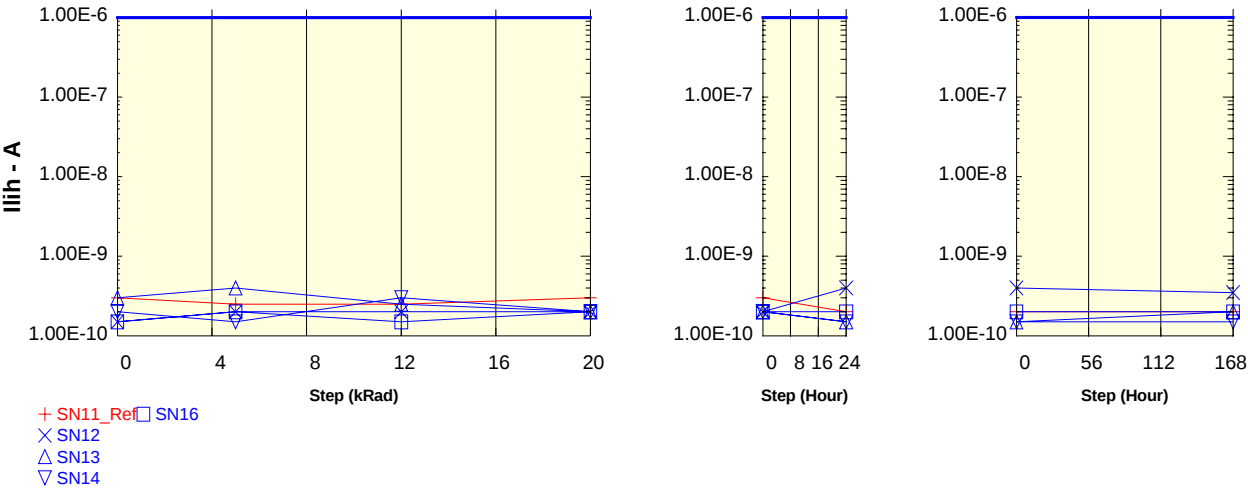
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	5.00E-10	2.00E-10	3.50E-10	2.00E-10
SN12	4.00E-10	2.00E-10	2.50E-10	3.00E-10
SN13	2.00E-10	2.50E-10	2.00E-10	1.50E-10
SN14	2.50E-10	2.50E-10	2.50E-10	2.50E-10
SN16	2.50E-10	2.00E-10	2.50E-10	3.00E-10
Statistics				
Min	2.00E-10	2.00E-10	2.00E-10	1.50E-10
Max	4.00E-10	2.50E-10	2.50E-10	3.00E-10
Mean	2.75E-10	2.25E-10	2.38E-10	2.50E-10
Sigma	8.66E-11	2.89E-11	2.50E-11	7.07E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	2.50E-10
SN12	3.00E-10	2.50E-10
SN13	1.50E-10	2.50E-10
SN14	2.50E-10	2.50E-10
SN16	3.00E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	3.00E-10	2.50E-10
Mean	2.50E-10	2.25E-10
Sigma	7.07E-11	5.00E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.50E-10	1.50E-10
SN12	2.50E-10	2.00E-10
SN13	2.50E-10	1.50E-10
SN14	2.50E-10	1.50E-10
SN16	1.50E-10	2.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.50E-10	2.50E-10
Mean	2.25E-10	1.88E-10
Sigma	5.00E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA6
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



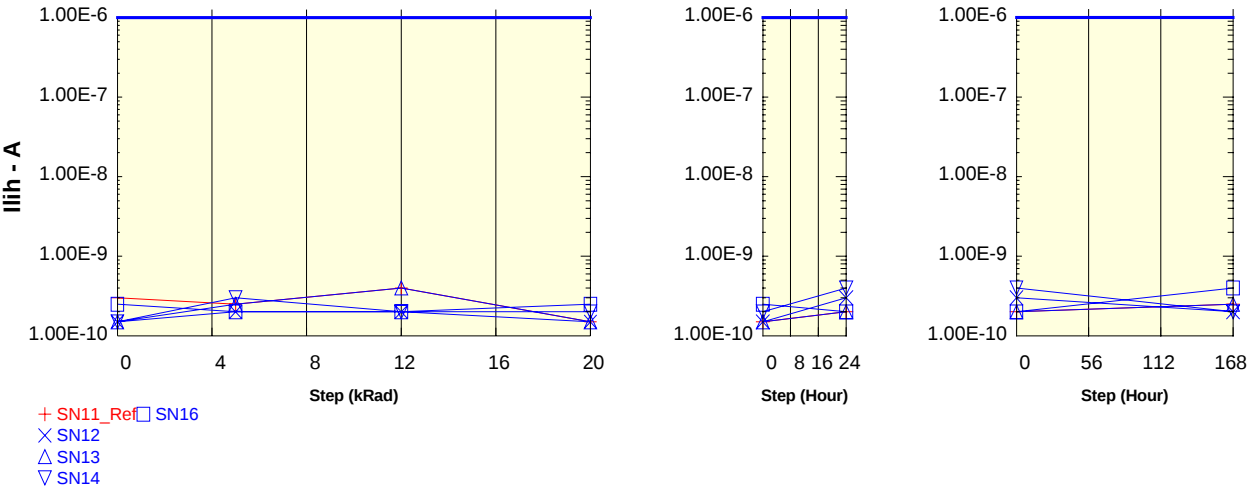
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	2.50E-10	2.50E-10	3.00E-10
SN12	1.50E-10	2.00E-10	2.00E-10	2.00E-10
SN13	3.00E-10	4.00E-10	2.50E-10	2.00E-10
SN14	2.00E-10	1.50E-10	3.00E-10	2.00E-10
SN16	1.50E-10	2.00E-10	1.50E-10	2.00E-10
Statistics				
Min	1.50E-10	1.50E-10	1.50E-10	2.00E-10
Max	3.00E-10	4.00E-10	3.00E-10	2.00E-10
Mean	2.00E-10	2.38E-10	2.25E-10	2.00E-10
Sigma	7.07E-11	1.11E-10	6.45E-11	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.00E-10	2.00E-10
SN12	2.00E-10	4.00E-10
SN13	2.00E-10	1.50E-10
SN14	2.00E-10	1.50E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	2.00E-10	4.00E-10
Mean	2.00E-10	2.25E-10
Sigma	0.00E+0	1.19E-10

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.00E-10
SN12	4.00E-10	3.50E-10
SN13	1.50E-10	2.00E-10
SN14	1.50E-10	1.50E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	4.00E-10	3.50E-10
Mean	2.25E-10	2.25E-10
Sigma	1.19E-10	8.66E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA5
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



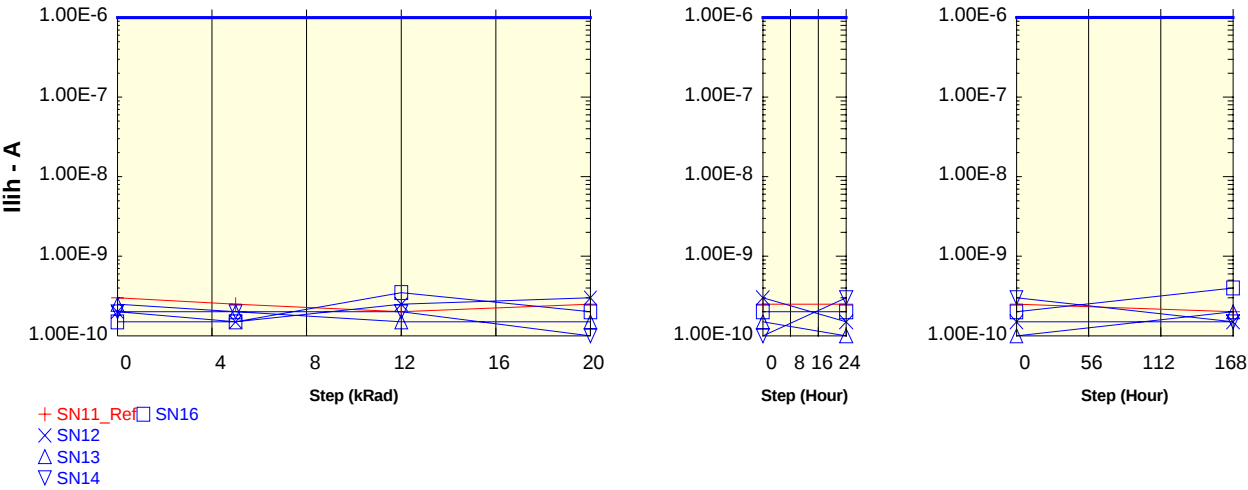
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	2.50E-10	4.00E-10	1.50E-10
SN12	1.50E-10	2.00E-10	2.00E-10	1.50E-10
SN13	1.50E-10	2.50E-10	4.00E-10	1.50E-10
SN14	1.50E-10	3.00E-10	2.00E-10	2.00E-10
SN16	2.50E-10	2.00E-10	2.00E-10	2.50E-10
Statistics				
Min	1.50E-10	2.00E-10	2.00E-10	1.50E-10
Max	2.50E-10	3.00E-10	4.00E-10	2.50E-10
Mean	1.75E-10	2.38E-10	2.50E-10	1.88E-10
Sigma	5.00E-11	4.79E-11	1.00E-10	4.79E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.50E-10	2.00E-10
SN12	1.50E-10	3.00E-10
SN13	1.50E-10	2.00E-10
SN14	2.00E-10	4.00E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	1.50E-10	2.00E-10
Max	2.50E-10	4.00E-10
Mean	1.88E-10	2.75E-10
Sigma	4.79E-11	9.57E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.50E-10
SN12	3.00E-10	2.00E-10
SN13	2.00E-10	2.50E-10
SN14	4.00E-10	2.00E-10
SN16	2.00E-10	4.00E-10
Statistics		
Min	2.00E-10	2.00E-10
Max	4.00E-10	4.00E-10
Mean	2.75E-10	2.63E-10
Sigma	9.57E-11	9.46E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA4
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



