Radiation Report

TPS7H2211-SEP Neutron Displacement Damage (NDD) Characterization

ABSTRACT

This report presents the effect of neutron displacement damage (NDD) on the TPS7H2211-SEP device. The results show that all devices were fully functional and within production test limits after having been irradiated up to 1 × 10^{13} n/cm^2(1-MeV(Si) equivalent). A sample size of nine units were exposed per MIL-STD-883, Method 1017 for Neutron Irradiation, and an additional two devices were used as control units and were not irradiated. Electrical testing was performed at Texas Instruments before and after neutron irradiation using the production test program for TPS7H2211-SEP.

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Trademarks

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1 Overview

The TPS7H2211-SEP is a radiation-tolerant single channel eFuse (integrated FET load switch with additional features) that provides reverse current protection, overvoltage protection, and a configurable rise time to minimize inrush current (soft start). The device contains P-channel MOSFETs that operate over an input voltage range of 4.5 V to 14 V and supports a maximum continuous current of 3.5 A

The TPS7H2211-SEP is controlled by an on and off input (EN), which is capable of interfacing directly with low-voltage control signals. Overvoltage protection and soft start are programmable with few external components through the OVP and SS pins. The TPS7H2211-SEP is available in a ceramic and plastic package with an exposed thermal pad allowing for improved thermal performance. A standard microcircuit drawing (SMD) is available for the QML 5962R1822001VXC. A vendor item drawing (VID) is available for the -SEP variant, V62/23609.

Table 1-1. Overview Information

TI Part Number	TPS7H2211-SEP
VID Number	V62/23609
Device Name	PTPS7H2211MDAPSEP
Device Function	Load switch
Technology	Linear BiCMOS 7 (LBC7)
Assembly Lot Number / Lot Trace Code	3113811 / 32AHRYK
Unbiased Quantity Tested	9
Exposure Facility	VPT Rad
Neutron Fluence (1-MeV equivalent)	1.0×10^{12}, 5.0×10^{12}, 1.0×10^{13} n/cm^2
Irradiation Temperature	Room temperature
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2 Test Procedures

The TPS7H2211-SEP was electrically pre- and post-tested using the production automated test equipment program.

General test procedures adhered to MIL-STD-883, Method 1017 for Neutron Irradiation of TPS7H2211-SEP. Neutron irradiation conditions are listed in Table 2-1.

Table 2-1. Neutron Irradiation Conditions

Group	Sample Quantity	Neutron Fluence (n/cm^2)	BIAS
A	3	1×10^{12}	Unbiased
B	3	5×10^{12}	Unbiased
C	3	1×10^{13}	Unbiased

Figure 2-1. TPS7H2211-SEP Device

3 Facility

VPT Rad performs all neutron displacement damage irradiations in a Low-Enriched, open-pool, water moderated, thermal neutron reactor. VPT Rad uses flat-plate type fuel, and having a maximum thermal energy output of up to 1 MW. The Fast Neutron Irradiator (FNI) faces one side of the reactor core, the design produces a geometrical planar beam of fast neutrons that is approximately uniform over an area of 12 in × 20 in. Lead and thermal neutron absorbing compounds are combined to filter out both fission gammas and thermal neutrons. The ratio of fast-to-thermal neutrons is approximately 400:1, with a gamma exposure of less than 150 rad (Si) for a 1E12 n/cm2 (1 MeV Si equivalent) exposure. The FNI can accommodate a sample or samples with size up to 30 cm in diameter and 15 cm thick including packaging materials. The minimum neutron fluence rate is 1E6 n/cm2-s. The maximum neutron fluence rate is approximately 1.0 E11 n/cm2-s. Both values are 1 MeV Si equivalent.

The neutron fluence rate is determined using the previously measured neutron radiation field for the FNI, performed in accordance with ASTM standards (ASTM F1190), and correlated to the measured reactor power level. The neutron dose is timed to meet the customer-specified fluence for the irradiation. Neutron dosimetry meeting ASTM standards (ASTM E265) is used to track and ensure irradiations meet the required minimum. The facility retains source-suitability with the Defense Logistics Agency (DLA) Laboratory Suitability Program for ASTM Test Method 1017. The DUTS are typically irradiation in an unbiased condition as per TM1017. If bias conditions are required, the conditions can be maintained through dry thimbles connected to the irradiation volume.

4 Results

There were no functional failures at any irradiation level. All parametric measurements remained well within all data sheet limits for all exposure levels. The full parameter list is shown in Section 4.1 and the related data can be found in Appendix A.

4.1 Data Sheet Electrical Parameters and Associated Tests

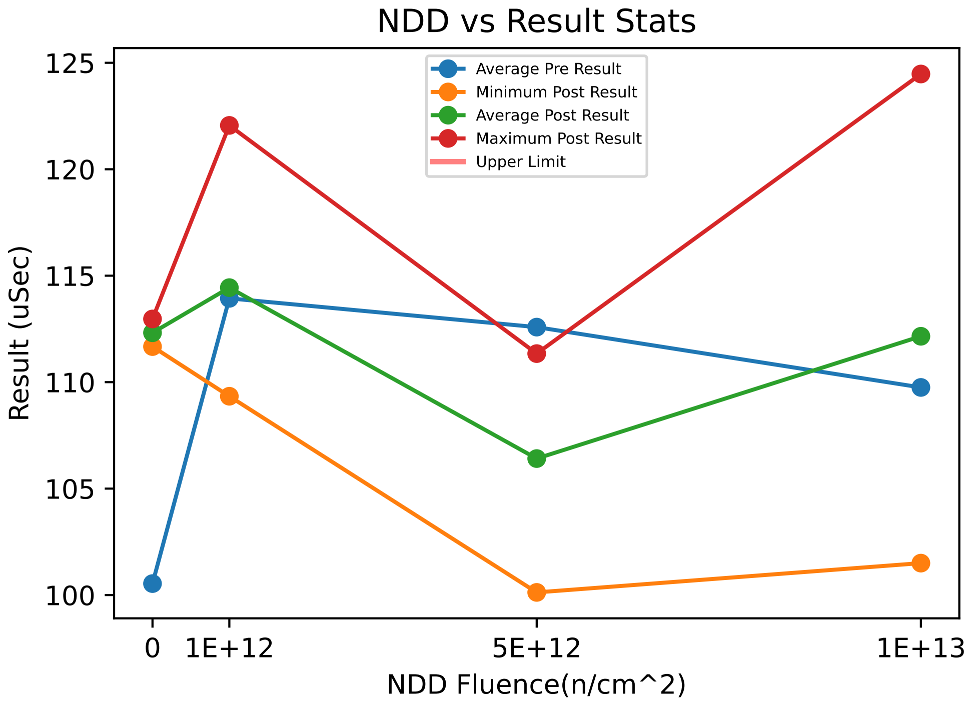
Parameter	Test Conditions	MIN	TYP	MAX	Unit	SPECID	Test Number
POWER SUPPLIES AND CURRENTS							
VIN_{UVLOR}		3.2	3.4	3.8	V	VIN_UVLO_RISE	5
VIN_{UVLOF}		2.6	2.9	3.2	V	VIN_UVLO_FALL	5.1
$HYST_{VIN\text{-}UVLO}$			0.55	0.75	V	VIN_UVLO_HYST	5.2
I_Q	IOUT = 0 mA, EN = 7 V, IOUT = 0 mA, EN = 7 V		5	10	mA	IQ_VIN	3
I_F	EN = 0 V, VOUT = 0 V, measured VOUT current, VIN = 14 V		1	1.3	mA	FORWARD_LEAKAGE	4.9
I_F	EN = 0 V, VOUT = 0 V, measured VOUT current, VIN = 12 V		0.65	0.94	mA	FORWARD_LEAKAGE_12V	4.7
I_F	EN = 0 V, VOUT = 0 V, measured VOUT current, VIN = 9 V		0.15	0.49	mA	FORWARD_LEAKAGE_9V	4.5
I_F	EN = 0 V, VOUT = 0 V, measured VOUT current, VIN = 4.5 V		0.04	0.23	mA	FORWARD_LEAKAGE_4p5V	4.1
I_{SD} VIN	EN = 0 V, VOUT = 0 V, measured VIN current, VIN = 14 V		6.9	10	mA	ISD_VIN_14V	4.8
I_{SD} VIN	EN = 0 V, VOUT = 0 V, measured VIN current, VIN = 12 V		5.9	9.5	mA	ISD_VIN_12V	4.6
I_{SD} VIN	EN = 0 V, VOUT = 0 V, measured VIN current, VIN = 9 V		4.4	8	mA	ISD_VIN_9V	4.4
I_{SD} VIN	EN = 0 V, VOUT = 0 V, measured VIN current, VIN = 4.5 V		3.7	7	mA	ISD_VIN_4p5V	4
V_{RCP_ENTER}	EN = 7 V, VIN = 4.5 V		390		mV	NS92N7_1	
V_{RCP_ENTER}	EN = 7 V, VIN = 14 V		363		mV	NSPQQO_1	
V_{RCP_EXIT}	EN = 7 V, VIN = 4.5 V		264		mV	NSMFME_1	
V_{RCP_EXIT}	EN = 7 V, VIN = 14 V		249		mV	NSY0QQ_1	
t_{RCP}	EN = 7 V, VIN = 4.5 V		208		µs	NS8C9O_1	
t_{RCP}	EN = 7 V, VIN = 14 V		247		µs	NSOWO7_1	
I_{RCP}	EN = 0 V, VOUT = 0 to 14 V and VOUT > VIN, EN = 0 V, VOUT = 0 to 14 V and VOUT > VIN		44	250	µA	IRCP_EN_0V	3.1, 3.3
I_{RCP}	EN = 7 V, VIN = 0 V, VOUT = 0 to 14 V, EN = 7 V, VIN = 0 V, VOUT = 0 to 14 V		37	240	µA	IRCP_EN_7V	3.4, 3.5
SOFT START							
I_{SS}			65	83	µA	SS_I_Charge	6.3, 6.7
ENABLE (EN) INPUT							
V_{IHEN}		0.59	0.63	0.67	V	EN_VTH_RISING_PLASTIC	6, 6.4
V_{ILEN}		0.49	0.52	0.55	V	EN_VTH_FALLING_PLASTIC	6.1, 6.5
$HYST_{EN}$		95	106	1	mV	EN_HYST_PLASTIC	6.2, 6.6
t_{LOW}	RTIMER = 0 V, RTIMER = 0 V	20			µs	EN_LOW_TIME_SHORT_RETRY	
t_{LOW_OFF}	VOUT falls to < 90%	47			µs	EN_LOW_TIME_CYCLING_PLASTIC	
VIN_{EN}		75%				VIN_EN_PERCENTAGE	

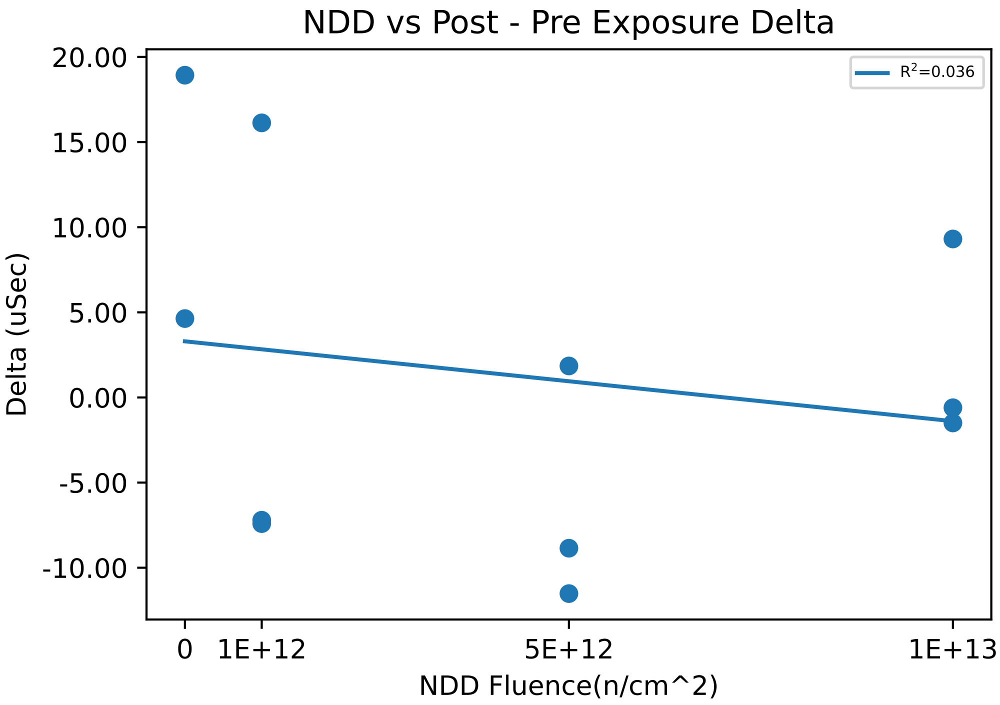
Parameter	Test Conditions	MIN	TYP	MAX	Unit	SPECID	Test Number
I_{EN}	EN = 7 V, VIN = 14 V, EN = 7 V, VIN = 14 V		2	12	nA	IEN_VIN	6.8, 6.9
OVERVOLTAGE PROTECTION (OVP)							
V_{OVPR}		1.07	1.15	1.22	V	OVP_VTH_Rising_PLASTIC	7, 7.3
V_{OVPF}		1.04	1.12	1.19	V	OVP_VTH_Falling_PLASTIC	7.1, 7.4
$HYST_{OVP}$	4.6 V < VIN < 14 V, 4.6 V < VIN < 14 V	24	28	33	mV	OVP_HYST_PLASTIC	7.2, 7.5
I_{OVP}	OVP = 7 V, OVP = 7 V		1.5	12	nA	OVP_ILEAK	7.6, 7.7
CURRENT LIMIT							
I_{L_trip}	VIN = 12 V, CSS = 2 nF, VIN = 12 V, CSS = 2 nF		8		A	NSFVE3_1	
I_{L_peak}	VIN = 12 V, 10 Ω to 10 mΩ short in 1 µs, switch inductance = 270 nH, VIN = 12 V, 10 Ω to 10 mΩ short in 1 µs, switch inductance = 270 nH		25		A	FTO_Current_Limit	
t_{ftr}	VIN = 12 V, 10 Ω to 10 mΩ short in 1 µs, switch inductance = 270 nH, VIN = 12 V, 10 Ω to 10 mΩ short in 1 µs, switch inductance = 270 nH		2.3		µs	Current_Limit_Timer	
t_{fto}	VIN = 12 V, CSS = 2 nF, VIN = 12 V, CSS = 2 nF		51		µs	FTO_OFF_TIME	
THERMAL SHUTDOWN							
Thermal shutdown			155		°C	Thermal_SHDN	
Thermal shutdown hysteresis			20		°C	Thermal_SHDN_Hyst	
RESISTANCE CHARACTERISTICS							
R_{ON}	VIN = 14 V, I_{out} = 3.5 A		44.3	46	mΩ	RON_VIN_14V_25_Plastic	8.4
R_{ON}	VIN = 12 V, I_{out} = 3.5 A		44	46	mΩ	RON_VIN_12V_25_Plastic	8.3
R_{ON}	VIN = 9 V, I_{out} = 3.5 A		43.6	45	mΩ	RON_VIN_9V_25_Plastic	8.2
R_{ON}	VIN = 6 V, I_{out} = 3.5 A		43.5	45	mΩ	RON_VIN_6V_25_Plastic	8.1
R_{ON}	VIN = 4.5 V, I_{out} = 3.5 A		47.6	49	mΩ	RON_VIN_4P5V_25_Plastic	8.0

A Appendix: NDD Report Data

This appendix contains the detailed NDD test results.

Device Test: 11.0 tON_VIN(TON_5p0V)





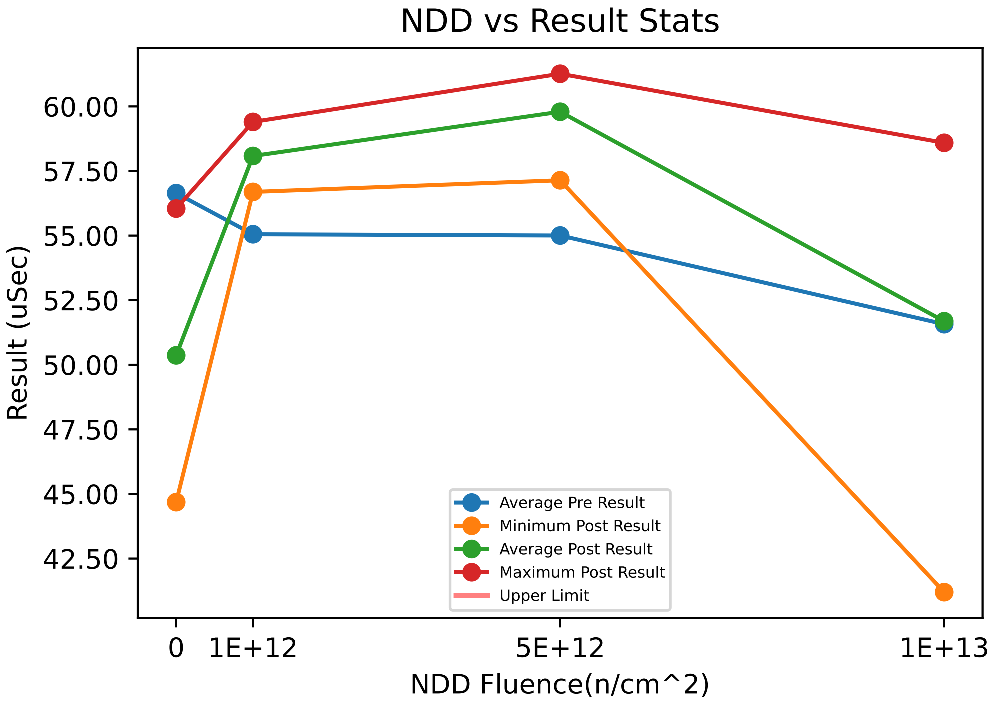
Test Results (No Limits Specified (uSec))

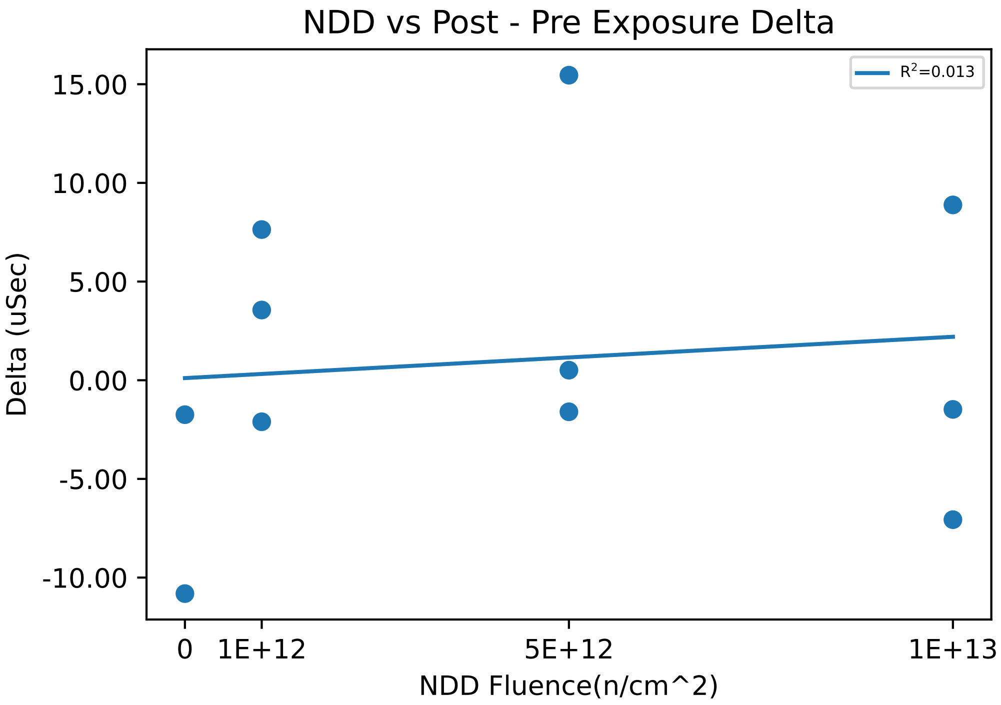
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	92.744	111.67	18.927
2	0	Correlation	108.33	112.97	4.634
3	1e+12	NDD, unbiased	116.75	109.34	-7.408
4	1e+12	NDD, unbiased	119.13	111.92	-7.209
5	1e+12	NDD, unbiased	105.93	122.06	16.127
6	5e+12	NDD, unbiased	111.64	100.12	-11.519
7	5e+12	NDD, unbiased	116.62	107.77	-8.853
8	5e+12	NDD, unbiased	109.49	111.34	1.85
9	1e+13	NDD, unbiased	103	101.5	-1.497
10	1e+13	NDD, unbiased	115.17	124.47	9.308
11	1e+13	NDD, unbiased	111.09	110.49	-0.603

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	92.744	100.54	108.33	11.024	111.67	112.32	112.97	0.91712	4.634	11.781	18.927	10.107
1e+12	105.93	113.94	119.13	7.0325	109.34	114.44	122.06	6.7248	-7.408	0.50333	16.127	13.531
5e+12	109.49	112.58	116.62	3.6565	100.12	106.41	111.34	5.7296	-11.519	-6.174	1.85	7.0757
1e+13	103	109.75	115.17	6.1944	101.5	112.16	124.47	11.577	-1.497	2.4027	9.308	5.9969

Device Test: 11.1 tOFF_VIN(TOFF_5p0V)





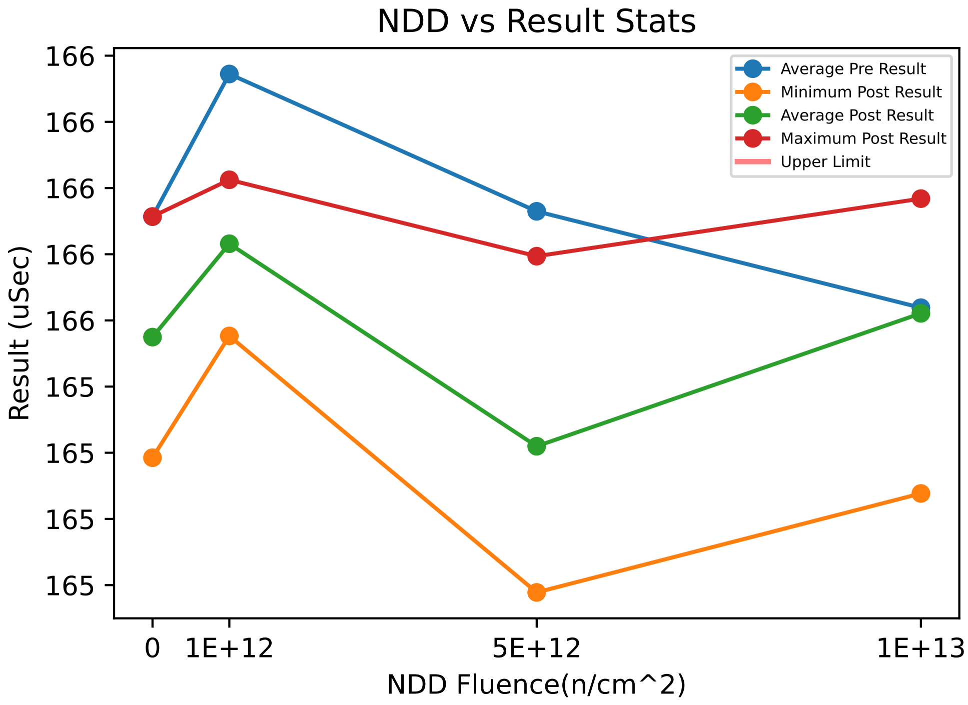
Test Results (No Limits Specified (uSec))

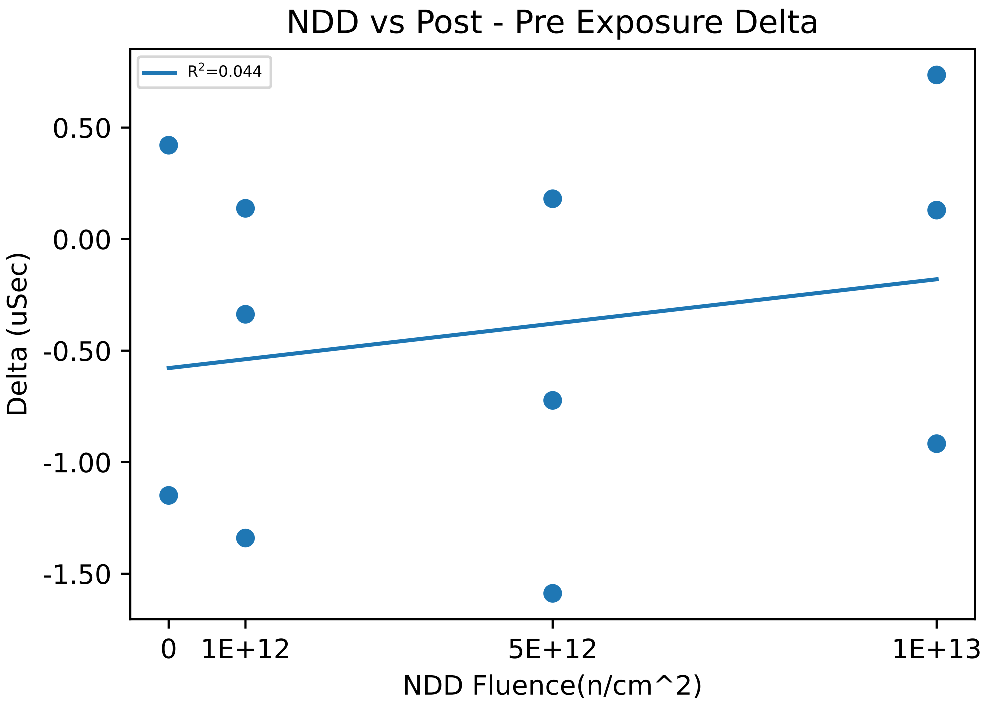
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	57.792	56.046	-1.746
2	0	Correlation	55.496	44.684	-10.812
3	1e+12	NDD, unbiased	58.795	56.691	-2.104
4	1e+12	NDD, unbiased	55.842	59.4	3.558
5	1e+12	NDD, unbiased	50.52	58.155	7.635
6	5e+12	NDD, unbiased	58.74	57.141	-1.599
7	5e+12	NDD, unbiased	45.807	61.264	15.457
8	5e+12	NDD, unbiased	60.464	60.974	0.51
9	1e+13	NDD, unbiased	46.381	55.265	8.884
10	1e+13	NDD, unbiased	48.266	41.2	-7.066
11	1e+13	NDD, unbiased	60.069	58.591	-1.478

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	55.496	56.644	57.792	1.6235	44.684	50.365	56.046	8.0341	-10.812	-6.279	-1.746	6.4106
1e+12	50.52	55.052	58.795	4.1936	56.691	58.082	59.4	1.356	-2.104	3.0297	7.635	4.8909
5e+12	45.807	55.004	60.464	8.0111	57.141	59.793	61.264	2.3013	-1.599	4.7893	15.457	9.2985
1e+13	46.381	51.572	60.069	7.4187	41.2	51.685	58.591	9.2316	-7.066	0.11333	8.884	8.0932

Device Test: 11.2 tF_VIN_EN(TFALL_5p0V)





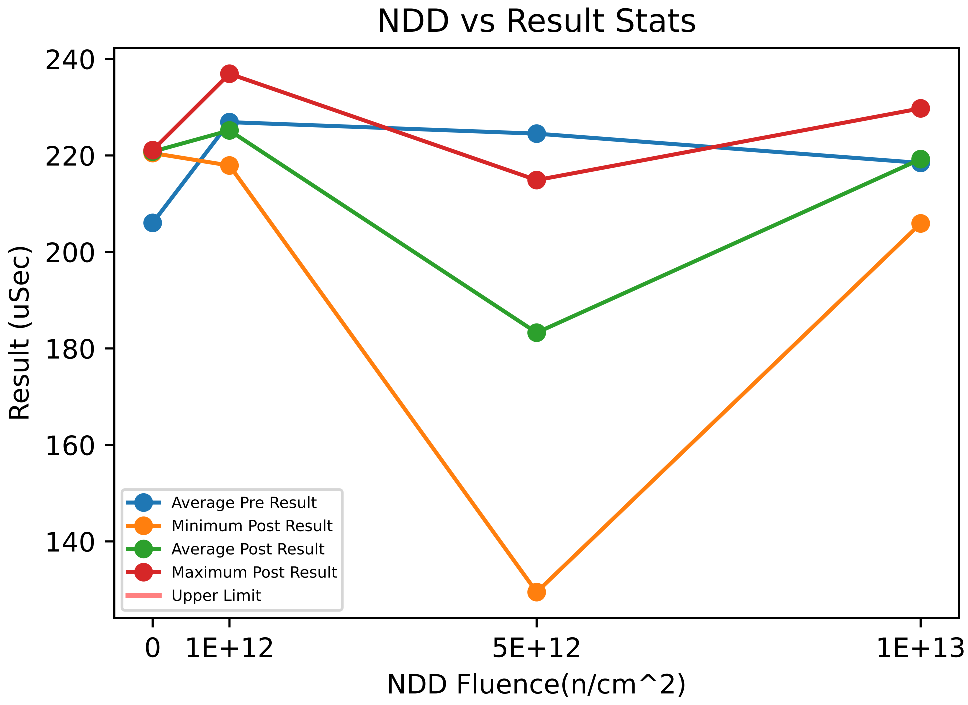
Test Results (No Limits Specified (uSec))

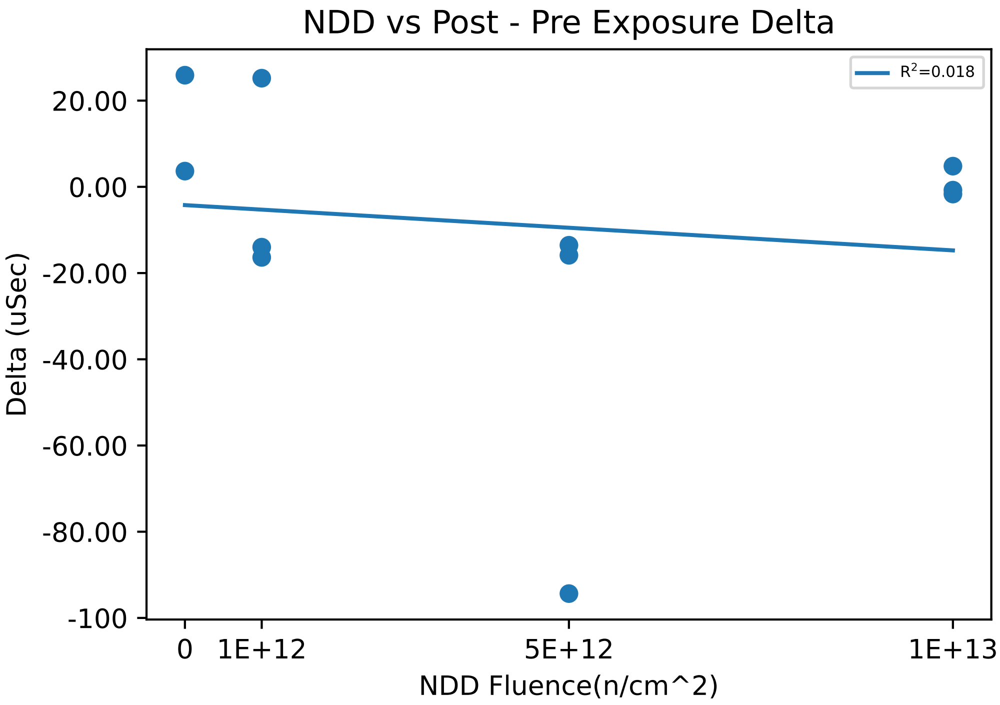
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	165.49	165.91	0.421
2	0	Correlation	166.33	165.19	-1.149
3	1e+12	NDD, unbiased	166.25	165.92	-0.337
4	1e+12	NDD, unbiased	166.89	165.55	-1.34
5	1e+12	NDD, unbiased	165.89	166.03	0.138
6	5e+12	NDD, unbiased	165.61	165.79	0.181
7	5e+12	NDD, unbiased	166.37	164.78	-1.588
8	5e+12	NDD, unbiased	165.81	165.09	-0.723
9	1e+13	NDD, unbiased	165.23	165.97	0.736
10	1e+13	NDD, unbiased	165.99	165.08	-0.917
11	1e+13	NDD, unbiased	165.69	165.82	0.13

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	165.49	165.91	166.33	0.59468	165.19	165.55	165.91	0.51548	-1.149	-0.364	0.421	1.1102
1e+12	165.89	166.34	166.89	0.50909	165.55	165.83	166.03	0.2473	-1.34	-0.513	0.138	0.75455
5e+12	165.61	165.93	166.37	0.3905	164.78	165.22	165.79	0.52083	-1.588	-0.71	0.181	0.88457
1e+13	165.23	165.64	165.99	0.38352	165.08	165.62	165.97	0.47726	-0.917	-0.017	0.736	0.83625

Device Test: 11.3 tON_VIN_EN_1p5V(TON_12p0V)





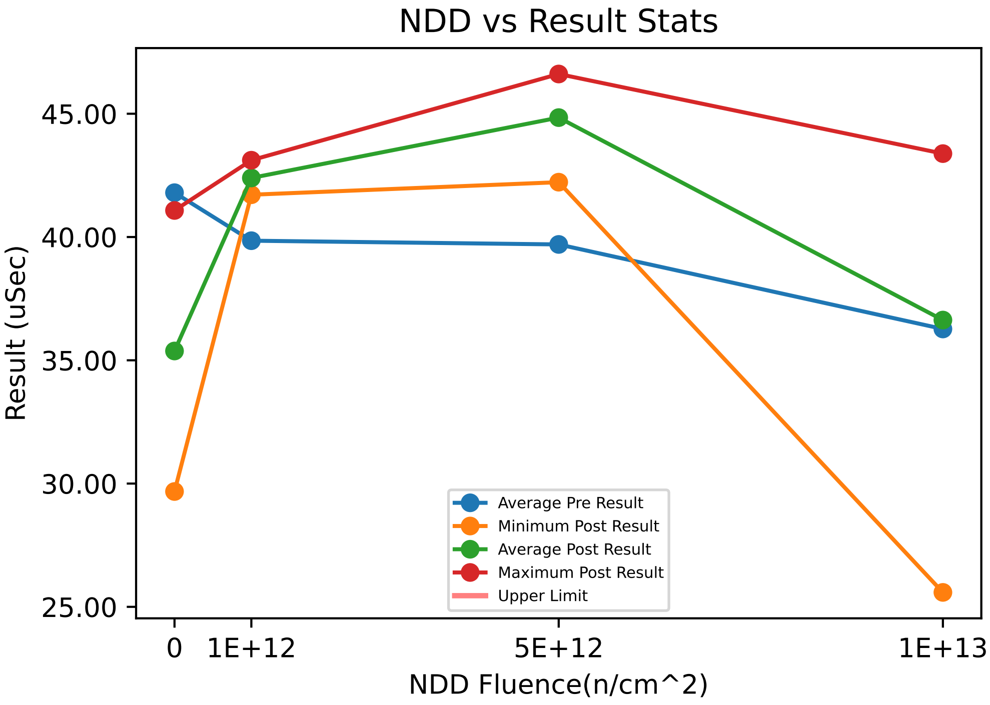
Test Results (No Limits Specified (uSec))

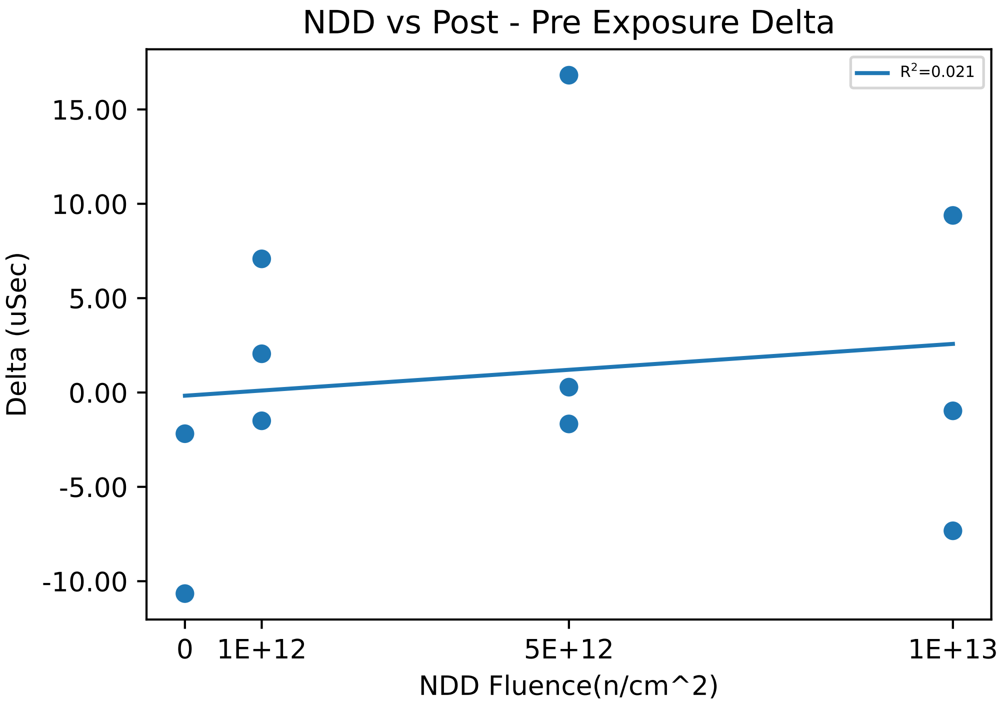
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	194.59	220.49	25.897
2	0	Correlation	217.45	221.09	3.648
3	1e+12	NDD, unbiased	231.91	217.91	-13.994
4	1e+12	NDD, unbiased	237.08	220.71	-16.366
5	1e+12	NDD, unbiased	211.73	236.93	25.206
6	5e+12	NDD, unbiased	221.28	205.4	-15.877
7	5e+12	NDD, unbiased	228.44	214.89	-13.55
8	5e+12	NDD, unbiased	223.84	129.48	-94.353
9	1e+13	NDD, unbiased	206.67	205.91	-0.767
10	1e+13	NDD, unbiased	224.95	229.75	4.8
11	1e+13	NDD, unbiased	223.73	222.06	-1.671

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	194.59	206.02	217.45	16.16	220.49	220.79	221.09	0.42709	3.648	14.773	25.897	15.732
1e+12	211.73	226.9	237.08	13.395	217.91	225.19	236.93	10.269	-16.366	-1.718	25.206	23.347
5e+12	221.28	224.52	228.44	3.6296	129.48	183.26	214.89	46.813	-94.353	-41.26	-13.55	45.995
1e+13	206.67	218.45	224.95	10.219	205.91	219.24	229.75	12.171	-1.671	0.78733	4.8	3.5043

Device Test: 11.4 tOFF_VIN_EN_1p5V(TOFF_12p0V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

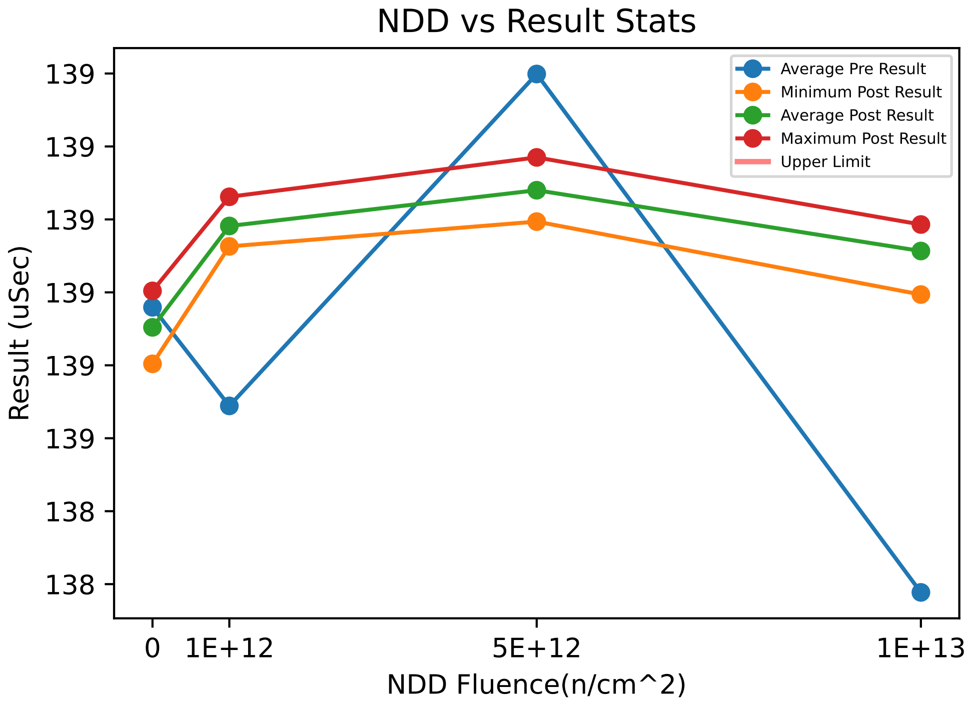
Test Results (No Limits Specified (uSec))

