TOTAL DOSE RADIATION

TEST REPORT

Part Type : M28F101

Package : FP-32

Description : 1 Mbit (128Kb x 8) Flash Memory

Manufacturer : STMicroelectronics

ESA Purchase Order reference: Call-Off Order N°3 under contract 22327/09/NL/SFE dated 12/10/2010

ESA Technical Responsible: Christian POIVEY

Hirex reference :	HRX/TID/0951	Issue : 02	Date :	January 24th, 2012
Written by :	G. SAVI	Engineer S&D		
Approved by :	O.PERROTIN	Study Manager		
Authorized by:	J.F. PASCAL	Technical Director		

CHANGE RECORD

ISSUE	DATE	PAGE	DESCRIPTION OF CHANGES
01	December 26th, 2011	All	Original Issue
02	January 24th, 2012	1 4 6	Change date of proposal Add identification information on sample SN13 to SN15 Change Annealing step values

TOTAL DOSE RADIATION TEST REPORT
on STMicroelectronics
M28F101
1 Mbit (128Kb x 8) Flash Memory

TABLE OF CONTENTS

1 Introduction

A total dose radiation characterization test of the STMicroelectronics M28F101, 1 Mbit (128Kb x 8) Flash Memory has been performed with an accumulated dose of about 55 Krad(Si) at a dose rate of 110 rad(Si)/hour, in response to ESA purchase order reference Call-Off Order N°3 under contract 22327/09/NL/SFE.
This work is in relation to the third Call Of Order (COO3) of the frame contract **radiation testing of candidate microelectronics parts for space applications**.

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 Engineering proposal reference HRX/PRO/2881 Issue 03 dated 12/10/2010.

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

2 Applicable and Reference Documents

2.1 Applicable Documents

- Hirex Engineering proposal: HRX/PRO/2881 Issue 03 dated 12/10/2010
- Hirex Engineering Detail Design Document: HRX/DDD/1475 Issue 01
- Hirex Engineering Test Conditions: HRX/TC/1160 Issue 01
- Hirex Engineering irradiation Test Plan: HRX/SPE/0246 issue 01 dated 04/08/2011

2.2 Reference Documents

- Manufacturer Datasheet
- ESA Statement of Work: TEC-QCA/CP/SOW/2009-3 issue 01.

3 Test Samples

12 samples of the M28F101 device were tested (10 ON + 2 control sample). Samples were allocated into the bias conditions during exposures and annealing as provided in the following table.
5 samples have been erased and rewritten (named “Reprogrammed”) at each step and 5 other samples have not been erased and written but read only (named “Not reprogrammed”)

Serial Number	Allocation	Top Marking
1	Control Not reprogrammed	logo 30926A M28F101K
2	Control Reprogrammed	logo 30926A M28F101K
5	Biased ON. Not reprogrammed	logo 30926A M28F101K
6	Biased ON. Not reprogrammed	logo 30926A M28F101K
7	Biased ON. Not reprogrammed	logo 30926A M28F101K
8	Biased ON. Not reprogrammed	logo 30926A M28F101K
10	Biased ON. Not reprogrammed	logo 30926A M28F101K
11	Biased ON. Reprogrammed	logo 30926A M28F101K
12	Biased ON. Reprogrammed	logo 30926A M28F101K
13	Biased ON. Reprogrammed	logo 31118 M28F101SH1
14	Biased ON. Reprogrammed	logo 31118 M28F101SH1
15	Biased ON. Reprogrammed	logo 31118 M28F101SH1

Identification of the component including external marking and any die identification is provided on the following photos.

Photo 1 – Device Top marking

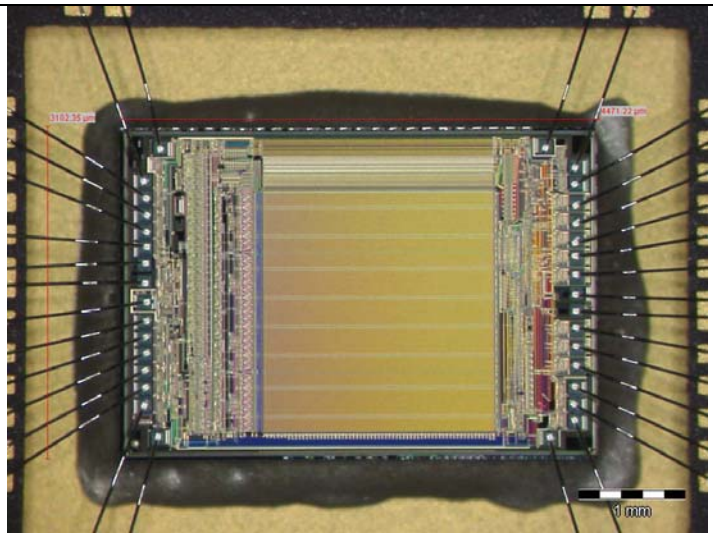


Photo 2 – Die, View

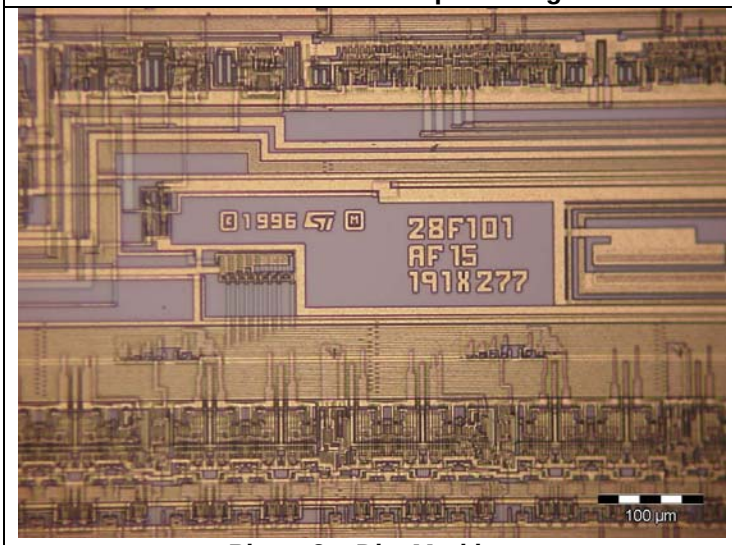


Photo 3 – Die, Marking

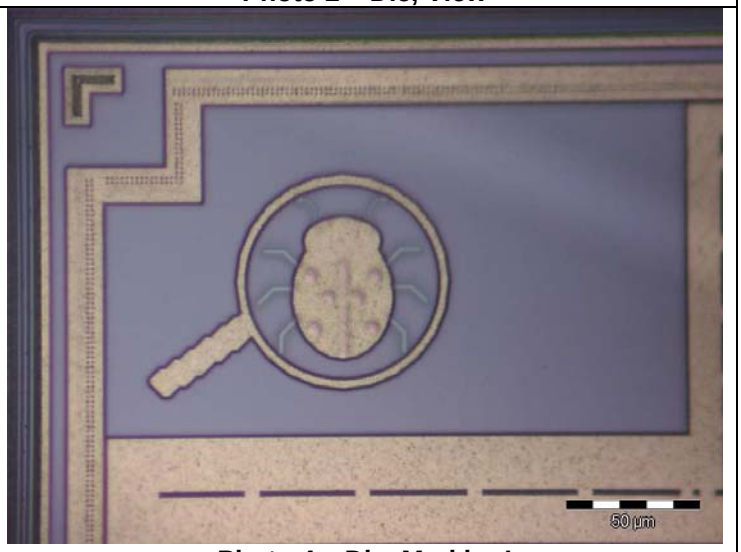


Photo 4 – Die, Marking!

4 Experimental Conditions

4.1 Radiation Source Dose Rate and Annealing

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

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

Resulting test conditions are provided below.

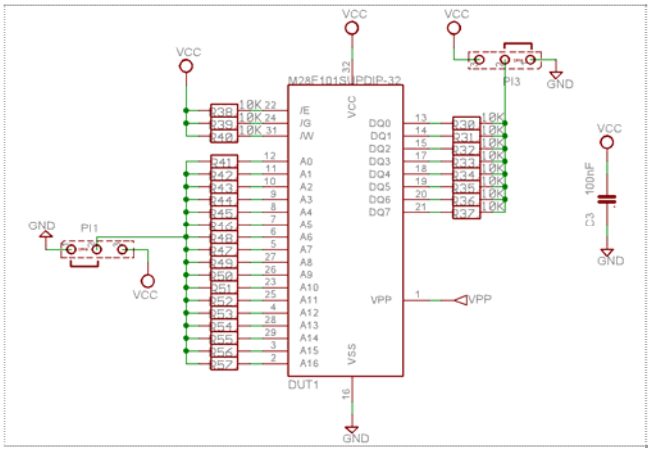
Irradiation Steps requested	Pellet dosimetry data	Dose rate	Annealing steps	Temperature
kRad(Si)	kRad(Si)	Rad(Si)/h	Hours	°C
0	0			
5	5.4	110		
10	10.8	110		
15	18 Note 1	110		
20	18.9 Note 1	10		
30	29.7	110		
40	41.4	110		
50	54.9	110		
			24	Room
			168	100
			500	100
			1000	100
			2000	100

Note 1: At 18 krad(Si) step, Hirex Flash memory tester failed without possibility to measure any device at this point. Samples were put back in the irradiation chamber at a dose rate of 10 rad(Si)/h during 48 hours pending tester reparation. When tester was again available, samples were measured at 18.9 krad(Si).

4.2 Bias during Dose Exposures and Measurements conditions

4.2.1 Bias conditions

During exposures test board allowed to bias 10 samples 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 temperatures.



PI1=GND, PI3=GND, VCC=5V, VPP=0V

Figure 1 : Bias Conditions during Irradiation Exposures and Annealing

Device Functionality (read checkerboard on addresses x0000 to x000F) have been checked and recorded in situ during exposures and annealing.
For this purpose a microcontroller based board has been designed to read alternately samples every 15 minutes (see figure 2).

Results of functionality monitoring during the various exposures are provided in Appendix 1
Results of functionality monitoring during annealing are provided in Appendix 2

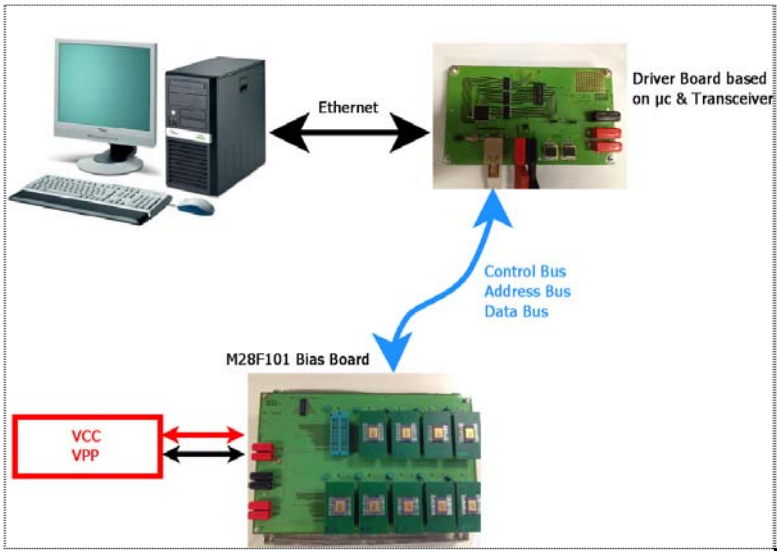


Figure 2 : In situ test functionality description during exposure and annealing

4.2.2 Electrical Measurements

Electrical parameters test program principle for M28F101 is provided in Figure 2.

One HP4142 DC tester and one Credence IMS tester were used to perform required measurements.

A dedicated test fixture was designed to ensure proper measurement conditions.

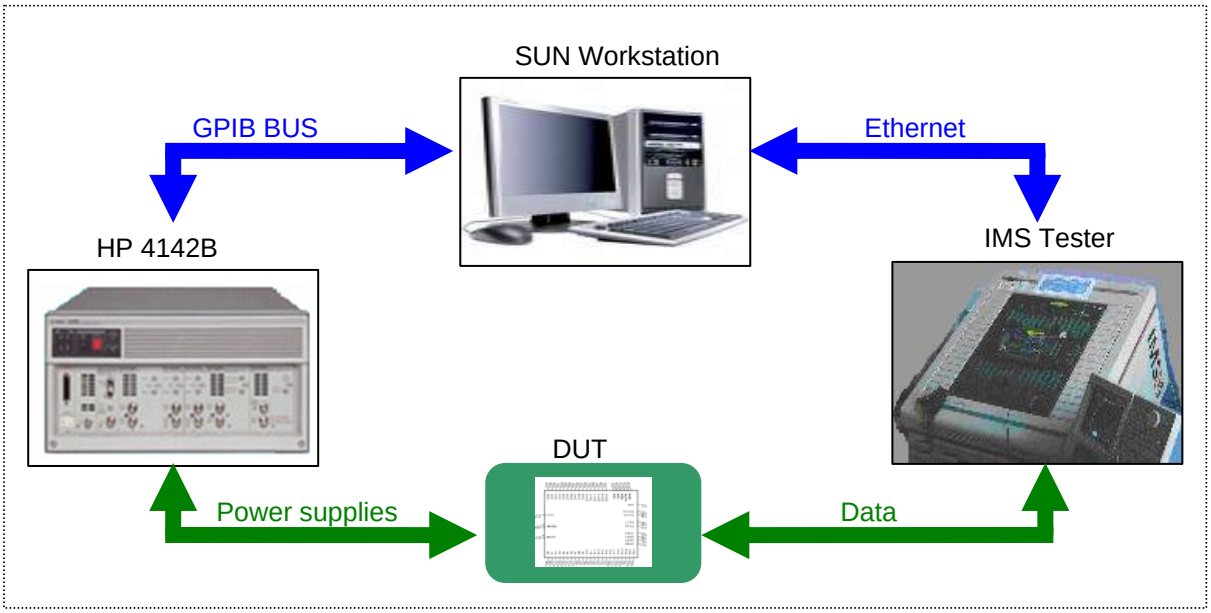


Figure 3 : M28F101 test program principle

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

PARAMETERS	SYMBOLS	TEST CONDITIONS (Vcc = 5V unless otherwise specified)	MIN	TYP	MAX	UNITS
Supply Current Read	ICC	/E=Vil, f=6MHz	-	-	30.0E-3	A
Supply Current Standby TTL	ICC1_TTL	/E=Vih	-	-	1.0E-3	A
Supply Current Standby CMOS	ICC1_CMOS	/E=VCC - 0.2V	-	-	50.0E-6	A
Input Low Voltage	VIL	Control and address inputs – Go-no-Go tested Note 1	-	-	800.0E-3	V
Input High Voltage TTL	VIH_TTL	Control and address inputs – Go-no-Go tested Note 1	2	-	-	V
Input High Voltage CMOS	VIH_CMOS	Control and address inputs – Go-no-Go tested Note 1	3.5	-	-	V
Output Low Voltage 1	VOL_1	IOL=5.8mA	-	-	0.45	V
Output Low Voltage 2	VOL_2	IOL=2.1mA	-	-	0.45	V
Output High Voltage CMOS 1	VOH_CMOS_1	IOH=-100uA, CMOS inputs	4.1	-	-	V
Output High Voltage CMOS 2	VOH_CMOS_2	IOH=-2.5mA, CMOS inputs	4.25	-	-	V
Output High Voltage TTL	VOH_TTL	IOH=-2.5mA, TTL Inputs	2.4	-	-	V
Read Cycle time	tRC	/E=Vil, /G=VIL, Vil=0.45V, Vih=2.4V, Vol=0.8V, Voh=2V	-	-	70.0E-9	s
Functional Test 1	FCT_1	Read Checkerboard Pattern	-	-	-	-
Functional Test 2	FCT_2	Erase, Program and Read Checkerboard Pattern	-	-	-	-

Notes:
[1]: Vil Vih not measured on DATA_IN pins
[2]: FCT_2 was performed during initial and final measurements for all samples.
FCT_1 was performed during exposures and annealing steps on SN5, 6, 7, 8, 10 and control sample SN1.
FCT_2 was performed during exposures and annealing steps on SN11, 12, 13, 14 15 and control sample SN2

Table 1 : Measured electrical parameters

5 Conclusion

A Total Ionizing Dose characterization test was carried out by Hirex Engineering under ESA contract on the STMicroelectronics M28F101 1 Mbit (128Kb x 8) Flash Memory in FP-32 package.

12 samples plus one control sample were used during testing. They were exposed to radiation using a dose rate of 110 rad(Si)/hour at room temperature.

For in-situ functionality monitoring, the group of reprogrammed samples has shown higher susceptibility to the dose received than the group of read only samples (first failures occurred at 14 Krad(Si) and 26 Krad(Si) respectively). More detailed results are provided below and in section 7 of this report (Appendix 1 and Appendix 2):

- Group of samples not reprogrammed at each electrical steps:
  - SN5 lost functionality after around 26 krad(Si)
  - SN6 lost functionality after around 30 krad(Si)
  - SN7 lost functionality after around 30 krad(Si)
  - SN8 functional all along testing
  - SN10 lost functionality around 30 krad(Si)

- Group of samples reprogrammed at each electrical steps:
  - SN11 lost functionality after 14 krad(Si). It recovered functionality at 18.5 krad(si) after exposure at 10rad(si)/h. Then it lost again functionality after 20 krad(Si)
  - SN12 lost functionality after 33 krad(Si)
  - SN13 lost functionality after 51 krad(Si)
  - SN14 lost functionality after 14 krad(si), recover functionality at 18.5 krad(si) after exposure at 10rad(si)/h. Then it lost again functionality after 20 krad(Si)
  - SN15 lost functionality after 14 krad(si), recover functionality at 18.5 krad(si) after exposure at 10rad(si)/h. Then it lost again functionality after 20 krad(Si)

After 24 hours annealing at room + 1 hour of annealing at 100°C, all samples recovered their functionality.

It should be noted that at 18 krad(Si) step, Hirex Flash memory tester failed without any possibility to measure devices at this point. Samples were put back in the irradiation chamber at a dose rate of 10 rad(Si)/h during 48 hours pending tester reparation. When tester was again available, samples were measured at 18.9 krad(Si).

A summary of the failed parameters is provided in Table 2. The behavior of each parameter is recorded for both groups of samples.

Parameters not listed remained within specification limits all along testing.
Detail test results for all parameters are presented in the next section.

Parameters	Failure Level between :		Annealing Recovery [Note 1]					Comments
			NA	No	Partial	Complete	Rebound	
ICC1_CMOS	ON_R samples	10.8 & 18.9 kRad(Si)				X		
	ON_RW samples	10.8 & 18.9 kRad(Si)				X		
VIL	ON_R samples	18.9 & 29.7 kRad(Si)				X		
	ON_RW samples	18.9 & 29.7 kRad(Si)				X		
VIH_TTL	ON_R samples	18.9 & 29.7 kRad(Si)				X		
	ON_RW samples	18.9 & 29.7 kRad(Si)				X		
VIH_CMOS	ON_R samples	18.9 & 29.7 kRad(Si)				X		
	ON_RW samples	18.9 & 29.7 kRad(Si)				X		
VOL parameters	ON_R samples	18.9 & 29.7 kRad(Si)				X		[Note 2]
	ON_RW samples	18.9 & 29.7 kRad(Si)				X		[Note 2]
tRC	ON_R samples	29.7 & 41.4 kRad(Si)				X		
	ON_RW samples	18.9 & 29.7 kRad(Si)				X		
FCT_1	ON_R samples	18.9 & 29.7 kRad(Si)				X		
	ON_RW samples	18.9 & 29.7 kRad(Si)				X		
FCT_2	ON_R samples	Not applicable						
	ON_RW samples	18.9 & 29.7 kRad(Si)				X		

[Note 1]: **NA** = Not applicable, **No:** means no sample has recovered, **Partial:** means at least one sample has recovered, **Complete:** means all samples have recovered, **Rebound**: means rebound has been observed on at least one sample.
[Note 2]: Missing points correspond to a failure due to a loss of functionality.

Table 2 : Summary of failed parameters

6 Test Results

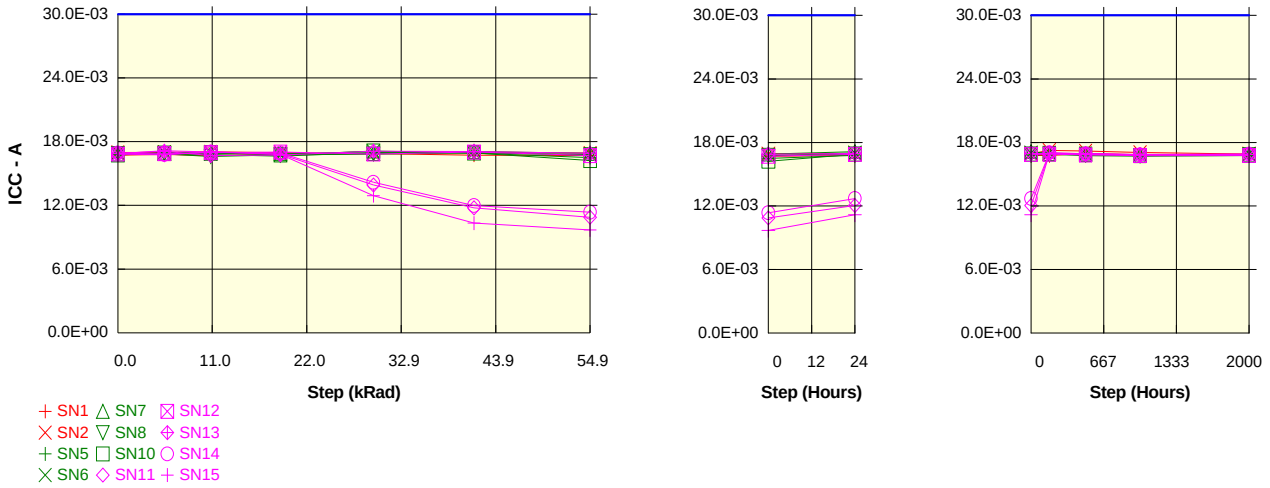
Test results including tables and graphics are provided in this section for each measured parameter.

Statistics are provided separately for both groups of samples.

Note on tables and plots:
In some cases, it may appear missing points in tables and plots, this situation corresponds to a failure due to an out of range measurement or a loss of functionality.

Failed values with respect to specified limits are highlighted in bold red font in the tables.

Parameter : Supply Current Read : ICC
Test conditions : /E=Vil. f=6MHZ
Unit : A
Spec Limit Max : 30.0E-03
Spec limits are represented in bold lines on the graphic.



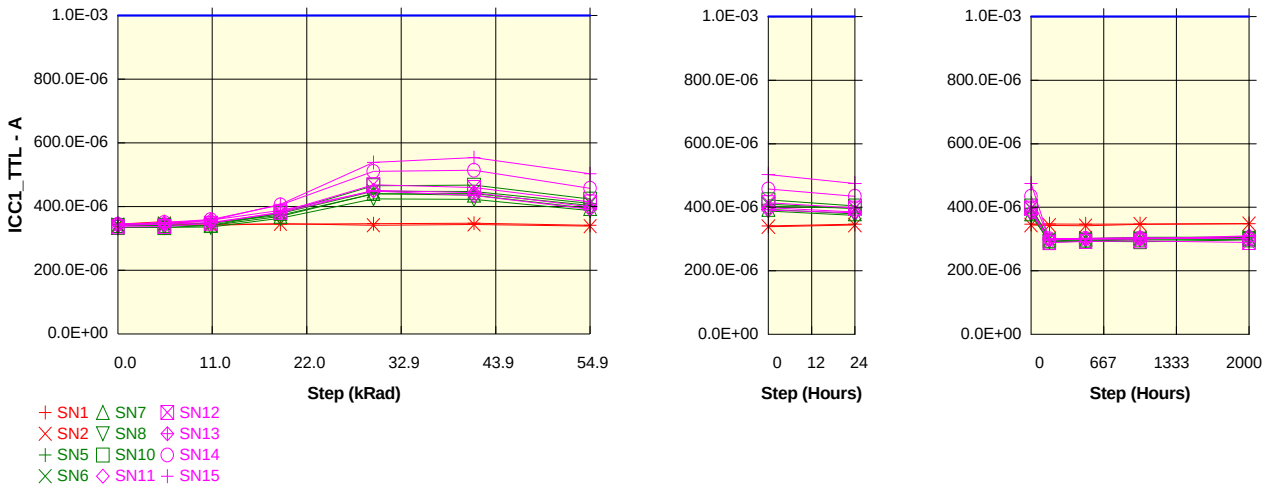
Measurements

ICC	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	16.7E-03	16.8E-03	16.7E-03	16.8E-03	16.9E-03	16.7E-03	16.7E-03	16.8E-03	16.8E-03	17.0E-03	16.8E-03	16.9E-03
SN2_REF	17.0E-03	17.0E-03	17.0E-03	17.0E-03	16.9E-03	17.0E-03	16.9E-03	16.9E-03	17.3E-03	17.2E-03	17.1E-03	16.9E-03
ON_R samples												
SN5	16.8E-03	16.8E-03	16.8E-03	16.6E-03	17.0E-03	16.9E-03	16.5E-03	16.8E-03	16.9E-03	16.8E-03	16.7E-03	16.8E-03
SN6	16.8E-03	17.0E-03	16.9E-03	16.8E-03	17.1E-03	17.0E-03	16.7E-03	17.0E-03	17.0E-03	16.9E-03	16.8E-03	16.9E-03
SN7	16.8E-03	16.9E-03	16.9E-03	16.9E-03	16.9E-03	17.1E-03	16.9E-03	17.1E-03	16.9E-03	16.9E-03	16.8E-03	16.8E-03
SN8	16.9E-03	16.9E-03	16.6E-03	16.8E-03	16.8E-03	17.0E-03	16.8E-03	16.9E-03	17.0E-03	16.9E-03	16.8E-03	16.9E-03
SN10	16.7E-03	16.9E-03	17.0E-03	16.7E-03	17.1E-03	16.9E-03	16.2E-03	16.9E-03	16.9E-03	16.9E-03	16.8E-03	16.8E-03
Statistics												
Min	16.7E-03	16.8E-03	16.6E-03	16.6E-03	16.8E-03	16.9E-03	16.2E-03	16.8E-03	16.9E-03	16.8E-03	16.7E-03	16.8E-03
Max	16.9E-03	17.0E-03	17.0E-03	16.9E-03	17.1E-03	17.1E-03	16.9E-03	17.1E-03	17.0E-03	16.9E-03	16.8E-03	16.9E-03
Average	16.8E-03	16.9E-03	16.8E-03	16.8E-03	17.0E-03	17.0E-03	16.6E-03	16.9E-03	16.9E-03	16.9E-03	16.8E-03	16.8E-03
Sigma	48.1E-06	47.9E-06	125.3E-06	72.2E-06	112.8E-06	51.2E-06	240.2E-06	120.8E-06	36.5E-06	58.6E-06	35.8E-06	44.4E-06

Measurements

ICC	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	16.7E-03	16.8E-03	16.7E-03	16.8E-03	16.9E-03	16.7E-03	16.7E-03	16.8E-03	16.8E-03	17.0E-03	16.8E-03	16.9E-03
SN2_REF	17.0E-03	17.0E-03	17.0E-03	17.0E-03	16.9E-03	17.0E-03	16.9E-03	16.9E-03	17.3E-03	17.2E-03	17.1E-03	16.9E-03
ON_RW samples												
SN11	16.8E-03	16.8E-03	17.0E-03	16.8E-03	13.9E-03	11.8E-03	10.9E-03	12.1E-03	17.0E-03	16.9E-03	16.9E-03	16.9E-03
SN12	16.8E-03	16.9E-03	16.9E-03	17.0E-03	16.8E-03	17.0E-03	16.7E-03	16.9E-03	16.9E-03	16.8E-03	16.7E-03	16.8E-03
SN13	16.9E-03	17.1E-03	16.7E-03	16.7E-03	17.1E-03	17.1E-03	16.9E-03	17.0E-03	16.9E-03	16.9E-03	16.8E-03	16.9E-03
SN14	16.9E-03	16.8E-03	17.0E-03	16.9E-03	14.2E-03	12.0E-03	11.4E-03	12.7E-03	17.0E-03	16.9E-03	16.8E-03	16.9E-03
SN15	16.9E-03	17.1E-03	17.0E-03	16.8E-03	12.9E-03	10.3E-03	9.7E-03	11.2E-03	17.0E-03	16.9E-03	16.8E-03	16.9E-03
Statistics												
Min	16.8E-03	16.8E-03	16.7E-03	16.7E-03	12.9E-03	10.3E-03	9.7E-03	11.2E-03	16.9E-03	16.8E-03	16.7E-03	16.8E-03
Max	16.9E-03	17.1E-03	17.0E-03	17.0E-03	17.1E-03	17.1E-03	16.9E-03	17.0E-03	17.0E-03	16.9E-03	16.9E-03	16.9E-03
Average	16.9E-03	16.9E-03	16.9E-03	16.9E-03	15.0E-03	13.6E-03	13.1E-03	14.0E-03	17.0E-03	16.9E-03	16.8E-03	16.9E-03
Sigma	41.4E-06	152.1E-06	131.3E-06	98.9E-06	1.7E-03	2.8E-03	3.1E-03	2.5E-03	47.5E-06	40.4E-06	40.1E-06	44.4E-06

Parameter : Supply Current Standby TTL : ICC1_TTL
Test conditions : /E=Vih
Unit : A
Spec Limit Max : 1.0E-03
Spec limits are represented in bold lines on the graphic.