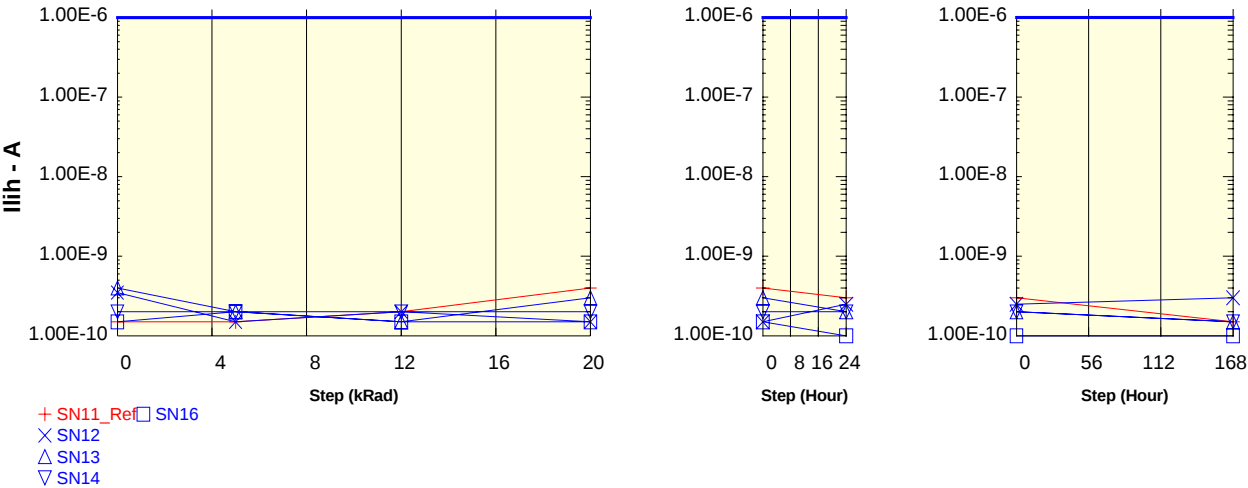
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	2.50E-10	2.00E-10	2.50E-10
SN12	2.00E-10	1.50E-10	2.50E-10	3.00E-10
SN13	2.50E-10	2.00E-10	1.50E-10	1.50E-10
SN14	2.00E-10	2.00E-10	2.00E-10	1.00E-10
SN16	1.50E-10	1.50E-10	3.50E-10	2.00E-10
Statistics				
Min	1.50E-10	1.50E-10	1.50E-10	1.00E-10
Max	2.50E-10	2.00E-10	3.50E-10	3.00E-10
Mean	2.00E-10	1.75E-10	2.38E-10	1.88E-10
Sigma	4.08E-11	2.89E-11	8.54E-11	8.54E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.50E-10	2.50E-10
SN12	3.00E-10	1.50E-10
SN13	1.50E-10	1.00E-10
SN14	1.00E-10	3.00E-10
SN16	2.00E-10	2.00E-10
Statistics		
Min	1.00E-10	1.00E-10
Max	3.00E-10	3.00E-10
Mean	1.88E-10	1.88E-10
Sigma	8.54E-11	8.54E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.50E-10	2.00E-10
SN12	1.50E-10	1.50E-10
SN13	1.00E-10	2.00E-10
SN14	3.00E-10	1.50E-10
SN16	2.00E-10	4.00E-10
Statistics		
Min	1.00E-10	1.50E-10
Max	3.00E-10	4.00E-10
Mean	1.88E-10	2.25E-10
Sigma	8.54E-11	1.19E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA3
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



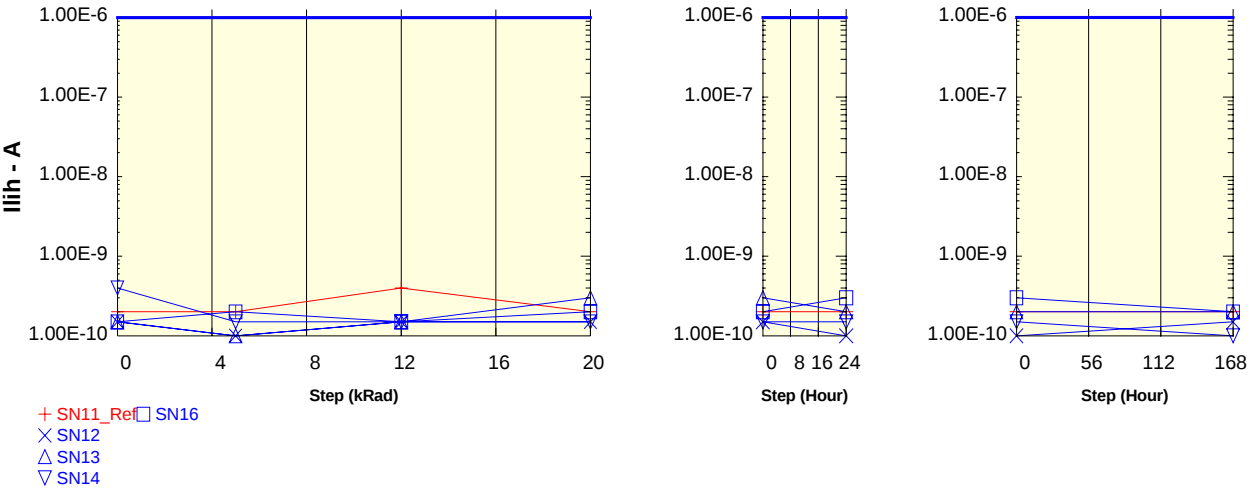
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.50E-10	1.50E-10	2.00E-10	4.00E-10
SN12	3.50E-10	1.50E-10	2.00E-10	1.50E-10
SN13	4.00E-10	2.00E-10	1.50E-10	3.00E-10
SN14	2.00E-10	2.00E-10	2.00E-10	2.00E-10
SN16	1.50E-10	2.00E-10	1.50E-10	1.50E-10
Statistics				
Min	1.50E-10	1.50E-10	1.50E-10	1.50E-10
Max	4.00E-10	2.00E-10	2.00E-10	3.00E-10
Mean	2.75E-10	1.88E-10	1.75E-10	2.00E-10
Sigma	1.19E-10	2.50E-11	2.89E-11	7.07E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	4.00E-10	3.00E-10
SN12	1.50E-10	2.50E-10
SN13	3.00E-10	2.00E-10
SN14	2.00E-10	2.00E-10
SN16	1.50E-10	1.00E-10
Statistics		
Min	1.50E-10	1.00E-10
Max	3.00E-10	2.50E-10
Mean	2.00E-10	1.88E-10
Sigma	7.07E-11	6.29E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.00E-10	1.50E-10
SN12	2.50E-10	3.00E-10
SN13	2.00E-10	1.50E-10
SN14	2.00E-10	1.50E-10
SN16	1.00E-10	1.00E-10
Statistics		
Min	1.00E-10	1.00E-10
Max	2.50E-10	3.00E-10
Mean	1.88E-10	1.75E-10
Sigma	6.29E-11	8.66E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA2
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



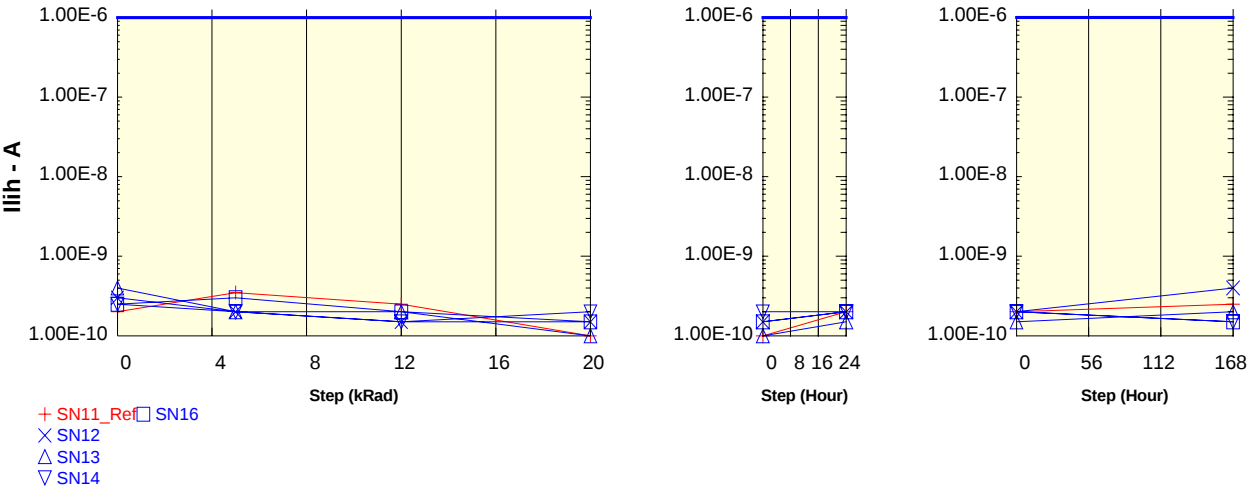
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	2.00E-10	4.00E-10	2.00E-10
SN12	1.50E-10	1.00E-10	1.50E-10	1.50E-10
SN13	1.50E-10	1.00E-10	1.50E-10	3.00E-10
SN14	4.00E-10	1.50E-10	1.50E-10	1.50E-10
SN16	1.50E-10	2.00E-10	1.50E-10	2.00E-10
Statistics				
Min	1.50E-10	1.00E-10	1.50E-10	1.50E-10
Max	4.00E-10	2.00E-10	1.50E-10	3.00E-10
Mean	2.13E-10	1.38E-10	1.50E-10	2.00E-10
Sigma	1.25E-10	4.79E-11	0.00E+0	7.07E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	2.00E-10
SN12	1.50E-10	1.00E-10
SN13	3.00E-10	2.00E-10
SN14	1.50E-10	1.50E-10
SN16	2.00E-10	3.00E-10
Statistics		
Min	1.50E-10	1.00E-10
Max	3.00E-10	3.00E-10
Mean	2.00E-10	1.88E-10
Sigma	7.07E-11	8.54E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.00E-10
SN12	1.00E-10	1.50E-10
SN13	2.00E-10	2.00E-10
SN14	1.50E-10	1.00E-10
SN16	3.00E-10	2.00E-10
Statistics		
Min	1.00E-10	1.00E-10
Max	3.00E-10	2.00E-10
Mean	1.88E-10	1.63E-10
Sigma	8.54E-11	4.79E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA1
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



