
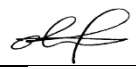



## TOTAL IONIZING DOSE TEST REPORT

<p><b>Part Type: AD7961BCPZ-RL7CT-ND</b></p> <p><b>Package: LFCSP-32</b></p> <p><b>Description: 16-Bit, 5 MSPS, PulSAR Differential ADC</b></p> <p><b>Manufacturer: Analog Devices</b></p> <p><b>Date Code: 1520</b></p>
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**Esa Estec Purchase Order N° 22327/09/NL/SFe / Call-off Order 6 dated July 13<sup>th</sup>, 2017**

<b>Hirex reference:</b>	HRX/TID/01557	Issue:01	Date:	February 7 <sup>th</sup> , 2018
<b>Written by:</b>	G. FAUCHON	Test Lab Engineering Technician		
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Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

**CHANGE RECORD**

ISSUE	DATE	PAGE	DESCRIPTION OF CHANGES
01	February 7th, 2018	All	Original Issue

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

**TOTAL IONIZING DOSE TEST REPORT  
on Analog Devices  
AD7961BCPZ-RL7CT-ND  
16-Bit, 5 MSPS, PuLSAR Differential ADC**

**TABLE OF CONTENTS**

**1 INTRODUCTION.....4**

**2 APPLICABLE AND REFERENCE DOCUMENTS .....4**

    2.1 APPLICABLE DOCUMENTS.....4

    2.2 REFERENCE DOCUMENTS.....4

**3 TEST SAMPLES.....4**

**4 EXPERIMENTAL CONDITIONS.....6**

    4.1 RADIATION SOURCE DOSE RATE AND ANNEALING .....6

    4.2 BIAS DURING DOSE EXPOSURES AND MEASUREMENTS CONDITIONS .....7

        4.2.1 Bias conditions .....7

        4.2.2 Electrical Measurements.....8

**5 CONCLUSION.....10**

**6 TEST RESULTS .....11**

**LIST OF FIGURES:**

Figure 1 : Bias Conditions during Irradiation Exposures and Annealing .....7

Figure 2: AD7961BCPZ-RL7CT-ND test setup synoptic .....8

**LIST OF TABLES:**

Table 1 : Measured electrical parameters .....9

Table 2 : Summary of parameters failure levels .....10

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

## 1 Introduction

A total ionizing dose verification test of the Analog Devices AD7961BCPZ-RL7CT-ND, 16-Bit, 5 MSPS, PulSAR Differential ADC has been performed with an accumulated dose of about 50 krad(Si) at a dose rate of 210 rad(Si)/hour, in response to Esa Estec purchase order reference 22327/09/NL/SFe / Call-off Order 6.

The purpose of this test was to evaluate total dose tolerance of this component, to investigate its suitability for being used in space applications. This test was conducted on samples provided by Esa Estec. Test has been performed in accordance with Hirex Engineering proposal reference HRX/EMP/07041 dated 20/06/2017.

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

## 2 Applicable and Reference Documents

### 2.1 Applicable Documents

- Hirex Engineering proposal: HRX/EMP/07041 dated 20/06/2017
- Hirex engineering Test plan reference: HRX/TDP/00107 issue 02.
- Hirex Engineering Detail Design Document: HRX/DDD/02562 Issue 01
- Hirex Engineering Test Conditions: HRX/TC/01850 Issue 01
- ESCC Basic Specification No. 22900 issue 05.

### 2.2 Reference Documents

- Analog Devices Datasheet

## 3 Test Samples

11 samples of the AD7961BCPZ-RL7CT-ND device have been tested (5 ON + 5 OFF + 1 control sample).

Samples were allocated into the bias conditions during exposures and annealing as provided in the following table.

Serial Numbers	Allocation
1	Control
2	Biased ON
3	Biased ON
4	Biased ON
5	Biased ON
6	Biased ON
7	Biased OFF
8	Biased OFF
9	Biased OFF
10	Biased OFF
11	Biased OFF

Identification of the AD7961BCPZ-RL7CT-ND is provided below:

<b>Part Number:</b>	AD7961BCPZ-RL7CT-ND	<b>Trace Number:</b>	-
<b>Top Marking:</b>	. AD7961 BCPZ #1520 3150203.1 CHINA	<b>Bottom Marking</b>	-
<b>Diffusion Lot:</b>	-	<b>Manuf Lot Number:</b>	AL99257.7
<b>Date Code:</b>	1520	<b>N°Article:</b>	-

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

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

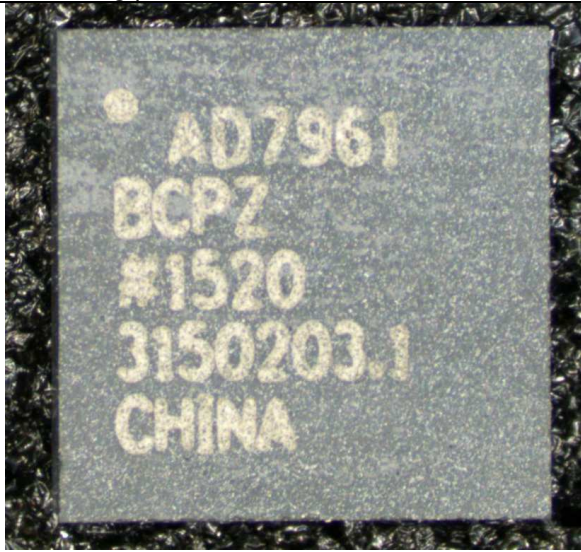


Photo 1 – Device Top Marking

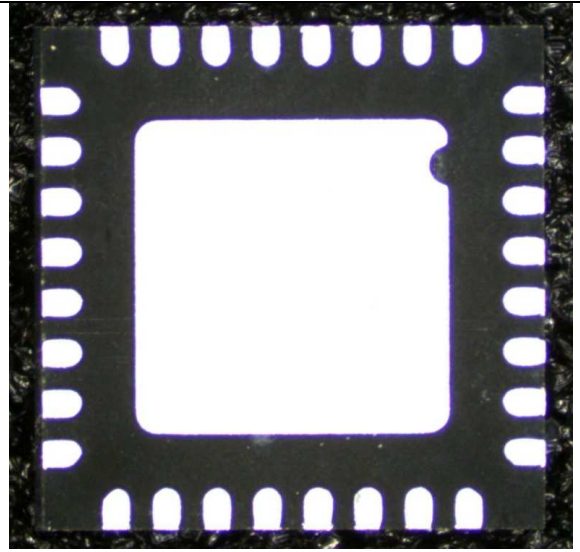


Photo 2 – Device Bottom View

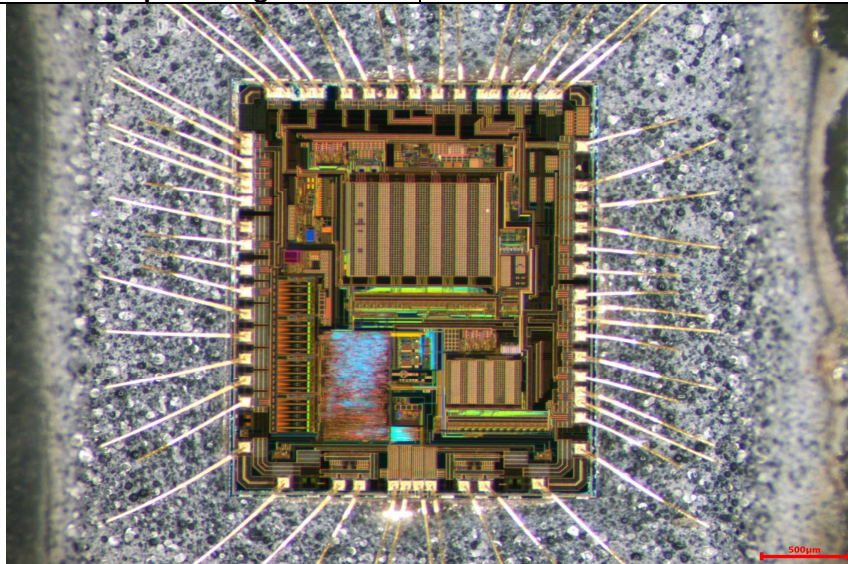


Photo 3 – Die, View

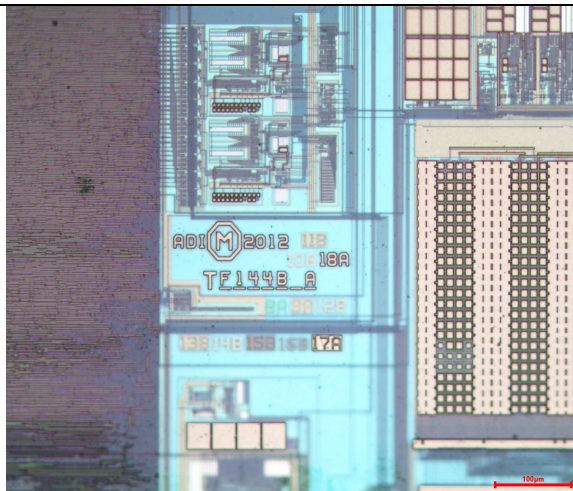


Photo 4 – Die, Marking

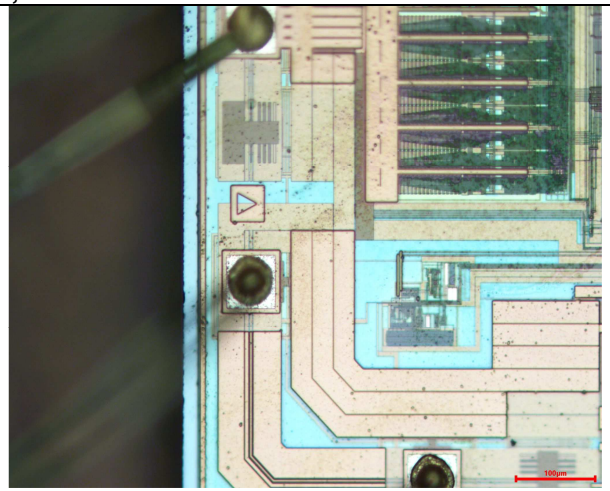


Photo 5 – Die, Marking



Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

## 4 Experimental Conditions

### 4.1 Radiation Source Dose Rate and Annealing

The dose exposures were performed at GAMRAY facility in Toulouse (France). In this irradiation facility, a Cobalt 60 source is used with the possibility to vary the dose rate by simply adjusting the distance to the source.

During the dose exposures, devices under test have been irradiated in an ambient temperature of 24°C ±6°C. The radiation environment is specified in Appendix 1 - Irradiation Certificate.

During annealing step at 100°C±5°C, the temperature was controlled and monitored by using an external monitoring system.

Before exposure, dose rate calibration, using an active dosimeter SAPHYMO gamma probe, was performed at each board location.

Resulting test conditions are provided below.  
CO<sup>60</sup> irradiation certificate is provided in appendix 1.

Total Irradiation Dose	Dosimetry data	Dose rate	Annealing steps	Date	Irradiation Time Out	Start Meas Time	End Meas Time	Irradiation Time In	Temp. Meas
kRad (Si)	kRad(Si)	Rad(Si)/h							°C
0	0	-	-	15/01/2018	-	-	-	10:07	25
5	4.7	210	-	16/01/2018	9:33	10:19	11:05	11:31	25
10	9.4	210	-	17/01/2018	9:34	09:40	10:23	11:33	25
20	19.8	210	-	19/01/2018	14:02	15:09	15:38	16:03	25
35	33.9	210	-	22/01/2018	9:33	09:45	10:14	11:32	24
50	49.8	210	-	25/01/2018	14:02	14:59	15:26	15:45	25
-	-	-	24 h / Room	26/01/2018	15:10	15:15	15:43	16:45	24
-	-	-	168 h / 100°C	02/02/2018	13:30	13:59	14:42	-	24

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

## 4.2 Bias during Dose Exposures and Measurements conditions

### 4.2.1 Bias conditions

During exposures bias boards provided by HIREX (references: PL321A and CB761A) allowed to bias 5 samples in accordance with the electrical circuit provided in Figure 1. 5 other samples were biased OFF with all pins connected to ground. During annealing steps the same stress conditions have been applied at room and 100°C temperatures.

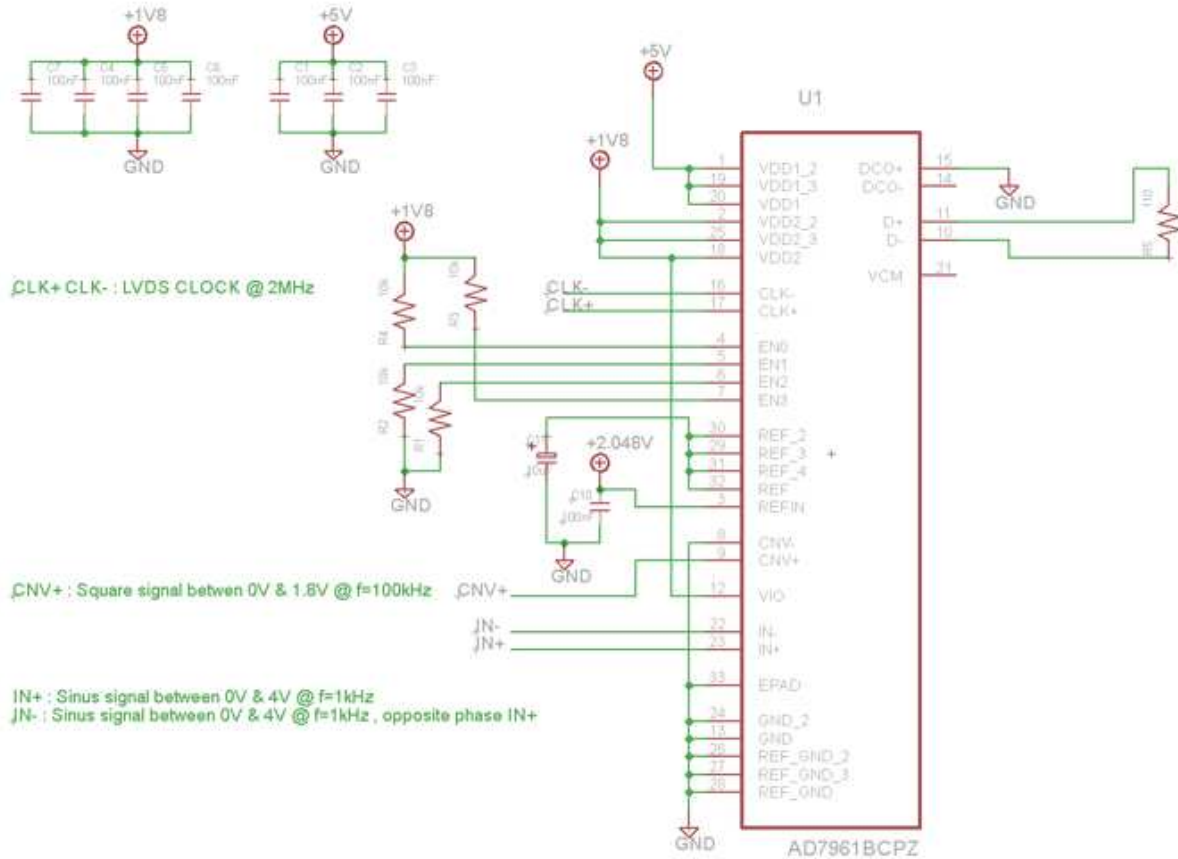


Figure 1 : Bias Conditions during Irradiation Exposures and Annealing

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

4.2.2 Electrical Measurements

Electrical parameters test setup synoptic for AD7961BCPZ-RL7CT-ND is provided in Figure 2.

One HP4142 DC tester, an IMS tester and a dedicated converters tester have been used to perform the required measurements.

A dedicated test fixture (Hirex reference: CT282A) was designed to ensure proper measurement conditions.

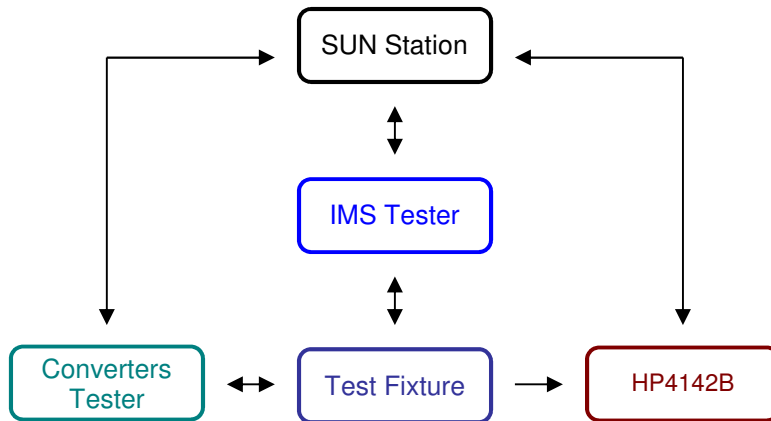


Figure 2: AD7961BCPZ-RL7CT-ND test setup synoptic



Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

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

PARAMETERS	SYMBOLS	TEST CONDITIONS Note 1	MIN	MAX	UNITS
Reference Output Voltage	REF_OUT	EN3 to EN0 = XX01	4.086	4.106	V
Common Mode Voltage	VCM_ERROR_OUT	-	- 0.01V	0.01V	V
Differential Output Voltage	VOD1	RL=100ohm	245	454	mV
Differential Output Voltage	VOD2	RL=100ohm	245	454	mV
Common Mode Output Voltage	VOCM1	RL=100ohm	0.98	1.375	V
Common Mode Output Voltage	VOCM2	RL=100ohm	0.98	1.375	V
Static—Not Converting, Internal Reference Buffer Disabled	IVDD1_STATIC_REF_DISABLED	Self clocked mode, CNV± in CMOS mode	-	40	µA
Static—Not Converting, Internal Reference Buffer Disabled	IVDD2_STATIC_REF_DISABLED	Self clocked mode, CNV± in CMOS mode	-	70	µA
Static—Not Converting, Internal Reference Buffer Disabled	IVIO_STATIC_REF_DISABLED	Self clocked mode, CNV± in CMOS mode	-	5.3	mA
Static—Not Converting, Internal Reference Buffer Enabled	IVDD1_STATIC_REF_ENABLED	Self clocked mode, CNV± in CMOS mode	-	2.9	mA
Static—Not Converting, Internal Reference Buffer Enabled	IVDD2_STATIC_REF_ENABLED	Self clocked mode, CNV± in CMOS mode	-	72	µA
Static—Not Converting, Internal Reference Buffer Enabled	IVIO_STATIC_REF_ENABLED	Self clocked mode, CNV± in CMOS mode	-	5.3	mA
Converting: Internal Reference Buffer Disabled	IVDD1_CONVERT_REF_DISABLED	Echoed clock mode, CNV± in LVDS mode Fs=1Msps	-	2.2	mA
Converting: Internal Reference Buffer Disabled	IVDD2_CONVERT_REF_DISABLED	Echoed clock mode, CNV± in LVDS mode Fs=1Msps	-	13.5	mA
Converting: Internal Reference Buffer Disabled	IVIO_CONVERT_REF_DISABLED	Echoed clock mode, CNV± in LVDS mode Fs=1Msps	-	10.3	mA
Converting: Internal Reference Buffer Enabled	IVDD1_CONVERT_REF_ENABLED	Echoed clock mode, CNV± in LVDS mode Fs=1Msps	-	6	mA
Converting: Internal Reference Buffer Enabled	IVDD2_CONVERT_REF_ENABLED	Echoed clock mode, CNV± in LVDS mode Fs=1Msps	-	13.5	mA
Converting: Internal Reference Buffer Enabled	IVIO_CONVERT_REF_ENABLED	Echoed clock mode, CNV± in LVDS mode Fs=1Msps	-	10.3	mA
Supply current Snooze Mode	IVDD1_SNOOZE_MODE	-	-	4.1	µA
Supply current Snooze Mode	IVDD2_SNOOZE_MODE	-	-	40.3	µA
Supply current Snooze Mode	IVIO_SNOOZE_MODE	-	-	4.8	µA
Supply current Power Down Mode	IVDD1_POWER_DOWN	EN3 to EN0 = X000	-	2.8	µA
Supply current Power Down Mode	IVDD2_POWER_DOWN	EN3 to EN0 = X000	-	37.8	µA
Supply current Power Down Mode	IVIO_POWER_DOWN	EN3 to EN0 = X000	-	4.6	µA
Convert Value	Convert_Val_-4V	Convert Voltage -4V, REF=4.096V	757	779	LSB (Note 2)
Convert Value	Convert_Val_-2V	Convert Voltage -2V, REF=4.096V	16757	16779	
Convert Value	Convert_Val_0V	Convert Voltage 0V, REF=4.096V	32757	32779	
Convert Value	Convert_Val_2V	Convert Voltage 2V, REF=4.096V	48757	48779	
Convert Value	Convert_Val_4V	Convert Voltage 4V, REF=4.096V	64757	64779	

**Note 1:** VDD1 = 5 V; VDD2 = 1.8 V; VIO = 1.8 V; REF = 4.096 V unless otherwise specified

**Note 2:** Limits are chosen at +/-11 LSB from theoretical value (Offset error + Gain Error) to detect a potential conversion problem during measurements.