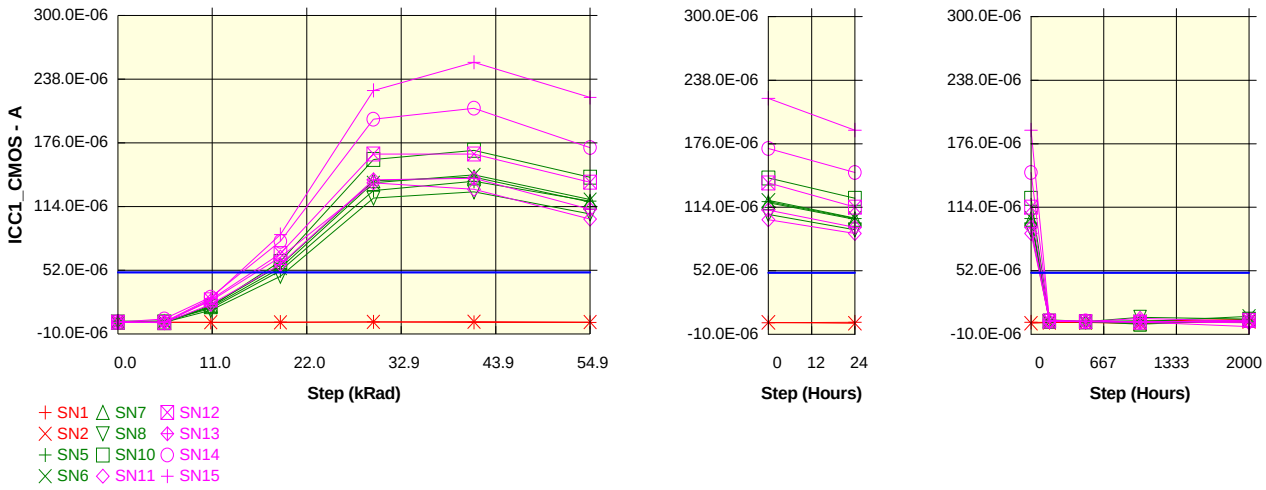
Measurements

ICC1_TTL	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	345.0E-06	352.8E-06	344.8E-06	345.1E-06	345.9E-06	347.9E-06	341.2E-06	346.8E-06	347.4E-06	347.1E-06	347.4E-06	348.0E-06
SN2_REF	340.8E-06	346.2E-06	341.4E-06	346.1E-06	341.3E-06	343.8E-06	338.8E-06	344.2E-06	342.8E-06	341.9E-06	346.1E-06	348.3E-06
ON_R samples												
SN5	343.4E-06	343.9E-06	347.7E-06	372.8E-06	439.6E-06	441.1E-06	403.4E-06	396.8E-06	301.1E-06	301.0E-06	305.5E-06	305.9E-06
SN6	343.8E-06	346.4E-06	346.9E-06	378.1E-06	448.6E-06	447.5E-06	409.8E-06	396.1E-06	300.6E-06	302.0E-06	302.7E-06	304.8E-06
SN7	334.7E-06	333.8E-06	340.7E-06	369.6E-06	441.0E-06	436.0E-06	393.7E-06	379.0E-06	290.2E-06	293.1E-06	291.8E-06	297.6E-06
SN8	334.3E-06	335.1E-06	335.4E-06	363.1E-06	424.3E-06	422.7E-06	387.6E-06	374.7E-06	292.2E-06	294.5E-06	297.1E-06	298.8E-06
SN10	340.2E-06	341.1E-06	341.3E-06	378.6E-06	465.8E-06	467.1E-06	423.5E-06	403.8E-06	294.5E-06	296.8E-06	299.6E-06	301.8E-06
Statistics												
Min	334.3E-06	333.8E-06	335.4E-06	363.1E-06	424.3E-06	422.7E-06	387.6E-06	374.7E-06	290.2E-06	293.1E-06	291.8E-06	297.6E-06
Max	343.8E-06	346.4E-06	347.7E-06	378.6E-06	465.8E-06	467.1E-06	423.5E-06	403.8E-06	301.1E-06	302.0E-06	305.5E-06	305.9E-06
Average	339.3E-06	340.1E-06	342.4E-06	372.4E-06	443.9E-06	442.9E-06	403.6E-06	390.1E-06	295.7E-06	297.5E-06	299.3E-06	301.8E-06
Sigma	4.1E-06	4.9E-06	4.5E-06	5.7E-06	13.5E-06	14.6E-06	12.6E-06	11.2E-06	4.4E-06	3.5E-06	4.7E-06	3.2E-06

Measurements

ICC1_TTL	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	345.0E-06	352.8E-06	344.8E-06	345.1E-06	345.9E-06	347.9E-06	341.2E-06	346.8E-06	347.4E-06	347.1E-06	347.4E-06	348.0E-06
SN2_REF	340.8E-06	346.2E-06	341.4E-06	346.1E-06	341.3E-06	343.8E-06	338.8E-06	344.2E-06	342.8E-06	341.9E-06	346.1E-06	348.3E-06
ON_RW samples												
SN11	345.1E-06	348.7E-06	357.4E-06	388.1E-06	449.0E-06	434.5E-06	391.2E-06	382.9E-06	299.6E-06	302.1E-06	303.6E-06	301.2E-06
SN12	336.3E-06	337.4E-06	348.0E-06	382.3E-06	468.6E-06	459.6E-06	414.3E-06	397.8E-06	288.8E-06	292.1E-06	293.7E-06	289.1E-06
SN13	345.4E-06	344.0E-06	350.1E-06	380.4E-06	450.7E-06	443.9E-06	398.9E-06	385.1E-06	297.5E-06	300.0E-06	300.3E-06	310.1E-06
SN14	344.1E-06	350.0E-06	359.0E-06	405.3E-06	510.2E-06	514.0E-06	457.4E-06	434.3E-06	301.5E-06	302.3E-06	303.0E-06	300.7E-06
SN15	340.4E-06	344.8E-06	356.4E-06	407.1E-06	538.3E-06	553.5E-06	503.0E-06	474.7E-06	297.2E-06	299.5E-06	300.0E-06	307.8E-06
Statistics												
Min	336.3E-06	337.4E-06	348.0E-06	380.4E-06	449.0E-06	434.5E-06	391.2E-06	382.9E-06	288.8E-06	292.1E-06	293.7E-06	289.1E-06
Max	345.4E-06	350.0E-06	359.0E-06	407.1E-06	538.3E-06	553.5E-06	503.0E-06	474.7E-06	301.5E-06	302.3E-06	303.6E-06	310.1E-06
Average	342.3E-06	345.0E-06	354.2E-06	392.6E-06	483.4E-06	481.1E-06	433.0E-06	415.0E-06	296.9E-06	299.2E-06	300.1E-06	301.8E-06
Sigma	3.4E-06	4.4E-06	4.3E-06	11.4E-06	35.2E-06	45.5E-06	41.8E-06	35.1E-06	4.4E-06	3.7E-06	3.5E-06	7.3E-06

Parameter : Supply Current Standby CMOS : ICC1_CMOS
Test conditions : /E=VCC-0.2V
Unit : A
Spec Limit Max : 50.0E-06
Spec limits are represented in bold lines on the graphic.



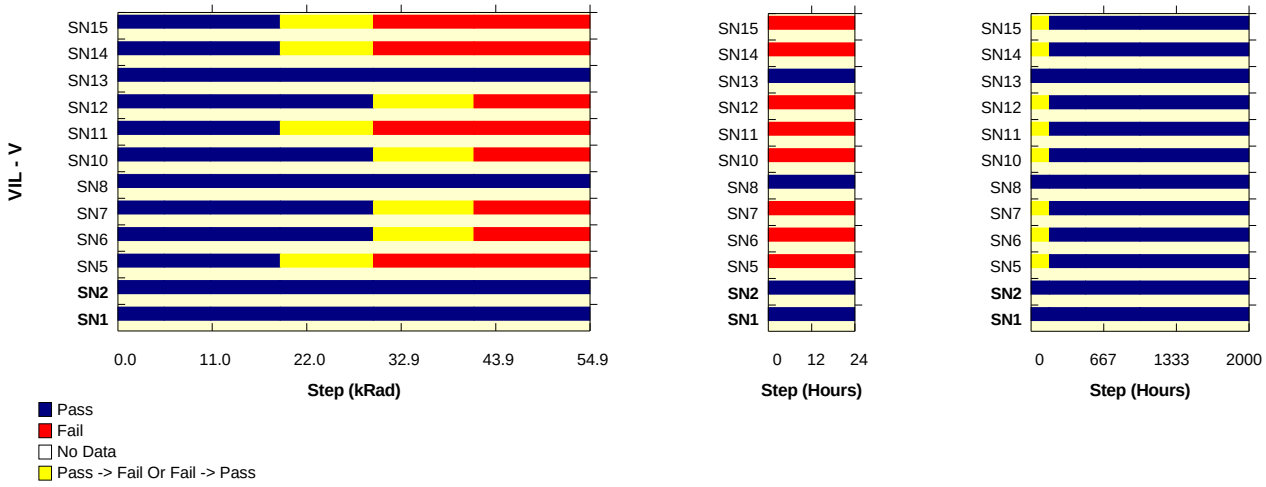
Measurements

ICC1_CMOS	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	1.6E-06	1.5E-06	1.3E-06	1.6E-06	1.7E-06	1.3E-06	1.2E-06	1.8E-06	1.6E-06	1.7E-06	2.8E-06	4.7E-06
SN2_REF	1.8E-06	1.4E-06	1.4E-06	1.2E-06	1.7E-06	2.0E-06	1.6E-06	840.0E-09	1.6E-06	1.7E-06	560.0E-09	2.7E-06
ON_R samples												
SN5	2.6E-06	2.7E-06	14.7E-06	51.5E-06	129.5E-06	138.6E-06	119.4E-06	102.9E-06	4.1E-06	2.6E-06	3.2E-06	1.6E-06
SN6	1.3E-06	1.4E-06	16.1E-06	54.2E-06	137.1E-06	144.8E-06	120.7E-06	103.4E-06	2.8E-06	2.4E-06	2.3E-06	7.6E-06
SN7	1.5E-06	1.0E-06	17.8E-06	57.0E-06	139.2E-06	142.7E-06	118.4E-06	102.2E-06	2.8E-06	2.3E-06	1.0E-06	4.0E-06
SN8	1.5E-06	1.4E-06	12.9E-06	46.1E-06	122.1E-06	128.3E-06	106.9E-06	92.0E-06	2.8E-06	2.3E-06	6.6E-06	4.8E-06
SN10	1.4E-06	1.5E-06	16.6E-06	60.6E-06	159.8E-06	168.8E-06	142.5E-06	122.7E-06	2.9E-06	2.4E-06	-140.0E-09	4.1E-06
Statistics												
Min	1.3E-06	1.0E-06	12.9E-06	46.1E-06	122.1E-06	128.3E-06	106.9E-06	92.0E-06	2.8E-06	2.3E-06	-140.0E-09	1.6E-06
Max	2.6E-06	2.7E-06	17.8E-06	60.6E-06	159.8E-06	168.8E-06	142.5E-06	122.7E-06	4.1E-06	2.6E-06	6.6E-06	7.6E-06
Average	1.6E-06	1.6E-06	15.6E-06	53.9E-06	137.6E-06	144.6E-06	121.6E-06	104.7E-06	3.1E-06	2.4E-06	2.6E-06	4.4E-06
Sigma	461.8E-09	580.8E-09	1.7E-06	4.9E-06	12.6E-06	13.3E-06	11.6E-06	10.0E-06	530.6E-09	129.1E-09	2.3E-06	1.9E-06

Measurements

ICC1_CMOS	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	1.6E-06	1.5E-06	1.3E-06	1.6E-06	1.7E-06	1.3E-06	1.2E-06	1.8E-06	1.6E-06	1.7E-06	2.8E-06	4.7E-06
SN2_REF	1.8E-06	1.4E-06	1.4E-06	1.2E-06	1.7E-06	2.0E-06	1.6E-06	840.0E-09	1.6E-06	1.7E-06	560.0E-09	2.7E-06
ON_RW samples												
SN11	1.5E-06	1.7E-06	22.2E-06	64.8E-06	137.0E-06	130.8E-06	101.8E-06	88.5E-06	2.8E-06	2.3E-06	5.6E-06	3.0E-06
SN12	1.4E-06	1.1E-06	23.2E-06	68.2E-06	165.2E-06	165.1E-06	137.8E-06	114.2E-06	2.9E-06	2.4E-06	1.8E-06	3.9E-06
SN13	1.6E-06	1.1E-06	18.9E-06	57.6E-06	140.1E-06	141.7E-06	111.4E-06	94.4E-06	2.6E-06	2.3E-06	2.4E-06	1.2E-06
SN14	1.6E-06	4.5E-06	25.8E-06	80.2E-06	199.1E-06	209.7E-06	171.3E-06	148.0E-06	3.6E-06	3.0E-06	2.4E-06	2.8E-06
SN15	1.2E-06	1.8E-06	24.6E-06	86.8E-06	227.1E-06	254.5E-06	220.3E-06	189.3E-06	3.1E-06	2.5E-06	2.0E-06	-2.5E-06
Statistics												
Min	1.2E-06	1.1E-06	18.9E-06	57.6E-06	137.0E-06	130.8E-06	101.8E-06	88.5E-06	2.6E-06	2.3E-06	1.8E-06	-2.5E-06
Max	1.6E-06	4.5E-06	25.8E-06	86.8E-06	227.1E-06	254.5E-06	220.3E-06	189.3E-06	3.6E-06	3.0E-06	5.6E-06	3.9E-06
Average	1.5E-06	2.0E-06	22.9E-06	71.5E-06	173.7E-06	180.4E-06	148.5E-06	126.9E-06	3.0E-06	2.5E-06	2.8E-06	1.7E-06
Sigma	144.3E-09	1.3E-06	2.4E-06	10.6E-06	34.8E-06	45.9E-06	43.2E-06	37.5E-06	321.6E-09	261.9E-09	1.4E-06	2.2E-06

Parameter : Input Low Voltage : VIL
Test conditions : Control and address inputs ; Go-no-Go tested (Vil Vih not measured on DATA_IN pins)
Unit : V
Spec Limit Max : 800.0E-03
Spec limits are represented in bold lines on the graphic.



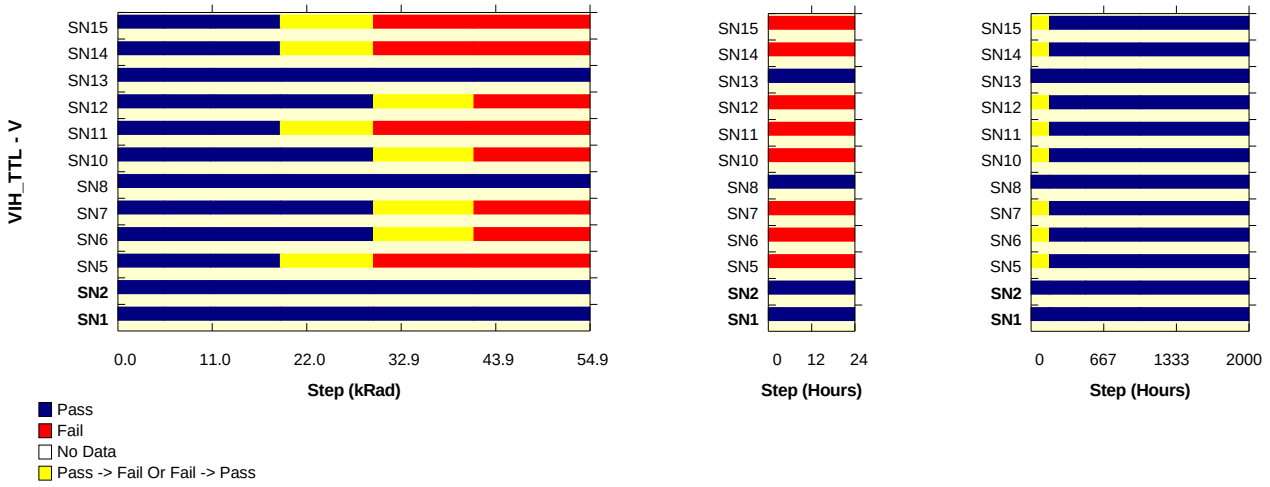
Measurements

VIL	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_R samples												
SN5	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN6	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN7	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN8	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN10	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

Measurements

VIL	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_RW samples												
SN11	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN13	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN14	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS
SN15	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS

Parameter : Input High Voltage TTL : VIH_TTL
Test conditions : Control and address inputs ; Go-no-Go tested (Vil Vih not measured on DATA_IN pins)
Unit : V
Spec Limit Min : 2.0E+00
Spec limits are represented in bold lines on the graphic.



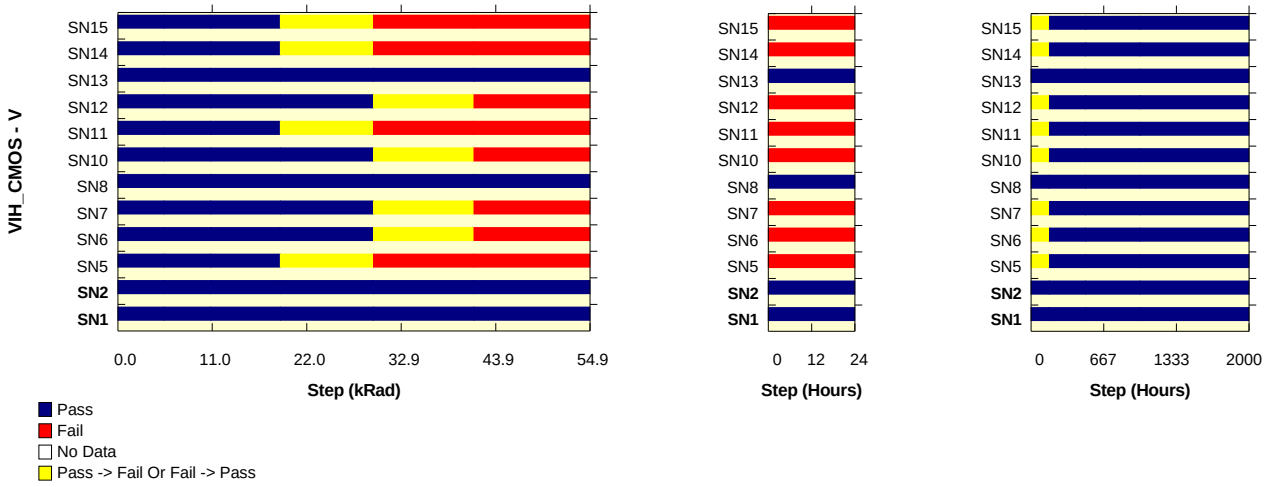
Measurements

VIH_TTL	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_R samples												
SN5	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN6	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN7	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN8	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN10	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

Measurements

VIH_TTL	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_RW samples												
SN11	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN13	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN14	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN15	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

Parameter : Input High Voltage CMOS : VIH_CMOS
Test conditions : Control and address inputs ; Go-no-Go tested (Vil Vih not measured on DATA_IN pins)
Unit : V
Spec Limit Min : 3.5E+00
Spec limits are represented in bold lines on the graphic.



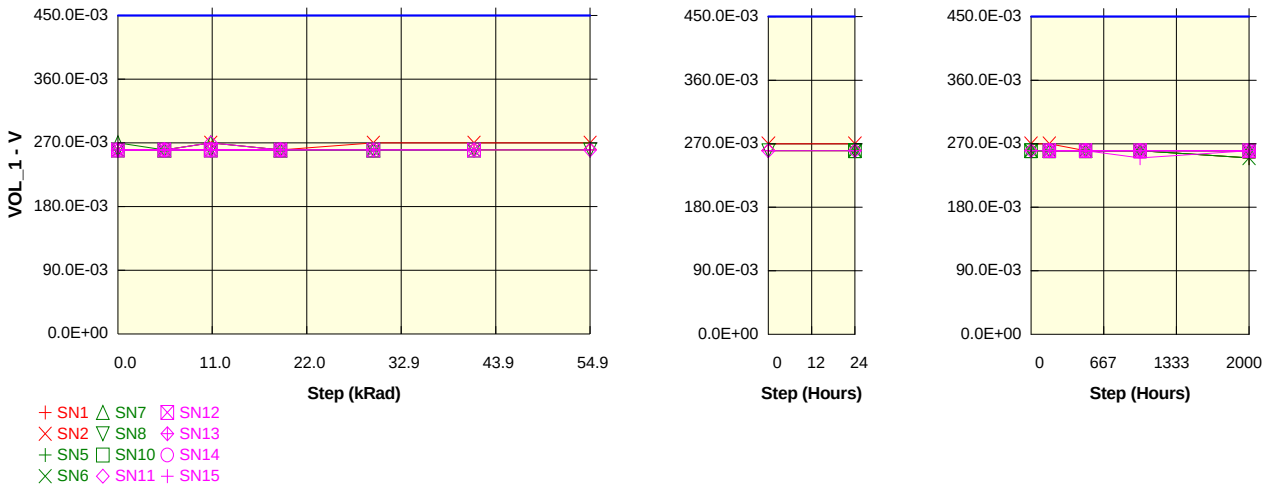
Measurements

VIH_CMOS	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_R samples												
SN5	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN6	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN7	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN8	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN10	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

Measurements

VIH_CMOS	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_RW samples												
SN11	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN13	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN14	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN15	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

Parameter : Output Low Voltage 1 : VOL_1DQ7
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



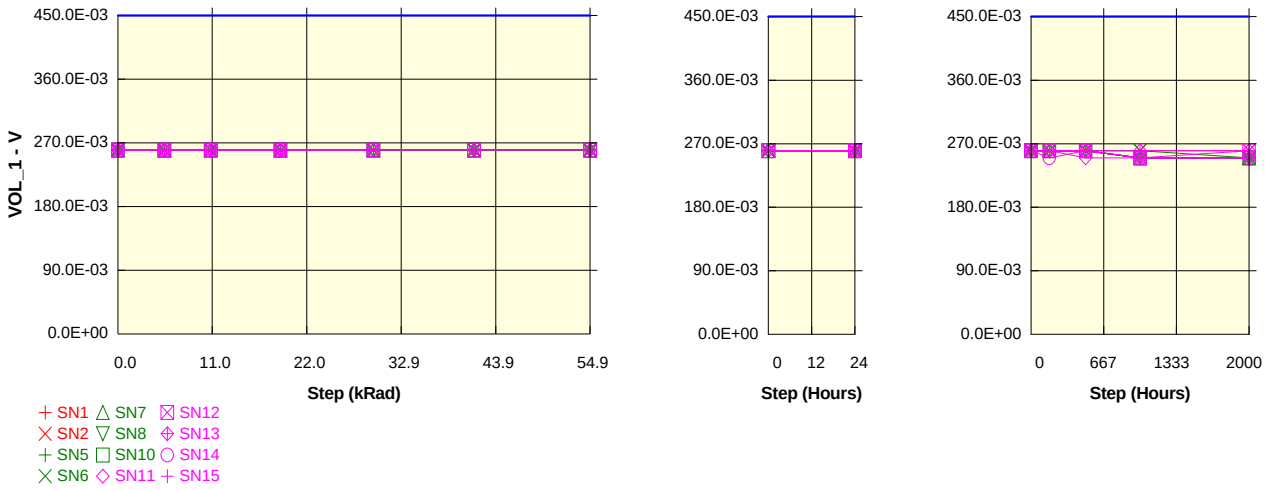
Measurements

VOL_1DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	270.0E-03	260.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
ON_R samples												
SN5	260.0E-03	260.0E-03	260.0E-03	260.0E-03					260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN6	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03		260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN7	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03			260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN8	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN10	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03		260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
Max	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Average	262.0E-03	260.0E-03	262.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	256.0E-03
Sigma	4.0E-03	1.7E-09	4.0E-03	1.7E-09	0.0E+00	2.2E-09	0.0E+00	0.0E+00	1.7E-09	1.7E-09	1.7E-09	4.9E-03

Measurements

VOL_1DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	270.0E-03	260.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
ON_RW samples												
SN11	260.0E-03	260.0E-03	270.0E-03	260.0E-03					260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN12	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03			260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN13	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN14	260.0E-03	260.0E-03	260.0E-03	260.0E-03					260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN15	260.0E-03	260.0E-03	260.0E-03	260.0E-03					260.0E-03	260.0E-03	250.0E-03	260.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	260.0E-03
Max	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Average	260.0E-03	260.0E-03	262.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	258.0E-03	260.0E-03
Sigma	1.7E-09	1.7E-09	4.0E-03	1.7E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-09	1.7E-09	4.0E-03	1.7E-09

Parameter : Output Low Voltage 1 : VOL_1DQ6
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



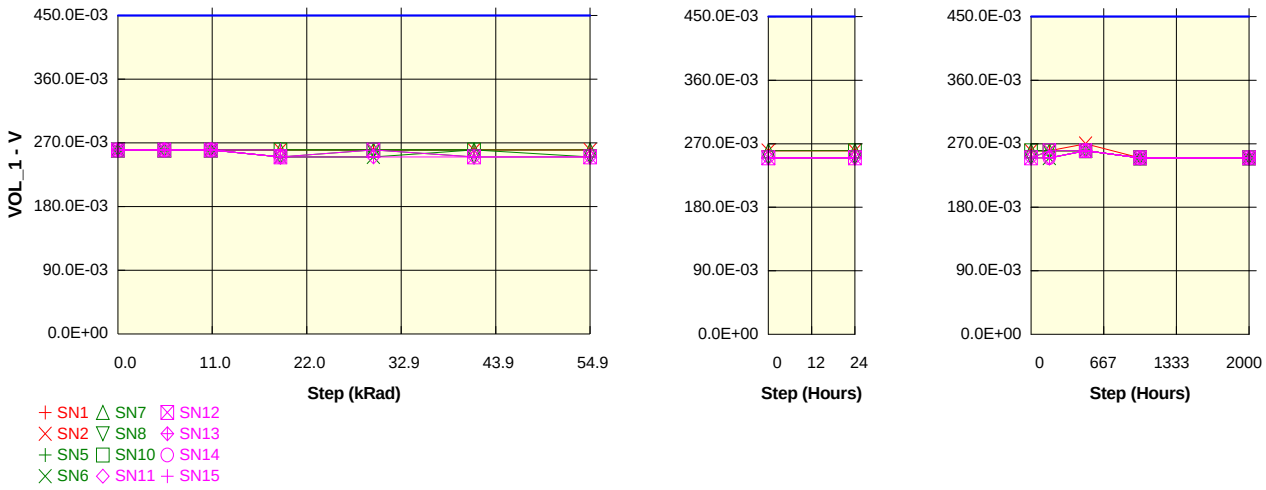
Measurements

VOL_1DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
ON_R samples												
SN5	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN6	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN7	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN8	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN10	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Max	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
Average	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	252.0E-03	250.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	4.0E-03	0.0E+00

Measurements

VOL_1DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
ON_RW samples												
SN11	260.0E-03	260.0E-03	260.0E-03	260.0E-03					260.0E-03	250.0E-03	250.0E-03	250.0E-03
SN12	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	260.0E-03
SN13	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN14	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03			260.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03
SN15	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03				260.0E-03	260.0E-03	250.0E-03	250.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
Max	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Average	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	258.0E-03	258.0E-03	252.0E-03	254.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	1.7E-09	0.0E+00	0.0E+00	0.0E+00	2.2E-09	4.0E-03	4.0E-03	4.0E-03	4.9E-03

Parameter : Output Low Voltage 1 : VOL_1DQ5
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



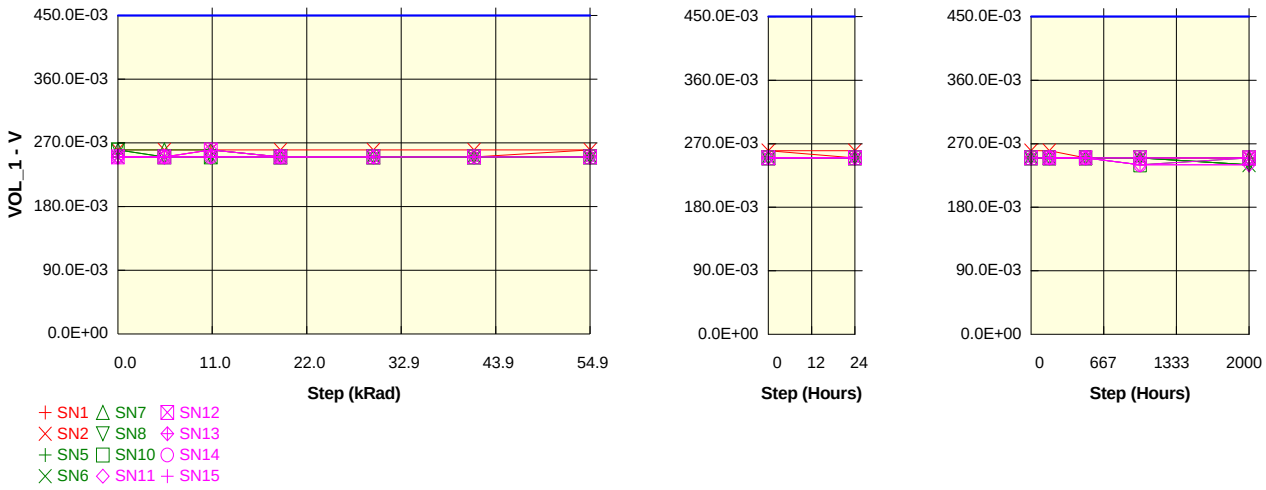
Measurements

VOL_1DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	270.0E-03	250.0E-03	250.0E-03
ON_R samples												
SN5	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03
SN6	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03				250.0E-03	260.0E-03	250.0E-03	250.0E-03
SN7	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN8	260.0E-03	260.0E-03	260.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN10	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03		260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03
Max	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Average	260.0E-03	260.0E-03	260.0E-03	254.0E-03	256.0E-03	257.5E-03	253.3E-03	255.0E-03	256.0E-03	260.0E-03	250.0E-03	250.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	4.9E-03	4.9E-03	4.3E-03	4.7E-03	5.0E-03	4.9E-03	1.7E-09	0.0E+00	0.0E+00

Measurements

VOL_1DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	270.0E-03	250.0E-03	250.0E-03
ON_RW samples												
SN11	260.0E-03	260.0E-03	260.0E-03	250.0E-03					250.0E-03	260.0E-03	250.0E-03	250.0E-03
SN12	260.0E-03	260.0E-03	260.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN13	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03
SN14	260.0E-03	260.0E-03	260.0E-03	250.0E-03					250.0E-03	260.0E-03	250.0E-03	250.0E-03
SN15	260.0E-03	260.0E-03	260.0E-03	260.0E-03					250.0E-03	260.0E-03	250.0E-03	250.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03
Max	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Average	260.0E-03	260.0E-03	260.0E-03	252.0E-03	255.0E-03	250.0E-03	250.0E-03	250.0E-03	252.0E-03	260.0E-03	250.0E-03	250.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	4.0E-03	5.0E-03	0.0E+00	0.0E+00	0.0E+00	4.0E-03	1.7E-09	0.0E+00	0.0E+00