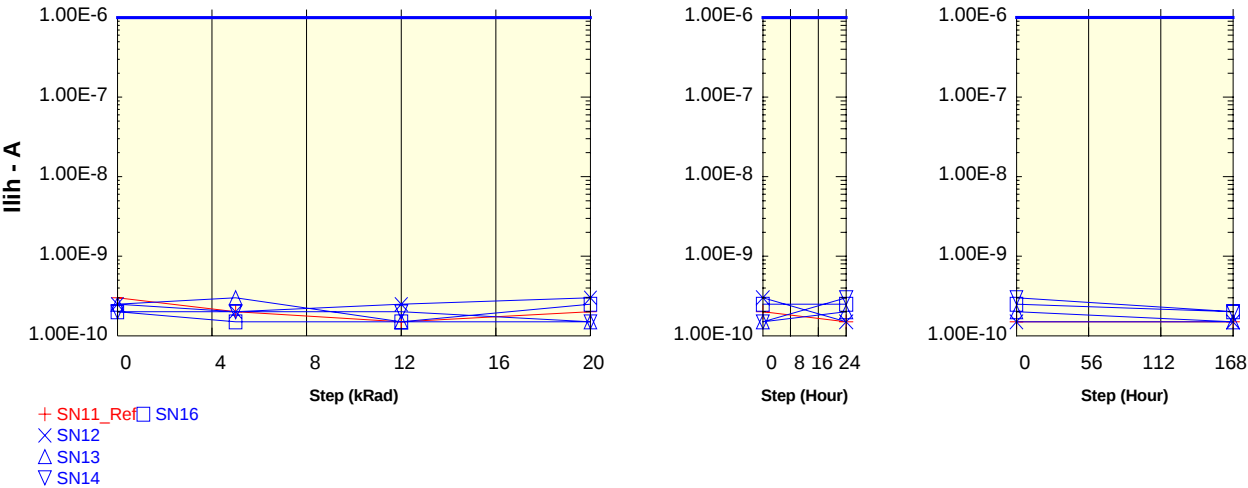
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	3.50E-10	2.50E-10	1.00E-10
SN12	3.00E-10	2.00E-10	1.50E-10	1.50E-10
SN13	4.00E-10	2.00E-10	2.00E-10	1.00E-10
SN14	2.50E-10	2.00E-10	1.50E-10	2.00E-10
SN16	2.50E-10	3.00E-10	2.00E-10	1.50E-10
Statistics				
Min	2.50E-10	2.00E-10	1.50E-10	1.00E-10
Max	4.00E-10	3.00E-10	2.00E-10	2.00E-10
Mean	3.00E-10	2.25E-10	1.75E-10	1.50E-10
Sigma	7.07E-11	5.00E-11	2.89E-11	4.08E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.00E-10	2.00E-10
SN12	1.50E-10	2.00E-10
SN13	1.00E-10	1.50E-10
SN14	2.00E-10	2.00E-10
SN16	1.50E-10	2.00E-10
Statistics		
Min	1.00E-10	1.50E-10
Max	2.00E-10	2.00E-10
Mean	1.50E-10	1.88E-10
Sigma	4.08E-11	2.50E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	2.50E-10
SN12	2.00E-10	4.00E-10
SN13	1.50E-10	2.00E-10
SN14	2.00E-10	1.50E-10
SN16	2.00E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.00E-10	4.00E-10
Mean	1.88E-10	2.25E-10
Sigma	2.50E-11	1.19E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : IlihA0
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



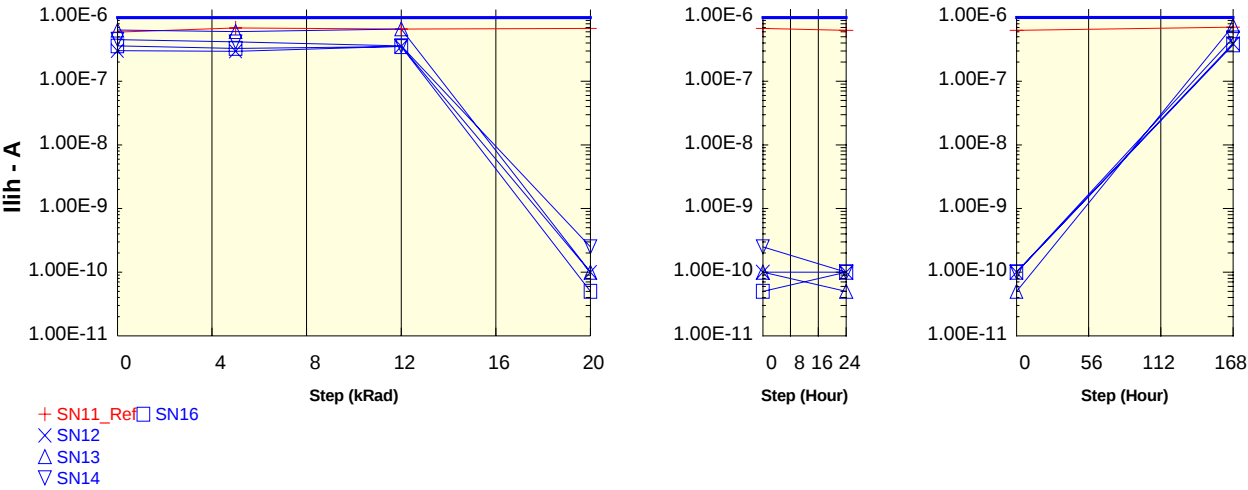
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.00E-10	2.00E-10	1.50E-10	2.00E-10
SN12	2.50E-10	2.00E-10	2.50E-10	3.00E-10
SN13	2.50E-10	3.00E-10	1.50E-10	1.50E-10
SN14	2.00E-10	2.00E-10	2.00E-10	1.50E-10
SN16	2.00E-10	1.50E-10	1.50E-10	2.50E-10
Statistics				
Min	2.00E-10	1.50E-10	1.50E-10	1.50E-10
Max	2.50E-10	3.00E-10	2.50E-10	3.00E-10
Mean	2.25E-10	2.13E-10	1.88E-10	2.13E-10
Sigma	2.89E-11	6.29E-11	4.79E-11	7.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	1.50E-10
SN12	3.00E-10	1.50E-10
SN13	1.50E-10	2.00E-10
SN14	1.50E-10	3.00E-10
SN16	2.50E-10	2.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	3.00E-10	3.00E-10
Mean	2.13E-10	2.25E-10
Sigma	7.50E-11	6.45E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.50E-10	1.50E-10
SN12	1.50E-10	1.50E-10
SN13	2.00E-10	1.50E-10
SN14	3.00E-10	2.00E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	3.00E-10	2.00E-10
Mean	2.25E-10	1.75E-10
Sigma	6.45E-11	2.89E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics

Test conditions : TID
Parameter : Input Leakage Current High : Ilih/RST
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



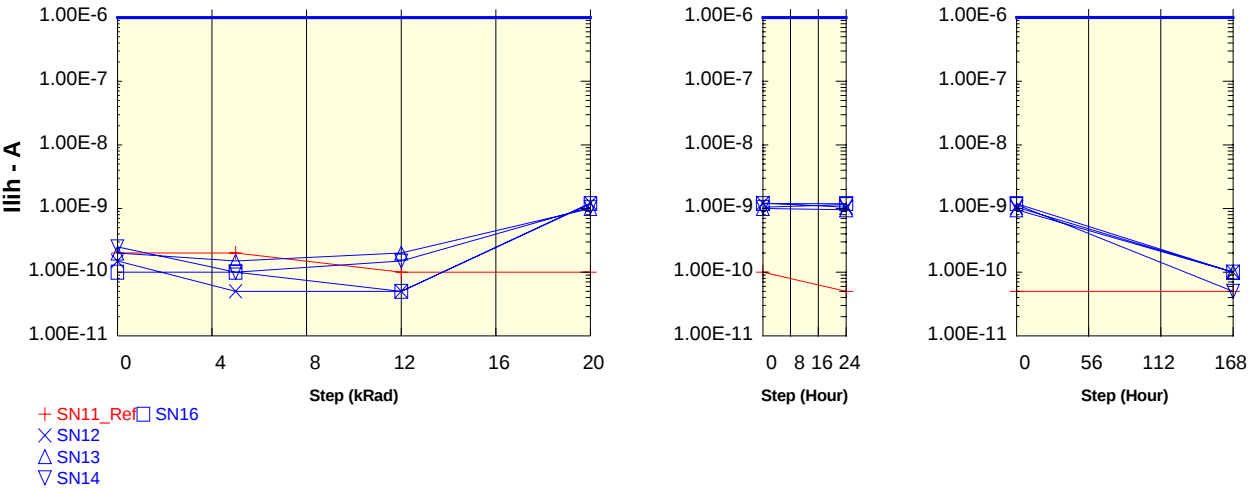
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	5.94E-7	6.88E-7	6.64E-7	6.72E-7
SN12	3.01E-7	2.97E-7	3.54E-7	1.00E-10
SN13	6.36E-7	6.03E-7	6.65E-7	1.00E-10
SN14	4.53E-7	4.14E-7	3.61E-7	2.50E-10
SN16	3.59E-7	3.28E-7	3.50E-7	5.00E-11
Statistics				
Min	3.01E-7	2.97E-7	3.50E-7	5.00E-11
Max	6.36E-7	6.03E-7	6.65E-7	2.50E-10
Mean	4.37E-7	4.10E-7	4.32E-7	1.25E-10
Sigma	1.46E-7	1.38E-7	1.55E-7	8.66E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	6.72E-7	6.35E-7
SN12	1.00E-10	1.00E-10
SN13	1.00E-10	5.00E-11
SN14	2.50E-10	1.00E-10
SN16	5.00E-11	1.00E-10
Statistics		
Min	5.00E-11	5.00E-11
Max	2.50E-10	1.00E-10
Mean	1.25E-10	8.75E-11
Sigma	8.66E-11	2.50E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	6.35E-7	7.05E-7
SN12	1.00E-10	3.91E-7
SN13	5.00E-11	7.47E-7
SN14	1.00E-10	4.76E-7
SN16	1.00E-10	3.75E-7
Statistics		
Min	5.00E-11	3.75E-7
Max	1.00E-10	7.47E-7
Mean	8.75E-11	4.97E-7
Sigma	2.50E-11	1.73E-7

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : Ilih/CE
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



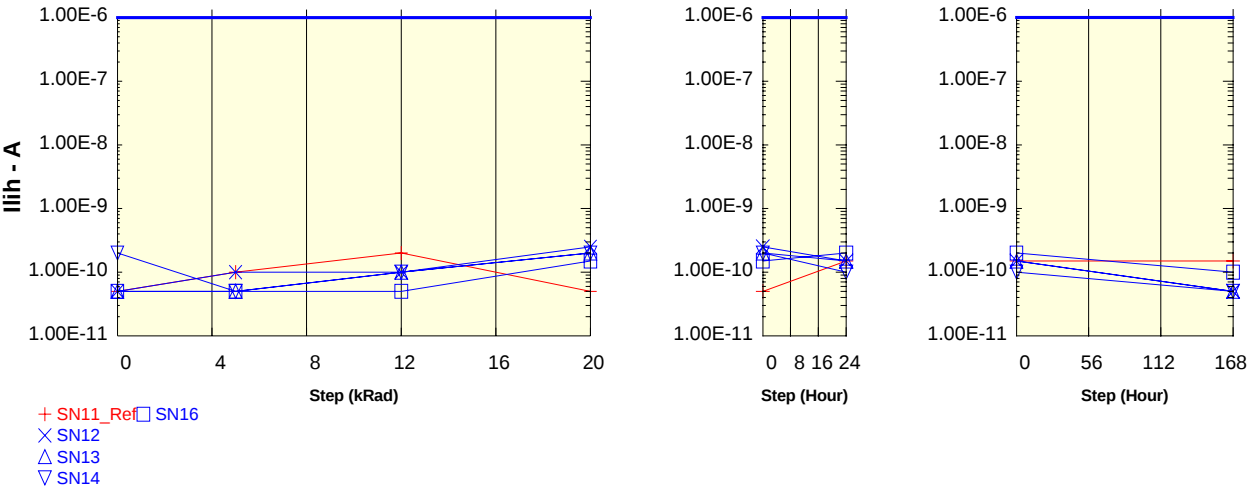
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.00E-10	2.00E-10	1.00E-10	1.00E-10
SN12	1.50E-10	5.00E-11	5.00E-11	1.21E-9
SN13	2.00E-10	1.50E-10	2.00E-10	1.00E-9
SN14	2.50E-10	1.00E-10	1.50E-10	1.05E-9
SN16	1.00E-10	1.00E-10	5.00E-11	1.20E-9
Statistics				
Min	1.00E-10	5.00E-11	5.00E-11	1.00E-9
Max	2.50E-10	1.50E-10	2.00E-10	1.21E-9
Mean	1.75E-10	1.00E-10	1.13E-10	1.12E-9
Sigma	6.45E-11	4.08E-11	7.50E-11	1.07E-10

