HIREL EXPERTISE
HIREX
ENGINEERING
a Tecnologica company

TOTAL DOSE RADIATION TEST REPORT

Part Type : AD9260

16-bit CMOS ADC at a 2.5MHz Output Word Rate

Package : MPQFP - 44

Manufacturer: Analog Devices

Report Reference : ESA_QCA0409T_C

Issue : 01

Date : September 20th 2004

ESA Call of order Number 15, Estec / Contract n° 13528/99/NL/MV

ESA Technical Officer: Reno HARBOE SORENSEN

Hirex reference :	HRX/TID/0235	Issue : 01	Date :	September 20th 2004
Written by :	T. MAUREL	Technician		
Approved by :	O. PERROTIN	Study Manager		
Authorised by :	J.F. PASCAL	Technical Manager		

CHANGE RECORD

Issue	Date	Page	DESCRIPTION OF CHANGES
01	September 20th 2004	All	Original Issue.

TOTAL DOSE RADIATION TEST REPORT
on
Analog Devices AD9260
16-bit CMOS ADC at a 2.5MHz Output Word Rate

TABLE OF CONTENTS

1 Abstract

Under ESA Contract No 13528/99/NL/MV covering "Radiation Evaluation of COTS Semiconductor Components", the radiation sensitivity to Total Ionizing Dose (TID) of three different 16-bit Analog to Digital converters was evaluated. Results from these evaluations, are reported in individual TID reports. Below summary table lists manufacturer and evaluated types, and gives references to the various reports issued.

Manufacturer	Type	Description	TID Report
Analog Devices	AD7677AST	16-bit, 1LSB INL, 1 MSPS, Differential ADC	ESA_QCA0408T_C
Analog Devices	AD9260AS	16-bit CMOS ADC at a 2.5MHz Output Word Rate	ESA_QCA0409T_C
Texas Instruments	ADS8402IB	16-bit 1.25 MSPS, Unipolar Differential Input ADC	ESA_QCA0407T_C

2 Introduction

A total dose radiation evaluation test of the Analog Devices AD926016-bit CMOS ADC at a 2.5MHz Output Word Rate has been performed with an accumulated dose of about 51 Krad(Si) ,at a dose rate of 360 rad(Si)/hour in response to ESA contract: Call of order Number 15, Estec / Contract n° 13528/99/NL/MV.

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 procured by Hirex Engineering.
Test has been performed in accordance with Hirex Engineering Proposal reference: HRX/PRO/0846 Issue 2 dated 3/11/03.

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

3 Applicable and Reference Documents

3.1 Applicable Documents

- Hirex proposal: HRX/PRO/0846 Issue 2 dated 3/11/03.
- Analog Devices AD9260 datasheet Rev. B, dated July 2000.
- ESA/SCC Basic specification N° 22900 issue 4.

3.2 Reference Documents

- NA

4 Test Samples

10 samples of the AD9260device were tested (10 + 1 control sample). Parts have been biased according to the allocation table hereunder.

Serial number	Allocation
Ref	Control
50	Static BIAS
51	Static BIAS
52	Static BIAS
53	Static BIAS
54	Static BIAS
55	Dynamic BIAS
56	Dynamic BIAS
57	Dynamic BIAS
58	Dynamic BIAS
59	Dynamic BIAS

Identification of the AD9260 is given below:

Part Number:	AD9260AS	**Mask Set:**	NA
Project:	-	**Diffusion Lot:**	NA
Lot Number:	-	**Marking:**	AD 9260AS 0326 269361.1
Date Code:	0326	**Project:**	NA

5 Experimental Conditions

5.1 Radiation Source Dose Rate and Annealing

The dose exposures were performed at CERT-ONERA. In this irradiation facility, a Cobalt 60 source is used with the possibility to vary the dose rate by simply adjusting the distance to the source.
The irradiation conditions used for this test are provided in the following table:

Irradiation Steps	Dose rate	Annealing steps	Temperature
krads	krads/h	hours	°C
0			25
7	0.36		25
14	0.36		25
20	0.36		25
27	0.36		25
51	0.36		25
		24	25
		168	100

5.2 Bias during Dose Exposures and Measurements conditions

5.2.1 Bias conditions

During exposures dedicated test boards were used mounted on a special board-holder made for irradiation. The test boards allowed two biasing conditions of the devices in accordance with electrical circuits provided in Figure 1 and 2.
These two conditions correspond to static and dynamic functioning of the components.

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

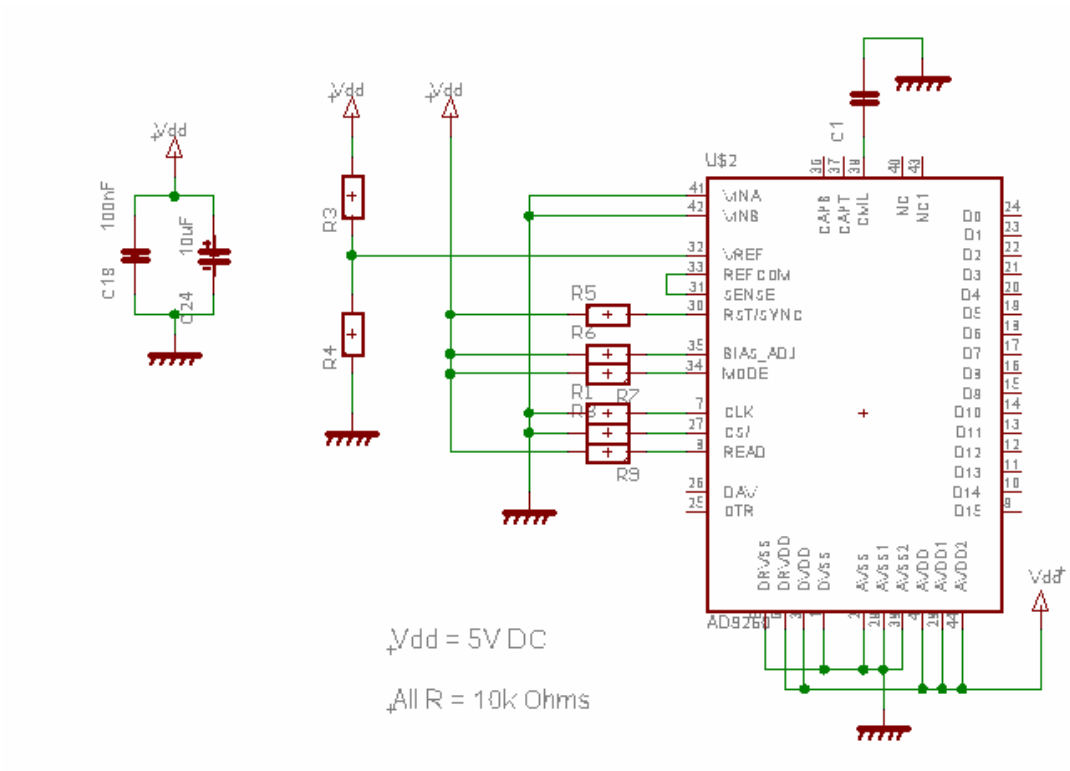


Figure 1 : Static Bias Conditions during Irradiation Exposures and Annealing

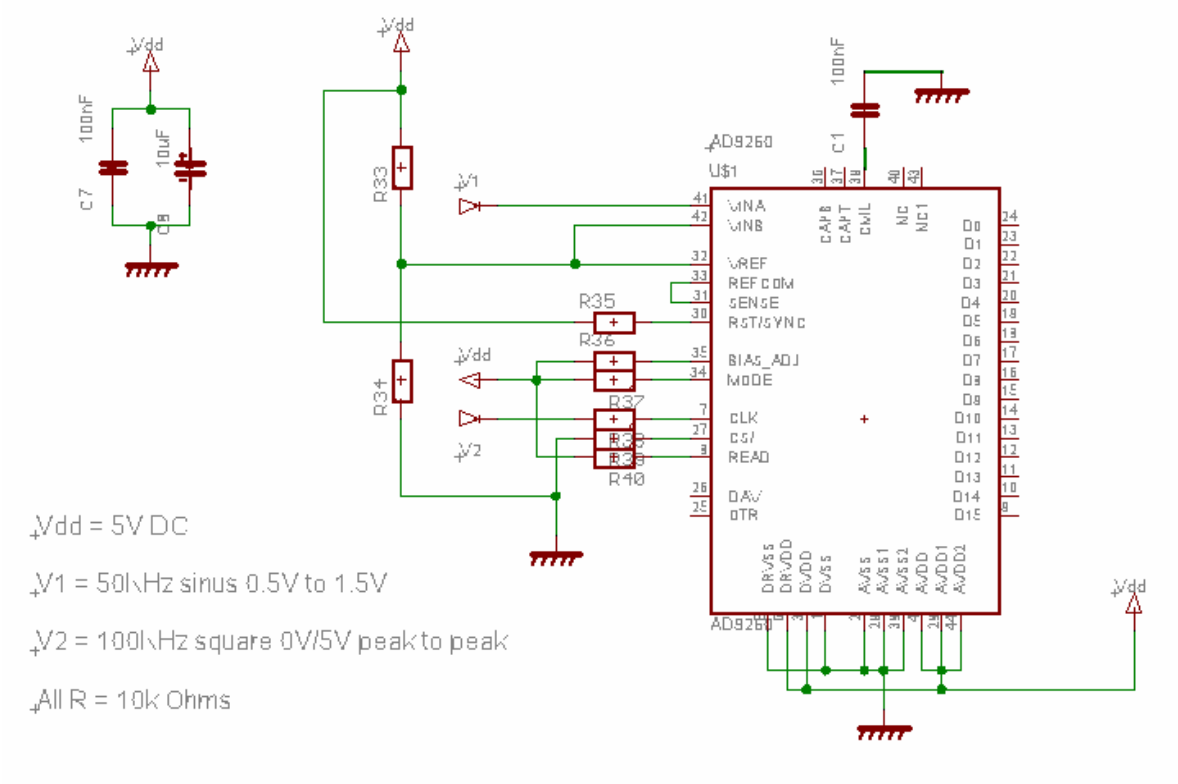


Figure 2 : Dynamic Bias Conditions during Irradiation Exposures and Annealing

5.2.2 Electrical Measurements

AD9260 test program principle is provided in Figure 3.

The test Setup for this ADC includes a CREDENCE Electra Mixed Signal Test Station, an arbitrary waveform generator (AWG), and a DC tester. To ensure coherent clocking to the mixed signal tester, ADC, and AWG, a clock from the ELECTRA is used.
The AWG has 18 bits of resolution, and provides pure enough signal to the test board thanks to internal filters. Additional filtering was also implemented onto the test fixture board to clean the noise and distortion from the input signal.
After input signal is generated, the ELECTRA acquires data output by the ADC. The dedicated Labview programs analyse the data and display the results on a SUN workstation.

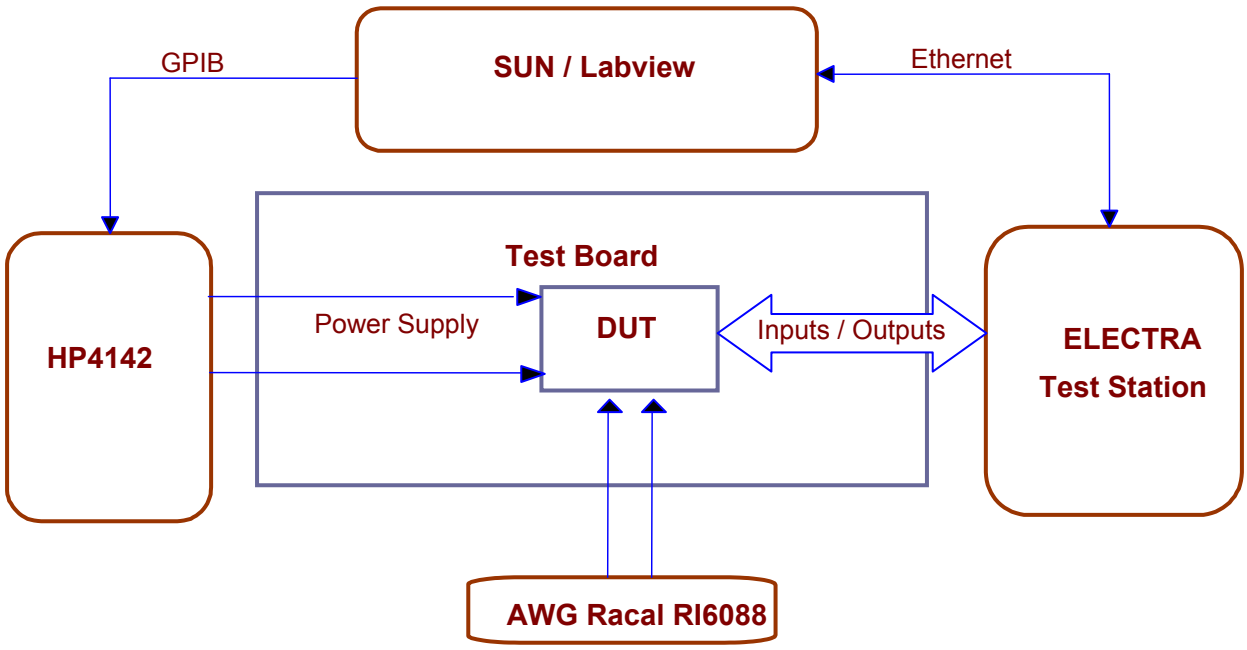
For conversion characteristics including Differential Non Linearity, Integral Non Linearity, Offset Error, Gain Error, a histogram test technique was used.
Two full scale pure ramps are input to the ADC. Thousands samples of the input signals are taken and processed by the histogram software. At the end of sampling, the histogram is plotted with possible output codes along the X axis and frequency of occurrence along Y axis. Above each possible output code, a point is plotted whose height is proportional to the total number of times that code occurred.

From histogram test data, dedicated math routines calculate the different parameter values.

For dynamic characteristics including Signal-to-Noise Ratio, Signal-to-Noise Plus Distortion Ratio, Effective Number of Bits, and Total Harmonic Distortion, a Fast Fourier Transform (FFT) algorithm was implemented.
Two full scale sine waves of specified frequency are input to the device under test. Harmonics of the input sine waves, caused by the integral nonlinearity of the ADC, are aliased into the baseband spectrum and can be readily identified. The frequency of the input sine waves is not arbitrary and must be selected so that harmonics, aliased into baseband, do not coincide with the fundamental.
From FFT spectra test data, dedicated math routines calculate the different parameter values.

Test results were automatically loaded in an Excel worksheet and compared in real time to specification limits. This allowed for real time data analysis in particular in case failures are recorded

Figure 3 : Test program principle



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

Table 1: Measured electrical parameters

Symbols	Parameters	Test conditions	Limits			Unit
			Min	Typ	Max	
INL	Integral non linearity	-		± 0.5		LSB
DNL	Differential non linearity	-		± 0.75		
OE	Offset Error	-	-	0,5		%FSR
GE	Gain Error	-	-	0,66		
THD	Total Harmonic Distortion	Input Amplitude= -0,5dBFS, f=100kHz	-	-97	-	dB
SNR	Signal to Noise Ratio	Input Amplitude= -0,5dBFS, f=100kHz	-	74	-	
SNRD	Signal to Noise Ratio + Distortion	Input Amplitude= -0,5dBFS, f =100kHz	-	74	-	
IIH	Input leakage current	DVDD=5V, Vin=DVDD (note 1)	-10	-	10	µA
IIL	Input leakage current	DVDD=5V, Vin=0V (note 1)	-10	-	10	
VOH	Output high voltage	DVDD=5V, Isource=50µA	+4,5	-	-	V
VOL	Output low voltage	DVDD=5V, Isink=50µA	-	-	+0,1	
IAVDD	Operating current	-	-	115	-	mA
IDVDD	Operating current	-	-	6,5	-	
IDRVDD	Operating current	-	-	1,7	-	

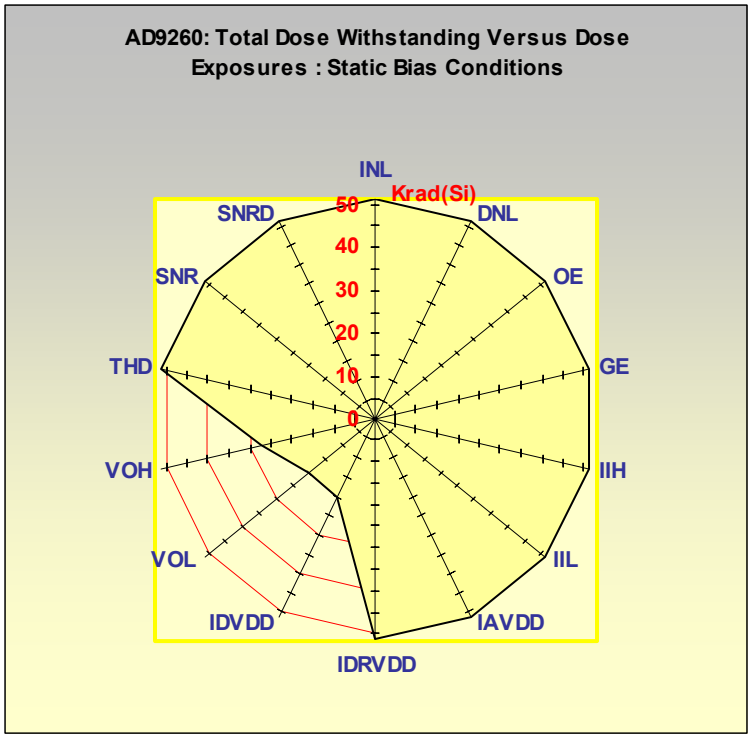
Specification for all parameters:
AVDD=+5V, DVDD=+3V, DRVDD=+3V, fclock=1MSPS, foutput=500kHz (f decimation N=2), Vref=+2,5V, Input CML=2V, unless otherwise noted, Rbias= 2kΩ.

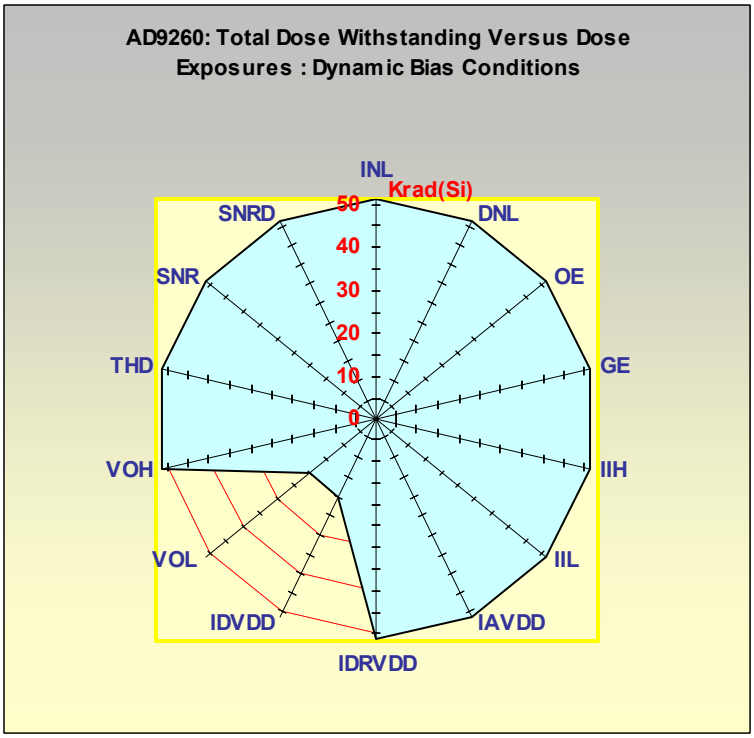
Note 1: Since CLK is referenced to AVDD, +5V logic input levels only apply

6 Conclusion

A Total Ionizing Dose evaluation test was carried out by Hirex Engineering under ESA contract on the Analog Devices AD9260 16-bit CMOS ADC at a 2.5MHz Output Word Rate in MPQFP - 44 package.
10 samples plus one control sample were used during testing. They were exposed to radiation using a dose rate of 360 rad(Si)/hour at room temperature.

A summary of the results obtained are presented in the following figures.





On theses figures, the last dose exposure at which a given parameter was measured within specification limits is plotted.

The bigger the surface of the polygon, the better the withstanding capabilities of the device.

From these plots we can see that samples exposed under static conditions present slightly more degraded performance with respect to samples exposed under dynamic conditions. Since most parameters are given with typical values in the manufacturer datasheet, this analysis is based on the most significant parameter drifts observed.

When considering samples biased in static conditions, the most affected parameters are IDVDD and VOL that failed specification limits at 27 Krad(Si) of dose exposure.
VOH parameter failed at 51 Krad(Si).
All these parameters did completely recover after annealing steps.

For samples biased in dynamic conditions the affected parameters are the same and show the same behaviour with the exception of VOH parameter that remained within specification limits.

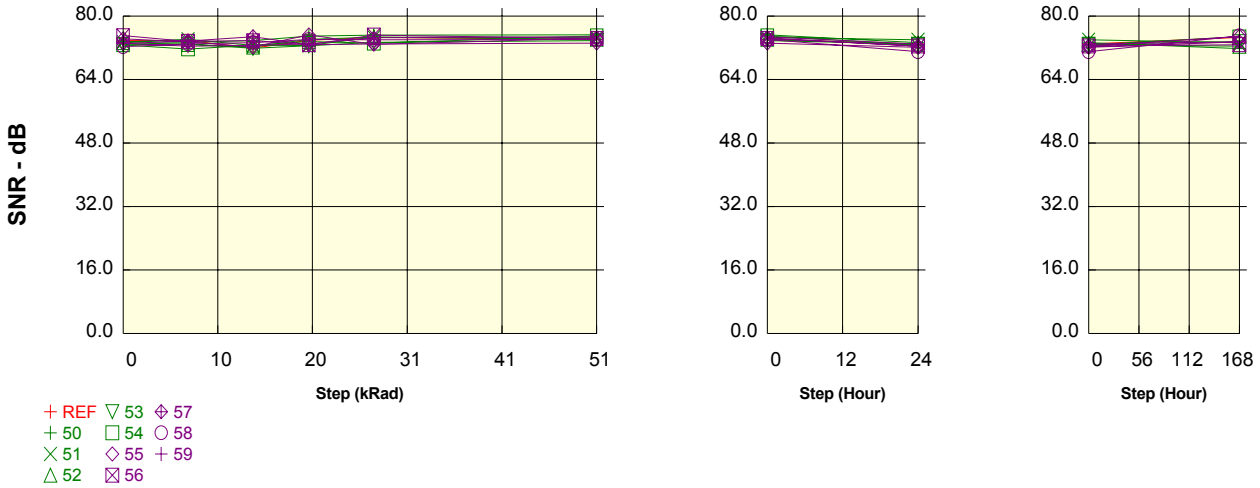
It should be noted that INL parameter was measured significantly above excepted typical values at initial readings.
This is attributed to the lead length of the test socket that induces an excessive inductance with respect to the device pins. A direct soldering of devices onto the test board would have probably improved results for INL.
Of course when repetitive measurements on many samples are required, soldering and de-soldering of components is not feasible.

All other parameters remained within specification limits all along testing.

7 Test Results

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

Test conditions : TID
Parameter : Signal to Noise Ratio : SNR
Input Amplitude= -0.5dBFS.
Unit : dB
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	73.85	73.82	71.91	73.88	74.6	74.06
50	73.56	73.35	73.81	74.96	75.17	75.25
51	73.43	74.14	72.56	72.58	74.68	74.63
52	73.32	72.87	72.19	74.12	74.69	74.14
53	72.81	72.92	71.87	72.53	73.37	73.84
54	72.74	71.71	72.66	73.54	73.19	75.02
55	74.26	73.47	72.21	75.25	72.88	74.5
56	75.07	73.61	73.79	72.78	75.19	74.37
57	73.08	73.71	74.8	72.76	73.0	73.16
58	72.26	73.0	73.32	74.07	74.01	74.06
59	73.2	72.39	72.62	72.99	74.52	74.79
Statistics						
Min	72.26	71.71	71.87	72.53	72.88	73.16
Max	75.07	74.14	74.8	75.25	75.19	75.25
Mean	73.37	73.12	72.98	73.56	74.07	74.38
Sigma	0.8	0.7	0.92	1.0	0.9	0.61

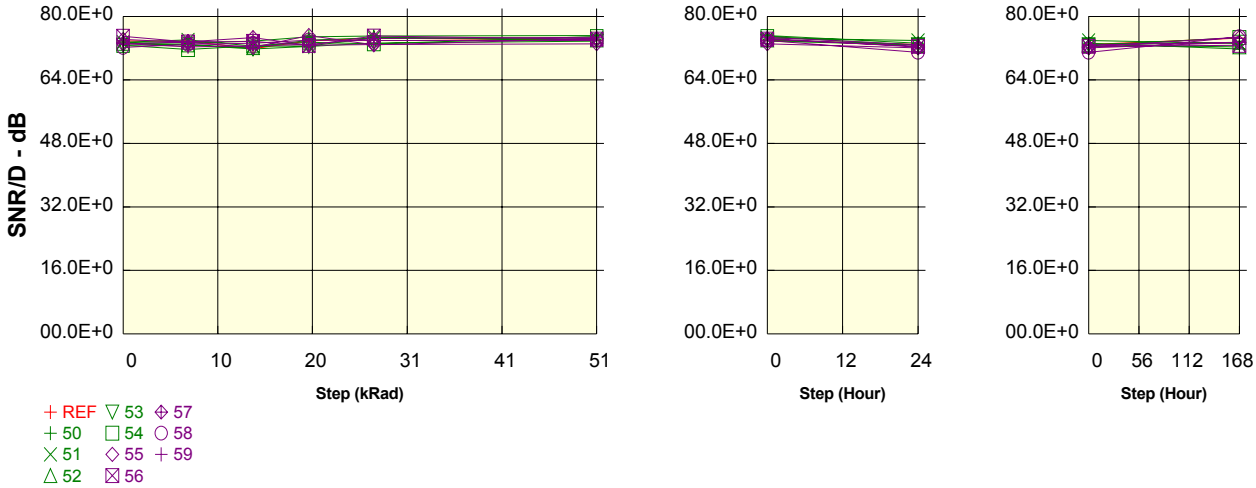
Test TST002 : Annealing_24H

	0 Hour	24 Hour
REF	74.06	72.98
50	75.25	73.31
51	74.63	74.0
52	74.14	72.88
53	73.84	72.92
54	75.02	72.74
55	74.5	72.37
56	74.37	72.46
57	73.16	72.12
58	74.06	70.99
59	74.79	72.92
Statistics		
Min	73.16	70.99
Max	75.25	74.0
Mean	74.38	72.67
Sigma	0.61	0.79

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	72.98	74.58
50	73.31	71.82
51	74.0	73.24
52	72.88	72.39
53	72.92	73.54
54	72.74	74.77
55	72.37	74.85
56	72.46	72.8
57	72.12	73.48
58	70.99	74.98
59	72.92	73.52
Statistics		
Min	70.99	71.82
Max	74.0	74.98
Mean	72.67	73.54
Sigma	0.79	1.06

Test conditions : TID
Parameter : Signal to Noise Ratio+Distorsion : SNR/D
Input Amplitude= -0.5dBFS.
Unit : dB
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	73.8E+0	73.8E+0	71.9E+0	73.8E+0	74.5E+0	74.0E+0
50	73.4E+0	73.3E+0	73.8E+0	74.9E+0	75.1E+0	75.2E+0
51	73.5E+0	74.1E+0	72.5E+0	72.5E+0	74.6E+0	74.6E+0
52	73.3E+0	72.8E+0	72.1E+0	74.0E+0	74.6E+0	74.1E+0
53	72.8E+0	72.9E+0	71.8E+0	72.5E+0	73.3E+0	73.8E+0
54	72.7E+0	71.7E+0	72.6E+0	73.5E+0	73.1E+0	74.9E+0
55	74.2E+0	73.4E+0	72.2E+0	75.2E+0	72.8E+0	74.4E+0
56	75.0E+0	73.5E+0	73.7E+0	72.7E+0	75.1E+0	74.3E+0
57	73.0E+0	73.6E+0	74.7E+0	72.7E+0	72.9E+0	73.1E+0
58	72.2E+0	73.0E+0	73.3E+0	74.0E+0	73.9E+0	74.0E+0
59	73.1E+0	72.3E+0	72.6E+0	72.9E+0	74.4E+0	74.7E+0
Statistics						
Min	72.2E+0	71.7E+0	71.8E+0	72.5E+0	72.8E+0	73.1E+0
Max	75.0E+0	74.1E+0	74.7E+0	75.2E+0	75.1E+0	75.2E+0
Mean	73.3E+0	73.1E+0	72.9E+0	73.5E+0	74.0E+0	74.3E+0
Sigma	78.9E-2	69.5E-2	90.5E-2	98.8E-2	88.5E-2	60.4E-2