**Table 1 : Measured electrical parameters**

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

## 5 Conclusion

A Total Ionizing Dose verification test was carried out by Hirex Engineering under Esa Estec contract on the Analog Devices AD7961BCPZ-RL7CT-ND 16-Bit, 5 MSPS, PulSAR Differential ADC in LFCSP-32 package.

10 samples plus one control sample were used during testing. They were exposed to radiation using a dose rate of 210Rad(Si)/hour at room temperature.

A summary of the failed parameters is provided in the following table. The behavior of each parameter is recorded for both biased ON and biased OFF samples.

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

Data are also provided in the Excel file referenced as:

- "AD7961\_TID\_01557\_01.xlsx"

Parameters	Failure Level between :		Annealing Recovery [Note 1]					Comments
			NA	No	Partial	Complete	Rebound	
<a href="#">IVDD1_STATIC_REF_DISABLED</a>	ON samples	19.8 & 33.9 kRad(Si)				X		
	OFF samples	No Failure	X					
<a href="#">IVDD1_SNOOZE_MODE</a>	ON samples	9.4 & 19.8 kRad(Si)		X				
	OFF samples	No Failure	X					
<a href="#">IVDD1_POWER_DOWN</a>	ON samples	9.4 & 19.8 kRad(Si)		X				
	OFF samples	No Failure	X					
<a href="#">IVDD2_POWER_DOWN</a>	ON samples	33.9 & 49.8 kRad(Si)				X		
	OFF samples	No Failure	X					
<a href="#">Convert_Val -4V</a>	ON samples	19.8 & 33.9 kRad(Si)				X		
	OFF samples	No Failure	X					
<a href="#">Convert_Val -2V</a>	ON samples	19.8 & 33.9 kRad(Si)				X		
	OFF samples	No Failure	X					
<a href="#">Convert_Val 2V</a>	ON samples	19.8 & 33.9 kRad(Si)				X		
	OFF samples	No Failure	X					
<a href="#">Convert_Val 4V</a>	ON samples	19.8 & 33.9 kRad(Si)				X		
	OFF samples	No Failure	X					

[Note 1]: **NA** = Not applicable, **No**: means no sample has recovered, **Partial**: means at least one sample has recovered, **Complete**: means all samples have recovered, **Rebound**: means rebound has been observed on at least one sample.

**Table 2 : Summary of parameters failure levels**

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

## 6 Test Results

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

Statistics are provided for biased ON and biased OFF samples.

Control sample have been measured before and after each electrical measurement step. Corresponding control sample data (identified respectively "IN" and "OUT") are provided here after.

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

Parameter : Reference Output Voltage : REF\_OUT

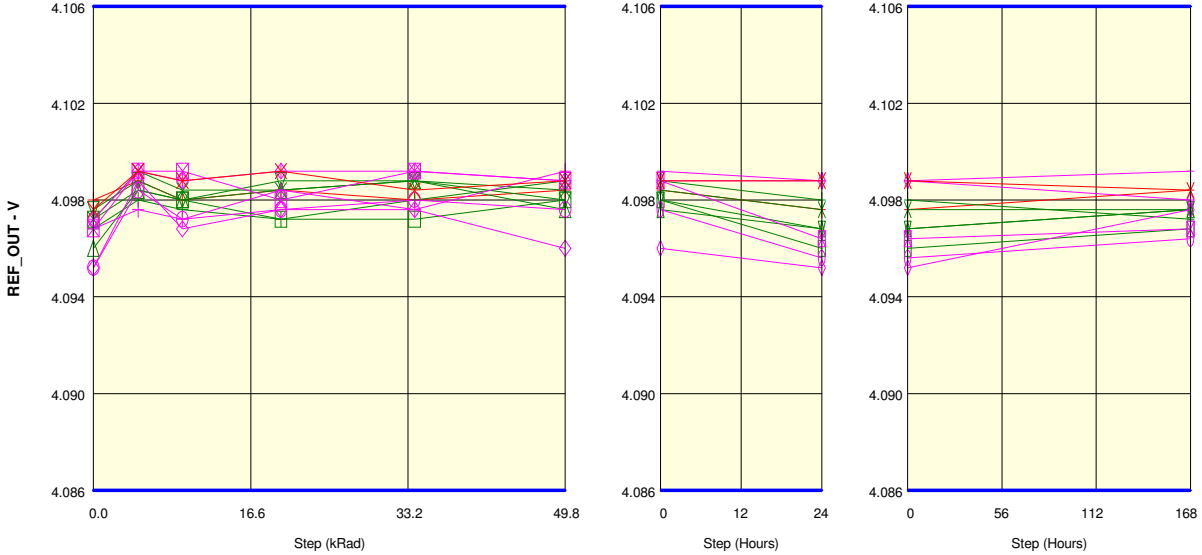
Test conditions : EN3 to EN0 = XX01

Unit : V

Spec Limit Min : 4.086

Spec Limit Max : 4.106

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements								
REF OUT	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	4.098	4.099	4.098	4.098	4.098	4.098	4.098	4.098
1 OUT REF	4.098	4.099	4.099	4.099	4.098	4.099	4.099	4.098
ON samples								
2	4.097	4.098	4.098	4.097	4.098	4.099	4.098	4.097
3	4.097	4.099	4.098	4.098	4.099	4.098	4.098	4.098
4	4.096	4.098	4.098	4.098	4.099	4.098	4.097	4.098
5	4.098	4.099	4.098	4.099	4.099	4.098	4.097	4.098
6	4.097	4.098	4.098	4.097	4.097	4.098	4.096	4.097
Statistics								
Min	4.096	4.098	4.098	4.097	4.097	4.098	4.096	4.097
Max	4.098	4.099	4.098	4.099	4.099	4.099	4.098	4.098
Average	4.097	4.099	4.098	4.098	4.098	4.098	4.097	4.097
Std Deviation	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.000

Measurements								
REF OUT	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	4.098	4.099	4.098	4.098	4.098	4.098	4.098	4.098
1 OUT REF	4.098	4.099	4.099	4.099	4.098	4.099	4.099	4.098
OFF samples								
7	4.095	4.099	4.097	4.098	4.098	4.096	4.095	4.098
8	4.097	4.099	4.099	4.098	4.099	4.099	4.096	4.097
9	4.097	4.099	4.099	4.099	4.099	4.099	4.099	4.098
11	4.095	4.098	4.097	4.098	4.098	4.098	4.096	4.096
12	4.097	4.098	4.097	4.098	4.098	4.099	4.099	4.099
Statistics								
Min	4.095	4.098	4.097	4.098	4.098	4.096	4.095	4.096
Max	4.097	4.099	4.099	4.099	4.099	4.099	4.099	4.099
Average	4.096	4.099	4.098	4.098	4.098	4.098	4.097	4.098
Std Deviation	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001

Parameter : Common Mode Voltage : VCM\_ERROR\_OUT

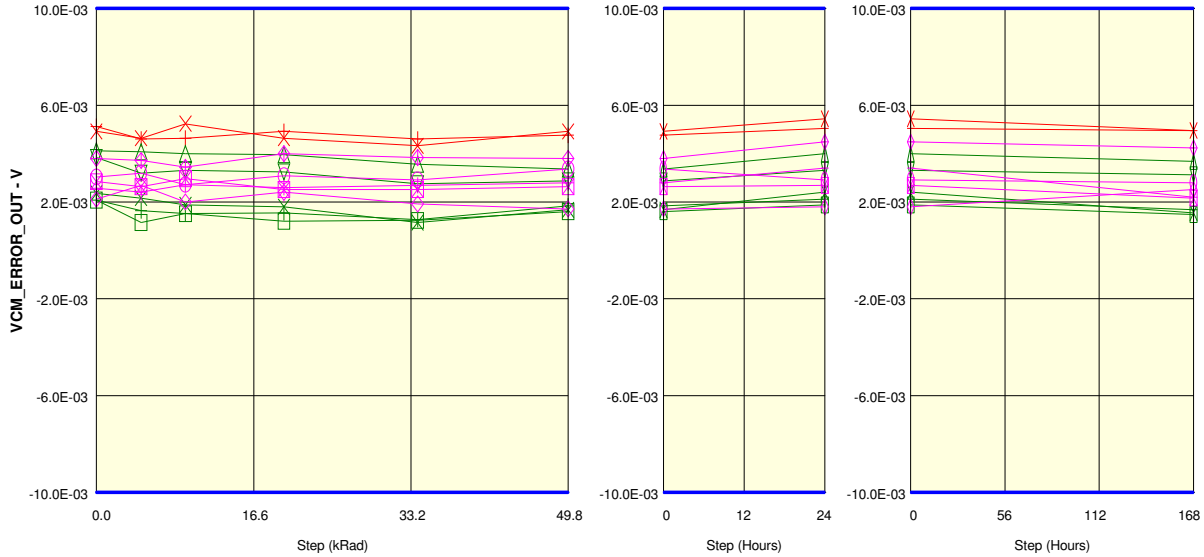
Test conditions :

Unit : V

Spec Limit Min : -10.0E-03

Spec Limit Max : 10.0E-03

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements								
VCM_ERROR_OUT	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	5.1E-03	4.6E-03	4.6E-03	4.9E-03	4.6E-03	4.8E-03	5.0E-03	5.0E-03
1 OUT REF	4.9E-03	4.6E-03	5.2E-03	4.6E-03	4.3E-03	4.9E-03	5.4E-03	5.0E-03
ON samples								
2	2.1E-03	1.6E-03	1.5E-03	1.6E-03	1.3E-03	1.8E-03	2.1E-03	1.7E-03
3	2.4E-03	2.2E-03	1.9E-03	1.8E-03	1.2E-03	1.7E-03	2.4E-03	1.6E-03
4	4.1E-03	4.1E-03	4.0E-03	4.0E-03	3.6E-03	3.4E-03	4.0E-03	3.7E-03
5	3.8E-03	3.2E-03	3.3E-03	3.2E-03	2.8E-03	2.9E-03	3.3E-03	3.1E-03
6	2.1E-03	1.2E-03	1.5E-03	1.2E-03	1.2E-03	1.6E-03	1.9E-03	1.5E-03
Statistics								
Min	2.1E-03	1.2E-03	1.5E-03	1.2E-03	1.2E-03	1.6E-03	1.9E-03	1.5E-03
Max	4.1E-03	4.1E-03	4.0E-03	4.0E-03	3.6E-03	3.4E-03	4.0E-03	3.7E-03
Average	2.9E-03	2.4E-03	2.4E-03	2.4E-03	2.0E-03	2.3E-03	2.7E-03	2.3E-03
Std Deviation	895.4E-06	1.1E-03	1.0E-03	1.1E-03	981.1E-06	713.0E-06	795.4E-06	914.5E-06

Measurements								
VCM_ERROR_OUT	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	5.1E-03	4.6E-03	4.6E-03	4.9E-03	4.6E-03	4.8E-03	5.0E-03	5.0E-03
1 OUT REF	4.9E-03	4.6E-03	5.2E-03	4.6E-03	4.3E-03	4.9E-03	5.4E-03	5.0E-03
OFF samples								
7	2.1E-03	2.7E-03	2.0E-03	2.4E-03	1.9E-03	1.7E-03	1.8E-03	2.5E-03
8	2.8E-03	2.6E-03	3.0E-03	2.5E-03	2.5E-03	2.6E-03	2.7E-03	2.2E-03
9	3.8E-03	3.7E-03	3.4E-03	4.0E-03	3.8E-03	3.8E-03	4.5E-03	4.2E-03
11	3.0E-03	3.2E-03	2.7E-03	3.1E-03	2.9E-03	3.4E-03	2.9E-03	2.8E-03
12	2.6E-03	2.4E-03	2.7E-03	2.6E-03	2.7E-03	2.8E-03	3.4E-03	2.2E-03
Statistics								
Min	2.1E-03	2.4E-03	2.0E-03	2.4E-03	1.9E-03	1.7E-03	1.8E-03	2.2E-03
Max	3.8E-03	3.7E-03	3.4E-03	4.0E-03	3.8E-03	3.8E-03	4.5E-03	4.2E-03
Average	2.9E-03	2.9E-03	2.8E-03	2.9E-03	2.8E-03	2.9E-03	3.1E-03	2.8E-03
Std Deviation	557.4E-06	474.2E-06	465.4E-06	587.3E-06	626.2E-06	705.0E-06	881.3E-06	764.2E-06

Parameter : Differential Output Voltage : VOD1

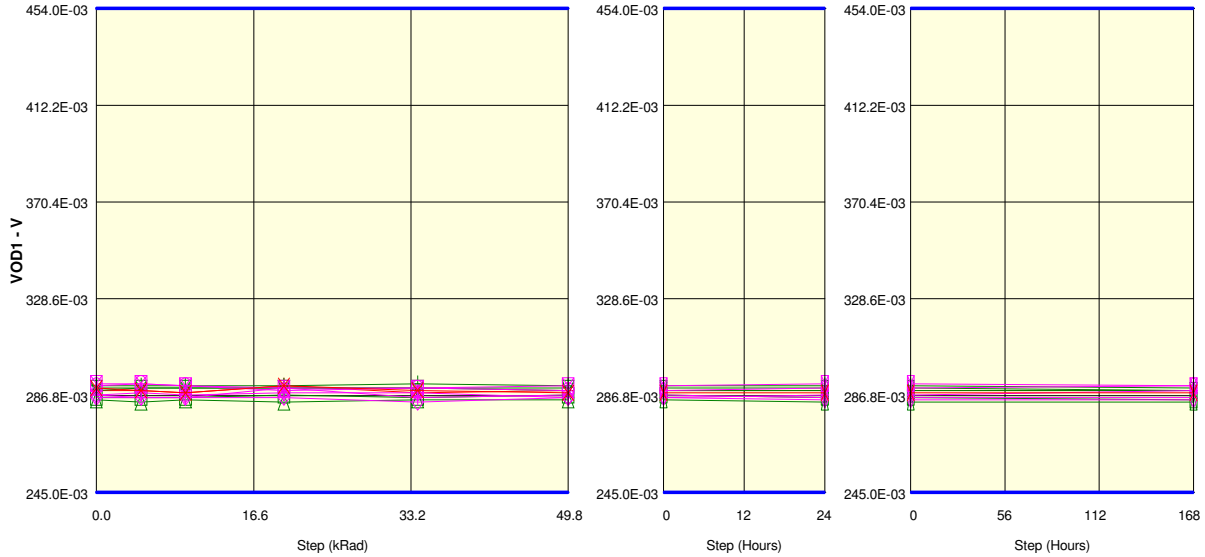
Test conditions : RL=100ohm

Unit : V

Spec Limit Min : 245.0E-03

Spec Limit Max : 454.0E-03

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements

VOD1	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	289.0E-03	289.0E-03	288.0E-03	291.0E-03	288.0E-03	289.0E-03	289.0E-03	289.0E-03
1 OUT REF	290.0E-03	289.0E-03	288.0E-03	291.0E-03	289.0E-03	288.0E-03	288.0E-03	288.0E-03
ON samples								
2	291.0E-03	291.0E-03	291.0E-03	291.0E-03	292.0E-03	291.0E-03	291.0E-03	290.0E-03
3	289.0E-03	290.0E-03	290.0E-03	290.0E-03	290.0E-03	289.0E-03	289.0E-03	289.0E-03
4	285.0E-03	284.0E-03	285.0E-03	284.0E-03	285.0E-03	285.0E-03	284.0E-03	284.0E-03
5	290.0E-03	290.0E-03	290.0E-03	290.0E-03	290.0E-03	290.0E-03	290.0E-03	289.0E-03
6	286.0E-03	286.0E-03	286.0E-03	287.0E-03	286.0E-03	287.0E-03	286.0E-03	285.0E-03
Statistics								
Min	285.0E-03	284.0E-03	285.0E-03	284.0E-03	285.0E-03	285.0E-03	284.0E-03	284.0E-03
Max	291.0E-03	291.0E-03	291.0E-03	291.0E-03	292.0E-03	291.0E-03	291.0E-03	290.0E-03
Average	288.2E-03	288.2E-03	288.4E-03	288.4E-03	288.6E-03	288.4E-03	288.0E-03	287.4E-03
Std Deviation	2.3E-03	2.7E-03	2.4E-03	2.6E-03	2.7E-03	2.2E-03	2.6E-03	2.4E-03

Measurements

VOD1	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	289.0E-03	289.0E-03	288.0E-03	291.0E-03	288.0E-03	289.0E-03	289.0E-03	289.0E-03
1 OUT REF	290.0E-03	289.0E-03	288.0E-03	291.0E-03	289.0E-03	288.0E-03	288.0E-03	288.0E-03
OFF samples								
7	286.0E-03	286.0E-03	286.0E-03	286.0E-03	284.0E-03	286.0E-03	285.0E-03	285.0E-03
8	292.0E-03	292.0E-03	291.0E-03	290.0E-03	290.0E-03	291.0E-03	292.0E-03	291.0E-03
9	287.0E-03	288.0E-03	287.0E-03	288.0E-03	288.0E-03	286.0E-03	287.0E-03	289.0E-03
11	291.0E-03	292.0E-03	291.0E-03	289.0E-03	290.0E-03	289.0E-03	290.0E-03	291.0E-03
12	287.0E-03	286.0E-03	286.0E-03	290.0E-03	286.0E-03	287.0E-03	286.0E-03	286.0E-03
Statistics								
Min	286.0E-03	286.0E-03	286.0E-03	286.0E-03	284.0E-03	286.0E-03	285.0E-03	285.0E-03
Max	292.0E-03	292.0E-03	291.0E-03	290.0E-03	290.0E-03	291.0E-03	292.0E-03	291.0E-03
Average	288.6E-03	288.8E-03	288.2E-03	288.6E-03	287.6E-03	287.8E-03	288.0E-03	288.4E-03
Std Deviation	2.4E-03	2.7E-03	2.3E-03	1.5E-03	2.3E-03	1.9E-03	2.6E-03	2.5E-03