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.00E-10	5.00E-11
SN12	1.21E-9	1.05E-9
SN13	1.00E-9	9.50E-10
SN14	1.05E-9	1.15E-9
SN16	1.20E-9	1.20E-9
Statistics		
Min	1.00E-9	9.50E-10
Max	1.21E-9	1.20E-9
Mean	1.12E-9	1.09E-9
Sigma	1.07E-10	1.11E-10

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	5.00E-11	5.00E-11
SN12	1.05E-9	1.00E-10
SN13	9.50E-10	1.00E-10
SN14	1.15E-9	5.00E-11
SN16	1.20E-9	1.00E-10
Statistics		
Min	9.50E-10	5.00E-11
Max	1.20E-9	1.00E-10
Mean	1.09E-9	8.75E-11
Sigma	1.11E-10	2.50E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : Ilih/OE
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	5 kRad	12 kRad	20 kRad
SN11	5.00E-11	1.00E-10	2.00E-10	5.00E-11
SN12	5.00E-11	1.00E-10	1.00E-10	2.50E-10
SN13	5.00E-11	5.00E-11	1.00E-10	2.00E-10
SN14	2.00E-10	5.00E-11	1.00E-10	2.00E-10
SN16	5.00E-11	5.00E-11	5.00E-11	1.50E-10
Statistics				
Min	5.00E-11	5.00E-11	5.00E-11	1.50E-10
Max	2.00E-10	1.00E-10	1.00E-10	2.50E-10
Mean	8.75E-11	6.25E-11	8.75E-11	2.00E-10
Sigma	7.50E-11	2.50E-11	2.50E-11	4.08E-11

Test TST002 : Annealing 24h

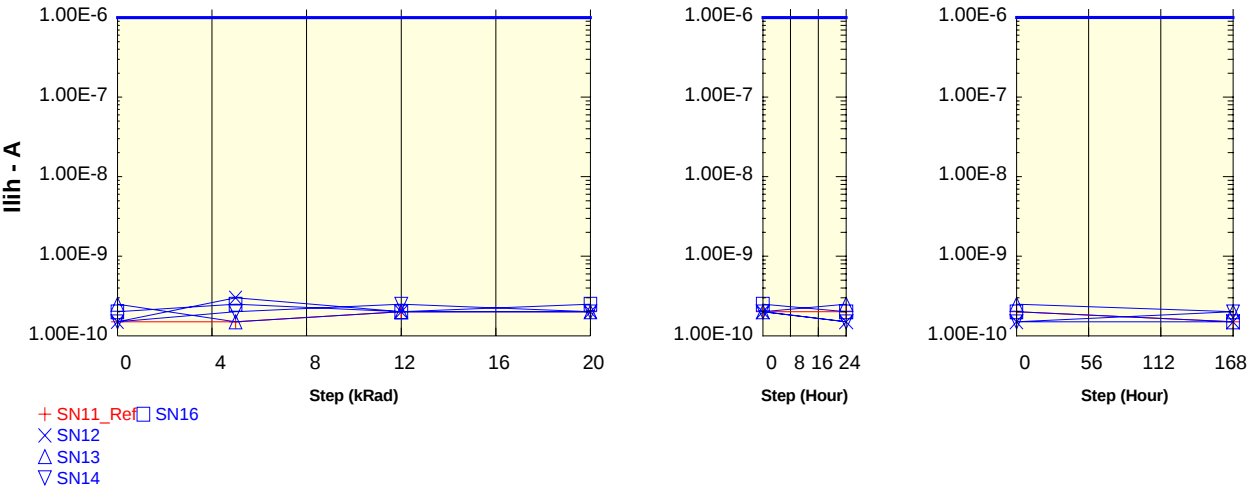
	0 Hour	24 Hour
SN11	5.00E-11	1.50E-10
SN12	2.50E-10	1.50E-10
SN13	2.00E-10	1.50E-10
SN14	2.00E-10	1.00E-10
SN16	1.50E-10	2.00E-10
Statistics		
Min	1.50E-10	1.00E-10
Max	2.50E-10	2.00E-10
Mean	2.00E-10	1.50E-10
Sigma	4.08E-11	4.08E-11

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	1.50E-10	1.50E-10
SN12	1.50E-10	5.00E-11
SN13	1.50E-10	5.00E-11
SN14	1.00E-10	5.00E-11
SN16	2.00E-10	1.00E-10
Statistics		
Min	1.00E-10	5.00E-11
Max	2.00E-10	1.00E-10
Mean	1.50E-10	6.25E-11
Sigma	4.08E-11	2.50E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Input Leakage Current High : Ilih/WE
Vin = Vcc. Vcc = VccMax
 Unit : A
 Spec Limit Max : 1.00E-6
 Spec limits are represented in bold lines on the graphic.



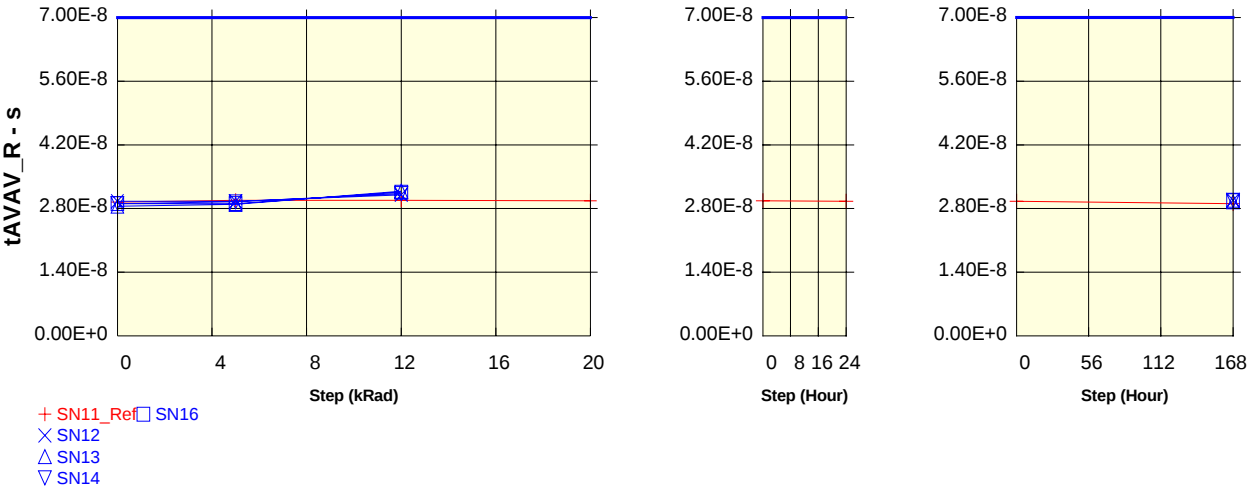
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.50E-10	1.50E-10	2.00E-10	2.00E-10
SN12	1.50E-10	3.00E-10	2.00E-10	2.00E-10
SN13	2.50E-10	1.50E-10	2.00E-10	2.00E-10
SN14	1.50E-10	2.00E-10	2.50E-10	2.00E-10
SN16	2.00E-10	2.50E-10	2.00E-10	2.50E-10
Statistics				
Min	1.50E-10	1.50E-10	2.00E-10	2.00E-10
Max	2.50E-10	3.00E-10	2.50E-10	2.50E-10
Mean	1.88E-10	2.25E-10	2.13E-10	2.13E-10
Sigma	4.79E-11	6.45E-11	2.50E-11	2.50E-11

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.00E-10	2.00E-10
SN12	2.00E-10	1.50E-10
SN13	2.00E-10	2.50E-10
SN14	2.00E-10	1.50E-10
SN16	2.50E-10	2.00E-10
Statistics		
Min	2.00E-10	1.50E-10
Max	2.50E-10	2.50E-10
Mean	2.13E-10	1.88E-10
Sigma	2.50E-11	4.79E-11

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.00E-10	1.50E-10
SN12	1.50E-10	1.50E-10
SN13	2.50E-10	2.00E-10
SN14	1.50E-10	2.00E-10
SN16	2.00E-10	1.50E-10
Statistics		
Min	1.50E-10	1.50E-10
Max	2.50E-10	2.00E-10
Mean	1.88E-10	1.75E-10
Sigma	4.79E-11	2.89E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Read Cycle Time : tAVAV_R
E* = Vil. G* = Vil
 Unit : s
 Spec Limit Max : 7.00E-8
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.94E-8	2.98E-8	2.98E-8	2.97E-8
SN12	2.96E-8	2.96E-8	3.10E-8	
SN13	2.85E-8	2.89E-8	3.18E-8	
SN14	2.91E-8	2.95E-8	3.13E-8	
SN16	2.91E-8	2.91E-8	3.16E-8	
Statistics				
Min	2.85E-8	2.89E-8	3.10E-8	0.00E+0
Max	2.96E-8	2.96E-8	3.18E-8	0.00E+0
Mean	2.91E-8	2.93E-8	3.14E-8	0.00E+0
Sigma	4.50E-10	3.30E-10	3.50E-10	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.97E-8	2.96E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.96E-8	2.91E-8
SN12		2.98E-8
SN13		2.95E-8
SN14		2.97E-8
SN16		2.98E-8
Statistics		
Min		2.95E-8
Max		2.98E-8
Mean		2.97E-8
Sigma		1.41E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID

