

MSP430FR5969-SP Neutron Displacement Damage Characterization

ABSTRACT

This report presents the effect of neutron displacement damage (NDD) on the MSP430FR5969-SP 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/cm². A sample size of nine units was exposed to radiation testing per MIL-STD-883, Method 1017 for Neutron Irradiation. All devices used in the experiment were from lot date code 76CGPPI and assembly lot 7635833CL7. Electrical testing was performed at Texas Instruments before and after neutron irradiation using the production test program for MSP430FR5969-SP.

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1 Overview

The MSP430™ ultra-low-power (ULP) FRAM platform combines uniquely embedded FRAM and a holistic ultra-low-power system architecture, allowing innovators to increase performance at lowered energy budgets. FRAM technology combines the speed, flexibility, and endurance of SRAM with the stability and reliability of flash at much lower power. The ultra low-power architecture of the MSP430FR5969-SP showcases seven low-power modes, optimized to achieve power efficient distributed telemetry/housekeeping systems. The integrated mixed-signal features of the MSP430FR5969-SP makes it ideally suited for distributed telemetry applications in next-generation spacecraft. General device information and testing conditions are listed in [Table 1](#).

Table 1. Overview Information

TI Part Number	MSP430FR5969-SP
Device Function	16-MHz ultra-low-power microcontroller low-noise, low-power, gain-configurable fully differential
Die Name	CNM5969HV
Technology	HPE035
A/T Lot Number / Date Code	7635833CL7 / 76CGPPI
Unbiased Quantity Tested	9
Exposure Facility	VPT Rad
Neutron Fluence (1-MeV eqv)	1.0×10^{12} , 5.0×10^{12} , 1.0×10^{13} n/cm ²
Irradiation Temperature	25°C
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2 Test Procedures

The MSP430FR5969-SP was electrically pre-tested using the production automated test equipment program. General test procedures were IAW MIL-STD-883, Method 1017 for Neutron Irradiation of MSP430FR5969-SP.

Table 2. Neutron Irradiation Conditions

Group	Sample Qty	Neutron Fluence (n/cm ²)	Bias
A	3	1.0×10^{12} n/cm ²	Unbiased
B	3	5.0×10^{12} n/cm ²	Unbiased
C	3	1.0×10^{13} n/cm ²	Unbiased



Figure 1. MSP430FR5969-SP Device

3 Facility

The University of Massachusetts's Fast Neutron Irradiation (FNI) facility is an experimental facility that replaced the three beam ports that originally existed on the left side of the research reactor. It is designed to give a fast flux level $\geq 10^{11}$ n/cm²-s, with relatively low thermal fluence and gamma dose rates. Samples with a cross-sectional area as large as 30 cm (12 in) \times 30 cm (12 in) and up to 15 cm (6 in) thick can be irradiated. The fast neutron flux is designed to be nearly uniform over the 30 cm (12 in) \times 30 cm (12 in) area facing the core, and the fast fluence variation through the sample thickness is minimized via a single 180° rotation of the sample canister at the midpoint of the irradiation period. The FNI facility offers a significantly larger sample volume than previously available within the University of Massachusetts Lowell Research Reactor (UMLRR). The fluences are calculated based on 1-MeV equivalences.

At the following link, there is an additional paper that discusses questions concerning spectrum and dosimetry:

https://www.uml.edu/docs/FNI%20Brochure_tcm18-90375.pdf

4 Results

There were no functional failures at any irradiation level. All parametric measurements remained well within data sheet (SLASEK0) limits and within production test limits which are guard-banded from the data sheet limits for all exposure levels. The full parameter list and graphs are found in Appendix A.

Table 3. MSP430FR5969-SP Specification Compliance Matrix

Parameters	Test Conditions	MSP430FR5969-SP Data Sheet SLASEK0				Test# or Name
		MIN	TYP	MAX	UNIT	
ILPM2,XT12 Low-power mode 2, 12-pF crystal			0.9	17	μ A	IDD_LPM2_xt_30 DVCC 17
LPM2,VLO Low-power mode 2, VLO, includes SVS			0.7	16.7	μ A	IDD_LPM2_vlo_30 DVCC 17
ILPM3,XT12 Low-power mode 3, 12-pF crystal, excludes SVS			0.6	4.9	μ A	IDD_LPM3_WDT_30 DVCC 17
LPM3,VLO Low-power mode 3, VLO, excludes SVS			0.4	4.7	μ A	IDD_LPM3_vlo_WDT_30 DVCC 17
ILPM4 Low-power mode 4, excludes SVS			0.5	4.8	μ A	IDD_LPM4_ref_svs_30 DVCC 17
Low-power mode 3.5, 12-pF ILPM3.5, XT12 crystal including SVS			0.45	2	μ A	IDD_LPM35_svs_30 DVCC 17
Low-power mode 4.5, including ILPM4.5, SVS			0.2	1.5	μ A	IDD_lpm45_svs_30 DVCC 17
RI Input MUX ON resistance	$0 V \leq V(Ax) \leq AVCC$		1	10	k Ω	ADC_mux_resistor_18.0 RI_A0_A2 44
VREF	CERSx = 11, CEREFLLx = 01, CEREFACC = 0	1.17	1.2	1.23	V	CPB_vref_1v2_18.0 VREF 1V2 0
	CERSx = 11, CEREFLLx = 10, CEREFACC = 0	1.92	2	2.08		CPB_vref_2v0_22.0 VREF 2V0 0
	CERSx = 11, CEREFLLx = 11, CEREFACC = 0	2.4	2.5	2.6		CPB_vref_2v5_27.0 VREF 1V2 0
	CERSx = 11, CEREFLLx = 01, CEREFACC = 1	1.1	1.2	1.245		CPB_vref_1v2_18.1 VREF 1V2 0
	CERSx = 11, CEREFLLx = 10, CEREFACC = 1	1.9	2	2.08		CPB_vref_2v0_22.1 VREF 2V0 0
	CERSx = 11, CEREFLLx = 11, CEREFACC = 1	2.35	2.5	2.6		CPB_vref_2v5_27.1 VREF 1V2 0
VCE_REF	VIN = reference into resistor ladder, n = 0 to 31	$VIN \times (n + 0.5) / 32$	$VIN \times (n + 1) / 32$	$VIN \times (n + 1.5) / 32$	V	CPB_Vref0_all_30.1 CPBladder_0 0 to CPB_Vref0_all_30.1 CPBladder_31 0

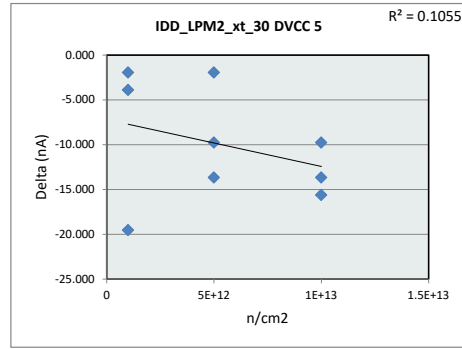
Test Results

This appendix contains the detailed test results.

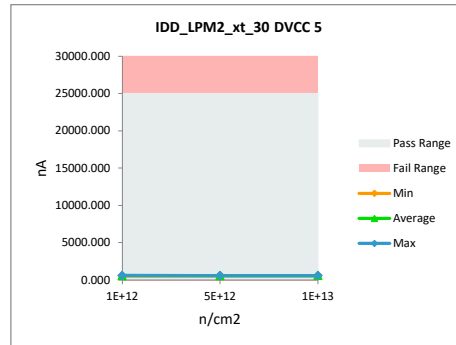
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IDD_LPM2_xt_30 DVCC 5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		nA	nA	
Max Limit		24999.99937	24999.99937	
Min Limit		0.050000001	0.050000001	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	587.891	607.422	-19.531
1E+12	14; site 2	570.313	572.266	-1.953
1E+12	15; site 2	542.969	546.875	-3.906
5E+12	16; site 2	574.219	576.172	-1.953
5E+12	17; site 2	580.078	593.750	-13.672
5E+12	18; site 2	560.547	570.313	-9.766
1E+13	19; site 2	556.641	570.313	-13.672
1E+13	20; site 2	582.031	597.656	-15.625
1E+13	; site 2	583.984	593.750	-9.766
	Max	587.891	607.422	-1.953
	Average	570.964	580.946	-9.983
	Min	542.969	546.875	-19.531
	Std Dev	14.875	18.686	6.287

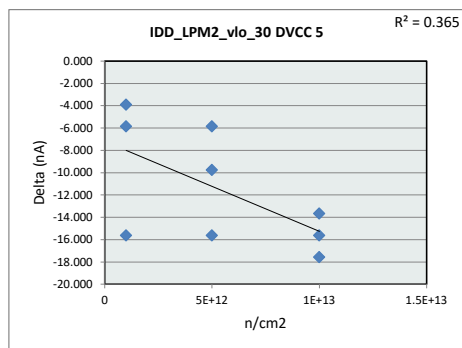


IDD_LPM2_xt_30 DVCC 5			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	24999.99937	nA	
Min Limit	0.050000001	nA	
n/cm2	1E+12	5E+12	1E+13
LL	0.050	0.050	0.050
Min	546.875	570.313	570.313
Average	575.521	580.078	587.240
Max	607.422	593.750	597.656
UL	24999.999	24999.999	24999.999

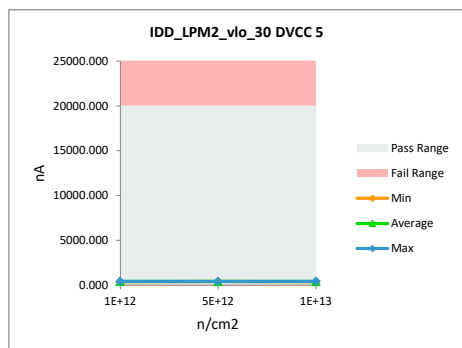


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IDD_LPM2_vlo_30 DVCC 5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		nA	nA	
Max Limit		19999.99949	19999.99949	
Min Limit		0.050000001	0.050000001	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	396.484	412.109	-15.625
1E+12	14; site 2	400.391	404.297	-3.906
1E+12	15; site 2	375.000	380.859	-5.859
5E+12	16; site 2	404.297	410.156	-5.859
5E+12	17; site 2	390.625	400.391	-9.766
5E+12	18; site 2	392.578	408.203	-15.625
1E+13	19; site 2	363.281	378.906	-15.625
1E+13	20; site 2	402.344	419.922	-17.578
1E+13	; site 2	386.719	400.391	-13.672
	Max	404.297	419.922	-3.906
	Average	390.191	401.693	-11.502
	Min	363.281	378.906	-17.578
	Std Dev	13.524	13.776	5.208

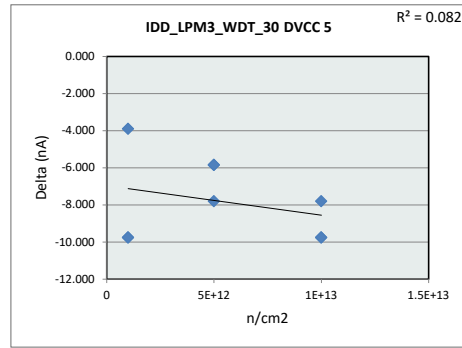


IDD_LPM2_vlo_30 DVCC 5			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	19999.99949	nA	
Min Limit	0.050000001	nA	
n/cm2	1E+12	5E+12	1E+13
LL	0.050	0.050	0.050
Min	380.859	400.391	378.906
Average	399.089	406.250	399.740
Max	412.109	410.156	419.922
UL	19999.999	19999.999	19999.999

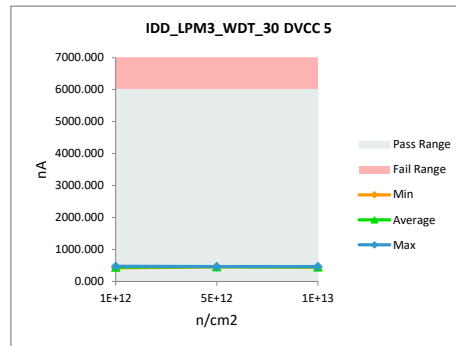


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IDD_LPM3_WDT_30 DVCC 5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		nA	nA	
Max Limit		6000.000212	6000.000212	
Min Limit		0.050000001	0.050000001	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	468.750	472.656	-3.906
1E+12	14; site 2	437.500	447.266	-9.766
1E+12	15; site 2	416.016	425.781	-9.766
5E+12	16; site 2	453.125	458.984	-5.859
5E+12	17; site 2	455.078	462.891	-7.813
5E+12	18; site 2	457.031	462.891	-5.859
1E+13	19; site 2	435.547	443.359	-7.813
1E+13	20; site 2	455.078	464.844	-9.766
1E+13	; site 2	455.078	464.844	-9.766
	Max	468.750	472.656	-3.906
	Average	448.134	455.946	-7.813
	Min	416.016	425.781	-9.766
	Std Dev	15.720	14.521	2.184

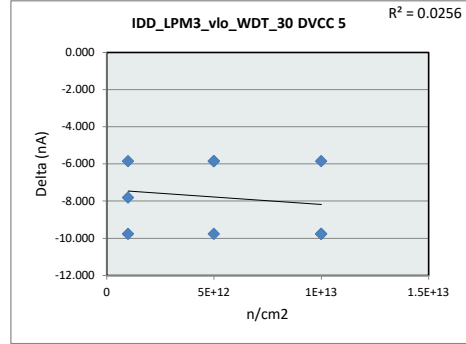


IDD_LPM3_WDT_30 DVCC 5			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		6000.000212	nA
Min Limit		0.050000001	nA
n/cm2	1E+12	5E+12	1E+13
LL	0.050	0.050	0.050
Min	425.781	458.984	443.359
Average	448.568	461.589	457.682
Max	472.656	462.891	464.844
UL	6000.000	6000.000	6000.000