Parameter : Differential Output Voltage : VOD2

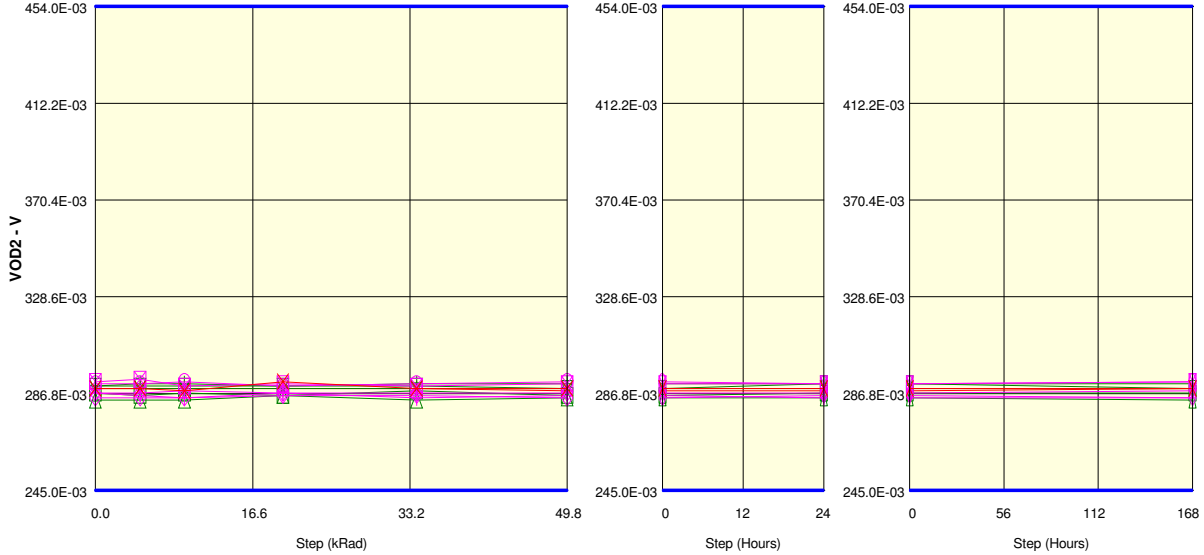
Test conditions : RL=100ohm

Unit : V

Spec Limit Min : 245.0E-03

Spec Limit Max : 454.0E-03

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements

VOD2	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	289.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03	288.0E-03	288.0E-03	289.0E-03
1 OUT REF	289.0E-03	289.0E-03	288.0E-03	292.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03
ON samples								
2	290.0E-03	291.0E-03	291.0E-03	290.0E-03	291.0E-03	291.0E-03	291.0E-03	291.0E-03
3	289.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03
4	284.0E-03	284.0E-03	284.0E-03	286.0E-03	284.0E-03	285.0E-03	285.0E-03	284.0E-03
5	290.0E-03	290.0E-03	290.0E-03	290.0E-03	290.0E-03	289.0E-03	291.0E-03	289.0E-03
6	287.0E-03	286.0E-03	287.0E-03	286.0E-03	288.0E-03	286.0E-03	287.0E-03	287.0E-03
Statistics								
Min	284.0E-03	284.0E-03	284.0E-03	286.0E-03	284.0E-03	285.0E-03	285.0E-03	284.0E-03
Max	290.0E-03	291.0E-03	291.0E-03	290.0E-03	291.0E-03	291.0E-03	291.0E-03	291.0E-03
Average	288.0E-03	288.0E-03	288.2E-03	288.2E-03	288.4E-03	288.0E-03	288.6E-03	288.0E-03
Std Deviation	2.3E-03	2.6E-03	2.5E-03	1.8E-03	2.4E-03	2.2E-03	2.3E-03	2.4E-03

Measurements

VOD2	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	289.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03	288.0E-03	288.0E-03	289.0E-03
1 OUT REF	289.0E-03	289.0E-03	288.0E-03	292.0E-03	289.0E-03	289.0E-03	289.0E-03	289.0E-03
OFF samples								
7	285.0E-03	285.0E-03	285.0E-03	286.0E-03	286.0E-03	285.0E-03	286.0E-03	285.0E-03
8	292.0E-03	293.0E-03	290.0E-03	291.0E-03	290.0E-03	291.0E-03	291.0E-03	292.0E-03
9	287.0E-03	287.0E-03	288.0E-03	287.0E-03	287.0E-03	287.0E-03	287.0E-03	288.0E-03
11	291.0E-03	291.0E-03	292.0E-03	290.0E-03	291.0E-03	292.0E-03	291.0E-03	292.0E-03
12	287.0E-03	286.0E-03	285.0E-03	287.0E-03	285.0E-03	286.0E-03	285.0E-03	285.0E-03
Statistics								
Min	285.0E-03	285.0E-03	285.0E-03	286.0E-03	285.0E-03	285.0E-03	285.0E-03	285.0E-03
Max	292.0E-03	293.0E-03	292.0E-03	291.0E-03	291.0E-03	292.0E-03	291.0E-03	292.0E-03
Average	288.4E-03	288.4E-03	288.0E-03	288.2E-03	287.8E-03	288.2E-03	288.0E-03	288.4E-03
Std Deviation	2.7E-03	3.1E-03	2.8E-03	1.9E-03	2.3E-03	2.8E-03	2.5E-03	3.1E-03

Parameter : Common Mode Output Voltage : VOCM1

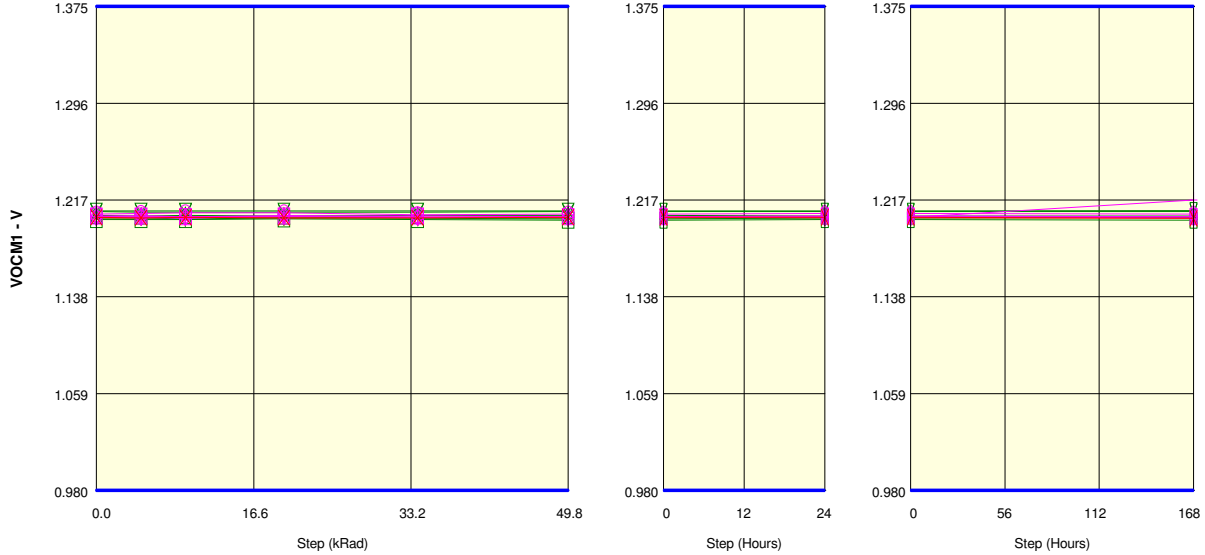
Test conditions : RL=100ohm

Unit : V

Spec Limit Min : 0.980

Spec Limit Max : 1.375

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements

VOCM1	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203
1 OUT REF	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.202
ON samples								
2	1.203	1.203	1.202	1.203	1.202	1.202	1.203	1.203
3	1.208	1.207	1.207	1.207	1.207	1.208	1.208	1.208
4	1.205	1.204	1.205	1.204	1.205	1.205	1.204	1.204
5	1.208	1.208	1.208	1.208	1.208	1.208	1.208	1.209
6	1.201	1.201	1.201	1.202	1.201	1.201	1.201	1.201
Statistics								
Min	1.201	1.201	1.201	1.202	1.201	1.201	1.201	1.201
Max	1.208	1.208	1.208	1.208	1.208	1.208	1.208	1.209
Average	1.205	1.205	1.204	1.205	1.205	1.204	1.205	1.205
Std Deviation	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003

Measurements

VOCM1	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203
1 OUT REF	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.202
OFF samples								
7	1.203	1.203	1.203	1.204	1.203	1.203	1.204	1.203
8	1.204	1.204	1.204	1.204	1.204	1.204	1.204	1.204
9	1.204	1.204	1.204	1.204	1.203	1.203	1.204	1.204
11	1.206	1.206	1.207	1.207	1.205	1.206	1.206	1.206
12	1.204	1.203	1.202	1.204	1.203	1.203	1.203	1.217
Statistics								
Min	1.203	1.203	1.202	1.204	1.203	1.203	1.203	1.203
Max	1.206	1.206	1.207	1.207	1.205	1.206	1.206	1.217
Average	1.204	1.204	1.204	1.205	1.204	1.204	1.204	1.206
Std Deviation	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.005

Parameter : Common Mode Output Voltage : VOXM2

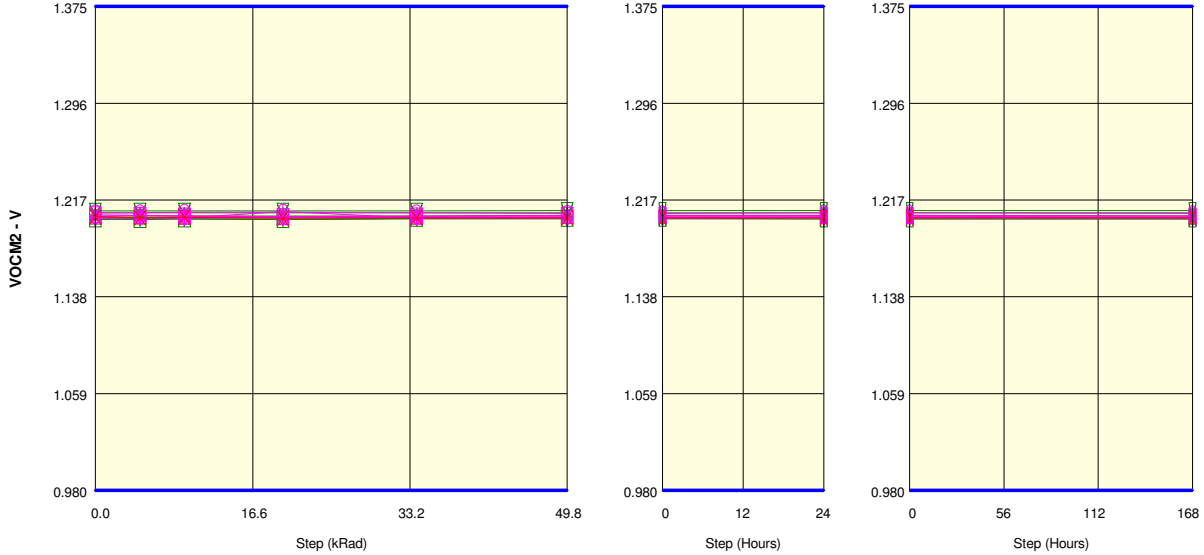
Test conditions : RL=100ohm

Unit : V

Spec Limit Min : 0.980

Spec Limit Max : 1.375

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2    × 3    △ 4    ▽ 5    □ 6    ◇ 7    ⊠ 8    ⊕ 9    ○ 11    + 12    × 1\_OUT

**Measurements**

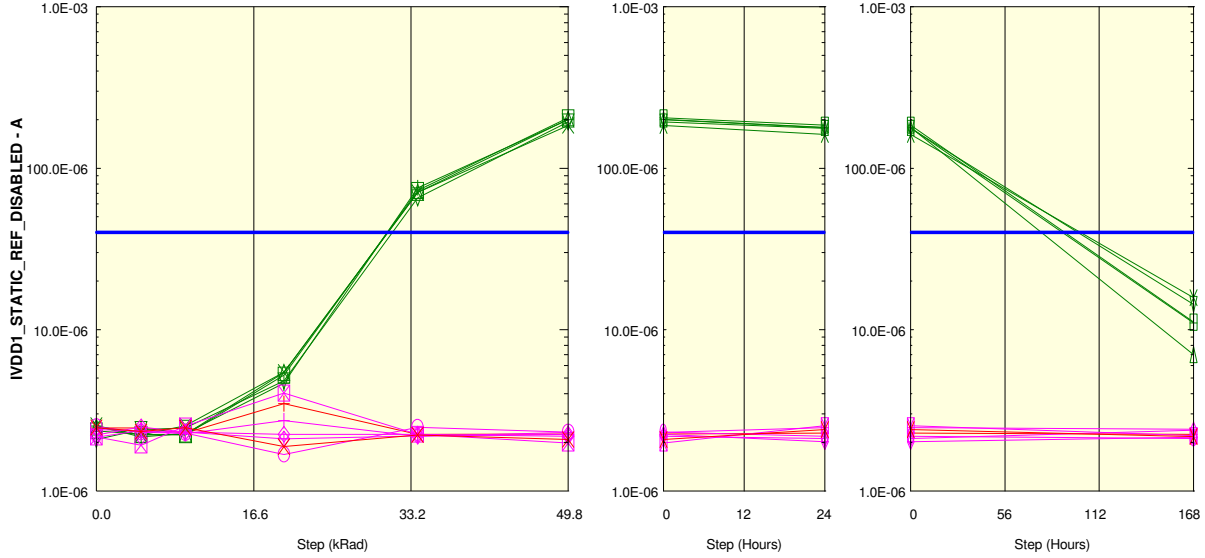
VOXM2	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203
1 OUT REF	1.204	1.203	1.203	1.202	1.203	1.203	1.203	1.203
<b>ON samples</b>								
2	1.201	1.202	1.202	1.201	1.202	1.202	1.202	1.202
3	1.207	1.207	1.207	1.207	1.207	1.207	1.207	1.207
4	1.204	1.204	1.204	1.204	1.204	1.205	1.205	1.204
5	1.208	1.208	1.208	1.208	1.208	1.209	1.209	1.209
6	1.202	1.201	1.202	1.201	1.202	1.202	1.202	1.202
<b>Statistics</b>								
Min	1.201	1.201	1.202	1.201	1.202	1.202	1.202	1.202
Max	1.208	1.208	1.208	1.208	1.208	1.209	1.209	1.209
Average	1.204	1.204	1.204	1.204	1.204	1.205	1.205	1.204
Std Deviation	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003

**Measurements**

VOXM2	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203
1 OUT REF	1.204	1.203	1.203	1.202	1.203	1.203	1.203	1.203
<b>OFF samples</b>								
7	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203
8	1.205	1.205	1.204	1.204	1.204	1.205	1.205	1.204
9	1.204	1.205	1.204	1.204	1.204	1.204	1.204	1.204
11	1.207	1.207	1.207	1.207	1.207	1.206	1.207	1.206
12	1.203	1.203	1.203	1.208	1.203	1.203	1.203	1.203
<b>Statistics</b>								
Min	1.203	1.203	1.203	1.203	1.203	1.203	1.203	1.203
Max	1.207	1.207	1.207	1.208	1.207	1.206	1.207	1.206
Average	1.204	1.204	1.204	1.205	1.204	1.204	1.204	1.204
Std Deviation	0.002	0.001	0.002	0.002	0.001	0.001	0.001	0.001

Parameter : Static—Not Converting. Internal Reference Buffer Disabled : IVDD1\_STATIC\_REF\_DISABLED  
 Test conditions : Self clocked mode. CNV± in CMOS mode

Unit : A  
 Spec Limit Max : 40.0E-06  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

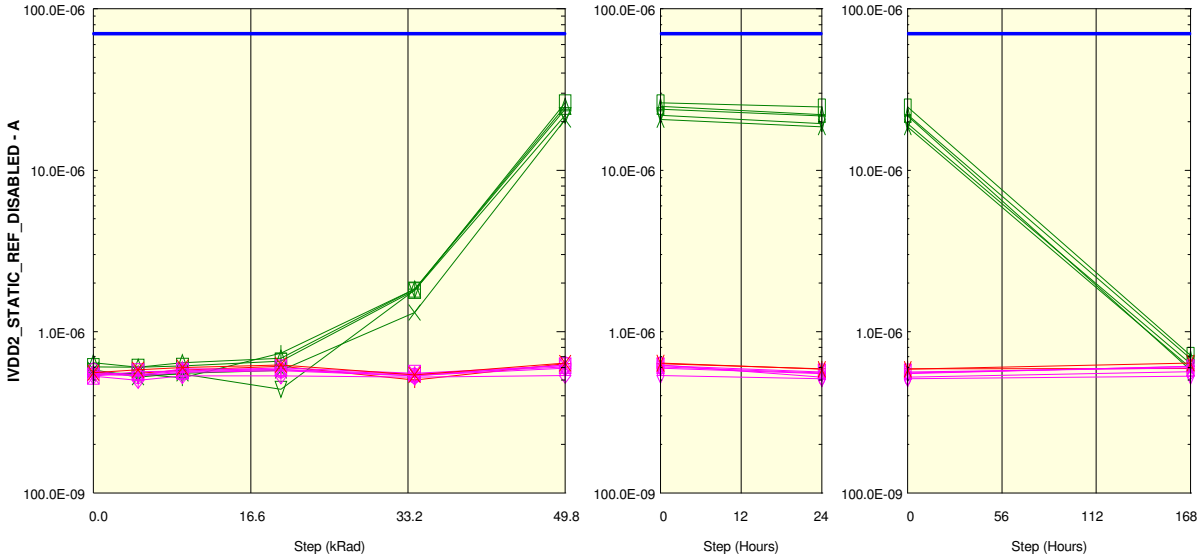
IVDD1_STATIC_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
<b>1_IN_REF</b>	2.5E-06	2.5E-06	2.3E-06	3.5E-06	2.2E-06	2.3E-06	2.3E-06	2.2E-06
<b>1_OUT_REF</b>	2.5E-06	2.3E-06	2.5E-06	1.9E-06	2.2E-06	2.1E-06	2.4E-06	2.2E-06
<b>ON samples</b>								
<b>2</b>	2.5E-06	2.2E-06	2.3E-06	4.7E-06	<b>75.6E-06</b>	<b>199.2E-06</b>	<b>178.0E-06</b>	11.0E-06
<b>3</b>	2.5E-06	2.2E-06	2.5E-06	5.4E-06	<b>70.8E-06</b>	<b>183.9E-06</b>	<b>161.4E-06</b>	15.8E-06
<b>4</b>	2.5E-06	2.2E-06	2.3E-06	5.4E-06	<b>70.7E-06</b>	<b>201.3E-06</b>	<b>179.1E-06</b>	7.0E-06
<b>5</b>	2.1E-06	2.4E-06	2.5E-06	4.8E-06	<b>65.6E-06</b>	<b>193.3E-06</b>	<b>176.7E-06</b>	14.3E-06
<b>6</b>	2.4E-06	2.2E-06	2.2E-06	5.2E-06	<b>72.8E-06</b>	<b>205.0E-06</b>	<b>184.6E-06</b>	11.1E-06
<b>Statistics</b>								
<b>Min</b>	<b>2.1E-06</b>	2.2E-06	2.2E-06	4.7E-06	65.6E-06	183.9E-06	161.4E-06	7.0E-06
<b>Max</b>	<b>2.5E-06</b>	2.4E-06	2.5E-06	5.4E-06	75.6E-06	205.0E-06	184.6E-06	15.8E-06
<b>Average</b>	<b>2.4E-06</b>	2.3E-06	2.3E-06	5.1E-06	71.1E-06	196.5E-06	176.0E-06	11.9E-06
<b>Std Deviation</b>	<b>172.1E-09</b>	80.3E-09	123.1E-09	319.3E-09	3.3E-06	7.4E-06	7.8E-06	3.1E-06

**Measurements**

IVDD1_STATIC_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
<b>1_IN_REF</b>	2.5E-06	2.5E-06	2.3E-06	3.5E-06	2.2E-06	2.3E-06	2.3E-06	2.2E-06
<b>1_OUT_REF</b>	2.5E-06	2.3E-06	2.5E-06	1.9E-06	2.2E-06	2.1E-06	2.4E-06	2.2E-06
<b>OFF samples</b>								
<b>7</b>	2.2E-06	2.5E-06	2.3E-06	2.2E-06	2.2E-06	2.2E-06	2.1E-06	2.4E-06
<b>8</b>	2.2E-06	1.9E-06	2.5E-06	4.0E-06	2.2E-06	2.0E-06	2.5E-06	2.2E-06
<b>9</b>	2.2E-06	2.4E-06	2.3E-06	2.1E-06	2.2E-06	2.2E-06	2.0E-06	2.2E-06
<b>11</b>	2.5E-06	2.3E-06	2.3E-06	1.7E-06	2.5E-06	2.3E-06	2.2E-06	2.1E-06
<b>12</b>	2.4E-06	2.4E-06	2.3E-06	2.7E-06	2.2E-06	2.3E-06	2.5E-06	2.4E-06
<b>Statistics</b>								
<b>Min</b>	2.2E-06	1.9E-06	2.3E-06	1.7E-06	2.2E-06	2.0E-06	2.0E-06	2.1E-06
<b>Max</b>	2.5E-06	2.5E-06	2.5E-06	4.0E-06	2.5E-06	2.3E-06	2.5E-06	2.4E-06
<b>Average</b>	2.3E-06	2.3E-06	2.3E-06	2.6E-06	2.3E-06	2.2E-06	2.3E-06	2.3E-06
<b>Std Deviation</b>	138.6E-09	195.8E-09	94.6E-09	812.7E-09	112.0E-09	120.0E-09	202.3E-09	121.3E-09