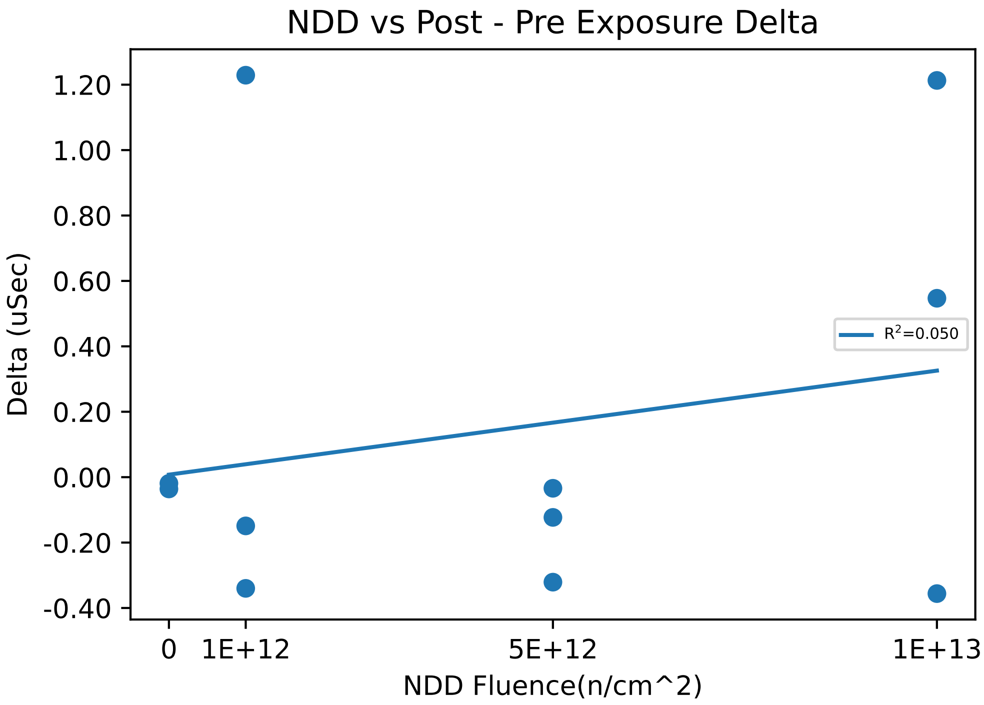
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	43.261	41.077	-2.184
2	0	Correlation	40.335	29.678	-10.657
3	1e+12	NDD, unbiased	43.215	41.715	-1.5
4	1e+12	NDD, unbiased	41.063	43.115	2.052
5	1e+12	NDD, unbiased	35.274	42.356	7.082
6	5e+12	NDD, unbiased	43.89	42.224	-1.666
7	5e+12	NDD, unbiased	29.797	46.612	16.815
8	5e+12	NDD, unbiased	45.411	45.694	0.283
9	1e+13	NDD, unbiased	31.542	40.926	9.384
10	1e+13	NDD, unbiased	32.915	25.586	-7.329
11	1e+13	NDD, unbiased	44.355	43.383	-0.972

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	40.335	41.798	43.261	2.069	29.678	35.377	41.077	8.0603	-10.657	-6.4205	-2.184	5.9913
1e+12	35.274	39.851	43.215	4.107	41.715	42.395	43.115	0.70083	-1.5	2.5447	7.082	4.3122
5e+12	29.797	39.699	45.411	8.6093	42.224	44.843	46.612	2.3144	-1.666	5.144	16.815	10.154
1e+13	31.542	36.271	44.355	7.0348	25.586	36.632	43.383	9.6444	-7.329	0.361	9.384	8.4359

Device Test: 11.5 tF_VIN_EN_1p5V(TFALL_12p0V)





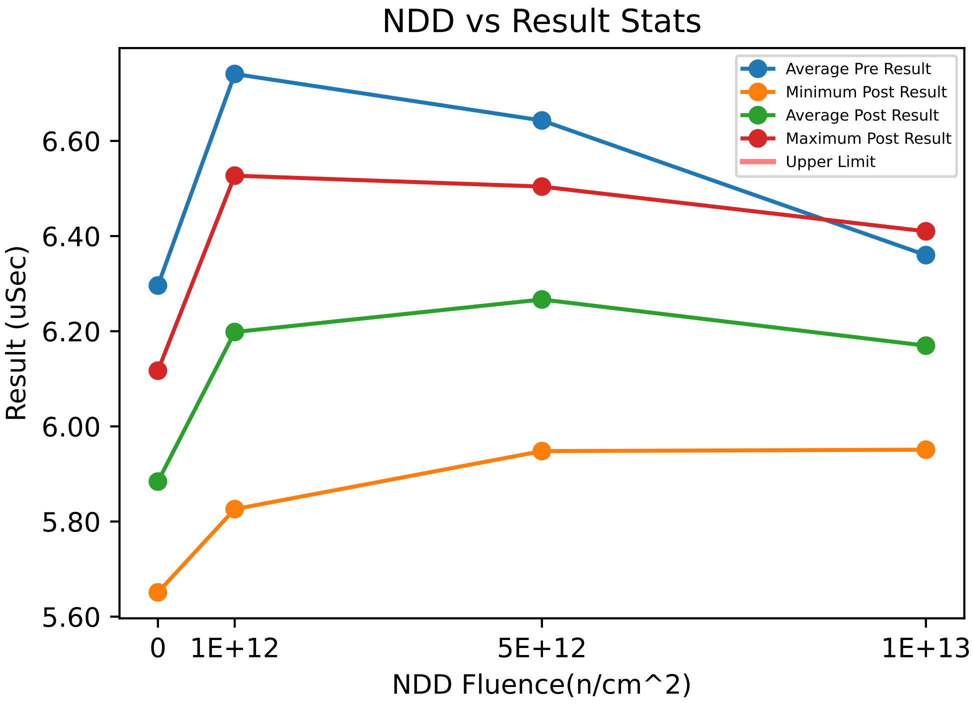
Test Results (No Limits Specified (uSec))

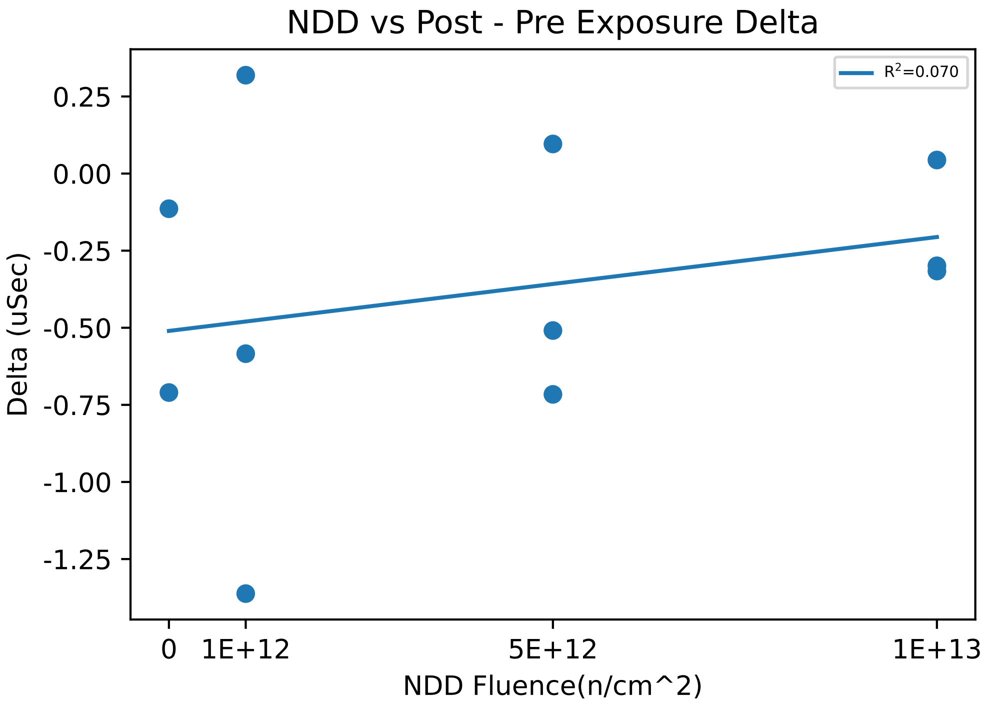
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	138.84	138.8	-0.036
2	0	Correlation	138.72	138.7	-0.019
3	1e+12	NDD, unbiased	139.27	138.93	-0.34
4	1e+12	NDD, unbiased	139.01	138.86	-0.149
5	1e+12	NDD, unbiased	137.65	138.88	1.229
6	5e+12	NDD, unbiased	138.97	138.94	-0.034
7	5e+12	NDD, unbiased	139.02	138.9	-0.123
8	5e+12	NDD, unbiased	139.31	138.99	-0.321
9	1e+13	NDD, unbiased	138.25	138.8	0.547
10	1e+13	NDD, unbiased	137.67	138.88	1.213
11	1e+13	NDD, unbiased	139.25	138.89	-0.356

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	138.72	138.78	138.84	0.082731	138.7	138.75	138.8	0.070711	-0.036	-0.0275	-0.019	0.012021
1e+12	137.65	138.64	139.27	0.8708	138.86	138.89	138.93	0.035553	-0.34	0.24667	1.229	0.85607
5e+12	138.97	139.1	139.31	0.18058	138.9	138.94	138.99	0.044034	-0.321	-0.15933	-0.034	0.14691
1e+13	137.67	138.39	139.25	0.80006	138.8	138.86	138.89	0.05208	-0.356	0.468	1.213	0.78748

Device Test: 12.0 OVP_Assert(T_ASSERT_5p0V)





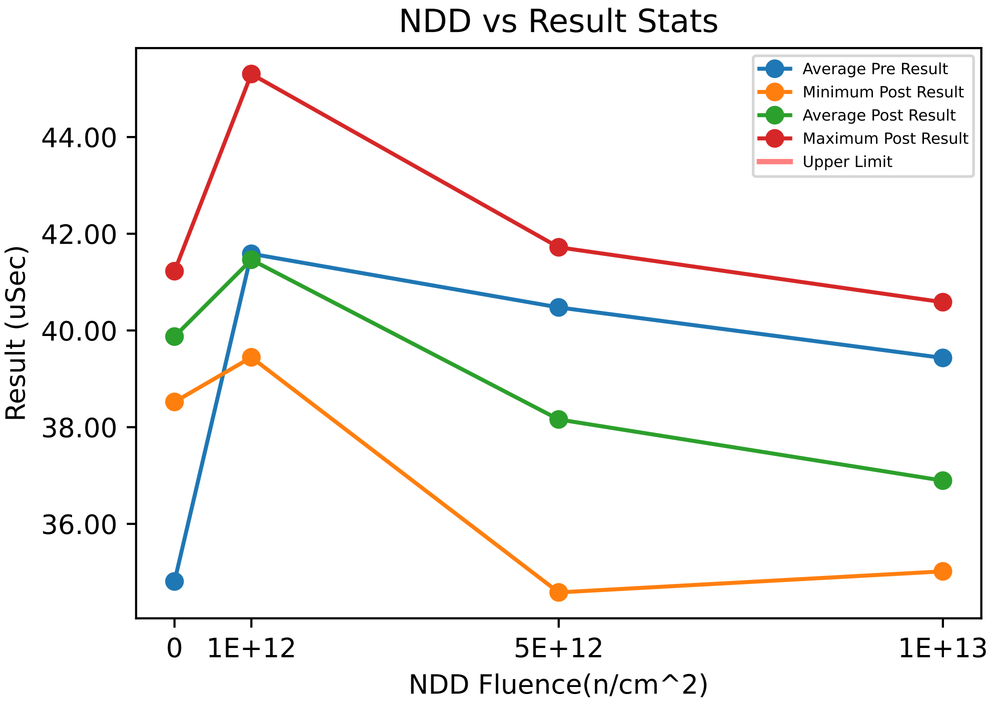
Test Results (No Limits Specified (uSec))

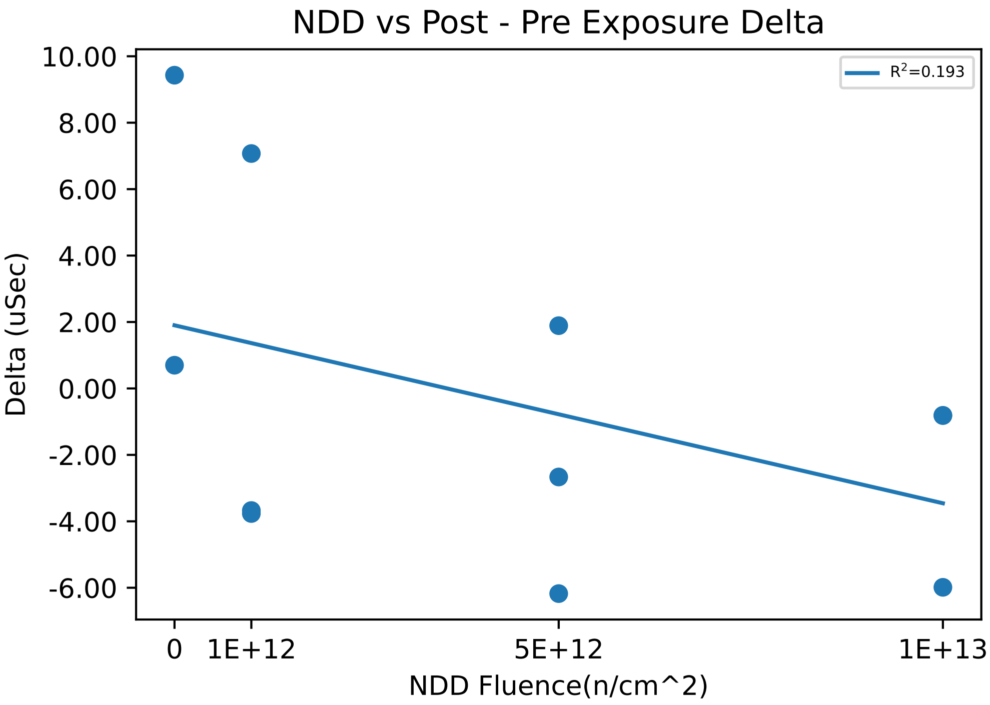
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	6.231	6.117	-0.114
2	0	Correlation	6.361	5.651	-0.71
3	1e+12	NDD, unbiased	6.826	6.242	-0.584
4	1e+12	NDD, unbiased	7.188	5.826	-1.362
5	1e+12	NDD, unbiased	6.208	6.527	0.319
6	5e+12	NDD, unbiased	6.252	6.348	0.096
7	5e+12	NDD, unbiased	6.664	5.948	-0.716
8	5e+12	NDD, unbiased	7.013	6.504	-0.509
9	1e+13	NDD, unbiased	6.104	6.148	0.044
10	1e+13	NDD, unbiased	6.267	5.951	-0.316
11	1e+13	NDD, unbiased	6.709	6.41	-0.299

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	6.231	6.296	6.361	0.091924	5.651	5.884	6.117	0.32951	-0.71	-0.412	-0.114	0.42144
1e+12	6.208	6.7407	7.188	0.49554	5.826	6.1983	6.527	0.35253	-1.362	-0.54233	0.319	0.84127
5e+12	6.252	6.643	7.013	0.38093	5.948	6.2667	6.504	0.28678	-0.716	-0.37633	0.096	0.42194
1e+13	6.104	6.36	6.709	0.31304	5.951	6.1697	6.41	0.23027	-0.316	-0.19033	0.044	0.20312

Device Test: 12.1 OVP_Deassert(T_DEASSERT_5p0V)





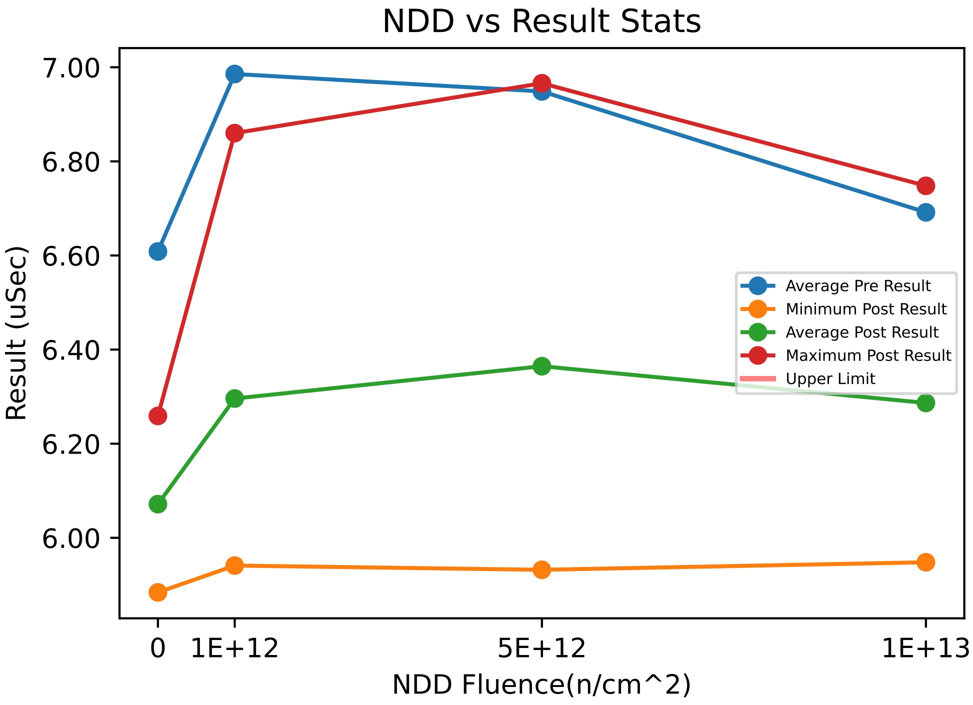
Test Results (No Limits Specified (uSec))

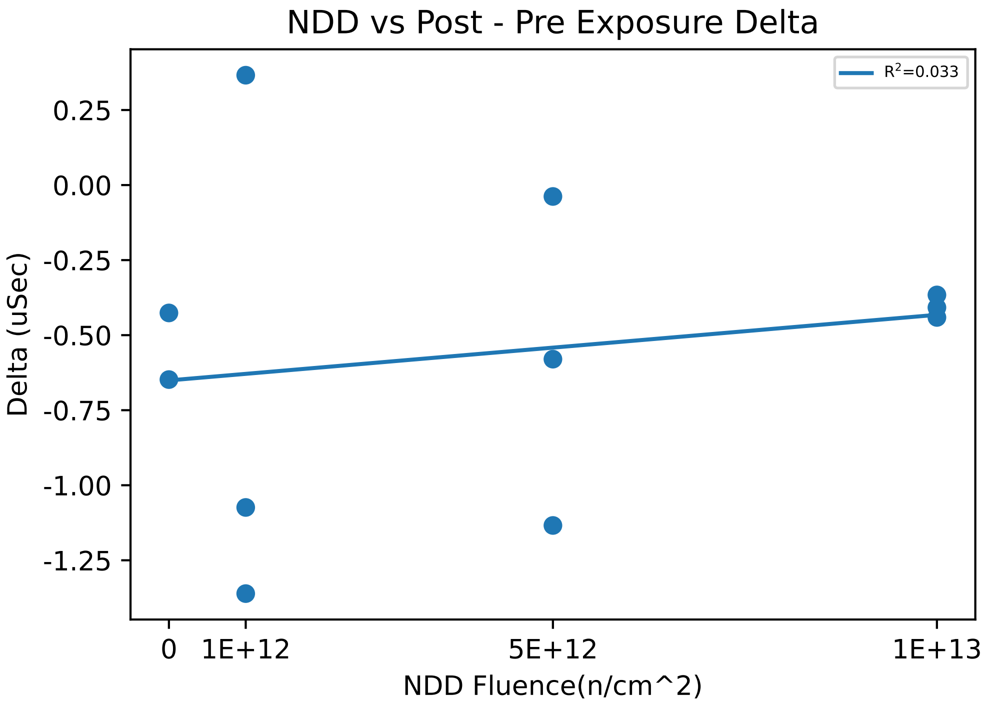
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	31.796	41.226	9.43
2	0	Correlation	37.823	38.522	0.699
3	1e+12	NDD, unbiased	43.21	39.445	-3.765
4	1e+12	NDD, unbiased	43.315	39.64	-3.675
5	1e+12	NDD, unbiased	38.232	45.304	7.072
6	5e+12	NDD, unbiased	40.759	34.583	-6.176
7	5e+12	NDD, unbiased	40.841	38.176	-2.665
8	5e+12	NDD, unbiased	39.83	41.72	1.89
9	1e+13	NDD, unbiased	35.89	35.081	-0.809
10	1e+13	NDD, unbiased	41.005	35.018	-5.987
11	1e+13	NDD, unbiased	41.402	40.585	-0.817

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	31.796	34.809	37.823	4.2617	38.522	39.874	41.226	1.912	0.699	5.0645	9.43	6.1737
1e+12	38.232	41.586	43.315	2.9048	39.445	41.463	45.304	3.3278	-3.765	-0.12267	7.072	6.2309
5e+12	39.83	40.477	40.841	0.56153	34.583	38.16	41.72	3.5685	-6.176	-2.317	1.89	4.0442
1e+13	35.89	39.432	41.402	3.0742	35.018	36.895	40.585	3.1961	-5.987	-2.5377	-0.809	2.9872

Device Test: 12.2 OVP_Assert_1p5V(T_ASSERT_12p0V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

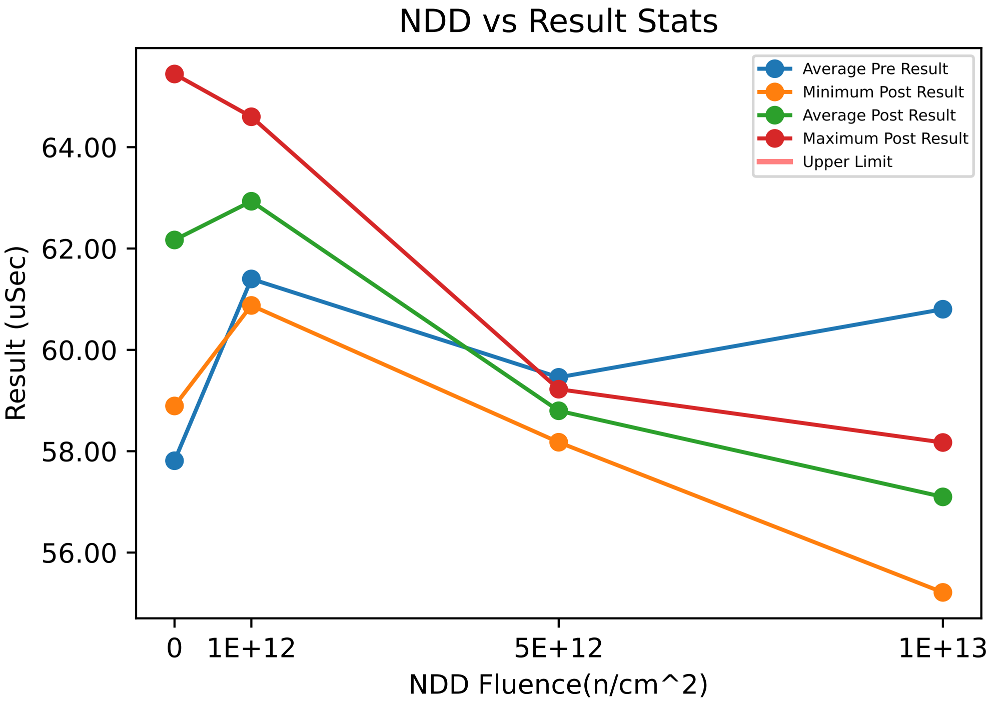
Test Results (No Limits Specified (uSec))

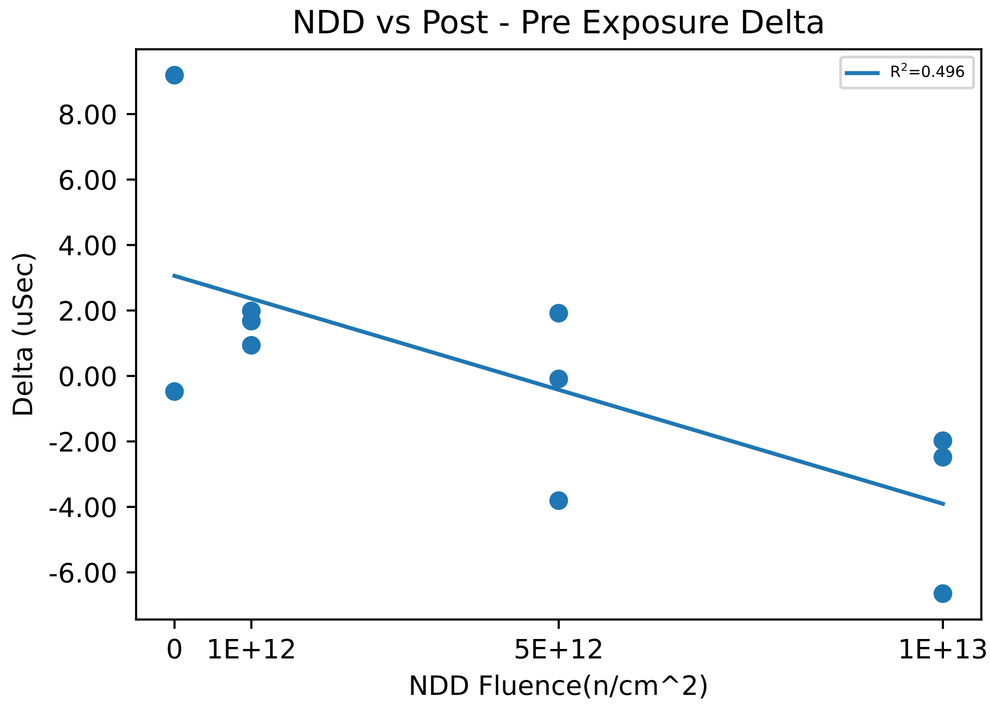
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	6.532	5.884	-0.648
2	0	Correlation	6.685	6.259	-0.426
3	1e+12	NDD, unbiased	7.302	5.941	-1.361
4	1e+12	NDD, unbiased	7.161	6.087	-1.074
5	1e+12	NDD, unbiased	6.494	6.86	0.366
6	5e+12	NDD, unbiased	6.512	5.932	-0.58
7	5e+12	NDD, unbiased	7.33	6.196	-1.134
8	5e+12	NDD, unbiased	7.004	6.966	-0.038
9	1e+13	NDD, unbiased	6.389	5.948	-0.441
10	1e+13	NDD, unbiased	6.53	6.164	-0.366
11	1e+13	NDD, unbiased	7.156	6.748	-0.408

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	6.532	6.6085	6.685	0.10819	5.884	6.0715	6.259	0.26517	-0.648	-0.537	-0.426	0.15698
1e+12	6.494	6.9857	7.302	0.43159	5.941	6.296	6.86	0.49386	-1.361	-0.68967	0.366	0.92543
5e+12	6.512	6.9487	7.33	0.4118	5.932	6.3647	6.966	0.53724	-1.134	-0.584	-0.038	0.54801
1e+13	6.389	6.6917	7.156	0.40826	5.948	6.2867	6.748	0.41387	-0.441	-0.405	-0.366	0.03759

Device Test: 12.3 OVP_Deassert_1p5V(T_DEASSERT_12p0V)





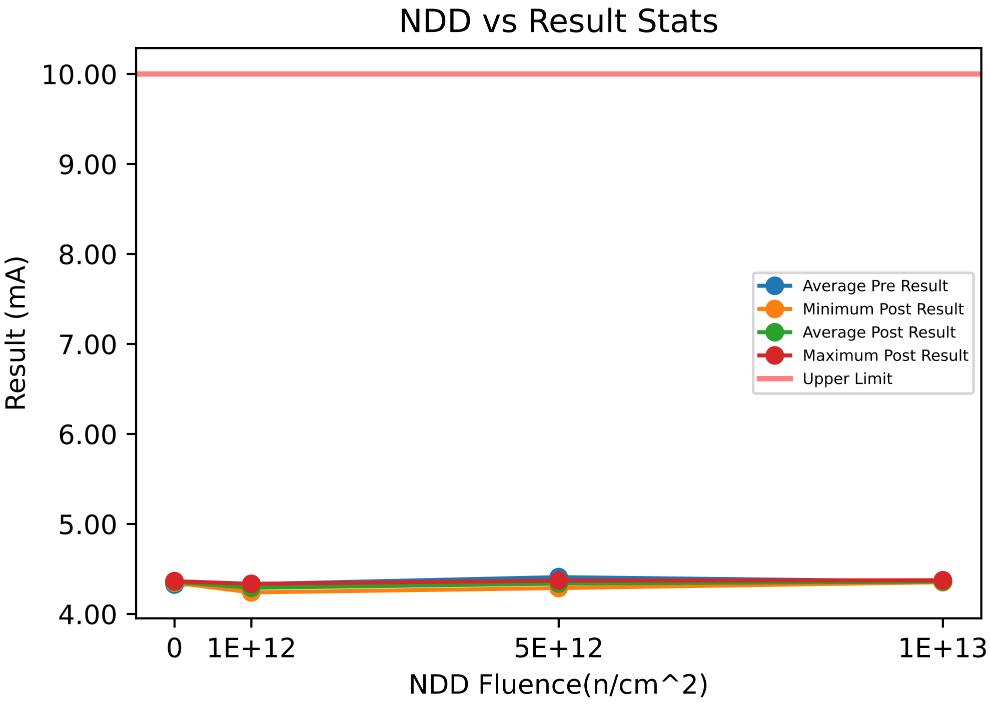
Test Results (No Limits Specified (uSec))

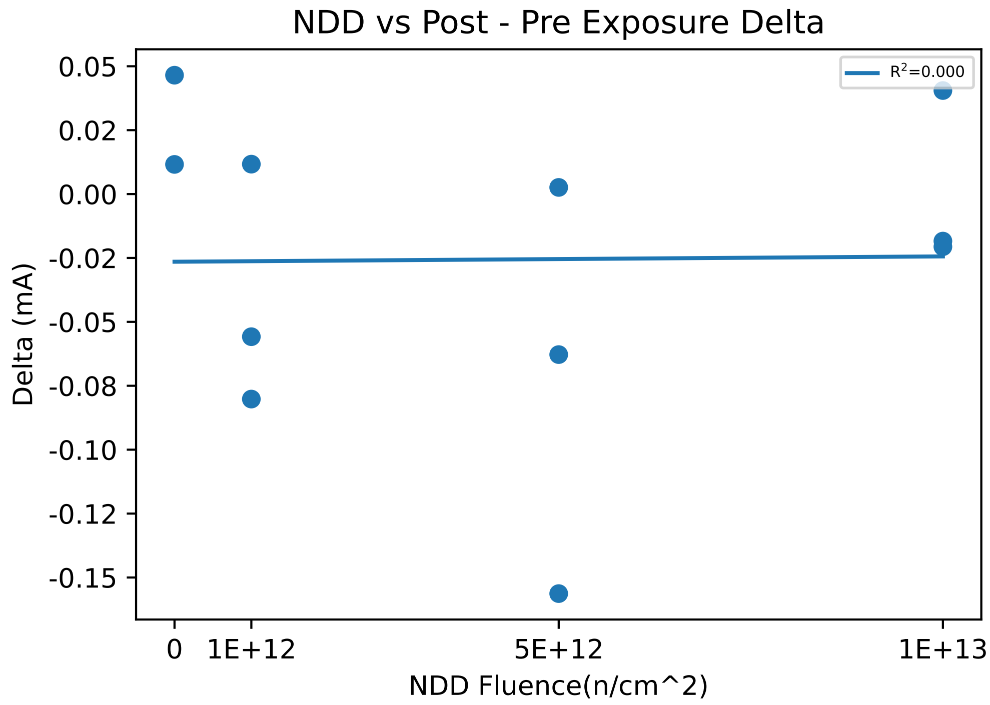
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	56.256	65.444	9.188
2	0	Correlation	59.368	58.893	-0.475
3	1e+12	NDD, unbiased	61.334	63.321	1.987
4	1e+12	NDD, unbiased	59.94	60.877	0.937
5	1e+12	NDD, unbiased	62.925	64.6	1.675
6	5e+12	NDD, unbiased	61.985	58.177	-3.808
7	5e+12	NDD, unbiased	59.083	58.993	-0.09
8	5e+12	NDD, unbiased	57.306	59.224	1.918
9	1e+13	NDD, unbiased	60.394	57.911	-2.483
10	1e+13	NDD, unbiased	61.862	55.214	-6.648
11	1e+13	NDD, unbiased	60.15	58.172	-1.978

Test Statistics (uSec)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	56.256	57.812	59.368	2.2005	58.893	62.169	65.444	4.6323	-0.475	4.3565	9.188	6.8328
1e+12	59.94	61.4	62.925	1.4936	60.877	62.933	64.6	1.8916	0.937	1.533	1.987	0.53921
5e+12	57.306	59.458	61.985	2.3619	58.177	58.798	59.224	0.55006	-3.808	-0.66	1.918	2.9052
1e+13	60.15	60.802	61.862	0.92606	55.214	57.099	58.172	1.6377	-6.648	-3.703	-1.978	2.5629

Device Test: 3.0 IQ_VIN(IQ_Vin_4p5V)





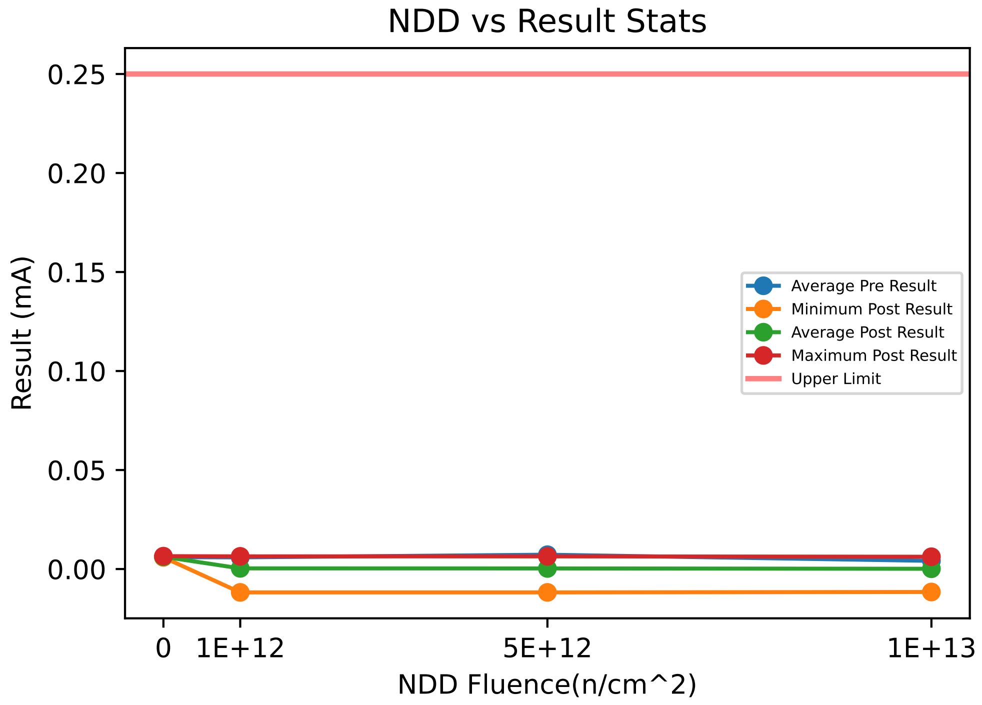
Test Results (Upper Limit = 10.0 (mA))

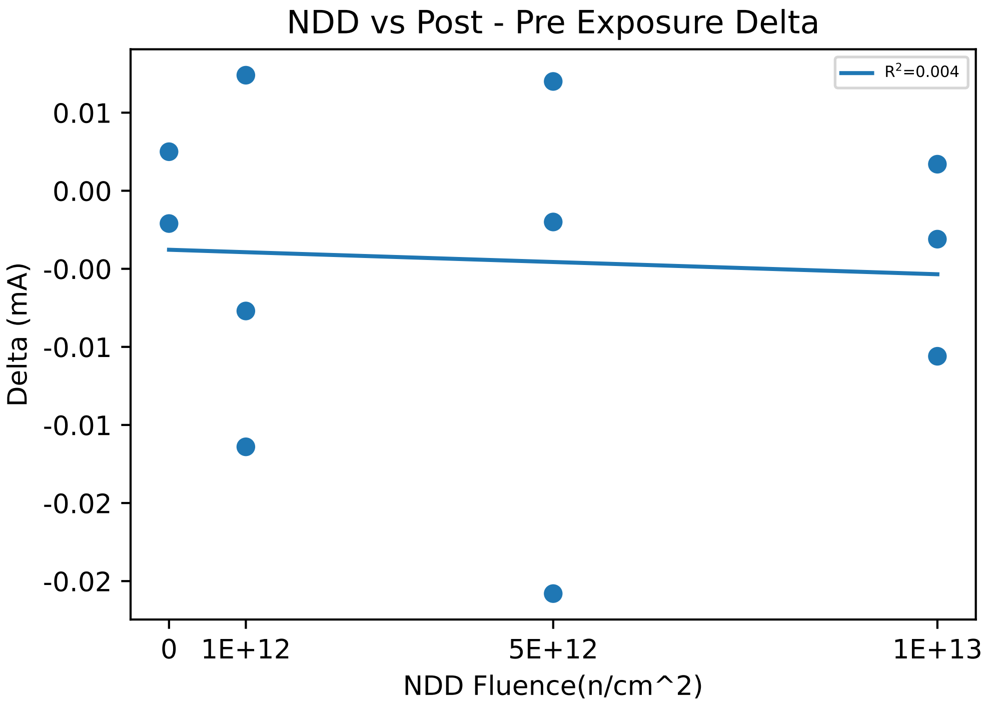
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	4.319	4.3655	0.0465
2	0	Correlation	4.3357	4.3473	0.0116
3	1e+12	NDD, unbiased	4.2851	4.2968	0.0117
4	1e+12	NDD, unbiased	4.3909	4.3351	-0.0558
5	1e+12	NDD, unbiased	4.3203	4.2401	-0.0802
6	5e+12	NDD, unbiased	4.3681	4.3707	0.0026
7	5e+12	NDD, unbiased	4.4166	4.3538	-0.0628
8	5e+12	NDD, unbiased	4.4447	4.2884	-0.1563
9	1e+13	NDD, unbiased	4.3714	4.353	-0.0184
10	1e+13	NDD, unbiased	4.3753	4.3547	-0.0206
11	1e+13	NDD, unbiased	4.3346	4.3751	0.0405

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	4.319	4.3274	4.3357	0.011809	4.3473	4.3564	4.3655	0.012869	0.0116	0.02905	0.0465	0.024678
1e+12	4.2851	4.3321	4.3909	0.053878	4.2401	4.2907	4.3351	0.047796	-0.0802	-0.041433	0.0117	0.047605
5e+12	4.3681	4.4098	4.4447	0.03875	4.2884	4.3376	4.3707	0.043467	-0.1563	-0.072167	0.0026	0.079863
1e+13	4.3346	4.3604	4.3753	0.022457	4.353	4.3609	4.3751	0.012298	-0.0206	0.0005	0.0405	0.034658