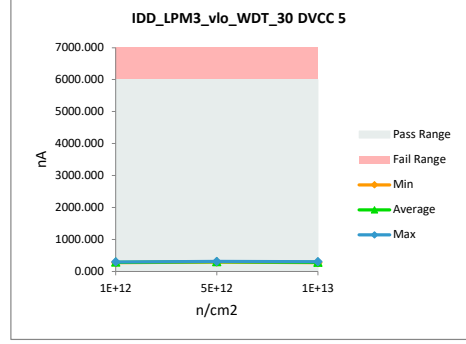


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IDD_LPM3_vlo_WDT_30 DVCC 5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		nA	nA	
Max Limit		6000.000212	6000.000212	
Min Limit		0.050000001	0.050000001	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	289.063	296.875	-7.813
1E+12	14; site 2	285.156	291.016	-5.859
1E+12	15; site 2	263.672	273.438	-9.766
5E+12	16; site 2	294.922	300.781	-5.859
5E+12	17; site 2	285.156	291.016	-5.859
5E+12	18; site 2	300.781	310.547	-9.766
1E+13	19; site 2	261.719	271.484	-9.766
1E+13	20; site 2	294.922	300.781	-5.859
1E+13	; site 2	275.391	285.156	-9.766
	Max	300.781	310.547	-5.859
	Average	283.420	291.233	-7.813
	Min	261.719	271.484	-9.766
	Std Dev	13.826	12.898	1.953

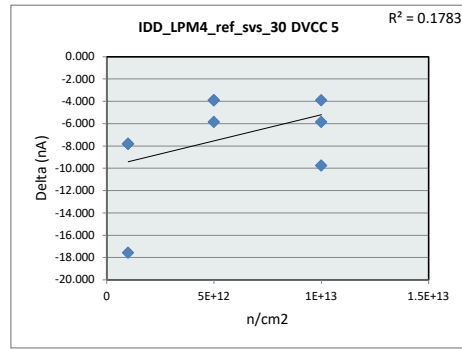


IDD_LPM3_vlo_WDT_30 DVCC 5			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	6000.000212	nA	
Min Limit	0.050000001	nA	
n/cm2	1E+12	5E+12	1E+13
LL	0.050	0.050	0.050
Min	273.438	291.016	271.484
Average	287.109	300.781	285.807
Max	296.875	310.547	300.781
UL	6000.000	6000.000	6000.000

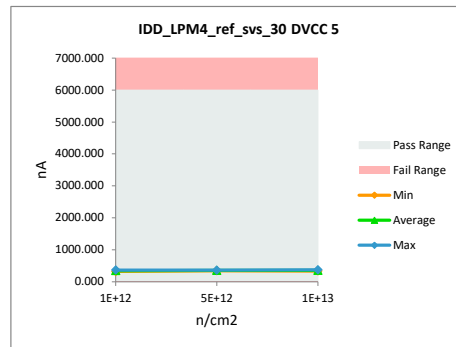


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IDD_LPM4_ref_svs_30 DVCC 5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		nA	nA	
Max Limit		6000.000212	6000.000212	
Min Limit		0.050000001	0.050000001	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	359.375	367.188	-7.813
1E+12	14; site 2	339.844	357.422	-17.578
1E+12	15; site 2	314.453	322.266	-7.813
5E+12	16; site 2	351.563	357.422	-5.859
5E+12	17; site 2	359.375	363.281	-3.906
5E+12	18; site 2	341.797	345.703	-3.906
1E+13	19; site 2	333.984	337.891	-3.906
1E+13	20; site 2	357.422	363.281	-5.859
1E+13	; site 2	361.328	371.094	-9.766
	Max	361.328	371.094	-3.906
	Average	346.571	353.950	-7.378
	Min	314.453	322.266	-17.578
	Std Dev	15.598	15.800	4.343

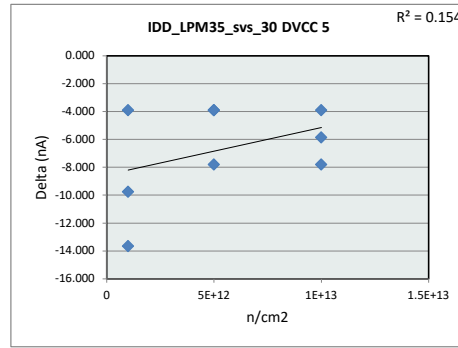


IDD_LPM4_ref_svs_30 DVCC 5			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	6000.000212	nA	
Min Limit	0.050000001	nA	
n/cm2	1E+12	5E+12	1E+13
LL	0.050	0.050	0.050
Min	322.266	345.703	337.891
Average	348.958	355.469	357.422
Max	367.188	363.281	371.094
UL	6000.000	6000.000	6000.000

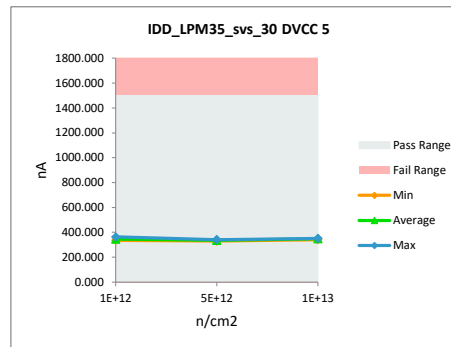


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IDD_LPM35_svs_30 DVCC 5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		nA	nA	
Max Limit		1500.000053	1500.000053	
Min Limit		0.050000001	0.050000001	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	359.375	363.281	-3.906
1E+12	14; site 2	326.172	339.844	-13.672
1E+12	15; site 2	326.172	335.938	-9.766
5E+12	16; site 2	333.984	337.891	-3.906
5E+12	17; site 2	333.984	341.797	-7.813
5E+12	18; site 2	326.172	330.078	-3.906
1E+13	19; site 2	333.984	341.797	-7.813
1E+13	20; site 2	345.703	351.563	-5.859
1E+13	; site 2	347.656	351.563	-3.906
	Max	359.375	363.281	-3.906
	Average	337.023	343.750	-6.727
	Min	326.172	330.078	-13.672
	Std Dev	11.559	10.054	3.399

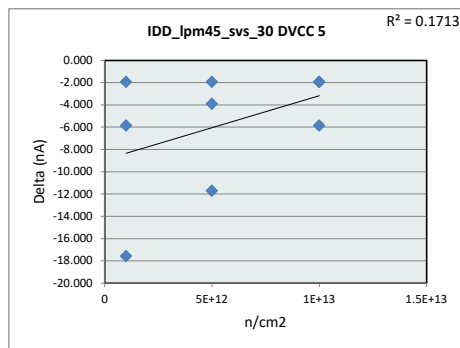


IDD_LPM35_svs_30 DVCC 5			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	1500.000053	nA	
Min Limit	0.050000001	nA	
n/cm2	1E+12	5E+12	1E+13
LL	0.050	0.050	0.050
Min	335.938	330.078	341.797
Average	346.354	336.589	348.307
Max	363.281	341.797	351.563
UL	1500.000	1500.000	1500.000

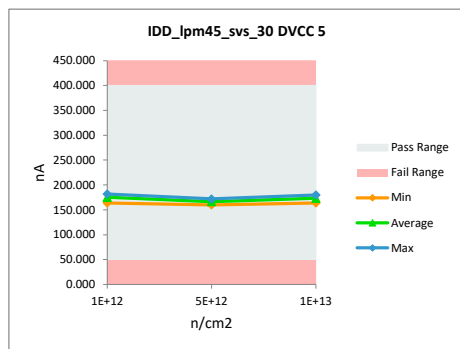


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IDD_lpm45_svs_30 DVCC 5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		nA	nA	
Max Limit		400.0000047	400.0000047	
Min Limit		50.00000058	50.00000058	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	177.734	179.688	-1.953
1E+12	14; site 2	164.063	181.641	-17.578
1E+12	15; site 2	158.203	164.063	-5.859
5E+12	16; site 2	160.156	171.875	-11.719
5E+12	17; site 2	164.063	167.969	-3.906
5E+12	18; site 2	158.203	160.156	-1.953
1E+13	19; site 2	162.109	164.063	-1.953
1E+13	20; site 2	173.828	175.781	-1.953
1E+13	; site 2	173.828	179.688	-5.859
	Max	177.734	181.641	-1.953
	Average	165.799	171.658	-5.859
	Min	158.203	160.156	-17.578
	Std Dev	7.402	7.960	5.437

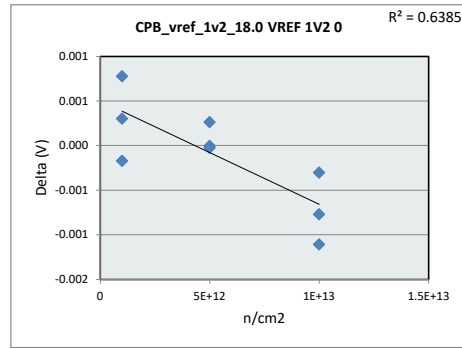


IDD_lpm45_svs_30 DVCC 5			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	400.0000047	nA	
Min Limit	50.00000058	nA	
n/cm2	1E+12	5E+12	1E+13
LL	50.000	50.000	50.000
Min	164.062	160.156	164.062
Average	175.130	166.667	173.177
Max	181.641	171.875	179.688
UL	400.000	400.000	400.000

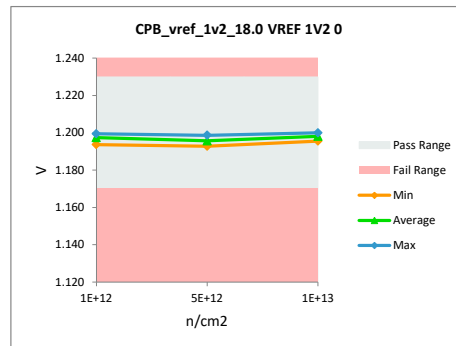


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		CPB_vref_1v2_18.0 VREF 1V2 0		
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		1.230000019	1.230000019	
Min Limit		1.169999957	1.169999957	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.194	1.194	0.000
1E+12	14; site 2	1.199	1.199	0.000
1E+12	15; site 2	1.200	1.199	0.001
5E+12	16; site 2	1.195	1.195	0.000
5E+12	17; site 2	1.199	1.199	0.000
5E+12	18; site 2	1.193	1.193	0.000
1E+13	19; site 2	1.198	1.199	-0.001
1E+13	20; site 2	1.195	1.196	0.000
1E+13	; site 2	1.199	1.200	-0.001
	Max	1.200	1.200	0.001
	Average	1.197	1.197	0.000
	Min	1.193	1.193	-0.001
	Std Dev	0.003	0.003	0.001

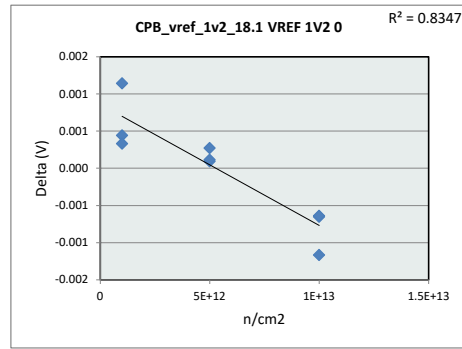


		CPB_vref_1v2_18.0 VREF 1V2 0		
Test Site		CLAB		
Tester		J750EX		
Test Number		JP079800		
Max Limit		1.230000019	V	
Min Limit		1.169999957	V	
n/cm2		1E+12	5E+12	1E+13
LL		1.170	1.170	1.170
Min		1.194	1.193	1.196
Average		1.197	1.196	1.198
Max		1.199	1.199	1.200
UL		1.230	1.230	1.230

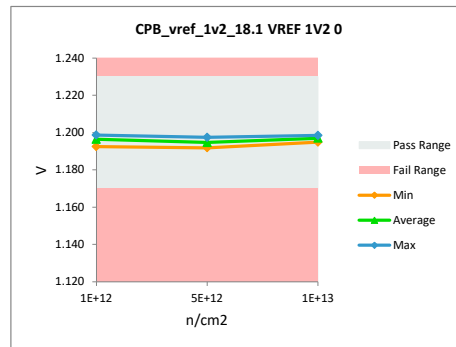


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CPB_vref_1v2_18.1 VREF 1V2 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	1.230000019	1.230000019		
Min Limit	1.169999957	1.169999957		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.193	1.193	0.000
1E+12	14; site 2	1.198	1.198	0.000
1E+12	15; site 2	1.200	1.199	0.001
5E+12	16; site 2	1.195	1.195	0.000
5E+12	17; site 2	1.198	1.197	0.000
5E+12	18; site 2	1.192	1.192	0.000
1E+13	19; site 2	1.197	1.198	-0.001
1E+13	20; site 2	1.194	1.195	-0.001
1E+13	; site 2	1.197	1.198	-0.001
	Max	1.200	1.199	0.001
	Average	1.196	1.196	0.000
	Min	1.192	1.192	-0.001
	Std Dev	0.003	0.003	0.001

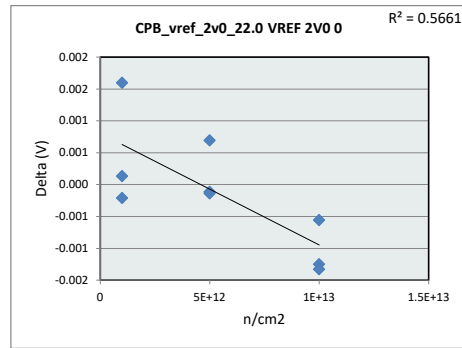


CPB_vref_1v2_18.1 VREF 1V2 0				
Test Site	CLAB			
Tester	J750EX			
Test Number	JP079800			
Max Limit	1.230000019	V		
Min Limit	1.169999957	V		
n/cm2	1E+12	5E+12	1E+13	
LL	1.170	1.170	1.170	
Min	1.193	1.192	1.195	
Average	1.196	1.195	1.197	
Max	1.199	1.197	1.198	
UL	1.230	1.230	1.230	

