

Total Ionization Dose (TID) Test Results of the RH1498M 10MHz, 6V/ μ s, Dual Rail-to-Rail Input and Output Precision C-Load Op Amp @ High Dose Rate (HDR)

HDR = 50 rads(Si)/s

26 November 2014

Duc Nguyen, Sana Rezgui

Acknowledgements

The authors would like to thank the Product Engineering and Design Signal-Conditioning Groups from Linear Technology for their help with the board design and assembly as well as the data collection pre- and post-irradiations. Special thanks are also for Thomas Shepherd from Defense Microelectronics Activity (DMEA) for the extensive work for board setup and continuous dosimetry monitoring throughout the ELDRS tests.

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: 52 units received, 2 units for control, 25 units for biased irradiation, and 25 units for unbiased irradiation. Serial numbers 776-780, 786-790, 796-800, 806-810, and 816-820 had all pins tied to ground during irradiation. Serial numbers 771-775, 781-785, 791-795, 801-805, and 811-815 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: 50 samples were divided into five groups of 10 each. Serial numbers 771-780 of group 1 were irradiated to 10 Krads(Si). Serial numbers 781-790 of group 2 were irradiated to 20 Krads(Si). Serial numbers 791-800 of group 3 were irradiated to 50 Krads(Si). Serial numbers 801-810 of group 4 were irradiated to 100 Krads(Si). Serial numbers 811-820 of group 5 were irradiated to 200 Krads(Si).

Radiation dose: 50 rads(Si)/sec.

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

Test Hardware and Software: LTX pre- irradiation test program: EQ2RRH1498.02; and 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 52 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 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 A (for high-dose rates ranging from 50 and 300 rads(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 50 rads(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 50 test samples and two control units were electrically tested at 25°C prior to irradiation. The parts were then placed in a lead/aluminum container and aligned with the radiation source, Cobalt-60, at DMEA facility in Sacramento, California. During irradiation, five units of five separate groups were biased at +/- 15V and 8V; other five of similar groups had all pads grounded. Ten units of group 1 were irradiated to 10 Krads(Si); group 2 to 20 Krads(Si); group 3 to 50 Krads(Si); group 4 to 100 Krads(Si); and group 5 to 200 Krads(Si). After 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 52 units (50 irradiated and 2 control).

The criteria to pass the high dose-rate test is that five samples in each corresponding dose group irradiated under electrical bias must pass the datasheet limits. If any of the tested 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.

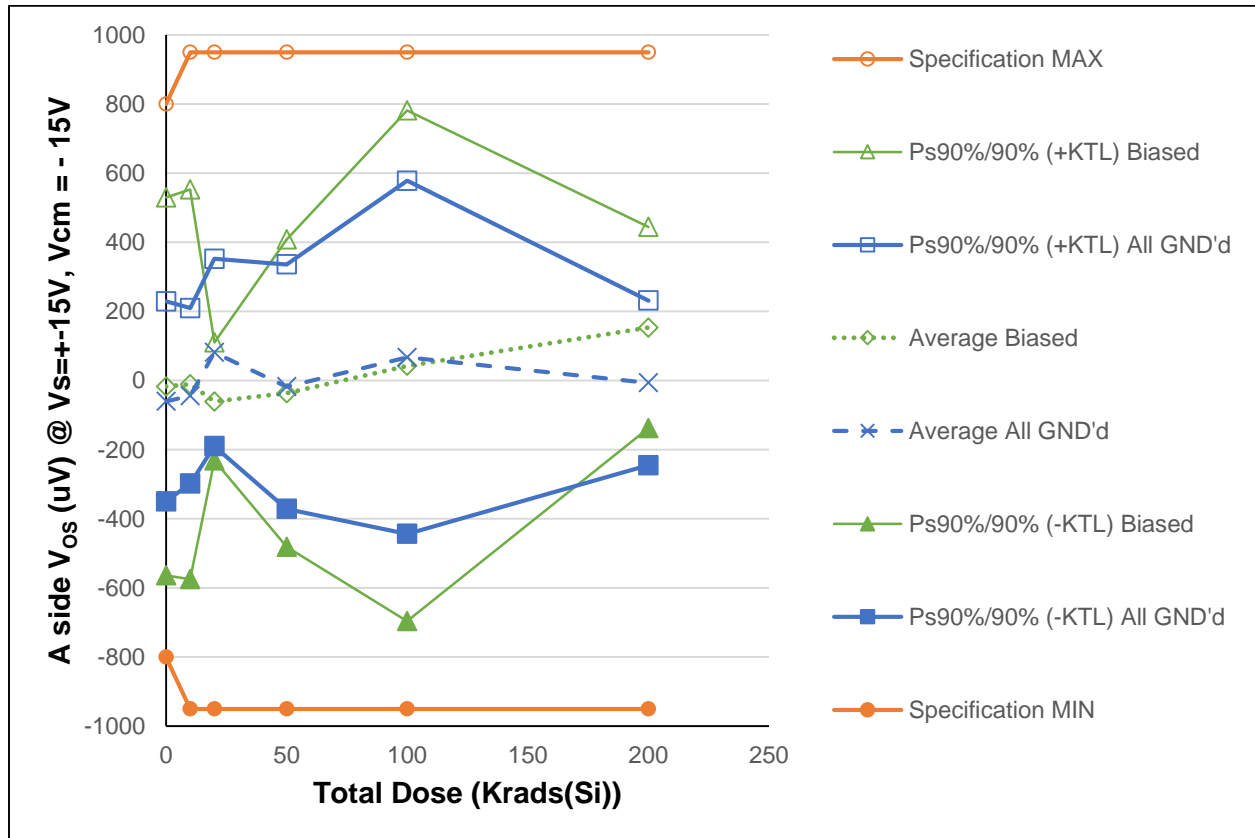


Figure 5.1 Plot of V_{os} (side A) @ $V_{cm} = -15V$ versus Total Dose

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 Units	A Vos @ Vs=+-15V, Vcm= -15V (uV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-119.460	-62.142				
777	All GND'd Irradiation	-217.023	-193.692				
778	All GND'd Irradiation	-11.785	-23.659				
779	All GND'd Irradiation	24.229	41.939				
780	All GND'd Irradiation	23.063	17.483				
771	Biased Irradiation	-36.074	-20.487				
772	Biased Irradiation	-172.091	-159.364				
773	Biased Irradiation	17.333	79.590				
774	Biased Irradiation	-196.135	-237.816				
775	Biased Irradiation	301.441	284.263				
786	All GND'd Irradiation	105.776		70.670			
787	All GND'd Irradiation	309.447		229.834			
788	All GND'd Irradiation	136.193		57.757			
789	All GND'd Irradiation	73.124		94.418			
790	All GND'd Irradiation	-37.081		-46.103			
781	Biased Irradiation	-118.993		-151.335			
782	Biased Irradiation	55.601		7.502			
783	Biased Irradiation	-37.599		-87.947			
784	Biased Irradiation	-5.067		-17.689			
785	Biased Irradiation	-69.415		-53.176			
796	All GND'd Irradiation	-1.657			5.986		
797	All GND'd Irradiation	-160.316			-162.405		
798	All GND'd Irradiation	95.801			32.050		
799	All GND'd Irradiation	-76.976			-123.159		
800	All GND'd Irradiation	156.606			159.636		
791	Biased Irradiation	-212.871			-257.446		
792	Biased Irradiation	98.030			65.783		
793	Biased Irradiation	65.835			69.016		
794	Biased Irradiation	103.465			102.247		
795	Biased Irradiation	-188.696			-161.133		
806	All GND'd Irradiation	-172.586				-170.456	
807	All GND'd Irradiation	-75.938				-89.960	
808	All GND'd Irradiation	239.000				242.092	
809	All GND'd Irradiation	116.773				141.645	
810	All GND'd Irradiation	193.305				213.679	
801	Biased Irradiation	248.913				226.860	
802	Biased Irradiation	-385.956				-412.727	
803	Biased Irradiation	5.665				22.835	
804	Biased Irradiation	165.979				133.419	
805	Biased Irradiation	340.589				243.403	
816	All GND'd Irradiation	-87.415					-85.996
817	All GND'd Irradiation	-135.438					-71.656
818	All GND'd Irradiation	61.645					58.557
819	All GND'd Irradiation	134.301					111.335
820	All GND'd Irradiation	-70.741					-45.370
811	Biased Irradiation	202.356					188.758
812	Biased Irradiation	119.343					112.348
813	Biased Irradiation	318.733					303.222
814	Biased Irradiation	46.108					13.099
815	Biased Irradiation	176.356					148.941
832	Control Unit	268.369	221.813	221.813	221.813	221.813	221.813
833	Control Unit	-57.196	-48.976	-48.976	-48.976	-48.976	-48.976
All GND'd Irradiation Statistics							
Average All GND'd		-60.195	-44.014	81.315	-17.578	67.400	-6.626
Std Dev All GND'd		105.487	92.623	98.910	128.982	186.256	86.881
Ps90%/90% (+KTL) All GND'd		229.051	209.958	352.527	336.090	578.113	231.601
Ps90%/90% (-KTL) All GND'd		-349.440	-297.986	-189.897	-371.247	-443.313	-244.853
Biased Irradiation Statistics							
Average Biased		-17.105	-10.763	-60.529	-36.307	42.758	153.273
Std Dev Biased		199.430	205.508	62.280	162.170	269.367	106.168
Ps90%/90% (+KTL) Biased		529.733	552.739	110.242	408.364	781.362	444.386
Ps90%/90% (-KTL) Biased		-563.944	-574.265	-231.301	-480.977	-695.847	-137.839
Specification MIN		-800	-950	-950	-950	-950	-950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		800	950	950	950	950	950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

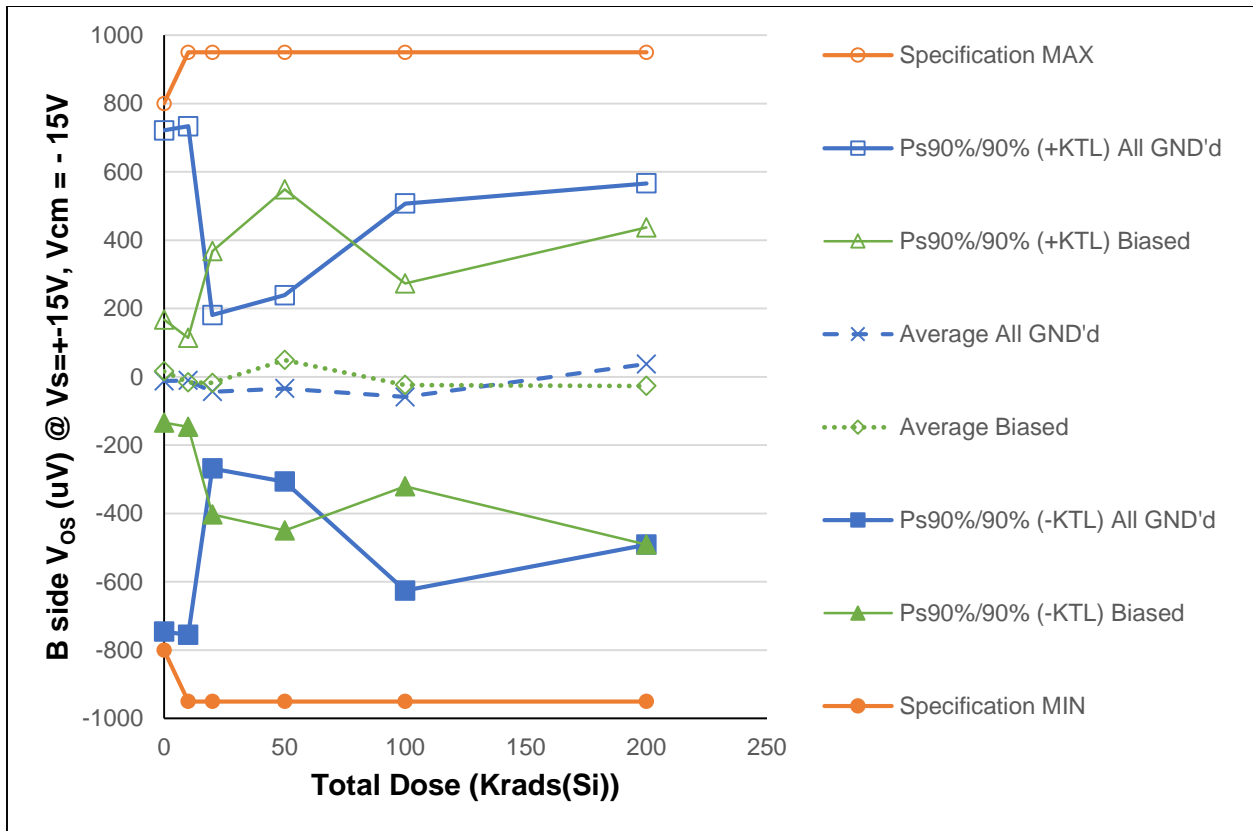


Figure 5.2: Plot of V_{os} (side B) @ $V_{cm} = -15V$ versus Total Dose

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

Parameter Units	B Vos @ $V_s = \pm 15V, V_{cm} = -15V$ (uV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	231.887	217.627				
777	All GND'd Irradiation	-412.574	-411.554				
778	All GND'd Irradiation	151.235	148.895				
779	All GND'd Irradiation	-156.965	-171.691				
780	All GND'd Irradiation	125.227	163.540				
771	Biased Irradiation	-16.516	-33.348				
772	Biased Irradiation	-47.367	-90.676				
773	Biased Irradiation	1.525	5.163				
774	Biased Irradiation	59.576	8.387				
775	Biased Irradiation	85.952	29.527				
786	All GND'd Irradiation	71.718	72.600				
787	All GND'd Irradiation	-69.262	-109.811				
788	All GND'd Irradiation	14.226	6.146				
789	All GND'd Irradiation	-27.161	-120.682				
790	All GND'd Irradiation	-24.353	-66.106				
781	Biased Irradiation	-66.971	-62.995				
782	Biased Irradiation	121.901	77.639				
783	Biased Irradiation	36.922	23.642				
784	Biased Irradiation	-284.677	-239.310				
785	Biased Irradiation	102.251	113.446				
796	All GND'd Irradiation	-54.205			-35.064		
797	All GND'd Irradiation	-65.439			-62.767		
798	All GND'd Irradiation	-188.948			-136.608		
799	All GND'd Irradiation	120.557			130.912		
800	All GND'd Irradiation	-57.311			-65.694		
791	Biased Irradiation	305.058			318.104		
792	Biased Irradiation	53.557			39.505		
793	Biased Irradiation	-121.245			-142.676		
794	Biased Irradiation	-49.252			-86.895		
795	Biased Irradiation	103.845			119.271		
806	All GND'd Irradiation	-406.277				-383.225	
807	All GND'd Irradiation	23.362				-20.822	
808	All GND'd Irradiation	171.419				191.105	
809	All GND'd Irradiation	-18.926				-19.153	
810	All GND'd Irradiation	-85.530				-63.247	
801	Biased Irradiation	-112.660				-184.217	
802	Biased Irradiation	36.830				-20.487	
803	Biased Irradiation	11.281				-1.497	
804	Biased Irradiation	-2.864				-31.054	
805	Biased Irradiation	114.949				119.332	
816	All GND'd Irradiation	78.923					153.728
817	All GND'd Irradiation	250.377					306.882
818	All GND'd Irradiation	-18.469					2.418
819	All GND'd Irradiation	-127.532					-132.652
820	All GND'd Irradiation	-178.875					-142.775
811	Biased Irradiation	52.367					40.070
812	Biased Irradiation	-309.431					-312.754
813	Biased Irradiation	25.818					-10.424
814	Biased Irradiation	155.905					135.730
815	Biased Irradiation	35.585					14.158
832	Control Unit	-260.684	-307.081	-307.081	-307.081	-307.081	-307.081
833	Control Unit	57.342	52.459	52.459	52.459	52.459	52.459
All GND'd Irradiation Statistics							
	Average All GND'd	-12.238	-10.636	-43.571	-33.844	-59.068	37.520
	Std.Dev All GND'd	267.597	271.369	81.868	99.445	206.602	192.845
	Ps90%/90% (+KTL) All GND'd	721.512	733.458	180.910	238.834	507.435	566.302
	Ps90%/90% (-KTL) All GND'd	-745.988	-754.731	-268.051	-306.522	-625.571	-491.261
Biased Irradiation Statistics							
	Average Biased	16.634	-16.189	-17.516	49.462	-23.584	-26.644
	Std.Dev Biased	54.937	47.415	140.677	182.107	108.145	169.265
	Ps90%/90% (+KTL) Biased	167.272	113.822	368.221	548.799	272.948	437.481
	Ps90%/90% (-KTL) Biased	-134.003	-146.201	-403.253	-449.875	-320.117	-490.769
	Specification MIN	-800	-950	-950	-950	-950	-950
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Specification MAX	800	950	950	950	950	950
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Status (+KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS

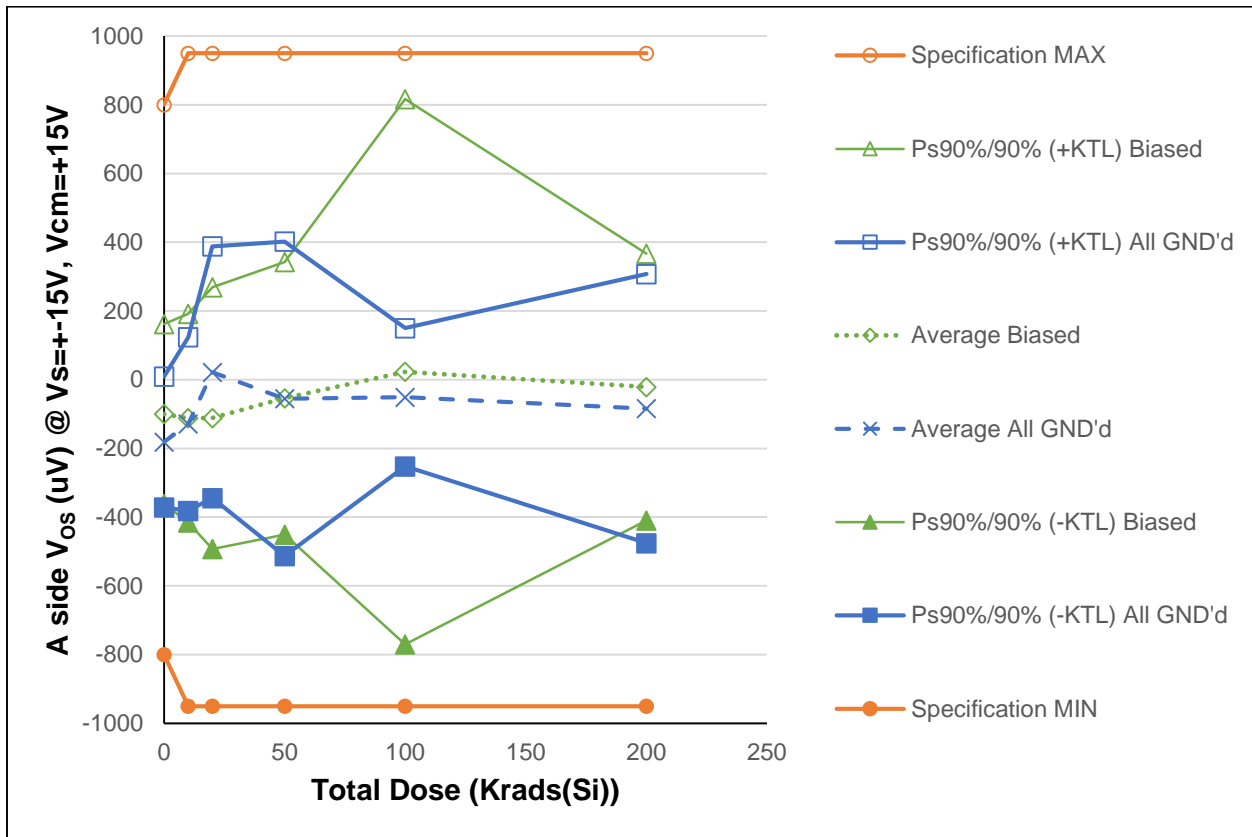


Figure 5.3: Plot of V_{os} (side A) @ $V_{cm} = +15V$ versus Total Dose

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 Units	A Vos @ $V_s = \pm 15V, V_{cm} = +15V$ (uV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-80.029	9.676				
777	All GND'd Irradiation	-167.939	-135.601				
778	All GND'd Irradiation	-179.308	-147.136				
779	All GND'd Irradiation	-208.423	-123.251				
780	All GND'd Irradiation	-271.352	-248.657				
771	Biased Irradiation	-76.915	-77.991				
772	Biased Irradiation	-243.518	-237.923				
773	Biased Irradiation	-19.109	-1.916				
774	Biased Irradiation	-143.045	-220.375				
775	Biased Irradiation	-16.896	-21.836				
786	All GND'd Irradiation	-12.020		-23.384			
787	All GND'd Irradiation	114.574		67.363			
788	All GND'd Irradiation	-9.801		-78.607			
789	All GND'd Irradiation	-85.920		-89.983			
790	All GND'd Irradiation	217.258		233.157			
781	Biased Irradiation	-66.117		-80.781			
782	Biased Irradiation	122.024		87.153			
783	Biased Irradiation	-211.284		-258.239			
784	Biased Irradiation	-253.892		-229.552			
785	Biased Irradiation	-96.764		-76.145			
796	All GND'd Irradiation	-138.789			-133.841		
797	All GND'd Irradiation	-132.477			-124.723		
798	All GND'd Irradiation	-239.611			-230.414		
799	All GND'd Irradiation	63.392			11.444		
800	All GND'd Irradiation	178.830			200.209		
791	Biased Irradiation	-250.511			-283.555		
792	Biased Irradiation	30.564			48.609		
793	Biased Irradiation	-54.205			-88.343		
794	Biased Irradiation	-16.416			-29.643		
795	Biased Irradiation	73.672			82.625		
806	All GND'd Irradiation	-163.604				-134.899	
807	All GND'd Irradiation	-102.510				-88.831	
808	All GND'd Irradiation	-148.768				-82.419	
809	All GND'd Irradiation	23.367				39.368	
810	All GND'd Irradiation	13.783				11.163	
801	Biased Irradiation	222.012				283.288	
802	Biased Irradiation	-341.940				-371.485	
803	Biased Irradiation	-60.631				-57.323	
804	Biased Irradiation	-41.195				-72.052	
805	Biased Irradiation	311.171				332.893	
816	All GND'd Irradiation	-231.001					-246.599
817	All GND'd Irradiation	-277.213					-215.534
818	All GND'd Irradiation	-5.435					-39.675
819	All GND'd Irradiation	4.877					-8.351
820	All GND'd Irradiation	53.412					89.622
811	Biased Irradiation	-73.069					-67.136
812	Biased Irradiation	0.304					-13.231
813	Biased Irradiation	108.173					204.859
814	Biased Irradiation	-22.948					-49.403
815	Biased Irradiation	-163.422					-182.607
832	Control Unit	-152.196	-122.702	-122.702	-122.702	-122.702	-122.702
833	Control Unit	-38.058	-19.937	-19.937	-19.937	-19.937	-19.937
All GND'd Irradiation Statistics							
Average All GND'd		-181.410	-128.994	21.709	-55.465	-51.124	-84.107
Std Dev All GND'd		69.432	92.134	133.573	166.878	73.294	142.804
Ps90%/90% (+KTL) All GND'd		8.972	123.637	387.965	402.113	149.848	307.461
Ps90%/90% (-KTL) All GND'd		-371.793	-381.624	-344.547	-513.043	-252.096	-475.675
Biased Irradiation Statistics							
Average Biased		-99.897	-112.008	-111.513	-54.061	23.064	-21.503
Std Dev Biased		95.437	110.687	138.857	144.623	289.348	141.530
Ps90%/90% (+KTL) Biased		161.791	191.495	269.233	342.494	816.455	366.573
Ps90%/90% (-KTL) Biased		-361.585	-415.511	-492.258	-450.617	-770.327	-409.580
Specification MIN		-800	-950	-950	-950	-950	-950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		800	950	950	950	950	950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

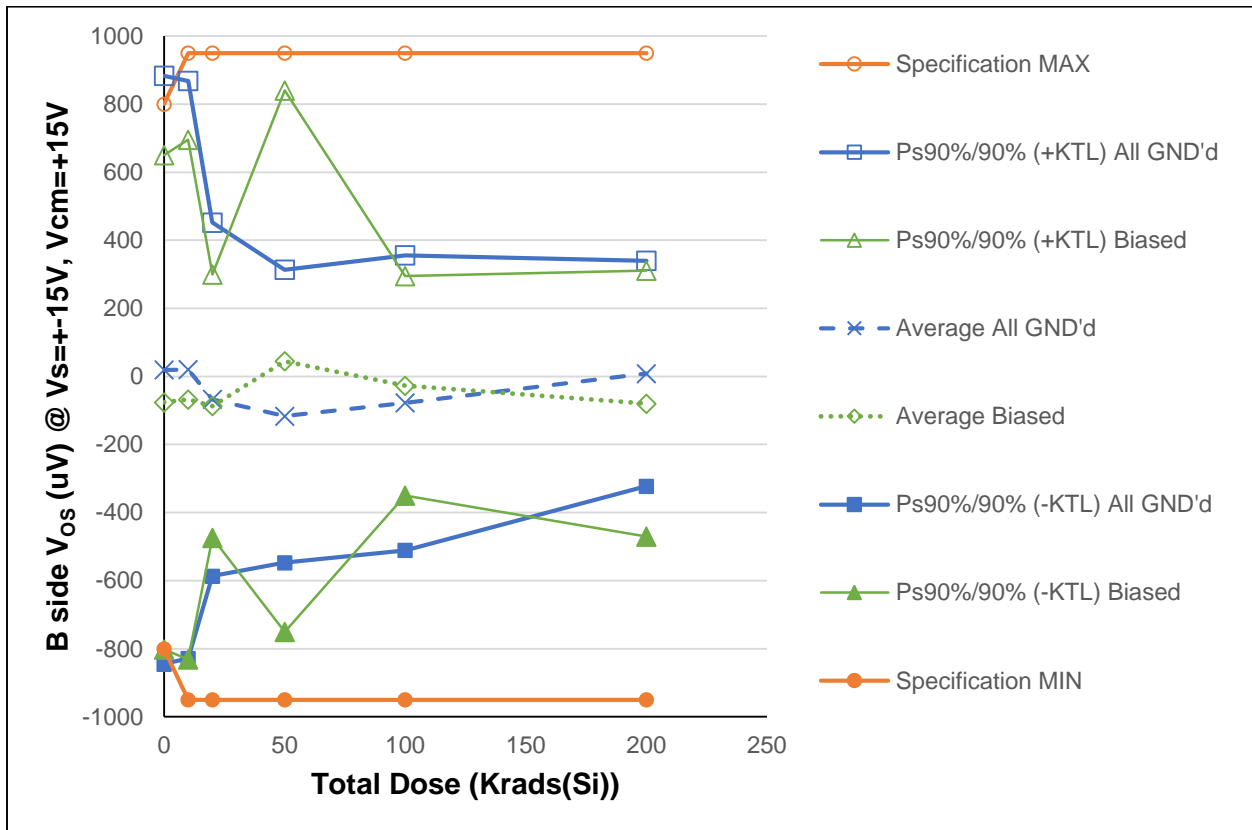


Figure 5.4: Plot of V_{os} (side B) @ $V_{cm} = +15V$ versus Total Dose

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 Units	B Vos @ $V_s = \pm 15V, V_{cm} = +15V$ (uV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	262.592	259.914				
777	All GND'd Irradiation	-258.776	-236.871				
778	All GND'd Irradiation	439.060	431.327				
779	All GND'd Irradiation	-245.349	-255.242				
780	All GND'd Irradiation	-101.579	-99.351				
771	Biased Irradiation	-197.479	-181.342				
772	Biased Irradiation	-414.946	-397.473				
773	Biased Irradiation	304.106	362.014				
774	Biased Irradiation	-76.252	-103.857				
775	Biased Irradiation	3.724	-17.987				
786	All GND'd Irradiation	-269.995		-255.013			
787	All GND'd Irradiation	-169.541		-203.884			
788	All GND'd Irradiation	116.589		124.211			
789	All GND'd Irradiation	-96.489		-149.537			
790	All GND'd Irradiation	215.282		147.531			
781	Biased Irradiation	22.643		43.089			
782	Biased Irradiation	-37.393		-29.582			
783	Biased Irradiation	-60.858		-14.221			
784	Biased Irradiation	-368.649		-317.723			
785	Biased Irradiation	-126.091		-117.092			
796	All GND'd Irradiation	-287.355			-266.227		
797	All GND'd Irradiation	-154.142			-153.327		
798	All GND'd Irradiation	-265.568			-229.872		
799	All GND'd Irradiation	85.462			125.971		
800	All GND'd Irradiation	-35.944			-60.533		
791	Biased Irradiation	140.582			159.765		
792	Biased Irradiation	-135.407			-111.854		
793	Biased Irradiation	-111.156			-4.912		
794	Biased Irradiation	-243.648			-291.826		
795	Biased Irradiation	358.561			472.585		
806	All GND'd Irradiation	-320.137				-255.912	
807	All GND'd Irradiation	-82.837				-104.047	
808	All GND'd Irradiation	167.925				179.030	
809	All GND'd Irradiation	-117.825				-90.593	
810	All GND'd Irradiation	-157.812				-115.948	
801	Biased Irradiation	86.439				74.742	
802	Biased Irradiation	3.127				-63.179	
803	Biased Irradiation	-25.878				-5.537	
804	Biased Irradiation	-82.347				-211.539	
805	Biased Irradiation	80.877				68.194	
816	All GND'd Irradiation	-12.088					25.380
817	All GND'd Irradiation	64.027					109.382
818	All GND'd Irradiation	-191.626					-176.181
819	All GND'd Irradiation	74.962					117.852
820	All GND'd Irradiation	-76.359					-33.599
811	Biased Irradiation	-35.401					-43.838
812	Biased Irradiation	-319.780					-314.408
813	Biased Irradiation	-58.242					-79.836
814	Biased Irradiation	80.502					69.428
815	Biased Irradiation	-18.439					-30.001
832	Control Unit	-215.801	-239.875	-239.875	-239.875	-239.875	-239.875
833	Control Unit	282.005	182.210	182.210	182.210	182.210	182.210
All GND'd Irradiation Statistics							
	Average All GND'd	19.190	19.955	-67.338	-116.798	-77.494	8.567
	Std Dev All GND'd	315.185	309.327	189.396	156.965	158.108	120.726
	Ps90%/90% (+KTL) All GND'd	883.427	868.131	451.984	313.600	356.039	339.599
	Ps90%/90% (-KTL) All GND'd	-845.048	-828.220	-586.661	-547.195	-511.028	-322.465
Biased Irradiation Statistics							
	Average Biased	-76.169	-67.729	-87.106	44.752	-27.464	-79.731
	Std Dev Biased	264.801	278.432	141.117	290.063	117.512	142.375
	Ps90%/90% (+KTL) Biased	649.915	695.731	299.836	840.104	294.754	310.662
	Ps90%/90% (-KTL) Biased	-802.253	-831.189	-474.047	-750.601	-349.682	-470.124
	Specification MIN	-800	-950	-950	-950	-950	-950
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Specification MAX	800	950	950	950	950	950
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) All GND'd	FAIL	PASS	PASS	PASS	PASS	PASS
	Status (+KTL) All GND'd	FAIL	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) Biased	FAIL	PASS	PASS	PASS	PASS	PASS
	Status (+KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS

