

Total Ionization Dose (TID) Test Results of the RH1498MW 10MHz, 6V/ μ s, Dual Rail-to-Rail Input and Output Precision C-Load Op-Amp @ Low Dose Rate (LDR)

LDR = 10 mrads(Si)/s

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TID LDR Testing of the RH1498MW 10MHz, 6V/ μ s, Dual Rail-to-Rail Input and Output Precision C-Load Op Amp

Part Type Tested: RH1498M 10MHz, 6V/ μ s, Dual Rail-to-Rail Input and Output Precision C-Load Op Amp.

Traceability Information: Fab Lot # W1403645.3; Assembly Lot# 741384.1; Wafer # 7; Date Code 1402A. See photograph of unit under test in Appendix A.

Quantity of Units: 12 units received, 2 units for control, 5 units for biased irradiation and 5 units for All GND'd irradiation. Serial numbers 826-830 had all pins tied to ground during irradiation. Serial numbers 821-825 were biased during irradiation. Serial numbers 832 and 833 were used as control. See Appendix B for the radiation bias connection tables.

Radiation and Electrical Test Increments: Ionizing radiation with the following electrical test increments: 10 Krads(Si), 20 Krads(Si), 50 Krads(Si), 73 Krads(Si), 107 Krads(Si), and 150 Krads(Si)

Radiation dose: 10 mrads(Si)/sec.

Radiation Test Standard: MIL-STD-883 TM1019.9 Condition D.

Test Hardware and Software: LTX pre-irradiation test program: EQ2RRH1498.02, LTX post-irradiation test program RAD1498.05.

Facility and Radiation Source: Defense Micro Electronic Activity (DMEA) and Cobalt-60.

Irradiation and Test Temperature: Room temperature controlled to 24°C \pm 6°C per MIL-STD-883 and MIL-STD-750.

SUMMARY

ALL 12 PARTS PASSED THE ELECTRICAL TEST LIMITS AS SPECIFIED IN THE DATASHEET AFTER EACH IRRADIATION INCREMENT. ADDITIONAL INFORMATION CAN BE PROVIDED PER REQUEST.

1.0 Overview and Background

Among other radiation effects, Total Ionizing Dose (TID) may affect circuits' electrical characteristics, causing parametric and/or functional failures in integrated circuits. During gamma-irradiations, TID-induced and transported electron-hole pairs may result in charge trapping in a transistor's dielectrics and interface regions, affecting the device's basic features. Such effects warrant testing and monitoring of circuits to TID, after which annealing and/or Time Dependent Effects (TDE) may take place, depending on the circuit's design and process technology. Hence the requirement per Condition D (for low-dose rates ranging from less than or equal to 10 mrads(Si)/sec) in TM1019, MIL-STD-883 is to not exceed the allowed time from the end of an incremented irradiation and an electrical test to more than one hour. Additionally, the total time from the end of one incremental irradiation to the start of the next incremental step should be less than two hours.

2.0 Radiation Facility and Test Equipment

The samples were irradiated at Defense Micro-Electronics Activity (DMEA) facility in Sacramento, California. DMEA utilizes J.L. Shepherd model 81-22/484 to provide the dose-rate of 10 mrads(Si)/s. A special design screw-driven automatic cart inside the exposure tunnel positions the Device-Under-Test (DUT) precisely and repeatedly from the source to attain optimal rate verified by ion chamber detectors. See Appendix C for the certificate of dosimetry.

3.0 Test Conditions

The 10 samples were placed in a lead/aluminum container and aligned with the radiation source, Cobalt-60, at DMEA facility in Sacramento, California. During irradiation, five units were biased at +/- 15V and 8V, other five had all pads grounded. The devices were irradiated up to 150 Krad(Si) with increments of 10, 20, 50, 73, 107 Krads(Si). After each irradiation, the samples were transported in dry ice to Linear Technology testing facility. Testing was performed on the two control units to confirm the operation of the test system prior to the electrical testing of the 12 units (10 irradiated and 2 control).

The criteria to pass the low dose-rate test is that five samples irradiated under electrical bias must pass the datasheet limits. If any of the measured parameters of these five units do not meet the required limits then a failure-analysis of the part should be conducted and if valid the lot will be scrapped.

4.0 Tested Parameters

The following parameters were measured pre- and post-irradiations, $V_s = \pm 15V$, and $V_{cm} = V_{out} = 0V$, unless otherwise note.

- A side V_{OS} @ $V_s = \pm 15V$, $V_{cm} = -15V$
- B side V_{OS} @ $V_s = \pm 15V$, $V_{cm} = -15V$
- A side V_{OS} @ $V_s = \pm 15V$, $V_{cm} = +15V$
- B side V_{OS} @ $V_s = \pm 15V$, $V_{cm} = +15V$
- A side I_B^- @ $V_s = \pm 15V$, $V_{cm} = -15V$
- B side I_B^- @ $V_s = \pm 15V$, $V_{cm} = -15V$
- A side I_B^- @ $V_s = \pm 15V$, $V_{cm} = +15V$
- B side I_B^- @ $V_s = \pm 15V$, $V_{cm} = +15V$
- A side I_B^+ @ $V_s = \pm 15V$, $V_{cm} = -15V$
- B side I_B^+ @ $V_s = \pm 15V$, $V_{cm} = -15V$
- A side I_B^+ @ $V_s = \pm 15V$, $V_{cm} = +15V$
- B side I_B^+ @ $V_s = \pm 15V$, $V_{cm} = +15V$
- A side I_{OS} @ $V_s = \pm 15V$, $V_{cm} = -15V$
- B side I_{OS} @ $V_s = \pm 15V$, $V_{cm} = -15V$
- A side I_{OS} @ $V_s = \pm 15V$, $V_{cm} = +15V$
- B side I_{OS} @ $V_s = \pm 15V$, $V_{cm} = +15V$
- A side Gain ($R_1 = 10K\Omega$) @ $V_o = -14.5V$ to $14.5V$
- B side Gain ($R_1 = 10K\Omega$) @ $V_o = -14.5V$ to $14.5V$
- A side Gain ($R_1 = 2K\Omega$) @ $V_o = -10V$ to $10V$
- B side Gain ($R_1 = 2K\Omega$) @ $V_o = -10V$ to $10V$
- A side CMRR @ $V_{cm} = 15V$ to $-15V$
- B side CMRR @ $V_{cm} = 15V$ to $-15V$
- CMRR Match @ $V_{cm} = 15V$ to $-15V$
- A side PSRR @ $V_s = \pm 2V$ to $\pm 16V$
- B side PSRR @ $V_s = \pm 2V$ to $\pm 16V$
- PSRR Match @ $V_s = \pm 2V$ to $\pm 16V$
- A side V_{OL} @ $V_s = \pm 15V$, No Load
- B side V_{OL} @ $V_s = \pm 15V$, No Load
- A side V_{OL} @ $V_s = \pm 15V$, $I_{SINK} = 1mA$
- B side V_{OL} @ $V_s = \pm 15V$, $I_{SINK} = 1mA$
- A side V_{OL} @ $V_s = \pm 15V$, $I_{SINK} = 10mA$
- B side V_{OL} @ $V_s = \pm 15V$, $I_{SINK} = 10mA$
- A side V_{OH} @ $V_s = \pm 15V$, No Load
- B side V_{OH} @ $V_s = \pm 15V$, No Load
- A side V_{OH} @ $V_s = \pm 15V$, $I_{SINK} = 1mA$
- B side V_{OH} @ $V_s = \pm 15V$, $I_{SINK} = 1mA$
- A side V_{OH} @ $V_s = \pm 15V$, $I_{SINK} = 10mA$
- B side V_{OH} @ $V_s = \pm 15V$, $I_{SINK} = 10mA$
- A side I_{SC}^+
- B side I_{SC}^+
- A side I_{SC}^-
- B side I_{SC}^-
- I_s @ $15V$
- A side GBWP @ $f=100KHz$
- B side GBWP @ $f=100KHz$

- A side Slew Rate (falling)
- B side Slew Rate (falling)
- A side Slew Rate (rising)
- B side Slew Rate (rising)

The following parameters were measured pre- and post-irradiations, $V_s = 5V$, and $V_{cm} = V_{out} =$ half supply, unless otherwise note.

- A side V_{OS} @ $V_s = 5V$, $V_{cm} = 5V$
- B side V_{OS} @ $V_s = 5V$, $V_{cm} = 5V$
- A side V_{OS} @ $V_s = 5V$, $V_{cm} = 0V$
- B side V_{OS} @ $V_s = 5V$, $V_{cm} = 0V$
- A side $I_B -$ @ $V_s = 5V$, $V_{cm} = 5V$
- B side $I_B -$ @ $V_s = 5V$, $V_{cm} = 5V$
- A side $I_B -$ @ $V_s = 5V$, $V_{cm} = 0V$
- B side $I_B -$ @ $V_s = 5V$, $V_{cm} = 0V$
- A side $I_B +$ @ $V_s = 5V$, $V_{cm} = 5V$
- B side $I_B +$ @ $V_s = 5V$, $V_{cm} = 5V$
- A side $I_B +$ @ $V_s = 5V$, $V_{cm} = 0V$
- B side $I_B +$ @ $V_s = 5V$, $V_{cm} = 0V$
- A side I_{OS} @ $V_s = 5V$, $V_{cm} = 5V$
- B side I_{OS} @ $V_s = 5V$, $V_{cm} = 5V$
- A side I_{OS} @ $V_s = 5V$, $V_{cm} = 0V$
- B side I_{OS} @ $V_s = 5V$, $V_{cm} = 0V$
- A side Gain ($R_1 = 10K\Omega$) @ $V_o = 75mV$ to $4.8V$
- B side Gain ($R_1 = 10K\Omega$) @ $V_o = 75mV$ to $4.8V$
- A side CMRR @ $V_{cm} = 0V$ to $5V$
- B side CMRR @ $V_{cm} = 0V$ to $5V$
- CMRR Match @ $V_{cm} = 0V$ to $5V$
- A side PSRR @ $V_s = 4.5V$ to $12V$
- B side PSRR @ $V_s = 4.5V$ to $12V$
- PSRR Match @ $V_s = 4.5V$ to $12V$
- A side V_{OL} @ $V_s = 5V$, No Load
- B side V_{OL} @ $V_s = 5V$, No Load
- A side V_{OL} @ $V_s = 5V$, $I_{SINK} = 1mA$
- B side V_{OL} @ $V_s = 5V$, $I_{SINK} = 1mA$
- A side V_{OL} @ $V_s = 5V$, $I_{SINK} = 2.5mA$
- B side V_{OL} @ $V_s = 5V$, $I_{SINK} = 2.5mA$
- A side V_{OH} @ $V_s = 5V$, No Load
- B side V_{OH} @ $V_s = 5V$, No Load
- A side V_{OH} @ $V_s = 5V$, $I_{SINK} = 1mA$
- B side V_{OH} @ $V_s = 5V$, $I_{SINK} = 1mA$
- A side V_{OH} @ $V_s = 5V$, $I_{SINK} = 2.5mA$
- B side V_{OH} @ $V_s = 5V$, $I_{SINK} = 2.5mA$
- A side $I_{SC} +$
- B side $I_{SC} +$
- A side $I_{SC} -$
- B side $I_{SC} -$
- I_s @ $5V$
- A side Slew Rate (falling)
- B side Slew Rate (falling)

- A side Slew Rate (rising)
- B side Slew Rate (rising)

Appendix D details the test conditions, minimum and maximum values at different accumulated doses.

5.0 Test Results

All fifteen samples passed the post-irradiation electrical tests. All measurements of the 94 listed parameters in section 4.0 are within the specification limits.

The used statistics in this report are based on the tolerance limits, which are bounds to gage the quality of the manufactured products. It assumes that if the quality of the items is normally distributed with known mean and known standard deviation, the two-sided tolerance limits can be calculated as follows:

$$+K_{TL} = \text{mean} + (K_{TL}) (\text{standard deviation})$$

$$-K_{TL} = \text{mean} - (K_{TL}) (\text{standard deviation})$$

Where $+K_{TL}$ is the upper tolerance limit and $-K_{TL}$ is the lower tolerance limit. These tolerance limits are defined in a table of inverse normal probability distribution.

However, in most cases, mean and standard deviation are unknown and therefore it is practical to estimate both of them from a sample. Hence the tolerance limit depends greatly on the sample size. The $P_{s90\%/90\%}$ K_{TL} factor for a lot quality P of 0.9, confidence C of 0.9 with a sample size of 5, can be found from the tabulated table (MIL-HDBK-814, page 94, table IX-B). The K_{TL} factor in this report is 2.742.

In the plots, the dotted lines with diamond markers are the average of the measured data points of five samples irradiated under electrical bias while the dashed lines with X-markers are the average of measured data points of five units irradiated with all pins tied to ground. The solid lines with triangle markers are the average of the data points after the calculation of the K_{TL} statistics on the sample irradiated in the biased setup. The solid lines with square symbols are the average of the measured points after the application of the K_{TL} statistics on the five samples irradiated with all pins grounded. The orange solid lines with circle markers are the specification limits.

The 107 Krads(Si) test limits are using Linear Technology datasheets 100 Krads(Si) specification limits.

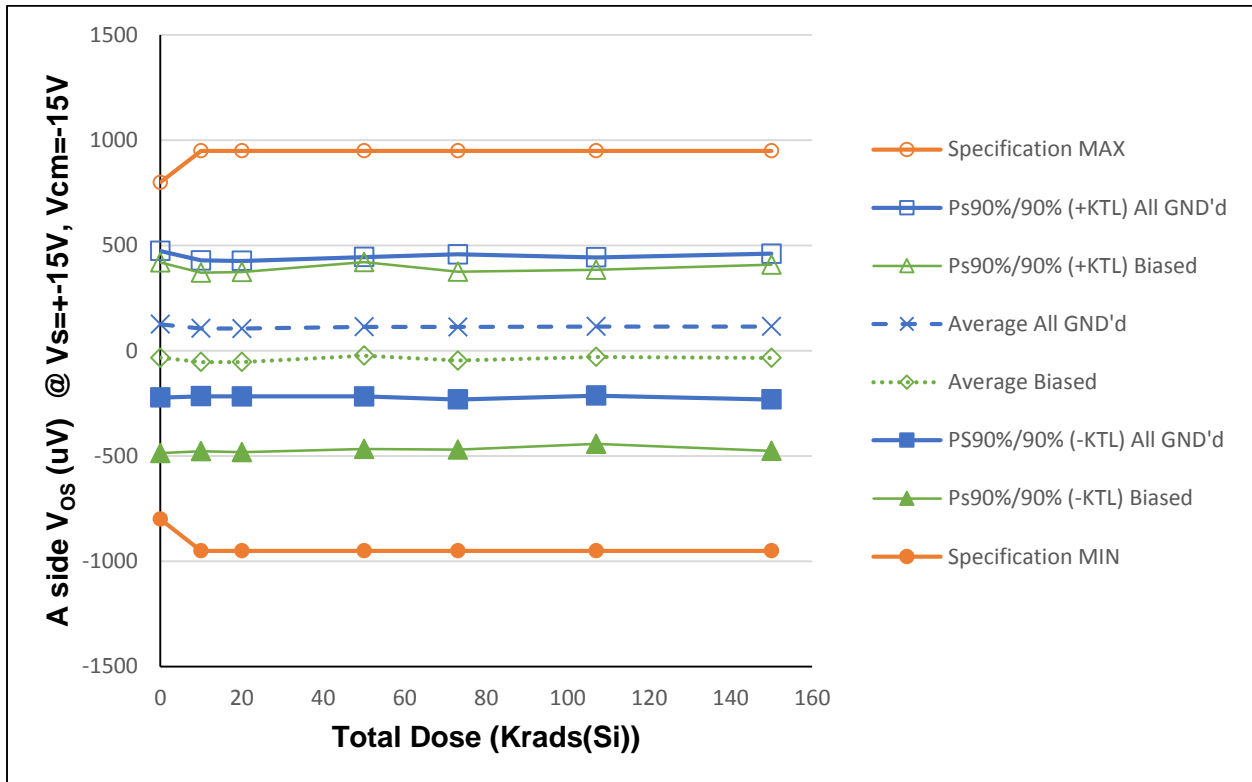


Figure 5.1 Plot of V_{os} (side A) @ $V_{cm} = -15V$ versus Total Dose

Table 5.1: Raw data for offset voltage (side A) @ Vcm = -15V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A V _{OS} @ Vs=+-15V, Vcm=-15V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(uV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	240.716	205.603	204.295	218.876	223.645	218.915	225.884
827	All GND'd Irradiation	205.904	204.242	204.540	209.721	210.660	205.675	208.469
828	All GND'd Irradiation	-81.738	-81.010	-80.158	-78.473	-87.007	-77.112	-88.919
829	All GND'd Irradiation	102.975	81.490	76.798	88.957	82.948	87.465	91.863
830	All GND'd Irradiation	161.223	121.140	121.251	131.724	136.538	142.201	138.198
821	Biased Irradiation	-125.183	-99.762	-99.955	-47.056	-91.879	-50.300	-90.171
822	Biased Irradiation	-11.905	-46.122	-44.411	-6.629	-24.063	-5.839	-7.303
823	Biased Irradiation	225.799	191.963	191.161	220.943	194.646	199.613	221.532
824	Biased Irradiation	-214.368	-234.511	-240.824	-231.574	-228.174	-218.694	-215.565
825	Biased Irradiation	-40.172	-77.245	-73.337	-49.099	-84.258	-69.267	-76.772
832	Control Unit	268.369	214.510	210.698	212.373	205.316	208.518	210.347
833	Control Unit	-57.196	-54.967	-48.081	-43.718	-54.745	-48.662	-49.439
All GND'd Irradiation Statistics								
	Average All GND'd	125.816	106.293	105.345	114.161	113.357	115.429	115.099
	Std Dev All GND'd	126.955	117.659	117.377	120.570	125.737	119.817	126.182
	Ps90%/90% (+KTL) All GND'd	473.926	428.914	427.194	444.763	458.126	443.967	461.091
	PS90%/90% (-KTL) All GND'd	-222.294	-216.328	-216.504	-216.441	-231.413	-213.109	-230.893
Biased Irradiation Statistics								
	Average Biased	-33.166	-53.136	-53.473	-22.683	-46.746	-28.897	-33.656
	Std Dev Biased	164.974	154.738	156.192	161.662	154.228	150.714	161.213
	Ps90%/90% (+KTL) Biased	419.192	371.155	374.804	420.595	376.147	384.361	408.392
	Ps90%/90% (-KTL) Biased	-485.523	-477.426	-481.751	-465.961	-469.639	-442.156	-475.703
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

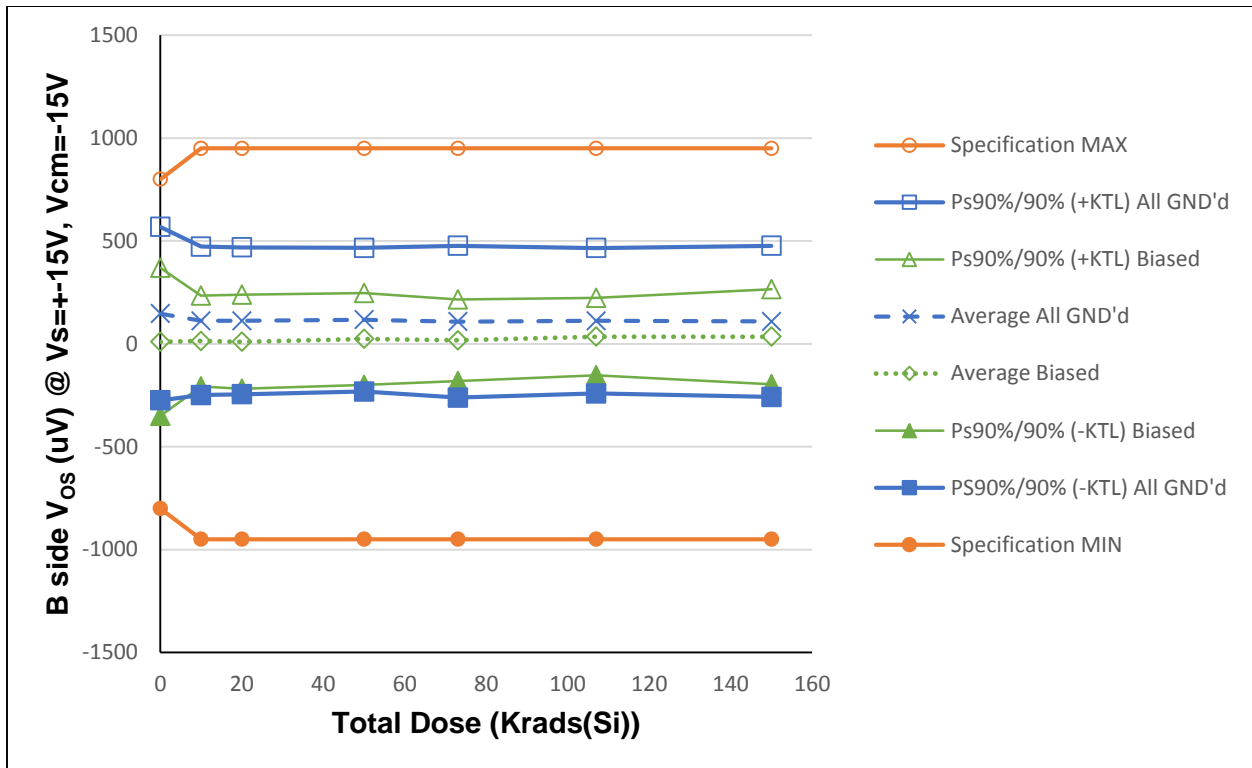


Figure 5.2: Plot of V_{os} (side B) @ $V_{cm} = -15V$ versus Total Dose

Table 5.2: Raw data for V_{OS} (side B) @ $V_{cm} = -15V$ versus total dose including the statistical calculations, minimum-maximum specifications, and the status of the test (PASS/FAIL under the second orange header)

Parameter	B V_{OS} @ $V_s = \pm 15V, V_{cm} = -15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(μV)							
826	All GND'd Irradiation	62.065	-1.476	-1.695	0.014	-4.867	-7.304	-3.073
827	All GND'd Irradiation	150.014	116.654	120.826	125.664	117.134	135.401	125.303
828	All GND'd Irradiation	225.225	167.767	159.931	168.424	170.539	165.811	175.876
829	All GND'd Irradiation	350.418	299.284	299.628	298.805	293.637	288.618	287.805
830	All GND'd Irradiation	-52.435	-22.590	-19.423	-6.934	-37.609	-21.139	-41.079
821	Biased Irradiation	83.904	44.642	39.143	53.196	44.023	53.822	50.887
822	Biased Irradiation	8.623	1.756	-8.186	0.761	13.292	25.349	92.000
823	Biased Irradiation	-197.189	-99.432	-105.691	-90.419	-81.256	-56.772	-87.430
824	Biased Irradiation	153.349	122.707	124.315	133.478	116.364	133.289	124.982
825	Biased Irradiation	0.549	-0.756	1.799	21.239	-7.666	18.632	-7.364
832	Control Unit	-260.684	-326.229	-327.666	-310.579	-327.756	-319.760	-330.456
833	Control Unit	57.342	41.955	43.667	51.786	34.129	40.642	37.717
All GND'd Irradiation Statistics								
	Average All GND'd	147.058	111.928	111.853	117.195	107.767	112.277	108.966
	Std Dev All GND'd	153.700	131.528	130.171	127.296	134.533	129.031	133.972
	Ps90%/90% (+KTL) All GND'd	568.504	472.577	468.783	466.242	476.656	466.082	476.316
	PS90%/90% (-KTL) All GND'd	-274.389	-248.721	-245.076	-231.852	-261.122	-241.527	-258.384
Biased Irradiation Statistics								
	Average Biased	9.847	13.783	10.276	23.651	16.951	34.864	34.615
	Std Dev Biased	131.367	80.608	83.215	81.358	72.249	68.553	84.234
	Ps90%/90% (+KTL) Biased	370.056	234.809	238.452	246.734	215.059	222.836	265.584
	Ps90%/90% (-KTL) Biased	-350.361	-207.242	-217.900	-199.433	-181.156	-153.108	-196.354
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

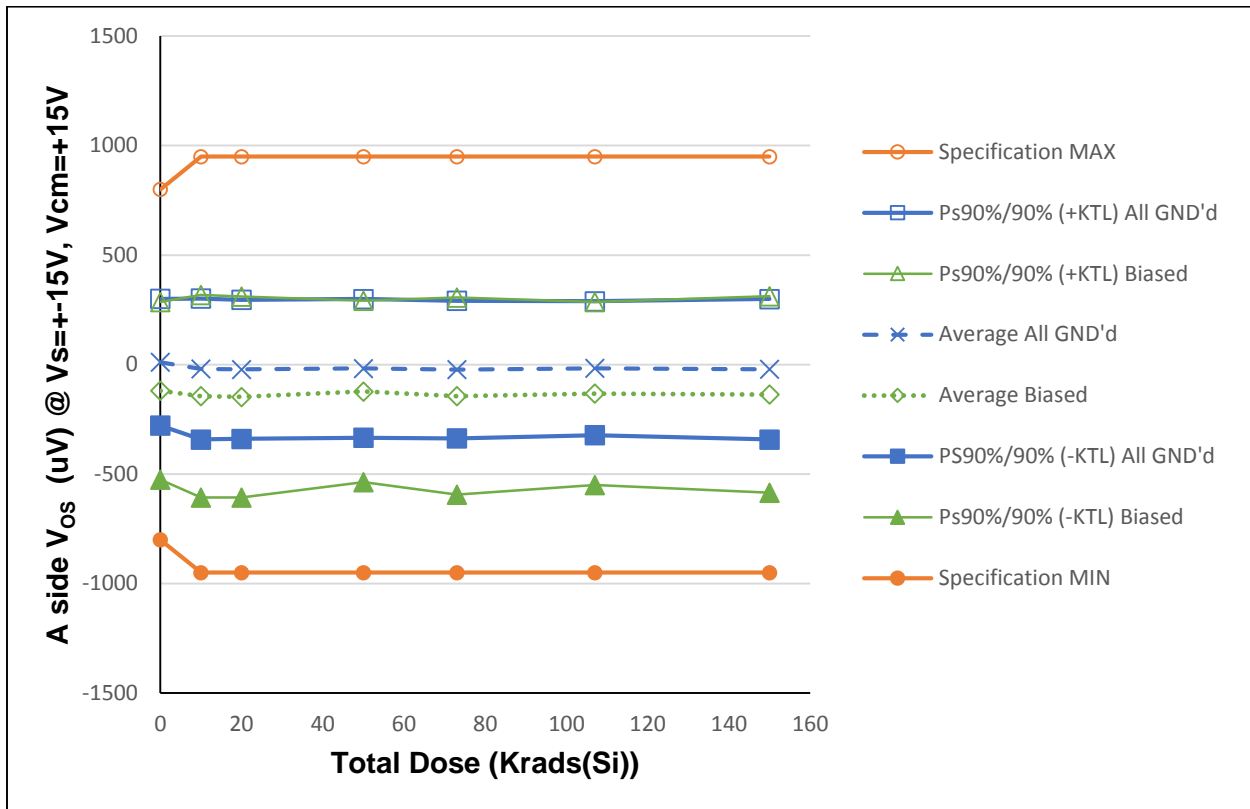


Figure 5.3: Plot of V_{os} (side A) @ $V_{cm} = +15V$ versus Total Dose

Table 5.3: Raw data for V_{OS} (side A) @ $V_{cm} = +15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL).

Parameter	A V_{OS} @ $V_s = \pm 15V$, $V_{cm} = +15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(μV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-52.442	-65.214	-65.708	-54.314	-58.748	-48.935	-52.608
827	All GND'd Irradiation	38.386	64.509	62.449	60.796	51.419	52.915	46.115
828	All GND'd Irradiation	-104.724	-171.620	-173.276	-172.782	-182.820	-173.251	-185.636
829	All GND'd Irradiation	172.967	127.385	122.098	126.892	117.840	121.152	126.120
830	All GND'd Irradiation	1.502	-54.990	-53.609	-46.606	-41.300	-35.114	-40.247
821	Biased Irradiation	-326.793	-360.994	-360.805	-305.960	-351.464	-320.972	-344.664
822	Biased Irradiation	-194.289	-253.579	-258.765	-224.720	-246.715	-227.475	-236.576
823	Biased Irradiation	65.133	73.983	69.986	84.963	75.189	77.615	81.731
824	Biased Irradiation	-63.919	-65.491	-69.944	-62.120	-67.810	-66.256	-58.357
825	Biased Irradiation	-75.977	-114.736	-118.008	-105.330	-127.480	-122.441	-124.779
832	Control Unit	-152.196	-129.221	-129.414	-117.931	-132.732	-128.547	-131.551
833	Control Unit	-38.058	-10.436	-10.348	-8.947	-12.949	-9.628	-7.356
All GND'd Irradiation Statistics								
	Average All GND'd	11.138	-19.986	-21.609	-17.203	-22.722	-16.647	-21.251
	Std Dev All GND'd	105.464	117.390	115.855	115.427	114.596	111.508	116.858
	Ps90%/90% (+KTL) All GND'd	300.319	301.897	296.064	299.299	291.501	289.108	299.173
	PS90%/90% (-KTL) All GND'd	-278.043	-341.869	-339.283	-333.704	-336.944	-322.401	-341.675
Biased Irradiation Statistics								
	Average Biased	-119.169	-144.163	-147.507	-122.633	-143.656	-131.906	-136.529
	Std Dev Biased	148.017	168.546	167.379	150.904	164.098	152.625	163.719
	Ps90%/90% (+KTL) Biased	286.694	317.989	311.447	291.145	306.301	286.593	312.390
	Ps90%/90% (-KTL) Biased	-525.032	-606.316	-606.462	-536.412	-593.613	-550.405	-585.447
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

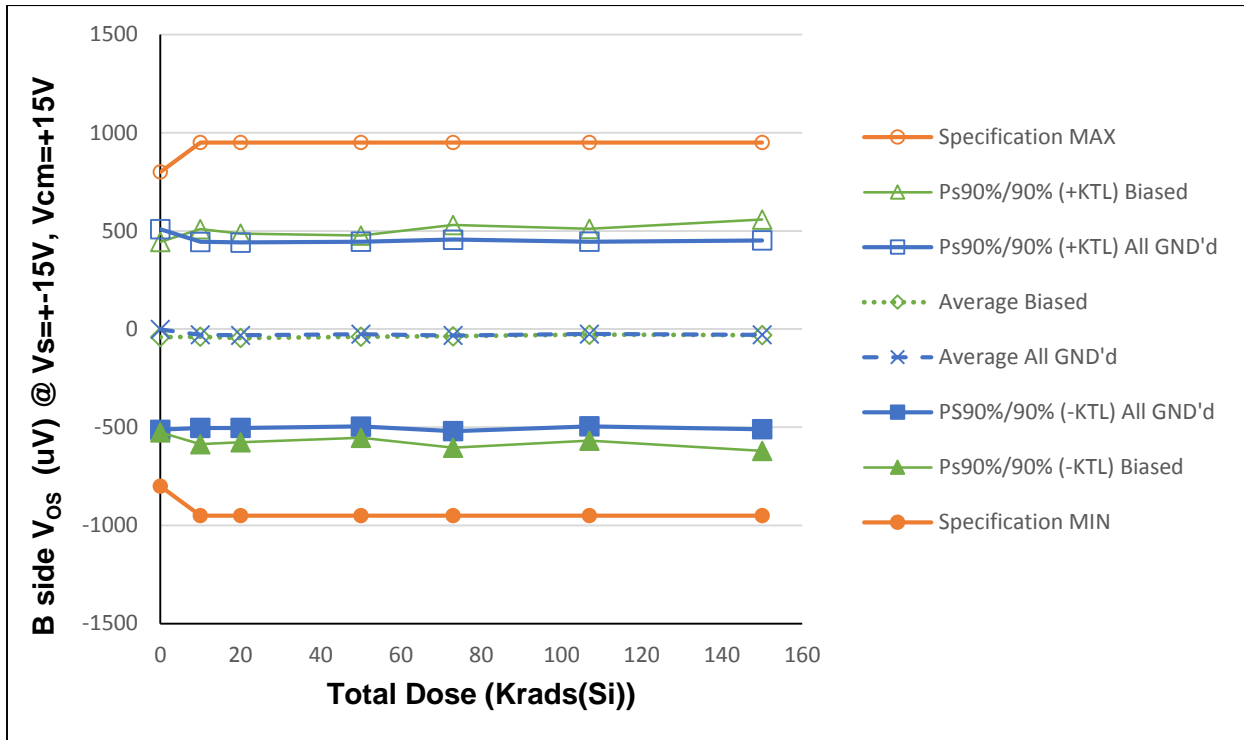


Figure 5.4: Plot of V_{OS} (side B) @ $V_{cm} = +15V$ versus Total Dose

Table 5.4: Raw data for V_{OS} (side B) @ $V_{cm} = +15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL).

Parameter	B V_{OS} @ $V_s = \pm 15V, V_{cm} = +15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(uV)							
826	All GND'd Irradiation	-224.898	-271.292	-275.515	-270.716	-284.188	-274.873	-277.211
827	All GND'd Irradiation	13.020	-62.335	-57.481	-51.202	-61.466	-42.074	-48.760
828	All GND'd Irradiation	170.159	141.858	134.938	142.390	147.552	141.865	150.131
829	All GND'd Irradiation	187.231	134.469	132.714	134.027	130.004	129.630	126.402
830	All GND'd Irradiation	-154.874	-89.629	-91.096	-83.229	-92.565	-81.038	-98.149
821	Biased Irradiation	160.391	107.310	101.830	111.773	127.125	129.424	127.624
822	Biased Irradiation	130.952	193.181	175.212	170.049	192.986	184.718	224.479
823	Biased Irradiation	-159.635	-70.678	-72.585	-60.297	-54.223	-38.744	-62.602
824	Biased Irradiation	-102.625	-106.495	-112.403	-113.502	-122.626	-111.280	-123.703
825	Biased Irradiation	-233.169	-319.380	-318.131	-301.211	-326.694	-307.021	-321.493
832	Control Unit	-215.801	-259.013	-257.431	-239.570	-259.287	-254.687	-263.552
833	Control Unit	282.005	182.504	184.827	190.105	182.611	186.958	186.114
All GND'd Irradiation Statistics								
	Average All GND'd	-1.872	-29.386	-31.288	-25.746	-32.133	-25.298	-29.517
	Std Dev All GND'd	186.230	172.776	172.074	171.581	177.918	171.481	175.369
	Ps90%/90% (+KTL) All GND'd	508.770	444.366	440.538	444.729	455.719	444.902	451.345
	PS90%/90% (-KTL) All GND'd	-512.515	-503.138	-503.114	-496.220	-519.984	-495.498	-510.379
Biased Irradiation Statistics								
	Average Biased	-40.817	-39.212	-45.216	-38.638	-36.686	-28.581	-31.139
	Std Dev Biased	176.725	199.679	193.621	187.878	206.991	196.808	214.715
	Ps90%/90% (+KTL) Biased	443.762	508.307	485.693	476.523	530.882	511.066	557.609
	Ps90%/90% (-KTL) Biased	-525.396	-586.732	-576.124	-553.798	-604.255	-568.227	-619.886
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

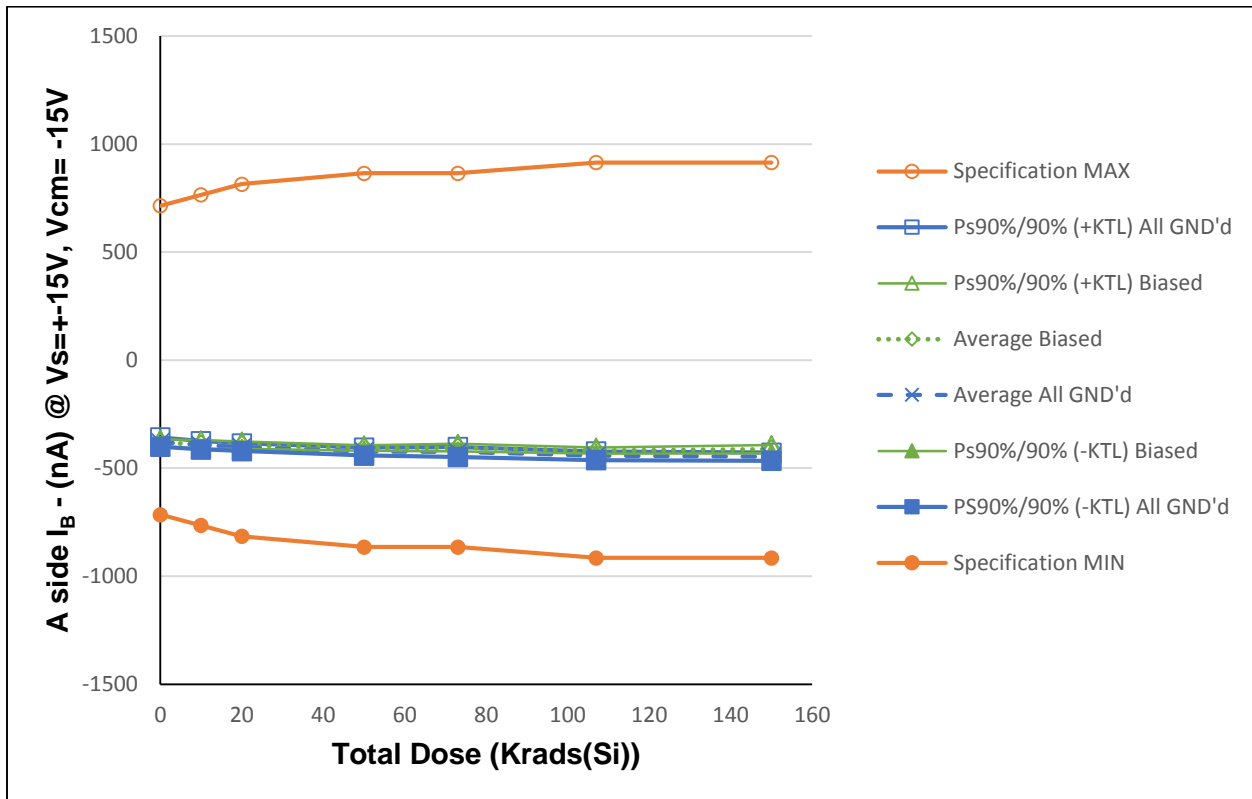


Figure 5.5: Plot of Negative Input Bias Current I_{B-} (side A) @ $V_{cm} = -15V$ versus Total Dose

Table 5.5: Raw data for negative input bias current I_{B-} (side A) @ $V_{cm} = -15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	$A_{I_{B-}}$ @ $V_s = \pm 15V, V_{cm} = -15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-371.023	-387.305	-396.701	-416.862	-417.743	-436.099	-440.899
827	All GND'd Irradiation	-378.989	-393.235	-402.947	-420.931	-418.513	-440.690	-443.742
828	All GND'd Irradiation	-384.575	-398.491	-407.495	-427.451	-430.747	-448.127	-451.482
829	All GND'd Irradiation	-372.107	-386.969	-396.207	-416.265	-421.653	-437.067	-442.155
830	All GND'd Irradiation	-389.273	-403.433	-410.752	-431.753	-437.085	-452.864	-456.749
821	Biased Irradiation	-372.946	-379.331	-384.132	-400.361	-395.219	-412.446	-401.611
822	Biased Irradiation	-384.092	-391.857	-394.721	-406.872	-406.933	-417.616	-414.076
823	Biased Irradiation	-379.543	-388.677	-391.526	-405.523	-403.543	-416.728	-411.218
824	Biased Irradiation	-388.545	-399.129	-401.272	-413.204	-413.561	-426.207	-420.835
825	Biased Irradiation	-383.309	-393.331	-394.606	-407.242	-405.776	-420.968	-414.061
832	Control Unit	-396.164	-396.501	-398.393	-409.745	-395.969	-397.285	-392.520
833	Control Unit	-381.451	-380.607	-383.070	-389.654	-376.410	-382.574	-378.632
All GND'd Irradiation Statistics								
	Average All GND'd	-379.194	-393.886	-402.820	-422.652	-425.148	-442.969	-447.005
	Std Dev All GND'd	7.867	7.140	6.441	6.766	8.440	7.275	6.827
	Ps90%/90% (+KTL) All GND'd	-357.622	-374.308	-385.158	-404.099	-402.007	-423.020	-428.285
	PS90%/90% (-KTL) All GND'd	-400.765	-413.465	-420.483	-441.206	-448.290	-462.919	-465.726
Biased Irradiation Statistics								
	Average Biased	-381.687	-390.465	-393.251	-406.640	-405.006	-418.793	-412.360
	Std Dev Biased	5.840	7.286	6.214	4.588	6.622	5.139	6.973
	Ps90%/90% (+KTL) Biased	-365.673	-370.485	-376.211	-394.061	-386.848	-404.702	-393.239
	Ps90%/90% (-KTL) Biased	-397.701	-410.444	-410.291	-419.220	-423.164	-432.884	-431.481
	Specification MIN	-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	715	765	815	865		915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

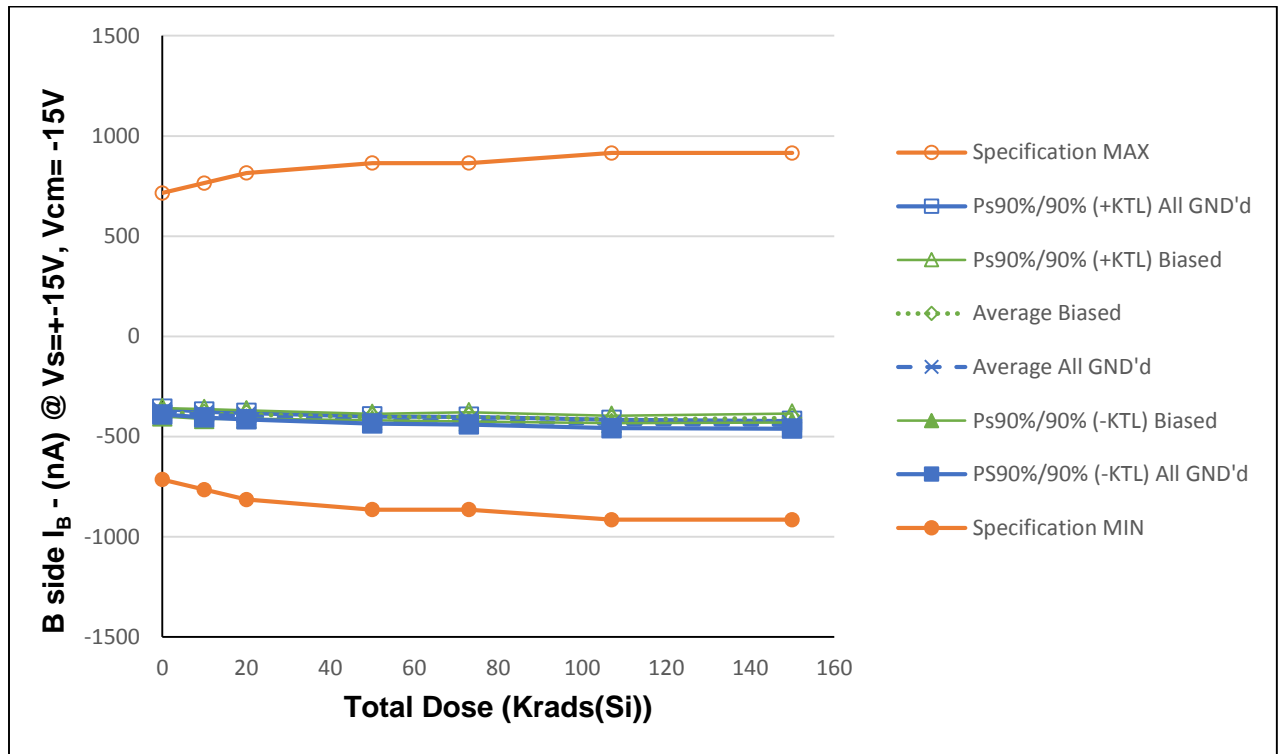


Figure 5.6: Plot of Negative Input Bias Current I_{B-} (side B) @ $V_{cm} = -15V$ versus Total Dose

Table 5.6: Raw data for negative input bias current I_{B-} (side B) @ $V_{cm} = -15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B I_{B-} @ $V_s = +15V$, $V_{cm} = -15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(nA)							
826	All GND'd Irradiation	-375.937	-392.134	-400.352	-419.678	-419.370	-438.190	-442.147
827	All GND'd Irradiation	-375.270	-389.595	-398.140	-417.365	-415.242	-435.081	-438.781
828	All GND'd Irradiation	-383.751	-398.883	-407.834	-428.095	-432.836	-450.501	-454.047
829	All GND'd Irradiation	-369.619	-384.522	-392.641	-412.256	-417.551	-432.311	-437.357
830	All GND'd Irradiation	-374.536	-388.319	-394.949	-412.820	-418.540	-432.658	-437.693
821	Biased Irradiation	-367.047	-373.097	-377.752	-393.712	-388.473	-405.286	-394.554
822	Biased Irradiation	-382.500	-390.237	-392.164	-404.228	-403.789	-414.248	-409.019
823	Biased Irradiation	-379.020	-387.456	-389.450	-403.340	-402.115	-414.502	-409.191
824	Biased Irradiation	-387.323	-397.233	-398.947	-410.568	-411.827	-424.353	-417.129
825	Biased Irradiation	-382.000	-391.249	-392.683	-403.919	-402.535	-417.627	-410.901
832	Control Unit	-394.470	-394.235	-395.585	-407.169	-394.011	-395.025	-390.505
833	Control Unit	-383.912	-383.730	-386.234	-392.870	-380.180	-386.312	-381.834
All GND'd Irradiation Statistics								
	Average All GND'd	-375.823	-390.691	-398.783	-418.043	-420.708	-437.748	-442.005
	Std Dev All GND'd	5.082	5.341	5.857	6.421	6.954	7.507	6.993
	Ps90%/90% (+KTL) All GND'd	-361.887	-376.047	-382.723	-400.435	-401.640	-417.164	-422.830
	PS90%/90% (-KTL) All GND'd	-389.758	-405.334	-414.844	-435.651	-439.776	-458.332	-461.180
Biased Irradiation Statistics								
	Average Biased	-379.578	-387.854	-390.199	-403.153	-401.748	-415.203	-408.159
	Std Dev Biased	7.611	8.988	7.779	6.039	8.407	6.880	8.290
	Ps90%/90% (+KTL) Biased	-358.708	-363.210	-368.870	-386.593	-378.695	-396.338	-385.429
	Ps90%/90% (-KTL) Biased	-400.448	-412.498	-411.529	-419.713	-424.801	-434.069	-430.889
	Specification MIN	-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	715	765	815	865		915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

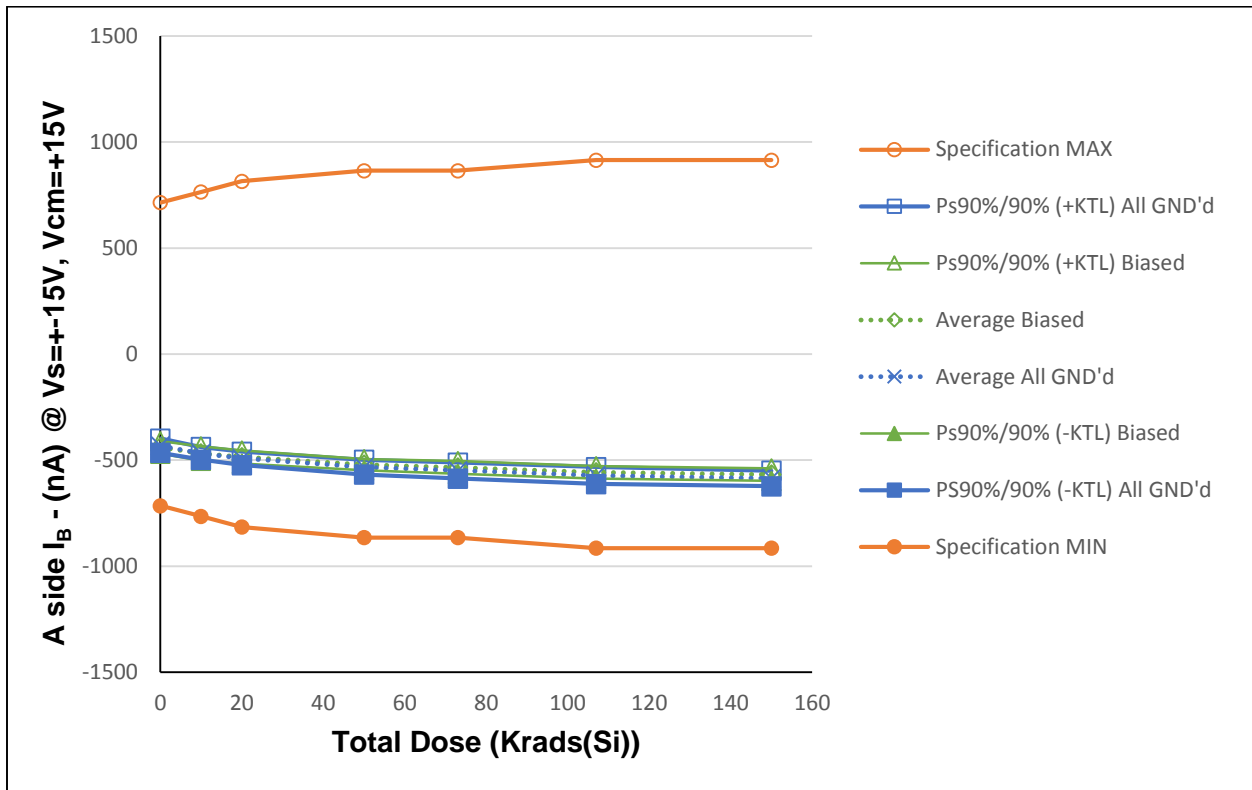


Figure 5.7: Plot of Negative Input Bias Current I_{B-} (side A) @ $V_{cm} = +15V$ versus Total Dose

Table 5.7: Raw data table for negative input bias current I_{B-} (side A) @ $V_{cm} = +15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	$A I_{B-}$ @ $V_s = \pm 15V, V_{cm} = +15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-425.691	-463.819	-488.114	-529.456	-544.324	-564.538	-579.537
827	All GND'd Irradiation	-417.308	-454.314	-477.892	-519.272	-532.652	-557.779	-571.999
828	All GND'd Irradiation	-450.520	-484.404	-509.642	-553.963	-570.746	-596.361	-607.539
829	All GND'd Irradiation	-433.383	-469.923	-492.377	-532.440	-548.153	-571.477	-584.681
830	All GND'd Irradiation	-432.204	-466.809	-488.522	-530.352	-548.399	-572.959	-586.990
821	Biased Irradiation	-426.877	-452.390	-472.424	-512.444	-523.519	-547.709	-555.515
822	Biased Irradiation	-439.473	-465.086	-482.479	-517.889	-530.601	-552.620	-565.874
823	Biased Irradiation	-439.683	-465.471	-482.199	-517.340	-529.596	-552.936	-562.122
824	Biased Irradiation	-456.785	-486.694	-503.516	-538.022	-552.567	-575.153	-584.239
825	Biased Irradiation	-435.623	-470.358	-486.970	-520.369	-534.687	-558.834	-569.892
832	Control Unit	-442.740	-445.882	-447.710	-454.613	-445.939	-446.985	-443.407
833	Control Unit	-432.544	-435.034	-437.181	-440.291	-433.031	-437.018	-433.423
All GND'd Irradiation Statistics								
	Average All GND'd	-431.821	-467.854	-491.309	-533.097	-548.855	-572.623	-586.149
	Std Dev All GND'd	12.252	10.942	11.567	12.726	13.811	14.583	13.270
	Ps90%/90% (+KTL) All GND'd	-398.226	-437.852	-459.592	-498.203	-510.984	-532.637	-549.764
	PS90%/90% (-KTL) All GND'd	-465.416	-497.856	-523.027	-567.990	-586.725	-612.608	-622.535
Biased Irradiation Statistics								
	Average Biased	-439.688	-468.000	-485.518	-521.213	-534.194	-557.450	-567.528
	Std Dev Biased	10.874	12.386	11.377	9.826	11.021	10.653	10.737
	Ps90%/90% (+KTL) Biased	-409.871	-434.039	-454.322	-494.270	-503.976	-528.241	-538.088
	Ps90%/90% (-KTL) Biased	-469.505	-501.961	-516.713	-548.155	-564.412	-586.660	-596.968
	Specification MIN	-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	715	765	815	865		915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

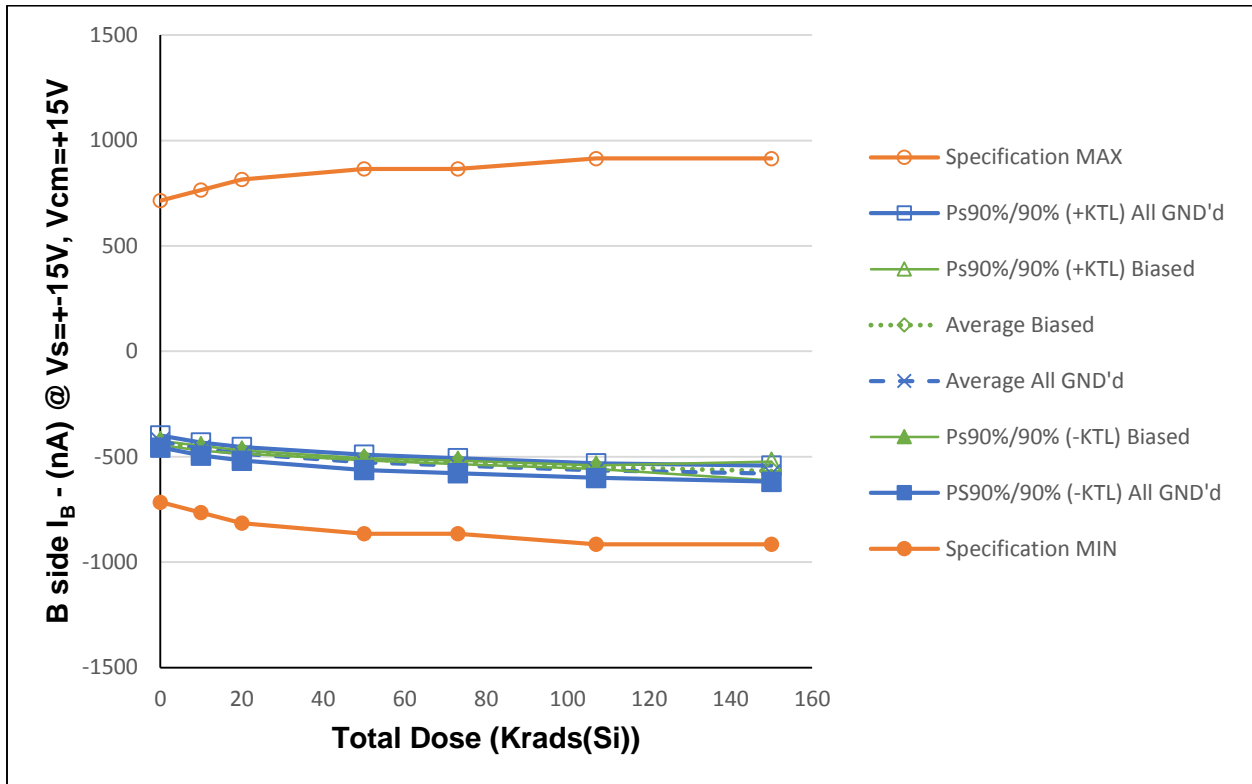


Figure 5.8: Plot of Negative Input Bias Current I_{B-} (side B) @ $V_{cm} = +15V$ versus Total Dose

Table 5.8: Raw data table for B-side negative input bias current @ Vcm = +15V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B _I - @ Vs=+-15V, Vcm=+15V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second							
		Units	(nA)	0	10	20	50	73	107
826	All GND'd Irradiation		-433.872	-470.811	-494.055	-535.187	-549.061	-570.052	-584.819
827	All GND'd Irradiation		-419.796	-455.387	-479.023	-520.800	-534.153	-558.713	-572.667
828	All GND'd Irradiation		-434.726	-471.466	-496.503	-540.761	-558.528	-582.834	-598.352
829	All GND'd Irradiation		-435.379	-470.173	-491.274	-528.755	-544.720	-566.043	-581.708
830	All GND'd Irradiation		-413.065	-446.818	-468.428	-506.691	-525.236	-548.985	-560.939
821	Biased Irradiation		-427.415	-453.564	-473.471	-512.532	-524.621	-549.080	-556.615
822	Biased Irradiation		-433.395	-458.898	-476.141	-510.036	-524.008	-545.274	-596.307
823	Biased Irradiation		-435.227	-462.057	-477.892	-513.938	-525.075	-549.000	-557.771
824	Biased Irradiation		-436.566	-464.489	-481.256	-514.311	-531.005	-552.129	-563.206
825	Biased Irradiation		-435.623	-461.465	-477.892	-512.356	-527.950	-552.102	-563.431
832	Control Unit		-436.665	-438.517	-439.789	-446.380	-438.485	-439.304	-435.427
833	Control Unit		-445.212	-447.142	-449.391	-453.089	-444.530	-449.362	-445.564
All GND'd Irradiation Statistics									
	Average All GND'd		-427.368	-462.931	-485.857	-526.439	-542.340	-565.325	-579.697
	Std Dev All GND'd		10.278	11.224	11.836	13.312	12.966	12.650	13.961
	Ps90%/90% (+KTL) All GND'd		-399.186	-432.154	-453.403	-489.938	-506.787	-530.638	-541.417
	PS90%/90% (-KTL) All GND'd		-455.549	-493.708	-518.311	-562.939	-577.892	-600.013	-617.977
Biased Irradiation Statistics									
	Average Biased		-433.645	-460.095	-477.330	-512.634	-526.532	-549.517	-567.466
	Std Dev Biased		3.668	4.157	2.844	1.684	2.923	2.827	16.416
	Ps90%/90% (+KTL) Biased		-423.587	-448.697	-469.532	-508.016	-518.518	-541.766	-522.452
	Ps90%/90% (-KTL) Biased		-443.703	-471.493	-485.129	-517.253	-534.545	-557.268	-612.479
	Specification MIN		-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
	Specification MAX		715	765	815	865		915	
	Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased		PASS	PASS	PASS	PASS		PASS	

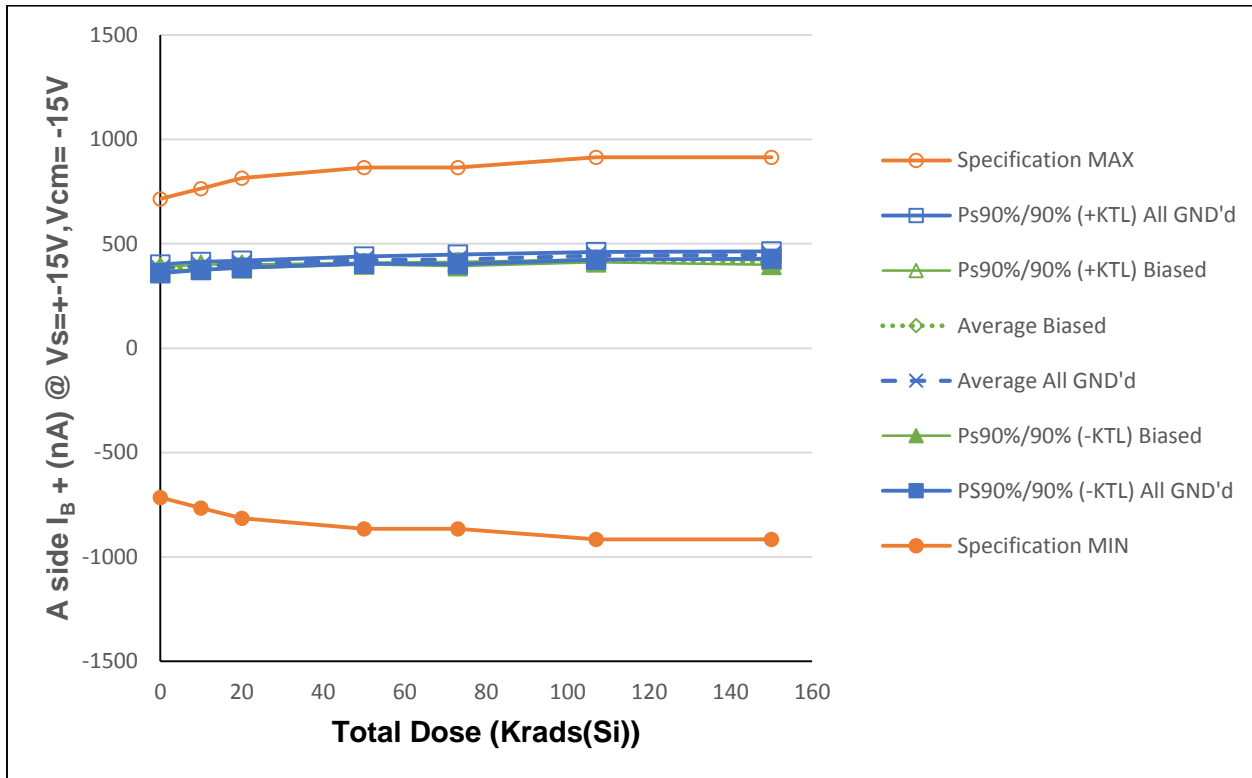


Figure 5.9: Plot of Positive Input Bias Current (side A) @ $V_{cm} = -15V$ versus Total Dose

Table 5.9: Raw data table for Positive Input Bias Current I_{B+} (side A) @ $V_{cm} = -15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A I_{B+} @ $V_s = -15V, V_{cm} = -15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	368.850	384.148	393.324	412.477	413.733	432.506	436.442
827	All GND'd Irradiation	379.926	394.549	403.341	422.702	420.383	442.203	444.727
828	All GND'd Irradiation	383.867	397.301	406.076	424.808	428.322	446.740	448.121
829	All GND'd Irradiation	377.784	393.053	401.318	421.064	427.251	442.219	447.757
830	All GND'd Irradiation	389.389	402.757	410.099	428.893	435.912	450.303	453.636
821	Biased Irradiation	375.738	381.835	387.150	404.406	398.377	416.832	404.779
822	Biased Irradiation	383.536	391.456	394.059	405.940	406.040	417.811	413.722
823	Biased Irradiation	378.987	386.983	389.163	403.185	401.605	415.436	409.322
824	Biased Irradiation	382.784	392.902	395.329	406.495	407.973	422.031	415.909
825	Biased Irradiation	381.895	391.759	393.225	405.792	404.455	420.641	412.791
832	Control Unit	400.850	399.925	401.781	413.969	399.805	400.837	395.459
833	Control Unit	379.293	378.397	380.947	387.258	374.813	380.692	376.595
All GND'd Irradiation Statistics								
	Average All GND'd	379.963	394.361	402.832	421.989	425.120	442.794	446.137
	Std Dev All GND'd	7.621	6.804	6.251	6.071	8.417	6.680	6.300
	Ps90%/90% (+KTL) All GND'd	400.861	413.018	419.971	438.636	448.199	461.110	463.412
	PS90%/90% (-KTL) All GND'd	359.066	375.705	385.692	405.341	402.042	424.478	428.861
Biased Irradiation Statistics								
	Average Biased	380.588	388.987	391.785	405.163	403.690	418.550	411.305
	Std Dev Biased	3.213	4.590	3.470	1.347	3.776	2.724	4.352
	Ps90%/90% (+KTL) Biased	389.399	401.573	401.300	408.857	414.044	426.020	423.239
	Ps90%/90% (-KTL) Biased	371.777	376.401	382.270	401.470	393.336	411.080	399.370
	Specification MIN	-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	715	765	815	865		915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

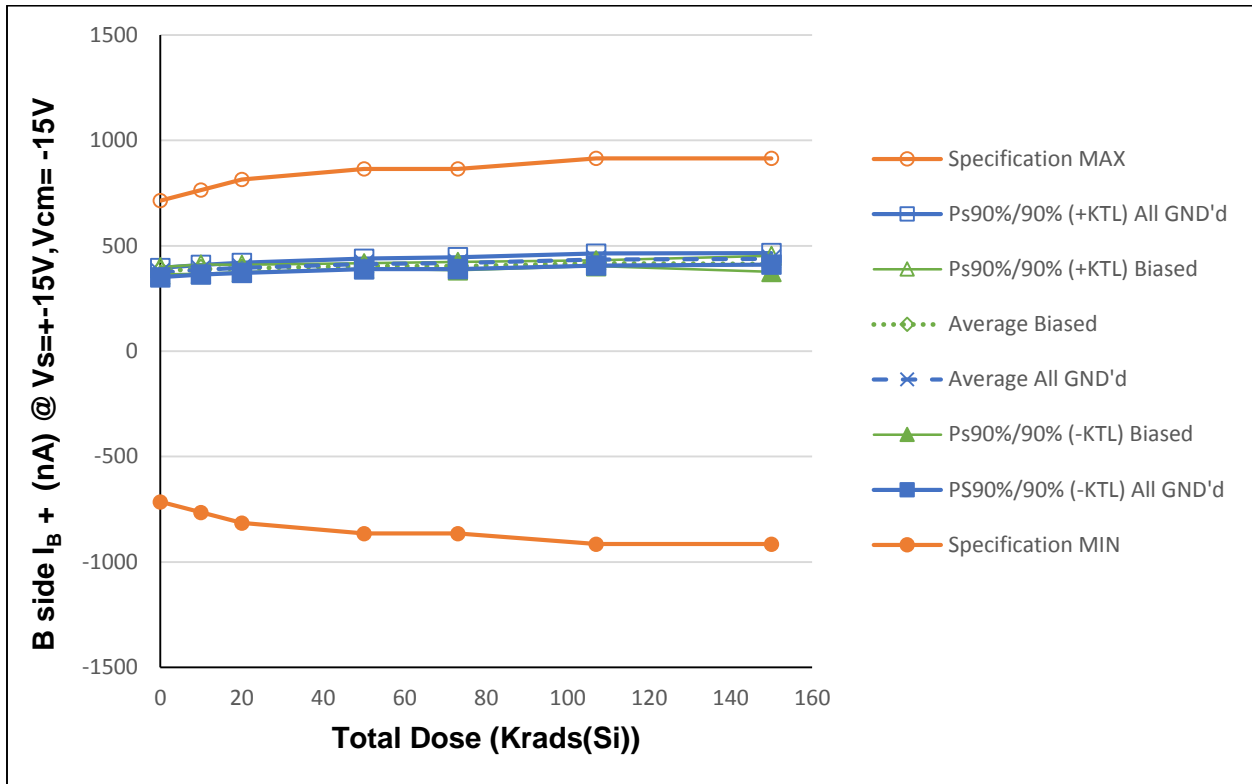


Figure 5.10: Plot of Positive Input Bias Current I_{B+} (side B) @ $V_{cm} = -15V$ versus Total Dose

Table 5.10: Raw data table for B-side positive input bias current @ $V_{cm} = -15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B _{Ib+} @ Vs=+-15V, Vcm= -15V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	368.390	382.651	391.264	410.211	410.893	429.503	433.088
827	All GND'd Irradiation	371.917	385.242	394.397	412.790	411.278	432.433	434.805
828	All GND'd Irradiation	386.612	400.638	410.187	429.717	435.126	452.799	456.008
829	All GND'd Irradiation	365.962	379.056	387.513	405.803	412.259	426.707	431.393
830	All GND'd Irradiation	373.492	387.129	394.513	412.097	419.182	432.178	436.981
821	Biased Irradiation	371.858	376.733	381.838	397.300	391.744	409.626	397.127
822	Biased Irradiation	387.402	395.250	397.417	408.498	408.407	418.622	435.227
823	Biased Irradiation	380.647	388.739	390.791	404.913	403.433	416.633	411.565
824	Biased Irradiation	387.435	396.530	397.513	409.449	410.550	423.533	416.909
825	Biased Irradiation	383.181	391.495	393.012	403.800	402.965	417.616	409.081
832	Control Unit	393.975	392.449	394.317	405.383	392.700	393.394	389.052
833	Control Unit	386.948	385.364	388.364	394.602	381.802	388.091	383.124
All GND'd Irradiation Statistics								
	Average All GND'd	373.275	386.943	395.575	414.124	417.748	434.724	438.455
	Std Dev All GND'd	8.017	8.233	8.655	9.132	10.284	10.368	10.029
	Ps90%/90% (+KTL) All GND'd	395.258	409.517	419.306	439.164	445.946	463.153	465.954
	PS90%/90% (-KTL) All GND'd	351.291	364.370	371.844	389.083	389.549	406.295	410.956
Biased Irradiation Statistics								
	Average Biased	382.105	389.749	392.114	404.792	403.420	417.206	413.982
	Std Dev Biased	6.418	7.901	6.431	4.810	7.284	5.000	13.909
	Ps90%/90% (+KTL) Biased	399.703	411.414	409.748	417.981	423.393	430.916	452.122
	Ps90%/90% (-KTL) Biased	364.507	368.084	374.480	391.602	383.446	403.496	375.842
	Specification MIN	-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	715	765	815	865		915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

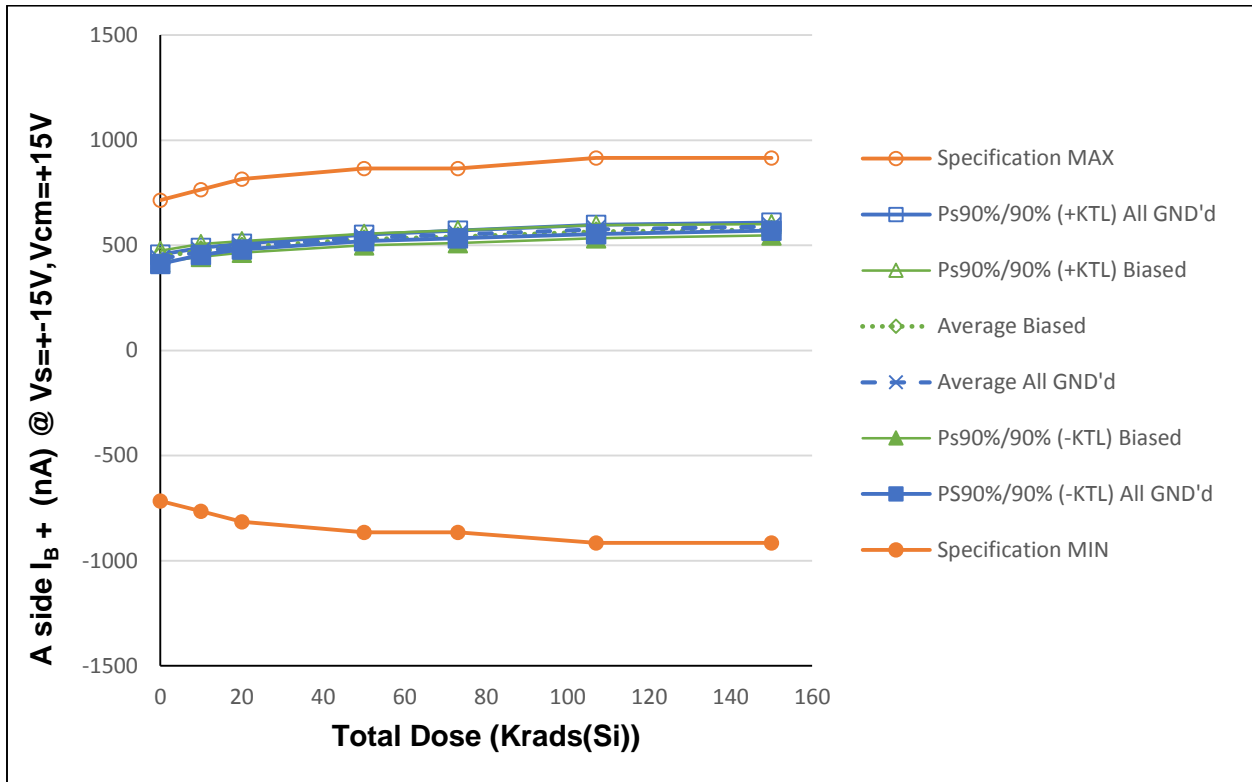


Figure 5.11: Plot of Positive Input Bias Current @ Vcm = +15V (side A) versus Total Dose