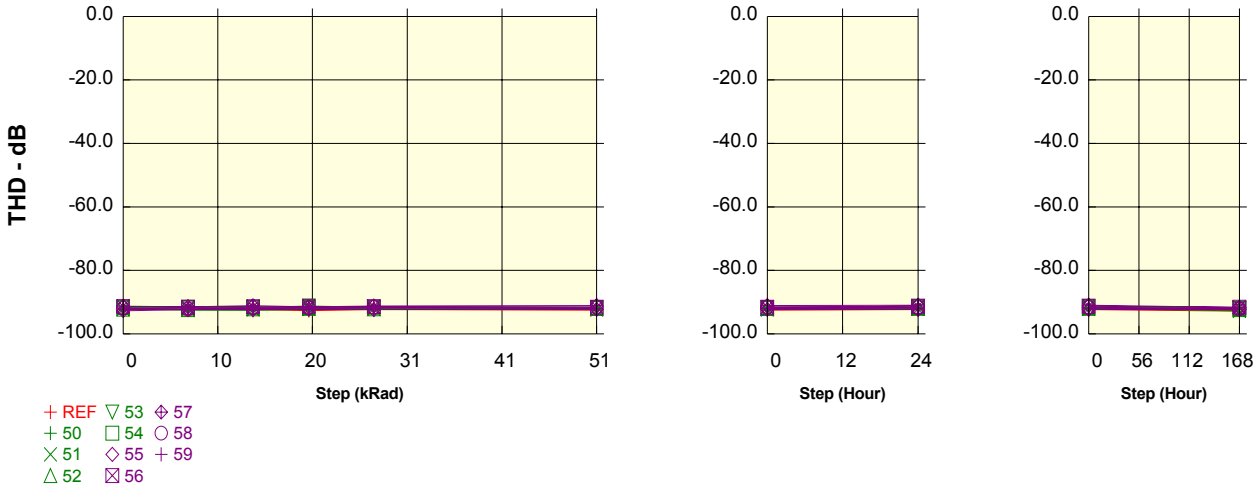
Test TST002 : Annealing_24H

	0 Hour	24 Hour
REF	74.0E+0	72.9E+0
50	75.2E+0	73.3E+0
51	74.6E+0	73.9E+0
52	74.1E+0	72.8E+0
53	73.8E+0	72.9E+0
54	74.9E+0	72.7E+0
55	74.4E+0	72.3E+0
56	74.3E+0	72.5E+0
57	73.1E+0	72.1E+0
58	74.0E+0	71.0E+0
59	74.7E+0	72.9E+0
Statistics		
Min	73.1E+0	71.0E+0
Max	75.2E+0	73.9E+0
Mean	74.3E+0	72.6E+0
Sigma	60.4E-2	77.9E-2

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	72.9E+0	74.5E+0
50	73.3E+0	71.8E+0
51	73.9E+0	73.2E+0
52	72.8E+0	72.4E+0
53	72.9E+0	73.5E+0
54	72.7E+0	74.7E+0
55	72.3E+0	74.8E+0
56	72.5E+0	72.7E+0
57	72.1E+0	73.4E+0
58	71.0E+0	74.9E+0
59	72.9E+0	73.5E+0
Statistics		
Min	71.0E+0	71.8E+0
Max	73.9E+0	74.9E+0
Mean	72.6E+0	73.5E+0
Sigma	77.9E-2	10.5E-1

Test conditions : TID
Parameter : Total Harmonic Distortion : THD
Input Amplitude= -0.5dBFS.
Unit : dB
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	-92.42	-92.19	-92.37	-92.69	-92.35	-92.49
50	-92.13	-92.56	-92.63	-92.31	-92.33	-92.27
51	-92.08	-92.2	-92.3	-92.14	-92.05	-92.36
52	-92.17	-92.36	-92.09	-91.95	-92.13	-91.98
53	-91.89	-91.6	-91.7	-91.23	-91.6	-91.7
54	-91.71	-91.85	-91.67	-91.71	-91.63	-91.94
55	-92.73	-92.34	-92.35	-92.27	-92.35	-92.32
56	-91.35	-91.64	-91.47	-91.35	-91.42	-91.65
57	-91.26	-91.45	-91.11	-91.47	-91.23	-91.04
58	-91.91	-92.18	-91.77	-91.72	-91.56	-91.58
59	-92.24	-92.24	-92.04	-92.1	-91.78	-92.0
Statistics						
Min	-92.73	-92.56	-92.63	-92.31	-92.35	-92.36
Max	-91.26	-91.45	-91.11	-91.23	-91.23	-91.04
Mean	-91.95	-92.04	-91.91	-91.82	-91.81	-91.88
Sigma	0.43	0.38	0.46	0.39	0.39	0.41

Test TST002 : Annealing_24H

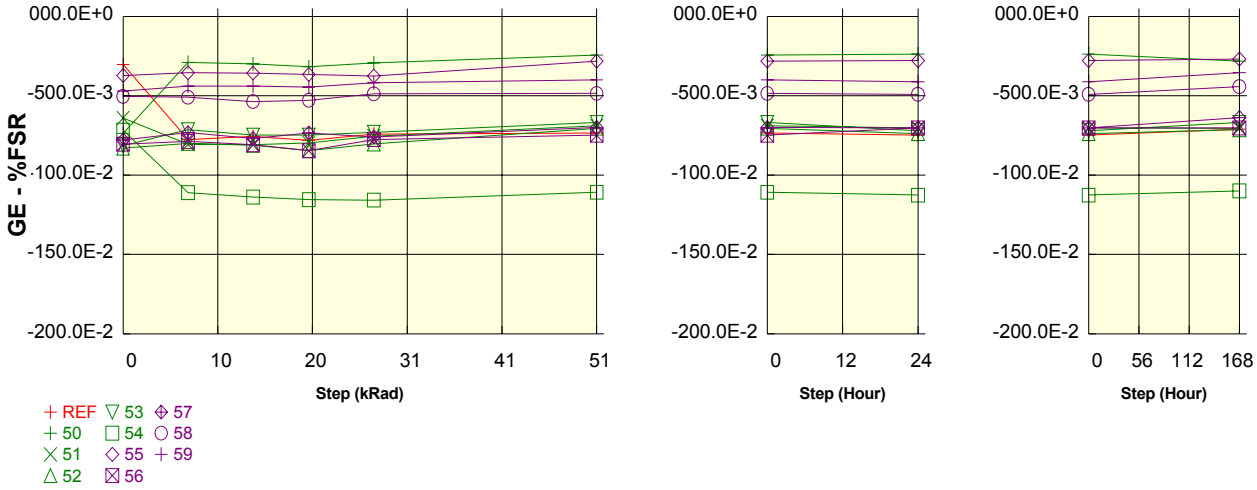
	0 Hour	24 Hour
REF	-92.49	-92.38
50	-92.27	-92.32
51	-92.36	-92.0
52	-91.98	-91.97
53	-91.7	-91.26
54	-91.94	-91.68
55	-92.32	-92.32
56	-91.65	-91.32
57	-91.04	-90.95
58	-91.58	-91.72
59	-92.0	-91.89
Statistics		
Min	-92.36	-92.32
Max	-91.04	-90.95
Mean	-91.88	-91.74
Sigma	0.41	0.45

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	-92.38	-92.85
50	-92.32	-92.11
51	-92.0	-92.76
52	-91.97	-92.4
53	-91.26	-91.97
54	-91.68	-92.07
55	-92.32	-92.32
56	-91.32	-91.65
57	-90.95	-91.67
58	-91.72	-92.11
59	-91.89	-92.23
Statistics		
Min	-92.32	-92.76
Max	-90.95	-91.65
Mean	-91.74	-92.13
Sigma	0.45	0.33

Test conditions : TID
Parameter : Gain Error : GE

Unit : %FSR
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	-302.1E-3	-775.1E-3	-756.8E-3	-781.3E-3	-741.6E-3	-735.5E-3
50	-737.1E-3	-289.9E-3	-299.1E-3	-317.4E-3	-293.0E-3	-244.1E-3
51	-640.1E-3	-805.7E-3	-808.7E-3	-796.5E-3	-753.8E-3	-689.7E-3
52	-830.1E-3	-799.6E-3	-811.8E-3	-845.3E-3	-802.6E-3	-705.0E-3
53	-814.8E-3	-714.1E-3	-747.7E-3	-747.7E-3	-729.4E-3	-668.3E-3
54	-717.2E-3	-111.1E-2	-113.8E-2	-115.4E-2	-115.7E-2	-110.8E-2
55	-372.3E-3	-354.0E-3	-357.1E-3	-366.2E-3	-375.4E-3	-280.8E-3
56	-805.7E-3	-787.4E-3	-808.7E-3	-845.3E-3	-775.1E-3	-747.7E-3
57	-778.2E-3	-732.4E-3	-769.0E-3	-735.5E-3	-759.9E-3	-698.9E-3
58	-503.5E-3	-509.6E-3	-537.1E-3	-528.0E-3	-488.3E-3	-485.2E-3
59	-470.0E-3	-439.5E-3	-439.5E-3	-445.6E-3	-418.1E-3	-399.8E-3
Statistics						
Min	-830.1E-3	-111.1E-2	-113.8E-2	-115.4E-2	-115.7E-2	-110.8E-2
Max	-372.3E-3	-289.9E-3	-299.1E-3	-317.4E-3	-293.0E-3	-244.1E-3
Mean	-666.9E-3	-654.3E-3	-671.7E-3	-678.1E-3	-655.3E-3	-602.7E-3
Sigma	163.5E-3	251.7E-3	258.1E-3	260.0E-3	259.9E-3	257.1E-3

Test TST002 : Annealing_24H

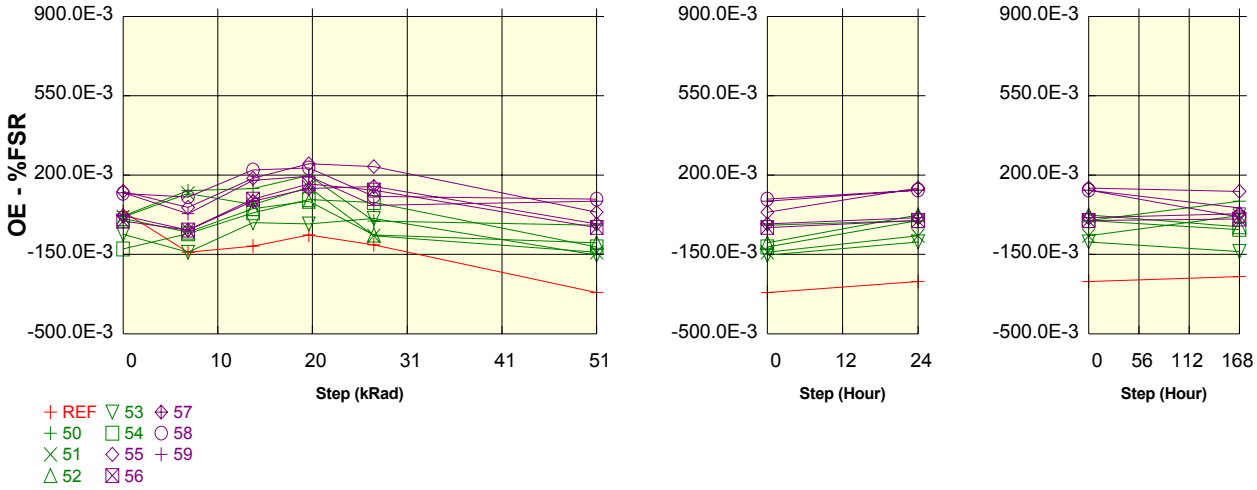
	0 Hour	24 Hour
REF	-735.5E-3	-747.7E-3
50	-244.1E-3	-238.0E-3
51	-689.7E-3	-701.9E-3
52	-705.0E-3	-738.5E-3
53	-668.3E-3	-720.2E-3
54	-110.8E-2	-112.6E-2
55	-280.8E-3	-277.7E-3
56	-747.7E-3	-701.9E-3
57	-698.9E-3	-701.9E-3
58	-485.2E-3	-491.3E-3
59	-399.8E-3	-412.0E-3
Statistics		
Min	-110.8E-2	-112.6E-2
Max	-244.1E-3	-238.0E-3
Mean	-602.7E-3	-611.0E-3
Sigma	257.1E-3	263.0E-3

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	-747.7E-3	-711.1E-3
50	-238.0E-3	-280.8E-3
51	-701.9E-3	-705.0E-3
52	-738.5E-3	-714.1E-3
53	-720.2E-3	-668.3E-3
54	-112.6E-2	-109.9E-2
55	-277.7E-3	-268.6E-3
56	-701.9E-3	-701.9E-3
57	-701.9E-3	-637.8E-3
58	-491.3E-3	-442.5E-3
59	-412.0E-3	-354.0E-3
Statistics		
Min	-112.6E-2	-109.9E-2
Max	-238.0E-3	-268.6E-3
Mean	-611.0E-3	-587.2E-3
Sigma	263.0E-3	254.9E-3

Test conditions : TID
Parameter : Ofset Error : OE

Unit : %FSR
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	396.7E-4	-140.4E-3	-112.9E-3	-640.9E-4	-106.8E-3	-317.4E-3
50	198.6E-4	131.2E-3	140.4E-3	198.4E-3	-305.2E-5	-213.6E-4
51	159.6E-4	119.0E-3	701.9E-4	146.5E-3	-671.4E-4	-140.4E-3
52	915.5E-5	-518.8E-4	518.8E-4	854.5E-4	-640.9E-4	-976.6E-4
53	-610.4E-4	-140.4E-3	-915.5E-5	-152.6E-4	915.5E-5	-152.6E-3
54	-125.1E-3	-579.8E-4	335.7E-4	915.5E-4	793.5E-4	-116.0E-3
55	128.2E-3	579.8E-4	186.2E-3	250.2E-3	238.0E-3	366.2E-4
56	-305.2E-5	-427.3E-4	946.0E-4	161.7E-3	134.3E-3	-305.2E-4
57	213.6E-4	-427.3E-4	854.5E-4	140.4E-3	149.5E-3	-152.6E-4
58	119.0E-3	103.8E-3	222.8E-3	231.9E-3	106.8E-3	946.0E-4
59	122.1E-3	305.2E-4	177.0E-3	195.3E-3	671.4E-4	854.5E-4
Statistics						
Min	-125.1E-3	-140.4E-3	-915.5E-5	-152.6E-4	-671.4E-4	-152.6E-3
Max	128.2E-3	131.2E-3	222.8E-3	250.2E-3	238.0E-3	946.0E-4
Mean	246.4E-4	106.8E-4	105.3E-3	148.6E-3	650.0E-4	-357.1E-4
Sigma	816.5E-4	911.1E-4	742.0E-4	790.7E-4	975.9E-4	897.2E-4

Test TST002 : Annealing_24H

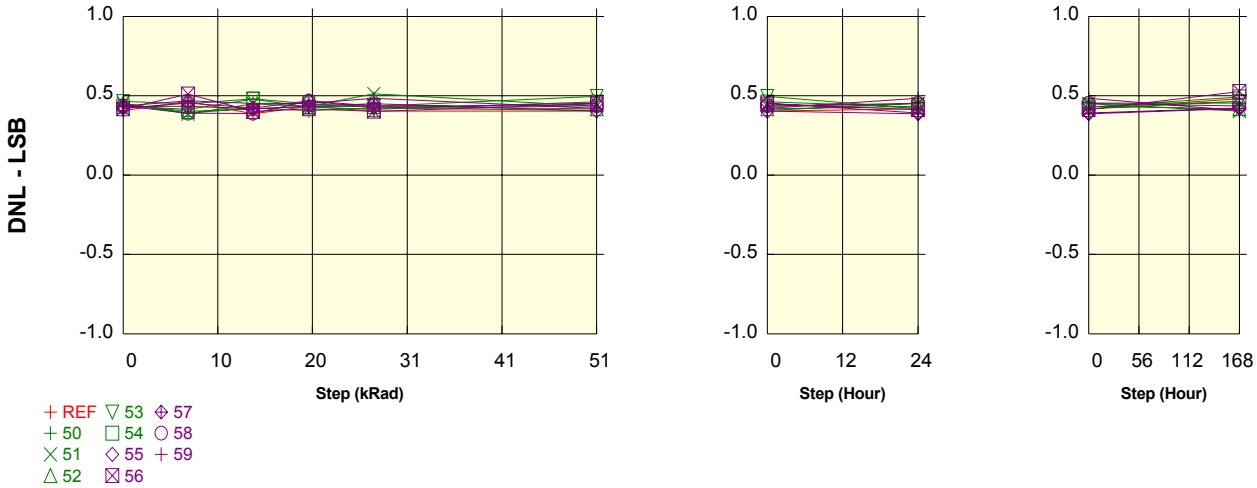
	0 Hour	24 Hour
REF	-317.4E-3	-268.6E-3
50	-213.6E-4	000.0E+0
51	-140.4E-3	-671.4E-4
52	-976.6E-4	244.1E-4
53	-152.6E-3	-946.0E-4
54	-116.0E-3	000.0E+0
55	366.2E-4	143.4E-3
56	-305.2E-4	000.0E+0
57	-152.6E-4	122.1E-4
58	946.0E-4	134.3E-3
59	854.5E-4	134.3E-3
Statistics		
Min	-152.6E-3	-946.0E-4
Max	946.0E-4	143.4E-3
Mean	-357.1E-4	286.9E-4
Sigma	897.2E-4	834.0E-4

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	-268.6E-3	-247.2E-3
50	000.0E+0	854.5E-4
51	-671.4E-4	213.6E-4
52	244.1E-4	-274.7E-4
53	-946.0E-4	-137.3E-3
54	000.0E+0	-396.7E-4
55	143.4E-3	128.2E-3
56	000.0E+0	610.4E-5
57	122.1E-4	305.2E-4
58	134.3E-3	152.6E-4
59	134.3E-3	549.3E-4
Statistics		
Min	-946.0E-4	-137.3E-3
Max	143.4E-3	128.2E-3
Mean	286.9E-4	137.3E-4
Sigma	834.0E-4	728.1E-4

Test conditions : TID
Parameter : Differential Nonlinearity : DNL

Unit : LSB
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	0.41	0.46	0.39	0.43	0.4	0.4
50	0.45	0.39	0.42	0.41	0.42	0.41
51	0.45	0.39	0.45	0.43	0.51	0.43
52	0.45	0.4	0.42	0.43	0.43	0.42
53	0.46	0.45	0.48	0.45	0.43	0.5
54	0.43	0.41	0.48	0.43	0.41	0.46
55	0.42	0.45	0.42	0.47	0.42	0.45
56	0.42	0.51	0.4	0.42	0.4	0.45
57	0.43	0.43	0.42	0.43	0.45	0.4
58	0.44	0.39	0.39	0.47	0.44	0.44
59	0.44	0.47	0.45	0.45	0.48	0.42
Statistics						
Min	0.42	0.39	0.39	0.41	0.4	0.4
Max	0.46	0.51	0.48	0.47	0.51	0.5
Mean	0.44	0.43	0.43	0.44	0.44	0.44
Sigma	0.01	0.04	0.03	0.02	0.03	0.03

Test TST002 : Annealing_24H

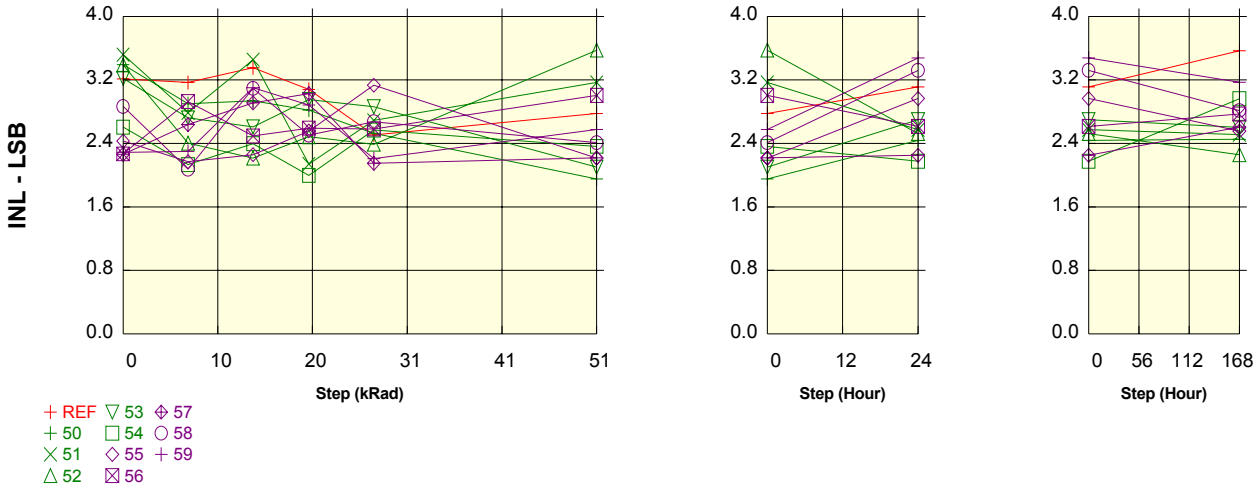
	0 Hour	24 Hour
REF	0.4	0.42
50	0.41	0.45
51	0.43	0.45
52	0.42	0.43
53	0.5	0.42
54	0.46	0.43
55	0.45	0.39
56	0.45	0.41
57	0.4	0.39
58	0.44	0.45
59	0.42	0.48
Statistics		
Min	0.4	0.39
Max	0.5	0.48
Mean	0.44	0.43
Sigma	0.03	0.03

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	0.42	0.48
50	0.45	0.45
51	0.45	0.4
52	0.43	0.42
53	0.42	0.47
54	0.43	0.49
55	0.39	0.42
56	0.41	0.53
57	0.39	0.42
58	0.45	0.44
59	0.48	0.41
Statistics		
Min	0.39	0.4
Max	0.48	0.53
Mean	0.43	0.44
Sigma	0.03	0.04

Test conditions : TID
Parameter : Integral Nonlinearity : INL

Unit : LSB
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	3.2	3.2	3.4	3.1	2.5	2.8
50	3.4	2.9	2.9	2.8	2.5	2.0
51	3.5	2.8	3.5	2.1	2.7	3.2
52	3.4	2.4	2.2	2.5	2.4	3.6
53	3.2	2.7	2.6	3.0	2.9	2.1
54	2.6	2.1	2.4	2.0	2.6	2.4
55	2.4	2.2	2.3	2.6	3.1	2.2
56	2.3	2.9	2.5	2.6	2.6	3.0
57	2.3	2.6	2.9	3.0	2.1	2.2
58	2.9	2.1	3.1	2.5	2.7	2.4
59	2.3	2.3	3.1	2.9	2.2	2.6
Statistics						
Min	2.3	2.1	2.2	2.0	2.1	2.0
Max	3.5	2.9	3.5	3.0	3.1	3.6
Mean	2.8	2.5	2.7	2.6	2.6	2.6
Sigma	0.5	0.3	0.4	0.3	0.3	0.5

Test TST002 : Annealing_24H

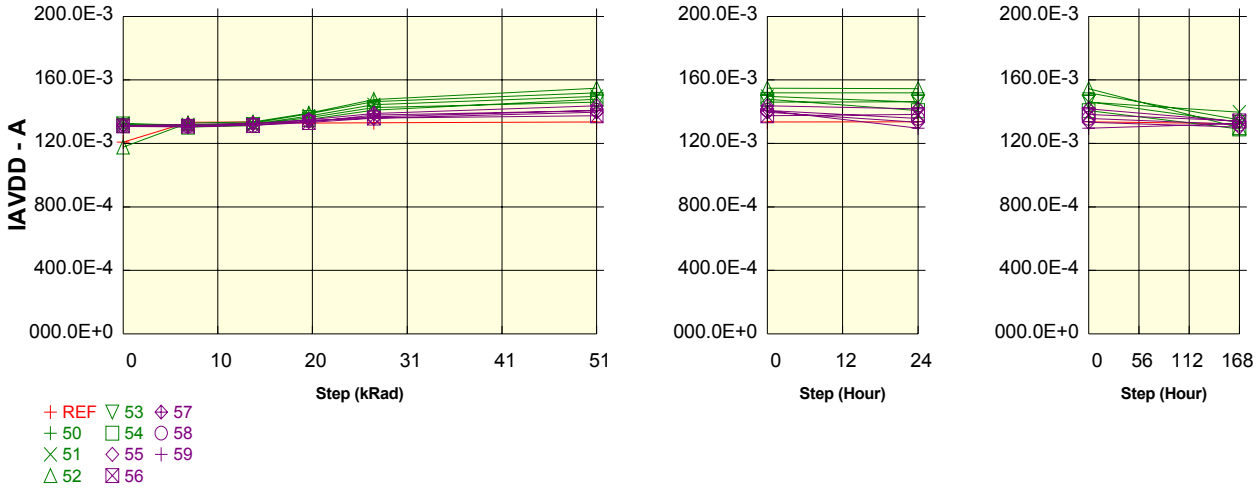
	0 Hour	24 Hour
REF	2.8	3.1
50	2.0	2.4
51	3.2	2.6
52	3.6	2.5
53	2.1	2.7
54	2.4	2.2
55	2.2	3.0
56	3.0	2.6
57	2.2	2.3
58	2.4	3.3
59	2.6	3.5
Statistics		
Min	2.0	2.2
Max	3.6	3.5
Mean	2.6	2.7
Sigma	0.5	0.4

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	3.1	3.6
50	2.4	2.5
51	2.6	2.5
52	2.5	2.3
53	2.7	2.6
54	2.2	3.0
55	3.0	2.6
56	2.6	2.8
57	2.3	2.6
58	3.3	2.8
59	3.5	3.2
Statistics		
Min	2.2	2.3
Max	3.5	3.2
Mean	2.7	2.7
Sigma	0.4	0.3

Test conditions : TID
Parameter : Supply Current : IAVDD

Unit : A
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	120.8E-3	133.3E-3	133.5E-3	132.9E-3	133.0E-3	133.5E-3
50	132.3E-3	131.5E-3	132.9E-3	138.6E-3	146.4E-3	151.9E-3
51	132.4E-3	131.8E-3	132.2E-3	137.3E-3	144.4E-3	149.6E-3
52	117.7E-3	132.9E-3	133.5E-3	139.1E-3	147.7E-3	154.9E-3
53	132.2E-3	130.8E-3	131.9E-3	136.3E-3	142.7E-3	146.0E-3
54	131.3E-3	130.3E-3	131.2E-3	135.1E-3	141.0E-3	147.8E-3
55	131.2E-3	132.1E-3	132.5E-3	134.5E-3	135.9E-3	139.7E-3
56	131.0E-3	130.8E-3	131.3E-3	133.2E-3	135.9E-3	137.4E-3
57	131.4E-3	130.6E-3	132.5E-3	135.0E-3	138.8E-3	143.7E-3
58	131.0E-3	130.8E-3	131.3E-3	134.2E-3	136.7E-3	140.9E-3
59	130.7E-3	130.4E-3	131.7E-3	133.6E-3	137.9E-3	140.7E-3
Statistics						
Min	117.7E-3	130.3E-3	131.2E-3	133.2E-3	135.9E-3	137.4E-3
Max	132.4E-3	132.9E-3	133.5E-3	139.1E-3	147.7E-3	154.9E-3
Mean	130.1E-3	131.2E-3	132.1E-3	135.7E-3	140.7E-3	145.3E-3
Sigma	439.5E-5	827.6E-6	756.1E-6	206.0E-5	437.5E-5	574.3E-5