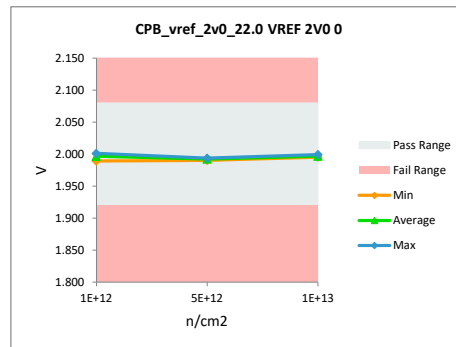


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CPB_vref_2v0_22.0 VREF 2V0 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.079999924	2.079999924		
Min Limit	1.919999957	1.919999957		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.989	1.989	0.000
1E+12	14; site 2	2.001	2.001	0.000
1E+12	15; site 2	2.001	2.000	0.002
5E+12	16; site 2	1.993	1.994	0.000
5E+12	17; site 2	1.994	1.993	0.001
5E+12	18; site 2	1.990	1.990	0.000
1E+13	19; site 2	1.994	1.995	-0.001
1E+13	20; site 2	1.995	1.996	-0.001
1E+13	; site 2	1.998	1.999	-0.001
	Max	2.001	2.001	0.002
	Average	1.995	1.995	0.000
	Min	1.989	1.989	-0.001
	Std Dev	0.004	0.004	0.001

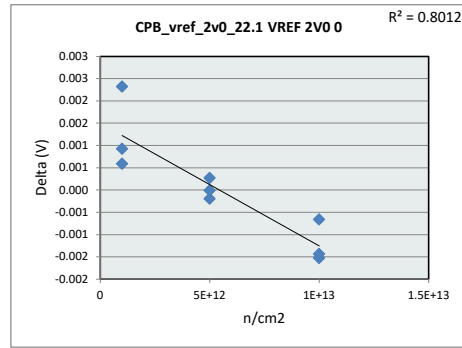


CPB_vref_2v0_22.0 VREF 2V0 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.079999924	V	
Min Limit	1.919999957	V	
n/cm2	1E+12	5E+12	1E+13
LL	1.920	1.920	1.920
Min	1.989	1.990	1.995
Average	1.997	1.992	1.997
Max	2.001	1.994	1.999
UL	2.080	2.080	2.080

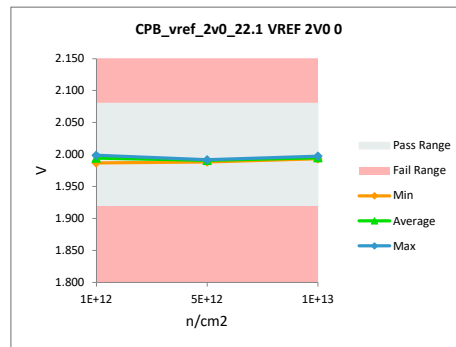


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CPB_vref_2v0_22.1 VREF 2V0 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		2.079999924	2.079999924	
Min Limit		1.919999957	1.919999957	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.988	1.987	0.001
1E+12	14; site 2	2.000	1.999	0.001
1E+12	15; site 2	2.000	1.998	0.002
5E+12	16; site 2	1.992	1.992	0.000
5E+12	17; site 2	1.992	1.992	0.000
5E+12	18; site 2	1.989	1.989	0.000
1E+13	19; site 2	1.992	1.993	-0.002
1E+13	20; site 2	1.994	1.994	-0.001
1E+13	; site 2	1.996	1.998	-0.001
	Max	2.000	1.999	0.002
	Average	1.993	1.993	0.000
	Min	1.988	1.987	-0.002
	Std Dev	0.004	0.004	0.001

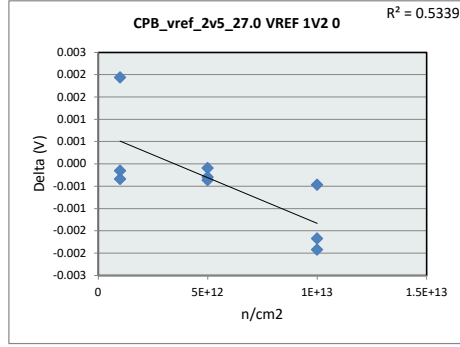


CPB_vref_2v0_22.1 VREF 2V0 0			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		2.079999924	V
Min Limit		1.919999957	V
n/cm2	1E+12	5E+12	1E+13
LL	1.920	1.920	1.920
Min	1.987	1.989	1.993
Average	1.995	1.991	1.995
Max	1.999	1.992	1.998
UL	2.080	2.080	2.080

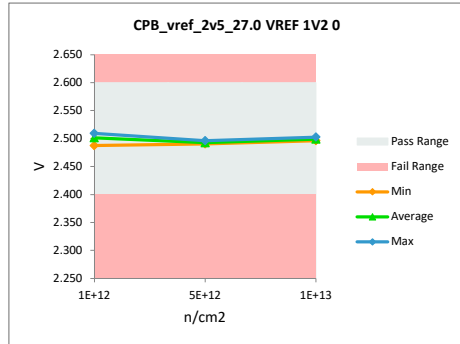


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CPB_vref_2v5_27.0 VREF 1V2 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		2.599999905	2.599999905	
Min Limit		2.400000095	2.400000095	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.487	2.487	0.000
1E+12	14; site 2	2.507	2.507	0.000
1E+12	15; site 2	2.511	2.509	0.002
5E+12	16; site 2	2.496	2.496	0.000
5E+12	17; site 2	2.491	2.491	0.000
5E+12	18; site 2	2.490	2.491	0.000
1E+13	19; site 2	2.496	2.498	-0.002
1E+13	20; site 2	2.502	2.503	0.000
1E+13	; site 2	2.494	2.496	-0.002
	Max	2.511	2.509	0.002
	Average	2.497	2.498	0.000
	Min	2.487	2.487	-0.002
	Std Dev	0.008	0.008	0.001

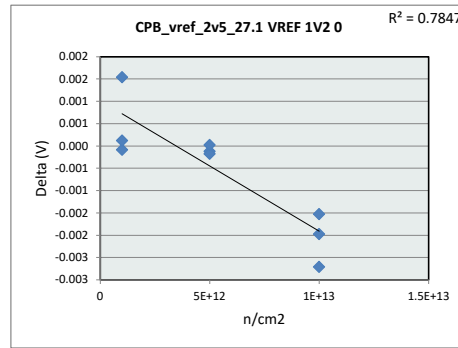


CPB_vref_2v5_27.0 VREF 1V2 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.599999905	V	
Min Limit	2.400000095	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.400	2.400	2.400
Min	2.487	2.491	2.496
Average	2.501	2.493	2.499
Max	2.509	2.496	2.503
UL	2.600	2.600	2.600

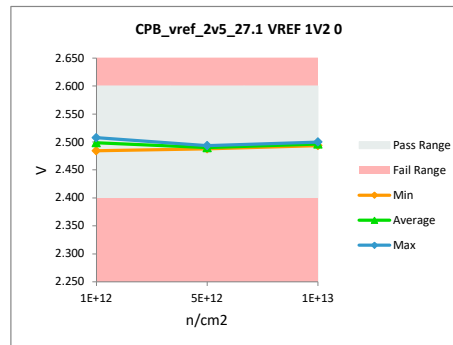


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CPB_vref_2v5_27.1 VREF 1V2 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.599999905	2.599999905		
Min Limit	2.400000095	2.400000095		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.484	2.484	0.000
1E+12	14; site 2	2.504	2.504	0.000
1E+12	15; site 2	2.509	2.508	0.002
5E+12	16; site 2	2.493	2.493	0.000
5E+12	17; site 2	2.488	2.488	0.000
5E+12	18; site 2	2.488	2.488	0.000
1E+13	19; site 2	2.493	2.495	-0.002
1E+13	20; site 2	2.498	2.500	-0.002
1E+13	; site 2	2.491	2.494	-0.003
	Max	2.509	2.508	0.002
	Average	2.494	2.495	-0.001
	Min	2.484	2.484	-0.003
	Std Dev	0.008	0.008	0.001

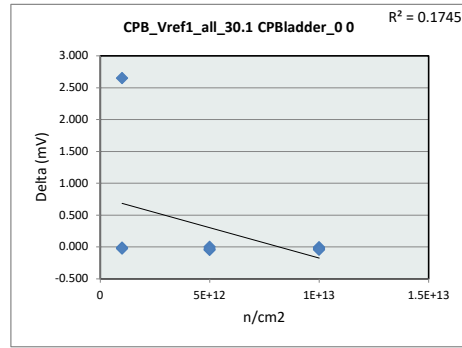


CPB_vref_2v5_27.1 VREF 1V2 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.599999905	V	
Min Limit	2.400000095	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.400	2.400	2.400
Min	2.484	2.488	2.494
Average	2.499	2.490	2.496
Max	2.508	2.493	2.500
UL	2.600	2.600	2.600

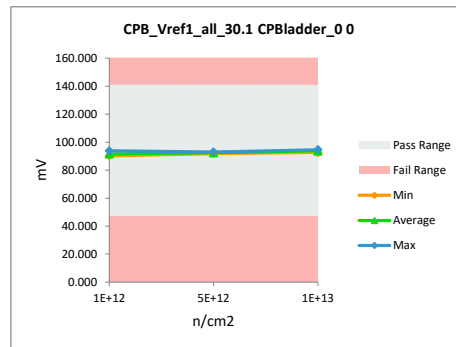


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CPB_Vref1_all_30.1 CPBladder_00				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		140.625	140.625	
Min Limit		46.875	46.875	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	92.945	90.297	2.648
1E+12	14; site 2	90.961	90.975	-0.014
1E+12	15; site 2	93.774	93.802	-0.028
5E+12	16; site 2	91.861	91.862	-0.001
5E+12	17; site 2	92.969	93.017	-0.049
5E+12	18; site 2	92.595	92.629	-0.034
1E+13	19; site 2	93.992	93.998	-0.006
1E+13	20; site 2	94.618	94.642	-0.024
1E+13	; site 2	92.610	92.658	-0.048
	Max	94.618	94.642	2.648
	Average	92.925	92.653	0.271
	Min	90.961	90.297	-0.049
	Std Dev	1.114	1.424	0.891

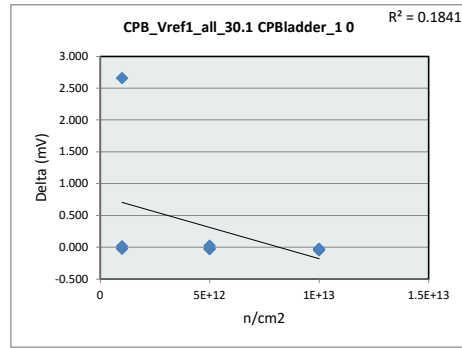


CPB_Vref1_all_30.1 CPBladder_00			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	140.625	mV	
Min Limit	46.875	mV	
n/cm2	1E+12	5E+12	1E+13
LL	46.875	46.875	46.875
Min	90.297	91.862	92.658
Average	91.691	92.503	93.766
Max	93.802	93.017	94.642
UL	140.625	140.625	140.625

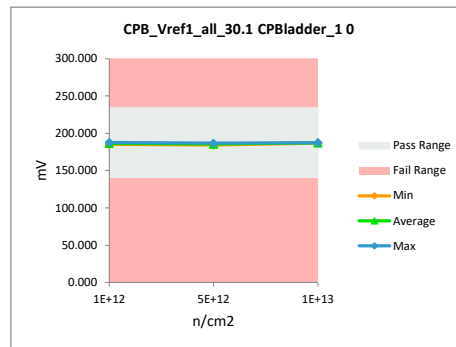


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CPB_Vref1_all_30.1 CPBladder_1_0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		234.375	234.375	
Min Limit		140.625	140.625	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	187.620	184.964	2.656
1E+12	14; site 2	186.834	186.859	-0.025
1E+12	15; site 2	187.639	187.627	0.012
5E+12	16; site 2	184.271	184.290	-0.018
5E+12	17; site 2	186.568	186.601	-0.033
5E+12	18; site 2	185.503	185.479	0.024
1E+13	19; site 2	186.909	186.942	-0.032
1E+13	20; site 2	186.906	186.956	-0.050
1E+13	; site 2	187.294	187.321	-0.027
	Max	187.639	187.627	2.656
	Average	186.616	186.338	0.278
	Min	184.271	184.290	-0.050
	Std Dev	1.088	1.148	0.892

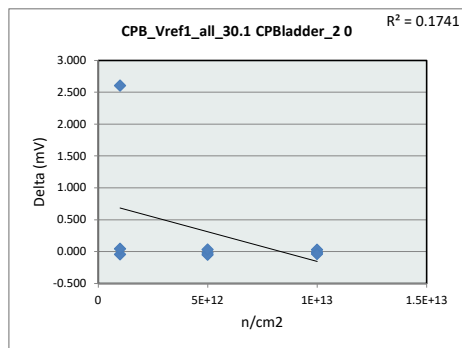


CPB_Vref1_all_30.1 CPBladder_1_0			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		234.375	mV
Min Limit		140.625	mV
n/cm2	1E+12	5E+12	1E+13
LL	140.625	140.625	140.625
Min	184.964	184.290	186.942
Average	186.483	185.456	187.073
Max	187.627	186.601	187.321
UL	234.375	234.375	234.375

