TEST REPORT / TEST RESULT

Low dose rate Co60 TID test of MAXIM HI-201 Quad SPST CMOS Analog Switch

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APPROVAL

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CHANGE LOG

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CHANGE RECORD

Issue Number 1	Revision Number 0		
Reason for change	**Date**	**Pages**	**Paragraph(s)**

Table of Contents

1 ACRONYMS

TID Total Ionizing Dose
SMD Standard Microcircuit Drawing

2 APPLICABLE AND REFERENCE DOCUMENTS

2.1 Applicable Documents

- ESCC Basic Specification No. 22900: Total Dose Steady State Irradiation Test Method.

2.2 Reference Documents

- Quad SPST CMOS Analog Switch datasheet MAXIM: HI-201
- Standard Microcircuit Drawing A/14933/77053

3 INTRODUCTION

A total dose characterization test of Maxim HI-201 Quad SPST CMOS Analog switch, has been performed at the ESTEC Co60 Facility. The transistors have been exposed to a total accumulated dose of 50 krad(Si), using a constant low dose rate of 360 rad(Si)/h.

The Purpose of this test is to evaluate the total dose tolerance of the component according with ESCC Basic Specification No. 22900 in support of AEOLUS project. Parts are coming from AEOLUS flight lot.

4 EXPERIMENTAL CONDITIONS

4.1 Facility and Dosimetry

The ESTEC Co-60 facility comprises of a Nordion Gamma beam 150°C irradiator containing a nominal 85.2 TBq (2300 Ci) Co-60 source at the last reload date in October 2011. The irradiation room is monitored for temperature, relative humidity and pressure.

The dosimetry system is based on Farmer type 2571A 0.6 cc air ionisation chambers linked to Farmer 2670 electrometer. The dosimetry system is compensated against temperature and pressure environmental fluctuations.

All irradiations and measurements have been performed at room temperature (22.5 ± 3 °C).

4.2 Tested Devices

Part type	HI-201
Manufacturer	MAXIM
Function	ANALOG SWITCH
Family	Transistor
Group	Switch
Package	16 Lead CERDIP (HI1)
Date Code	1228
Devices S/N	Serialized from 01 to 11

Table 1 Information Tested Devices

4.3 Irradiation test conditions

The radiation test steps are reported in the following table:

Run	Irradiation Steps	Cum. Rad.	Dose rate	Annealing steps	Temperature
	krad(Si)	krad(Si)	rad(Si)/min	hours	°C
1	2,147	0	6	-	Room
2	7,233	2,147	6	-	Room
3	25,419	9,380	6	-	Room
4	9,581	34,799	6	-	Room
6	-	44,380	6		
7	-			24	Room
8	-			168	100

Table 2 Test conditions

At the completion of each irradiating step, intermediate electrical measurements were carried out according to the electrical measurement parameters (table 4). Following the ESCC 22900 recommendations, the time interval from the completion of the exposure to the start of the measurements was 1 hour max and the next exposure started after a maximum of 2 hours.

4.3.1 Bias condition during irradiation

In total 11 DUT were tested:

- 5 samples biased (s/n 02, 03, 04, 05, 06)
- 5 samples unbiased (s/n 07, 08, 09, 10, 11)
- 1 sample as reference device (not irradiated, s/n 01)

The biased conditions are:

- V+= +15V, V-=15V
- Digital input A1 and A3 to 5V
- IN1 , IN2, connected to 15V
- OUT1, OUT2 connected to GND via a 2 KΩ resistor
- Digital inputs A2 and A4 connected to GND
- IN3, IN4 connected to 2V
- OUT3, OUT4 connected to GND via 2 KΩ resistor

The following figure shows the configuration during irradiation:

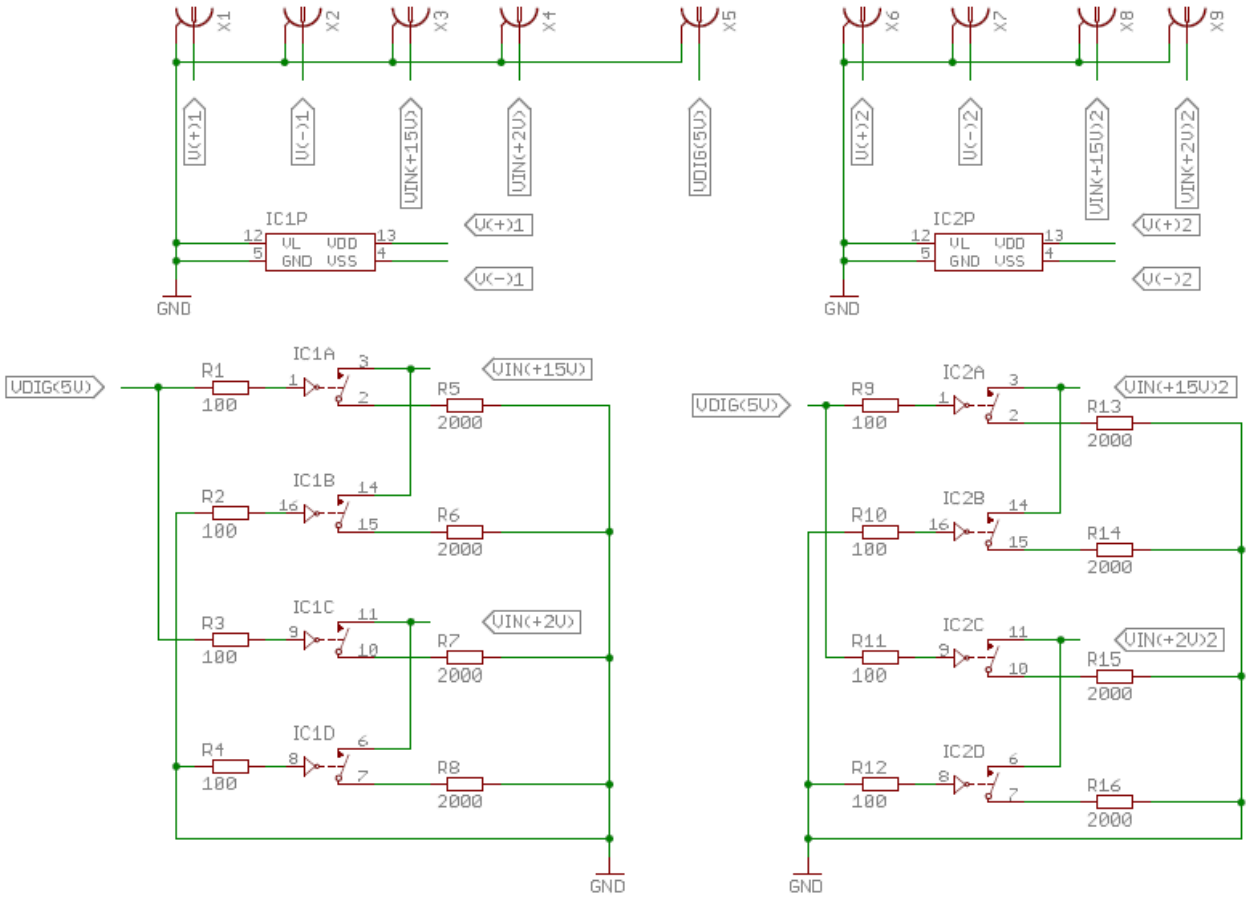

Figure 1: Configurations during the irradiation

4.4 Measurements Setup

No in-situ measurements were performed during irradiation.
In the table 4 there are the measured electrical parameter:

Symbol	Parameter	Test conditions $-55°C \le T_A \le 125°C$		Limits		Unit
				Min	Max	
SWITCH						
V_{ANALOG}	Analog-Signal Range			-15	15	V
$r_{DS(on)}$	Drain-Source On Resistance	V_S=±10V, V_{IN}=0.8V, I_S=-/+1mA, all unused channels V_A=2.4			70	Ω
$I_{S(off)}$	Off Input Leakage Current	V_{IN}=2.4V	V_S=14V, V_D=-14V	-2	2	nA
			V_S=-14V, V_D=14V	-2	2	nA
$I_{D(off)}$	Off Output Leakage Current	V_{IN}=2.4V, V_S=±14V		-2	2	nA
$I_{D(on)}$	Drain-On Leakage Current	V_{IN}=0.8V, V_D=V_S=±14V		-2	2	nA
LOGIC INPUT						
V_{IL}	Low Level Input Voltage				0.8	V
V_{IH}	High Level Input Voltage			2.4		V
I_{IH}	Input Current with Input Voltage High	V_{IN}=2.4V		-0.5	0.5	µA
		V_{IN}=15V		-0.5	0.5	µA
I_{IL}	Input Current with Input Voltage Low	V_{IN}=0.8V		-0.5	0.5	µA
DYNAMIC						
t_{on}	Switch On Time	R_L=1kΩ, C_L=100pF, V_{IH}=+4V, V_{IL}=0V			600	ns
t_{off}	Switch Off Time	R_L=1kΩ, C_L=100pF, V_{IH}=+4V, V_{IL}=0V			500	ns
SUPPLY						
I_+	Positive Supply Current	V_{IN}=0.8V			1.5	mA
		V_{IN}=2.4V			1.5	mA
I_-	Negative Supply Current	V_{IN}=0.8V			-1.5	mA
		V_{IN}=2.4V			-1.5	mA

Table 3 Measured Parameters, Min-Max Limits and Test conditions.(from SMD 14933/77053: Device type 02/HI-201 Quad SPST analog switch with dielectric isolation, Case Outline E, Group A and Subgroup 1 for switch, logic input and supply parameters and Subgroup 9 for dynamic parameters).

The electrical measurements about Switch, Logic Input and Supply parameters were performed at room temperature using an ***Agilent 4156C*** *Precision Semiconductor Parameter Analyzer* with two***Agilent E5252A 10x12 Matrix Switch.*** Whereas the electrical measurements about Dynamic parameters were performed at room temperature using an Oscilloscope.

For the measurements about the switch on and switch off time were used the following configuration for every switch:

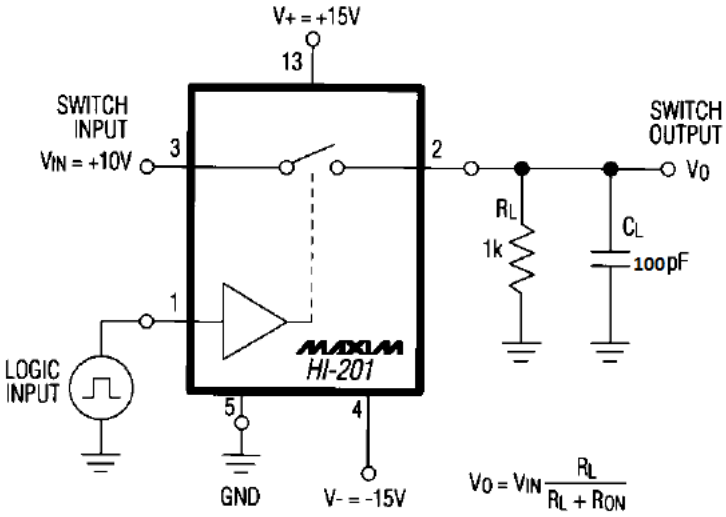

Figure 2: Configuration Measurement Switch on and Switch off time

5 TEST RESULTS

In this section the results of the electrical measurements are shown with tables and graphics.
These results include all the electrical parameters in table 3. Errors bars are calculated at +/- 1 standard deviation.

R_{DS} on (V_S=-10V, I_D=-1mA) [Ω]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.000	0.000
max	70.00	70.00	70.00	70.00	70.00	70.000	70.000
Ref 01 - SW1	39.28	39.37	39.36	39.46	39.38	39.38	39.50
Ref 01 - SW2	39.48	39.54	39.58	39.58	39.54	39.56	39.60
Ref 01 - SW3	39.40	39.48	39.44	39.44	39.50	39.48	39.44
Ref 01 - SW4	39.42	39.46	39.52	39.50	39.48	39.46	39.46
Biased 02 - SW1	38.90	40.92	44.17	48.32	49.37	49.27	45.14
Biased 02 - SW2	38.80	39.96	43.88	53.62	56.70	56.47	47.34
Biased 02 - SW3	38.84	40.86	44.02	47.74	48.87	48.73	44.58
Biased 02 - SW4	38.82	40.64	46.16	59.58	63.31	64.45	69.10
Biased 03 - SW1	38.48	40.94	43.72	48.23	49.06	49.20	44.72
Biased 03 - SW2	38.32	39.58	43.46	53.32	56.46	56.50	47.04
Biased 03 - SW3	38.38	40.36	44.18	47.76	49.18	49.00	44.44
Biased 03 - SW4	38.38	40.44	48.00	63.14	66.71	67.12	69.40
Biased 04 - SW1	38.82	40.82	44.26	48.11	49.23	49.29	45.08
Biased 04 - SW2	38.72	39.86	44.64	54.14	57.44	57.58	47.24
Biased 04 - SW3	38.80	40.78	45.82	48.01	49.42	49.30	44.54
Biased 04 - SW4	38.88	40.92	46.14	60.64	67.38	68.18	47.88
Biased 05- SW1	38.92	40.90	44.18	48.24			44.72
Biased 05- SW2	38.94	40.24	44.30	54.88	58.16	58.27	47.24
Biased 05- SW3	38.90	40.96	44.42	48.38			44.62
Biased 05- SW4	38.94	41.18	48.00	58.52			46.04
Biased 06 - SW1	39.36	41.46	44.70	48.55	49.74	49.60	45.42
Biased 06 - SW2	39.30	40.60	45.34	55.12	58.37	58.47	47.80
Biased 06 - SW3	39.34	41.42	46.36	48.69	50.11		45.18
Biased 06 - SW4	39.42	41.64	49.64	64.72	68.69	69.63	70.64
Unbiased 07 - SW1	39.06	40.82	45.04	53.46	55.96	55.92	47.38
Unbiased 07 - SW2	38.98	40.74	44.88	53.04	55.91	55.90	47.18
Unbiased 07 - SW3	38.90	40.74	44.82	53.10	55.98	55.94	47.16
Unbiased 07 - SW4	38.96	40.70	44.72	52.90	55.68	55.71	47.18
Unbiased 08 - SW1	39.32	41.24	45.08	54.26	56.89	56.91	47.76
Unbiased 08 - SW2	39.24	41.04	44.94	53.88	56.81	56.68	47.40
Unbiased 08 - SW3	39.16	41.02	44.88	53.72	56.73	56.66	47.32
Unbiased 08 - SW4	39.30	41.02	44.92	53.80	56.90	56.85	47.36
Unbiased 09 - SW1	38.50	40.06	44.42	52.88	55.52	55.38	46.94
Unbiased 09 - SW2	38.50	40.10	44.34	52.68	55.56	55.48	46.78
Unbiased 09 - SW3	38.58	40.18	44.46	52.88	55.82	55.74	46.78
Unbiased 09 - SW4	38.52	40.14	44.30	52.44	55.24	55.26	46.80
Unbiased 10 - SW1	39.20	40.86	45.08	53.30	56.27	56.10	47.28
Unbiased 10 - SW2	39.10	40.78	44.86	53.18	56.21	56.11	47.14
Unbiased 10 - SW3	39.10	40.82	44.82	53.24	56.26	56.22	47.14
Unbiased 10 - SW4	39.24	40.96	44.88	53.28	56.22	56.12	47.18
Unbiased 11 - SW1	39.06	40.78	44.88	52.88	55.92	55.72	47.08
Unbiased 11 - SW2	39.04	40.72	44.76	52.88	55.92	55.80	47.04
Unbiased 11 - SW3	38.94	40.70	44.64	53.00	56.02	55.96	46.90
Unbiased 11 - SW4	38.86	40.60	44.48	52.78	55.72	55.67	46.78

Table 3: R_{DS} on, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	38.32	39.58	43.46	47.74			44.44
Max	39.42	41.64	49.64	64.72			70.64
Average	38.86	40.73	45.27	52.98			49.41
Std.Dev.	0.32	0.53	1.67	5.68			8.83

Table 4: R_{DS} on, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values)for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	38.50	40.06	44.30	52.44	55.24	55.26	46.78
Max	39.32	41.24	45.08	54.26	56.90	56.91	47.76
Average	38.98	40.70	44.76	53.18	56.08	56.01	47.13
Std.Dev.	0.26	0.33	0.24	0.45	0.46	0.47	0.25

Table 5: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	39.28	39.37	39.36	39.44	39.38	39.38	39.44
Max	39.48	39.54	39.58	39.58	39.54	39.56	39.60
Average	39.39	39.46	39.47	39.49	39.48	39.47	39.50
Std.Dev.	0.08	0.07	0.10	0.06	0.07	0.07	0.07

Table 6: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

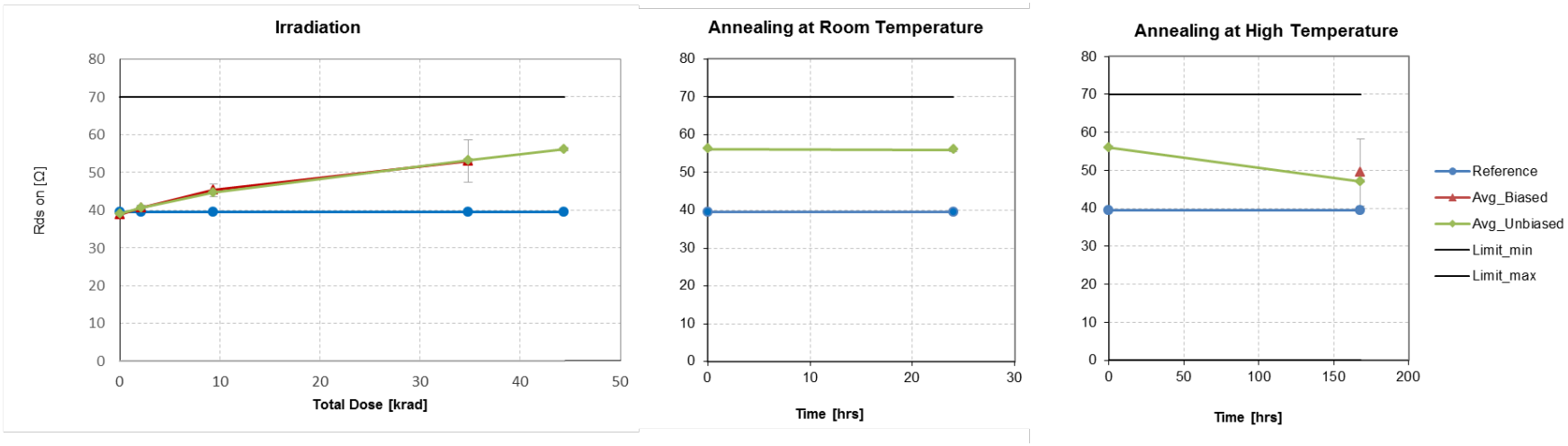

Figure 3: Irradiation [rad (Si)], annealing and ageing of R_{DS} on (V_S=-10V, I_D=-1mA) (average values)

R_{DS} on (V_S=-10V, I_D=+1mA) [Ω]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.000	0.000
max	70.00	70.00	70.00	70.00	70.00	70.000	70.000
Ref 01 - SW1	41.12	41.32	41.26	41.22	41.36	41.24	41.44
Ref 01 - SW2	41.34	41.62	41.46	41.42	41.56	41.46	41.58
Ref 01 - SW3	41.22	41.50	41.40	41.24	41.44	41.30	41.44
Ref 01 - SW4	41.26	41.50	41.42	41.28	41.48	41.34	41.46
Biased 02 - SW1	40.78	42.92	46.39	50.43	52.33	51.55	47.32
Biased 02 - SW2	40.76	41.98	45.94	55.68	58.96	58.54	49.50
Biased 02 - SW3	40.68	42.78	46.23	49.81	51.63	50.96	46.70
Biased 02 - SW4	40.72	42.56	48.22	61.64	65.52	66.50	71.36
Biased 03 - SW1	40.40	42.79	45.92	50.23	51.31	51.20	46.86
Biased 03 - SW2	40.30	41.54	45.54	55.44	58.78	58.62	49.20
Biased 03 - SW3	40.24	42.24	46.36	49.72	51.37	51.02	46.52
Biased 03 - SW4	40.24	42.32	50.06	65.20	68.98	69.20	71.70
Biased 04 - SW1	40.74	42.76	46.52	50.11	51.50	51.28	47.14
Biased 04 - SW2	40.74	41.90	46.86	56.30	59.74	59.66	49.36
Biased 04 - SW3	40.66	42.64	48.08	50.01	51.63	51.29	46.64
Biased 04 - SW4	40.76	42.82	48.40	62.72	69.70	70.37	49.96
Biased 05- SW1	40.80	42.74	46.34	50.23			46.80
Biased 05- SW2	40.92	42.14	46.44	56.92	60.50	60.40	49.50
Biased 05- SW3	40.80	42.80	46.58	50.39			46.74
Biased 05- SW4	40.76	42.94	49.92	60.58			48.10
Biased 06 - SW1	41.28	43.26	46.86	50.65	52.02	51.55	47.50
Biased 06 - SW2	41.34	42.44	47.46	57.22	60.68	60.56	50.00
Biased 06 - SW3	41.24	43.18	48.40	50.75	52.32		47.24
Biased 06 - SW4	41.28	43.32	51.64	66.86	71.00	71.76	72.98
Unbiased 07 - SW1	40.90	42.60	47.08	55.46	58.26	57.88	49.48
Unbiased 07 - SW2	40.82	42.56	47.04	55.20	58.22	57.94	49.38
Unbiased 07 - SW3	40.78	42.42	46.82	55.16	58.20	57.92	49.24
Unbiased 07 - SW4	40.78	42.46	46.76	54.94	57.92	57.64	49.34
Unbiased 08 - SW1	41.16	42.96	47.16	56.36	59.08	58.96	49.82
Unbiased 08 - SW2	41.16	42.88	47.16	56.02	59.12	58.86	49.46
Unbiased 08 - SW3	41.04	42.74	46.94	55.80	58.94	58.64	49.38
Unbiased 08 - SW4	41.14	42.80	47.02	55.92	59.10	58.86	49.38
Unbiased 09 - SW1	40.32	41.86	46.60	54.96	57.74	57.44	48.96
Unbiased 09 - SW2	40.44	41.96	46.58	54.88	57.90	57.68	48.82
Unbiased 09 - SW3	40.44	41.96	46.54	54.94	57.96	57.78	48.72
Unbiased 09 - SW4	40.48	41.92	46.40	54.48	57.42	57.24	48.74
Unbiased 10 - SW1	41.06	42.60	47.26	55.38	58.42	58.18	49.28
Unbiased 10 - SW2	41.08	42.64	47.10	55.38	58.42	58.24	49.24
Unbiased 10 - SW3	40.98	42.56	46.96	55.34	58.46	58.20	49.08
Unbiased 10 - SW4	41.06	42.66	47.02	55.26	58.38	58.12	49.16
Unbiased 11 - SW1	40.90	42.54	47.04	54.94	58.14	57.72	49.10
Unbiased 11 - SW2	40.98	42.62	46.96	55.06	58.18	57.94	49.14
Unbiased 11 - SW3	40.80	42.40	46.78	55.08	58.22	57.98	48.88
Unbiased 11 - SW4	40.68	42.28	46.66	54.84	57.96	57.72	48.80

Table 7: R_{DS} on, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	40.24	41.54	45.54	49.72			46.52
Max	41.34	43.32	51.64	66.86			72.98
Average	40.77	42.60	47.41	55.04			51.56
Std.Dev.	0.33	0.47	1.62	5.71			8.90

Table 8: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	40.32	41.86	46.40	54.48	57.42	57.24	48.72
Max	41.16	42.96	47.26	56.36	59.12	58.96	49.82
Average	40.85	42.47	46.89	55.27	58.30	58.05	49.17
Std.Dev.	0.26	0.32	0.24	0.46	0.46	0.47	0.29

Table 9: R_{DS} on, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	41.12	41.32	41.26	41.22	41.36	41.24	41.44
Max	41.34	41.62	41.46	41.42	41.56	41.46	41.58
Average	41.24	41.49	41.39	41.29	41.46	41.34	41.48
Std.Dev.	0.09	0.12	0.09	0.09	0.08	0.09	0.07

Table 10: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

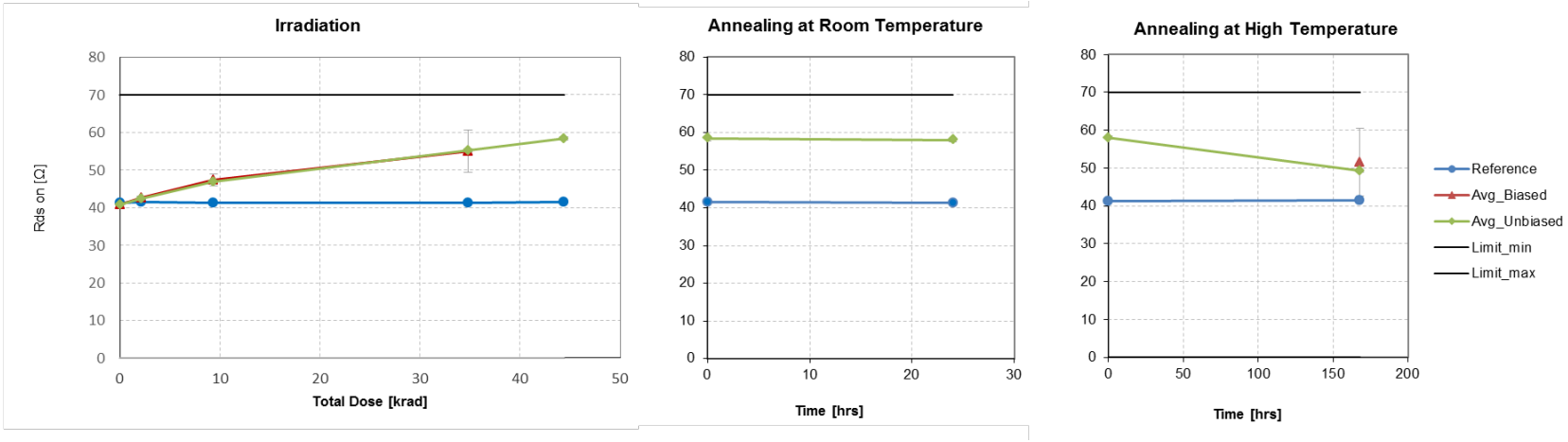

Figure 4: Irradiation [rad (Si)], annealing and ageing of R_{DS} on (V_S=-10V, I_D=+1mA) (average values)

R_{DS} on (V_S=+10V, I_D=-1mA) [Ω]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.000	0.000
max	70.00	70.00	70.00	70.00	70.00	70.000	70.000
Ref 01 - SW1	38.82	38.98	38.92	38.94	39.00	38.88	39.10
Ref 01 - SW2	39.04	39.24	39.20	39.10	39.20	39.08	39.18
Ref 01 - SW3	38.98	39.18	39.10	39.02	39.10	39.04	39.10
Ref 01 - SW4	38.96	39.16	39.10	39.06	39.14	39.04	39.12
Biased 02 - SW1	38.10	39.52	43.69	57.66	64.73	61.87	44.55
Biased 02 - SW2	38.16	38.98	42.38	52.58	55.86	55.36	45.14
Biased 02 - SW3	38.16	39.62	44.25	59.28	67.42	64.66	44.25
Biased 02 - SW4	38.18	39.36	42.58	50.98	54.08	55.52	60.28
Biased 03 - SW1	37.64	39.44	42.82	57.01	61.63	60.86	43.58
Biased 03 - SW2	37.56	38.52	41.84	52.08	55.16	55.14	44.60
Biased 03 - SW3	37.68	39.14	44.08	58.75	64.25	63.16	43.40
Biased 03 - SW4	37.70	39.30	44.42	54.78	56.90	57.38	59.64
Biased 04 - SW1	38.42	39.82	44.24	58.44	64.09	63.11	44.65
Biased 04 - SW2	38.34	39.14	43.48	53.74	56.94	57.04	45.56
Biased 04 - SW3	38.32	39.82	46.54	60.82	66.95	65.61	44.24
Biased 04 - SW4	38.40	39.94	47.11	60.06	73.76	73.62	46.88
Biased 05- SW1	38.38	39.76	43.98	58.77			44.14
Biased 05- SW2	38.42	39.30	42.88	54.20	57.34	57.44	45.60
Biased 05- SW3	38.44	39.96	45.32	61.69			44.30
Biased 05- SW4	38.34	39.98	44.60	75.43			44.18
Biased 06 - SW1	38.70	40.04	44.40	58.90	64.54	62.65	44.66
Biased 06 - SW2	38.68	39.52	43.80	54.30	57.44	57.56	45.88
Biased 06 - SW3	38.78	40.18	46.80	61.62	67.59		44.68
Biased 06 - SW4	38.78	40.36	45.86	56.34	58.78	59.70	61.56
Unbiased 07 - SW1	38.26	39.22	43.30	61.80	70.26	69.82	46.82
Unbiased 07 - SW2	38.24	39.22	43.26	62.86	70.86	70.42	46.78
Unbiased 07 - SW3	38.16	39.18	43.20	63.14	71.04	70.54	46.64
Unbiased 07 - SW4	38.18	39.16	43.04	62.40	70.00	69.62	46.78
Unbiased 08 - SW1	39.08	40.26	44.52	66.42	74.59	74.41	48.26
Unbiased 08 - SW2	39.12	40.18	44.44	66.54	75.23	75.12	47.98
Unbiased 08 - SW3	39.02	40.06	44.26	66.16	74.95	74.85	47.80
Unbiased 08 - SW4	39.12	40.10	44.38	66.50	75.27	75.22	47.88
Unbiased 09 - SW1	37.88	38.76	42.78	61.64	69.36	69.23	46.16
Unbiased 09 - SW2	37.96	38.90	42.80	62.16	70.12	69.90	46.16
Unbiased 09 - SW3	38.00	38.94	42.86	62.60	70.58	70.28	46.16
Unbiased 09 - SW4	37.98	38.88	42.68	61.36	69.06	68.92	46.20
Unbiased 10 - SW1	38.48	39.38	43.52	62.08	70.18	69.73	46.72
Unbiased 10 - SW2	38.44	39.36	43.34	62.46	70.72	70.27	46.58
Unbiased 10 - SW3	38.42	39.40	43.30	62.82	71.14	70.64	46.56
Unbiased 10 - SW4	38.50	39.46	43.34	62.64	70.80	70.34	46.64
Unbiased 11 - SW1	38.40	39.38	43.40	61.90	69.90	69.58	46.48
Unbiased 11 - SW2	38.42	39.34	43.36	62.46	70.62	70.30	46.52
Unbiased 11 - SW3	38.34	39.32	43.34	63.14	71.39	71.06	46.40
Unbiased 11 - SW4	38.30	39.26	43.24	62.88	71.08	70.74	46.40