Device Test: 3.1 IRCP_EN_0V(IRCP_EN0p0V_4p5V)





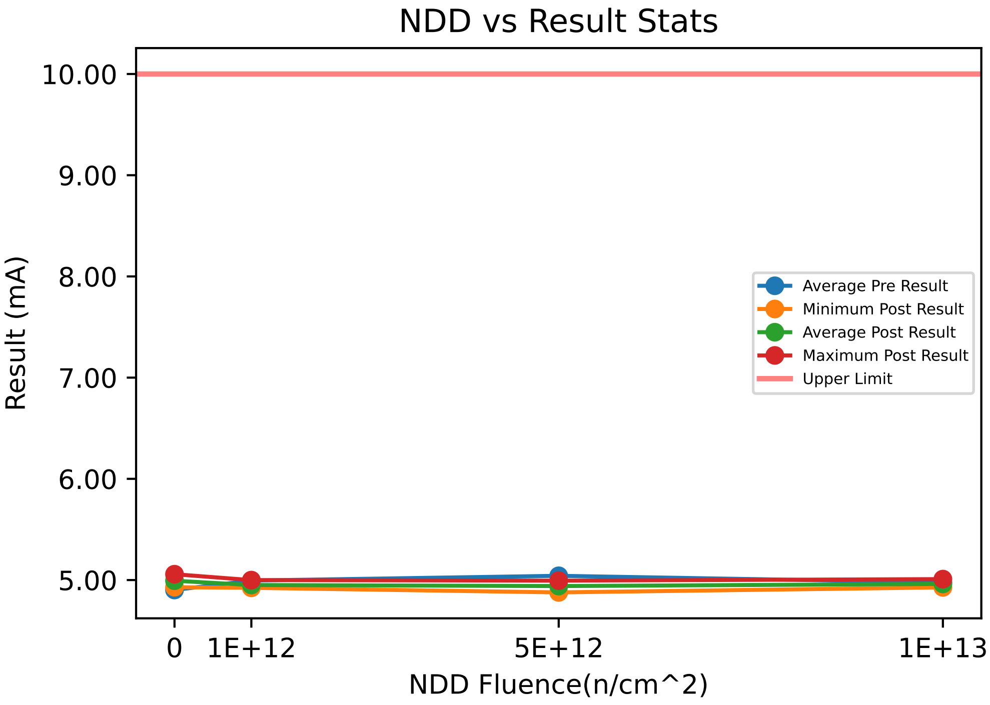
Test Results (Upper Limit = 0.25 (mA))

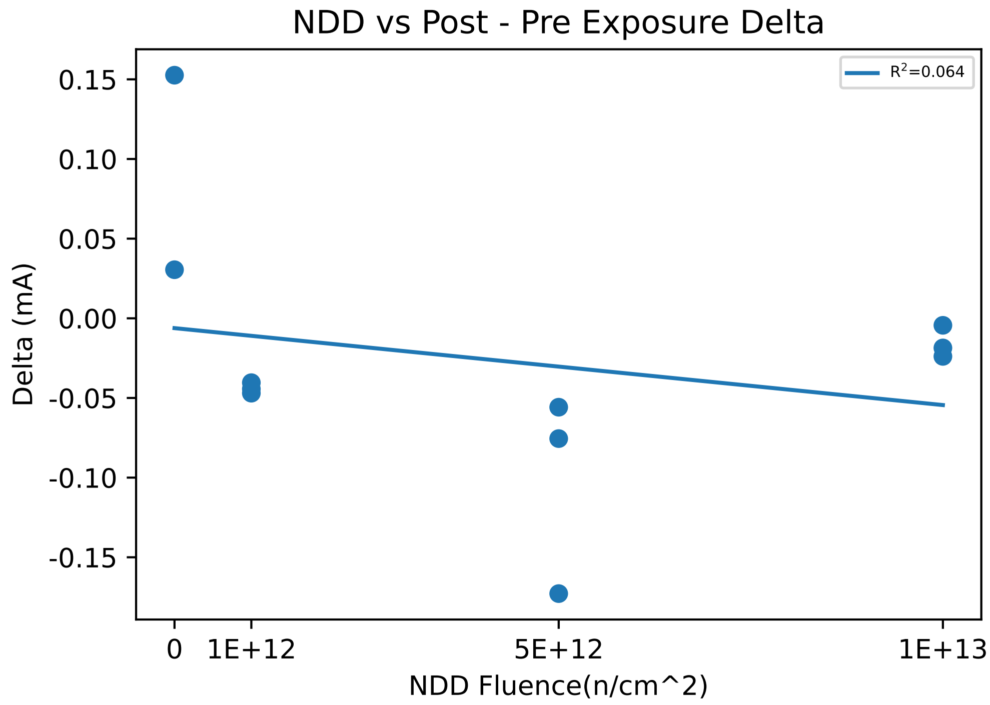
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.004	0.0065	0.0025
2	0	Correlation	0.008	0.0059	-0.0021
3	1e+12	NDD, unbiased	-0.001	0.0064	0.0074
4	1e+12	NDD, unbiased	0.0141	0.0064	-0.0077
5	1e+12	NDD, unbiased	0.0046	-0.0118	-0.0164
6	5e+12	NDD, unbiased	0.0084	0.0064	-0.002
7	5e+12	NDD, unbiased	-0.0007	0.0063	0.007
8	5e+12	NDD, unbiased	0.014	-0.0118	-0.0258
9	1e+13	NDD, unbiased	0.0045	0.0062	0.0017
10	1e+13	NDD, unbiased	0.0089	0.0058	-0.0031
11	1e+13	NDD, unbiased	-0.001	-0.0116	-0.0106

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.004	0.006	0.008	0.0028284	0.0059	0.0062	0.0065	0.00042426	-0.0021	0.0002	0.0025	0.0032527
1e+12	-0.001	0.0059	0.0141	0.0076335	-0.0118	0.00033333	0.0064	0.010508	-0.0164	-0.0055667	0.0074	0.012043
5e+12	-0.0007	0.0072333	0.014	0.0074191	-0.0118	0.0003	0.0064	0.010479	-0.0258	-0.0069333	0.007	0.016947
1e+13	-0.001	0.0041333	0.0089	0.0049602	-0.0116	0.00013333	0.0062	0.010163	-0.0106	-0.004	0.0017	0.0061992

Device Test: 3.2 IQ_VIN(IQ_Vin_14p0V)





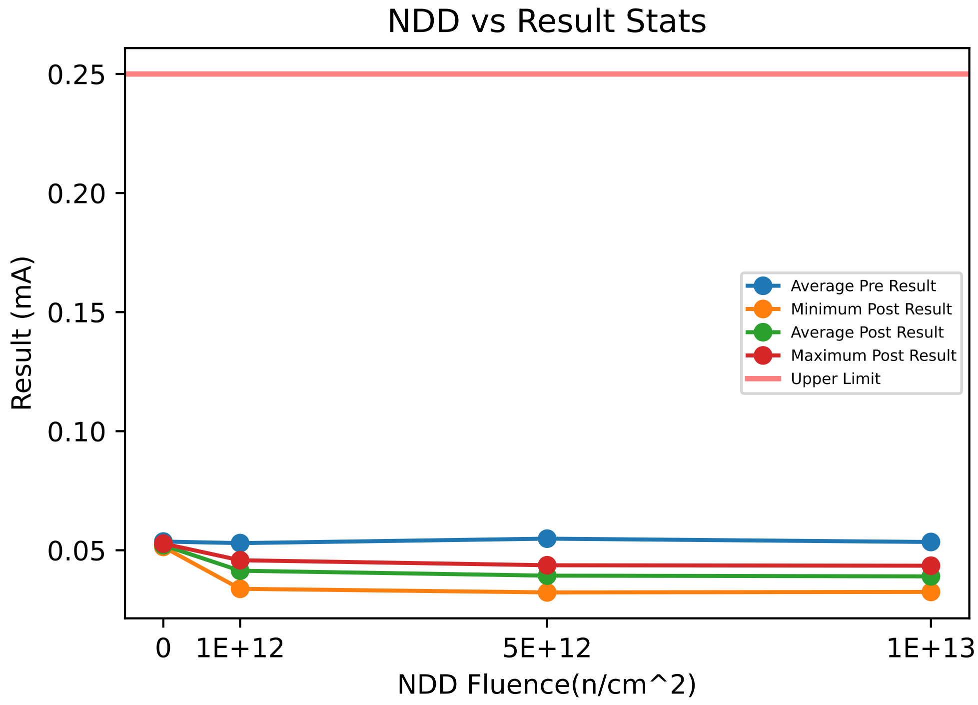
Test Results (Upper Limit = 10.0 (mA))

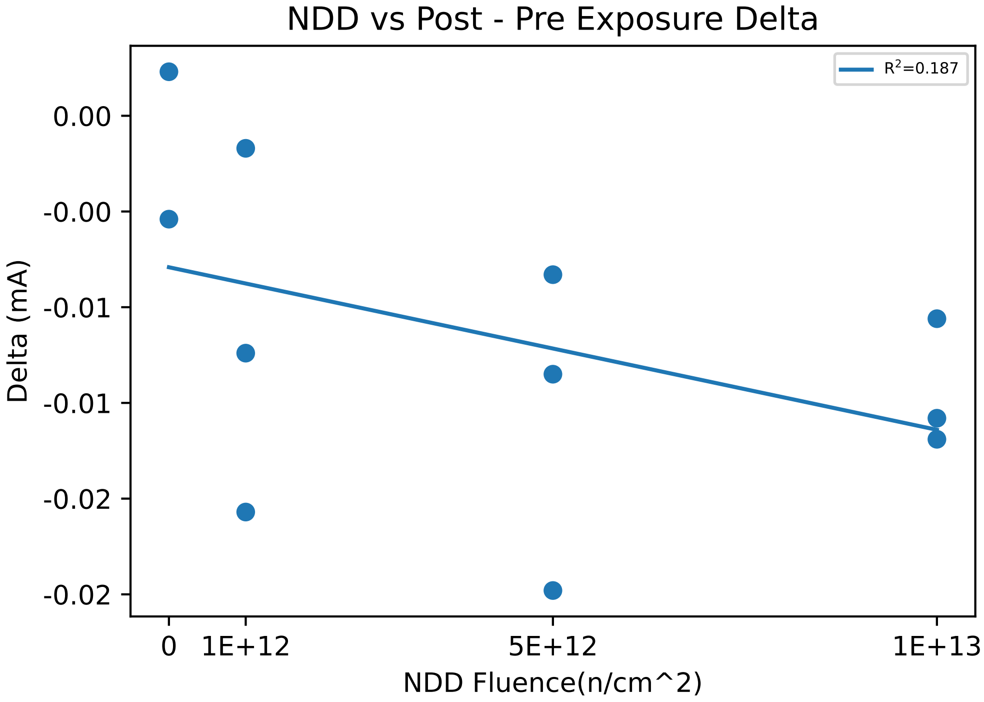
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	4.905	5.0576	0.1526
2	0	Correlation	4.8988	4.9293	0.0305
3	1e+12	NDD, unbiased	4.9635	4.9231	-0.0404
4	1e+12	NDD, unbiased	5.0464	4.9994	-0.047
5	1e+12	NDD, unbiased	4.9746	4.9303	-0.0443
6	5e+12	NDD, unbiased	5.0252	4.9497	-0.0755
7	5e+12	NDD, unbiased	5.05	4.9942	-0.0558
8	5e+12	NDD, unbiased	5.0508	4.878	-0.1728
9	1e+13	NDD, unbiased	4.9664	4.9478	-0.0186
10	1e+13	NDD, unbiased	5.0137	5.0093	-0.0044
11	1e+13	NDD, unbiased	4.9513	4.9274	-0.0239

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	4.8988	4.9019	4.905	0.0043841	4.9293	4.9934	5.0576	0.090722	0.0305	0.09155	0.1526	0.086338
1e+12	4.9635	4.9948	5.0464	0.045002	4.9231	4.9509	4.9994	0.042127	-0.047	-0.0439	-0.0404	0.0033181
5e+12	5.0252	5.042	5.0508	0.014555	4.878	4.9406	4.9942	0.058628	-0.1728	-0.10137	-0.0558	0.062642
1e+13	4.9513	4.9771	5.0137	0.032555	4.9274	4.9615	5.0093	0.042634	-0.0239	-0.015633	-0.0044	0.010083

Device Test: 3.3 IRCP_EN_0V(IRCP_EN0p0V_14p0V)





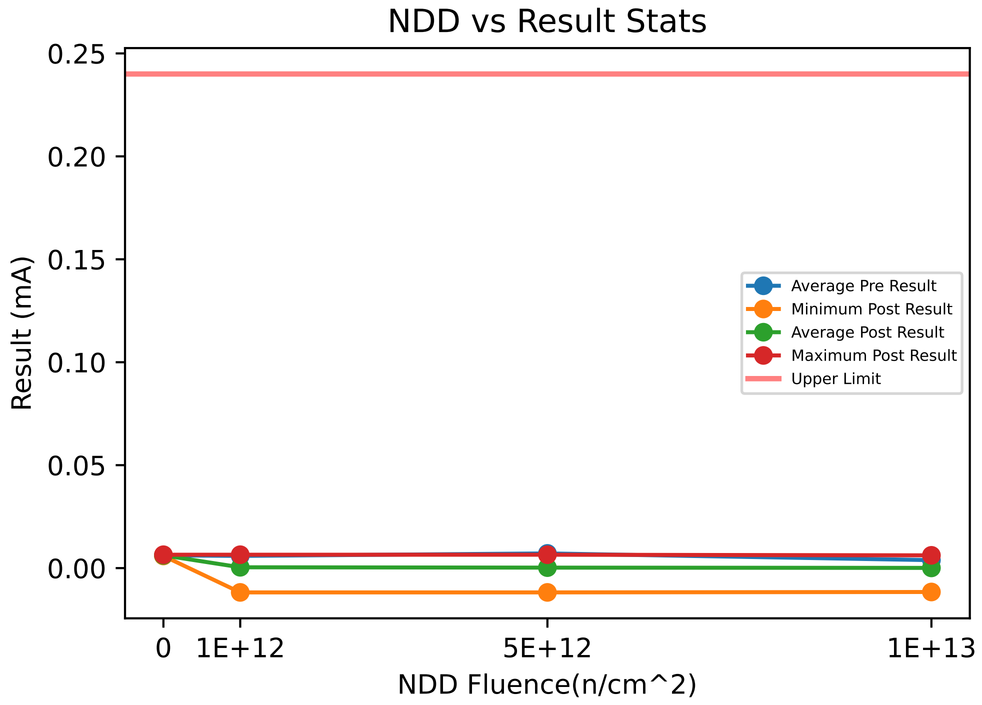
Test Results (Upper Limit = 0.25 (mA))

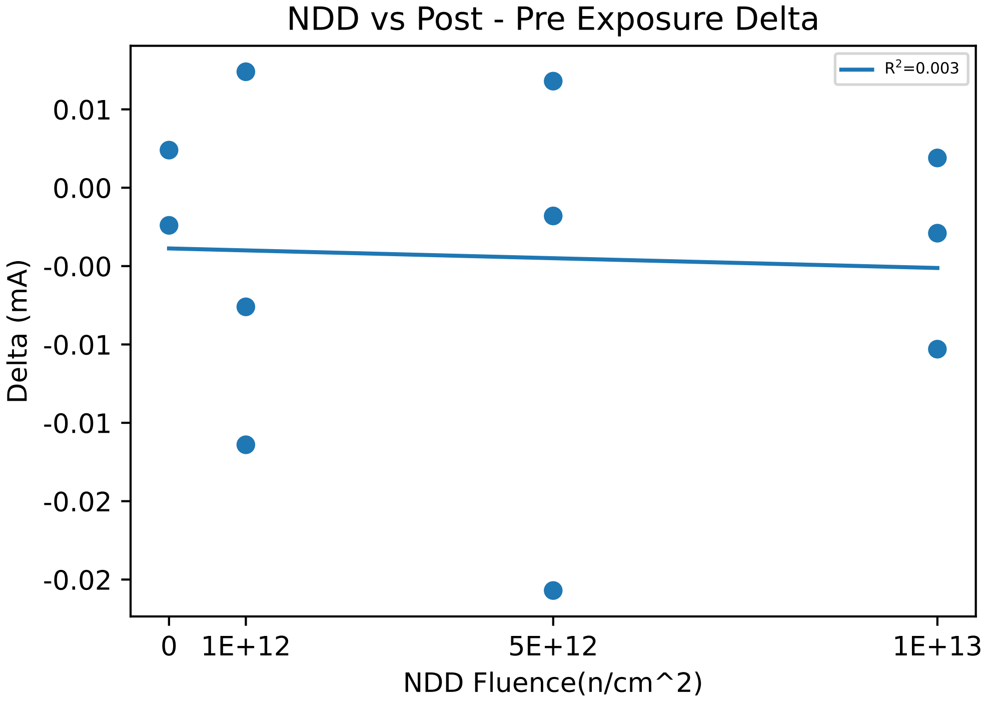
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.0505	0.0528	0.0023
2	0	Correlation	0.0568	0.0514	-0.0054
3	1e+12	NDD, unbiased	0.0475	0.0458	-0.0017
4	1e+12	NDD, unbiased	0.057	0.0446	-0.0124
5	1e+12	NDD, unbiased	0.0545	0.0338	-0.0207
6	5e+12	NDD, unbiased	0.0572	0.0437	-0.0135
7	5e+12	NDD, unbiased	0.0503	0.042	-0.0083
8	5e+12	NDD, unbiased	0.0571	0.0323	-0.0248
9	1e+13	NDD, unbiased	0.0541	0.0435	-0.0106
10	1e+13	NDD, unbiased	0.0569	0.0411	-0.0158
11	1e+13	NDD, unbiased	0.0494	0.0325	-0.0169

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.0505	0.05365	0.0568	0.0044548	0.0514	0.0521	0.0528	0.00098995	-0.0054	-0.00155	0.0023	0.0054447
1e+12	0.0475	0.053	0.057	0.0049244	0.0338	0.0414	0.0458	0.0066091	-0.0207	-0.0116	-0.0017	0.0095252
5e+12	0.0503	0.054867	0.0572	0.0039552	0.0323	0.039333	0.0437	0.0061501	-0.0248	-0.015533	-0.0083	0.0084358
1e+13	0.0494	0.053467	0.0569	0.0037899	0.0325	0.039033	0.0435	0.0057839	-0.0169	-0.014433	-0.0106	0.003365

Device Test: 3.4 IRCP_EN_7V(IRCP_EN7p0V_4p5V)





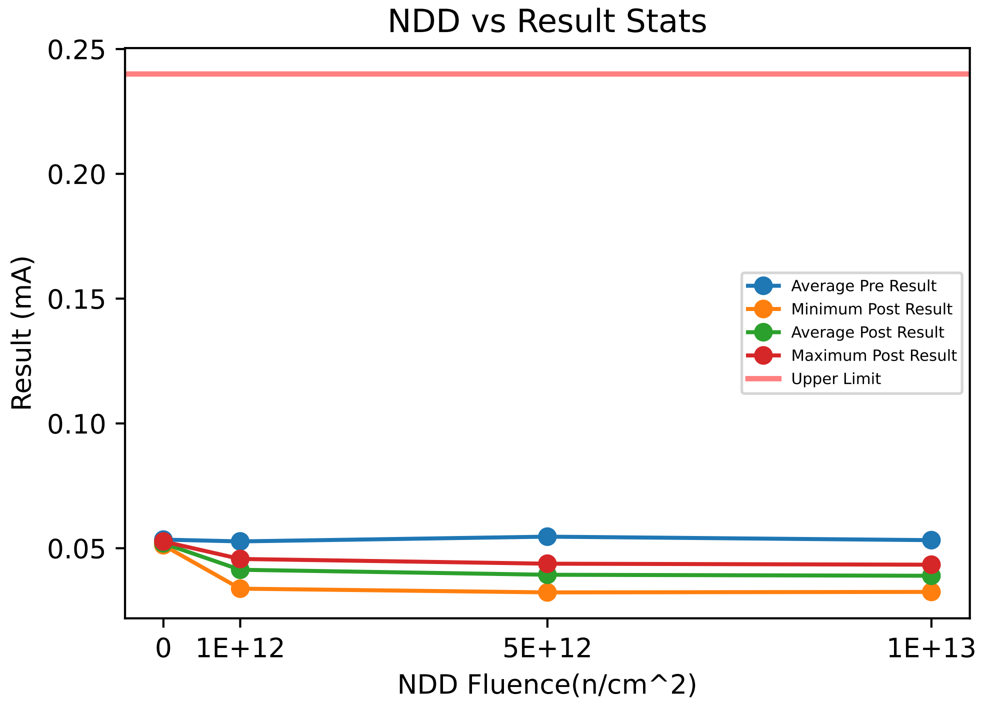
Test Results (Upper Limit = 0.24 (mA))

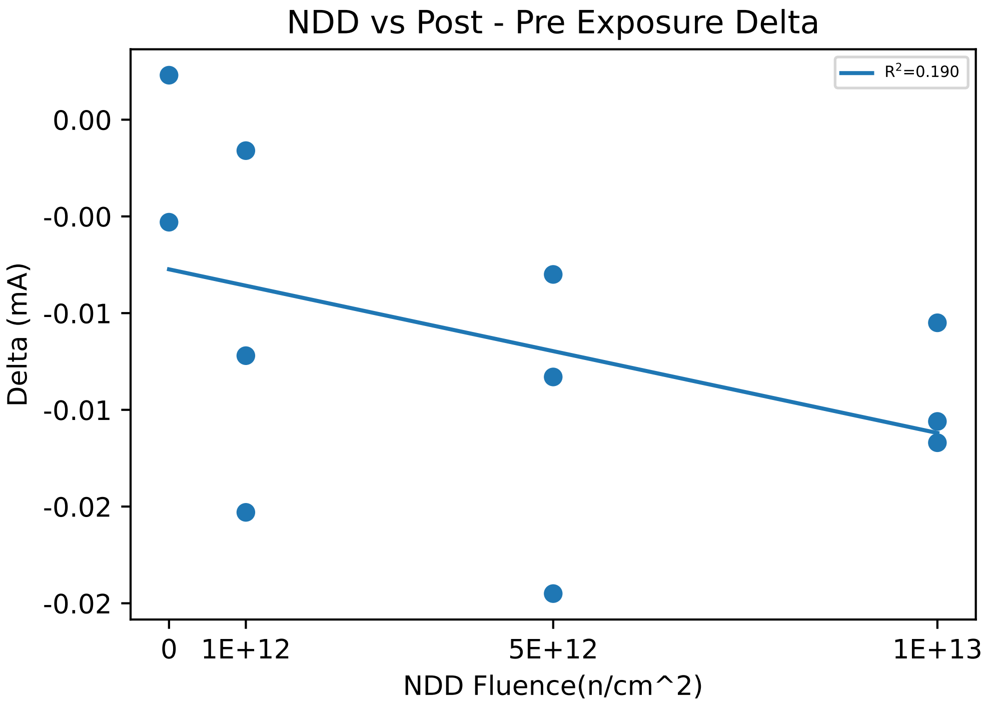
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.0041	0.0065	0.0024
2	0	Correlation	0.0083	0.0059	-0.0024
3	1e+12	NDD, unbiased	-0.0009	0.0065	0.0074
4	1e+12	NDD, unbiased	0.0141	0.0065	-0.0076
5	1e+12	NDD, unbiased	0.0046	-0.0118	-0.0164
6	5e+12	NDD, unbiased	0.0083	0.0065	-0.0018
7	5e+12	NDD, unbiased	-0.0008	0.006	0.0068
8	5e+12	NDD, unbiased	0.0139	-0.0118	-0.0257
9	1e+13	NDD, unbiased	0.0043	0.0062	0.0019
10	1e+13	NDD, unbiased	0.0086	0.0057	-0.0029
11	1e+13	NDD, unbiased	-0.0013	-0.0116	-0.0103

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.0041	0.0062	0.0083	0.0029698	0.0059	0.0062	0.0065	0.00042426	-0.0024	-4.3368e-19	0.0024	0.0033941
1e+12	-0.0009	0.0059333	0.0141	0.0075884	-0.0118	0.0004	0.0065	0.010566	-0.0164	-0.0055333	0.0074	0.012034
5e+12	-0.0008	0.0071333	0.0139	0.0074191	-0.0118	0.00023333	0.0065	0.010424	-0.0257	-0.0069	0.0068	0.01684
1e+13	-0.0013	0.0038667	0.0086	0.0049642	-0.0116	0.0001	0.0062	0.010136	-0.0103	-0.0037667	0.0019	0.006146

Device Test: 3.5 IRCP_EN_7V(IRCP_EN7p0V_14p0V)





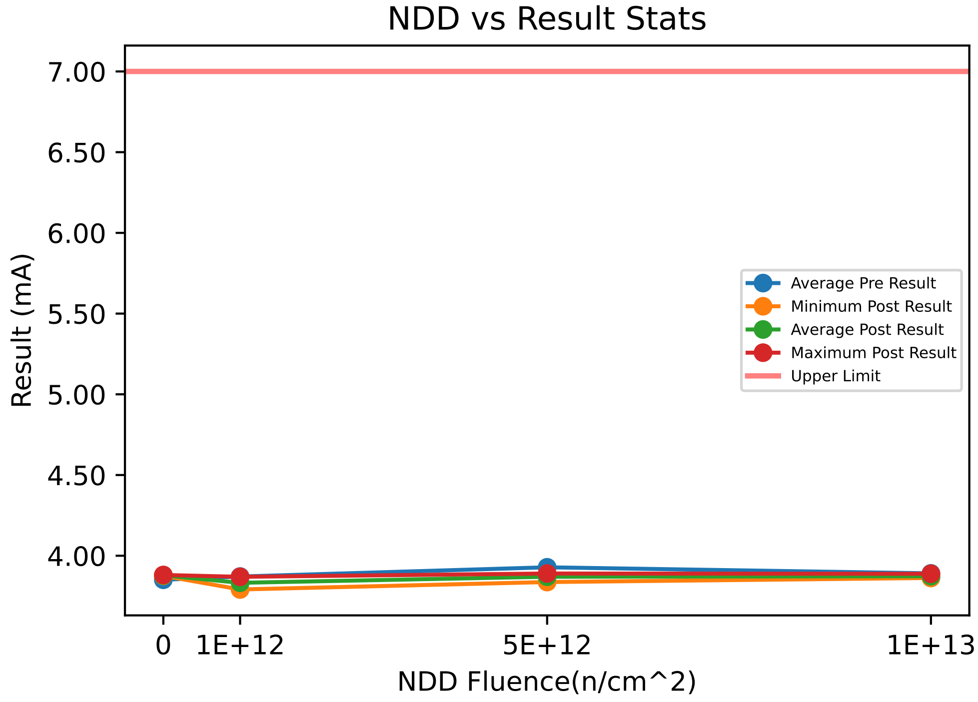
Test Results (Upper Limit = 0.24 (mA))

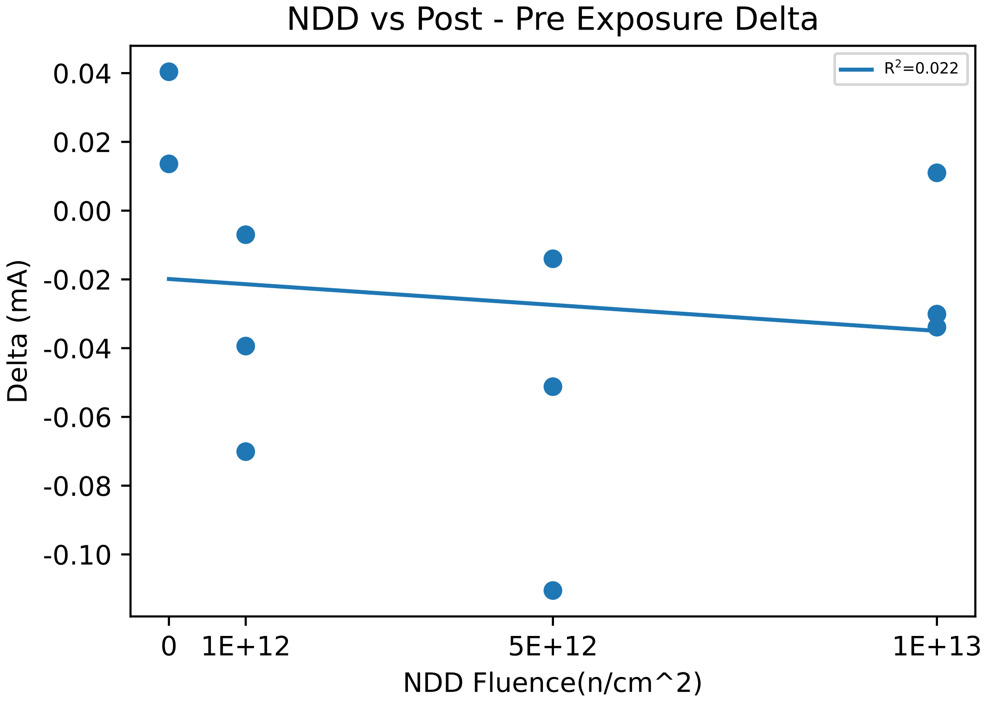
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.0504	0.0527	0.0023
2	0	Correlation	0.0565	0.0512	-0.0053
3	1e+12	NDD, unbiased	0.0473	0.0457	-0.0016
4	1e+12	NDD, unbiased	0.0568	0.0446	-0.0122
5	1e+12	NDD, unbiased	0.0541	0.0338	-0.0203
6	5e+12	NDD, unbiased	0.0571	0.0438	-0.0133
7	5e+12	NDD, unbiased	0.05	0.042	-0.008
8	5e+12	NDD, unbiased	0.0568	0.0323	-0.0245
9	1e+13	NDD, unbiased	0.0539	0.0434	-0.0105
10	1e+13	NDD, unbiased	0.0566	0.041	-0.0156
11	1e+13	NDD, unbiased	0.0492	0.0325	-0.0167

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.0504	0.05345	0.0565	0.0043134	0.0512	0.05195	0.0527	0.0010607	-0.0053	-0.0015	0.0023	0.005374
1e+12	0.0473	0.052733	0.0568	0.0048952	0.0338	0.041367	0.0457	0.006576	-0.0203	-0.011367	-0.0016	0.0093778
5e+12	0.05	0.054633	0.0571	0.0040154	0.0323	0.039367	0.0438	0.0061857	-0.0245	-0.015267	-0.008	0.008424
1e+13	0.0492	0.053233	0.0566	0.0037448	0.0325	0.038967	0.0434	0.0057274	-0.0167	-0.014267	-0.0105	0.0033081

Device Test: 4.0 ISD_VIN_4p5V(ISD_Vin_4p5V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

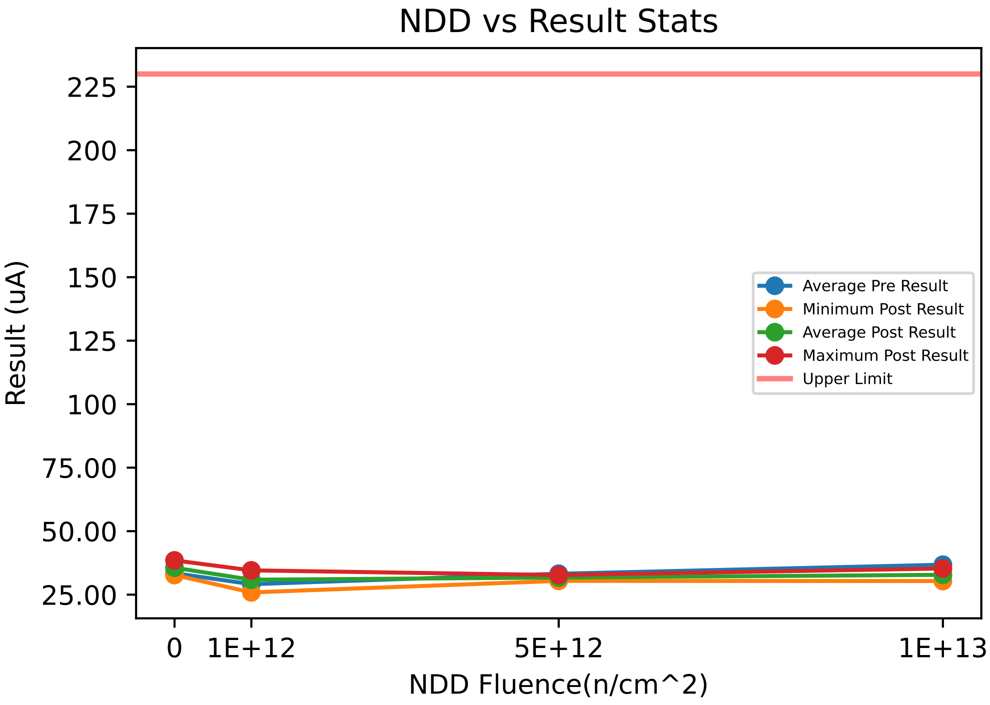
Test Results (Upper Limit = 7.0 (mA))

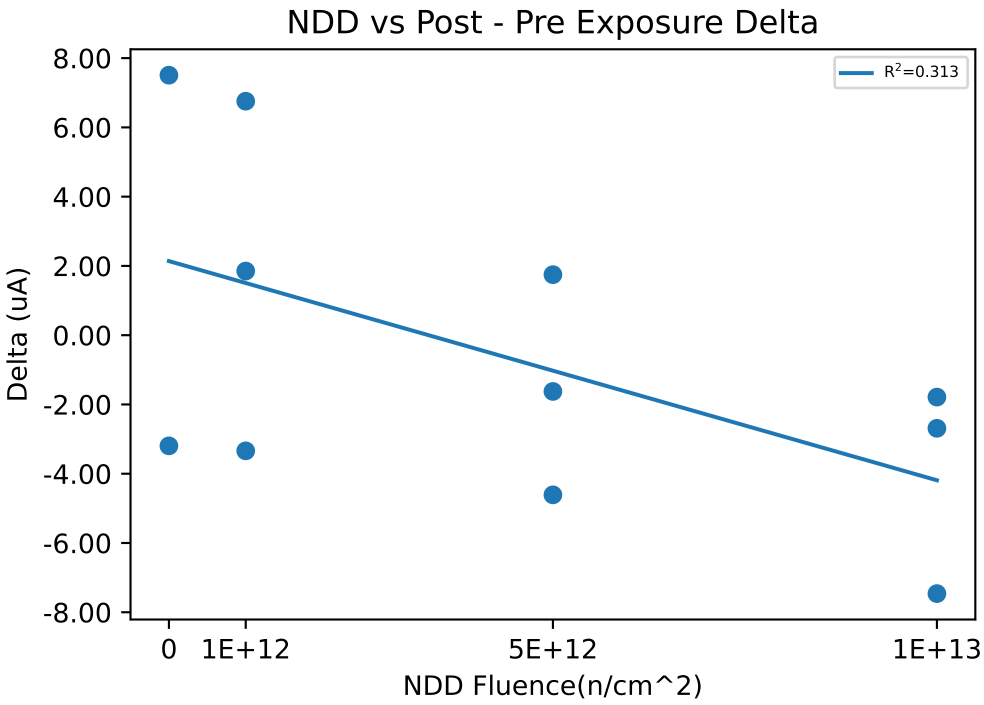
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	3.8405	3.8809	0.0404
2	0	Correlation	3.8618	3.8754	0.0136
3	1e+12	NDD, unbiased	3.8435	3.8365	-0.007
4	1e+12	NDD, unbiased	3.9088	3.8694	-0.0394
5	1e+12	NDD, unbiased	3.8611	3.791	-0.0701
6	5e+12	NDD, unbiased	3.9039	3.8899	-0.014
7	5e+12	NDD, unbiased	3.9338	3.8826	-0.0512
8	5e+12	NDD, unbiased	3.9475	3.837	-0.1105
9	1e+13	NDD, unbiased	3.8924	3.8623	-0.0301
10	1e+13	NDD, unbiased	3.9027	3.8688	-0.0339
11	1e+13	NDD, unbiased	3.8772	3.8882	0.011

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	3.8405	3.8512	3.8618	0.015061	3.8754	3.8781	3.8809	0.0038891	0.0136	0.027	0.0404	0.01895
1e+12	3.8435	3.8711	3.9088	0.033786	3.791	3.8323	3.8694	0.039368	-0.0701	-0.038833	-0.007	0.031554
5e+12	3.9039	3.9284	3.9475	0.022296	3.837	3.8698	3.8899	0.028668	-0.1105	-0.058567	-0.014	0.04867
1e+13	3.8772	3.8908	3.9027	0.012828	3.8623	3.8731	3.8882	0.013475	-0.0339	-0.017667	0.011	0.024899

Device Test: 4.1 FORWARD_LEAKAGE_4p5V(Forward_Leakage_4p5V)





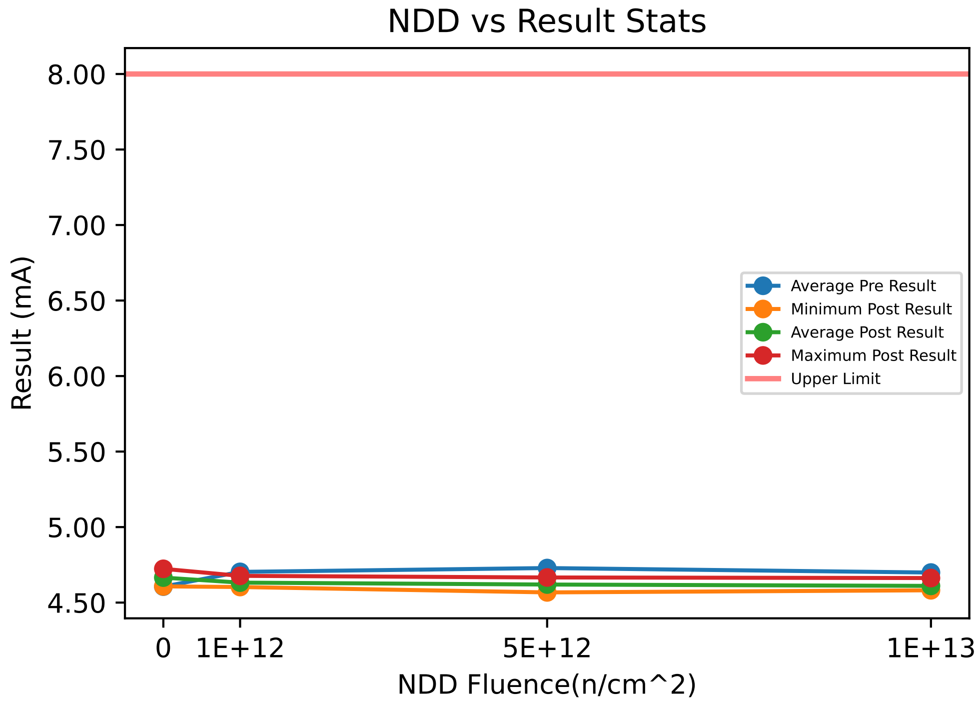
Test Results (Upper Limit = 230.0 (uA))