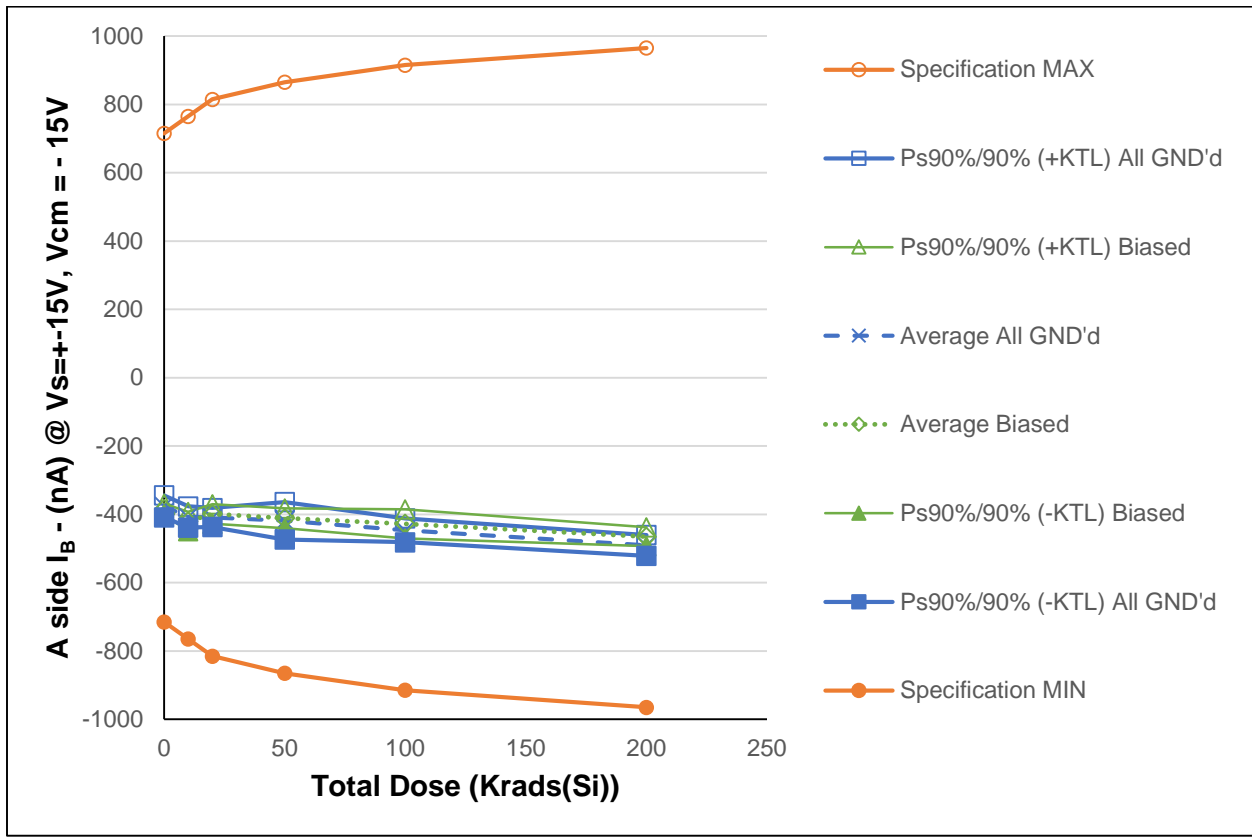


Figure 5.5: Plot of Negative Input Bias Current I_{B-} (side A) @ $V_{cm} = -15V$ versus Total Dose

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)) @ 50 rads(Si)/s						
		Units	(nA)	0	10	20	50	100
776	All GND'd Irradiation		-380.642	-414.656				
777	All GND'd Irradiation		-376.181	-413.407				
778	All GND'd Irradiation		-356.436	-390.074				
779	All GND'd Irradiation		-386.716	-417.164				
780	All GND'd Irradiation		-381.252	-402.815				
771	Biased Irradiation		-378.078	-405.029				
772	Biased Irradiation		-393.004	-432.556				
773	Biased Irradiation		-383.019	-418.760				
774	Biased Irradiation		-386.472	-425.954				
775	Biased Irradiation		-381.104	-422.079				
786	All GND'd Irradiation		-366.074		-399.089			
787	All GND'd Irradiation		-384.034		-420.749			
788	All GND'd Irradiation		-380.821		-412.073			
789	All GND'd Irradiation		-390.315		-416.516			
790	All GND'd Irradiation		-374.197		-398.426			
781	Biased Irradiation		-364.362		-390.779			
782	Biased Irradiation		-366.808		-405.669			
783	Biased Irradiation		-379.054		-413.700			
784	Biased Irradiation		-353.574		-389.118			
785	Biased Irradiation		-366.449		-395.945			
796	All GND'd Irradiation		-360.062			-412.256		
797	All GND'd Irradiation		-388.181			-442.364		
798	All GND'd Irradiation		-385.705			-436.752		
799	All GND'd Irradiation		-345.775			-396.326		
800	All GND'd Irradiation		-361.179			-405.787		
791	Biased Irradiation		-357.562			-395.674		
792	Biased Irradiation		-365.011			-405.428		
793	Biased Irradiation		-372.665			-419.274		
794	Biased Irradiation		-379.463			-420.189		
795	Biased Irradiation		-374.017			-416.531		
806	All GND'd Irradiation		-395.615				-465.335	
807	All GND'd Irradiation		-361.747				-441.724	
808	All GND'd Irradiation		-356.643				-430.019	
809	All GND'd Irradiation		-376.272				-448.460	
810	All GND'd Irradiation		-384.278				-447.820	
801	Biased Irradiation		-360.153				-415.605	
802	Biased Irradiation		-369.738				-422.613	
803	Biased Irradiation		-387.449				-447.728	
804	Biased Irradiation		-354.891				-413.102	
805	Biased Irradiation		-386.578				-440.542	
816	All GND'd Irradiation		-376.822					-489.849
817	All GND'd Irradiation		-383.816					-510.063
818	All GND'd Irradiation		-364.090					-482.656
819	All GND'd Irradiation		-370.764					-484.123
820	All GND'd Irradiation		-374.536					-487.998
811	Biased Irradiation		-385.281					-465.168
812	Biased Irradiation		-377.344					-465.659
813	Biased Irradiation		-380.127					-461.202
814	Biased Irradiation		-395.317					-481.517
815	Biased Irradiation		-375.147					-453.528
832	Control Unit		-396.164	-407.802	-407.802	-407.802	-407.802	-407.802
833	Control Unit		-381.451	-389.388	-389.388	-389.388	-389.388	-389.388
All GND'd Irradiation Statistics								
Average All GND'd			-376.245	-407.623	-409.370	-418.697	-446.672	-490.938
Std Dev All GND'd			11.688	11.237	10.165	19.967	12.793	11.075
Ps90%/90% (+KTL) All GND'd			-344.197	-376.812	-381.497	-363.948	-411.593	-460.570
Ps90%/90% (-KTL) All GND'd			-408.294	-438.434	-437.243	-473.446	-481.750	-521.306
Biased Irradiation Statistics								
Average Biased			-384.335	-420.876	-399.042	-411.419	-427.918	-465.415
Std Dev Biased			5.724	10.238	10.430	10.589	15.420	10.228
Ps90%/90% (+KTL) Biased			-368.641	-392.803	-370.443	-382.383	-385.637	-437.369
Ps90%/90% (-KTL) Biased			-400.030	-448.949	-427.641	-440.455	-470.199	-493.461
Specification MIN			-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd			PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased			PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX			715	765	815	865	915	965
Status (Measurements) All GND'd			PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased			PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd			PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd			PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased			PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased			PASS	PASS	PASS	PASS	PASS	PASS

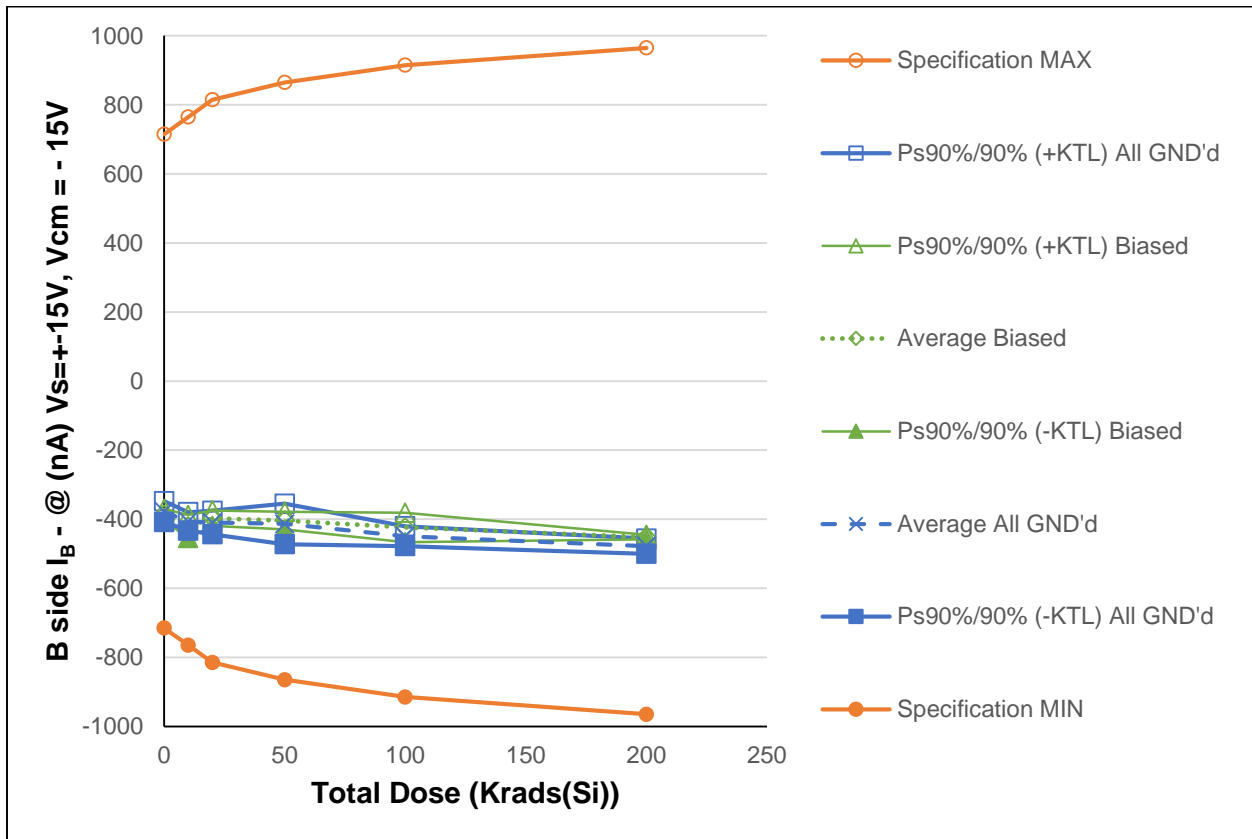


Figure 5.6: Plot of Negative Input Bias Current I_{B-} (side B) @ $V_{cm} = -15V$ versus Total Dose

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 Units	B IB- @ $V_s = \pm 15V, V_{cm} = -15V$ (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-375.659	-406.324				
777	All GND'd Irradiation	-380.073	-415.087				
778	All GND'd Irradiation	-360.062	-390.919				
779	All GND'd Irradiation	-386.961	-414.447				
780	All GND'd Irradiation	-386.423	-405.337				
771	Biased Irradiation	-377.346	-400.776				
772	Biased Irradiation	-390.497	-427.157				
773	Biased Irradiation	-384.061	-419.381				
774	Biased Irradiation	-392.665	-426.940				
775	Biased Irradiation	-389.490	-430.994				
786	All GND'd Irradiation	-369.131		-398.426			
787	All GND'd Irradiation	-392.879		-426.334			
788	All GND'd Irradiation	-383.416		-411.269			
789	All GND'd Irradiation	-392.299		-416.063			
790	All GND'd Irradiation	-374.686		-396.700			
781	Biased Irradiation	-368.062		-391.293			
782	Biased Irradiation	-378.379		-406.777			
783	Biased Irradiation	-375.052		-404.537			
784	Biased Irradiation	-361.634		-388.168			
785	Biased Irradiation	-370.470		-394.939			
796	All GND'd Irradiation	-363.083			-407.387		
797	All GND'd Irradiation	-383.159			-432.503		
798	All GND'd Irradiation	-390.834			-439.617		
799	All GND'd Irradiation	-348.125			-390.638		
800	All GND'd Irradiation	-358.386			-398.262		
791	Biased Irradiation	-360.397			-390.702		
792	Biased Irradiation	-362.900			-397.896		
793	Biased Irradiation	-368.120			-406.644		
794	Biased Irradiation	-377.005			-411.852		
795	Biased Irradiation	-377.955			-411.879		
806	All GND'd Irradiation	-394.726				-459.834	
807	All GND'd Irradiation	-365.097				-439.453	
808	All GND'd Irradiation	-367.784				-436.546	
809	All GND'd Irradiation	-387.449				-454.118	
810	All GND'd Irradiation	-394.042				-456.313	
801	Biased Irradiation	-362.747				-413.502	
802	Biased Irradiation	-370.138				-418.955	
803	Biased Irradiation	-386.537				-443.092	
804	Biased Irradiation	-352.693				-406.446	
805	Biased Irradiation	-385.705				-436.397	
816	All GND'd Irradiation	-374.349					-477.798
817	All GND'd Irradiation	-378.658					-491.995
818	All GND'd Irradiation	-361.267					-472.636
819	All GND'd Irradiation	-370.154					-475.105
820	All GND'd Irradiation	-372.180					-472.788
811	Biased Irradiation	-385.934					-453.250
812	Biased Irradiation	-375.513					-451.935
813	Biased Irradiation	-379.020					-454.381
814	Biased Irradiation	-376.856					-452.575
815	Biased Irradiation	-376.028					-448.155
832	Control Unit	-394.470	-406.168	-406.168	-406.168	-406.168	-406.168
833	Control Unit	-383.912	-392.139	-392.139	-392.139	-392.139	-392.139
All GND'd Irradiation Statistics							
Average All GND'd		-377.835	-406.423	-409.758	-413.681	-449.253	-478.064
Std Dev All GND'd		10.985	9.760	12.407	21.420	10.524	8.065
Ps90%/90% (+KTL) All GND'd		-347.715	-379.662	-375.738	-354.947	-420.397	-455.949
Ps90%/90% (-KTL) All GND'd		-407.956	-433.184	-443.779	-472.415	-478.108	-500.180
Biased Irradiation Statistics							
Average Biased		-386.812	-421.050	-397.143	-403.795	-423.678	-452.059
Std Dev Biased		6.168	12.090	8.172	9.282	15.504	2.363
Ps90%/90% (+KTL) Biased		-369.898	-387.898	-374.736	-378.344	-381.167	-445.580
Ps90%/90% (-KTL) Biased		-403.725	-454.202	-419.550	-429.245	-466.189	-458.538
Specification MIN		-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		715	765	815	865	915	965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

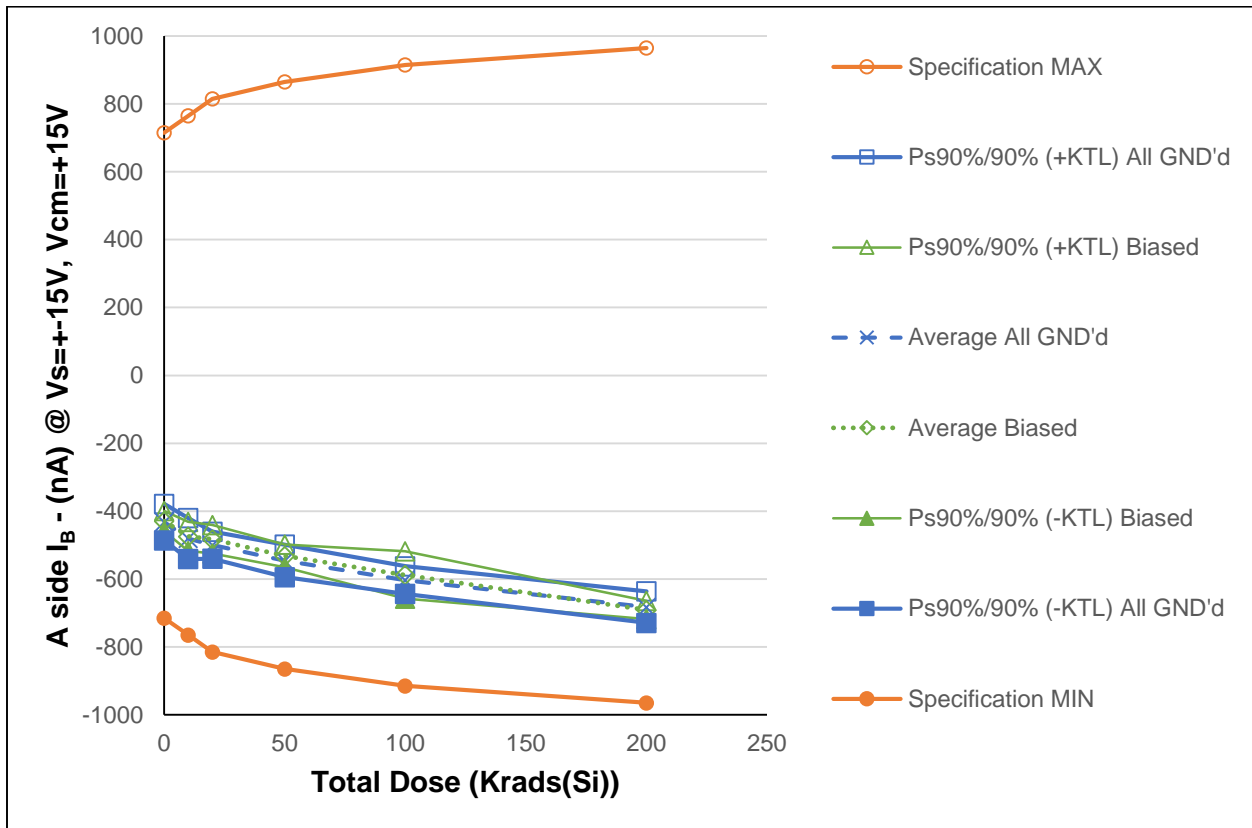


Figure 5.7: Plot of Negative Input Bias Current I_{B-} (side A) @ $V_{cm} = +15V$ versus Total Dose

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 Units	A I_{B-} @ $V_{s}=\pm 15V, V_{cm}=\pm 15V$ (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-432.067	-483.200				
777	All GND'd Irradiation	-406.826	-453.964				
778	All GND'd Irradiation	-421.662	-471.373				
779	All GND'd Irradiation	-458.674	-514.242				
780	All GND'd Irradiation	-440.752	-479.767				
771	Biased Irradiation	-412.087	-450.608				
772	Biased Irradiation	-427.793	-471.701				
773	Biased Irradiation	-441.458	-493.807				
774	Biased Irradiation	-431.414	-477.309				
775	Biased Irradiation	-432.112	-478.742				
786	All GND'd Irradiation	-419.415		-481.919			
787	All GND'd Irradiation	-445.364		-517.472			
788	All GND'd Irradiation	-443.960		-505.581			
789	All GND'd Irradiation	-432.602		-488.381			
790	All GND'd Irradiation	-445.735		-507.292			
781	Biased Irradiation	-430.156		-484.502			
782	Biased Irradiation	-419.628		-484.899			
783	Biased Irradiation	-443.437		-506.374			
784	Biased Irradiation	-408.536		-465.928			
785	Biased Irradiation	-420.727		-472.950			
796	All GND'd Irradiation	-434.555			-557.860		
797	All GND'd Irradiation	-423.276			-541.008		
798	All GND'd Irradiation	-444.861			-567.888		
799	All GND'd Irradiation	-401.514			-522.475		
800	All GND'd Irradiation	-427.751			-542.010		
791	Biased Irradiation	-413.343			-514.908		
792	Biased Irradiation	-436.299			-543.149		
793	Biased Irradiation	-427.534			-543.183		
794	Biased Irradiation	-421.112			-533.273		
795	Biased Irradiation	-414.988			-524.940		
806	All GND'd Irradiation	-442.007				-610.531	
807	All GND'd Irradiation	-436.084				-620.084	
808	All GND'd Irradiation	-413.202				-591.721	
809	All GND'd Irradiation	-438.863				-609.160	
810	All GND'd Irradiation	-423.947				-583.784	
801	Biased Irradiation	-414.354				-579.395	
802	Biased Irradiation	-411.970				-572.506	
803	Biased Irradiation	-446.312				-624.244	
804	Biased Irradiation	-405.807				-560.889	
805	Biased Irradiation	-445.044				-602.953	
816	All GND'd Irradiation	-410.959					-669.119
817	All GND'd Irradiation	-447.197					-710.238
818	All GND'd Irradiation	-424.973					-687.129
819	All GND'd Irradiation	-420.635					-671.923
820	All GND'd Irradiation	-434.680					-674.880
811	Biased Irradiation	-433.791					-680.916
812	Biased Irradiation	-439.503					-693.351
813	Biased Irradiation	-452.378					-704.869
814	Biased Irradiation	-444.567					-693.656
815	Biased Irradiation	-434.646					-682.916
832	Control Unit	-442.740	-453.431	-453.431	-453.431	-453.431	-453.431
833	Control Unit	-432.544	-441.380	-441.380	-441.380	-441.380	-441.380
All GND'd Irradiation Statistics							
Average All GND'd		-431.996	-480.509	-500.129	-546.248	-603.056	-682.658
Std Dev All GND'd		19.549	21.987	14.590	17.419	14.857	16.880
Ps90%/90% (+KTL) All GND'd		-378.392	-420.220	-460.124	-498.485	-562.317	-636.374
Ps90%/90% (-KTL) All GND'd		-485.600	-540.798	-540.134	-594.011	-643.795	-728.942
Biased Irradiation Statistics							
Average Biased		-428.973	-474.433	-482.931	-531.891	-587.997	-691.142
Std Dev Biased		10.703	15.631	15.367	12.175	25.428	9.642
Ps90%/90% (+KTL) Biased		-399.625	-431.574	-440.794	-498.508	-518.274	-664.702
Ps90%/90% (-KTL) Biased		-458.320	-517.293	-525.067	-565.274	-657.721	-717.581
Specification MIN		-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		715	765	815	865	915	965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

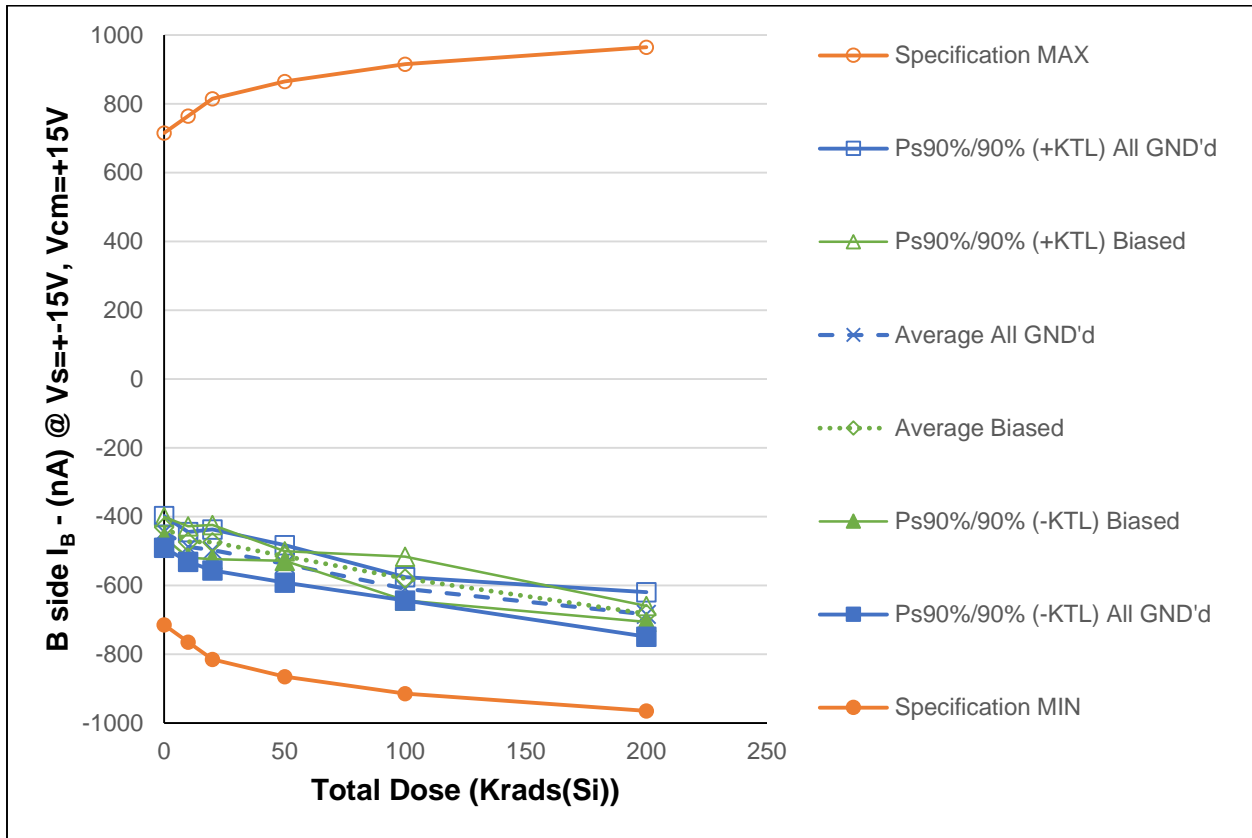


Figure 5.8: Plot of Negative Input Bias Current I_{B-} (side B) @ $V_{cm} = +15V$ versus Total Dose