Parameter : Static—Not Converting. Internal Reference Buffer Disabled : IVDD2\_STATIC\_REF\_DISABLED  
 Test conditions : Self clocked mode. CNV± in CMOS mode

Unit : A  
 Spec Limit Max : 70.0E-06  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

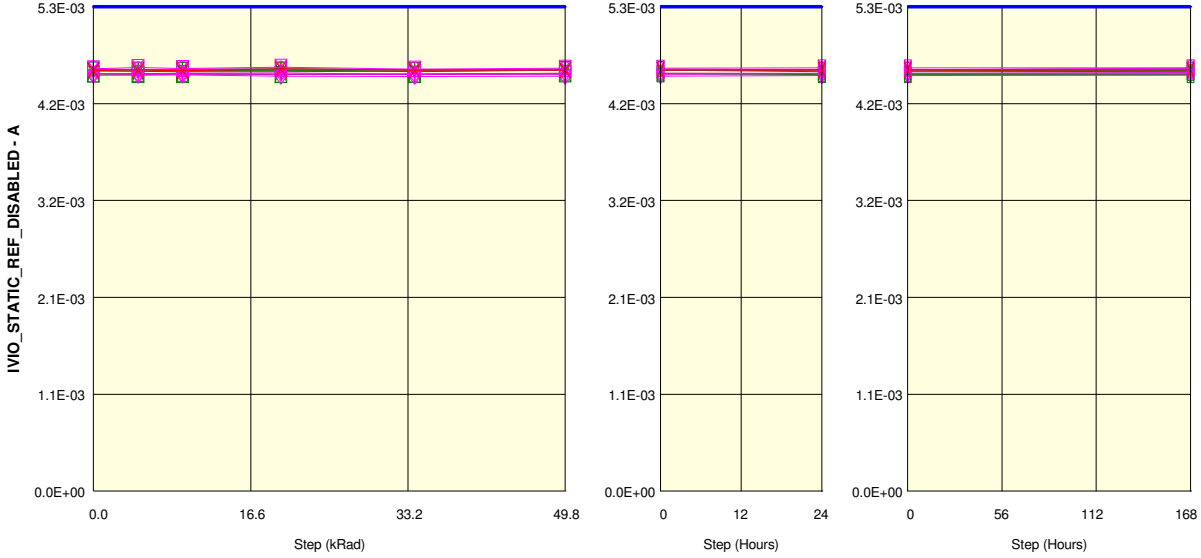
IVDD2_STATIC_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	543.9E-09	550.9E-09	576.0E-09	609.0E-09	500.0E-09	633.5E-09	586.8E-09	591.5E-09
1_OUT_REF	555.8E-09	578.3E-09	599.8E-09	621.6E-09	540.6E-09	636.8E-09	584.7E-09	637.6E-09
<b>ON samples</b>								
2	557.5E-09	547.4E-09	516.3E-09	736.0E-09	1.8E-06	23.8E-06	21.7E-06	576.4E-09
3	578.6E-09	521.6E-09	550.9E-09	575.4E-09	1.3E-06	20.6E-06	18.6E-06	597.9E-09
4	641.2E-09	601.0E-09	640.5E-09	686.4E-09	1.8E-06	24.9E-06	22.1E-06	678.8E-09
5	563.8E-09	536.6E-09	546.2E-09	440.0E-09	1.8E-06	21.9E-06	19.4E-06	633.6E-09
6	605.5E-09	602.2E-09	613.0E-09	657.0E-09	1.8E-06	26.2E-06	24.7E-06	711.8E-09
<b>Statistics</b>								
Min	557.5E-09	521.6E-09	516.3E-09	440.0E-09	1.3E-06	20.6E-06	18.6E-06	576.4E-09
Max	641.2E-09	602.2E-09	640.5E-09	736.0E-09	1.8E-06	26.2E-06	24.7E-06	711.8E-09
Average	589.3E-09	561.8E-09	573.4E-09	619.0E-09	1.7E-06	23.5E-06	21.3E-06	639.7E-09
Std Deviation	30.8E-09	33.5E-09	46.0E-09	103.6E-09	203.6E-09	2.0E-06	2.2E-06	50.0E-09

**Measurements**

IVDD2_STATIC_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	543.9E-09	550.9E-09	576.0E-09	609.0E-09	500.0E-09	633.5E-09	586.8E-09	591.5E-09
1_OUT_REF	555.8E-09	578.3E-09	599.8E-09	621.6E-09	540.6E-09	636.8E-09	584.7E-09	637.6E-09
<b>OFF samples</b>								
7	552.2E-09	541.7E-09	568.1E-09	578.8E-09	535.4E-09	593.8E-09	549.6E-09	609.6E-09
8	529.4E-09	565.9E-09	570.8E-09	597.2E-09	550.2E-09	613.8E-09	562.6E-09	597.7E-09
9	527.9E-09	497.5E-09	532.6E-09	530.4E-09	522.7E-09	534.0E-09	510.7E-09	527.6E-09
11	569.7E-09	528.0E-09	559.5E-09	573.3E-09	531.2E-09	621.8E-09	520.8E-09	565.3E-09
12	542.1E-09	534.4E-09	590.1E-09	582.0E-09	543.6E-09	605.3E-09	553.6E-09	608.0E-09
<b>Statistics</b>								
Min	527.9E-09	497.5E-09	532.6E-09	530.4E-09	522.7E-09	534.0E-09	510.7E-09	527.6E-09
Max	569.7E-09	565.9E-09	590.1E-09	597.2E-09	550.2E-09	621.8E-09	562.6E-09	609.6E-09
Average	544.3E-09	533.5E-09	564.2E-09	572.3E-09	536.6E-09	593.7E-09	539.5E-09	581.7E-09
Std Deviation	15.5E-09	22.1E-09	18.7E-09	22.4E-09	9.6E-09	31.3E-09	20.1E-09	31.4E-09

Parameter : Static—Not Converting. Internal Reference Buffer Disabled : **IVIO\_STATIC\_REF\_DISABLED**  
 Test conditions : Self clocked mode. CNV± in CMOS mode

Unit : A  
 Spec Limit Max : 5.3E-03  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 x 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 x 1\_OUT

**Measurements**

IVIO_STATIC_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
1 OUT REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>ON samples</b>								
2	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
3	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
4	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
5	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
6	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>Statistics</b>								
Min	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Max	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Average	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Std Deviation	21.0E-06	22.2E-06	21.0E-06	24.0E-06	21.3E-06	22.6E-06	22.2E-06	21.8E-06

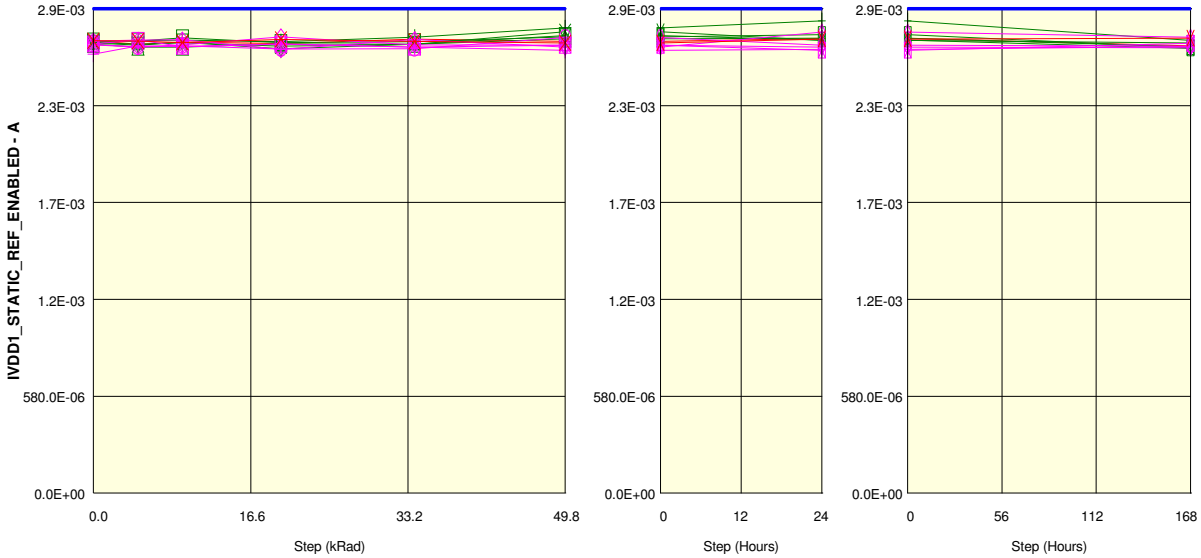
**Measurements**

IVIO_STATIC_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
1 OUT REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>OFF samples</b>								
7	4.6E-03	4.6E-03	4.6E-03	4.5E-03	4.5E-03	4.5E-03	4.5E-03	4.6E-03
8	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
9	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
11	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
12	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>Statistics</b>								
Min	4.6E-03	4.6E-03	4.6E-03	4.5E-03	4.5E-03	4.5E-03	4.5E-03	4.6E-03
Max	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Average	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Std Deviation	30.2E-06	32.5E-06	29.8E-06	35.5E-06	30.7E-06	32.5E-06	31.0E-06	32.3E-06



Parameter : Static—Not Converting. Internal Reference Buffer Enabled : IVDD1\_STATIC\_REF\_ENABLED  
 Test conditions : Self clocked mode. CNV± in CMOS mode

Unit : A  
 Spec Limit Max : 2.9E-03  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

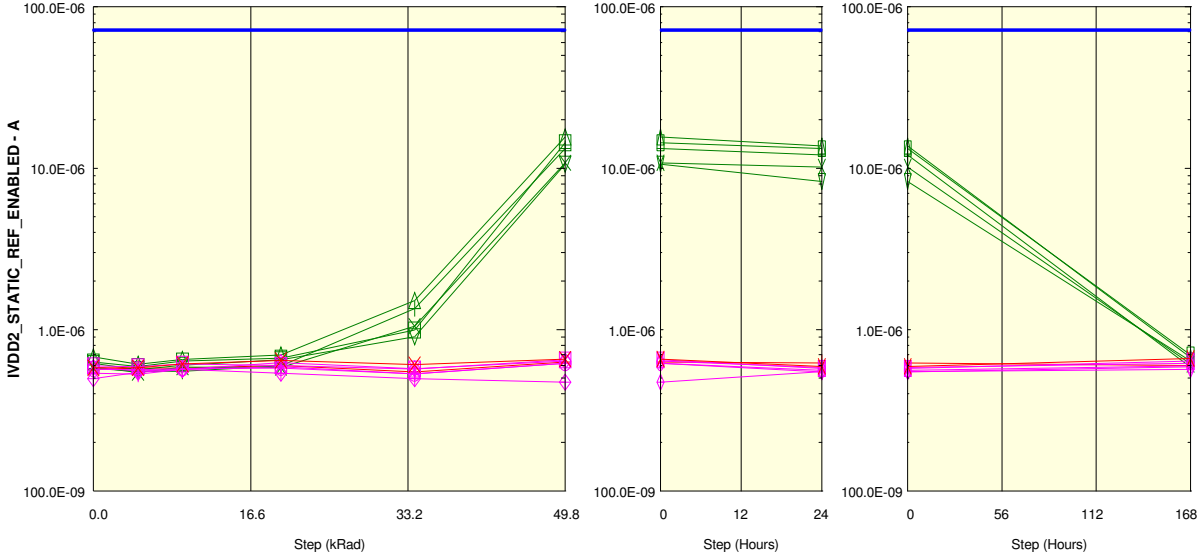
IVDD1_STATIC_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
1_OUT_REF	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
<b>ON samples</b>								
2	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.8E-03	2.8E-03	2.7E-03
3	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.8E-03	2.7E-03	2.7E-03
4	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
5	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
6	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
<b>Statistics</b>								
Min	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
Max	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.8E-03	2.8E-03	2.7E-03
Average	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
Std Deviation	7.1E-06	14.8E-06	18.4E-06	15.6E-06	16.7E-06	23.3E-06	43.7E-06	17.9E-06

**Measurements**

IVDD1_STATIC_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
1_OUT_REF	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
<b>OFF samples</b>								
7	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
8	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
9	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.8E-03	2.7E-03
11	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
12	2.6E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
<b>Statistics</b>								
Min	2.6E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
Max	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.8E-03	2.7E-03
Average	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
Std Deviation	26.5E-06	18.8E-06	14.7E-06	27.0E-06	19.7E-06	25.2E-06	39.8E-06	22.5E-06

Parameter : Static—Not Converting. Internal Reference Buffer Enabled : IVDD2\_STATIC\_REF\_ENABLED  
 Test conditions : Self clocked mode. CNV± in CMOS mode

Unit : A  
 Spec Limit Max : 72.0E-06  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

IVDD2_STATIC_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	568.0E-09	576.1E-09	576.4E-09	598.0E-09	547.0E-09	630.8E-09	621.1E-09	598.2E-09
1_OUT REF	578.2E-09	579.5E-09	610.6E-09	643.0E-09	605.5E-09	656.4E-09	592.7E-09	662.7E-09
<b>ON samples</b>								
2	573.6E-09	552.0E-09	550.0E-09	597.2E-09	1.4E-06	13.3E-06	12.1E-06	583.7E-09
3	588.3E-09	541.4E-09	585.1E-09	582.4E-09	1.1E-06	10.8E-06	10.2E-06	610.6E-09
4	677.4E-09	609.4E-09	655.0E-09	695.6E-09	1.5E-06	15.6E-06	13.8E-06	671.4E-09
5	617.2E-09	565.1E-09	601.6E-09	650.8E-09	903.6E-09	10.6E-06	8.3E-06	637.8E-09
6	630.1E-09	591.0E-09	638.8E-09	665.2E-09	994.8E-09	14.4E-06	13.2E-06	697.4E-09
<b>Statistics</b>								
Min	573.6E-09	541.4E-09	550.0E-09	582.4E-09	903.6E-09	10.6E-06	8.3E-06	583.7E-09
Max	677.4E-09	609.4E-09	655.0E-09	695.6E-09	1.5E-06	15.6E-06	13.8E-06	697.4E-09
Average	617.3E-09	571.8E-09	606.1E-09	638.2E-09	1.2E-06	12.9E-06	11.5E-06	640.2E-09
Std Deviation	36.1E-09	25.1E-09	37.6E-09	42.4E-09	230.8E-09	2.0E-06	2.0E-06	40.8E-09

**Measurements**

IVDD2_STATIC_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	568.0E-09	576.1E-09	576.4E-09	598.0E-09	547.0E-09	630.8E-09	621.1E-09	598.2E-09
1_OUT REF	578.2E-09	579.5E-09	610.6E-09	643.0E-09	605.5E-09	656.4E-09	592.7E-09	662.7E-09
<b>OFF samples</b>								
7	583.5E-09	552.4E-09	568.0E-09	624.0E-09	572.8E-09	639.0E-09	581.9E-09	617.9E-09
8	597.4E-09	588.0E-09	612.0E-09	599.4E-09	570.5E-09	648.0E-09	573.8E-09	639.0E-09
9	495.8E-09	545.2E-09	568.1E-09	537.8E-09	495.4E-09	472.0E-09	549.5E-09	566.6E-09
11	567.6E-09	565.2E-09	573.0E-09	576.8E-09	530.2E-09	618.2E-09	559.8E-09	595.6E-09
12	537.2E-09	529.0E-09	567.7E-09	589.7E-09	533.7E-09	616.6E-09	546.6E-09	586.6E-09
<b>Statistics</b>								
Min	495.8E-09	529.0E-09	567.7E-09	537.8E-09	495.4E-09	472.0E-09	546.6E-09	566.6E-09
Max	597.4E-09	588.0E-09	612.0E-09	624.0E-09	572.8E-09	648.0E-09	581.9E-09	639.0E-09
Average	556.3E-09	556.0E-09	577.7E-09	585.5E-09	540.5E-09	598.8E-09	562.3E-09	601.1E-09
Std Deviation	36.3E-09	19.8E-09	17.2E-09	28.4E-09	28.7E-09	64.5E-09	13.7E-09	25.1E-09

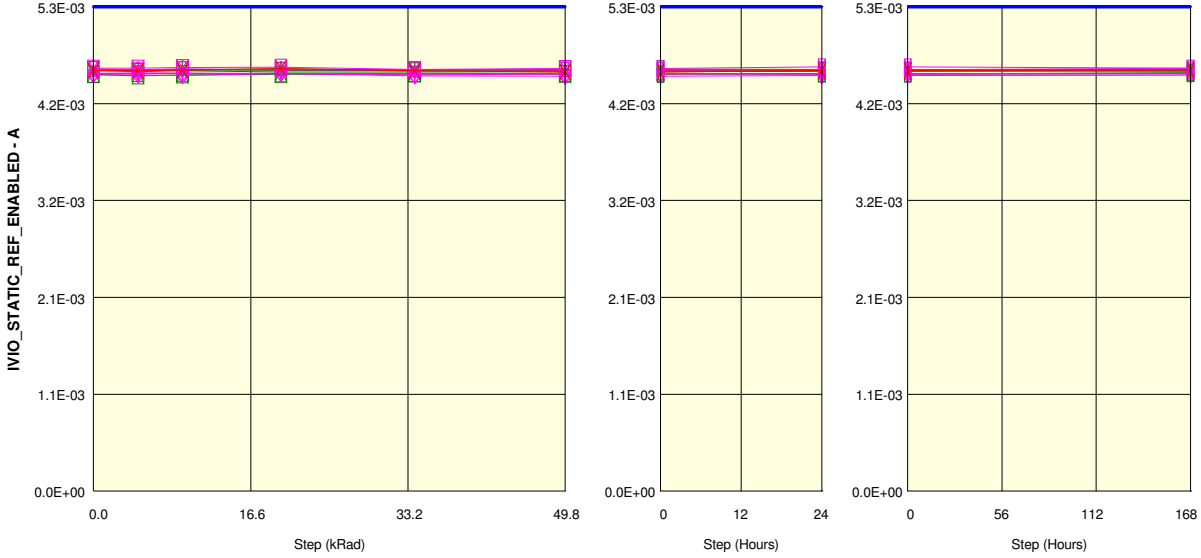
Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

Parameter : Static—Not Converting. Internal Reference Buffer Enabled : IVIO\_STATIC\_REF\_ENABLED  
 Test conditions : Self clocked mode. CNV± in CMOS mode

Unit : A

Spec Limit Max : 5.3E-03

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

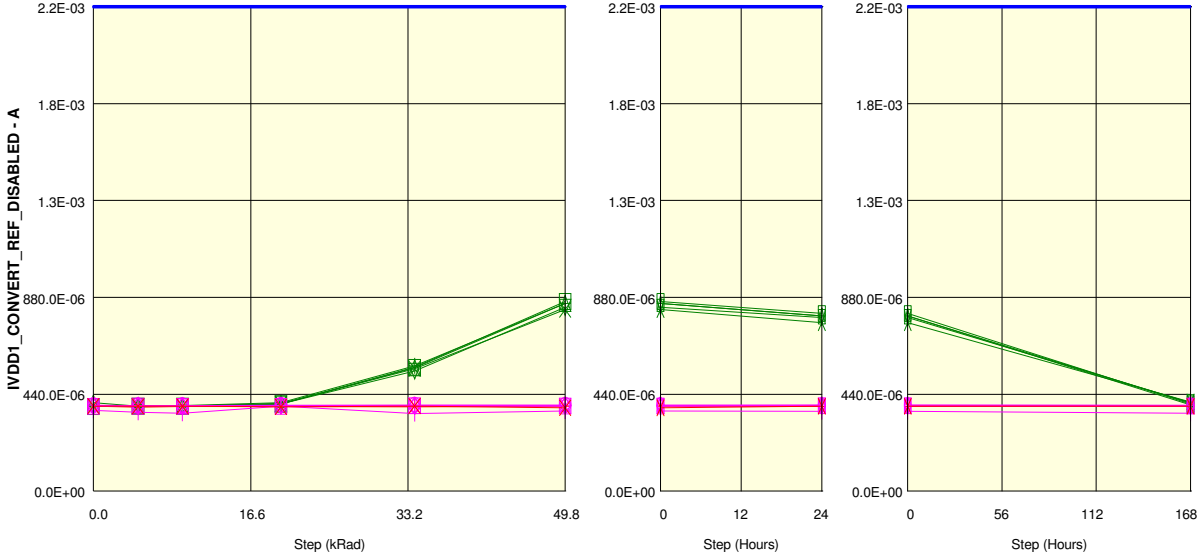
IVIO_STATIC_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
1 OUT REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>ON samples</b>								
2	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
3	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
4	4.6E-03	4.5E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
5	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
6	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>Statistics</b>								
Min	4.6E-03	4.5E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Max	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Average	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Std Deviation	26.4E-06	22.1E-06	22.4E-06	22.3E-06	19.1E-06	22.0E-06	21.7E-06	15.4E-06