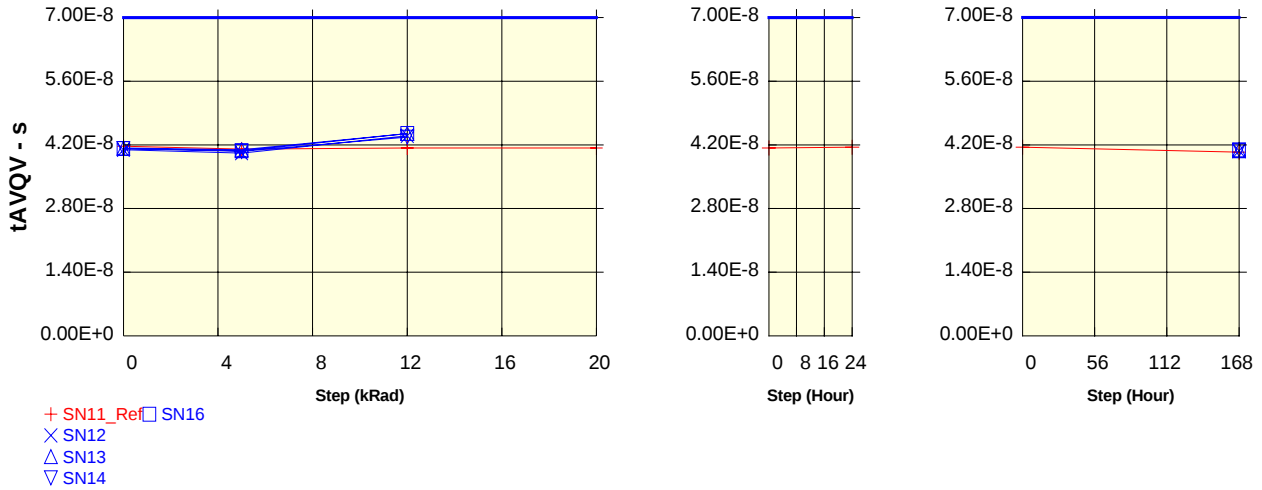
Parameter : Address to Output Delay : tAVQV

E* = Vil. G* = Vil

Unit : s

Spec Limit Max : 7.00E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	5 kRad	12 kRad	20 kRad
SN11	4.17E-8	4.11E-8	4.13E-8	4.13E-8
SN12	4.09E-8	4.02E-8	4.40E-8	
SN13	4.13E-8	4.09E-8	4.45E-8	
SN14	4.12E-8	4.06E-8	4.37E-8	
SN16	4.12E-8	4.07E-8	4.45E-8	
Statistics				
Min	4.09E-8	4.02E-8	4.37E-8	0.00E+0
Max	4.13E-8	4.09E-8	4.45E-8	0.00E+0
Mean	4.12E-8	4.06E-8	4.42E-8	0.00E+0
Sigma	1.73E-10	2.94E-10	3.95E-10	0.00E+0

Test TST002 : Annealing 24h

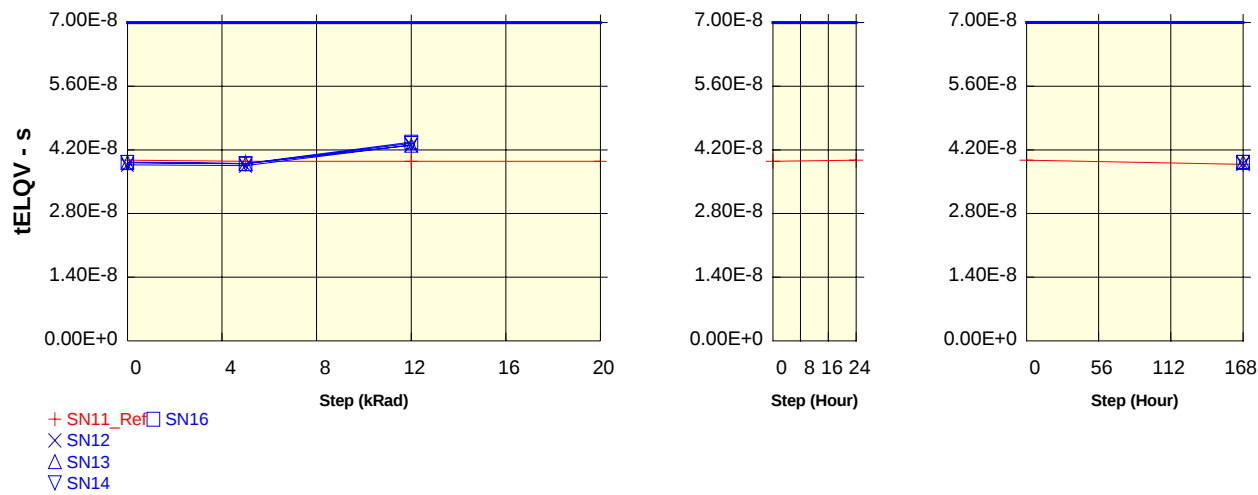
	0 Hour	24 Hour
SN11	4.13E-8	4.15E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h

	0 Hour	168 Hour
SN11	4.15E-8	4.04E-8
SN12		4.07E-8
SN13		4.09E-8
SN14		4.09E-8
SN16		4.07E-8
Statistics		
Min		4.07E-8
Max		4.09E-8
Mean		4.08E-8
Sigma		1.15E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Chip Enable to Output Delay : tELQV
G* = VIL
 Unit : s
 Spec Limit Max : 7.00E-8
 Spec limits are represented in bold lines on the graphic.



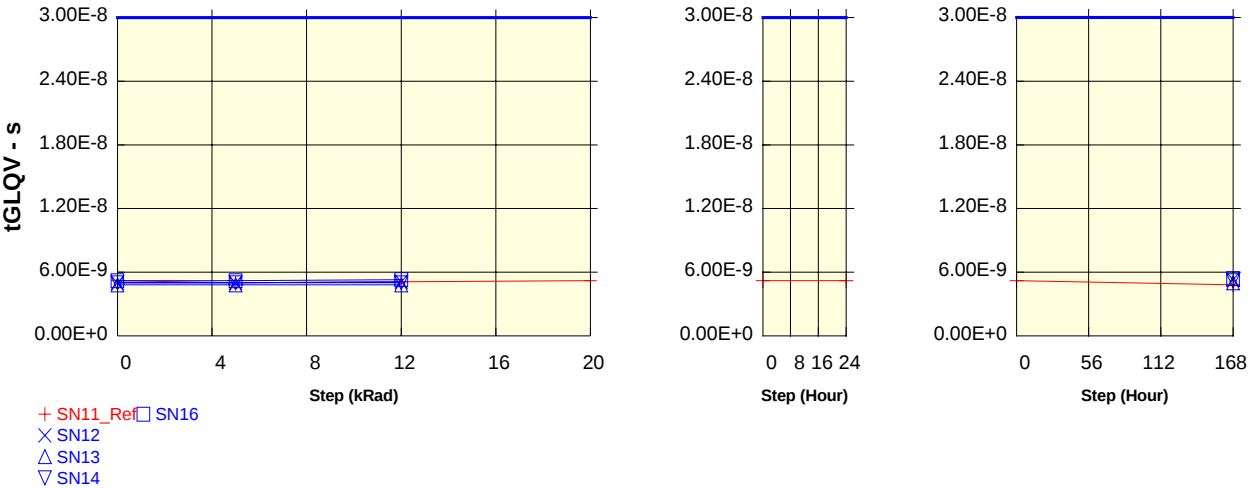
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	3.97E-8	3.95E-8	3.95E-8	3.95E-8
SN12	3.87E-8	3.85E-8	4.31E-8	
SN13	3.92E-8	3.90E-8	4.30E-8	
SN14	3.92E-8	3.89E-8	4.34E-8	
SN16	3.93E-8	3.90E-8	4.37E-8	
Statistics				
Min	3.87E-8	3.85E-8	4.30E-8	0.00E+0
Max	3.93E-8	3.90E-8	4.37E-8	0.00E+0
Mean	3.91E-8	3.89E-8	4.33E-8	0.00E+0
Sigma	2.71E-10	2.38E-10	3.16E-10	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	3.95E-8	3.97E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	3.97E-8	3.88E-8
SN12		3.90E-8
SN13		3.93E-8
SN14		3.93E-8
SN16		3.93E-8
Statistics		
Min		3.90E-8
Max		3.93E-8
Mean		3.92E-8
Sigma		1.50E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output Enable to Output Delay : tGLQV
E* = VIL
 Unit : s
 Spec Limit Max : 3.00E-8
 Spec limits are represented in bold lines on the graphic.



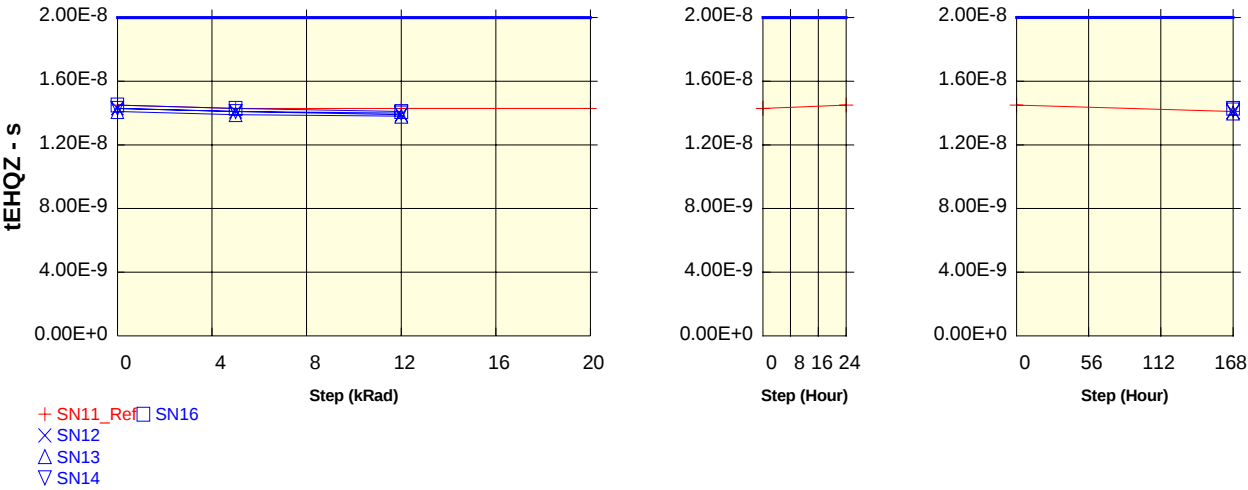
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	5.20E-9	5.00E-9	5.10E-9	5.20E-9
SN12	5.00E-9	5.00E-9	5.10E-9	
SN13	4.80E-9	4.80E-9	4.80E-9	
SN14	5.00E-9	5.00E-9	5.00E-9	
SN16	5.20E-9	5.20E-9	5.30E-9	
Statistics				
Min	4.80E-9	4.80E-9	4.80E-9	0.00E+0
Max	5.20E-9	5.20E-9	5.30E-9	0.00E+0
Mean	5.00E-9	5.00E-9	5.05E-9	0.00E+0
Sigma	1.63E-10	1.63E-10	2.08E-10	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	5.20E-9	5.20E-9
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	5.20E-9	4.80E-9
SN12		5.30E-9
SN13		5.00E-9
SN14		5.20E-9
SN16		5.40E-9
Statistics		
Min		5.00E-9
Max		5.40E-9
Mean		5.23E-9
Sigma		1.71E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Chip Enable to Output HiZ : tEHQZ
G* = VIL
 Unit : s
 Spec Limit Max : 2.00E-8
 Spec limits are represented in bold lines on the graphic.