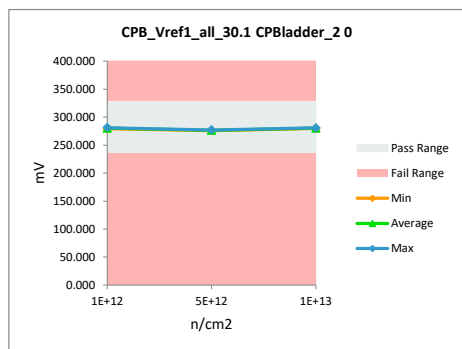


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CPB_Vref1_all_30.1 CPBladder_2				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		328.125	328.125	
Min Limit		234.375	234.375	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	283.848	281.247	2.602
1E+12	14; site 2	279.155	279.201	-0.046
1E+12	15; site 2	280.694	280.650	0.044
5E+12	16; site 2	275.877	275.898	-0.021
5E+12	17; site 2	276.658	276.708	-0.050
5E+12	18; site 2	277.117	277.087	0.030
1E+13	19; site 2	280.163	280.174	-0.011
1E+13	20; site 2	279.852	279.824	0.028
1E+13	; site 2	280.695	280.733	-0.038
Max		283.848	281.247	2.602
Average		279.340	279.058	0.282
Min		275.877	275.898	-0.050
Std Dev		2.477	1.980	0.871

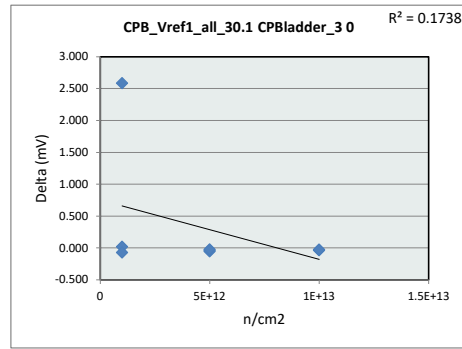


CPB_Vref1_all_30.1 CPBladder			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	328.125	mV	
Min Limit	234.375	mV	
n/cm2	1E+12	5E+12	1E+13
LL	234.375	234.375	234.375
Min	279.201	275.898	279.824
Average	280.366	276.564	280.244
Max	281.247	277.087	280.733
UL	328.125	328.125	328.125

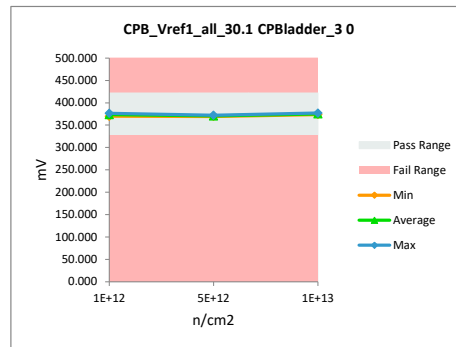


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CPB_Vref1_all_30.1 CPBladder_3				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		421.875	421.875	
Min Limit		328.125	328.125	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	377.192	374.607	2.585
1E+12	14; site 2	369.723	369.705	0.018
1E+12	15; site 2	376.231	376.303	-0.072
5E+12	16; site 2	372.234	372.271	-0.038
5E+12	17; site 2	369.296	369.349	-0.053
5E+12	18; site 2	370.002	370.026	-0.025
1E+13	19; site 2	373.805	373.838	-0.033
1E+13	20; site 2	374.186	374.221	-0.036
1E+13	; site 2	376.890	376.916	-0.026
	Max	377.192	376.916	2.585
	Average	373.284	373.026	0.258
	Min	369.296	369.349	-0.072
	Std Dev	3.133	2.841	0.873

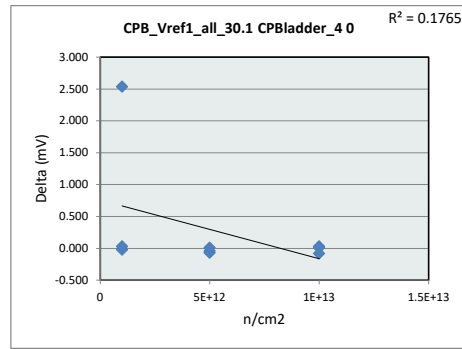


CPB_Vref1_all_30.1 CPBladder			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	421.875	mV	
Min Limit	328.125	mV	
n/cm2	1E+12	5E+12	1E+13
LL	328.125	328.125	328.125
Min	369.705	369.349	373.838
Average	373.539	370.549	374.992
Max	376.303	372.271	376.916
UL	421.875	421.875	421.875

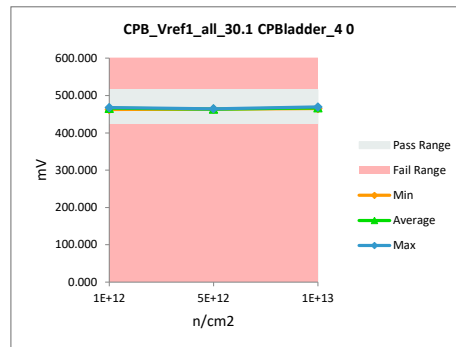


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CPB_Vref1_all_30.1 CPBladder_4				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		515.625	515.625	
Min Limit		421.875	421.875	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	469.092	466.556	2.536
1E+12	14; site 2	462.721	462.744	-0.022
1E+12	15; site 2	467.965	467.934	0.030
5E+12	16; site 2	464.526	464.567	-0.041
5E+12	17; site 2	463.554	463.624	-0.070
5E+12	18; site 2	463.255	463.245	0.010
1E+13	19; site 2	467.362	467.331	0.031
1E+13	20; site 2	465.138	465.129	0.009
1E+13	; site 2	469.315	469.396	-0.081
	Max	469.315	469.396	2.536
	Average	465.881	465.614	0.267
	Min	462.721	462.744	-0.081
	Std Dev	2.582	2.309	0.852

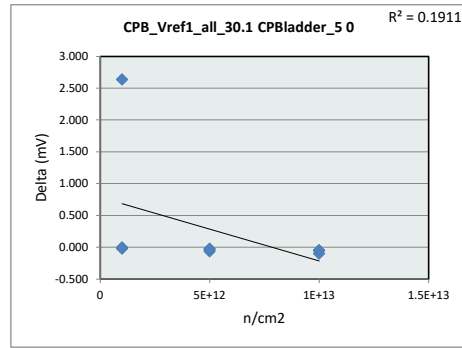


CPB_Vref1_all_30.1 CPBladder			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	515.625	mV	
Min Limit	421.875	mV	
n/cm2	1E+12	5E+12	1E+13
LL	421.875	421.875	421.875
Min	462.744	463.245	465.129
Average	465.745	463.812	467.285
Max	467.934	464.567	469.396
UL	515.625	515.625	515.625

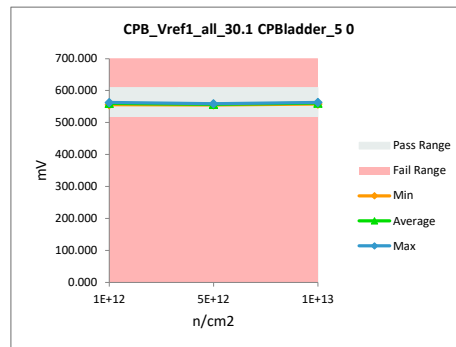


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CPB_Vref1_all_30.1 CPBladder_5				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		609.375	609.375	
Min Limit		515.625	515.625	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	563.757	561.124	2.633
1E+12	14; site 2	555.810	555.834	-0.024
1E+12	15; site 2	562.597	562.602	-0.005
5E+12	16; site 2	558.689	558.714	-0.024
5E+12	17; site 2	557.058	557.122	-0.064
5E+12	18; site 2	554.922	554.958	-0.035
1E+13	19; site 2	562.207	562.259	-0.052
1E+13	20; site 2	557.440	557.542	-0.102
1E+13	; site 2	562.787	562.837	-0.050
	Max	563.757	562.837	2.633
	Average	559.474	559.221	0.253
	Min	554.922	554.958	-0.102
	Std Dev	3.378	3.051	0.893

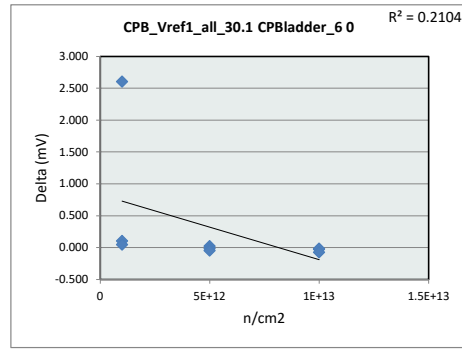


CPB_Vref1_all_30.1 CPBladder_5			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		609.375	mV
Min Limit		515.625	mV
n/cm2	1E+12	5E+12	1E+13
LL	515.625	515.625	515.625
Min	555.834	554.958	557.542
Average	559.853	556.931	560.879
Max	562.602	558.714	562.837
UL	609.375	609.375	609.375

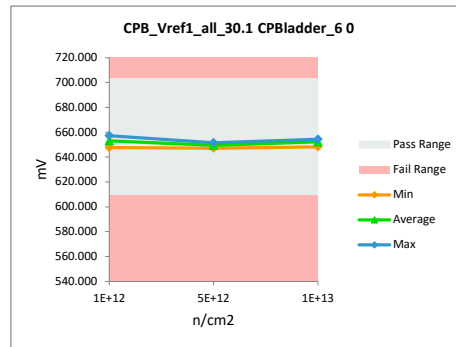


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CPB_Vref1_all_30.1 CPBladder_6 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		703.125	703.125	
Min Limit		609.375	609.375	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	656.632	654.029	2.603
1E+12	14; site 2	647.775	647.674	0.102
1E+12	15; site 2	657.362	657.317	0.045
5E+12	16; site 2	651.550	651.530	0.020
5E+12	17; site 2	649.346	649.361	-0.015
5E+12	18; site 2	647.219	647.267	-0.048
1E+13	19; site 2	654.087	654.113	-0.026
1E+13	20; site 2	648.245	648.264	-0.019
1E+13	; site 2	654.213	654.289	-0.076
	Max	657.362	657.317	2.603
	Average	651.826	651.538	0.287
	Min	647.219	647.267	-0.076
	Std Dev	3.893	3.578	0.870

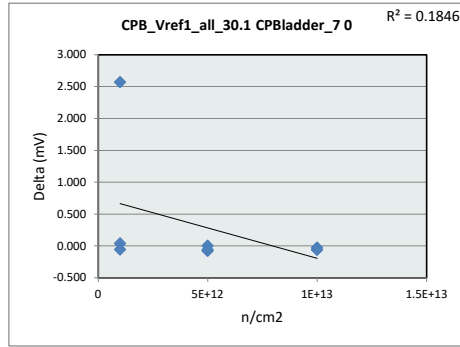


CPB_Vref1_all_30.1 CPBladder_6 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	703.125	mV	
Min Limit	609.375	mV	
n/cm2	1E+12	5E+12	1E+13
LL	609.375	609.375	609.375
Min	647.674	647.267	648.264
Average	653.007	649.386	652.222
Max	657.317	651.530	654.289
UL	703.125	703.125	703.125

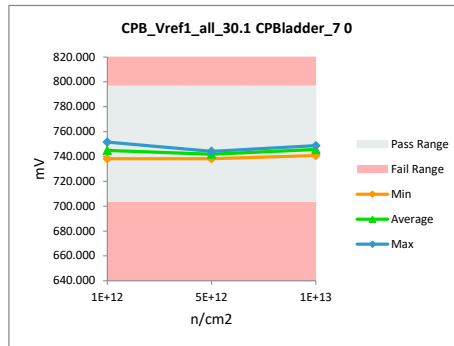


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CPB_Vref1_all_30.1 CPBladder_7				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		796.875	796.875	
Min Limit		703.125	703.125	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	747.798	745.230	2.568
1E+12	14; site 2	738.121	738.083	0.038
1E+12	15; site 2	751.506	751.563	-0.056
5E+12	16; site 2	744.113	744.109	0.003
5E+12	17; site 2	743.073	743.153	-0.079
5E+12	18; site 2	738.124	738.184	-0.060
1E+13	19; site 2	748.572	748.630	-0.057
1E+13	20; site 2	740.793	740.819	-0.026
1E+13	; site 2	747.211	747.270	-0.059
Max		751.506	751.563	2.568
Average		744.368	744.116	0.252
Min		738.121	738.083	-0.079
Std Dev		4.757	4.615	0.869

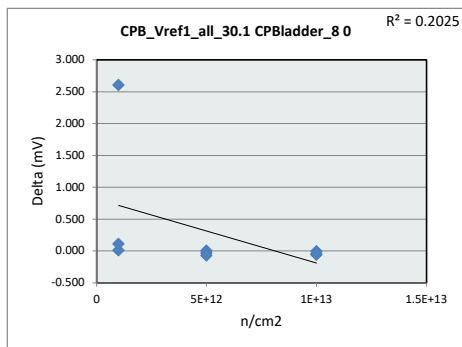


CPB_Vref1_all_30.1 CPBladder_7			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		796.875	mV
Min Limit		703.125	mV
n/cm2	1E+12	5E+12	1E+13
LL	703.125	703.125	703.125
Min	738.083	738.184	740.819
Average	744.959	741.815	745.573
Max	751.563	744.109	748.630
UL	796.875	796.875	796.875

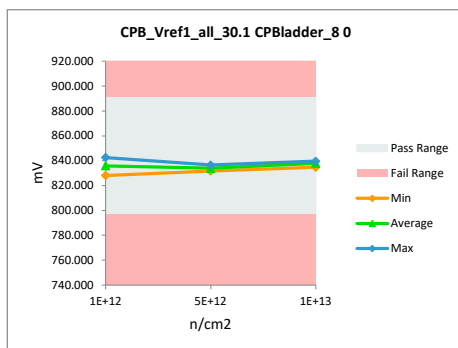


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CPB_Vref1_all_30.1 CPBladder_8				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		890.625	890.625	
Min Limit		796.875	796.875	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	839.645	837.042	2.603
1E+12	14; site 2	828.235	828.128	0.107
1E+12	15; site 2	842.633	842.626	0.008
5E+12	16; site 2	833.606	833.605	0.001
5E+12	17; site 2	836.469	836.504	-0.035
5E+12	18; site 2	831.543	831.616	-0.073
1E+13	19; site 2	839.567	839.575	-0.008
1E+13	20; site 2	834.673	834.734	-0.061
1E+13	; site 2	839.509	839.556	-0.047
	Max	842.633	842.626	2.603
	Average	836.209	835.932	0.277
	Min	828.235	828.128	-0.073
	Std Dev	4.607	4.460	0.874