Table 11: R_{DS} on, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	37.56	38.52	41.84	50.98			43.40
Max	38.78	40.36	47.11	75.43			61.56
Average	38.26	39.59	44.25	57.87			47.09
Std.Dev.	0.37	0.45	1.47	5.23			5.84

Table 12: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	37.88	38.76	42.68	61.36	69.06	68.92	46.16
Max	39.12	40.26	44.52	66.54	75.27	75.22	48.26
Average	38.41	39.39	43.42	63.20	71.36	71.05	46.79
Std.Dev.	0.39	0.44	0.55	1.71	1.96	2.04	0.65

Table 13: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	38.82	38.98	38.92	38.94	39.00	38.88	39.10
Max	39.04	39.24	39.20	39.10	39.20	39.08	39.18
Average	38.95	39.14	39.08	39.03	39.11	39.01	39.12
Std.Dev.	0.09	0.11	0.12	0.07	0.08	0.09	0.04

Table 14: R_{DS} on, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

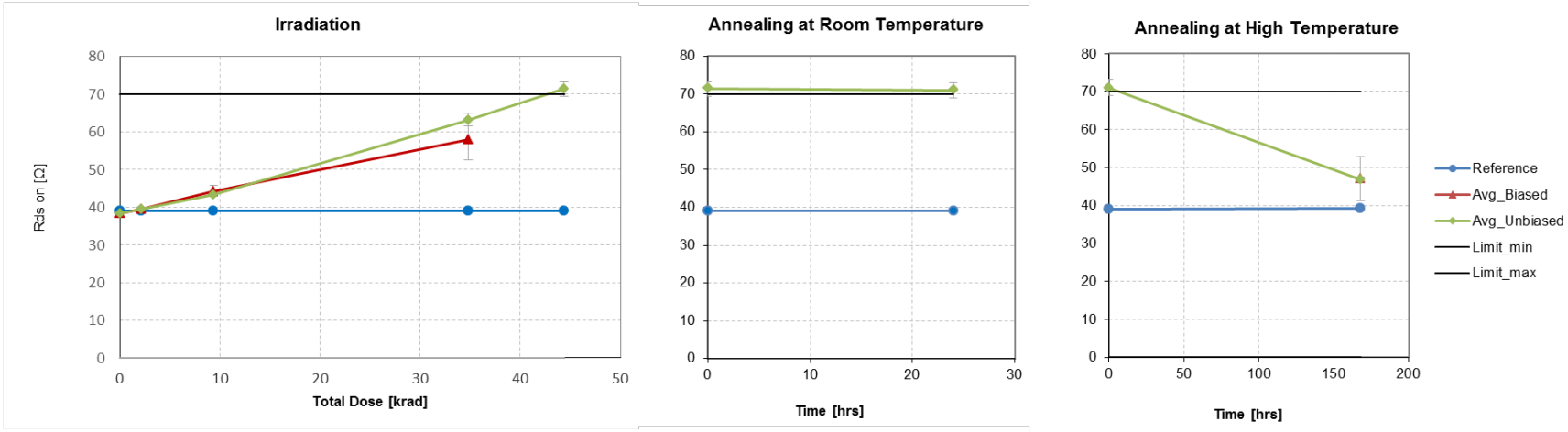

Figure 5: Irradiation [rad (Si)], annealing and ageing of R_{DS} on (V_S=+10V, I_D=-1mA) (average values)

R_{DS} on (V_S=+10V, I_D=+1mA) [Ω]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.000	0.000
max	70.00	70.00	70.00	70.00	70.00	70.000	70.000
Ref 01 - SW1	39.00	39.02	39.06	39.14	39.10	39.08	39.22
Ref 01 - SW2	39.24	39.34	39.30	39.32	39.36	39.34	39.38
Ref 01 - SW3	39.16	39.24	39.24	39.18	39.26	39.24	39.24
Ref 01 - SW4	39.14	39.22	39.24	39.18	39.28	39.26	39.24
Biased 02 - SW1	38.36	39.59	43.87	58.34	66.99	63.15	44.91
Biased 02 - SW2	38.42	39.14	42.56	52.86	56.06	55.64	45.44
Biased 02 - SW3	38.36	39.66	44.49	59.96	69.40	65.82	44.53
Biased 02 - SW4	38.40	39.38	42.72	51.20	54.24	55.76	60.26
Biased 03 - SW1	37.90	39.43	42.99	57.35	62.02	61.31	43.82
Biased 03 - SW2	37.92	38.60	42.04	52.44	55.38	55.44	44.84
Biased 03 - SW3	37.88	39.20	44.26	59.13	64.61	63.59	43.62
Biased 03 - SW4	37.90	39.32	44.62	54.92	57.00	57.58	59.64
Biased 04 - SW1	38.70	39.88	44.52	58.78	64.60	63.65	44.84
Biased 04 - SW2	38.66	39.32	43.80	54.08	57.20	57.34	45.76
Biased 04 - SW3	38.54	39.86	46.74	61.24	67.41	66.10	44.46
Biased 04 - SW4	38.66	40.02	47.35	60.34	**73.65**	**73.51**	47.06
Biased 05- SW1	38.64	39.84	44.16	59.11			44.36
Biased 05- SW2	38.74	39.44	43.12	54.48	57.58	57.74	45.84
Biased 05- SW3	38.70	40.08	45.46	62.11			44.48
Biased 05- SW4	38.56	40.08	44.74	**75.47**			44.34
Biased 06 - SW1	38.94	40.16	44.58	59.35	65.02	63.10	44.86
Biased 06 - SW2	39.02	39.68	44.14	54.64	57.68	57.84	46.14
Biased 06 - SW3	38.90	40.26	46.96	62.03	68.10		44.86
Biased 06 - SW4	38.98	40.38	46.08	56.58	59.00	59.90	61.52
Unbiased 07 - SW1	38.48	39.38	43.48	62.12	**70.64**	**70.18**	47.02
Unbiased 07 - SW2	38.50	39.42	43.52	63.28	**71.28**	**70.82**	47.04
Unbiased 07 - SW3	38.38	39.22	43.30	63.46	**71.34**	**70.92**	46.86
Unbiased 07 - SW4	38.36	39.26	43.14	62.74	**70.36**	69.98	47.00
Unbiased 08 - SW1	39.38	40.36	44.76	66.82	**74.90**	**74.80**	48.46
Unbiased 08 - SW2	39.42	40.34	44.76	66.98	**75.66**	**75.60**	48.24
Unbiased 08 - SW3	39.22	40.16	44.50	66.52	**75.22**	**75.18**	48.02
Unbiased 08 - SW4	39.30	40.20	44.56	66.88	**75.60**	**75.56**	48.10
Unbiased 09 - SW1	38.08	38.90	43.00	62.02	69.64	69.58	46.42
Unbiased 09 - SW2	38.26	39.12	43.10	62.64	**70.58**	**70.40**	46.42
Unbiased 09 - SW3	38.20	39.06	43.08	62.92	**70.84**	**70.66**	46.34
Unbiased 09 - SW4	38.24	39.00	42.84	61.74	69.32	69.24	46.42
Unbiased 10 - SW1	38.72	39.50	43.76	62.50	**70.48**	**70.14**	46.94
Unbiased 10 - SW2	38.70	39.52	43.58	62.94	**71.10**	**70.72**	46.88
Unbiased 10 - SW3	38.60	39.44	43.50	63.16	**71.36**	**71.00**	46.70
Unbiased 10 - SW4	38.68	39.48	43.50	62.98	**71.12**	**70.68**	46.82
Unbiased 11 - SW1	38.58	39.50	43.58	62.24	**70.20**	**70.02**	46.76
Unbiased 11 - SW2	38.68	39.56	43.58	62.90	**71.02**	**70.80**	46.80
Unbiased 11 - SW3	38.58	39.42	43.48	63.46	**71.66**	**71.42**	46.56
Unbiased 11 - SW4	38.50	39.34	43.42	63.22	**71.42**	**71.12**	46.58

Table 15: R_{DS} on, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	37.88	38.60	42.04	51.20			43.62
Max	39.02	40.38	47.35	75.47			61.52
Average	38.51	39.67	44.46	58.22			47.28
Std.Dev.	0.37	0.44	1.47	5.21			5.75

Table 16: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	38.08	38.90	42.84	61.74	69.32	69.24	46.34
Max	39.42	40.36	44.76	66.98	75.66	75.60	48.46
Average	38.64	39.51	43.62	63.58	71.69	71.44	47.02
Std.Dev.	0.40	0.43	0.58	1.72	1.97	2.04	0.65

Table 17: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Min	39.00	39.02	39.06	39.14	39.10	39.08	39.22
Max	39.24	39.34	39.30	39.32	39.36	39.34	39.38
Average	39.14	39.21	39.21	39.21	39.25	39.23	39.27
Std.Dev.	0.10	0.13	0.10	0.08	0.11	0.11	0.07

Table 18: R_{DS} on , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

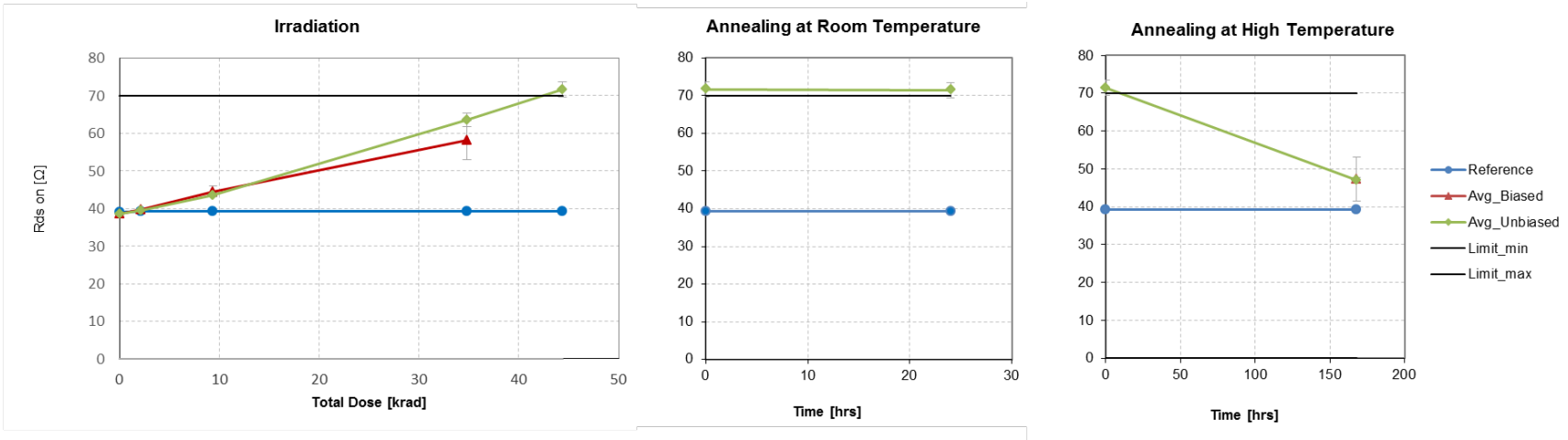

Figure 6: Irradiation [rad (Si)], annealing and ageing of R_{DS} on (V_S=+10V, I_D=+1mA) (average values)

I_{SOff} (V_S=+14V, V_D=-14V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	-1.86E-10	-1.91E-10	-1.83E-10	-1.86E-10	-1.86E-10	-1.83E-10	-1.89E-10
Ref 01 - SW2	-1.83E-10	-1.88E-10	-1.89E-10	-1.89E-10	-1.90E-10	-1.88E-10	-1.89E-10
Ref 01 - SW3	-1.69E-10	-1.76E-10	-1.77E-10	-1.74E-10	-1.79E-10	-1.72E-10	-1.74E-10
Ref 01 - SW4	-1.94E-10	-2.01E-10	-2.00E-10	-2.00E-10	-2.03E-10	-1.99E-10	-2.00E-10
Biased 02 - SW1	-1.83E-10	-2.47E-10	-4.38E-10	**-5.00E-03**	**-4.99E-03**	**-5.00E-03**	**-5.00E-03**
Biased 02 - SW2	-1.77E-10	-2.09E-10	-5.05E-11	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-1.80E-10
Biased 02 - SW3	-1.68E-10	-2.27E-10	-4.23E-10	**-5.00E-03**	**-4.99E-03**	**-5.00E-03**	**-5.00E-03**
Biased 02 - SW4	-1.82E-10	1.38E-09	**-8.84E-07**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	**4.22E-09**
Biased 03 - SW1	-1.98E-10	-2.76E-10	**-4.80E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**
Biased 03 - SW2	-2.00E-10	-2.33E-10	-1.43E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.29E-10
Biased 03 - SW3	-1.94E-10	-2.57E-10	**-4.96E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**
Biased 03 - SW4	-1.98E-10	**3.06E-09**	**-2.57E-06**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	**-2.70E-09**
Biased 04 - SW1	-1.93E-10	-2.66E-10	**-4.78E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**
Biased 04 - SW2	-1.84E-10	-2.18E-10	-6.87E-11	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.00E-10
Biased 04 - SW3	-1.82E-10	-2.47E-10	**-4.66E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**
Biased 04 - SW4	-1.94E-10	-2.61E-10	**-4.77E-03**	**-5.00E-03**	**-5.00E-03**	**-3.06E-09**	**-1.60E-08**
Biased 05- SW1	-2.09E-10	-2.77E-10	**-4.86E-03**	**-5.00E-03**	**-3.76E-09**	**-5.13E-09**	**-5.00E-03**
Biased 05- SW2	-2.00E-10	-2.36E-10	-1.58E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.21E-10
Biased 05- SW3	-2.01E-10	-2.68E-10	**-5.00E-03**	**-5.00E-03**	**-5.49E-09**	**-6.92E-09**	**-5.00E-03**
Biased 05- SW4	-2.08E-10	9.01E-10	**-2.10E-07**	**-5.00E-03**	**-3.24E-08**	**-5.58E-07**	**-1.73E-07**
Biased 06 - SW1	-1.99E-10	-2.58E-10	**-3.49E-04**	**-5.00E-03**	**-5.00E-03**	**-3.79E-09**	**-5.00E-03**
Biased 06 - SW2	-1.93E-10	-2.27E-10	-7.90E-11	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.11E-10
Biased 06 - SW3	-1.81E-10	-2.40E-10	**-4.54E-03**	**-5.00E-03**	**-5.00E-03**	**-7.46E-09**	**-5.00E-03**
Biased 06 - SW4	-1.99E-10	8.94E-10	**-5.30E-07**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-3.39E-10
Unbiased 07 - SW1	-1.80E-10	-2.19E-10	-2.62E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.45E-10
Unbiased 07 - SW2	-1.79E-10	-2.22E-10	-2.75E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.45E-10
Unbiased 07 - SW3	-1.76E-10	-2.15E-10	-2.74E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.46E-10
Unbiased 07 - SW4	-1.85E-10	-2.25E-10	-2.73E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.52E-10
Unbiased 08 - SW1	-2.11E-10	-2.69E-10	-3.13E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.85E-10
Unbiased 08 - SW2	-2.08E-10	-2.50E-10	-3.04E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.74E-10
Unbiased 08 - SW3	-2.06E-10	-2.48E-10	-3.06E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.72E-10
Unbiased 08 - SW4	-2.14E-10	**-4.70E-08**	**-1.45E-08**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.95E-10
Unbiased 09 - SW1	-1.85E-10	-2.18E-10	-2.61E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.55E-10
Unbiased 09 - SW2	-1.80E-10	-2.17E-10	-2.69E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.43E-10
Unbiased 09 - SW3	-1.69E-10	-2.05E-10	-2.60E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.37E-10
Unbiased 09 - SW4	-2.00E-10	**-2.20E-09**	-7.04E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.66E-10
Unbiased 10 - SW1	-2.01E-10	-2.39E-10	-2.88E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.65E-10
Unbiased 10 - SW2	-2.00E-10	-2.37E-10	-2.85E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.56E-10
Unbiased 10 - SW3	-1.83E-10	-2.22E-10	-2.73E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.47E-10
Unbiased 10 - SW4	-2.14E-10	**-3.64E-08**	**-8.05E-09**	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.78E-10
Unbiased 11 - SW1	-1.91E-10	-2.26E-10	-2.70E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.46E-10
Unbiased 11 - SW2	-1.78E-10	-2.15E-10	-2.65E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.38E-10
Unbiased 11 - SW3	-1.69E-10	-2.08E-10	-2.63E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.31E-10
Unbiased 11 - SW4	-2.06E-10	-2.68E-10	-3.21E-10	**-5.00E-03**	**-5.00E-03**	**-5.00E-03**	-2.61E-10

Table 19: I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-2.09E-10	-2.77E-10	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03
Max	-1.68E-10	3.06E-09	-5.05E-11	-5.00E-03	-3.76E-09	-3.06E-09	4.22E-09
Average	-1.92E-10	1.15E-10	-1.94E-03	-5.00E-03	-4.25E-03	-3.50E-03	-2.50E-03
Std.Dev.	1.07E-11	8.47E-10	2.40E-03	5.19E-07	1.83E-03	2.35E-03	2.56E-03

Table 20: I_{SOFF} , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-2.14E-10	-4.70E-08	-1.45E-08	-5.00E-03	-5.00E-03	-5.00E-03	-2.95E-10
Max	-1.69E-10	-2.05E-10	-2.60E-10	-5.00E-03	-5.00E-03	-5.00E-03	-2.31E-10
Average	-1.92E-10	-4.48E-09	-1.40E-09	-5.00E-03	-5.00E-03	-5.00E-03	-2.57E-10
Std.Dev.	1.51E-11	1.29E-08	3.54E-09	1.24E-08	1.57E-08	1.95E-08	1.71E-11

Table 21: I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-1.94E-10	-2.01E-10	-2.00E-10	-2.00E-10	-2.03E-10	-1.99E-10	-2.00E-10
Max	-1.69E-10	-1.76E-10	-1.77E-10	-1.74E-10	-1.79E-10	-1.72E-10	-1.74E-10
Average	-1.83E-10	-1.89E-10	-1.87E-10	-1.87E-10	-1.90E-10	-1.86E-10	-1.88E-10
Std.Dev.	1.05E-11	1.02E-11	9.90E-12	1.06E-11	9.94E-12	1.12E-11	1.07E-11

Table 22: I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

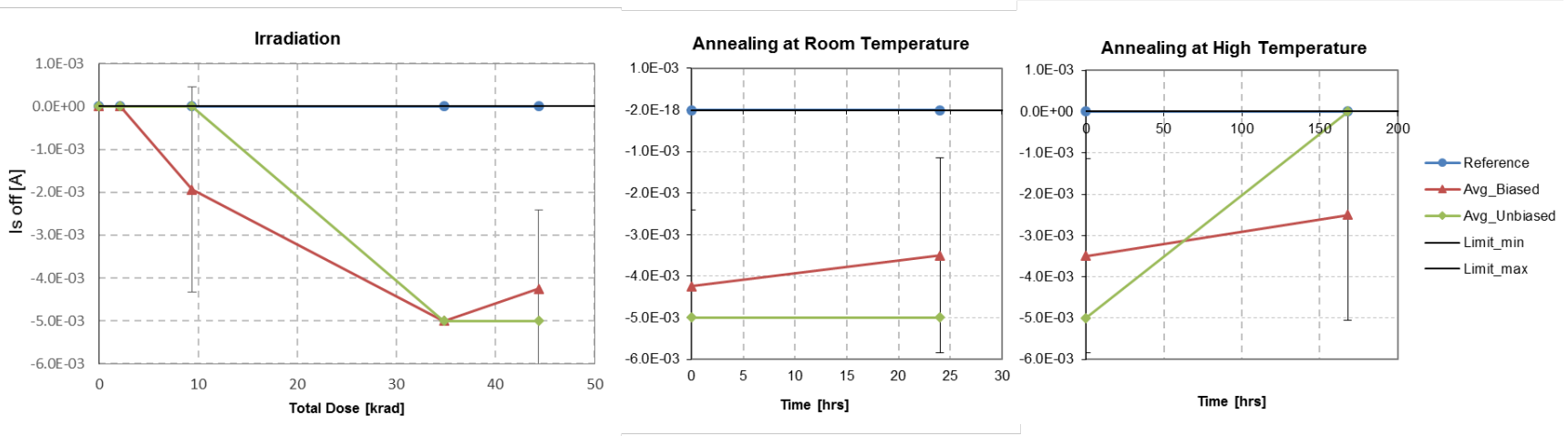

Figure 7: I_{SOFF}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{SOff} (V_S=+14V, V_D=+14V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	2.27E-10	2.27E-10	2.24E-10	2.26E-10	2.26E-10	2.22E-10	2.28E-10
Ref 01 - SW2	2.09E-10	2.14E-10	2.15E-10	2.16E-10	2.18E-10	2.14E-10	2.15E-10
Ref 01 - SW3	2.00E-10	2.04E-10	2.04E-10	2.07E-10	2.12E-10	2.05E-10	2.06E-10
Ref 01 - SW4	2.31E-10	2.38E-10	2.37E-10	2.39E-10	2.41E-10	2.37E-10	2.39E-10
Biased 02 - SW1	2.25E-10	2.88E-10	6.35E-10	-2.80E-06	4.37E-06	4.00E-08	-4.41E-06
Biased 02 - SW2	2.05E-10	2.65E-10	8.74E-10	-6.25E-06	-5.89E-06	-6.32E-06	3.30E-10
Biased 02 - SW3	1.96E-10	2.58E-10	4.62E-10	-3.46E-06	3.04E-06	-1.02E-07	-4.68E-06
Biased 02 - SW4	2.22E-10	1.15E-08	1.45E-07	-6.08E-06	-5.87E-06	-5.44E-06	2.76E-08
Biased 03 - SW1	2.51E-10	3.28E-10	7.36E-05	-4.96E-06	-4.53E-06	-4.30E-06	-5.59E-06
Biased 03 - SW2	2.25E-10	2.82E-10	6.55E-10	-7.22E-06	-6.27E-06	-6.19E-06	3.10E-10
Biased 03 - SW3	2.20E-10	2.85E-10	1.35E-05	-4.59E-06	-4.24E-06	-4.00E-06	-5.61E-06
Biased 03 - SW4	2.39E-10	8.84E-09	1.20E-07	-5.55E-06	-5.10E-06	-5.53E-06	1.40E-08
Biased 04 - SW1	2.32E-10	2.76E-10	6.09E-04	-4.47E-06	-3.60E-06	-4.11E-06	-4.88E-06
Biased 04 - SW2	2.13E-10	2.66E-10	1.05E-09	-6.92E-06	-5.95E-06	-5.63E-06	3.13E-10
Biased 04 - SW3	2.08E-10	2.64E-10	2.98E-04	-4.39E-06	-3.43E-06	-4.11E-06	-5.76E-06
Biased 04 - SW4	2.33E-10	2.94E-10	1.68E-04	-5.38E-06	-4.49E-06	7.03E-09	1.60E-09
Biased 05- SW1	2.60E-10	2.89E-10	4.21E-05	-4.07E-06	4.60E-09	3.18E-09	-5.91E-06
Biased 05- SW2	2.30E-10	2.66E-10	7.70E-10	-6.44E-06	-6.05E-06	-6.50E-06	3.22E-10
Biased 05- SW3	2.25E-10	2.64E-10	-4.55E-06	-4.56E-06	3.61E-09	2.49E-09	-5.50E-06
Biased 05- SW4	2.47E-10	4.63E-09	4.12E-08	-4.42E-06	2.19E-08	3.37E-08	1.82E-09
Biased 06 - SW1	2.40E-10	2.75E-10	1.01E-08	-4.82E-06	-4.29E-06	3.09E-09	-5.49E-06
Biased 06 - SW2	2.21E-10	2.58E-10	1.07E-09	-6.94E-06	-6.42E-06	-5.97E-06	3.22E-10
Biased 06 - SW3	2.09E-10	2.48E-10	4.87E-04	-4.55E-06	-3.93E-06	2.86E-09	-5.55E-06
Biased 06 - SW4	2.38E-10	4.34E-09	8.79E-08	-5.94E-06	-5.97E-06	-5.29E-06	1.52E-08
Unbiased 07 - SW1	2.21E-10	2.42E-10	3.89E-10	-4.51E-06	-4.94E-06	-4.52E-06	2.67E-10
Unbiased 07 - SW2	2.09E-10	2.33E-10	3.54E-10	-6.00E-06	-5.46E-06	-5.03E-06	2.50E-10
Unbiased 07 - SW3	2.02E-10	2.25E-10	3.27E-10	-5.06E-06	-4.80E-06	-4.70E-06	2.43E-10
Unbiased 07 - SW4	2.25E-10	2.49E-10	3.56E-10	-4.56E-06	-4.97E-06	-4.78E-06	2.68E-10
Unbiased 08 - SW1	2.50E-10	2.85E-10	4.21E-10	-4.63E-06	-4.51E-06	-4.54E-06	2.96E-10
Unbiased 08 - SW2	2.32E-10	2.56E-10	3.70E-10	-5.21E-06	-5.18E-06	-5.08E-06	2.71E-10
Unbiased 08 - SW3	2.28E-10	2.54E-10	3.49E-10	-4.35E-06	-4.33E-06	-4.36E-06	2.61E-10
Unbiased 08 - SW4	2.50E-10	1.70E-08	5.27E-09	-4.22E-06	-4.24E-06	-4.25E-06	3.00E-10
Unbiased 09 - SW1	2.26E-10	2.40E-10	3.62E-10	-5.08E-06	-4.67E-06	-4.46E-06	2.61E-10
Unbiased 09 - SW2	2.11E-10	2.31E-10	3.22E-10	-5.77E-06	-5.59E-06	-5.70E-06	2.39E-10
Unbiased 09 - SW3	2.00E-10	2.21E-10	2.98E-10	-4.98E-06	-4.31E-06	-4.69E-06	2.31E-10
Unbiased 09 - SW4	2.37E-10	1.69E-09	6.19E-10	-4.70E-06	-4.52E-06	-4.52E-06	2.72E-10
Unbiased 10 - SW1	2.42E-10	2.62E-10	4.05E-10	-5.13E-06	-4.21E-06	-4.72E-06	2.75E-10
Unbiased 10 - SW2	2.27E-10	2.48E-10	3.62E-10	-5.54E-06	-5.04E-06	-5.51E-06	2.58E-10
Unbiased 10 - SW3	2.16E-10	2.37E-10	3.31E-10	-4.36E-06	-4.35E-06	-4.40E-06	2.46E-10
Unbiased 10 - SW4	2.52E-10	1.85E-08	4.43E-09	-4.43E-06	-4.58E-06	-4.58E-06	2.89E-10
Unbiased 11 - SW1	2.36E-10	2.48E-10	3.87E-10	-5.06E-06	-4.49E-06	-4.67E-06	2.61E-10
Unbiased 11 - SW2	2.11E-10	2.31E-10	3.40E-10	-5.99E-06	-5.22E-06	-5.31E-06	2.43E-10
Unbiased 11 - SW3	2.01E-10	2.24E-10	3.15E-10	-4.94E-06	-4.10E-06	-4.54E-06	2.31E-10
Unbiased 11 - SW4	2.43E-10	2.82E-10	3.82E-10	-5.04E-06	-4.53E-06	-4.54E-06	2.73E-10