**Measurements**

IVIO_STATIC_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
1 OUT REF	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>OFF samples</b>								
7	4.6E-03	4.6E-03	4.5E-03	4.6E-03	4.5E-03	4.5E-03	4.5E-03	4.6E-03
8	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
9	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
11	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
12	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
<b>Statistics</b>								
Min	4.6E-03	4.6E-03	4.5E-03	4.6E-03	4.5E-03	4.5E-03	4.5E-03	4.6E-03
Max	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Average	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03	4.6E-03
Std Deviation	29.6E-06	27.9E-06	33.4E-06	28.6E-06	29.0E-06	30.6E-06	34.3E-06	32.5E-06

Parameter : Converting: Internal Reference Buffer Disabled : IVDD1\_CONVERT\_REF\_DISABLED  
 Test conditions : Echoed clock mode. CNV± in LVDS mode Fs=1MSPs

Unit : A  
 Spec Limit Max : 2.2E-03  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

IVDD1_CONVERT_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	384.5E-06	380.9E-06	383.5E-06	383.2E-06	382.1E-06	385.1E-06	383.9E-06	384.1E-06
1 OUT REF	385.8E-06	384.8E-06	384.9E-06	382.6E-06	385.5E-06	378.3E-06	385.0E-06	385.1E-06
<b>ON samples</b>								
2	388.6E-06	387.5E-06	389.3E-06	400.1E-06	568.2E-06	851.4E-06	796.2E-06	399.0E-06
3	386.2E-06	385.1E-06	385.1E-06	396.7E-06	555.0E-06	824.5E-06	765.3E-06	405.0E-06
4	401.2E-06	385.7E-06	384.2E-06	394.8E-06	560.0E-06	851.4E-06	795.6E-06	390.8E-06
5	385.0E-06	386.1E-06	385.0E-06	395.3E-06	544.2E-06	834.6E-06	787.9E-06	401.5E-06
6	383.5E-06	384.2E-06	385.5E-06	394.8E-06	562.3E-06	860.7E-06	806.4E-06	395.5E-06
<b>Statistics</b>								
Min	383.5E-06	384.2E-06	384.2E-06	394.8E-06	544.2E-06	824.5E-06	765.3E-06	390.8E-06
Max	401.2E-06	387.5E-06	389.3E-06	400.1E-06	568.2E-06	860.7E-06	806.4E-06	405.0E-06
Average	388.9E-06	385.7E-06	385.8E-06	396.4E-06	558.0E-06	844.5E-06	790.3E-06	398.4E-06
Std Deviation	6.4E-06	1.1E-06	1.8E-06	2.0E-06	8.1E-06	13.1E-06	13.8E-06	4.9E-06

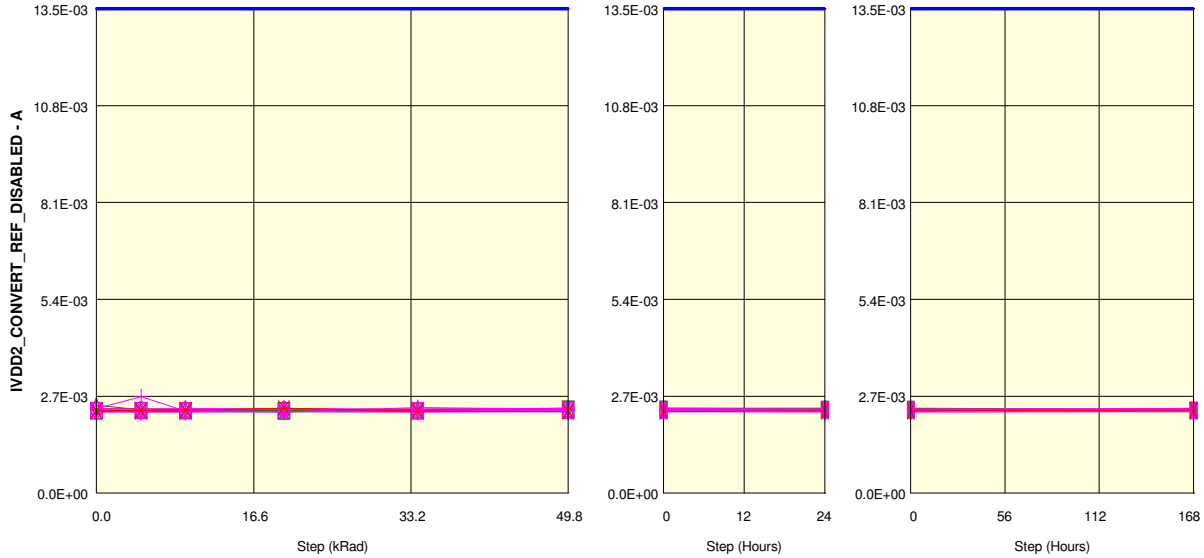
**Measurements**

IVDD1_CONVERT_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	384.5E-06	380.9E-06	383.5E-06	383.2E-06	382.1E-06	385.1E-06	383.9E-06	384.1E-06
1 OUT REF	385.8E-06	384.8E-06	384.9E-06	382.6E-06	385.5E-06	378.3E-06	385.0E-06	385.1E-06
<b>OFF samples</b>								
7	384.7E-06	385.4E-06	386.2E-06	387.5E-06	385.4E-06	388.6E-06	387.2E-06	385.6E-06
8	385.1E-06	385.3E-06	384.6E-06	384.2E-06	387.6E-06	385.8E-06	387.3E-06	385.5E-06
9	389.4E-06	389.3E-06	389.2E-06	388.4E-06	390.1E-06	389.9E-06	390.9E-06	389.6E-06
11	388.3E-06	386.9E-06	388.1E-06	389.8E-06	390.0E-06	389.5E-06	388.1E-06	388.0E-06
12	365.5E-06	357.6E-06	352.5E-06	385.6E-06	350.7E-06	363.0E-06	362.5E-06	352.9E-06
<b>Statistics</b>								
Min	365.5E-06	357.6E-06	352.5E-06	384.2E-06	350.7E-06	363.0E-06	362.5E-06	352.9E-06
Max	389.4E-06	389.3E-06	389.2E-06	389.8E-06	390.1E-06	389.9E-06	390.9E-06	389.6E-06
Average	382.6E-06	380.9E-06	380.1E-06	387.1E-06	380.8E-06	383.3E-06	383.2E-06	380.3E-06
Std Deviation	8.7E-06	11.7E-06	13.9E-06	2.0E-06	15.1E-06	10.3E-06	10.4E-06	13.8E-06

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

Parameter : Converting: Internal Reference Buffer Disabled : IVDD2\_CONVERT\_REF\_DISABLED  
 Test conditions : Echoed clock mode. CNV± in LVDS mode Fs=1MSPS

Unit : A  
 Spec Limit Max : 13.5E-03  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 x 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 × 1\_OUT

**Measurements**

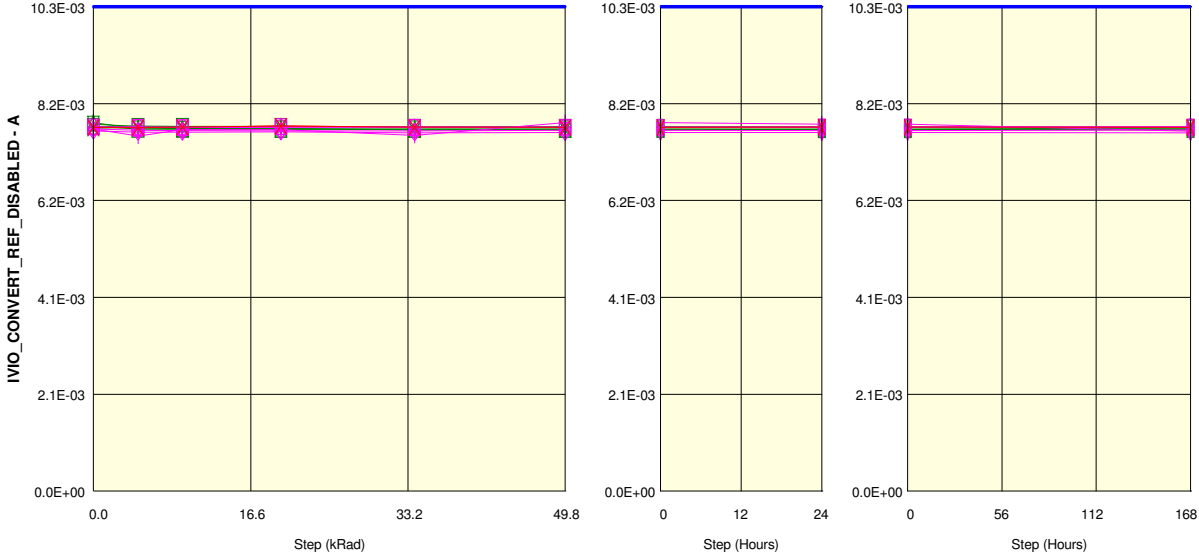
IVDD2_CONVERT_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
1 OUT REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
<b>ON samples</b>								
2	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.4E-03	2.3E-03
3	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
4	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03
5	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
6	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
<b>Statistics</b>								
Min	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
Max	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.4E-03	2.3E-03
Average	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
Std Deviation	61.8E-06	24.5E-06	22.2E-06	24.2E-06	21.2E-06	23.3E-06	24.0E-06	20.0E-06

**Measurements**

IVDD2_CONVERT_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
1 OUT REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
<b>OFF samples</b>								
7	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
8	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
9	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.4E-03
11	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
12	2.4E-03	2.7E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.4E-03
<b>Statistics</b>								
Min	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
Max	2.4E-03	2.7E-03	2.4E-03	2.3E-03	2.4E-03	2.4E-03	2.3E-03	2.4E-03
Average	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
Std Deviation	35.8E-06	156.1E-06	32.2E-06	36.2E-06	45.1E-06	30.6E-06	29.9E-06	36.4E-06

Parameter : Converting: Internal Reference Buffer Disabled : IVIO\_CONVERT\_REF\_DISABLED  
 Test conditions : Echoed clock mode. CNV± in LVDS mode Fs=1MSPS

Unit : A  
 Spec Limit Max : 10.3E-03  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

IVIO_CONVERT_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
1 OUT REF	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
<b>ON samples</b>								
2	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.7E-03
3	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
4	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
5	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
6	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
<b>Statistics</b>								
Min	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
Max	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.7E-03
Average	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
Std Deviation	44.3E-06	26.8E-06	25.5E-06	27.0E-06	25.8E-06	27.1E-06	25.7E-06	21.1E-06

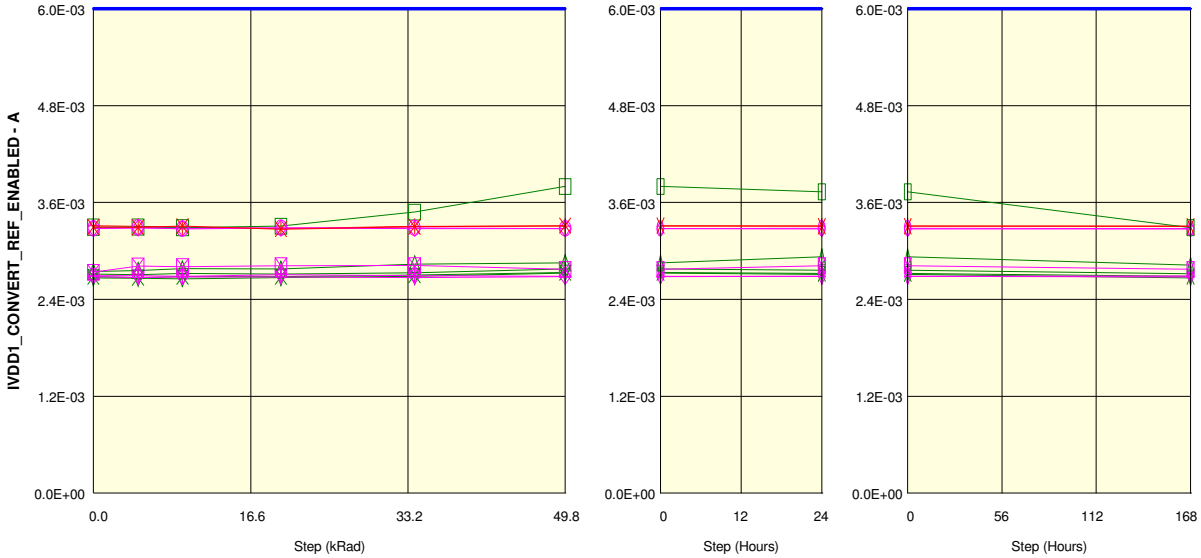
**Measurements**

IVIO_CONVERT_REF_DISABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
1 OUT REF	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
<b>OFF samples</b>								
7	7.7E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03
8	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
9	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
11	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.8E-03
12	7.7E-03	7.6E-03	7.7E-03	7.7E-03	7.6E-03	7.8E-03	7.8E-03	7.7E-03
<b>Statistics</b>								
Min	7.7E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03
Max	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.8E-03	7.8E-03	7.8E-03
Average	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
Std Deviation	30.8E-06	70.0E-06	37.4E-06	43.4E-06	68.2E-06	69.3E-06	63.0E-06	51.5E-06



Parameter : Converting: Internal Reference Buffer Enabled : IVDD1\_CONVERT\_REF\_ENABLED  
 Test conditions : Echoed clock mode. CNV± in LVDS mode Fs=1Mpsps

Unit : A  
 Spec Limit Max : 6.0E-03  
 Spec limits are represented in bold lines on the graphic.



**Measurements**

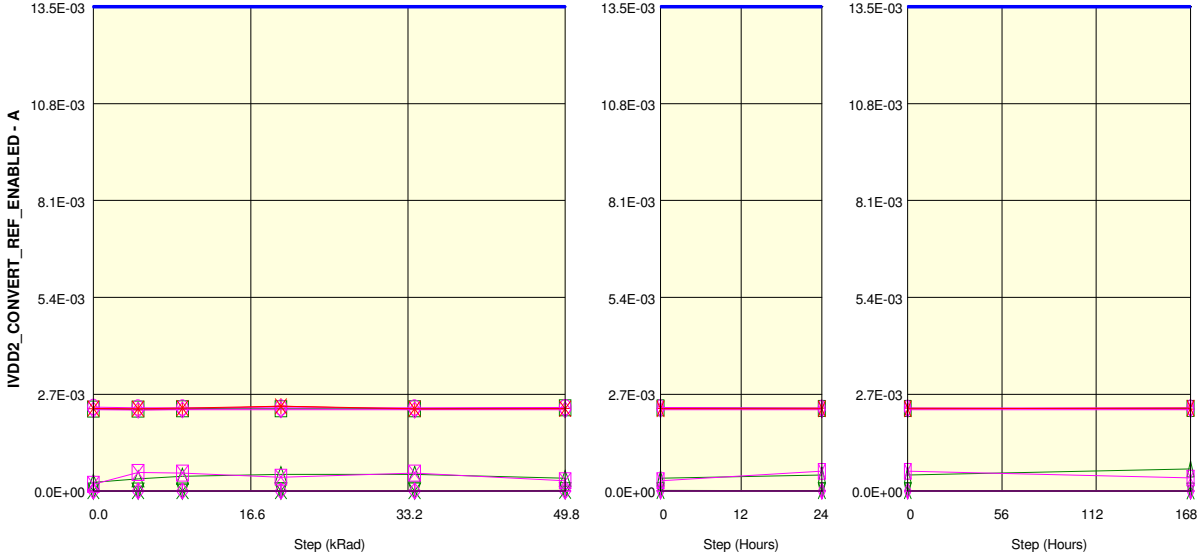
IVDD1_CONVERT_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03
1_OUT REF	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03
<b>ON samples</b>								
2	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.8E-03	2.8E-03	2.7E-03
3	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
4	2.7E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.9E-03	2.9E-03	2.8E-03
5	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
6	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.5E-03	3.8E-03	3.7E-03	3.3E-03
<b>Statistics</b>								
Min	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
Max	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.5E-03	3.8E-03	3.7E-03	3.3E-03
Average	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.9E-03	3.0E-03	3.0E-03	2.8E-03
Std Deviation	238.4E-06	240.8E-06	236.1E-06	242.2E-06	302.3E-06	413.2E-06	389.5E-06	233.6E-06

**Measurements**

IVDD1_CONVERT_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03
1_OUT REF	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03
<b>OFF samples</b>								
7	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03
8	2.7E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
9	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
11	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03
12	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
<b>Statistics</b>								
Min	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03	2.7E-03
Max	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03	3.3E-03
Average	2.9E-03	2.9E-03	2.9E-03	3.0E-03	2.9E-03	2.9E-03	2.9E-03	2.9E-03
Std Deviation	282.6E-06	279.5E-06	276.0E-06	274.6E-06	276.1E-06	278.5E-06	274.1E-06	278.0E-06

Parameter : Converting: Internal Reference Buffer Enabled : IVDD2\_CONVERT\_REF\_ENABLED  
 Test conditions : Echoed clock mode. CNV± in LVDS mode Fs=1MSPs

Unit : A  
 Spec Limit Max : 13.5E-03  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ◊ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

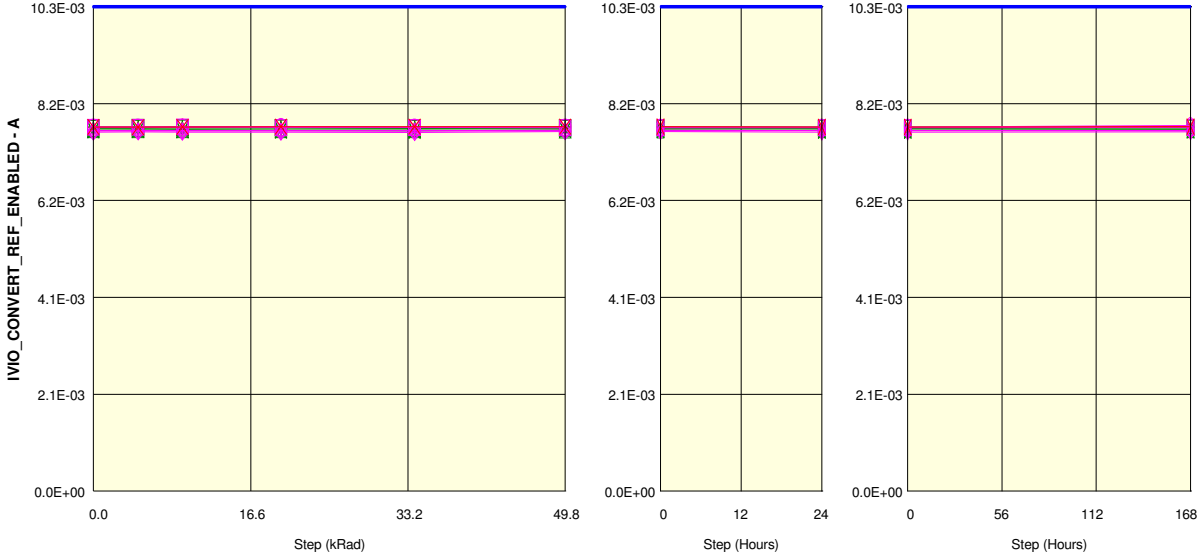
IVDD2_CONVERT_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
1_OUT_REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
<b>ON samples</b>								
2	554.8E-09	513.7E-09	522.7E-09	642.0E-09	1.3E-06	13.6E-06	12.1E-06	569.0E-09
3	569.8E-09	517.8E-09	545.9E-09	592.6E-09	991.6E-09	11.5E-06	10.3E-06	583.4E-09
4	242.1E-06	332.9E-06	413.1E-06	455.4E-06	466.5E-06	355.6E-06	443.1E-06	611.4E-06
5	569.2E-09	552.0E-09	561.4E-09	580.2E-09	882.0E-09	10.6E-06	8.9E-06	624.0E-09
6	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
<b>Statistics</b>								
Min	554.8E-09	513.7E-09	522.7E-09	580.2E-09	882.0E-09	10.6E-06	8.9E-06	569.0E-09
Max	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
Average	506.2E-06	524.8E-06	541.3E-06	550.6E-06	552.5E-06	542.6E-06	556.1E-06	582.6E-06
Std Deviation	895.5E-06	891.7E-06	889.6E-06	890.1E-06	888.6E-06	899.4E-06	890.9E-06	890.5E-06