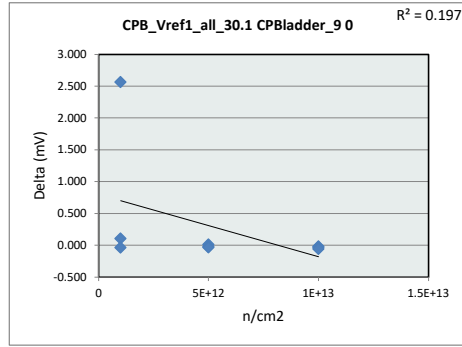


CPB_Vref1_all_30.1 CPBladder_8			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		890.625	mV
Min Limit		796.875	mV
n/cm2	1E+12	5E+12	1E+13
LL	796.875	796.875	796.875
Min	828.128	831.616	834.734
Average	835.932	833.909	837.955
Max	842.626	836.504	839.575
UL	890.625	890.625	890.625

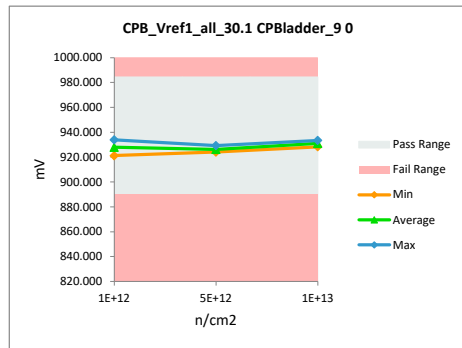


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CPB_Vref1_all_30.1 CPBladder_9				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		mV	mV	
Max Limit		984.375	984.375	
Min Limit		890.625	890.625	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	931.274	928.711	2.563
1E+12	14; site 2	921.257	921.152	0.105
1E+12	15; site 2	933.941	933.978	-0.037
5E+12	16; site 2	925.501	925.489	0.012
5E+12	17; site 2	929.225	929.249	-0.024
5E+12	18; site 2	923.996	924.030	-0.033
1E+13	19; site 2	933.460	933.480	-0.020
1E+13	20; site 2	928.244	928.279	-0.035
1E+13	; site 2	931.294	931.353	-0.059
	Max	933.941	933.978	2.563
	Average	928.688	928.413	0.275
	Min	921.257	921.152	-0.059
	Std Dev	4.355	4.280	0.860

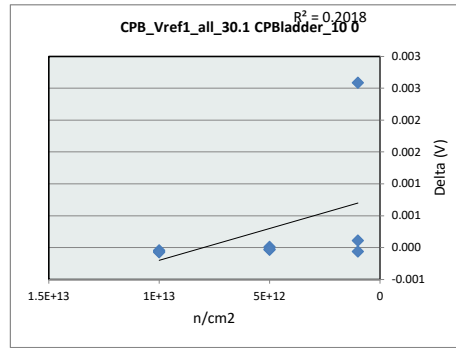


CPB_Vref1_all_30.1 CPBladder_9			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		984.375	mV
Min Limit		890.625	mV
n/cm2	1E+12	5E+12	1E+13
LL	890.625	890.625	890.625
Min	921.152	924.030	928.279
Average	927.947	926.256	931.037
Max	933.978	929.249	933.480
UL	984.375	984.375	984.375

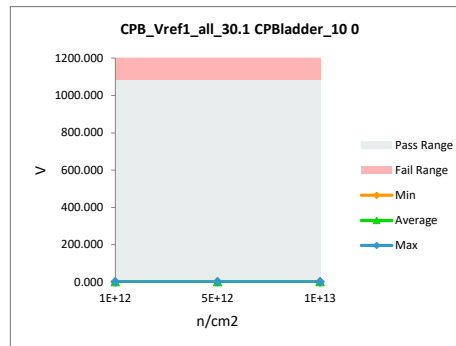


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CPB_Vref1_all_30.1 CPBladder_10 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		1078.125	1078.125	
Min Limit		0.984375	0.984375	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.022	1.020	0.003
1E+12	14; site 2	1.014	1.014	0.000
1E+12	15; site 2	1.025	1.025	0.000
5E+12	16; site 2	1.018	1.018	0.000
5E+12	17; site 2	1.022	1.022	0.000
5E+12	18; site 2	1.016	1.016	0.000
1E+13	19; site 2	1.027	1.027	0.000
1E+13	20; site 2	1.020	1.020	0.000
1E+13	; site 2	1.024	1.024	0.000
	Max	1.027	1.027	0.003
	Average	1.021	1.020	0.000
	Min	1.014	1.014	0.000
	Std Dev	0.004	0.004	0.001

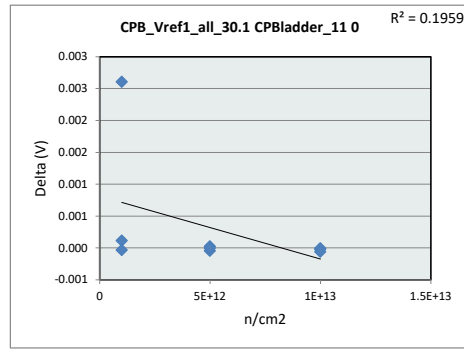


CPB_Vref1_all_30.1 CPBladder_10 0			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		1078.125	V
Min Limit		0.984375	V
n/cm2	1E+12	5E+12	1E+13
LL	0.984	0.984	0.984
Min	1.014	1.016	1.020
Average	1.020	1.018	1.023
Max	1.025	1.022	1.027
UL	1078.125	1078.125	1078.125

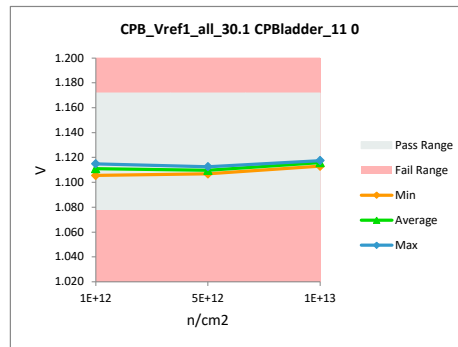


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CPB_Vref1_all_30.1 CPBladder_11 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	1.171875	1.171875		
Min Limit	1.078125	1.078125		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.115	1.113	0.003
1E+12	14; site 2	1.106	1.106	0.000
1E+12	15; site 2	1.115	1.115	0.000
5E+12	16; site 2	1.109	1.109	0.000
5E+12	17; site 2	1.113	1.113	0.000
5E+12	18; site 2	1.107	1.107	0.000
1E+13	19; site 2	1.118	1.118	0.000
1E+13	20; site 2	1.113	1.113	0.000
1E+13	; site 2	1.117	1.117	0.000
	Max	1.118	1.118	0.003
	Average	1.112	1.112	0.000
	Min	1.106	1.106	0.000
	Std Dev	0.004	0.004	0.001

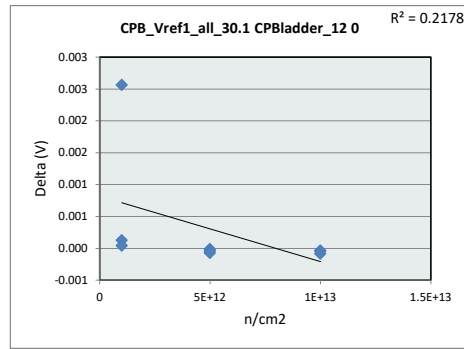


CPB_Vref1_all_30.1 CPBladder_11 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	1.171875	V	
Min Limit	1.078125	V	
n/cm2	1E+12	5E+12	1E+13
LL	1.078	1.078	1.078
Min	1.106	1.107	1.113
Average	1.111	1.110	1.116
Max	1.115	1.113	1.118
UL	1.172	1.172	1.172

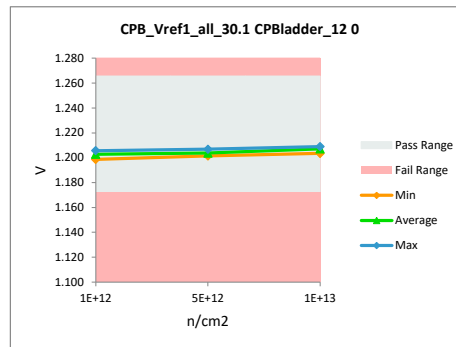


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CPB_Vref1_all_30.1 CPBladder_12 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	1.265625	1.265625		
Min Limit	1.171875	1.171875		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.207	1.204	0.003
1E+12	14; site 2	1.199	1.199	0.000
1E+12	15; site 2	1.206	1.206	0.000
5E+12	16; site 2	1.203	1.203	0.000
5E+12	17; site 2	1.207	1.207	0.000
5E+12	18; site 2	1.201	1.201	0.000
1E+13	19; site 2	1.209	1.209	0.000
1E+13	20; site 2	1.203	1.203	0.000
1E+13	; site 2	1.209	1.209	0.000
	Max	1.209	1.209	0.003
	Average	1.205	1.205	0.000
	Min	1.199	1.199	0.000
	Std Dev	0.003	0.003	0.001

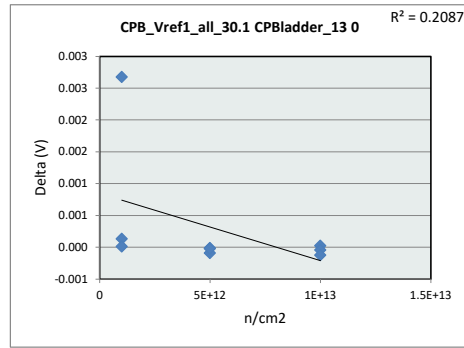


CPB_Vref1_all_30.1 CPBladder_12 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	1.265625	V	
Min Limit	1.171875	V	
n/cm2	1E+12	5E+12	1E+13
LL	1.172	1.172	1.172
Min	1.199	1.201	1.203
Average	1.203	1.204	1.207
Max	1.206	1.207	1.209
UL	1.266	1.266	1.266

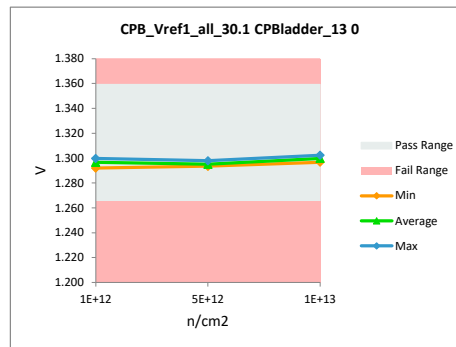


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CPB_Vref1_all_30.1 CPBladder_13 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	1.359375	1.359375		
Min Limit	1.265625	1.265625		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.301	1.298	0.003
1E+12	14; site 2	1.292	1.292	0.000
1E+12	15; site 2	1.300	1.300	0.000
5E+12	16; site 2	1.294	1.294	0.000
5E+12	17; site 2	1.298	1.298	0.000
5E+12	18; site 2	1.293	1.293	0.000
1E+13	19; site 2	1.300	1.300	0.000
1E+13	20; site 2	1.297	1.297	0.000
1E+13	; site 2	1.302	1.302	0.000
	Max	1.302	1.302	0.003
	Average	1.297	1.297	0.000
	Min	1.292	1.292	0.000
	Std Dev	0.004	0.003	0.001

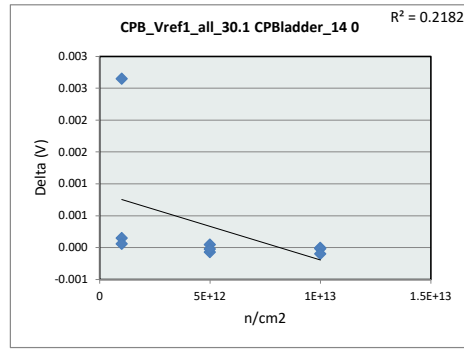


CPB_Vref1_all_30.1 CPBladder_13 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	1.359375	V	
Min Limit	1.265625	V	
n/cm2	1E+12	5E+12	1E+13
LL	1.266	1.266	1.266
Min	1.292	1.293	1.297
Average	1.297	1.295	1.300
Max	1.300	1.298	1.302
UL	1.359	1.359	1.359

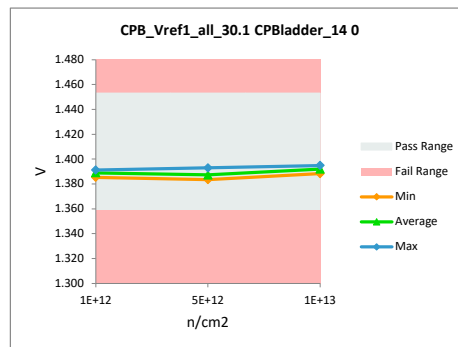


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CPB_Vref1_all_30.1 CPBladder_14 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		1.453125	1.453125	
Min Limit		1.359375	1.359375	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.393	1.390	0.003
1E+12	14; site 2	1.385	1.385	0.000
1E+12	15; site 2	1.391	1.391	0.000
5E+12	16; site 2	1.383	1.383	0.000
5E+12	17; site 2	1.393	1.393	0.000
5E+12	18; site 2	1.385	1.385	0.000
1E+13	19; site 2	1.393	1.393	0.000
1E+13	20; site 2	1.388	1.388	0.000
1E+13	; site 2	1.395	1.395	0.000
Max		1.395	1.395	0.003
Average		1.390	1.389	0.000
Min		1.383	1.383	0.000
Std Dev		0.004	0.004	0.001