Table 5.11: Raw data table for A-side I_{B+} @ V_{cm} = 15V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A I _{B+} @ Vs=+-15V,Vcm=+15V Units (nA)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	428.636	467.033	491.030	531.395	546.749	567.037	582.062
827	All GND'd Irradiation	429.524	466.694	491.713	531.996	545.902	572.047	585.863
828	All GND'd Irradiation	430.251	469.831	494.278	537.196	554.398	579.789	593.948
829	All GND'd Irradiation	433.928	470.998	492.813	532.117	550.362	572.539	586.367
830	All GND'd Irradiation	447.767	481.998	503.441	544.787	562.364	587.376	599.454
821	Biased Irradiation	439.708	465.633	484.899	522.966	534.101	559.661	565.674
822	Biased Irradiation	441.490	467.849	484.832	519.282	533.333	554.049	569.181
823	Biased Irradiation	446.481	472.845	488.874	523.927	536.299	561.471	567.960
824	Biased Irradiation	463.809	493.213	509.302	545.294	559.628	583.474	590.027
825	Biased Irradiation	442.528	479.075	495.081	527.554	542.460	566.515	576.570
832	Control Unit	448.885	451.882	453.504	461.140	452.092	452.891	449.303
833	Control Unit	450.434	452.441	455.154	459.410	450.009	454.952	450.833
All GND'd Irradiation Statistics								
	Average All GND'd	434.021	471.311	494.655	535.498	551.955	575.758	589.539
	Std Dev All GND'd	7.943	6.248	5.063	5.694	6.719	7.928	7.022
	Ps90%/90% (+KTL) All GND'd	455.802	488.442	508.536	551.112	570.379	597.496	608.793
	PS90%/90% (-KTL) All GND'd	412.240	454.180	480.773	519.885	533.530	554.020	570.285
Biased Irradiation Statistics								
	Average Biased	446.803	475.723	492.597	527.805	541.164	565.034	573.882
	Std Dev Biased	9.825	11.059	10.230	10.211	10.926	11.230	9.905
	Ps90%/90% (+KTL) Biased	473.744	506.047	520.649	555.802	571.123	595.827	601.042
	Ps90%/90% (-KTL) Biased	419.862	445.399	464.546	499.807	511.206	534.240	546.723
	Specification MIN	-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	715	765	815	865		915	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

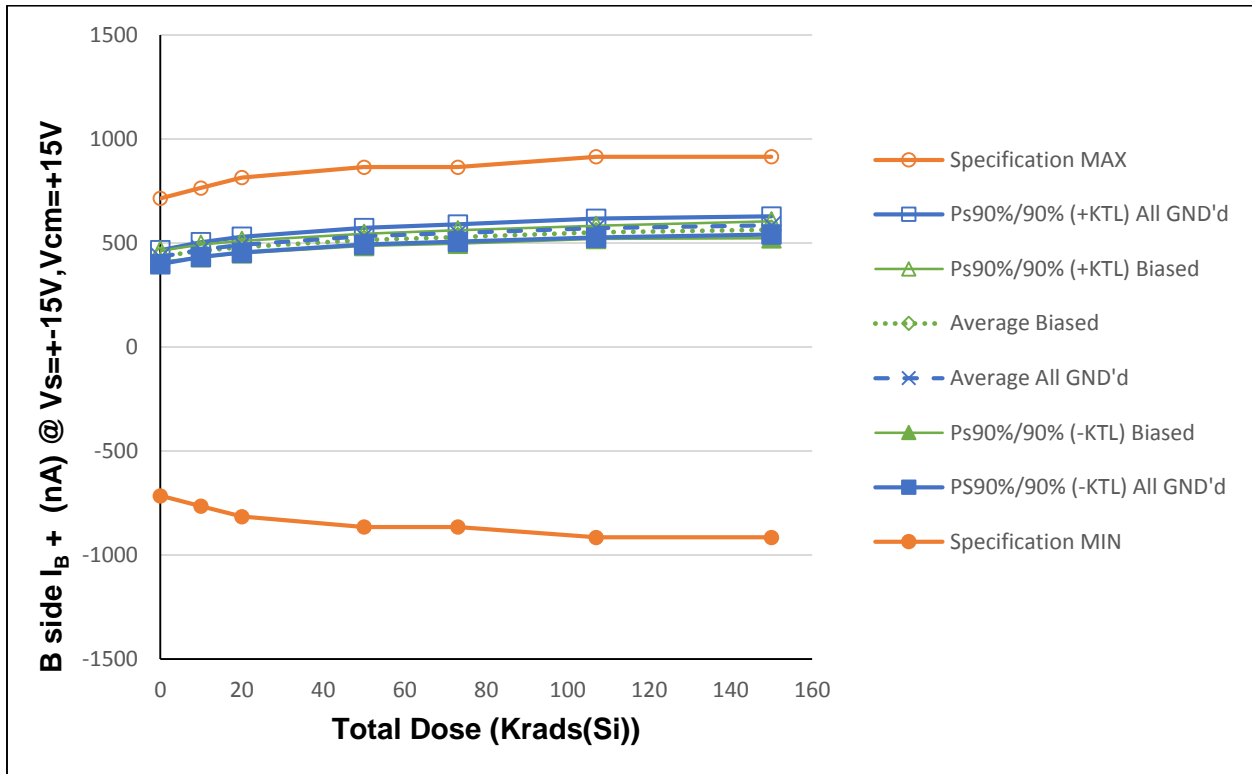


Figure 5.12: Plot of Positive Input Bias Current (side B) @ Vcm = +15V versus Total Dose

Table 5.12: Raw data table for B-side positive input bias current @ Vcm = +15V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B _I + @ Vs=+-15V,Vcm=+15V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second							
		Units	(nA)	0	10	20	50	73	107
826	All GND'd Irradiation		430.469	467.040	490.637	530.551	544.167	564.446	578.881
827	All GND'd Irradiation		413.520	450.409	473.650	516.019	529.935	554.186	567.896
828	All GND'd Irradiation		447.115	486.891	512.522	556.282	572.073	598.593	610.724
829	All GND'd Irradiation		436.087	471.439	493.092	532.694	548.537	570.219	584.425
830	All GND'd Irradiation		434.027	468.000	490.331	528.838	546.082	571.350	581.261
821	Biased Irradiation		428.406	454.022	474.056	512.556	523.636	548.073	553.825
822	Biased Irradiation		443.951	469.694	488.111	521.778	534.983	556.400	581.671
823	Biased Irradiation		422.911	447.758	463.878	497.399	510.425	533.447	544.249
824	Biased Irradiation		443.906	472.783	489.763	524.179	540.318	562.157	571.544
825	Biased Irradiation		441.128	467.815	484.899	518.021	533.676	558.838	569.933
832	Control Unit		438.506	440.575	441.985	448.509	440.740	441.738	437.449
833	Control Unit		435.273	437.201	439.776	442.845	435.358	439.902	436.126
All GND'd Irradiation Statistics									
	Average All GND'd		432.244	468.756	492.046	532.877	548.159	571.759	584.637
	Std Dev All GND'd		12.174	13.002	13.818	14.610	15.202	16.469	15.854
	Ps90%/90% (+KTL) All GND'd		465.625	504.408	529.934	572.936	589.842	616.917	628.109
	PS90%/90% (-KTL) All GND'd		398.862	433.104	454.158	492.818	506.475	526.601	541.166
Biased Irradiation Statistics									
	Average Biased		436.060	462.414	480.142	514.786	528.608	551.783	564.244
	Std Dev Biased		9.760	10.896	10.957	10.664	11.819	11.496	14.981
	Ps90%/90% (+KTL) Biased		462.821	492.291	510.187	544.027	561.016	583.306	605.321
	Ps90%/90% (-KTL) Biased		409.300	432.537	450.097	485.546	496.199	520.259	523.167
	Specification MIN		-715	-765	-815	-865		-915	
	Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
	Specification MAX		715	765	815	865		915	
	Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased		PASS	PASS	PASS	PASS		PASS	

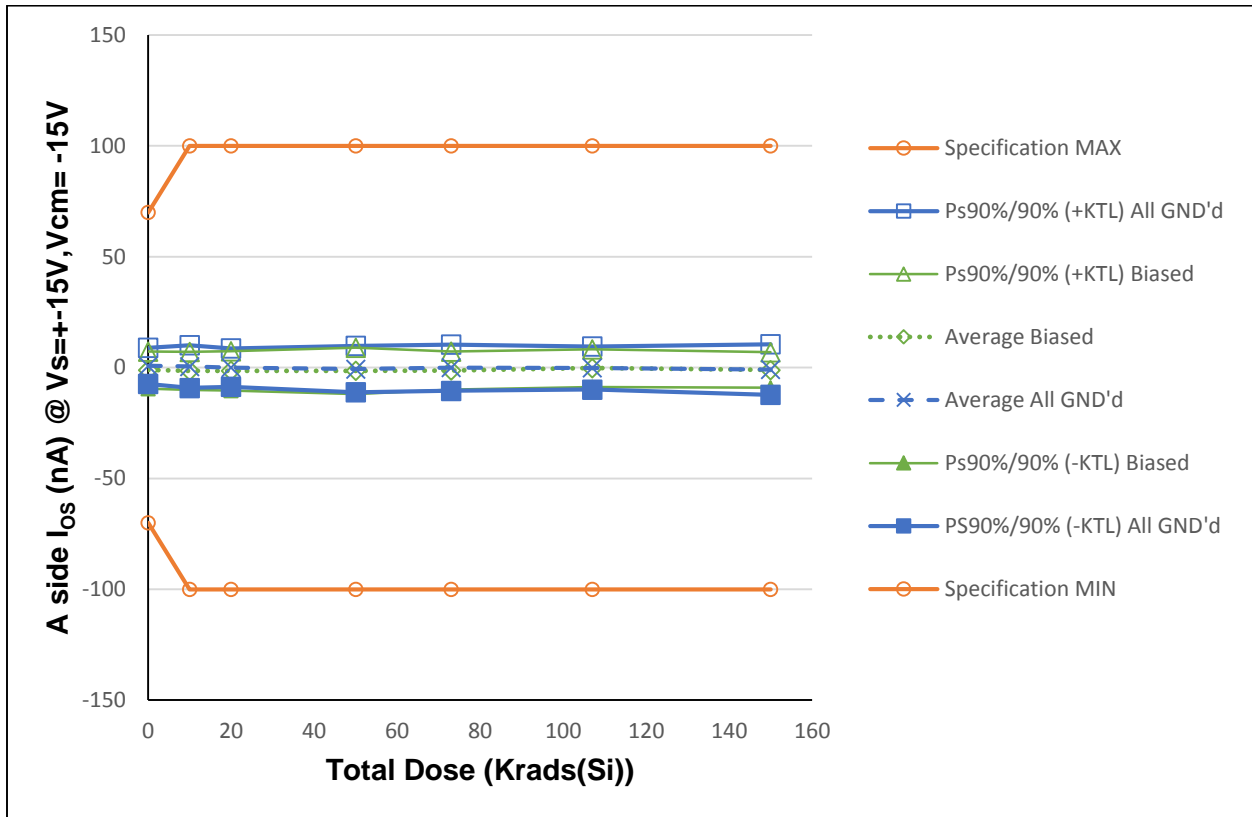


Figure 5.13: Plot of Input Offset Current I_{os} (side A) @ $V_{cm} = -15V$ versus Total Dose

Table 5.13: Raw data table for input offset current @ Vcm = -15V of side A versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A I_{os} @ Vs=+-15V, Vcm= -15V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-2.173	-3.156	-3.377	-4.385	-4.010	-3.593	-4.456
827	All GND'd Irradiation	0.936	1.314	0.394	1.770	1.870	1.513	0.984
828	All GND'd Irradiation	-0.708	-1.190	-1.419	-2.643	-2.425	-1.387	-3.361
829	All GND'd Irradiation	5.676	6.084	5.111	4.800	5.598	5.152	5.602
830	All GND'd Irradiation	0.116	-0.677	-0.653	-2.860	-1.173	-2.560	-3.113
821	Biased Irradiation	2.792	2.504	3.018	4.045	3.158	4.386	3.168
822	Biased Irradiation	-0.556	-0.400	-0.662	-0.932	-0.893	0.195	-0.354
823	Biased Irradiation	-0.556	-1.694	-2.362	-2.339	-1.938	-1.292	-1.896
824	Biased Irradiation	-5.760	-6.227	-5.943	-6.709	-5.587	-4.176	-4.926
825	Biased Irradiation	-1.414	-1.571	-1.381	-1.450	-1.321	-0.327	-1.270
832	Control Unit	4.685	3.424	3.388	4.224	3.836	3.552	2.939
833	Control Unit	-2.158	-2.210	-2.123	-2.396	-1.597	-1.882	-2.037
All GND'd Irradiation Statistics								
	Average All GND'd	0.770	0.475	0.011	-0.663	-0.028	-0.175	-0.869
	Std Dev All GND'd	2.974	3.516	3.167	3.820	3.813	3.538	4.166
	Ps90%/90% (+KTL) All GND'd	8.924	10.116	8.696	9.810	10.428	9.526	10.555
	PS90%/90% (-KTL) All GND'd	-7.384	-9.166	-8.673	-11.137	-10.484	-9.876	-12.293
Biased Irradiation Statistics								
	Average Biased	-1.099	-1.478	-1.466	-1.477	-1.316	-0.243	-1.055
	Std Dev Biased	3.064	3.147	3.225	3.838	3.116	3.090	2.918
	Ps90%/90% (+KTL) Biased	7.303	7.153	7.378	9.046	7.227	8.230	6.946
	Ps90%/90% (-KTL) Biased	-9.500	-10.108	-10.310	-12.000	-9.859	-8.716	-9.057
	Specification MIN	-70	-100	-100	-100		-100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	70	100	100	100		100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

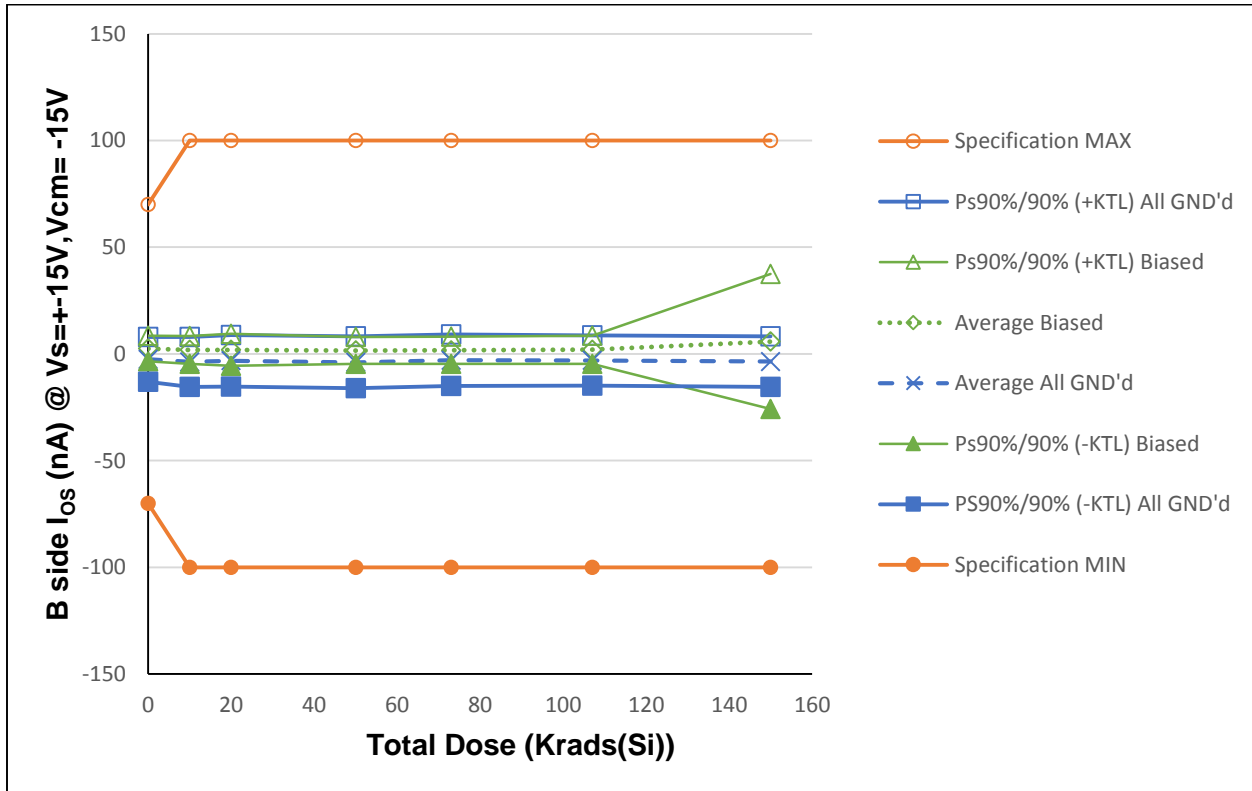


Figure 5.14: Plot of B-side Input Offset Current @ $V_{cm} = -15V$ versus Total Dose

Table 5.14: Raw data table for B-side input offset current @ $V_{cm} = -15V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B I_{OS} @ $V_s=+15V, V_{cm}=-15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-7.547	-9.483	-9.088	-9.467	-8.478	-8.687	-9.059
827	All GND'd Irradiation	-3.352	-4.353	-3.743	-4.575	-3.964	-2.647	-3.976
828	All GND'd Irradiation	2.861	1.754	2.353	1.622	2.290	2.298	1.961
829	All GND'd Irradiation	-3.657	-5.466	-5.128	-6.454	-5.292	-5.605	-5.964
830	All GND'd Irradiation	-1.044	-1.190	-0.436	-0.723	0.642	-0.480	-0.712
821	Biased Irradiation	4.810	3.636	4.085	3.588	3.271	4.340	2.572
822	Biased Irradiation	4.902	5.013	5.253	4.270	4.618	4.374	26.208
823	Biased Irradiation	1.627	1.283	1.341	1.572	1.318	2.130	2.374
824	Biased Irradiation	0.112	-0.703	-1.435	-1.119	-1.277	-0.819	-0.220
825	Biased Irradiation	1.181	0.246	0.329	-0.120	0.431	-0.011	-1.819
832	Control Unit	-0.495	-1.786	-1.268	-1.786	-1.312	-1.631	-1.453
833	Control Unit	3.037	1.634	2.130	1.732	1.623	1.780	1.290
All GND'd Irradiation Statistics								
	Average All GND'd	-2.548	-3.747	-3.208	-3.919	-2.960	-3.024	-3.550
	Std Dev All GND'd	3.820	4.273	4.392	4.432	4.399	4.292	4.324
	Ps90%/90% (+KTL) All GND'd	7.927	7.969	8.834	8.232	9.103	8.744	8.307
	PS90%/90% (-KTL) All GND'd	-13.023	-15.464	-15.251	-16.071	-15.024	-14.792	-15.406
Biased Irradiation Statistics								
	Average Biased	2.527	1.895	1.915	1.638	1.672	2.003	5.823
	Std Dev Biased	2.197	2.377	2.735	2.314	2.324	2.404	11.543
	Ps90%/90% (+KTL) Biased	8.551	8.413	9.414	7.984	8.044	8.596	37.473
	Ps90%/90% (-KTL) Biased	-3.498	-4.623	-5.585	-4.707	-4.700	-4.590	-25.827
	Specification MIN	-70	-100	-100	-100		-100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	70	100	100	100		100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

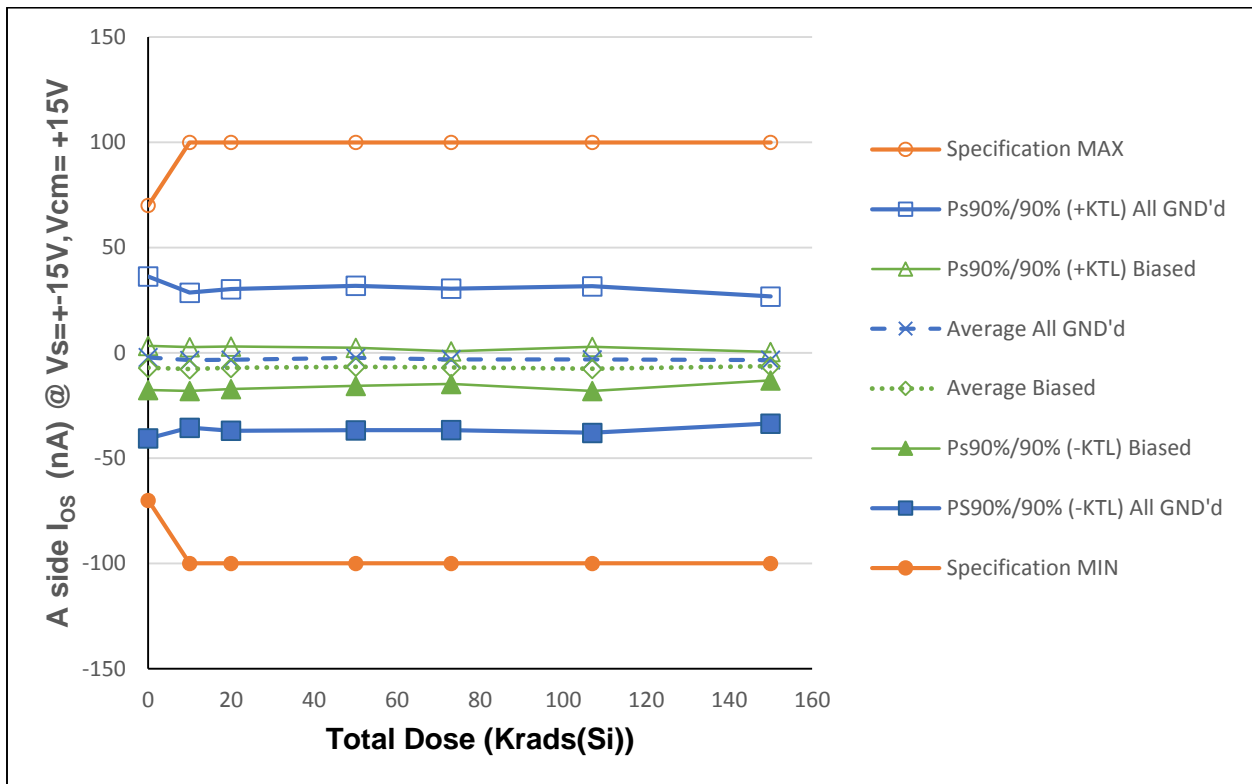


Figure 5.15: Plot of Input Offset Current @ $V_{cm} = +15V$ (side A) versus Total Dose

Table 5.15: Raw data table for side A input offset current @ Vcm = +15V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A I _{os} @ Vs=+15V, Vcm= +15V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-2.944	-3.214	-2.916	-1.939	-2.425	-2.499	-2.525
827	All GND'd Irradiation	-12.217	-12.380	-13.821	-12.725	-13.250	-14.268	-13.864
828	All GND'd Irradiation	20.269	14.573	15.363	16.768	16.348	16.571	13.591
829	All GND'd Irradiation	-0.544	-1.075	-0.436	0.323	-2.208	-1.063	-1.686
830	All GND'd Irradiation	-15.563	-15.189	-14.919	-14.435	-13.965	-14.417	-12.464
821	Biased Irradiation	-12.831	-13.244	-12.475	-10.522	-10.582	-11.952	-10.158
822	Biased Irradiation	-2.017	-2.764	-2.353	-1.393	-2.732	-1.428	-3.308
823	Biased Irradiation	-6.798	-7.375	-6.675	-6.587	-6.703	-8.535	-5.838
824	Biased Irradiation	-7.024	-6.519	-5.786	-7.273	-7.061	-8.321	-5.788
825	Biased Irradiation	-6.905	-8.717	-8.111	-7.185	-7.773	-7.681	-6.678
832	Control Unit	-6.145	-5.999	-5.794	-6.526	-6.153	-5.906	-5.895
833	Control Unit	-17.890	-17.407	-17.974	-19.119	-16.978	-17.934	-17.410
All GND'd Irradiation Statistics								
	Average All GND'd	-2.200	-3.457	-3.346	-2.402	-3.100	-3.135	-3.390
	Std Dev All GND'd	14.027	11.706	12.271	12.515	12.253	12.691	11.000
	Ps90%/90% (+KTL) All GND'd	36.262	28.640	30.302	31.914	30.497	31.664	26.773
	PS90%/90% (-KTL) All GND'd	-40.662	-35.554	-36.994	-36.717	-36.697	-37.934	-33.553
Biased Irradiation Statistics								
	Average Biased	-7.115	-7.724	-7.080	-6.592	-6.970	-7.584	-6.354
	Std Dev Biased	3.835	3.796	3.686	3.290	2.817	3.822	2.472
	Ps90%/90% (+KTL) Biased	3.399	2.685	3.027	2.428	0.753	2.896	0.424
	Ps90%/90% (-KTL) Biased	-17.629	-18.132	-17.187	-15.612	-14.693	-18.063	-13.132
	Specification MIN	-70	-100	-100	-100		-100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	70	100	100	100		100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

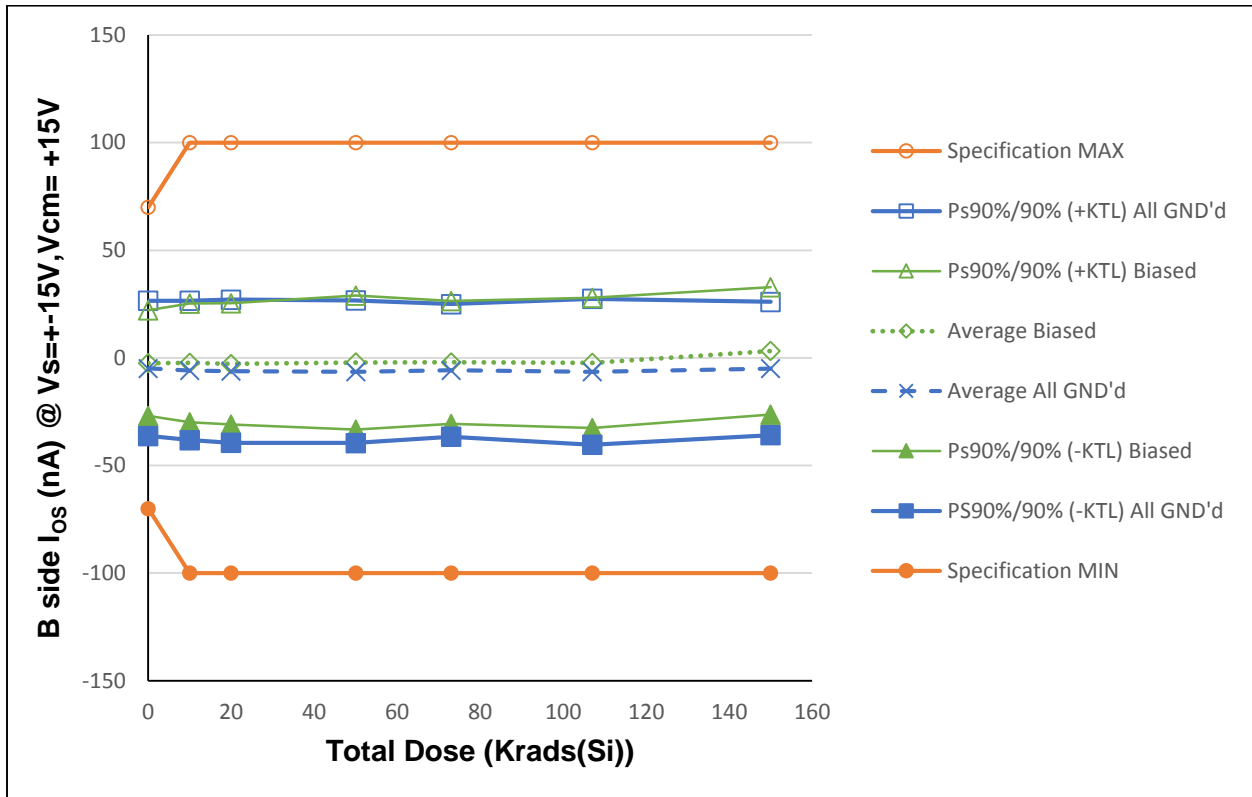


Figure 5.16: Plot of B-side Input Offset Current @ $V_{cm} = +15V$ versus Total Dose

Table 5.16: Raw data table for input offset current of side B @ Vcm = +15V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B I _{OS} @ Vs=±15V, Vcm= +15V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	3.403	3.771	3.419	4.636	4.894	5.606	5.938
827	All GND'd Irradiation	6.276	4.978	5.374	4.781	4.218	4.527	4.770
828	All GND'd Irradiation	-12.389	-15.425	-16.019	-15.522	-13.545	-15.759	-12.372
829	All GND'd Irradiation	-0.708	-1.267	-1.818	-3.939	-3.817	-4.176	-2.716
830	All GND'd Irradiation	-20.962	-21.182	-21.903	-22.148	-20.846	-22.365	-20.322
821	Biased Irradiation	-0.991	-0.458	-0.586	-0.024	0.984	1.007	2.790
822	Biased Irradiation	-10.556	-10.796	-11.971	-11.742	-10.975	-11.126	14.636
823	Biased Irradiation	12.316	14.299	14.014	16.539	14.650	15.553	13.522
824	Biased Irradiation	-7.340	-8.293	-8.507	-9.868	-9.313	-10.028	-8.338
825	Biased Irradiation	-5.505	-6.350	-7.007	-5.665	-5.726	-6.736	-6.502
832	Control Unit	-1.841	-2.059	-2.196	-2.129	-2.255	-2.434	-2.022
833	Control Unit	9.939	9.940	9.615	10.245	9.173	9.461	9.438
All GND'd Irradiation Statistics								
	Average All GND'd	-4.876	-5.825	-6.190	-6.438	-5.819	-6.433	-4.940
	Std Dev All GND'd	11.462	11.807	12.131	12.084	11.236	12.359	11.285
	Ps90%/90% (+KTL) All GND'd	26.552	26.549	27.074	26.695	24.991	27.454	26.004
	PS90%/90% (-KTL) All GND'd	-36.304	-38.199	-39.453	-39.571	-36.629	-40.321	-35.884
Biased Irradiation Statistics								
	Average Biased	-2.415	-2.320	-2.811	-2.152	-2.076	-2.266	3.222
	Std Dev Biased	8.932	10.043	10.271	11.377	10.416	11.034	10.779
	Ps90%/90% (+KTL) Biased	22.077	25.218	25.352	29.043	26.486	27.988	32.778
	Ps90%/90% (-KTL) Biased	-26.907	-29.857	-30.975	-33.347	-30.638	-32.520	-26.335
	Specification MIN	-70	-100	-100	-100		-100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	70	100	100	100		100	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

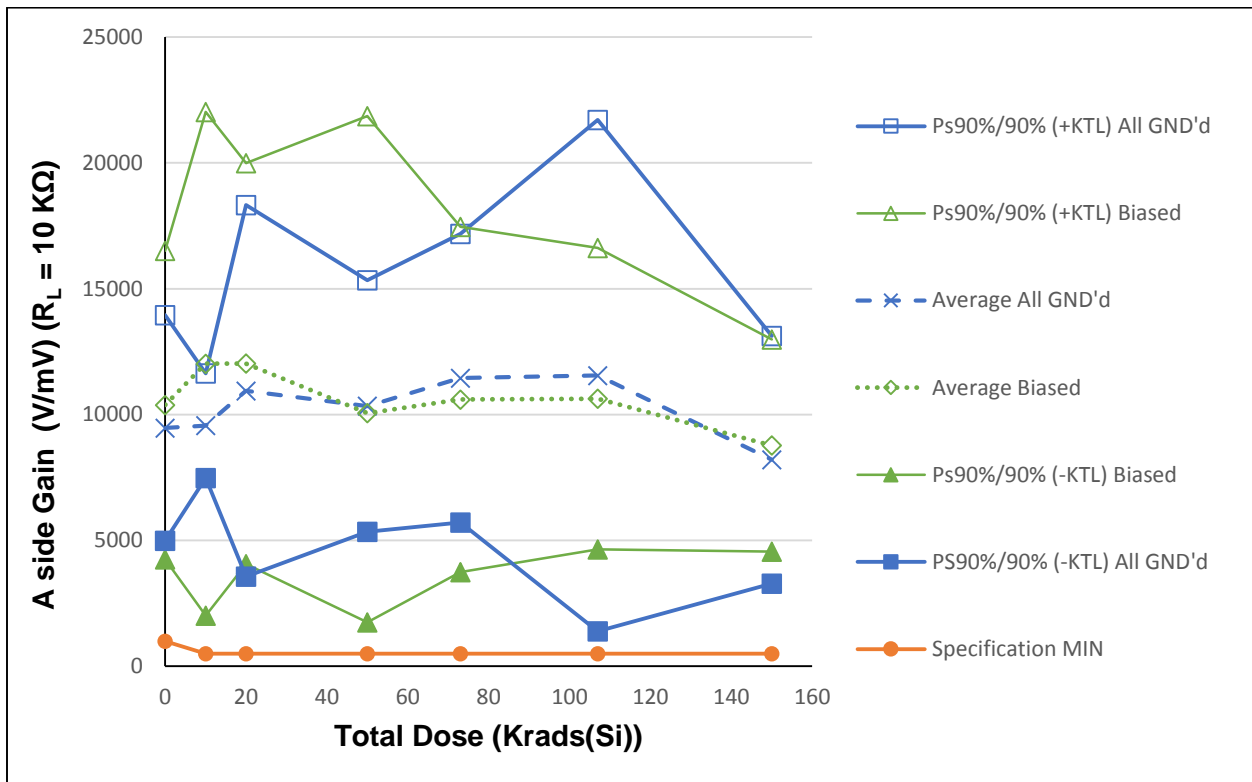


Figure 5.17: Plot of Gain ($R_L = 10K\Omega$, side A) versus Total Dose

Table 5.17: Raw data table for gain ($R_L = 10K\Omega$, A-side) versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	A side GAIN ($R_L = 10K\Omega$)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(V/mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	10384	9688	9492	9327	10815	15342	11307
827	All GND'd Irradiation	8078	9881	11738	11656	10087	7404	6901
828	All GND'd Irradiation	10094	8471	8035	12259	14863	14722	7932
829	All GND'd Irradiation	11325	10508	15119	7751	11867	12314	7029
830	All GND'd Irradiation	7451	9255	10336	10706	9610	7988	7874
821	Biased Irradiation	9256	8586	8681	7290	7728	7544	10598
822	Biased Irradiation	8950	12239	15861	8309	8691	12277	10145
823	Biased Irradiation	11603	16390	13557	17698	12372	12899	7538
824	Biased Irradiation	13724	14747	12352	8798	13755	11046	8415
825	Biased Irradiation	8379	8162	9699	8209	10450	9399	7162
832	Control Unit	14844	13973	13379	12003	10106	13812	13866
833	Control Unit	8887	7331	8224	5731	7050	29000	19943
All GND'd Irradiation Statistics								
	Average All GND'd	9467	9561	10944	10340	11449	11554	8209
	Std Dev All GND'd	1634	758	2693	1822	2090	3705	1795
	Ps90%/90% (+KTL) All GND'd	13947	11639	18327	15335	17179	21713	13131
	PS90%/90% (-KTL) All GND'd	4986	7482	3561	5344	5718	1395	3286
Biased Irradiation Statistics								
	Average Biased	10382	12025	12030	10061	10599	10633	8771
	Std Dev Biased	2235	3649	2905	4304	2500	2184	1538
	Ps90%/90% (+KTL) Biased	16512	22031	19996	21862	17455	16621	12988
	Ps90%/90% (-KTL) Biased	4253	2019	4064	1740	3743	4645	4554
	Specification MIN	1000	500	500	500		500	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

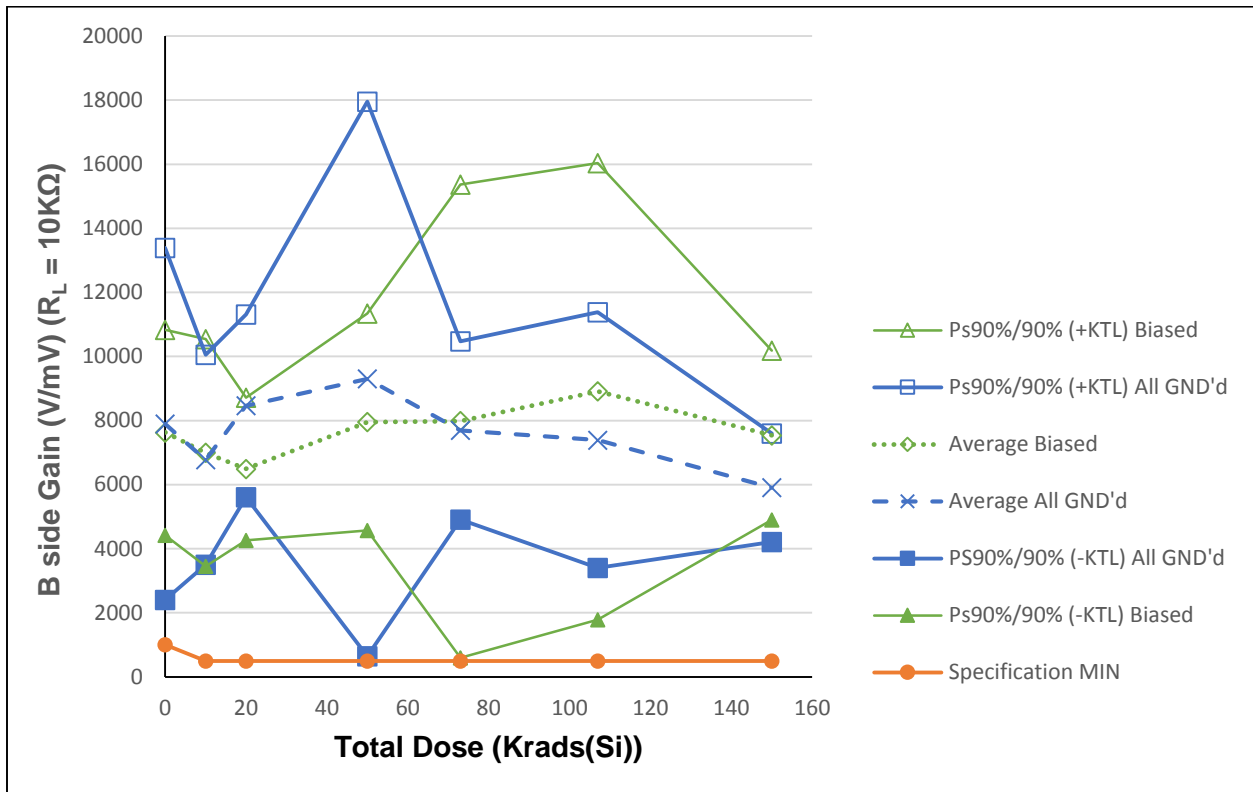


Figure 5.18: Plot of B-side Gain with $R_L = 10K\Omega$ versus Total Dose

Table 5.18: Raw data table for B-side Gain with $R_L = 10K\Omega$ versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	B side GAIN ($R_L = 10K\Omega$)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(V/mV)							
826	All GND'd Irradiation	6128	4770	9915	6422	7407	8044	6506
827	All GND'd Irradiation	10997	6912	9132	14042	8183	9548	5978
828	All GND'd Irradiation	6153	6991	8121	9514	6500	7106	4915
829	All GND'd Irradiation	8407	7253	7410	10120	9158	6343	6316
830	All GND'd Irradiation	7788	7959	7728	6407	7219	5905	5818
821	Biased Irradiation	6291	6396	6989	5932	6813	7086	9133
822	Biased Irradiation	6942	7909	6376	9149	6634	10342	7722
823	Biased Irradiation	9393	7657	6395	7791	6828	8354	7162
824	Biased Irradiation	7910	4994	5265	8645	12799	12619	6958
825	Biased Irradiation	7601	8023	7417	8246	6838	6159	6730
832	Control Unit	6557	6921	6906	8028	7191	7180	6827
833	Control Unit	10148	8651	8717	6832	9737	7397	9014
All GND'd Irradiation Statistics								
	Average All GND'd	7895	6777	8461	9301	7693	7389	5907
	Std Dev All GND'd	2003	1195	1040	3157	1015	1455	617
	Ps90%/90% (+KTL) All GND'd	13388	10055	11312	17956	10475	11379	7599
	PS90%/90% (-KTL) All GND'd	2402	3499	5611	646	4912	3399	4215
Biased Irradiation Statistics								
	Average Biased	7627	6996	6488	7953	7982	8912	7541
	Std Dev Biased	1168	1294	811	1235	2694	2598	963
	Ps90%/90% (+KTL) Biased	10829	10543	8712	11340	15370	16037	10181
	Ps90%/90% (-KTL) Biased	4425	3448	4265	4565	595	1787	4901
	Specification MIN	1000	500	500	500		500	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

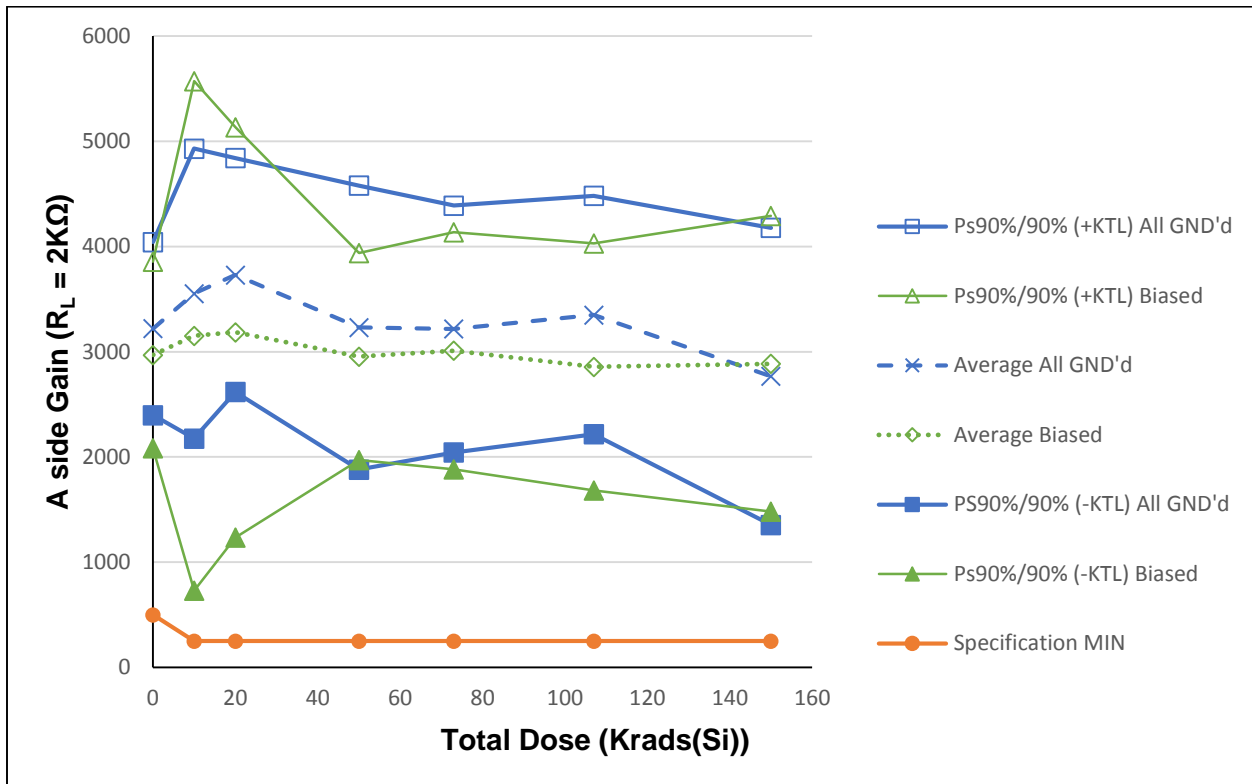


Figure 5.19: Plot of Gain with $R_L = 2K\Omega$ of A-side versus Total Dose

Table 5.19: Raw data table for A-side Gain with $R_L = 2K\Omega$ versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	A side GAIN ($R_L = 2K\Omega$)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(V/mV)							
826	All GND'd Irradiation	3334	3080	3632	3056	3455	3095	2426
827	All GND'd Irradiation	3272	4019	3576	2781	3794	2944	3464
828	All GND'd Irradiation	3600	3995	4397	3870	2935	3796	2390
829	All GND'd Irradiation	3105	3709	3732	3625	3192	3796	3174
830	All GND'd Irradiation	2788	2962	3308	2817	2706	3113	2377
821	Biased Irradiation	2567	2513	2653	2646	2647	2385	2397
822	Biased Irradiation	3204	2878	3072	2590	2558	2710	2758
823	Biased Irradiation	3090	4707	4420	3363	3523	3544	3690
824	Biased Irradiation	3298	2774	3002	3293	3036	2909	3047
825	Biased Irradiation	2688	2884	2776	2878	3283	2737	2536
832	Control Unit	3033	3694	3641	3057	3614	3666	3560
833	Control Unit	3640	3399	5649	3040	3177	2662	3491
All GND'd Irradiation Statistics								
	Average All GND'd	3220	3553	3729	3230	3216	3349	2766
	Std Dev All GND'd	300	503	405	492	428	413	515
	Ps90%/90% (+KTL) All GND'd	4042	4931	4840	4579	4389	4482	4179
	PS90%/90% (-KTL) All GND'd	2397	2175	2618	1880	2043	2216	1354
Biased Irradiation Statistics								
	Average Biased	2970	3151	3184	2954	3009	2857	2886
	Std Dev Biased	324	883	711	359	411	428	513
	Ps90%/90% (+KTL) Biased	3857	5571	5133	3938	4136	4031	4291
	Ps90%/90% (-KTL) Biased	2082	731	1236	1969	1883	1683	1480
	Specification MIN	500	250	250	250		250	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

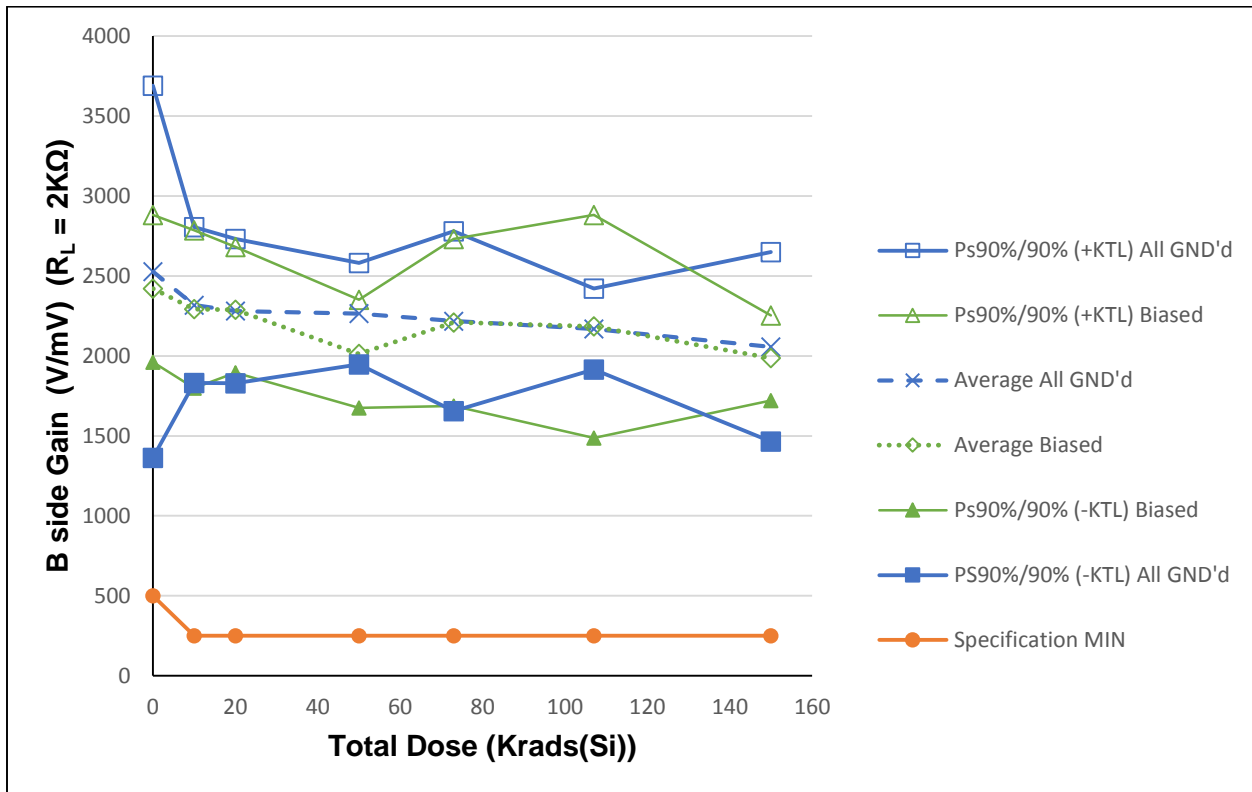


Figure 5.20: Plot of Gain ($R_L = 2K\Omega$, side B) versus Total Dose

Table 5.20: Raw data table for Gain ($R_L = 2K\Omega$, side B) versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	B side GAIN ($R_L = 2K\Omega$)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(V/mV)							
826	All GND'd Irradiation	2534	2305	2533	2233	2468	2053	2236
827	All GND'd Irradiation	2271	2160	2205	2169	2108	2171	1960
828	All GND'd Irradiation	2324	2619	2154	2448	2112	2223	1772
829	All GND'd Irradiation	3258	2281	2360	2301	2403	2287	2305
830	All GND'd Irradiation	2247	2224	2152	2173	1997	2109	2011
821	Biased Irradiation	2311	2196	2128	2058	1931	2303	2015
822	Biased Irradiation	2454	2609	2215	2194	2392	2442	1888
823	Biased Irradiation	2377	2213	2513	1998	2151	2263	2107
824	Biased Irradiation	2268	2268	2271	1945	2191	2142	2037
825	Biased Irradiation	2693	2176	2315	1867	2383	1771	1886
832	Control Unit	2303	1975	2228	2225	2128	2174	1961
833	Control Unit	2390	2486	2529	2414	2769	2707	2156
All GND'd Irradiation Statistics								
	Average All GND'd	2527	2318	2281	2265	2218	2169	2057
	Std Dev All GND'd	424	178	164	116	205	92	216
	Ps90%/90% (+KTL) All GND'd	3690	2805	2732	2583	2780	2421	2649
	PS90%/90% (-KTL) All GND'd	1364	1831	1830	1947	1655	1916	1464
Biased Irradiation Statistics								
	Average Biased	2421	2293	2289	2012	2209	2185	1987
	Std Dev Biased	168	180	144	123	190	255	97
	Ps90%/90% (+KTL) Biased	2881	2786	2682	2350	2731	2883	2253
	Ps90%/90% (-KTL) Biased	1961	1799	1895	1674	1688	1487	1721
	Specification MIN	500	250	250	250		250	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

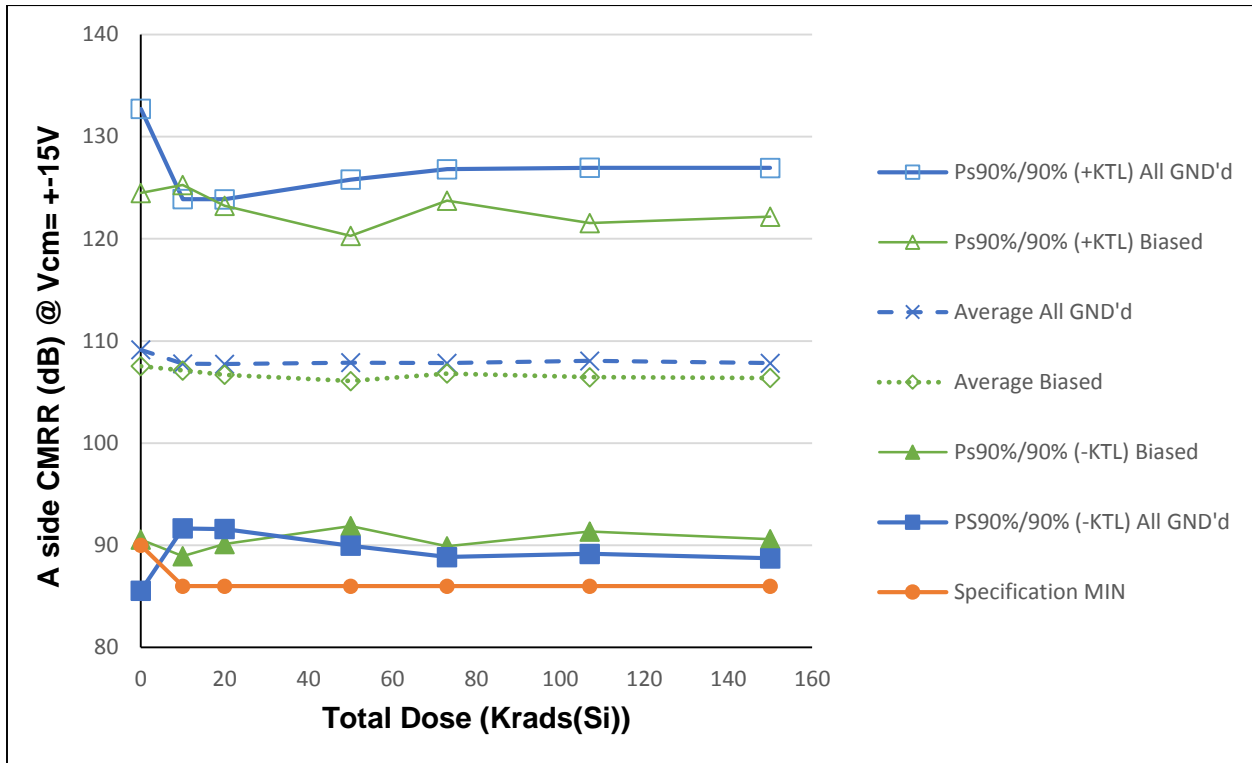


Figure 5.21: Plot of A-side Common Mode Rejection Ration CMRR @ Vcm = +/-15V versus Total Dose

Note: the pre-irradiation All GND'd – KTL point (blue square marker) is lower than the specification limit due to the small 5-piece sample size.

Table 5.21: Raw data table for CMRR (Vcm = +/- 15V, side A) versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter Units	A CMRR, Vcm= +/-15V (dB)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	100.200	100.889	100.915	100.813	100.525	100.985	100.646
827	All GND'd Irradiation	105.061	106.637	106.491	106.083	105.501	105.862	105.333
828	All GND'd Irradiation	122.313	110.399	110.162	110.051	109.914	109.884	109.832
829	All GND'd Irradiation	112.642	116.307	116.420	117.962	118.688	118.993	118.847
830	All GND'd Irradiation	105.475	104.626	104.689	104.518	104.542	104.568	104.512
821	Biased Irradiation	103.452	101.202	101.215	101.280	101.257	100.894	101.429
822	Biased Irradiation	104.323	103.204	102.920	102.770	102.590	102.630	102.335
823	Biased Irradiation	105.424	108.106	107.874	106.873	107.998	107.815	106.632
824	Biased Irradiation	105.995	104.984	104.889	104.961	105.440	105.881	105.613
825	Biased Irradiation	118.464	118.064	116.542	114.543	116.828	115.029	115.916
832	Control Unit	97.066	98.818	98.910	99.164	98.963	98.988	98.864
833	Control Unit	123.905	116.569	118.008	118.718	117.120	117.714	117.060
All GND'd Irradiation Statistics								
Average All GND'd		109.138	107.771	107.735	107.885	107.834	108.058	107.834
Std Dev All GND'd		8.599	5.880	5.888	6.535	6.925	6.891	6.969
Ps90%/90% (+KTL) All GND'd		132.717	123.895	123.880	125.805	126.823	126.954	126.942
PS90%/90% (-KTL) All GND'd		85.560	91.647	91.591	89.966	88.845	89.163	88.727
Biased Irradiation Statistics								
Average Biased		107.531	107.112	106.688	106.085	106.823	106.450	106.385
Std Dev Biased		6.190	6.627	6.040	5.184	6.171	5.506	5.755
Ps90%/90% (+KTL) Biased		124.504	125.283	123.248	120.300	123.742	121.546	122.164
Ps90%/90% (-KTL) Biased		90.559	88.941	90.127	91.870	89.903	91.353	90.606
Specification MIN		90	86	86	86		86	
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Specification MAX								
Status (Measurements) All GND'd								
Status (Measurements) Biased								
Status (-KTL) All GND'd		FAIL	PASS	PASS	PASS		PASS	
Status (+KTL) All GND'd								
Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
Status (+KTL) Biased								

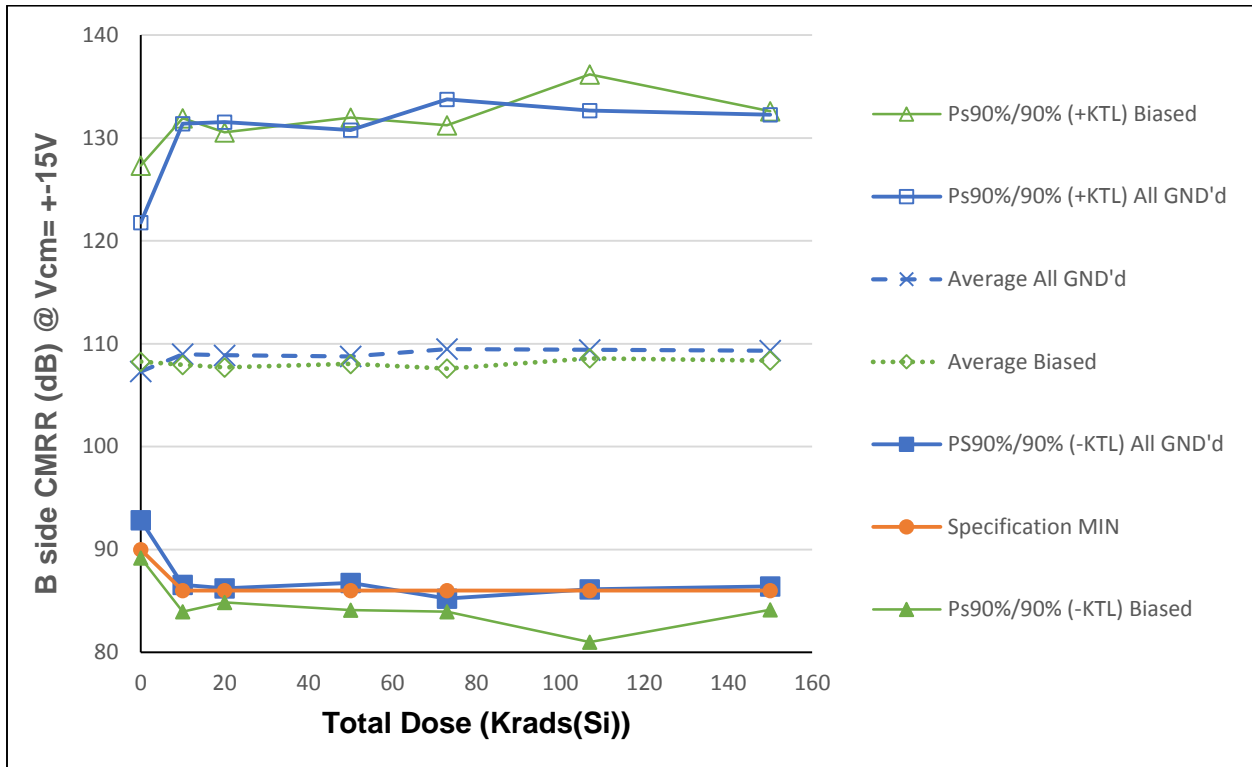


Figure 5.22: Plot of B-side CMRR @ Vcm = +/-15V versus Total Dose

All samples passed the CMRR parameter but due to the small 5-piece sample size, the computed – KTL line (green with filled triangle markers) for Biased Irradiation is lower than the specification MIN line.

Table 5.22: Raw data table for CMRR (Vcm = +/- 15V, side B) versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter Units	B CMRR, Vcm= +/-15V (dB)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	100.386	100.921	100.793	100.892	100.620	100.994	100.783
827	All GND'd Irradiation	106.808	104.486	104.519	104.590	104.505	104.560	104.728
828	All GND'd Irradiation	114.725	121.273	121.586	121.232	122.313	121.958	121.329
829	All GND'd Irradiation	105.289	105.203	105.093	105.205	105.265	105.515	105.384
830	All GND'd Irradiation	109.333	113.016	112.435	111.893	114.742	113.994	114.414
821	Biased Irradiation	111.871	113.602	113.599	114.188	111.150	111.972	111.842
822	Biased Irradiation	107.792	103.903	104.275	104.970	104.452	105.494	107.100
823	Biased Irradiation	118.049	120.369	119.144	119.965	120.905	124.424	121.644
824	Biased Irradiation	101.379	102.338	102.058	101.689	101.975	101.774	101.629
825	Biased Irradiation	102.169	99.477	99.441	99.373	99.466	99.287	99.600
832	Control Unit	116.501	112.993	112.611	112.516	112.833	113.274	113.033
833	Control Unit	102.512	106.586	106.548	106.725	106.109	106.237	106.114
All GND'd Irradiation Statistics								
	Average All GND'd	107.308	108.980	108.885	108.762	109.489	109.404	109.328
	Std Dev All GND'd	5.276	8.167	8.259	8.020	8.851	8.485	8.361
	Ps90%/90% (+KTL) All GND'd	121.775	131.375	131.531	130.754	133.759	132.670	132.253
	PS90%/90% (-KTL) All GND'd	92.841	86.585	86.239	86.770	85.219	86.138	86.402
Biased Irradiation Statistics								
	Average Biased	108.252	107.938	107.703	108.037	107.589	108.590	108.363
	Std Dev Biased	6.956	8.744	8.330	8.730	8.622	10.059	8.835
	Ps90%/90% (+KTL) Biased	127.325	131.914	130.544	131.975	131.230	136.171	132.587
	Ps90%/90% (-KTL) Biased	89.178	83.961	84.863	84.099	83.949	81.009	84.139
	Specification MIN	90	86	86	86		86	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	FAIL	FAIL	FAIL	FAIL		FAIL	
	Status (+KTL) Biased							

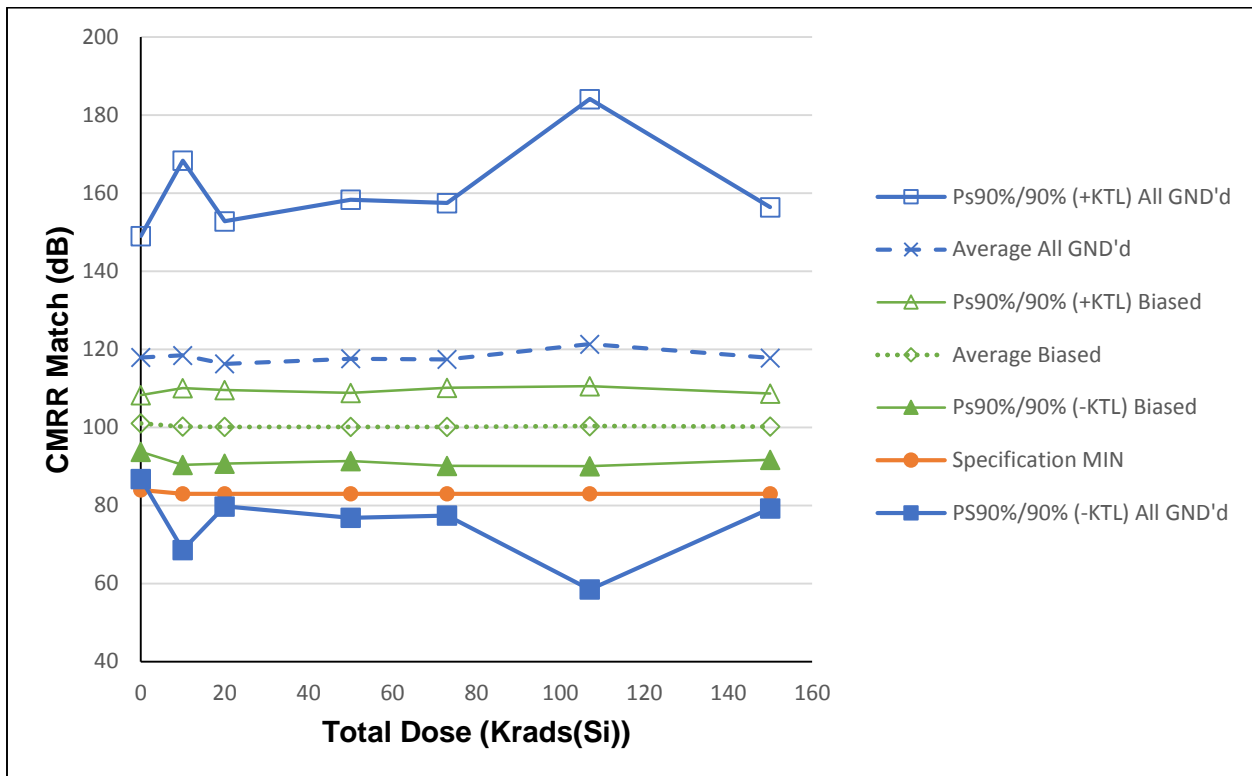


Figure 5.23: Plot of CMRR Matching @ Vcm = +-15V versus Total Dose

All samples passed the CMRR Matching parameter but due to the small 5-piece sample size, the computed – KTL line (blue with filled square markers) for All GND'd Irradiation is lower than the specification MIN line.

Table 5.23: Raw data table for CMRR matching versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	CMRR MATCH	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(dB)	0	10	20	50	73	107	150
826	All GND'd Irradiation	133.701	149.522	137.910	141.725	139.795	160.568	136.765
827	All GND'd Irradiation	119.849	117.664	118.365	120.617	123.805	121.683	128.172
828	All GND'd Irradiation	119.418	113.324	112.876	112.857	112.297	112.372	112.521
829	All GND'd Irradiation	102.189	103.069	103.007	103.405	103.586	103.846	103.712
830	All GND'd Irradiation	114.382	108.787	109.270	109.367	107.753	108.148	107.860
821	Biased Irradiation	100.659	99.334	99.344	99.508	98.844	98.754	99.140
822	Biased Irradiation	99.865	97.526	97.550	97.780	97.450	97.924	98.374
823	Biased Irradiation	103.600	106.212	105.776	105.135	106.226	106.618	105.212
824	Biased Irradiation	97.363	97.540	97.338	97.152	97.515	97.566	97.374
825	Biased Irradiation	103.613	100.564	100.748	101.038	100.730	100.836	101.041
832	Control Unit	96.185	97.267	97.279	97.473	97.361	97.455	97.312
833	Control Unit	103.285	109.895	109.250	109.240	108.980	108.932	109.011
All GND'd Irradiation Statistics								
Average All GND'd		117.908	118.473	116.285	117.594	117.447	121.323	117.806
Std Dev All GND'd		11.347	18.182	13.314	14.857	14.599	22.910	14.075
Ps90%/90% (+KTL) All GND'd		149.021	168.328	152.793	158.332	157.477	184.142	156.399
PS90%/90% (-KTL) All GND'd		86.795	68.618	79.778	76.857	77.417	58.505	79.213
Biased Irradiation Statistics								
Average Biased		101.020	100.235	100.151	100.122	100.153	100.340	100.228
Std Dev Biased		2.656	3.579	3.440	3.188	3.647	3.732	3.093
Ps90%/90% (+KTL) Biased		108.302	110.050	109.583	108.864	110.152	110.573	108.710
Ps90%/90% (-KTL) Biased		93.737	90.420	90.719	91.381	90.154	90.107	91.747
Specification MIN		84	83	83	83		83	
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Specification MAX								
Status (Measurements) All GND'd								
Status (Measurements) Biased								
Status (-KTL) All GND'd		PASS	FAIL	FAIL	FAIL		FAIL	
Status (+KTL) All GND'd								
Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
Status (+KTL) Biased								

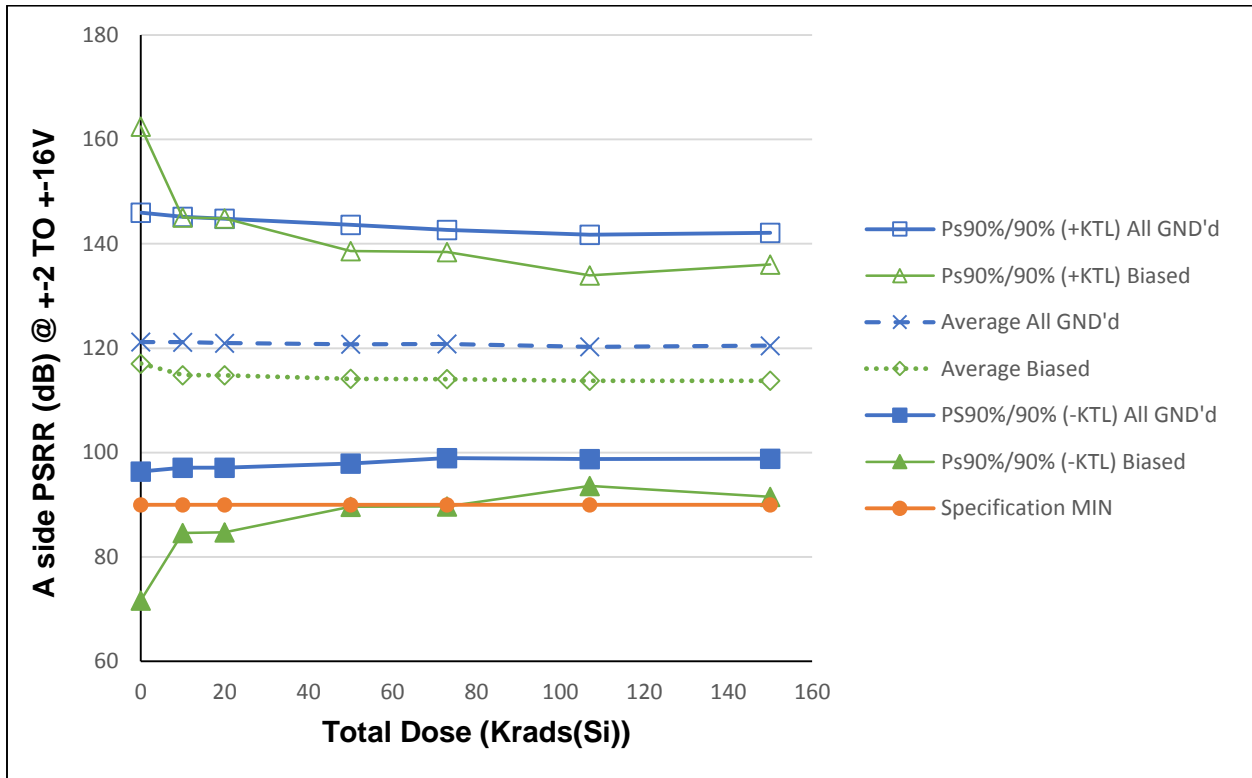


Figure 5.24: Plot of A-side Power Supply Rejection Ratio PSRR @ $V_{cm} = \pm 2V$ to $\pm 16V$ versus Total Dose

All samples passed the PSRR parameter but due to the small 5-piece sample size, the computed – KTL points (green filled triangle markers) for Biased Irradiation are lower than the specification MIN points at 0, 10, 20, 50 Krad(Si).