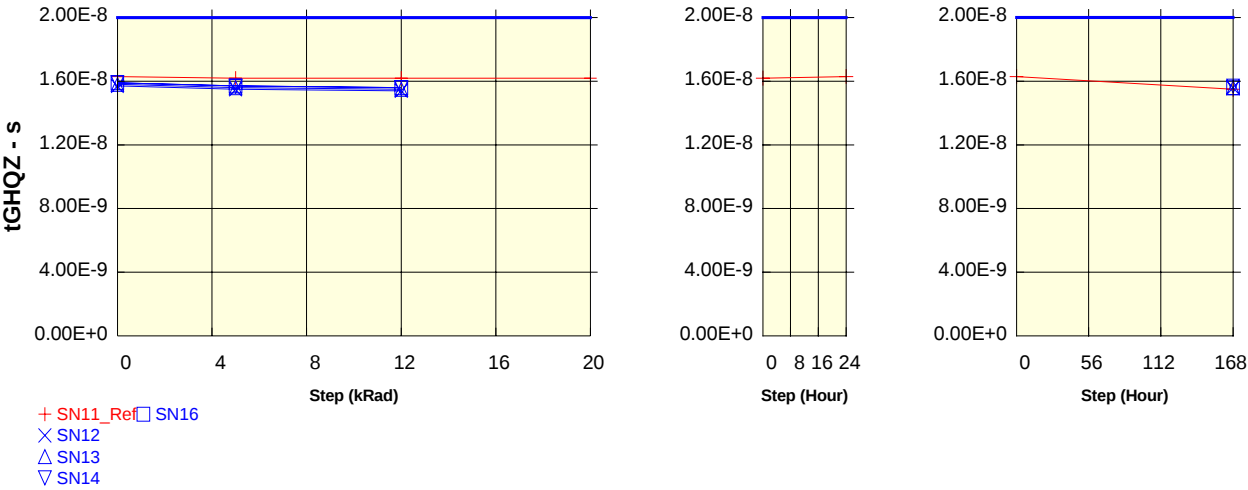
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.45E-8	1.43E-8	1.43E-8	1.43E-8
SN12	1.43E-8	1.41E-8	1.39E-8	
SN13	1.41E-8	1.39E-8	1.38E-8	
SN14	1.43E-8	1.41E-8	1.40E-8	
SN16	1.45E-8	1.43E-8	1.41E-8	
Statistics				
Min	1.41E-8	1.39E-8	1.38E-8	0.00E+0
Max	1.45E-8	1.43E-8	1.41E-8	0.00E+0
Mean	1.43E-8	1.41E-8	1.40E-8	0.00E+0
Sigma	1.63E-10	1.63E-10	1.29E-10	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.43E-8	1.45E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.45E-8	1.41E-8
SN12		1.41E-8
SN13		1.40E-8
SN14		1.42E-8
SN16		1.43E-8
Statistics		
Min		1.40E-8
Max		1.43E-8
Mean		1.42E-8
Sigma		1.29E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Output Enable to Output HiZ : tGHQZ
E* = VIL
 Unit : s
 Spec Limit Max : 2.00E-8
 Spec limits are represented in bold lines on the graphic.



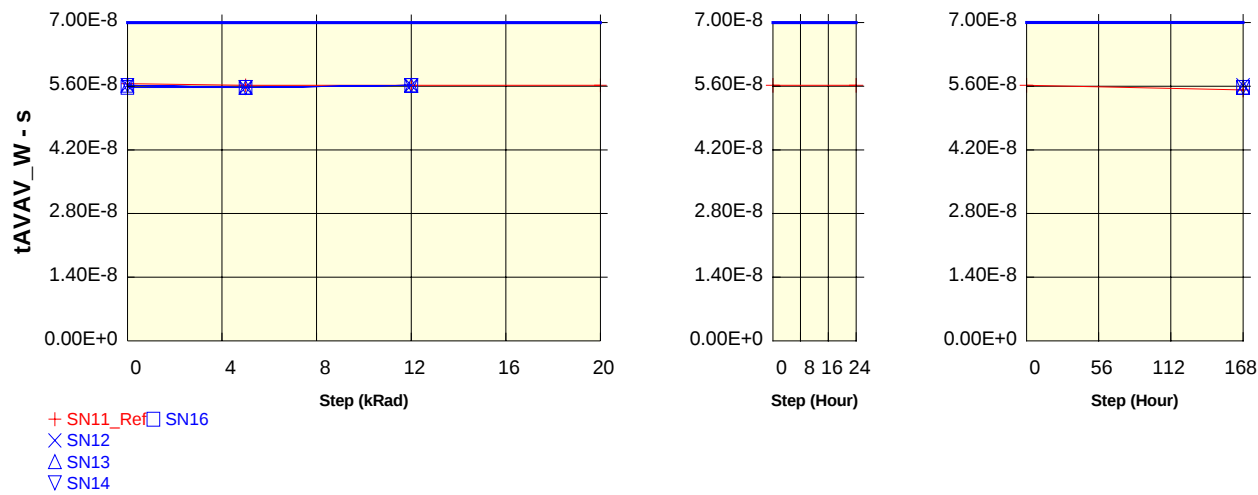
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.63E-8	1.62E-8	1.62E-8	1.62E-8
SN12	1.57E-8	1.55E-8	1.54E-8	
SN13	1.58E-8	1.56E-8	1.55E-8	
SN14	1.59E-8	1.57E-8	1.56E-8	
SN16	1.59E-8	1.57E-8	1.56E-8	
Statistics				
Min	1.57E-8	1.55E-8	1.54E-8	0.00E+0
Max	1.59E-8	1.57E-8	1.56E-8	0.00E+0
Mean	1.58E-8	1.56E-8	1.55E-8	0.00E+0
Sigma	9.57E-11	9.57E-11	9.57E-11	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.62E-8	1.63E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.63E-8	1.55E-8
SN12		1.56E-8
SN13		1.56E-8
SN14		1.57E-8
SN16		1.56E-8
Statistics		
Min		1.56E-8
Max		1.57E-8
Mean		1.56E-8
Sigma		5.00E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Write Cycle Time : tAVAV_W
 -
 Unit : s
 Spec Limit Max : 7.00E-8
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	5.66E-8	5.62E-8	5.62E-8	5.62E-8
SN12	5.62E-8	5.57E-8	5.62E-8	
SN13	5.62E-8	5.57E-8	5.62E-8	
SN14	5.62E-8	5.57E-8	5.62E-8	
SN16	5.57E-8	5.57E-8	5.62E-8	
Statistics				
Min	5.57E-8	5.57E-8	5.62E-8	0.00E+0
Max	5.62E-8	5.57E-8	5.62E-8	0.00E+0
Mean	5.61E-8	5.57E-8	5.62E-8	0.00E+0
Sigma	2.30E-10	0.00E+0	0.00E+0	0.00E+0

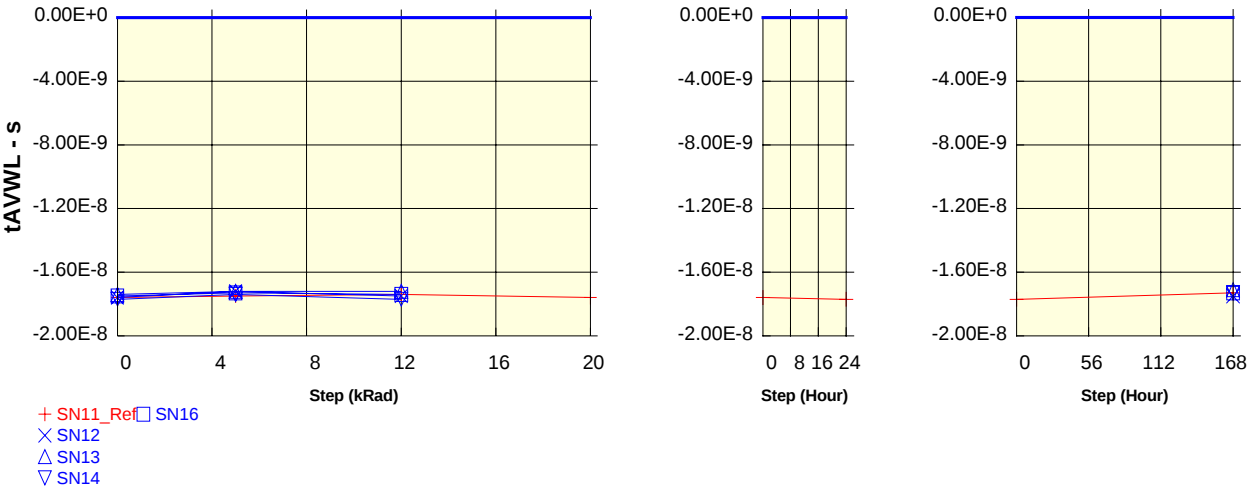
Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	5.62E-8	5.62E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	5.62E-8	5.52E-8
SN12		5.62E-8
SN13		5.57E-8
SN14		5.57E-8
SN16		5.57E-8
Statistics		
Min		5.57E-8
Max		5.62E-8
Mean		5.59E-8
Sigma		2.30E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Address Setup Time : tAVWL

Unit : s
Spec Limit Max : 0.00E+0
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	-1.76E-8	-1.75E-8	-1.74E-8	-1.76E-8
SN12	-1.76E-8	-1.72E-8	-1.75E-8	
SN13	-1.74E-8	-1.72E-8	-1.72E-8	
SN14	-1.77E-8	-1.74E-8	-1.77E-8	
SN16	-1.75E-8	-1.73E-8	-1.74E-8	
Statistics				
Min	-1.77E-8	-1.74E-8	-1.77E-8	0.00E+0
Max	-1.74E-8	-1.72E-8	-1.72E-8	0.00E+0
Mean	-1.76E-8	-1.73E-8	-1.75E-8	0.00E+0
Sigma	1.29E-10	9.57E-11	2.08E-10	0.00E+0

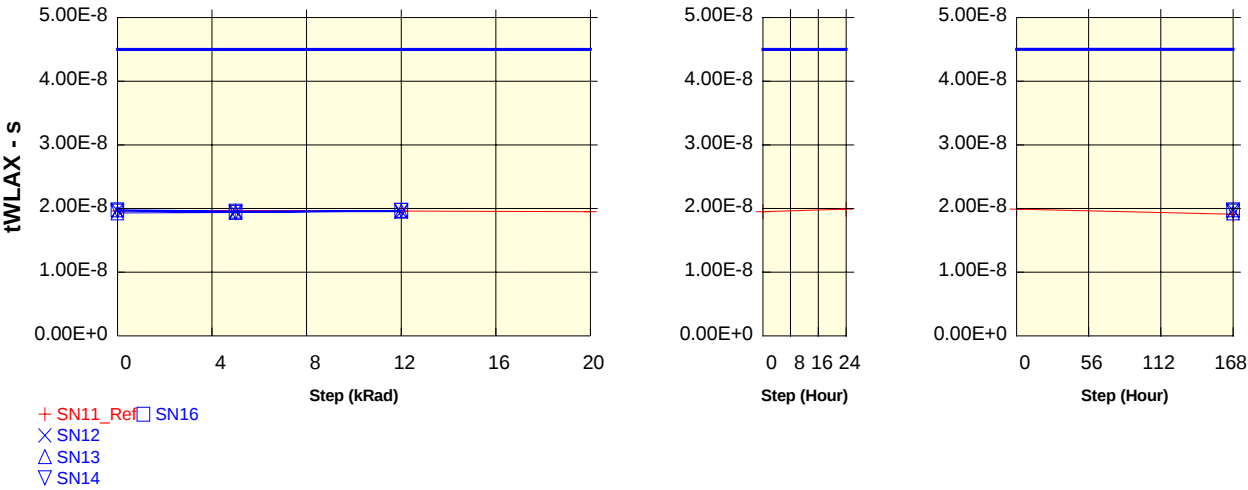
Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	-1.76E-8	-1.77E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	-1.77E-8	-1.73E-8
SN12		-1.75E-8
SN13		-1.71E-8
SN14		-1.73E-8
SN16		-1.73E-8
Statistics		
Min		-1.75E-8
Max		-1.71E-8
Mean		-1.73E-8
Sigma		1.63E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Address Hold Time : tWLAX
-

Unit : s
Spec Limit Max : 4.50E-8
Spec limits are represented in bold lines on the graphic.