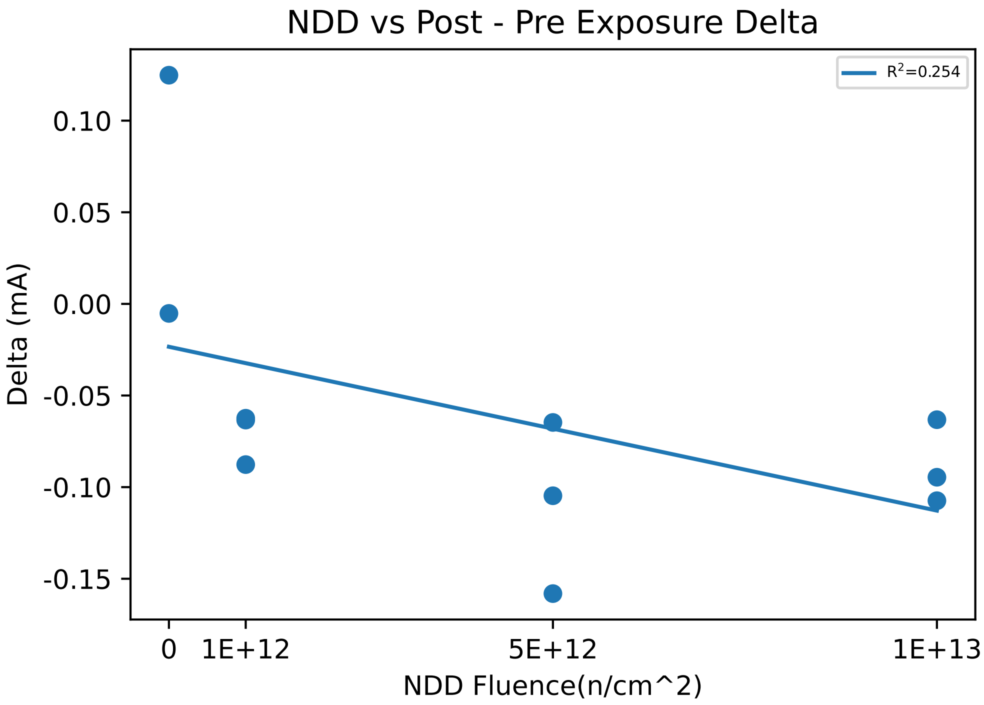
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	30.986	38.492	7.5068
2	0	Correlation	35.919	32.724	-3.1955
3	1e+12	NDD, unbiased	30.328	32.18	1.8524
4	1e+12	NDD, unbiased	27.813	34.569	6.756
5	1e+12	NDD, unbiased	29.23	25.891	-3.3393
6	5e+12	NDD, unbiased	33.705	32.081	-1.6243
7	5e+12	NDD, unbiased	30.971	32.719	1.7476
8	5e+12	NDD, unbiased	35.035	30.425	-4.61
9	1e+13	NDD, unbiased	37.085	35.298	-1.7868
10	1e+13	NDD, unbiased	40.23	32.769	-7.4612
11	1e+13	NDD, unbiased	33.057	30.368	-2.6885

Test Statistics (uA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	30.986	33.452	35.919	3.4887	32.724	35.608	38.492	4.079	-3.1955	2.1556	7.5068	7.5677
1e+12	27.813	29.124	30.328	1.2606	25.891	30.88	34.569	4.4829	-3.3393	1.7564	6.756	5.0483
5e+12	30.971	33.237	35.035	2.0719	30.425	31.742	32.719	1.1841	-4.61	-1.4956	1.7476	3.1808
1e+13	33.057	36.791	40.23	3.5957	30.368	32.812	35.298	2.4653	-7.4612	-3.9788	-1.7868	3.0493

Device Test: 4.4 ISD_VIN_9V(ISD_Vin_9p0V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

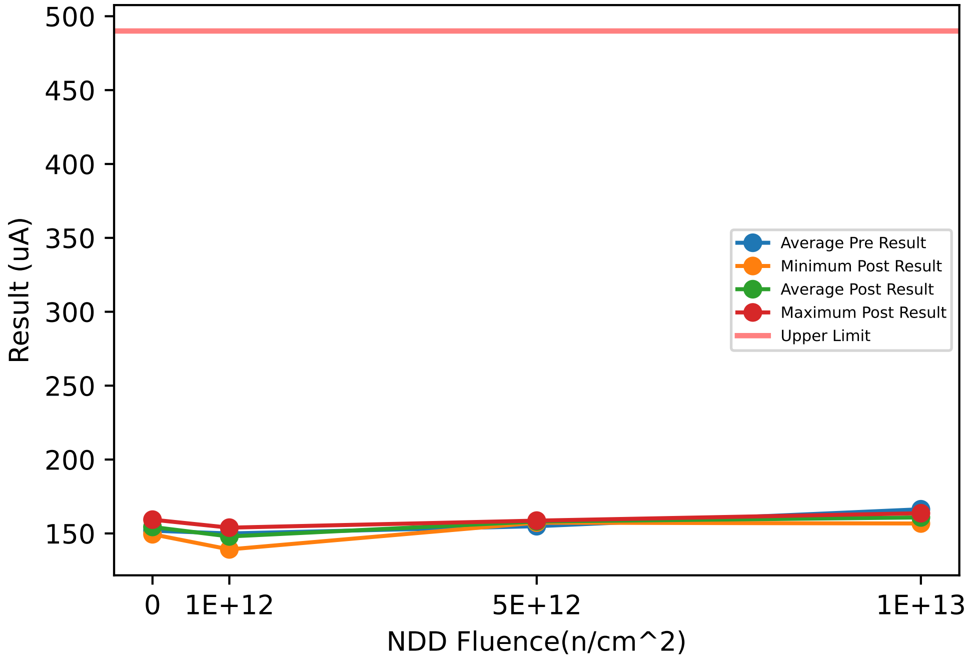
Test Results (Upper Limit = 8.0 (mA))

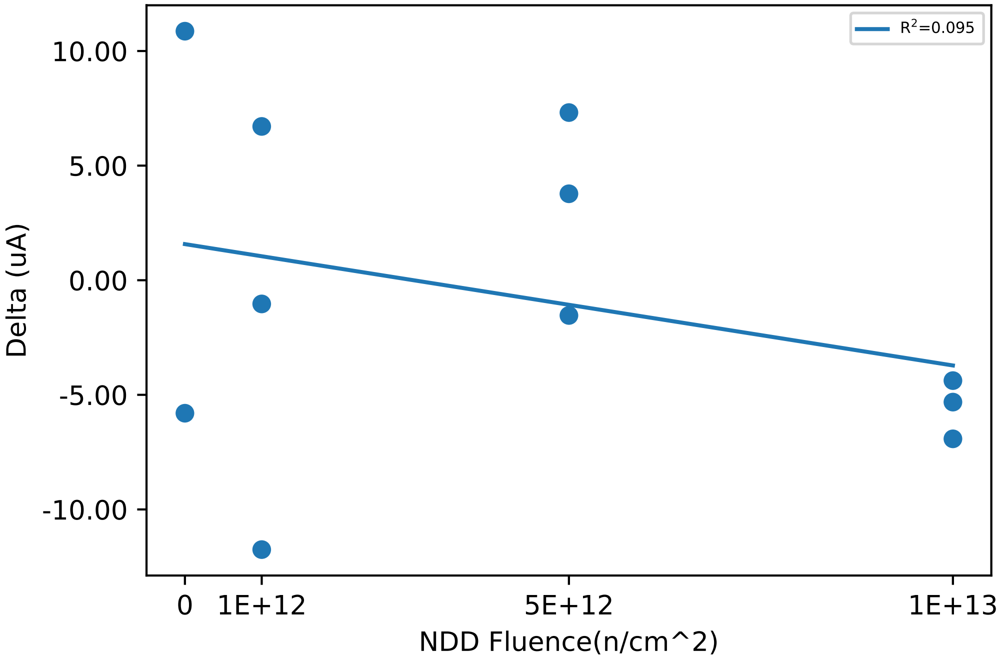
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	4.5988	4.7236	0.1248
2	0	Correlation	4.6126	4.6074	-0.0052
3	1e+12	NDD, unbiased	4.6908	4.6031	-0.0877
4	1e+12	NDD, unbiased	4.7395	4.6771	-0.0624
5	1e+12	NDD, unbiased	4.6798	4.6164	-0.0634
6	5e+12	NDD, unbiased	4.7296	4.6249	-0.1047
7	5e+12	NDD, unbiased	4.7311	4.6664	-0.0647
8	5e+12	NDD, unbiased	4.7256	4.5675	-0.1581
9	1e+13	NDD, unbiased	4.6889	4.5815	-0.1074
10	1e+13	NDD, unbiased	4.7257	4.6625	-0.0632
11	1e+13	NDD, unbiased	4.6824	4.5878	-0.0946

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	4.5988	4.6057	4.6126	0.0097581	4.6074	4.6655	4.7236	0.082166	-0.0052	0.0598	0.1248	0.091924
1e+12	4.6798	4.7034	4.7395	0.031772	4.6031	4.6322	4.6771	0.039449	-0.0877	-0.071167	-0.0624	0.014327
5e+12	4.7256	4.7288	4.7311	0.0028431	4.5675	4.6196	4.6664	0.049663	-0.1581	-0.10917	-0.0647	0.04686
1e+13	4.6824	4.699	4.7257	0.02335	4.5815	4.6106	4.6625	0.045057	-0.1074	-0.0884	-0.0632	0.022743

Device Test: 4.5 FORWARD_LEAKAGE_9V(Forward_Leakage_9p0V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

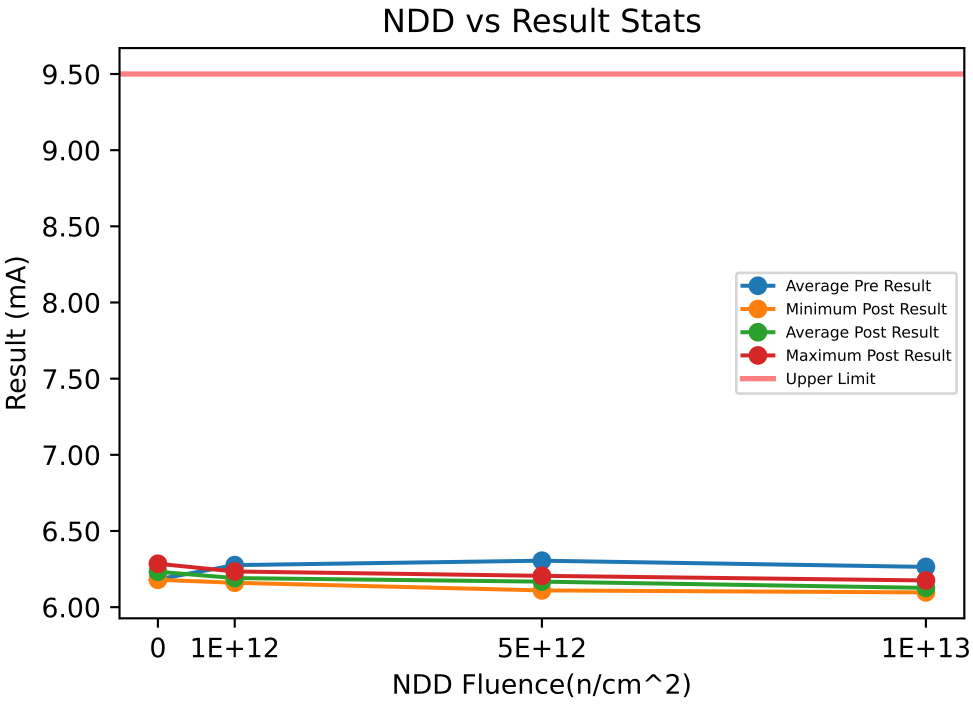
Test Results (Upper Limit = 490.0 (uA))

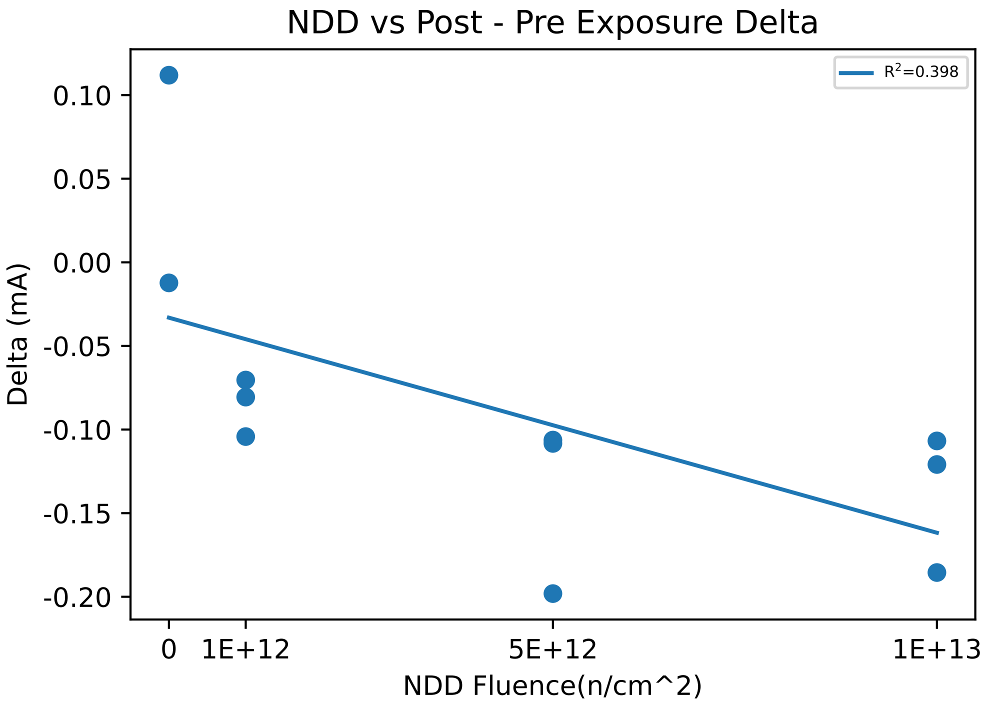
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	148.46	159.32	10.865
2	0	Correlation	155.24	149.43	-5.8023
3	1e+12	NDD, unbiased	151.8	150.76	-1.034
4	1e+12	NDD, unbiased	147.19	153.9	6.71
5	1e+12	NDD, unbiased	150.95	139.19	-11.752
6	5e+12	NDD, unbiased	159.8	158.26	-1.5373
7	5e+12	NDD, unbiased	151.35	158.67	7.3151
8	5e+12	NDD, unbiased	153.51	157.28	3.772
9	1e+13	NDD, unbiased	166.44	162.06	-4.3796
10	1e+13	NDD, unbiased	168.98	163.67	-5.3171
11	1e+13	NDD, unbiased	163.64	156.72	-6.9198

Test Statistics (uA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	148.46	151.85	155.24	4.7911	149.43	154.38	159.32	6.9943	-5.8023	2.5312	10.865	11.785
1e+12	147.19	149.98	151.8	2.45	139.19	147.95	153.9	7.7472	-11.752	-2.0254	6.71	9.2709
5e+12	151.35	154.89	159.8	4.3868	157.28	158.07	158.67	0.71169	-1.5373	3.1833	7.3151	4.4555
1e+13	163.64	166.36	168.98	2.6712	156.72	160.82	163.67	3.6348	-6.9198	-5.5388	-4.3796	1.2845

Device Test: 4.6 ISD_VIN_12V(ISD_Vin_12p0V)





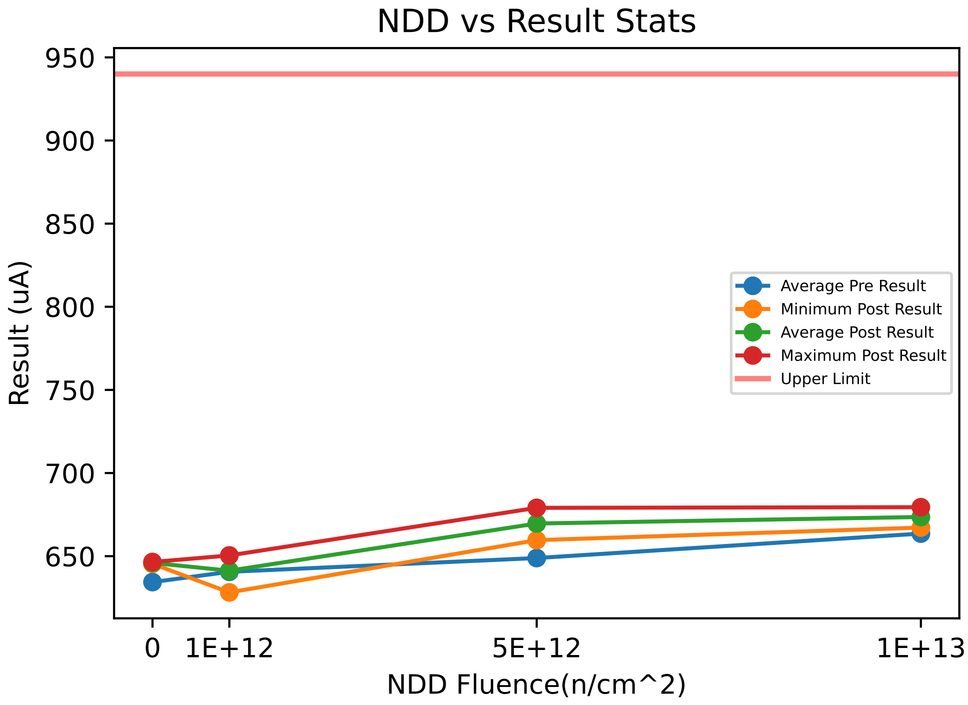
Test Results (Upper Limit = 9.5 (mA))

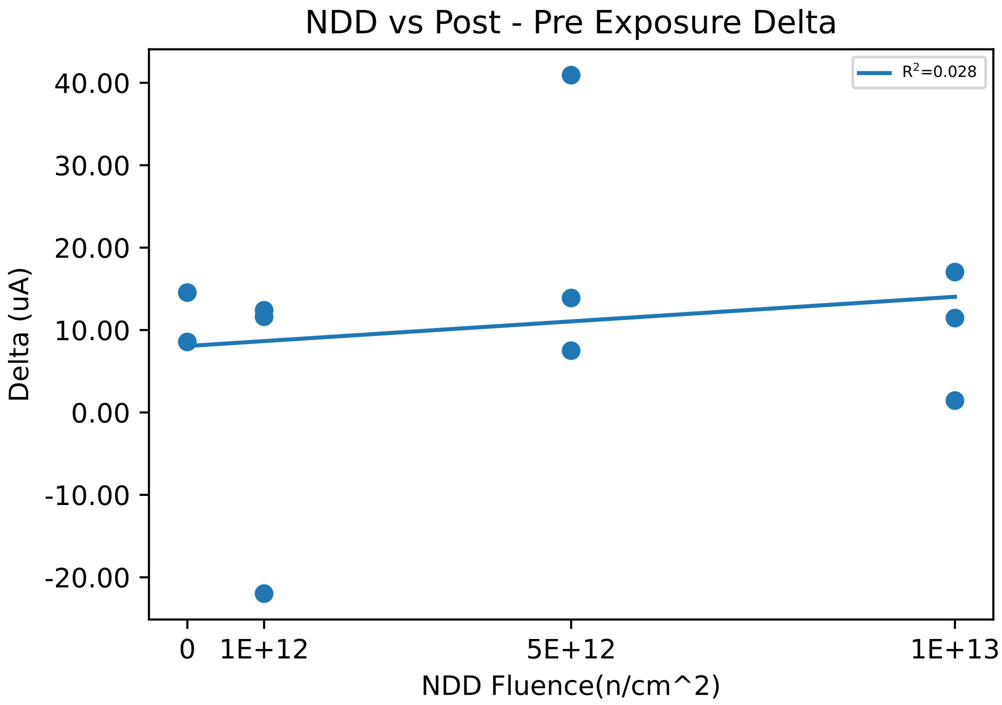
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	6.1731	6.285	0.1119
2	0	Correlation	6.1921	6.1798	-0.0123
3	1e+12	NDD, unbiased	6.2643	6.1601	-0.1042
4	1e+12	NDD, unbiased	6.3046	6.2342	-0.0704
5	1e+12	NDD, unbiased	6.2591	6.1785	-0.0806
6	5e+12	NDD, unbiased	6.2953	6.187	-0.1083
7	5e+12	NDD, unbiased	6.312	6.2057	-0.1063
8	5e+12	NDD, unbiased	6.308	6.1099	-0.1981
9	1e+13	NDD, unbiased	6.2824	6.0969	-0.1855
10	1e+13	NDD, unbiased	6.2821	6.1753	-0.1068
11	1e+13	NDD, unbiased	6.2281	6.1072	-0.1209

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	6.1731	6.1826	6.1921	0.013435	6.1798	6.2324	6.285	0.074388	-0.0123	0.0498	0.1119	0.087823
1e+12	6.2591	6.276	6.3046	0.024904	6.1601	6.1909	6.2342	0.038583	-0.1042	-0.085067	-0.0704	0.017337
5e+12	6.2953	6.3051	6.312	0.0087195	6.1099	6.1675	6.2057	0.05078	-0.1981	-0.13757	-0.1063	0.052433
1e+13	6.2281	6.2642	6.2824	0.031264	6.0969	6.1265	6.1753	0.042603	-0.1855	-0.13773	-0.1068	0.041964

Device Test: 4.7 FORWARD_LEAKAGE_12V(Forward_Leakage_12p0V)





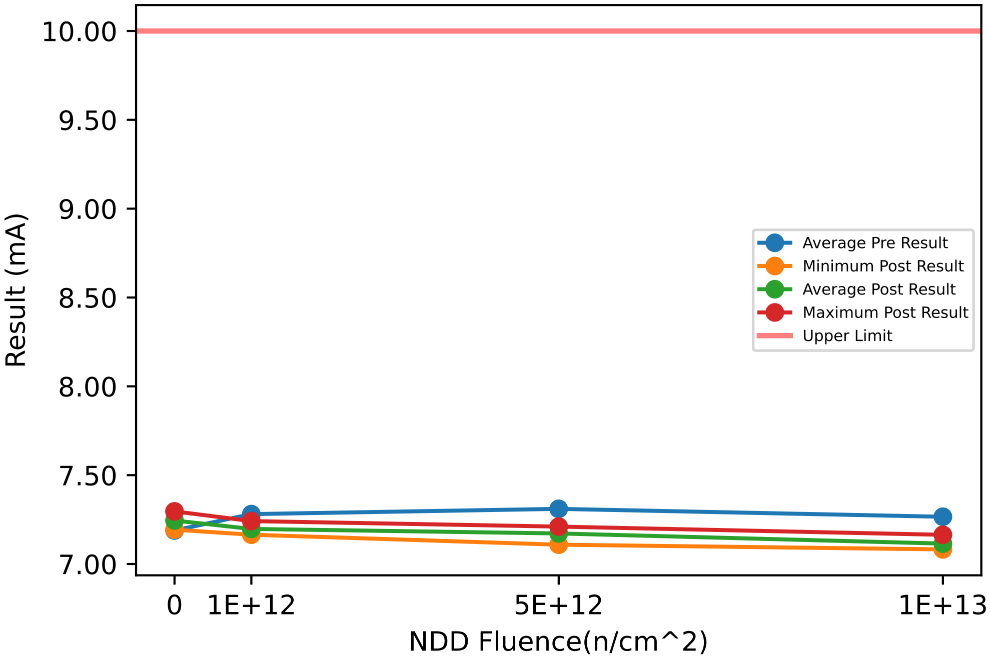
Test Results (Upper Limit = 940.0 (uA))

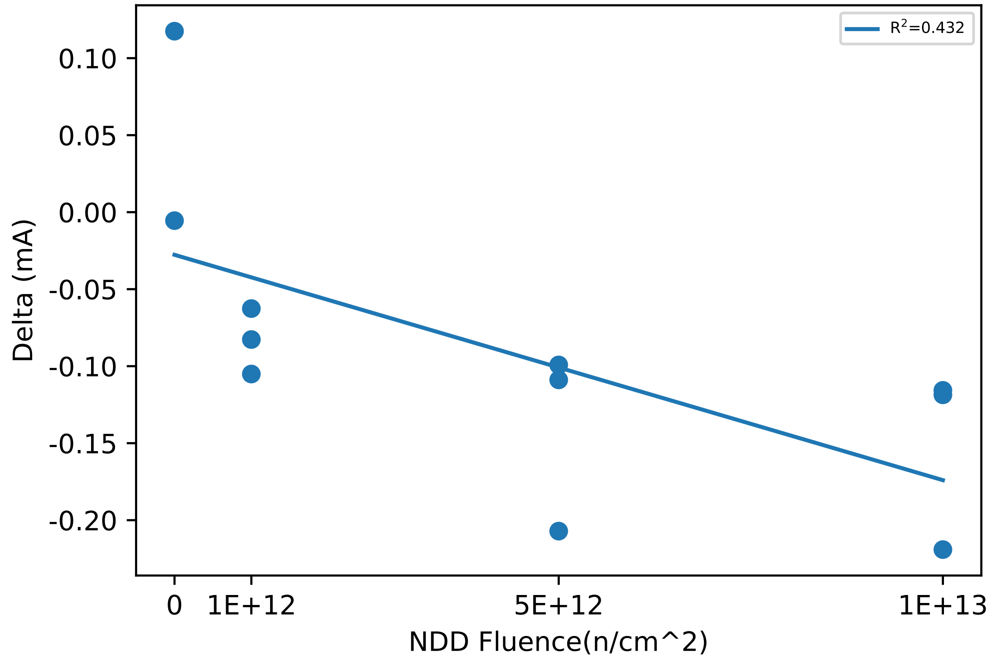
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	631.95	646.5	14.548
2	0	Correlation	636.87	645.42	8.5571
3	1e+12	NDD, unbiased	638.83	650.44	11.61
4	1e+12	NDD, unbiased	632.78	645.17	12.393
5	1e+12	NDD, unbiased	650.19	628.21	-21.98
6	5e+12	NDD, unbiased	662.73	670.23	7.4961
7	5e+12	NDD, unbiased	645.74	659.63	13.889
8	5e+12	NDD, unbiased	638.16	679.08	40.923
9	1e+13	NDD, unbiased	662.42	679.45	17.034
10	1e+13	NDD, unbiased	662.6	674.05	11.451
11	1e+13	NDD, unbiased	665.75	667.19	1.4404

Test Statistics (uA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	631.95	634.41	636.87	3.475	645.42	645.96	646.5	0.76092	8.5571	11.552	14.548	4.2359
1e+12	632.78	640.6	650.19	8.8421	628.21	641.27	650.44	11.613	-21.98	0.67447	12.393	19.623
5e+12	638.16	648.88	662.73	12.582	659.63	669.65	679.08	9.7367	7.4961	20.77	40.923	17.744
1e+13	662.42	663.59	665.75	1.8712	667.19	673.56	679.45	6.1466	1.4404	9.975	17.034	7.9007

Device Test: 4.8 ISD_VIN_14V(ISD_Vin_14p0V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

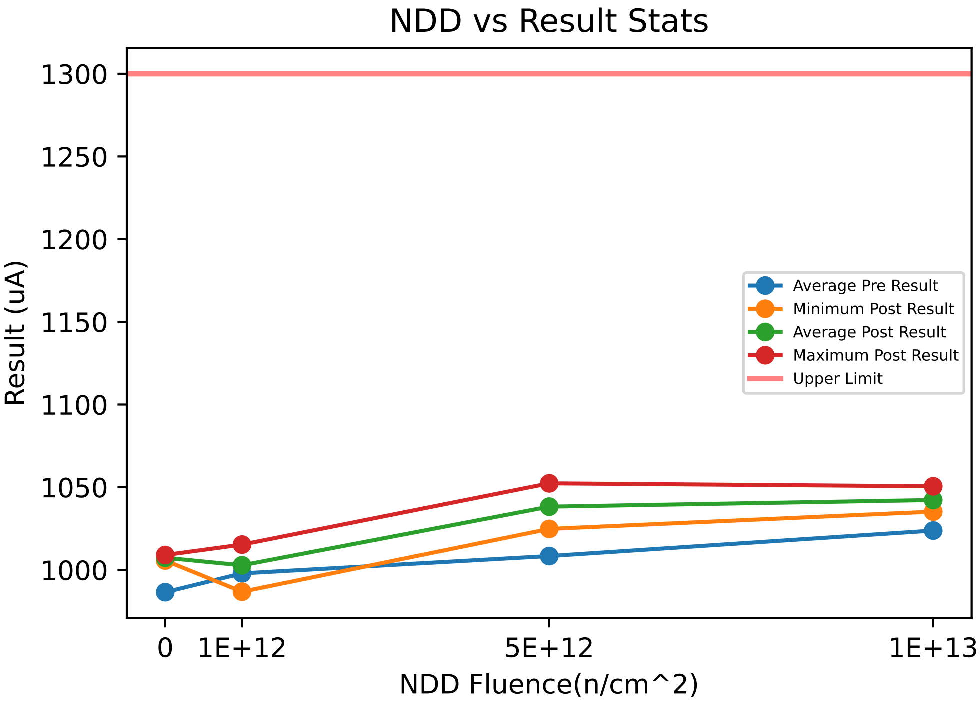
Test Results (Upper Limit = 10.0 (mA))

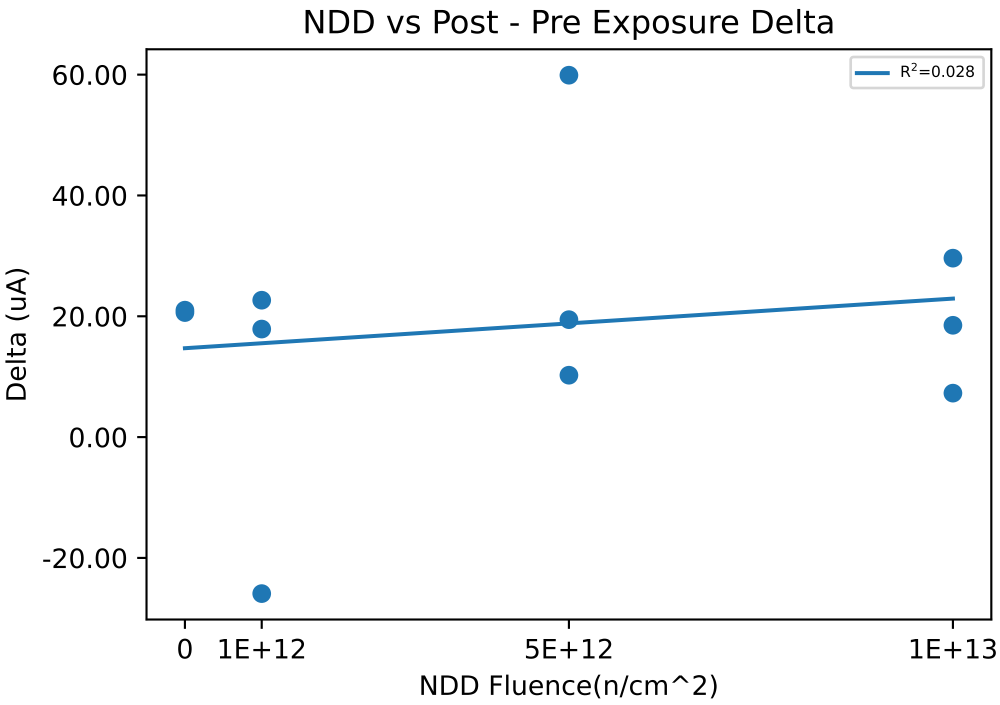
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	7.1787	7.2962	0.1175
2	0	Correlation	7.1988	7.1933	-0.0055
3	1e+12	NDD, unbiased	7.27	7.1649	-0.1051
4	1e+12	NDD, unbiased	7.3041	7.2415	-0.0626
5	1e+12	NDD, unbiased	7.2685	7.1858	-0.0827
6	5e+12	NDD, unbiased	7.2958	7.1966	-0.0992
7	5e+12	NDD, unbiased	7.3194	7.2105	-0.1089
8	5e+12	NDD, unbiased	7.3158	7.1087	-0.2071
9	1e+13	NDD, unbiased	7.3013	7.0822	-0.2191
10	1e+13	NDD, unbiased	7.28	7.1643	-0.1157
11	1e+13	NDD, unbiased	7.2166	7.098	-0.1186

Test Statistics (mA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	7.1787	7.1888	7.1988	0.014213	7.1933	7.2447	7.2962	0.072761	-0.0055	0.056	0.1175	0.086974
1e+12	7.2685	7.2809	7.3041	0.020135	7.1649	7.1974	7.2415	0.039596	-0.1051	-0.083467	-0.0626	0.02126
5e+12	7.2958	7.3103	7.3194	0.012714	7.1087	7.1719	7.2105	0.055201	-0.2071	-0.1384	-0.0992	0.059693
1e+13	7.2166	7.266	7.3013	0.044059	7.0822	7.1148	7.1643	0.043562	-0.2191	-0.15113	-0.1157	0.058879

Device Test: 4.9 FORWARD_LEAKAGE(Forward_Leakage_14p0V)





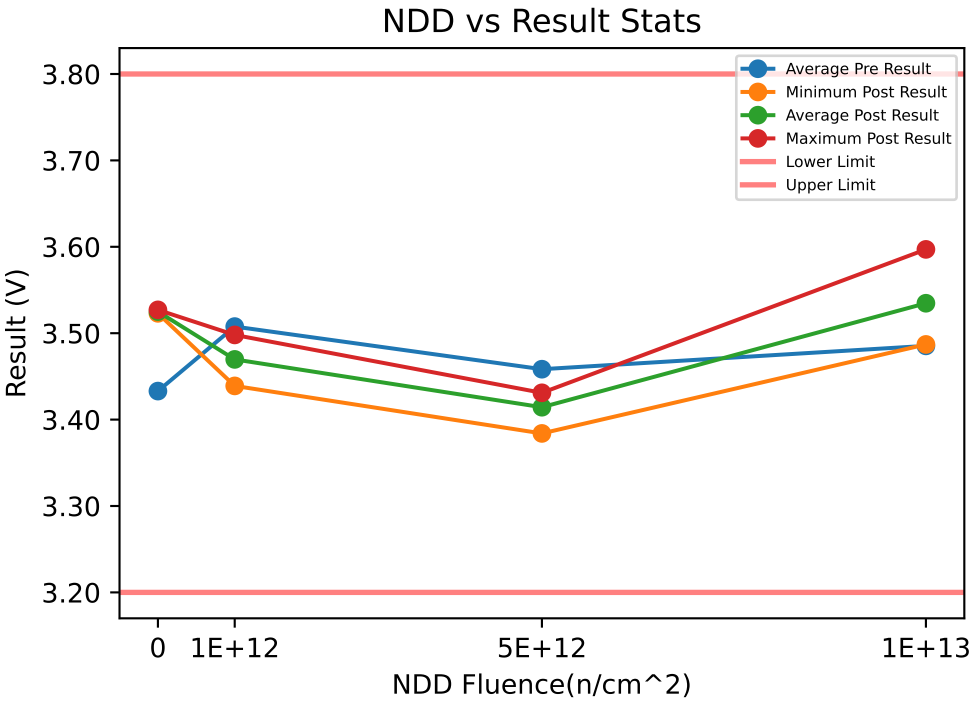
Test Results (Upper Limit = 1300.0 (uA))

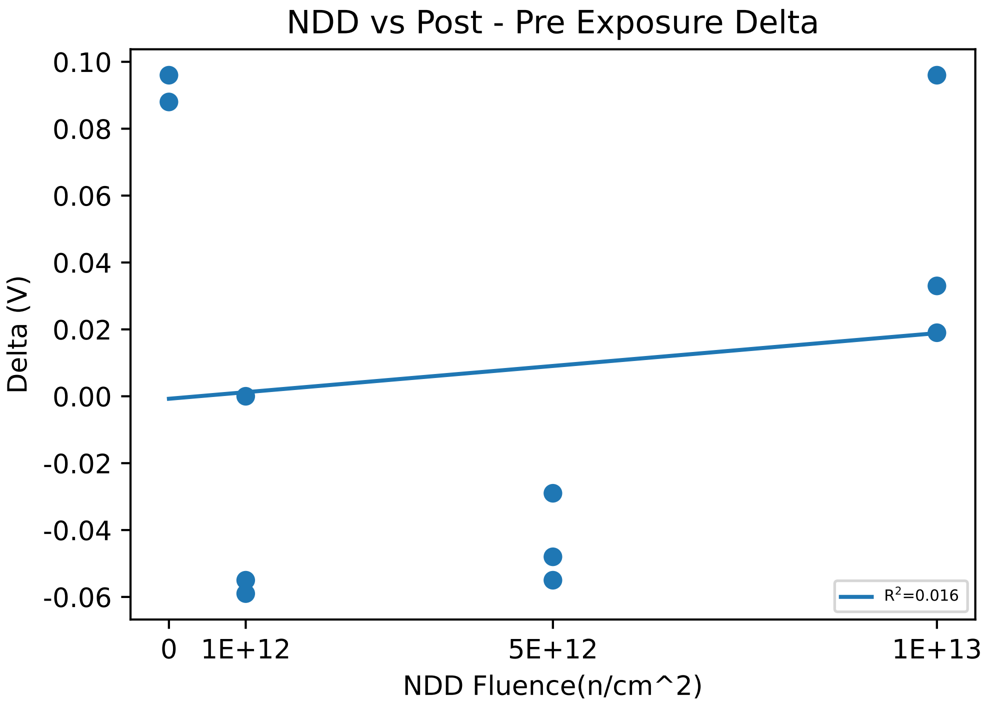
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	984.67	1005.7	21.013
2	0	Correlation	988.39	1009	20.615
3	1e+12	NDD, unbiased	992.65	1015.3	22.66
4	1e+12	NDD, unbiased	988.36	1006.2	17.885
5	1e+12	NDD, unbiased	1012.7	986.82	-25.906
6	5e+12	NDD, unbiased	1027.3	1037.6	10.245
7	5e+12	NDD, unbiased	1005.4	1024.8	19.441
8	5e+12	NDD, unbiased	992.44	1052.3	59.907
9	1e+13	NDD, unbiased	1020.9	1050.6	29.622
10	1e+13	NDD, unbiased	1022.5	1041	18.509
11	1e+13	NDD, unbiased	1028	1035.2	7.2766

Test Statistics (uA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	984.67	986.53	988.39	2.6287	1005.7	1007.3	1009	2.3475	20.615	20.814	21.013	0.28129
1e+12	988.36	997.91	1012.7	13.007	986.82	1002.8	1015.3	14.554	-25.906	4.8799	22.66	26.768
5e+12	992.44	1008.4	1027.3	17.65	1024.8	1038.2	1052.3	13.785	10.245	29.864	59.907	26.421
1e+13	1020.9	1023.8	1028	3.7001	1035.2	1042.3	1050.6	7.7386	7.2766	18.469	29.622	11.173

Device Test: 5.0 VIN_UVLO_RISE(VIN_UVLO_RISING)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

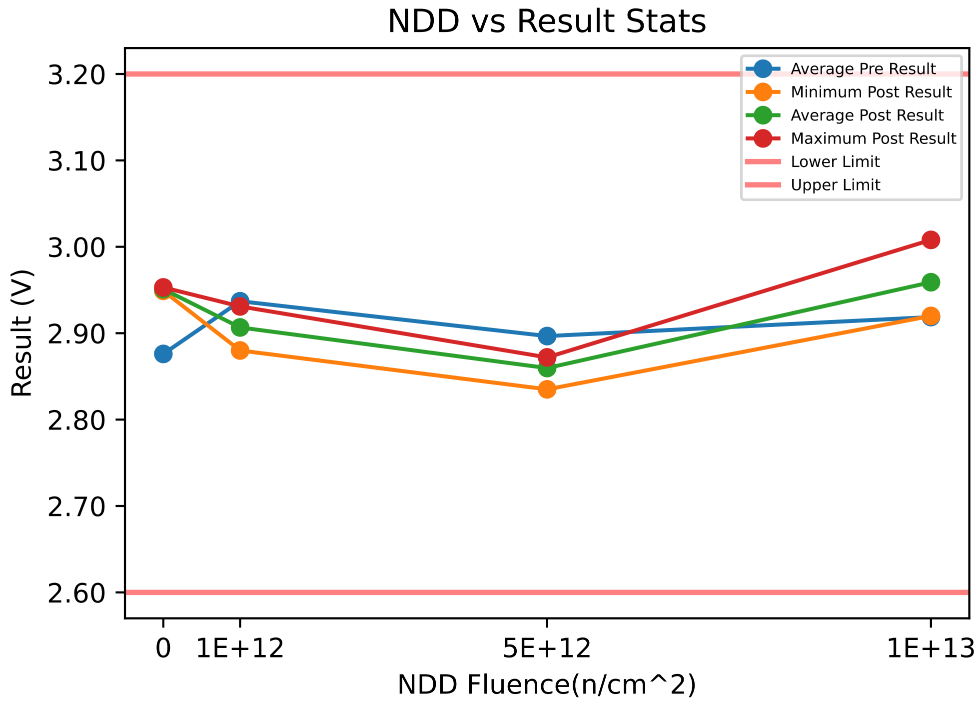
Test Results (Lower Limit = 3.2, Upper Limit = 3.8 (V))

Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	3.435	3.523	0.088
2	0	Correlation	3.431	3.527	0.096
3	1e+12	NDD, unbiased	3.527	3.472	-0.055
4	1e+12	NDD, unbiased	3.498	3.498	0
5	1e+12	NDD, unbiased	3.498	3.439	-0.059
6	5e+12	NDD, unbiased	3.483	3.428	-0.055
7	5e+12	NDD, unbiased	3.479	3.431	-0.048
8	5e+12	NDD, unbiased	3.413	3.384	-0.029
9	1e+13	NDD, unbiased	3.501	3.52	0.019
10	1e+13	NDD, unbiased	3.501	3.597	0.096
11	1e+13	NDD, unbiased	3.454	3.487	0.033