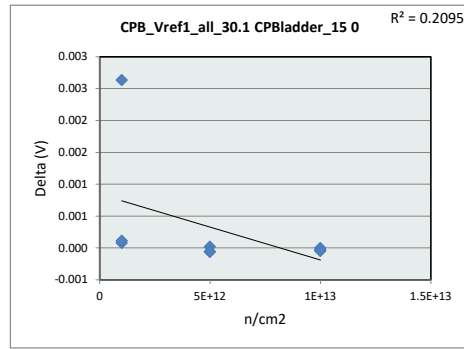


CPB_Vref1_all_30.1 CPBladder_14 0			
Test Site		CLAB	CLAB
Tester		J750EX	J750EX
Test Number		JP079800	JP079800
Max Limit		1.453125	V
Min Limit		1.359375	V
n/cm2	1E+12	5E+12	1E+13
LL	1.359	1.359	1.359
Min	1.385	1.383	1.388
Average	1.389	1.387	1.392
Max	1.391	1.393	1.395
UL	1.453	1.453	1.453

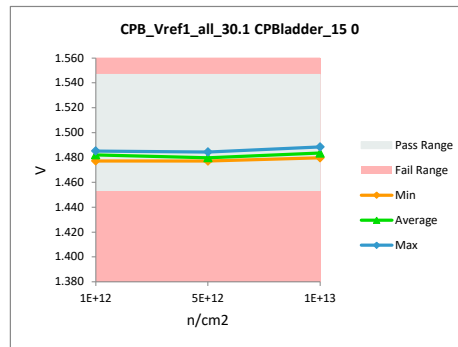


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CPB_Vref1_all_30.1 CPBladder_15 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	1.546875	1.546875		
Min Limit	1.453125	1.453125		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.488	1.485	0.003
1E+12	14; site 2	1.477	1.477	0.000
1E+12	15; site 2	1.484	1.484	0.000
5E+12	16; site 2	1.477	1.477	0.000
5E+12	17; site 2	1.484	1.484	0.000
5E+12	18; site 2	1.478	1.478	0.000
1E+13	19; site 2	1.482	1.482	0.000
1E+13	20; site 2	1.480	1.480	0.000
1E+13	; site 2	1.488	1.489	0.000
	Max	1.488	1.489	0.003
	Average	1.482	1.482	0.000
	Min	1.477	1.477	0.000
	Std Dev	0.004	0.004	0.001

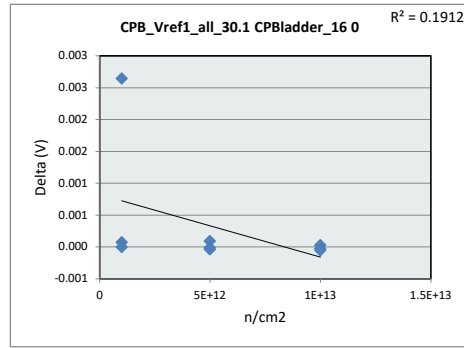


CPB_Vref1_all_30.1 CPBladder_15 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	1.546875	V	
Min Limit	1.453125	V	
n/cm2	1E+12	5E+12	1E+13
LL	1.453	1.453	1.453
Min	1.477	1.477	1.480
Average	1.482	1.480	1.484
Max	1.485	1.484	1.489
UL	1.547	1.547	1.547

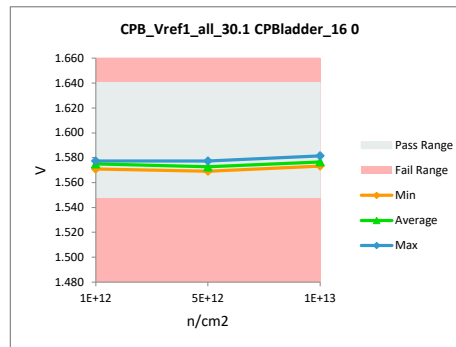


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CPB_Vref1_all_30.1 CPBladder_16 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		1.640625	1.640625	
Min Limit		1.546875	1.546875	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.580	1.577	0.003
1E+12	14; site 2	1.571	1.571	0.000
1E+12	15; site 2	1.577	1.577	0.000
5E+12	16; site 2	1.571	1.571	0.000
5E+12	17; site 2	1.577	1.577	0.000
5E+12	18; site 2	1.569	1.569	0.000
1E+13	19; site 2	1.573	1.573	0.000
1E+13	20; site 2	1.575	1.575	0.000
1E+13	; site 2	1.581	1.582	0.000
Max		1.581	1.582	0.003
Average		1.575	1.575	0.000
Min		1.569	1.569	0.000
Std Dev		0.004	0.004	0.001

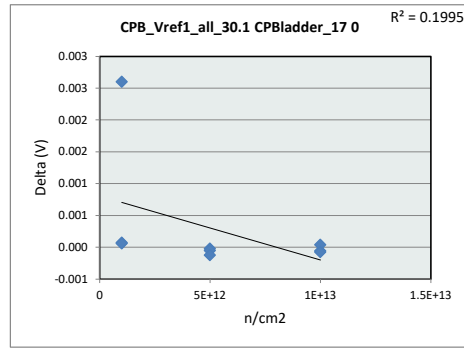


CPB_Vref1_all_30.1 CPBladder_16 0			
Test Site		CLAB	
Tester		J750EX	
Test Number		JP079800	
Max Limit		1.640625	V
Min Limit		1.546875	V
n/cm2	1E+12	5E+12	1E+13
LL	1.547	1.547	1.547
Min	1.571	1.569	1.573
Average	1.575	1.573	1.577
Max	1.577	1.577	1.582
UL	1.641	1.641	1.641

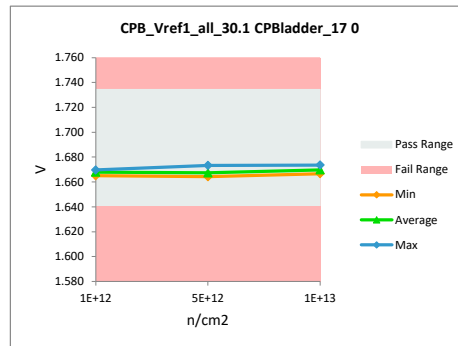


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CPB_Vref1_all_30.1 CPBladder_17 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		1.734375	1.734375	
Min Limit		1.640625	1.640625	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.672	1.669	0.003
1E+12	14; site 2	1.665	1.665	0.000
1E+12	15; site 2	1.670	1.670	0.000
5E+12	16; site 2	1.664	1.664	0.000
5E+12	17; site 2	1.673	1.673	0.000
5E+12	18; site 2	1.664	1.665	0.000
1E+13	19; site 2	1.667	1.667	0.000
1E+13	20; site 2	1.669	1.669	0.000
1E+13	; site 2	1.674	1.674	0.000
Max		1.674	1.674	0.003
Average		1.669	1.668	0.000
Min		1.664	1.664	0.000
Std Dev		0.004	0.004	0.001

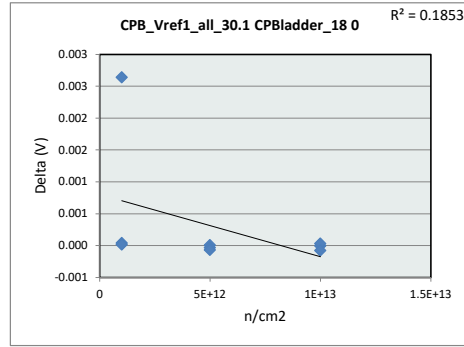


CPB_Vref1_all_30.1 CPBladder_17 0			
Test Site		CLAB	CLAB
Tester		J750EX	J750EX
Test Number		JP079800	JP079800
Max Limit		1.734375	V
Min Limit		1.640625	V
n/cm2	1E+12	5E+12	1E+13
LL	1.641	1.641	1.641
Min	1.665	1.664	1.667
Average	1.668	1.667	1.670
Max	1.670	1.673	1.674
UL	1.734	1.734	1.734

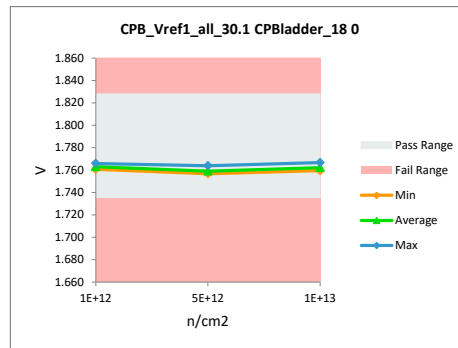


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CPB_Vref1_all_30.1 CPBladder_18 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		1.828125	1.828125	
Min Limit		1.734375	1.734375	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.766	1.763	0.003
1E+12	14; site 2	1.761	1.761	0.000
1E+12	15; site 2	1.766	1.766	0.000
5E+12	16; site 2	1.757	1.757	0.000
5E+12	17; site 2	1.764	1.764	0.000
5E+12	18; site 2	1.757	1.757	0.000
1E+13	19; site 2	1.761	1.761	0.000
1E+13	20; site 2	1.760	1.759	0.000
1E+13	; site 2	1.767	1.767	0.000
Max		1.767	1.767	0.003
Average		1.762	1.762	0.000
Min		1.757	1.757	0.000
Std Dev		0.004	0.004	0.001

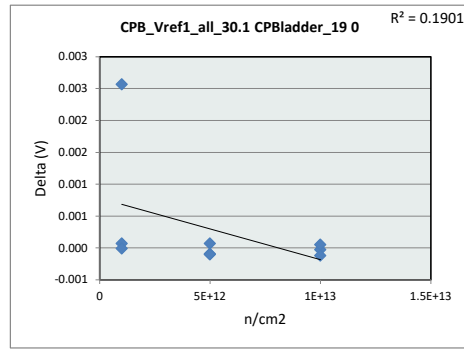


CPB_Vref1_all_30.1 CPBladder_18 0			
Test Site		CLAB	CLAB
Tester		J750EX	J750EX
Test Number		JP079800	JP079800
Max Limit		1.828125	V
Min Limit		1.734375	V
n/cm2	1E+12	5E+12	1E+13
LL	1.734	1.734	1.734
Min	1.761	1.757	1.759
Average	1.763	1.759	1.762
Max	1.766	1.764	1.767
UL	1.828	1.828	1.828

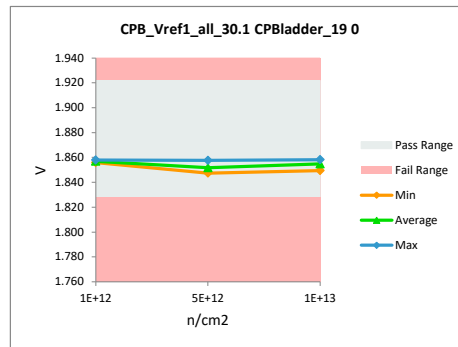


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CPB_Vref1_all_30.1 CPBladder_19 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	1.921875	1.921875		
Min Limit	1.828125	1.828125		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.859	1.856	0.003
1E+12	14; site 2	1.857	1.857	0.000
1E+12	15; site 2	1.858	1.858	0.000
5E+12	16; site 2	1.848	1.847	0.000
5E+12	17; site 2	1.858	1.858	0.000
5E+12	18; site 2	1.850	1.850	0.000
1E+13	19; site 2	1.857	1.857	0.000
1E+13	20; site 2	1.850	1.849	0.000
1E+13	; site 2	1.858	1.858	0.000
	Max	1.859	1.858	0.003
	Average	1.855	1.855	0.000
	Min	1.848	1.847	0.000
	Std Dev	0.004	0.004	0.001

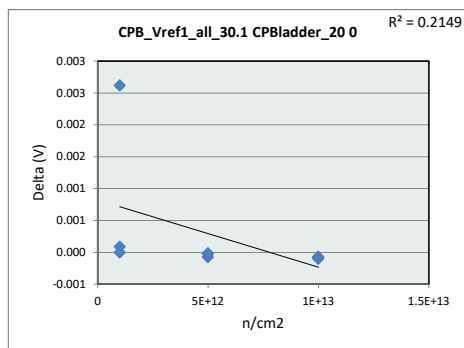


CPB_Vref1_all_30.1 CPBladder_19 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	1.921875	V	
Min Limit	1.828125	V	
n/cm2	1E+12	5E+12	1E+13
LL	1.828	1.828	1.828
Min	1.856	1.847	1.849
Average	1.857	1.852	1.855
Max	1.858	1.858	1.858
UL	1.922	1.922	1.922

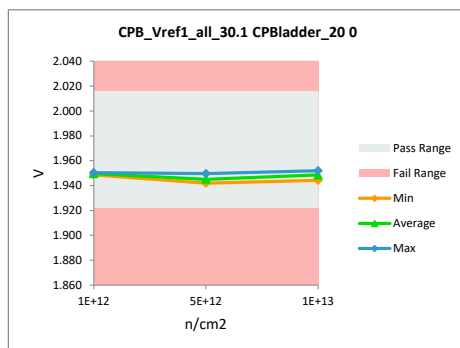


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CPB_Vref1_all_30.1 CPBladder_20				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.015625	2.015625		
Min Limit	1.921875	1.921875		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1.951	1.949	0.003
1E+12	14; site 2	1.950	1.950	0.000
1E+12	15; site 2	1.950	1.950	0.000
5E+12	16; site 2	1.942	1.942	0.000
5E+12	17; site 2	1.950	1.950	0.000
5E+12	18; site 2	1.944	1.944	0.000
1E+13	19; site 2	1.952	1.952	0.000
1E+13	20; site 2	1.944	1.944	0.000
1E+13	; site 2	1.949	1.949	0.000
	Max	1.952	1.952	0.003
	Average	1.948	1.948	0.000
	Min	1.942	1.942	0.000
	Std Dev	0.004	0.004	0.001