Table 5.24: Raw data table for PSRR of A-side @ Vcm = +-2V to +-16V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter Units	A PSRR, +-2 TO +-16V (dB)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	134.340	133.745	133.632	132.429	131.681	131.166	131.298
827	All GND'd Irradiation	118.909	119.148	119.042	118.204	119.627	117.899	119.110
828	All GND'd Irradiation	120.301	120.572	120.777	120.432	120.545	120.214	120.384
829	All GND'd Irradiation	109.191	109.254	109.267	109.397	109.380	109.509	109.232
830	All GND'd Irradiation	123.174	122.998	122.180	123.375	122.862	122.536	122.368
821	Biased Irradiation	107.408	107.639	107.771	108.356	108.202	108.990	108.362
822	Biased Irradiation	114.084	114.763	114.582	115.125	115.156	115.989	115.674
823	Biased Irradiation	146.180	133.721	133.643	129.106	128.926	125.536	126.984
824	Biased Irradiation	106.478	106.803	106.743	106.938	106.890	107.188	106.811
825	Biased Irradiation	111.165	111.247	111.261	111.141	111.142	111.186	111.045
832	Control Unit	123.877	123.746	123.786	124.454	124.282	124.007	123.672
833	Control Unit	130.872	130.948	129.887	131.546	129.910	130.382	133.397
All GND'd Irradiation Statistics								
	Average All GND'd	121.183	121.144	120.980	120.767	120.819	120.265	120.478
	Std Dev All GND'd	9.039	8.773	8.697	8.348	7.976	7.831	7.890
	Ps90%/90% (+KTL) All GND'd	145.968	145.200	144.825	143.659	142.690	141.737	142.112
	PS90%/90% (-KTL) All GND'd	96.398	97.087	97.134	97.876	98.947	98.793	98.844
Biased Irradiation Statistics								
	Average Biased	117.063	114.835	114.800	114.133	114.063	113.778	113.775
	Std Dev Biased	16.558	11.021	10.977	8.934	8.894	7.352	8.114
	Ps90%/90% (+KTL) Biased	162.465	145.055	144.898	138.630	138.451	133.937	136.024
	Ps90%/90% (-KTL) Biased	71.660	84.615	84.702	89.636	89.675	93.618	91.527
	Specification MIN	90	90	90	90		90	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	FAIL	FAIL	FAIL	FAIL		PASS	
	Status (+KTL) Biased							

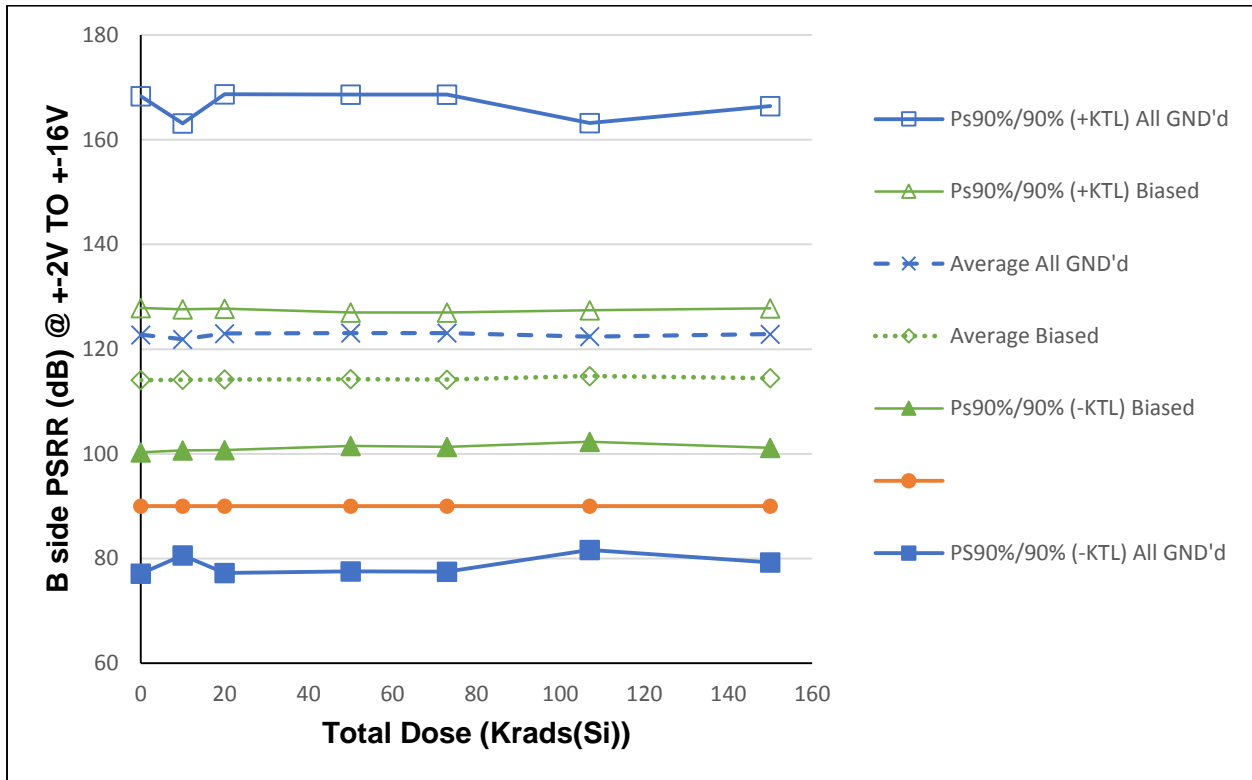


Figure 5.25: Plot of Power Supply Rejection Ratio PSRR (side B) @ $V_{cm} = +2V$ to $+16V$ versus Total Dose

All samples passed the PSRR parameter but due to the small 5-piece sample size, the computed – KTL line (blue filled square markers) for All GND'd Irradiation is lower than the specification MIN limit.

Table 5.25: Raw data table for PSRR of B-side @ Vcm = +-2V to +-16V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	B PSRR, +-2V TO +-16V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(dB)							
826	All GND'd Irradiation	148.943	144.693	148.943	148.943	148.943	144.432	146.966
827	All GND'd Irradiation	116.716	116.596	116.870	117.115	116.856	117.623	117.188
828	All GND'd Irradiation	127.238	127.433	128.100	128.008	127.999	128.525	128.770
829	All GND'd Irradiation	104.938	104.863	104.904	104.858	104.908	104.930	104.909
830	All GND'd Irradiation	115.922	115.790	116.083	116.477	116.617	116.554	116.510
821	Biased Irradiation	111.799	112.045	112.091	112.382	112.180	112.772	112.096
822	Biased Irradiation	116.390	116.825	116.878	116.973	116.794	117.150	117.453
823	Biased Irradiation	106.356	106.450	106.512	106.944	106.803	107.774	106.986
824	Biased Irradiation	118.591	118.143	118.366	117.997	117.503	118.754	118.559
825	Biased Irradiation	117.293	117.298	117.184	117.069	117.594	117.847	117.186
832	Control Unit	120.922	120.946	120.722	121.650	120.737	121.094	121.238
833	Control Unit	108.792	108.645	108.745	108.929	108.564	108.717	108.578
All GND'd Irradiation Statistics								
	Average All GND'd	122.752	121.875	122.980	123.080	123.065	122.413	122.869
	Std Dev All GND'd	16.632	15.049	16.673	16.616	16.612	14.876	15.896
	Ps90%/90% (+KTL) All GND'd	168.357	163.139	168.697	168.642	168.615	163.202	166.456
	PS90%/90% (-KTL) All GND'd	77.146	80.611	77.263	77.518	77.514	81.624	79.281
Biased Irradiation Statistics								
	Average Biased	114.086	114.152	114.206	114.273	114.175	114.859	114.456
	Std Dev Biased	5.022	4.918	4.924	4.644	4.689	4.580	4.864
	Ps90%/90% (+KTL) Biased	127.855	127.636	127.708	127.007	127.033	127.417	127.794
	Ps90%/90% (-KTL) Biased	100.317	100.668	100.704	101.539	101.317	102.302	101.118
	Specification MIN	90	90	90	90		90	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	FAIL	FAIL	FAIL	FAIL		FAIL	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

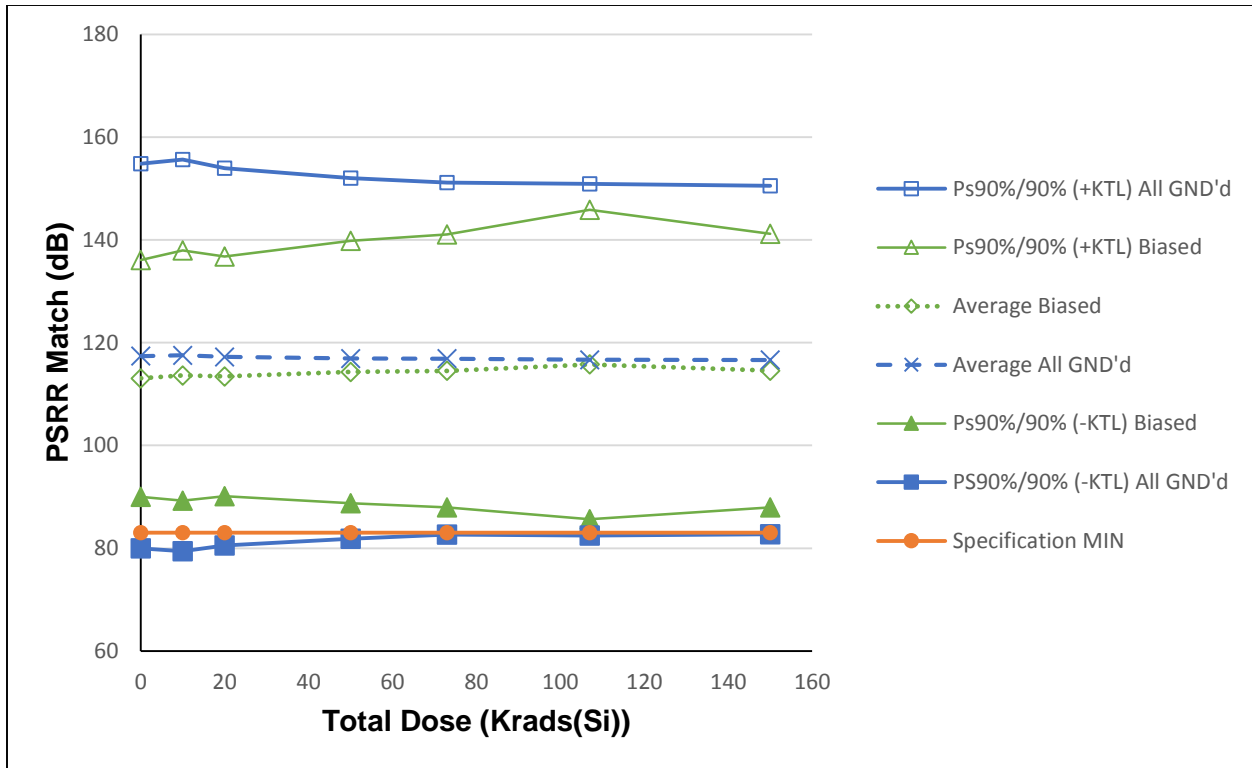


Figure 5.26: Plot of PSRR Matching @ $V_{cm} = +2V$ to $-16V$ versus Total Dose

All samples passed the PSRR parameter but due to the small 5-piece sample size, the computed - KTL blue line (with filled square markers) for All GND'd Irradiation is lower than the specification MIN limit.

Table 5.26: Raw data table for PSRR matching @ Vcm = +-2V to +-16V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	PSRR MATCH	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(dB)							
826	All GND'd Irradiation	136.129	136.641	135.267	133.835	132.961	133.292	132.861
827	All GND'd Irradiation	111.723	111.758	111.868	111.622	112.111	111.739	112.075
828	All GND'd Irradiation	125.493	125.826	125.666	125.135	125.335	124.424	124.548
829	All GND'd Irradiation	100.786	100.763	100.794	100.814	100.839	100.900	100.784
830	All GND'd Irradiation	112.792	112.646	112.586	113.238	113.169	113.020	112.933
821	Biased Irradiation	115.437	115.644	115.908	116.970	116.897	118.034	117.494
822	Biased Irradiation	126.732	128.264	127.259	129.475	130.449	134.043	130.323
823	Biased Irradiation	106.445	106.834	106.903	107.649	107.512	108.978	107.901
824	Biased Irradiation	108.953	109.549	109.386	109.790	109.923	109.851	109.410
825	Biased Irradiation	107.678	107.735	107.707	107.588	107.762	107.872	107.563
832	Control Unit	131.723	132.142	131.257	132.837	130.235	132.000	133.475
833	Control Unit	109.504	109.338	109.542	109.596	109.342	109.465	109.091
All GND'd Irradiation Statistics								
	Average All GND'd	117.385	117.527	117.236	116.929	116.883	116.675	116.640
	Std Dev All GND'd	13.654	13.896	13.388	12.793	12.489	12.477	12.366
	Ps90%/90% (+KTL) All GND'd	154.824	155.629	153.947	152.006	151.129	150.888	150.547
	PS90%/90% (-KTL) All GND'd	79.945	79.425	80.526	81.851	82.637	82.462	82.733
Biased Irradiation Statistics								
	Average Biased	113.049	113.605	113.432	114.295	114.509	115.756	114.538
	Std Dev Biased	8.399	8.885	8.502	9.314	9.687	10.984	9.707
	Ps90%/90% (+KTL) Biased	136.079	137.968	136.744	139.835	141.069	145.873	141.155
	Ps90%/90% (-KTL) Biased	90.020	89.242	90.121	88.754	87.948	85.639	87.921
	Specification MIN	83	83	83	83		83	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	FAIL	FAIL	FAIL	FAIL		FAIL	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

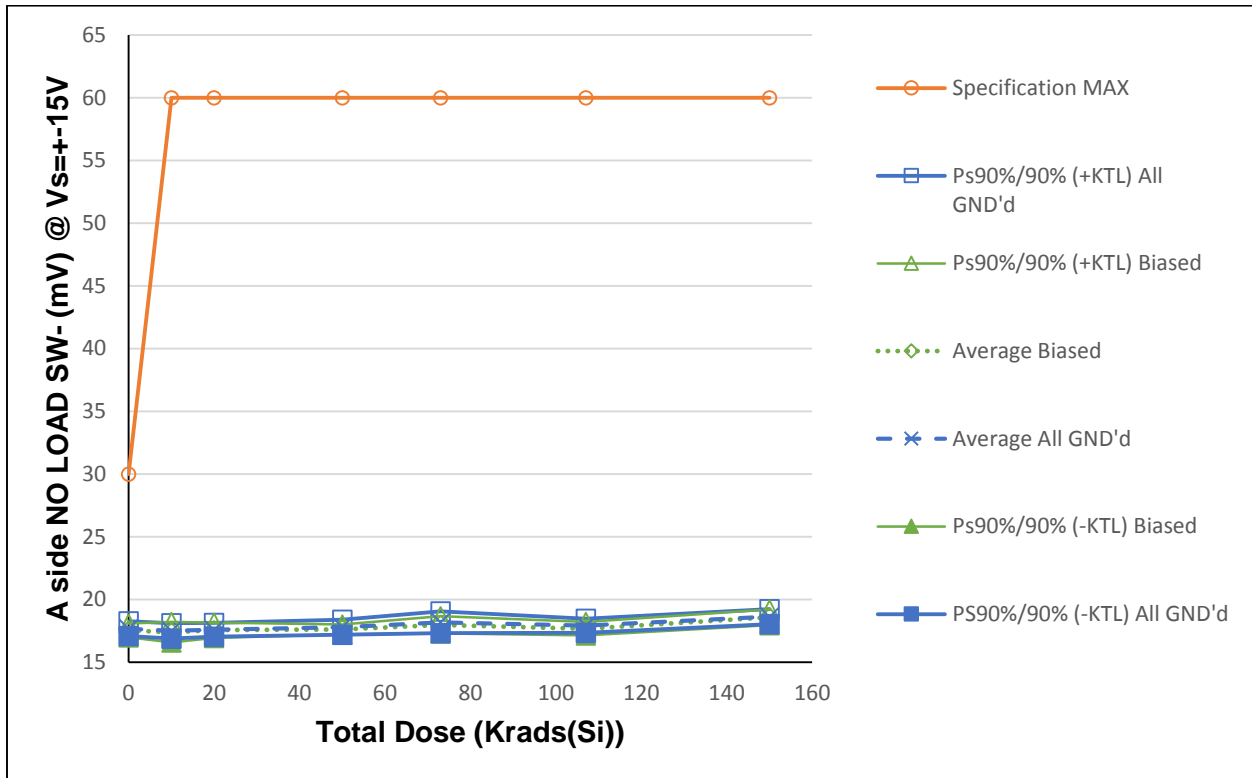


Figure 5.27: Plot of Output Voltage Swing Low at No Load and $V_s = \pm 15V$ versus Total Dose (side A)

Table 5.27: Raw data table for output voltage swing low with no load @ Vs = +-15V on side A versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A NO LOAD SW- @ Vs=+-15V (mV)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	17.566	17.440	17.510	17.668	18.287	17.865	18.523
827	All GND'd Irradiation	17.826	17.650	17.704	17.956	18.518	18.018	18.807
828	All GND'd Irradiation	17.892	17.695	17.776	18.006	18.287	18.134	18.855
829	All GND'd Irradiation	17.762	17.628	17.680	17.880	18.144	17.960	18.676
830	All GND'd Irradiation	17.359	17.154	17.281	17.489	17.668	17.589	18.321
821	Biased Irradiation	17.750	17.746	17.824	17.651	18.251	17.713	18.821
822	Biased Irradiation	17.566	17.476	17.551	17.711	18.004	17.829	18.562
823	Biased Irradiation	17.588	17.428	17.620	17.637	17.983	17.698	18.592
824	Biased Irradiation	17.207	16.924	17.201	17.375	17.580	17.348	18.218
825	Biased Irradiation	17.559	17.390	17.594	17.728	18.101	17.808	18.714
832	Control Unit	17.500	17.230	17.033	16.716	17.218	17.229	17.467
833	Control Unit	17.606	17.342	17.091	16.913	17.452	17.208	17.506
All GND'd Irradiation Statistics								
	Average All GND'd	17.681	17.513	17.590	17.800	18.181	17.913	18.636
	Std Dev All GND'd	0.218	0.223	0.198	0.216	0.316	0.206	0.218
	Ps90%/90% (+KTL) All GND'd	18.278	18.126	18.135	18.394	19.048	18.478	19.235
	PS90%/90% (-KTL) All GND'd	17.084	16.901	17.046	17.206	17.314	17.349	18.038
Biased Irradiation Statistics								
	Average Biased	17.534	17.393	17.558	17.620	17.984	17.679	18.582
	Std Dev Biased	0.199	0.297	0.225	0.142	0.249	0.194	0.228
	Ps90%/90% (+KTL) Biased	18.079	18.207	18.176	18.011	18.667	18.210	19.206
	Ps90%/90% (-KTL) Biased	16.988	16.578	16.940	17.230	17.300	17.148	17.957
	Specification MIN							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Specification MAX	30	60	60	60		60	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

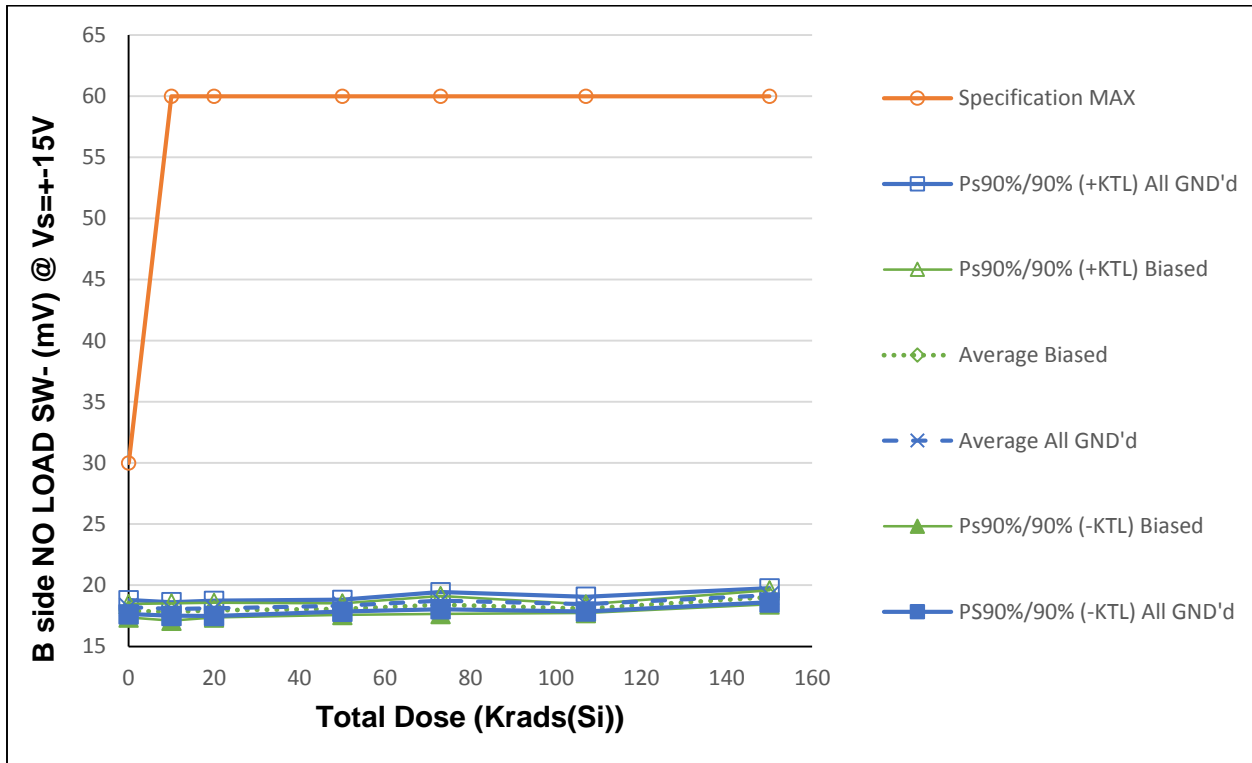


Figure 5.28: Plot of Output Voltage Swing Low at No Load and $V_s = \pm 15V$ versus Total Dose (side B)

Table 5.28: Raw data table for output voltage swing low with no load @ Vs = +/-15V of B-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B NO LOAD SW- @ Vs=+-15V (mV)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	18.081	17.984	17.986	18.225	18.803	18.420	19.131
827	All GND'd Irradiation	18.284	18.153	18.123	18.413	19.015	18.496	19.265
828	All GND'd Irradiation	18.310	18.162	18.270	18.425	18.786	18.524	19.324
829	All GND'd Irradiation	17.928	17.746	17.817	18.083	18.318	18.134	18.845
830	All GND'd Irradiation	18.463	18.258	18.386	18.518	18.767	18.744	19.362
821	Biased Irradiation	18.224	18.239	18.290	18.273	18.803	18.220	19.341
822	Biased Irradiation	17.716	17.647	17.747	17.909	18.166	18.018	18.874
823	Biased Irradiation	17.892	17.772	17.986	17.947	18.325	18.008	18.931
824	Biased Irradiation	17.767	17.575	17.776	17.937	18.181	17.960	18.855
825	Biased Irradiation	17.971	17.849	18.046	18.209	18.487	18.229	19.150
832	Control Unit	17.892	17.602	17.435	17.092	17.640	17.560	17.880
833	Control Unit	17.978	17.734	17.527	17.347	17.927	17.610	17.885
All GND'd Irradiation Statistics								
	Average All GND'd	18.213	18.060	18.116	18.333	18.738	18.464	19.186
	Std Dev All GND'd	0.209	0.202	0.225	0.176	0.255	0.220	0.210
	Ps90%/90% (+KTL) All GND'd	18.787	18.614	18.734	18.815	19.438	19.067	19.760
	PS90%/90% (-KTL) All GND'd	17.639	17.507	17.499	17.851	18.038	17.860	18.611
Biased Irradiation Statistics								
	Average Biased	17.914	17.816	17.969	18.055	18.392	18.087	19.030
	Std Dev Biased	0.200	0.259	0.221	0.172	0.264	0.127	0.210
	Ps90%/90% (+KTL) Biased	18.463	18.527	18.575	18.526	19.115	18.436	19.605
	Ps90%/90% (-KTL) Biased	17.365	17.106	17.363	17.584	17.669	17.738	18.455
	Specification MIN							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Specification MAX	30	60	60	60		60	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

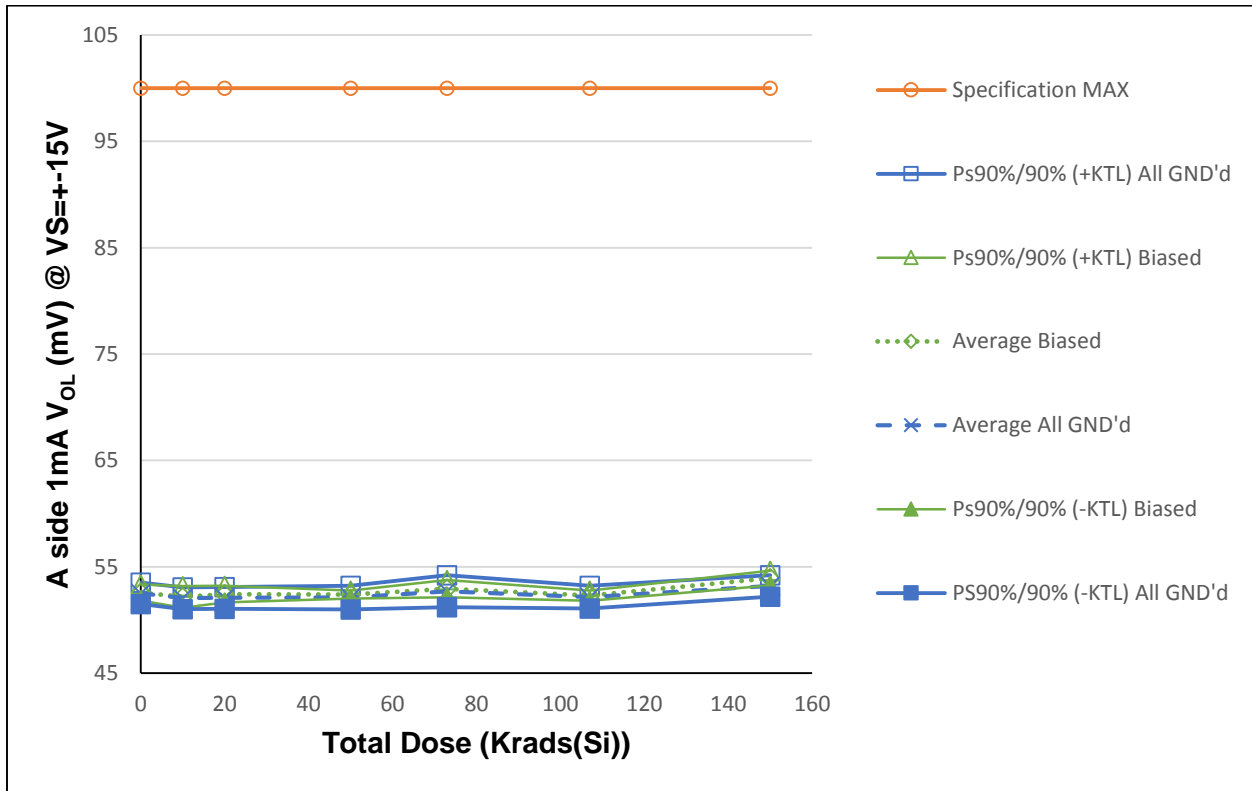


Figure 5.29: Plot of V_{OL} with $I_{SINK} = 1\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side A)

Table 5.29: Raw data table for output voltage swing low with $I_{SINK} = 1 \text{ mA}$ @ $V_s = \pm 15V$ of A-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A 1mA V_{OL} @ $V_s = \pm 15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	52.498	52.055	52.024	52.147	53.083	52.170	53.221
827	All GND'd Irradiation	52.634	52.203	52.176	52.259	53.112	52.187	53.349
828	All GND'd Irradiation	52.274	51.863	51.837	51.811	52.329	51.903	52.973
829	All GND'd Irradiation	53.015	52.551	52.639	52.661	53.033	52.732	53.690
830	All GND'd Irradiation	52.043	51.557	51.664	51.621	51.898	51.691	52.732
821	Biased Irradiation	52.884	52.597	52.723	52.371	53.210	52.132	54.181
822	Biased Irradiation	52.389	52.094	52.316	52.466	52.732	52.427	53.766
823	Biased Irradiation	52.805	52.440	52.677	52.511	53.112	52.444	54.093
824	Biased Irradiation	52.233	51.654	52.036	52.164	52.523	52.073	53.571
825	Biased Irradiation	52.536	52.015	52.335	52.442	53.115	52.377	54.055
832	Control Unit	51.947	51.490	51.224	50.440	51.431	51.408	51.957
833	Control Unit	52.646	52.161	51.781	51.402	52.424	51.932	52.415
All GND'd Irradiation Statistics								
	Average All GND'd	52.493	52.046	52.068	52.100	52.691	52.137	53.193
	Std Dev All GND'd	0.368	0.372	0.373	0.405	0.550	0.391	0.365
	Ps90%/90% (+KTL) All GND'd	53.503	53.065	53.091	53.210	54.198	53.209	54.194
	PS90%/90% (-KTL) All GND'd	51.483	51.027	51.045	50.990	51.184	51.065	52.192
Biased Irradiation Statistics								
	Average Biased	52.570	52.160	52.417	52.391	52.938	52.291	53.933
	Std Dev Biased	0.275	0.371	0.284	0.137	0.296	0.175	0.255
	Ps90%/90% (+KTL) Biased	53.322	53.177	53.196	52.766	53.750	52.770	54.634
	Ps90%/90% (-KTL) Biased	51.817	51.142	51.638	52.016	52.127	51.811	53.233
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

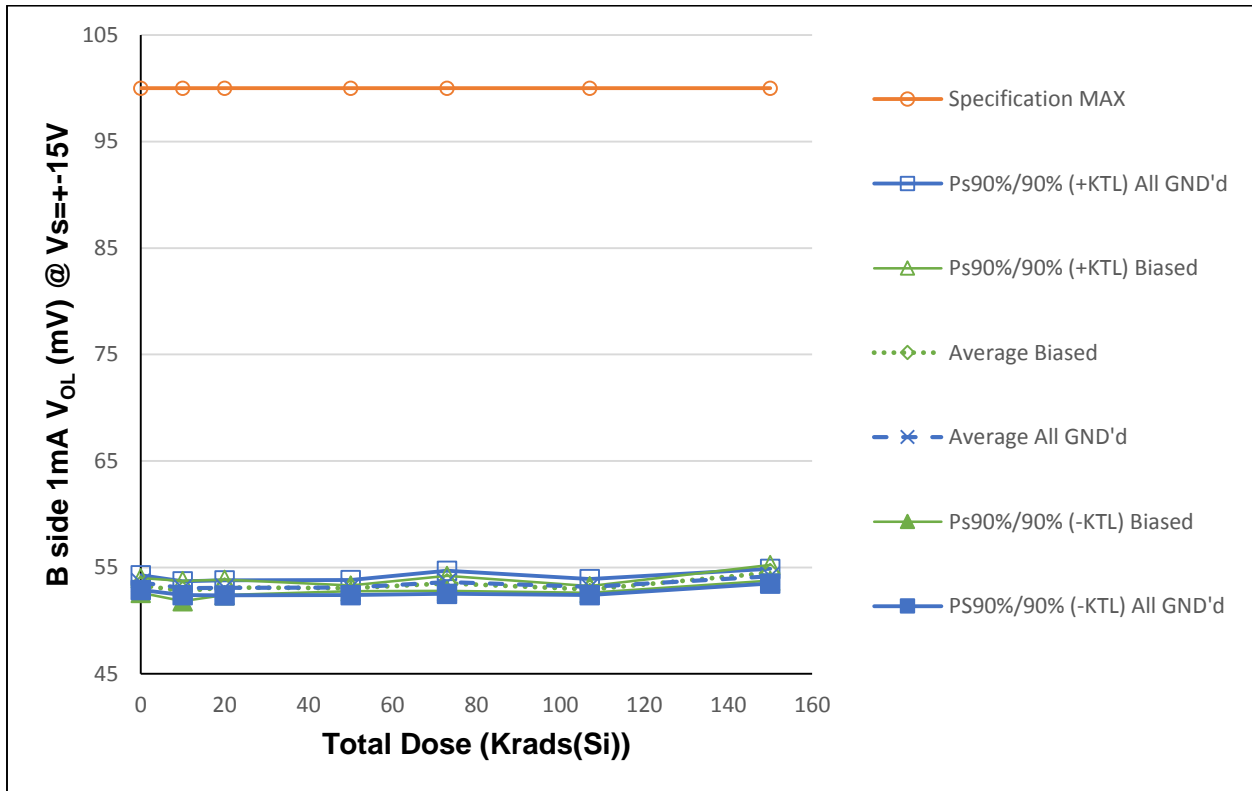


Figure 5.30: Plot of V_{OL} with $I_{SINK} = 1\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

Table 5.30: Raw data table for output voltage swing low with $I_{SINK} = 1 \text{ mA}$ @ $V_s = \pm 15V$ of B-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B 1mA V_{OL} @ $V_s = \pm 15V$	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	53.680	53.196	53.210	53.230	54.075	53.332	54.381
827	All GND'd Irradiation	53.600	53.141	53.116	53.106	53.918	53.118	54.122
828	All GND'd Irradiation	53.146	52.623	52.635	52.676	53.076	52.701	53.752
829	All GND'd Irradiation	53.742	53.162	53.215	53.271	53.541	53.282	54.308
830	All GND'd Irradiation	53.721	53.128	53.258	53.271	53.427	53.380	54.286
821	Biased Irradiation	53.625	53.272	53.401	52.992	53.801	52.818	54.801
822	Biased Irradiation	52.979	52.472	52.783	52.899	53.134	52.834	54.076
823	Biased Irradiation	53.494	53.029	53.361	53.078	53.645	53.082	54.567
824	Biased Irradiation	53.256	52.530	53.080	53.166	53.372	53.027	54.398
825	Biased Irradiation	53.189	52.635	52.962	53.068	53.570	52.939	54.591
832	Control Unit	52.608	52.091	51.835	51.061	51.927	51.996	52.548
833	Control Unit	53.416	52.989	52.544	52.052	53.150	52.673	53.101
All GND'd Irradiation Statistics								
	Average All GND'd	53.578	53.050	53.087	53.111	53.607	53.162	54.170
	Std Dev All GND'd	0.247	0.240	0.258	0.252	0.398	0.276	0.252
	Ps90%/90% (+KTL) All GND'd	54.256	53.708	53.794	53.803	54.699	53.919	54.861
	PS90%/90% (-KTL) All GND'd	52.900	52.392	52.380	52.419	52.515	52.406	53.479
Biased Irradiation Statistics								
	Average Biased	53.309	52.788	53.117	53.041	53.504	52.940	54.487
	Std Dev Biased	0.255	0.347	0.263	0.100	0.258	0.116	0.270
	Ps90%/90% (+KTL) Biased	54.008	53.740	53.839	53.316	54.212	53.258	55.228
	Ps90%/90% (-KTL) Biased	52.609	51.835	52.395	52.766	52.796	52.622	53.745
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

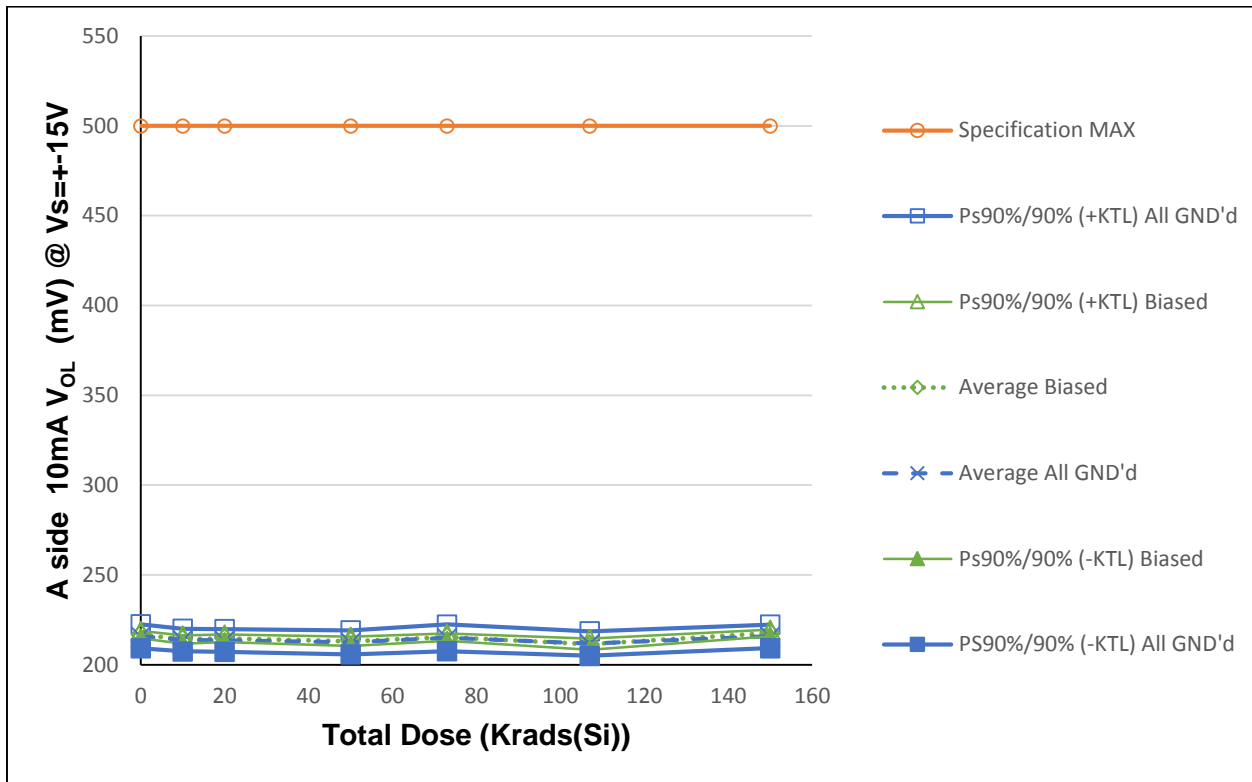


Figure 5.31: Plot of V_{OL} with $I_{SINK} = 10\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side A)

Table 5.31: Raw data table for output voltage swing low with $I_{SINK} = 10 \text{ mA}$ @ $V_s = \pm 15V$ of A-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A 10mA V_{OL} @ $V_s = \pm 15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	217.066	214.814	214.511	213.768	217.589	213.176	217.059
827	All GND'd Irradiation	214.831	213.135	212.523	211.431	215.483	210.357	214.794
828	All GND'd Irradiation	213.143	211.345	211.062	209.745	212.019	209.199	213.244
829	All GND'd Irradiation	219.383	217.147	217.001	215.954	217.479	215.385	219.291
830	All GND'd Irradiation	214.659	212.351	212.490	211.345	212.287	210.737	214.617
821	Biased Irradiation	216.456	214.622	214.322	211.426	214.920	209.418	217.102
822	Biased Irradiation	216.456	213.717	214.404	213.401	214.805	212.128	217.059
823	Biased Irradiation	218.135	215.159	216.040	213.768	216.367	212.075	218.633
824	Biased Irradiation	216.260	213.063	214.207	213.269	214.728	211.542	217.345
825	Biased Irradiation	216.628	213.573	214.593	213.516	215.953	211.751	218.056
832	Control Unit	212.684	211.052	210.089	206.108	210.850	210.537	212.748
833	Control Unit	215.956	214.641	213.182	211.026	215.991	213.384	215.428
All GND'd Irradiation Statistics								
	Average All GND'd	215.816	213.758	213.517	212.449	214.971	211.771	215.801
	Std Dev All GND'd	2.436	2.280	2.302	2.428	2.707	2.486	2.383
	Ps90%/90% (+KTL) All GND'd	222.496	220.010	219.830	219.107	222.395	218.586	222.335
	PS90%/90% (-KTL) All GND'd	209.136	207.507	207.205	205.790	207.547	204.955	209.266
Biased Irradiation Statistics								
	Average Biased	216.787	214.027	214.713	213.076	215.354	211.383	217.639
	Std Dev Biased	0.765	0.847	0.755	0.941	0.753	1.124	0.684
	Ps90%/90% (+KTL) Biased	218.884	216.349	216.783	215.655	217.418	214.465	219.515
	Ps90%/90% (-KTL) Biased	214.690	211.705	212.643	210.497	213.290	208.301	215.763
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd								
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased								
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

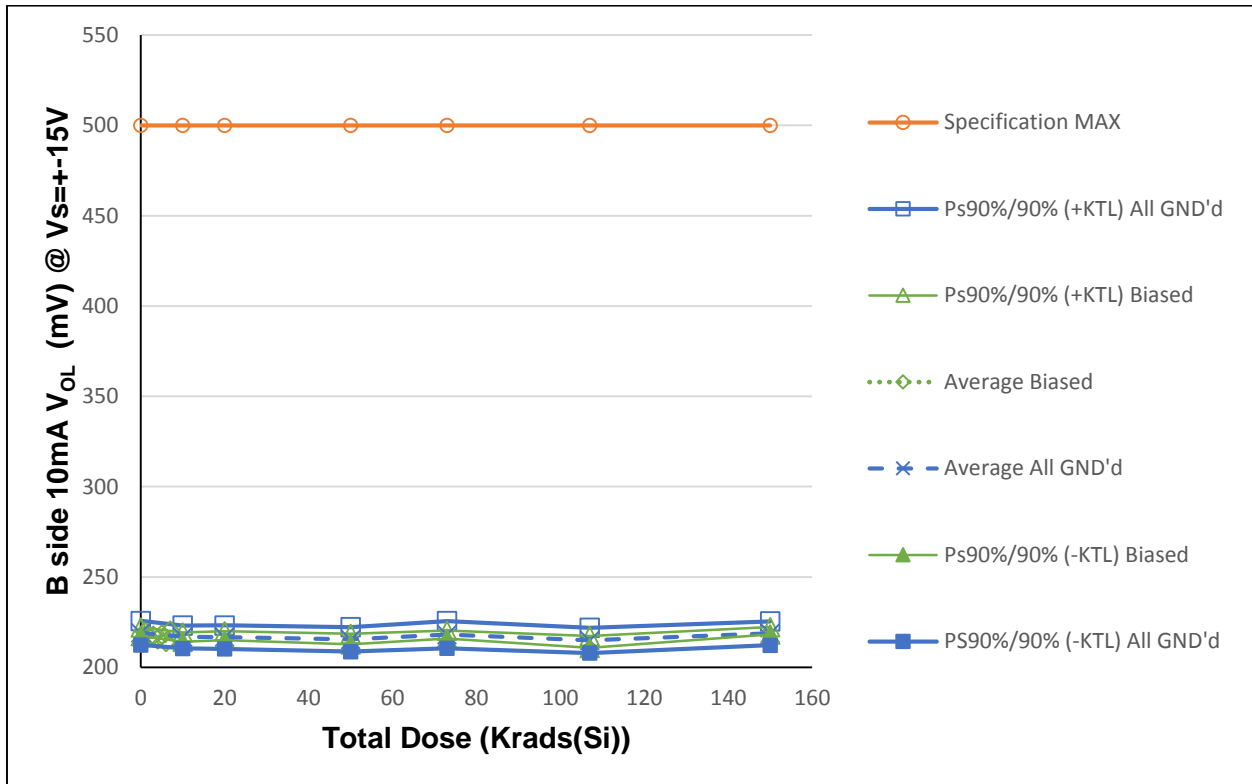


Figure 5.32: Plot of V_{OL} with $I_{SINK} = 10\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

Table 5.32: Raw data table for output voltage swing low with $I_{SINK} = 10 \text{ mA}$ @ $V_s = \pm 15V$ of B-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B 10mA V_{OL} @ $V_s = \pm 15V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	220.422	218.022	217.959	216.968	221.029	216.527	220.350
827	All GND'd Irradiation	218.169	216.232	215.655	214.392	218.705	213.532	217.846
828	All GND'd Irradiation	216.042	214.019	213.903	212.445	214.766	211.823	215.986
829	All GND'd Irradiation	222.439	220.090	220.128	218.829	220.287	218.303	222.133
830	All GND'd Irradiation	218.320	215.770	216.083	214.792	215.790	214.318	217.956
821	Biased Irradiation	219.203	217.104	216.920	213.816	217.589	212.018	219.696
822	Biased Irradiation	219.122	216.117	217.001	215.768	217.339	214.604	219.544
823	Biased Irradiation	221.214	218.199	219.056	216.530	219.457	215.047	221.446
824	Biased Irradiation	219.617	216.232	217.420	216.301	217.974	214.647	220.383
825	Biased Irradiation	219.241	215.964	217.248	215.839	218.396	214.141	220.388
832	Control Unit	215.503	213.712	212.837	208.588	213.466	213.242	215.404
833	Control Unit	218.873	217.358	215.968	213.597	218.700	216.127	218.084
All GND'd Irradiation Statistics								
	Average All GND'd	219.078	216.827	216.746	215.485	218.115	214.900	218.854
	Std Dev All GND'd	2.435	2.315	2.378	2.465	2.747	2.545	2.400
	Ps90%/90% (+KTL) All GND'd	225.756	223.173	223.266	222.243	225.646	221.879	225.435
	PS90%/90% (-KTL) All GND'd	212.401	210.480	210.225	208.727	210.584	207.922	212.273
Biased Irradiation Statistics								
	Average Biased	219.679	216.723	217.529	215.651	218.151	214.091	220.291
	Std Dev Biased	0.879	0.937	0.877	1.074	0.832	1.203	0.753
	Ps90%/90% (+KTL) Biased	222.089	219.292	219.933	218.595	220.433	217.389	222.355
	Ps90%/90% (-KTL) Biased	217.270	214.155	215.125	212.707	215.869	210.794	218.228
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd								
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased								
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

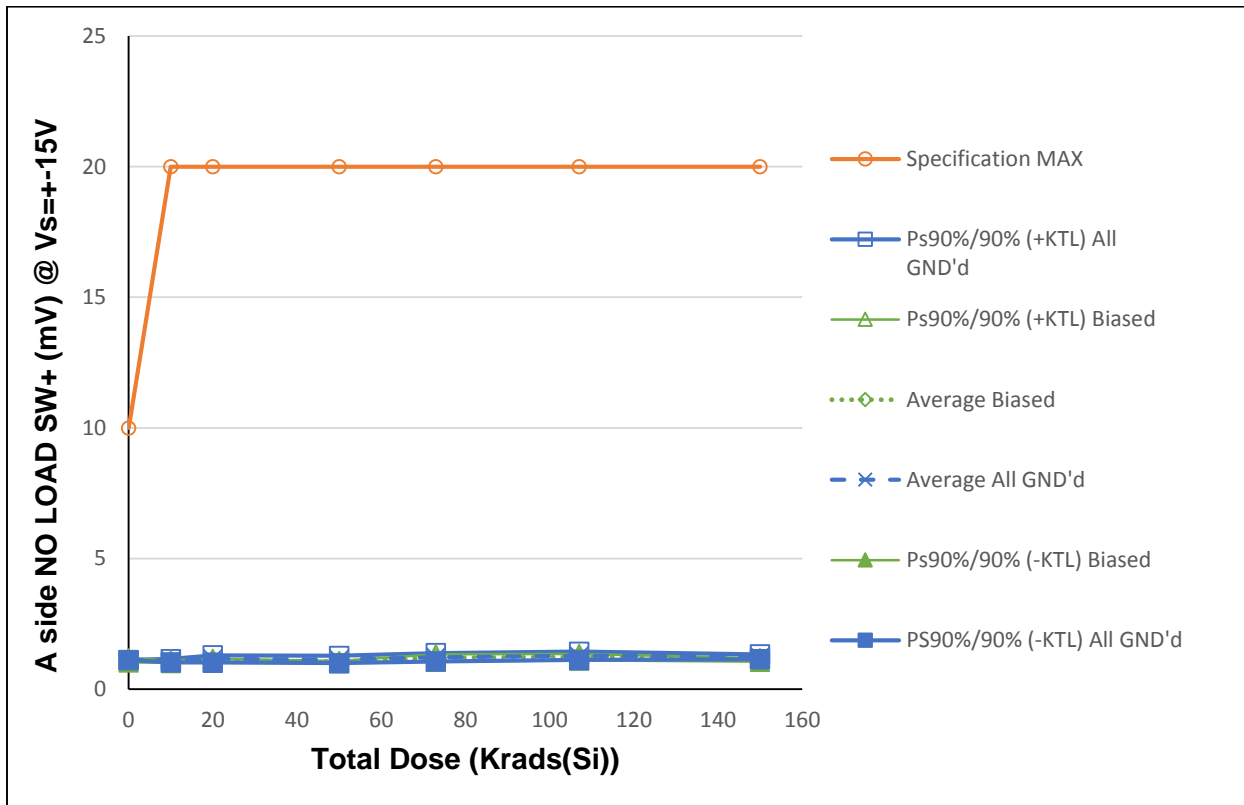


Figure 5.33: Plot of Output Voltage Swing High with No Load and $V_s = \pm 15V$ versus Total Dose (side A)

Table 5.33: Raw data table for output voltage swing high with no load @ Vs = +-15V on side A versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A NO LOAD SW+ @ Vs=+-15V (mV)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	1.115	1.071	1.162	1.078	1.300	1.312	1.250
827	All GND'd Irradiation	1.115	1.119	1.236	1.193	1.229	1.322	1.231
828	All GND'd Irradiation	1.115	1.100	1.159	1.176	1.242	1.305	1.278
829	All GND'd Irradiation	1.115	1.100	1.121	1.143	1.150	1.258	1.185
830	All GND'd Irradiation	1.115	1.062	1.107	1.091	1.184	1.181	1.247
821	Biased Irradiation	1.108	1.066	1.107	1.069	1.150	1.162	1.097
822	Biased Irradiation	1.155	1.054	1.123	1.050	1.256	1.274	1.114
823	Biased Irradiation	1.093	1.023	1.107	1.050	1.244	1.208	1.157
824	Biased Irradiation	1.079	1.062	1.085	1.050	1.150	1.229	1.109
825	Biased Irradiation	1.115	1.059	1.066	1.050	1.167	1.258	1.140
832	Control Unit	1.115	1.062	1.066	0.938	0.958	0.967	0.890
833	Control Unit	1.069	1.083	1.090	1.033	1.025	0.970	0.868
All GND'd Irradiation Statistics								
	Average All GND'd	1.115	1.090	1.157	1.136	1.221	1.276	1.238
	Std Dev All GND'd	0.000	0.023	0.050	0.051	0.057	0.058	0.034
	Ps90%/90% (+KTL) All GND'd	1.115	1.155	1.295	1.275	1.378	1.435	1.332
	PS90%/90% (-KTL) All GND'd	1.115	1.026	1.019	0.997	1.064	1.116	1.144
Biased Irradiation Statistics								
	Average Biased	1.110	1.053	1.098	1.054	1.193	1.226	1.123
	Std Dev Biased	0.029	0.017	0.022	0.009	0.052	0.044	0.024
	Ps90%/90% (+KTL) Biased	1.189	1.100	1.159	1.077	1.336	1.347	1.190
	Ps90%/90% (-KTL) Biased	1.031	1.006	1.036	1.030	1.050	1.106	1.056
	Specification MIN							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Specification MAX	10	20	20	20		20	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

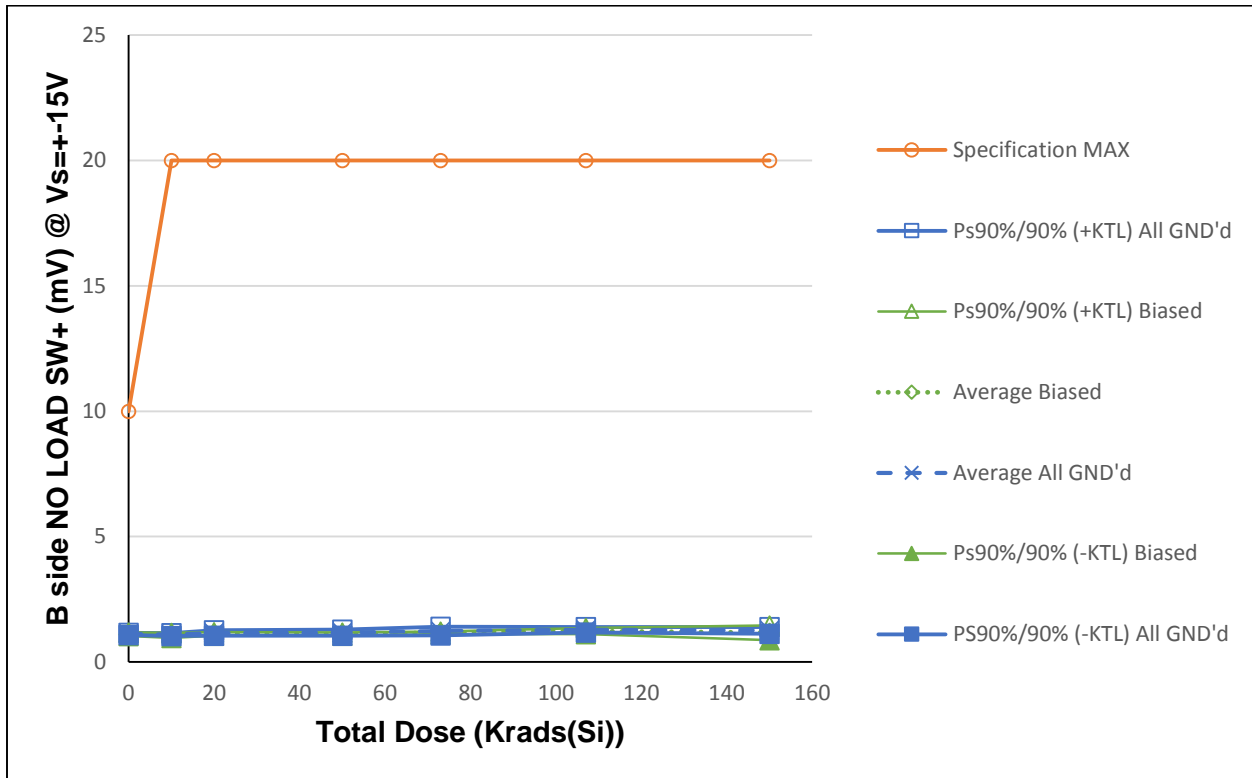


Figure 5.34: Plot of Output Voltage Swing High with No Load and Vs = +-15V versus Total Dose (side B)

Table 5.34: Raw data table for output voltage swing high with no load @ Vs = +-15V on side B versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B NO LOAD SW+ @ Vs=+-15V (mV)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	1.136	1.097	1.200	1.166	1.300	1.334	1.247
827	All GND'd Irradiation	1.115	1.100	1.203	1.202	1.292	1.258	1.247
828	All GND'd Irradiation	1.096	1.062	1.123	1.231	1.222	1.239	1.338
829	All GND'd Irradiation	1.112	1.093	1.133	1.166	1.152	1.284	1.202
830	All GND'd Irradiation	1.136	1.119	1.133	1.112	1.196	1.312	1.271
821	Biased Irradiation	1.112	1.119	1.085	1.107	1.157	1.203	1.157
822	Biased Irradiation	1.115	1.054	1.155	1.145	1.145	1.208	1.354
823	Biased Irradiation	1.069	1.042	1.116	1.100	1.191	1.305	1.109
824	Biased Irradiation	1.086	1.062	1.123	1.126	1.179	1.239	1.116
825	Biased Irradiation	1.136	1.016	1.121	1.090	1.152	1.208	1.099
832	Control Unit	1.136	1.054	1.066	0.986	0.987	0.963	0.832
833	Control Unit	1.079	1.021	1.116	0.955	0.994	0.970	0.868
All GND'd Irradiation Statistics								
	Average All GND'd	1.119	1.094	1.158	1.176	1.232	1.285	1.261
	Std Dev All GND'd	0.017	0.021	0.039	0.045	0.063	0.039	0.050
	Ps90%/90% (+KTL) All GND'd	1.167	1.151	1.266	1.298	1.406	1.391	1.397
	PS90%/90% (-KTL) All GND'd	1.072	1.037	1.050	1.053	1.059	1.179	1.125
Biased Irradiation Statistics								
	Average Biased	1.104	1.059	1.120	1.114	1.165	1.232	1.167
	Std Dev Biased	0.026	0.038	0.025	0.022	0.019	0.043	0.107
	Ps90%/90% (+KTL) Biased	1.176	1.163	1.188	1.174	1.217	1.350	1.460
	Ps90%/90% (-KTL) Biased	1.032	0.955	1.052	1.053	1.112	1.114	0.874
	Specification MIN							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Specification MAX	10	20	20	20		20	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status *Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

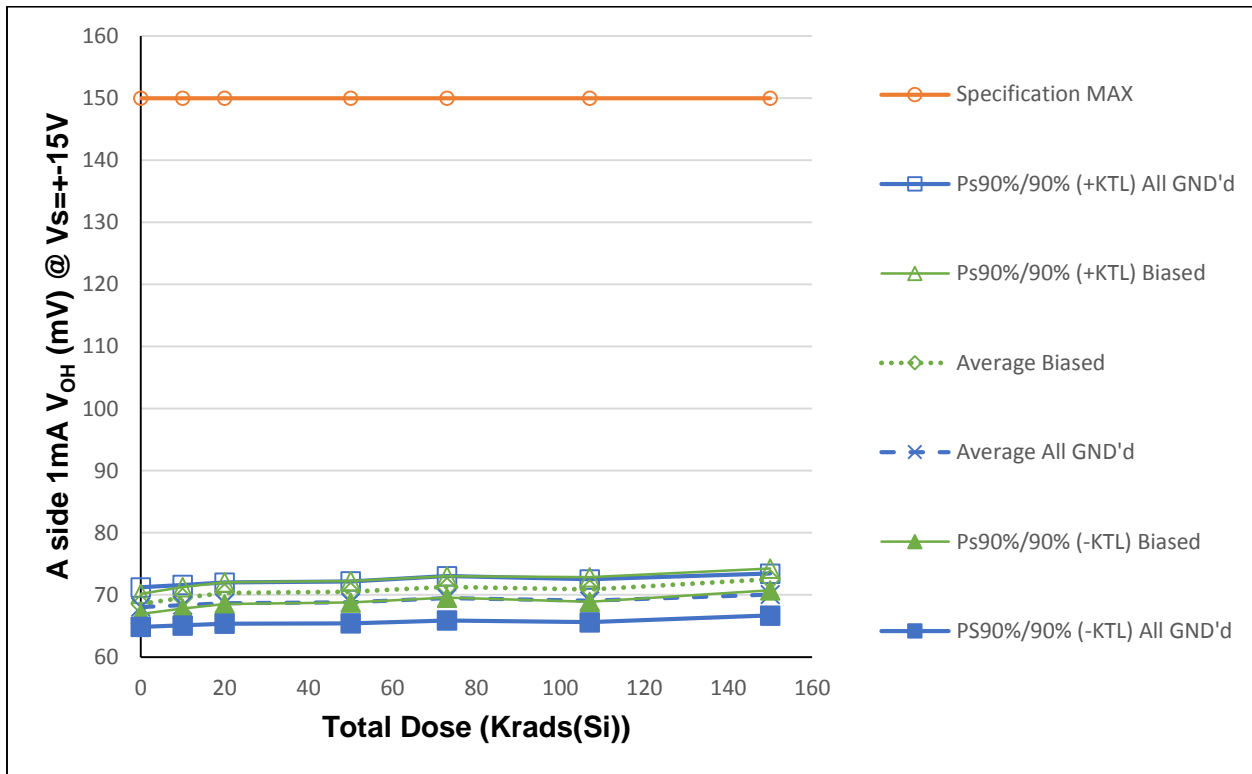


Figure 5.35: Plot of V_{OH} with $I_{SOURCE} = 1\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side A)

Table 5.35: Raw data table for output voltage swing high with $I_{SOURCE} = 1 \text{ mA}$ @ $V_s = \pm 15\text{V}$ of A-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A 1mA V_{OH} @ $V_s = \pm 15\text{V}$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	68.640	68.986	69.329	69.511	70.579	69.904	70.851
827	All GND'd Irradiation	67.706	67.992	68.258	68.385	69.472	68.554	69.610
828	All GND'd Irradiation	67.174	67.543	67.912	67.987	68.534	68.230	69.286
829	All GND'd Irradiation	69.756	70.090	70.454	70.580	70.884	70.830	71.793
830	All GND'd Irradiation	66.943	67.151	67.452	67.559	67.825	67.809	68.780
821	Biased Irradiation	68.164	69.443	69.879	69.816	70.850	70.056	72.072
822	Biased Irradiation	68.166	69.195	69.980	70.330	70.816	70.754	72.010
823	Biased Irradiation	69.413	70.453	71.236	71.254	72.228	71.842	73.429
824	Biased Irradiation	68.924	69.840	70.625	71.068	71.646	71.373	72.925
825	Biased Irradiation	68.085	68.810	69.699	70.073	70.887	70.383	72.055
832	Control Unit	66.922	66.743	66.560	65.550	66.484	66.547	66.864
833	Control Unit	68.774	68.774	68.449	67.816	68.825	68.423	68.628
All GND'd Irradiation Statistics								
	Average All GND'd	68.044	68.352	68.681	68.804	69.459	69.065	70.064
	Std Dev All GND'd	1.159	1.188	1.209	1.230	1.305	1.260	1.232
	Ps90%/90% (+KTL) All GND'd	71.221	71.611	71.995	72.176	73.037	72.521	73.442
	PS90%/90% (-KTL) All GND'd	64.867	65.094	65.367	65.432	65.880	65.609	66.686
Biased Irradiation Statistics								
	Average Biased	68.550	69.548	70.284	70.508	71.285	70.882	72.498
	Std Dev Biased	0.591	0.629	0.637	0.627	0.630	0.726	0.645
	Ps90%/90% (+KTL) Biased	70.171	71.273	72.030	72.227	73.013	72.873	74.267
	Ps90%/90% (-KTL) Biased	66.930	67.823	68.538	68.790	69.558	68.890	70.729
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

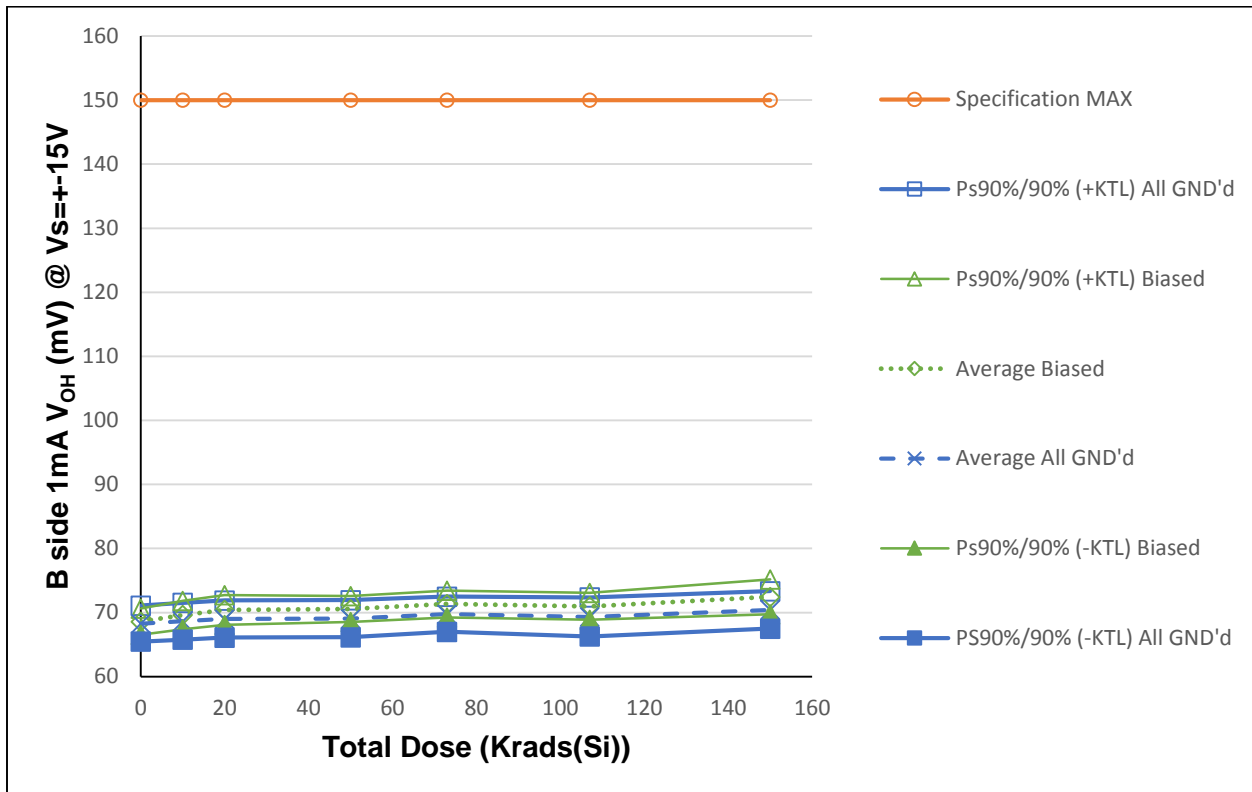


Figure 5.36: Plot of V_{OH} with $I_{SOURCE} = 1\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

Table 5.36: Raw data table for output voltage swing high with $I_{SOURCE} = 1 \text{ mA}$ @ $V_s = \pm 15\text{V}$ of B-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B 1mA V_{OH} @ $V_s = \pm 15\text{V}$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	68.774	69.043	69.444	69.633	70.655	70.001	71.11842
827	All GND'd Irradiation	67.725	68.199	68.571	68.480	69.583	68.649	69.80985
828	All GND'd Irradiation	66.867	67.168	67.512	67.590	68.252	67.814	68.95417
829	All GND'd Irradiation	69.543	69.988	70.356	70.330	70.691	70.640	71.64997
830	All GND'd Irradiation	68.488	68.854	69.097	69.202	69.508	69.485	70.51778
821	Biased Irradiation	68.599	69.784	70.337	70.254	71.341	70.514	72.53903
822	Biased Irradiation	68.164	69.274	69.977	70.276	70.891	70.839	71.25908
823	Biased Irradiation	69.649	70.648	71.664	71.530	72.491	72.042	73.75312
824	Biased Irradiation	68.889	69.902	70.683	71.016	71.542	71.385	72.95853
825	Biased Irradiation	67.658	68.469	69.384	69.654	70.463	70.063	71.72388
832	Control Unit	67.379	67.305	67.263	66.045	67.057	67.123	67.40725
833	Control Unit	68.585	68.736	68.523	67.673	68.782	68.271	68.54182
All GND'd Irradiation Statistics								
	Average All GND'd	68.279	68.650	68.996	69.047	69.738	69.318	70.410
	Std Dev All GND'd	1.023	1.047	1.054	1.056	1.004	1.113	1.064
	Ps90%/90% (+KTL) All GND'd	71.085	71.522	71.886	71.942	72.492	72.369	73.328
	PS90%/90% (-KTL) All GND'd	65.473	65.779	66.106	66.152	66.984	66.267	67.492
Biased Irradiation Statistics								
	Average Biased	68.592	69.616	70.409	70.546	71.346	70.969	72.447
	Std Dev Biased	0.752	0.807	0.850	0.732	0.764	0.769	0.989
	Ps90%/90% (+KTL) Biased	70.653	71.830	72.740	72.553	73.441	73.079	75.158
	Ps90%/90% (-KTL) Biased	66.530	67.402	68.078	68.539	69.250	68.859	69.736
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

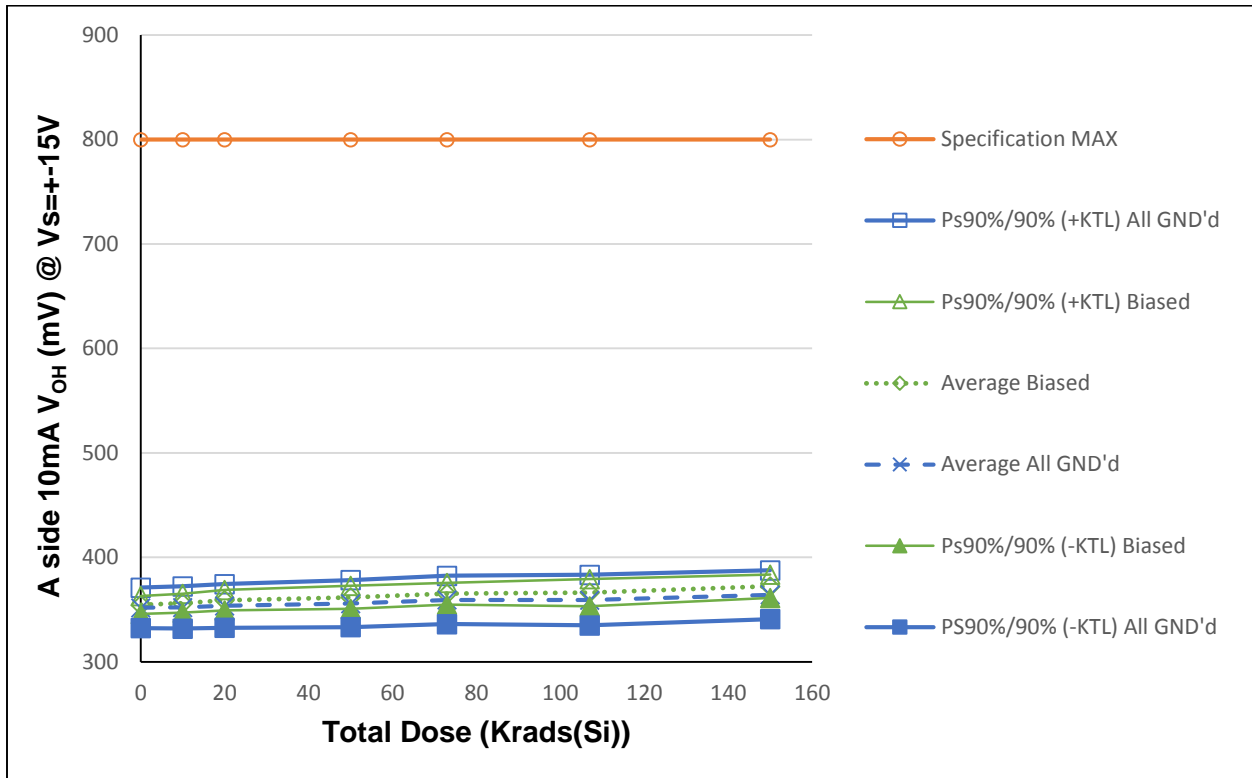


Figure 5.37: Plot of V_{OH} with $I_{SOURCE} = 10\text{ mA}$ and $V_s = \pm 15V$ versus Total Dose (side A)