**Measurements**

IVDD2_CONVERT_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
1_OUT_REF	2.3E-03	2.3E-03	2.3E-03	2.4E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
<b>OFF samples</b>								
7	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
8	187.2E-06	519.4E-06	501.4E-06	386.4E-06	499.4E-06	288.7E-06	547.4E-06	358.6E-06
9	523.3E-09	482.7E-09	519.7E-09	646.0E-09	504.2E-09	554.2E-09	522.7E-09	540.1E-09
11	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
12	519.8E-09	477.6E-09	537.0E-09	557.6E-09	468.8E-09	559.4E-09	507.9E-09	580.4E-09
<b>Statistics</b>								
Min	519.8E-09	477.6E-09	519.7E-09	557.6E-09	468.8E-09	554.2E-09	507.9E-09	540.1E-09
Max	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03	2.3E-03
Average	957.0E-06	1.0E-03	1.0E-03	993.6E-06	1.0E-03	976.2E-06	1.0E-03	989.4E-06
Std Deviation	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.0E-03	1.1E-03

Parameter : Converting: Internal Reference Buffer Enabled : IVIO\_CONVERT\_REF\_ENABLED  
 Test conditions : Echoed clock mode. CNV± in LVDS mode Fs=1MSPS

Unit : A  
 Spec Limit Max : 10.3E-03  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

IVIO_CONVERT_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.8E-03
1 OUT REF	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.8E-03	7.8E-03	7.7E-03	7.8E-03
<b>ON samples</b>								
2	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
3	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
4	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
5	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
6	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
<b>Statistics</b>								
Min	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
Max	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
Average	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
Std Deviation	28.9E-06	27.4E-06	25.8E-06	32.7E-06	30.9E-06	23.9E-06	27.4E-06	23.4E-06

**Measurements**

IVIO_CONVERT_REF_ENABLED	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.8E-03
1 OUT REF	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.8E-03	7.8E-03	7.7E-03	7.8E-03
<b>OFF samples</b>								
7	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03
8	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
9	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
11	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.8E-03
12	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
<b>Statistics</b>								
Min	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03	7.6E-03
Max	7.7E-03	7.7E-03	7.7E-03	7.8E-03	7.7E-03	7.7E-03	7.7E-03	7.8E-03
Average	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03	7.7E-03
Std Deviation	44.9E-06	43.6E-06	46.1E-06	45.9E-06	44.6E-06	37.6E-06	42.3E-06	49.0E-06

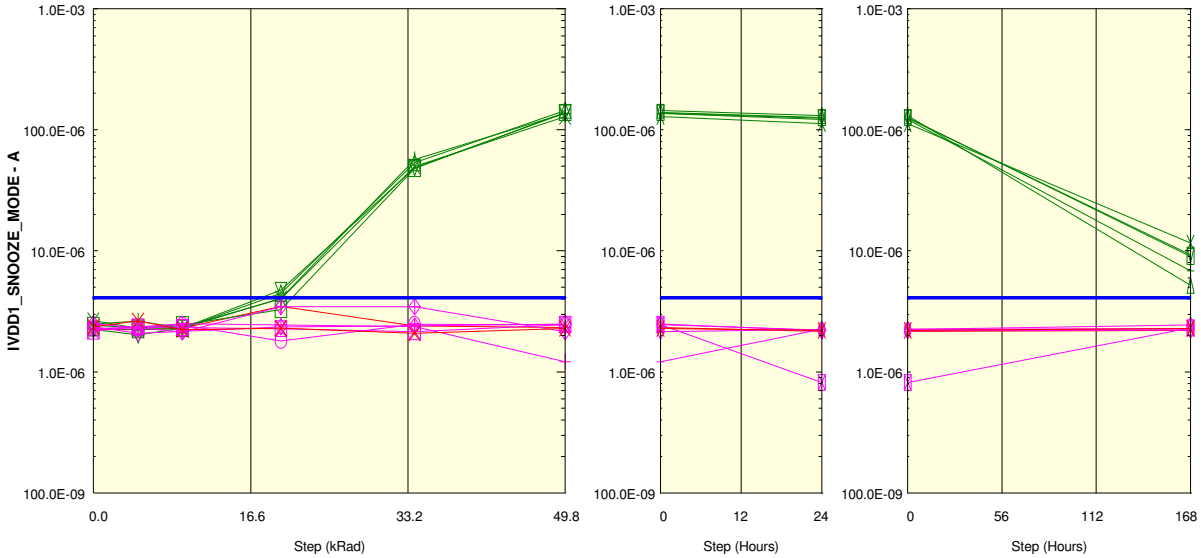
Parameter : Supply current Snooze Mode : IVDD1\_SNOOZE\_MODE

Test conditions :

Unit : A

Spec Limit Max : 4.1E-06

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

IVDD1_SNOOZE_MODE	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	2.2E-06	2.2E-06	2.3E-06	3.5E-06	2.4E-06	2.3E-06	2.2E-06	2.2E-06
1_OUT_REF	2.4E-06	2.6E-06	2.2E-06	2.3E-06	2.1E-06	2.3E-06	2.2E-06	2.3E-06
<b>ON samples</b>								
2	2.5E-06	2.6E-06	2.3E-06	4.0E-06	<b>57.1E-06</b>	<b>137.0E-06</b>	<b>122.1E-06</b>	<b>6.8E-06</b>
3	2.7E-06	2.3E-06	2.3E-06	4.0E-06	<b>49.7E-06</b>	<b>128.7E-06</b>	<b>112.6E-06</b>	<b>11.6E-06</b>
4	2.3E-06	2.2E-06	2.3E-06	<b>4.5E-06</b>	<b>53.4E-06</b>	<b>144.6E-06</b>	<b>130.8E-06</b>	<b>5.2E-06</b>
5	2.2E-06	2.0E-06	2.3E-06	<b>4.7E-06</b>	<b>48.6E-06</b>	<b>137.8E-06</b>	<b>125.2E-06</b>	<b>9.2E-06</b>
6	2.4E-06	2.3E-06	2.5E-06	3.3E-06	<b>47.8E-06</b>	<b>139.0E-06</b>	<b>126.6E-06</b>	<b>9.0E-06</b>
<b>Statistics</b>								
Min	<b>2.2E-06</b>	2.0E-06	2.3E-06	3.3E-06	47.8E-06	128.7E-06	112.6E-06	5.2E-06
Max	<b>2.7E-06</b>	2.6E-06	2.5E-06	4.7E-06	57.1E-06	144.6E-06	130.8E-06	11.6E-06
Average	<b>2.4E-06</b>	2.3E-06	2.3E-06	4.1E-06	51.3E-06	137.4E-06	123.4E-06	8.4E-06
Std Deviation	<b>147.5E-09</b>	195.0E-09	59.9E-09	494.6E-09	3.5E-06	5.1E-06	6.1E-06	2.2E-06

**Measurements**

IVDD1_SNOOZE_MODE	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	2.2E-06	2.2E-06	2.3E-06	3.5E-06	2.4E-06	2.3E-06	2.2E-06	2.2E-06
1_OUT_REF	2.4E-06	2.6E-06	2.2E-06	2.3E-06	2.1E-06	2.3E-06	2.2E-06	2.3E-06
<b>OFF samples</b>								
7	2.4E-06	2.1E-06	2.2E-06	2.4E-06	2.4E-06	2.5E-06	2.2E-06	2.2E-06
8	2.2E-06	2.4E-06	2.3E-06	2.3E-06	2.2E-06	2.5E-06	820.0E-09	2.3E-06
9	2.5E-06	2.3E-06	2.1E-06	3.5E-06	3.5E-06	2.2E-06	2.2E-06	2.4E-06
11	2.3E-06	2.3E-06	2.4E-06	1.8E-06	2.5E-06	2.5E-06	2.2E-06	2.3E-06
12	2.3E-06	2.4E-06	2.5E-06	2.4E-06	2.4E-06	1.2E-06	2.3E-06	2.3E-06
<b>Statistics</b>								
Min	2.2E-06	2.1E-06	2.1E-06	1.8E-06	2.2E-06	1.2E-06	820.0E-09	2.2E-06
Max	2.5E-06	2.4E-06	2.5E-06	3.5E-06	3.5E-06	2.5E-06	2.3E-06	2.4E-06
Average	2.3E-06	2.3E-06	2.3E-06	2.5E-06	2.6E-06	2.2E-06	1.9E-06	2.3E-06
Std Deviation	106.9E-09	105.1E-09	143.6E-09	544.3E-09	457.6E-09	485.0E-09	563.1E-09	77.9E-09

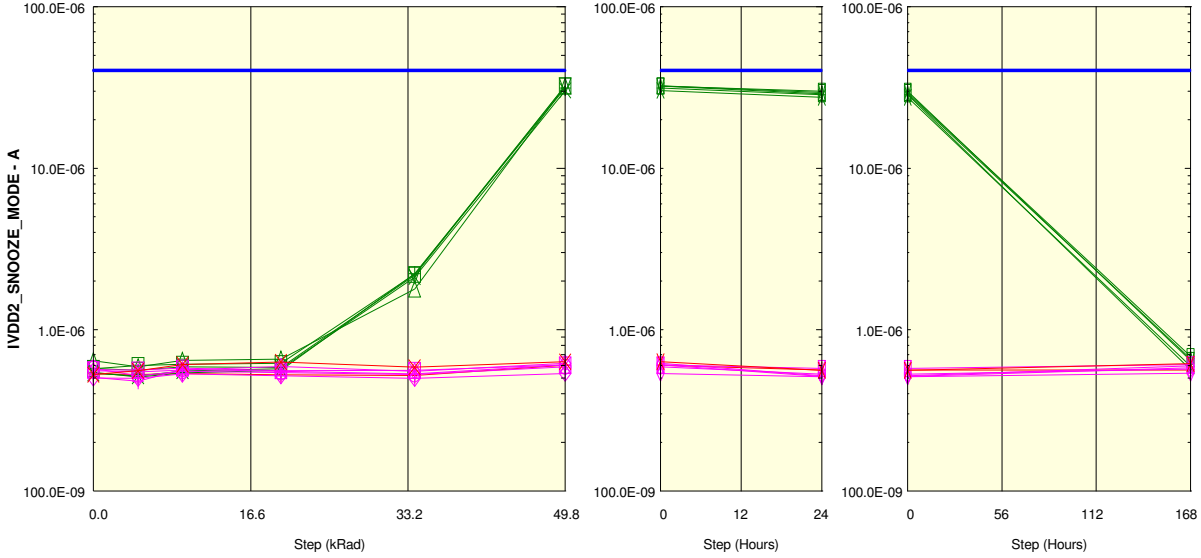
Parameter : Supply current Snooze Mode : IVDD2\_SNOOZE\_MODE

Test conditions :

Unit : A

Spec Limit Max : 40.3E-06

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements

IVDD2_SNOOZE_MODE	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	532.4E-09	526.9E-09	535.4E-09	523.2E-09	518.8E-09	602.6E-09	563.6E-09	562.4E-09
1_OUT_REF	526.8E-09	555.6E-09	606.8E-09	630.2E-09	583.4E-09	633.5E-09	559.1E-09	613.5E-09
ON samples								
2	543.3E-09	509.1E-09	540.4E-09	558.6E-09	2.2E-06	31.3E-06	28.6E-06	564.0E-09
3	538.4E-09	515.5E-09	552.3E-09	571.8E-09	2.1E-06	30.4E-06	27.5E-06	594.7E-09
4	640.6E-09	589.6E-09	643.0E-09	657.4E-09	1.8E-06	32.3E-06	28.9E-06	659.0E-09
5	573.5E-09	559.2E-09	586.2E-09	581.2E-09	2.2E-06	32.3E-06	30.1E-06	644.4E-09
6	571.4E-09	597.9E-09	610.3E-09	617.4E-09	2.2E-06	32.4E-06	29.4E-06	683.2E-09
Statistics								
Min	538.4E-09	509.1E-09	540.4E-09	558.6E-09	1.8E-06	30.4E-06	27.5E-06	564.0E-09
Max	640.6E-09	597.9E-09	643.0E-09	657.4E-09	2.2E-06	32.4E-06	30.1E-06	683.2E-09
Average	573.4E-09	554.3E-09	586.4E-09	597.3E-09	2.1E-06	31.8E-06	28.9E-06	629.1E-09
Std Deviation	36.5E-09	36.7E-09	37.6E-09	35.8E-09	160.0E-09	799.7E-09	861.4E-09	43.5E-09

Measurements

IVDD2_SNOOZE_MODE	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	532.4E-09	526.9E-09	535.4E-09	523.2E-09	518.8E-09	602.6E-09	563.6E-09	562.4E-09
1_OUT_REF	526.8E-09	555.6E-09	606.8E-09	630.2E-09	583.4E-09	633.5E-09	559.1E-09	613.5E-09
OFF samples								
7	554.6E-09	546.3E-09	561.8E-09	591.2E-09	550.3E-09	618.4E-09	517.6E-09	596.1E-09
8	565.4E-09	562.5E-09	577.8E-09	555.4E-09	560.3E-09	603.0E-09	574.5E-09	607.7E-09
9	501.3E-09	497.9E-09	529.5E-09	517.2E-09	497.5E-09	536.0E-09	509.9E-09	536.7E-09
11	575.7E-09	518.0E-09	550.7E-09	542.2E-09	525.3E-09	585.6E-09	527.4E-09	570.5E-09
12	506.9E-09	478.2E-09	567.7E-09	551.4E-09	532.4E-09	604.2E-09	513.2E-09	579.1E-09
Statistics								
Min	501.3E-09	478.2E-09	529.5E-09	517.2E-09	497.5E-09	536.0E-09	509.9E-09	536.7E-09
Max	575.7E-09	562.5E-09	577.8E-09	591.2E-09	560.3E-09	618.4E-09	574.5E-09	607.7E-09
Average	540.8E-09	520.6E-09	557.5E-09	551.5E-09	533.2E-09	589.4E-09	528.5E-09	578.0E-09
Std Deviation	30.7E-09	30.8E-09	16.5E-09	23.9E-09	21.7E-09	28.7E-09	23.7E-09	24.4E-09

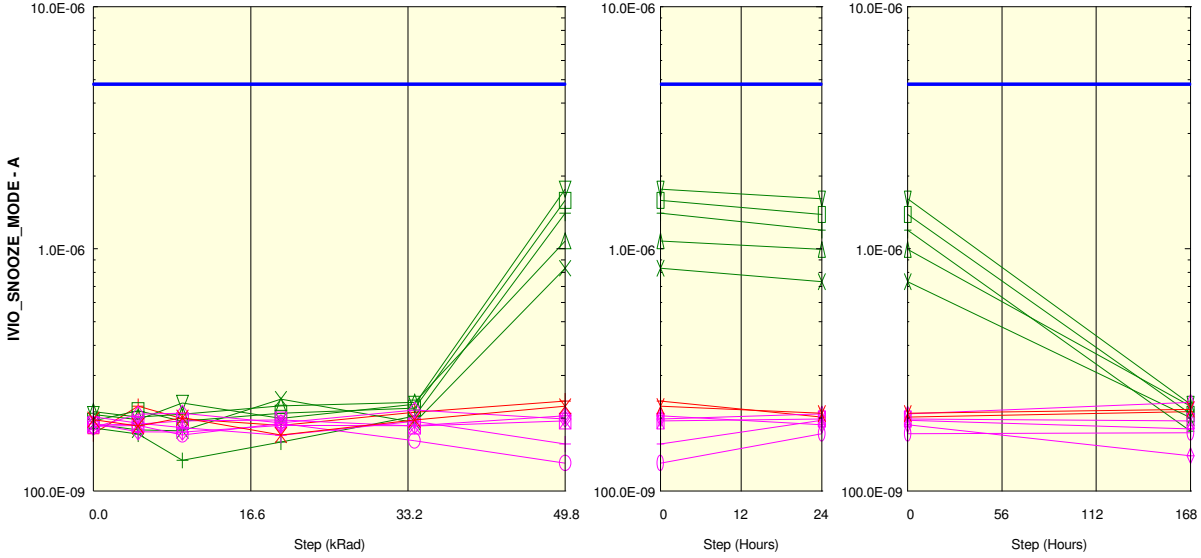
Parameter : Supply current Snooze Mode : IVIO\_SNOOZE\_MODE

Test conditions :

Unit : A

Spec Limit Max : 4.8E-06

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

**Measurements**

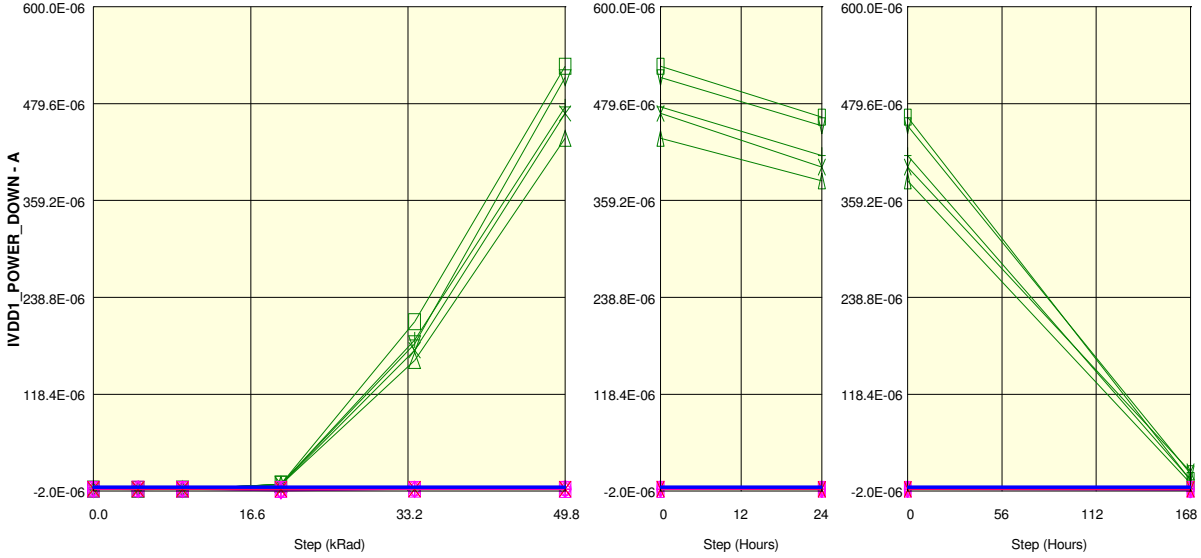
IVIO_SNOOZE_MODE	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	172.5E-09	223.8E-09	198.9E-09	186.6E-09	211.2E-09	235.3E-09	202.5E-09	212.5E-09
1_OUT_REF	197.0E-09	185.6E-09	200.6E-09	170.0E-09	196.8E-09	223.4E-09	208.9E-09	217.4E-09
<b>ON samples</b>								
2	181.8E-09	172.0E-09	133.6E-09	159.0E-09	204.1E-09	1.4E-06	1.2E-06	177.1E-09
3	188.7E-09	178.9E-09	177.3E-09	240.0E-09	191.7E-09	832.6E-09	731.6E-09	200.8E-09
4	212.6E-09	201.5E-09	207.5E-09	224.7E-09	232.4E-09	1.1E-06	994.4E-09	223.8E-09
5	207.0E-09	197.3E-09	230.8E-09	199.4E-09	228.1E-09	1.8E-06	1.6E-06	228.0E-09
6	194.6E-09	214.8E-09	193.9E-09	209.8E-09	220.0E-09	1.6E-06	1.4E-06	208.0E-09
<b>Statistics</b>								
Min	181.8E-09	172.0E-09	133.6E-09	159.0E-09	191.7E-09	832.6E-09	731.6E-09	177.1E-09
Max	212.6E-09	214.8E-09	230.8E-09	240.0E-09	232.4E-09	1.8E-06	1.6E-06	228.0E-09
Average	196.9E-09	192.9E-09	188.6E-09	206.6E-09	215.3E-09	1.3E-06	1.2E-06	207.5E-09
Std Deviation	11.4E-09	15.5E-09	32.6E-09	27.5E-09	15.2E-09	338.1E-09	304.4E-09	18.2E-09