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 Units	B IB- @ Vs=+15V, Vcm=+15V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-435.845	-479.793				
777	All GND'd Irradiation	-423.154	-468.314				
778	All GND'd Irradiation	-440.053	-490.081				
779	All GND'd Irradiation	-466.488	-511.132				
780	All GND'd Irradiation	-454.061	-490.233				
771	Biased Irradiation	-415.705	-449.312				
772	Biased Irradiation	-437.302	-483.562				
773	Biased Irradiation	-433.125	-476.311				
774	Biased Irradiation	-424.115	-465.239				
775	Biased Irradiation	-443.213	-492.291				
786	All GND'd Irradiation	-422.803		-481.485			
787	All GND'd Irradiation	-443.163		-506.755			
788	All GND'd Irradiation	-468.061		-530.442			
789	All GND'd Irradiation	-425.366		-479.169			
790	All GND'd Irradiation	-433.079		-486.640			
781	Biased Irradiation	-423.020		-471.186			
782	Biased Irradiation	-440.416		-499.134			
783	Biased Irradiation	-421.009		-477.225			
784	Biased Irradiation	-400.843		-448.440			
785	Biased Irradiation	-426.530		-474.722			
796	All GND'd Irradiation	-423.321			-535.285		
797	All GND'd Irradiation	-426.375			-542.433		
798	All GND'd Irradiation	-439.627			-561.274		
799	All GND'd Irradiation	-401.648			-506.164		
800	All GND'd Irradiation	-433.491			-541.232		
791	Biased Irradiation	-418.392			-515.457		
792	Biased Irradiation	-407.417			-509.147		
793	Biased Irradiation	-414.347			-522.437		
794	Biased Irradiation	-407.051			-511.388		
795	Biased Irradiation	-411.110			-515.430		
806	All GND'd Irradiation	-436.829				-604.557	
807	All GND'd Irradiation	-445.881				-615.130	
808	All GND'd Irradiation	-449.177				-628.476	
809	All GND'd Irradiation	-438.173				-603.029	
810	All GND'd Irradiation	-435.174				-597.074	
801	Biased Irradiation	-418.742				-576.305	
802	Biased Irradiation	-420.101				-583.419	
803	Biased Irradiation	-437.974				-603.243	
804	Biased Irradiation	-398.080				-542.646	
805	Biased Irradiation	-434.509				-594.041	
816	All GND'd Irradiation	-428.297					-694.281
817	All GND'd Irradiation	-459.174					-719.885
818	All GND'd Irradiation	-417.704					-674.518
819	All GND'd Irradiation	-427.564					-672.091
820	All GND'd Irradiation	-431.388					-659.445
811	Biased Irradiation	-443.544					-687.975
812	Biased Irradiation	-433.952					-674.914
813	Biased Irradiation	-429.660					-682.576
814	Biased Irradiation	-452.782					-694.601
815	Biased Irradiation	-437.046					-674.392
832	Control Unit	-436.665	-444.557	-444.557	-444.557	-444.557	-444.557
833	Control Unit	-445.212	-451.568	-451.568	-451.568	-451.568	-451.568
All GND'd Irradiation Statistics							
Average All GND'd		-443.920	-487.911	-496.898	-537.277	-609.653	-684.044
Std Dev All GND'd		16.760	15.806	21.677	19.938	12.373	23.602
Ps90%/90% (+KTL) All GND'd		-397.964	-444.571	-437.461	-482.608	-575.725	-619.329
Ps90%/90% (-KTL) All GND'd		-489.876	-531.250	-556.335	-591.947	-643.581	-748.759
Biased Irradiation Statistics							
Average Biased		-430.692	-473.343	-474.141	-514.772	-579.931	-682.892
Std Dev Biased		10.889	16.699	18.054	5.068	23.227	8.645
Ps90%/90% (+KTL) Biased		-400.835	-427.554	-424.638	-500.875	-516.242	-659.188
Ps90%/90% (-KTL) Biased		-460.549	-519.131	-523.645	-528.669	-643.619	-706.596
Specification MIN		-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		715	765	815	865	915	965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

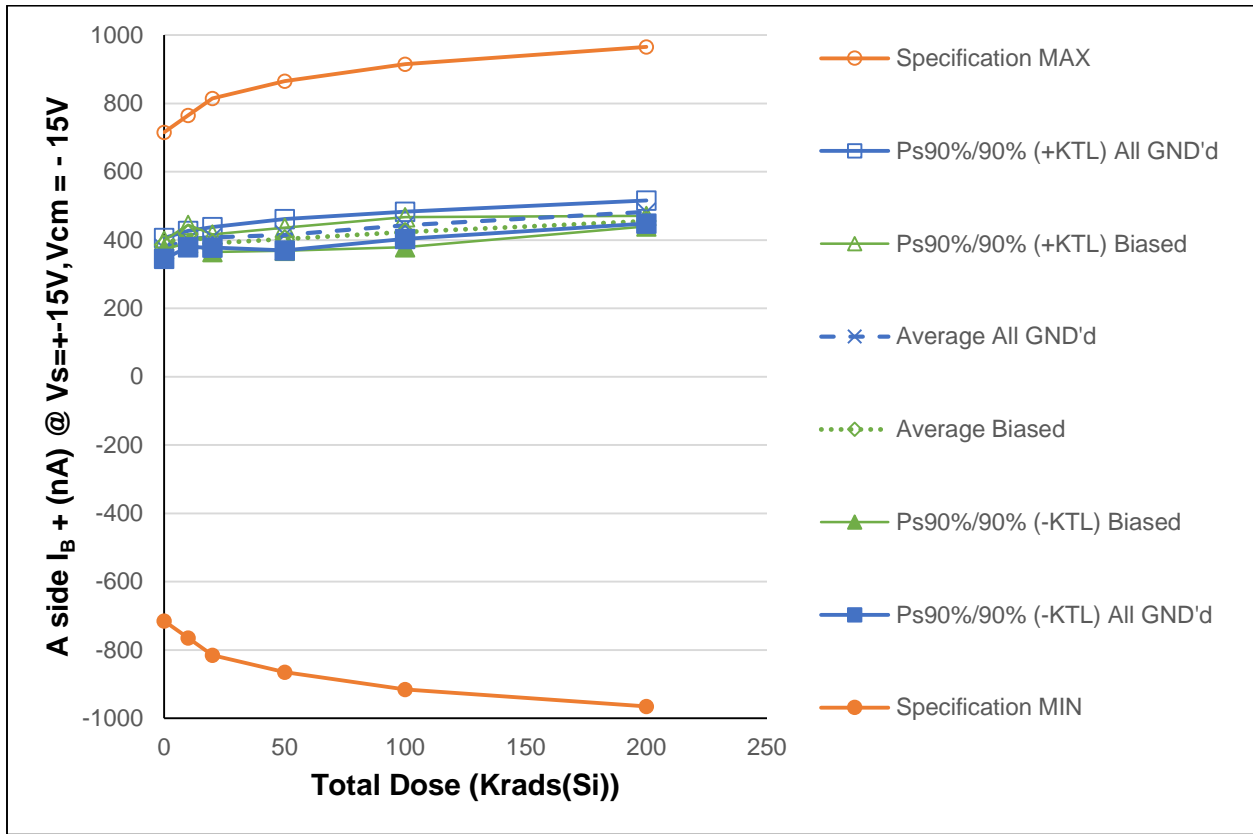


Figure 5.9: Plot of Positive Input Bias Current (side A) @ $V_{cm} = -15V$ versus Total Dose

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 Units	A IB+ @ Vs=-15V,Vcm= -15V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	379.259	408.468				
777	All GND'd Irradiation	372.298	404.445				
778	All GND'd Irradiation	358.866	388.675				
779	All GND'd Irradiation	385.398	410.941				
780	All GND'd Irradiation	385.315	401.318				
771	Biased Irradiation	379.705	401.245				
772	Biased Irradiation	392.266	425.836				
773	Biased Irradiation	385.006	417.404				
774	Biased Irradiation	387.795	419.598				
775	Biased Irradiation	386.475	424.124				
786	All GND'd Irradiation	369.023		395.728			
787	All GND'd Irradiation	385.673		414.831			
788	All GND'd Irradiation	386.361		411.934			
789	All GND'd Irradiation	397.350		419.901			
790	All GND'd Irradiation	376.986		396.905			
781	Biased Irradiation	362.718		385.837			
782	Biased Irradiation	373.598		397.831			
783	Biased Irradiation	375.748		400.685			
784	Biased Irradiation	352.053		377.135			
785	Biased Irradiation	367.782		390.889			
796	All GND'd Irradiation	363.865			409.296		
797	All GND'd Irradiation	382.676			425.691		
798	All GND'd Irradiation	390.214			437.344		
799	All GND'd Irradiation	350.765			393.777		
800	All GND'd Irradiation	368.401			410.281		
791	Biased Irradiation	357.671			386.759		
792	Biased Irradiation	362.742			395.640		
793	Biased Irradiation	366.153			403.428		
794	Biased Irradiation	385.399			418.974		
795	Biased Irradiation	374.423			408.800		
806	All GND'd Irradiation	400.848				465.410	
807	All GND'd Irradiation	362.684				435.205	
808	All GND'd Irradiation	359.252				427.124	
809	All GND'd Irradiation	378.328				442.055	
810	All GND'd Irradiation	386.494				446.246	
801	Biased Irradiation	366.544				415.950	
802	Biased Irradiation	364.691				412.489	
803	Biased Irradiation	389.498				443.457	
804	Biased Irradiation	353.507				406.971	
805	Biased Irradiation	388.190				437.003	
816	All GND'd Irradiation	373.808					477.337
817	All GND'd Irradiation	386.608					504.276
818	All GND'd Irradiation	363.382					474.857
819	All GND'd Irradiation	369.934					476.488
820	All GND'd Irradiation	373.275					477.940
811	Biased Irradiation	385.580					455.719
812	Biased Irradiation	375.308					455.327
813	Biased Irradiation	376.774					451.520
814	Biased Irradiation	385.848					464.459
815	Biased Irradiation	375.675					450.098
832	Control Unit	400.850	412.331	412.331	412.331	412.331	412.331
833	Control Unit	379.293	385.905	385.905	385.905	385.905	385.905
All GND'd Irradiation Statistics							
Average All GND'd		376.227	402.770	407.860	415.278	443.208	482.179
Std Dev All GND'd		11.099	8.701	10.925	16.721	14.372	12.407
Ps90%/90% (+KTL) All GND'd		406.660	426.627	437.815	461.127	482.617	516.198
Ps90%/90% (-KTL) All GND'd		345.794	378.912	377.905	369.428	403.799	448.161
Biased Irradiation Statistics							
Average Biased		386.249	417.641	390.475	402.720	423.174	455.425
Std Dev Biased		4.556	9.771	9.460	12.314	16.059	5.598
Ps90%/90% (+KTL) Biased		398.741	444.433	416.416	436.485	467.207	470.773
Ps90%/90% (-KTL) Biased		373.758	390.849	364.535	368.955	379.141	440.076
Specification MIN		-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		715	765	815	865	915	965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

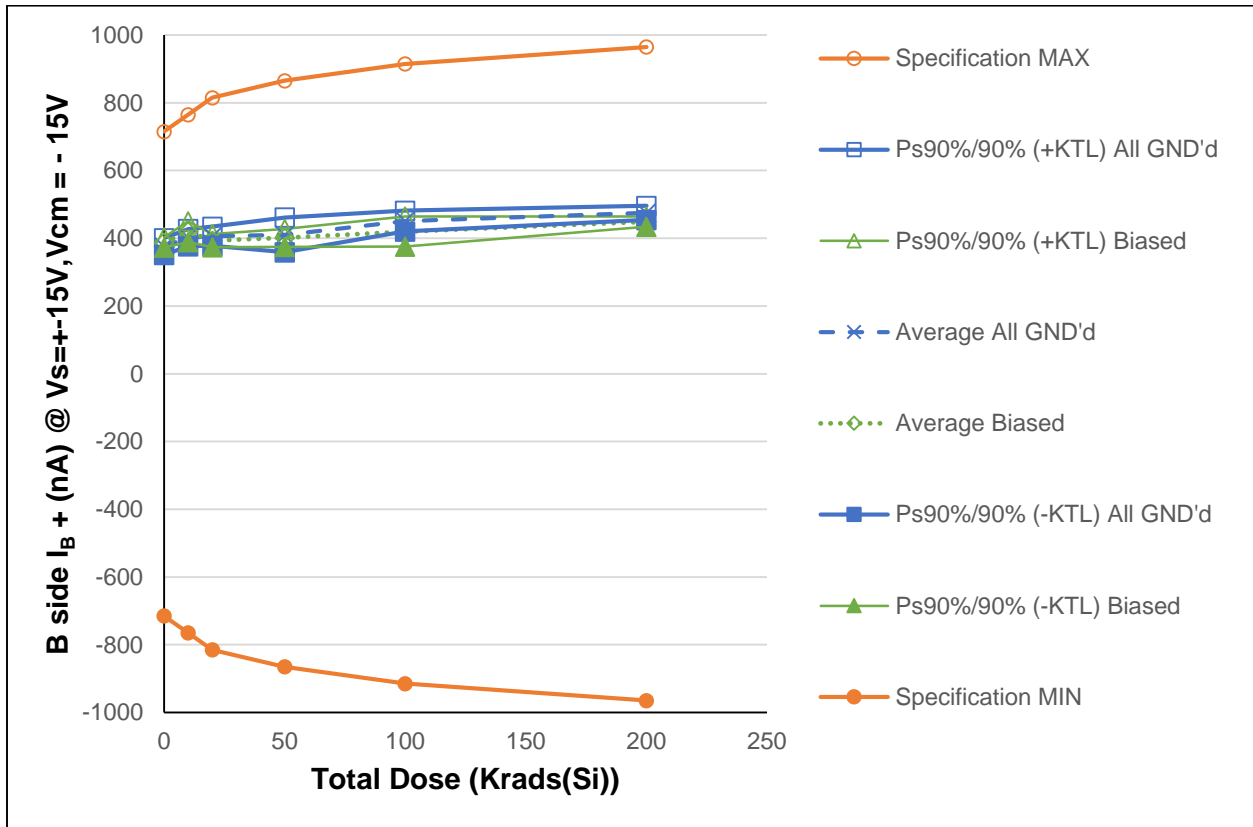


Figure 5.10: Plot of Positive Input Bias Current I_{B+} (side B) @ $V_{cm} = -15V$ versus Total Dose

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

Parameter Units	B IB+ @ Vs=+-15V, Vcm= -15V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	378.730	407.941				
777	All GND'd Irradiation	379.422	411.734				
778	All GND'd Irradiation	359.559	388.465				
779	All GND'd Irradiation	380.121	404.738				
780	All GND'd Irradiation	380.674	397.153				
771	Biased Irradiation	378.190	400.197				
772	Biased Irradiation	392.014	427.021				
773	Biased Irradiation	387.716	421.227				
774	Biased Irradiation	391.007	421.938				
775	Biased Irradiation	388.457	427.504				
786	All GND'd Irradiation	369.136		395.408			
787	All GND'd Irradiation	381.239		410.617			
788	All GND'd Irradiation	387.669		414.945			
789	All GND'd Irradiation	393.769		414.874			
790	All GND'd Irradiation	374.984		394.227			
781	Biased Irradiation	368.468		390.432			
782	Biased Irradiation	375.838		400.326			
783	Biased Irradiation	374.710		399.569			
784	Biased Irradiation	359.674		383.379			
785	Biased Irradiation	369.361		391.003			
796	All GND'd Irradiation	362.279			404.491		
797	All GND'd Irradiation	382.481			429.207		
798	All GND'd Irradiation	383.777			429.219		
799	All GND'd Irradiation	346.700			387.460		
800	All GND'd Irradiation	360.984			399.133		
791	Biased Irradiation	357.736			386.130		
792	Biased Irradiation	367.356			400.927		
793	Biased Irradiation	366.587			401.081		
794	Biased Irradiation	374.431			406.698		
795	Biased Irradiation	378.376			411.748		
806	All GND'd Irradiation	397.674				464.729	
807	All GND'd Irradiation	366.248				436.889	
808	All GND'd Irradiation	373.751				444.328	
809	All GND'd Irradiation	385.765				450.034	
810	All GND'd Irradiation	399.582				458.986	
801	Biased Irradiation	357.700				405.177	
802	Biased Irradiation	369.697				417.701	
803	Biased Irradiation	382.800				435.254	
804	Biased Irradiation	352.561				403.394	
805	Biased Irradiation	389.050				437.965	
816	All GND'd Irradiation	372.877					477.572
817	All GND'd Irradiation	380.174					485.864
818	All GND'd Irradiation	359.788					465.393
819	All GND'd Irradiation	370.754					473.566
820	All GND'd Irradiation	372.994					472.183
811	Biased Irradiation	386.665					452.549
812	Biased Irradiation	371.768					445.302
813	Biased Irradiation	369.399					443.008
814	Biased Irradiation	382.857					456.707
815	Biased Irradiation	376.384					448.325
832	Control Unit	393.975	405.124	405.124	405.124	405.124	405.124
833	Control Unit	386.948	393.886	393.886	393.886	393.886	393.886
All GND'd Irradiation Statistics							
Average All GND'd		375.701	402.006	406.014	409.902	450.993	474.915
Std Dev All GND'd		9.053	9.277	10.379	18.673	11.145	7.532
Ps90%/90% (+KTL) All GND'd		400.525	427.443	434.472	461.104	481.552	495.567
Ps90%/90% (-KTL) All GND'd		350.877	376.570	377.556	358.700	420.434	454.264
Biased Irradiation Statistics							
Average Biased		387.477	419.577	392.942	401.317	419.898	449.178
Std Dev Biased		5.484	11.204	7.070	9.599	16.249	5.520
Ps90%/90% (+KTL) Biased		402.515	450.299	412.329	427.638	464.453	464.314
Ps90%/90% (-KTL) Biased		372.439	388.856	373.555	374.995	375.344	434.042
Specification MIN		-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		715	765	815	865	915	965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

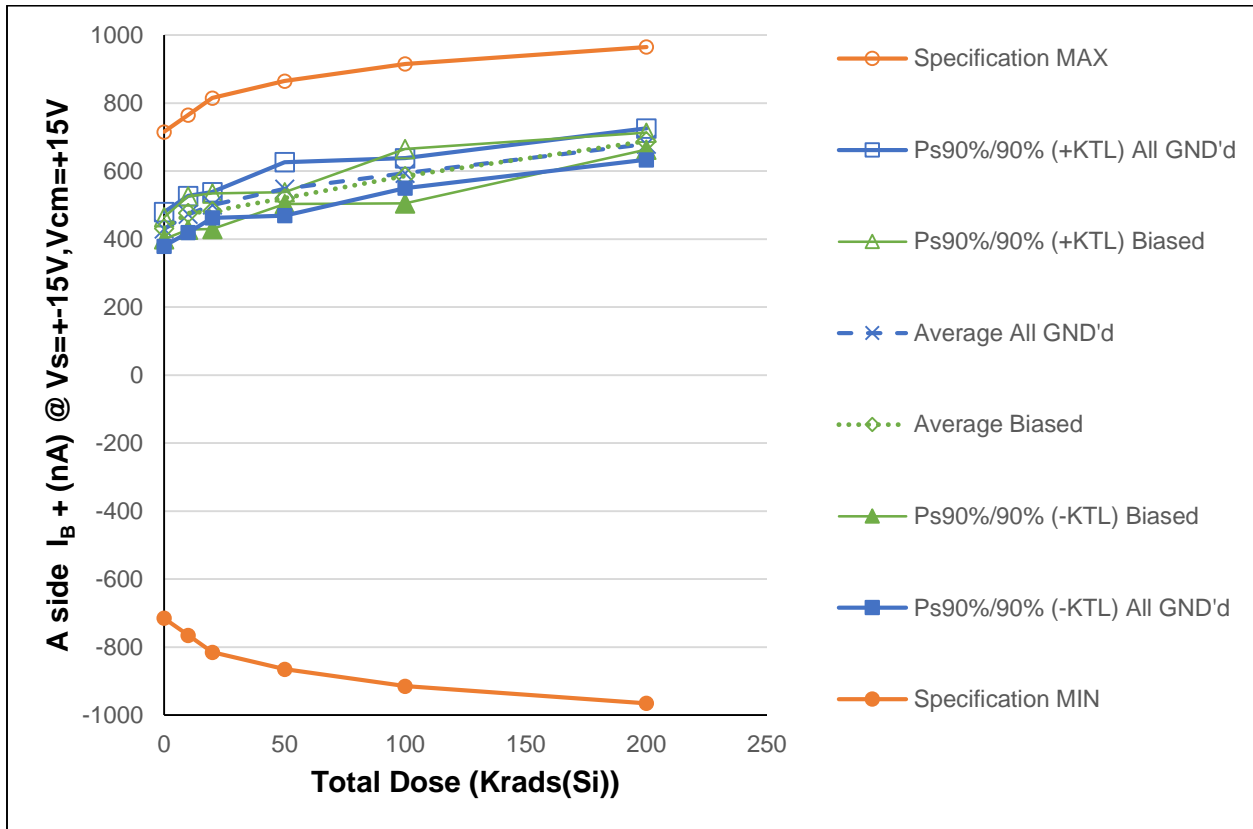


Figure 5.11: Plot of Positive Input Bias Current @ $V_{cm} = +15V$ (side A) versus Total Dose

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 Units	A I _{B+} @ V _s =±15V, V _{cm} =±15V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	429.973	475.226				
777	All GND'd Irradiation	408.423	451.295				
778	All GND'd Irradiation	413.909	456.831				
779	All GND'd Irradiation	449.719	500.229				
780	All GND'd Irradiation	444.700	481.035				
771	Biased Irradiation	414.993	448.395				
772	Biased Irradiation	442.665	492.363				
773	Biased Irradiation	426.456	472.639				
774	Biased Irradiation	443.463	491.665				
775	Biased Irradiation	432.210	478.267				
786	All GND'd Irradiation	427.529		486.278			
787	All GND'd Irradiation	455.936		522.627			
788	All GND'd Irradiation	442.348		501.708			
789	All GND'd Irradiation	439.442		492.835			
790	All GND'd Irradiation	440.073		498.115			
781	Biased Irradiation	451.099		501.755			
782	Biased Irradiation	418.481		471.915			
783	Biased Irradiation	444.313		501.376			
784	Biased Irradiation	409.400		458.336			
785	Biased Irradiation	429.959		478.132			
796	All GND'd Irradiation	424.361			541.508		
797	All GND'd Irradiation	426.701			539.253		
798	All GND'd Irradiation	467.994			593.461		
799	All GND'd Irradiation	403.386			514.868		
800	All GND'd Irradiation	440.333			549.565		
791	Biased Irradiation	419.260			515.033		
792	Biased Irradiation	413.310			515.733		
793	Biased Irradiation	422.940			529.670		
794	Biased Irradiation	414.959			516.693		
795	Biased Irradiation	420.417			523.673		
806	All GND'd Irradiation	422.238				589.318	
807	All GND'd Irradiation	445.359				619.643	
808	All GND'd Irradiation	415.788				590.644	
809	All GND'd Irradiation	433.869				594.923	
810	All GND'd Irradiation	419.136				575.446	
801	Biased Irradiation	413.719				575.202	
802	Biased Irradiation	415.119				575.100	
803	Biased Irradiation	462.924				634.455	
804	Biased Irradiation	410.452				557.701	
805	Biased Irradiation	433.613				582.940	
816	All GND'd Irradiation	414.662					667.307
817	All GND'd Irradiation	447.237					706.838
818	All GND'd Irradiation	415.187					672.847
819	All GND'd Irradiation	422.721					666.073
820	All GND'd Irradiation	443.024					683.205
811	Biased Irradiation	444.673					679.046
812	Biased Irradiation	434.456					679.820
813	Biased Irradiation	445.743					690.571
814	Biased Irradiation	447.229					689.330
815	Biased Irradiation	461.698					700.976
832	Control Unit	448.885	459.588	459.588	459.588	459.588	459.588
833	Control Unit	450.434	457.096	457.096	457.096	457.096	457.096
All GND'd Irradiation Statistics							
Average All GND'd		429.345	472.923	500.313	547.731	593.995	679.254
Std Dev All GND'd		18.216	19.644	13.762	28.658	16.093	16.837
Ps90%/90% (+KTL) All GND'd		479.292	526.786	538.049	626.312	638.120	725.422
Ps90%/90% (-KTL) All GND'd		379.397	419.061	462.576	469.150	549.869	633.086
Biased Irradiation Statistics							
Average Biased		431.957	476.666	482.303	520.160	585.080	687.949
Std Dev Biased		11.886	17.954	18.986	6.338	29.109	8.998
Ps90%/90% (+KTL) Biased		464.549	525.895	534.362	537.540	664.895	712.620
Ps90%/90% (-KTL) Biased		399.365	427.436	430.244	502.781	505.264	663.277
Specification MIN		-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		715	765	815	865	915	965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

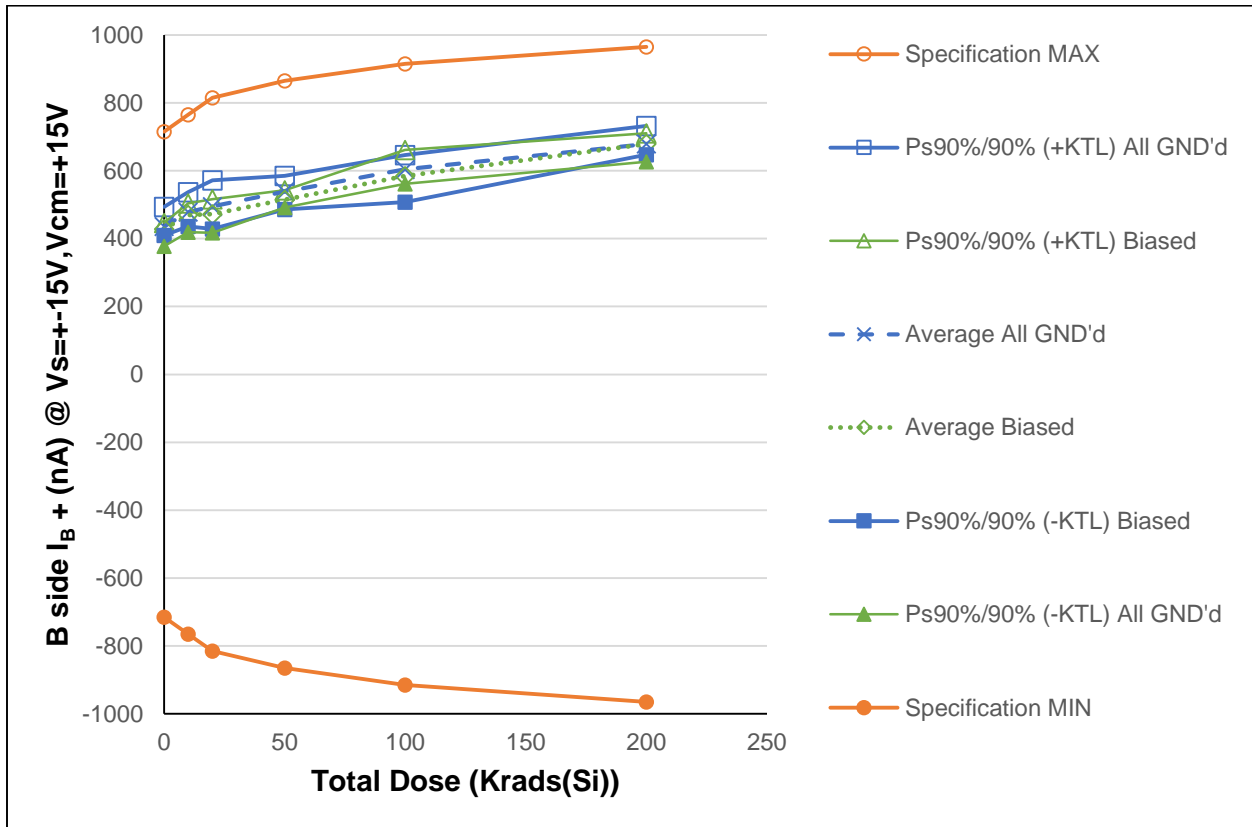


Figure 5.12: Plot of Positive Input Bias Current (side B) @ V_{cm} = +15V versus Total Dose