Table 23: $I_{SOF,F}$ Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	1.96E-10	2.48E-10	-4.55E-06	-7.22E-06	-6.42E-06	-6.50E-06	-5.91E-06
Max	2.60E-10	1.15E-08	6.09E-04	-2.80E-06	4.37E-06	4.00E-08	2.76E-08
Average	2.27E-10	1.68E-09	8.44E-05	-5.19E-06	-3.43E-06	-3.17E-06	-2.67E-06
Std.Dev.	1.62E-11	3.20E-09	1.76E-04	1.20E-06	3.19E-06	2.75E-06	2.76E-06

Table 24: I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	2.00E-10	2.21E-10	2.98E-10	-6.00E-06	-5.59E-06	-5.70E-06	2.31E-10
Max	2.52E-10	1.85E-08	5.27E-09	-4.22E-06	-4.10E-06	-4.25E-06	3.00E-10
Average	2.26E-10	2.06E-09	8.19E-10	-4.98E-06	-4.70E-06	-4.75E-06	2.62E-10
Std.Dev.	1.68E-11	5.37E-09	1.39E-09	5.33E-07	4.30E-07	3.89E-07	1.98E-11

Table 25: I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	2.00E-10	2.04E-10	2.04E-10	2.07E-10	2.12E-10	2.05E-10	2.06E-10
Max	2.31E-10	2.38E-10	2.37E-10	2.39E-10	2.41E-10	2.37E-10	2.39E-10
Average	2.17E-10	2.21E-10	2.20E-10	2.22E-10	2.24E-10	2.19E-10	2.22E-10
Std.Dev.	1.49E-11	1.49E-11	1.41E-11	1.37E-11	1.28E-11	1.35E-11	1.42E-11

Table 26: I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

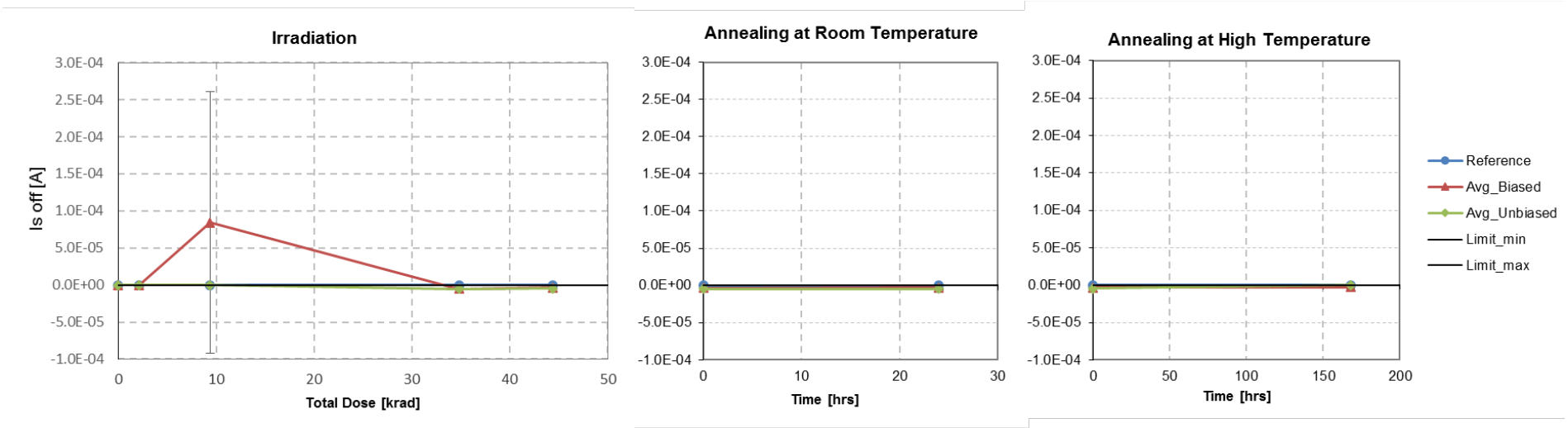

Figure 8: I_{SOFF}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{SOff} (V_S=-14V, V_D=-14V)

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	-2.10E-10	-2.09E-10	-2.05E-10	-2.08E-10	-2.07E-10	-2.03E-10	-2.10E-10
Ref 01 - SW2	-1.92E-10	-1.99E-10	-2.00E-10	-2.03E-10	-2.02E-10	-2.00E-10	-2.01E-10
Ref 01 - SW3	-1.83E-10	-1.89E-10	-1.86E-10	-1.90E-10	-1.94E-10	-1.88E-10	-1.89E-10
Ref 01 - SW4	-2.17E-10	-2.23E-10	-2.22E-10	-2.24E-10	-2.26E-10	-2.22E-10	-2.24E-10
Biased 02 - SW1	-2.09E-10	-2.79E-10	-4.87E-10	**-1.08E-06**	**-1.00E-06**	**9.97E-08**	**-3.26E-06**
Biased 02 - SW2	-1.89E-10	-2.30E-10	-2.14E-11	**-2.00E-06**	**-4.16E-06**	**-1.62E-06**	-2.05E-10
Biased 02 - SW3	-1.80E-10	-2.52E-10	-4.92E-10	**-1.67E-06**	**-2.11E-06**	**7.59E-08**	**-3.23E-06**
Biased 02 - SW4	-2.09E-10	**5.22E-09**	**8.15E-08**	**-1.68E-06**	**-3.87E-06**	**-1.14E-07**	**1.19E-08**
Biased 03 - SW1	-2.18E-10	-3.03E-10	**3.55E-05**	**-2.05E-06**	**-5.29E-06**	**-1.91E-06**	**-3.82E-06**
Biased 03 - SW2	-2.02E-10	-2.46E-10	-1.31E-10	**-3.21E-06**	**-5.09E-06**	**-1.75E-06**	-2.48E-10
Biased 03 - SW3	-1.96E-10	-2.73E-10	**4.46E-06**	**-1.98E-06**	**-5.20E-06**	**-1.15E-07**	**-3.78E-06**
Biased 03 - SW4	-2.23E-10	**4.73E-09**	**6.66E-08**	**-1.56E-06**	**-3.52E-06**	**-1.13E-07**	**6.28E-09**
Biased 04 - SW1	-2.13E-10	-2.84E-10	**1.86E-04**	**-2.67E-06**	**-5.30E-06**	**-1.53E-06**	**-2.92E-06**
Biased 04 - SW2	-1.92E-10	-2.37E-10	-2.04E-11	**-3.59E-06**	**-5.11E-06**	**-1.69E-06**	-2.22E-10
Biased 04 - SW3	-1.87E-10	-2.67E-10	**1.33E-04**	**-2.68E-06**	**-4.35E-06**	**-1.20E-06**	**-4.26E-06**
Biased 04 - SW4	-2.15E-10	-2.84E-10	**9.10E-05**	**-2.16E-06**	**-3.57E-06**	1.81E-09	3.72E-10
Biased 05- SW1	-2.41E-10	-2.95E-10	**1.73E-05**	**-1.96E-06**	-1.16E-09	-9.69E-10	**-4.10E-06**
Biased 05- SW2	-2.05E-10	-2.53E-10	-1.48E-10	**-2.97E-06**	**-4.68E-06**	**-1.79E-06**	-2.38E-10
Biased 05- SW3	-2.00E-10	-2.83E-10	**-5.27E-06**	**-2.90E-06**	-1.23E-09	-9.42E-10	**-4.54E-06**
Biased 05- SW4	-2.29E-10	**2.02E-09**	**2.20E-08**	**-1.73E-06**	**7.75E-09**	**1.65E-08**	6.27E-10
Biased 06 - SW1	-2.20E-10	-2.80E-10	-4.16E-10	**-3.96E-06**	**-5.06E-06**	-1.11E-09	**-3.48E-06**
Biased 06 - SW2	-1.99E-10	-2.49E-10	-2.90E-11	**-4.20E-06**	**-5.06E-06**	**-1.69E-06**	-2.34E-10
Biased 06 - SW3	-1.90E-10	-2.69E-10	**1.74E-04**	**-3.67E-06**	**-5.05E-06**	-9.77E-10	**-4.08E-06**
Biased 06 - SW4	-2.20E-10	1.97E-09	**5.34E-08**	**-2.87E-06**	**-3.81E-06**	**-2.26E-07**	**6.73E-09**
Unbiased 07 - SW1	-2.06E-10	-2.44E-10	-2.84E-10	**-2.55E-06**	**-4.85E-06**	**-1.13E-07**	-2.69E-10
Unbiased 07 - SW2	-1.90E-10	-2.32E-10	-2.89E-10	**-3.78E-06**	**-5.70E-06**	**-1.76E-06**	-2.57E-10
Unbiased 07 - SW3	-1.82E-10	-2.21E-10	-2.87E-10	**-3.13E-06**	**-4.44E-06**	**-1.04E-06**	-2.58E-10
Unbiased 07 - SW4	-2.11E-10	-2.50E-10	-3.04E-10	**-2.59E-06**	**-4.76E-06**	**-1.13E-07**	-2.80E-10
Unbiased 08 - SW1	-2.24E-10	-2.84E-10	-3.24E-10	**-3.21E-06**	**-4.31E-06**	**-1.68E-06**	-2.96E-10
Unbiased 08 - SW2	-2.07E-10	-2.51E-10	-3.11E-10	**-3.73E-06**	**-4.99E-06**	**-2.22E-06**	-2.75E-10
Unbiased 08 - SW3	-1.97E-10	-2.42E-10	-3.10E-10	**-2.85E-06**	**-4.03E-06**	**-1.10E-07**	-2.67E-10
Unbiased 08 - SW4	-2.25E-10	**-2.23E-08**	**-6.82E-09**	**-2.41E-06**	**-3.92E-06**	**-1.39E-06**	-3.05E-10
Unbiased 09 - SW1	-2.08E-10	-2.38E-10	-2.78E-10	**-3.02E-06**	**-4.30E-06**	**-1.23E-06**	-2.81E-10
Unbiased 09 - SW2	-1.97E-10	-2.32E-10	-2.84E-10	**-4.06E-06**	**-5.35E-06**	**-2.62E-06**	-2.64E-10
Unbiased 09 - SW3	-1.84E-10	-2.20E-10	-2.79E-10	**-3.09E-06**	**-4.19E-06**	**-1.29E-06**	-2.54E-10
Unbiased 09 - SW4	-2.18E-10	**-2.18E-09**	-6.59E-10	**-2.96E-06**	**-3.69E-06**	**-1.21E-06**	-2.87E-10
Unbiased 10 - SW1	-2.20E-10	-2.59E-10	-3.06E-10	**-3.41E-06**	**-3.54E-06**	**-1.55E-06**	-2.87E-10
Unbiased 10 - SW2	-2.06E-10	-2.45E-10	-2.98E-10	**-3.95E-06**	**-4.54E-06**	**-2.40E-06**	-2.70E-10
Unbiased 10 - SW3	-1.95E-10	-2.31E-10	-2.92E-10	**-2.45E-06**	**-4.25E-06**	**-1.15E-07**	-2.62E-10
Unbiased 10 - SW4	-2.29E-10	**-2.47E-08**	**-5.88E-09**	**-2.43E-06**	**-4.28E-06**	**-1.15E-07**	-2.98E-10
Unbiased 11 - SW1	-2.19E-10	-2.50E-10	-2.97E-10	**-3.13E-06**	**-4.06E-06**	**-1.14E-07**	-2.69E-10
Unbiased 11 - SW2	-1.99E-10	-2.36E-10	-2.93E-10	**-3.97E-06**	**-4.83E-06**	**-1.82E-06**	-2.57E-10
Unbiased 11 - SW3	-1.85E-10	-2.24E-10	-2.87E-10	**-2.94E-06**	**-3.47E-06**	**-1.22E-06**	-2.50E-10
Unbiased 11 - SW4	-2.25E-10	-2.78E-10	-3.33E-10	**-2.86E-06**	**-3.93E-06**	**-1.09E-06**	-2.81E-10

Table 27: : I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-2.41E-10	-3.03E-10	-5.27E-06	-4.20E-06	-5.30E-06	-1.91E-06	-4.54E-06
Max	-1.80E-10	5.22E-09	1.86E-04	-1.08E-06	7.75E-09	9.97E-08	1.19E-08
Average	-2.07E-10	4.83E-10	3.18E-05	-2.53E-06	-3.61E-06	-6.78E-07	-1.87E-06
Std.Dev.	1.57E-11	1.69E-09	6.17E-05	8.76E-07	1.91E-06	8.26E-07	1.96E-06

Table 28: : I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-2.29E-10	-2.47E-08	-6.82E-09	-4.06E-06	-5.70E-06	-2.62E-06	-3.05E-10
Max	-1.82E-10	-2.20E-10	-2.78E-10	-2.41E-06	-3.47E-06	-1.10E-07	-2.50E-10
Average	-2.06E-10	-2.66E-09	-9.21E-10	-3.13E-06	-4.37E-06	-1.16E-06	-2.73E-10
Std.Dev.	1.49E-11	7.14E-09	1.86E-09	5.35E-07	5.80E-07	8.17E-07	1.56E-11

Table 29: : I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-2.17E-10	-2.23E-10	-2.22E-10	-2.24E-10	-2.26E-10	-2.22E-10	-2.24E-10
Max	-1.83E-10	-1.89E-10	-1.86E-10	-1.90E-10	-1.94E-10	-1.88E-10	-1.89E-10
Average	-2.00E-10	-2.05E-10	-2.03E-10	-2.06E-10	-2.07E-10	-2.03E-10	-2.06E-10
Std.Dev.	1.55E-11	1.48E-11	1.48E-11	1.41E-11	1.38E-11	1.42E-11	1.48E-11

Table 30: : I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference samples

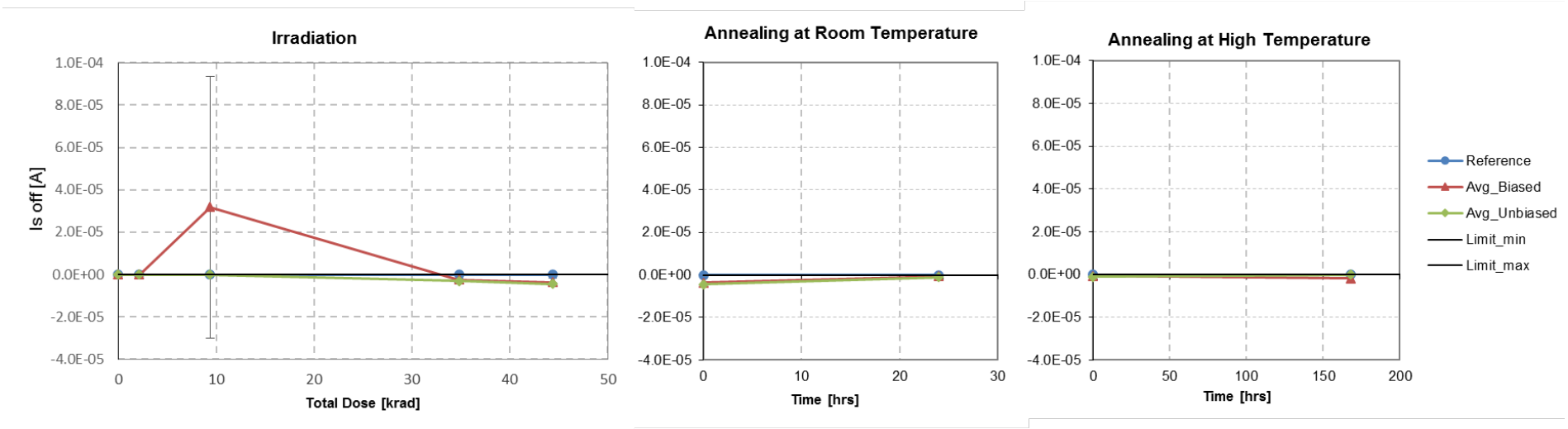

Figure 9: : I_{SOFF}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{SOff} (V_S=-14V, V_D=+14V)

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	2.31E-10	2.31E-10	2.27E-10	2.29E-10	2.30E-10	2.25E-10	2.31E-10
Ref 01 - SW2	2.16E-10	2.21E-10	2.23E-10	2.23E-10	2.25E-10	2.21E-10	2.21E-10
Ref 01 - SW3	2.05E-10	2.10E-10	2.12E-10	2.11E-10	2.16E-10	2.09E-10	2.10E-10
Ref 01 - SW4	2.37E-10	2.44E-10	2.43E-10	2.44E-10	2.47E-10	2.42E-10	2.44E-10
Biased 02 - SW1	2.28E-10	2.93E-10	6.89E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 02 - SW2	2.12E-10	2.74E-10	9.22E-10	5.00E-03	5.00E-03	5.00E-03	3.39E-10
Biased 02 - SW3	2.03E-10	2.64E-10	4.89E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 02 - SW4	2.26E-10	1.61E-08	1.04E-06	5.00E-03	5.00E-03	5.00E-03	3.46E-08
Biased 03 - SW1	2.55E-10	3.35E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 03 - SW2	2.34E-10	2.95E-10	7.70E-10	5.00E-03	5.00E-03	5.00E-03	3.19E-10
Biased 03 - SW3	2.30E-10	2.97E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 03 - SW4	2.42E-10	1.13E-08	3.08E-06	5.00E-03	5.00E-03	5.00E-03	2.33E-08
Biased 04 - SW1	2.37E-10	2.85E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 04 - SW2	2.20E-10	2.77E-10	1.12E-09	5.00E-03	5.00E-03	5.00E-03	3.20E-10
Biased 04 - SW3	2.17E-10	2.75E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 04 - SW4	2.39E-10	2.83E-10	5.00E-03	5.00E-03	5.00E-03	1.05E-08	2.49E-09
Biased 05- SW1	2.59E-10	2.97E-10	5.00E-03	5.00E-03	8.10E-09	8.61E-09	5.00E-03
Biased 05- SW2	2.36E-10	2.77E-10	7.80E-10	5.00E-03	5.00E-03	5.00E-03	3.30E-10
Biased 05- SW3	2.38E-10	2.77E-10	5.00E-03	5.00E-03	8.29E-09	8.79E-09	5.00E-03
Biased 05- SW4	2.52E-10	6.43E-09	3.15E-07	5.00E-03	5.50E-08	4.63E-07	1.24E-08
Biased 06 - SW1	2.45E-10	2.81E-10	3.83E-05	5.00E-03	5.00E-03	6.77E-09	5.00E-03
Biased 06 - SW2	2.30E-10	2.69E-10	1.14E-09	5.00E-03	5.00E-03	5.00E-03	3.31E-10
Biased 06 - SW3	2.17E-10	2.53E-10	5.00E-03	5.00E-03	5.00E-03	1.07E-08	5.00E-03
Biased 06 - SW4	2.43E-10	5.65E-09	7.17E-07	5.00E-03	5.00E-03	5.00E-03	2.28E-08
Unbiased 07 - SW1	2.24E-10	2.49E-10	3.79E-10	5.00E-03	5.00E-03	5.00E-03	2.70E-10
Unbiased 07 - SW2	2.16E-10	2.41E-10	3.48E-10	5.00E-03	5.00E-03	5.00E-03	2.58E-10
Unbiased 07 - SW3	2.11E-10	2.34E-10	3.19E-10	5.00E-03	5.00E-03	5.00E-03	2.51E-10
Unbiased 07 - SW4	2.29E-10	2.55E-10	3.47E-10	5.00E-03	5.00E-03	5.00E-03	2.72E-10
Unbiased 08 - SW1	2.54E-10	2.94E-10	4.14E-10	5.00E-03	5.00E-03	5.00E-03	3.03E-10
Unbiased 08 - SW2	2.41E-10	2.69E-10	3.60E-10	5.00E-03	5.00E-03	5.00E-03	2.79E-10
Unbiased 08 - SW3	2.41E-10	2.68E-10	3.42E-10	5.00E-03	5.00E-03	5.00E-03	2.72E-10
Unbiased 08 - SW4	2.59E-10	4.14E-08	1.30E-08	5.00E-03	5.00E-03	5.00E-03	3.10E-10
Unbiased 09 - SW1	2.31E-10	2.46E-10	3.66E-10	5.00E-03	5.00E-03	5.00E-03	2.63E-10
Unbiased 09 - SW2	2.17E-10	2.37E-10	3.27E-10	5.00E-03	5.00E-03	5.00E-03	2.46E-10
Unbiased 09 - SW3	2.05E-10	2.25E-10	2.97E-10	5.00E-03	5.00E-03	5.00E-03	2.35E-10
Unbiased 09 - SW4	2.44E-10	1.74E-09	6.66E-10	5.00E-03	5.00E-03	5.00E-03	2.78E-10
Unbiased 10 - SW1	2.45E-10	2.66E-10	3.95E-10	5.00E-03	5.00E-03	5.00E-03	2.78E-10
Unbiased 10 - SW2	2.33E-10	2.56E-10	3.56E-10	5.00E-03	5.00E-03	5.00E-03	2.63E-10
Unbiased 10 - SW3	2.18E-10	2.42E-10	3.22E-10	5.00E-03	5.00E-03	5.00E-03	2.50E-10
Unbiased 10 - SW4	2.58E-10	2.97E-08	6.63E-09	5.00E-03	5.00E-03	5.00E-03	2.95E-10
Unbiased 11 - SW1	2.38E-10	2.52E-10	3.80E-10	5.00E-03	5.00E-03	5.00E-03	2.65E-10
Unbiased 11 - SW2	2.15E-10	2.37E-10	3.31E-10	5.00E-03	5.00E-03	5.00E-03	2.47E-10
Unbiased 11 - SW3	2.05E-10	2.28E-10	3.04E-10	5.00E-03	5.00E-03	5.00E-03	2.34E-10
Unbiased 11 - SW4	2.49E-10	2.94E-10	3.83E-10	5.00E-03	5.00E-03	5.00E-03	2.80E-10

Table 31: : I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	2.03E-10	2.53E-10	4.89E-10	5.00E-03	8.10E-09	6.77E-09	3.19E-10
Max	2.59E-10	1.61E-08	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Average	2.33E-10	2.20E-09	2.00E-03	5.00E-03	4.25E-03	3.50E-03	2.50E-03
Std.Dev.	1.46E-11	4.38E-09	2.51E-03	3.56E-08	1.83E-03	2.35E-03	2.57E-03

Table 32: : I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	2.05E-10	2.25E-10	2.97E-10	5.00E-03	5.00E-03	5.00E-03	2.34E-10
Max	2.59E-10	4.14E-08	1.30E-08	5.00E-03	5.00E-03	5.00E-03	3.10E-10
Average	2.32E-10	3.86E-09	1.31E-09	5.00E-03	5.00E-03	5.00E-03	2.67E-10
Std.Dev.	1.72E-11	1.10E-08	3.09E-09	1.82E-08	2.23E-08	2.02E-08	2.07E-11

Table 33: : I_{SOFF} , Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	2.05E-10	2.10E-10	2.12E-10	2.11E-10	2.16E-10	2.09E-10	2.10E-10
Max	2.37E-10	2.44E-10	2.43E-10	2.44E-10	2.47E-10	2.42E-10	2.44E-10
Average	2.22E-10	2.26E-10	2.26E-10	2.27E-10	2.29E-10	2.25E-10	2.27E-10
Std.Dev.	1.44E-11	1.44E-11	1.28E-11	1.37E-11	1.28E-11	1.36E-11	1.42E-11

Table 34: : I_{SOFF}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

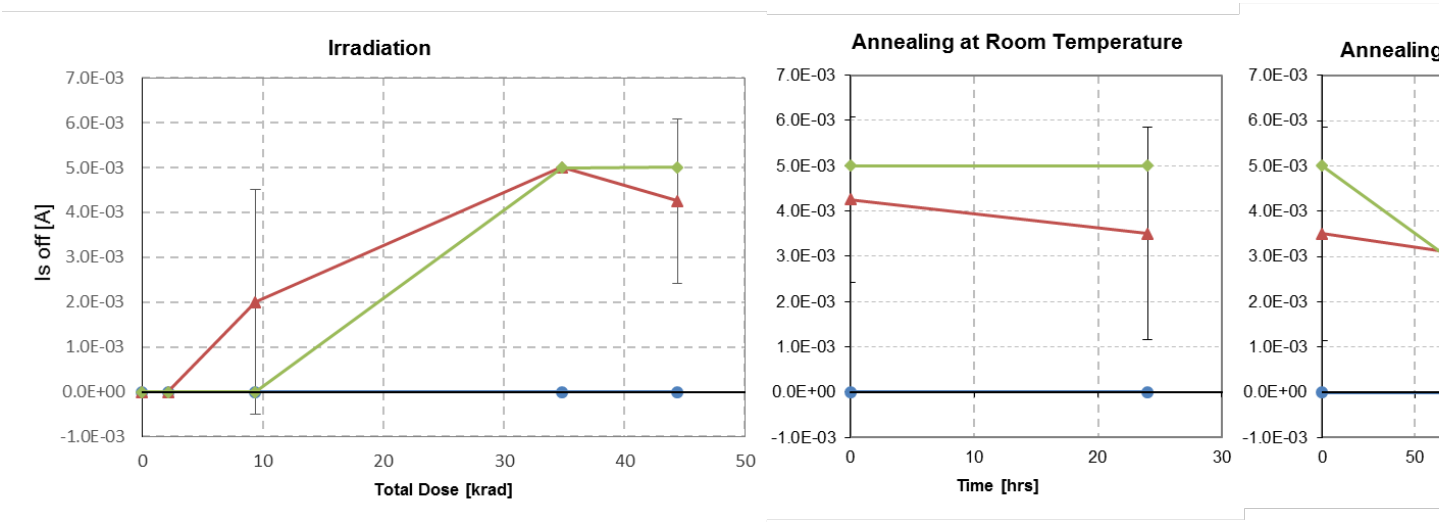

Figure 10: : I_{SOFF}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{DOff} (V_S=+14V, V_D=0V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	1.31E-10	1.30E-10	1.29E-10	1.30E-10	1.28E-10	1.27E-10	1.30E-10
Ref 01 - SW2	1.15E-10	1.15E-10	1.15E-10	1.18E-10	1.18E-10	1.18E-10	1.16E-10
Ref 01 - SW3	1.14E-10	1.16E-10	1.15E-10	1.18E-10	1.20E-10	1.17E-10	1.18E-10
Ref 01 - SW4	1.29E-10	1.31E-10	1.30E-10	1.32E-10	1.32E-10	1.30E-10	1.31E-10
Biased 02 - SW1	1.30E-10	1.46E-10	2.90E-10	-5.00E-03	-4.98E-03	-4.99E-03	-5.00E-03
Biased 02 - SW2	1.15E-10	1.35E-10	5.00E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.90E-10
Biased 02 - SW3	1.11E-10	1.29E-10	1.91E-10	-5.00E-03	-4.99E-03	-4.99E-03	-5.00E-03
Biased 02 - SW4	1.25E-10	8.29E-09	1.13E-07	-5.00E-03	-5.00E-03	-5.00E-03	2.12E-08
Biased 03 - SW1	1.37E-10	1.56E-10	-4.81E-03	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03
Biased 03 - SW2	1.22E-10	1.44E-10	3.87E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.64E-10
Biased 03 - SW3	1.23E-10	1.45E-10	-4.96E-03	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03
Biased 03 - SW4	1.35E-10	6.98E-09	9.46E-08	-5.00E-03	-5.00E-03	-5.00E-03	1.11E-08
Biased 04 - SW1	1.32E-10	1.28E-10	-4.67E-03	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03
Biased 04 - SW2	1.18E-10	1.19E-10	5.64E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.76E-10
Biased 04 - SW3	1.15E-10	1.12E-10	-4.39E-03	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03
Biased 04 - SW4	1.31E-10	1.28E-10	-4.65E-03	-5.00E-03	-5.00E-03	5.25E-09	1.33E-09
Biased 05- SW1	1.41E-10	1.32E-10	-4.88E-03	-5.00E-03	1.09E-09	1.04E-09	-5.00E-03
Biased 05- SW2	1.25E-10	1.27E-10	3.95E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.76E-10
Biased 05- SW3	1.24E-10	1.18E-10	-5.00E-03	-5.00E-03	7.43E-10	7.04E-10	-5.00E-03
Biased 05- SW4	1.38E-10	3.45E-09	3.25E-08	-5.00E-03	1.65E-08	2.80E-08	1.60E-09
Biased 06 - SW1	1.38E-10	1.31E-10	-3.71E-04	-5.00E-03	-5.00E-03	6.66E-10	-5.00E-03
Biased 06 - SW2	1.21E-10	1.23E-10	5.72E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.76E-10
Biased 06 - SW3	1.18E-10	1.16E-10	-3.99E-03	-5.00E-03	-5.00E-03	7.21E-10	-5.00E-03
Biased 06 - SW4	1.32E-10	3.29E-09	6.79E-08	-5.00E-03	-5.00E-03	-5.00E-03	1.21E-08
Unbiased 07 - SW1	1.28E-10	1.24E-10	1.84E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.30E-10
Unbiased 07 - SW2	1.17E-10	1.12E-10	1.57E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.18E-10
Unbiased 07 - SW3	1.14E-10	1.10E-10	1.42E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.15E-10
Unbiased 07 - SW4	1.27E-10	1.25E-10	1.62E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.30E-10
Unbiased 08 - SW1	1.38E-10	1.38E-10	1.92E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.37E-10
Unbiased 08 - SW2	1.25E-10	1.22E-10	1.62E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.25E-10
Unbiased 08 - SW3	1.24E-10	1.22E-10	1.48E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.22E-10
Unbiased 08 - SW4	1.38E-10	-1.46E-08	-4.12E-09	-5.00E-03	-5.00E-03	-5.00E-03	1.41E-10
Unbiased 09 - SW1	1.31E-10	1.24E-10	1.71E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.27E-10
Unbiased 09 - SW2	1.20E-10	1.17E-10	1.43E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.13E-10
Unbiased 09 - SW3	1.15E-10	1.13E-10	1.30E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.11E-10
Unbiased 09 - SW4	1.32E-10	-1.41E-10	9.81E-11	-5.00E-03	-5.00E-03	-5.00E-03	1.31E-10
Unbiased 10 - SW1	1.38E-10	1.33E-10	1.89E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.36E-10
Unbiased 10 - SW2	1.24E-10	1.19E-10	1.62E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.24E-10
Unbiased 10 - SW3	1.22E-10	1.19E-10	1.46E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.20E-10
Unbiased 10 - SW4	1.39E-10	-8.57E-09	-1.62E-09	-5.00E-03	-5.00E-03	-5.00E-03	1.41E-10
Unbiased 11 - SW1	1.35E-10	1.27E-10	1.82E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.29E-10
Unbiased 11 - SW2	1.18E-10	1.14E-10	1.53E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.16E-10
Unbiased 11 - SW3	1.15E-10	1.13E-10	1.39E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.12E-10
Unbiased 11 - SW4	1.34E-10	1.33E-10	1.63E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.33E-10