Test Statistics (V)

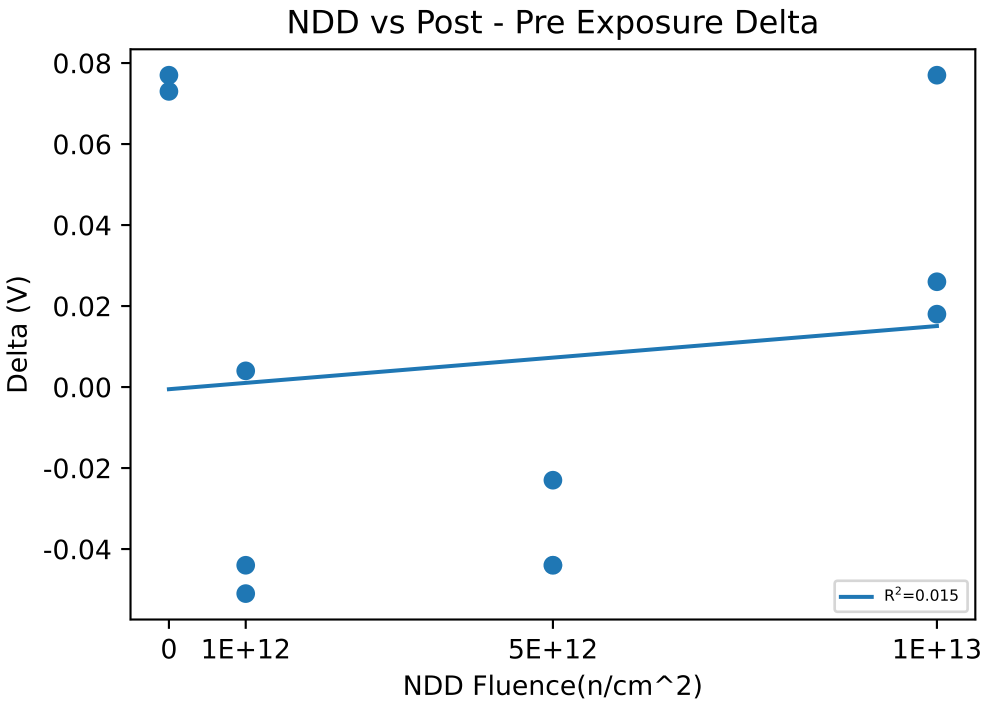
Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	3.431	3.433	3.435	0.0028284	3.523	3.525	3.527	0.0028284	0.088	0.092	0.096	0.0056569
1e+12	3.498	3.5077	3.527	0.016743	3.439	3.4697	3.498	0.029569	-0.059	-0.038	0	0.03297
5e+12	3.413	3.4583	3.483	0.039311	3.384	3.4143	3.431	0.026312	-0.055	-0.044	-0.029	0.013454
1e+13	3.454	3.4853	3.501	0.027135	3.487	3.5347	3.597	0.056448	0.019	0.049333	0.096	0.041016

Device Test: 5.1 VIN_UVLO_FALL(VIN_UVLO_FALLING)



Test Results (Lower Limit = 2.6, Upper Limit = 3.2 (V))

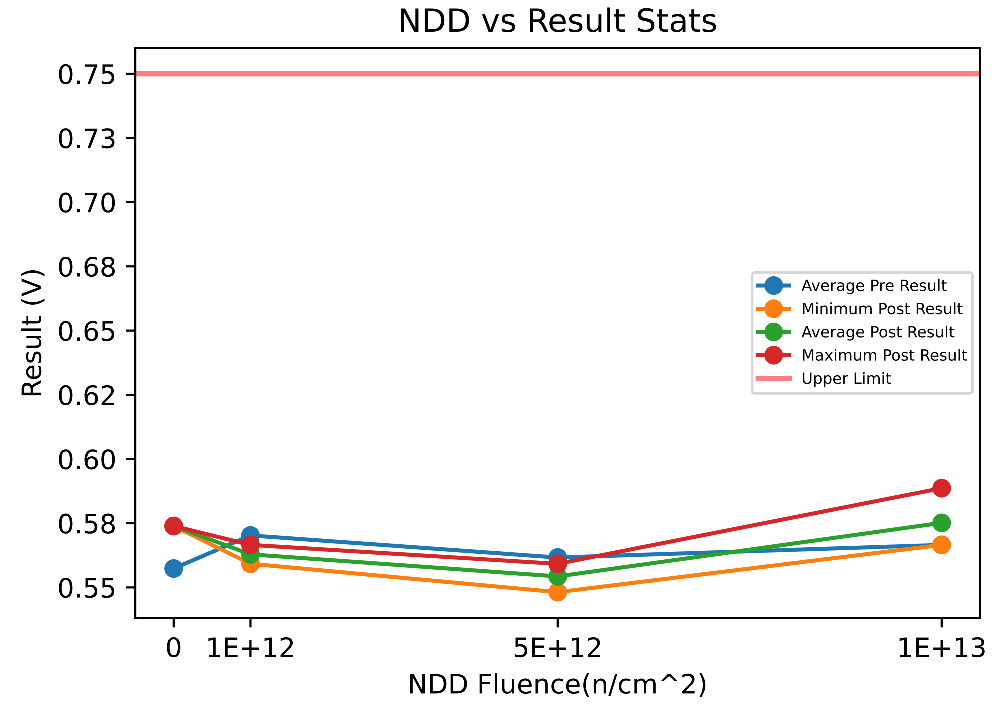
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	2.876	2.949	0.073
2	0	Correlation	2.876	2.953	0.077
3	1e+12	NDD, unbiased	2.953	2.909	-0.044
4	1e+12	NDD, unbiased	2.927	2.931	0.004
5	1e+12	NDD, unbiased	2.931	2.88	-0.051
6	5e+12	NDD, unbiased	2.916	2.872	-0.044
7	5e+12	NDD, unbiased	2.916	2.872	-0.044
8	5e+12	NDD, unbiased	2.858	2.835	-0.023
9	1e+13	NDD, unbiased	2.931	2.949	0.018
10	1e+13	NDD, unbiased	2.931	3.008	0.077
11	1e+13	NDD, unbiased	2.894	2.92	0.026

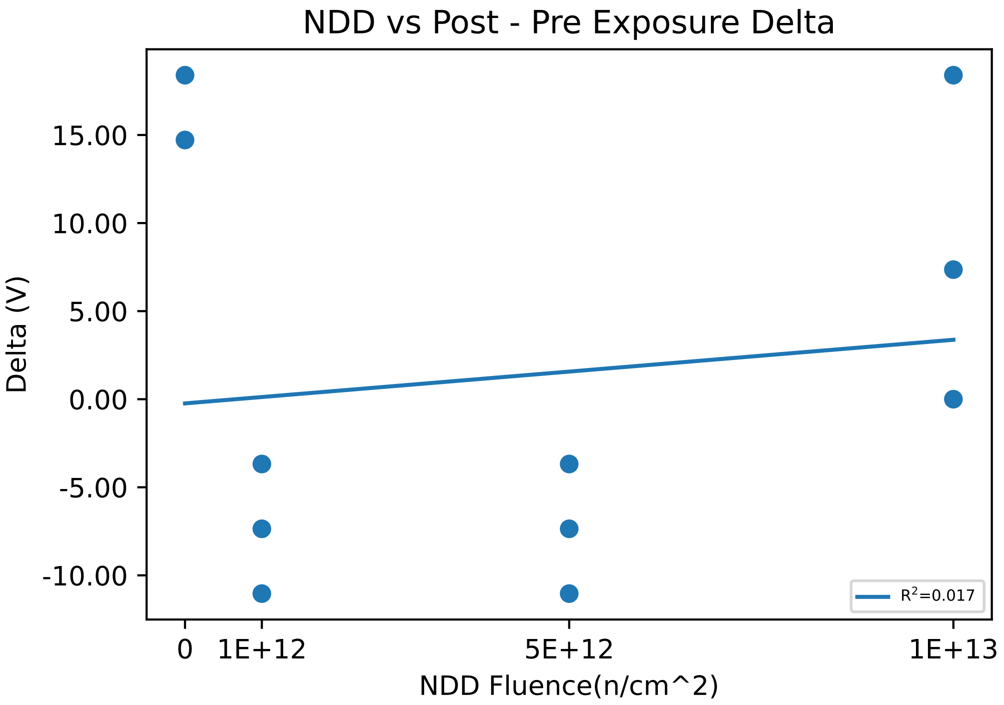


Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	2.876	2.876	2.876	0	2.949	2.951	2.953	0.0028284	0.073	0.075	0.077	0.0028284
1e+12	2.927	2.937	2.953	0.014	2.88	2.9067	2.931	0.02558	-0.051	-0.030333	0.004	0.029939
5e+12	2.858	2.8967	2.916	0.033486	2.835	2.8597	2.872	0.021362	-0.044	-0.037	-0.023	0.012124
1e+13	2.894	2.9187	2.931	0.021362	2.92	2.959	3.008	0.044844	0.018	0.040333	0.077	0.032005

Device Test: 5.2 VIN_UVLO_HYST(VIN_UVLO_HYSTERESIS)





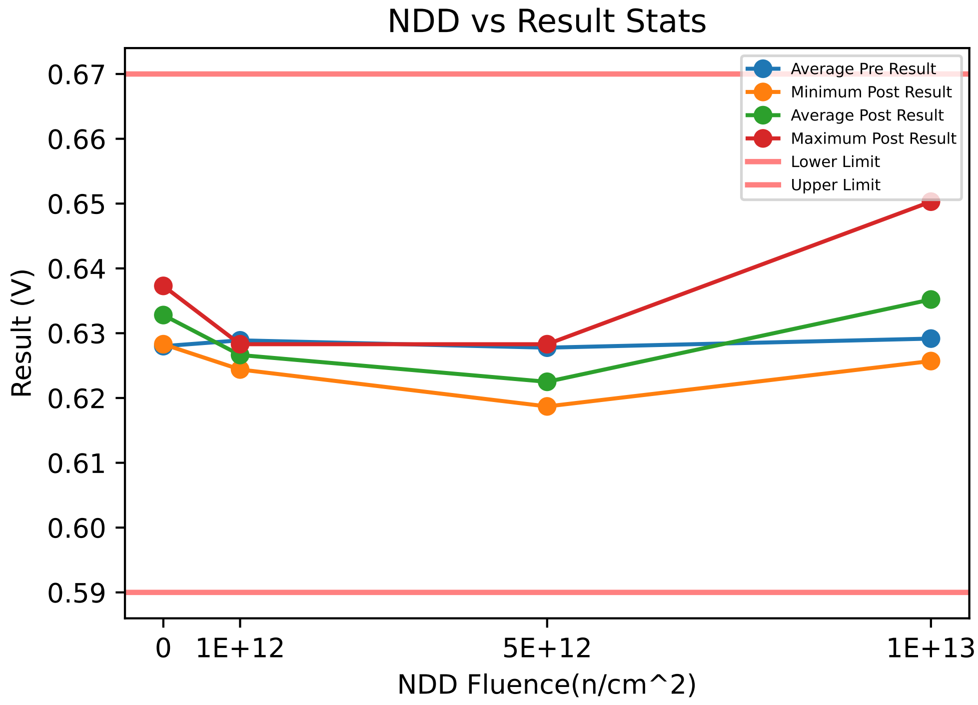
Test Results (Upper Limit = 0.75 (V))

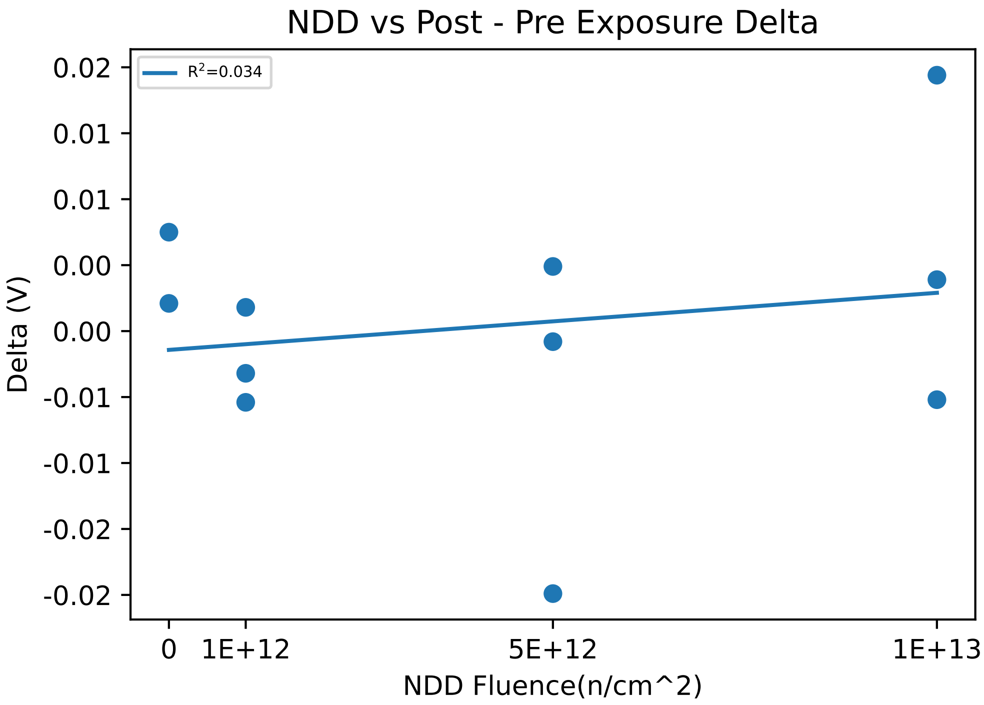
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.5592	0.57391	14.716
2	0	Correlation	0.55552	0.57391	18.395
3	1e+12	NDD, unbiased	0.57391	0.56288	-11.037
4	1e+12	NDD, unbiased	0.57023	0.56655	-3.679
5	1e+12	NDD, unbiased	0.56655	0.5592	-7.358
6	5e+12	NDD, unbiased	0.56655	0.55552	-11.037
7	5e+12	NDD, unbiased	0.56288	0.5592	-3.679
8	5e+12	NDD, unbiased	0.55552	0.54816	-7.358
9	1e+13	NDD, unbiased	0.57023	0.57023	0
10	1e+13	NDD, unbiased	0.57023	0.58863	18.395
11	1e+13	NDD, unbiased	0.5592	0.56655	7.357

Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.55552	0.55736	0.5592	0.0026014	0.57391	0.57391	0.57391	0	14.716	16.555	18.395	2.6014
1e+12	0.56655	0.57023	0.57391	0.003679	0.5592	0.56288	0.56655	0.003679	-11.037	-7.358	-3.679	3.679
5e+12	0.55552	0.56165	0.56655	0.0056198	0.54816	0.55429	0.5592	0.0056198	-11.037	-7.358	-3.679	3.679
1e+13	0.5592	0.56656	0.57023	0.0063716	0.56655	0.57514	0.58863	0.011826	0	8.584	18.395	9.2587

Device Test: 6.0 EN_VTH_RISING_PLASTIC(EN_UVLO_RISING_4p5V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

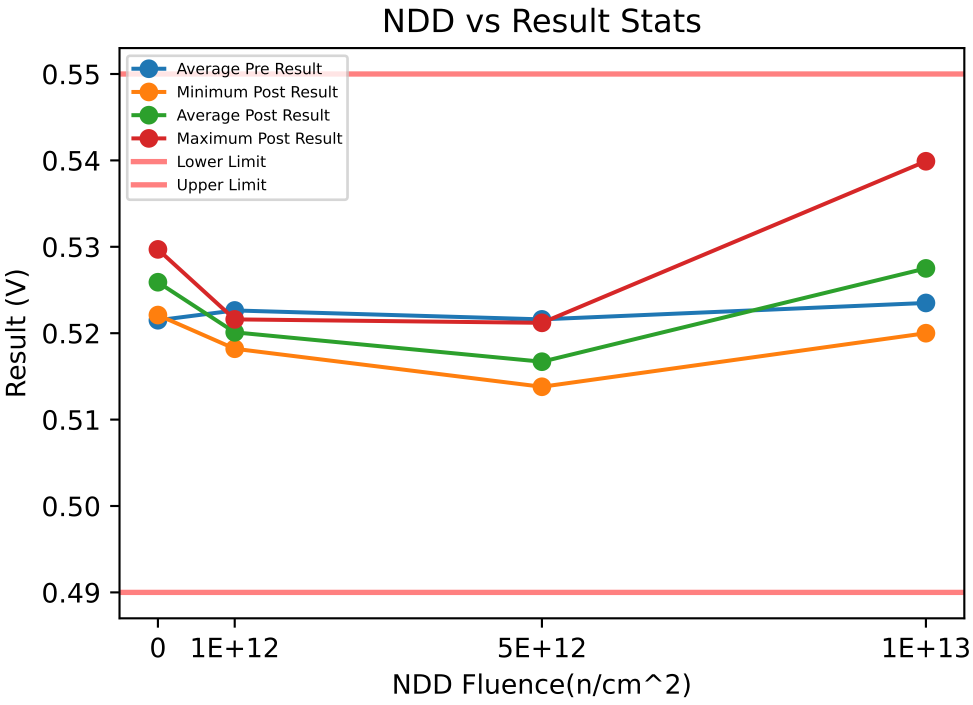
Test Results (Lower Limit = 0.59, Upper Limit = 0.67 (V))

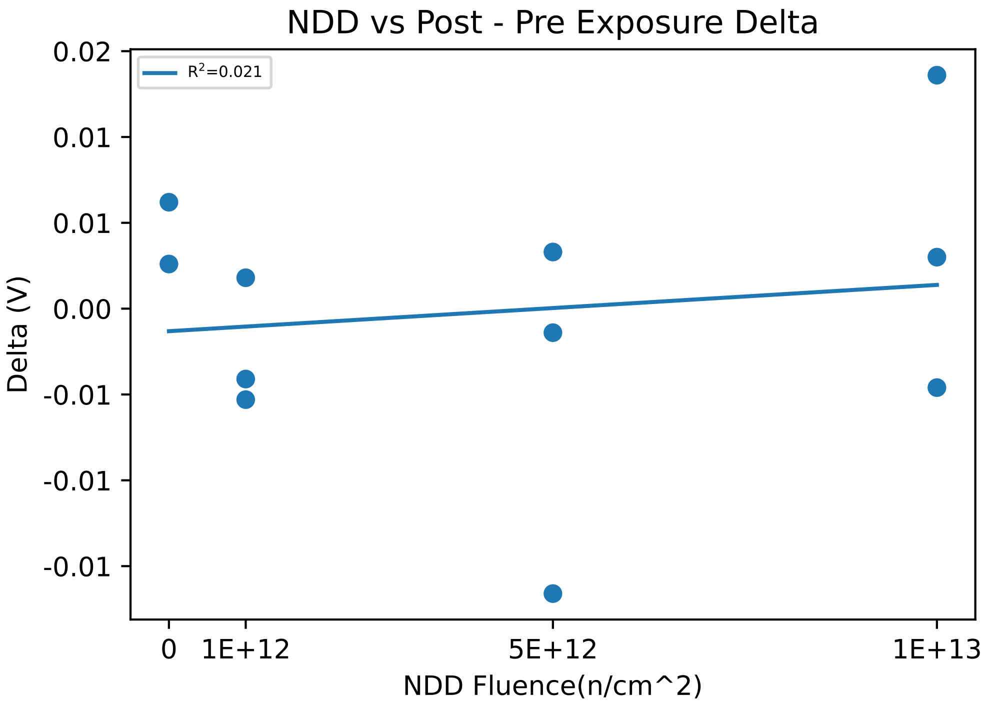
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.6262	0.6283	0.0021
2	0	Correlation	0.6298	0.6373	0.0075
3	1e+12	NDD, unbiased	0.6265	0.6283	0.0018
4	1e+12	NDD, unbiased	0.6298	0.6244	-0.0054
5	1e+12	NDD, unbiased	0.6304	0.6272	-0.0032
6	5e+12	NDD, unbiased	0.6234	0.6283	0.0049
7	5e+12	NDD, unbiased	0.6386	0.6187	-0.0199
8	5e+12	NDD, unbiased	0.6213	0.6205	-0.0008
9	1e+13	NDD, unbiased	0.6348	0.6296	-0.0052
10	1e+13	NDD, unbiased	0.6309	0.6503	0.0194
11	1e+13	NDD, unbiased	0.6218	0.6257	0.0039

Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.6262	0.628	0.6298	0.0025456	0.6283	0.6328	0.6373	0.006364	0.0021	0.0048	0.0075	0.0038184
1e+12	0.6265	0.6289	0.6304	0.0021	0.6244	0.62663	0.6283	0.0020108	-0.0054	-0.0022667	0.0018	0.0036896
5e+12	0.6213	0.62777	0.6386	0.0094405	0.6187	0.6225	0.6283	0.0051029	-0.0199	-0.0052667	0.0049	0.012989
1e+13	0.6218	0.62917	0.6348	0.0066711	0.6257	0.6352	0.6503	0.013222	-0.0052	0.0060333	0.0194	0.012438

Device Test: 6.1 EN_VTH_FALLING_PLASTIC(EN_UVLO_FALLING_4p5V)





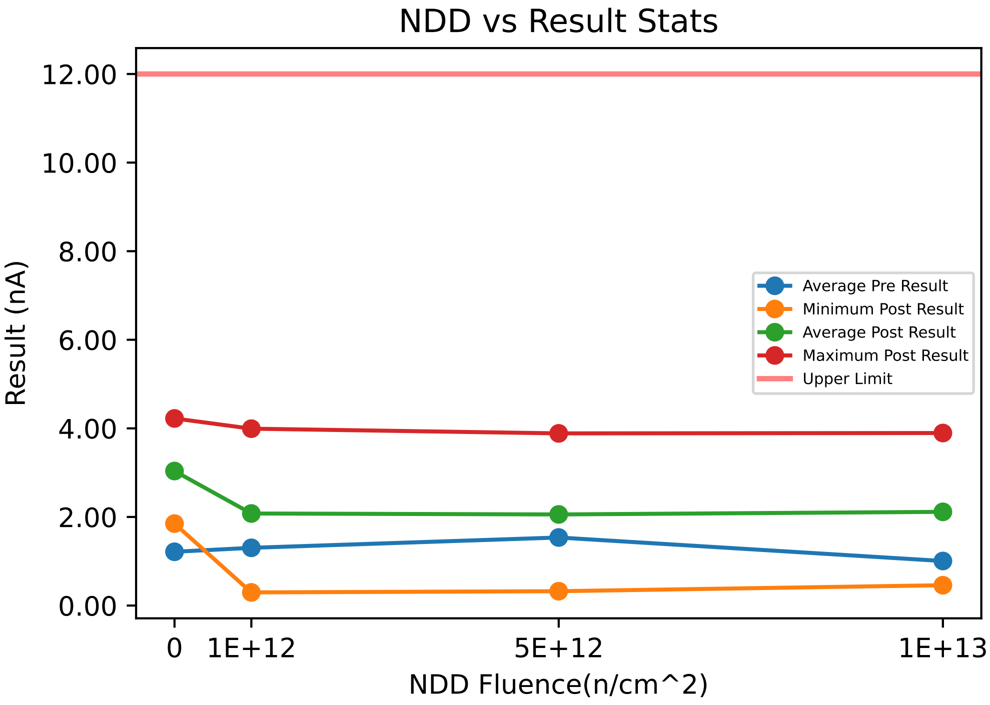
Test Results (Lower Limit = 0.49, Upper Limit = 0.55 (V))

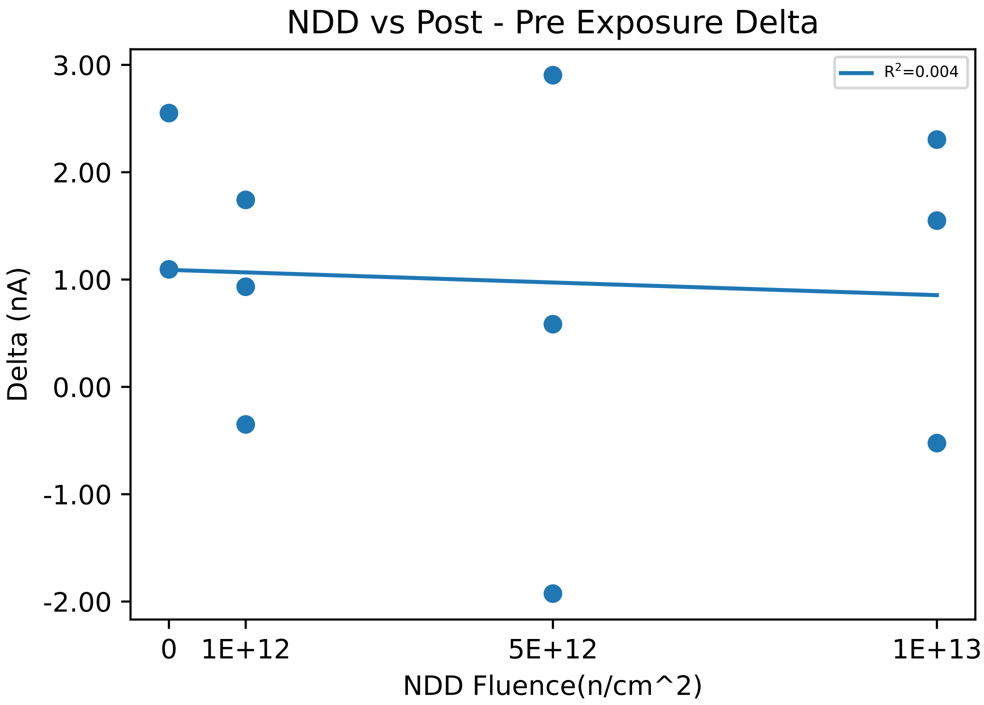
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.5195	0.5221	0.0026
2	0	Correlation	0.5235	0.5297	0.0062
3	1e+12	NDD, unbiased	0.5198	0.5216	0.0018
4	1e+12	NDD, unbiased	0.5235	0.5182	-0.0053
5	1e+12	NDD, unbiased	0.5246	0.5205	-0.0041
6	5e+12	NDD, unbiased	0.5179	0.5212	0.0033
7	5e+12	NDD, unbiased	0.5304	0.5138	-0.0166
8	5e+12	NDD, unbiased	0.5165	0.5151	-0.0014
9	1e+13	NDD, unbiased	0.5272	0.5226	-0.0046
10	1e+13	NDD, unbiased	0.5263	0.5399	0.0136
11	1e+13	NDD, unbiased	0.517	0.52	0.003

Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.5195	0.5215	0.5235	0.0028284	0.5221	0.5259	0.5297	0.005374	0.0026	0.0044	0.0062	0.0025456
1e+12	0.5198	0.52263	0.5246	0.0025146	0.5182	0.5201	0.5216	0.0017349	-0.0053	-0.0025333	0.0018	0.0038004
5e+12	0.5165	0.5216	0.5304	0.0076531	0.5138	0.5167	0.5212	0.0039509	-0.0166	-0.0049	0.0033	0.010401
1e+13	0.517	0.5235	0.5272	0.0056471	0.52	0.5275	0.5399	0.010817	-0.0046	0.004	0.0136	0.0091411

Device Test: 6.10 IEN_VIN(EN3p3V_I_Vin14V)





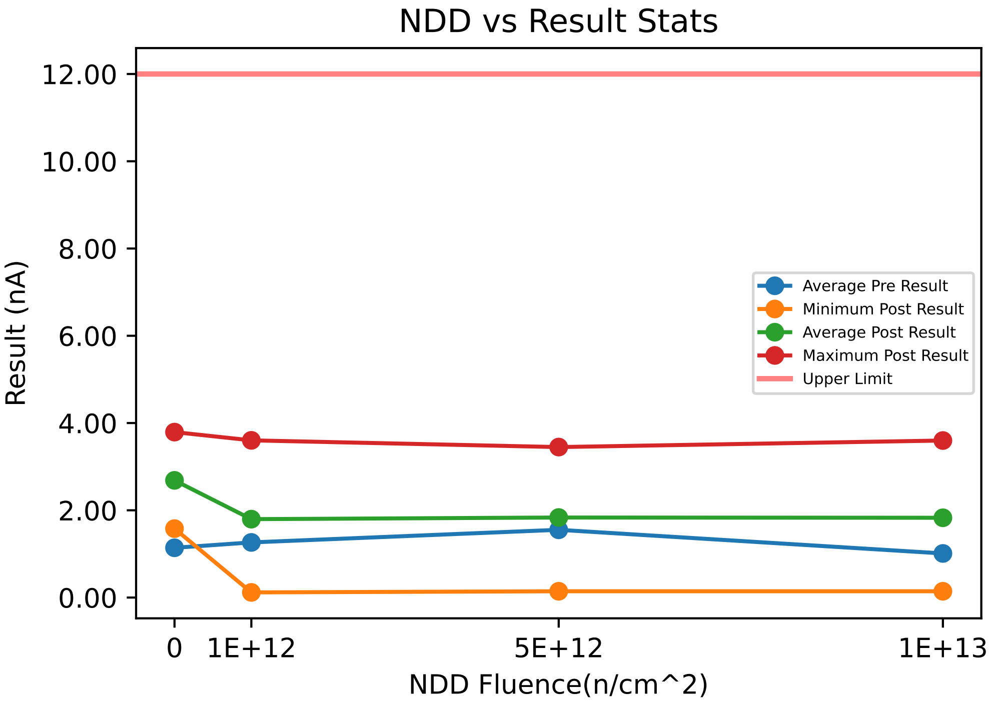
Test Results (Upper Limit = 12.0 (nA))

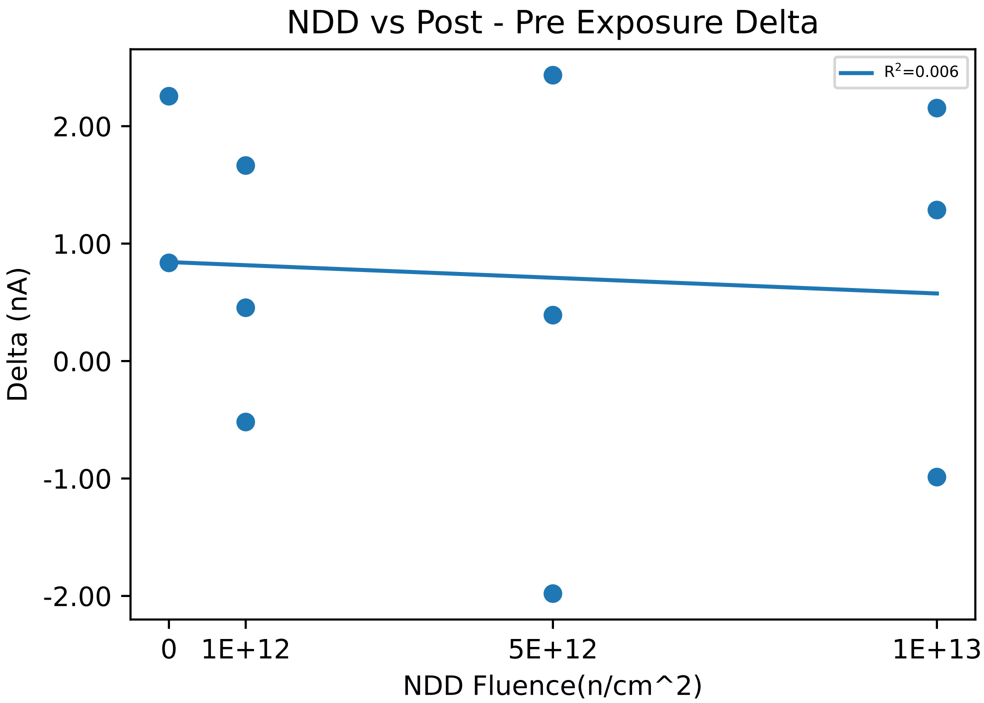
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.755	1.85	1.095
2	0	Correlation	1.673	4.224	2.551
3	1e+12	NDD, unbiased	1.012	1.945	0.933
4	1e+12	NDD, unbiased	2.251	3.993	1.742
5	1e+12	NDD, unbiased	0.647	0.297	-0.35
6	5e+12	NDD, unbiased	1.376	1.96	0.584
7	5e+12	NDD, unbiased	0.983	3.887	2.904
8	5e+12	NDD, unbiased	2.25	0.324	-1.926
9	1e+13	NDD, unbiased	0.443	1.992	1.549
10	1e+13	NDD, unbiased	1.591	3.895	2.304
11	1e+13	NDD, unbiased	0.983	0.459	-0.524

Test Statistics (nA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.755	1.214	1.673	0.64912	1.85	3.037	4.224	1.6787	1.095	1.823	2.551	1.0295
1e+12	0.647	1.3033	2.251	0.84075	0.297	2.0783	3.993	1.8516	-0.35	0.775	1.742	1.0549
5e+12	0.983	1.5363	2.25	0.64854	0.324	2.057	3.887	1.7835	-1.926	0.52067	2.904	2.4156
1e+13	0.443	1.0057	1.591	0.57434	0.459	2.1153	3.895	1.7213	-0.524	1.1097	2.304	1.4643

Device Test: 6.11 IEN_VIN(EN1p8V_I_Vin14V)





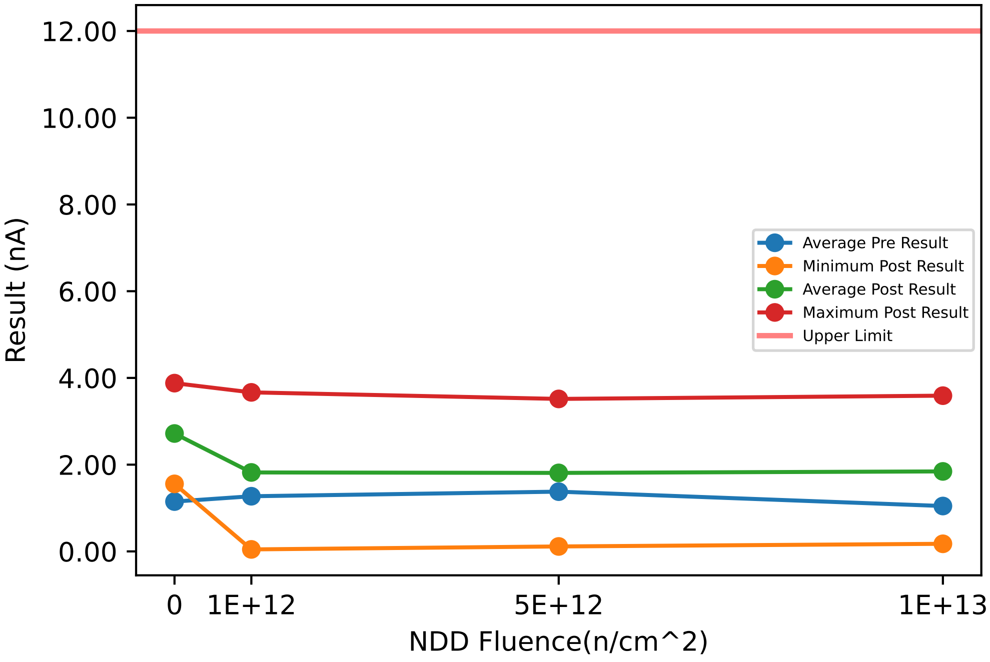
Test Results (Upper Limit = 12.0 (nA))

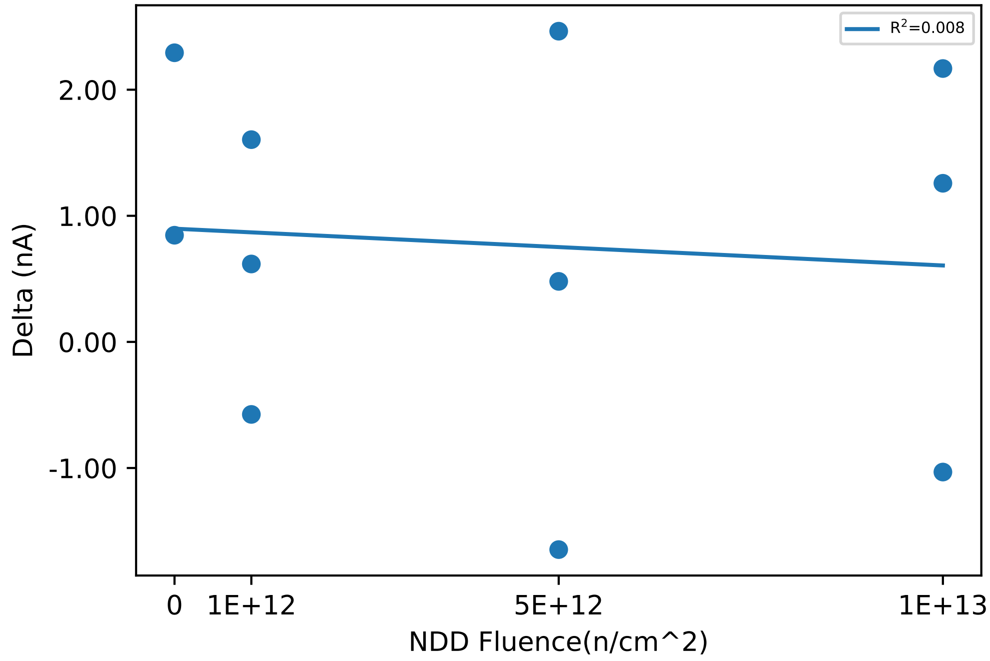
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.744	1.58	0.836
2	0	Correlation	1.537	3.792	2.255
3	1e+12	NDD, unbiased	1.216	1.67	0.454
4	1e+12	NDD, unbiased	1.938	3.603	1.665
5	1e+12	NDD, unbiased	0.637	0.118	-0.519
6	5e+12	NDD, unbiased	1.519	1.91	0.391
7	5e+12	NDD, unbiased	1.015	3.449	2.434
8	5e+12	NDD, unbiased	2.124	0.144	-1.98
9	1e+13	NDD, unbiased	0.456	1.742	1.286
10	1e+13	NDD, unbiased	1.445	3.599	2.154
11	1e+13	NDD, unbiased	1.132	0.144	-0.988

Test Statistics (nA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.744	1.1405	1.537	0.56074	1.58	2.686	3.792	1.5641	0.836	1.5455	2.255	1.0034
1e+12	0.637	1.2637	1.938	0.65181	0.118	1.797	3.603	1.746	-0.519	0.53333	1.665	1.0942
5e+12	1.015	1.5527	2.124	0.55527	0.144	1.8343	3.449	1.6538	-1.98	0.28167	2.434	2.209
1e+13	0.456	1.011	1.445	0.50548	0.144	1.8283	3.599	1.7291	-0.988	0.81733	2.154	1.6226

Device Test: 6.12 IEN_VIN(EN1p5V_I_Vin14V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

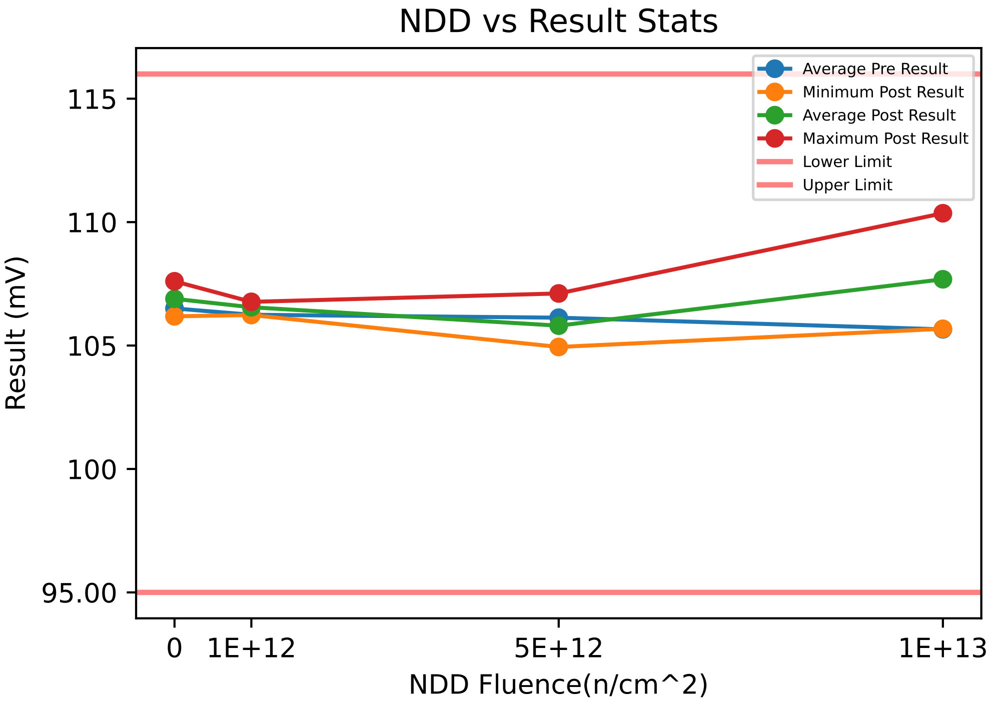
Test Results (Upper Limit = 12.0 (nA))