Test TST002 : Annealing_24H

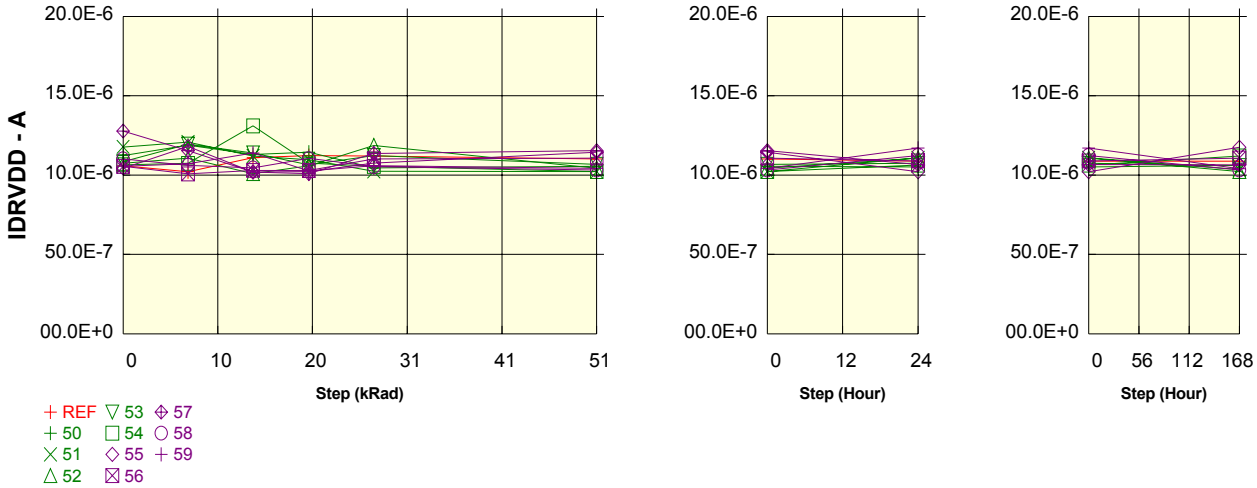
	0 Hour	24 Hour
REF	133.5E-3	133.7E-3
50	151.9E-3	151.8E-3
51	149.6E-3	146.1E-3
52	154.9E-3	154.5E-3
53	146.0E-3	146.2E-3
54	147.8E-3	140.6E-3
55	139.7E-3	133.3E-3
56	137.4E-3	138.2E-3
57	143.7E-3	141.8E-3
58	140.9E-3	135.7E-3
59	140.7E-3	129.7E-3
Statistics		
Min	137.4E-3	129.7E-3
Max	154.9E-3	154.5E-3
Mean	145.3E-3	141.8E-3
Sigma	574.3E-5	796.4E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	133.7E-3	132.4E-3
50	151.8E-3	134.7E-3
51	146.1E-3	139.6E-3
52	154.5E-3	129.9E-3
53	146.2E-3	133.1E-3
54	140.6E-3	129.1E-3
55	133.3E-3	130.2E-3
56	138.2E-3	134.2E-3
57	141.8E-3	133.9E-3
58	135.7E-3	132.0E-3
59	129.7E-3	132.5E-3
Statistics		
Min	129.7E-3	129.1E-3
Max	154.5E-3	139.6E-3
Mean	141.8E-3	132.9E-3
Sigma	796.4E-5	303.3E-5

Test conditions : TID
Parameter : Supply Current : IDRVDD

Unit : A
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	10.6E-6	10.2E-6	11.1E-6	11.2E-6	11.2E-6	11.0E-6
50	11.2E-6	11.9E-6	11.3E-6	11.5E-6	10.5E-6	10.6E-6
51	11.8E-6	12.1E-6	11.2E-6	11.0E-6	10.3E-6	10.2E-6
52	10.7E-6	11.1E-6	10.1E-6	10.6E-6	11.9E-6	10.4E-6
53	10.9E-6	12.0E-6	11.4E-6	10.7E-6	11.2E-6	10.7E-6
54	10.7E-6	10.7E-6	13.1E-6	10.8E-6	10.6E-6	10.2E-6
55	10.4E-6	11.8E-6	10.2E-6	10.2E-6	10.8E-6	11.4E-6
56	10.6E-6	10.1E-6	10.3E-6	10.3E-6	11.0E-6	11.1E-6
57	12.8E-6	11.6E-6	10.2E-6	10.1E-6	11.4E-6	11.6E-6
58	11.0E-6	10.6E-6	10.5E-6	11.1E-6	10.5E-6	10.3E-6
59	10.6E-6	10.7E-6	11.4E-6	10.3E-6	10.6E-6	10.4E-6
Statistics						
Min	10.4E-6	10.1E-6	10.1E-6	10.1E-6	10.3E-6	10.2E-6
Max	12.8E-6	12.1E-6	13.1E-6	11.5E-6	11.9E-6	11.6E-6
Mean	11.1E-6	11.2E-6	11.0E-6	10.6E-6	10.9E-6	10.7E-6
Sigma	72.4E-8	69.4E-8	92.7E-8	43.3E-8	50.0E-8	49.1E-8

Test TST002 : Annealing_24H

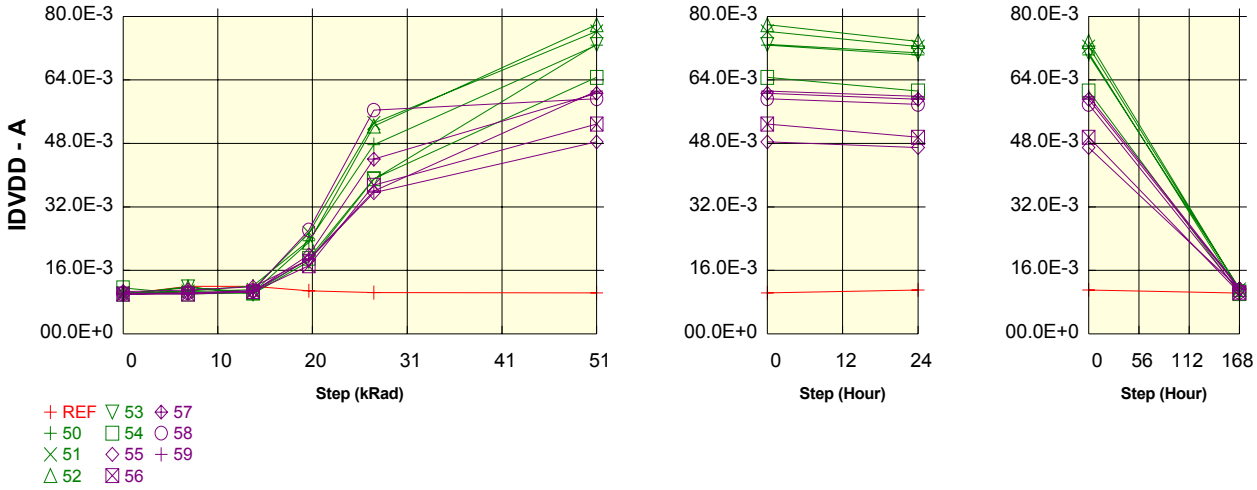
	0 Hour	24 Hour
REF	11.0E-6	10.9E-6
50	10.6E-6	10.5E-6
51	10.2E-6	11.1E-6
52	10.4E-6	11.1E-6
53	10.7E-6	10.7E-6
54	10.2E-6	10.6E-6
55	11.4E-6	10.2E-6
56	11.1E-6	10.9E-6
57	11.6E-6	10.7E-6
58	10.3E-6	11.2E-6
59	10.4E-6	11.7E-6
Statistics		
Min	10.2E-6	10.2E-6
Max	11.6E-6	11.7E-6
Mean	10.7E-6	10.9E-6
Sigma	49.1E-8	42.0E-8

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	10.9E-6	10.9E-6
50	10.5E-6	10.6E-6
51	11.1E-6	10.4E-6
52	11.1E-6	10.2E-6
53	10.7E-6	10.6E-6
54	10.6E-6	11.2E-6
55	10.2E-6	11.8E-6
56	10.9E-6	11.1E-6
57	10.7E-6	10.7E-6
58	11.2E-6	10.3E-6
59	11.7E-6	10.4E-6
Statistics		
Min	10.2E-6	10.2E-6
Max	11.7E-6	11.8E-6
Mean	10.9E-6	10.7E-6
Sigma	42.0E-8	48.2E-8

Test conditions : TID
Parameter : Supply Current : IDVDD

Unit : A
No spec limit specified.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	10.0E-3	12.0E-3	12.0E-3	10.9E-3	10.4E-3	10.3E-3
50	10.1E-3	10.8E-3	12.1E-3	23.5E-3	47.7E-3	72.8E-3
51	10.2E-3	10.7E-3	11.1E-3	25.5E-3	53.2E-3	76.2E-3
52	10.0E-3	11.7E-3	10.4E-3	23.1E-3	52.4E-3	77.9E-3
53	10.0E-3	11.8E-3	10.1E-3	18.3E-3	38.9E-3	72.9E-3
54	11.6E-3	10.1E-3	10.3E-3	19.0E-3	39.1E-3	64.7E-3
55	10.6E-3	11.1E-3	11.8E-3	18.7E-3	35.6E-3	48.4E-3
56	10.0E-3	10.0E-3	10.6E-3	17.2E-3	37.5E-3	52.9E-3
57	10.0E-3	10.3E-3	10.6E-3	19.9E-3	44.0E-3	60.6E-3
58	10.1E-3	10.4E-3	10.9E-3	26.1E-3	56.4E-3	59.3E-3
59	10.3E-3	10.1E-3	10.7E-3	18.8E-3	35.9E-3	61.2E-3
Statistics						
Min	10.0E-3	10.0E-3	10.1E-3	17.2E-3	35.6E-3	48.4E-3
Max	11.6E-3	11.8E-3	12.1E-3	26.1E-3	56.4E-3	77.9E-3
Mean	10.3E-3	10.7E-3	10.9E-3	21.0E-3	44.1E-3	64.7E-3
Sigma	48.7E-5	64.8E-5	65.6E-5	32.3E-4	78.0E-4	10.0E-3

Test TST002 : Annealing_24H

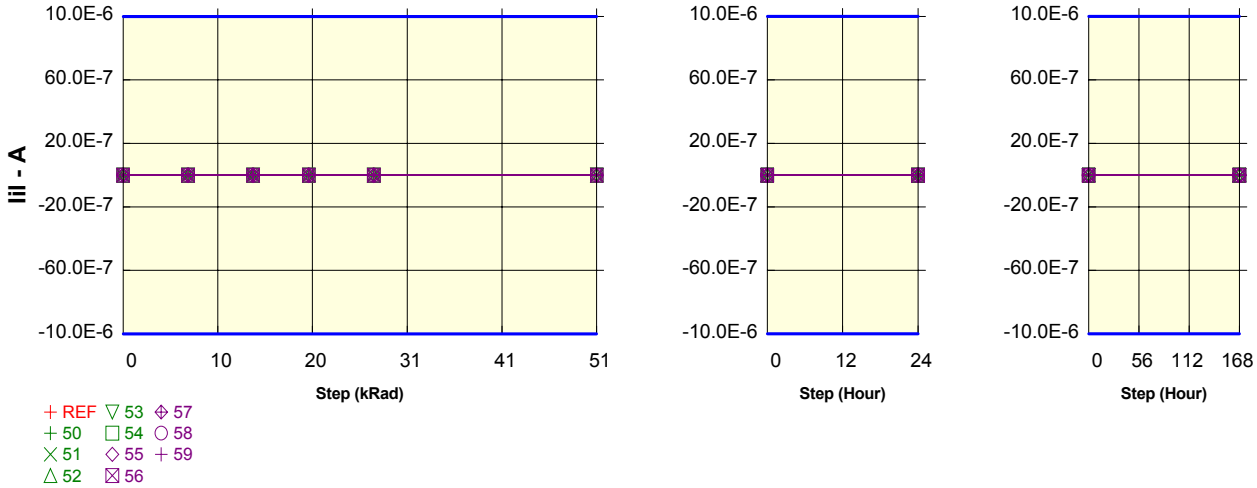
	0 Hour	24 Hour
REF	10.3E-3	11.1E-3
50	72.8E-3	70.3E-3
51	76.2E-3	72.4E-3
52	77.9E-3	73.7E-3
53	72.9E-3	70.8E-3
54	64.7E-3	61.2E-3
55	48.4E-3	47.0E-3
56	52.9E-3	49.6E-3
57	60.6E-3	59.1E-3
58	59.3E-3	57.8E-3
59	61.2E-3	59.9E-3
Statistics		
Min	48.4E-3	47.0E-3
Max	77.9E-3	73.7E-3
Mean	64.7E-3	62.2E-3
Sigma	10.0E-3	94.5E-4

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	11.1E-3	10.3E-3
50	70.3E-3	11.5E-3
51	72.4E-3	11.2E-3
52	73.7E-3	11.2E-3
53	70.8E-3	10.5E-3
54	61.2E-3	10.1E-3
55	47.0E-3	11.3E-3
56	49.6E-3	10.4E-3
57	59.1E-3	11.3E-3
58	57.8E-3	10.5E-3
59	59.9E-3	11.6E-3
Statistics		
Min	47.0E-3	10.1E-3
Max	73.7E-3	11.6E-3
Mean	62.2E-3	11.0E-3
Sigma	94.5E-4	52.0E-5

Test conditions : TID
Parameter : Input Low Current : Iil/CS

Unit : A
Spec Limit Min : -10.0E-6
Spec Limit Max : 10.0E-6
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	15.0E-11	-50.0E-12	15.0E-11	10.0E-11	15.0E-11	-80.0E-11
50	10.0E-11	10.0E-11	15.0E-11	20.0E-11	15.0E-11	-60.0E-11
51	10.0E-11	50.0E-12	20.0E-11	15.0E-11	15.0E-11	-60.0E-11
52	15.0E-11	10.0E-11	10.0E-11	10.0E-11	10.0E-11	-60.0E-11
53	20.0E-11	10.0E-11	10.0E-11	10.0E-11	50.0E-12	-45.0E-11
54	10.0E-11	15.0E-11	20.0E-11	10.0E-11	10.0E-11	-55.0E-11
55	50.0E-12	10.0E-11	15.0E-11	10.0E-11	10.0E-11	-45.0E-11
56	10.0E-11	15.0E-11	50.0E-12	50.0E-12	50.0E-12	-40.0E-11
57	10.0E-11	10.0E-11	15.0E-11	10.0E-11	10.0E-11	-40.0E-11
58	50.0E-12	00.0E+0	10.0E-11	10.0E-11	00.0E+0	-40.0E-11
59	10.0E-11	50.0E-12	10.0E-11	15.0E-11	50.0E-12	-35.0E-11
Statistics						
Min	50.0E-12	00.0E+0	50.0E-12	50.0E-12	00.0E+0	-60.0E-11
Max	20.0E-11	15.0E-11	20.0E-11	20.0E-11	15.0E-11	-35.0E-11
Mean	10.5E-11	90.0E-12	13.0E-11	11.5E-11	85.0E-12	-48.0E-11
Sigma	43.8E-12	45.9E-12	48.3E-12	41.2E-12	47.4E-12	97.8E-12

Test TST002 : Annealing_24H

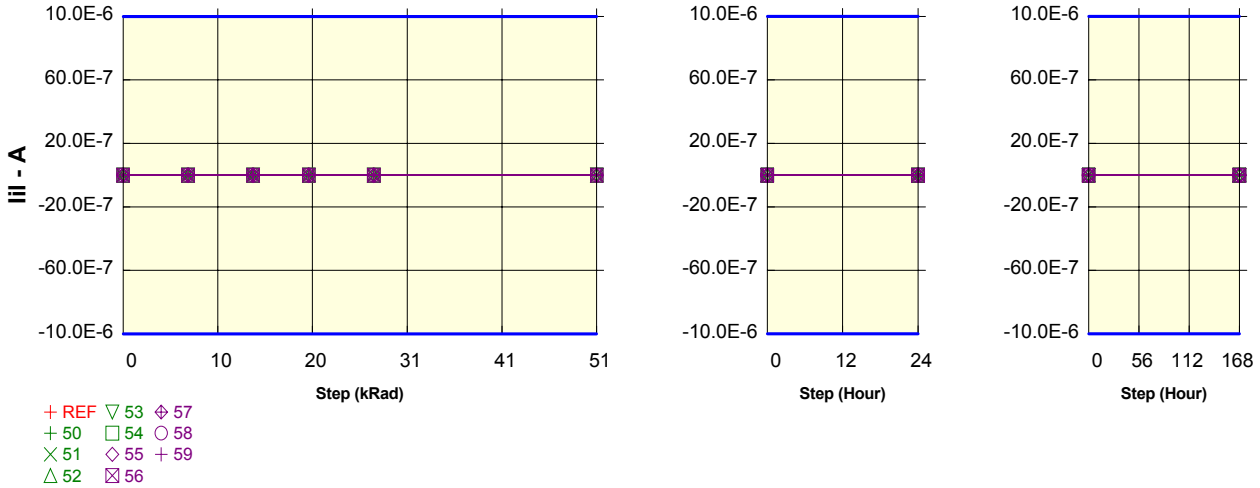
	0 Hour	24 Hour
REF	-80.0E-11	15.0E-11
50	-60.0E-11	50.0E-12
51	-60.0E-11	50.0E-12
52	-60.0E-11	10.0E-11
53	-45.0E-11	-50.0E-12
54	-55.0E-11	-50.0E-12
55	-45.0E-11	10.0E-11
56	-40.0E-11	10.0E-11
57	-40.0E-11	50.0E-12
58	-40.0E-11	50.0E-12
59	-35.0E-11	50.0E-12
Statistics		
Min	-60.0E-11	-50.0E-12
Max	-35.0E-11	10.0E-11
Mean	-48.0E-11	45.0E-12
Sigma	97.8E-12	55.0E-12

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	15.0E-11	-50.0E-12
50	50.0E-12	10.0E-11
51	50.0E-12	-50.0E-12
52	10.0E-11	15.0E-11
53	-50.0E-12	10.0E-11
54	-50.0E-12	50.0E-12
55	10.0E-11	10.0E-11
56	10.0E-11	50.0E-12
57	50.0E-12	10.0E-11
58	50.0E-12	50.0E-12
59	50.0E-12	-50.0E-12
Statistics		
Min	-50.0E-12	-50.0E-12
Max	10.0E-11	15.0E-11
Mean	45.0E-12	60.0E-12
Sigma	55.0E-12	65.8E-12

Test conditions : TID
Parameter : Input Low Current : Iil/RST

Unit : A
Spec Limit Min : -10.0E-6
Spec Limit Max : 10.0E-6
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	10.0E-11	-10.0E-11	50.0E-12	50.0E-12	00.0E+0	-40.0E-11
50	50.0E-12	50.0E-12	50.0E-12	15.0E-11	10.0E-11	-30.0E-11
51	50.0E-12	50.0E-12	50.0E-12	-50.0E-12	10.0E-11	-45.0E-11
52	-50.0E-12	10.0E-11	10.0E-11	10.0E-11	50.0E-12	-30.0E-11
53	-50.0E-12	50.0E-12	00.0E+0	10.0E-11	10.0E-11	-25.0E-11
54	00.0E+0	50.0E-12	10.0E-11	00.0E+0	00.0E+0	-30.0E-11
55	10.0E-11	50.0E-12	10.0E-11	50.0E-12	50.0E-12	-30.0E-11
56	10.0E-11	00.0E+0	00.0E+0	-50.0E-12	50.0E-12	-25.0E-11
57	10.0E-11	50.0E-12	-50.0E-12	10.0E-11	00.0E+0	-25.0E-11
58	50.0E-12	50.0E-12	00.0E+0	-50.0E-12	50.0E-12	-20.0E-11
59	50.0E-12	50.0E-12	50.0E-12	00.0E+0	00.0E+0	-10.0E-11
Statistics						
Min	-50.0E-12	00.0E+0	-50.0E-12	-50.0E-12	00.0E+0	-45.0E-11
Max	10.0E-11	10.0E-11	10.0E-11	15.0E-11	10.0E-11	-10.0E-11
Mean	40.0E-12	50.0E-12	40.0E-12	35.0E-12	50.0E-12	-27.0E-11
Sigma	56.8E-12	23.6E-12	51.6E-12	74.7E-12	40.8E-12	88.8E-12

Test TST002 : Annealing_24H

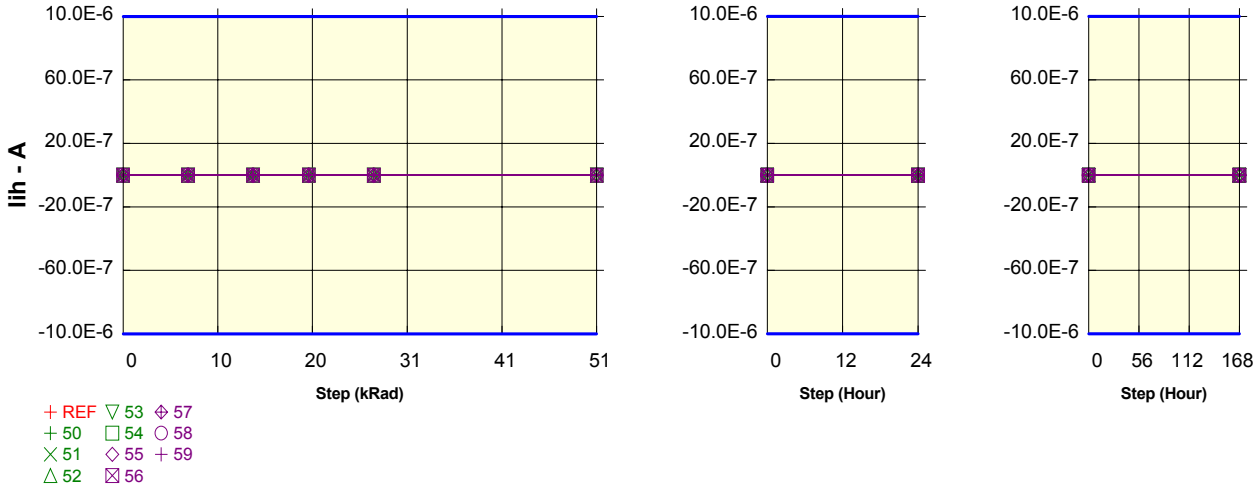
	0 Hour	24 Hour
REF	-40.0E-11	00.0E+0
50	-30.0E-11	10.0E-11
51	-45.0E-11	10.0E-11
52	-30.0E-11	00.0E+0
53	-25.0E-11	15.0E-11
54	-30.0E-11	00.0E+0
55	-30.0E-11	00.0E+0
56	-25.0E-11	50.0E-12
57	-25.0E-11	00.0E+0
58	-20.0E-11	15.0E-11
59	-10.0E-11	00.0E+0
Statistics		
Min	-45.0E-11	00.0E+0
Max	-10.0E-11	15.0E-11
Mean	-27.0E-11	55.0E-12
Sigma	88.8E-12	64.3E-12

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	00.0E+0	-50.0E-12
50	10.0E-11	-21.5E-10
51	10.0E-11	-50.0E-12
52	00.0E+0	00.0E+0
53	15.0E-11	15.0E-11
54	00.0E+0	-50.0E-12
55	00.0E+0	50.0E-12
56	50.0E-12	10.0E-11
57	00.0E+0	10.0E-11
58	15.0E-11	-10.0E-11
59	00.0E+0	50.0E-12
Statistics		
Min	00.0E+0	-21.5E-10
Max	15.0E-11	15.0E-11
Mean	55.0E-12	-19.0E-11
Sigma	64.3E-12	69.3E-11

Test conditions : TID
Parameter : Input High Current : Iih/CS

Unit : A
Spec Limit Min : -10.0E-6
Spec Limit Max : 10.0E-6
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	30.0E-11	30.0E-11	25.0E-11	20.0E-11	30.0E-11	12.0E-11
50	30.0E-11	30.0E-11	20.0E-11	25.0E-11	40.0E-11	15.9E-11
51	20.0E-11	20.0E-11	25.0E-11	25.0E-11	30.0E-11	11.3E-11
52	00.0E+0	25.0E-11	20.0E-11	25.0E-11	30.0E-11	11.2E-11
53	30.0E-11	20.0E-11	25.0E-11	20.0E-11	15.0E-11	11.4E-11
54	25.0E-11	30.0E-11	25.0E-11	25.0E-11	25.0E-11	11.5E-11
55	20.0E-11	30.0E-11	20.0E-11	20.0E-11	20.0E-11	14.0E-11
56	25.0E-11	25.0E-11	20.0E-11	15.0E-11	20.0E-11	10.5E-11
57	20.0E-11	25.0E-11	40.0E-11	25.0E-11	15.0E-11	11.0E-11
58	20.0E-11	25.0E-11	30.0E-11	20.0E-11	30.0E-11	12.0E-11
59	25.0E-11	30.0E-11	20.0E-11	25.0E-11	20.0E-11	11.5E-11
Statistics						
Min	00.0E+0	20.0E-11	20.0E-11	15.0E-11	15.0E-11	10.5E-11
Max	30.0E-11	30.0E-11	40.0E-11	25.0E-11	40.0E-11	15.9E-11
Mean	21.5E-11	26.0E-11	24.5E-11	22.5E-11	24.5E-11	12.0E-11
Sigma	85.1E-12	39.4E-12	64.3E-12	35.4E-12	79.8E-12	16.3E-12

Test TST002 : Annealing_24H

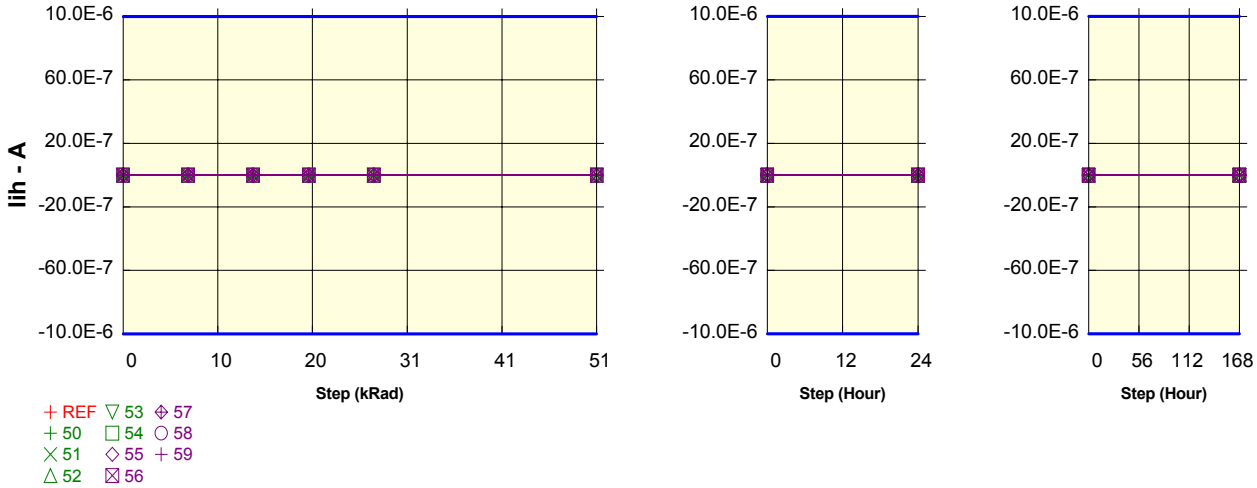
	0 Hour	24 Hour
REF	12.0E-11	25.0E-11
50	15.9E-11	23.0E-11
51	11.3E-11	44.0E-11
52	11.2E-11	53.0E-11
53	11.4E-11	32.9E-11
54	11.5E-11	20.0E-11
55	14.0E-11	20.0E-11
56	10.5E-11	15.0E-11
57	11.0E-11	15.0E-11
58	12.0E-11	25.0E-11
59	11.5E-11	20.0E-11
Statistics		
Min	10.5E-11	15.0E-11
Max	15.9E-11	53.0E-11
Mean	12.0E-11	26.8E-11
Sigma	16.3E-12	12.7E-11

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	25.0E-11	20.0E-11
50	23.0E-11	30.0E-11
51	44.0E-11	40.0E-11
52	53.0E-11	35.0E-11
53	32.9E-11	20.0E-11
54	20.0E-11	35.0E-11
55	20.0E-11	15.0E-11
56	15.0E-11	25.0E-11
57	15.0E-11	30.0E-11
58	25.0E-11	25.0E-11
59	20.0E-11	25.0E-11
Statistics		
Min	15.0E-11	15.0E-11
Max	53.0E-11	40.0E-11
Mean	26.8E-11	28.0E-11
Sigma	12.7E-11	75.3E-12

Test conditions : TID
Parameter : Input High Current : Iih/RST

Unit : A
Spec Limit Min : -10.0E-6
Spec Limit Max : 10.0E-6
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	20.0E-11	25.0E-11	30.0E-11	30.0E-11	15.0E-11	12.0E-10
50	20.0E-11	25.0E-11	30.0E-11	30.0E-11	30.0E-11	14.0E-10
51	30.0E-11	30.0E-11	25.0E-11	30.0E-11	25.0E-11	17.0E-10
52	30.0E-11	15.0E-11	30.0E-11	35.0E-11	20.0E-11	16.0E-10
53	20.0E-11	30.0E-11	15.0E-11	25.0E-11	25.0E-11	14.5E-10
54	25.0E-11	30.0E-11	30.0E-11	30.0E-11	25.0E-11	11.0E-10
55	20.0E-11	20.0E-11	25.0E-11	30.0E-11	30.0E-11	12.0E-10
56	25.0E-11	25.0E-11	20.0E-11	15.0E-11	30.0E-11	95.0E-11
57	30.0E-11	30.0E-11	15.0E-11	20.0E-11	15.0E-11	80.0E-11
58	40.0E-11	20.0E-11	25.0E-11	20.0E-11	20.0E-11	95.0E-11
59	20.0E-11	25.0E-11	20.0E-11	20.0E-11	30.0E-11	80.0E-11
Statistics						
Min	20.0E-11	15.0E-11	15.0E-11	15.0E-11	15.0E-11	80.0E-11
Max	40.0E-11	30.0E-11	30.0E-11	35.0E-11	30.0E-11	17.0E-10
Mean	26.0E-11	25.0E-11	23.5E-11	25.5E-11	25.0E-11	12.0E-10
Sigma	65.8E-12	52.7E-12	58.0E-12	64.3E-12	52.7E-12	32.8E-11

Test TST002 : Annealing_24H

	0 Hour	24 Hour
REF	12.0E-10	25.0E-11
50	14.0E-10	20.0E-11
51	17.0E-10	20.0E-11
52	16.0E-10	30.0E-11
53	14.5E-10	40.0E-11
54	11.0E-10	25.0E-11
55	12.0E-10	35.0E-11
56	95.0E-11	35.0E-11
57	80.0E-11	25.0E-11
58	95.0E-11	30.0E-11
59	80.0E-11	15.0E-11
Statistics		
Min	80.0E-11	15.0E-11
Max	17.0E-10	40.0E-11
Mean	12.0E-10	27.5E-11
Sigma	32.8E-11	79.1E-12

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	25.0E-11	25.0E-11
50	20.0E-11	30.0E-11
51	20.0E-11	25.0E-11
52	30.0E-11	15.0E-11
53	40.0E-11	25.0E-11
54	25.0E-11	35.0E-11
55	35.0E-11	20.0E-11
56	35.0E-11	20.0E-11
57	25.0E-11	30.0E-11
58	30.0E-11	25.0E-11
59	15.0E-11	20.0E-11
Statistics		
Min	15.0E-11	15.0E-11
Max	40.0E-11	35.0E-11
Mean	27.5E-11	24.5E-11
Sigma	79.1E-12	59.9E-12

Test conditions : TID
Parameter : Output High Voltage : VOHB1

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.

Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.97	4.97	4.98
50	4.98	4.98	4.97	4.96	4.94	4.43
51	4.98	4.98	4.97	4.96	4.94	4.3
52	4.98	4.98	4.98	4.96	4.94	4.3
53	4.97	4.97	4.97	4.96	4.95	4.35
54	4.98	4.98	4.99	4.96	4.95	4.32
55	4.98	4.98	4.97	4.96	4.95	4.93
56	4.97	4.98	4.98	4.96	4.94	4.93
57	4.97	4.98	4.97	4.96	4.94	4.92
58	4.97	4.98	4.97	4.95	4.87	4.93
59	4.97	4.98	4.98	4.96	4.95	4.92
Statistics						
Min	4.97	4.97	4.97	4.95	4.87	4.3
Max	4.98	4.98	4.99	4.96	4.95	4.93
Mean	4.98	4.98	4.98	4.96	4.94	4.63
Sigma	0.01	0.0	0.01	0.0	0.02	0.31

Test TST002 : Annealing_24H

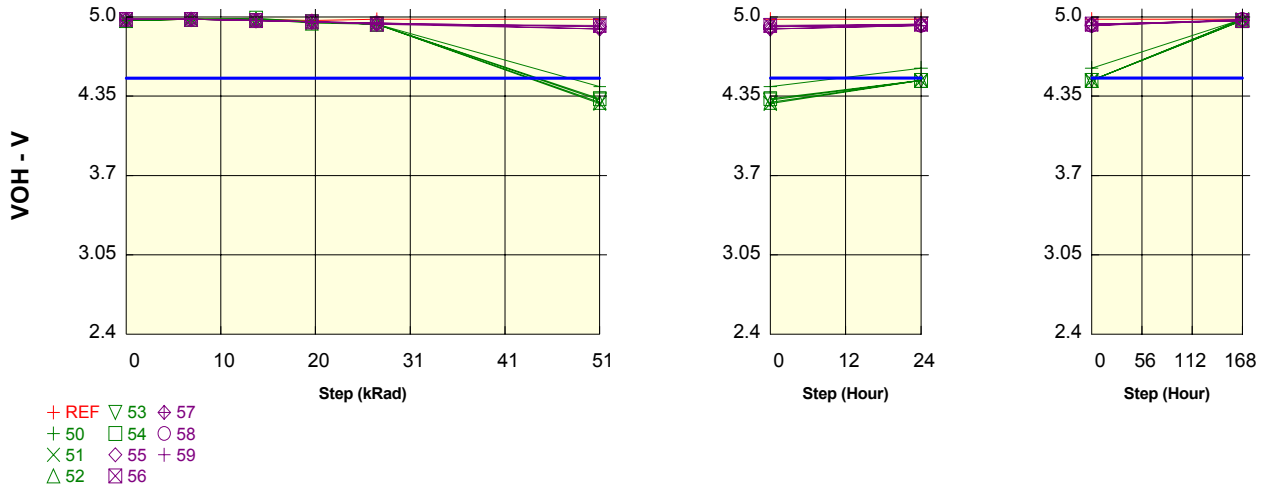
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.58
51	4.3	4.53
52	4.3	4.5
53	4.35	4.47
54	4.32	4.43
55	4.93	4.94
56	4.93	4.94
57	4.92	4.93
58	4.93	4.93
59	4.92	4.93
Statistics		
Min	4.3	4.43
Max	4.93	4.94
Mean	4.63	4.72
Sigma	0.31	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.58	4.98
51	4.53	4.98
52	4.5	4.98
53	4.47	4.98
54	4.43	4.97
55	4.94	4.97
56	4.94	4.98
57	4.93	4.97
58	4.93	4.98
59	4.93	4.98
Statistics		
Min	4.43	4.97
Max	4.94	4.98
Mean	4.72	4.98
Sigma	0.23	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB2

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.97	4.98	4.98	4.97	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.97	4.98	4.97	4.96	4.94	4.29
52	4.97	4.98	4.98	4.95	4.94	4.3
53	4.98	4.98	4.97	4.96	4.94	4.32
54	4.98	4.98	4.99	4.96	4.94	4.33
55	4.98	4.98	4.97	4.96	4.95	4.92
56	4.98	4.98	4.97	4.96	4.94	4.93
57	4.98	4.98	4.97	4.96	4.94	4.9
58	4.98	4.98	4.97	4.96	4.95	4.92
59	4.98	4.98	4.97	4.96	4.95	4.9
Statistics						
Min	4.97	4.98	4.97	4.95	4.94	4.29
Max	4.98	4.98	4.99	4.96	4.95	4.93
Mean	4.98	4.98	4.97	4.96	4.94	4.62
Sigma	0.0	0.0	0.01	0.0	0.0	0.31

Test TST002 : Annealing_24H

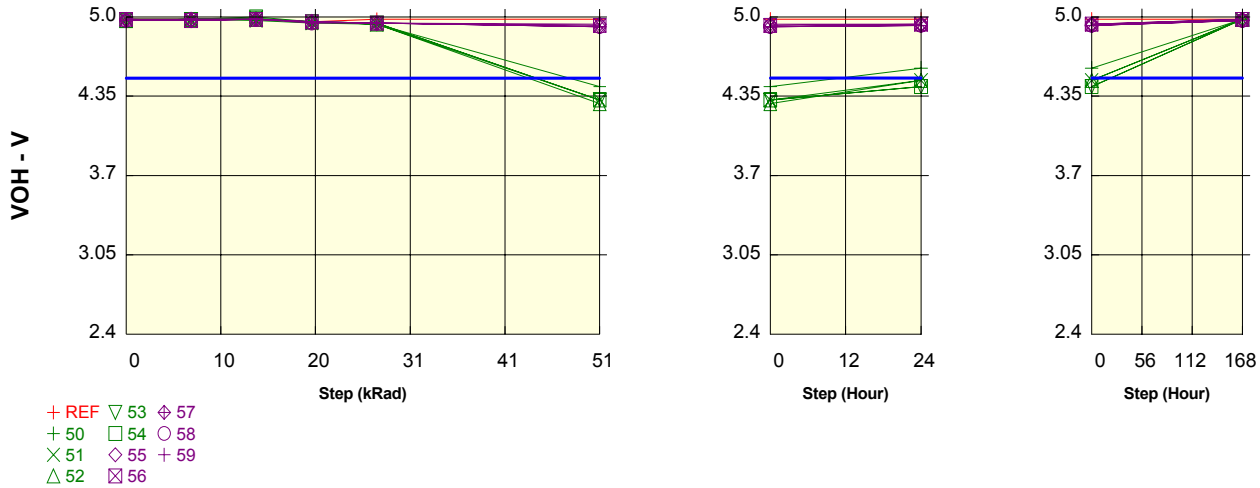
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.58
51	4.29	4.48
52	4.3	4.48
53	4.32	4.48
54	4.33	4.48
55	4.92	4.94
56	4.93	4.94
57	4.9	4.93
58	4.92	4.93
59	4.9	4.93
Statistics		
Min	4.29	4.48
Max	4.93	4.94
Mean	4.62	4.72
Sigma	0.31	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.58	4.98
51	4.48	4.98
52	4.48	4.98
53	4.48	4.97
54	4.48	4.97
55	4.94	4.97
56	4.94	4.97
57	4.93	4.97
58	4.93	4.98
59	4.93	4.97
Statistics		
Min	4.48	4.97
Max	4.94	4.98
Mean	4.72	4.97
Sigma	0.23	0.01

Test conditions : TID
Parameter : Output High Voltage : VOHB3

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.96	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.98	4.98	4.97	4.95	4.94	4.32
52	4.97	4.98	4.98	4.96	4.94	4.29
53	4.98	4.98	4.99	4.96	4.95	4.32
54	4.97	4.98	5.0	4.96	4.95	4.32
55	4.98	4.97	4.98	4.96	4.95	4.94
56	4.98	4.97	4.98	4.96	4.95	4.93
57	4.97	4.97	4.98	4.96	4.95	4.92
58	4.97	4.98	4.98	4.95	4.95	4.92
59	4.98	4.98	4.98	4.96	4.95	4.92
Statistics						
Min	4.97	4.97	4.97	4.95	4.94	4.29
Max	4.98	4.98	5.0	4.96	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.95	4.63
Sigma	0.01	0.0	0.01	0.0	0.0	0.31

Test TST002 : Annealing_24H

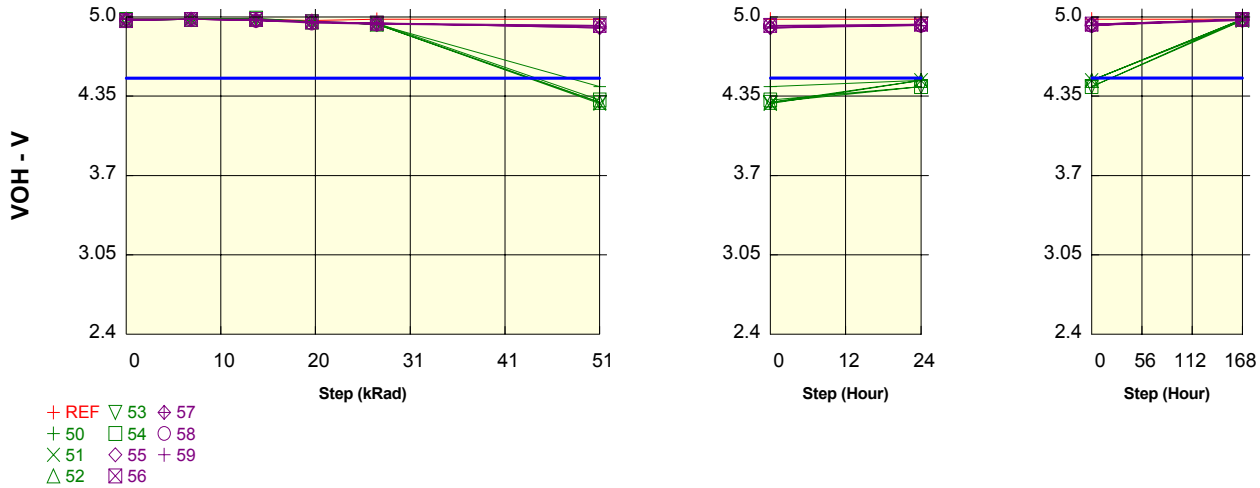
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.58
51	4.32	4.48
52	4.29	4.48
53	4.32	4.43
54	4.32	4.43
55	4.94	4.94
56	4.93	4.94
57	4.92	4.93
58	4.92	4.93
59	4.92	4.93
Statistics		
Min	4.29	4.43
Max	4.94	4.94
Mean	4.63	4.71
Sigma	0.31	0.24

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.58	4.98
51	4.48	4.98
52	4.48	4.98
53	4.43	4.98
54	4.43	4.98
55	4.94	4.98
56	4.94	4.98
57	4.93	4.97
58	4.93	4.97
59	4.93	4.97
Statistics		
Min	4.43	4.97
Max	4.94	4.98
Mean	4.71	4.98
Sigma	0.24	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB4

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.97	4.98	4.98
50	4.98	4.98	4.98	4.96	4.94	4.43
51	4.97	4.98	4.98	4.96	4.94	4.29
52	4.98	4.98	4.98	4.96	4.94	4.3
53	4.97	4.98	4.98	4.96	4.94	4.3
54	4.98	4.98	4.99	4.96	4.95	4.32
55	4.97	4.98	4.97	4.96	4.95	4.91
56	4.97	4.98	4.98	4.96	4.95	4.93
57	4.98	4.98	4.97	4.96	4.94	4.92
58	4.97	4.98	4.97	4.95	4.94	4.93
59	4.98	4.98	4.97	4.96	4.95	4.91
Statistics						
Min	4.97	4.98	4.97	4.95	4.94	4.29
Max	4.98	4.98	4.99	4.96	4.95	4.93
Mean	4.98	4.98	4.98	4.96	4.94	4.62
Sigma	0.01	0.0	0.01	0.0	0.01	0.31

Test TST002 : Annealing_24H

	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.48
51	4.29	4.48
52	4.3	4.48
53	4.3	4.43
54	4.32	4.43
55	4.91	4.94
56	4.93	4.94
57	4.92	4.93
58	4.93	4.93
59	4.91	4.93
Statistics		
Min	4.29	4.43
Max	4.93	4.94
Mean	4.62	4.7
Sigma	0.31	0.25

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.48	4.98
51	4.48	4.97
52	4.48	4.98
53	4.43	4.97
54	4.43	4.98
55	4.94	4.98
56	4.94	4.98
57	4.93	4.97
58	4.93	4.98
59	4.93	4.98
Statistics		
Min	4.43	4.97
Max	4.94	4.98
Mean	4.7	4.98
Sigma	0.25	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB5

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.

Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.96	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.98	4.98	4.98	4.96	4.94	4.29
52	4.98	4.98	4.97	4.96	4.94	4.31
53	4.98	4.98	4.99	4.96	4.95	4.31
54	4.98	4.98	4.99	4.96	4.95	4.32
55	4.97	4.98	4.97	4.96	4.95	4.94
56	4.97	4.98	4.97	4.96	4.95	4.93
57	4.98	4.98	4.97	4.96	4.94	4.9
58	4.98	4.98	4.98	4.95	4.94	4.93
59	4.98	4.98	4.98	4.96	4.95	4.92
Statistics						
Min	4.97	4.98	4.97	4.95	4.94	4.29
Max	4.98	4.98	4.99	4.96	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.95	4.63
Sigma	0.0	0.0	0.01	0.0	0.01	0.31

Test TST002 : Annealing_24H

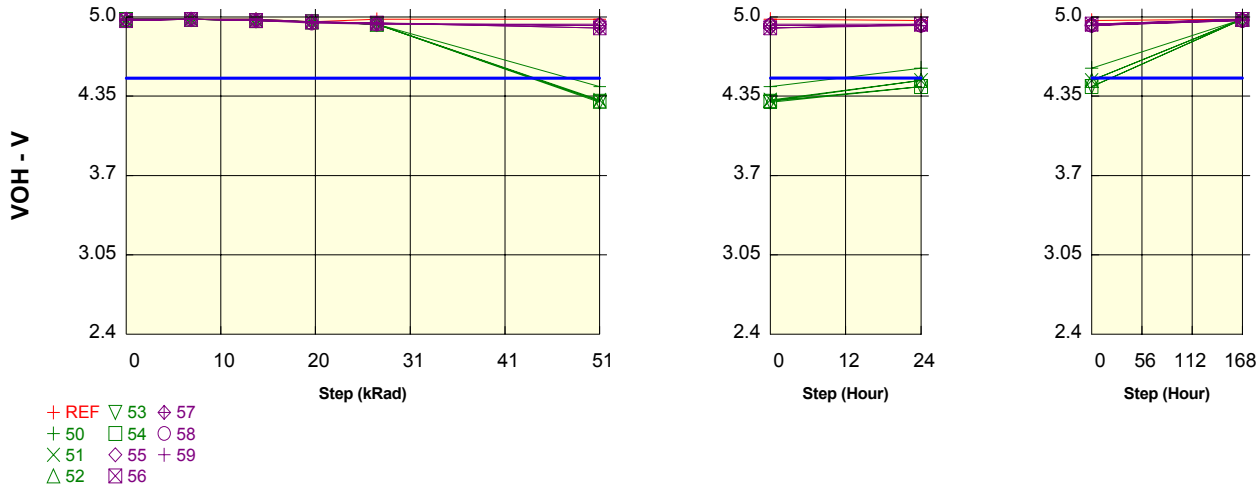
	0 Hour	24 Hour
REF	4.98	4.97
50	4.43	4.48
51	4.29	4.48
52	4.31	4.48
53	4.31	4.48
54	4.32	4.48
55	4.94	4.94
56	4.93	4.94
57	4.9	4.93
58	4.93	4.93
59	4.92	4.93
Statistics		
Min	4.29	4.48
Max	4.94	4.94
Mean	4.63	4.71
Sigma	0.31	0.24

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.97	4.98
50	4.48	4.98
51	4.48	4.98
52	4.48	4.98
53	4.48	4.98
54	4.48	4.98
55	4.94	4.97
56	4.94	4.97
57	4.93	4.97
58	4.93	4.98
59	4.93	4.98
Statistics		
Min	4.48	4.97
Max	4.94	4.98
Mean	4.71	4.98
Sigma	0.24	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB6

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.96	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.98	4.98	4.97	4.96	4.94	4.32
52	4.98	4.98	4.97	4.96	4.94	4.31
53	4.98	4.98	4.97	4.96	4.94	4.3
54	4.98	4.98	4.97	4.96	4.94	4.31
55	4.97	4.98	4.97	4.96	4.94	4.94
56	4.97	4.98	4.97	4.96	4.95	4.91
57	4.97	4.98	4.97	4.96	4.95	4.91
58	4.98	4.98	4.97	4.95	4.94	4.93
59	4.98	4.98	4.98	4.96	4.95	4.93
Statistics						
Min	4.97	4.98	4.97	4.95	4.94	4.3
Max	4.98	4.98	4.98	4.96	4.95	4.94
Mean	4.98	4.98	4.97	4.96	4.94	4.63
Sigma	0.01	0.0	0.0	0.0	0.0	0.31

Test TST002 : Annealing_24H

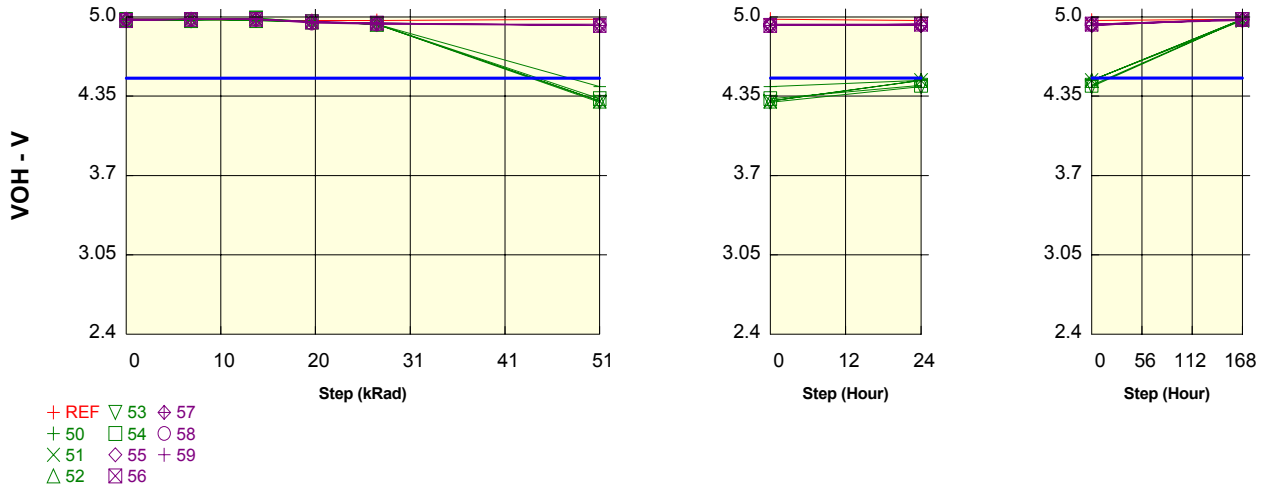
	0 Hour	24 Hour
REF	4.98	4.97
50	4.43	4.58
51	4.32	4.48
52	4.31	4.48
53	4.3	4.43
54	4.31	4.43
55	4.94	4.94
56	4.91	4.94
57	4.91	4.93
58	4.93	4.93
59	4.93	4.93
Statistics		
Min	4.3	4.43
Max	4.94	4.94
Mean	4.63	4.71
Sigma	0.31	0.24

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.97	4.98
50	4.58	4.98
51	4.48	4.98
52	4.48	4.98
53	4.43	4.98
54	4.43	4.98
55	4.94	4.98
56	4.94	4.98
57	4.93	4.97
58	4.93	4.97
59	4.93	4.98
Statistics		
Min	4.43	4.97
Max	4.94	4.98
Mean	4.71	4.98
Sigma	0.24	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB7

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.97	4.97	4.97	4.98
50	4.98	4.98	4.97	4.96	4.94	4.43
51	4.97	4.98	4.98	4.96	4.94	4.31
52	4.98	4.98	4.97	4.96	4.94	4.31
53	4.97	4.97	4.99	4.96	4.94	4.3
54	4.98	4.97	4.99	4.96	4.94	4.33
55	4.98	4.98	4.98	4.96	4.94	4.94
56	4.97	4.98	4.98	4.96	4.95	4.93
57	4.97	4.98	4.98	4.96	4.95	4.93
58	4.98	4.98	4.98	4.95	4.94	4.93
59	4.97	4.98	4.98	4.96	4.95	4.93
Statistics						
Min	4.97	4.97	4.97	4.95	4.94	4.3
Max	4.98	4.98	4.99	4.96	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.94	4.63
Sigma	0.01	0.0	0.01	0.0	0.0	0.32

Test TST002 : Annealing_24H

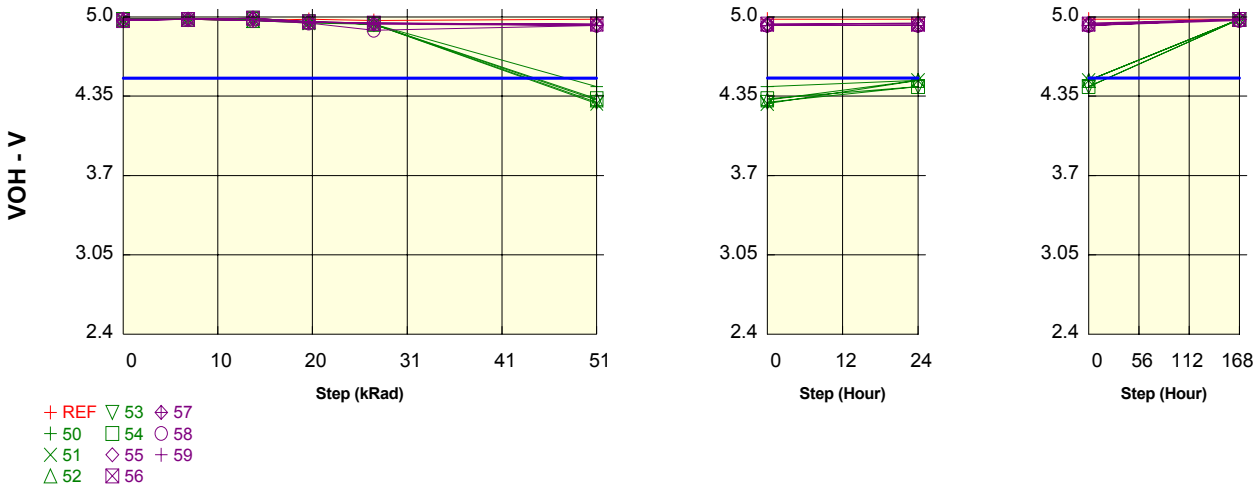
	0 Hour	24 Hour
REF	4.98	4.97
50	4.43	4.48
51	4.31	4.48
52	4.31	4.48
53	4.3	4.43
54	4.33	4.44
55	4.94	4.94
56	4.93	4.94
57	4.93	4.93
58	4.93	4.94
59	4.93	4.93
Statistics		
Min	4.3	4.43
Max	4.94	4.94
Mean	4.63	4.7
Sigma	0.32	0.25

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.97	4.98
50	4.48	4.98
51	4.48	4.97
52	4.48	4.98
53	4.43	4.98
54	4.44	4.98
55	4.94	4.97
56	4.94	4.98
57	4.93	4.98
58	4.94	4.98
59	4.93	4.98
Statistics		
Min	4.43	4.97
Max	4.94	4.98
Mean	4.7	4.98
Sigma	0.25	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB8

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.97	4.98	4.97	4.98
50	4.98	4.98	4.98	4.96	4.94	4.43
51	4.98	4.98	4.97	4.95	4.94	4.29
52	4.98	4.98	4.97	4.96	4.94	4.32
53	4.98	4.98	4.98	4.96	4.94	4.3
54	4.98	4.98	4.99	4.96	4.94	4.33
55	4.97	4.98	4.99	4.96	4.95	4.94
56	4.97	4.98	4.99	4.96	4.95	4.94
57	4.97	4.98	4.99	4.96	4.94	4.93
58	4.98	4.98	4.97	4.95	4.89	4.93
59	4.98	4.98	4.97	4.96	4.95	4.93
Statistics						
Min	4.97	4.98	4.97	4.95	4.89	4.29
Max	4.98	4.98	4.99	4.96	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.94	4.63
Sigma	0.0	0.0	0.01	0.0	0.02	0.32