**Measurements**

IVIO_SNOOZE_MODE	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN_REF	172.5E-09	223.8E-09	198.9E-09	186.6E-09	211.2E-09	235.3E-09	202.5E-09	212.5E-09
1_OUT_REF	197.0E-09	185.6E-09	200.6E-09	170.0E-09	196.8E-09	223.4E-09	208.9E-09	217.4E-09
<b>OFF samples</b>								
7	182.9E-09	207.7E-09	209.9E-09	191.4E-09	215.9E-09	198.1E-09	208.0E-09	232.9E-09
8	186.8E-09	188.8E-09	194.6E-09	196.7E-09	185.5E-09	194.5E-09	198.3E-09	194.3E-09
9	189.4E-09	175.5E-09	174.8E-09	186.5E-09	186.2E-09	204.8E-09	187.6E-09	139.8E-09
11	185.0E-09	186.6E-09	170.7E-09	190.0E-09	161.3E-09	130.6E-09	172.6E-09	173.8E-09
12	203.0E-09	191.0E-09	182.5E-09	169.5E-09	194.2E-09	156.2E-09	196.1E-09	180.2E-09
<b>Statistics</b>								
Min	182.9E-09	175.5E-09	170.7E-09	169.5E-09	161.3E-09	130.6E-09	172.6E-09	139.8E-09
Max	203.0E-09	207.7E-09	209.9E-09	196.7E-09	215.9E-09	204.8E-09	208.0E-09	232.9E-09
Average	189.4E-09	189.9E-09	186.5E-09	186.8E-09	188.6E-09	176.8E-09	192.5E-09	184.2E-09
Std Deviation	7.1E-09	10.4E-09	14.3E-09	9.3E-09	17.5E-09	28.7E-09	11.9E-09	30.2E-09

Parameter : Supply current Power Down Mode : IVDD1\_POWER\_DOWN  
 Test conditions : EN3 to EN0 = X000

Unit : A  
 Spec Limit Max : 2.8E-06  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements

IVDD1_POWER_DOWN	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	250.0E-09	-2.0E-09	228.0E-09	380.0E-09	372.0E-09	14.0E-09	384.0E-09	104.0E-09
1 OUT REF	424.0E-09	184.0E-09	54.0E-09	202.0E-09	400.0E-09	498.0E-09	322.0E-09	354.0E-09
ON samples								
2	110.0E-09	128.0E-09	-58.0E-09	6.6E-06	185.8E-06	475.5E-06	415.4E-06	12.1E-06
3	140.0E-09	216.0E-09	474.0E-09	6.1E-06	173.2E-06	467.4E-06	400.6E-06	21.8E-06
4	334.0E-09	228.0E-09	466.0E-09	5.9E-06	160.3E-06	436.5E-06	383.4E-06	7.6E-06
5	372.0E-09	296.0E-09	388.0E-09	6.3E-06	180.9E-06	512.1E-06	452.2E-06	19.7E-06
6	392.0E-09	266.0E-09	372.0E-09	6.6E-06	208.4E-06	526.1E-06	462.8E-06	11.2E-06
Statistics								
Min	110.0E-09	128.0E-09	-58.0E-09	5.9E-06	160.3E-06	436.5E-06	383.4E-06	7.6E-06
Max	392.0E-09	296.0E-09	474.0E-09	6.6E-06	208.4E-06	526.1E-06	462.8E-06	21.8E-06
Average	269.6E-09	226.8E-09	328.4E-09	6.3E-06	181.7E-06	483.5E-06	422.9E-06	14.5E-06
Std Deviation	119.9E-09	56.9E-09	197.4E-09	281.9E-09	15.9E-06	32.1E-06	30.2E-06	5.4E-06

Measurements

IVDD1_POWER_DOWN	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	250.0E-09	-2.0E-09	228.0E-09	380.0E-09	372.0E-09	14.0E-09	384.0E-09	104.0E-09
1 OUT REF	424.0E-09	184.0E-09	54.0E-09	202.0E-09	400.0E-09	498.0E-09	322.0E-09	354.0E-09
OFF samples								
7	96.0E-09	154.0E-09	468.0E-09	-1.2E-06	0.0E+00	394.0E-09	436.0E-09	178.0E-09
8	324.0E-09	522.0E-09	206.0E-09	-28.0E-09	194.0E-09	12.0E-09	142.0E-09	224.0E-09
9	532.0E-09	412.0E-09	52.0E-09	-2.0E-06	336.0E-09	272.0E-09	-36.0E-09	182.0E-09
11	124.0E-09	-540.0E-09	264.0E-09	-720.0E-09	318.0E-09	620.0E-09	10.0E-09	-1.1E-06
12	464.0E-09	-40.0E-09	88.0E-09	-980.0E-09	422.0E-09	376.0E-09	380.0E-09	330.0E-09
Statistics								
Min	96.0E-09	-540.0E-09	52.0E-09	-2.0E-06	0.0E+00	12.0E-09	-36.0E-09	-1.1E-06
Max	532.0E-09	522.0E-09	468.0E-09	-28.0E-09	422.0E-09	620.0E-09	436.0E-09	330.0E-09
Average	308.0E-09	101.6E-09	215.6E-09	-997.6E-09	254.0E-09	334.8E-09	186.4E-09	-37.2E-09
Std Deviation	175.3E-09	376.2E-09	147.8E-09	656.3E-09	146.4E-09	197.3E-09	191.0E-09	534.2E-09

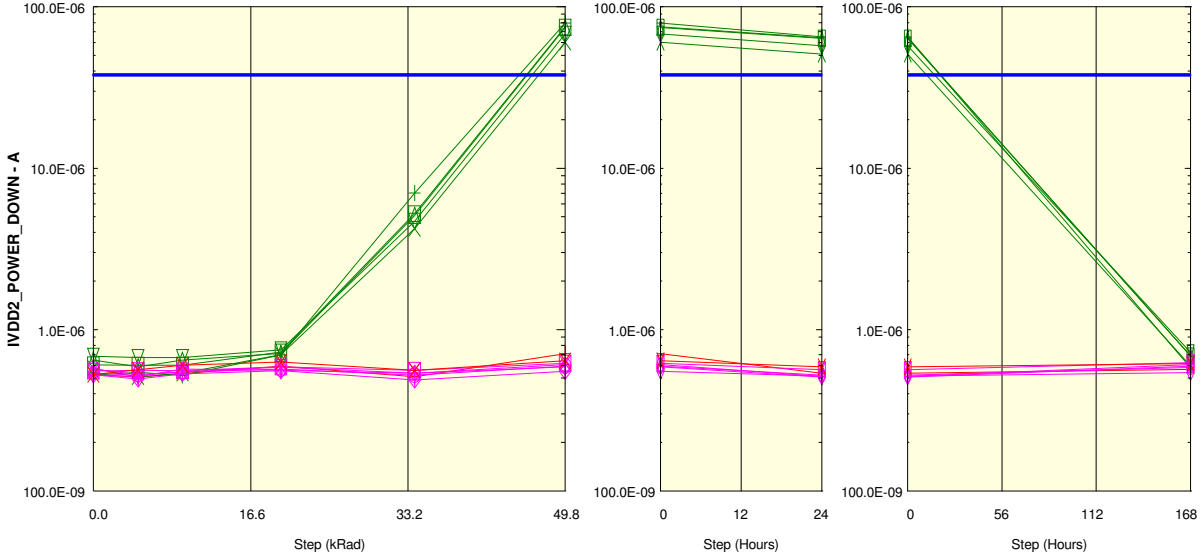
Parameter : Supply current Power Down Mode : IVDD2\_POWER\_DOWN

Test conditions : EN3 to EN0 = X000

Unit : A

Spec Limit Max : 37.8E-06

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements

IVDD2_POWER_DOWN	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN REF	525.3E-09	508.6E-09	536.1E-09	594.0E-09	510.6E-09	708.0E-09	538.2E-09	567.0E-09
1_OUT REF	525.8E-09	565.4E-09	601.6E-09	630.4E-09	559.8E-09	639.8E-09	588.4E-09	615.6E-09
ON samples								
2	521.6E-09	544.0E-09	518.9E-09	698.2E-09	7.0E-06	79.6E-06	65.3E-06	578.2E-09
3	573.5E-09	508.6E-09	537.6E-09	700.0E-09	4.2E-06	60.4E-06	51.0E-06	596.5E-09
4	647.4E-09	588.4E-09	645.2E-09	712.0E-09	5.1E-06	74.5E-06	63.8E-06	688.6E-09
5	684.6E-09	672.2E-09	672.2E-09	749.4E-09	4.7E-06	67.9E-06	57.3E-06	721.2E-09
6	605.2E-09	601.4E-09	600.5E-09	725.4E-09	5.2E-06	75.1E-06	64.1E-06	688.0E-09
Statistics								
Min	521.6E-09	508.6E-09	518.9E-09	698.2E-09	4.2E-06	60.4E-06	51.0E-06	578.2E-09
Max	684.6E-09	672.2E-09	672.2E-09	749.4E-09	7.0E-06	79.6E-06	65.3E-06	721.2E-09
Average	606.5E-09	582.9E-09	594.9E-09	717.0E-09	5.3E-06	71.5E-06	60.3E-06	654.5E-09
Std Deviation	56.7E-09	55.5E-09	59.3E-09	18.9E-09	946.6E-09	6.7E-06	5.4E-06	56.4E-09

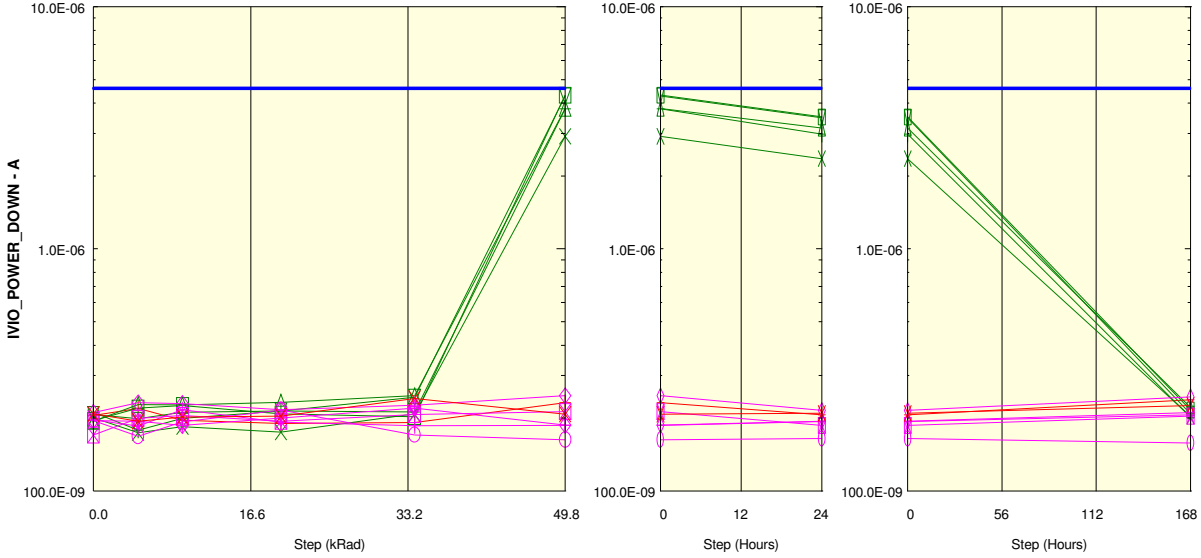
Measurements

IVDD2_POWER_DOWN	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1_IN REF	525.3E-09	508.6E-09	536.1E-09	594.0E-09	510.6E-09	708.0E-09	538.2E-09	567.0E-09
1_OUT REF	525.8E-09	565.4E-09	601.6E-09	630.4E-09	559.8E-09	639.8E-09	588.4E-09	615.6E-09
OFF samples								
7	538.8E-09	519.9E-09	545.6E-09	584.8E-09	537.5E-09	586.5E-09	509.6E-09	593.2E-09
8	554.2E-09	557.6E-09	555.0E-09	587.0E-09	560.9E-09	620.0E-09	565.9E-09	624.6E-09
9	523.8E-09	494.7E-09	532.6E-09	555.2E-09	487.9E-09	551.6E-09	516.1E-09	542.0E-09
11	568.9E-09	526.6E-09	546.7E-09	569.4E-09	522.1E-09	595.0E-09	521.8E-09	582.4E-09
12	524.9E-09	511.3E-09	570.3E-09	558.0E-09	536.2E-09	605.8E-09	512.2E-09	607.4E-09
Statistics								
Min	523.8E-09	494.7E-09	532.6E-09	555.2E-09	487.9E-09	551.6E-09	509.6E-09	542.0E-09
Max	568.9E-09	557.6E-09	570.3E-09	587.0E-09	560.9E-09	620.0E-09	565.9E-09	624.6E-09
Average	542.1E-09	522.0E-09	550.0E-09	570.9E-09	528.9E-09	591.8E-09	525.1E-09	589.9E-09
Std Deviation	17.3E-09	20.7E-09	12.4E-09	13.2E-09	24.0E-09	23.0E-09	20.8E-09	27.8E-09



Parameter : Supply current Power Down Mode : **IVIO\_POWER\_DOWN**  
 Test conditions : EN3 to EN0 = X000

Unit : A  
 Spec Limit Max : 4.6E-06  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

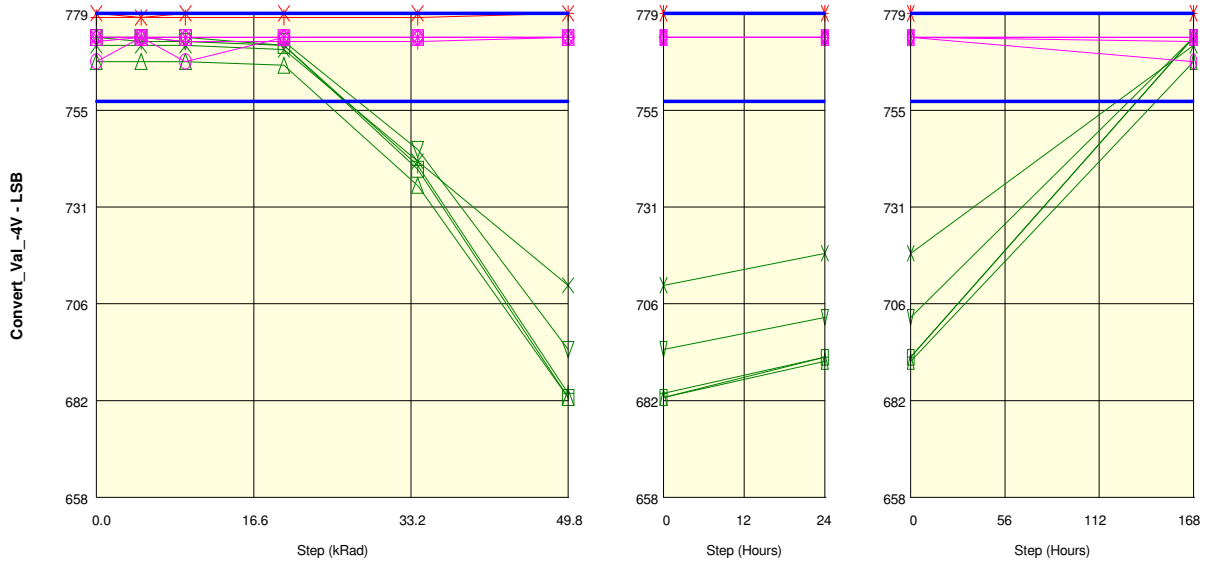
**Measurements**

IVIO_POWER_DOWN	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	205.3E-09	219.5E-09	196.1E-09	190.0E-09	191.7E-09	231.9E-09	206.4E-09	238.1E-09
1_OUT REF	208.3E-09	194.2E-09	202.3E-09	204.0E-09	241.4E-09	207.3E-09	209.0E-09	225.5E-09
<b>ON samples</b>								
2	211.4E-09	178.4E-09	199.6E-09	214.0E-09	212.4E-09	3.8E-06	3.0E-06	201.1E-09
3	200.4E-09	174.0E-09	184.4E-09	175.0E-09	208.2E-09	2.9E-06	2.4E-06	203.2E-09
4	193.7E-09	227.7E-09	227.0E-09	232.6E-09	247.2E-09	3.8E-06	3.2E-06	221.1E-09
5	206.8E-09	198.7E-09	211.4E-09	213.7E-09	244.0E-09	4.3E-06	3.5E-06	207.8E-09
6	195.4E-09	219.8E-09	225.4E-09	208.0E-09	202.8E-09	4.3E-06	3.5E-06	216.0E-09
<b>Statistics</b>								
Min	193.7E-09	174.0E-09	184.4E-09	175.0E-09	202.8E-09	2.9E-06	2.4E-06	201.1E-09
Max	211.4E-09	227.7E-09	227.0E-09	232.6E-09	247.2E-09	4.3E-06	3.5E-06	221.1E-09
Average	201.5E-09	199.7E-09	209.6E-09	208.6E-09	222.9E-09	3.8E-06	3.1E-06	209.8E-09
Std Deviation	6.7E-09	21.5E-09	16.1E-09	18.8E-09	18.8E-09	503.3E-09	418.3E-09	7.6E-09

**Measurements**

IVIO_POWER_DOWN	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	205.3E-09	219.5E-09	196.1E-09	190.0E-09	191.7E-09	231.9E-09	206.4E-09	238.1E-09
1_OUT REF	208.3E-09	194.2E-09	202.3E-09	204.0E-09	241.4E-09	207.3E-09	209.0E-09	225.5E-09
<b>OFF samples</b>								
7	210.8E-09	231.2E-09	229.4E-09	216.4E-09	226.2E-09	247.6E-09	214.8E-09	244.3E-09
8	170.3E-09	199.2E-09	204.8E-09	194.1E-09	206.9E-09	212.5E-09	186.4E-09	204.1E-09
9	195.4E-09	194.0E-09	186.3E-09	200.0E-09	220.0E-09	186.9E-09	194.2E-09	210.9E-09
11	195.8E-09	168.0E-09	192.8E-09	216.0E-09	170.6E-09	162.7E-09	164.3E-09	157.9E-09
12	196.6E-09	185.3E-09	216.8E-09	192.1E-09	186.2E-09	186.4E-09	193.3E-09	206.5E-09
<b>Statistics</b>								
Min	170.3E-09	168.0E-09	186.3E-09	192.1E-09	170.6E-09	162.7E-09	164.3E-09	157.9E-09
Max	210.8E-09	231.2E-09	229.4E-09	216.4E-09	226.2E-09	247.6E-09	214.8E-09	244.3E-09
Average	193.8E-09	195.5E-09	206.0E-09	203.7E-09	202.0E-09	199.2E-09	190.6E-09	204.7E-09
Std Deviation	13.1E-09	20.7E-09	15.7E-09	10.5E-09	20.8E-09	28.9E-09	16.2E-09	27.6E-09

Parameter : Convert Value : Convert\_Val\_-4V  
 Test conditions : Convert Voltage -4V.REF=4.096V  
 Unit : LSB  
 Spec Limit Min : 757  
 Spec Limit Max : 779  
 Spec limits are represented in bold lines on the graphic.