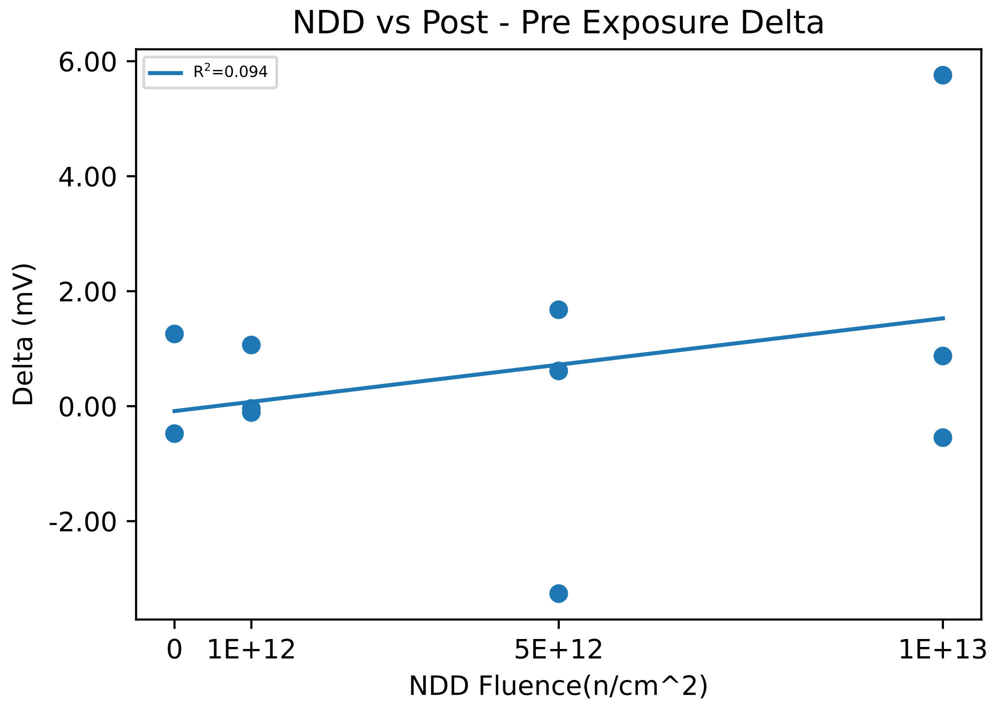
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.711	1.557	0.846
2	0	Correlation	1.587	3.88	2.293
3	1e+12	NDD, unbiased	1.131	1.749	0.618
4	1e+12	NDD, unbiased	2.063	3.667	1.604
5	1e+12	NDD, unbiased	0.621	0.046	-0.575
6	5e+12	NDD, unbiased	1.32	1.8	0.48
7	5e+12	NDD, unbiased	1.052	3.516	2.464
8	5e+12	NDD, unbiased	1.761	0.114	-1.647
9	1e+13	NDD, unbiased	0.509	1.767	1.258
10	1e+13	NDD, unbiased	1.423	3.591	2.168
11	1e+13	NDD, unbiased	1.207	0.175	-1.032

Test Statistics (nA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.711	1.149	1.587	0.61943	1.557	2.7185	3.88	1.6426	0.846	1.5695	2.293	1.0232
1e+12	0.621	1.2717	2.063	0.73122	0.046	1.8207	3.667	1.8116	-0.575	0.549	1.604	1.0911
5e+12	1.052	1.3777	1.761	0.358	0.114	1.81	3.516	1.701	-1.647	0.43233	2.464	2.0559
1e+13	0.509	1.0463	1.423	0.47771	0.175	1.8443	3.591	1.7093	-1.032	0.798	2.168	1.6488

Device Test: 6.2 EN_HYST_PLASTIC(EN_UVLO_HYSTERESIS_4p5V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

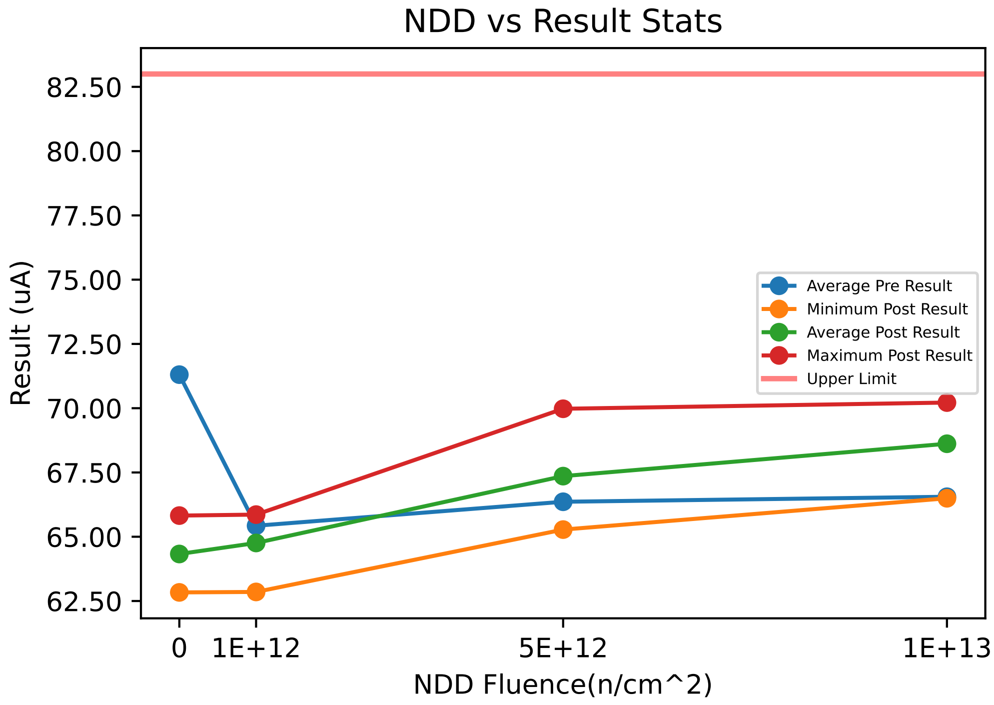
Test Results (Lower Limit = 95.0, Upper Limit = 116.0 (mV))

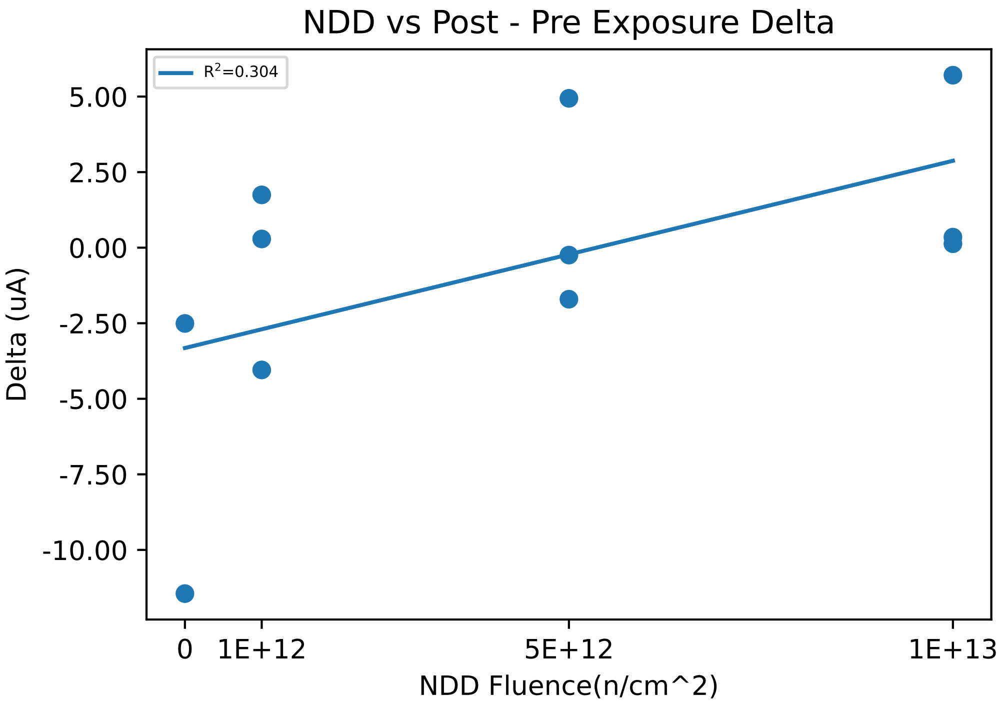
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	106.66	106.18	-0.477
2	0	Correlation	106.35	107.6	1.256
3	1e+12	NDD, unbiased	106.69	106.65	-0.04
4	1e+12	NDD, unbiased	106.35	106.24	-0.11
5	1e+12	NDD, unbiased	105.71	106.77	1.064
6	5e+12	NDD, unbiased	105.43	107.11	1.677
7	5e+12	NDD, unbiased	108.2	104.94	-3.26
8	5e+12	NDD, unbiased	104.75	105.36	0.613
9	1e+13	NDD, unbiased	107.56	107.02	-0.547
10	1e+13	NDD, unbiased	104.6	110.36	5.757
11	1e+13	NDD, unbiased	104.81	105.68	0.873

Test Statistics (mV)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	106.35	106.5	106.66	0.22132	106.18	106.89	107.6	1.0041	-0.477	0.3895	1.256	1.2254
1e+12	105.71	106.25	106.69	0.49814	106.24	106.55	106.77	0.27908	-0.11	0.30467	1.064	0.65853
5e+12	104.75	106.13	108.2	1.8277	104.94	105.81	107.11	1.1494	-3.26	-0.32333	1.677	2.5983
1e+13	104.6	105.66	107.56	1.6535	105.68	107.68	110.36	2.4111	-0.547	2.0277	5.757	3.3068

Device Test: 6.3 SS_I_Charge(SS_Icharge_4p5V)





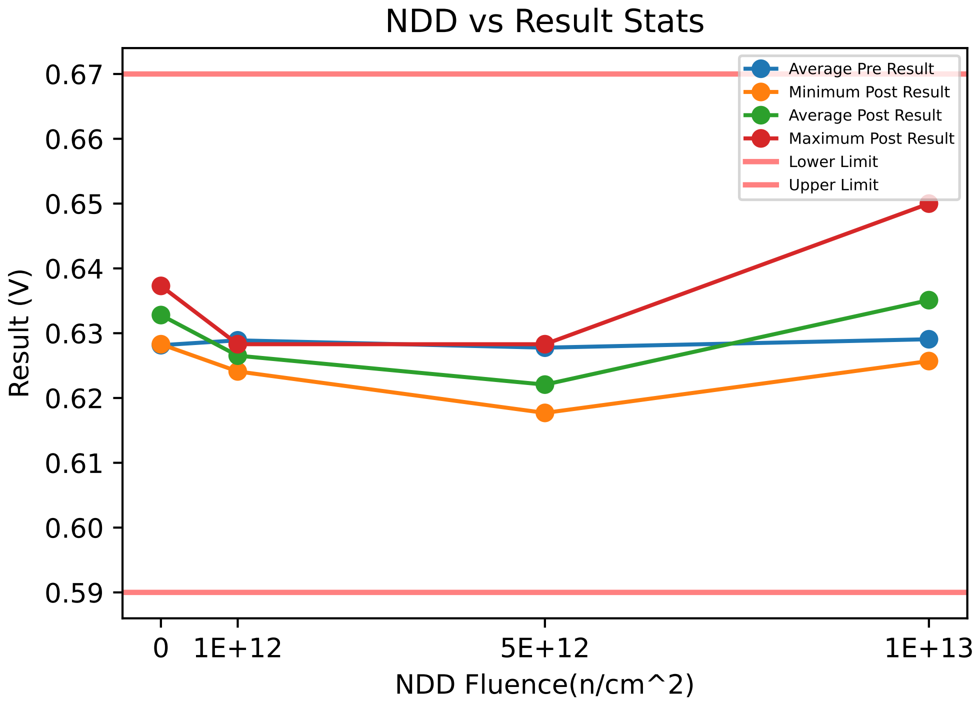
Test Results (Upper Limit = 83.0 (uA))

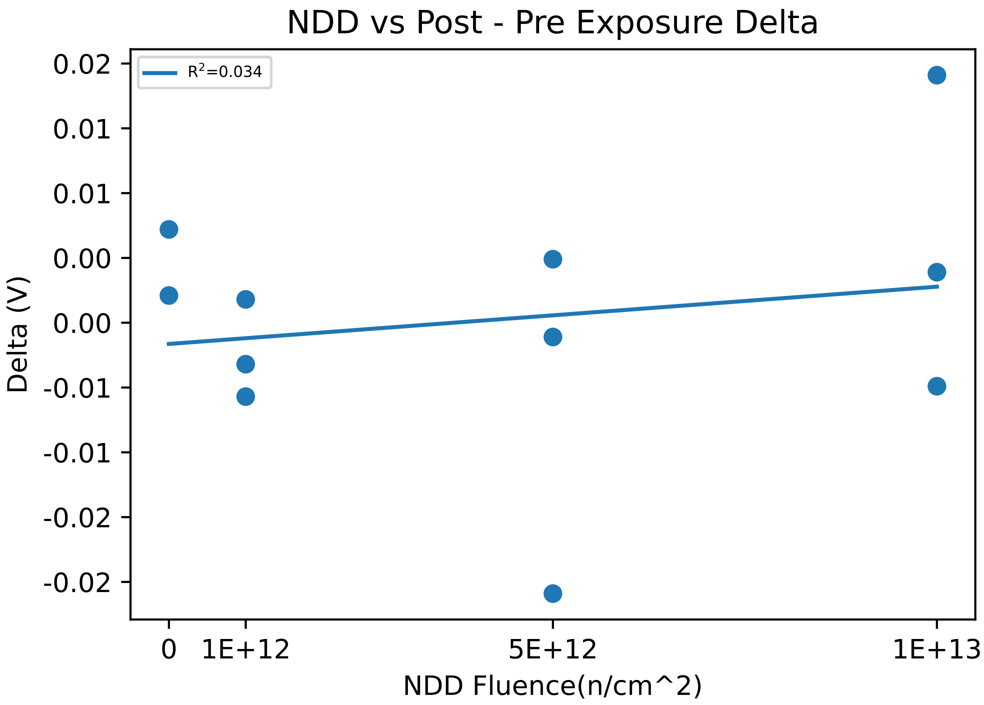
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	74.281	62.835	-11.446
2	0	Correlation	68.33	65.823	-2.507
3	1e+12	NDD, unbiased	65.271	65.56	0.289
4	1e+12	NDD, unbiased	64.114	65.861	1.747
5	1e+12	NDD, unbiased	66.898	62.853	-4.045
6	5e+12	NDD, unbiased	65.036	69.978	4.942
7	5e+12	NDD, unbiased	67.063	66.818	-0.245
8	5e+12	NDD, unbiased	66.983	65.278	-1.705
9	1e+13	NDD, unbiased	69.007	69.137	0.13
10	1e+13	NDD, unbiased	64.512	70.219	5.707
11	1e+13	NDD, unbiased	66.147	66.496	0.349

Test Statistics (uA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	68.33	71.305	74.281	4.208	62.835	64.329	65.823	2.1128	-11.446	-6.9765	-2.507	6.3208
1e+12	64.114	65.428	66.898	1.3986	62.853	64.758	65.861	1.6566	-4.045	-0.66967	1.747	3.0127
5e+12	65.036	66.361	67.063	1.1479	65.278	67.358	69.978	2.3961	-1.705	0.99733	4.942	3.4933
1e+13	64.512	66.555	69.007	2.2752	66.496	68.617	70.219	1.9151	0.13	2.062	5.707	3.1586

Device Test: 6.4 EN_VTH_RISING_PLASTIC(EN_UVLO_RISING_14V)





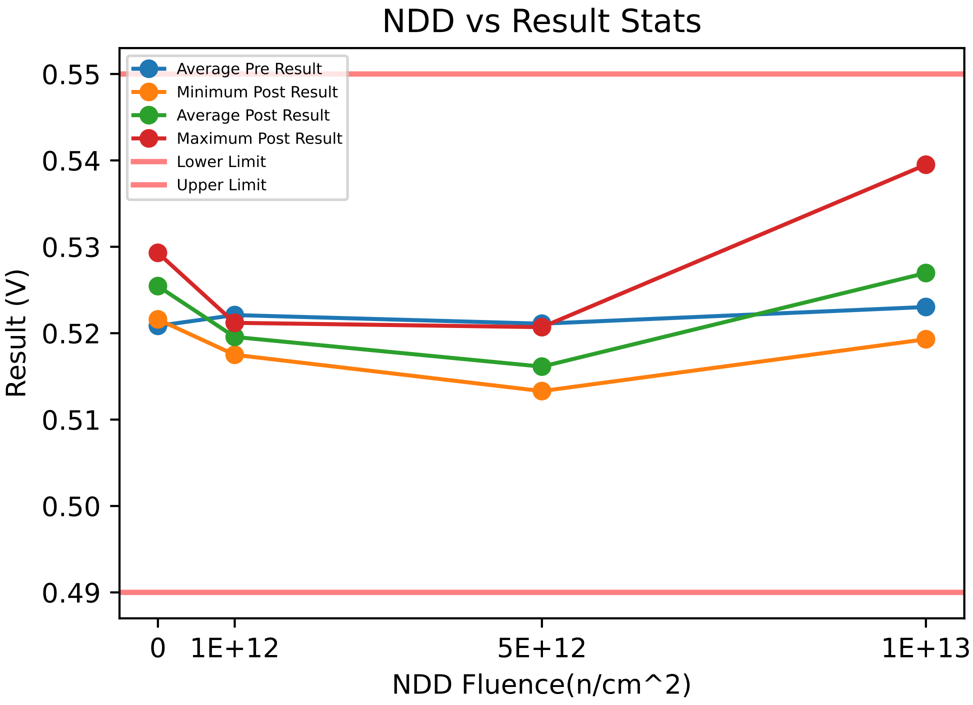
Test Results (Lower Limit = 0.59, Upper Limit = 0.67 (V))

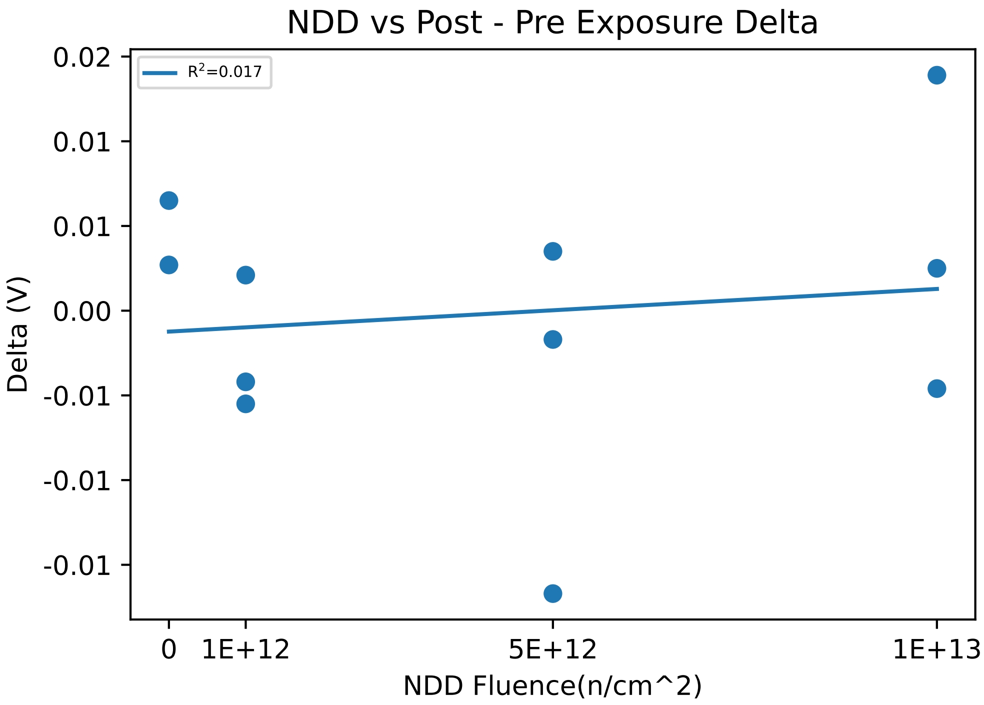
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.6262	0.6283	0.0021
2	0	Correlation	0.6301	0.6373	0.0072
3	1e+12	NDD, unbiased	0.6265	0.6283	0.0018
4	1e+12	NDD, unbiased	0.6298	0.6241	-0.0057
5	1e+12	NDD, unbiased	0.6304	0.6272	-0.0032
6	5e+12	NDD, unbiased	0.6234	0.6283	0.0049
7	5e+12	NDD, unbiased	0.6386	0.6177	-0.0209
8	5e+12	NDD, unbiased	0.6213	0.6202	-0.0011
9	1e+13	NDD, unbiased	0.6345	0.6296	-0.0049
10	1e+13	NDD, unbiased	0.6309	0.65	0.0191
11	1e+13	NDD, unbiased	0.6218	0.6257	0.0039

Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.6262	0.62815	0.6301	0.0027577	0.6283	0.6328	0.6373	0.006364	0.0021	0.00465	0.0072	0.0036062
1e+12	0.6265	0.6289	0.6304	0.0021	0.6241	0.62653	0.6283	0.0021779	-0.0057	-0.0023667	0.0018	0.0038188
5e+12	0.6213	0.62777	0.6386	0.0094405	0.6177	0.62207	0.6283	0.0055411	-0.0209	-0.0057	0.0049	0.013501
1e+13	0.6218	0.62907	0.6345	0.0065455	0.6257	0.6351	0.65	0.01305	-0.0049	0.0060333	0.0191	0.012141

Device Test: 6.5 EN_VTH_FALLING_PLASTIC(EN_UVLO_FALLING_14V)





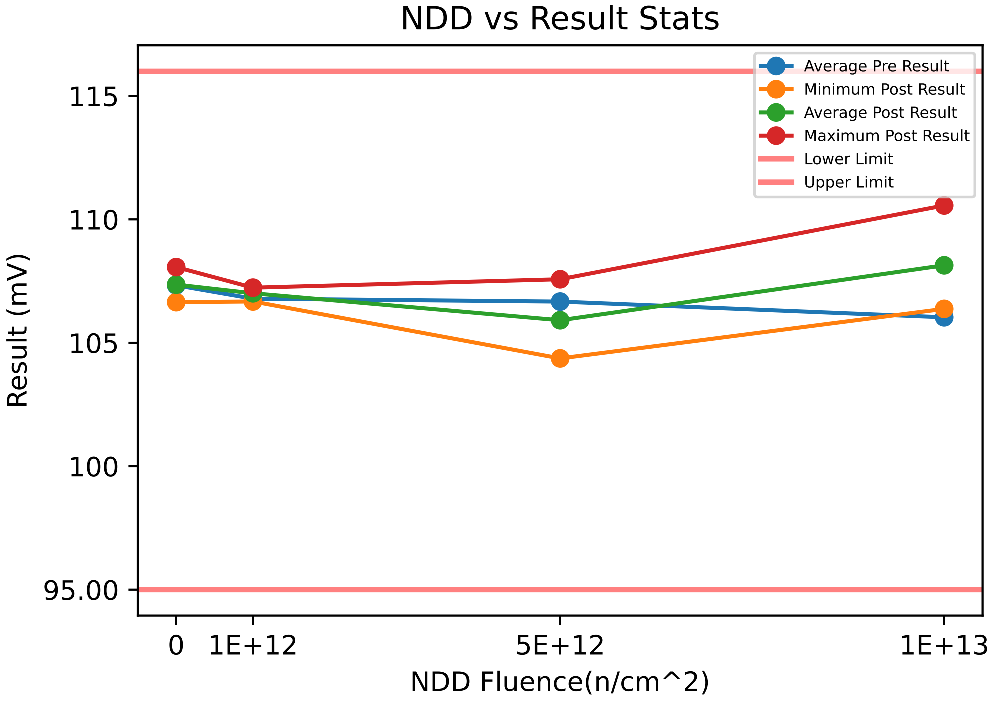
Test Results (Lower Limit = 0.49, Upper Limit = 0.55 (V))

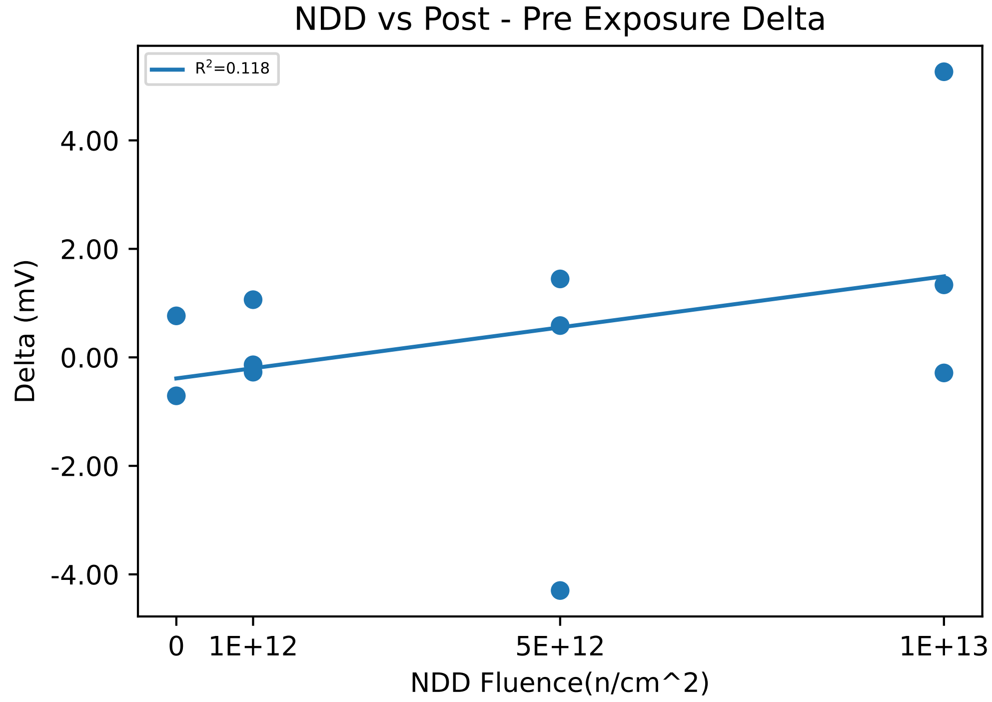
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.5189	0.5216	0.0027
2	0	Correlation	0.5228	0.5293	0.0065
3	1e+12	NDD, unbiased	0.5191	0.5212	0.0021
4	1e+12	NDD, unbiased	0.523	0.5175	-0.0055
5	1e+12	NDD, unbiased	0.5242	0.52	-0.0042
6	5e+12	NDD, unbiased	0.5172	0.5207	0.0035
7	5e+12	NDD, unbiased	0.53	0.5133	-0.0167
8	5e+12	NDD, unbiased	0.5161	0.5144	-0.0017
9	1e+13	NDD, unbiased	0.5267	0.5221	-0.0046
10	1e+13	NDD, unbiased	0.5256	0.5395	0.0139
11	1e+13	NDD, unbiased	0.5168	0.5193	0.0025

Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.5189	0.52085	0.5228	0.0027577	0.5216	0.52545	0.5293	0.0054447	0.0027	0.0046	0.0065	0.002687
1e+12	0.5191	0.5221	0.5242	0.0026665	0.5175	0.51957	0.5212	0.0018877	-0.0055	-0.0025333	0.0021	0.0040649
5e+12	0.5161	0.5211	0.53	0.0077272	0.5133	0.51613	0.5207	0.0039929	-0.0167	-0.0049667	0.0035	0.010489
1e+13	0.5168	0.52303	0.5267	0.0054262	0.5193	0.52697	0.5395	0.010944	-0.0046	0.0039333	0.0139	0.0093329

Device Test: 6.6 EN_HYST_PLASTIC(EN_UVLO_HYSTERESIS_14V)





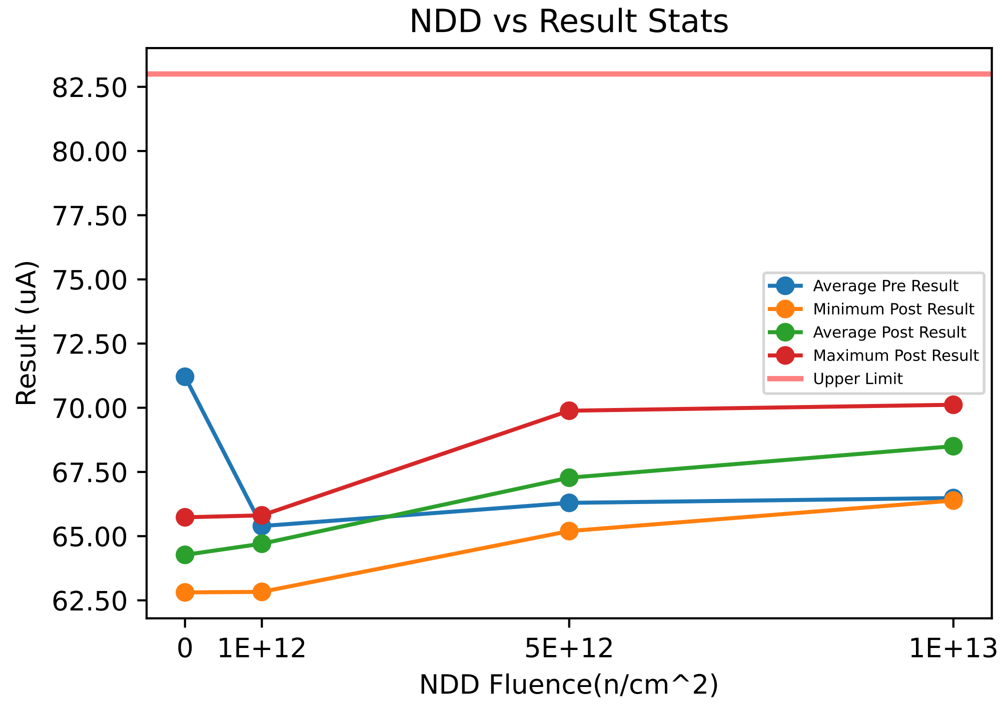
Test Results (Lower Limit = 95.0, Upper Limit = 116.0 (mV))

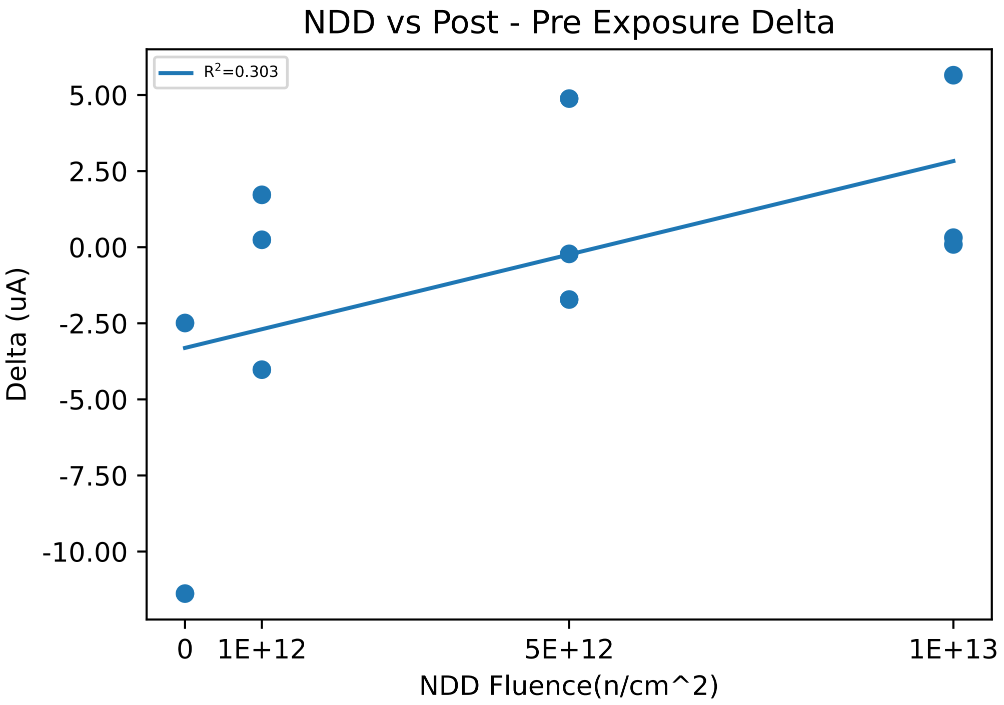
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	107.36	106.65	-0.709
2	0	Correlation	107.3	108.07	0.765
3	1e+12	NDD, unbiased	107.38	107.11	-0.273
4	1e+12	NDD, unbiased	106.81	106.67	-0.137
5	1e+12	NDD, unbiased	106.17	107.23	1.063
6	5e+12	NDD, unbiased	106.13	107.57	1.446
7	5e+12	NDD, unbiased	108.67	104.37	-4.298
8	5e+12	NDD, unbiased	105.21	105.8	0.586
9	1e+13	NDD, unbiased	107.77	107.48	-0.287
10	1e+13	NDD, unbiased	105.3	110.56	5.265
11	1e+13	NDD, unbiased	105.04	106.37	1.337

Test Statistics (mV)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	107.3	107.33	107.36	0.038184	106.65	107.36	108.07	1.0041	-0.709	0.028	0.765	1.0423
1e+12	106.17	106.79	107.38	0.60683	106.67	107.01	107.23	0.29374	-0.273	0.21767	1.063	0.73523
5e+12	105.21	106.67	108.67	1.7885	104.37	105.91	107.57	1.606	-4.298	-0.75533	1.446	3.098
1e+13	105.04	106.03	107.77	1.5059	106.37	108.14	110.56	2.171	-0.287	2.105	5.265	2.8546

Device Test: 6.7 SS_I_Charge(SS_Icharge_14V)





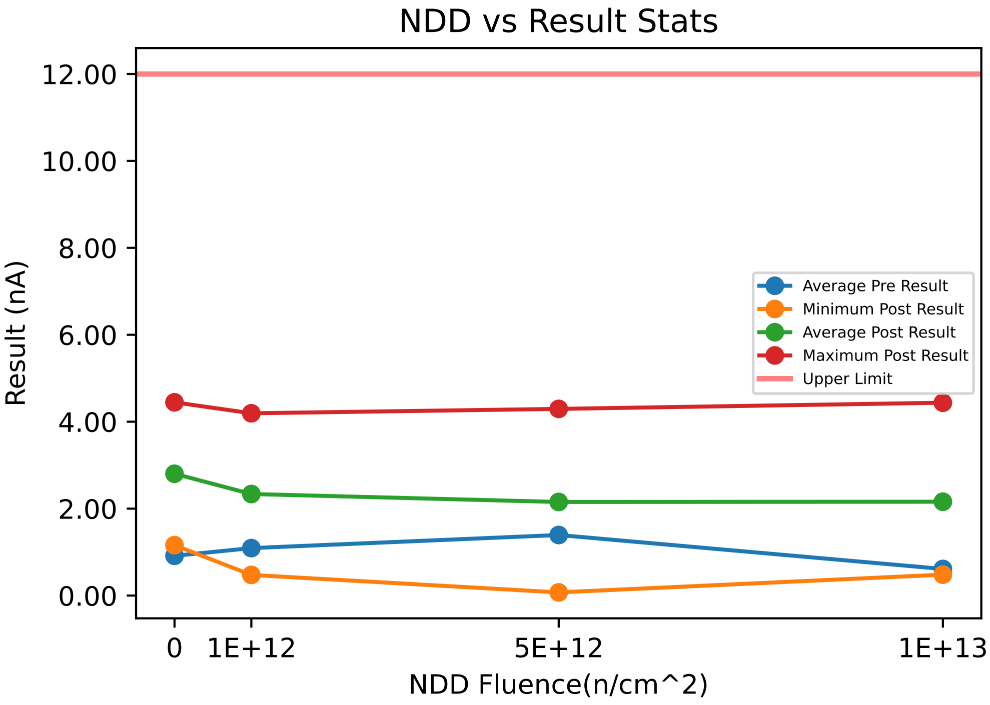
Test Results (Upper Limit = 83.0 (uA))

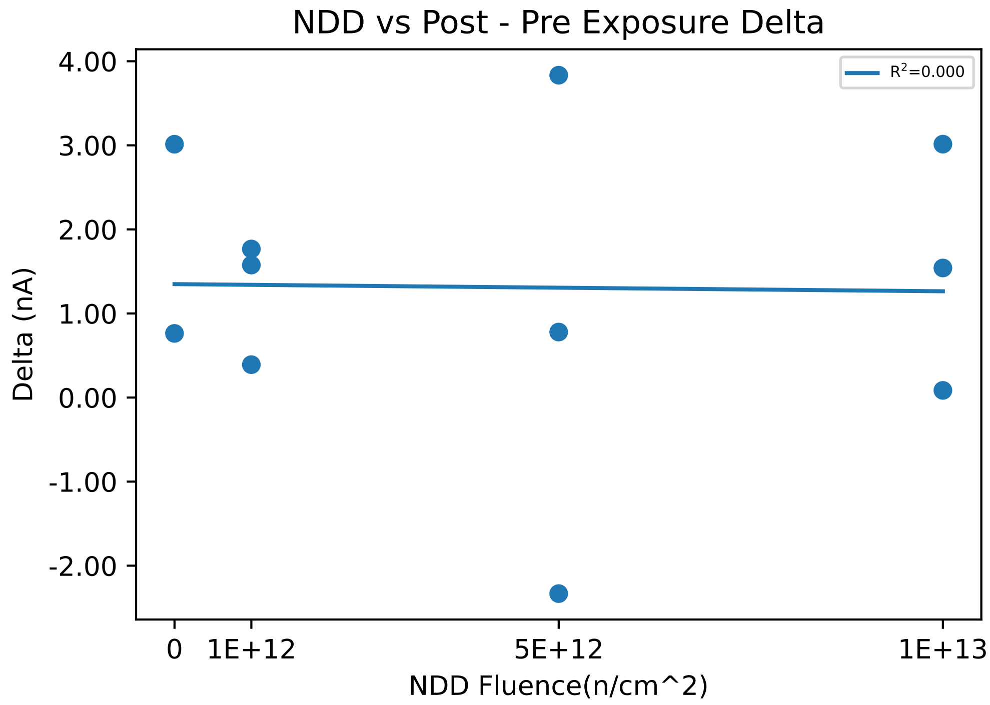
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	74.191	62.809	-11.382
2	0	Correlation	68.225	65.734	-2.491
3	1e+12	NDD, unbiased	65.233	65.476	0.243
4	1e+12	NDD, unbiased	64.09	65.81	1.72
5	1e+12	NDD, unbiased	66.855	62.83	-4.025
6	5e+12	NDD, unbiased	65.003	69.885	4.882
7	5e+12	NDD, unbiased	66.969	66.749	-0.22
8	5e+12	NDD, unbiased	66.917	65.197	-1.72
9	1e+13	NDD, unbiased	68.915	69.005	0.09
10	1e+13	NDD, unbiased	64.466	70.117	5.651
11	1e+13	NDD, unbiased	66.074	66.387	0.313