Parameter : Output Low Voltage 1 : VOL_1DQ4
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



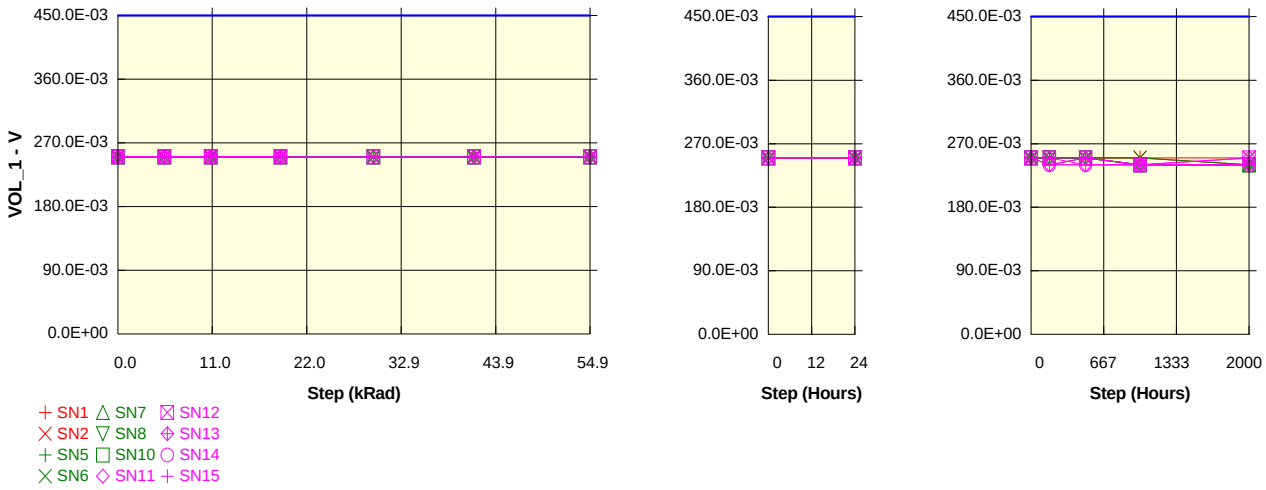
Measurements

VOL_1DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03
ON_R samples												
SN5	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03
SN6	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03
SN7	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
SN8	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03
SN10	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	250.0E-03
Statistics												
Min	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	240.0E-03
Max	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
Average	256.0E-03	252.0E-03	252.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	248.0E-03	244.0E-03
Sigma	4.9E-03	4.0E-03	4.0E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-03	4.9E-03

Measurements

VOL_1DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03
ON_RW samples												
SN11	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03				250.0E-03	250.0E-03	240.0E-03	240.0E-03
SN12	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
SN13	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
SN14	250.0E-03	250.0E-03	250.0E-03	250.0E-03					250.0E-03	250.0E-03	240.0E-03	250.0E-03
SN15	250.0E-03	250.0E-03	250.0E-03	250.0E-03					250.0E-03	250.0E-03	240.0E-03	240.0E-03
Statistics												
Min	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	240.0E-03
Max	250.0E-03	250.0E-03	260.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
Average	250.0E-03	250.0E-03	254.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	244.0E-03	246.0E-03
Sigma	0.0E+00	0.0E+00	4.9E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-03	4.9E-03

Parameter : Output Low Voltage 1 : VOL_1DQ3
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



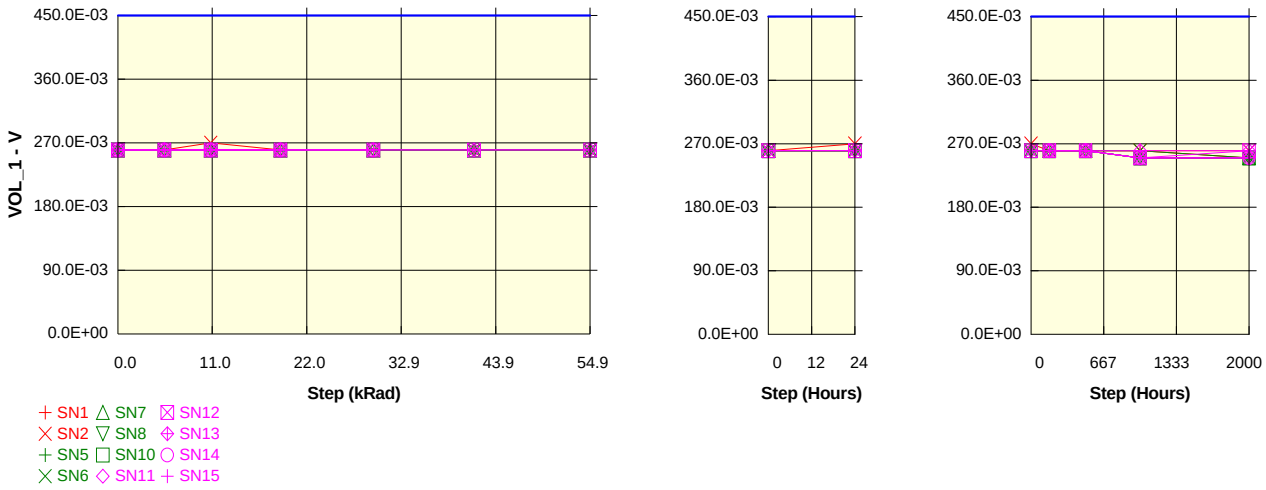
Measurements

VOL_1DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03
SN2_REF	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
ON_R samples												
SN5	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	250.0E-03	240.0E-03	240.0E-03
SN6	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03
SN7	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	240.0E-03
SN8	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	240.0E-03
SN10	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	240.0E-03
Statistics												
Min	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	250.0E-03	240.0E-03	240.0E-03
Max	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03
Average	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	248.0E-03	250.0E-03	242.0E-03	240.0E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-03	0.0E+00	4.0E-03	1.7E-09

Measurements

VOL_1DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03
SN2_REF	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03
ON_RW samples												
SN11	250.0E-03	250.0E-03	250.0E-03	250.0E-03					250.0E-03	240.0E-03	240.0E-03	240.0E-03
SN12	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	250.0E-03
SN13	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	250.0E-03	240.0E-03	250.0E-03
SN14	250.0E-03	250.0E-03	250.0E-03	250.0E-03					240.0E-03	240.0E-03	240.0E-03	240.0E-03
SN15	250.0E-03	250.0E-03	250.0E-03	250.0E-03					240.0E-03	240.0E-03	240.0E-03	240.0E-03
Statistics												
Min	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	240.0E-03	240.0E-03	240.0E-03
Max	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	240.0E-03	250.0E-03
Average	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	250.0E-03	244.0E-03	244.0E-03	240.0E-03	244.0E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-03	4.9E-03	1.7E-09	4.9E-03

Parameter : Output Low Voltage 1 : VOL_1DQ2
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



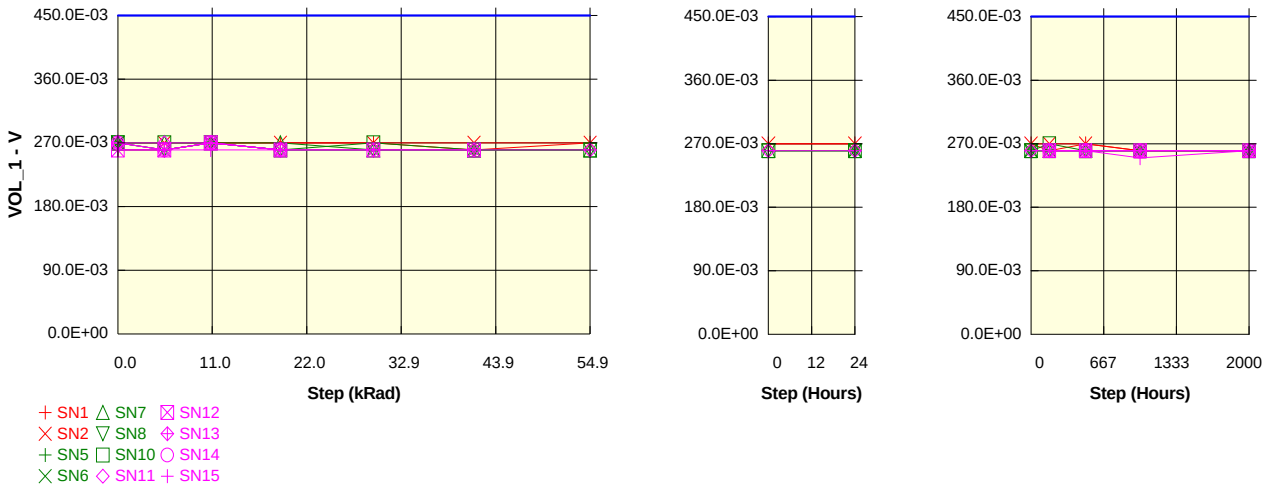
Measurements

VOL_1DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
ON_R samples												
SN5	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN6	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN7	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN8	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN10	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Max	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
Average	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	252.0E-03	250.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	4.0E-03	0.0E+00

Measurements

VOL_1DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03
SN2_REF	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
ON_RW samples												
SN11	260.0E-03	260.0E-03	260.0E-03	260.0E-03					260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN12	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	260.0E-03
SN13	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN14	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03				260.0E-03	260.0E-03	250.0E-03	250.0E-03
SN15	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03				260.0E-03	260.0E-03	250.0E-03	250.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	250.0E-03
Max	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Average	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	252.0E-03	254.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	1.7E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-09	1.7E-09	4.0E-03	4.9E-03

Parameter : Output Low Voltage 1 : VOL_1DQ1
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



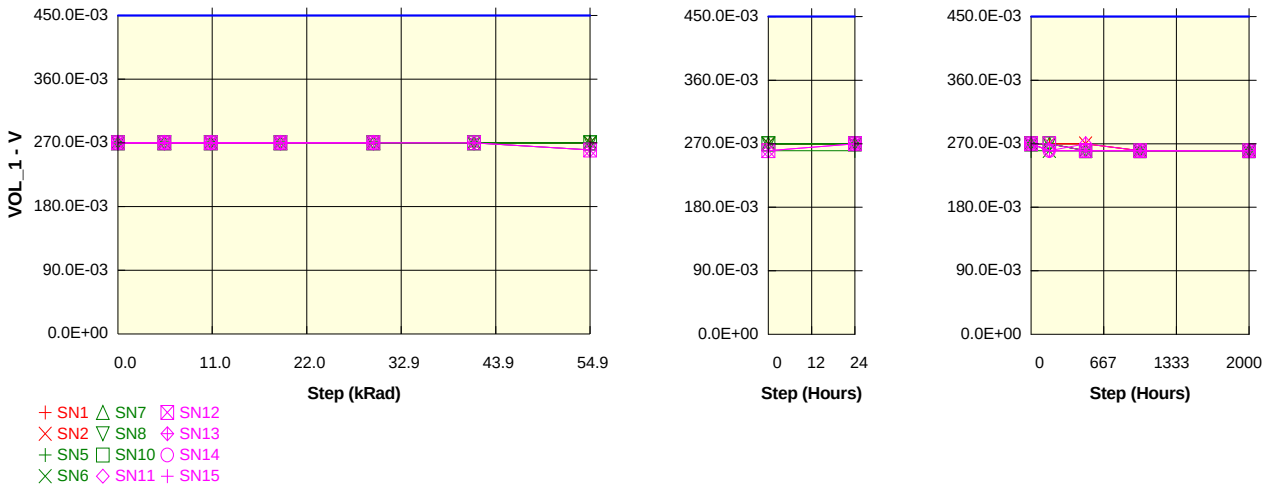
Measurements

VOL_1DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03
SN2_REF	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03
ON_R samples												
SN5	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN6	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03		260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN7	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN8	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN10	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
Statistics												
Min	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Max	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
Average	268.0E-03	264.0E-03	270.0E-03	262.0E-03	262.0E-03	260.0E-03	260.0E-03	260.0E-03	262.0E-03	260.0E-03	260.0E-03	260.0E-03
Sigma	4.0E-03	4.9E-03	1.7E-09	4.0E-03	4.0E-03	1.7E-09	0.0E+00	1.7E-09	4.0E-03	1.7E-09	1.7E-09	1.7E-09

Measurements

VOL_1DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	260.0E-03	260.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03
SN2_REF	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03
ON_RW samples												
SN11	270.0E-03	270.0E-03	270.0E-03	260.0E-03					260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN12	260.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03			260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN13	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN14	270.0E-03	260.0E-03	270.0E-03	260.0E-03					260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN15	260.0E-03	260.0E-03	260.0E-03	260.0E-03					260.0E-03	260.0E-03	250.0E-03	260.0E-03
Statistics												
Min	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	250.0E-03	260.0E-03
Max	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Average	266.0E-03	262.0E-03	268.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	258.0E-03	260.0E-03
Sigma	4.9E-03	4.0E-03	4.0E-03	1.7E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-09	1.7E-09	4.0E-03	1.7E-09

Parameter : Output Low Voltage 1 : VOL_1DQ0
Test conditions : IOL=5.8mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



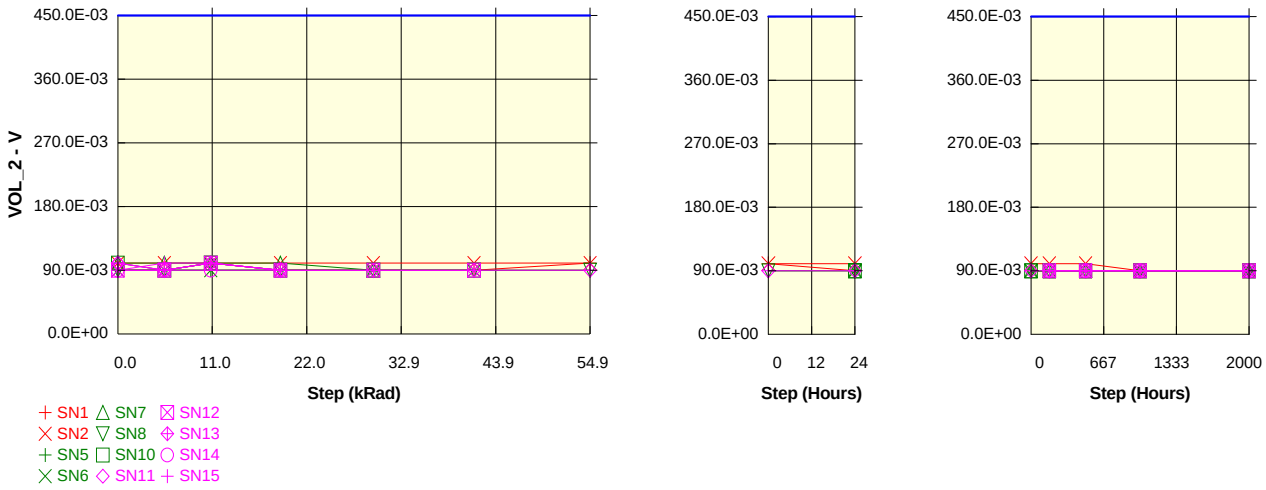
Measurements

VOL_1DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03
SN2_REF	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03
ON_R samples												
SN5	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN6	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN7	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
SN8	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
SN10	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
Statistics												
Min	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Max	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
Average	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	268.0E-03	268.0E-03	266.0E-03	260.0E-03	260.0E-03	260.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	1.7E-09	4.0E-03	4.0E-03	4.9E-03	1.7E-09	1.7E-09	1.7E-09

Measurements

VOL_1DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03
SN2_REF	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03
ON_RW samples												
SN11	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03			270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN12	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03
SN13	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03
SN14	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03			270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
SN15	270.0E-03	270.0E-03	270.0E-03	270.0E-03					260.0E-03	260.0E-03	260.0E-03	260.0E-03
Statistics												
Min	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	260.0E-03	260.0E-03	260.0E-03	260.0E-03
Max	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	260.0E-03
Average	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	270.0E-03	260.0E-03	270.0E-03	262.0E-03	262.0E-03	260.0E-03	260.0E-03
Sigma	1.7E-09	1.7E-09	1.7E-09	1.7E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-03	4.0E-03	1.7E-09	1.7E-09

Parameter : Output Low Voltage 2 : VOL_2DQ7
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



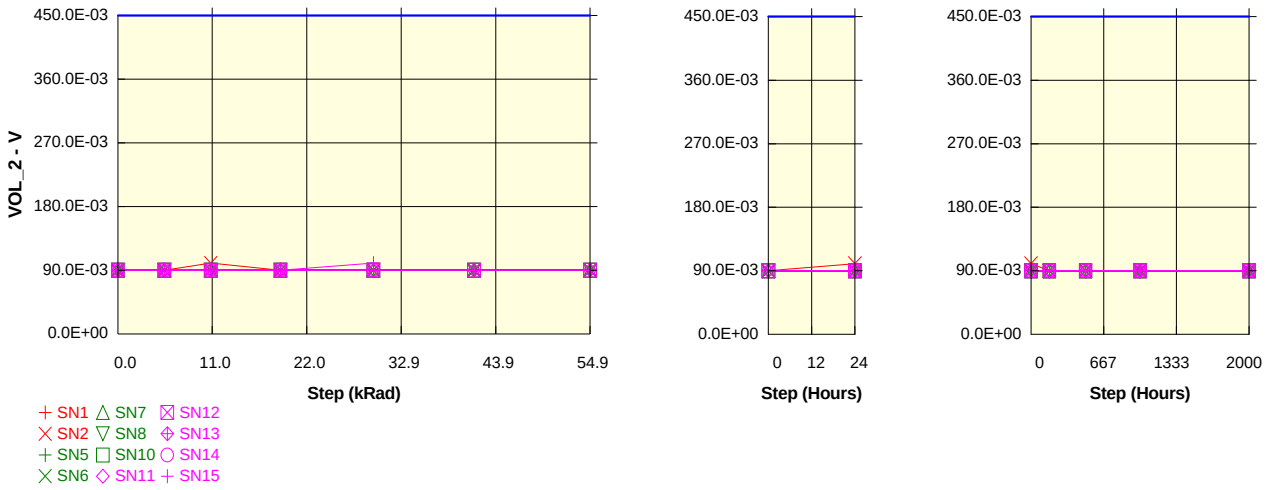
Measurements

VOL_2DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
ON_R samples												
SN5	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03		90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN7	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03			90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN8	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	100.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03		90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	94.0E-03	92.0E-03	96.0E-03	92.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	4.9E-03	4.0E-03	4.9E-03	4.0E-03	0.0E+00	1.3E-09	0.0E+00	0.0E+00	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Measurements

VOL_2DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
ON_RW samples												
SN11	100.0E-03	90.0E-03	100.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03			90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	100.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN14	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN15	90.0E-03	100.0E-03	100.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	94.0E-03	92.0E-03	98.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	4.9E-03	4.0E-03	4.0E-03	833.0E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Parameter : Output Low Voltage 2 : VOL_2DQ6
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



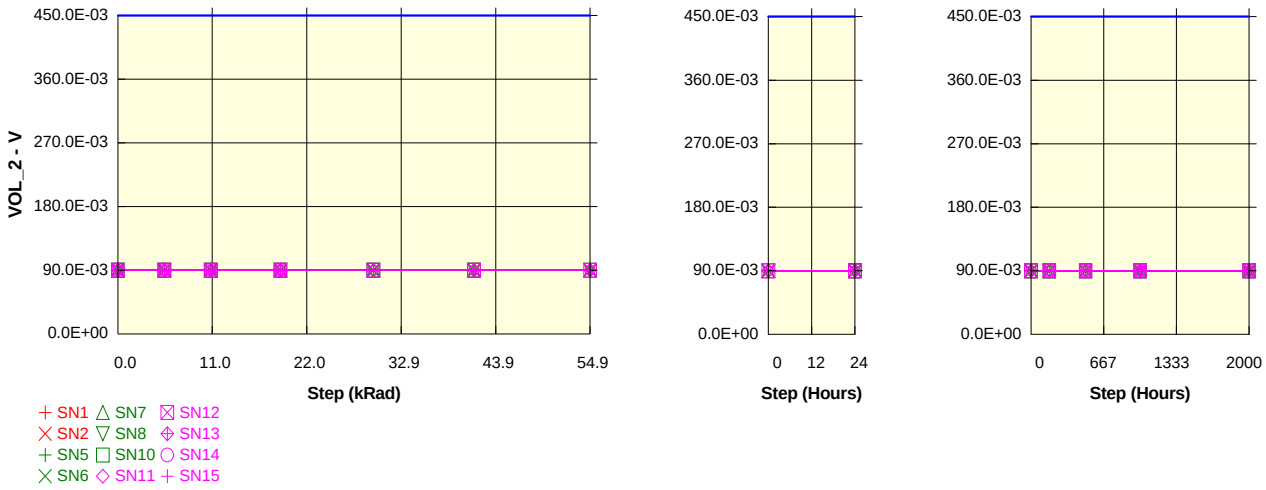
Measurements

VOL_2DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_R samples												
SN5	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN7	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN8	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Measurements

VOL_2DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_RW samples												
SN11	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN14	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03			90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN15	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03				90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	92.5E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	4.3E-03	0.0E+00	0.0E+00	1.3E-09	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Parameter : Output Low Voltage 2 : VOL_2DQ5
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



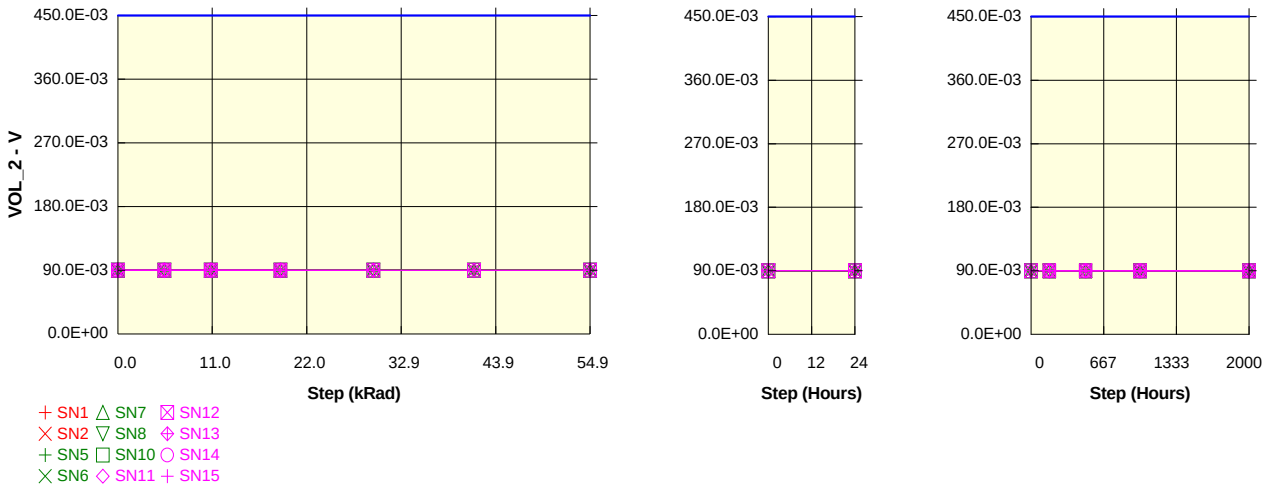
Measurements

VOL_2DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_R samples												
SN5	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03				90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN7	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN8	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03		90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	0.0E+00	1.3E-09	0.0E+00	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Measurements

VOL_2DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_RW samples												
SN11	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN14	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN15	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Parameter : Output Low Voltage 2 : VOL_2DQ4
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



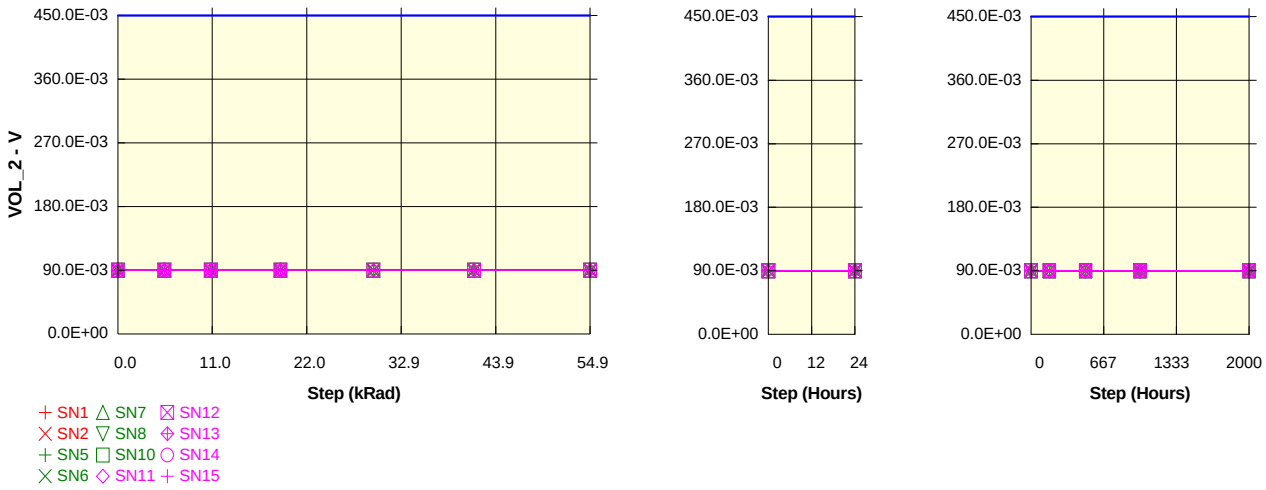
Measurements

VOL_2DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_R samples												
SN5	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN7	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN8	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Measurements

VOL_2DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_RW samples												
SN11	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03				90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN14	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN15	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	1.3E-09	0.0E+00	0.0E+00	0.0E+00	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Parameter : Output Low Voltage 2 : VOL_2DQ3
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



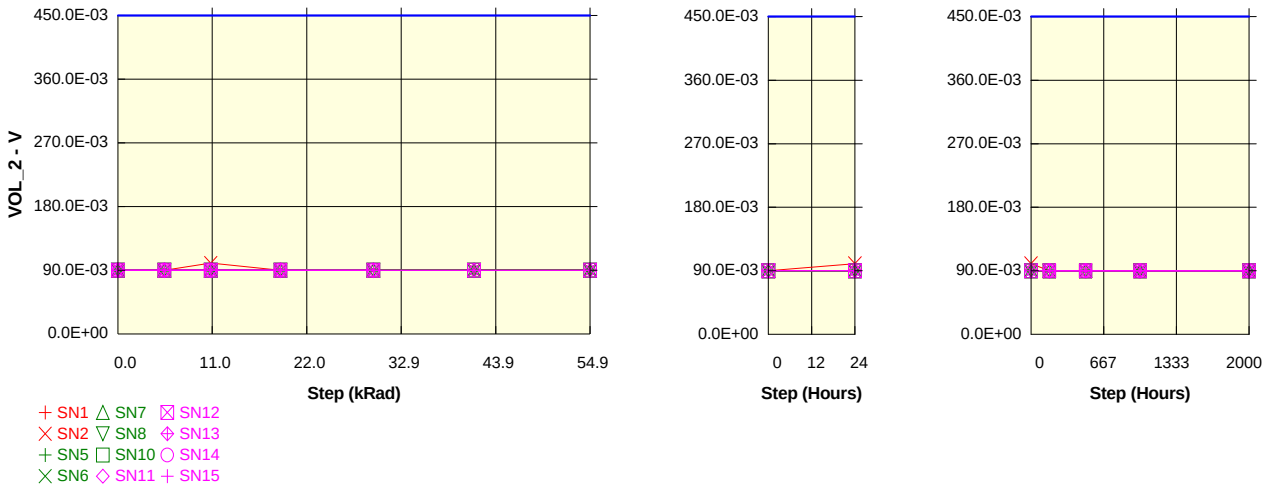
Measurements

VOL_2DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_R samples												
SN5	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN7	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN8	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Measurements

VOL_2DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_RW samples												
SN11	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN14	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN15	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Parameter : Output Low Voltage 2 : VOL_2DQ2
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



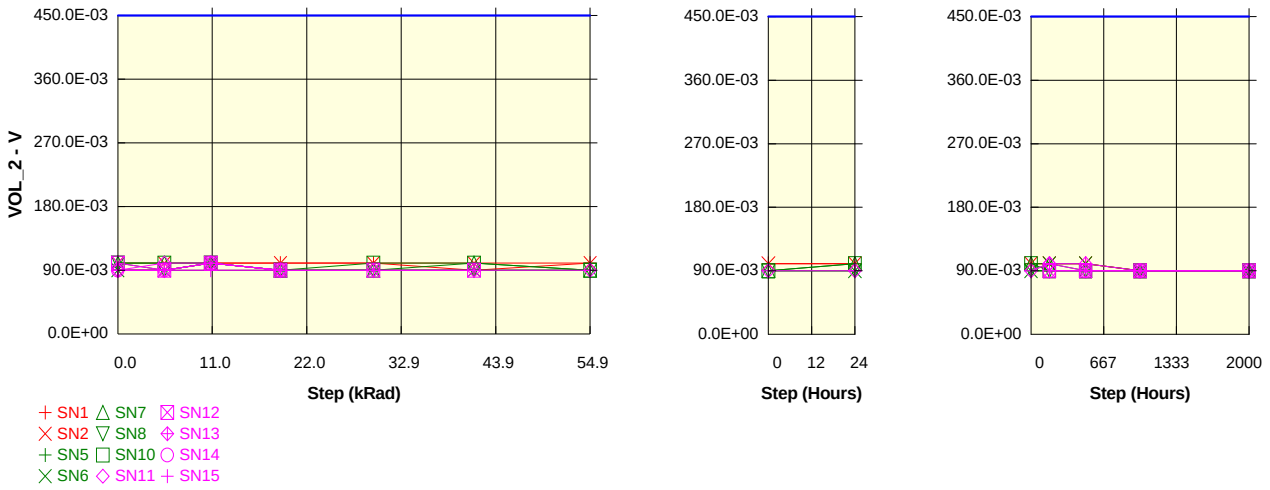
Measurements

VOL_2DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_R samples												
SN5	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN7	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN8	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Measurements

VOL_2DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN2_REF	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
ON_RW samples												
SN11	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN14	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03				90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN15	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03				90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Average	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Sigma	833.0E-12	833.0E-12	833.0E-12	833.0E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	833.0E-12	833.0E-12	833.0E-12	833.0E-12

Parameter : Output Low Voltage 2 : VOL_2DQ1
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



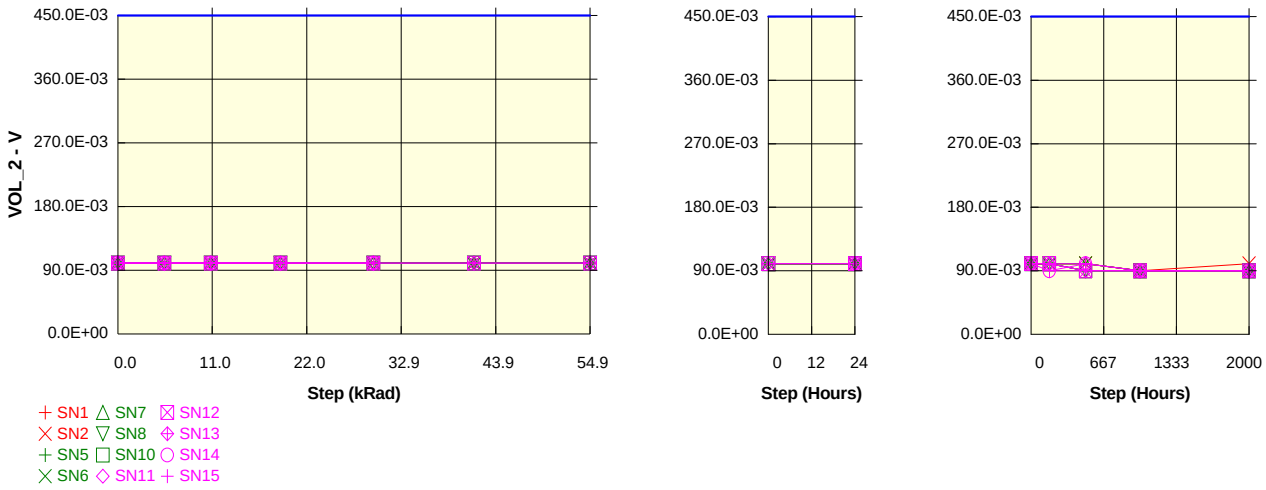
Measurements

VOL_2DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN2_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
ON_R samples												
SN5	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03		90.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN7	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	100.0E-03	90.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03
SN8	100.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	100.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	100.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
Average	96.0E-03	94.0E-03	100.0E-03	90.0E-03	92.0E-03	94.0E-03	90.0E-03	94.0E-03	94.0E-03	92.0E-03	90.0E-03	90.0E-03
Sigma	4.9E-03	4.9E-03	0.0E+00	833.0E-12	4.0E-03	4.9E-03	0.0E+00	4.9E-03	4.9E-03	4.0E-03	833.0E-12	833.0E-12

Measurements

VOL_2DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	90.0E-03	90.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN2_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
ON_RW samples												
SN11	90.0E-03	100.0E-03	100.0E-03	90.0E-03					100.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	100.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03			90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	90.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN14	90.0E-03	90.0E-03	100.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
SN15	90.0E-03	90.0E-03	90.0E-03	90.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
Average	92.0E-03	92.0E-03	98.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03	94.0E-03	92.0E-03	90.0E-03	90.0E-03
Sigma	4.0E-03	4.0E-03	4.0E-03	833.0E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-03	4.0E-03	833.0E-12	833.0E-12

Parameter : Output Low Voltage 2 : VOL_2DQ0
Test conditions : IOL=2.1mA
Unit : V
Spec Limit Max : 450.0E-03
Spec limits are represented in bold lines on the graphic.