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 Units	B IB+ @ Vs=+-15V,Vcm=+15V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	428.709	469.214				
777	All GND'd Irradiation	414.302	457.369				
778	All GND'd Irradiation	419.830	462.509				
779	All GND'd Irradiation	455.893	495.695				
780	All GND'd Irradiation	460.371	506.133				
771	Biased Irradiation	418.214	449.834				
772	Biased Irradiation	435.633	481.929				
773	Biased Irradiation	432.215	475.074				
774	Biased Irradiation	425.652	467.665				
775	Biased Irradiation	430.561	475.615				
786	All GND'd Irradiation	422.141		478.606			
787	All GND'd Irradiation	452.681		516.543			
788	All GND'd Irradiation	470.753		532.519			
789	All GND'd Irradiation	414.316		466.193			
790	All GND'd Irradiation	428.268		480.866			
781	Biased Irradiation	431.054		478.883			
782	Biased Irradiation	430.847		482.382			
783	Biased Irradiation	434.817		489.174			
784	Biased Irradiation	406.657		451.618			
785	Biased Irradiation	414.947		459.098			
796	All GND'd Irradiation	434.934			547.370		
797	All GND'd Irradiation	427.059			542.575		
798	All GND'd Irradiation	439.328			558.680		
799	All GND'd Irradiation	408.923			514.077		
800	All GND'd Irradiation	424.258			530.219		
791	Biased Irradiation	410.925			504.923		
792	Biased Irradiation	418.447			518.353		
793	Biased Irradiation	411.584			518.076		
794	Biased Irradiation	419.726			528.278		
795	Biased Irradiation	404.346			503.430		
806	All GND'd Irradiation	430.096				599.647	
807	All GND'd Irradiation	455.479				625.814	
808	All GND'd Irradiation	436.949				613.664	
809	All GND'd Irradiation	433.545				596.915	
810	All GND'd Irradiation	425.906				586.129	
801	Biased Irradiation	414.939				567.894	
802	Biased Irradiation	426.368				588.901	
803	Biased Irradiation	447.004				615.390	
804	Biased Irradiation	398.086				545.664	
805	Biased Irradiation	447.764				604.164	
816	All GND'd Irradiation	440.151					701.688
817	All GND'd Irradiation	441.912					697.255
818	All GND'd Irradiation	416.372					670.157
819	All GND'd Irradiation	424.890					668.686
820	All GND'd Irradiation	422.734					657.828
811	Biased Irradiation	440.962					679.095
812	Biased Irradiation	434.088					669.597
813	Biased Irradiation	428.277					668.934
814	Biased Irradiation	457.993					697.440
815	Biased Irradiation	438.655					680.233
832	Control Unit	438.506	446.176	446.176	446.176	446.176	446.176
833	Control Unit	435.273	440.962	440.962	440.962	440.962	440.962
All GND'd Irradiation Statistics							
Average All GND'd		435.821	478.184	494.945	538.584	604.434	679.123
Std Dev All GND'd		21.065	21.490	28.152	17.085	15.466	19.240
Ps90%/90% (+KTL) All GND'd		493.582	537.109	572.138	585.431	646.842	731.880
Ps90%/90% (-KTL) All GND'd		378.061	419.259	417.752	491.738	562.025	626.366
Biased Irradiation Statistics							
Average Biased		428.455	470.023	472.231	514.612	584.402	679.060
Std Dev Biased		6.761	12.366	16.060	10.388	28.037	11.525
Ps90%/90% (+KTL) Biased		446.993	503.931	516.268	543.097	661.279	710.661
Ps90%/90% (-KTL) Biased		409.917	436.115	428.194	486.127	507.526	647.459
Specification MIN		-715	-765	-815	-865	-915	-965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		715	765	815	865	915	965
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Control Unit Statistics							
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

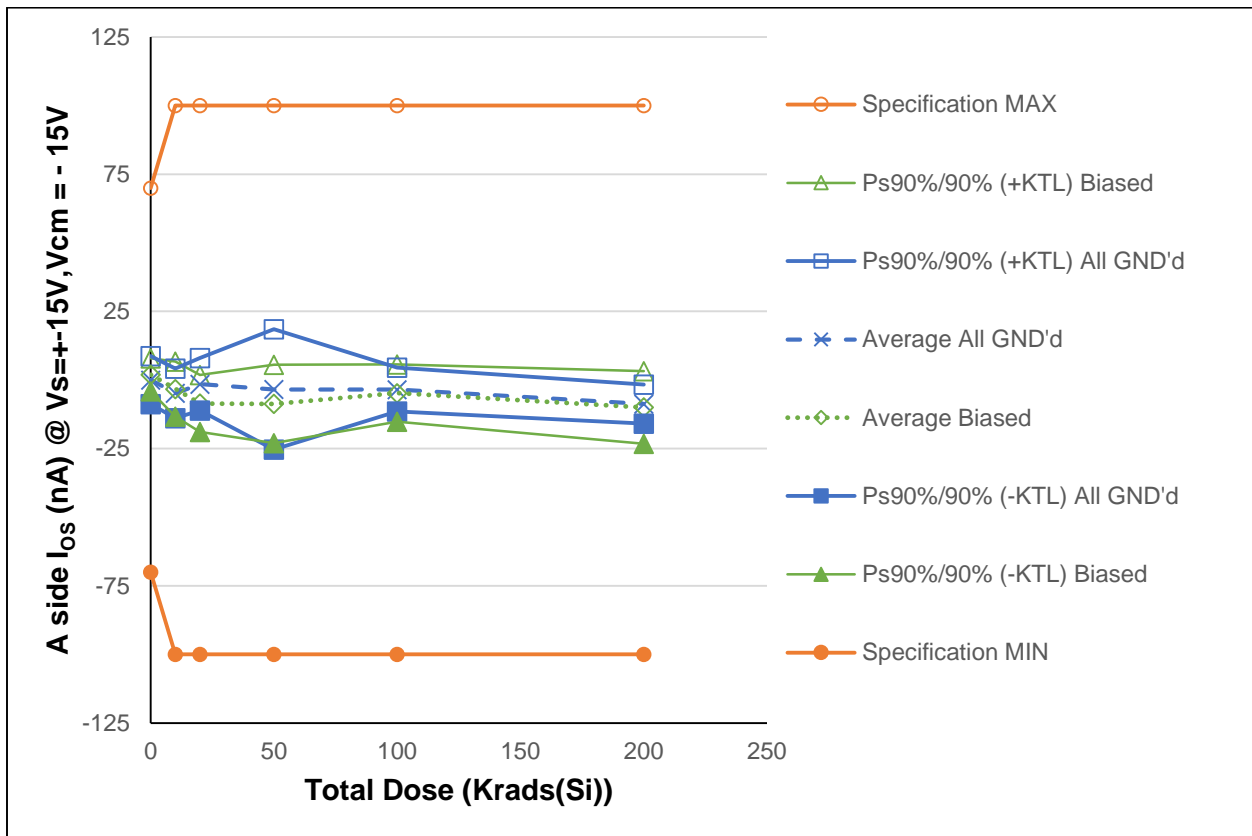


Figure 5.13: Plot of Input Offset Current I_{os} (side A) @ $V_{cm} = -15V$ versus Total Dose

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 Units	A Ios @ Vs=+-15V,Vcm= -15V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-1.384	-6.188				
777	All GND'd Irradiation	-3.883	-8.961				
778	All GND'd Irradiation	2.430	-1.398				
779	All GND'd Irradiation	-1.319	-6.222				
780	All GND'd Irradiation	4.063	-1.497				
771	Biased Irradiation	1.627	-3.784				
772	Biased Irradiation	-0.738	-6.721				
773	Biased Irradiation	1.987	-1.356				
774	Biased Irradiation	1.322	-6.355				
775	Biased Irradiation	5.372	2.044				
786	All GND'd Irradiation	2.949		-3.361			
787	All GND'd Irradiation	1.639		-5.917			
788	All GND'd Irradiation	5.540		-0.139			
789	All GND'd Irradiation	7.036		3.386			
790	All GND'd Irradiation	2.789		-1.520			
781	Biased Irradiation	-1.644		-4.942			
782	Biased Irradiation	6.791		-7.838			
783	Biased Irradiation	-3.307		-13.015			
784	Biased Irradiation	-1.521		-11.983			
785	Biased Irradiation	1.333		-5.056			
796	All GND'd Irradiation	3.803			-2.960		
797	All GND'd Irradiation	-5.505			-16.673		
798	All GND'd Irradiation	4.509			0.593		
799	All GND'd Irradiation	4.990			-2.549		
800	All GND'd Irradiation	7.222			4.494		
791	Biased Irradiation	0.108			-8.916		
792	Biased Irradiation	-2.269			-9.788		
793	Biased Irradiation	-6.511			-15.846		
794	Biased Irradiation	5.936			-1.215		
795	Biased Irradiation	0.406			-7.731		
806	All GND'd Irradiation	5.234				0.075	
807	All GND'd Irradiation	0.936				-6.519	
808	All GND'd Irradiation	2.609				-2.895	
809	All GND'd Irradiation	2.056				-6.405	
810	All GND'd Irradiation	2.217				-1.573	
801	Biased Irradiation	6.390				0.345	
802	Biased Irradiation	-5.047				-10.123	
803	Biased Irradiation	2.048				-4.271	
804	Biased Irradiation	-1.384				-6.131	
805	Biased Irradiation	1.612				-3.540	
816	All GND'd Irradiation	-3.013					-12.513
817	All GND'd Irradiation	2.792					-5.788
818	All GND'd Irradiation	-0.708					-7.800
819	All GND'd Irradiation	-0.830					-7.636
820	All GND'd Irradiation	-1.261					-10.058
811	Biased Irradiation	0.299					-9.449
812	Biased Irradiation	-2.036					-10.333
813	Biased Irradiation	-3.352					-9.682
814	Biased Irradiation	-9.470					-17.058
815	Biased Irradiation	0.528					-3.429
832	Control Unit	4.685	4.529	4.529	4.529	4.529	4.529
833	Control Unit	-2.158	-3.483	-3.483	-3.483	-3.483	-3.483
All GND'd Irradiation Statistics							
Average All GND'd		-0.018	-4.853	-1.510	-3.419	-3.464	-8.759
Std Dev All GND'd		3.207	3.306	3.489	7.990	2.933	2.588
Ps90%/90% (+KTL) All GND'd		8.775	4.213	8.057	18.489	4.578	-1.662
Ps90%/90% (-KTL) All GND'd		-8.812	-13.920	-11.077	-25.327	-11.505	-15.855
Biased Irradiation Statistics							
Average Biased		1.914	-3.234	-8.567	-8.699	-4.744	-9.990
Std Dev Biased		2.204	3.660	3.790	5.226	3.822	4.835
Ps90%/90% (+KTL) Biased		7.957	6.802	1.826	5.631	5.736	3.267
Ps90%/90% (-KTL) Biased		-4.129	-13.271	-18.959	-23.030	-15.224	-23.248
Specification MIN		-70	-100	-100	-100	-100	-100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		70	100	100	100	100	100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

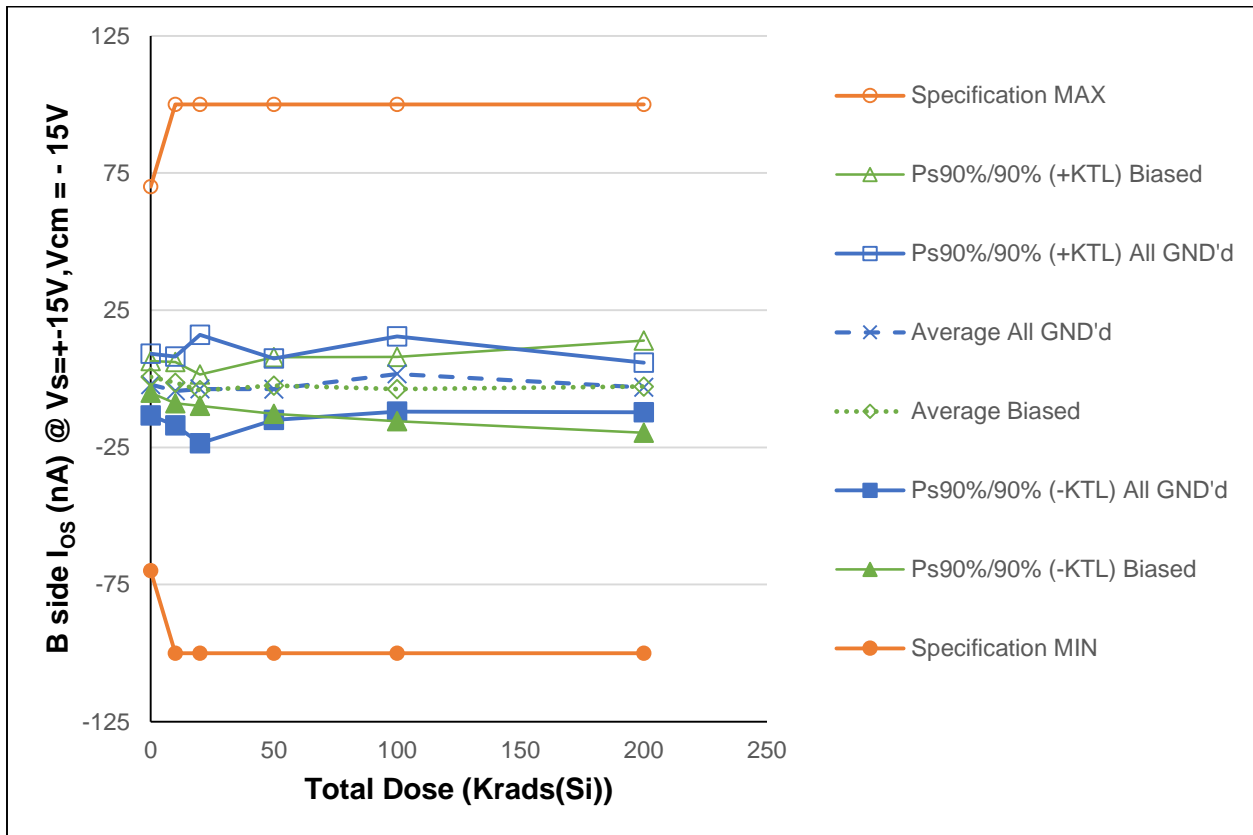


Figure 5.14: Plot of B-side Input Offset Current @ $V_{cm} = -15V$ versus Total Dose

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

Parameter Units	B los @ Vs=+-15V,Vcm= -15V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	3.071	1.617				
777	All GND'd Irradiation	-0.651	-3.353				
778	All GND'd Irradiation	-0.502	-2.454				
779	All GND'd Irradiation	-6.840	-9.708				
780	All GND'd Irradiation	-5.749	-8.184				
771	Biased Irradiation	0.844	-0.579				
772	Biased Irradiation	1.516	-0.137				
773	Biased Irradiation	3.655	1.846				
774	Biased Irradiation	-1.658	-5.003				
775	Biased Irradiation	-1.033	-3.490				
786	All GND'd Irradiation	0.005		-3.017			
787	All GND'd Irradiation	-11.640		-15.717			
788	All GND'd Irradiation	4.253		3.675			
789	All GND'd Irradiation	1.470		-1.189			
790	All GND'd Irradiation	0.299		-2.473			
781	Biased Irradiation	0.406		-0.861			
782	Biased Irradiation	-2.540		-6.451			
783	Biased Irradiation	-0.342		-4.968			
784	Biased Irradiation	-1.960		-4.789			
785	Biased Irradiation	-1.109		-3.936			
796	All GND'd Irradiation	-0.803			-2.895		
797	All GND'd Irradiation	-0.678			-3.296		
798	All GND'd Irradiation	-7.057			-10.398		
799	All GND'd Irradiation	-1.426			-3.178		
800	All GND'd Irradiation	2.598			0.871		
791	Biased Irradiation	-2.661			-4.572		
792	Biased Irradiation	4.456			3.031		
793	Biased Irradiation	-1.533			-5.563		
794	Biased Irradiation	-2.575			-5.155		
795	Biased Irradiation	0.421			-0.131		
806	All GND'd Irradiation	2.949				4.895	
807	All GND'd Irradiation	1.150				-2.564	
808	All GND'd Irradiation	5.967				7.782	
809	All GND'd Irradiation	-1.685				-4.084	
810	All GND'd Irradiation	5.540				2.674	
801	Biased Irradiation	-5.047				-8.325	
802	Biased Irradiation	-0.441				-1.254	
803	Biased Irradiation	-3.738				-7.838	
804	Biased Irradiation	-0.132				-3.052	
805	Biased Irradiation	3.345				1.568	
816	All GND'd Irradiation	-1.471					-0.226
817	All GND'd Irradiation	1.516					-6.131
818	All GND'd Irradiation	-1.479					-7.243
819	All GND'd Irradiation	0.601					-1.539
820	All GND'd Irradiation	0.814					-0.606
811	Biased Irradiation	0.731					-0.701
812	Biased Irradiation	-3.745					-6.634
813	Biased Irradiation	-9.622					-11.374
814	Biased Irradiation	6.001					4.132
815	Biased Irradiation	0.356					0.170
832	Control Unit	-0.495	-1.044	-1.044	-1.044	-1.044	-1.044
833	Control Unit	3.037	1.747	1.747	1.747	1.747	1.747
All GND'd Irradiation Statistics							
Average All GND'd		-2.134	-4.416	-3.744	-3.779	1.740	-3.149
Std Dev All GND'd		4.098	4.571	7.195	4.087	4.995	3.288
Ps90%/90% (+KTL) All GND'd		9.102	8.118	15.985	7.427	15.436	5.868
Ps90%/90% (-KTL) All GND'd		-13.370	-16.951	-23.473	-14.985	-11.955	-12.166
Biased Irradiation Statistics							
Average Biased		0.665	-1.472	-4.201	-2.478	-3.780	-2.881
Std Dev Biased		2.120	2.745	2.075	3.772	4.261	6.113
Ps90%/90% (+KTL) Biased		6.478	6.053	1.489	7.866	7.905	13.879
Ps90%/90% (-KTL) Biased		-5.148	-8.998	-9.891	-12.822	-15.465	-19.642
Specification MIN		-70	-100	-100	-100	-100	-100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		70	100	100	100	100	100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

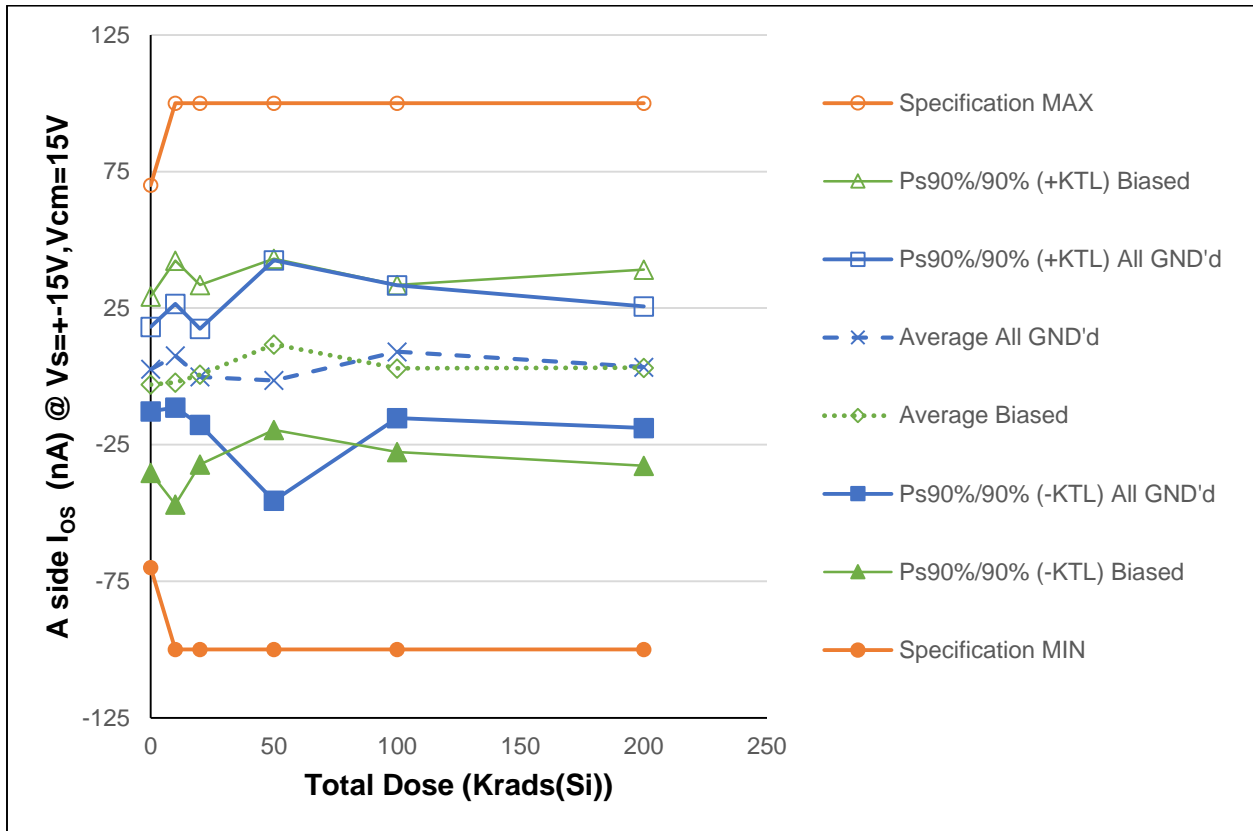


Figure 5.15: Plot of Input Offset Current @ $V_{cm} = +15V$ (side A) versus Total Dose

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 Units	A los @ Vs=+15V,Vcm=15V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	2.094	7.973				
777	All GND'd Irradiation	-1.598	2.670				
778	All GND'd Irradiation	7.752	14.542				
779	All GND'd Irradiation	8.955	14.012				
780	All GND'd Irradiation	-3.948	-1.269				
771	Biased Irradiation	-2.906	2.212				
772	Biased Irradiation	-14.872	-20.662				
773	Biased Irradiation	15.002	21.168				
774	Biased Irradiation	-12.048	-14.356				
775	Biased Irradiation	-0.098	0.475				
786	All GND'd Irradiation	-8.114		-4.359			
787	All GND'd Irradiation	-10.572		-5.155			
788	All GND'd Irradiation	1.612		3.873			
789	All GND'd Irradiation	-6.840		-4.454			
790	All GND'd Irradiation	5.662		9.177			
781	Biased Irradiation	-20.943		-17.252			
782	Biased Irradiation	1.147		12.984			
783	Biased Irradiation	-0.876		4.998			
784	Biased Irradiation	-0.865		7.592			
785	Biased Irradiation	-9.233		-5.181			
796	All GND'd Irradiation	10.194			16.352		
797	All GND'd Irradiation	-3.425			1.755		
798	All GND'd Irradiation	-23.134			-25.573		
799	All GND'd Irradiation	-1.872			7.607		
800	All GND'd Irradiation	-12.583			-7.555		
791	Biased Irradiation	-5.917			-0.125		
792	Biased Irradiation	22.989			27.416		
793	Biased Irradiation	4.594			13.513		
794	Biased Irradiation	6.153			16.580		
795	Biased Irradiation	-5.429			1.267		
806	All GND'd Irradiation	19.769				21.214	
807	All GND'd Irradiation	-9.275				0.440	
808	All GND'd Irradiation	-2.586				1.077	
809	All GND'd Irradiation	4.994				14.237	
810	All GND'd Irradiation	4.810				8.339	
801	Biased Irradiation	0.635				4.193	
802	Biased Irradiation	-3.150				-2.594	
803	Biased Irradiation	-16.612				-10.211	
804	Biased Irradiation	-4.646				3.188	
805	Biased Irradiation	11.431				20.013	
816	All GND'd Irradiation	-3.703					1.812
817	All GND'd Irradiation	-0.041					3.401
818	All GND'd Irradiation	9.786					14.283
819	All GND'd Irradiation	-2.086					5.851
820	All GND'd Irradiation	-8.344					-8.325
811	Biased Irradiation	-10.881					1.869
812	Biased Irradiation	5.048					13.532
813	Biased Irradiation	6.635					14.298
814	Biased Irradiation	-2.661					4.327
815	Biased Irradiation	-27.053					-18.060
832	Control Unit	-6.145	-6.157	-6.157	-6.157	-6.157	-6.157
833	Control Unit	-17.890	-15.717	-15.717	-15.717	-15.717	-15.717
All GND'd Irradiation Statistics							
Average All GND'd		2.651	7.586	-0.183	-1.483	9.061	3.404
Std Dev All GND'd		5.650	6.936	6.412	16.034	8.847	8.131
Ps90%/90% (+KTL) All GND'd		18.142	26.603	17.398	42.483	33.319	25.699
Ps90%/90% (-KTL) All GND'd		-12.840	-11.432	-17.765	-45.449	-15.196	-18.890
Biased Irradiation Statistics							
Average Biased		-2.984	-2.233	0.628	11.730	2.918	3.193
Std Dev Biased		11.783	16.289	11.976	11.432	11.143	13.086
Ps90%/90% (+KTL) Biased		29.323	42.431	33.466	43.077	33.473	39.074
Ps90%/90% (-KTL) Biased		-35.292	-46.896	-32.210	-19.617	-27.637	-32.688
Specification MIN		-70	-100	-100	-100	-100	-100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		70	100	100	100	100	100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

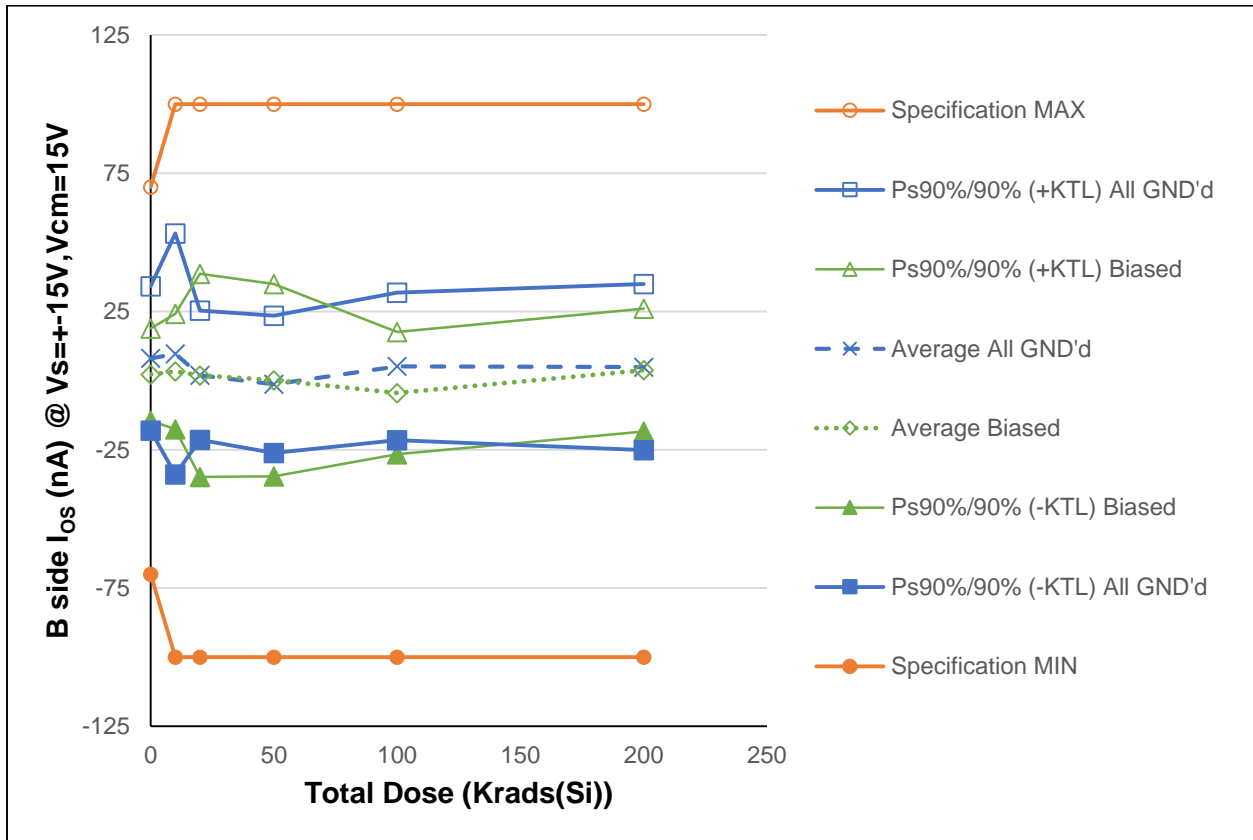


Figure 5.16: Plot of B-side Input Offset Current @ $V_{cm} = +15V$ versus Total Dose