Test Statistics (uA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	68.225	71.208	74.191	4.2186	62.809	64.272	65.734	2.0683	-11.382	-6.9365	-2.491	6.2869
1e+12	64.09	65.393	66.855	1.3894	62.83	64.705	65.81	1.6326	-4.025	-0.68733	1.72	2.9834
5e+12	65.003	66.296	66.969	1.1204	65.197	67.277	69.885	2.3882	-1.72	0.98067	4.882	3.4609
1e+13	64.466	66.485	68.915	2.2528	66.387	68.503	70.117	1.915	0.09	2.018	5.651	3.1482

Device Test: 6.8 IEN_VIN(EN7p0V_I_Vin14V)





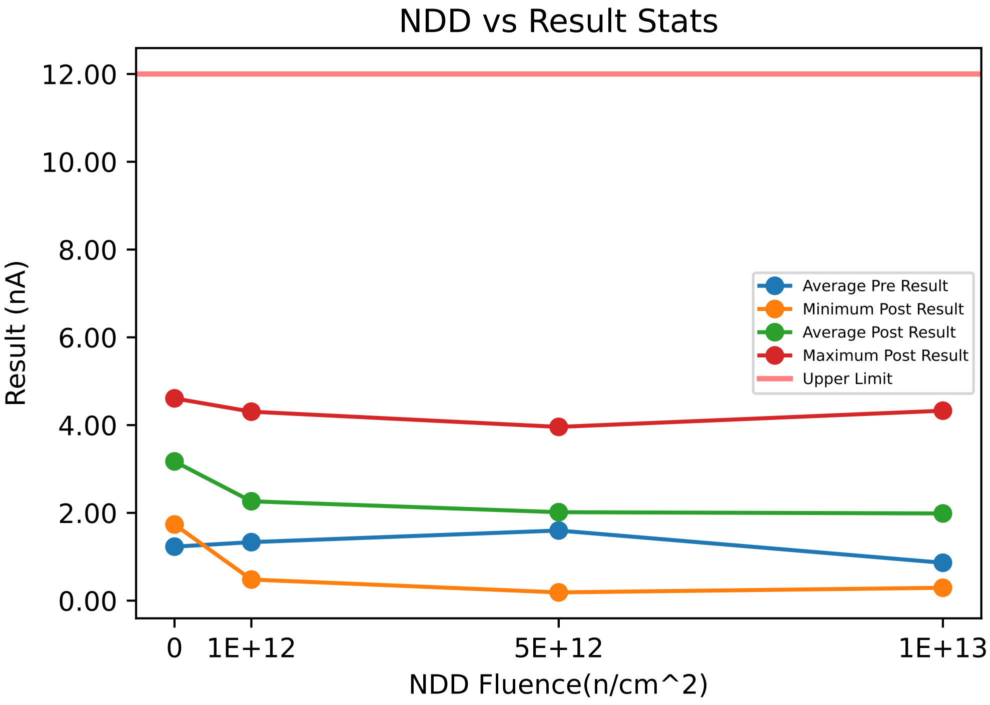
Test Results (Upper Limit = 12.0 (nA))

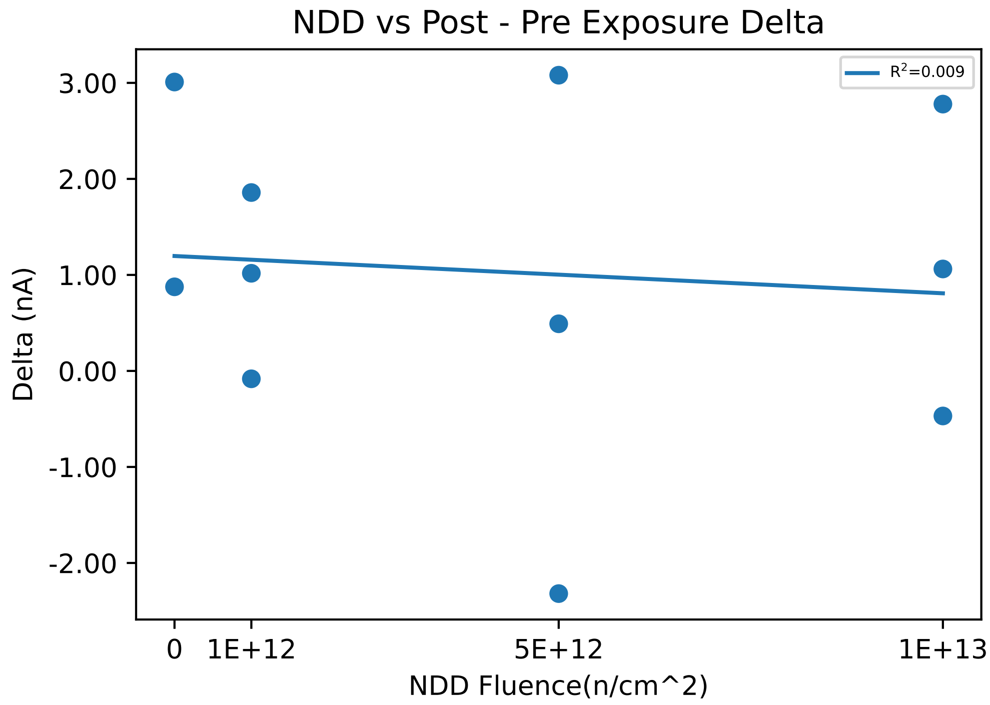
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.397	1.16	0.763
2	0	Correlation	1.433	4.446	3.013
3	1e+12	NDD, unbiased	0.765	2.341	1.576
4	1e+12	NDD, unbiased	2.427	4.194	1.767
5	1e+12	NDD, unbiased	0.084	0.475	0.391
6	5e+12	NDD, unbiased	1.314	2.093	0.779
7	5e+12	NDD, unbiased	0.461	4.295	3.834
8	5e+12	NDD, unbiased	2.405	0.073	-2.332
9	1e+13	NDD, unbiased	0.018	1.559	1.541
10	1e+13	NDD, unbiased	1.423	4.437	3.014
11	1e+13	NDD, unbiased	0.396	0.481	0.085

Test Statistics (nA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.397	0.915	1.433	0.73256	1.16	2.803	4.446	2.3236	0.763	1.888	3.013	1.591
1e+12	0.084	1.092	2.427	1.2052	0.475	2.3367	4.194	1.8595	0.391	1.2447	1.767	0.74544
5e+12	0.461	1.3933	2.405	0.97443	0.073	2.1537	4.295	2.1117	-2.332	0.76033	3.834	3.083
1e+13	0.018	0.61233	1.423	0.72705	0.481	2.159	4.437	2.0451	0.085	1.5467	3.014	1.4645

Device Test: 6.9 IEN_VIN(EN5p0V_I_Vin14V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

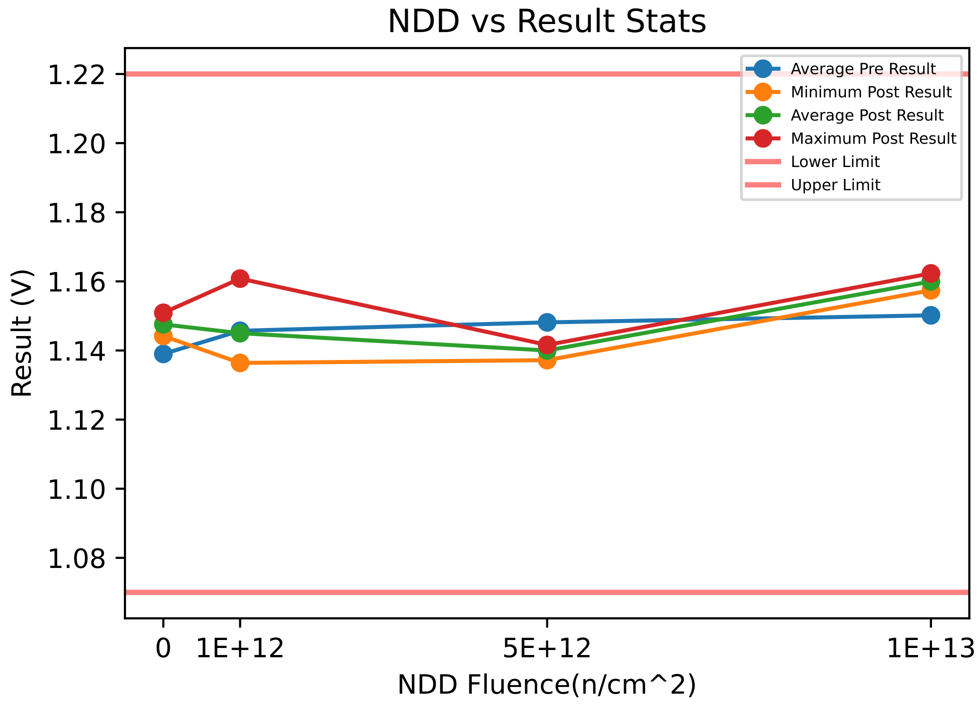
Test Results (Upper Limit = 12.0 (nA))

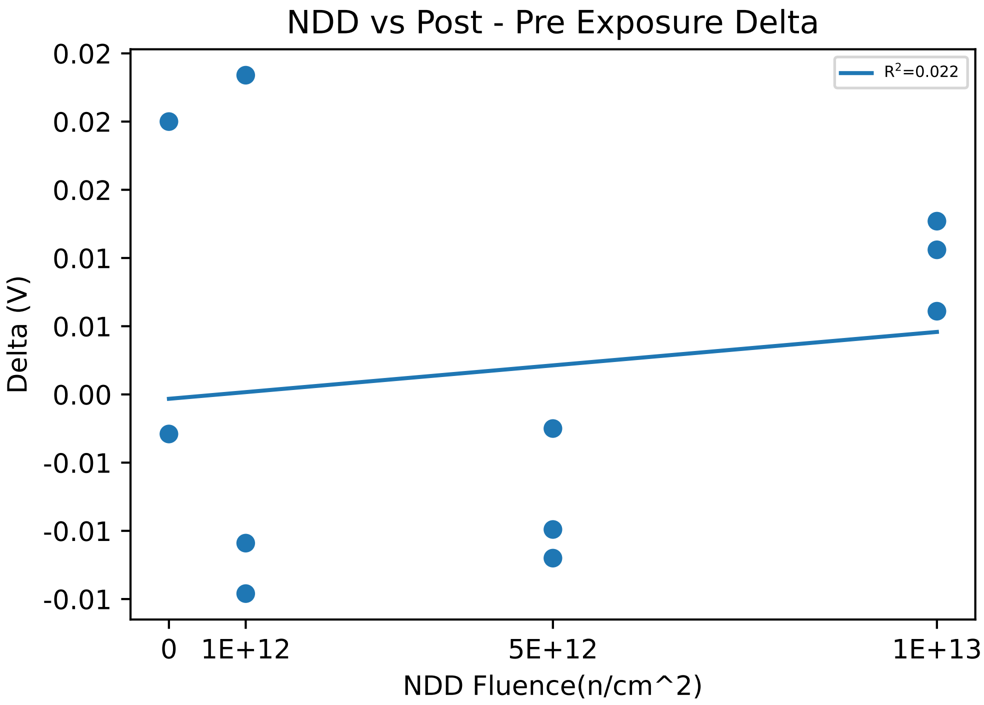
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.86	1.736	0.876
2	0	Correlation	1.6	4.609	3.009
3	1e+12	NDD, unbiased	0.988	2.005	1.017
4	1e+12	NDD, unbiased	2.448	4.306	1.858
5	1e+12	NDD, unbiased	0.563	0.481	-0.082
6	5e+12	NDD, unbiased	1.409	1.9	0.491
7	5e+12	NDD, unbiased	0.879	3.959	3.08
8	5e+12	NDD, unbiased	2.507	0.188	-2.319
9	1e+13	NDD, unbiased	0.278	1.34	1.062
10	1e+13	NDD, unbiased	1.549	4.328	2.779
11	1e+13	NDD, unbiased	0.762	0.293	-0.469

Test Statistics (nA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.86	1.23	1.6	0.52326	1.736	3.1725	4.609	2.0315	0.876	1.9425	3.009	1.5083
1e+12	0.563	1.333	2.448	0.98872	0.481	2.264	4.306	1.9256	-0.082	0.931	1.858	0.97286
5e+12	0.879	1.5983	2.507	0.83035	0.188	2.0157	3.959	1.8882	-2.319	0.41733	3.08	2.7003
1e+13	0.278	0.863	1.549	0.64149	0.293	1.987	4.328	2.0939	-0.469	1.124	2.779	1.6249

Device Test: 7.0 OVP_VTH_Rising_PLASTIC(OVP_UVLO_RISING_4p5V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

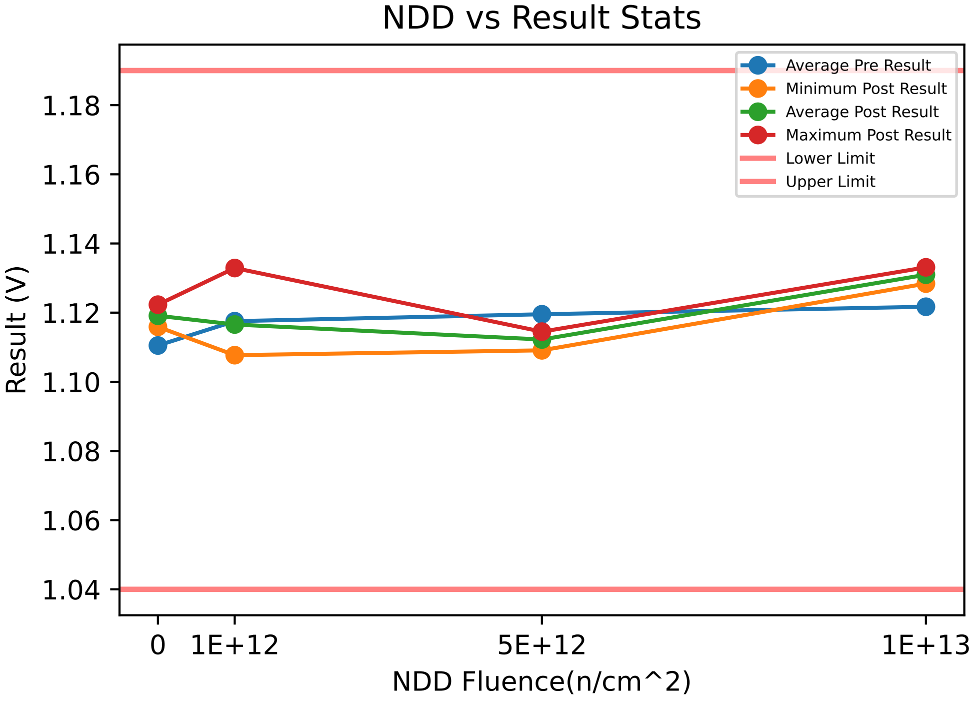
Test Results (Lower Limit = 1.07, Upper Limit = 1.22 (V))

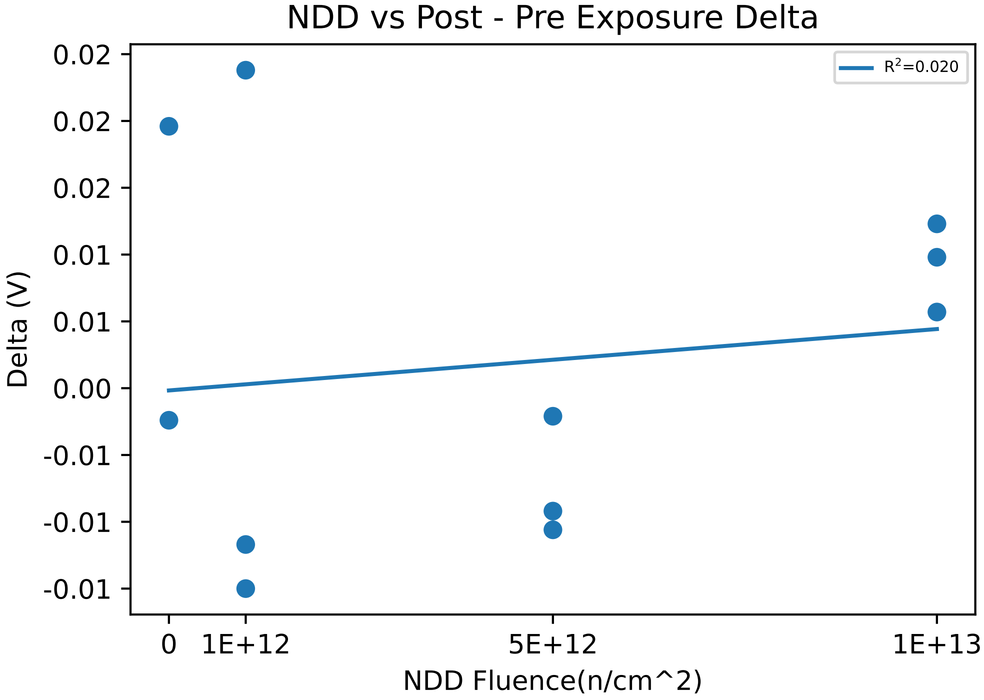
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	1.1471	1.1442	-0.0029
2	0	Correlation	1.1309	1.1509	0.02
3	1e+12	NDD, unbiased	1.1524	1.1378	-0.0146
4	1e+12	NDD, unbiased	1.1374	1.1608	0.0234
5	1e+12	NDD, unbiased	1.1473	1.1364	-0.0109
6	5e+12	NDD, unbiased	1.1536	1.1416	-0.012
7	5e+12	NDD, unbiased	1.1471	1.1372	-0.0099
8	5e+12	NDD, unbiased	1.1437	1.1412	-0.0025
9	1e+13	NDD, unbiased	1.1513	1.1574	0.0061
10	1e+13	NDD, unbiased	1.1496	1.1623	0.0127
11	1e+13	NDD, unbiased	1.1496	1.1602	0.0106

Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	1.1309	1.139	1.1471	0.011455	1.1442	1.1476	1.1509	0.0047376	-0.0029	0.00855	0.02	0.016193
1e+12	1.1374	1.1457	1.1524	0.0076269	1.1364	1.145	1.1608	0.013701	-0.0146	-0.0007	0.0234	0.020953
5e+12	1.1437	1.1481	1.1536	0.0050302	1.1372	1.14	1.1416	0.0024331	-0.012	-0.0081333	-0.0025	0.0049903
1e+13	1.1496	1.1502	1.1513	0.0009815	1.1574	1.16	1.1623	0.0024583	0.0061	0.0098	0.0127	0.0033719

Device Test: 7.1 OVP_VTH_Falling_PLASTIC(OVP_UVLO_FALLING_4p5V)





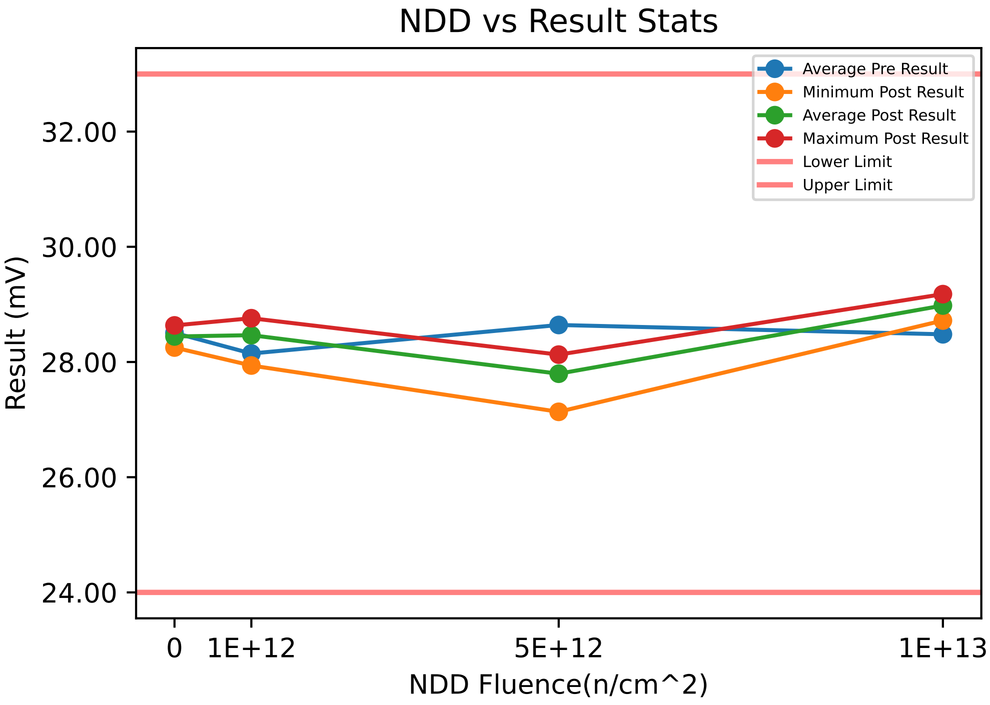
Test Results (Lower Limit = 1.04, Upper Limit = 1.19 (V))

Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	1.1183	1.1159	-0.0024
2	0	Correlation	1.1027	1.1223	0.0196
3	1e+12	NDD, unbiased	1.1241	1.1091	-0.015
4	1e+12	NDD, unbiased	1.1091	1.1329	0.0238
5	1e+12	NDD, unbiased	1.1194	1.1077	-0.0117
6	5e+12	NDD, unbiased	1.1251	1.1145	-0.0106
7	5e+12	NDD, unbiased	1.1183	1.1091	-0.0092
8	5e+12	NDD, unbiased	1.1152	1.1131	-0.0021
9	1e+13	NDD, unbiased	1.1227	1.1284	0.0057
10	1e+13	NDD, unbiased	1.1208	1.1331	0.0123
11	1e+13	NDD, unbiased	1.1216	1.1314	0.0098

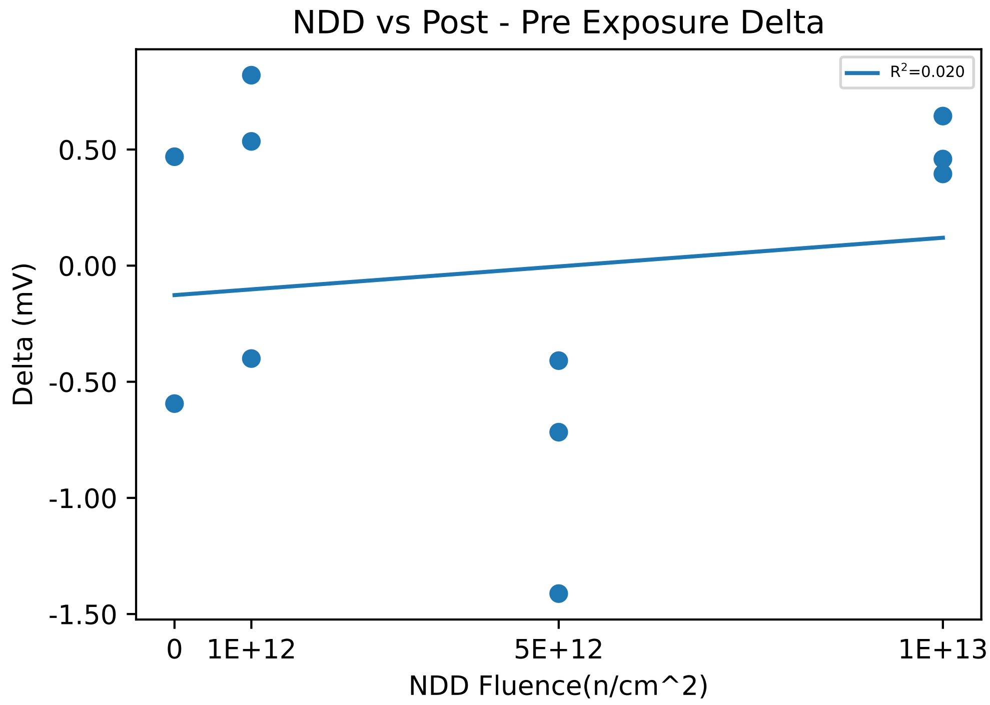
Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	1.1027	1.1105	1.1183	0.011031	1.1159	1.1191	1.1223	0.0045255	-0.0024	0.0086	0.0196	0.015556
1e+12	1.1091	1.1175	1.1241	0.0076722	1.1077	1.1166	1.1329	0.014162	-0.015	-0.00096667	0.0238	0.021512
5e+12	1.1152	1.1195	1.1251	0.0050639	1.1091	1.1122	1.1145	0.0028024	-0.0106	-0.0073	-0.0021	0.0045574
1e+13	1.1208	1.1217	1.1227	0.00095394	1.1284	1.131	1.1331	0.0023798	0.0057	0.0092667	0.0123	0.0033322

Device Test: 7.2 OVP_HYST_PLASTIC(OVP_UVLO_HYSTERESIS_4p5V)



NDD vs Result Stats



NDD vs Post - Pre Exposure Delta

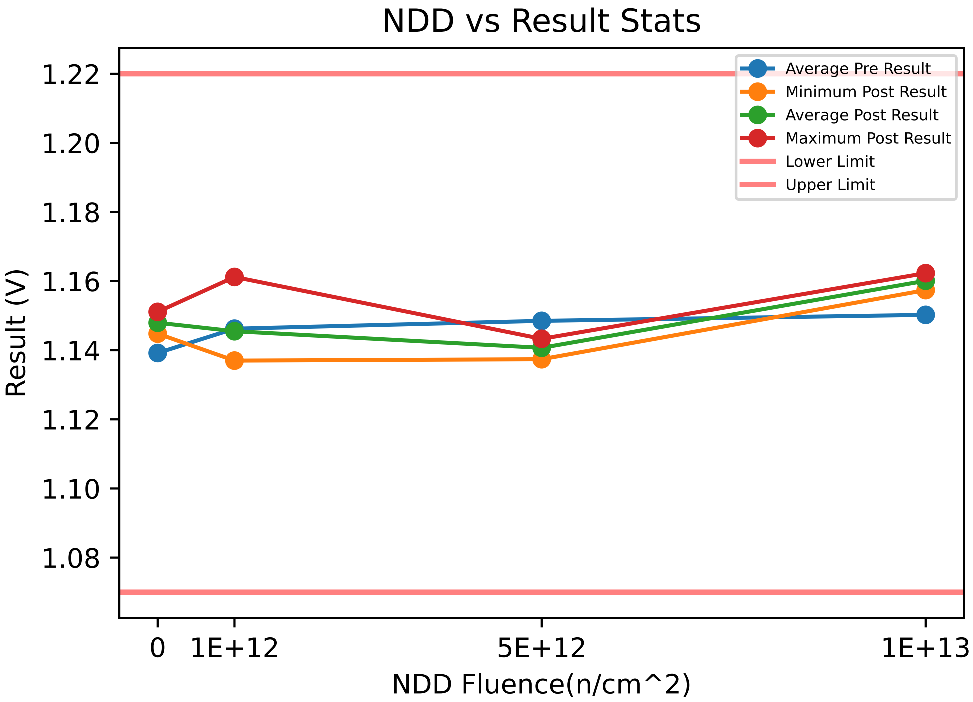
Test Results (Lower Limit = 24.0, Upper Limit = 33.0 (mV))

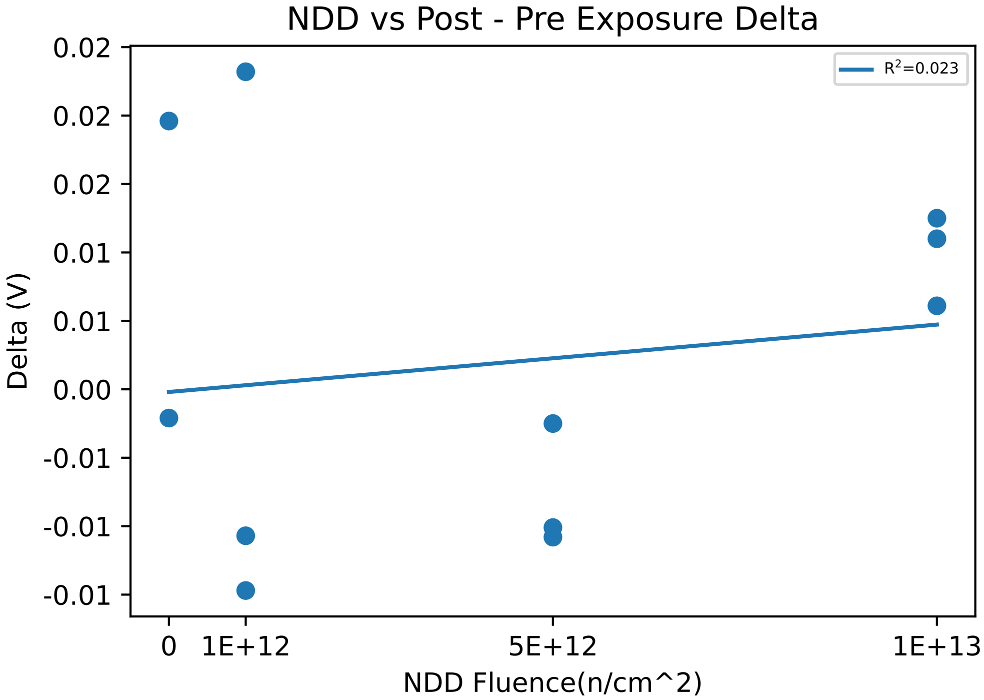
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	28.845	28.251	-0.594
2	0	Correlation	28.166	28.635	0.469
3	1e+12	NDD, unbiased	28.225	28.76	0.535
4	1e+12	NDD, unbiased	28.339	27.939	-0.4
5	1e+12	NDD, unbiased	27.878	28.698	0.82
6	5e+12	NDD, unbiased	28.547	27.135	-1.412
7	5e+12	NDD, unbiased	28.845	28.128	-0.717
8	5e+12	NDD, unbiased	28.536	28.127	-0.409
9	1e+13	NDD, unbiased	28.584	29.043	0.459
10	1e+13	NDD, unbiased	28.783	29.178	0.395
11	1e+13	NDD, unbiased	28.076	28.72	0.644

Test Statistics (mV)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	28.166	28.505	28.845	0.48013	28.251	28.443	28.635	0.27153	-0.594	-0.0625	0.469	0.75165
1e+12	27.878	28.147	28.339	0.24011	27.939	28.466	28.76	0.45716	-0.4	0.31833	0.82	0.63821
5e+12	28.536	28.643	28.845	0.17531	27.135	27.797	28.128	0.57302	-1.412	-0.846	-0.409	0.51379
1e+13	28.076	28.481	28.783	0.36458	28.72	28.98	29.178	0.23534	0.395	0.49933	0.644	0.12931

Device Test: 7.3 OVP_VTH_Rising_PLASTIC(OVP_UVLO_RISING_14p0V)





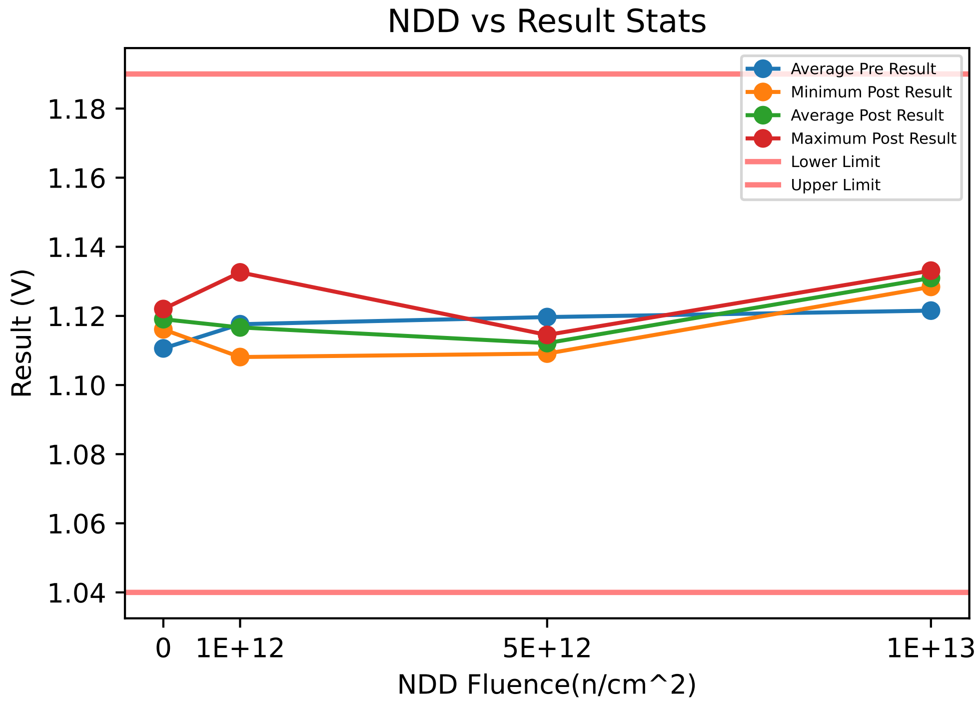
Test Results (Lower Limit = 1.07, Upper Limit = 1.22 (V))

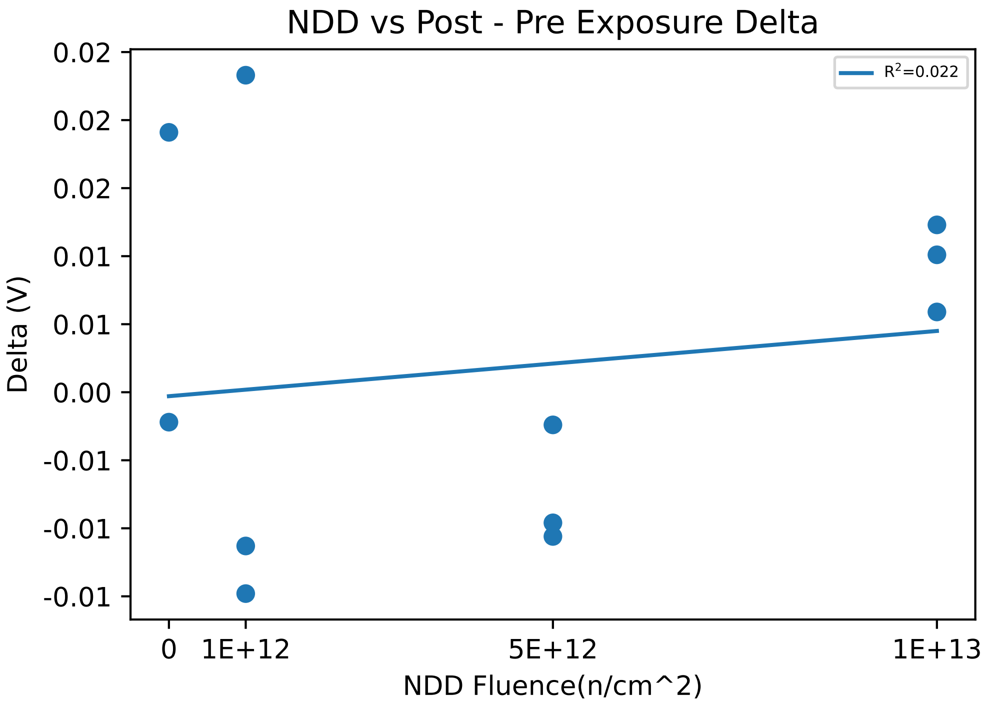
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	1.1469	1.1448	-0.0021
2	0	Correlation	1.1315	1.1511	0.0196
3	1e+12	NDD, unbiased	1.153	1.1383	-0.0147
4	1e+12	NDD, unbiased	1.138	1.1612	0.0232
5	1e+12	NDD, unbiased	1.1477	1.137	-0.0107
6	5e+12	NDD, unbiased	1.1541	1.1433	-0.0108
7	5e+12	NDD, unbiased	1.1475	1.1374	-0.0101
8	5e+12	NDD, unbiased	1.1439	1.1414	-0.0025
9	1e+13	NDD, unbiased	1.1513	1.1574	0.0061
10	1e+13	NDD, unbiased	1.1498	1.1623	0.0125
11	1e+13	NDD, unbiased	1.1496	1.1606	0.011

Test Statistics (V)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	1.1315	1.1392	1.1469	0.010889	1.1448	1.148	1.1511	0.0044548	-0.0021	0.00875	0.0196	0.015344
1e+12	1.138	1.1462	1.153	0.0076068	1.137	1.1455	1.1612	0.013612	-0.0147	-0.00073333	0.0232	0.020823
5e+12	1.1439	1.1485	1.1541	0.005173	1.1374	1.1407	1.1433	0.0030116	-0.0108	-0.0078	-0.0025	0.0046033
1e+13	1.1496	1.1502	1.1513	0.00092916	1.1574	1.1601	1.1623	0.002488	0.0061	0.0098667	0.0125	0.0033471

Device Test: 7.4 OVP_VTH_Falling_PLASTIC(OVP_UVLO_FALLING_14p0V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

Test Results (Lower Limit = 1.04, Upper Limit = 1.19 (V))

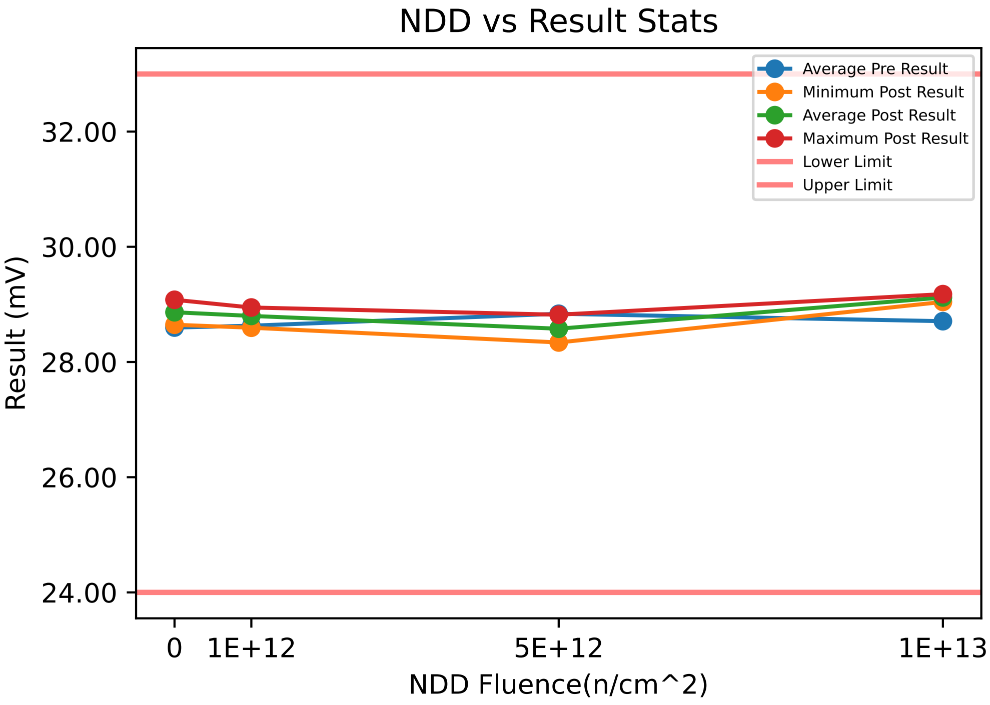
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	1.1183	1.1161	-0.0022
2	0	Correlation	1.1029	1.122	0.0191
3	1e+12	NDD, unbiased	1.1241	1.1093	-0.0148
4	1e+12	NDD, unbiased	1.1093	1.1326	0.0233
5	1e+12	NDD, unbiased	1.1194	1.1081	-0.0113
6	5e+12	NDD, unbiased	1.1251	1.1145	-0.0106
7	5e+12	NDD, unbiased	1.1187	1.1091	-0.0096
8	5e+12	NDD, unbiased	1.1152	1.1128	-0.0024
9	1e+13	NDD, unbiased	1.1225	1.1284	0.0059
10	1e+13	NDD, unbiased	1.1208	1.1331	0.0123
11	1e+13	NDD, unbiased	1.1213	1.1314	0.0101

Test Statistics (V)