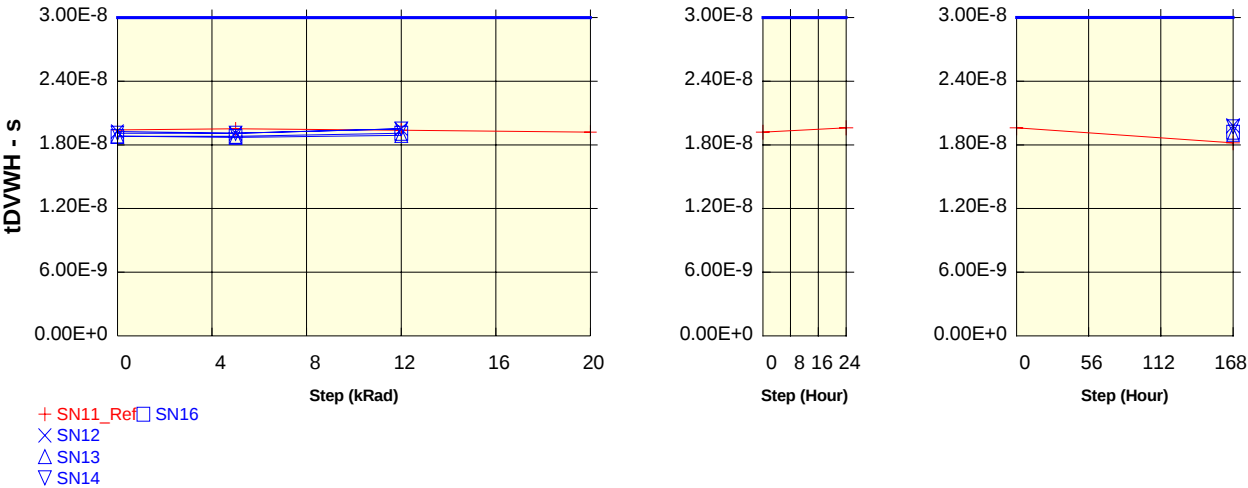
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.96E-8	1.97E-8	1.96E-8	1.95E-8
SN12	1.97E-8	1.95E-8	1.95E-8	
SN13	1.93E-8	1.94E-8	1.96E-8	
SN14	1.96E-8	1.94E-8	1.97E-8	
SN16	1.98E-8	1.96E-8	1.97E-8	
Statistics				
Min	1.93E-8	1.94E-8	1.95E-8	0.00E+0
Max	1.98E-8	1.96E-8	1.97E-8	0.00E+0
Mean	1.96E-8	1.95E-8	1.96E-8	0.00E+0
Sigma	2.16E-10	9.57E-11	9.57E-11	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.95E-8	1.99E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.99E-8	1.91E-8
SN12		1.97E-8
SN13		1.93E-8
SN14		1.96E-8
SN16		1.98E-8
Statistics		
Min		1.93E-8
Max		1.98E-8
Mean		1.96E-8
Sigma		2.16E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : Data Setup Time : tDVWH
 -
 Unit : s
 Spec Limit Max : 3.00E-8
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.94E-8	1.95E-8	1.94E-8	1.92E-8
SN12	1.93E-8	1.91E-8	1.95E-8	
SN13	1.88E-8	1.87E-8	1.89E-8	
SN14	1.91E-8	1.91E-8	1.95E-8	
SN16	1.88E-8	1.88E-8	1.91E-8	
Statistics				
Min	1.88E-8	1.87E-8	1.89E-8	0.00E+0
Max	1.93E-8	1.91E-8	1.95E-8	0.00E+0
Mean	1.90E-8	1.89E-8	1.93E-8	0.00E+0
Sigma	2.24E-10	2.06E-10	3.00E-10	0.00E+0

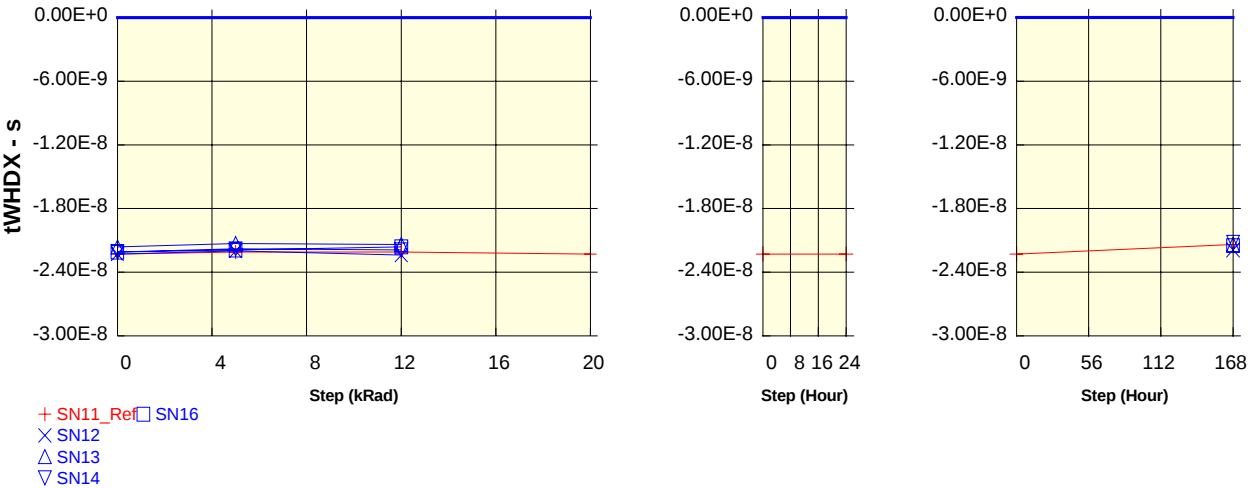
Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.92E-8	1.96E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.96E-8	1.82E-8
SN12		1.98E-8
SN13		1.90E-8
SN14		1.97E-8
SN16		1.92E-8
Statistics		
Min		1.90E-8
Max		1.98E-8
Mean		1.94E-8
Sigma		3.86E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201
				Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Data Hold Time : tWHDX

Unit : s
Spec Limit Max : 0.00E+0
Spec limits are represented in bold lines on the graphic.



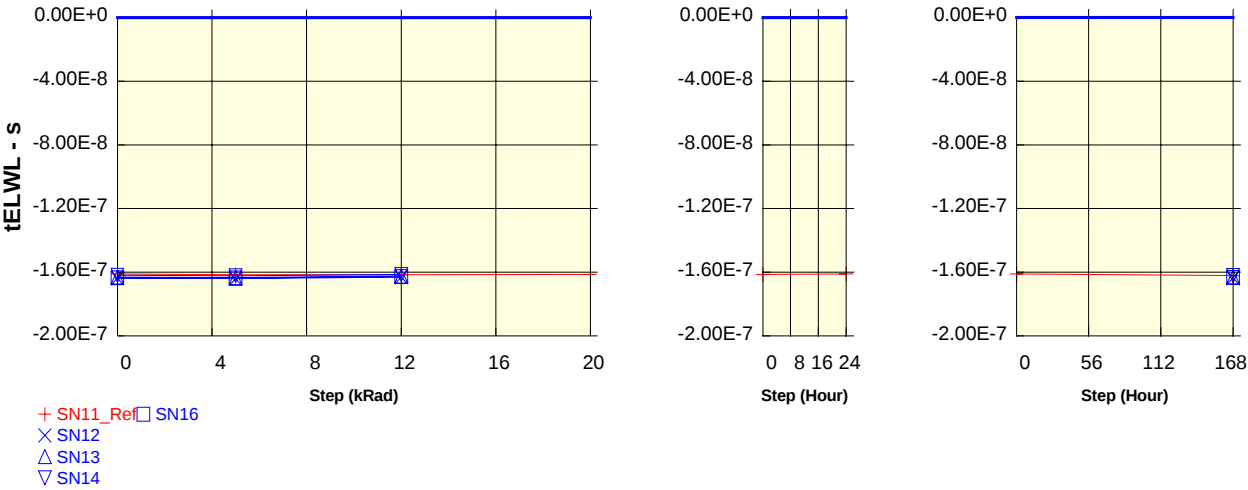
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	-2.23E-8	-2.21E-8	-2.21E-8	-2.23E-8
SN12	-2.23E-8	-2.20E-8	-2.24E-8	
SN13	-2.16E-8	-2.13E-8	-2.14E-8	
SN14	-2.21E-8	-2.18E-8	-2.19E-8	
SN16	-2.21E-8	-2.19E-8	-2.16E-8	
Statistics				
Min	-2.23E-8	-2.20E-8	-2.24E-8	0.00E+0
Max	-2.16E-8	-2.13E-8	-2.14E-8	0.00E+0
Mean	-2.20E-8	-2.18E-8	-2.18E-8	0.00E+0
Sigma	2.99E-10	3.11E-10	4.35E-10	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	-2.23E-8	-2.23E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	-2.23E-8	-2.14E-8
SN12		-2.19E-8
SN13		-2.14E-8
SN14		-2.12E-8
SN16		-2.15E-8
Statistics		
Min		-2.19E-8
Max		-2.12E-8
Mean		-2.15E-8
Sigma		2.94E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
 Parameter : CE* Setup Time : tELWL
 -
 Unit : s
 Spec Limit Max : 0.00E+0
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	-1.61E-7	-1.62E-7	-1.62E-7	-1.61E-7
SN12	-1.64E-7	-1.64E-7	-1.63E-7	
SN13	-1.63E-7	-1.63E-7	-1.63E-7	
SN14	-1.62E-7	-1.62E-7	-1.61E-7	
SN16	-1.64E-7	-1.64E-7	-1.63E-7	
Statistics				
Min	-1.64E-7	-1.64E-7	-1.63E-7	0.00E+0
Max	-1.62E-7	-1.62E-7	-1.61E-7	0.00E+0
Mean	-1.63E-7	-1.63E-7	-1.62E-7	0.00E+0
Sigma	8.06E-10	8.34E-10	7.42E-10	0.00E+0