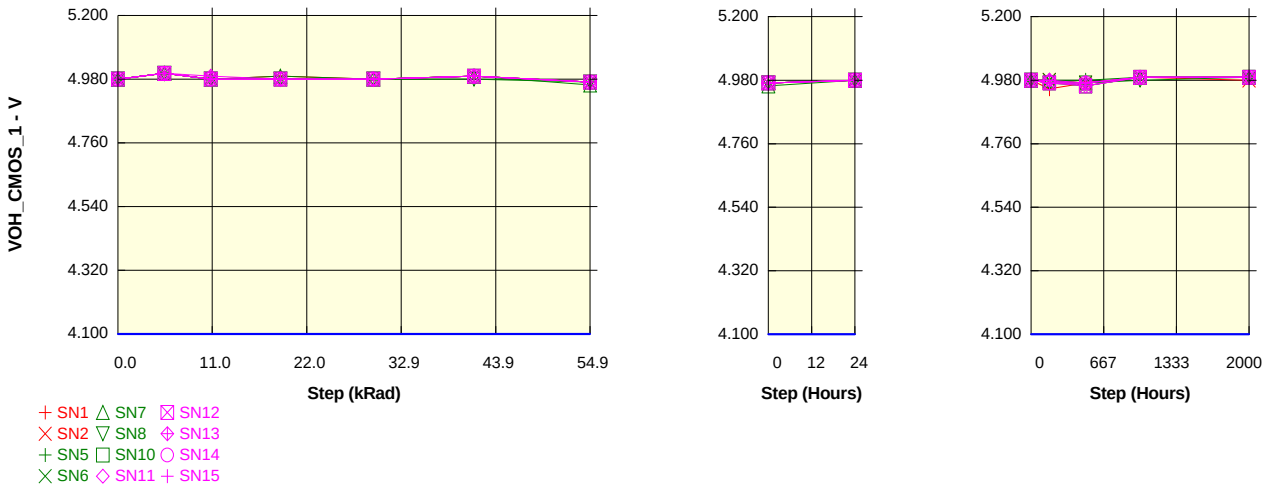
Measurements

VOL_2DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN2_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03
ON_R samples												
SN5	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03
SN6	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN7	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN8	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03
SN10	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
Average	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	94.0E-03	90.0E-03	90.0E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-03	833.0E-12	833.0E-12

Measurements

VOL_2DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN2_REF	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	100.0E-03
ON_RW samples												
SN11	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03			100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03
SN12	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03
SN13	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
SN14	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03			100.0E-03	90.0E-03	100.0E-03	90.0E-03	90.0E-03
SN15	100.0E-03	100.0E-03	100.0E-03	100.0E-03					90.0E-03	90.0E-03	90.0E-03	90.0E-03
Statistics												
Min	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03	90.0E-03	90.0E-03
Max	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	90.0E-03	90.0E-03
Average	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	100.0E-03	96.0E-03	94.0E-03	90.0E-03	90.0E-03
Sigma	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-03	4.9E-03	833.0E-12	833.0E-12

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ7
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



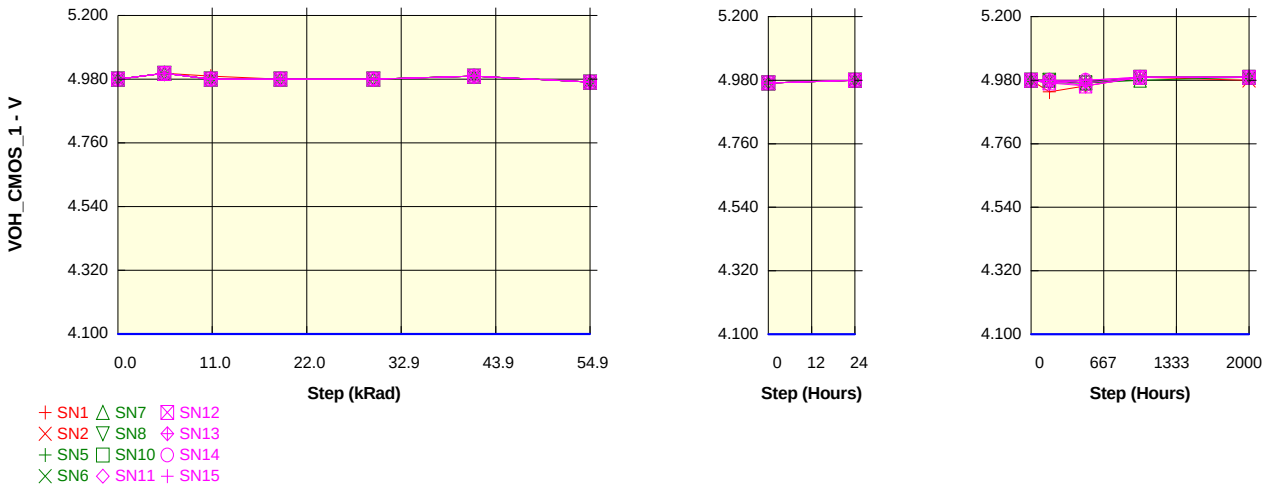
Measurements

VOH_CMOS_1DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.990	4.980	4.990	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN7	4.980	5.000	4.980	4.990	4.980	4.990	4.960	4.980	4.980	4.970	4.990	4.990
SN8	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.970	4.970	4.980	4.990
SN10	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.980	4.960	4.980	4.970	4.960	4.980	4.990
Max	4.980	5.000	4.980	4.990	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
Average	4.980	5.000	4.980	4.982	4.980	4.988	4.968	4.980	4.976	4.968	4.988	4.990
Sigma	0.000	0.000	0.000	0.004	0.000	0.004	0.004	0.000	0.005	0.007	0.004	0.000

Measurements

VOH_CMOS_1DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.990	4.980	4.990	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.980
ON_RW samples												
SN11	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN12	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
SN13	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN15	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
Max	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.982	4.980	4.980	4.990	4.970	4.980	4.974	4.966	4.990	4.990
Sigma	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.005	0.005	0.000	0.000

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ6
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



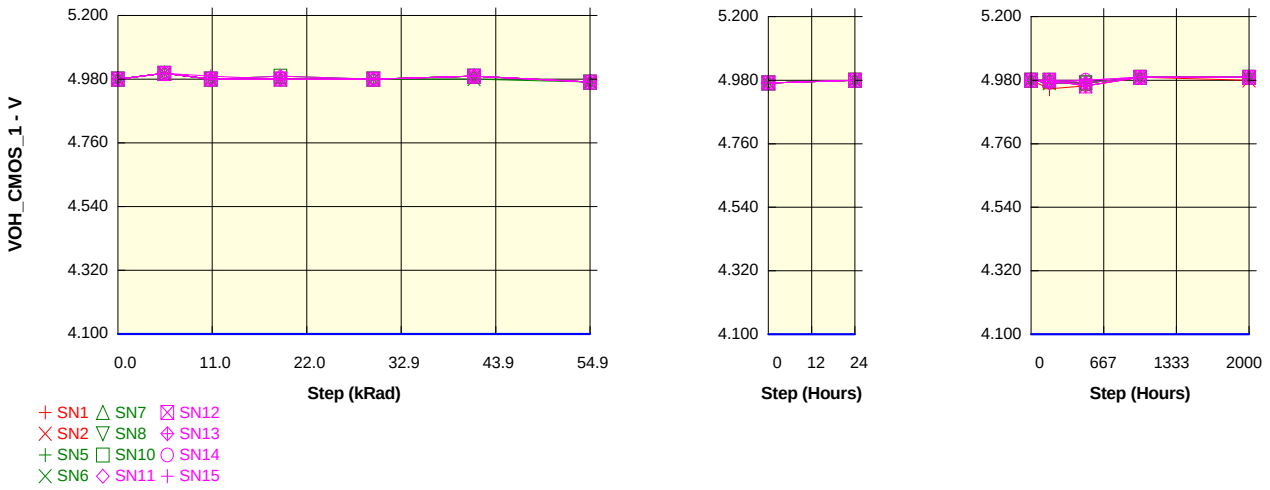
Measurements

VOH_CMOS_1DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.940	4.960	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN7	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.980	4.990
SN8	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN10	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.980	4.990
Max	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.978	4.970	4.988	4.990
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.004	0.000

Measurements

VOH_CMOS_1DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.940	4.960	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.980
ON_RW samples												
SN11	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN12	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
SN13	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.980	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
SN15	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
Max	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
Average	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.976	4.970	4.990	4.990
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.009	0.000	0.000

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ5
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



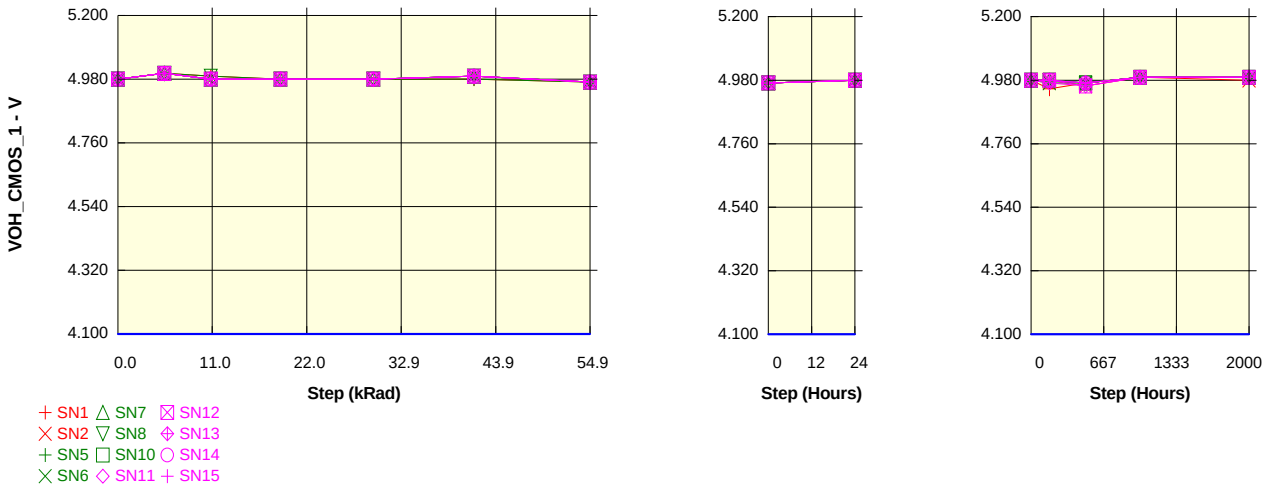
Measurements

VOH_CMOS_1DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.950	4.960	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.970	4.970	4.990	4.990
SN7	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN8	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN10	4.980	5.000	4.980	4.990	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.970	4.970	4.990	4.990
Max	4.980	5.000	4.980	4.990	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.980	4.982	4.980	4.988	4.970	4.980	4.974	4.970	4.990	4.990
Sigma	0.000	0.000	0.000	0.004	0.000	0.004	0.000	0.000	0.005	0.000	0.000	0.000

Measurements

VOH_CMOS_1DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.950	4.960	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.980
ON_RW samples												
SN11	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN12	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN13	4.980	5.000	4.980	4.990	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
SN15	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.970	4.980	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
Max	4.980	5.000	4.990	4.990	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
Average	4.980	5.000	4.982	4.982	4.980	4.990	4.970	4.980	4.976	4.970	4.990	4.990
Sigma	0.000	0.000	0.004	0.004	0.000	0.000	0.000	0.000	0.005	0.009	0.000	0.000

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ4
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



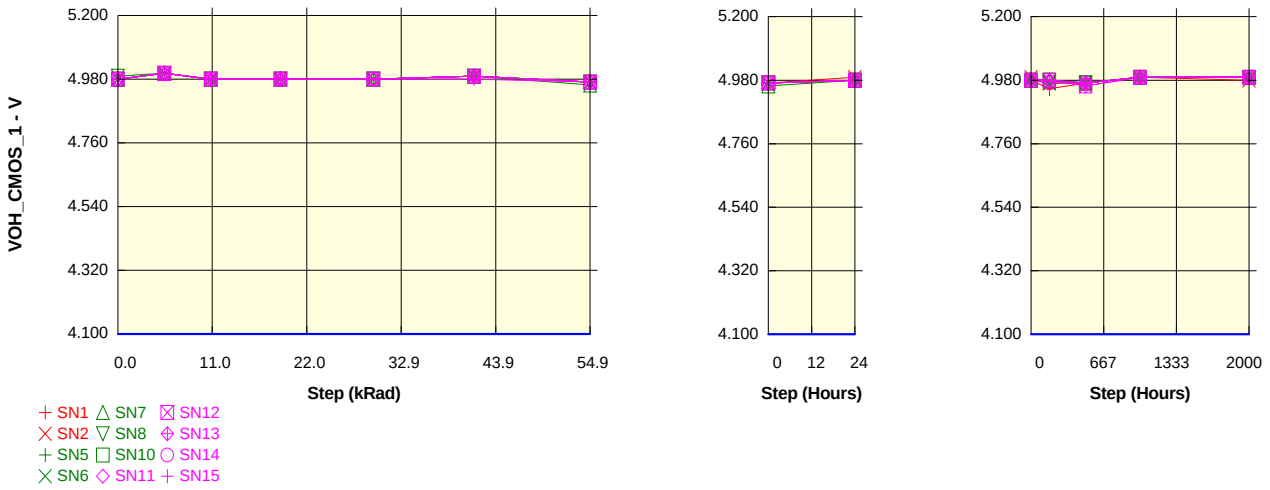
Measurements

VOH_CMOS_1DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.990	4.980	4.980	4.980	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.980	4.970	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN7	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN8	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN10	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.970	4.970	4.990	4.990
Max	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.982	4.980	4.980	4.988	4.970	4.980	4.978	4.970	4.990	4.990
Sigma	0.000	0.000	0.004	0.000	0.000	0.004	0.000	0.000	0.004	0.000	0.000	0.000

Measurements

VOH_CMOS_1DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.990	4.980	4.980	4.980	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.980
ON_RW samples												
SN11	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
SN12	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN13	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN15	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
Max	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.978	4.966	4.990	4.990
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.005	0.000	0.000

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ3
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



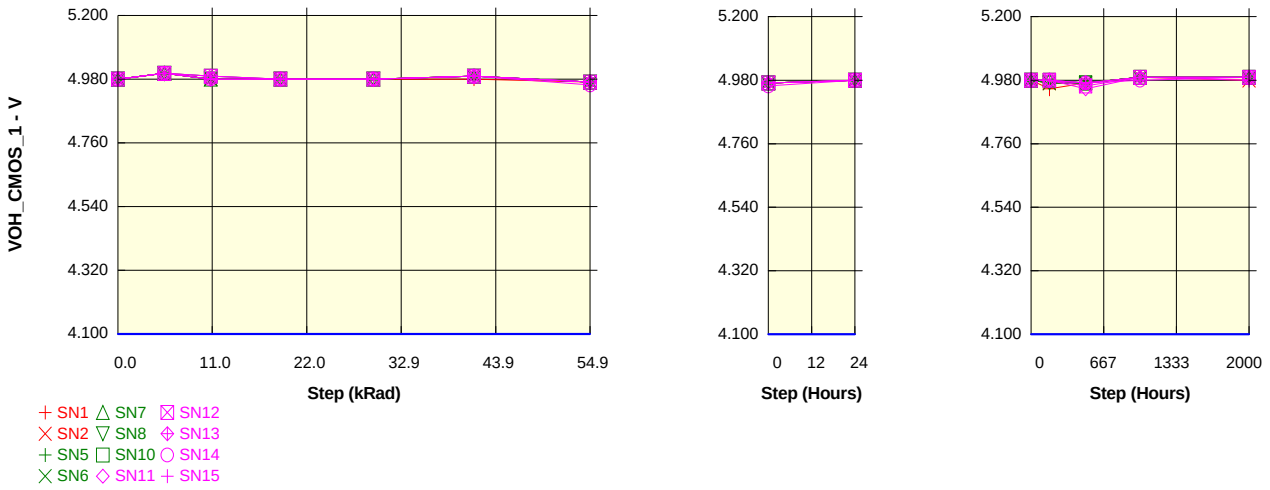
Measurements

VOH_CMOS_1DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.990	4.970	4.970	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN7	4.980	5.000	4.980	4.980	4.980	4.990	4.960	4.980	4.980	4.970	4.990	4.990
SN8	4.990	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN10	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.960	4.980	4.970	4.970	4.990	4.990
Max	4.990	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.982	5.000	4.980	4.980	4.980	4.990	4.968	4.980	4.978	4.970	4.990	4.990
Sigma	0.004	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.004	0.000	0.000	0.000

Measurements

VOH_CMOS_1DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.990	4.970	4.970	4.990	4.980
ON_RW samples												
SN11	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN12	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN13	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN15	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.970	4.960	4.990	4.990
Max	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.980	4.980	4.980	4.988	4.970	4.980	4.978	4.966	4.990	4.990
Sigma	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.004	0.005	0.000	0.000

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ2
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



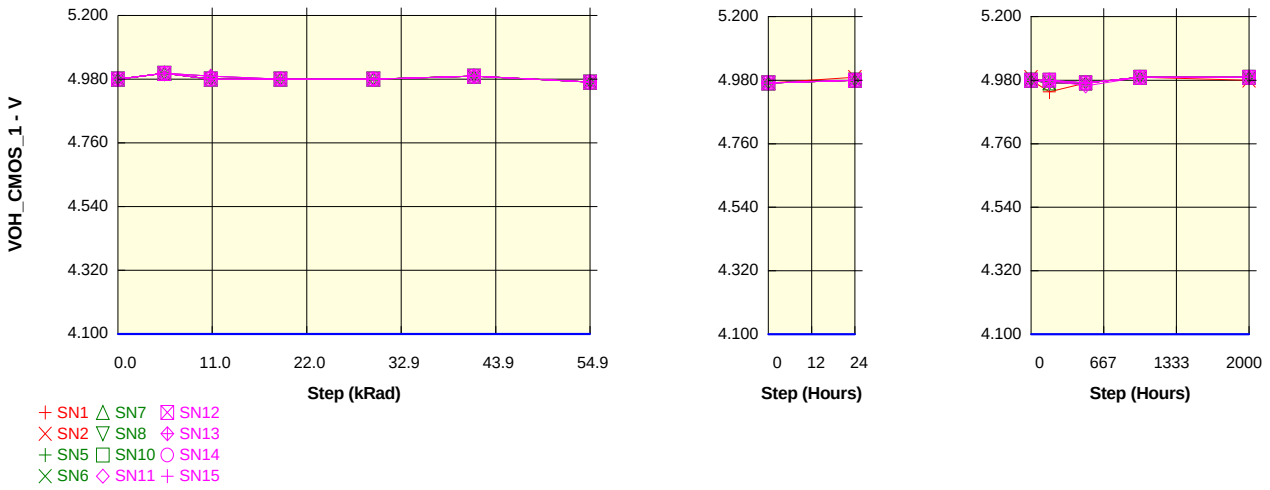
Measurements

VOH_CMOS_1DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN7	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN8	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN10	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
Max	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.982	4.980	4.980	4.990	4.970	4.980	4.976	4.970	4.990	4.990
Sigma	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000

Measurements

VOH_CMOS_1DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.950	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.980
ON_RW samples												
SN11	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.950	4.990	4.990
SN12	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN13	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.960	4.980	4.980	4.970	4.980	4.990
SN15	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.980
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.960	4.980	4.980	4.950	4.980	4.980
Max	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.984	4.980	4.980	4.990	4.968	4.980	4.980	4.964	4.988	4.988
Sigma	0.000	0.000	0.005	0.000	0.000	0.000	0.004	0.000	0.000	0.008	0.004	0.004

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ1
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



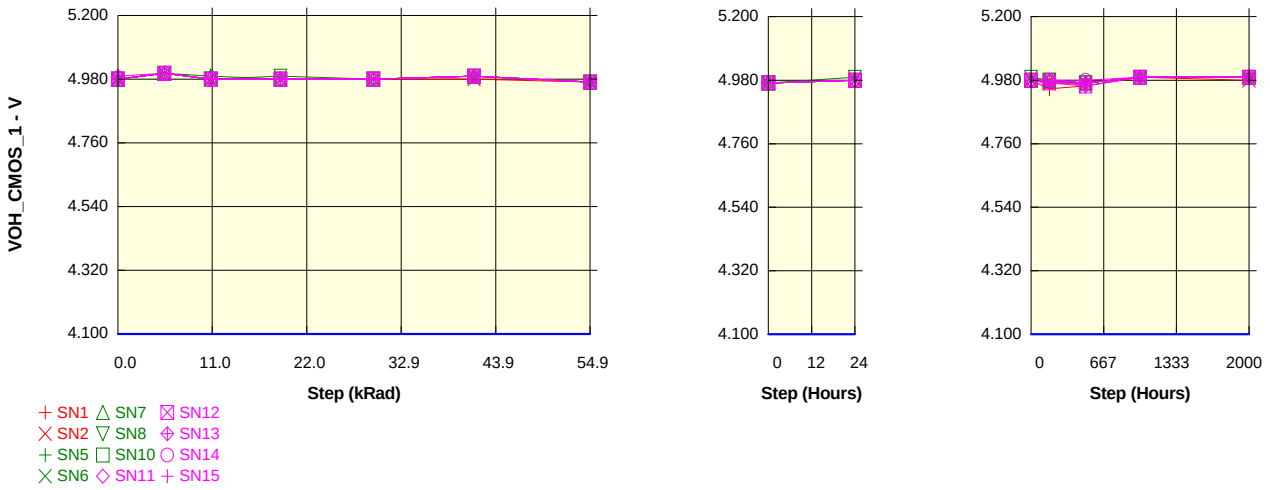
Measurements

VOH_CMOS_1DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.940	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.990	4.970	4.970	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN7	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN8	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN10	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
Max	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.982	4.980	4.980	4.990	4.970	4.980	4.974	4.970	4.990	4.990
Sigma	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000

Measurements

VOH_CMOS_1DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.940	4.970	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.990	4.970	4.970	4.990	4.980
ON_RW samples												
SN11	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN12	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN13	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN15	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
Max	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.984	4.980	4.980	4.990	4.970	4.980	4.978	4.968	4.990	4.990
Sigma	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.000	0.000

Parameter : Output High Voltage CMOS 1 : VOH_CMOS_1DQ0
Test conditions : IOH=-100uA. CMOS inputs
Unit : V
Spec Limit Min : 4.100
Spec limits are represented in bold lines on the graphic.