Test TST002 : Annealing_24H

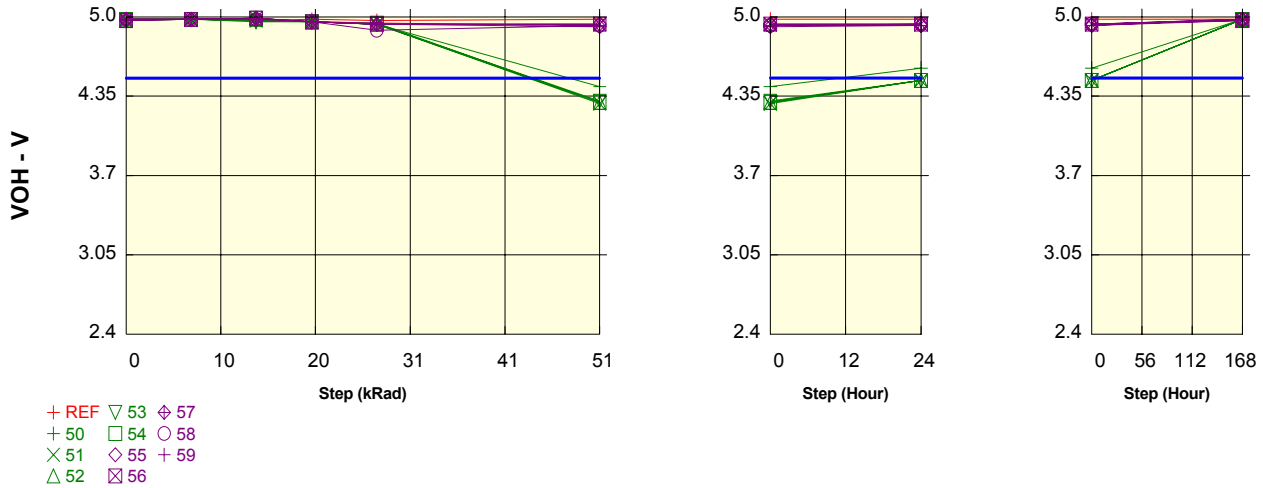
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.48
51	4.29	4.48
52	4.32	4.48
53	4.3	4.43
54	4.33	4.43
55	4.94	4.95
56	4.94	4.94
57	4.93	4.93
58	4.93	4.93
59	4.93	4.93
Statistics		
Min	4.29	4.43
Max	4.94	4.95
Mean	4.63	4.7
Sigma	0.32	0.25

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.48	4.98
51	4.48	4.98
52	4.48	4.98
53	4.43	4.98
54	4.43	4.98
55	4.95	4.98
56	4.94	4.98
57	4.93	4.98
58	4.93	4.97
59	4.93	4.98
Statistics		
Min	4.43	4.97
Max	4.95	4.98
Mean	4.7	4.98
Sigma	0.25	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB9

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.97	4.98	4.97	4.98
50	4.97	4.98	4.97	4.96	4.94	4.43
51	4.98	4.98	4.97	4.96	4.94	4.29
52	4.98	4.98	4.98	4.96	4.94	4.3
53	4.98	4.98	4.96	4.96	4.94	4.31
54	4.97	4.98	4.99	4.96	4.95	4.3
55	4.98	4.98	4.99	4.96	4.94	4.94
56	4.97	4.98	4.99	4.96	4.94	4.94
57	4.97	4.98	4.99	4.96	4.94	4.92
58	4.98	4.98	4.98	4.96	4.89	4.93
59	4.98	4.98	4.99	4.96	4.95	4.93
Statistics						
Min	4.97	4.98	4.96	4.96	4.89	4.29
Max	4.98	4.98	4.99	4.96	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.94	4.63
Sigma	0.01	0.0	0.01	0.0	0.02	0.32

Test TST002 : Annealing_24H

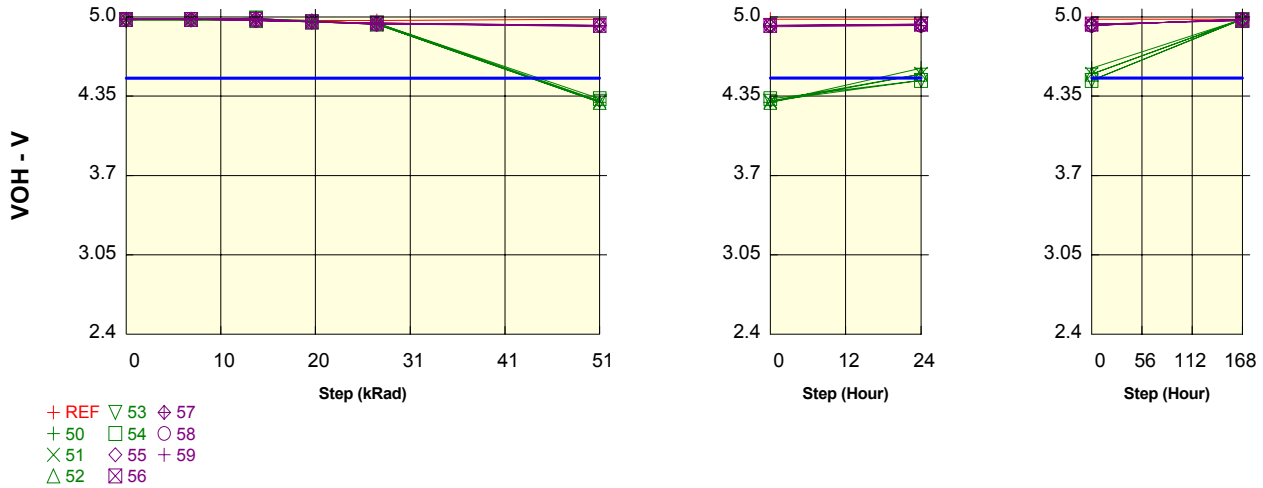
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.58
51	4.29	4.48
52	4.3	4.48
53	4.31	4.48
54	4.3	4.48
55	4.94	4.94
56	4.94	4.94
57	4.92	4.93
58	4.93	4.94
59	4.93	4.93
Statistics		
Min	4.29	4.48
Max	4.94	4.94
Mean	4.63	4.72
Sigma	0.32	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.58	4.98
51	4.48	4.98
52	4.48	4.98
53	4.48	4.98
54	4.48	4.98
55	4.94	4.98
56	4.94	4.97
57	4.93	4.97
58	4.94	4.98
59	4.93	4.98
Statistics		
Min	4.48	4.97
Max	4.94	4.98
Mean	4.72	4.98
Sigma	0.23	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB10

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.97	4.97	4.98
50	4.98	4.97	4.98	4.97	4.94	4.3
51	4.98	4.98	4.98	4.96	4.94	4.31
52	4.98	4.98	4.97	4.96	4.94	4.3
53	4.97	4.98	4.99	4.96	4.95	4.31
54	4.98	4.98	4.99	4.96	4.95	4.33
55	4.98	4.98	4.99	4.96	4.95	4.93
56	4.98	4.98	4.98	4.96	4.95	4.93
57	4.98	4.98	4.97	4.96	4.94	4.93
58	4.98	4.98	4.97	4.96	4.94	4.93
59	4.98	4.98	4.97	4.96	4.95	4.92
Statistics						
Min	4.97	4.97	4.97	4.96	4.94	4.3
Max	4.98	4.98	4.99	4.97	4.95	4.93
Mean	4.98	4.98	4.98	4.96	4.95	4.62
Sigma	0.0	0.0	0.01	0.0	0.01	0.33

Test TST002 : Annealing_24H

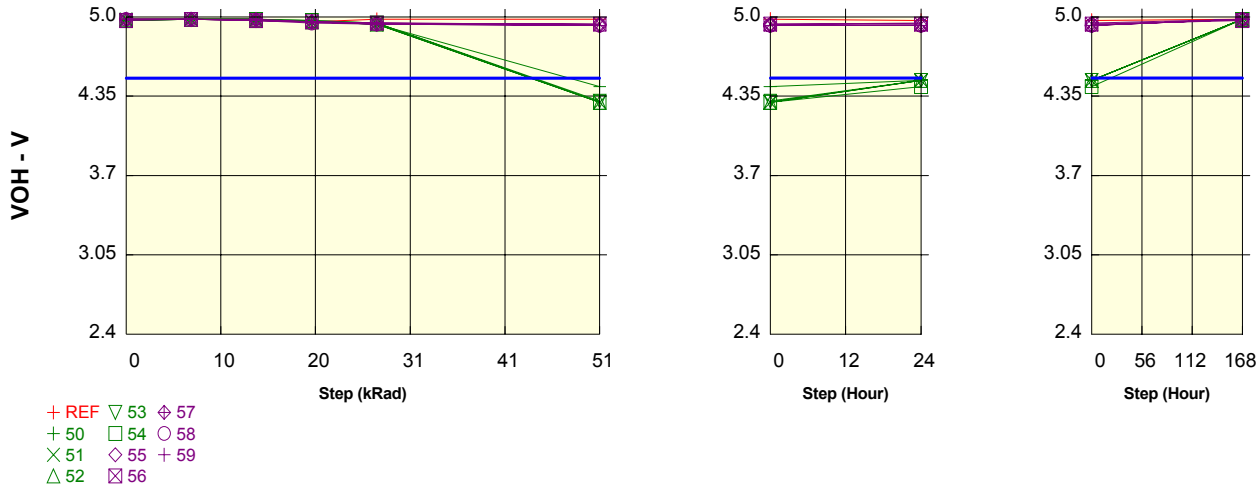
	0 Hour	24 Hour
REF	4.98	4.98
50	4.3	4.58
51	4.31	4.53
52	4.3	4.53
53	4.31	4.48
54	4.33	4.48
55	4.93	4.94
56	4.93	4.94
57	4.93	4.93
58	4.93	4.93
59	4.92	4.93
Statistics		
Min	4.3	4.48
Max	4.93	4.94
Mean	4.62	4.73
Sigma	0.33	0.22

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.58	4.98
51	4.53	4.98
52	4.53	4.98
53	4.48	4.98
54	4.48	4.98
55	4.94	4.97
56	4.94	4.97
57	4.93	4.98
58	4.93	4.98
59	4.93	4.98
Statistics		
Min	4.48	4.97
Max	4.94	4.98
Mean	4.73	4.98
Sigma	0.22	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB11

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.96	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.98	4.98	4.98	4.96	4.94	4.3
52	4.98	4.98	4.97	4.96	4.94	4.3
53	4.97	4.98	4.98	4.97	4.95	4.31
54	4.97	4.98	4.98	4.97	4.95	4.3
55	4.98	4.98	4.97	4.96	4.95	4.94
56	4.97	4.98	4.97	4.96	4.95	4.94
57	4.98	4.98	4.98	4.96	4.94	4.93
58	4.98	4.98	4.97	4.95	4.94	4.93
59	4.98	4.98	4.97	4.96	4.95	4.93
Statistics						
Min	4.97	4.98	4.97	4.95	4.94	4.3
Max	4.98	4.98	4.98	4.97	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.95	4.63
Sigma	0.01	0.0	0.01	0.01	0.01	0.32

Test TST002 : Annealing_24H

	0 Hour	24 Hour
REF	4.98	4.97
50	4.43	4.48
51	4.3	4.48
52	4.3	4.48
53	4.31	4.48
54	4.3	4.43
55	4.94	4.95
56	4.94	4.94
57	4.93	4.93
58	4.93	4.93
59	4.93	4.93
Statistics		
Min	4.3	4.43
Max	4.94	4.95
Mean	4.63	4.7
Sigma	0.32	0.25

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.97	4.98
50	4.48	4.98
51	4.48	4.98
52	4.48	4.98
53	4.48	4.98
54	4.43	4.98
55	4.95	4.98
56	4.94	4.97
57	4.93	4.98
58	4.93	4.98
59	4.93	4.98
Statistics		
Min	4.43	4.97
Max	4.95	4.98
Mean	4.7	4.98
Sigma	0.25	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB12

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.

Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.97	4.98	4.98	4.98	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.97	4.98	4.98	4.96	4.94	4.29
52	4.97	4.98	4.98	4.96	4.94	4.3
53	4.98	4.98	4.98	4.96	4.95	4.3
54	4.98	4.98	4.98	4.96	4.95	4.32
55	4.97	4.98	4.98	4.96	4.95	4.94
56	4.97	4.98	4.97	4.96	4.95	4.94
57	4.97	4.98	4.98	4.96	4.94	4.93
58	4.98	4.98	4.98	4.96	4.9	4.93
59	4.97	4.98	4.98	4.96	4.95	4.93
Statistics						
Min	4.97	4.98	4.97	4.96	4.9	4.29
Max	4.98	4.98	4.98	4.96	4.95	4.94
Mean	4.97	4.98	4.98	4.96	4.94	4.63
Sigma	0.0	0.0	0.0	0.0	0.02	0.32

Test TST002 : Annealing_24H

	0 Hour	24 Hour
REF	4.98	4.97
50	4.43	4.58
51	4.29	4.48
52	4.3	4.48
53	4.3	4.44
54	4.32	4.54
55	4.94	4.94
56	4.94	4.94
57	4.93	4.93
58	4.93	4.93
59	4.93	4.93
Statistics		
Min	4.29	4.44
Max	4.94	4.94
Mean	4.63	4.72
Sigma	0.32	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.97	4.98
50	4.58	4.98
51	4.48	4.98
52	4.48	4.98
53	4.44	4.98
54	4.54	4.98
55	4.94	4.98
56	4.94	4.98
57	4.93	4.98
58	4.93	4.98
59	4.93	4.98
Statistics		
Min	4.44	4.98
Max	4.94	4.98
Mean	4.72	4.98
Sigma	0.23	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB13

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.

Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.97	4.98	4.98	4.96	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.97	4.97	4.98	4.96	4.94	4.29
52	4.97	4.98	4.98	4.96	4.94	4.3
53	4.98	4.98	5.0	4.96	4.94	4.3
54	4.98	4.97	4.97	4.96	4.95	4.32
55	4.98	4.98	4.97	4.96	4.95	4.94
56	4.97	4.98	4.98	4.96	4.95	4.93
57	4.98	4.98	4.98	4.96	4.95	4.93
58	4.98	4.98	4.98	4.96	4.95	4.93
59	4.97	4.97	4.97	4.96	4.95	4.94
Statistics						
Min	4.97	4.97	4.97	4.96	4.94	4.29
Max	4.98	4.98	5.0	4.96	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.95	4.63
Sigma	0.01	0.0	0.01	0.0	0.01	0.32

Test TST002 : Annealing_24H

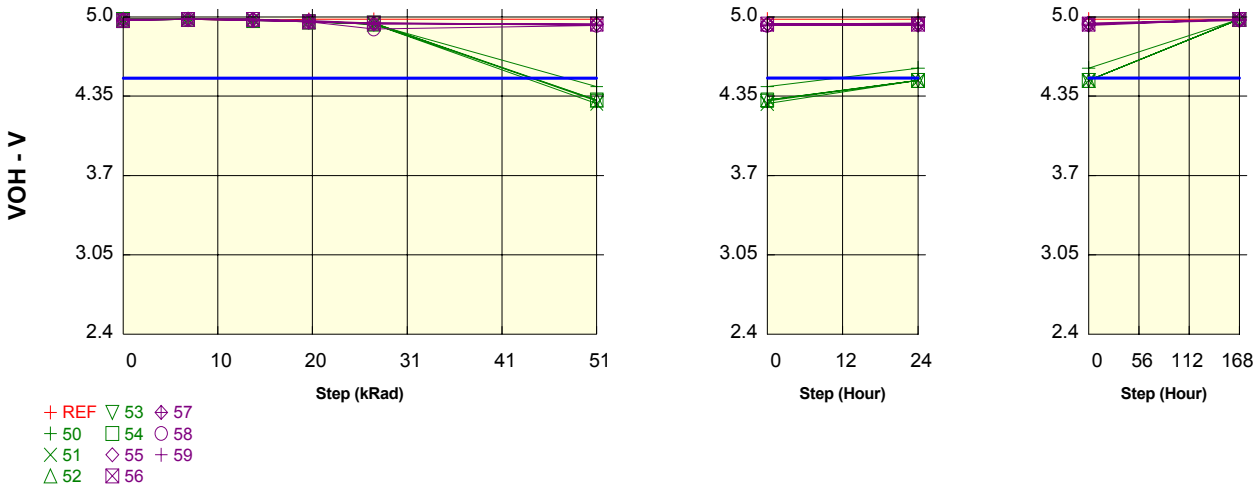
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.48
51	4.29	4.48
52	4.3	4.48
53	4.3	4.43
54	4.32	4.43
55	4.94	4.94
56	4.93	4.94
57	4.93	4.94
58	4.93	4.94
59	4.94	4.93
Statistics		
Min	4.29	4.43
Max	4.94	4.94
Mean	4.63	4.7
Sigma	0.32	0.25

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.48	4.98
51	4.48	4.98
52	4.48	4.98
53	4.43	4.98
54	4.43	4.98
55	4.94	4.98
56	4.94	4.98
57	4.94	4.97
58	4.94	4.97
59	4.93	4.97
Statistics		
Min	4.43	4.97
Max	4.94	4.98
Mean	4.7	4.98
Sigma	0.25	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB14

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.97	4.98	4.98	4.98
50	4.97	4.98	4.98	4.96	4.94	4.43
51	4.98	4.98	4.98	4.96	4.94	4.29
52	4.98	4.98	4.97	4.96	4.94	4.32
53	4.98	4.98	4.98	4.96	4.95	4.31
54	4.97	4.98	4.98	4.96	4.95	4.32
55	4.98	4.98	4.98	4.97	4.95	4.94
56	4.97	4.98	4.98	4.96	4.95	4.94
57	4.97	4.98	4.98	4.96	4.94	4.94
58	4.97	4.98	4.97	4.96	4.9	4.93
59	4.98	4.98	4.97	4.96	4.95	4.93
Statistics						
Min	4.97	4.98	4.97	4.96	4.9	4.29
Max	4.98	4.98	4.98	4.97	4.95	4.94
Mean	4.98	4.98	4.98	4.96	4.94	4.64
Sigma	0.01	0.0	0.0	0.0	0.02	0.32

Test TST002 : Annealing_24H

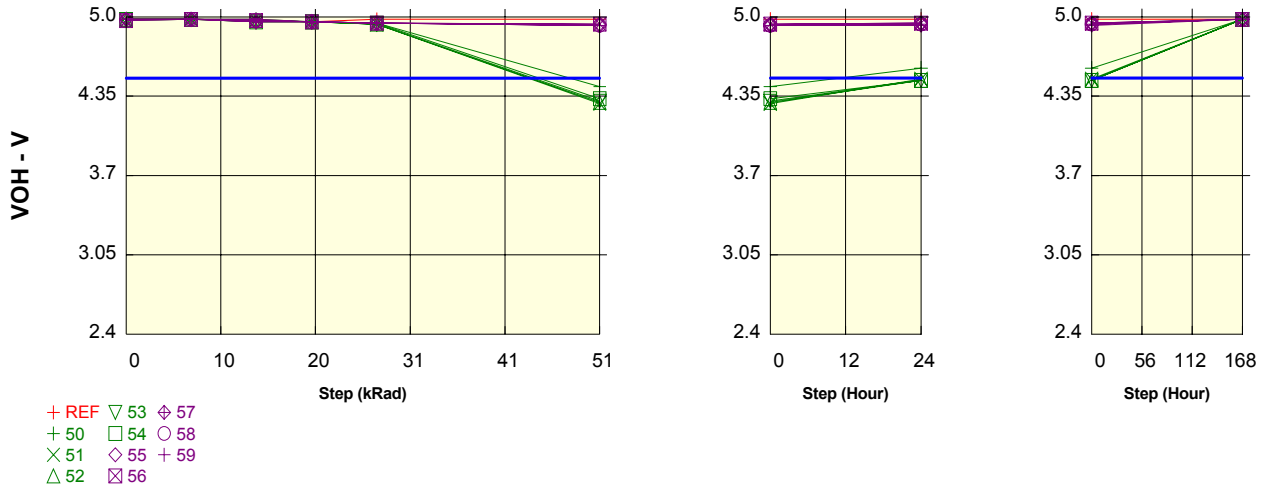
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.58
51	4.29	4.48
52	4.32	4.48
53	4.31	4.48
54	4.32	4.48
55	4.94	4.95
56	4.94	4.94
57	4.94	4.94
58	4.93	4.94
59	4.93	4.93
Statistics		
Min	4.29	4.48
Max	4.94	4.95
Mean	4.64	4.72
Sigma	0.32	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.58	4.98
51	4.48	4.98
52	4.48	4.98
53	4.48	4.98
54	4.48	4.98
55	4.95	4.98
56	4.94	4.98
57	4.94	4.97
58	4.94	4.98
59	4.93	4.98
Statistics		
Min	4.48	4.97
Max	4.95	4.98
Mean	4.72	4.98
Sigma	0.23	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB15

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.97	4.96	4.98	4.98
50	4.98	4.98	4.98	4.96	4.95	4.43
51	4.97	4.98	4.97	4.96	4.94	4.29
52	4.98	4.98	4.97	4.96	4.94	4.3
53	4.98	4.98	4.96	4.96	4.94	4.31
54	4.98	4.98	4.96	4.96	4.95	4.33
55	4.98	4.98	4.96	4.96	4.95	4.94
56	4.97	4.98	4.97	4.96	4.95	4.94
57	4.98	4.98	4.96	4.96	4.95	4.93
58	4.97	4.98	4.97	4.96	4.95	4.93
59	4.98	4.98	4.98	4.96	4.95	4.93
Statistics						
Min	4.97	4.98	4.96	4.96	4.94	4.29
Max	4.98	4.98	4.98	4.96	4.95	4.94
Mean	4.98	4.98	4.97	4.96	4.95	4.63
Sigma	0.0	0.0	0.01	0.0	0.0	0.32

Test TST002 : Annealing_24H

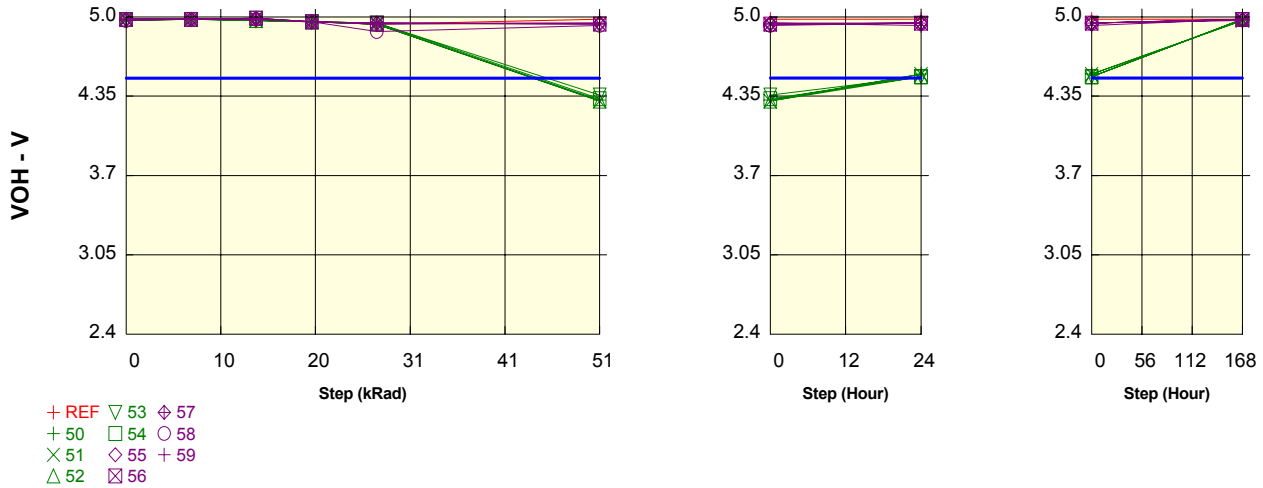
	0 Hour	24 Hour
REF	4.98	4.98
50	4.43	4.58
51	4.29	4.49
52	4.3	4.48
53	4.31	4.48
54	4.33	4.48
55	4.94	4.95
56	4.94	4.95
57	4.93	4.94
58	4.93	4.94
59	4.93	4.93
Statistics		
Min	4.29	4.48
Max	4.94	4.95
Mean	4.63	4.72
Sigma	0.32	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.58	4.98
51	4.49	4.98
52	4.48	4.98
53	4.48	4.98
54	4.48	4.98
55	4.95	4.98
56	4.95	4.98
57	4.94	4.98
58	4.94	4.98
59	4.93	4.98
Statistics		
Min	4.48	4.98
Max	4.95	4.98
Mean	4.72	4.98
Sigma	0.23	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHB16

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.98	4.96	4.94	4.98
50	4.97	4.98	4.98	4.96	4.94	4.32
51	4.98	4.98	4.97	4.96	4.94	4.31
52	4.98	4.98	4.97	4.96	4.94	4.31
53	4.97	4.98	4.97	4.96	4.95	4.36
54	4.98	4.98	4.99	4.96	4.95	4.33
55	4.98	4.98	4.99	4.96	4.95	4.95
56	4.98	4.98	4.99	4.96	4.95	4.94
57	4.98	4.98	4.98	4.96	4.95	4.94
58	4.97	4.98	4.98	4.96	4.88	4.93
59	4.98	4.98	4.99	4.96	4.94	4.95
Statistics						
Min	4.97	4.98	4.97	4.96	4.88	4.31
Max	4.98	4.98	4.99	4.96	4.95	4.95
Mean	4.98	4.98	4.98	4.96	4.94	4.63
Sigma	0.0	0.0	0.01	0.0	0.02	0.33

Test TST002 : Annealing_24H

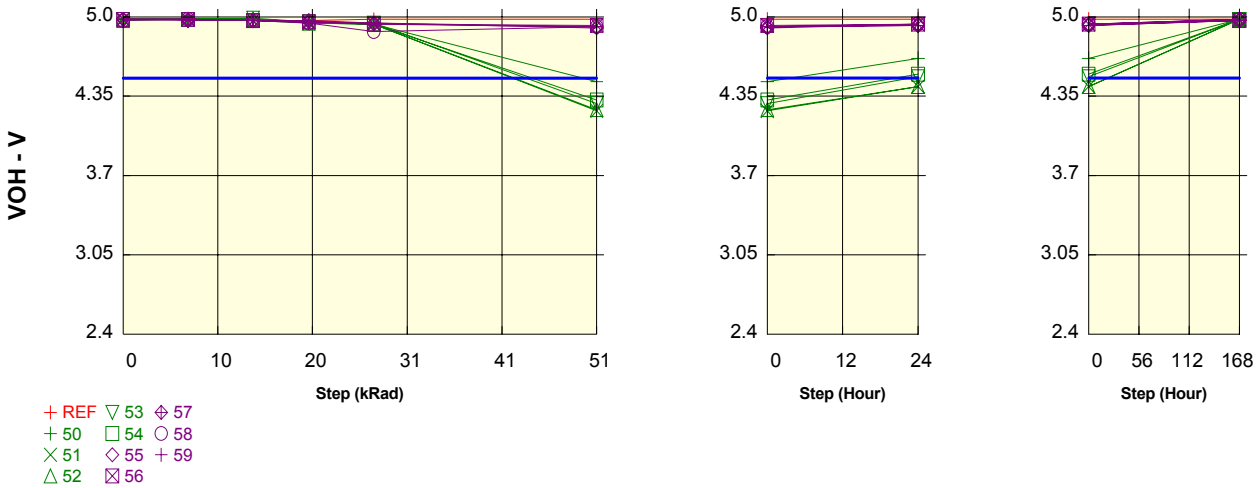
	0 Hour	24 Hour
REF	4.98	4.98
50	4.32	4.53
51	4.31	4.53
52	4.31	4.51
53	4.36	4.51
54	4.33	4.51
55	4.95	4.95
56	4.94	4.95
57	4.94	4.95
58	4.93	4.95
59	4.95	4.93
Statistics		
Min	4.31	4.51
Max	4.95	4.95
Mean	4.63	4.73
Sigma	0.33	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.53	4.97
51	4.53	4.97
52	4.51	4.98
53	4.51	4.98
54	4.51	4.98
55	4.95	4.97
56	4.95	4.98
57	4.95	4.98
58	4.95	4.98
59	4.93	4.98
Statistics		
Min	4.51	4.97
Max	4.95	4.98
Mean	4.73	4.98
Sigma	0.23	0.0