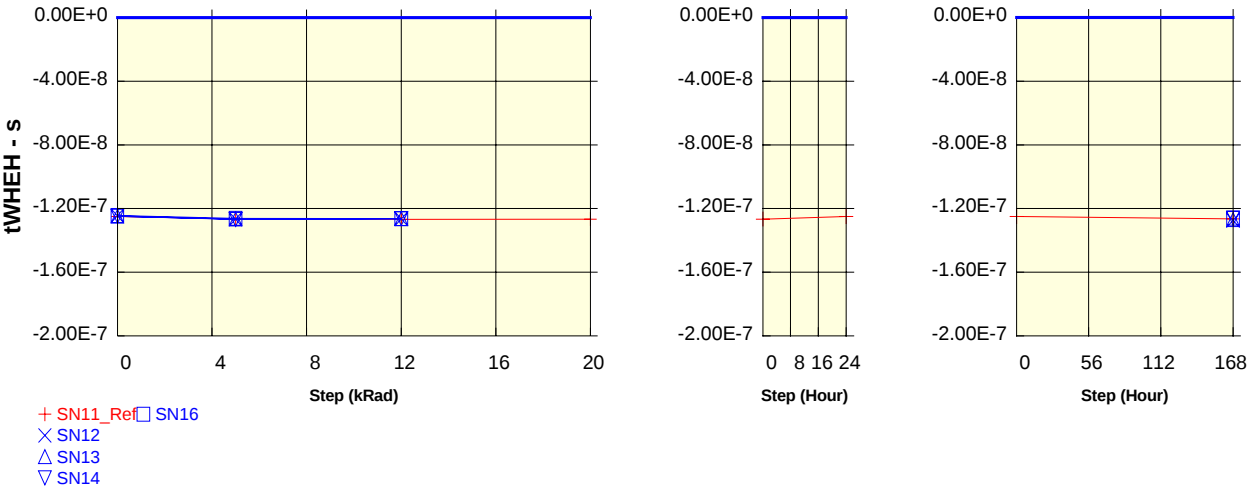
Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	-1.61E-7	-1.61E-7
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	-1.61E-7	-1.62E-7
SN12		-1.64E-7
SN13		-1.63E-7
SN14		-1.62E-7
SN16		-1.63E-7
Statistics		
Min		-1.64E-7
Max		-1.62E-7
Mean		-1.63E-7
Sigma		6.50E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : CE* Hold Time : tWHEH
-

Unit : s
Spec Limit Max : 0.00E+0
Spec limits are represented in bold lines on the graphic.



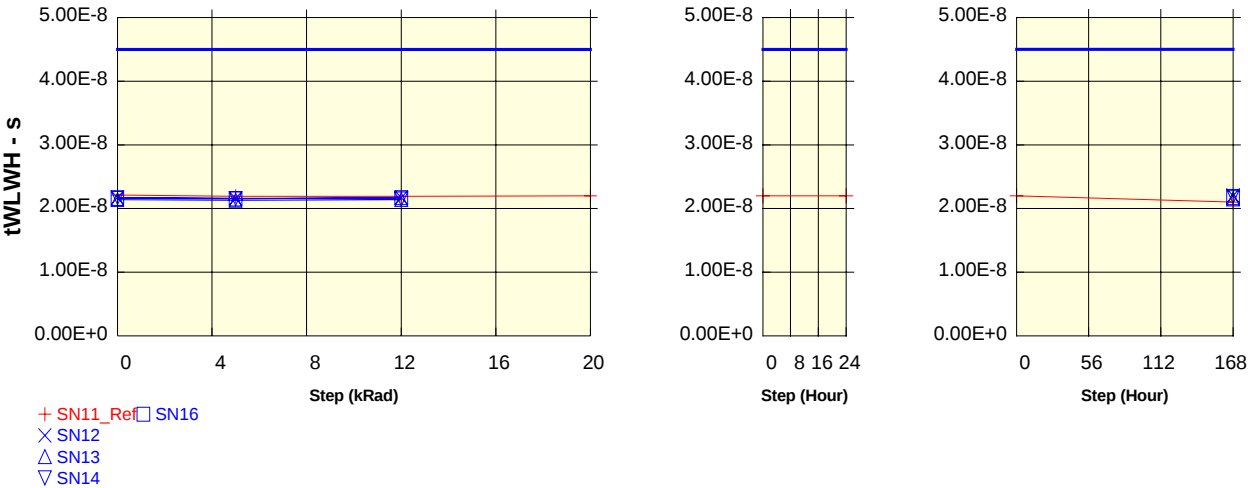
Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	-1.25E-7	-1.27E-7	-1.27E-7	-1.27E-7
SN12	-1.25E-7	-1.27E-7	-1.27E-7	
SN13	-1.25E-7	-1.27E-7	-1.26E-7	
SN14	-1.25E-7	-1.27E-7	-1.26E-7	
SN16	-1.24E-7	-1.26E-7	-1.26E-7	
Statistics				
Min	-1.25E-7	-1.27E-7	-1.27E-7	0.00E+0
Max	-1.24E-7	-1.26E-7	-1.26E-7	0.00E+0
Mean	-1.25E-7	-1.27E-7	-1.26E-7	0.00E+0
Sigma	2.22E-10	2.63E-10	9.57E-11	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	-1.27E-7	-1.25E-7
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	-1.25E-7	-1.27E-7
SN12		-1.27E-7
SN13		-1.27E-7
SN14		-1.26E-7
SN16		-1.26E-7
Statistics		
Min		-1.27E-7
Max		-1.26E-7
Mean		-1.27E-7
Sigma		6.85E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Write Pulse Width : tWLWH
 -
 Unit : s
 Spec Limit Max : 4.50E-8
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	2.21E-8	2.19E-8	2.19E-8	2.20E-8
SN12	2.17E-8	2.16E-8	2.17E-8	
SN13	2.14E-8	2.13E-8	2.14E-8	
SN14	2.17E-8	2.16E-8	2.15E-8	
SN16	2.16E-8	2.15E-8	2.17E-8	
Statistics				
Min	2.14E-8	2.13E-8	2.14E-8	0.00E+0
Max	2.17E-8	2.16E-8	2.17E-8	0.00E+0
Mean	2.16E-8	2.15E-8	2.16E-8	0.00E+0
Sigma	1.41E-10	1.41E-10	1.50E-10	0.00E+0

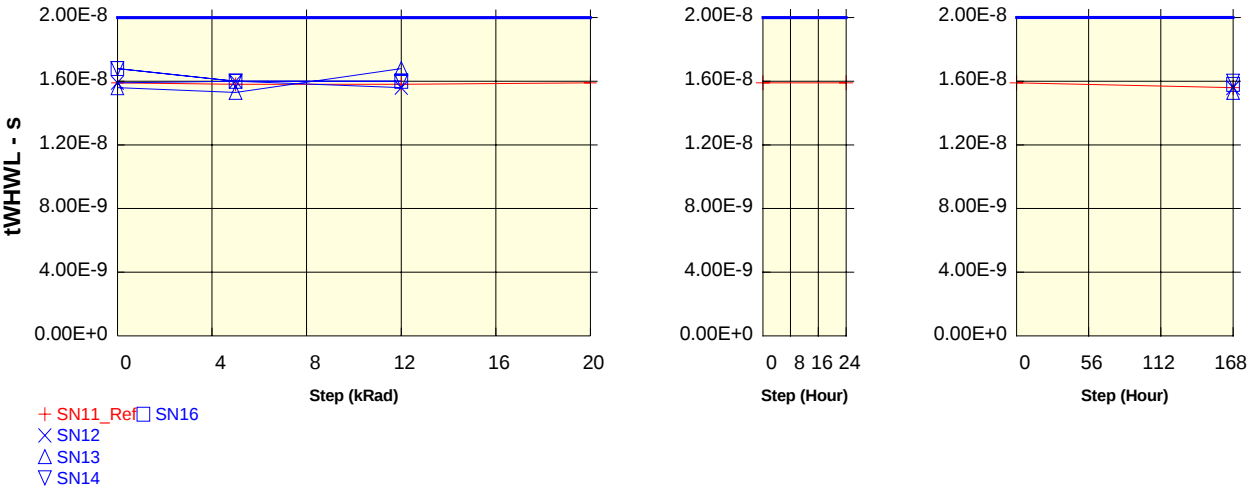
Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	2.20E-8	2.20E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	2.20E-8	2.10E-8
SN12		2.20E-8
SN13		2.15E-8
SN14		2.19E-8
SN16		2.17E-8
Statistics		
Min		2.15E-8
Max		2.20E-8
Mean		2.18E-8
Sigma		2.22E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0201 Issue : 01
Part Type :	M29F016B	Manufacturer :	ST Microelectronics	

Test conditions : TID
Parameter : Write Pulse Width High : tWHWL

Unit : s
Spec Limit Max : 2.00E-8
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure				
	0 kRad	5 kRad	12 kRad	20 kRad
SN11	1.59E-8	1.58E-8	1.58E-8	1.59E-8
SN12	1.59E-8	1.60E-8	1.56E-8	
SN13	1.56E-8	1.53E-8	1.68E-8	
SN14	1.68E-8	1.60E-8	1.60E-8	
SN16	1.68E-8	1.60E-8	1.60E-8	
Statistics				
Min	1.56E-8	1.53E-8	1.56E-8	0.00E+0
Max	1.68E-8	1.60E-8	1.68E-8	0.00E+0
Mean	1.63E-8	1.58E-8	1.61E-8	0.00E+0
Sigma	6.18E-10	3.50E-10	5.03E-10	0.00E+0

Test TST002 : Annealing 24h		
	0 Hour	24 Hour
SN11	1.59E-8	1.59E-8
SN12		
SN13		
SN14		
SN16		
Statistics		
Min		0.00E+0
Max		0.00E+0
Mean		0.00E+0
Sigma		0.00E+0

Test TST003 : Annealing 168h		
	0 Hour	168 Hour
SN11	1.59E-8	1.56E-8
SN12		1.56E-8
SN13		1.53E-8
SN14		1.60E-8
SN16		1.58E-8
Statistics		
Min		1.53E-8
Max		1.60E-8
Mean		1.57E-8
Sigma		2.99E-10