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 Units	B los @ Vs=+15V,Vcm=15V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	7.135	10.579				
777	All GND'd Irradiation	8.852	10.945				
778	All GND'd Irradiation	20.223	27.572				
779	All GND'd Irradiation	10.595	15.437				
780	All GND'd Irradiation	-6.310	-15.900				
771	Biased Irradiation	-2.510	-0.522				
772	Biased Irradiation	1.669	1.633				
773	Biased Irradiation	0.909	1.237				
774	Biased Irradiation	-1.537	-2.427				
775	Biased Irradiation	12.652	16.676				
786	All GND'd Irradiation	0.662		2.879			
787	All GND'd Irradiation	-9.518		-9.788			
788	All GND'd Irradiation	-2.692		-2.077			
789	All GND'd Irradiation	11.050		12.976			
790	All GND'd Irradiation	4.810		5.774			
781	Biased Irradiation	-8.034		-7.697			
782	Biased Irradiation	9.570		16.752			
783	Biased Irradiation	-13.808		-11.949			
784	Biased Irradiation	-5.814		-3.178			
785	Biased Irradiation	11.583		15.624			
796	All GND'd Irradiation	-11.613			-12.086		
797	All GND'd Irradiation	-0.685			-0.143		
798	All GND'd Irradiation	0.299			2.594		
799	All GND'd Irradiation	-7.275			-7.913		
800	All GND'd Irradiation	9.233			11.014		
791	Biased Irradiation	7.467			10.534		
792	Biased Irradiation	-11.029			-9.205		
793	Biased Irradiation	2.762			4.361		
794	Biased Irradiation	-12.674			-16.890		
795	Biased Irradiation	6.764			12.000		
806	All GND'd Irradiation	6.734				4.910	
807	All GND'd Irradiation	-9.599				-10.683	
808	All GND'd Irradiation	12.228				14.812	
809	All GND'd Irradiation	4.628				6.114	
810	All GND'd Irradiation	9.267				10.945	
801	Biased Irradiation	3.803				8.411	
802	Biased Irradiation	-6.268				-5.483	
803	Biased Irradiation	-9.030				-12.147	
804	Biased Irradiation	-0.006				-3.017	
805	Biased Irradiation	-13.255				-10.123	
816	All GND'd Irradiation	-11.854					-7.407
817	All GND'd Irradiation	17.262					22.631
818	All GND'd Irradiation	1.333					4.361
819	All GND'd Irradiation	2.674					3.405
820	All GND'd Irradiation	8.654					1.618
811	Biased Irradiation	2.583					8.880
812	Biased Irradiation	-0.136					5.318
813	Biased Irradiation	1.382					13.642
814	Biased Irradiation	-5.211					-2.838
815	Biased Irradiation	-1.609					-5.841
832	Control Unit	-1.841	-1.619	-1.619	-1.619	-1.619	-1.619
833	Control Unit	9.939	10.606	10.606	10.606	10.606	10.606
All GND'd Irradiation Statistics							
Average All GND'd		8.099	9.727	1.953	-1.307	5.220	4.921
Std Dev All GND'd		9.517	15.890	8.530	9.058	9.729	10.945
Ps90%/90% (+KTL) All GND'd		34.196	53.298	25.343	23.530	31.896	34.932
Ps90%/90% (-KTL) All GND'd		-17.998	-33.844	-21.437	-26.144	-21.457	-25.089
Biased Irradiation Statistics							
Average Biased		2.237	3.319	1.911	0.160	-4.472	3.832
Std Dev Biased		6.069	7.638	13.403	12.687	8.062	8.093
Ps90%/90% (+KTL) Biased		18.878	24.262	38.662	34.948	17.633	26.024
Ps90%/90% (-KTL) Biased		-14.404	-17.624	-34.841	-34.629	-26.577	-18.359
Specification MIN		-70	-100	-100	-100	-100	-100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		70	100	100	100	100	100
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

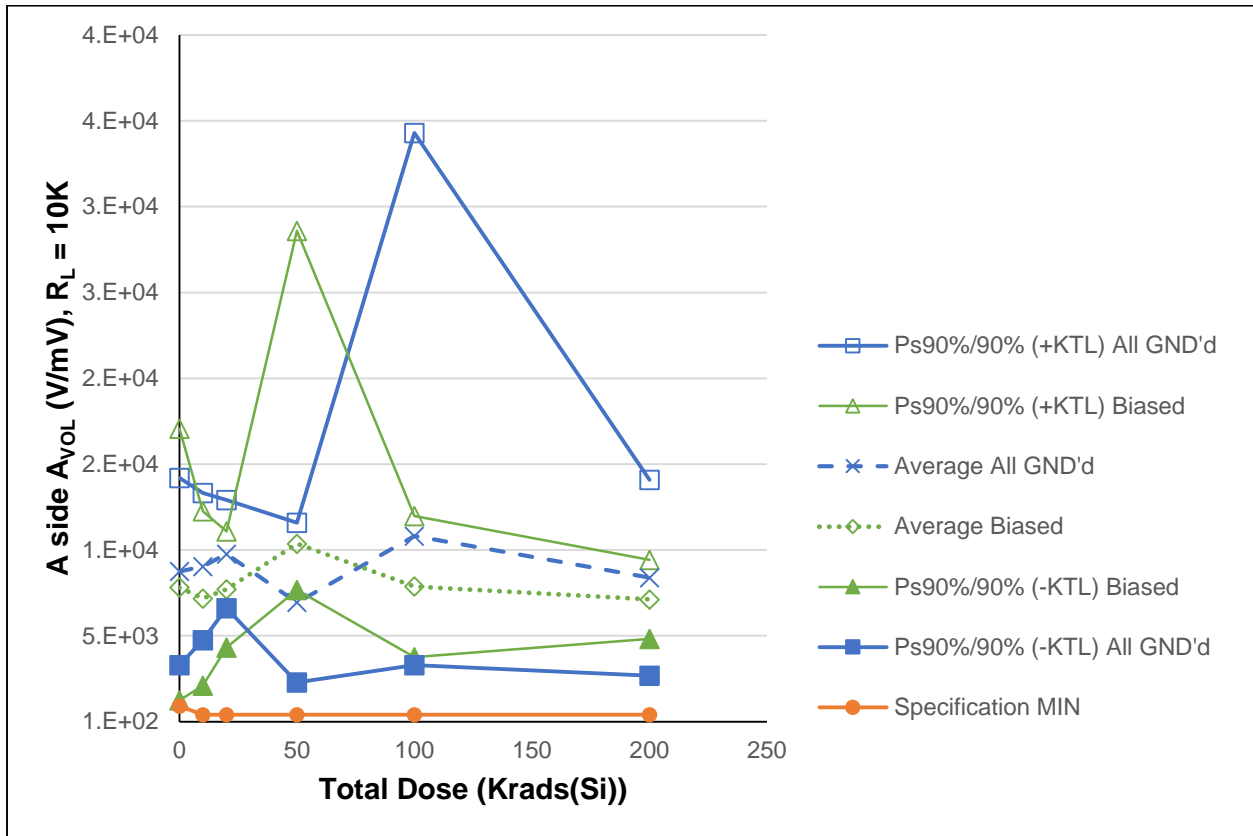


Figure 5.17: Plot of Gain ($R_L = 10K\Omega$, side A) versus Total Dose

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 Units	A 10K GAIN (V/mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	6896	7160				
777	All GND'd Irradiation	9014	11061				
778	All GND'd Irradiation	11926	10135				
779	All GND'd Irradiation	7279	9282				
780	All GND'd Irradiation	9133	8062				
771	Biased Irradiation	8351	4399				
772	Biased Irradiation	8932	7008				
773	Biased Irradiation	11988	9148				
774	Biased Irradiation	7662	8650				
775	Biased Irradiation	2654	7194				
786	All GND'd Irradiation	9305		10857			
787	All GND'd Irradiation	10844		9431			
788	All GND'd Irradiation	10271		10812			
789	All GND'd Irradiation	7701		10122			
790	All GND'd Irradiation	9071		8096			
781	Biased Irradiation	10040		8768			
782	Biased Irradiation	12669		6391			
783	Biased Irradiation	10327		7650			
784	Biased Irradiation	11875		6888			
785	Biased Irradiation	8620		9328			
796	All GND'd Irradiation	8113			4517		
797	All GND'd Irradiation	10798			7807		
798	All GND'd Irradiation	7818			9019		
799	All GND'd Irradiation	11875			7484		
800	All GND'd Irradiation	6760			6380		
791	Biased Irradiation	9225			6864		
792	Biased Irradiation	14073			9314		
793	Biased Irradiation	8476			7620		
794	Biased Irradiation	7794			6316		
795	Biased Irradiation	7124			22185		
806	All GND'd Irradiation	7473				5766	
807	All GND'd Irradiation	5054				26063	
808	All GND'd Irradiation	12359				8598	
809	All GND'd Irradiation	8696				8150	
810	All GND'd Irradiation	10627				5974	
801	Biased Irradiation	8482				10027	
802	Biased Irradiation	8426				7659	
803	Biased Irradiation	10121				6193	
804	Biased Irradiation	10323				8851	
805	Biased Irradiation	8654				7126	
816	All GND'd Irradiation	8743					11046
817	All GND'd Irradiation	9987					9548
818	All GND'd Irradiation	10798					6996
819	All GND'd Irradiation	9523					5819
820	All GND'd Irradiation	11050					9019
811	Biased Irradiation	10840					6676
812	Biased Irradiation	11061					6337
813	Biased Irradiation	10398					8157
814	Biased Irradiation	8815					8081
815	Biased Irradiation	8297					6851
832	Control Unit	8887	9104	9104	9104	9104	9104
833	Control Unit	14844	19667	19667	19667	19667	19667
All GND'd Irradiation Statistics							
Average All GND'd		8849	9140	9864	7041	10910	8486
Std Dev All GND'd		1991	1564	1147	1696	8565	2080
Ps90%/90% (+KTL) All GND'd		14308	13428	13010	11691	34394	14188
Ps90%/90% (-KTL) All GND'd		3391	4852	6718	2392	3391	2783
Biased Irradiation Statistics							
Average Biased		7917	7280	7805	10460	7971	7220
Std Dev Biased		3375	1854	1236	6651	1498	841
Ps90%/90% (+KTL) Biased		17171	12363	11195	28697	12078	9527
Ps90%/90% (-KTL) Biased		1336	2197	4415	7778	3865	4914
Specification MIN		1000	500	500	500	500	500
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

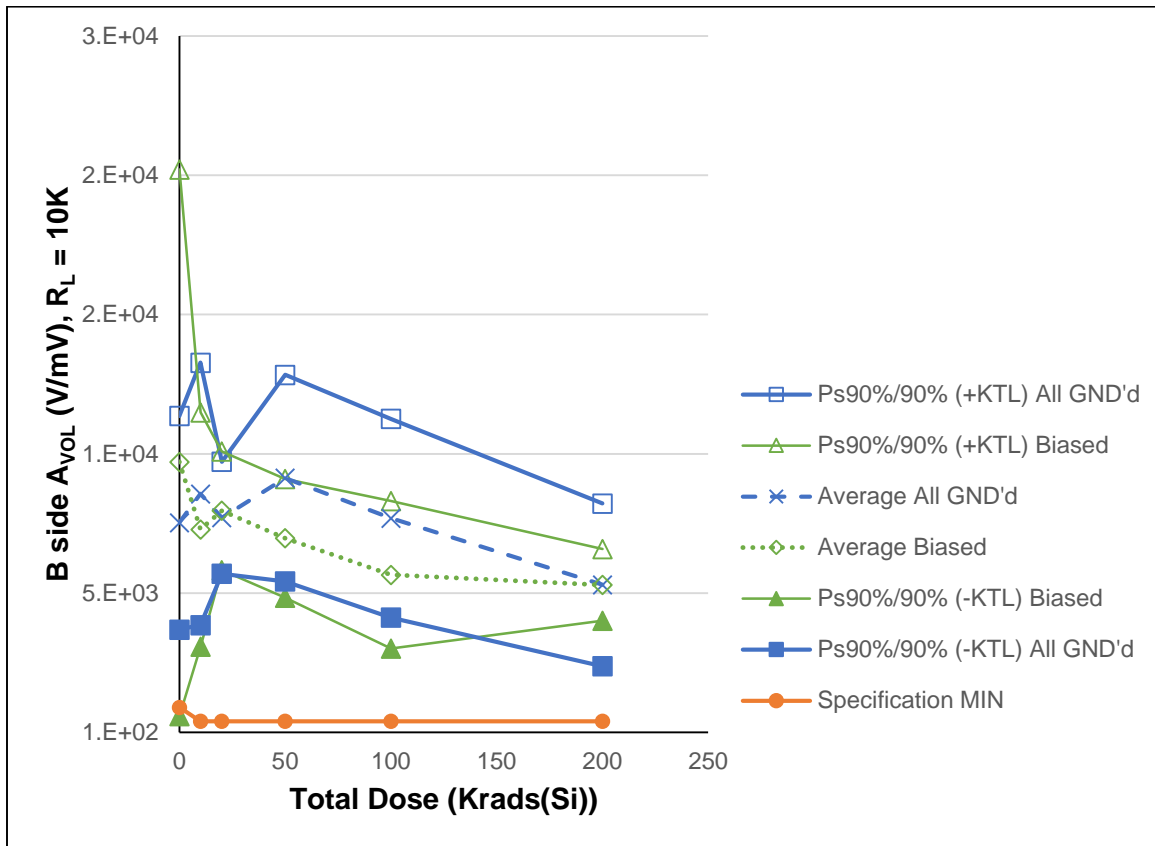


Figure 5.18: Plot of B-side Gain with $R_L = 10K\Omega$ versus Total Dose

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 Units	B 10K GAIN (V/mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	6457	8728				
777	All GND'd Irradiation	6270	7002				
778	All GND'd Irradiation	9756	11464				
779	All GND'd Irradiation	7852	7581				
780	All GND'd Irradiation	7796	8533				
771	Biased Irradiation	8288	6555				
772	Biased Irradiation	16095	5257				
773	Biased Irradiation	6592	7855				
774	Biased Irradiation	10676	9284				
775	Biased Irradiation	7415	7987				
786	All GND'd Irradiation	7473		6561			
787	All GND'd Irradiation	8520		8438			
788	All GND'd Irradiation	7136		8203			
789	All GND'd Irradiation	29000		7829			
790	All GND'd Irradiation	7096		8003			
781	Biased Irradiation	8482		7047			
782	Biased Irradiation	6498		7766			
783	Biased Irradiation	12641		9008			
784	Biased Irradiation	7481		8649			
785	Biased Irradiation	8119		7830			
796	All GND'd Irradiation	7343			10933		
797	All GND'd Irradiation	7422			10312		
798	All GND'd Irradiation	6738			7768		
799	All GND'd Irradiation	6512			8904		
800	All GND'd Irradiation	8142			8228		
791	Biased Irradiation	7282			6852		
792	Biased Irradiation	8520			7751		
793	Biased Irradiation	9104			5988		
794	Biased Irradiation	8627			7902		
795	Biased Irradiation	9781			6863		
806	All GND'd Irradiation	5592				8106	
807	All GND'd Irradiation	14448				6590	
808	All GND'd Irradiation	8726				7839	
809	All GND'd Irradiation	5429				9769	
810	All GND'd Irradiation	7662				6647	
801	Biased Irradiation	11309				5601	
802	Biased Irradiation	14902				5345	
803	Biased Irradiation	7315				5671	
804	Biased Irradiation	8706				7375	
805	Biased Irradiation	7245				4802	
816	All GND'd Irradiation	7343					5210
817	All GND'd Irradiation	6986					5156
818	All GND'd Irradiation	6786					5625
819	All GND'd Irradiation	7794					4021
820	All GND'd Irradiation	6137					6977
811	Biased Irradiation	7861					5021
812	Biased Irradiation	7252					6095
813	Biased Irradiation	7540					4910
814	Biased Irradiation	7226					5421
815	Biased Irradiation	8890					5532
832	Control Unit	6557	7154	7154	7154	7154	7154
833	Control Unit	10148	9149	9149	9149	9149	9149
All GND'd Irradiation Statistics							
Average All GND'd		7626	8661	7807	9229	7790	5398
Std Dev All GND'd		1398	1717	733	1353	1300	1065
Ps90%/90% (+KTL) All GND'd		11461	13371	9816	12939	11356	8317
Ps90%/90% (-KTL) All GND'd		3792	3952	5798	5520	4225	2478
Biased Irradiation Statistics							
Average Biased		9813	7388	8060	7071	5759	5396
Std Dev Biased		3830	1534	776	777	966	470
Ps90%/90% (+KTL) Biased		20314	11593	10189	9203	8407	6684
Ps90%/90% (-KTL) Biased		688	3182	5931	4940	3111	4107
Specification MIN		1000	500	500	500	500	500
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		FAIL	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

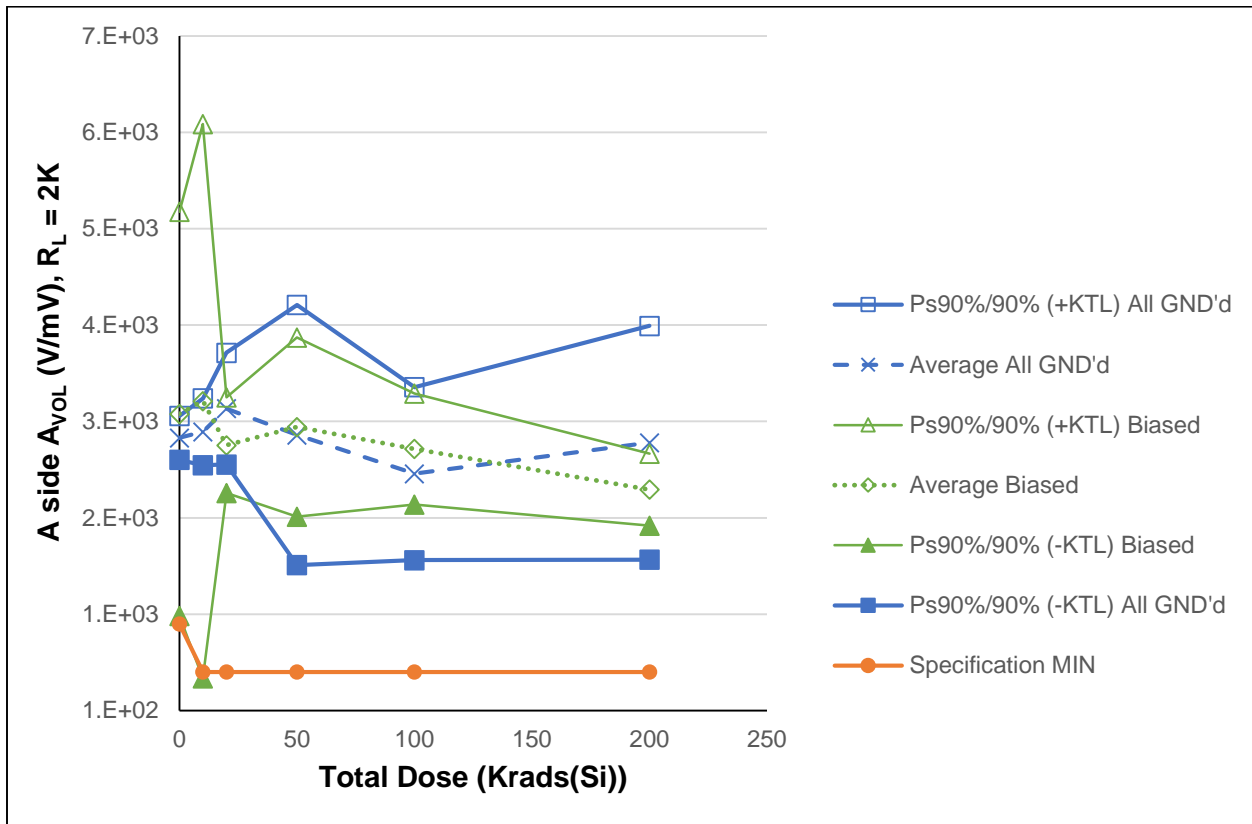


Figure 5.19: Plot of Gain with $R_L = 2K\Omega$ of A-side versus Total Dose

Note: All fifty samples pass the Gain test but due to the small 5-piece sample size the computed -KTL Biased is lower than the MIN specification at 10 Krad(Si).

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 Units	A 2K GAIN (V/mV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	3012	2936				
777	All GND'd Irradiation	2909	2937				
778	All GND'd Irradiation	2997	3172				
779	All GND'd Irradiation	2804	2850				
780	All GND'd Irradiation	2925	3066				
771	Biased Irradiation	2979	2192				
772	Biased Irradiation	2827	3017				
773	Biased Irradiation	4538	5009				
774	Biased Irradiation	2749	3429				
775	Biased Irradiation	2799	2910				
786	All GND'd Irradiation	3212		3057			
787	All GND'd Irradiation	3173		3267			
788	All GND'd Irradiation	3307		3325			
789	All GND'd Irradiation	3216		3521			
790	All GND'd Irradiation	2845		2998			
781	Biased Irradiation	3218		3149			
782	Biased Irradiation	3560		2761			
783	Biased Irradiation	2897		2854			
784	Biased Irradiation	3107		2839			
785	Biased Irradiation	3188		2666			
796	All GND'd Irradiation	2730			2364		
797	All GND'd Irradiation	3468			3314		
798	All GND'd Irradiation	3379			3549		
799	All GND'd Irradiation	3035			2583		
800	All GND'd Irradiation	3131			2991		
791	Biased Irradiation	3261			2658		
792	Biased Irradiation	2889			3124		
793	Biased Irradiation	2757			3178		
794	Biased Irradiation	2571			3495		
795	Biased Irradiation	2720			2756		
806	All GND'd Irradiation	2115				2039	
807	All GND'd Irradiation	2877				2915	
808	All GND'd Irradiation	3019				2716	
809	All GND'd Irradiation	3137				2502	
810	All GND'd Irradiation	2971				2618	
801	Biased Irradiation	3276				2907	
802	Biased Irradiation	2786				2561	
803	Biased Irradiation	3428				3073	
804	Biased Irradiation	3053				2640	
805	Biased Irradiation	3328				2892	
816	All GND'd Irradiation	2696					2385
817	All GND'd Irradiation	3842					2780
818	All GND'd Irradiation	2400					2910
819	All GND'd Irradiation	3611					2731
820	All GND'd Irradiation	3691					3590
811	Biased Irradiation	2673					2256
812	Biased Irradiation	2918					2239
813	Biased Irradiation	3090					2494
814	Biased Irradiation	3142					2448
815	Biased Irradiation	2859					2528
832	Control Unit	3033	3537	3537	3537	3537	3537
833	Control Unit	3640	2864	2864	2864	2864	2864
All GND'd Irradiation Statistics							
Average All GND'd		2929	2992	3233	2960	2558	2879
Std Dev All GND'd		83	127	211	492	327	442
Ps90%/90% (+KTL) All GND'd		3156	3339	3813	4310	3455	4092
Ps90%/90% (-KTL) All GND'd		2702	2645	2654	1610	1660	1666
Biased Irradiation Statistics							
Average Biased		3178	3311	2854	3042	2815	2393
Std Dev Biased		765	1049	181	339	210	136
Ps90%/90% (+KTL) Biased		5276	6186	3351	3972	3390	2766
Ps90%/90% (-KTL) Biased		1081	436	2357	2112	2239	2020
Specification MIN		1000	500	500	500	500	500
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	FAIL	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

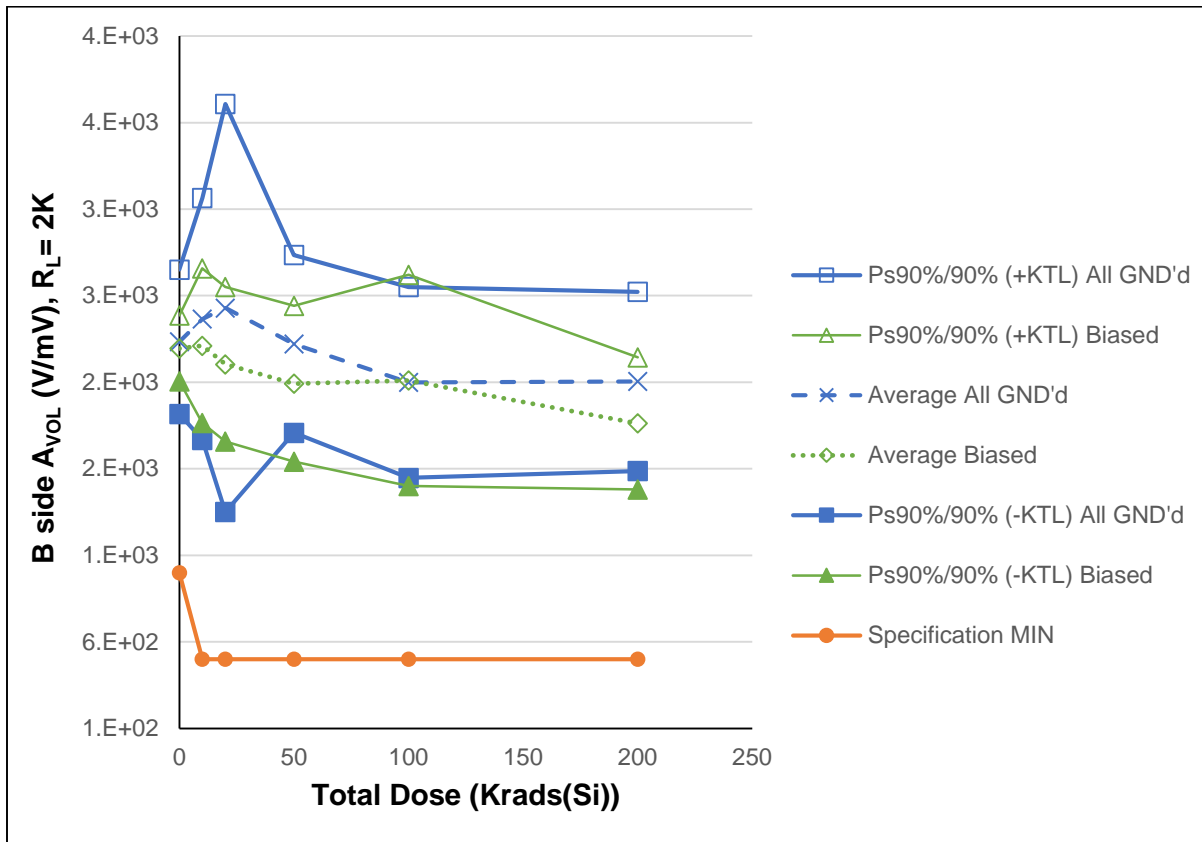


Figure 5.20: Plot of Gain ($R_L = 2K\Omega$, side B) versus Total Dose

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 Units	B 2K GAIN (V/mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	2457	2340				
777	All GND'd Irradiation	2162	2136				
778	All GND'd Irradiation	2236	2731				
779	All GND'd Irradiation	2525	2408				
780	All GND'd Irradiation	2290	2713				
771	Biased Irradiation	2268	2300				
772	Biased Irradiation	2220	2203				
773	Biased Irradiation	2409	2289				
774	Biased Irradiation	2291	2586				
775	Biased Irradiation	2290	2177				
786	All GND'd Irradiation	2397		2117			
787	All GND'd Irradiation	2855		3246			
788	All GND'd Irradiation	2408		2370			
789	All GND'd Irradiation	4610		2360			
790	All GND'd Irradiation	2439		2553			
781	Biased Irradiation	2466		2020			
782	Biased Irradiation	2299		2218			
783	Biased Irradiation	2206		2357			
784	Biased Irradiation	2306		2057			
785	Biased Irradiation	2520		2368			
796	All GND'd Irradiation	1857			2243		
797	All GND'd Irradiation	2278			2382		
798	All GND'd Irradiation	2361			2072		
799	All GND'd Irradiation	2741			2583		
800	All GND'd Irradiation	2384			2326		
791	Biased Irradiation	2344			2082		
792	Biased Irradiation	2437			2169		
793	Biased Irradiation	2165			1923		
794	Biased Irradiation	2368			2327		
795	Biased Irradiation	2299			1956		
806	All GND'd Irradiation	2305				2268	
807	All GND'd Irradiation	2224				1949	
808	All GND'd Irradiation	2135				2361	
809	All GND'd Irradiation	2034				1992	
810	All GND'd Irradiation	3047				1924	
801	Biased Irradiation	2439				2086	
802	Biased Irradiation	2737				2495	
803	Biased Irradiation	2100				1936	
804	Biased Irradiation	2538				1985	
805	Biased Irradiation	2306				2050	
816	All GND'd Irradiation	2012					2025
817	All GND'd Irradiation	2408					2047
818	All GND'd Irradiation	2472					2412
819	All GND'd Irradiation	2426					2130
820	All GND'd Irradiation	2239					1911
811	Biased Irradiation	2349					1905
812	Biased Irradiation	2148					1983
813	Biased Irradiation	2061					1622
814	Biased Irradiation	2291					1916
815	Biased Irradiation	2293					1886
832	Control Unit	2303	2010	2010	2010	2010	2010
833	Control Unit	2390	2412	2412	2412	2412	2412
All GND'd Irradiation Statistics							
Average All GND'd		2334	2465	2529	2321	2099	2105
Std Dev All GND'd		152	255	430	187	201	189
Ps90%/90% (+KTL) All GND'd		2751	3164	3708	2835	2650	2622
Ps90%/90% (-KTL) All GND'd		1917	1767	1351	1808	1548	1588
Biased Irradiation Statistics							
Average Biased		2295	2311	2204	2091	2110	1862
Std Dev Biased		70	163	163	164	223	139
Ps90%/90% (+KTL) Biased		2486	2758	2650	2542	2721	2244
Ps90%/90% (-KTL) Biased		2105	1865	1757	1641	1500	1481
Specification MIN		1000	500	500	500	500	500
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