Test conditions : TID
Parameter : Output High Voltage : VOHOTR

Unit : V
Spec Limit Min : 4.5
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	4.98	4.98	4.97	4.97	4.98	4.98
50	4.98	4.98	4.98	4.96	4.94	4.47
51	4.98	4.98	4.97	4.95	4.94	4.23
52	4.97	4.98	4.98	4.95	4.94	4.24
53	4.98	4.98	4.99	4.96	4.95	4.29
54	4.98	4.98	4.97	4.96	4.94	4.32
55	4.98	4.98	4.97	4.97	4.95	4.91
56	4.98	4.98	4.97	4.96	4.94	4.93
57	4.98	4.97	4.97	4.96	4.94	4.92
58	4.97	4.98	4.97	4.95	4.88	4.92
59	4.98	4.98	4.97	4.96	4.95	4.92
Statistics						
Min	4.97	4.97	4.97	4.95	4.88	4.23
Max	4.98	4.98	4.99	4.97	4.95	4.93
Mean	4.98	4.98	4.97	4.96	4.94	4.62
Sigma	0.0	0.0	0.01	0.01	0.02	0.33

Test TST002 : Annealing_24H

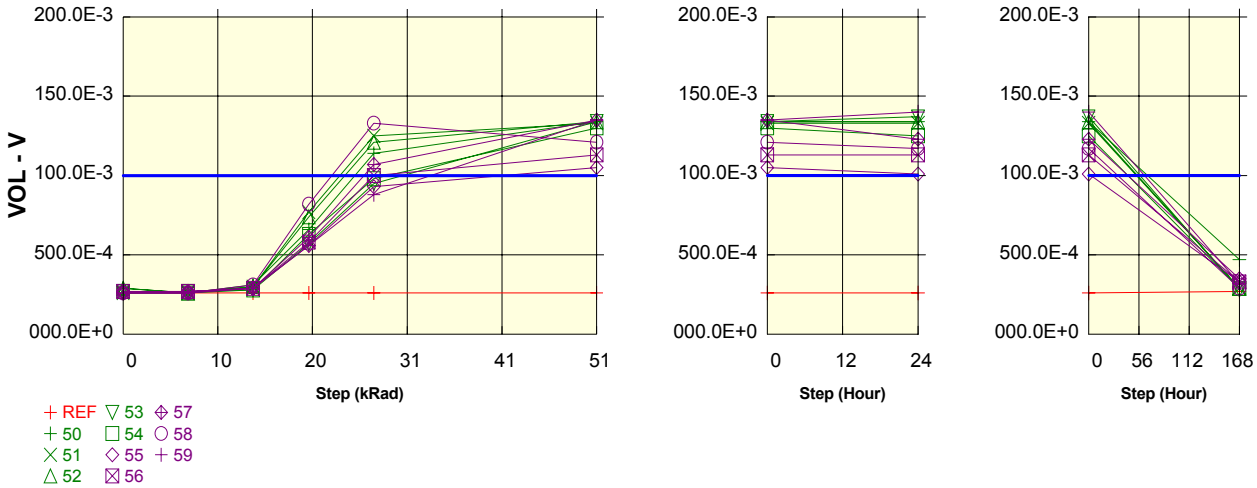
	0 Hour	24 Hour
REF	4.98	4.98
50	4.47	4.66
51	4.23	4.43
52	4.24	4.43
53	4.29	4.51
54	4.32	4.53
55	4.91	4.94
56	4.93	4.94
57	4.92	4.93
58	4.92	4.94
59	4.92	4.93
Statistics		
Min	4.23	4.43
Max	4.93	4.94
Mean	4.62	4.72
Sigma	0.33	0.23

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	4.98	4.98
50	4.66	4.98
51	4.43	4.98
52	4.43	4.98
53	4.51	4.98
54	4.53	4.98
55	4.94	4.98
56	4.94	4.97
57	4.93	4.97
58	4.94	4.98
59	4.93	4.97
Statistics		
Min	4.43	4.97
Max	4.94	4.98
Mean	4.72	4.98
Sigma	0.23	0.0

Test conditions : TID
Parameter : Output Low Voltage : VOLB1

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	260.0E-4	260.0E-4	260.0E-4	260.0E-4	260.0E-4	260.0E-4
50	290.0E-4	260.0E-4	310.0E-4	660.0E-4	114.0E-3	134.0E-3
51	260.0E-4	260.0E-4	300.0E-4	770.0E-4	125.0E-3	133.0E-3
52	290.0E-4	260.0E-4	300.0E-4	740.0E-4	121.0E-3	134.0E-3
53	260.0E-4	270.0E-4	280.0E-4	570.0E-4	950.0E-4	134.0E-3
54	270.0E-4	260.0E-4	280.0E-4	630.0E-4	980.0E-4	130.0E-3
55	270.0E-4	270.0E-4	290.0E-4	560.0E-4	930.0E-4	105.0E-3
56	270.0E-4	270.0E-4	290.0E-4	580.0E-4	100.0E-3	113.0E-3
57	260.0E-4	260.0E-4	290.0E-4	610.0E-4	107.0E-3	135.0E-3
58	260.0E-4	260.0E-4	310.0E-4	820.0E-4	133.0E-3	121.0E-3
59	260.0E-4	260.0E-4	290.0E-4	560.0E-4	880.0E-4	135.0E-3
Statistics						
Min	260.0E-4	260.0E-4	280.0E-4	560.0E-4	880.0E-4	105.0E-3
Max	290.0E-4	270.0E-4	310.0E-4	820.0E-4	133.0E-3	135.0E-3
Mean	269.0E-4	263.0E-4	294.0E-4	650.0E-4	107.4E-3	127.4E-3
Sigma	119.7E-5	483.0E-6	107.5E-5	948.7E-5	151.8E-4	107.2E-4

Test TST002 : Annealing_24H

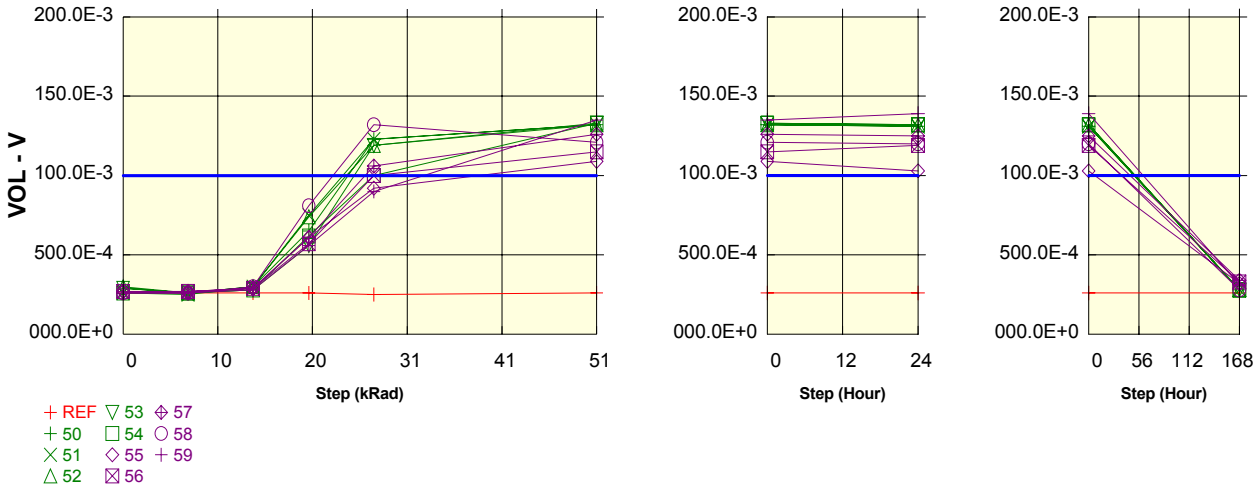
	0 Hour	24 Hour
REF	260.0E-4	260.0E-4
50	134.0E-3	134.0E-3
51	133.0E-3	133.0E-3
52	134.0E-3	134.0E-3
53	134.0E-3	137.0E-3
54	130.0E-3	125.0E-3
55	105.0E-3	101.0E-3
56	113.0E-3	113.0E-3
57	135.0E-3	123.0E-3
58	121.0E-3	117.0E-3
59	135.0E-3	140.0E-3
Statistics		
Min	105.0E-3	101.0E-3
Max	135.0E-3	140.0E-3
Mean	127.4E-3	125.7E-3
Sigma	107.2E-4	123.7E-4

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	270.0E-4
50	134.0E-3	470.0E-4
51	133.0E-3	290.0E-4
52	134.0E-3	290.0E-4
53	137.0E-3	280.0E-4
54	125.0E-3	290.0E-4
55	101.0E-3	330.0E-4
56	113.0E-3	330.0E-4
57	123.0E-3	350.0E-4
58	117.0E-3	290.0E-4
59	140.0E-3	320.0E-4
Statistics		
Min	101.0E-3	280.0E-4
Max	140.0E-3	470.0E-4
Mean	125.7E-3	324.0E-4
Sigma	123.7E-4	564.1E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB2

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	260.0E-4	260.0E-4	260.0E-4	260.0E-4	250.0E-4	260.0E-4
50	290.0E-4	260.0E-4	300.0E-4	650.0E-4	123.0E-3	132.0E-3
51	260.0E-4	250.0E-4	300.0E-4	750.0E-4	123.0E-3	132.0E-3
52	300.0E-4	260.0E-4	300.0E-4	740.0E-4	119.0E-3	132.0E-3
53	290.0E-4	260.0E-4	280.0E-4	560.0E-4	119.0E-3	133.0E-3
54	260.0E-4	260.0E-4	280.0E-4	620.0E-4	100.0E-3	133.0E-3
55	270.0E-4	270.0E-4	290.0E-4	610.0E-4	920.0E-4	109.0E-3
56	270.0E-4	270.0E-4	290.0E-4	570.0E-4	100.0E-3	115.0E-3
57	270.0E-4	260.0E-4	290.0E-4	610.0E-4	106.0E-3	126.0E-3
58	260.0E-4	260.0E-4	300.0E-4	810.0E-4	132.0E-3	121.0E-3
59	260.0E-4	260.0E-4	280.0E-4	560.0E-4	900.0E-4	135.0E-3
Statistics						
Min	260.0E-4	250.0E-4	280.0E-4	560.0E-4	900.0E-4	109.0E-3
Max	300.0E-4	270.0E-4	300.0E-4	810.0E-4	132.0E-3	135.0E-3
Mean	273.0E-4	261.0E-4	291.0E-4	648.0E-4	110.4E-3	126.8E-3
Sigma	149.4E-5	567.6E-6	875.6E-6	884.2E-5	146.2E-4	891.7E-5

Test TST002 : Annealing_24H

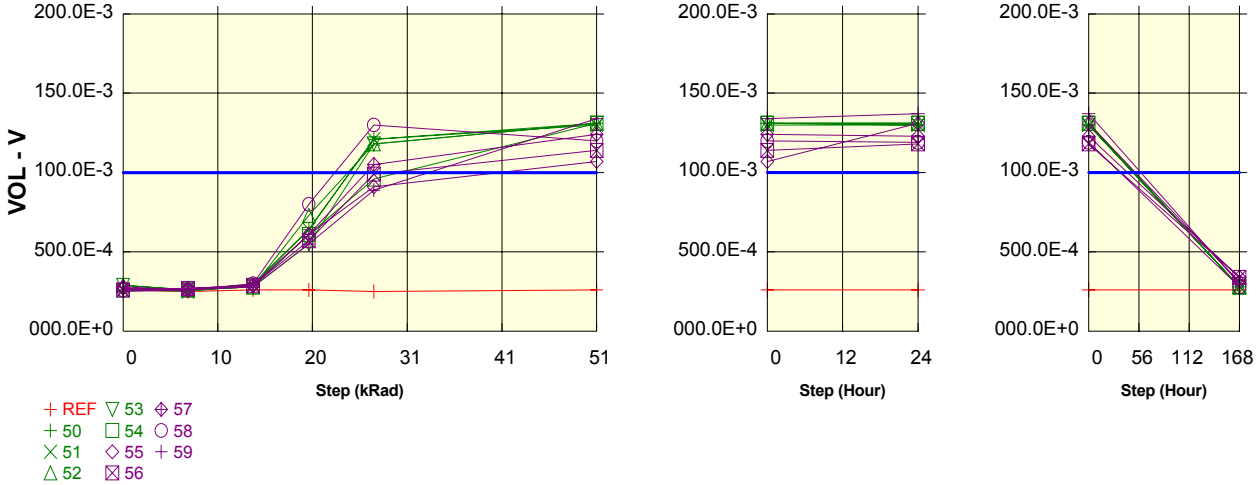
	0 Hour	24 Hour
REF	260.0E-4	260.0E-4
50	132.0E-3	131.0E-3
51	132.0E-3	131.0E-3
52	132.0E-3	132.0E-3
53	133.0E-3	132.0E-3
54	133.0E-3	132.0E-3
55	109.0E-3	103.0E-3
56	115.0E-3	119.0E-3
57	126.0E-3	125.0E-3
58	121.0E-3	120.0E-3
59	135.0E-3	139.0E-3
Statistics		
Min	109.0E-3	103.0E-3
Max	135.0E-3	139.0E-3
Mean	126.8E-3	126.4E-3
Sigma	891.7E-5	102.2E-4

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	260.0E-4
50	131.0E-3	280.0E-4
51	131.0E-3	280.0E-4
52	132.0E-3	280.0E-4
53	132.0E-3	280.0E-4
54	132.0E-3	280.0E-4
55	103.0E-3	320.0E-4
56	119.0E-3	330.0E-4
57	125.0E-3	340.0E-4
58	120.0E-3	280.0E-4
59	139.0E-3	310.0E-4
Statistics		
Min	103.0E-3	280.0E-4
Max	139.0E-3	340.0E-4
Mean	126.4E-3	298.0E-4
Sigma	102.2E-4	244.0E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB3

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	260.0E-4	250.0E-4	260.0E-4	260.0E-4	250.0E-4	260.0E-4
50	260.0E-4	260.0E-4	300.0E-4	640.0E-4	121.0E-3	131.0E-3
51	260.0E-4	250.0E-4	290.0E-4	640.0E-4	121.0E-3	130.0E-3
52	290.0E-4	260.0E-4	280.0E-4	730.0E-4	118.0E-3	131.0E-3
53	290.0E-4	260.0E-4	280.0E-4	550.0E-4	118.0E-3	131.0E-3
54	260.0E-4	260.0E-4	280.0E-4	610.0E-4	960.0E-4	131.0E-3
55	270.0E-4	270.0E-4	290.0E-4	610.0E-4	910.0E-4	107.0E-3
56	260.0E-4	270.0E-4	290.0E-4	570.0E-4	990.0E-4	114.0E-3
57	280.0E-4	260.0E-4	290.0E-4	610.0E-4	105.0E-3	124.0E-3
58	260.0E-4	260.0E-4	300.0E-4	800.0E-4	130.0E-3	120.0E-3
59	250.0E-4	260.0E-4	280.0E-4	550.0E-4	890.0E-4	134.0E-3
Statistics						
Min	250.0E-4	250.0E-4	280.0E-4	550.0E-4	890.0E-4	107.0E-3
Max	290.0E-4	270.0E-4	300.0E-4	800.0E-4	130.0E-3	134.0E-3
Mean	268.0E-4	261.0E-4	288.0E-4	631.0E-4	108.8E-3	125.3E-3
Sigma	139.8E-5	567.6E-6	788.8E-6	793.7E-5	145.3E-4	894.5E-5

Test TST002 : Annealing_24H

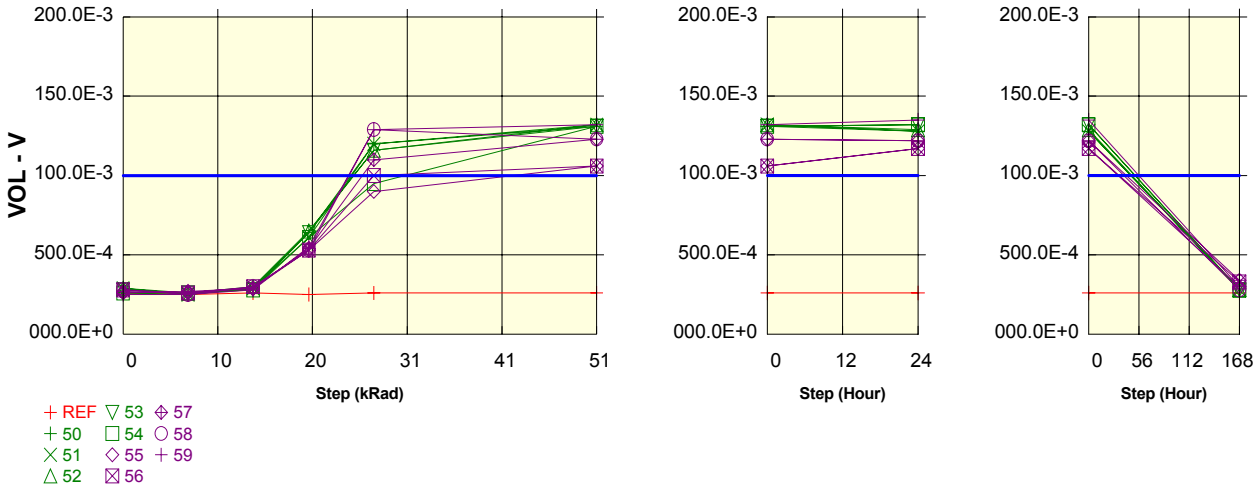
	0 Hour	24 Hour
REF	260.0E-4	260.0E-4
50	131.0E-3	130.0E-3
51	130.0E-3	130.0E-3
52	131.0E-3	131.0E-3
53	131.0E-3	131.0E-3
54	131.0E-3	131.0E-3
55	107.0E-3	131.0E-3
56	114.0E-3	118.0E-3
57	124.0E-3	123.0E-3
58	120.0E-3	119.0E-3
59	134.0E-3	137.0E-3
Statistics		
Min	107.0E-3	118.0E-3
Max	134.0E-3	137.0E-3
Mean	125.3E-3	128.1E-3
Sigma	894.5E-5	606.4E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	260.0E-4
50	130.0E-3	280.0E-4
51	130.0E-3	280.0E-4
52	131.0E-3	280.0E-4
53	131.0E-3	280.0E-4
54	131.0E-3	280.0E-4
55	131.0E-3	310.0E-4
56	118.0E-3	340.0E-4
57	123.0E-3	340.0E-4
58	119.0E-3	280.0E-4
59	137.0E-3	300.0E-4
Statistics		
Min	118.0E-3	280.0E-4
Max	137.0E-3	340.0E-4
Mean	128.1E-3	297.0E-4
Sigma	606.4E-5	249.7E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB4

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	260.0E-4	250.0E-4	260.0E-4	250.0E-4	260.0E-4	260.0E-4
50	260.0E-4	250.0E-4	290.0E-4	640.0E-4	120.0E-3	131.0E-3
51	290.0E-4	250.0E-4	290.0E-4	610.0E-4	120.0E-3	132.0E-3
52	290.0E-4	260.0E-4	300.0E-4	650.0E-4	116.0E-3	132.0E-3
53	280.0E-4	260.0E-4	280.0E-4	640.0E-4	116.0E-3	131.0E-3
54	260.0E-4	260.0E-4	280.0E-4	610.0E-4	950.0E-4	131.0E-3
55	260.0E-4	270.0E-4	290.0E-4	530.0E-4	900.0E-4	106.0E-3
56	280.0E-4	260.0E-4	300.0E-4	530.0E-4	100.0E-3	106.0E-3
57	270.0E-4	260.0E-4	290.0E-4	540.0E-4	110.0E-3	123.0E-3
58	280.0E-4	250.0E-4	300.0E-4	530.0E-4	129.0E-3	123.0E-3
59	250.0E-4	250.0E-4	280.0E-4	550.0E-4	129.0E-3	132.0E-3
Statistics						
Min	250.0E-4	250.0E-4	280.0E-4	530.0E-4	900.0E-4	106.0E-3
Max	290.0E-4	270.0E-4	300.0E-4	650.0E-4	129.0E-3	132.0E-3
Mean	272.0E-4	257.0E-4	290.0E-4	583.0E-4	112.5E-3	124.7E-3
Sigma	139.8E-5	674.9E-6	816.5E-6	514.3E-5	135.7E-4	104.6E-4

Test TST002 : Annealing_24H

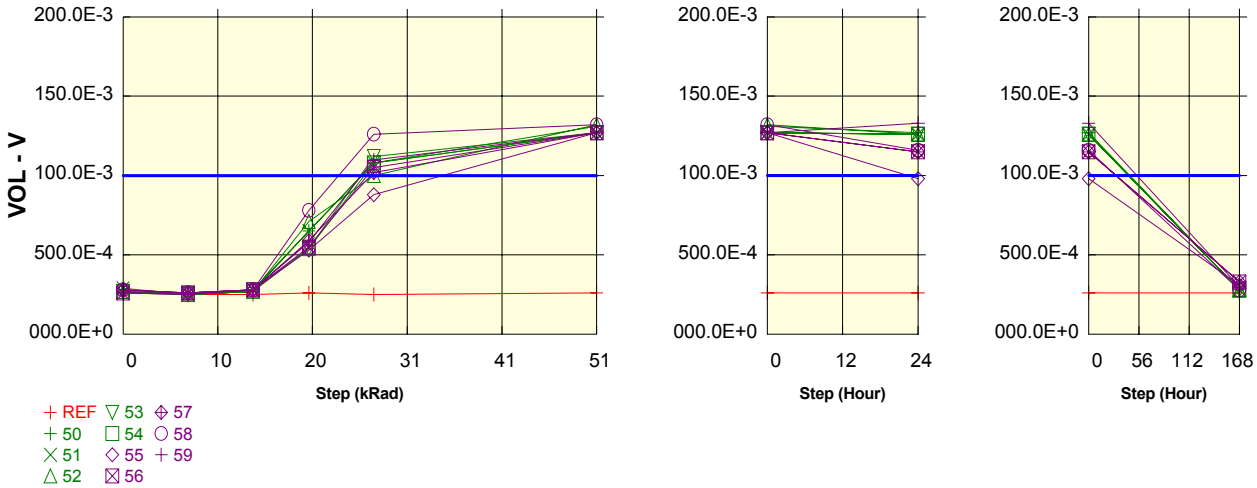
	0 Hour	24 Hour
REF	260.0E-4	260.0E-4
50	131.0E-3	128.0E-3
51	132.0E-3	128.0E-3
52	132.0E-3	129.0E-3
53	131.0E-3	132.0E-3
54	131.0E-3	132.0E-3
55	106.0E-3	117.0E-3
56	106.0E-3	117.0E-3
57	123.0E-3	122.0E-3
58	123.0E-3	122.0E-3
59	132.0E-3	135.0E-3
Statistics		
Min	106.0E-3	117.0E-3
Max	132.0E-3	135.0E-3
Mean	124.7E-3	126.2E-3
Sigma	104.6E-4	635.6E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	260.0E-4
50	128.0E-3	280.0E-4
51	128.0E-3	280.0E-4
52	129.0E-3	280.0E-4
53	132.0E-3	280.0E-4
54	132.0E-3	280.0E-4
55	117.0E-3	300.0E-4
56	117.0E-3	330.0E-4
57	122.0E-3	340.0E-4
58	122.0E-3	280.0E-4
59	135.0E-3	300.0E-4
Statistics		
Min	117.0E-3	280.0E-4
Max	135.0E-3	340.0E-4
Mean	126.2E-3	295.0E-4
Sigma	635.6E-5	227.3E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB5

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	260.0E-4	250.0E-4	250.0E-4	260.0E-4	250.0E-4	260.0E-4
50	260.0E-4	250.0E-4	270.0E-4	650.0E-4	108.0E-3	131.0E-3
51	290.0E-4	250.0E-4	280.0E-4	650.0E-4	108.0E-3	127.0E-3
52	270.0E-4	250.0E-4	270.0E-4	710.0E-4	100.0E-3	132.0E-3
53	270.0E-4	250.0E-4	270.0E-4	540.0E-4	112.0E-3	127.0E-3
54	270.0E-4	260.0E-4	280.0E-4	540.0E-4	108.0E-3	127.0E-3
55	280.0E-4	260.0E-4	280.0E-4	530.0E-4	880.0E-4	127.0E-3
56	260.0E-4	260.0E-4	280.0E-4	550.0E-4	105.0E-3	127.0E-3
57	280.0E-4	260.0E-4	280.0E-4	590.0E-4	102.0E-3	127.0E-3
58	280.0E-4	260.0E-4	280.0E-4	780.0E-4	126.0E-3	132.0E-3
59	260.0E-4	250.0E-4	280.0E-4	580.0E-4	110.0E-3	127.0E-3
Statistics						
Min	260.0E-4	250.0E-4	270.0E-4	530.0E-4	880.0E-4	127.0E-3
Max	290.0E-4	260.0E-4	280.0E-4	780.0E-4	126.0E-3	132.0E-3
Mean	272.0E-4	255.0E-4	277.0E-4	612.0E-4	106.7E-3	128.4E-3
Sigma	103.3E-5	527.0E-6	483.0E-6	837.7E-5	963.8E-5	227.1E-5

Test TST002 : Annealing_24H

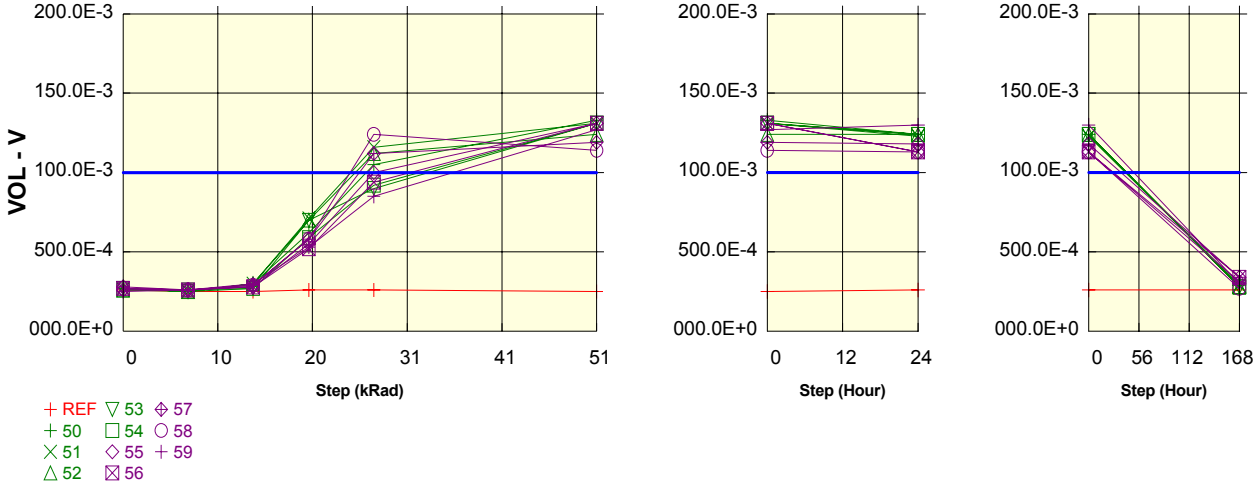
	0 Hour	24 Hour
REF	260.0E-4	260.0E-4
50	131.0E-3	127.0E-3
51	127.0E-3	126.0E-3
52	132.0E-3	126.0E-3
53	127.0E-3	126.0E-3
54	127.0E-3	126.0E-3
55	127.0E-3	980.0E-4
56	127.0E-3	115.0E-3
57	127.0E-3	115.0E-3
58	132.0E-3	116.0E-3
59	127.0E-3	133.0E-3
Statistics		
Min	127.0E-3	980.0E-4
Max	132.0E-3	133.0E-3
Mean	128.4E-3	120.8E-3
Sigma	227.1E-5	100.3E-4

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	260.0E-4
50	127.0E-3	280.0E-4
51	126.0E-3	280.0E-4
52	126.0E-3	280.0E-4
53	126.0E-3	280.0E-4
54	126.0E-3	280.0E-4
55	980.0E-4	310.0E-4
56	115.0E-3	330.0E-4
57	115.0E-3	330.0E-4
58	116.0E-3	280.0E-4
59	133.0E-3	300.0E-4
Statistics		
Min	980.0E-4	280.0E-4
Max	133.0E-3	330.0E-4
Mean	120.8E-3	295.0E-4
Sigma	100.3E-4	212.1E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB6