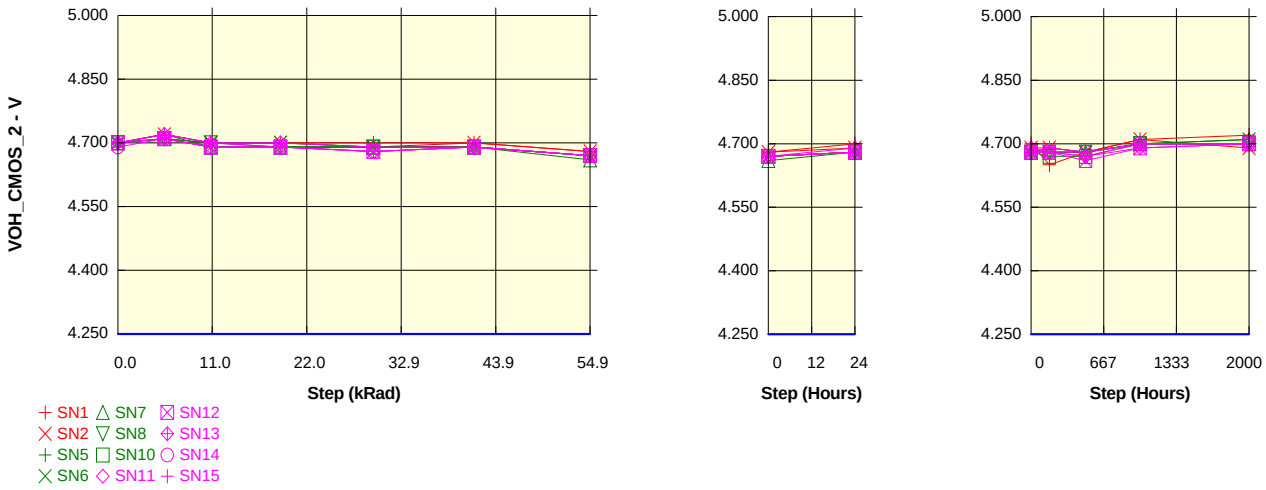
Measurements

VOH_CMOS_1DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.950	4.960	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.980	4.970	4.990	4.980
ON_R samples												
SN5	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN6	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
SN7	4.980	5.000	4.990	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN8	4.980	5.000	4.980	4.990	4.980	4.990	4.970	4.990	4.980	4.970	4.990	4.990
SN10	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
Max	4.980	5.000	4.990	4.990	4.980	4.990	4.970	4.990	4.980	4.970	4.990	4.990
Average	4.980	5.000	4.982	4.982	4.980	4.990	4.970	4.982	4.976	4.970	4.990	4.990
Sigma	0.000	0.000	0.004	0.004	0.000	0.000	0.000	0.004	0.005	0.000	0.000	0.000

Measurements

VOH_CMOS_1DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.950	4.960	4.990	4.990
SN2_REF	4.980	5.000	4.980	4.980	4.980	4.980	4.970	4.980	4.980	4.970	4.990	4.980
ON_RW samples												
SN11	4.990	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.960	4.990	4.990
SN12	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
SN13	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.970	4.990	4.990
SN14	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
SN15	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.970	4.990	4.990
Statistics												
Min	4.980	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.970	4.960	4.990	4.990
Max	4.990	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.980	4.980	4.990	4.990
Average	4.982	5.000	4.980	4.980	4.980	4.990	4.970	4.980	4.976	4.968	4.990	4.990
Sigma	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.007	0.000	0.000

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ7
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



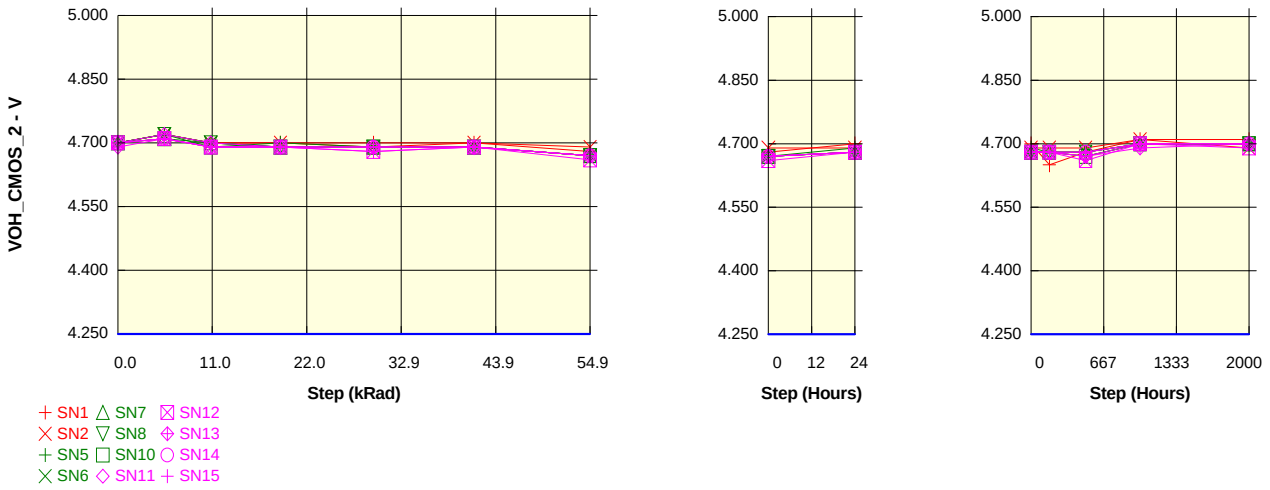
Measurements

VOH_CMOS_2DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.700
SN6	4.700	4.710	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.710
SN7	4.700	4.710	4.690	4.690	4.690	4.690	4.660	4.680	4.680	4.680	4.700	4.710
SN8	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN10	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.670	4.670	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.660	4.680	4.670	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.710
Average	4.700	4.712	4.694	4.692	4.690	4.690	4.668	4.680	4.680	4.678	4.700	4.704
Sigma	0.000	0.004	0.005	0.004	0.000	0.000	0.004	0.000	0.006	0.004	0.000	0.005

Measurements

VOH_CMOS_2DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN12	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.660	4.690	4.700
SN13	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.670	4.690	4.700
SN14	4.690	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.720	4.700	4.690	4.680	4.690	4.670	4.680	4.690	4.680	4.700	4.700
Statistics												
Min	4.690	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.660	4.690	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.700
Average	4.698	4.714	4.694	4.692	4.682	4.690	4.670	4.682	4.682	4.672	4.696	4.700
Sigma	0.004	0.005	0.005	0.004	0.004	0.000	0.000	0.004	0.004	0.007	0.005	0.000

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ6
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



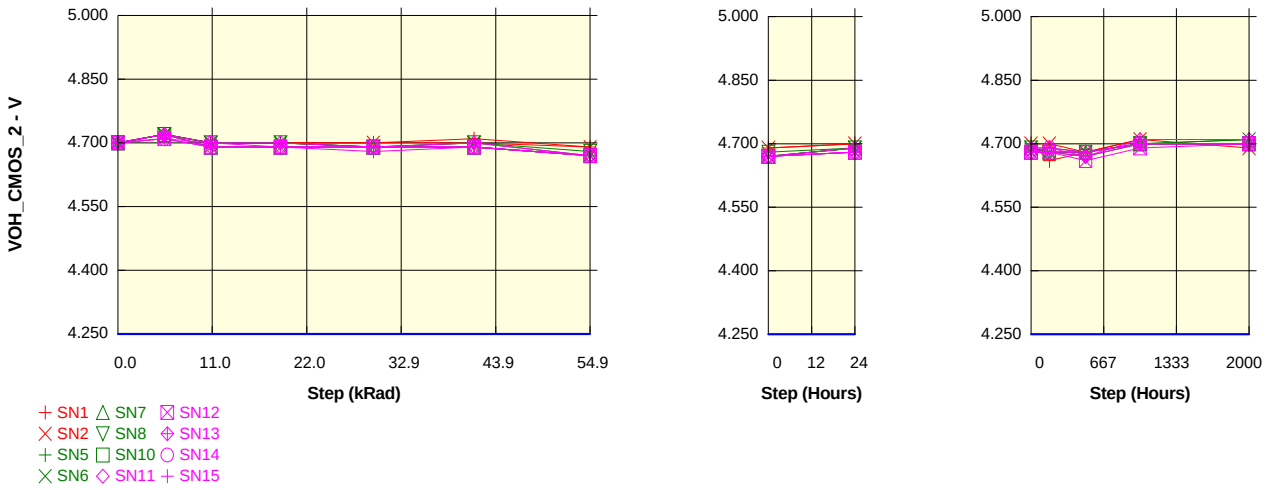
Measurements

VOH_CMOS_2DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.690	4.700	4.690	4.690	4.690	4.690	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.690	4.700	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN6	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN7	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN8	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN10	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Average	4.700	4.716	4.696	4.692	4.690	4.690	4.670	4.682	4.680	4.676	4.700	4.700
Sigma	0.000	0.005	0.005	0.004	0.000	0.000	0.000	0.004	0.000	0.005	0.000	0.000

Measurements

VOH_CMOS_2DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.690	4.700	4.690	4.690	4.690	4.690	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN12	4.700	4.710	4.690	4.690	4.680	4.690	4.660	4.680	4.680	4.660	4.700	4.690
SN13	4.690	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.690	4.700
SN14	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.690	4.710	4.690	4.690	4.680	4.690	4.660	4.680	4.680	4.660	4.690	4.690
Max	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Average	4.698	4.712	4.692	4.690	4.686	4.690	4.668	4.680	4.680	4.672	4.698	4.698
Sigma	0.004	0.004	0.004	0.000	0.005	0.000	0.004	0.000	0.000	0.007	0.004	0.004

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ5
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



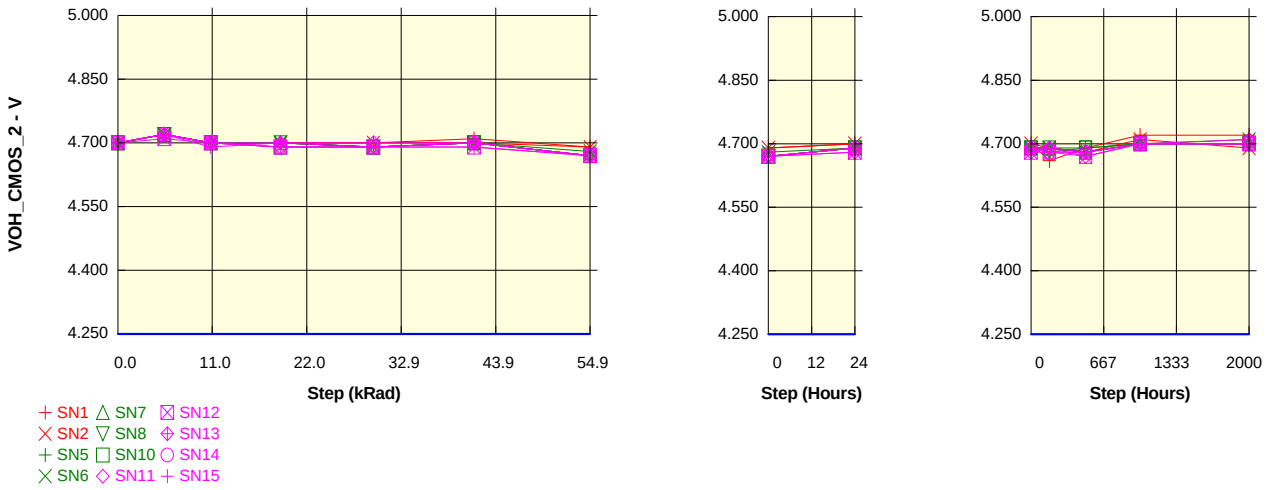
Measurements

VOH_CMOS_2DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.660	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.700	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.710
SN6	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.710
SN7	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN8	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.680	4.670	4.700	4.700
SN10	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.720	4.696	4.696	4.690	4.694	4.672	4.688	4.682	4.678	4.700	4.704
Sigma	0.000	0.000	0.005	0.005	0.000	0.005	0.004	0.004	0.004	0.004	0.000	0.005

Measurements

VOH_CMOS_2DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.660	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.700	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.670	4.710	4.710
SN12	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.660	4.690	4.700
SN13	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN14	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.700
SN15	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.660	4.690	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.710	4.710
Average	4.700	4.714	4.694	4.692	4.688	4.692	4.670	4.682	4.684	4.672	4.700	4.702
Sigma	0.000	0.005	0.005	0.004	0.004	0.004	0.000	0.004	0.005	0.007	0.006	0.004

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ4
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



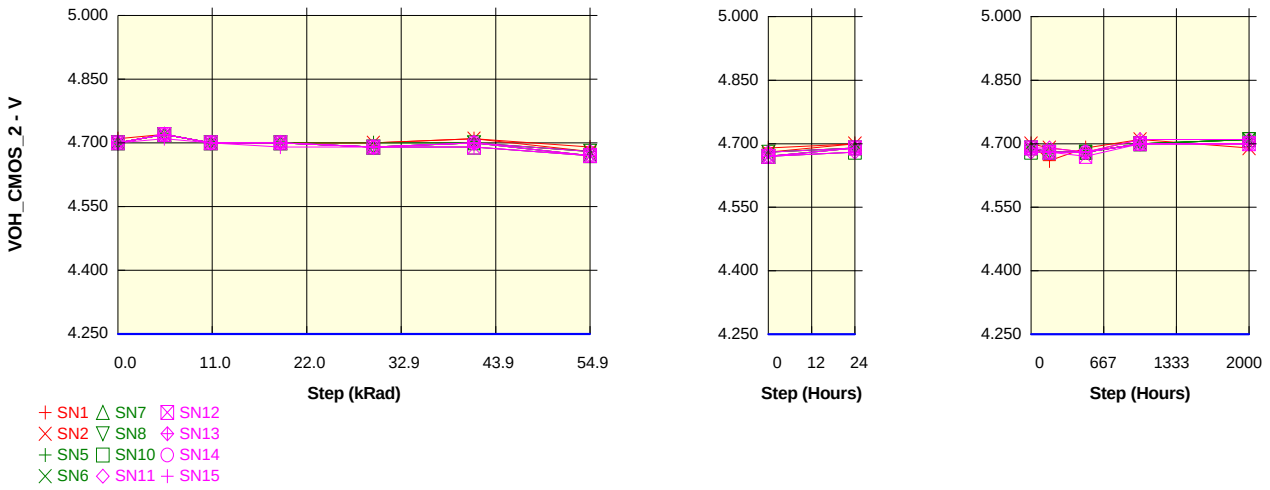
Measurements

VOH_CMOS_2DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.660	4.690	4.720	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.690	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.700
SN6	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.700	4.710
SN7	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.700
SN8	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.690	4.700	4.700
SN10	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.690	4.690	4.690	4.700	4.700
Statistics												
Min	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.690	4.700	4.710
Average	4.700	4.720	4.700	4.698	4.690	4.700	4.672	4.690	4.688	4.684	4.700	4.702
Sigma	0.000	0.000	0.000	0.004	0.000	0.000	0.004	0.000	0.004	0.005	0.000	0.004

Measurements

VOH_CMOS_2DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.660	4.690	4.720	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.690	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.700	4.700	4.670	4.690	4.690	4.670	4.700	4.710
SN12	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN13	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.680	4.690	4.680	4.700	4.700
SN14	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.700
SN15	4.700	4.720	4.690	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.700	4.700	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.718	4.698	4.694	4.692	4.696	4.670	4.686	4.684	4.676	4.700	4.702
Sigma	0.000	0.004	0.004	0.005	0.004	0.005	0.000	0.005	0.005	0.005	0.000	0.004

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ3
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



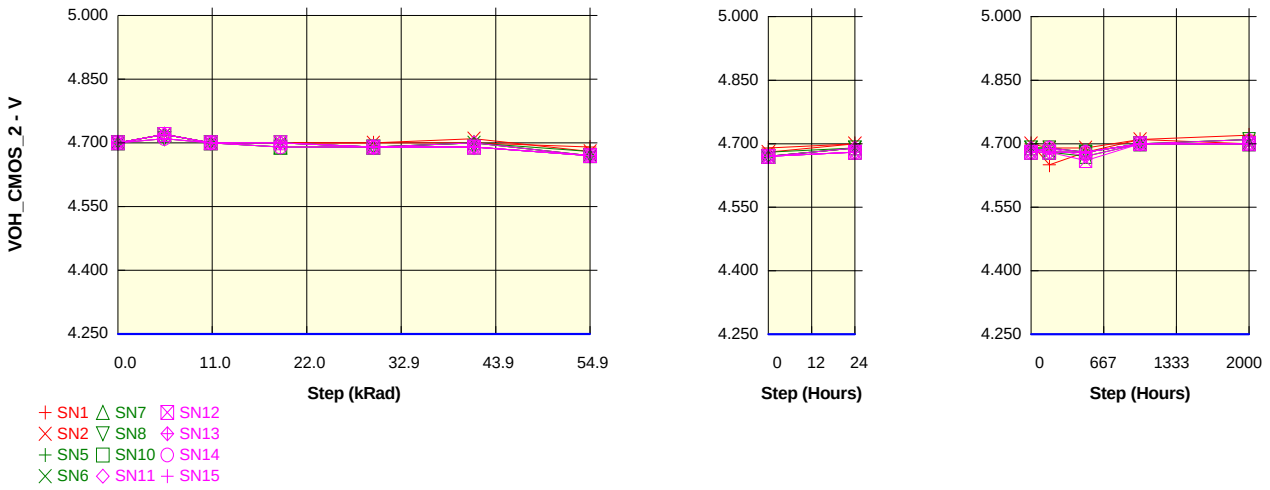
Measurements

VOH_CMOS_2DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.710	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.660	4.690	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.690	4.680	4.680	4.700	4.710
SN6	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.710
SN7	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.710
SN8	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.680	4.680	4.700	4.710
SN10	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.710
Statistics												
Min	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.710
Max	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.690	4.680	4.680	4.700	4.710
Average	4.700	4.720	4.700	4.700	4.692	4.698	4.674	4.688	4.680	4.680	4.700	4.710
Sigma	0.000	0.000	0.000	0.000	0.004	0.004	0.005	0.004	0.000	0.000	0.000	0.000

Measurements

VOH_CMOS_2DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.710	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.660	4.690	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.710	4.710
SN12	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN13	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.680	4.680	4.680	4.700	4.700
SN14	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.700
SN15	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.710	4.710
Average	4.700	4.718	4.700	4.698	4.690	4.696	4.672	4.686	4.682	4.678	4.702	4.702
Sigma	0.000	0.004	0.000	0.004	0.000	0.005	0.004	0.005	0.004	0.004	0.004	0.004

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ2
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



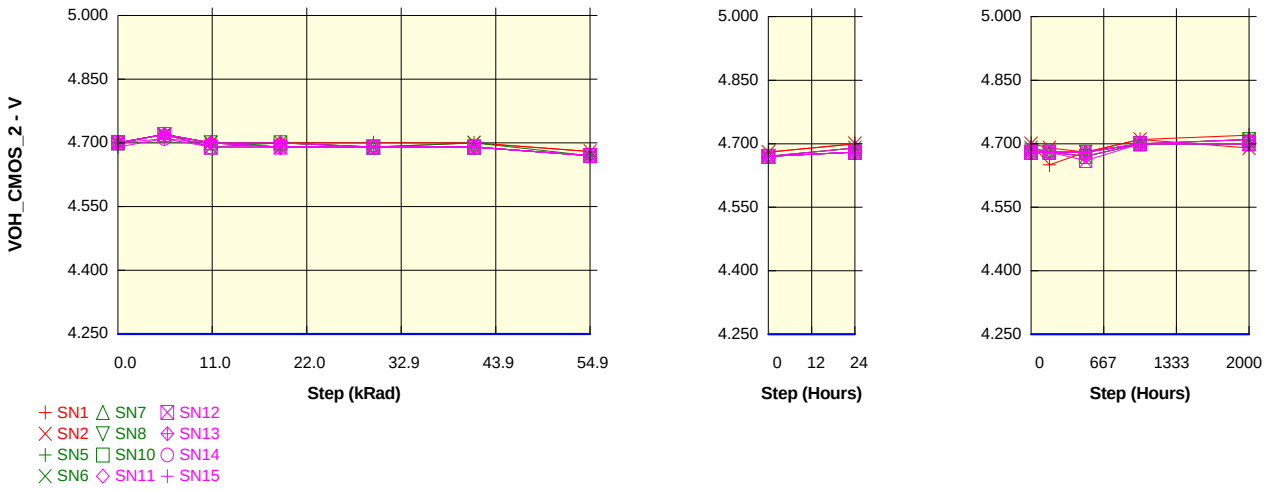
Measurements

VOH_CMOS_2DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.690	4.710	4.700
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.700	4.710
SN6	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.700
SN7	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.690	4.680	4.670	4.700	4.700
SN8	4.700	4.710	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.710
SN10	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.718	4.700	4.696	4.690	4.696	4.672	4.688	4.684	4.678	4.700	4.704
Sigma	0.000	0.004	0.000	0.005	0.000	0.005	0.004	0.004	0.005	0.004	0.000	0.005

Measurements

VOH_CMOS_2DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.690	4.710	4.700
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.680	4.690	4.670	4.700	4.710
SN12	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.660	4.700	4.700
SN13	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN14	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.700
SN15	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.660	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.716	4.700	4.696	4.690	4.692	4.670	4.682	4.684	4.674	4.700	4.702
Sigma	0.000	0.005	0.000	0.005	0.000	0.004	0.000	0.004	0.005	0.008	0.000	0.004

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ1
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



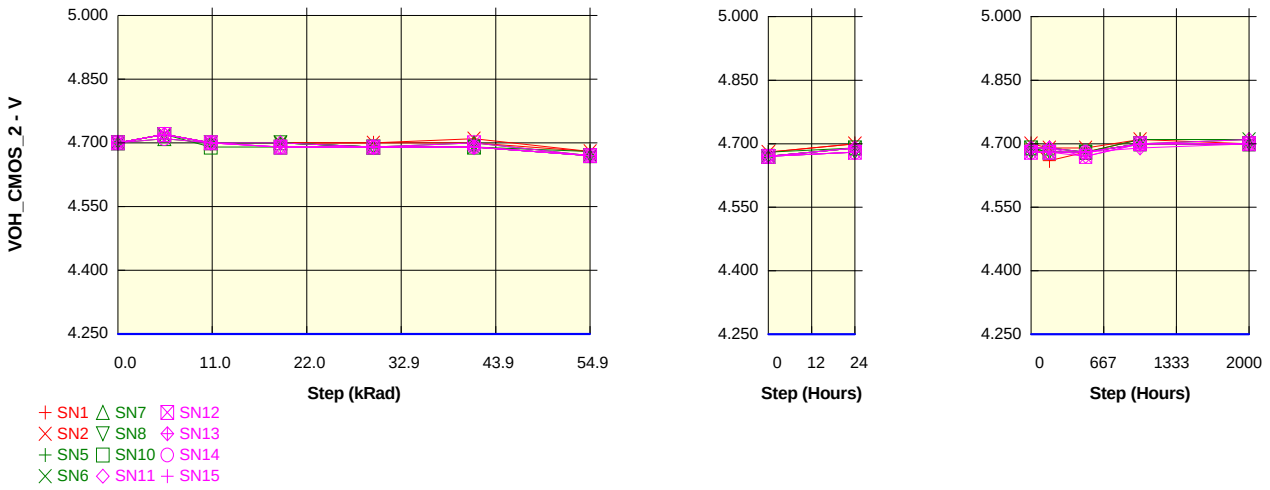
Measurements

VOH_CMOS_2DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.700	4.690	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN6	4.700	4.720	4.690	4.690	4.690	4.700	4.670	4.690	4.680	4.670	4.700	4.710
SN7	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN8	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN10	4.700	4.720	4.690	4.700	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.710
Statistics												
Min	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.710
Average	4.700	4.720	4.696	4.694	4.690	4.692	4.670	4.684	4.680	4.676	4.700	4.704
Sigma	0.000	0.000	0.005	0.005	0.000	0.004	0.000	0.005	0.000	0.005	0.000	0.005

Measurements

VOH_CMOS_2DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.700	4.690	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.710
SN12	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.660	4.700	4.700
SN13	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN14	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.690	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.710
Statistics												
Min	4.690	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.660	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.710
Average	4.698	4.716	4.696	4.692	4.690	4.690	4.670	4.682	4.680	4.674	4.700	4.704
Sigma	0.004	0.005	0.005	0.004	0.000	0.000	0.000	0.004	0.000	0.008	0.000	0.005

Parameter : Output High Voltage CMOS 2 : VOH_CMOS_2DQ0
Test conditions : IOH=-2.5mA. CMOS inputs
Unit : V
Spec Limit Min : 4.250
Spec limits are represented in bold lines on the graphic.



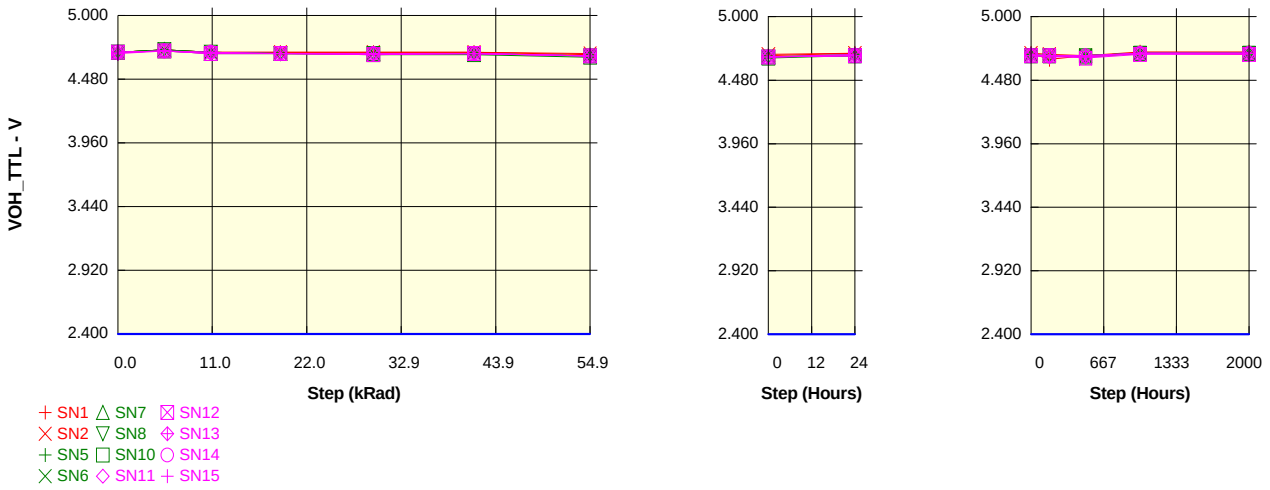
Measurements

VOH_CMOS_2DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.660	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.690	4.710	4.700
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.690	4.680	4.690	4.690	4.680	4.710	4.710
SN6	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.710
SN7	4.700	4.710	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.700
SN8	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN10	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.710	4.710
Average	4.700	4.718	4.698	4.698	4.690	4.692	4.672	4.688	4.684	4.680	4.702	4.704
Sigma	0.000	0.004	0.004	0.004	0.000	0.004	0.004	0.004	0.005	0.000	0.004	0.005

Measurements

VOH_CMOS_2DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.660	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.690	4.710	4.700
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.670	4.700	4.710
SN12	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.680	4.680	4.670	4.700	4.700
SN13	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.690	4.680	4.690	4.700
SN14	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.690	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.718	4.700	4.692	4.690	4.692	4.670	4.684	4.684	4.676	4.698	4.702
Sigma	0.000	0.004	0.000	0.004	0.000	0.004	0.000	0.005	0.005	0.005	0.004	0.004

Parameter : Output High Voltage TTL : VOH_TTLDQ7
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



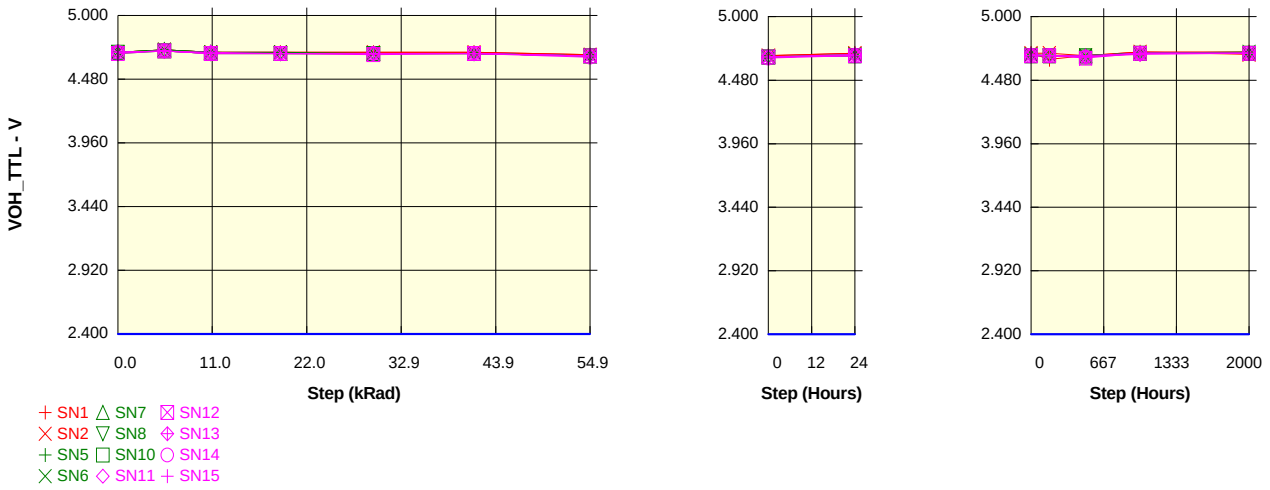
Measurements

VOH_TTL DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.690	4.680	4.700	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN6	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN7	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN8	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN10	4.700	4.710	4.690	4.690	4.680	4.680	4.660	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.680	4.680	4.660	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Average	4.700	4.718	4.696	4.690	4.688	4.688	4.668	4.682	4.680	4.676	4.700	4.700
Sigma	0.000	0.004	0.005	0.000	0.004	0.004	0.004	0.004	0.000	0.005	0.000	0.000

Measurements

VOH_TTL DQ7	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.690	4.680	4.700	4.690
ON_RW samples												
SN11	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN12	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.660	4.690	4.690
SN13	4.690	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.670	4.670	4.700	4.700
SN14	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.690	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.670	4.660	4.690	4.690
Max	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Average	4.698	4.710	4.694	4.690	4.686	4.690	4.670	4.682	4.678	4.672	4.698	4.698
Sigma	0.004	0.000	0.005	0.000	0.005	0.000	0.000	0.004	0.004	0.007	0.004	0.004

Parameter : Output High Voltage TTL : VOH_TTLDQ6
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



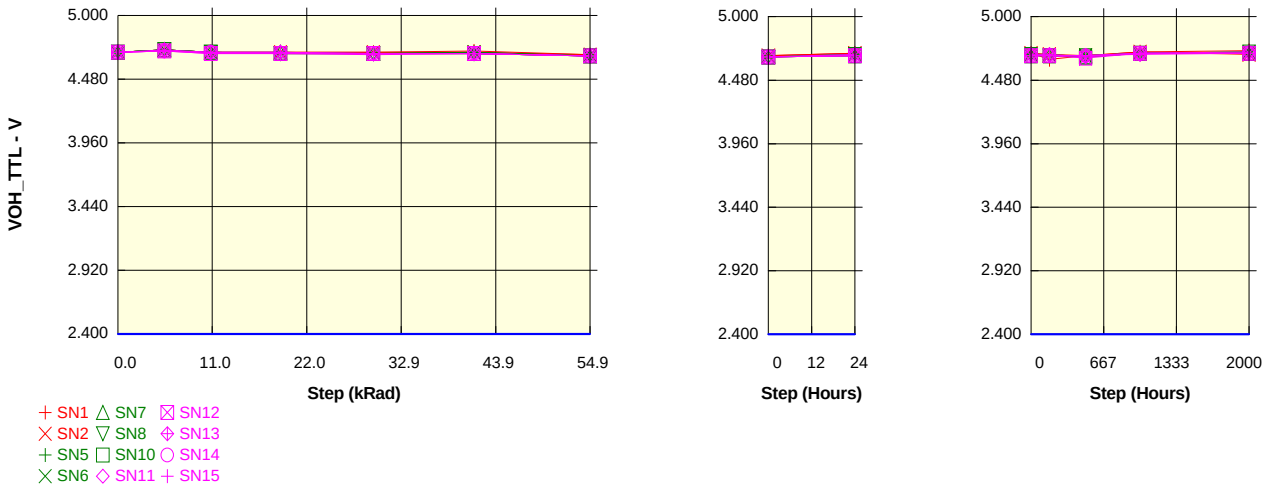
Measurements

VOH_TTL DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.700	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN6	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.710
SN7	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN8	4.690	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN10	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Statistics												
Min	4.690	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.710
Average	4.698	4.716	4.696	4.692	4.690	4.690	4.670	4.682	4.680	4.678	4.700	4.702
Sigma	0.004	0.005	0.005	0.004	0.000	0.000	0.000	0.004	0.000	0.004	0.000	0.004

Measurements

VOH_TTL DQ6	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.700	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN12	4.690	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.660	4.700	4.700
SN13	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.690	4.700
SN14	4.700	4.710	4.690	4.690	4.690	4.690	4.660	4.680	4.680	4.670	4.700	4.700
SN15	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.690	4.710	4.690	4.690	4.680	4.690	4.660	4.680	4.680	4.660	4.690	4.700
Max	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Average	4.698	4.710	4.692	4.690	4.688	4.690	4.668	4.682	4.680	4.670	4.698	4.700
Sigma	0.004	0.000	0.004	0.000	0.004	0.000	0.004	0.004	0.000	0.006	0.004	0.000