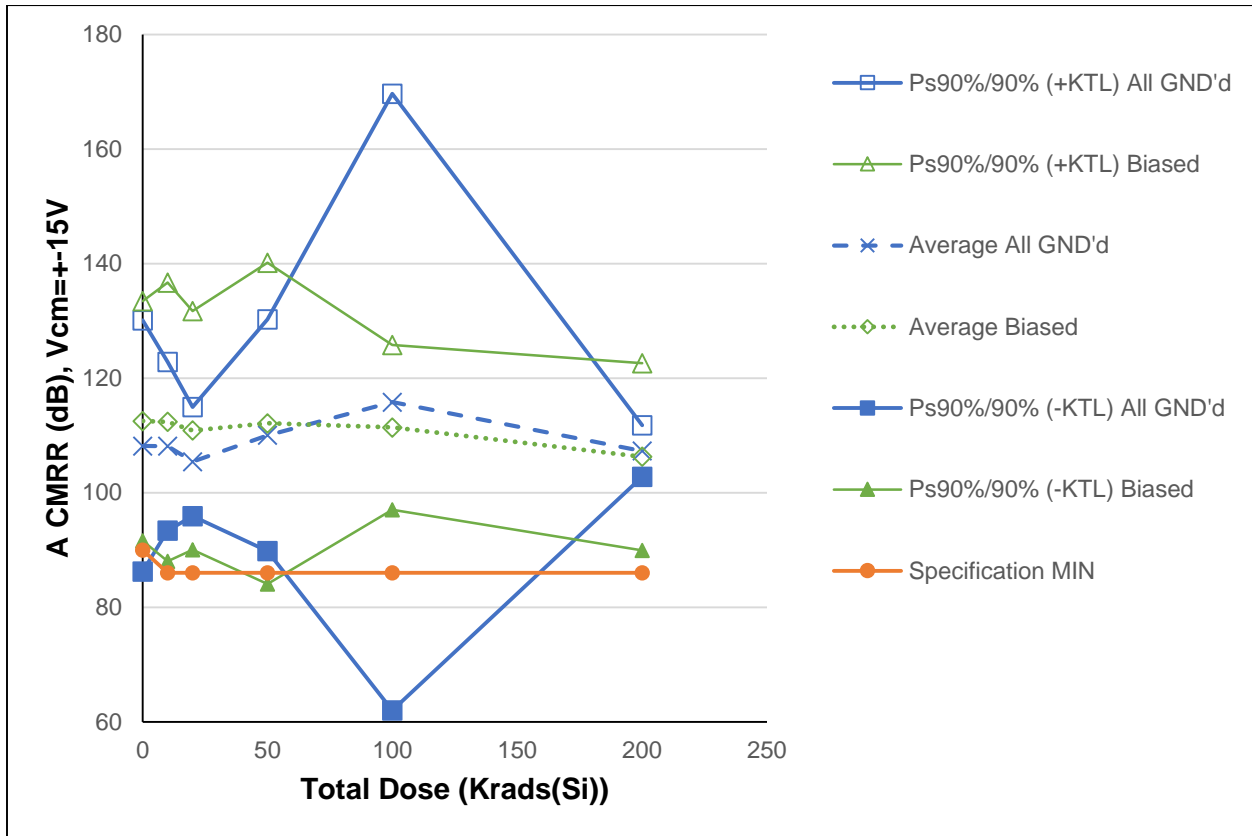


Figure 5.21: Plot of A-side Common Mode Rejection Ratio CMRR @ $V_{cm} = \pm 15V$ versus Total Dose

Note: All samples pass the CMRR test. The calculated -KTL All GND'd at 100 Krads(Si) is lower than the MIN 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) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	117.626	112.418				
777	All GND'd Irradiation	115.724	114.260				
778	All GND'd Irradiation	105.061	107.711				
779	All GND'd Irradiation	102.208	105.183				
780	All GND'd Irradiation	100.163	101.040				
771	Biased Irradiation	117.321	114.348				
772	Biased Irradiation	112.465	111.639				
773	Biased Irradiation	118.310	111.319				
774	Biased Irradiation	115.042	124.711				
775	Biased Irradiation	99.485	99.825				
786	All GND'd Irradiation	108.120		110.075			
787	All GND'd Irradiation	103.747		105.327			
788	All GND'd Irradiation	106.256		106.848			
789	All GND'd Irradiation	105.512		104.227			
790	All GND'd Irradiation	101.434		100.622			
781	Biased Irradiation	115.077		112.572			
782	Biased Irradiation	113.096		111.519			
783	Biased Irradiation	104.747		104.919			
784	Biased Irradiation	101.625		103.021			
785	Biased Irradiation	120.803		122.320			
796	All GND'd Irradiation	106.800			106.631		
797	All GND'd Irradiation	120.649			118.020		
798	All GND'd Irradiation	99.031			101.161		
799	All GND'd Irradiation	106.597			106.961		
800	All GND'd Irradiation	122.606			117.378		
791	Biased Irradiation	118.029			121.207		
792	Biased Irradiation	112.961			124.845		
793	Biased Irradiation	107.956			105.605		
794	Biased Irradiation	107.967			107.138		
795	Biased Irradiation	101.164			101.803		
806	All GND'd Irradiation	130.475				118.524	
807	All GND'd Irradiation	121.054				148.487	
808	All GND'd Irradiation	97.771				99.318	
809	All GND'd Irradiation	110.135				109.347	
810	All GND'd Irradiation	104.460				103.413	
801	Biased Irradiation	120.947				114.513	
802	Biased Irradiation	116.670				117.236	
803	Biased Irradiation	113.113				111.464	
804	Biased Irradiation	103.216				103.287	
805	Biased Irradiation	120.170				110.507	
816	All GND'd Irradiation	106.400					105.427
817	All GND'd Irradiation	106.510					106.383
818	All GND'd Irradiation	113.011					109.697
819	All GND'd Irradiation	107.302					107.982
820	All GND'd Irradiation	107.663					106.936
811	Biased Irradiation	100.742					101.381
812	Biased Irradiation	108.029					107.564
813	Biased Irradiation	103.075					109.686
814	Biased Irradiation	112.758					113.625
815	Biased Irradiation	98.919					99.132
832	Control Unit	97.066	98.798	98.798	98.798	98.798	98.798
833	Control Unit	123.905	120.283	120.283	120.283	120.283	120.283
All GND'd Irradiation Statistics							
Average All GND'd		108.156	108.122	105.420	110.030	115.818	107.285
Std Dev All GND'd		7.997	5.364	3.470	7.373	19.638	1.635
Ps90%/90% (+KTL) All GND'd		130.083	122.831	114.934	130.247	169.665	111.768
Ps90%/90% (-KTL) All GND'd		86.230	93.414	95.906	89.813	61.971	102.802
Biased Irradiation Statistics							
Average Biased		112.525	112.368	110.870	112.120	111.401	106.277
Std Dev Biased		7.630	8.877	7.606	10.225	5.253	5.964
Ps90%/90% (+KTL) Biased		133.446	136.710	131.727	140.156	125.804	122.631
Ps90%/90% (-KTL) Biased		91.604	88.027	90.013	84.083	96.999	89.923
Specification MIN		90	86	86	86	86	86
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		FAIL	PASS	PASS	PASS	FAIL	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	FAIL	PASS	PASS
Status (+KTL) Biased							

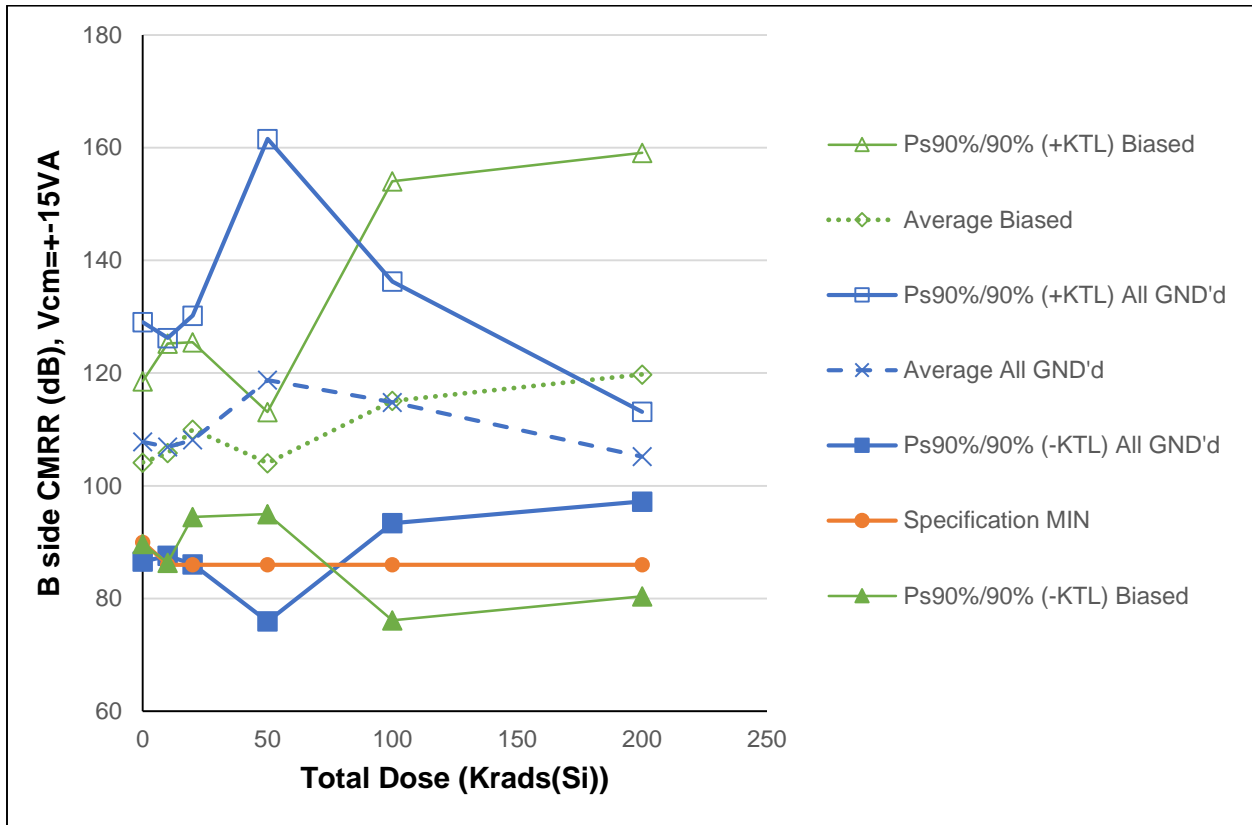


Figure 5.22: Plot of B-side CMRR @ $V_{cm} = \pm 15V$ versus Total Dose

All samples passed the CMRR parameter but due to the small 5-piece sample size, the computed - KTL of both All GND'd and Biased at 0, 50, 100 and 200 Krad(Si) are lower than the MIN specification limit.

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)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	119.798	117.018				
777	All GND'd Irradiation	105.803	104.697				
778	All GND'd Irradiation	100.360	100.524				
779	All GND'd Irradiation	110.615	111.103				
780	All GND'd Irradiation	102.429	101.147				
771	Biased Irradiation	104.391	106.138				
772	Biased Irradiation	98.235	99.805				
773	Biased Irradiation	99.926	98.493				
774	Biased Irradiation	106.883	108.539				
775	Biased Irradiation	111.242	116.006				
786	All GND'd Irradiation	98.869		99.235			
787	All GND'd Irradiation	109.518		110.073			
788	All GND'd Irradiation	109.340		108.100			
789	All GND'd Irradiation	112.724		120.338			
790	All GND'd Irradiation	101.951		102.949			
781	Biased Irradiation	110.495		109.029			
782	Biased Irradiation	105.498		108.937			
783	Biased Irradiation	109.737		117.978			
784	Biased Irradiation	111.060		111.655			
785	Biased Irradiation	102.371		102.288			
796	All GND'd Irradiation	102.190			102.264		
797	All GND'd Irradiation	110.584			110.404		
798	All GND'd Irradiation	111.856			110.148		
799	All GND'd Irradiation	118.638			135.667		
800	All GND'd Irradiation	122.948			135.287		
791	Biased Irradiation	105.220			105.551		
792	Biased Irradiation	104.015			105.942		
793	Biased Irradiation	129.466			106.760		
794	Biased Irradiation	103.769			103.310		
795	Biased Irradiation	101.421			98.579		
806	All GND'd Irradiation	110.838				107.445	
807	All GND'd Irradiation	109.020				111.137	
808	All GND'd Irradiation	138.676				127.905	
809	All GND'd Irradiation	109.639				112.464	
810	All GND'd Irradiation	112.362				115.106	
801	Biased Irradiation	103.561				101.278	
802	Biased Irradiation	118.989				116.936	
803	Biased Irradiation	118.141				137.415	
804	Biased Irradiation	111.537				104.414	
805	Biased Irradiation	118.894				115.368	
816	All GND'd Irradiation	110.361					107.375
817	All GND'd Irradiation	104.136					103.631
818	All GND'd Irradiation	104.774					104.505
819	All GND'd Irradiation	103.414					101.566
820	All GND'd Irradiation	109.327					108.780
811	Biased Irradiation	110.676					111.066
812	Biased Irradiation	129.244					145.172
813	Biased Irradiation	111.051					112.714
814	Biased Irradiation	111.995					113.112
815	Biased Irradiation	114.891					116.642
832	Control Unit	116.501	112.994	112.994	112.994	112.994	112.994
833	Control Unit	102.512	107.280	107.280	107.280	107.280	107.280
All GND'd Irradiation Statistics							
Average All GND'd		107.801	106.898	108.139	118.754	114.811	105.171
Std Dev All GND'd		7.747	7.047	8.043	15.613	7.823	2.902
Ps90%/90% (+KTL) All GND'd		129.044	126.221	130.194	161.565	136.262	113.129
Ps90%/90% (-KTL) All GND'd		86.559	87.575	86.085	75.942	93.361	97.213
Biased Irradiation Statistics							
Average Biased		104.135	105.796	109.977	104.028	115.082	119.741
Std Dev Biased		5.259	7.091	5.656	3.303	14.201	14.361
Ps90%/90% (+KTL) Biased		118.557	125.239	125.485	113.086	154.021	159.118
Ps90%/90% (-KTL) Biased		89.714	86.353	94.470	94.971	76.143	80.365
Specification MIN		90	86	86	86	86	86
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		FAIL	PASS	PASS	FAIL	PASS	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		FAIL	PASS	PASS	PASS	FAIL	FAIL
Status (+KTL) Biased							

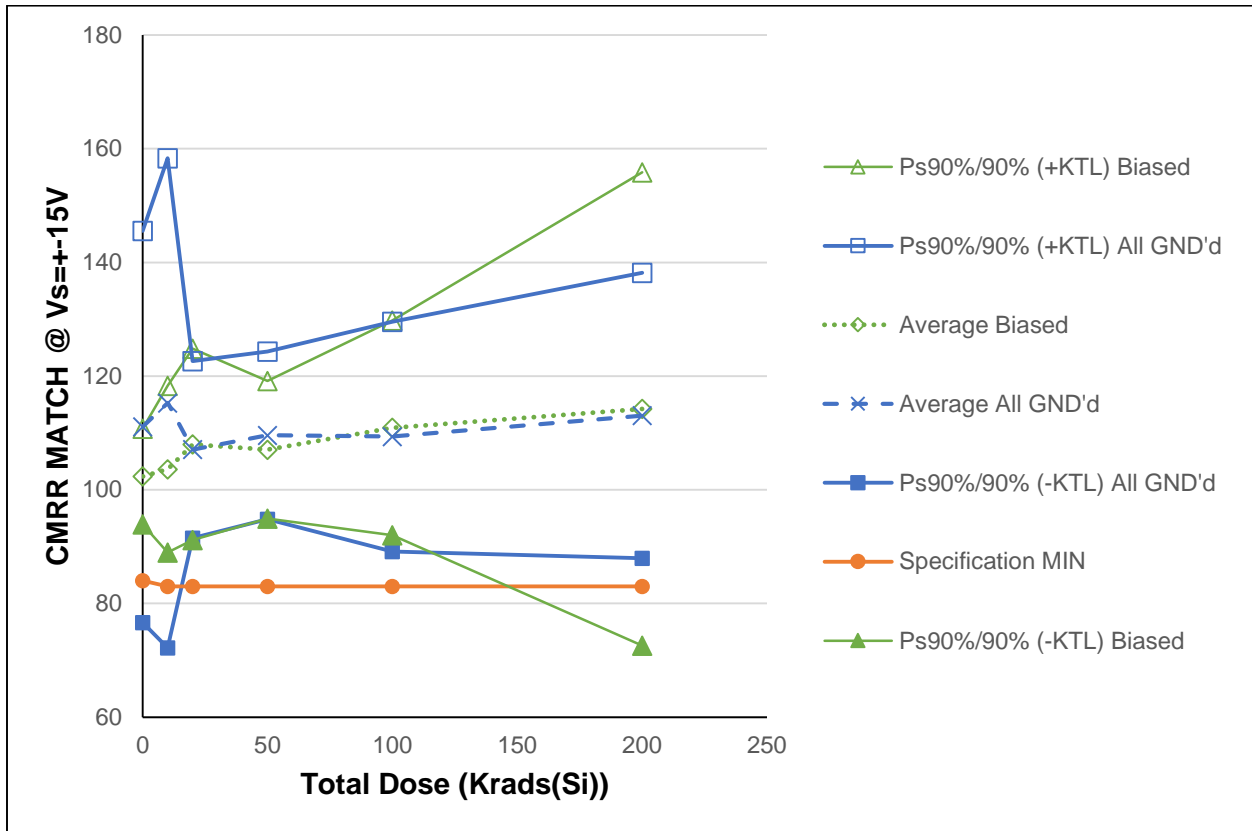


Figure 5.23: Plot of CMRR Matching @ $V_{cm} = \pm 15V$ versus Total Dose

All samples passed the CMRR Matching parameter but due to the small 5-piece sample size, the computed -KTL of All GND'd at 0, 10 Krad(Si) and of Biased at 200 Krad(Si) are lower than the MIN specification limit.

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 Units	CMRR MATCH (dB)	Total Dose (Krad(Si)) @ 50 rads(Si/s)					
		0	10	20	50	100	200
776	All GND'd Irradiation	130.727	120.137				
777	All GND'd Irradiation	109.142	108.209				
778	All GND'd Irradiation	96.376	97.374				
779	All GND'd Irradiation	106.359	111.305				
780	All GND'd Irradiation	112.942	139.308				
771	Biased Irradiation	106.612	110.410				
772	Biased Irradiation	100.112	102.375				
773	Biased Irradiation	98.938	96.706				
774	Biased Irradiation	104.017	107.285				
775	Biased Irradiation	102.080	101.290				
786	All GND'd Irradiation	102.541		102.175			
787	All GND'd Irradiation	110.025		112.842			
788	All GND'd Irradiation	101.641		101.431			
789	All GND'd Irradiation	110.485		105.705			
790	All GND'd Irradiation	126.193		113.201			
781	Biased Irradiation	118.240		118.531			
782	Biased Irradiation	102.471		104.112			
783	Biased Irradiation	111.937		107.103			
784	Biased Irradiation	105.201		107.036			
785	Biased Irradiation	103.479		103.199			
796	All GND'd Irradiation	109.895			110.330		
797	All GND'd Irradiation	108.213			107.382		
798	All GND'd Irradiation	101.283			104.974		
799	All GND'd Irradiation	104.659			106.648		
800	All GND'd Irradiation	150.886			118.560		
791	Biased Irradiation	107.478			107.116		
792	Biased Irradiation	107.851			106.988		
793	Biased Irradiation	107.255			100.142		
794	Biased Irradiation	112.098			112.271		
795	Biased Irradiation	131.867			108.750		
806	All GND'd Irradiation	111.795				110.290	
807	All GND'd Irradiation	111.521				111.020	
808	All GND'd Irradiation	97.850				99.647	
809	All GND'd Irradiation	134.745				119.761	
810	All GND'd Irradiation	108.935				106.031	
801	Biased Irradiation	102.460				103.413	
802	Biased Irradiation	111.732				111.064	
803	Biased Irradiation	120.253				111.913	
804	Biased Irradiation	107.419				121.589	
805	Biased Irradiation	136.185				106.581	
816	All GND'd Irradiation	115.127					119.370
817	All GND'd Irradiation	116.561					114.956
818	All GND'd Irradiation	109.030					111.441
819	All GND'd Irradiation	99.122					98.174
820	All GND'd Irradiation	122.838					121.304
811	Biased Irradiation	104.075					104.833
812	Biased Irradiation	108.819					107.679
813	Biased Irradiation	107.501					120.309
814	Biased Irradiation	133.491					137.947
815	Biased Irradiation	100.423					100.373
832	Control Unit	96.185	97.250	97.250	97.250	97.250	97.250
833	Control Unit	103.285	109.481	109.481	109.481	109.481	109.481
All GND'd Irradiation Statistics							
Average All GND'd		111.109	115.267	107.071	109.579	109.350	113.049
Std Dev All GND'd		12.567	15.711	5.669	5.381	7.369	9.160
Ps90%/90% (+KTL) All GND'd		145.568	158.347	122.614	124.334	129.556	138.165
Ps90%/90% (-KTL) All GND'd		76.650	72.186	91.528	94.823	89.143	87.933
Biased Irradiation Statistics							
Average Biased		102.352	103.613	107.996	107.053	110.912	114.228
Std Dev Biased		3.069	5.346	6.140	4.412	6.892	15.188
Ps90%/90% (+KTL) Biased		110.766	118.272	124.832	119.152	129.810	155.873
Ps90%/90% (-KTL) Biased		93.937	88.954	91.160	94.955	92.013	72.583
Specification MIN		84	83	83	83	83	83
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		FAIL	FAIL	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	FAIL
Status (+KTL) Biased							

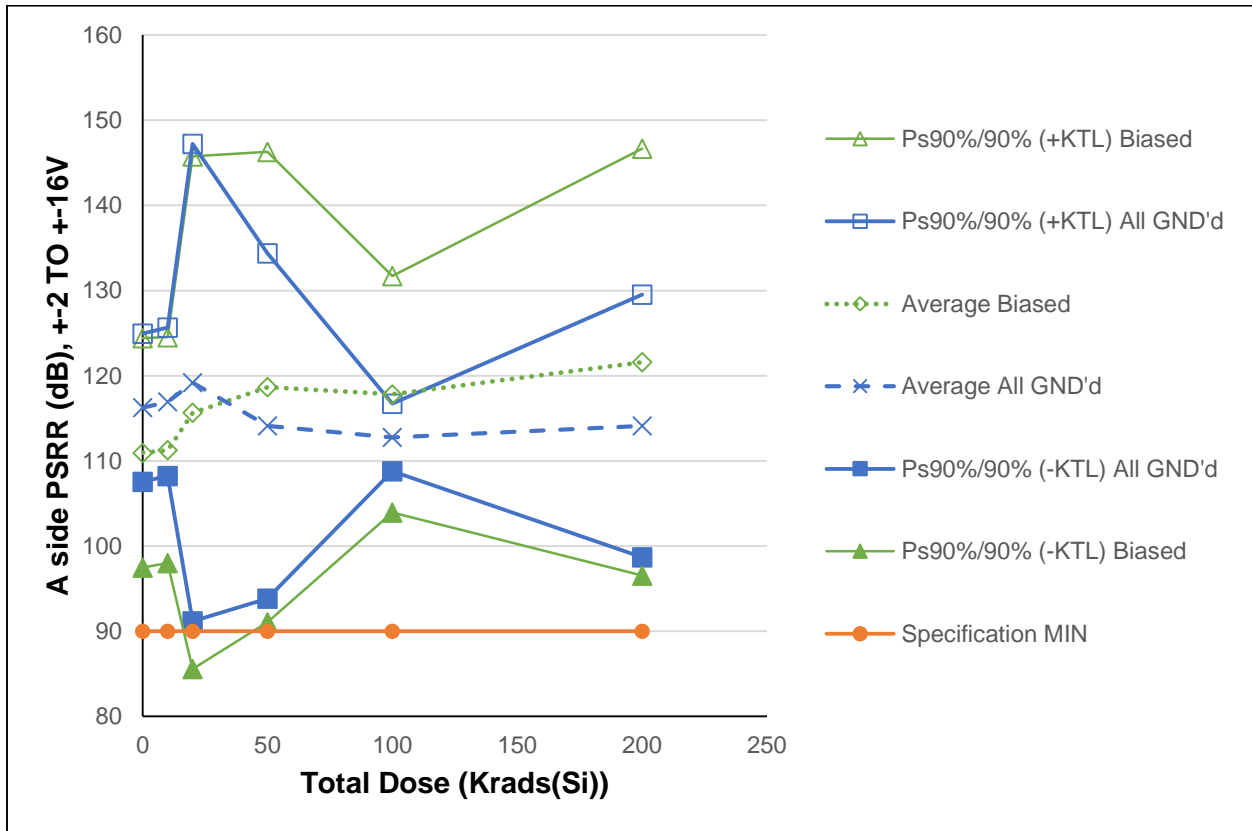


Figure 5.24: Plot of A-side Power Supply Rejection Ratio PSRR @ $V_{cm} = +2V$ to $+16V$ versus Total Dose

All samples passed the PSRR parameter but due to the small 5-piece sample size, the computed - KTL points of Biased Irradiation at 20 Krad(Si) is smaller than the specification MIN.