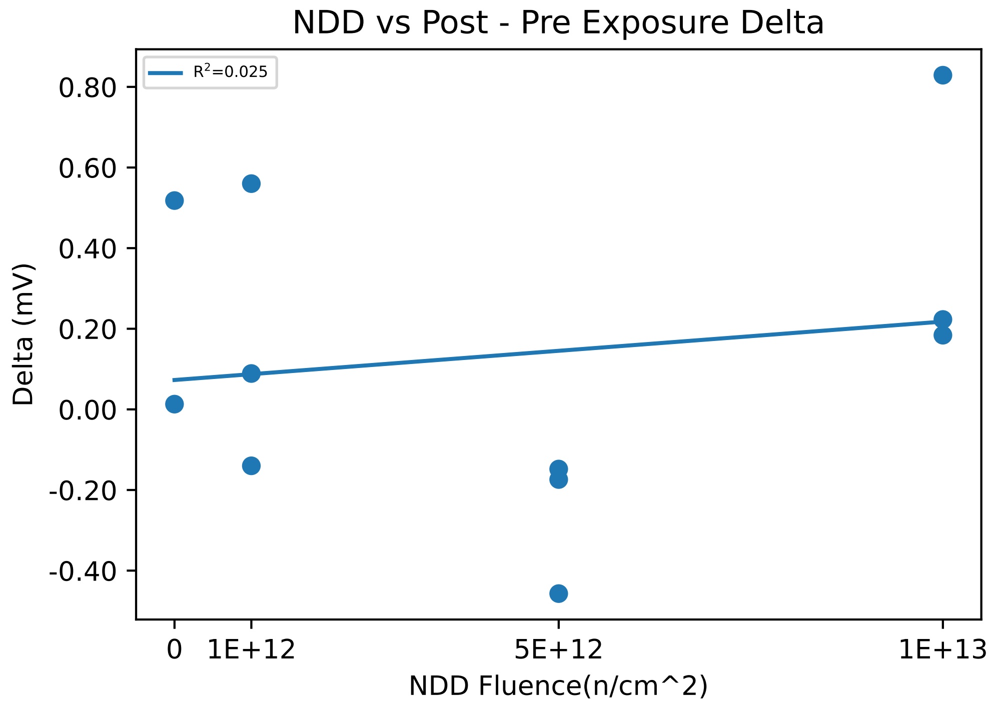
Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	1.1029	1.1106	1.1183	0.010889	1.1161	1.1191	1.122	0.0041719	-0.0022	0.00845	0.0191	0.015061
1e+12	1.1093	1.1176	1.1241	0.0075624	1.1081	1.1167	1.1326	0.013812	-0.0148	-0.00093333	0.0233	0.02106
5e+12	1.1152	1.1197	1.1251	0.0050203	1.1091	1.1121	1.1145	0.002761	-0.0106	-0.0075333	-0.0024	0.0044736
1e+13	1.1208	1.1215	1.1225	0.00087369	1.1284	1.131	1.1331	0.0023798	0.0059	0.0094333	0.0123	0.0032517

Device Test: 7.5 OVP_HYST_PLASTIC(OVP_UVLO_HYSTERESIS_14p0V)

NDD vs Result Stats



NDD vs Post - Pre Exposure Delta



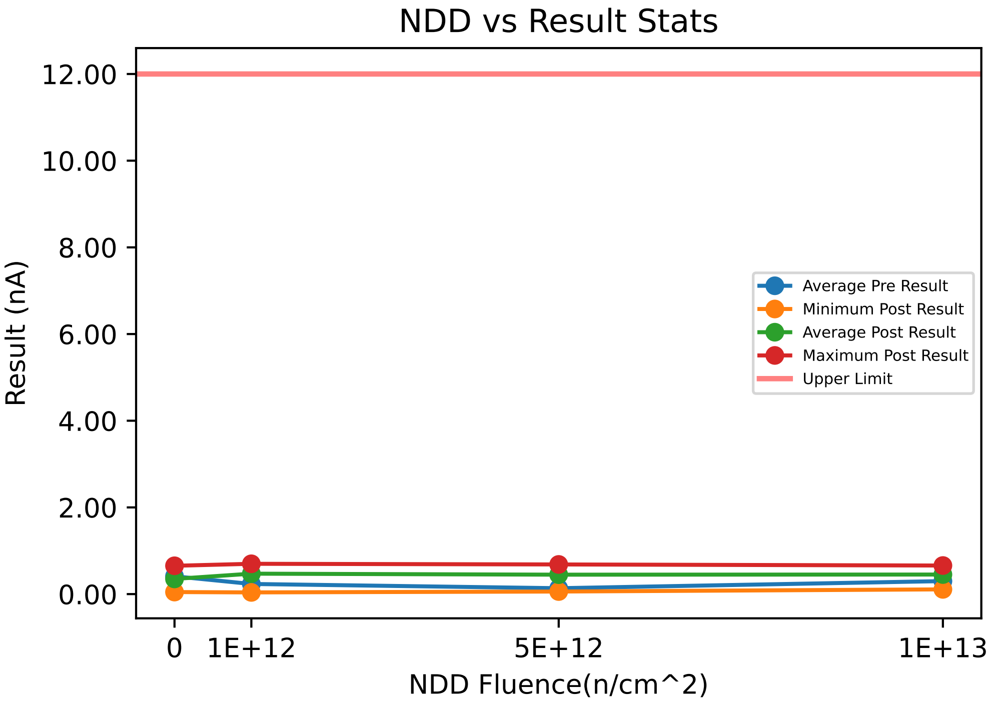
Test Results (Lower Limit = 24.0, Upper Limit = 33.0 (mV))

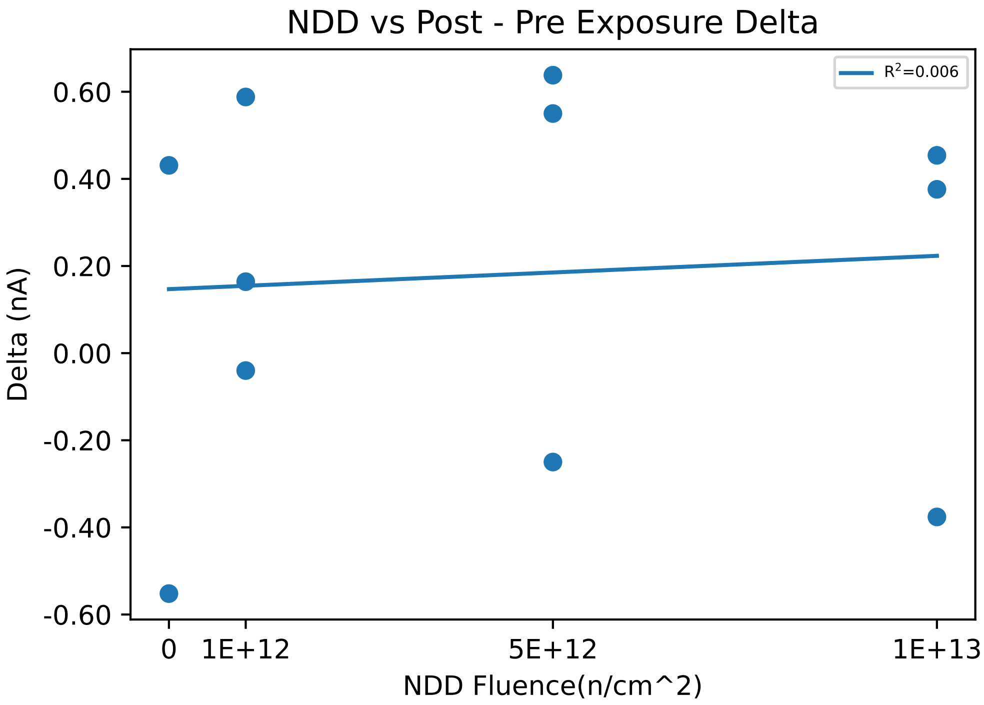
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	28.634	28.647	0.013
2	0	Correlation	28.562	29.08	0.518
3	1e+12	NDD, unbiased	28.857	28.946	0.089
4	1e+12	NDD, unbiased	28.735	28.595	-0.14
5	1e+12	NDD, unbiased	28.299	28.859	0.56
6	5e+12	NDD, unbiased	28.969	28.821	-0.148
7	5e+12	NDD, unbiased	28.796	28.339	-0.457
8	5e+12	NDD, unbiased	28.747	28.573	-0.174
9	1e+13	NDD, unbiased	28.82	29.043	0.223
10	1e+13	NDD, unbiased	28.994	29.178	0.184
11	1e+13	NDD, unbiased	28.312	29.141	0.829

Test Statistics (mV)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	28.562	28.598	28.634	0.050912	28.647	28.863	29.08	0.30618	0.013	0.2655	0.518	0.35709
1e+12	28.299	28.63	28.857	0.29336	28.595	28.8	28.946	0.18279	-0.14	0.16967	0.56	0.3569
5e+12	28.747	28.837	28.969	0.11663	28.339	28.578	28.821	0.24103	-0.457	-0.25967	-0.148	0.17139
1e+13	28.312	28.709	28.994	0.35437	29.043	29.121	29.178	0.069759	0.184	0.412	0.829	0.36166

Device Test: 7.6 OVP_ILEAK(OVP_I_Vin7V)





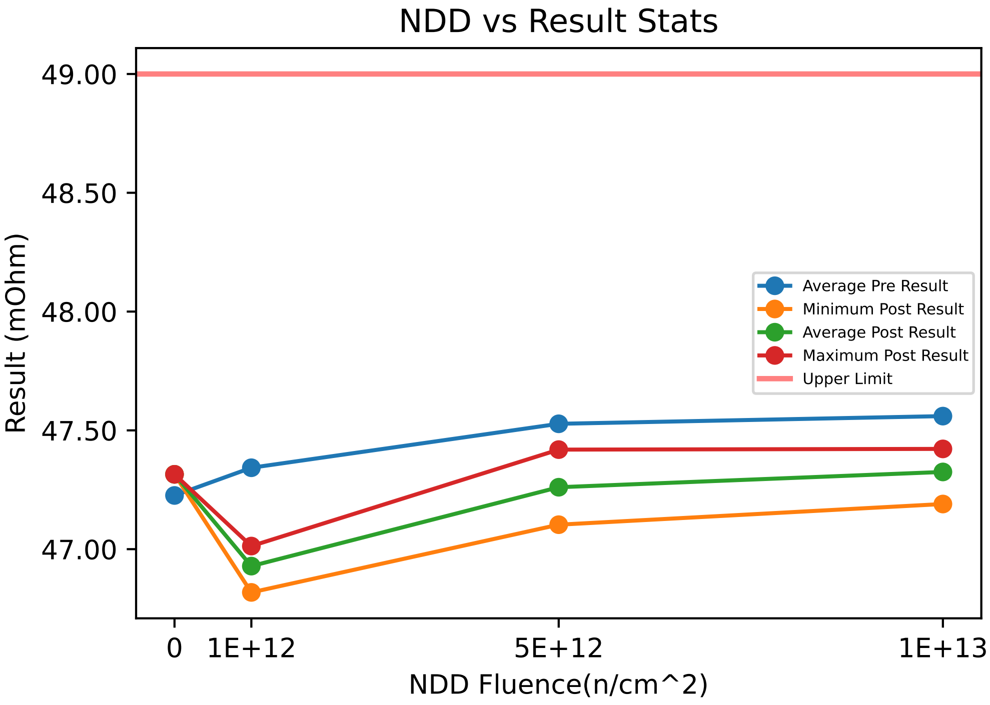
Test Results (Upper Limit = 12.0 (nA))

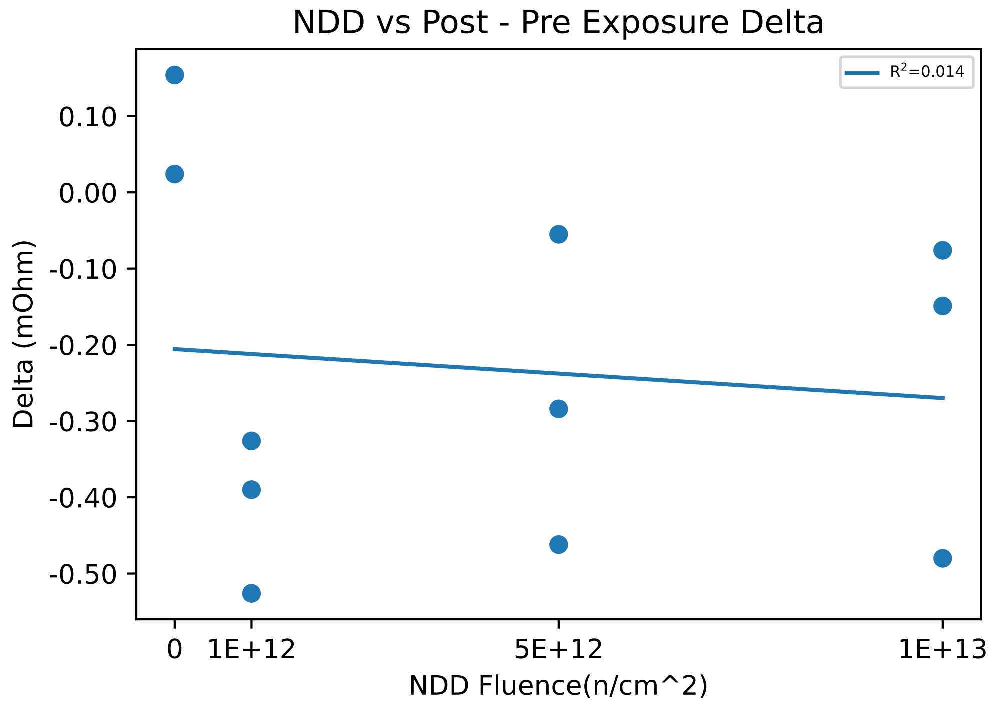
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	0.599	0.047	-0.552
2	0	Correlation	0.222	0.653	0.431
3	1e+12	NDD, unbiased	0.079	0.039	-0.04
4	1e+12	NDD, unbiased	0.111	0.699	0.588
5	1e+12	NDD, unbiased	0.511	0.675	0.164
6	5e+12	NDD, unbiased	0.309	0.059	-0.25
7	5e+12	NDD, unbiased	0.046	0.684	0.638
8	5e+12	NDD, unbiased	0.051	0.601	0.55
9	1e+13	NDD, unbiased	0.485	0.109	-0.376
10	1e+13	NDD, unbiased	0.283	0.659	0.376
11	1e+13	NDD, unbiased	0.131	0.585	0.454

Test Statistics (nA)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	0.222	0.4105	0.599	0.26658	0.047	0.35	0.653	0.42851	-0.552	-0.0605	0.431	0.69509
1e+12	0.079	0.23367	0.511	0.24071	0.039	0.471	0.699	0.37432	-0.04	0.23733	0.588	0.32036
5e+12	0.046	0.13533	0.309	0.15042	0.059	0.448	0.684	0.33943	-0.25	0.31267	0.638	0.48927
1e+13	0.131	0.29967	0.485	0.17759	0.109	0.451	0.659	0.29848	-0.376	0.15133	0.454	0.45835

Device Test: 8.0 RON_VIN_4P5V_25_PLASTIC(RdsOn_3p50A_4p5V)


NDD vs Result Stats


NDD vs Post - Pre Exposure Delta

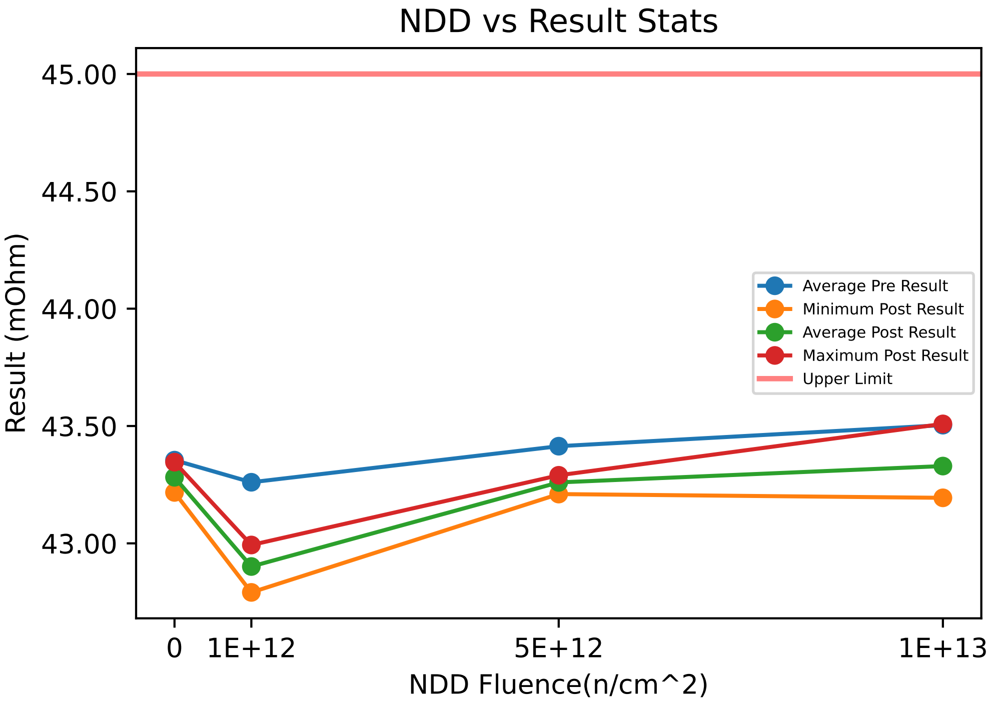
Test Results (Upper Limit = 49.0 (mOhm))

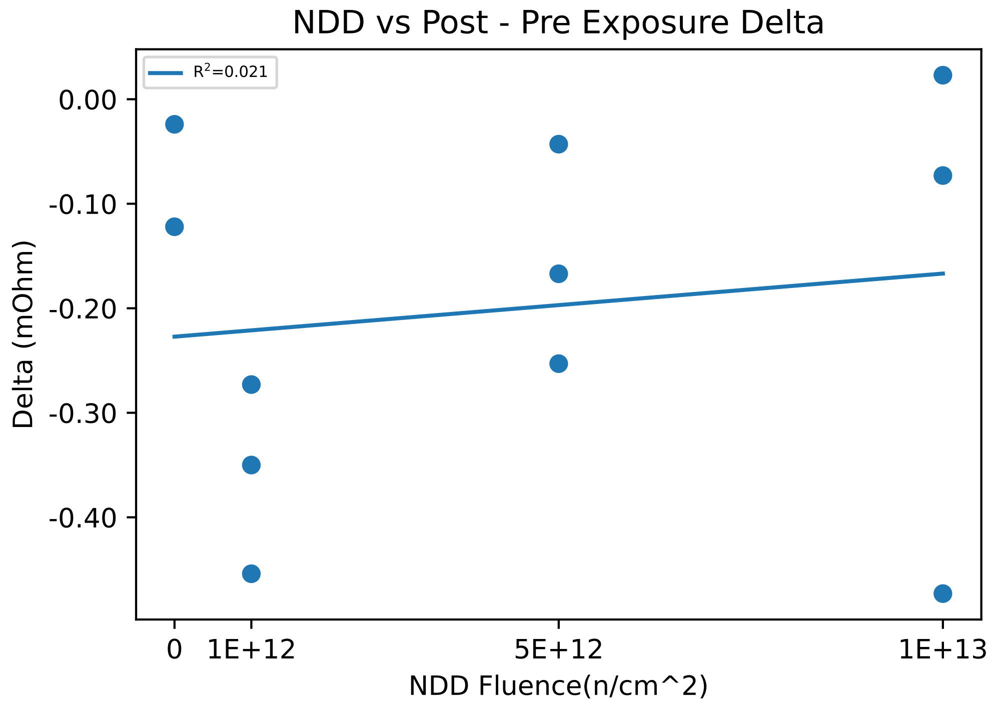
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	47.291	47.315	0.024
2	0	Correlation	47.161	47.315	0.154
3	1e+12	NDD, unbiased	47.345	46.955	-0.39
4	1e+12	NDD, unbiased	47.144	46.818	-0.326
5	1e+12	NDD, unbiased	47.539	47.013	-0.526
6	5e+12	NDD, unbiased	47.565	47.103	-0.462
7	5e+12	NDD, unbiased	47.474	47.419	-0.055
8	5e+12	NDD, unbiased	47.544	47.26	-0.284
9	1e+13	NDD, unbiased	47.67	47.19	-0.48
10	1e+13	NDD, unbiased	47.439	47.363	-0.076
11	1e+13	NDD, unbiased	47.571	47.422	-0.149

Test Statistics (mOhm)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	47.161	47.226	47.291	0.091924	47.315	47.315	47.315	0	0.024	0.089	0.154	0.091924
1e+12	47.144	47.343	47.539	0.19751	46.818	46.929	47.013	0.10013	-0.526	-0.414	-0.326	0.10214
5e+12	47.474	47.528	47.565	0.047648	47.103	47.261	47.419	0.158	-0.462	-0.267	-0.055	0.20403
1e+13	47.439	47.56	47.67	0.11589	47.19	47.325	47.422	0.12058	-0.48	-0.235	-0.076	0.21529

Device Test: 8.1 RON_VIN_6V_25_PLASTIC(RdsOn_3p50A_6p0V)





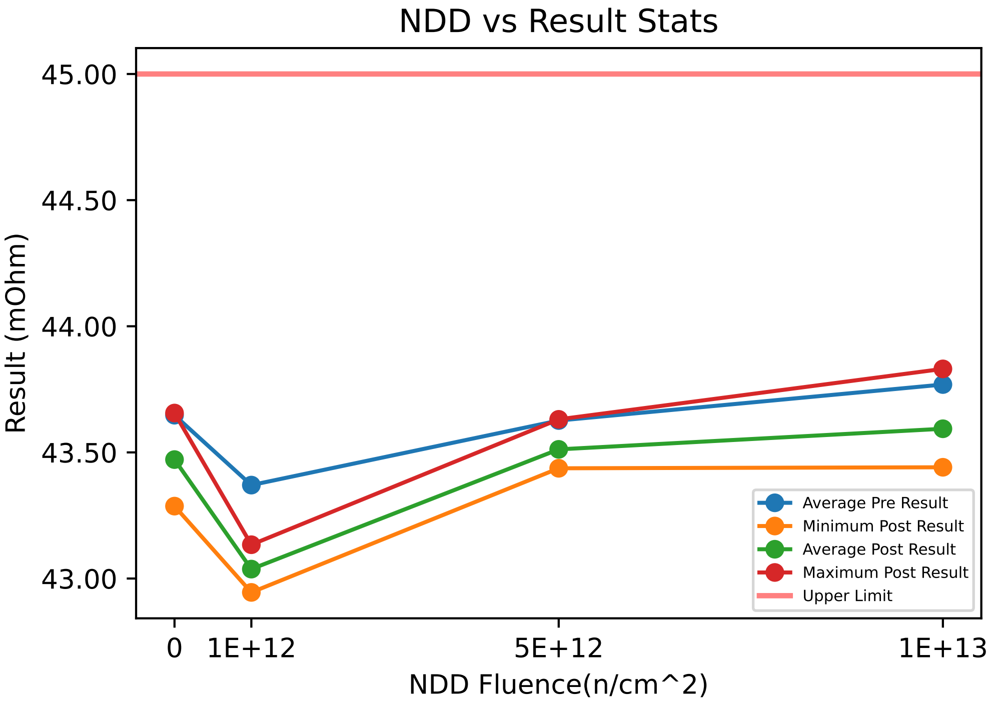
Test Results (Upper Limit = 45.0 (mOhm))

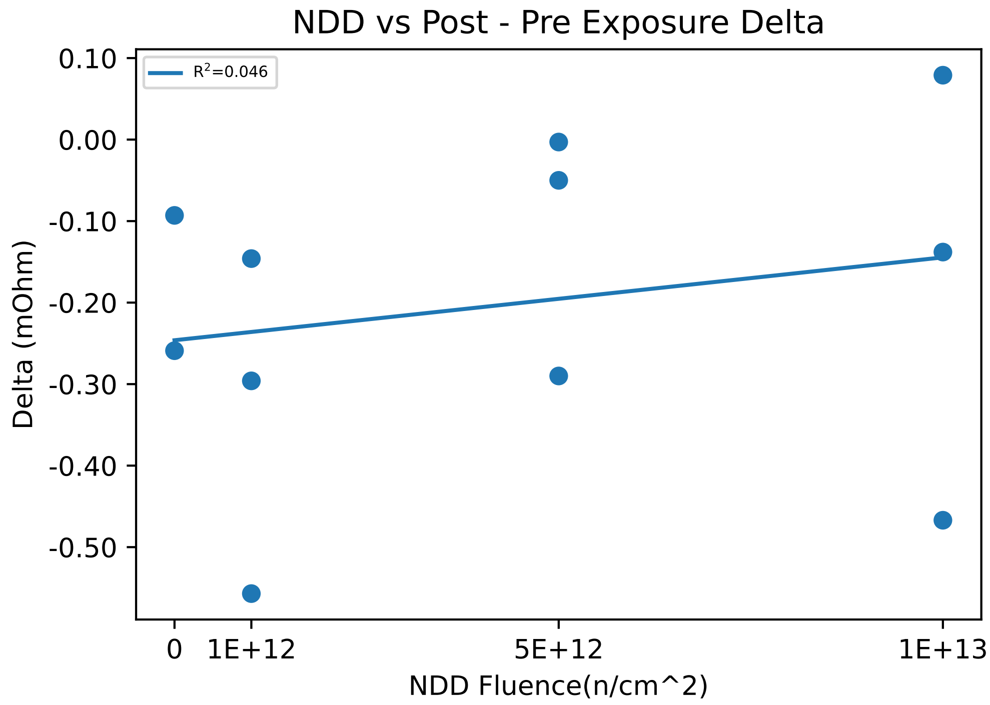
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	43.241	43.217	-0.024
2	0	Correlation	43.468	43.346	-0.122
3	1e+12	NDD, unbiased	43.27	42.92	-0.35
4	1e+12	NDD, unbiased	43.064	42.791	-0.273
5	1e+12	NDD, unbiased	43.447	42.993	-0.454
6	5e+12	NDD, unbiased	43.446	43.279	-0.167
7	5e+12	NDD, unbiased	43.333	43.29	-0.043
8	5e+12	NDD, unbiased	43.463	43.21	-0.253
9	1e+13	NDD, unbiased	43.667	43.194	-0.473
10	1e+13	NDD, unbiased	43.358	43.285	-0.073
11	1e+13	NDD, unbiased	43.486	43.509	0.023

Test Statistics (mOhm)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	43.241	43.355	43.468	0.16051	43.217	43.281	43.346	0.091217	-0.122	-0.073	-0.024	0.069296
1e+12	43.064	43.26	43.447	0.19168	42.791	42.901	42.993	0.10229	-0.454	-0.359	-0.273	0.090835
5e+12	43.333	43.414	43.463	0.070661	43.21	43.26	43.29	0.043363	-0.253	-0.15433	-0.043	0.10557
1e+13	43.358	43.504	43.667	0.15526	43.194	43.329	43.509	0.16211	-0.473	-0.17433	0.023	0.26307

Device Test: 8.2 RON_VIN_9V_25_PLASTIC(RdsOn_3p50A_9p0V)





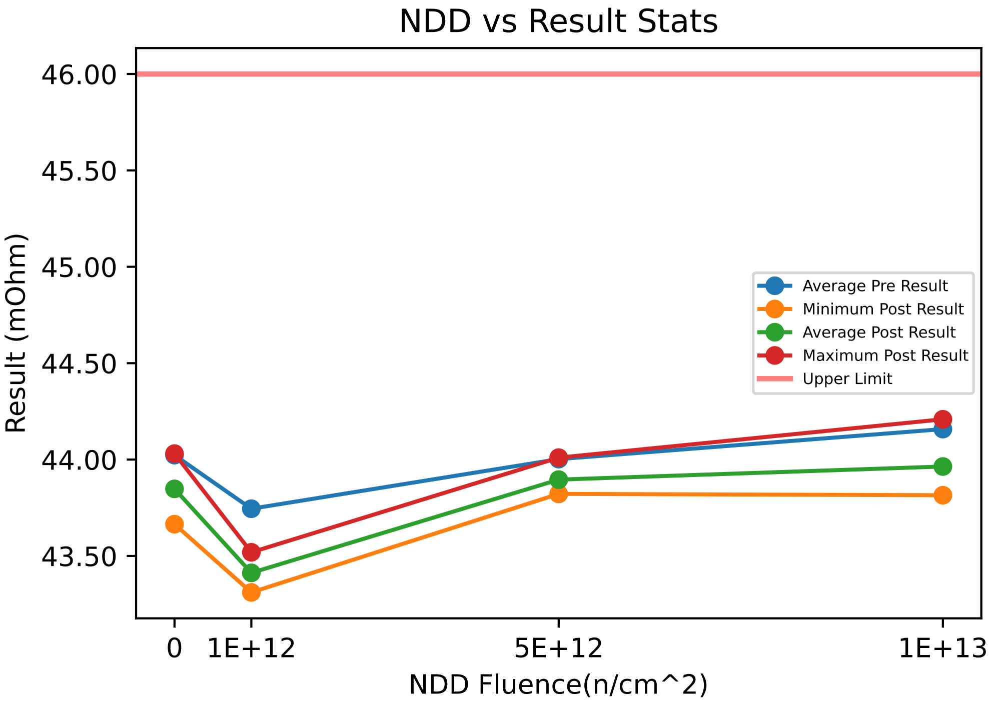
Test Results (Upper Limit = 45.0 (mOhm))

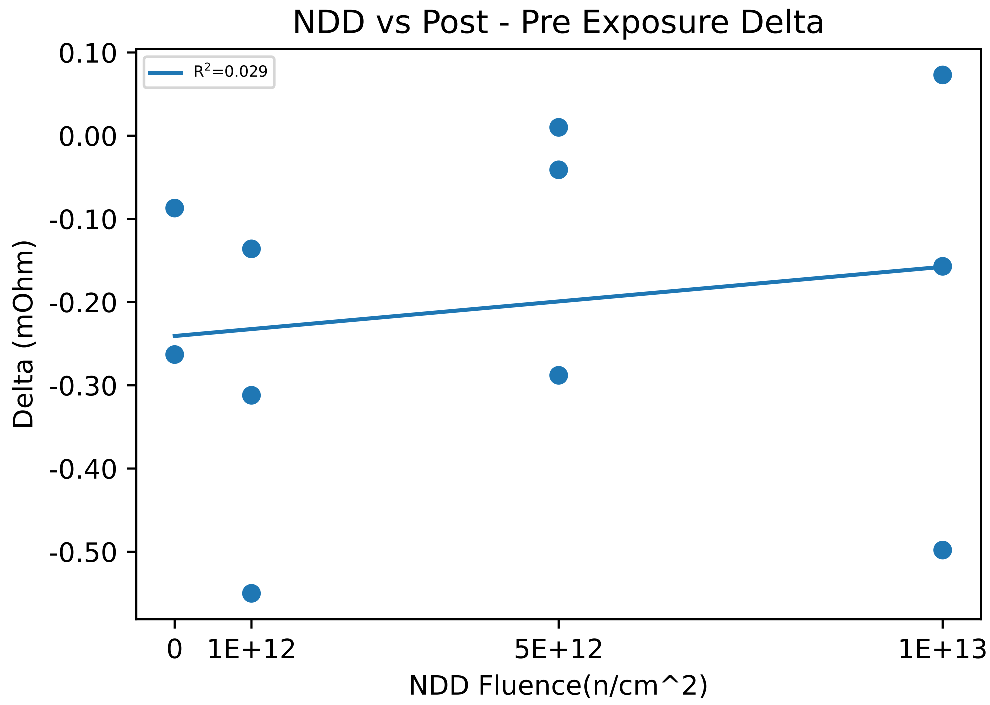
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	43.546	43.287	-0.259
2	0	Correlation	43.749	43.656	-0.093
3	1e+12	NDD, unbiased	43.28	43.134	-0.146
4	1e+12	NDD, unbiased	43.241	42.945	-0.296
5	1e+12	NDD, unbiased	43.59	43.033	-0.557
6	5e+12	NDD, unbiased	43.634	43.631	-0.003
7	5e+12	NDD, unbiased	43.487	43.437	-0.05
8	5e+12	NDD, unbiased	43.758	43.468	-0.29
9	1e+13	NDD, unbiased	43.976	43.509	-0.467
10	1e+13	NDD, unbiased	43.579	43.441	-0.138
11	1e+13	NDD, unbiased	43.752	43.831	0.079

Test Statistics (mOhm)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	43.546	43.648	43.749	0.14354	43.287	43.471	43.656	0.26092	-0.259	-0.176	-0.093	0.11738
1e+12	43.241	43.37	43.59	0.19123	42.945	43.037	43.134	0.094574	-0.557	-0.333	-0.146	0.20798
5e+12	43.487	43.626	43.758	0.13566	43.437	43.512	43.631	0.10422	-0.29	-0.11433	-0.003	0.15394
1e+13	43.579	43.769	43.976	0.19905	43.441	43.594	43.831	0.20833	-0.467	-0.17533	0.079	0.27491

Device Test: 8.3 RON_VIN_12V_25_PLASTIC(RdsOn_3p50A_12p0V)





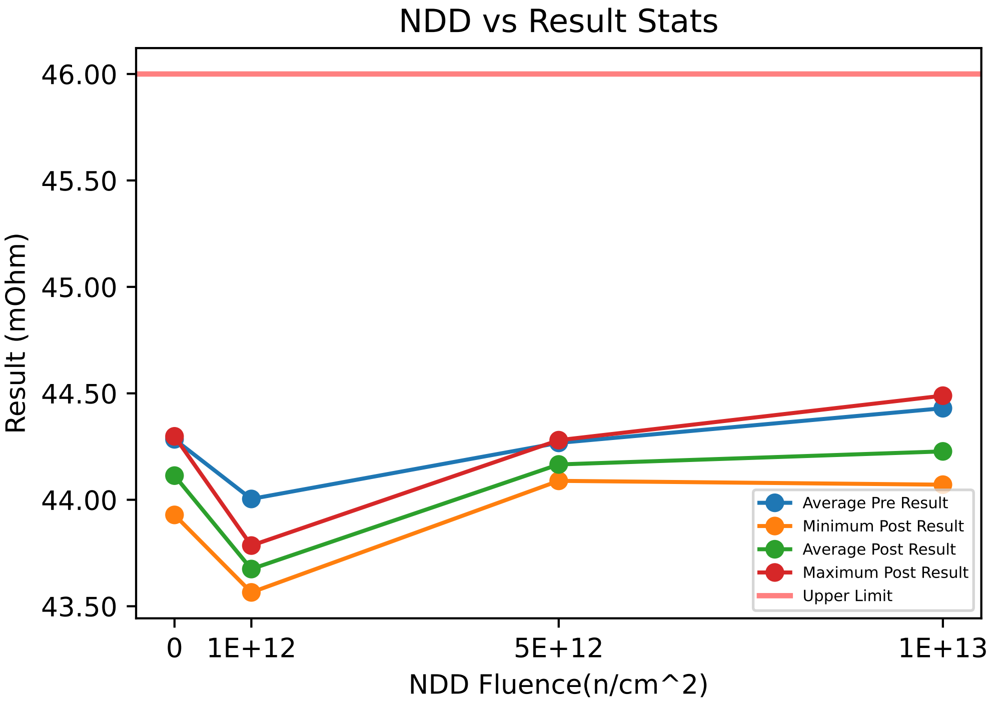
Test Results (Upper Limit = 46.0 (mOhm))

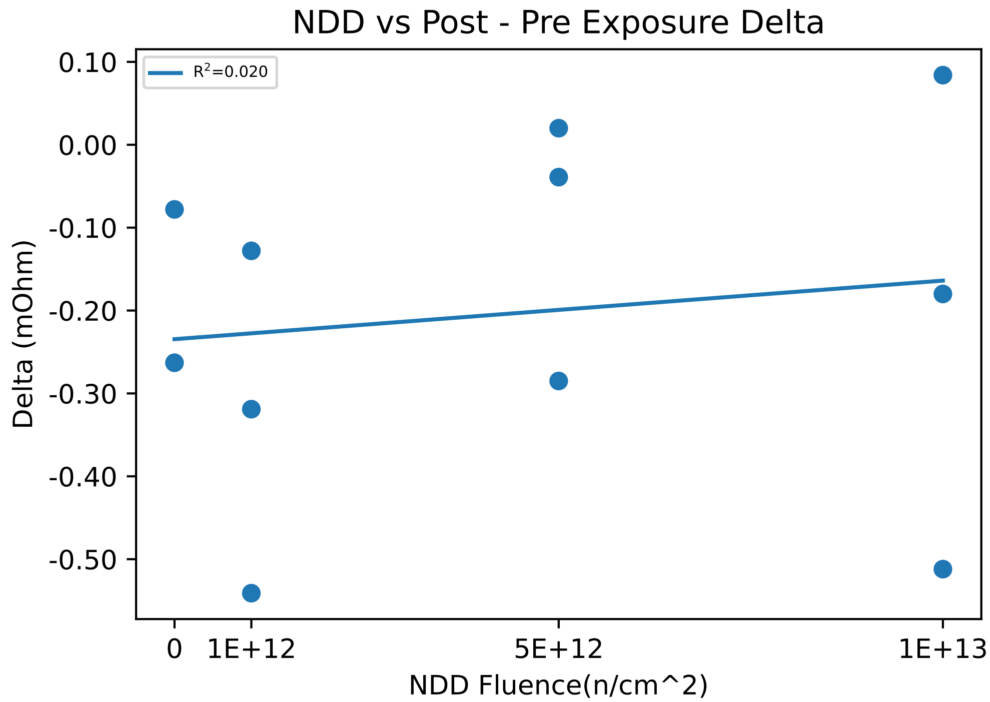
Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	43.928	43.665	-0.263
2	0	Correlation	44.118	44.031	-0.087
3	1e+12	NDD, unbiased	43.655	43.519	-0.136
4	1e+12	NDD, unbiased	43.623	43.311	-0.312
5	1e+12	NDD, unbiased	43.957	43.407	-0.55
6	5e+12	NDD, unbiased	44	44.01	0.01
7	5e+12	NDD, unbiased	43.863	43.822	-0.041
8	5e+12	NDD, unbiased	44.144	43.856	-0.288
9	1e+13	NDD, unbiased	44.366	43.868	-0.498
10	1e+13	NDD, unbiased	43.972	43.815	-0.157
11	1e+13	NDD, unbiased	44.136	44.209	0.073

Test Statistics (mOhm)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	43.928	44.023	44.118	0.13435	43.665	43.848	44.031	0.2588	-0.263	-0.175	-0.087	0.12445
1e+12	43.623	43.745	43.957	0.18429	43.311	43.412	43.519	0.1041	-0.55	-0.33267	-0.136	0.20777
5e+12	43.863	44.002	44.144	0.14051	43.822	43.896	44.01	0.10018	-0.288	-0.10633	0.01	0.15938
1e+13	43.972	44.158	44.366	0.19792	43.815	43.964	44.209	0.21382	-0.498	-0.194	0.073	0.28729

Device Test: 8.4 RON_VIN_14V_25_PLASTIC(RdsOn_3p50A_14p0V)





Test Results (Upper Limit = 46.0 (mOhm))

Serial #	Fluence(n/cm^2)	Exposure Conditions	Pre Result	Post Result	Delta
1	0	Correlation	44.192	43.929	-0.263
2	0	Correlation	44.376	44.298	-0.078
3	1e+12	NDD, unbiased	43.913	43.785	-0.128
4	1e+12	NDD, unbiased	43.884	43.565	-0.319
5	1e+12	NDD, unbiased	44.215	43.674	-0.541
6	5e+12	NDD, unbiased	44.26	44.28	0.02
7	5e+12	NDD, unbiased	44.128	44.089	-0.039
8	5e+12	NDD, unbiased	44.414	44.129	-0.285
9	1e+13	NDD, unbiased	44.634	44.122	-0.512
10	1e+13	NDD, unbiased	44.251	44.071	-0.18
11	1e+13	NDD, unbiased	44.405	44.489	0.084

Test Statistics (mOhm)

Fluence(n/cm^2)	Pre Exposure Min	Pre Exposure Avg	Pre Exposure Max	Pre Exposure Std	Post Exposure Min	Post Exposure Avg	Post Exposure Max	Post Exposure Std	Min Delta	Avg Delta	Max Delta	Std Delta
0	44.192	44.284	44.376	0.13011	43.929	44.114	44.298	0.26092	-0.263	-0.1705	-0.078	0.13081
1e+12	43.884	44.004	44.215	0.18331	43.565	43.675	43.785	0.11	-0.541	-0.32933	-0.128	0.20669
5e+12	44.128	44.267	44.414	0.14314	44.089	44.166	44.28	0.10073	-0.285	-0.10133	0.02	0.16177
1e+13	44.251	44.43	44.634	0.19272	44.071	44.227	44.489	0.22804	-0.512	-0.20267	0.084	0.29865

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