Table 5.37: Raw data table for output voltage swing high with $I_{SOURCE} = 10 \text{ mA}$ @ $V_s = \pm 15\text{V}$ of A-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	A 10mA V_{OH} @ $V_s = \pm 15\text{V}$	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	355.206	355.867	357.575	360.353	365.219	364.204	369.1244
827	All GND'd Irradiation	349.762	350.048	351.231	353.292	358.350	356.453	361.704
828	All GND'd Irradiation	345.901	346.303	347.556	349.431	352.913	352.796	358.022
829	All GND'd Irradiation	362.335	363.043	364.824	367.595	370.205	371.994	376.550
830	All GND'd Irradiation	345.557	345.259	346.665	347.859	349.834	350.568	355.871
821	Biased Irradiation	352.728	355.347	357.161	359.006	363.305	363.385	370.341
822	Biased Irradiation	352.509	353.994	356.876	359.778	362.550	363.685	369.124
823	Biased Irradiation	359.102	361.076	364.338	367.666	371.062	373.403	378.338
824	Biased Irradiation	356.428	357.659	360.862	364.143	367.138	368.885	374.733
825	Biased Irradiation	351.736	352.734	355.670	358.243	362.014	362.171	369.029
832	Control Unit	344.151	342.353	341.533	337.347	342.014	341.754	343.816
833	Control Unit	354.945	353.533	352.225	350.035	354.702	352.277	353.945
All GND'd Irradiation Statistics								
	Average All GND'd	351.752	352.104	353.570	355.706	359.304	359.203	364.254
	Std Dev All GND'd	7.080	7.392	7.616	8.211	8.445	8.829	8.522
	Ps90%/90% (+KTL) All GND'd	371.165	372.372	374.454	378.222	382.460	383.411	387.622
	PS90%/90% (-KTL) All GND'd	332.339	331.836	332.686	333.190	336.149	334.994	340.887
Biased Irradiation Statistics								
	Average Biased	354.501	356.162	358.981	361.767	365.214	366.306	372.313
	Std Dev Biased	3.148	3.298	3.569	4.014	3.837	4.731	4.093
	Ps90%/90% (+KTL) Biased	363.133	365.205	368.767	372.773	375.735	379.277	383.535
	Ps90%/90% (-KTL) Biased	345.869	347.119	349.196	350.761	354.693	353.334	361.091
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

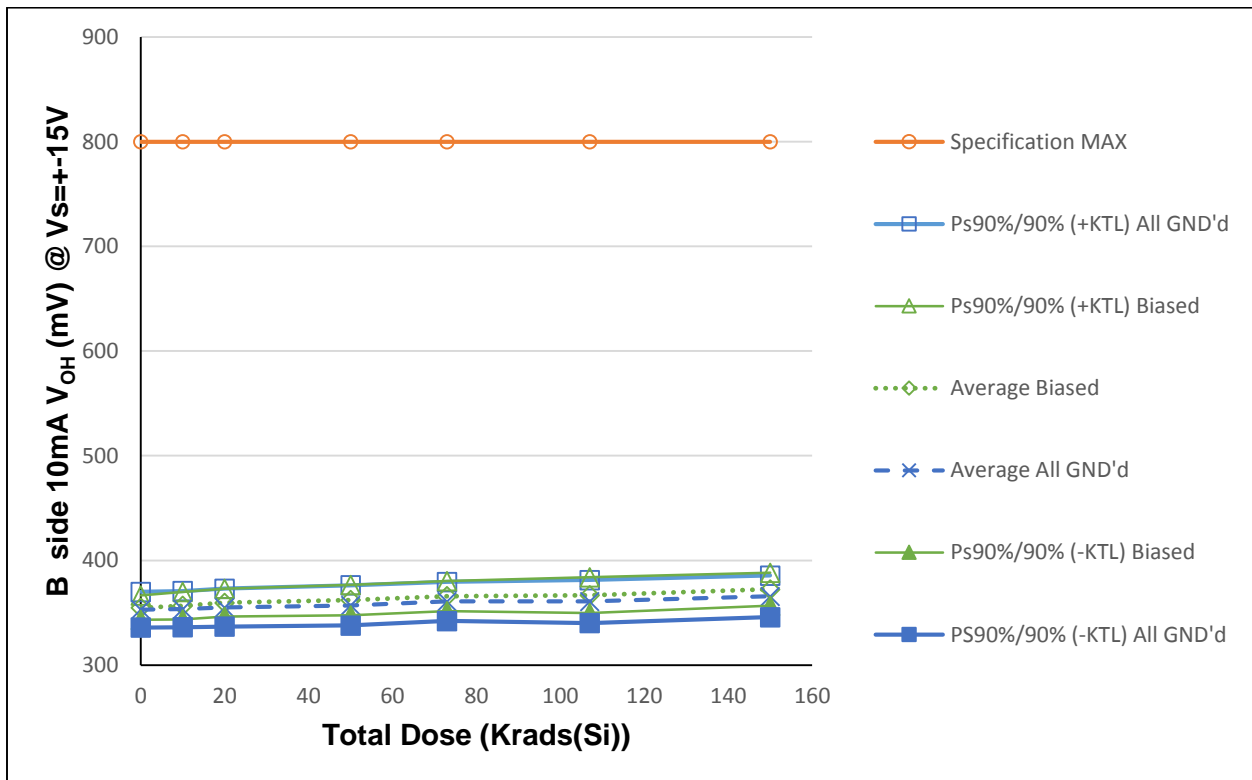


Figure 5.38: Plot of V_{OH} with $I_{SOURCE} = 10\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

Table 5.38: Raw data table for output voltage swing high with $I_{SOURCE} = 10 \text{ mA}$ @ $V_s = \pm 15\text{V}$ of B-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	B 10mA V_{OH} @ $V_s = \pm 15\text{V}$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	355.703	356.265	358.229	360.701	365.868	364.813	369.716
827	All GND'd Irradiation	350.101	350.683	351.847	353.749	358.976	357.077	362.152
828	All GND'd Irradiation	344.265	344.643	345.733	347.155	350.847	350.220	355.719
829	All GND'd Irradiation	360.890	361.560	363.270	365.615	368.312	369.875	374.675
830	All GND'd Irradiation	353.858	353.898	355.632	357.710	359.879	361.690	366.258
821	Biased Irradiation	354.749	357.703	359.715	361.615	365.988	366.508	373.021
822	Biased Irradiation	352.427	354.095	356.818	359.402	362.507	363.399	367.503
823	Biased Irradiation	360.933	363.239	366.507	369.747	373.472	375.936	380.603
824	Biased Irradiation	356.508	357.848	360.996	364.124	367.378	368.861	374.718
825	Biased Irradiation	349.738	350.444	353.529	355.592	359.657	359.196	366.358
832	Control Unit	347.011	345.099	344.439	340.241	344.794	344.606	346.620
833	Control Unit	354.163	352.700	351.509	348.959	353.885	351.405	353.158
All GND'd Irradiation Statistics								
	Average All GND'd	352.963	353.410	354.942	356.986	360.776	360.735	365.704
	Std Dev All GND'd	6.225	6.307	6.615	6.998	6.807	7.500	7.232
	Ps90%/90% (+KTL) All GND'd	370.032	370.703	373.080	376.175	379.442	381.301	385.534
	PS90%/90% (-KTL) All GND'd	335.895	336.117	336.804	337.797	342.111	340.169	345.874
Biased Irradiation Statistics								
	Average Biased	354.871	356.666	359.513	362.096	365.800	366.780	372.441
	Std Dev Biased	4.236	4.770	4.853	5.302	5.244	6.269	5.778
	Ps90%/90% (+KTL) Biased	366.485	369.745	372.821	376.634	380.178	383.969	388.283
	Ps90%/90% (-KTL) Biased	343.257	343.586	346.205	347.557	351.423	349.591	356.598
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

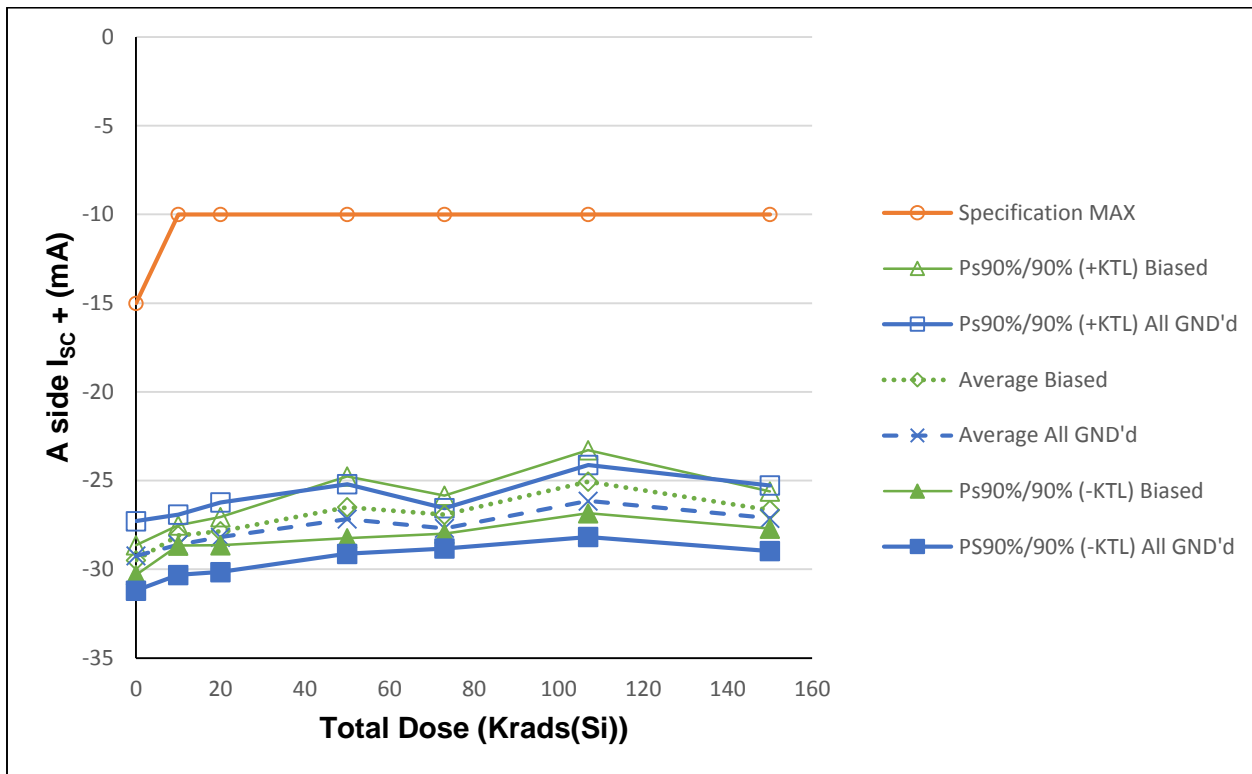


Figure 5.39: Plot of Output Short Circuit Current I_{sc+} at $V_s = \pm 15V$ versus Total Dose (side A)

Table 5.39: Raw data table for output short circuit current @ Vs = +/-15V of A-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter Units	A ISC+ (mA)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	-29.296	-28.496	-28.070	-27.076	-27.950	-26.150	-27.042
827	All GND'd Irradiation	-28.462	-27.982	-27.443	-26.397	-27.564	-25.314	-26.379
828	All GND'd Irradiation	-28.594	-28.087	-27.610	-26.590	-27.042	-25.552	-26.607
829	All GND'd Irradiation	-29.768	-29.089	-28.706	-27.637	-27.788	-26.624	-27.577
830	All GND'd Irradiation	-30.091	-29.403	-29.124	-28.114	-28.103	-27.100	-28.005
821	Biased Irradiation	-29.061	-28.066	-27.504	-25.736	-26.529	-24.247	-26.228
822	Biased Irradiation	-29.811	-28.320	-28.089	-26.979	-27.091	-25.695	-26.913
823	Biased Irradiation	-29.282	-27.761	-27.567	-25.880	-26.503	-24.475	-26.251
824	Biased Irradiation	-29.672	-28.186	-28.063	-26.990	-27.101	-25.487	-26.927
825	Biased Irradiation	-29.595	-28.103	-28.033	-26.932	-27.392	-25.362	-26.974
832	Control Unit	-29.432	-29.633	-29.312	-27.789	-29.589	-29.438	-30.222
833	Control Unit	-28.745	-28.936	-28.472	-27.671	-29.400	-28.494	-29.173
All GND'd Irradiation Statistics								
	Average All GND'd	-29.242	-28.611	-28.190	-27.163	-27.689	-26.148	-27.122
	Std Dev All GND'd	0.712	0.620	0.715	0.716	0.413	0.739	0.673
	Ps90%/90% (+KTL) All GND'd	-27.289	-26.910	-26.229	-25.199	-26.556	-24.122	-25.277
	PS90%/90% (-KTL) All GND'd	-31.196	-30.312	-30.152	-29.126	-28.822	-28.174	-28.967
Biased Irradiation Statistics								
	Average Biased	-29.484	-28.087	-27.851	-26.503	-26.923	-25.053	-26.659
	Std Dev Biased	0.306	0.207	0.290	0.637	0.391	0.648	0.383
	Ps90%/90% (+KTL) Biased	-28.645	-27.520	-27.057	-24.757	-25.851	-23.276	-25.608
	Ps90%/90% (-KTL) Biased	-30.323	-28.655	-28.646	-28.250	-27.995	-26.830	-27.709
	Specification MIN							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Specification MAX	-15	-10	-10	-10		-10	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

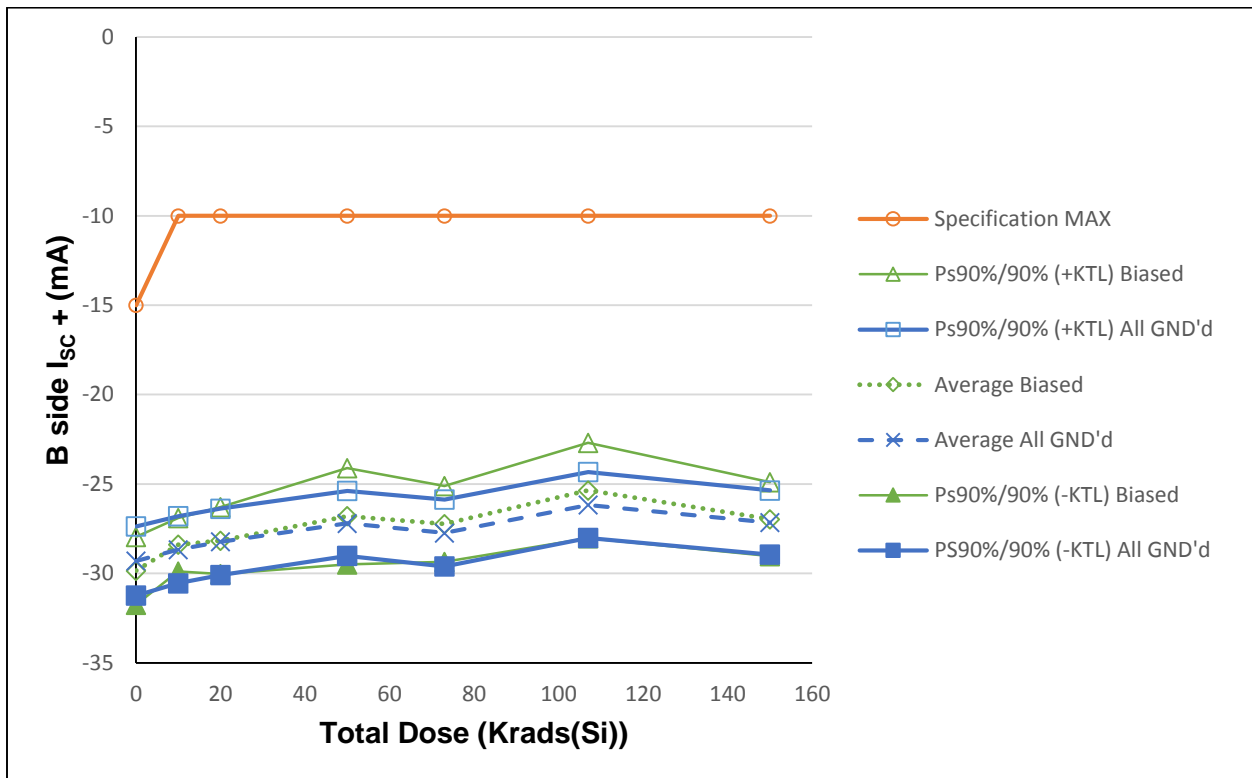


Figure 5.40: Plot of Output Short Circuit Current I_{sc+} at $V_s = \pm 15V$ versus Total Dose (side B)

Table 5.40: Raw data table for output short circuit current @ Vs = +-15V of B-side versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter Units	B ISC+ (mA)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	-29.443	-28.631	-28.207	-27.200	-28.098	-26.265	-27.164
827	All GND'd Irradiation	-28.747	-28.219	-27.672	-26.629	-27.827	-25.532	-26.597
828	All GND'd Irradiation	-29.392	-28.927	-28.414	-27.366	-27.836	-26.294	-27.373
829	All GND'd Irradiation	-30.358	-29.675	-29.275	-28.219	-28.349	-27.185	-28.120
830	All GND'd Irradiation	-28.574	-27.905	-27.596	-26.598	-26.580	-25.581	-26.501
821	Biased Irradiation	-28.909	-27.856	-27.291	-25.552	-26.342	-24.095	-26.049
822	Biased Irradiation	-30.349	-28.769	-28.530	-27.399	-27.539	-26.129	-27.411
823	Biased Irradiation	-29.334	-27.767	-27.596	-25.933	-26.552	-24.523	-26.280
824	Biased Irradiation	-30.168	-28.617	-28.539	-27.410	-27.525	-25.895	-27.325
825	Biased Irradiation	-30.494	-28.954	-28.865	-27.714	-28.215	-26.148	-27.767
832	Control Unit	-29.148	-29.293	-28.984	-27.475	-29.284	-29.100	-29.882
833	Control Unit	-29.109	-29.266	-28.865	-28.046	-29.745	-28.858	-29.529
All GND'd Irradiation Statistics								
Average All GND'd		-29.303	-28.671	-28.233	-27.202	-27.738	-26.171	-27.151
Std Dev All GND'd		0.704	0.683	0.678	0.662	0.682	0.672	0.655
Ps90%/90% (+KTL) All GND'd		-27.372	-26.799	-26.373	-25.387	-25.868	-24.328	-25.355
PS90%/90% (-KTL) All GND'd		-31.233	-30.544	-30.092	-29.018	-29.608	-28.015	-28.947
Biased Irradiation Statistics								
Average Biased		-29.851	-28.393	-28.164	-26.801	-27.235	-25.358	-26.966
Std Dev Biased		0.692	0.545	0.680	0.984	0.775	0.974	0.755
Ps90%/90% (+KTL) Biased		-27.953	-26.898	-26.299	-24.102	-25.111	-22.686	-24.896
Ps90%/90% (-KTL) Biased		-31.749	-29.887	-30.029	-29.501	-29.359	-28.030	-29.036
Specification MIN								
Status (Measurements) All GND'd								
Status (Measurements) Biased								
Specification MAX		-15	-10	-10	-10		-10	
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd								
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased								
Status (+KTL) Biased		PASS	PASS	PASS	PASS		PASS	

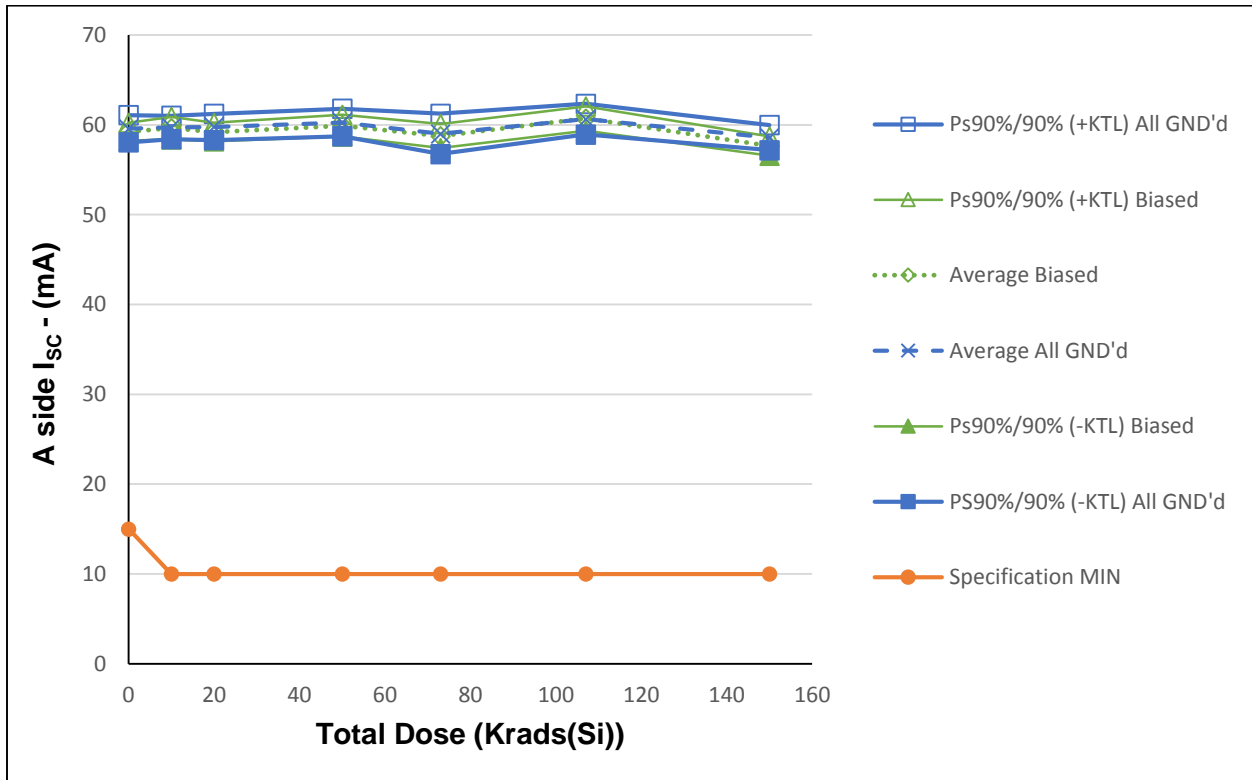


Figure 5.41: Plot of Output Short Circuit Current I_{sc-} at $V_s = \pm 15V$ versus Total Dose (side A)

Table 5.41: Raw data table for output short circuit current @ Vs = +-15V of A-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter Units	A ISC- (mA)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	59.278	59.531	59.544	59.935	58.143	60.238	58.258
827	All GND'd Irradiation	59.781	59.789	60.012	60.533	58.338	61.059	58.853
828	All GND'd Irradiation	60.264	60.290	60.433	60.970	59.787	61.380	59.166
829	All GND'd Irradiation	58.800	59.031	59.010	59.512	58.837	59.828	57.883
830	All GND'd Irradiation	59.705	59.960	59.860	60.381	59.929	60.718	58.754
821	Biased Irradiation	59.257	59.170	59.235	60.572	58.804	61.510	57.748
822	Biased Irradiation	59.581	60.007	59.544	59.918	59.215	60.522	58.053
823	Biased Irradiation	58.771	59.293	58.742	59.814	58.465	60.519	57.419
824	Biased Irradiation	59.599	60.210	59.593	59.942	59.212	60.754	57.947
825	Biased Irradiation	58.973	59.523	58.895	59.327	58.088	60.219	57.105
832	Control Unit	60.607	60.642	61.081	63.175	60.664	60.915	59.781
833	Control Unit	59.640	59.540	60.145	61.319	58.851	60.143	59.155
All GND'd Irradiation Statistics								
	Average All GND'd	59.565	59.720	59.772	60.266	59.007	60.645	58.583
	Std Dev All GND'd	0.553	0.474	0.533	0.561	0.819	0.623	0.509
	Ps90%/90% (+KTL) All GND'd	61.082	61.019	61.233	61.805	61.252	62.352	59.980
	PS90%/90% (-KTL) All GND'd	58.049	58.421	58.311	58.728	56.761	58.937	57.186
Biased Irradiation Statistics								
	Average Biased	59.236	59.640	59.202	59.915	58.757	60.705	57.654
	Std Dev Biased	0.366	0.451	0.380	0.444	0.488	0.488	0.391
	Ps90%/90% (+KTL) Biased	60.240	60.877	60.243	61.131	60.095	62.044	58.726
	Ps90%/90% (-KTL) Biased	58.232	58.403	58.160	58.698	57.419	59.365	56.583
	Specification MIN	15	10	10	10		10	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

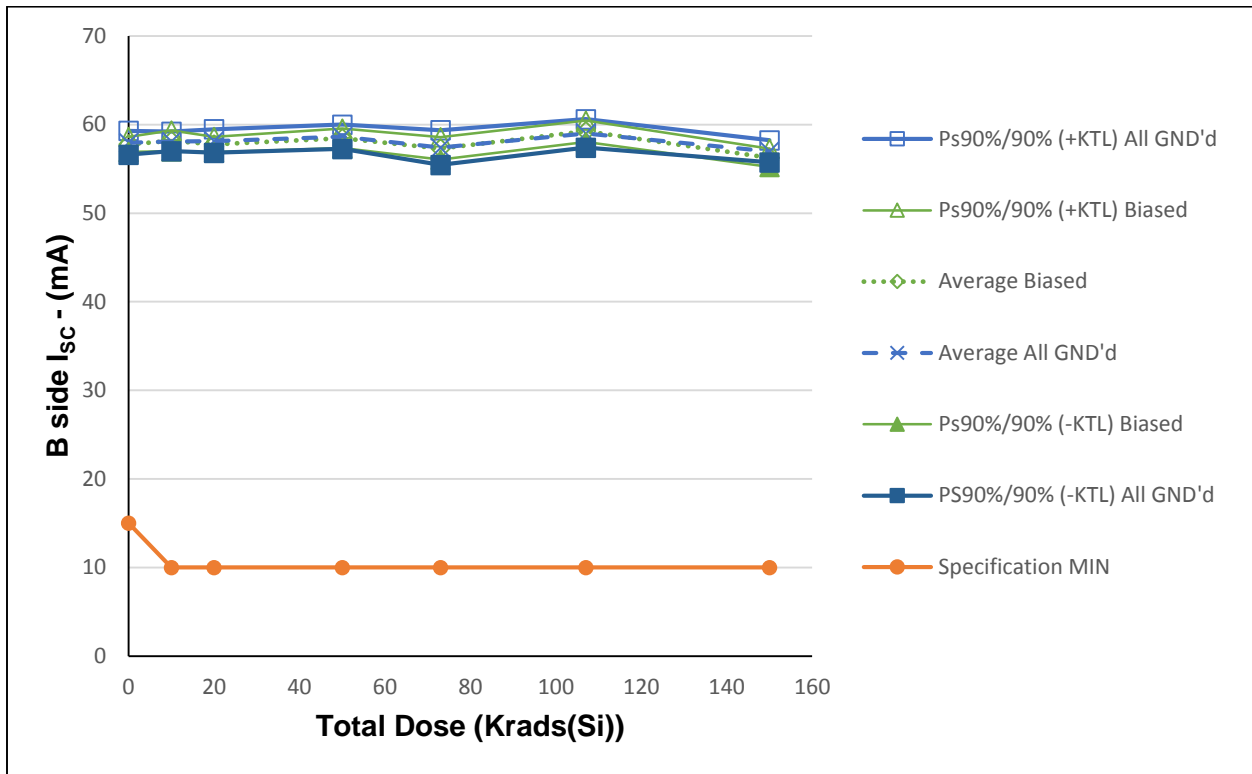


Figure 5.42: Plot of Output Short Circuit Current I_{sc-} at $V_s = \pm 15V$ versus Total Dose (side B)

Table 5.42: Raw data table for output short circuit current @ Vs = +-15V of B-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter Units	B ISC- (mA)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	57.703	57.913	57.931	58.314	56.570	58.619	56.678
827	All GND'd Irradiation	58.246	58.272	58.490	59.014	56.846	59.529	57.357
828	All GND'd Irradiation	58.606	58.636	58.766	59.265	58.141	59.700	57.525
829	All GND'd Irradiation	57.339	57.561	57.531	58.043	57.367	58.342	56.433
830	All GND'd Irradiation	57.884	58.156	58.036	58.544	58.107	58.868	56.966
821	Biased Irradiation	57.731	57.631	57.684	59.019	57.284	59.962	56.242
822	Biased Irradiation	58.132	58.540	58.074	58.443	57.774	59.052	56.718
823	Biased Irradiation	57.474	57.987	57.482	58.543	57.192	59.262	56.159
824	Biased Irradiation	58.089	58.672	58.108	58.446	57.710	59.256	56.475
825	Biased Irradiation	57.516	58.051	57.455	57.890	56.646	58.761	55.712
832	Control Unit	58.980	58.950	59.402	61.461	59.024	59.248	58.129
833	Control Unit	58.136	58.051	58.656	59.810	57.363	58.647	57.648
All GND'd Irradiation Statistics								
Average All GND'd		57.956	58.108	58.151	58.636	57.406	59.012	56.992
Std Dev All GND'd		0.489	0.402	0.484	0.501	0.715	0.584	0.455
Ps90%/90% (+KTL) All GND'd		59.297	59.209	59.479	60.009	59.367	60.613	58.240
PS90%/90% (-KTL) All GND'd		56.614	57.007	56.822	57.263	55.446	57.410	55.743
Biased Irradiation Statistics								
Average Biased		57.789	58.176	57.761	58.468	57.321	59.259	56.261
Std Dev Biased		0.310	0.426	0.315	0.401	0.455	0.443	0.376
Ps90%/90% (+KTL) Biased		58.639	59.345	58.624	59.568	58.570	60.474	57.293
Ps90%/90% (-KTL) Biased		56.938	57.008	56.898	57.368	56.072	58.044	55.230
Specification MIN		15	10	10	10		10	
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Specification MAX								
Status (Measurements) All GND'd								
Status (Measurements) Biased								
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (+KTL) All GND'd								
Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
Status (+KTL) Biased								

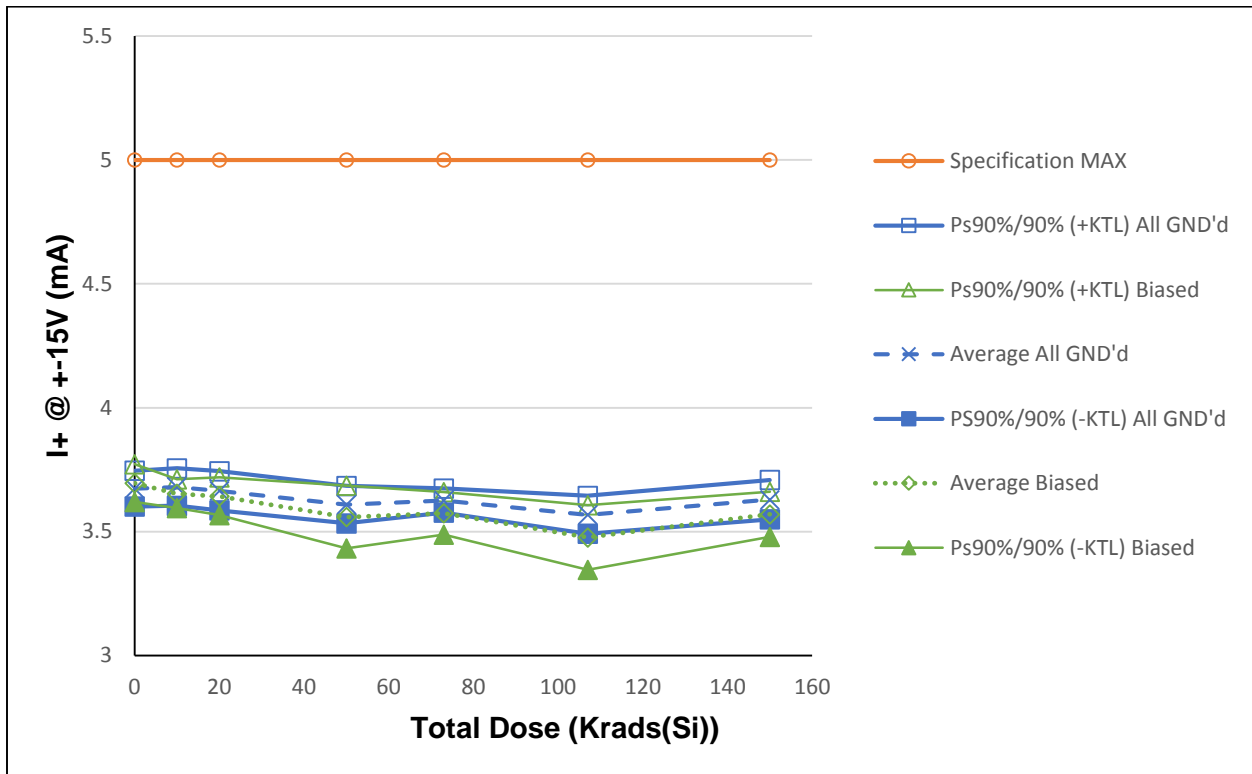


Figure 5.43: Plot of Device Supply Current I_{SC} at $V_s = \pm 15V$ versus Total Dose

Table 5.43: Raw data table for device supply current @ Vs = +-15V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL)

Parameter	I+ @ +-15V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	3.653	3.652	3.639	3.586	3.625	3.549	3.603
827	All GND'd Irradiation	3.640	3.654	3.631	3.575	3.615	3.529	3.595
828	All GND'd Irradiation	3.700	3.716	3.696	3.639	3.654	3.595	3.662
829	All GND'd Irradiation	3.696	3.698	3.687	3.629	3.627	3.588	3.649
830	All GND'd Irradiation	3.679	3.681	3.671	3.617	3.608	3.578	3.637
821	Biased Irradiation	3.655	3.636	3.605	3.501	3.541	3.415	3.530
822	Biased Irradiation	3.710	3.659	3.652	3.579	3.582	3.509	3.580
823	Biased Irradiation	3.680	3.625	3.623	3.518	3.542	3.437	3.540
824	Biased Irradiation	3.718	3.674	3.668	3.600	3.597	3.516	3.599
825	Biased Irradiation	3.716	3.670	3.667	3.596	3.610	3.508	3.601
832	Control Unit	3.728	3.762	3.750	3.656	3.748	3.746	3.786
833	Control Unit	3.661	3.691	3.672	3.621	3.702	3.663	3.701
All GND'd Irradiation Statistics								
	Average All GND'd	3.674	3.680	3.665	3.609	3.626	3.568	3.629
	Std Dev All GND'd	0.026	0.028	0.029	0.028	0.018	0.028	0.029
	Ps90%/90% (+KTL) All GND'd	3.746	3.756	3.744	3.685	3.674	3.644	3.709
	PS90%/90% (-KTL) All GND'd	3.602	3.604	3.586	3.534	3.577	3.491	3.550
Biased Irradiation Statistics								
	Average Biased	3.696	3.653	3.643	3.559	3.574	3.477	3.570
	Std Dev Biased	0.028	0.021	0.028	0.046	0.031	0.047	0.033
	Ps90%/90% (+KTL) Biased	3.772	3.711	3.719	3.685	3.660	3.607	3.661
	Ps90%/90% (-KTL) Biased	3.620	3.595	3.567	3.432	3.489	3.347	3.479
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd								
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased								
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

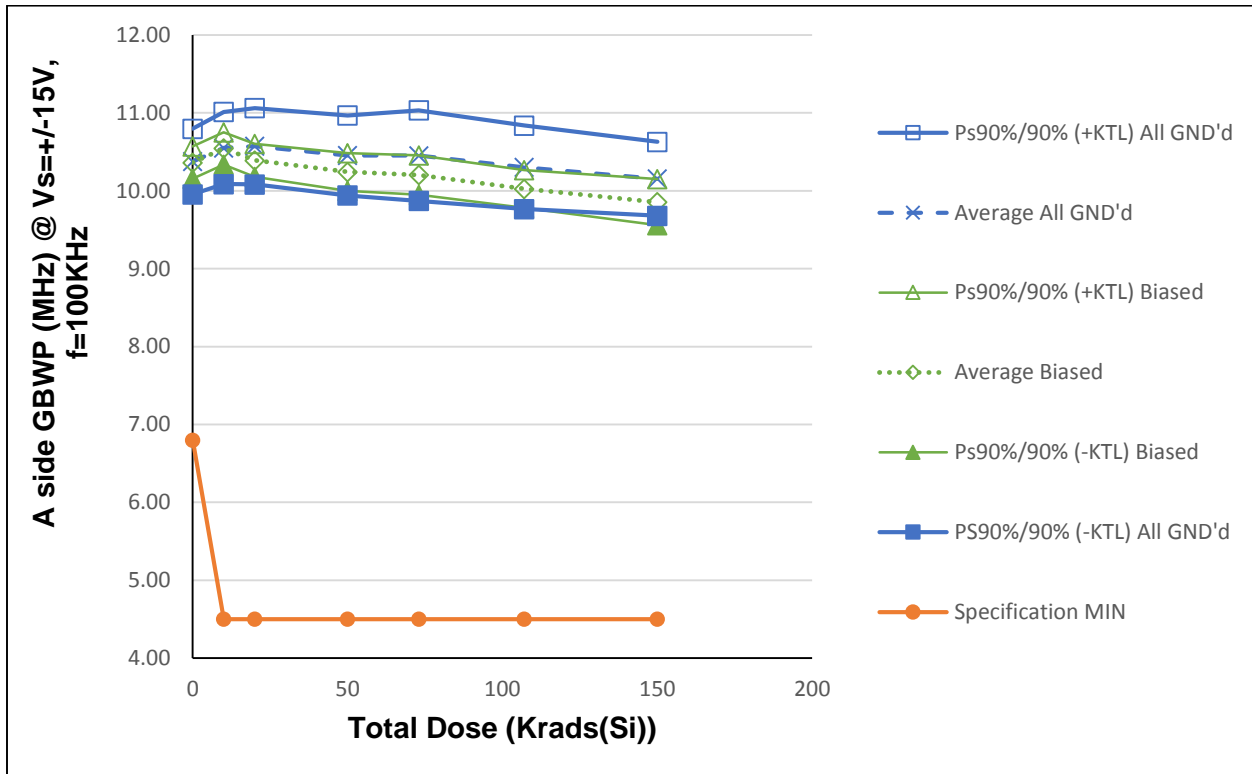


Figure 5.44: Plot of Gain Bandwidth Product (GBWP) at $V_s = \pm 15V$ versus Total Dose (side A)

Table 5.44: Raw data table for gain bandwidth product @ Vs = +-15V of A-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	A GBWP @ Vs=+-15V, f=100KHz Units (MHz)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	10.232	10.386	10.418	10.267	10.243	10.114	9.968
827	All GND'd Irradiation	10.263	10.409	10.452	10.338	10.315	10.179	10.068
828	All GND'd Irradiation	10.554	10.752	10.808	10.695	10.617	10.564	10.361
829	All GND'd Irradiation	10.304	10.500	10.466	10.359	10.353	10.201	10.062
830	All GND'd Irradiation	10.530	10.705	10.722	10.613	10.735	10.457	10.317
821	Biased Irradiation	10.255	10.545	10.276	10.150	10.079	9.923	9.727
822	Biased Irradiation	10.453	10.477	10.460	10.373	10.264	10.094	10.021
823	Biased Irradiation	10.347	10.630	10.356	10.184	10.157	9.956	9.817
824	Biased Irradiation	10.414	10.461	10.457	10.287	10.316	10.131	9.884
825	Biased Irradiation	10.342	10.608	10.409	10.217	10.198	10.020	9.827
832	Control Unit	10.688	10.980	10.971	10.962	10.965	10.793	10.791
833	Control Unit	10.289	10.589	10.593	10.518	10.562	10.399	10.382
All GND'd Irradiation Statistics								
	Average All GND'd	10.376	10.550	10.573	10.454	10.453	10.303	10.155
	Std Dev All GND'd	0.153	0.169	0.179	0.188	0.212	0.196	0.173
	Ps90%/90% (+KTL) All GND'd	10.797	11.014	11.063	10.969	11.034	10.839	10.630
	PS90%/90% (-KTL) All GND'd	9.956	10.087	10.084	9.940	9.871	9.767	9.681
Biased Irradiation Statistics								
	Average Biased	10.362	10.544	10.392	10.242	10.203	10.025	9.855
	Std Dev Biased	0.076	0.075	0.077	0.089	0.092	0.089	0.108
	Ps90%/90% (+KTL) Biased	10.570	10.751	10.603	10.486	10.455	10.268	10.152
	Ps90%/90% (-KTL) Biased	10.154	10.337	10.180	9.999	9.950	9.782	9.558
	Specification MIN	6.8	4.5	4.5	4.5		4.5	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

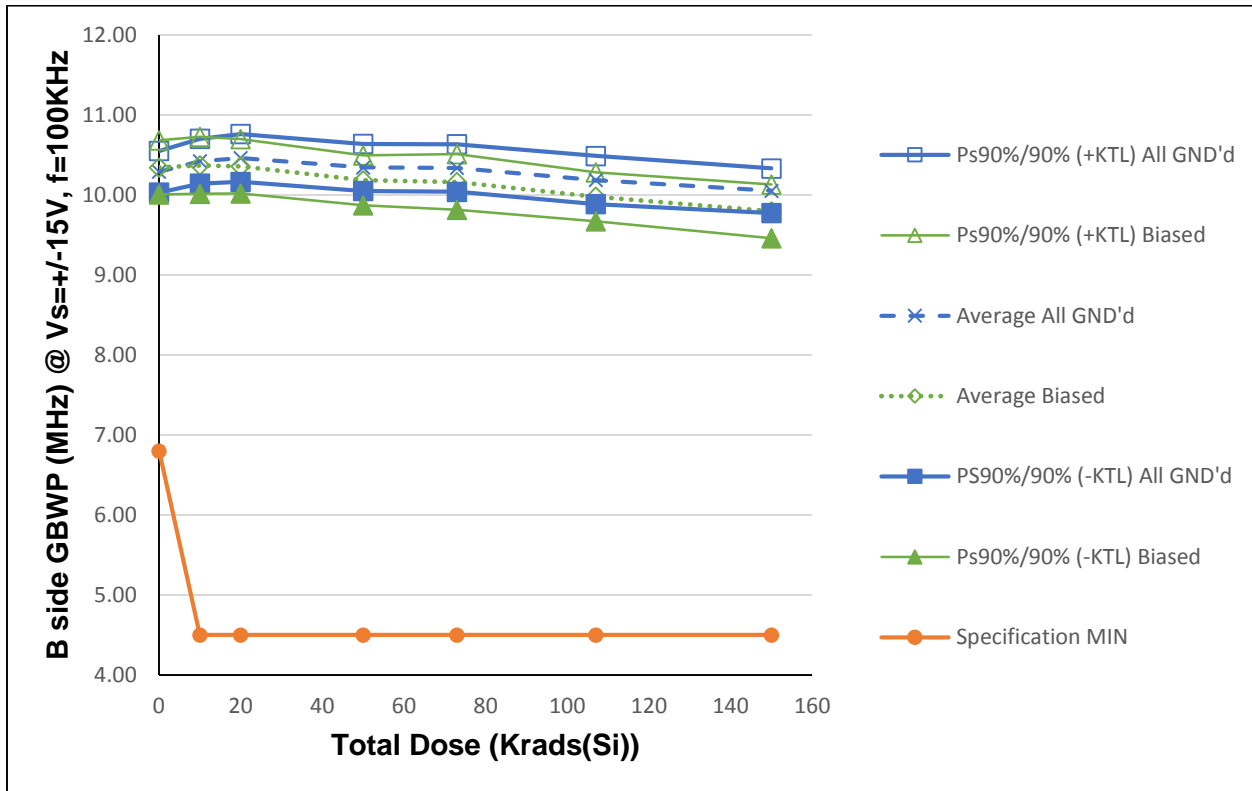


Figure 5.45: Plot of Gain Bandwidth Product (GBWP) at $V_s = \pm 15V$ versus Total Dose (side B)

Table 5.45: Raw data table for gain bandwidth product @ Vs = +/-15V of B-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	B GBWP @ Vs=+/-15V,f=100KHz Units (MHz)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	10.212	10.327	10.363	10.247	10.217	10.086	9.950
827	All GND'd Irradiation	10.296	10.440	10.483	10.363	10.341	10.209	10.073
828	All GND'd Irradiation	10.438	10.578	10.632	10.510	10.503	10.356	10.204
829	All GND'd Irradiation	10.305	10.435	10.471	10.353	10.358	10.194	10.073
830	All GND'd Irradiation	10.201	10.335	10.370	10.252	10.272	10.094	9.968
821	Biased Irradiation	10.142	10.161	10.164	10.013	9.968	9.816	9.599
822	Biased Irradiation	10.419	10.434	10.421	10.233	10.229	10.029	9.869
823	Biased Irradiation	10.313	10.330	10.307	10.129	10.104	9.912	9.756
824	Biased Irradiation	10.442	10.473	10.459	10.282	10.270	10.073	9.894
825	Biased Irradiation	10.409	10.459	10.443	10.269	10.247	10.066	9.864
832	Control Unit	10.610	10.795	10.879	10.870	10.856	10.707	10.627
833	Control Unit	10.282	10.451	10.549	10.515	10.496	10.383	10.304
All GND'd Irradiation Statistics								
	Average All GND'd	10.290	10.423	10.464	10.345	10.338	10.188	10.053
	Std Dev All GND'd	0.095	0.102	0.109	0.107	0.108	0.110	0.102
	Ps90%/90% (+KTL) All GND'd	10.551	10.703	10.763	10.638	10.635	10.488	10.333
	PS90%/90% (-KTL) All GND'd	10.030	10.143	10.165	10.052	10.042	9.887	9.774
Biased Irradiation Statistics								
	Average Biased	10.345	10.372	10.359	10.185	10.164	9.979	9.796
	Std Dev Biased	0.124	0.130	0.124	0.114	0.127	0.112	0.122
	Ps90%/90% (+KTL) Biased	10.684	10.728	10.699	10.497	10.511	10.286	10.132
	Ps90%/90% (-KTL) Biased	10.006	10.015	10.018	9.874	9.816	9.673	9.460
	Specification MIN	6.8	4.5	4.5	4.5		4.5	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

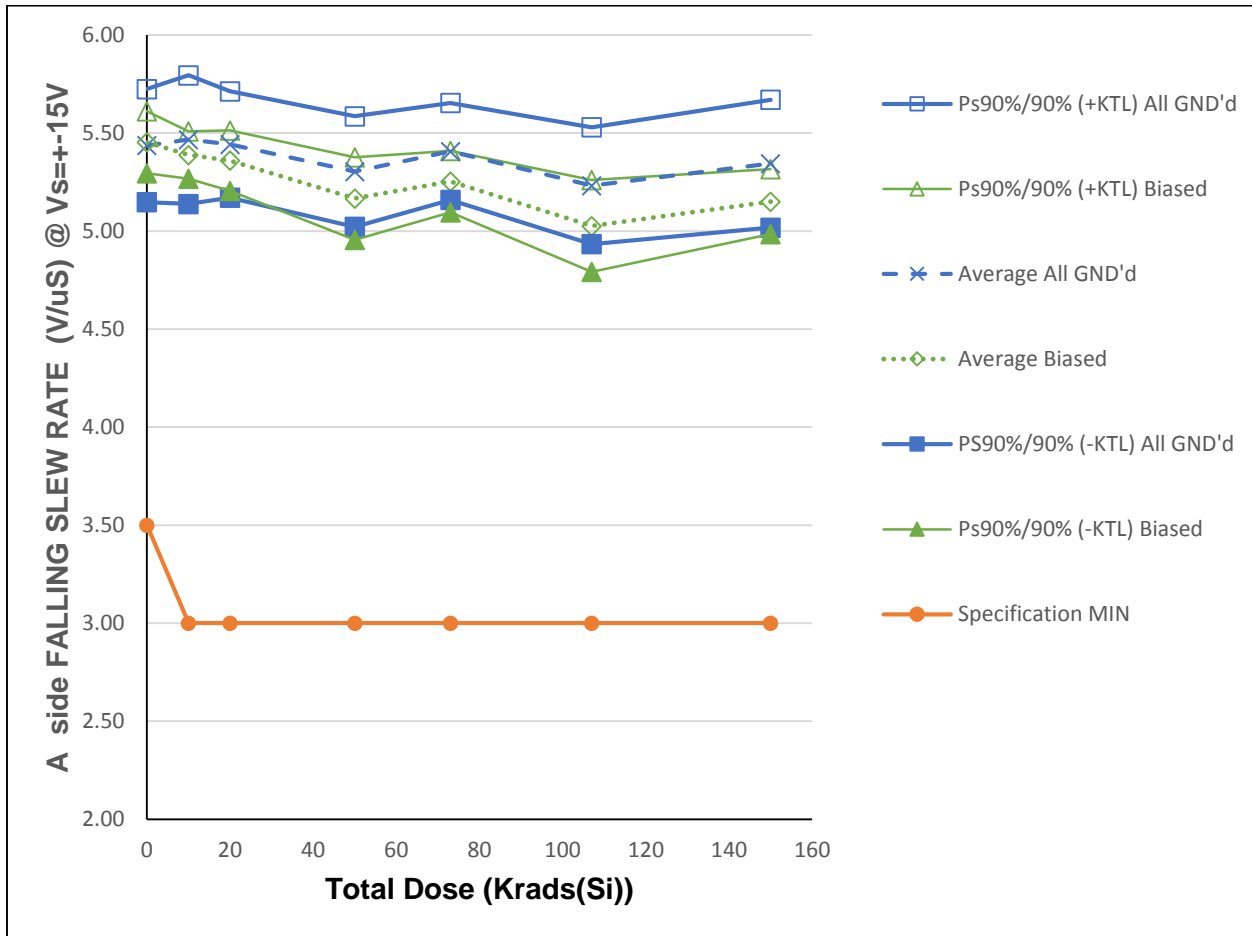


Figure 5.46: Plot of Falling Slew Rate at Vs = +-15V versus Total Dose (side A)

Table 5.46: Raw data table for falling slew rate @ Vs = +/-15V of A-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	A FALL SLEW RATE @ Vs=+-15V Units (V/uS)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	5.319	5.319	5.319	5.181	5.291	5.102	5.208
827	All GND'd Irradiation	5.376	5.405	5.376	5.236	5.376	5.155	5.263
828	All GND'd Irradiation	5.494	5.556	5.525	5.376	5.464	5.291	5.435
829	All GND'd Irradiation	5.405	5.435	5.435	5.291	5.376	5.236	5.319
830	All GND'd Irradiation	5.587	5.618	5.556	5.435	5.525	5.376	5.495
821	Biased Irradiation	5.376	5.348	5.291	5.076	5.181	4.926	5.076
822	Biased Irradiation	5.494	5.435	5.376	5.208	5.263	5.076	5.208
823	Biased Irradiation	5.435	5.348	5.319	5.102	5.208	4.950	5.102
824	Biased Irradiation	5.525	5.435	5.435	5.263	5.319	5.128	5.208
825	Biased Irradiation	5.435	5.376	5.376	5.181	5.291	5.050	5.155
832	Control Unit	5.587	5.650	5.650	5.464	5.714	5.618	5.714
833	Control Unit	5.348	5.435	5.405	5.291	5.494	5.376	5.435
All GND'd Irradiation Statistics								
	Average All GND'd	5.436	5.467	5.442	5.304	5.407	5.232	5.344
	Std Dev All GND'd	0.105	0.120	0.099	0.103	0.090	0.109	0.119
	Ps90%/90% (+KTL) All GND'd	5.725	5.795	5.714	5.586	5.654	5.530	5.670
	PS90%/90% (-KTL) All GND'd	5.148	5.138	5.171	5.022	5.159	4.934	5.018
Biased Irradiation Statistics								
	Average Biased	5.453	5.388	5.360	5.166	5.253	5.026	5.150
	Std Dev Biased	0.058	0.044	0.056	0.077	0.057	0.085	0.060
	Ps90%/90% (+KTL) Biased	5.612	5.509	5.513	5.377	5.409	5.261	5.315
	Ps90%/90% (-KTL) Biased	5.294	5.267	5.206	4.955	5.096	4.792	4.984
	Specification MIN	3.5	3.0	3.0	3.0		3.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

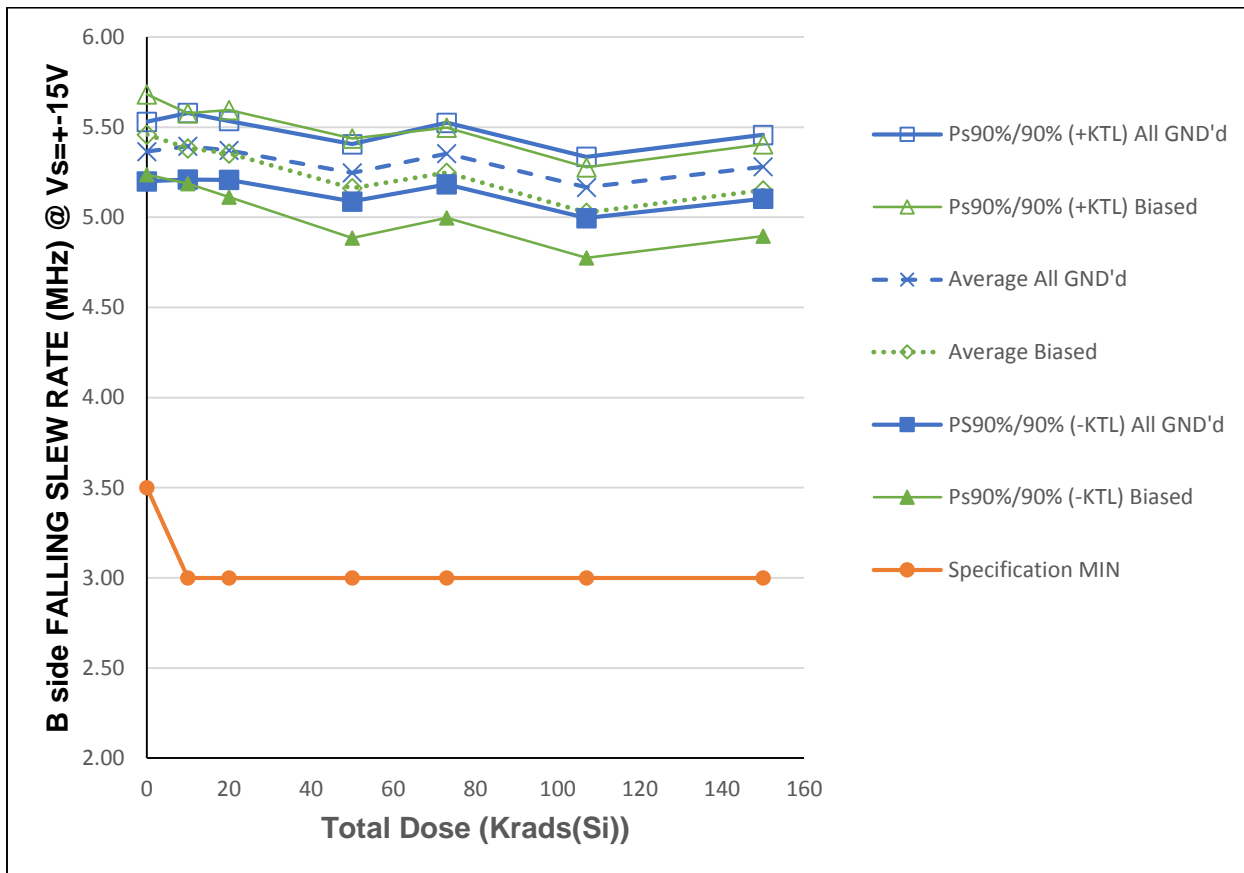


Figure 5.47: Plot of Falling Slew Rate at $V_s = \pm 15V$ versus Total Dose (side B)

Table 5.47: Raw data table for falling slew rate @ Vs = +/-15V of B-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	B FALL SLEW RATE @ Vs=+-15V Units (V/uS)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	5.319	5.348	5.319	5.208	5.319	5.102	5.208
827	All GND'd Irradiation	5.348	5.405	5.376	5.236	5.405	5.155	5.291
828	All GND'd Irradiation	5.464	5.494	5.464	5.348	5.435	5.263	5.376
829	All GND'd Irradiation	5.376	5.405	5.376	5.236	5.319	5.181	5.291
830	All GND'd Irradiation	5.319	5.319	5.319	5.208	5.291	5.128	5.236
821	Biased Irradiation	5.319	5.263	5.208	5.000	5.102	4.878	5.000
822	Biased Irradiation	5.525	5.435	5.376	5.208	5.263	5.076	5.181
823	Biased Irradiation	5.464	5.376	5.348	5.128	5.236	5.000	5.128
824	Biased Irradiation	5.494	5.405	5.405	5.236	5.291	5.076	5.208
825	Biased Irradiation	5.494	5.435	5.435	5.236	5.348	5.102	5.236
832	Control Unit	5.618	5.682	5.650	5.494	5.682	5.618	5.682
833	Control Unit	5.435	5.494	5.464	5.319	5.525	5.405	5.464
All GND'd Irradiation Statistics								
	Average All GND'd	5.365	5.394	5.371	5.247	5.354	5.166	5.280
	Std Dev All GND'd	0.060	0.067	0.060	0.058	0.062	0.062	0.064
	Ps90%/90% (+KTL) All GND'd	5.531	5.579	5.534	5.406	5.525	5.336	5.457
	PS90%/90% (-KTL) All GND'd	5.200	5.210	5.208	5.089	5.183	4.996	5.104
Biased Irradiation Statistics								
	Average Biased	5.459	5.383	5.354	5.162	5.248	5.026	5.151
	Std Dev Biased	0.081	0.071	0.088	0.100	0.091	0.091	0.093
	Ps90%/90% (+KTL) Biased	5.682	5.578	5.596	5.437	5.499	5.277	5.406
	Ps90%/90% (-KTL) Biased	5.237	5.188	5.113	4.886	4.997	4.776	4.895
	Specification MIN	3.5	3.0	3.0	3.0		3.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

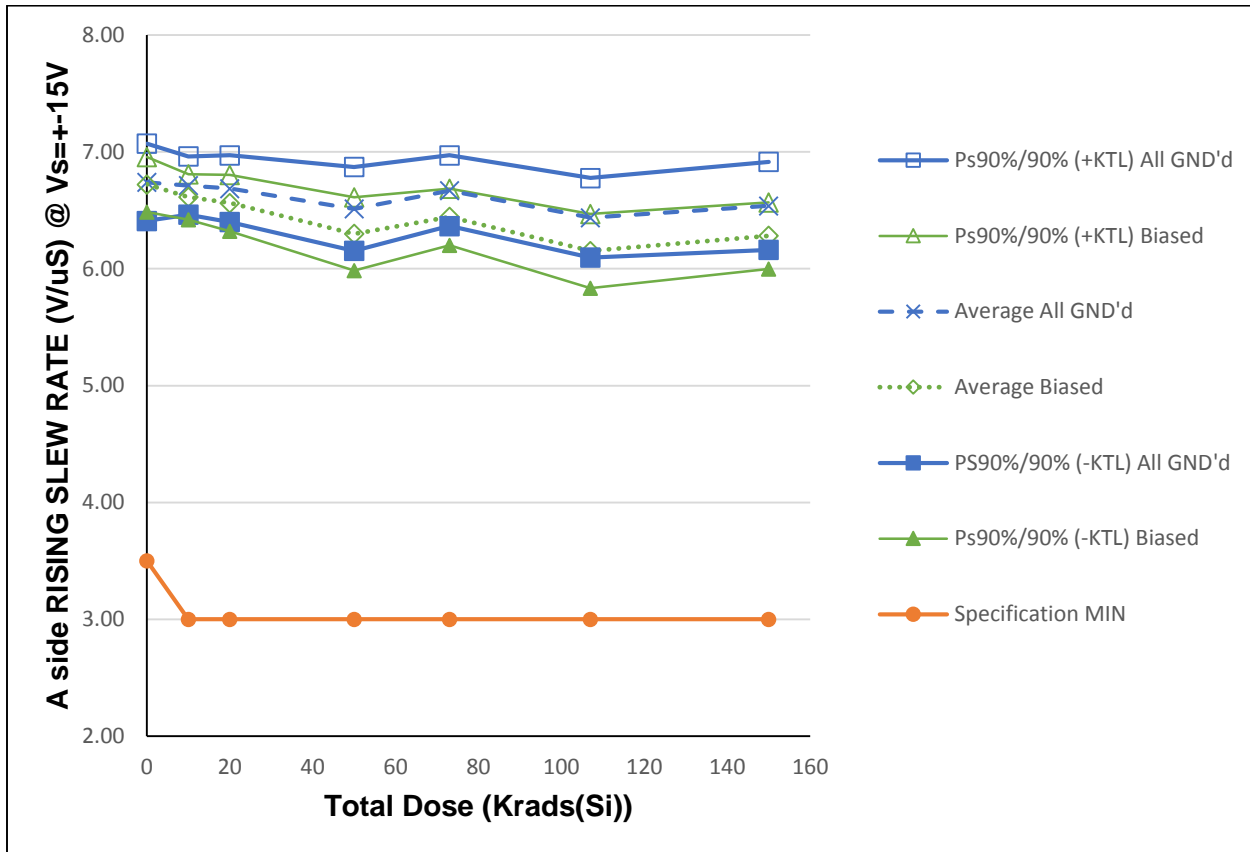


Figure 5.48: Plot of Rising Slew Rate at Vs = +-15V versus Total Dose (side A)

Table 5.48: Raw data table for rising slew rate @ Vs = +-15V of A-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	A RISE SLEW RATE @ Vs=+-15V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(V/uS)	0	10	20	50	73	107	150
826	All GND'd Irradiation	6.667	6.622	6.579	6.410	6.579	6.329	6.410
827	All GND'd Irradiation	6.667	6.667	6.622	6.410	6.667	6.329	6.452
828	All GND'd Irradiation	6.757	6.757	6.711	6.579	6.667	6.493	6.579
829	All GND'd Irradiation	6.667	6.667	6.667	6.452	6.579	6.410	6.494
830	All GND'd Irradiation	6.944	6.849	6.849	6.711	6.849	6.623	6.757
821	Biased Irradiation	6.579	6.493	6.410	6.098	6.289	5.952	6.098
822	Biased Irradiation	6.757	6.667	6.622	6.369	6.493	6.250	6.329
823	Biased Irradiation	6.803	6.667	6.622	6.329	6.493	6.173	6.329
824	Biased Irradiation	6.757	6.622	6.579	6.369	6.452	6.211	6.329
825	Biased Irradiation	6.711	6.622	6.579	6.329	6.493	6.173	6.329
832	Control Unit	6.944	6.993	6.993	6.757	7.042	6.897	6.944
833	Control Unit	6.623	6.667	6.622	6.452	6.757	6.536	6.667
All GND'd Irradiation Statistics								
	Average All GND'd	6.740	6.712	6.686	6.512	6.668	6.437	6.538
	Std Dev All GND'd	0.121	0.091	0.104	0.131	0.110	0.124	0.137
	Ps90%/90% (+KTL) All GND'd	7.071	6.961	6.971	6.872	6.971	6.777	6.914
	PS90%/90% (-KTL) All GND'd	6.409	6.463	6.401	6.153	6.365	6.097	6.162
Biased Irradiation Statistics								
	Average Biased	6.721	6.614	6.563	6.299	6.444	6.152	6.283
	Std Dev Biased	0.086	0.071	0.088	0.114	0.089	0.116	0.104
	Ps90%/90% (+KTL) Biased	6.957	6.809	6.804	6.612	6.687	6.470	6.567
	Ps90%/90% (-KTL) Biased	6.486	6.419	6.322	5.985	6.202	5.834	5.999
	Specification MIN	3.5	3.0	3.0	3.0		3.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

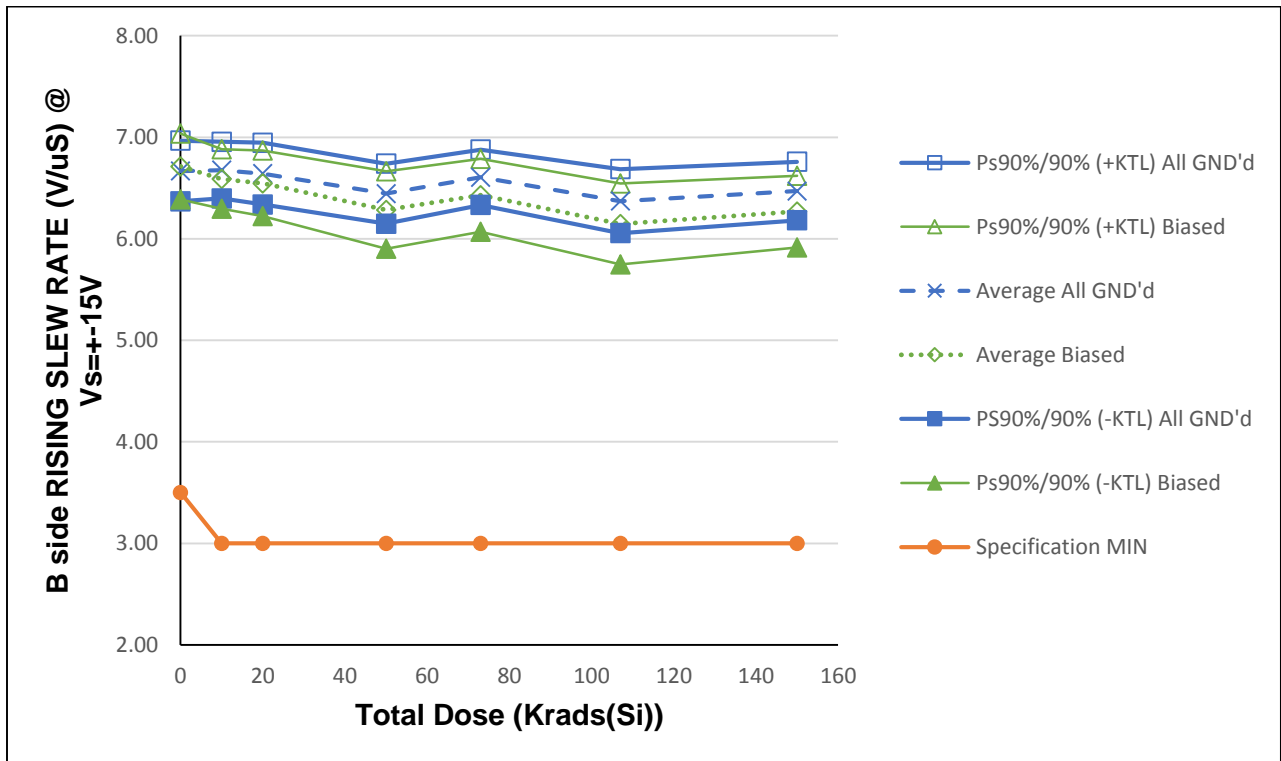


Figure 5.49: Plot of Rising Slew Rate at Vs = +-15V versus Total Dose (side B)

Table 5.49: Raw data table for rising slew rate @ Vs = +-15V of B-side versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL)

Parameter	B RISIE SLEW RATE @ Vs=+-15V Units	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	6.623	6.579	6.536	6.369	6.579	6.289	6.369
827	All GND'd Irradiation	6.623	6.667	6.622	6.410	6.622	6.329	6.452
828	All GND'd Irradiation	6.757	6.803	6.757	6.579	6.711	6.493	6.579
829	All GND'd Irradiation	6.803	6.757	6.757	6.536	6.667	6.493	6.579
830	All GND'd Irradiation	6.536	6.579	6.536	6.329	6.452	6.250	6.369
821	Biased Irradiation	6.536	6.452	6.369	6.098	6.250	5.952	6.098
822	Biased Irradiation	6.757	6.667	6.579	6.369	6.493	6.250	6.329
823	Biased Irradiation	6.667	6.493	6.493	6.173	6.329	6.024	6.173
824	Biased Irradiation	6.849	6.667	6.667	6.410	6.536	6.250	6.410
825	Biased Irradiation	6.757	6.667	6.622	6.369	6.536	6.250	6.329
832	Control Unit	6.849	6.897	6.849	6.667	6.897	6.803	6.897
833	Control Unit	6.667	6.667	6.667	6.493	6.757	6.579	6.667
All GND'd Irradiation Statistics								
	Average All GND'd	6.668	6.677	6.642	6.445	6.606	6.371	6.470
	Std Dev All GND'd	0.109	0.102	0.111	0.108	0.100	0.115	0.105
	Ps90%/90% (+KTL) All GND'd	6.967	6.956	6.946	6.741	6.879	6.687	6.758
	PS90%/90% (-KTL) All GND'd	6.369	6.397	6.337	6.149	6.333	6.055	6.181
Biased Irradiation Statistics								
	Average Biased	6.713	6.589	6.546	6.284	6.429	6.145	6.268
	Std Dev Biased	0.118	0.107	0.118	0.139	0.131	0.146	0.128
	Ps90%/90% (+KTL) Biased	7.037	6.883	6.869	6.666	6.789	6.545	6.619
	Ps90%/90% (-KTL) Biased	6.389	6.295	6.223	5.902	6.069	5.746	5.916
	Specification MIN	3.5	3.0	3.0	3.0		3.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