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	118.414	119.052				
777	All GND'd Irradiation	113.786	114.585				
778	All GND'd Irradiation	117.162	117.748				
779	All GND'd Irradiation	112.179	112.814				
780	All GND'd Irradiation	119.725	120.508				
771	Biased Irradiation	115.379	116.095				
772	Biased Irradiation	113.372	112.885				
773	Biased Irradiation	104.471	104.522				
774	Biased Irradiation	114.570	114.742				
775	Biased Irradiation	106.959	108.075				
786	All GND'd Irradiation	125.935		127.038			
787	All GND'd Irradiation	109.827		110.197			
788	All GND'd Irradiation	110.709		111.185			
789	All GND'd Irradiation	114.020		114.583			
790	All GND'd Irradiation	133.404		132.990			
781	Biased Irradiation	109.601		110.527			
782	Biased Irradiation	104.309		104.894			
783	Biased Irradiation	133.550		132.024			
784	Biased Irradiation	120.442		121.435			
785	Biased Irradiation	108.794		109.451			
796	All GND'd Irradiation	119.259			120.729		
797	All GND'd Irradiation	123.126			123.243		
798	All GND'd Irradiation	110.255			110.744		
799	All GND'd Irradiation	108.856			109.376		
800	All GND'd Irradiation	106.103			106.508		
791	Biased Irradiation	108.964			109.479		
792	Biased Irradiation	126.685			127.159		
793	Biased Irradiation	131.485			130.331		
794	Biased Irradiation	107.447			108.024		
795	Biased Irradiation	117.106			118.355		
806	All GND'd Irradiation	113.744				112.387	
807	All GND'd Irradiation	112.461				112.866	
808	All GND'd Irradiation	113.688				114.841	
809	All GND'd Irradiation	110.860				110.806	
810	All GND'd Irradiation	112.711				112.948	
801	Biased Irradiation	115.550				116.304	
802	Biased Irradiation	118.994				118.168	
803	Biased Irradiation	115.246				115.804	
804	Biased Irradiation	126.314				126.170	
805	Biased Irradiation	112.202				112.690	
816	All GND'd Irradiation	114.600					115.860
817	All GND'd Irradiation	112.371					112.573
818	All GND'd Irradiation	118.073					119.405
819	All GND'd Irradiation	117.819					117.611
820	All GND'd Irradiation	105.167					105.131
811	Biased Irradiation	115.326					116.420
812	Biased Irradiation	114.598					114.452
813	Biased Irradiation	114.453					114.673
814	Biased Irradiation	134.170					134.596
815	Biased Irradiation	137.106					127.863
832	Control Unit	123.877	123.729	123.729	123.729	123.729	123.729
833	Control Unit	130.872	132.306	132.306	132.306	132.306	132.306
All GND'd Irradiation Statistics							
Average All GND'd		116.253	116.941	119.199	114.120	112.770	114.116
Std Dev All GND'd		3.172	3.179	10.225	7.395	1.443	5.620
Ps90%/90% (+KTL) All GND'd		124.949	125.657	147.236	134.398	116.728	129.526
Ps90%/90% (-KTL) All GND'd		107.557	108.226	91.161	93.842	108.812	98.706
Biased Irradiation Statistics							
Average Biased		110.950	111.264	115.666	118.670	117.827	121.601
Std Dev Biased		4.911	4.840	10.977	10.074	5.062	9.138
Ps90%/90% (+KTL) Biased		124.417	124.534	145.764	146.293	131.708	146.657
Ps90%/90% (-KTL) Biased		97.483	97.993	85.568	91.046	103.946	96.544
Specification MIN		90	90	90	90	90	90
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	FAIL	PASS	PASS	PASS
Status (+KTL) Biased							

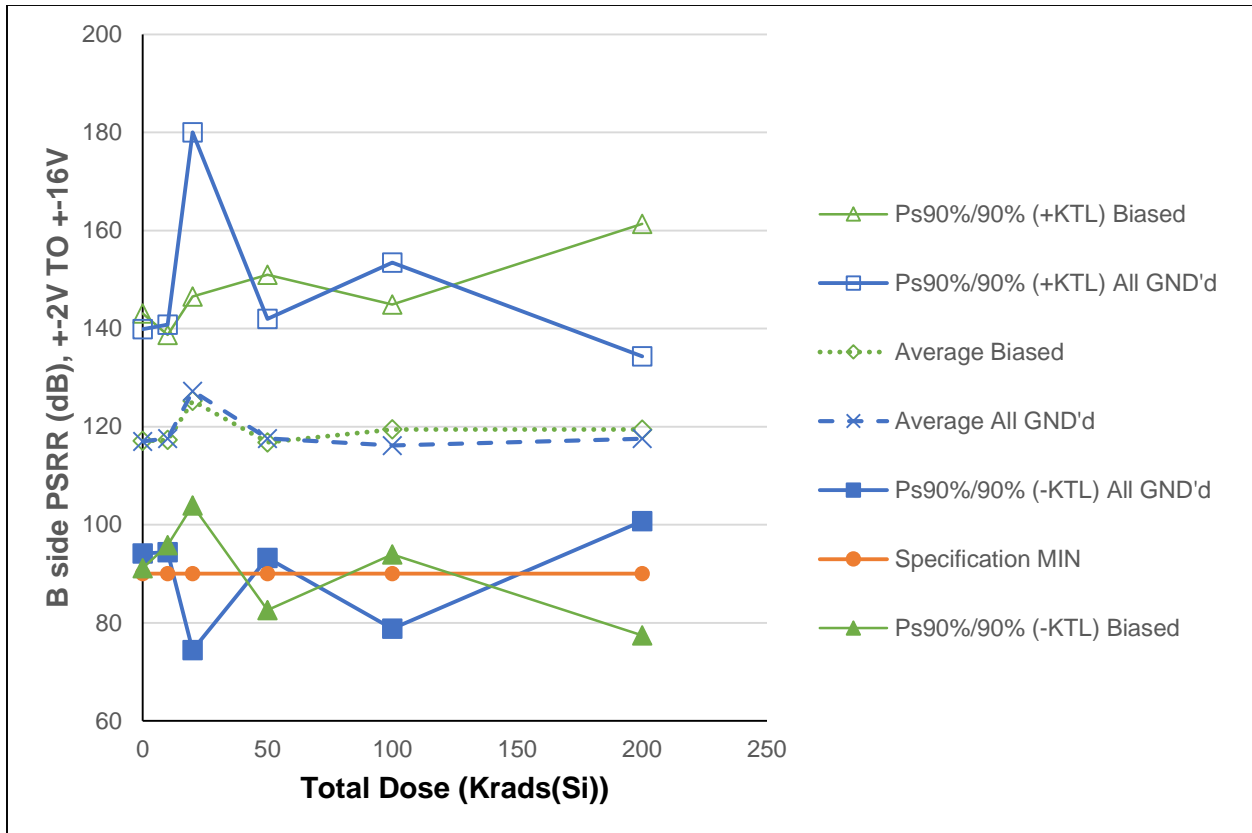


Figure 5.25: Plot of Power Supply Rejection Ratio PSRR (side B) @ $V_{cm} = +2V$ to $+16V$ versus Total Dose

All samples passed the PSRR parameter but due to the small 5-piece sample size, the computed – KTL of both biases are lower than the MIN datasheet limit at 20, 100 Krad(Si) for All GND'd and at 50, 200 Krad(Si) for Biased Irradiation.

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 Units	B PSRR, +-2V TO +-16V (dB)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	114.375	115.168				
777	All GND'd Irradiation	108.406	109.380				
778	All GND'd Irradiation	113.002	113.079				
779	All GND'd Irradiation	118.893	118.967				
780	All GND'd Irradiation	130.337	131.391				
771	Biased Irradiation	116.052	116.756				
772	Biased Irradiation	106.310	107.233				
773	Biased Irradiation	112.176	113.500				
774	Biased Irradiation	131.682	128.063				
775	Biased Irradiation	119.187	120.842				
786	All GND'd Irradiation	131.609		146.076			
787	All GND'd Irradiation	141.298		148.943			
788	All GND'd Irradiation	106.241		106.683			
789	All GND'd Irradiation	112.675		113.126			
790	All GND'd Irradiation	121.024		121.321			
781	Biased Irradiation	125.745		128.611			
782	Biased Irradiation	115.108		115.334			
783	Biased Irradiation	128.531		127.364			
784	Biased Irradiation	134.340		135.119			
785	Biased Irradiation	121.380		119.805			
796	All GND'd Irradiation	110.762			111.472		
797	All GND'd Irradiation	133.412			131.954		
798	All GND'd Irradiation	118.189			118.329		
799	All GND'd Irradiation	117.151			117.052		
800	All GND'd Irradiation	108.799			109.170		
791	Biased Irradiation	114.404			114.026		
792	Biased Irradiation	110.558			111.206		
793	Biased Irradiation	136.642			138.798		
794	Biased Irradiation	107.078			108.209		
795	Biased Irradiation	111.389			111.772		
806	All GND'd Irradiation	108.699				109.419	
807	All GND'd Irradiation	115.964				116.151	
808	All GND'd Irradiation	105.367				105.912	
809	All GND'd Irradiation	148.943				139.583	
810	All GND'd Irradiation	109.252				109.600	
801	Biased Irradiation	117.262				116.981	
802	Biased Irradiation	108.489				108.475	
803	Biased Irradiation	133.953				133.990	
804	Biased Irradiation	120.146				120.639	
805	Biased Irradiation	116.647				117.081	
816	All GND'd Irradiation	122.875					121.784
817	All GND'd Irradiation	122.305					124.266
818	All GND'd Irradiation	113.994					114.814
819	All GND'd Irradiation	119.741					118.153
820	All GND'd Irradiation	108.367					108.669
811	Biased Irradiation	115.494					116.368
812	Biased Irradiation	125.696					142.694
813	Biased Irradiation	104.781					104.341
814	Biased Irradiation	107.702					108.331
815	Biased Irradiation	123.735					125.287
832	Control Unit	120.922	121.426	121.426	121.426	121.426	121.426
833	Control Unit	108.792	108.828	108.828	108.828	108.828	108.828
All GND'd Irradiation Statistics							
Average All GND'd		117.003	117.597	127.230	117.595	116.133	117.537
Std Dev All GND'd		8.340	8.455	19.253	8.881	13.621	6.119
Ps90%/90% (+KTL) All GND'd		139.870	140.782	180.021	141.946	153.482	134.315
Ps90%/90% (-KTL) All GND'd		94.135	94.412	74.439	93.245	78.784	100.759
Biased Irradiation Statistics							
Average Biased		117.081	117.279	125.247	116.802	119.433	119.404
Std Dev Biased		9.470	7.818	7.764	12.470	9.287	15.295
Ps90%/90% (+KTL) Biased		143.049	138.715	146.536	150.994	144.897	161.344
Ps90%/90% (-KTL) Biased		91.114	95.842	103.957	82.610	93.969	77.465
Specification MIN		90	90	90	90	90	90
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		PASS	PASS	FAIL	PASS	FAIL	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	FAIL	PASS	FAIL
Status (+KTL) Biased							

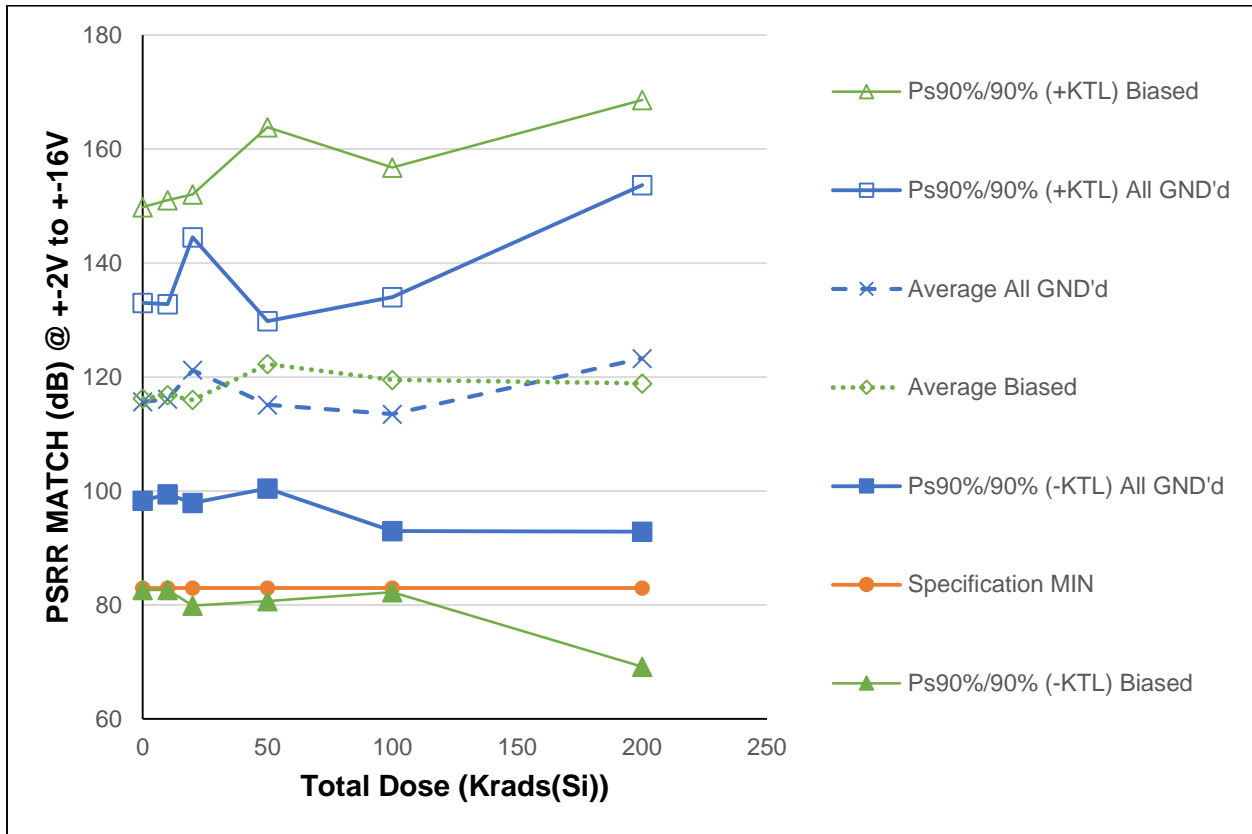


Figure 5.26: Plot of PSRR Matching @ $V_{cm} = +2V$ to $+16V$ versus Total Dose

All samples passed the PSRR parameter but due to the small 5-piece sample size, the computed – KTL green line (with filled triangle markers) for Biased 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

Parameter Units	PSRR MATCH. +-2V to +-16V (dB)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	110.141	110.874				
777	All GND'd Irradiation	115.118	116.301				
778	All GND'd Irradiation	121.393	120.700				
779	All GND'd Irradiation	108.882	109.336				
780	All GND'd Irradiation	122.757	123.430				
771	Biased Irradiation	137.929	138.804				
772	Biased Irradiation	111.401	113.639				
773	Biased Irradiation	109.082	108.340				
774	Biased Irradiation	113.436	113.045				
775	Biased Irradiation	109.397	110.345				
786	All GND'd Irradiation	132.315		128.067			
787	All GND'd Irradiation	109.598		110.098			
788	All GND'd Irradiation	114.153		114.546			
789	All GND'd Irradiation	129.541		129.352			
790	All GND'd Irradiation	123.412		123.947			
781	Biased Irradiation	111.073		111.684			
782	Biased Irradiation	102.108		102.611			
783	Biased Irradiation	135.684		134.998			
784	Biased Irradiation	122.400		123.449			
785	Biased Irradiation	106.962		107.148			
796	All GND'd Irradiation	114.859			115.140		
797	All GND'd Irradiation	120.807			120.529		
798	All GND'd Irradiation	114.708			115.439		
799	All GND'd Irradiation	106.028			106.372		
800	All GND'd Irradiation	117.579			118.076		
791	Biased Irradiation	105.244			105.437		
792	Biased Irradiation	112.033			112.713		
793	Biased Irradiation	138.465			134.445		
794	Biased Irradiation	134.699			141.549		
795	Biased Irradiation	117.724			117.265		
806	All GND'd Irradiation	104.839				104.756	
807	All GND'd Irradiation	122.042				122.903	
808	All GND'd Irradiation	109.570				109.757	
809	All GND'd Irradiation	110.753				110.496	
810	All GND'd Irradiation	118.921				119.501	
801	Biased Irradiation	130.503				138.796	
802	Biased Irradiation	106.221				106.014	
803	Biased Irradiation	116.318				116.946	
804	Biased Irradiation	126.022				127.178	
805	Biased Irradiation	108.123				108.590	
816	All GND'd Irradiation	118.832					121.977
817	All GND'd Irradiation	115.704					115.191
818	All GND'd Irradiation	122.520					122.546
819	All GND'd Irradiation	131.868					141.969
820	All GND'd Irradiation	115.392					114.642
811	Biased Irradiation	149.673					148.943
812	Biased Irradiation	112.463					114.122
813	Biased Irradiation	102.315					102.033
814	Biased Irradiation	108.125					108.764
815	Biased Irradiation	122.047					120.460
832	Control Unit	131.723	134.086	134.086	134.086	134.086	134.086
833	Control Unit	109.504	109.430	109.430	109.430	109.430	109.430
All GND'd Irradiation Statistics							
Average All GND'd		115.658	116.128	121.202	115.111	113.483	123.265
Std Dev All GND'd		6.323	6.082	8.495	5.353	7.482	11.086
Ps90%/90% (+KTL) All GND'd		132.996	132.806	144.497	129.790	133.998	153.662
Ps90%/90% (-KTL) All GND'd		98.320	99.450	97.907	100.433	92.967	92.869
Biased Irradiation Statistics							
Average Biased		116.249	116.835	115.978	122.282	119.505	118.864
Std Dev Biased		12.245	12.465	13.159	15.163	13.590	18.132
Ps90%/90% (+KTL) Biased		149.824	151.014	152.061	163.858	156.768	168.582
Ps90%/90% (-KTL) Biased		82.674	82.656	79.895	80.706	82.242	69.146
Specification MIN		83	83	83	83	83	83
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		FAIL	FAIL	FAIL	FAIL	FAIL	FAIL
Status (+KTL) Biased							

(PASS/FAIL)

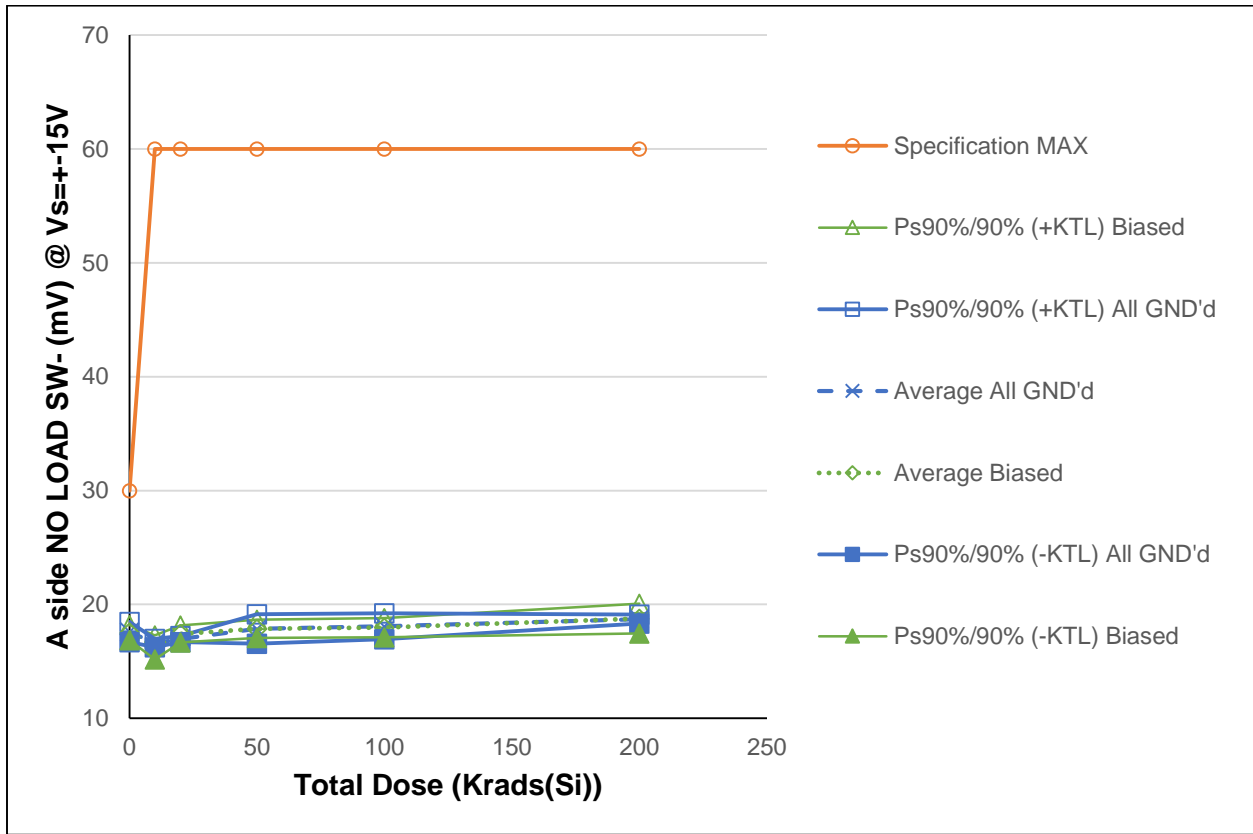


Figure 5.27: Plot of Output Voltage Swing Low at No Load and Vs = +-15V versus Total Dose (side A)

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	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
Units	(mV)	0	10	20	50	100	200
776	All GND'd Irradiation	17.563	16.460				
777	All GND'd Irradiation	17.919	16.622				
778	All GND'd Irradiation	17.892	16.779				
779	All GND'd Irradiation	17.385	16.479				
780	All GND'd Irradiation	17.166	16.665				
771	Biased Irradiation	17.645	16.786				
772	Biased Irradiation	17.645	16.267				
773	Biased Irradiation	17.144	15.810				
774	Biased Irradiation	17.757	16.343				
775	Biased Irradiation	17.435	15.948				
786	All GND'd Irradiation	17.587		16.953			
787	All GND'd Irradiation	17.414		16.860			
788	All GND'd Irradiation	17.528		17.041			
789	All GND'd Irradiation	17.340		16.889			
790	All GND'd Irradiation	17.359		17.091			
781	Biased Irradiation	17.833		17.527			
782	Biased Irradiation	17.664		17.248			
783	Biased Irradiation	17.606		17.239			
784	Biased Irradiation	18.274		17.832			
785	Biased Irradiation	17.716		17.210			
796	All GND'd Irradiation	18.310			18.194		
797	All GND'd Irradiation	17.445			17.353		
798	All GND'd Irradiation	17.342			17.312		
799	All GND'd Irradiation	18.198			18.120		
800	All GND'd Irradiation	18.233			18.267		
791	Biased Irradiation	17.817			18.108		
792	Biased Irradiation	17.983			18.172		
793	Biased Irradiation	17.411			17.450		
794	Biased Irradiation	17.757			17.777		
795	Biased Irradiation	17.798			17.774		
806	All GND'd Irradiation	17.359				17.689	
807	All GND'd Irradiation	17.950				18.267	
808	All GND'd Irradiation	18.217				18.724	
809	All GND'd Irradiation	17.559				17.960	
810	All GND'd Irradiation	17.342				17.789	
801	Biased Irradiation	17.566				18.003	
802	Biased Irradiation	17.902				18.458	
803	Biased Irradiation	17.223				17.651	
804	Biased Irradiation	17.606				17.889	
805	Biased Irradiation	17.452				17.803	
816	All GND'd Irradiation	18.017					18.934
817	All GND'd Irradiation	17.623					18.565
818	All GND'd Irradiation	17.755					18.746
819	All GND'd Irradiation	17.623					18.629
820	All GND'd Irradiation	17.606					18.658
811	Biased Irradiation	17.418					18.496
812	Biased Irradiation	17.606					18.498
813	Biased Irradiation	17.664					18.610
814	Biased Irradiation	17.640					18.565
815	Biased Irradiation	18.768					19.598
832	Control Unit	17.500	16.743	16.743	16.743	16.743	16.743
833	Control Unit	17.606	17.029	17.029	17.029	17.029	17.029
All GND'd Irradiation Statistics							
Average All GND'd		17.585	16.601	16.967	17.849	18.086	18.706
Std Dev All GND'd		0.325	0.133	0.098	0.475	0.419	0.143
Ps90%/90% (+KTL) All GND'd		18.476	16.966	17.237	19.150	19.235	19.098
Ps90%/90% (-KTL) All GND'd		16.694	16.236	16.697	16.548	16.937	18.314
Biased Irradiation Statistics							
Average Biased		17.525	16.231	17.411	17.856	17.961	18.753
Std Dev Biased		0.243	0.381	0.268	0.292	0.306	0.475
Ps90%/90% (+KTL) Biased		18.190	17.275	18.145	18.657	18.800	20.055
Ps90%/90% (-KTL) Biased		16.860	15.188	16.677	17.056	17.121	17.452
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	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

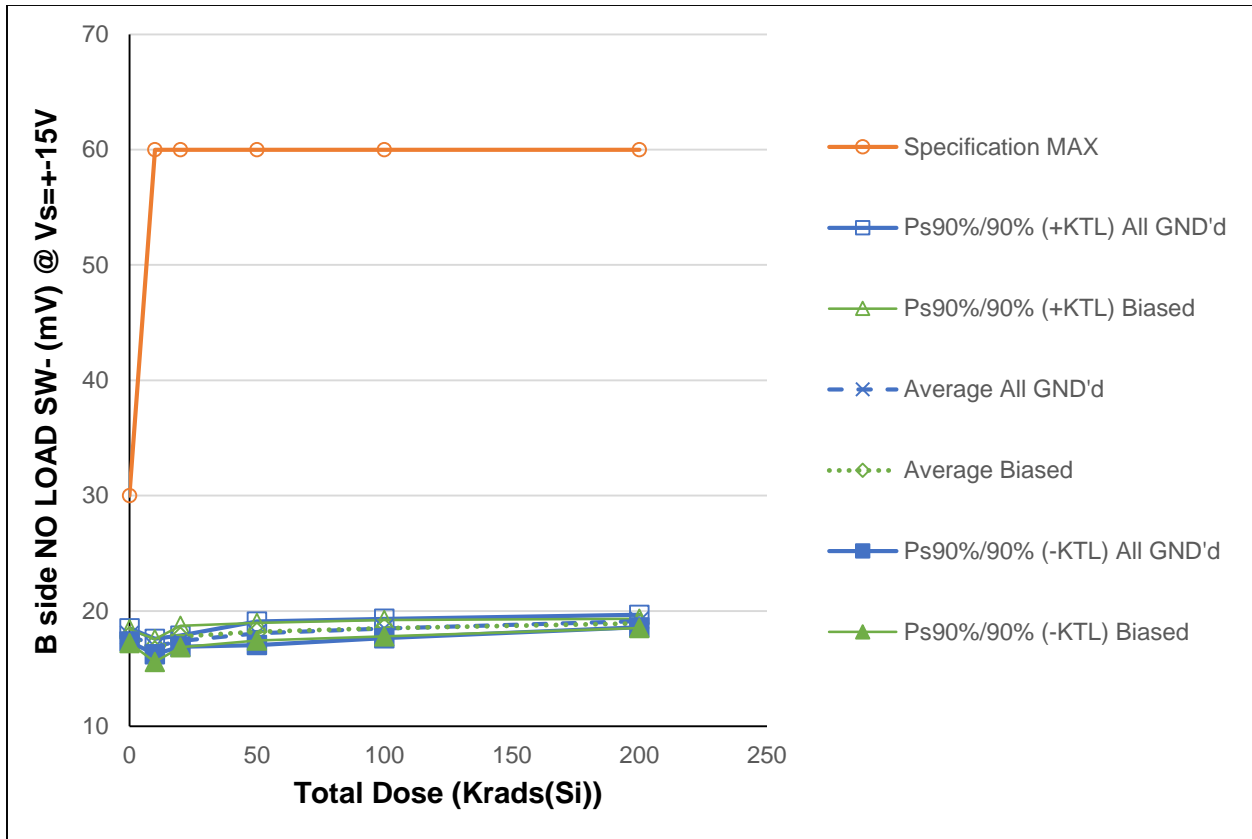


Figure 5.28: Plot of Output Voltage Swing Low at No Load and $V_s = \pm 15V$ versus Total Dose (side B)