Parameter : Output High Voltage TTL : VOH_TTLDQ5
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



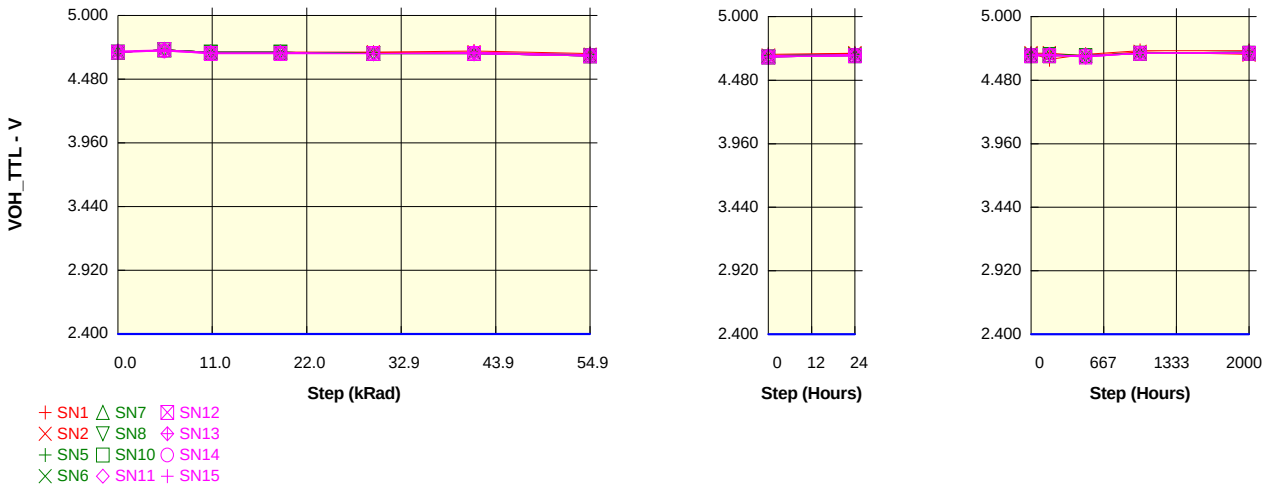
Measurements

VOH_TTL DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.690	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.690	4.690	4.670	4.700	4.700
SN6	4.700	4.720	4.700	4.690	4.690	4.700	4.670	4.680	4.680	4.680	4.700	4.710
SN7	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN8	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.710
SN10	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Statistics												
Min	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.720	4.700	4.692	4.690	4.694	4.670	4.684	4.682	4.674	4.700	4.704
Sigma	0.000	0.000	0.000	0.004	0.000	0.005	0.000	0.005	0.004	0.005	0.000	0.005

Measurements

VOH_TTL DQ5	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.650	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.690	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.670	4.700	4.710
SN12	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.660	4.700	4.700
SN13	4.700	4.710	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.690	4.700
SN14	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.660	4.690	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.712	4.696	4.694	4.688	4.690	4.670	4.682	4.682	4.674	4.698	4.702
Sigma	0.000	0.004	0.005	0.005	0.004	0.000	0.000	0.004	0.004	0.008	0.004	0.004

Parameter : Output High Voltage TTL : VOH_TTLDQ4
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



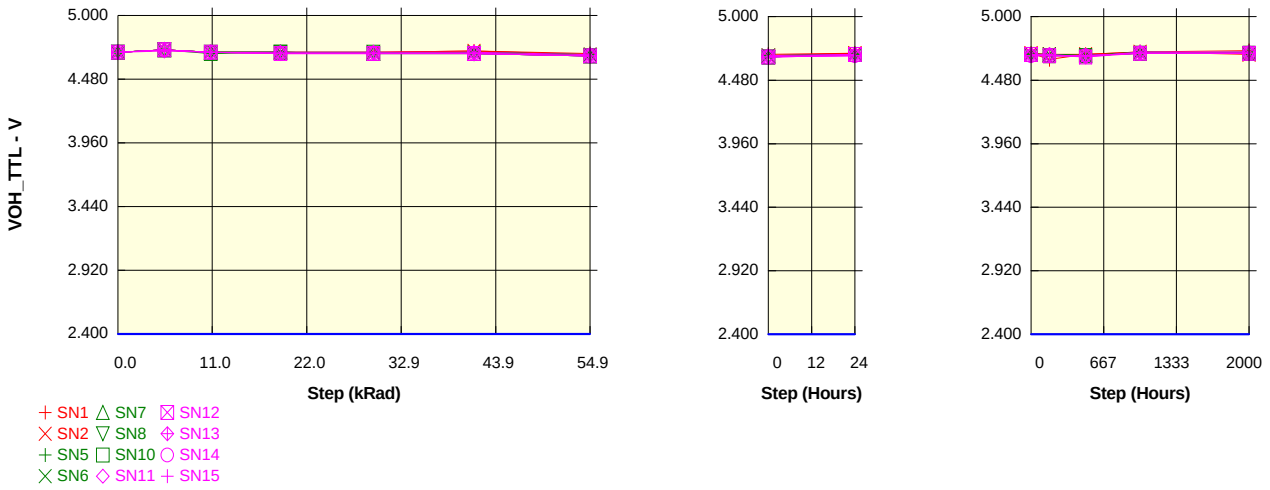
Measurements

VOH_TTL DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.650	4.690	4.720	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.700	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.690	4.680	4.690	4.680	4.680	4.700	4.710
SN6	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN7	4.700	4.720	4.700	4.700	4.690	4.690	4.680	4.690	4.690	4.680	4.700	4.710
SN8	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.700
SN10	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.680	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.720	4.700	4.700	4.690	4.690	4.674	4.686	4.684	4.680	4.700	4.704
Sigma	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.005	0.005	0.000	0.000	0.005

Measurements

VOH_TTL DQ4	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.650	4.690	4.720	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.700	4.680	4.710	4.690
ON_RW samples												
SN11	4.710	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.670	4.700	4.710
SN12	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN13	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.690	4.670	4.700	4.700
SN14	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.710	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.700	4.710
Average	4.702	4.716	4.692	4.692	4.690	4.692	4.672	4.682	4.684	4.674	4.700	4.702
Sigma	0.004	0.005	0.004	0.004	0.000	0.004	0.004	0.004	0.005	0.005	0.000	0.004

Parameter : Output High Voltage TTL : VOH_TTLDQ3
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



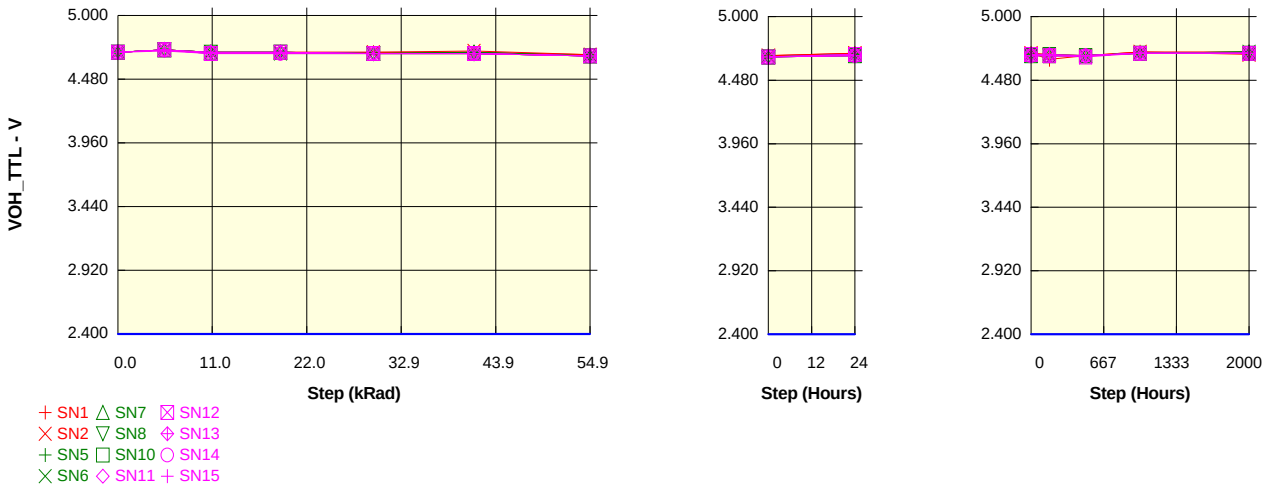
Measurements

VOH_TTL DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.650	4.690	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.690	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.710	4.700
SN6	4.700	4.720	4.700	4.700	4.690	4.700	4.680	4.690	4.690	4.680	4.700	4.700
SN7	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.710
SN8	4.700	4.720	4.700	4.700	4.700	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN10	4.700	4.720	4.690	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.720	4.690	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.690	4.690	4.680	4.710	4.710
Average	4.700	4.720	4.698	4.700	4.692	4.694	4.674	4.690	4.686	4.680	4.702	4.702
Sigma	0.000	0.000	0.004	0.000	0.004	0.005	0.005	0.000	0.005	0.000	0.004	0.004

Measurements

VOH_TTL DQ3	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.690	4.700	4.650	4.690	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.690	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.690	4.690	4.670	4.710	4.710
SN12	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN13	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN14	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.690	4.690	4.680	4.710	4.710
Average	4.700	4.718	4.700	4.692	4.692	4.692	4.672	4.684	4.682	4.676	4.702	4.702
Sigma	0.000	0.004	0.000	0.004	0.004	0.004	0.004	0.005	0.004	0.005	0.004	0.004

Parameter : Output High Voltage TTL : VOH_TTLDQ2
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



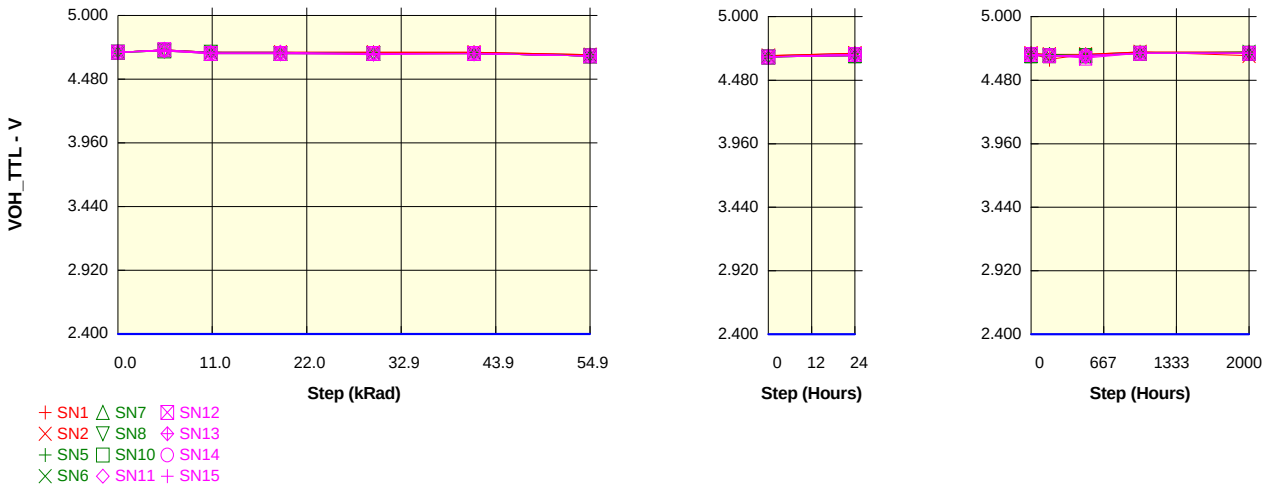
Measurements

VOH_TTL DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.680	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.710
SN6	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.710
SN7	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.710
SN8	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN10	4.700	4.720	4.690	4.700	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.700
Statistics												
Min	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.720	4.698	4.698	4.690	4.694	4.670	4.684	4.682	4.680	4.700	4.706
Sigma	0.000	0.000	0.004	0.004	0.000	0.005	0.000	0.005	0.004	0.000	0.000	0.005

Measurements

VOH_TTL DQ2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.680	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.710	4.680	4.700	4.690	4.680	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.700
SN12	4.700	4.720	4.690	4.700	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN13	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN14	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN15	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.700
Average	4.700	4.718	4.694	4.696	4.690	4.690	4.670	4.684	4.682	4.678	4.700	4.700
Sigma	0.000	0.004	0.005	0.005	0.000	0.000	0.000	0.005	0.004	0.004	0.000	0.000

Parameter : Output High Voltage TTL : VOH_TTLDQ1
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



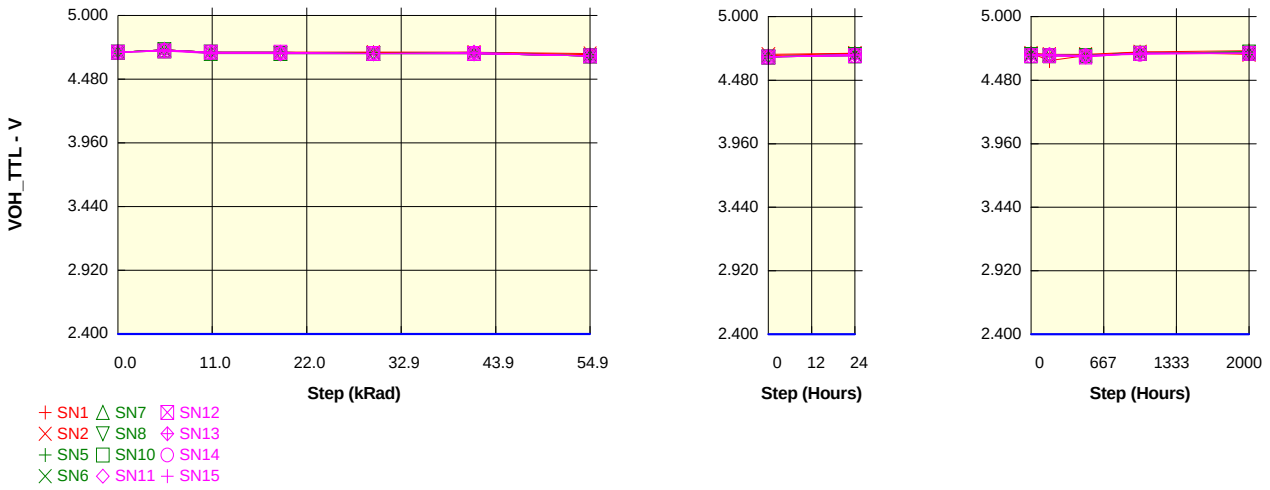
Measurements

VOH_TTL DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.690	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.690	4.690	4.710	4.680
ON_R samples												
SN5	4.700	4.710	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN6	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.710
SN7	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.700
SN8	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN10	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.714	4.696	4.692	4.690	4.690	4.670	4.684	4.682	4.680	4.700	4.702
Sigma	0.000	0.005	0.005	0.004	0.000	0.000	0.000	0.005	0.004	0.000	0.000	0.004

Measurements

VOH_TTL DQ1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.650	4.690	4.710	4.710
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.690	4.690	4.710	4.680
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.670	4.700	4.700
SN12	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.690	4.680	4.660	4.700	4.700
SN13	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
SN14	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN15	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.680	4.690	4.670	4.680	4.680	4.660	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
Average	4.700	4.716	4.692	4.692	4.688	4.690	4.670	4.686	4.680	4.674	4.700	4.700
Sigma	0.000	0.005	0.004	0.004	0.004	0.000	0.000	0.005	0.000	0.008	0.000	0.000

Parameter : Output High Voltage TTL : VOH_TTLDQ0
Test conditions : IOH=-2.5mA. TTL inputs
Unit : V
Spec Limit Min : 2.400
Spec limits are represented in bold lines on the graphic.



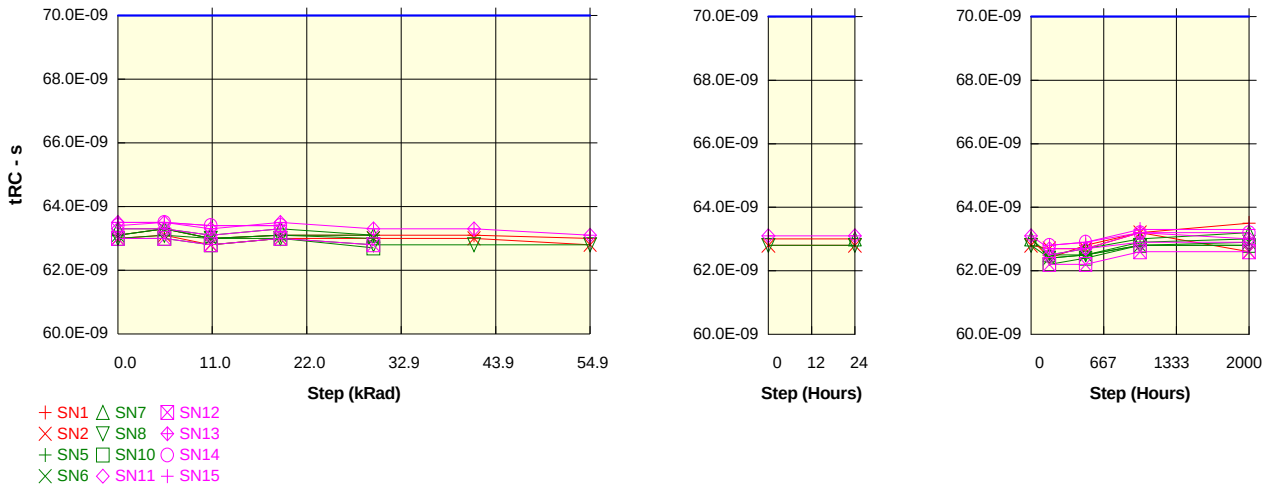
Measurements

VOH_TTL DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.640	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.690	4.690	4.710	4.690
ON_R samples												
SN5	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.680	4.700	4.710
SN6	4.700	4.720	4.700	4.700	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.710
SN7	4.700	4.720	4.690	4.690	4.690	4.690	4.670	4.680	4.690	4.680	4.700	4.700
SN8	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.680	4.680	4.700	4.700
SN10	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.710
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.710
Average	4.700	4.718	4.698	4.694	4.690	4.692	4.670	4.686	4.682	4.680	4.700	4.706
Sigma	0.000	0.004	0.004	0.005	0.000	0.004	0.000	0.005	0.004	0.000	0.000	0.005

Measurements

VOH_TTL DQ0	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.680	4.700	4.640	4.680	4.710	4.720
SN2_REF	4.700	4.720	4.700	4.700	4.700	4.700	4.690	4.700	4.690	4.690	4.710	4.690
ON_RW samples												
SN11	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.680	4.670	4.700	4.700
SN12	4.700	4.710	4.700	4.700	4.690	4.690	4.670	4.680	4.680	4.670	4.700	4.700
SN13	4.700	4.720	4.700	4.690	4.690	4.690	4.670	4.690	4.690	4.680	4.700	4.700
SN14	4.700	4.710	4.700	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.690	4.700
SN15	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.680	4.700	4.700
Statistics												
Min	4.700	4.710	4.690	4.690	4.690	4.690	4.670	4.680	4.680	4.670	4.690	4.700
Max	4.700	4.720	4.700	4.700	4.690	4.700	4.670	4.690	4.690	4.680	4.700	4.700
Average	4.700	4.714	4.698	4.694	4.690	4.692	4.670	4.684	4.682	4.676	4.698	4.700
Sigma	0.000	0.005	0.004	0.005	0.000	0.004	0.000	0.005	0.004	0.005	0.004	0.000

Parameter : Read Cycle Time : tRC
Test conditions : /E=Vil. /G=Vil. Vil=0.45V. Vih=2.4V. Vol=0.8V. Voh=2V
Unit : s
Spec Limit Max : 70.0E-09
Spec limits are represented in bold lines on the graphic.



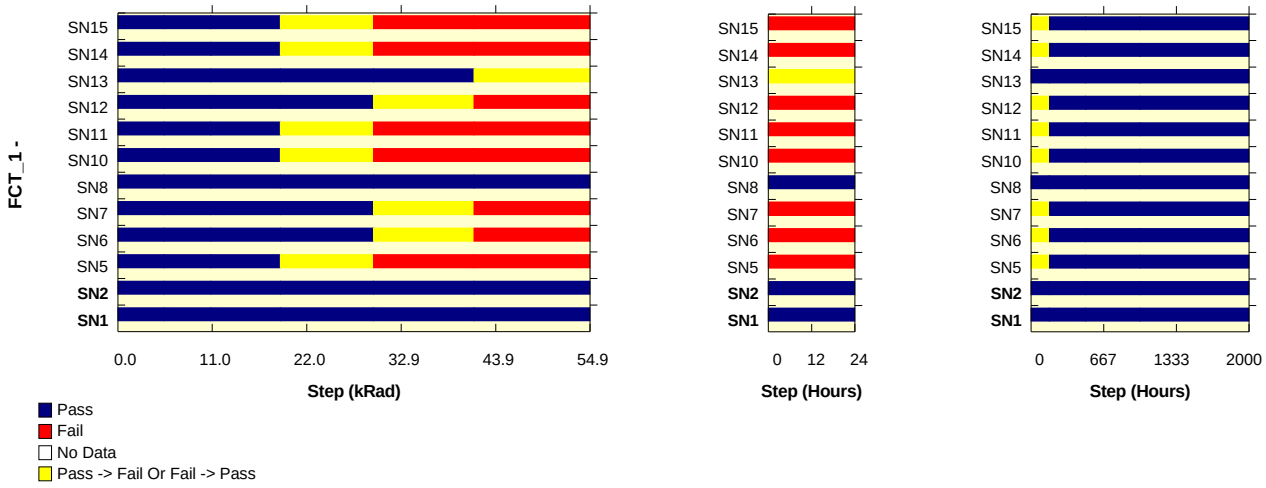
Measurements

tRC	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	63.1E-09	63.3E-09	63.0E-09	63.1E-09	63.1E-09	63.1E-09	63.0E-09	63.0E-09	62.4E-09	62.8E-09	63.2E-09	63.5E-09
SN2_REF	63.0E-09	63.1E-09	62.8E-09	63.0E-09	63.0E-09	63.0E-09	62.8E-09	62.8E-09	62.7E-09	62.7E-09	63.2E-09	62.6E-09
ON_R samples												
SN5	63.1E-09	63.3E-09	63.0E-09	63.1E-09	63.1E-09				62.5E-09	62.5E-09	62.9E-09	63.0E-09
SN6	63.1E-09	63.3E-09	63.0E-09	63.1E-09	63.0E-09				62.4E-09	62.5E-09	62.8E-09	62.9E-09
SN7	63.3E-09	63.3E-09	63.1E-09	63.3E-09	63.1E-09			63.0E-09	62.5E-09	62.7E-09	63.0E-09	63.2E-09
SN8	63.0E-09	63.1E-09	63.0E-09	63.0E-09	62.8E-09	62.8E-09	62.8E-09	62.8E-09	62.4E-09	62.5E-09	62.8E-09	62.8E-09
SN10	63.0E-09	63.0E-09	62.8E-09	63.0E-09	62.7E-09				62.2E-09	62.4E-09	62.8E-09	62.8E-09
Statistics												
Min	63.0E-09	63.0E-09	62.8E-09	63.0E-09	62.7E-09	62.8E-09	62.8E-09	62.8E-09	62.2E-09	62.4E-09	62.8E-09	62.8E-09
Max	63.3E-09	63.3E-09	63.1E-09	63.3E-09	63.1E-09	62.8E-09	62.8E-09	63.0E-09	62.5E-09	62.7E-09	63.0E-09	63.2E-09
Average	63.1E-09	63.2E-09	63.0E-09	63.1E-09	62.9E-09	62.8E-09	62.8E-09	62.9E-09	62.4E-09	62.5E-09	62.9E-09	62.9E-09
Sigma	109.5E-12	126.5E-12	98.0E-12	109.5E-12	162.5E-12	0.0E+00	0.0E+00	100.0E-12	109.5E-12	98.0E-12	80.0E-12	149.7E-12

Measurements

tRC	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	63.1E-09	63.3E-09	63.0E-09	63.1E-09	63.1E-09	63.1E-09	63.0E-09	63.0E-09	62.4E-09	62.8E-09	63.2E-09	63.5E-09
SN2_REF	63.0E-09	63.1E-09	62.8E-09	63.0E-09	63.0E-09	63.0E-09	62.8E-09	62.8E-09	62.7E-09	62.7E-09	63.2E-09	62.6E-09
ON_RW samples												
SN11	63.3E-09	63.3E-09	63.1E-09	63.3E-09					62.5E-09	62.7E-09	62.9E-09	62.9E-09
SN12	63.0E-09	63.0E-09	62.8E-09	63.0E-09	62.8E-09				62.2E-09	62.2E-09	62.6E-09	62.6E-09
SN13	63.5E-09	63.5E-09	63.3E-09	63.5E-09	63.3E-09	63.3E-09	63.1E-09	63.1E-09	62.7E-09	62.7E-09	63.2E-09	63.0E-09
SN14	63.4E-09	63.5E-09	63.4E-09	63.4E-09					62.8E-09	62.9E-09	63.2E-09	63.2E-09
SN15	63.5E-09	63.5E-09	63.4E-09	63.4E-09					62.8E-09	62.9E-09	63.3E-09	63.3E-09
Statistics												
Min	63.0E-09	63.0E-09	62.8E-09	63.0E-09	62.8E-09	63.3E-09	63.1E-09	63.1E-09	62.2E-09	62.2E-09	62.6E-09	62.6E-09
Max	63.5E-09	63.5E-09	63.4E-09	63.5E-09	63.3E-09	63.3E-09	63.1E-09	63.1E-09	62.8E-09	62.9E-09	63.3E-09	63.3E-09
Average	63.3E-09	63.4E-09	63.2E-09	63.3E-09	63.1E-09	63.3E-09	63.1E-09	63.1E-09	62.6E-09	62.7E-09	63.0E-09	63.0E-09
Sigma	185.5E-12	196.0E-12	228.0E-12	172.0E-12	250.0E-12	0.0E+00	0.0E+00	0.0E+00	228.0E-12	256.1E-12	257.7E-12	244.9E-12

Parameter : Functionnal Test 1 : FCT_1
Test conditions : Read Checkerboard Pattern (setup 1)
Unit :
No spec limit specified.



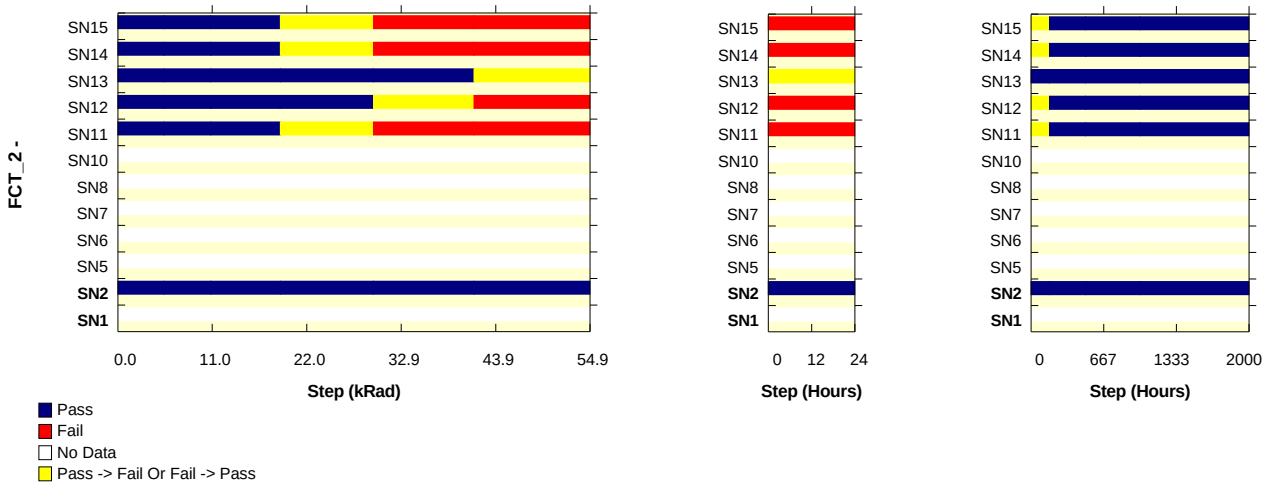
Measurements

FCT_1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_R samples												
SN5	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN6	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN7	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN8	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN10	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

Measurements

FCT_1	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_RW samples												
SN11	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN13	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	PASS	PASS
SN14	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN15	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

Parameter : Functionnal Test 2 : FCT_2
Test conditions : Erase. Program and Read Checkerboard Pattern (setup 2)
Unit :
No spec limit specified.