Table 35: I_{DOFF}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	1.11E-10	1.12E-10	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03	-5.00E-03
Max	1.41E-10	8.29E-09	1.13E-07	-5.00E-03	1.65E-08	2.80E-08	2.12E-08
Average	1.27E-10	1.21E-09	-1.89E-03	-5.00E-03	-4.25E-03	-3.50E-03	-2.50E-03
Std.Dev.	8.75E-12	2.42E-09	2.34E-03	9.95E-07	1.83E-03	2.35E-03	2.56E-03

Table 36: I_{DOFF} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	1.14E-10	-1.46E-08	-4.12E-09	-5.00E-03	-5.00E-03	-5.00E-03	1.11E-10
Max	1.39E-10	1.38E-10	1.92E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.41E-10
Average	1.27E-10	-1.06E-09	-1.46E-10	-5.00E-03	-5.00E-03	-5.00E-03	1.26E-10
Std.Dev.	8.55E-12	3.73E-09	1.02E-09	1.97E-08	1.81E-08	2.23E-08	9.39E-12

Table 37: I_{DOFF} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	1.14E-10	1.15E-10	1.15E-10	1.18E-10	1.18E-10	1.17E-10	1.16E-10
Max	1.31E-10	1.31E-10	1.30E-10	1.32E-10	1.32E-10	1.30E-10	1.31E-10
Average	1.22E-10	1.23E-10	1.22E-10	1.24E-10	1.24E-10	1.23E-10	1.24E-10
	1.22E-10	1.23E-10	1.22E-10	1.24E-10	1.24E-10	1.22E-10	1.24E-10
Std.Dev.	8.65E-12	8.65E-12	8.09E-12	7.25E-12	6.63E-12	6.68E-12	7.97E-12

Table 38: I_{DOFF} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

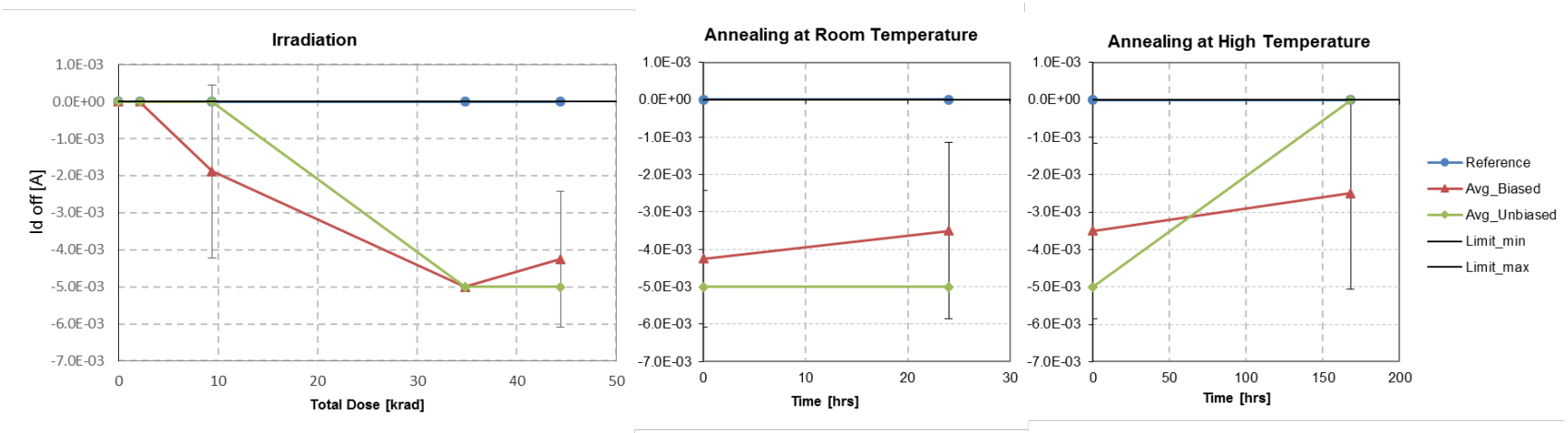

Figure 11: I_{DOFF}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{DOff} (V_S=-14V, V_D=0V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	1.33E-10	1.32E-10	1.30E-10	1.31E-10	1.31E-10	1.29E-10	1.32E-10
Ref 01 - SW2	1.21E-10	1.23E-10	1.24E-10	1.27E-10	1.25E-10	1.26E-10	1.25E-10
Ref 01 - SW3	1.18E-10	1.21E-10	1.20E-10	1.21E-10	1.23E-10	1.20E-10	1.22E-10
Ref 01 - SW4	1.33E-10	1.35E-10	1.34E-10	1.35E-10	1.36E-10	1.34E-10	1.35E-10
Biased 02 - SW1	1.30E-10	1.41E-10	3.10E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 02 - SW2	1.21E-10	1.39E-10	5.34E-10	5.00E-03	5.00E-03	5.00E-03	1.92E-10
Biased 02 - SW3	1.17E-10	1.25E-10	1.78E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 02 - SW4	1.27E-10	1.16E-08	8.00E-07	5.00E-03	5.00E-03	5.00E-03	2.60E-08
Biased 03 - SW1	1.39E-10	1.56E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 03 - SW2	1.34E-10	1.52E-10	4.06E-10	5.00E-03	5.00E-03	5.00E-03	1.70E-10
Biased 03 - SW3	1.34E-10	1.47E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 03 - SW4	1.37E-10	8.52E-09	2.45E-06	5.00E-03	5.00E-03	5.00E-03	1.76E-08
Biased 04 - SW1	1.35E-10	1.30E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 04 - SW2	1.26E-10	1.25E-10	6.34E-10	5.00E-03	5.00E-03	5.00E-03	1.75E-10
Biased 04 - SW3	1.24E-10	1.11E-10	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Biased 04 - SW4	1.35E-10	1.27E-10	5.00E-03	5.00E-03	5.00E-03	7.61E-09	1.95E-09
Biased 05- SW1	1.48E-10	1.34E-10	5.00E-03	5.00E-03	3.05E-09	3.92E-09	5.00E-03
Biased 05- SW2	1.36E-10	1.31E-10	4.04E-10	5.00E-03	5.00E-03	5.00E-03	1.79E-10
Biased 05- SW3	1.36E-10	1.19E-10	5.00E-03	5.00E-03	3.29E-09	4.09E-09	5.00E-03
Biased 05- SW4	1.42E-10	4.62E-09	2.26E-07	5.00E-03	3.98E-08	3.44E-07	9.46E-09
Biased 06 - SW1	1.40E-10	1.30E-10	4.38E-10	5.00E-03	5.00E-03	2.72E-09	5.00E-03
Biased 06 - SW2	1.32E-10	1.25E-10	6.42E-10	5.00E-03	5.00E-03	5.00E-03	1.82E-10
Biased 06 - SW3	1.25E-10	1.09E-10	5.00E-03	5.00E-03	5.00E-03	4.61E-09	5.00E-03
Biased 06 - SW4	1.37E-10	4.20E-09	5.41E-07	5.00E-03	5.00E-03	5.00E-03	1.71E-08
Unbiased 07 - SW1	1.28E-10	1.21E-10	1.70E-10	5.00E-03	5.00E-03	5.00E-03	1.26E-10
Unbiased 07 - SW2	1.24E-10	1.19E-10	1.48E-10	5.00E-03	5.00E-03	5.00E-03	1.21E-10
Unbiased 07 - SW3	1.22E-10	1.14E-10	1.32E-10	5.00E-03	5.00E-03	5.00E-03	1.18E-10
Unbiased 07 - SW4	1.29E-10	1.24E-10	1.48E-10	5.00E-03	5.00E-03	5.00E-03	1.27E-10
Unbiased 08 - SW1	1.47E-10	1.40E-10	1.83E-10	5.00E-03	5.00E-03	5.00E-03	1.40E-10
Unbiased 08 - SW2	1.38E-10	1.33E-10	1.56E-10	5.00E-03	5.00E-03	5.00E-03	1.32E-10
Unbiased 08 - SW3	1.39E-10	1.33E-10	1.43E-10	5.00E-03	5.00E-03	5.00E-03	1.31E-10
Unbiased 08 - SW4	1.47E-10	9.62E-09	3.23E-09	5.00E-03	5.00E-03	5.00E-03	1.48E-10
Unbiased 09 - SW1	1.32E-10	1.24E-10	1.64E-10	5.00E-03	5.00E-03	5.00E-03	1.24E-10
Unbiased 09 - SW2	1.24E-10	1.19E-10	1.36E-10	5.00E-03	5.00E-03	5.00E-03	1.14E-10
Unbiased 09 - SW3	1.19E-10	1.13E-10	1.19E-10	5.00E-03	5.00E-03	5.00E-03	1.09E-10
Unbiased 09 - SW4	1.38E-10	-1.00E-10	1.36E-10	5.00E-03	5.00E-03	5.00E-03	1.31E-10
Unbiased 10 - SW1	1.41E-10	1.31E-10	1.76E-10	5.00E-03	5.00E-03	5.00E-03	1.33E-10
Unbiased 10 - SW2	1.33E-10	1.26E-10	1.53E-10	5.00E-03	5.00E-03	5.00E-03	1.24E-10
Unbiased 10 - SW3	1.26E-10	1.19E-10	1.33E-10	5.00E-03	5.00E-03	5.00E-03	1.19E-10
Unbiased 10 - SW4	1.46E-10	2.92E-09	4.91E-10	5.00E-03	5.00E-03	5.00E-03	1.41E-10
Unbiased 11 - SW1	1.35E-10	1.24E-10	1.67E-10	5.00E-03	5.00E-03	5.00E-03	1.27E-10
Unbiased 11 - SW2	1.21E-10	1.16E-10	1.39E-10	5.00E-03	5.00E-03	5.00E-03	1.15E-10
Unbiased 11 - SW3	1.18E-10	1.11E-10	1.22E-10	5.00E-03	5.00E-03	5.00E-03	1.10E-10
Unbiased 11 - SW4	1.39E-10	1.39E-10	1.58E-10	5.00E-03	5.00E-03	5.00E-03	1.34E-10

Table 39: I_{DOFF}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	1.17E-10	1.09E-10	1.78E-10	5.00E-03	3.05E-09	2.72E-09	1.70E-10
Max	1.48E-10	1.16E-08	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03
Average	1.33E-10	1.55E-09	2.00E-03	5.00E-03	4.25E-03	3.50E-03	2.50E-03
Std.Dev.	7.60E-12	3.22E-09	2.51E-03	7.07E-08	1.83E-03	2.35E-03	2.57E-03

Table 40: I_{DOFF} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	1.18E-10	-1.00E-10	1.19E-10	5.00E-03	5.00E-03	5.00E-03	1.09E-10
Max	1.47E-10	9.62E-09	3.23E-09	5.00E-03	5.00E-03	5.00E-03	1.48E-10
Average	1.32E-10	7.27E-10	3.20E-10	5.00E-03	5.00E-03	5.00E-03	1.26E-10
Std.Dev.	9.26E-12	2.19E-09	6.90E-10	1.21E-08	2.51E-08	1.05E-07	1.04E-11

Table 41: I_{DOFF} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	1.18E-10	1.21E-10	1.20E-10	1.21E-10	1.23E-10	1.20E-10	1.22E-10
Max	1.33E-10	1.35E-10	1.34E-10	1.35E-10	1.36E-10	1.34E-10	1.35E-10
Average	1.26E-10	1.28E-10	1.27E-10	1.28E-10	1.29E-10	1.28E-10	1.29E-10
Std.Dev.	7.70E-12	6.73E-12	6.29E-12	6.11E-12	5.82E-12	5.82E-12	6.03E-12

Table 42: I_{DOFF} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference samples

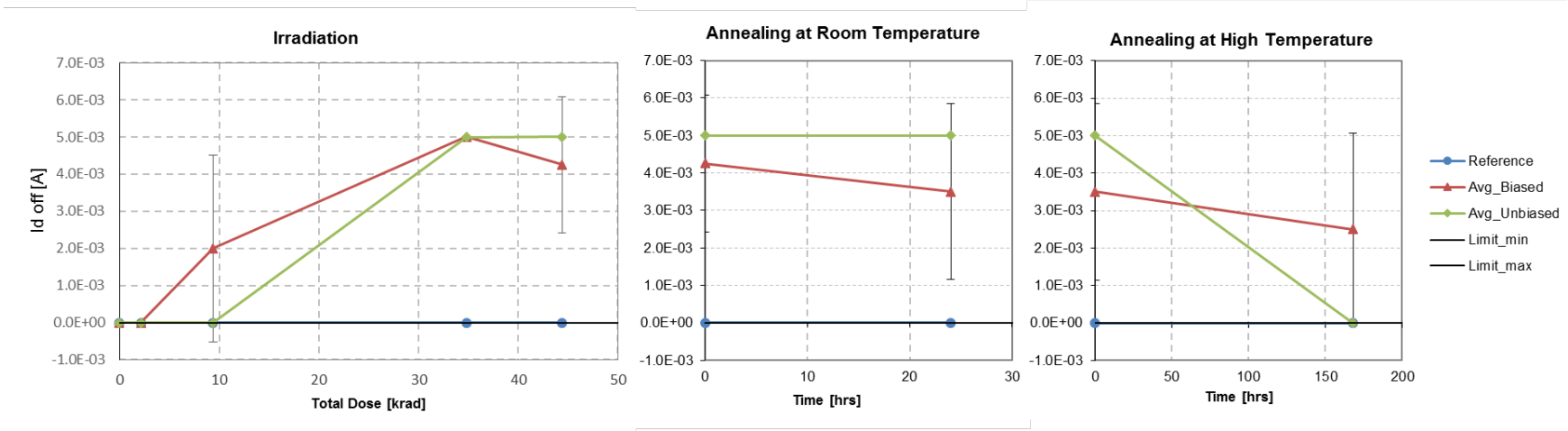

Figure 12: I_{DOFF}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{Don} (V_S=-14V, V_D=-14V)

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	-2.62E-10	-2.67E-10	-2.59E-10	-2.64E-10	-2.61E-10	-2.55E-10	-2.64E-10
Ref 01 - SW2	-2.73E-10	-2.79E-10	-2.80E-10	-2.84E-10	-2.88E-10	-2.80E-10	-2.83E-10
Ref 01 - SW3	-2.33E-10	-2.40E-10	-2.39E-10	-2.43E-10	-2.49E-10	-2.38E-10	-2.41E-10
Ref 01 - SW4	-2.72E-10	-2.82E-10	-2.81E-10	-2.81E-10	-2.86E-10	-2.79E-10	-2.84E-10
Biased 02 - SW1	-2.58E-10	6.54E-08	8.70E-08	1.88E-06	7.32E-06	3.93E-06	1.29E-06
Biased 02 - SW2	-2.65E-10	-3.73E-10	-6.22E-10	5.73E-10	1.44E-09	1.16E-09	-3.40E-10
Biased 02 - SW3	-2.27E-10	5.02E-08	7.23E-08	1.42E-06	6.12E-06	3.19E-06	9.54E-07
Biased 02 - SW4	-2.62E-10	-3.88E-10	-6.82E-10	-7.64E-11	3.75E-10	3.41E-10	-3.18E-10
Biased 03 - SW1	-2.73E-10	7.33E-08	4.22E-08	7.68E-08	1.17E-07	4.48E-08	9.62E-09
Biased 03 - SW2	-2.92E-10	-3.82E-10	-6.38E-10	-3.50E-11	-3.90E-11	-1.72E-10	-3.70E-10
Biased 03 - SW3	-2.53E-10	4.55E-08	4.00E-08	5.62E-08	8.29E-08	2.97E-08	6.75E-09
Biased 03 - SW4	-2.81E-10	-3.88E-10	-1.02E-09	-4.19E-10	-7.53E-10	-7.07E-10	-3.43E-10
Biased 04 - SW1	-2.64E-10	1.64E-08	2.85E-08	1.31E-07	4.80E-07	2.01E-07	5.03E-08
Biased 04 - SW2	-2.75E-10	-3.84E-10	-8.23E-10	1.24E-10	1.26E-10	7.89E-11	-3.47E-10
Biased 04 - SW3	-2.39E-10	1.08E-08	3.44E-08	1.06E-07	3.54E-07	1.29E-07	3.58E-08
Biased 04 - SW4	-2.73E-10	1.15E-08	5.06E-08	2.03E-09	1.82E-08	4.70E-08	3.66E-07
Biased 05- SW1	-2.85E-10	1.06E-08	1.88E-08	6.86E-08	1.18E-08	1.23E-09	1.47E-08
Biased 05- SW2	-2.96E-10	-4.13E-10	-7.03E-10	2.17E-11	2.69E-11	5.81E-11	-3.64E-10
Biased 05- SW3	-2.60E-10	7.34E-09	1.86E-08	5.73E-08	-1.75E-09	-1.35E-09	9.95E-09
Biased 05- SW4	-2.92E-10	-4.22E-10	-7.81E-10	4.39E-08	2.20E-08	4.47E-08	3.85E-07
Biased 06 - SW1	-2.70E-10	9.94E-09	2.47E-08	1.01E-07	2.84E-07	2.46E-09	3.67E-08
Biased 06 - SW2	-2.86E-10	-4.00E-10	-8.22E-10	4.29E-12	2.90E-10	2.25E-10	-3.62E-10
Biased 06 - SW3	-2.45E-10	6.90E-09	3.12E-08	9.59E-08	-2.05E-09	-1.43E-09	2.91E-08
Biased 06 - SW4	-2.80E-10	-4.08E-10	-1.20E-09	-4.74E-10	-7.23E-10	-6.02E-10	-3.29E-10
Unbiased 07 - SW1	-2.56E-10	-3.57E-10	-4.89E-10	5.19E-10	-5.06E-10	-5.48E-10	-3.49E-10
Unbiased 07 - SW2	-2.70E-10	-3.69E-10	-5.95E-10	-2.08E-10	-6.88E-10	-6.88E-10	-3.64E-10
Unbiased 07 - SW3	-2.32E-10	-3.26E-10	-5.10E-10	-2.23E-10	-6.08E-10	-6.22E-10	-3.30E-10
Unbiased 07 - SW4	-2.66E-10	-3.61E-10	-5.47E-10	-2.82E-10	-6.47E-10	-6.59E-10	-3.66E-10
Unbiased 08 - SW1	-2.83E-10	-4.10E-10	-5.39E-10	-1.10E-09	-4.88E-10	-5.80E-10	-3.87E-10
Unbiased 08 - SW2	-3.04E-10	-4.11E-10	-6.44E-10	-1.02E-09	-7.02E-10	-7.19E-10	-3.95E-10
Unbiased 08 - SW3	-2.58E-10	-3.61E-10	-5.47E-10	-9.27E-10	-6.03E-10	-6.35E-10	-3.49E-10
Unbiased 08 - SW4	-2.92E-10	-2.35E-08	-6.94E-09	-3.75E-09	-2.85E-09	-1.23E-09	-4.01E-10
Unbiased 09 - SW1	-2.60E-10	-3.33E-10	-4.63E-10	-8.53E-10	-5.69E-10	-6.10E-10	-3.57E-10
Unbiased 09 - SW2	-2.76E-10	-3.52E-10	-5.08E-10	-9.00E-10	-7.30E-10	-7.41E-10	-3.61E-10
Unbiased 09 - SW3	-2.32E-10	-3.11E-10	-4.71E-10	-8.02E-10	-6.59E-10	-6.55E-10	-3.22E-10
Unbiased 09 - SW4	-2.76E-10	-2.12E-09	-8.44E-10	-9.56E-10	-7.36E-10	-7.05E-10	-3.70E-10
Unbiased 10 - SW1	-2.79E-10	-3.80E-10	-5.08E-10	-8.36E-10	-5.83E-10	-5.67E-10	-3.71E-10
Unbiased 10 - SW2	-3.00E-10	-3.92E-10	-5.61E-10	-9.38E-10	-7.78E-10	-7.27E-10	-3.86E-10
Unbiased 10 - SW3	-2.51E-10	-3.44E-10	-5.13E-10	-8.78E-10	-6.69E-10	-6.41E-10	-3.37E-10
Unbiased 10 - SW4	-2.94E-10	-2.35E-08	-5.82E-09	-3.26E-09	-2.07E-09	-1.08E-09	-3.91E-10
Unbiased 11 - SW1	-2.76E-10	-3.64E-10	-5.14E-10	-8.05E-10	-6.13E-10	-6.44E-10	-3.46E-10
Unbiased 11 - SW2	-2.80E-10	-3.73E-10	-5.47E-10	-9.23E-10	-8.09E-10	-7.79E-10	-3.61E-10
Unbiased 11 - SW3	-2.35E-10	-3.27E-10	-5.08E-10	-8.68E-10	-6.51E-10	-6.45E-10	-3.18E-10
Unbiased 11 - SW4	-2.85E-10	-3.92E-10	-5.79E-10	-8.79E-10	-7.06E-10	-7.17E-10	-3.66E-10

Table 43: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-2.96E-10	-4.22E-10	-1.20E-09	-4.74E-10	-2.05E-09	-1.43E-09	-3.70E-10
Max	-2.27E-10	7.33E-08	8.70E-08	1.88E-06	7.32E-06	3.93E-06	1.29E-06
Average	-2.69E-10	1.52E-08	2.20E-08	2.02E-07	7.40E-07	3.81E-07	1.59E-07
Std.Dev.	1.84E-11	2.34E-08	2.65E-08	5.03E-07	2.06E-06	1.10E-06	3.52E-07

Table 44: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-3.04E-10	-2.35E-08	-6.94E-09	-3.75E-09	-2.85E-09	-1.23E-09	-4.01E-10
Max	-2.32E-10	-3.11E-10	-4.63E-10	5.19E-10	-4.88E-10	-5.48E-10	-3.18E-10
Average	-2.70E-10	-2.76E-09	-1.13E-09	-9.94E-10	-8.33E-10	-7.09E-10	-3.61E-10
Std.Dev.	2.14E-11	7.10E-09	1.81E-09	9.43E-10	5.76E-10	1.65E-10	2.37E-11

Table 45: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	-2.73E-10	-2.82E-10	-2.81E-10	-2.84E-10	-2.88E-10	-2.80E-10	-2.84E-10
Max	-2.33E-10	-2.40E-10	-2.39E-10	-2.43E-10	-2.49E-10	-2.38E-10	-2.41E-10
Average	-2.60E-10	-2.67E-10	-2.65E-10	-2.68E-10	-2.71E-10	-2.63E-10	-2.68E-10
Std.Dev.	1.87E-11	1.93E-11	1.99E-11	1.90E-11	1.91E-11	2.04E-11	2.04E-11

Table 46: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

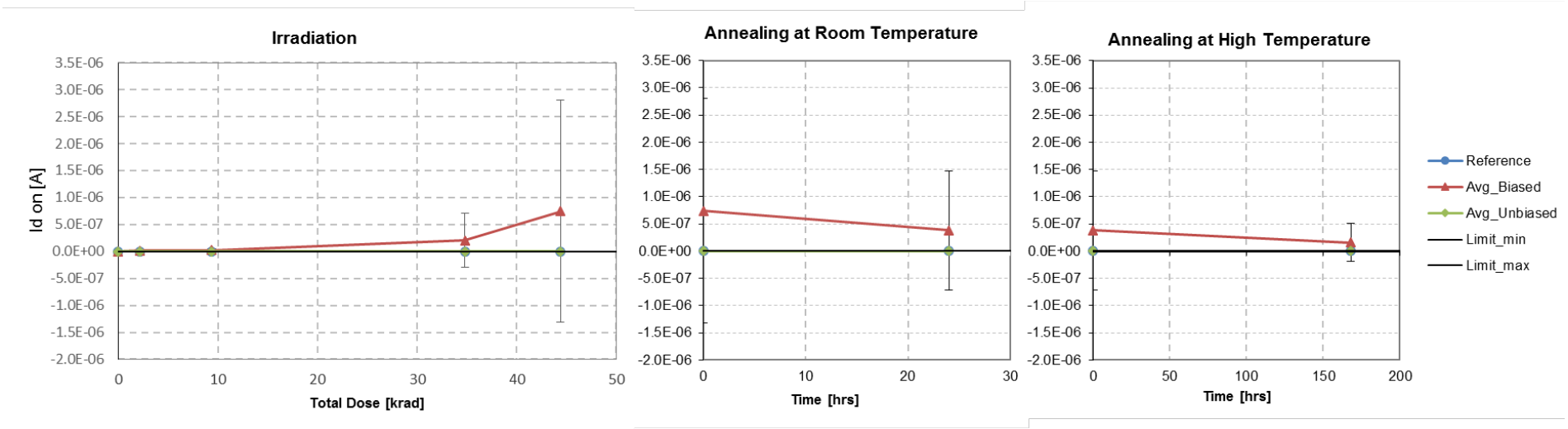

Figure 13: I_{DON}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{Don} (V_S=+14V, V_D=+14V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Ref 01 - SW1	8.67E-10	8.35E-10	8.35E-10	8.62E-10	8.54E-10	8.46E-10	8.52E-10
Ref 01 - SW2	8.39E-10	8.73E-10	8.53E-10	8.77E-10	8.62E-10	8.79E-10	8.80E-10
Ref 01 - SW3	5.26E-10	5.35E-10	5.33E-10	5.49E-10	5.58E-10	7.53E-10	5.41E-10
Ref 01 - SW4	8.65E-10	8.83E-10	8.78E-10	8.90E-10	8.92E-10	8.78E-10	8.87E-10
Biased 02 - SW1	8.56E-10	1.29E-07	2.07E-07	4.53E-06	2.11E-05	1.05E-05	2.54E-06
Biased 02 - SW2	8.48E-10	1.12E-09	1.31E-09	4.36E-09	6.34E-09	5.39E-09	1.15E-09
Biased 02 - SW3	7.20E-10	9.74E-08	1.70E-07	3.46E-06	1.70E-05	8.25E-06	2.04E-06
Biased 02 - SW4	8.30E-10	1.10E-09	1.24E-09	3.15E-09	4.51E-09	3.87E-09	1.12E-09
Biased 03 - SW1	1.14E-09	1.28E-07	9.11E-08	1.69E-07	2.64E-07	1.09E-07	2.27E-08
Biased 03 - SW2	8.96E-10	1.18E-09	1.29E-09	2.67E-09	3.20E-09	2.72E-09	1.11E-09
Biased 03 - SW3	7.73E-10	8.34E-08	8.42E-08	1.27E-07	1.97E-07	7.57E-08	1.64E-08
Biased 03 - SW4	8.87E-10	1.15E-09	1.23E-09	2.18E-09	2.10E-09	1.86E-09	1.18E-09
Biased 04 - SW1	8.71E-10	3.34E-08	6.81E-08	3.13E-07	1.17E-06	4.83E-07	1.02E-07
Biased 04 - SW2	8.66E-10	8.50E-10	1.42E-09	3.28E-09	3.88E-09	3.64E-09	1.13E-09
Biased 04 - SW3	7.45E-10	2.14E-08	8.21E-08	2.51E-07	7.96E-07	3.04E-07	7.51E-08
Biased 04 - SW4	8.65E-10	2.31E-08	1.17E-07	7.58E-09	5.38E-08	1.01E-07	4.47E-07
Biased 05- SW1	9.26E-10	2.10E-08	4.21E-08	1.62E-07	3.38E-07	1.01E-07	3.08E-08
Biased 05- SW2	9.10E-10	9.73E-10	1.35E-09	3.35E-09	3.96E-09	3.79E-09	1.12E-09
Biased 05- SW3	7.71E-10	1.62E-08	4.01E-08	1.34E-07	1.71E-08	8.11E-09	2.12E-08
Biased 05- SW4	9.12E-10	9.66E-10	1.29E-09	1.02E-07	6.15E-08	9.39E-08	4.70E-07
Biased 06 - SW1	9.00E-10	2.20E-08	5.63E-08	2.40E-07	6.70E-07	1.50E-07	7.31E-08
Biased 06 - SW2	8.77E-10	9.45E-10	1.47E-09	3.25E-09	4.33E-09	4.04E-09	9.69E-10
Biased 06 - SW3	7.62E-10	1.54E-08	7.30E-08	2.28E-07	2.45E-08	1.09E-08	6.42E-08
Biased 06 - SW4	8.82E-10	9.42E-10	1.30E-09	2.49E-09	2.73E-09	2.58E-09	9.50E-10
Unbiased 07 - SW1	8.55E-10	8.65E-10	1.07E-09	3.67E-09	2.18E-09	1.93E-09	8.77E-10
Unbiased 07 - SW2	7.88E-10	8.85E-10	9.35E-10	2.38E-09	1.93E-09	1.68E-09	8.78E-10
Unbiased 07 - SW3	5.24E-10	5.38E-10	8.12E-10	2.12E-09	1.85E-09	1.59E-09	5.65E-10
Unbiased 07 - SW4	8.51E-10	8.68E-10	9.35E-10	2.15E-09	1.86E-09	1.68E-09	8.89E-10
Unbiased 08 - SW1	9.10E-10	9.66E-10	1.13E-09	1.29E-09	2.35E-09	2.14E-09	9.32E-10
Unbiased 08 - SW2	9.20E-10	9.46E-10	9.74E-10	1.28E-09	2.08E-09	1.78E-09	9.42E-10
Unbiased 08 - SW3	7.87E-10	8.15E-10	8.84E-10	1.14E-09	1.99E-09	1.68E-09	8.09E-10
Unbiased 08 - SW4	9.06E-10	2.19E-08	6.76E-09	3.82E-09	4.00E-09	2.20E-09	9.57E-10
Unbiased 09 - SW1	8.63E-10	6.10E-10	1.01E-09	1.24E-09	1.88E-09	1.57E-09	8.59E-10
Unbiased 09 - SW2	8.52E-10	8.60E-10	9.57E-10	1.14E-09	1.63E-09	1.45E-09	8.77E-10
Unbiased 09 - SW3	5.27E-10	5.43E-10	8.13E-10	1.05E-09	1.53E-09	1.37E-09	5.48E-10
Unbiased 09 - SW4	8.78E-10	2.42E-09	1.23E-09	1.24E-09	1.69E-09	1.50E-09	8.95E-10
Unbiased 10 - SW1	9.02E-10	9.20E-10	1.12E-09	1.41E-09	2.17E-09	1.99E-09	9.16E-10
Unbiased 10 - SW2	8.98E-10	8.93E-10	1.02E-09	1.27E-09	1.83E-09	1.68E-09	9.25E-10
Unbiased 10 - SW3	7.63E-10	7.72E-10	8.47E-10	1.14E-09	1.75E-09	1.62E-09	7.74E-10
Unbiased 10 - SW4	9.15E-10	2.17E-08	5.69E-09	3.44E-09	2.99E-09	1.98E-09	9.55E-10
Unbiased 11 - SW1	8.98E-10	8.87E-10	1.08E-09	1.36E-09	2.07E-09	1.79E-09	8.71E-10
Unbiased 11 - SW2	8.89E-10	9.00E-10	9.87E-10	1.19E-09	1.77E-09	1.54E-09	8.89E-10
Unbiased 11 - SW3	5.31E-10	7.60E-10	8.31E-10	1.09E-09	1.72E-09	1.52E-09	5.45E-10
Unbiased 11 - SW4	8.98E-10	9.33E-10	9.95E-10	1.32E-09	1.88E-09	1.66E-09	8.94E-10