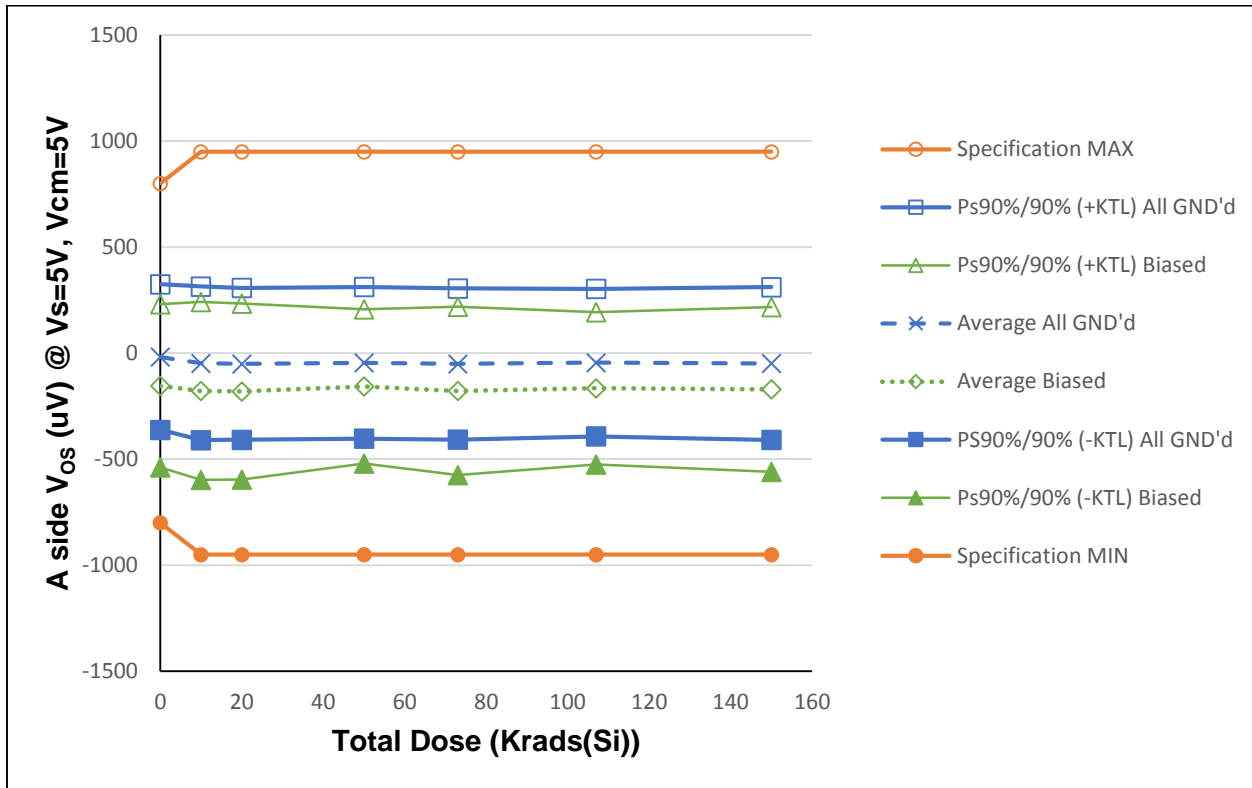


Figure 5.50: Plot of V_{OS} (side A) @ $V_{cm} = 5V$ versus Total Dose

Table 5.50: Raw data for offset voltage (side A) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A V _{OS} @ Vs=5V, Vcm=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(uV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-123.703	-132.927	-134.828	-122.292	-128.223	-113.085	-119.114
827	All GND'd Irradiation	10.736	37.970	33.445	32.549	21.661	23.631	16.129
828	All GND'd Irradiation	-149.921	-215.119	-216.595	-217.998	-226.126	-219.594	-228.685
829	All GND'd Irradiation	162.388	117.197	111.892	116.624	108.671	110.358	116.321
830	All GND'd Irradiation	9.233	-45.804	-46.321	-37.190	-32.086	-24.701	-29.413
821	Biased Irradiation	-354.291	-387.997	-385.051	-330.454	-375.124	-343.111	-366.776
822	Biased Irradiation	-221.443	-277.724	-282.647	-247.093	-270.994	-248.856	-257.756
823	Biased Irradiation	-27.693	-20.416	-23.381	-13.083	-22.843	-22.521	-17.425
824	Biased Irradiation	-146.956	-144.724	-151.535	-142.718	-149.361	-145.251	-141.003
825	Biased Irradiation	-19.238	-60.942	-62.207	-51.565	-72.042	-69.462	-70.552
832	Control Unit	-213.739	-190.113	-189.725	-176.471	-193.267	-189.186	-193.984
833	Control Unit	20.315	51.240	48.472	47.404	48.271	49.243	51.153
All GND'd Irradiation Statistics								
	Average All GND'd	-18.253	-47.737	-50.481	-45.662	-51.221	-44.678	-48.952
	Std Dev All GND'd	125.183	132.124	130.512	130.477	130.158	126.863	131.490
	Ps90%/90% (+KTL) All GND'd	324.998	314.546	307.384	312.107	305.672	303.179	311.594
	PS90%/90% (-KTL) All GND'd	-361.504	-410.020	-408.347	-403.430	-408.114	-392.536	-409.499
Biased Irradiation Statistics								
	Average Biased	-153.924	-178.361	-180.964	-156.983	-178.073	-165.840	-170.702
	Std Dev Biased	140.383	153.040	151.487	132.510	144.592	130.929	141.800
	Ps90%/90% (+KTL) Biased	231.005	241.276	234.412	206.360	218.397	193.167	218.114
	Ps90%/90% (-KTL) Biased	-538.853	-597.997	-596.341	-520.325	-574.543	-524.848	-559.519
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

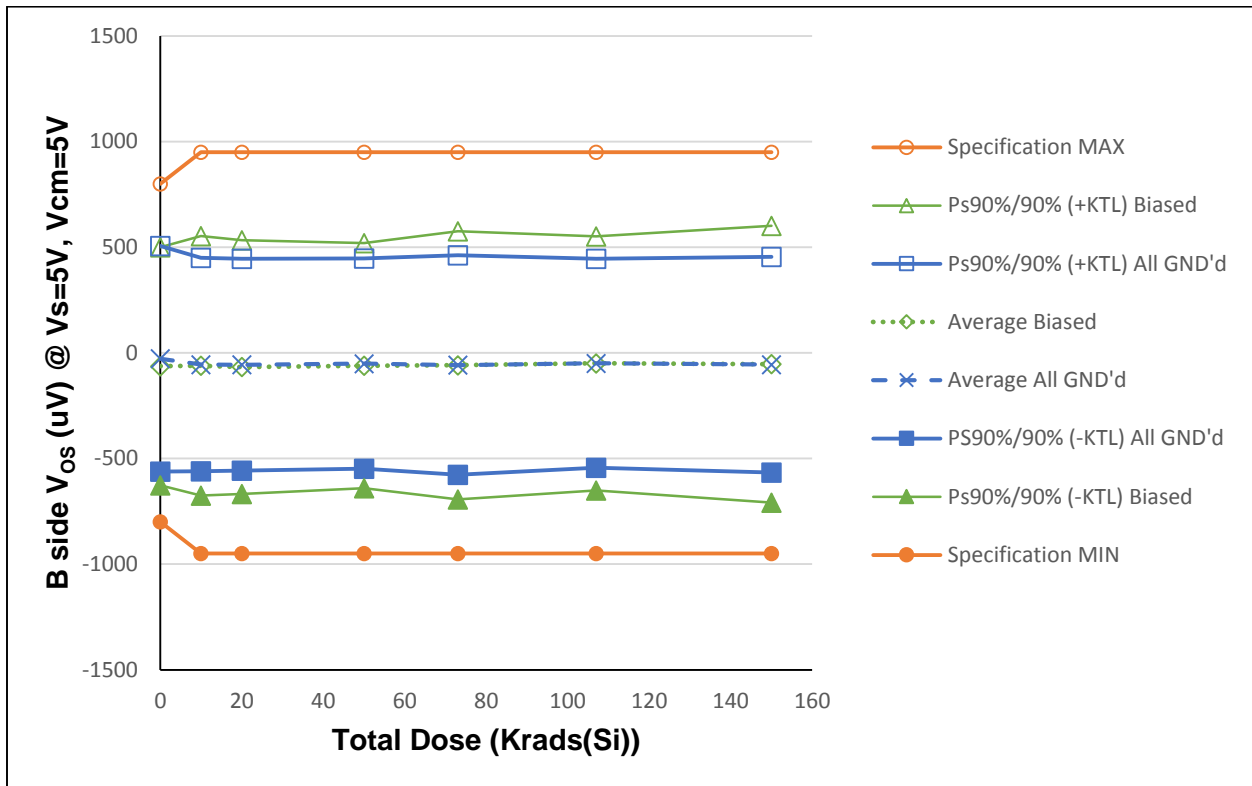


Figure 5.51: Plot of V_{os} (side B) @ $V_{cm} = 5V$ versus Total Dose

Table 5.51: Raw data for offset voltage (side B) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B V _{OS} @ Vs=5V, Vcm=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(uV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-251.851	-301.183	-303.360	-296.940	-312.686	-300.686	-307.253
827	All GND'd Irradiation	-33.580	-105.845	-102.404	-94.970	-106.881	-84.627	-94.470
828	All GND'd Irradiation	181.054	153.845	146.480	154.719	159.190	151.725	159.442
829	All GND'd Irradiation	153.318	101.541	102.791	101.219	98.469	97.597	93.776
830	All GND'd Irradiation	-186.373	-122.687	-122.723	-115.588	-124.368	-110.768	-129.462
821	Biased Irradiation	159.488	106.241	102.910	111.003	127.329	128.365	126.848
822	Biased Irradiation	152.562	214.137	196.485	188.995	213.049	202.392	242.502
823	Biased Irradiation	-219.547	-130.087	-130.391	-118.262	-111.384	-89.417	-118.079
824	Biased Irradiation	-136.245	-139.375	-146.435	-147.046	-157.194	-145.094	-160.109
825	Biased Irradiation	-270.746	-354.864	-355.304	-337.251	-364.683	-343.462	-357.658
832	Control Unit	-197.175	-238.990	-238.538	-221.732	-239.900	-235.502	-244.298
833	Control Unit	231.288	132.581	136.120	141.601	133.287	138.340	136.615
All GND'd Irradiation Statistics								
	Average All GND'd	-27.486	-54.866	-55.843	-50.312	-57.255	-49.352	-55.593
	Std Dev All GND'd	194.808	184.319	183.033	181.714	189.282	180.424	186.314
	Ps90%/90% (+KTL) All GND'd	506.677	450.537	446.034	447.948	461.756	445.370	455.280
	PS90%/90% (-KTL) All GND'd	-561.650	-560.269	-557.720	-548.573	-576.266	-544.074	-566.467
Biased Irradiation Statistics								
	Average Biased	-62.898	-60.790	-66.547	-60.512	-58.577	-49.443	-53.299
	Std Dev Biased	205.547	224.132	218.941	211.589	231.601	219.221	238.846
	Ps90%/90% (+KTL) Biased	500.711	553.781	533.789	519.664	576.474	551.659	601.618
	Ps90%/90% (-KTL) Biased	-626.506	-675.360	-666.883	-640.688	-693.627	-650.546	-708.216
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

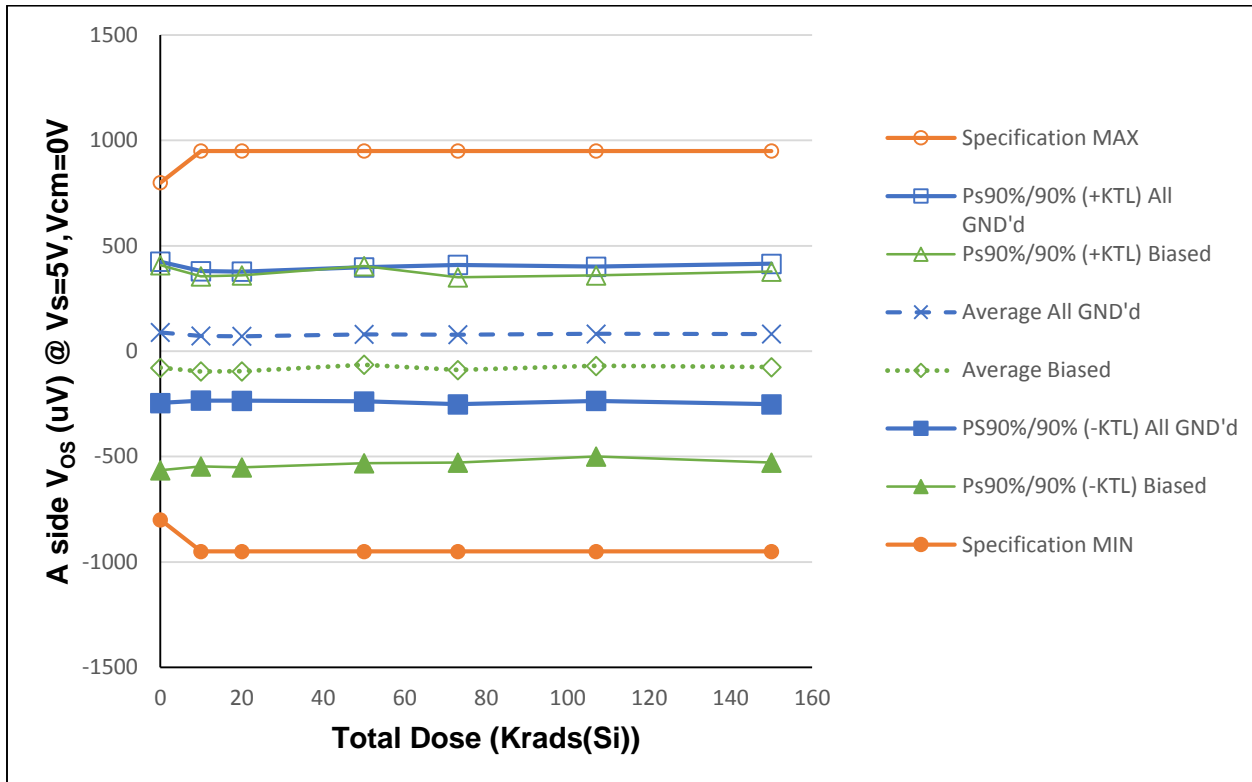


Figure 5.52: Plot of V_{OS} (side A) @ $V_{cm} = 0V$ versus Total Dose

Table 5.52: Raw data for offset voltage (side A) @ $V_{cm} = 0V$ versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A V_{OS} @ $V_s=5V, V_{cm}=0V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(μV)							
826	All GND'd Irradiation	169.043	138.339	136.151	151.945	153.918	154.274	158.751
827	All GND'd Irradiation	165.913	165.481	165.073	171.545	171.304	166.912	170.216
828	All GND'd Irradiation	-117.844	-114.535	-114.407	-114.078	-122.520	-112.094	-123.571
829	All GND'd Irradiation	74.314	56.975	52.019	62.691	57.800	62.738	66.919
830	All GND'd Irradiation	155.481	117.013	117.191	127.500	133.730	140.996	135.791
821	Biased Irradiation	-175.216	-147.019	-144.034	-88.931	-133.749	-86.917	-129.320
822	Biased Irradiation	-54.647	-82.108	-79.435	-40.314	-58.454	-36.283	-39.244
823	Biased Irradiation	155.676	121.826	120.197	146.661	118.707	123.922	144.752
824	Biased Irradiation	-314.394	-330.330	-335.800	-325.052	-323.492	-310.874	-310.447
825	Biased Irradiation	-3.074	-41.921	-37.712	-13.170	-47.418	-35.918	-42.107
832	Control Unit	200.355	145.385	143.710	148.170	138.512	141.544	142.649
833	Control Unit	-23.088	-17.303	-8.969	-7.581	-16.447	-10.973	-10.918
All GND'd Irradiation Statistics								
	Average All GND'd	89.382	72.654	71.206	79.920	78.846	82.565	81.621
	Std Dev All GND'd	122.210	112.010	111.763	115.951	120.611	116.142	121.504
	Ps90%/90% (+KTL) All GND'd	424.482	379.785	377.659	397.859	409.560	401.027	414.784
	PS90%/90% (-KTL) All GND'd	-245.719	-234.476	-235.248	-238.018	-251.868	-235.896	-251.542
Biased Irradiation Statistics								
	Average Biased	-78.331	-95.910	-95.357	-64.161	-88.881	-69.214	-75.273
	Std Dev Biased	177.550	164.377	165.999	170.508	160.307	156.690	165.104
	Ps90%/90% (+KTL) Biased	408.511	354.811	359.811	403.372	350.680	360.431	377.441
	Ps90%/90% (-KTL) Biased	-565.174	-546.632	-550.525	-531.694	-528.443	-498.859	-527.988
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

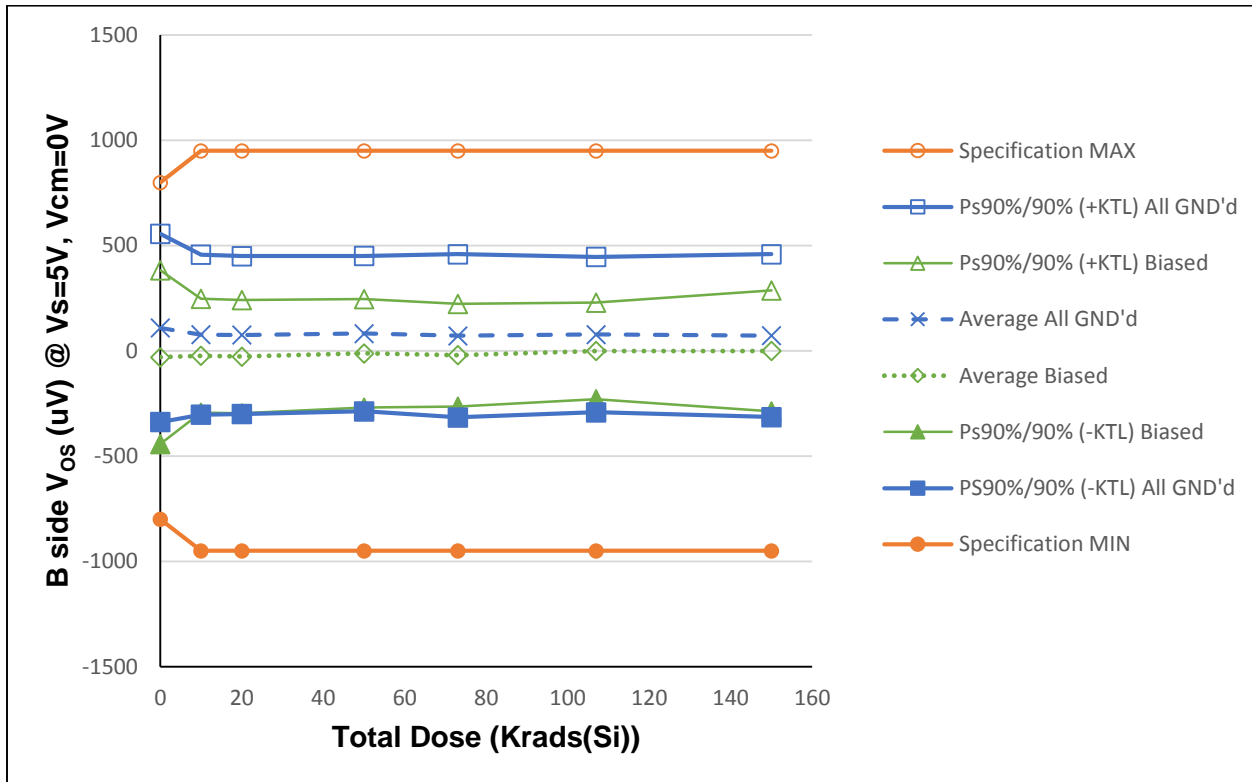


Figure 5.53: Plot of V_{os} (side B) @ $V_{cm} = 0V$ versus Total Dose

Table 5.53: Raw data for offset voltage (side B) @ Vcm = 0V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B V _{OS} @ V _s =5V, V _{cm} =0V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(uV)							
826	All GND'd Irradiation	20.070	-37.495	-39.933	-38.607	-43.327	-44.445	-43.771
827	All GND'd Irradiation	93.427	64.031	65.369	75.752	61.279	84.403	71.545
828	All GND'd Irradiation	221.882	165.701	157.125	165.742	169.145	164.576	171.838
829	All GND'd Irradiation	311.416	262.173	260.927	261.989	254.208	249.604	248.623
830	All GND'd Irradiation	-101.673	-69.413	-67.479	-53.726	-82.118	-65.039	-85.818
821	Biased Irradiation	64.703	27.553	23.379	38.089	27.652	40.327	36.066
822	Biased Irradiation	8.623	5.344	-4.778	2.625	17.331	27.814	94.021
823	Biased Irradiation	-276.683	-178.709	-182.873	-160.465	-157.827	-130.174	-158.349
824	Biased Irradiation	106.153	79.956	76.704	89.671	67.633	88.263	77.896
825	Biased Irradiation	-52.018	-50.949	-49.238	-27.787	-55.699	-29.022	-50.965
832	Control Unit	-266.473	-327.924	-332.319	-313.975	-331.884	-324.286	-333.175
833	Control Unit	-12.006	-28.448	-22.175	-14.317	-33.934	-26.259	-28.791
All GND'd Irradiation Statistics								
	Average All GND'd	109.024	76.999	75.202	82.230	71.837	77.820	72.484
	Std Dev All GND'd	162.979	138.628	136.854	134.550	141.248	134.571	140.954
	Ps90%/90% (+KTL) All GND'd	555.912	457.118	450.455	451.167	459.140	446.813	458.979
	PS90%/90% (-KTL) All GND'd	-337.864	-303.120	-300.051	-286.707	-315.465	-291.173	-314.012
Biased Irradiation Statistics								
	Average Biased	-29.844	-23.361	-27.361	-11.573	-20.182	-0.558	-0.266
	Std Dev Biased	150.279	98.723	98.205	94.008	88.902	83.630	104.738
	Ps90%/90% (+KTL) Biased	382.221	247.337	241.916	246.196	223.588	228.756	286.925
	Ps90%/90% (-KTL) Biased	-441.910	-294.058	-296.638	-269.343	-263.952	-229.872	-287.457
	Specification MIN	-800	-950	-950	-950		-950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	800	950	950	950		950	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status *Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

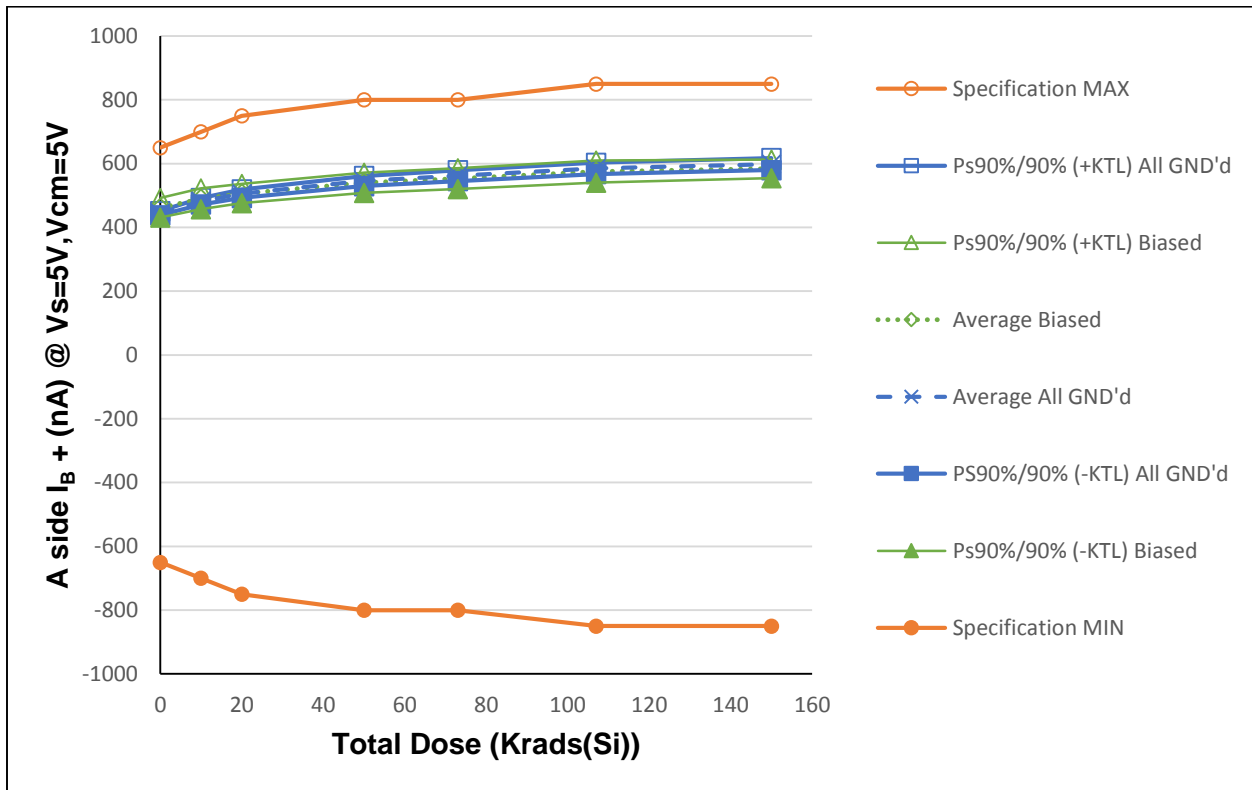


Figure 5.54: Plot of Positive Input Bias Current I_{B+} (side A) @ $V_{cm} = 5V$ versus Total Dose

Table 5.54: Raw data for positive input bias current (side A) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A _{Ib+} @ Vs=5V,Vcm=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	444.211	483.138	507.383	547.451	563.335	581.837	597.470
827	All GND'd Irradiation	444.272	481.557	506.837	547.058	560.846	585.810	598.126
828	All GND'd Irradiation	444.038	484.010	508.709	551.179	568.754	592.672	607.180
829	All GND'd Irradiation	449.122	486.213	508.424	547.123	566.802	589.598	602.168
830	All GND'd Irradiation	443.085	476.424	497.129	535.872	552.820	576.049	588.680
821	Biased Irradiation	455.322	481.026	499.299	535.419	546.759	569.438	576.612
822	Biased Irradiation	453.635	478.891	495.199	528.815	542.057	560.766	575.265
823	Biased Irradiation	464.911	490.562	506.130	540.112	552.566	575.968	582.291
824	Biased Irradiation	479.938	508.685	524.096	559.331	573.169	594.951	601.817
825	Biased Irradiation	454.987	490.985	506.527	537.441	552.301	573.610	584.463
832	Control Unit	462.381	465.522	467.078	473.900	465.843	466.725	463.348
833	Control Unit	465.350	467.556	468.897	474.052	465.322	470.104	466.317
All GND'd Irradiation Statistics								
	Average All GND'd	444.946	482.268	505.696	545.736	562.511	585.193	598.725
	Std Dev All GND'd	2.383	3.675	4.849	5.778	6.220	6.531	6.822
	Ps90%/90% (+KTL) All GND'd	451.481	492.344	518.993	561.579	579.566	603.100	617.432
	PS90%/90% (-KTL) All GND'd	438.411	472.193	492.400	529.894	545.457	567.286	580.018
Biased Irradiation Statistics								
	Average Biased	461.759	490.030	506.250	540.224	553.370	574.946	584.089
	Std Dev Biased	11.110	11.772	11.057	11.468	11.890	12.594	10.623
	Ps90%/90% (+KTL) Biased	492.221	522.310	536.568	571.669	585.973	609.479	613.218
	Ps90%/90% (-KTL) Biased	431.296	457.750	475.932	508.778	520.767	540.414	554.961
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

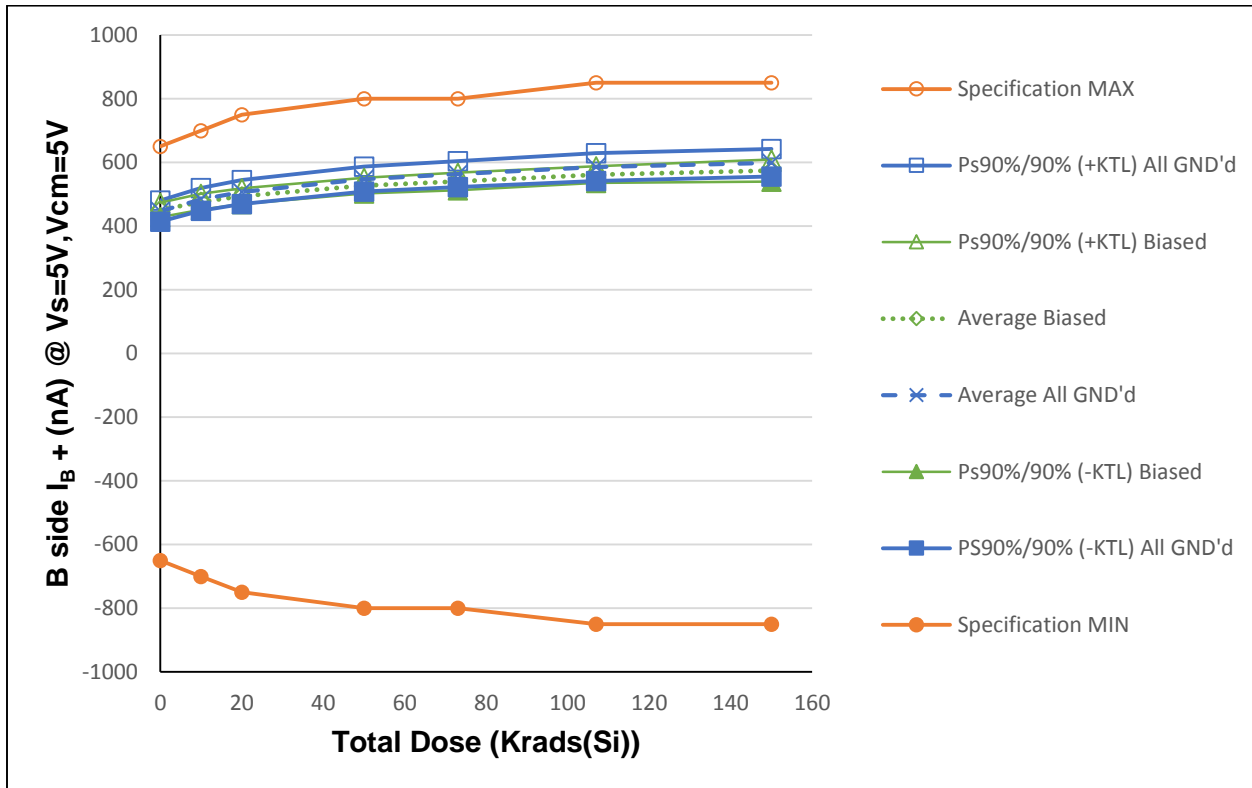


Figure 5.55: Plot of Positive Input Bias Current I_{B+} (side B) @ $V_{cm} = 5V$ versus Total Dose

Table 5.55: Raw data for positive input bias current (side B) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B I _B + @ Vs=5V,Vcm=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	445.991	482.998	507.020	545.772	559.768	579.260	593.525
827	All GND'd Irradiation	427.706	465.252	488.352	530.029	544.639	567.875	581.613
828	All GND'd Irradiation	460.974	501.583	527.016	569.710	586.239	611.140	624.456
829	All GND'd Irradiation	451.537	487.388	509.418	547.950	564.124	585.604	599.687
830	All GND'd Irradiation	449.690	484.430	505.146	545.618	561.192	584.835	595.225
821	Biased Irradiation	443.532	468.802	488.742	525.038	536.235	558.110	564.664
822	Biased Irradiation	456.010	480.645	498.549	530.907	543.439	562.946	588.231
823	Biased Irradiation	440.435	464.694	480.877	512.956	526.172	547.343	557.958
824	Biased Irradiation	459.050	486.956	503.724	537.308	553.252	572.615	582.745
825	Biased Irradiation	454.158	480.056	496.709	528.686	543.843	566.588	577.681
832	Control Unit	451.155	453.571	454.877	460.492	453.785	454.819	452.497
833	Control Unit	450.288	452.376	454.642	457.518	450.846	454.910	451.495
All GND'd Irradiation Statistics								
	Average All GND'd	447.180	484.330	507.390	547.816	563.192	585.743	598.901
	Std Dev All GND'd	12.209	12.969	13.756	14.184	14.933	15.868	15.772
	Ps90%/90% (+KTL) All GND'd	480.656	519.891	545.109	586.708	604.138	629.253	642.147
	PS90%/90% (-KTL) All GND'd	413.703	448.769	469.672	508.924	522.247	542.233	555.655
Biased Irradiation Statistics								
	Average Biased	450.637	476.231	493.720	526.979	540.588	561.520	574.256
	Std Dev Biased	8.164	9.185	8.973	9.020	10.073	9.532	12.617
	Ps90%/90% (+KTL) Biased	473.023	501.415	518.325	551.712	568.208	587.657	608.851
	Ps90%/90% (-KTL) Biased	428.251	451.046	469.116	502.246	512.968	535.384	539.661
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

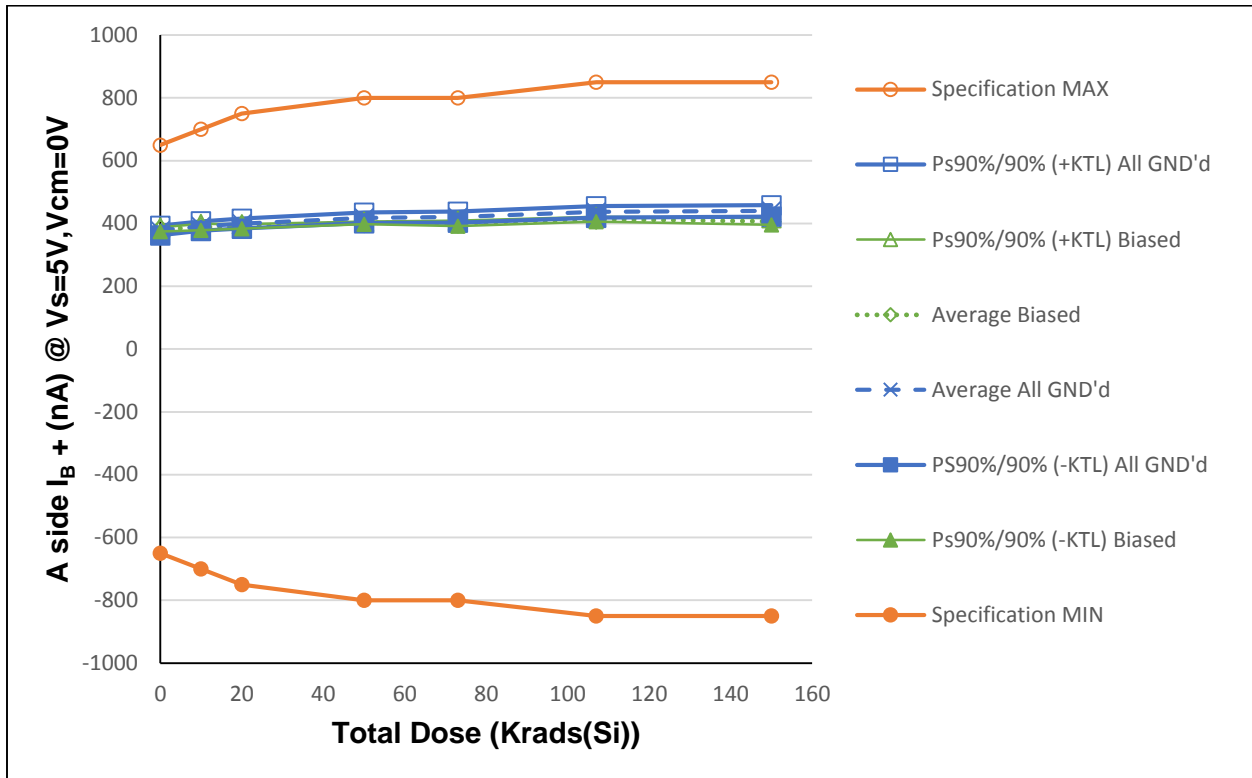


Figure 5.56: Plot of Positive Input Bias Current I_{B+} (side A) @ $V_{cm} = 0V$ versus Total Dose

Table 5.56: Raw data for positive input bias current (side A) @ Vcm = 0V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A _{B+} @ Vs=5V,Vcm=0V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	370.087	385.459	394.020	412.761	412.858	431.176	434.946
827	All GND'd Irradiation	380.826	395.183	403.475	422.089	419.448	440.359	442.392
828	All GND'd Irradiation	383.865	397.515	405.288	423.619	426.655	443.186	445.450
829	All GND'd Irradiation	379.159	393.907	401.982	421.060	427.019	441.159	446.681
830	All GND'd Irradiation	373.517	386.214	392.861	409.890	415.753	428.101	431.771
821	Biased Irradiation	377.176	382.353	386.519	401.655	395.941	411.786	400.600
822	Biased Irradiation	381.745	388.310	390.256	400.026	399.903	409.657	405.898
823	Biased Irradiation	382.498	389.400	390.890	403.281	401.544	413.409	407.448
824	Biased Irradiation	383.539	392.530	394.111	403.893	405.030	417.270	411.463
825	Biased Irradiation	381.426	390.073	390.990	401.497	400.217	413.985	406.532
832	Control Unit	400.376	399.403	401.115	412.110	399.299	400.352	395.905
833	Control Unit	381.090	379.897	382.240	388.352	376.886	382.368	378.259
All GND'd Irradiation Statistics								
	Average All GND'd	377.491	391.656	399.525	417.884	420.347	436.796	440.248
	Std Dev All GND'd	5.593	5.474	5.692	6.140	6.370	6.703	6.577
	Ps90%/90% (+KTL) All GND'd	392.828	406.665	415.131	434.720	437.813	455.177	458.281
	PS90%/90% (-KTL) All GND'd	362.154	376.647	383.919	401.048	402.880	418.416	422.215
Biased Irradiation Statistics								
	Average Biased	381.277	388.533	390.553	402.071	400.527	413.221	406.388
	Std Dev Biased	2.432	3.786	2.708	1.538	3.272	2.818	3.894
	Ps90%/90% (+KTL) Biased	387.947	398.915	397.977	406.289	409.500	420.949	417.065
	Ps90%/90% (-KTL) Biased	374.607	378.152	383.129	397.852	391.555	405.493	395.711
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

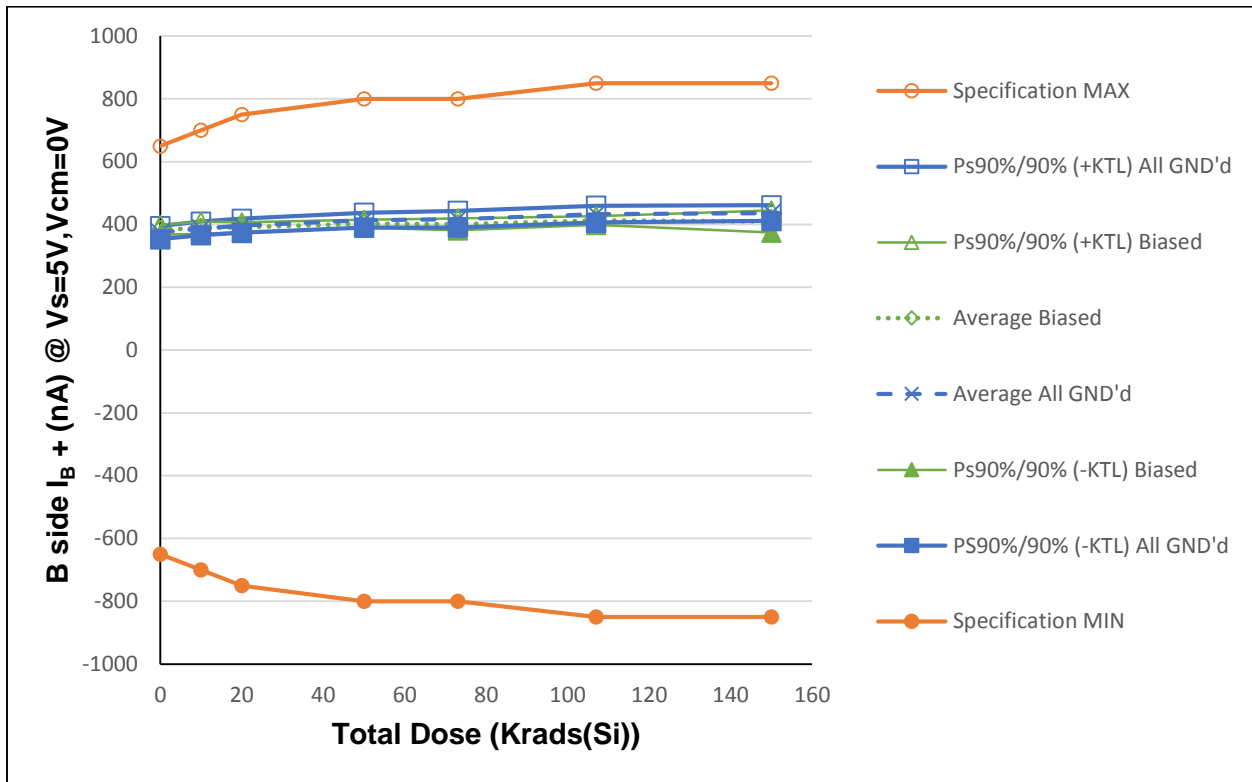


Figure 5.57: Plot of Positive Input Bias Current I_{B+} (side B) @ $V_{cm} = 0V$ versus Total Dose

Table 5.57: Raw data for positive input bias current (side B) @ Vcm = 0V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B I _B + @ Vs=5V,Vcm=0V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	370.051	383.798	392.307	410.277	411.204	428.406	431.500
827	All GND'd Irradiation	372.771	385.691	394.840	412.104	410.494	430.212	432.427
828	All GND'd Irradiation	387.006	400.787	409.634	428.493	433.282	449.933	452.375
829	All GND'd Irradiation	367.198	380.111	388.186	406.035	411.786	425.506	430.199
830	All GND'd Irradiation	374.470	387.569	395.034	411.735	418.210	430.243	434.809
821	Biased Irradiation	373.663	377.679	381.708	395.178	389.832	405.054	393.646
822	Biased Irradiation	386.090	392.864	394.207	403.663	403.107	411.786	428.045
823	Biased Irradiation	384.234	391.390	392.549	405.233	403.218	414.774	409.069
824	Biased Irradiation	388.583	396.125	396.799	407.120	407.824	418.919	412.761
825	Biased Irradiation	382.341	389.145	390.283	399.813	398.540	411.093	402.578
832	Control Unit	393.574	392.261	394.028	404.072	392.706	393.398	389.022
833	Control Unit	387.941	386.504	389.141	395.163	383.205	389.269	384.456
All GND'd Irradiation Statistics								
	Average All GND'd	374.299	387.591	396.000	413.729	416.995	432.860	436.262
	Std Dev All GND'd	7.621	7.875	8.106	8.598	9.614	9.738	9.164
	Ps90%/90% (+KTL) All GND'd	395.195	409.186	418.228	437.305	443.356	459.561	461.389
	PS90%/90% (-KTL) All GND'd	353.404	365.997	373.772	390.152	390.634	406.159	411.135
Biased Irradiation Statistics								
	Average Biased	382.982	389.440	391.109	402.201	400.504	412.325	409.220
	Std Dev Biased	5.698	7.047	5.769	4.758	6.809	5.103	12.783
	Ps90%/90% (+KTL) Biased	398.605	408.763	406.926	415.248	419.175	426.317	444.270
	Ps90%/90% (-KTL) Biased	367.359	370.118	375.292	389.155	381.833	398.333	374.169
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

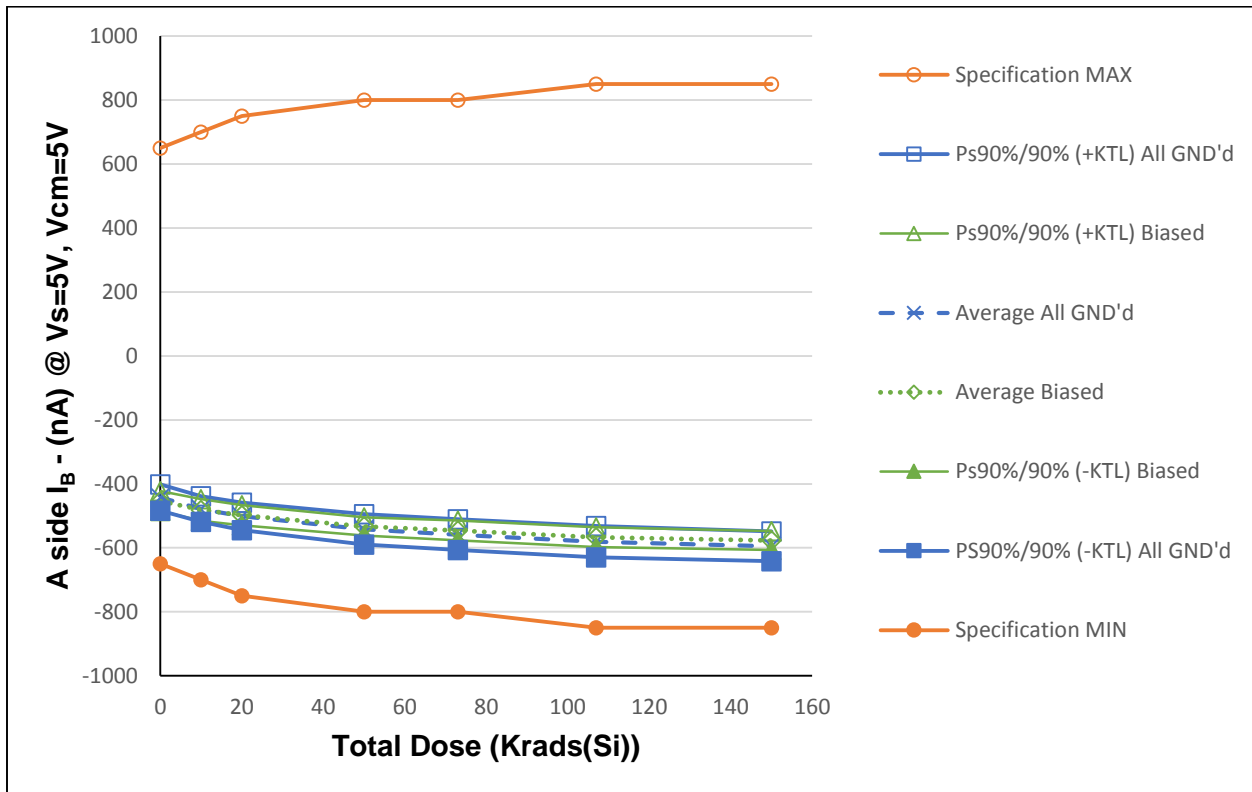


Figure 5.58: Plot of Negative Input Bias Current I_B - (side A) @ $V_{cm} = 5V$ versus Total Dose

Table 5.58: Raw data for negative input bias current (side A) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A _I - @ Vs=5V, Vcm=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-440.298	-479.016	-502.908	-543.748	-559.229	-578.175	-593.620
827	All GND'd Irradiation	-430.953	-468.367	-491.673	-532.607	-546.948	-570.417	-584.926
828	All GND'd Irradiation	-464.383	-498.732	-523.457	-567.188	-584.701	-608.580	-620.607
829	All GND'd Irradiation	-448.536	-485.500	-507.714	-546.892	-563.651	-585.700	-599.444
830	All GND'd Irradiation	-427.358	-461.176	-481.867	-520.827	-538.913	-561.330	-575.869
821	Biased Irradiation	-441.579	-466.899	-485.685	-523.936	-535.603	-556.697	-565.824
822	Biased Irradiation	-450.886	-475.608	-491.946	-526.389	-539.270	-559.013	-571.907
823	Biased Irradiation	-456.720	-481.780	-497.538	-531.952	-544.585	-565.544	-574.930
824	Biased Irradiation	-471.629	-500.668	-516.727	-550.286	-564.700	-585.429	-594.501
825	Biased Irradiation	-448.296	-482.445	-498.084	-530.779	-545.083	-566.695	-577.953
832	Control Unit	-455.259	-458.548	-460.021	-466.044	-458.966	-459.730	-456.643
833	Control Unit	-447.452	-449.915	-451.743	-454.708	-448.120	-451.907	-448.968
All GND'd Irradiation Statistics								
	Average All GND'd	-442.305	-478.558	-501.524	-542.252	-558.688	-580.840	-594.893
	Std Dev All GND'd	14.854	14.675	15.849	17.303	17.539	17.955	16.917
	Ps90%/90% (+KTL) All GND'd	-401.576	-438.320	-458.067	-494.806	-510.597	-531.609	-548.506
	PS90%/90% (-KTL) All GND'd	-483.035	-518.797	-544.981	-589.698	-606.780	-630.072	-641.280
Biased Irradiation Statistics								
	Average Biased	-453.822	-481.480	-497.996	-532.668	-545.848	-566.676	-577.023
	Std Dev Biased	11.342	12.413	11.611	10.370	11.245	11.306	10.751
	Ps90%/90% (+KTL) Biased	-422.723	-447.444	-466.159	-504.233	-515.015	-535.676	-547.544
	Ps90%/90% (-KTL) Biased	-484.920	-515.515	-529.833	-561.104	-576.681	-597.675	-606.502
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

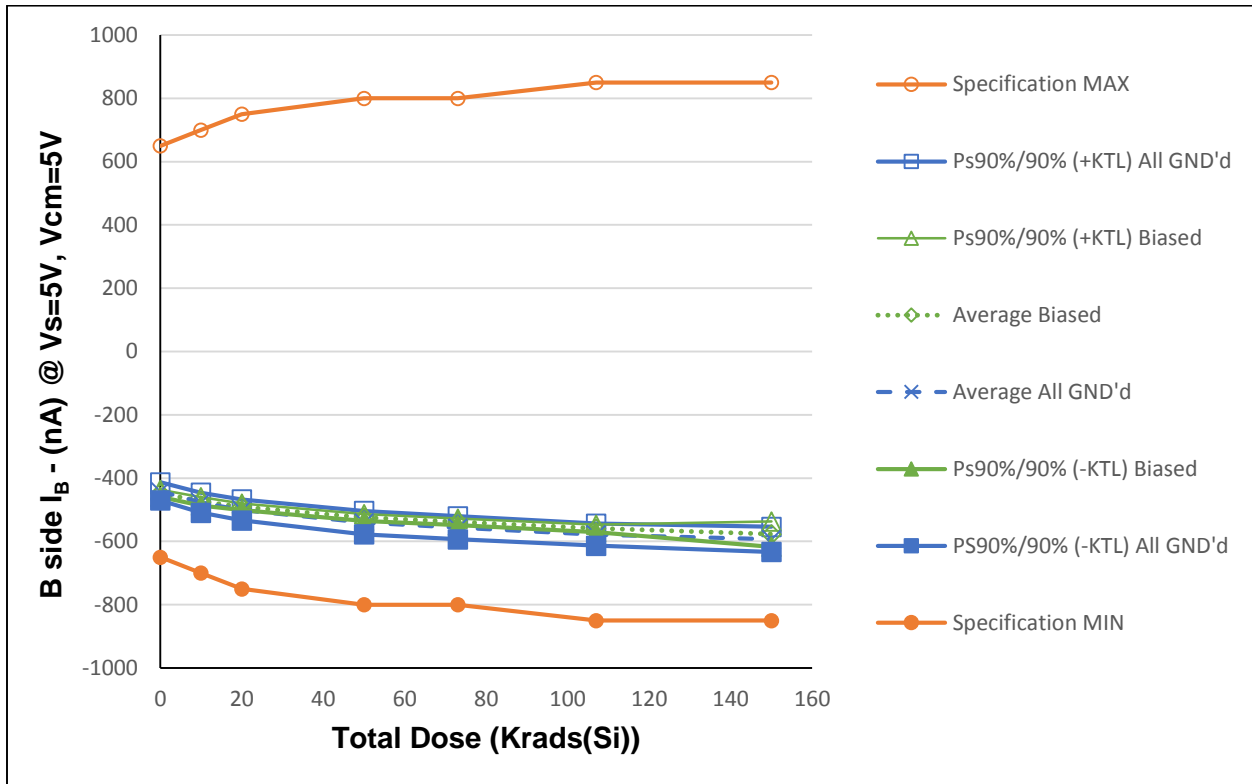


Figure 5.59: Plot of Negative Input Bias Current I_{B-} (side B) @ $V_{cm} = 5V$ versus Total Dose

Table 5.59: Raw data for negative input bias current (side B) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B _{I-} @ Vs=5V, Vcm=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-448.848	-486.544	-509.504	-550.713	-564.908	-584.576	-599.658
827	All GND'd Irradiation	-433.707	-469.622	-493.571	-534.177	-548.310	-571.484	-585.678
828	All GND'd Irradiation	-448.143	-485.443	-510.566	-553.944	-572.147	-595.016	-611.794
829	All GND'd Irradiation	-450.428	-485.578	-506.629	-543.901	-559.718	-580.640	-596.204
830	All GND'd Irradiation	-427.461	-461.235	-482.688	-520.770	-538.794	-561.734	-573.762
821	Biased Irradiation	-442.499	-468.156	-487.932	-525.162	-537.131	-558.735	-567.080
822	Biased Irradiation	-445.182	-469.239	-486.117	-518.971	-532.556	-551.763	-602.932
823	Biased Irradiation	-452.752	-478.598	-494.251	-529.296	-540.195	-562.458	-571.324
824	Biased Irradiation	-450.859	-477.839	-494.548	-526.408	-543.038	-562.126	-573.617
825	Biased Irradiation	-448.047	-472.628	-489.076	-522.358	-537.878	-559.044	-570.514
832	Control Unit	-449.363	-451.570	-452.681	-458.641	-451.480	-452.415	-449.606
833	Control Unit	-460.196	-462.046	-464.008	-467.351	-459.681	-463.978	-460.574
All GND'd Irradiation Statistics								
	Average All GND'd	-441.718	-477.684	-500.591	-540.701	-556.775	-578.690	-593.419
	Std Dev All GND'd	10.433	11.582	12.095	13.469	13.286	12.692	14.410
	Ps90%/90% (+KTL) All GND'd	-413.110	-445.926	-467.426	-503.768	-520.345	-543.887	-553.906
	PS90%/90% (-KTL) All GND'd	-470.325	-509.443	-533.757	-577.634	-593.206	-613.493	-632.933
Biased Irradiation Statistics								
	Average Biased	-447.868	-473.292	-490.385	-524.439	-538.160	-558.825	-577.093
	Std Dev Biased	4.149	4.798	3.815	3.944	3.888	4.302	14.634
	Ps90%/90% (+KTL) Biased	-436.490	-460.137	-479.923	-513.624	-527.497	-547.029	-536.968
	Ps90%/90% (-KTL) Biased	-459.246	-486.447	-500.846	-535.254	-548.822	-570.621	-617.219
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

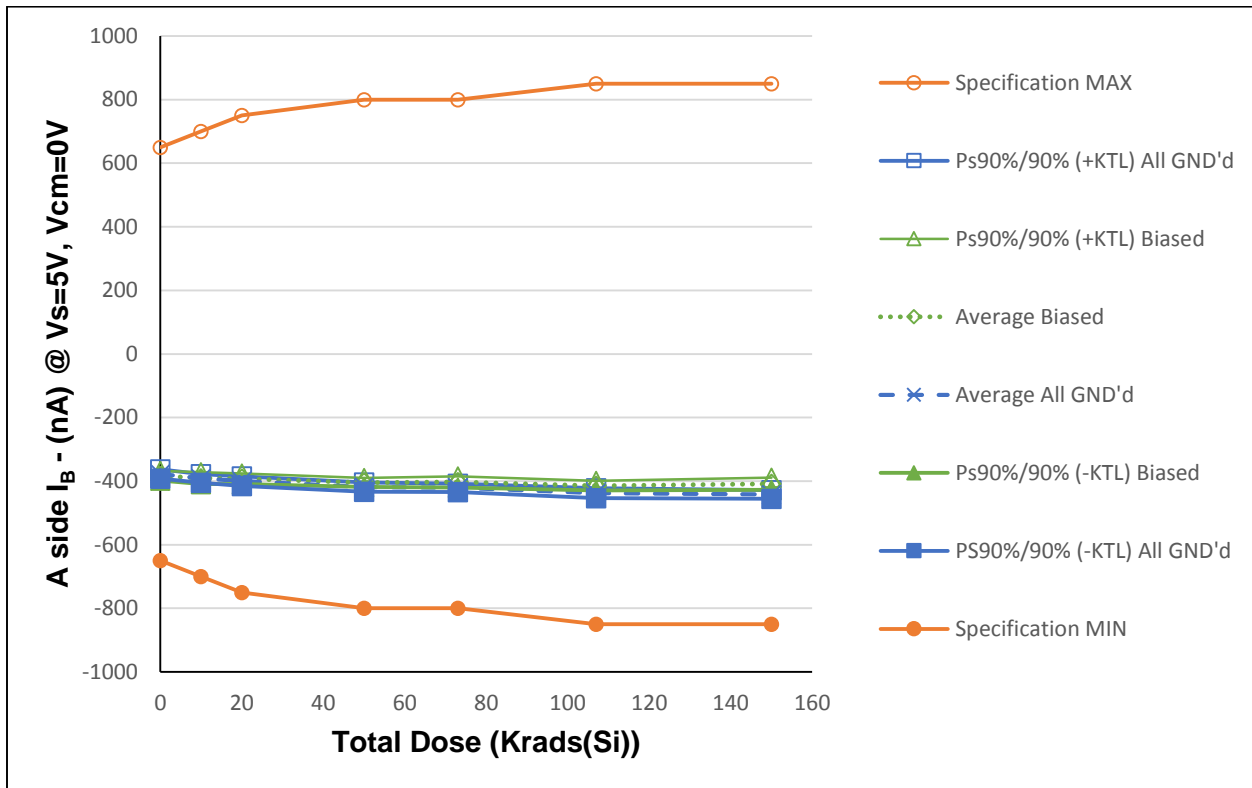


Figure 5.60: Plot of Negative Input Bias Current $I_B -$ (side A) @ $V_{cm} = 0V$ versus Total Dose

Table 5.60: Raw data for negative input bias current (side A) @ Vcm = 0V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A _{I-} @ Vs=5V, Vcm=0V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-373.233	-389.108	-397.849	-417.960	-418.150	-435.977	-440.815
827	All GND'd Irradiation	-380.779	-394.542	-403.666	-420.547	-418.651	-439.677	-442.460
828	All GND'd Irradiation	-385.126	-398.644	-407.288	-425.931	-429.172	-445.776	-449.204
829	All GND'd Irradiation	-373.891	-388.620	-397.040	-415.834	-421.960	-436.723	-441.723
830	All GND'd Irradiation	-373.680	-386.958	-393.726	-411.863	-417.293	-430.506	-434.934
821	Biased Irradiation	-374.960	-380.434	-384.036	-398.010	-393.402	-407.968	-398.028
822	Biased Irradiation	-382.866	-389.262	-391.367	-401.526	-401.588	-410.312	-407.149
823	Biased Irradiation	-384.030	-392.161	-393.741	-406.194	-404.304	-415.844	-410.386
824	Biased Irradiation	-390.623	-399.734	-400.937	-411.516	-411.700	-422.523	-417.652
825	Biased Irradiation	-383.084	-391.125	-391.855	-402.887	-401.372	-413.988	-407.848
832	Control Unit	-396.790	-396.899	-398.397	-408.834	-396.683	-397.624	-393.959
833	Control Unit	-383.019	-381.928	-384.166	-390.173	-378.514	-384.132	-380.418
All GND'd Irradiation Statistics								
	Average All GND'd	-377.342	-391.574	-399.914	-418.427	-421.045	-437.732	-441.827
	Std Dev All GND'd	5.353	4.871	5.461	5.264	4.875	5.586	5.084
	Ps90%/90% (+KTL) All GND'd	-362.665	-378.218	-384.941	-403.994	-407.677	-422.415	-427.888
	PS90%/90% (-KTL) All GND'd	-392.018	-404.931	-414.887	-432.860	-434.413	-453.048	-455.766
Biased Irradiation Statistics								
	Average Biased	-383.113	-390.543	-392.387	-404.027	-402.473	-414.127	-408.212
	Std Dev Biased	5.563	6.915	6.042	5.112	6.572	5.611	7.050
	Ps90%/90% (+KTL) Biased	-367.859	-371.582	-375.821	-390.009	-384.453	-398.741	-388.880
	Ps90%/90% (-KTL) Biased	-398.366	-409.504	-408.953	-418.045	-420.494	-429.514	-427.544
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

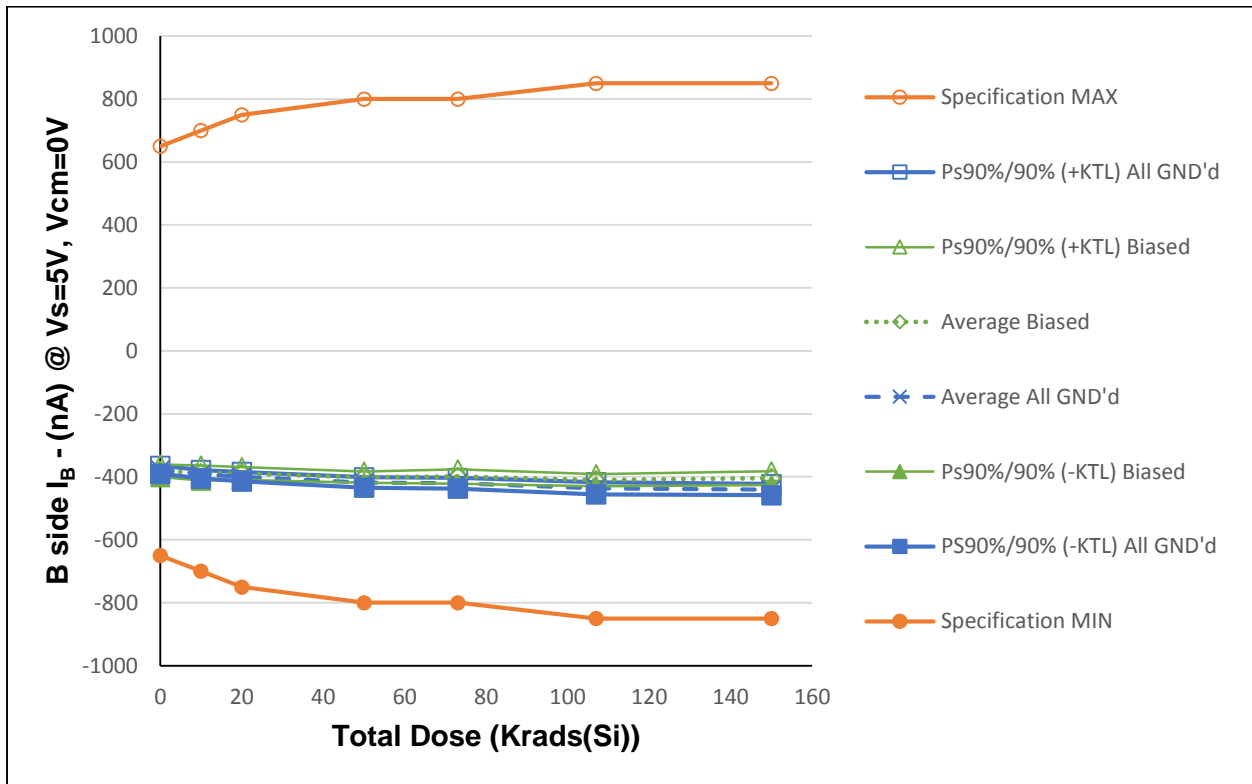


Figure 5.61: Plot of Negative Input Bias Current I_B - (side B) @ $V_{cm} = 0V$ versus Total Dose

Table 5.61: Raw data for negative input bias current (side B) @ Vcm = 0V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B _I - @ Vs=5V, Vcm=0V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(nA)							
826	All GND'd Irradiation	-378.181	-394.105	-401.818	-420.349	-419.982	-437.973	-441.536
827	All GND'd Irradiation	-376.823	-390.548	-399.160	-417.045	-415.115	-433.714	-437.403
828	All GND'd Irradiation	-384.565	-399.196	-407.927	-427.252	-431.265	-448.062	-451.482
829	All GND'd Irradiation	-371.692	-386.327	-393.883	-413.220	-417.992	-431.968	-437.071
830	All GND'd Irradiation	-376.181	-389.325	-395.900	-412.641	-417.989	-430.784	-435.712
821	Biased Irradiation	-369.341	-374.167	-378.109	-391.929	-386.924	-401.156	-391.650
822	Biased Irradiation	-381.462	-387.943	-389.172	-399.271	-398.748	-407.690	-402.447
823	Biased Irradiation	-383.572	-390.868	-391.925	-404.499	-402.280	-412.968	-407.500
824	Biased Irradiation	-389.204	-397.811	-398.767	-409.242	-409.774	-420.534	-413.637
825	Biased Irradiation	-381.985	-389.664	-390.577	-400.357	-398.778	-411.626	-405.206
832	Control Unit	-394.439	-394.228	-395.531	-406.148	-394.288	-395.105	-391.284
833	Control Unit	-385.892	-385.742	-387.888	-394.410	-382.451	-388.224	-384.109
All GND'd Irradiation Statistics								
	Average All GND'd	-377.488	-391.900	-399.738	-418.101	-420.469	-436.500	-440.641
	Std Dev All GND'd	4.645	4.940	5.494	5.991	6.280	7.015	6.439
	Ps90%/90% (+KTL) All GND'd	-364.751	-378.355	-384.674	-401.675	-403.250	-417.265	-422.984
	PS90%/90% (-KTL) All GND'd	-390.225	-405.445	-414.801	-434.528	-437.688	-455.735	-458.297
Biased Irradiation Statistics								
	Average Biased	-381.113	-388.090	-389.710	-401.060	-399.301	-410.795	-404.088
	Std Dev Biased	7.262	8.640	7.459	6.439	8.251	7.121	8.085
	Ps90%/90% (+KTL) Biased	-361.199	-364.400	-369.257	-383.404	-376.676	-391.270	-381.919
	Ps90%/90% (-KTL) Biased	-401.026	-411.781	-410.163	-418.715	-421.926	-430.320	-426.258
	Specification MIN	-650	-700	-750	-800		-850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	650	700	750	800		850	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

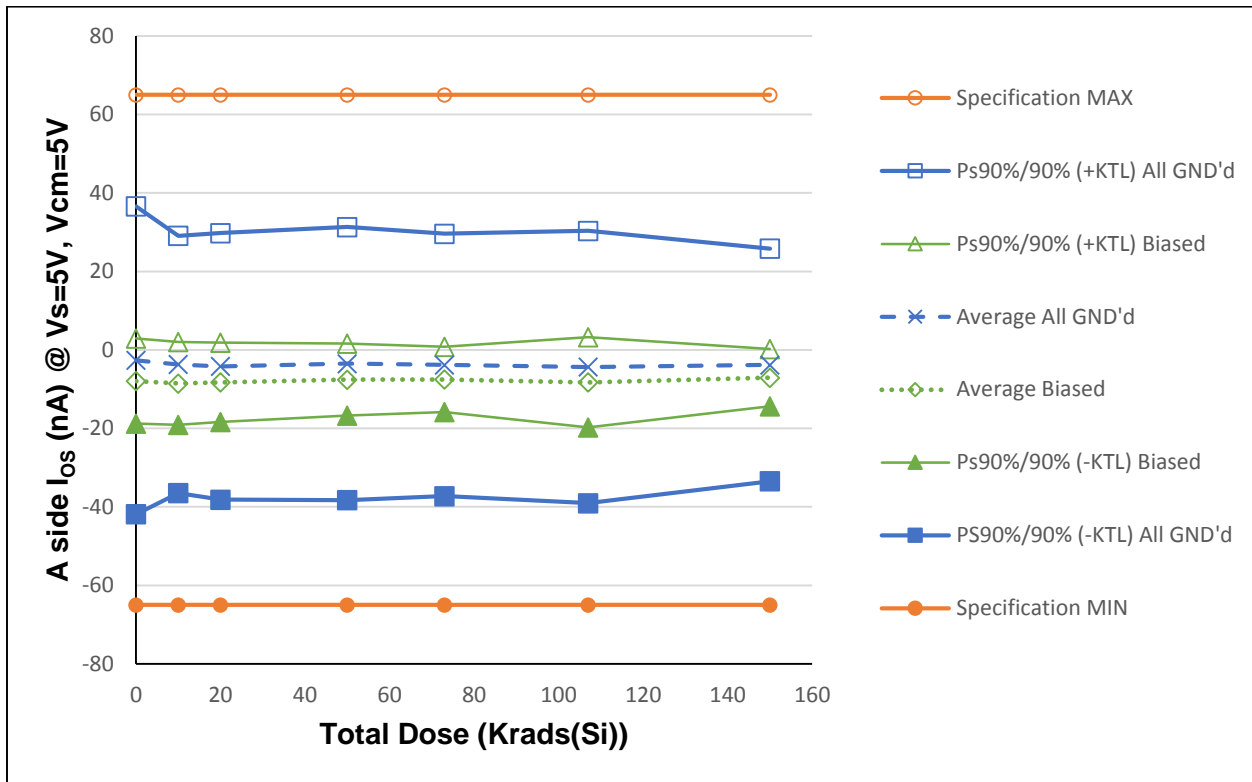


Figure 5.62: Plot of Input Offset Current I_{os} (side A) @ $V_{cm} = 5V$ versus Total Dose

Table 5.62: Raw data for input offset current (side A) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A I_{os} @ Vs=5V, Vcm=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
Units	(nA)							
826	All GND'd Irradiation	-3.914	-4.122	-4.475	-3.703	-4.106	-3.662	-3.850
827	All GND'd Irradiation	-13.320	-13.190	-15.164	-14.450	-13.898	-15.393	-13.200
828	All GND'd Irradiation	20.345	14.723	14.748	16.009	15.947	15.908	13.426
829	All GND'd Irradiation	-0.586	-0.713	-0.710	-0.231	-3.151	-3.898	-2.724
830	All GND'd Irradiation	-15.727	-15.248	-15.262	-15.045	-13.907	-14.718	-12.811
821	Biased Irradiation	-13.743	-14.128	-13.614	-11.483	-11.155	-12.741	-10.788
822	Biased Irradiation	-2.749	-3.283	-3.254	-2.426	-2.787	-1.753	-3.357
823	Biased Irradiation	-8.191	-8.782	-8.592	-8.160	-7.981	-10.424	-7.361
824	Biased Irradiation	-8.309	-8.017	-7.369	-9.044	-8.470	-9.521	-7.315
825	Biased Irradiation	-6.691	-8.540	-8.442	-6.662	-7.219	-6.915	-6.510
832	Control Unit	-7.122	-6.974	-7.056	-7.856	-6.877	-6.995	-6.704
833	Control Unit	-17.898	-17.641	-17.154	-19.344	-17.202	-18.197	-17.349
All GND'd Irradiation Statistics								
	Average All GND'd	-2.640	-3.710	-4.173	-3.484	-3.823	-4.353	-3.832
	Std Dev All GND'd	14.313	11.957	12.388	12.694	12.192	12.654	10.810
	Ps90%/90% (+KTL) All GND'd	36.607	29.077	29.795	31.323	29.608	30.345	25.811
	PS90%/90% (-KTL) All GND'd	-41.888	-36.497	-38.140	-38.291	-37.254	-39.050	-33.474
Biased Irradiation Statistics								
	Average Biased	-7.937	-8.550	-8.254	-7.555	-7.522	-8.271	-7.066
	Std Dev Biased	3.949	3.847	3.697	3.359	3.034	4.198	2.649
	Ps90%/90% (+KTL) Biased	2.891	1.998	1.882	1.654	0.797	3.241	0.197
	Ps90%/90% (-KTL) Biased	-18.765	-19.098	-18.390	-16.764	-15.842	-19.783	-14.330
	Specification MIN	-65	-65	-65	-65		-65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	65	65	65	65		65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