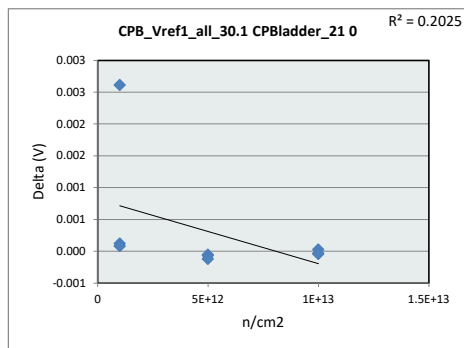


CPB_Vref1_all_30.1 CPBladder_20				
Test Site	CLAB			
Tester	J750EX			
Test Number	JP079800			
Max Limit	2.015625	V		
Min Limit	1.921875	V		
n/cm2	1E+12	5E+12	1E+13	
LL	1.922	1.922	1.922	
Min	1.949	1.942	1.944	
Average	1.950	1.945	1.949	
Max	1.950	1.950	1.952	
UL	2.016	2.016	2.016	

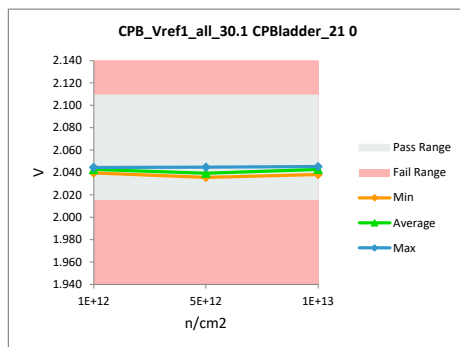


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CPB_Vref1_all_30.1 CPBladder_21 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.109375	2.109375		
Min Limit	2.015625	2.015625		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.042	2.040	0.003
1E+12	14; site 2	2.044	2.044	0.000
1E+12	15; site 2	2.045	2.045	0.000
5E+12	16; site 2	2.036	2.036	0.000
5E+12	17; site 2	2.045	2.045	0.000
5E+12	18; site 2	2.038	2.038	0.000
1E+13	19; site 2	2.045	2.045	0.000
1E+13	20; site 2	2.038	2.038	0.000
1E+13	; site 2	2.045	2.045	0.000
	Max	2.045	2.045	0.003
	Average	2.042	2.042	0.000
	Min	2.036	2.036	0.000
	Std Dev	0.004	0.004	0.001

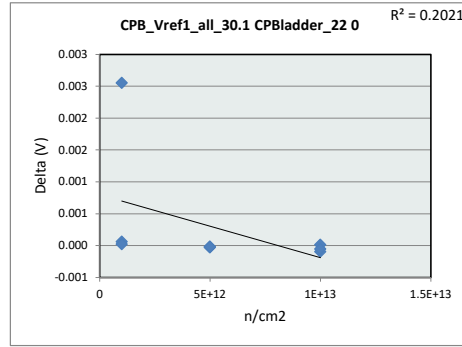


CPB_Vref1_all_30.1 CPBladder_21 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.109375	V	
Min Limit	2.015625	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.016	2.016	2.016
Min	2.040	2.036	2.038
Average	2.043	2.039	2.043
Max	2.045	2.045	2.045
UL	2.109	2.109	2.109

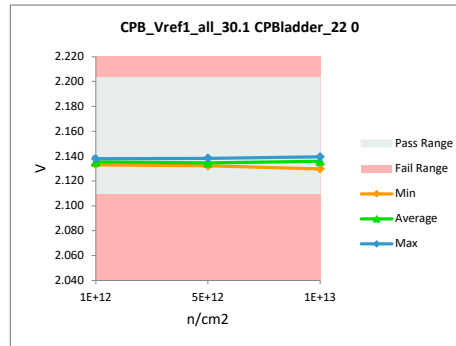


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CPB_Vref1_all_30.1 CPBladder_22 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.203125	2.203125		
Min Limit	2.109375	2.109375		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.136	2.133	0.003
1E+12	14; site 2	2.138	2.138	0.000
1E+12	15; site 2	2.135	2.135	0.000
5E+12	16; site 2	2.132	2.132	0.000
5E+12	17; site 2	2.138	2.138	0.000
5E+12	18; site 2	2.133	2.133	0.000
1E+13	19; site 2	2.139	2.139	0.000
1E+13	20; site 2	2.130	2.130	0.000
1E+13	; site 2	2.139	2.139	0.000
	Max	2.139	2.139	0.003
	Average	2.135	2.135	0.000
	Min	2.130	2.130	0.000
	Std Dev	0.003	0.003	0.001

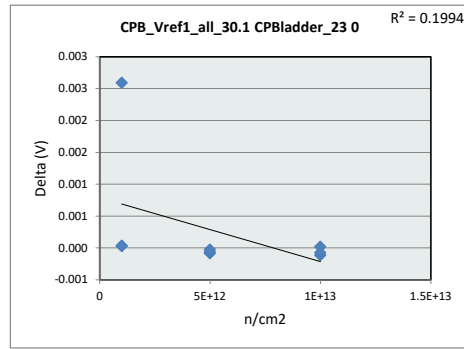


CPB_Vref1_all_30.1 CPBladder_22 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.203125	V	
Min Limit	2.109375	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.109	2.109	2.109
Min	2.133	2.132	2.130
Average	2.135	2.134	2.136
Max	2.138	2.138	2.139
UL	2.203	2.203	2.203

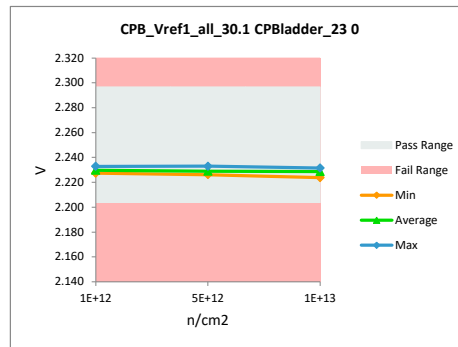


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CPB_Vref1_all_30.1 CPBladder_23 0				
Test Site	CLAB		CLAB	
Tester	J750EX		J750EX	
Test Number	JP079800		JP079800	
Unit	V		V	
Max Limit	2.296875		2.296875	
Min Limit	2.203125		2.203125	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.230	2.227	0.003
1E+12	14; site 2	2.233	2.233	0.000
1E+12	15; site 2	2.229	2.229	0.000
5E+12	16; site 2	2.226	2.226	0.000
5E+12	17; site 2	2.233	2.233	0.000
5E+12	18; site 2	2.228	2.228	0.000
1E+13	19; site 2	2.231	2.232	0.000
1E+13	20; site 2	2.224	2.224	0.000
1E+13	; site 2	2.231	2.231	0.000
	Max	2.233	2.233	0.003
	Average	2.229	2.229	0.000
	Min	2.224	2.224	0.000
	Std Dev	0.003	0.003	0.001

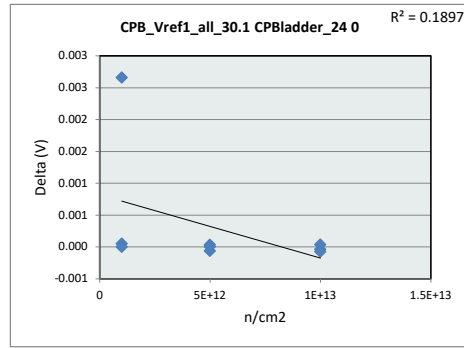


CPB_Vref1_all_30.1 CPBladder_23 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.296875 V		
Min Limit	2.203125 V		
n/cm2	1E+12	5E+12	1E+13
LL	2.203	2.203	2.203
Min	2.227	2.226	2.224
Average	2.230	2.229	2.229
Max	2.233	2.233	2.232
UL	2.297	2.297	2.297

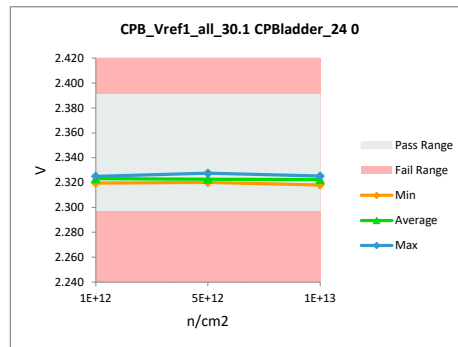


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CPB_Vref1_all_30.1 CPBladder_24 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.390625	2.390625		
Min Limit	2.296875	2.296875		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.322	2.320	0.003
1E+12	14; site 2	2.325	2.325	0.000
1E+12	15; site 2	2.325	2.325	0.000
5E+12	16; site 2	2.321	2.321	0.000
5E+12	17; site 2	2.328	2.328	0.000
5E+12	18; site 2	2.320	2.320	0.000
1E+13	19; site 2	2.325	2.325	0.000
1E+13	20; site 2	2.318	2.318	0.000
1E+13	; site 2	2.324	2.324	0.000
	Max	2.328	2.328	0.003
	Average	2.323	2.323	0.000
	Min	2.318	2.318	0.000
	Std Dev	0.003	0.003	0.001

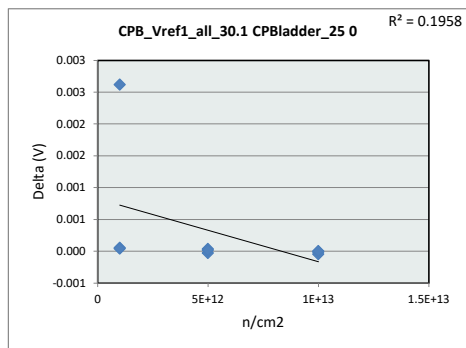


CPB_Vref1_all_30.1 CPBladder			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.390625	V	
Min Limit	2.296875	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.297	2.297	2.297
Min	2.320	2.320	2.318
Average	2.323	2.323	2.322
Max	2.325	2.328	2.325
UL	2.391	2.391	2.391

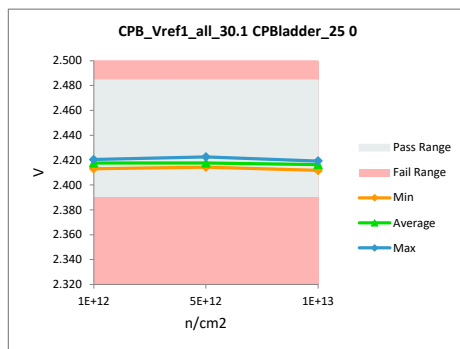


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CPB_Vref1_all_30.1 CPBladder_25 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		2.484375	2.484375	
Min Limit		2.390625	2.390625	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.416	2.413	0.003
1E+12	14; site 2	2.420	2.420	0.000
1E+12	15; site 2	2.420	2.420	0.000
5E+12	16; site 2	2.414	2.414	0.000
5E+12	17; site 2	2.423	2.423	0.000
5E+12	18; site 2	2.416	2.416	0.000
1E+13	19; site 2	2.419	2.419	0.000
1E+13	20; site 2	2.412	2.412	0.000
1E+13	; site 2	2.418	2.418	0.000
Max		2.423	2.423	0.003
Average		2.418	2.417	0.000
Min		2.412	2.412	0.000
Std Dev		0.003	0.004	0.001

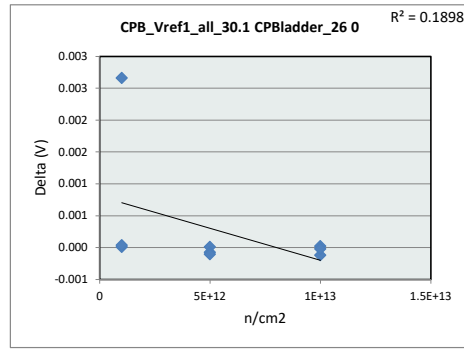


CPB_Vref1_all_30.1 CPBladder_25 0				
Test Site		CLAB		
Tester		J750EX		
Test Number		JP079800		
Max Limit		2.484375	V	
Min Limit		2.390625	V	
n/cm2		1E+12	5E+12	1E+13
LL		2.391	2.391	2.391
Min		2.413	2.414	2.412
Average		2.418	2.418	2.416
Max		2.420	2.423	2.419
UL		2.484	2.484	2.484

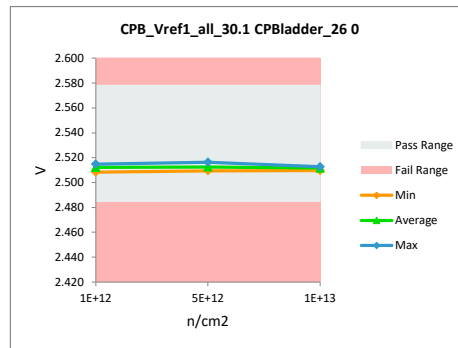


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CPB_Vref1_all_30.1 CPBladder_26 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.578125	2.578125		
Min Limit	2.484375	2.484375		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.511	2.508	0.003
1E+12	14; site 2	2.515	2.515	0.000
1E+12	15; site 2	2.514	2.513	0.000
5E+12	16; site 2	2.510	2.509	0.000
5E+12	17; site 2	2.516	2.516	0.000
5E+12	18; site 2	2.511	2.512	0.000
1E+13	19; site 2	2.513	2.513	0.000
1E+13	20; site 2	2.510	2.510	0.000
1E+13	; site 2	2.512	2.512	0.000
	Max	2.516	2.516	0.003
	Average	2.512	2.512	0.000
	Min	2.510	2.508	0.000
	Std Dev	0.002	0.003	0.001

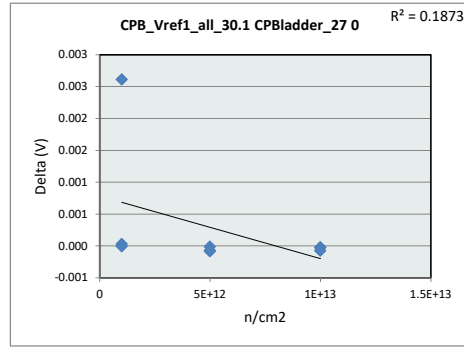


CPB_Vref1_all_30.1 CPBladder_26 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.578125	V	
Min Limit	2.484375	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.484	2.484	2.484
Min	2.508	2.509	2.510
Average	2.512	2.512	2.512
Max	2.515	2.516	2.513
UL	2.578	2.578	2.578