Table 47: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	7.20E-10	8.50E-10	1.23E-09	2.18E-09	2.10E-09	1.86E-09	9.50E-10
Max	1.14E-09	1.29E-07	2.07E-07	4.53E-06	2.11E-05	1.05E-05	2.54E-06
Average	8.62E-10	3.00E-08	5.21E-08	4.88E-07	2.09E-06	1.01E-06	2.96E-07
Std.Dev.	8.85E-11	4.30E-08	6.05E-08	1.22E-06	5.85E-06	2.89E-06	7.01E-07

Table 48: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	5.24E-10	5.38E-10	8.12E-10	1.05E-09	1.53E-09	1.37E-09	5.45E-10
Max	9.20E-10	2.19E-08	6.76E-09	3.82E-09	4.00E-09	2.20E-09	9.57E-10
Average	8.18E-10	3.00E-09	1.50E-09	1.74E-09	2.06E-09	1.72E-09	8.40E-10
Std.Dev.	1.33E-10	6.45E-09	1.63E-09	9.04E-10	5.54E-10	2.25E-10	1.31E-10

Table 49: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09	-2.00E-09
max	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09
Min	5.26E-10	5.35E-10	5.33E-10	5.49E-10	5.58E-10	7.53E-10	5.41E-10
Max	8.67E-10	8.83E-10	8.78E-10	8.90E-10	8.92E-10	8.79E-10	8.87E-10
Average	7.74E-10	7.82E-10	7.75E-10	7.94E-10	7.92E-10	8.39E-10	7.90E-10
	8.52E-10	8.54E-10	8.44E-10	8.70E-10	8.58E-10	8.62E-10	8.66E-10
Std.Dev.	1.66E-10	1.65E-10	1.62E-10	1.64E-10	1.56E-10	5.94E-11	1.67E-10

Table 50: I_{DON}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

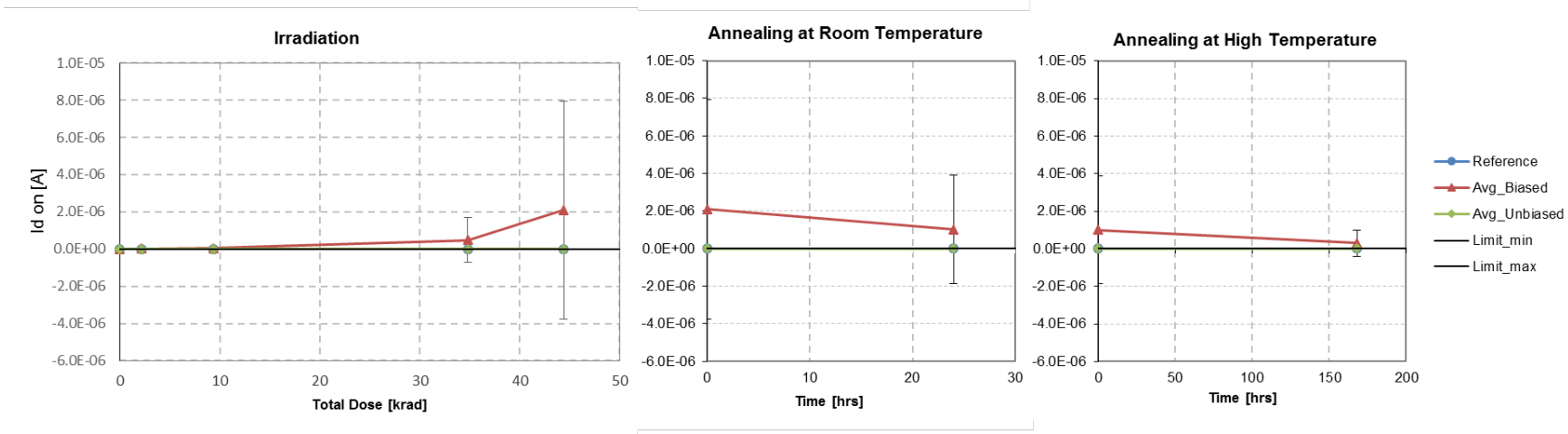

Figure 13: IDON, Irradiation [rad (Si)], annealing and ageing (average values)

V_{TR} (Vin=0->5V) (V_{IH}) [V]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Ref 01 - SW1	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Ref 01 - SW2	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Ref 01 - SW3	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Ref 01 - SW4	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Biased 02 - SW1	1.91	1.66	2.26	3.70	4.08	4.56	4.41
Biased 02 - SW2	1.91	1.78	2.12	3.09	4.21	3.16	0.92
Biased 02 - SW3	1.91	1.70	2.30	3.74	4.11	4.61	4.43
Biased 02 - SW4	1.91	1.79	2.15	3.08	4.20	3.06	0.91
Biased 03 - SW1	1.92	1.82	2.70	3.71	1.63	0.77	4.56
Biased 03 - SW2	1.92	1.81	2.14	2.76	2.13	1.92	0.77
Biased 03 - SW3	1.92	1.84	2.67	3.75	1.89	0.90	4.61
Biased 03 - SW4	1.92	1.81	2.15	2.80	2.30	2.20	0.78
Biased 04 - SW1	1.94	1.82	2.00	3.65	2.03	0.86	4.59
Biased 04 - SW2	1.94	1.82	2.00	2.85	2.06	1.95	0.65
Biased 04 - SW3	1.94	1.86	2.00	3.66	1.64	0.72	4.61
Biased 04 - SW4	1.94	1.81	2.00	3.60	2.25	0.50	0.58
Biased 05- SW1	1.94	1.84	2.70	3.24	0.00	0.12	4.58
Biased 05- SW2	1.94	1.82	2.18	2.55	1.97	1.85	0.67
Biased 05- SW3	1.94	1.88	2.76	3.25	0.00	0.10	4.59
Biased 05- SW4	1.94	1.84	2.20	3.57	0.42	0.50	0.73
Biased 06 - SW1	1.94	1.83	2.00	3.58	0.74	0.52	4.54
Biased 06 - SW2	1.94	1.82	2.00	2.95	1.99	1.94	0.67
Biased 06 - SW3	1.94	1.85	2.00	3.60	0.34	0.50	4.56
Biased 06 - SW4	1.94	1.83	2.00	2.90	2.09	1.99	0.70
Unbiased 07 - SW1	1.92	1.78	2.00	3.02	3.95	3.94	2.17
Unbiased 07 - SW2	1.92	1.79	2.07	3.02	3.95	3.93	2.19
Unbiased 07 - SW3	1.92	1.79	2.08	3.02	3.94	3.93	2.18
Unbiased 07 - SW4	1.92	1.80	2.09	3.01	3.92	3.92	2.19
Unbiased 08 - SW1	1.93	1.80	2.06	3.66	3.35	4.03	2.15
Unbiased 08 - SW2	1.93	1.81	2.11	3.64	3.37	4.04	2.17
Unbiased 08 - SW3	1.94	1.82	2.14	3.66	3.37	4.05	2.18
Unbiased 08 - SW4	1.94	1.82	2.14	3.64	3.37	4.04	2.18
Unbiased 09 - SW1	1.92	1.79	2.05	3.58	3.92	3.93	2.20
Unbiased 09 - SW2	1.92	1.80	2.09	3.56	3.91	3.92	2.20
Unbiased 09 - SW3	1.92	1.81	2.10	3.57	3.93	3.94	2.20
Unbiased 09 - SW4	1.92	1.81	2.11	3.54	3.89	3.90	2.21
Unbiased 10 - SW1	1.92	1.78	2.04	3.54	3.89	3.90	2.18
Unbiased 10 - SW2	1.92	1.79	2.08	3.53	3.89	3.88	2.19
Unbiased 10 - SW3	1.92	1.79	2.09	3.55	3.92	3.89	2.19
Unbiased 10 - SW4	1.91	1.79	2.09	3.52	3.88	3.88	2.18
Unbiased 11 - SW1	1.92	1.78	2.03	3.52	3.88	3.88	2.16
Unbiased 11 - SW2	1.92	1.79	2.07	3.51	3.88	3.89	2.17
Unbiased 11 - SW3	1.92	1.80	2.11	3.58	3.96	3.96	2.16
Unbiased 11 - SW4	1.92	1.80	2.11	3.55	3.93	3.93	2.16

Table 51: V_{TR}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Min	1.91	1.66	2.00	2.55			0.58
Max	1.94	1.88	2.76	3.75			4.61
Average	1.93	1.81	2.22	3.30			2.64
Std.Dev.	0.01	0.05	0.27	0.40			1.96

Table 52: V_{TR}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Min	1.91	1.78	2.00	3.01	3.35	3.88	2.15
Max	1.94	1.82	2.14	3.66	3.96	4.05	2.21
Average	1.92	1.80	2.08	3.46	3.80	3.94	2.18
Std.Dev.	0.01	0.01	0.04	0.23	0.23	0.06	0.02

Table 53: V_{TR}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Min	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Max	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Average	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Std.Dev.	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 54: V_{TR}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

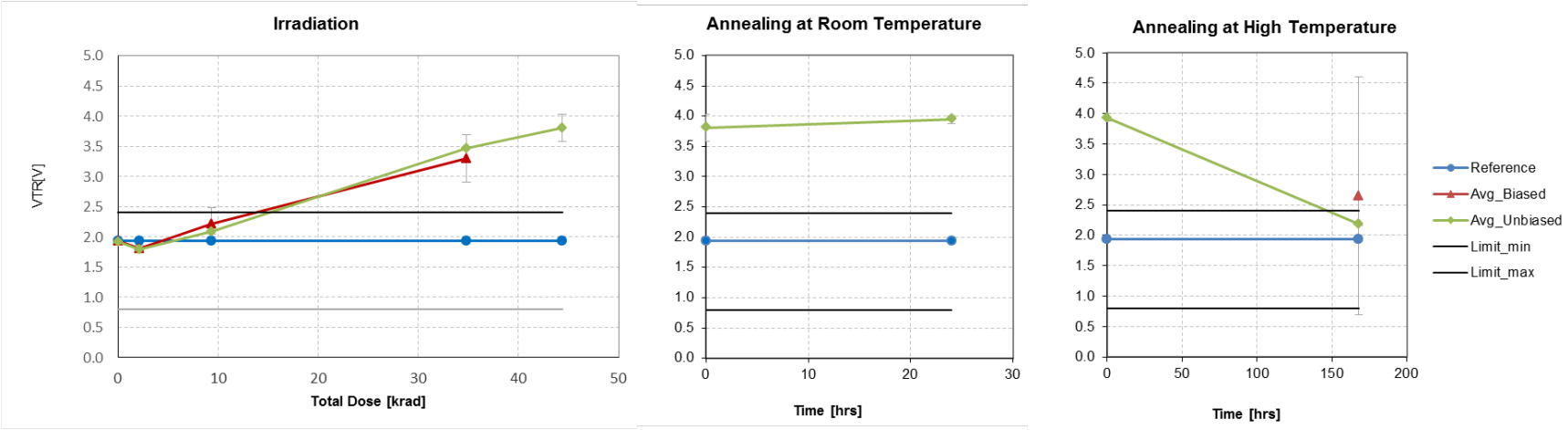

Figure 14: V_{TR}, Irradiation [rad (Si)], annealing and ageing (average values)

V_{TR} (Vin=5->0V) (V_{IL}) [V]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Ref 01 - SW1	1.95	1.94	1.94	1.94	1.94	1.94	1.94
Ref 01 - SW2	1.95	1.94	1.94	1.95	1.94	1.94	1.94
Ref 01 - SW3	1.95	1.94	1.94	1.94	1.94	1.94	1.94
Ref 01 - SW4	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Biased 02 - SW1	1.91	1.67	2.28	5.00	5.00	5.00	4.42
Biased 02 - SW2	1.91	1.79	2.14	3.64	4.26	3.22	0.93
Biased 02 - SW3	1.91	1.70	2.30	3.77	5.00	4.63	4.44
Biased 02 - SW4	1.91	5.00	5.00	5.00	5.00	5.00	5.00
Biased 03 - SW1	1.92	1.83	2.74	3.74	5.00	0.89	4.57
Biased 03 - SW2	1.92	1.82	2.16	2.82	2.24	1.98	0.78
Biased 03 - SW3	1.93	1.84	2.61	3.78	2.03	0.99	4.62
Biased 03 - SW4	1.92	5.00	5.00	5.00	5.00	5.00	5.00
Biased 04 - SW1	1.94	1.84	3.00	5.00	5.00	5.00	4.60
Biased 04 - SW2	1.94	1.83	5.00	2.91	2.18	2.16	0.66
Biased 04 - SW3	1.94	1.86	3.00	3.69	5.00	0.80	4.62
Biased 04 - SW4	1.94	1.82	5.00	5.00	5.00	0.55	0.59
Biased 05- SW1	1.94	1.85	2.75	5.00	5.00	5.00	4.59
Biased 05- SW2	1.94	1.83	2.20	2.62	2.15	1.93	0.68
Biased 05- SW3	1.95	1.88	2.77	3.32	0.04	0.14	4.60
Biased 05- SW4	1.94	1.84	5.00	3.64	5.00	5.00	0.73
Biased 06 - SW1	1.94	1.85	3.00	5.00	5.00	5.00	4.55
Biased 06 - SW2	1.94	1.83	5.00	3.00	2.14	2.11	0.69
Biased 06 - SW3	1.94	1.86	3.00	3.64	5.00	0.53	4.57
Biased 06 - SW4	1.94	1.84	5.00	5.00	5.00	5.00	5.00
Unbiased 07 - SW1	1.92	1.79	2.05	3.43	3.99	3.98	2.19
Unbiased 07 - SW2	1.93	1.80	2.09	3.43	3.98	3.97	2.20
Unbiased 07 - SW3	1.92	1.80	2.10	3.43	3.98	3.97	2.20
Unbiased 07 - SW4	1.92	1.80	2.10	3.40	3.96	3.95	2.20
Unbiased 08 - SW1	1.94	1.81	2.10	3.70	4.05	4.08	2.18
Unbiased 08 - SW2	1.94	1.82	2.13	3.68	4.05	4.09	2.18
Unbiased 08 - SW3	1.94	1.82	2.15	3.69	4.06	4.09	2.19
Unbiased 08 - SW4	1.94	1.83	2.15	3.68	4.05	4.08	2.19
Unbiased 09 - SW1	1.92	1.80	2.08	3.62	3.96	3.96	2.21
Unbiased 09 - SW2	1.92	1.81	2.10	3.61	3.95	3.96	2.21
Unbiased 09 - SW3	1.93	1.81	2.12	3.61	3.97	3.97	2.21
Unbiased 09 - SW4	1.93	1.82	2.12	3.58	3.94	3.94	2.22
Unbiased 10 - SW1	1.92	1.79	2.07	3.58	3.95	3.95	2.19
Unbiased 10 - SW2	1.92	1.80	2.09	3.58	3.94	3.93	2.20
Unbiased 10 - SW3	1.92	1.80	2.10	3.59	3.96	3.94	2.19
Unbiased 10 - SW4	1.92	1.80	2.10	3.56	3.93	3.93	2.19
Unbiased 11 - SW1	1.93	1.79	2.06	3.56	3.93	3.92	2.18
Unbiased 11 - SW2	1.93	1.80	2.09	3.56	3.92	3.93	2.18
Unbiased 11 - SW3	1.93	1.81	2.12	3.63	4.00	4.00	2.17
Unbiased 11 - SW4	1.92	1.81	2.12	3.60	3.97	3.96	2.18

Table 55: Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Min	1.91	1.67	2.14	2.62	0.04	0.14	0.59
Max	1.95						
Average	1.93						
Std.Dev.	0.01						

Table 56: V_{TR}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Min	1.92	1.79	2.05	3.40	3.92	3.92	2.17
Max	1.94	1.83	2.15	3.70	4.06	4.09	2.22
Average	1.93	1.80	2.10	3.58	3.98	3.98	2.19
Std.Dev.	0.01	0.01	0.03	0.09	0.04	0.06	0.01

Table 57: V_{TR}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.80	0.80	0.80	0.80	0.80	0.80	0.80
max	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Min	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Max	1.95	1.94	1.94	1.95	1.94	1.94	1.94
Average	1.95	1.94	1.94	1.94	1.94	1.94	1.94
Std.Dev.	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 58: V_{TR}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

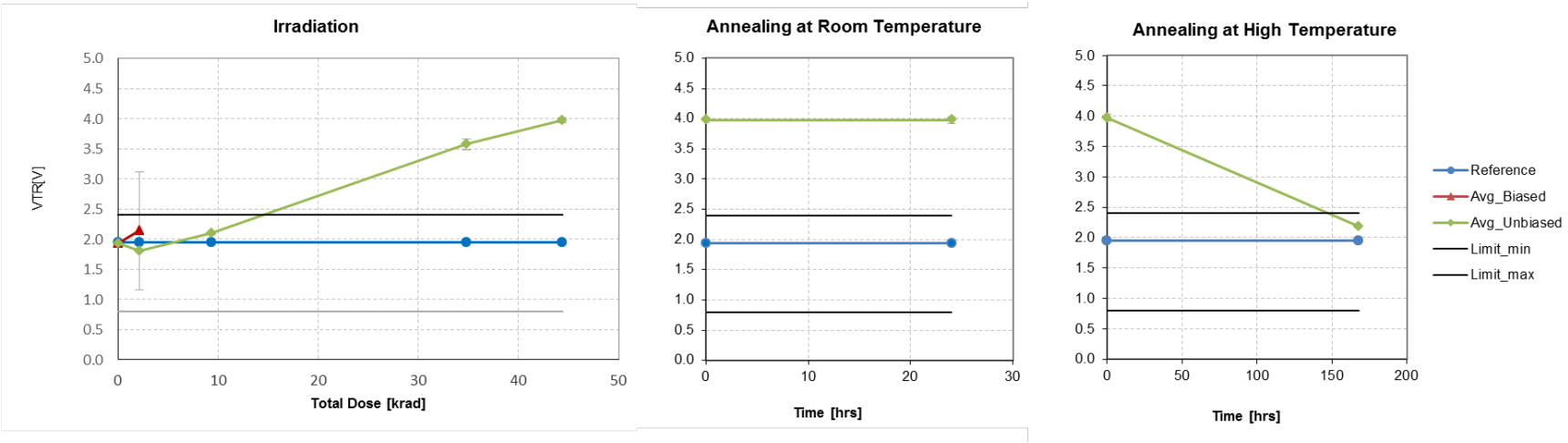

Figure 15: V_{TR}, Irradiation [rad (Si)], annealing and ageing (average values)

I_{IL} (Vin=0.8) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Ref 01 - SW1	-2.28E-12	-2.42E-12	-2.50E-12	-2.25E-12	-2.48E-12	-2.39E-12	-2.27E-12
Ref 01 - SW2	-5.02E-12	-5.39E-12	-5.84E-12	-5.78E-12	-5.17E-12	-5.09E-12	-5.52E-12
Ref 01 - SW3	-3.40E-12	-3.27E-12	-3.48E-12	-3.71E-12	-3.50E-12	-3.37E-12	-3.41E-12
Ref 01 - SW4	-3.07E-12	-3.22E-12	-3.43E-12	-3.27E-12	-3.37E-12	-3.39E-12	-3.30E-12
Biased 02 - SW1	-2.05E-12	-1.52E-11	-4.62E-11	-8.97E-11	-1.10E-10	-8.44E-11	-6.36E-12
Biased 02 - SW2	-4.05E-12	-1.63E-11	-4.52E-11	-9.43E-11	-1.15E-10	-9.10E-11	-6.18E-12
Biased 02 - SW3	-2.89E-12	-1.54E-11	-4.02E-11	-8.57E-11	-1.03E-10	-8.45E-11	-7.57E-12
Biased 02 - SW4	-2.40E-12	-1.52E-11	-4.16E-11	-8.97E-11	-1.09E-10	-8.79E-11	-5.71E-12
Biased 03 - SW1	-4.10E-12	-1.54E-11	-4.56E-11	-6.91E-11	-9.54E-11	-7.99E-11	-8.62E-12
Biased 03 - SW2	-6.68E-12	-1.67E-11	-4.27E-11	-7.53E-11	-1.01E-10	-8.48E-11	-1.44E-11
Biased 03 - SW3	-4.30E-12	-1.61E-11	-6.81E-11	-6.99E-11	-9.10E-11	-7.70E-11	-8.88E-12
Biased 03 - SW4	-3.53E-12	-1.52E-11	-5.73E-11	-7.45E-11	-1.00E-10	-8.36E-11	-1.26E-11
Biased 04 - SW1	-2.85E-12	-1.63E-11	-6.05E-11	-8.31E-11	-1.07E-10	-9.30E-11	-7.51E-12
Biased 04 - SW2	-5.33E-12	-1.67E-11	-8.71E-11	-8.86E-11	-1.16E-10	-9.67E-11	-1.14E-11
Biased 04 - SW3	-3.33E-12	-1.67E-11	-8.08E-11	-8.16E-11	-1.06E-10	-9.37E-11	-7.76E-12
Biased 04 - SW4	-2.62E-12	-1.55E-11	-9.91E-11	-8.43E-11	-9.56E-11	-7.61E-11	-8.05E-12
Biased 05- SW1	-4.12E-12	-1.86E-11	-5.25E-11	-8.58E-11	-1.13E-10	-1.01E-10	-8.82E-12
Biased 05- SW2	-6.83E-12	-1.91E-11	-5.03E-11	-9.29E-11	-1.15E-10	-9.80E-11	-1.41E-11
Biased 05- SW3	-4.62E-12	-1.83E-11	-5.18E-11	-8.36E-11	-1.11E-10	-9.58E-11	-9.30E-12
Biased 05- SW4	-4.08E-12	-1.59E-11	-4.85E-11	-7.31E-11	-1.07E-10	-8.96E-11	-1.08E-11
Biased 06 - SW1	-2.53E-12	-1.69E-11	-5.96E-11	-8.55E-11	-1.07E-10	-9.85E-11	-7.63E-12
Biased 06 - SW2	-5.60E-12	-1.83E-11	-9.55E-11	-9.28E-11	-1.18E-10	-9.87E-11	-1.25E-11
Biased 06 - SW3	-3.66E-12	-1.71E-11	-7.62E-11	-8.52E-11	-1.15E-10	-9.54E-11	-8.10E-12
Biased 06 - SW4	-2.86E-12	-1.48E-11	-1.08E-10	-8.92E-11	-1.15E-10	-9.54E-11	-1.08E-11
Unbiased 07 - SW1	-2.14E-12	-1.24E-11	-3.06E-11	-6.65E-11	-7.81E-11	-7.07E-11	-1.02E-11
Unbiased 07 - SW2	-4.82E-12	-1.52E-11	-3.22E-11	-6.86E-11	-8.06E-11	-7.33E-11	-1.29E-11
Unbiased 07 - SW3	-3.05E-12	-1.33E-11	-2.93E-11	-6.66E-11	-7.83E-11	-7.12E-11	-1.17E-11
Unbiased 07 - SW4	-2.28E-12	-1.23E-11	-2.76E-11	-6.45E-11	-7.57E-11	-6.90E-11	-1.03E-11
Unbiased 08 - SW1	-4.79E-12	-1.58E-11	-3.32E-11	-7.30E-11	-8.37E-11	-7.56E-11	-1.30E-11
Unbiased 08 - SW2	-7.72E-12	-1.85E-11	-3.46E-11	-7.51E-11	-8.53E-11	-7.75E-11	-1.55E-11
Unbiased 08 - SW3	-5.23E-12	-1.62E-11	-3.21E-11	-7.08E-11	-8.28E-11	-7.57E-11	-1.31E-11
Unbiased 08 - SW4	-4.58E-12	-1.95E-09	-6.38E-10	-3.56E-10	-2.88E-10	-1.18E-10	-1.31E-11
Unbiased 09 - SW1	-2.29E-12	-1.06E-11	-2.56E-11	-5.83E-11	-6.70E-11	-6.17E-11	-9.04E-12
Unbiased 09 - SW2	-5.84E-12	-1.32E-11	-2.77E-11	-5.97E-11	-6.90E-11	-6.39E-11	-1.22E-11
Unbiased 09 - SW3	-2.93E-12	-1.14E-11	-2.56E-11	-5.82E-11	-6.80E-11	-6.28E-11	-1.07E-11
Unbiased 09 - SW4	-2.83E-12	-1.66E-10	-5.87E-11	-6.71E-11	-7.10E-11	-6.31E-11	-1.01E-11
Unbiased 10 - SW1	-4.05E-12	-1.38E-11	-3.11E-11	-6.85E-11	-7.96E-11	-7.36E-11	-1.17E-11
Unbiased 10 - SW2	-7.88E-12	-1.76E-11	-3.35E-11	-7.08E-11	-8.25E-11	-7.55E-11	-1.46E-11
Unbiased 10 - SW3	-4.68E-12	-1.49E-11	-3.02E-11	-6.97E-11	-8.00E-11	-7.33E-11	-1.17E-11
Unbiased 10 - SW4	-4.35E-12	-2.03E-09	-5.67E-10	-3.15E-10	-2.11E-10	-1.07E-10	-1.11E-11
Unbiased 11 - SW1	-3.91E-12	-1.35E-11	-3.02E-11	-6.59E-11	-7.79E-11	-7.06E-11	-1.05E-11
Unbiased 11 - SW2	-6.66E-12	-1.62E-11	-3.22E-11	-6.80E-11	-8.08E-11	-7.33E-11	-1.35E-11
Unbiased 11 - SW3	-3.35E-12	-1.30E-11	-2.93E-11	-6.63E-11	-7.82E-11	-7.14E-11	-1.06E-11
Unbiased 11 - SW4	-3.03E-12	-1.43E-11	-2.92E-11	-6.71E-11	-7.83E-11	-7.18E-11	-1.03E-11