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	260.0E-4	250.0E-4	250.0E-4	260.0E-4	260.0E-4	250.0E-4
50	270.0E-4	250.0E-4	300.0E-4	620.0E-4	105.0E-3	133.0E-3
51	270.0E-4	250.0E-4	300.0E-4	710.0E-4	116.0E-3	131.0E-3
52	260.0E-4	250.0E-4	300.0E-4	700.0E-4	112.0E-3	124.0E-3
53	270.0E-4	250.0E-4	270.0E-4	700.0E-4	900.0E-4	131.0E-3
54	260.0E-4	260.0E-4	270.0E-4	590.0E-4	920.0E-4	131.0E-3
55	260.0E-4	260.0E-4	280.0E-4	550.0E-4	100.0E-3	131.0E-3
56	270.0E-4	260.0E-4	280.0E-4	520.0E-4	940.0E-4	131.0E-3
57	280.0E-4	260.0E-4	290.0E-4	580.0E-4	112.0E-3	119.0E-3
58	270.0E-4	260.0E-4	290.0E-4	580.0E-4	124.0E-3	114.0E-3
59	250.0E-4	260.0E-4	300.0E-4	530.0E-4	850.0E-4	127.0E-3
Statistics						
Min	250.0E-4	250.0E-4	270.0E-4	520.0E-4	850.0E-4	114.0E-3
Max	280.0E-4	260.0E-4	300.0E-4	710.0E-4	124.0E-3	133.0E-3
Mean	266.0E-4	256.0E-4	288.0E-4	608.0E-4	103.0E-3	127.2E-3
Sigma	843.3E-6	516.4E-6	122.9E-5	719.3E-5	128.2E-4	630.3E-5

Test TST002 : Annealing_24H

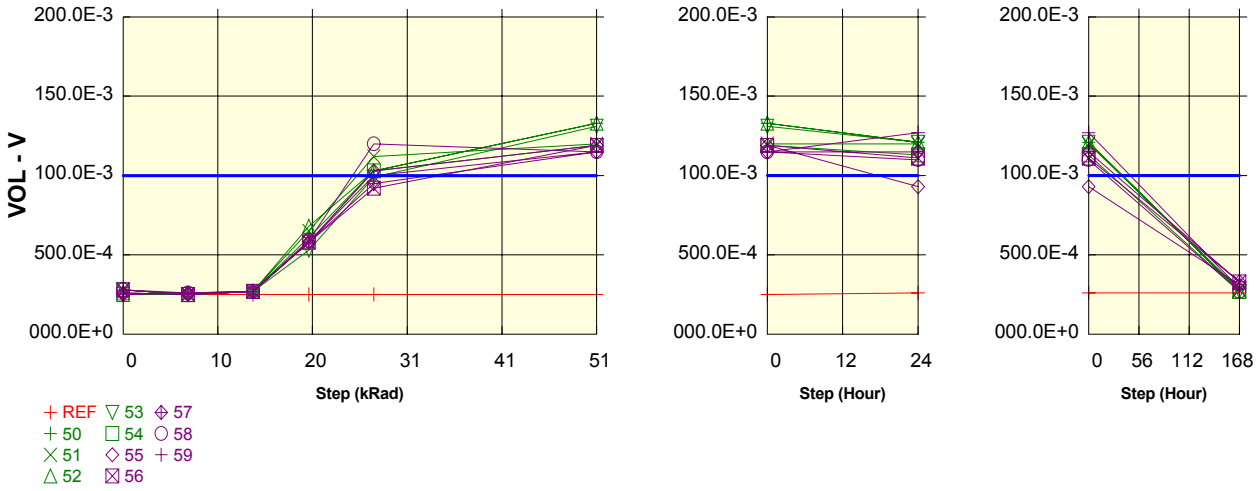
	0 Hour	24 Hour
REF	250.0E-4	260.0E-4
50	133.0E-3	124.0E-3
51	131.0E-3	123.0E-3
52	124.0E-3	124.0E-3
53	131.0E-3	124.0E-3
54	131.0E-3	124.0E-3
55	131.0E-3	113.0E-3
56	131.0E-3	113.0E-3
57	119.0E-3	118.0E-3
58	114.0E-3	113.0E-3
59	127.0E-3	130.0E-3
Statistics		
Min	114.0E-3	113.0E-3
Max	133.0E-3	130.0E-3
Mean	127.2E-3	120.6E-3
Sigma	630.3E-5	596.7E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	260.0E-4
50	124.0E-3	290.0E-4
51	123.0E-3	290.0E-4
52	124.0E-3	280.0E-4
53	124.0E-3	280.0E-4
54	124.0E-3	280.0E-4
55	113.0E-3	310.0E-4
56	113.0E-3	340.0E-4
57	118.0E-3	340.0E-4
58	113.0E-3	270.0E-4
59	130.0E-3	300.0E-4
Statistics		
Min	113.0E-3	270.0E-4
Max	130.0E-3	340.0E-4
Mean	120.6E-3	298.0E-4
Sigma	596.7E-5	248.6E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB7

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	250.0E-4	250.0E-4	250.0E-4	250.0E-4	250.0E-4	250.0E-4
50	280.0E-4	250.0E-4	270.0E-4	610.0E-4	103.0E-3	133.0E-3
51	280.0E-4	250.0E-4	270.0E-4	650.0E-4	112.0E-3	120.0E-3
52	260.0E-4	250.0E-4	270.0E-4	680.0E-4	103.0E-3	133.0E-3
53	280.0E-4	250.0E-4	270.0E-4	530.0E-4	990.0E-4	131.0E-3
54	250.0E-4	250.0E-4	270.0E-4	580.0E-4	103.0E-3	119.0E-3
55	260.0E-4	250.0E-4	270.0E-4	580.0E-4	103.0E-3	119.0E-3
56	280.0E-4	250.0E-4	270.0E-4	580.0E-4	920.0E-4	119.0E-3
57	250.0E-4	260.0E-4	270.0E-4	580.0E-4	950.0E-4	115.0E-3
58	280.0E-4	260.0E-4	270.0E-4	590.0E-4	120.0E-3	115.0E-3
59	250.0E-4	260.0E-4	270.0E-4	580.0E-4	100.0E-3	115.0E-3
Statistics						
Min	250.0E-4	250.0E-4	270.0E-4	530.0E-4	920.0E-4	115.0E-3
Max	280.0E-4	260.0E-4	270.0E-4	680.0E-4	120.0E-3	133.0E-3
Mean	267.0E-4	253.0E-4	270.0E-4	596.0E-4	103.0E-3	121.9E-3
Sigma	141.8E-5	483.0E-6	620.9E-12	419.5E-5	802.8E-5	746.0E-5

Test TST002 : Annealing_24H

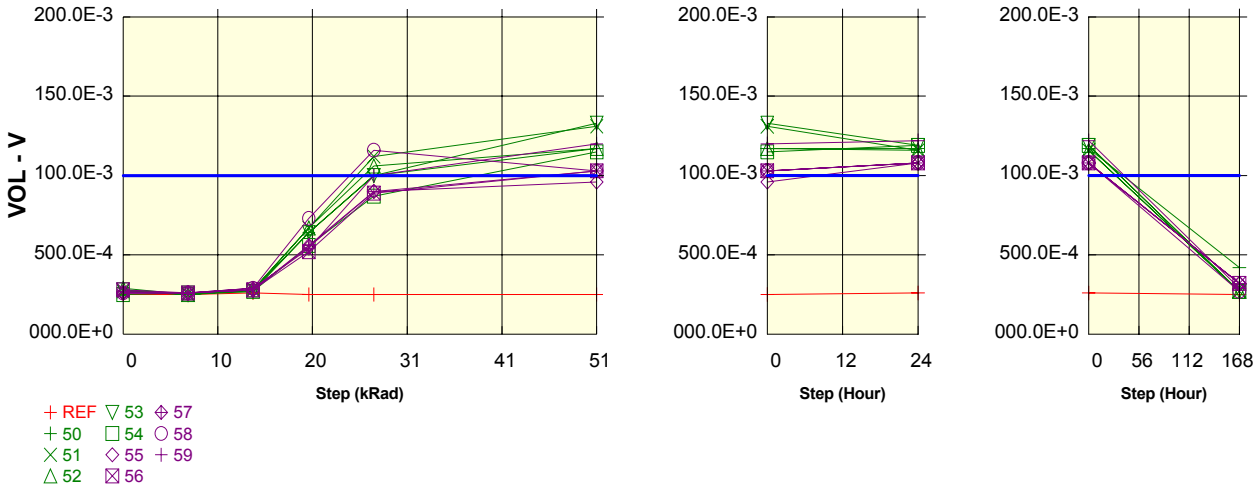
	0 Hour	24 Hour
REF	250.0E-4	260.0E-4
50	133.0E-3	121.0E-3
51	120.0E-3	120.0E-3
52	133.0E-3	121.0E-3
53	131.0E-3	121.0E-3
54	119.0E-3	113.0E-3
55	119.0E-3	930.0E-4
56	119.0E-3	111.0E-3
57	115.0E-3	115.0E-3
58	115.0E-3	110.0E-3
59	115.0E-3	127.0E-3
Statistics		
Min	115.0E-3	930.0E-4
Max	133.0E-3	127.0E-3
Mean	121.9E-3	115.2E-3
Sigma	746.0E-5	946.1E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	260.0E-4
50	121.0E-3	280.0E-4
51	120.0E-3	280.0E-4
52	121.0E-3	270.0E-4
53	121.0E-3	270.0E-4
54	113.0E-3	270.0E-4
55	930.0E-4	310.0E-4
56	111.0E-3	330.0E-4
57	115.0E-3	330.0E-4
58	110.0E-3	270.0E-4
59	127.0E-3	290.0E-4
Statistics		
Min	930.0E-4	270.0E-4
Max	127.0E-3	330.0E-4
Mean	115.2E-3	290.0E-4
Sigma	946.1E-5	244.9E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB8

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	250.0E-4	250.0E-4	260.0E-4	250.0E-4	250.0E-4	250.0E-4
50	270.0E-4	250.0E-4	280.0E-4	640.0E-4	100.0E-3	117.0E-3
51	270.0E-4	250.0E-4	280.0E-4	670.0E-4	112.0E-3	131.0E-3
52	290.0E-4	250.0E-4	280.0E-4	670.0E-4	106.0E-3	117.0E-3
53	280.0E-4	250.0E-4	270.0E-4	640.0E-4	100.0E-3	133.0E-3
54	250.0E-4	260.0E-4	270.0E-4	560.0E-4	870.0E-4	115.0E-3
55	260.0E-4	260.0E-4	280.0E-4	550.0E-4	900.0E-4	960.0E-4
56	280.0E-4	260.0E-4	280.0E-4	520.0E-4	890.0E-4	103.0E-3
57	260.0E-4	260.0E-4	280.0E-4	560.0E-4	900.0E-4	103.0E-3
58	260.0E-4	260.0E-4	290.0E-4	730.0E-4	116.0E-3	103.0E-3
59	270.0E-4	260.0E-4	290.0E-4	540.0E-4	100.0E-3	120.0E-3
Statistics						
Min	250.0E-4	250.0E-4	270.0E-4	520.0E-4	870.0E-4	960.0E-4
Max	290.0E-4	260.0E-4	290.0E-4	730.0E-4	116.0E-3	133.0E-3
Mean	269.0E-4	256.0E-4	280.0E-4	608.0E-4	990.0E-4	113.8E-3
Sigma	119.7E-5	516.4E-6	666.7E-6	706.8E-5	100.9E-4	124.3E-4

Test TST002 : Annealing_24H

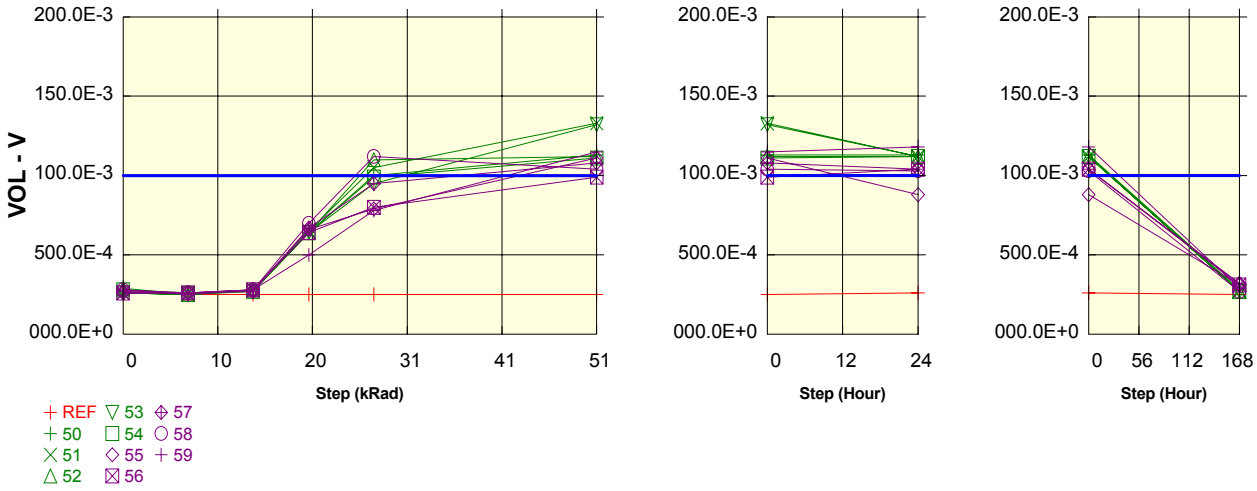
	0 Hour	24 Hour
REF	250.0E-4	260.0E-4
50	117.0E-3	117.0E-3
51	131.0E-3	116.0E-3
52	117.0E-3	116.0E-3
53	133.0E-3	119.0E-3
54	115.0E-3	119.0E-3
55	960.0E-4	108.0E-3
56	103.0E-3	108.0E-3
57	103.0E-3	108.0E-3
58	103.0E-3	108.0E-3
59	120.0E-3	122.0E-3
Statistics		
Min	960.0E-4	108.0E-3
Max	133.0E-3	122.0E-3
Mean	113.8E-3	114.1E-3
Sigma	124.3E-4	552.7E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	250.0E-4
50	117.0E-3	420.0E-4
51	116.0E-3	270.0E-4
52	116.0E-3	270.0E-4
53	119.0E-3	270.0E-4
54	119.0E-3	270.0E-4
55	108.0E-3	320.0E-4
56	108.0E-3	320.0E-4
57	108.0E-3	320.0E-4
58	108.0E-3	270.0E-4
59	122.0E-3	290.0E-4
Statistics		
Min	108.0E-3	270.0E-4
Max	122.0E-3	420.0E-4
Mean	114.1E-3	302.0E-4
Sigma	552.7E-5	473.3E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB9

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	270.0E-4	250.0E-4	250.0E-4	250.0E-4	250.0E-4	250.0E-4
50	260.0E-4	250.0E-4	280.0E-4	640.0E-4	100.0E-3	113.0E-3
51	260.0E-4	250.0E-4	280.0E-4	650.0E-4	105.0E-3	133.0E-3
52	290.0E-4	250.0E-4	280.0E-4	640.0E-4	110.0E-3	112.0E-3
53	260.0E-4	250.0E-4	270.0E-4	640.0E-4	950.0E-4	132.0E-3
54	280.0E-4	260.0E-4	270.0E-4	640.0E-4	990.0E-4	111.0E-3
55	260.0E-4	260.0E-4	280.0E-4	660.0E-4	790.0E-4	111.0E-3
56	260.0E-4	260.0E-4	280.0E-4	640.0E-4	800.0E-4	990.0E-4
57	270.0E-4	260.0E-4	270.0E-4	670.0E-4	950.0E-4	108.0E-3
58	280.0E-4	260.0E-4	280.0E-4	700.0E-4	112.0E-3	104.0E-3
59	280.0E-4	250.0E-4	280.0E-4	500.0E-4	780.0E-4	115.0E-3
Statistics						
Min	260.0E-4	250.0E-4	270.0E-4	500.0E-4	780.0E-4	990.0E-4
Max	290.0E-4	260.0E-4	280.0E-4	700.0E-4	112.0E-3	133.0E-3
Mean	270.0E-4	255.0E-4	277.0E-4	638.0E-4	953.0E-4	113.8E-3
Sigma	115.5E-5	527.0E-6	483.0E-6	522.4E-5	125.8E-4	109.0E-4

Test TST002 : Annealing_24H

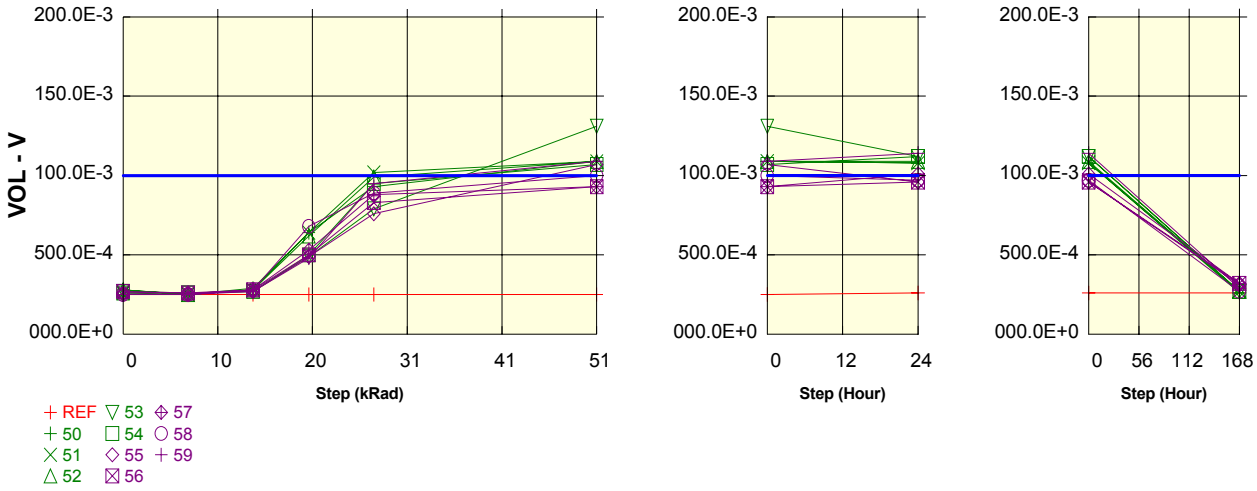
	0 Hour	24 Hour
REF	250.0E-4	260.0E-4
50	113.0E-3	113.0E-3
51	133.0E-3	112.0E-3
52	112.0E-3	112.0E-3
53	132.0E-3	112.0E-3
54	111.0E-3	112.0E-3
55	111.0E-3	880.0E-4
56	990.0E-4	104.0E-3
57	108.0E-3	104.0E-3
58	104.0E-3	103.0E-3
59	115.0E-3	118.0E-3
Statistics		
Min	990.0E-4	880.0E-4
Max	133.0E-3	118.0E-3
Mean	113.8E-3	107.8E-3
Sigma	109.0E-4	847.0E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	250.0E-4
50	113.0E-3	280.0E-4
51	112.0E-3	270.0E-4
52	112.0E-3	270.0E-4
53	112.0E-3	270.0E-4
54	112.0E-3	270.0E-4
55	880.0E-4	310.0E-4
56	104.0E-3	310.0E-4
57	104.0E-3	320.0E-4
58	103.0E-3	270.0E-4
59	118.0E-3	290.0E-4
Statistics		
Min	880.0E-4	270.0E-4
Max	118.0E-3	320.0E-4
Mean	107.8E-3	286.0E-4
Sigma	847.0E-5	201.1E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB10

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	250.0E-4	250.0E-4	250.0E-4	250.0E-4	250.0E-4	250.0E-4
50	280.0E-4	250.0E-4	290.0E-4	640.0E-4	930.0E-4	109.0E-3
51	260.0E-4	250.0E-4	280.0E-4	640.0E-4	102.0E-3	109.0E-3
52	280.0E-4	250.0E-4	280.0E-4	620.0E-4	990.0E-4	109.0E-3
53	270.0E-4	260.0E-4	270.0E-4	490.0E-4	790.0E-4	131.0E-3
54	260.0E-4	260.0E-4	270.0E-4	500.0E-4	950.0E-4	107.0E-3
55	260.0E-4	260.0E-4	270.0E-4	490.0E-4	760.0E-4	107.0E-3
56	270.0E-4	260.0E-4	280.0E-4	500.0E-4	830.0E-4	930.0E-4
57	250.0E-4	250.0E-4	280.0E-4	530.0E-4	880.0E-4	930.0E-4
58	250.0E-4	250.0E-4	280.0E-4	680.0E-4	890.0E-4	100.0E-3
59	250.0E-4	250.0E-4	270.0E-4	480.0E-4	950.0E-4	109.0E-3
Statistics						
Min	250.0E-4	250.0E-4	270.0E-4	480.0E-4	760.0E-4	930.0E-4
Max	280.0E-4	260.0E-4	290.0E-4	680.0E-4	102.0E-3	131.0E-3
Mean	263.0E-4	254.0E-4	277.0E-4	557.0E-4	899.0E-4	106.7E-3
Sigma	116.0E-5	516.4E-6	674.9E-6	781.8E-5	853.0E-5	107.1E-4

Test TST002 : Annealing_24H

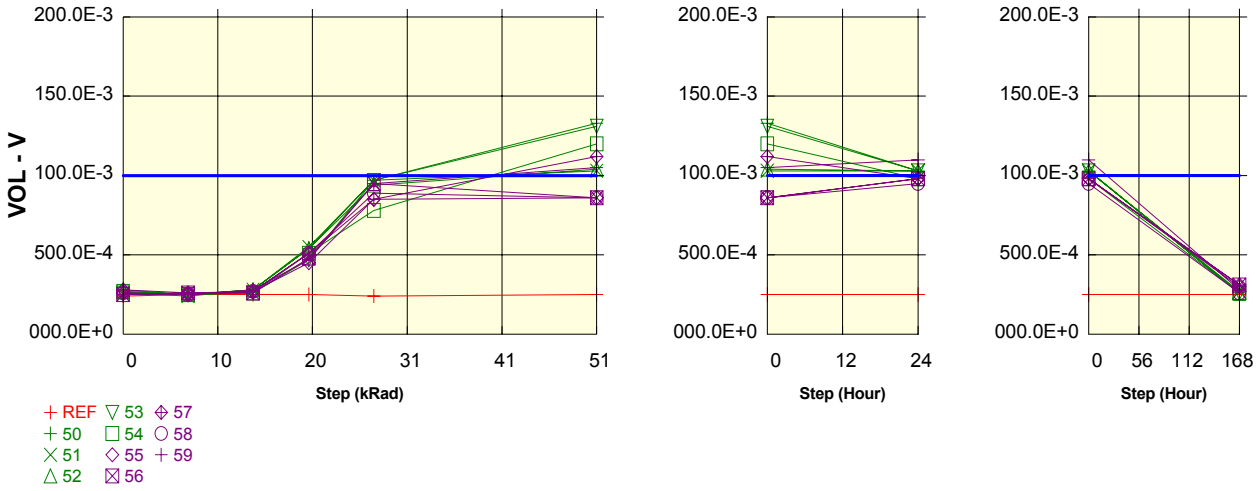
	0 Hour	24 Hour
REF	250.0E-4	260.0E-4
50	109.0E-3	108.0E-3
51	109.0E-3	108.0E-3
52	109.0E-3	109.0E-3
53	131.0E-3	112.0E-3
54	107.0E-3	112.0E-3
55	107.0E-3	960.0E-4
56	930.0E-4	960.0E-4
57	930.0E-4	101.0E-3
58	100.0E-3	970.0E-4
59	109.0E-3	114.0E-3
Statistics		
Min	930.0E-4	960.0E-4
Max	131.0E-3	114.0E-3
Mean	106.7E-3	105.3E-3
Sigma	107.1E-4	710.3E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	260.0E-4	260.0E-4
50	108.0E-3	260.0E-4
51	108.0E-3	270.0E-4
52	109.0E-3	270.0E-4
53	112.0E-3	270.0E-4
54	112.0E-3	270.0E-4
55	960.0E-4	310.0E-4
56	960.0E-4	320.0E-4
57	101.0E-3	320.0E-4
58	970.0E-4	270.0E-4
59	114.0E-3	290.0E-4
Statistics		
Min	960.0E-4	260.0E-4
Max	114.0E-3	320.0E-4
Mean	105.3E-3	285.0E-4
Sigma	710.3E-5	232.1E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB11

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	240.0E-4	250.0E-4	250.0E-4	250.0E-4	240.0E-4	250.0E-4
50	280.0E-4	250.0E-4	280.0E-4	540.0E-4	970.0E-4	133.0E-3
51	260.0E-4	240.0E-4	280.0E-4	550.0E-4	970.0E-4	103.0E-3
52	270.0E-4	250.0E-4	280.0E-4	540.0E-4	940.0E-4	104.0E-3
53	260.0E-4	250.0E-4	260.0E-4	470.0E-4	970.0E-4	131.0E-3
54	270.0E-4	250.0E-4	260.0E-4	510.0E-4	780.0E-4	120.0E-3
55	260.0E-4	250.0E-4	270.0E-4	450.0E-4	850.0E-4	860.0E-4
56	250.0E-4	260.0E-4	260.0E-4	480.0E-4	950.0E-4	860.0E-4
57	280.0E-4	260.0E-4	270.0E-4	510.0E-4	850.0E-4	112.0E-3
58	260.0E-4	250.0E-4	270.0E-4	510.0E-4	890.0E-4	860.0E-4
59	250.0E-4	250.0E-4	280.0E-4	470.0E-4	950.0E-4	105.0E-3
Statistics						
Min	250.0E-4	240.0E-4	260.0E-4	450.0E-4	780.0E-4	860.0E-4
Max	280.0E-4	260.0E-4	280.0E-4	550.0E-4	970.0E-4	133.0E-3
Mean	264.0E-4	251.0E-4	271.0E-4	503.0E-4	912.0E-4	106.6E-3
Sigma	107.5E-5	567.6E-6	875.6E-6	343.3E-5	661.3E-5	176.3E-4

Test TST002 : Annealing_24H

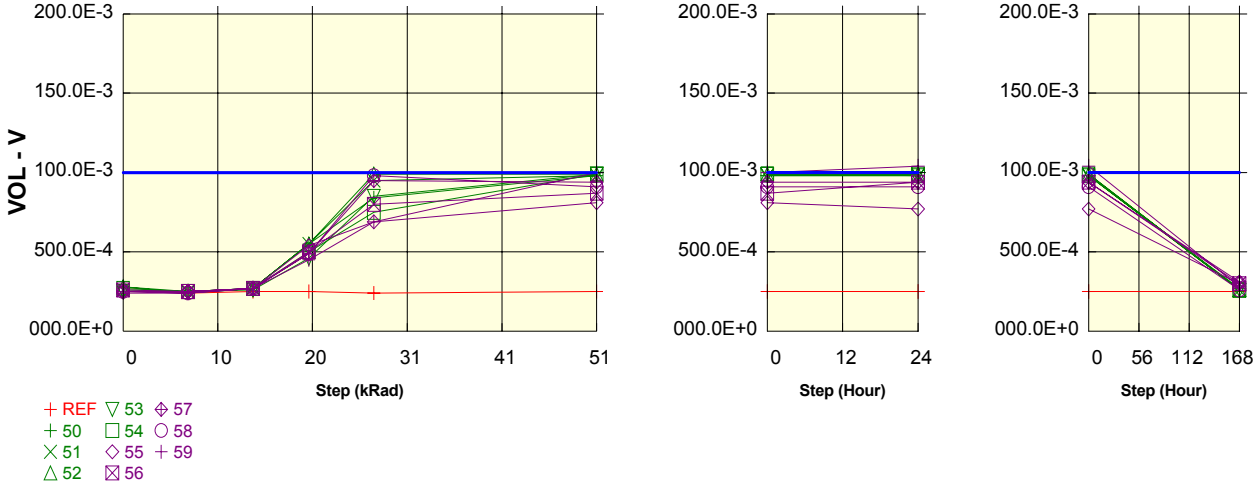
	0 Hour	24 Hour
REF	250.0E-4	250.0E-4
50	133.0E-3	103.0E-3
51	103.0E-3	103.0E-3
52	104.0E-3	103.0E-3
53	131.0E-3	103.0E-3
54	120.0E-3	980.0E-4
55	860.0E-4	980.0E-4
56	860.0E-4	980.0E-4
57	112.0E-3	980.0E-4
58	860.0E-4	950.0E-4
59	105.0E-3	110.0E-3
Statistics		
Min	860.0E-4	950.0E-4
Max	133.0E-3	110.0E-3
Mean	106.6E-3	100.9E-3
Sigma	176.3E-4	433.2E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	250.0E-4	250.0E-4
50	103.0E-3	260.0E-4
51	103.0E-3	270.0E-4
52	103.0E-3	260.0E-4
53	103.0E-3	260.0E-4
54	980.0E-4	260.0E-4
55	980.0E-4	300.0E-4
56	980.0E-4	310.0E-4
57	980.0E-4	310.0E-4
58	950.0E-4	260.0E-4
59	110.0E-3	280.0E-4
Statistics		
Min	950.0E-4	260.0E-4
Max	110.0E-3	310.0E-4
Mean	100.9E-3	277.0E-4
Sigma	433.2E-5	216.3E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB12