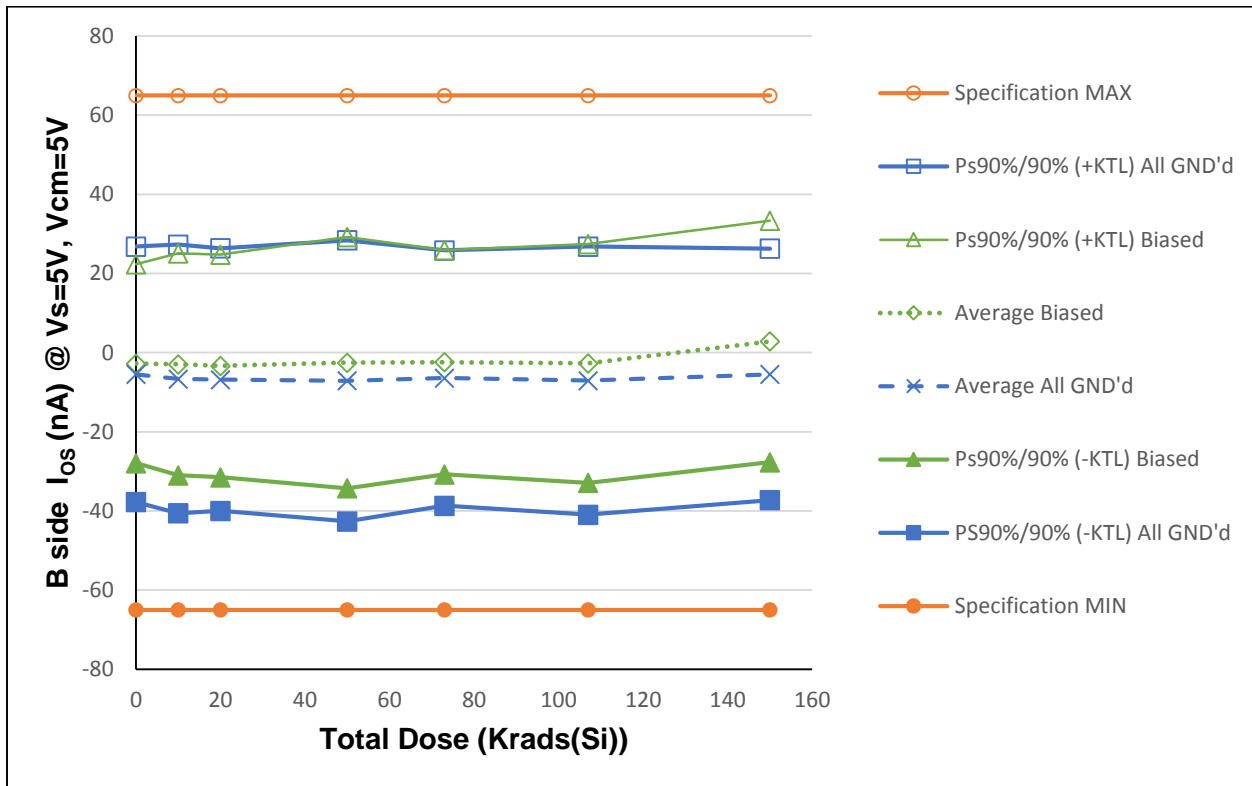


Figure 5.63: Plot of Input Offset Current I_{os} (side B) @ $V_{cm} = 5V$ versus Total Dose

Table 5.63: Raw data for input offset current (side B) @ Vcm = 5V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B I_{OS} @ Vs=5V, Vcm=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	2.857	3.547	2.483	4.941	5.140	5.316	6.133
827	All GND'd Irradiation	6.001	4.371	5.219	4.148	3.671	3.609	4.064
828	All GND'd Irradiation	-12.831	-16.140	-16.450	-15.765	-14.092	-16.125	-12.662
829	All GND'd Irradiation	-1.109	-1.809	-2.790	-4.049	-4.407	-4.964	-3.483
830	All GND'd Irradiation	-22.228	-23.195	-22.458	-24.849	-22.398	-23.101	-21.463
821	Biased Irradiation	-1.033	-0.646	-0.810	0.125	0.896	0.625	2.416
822	Biased Irradiation	-10.828	-11.406	-12.433	-11.936	-10.883	-11.183	14.701
823	Biased Irradiation	12.316	13.904	13.374	16.341	14.023	15.115	13.365
824	Biased Irradiation	-8.191	-9.117	-9.176	-10.900	-10.214	-10.489	-9.128
825	Biased Irradiation	-6.111	-7.429	-7.633	-6.328	-5.965	-7.544	-7.166
832	Control Unit	-1.792	-2.001	-2.196	-1.851	-2.304	-2.404	-2.892
833	Control Unit	9.909	9.670	9.366	9.833	8.835	9.068	9.079
All GND'd Irradiation Statistics								
	Average All GND'd	-5.462	-6.645	-6.799	-7.115	-6.417	-7.053	-5.482
	Std Dev All GND'd	11.779	12.376	12.094	12.951	11.765	12.358	11.586
	Ps90%/90% (+KTL) All GND'd	26.836	27.290	26.362	28.397	25.843	26.832	26.288
	PS90%/90% (-KTL) All GND'd	-37.760	-40.580	-39.960	-42.626	-38.676	-40.938	-37.252
Biased Irradiation Statistics								
	Average Biased	-2.769	-2.939	-3.336	-2.540	-2.428	-2.695	2.838
	Std Dev Biased	9.166	10.234	10.258	11.577	10.324	11.006	11.124
	Ps90%/90% (+KTL) Biased	22.365	25.124	24.792	29.204	25.879	27.483	33.341
	Ps90%/90% (-KTL) Biased	-27.903	-31.001	-31.464	-34.283	-30.736	-32.873	-27.665
	Specification MIN	-65	-65	-65	-65		-65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	65	65	65	65		65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

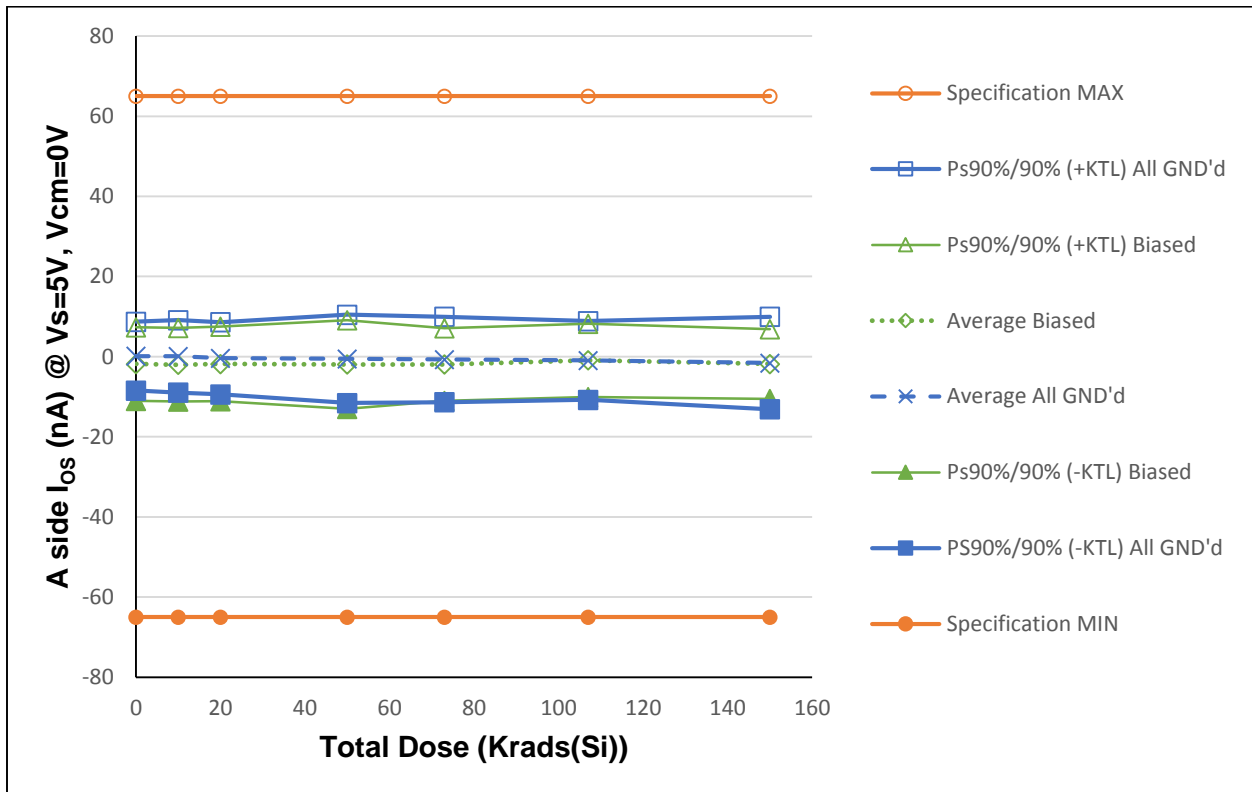


Figure 5.64: Plot of Input Offset Current I_{OS} (side A) @ $V_{cm} = 0V$ versus Total Dose

Table 5.64: Raw data for input offset current (side A) @ Vcm = 0V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	I_{OS} @ Vs=5V, Vcm=0V	0	10	20	50	73	107	150
	(nA)							
826	All GND'd Irradiation	-3.146	-3.649	-3.829	-5.199	-5.292	-4.801	-5.869
827	All GND'd Irradiation	0.047	0.641	-0.191	1.542	0.796	0.683	-0.067
828	All GND'd Irradiation	-1.261	-1.129	-2.000	-2.312	-2.517	-2.590	-3.754
829	All GND'd Irradiation	5.268	5.287	4.942	5.227	5.059	4.435	4.957
830	All GND'd Irradiation	-0.163	-0.743	-0.865	-1.973	-1.539	-2.404	-3.163
821	Biased Irradiation	2.217	1.919	2.483	3.645	2.539	3.818	2.572
822	Biased Irradiation	-1.121	-0.952	-1.111	-1.500	-1.685	-0.655	-1.251
823	Biased Irradiation	-1.533	-2.761	-2.851	-2.913	-2.760	-2.435	-2.938
824	Biased Irradiation	-7.084	-7.205	-6.826	-7.623	-6.670	-5.254	-6.189
825	Biased Irradiation	-1.658	-1.052	-0.865	-1.390	-1.154	-0.003	-1.315
832	Control Unit	3.586	2.504	2.717	3.276	2.616	2.729	1.946
833	Control Unit	-1.929	-2.032	-1.926	-1.820	-1.628	-1.764	-2.159
All GND'd Irradiation Statistics								
	Average All GND'd	0.149	0.081	-0.388	-0.543	-0.698	-0.935	-1.579
	Std Dev All GND'd	3.129	3.297	3.283	4.015	3.889	3.581	4.203
	Ps90%/90% (+KTL) All GND'd	8.729	9.121	8.614	10.467	9.965	8.884	9.945
	PS90%/90% (-KTL) All GND'd	-8.430	-8.958	-9.391	-11.553	-11.362	-10.755	-13.103
Biased Irradiation Statistics								
	Average Biased	-1.836	-2.010	-1.834	-1.956	-1.946	-0.906	-1.824
	Std Dev Biased	3.339	3.355	3.393	4.029	3.309	3.333	3.170
	Ps90%/90% (+KTL) Biased	7.320	7.189	7.470	9.092	7.126	8.233	6.869
	Ps90%/90% (-KTL) Biased	-10.992	-11.209	-11.138	-13.004	-11.018	-10.045	-10.518
	Specification MIN	-65	-65	-65	-65		-65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	65	65	65	65		65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

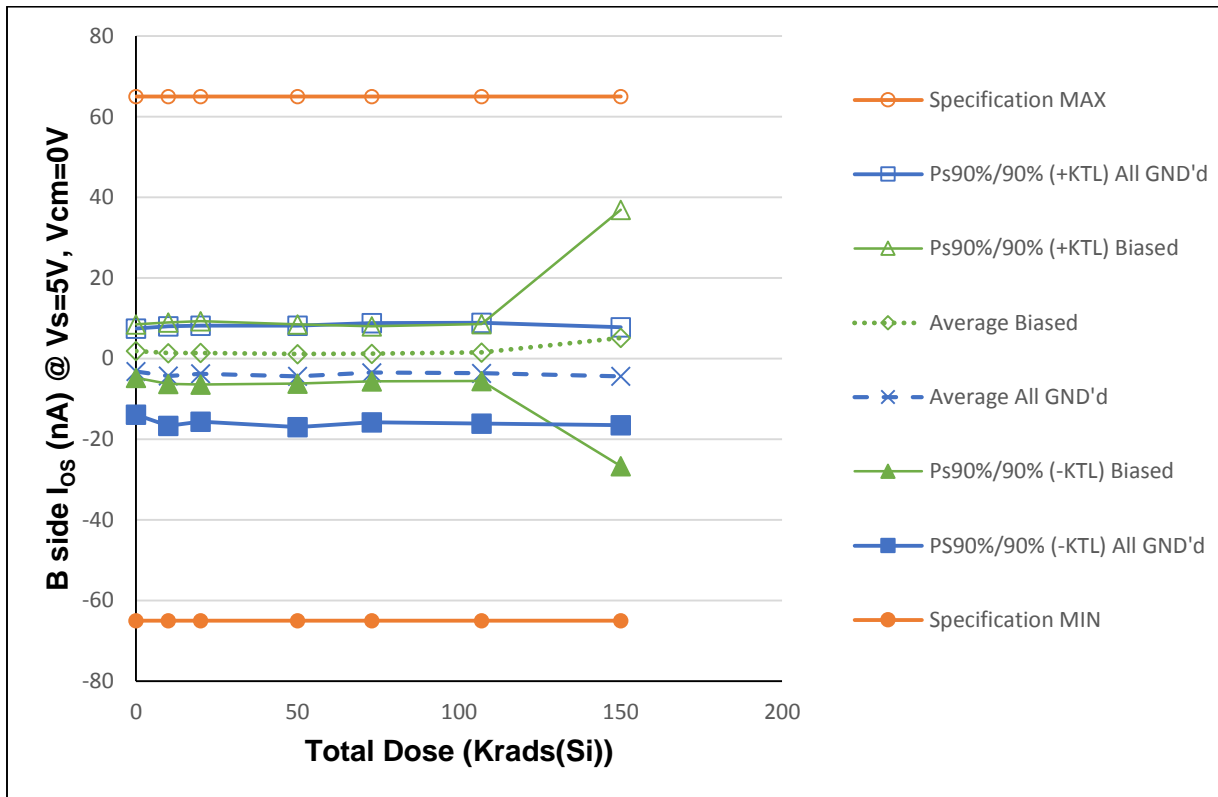


Figure 5.65: Plot of Input Offset Current I_{os} (side B) @ $V_{cm} = 0V$ versus Total Dose

Table 5.65: Raw data for input offset current (side B) @ Vcm = 0V versus total dose including the statistical calculations, minimum specification, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B I_{OS} @ Vs=5V, Vcm=0V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(nA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-8.130	-10.307	-9.512	-10.073	-8.778	-9.567	-10.036
827	All GND'd Irradiation	-4.051	-4.857	-4.320	-4.941	-4.621	-3.502	-4.976
828	All GND'd Irradiation	2.441	1.592	1.707	1.241	2.017	1.871	0.893
829	All GND'd Irradiation	-4.494	-6.216	-5.698	-7.185	-6.207	-6.462	-6.872
830	All GND'd Irradiation	-1.711	-1.755	-0.865	-0.906	0.222	-0.541	-0.903
821	Biased Irradiation	4.322	3.512	3.599	3.249	2.909	3.898	1.996
822	Biased Irradiation	4.628	4.921	5.035	4.392	4.360	4.096	25.597
823	Biased Irradiation	0.662	0.522	0.624	0.734	0.938	1.806	1.568
824	Biased Irradiation	-0.621	-1.686	-1.968	-2.122	-1.950	-1.615	-0.877
825	Biased Irradiation	0.356	-0.519	-0.294	-0.544	-0.239	-0.533	-2.628
832	Control Unit	-0.865	-1.966	-1.504	-2.076	-1.582	-1.707	-2.262
833	Control Unit	2.048	0.761	1.253	0.753	0.754	1.045	0.347
All GND'd Irradiation Statistics								
	Average All GND'd	-3.189	-4.309	-3.737	-4.373	-3.473	-3.640	-4.379
	Std Dev All GND'd	3.897	4.507	4.342	4.589	4.493	4.558	4.429
	Ps90%/90% (+KTL) All GND'd	7.496	8.050	8.168	8.212	8.845	8.857	7.764
	PS90%/90% (-KTL) All GND'd	-13.874	-16.667	-15.643	-16.957	-15.792	-16.138	-16.522
Biased Irradiation Statistics								
	Average Biased	1.869	1.350	1.399	1.142	1.204	1.530	5.131
	Std Dev Biased	2.428	2.776	2.866	2.677	2.498	2.570	11.594
	Ps90%/90% (+KTL) Biased	8.526	8.962	9.258	8.482	8.054	8.577	36.922
	Ps90%/90% (-KTL) Biased	-4.787	-6.262	-6.460	-6.198	-5.646	-5.516	-26.660
	Specification MIN	-65	-65	-65	-65		-65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX	65	65	65	65		65	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

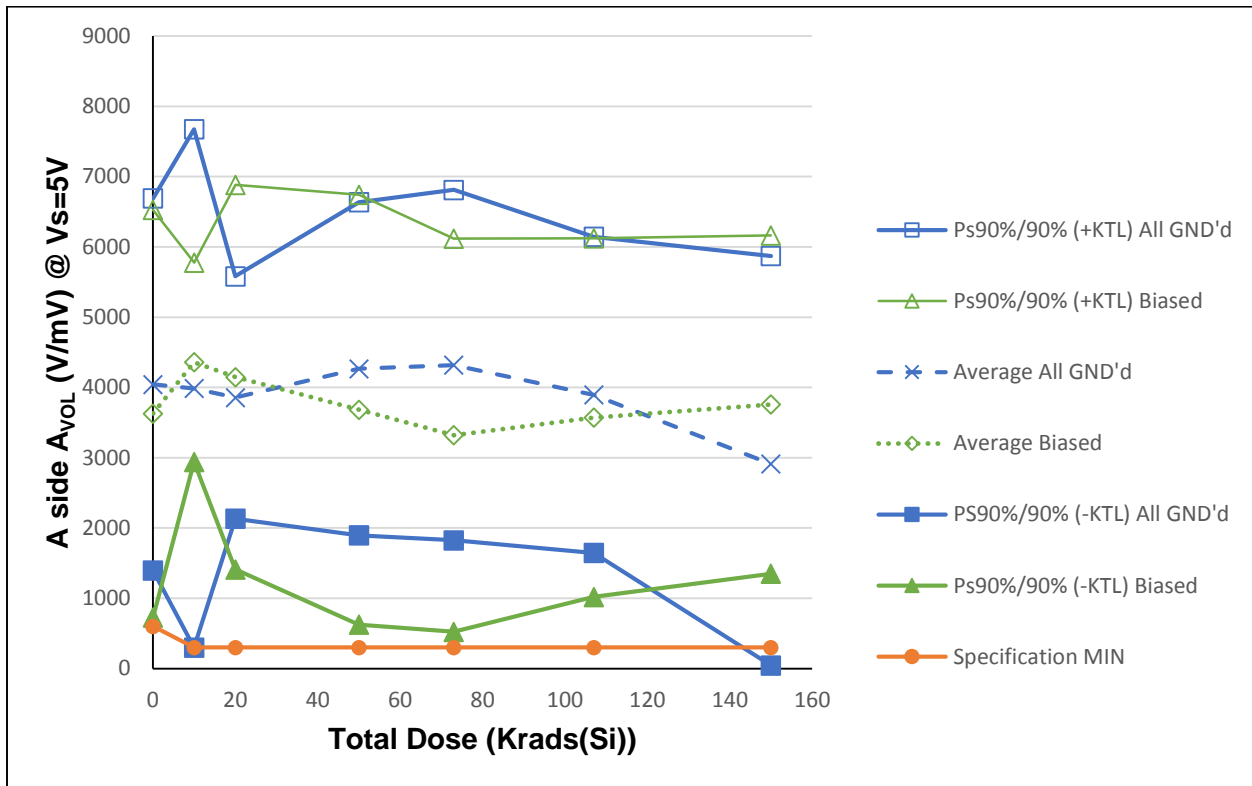


Figure 5.66: Plot of Large Signal Voltage Gain A_{VOL} (side A) @ $V_s = 5V$ versus Total Dose

Table 5.66: Raw data for A-side large signal voltage gain @ $V_s = 5V$ versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A-side GAIN ($R_L = 10K\Omega$)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(V/mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	4725	1626	3382	4725	4725	4725	2276
827	All GND'd Irradiation	2669	4725	4725	2739	4725	2897	2955
828	All GND'd Irradiation	3374	4725	3859	4725	4725	4507	2640
829	All GND'd Irradiation	4725	4725	3148	4415	2692	4191	1968
830	All GND'd Irradiation	4725	4136	4172	4725	4725	3156	4725
821	Biased Irradiation	4725	4001	4492	2063	2614	4366	2668
822	Biased Irradiation	2341	4725	4725	4725	3675	4725	4725
823	Biased Irradiation	4725	4725	4418	4725	4725	3307	3809
824	Biased Irradiation	3191	4725	4725	3637	3511	2851	4486
825	Biased Irradiation	3159	3624	2380	3265	2084	2616	3103
832	Control Unit	4085	4725	4725	2719	3327	4725	4725
833	Control Unit	2089	3746	2497	2695	1987	1944	4725
All GND'd Irradiation Statistics								
	Average All GND'd	4044	3987	3857	4266	4318	3895	2913
	Std Dev All GND'd	966	1344	629	864	909	820	1079
	Ps90%/90% (+KTL) All GND'd	6691	7674	5581	6635	6812	6145	5872
	PS90%/90% (-KTL) All GND'd	1396	301	2133	1896	1825	1646	46
Biased Irradiation Statistics								
	Average Biased	3628	4360	4148	3683	3322	3573	3758
	Std Dev Biased	1058	517	998	1115	1020	931	878
	Ps90%/90% (+KTL) Biased	6528	5778	6885	6740	6119	6125	6166
	Ps90%/90% (-KTL) Biased	728	2942	1411	626	525	1021	1350
	Specification MIN	600	300	300	300		300	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

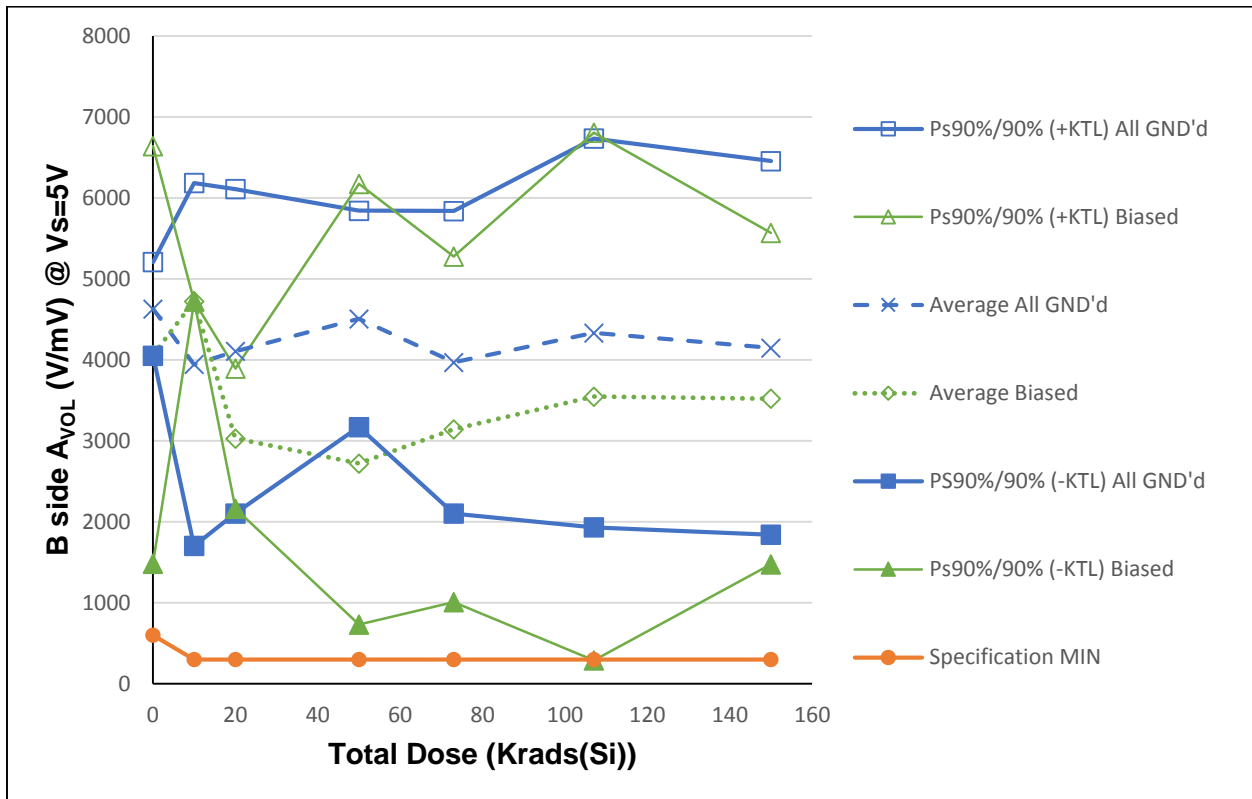


Figure 5.67: Plot of Large Signal Voltage Gain A_{VOL} (side B) @ $V_s = 5V$ versus Total Dose

All measured data of ten samples are higher than the MIN specification limit.

Note: The computed – KTL point of Biased Irradiation at 107 Krad(Si) is slightly lower than the MIN specification limit due the small 5-piece sample size.

Table 5.67 Raw data for B-side large signal voltage gain @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B-side GAIN (R _L = 10KΩ)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(V/mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	4725	4725	4434	4725	3610	4725	4725
827	All GND'd Irradiation	4725	3093	3176	4725	4725	4725	4725
828	All GND'd Irradiation	4725	4076	3477	4725	3439	4725	2872
829	All GND'd Irradiation	4725	4725	4725	4725	3382	4725	4725
830	All GND'd Irradiation	4254	3101	4725	3636	4698	2768	3696
821	Biased Irradiation	4725	4725	3511	3033	2277	4725	3955
822	Biased Irradiation	2721	4725	2742	2047	2315	3544	4375
823	Biased Irradiation	4725	4725	3109	1438	3769	2610	3373
824	Biased Irradiation	3412	4725	3032	4725	3788	4725	2385
825	Biased Irradiation	4725	4725	2752	2362	3568	2135	3517
832	Control Unit	3698	2817	3547	4092	4725	3070	4725
833	Control Unit	3294	4725	4725	4725	4725	4725	4725
All GND'd Irradiation Statistics								
	Average All GND'd	4631	3944	4107	4507	3971	4334	4149
	Std Dev All GND'd	211	817	730	487	681	875	841
	Ps90%/90% (+KTL) All GND'd	5208	6185	6110	5843	5839	6734	6455
	PS90%/90% (-KTL) All GND'd	4053	1703	2105	3172	2102	1933	1842
Biased Irradiation Statistics								
	Average Biased	4061	4725	3029	2721	3143	3548	3521
	Std Dev Biased	941	0	315	1259	778	1188	746
	Ps90%/90% (+KTL) Biased	6641	4725	3894	6174	5278	6806	5568
	Ps90%/90% (-KTL) Biased	1482	4725	2164	732	1009	289	1474
	Specification MIN	600	300	300	300		300	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		FAIL	
	Status (+KTL) Biased							

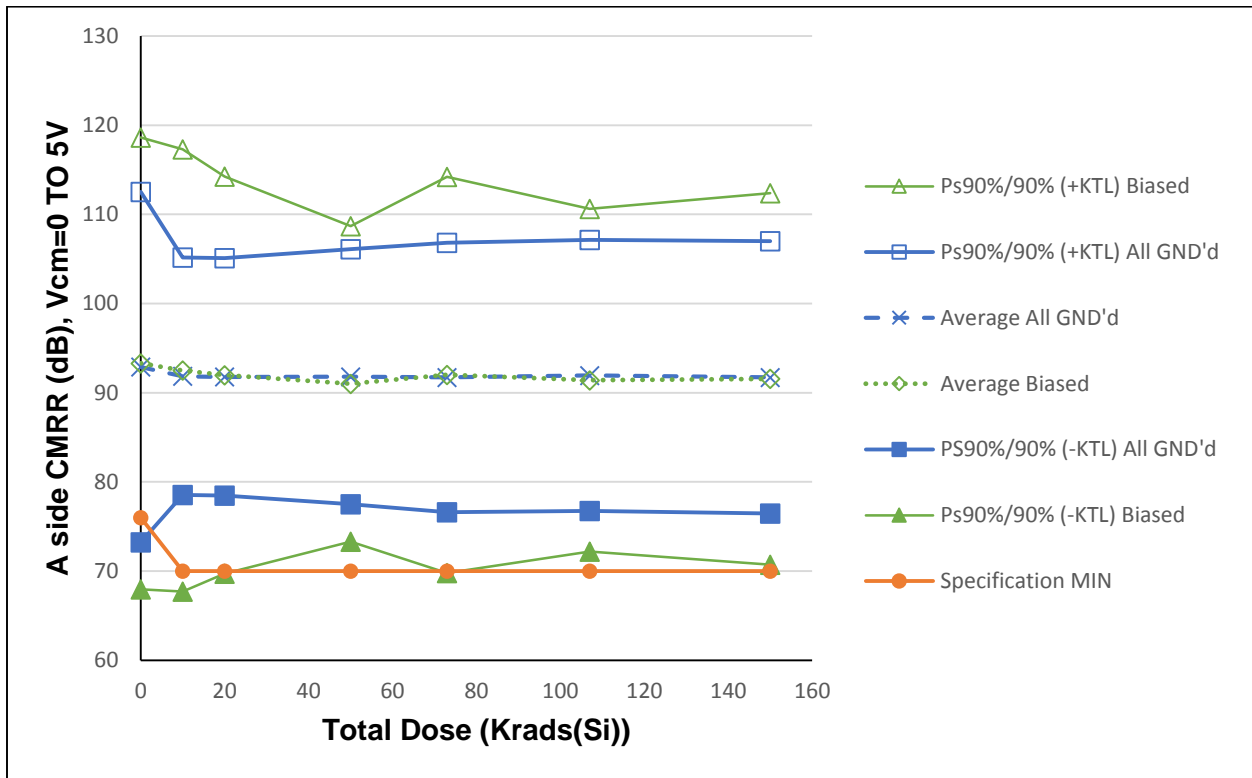


Figure 5.68: Plot of CMRR (side A) @ Vs = 5V versus Total Dose

All measured data of ten samples are higher than the MIN specification limit.

Note: The computed – KTL point of Biased Irradiation at 0, 10, 20 Krads(Si) are slightly lower than the MIN specification limit due the small 5-piece sample size.

Table 5.68: Raw data for A-side common mode rejection ratio @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A CMRR, Vcm=0 TO 5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(dB)	0	10	20	50	73	107	150
826	All GND'd Irradiation	84.650	85.312	85.321	85.217	84.970	85.438	85.103
827	All GND'd Irradiation	90.163	91.868	91.592	91.119	90.478	90.856	90.224
828	All GND'd Irradiation	103.856	93.929	93.791	93.645	93.672	93.351	93.546
829	All GND'd Irradiation	95.083	98.384	98.435	99.342	99.850	100.424	100.105
830	All GND'd Irradiation	90.678	89.745	89.708	89.646	89.587	89.593	89.619
821	Biased Irradiation	88.919	86.340	86.338	86.320	86.326	85.808	86.468
822	Biased Irradiation	89.536	88.151	87.820	87.669	87.431	87.429	87.190
823	Biased Irradiation	88.713	90.919	90.838	89.911	90.961	90.666	89.780
824	Biased Irradiation	89.502	88.608	88.671	88.762	89.162	89.597	89.399
825	Biased Irradiation	109.809	108.395	106.198	102.294	106.152	103.467	104.899
832	Control Unit	81.637	83.466	83.519	83.751	83.562	83.590	83.436
833	Control Unit	101.229	97.260	98.795	99.174	97.759	98.385	98.122
All GND'd Irradiation Statistics								
Average All GND'd		92.886	91.848	91.770	91.794	91.711	91.932	91.719
Std Dev All GND'd		7.164	4.853	4.858	5.214	5.513	5.544	5.569
Ps90%/90% (+KTL) All GND'd		112.529	105.154	105.089	106.090	106.827	107.133	106.991
PS90%/90% (-KTL) All GND'd		73.242	78.541	78.450	77.498	76.596	76.731	76.448
Biased Irradiation Statistics								
Average Biased		93.296	92.482	91.973	90.991	92.006	91.393	91.547
Std Dev Biased		9.238	9.044	8.117	6.456	8.101	7.008	7.596
Ps90%/90% (+KTL) Biased		118.626	117.280	114.229	108.695	114.219	110.609	112.376
Ps90%/90% (-KTL) Biased		67.965	67.685	69.716	73.288	69.794	72.178	70.718
Specification MIN		76	70	70	70		70	
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Specification MAX								
Status (Measurements) All GND'd								
Status (Measurements) Biased								
Status (-KTL) All GND'd		FAIL	PASS	PASS	PASS		PASS	
Status (+KTL) All GND'd								
Status (-KTL) Biased		FAIL	FAIL	FAIL	PASS		PASS	
Status (+KTL) Biased								

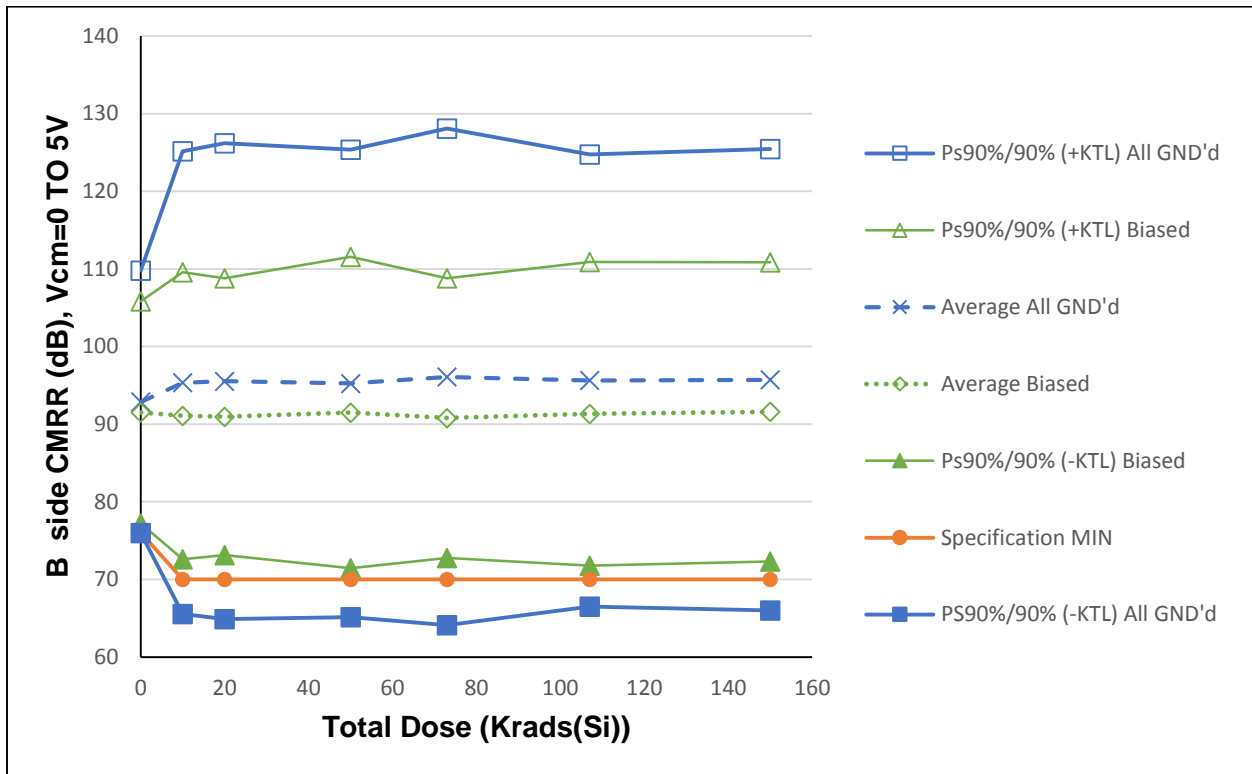


Figure 5.69: Plot of CMRR (side B) @ Vs = 5V versus Total Dose

All measured data of ten samples are higher than the MIN specification limit.

Note: The computed - KTL line of All GND'd Irradiation is slightly lower than the MIN specification limit due the small 5-piece sample size (serial number 828 originally has the highest value among five).

Table 5.69: Raw data for B-side common mode rejection ratio @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B CMRR, Vcm=0 TO 5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second							
		Units	(dB)	0	10	20	50	73	107
826	All GND'd Irradiation		85.291	85.558	85.566	85.736	85.373	85.806	85.564
827	All GND'd Irradiation		91.903	89.377	89.485	89.334	89.465	89.420	89.576
828	All GND'd Irradiation		101.760	112.500	113.437	113.134	114.019	111.801	112.114
829	All GND'd Irradiation		90.001	89.863	89.999	89.855	90.131	90.342	90.181
830	All GND'd Irradiation		95.422	99.449	99.134	98.151	101.463	100.776	101.181
821	Biased Irradiation		94.445	96.061	95.969	96.723	94.008	95.086	94.819
822	Biased Irradiation		90.816	87.585	87.904	88.572	88.147	89.140	90.546
823	Biased Irradiation		98.841	100.243	99.579	101.473	100.641	101.775	101.880
824	Biased Irradiation		86.289	87.157	87.008	86.495	86.942	86.619	86.448
825	Biased Irradiation		87.181	84.324	84.263	84.167	84.181	84.029	84.245
832	Control Unit		97.165	94.998	94.537	94.681	94.705	95.013	95.004
833	Control Unit		86.257	89.841	89.990	90.121	89.514	89.651	89.608
All GND'd Irradiation Statistics									
Average All GND'd			92.875	95.349	95.524	95.242	96.090	95.629	95.723
Std Dev All GND'd			6.168	10.870	11.181	10.987	11.668	10.618	10.841
Ps90%/90% (+KTL) All GND'd			109.787	125.154	126.182	125.369	128.083	124.744	125.450
PS90%/90% (-KTL) All GND'd			75.963	65.544	64.866	65.115	64.097	66.514	65.997
Biased Irradiation Statistics									
Average Biased			91.514	91.074	90.945	91.486	90.784	91.330	91.588
Std Dev Biased			5.216	6.746	6.504	7.317	6.574	7.133	7.032
Ps90%/90% (+KTL) Biased			105.817	109.570	108.777	111.548	108.809	110.888	110.869
Ps90%/90% (-KTL) Biased			77.211	72.578	73.112	71.424	72.758	71.771	72.306
Specification MIN			76	70	70	70		70	
Status (Measurements) All GND'd			PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased			PASS	PASS	PASS	PASS		PASS	
Specification MAX									
Status (Measurements) All GND'd									
Status (Measurements) Biased									
Status (-KTL) All GND'd			FAIL	FAIL	FAIL	FAIL		FAIL	
Status (+KTL) All GND'd									
Status (-KTL) Biased			PASS	PASS	PASS	PASS		PASS	
Status (+KTL) Biased									

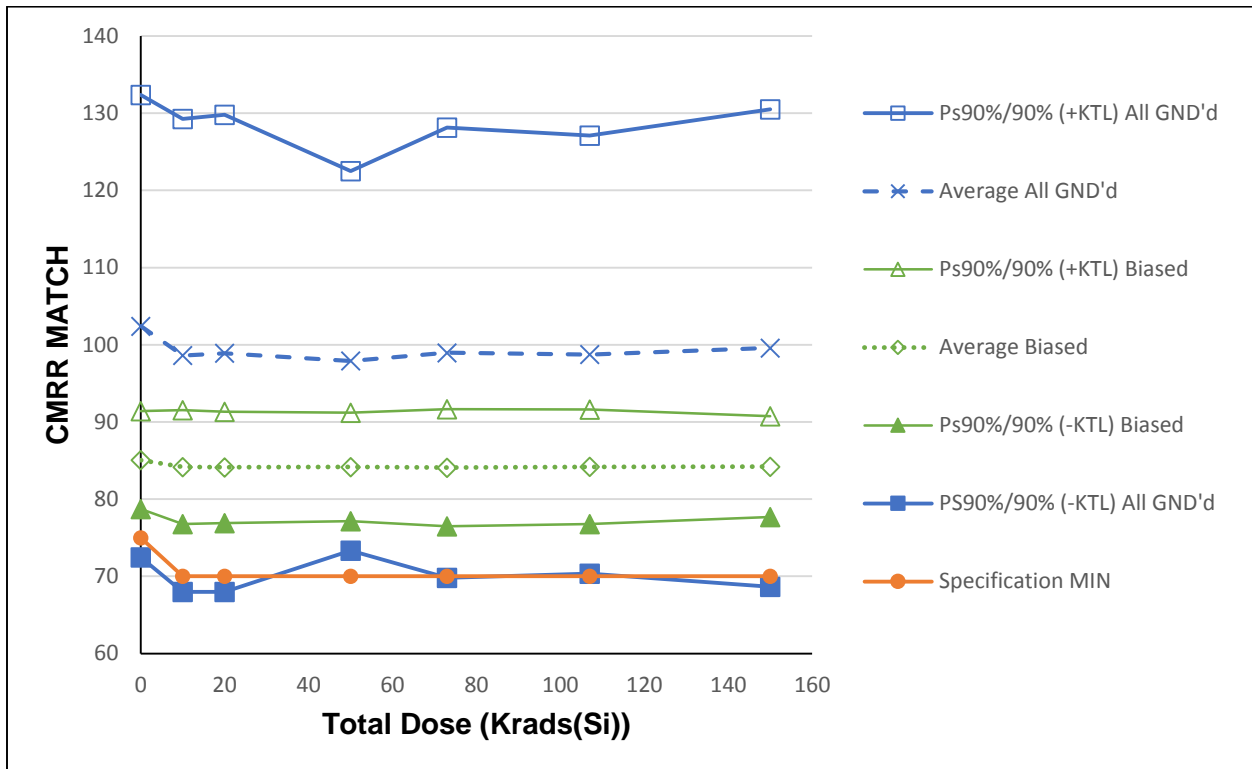


Figure 5.70: Plot of CMRR Match @ $V_s = 5V$ versus Total Dose

All measured data of ten samples are higher than the MIN specification limit.

Note: The computed - KTL point of All GND'd Irradiation at 0, 10, 20 Krad(Si) are slightly lower than the MIN specification limit due the small 5-piece sample size.

Table 5.70: Raw data for common mode rejection ratio match @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter Units	CMRR MATCH (dB)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	107.608	116.389	116.418	109.949	111.848	113.059	110.823
827	All GND'd Irradiation	104.984	101.439	102.818	103.951	108.628	105.764	112.448
828	All GND'd Irradiation	115.138	95.018	94.747	94.619	94.549	94.457	94.636
829	All GND'd Irradiation	86.155	87.097	87.210	87.343	87.676	87.975	87.776
830	All GND'd Irradiation	98.195	93.188	93.289	93.737	92.141	92.398	92.284
821	Biased Irradiation	85.229	83.885	83.862	84.029	83.323	83.242	83.656
822	Biased Irradiation	84.132	81.843	81.842	82.088	81.761	82.222	82.686
823	Biased Irradiation	86.357	88.365	88.132	87.875	88.497	88.533	87.853
824	Biased Irradiation	81.727	81.832	81.779	81.534	81.961	81.960	81.778
825	Biased Irradiation	87.848	84.886	84.988	85.318	84.902	85.008	85.091
832	Control Unit	80.293	81.423	81.366	81.579	81.437	81.524	81.401
833	Control Unit	87.964	94.658	93.905	93.899	93.765	93.607	93.694
All GND'd Irradiation Statistics								
Average All GND'd		102.416	98.626	98.897	97.920	98.968	98.731	99.593
Std Dev All GND'd		10.928	11.168	11.265	8.963	10.640	10.354	11.281
Ps90%/90% (+KTL) All GND'd		132.380	129.250	129.786	122.496	128.143	127.121	130.525
PS90%/90% (-KTL) All GND'd		72.452	68.002	68.007	73.343	69.794	70.340	68.662
Biased Irradiation Statistics								
Average Biased		85.059	84.162	84.120	84.169	84.089	84.193	84.213
Std Dev Biased		2.316	2.696	2.626	2.566	2.767	2.705	2.377
Ps90%/90% (+KTL) Biased		91.409	91.555	91.321	91.205	91.676	91.611	90.729
Ps90%/90% (-KTL) Biased		78.708	76.770	76.920	77.132	76.502	76.775	77.696
Specification MIN		75	70	70	70		70	
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Specification MAX								
Status (Measurements) All GND'd								
Status (Measurements) Biased								
Status (-KTL) All GND'd		FAIL	FAIL	FAIL	PASS		PASS	
Status (+KTL) All GND'd								
Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
Status (+KTL) Biased								

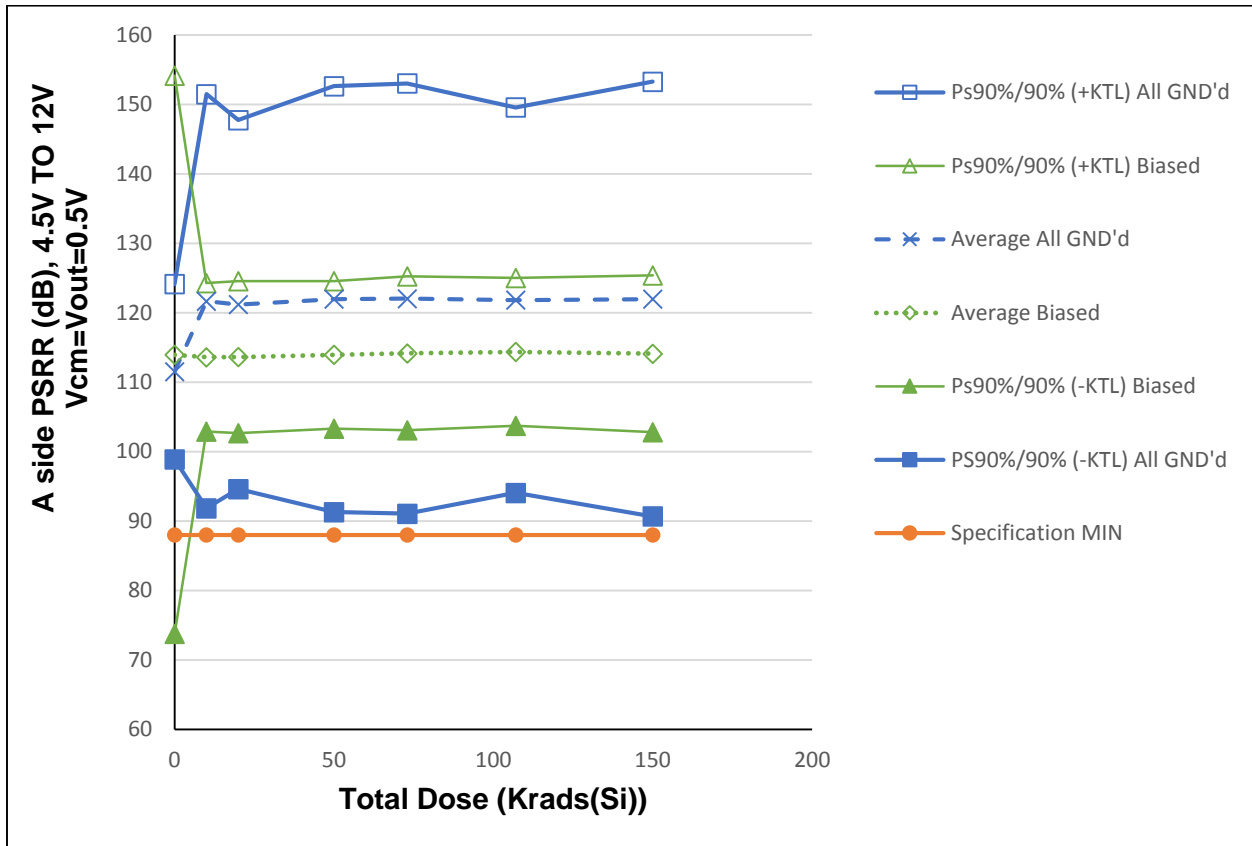


Figure 5.71: Plot of PSRR (side A) @ $V_s = 5V$ versus Total Dose

Table 5.71: Raw data for power supply rejection ratio (side A) @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A PSRR,4.5-12V VCM=VOUT=0.5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(dB)	0	10	20	50	73	107	150
826	All GND'd Irradiation	106.130	109.897	110.050	110.421	109.619	110.419	110.111
827	All GND'd Irradiation	108.599	114.985	115.448	114.268	114.784	114.997	114.351
828	All GND'd Irradiation	117.646	137.501	134.219	137.501	137.501	133.866	137.501
829	All GND'd Irradiation	110.724	118.739	118.523	118.376	118.885	119.045	117.892
830	All GND'd Irradiation	114.506	127.222	127.641	129.303	129.448	130.792	130.020
821	Biased Irradiation	108.368	113.286	113.823	114.862	114.478	115.491	114.735
822	Biased Irradiation	108.874	114.891	114.496	115.523	117.398	116.706	116.802
823	Biased Irradiation	109.295	115.871	116.272	116.181	115.203	115.976	115.833
824	Biased Irradiation	103.426	107.049	106.787	107.078	107.217	107.462	106.871
825	Biased Irradiation	139.825	116.928	116.694	116.079	116.491	116.170	116.251
832	Control Unit	105.617	109.575	109.627	109.769	109.509	109.673	109.529
833	Control Unit	136.039	114.524	116.169	115.836	115.837	116.992	116.081
All GND'd Irradiation Statistics								
	Average All GND'd	111.521	121.669	121.176	121.974	122.047	121.824	121.975
	Std Dev All GND'd	4.601	10.878	9.690	11.187	11.301	10.122	11.416
	Ps90%/90% (+KTL) All GND'd	124.136	151.497	147.746	152.649	153.034	149.579	153.279
	PS90%/90% (-KTL) All GND'd	98.906	91.841	94.606	91.298	91.061	94.068	90.671
Biased Irradiation Statistics								
	Average Biased	113.957	113.605	113.614	113.945	114.157	114.361	114.098
	Std Dev Biased	14.653	3.903	4.000	3.874	4.041	3.881	4.110
	Ps90%/90% (+KTL) Biased	154.136	124.306	124.581	124.567	125.237	125.003	125.369
	Ps90%/90% (-KTL) Biased	73.779	102.904	102.648	103.322	103.077	103.719	102.827
	Specification MIN	88	88	88	88		88	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	FAIL	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

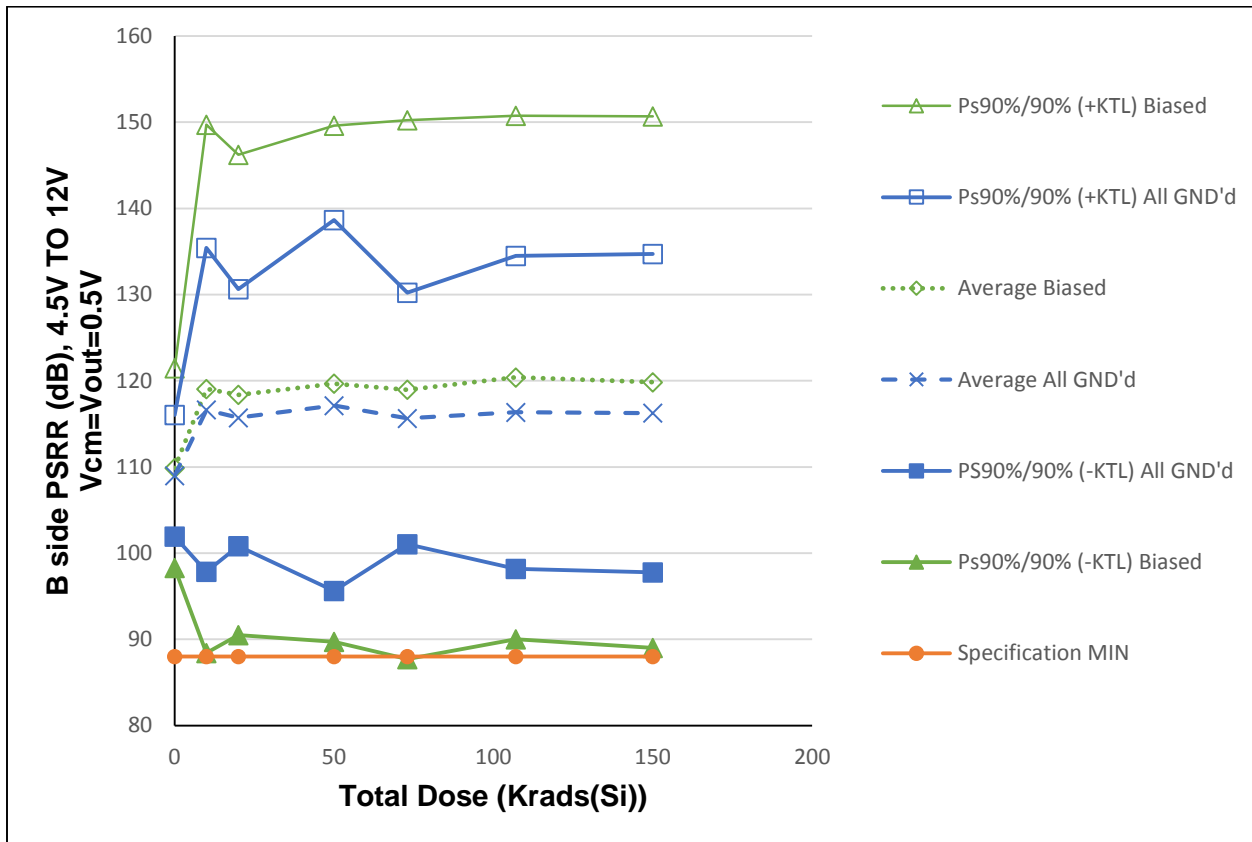


Figure 5.72: Plot of PSRR (side B) @ Vs = 5V versus Total Dose

Table 5.72: Raw data for power supply rejection ratio (side B) @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B PSRR,4.5-12V VCM=VOUT=0.5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(dB)	0	10	20	50	73	107	150
826	All GND'd Irradiation	108.544	114.657	114.287	114.085	114.585	114.700	113.948
827	All GND'd Irradiation	106.897	111.693	111.663	112.237	111.792	112.138	111.914
828	All GND'd Irradiation	113.447	128.550	125.192	131.055	124.982	128.044	128.178
829	All GND'd Irradiation	108.295	115.654	114.736	114.869	113.895	114.003	114.436
830	All GND'd Irradiation	107.723	112.602	112.725	113.367	112.986	112.808	112.783
821	Biased Irradiation	112.693	121.475	121.146	122.553	122.374	125.510	124.476
822	Biased Irradiation	115.769	137.501	134.898	137.501	137.501	137.501	137.501
823	Biased Irradiation	105.491	109.733	109.602	110.538	109.917	111.027	110.202
824	Biased Irradiation	107.787	113.647	113.050	114.308	112.441	114.600	113.718
825	Biased Irradiation	107.620	112.915	113.171	113.417	112.623	113.288	113.319
832	Control Unit	114.646	129.619	129.139	132.287	130.246	128.100	130.333
833	Control Unit	106.291	110.431	110.297	110.363	110.421	110.275	110.235
All GND'd Irradiation Statistics								
Average All GND'd		108.981	116.631	115.720	117.123	115.648	116.339	116.252
Std Dev All GND'd		2.575	6.847	5.435	7.848	5.322	6.619	6.740
Ps90%/90% (+KTL) All GND'd		116.042	135.406	130.624	138.643	130.241	134.489	134.732
PS90%/90% (-KTL) All GND'd		101.920	97.856	100.817	95.602	101.055	98.188	97.772
Biased Irradiation Statistics								
Average Biased		109.872	119.054	118.373	119.663	118.971	120.385	119.843
Std Dev Biased		4.223	11.180	10.162	10.926	11.400	11.075	11.251
Ps90%/90% (+KTL) Biased		121.452	149.710	146.239	149.623	150.231	150.753	150.692
Ps90%/90% (-KTL) Biased		98.292	88.399	90.508	89.704	87.711	90.017	88.994
Specification MIN		88	88	88	88		88	
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Specification MAX								
Status (Measurements) All GND'd								
Status (Measurements) Biased								
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (+KTL) All GND'd								
Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
Status (+KTL) Biased								

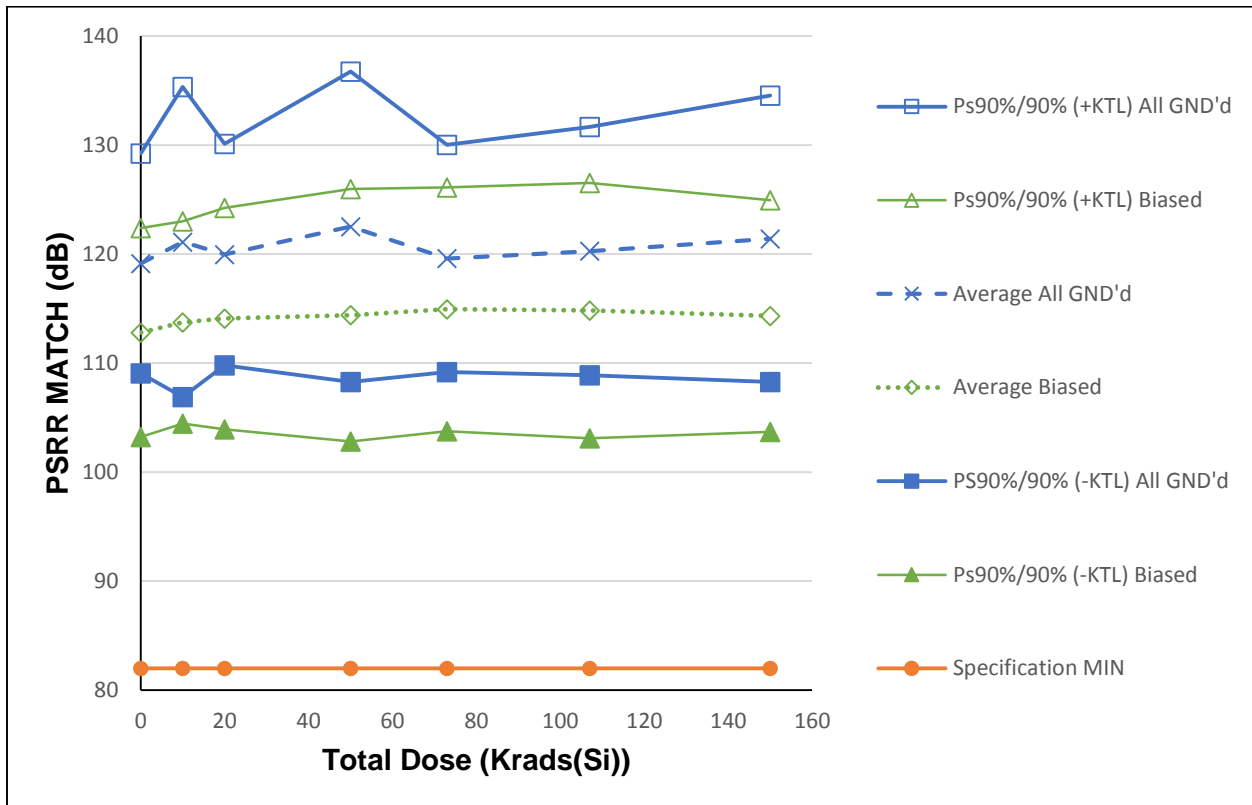


Figure 5.73: Plot of PSRR Match @ Vs = 5V versus Total Dose

Table 5.73: Raw data for power supply rejection ratio match @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter Units	PSRR MATCH (dB)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	118.431	117.393	118.317	119.687	116.840	118.616	119.056
827	All GND'd Irradiation	121.892	121.714	120.701	125.857	122.502	123.180	124.143
828	All GND'd Irradiation	121.774	125.900	122.562	127.673	123.138	124.456	125.624
829	All GND'd Irradiation	120.548	126.142	123.770	124.441	121.085	121.125	124.112
830	All GND'd Irradiation	113.043	114.387	114.444	114.878	114.400	113.979	114.068
821	Biased Irradiation	116.498	117.573	118.712	119.483	118.958	118.784	118.159
822	Biased Irradiation	114.100	114.270	115.367	114.858	116.579	115.947	116.035
823	Biased Irradiation	114.495	115.638	115.019	116.953	116.739	118.271	116.632
824	Biased Irradiation	111.501	112.529	112.571	112.038	114.114	112.492	112.138
825	Biased Irradiation	107.410	108.671	108.735	108.626	108.323	108.589	108.641
832	Control Unit	109.408	110.485	110.598	110.444	110.347	110.782	110.359
833	Control Unit	106.012	106.218	106.725	106.655	106.693	106.979	106.655
All GND'd Irradiation Statistics								
	Average All GND'd	119.138	121.107	119.959	122.507	119.593	120.271	121.400
	Std Dev All GND'd	3.680	5.187	3.707	5.192	3.801	4.154	4.795
	Ps90%/90% (+KTL) All GND'd	129.227	135.331	130.123	136.742	130.016	131.662	134.549
	PS90%/90% (-KTL) All GND'd	109.048	106.883	109.795	108.272	109.170	108.880	108.252
Biased Irradiation Statistics								
	Average Biased	112.801	113.736	114.081	114.391	114.943	114.817	114.321
	Std Dev Biased	3.499	3.381	3.703	4.227	4.078	4.276	3.874
	Ps90%/90% (+KTL) Biased	122.395	123.008	124.234	125.983	126.126	126.541	124.943
	Ps90%/90% (-KTL) Biased	103.206	104.464	103.928	102.800	103.760	103.092	103.698
	Specification MIN	82	82	82	82		82	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

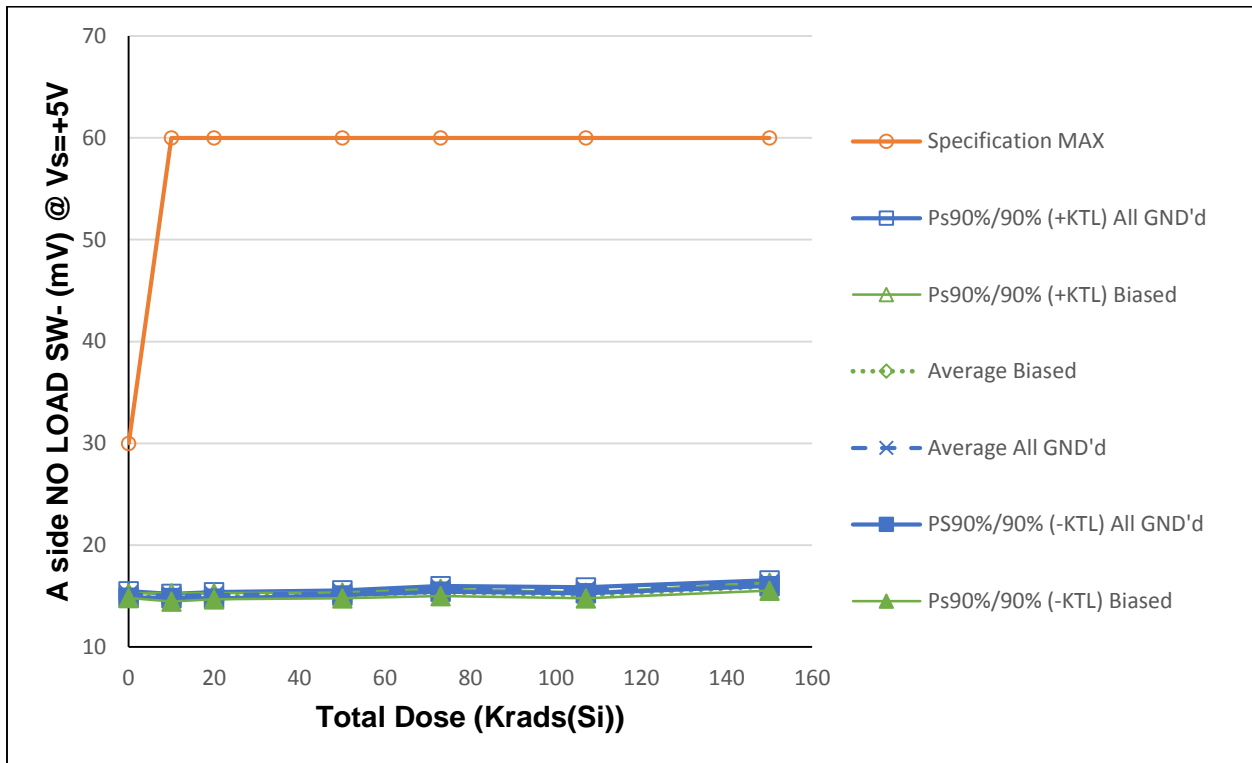


Figure 5.74: Plot of Output Voltage Swing Low with No Load @ Vs = 5V versus Total Dose (side A)

Table 5.74: Raw data for output voltage swing low with No Load (side A) @ Vs = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A	NO LOAD SW- @ Vs=+5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units		(mV)	0	10	20	50	73	107	150
826		All GND'd Irradiation	14.994	14.919	14.912	15.187	15.764	15.408	16.092
827		All GND'd Irradiation	15.156	14.996	14.998	15.306	15.840	15.522	16.290
828		All GND'd Irradiation	15.204	15.091	15.179	15.366	15.737	15.641	16.359
829		All GND'd Irradiation	15.316	15.093	15.143	15.423	15.636	15.620	16.323
830		All GND'd Irradiation	15.182	15.031	15.143	15.302	15.595	15.656	16.302
821		Biased Irradiation	15.104	15.032	15.064	15.002	15.427	14.970	16.044
822		Biased Irradiation	15.054	14.895	14.986	15.166	15.345	15.184	15.909
823		Biased Irradiation	15.126	14.936	15.047	15.073	15.425	15.065	15.937
824		Biased Irradiation	14.901	14.628	14.799	14.963	15.160	14.960	15.701
825		Biased Irradiation	15.092	14.879	15.026	15.204	15.501	15.172	16.061
832		Control Unit	15.030	14.742	14.590	14.311	14.773	14.706	15.020
833		Control Unit	15.052	14.802	14.568	14.399	14.965	14.723	15.005
All GND'd Irradiation Statistics									
		Average All GND'd	15.171	15.026	15.075	15.317	15.714	15.569	16.273
		Std Dev All GND'd	0.116	0.072	0.115	0.088	0.099	0.104	0.105
		Ps90%/90% (+KTL) All GND'd	15.488	15.224	15.389	15.558	15.986	15.855	16.560
		PS90%/90% (-KTL) All GND'd	14.853	14.828	14.761	15.076	15.443	15.284	15.986
Biased Irradiation Statistics									
		Average Biased	15.056	14.874	14.984	15.082	15.372	15.070	15.931
		Std Dev Biased	0.090	0.150	0.108	0.103	0.131	0.107	0.144
		Ps90%/90% (+KTL) Biased	15.303	15.285	15.279	15.364	15.730	15.363	16.326
		Ps90%/90% (-KTL) Biased	14.808	14.464	14.690	14.799	15.014	14.778	15.535
		Specification MIN							
		Status (Measurements) All GND'd							
		Status (Measurements) Biased							
		Specification MAX	30	60	60	60	60	60	
		Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
		Status (-KTL) All GND'd							
		Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (-KTL) Biased							
		Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

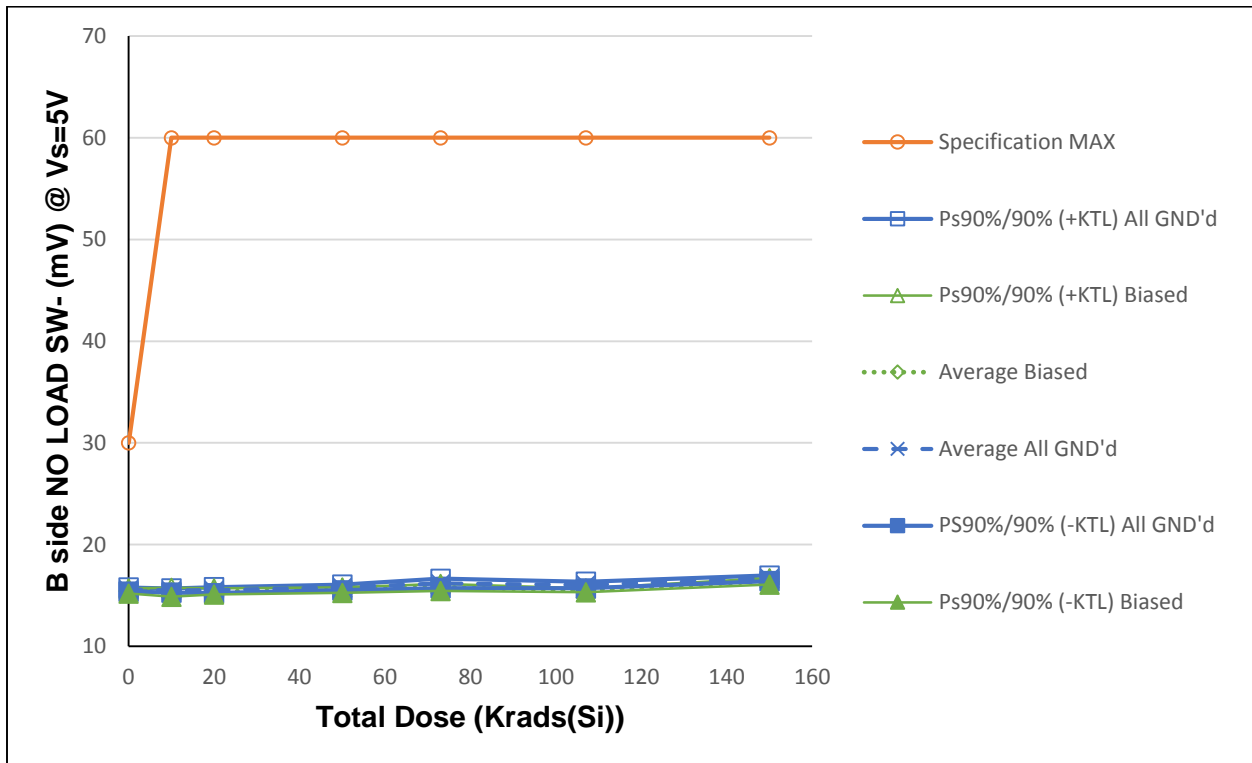


Figure 5.75: Plot of Output Voltage Swing Low with No Load @ Vs = 5V versus Total Dose (side B)