Table 59: I_{IL} Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	-6.83E-12	-1.91E-11	-1.08E-10	-9.43E-11	-1.18E-10	-1.01E-10	-1.44E-11
Max	-2.05E-12	-1.48E-11	-4.02E-11	-6.91E-11	-9.10E-11	-7.61E-11	-5.71E-12
Average	-3.92E-12	-1.65E-11	-6.28E-11	-8.37E-11	-1.07E-10	-9.03E-11	-9.35E-12
Std.Dev.	1.36E-12	1.26E-12	2.10E-11	7.60E-12	7.72E-12	7.61E-12	2.57E-12

Table 60: I_{IL} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	-7.88E-12	-2.03E-09	-6.38E-10	-3.56E-10	-2.88E-10	-1.18E-10	-1.55E-11
Max	-2.14E-12	-1.06E-11	-2.56E-11	-5.82E-11	-6.70E-11	-6.17E-11	-9.04E-12
Average	-4.32E-12	-2.19E-10	-8.89E-11	-9.38E-11	-9.48E-11	-7.50E-11	-1.18E-11
Std.Dev.	1.70E-12	6.06E-10	1.76E-10	8.31E-11	5.45E-11	1.38E-11	1.65E-12

Table 61: I_{IL} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	-5.02E-12	-5.39E-12	-5.84E-12	-5.78E-12	-5.17E-12	-5.09E-12	-5.52E-12
Max	-2.28E-12	-2.42E-12	-2.50E-12	-2.25E-12	-2.48E-12	-2.39E-12	-2.27E-12
Average	-3.44E-12	-3.58E-12	-3.81E-12	-3.75E-12	-3.63E-12	-3.56E-12	-3.63E-12
Std.Dev.	1.15E-12	1.27E-12	1.42E-12	1.48E-12	1.12E-12	1.12E-12	1.36E-12

Table 62: I_{IL} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference samples

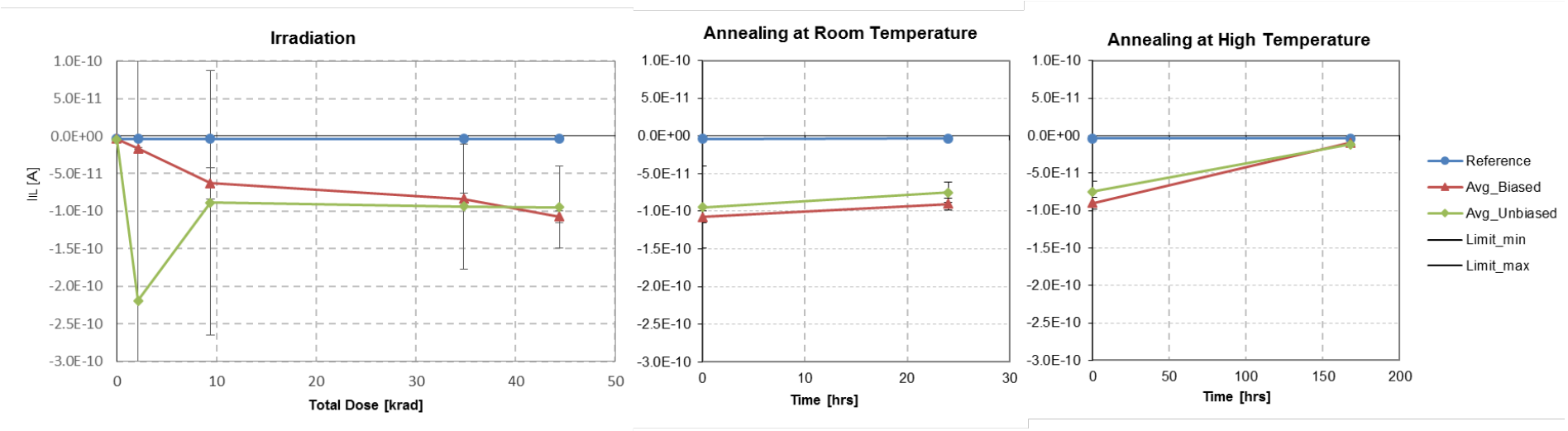

Figure 16: Irradiation [rad (Si)], annealing and ageing (average values)

I_{IH} (Vin=2.4V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Ref 01 - SW1	9.93E-12	1.00E-11	9.54E-12	9.53E-12	9.89E-12	9.74E-12	9.96E-12
Ref 01 - SW2	3.67E-12	3.33E-12	3.38E-12	2.64E-12	3.83E-12	3.91E-12	3.32E-12
Ref 01 - SW3	8.08E-12	8.77E-12	8.48E-12	8.00E-12	8.58E-12	8.38E-12	8.26E-12
Ref 01 - SW4	9.15E-12	9.47E-12	9.31E-12	9.52E-12	9.74E-12	9.25E-12	9.02E-12
Biased 02 - SW1	1.01E-11	-3.20E-13	-3.02E-11	-6.87E-11	-8.76E-11	-6.50E-11	7.71E-12
Biased 02 - SW2	3.34E-12	-5.67E-12	-3.28E-11	-7.66E-11	-9.58E-11	-7.43E-11	2.50E-12
Biased 02 - SW3	8.47E-12	-8.20E-13	-2.48E-11	-6.44E-11	-8.16E-11	-6.51E-11	6.79E-12
Biased 02 - SW4	9.62E-12	2.70E-13	-2.39E-11	-6.87E-11	-8.75E-11	-6.85E-11	8.24E-12
Biased 03 - SW1	8.66E-12	-6.30E-13	-2.86E-11	-4.82E-11	-7.55E-11	-6.30E-11	7.57E-12
Biased 03 - SW2	2.15E-12	-5.32E-12	-3.10E-11	-5.76E-11	-8.61E-11	-7.13E-11	9.20E-13
Biased 03 - SW3	7.05E-12	-2.15E-12	-5.15E-11	-4.90E-11	-7.32E-11	-6.05E-11	6.91E-12
Biased 03 - SW4	8.40E-12	6.90E-13	-3.73E-11	-5.34E-11	-7.78E-11	-6.49E-11	8.63E-12
Biased 04 - SW1	9.73E-12	-8.00E-13	-5.30E-11	-6.21E-11	-8.67E-11	-7.41E-11	7.41E-12
Biased 04 - SW2	5.30E-13	-5.90E-12	0.00E+00	-7.13E-11	-1.01E-10	-8.27E-11	2.37E-12
Biased 04 - SW3	8.31E-12	-1.50E-12	-6.57E-11	-6.10E-11	-8.58E-11	-7.11E-11	6.64E-12
Biased 04 - SW4	9.69E-12	-9.00E-14	-7.63E-11	-6.29E-11	-7.32E-11	-5.30E-11	9.24E-12
Biased 05- SW1	8.96E-12	-2.53E-12	-3.44E-11	-6.27E-11	-8.49E-11	-7.31E-11	7.48E-12
Biased 05- SW2	2.31E-12	-7.76E-12	-3.65E-11	-7.30E-11	-9.97E-11	-8.36E-11	1.40E-12
Biased 05- SW3	6.81E-12	-3.10E-12	-3.24E-11	-6.18E-11	-8.56E-11	-7.20E-11	6.74E-12
Biased 05- SW4	7.84E-12	-1.24E-12	-3.00E-11	-5.13E-11	-7.85E-11	-6.30E-11	8.04E-12
Biased 06 - SW1	1.07E-11	-1.34E-12	-5.53E-11	-6.40E-11	-8.62E-11	-7.23E-11	8.17E-12
Biased 06 - SW2	3.63E-12	-7.61E-12	0.00E+00	-7.41E-11	-1.02E-10	-8.38E-11	2.31E-12
Biased 06 - SW3	8.04E-12	-2.31E-12	-7.19E-11	-6.41E-11	-8.85E-11	-7.28E-11	6.42E-12
Biased 06 - SW4	9.58E-12	1.50E-13	0.00E+00	-6.74E-11	-9.34E-11	-7.56E-11	8.94E-12
Unbiased 07 - SW1	1.01E-11	2.90E-13	-1.53E-11	-4.74E-11	-5.74E-11	-5.15E-11	2.44E-12
Unbiased 07 - SW2	3.66E-12	-5.97E-12	-2.04E-11	-5.17E-11	-6.25E-11	-5.64E-11	-4.20E-12
Unbiased 07 - SW3	8.46E-12	-1.00E-14	-1.43E-11	-4.71E-11	-5.78E-11	-5.20E-11	6.20E-13
Unbiased 07 - SW4	9.85E-12	1.13E-12	-1.22E-11	-4.51E-11	-5.51E-11	-4.96E-11	2.67E-12
Unbiased 08 - SW1	8.57E-12	-1.19E-12	-1.70E-11	-5.00E-11	-6.04E-11	-5.37E-11	1.17E-12
Unbiased 08 - SW2	1.89E-12	-8.26E-12	-2.20E-11	-5.53E-11	-6.50E-11	-5.87E-11	-6.28E-12
Unbiased 08 - SW3	7.32E-12	-1.22E-12	-1.57E-11	-4.85E-11	-5.96E-11	-5.35E-11	7.80E-13
Unbiased 08 - SW4	8.37E-12	-2.40E-13	-1.59E-11	-4.99E-11	-6.02E-11	-5.41E-11	1.29E-12
Unbiased 09 - SW1	1.03E-11	2.96E-12	-9.95E-12	-3.91E-11	-4.70E-11	-4.29E-11	3.63E-12
Unbiased 09 - SW2	1.50E-12	-3.75E-12	-1.58E-11	-4.32E-11	-5.18E-11	-4.80E-11	-3.39E-12
Unbiased 09 - SW3	8.16E-12	1.19E-12	-1.08E-11	-3.93E-11	-4.79E-11	-4.43E-11	1.00E-12
Unbiased 09 - SW4	9.09E-12	4.15E-12	-8.67E-12	-3.75E-11	-4.63E-11	-4.27E-11	3.19E-12
Unbiased 10 - SW1	8.80E-12	-1.60E-13	-1.57E-11	-4.73E-11	-5.73E-11	-5.26E-11	1.59E-12
Unbiased 10 - SW2	2.40E-13	-8.47E-12	-2.20E-11	-5.22E-11	-6.30E-11	-5.74E-11	-5.66E-12
Unbiased 10 - SW3	6.70E-12	-1.69E-12	-1.50E-11	-4.76E-11	-5.83E-11	-5.29E-11	4.80E-13
Unbiased 10 - SW4	8.40E-12	-1.24E-10	-2.75E-11	-4.93E-11	-5.80E-11	-5.19E-11	1.69E-12
Unbiased 11 - SW1	8.69E-12	-4.60E-13	-1.47E-11	-4.55E-11	-5.64E-11	-5.05E-11	2.49E-12
Unbiased 11 - SW2	2.07E-12	-6.48E-12	-2.07E-11	-5.05E-11	-6.18E-11	-5.60E-11	-5.34E-12
Unbiased 11 - SW3	8.11E-12	2.80E-13	-1.40E-11	-4.61E-11	-5.70E-11	-5.17E-11	1.38E-12
Unbiased 11 - SW4	9.68E-12	5.20E-13	-1.19E-11	-4.51E-11	-5.52E-11	-5.07E-11	2.62E-12

Table 63: I_{IH} Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	5.30E-13	-7.76E-12	-7.63E-11	-7.66E-11	-1.02E-10	-8.38E-11	9.20E-13
Max	1.07E-11	6.90E-13	0.00E+00	-4.82E-11	-7.32E-11	-5.30E-11	9.24E-12
Average	7.19E-12	-2.40E-12	-3.58E-11	-6.31E-11	-8.65E-11	-7.05E-11	6.22E-12
Std.Dev.	3.05E-12	2.64E-12	2.18E-11	8.10E-12	8.61E-12	7.90E-12	2.69E-12

Table 64: I_{IH} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	2.40E-13	-1.24E-10	-2.75E-11	-5.53E-11	-6.50E-11	-5.87E-11	-6.28E-12
Max	1.03E-11	4.15E-12	-8.67E-12	-3.75E-11	-4.63E-11	-4.27E-11	3.63E-12
Average	7.00E-12	-7.58E-12	-1.60E-11	-4.69E-11	-5.69E-11	-5.16E-11	1.09E-13
Std.Dev.	3.20E-12	2.77E-11	4.62E-12	4.54E-12	5.21E-12	4.41E-12	3.17E-12

Table 65: I_{IH} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	3.67E-12	3.33E-12	3.38E-12	2.64E-12	3.83E-12	3.91E-12	3.32E-12
Max	9.93E-12	1.00E-11	9.54E-12	9.53E-12	9.89E-12	9.74E-12	9.96E-12
Average	7.71E-12	7.90E-12	7.68E-12	7.42E-12	8.01E-12	7.82E-12	7.64E-12
Std.Dev.	2.80E-12	3.09E-12	2.90E-12	3.27E-12	2.85E-12	2.67E-12	2.96E-12

Table 66: I_{IH} Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

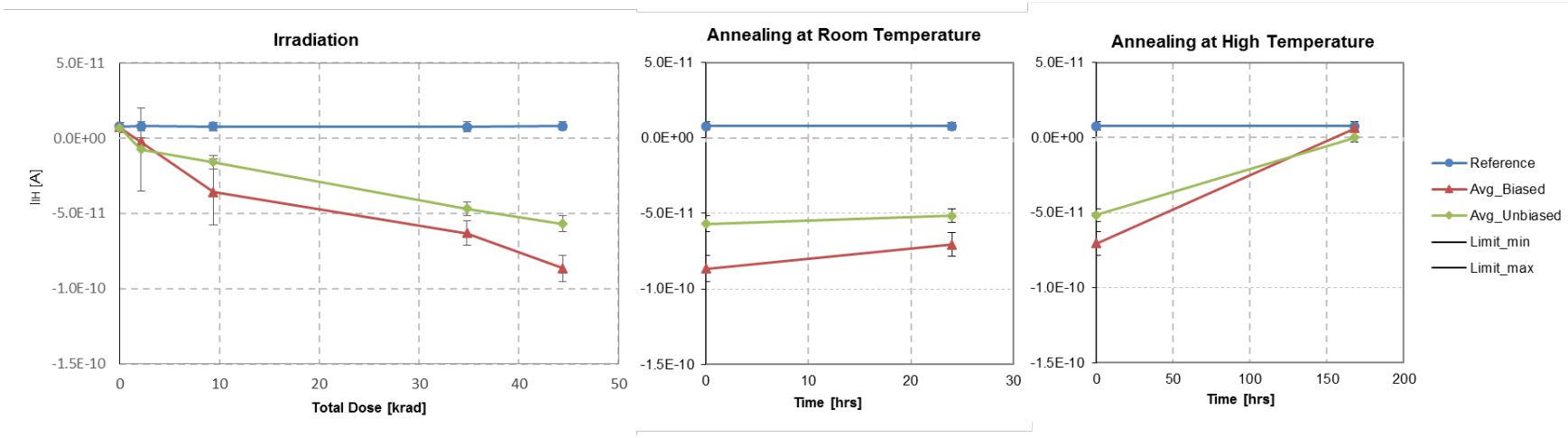

Figure 17: I_{IH} Irradiation [rad (Si)], annealing and ageing (average values)

I_{IH} (Vin=15V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Ref 01 - SW1	1.45E-10	1.48E-10	1.44E-10	1.47E-10	1.46E-10	1.43E-10	1.48E-10
Ref 01 - SW2	1.08E-10	1.09E-10	1.09E-10	1.11E-10	1.11E-10	1.09E-10	1.09E-10
Ref 01 - SW3	1.31E-10	1.37E-10	1.36E-10	1.38E-10	1.41E-10	1.35E-10	1.37E-10
Ref 01 - SW4	1.43E-10	1.47E-10	1.48E-10	1.50E-10	1.51E-10	1.47E-10	1.48E-10
Biased 02 - SW1	1.41E-10	1.49E-10	1.53E-10	1.59E-10	1.64E-10	1.49E-10	1.40E-10
Biased 02 - SW2	1.03E-10	1.10E-10	1.13E-10	1.15E-10	1.16E-10	1.08E-10	1.03E-10
Biased 02 - SW3	1.27E-10	1.40E-10	1.44E-10	1.54E-10	1.55E-10	1.36E-10	1.36E-10
Biased 02 - SW4	1.36E-10	1.53E-10	1.62E-10	1.63E-10	1.60E-10	1.50E-10	1.49E-10
Biased 03 - SW1	1.56E-10	1.65E-10	1.71E-10	1.64E-10	1.77E-10	1.62E-10	1.54E-10
Biased 03 - SW2	1.16E-10	1.24E-10	1.29E-10	1.25E-10	1.29E-10	1.23E-10	1.15E-10
Biased 03 - SW3	1.40E-10	1.58E-10	1.67E-10	1.57E-10	1.59E-10	1.50E-10	1.45E-10
Biased 03 - SW4	1.47E-10	1.66E-10	1.81E-10	1.70E-10	1.74E-10	1.66E-10	1.65E-10
Biased 04 - SW1	1.47E-10	1.55E-10	1.60E-10	1.64E-10	1.74E-10	1.62E-10	1.44E-10
Biased 04 - SW2	1.13E-10	1.13E-10	1.00E-04	1.14E-10	1.22E-10	1.15E-10	1.06E-10
Biased 04 - SW3	1.33E-10	1.46E-10	1.58E-10	1.49E-10	1.61E-10	1.45E-10	1.36E-10
Biased 04 - SW4	1.43E-10	1.53E-10	1.00E-04	1.67E-10	1.69E-10	1.51E-10	1.44E-10
Biased 05- SW1	1.58E-10	1.67E-10	1.75E-10	1.80E-10	1.81E-10	1.80E-10	1.56E-10
Biased 05- SW2	1.21E-10	1.27E-10	1.36E-10	1.32E-10	1.34E-10	1.27E-10	1.18E-10
Biased 05- SW3	1.45E-10	1.56E-10	1.63E-10	1.60E-10	1.63E-10	1.55E-10	1.47E-10
Biased 05- SW4	1.53E-10	1.60E-10	1.78E-10	1.63E-10	1.80E-10	1.70E-10	1.54E-10
Biased 06 - SW1	1.52E-10	1.57E-10	1.62E-10	1.67E-10	1.71E-10	1.69E-10	1.51E-10
Biased 06 - SW2	1.14E-10	1.22E-10	1.00E-04	1.23E-10	1.27E-10	1.19E-10	1.13E-10
Biased 06 - SW3	1.32E-10	1.42E-10	1.53E-10	1.50E-10	1.60E-10	1.45E-10	1.37E-10
Biased 06 - SW4	1.43E-10	1.50E-10	1.00E-04	1.71E-10	1.70E-10	1.65E-10	1.55E-10
Unbiased 07 - SW1	1.43E-10	1.49E-10	1.50E-10	1.48E-10	1.53E-10	1.45E-10	1.43E-10
Unbiased 07 - SW2	1.06E-10	1.13E-10	1.16E-10	1.15E-10	1.17E-10	1.12E-10	1.07E-10
Unbiased 07 - SW3	1.31E-10	1.43E-10	1.43E-10	1.44E-10	1.46E-10	1.40E-10	1.42E-10
Unbiased 07 - SW4	1.38E-10	1.49E-10	1.51E-10	1.51E-10	1.52E-10	1.46E-10	1.46E-10
Unbiased 08 - SW1	1.60E-10	1.79E-10	1.76E-10	1.76E-10	1.75E-10	1.66E-10	1.61E-10
Unbiased 08 - SW2	1.20E-10	1.28E-10	1.30E-10	1.33E-10	1.33E-10	1.25E-10	1.22E-10
Unbiased 08 - SW3	1.48E-10	1.67E-10	1.65E-10	1.66E-10	1.65E-10	1.59E-10	1.55E-10
Unbiased 08 - SW4	1.56E-10	1.62E-08	5.24E-09	2.54E-09	1.84E-09	5.02E-10	1.69E-10
Unbiased 09 - SW1	1.48E-10	1.52E-10	1.54E-10	1.53E-10	1.54E-10	1.48E-10	1.47E-10
Unbiased 09 - SW2	1.11E-10	1.16E-10	1.19E-10	1.17E-10	1.19E-10	1.14E-10	1.08E-10
Unbiased 09 - SW3	1.31E-10	1.44E-10	1.43E-10	1.45E-10	1.49E-10	1.39E-10	1.38E-10
Unbiased 09 - SW4	1.44E-10	1.42E-09	4.22E-10	2.37E-10	1.93E-10	1.60E-10	1.49E-10
Unbiased 10 - SW1	1.57E-10	1.63E-10	1.64E-10	1.65E-10	1.67E-10	1.59E-10	1.58E-10
Unbiased 10 - SW2	1.18E-10	1.25E-10	1.27E-10	1.28E-10	1.28E-10	1.20E-10	1.17E-10
Unbiased 10 - SW3	1.41E-10	1.52E-10	1.52E-10	1.65E-10	1.55E-10	1.48E-10	1.44E-10
Unbiased 10 - SW4	1.55E-10	1.72E-08	4.57E-09	2.13E-09	1.22E-09	4.25E-10	1.58E-10
Unbiased 11 - SW1	1.52E-10	1.55E-10	1.57E-10	1.59E-10	1.60E-10	1.55E-10	1.46E-10
Unbiased 11 - SW2	1.11E-10	1.18E-10	1.22E-10	1.21E-10	1.24E-10	1.16E-10	1.09E-10
Unbiased 11 - SW3	1.35E-10	1.49E-10	1.48E-10	1.51E-10	1.52E-10	1.42E-10	1.37E-10
Unbiased 11 - SW4	1.49E-10	1.71E-10	1.73E-10	1.72E-10	1.72E-10	1.60E-10	1.45E-10

Table 67: I_{IH}, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	1.03E-10	1.10E-10	1.13E-10	1.14E-10	1.16E-10	1.08E-10	1.03E-10
Max	1.58E-10	1.67E-10	1.00E-04	1.80E-10	1.81E-10	1.80E-10	1.65E-10
Average	1.36E-10	1.46E-10	2.00E-05	1.52E-10	1.57E-10	1.47E-10	1.38E-10
Std.Dev.	1.57E-11	1.75E-11	4.10E-05	1.96E-11	2.03E-11	2.00E-11	1.79E-11

Table 68 I_{IH}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	1.06E-10	1.13E-10	1.16E-10	1.15E-10	1.17E-10	1.12E-10	1.07E-10
Max	1.60E-10	1.72E-08	5.24E-09	2.54E-09	1.84E-09	5.02E-10	1.69E-10
Average	1.38E-10	1.86E-09	6.36E-10	3.71E-10	2.89E-10	1.74E-10	1.40E-10
Std.Dev.	1.69E-11	5.08E-09	1.47E-09	6.76E-10	4.37E-10	1.01E-10	1.84E-11

Table 69: I_{IH}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07	-5.00E-07
max	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07	5.00E-07
Min	1.08E-10	1.09E-10	1.09E-10	1.11E-10	1.11E-10	1.09E-10	1.09E-10
Max	1.45E-10	1.48E-10	1.48E-10	1.50E-10	1.51E-10	1.47E-10	1.48E-10
Average	1.32E-10	1.35E-10	1.34E-10	1.37E-10	1.37E-10	1.34E-10	1.35E-10
Std.Dev.	1.72E-11	1.83E-11	1.76E-11	1.75E-11	1.78E-11	1.72E-11	1.86E-11

Table 70: I_{IH}, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

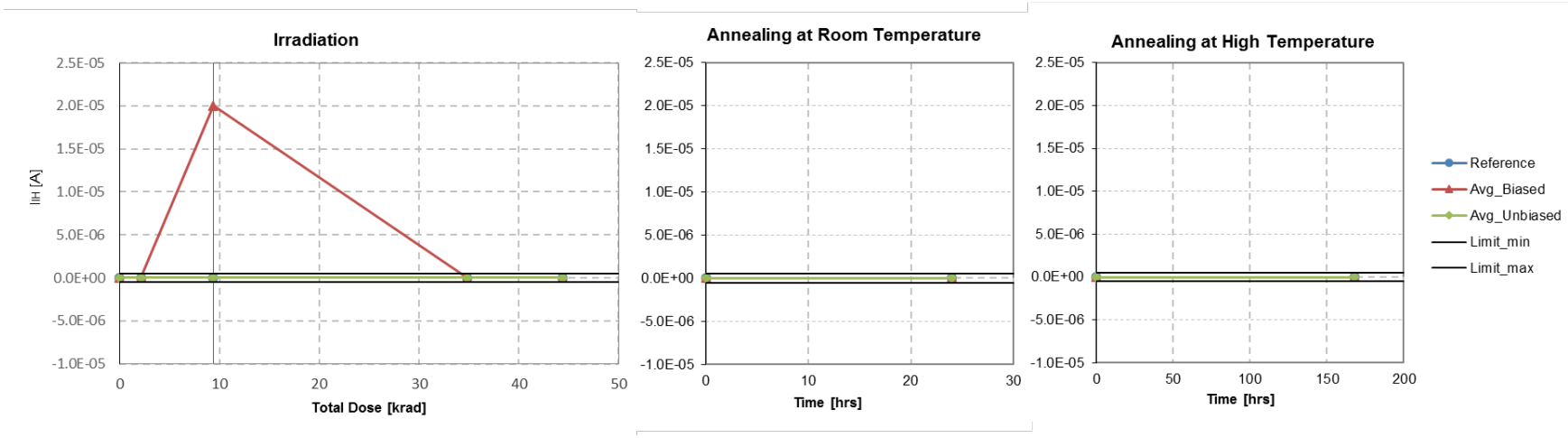

Figure 18: I_{IH}, Irradiation [rad (Si)], annealing and ageing (average values)