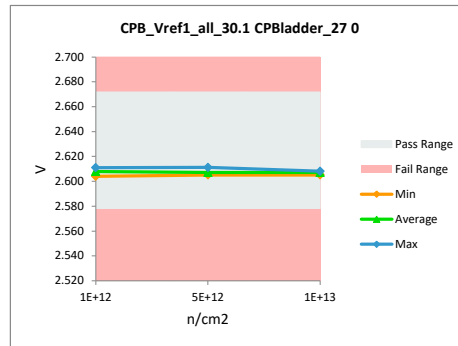


MSP430FR5969-SP NDD Report
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CPB_Vref1_all_30.1 CPBladder_27 0				
Test Site	CLAB		CLAB	
Tester	J750EX		J750EX	
Test Number	JP079800		JP079800	
Unit	V		V	
Max Limit	2.671875		2.671875	
Min Limit	2.578125		2.578125	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.607	2.604	0.003
1E+12	14; site 2	2.609	2.609	0.000
1E+12	15; site 2	2.611	2.611	0.000
5E+12	16; site 2	2.605	2.605	0.000
5E+12	17; site 2	2.611	2.611	0.000
5E+12	18; site 2	2.605	2.605	0.000
1E+13	19; site 2	2.608	2.608	0.000
1E+13	20; site 2	2.605	2.605	0.000
1E+13	; site 2	2.608	2.608	0.000
	Max	2.611	2.611	0.003
	Average	2.608	2.607	0.000
	Min	2.605	2.604	0.000
	Std Dev	0.002	0.003	0.001

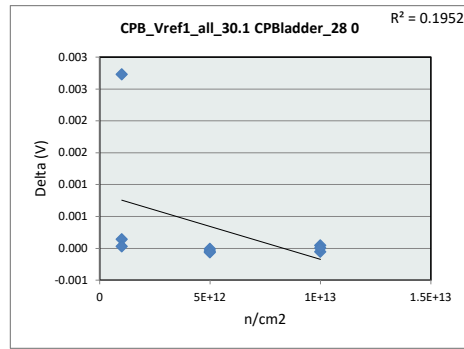


CPB_Vref1_all_30.1 CPBladder_27 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.671875		V
Min Limit	2.578125		V
n/cm2	1E+12	5E+12	1E+13
LL	2.578	2.578	2.578
Min	2.604	2.605	2.605
Average	2.608	2.607	2.607
Max	2.611	2.611	2.608
UL	2.672	2.672	2.672

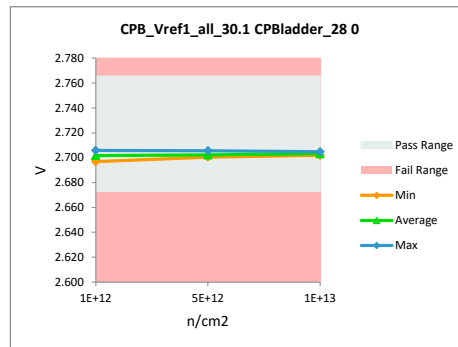


MSP430FR5969-SP NDD Report
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CPB_Vref1_all_30.1 CPBladder_28 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.765625	2.765625		
Min Limit	2.671875	2.671875		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.700	2.697	0.003
1E+12	14; site 2	2.703	2.703	0.000
1E+12	15; site 2	2.706	2.706	0.000
5E+12	16; site 2	2.701	2.701	0.000
5E+12	17; site 2	2.706	2.706	0.000
5E+12	18; site 2	2.701	2.701	0.000
1E+13	19; site 2	2.703	2.703	0.000
1E+13	20; site 2	2.702	2.702	0.000
1E+13	; site 2	2.705	2.705	0.000
	Max	2.706	2.706	0.003
	Average	2.703	2.702	0.000
	Min	2.700	2.697	0.000
	Std Dev	0.002	0.003	0.001

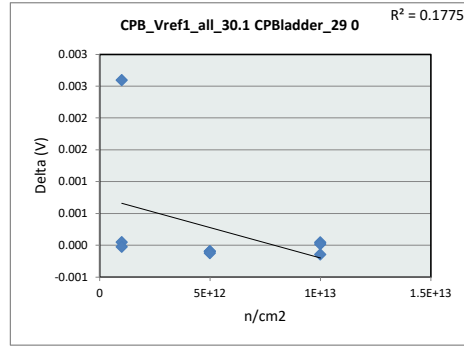


CPB_Vref1_all_30.1 CPBladder_28 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.765625	V	
Min Limit	2.671875	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.672	2.672	2.672
Min	2.697	2.701	2.702
Average	2.702	2.702	2.703
Max	2.706	2.706	2.705
UL	2.766	2.766	2.766

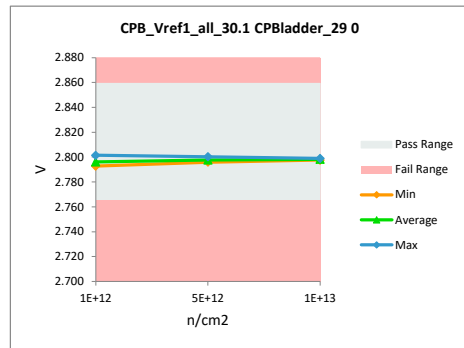


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MSP430FR5969-SP

CPB_Vref1_all_30.1 CPBladder_29 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.859375	2.859375		
Min Limit	2.765625	2.765625		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.795	2.793	0.003
1E+12	14; site 2	2.794	2.794	0.000
1E+12	15; site 2	2.801	2.801	0.000
5E+12	16; site 2	2.796	2.796	0.000
5E+12	17; site 2	2.800	2.800	0.000
5E+12	18; site 2	2.797	2.797	0.000
1E+13	19; site 2	2.798	2.798	0.000
1E+13	20; site 2	2.798	2.798	0.000
1E+13	; site 2	2.799	2.799	0.000
	Max	2.801	2.801	0.003
	Average	2.798	2.797	0.000
	Min	2.794	2.793	0.000
	Std Dev	0.002	0.003	0.001

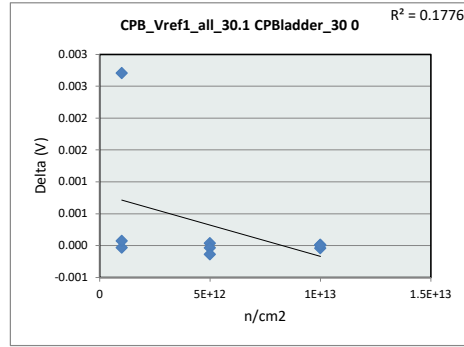


CPB_Vref1_all_30.1 CPBladder_29 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.859375	V	
Min Limit	2.765625	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.766	2.766	2.766
Min	2.793	2.796	2.798
Average	2.796	2.798	2.798
Max	2.801	2.800	2.799
UL	2.859	2.859	2.859

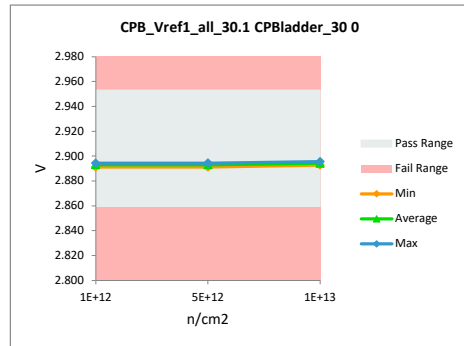


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CPB_Vref1_all_30.1 CPBladder_30 0				
Test Site	CLAB	CLAB		
Tester	J750EX	J750EX		
Test Number	JP079800	JP079800		
Unit	V	V		
Max Limit	2.953125	2.953125		
Min Limit	2.859375	2.859375		
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.894	2.891	0.003
1E+12	14; site 2	2.894	2.894	0.000
1E+12	15; site 2	2.894	2.894	0.000
5E+12	16; site 2	2.893	2.893	0.000
5E+12	17; site 2	2.894	2.894	0.000
5E+12	18; site 2	2.891	2.891	0.000
1E+13	19; site 2	2.896	2.896	0.000
1E+13	20; site 2	2.894	2.894	0.000
1E+13	; site 2	2.893	2.893	0.000
	Max	2.896	2.896	0.003
	Average	2.894	2.893	0.000
	Min	2.891	2.891	0.000
	Std Dev	0.001	0.001	0.001

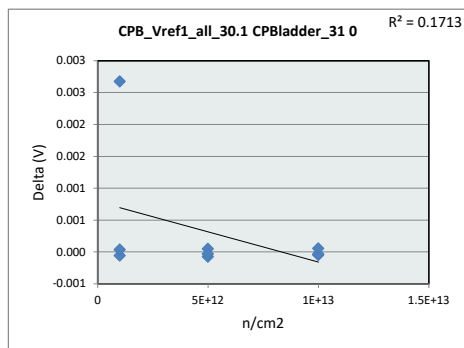


CPB_Vref1_all_30.1 CPBladder_30 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	2.953125	V	
Min Limit	2.859375	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.859	2.859	2.859
Min	2.891	2.891	2.893
Average	2.893	2.893	2.894
Max	2.894	2.894	2.896
UL	2.953	2.953	2.953

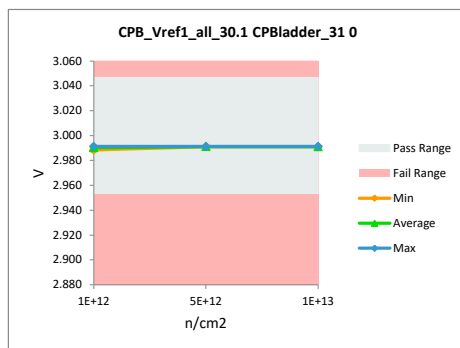


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CPB_Vref1_all_30.1 CPBladder_31 0				
Test Site		CLAB	CLAB	
Tester		J750EX	J750EX	
Test Number		JP079800	JP079800	
Unit		V	V	
Max Limit		3.046875	3.046875	
Min Limit		2.953125	2.953125	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	2.991	2.988	0.003
1E+12	14; site 2	2.991	2.991	0.000
1E+12	15; site 2	2.991	2.991	0.000
5E+12	16; site 2	2.991	2.991	0.000
5E+12	17; site 2	2.991	2.991	0.000
5E+12	18; site 2	2.991	2.991	0.000
1E+13	19; site 2	2.991	2.991	0.000
1E+13	20; site 2	2.991	2.991	0.000
1E+13	; site 2	2.991	2.991	0.000
	Max	2.991	2.991	0.003
	Average	2.991	2.991	0.000
	Min	2.991	2.988	0.000
	Std Dev	0.000	0.001	0.001

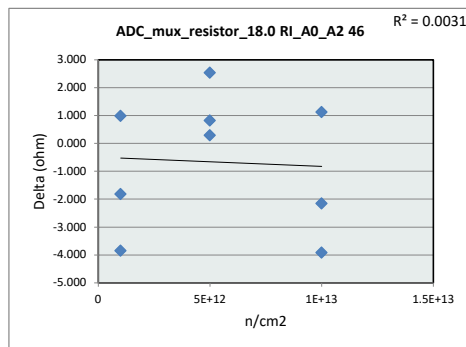


CPB_Vref1_all_30.1 CPBladder_31 0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	3.046875	V	
Min Limit	2.953125	V	
n/cm2	1E+12	5E+12	1E+13
LL	2.953	2.953	2.953
Min	2.988	2.991	2.991
Average	2.990	2.991	2.991
Max	2.991	2.991	2.991
UL	3.047	3.047	3.047

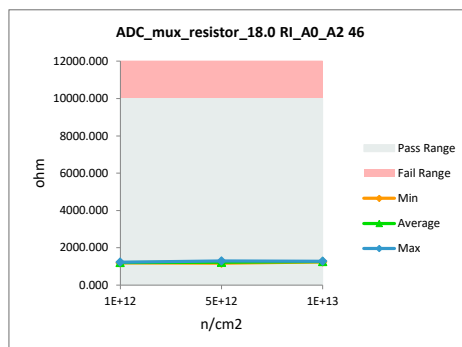


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ADC_mux_resistor_18.0 RI_A0				
Test Site	CLAB		CLAB	
Tester	J750EX		J750EX	
Test Number	JP079800		JP079800	
Unit	ohm		ohm	
Max Limit	10000		10000	
Min Limit	0		0	
n/cm2	Serial #	Pretesting	Posttesting	Delta
1E+12	13; site 2	1215.181	1219.035	-3.855
1E+12	14; site 2	1188.300	1187.312	0.988
1E+12	15; site 2	1229.384	1231.202	-1.818
5E+12	16; site 2	1301.272	1298.735	2.537
5E+12	17; site 2	1208.420	1208.128	0.292
5E+12	18; site 2	1171.031	1170.208	0.823
1E+13	19; site 2	1276.502	1280.428	-3.926
1E+13	20; site 2	1240.835	1242.996	-2.161
1E+13	; site 2	1268.400	1267.274	1.126
Max		1301.272	1298.735	2.537
Average		1233.258	1233.924	-0.666
Min		1171.031	1170.208	-3.926
Std Dev		42.779	42.843	2.337



ADC_mux_resistor_18.0 RI_A0			
Test Site	CLAB		
Tester	J750EX		
Test Number	JP079800		
Max Limit	10000	ohm	
Min Limit	0	ohm	
n/cm2	1E+12	5E+12	1E+13
LL	0.000	0.000	0.000
Min	1187.312	1170.208	1242.996
Average	1212.516	1225.690	1263.566
Max	1231.202	1298.735	1280.428
UL	10000.000	10000.000	10000.000



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