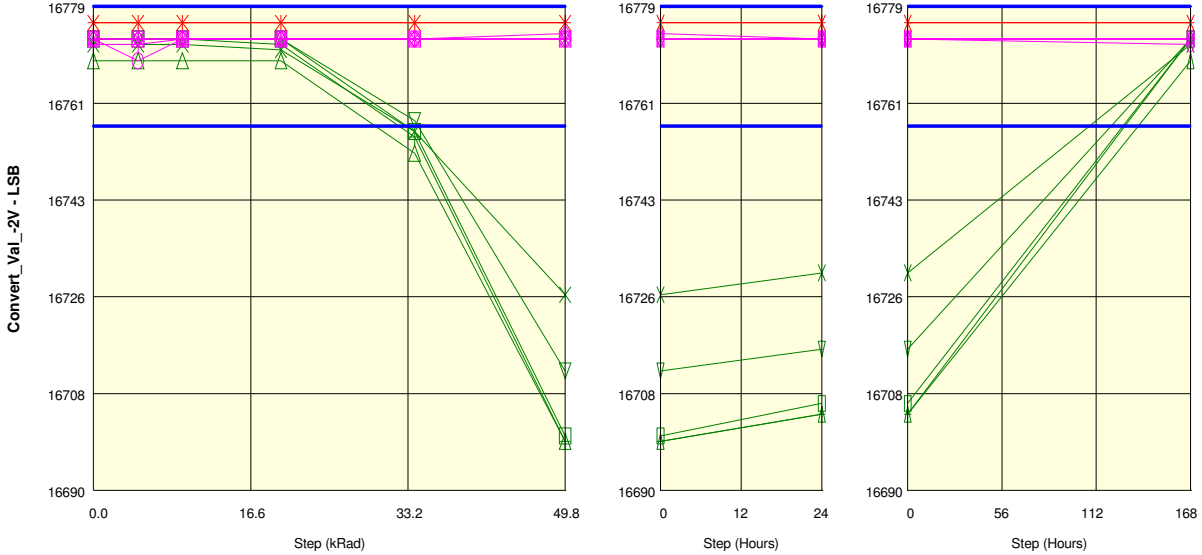


+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements									
Convert Val -4V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours	
1 IN REF	778	778	778	778	778	779	779	779	
1 OUT REF	779	778	779	779	779	779	779	779	
ON samples									
2	773	772	772	771	741	684	693	773	
3	771	771	771	770	742	711	719	771	
4	767	767	767	766	736	683	692	767	
5	773	773	772	772	745	695	703	773	
6	773	773	773	771	740	683	693	773	
Statistics									
Min	767	767	767	766	736	683	692	767	
Max	773	773	773	772	745	711	719	773	
Average	771	771	771	770	741	691	700	771	
Std Deviation	2	2	2	2	3	11	10	2	

Measurements									
Convert Val -4V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours	
1 IN REF	778	778	778	778	778	779	779	779	
1 OUT REF	779	778	779	779	779	779	779	779	
OFF samples									
7	773	773	773	773	773	773	773	773	
8	773	773	773	773	773	773	773	773	
9	773	773	773	773	773	773	773	773	
11	767	773	767	773	773	773	773	767	
12	772	773	772	772	772	773	773	772	
Statistics									
Min	767	773	767	772	772	773	773	767	
Max	773	773	773	773	773	773	773	773	
Average	772	773	772	773	773	773	773	772	
Std Deviation	2	0	2	0	0	0	0	2	

Parameter : Convert Value : Convert\_Val\_-2V  
 Test conditions : Convert Voltage -2V.REF=4.096V  
 Unit : LSB  
 Spec Limit Min : 16757  
 Spec Limit Max : 16779  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2    × 3    △ 4    ▽ 5    □ 6    ◇ 7    ⊠ 8    ⊕ 9    ○ 11    + 12    × 1\_OUT

**Measurements**

Convert Val -2V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	16776	16776	16776	16776	16776	16776	16776	16776
1 OUT REF	16776	16776	16776	16776	16776	16776	16776	16776
<b>ON samples</b>								
2	16773	16773	16773	16772	16755	16699	16704	16773
3	16772	16772	16772	16771	16756	16726	16730	16772
4	16769	16769	16769	16769	16752	16699	16704	16769
5	16773	16773	16773	16773	16758	16712	16716	16773
6	16773	16773	16773	16773	16756	16700	16706	16773
<b>Statistics</b>								
Min	16769	16769	16769	16769	16752	16699	16704	16769
Max	16773	16773	16773	16773	16758	16726	16730	16773
Average	16772	16772	16772	16772	16755	16707	16712	16772
Std Deviation	2	2	2	1	2	11	10	2

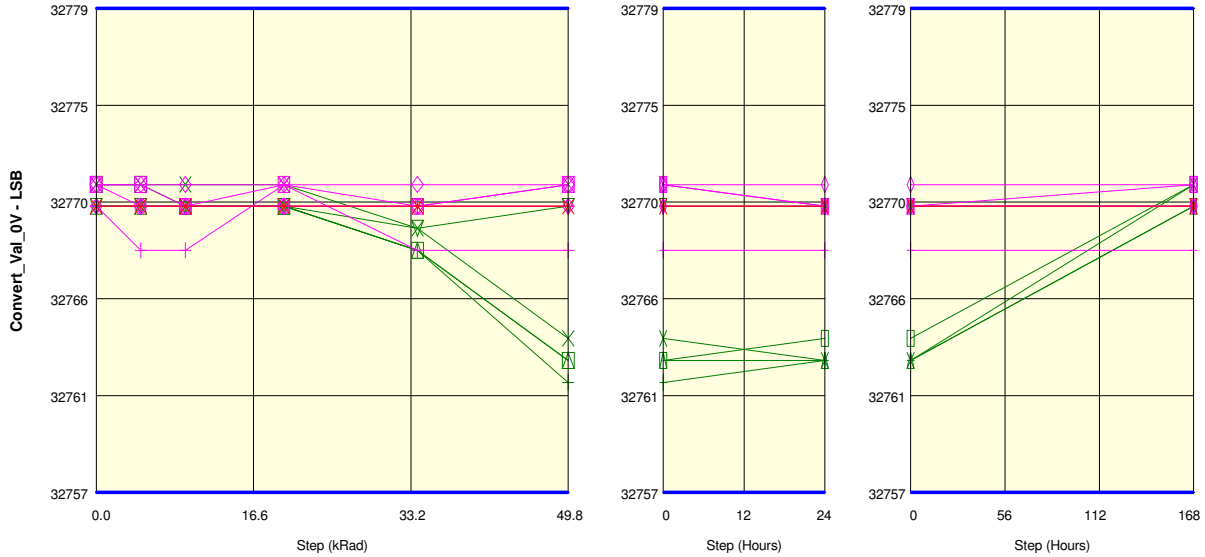
**Measurements**

Convert Val -2V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	16776	16776	16776	16776	16776	16776	16776	16776
1 OUT REF	16776	16776	16776	16776	16776	16776	16776	16776
<b>OFF samples</b>								
7	16773	16773	16773	16773	16773	16774	16773	16773
8	16773	16773	16773	16773	16773	16773	16773	16773
9	16773	16773	16773	16773	16773	16773	16773	16773
11	16773	16769	16773	16773	16773	16773	16773	16772
12	16772	16772	16773	16773	16773	16773	16773	16773
<b>Statistics</b>								
Min	16772	16769	16773	16773	16773	16773	16773	16772
Max	16773	16773	16773	16773	16773	16774	16773	16773
Average	16773	16772	16773	16773	16773	16773	16773	16773
Std Deviation	0	2	0	0	0	0	0	0

Parameter : Convert Value : Convert\_Val\_0V  
 Test conditions : Convert Voltage 0V.REF=4.096V

Unit : LSB  
 Spec Limit Min : 32757  
 Spec Limit Max : 32779

Spec limits are represented in bold lines on the graphic.



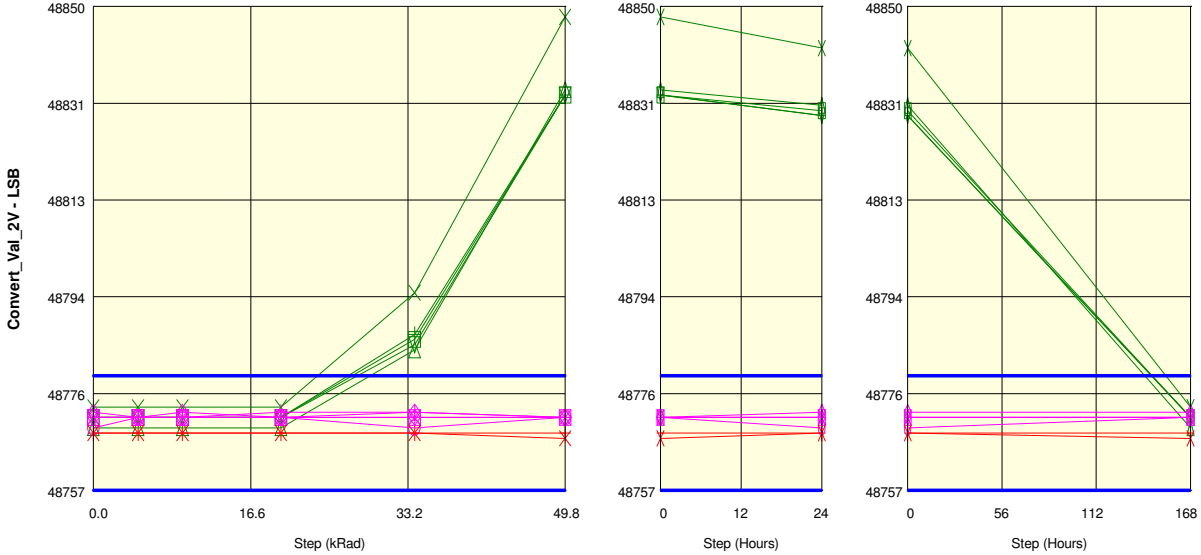
+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements								
Convert_Val_0V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	32770	32770	32770	32770	32770	32770	32770	32770
1 OUT REF	32770	32770	32770	32770	32770	32770	32770	32770
ON samples								
2	32770	32770	32770	32770	32768	32762	32763	32770
3	32771	32771	32771	32771	32769	32764	32763	32771
4	32770	32770	32770	32770	32768	32763	32763	32770
5	32770	32770	32770	32770	32769	32770	32770	32770
6	32771	32771	32770	32770	32768	32763	32764	32771
Statistics								
Min	32770	32770	32770	32770	32768	32762	32763	32770
Max	32771	32771	32771	32771	32769	32770	32770	32771
Average	32770	32770	32770	32770	32768	32764	32765	32770
Std Deviation	0	0	0	0	0	3	3	0

Measurements								
Convert_Val_0V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	32770	32770	32770	32770	32770	32770	32770	32770
1 OUT REF	32770	32770	32770	32770	32770	32770	32770	32770
OFF samples								
7	32771	32771	32771	32771	32771	32771	32771	32771
8	32771	32771	32770	32771	32770	32771	32770	32771
9	32770	32770	32770	32770	32770	32770	32770	32770
11	32771	32770	32770	32770	32770	32771	32770	32770
12	32770	32768	32768	32771	32768	32768	32768	32768
Statistics								
Min	32770	32768	32768	32770	32768	32768	32768	32768
Max	32771	32771	32771	32771	32771	32771	32771	32771
Average	32771	32770	32770	32771	32770	32770	32770	32770
Std Deviation	0	1	1	0	1	1	1	1

Parameter : Convert Value : Convert\_Val\_2V  
 Test conditions : Convert Voltage 2V.REF=4.096V

Unit : LSB  
 Spec Limit Min : 48757  
 Spec Limit Max : 48779  
 Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊗ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

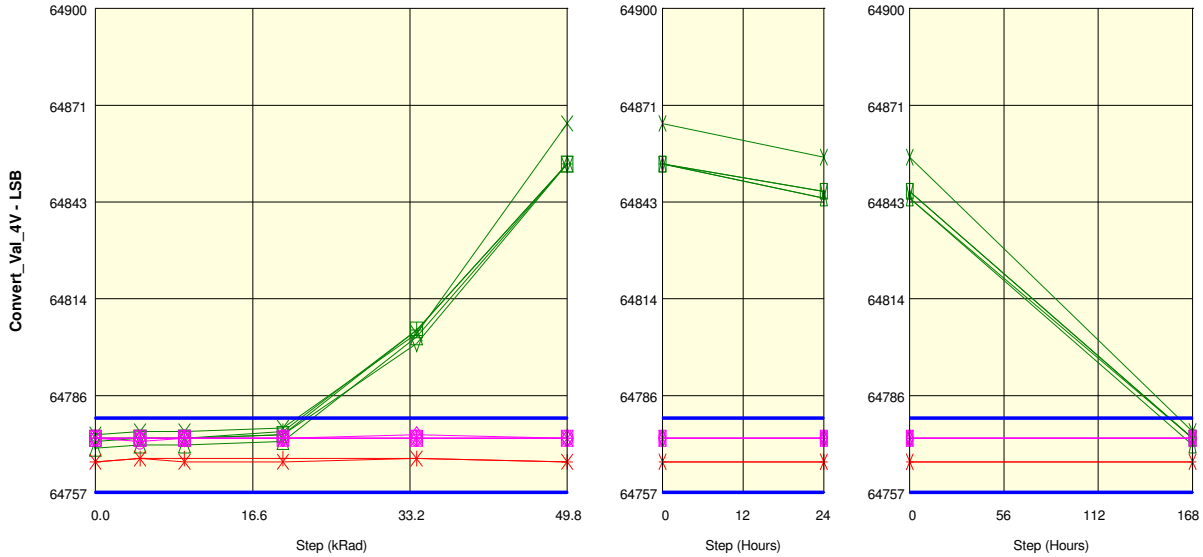
Measurements									
Convert_Val_2V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours	
1 IN REF	48768	48768	48768	48768	48768	48768	48768	48768	
1 OUT REF	48768	48768	48768	48768	48768	48767	48768	48767	
ON samples									
2	48771	48771	48771	48771	48787	48833	48829	48771	
3	48773	48773	48773	48773	48795	48848	48842	48773	
4	48769	48769	48769	48769	48784	48834	48831	48769	
5	48771	48771	48771	48771	48785	48833	48829	48771	
6	48771	48771	48771	48771	48786	48833	48830	48771	
Statistics									
Min	48769	48769	48769	48769	48784	48833	48829	48769	
Max	48773	48773	48773	48773	48795	48848	48842	48773	
Average	48771	48771	48771	48771	48787	48836	48832	48771	
Std Deviation	1	1	1	1	4	6	5	1	

Measurements									
Convert_Val_2V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours	
1 IN REF	48768	48768	48768	48768	48768	48768	48768	48768	
1 OUT REF	48768	48768	48768	48768	48768	48767	48768	48767	
OFF samples									
7	48772	48771	48772	48771	48772	48771	48772	48772	
8	48771	48771	48771	48771	48771	48771	48771	48771	
9	48771	48771	48771	48771	48771	48771	48771	48771	
11	48769	48771	48771	48771	48769	48771	48769	48771	
12	48771	48771	48771	48772	48772	48771	48771	48771	
Statistics									
Min	48769	48771	48771	48771	48769	48771	48769	48771	
Max	48772	48771	48772	48772	48772	48771	48772	48772	
Average	48771	48771	48771	48771	48771	48771	48771	48771	
Std Deviation	1	0	0	0	1	0	1	0	

Parameter : Convert Value : Convert\_Val\_4V  
 Test conditions : Convert Voltage 4V.REF=4.096V

Unit : LSB  
 Spec Limit Min : 64757  
 Spec Limit Max : 64779

Spec limits are represented in bold lines on the graphic.



+ 1\_IN + 2 X 3 Δ 4 ▽ 5 □ 6 ◇ 7 ⊠ 8 ⊕ 9 ○ 11 + 12 X 1\_OUT

Measurements								
Convert_Val_4V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	64766	64767	64767	64767	64767	64766	64766	64766
1 OUT REF	64766	64767	64766	64766	64767	64766	64766	64766
ON samples								
2	64773	64773	64773	64775	64805	64854	64844	64773
3	64774	64775	64775	64776	64804	64866	64856	64775
4	64770	64771	64771	64772	64803	64854	64844	64771
5	64772	64773	64773	64774	64801	64854	64846	64773
6	64773	64773	64773	64774	64805	64854	64846	64773
Statistics								
Min	64770	64771	64771	64772	64801	64854	64844	64771
Max	64774	64775	64775	64776	64805	64866	64856	64775
Average	64772	64773	64773	64774	64804	64856	64847	64773
Std Deviation	1	1	1	1	1	5	4	1

Measurements								
Convert_Val_4V	0 kRad	4.7 kRad	9.4 kRad	19.8 kRad	33.9 kRad	49.8 kRad	24 Hours	168 Hours
1 IN REF	64766	64767	64767	64767	64767	64766	64766	64766
1 OUT REF	64766	64767	64766	64766	64767	64766	64766	64766
OFF samples								
7	64773	64773	64773	64773	64774	64773	64773	64773
8	64773	64773	64773	64773	64773	64773	64773	64773
9	64773	64773	64773	64773	64773	64773	64773	64773
11	64773	64772	64773	64773	64773	64773	64773	64773
12	64773	64773	64773	64773	64773	64773	64773	64773
Statistics								
Min	64773	64772	64773	64773	64773	64773	64773	64773
Max	64773	64773	64773	64773	64774	64773	64773	64773
Average	64773	64773	64773	64773	64773	64773	64773	64773
Std Deviation	0	0	0	0	0	0	0	0

Hirex Engineering	Total Ionizing Dose Test Report		Ref.:	HRX/TID/01557
	AD7961BCPZ-RL7CT-ND	Analog Devices	Issue:	01

### Appendix 1: CO<sup>60</sup> irradiation certificate

Customer: HIR Case followed up by: JPA  
 FAO: Frédéric TILHAC

Source: Coblat-60 (Co60)	
Certificate	N° 36708 of 08/10/2015
Activity	14.8 TBq of 04/09/2015

Reference : PV/ATR/GAMRAY-210/XX34/HIR/JPA/1712  
 Device irradiated : NA  
*Irradiation certificate applied only to the device subjected to the irradiation  
 In agreement with the quality procedure according ESCC 22900 (Pro.026 Rev. 5)*

#### Irradiation environment

	Units	Min	Max	Time-weighted average
Temperature	°C	19.5	20.9	20.3
Relative humidity	%	37.7	54.8	46.8

#### Dose rate measurement

*The instruments used for dose rate measurement is a PTW ionization chamber(TM30013) and universal dosimeter UNIDOS E which is controlled annually.*

UNIDOS E	Serial number: 82253	Certificate number: 17D243	Date: 02/11/2017
TM30013	Serial number: 9314	Certificate number: 17D243	Date: 02/11/2017

*The measurement unit of the international system for the dose rate is Gy/s. We commonly use rad/h (1 Gy/h = 100 rad/h).  
 The dose rate is measured at the center of the device.*

TRAD position	Date	Dose rate [rad/h] (Kerma in the air)
210-22	15/12/2017	220.31

#### Dosimetry

*Each exit and input of Cobalt-60 source is logged in a digital file. We compute the dose at each step taking into account the source decay, the dose rate measured by the gamma probe and the downtime irradiation.*

TRAD position	Date	Total ionizing dose [krad] (Kerma in the air)
210-22	15/01/2018	-
	16/01/2018	4.70
	17/01/2018	9.37
	19/01/2018	19.85
	22/01/2018	33.87
	25/01/2018	49.77

#### Measurement uncertainty : 1.6%

*ESCC 22900: The dose at the device under test shall be measured to a resolution of better than 10%. The test devices shall be exposed to within 10% of the specified radiation dose level(s).  
 The gamma-ray dose rate of a Cobalt 60 source shall be calibrated in accordance with the requirements of ESCC Basic Specification No. 21500 to 5% or better. Dosimetry shall be traceable to national standards.*