I_+ (Vin=0.8V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Ref 01 - SW1	2.78E-04	2.78E-04	2.78E-04	2.77E-04	2.77E-04	2.78E-04	2.76E-04
Ref 01 - SW2	2.78E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04
Ref 01 - SW3	2.78E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04
Ref 01 - SW4	2.78E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04
Biased 02 - SW1	2.78E-04	2.81E-04	6.71E-03	1.66E-04	1.22E-04	9.88E-05	1.21E-04
Biased 02 - SW2	2.79E-04	2.59E-04	8.34E-03	1.29E-04	1.19E-04	6.79E-05	6.69E-05
Biased 02 - SW3	2.79E-04	2.71E-04	4.11E-03	1.05E-04	1.12E-04	6.84E-05	1.21E-04
Biased 02 - SW4	2.78E-04	2.60E-04	8.30E-03	1.07E-04	1.16E-04	6.13E-05	6.63E-05
Biased 03 - SW1	3.72E-04	3.48E-04	4.17E-03	9.80E-05	6.18E-05	5.38E-05	1.34E-04
Biased 03 - SW2	2.90E-04	2.69E-04	6.59E-03	7.41E-05	5.39E-05	4.63E-05	8.56E-05
Biased 03 - SW3	2.91E-04	2.76E-04	3.87E-03	7.79E-05	5.39E-05	4.83E-05	1.35E-04
Biased 03 - SW4	2.91E-04	2.70E-04	1.02E-02	6.96E-05	5.23E-05	4.76E-05	8.60E-05
Biased 04 - SW1	2.78E-04	2.64E-04	1.17E-02	4.59E-05	2.49E-05	6.21E-04	8.44E-05
Biased 04 - SW2	2.78E-04	2.56E-04	1.68E-02	2.64E-05	1.87E-05	6.06E-04	3.94E-05
Biased 04 - SW3	2.78E-04	2.62E-04	1.29E-02	2.66E-05	1.82E-05	6.10E-04	8.53E-05
Biased 04 - SW4	2.78E-04	2.60E-04	1.38E-02	3.13E-05	2.20E-05	1.49E-05	7.80E-05
Biased 05- SW1	2.77E-04	2.64E-04	3.07E-03	5.56E-05	2.62E-03	2.40E-03	8.07E-05
Biased 05- SW2	2.77E-04	2.56E-04	4.57E-03	3.50E-05	2.58E-03	2.36E-03	3.64E-05
Biased 05- SW3	2.77E-04	2.61E-04	2.91E-03	3.59E-05	2.60E-03	2.37E-03	8.09E-05
Biased 05- SW4	2.77E-04	2.57E-04	4.50E-03	3.09E-05	2.61E-03	2.39E-03	1.26E-04
Biased 06 - SW1	2.76E-04	2.65E-04	8.85E-03	3.69E-05	3.04E-05	2.12E-05	9.27E-05
Biased 06 - SW2	2.77E-04	2.56E-04	1.55E-02	2.78E-05	2.36E-05	1.95E-03	4.81E-05
Biased 06 - SW3	2.76E-04	2.62E-04	9.55E-03	2.77E-05	2.21E-05	1.96E-03	9.29E-05
Biased 06 - SW4	2.76E-04	2.57E-04	1.70E-02	2.55E-05	2.18E-05	1.96E-03	4.80E-05
Unbiased 07 - SW1	2.79E-04	2.54E-04	2.03E-04	2.07E-04	2.89E-05	2.87E-05	1.71E-04
Unbiased 07 - SW2	2.79E-04	2.54E-04	1.98E-04	8.87E-05	2.06E-05	2.11E-05	1.70E-04
Unbiased 07 - SW3	2.80E-04	2.54E-04	1.98E-04	6.89E-05	1.90E-05	1.94E-05	1.69E-04
Unbiased 07 - SW4	2.80E-04	2.54E-04	1.97E-04	5.35E-05	1.73E-05	1.82E-05	1.69E-04
Unbiased 08 - SW1	2.75E-04	2.49E-04	1.96E-04	3.70E-05	2.74E-05	2.61E-05	1.69E-04
Unbiased 08 - SW2	2.76E-04	2.49E-04	1.91E-04	3.10E-05	1.91E-05	1.78E-05	1.68E-04
Unbiased 08 - SW3	2.76E-04	2.49E-04	1.91E-04	2.96E-05	1.77E-05	1.68E-05	1.67E-04
Unbiased 08 - SW4	2.76E-04	2.49E-04	1.91E-04	2.84E-05	1.59E-05	1.57E-05	1.67E-04
Unbiased 09 - SW1	2.87E-04	2.62E-04	2.09E-04	4.87E-05	3.21E-05	2.52E-05	1.76E-04
Unbiased 09 - SW2	2.87E-04	2.62E-04	2.05E-04	3.65E-05	2.17E-05	1.91E-05	1.76E-04
Unbiased 09 - SW3	2.87E-04	2.62E-04	2.05E-04	3.47E-05	1.99E-05	1.81E-05	1.76E-04
Unbiased 09 - SW4	2.87E-04	2.62E-04	2.04E-04	3.23E-05	1.78E-05	1.70E-05	1.76E-04
Unbiased 10 - SW1	2.79E-04	2.55E-04	2.02E-04	5.33E-05	3.53E-05	3.45E-05	1.71E-04
Unbiased 10 - SW2	2.80E-04	2.55E-04	1.99E-04	3.92E-05	2.35E-05	2.35E-05	1.72E-04
Unbiased 10 - SW3	2.80E-04	2.55E-04	1.98E-04	3.78E-05	2.14E-05	2.10E-05	1.71E-04
Unbiased 10 - SW4	2.80E-04	2.55E-04	1.98E-04	3.48E-05	1.92E-05	1.95E-05	1.71E-04
Unbiased 11 - SW1	2.79E-04	2.54E-04	2.02E-04	5.28E-05	3.40E-05	2.99E-05	1.75E-04
Unbiased 11 - SW2	2.79E-04	2.54E-04	1.98E-04	3.84E-05	2.21E-05	2.11E-05	1.74E-04
Unbiased 11 - SW3	2.79E-04	2.54E-04	1.99E-04	3.81E-05	2.08E-05	2.01E-05	1.73E-04
Unbiased 11 - SW4	2.79E-04	2.54E-04	1.99E-04	3.59E-05	1.89E-05	1.82E-05	1.73E-04

Table 71:I+, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Min	2.76E-04	2.56E-04	2.91E-03	2.55E-05	1.82E-05	1.49E-05	3.64E-05
Max	3.72E-04	3.48E-04	1.70E-02	1.66E-04	2.62E-03	2.40E-03	1.35E-04
Average	2.84E-04	2.68E-04	8.68E-03	6.16E-05	5.64E-04	8.88E-04	8.54E-05
Std.Dev.	2.12E-05	2.01E-05	4.65E-03	4.07E-05	1.05E-03	1.01E-03	3.01E-05

Table 72: I+, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Min	2.75E-04	2.49E-04	1.91E-04	2.84E-05	1.59E-05	1.57E-05	1.67E-04
Max	2.87E-04	2.62E-04	2.09E-04	2.07E-04	3.53E-05	3.45E-05	1.76E-04
Average	2.80E-04	2.55E-04	1.99E-04	5.13E-05	2.26E-05	2.15E-05	1.72E-04
Std.Dev.	3.85E-06	4.21E-06	4.65E-06	3.95E-05	5.77E-06	4.98E-06	3.07E-06

Table 73: I+, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Min	2.78E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.76E-04
Max	2.78E-04	2.78E-04	2.78E-04	2.77E-04	2.77E-04	2.78E-04	2.77E-04
Average	2.78E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04	2.77E-04
Std.Dev.	2.52E-07	3.77E-07	2.71E-07	5.39E-08	1.98E-07	2.35E-07	2.33E-07

Table 74: I+, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

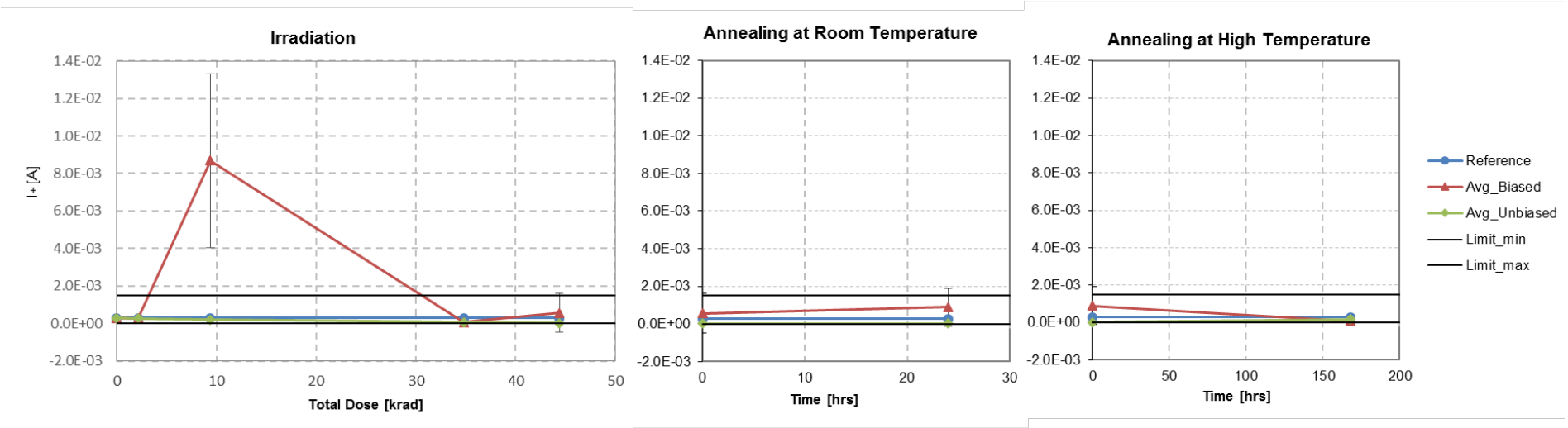

Figure 19: I+, Irradiation [rad (Si)], annealing and ageing (average values)

I_+ (Vin=2.4V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Ref 01 - SW1	3.71E-04	3.70E-04	3.70E-04	3.70E-04	3.69E-04	3.70E-04	3.69E-04
Ref 01 - SW2	3.71E-04	3.69E-04	3.70E-04	3.70E-04	3.69E-04	3.70E-04	3.69E-04
Ref 01 - SW3	3.70E-04	3.69E-04	3.69E-04	3.70E-04	3.69E-04	3.70E-04	3.69E-04
Ref 01 - SW4	3.70E-04	3.69E-04	3.69E-04	3.70E-04	3.69E-04	3.70E-04	3.69E-04
Biased 02 - SW1	3.71E-04	3.46E-04	1.19E-02	2.15E-04	1.38E-04	9.42E-05	1.22E-04
Biased 02 - SW2	3.71E-04	3.46E-04	8.41E-03	1.61E-04	1.26E-04	8.15E-05	1.21E-04
Biased 02 - SW3	3.71E-04	3.48E-04	7.20E-03	1.42E-04	1.25E-04	7.38E-05	1.21E-04
Biased 02 - SW4	3.71E-04	3.47E-04	7.10E-03	1.36E-04	1.24E-04	7.42E-05	1.21E-04
Biased 03 - SW1	3.87E-04	3.57E-04	8.21E-03	1.08E-04	6.61E-05	5.62E-05	1.35E-04
Biased 03 - SW2	3.87E-04	3.60E-04	6.65E-03	9.23E-05	6.07E-05	5.28E-05	1.35E-04
Biased 03 - SW3	3.87E-04	3.62E-04	7.11E-03	8.68E-05	5.89E-05	5.14E-05	1.35E-04
Biased 03 - SW4	3.88E-04	3.62E-04	1.03E-02	8.74E-05	5.91E-05	5.18E-05	1.36E-04
Biased 04 - SW1	3.70E-04	3.43E-04	2.50E-02	5.63E-05	3.08E-05	6.17E-04	8.50E-05
Biased 04 - SW2	3.71E-04	3.43E-04	1.77E-02	4.32E-05	2.59E-05	6.10E-04	8.55E-05
Biased 04 - SW3	3.71E-04	3.44E-04	2.08E-02	3.67E-05	2.41E-05	6.11E-04	8.57E-05
Biased 04 - SW4	3.71E-04	3.44E-04	2.08E-02	3.62E-05	2.36E-05	6.12E-04	8.58E-05
Biased 05- SW1	3.69E-04	3.42E-04	6.96E-03	6.36E-05	2.58E-03	2.36E-03	8.11E-05
Biased 05- SW2	3.70E-04	3.42E-04	4.60E-03	5.20E-05	2.58E-03	2.36E-03	8.12E-05
Biased 05- SW3	3.70E-04	3.44E-04	4.71E-03	4.51E-05	2.58E-03	2.36E-03	8.13E-05
Biased 05- SW4	3.70E-04	3.43E-04	4.59E-03	4.48E-05	2.60E-03	2.37E-03	8.13E-05
Biased 06 - SW1	3.68E-04	3.42E-04	2.50E-02	4.44E-05	3.65E-05	1.96E-03	9.33E-05
Biased 06 - SW2	3.69E-04	3.42E-04	1.65E-02	3.79E-05	1.06E-03	1.95E-03	9.34E-05
Biased 06 - SW3	3.68E-04	3.44E-04	1.88E-02	3.59E-05	2.91E-05	1.95E-03	9.35E-05
Biased 06 - SW4	3.68E-04	3.43E-04	1.79E-02	3.59E-05	2.82E-05	1.96E-03	9.35E-05
Unbiased 07 - SW1	3.72E-04	3.37E-04	2.63E-04	2.37E-04	3.51E-05	3.52E-05	2.27E-04
Unbiased 07 - SW2	3.72E-04	3.38E-04	2.62E-04	1.25E-04	2.84E-05	2.90E-05	2.25E-04
Unbiased 07 - SW3	3.73E-04	3.38E-04	2.62E-04	1.02E-04	2.68E-05	2.73E-05	2.25E-04
Unbiased 07 - SW4	3.73E-04	3.38E-04	2.63E-04	8.68E-05	2.54E-05	2.61E-05	2.24E-04
Unbiased 08 - SW1	3.67E-04	3.31E-04	2.55E-04	4.69E-05	3.41E-05	3.26E-05	2.23E-04
Unbiased 08 - SW2	3.68E-04	3.32E-04	2.54E-04	4.31E-05	2.64E-05	2.46E-05	2.23E-04
Unbiased 08 - SW3	3.68E-04	3.32E-04	2.54E-04	4.18E-05	2.47E-05	2.35E-05	2.22E-04
Unbiased 08 - SW4	3.68E-04	3.32E-04	2.54E-04	4.07E-05	2.32E-05	2.24E-05	2.22E-04
Unbiased 09 - SW1	3.82E-04	3.49E-04	2.72E-04	5.96E-05	3.88E-05	3.10E-05	2.34E-04
Unbiased 09 - SW2	3.83E-04	3.49E-04	2.72E-04	5.04E-05	3.02E-05	2.63E-05	2.34E-04
Unbiased 09 - SW3	3.83E-04	3.49E-04	2.72E-04	4.84E-05	2.79E-05	2.50E-05	2.34E-04
Unbiased 09 - SW4	3.83E-04	3.49E-04	2.72E-04	4.68E-05	2.62E-05	2.42E-05	2.34E-04
Unbiased 10 - SW1	3.72E-04	3.39E-04	2.63E-04	6.52E-05	4.30E-05	4.17E-05	2.27E-04
Unbiased 10 - SW2	3.73E-04	3.39E-04	2.63E-04	5.43E-05	3.26E-05	3.25E-05	2.28E-04
Unbiased 10 - SW3	3.73E-04	3.39E-04	2.63E-04	5.20E-05	3.01E-05	2.98E-05	2.28E-04
Unbiased 10 - SW4	3.73E-04	3.39E-04	2.64E-04	5.01E-05	2.83E-05	2.81E-05	2.27E-04
Unbiased 11 - SW1	3.72E-04	3.38E-04	2.63E-04	6.59E-05	4.18E-05	3.76E-05	2.32E-04
Unbiased 11 - SW2	3.72E-04	3.38E-04	2.64E-04	5.44E-05	3.14E-05	2.95E-05	2.30E-04
Unbiased 11 - SW3	3.72E-04	3.38E-04	2.64E-04	5.19E-05	2.88E-05	2.73E-05	2.30E-04
Unbiased 11 - SW4	3.72E-04	3.39E-04	2.64E-04	5.04E-05	2.72E-05	2.60E-05	2.30E-04

Table 75: I+, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Min	3.68E-04	3.42E-04	4.59E-03	3.59E-05	2.36E-05	5.14E-05	8.11E-05
Max	3.88E-04	3.62E-04	2.50E-02	2.15E-04	2.60E-03	2.37E-03	1.36E-04
Average	3.73E-04	3.47E-04	1.25E-02	7.80E-05	6.18E-04	1.01E-03	1.03E-04
Std.Dev.	7.15E-06	6.91E-06	7.03E-03	5.06E-05	1.03E-03	9.91E-04	2.18E-05

Table 76: I+, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Min	3.67E-04	3.31E-04	2.54E-04	4.07E-05	2.32E-05	2.24E-05	2.22E-04
Max	3.83E-04	3.49E-04	2.72E-04	2.37E-04	4.30E-05	4.17E-05	2.34E-04
Average	3.74E-04	3.39E-04	2.63E-04	6.87E-05	3.05E-05	2.90E-05	2.28E-04
Std.Dev.	5.13E-06	5.64E-06	5.72E-06	4.51E-05	5.53E-06	4.95E-06	4.13E-06

Table 77: I+, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Min	3.70E-04	3.69E-04	3.69E-04	3.70E-04	3.69E-04	3.70E-04	3.69E-04
Max	3.71E-04	3.70E-04	3.70E-04	3.70E-04	3.69E-04	3.70E-04	3.69E-04
Average	3.71E-04	3.69E-04	3.70E-04	3.70E-04	3.69E-04	3.70E-04	3.69E-04
Std.Dev.	2.55E-07	4.23E-07	2.90E-07	1.07E-07	1.93E-07	2.39E-07	3.58E-07

Table 78: I+, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference samples

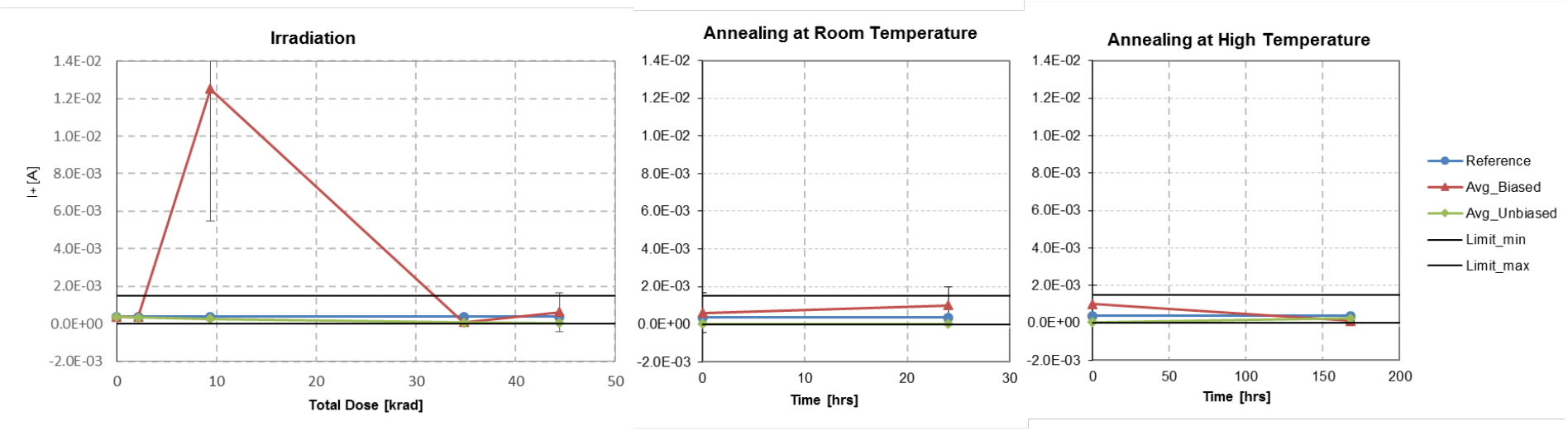

Figure 20: I+, Irradiation [rad (Si)], annealing and ageing (average values)

I- (Vin=0.8V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ref 01 - SW1	-1.19E-10	-1.20E-10	-1.21E-10	-1.20E-10	-1.22E-10	-1.18E-10	-1.24E-10
Ref 01 - SW2	-1.16E-10	-1.19E-10	-1.15E-10	-1.15E-10	-1.16E-10	-1.16E-10	-1.17E-10
Ref 01 - SW3	-1.14E-10	-1.21E-10	-1.16E-10	-1.15E-10	-1.17E-10	-1.17E-10	-1.21E-10
Ref 01 - SW4	-1.11E-10	-1.17E-10	-1.15E-10	-1.13E-10	-1.16E-10	-1.12E-10	-1.17E-10
Biased 02 - SW1	-1.15E-10	-1.06E-06	**-5.07E-03**	-2.61E-05	-1.22E-04	-6.09E-05	-2.72E-05
Biased 02 - SW2	-1.10E-10	-3.12E-07	**-5.83E-03**	-2.35E-05	-1.15E-04	-5.69E-05	-1.97E-05
Biased 02 - SW3	-1.11E-10	-8.30E-07	**-2.63E-03**	-2.38E-05	-1.16E-04	-5.88E-05	-2.57E-05
Biased 02 - SW4	-1.08E-10	-2.42E-07	**-6.16E-03**	-2.31E-05	-1.14E-04	-5.76E-05	-1.88E-05
Biased 03 - SW1	-8.16E-05	-7.38E-05	**-3.23E-03**	-3.90E-05	-3.77E-05	-3.64E-05	-3.47E-05
Biased 03 - SW2	-1.20E-10	-2.55E-07	**-5.22E-03**	-3.94E-05	-3.73E-05	-3.62E-05	-3.44E-05
Biased 03 - SW3	-1.21E-10	-6.96E-07	**-3.06E-03**	-4.00E-05	-3.72E-05	-3.62E-05	-3.47E-05
Biased 03 - SW4	-3.17E-10	-2.17E-07	**-8.96E-03**	-4.03E-05	-3.72E-05	-3.62E-05	-3.47E-05
Biased 04 - SW1	-1.21E-10	-1.70E-07	**-1.03E-02**	-1.83E-06	-7.19E-06	-2.75E-06	-9.14E-07
Biased 04 - SW2	-1.18E-10	-1.01E-09	**-1.51E-02**	-1.59E-06	-6.62E-06	-2.45E-06	-4.92E-07
Biased 04 - SW3	-1.18E-10	-1.11E-07	**-1.19E-02**	-1.66E-06	-6.58E-06	-2.40E-06	-7.99E-07
Biased 04 - SW4	-1.13E-10	-1.23E-07	**-1.30E-02**	-1.57E-06	-6.51E-06	-2.65E-06	-2.39E-06
Biased 05- SW1	-1.31E-10	-1.74E-07	**-2.21E-03**	-1.25E-06	-8.00E-07	-5.60E-07	-2.58E-07
Biased 05- SW2	-1.30E-10	-5.24E-08	**-3.38E-03**	-1.14E-06	-5.06E-07	-4.46E-07	-1.64E-07
Biased 05- SW3	-1.24E-10	-1.17E-07	**-2.13E-03**	-1.18E-06	-5.19E-07	-4.52E-07	-2.43E-07
Biased 05- SW4	-1.25E-10	-2.91E-08	**-3.35E-03**	-1.14E-06	-5.14E-07	-4.48E-07	-1.75E-06
Biased 06 - SW1	-1.21E-10	-1.78E-07	**-8.36E-03**	-1.41E-06	-4.42E-06	-1.58E-06	-1.22E-06
Biased 06 - SW2	-1.18E-10	-4.72E-08	**-1.49E-02**	-1.29E-06	-4.12E-06	-4.27E-07	-7.69E-07
Biased 06 - SW3	-1.21E-10	-1.17E-07	**-9.43E-03**	-1.37E-06	-4.12E-06	-4.43E-07	-1.15E-06
Biased 06 - SW4	-1.15E-10	-3.54E-08	**-1.68E-02**	-1.28E-06	-4.05E-06	-4.60E-07	-7.59E-07
Unbiased 07 - SW1	-1.16E-10	-6.50E-10	-6.71E-09	-2.42E-08	-1.40E-08	-1.17E-08	-1.04E-09
Unbiased 07 - SW2	-1.18E-10	-6.13E-10	-3.39E-09	-1.19E-08	-1.11E-08	-9.46E-09	-8.21E-10
Unbiased 07 - SW3	-1.14E-10	-6.04E-10	-3.03E-09	-1.01E-08	-1.04E-08	-8.94E-09	-7.99E-10
Unbiased 07 - SW4	-1.13E-10	-5.94E-10	-2.76E-09	-8.69E-09	-9.96E-09	-8.60E-09	-7.66E-10
Unbiased 08 - SW1	-1.28E-10	-8.29E-10	-6.38E-09	-7.23E-09	-1.51E-08	-1.34E-08	-1.07E-09
Unbiased 08 - SW2	-1.24E-10	-7.55E-10	-3.18E-09	-5.95E-09	-1.17E-08	-9.92E-09	-7.92E-10
Unbiased 08 - SW3	-1.28E-10	-7.40E-10	-2.91E-09	-5.82E-09	-1.09E-08	-9.38E-09	-7.58E-10
Unbiased 08 - SW4	-1.24E-10	-7.24E-10	-2.70E-09	-5.78E-09	-1.02E-08	-9.03E-09	-7.19E-10
Unbiased 09 - SW1	-1.18E-10	-5.12E-10	-5.16E-09	-6.16E-09	-1.12E-08	-9.03E-09	-7.62E-10
Unbiased 09 - SW2	-1.12E-10	-4.98E-10	-2.57E-09	-4.81E-09	-8.70E-09	-7.54E-09	-6.77E-10
Unbiased 09 - SW3	-1.13E-10	-4.88E-10	-2.35E-09	-4.67E-09	-8.18E-09	-7.18E-09	-6.72E-10
Unbiased 09 - SW4	-1.11E-10	-4.84E-10	-2.18E-09	-4.59E-09	-7.76E-09	-6.93E-09	-6.51E-10
Unbiased 10 - SW1	-1.31E-10	-6.36E-10	-6.52E-09	-7.33E-09	-1.37E-08	-1.22E-08	-7.79E-10
Unbiased 10 - SW2	-1.28E-10	-6.08E-10	-3.14E-09	-5.88E-09	-1.05E-08	-9.45E-09	-7.13E-10
Unbiased 10 - SW3	-1.28E-10	-6.09E-10	-2.86E-09	-5.75E-09	-9.91E-09	-8.87E-09	-7.14E-10
Unbiased 10 - SW4	-1.25E-10	-5.95E-10	-2.66E-09	-5.62E-09	-9.45E-09	-8.47E-09	-6.93E-10
Unbiased 11 - SW1	-1.20E-10	-6.28E-10	-6.05E-09	-6.88E-09	-1.34E-08	-1.08E-08	-9.27E-10
Unbiased 11 - SW2	-1.16E-10	-5.88E-10	-3.03E-09	-5.61E-09	-1.02E-08	-8.75E-09	-7.64E-10
Unbiased 11 - SW3	-1.17E-10	-5.80E-10	-2.75E-09	-5.48E-09	-9.70E-09	-8.29E-09	-7.47E-10
Unbiased 11 - SW4	-1.14E-10	-5.70E-10	-2.56E-09	-5.37E-09	-9.16E-09	-7.86E-09	-7.07E-10

Table 79:I-, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Min	-8.16E-05	-7.38E-05	-1.68E-02	-4.03E-05	-1.22E-04	-6.09E-05	-3.47E-05
Max	-1.08E-10	-1.01E-09	-2.13E-03	-1.14E-06	-5.06E-07	-4.27E-07	-1.64E-07
Average	-4.08E-06	-3.93E-06	-7.55E-03	-1.36E-05	-3.31E-05	-1.97E-05	-1.20E-05
Std.Dev.	1.83E-05	1.65E-05	4.77E-03	1.62E-05	4.50E-05	2.43E-05	1.46E-05

Table 80: I., Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Min	-1.31E-10	-8.29E-10	-6.71E-09	-2.42E-08	-1.51E-08	-1.34E-08	-1.07E-09
Max	-1.11E-10	-4.84E-10	-2.18E-09	-4.59E-09	-7.76E-09	-6.93E-09	-6.51E-10
Average	-1.20E-10	-6.15E-10	-3.64E-09	-7.39E-09	-1.08E-08	-9.29E-09	-7.79E-10
Std.Dev.	6.34E-12	9.10E-11	1.54E-09	4.37E-09	1.96E-09	1.65E-09	1.13E-10

Table 81: I., Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Min	-1.19E-10	-1.21E-10	-1.21E-10	-1.20E-10	-1.22E-10	-1.18E-10	-1.24E-10
Max	-1.11E-10	-1.17E-10	-1.15E-10	-1.13E-10	-1.16E-10	-1.12E-10	-1.17E-10
Average	-1.15E-10	-1.19E-10	-1.17E-10	-1.16E-10	-1.18E-10	-1.16E-10	-1.20E-10
Std.Dev.	3.11E-12	1.60E-12	2.56E-12	3.26E-12	2.72E-12	2.55E-12	3.23E-12

Table 82: I., Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

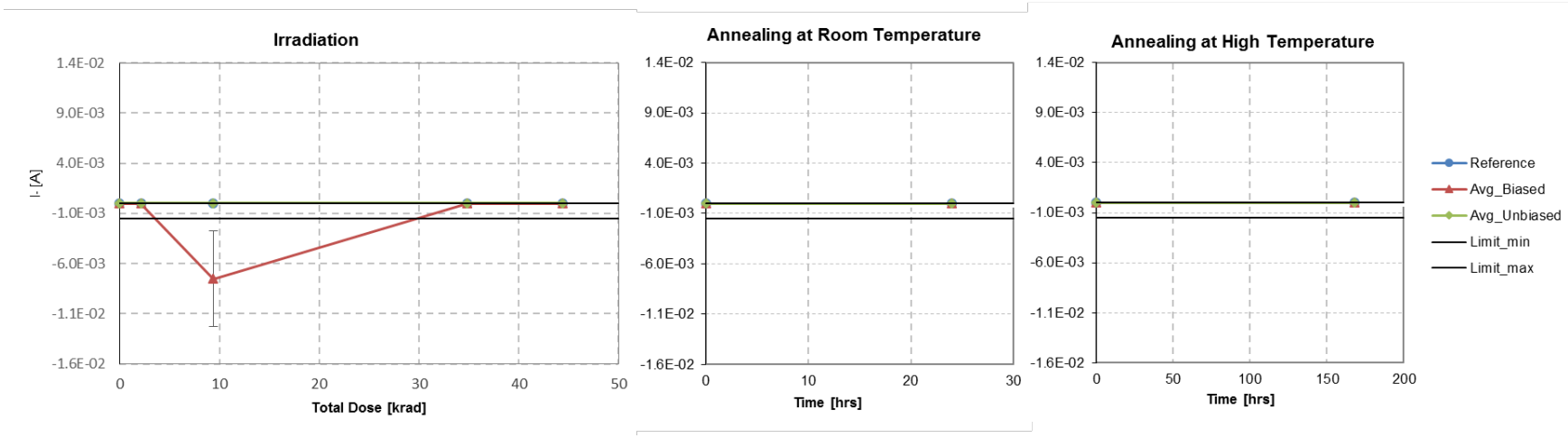

Figure 21: I-, Irradiation [rad (Si)], annealing and ageing (average values)