Table 5.75: Raw data for output voltage swing low with No Load (side B) @ Vs = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B	NO LOAD SW- @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units		(mV)	0	10	20	50	73	107	150
826		All GND'd Irradiation	15.499	15.403	15.429	15.747	16.302	15.989	16.643
827		All GND'd Irradiation	15.605	15.530	15.516	15.823	16.343	16.049	16.693
828		All GND'd Irradiation	15.614	15.514	15.602	15.863	16.227	16.103	16.786
829		All GND'd Irradiation	15.545	15.403	15.410	15.649	15.922	15.863	16.550
830		All GND'd Irradiation	15.681	15.566	15.658	15.899	16.112	16.173	16.786
821		Biased Irradiation	15.554	15.588	15.542	15.547	15.924	15.484	16.490
822		Biased Irradiation	15.335	15.203	15.257	15.483	15.691	15.522	16.512
823		Biased Irradiation	15.471	15.259	15.362	15.387	15.747	15.408	16.302
824		Biased Irradiation	15.393	15.203	15.362	15.518	15.691	15.520	16.264
825		Biased Irradiation	15.509	15.355	15.449	15.656	15.941	15.608	16.454
832		Control Unit	15.335	15.129	14.912	14.664	15.080	15.122	15.363
833		Control Unit	15.461	15.208	15.008	14.899	15.425	15.182	15.422
All GND'd Irradiation Statistics									
		Average All GND'd	15.589	15.483	15.523	15.796	16.181	16.035	16.691
		Std Dev All GND'd	0.069	0.076	0.107	0.100	0.169	0.118	0.100
		Ps90%/90% (+KTL) All GND'd	15.779	15.691	15.817	16.070	16.645	16.358	16.966
		PS90%/90% (-KTL) All GND'd	15.398	15.276	15.229	15.523	15.717	15.712	16.416
Biased Irradiation Statistics									
		Average Biased	15.452	15.322	15.394	15.518	15.799	15.509	16.404
		Std Dev Biased	0.088	0.161	0.107	0.098	0.125	0.072	0.114
		Ps90%/90% (+KTL) Biased	15.695	15.764	15.688	15.787	16.140	15.707	16.716
		Ps90%/90% (-KTL) Biased	15.210	14.880	15.101	15.250	15.457	15.310	16.093
Specification MIN									
		Status (Measurements) All GND'd							
		Status (Measurements) Biased							
Specification MAX									
		Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd									
		Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased									
		Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

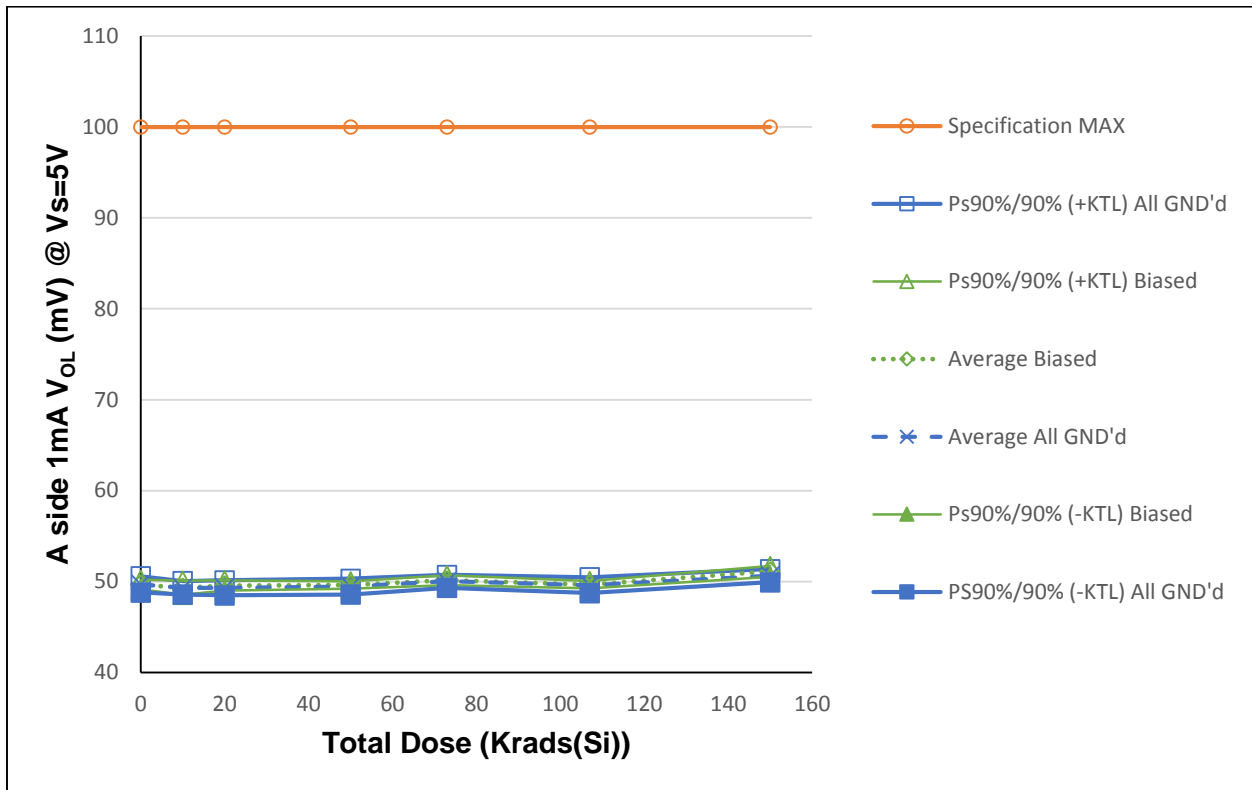


Figure 5.76: Plot of Output Voltage Swing Low with $I_{SINK} = 1mA$ @ $V_s = 5V$ versus Total Dose (side A)

Table 5.76: Raw data for output voltage swing low with $I_{SINK} = 1\text{mA}$ (side A) @ $V_s = 5\text{V}$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A	1mA V_{OL} @ $V_s=5\text{V}$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second							
			Units	(mV)	0	10	20	50	73	107
826		All GND'd Irradiation		49.488	49.150	49.124	49.364	50.231	49.506	50.532
827		All GND'd Irradiation		49.659	49.265	49.211	49.290	50.250	49.468	50.570
828		All GND'd Irradiation		49.319	48.981	48.975	49.059	49.620	49.190	50.329
829		All GND'd Irradiation		50.157	49.652	49.703	49.862	50.104	49.999	50.987
830		All GND'd Irradiation		49.840	49.516	49.538	49.662	49.937	49.827	50.835
821		Biased Irradiation		49.852	49.657	49.777	49.516	50.253	49.558	51.309
822		Biased Irradiation		49.583	49.287	49.545	49.716	50.038	49.827	51.006
823		Biased Irradiation		49.833	49.448	49.701	49.742	50.267	49.675	51.178
824		Biased Irradiation		49.394	48.885	49.239	49.402	49.831	49.468	50.804
825		Biased Irradiation		49.699	49.265	49.566	49.705	50.289	49.739	51.295
832		Control Unit		49.166	48.685	48.409	47.709	48.627	48.635	49.059
833		Control Unit		49.659	49.236	48.934	48.602	49.553	49.044	49.481
All GND'd Irradiation Statistics										
		Average All GND'd		49.693	49.313	49.310	49.447	50.028	49.598	50.651
		Std Dev All GND'd		0.324	0.272	0.301	0.316	0.260	0.318	0.260
		Ps90%/90% (+KTL) All GND'd		50.582	50.057	50.136	50.314	50.742	50.471	51.364
		PS90%/90% (-KTL) All GND'd		48.803	48.568	48.484	48.580	49.314	48.725	49.937
Biased Irradiation Statistics										
		Average Biased		49.673	49.309	49.566	49.616	50.135	49.654	51.118
		Std Dev Biased		0.190	0.284	0.206	0.150	0.198	0.143	0.214
		Ps90%/90% (+KTL) Biased		50.193	50.087	50.131	50.027	50.678	50.045	51.704
		Ps90%/90% (-KTL) Biased		49.152	48.530	49.000	49.206	49.593	49.262	50.533
Specification MIN										
		Status (Measurements) All GND'd								
		Status (Measurements) Biased								
Specification MAX										
		Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
		Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd										
		Status (+KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased										
		Status (+KTL) Biased		PASS	PASS	PASS	PASS		PASS	

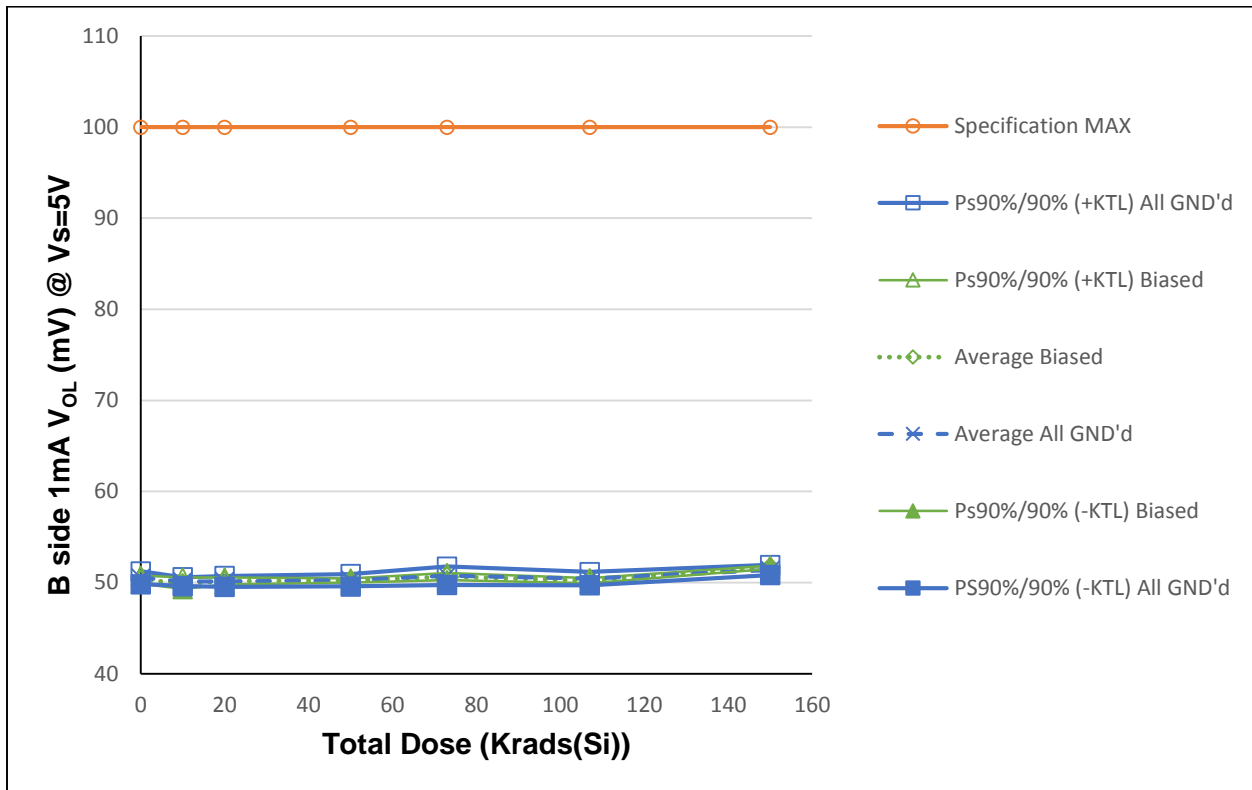


Figure 5.77: Plot of Output Voltage Swing Low with $I_{SINK} = 1mA$ @ $V_s = 5V$ versus Total Dose (side B)

Table 5.77: Raw data for output voltage swing low with $I_{SINK} = 1\text{mA}$ (side B) @ $V_s = 5\text{V}$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter Units	B 1mA V_{OL} @ $V_s=5\text{V}$ (mV)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	50.641	50.182	50.268	50.431	51.242	50.608	51.490
827	All GND'd Irradiation	50.591	50.146	50.081	50.271	51.020	50.375	51.338
828	All GND'd Irradiation	50.098	49.801	49.777	49.842	50.342	49.990	51.042
829	All GND'd Irradiation	50.777	50.239	50.308	50.355	50.640	50.589	51.512
830	All GND'd Irradiation	50.574	50.179	50.235	50.431	50.536	50.608	51.519
821	Biased Irradiation	50.498	50.280	50.356	50.126	50.820	50.044	51.788
822	Biased Irradiation	50.081	49.688	49.973	50.162	50.441	50.273	51.636
823	Biased Irradiation	50.422	49.995	50.213	50.278	50.690	50.197	51.693
824	Biased Irradiation	50.331	49.832	50.137	50.283	50.649	50.304	51.643
825	Biased Irradiation	50.259	49.823	50.120	50.309	50.724	50.263	51.709
832	Control Unit	49.735	49.210	48.965	48.231	49.105	49.194	49.545
833	Control Unit	50.443	49.953	49.653	49.290	50.190	49.787	50.167
All GND'd Irradiation Statistics								
	Average All GND'd	50.536	50.109	50.134	50.266	50.756	50.434	51.380
	Std Dev All GND'd	0.258	0.176	0.217	0.246	0.367	0.267	0.203
	Ps90%/90% (+KTL) All GND'd	51.243	50.591	50.729	50.940	51.762	51.167	51.936
	PS90%/90% (-KTL) All GND'd	49.829	49.628	49.539	49.592	49.750	49.701	50.824
Biased Irradiation Statistics								
	Average Biased	50.318	49.924	50.160	50.232	50.665	50.216	51.694
	Std Dev Biased	0.161	0.227	0.140	0.082	0.140	0.104	0.062
	Ps90%/90% (+KTL) Biased	50.759	50.546	50.543	50.457	51.050	50.501	51.862
	Ps90%/90% (-KTL) Biased	49.878	49.301	49.777	50.006	50.280	49.931	51.525
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

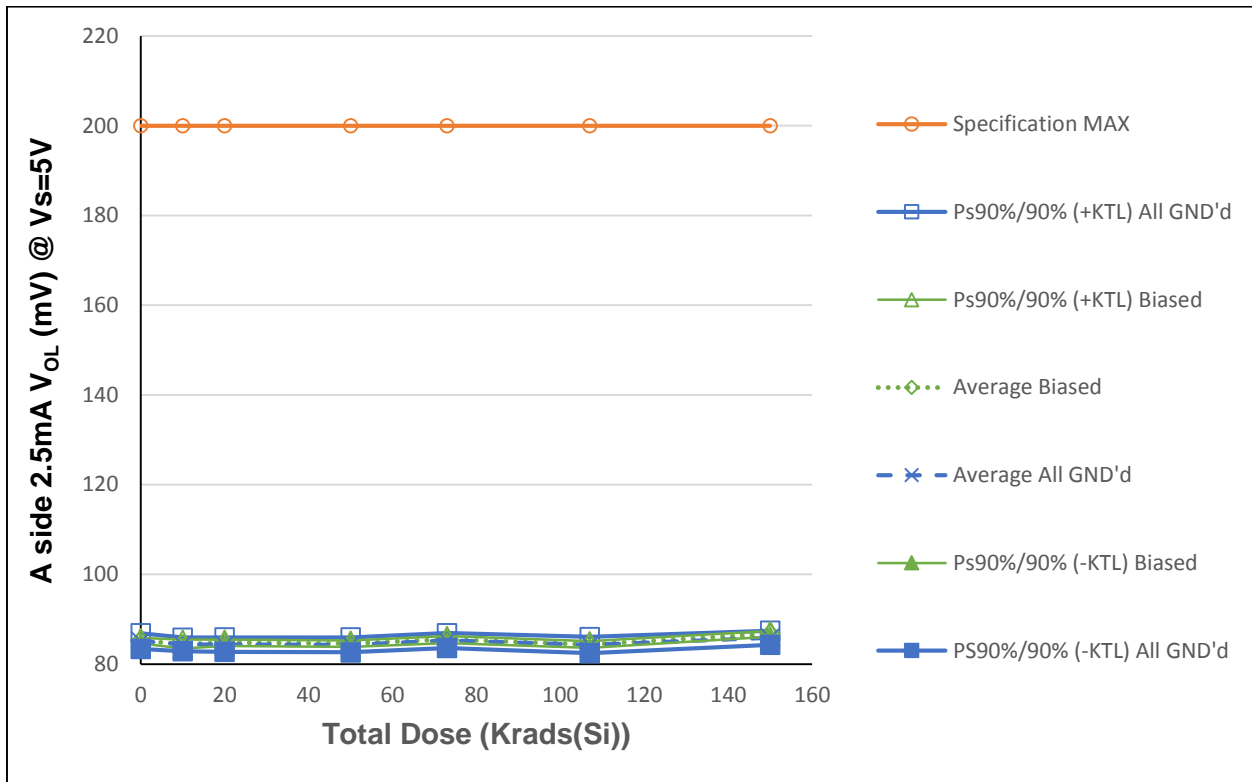


Figure 5.78: Plot of Output Voltage Swing Low with $I_{SINK} = 2.5mA$ @ $V_s = 5V$ versus Total Dose (side A)

Table 5.78: Raw data for output voltage swing low with $I_{SINK} = 2.5mA$ (side A) @ $V_s = 5V$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A 2.5mA V_{OL} @ $V_s=5V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation	85.093	84.327	84.300	84.299	85.824	84.364	85.819
827	All GND'd Irradiation	84.900	84.277	84.049	84.044	85.547	83.888	85.616
828	All GND'd Irradiation	84.280	83.640	83.612	83.472	84.354	83.371	85.121
829	All GND'd Irradiation	86.027	85.184	85.166	85.099	85.630	85.090	86.675
830	All GND'd Irradiation	85.300	84.515	84.605	84.532	84.946	84.545	86.057
821	Biased Irradiation	85.357	84.919	84.946	84.168	85.574	83.952	86.872
822	Biased Irradiation	85.119	84.381	84.680	84.720	85.295	84.650	86.551
823	Biased Irradiation	85.474	84.652	85.072	84.720	85.687	84.400	86.915
824	Biased Irradiation	84.883	83.928	84.411	84.396	85.061	84.181	86.429
825	Biased Irradiation	85.245	84.354	84.745	84.768	85.709	84.516	86.951
832	Control Unit	84.047	83.387	82.909	81.601	83.337	83.181	83.988
833	Control Unit	85.093	84.515	83.934	83.282	85.042	84.057	84.873
All GND'd Irradiation Statistics								
	Average All GND'd	85.120	84.388	84.346	84.289	85.260	84.251	85.857
	Std Dev All GND'd	0.634	0.554	0.585	0.600	0.603	0.654	0.572
	Ps90%/90% (+KTL) All GND'd	86.860	85.906	85.950	85.935	86.915	86.044	87.427
	PS90%/90% (-KTL) All GND'd	83.380	82.871	82.743	82.643	83.605	82.459	84.288
Biased Irradiation Statistics								
	Average Biased	85.216	84.447	84.771	84.554	85.465	84.340	86.744
	Std Dev Biased	0.228	0.370	0.255	0.262	0.280	0.277	0.237
	Ps90%/90% (+KTL) Biased	85.841	85.461	85.470	85.273	86.232	85.099	87.394
	Ps90%/90% (-KTL) Biased	84.591	83.433	84.072	83.836	84.698	83.581	86.093
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

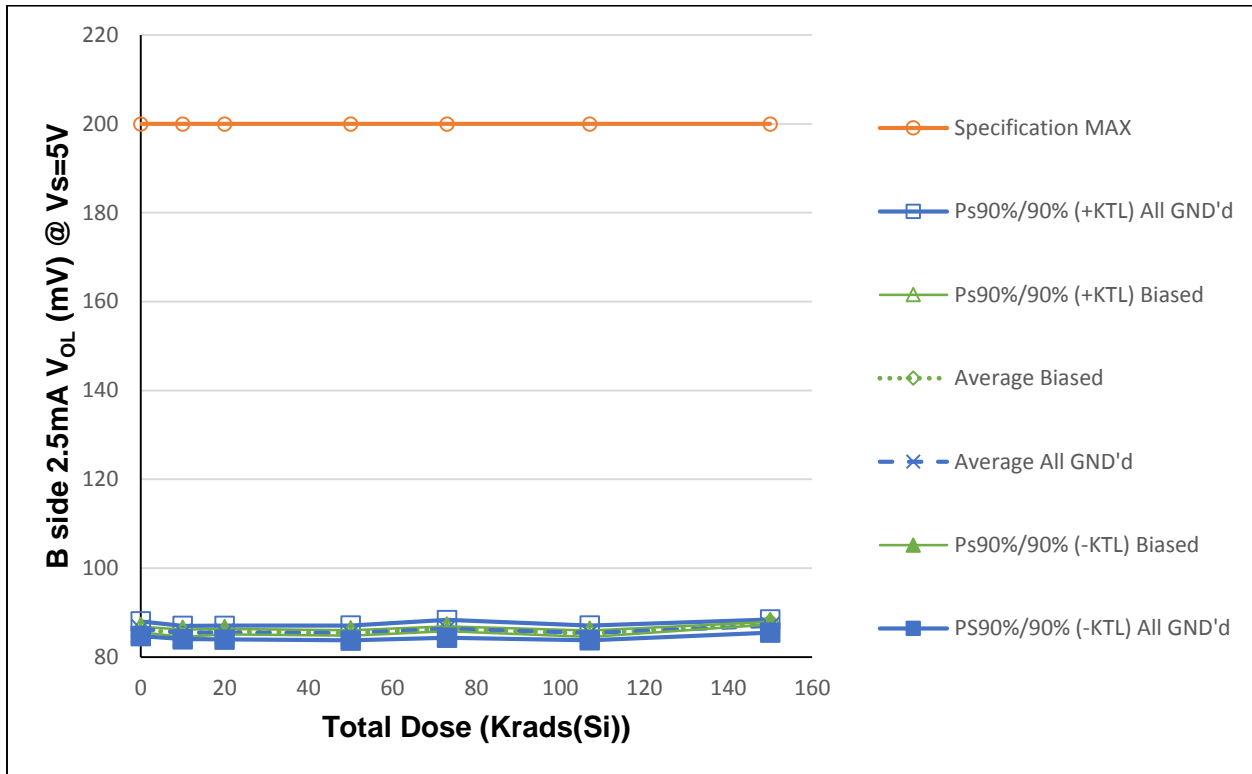


Figure 5.79: Plot of Output Voltage Swing Low with $I_{SINK} = 2.5mA$ @ $V_s = 5V$ versus Total Dose (side B)

Table 5.79: Raw data for output voltage swing low with $I_{SINK} = 2.5mA$ (side B) @ $V_s = 5V$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B 2.5mA V_{OL} @ $V_s=5V$ (mV)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	86.709	85.814	85.836	85.844	87.282	85.883	87.437
827	All GND'd Irradiation	86.313	85.422	85.346	85.234	86.757	85.166	86.815
828	All GND'd Irradiation	85.474	84.744	84.699	84.513	85.458	84.590	86.226
829	All GND'd Irradiation	87.090	86.214	86.217	86.089	86.547	86.114	87.585
830	All GND'd Irradiation	86.294	85.449	85.520	85.428	85.831	85.536	86.930
821	Biased Irradiation	86.330	85.795	85.841	85.061	86.399	84.790	87.695
822	Biased Irradiation	85.932	85.109	85.428	85.442	86.069	85.412	87.459
823	Biased Irradiation	86.521	85.600	86.027	85.599	86.588	85.312	87.738
824	Biased Irradiation	86.178	85.201	85.616	85.615	86.262	85.447	87.545
825	Biased Irradiation	86.084	85.143	85.616	85.480	86.432	85.314	87.678
832	Control Unit	84.995	84.231	83.877	82.465	84.135	84.136	84.789
833	Control Unit	86.237	85.492	84.987	84.196	85.984	85.126	85.819
All GND'd Irradiation Statistics								
	Average All GND'd	86.376	85.529	85.524	85.422	86.375	85.458	86.999
	Std Dev All GND'd	0.601	0.544	0.568	0.609	0.730	0.603	0.541
	Ps90%/90% (+KTL) All GND'd	88.024	87.020	87.081	87.092	88.378	87.111	88.482
	PS90%/90% (-KTL) All GND'd	84.728	84.037	83.967	83.751	84.372	83.804	85.515
Biased Irradiation Statistics								
	Average Biased	86.209	85.370	85.706	85.439	86.350	85.255	87.623
	Std Dev Biased	0.226	0.309	0.232	0.224	0.195	0.267	0.117
	Ps90%/90% (+KTL) Biased	86.830	86.216	86.341	86.054	86.885	85.986	87.943
	Ps90%/90% (-KTL) Biased	85.588	84.523	85.070	84.824	85.815	84.524	87.303
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

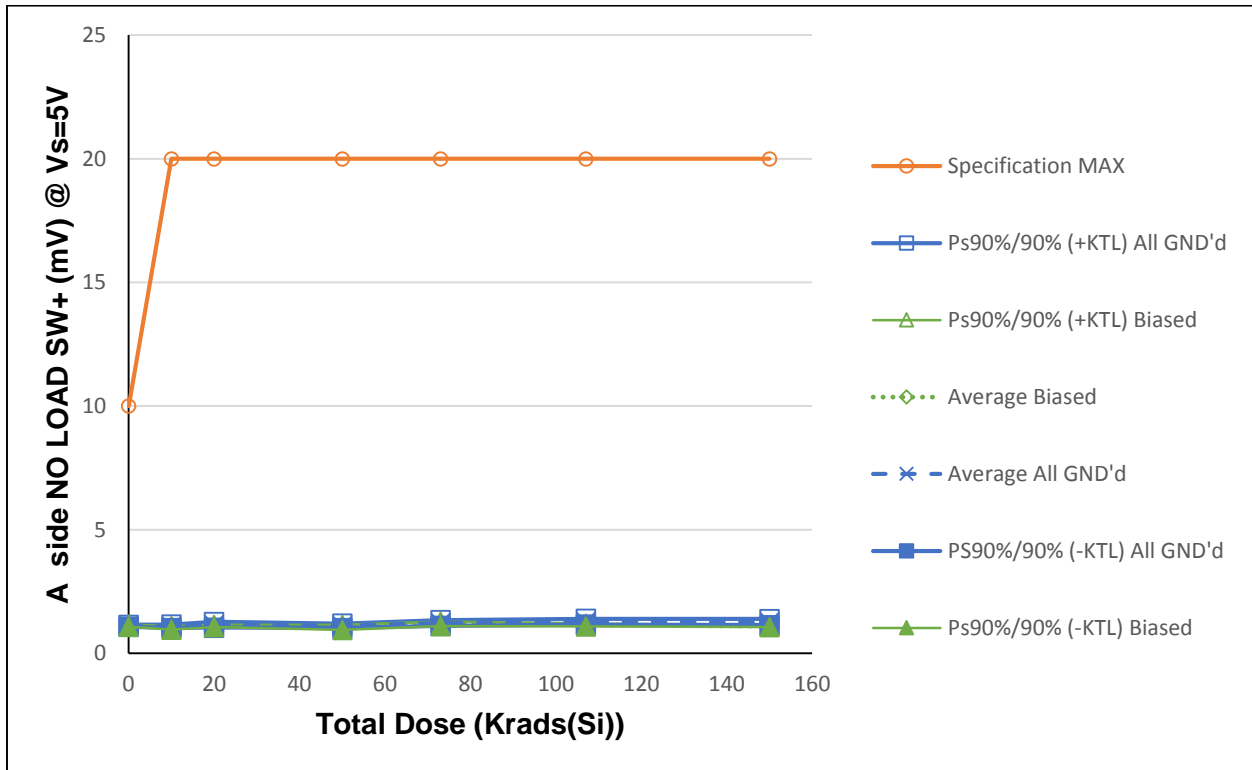


Figure 5.80: Plot of Output Voltage Swing High with No Load @ Vs = 5V versus Total Dose (A side)

Table 5.80: Raw data for output voltage swing high with No Load (side A) @ Vs = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A	NO LOAD SW+ @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units		(mV)	0	10	20	50	73	107	150
826		All GND'd Irradiation	1.096	1.097	1.107	1.107	1.234	1.293	1.202
827		All GND'd Irradiation	1.136	1.136	1.219	1.126	1.292	1.239	1.300
828		All GND'd Irradiation	1.115	1.097	1.133	1.147	1.233	1.312	1.316
829		All GND'd Irradiation	1.115	1.066	1.164	1.138	1.191	1.229	1.269
830		All GND'd Irradiation	1.108	1.093	1.164	1.066	1.186	1.322	1.250
821		Biased Irradiation	1.108	1.062	1.107	1.090	1.217	1.122	1.097
822		Biased Irradiation	1.136	1.042	1.116	1.100	1.227	1.181	1.097
823		Biased Irradiation	1.096	1.016	1.121	1.014	1.186	1.158	1.083
824		Biased Irradiation	1.120	0.994	1.116	1.040	1.152	1.141	1.095
825		Biased Irradiation	1.136	1.042	1.078	1.033	1.167	1.153	1.076
832		Control Unit	1.115	0.966	1.123	1.014	0.992	1.008	0.811
833		Control Unit	1.096	0.987	1.018	0.938	0.992	1.001	0.842
All GND'd Irradiation Statistics									
		Average All GND'd	1.114	1.098	1.157	1.117	1.227	1.279	1.267
		Std Dev All GND'd	0.015	0.025	0.042	0.032	0.043	0.043	0.045
		Ps90%/90% (+KTL) All GND'd	1.154	1.166	1.273	1.205	1.345	1.396	1.390
		PS90%/90% (-KTL) All GND'd	1.073	1.030	1.042	1.029	1.110	1.162	1.144
Biased Irradiation Statistics									
		Average Biased	1.119	1.031	1.108	1.056	1.190	1.151	1.089
		Std Dev Biased	0.018	0.026	0.017	0.037	0.032	0.022	0.010
		Ps90%/90% (+KTL) Biased	1.168	1.103	1.155	1.158	1.277	1.211	1.116
		Ps90%/90% (-KTL) Biased	1.070	0.959	1.060	0.953	1.103	1.091	1.063
Specification MIN									
		Status (Measurements) All GND'd							
		Status (Measurements) Biased							
Specification MAX			10	20	20	20		20	
		Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd									
		Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased									
		Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

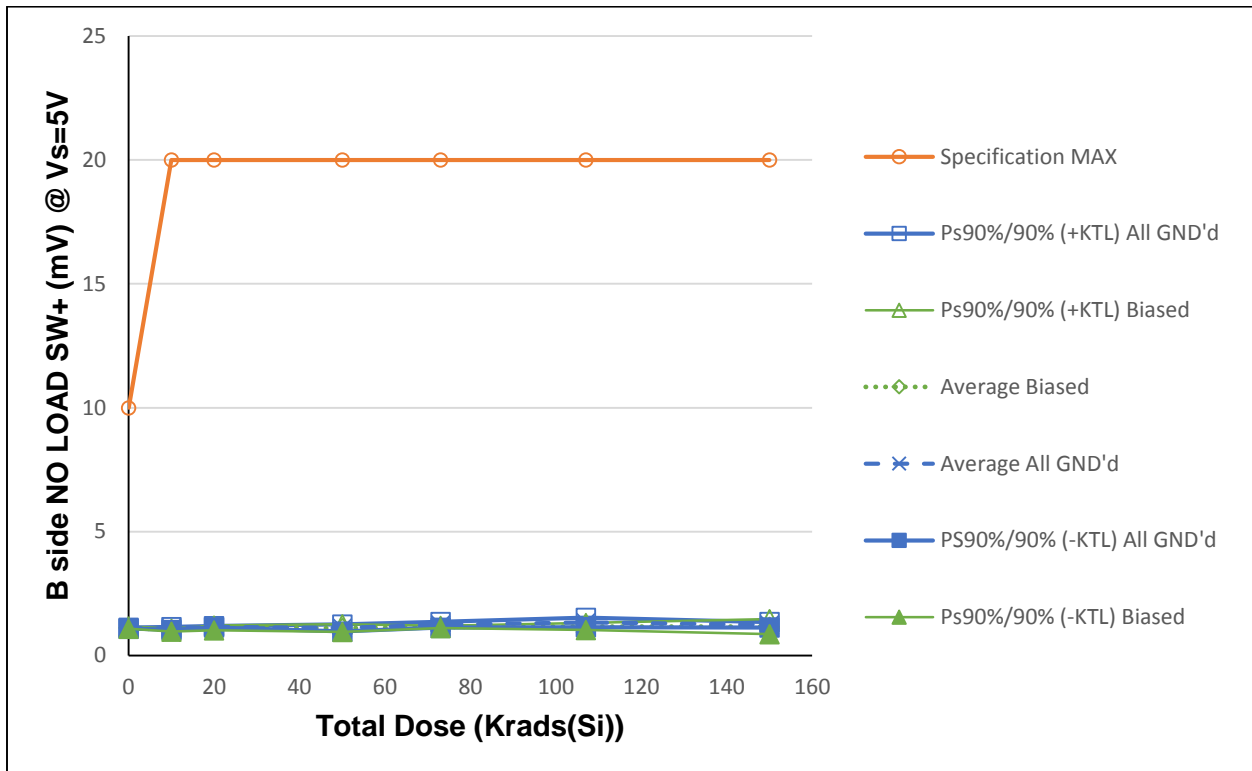


Figure 5.81: Plot of Output Voltage Swing High with No Load @ Vs = 5V versus Total Dose (side B)

Table 5.81: Raw data for output voltage swing high with No Load (side B) @ Vs = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B	NO LOAD SW+ @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units		(mV)	0	10	20	50	73	107	150
826		All GND'd Irradiation	1.108	1.064	1.164	1.193	1.264	1.343	1.235
827		All GND'd Irradiation	1.112	1.097	1.167	1.105	1.283	1.398	1.185
828		All GND'd Irradiation	1.096	1.083	1.143	1.100	1.264	1.369	1.292
829		All GND'd Irradiation	1.115	1.100	1.164	1.050	1.184	1.217	1.262
830		All GND'd Irradiation	1.108	1.119	1.167	1.107	1.208	1.343	1.231
821		Biased Irradiation	1.136	1.023	1.107	1.090	1.186	1.217	1.076
822		Biased Irradiation	1.146	1.023	1.085	1.181	1.145	1.158	1.347
823		Biased Irradiation	1.108	1.062	1.143	1.138	1.150	1.229	1.171
824		Biased Irradiation	1.136	1.016	1.083	1.033	1.157	1.141	1.157
825		Biased Irradiation	1.115	1.006	1.159	1.090	1.157	1.105	1.088
832		Control Unit	1.115	1.006	1.085	0.974	0.994	0.970	0.866
833		Control Unit	1.112	1.021	1.056	0.955	0.977	1.029	0.885
All GND'd Irradiation Statistics									
		Average All GND'd	1.108	1.093	1.161	1.111	1.240	1.334	1.241
		Std Dev All GND'd	0.007	0.021	0.010	0.051	0.042	0.069	0.040
		Ps90%/90% (+KTL) All GND'd	1.128	1.149	1.189	1.252	1.357	1.524	1.350
		Ps90%/90% (-KTL) All GND'd	1.087	1.036	1.133	0.970	1.124	1.144	1.132
Biased Irradiation Statistics									
		Average Biased	1.128	1.026	1.115	1.106	1.159	1.170	1.168
		Std Dev Biased	0.016	0.021	0.034	0.056	0.016	0.052	0.109
		Ps90%/90% (+KTL) Biased	1.172	1.084	1.210	1.259	1.203	1.313	1.466
		Ps90%/90% (-KTL) Biased	1.084	0.968	1.021	0.954	1.116	1.027	0.869
Specification MIN									
		Status (Measurements) All GND'd							
		Status (Measurements) Biased							
Specification MAX									
		Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
		Status (-KTL) All GND'd							
		Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (-KTL) Biased							
		Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

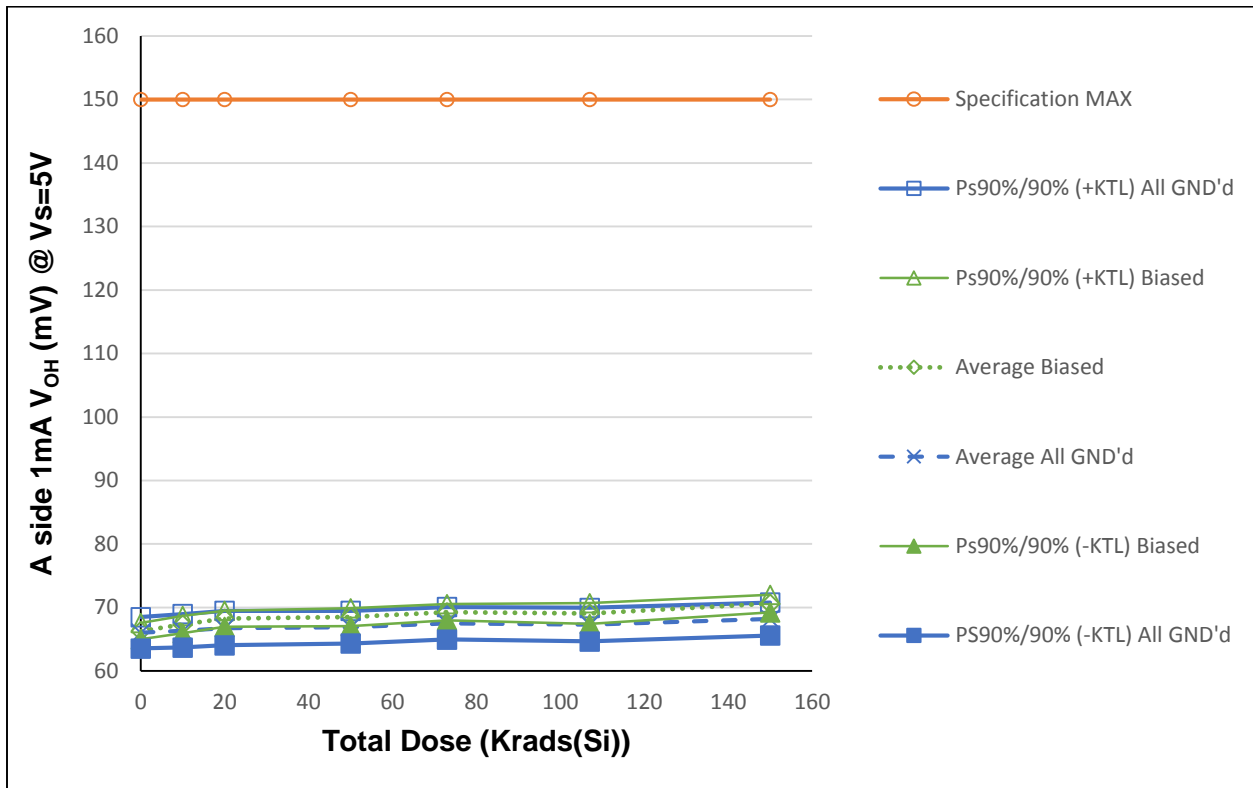


Figure 5.82: Plot of Output Voltage Swing High with $I_{SOURCE} = 1\text{ mA}$ @ $V_s = 5\text{V}$ versus Total Dose (side A)

Table 5.82: Raw data for output voltage swing high with I_{SOURCE} = 1 mA (side A) @ V_s = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter Units	A 1mA V _{OH} @ V _s =5V (mV)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	66.333	66.695	67.205	67.318	68.252	67.783	68.649
827	All GND'd Irradiation	65.492	65.765	66.158	66.276	67.254	66.650	67.560
828	All GND'd Irradiation	65.055	65.385	65.755	65.931	66.463	66.326	67.255
829	All GND'd Irradiation	67.408	67.821	68.258	68.306	68.698	68.735	69.602
830	All GND'd Irradiation	65.828	66.016	66.442	66.673	66.908	67.071	67.898
821	Biased Irradiation	65.949	67.131	67.875	67.797	68.830	68.306	70.179
822	Biased Irradiation	66.124	67.112	68.046	68.537	69.043	69.078	70.301
823	Biased Irradiation	66.972	68.047	68.944	69.068	69.931	69.773	71.328
824	Biased Irradiation	66.617	67.589	68.449	68.864	69.526	69.509	70.961
825	Biased Irradiation	65.882	66.750	67.876	68.156	68.928	68.630	70.306
832	Control Unit	64.767	64.613	64.446	63.509	64.390	64.469	64.688
833	Control Unit	66.540	66.628	66.389	65.692	66.513	66.204	66.339
All GND'd Irradiation Statistics								
	Average All GND'd	66.023	66.336	66.764	66.901	67.515	67.313	68.193
	Std Dev All GND'd	0.904	0.958	0.990	0.940	0.934	0.964	0.944
	Ps90%/90% (+KTL) All GND'd	68.502	68.962	69.477	69.478	70.075	69.956	70.781
	PS90%/90% (-KTL) All GND'd	63.544	63.710	64.050	64.324	64.955	64.670	65.605
Biased Irradiation Statistics								
	Average Biased	66.309	67.326	68.238	68.485	69.252	69.059	70.615
	Std Dev Biased	0.469	0.501	0.459	0.517	0.464	0.605	0.503
	Ps90%/90% (+KTL) Biased	67.595	68.700	69.496	69.901	70.525	70.717	71.995
	Ps90%/90% (-KTL) Biased	65.022	65.952	66.980	67.068	67.978	67.401	69.235
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd								
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased								
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

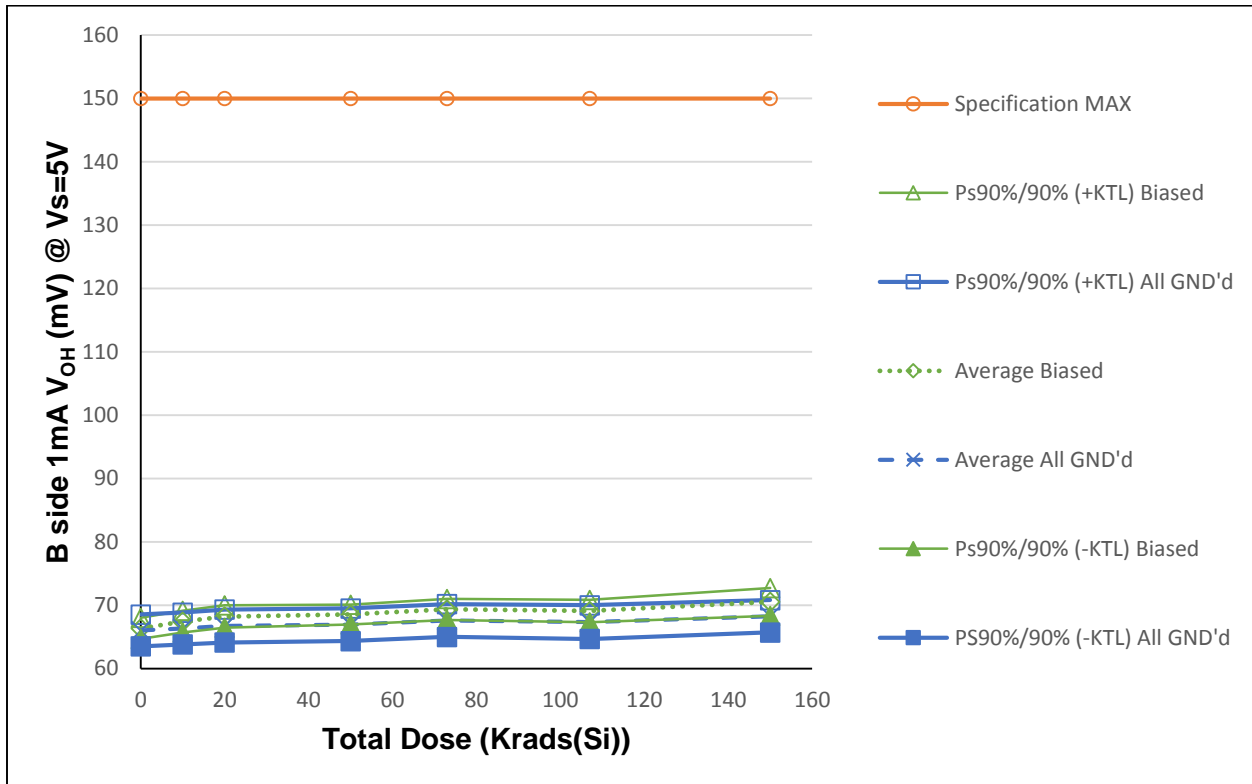


Figure 5.83: Plot of Output Voltage Swing High with $I_{SOURCE} = 1\text{ mA}$ @ $V_s = 5\text{V}$ versus Total Dose (side B)

Table 5.83: Raw data for output voltage swing high with I_{SOURCE} = 1 mA (side B) @ V_s = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B 1mA V _{OH} @ V _s =5V (mV)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	66.429	66.828	67.186	67.454	68.436	67.888	68.845
827	All GND'd Irradiation	65.535	65.902	66.194	66.395	67.410	66.766	67.681
828	All GND'd Irradiation	64.729	65.024	65.427	65.607	66.185	66.004	66.997
829	All GND'd Irradiation	67.136	67.437	67.910	68.023	68.486	68.478	69.352
830	All GND'd Irradiation	66.235	66.424	66.844	67.102	67.370	67.564	68.368
821	Biased Irradiation	66.369	67.589	68.249	68.273	69.338	68.728	70.687
822	Biased Irradiation	66.064	67.209	67.986	68.516	69.043	69.088	69.512
823	Biased Irradiation	67.191	68.257	69.116	69.283	70.215	69.954	71.559
824	Biased Irradiation	66.540	67.516	68.316	68.833	69.506	69.433	70.909
825	Biased Irradiation	65.548	66.530	67.323	67.759	68.575	68.273	69.936
832	Control Unit	65.261	65.079	65.049	63.983	64.926	64.952	65.241
833	Control Unit	66.333	66.292	66.024	65.454	66.420	66.040	66.256
All GND'd Irradiation Statistics								
	Average All GND'd	66.013	66.323	66.712	66.916	67.577	67.340	68.249
	Std Dev All GND'd	0.917	0.918	0.948	0.940	0.945	0.969	0.932
	Ps90%/90% (+KTL) All GND'd	68.526	68.840	69.311	69.494	70.169	69.998	70.804
	PS90%/90% (-KTL) All GND'd	63.499	63.806	64.113	64.339	64.986	64.682	65.693
Biased Irradiation Statistics								
	Average Biased	66.343	67.420	68.198	68.533	69.335	69.095	70.521
	Std Dev Biased	0.606	0.628	0.646	0.574	0.606	0.645	0.809
	Ps90%/90% (+KTL) Biased	68.004	69.141	69.970	70.107	70.996	70.863	72.738
	Ps90%/90% (-KTL) Biased	64.681	65.699	66.426	66.958	67.675	67.327	68.303
	Specification MIN							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Specification MAX	150	150	150	150	150	150	150
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS	PASS

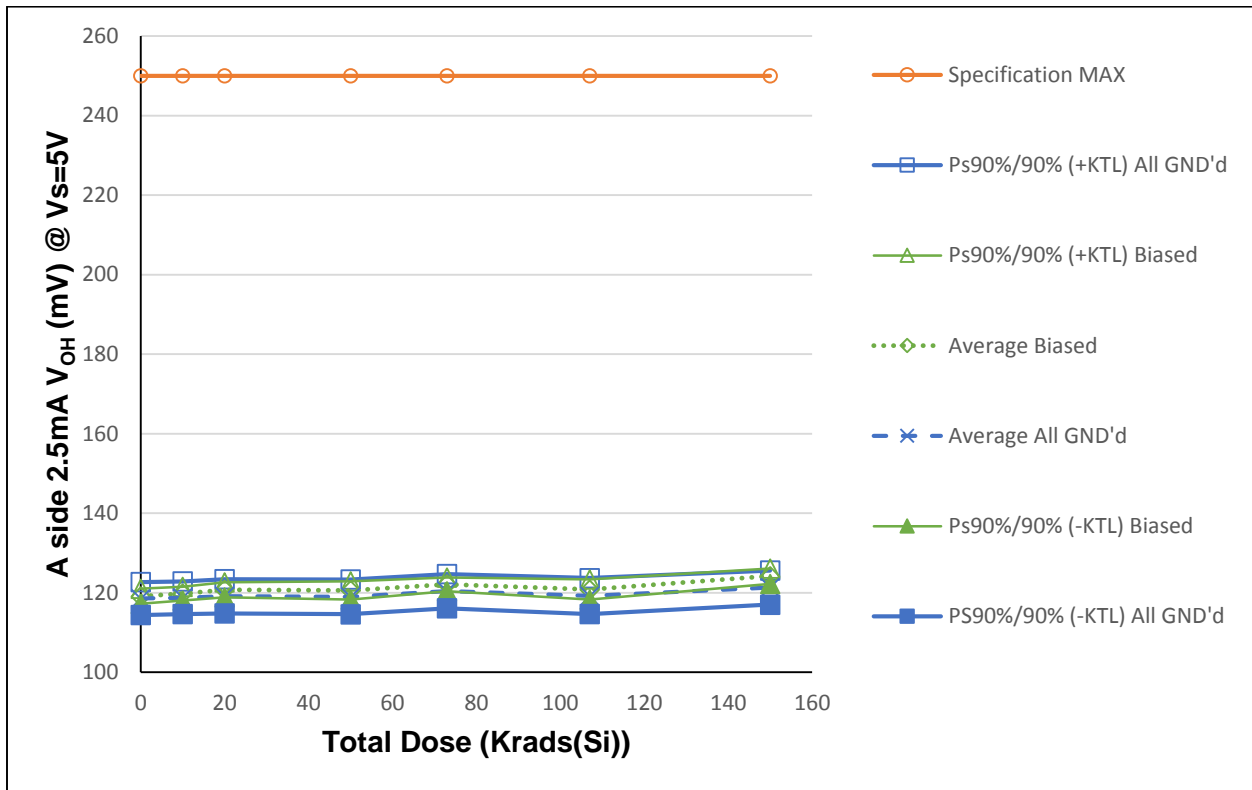


Figure 5.84: Plot of Output Voltage Swing High with $I_{SOURCE} = 2.5 \text{ mA}$ @ $V_s = 5V$ versus Total Dose (side A)

Table 5.84: Raw data for output voltage swing high with I_{SOURCE} = 2.5 mA (side A) @ V_s = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A 2.5mA V _{OH} @ V _s =5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second							
		Units	0	10	20	50	73	107	150
826	All GND'd Irradiation	(mV)	119.153	119.358	119.787	119.781	121.825	120.061	122.094
827	All GND'd Irradiation		117.647	117.980	118.146	117.893	120.185	117.957	120.232
828	All GND'd Irradiation		116.905	117.162	117.425	117.190	118.561	117.454	119.727
829	All GND'd Irradiation		120.815	121.017	121.442	121.217	122.111	121.537	123.588
830	All GND'd Irradiation		118.221	118.191	118.703	118.616	119.193	118.833	120.812
821	Biased Irradiation		118.476	119.621	120.131	119.305	121.408	119.323	123.407
822	Biased Irradiation		118.886	119.507	120.590	120.709	121.799	121.102	123.770
823	Biased Irradiation		120.068	120.711	121.718	121.285	122.991	121.549	125.042
824	Biased Irradiation		119.537	120.044	121.129	121.321	122.494	121.473	124.711
825	Biased Irradiation		118.507	119.016	120.143	120.219	121.866	120.416	123.805
832	Control Unit		116.619	116.299	115.991	113.783	116.021	115.930	116.762
833	Control Unit		119.191	119.206	118.568	117.207	119.555	118.368	119.117
All GND'd Irradiation Statistics									
	Average All GND'd		118.548	118.741	119.101	118.939	120.375	119.168	121.291
	Std Dev All GND'd		1.510	1.495	1.567	1.593	1.569	1.653	1.559
	Ps90%/90% (+KTL) All GND'd		122.689	122.840	123.399	123.308	124.676	123.701	125.565
	PS90%/90% (-KTL) All GND'd		114.407	114.643	114.803	114.571	116.074	114.636	117.016
Biased Irradiation Statistics									
	Average Biased		119.095	119.780	120.742	120.568	122.111	120.773	124.147
	Std Dev Biased		0.692	0.636	0.682	0.839	0.627	0.926	0.694
	Ps90%/90% (+KTL) Biased		120.992	121.525	122.611	122.870	123.830	123.311	126.050
	Ps90%/90% (-KTL) Biased		117.197	118.035	118.873	118.266	120.392	118.234	122.244
	Specification MIN								
	Status (Measurements) All GND'd								
	Status (Measurements) Biased								
	Specification MAX		250	250	250	250		250	
	Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd								
	Status (+KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased								
	Status (+KTL) Biased		PASS	PASS	PASS	PASS		PASS	

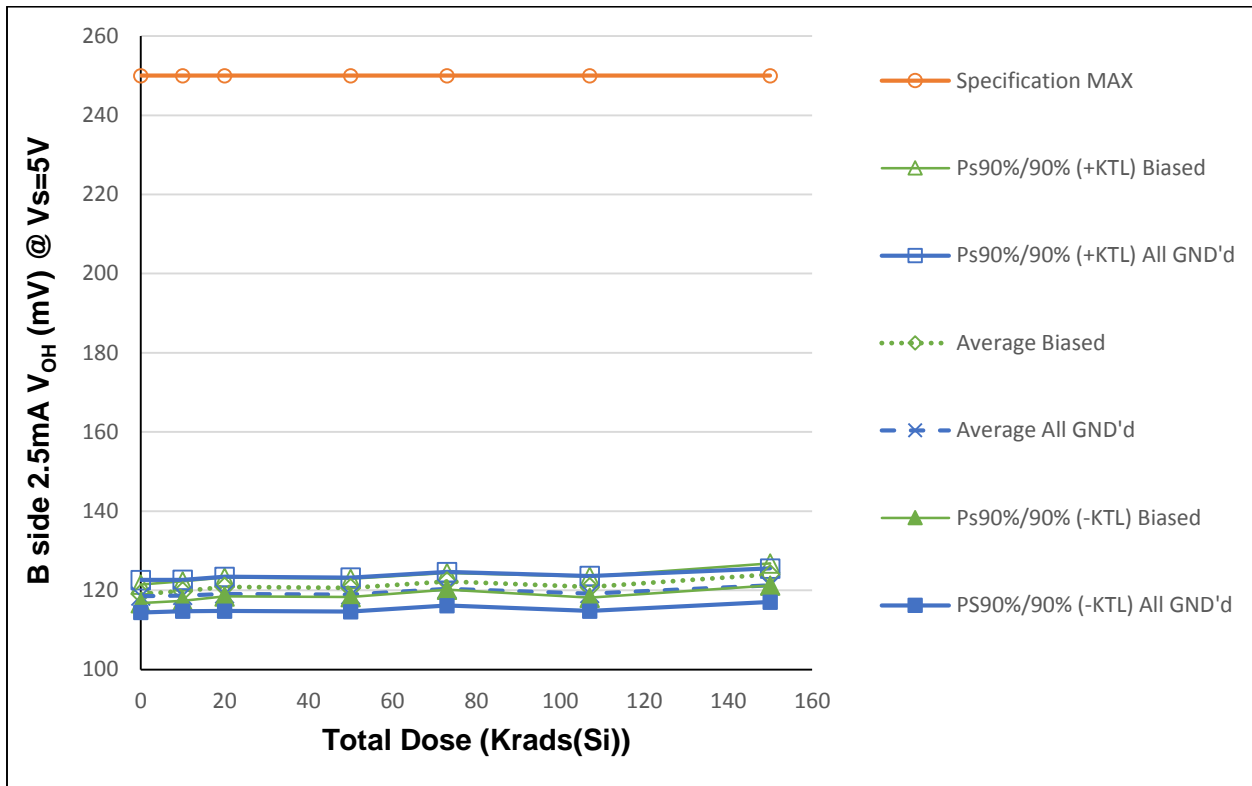


Figure 5.85: Plot of Output Voltage Swing High with $I_{SOURCE} = 2.5 \text{ mA}$ @ $V_s = 5V$ versus Total Dose (side B)

Table 5.85: Raw data for output voltage swing high with I_{SOURCE} = 2.5 mA (side B) @ Vs = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B	2.5mA V _{OH} @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units		(mV)	0	10	20	50	73	107	150
826	All GND'd Irradiation		119.248	119.433	119.828	119.807	121.943	120.156	122.244
827	All GND'd Irradiation		117.744	118.133	118.282	118.050	120.338	118.223	120.337
828	All GND'd Irradiation		116.488	116.719	116.957	116.781	118.210	117.068	119.296
829	All GND'd Irradiation		120.443	120.599	121.108	120.848	121.791	121.183	123.250
830	All GND'd Irradiation		118.733	118.668	119.351	119.112	119.744	119.416	121.329
821	Biased Irradiation		118.967	120.116	120.691	119.752	122.036	119.806	123.903
822	Biased Irradiation		118.812	119.554	120.672	120.790	121.921	121.092	122.880
823	Biased Irradiation		120.340	120.981	122.166	121.543	123.448	121.901	125.388
824	Biased Irradiation		119.496	119.882	121.081	121.285	122.532	121.506	124.656
825	Biased Irradiation		118.028	118.536	119.790	119.731	121.456	119.833	123.329
832	Control Unit		117.153	116.958	116.643	114.305	116.656	116.535	117.389
833	Control Unit		118.908	118.858	118.349	116.895	119.345	118.180	118.890
All GND'd Irradiation Statistics									
	Average All GND'd		118.531	118.710	119.105	118.919	120.405	119.209	121.291
	Std Dev All GND'd		1.500	1.448	1.572	1.571	1.545	1.612	1.552
	Ps90%/90% (+KTL) All GND'd		122.645	122.681	123.416	123.227	124.641	123.628	125.547
	PS90%/90% (-KTL) All GND'd		114.418	114.740	114.794	114.612	116.170	114.790	117.035
Biased Irradiation Statistics									
	Average Biased		119.129	119.814	120.880	120.620	122.279	120.828	124.031
	Std Dev Biased		0.857	0.889	0.861	0.847	0.758	0.964	1.008
	Ps90%/90% (+KTL) Biased		121.479	122.251	123.240	122.942	124.356	123.471	126.796
	Ps90%/90% (-KTL) Biased		116.778	117.377	118.520	118.299	120.202	118.185	121.267
Specification MIN									
	Status (Measurements) All GND'd								
	Status (Measurements) Biased								
Specification MAX									
	Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
Status (-KTL) All GND'd									
	Status (+KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
Status (-KTL) Biased									
	Status (+KTL) Biased		PASS	PASS	PASS	PASS		PASS	

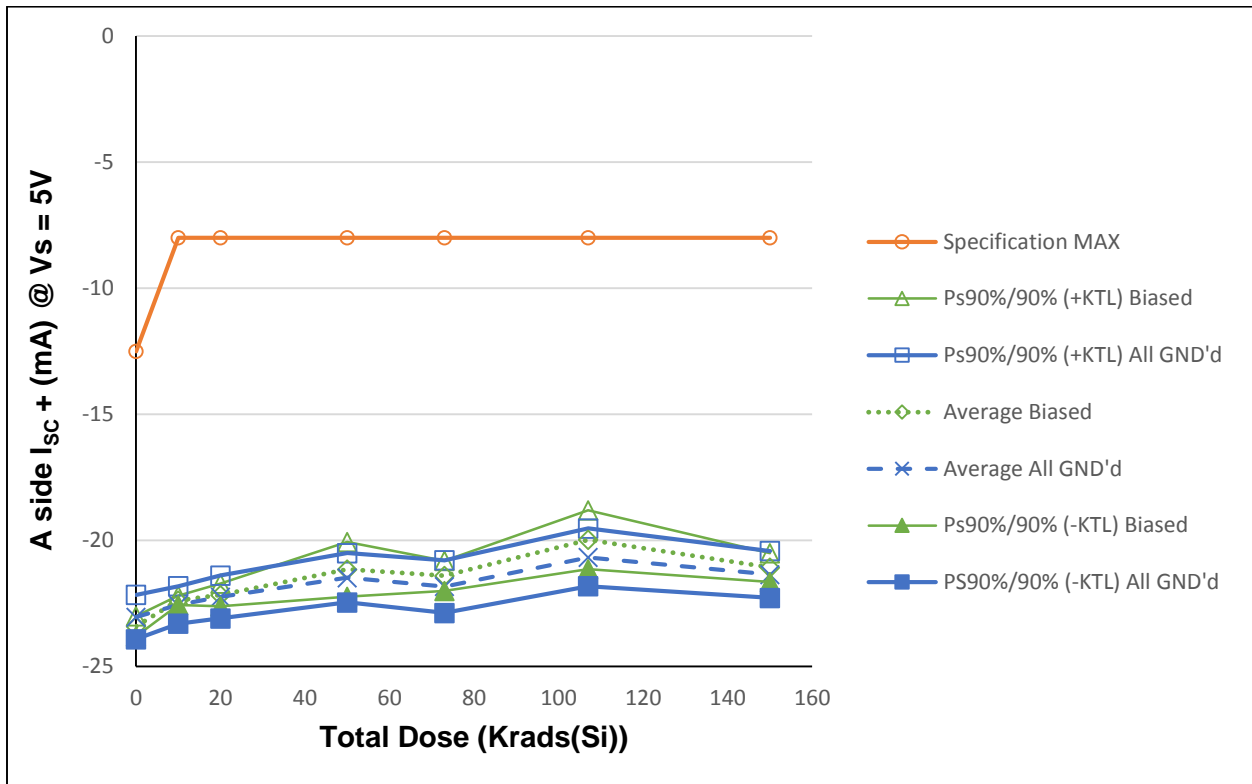


Figure 5.86: Plot of Output Short Circuit Current I_{sc+} @ $V_s = 5V$ versus Total Dose (side A)

Table 5.86: Raw data for output short circuit current I_{sc+} (side A) @ $V_s = 5V$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A I_{sc+} @ $V_s = 5V$	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
Units	(mA)	0	10	20	50	73	107	150
826	All GND'd Irradiation	-23.338	-22.728	-22.418	-21.676	-22.253	-20.934	-21.570
827	All GND'd Irradiation	-22.720	-22.338	-21.926	-21.120	-21.977	-20.242	-21.013
828	All GND'd Irradiation	-22.804	-22.399	-22.023	-21.235	-21.537	-20.371	-21.143
829	All GND'd Irradiation	-23.425	-22.954	-22.686	-21.997	-22.053	-21.258	-21.831
830	All GND'd Irradiation	-22.914	-22.371	-22.156	-21.365	-21.337	-20.566	-21.197
821	Biased Irradiation	-23.172	-22.380	-21.909	-20.578	-21.115	-19.330	-20.769
822	Biased Irradiation	-23.529	-22.404	-22.190	-21.330	-21.366	-20.308	-21.112
823	Biased Irradiation	-23.382	-22.322	-22.136	-20.917	-21.304	-19.788	-20.987
824	Biased Irradiation	-23.524	-22.485	-22.364	-21.551	-21.590	-20.362	-21.311
825	Biased Irradiation	-23.443	-22.322	-22.223	-21.378	-21.647	-20.095	-21.193
832	Control Unit	-23.386	-23.487	-23.259	-22.206	-23.460	-23.360	-23.906
833	Control Unit	-22.967	-23.076	-22.767	-22.231	-23.388	-22.809	-23.253
All GND'd Irradiation Statistics								
	Average All GND'd	-23.040	-22.558	-22.242	-21.479	-21.831	-20.674	-21.351
	Std Dev All GND'd	0.321	0.271	0.310	0.356	0.380	0.418	0.339
	Ps90%/90% (+KTL) All GND'd	-22.161	-21.814	-21.392	-20.501	-20.788	-19.528	-20.422
	PS90%/90% (-KTL) All GND'd	-23.919	-23.302	-23.091	-22.456	-22.875	-21.820	-22.281
Biased Irradiation Statistics								
	Average Biased	-23.410	-22.383	-22.164	-21.151	-21.404	-19.977	-21.075
	Std Dev Biased	0.146	0.068	0.166	0.396	0.217	0.426	0.208
	Ps90%/90% (+KTL) Biased	-23.009	-22.197	-21.709	-20.066	-20.809	-18.809	-20.505
	Ps90%/90% (-KTL) Biased	-23.811	-22.568	-22.619	-22.236	-22.000	-21.145	-21.645
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

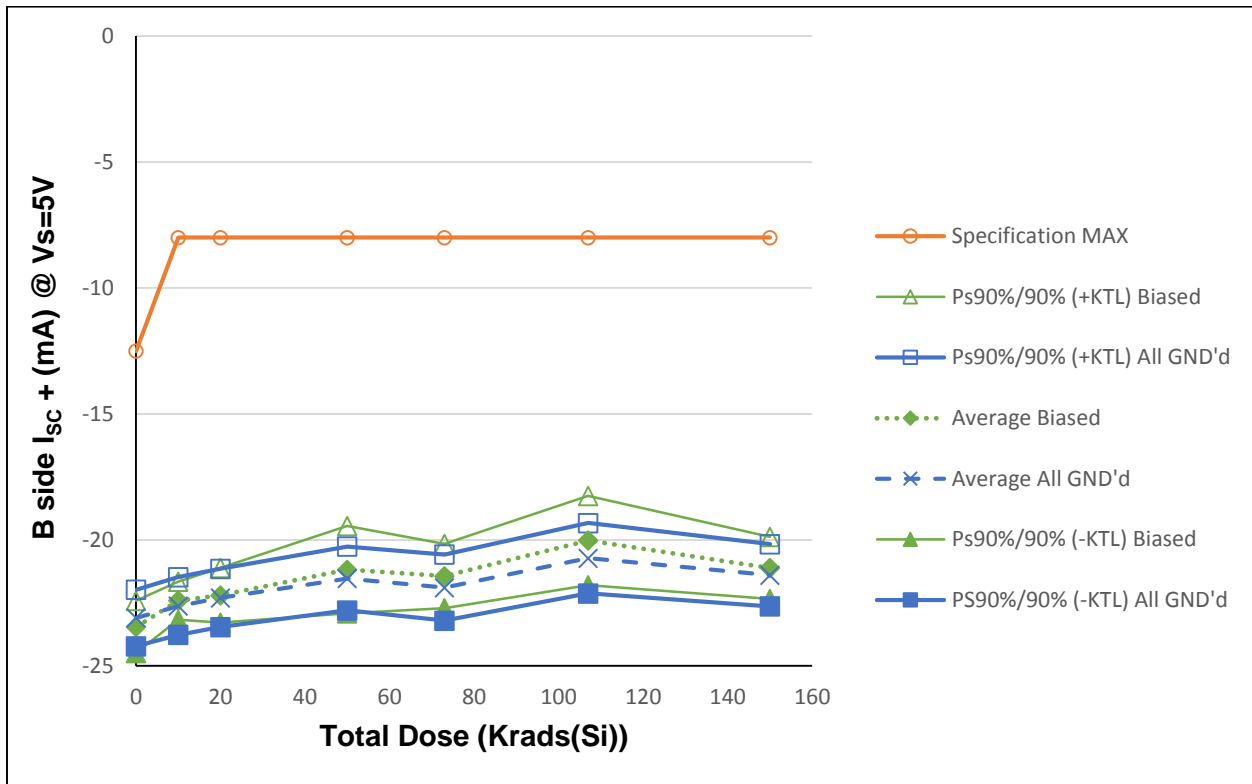


Figure 5.87: Plot of Output Short Circuit Current I_{sc+} @ $V_s = 5V$ versus Total Dose (side B)

Table 5.87: Raw data for output short circuit current I_{sc+} (side B) @ $V_s = 5V$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B I_{sc+} @ $V_s = 5V$ (mA)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	-23.252	-22.656	-22.329	-21.569	-22.162	-20.847	-21.464
827	All GND'd Irradiation	-22.739	-22.342	-21.930	-21.120	-21.990	-20.236	-21.013
828	All GND'd Irradiation	-23.197	-22.820	-22.432	-21.628	-21.952	-20.775	-21.548
829	All GND'd Irradiation	-23.643	-23.181	-22.915	-22.227	-22.281	-21.485	-22.044
830	All GND'd Irradiation	-22.642	-22.104	-21.880	-21.094	-21.069	-20.274	-20.926
821	Biased Irradiation	-22.892	-22.054	-21.620	-20.274	-20.816	-19.042	-20.470
822	Biased Irradiation	-23.643	-22.514	-22.304	-21.431	-21.459	-20.409	-21.269
823	Biased Irradiation	-23.252	-22.185	-21.994	-20.780	-21.170	-19.664	-20.839
824	Biased Irradiation	-23.643	-22.590	-22.459	-21.656	-21.693	-20.495	-21.421
825	Biased Irradiation	-23.824	-22.704	-22.614	-21.753	-22.024	-20.479	-21.555
832	Control Unit	-23.028	-23.106	-22.863	-21.831	-23.083	-22.975	-23.511
833	Control Unit	-23.053	-23.161	-22.858	-22.339	-23.475	-22.890	-23.326
All GND'd Irradiation Statistics								
	Average All GND'd	-23.095	-22.621	-22.297	-21.528	-21.891	-20.724	-21.399
	Std Dev All GND'd	0.409	0.418	0.421	0.462	0.478	0.509	0.451
	Ps90%/90% (+KTL) All GND'd	-21.975	-21.475	-21.142	-20.260	-20.580	-19.327	-20.162
	PS90%/90% (-KTL) All GND'd	-24.215	-23.766	-23.452	-22.796	-23.202	-22.120	-22.636
Biased Irradiation Statistics								
	Average Biased	-23.451	-22.409	-22.198	-21.179	-21.432	-20.018	-21.111
	Std Dev Biased	0.376	0.277	0.396	0.632	0.466	0.646	0.448
	Ps90%/90% (+KTL) Biased	-22.420	-21.649	-21.111	-19.445	-20.155	-18.246	-19.882
	Ps90%/90% (-KTL) Biased	-24.482	-23.170	-23.285	-22.912	-22.710	-21.789	-22.339
	Specification MIN							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Specification MAX	-12.5	-8.0	-8.0	-8.0		-8.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