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	280.0E-4	240.0E-4	250.0E-4	250.0E-4	240.0E-4	250.0E-4
50	280.0E-4	240.0E-4	270.0E-4	550.0E-4	840.0E-4	980.0E-4
51	260.0E-4	250.0E-4	270.0E-4	550.0E-4	950.0E-4	980.0E-4
52	280.0E-4	250.0E-4	270.0E-4	550.0E-4	990.0E-4	990.0E-4
53	250.0E-4	250.0E-4	260.0E-4	460.0E-4	850.0E-4	990.0E-4
54	270.0E-4	250.0E-4	270.0E-4	500.0E-4	750.0E-4	990.0E-4
55	250.0E-4	250.0E-4	270.0E-4	540.0E-4	690.0E-4	810.0E-4
56	260.0E-4	250.0E-4	270.0E-4	500.0E-4	800.0E-4	870.0E-4
57	250.0E-4	250.0E-4	270.0E-4	490.0E-4	950.0E-4	940.0E-4
58	250.0E-4	240.0E-4	270.0E-4	490.0E-4	980.0E-4	910.0E-4
59	240.0E-4	240.0E-4	270.0E-4	450.0E-4	690.0E-4	100.0E-3
Statistics						
Min	240.0E-4	240.0E-4	260.0E-4	450.0E-4	690.0E-4	810.0E-4
Max	280.0E-4	250.0E-4	270.0E-4	550.0E-4	990.0E-4	100.0E-3
Mean	259.0E-4	247.0E-4	269.0E-4	508.0E-4	849.0E-4	946.0E-4
Sigma	137.0E-5	483.0E-6	316.2E-6	376.5E-5	115.6E-4	638.1E-5

Test TST002 : Annealing_24H

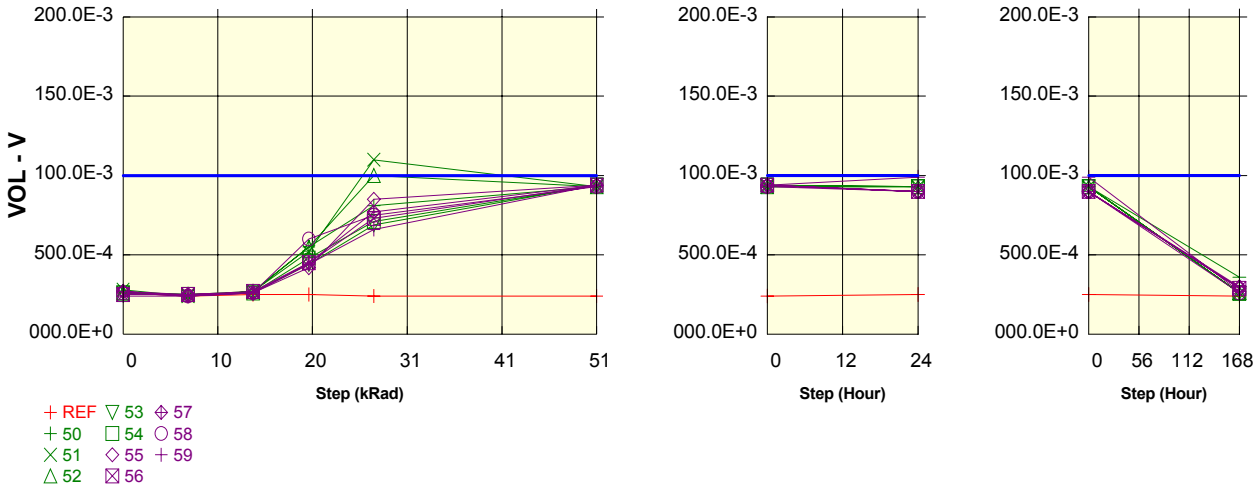
	0 Hour	24 Hour
REF	250.0E-4	250.0E-4
50	980.0E-4	980.0E-4
51	980.0E-4	980.0E-4
52	990.0E-4	990.0E-4
53	990.0E-4	990.0E-4
54	990.0E-4	980.0E-4
55	810.0E-4	770.0E-4
56	870.0E-4	940.0E-4
57	940.0E-4	940.0E-4
58	910.0E-4	910.0E-4
59	100.0E-3	104.0E-3
Statistics		
Min	810.0E-4	770.0E-4
Max	100.0E-3	104.0E-3
Mean	946.0E-4	952.0E-4
Sigma	638.1E-5	731.5E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	250.0E-4	250.0E-4
50	980.0E-4	270.0E-4
51	980.0E-4	260.0E-4
52	990.0E-4	260.0E-4
53	990.0E-4	260.0E-4
54	980.0E-4	260.0E-4
55	770.0E-4	300.0E-4
56	940.0E-4	300.0E-4
57	940.0E-4	310.0E-4
58	910.0E-4	260.0E-4
59	104.0E-3	280.0E-4
Statistics		
Min	770.0E-4	260.0E-4
Max	104.0E-3	310.0E-4
Mean	952.0E-4	276.0E-4
Sigma	731.5E-5	201.1E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB13

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	260.0E-4	240.0E-4	250.0E-4	250.0E-4	240.0E-4	240.0E-4
50	270.0E-4	240.0E-4	270.0E-4	550.0E-4	810.0E-4	930.0E-4
51	280.0E-4	240.0E-4	270.0E-4	520.0E-4	110.0E-3	930.0E-4
52	260.0E-4	250.0E-4	270.0E-4	550.0E-4	100.0E-3	930.0E-4
53	260.0E-4	250.0E-4	260.0E-4	440.0E-4	690.0E-4	940.0E-4
54	260.0E-4	250.0E-4	260.0E-4	480.0E-4	710.0E-4	940.0E-4
55	270.0E-4	250.0E-4	260.0E-4	420.0E-4	850.0E-4	940.0E-4
56	250.0E-4	250.0E-4	270.0E-4	450.0E-4	730.0E-4	940.0E-4
57	270.0E-4	240.0E-4	260.0E-4	450.0E-4	770.0E-4	940.0E-4
58	260.0E-4	240.0E-4	260.0E-4	600.0E-4	750.0E-4	930.0E-4
59	240.0E-4	240.0E-4	260.0E-4	440.0E-4	660.0E-4	940.0E-4
Statistics						
Min	240.0E-4	240.0E-4	260.0E-4	420.0E-4	660.0E-4	930.0E-4
Max	280.0E-4	250.0E-4	270.0E-4	600.0E-4	110.0E-3	940.0E-4
Mean	262.0E-4	245.0E-4	264.0E-4	490.0E-4	807.0E-4	936.0E-4
Sigma	113.5E-5	527.0E-6	516.4E-6	609.2E-5	141.5E-4	516.4E-6

Test TST002 : Annealing_24H

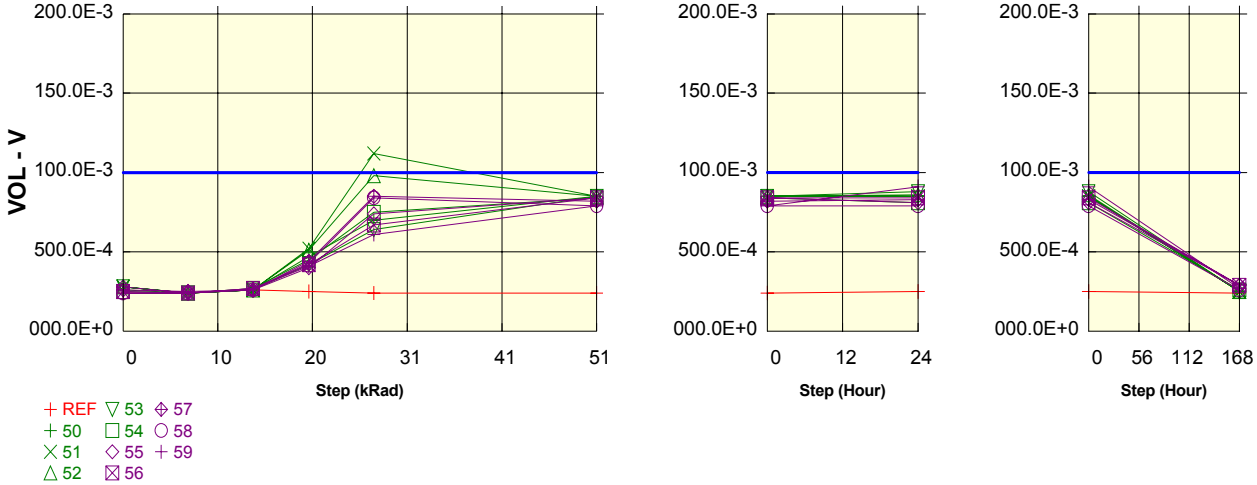
	0 Hour	24 Hour
REF	240.0E-4	250.0E-4
50	930.0E-4	930.0E-4
51	930.0E-4	930.0E-4
52	930.0E-4	930.0E-4
53	940.0E-4	930.0E-4
54	940.0E-4	930.0E-4
55	940.0E-4	900.0E-4
56	940.0E-4	900.0E-4
57	940.0E-4	900.0E-4
58	930.0E-4	900.0E-4
59	940.0E-4	990.0E-4
Statistics		
Min	930.0E-4	900.0E-4
Max	940.0E-4	990.0E-4
Mean	936.0E-4	924.0E-4
Sigma	516.4E-6	275.7E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	250.0E-4	240.0E-4
50	930.0E-4	360.0E-4
51	930.0E-4	260.0E-4
52	930.0E-4	260.0E-4
53	930.0E-4	260.0E-4
54	930.0E-4	260.0E-4
55	900.0E-4	290.0E-4
56	900.0E-4	290.0E-4
57	900.0E-4	300.0E-4
58	900.0E-4	260.0E-4
59	990.0E-4	270.0E-4
Statistics		
Min	900.0E-4	260.0E-4
Max	990.0E-4	360.0E-4
Mean	924.0E-4	281.0E-4
Sigma	275.7E-5	317.8E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB14

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	240.0E-4	240.0E-4	260.0E-4	250.0E-4	240.0E-4	240.0E-4
50	260.0E-4	240.0E-4	260.0E-4	470.0E-4	700.0E-4	850.0E-4
51	280.0E-4	240.0E-4	260.0E-4	520.0E-4	112.0E-3	850.0E-4
52	280.0E-4	240.0E-4	260.0E-4	510.0E-4	980.0E-4	850.0E-4
53	280.0E-4	240.0E-4	260.0E-4	420.0E-4	640.0E-4	850.0E-4
54	250.0E-4	240.0E-4	270.0E-4	450.0E-4	750.0E-4	840.0E-4
55	280.0E-4	240.0E-4	260.0E-4	400.0E-4	740.0E-4	840.0E-4
56	250.0E-4	240.0E-4	270.0E-4	420.0E-4	670.0E-4	840.0E-4
57	260.0E-4	250.0E-4	260.0E-4	440.0E-4	850.0E-4	820.0E-4
58	240.0E-4	240.0E-4	260.0E-4	430.0E-4	840.0E-4	790.0E-4
59	240.0E-4	240.0E-4	270.0E-4	410.0E-4	610.0E-4	790.0E-4
Statistics						
Min	240.0E-4	240.0E-4	260.0E-4	400.0E-4	610.0E-4	790.0E-4
Max	280.0E-4	250.0E-4	270.0E-4	520.0E-4	112.0E-3	850.0E-4
Mean	262.0E-4	241.0E-4	263.0E-4	447.0E-4	790.0E-4	832.0E-4
Sigma	168.7E-5	316.2E-6	483.0E-6	411.1E-5	160.8E-4	239.4E-5

Test TST002 : Annealing_24H

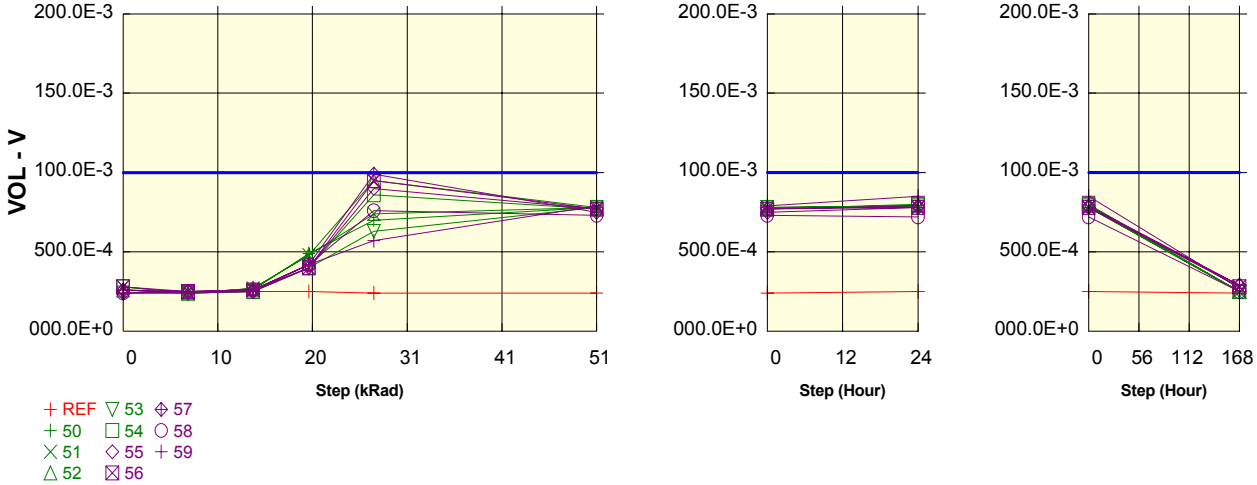
	0 Hour	24 Hour
REF	240.0E-4	250.0E-4
50	850.0E-4	850.0E-4
51	850.0E-4	850.0E-4
52	850.0E-4	860.0E-4
53	850.0E-4	880.0E-4
54	840.0E-4	810.0E-4
55	840.0E-4	810.0E-4
56	840.0E-4	840.0E-4
57	820.0E-4	830.0E-4
58	790.0E-4	790.0E-4
59	790.0E-4	910.0E-4
Statistics		
Min	790.0E-4	790.0E-4
Max	850.0E-4	910.0E-4
Mean	832.0E-4	843.0E-4
Sigma	239.4E-5	356.1E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	250.0E-4	240.0E-4
50	850.0E-4	250.0E-4
51	850.0E-4	250.0E-4
52	860.0E-4	250.0E-4
53	880.0E-4	250.0E-4
54	810.0E-4	260.0E-4
55	810.0E-4	290.0E-4
56	840.0E-4	290.0E-4
57	830.0E-4	290.0E-4
58	790.0E-4	260.0E-4
59	910.0E-4	270.0E-4
Statistics		
Min	790.0E-4	250.0E-4
Max	910.0E-4	290.0E-4
Mean	843.0E-4	266.0E-4
Sigma	356.1E-5	177.6E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB15

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	240.0E-4	240.0E-4	250.0E-4	250.0E-4	240.0E-4	240.0E-4
50	260.0E-4	240.0E-4	260.0E-4	490.0E-4	700.0E-4	780.0E-4
51	280.0E-4	240.0E-4	270.0E-4	480.0E-4	740.0E-4	780.0E-4
52	260.0E-4	240.0E-4	270.0E-4	480.0E-4	950.0E-4	780.0E-4
53	240.0E-4	240.0E-4	250.0E-4	400.0E-4	630.0E-4	780.0E-4
54	280.0E-4	240.0E-4	250.0E-4	400.0E-4	860.0E-4	770.0E-4
55	260.0E-4	250.0E-4	250.0E-4	400.0E-4	900.0E-4	770.0E-4
56	280.0E-4	250.0E-4	260.0E-4	400.0E-4	950.0E-4	770.0E-4
57	240.0E-4	250.0E-4	260.0E-4	420.0E-4	990.0E-4	750.0E-4
58	240.0E-4	250.0E-4	260.0E-4	420.0E-4	760.0E-4	730.0E-4
59	260.0E-4	240.0E-4	250.0E-4	420.0E-4	570.0E-4	790.0E-4
Statistics						
Min	240.0E-4	240.0E-4	250.0E-4	400.0E-4	570.0E-4	730.0E-4
Max	280.0E-4	250.0E-4	270.0E-4	490.0E-4	990.0E-4	790.0E-4
Mean	260.0E-4	244.0E-4	258.0E-4	431.0E-4	805.0E-4	770.0E-4
Sigma	163.3E-5	516.4E-6	788.8E-6	372.5E-5	145.8E-4	176.4E-5

Test TST002 : Annealing_24H

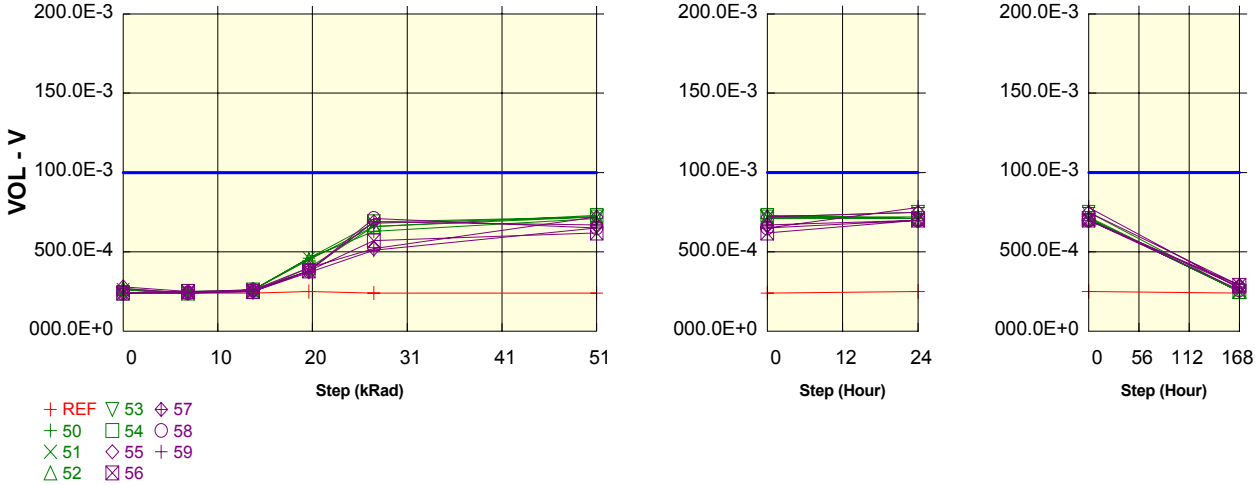
	0 Hour	24 Hour
REF	240.0E-4	250.0E-4
50	780.0E-4	780.0E-4
51	780.0E-4	780.0E-4
52	780.0E-4	790.0E-4
53	780.0E-4	790.0E-4
54	770.0E-4	800.0E-4
55	770.0E-4	790.0E-4
56	770.0E-4	780.0E-4
57	750.0E-4	780.0E-4
58	730.0E-4	720.0E-4
59	790.0E-4	850.0E-4
Statistics		
Min	730.0E-4	720.0E-4
Max	790.0E-4	850.0E-4
Mean	770.0E-4	786.0E-4
Sigma	176.4E-5	313.4E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	250.0E-4	240.0E-4
50	780.0E-4	250.0E-4
51	780.0E-4	250.0E-4
52	790.0E-4	250.0E-4
53	790.0E-4	250.0E-4
54	800.0E-4	250.0E-4
55	790.0E-4	290.0E-4
56	780.0E-4	280.0E-4
57	780.0E-4	290.0E-4
58	720.0E-4	250.0E-4
59	850.0E-4	270.0E-4
Statistics		
Min	720.0E-4	250.0E-4
Max	850.0E-4	290.0E-4
Mean	786.0E-4	263.0E-4
Sigma	313.4E-5	176.7E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLB16

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	240.0E-4	240.0E-4	240.0E-4	250.0E-4	240.0E-4	240.0E-4
50	260.0E-4	240.0E-4	260.0E-4	460.0E-4	630.0E-4	710.0E-4
51	260.0E-4	240.0E-4	260.0E-4	460.0E-4	680.0E-4	720.0E-4
52	270.0E-4	240.0E-4	260.0E-4	450.0E-4	660.0E-4	720.0E-4
53	240.0E-4	250.0E-4	260.0E-4	380.0E-4	690.0E-4	720.0E-4
54	240.0E-4	250.0E-4	250.0E-4	400.0E-4	660.0E-4	730.0E-4
55	280.0E-4	250.0E-4	260.0E-4	400.0E-4	520.0E-4	720.0E-4
56	240.0E-4	250.0E-4	250.0E-4	380.0E-4	570.0E-4	620.0E-4
57	240.0E-4	240.0E-4	250.0E-4	380.0E-4	690.0E-4	670.0E-4
58	240.0E-4	240.0E-4	260.0E-4	380.0E-4	710.0E-4	650.0E-4
59	270.0E-4	240.0E-4	250.0E-4	370.0E-4	510.0E-4	650.0E-4
Statistics						
Min	240.0E-4	240.0E-4	250.0E-4	370.0E-4	510.0E-4	620.0E-4
Max	280.0E-4	250.0E-4	260.0E-4	460.0E-4	710.0E-4	730.0E-4
Mean	254.0E-4	244.0E-4	256.0E-4	406.0E-4	632.0E-4	691.0E-4
Sigma	157.8E-5	516.4E-6	516.4E-6	362.7E-5	730.0E-5	395.7E-5

Test TST002 : Annealing_24H

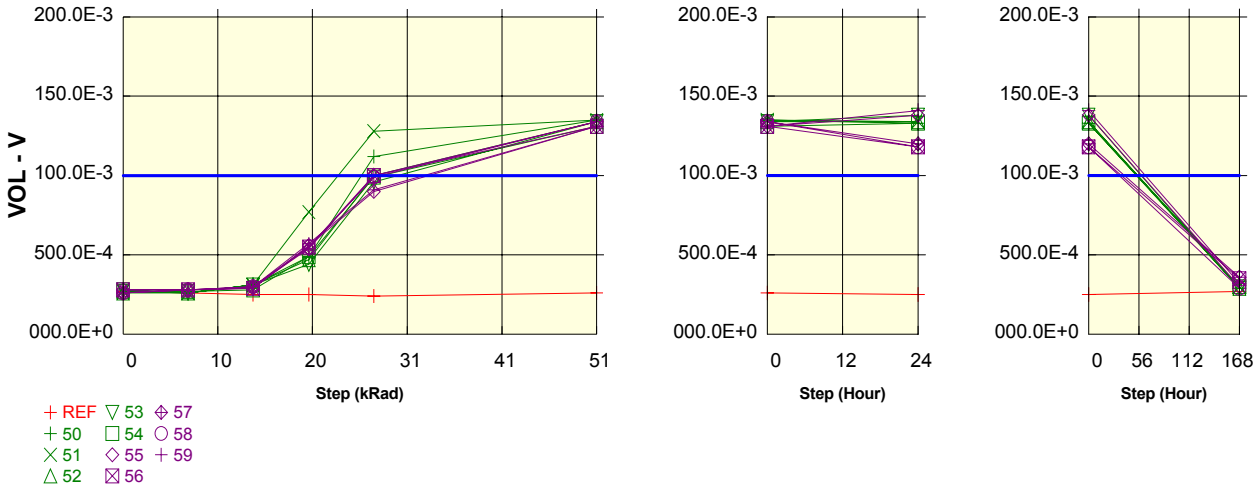
	0 Hour	24 Hour
REF	240.0E-4	250.0E-4
50	710.0E-4	710.0E-4
51	720.0E-4	710.0E-4
52	720.0E-4	720.0E-4
53	720.0E-4	750.0E-4
54	730.0E-4	710.0E-4
55	720.0E-4	750.0E-4
56	620.0E-4	700.0E-4
57	670.0E-4	700.0E-4
58	650.0E-4	700.0E-4
59	650.0E-4	780.0E-4
Statistics		
Min	620.0E-4	700.0E-4
Max	730.0E-4	780.0E-4
Mean	691.0E-4	723.0E-4
Sigma	395.7E-5	275.1E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	250.0E-4	240.0E-4
50	710.0E-4	250.0E-4
51	710.0E-4	250.0E-4
52	720.0E-4	250.0E-4
53	750.0E-4	250.0E-4
54	710.0E-4	250.0E-4
55	750.0E-4	290.0E-4
56	700.0E-4	290.0E-4
57	700.0E-4	280.0E-4
58	700.0E-4	260.0E-4
59	780.0E-4	270.0E-4
Statistics		
Min	700.0E-4	250.0E-4
Max	780.0E-4	290.0E-4
Mean	723.0E-4	264.0E-4
Sigma	275.1E-5	171.3E-5

Test conditions : TID
Parameter : Output Low Voltage : VOLOTR

Unit : V
Spec Limit Max : 100.0E-3
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	7 kRad	14 kRad	20 kRad	27 kRad	51 kRad
REF	270.0E-4	260.0E-4	250.0E-4	250.0E-4	240.0E-4	260.0E-4
50	280.0E-4	260.0E-4	310.0E-4	490.0E-4	112.0E-3	135.0E-3
51	270.0E-4	260.0E-4	310.0E-4	770.0E-4	128.0E-3	135.0E-3
52	260.0E-4	260.0E-4	310.0E-4	470.0E-4	100.0E-3	134.0E-3
53	280.0E-4	260.0E-4	310.0E-4	440.0E-4	960.0E-4	134.0E-3
54	270.0E-4	270.0E-4	280.0E-4	490.0E-4	990.0E-4	131.0E-3
55	280.0E-4	280.0E-4	290.0E-4	560.0E-4	900.0E-4	131.0E-3
56	280.0E-4	280.0E-4	290.0E-4	550.0E-4	100.0E-3	131.0E-3
57	260.0E-4	280.0E-4	300.0E-4	540.0E-4	100.0E-3	134.0E-3
58	260.0E-4	280.0E-4	300.0E-4	550.0E-4	990.0E-4	134.0E-3
59	260.0E-4	280.0E-4	300.0E-4	570.0E-4	910.0E-4	131.0E-3
Statistics						
Min	260.0E-4	260.0E-4	280.0E-4	440.0E-4	900.0E-4	131.0E-3
Max	280.0E-4	280.0E-4	310.0E-4	770.0E-4	128.0E-3	135.0E-3
Mean	270.0E-4	271.0E-4	300.0E-4	543.0E-4	101.5E-3	133.0E-3
Sigma	942.8E-6	994.4E-6	105.4E-5	908.1E-5	110.8E-4	176.4E-5

Test TST002 : Annealing_24H

	0 Hour	24 Hour
REF	260.0E-4	250.0E-4
50	135.0E-3	133.0E-3
51	135.0E-3	134.0E-3
52	134.0E-3	134.0E-3
53	134.0E-3	138.0E-3
54	131.0E-3	133.0E-3
55	131.0E-3	138.0E-3
56	131.0E-3	118.0E-3
57	134.0E-3	120.0E-3
58	134.0E-3	118.0E-3
59	131.0E-3	141.0E-3
Statistics		
Min	131.0E-3	118.0E-3
Max	135.0E-3	141.0E-3
Mean	133.0E-3	130.7E-3
Sigma	176.4E-5	870.6E-5

Test TST003 : Annealing_168H

	0 Hour	168 Hour
REF	250.0E-4	270.0E-4
50	133.0E-3	290.0E-4
51	134.0E-3	300.0E-4
52	134.0E-3	290.0E-4
53	138.0E-3	290.0E-4
54	133.0E-3	300.0E-4
55	138.0E-3	300.0E-4
56	118.0E-3	350.0E-4
57	120.0E-3	360.0E-4
58	118.0E-3	290.0E-4
59	141.0E-3	320.0E-4
Statistics		
Min	118.0E-3	290.0E-4
Max	141.0E-3	360.0E-4
Mean	130.7E-3	309.0E-4
Sigma	870.6E-5	260.1E-5