Measurements

FCT_2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS											
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_R samples												
SN5	PASS											
SN6	PASS											
SN7	PASS											
SN8	PASS											
SN10	PASS											

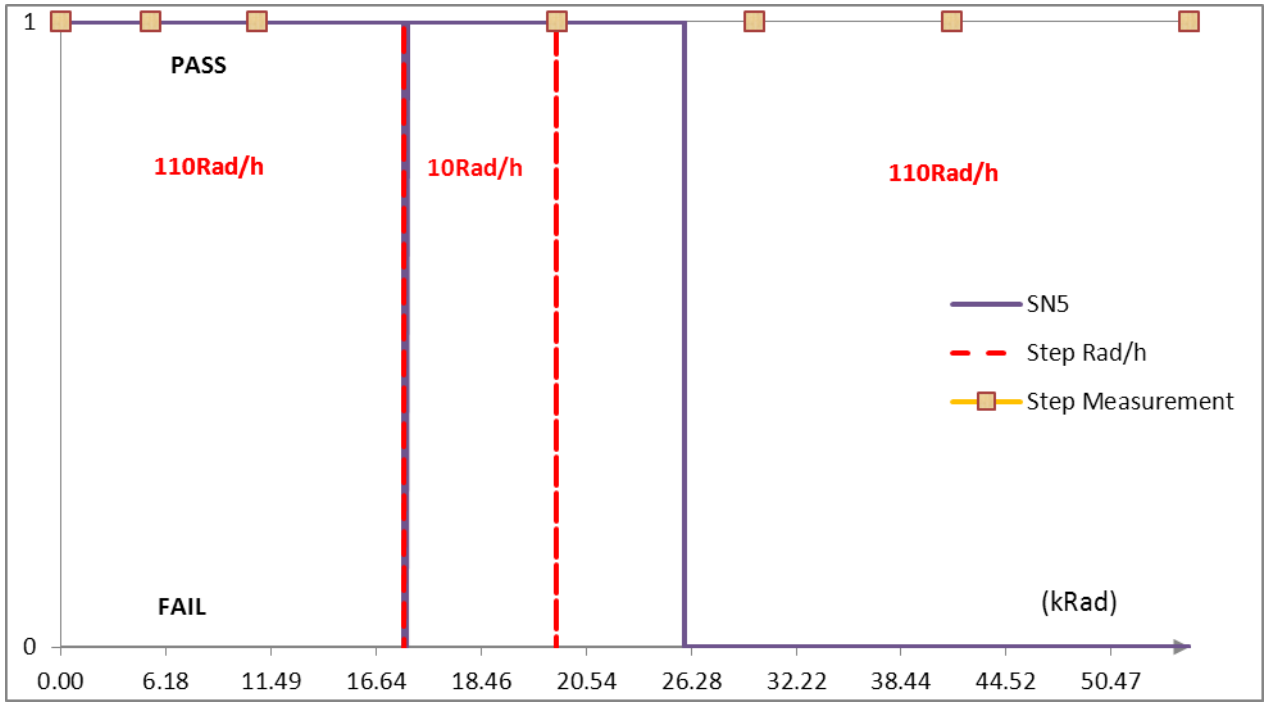
Measurements

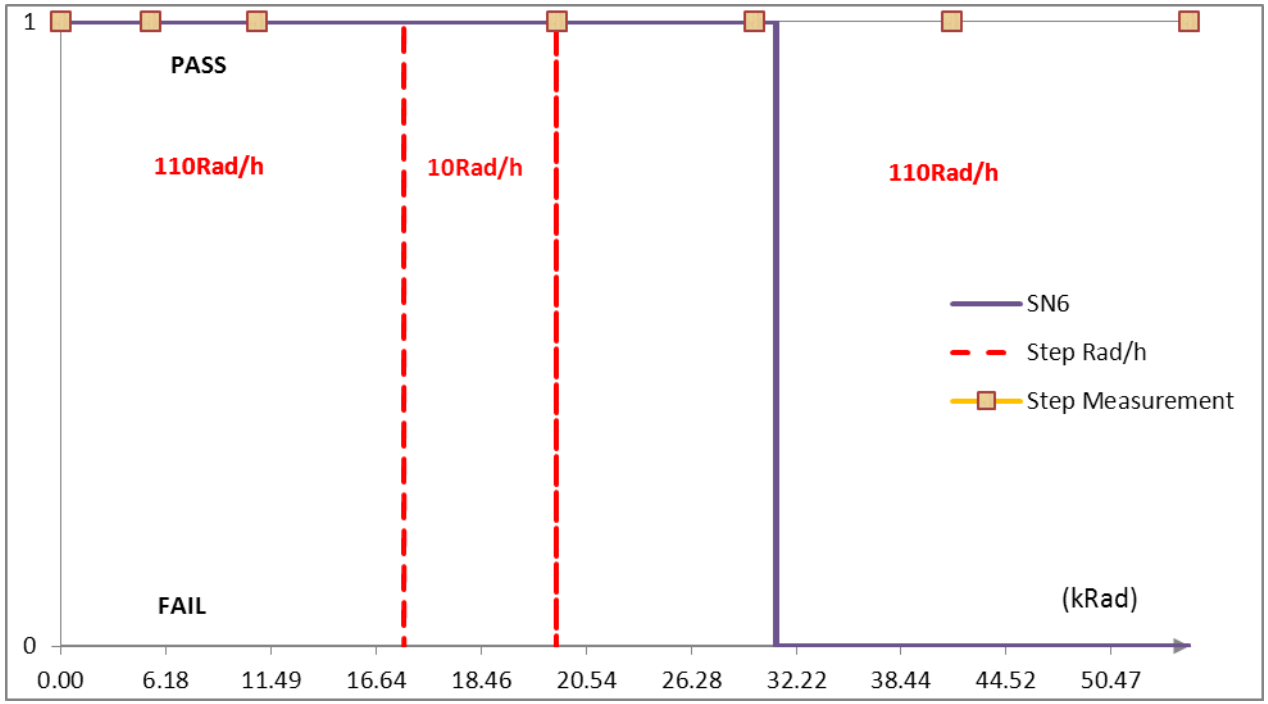
FCT_2	0 kRad	5.4 kRad	10.8 kRad	18.9 kRad	29.7 kRad	41.4 kRad	54.9 kRad	24 Hours	168 Hours	500 Hours	1000 Hours	2000 Hours
SN1_REF	PASS											
SN2_REF	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
ON_RW samples												
SN11	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN12	PASS	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN13	PASS	PASS	PASS	PASS	PASS	PASS	FAIL	PASS	PASS	PASS	PASS	PASS
SN14	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS
SN15	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	FAIL	PASS	PASS	PASS	PASS

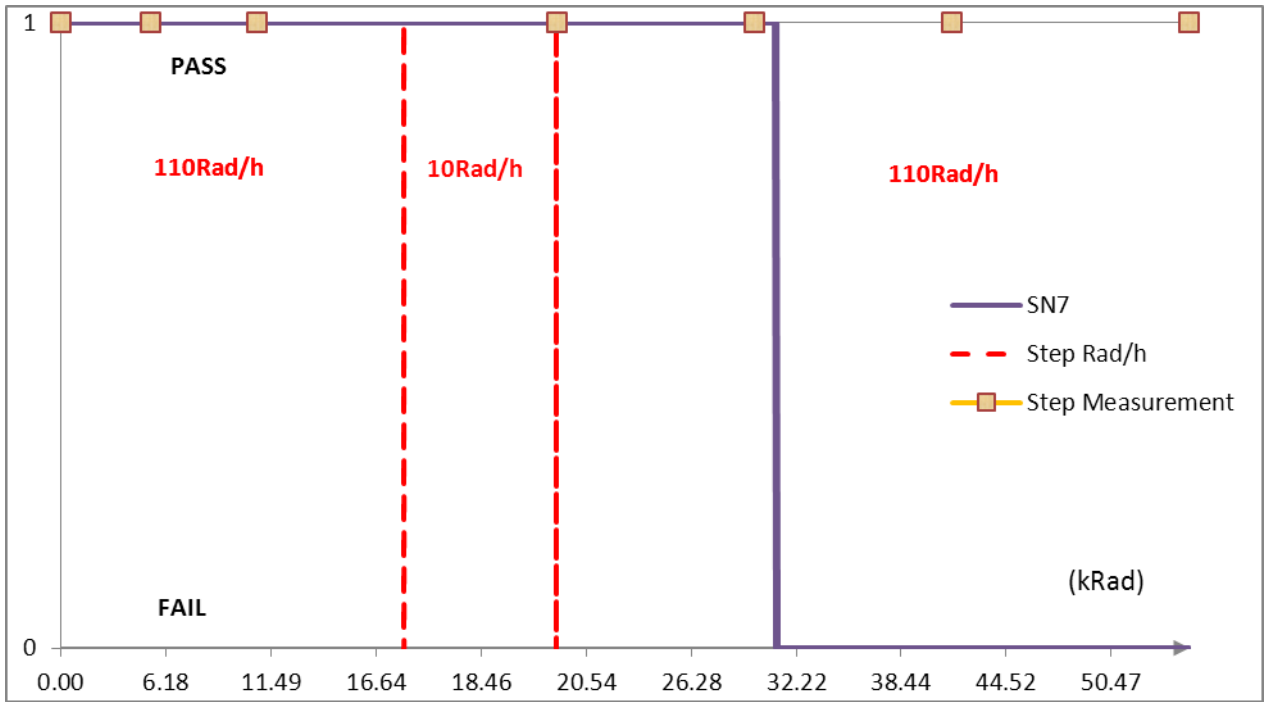
7 Appendix

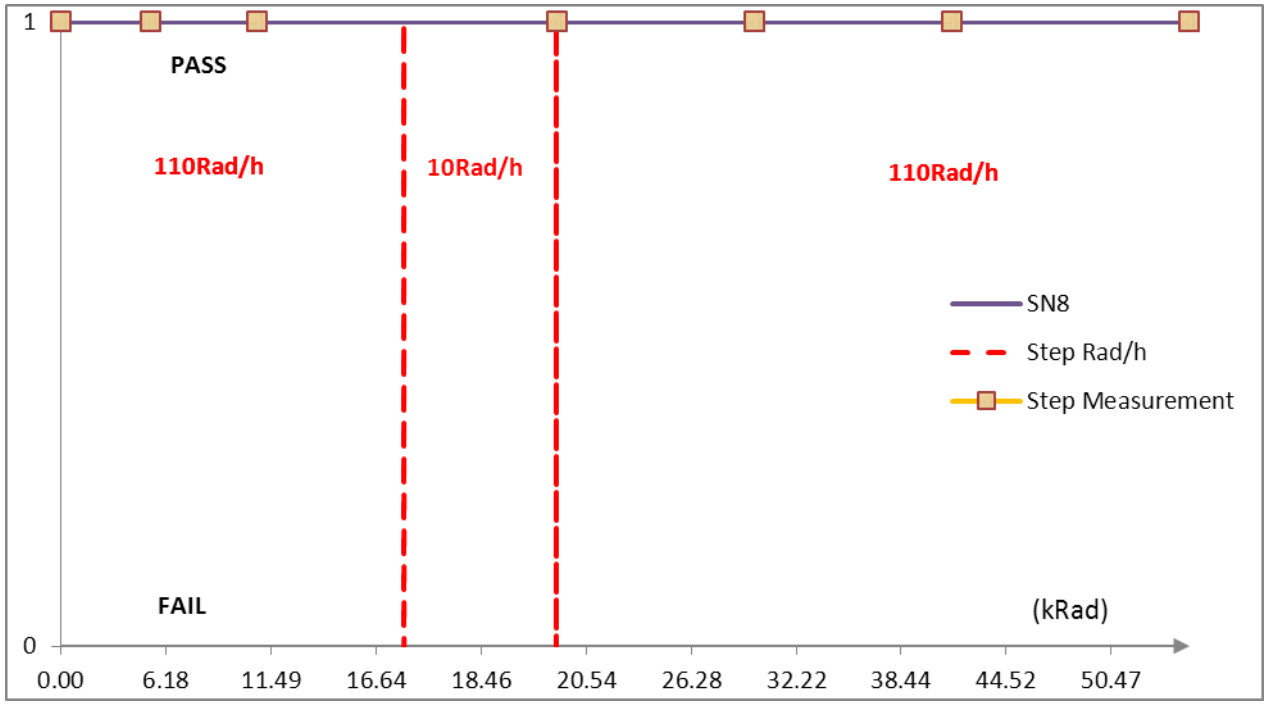
7.1 Appendix 1: In-situ functionality monitoring during exposures

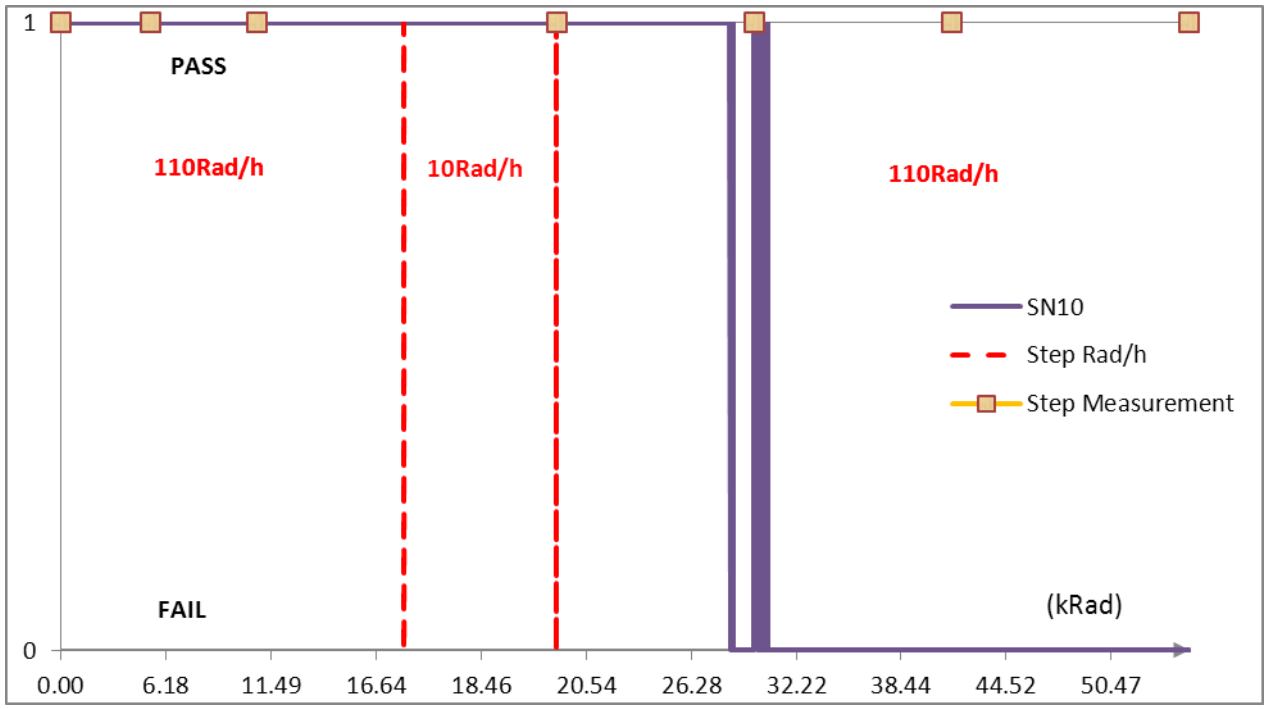
7.1.1 Read only samples (SN5-6-7-8-10)



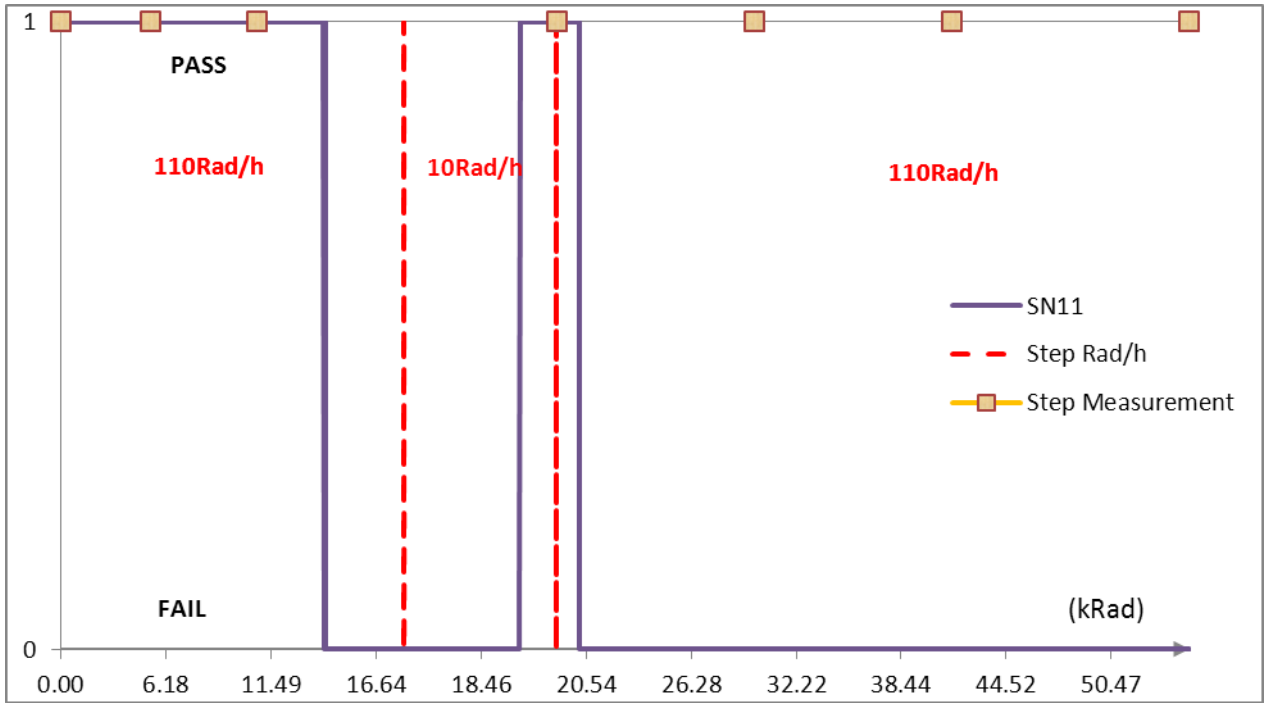

1
PASS
110Rad/h
10Rad/h
110Rad/h
SN6
Step Rad/h
Step Measurement
FAIL
(kRad)
0
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

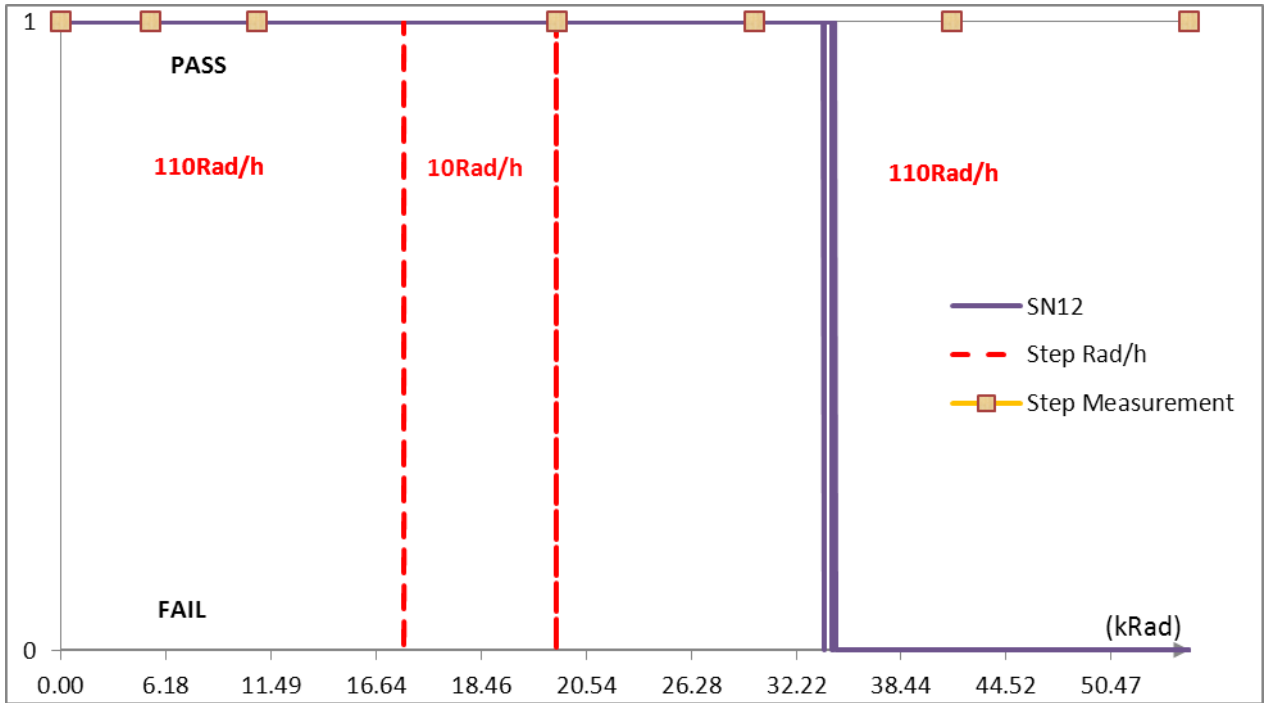

1
PASS
110Rad/h
10Rad/h
110Rad/h
SN7
Step Rad/h
Step Measurement
(kRad)
FAIL
0
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

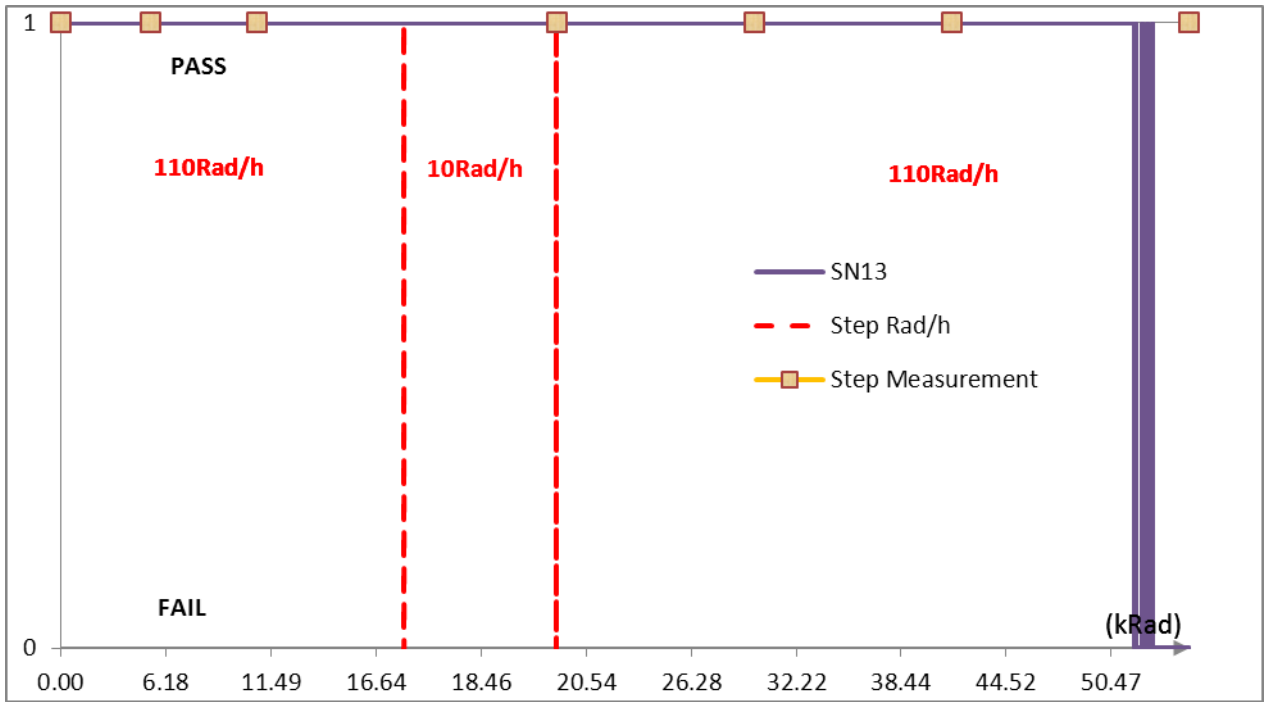

1
PASS
110Rad/h
10Rad/h
110Rad/h
SN8
Step Rad/h
Step Measurement
FAIL
(kRad)
0
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

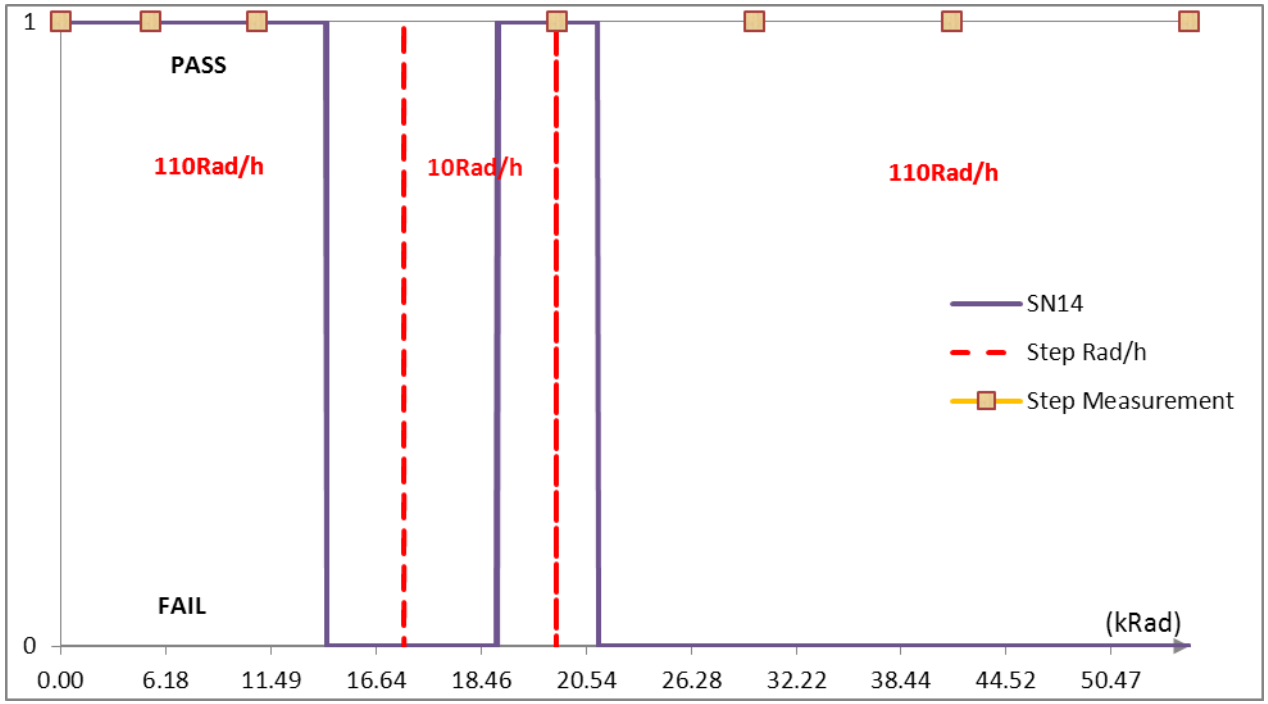

1
PASS
110Rad/h
10Rad/h
110Rad/h
SN10
Step Rad/h
Step Measurement
FAIL
(kRad)
0
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

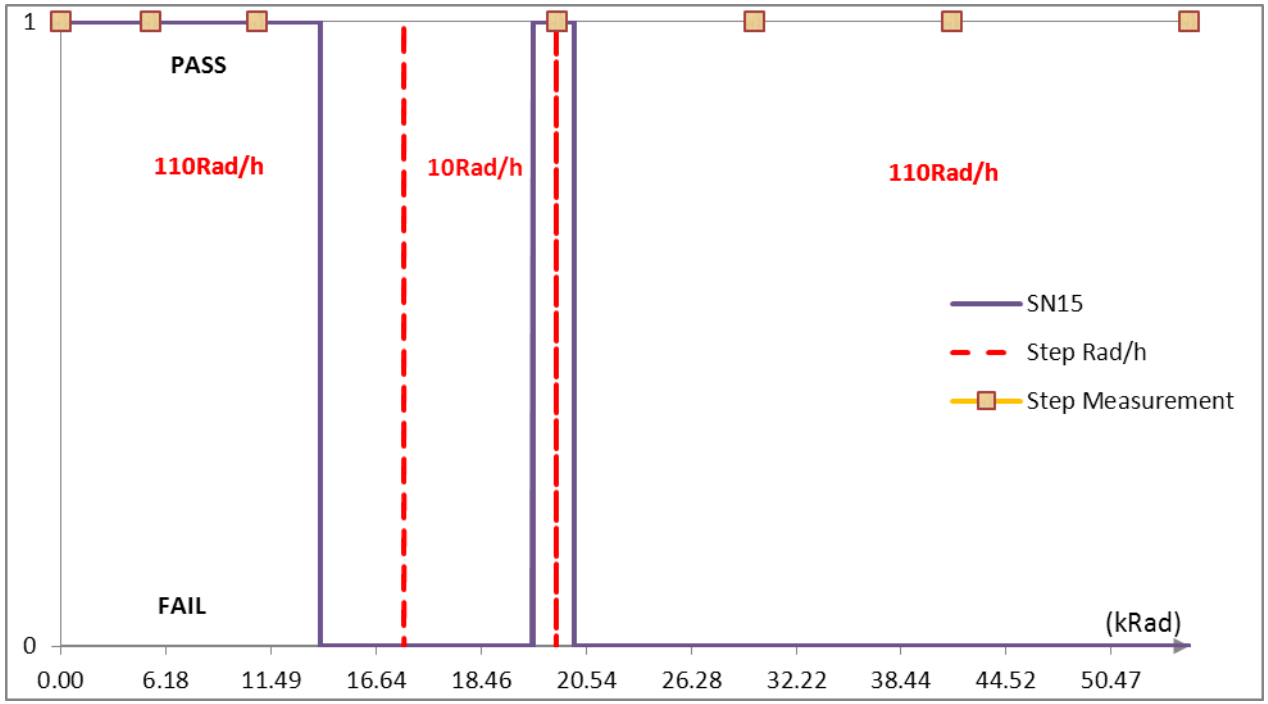
7.1.2 Read Erase Write Read samples (SN11-12-13-14-15)




1
PASS
110Rad/h
10Rad/h
110Rad/h
SN12
Step Rad/h
Step Measurement
FAIL
(kRad)
0
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