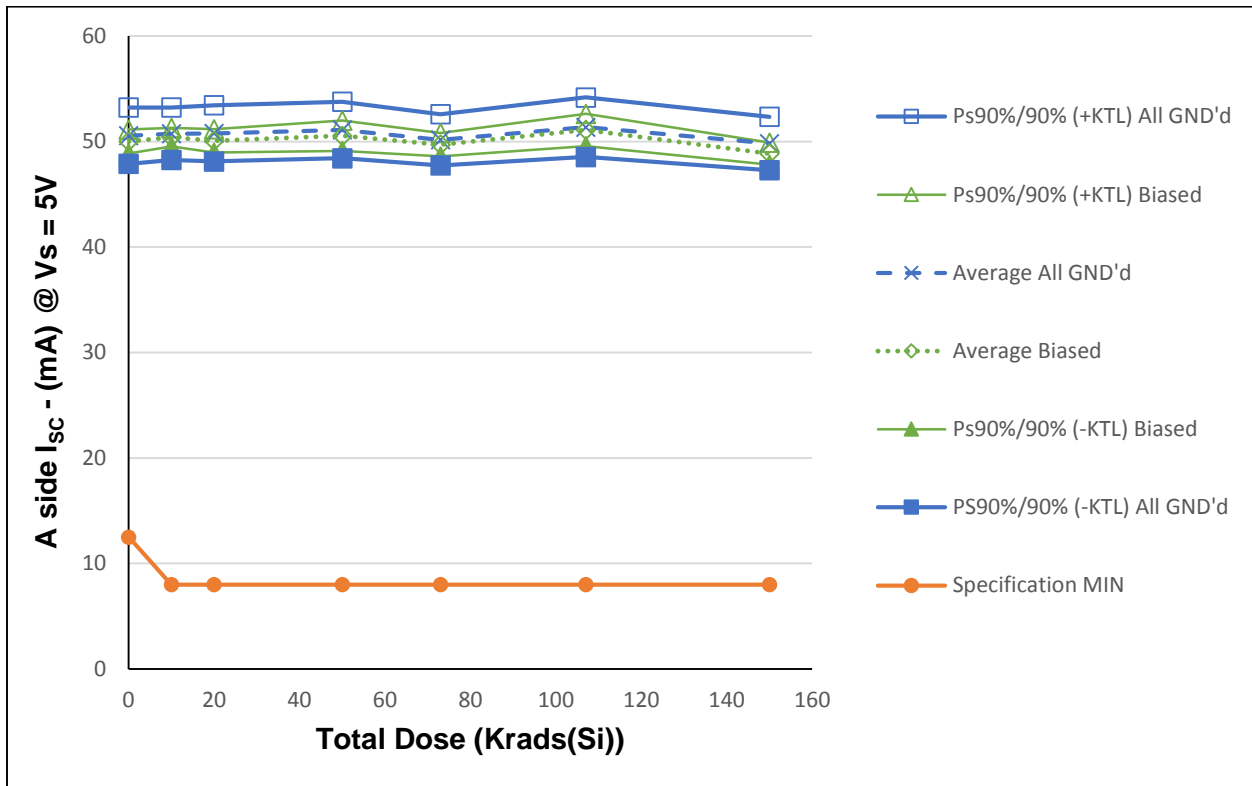


Figure 5.88: Plot of Output Short Circuit Current I_{sc-} @ $V_s = 5V$ versus Total Dose (side A)

Table 5.88: Raw data for output short circuit current I_{sc} - (side A) @ $V_s = 5V$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter Units	A I_{sc} - @ $V_s = 5V$ (mA)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	50.271	50.522	50.521	50.768	49.459	50.994	49.497
827	All GND'd Irradiation	51.249	51.334	51.505	51.860	50.205	52.222	50.556
828	All GND'd Irradiation	51.531	51.621	51.722	52.069	51.187	52.366	50.688
829	All GND'd Irradiation	49.055	49.303	49.267	49.627	49.118	49.832	48.408
830	All GND'd Irradiation	50.682	50.943	50.870	51.193	50.865	51.422	49.962
821	Biased Irradiation	50.433	50.464	50.480	51.422	50.119	52.067	49.294
822	Biased Irradiation	50.348	50.769	50.412	50.638	50.149	51.065	49.238
823	Biased Irradiation	49.428	49.903	49.495	50.226	49.266	50.742	48.456
824	Biased Irradiation	49.799	50.349	49.902	50.112	49.576	50.674	48.626
825	Biased Irradiation	50.061	50.543	50.068	50.361	49.432	50.988	48.676
832	Control Unit	51.569	51.651	51.952	53.474	51.676	51.837	50.984
833	Control Unit	50.501	50.532	50.979	51.798	49.976	50.941	50.198
All GND'd Irradiation Statistics								
	Average All GND'd	50.557	50.745	50.777	51.103	50.167	51.367	49.822
	Std Dev All GND'd	0.972	0.906	0.972	0.975	0.885	1.028	0.924
	Ps90%/90% (+KTL) All GND'd	53.224	53.228	53.442	53.777	52.592	54.186	52.355
	PS90%/90% (-KTL) All GND'd	47.891	48.261	48.112	48.429	47.741	48.549	47.289
Biased Irradiation Statistics								
	Average Biased	50.014	50.406	50.071	50.552	49.708	51.107	48.858
	Std Dev Biased	0.412	0.320	0.401	0.524	0.404	0.561	0.382
	Ps90%/90% (+KTL) Biased	51.144	51.283	51.171	51.990	50.816	52.645	49.905
	Ps90%/90% (-KTL) Biased	48.883	49.528	48.972	49.114	48.601	49.569	47.811
	Specification MIN	12.5	8.0	8.0	8.0		8.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

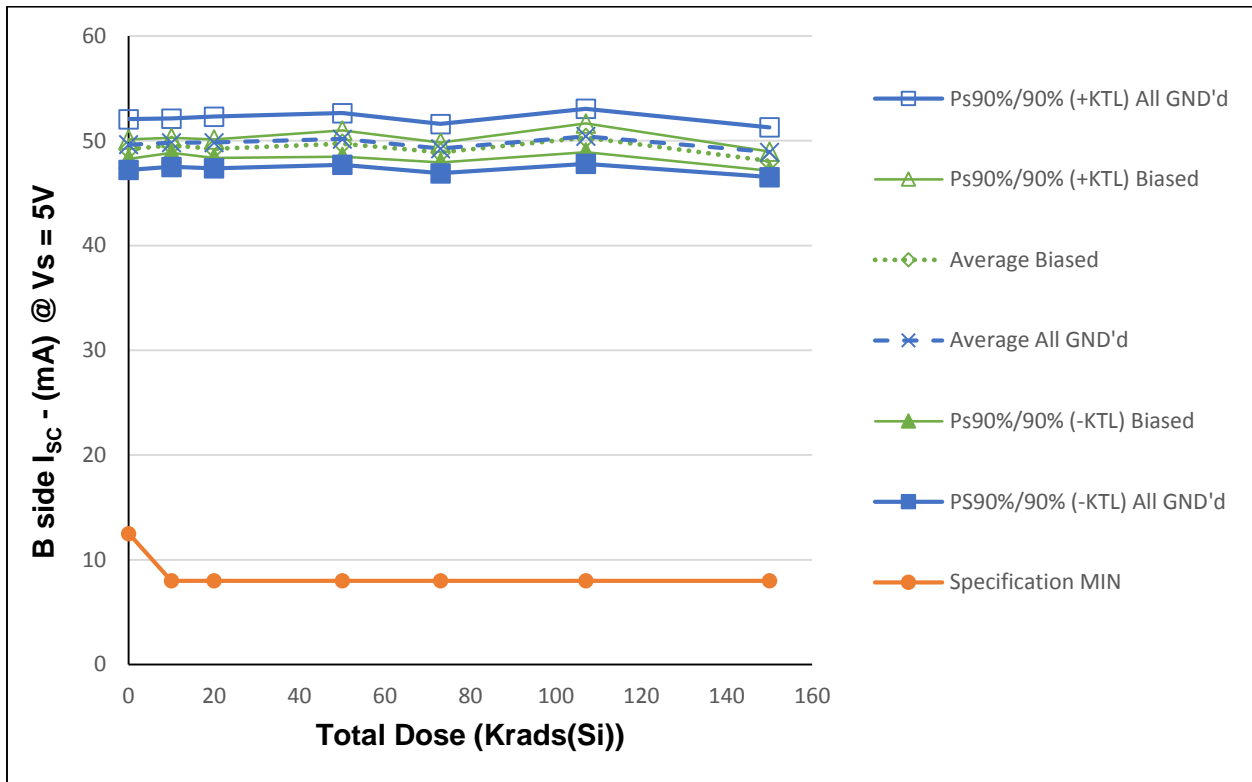


Figure 5.89: Plot of Output Short Circuit Current I_{sc} @ $V_s = 5V$ versus Total Dose (side B)

Table 5.89: Raw data for output short circuit current I_{SC} - (side B) @ $V_s = 5V$ versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter Units	B I_{SC} - @ $V_s = 5V$ (mA)	Total Dose (Krad(Si)) @ 10 mrad(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	49.308	49.526	49.525	49.789	48.488	50.010	48.534
827	All GND'd Irradiation	50.270	50.353	50.517	50.874	49.241	51.242	49.592
828	All GND'd Irradiation	50.504	50.580	50.688	51.036	50.171	51.326	49.683
829	All GND'd Irradiation	48.285	48.485	48.455	48.822	48.324	49.007	47.597
830	All GND'd Irradiation	49.852	50.132	50.029	50.369	50.052	50.581	49.157
821	Biased Irradiation	49.527	49.526	49.553	50.505	49.223	51.152	48.400
822	Biased Irradiation	49.517	49.903	49.558	49.798	49.290	50.217	48.451
823	Biased Irradiation	48.736	49.185	48.791	49.540	48.565	50.045	47.750
824	Biased Irradiation	49.021	49.548	49.100	49.326	48.794	49.893	47.840
825	Biased Irradiation	49.194	49.664	49.218	49.512	48.587	50.126	47.840
832	Control Unit	50.606	50.656	50.976	52.467	50.687	50.836	49.993
833	Control Unit	49.646	49.679	50.131	50.943	49.147	50.094	49.362
All GND'd Irradiation Statistics								
	Average All GND'd	49.644	49.815	49.843	50.178	49.255	50.433	48.913
	Std Dev All GND'd	0.885	0.841	0.899	0.901	0.856	0.960	0.864
	Ps90%/90% (+KTL) All GND'd	52.071	52.121	52.307	52.648	51.602	53.066	51.283
	PS90%/90% (-KTL) All GND'd	47.217	47.510	47.379	47.708	46.909	47.801	46.543
Biased Irradiation Statistics								
	Average Biased	49.199	49.565	49.244	49.736	48.892	50.287	48.056
	Std Dev Biased	0.337	0.260	0.325	0.461	0.346	0.498	0.339
	Ps90%/90% (+KTL) Biased	50.123	50.278	50.134	51.001	49.839	51.652	48.987
	Ps90%/90% (-KTL) Biased	48.275	48.853	48.354	48.471	47.944	48.921	47.125
	Specification MIN	12.5	8.0	8.0	8.0		8.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

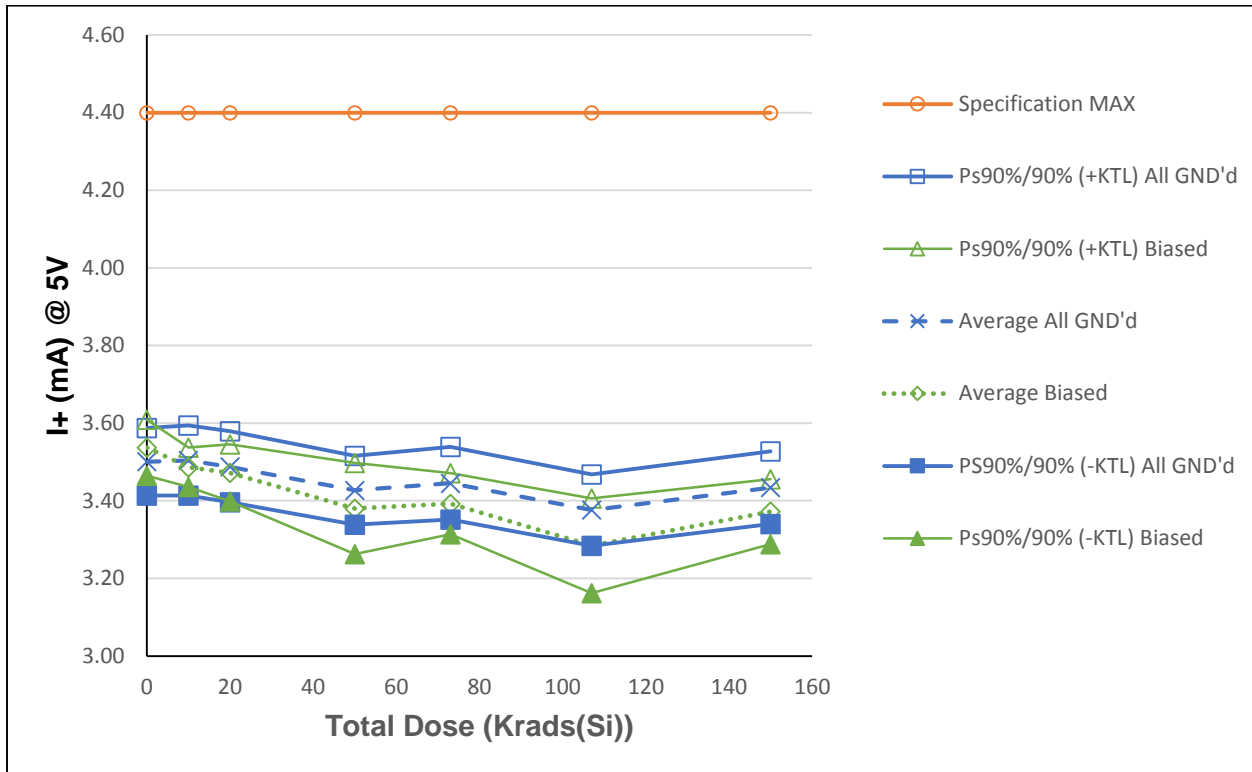


Figure 5.90: Plot of Device Supply Current @ $V_s = 5V$ versus Total Dose

Table 5.90: Raw data for device supply current @ Vs = 5V versus total dose including the statistical calculations, maximum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter Units	I+ @ 5V (mA)	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
		0	10	20	50	73	107	150
826	All GND'd Irradiation	3.496	3.490	3.474	3.416	3.457	3.371	3.423
827	All GND'd Irradiation	3.473	3.488	3.462	3.400	3.447	3.344	3.408
828	All GND'd Irradiation	3.526	3.541	3.521	3.458	3.471	3.404	3.468
829	All GND'd Irradiation	3.540	3.537	3.526	3.465	3.465	3.417	3.472
830	All GND'd Irradiation	3.469	3.466	3.455	3.396	3.386	3.344	3.399
821	Biased Irradiation	3.496	3.469	3.434	3.319	3.355	3.218	3.331
822	Biased Irradiation	3.535	3.476	3.466	3.385	3.382	3.301	3.365
823	Biased Irradiation	3.540	3.479	3.469	3.359	3.383	3.265	3.362
824	Biased Irradiation	3.568	3.516	3.508	3.429	3.424	3.334	3.411
825	Biased Irradiation	3.545	3.492	3.484	3.406	3.419	3.305	3.391
832	Control Unit	3.561	3.595	3.583	3.488	3.582	3.578	3.618
833	Control Unit	3.502	3.536	3.514	3.465	3.549	3.509	3.544
All GND'd Irradiation Statistics								
	Average All GND'd	3.501	3.504	3.488	3.427	3.445	3.376	3.434
	Std Dev All GND'd	0.032	0.033	0.033	0.032	0.034	0.034	0.034
	Ps90%/90% (+KTL) All GND'd	3.588	3.594	3.579	3.516	3.539	3.468	3.528
	PS90%/90% (-KTL) All GND'd	3.413	3.414	3.396	3.338	3.351	3.284	3.340
Biased Irradiation Statistics								
	Average Biased	3.537	3.486	3.472	3.380	3.392	3.284	3.372
	Std Dev Biased	0.026	0.018	0.027	0.043	0.029	0.045	0.031
	Ps90%/90% (+KTL) Biased	3.609	3.537	3.546	3.497	3.471	3.407	3.456
	Ps90%/90% (-KTL) Biased	3.465	3.436	3.398	3.262	3.314	3.162	3.289
Specification MIN								
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
Specification MAX								
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) All GND'd							
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (-KTL) Biased							
	Status (+KTL) Biased	PASS	PASS	PASS	PASS		PASS	

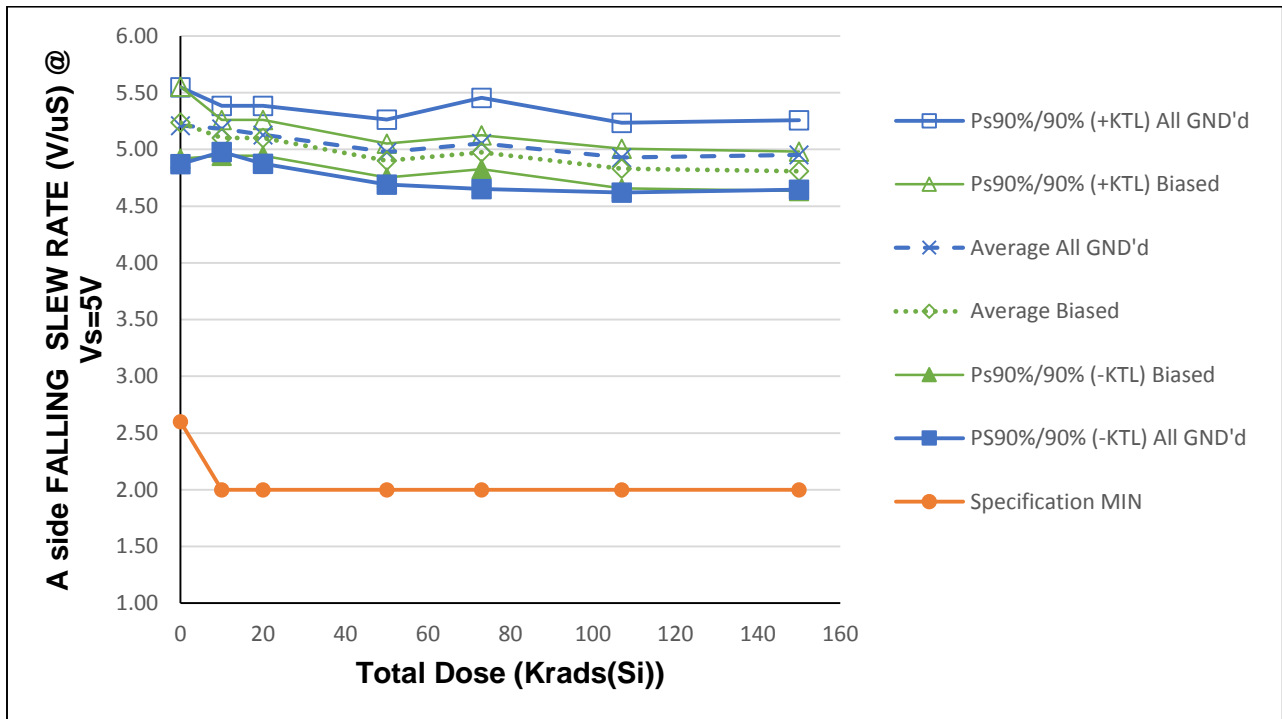


Figure 5.91: Plot of A-side Slew Rate (Falling) @ Vs = 5V versus Total Dose

Table 5.91: Raw data for slew rate (falling) of side A @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A FALL SLEW RATE @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(V/uS)	0	10	20	50	73	107	150
826	All GND'd Irradiation	5.263	5.128	5.128	4.878	5.000	4.878	4.878
827	All GND'd Irradiation	5.128	5.128	5.128	5.000	5.000	4.878	4.878
828	All GND'd Irradiation	5.405	5.263	5.263	5.128	5.263	5.128	5.128
829	All GND'd Irradiation	5.128	5.263	5.128	5.000	5.128	4.878	5.000
830	All GND'd Irradiation	5.128	5.128	5.000	4.878	4.878	4.878	4.878
821	Biased Irradiation	5.128	5.128	5.128	4.878	4.878	4.762	4.762
822	Biased Irradiation	5.263	5.128	5.128	4.878	5.000	4.878	4.878
823	Biased Irradiation	5.263	5.128	5.000	4.878	5.000	4.878	4.762
824	Biased Irradiation	5.405	5.128	5.128	5.000	5.000	4.878	4.878
825	Biased Irradiation	5.128	5.000	5.128	4.878	5.000	4.762	4.762
832	Control Unit	5.263	5.263	5.263	5.405	5.405	5.263	5.263
833	Control Unit	5.128	5.128	5.128	5.128	5.128	5.128	5.128
All GND'd Irradiation Statistics								
	Average All GND'd	5.211	5.182	5.130	4.977	5.054	4.928	4.952
	Std Dev All GND'd	0.124	0.074	0.093	0.104	0.147	0.112	0.112
	Ps90%/90% (+KTL) All GND'd	5.549	5.385	5.385	5.263	5.456	5.235	5.258
	PS90%/90% (-KTL) All GND'd	4.872	4.979	4.874	4.691	4.652	4.621	4.647
Biased Irradiation Statistics								
	Average Biased	5.238	5.103	5.103	4.902	4.976	4.832	4.808
	Std Dev Biased	0.116	0.057	0.057	0.055	0.055	0.064	0.064
	Ps90%/90% (+KTL) Biased	5.554	5.260	5.260	5.052	5.125	5.006	4.983
	Ps90%/90% (-KTL) Biased	4.921	4.945	4.945	4.753	4.826	4.657	4.634
	Specification MIN	2.6	2.0	2.0	2.0		2.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) Biased							

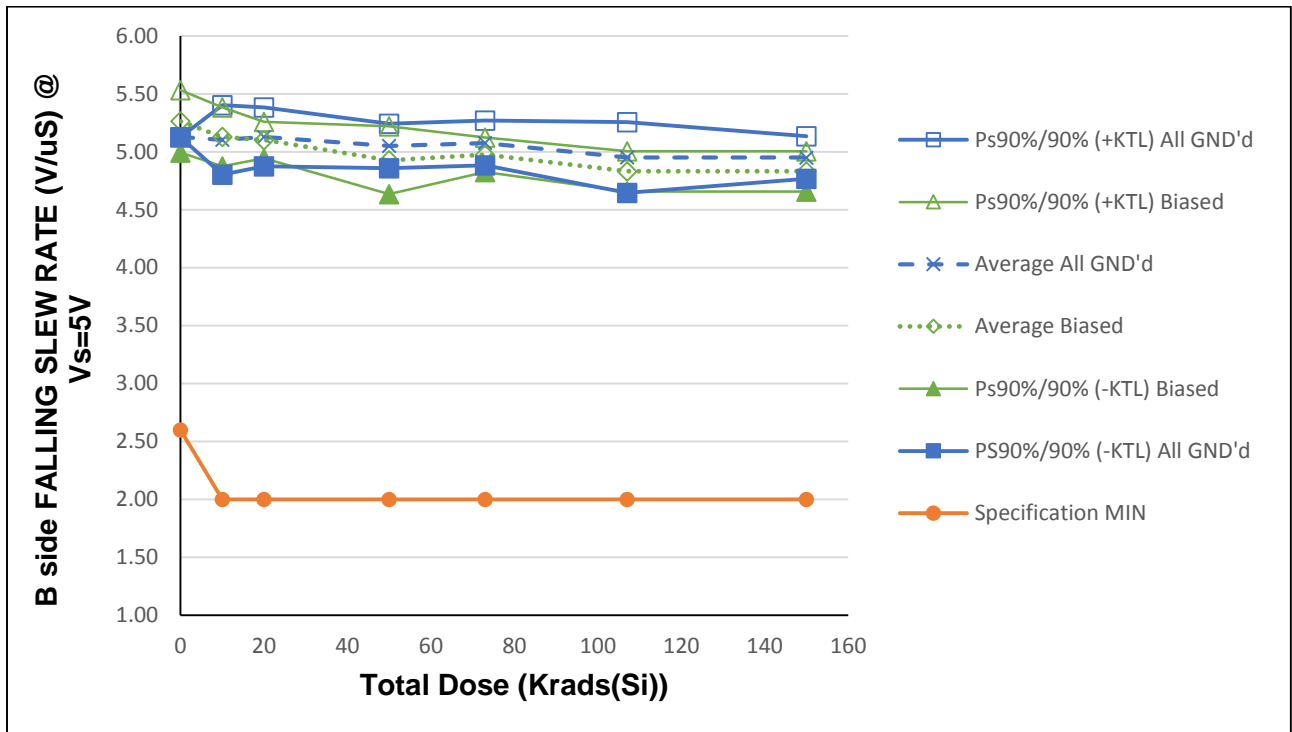


Figure 5.92: Plot of B-side Slew Rate (Falling) @ Vs = 5V versus Total Dose

Table 5.92: Raw data for slew rate (falling) of side B @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B FALL SLEW RATE @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units	(V/uS)	0	10	20	50	73	107	150
826	All GND'd Irradiation	5.128	5.000	5.128	5.000	5.000	4.878	4.878
827	All GND'd Irradiation	5.128	5.128	5.128	5.000	5.128	4.878	5.000
828	All GND'd Irradiation	5.128	5.263	5.263	5.128	5.128	5.128	5.000
829	All GND'd Irradiation	5.128	5.128	5.128	5.128	5.128	4.878	5.000
830	All GND'd Irradiation	5.128	5.000	5.000	5.000	5.000	5.000	4.878
821	Biased Irradiation	5.128	5.000	5.000	4.762	4.878	4.762	4.762
822	Biased Irradiation	5.263	5.128	5.128	4.878	5.000	4.878	4.878
823	Biased Irradiation	5.405	5.263	5.128	5.000	5.000	4.762	4.762
824	Biased Irradiation	5.263	5.128	5.128	5.000	5.000	4.878	4.878
825	Biased Irradiation	5.263	5.128	5.128	5.000	5.000	4.878	4.878
832	Control Unit	5.128	5.405	5.405	5.128	5.405	5.405	5.263
833	Control Unit	5.128	5.263	5.128	5.128	5.263	5.128	5.128
All GND'd Irradiation Statistics								
	Average All GND'd	5.128	5.104	5.130	5.051	5.077	4.952	4.951
	Std Dev All GND'd	0.000	0.110	0.093	0.070	0.070	0.112	0.067
	Ps90%/90% (+KTL) All GND'd	5.128	5.405	5.385	5.244	5.269	5.258	5.134
	PS90%/90% (-KTL) All GND'd	5.128	4.803	4.874	4.859	4.884	4.647	4.768
Biased Irradiation Statistics								
	Average Biased	5.265	5.130	5.103	4.928	4.976	4.832	4.832
	Std Dev Biased	0.098	0.093	0.057	0.107	0.055	0.064	0.064
	Ps90%/90% (+KTL) Biased	5.533	5.385	5.260	5.221	5.125	5.006	5.006
	Ps90%/90% (-KTL) Biased	4.996	4.874	4.945	4.635	4.826	4.657	4.657
	Specification MIN	2.6	2.0	2.0	2.0		2.0	
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
	Specification MAX							
	Status (Measurements) All GND'd							
	Status (Measurements) Biased							
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
	Status (+KTL) All GND'd							
	Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
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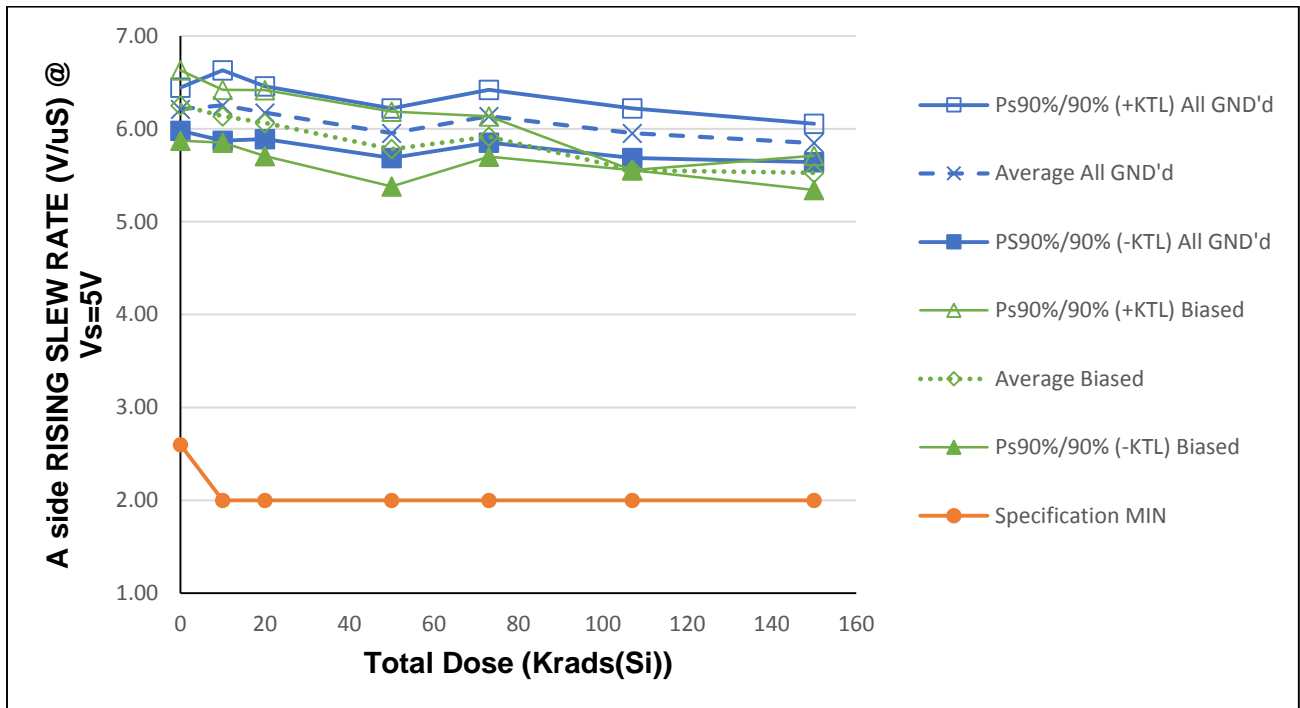


Figure 5.93: Plot of A-side Slew Rate (Rising) @ Vs = 5V versus Total Dose

Table 5.93: Raw data for slew rate (rising) of side A @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	A	RISE SLEW RATE @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second							
			Units	(V/uS)	0	10	20	50	73	107
826		All GND'd Irradiation		6.250	6.250	6.061	5.882	6.061	5.882	5.882
827		All GND'd Irradiation		6.250	6.250	6.250	5.882	6.250	5.882	5.882
828		All GND'd Irradiation		6.250	6.452	6.250	6.061	6.250	6.061	5.882
829		All GND'd Irradiation		6.250	6.061	6.250	6.061	6.061	6.061	5.882
830		All GND'd Irradiation		6.061	6.250	6.061	5.882	6.061	5.882	5.714
821		Biased Irradiation		6.061	6.061	5.882	5.556	5.882	5.556	5.405
822		Biased Irradiation		6.250	6.061	6.061	5.714	5.882	5.556	5.556
823		Biased Irradiation		6.452	6.250	6.061	5.882	6.061	5.556	5.556
824		Biased Irradiation		6.250	6.250	6.061	5.882	5.882	5.556	5.556
825		Biased Irradiation		6.250	6.061	6.250	5.882	5.882	5.556	5.556
832		Control Unit		6.452	6.452	6.452	6.250	6.452	6.250	6.250
833		Control Unit		6.061	6.250	6.250	6.061	6.250	6.061	6.061
All GND'd Irradiation Statistics										
		Average All GND'd		6.212	6.252	6.174	5.954	6.136	5.954	5.849
		Std Dev All GND'd		0.085	0.138	0.104	0.098	0.104	0.098	0.075
		Ps90%/90% (+KTL) All GND'd		6.444	6.632	6.459	6.221	6.421	6.221	6.055
		PS90%/90% (-KTL) All GND'd		5.980	5.873	5.890	5.686	5.852	5.686	5.643
Biased Irradiation Statistics										
		Average Biased		6.252	6.136	6.063	5.783	5.918	5.556	5.526
		Std Dev Biased		0.138	0.104	0.130	0.147	0.080	0.000	0.067
		Ps90%/90% (+KTL) Biased		6.632	6.421	6.419	6.186	6.137	5.556	5.710
		Ps90%/90% (-KTL) Biased		5.873	5.852	5.706	5.381	5.699	5.556	5.341
		Specification MIN		2.6	2.0	2.0	2.0		2.0	
		Status (Measurements) All GND'd		PASS	PASS	PASS	PASS		PASS	
		Status (Measurements) Biased		PASS	PASS	PASS	PASS		PASS	
		Specification MAX								
		Status (Measurements) All GND'd								
		Status (Measurements) Biased								
		Status (-KTL) All GND'd		PASS	PASS	PASS	PASS		PASS	
		Status (+KTL) All GND'd								
		Status (-KTL) Biased		PASS	PASS	PASS	PASS		PASS	
		Status (+KTL) Biased								

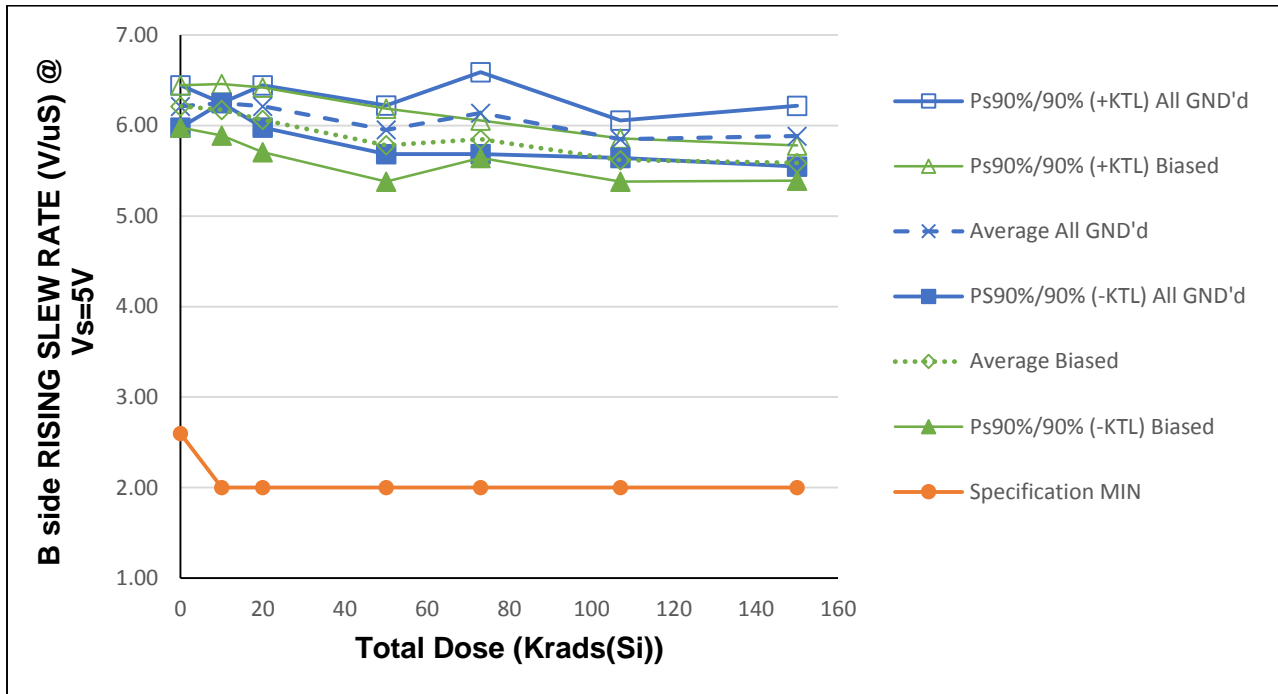


Figure 5.94: Plot of B-side Slew Rate (Rising) @ Vs = 5V versus Total Dose

Table 5.94: Raw data for slew rate (rising) of side B @ Vs = 5V versus total dose including the statistical calculations, minimum specification, and the status of the test (PASS/FAIL) under the orange headers)

Parameter	B	RISE SLEW RATE @ Vs=5V	Total Dose (Krad(Si)) @ 10 mrads(Si)/second						
Units		(V/uS)	0	10	20	50	73	107	150
826		All GND'd Irradiation	6.250	6.250	6.250	5.882	6.061	5.882	5.882
827		All GND'd Irradiation	6.250	6.250	6.250	5.882	6.250	5.882	5.882
828		All GND'd Irradiation	6.250	6.250	6.250	6.061	6.250	5.882	5.882
829		All GND'd Irradiation	6.250	6.250	6.250	6.061	6.250	5.882	6.061
830		All GND'd Irradiation	6.061	6.250	6.061	5.882	5.882	5.714	5.714
821		Biased Irradiation	6.061	6.061	5.882	5.556	5.714	5.556	5.556
822		Biased Irradiation	6.250	6.250	6.061	5.882	5.882	5.714	5.556
823		Biased Irradiation	6.250	6.061	6.250	5.714	5.882	5.556	5.556
824		Biased Irradiation	6.250	6.250	6.061	5.882	5.882	5.714	5.714
825		Biased Irradiation	6.250	6.250	6.061	5.882	5.882	5.556	5.556
832		Control Unit	6.452	6.452	6.452	6.250	6.452	6.250	6.250
833		Control Unit	6.250	6.250	6.250	6.061	6.250	6.250	5.882
All GND'd Irradiation Statistics									
		Average All GND'd	6.212	6.250	6.212	5.954	6.139	5.849	5.884
		Std Dev All GND'd	0.085	0.000	0.085	0.098	0.165	0.075	0.122
		Ps90%/90% (+KTL) All GND'd	6.444	6.250	6.444	6.221	6.591	6.055	6.220
		PS90%/90% (-KTL) All GND'd	5.980	6.250	5.980	5.686	5.686	5.643	5.549
Biased Irradiation Statistics									
		Average Biased	6.212	6.174	6.063	5.783	5.849	5.619	5.587
		Std Dev Biased	0.085	0.104	0.130	0.147	0.075	0.087	0.071
		Ps90%/90% (+KTL) Biased	6.444	6.459	6.419	6.186	6.055	5.857	5.782
		Ps90%/90% (-KTL) Biased	5.980	5.890	5.706	5.381	5.643	5.381	5.393
		Specification MIN	2.6	2.0	2.0	2.0		2.0	
		Status (Measurements) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (Measurements) Biased	PASS	PASS	PASS	PASS		PASS	
		Specification MAX							
		Status (Measurements) All GND'd							
		Status (Measurements) Biased							
		Status (-KTL) All GND'd	PASS	PASS	PASS	PASS		PASS	
		Status (+KTL) All GND'd							
		Status (-KTL) Biased	PASS	PASS	PASS	PASS		PASS	
		Status (+KTL) Biased							

Appendix A



Figure A1: Top View



Figure A2: Bottom View

Appendix B

Radiation Bias Connection Tables

Table B1: Biased Conditions

Pin	Function	Connection/Bias
1	OUT A	To 5 K Ω /40pF to pin 2
2	-IN A	To 5 K Ω /40pF to pin 1
3	+IN A	To 5 K Ω to +8V
4	NC	NC
5	V ⁻	To -15 and bypass C
6	NC	NC
7	+IN B	To 5 K Ω to +8V
8	-IN B	To 5 K Ω /40pF to pin 9
9	OUT B	To 5 K Ω /40pF to pin 8
10	V ⁺	To +15V and bypass C

Table B2: All GND'd

Pin	Function	Connection/Bias
1	OUT A	GROUND
2	-IN A	GROUND
3	+IN A	GROUND
4	NC	GROUND
5	V ⁻	GROUND
6	NC	GROUND
7	+IN B	GROUND
8	-IN B	GROUND
9	OUT B	GROUND
10	V ⁺	GROUND

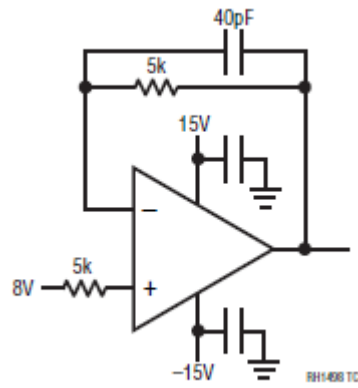


Figure B1: Total Dose Bias Circuit

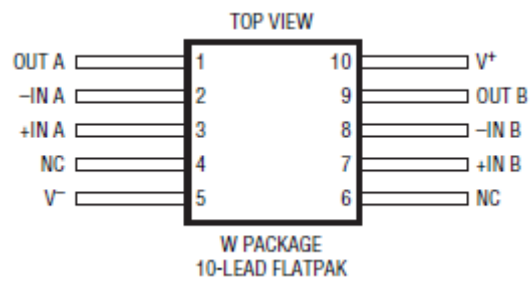


Figure B2: Pin-Out

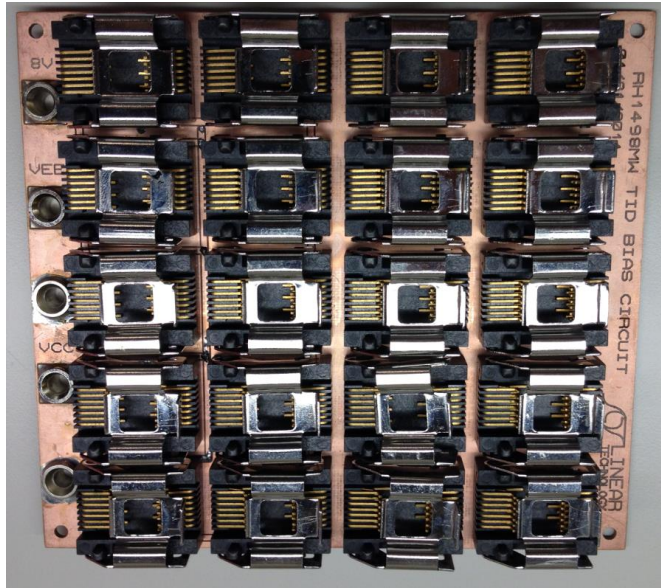


Figure B3: Bias Board (top)

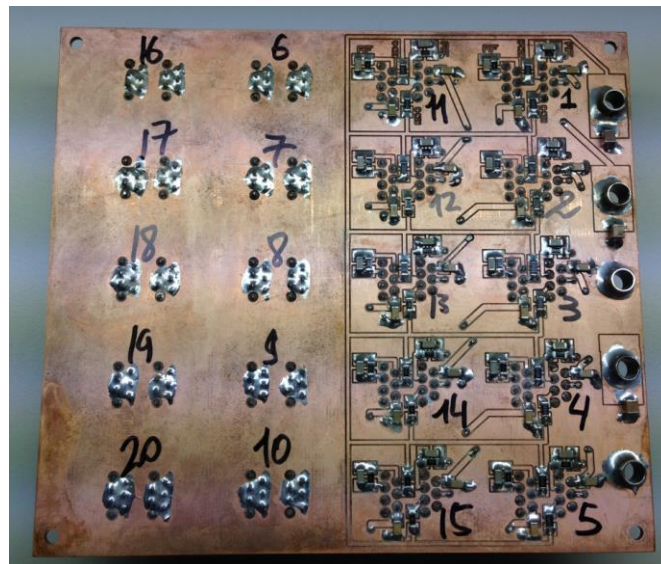




Figure B4: Bias Board (back)

Appendix C

TEST CERTIFICATE		
		
Defense Microelectronics Activity Science and Engineering Gamma Irradiation Test Facility DMEA/MEBC 4234 54th Street McClellan, CA 95652		
		
Testing Certificate Number: 1691.01		
<p>This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the dosimetry reported in this test certificate has been determined in accordance with the laboratory's terms of accreditation. The results contained herein relate only to the items tested. This certificate may not be reproduced, except in full, without the approval of this laboratory.</p>		
Date: 2013-12-05	Test Certificate #: 2014-NRC-005	Total Pages (except cover): 3

WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et seq.) or the Export Administration Act of 1979 (Title 50, U.S.C., App. 2401 et seq.), as amended. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

REQUEST FOR AND RESULTS OF TESTS				PAGE NO.	NO. OF PAGES				
				1	3				
SECTION A - REQUEST FOR TEST									
1. TO: (include ZIP Code) Defense Microelectronics Activity Science and Engineering Gamma Irradiation Test Facility 4234 54th Street McClellan, CA 95652-2100			2. FROM: (include ZIP Code) Dr. Sana Rezgui Linear Technology Corp. 1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408) 432-1900 Email: srezgui@linear.com						
3. PRIME CONTRACTOR AND ADDRESS (include ZIP Code) Same as block 2			4. MANUFACTURING PLANT NAME AND ADDRESS (include ZIP Code) Linear Technology Corp. 1630 McCarthy Blvd. Milpitas, CA 95035						
CONTRACT NUMBER CRADA CR-08-17			P.O. NUMBER TBD						
5. END ITEM AND/OR PROJECT N/A		6. SAMPLE NUMBER N/A	7. LOT NO. See below	8. REASON FOR SUBMITTAL Total Ionizing Dose (TID) Testing	9. DATE SUBMITTED 2013-12-03				
10. MATERIAL TO BE TESTED Various biased/unbiased devices - see below	10a. QUANTITY SUBMITTED See below	11. QUANTITY REPRESENTED N/A	12. SPEC. & AMEND AND/OR DRAWING NO. & REV. FOR SAMPLE & DATE N/A						
13. PURCHASED FROM OR SOURCE Linear Technology Corp.		14. SHIPMENT METHOD Hand carry	15. DATE SAMPLED AND SUBMITTED BY 2013-12-03 by Tom Shepherd						
16. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS. Dose Rate: 3000 ±10% rad(SiO ₂)/min Irradiation Steps: 13 Type of Test: Customer-Performed Total Dose: see below ±10% krad(SiO ₂) Requested Test Start Date: 2013-12-04 Dimensions: various Security Requirements, Safety or Handling Precautions: Customer to perform pre- and post-irradiation electrical testing. Parts may be packed by customer in dry ice for transport. Irradiation portion of testing to be conducted per MIL-STD-883H, Test Method 1019.8, Condition A. Customer reserves right to modify parameters, devices, etc. to suit test requirements. Description of parts to be irradiated is as follows: WQRH1498MW, fab lot #W1046927.1, ass'y lot #715549.2, WFR #19: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1498MW, fab lot #W1403645.3, ass'y lot #734726.2, WFR #6: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1498MW, fab lot #W1403645.3, ass'y lot #734727.2, WFR #7: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1498MW, fab lot #W1403645.3, ass'y lot #734729.2, WFR #13: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1498MW, fab lot #W1403645.3, ass'y lot #734728.2, WFR #10: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1014MW, fab lot #W1213460.1, ass'y lot #739171.2, WFR #11: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1014MW, fab lot #W1213460.1, ass'y lot #739172.2, WFR #12: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1014MW, fab lot #W1213460.1, ass'y lot #739173.2, WFR #13: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased WQRH1014MW, fab lot #W1213460.1, ass'y lot #739174.2, WFR #14: 50 and 200 krad(SiO ₂), 5 devices per dose level, biased RH1028MW, fab lot #W117814.1, ass'y lot #675617.1, WFR #5: 10, 30, 50, 100, 150, and 200 krad(SiO ₂), 10 devices per dose level, biased BIPC150 Devices, fab lot #HP201494.1, ass'y lot #GA, WFR #2: 50, 100, and 200 krad(SiO ₂), TBD devices per dose level, biased (GND)									
Experiment #: 2014-NRC-005		DMEA Approval:		<table border="1"> <tr> <td>SHEPHERD THOMAS J. AS.J.125523594</td> <td>SHEPHERD THOMAS J. AS.J.125523594</td> <td>ARSHAD MOHAMMAD MAD.1231956693</td> <td>MELINE CARY MW.1231854033</td> </tr> </table>		SHEPHERD THOMAS J. AS.J.125523594	SHEPHERD THOMAS J. AS.J.125523594	ARSHAD MOHAMMAD MAD.1231956693	MELINE CARY MW.1231854033
SHEPHERD THOMAS J. AS.J.125523594	SHEPHERD THOMAS J. AS.J.125523594	ARSHAD MOHAMMAD MAD.1231956693	MELINE CARY MW.1231854033						
17. SEND REPORT OF TEST TO Individual identified in Block 2									
SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)									
1. DATE SAMPLE RECEIVED 2013-12-04		2. DATE RESULTS REPORTED 2013-12-05		3. LAB REPORT NUMBER N/A					
4. TEST PERFORMED				RESULTS OF TEST					
				SAMPLE RESULT					
				REQUIREMENTS					
Please see next page.									
DATE 2013-12-05	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST Thomas J. Shepherd, SEGIT Technical Manager		SIGNATURE SHEPHERD.THOMAS.J.125523594						
2013-12-06	Mohammad Arshad, Alt. SEGIT Facility Supervisor		ARSHAD.MOHAMMAD.1231956693						

DD FORM 1222, FEB 62 (EF)

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

Continuation of DD Form 1222		Experiment #:		2014-NRC-005		Page 2 of 3		
4. Test Performed		Results of Test		Sample Result		Requirements		Step No.
20131204 09:38:00	to 20131204 09:54:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #19, S/Ns 1-5:	50 krad TD		1
20131204 09:38:00	to 20131204 09:54:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #13, S/Ns 1-5:	50 krad TD		1
20131204 09:38:00	to 20131204 09:54:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #10, S/Ns 1-5:	50 krad TD		1
20131204 09:38:00	to 20131204 09:54:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #7, S/Ns 37-41:	50 krad TD		1
20131204 10:04:30	to 20131204 11:09:21	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #19, S/Ns 6-10:	200 krad TD		2
20131204 10:04:30	to 20131204 11:09:21	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #13, S/Ns 6-10:	200 krad TD		2
20131204 10:04:30	to 20131204 11:09:21	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #10, S/Ns 6-10:	200 krad TD		2
20131204 10:04:30	to 20131204 11:09:21	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1498MW, WFR #7, S/Ns 42-46:	200 krad TD		2
20131204 11:21:30	to 20131204 11:36:49	5.000E+04	rad(SiO2) at 3.266E+03	rad(SiO2)/min	WQRH1498MW, WFR #6, S/Ns 29-38:	50 krad SD, 50 krad TD		3
20131204 11:42:00	to 20131204 12:27:56	1.500E+05	rad(SiO2) at 3.266E+03	rad(SiO2)/min	WQRH1498MW, WFR #6, S/Ns 34-38:	150 krad SD, 200 krad TD		4
20131204 12:55:00	to 20131204 13:11:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #11, S/Ns 3-7:	50 krad TD		5
20131204 12:55:00	to 20131204 13:11:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #12, S/Ns 15-19:	50 krad TD		5
20131204 12:55:00	to 20131204 13:11:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #13, S/Ns 27-31:	50 krad TD		5
20131204 12:55:00	to 20131204 13:11:13	5.000E+04	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #14, S/Ns 38-42:	50 krad TD		5
20131204 13:21:35	to 20131204 14:26:26	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #11, S/Ns 8-12:	200 krad TD		6
20131204 13:21:35	to 20131204 14:26:26	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #12, S/Ns 20-24:	200 krad TD		6
20131204 13:21:35	to 20131204 14:26:26	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #13, S/Ns 32-36:	200 krad TD		6
20131204 13:21:35	to 20131204 14:26:26	2.000E+05	rad(SiO2) at 3.084E+03	rad(SiO2)/min	WQRH1014MW, WFR #14, S/Ns 43-47:	200 krad TD		6

Uncertainty: Total Doses reported are ± 14.80% (Step Nos. 1-2, 5-6)
 8.76% (Step Nos. 3-4)

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

//

NOTES:

- ASTM = American Society for Testing and Materials.
- DUT = Device Under Test.
- S/N = Serial Number.
- SD = Step Dose.
- TD = Total Dose.
- Dose rate uniformity across target area: ± 8.56% (Step Nos. 1-2, 5-6)
 ± 2.52% (Step Nos. 3-4)
- All irradiation steps met the requirements of MIL-STD-883H, Test Method 1019.8, Condition A.
- After the original Test Request (DD Form 1222) was approved, the following changes were made:
 - Total number of irradiation steps was 15 instead of 13 per customer request.
 - Latitude to change test parameters to suit customer requirements was included in the original Test Request; no Customer Order Change Request (SEGIT Form QP03-4, Rev. 5) was required/issued.
- Source information:
 - Irradiator = J.L. Shepherd & Associates Model 81-22/484 self-contained irradiation facility, S/Ns 7125/50016.
 - Source selection = two large Co-60 sources.
- Dosimeter system:
 - Radcal Model No. 9010 Radiation Monitor Controller, S/N 90-1286.
 - Radcal Model No. 90X5-0.18 Electrometer/Ion Chamber, S/Ns 95-0476/9770.
 - This dosimeter system was calibrated per ISO/IEC 17025:2005 by University of Wisconsin Medical Radiation Research Center on 11 Oct 2012 (Report No. ION13910). This calibration is effective for two years.
- Irradiation geometry: in accordance with section 7.3.2 of ASTM E1249-00 (2005), the DUT's semiconductor chip plane was perpendicular to the incident radiation beam.
- Filter box: a DMEA Dose Enhancement Chamber (DEC) was used for all testing/dosimetry involved with this experiment. The DEC's Pb and Al layers are compliant with section 7.2.2 of ASTM E1249-00 (2005) with respect to thickness and geometry.

Continuation of DD Form 1222		Experiment #:		2014-NRC-005		Page 3 of 3		
4. Test Performed		Results of Test		Sample Result		Requirements		Step No.
20131204 15:06:00 to 20131204 15:09:07	1.000E+04	rad(SiO2) at	3.212E+03	rad(SiO2) min	WQRH1028MW, WFR #5, S/Ns 352-362 (no 354), 363-375 (no 367,369, 372);	10 krad SD, 10 krad TD		7
20131204 15:14:20 to 20131204 15:20:34	2.000E+04	rad(SiO2) at	3.212E+03	rad(SiO2) min	WQRH1028MW, WFR #5, S/Ns 363-366, 368, 370-371, 373-375;	20 krad SD, 30 krad TD		8
20131204 15:30:15 to 20131204 15:45:49	5.000E+04	rad(SiO2) at	3.212E+03	rad(SiO2) min	WQRH1028MW, WFR #5, S/Ns 380,382,384-386, 388,391-394,396-406 (no 401);	50 krad SD, 50 krad TD		9
20131204 15:53:00 to 20131204 16:08:34	5.000E+04	rad(SiO2) at	3.212E+03	rad(SiO2) min	WQRH1028MW, WFR #5, S/Ns 396-406 (no 401);	50 krad SD, 100 krad TD		10
20131204 16:17:35 to 20131204 17:04:17	1.500E+05	rad(SiO2) at	3.212E+03	rad(SiO2) min	WQRH1028MW, WFR #5, S/Ns 407-414,416,418-425,428-430;	150 krad SD, 150 krad TD		11
20131204 17:08:50 to 20131204 17:24:24	5.000E+04	rad(SiO2) at	3.212E+03	rad(SiO2) min	WQRH1028MW, WFR #5, S/Ns 419-425,428-430;	50 krad SD, 200 krad TD		12
20131204 17:47:30 to 20131204 18:03:46	5.000E+04	rad(SiO2) at	3.073E+03	rad(SiO2) min	BIPC150 Devices E, G, J, N, WFR #2, S/Ns E1-E3, G1-G3, J1-J3, N1-N3;	50 krad SD, 50 krad TD		13
20131204 18:09:30 to 20131204 18:25:46	5.000E+04	rad(SiO2) at	3.073E+03	rad(SiO2) min	BIPC150 Devices E, G, J, N, WFR #2, S/Ns E2-E3, G2-G3, J2-J3, N2-N3;	50 krad SD, 100 krad TD		14
20131204 18:29:30 to 20131204 19:02:03	1.000E+05	rad(SiO2) at	3.073E+03	rad(SiO2) min	BIPC150 Devices E, G, J, N, WFR #2, S/Ns E3, G3, J3, N3;	100 krad SD, 200 krad TD		15

Uncertainty: Total Doses reported are ± 10.46% (Step Nos. 7-12)
 15.18% (Step Nos. 13-15)

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

NOTES:

1. ASTM = American Society for Testing and Materials.
2. DUT = Device Under Test.
3. S/N = Serial Number.
4. SD = Step Dose.
5. TD = Total Dose.
6. Dose rate uniformity across target area:
 - = 4.22% (Step Nos. 7-12)
 - = 8.95% (Step Nos. 13-15)
7. All irradiation steps met the requirements of MIL-STD-883H, Test Method 1019.8, Condition A.
8. After the original Test Request (DD Form 1222) was approved, the following changes were made:
 - a. BIPC device quantity per dose level was 4 each (was TBD).
 - b. Total number of irradiation steps was 15 instead of 13 per customer request.
 Latitude to change test parameters to suit customer requirements was included in the original Test Request; no Customer Order Change Request (SEGIT Form QP03-4, Rev. 5) was required/issued.
9. Source information:
 - a. Irradiator = J.L. Shepherd & Associates Model 81-22/484 self-contained irradiation facility, S/Ns 7125/50016.
 - b. Source selection = two large Co-60 sources.
10. Dosimeter system:
 - a. Radcal Model No. 9010 Radiation Monitor Controller, S/N 90-1286.
 - b. Radcal Model No. 90XS-0.18 Electrometer/Ion Chamber, S/Ns 95-0476/9770.
 - c. This dosimeter system was calibrated per ISO/IEC 17025:2005 by University of Wisconsin Medical Radiation Research Center on 11 Oct 2012 (Report No. ION13910). This calibration is effective for two years.
11. Irradiation geometry: in accordance with section 7.3.2 of ASTM E1249-00 (2005), the DUT's semiconductor chip plane was perpendicular to the incident radiation beam.
12. Filter box: a DMEA Dose Enhancement Chamber (DEC) was used for all testing/dosimetry involved with this experiment.

The DEC's Pb and Al layers are compliant with section 7.2.2 of ASTM E1249-00 (2005) with respect to thickness and geometry.

Appendix D

Table D1: Electrical Characteristics of Device-Under-Test (Pre-irradiation)

(Preirradiation) $V_S = \pm 15V$, $V_{CM} = V_{OUT} = 0V$, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	NOTES	$T_A = 25^\circ C$			SUB-GROUP	$-55^\circ C \leq T_A \leq 125^\circ C$			SUB-GROUP	UNITS
				MIN	TYP	MAX		MIN	TYP	MAX		
V_{OS}	Input Offset Voltage	$V_{CM} = V^+, V^-$ $V_{CM} = 14.5V, -14.5V$			200	800	1		350	1100	2, 3	μV μV
	Input Offset Voltage Match (Channel-to-Channel) (Note 3)	$V_{CM} = V^+ \text{ to } V^-$ $V_{CM} = 14.5V \text{ to } -14.5V$	3		250	1400			450	1800		μV μV
I_B	Input Bias Current	$V_{CM} = V^+$ $V_{CM} = 14.5V$ $V_{CM} = V^-$ $V_{CM} = -14.5V$		0	250	715	1		500	1200	2, 3	nA nA nA nA
	Input Bias Current Match (Channel-to-Channel) (Note 3)	$V_{CM} = V^+, V^-$ $V_{CM} = 14.5V, -14.5V$	3	0	12	200			50	400		nA nA
I_{OS}	Input Offset Current	$V_{CM} = V^+, V^-$ $V_{CM} = 14.5V, -14.5V$			6	70	1		40	300	2, 3	nA nA
	Input Voltage Range			-15		15		-14.5		14.5		V
	Input Noise Voltage	0.1Hz to 10Hz			400							nV _{p-p}
e_n	Input Noise Voltage Density	$f = 1kHz$			12							nV/ \sqrt{Hz}
i_n	Input Noise Current Density	$f = 1kHz$			0.3							pA/ \sqrt{Hz}
A_{VOL}	Large-Signal Voltage Gain	$V_O = -14.5V \text{ to } 14.5V$, $R_1 = 10k$ $V_O = -10V \text{ to } 10V$, $R_1 = 2k$		1000	5200		4	60	400		5, 6	V/mV V/mV
$CMRR$	Common Mode Rejection Ratio	$V_{CM} = V^+ \text{ to } V^-$ $V_{CM} = 14.5V \text{ to } -14.5V$		90	102		1	86	102		2, 3	dB dB
	CMRR Match (Channel-to-Channel) (Note 3)	$V_{CM} = V^+ \text{ to } V^-$ $V_{CM} = 14.5V \text{ to } -14.5V$	3	84	103			80	100			dB dB
$PSRR$	Power Supply Rejection Ratio	$V_S = \pm 2V \text{ to } \pm 16V$		90	110		1	88			2, 3	dB
	PSRR Match (Channel-to-Channel) (Note 3)	$V_S = \pm 2V \text{ to } \pm 16V$	3	83	110			82	100			dB
V_{OL}	Output Voltage Swing (Low) (Note 4)	No Load $I_{SINK} = 1mA$ $I_{SINK} = 10mA$ $I_{SINK} = 5mA$	4		18	30	4		25	75	5, 6	mV mV mV mV
					50	100			70	150		
					230	500			180	500		
V_{OH}	Output Voltage Swing (High) (Note 4)	No Load $I_{SOURCE} = 1mA$ $I_{SOURCE} = 10mA$ $I_{SOURCE} = 5mA$	4		2.5	10	4		5	25	5, 6	mV mV mV mV
					75	150			100	250		
					420	800			300	800		
I_{SC}	Short-Circuit Current			± 15	± 30		1	± 7.5	± 12		2, 3	mA
I_S	Supply Current per Amp				1.8	2.5	1		2.2	3	2, 3	mA
GBW	Gain-Bandwidth Product	$f = 100kHz$		6.8	10.5			5.8	8.5			MHz
SR	Slew Rate	$A_V = -1$, $R_L = 10k$, $V_O = \pm 10V$, Measure at $V_O = \pm 5V$		3.5	6		4	2.2	4		5, 6	V/ μs

Table D1 (continued): Electrical Characteristics of Device-Under-Test (Pre-irradiation)

 (Preirradiation) $V_S = 5V$; $V_{CM} = V_{OUT} = \text{half supply}$, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	NOTES	$T_A = 25^\circ\text{C}$			SUB-GROUP	$-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$			SUB-GROUP	UNITS
				MIN	TYP	MAX		MIN	TYP	MAX		
V_{OS}	Input Offset Voltage	$V_{CM} = V^+, V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$		150	800		1	300	1100		2, 3	μV μV
	Input Offset Voltage Match (Channel-to-Channel) (Note 3)	$V_{CM} = V^+ \text{ to } V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$	3	200	1400			350	1800			μV μV
I_B	Input Bias Current	$V_{CM} = V^+$ $V_{CM} = V^+ - 0.5V$ $V_{CM} = V^-$ $V_{CM} = V^- + 0.5V$		0	250	650	1	0	450	1100	2, 3	nA nA nA nA
	Input Bias Current Match (Channel-to-Channel) (Note 3)	$V_{CM} = V^+, V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$	3	0	10	180		0	30	400		nA nA
I_{OS}	Input Offset Current	$V_{CM} = V^+, V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$		5	65		1	15	300		2, 3	nA nA
	Input Voltage Range			V^-	V^+			$V^- + 0.5V$	$V^+ - 0.5V$			V
	Input Noise Voltage	0.1Hz to 10Hz		400								nV _{p-p}
e_n	Input Noise Voltage Density	$f = 1\text{kHz}$		12								nV/ $\sqrt{\text{Hz}}$
i_n	Input Noise Current Density	$f = 1\text{kHz}$		0.3								pA/ $\sqrt{\text{Hz}}$
C_{IN}	Input Capacitance			5								pF
A_{VOL}	Large-Signal Voltage Gain	$V_S = 5V, V_O = 75\text{mV to } 4.8V,$ $R_L = 10k$		600	3800		4	60	210		5, 6	V/mV
CMRR	Common Mode Rejection Ratio	$V_S = 5V, V_{CM} = V^+ \text{ to } V^-$ $V_S = 5V, V_{CM} = 0.5V \text{ to } 4.5V$		76	90			68	85			dB dB
	CMRR Match (Channel-to-Channel) (Note 3)	$V_S = 5V, V_{CM} = V^+ \text{ to } V^-$ $V_S = 5V, V_{CM} = 0.5V \text{ to } 4.5V$	3	75	91			66				dB dB
PSRR	Power Supply Rejection Ratio	$V_S = 4.5V \text{ to } 12V,$ $V_{CM} = V_O = 0.5V$		88	105		1	86	104		2, 3	dB
	PSRR Match (Channel-to-Channel) (Note 3)	$V_S = 4.5V \text{ to } 12V,$ $V_{CM} = V_O = 0.5V$	3	82	120			80	118			dB
V_{OL}	Output Voltage Swing (Low) (Note 4)	No Load $I_{SINK} = 1\text{mA}$ $I_{SINK} = 2.5\text{mA}$	4	14	30		4	25	75		5, 6	mV mV mV
V_{OH}	Output Voltage Swing (High) (Note 4)	No Load $I_{SOURCE} = 1\text{mA}$ $I_{SOURCE} = 2.5\text{mA}$	4	2.5	10		4	5	25		5, 6	mV mV mV
I_{SC}	Short-Circuit Current	$V_S = 5V$		± 12.5	24		1	± 5	± 10		2, 3	mA
I_S	Supply Current per Amp			1.7	2.2		1	2	2.7		2, 3	mA
GBW	Gain-Bandwidth Product	$V_S = 5V, f = 100\text{kHz}$		6.8	10.5			5.8	8.5			MHz
SR	Slew Rate	$V_S = \pm 2.5V, A_V = -1,$ $R_L = 10k, V_O = \pm 2V,$ Measure at $V_O = \pm 1V$		2.6	4.5		4	2	3.6		5, 6	V/ μs

Table D2: Electrical Characteristics of Device-Under-Test (Post-irradiation)

(Postirradiation) $V_S = \pm 15V$, $V_{CM} = 0V$, $T_A = 25^\circ C$, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	NOTES	10-Krad(Si)		20Krad(Si)		50Krad(Si)		100Krad(Si)		200Krad(Si)		UNITS
				MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V_{OS}	Input Offset Voltage	$V_{CM} = V^+, V^-$		950		950		950		950		950		μV
I_B	Input Bias Current	$V_{CM} = V^+, V^-$		765		815		865		915		965		nA
I_{OS}	Input Offset Current	$V_{CM} = V^+, V^-$		100		100		100		100		100		nA
	Input Voltage Range			V^-	V^+	V^-	V^+	V^-	V^+	V^-	V^+	V^-	V^+	V
A_{VOL}	Large-Signal Voltage Gain	$V_O = -14.5V$ to $14.5V$, $R_1 = 10k$		500		500		500		500		500		V/mV
		$V_O = -10V$ to $10V$, $R_1 = 2k$		250		250		250		250		250		V/mV
CMRR	Common Mode Rejection Ratio	$V_{CM} = V^+$ to V^-		86		86		86		86		86		dB
	CMRR Match (Channel-to-Channel)	$V_{CM} = V^+$ to V^-	3	83		83		83		83		83		dB
PSRR	Power Supply Rejection Ratio	$V_S = \pm 2V$ to $\pm 16V$		90		90		90		90		90		dB
	PSRR Match (Channel-to-Channel)	$V_S = \pm 2V$ to $\pm 16V$	3	83		83		83		83		83		dB
V_{OUT}	Output Voltage Swing Low	No Load	4	60		60		60		60		60		mV
		$I_{SINK} = 1mA$		100		100		100		100		100		mV
$I_{SINK} = 10mA$		500		500		500		500		500		mV		
V_{OUT}	Output Voltage Swing High	No Load	4	20		20		20		20		20		mV
		$I_{SOURCE} = 1mA$		150		150		150		150		150		mV
		$I_{SOURCE} = 10mA$		800		800		800		800		800		mV
I_{SC}	Short-Circuit Current			± 10		± 10		± 10		± 10		± 10		mA
I_S	Supply Current			2.5		2.5		2.5		2.5		2.5		mA
GBW	Gain-Bandwidth Product	$f = 100kHz$		4.5		4.5		4.5		4.5		4.5		MHz
SR	Slew Rate	$A_V = -1$, $R_L = 10k$, $V_O = \pm 10V$, Measure at $V_O = \pm 5V$		3		3		3		3		3		V/ μs

Table D2 (continued): Electrical Characteristics of Device-Under-Test (Post-irradiation)

(Preirradiation) $V_S = 5V$; $V_{CM} = V_{OUT} = \text{half supply}$, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	NOTES	$T_A = 25^\circ\text{C}$			SUB-GROUP	$-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$			SUB-GROUP	UNITS
				MIN	TYP	MAX		MIN	TYP	MAX		
V_{OS}	Input Offset Voltage	$V_{CM} = V^+, V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$		150	800		1	300	1100		2, 3	μV μV
	Input Offset Voltage Match (Channel-to-Channel) (Note 3)	$V_{CM} = V^+ \text{ to } V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$	3	200	1400			350	1800			μV μV
I_B	Input Bias Current	$V_{CM} = V^+$ $V_{CM} = V^+ - 0.5V$ $V_{CM} = V^-$ $V_{CM} = V^- + 0.5V$		0 -650	250 -250	650 0	1	0 -1100	450 -450	1100 0	2, 3	nA nA nA nA
	Input Bias Current Match (Channel-to-Channel) (Note 3)	$V_{CM} = V^+, V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$	3	0	10	180		0	30	400		nA nA
I_{OS}	Input Offset Current	$V_{CM} = V^+, V^-$ $V_{CM} = V^+ - 0.5V, V^- + 0.5V$		5	65		1	15	300		2, 3	nA nA
	Input Voltage Range			V^-		V^+		$V^- + 0.5V$		$V^+ - 0.5V$		V
	Input Noise Voltage	0.1Hz to 10Hz		400								nV _{p-p}
e_n	Input Noise Voltage Density	$f = 1\text{kHz}$		12								nV/ $\sqrt{\text{Hz}}$
i_n	Input Noise Current Density	$f = 1\text{kHz}$		0.3								pA/ $\sqrt{\text{Hz}}$
C_{IN}	Input Capacitance			5								pF
A_{VOL}	Large-Signal Voltage Gain	$V_S = 5V, V_O = 75\text{mV to } 4.8V,$ $R_L = 10k$		600	3800		4	60	210		5, 6	V/mV
CMRR	Common Mode Rejection Ratio	$V_S = 5V, V_{CM} = V^+ \text{ to } V^-$ $V_S = 5V, V_{CM} = 0.5V \text{ to } 4.5V$		76	90			68	85			dB dB
	CMRR Match (Channel-to-Channel) (Note 3)	$V_S = 5V, V_{CM} = V^+ \text{ to } V^-$ $V_S = 5V, V_{CM} = 0.5V \text{ to } 4.5V$	3	75	91			66				dB dB
PSRR	Power Supply Rejection Ratio	$V_S = 4.5V \text{ to } 12V,$ $V_{CM} = V_O = 0.5V$		88	105		1	86	104		2, 3	dB
	PSRR Match (Channel-to-Channel) (Note 3)	$V_S = 4.5V \text{ to } 12V,$ $V_{CM} = V_O = 0.5V$	3	82	120			80	118			dB
V_{OL}	Output Voltage Swing (Low) (Note 4)	No Load $I_{SINK} = 1\text{mA}$ $I_{SINK} = 2.5\text{mA}$	4	14 50 90	30 100 200		4	25 65 110	75 150 220		5, 6	mV mV mV
V_{OH}	Output Voltage Swing (High) (Note 4)	No Load $I_{SOURCE} = 1\text{mA}$ $I_{SOURCE} = 2.5\text{mA}$	4	2.5 70 140	10 150 250		4	5 100 180	25 250 300		5, 6	mV mV mV
I_{SC}	Short-Circuit Current	$V_S = 5V$		± 12.5	24		1	± 5	± 10		2, 3	mA
I_S	Supply Current per Amp			1.7	2.2		1	2	2.7		2, 3	mA
GBW	Gain-Bandwidth Product	$V_S = 5V, f = 100\text{kHz}$		6.8	10.5			5.8	8.5			MHz
SR	Slew Rate	$V_S = \pm 2.5V, A_V = -1,$ $R_L = 10k, V_O = \pm 2V,$ Measure at $V_O = \pm 1V$		2.6	4.5		4	2	3.6		5, 6	V/ μs