I- (Vin=2.4V) [A]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ref 01 - SW1	-8.51E-11	-8.74E-11	-9.07E-11	-8.62E-11	-8.89E-11	-8.57E-11	-8.95E-11
Ref 01 - SW2	-7.96E-11	-8.42E-11	-8.14E-11	-8.03E-11	-8.26E-11	-8.02E-11	-8.25E-11
Ref 01 - SW3	-8.32E-11	-8.43E-11	-8.14E-11	-8.03E-11	-8.31E-11	-8.12E-11	-8.46E-11
Ref 01 - SW4	-8.00E-11	-8.39E-11	-8.20E-11	-8.10E-11	-8.32E-11	-8.08E-11	-8.28E-11
Biased 02 - SW1	-8.50E-11	-5.70E-07	**-8.77E-03**	-2.62E-05	-1.22E-04	-6.03E-05	-2.72E-05
Biased 02 - SW2	-7.81E-11	-5.64E-07	**-5.59E-03**	-2.37E-05	-1.15E-04	-5.71E-05	-2.57E-05
Biased 02 - SW3	-7.87E-11	-5.46E-07	**-4.50E-03**	-2.39E-05	-1.16E-04	-5.90E-05	-2.59E-05
Biased 02 - SW4	-7.82E-11	-5.42E-07	**-4.88E-03**	-2.32E-05	-1.14E-04	-5.78E-05	-2.54E-05
Biased 03 - SW1	-9.50E-11	-5.07E-07	**-6.53E-03**	-4.01E-05	-3.81E-05	-3.65E-05	-3.47E-05
Biased 03 - SW2	-8.69E-11	-4.78E-07	**-5.22E-03**	-3.94E-05	-3.73E-05	-3.62E-05	-3.45E-05
Biased 03 - SW3	-8.65E-11	-4.54E-07	**-5.62E-03**	-4.00E-05	-3.72E-05	-3.62E-05	-3.47E-05
Biased 03 - SW4	-8.68E-11	-4.56E-07	**-9.02E-03**	-4.02E-05	-3.72E-05	-3.63E-05	-3.48E-05
Biased 04 - SW1	-8.99E-11	-5.19E-08	**-2.24E-02**	-1.85E-06	-7.24E-06	-2.78E-06	-9.16E-07
Biased 04 - SW2	-8.24E-11	-4.66E-08	**-1.61E-02**	-1.61E-06	-6.73E-06	-2.50E-06	-8.10E-07
Biased 04 - SW3	-8.23E-11	-4.36E-08	**-1.94E-02**	-1.68E-06	-6.67E-06	-2.43E-06	-8.05E-07
Biased 04 - SW4	-8.16E-11	-4.93E-08	**-1.96E-02**	-1.59E-06	-6.61E-06	-2.38E-06	-7.85E-07
Biased 05- SW1	-9.95E-11	-8.76E-08	**-5.33E-03**	-1.26E-06	-1.02E-06	-6.42E-07	-2.60E-07
Biased 05- SW2	-9.36E-11	-8.36E-08	**-3.36E-03**	-1.17E-06	-5.01E-07	-4.48E-07	-2.43E-07
Biased 05- SW3	-9.34E-11	-7.81E-08	**-3.42E-03**	-1.19E-06	-5.34E-07	-4.56E-07	-2.44E-07
Biased 05- SW4	-9.29E-11	-7.74E-08	**-3.36E-03**	-1.16E-06	-5.23E-07	-4.54E-07	-2.49E-07
Biased 06 - SW1	-8.83E-11	-9.35E-08	**-2.28E-02**	-1.43E-06	-4.46E-06	-6.47E-07	-1.22E-06
Biased 06 - SW2	-8.33E-11	-8.58E-08	**-1.59E-02**	-1.32E-06	-2.47E-06	-3.89E-07	-1.15E-06
Biased 06 - SW3	-8.33E-11	-7.90E-08	**-1.86E-02**	-1.38E-06	-4.19E-06	-4.36E-07	-1.15E-06
Biased 06 - SW4	-8.31E-11	-8.00E-08	**-1.77E-02**	-1.30E-06	-4.13E-06	-4.22E-07	-1.13E-06
Unbiased 07 - SW1	-8.72E-11	-6.89E-10	-5.62E-09	-2.43E-08	-1.43E-08	-1.20E-08	-1.06E-09
Unbiased 07 - SW2	-8.25E-11	-6.50E-10	-3.95E-09	-1.22E-08	-1.16E-08	-9.88E-09	-9.11E-10
Unbiased 07 - SW3	-8.26E-11	-6.39E-10	-3.51E-09	-1.04E-08	-1.09E-08	-9.40E-09	-8.69E-10
Unbiased 07 - SW4	-8.56E-11	-6.32E-10	-3.26E-09	-8.95E-09	-1.05E-08	-9.10E-09	-8.53E-10
Unbiased 08 - SW1	-9.83E-11	-8.58E-10	-5.34E-09	-7.24E-09	-1.54E-08	-1.36E-08	-1.09E-09
Unbiased 08 - SW2	-9.08E-11	-7.91E-10	-3.70E-09	-6.09E-09	-1.22E-08	-1.04E-08	-8.63E-10
Unbiased 08 - SW3	-9.09E-11	-7.77E-10	-3.38E-09	-5.96E-09	-1.14E-08	-9.87E-09	-8.14E-10
Unbiased 08 - SW4	-9.07E-11	-7.83E-10	-3.18E-09	-5.92E-09	-1.07E-08	-9.54E-09	-7.90E-10
Unbiased 09 - SW1	-8.62E-11	-5.33E-10	-4.36E-09	-6.17E-09	-1.14E-08	-9.37E-09	-8.13E-10
Unbiased 09 - SW2	-7.94E-11	-5.16E-10	-2.99E-09	-4.93E-09	-9.13E-09	-7.96E-09	-7.25E-10
Unbiased 09 - SW3	-7.95E-11	-5.07E-10	-2.73E-09	-4.78E-09	-8.66E-09	-7.57E-09	-7.15E-10
Unbiased 09 - SW4	-7.98E-11	-5.11E-10	-2.59E-09	-4.70E-09	-8.24E-09	-7.37E-09	-7.05E-10
Unbiased 10 - SW1	-9.68E-11	-6.63E-10	-5.43E-09	-7.36E-09	-1.40E-08	-1.25E-08	-8.22E-10
Unbiased 10 - SW2	-9.11E-11	-6.38E-10	-3.65E-09	-6.02E-09	-1.09E-08	-9.86E-09	-7.65E-10
Unbiased 10 - SW3	-9.16E-11	-6.35E-10	-3.31E-09	-5.87E-09	-1.03E-08	-9.29E-09	-7.53E-10
Unbiased 10 - SW4	-9.19E-11	-6.53E-10	-3.12E-09	-5.76E-09	-9.92E-09	-8.95E-09	-7.49E-10
Unbiased 11 - SW1	-8.72E-11	-6.57E-10	-5.16E-09	-6.92E-09	-1.37E-08	-1.11E-08	-9.58E-10
Unbiased 11 - SW2	-8.30E-11	-6.18E-10	-3.53E-09	-5.75E-09	-1.07E-08	-9.24E-09	-8.40E-10
Unbiased 11 - SW3	-8.28E-11	-6.11E-10	-3.22E-09	-5.61E-09	-1.02E-08	-8.71E-09	-8.00E-10
Unbiased 11 - SW4	-8.36E-11	-6.05E-10	-3.05E-09	-5.50E-09	-9.64E-09	-8.29E-09	-7.83E-10

Table 83: I-, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Min	-9.95E-11	-5.70E-07	-2.28E-02	-4.02E-05	-1.22E-04	-6.03E-05	-3.48E-05
Max	-7.81E-11	-4.36E-08	-3.36E-03	-1.16E-06	-5.01E-07	-3.89E-07	-2.43E-07
Average	-8.64E-11	-2.49E-07	-1.09E-02	-1.37E-05	-3.31E-05	-1.97E-05	-1.26E-05
Std.Dev.	6.02E-12	2.25E-07	7.15E-03	1.62E-05	4.51E-05	2.44E-05	1.51E-05

Table 84: I., Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Min	-9.83E-11	-8.58E-10	-5.62E-09	-2.43E-08	-1.54E-08	-1.36E-08	-1.09E-09
Max	-7.94E-11	-5.07E-10	-2.59E-09	-4.70E-09	-8.24E-09	-7.37E-09	-7.05E-10
Average	-8.71E-11	-6.48E-10	-3.75E-09	-7.52E-09	-1.12E-08	-9.70E-09	-8.34E-10
Std.Dev.	5.54E-12	9.61E-11	9.29E-10	4.39E-09	1.91E-09	1.60E-09	1.05E-10

Table 85: I., Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03	-1.50E-03
max	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Min	-8.51E-11	-8.74E-11	-9.07E-11	-8.62E-11	-8.89E-11	-8.57E-11	-8.95E-11
Max	-7.96E-11	-8.39E-11	-8.14E-11	-8.03E-11	-8.26E-11	-8.02E-11	-8.25E-11
Average	-8.20E-11	-8.49E-11	-8.39E-11	-8.19E-11	-8.45E-11	-8.20E-11	-8.49E-11
Std.Dev.	2.61E-12	1.65E-12	4.54E-12	2.85E-12	3.00E-12	2.52E-12	3.21E-12

Table 86: I., Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

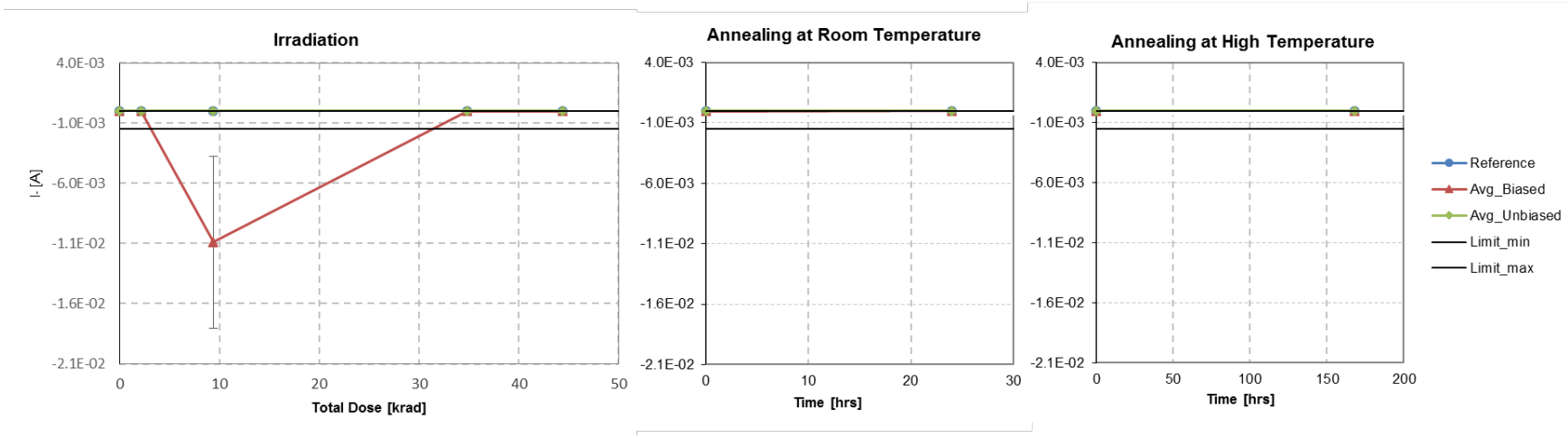

Figure 22: I-, Irradiation [rad (Si)], annealing and ageing (average values)

Time delay L->H (toff) [ns]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	500.00	500.00	500.00	500.00	500.00	500.00	500.00
Ref 01 - SW1	254.40	255.20	256.00	255.20	260.80	252.80	260.00
Ref 01 - SW2	256.00	254.40	255.20	255.20	260.00	258.40	254.40
Ref 01 - SW3	255.20	254.40	255.20	254.40	256.80	256.00	256.80
Ref 01 - SW4	253.60	255.20	255.20	254.40	256.80	252.80	252.80
Biased 02 - SW1	253.60	248.00	255.20	396.00			103.20
Biased 02 - SW2	254.40	252.80	270.40	434.40			270.40
Biased 02 - SW3	253.60	245.60	255.20	411.20			1790.40
Biased 02 - SW4	252.00	252.00	268.80	431.20			272.00
Biased 03 - SW1	253.60	250.40	271.20				102.40
Biased 03 - SW2	253.60	252.00	270.40	1144.00			273.60
Biased 03 - SW3	253.60	249.60	270.40				896.80
Biased 03 - SW4	253.60	252.80	269.60	2484.00			270.40
Biased 04 - SW1	255.20	251.20	268.00				896.80
Biased 04 - SW2	254.40	252.80	272.00				272.00
Biased 04 - SW3	255.20	250.40	268.80				100.00
Biased 04 - SW4	254.40	249.60	269.60				252.80
Biased 05- SW1	254.40	251.20	272.80				896.00
Biased 05- SW2	253.60	252.00	271.20				272.00
Biased 05- SW3	254.40	249.60	275.20				95.20
Biased 05- SW4	254.40	252.80	271.20				251.20
Biased 06 - SW1	254.40	250.40	266.40				103.20
Biased 06 - SW2	255.20	252.80	272.00				267.20
Biased 06 - SW3	254.40	249.60	267.20				896.80
Biased 06 - SW4	253.60	252.80	272.00				275.20
Unbiased 07 - SW1	254.40	252.80	264.80	820.80			288.80
Unbiased 07 - SW2	254.40	250.40	264.80	876.80			284.00
Unbiased 07 - SW3	253.60	250.40	264.80	934.40			280.80
Unbiased 07 - SW4	253.60	250.40	264.00	827.20			285.60
Unbiased 08 - SW1	255.20	252.00	266.40	585.60			288.80
Unbiased 08 - SW2	254.40	250.40	265.60	670.40			283.20
Unbiased 08 - SW3	254.40	251.20	266.40	784.00			286.40
Unbiased 08 - SW4	253.60	252.00	266.40	868.80			280.80
Unbiased 09 - SW1	254.40	252.80	264.80	640.00			282.40
Unbiased 09 - SW2	253.60	251.20	265.60	678.40			280.80
Unbiased 09 - SW3	254.40	251.20	265.60	729.60			283.20
Unbiased 09 - SW4	253.60	251.20	265.60	681.60			281.60
Unbiased 10 - SW1	254.40	252.00	261.60	584.00			276.00
Unbiased 10 - SW2	254.40	250.40	262.40	614.40			283.20
Unbiased 10 - SW3	254.40	250.40	262.40	678.40			280.00
Unbiased 10 - SW4	253.60	252.00	261.60	652.80			276.00
Unbiased 11 - SW1	253.60	252.00	264.80	585.60			281.60
Unbiased 11 - SW2	254.40	251.20	264.80	620.80			284.00
Unbiased 11 - SW3	254.40	251.20	266.40	804.80			286.40
Unbiased 11 - SW4	253.60	251.20	264.80	755.20			284.80

Table 87: toff, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	500.00	500.00	500.00	500.00	500.00	500.00	500.00
Min	252.00	245.60	255.20				95.20
Max	255.20	252.80	275.20				1790.40
Average	254.08	250.92	268.88				427.88
Std.Dev.	0.75	1.91	5.09				430.88

Table 88: : toff, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	500.00	500.00	500.00	500.00	500.00	500.00	500.00
Min	253.60	250.40	261.60				276.00
Max	255.20	252.80	266.40				288.80
Average	254.12	251.32	264.68				282.92
Std.Dev.	0.47	0.79	1.54				3.47

Table 89: : toff, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	500.00	500.00	500.00	500.00	500.00	500.00	500.00
Min	253.60	254.40	255.20	254.40	256.80	252.80	252.80
Max	256.00	255.20	256.00	255.20	260.80	258.40	260.00
Average	254.80	254.80	255.40	254.80	258.60	255.00	256.00
	254.80	254.80	255.20	254.80	258.40	254.40	255.60
Std.Dev.	1.03	0.46	0.40	0.46	2.10	2.72	3.13

Table 90: Ir: toff, radiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

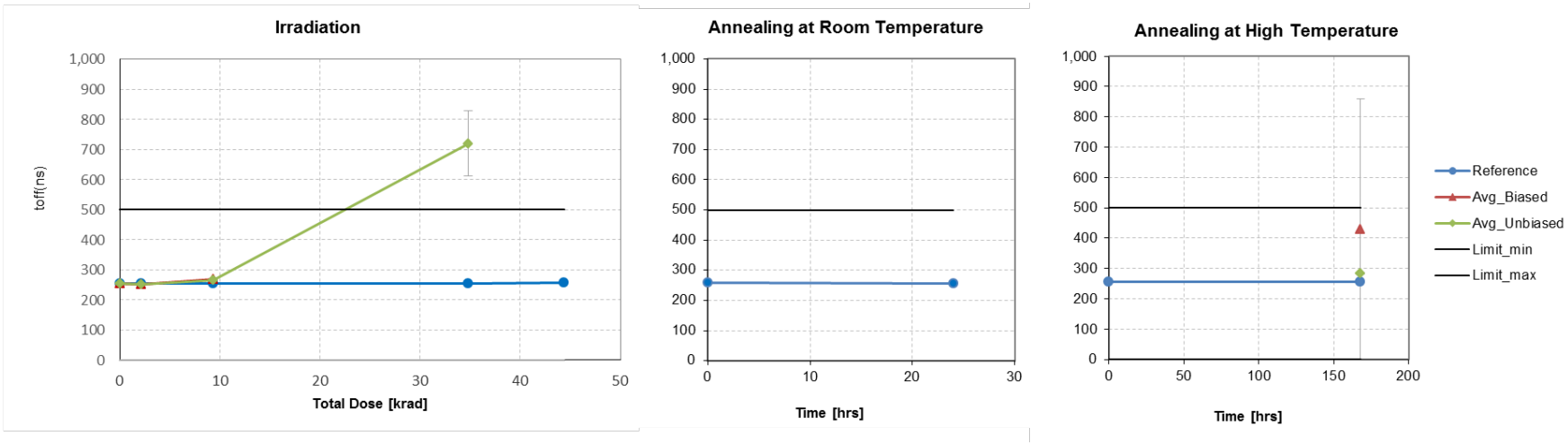

Figure 23: : toff, Irradiation [rad (Si)], annealing and ageing (average values)

Time delay H->L (ton) [ns]

Step #	0	1	2	3	4		6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Ref 01 - SW1	256.80	253.60	259.20	253.60	254.40	252.80	254.40
Ref 01 - SW2	257.60	254.40	259.20	253.60	253.60	253.60	255.20
Ref 01 - SW3	258.40	255.20	260.00	254.40	252.80	254.40	254.40
Ref 01 - SW4	257.60	256.80	260.00	255.20	254.40	254.40	256.80
Biased 02 - SW1	254.40	271.20	332.00	644.00			98.40
Biased 02 - SW2	254.40	259.20	296.80	577.60			17360.00
Biased 02 - SW3	256.00	272.80	337.60	648.80			1790.40
Biased 02 - SW4	255.20	260.00	299.20	584.00			18760.00
Biased 03 - SW1	255.20	268.00	328.00				889.60
Biased 03 - SW2	253.60	261.60	309.60	788.00			722400.00
Biased 03 - SW3	253.60	269.60	335.20				896.00
Biased 03 - SW4	254.40	263.20	314.40	764.00			824000.00
Biased 04 - SW1	257.60	276.00	341.60				894.40
Biased 04 - SW2	257.60	268.80	319.20				3992000.00
Biased 04 - SW3	257.60	278.40	344.80				98.40
Biased 04 - SW4	258.40	278.40	348.00				2292.00
Biased 05- SW1	256.00	276.00	340.00				103.20
Biased 05- SW2	256.00	270.40	327.20				7512000.00
Biased 05- SW3	258.40	276.80	345.60				102.40
Biased 05- SW4	259.20	270.40	329.60				1017.60
Biased 06 - SW1	258.40	276.00	341.60				102.40
Biased 06 - SW2	257.60	268.80	320.80				4840000.00
Biased 06 - SW3	258.40	277.60	344.80				895.20
Biased 06 - SW4	257.60	269.60	323.20				2632000.00
Unbiased 07 - SW1	253.60	268.80	324.00	728.00			354.40
Unbiased 07 - SW2	253.60	268.80	324.80	731.20			353.60
Unbiased 07 - SW3	255.20	269.60	326.40	731.20			354.40
Unbiased 07 - SW4	254.40	270.40	326.40	724.80			356.80
Unbiased 08 - SW1	256.00	270.40	332.00	758.40			352.80
Unbiased 08 - SW2	256.00	272.00	334.40	764.80			353.60
Unbiased 08 - SW3	256.80	272.00	334.40	764.80			352.80
Unbiased 08 - SW4	256.80	272.00	335.20	769.60			353.60
Unbiased 09 - SW1	253.60	268.80	322.40	696.00			341.60
Unbiased 09 - SW2	253.60	269.60	322.40	700.80			343.20
Unbiased 09 - SW3	254.40	269.60	322.40	700.80			343.20
Unbiased 09 - SW4	255.20	270.40	324.00	697.60			344.00
Unbiased 10 - SW1	256.00	270.40	320.00	710.40			347.20
Unbiased 10 - SW2	256.80	271.20	320.00	712.00			348.00
Unbiased 10 - SW3	257.60	271.20	320.80	720.00			349.60
Unbiased 10 - SW4	257.60	271.20	323.20	718.40			350.40
Unbiased 11 - SW1	256.80	269.60	324.80	699.20			347.20
Unbiased 11 - SW2	256.80	270.40	325.60	707.20			348.00
Unbiased 11 - SW3	256.80	270.40	328.00	728.00			347.20
Unbiased 11 - SW4	257.60	272.00	328.80	729.60			348.00

Table 91: ton, Irradiation, Annealing room temperature and annealing high temperature

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Min	253.60	259.20	296.80				98.40
Max	259.20	278.40	348.00				7512000.00
Average	256.48	270.64	328.96				1028385.00
Std.Dev.	1.81	6.05	15.24				2087169.09

Table 92: : ton, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for biased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Min	253.60	268.80	320.00	696.00			341.60
Max	257.60	272.00	335.20	769.60			356.80
Average	255.76	270.44	326.00	724.64			349.48
Std.Dev.	1.45	1.09	4.76	23.60			4.41

Table 93: : ton, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for unbiased samples

	0	1	2	3	4	5	6
IRRADIATION @	Pre-irradiation	2147 [Rad] irradiation step	9380 [Rad] irradiation step	34799 [Rad] irradiation step	44380 [Rad] irradiation step	Annealing: 24 [hrs] @ RT	Ageing: 168 [hrs] @ HT
min	0.00	0.00	0.00	0.00	0.00	0.00	0.00
max	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Min	256.80	253.60	259.20	253.60	252.80	252.80	254.40
Max	258.40	256.80	260.00	255.20	254.40	254.40	256.80
Average	257.60	255.00	259.60	254.20	253.80	253.80	255.20
Std.Dev.	0.65	1.37	0.46	0.77	0.77	0.77	1.13

Table 94: : ton, Irradiation, Annealing room temperature and annealing high temperature (min, max, average and standard deviation values) for reference sample

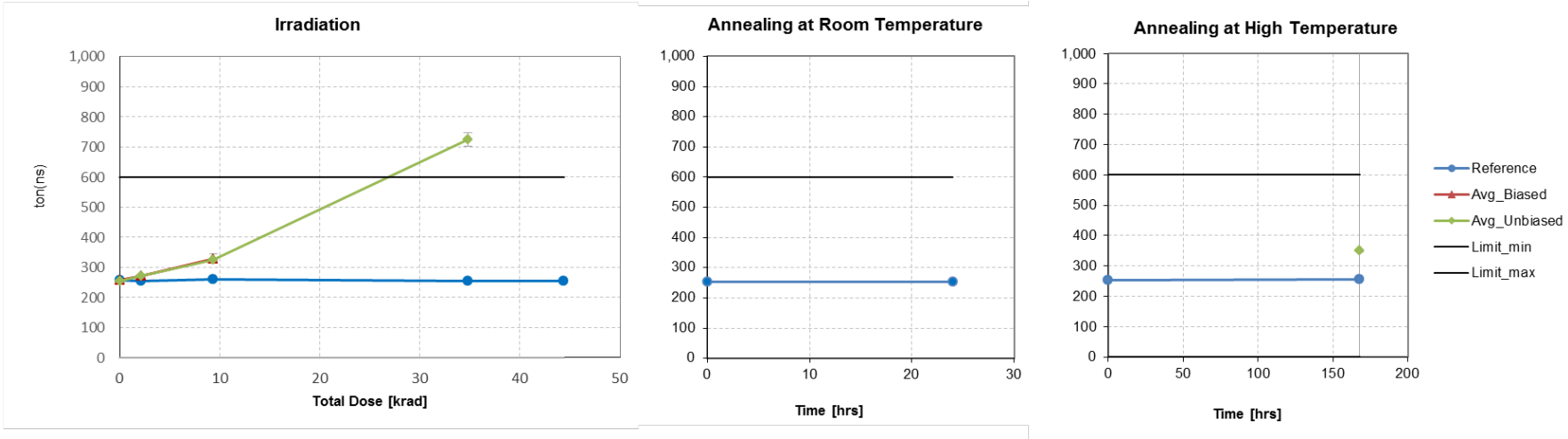

Figure 23: : ton, Irradiation [rad (Si)], annealing and ageing (average values)

6 CONCLUSION

We can make the following observation on the test results:

- $R_{DS\,(ON)}$ parameter is increasing with dose. In the worst case condition (V_S=+10V, I_D=-1mA), one switch of biased part SN5 is slightly out of specification limit at 34.8Krad-Si. At 44 krad-Si some switches of 2 biased parts (SN5 and SN6) are no longer measurable and most switches of all unbiased parts are slightly above specification limits. All switches of all parts are back within specification limits after high temperature annealing.
- The Off Input Leakage current $I_{S(off)}$ and Off Output Leakage current $I_{D(off)}$, increase significantly with dose. Some switches of some parts, biased and unbiased, are out of specifications limits at 2 krad-Si, and leakage current becomes no longer measurable at 9 Krad-Si. All switches of all parts are not measurable at 35 Krad-Si. Little recovery is observed on biased parts.
- Drain On Leakage current $I_{D(on)}$ is increasing with dose. Most parts, biased and unbiased, have switches out of specification limits at 2 Krad-Si. All switches of all biased parts are out of specification limits at 35 Krad-Si. Little annealing is observed on biased parts. Some switches even show increased degradation after annealing.
- Low to high level threshold voltage $V_{TR(off)}$, increases with dose. Some switches of biased parts are out of specification limits at 9.4 Krad-Si, and all switches of all parts, biased and unbiased, are out of specification limits at 35 Krad-Si. Then, the behaviour of biased parts with increasing dose level becomes erratic. On some parts, $V_{TR(off)}$ continues to degrade with increasing dose and no or little annealing is observed. For some parts, switches show some recovery with increasing dose and degrade again with annealing. Similar behaviour is observed for high to low level threshold voltage VTR(on). However, some switches of biased parts are out of specification limits at 2 Krad-Si.
- Input Current with Input Voltage Low, I_{IL}, increases slightly with dose, but all switches of all parts stay within specification limits up to the maximum tested dose level of 44 Krad-Si.
- For Input Current with Input Voltage High, I_{IH}, measured under the worst case case condition (V_{IN}=15V) some switches of 2 biased devices are out of specification limits, at 9 Krad-Si. Then, I_{IH} comes back within specification limits at further dose levels.
- For Positive Supply Current, I+, some switches of biased devices are out of of specifications limits at 9 Krad-Si and come back within specification limits at 35 Krad-Si. However, for the worst case test conditions (Vin=2.4V), some switches of biased parts come again out of specification limits at 44 Krad-Si.
- For Negative Supply Current, I_-, in the both conditions, for the biased devices, some switches of some parts are out of specification limits at 9 Krad-Si and then come back with specification limits at further irradiation steps.
- For Switch On Time, t_{on}, Most switches of the biased devices are no longer measurable at 35 Krad-Si. And all switches of all unbiased devices exceed the limit after 35 Krad-Si. All parts are measurable again after high temperature annealing but some switches of biased parts stay out of specification limits
- For Switch Off Time, t_{off}, Most biased devices are no longer measurable at 35 Krad-Si. The unbiased devices exceed the limit at 35 Krad and are then no longer measurable at 44 Krad-Si. All parts are measurable again after high temperature annealing but some switches of biased parts stay out of specification limits.

  To summarize, parts start to show degradation at 2 Krad-Si and functional failures can be observed at 9 Krad-Si. Considering the erratic behaviour of degradations with increasing dose and annealing, it is not recommended to use this part on applications with a dose level greater than 2 Krad-Si.