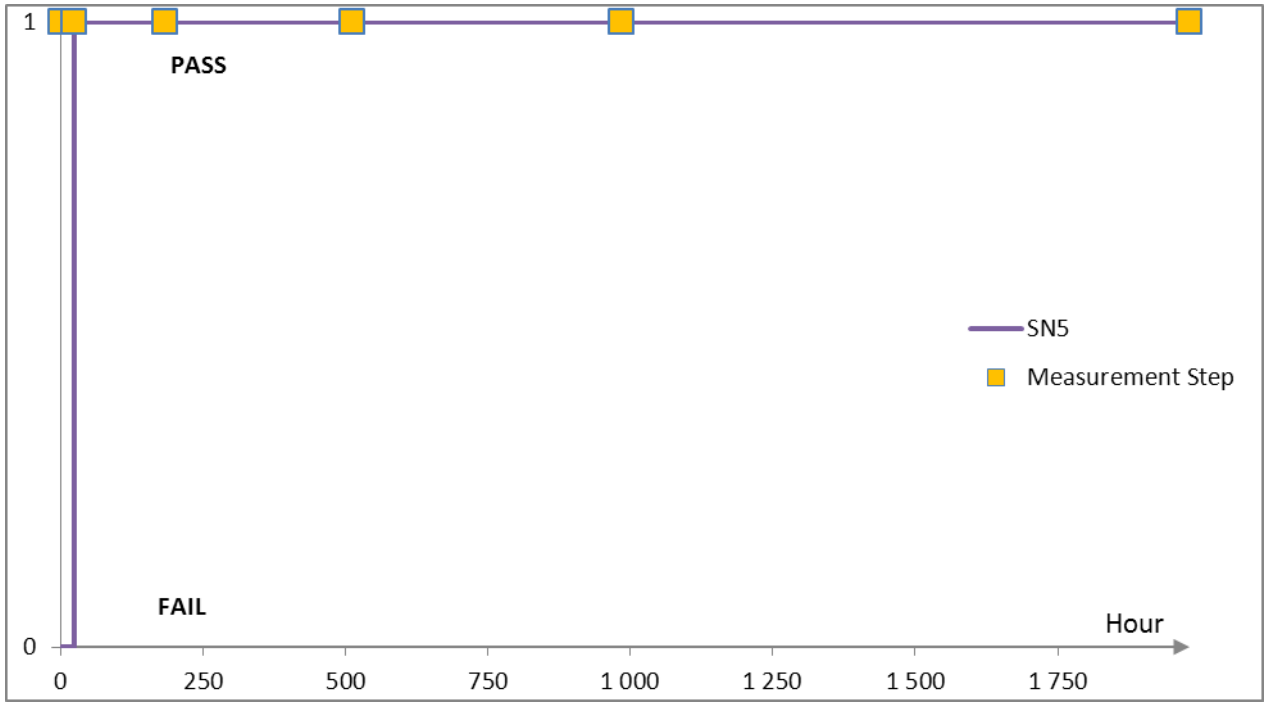

1
PASS
110Rad/h
10Rad/h
110Rad/h
SN13
Step Rad/h
Step Measurement
FAIL
0
(kRad)
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

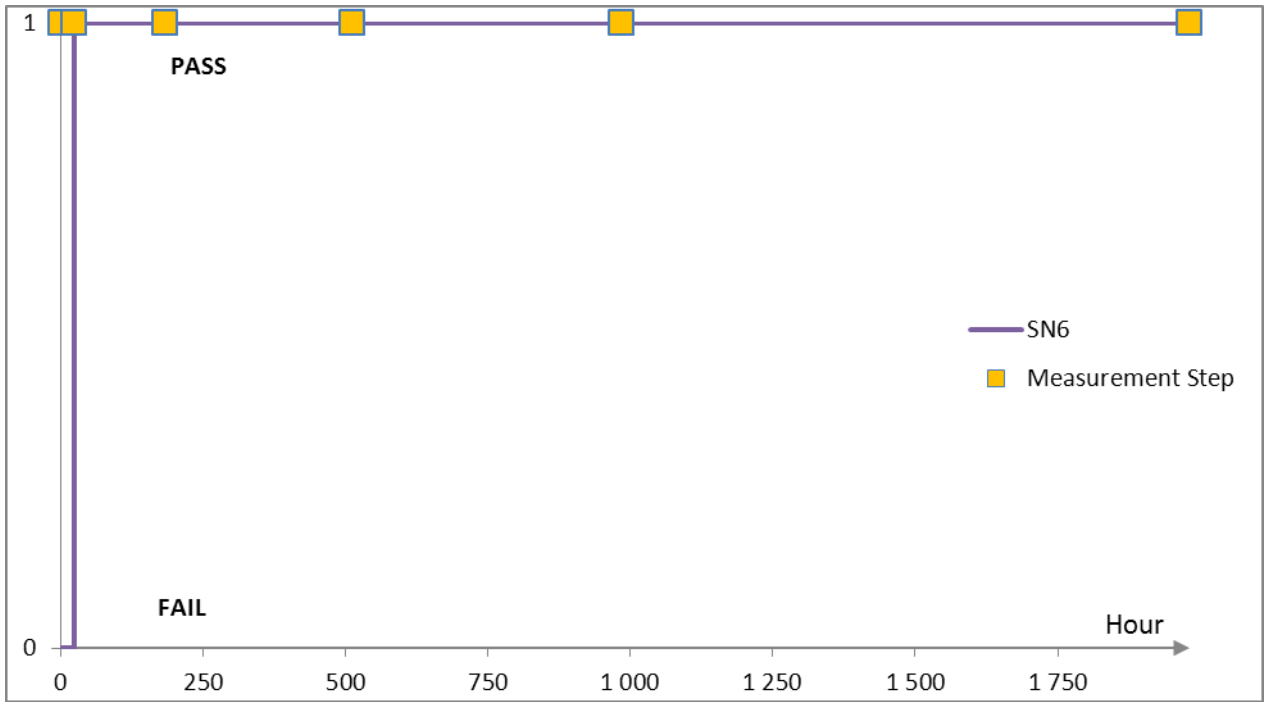

1
PASS
110Rad/h
10Rad/h
110Rad/h
SN14
Step Rad/h
Step Measurement
FAIL
0
(kRad)
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

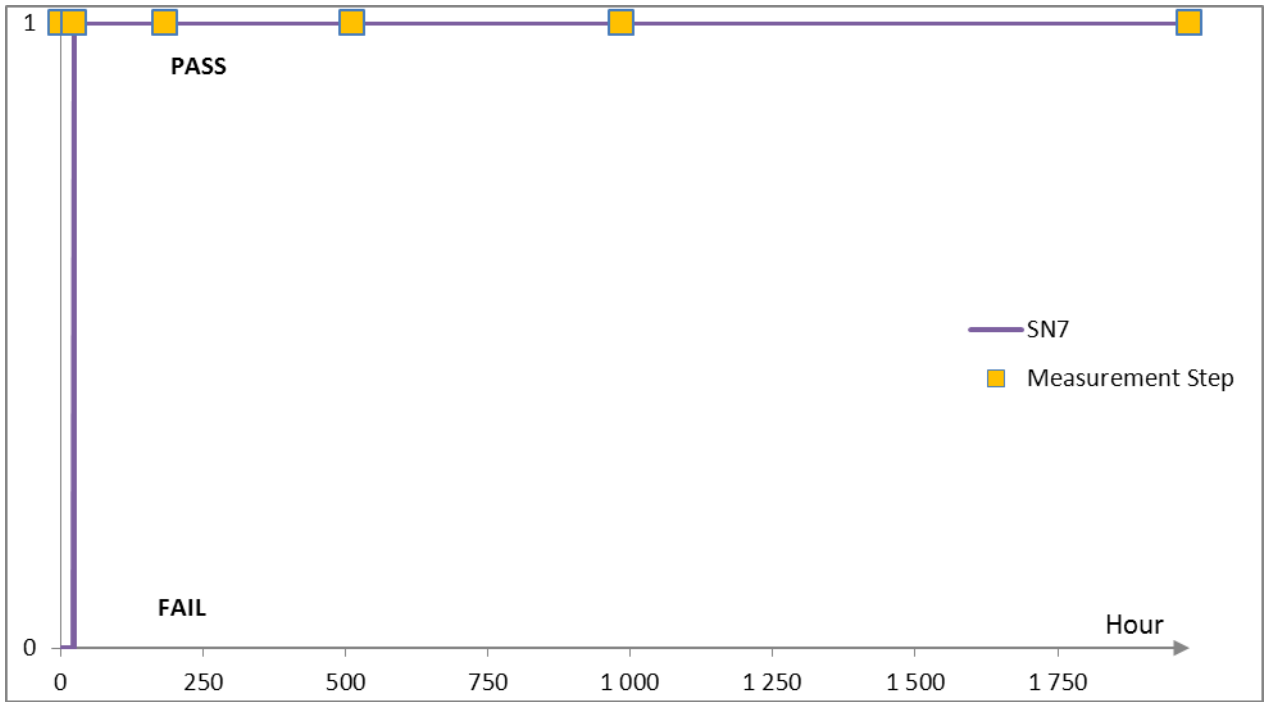

1
PASS
110Rad/h
10Rad/h
110Rad/h
SN15
Step Rad/h
Step Measurement
FAIL
0
(kRad)
0.00
6.18
11.49
16.64
18.46
20.54
26.28
32.22
38.44
44.52
50.47

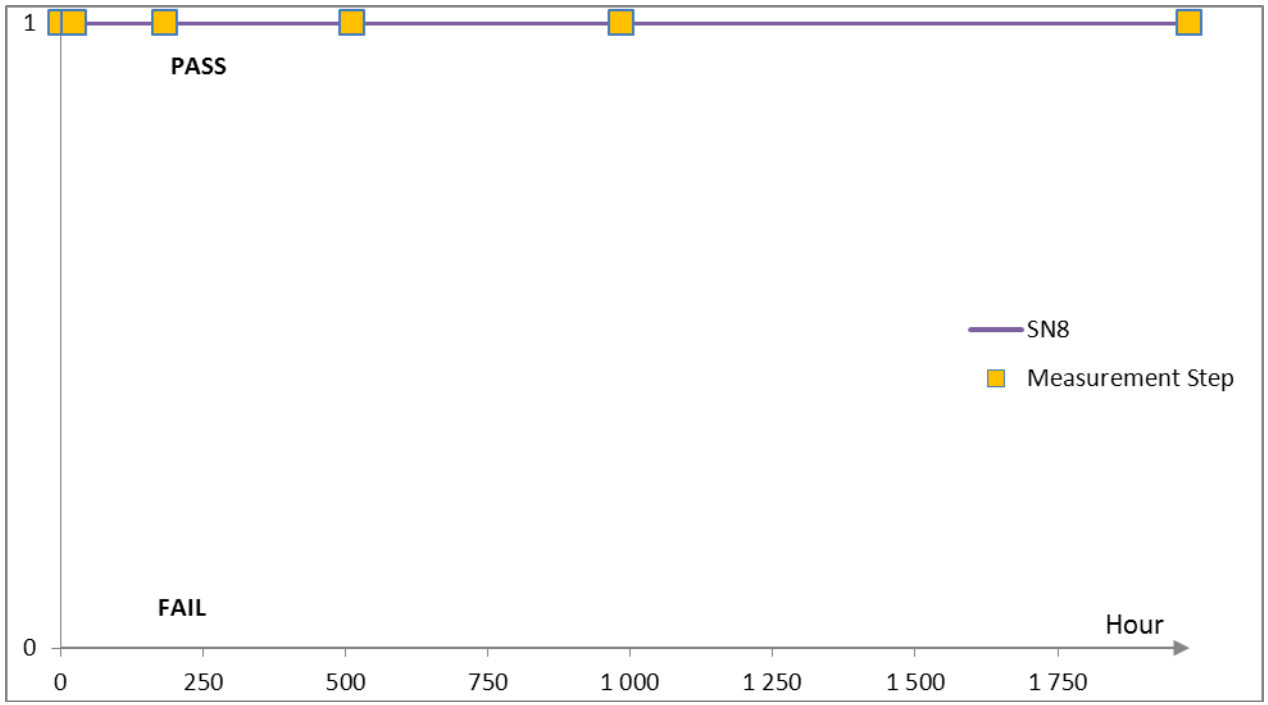
7.2 Appendix 2: In-situ functionality monitoring during Annealing

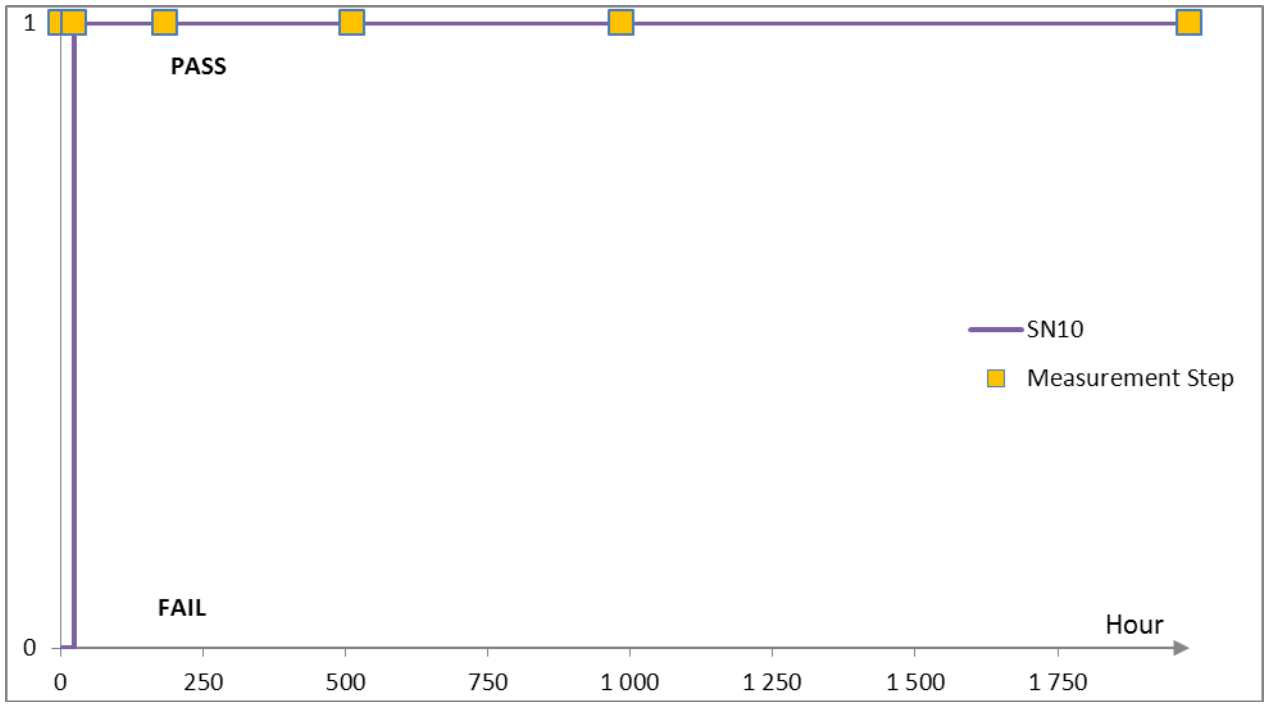
7.2.1 Read only samples (SN5-6-7-8-10)



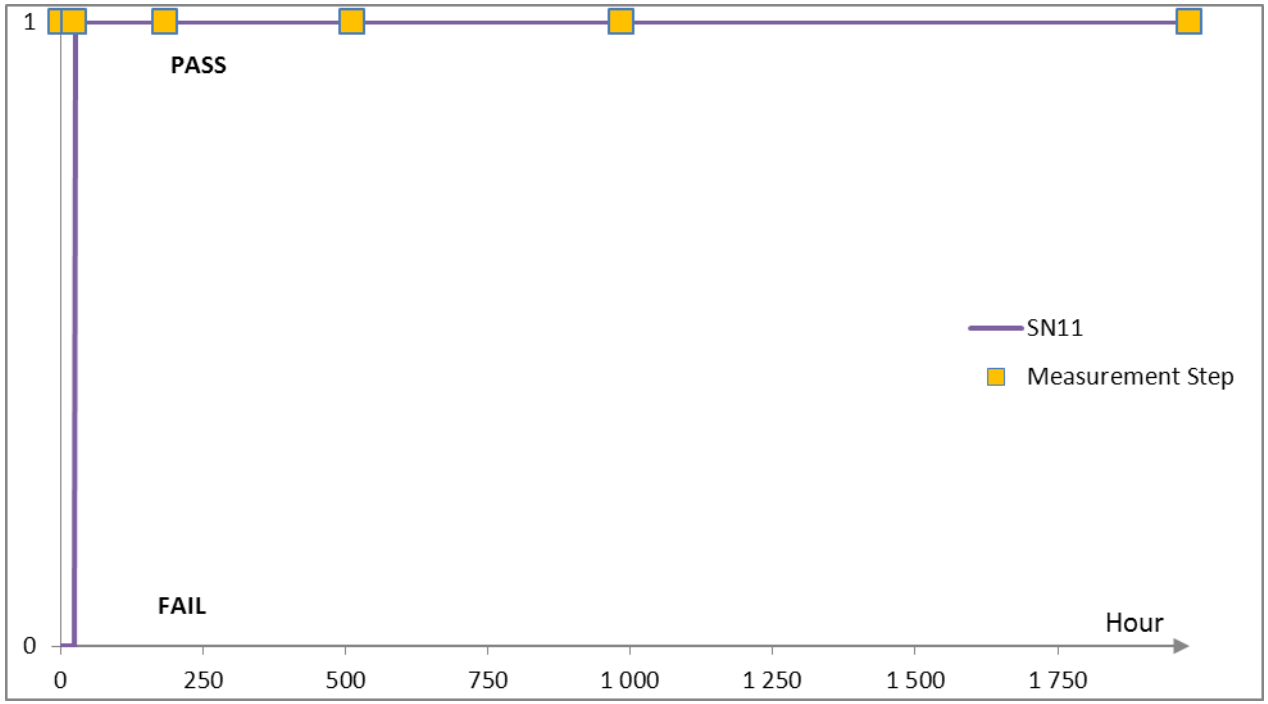

1
PASS
FAIL
0
Hour
0
250
500
750
1 000
1 250
1 500
1 750
SN6
Measurement Step

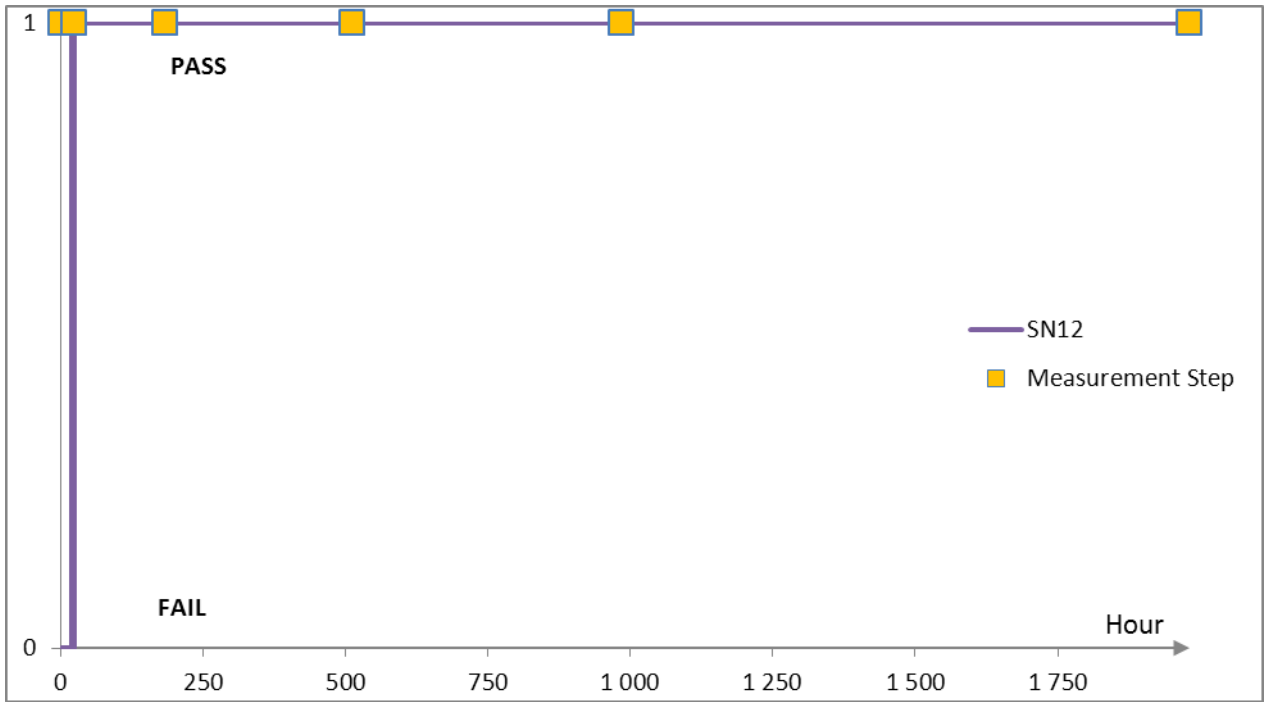

1
PASS
FAIL
0
SN7
Measurement Step
Hour
0
250
500
750
1 000
1 250
1 500
1 750

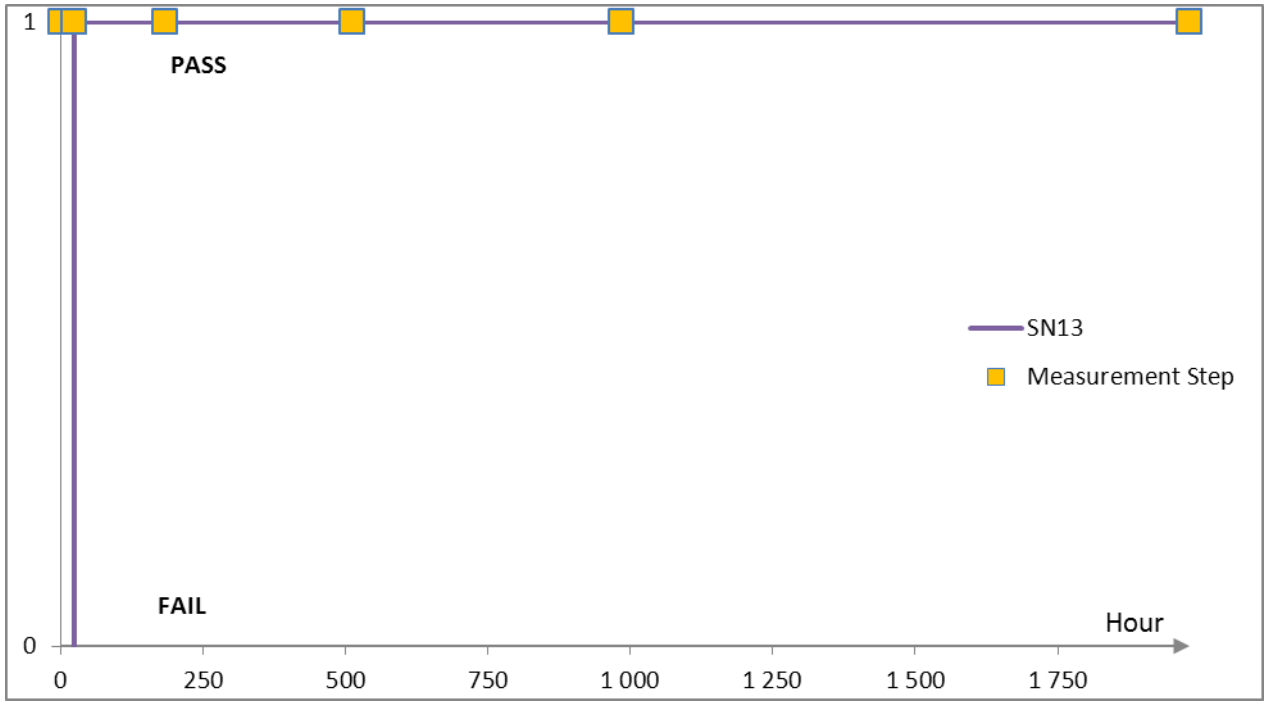

1
PASS
FAIL
0
Hour
0
250
500
750
1 000
1 250
1 500
1 750
SN8
Measurement Step

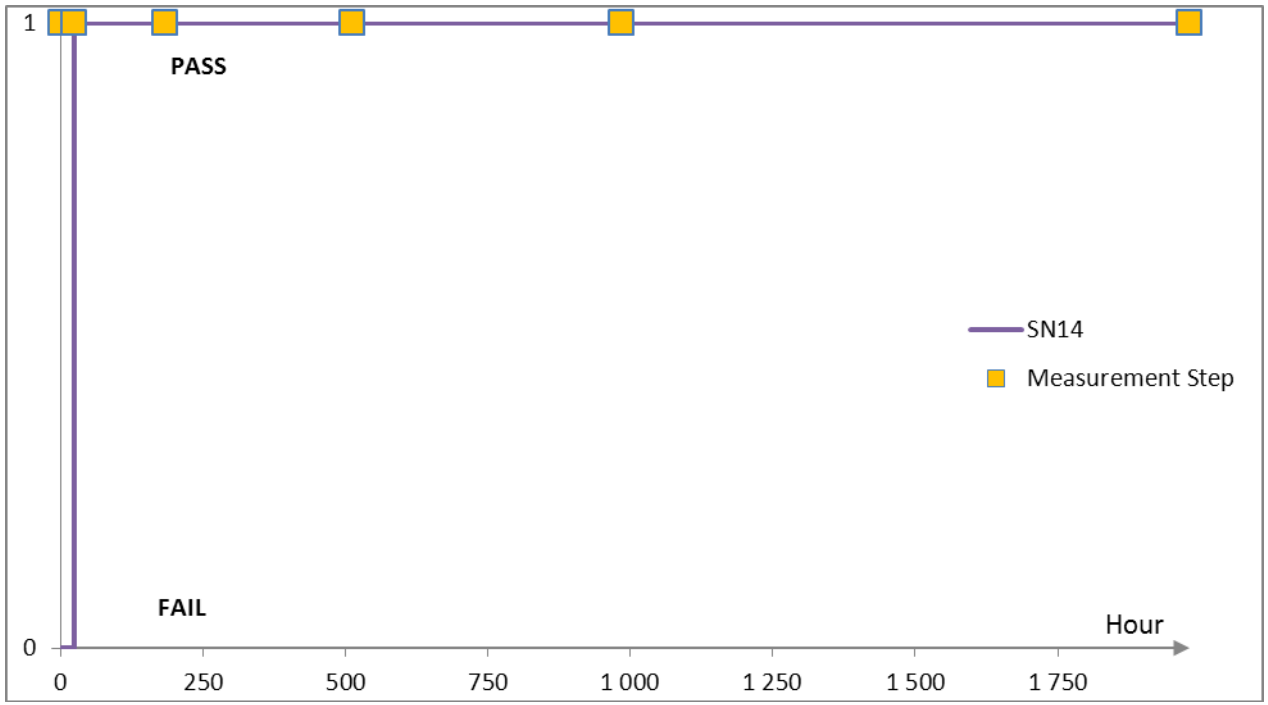

1
PASS
FAIL
0
Hour
0
250
500
750
1 000
1 250
1 500
1 750
SN10
Measurement Step

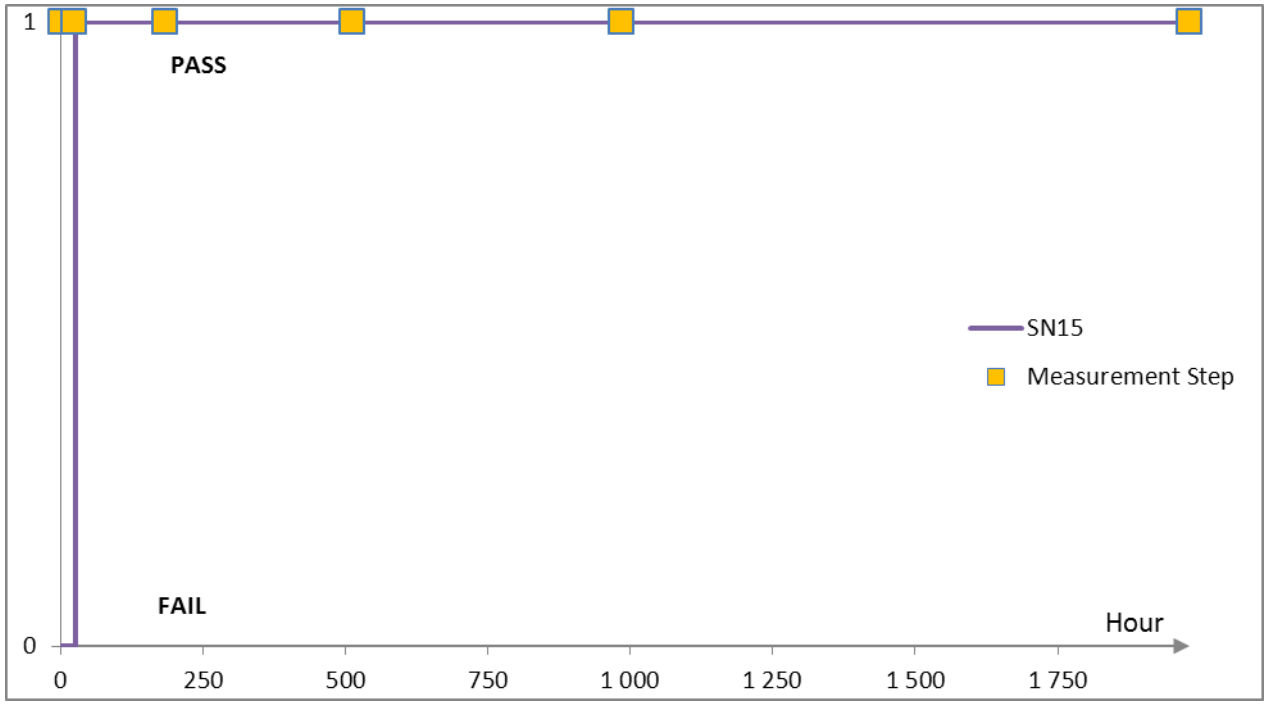
7.2.2 Read Erase Write Read samples




1
PASS
FAIL
0
Hour
0
250
500
750
1 000
1 250
1 500
1 750
SN12
Measurement Step


1
PASS
FAIL
0
Hour
0
250
500
750
1 000
1 250
1 500
1 750
SN13
Measurement Step


1
PASS
FAIL
0
Hour
0
250
500
750
1 000
1 250
1 500
1 750
SN14
Measurement Step


1
PASS
SN15
Measurement Step
FAIL
Hour
0
0
250
500
750
1 000
1 250
1 500
1 750