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	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
Units	(mV)	0	10	20	50	100	200
776	All GND'd Irradiation	17.952	16.824				
777	All GND'd Irradiation	17.871	16.589				
778	All GND'd Irradiation	18.255	17.048				
779	All GND'd Irradiation	17.750	16.860				
780	All GND'd Irradiation	17.740	17.231				
771	Biased Irradiation	18.005	17.146				
772	Biased Irradiation	18.024	16.670				
773	Biased Irradiation	17.495	16.258				
774	Biased Irradiation	17.740	16.470				
775	Biased Irradiation	17.798	16.308				
786	All GND'd Irradiation	17.928		17.301			
787	All GND'd Irradiation	17.853		17.194			
788	All GND'd Irradiation	18.124		17.584			
789	All GND'd Irradiation	17.700		17.274			
790	All GND'd Irradiation	17.826		17.553			
781	Biased Irradiation	18.300		17.984			
782	Biased Irradiation	17.986		17.584			
783	Biased Irradiation	17.833		17.469			
784	Biased Irradiation	18.789		18.277			
785	Biased Irradiation	18.045		17.584			
796	All GND'd Irradiation	18.350			18.248		
797	All GND'd Irradiation	17.817			17.791		
798	All GND'd Irradiation	17.566			17.543		
799	All GND'd Irradiation	18.522			18.413		
800	All GND'd Irradiation	18.250			18.298		
791	Biased Irradiation	18.219			18.581		
792	Biased Irradiation	18.139			18.267		
793	Biased Irradiation	18.021			18.058		
794	Biased Irradiation	18.139			18.222		
795	Biased Irradiation	17.928			17.832		
806	All GND'd Irradiation	17.909				18.196	
807	All GND'd Irradiation	18.665				18.962	
808	All GND'd Irradiation	17.892				18.382	
809	All GND'd Irradiation	18.141				18.572	
810	All GND'd Irradiation	17.869				18.265	
801	Biased Irradiation	17.952				18.455	
802	Biased Irradiation	18.437				18.934	
803	Biased Irradiation	17.776				18.260	
804	Biased Irradiation	18.207				18.536	
805	Biased Irradiation	18.029				18.365	
816	All GND'd Irradiation	18.310					19.255
817	All GND'd Irradiation	17.969					18.934
818	All GND'd Irradiation	18.139					19.127
819	All GND'd Irradiation	18.310					19.365
820	All GND'd Irradiation	17.912					18.920
811	Biased Irradiation	17.757					18.841
812	Biased Irradiation	18.207					19.115
813	Biased Irradiation	17.957					18.953
814	Biased Irradiation	17.852					18.722
815	Biased Irradiation	18.122					18.974
832	Control Unit	17.892	17.129	17.129	17.129	17.129	17.129
833	Control Unit	17.978	17.431	17.431	17.431	17.431	17.431
All GND'd Irradiation Statistics							
Average All GND'd		17.914	16.911	17.381	18.059	18.475	19.120
Std Dev All GND'd		0.210	0.243	0.176	0.373	0.307	0.196
Ps90%/90% (+KTL) All GND'd		18.490	17.576	17.863	19.081	19.318	19.657
Ps90%/90% (-KTL) All GND'd		17.337	16.245	16.899	17.037	17.633	18.584
Biased Irradiation Statistics							
Average Biased		17.812	16.570	17.780	18.192	18.510	18.921
Std Dev Biased		0.217	0.360	0.340	0.277	0.258	0.148
Ps90%/90% (+KTL) Biased		18.407	17.557	18.711	18.951	19.218	19.326
Ps90%/90% (-KTL) Biased		17.218	15.584	16.848	17.434	17.802	18.516
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	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

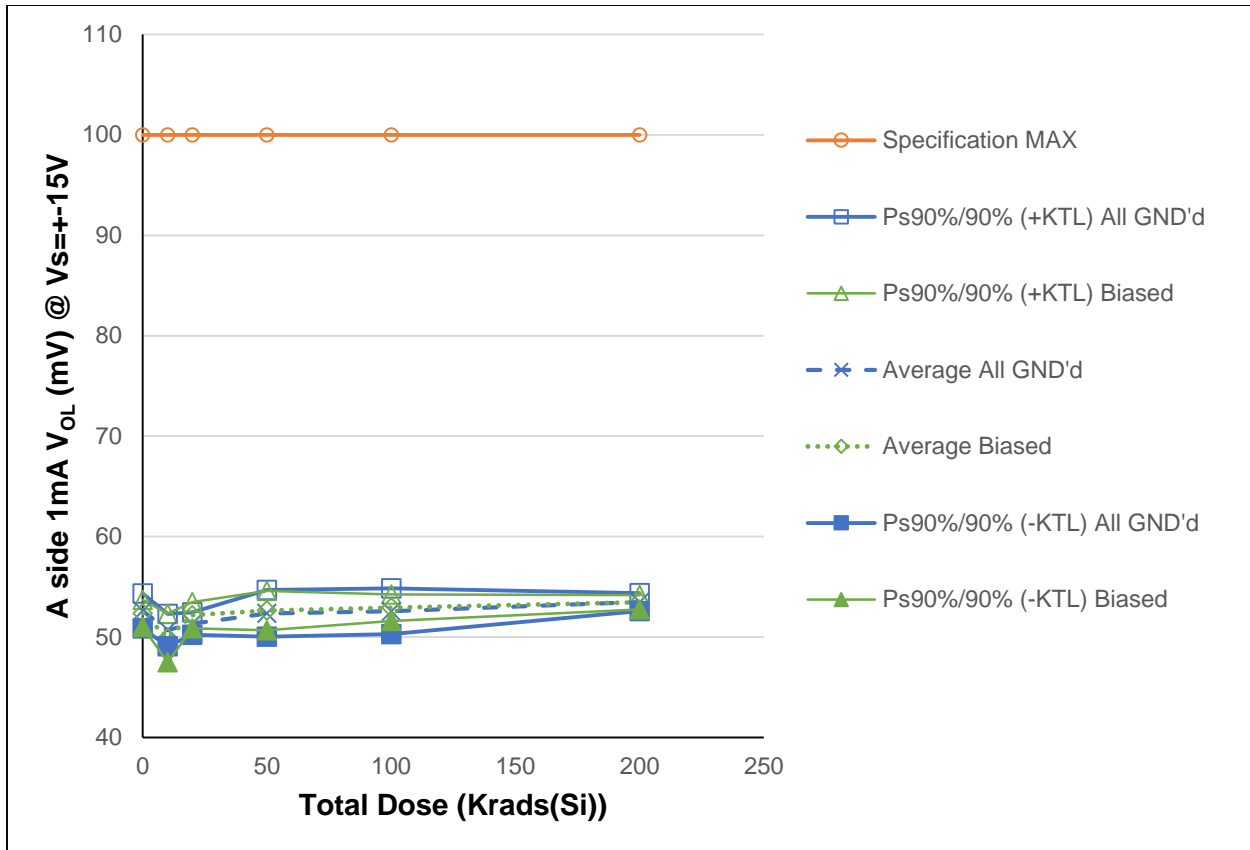


Figure 5.29: Plot of V_{OL} with $I_{SINK} = 1\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side A)

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

Parameter Units	A 1mA V_{OL} @ $V_s = \pm 15\text{V}$ (mV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	52.253	50.094				
777	All GND'd Irradiation	52.731	50.344				
778	All GND'd Irradiation	53.680	51.389				
779	All GND'd Irradiation	52.176	50.385				
780	All GND'd Irradiation	52.243	51.277				
771	Biased Irradiation	53.142	51.456				
772	Biased Irradiation	51.852	49.296				
773	Biased Irradiation	52.083	49.637				
774	Biased Irradiation	52.481	49.830				
775	Biased Irradiation	52.310	49.372				
786	All GND'd Irradiation	52.884		51.541			
787	All GND'd Irradiation	52.424		51.020			
788	All GND'd Irradiation	52.389		51.180			
789	All GND'd Irradiation	52.064		51.020			
790	All GND'd Irradiation	52.710		51.972			
781	Biased Irradiation	53.494		52.551			
782	Biased Irradiation	52.884		51.827			
783	Biased Irradiation	52.844		51.694			
784	Biased Irradiation	54.007		52.801			
785	Biased Irradiation	53.036		52.039			
796	All GND'd Irradiation	53.437			52.741		
797	All GND'd Irradiation	52.085			51.401		
798	All GND'd Irradiation	52.155			51.541		
799	All GND'd Irradiation	53.463			52.803		
800	All GND'd Irradiation	53.692			53.334		
791	Biased Irradiation	53.647			53.649		
792	Biased Irradiation	53.566			53.132		
793	Biased Irradiation	52.710			52.246		
794	Biased Irradiation	52.625			52.134		
795	Biased Irradiation	52.548			52.039		
806	All GND'd Irradiation	51.912				51.642	
807	All GND'd Irradiation	52.956				52.668	
808	All GND'd Irradiation	53.866				53.903	
809	All GND'd Irradiation	52.574				52.456	
810	All GND'd Irradiation	52.217				52.208	
801	Biased Irradiation	53.015				53.313	
802	Biased Irradiation	53.044				53.217	
803	Biased Irradiation	52.389				52.496	
804	Biased Irradiation	53.272				53.294	
805	Biased Irradiation	52.253				52.315	
816	All GND'd Irradiation	52.710					53.229
817	All GND'd Irradiation	52.710					53.322
818	All GND'd Irradiation	53.447					53.998
819	All GND'd Irradiation	52.684					53.277
820	All GND'd Irradiation	52.980					53.627
811	Biased Irradiation	52.274					53.322
812	Biased Irradiation	52.694					53.334
813	Biased Irradiation	52.844					53.639
814	Biased Irradiation	52.536					53.217
815	Biased Irradiation	53.189					53.849
832	Control Unit	51.947	50.618	50.618	50.618	50.618	50.618
833	Control Unit	52.646	51.553	51.553	51.553	51.553	51.553
All GND'd Irradiation Statistics							
Average All GND'd		52.617	50.698	51.347	52.364	52.575	53.491
Std Dev All GND'd		0.634	0.592	0.409	0.849	0.836	0.324
Ps90%/90% (+KTL) All GND'd		54.356	52.321	52.470	54.691	54.867	54.378
Ps90%/90% (-KTL) All GND'd		50.877	49.075	50.224	50.037	50.284	52.604
Biased Irradiation Statistics							
Average Biased		52.374	49.918	52.182	52.640	52.927	53.472
Std Dev Biased		0.490	0.885	0.475	0.713	0.481	0.263
Ps90%/90% (+KTL) Biased		53.718	52.346	53.486	54.594	54.247	54.193
Ps90%/90% (-KTL) Biased		51.029	47.491	50.879	50.686	51.607	52.752
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

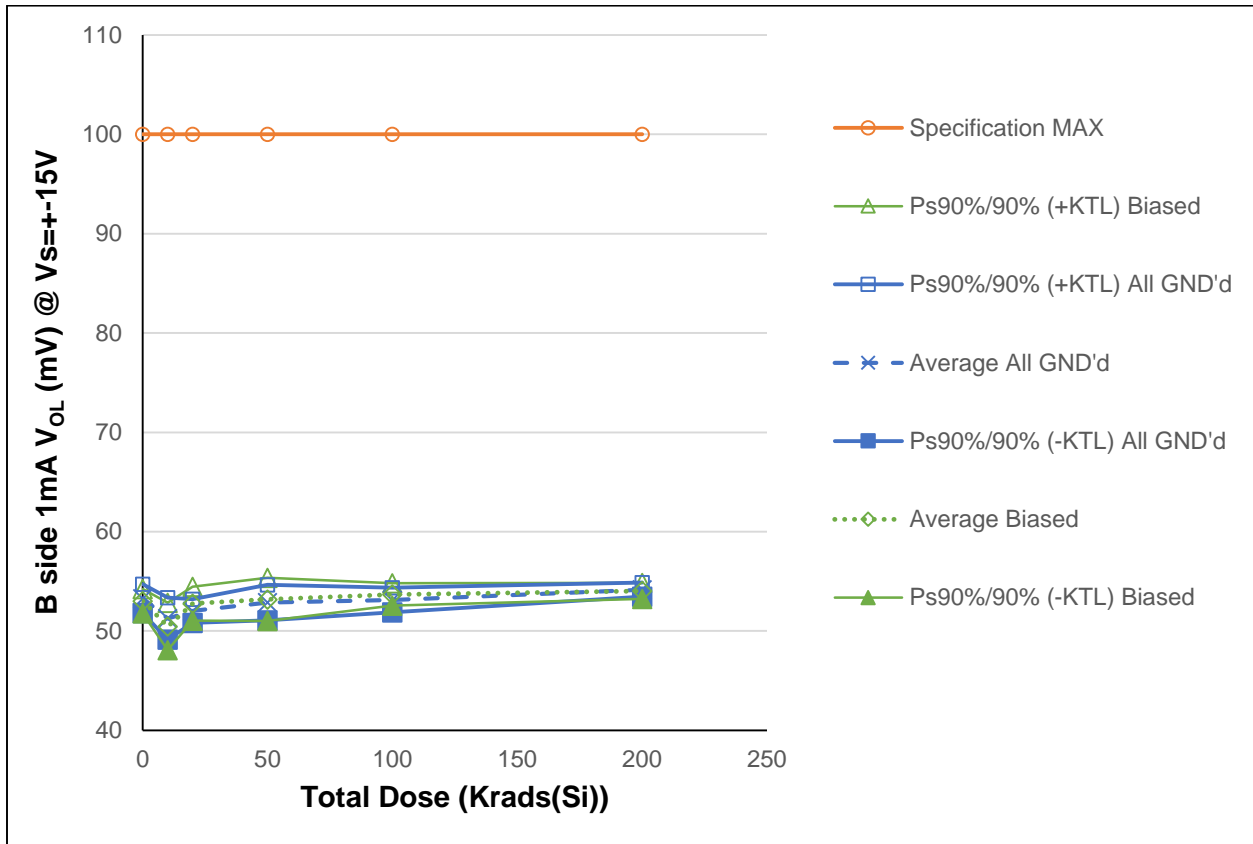


Figure 5.30: Plot of V_{OL} with $I_{SINK} = 1 \text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

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 Units	B 1mA V _{OL} @ V _s =±15V (mV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	52.891	50.656				
777	All GND'd Irradiation	52.958	50.399				
778	All GND'd Irradiation	54.179	51.837				
779	All GND'd Irradiation	53.065	51.144				
780	All GND'd Irradiation	53.244	52.227				
771	Biased Irradiation	53.800	51.972				
772	Biased Irradiation	52.675	49.906				
773	Biased Irradiation	52.884	50.323				
774	Biased Irradiation	52.841	50.161				
775	Biased Irradiation	52.844	49.906				
786	All GND'd Irradiation	53.523		52.087			
787	All GND'd Irradiation	53.070		51.565			
788	All GND'd Irradiation	53.514		52.134			
789	All GND'd Irradiation	52.765		51.639			
790	All GND'd Irradiation	53.397		52.649			
781	Biased Irradiation	54.222		53.198			
782	Biased Irradiation	53.514		52.268			
783	Biased Irradiation	53.397		52.104			
784	Biased Irradiation	54.867		53.584			
785	Biased Irradiation	53.778		52.665			
796	All GND'd Irradiation	53.895			53.029		
797	All GND'd Irradiation	53.065			52.239		
798	All GND'd Irradiation	52.853			52.125		
799	All GND'd Irradiation	54.200			53.544		
800	All GND'd Irradiation	53.819			53.394		
791	Biased Irradiation	54.312			54.191		
792	Biased Irradiation	54.083			53.715		
793	Biased Irradiation	53.625			53.120		
794	Biased Irradiation	53.263			52.665		
795	Biased Irradiation	52.853			52.227		
806	All GND'd Irradiation	52.930				52.591	
807	All GND'd Irradiation	53.800				53.410	
808	All GND'd Irradiation	53.568				53.522	
809	All GND'd Irradiation	53.494				53.410	
810	All GND'd Irradiation	52.805				52.658	
801	Biased Irradiation	53.752				53.920	
802	Biased Irradiation	53.855				53.963	
803	Biased Irradiation	53.295				53.277	
804	Biased Irradiation	54.214				54.053	
805	Biased Irradiation	53.349				53.191	
816	All GND'd Irradiation	53.654					54.046
817	All GND'd Irradiation	53.437					53.849
818	All GND'd Irradiation	54.107					54.541
819	All GND'd Irradiation	53.683					54.132
820	All GND'd Irradiation	53.685					54.267
811	Biased Irradiation	53.015					54.029
812	Biased Irradiation	53.616					54.191
813	Biased Irradiation	53.608					54.303
814	Biased Irradiation	52.998					53.544
815	Biased Irradiation	53.549					54.106
832	Control Unit	52.608	51.144	51.144	51.144	51.144	51.144
833	Control Unit	53.416	52.227	52.227	52.227	52.227	52.227
All GND'd Irradiation Statistics							
Average All GND'd		53.268	51.253	52.015	52.866	53.119	54.167
Std Dev All GND'd		0.527	0.773	0.437	0.653	0.454	0.259
Ps90%/90% (+KTL) All GND'd		54.711	53.371	53.214	54.657	54.362	54.876
Ps90%/90% (-KTL) All GND'd		51.824	49.134	50.816	51.075	51.875	53.458
Biased Irradiation Statistics							
Average Biased		53.009	50.454	52.764	53.184	53.681	54.035
Std Dev Biased		0.449	0.867	0.623	0.788	0.412	0.293
Ps90%/90% (+KTL) Biased		54.241	52.832	54.473	55.345	54.810	54.837
Ps90%/90% (-KTL) Biased		51.776	48.075	51.055	51.023	52.552	53.232
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

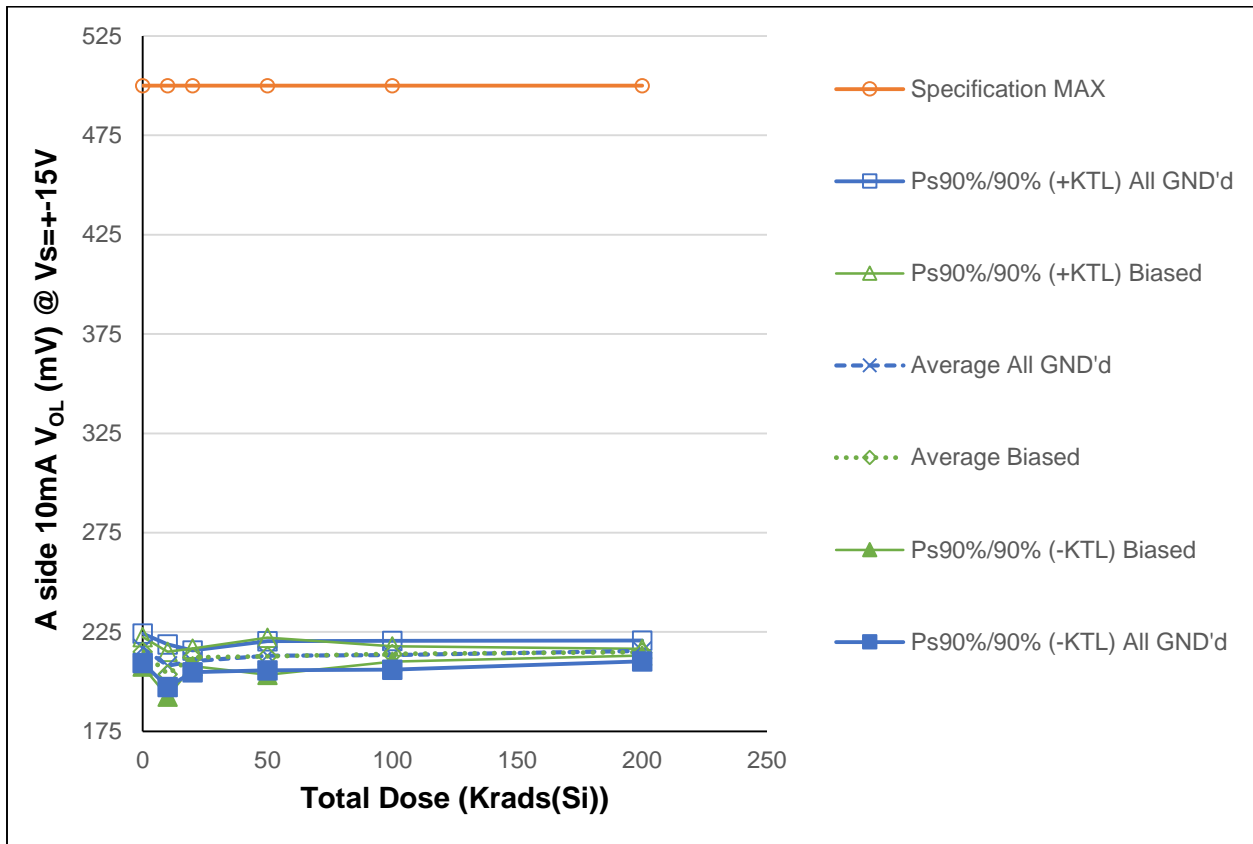


Figure 5.31: Plot of V_{OL} with $I_{SINK} = 10\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side A)

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 Units	A 10mA V_{OL} @ $V_s = \pm 15V$ (mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	214.087	204.336				
777	All GND'd Irradiation	214.544	203.674				
778	All GND'd Irradiation	220.838	210.417				
779	All GND'd Irradiation	217.291	209.212				
780	All GND'd Irradiation	217.404	212.707				
771	Biased Irradiation	218.859	210.735				
772	Biased Irradiation	211.230	199.866				
773	Biased Irradiation	215.236	203.522				
774	Biased Irradiation	215.197	202.736				
775	Biased Irradiation	215.036	202.222				
786	All GND'd Irradiation	216.475		210.016			
787	All GND'd Irradiation	215.846		209.264			
788	All GND'd Irradiation	215.126		209.007			
789	All GND'd Irradiation	214.472		209.274			
790	All GND'd Irradiation	217.425		213.802			
781	Biased Irradiation	219.617		213.783			
782	Biased Irradiation	217.442		211.059			
783	Biased Irradiation	217.119		210.255			
784	Biased Irradiation	220.952		213.844			
785	Biased Irradiation	218.744		212.468			
796	All GND'd Irradiation	218.610			213.844		
797	All GND'd Irradiation	214.125			209.464		
798	All GND'd Irradiation	215.726			211.178		
799	All GND'd Irradiation	219.579			215.407		
800	All GND'd Irradiation	218.859			215.559		
791	Biased Irradiation	220.728			217.649		
792	Biased Irradiation	218.859			214.564		
793	Biased Irradiation	216.932			212.378		
794	Biased Irradiation	214.625			210.026		
795	Biased Irradiation	213.900			209.288		
806	All GND'd Irradiation	213.610				209.874	
807	All GND'd Irradiation	218.134				214.621	
808	All GND'd Irradiation	219.698				216.806	
809	All GND'd Irradiation	216.260				213.497	
810	All GND'd Irradiation	214.587				211.878	
801	Biased Irradiation	218.553				215.882	
802	Biased Irradiation	217.176				213.925	
803	Biased Irradiation	217.782				214.225	
804	Biased Irradiation	217.257				213.730	
805	Biased Irradiation	215.580				211.954	
816	All GND'd Irradiation	215.154					212.664
817	All GND'd Irradiation	218.320					215.882
818	All GND'd Irradiation	219.203					216.873
819	All GND'd Irradiation	216.781					214.688
820	All GND'd Irradiation	219.246					217.501
811	Biased Irradiation	215.460					215.064
812	Biased Irradiation	217.872					215.516
813	Biased Irradiation	217.171					215.102
814	Biased Irradiation	216.832					214.383
815	Biased Irradiation	216.456					213.954
832	Control Unit	212.684	206.608	206.608	206.608	206.608	206.608
833	Control Unit	215.956	211.554	211.554	211.554	211.554	211.554
All GND'd Irradiation Statistics							
Average All GND'd		216.833	208.069	210.272	213.090	213.335	215.521
Std Dev All GND'd		2.709	3.923	2.009	2.685	2.638	1.919
Ps90%/90% (+KTL) All GND'd		224.261	218.827	215.780	220.452	220.568	220.785
Ps90%/90% (-KTL) All GND'd		209.404	197.311	204.765	205.729	206.103	210.258
Biased Irradiation Statistics							
Average Biased		215.111	203.816	212.282	212.781	213.943	214.804
Std Dev Biased		2.699	4.101	1.607	3.422	1.400	0.625
Ps90%/90% (+KTL) Biased		222.512	215.062	216.689	222.163	217.782	216.518
Ps90%/90% (-KTL) Biased		207.711	192.571	207.875	203.399	210.104	213.089
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX		500	500	500	500	500	500
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

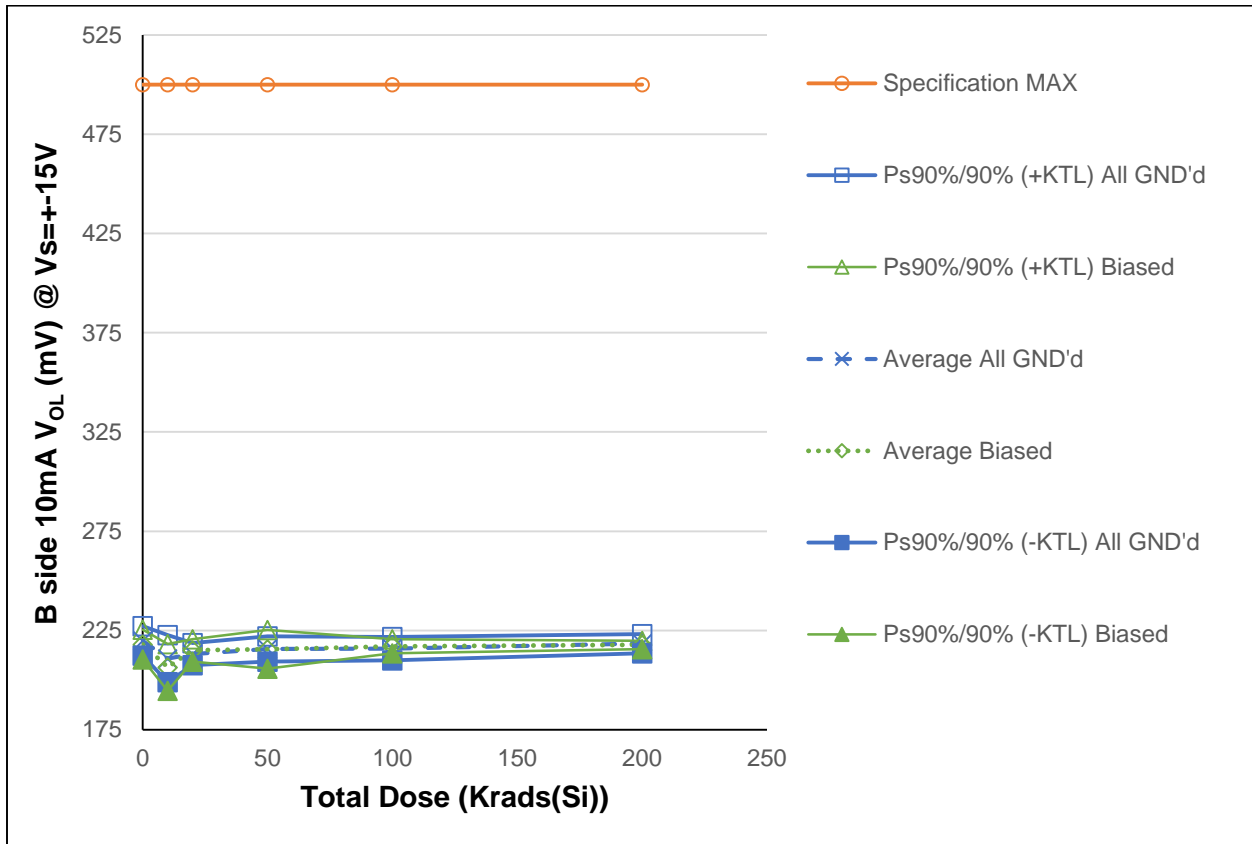


Figure 5.32: Plot of V_{OL} with $I_{SINK} = 10\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

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 Units	B 10mA V_{OL} @ $V_s = \pm 15V$ (mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	216.985	206.945				
777	All GND'd Irradiation	217.066	205.936				
778	All GND'd Irradiation	223.241	212.702				
779	All GND'd Irradiation	220.423	212.159				
780	All GND'd Irradiation	221.072	216.325				
771	Biased Irradiation	221.815	213.630				
772	Biased Irradiation	214.120	202.356				
773	Biased Irradiation	218.440	206.436				
774	Biased Irradiation	217.576	205.118				
775	Biased Irradiation	217.481	204.436				
786	All GND'd Irradiation	219.203		212.607			
787	All GND'd Irradiation	218.440		211.702			
788	All GND'd Irradiation	218.569		212.359			
789	All GND'd Irradiation	217.238		211.954			
790	All GND'd Irradiation	220.314		216.620			
781	Biased Irradiation	222.712		216.644			
782	Biased Irradiation	219.851		213.344			
783	Biased Irradiation	219.311		212.326			
784	Biased Irradiation	224.037		216.968			
785	Biased Irradiation	222.054		215.592			
796	All GND'd Irradiation	221.300			216.430		
797	All GND'd Irradiation	217.291			212.511		
798	All GND'd Irradiation	218.625			214.035		
799	All GND'd Irradiation	222.077			217.897		
800	All GND'd Irradiation	220.766			217.482		
791	Biased Irradiation	223.473			220.377		
792	Biased Irradiation	221.773			217.330		
793	Biased Irradiation	220.228			215.459		
794	Biased Irradiation	217.404			212.640		
795	Biased Irradiation	216.356			211.635		
806	All GND'd Irradiation	216.800				212.988	
807	All GND'd Irradiation	220.647				217.101	
808	All GND'd Irradiation	221.051				218.220	
809	All GND'd Irradiation	219.307				216.525	
810	All GND'd Irradiation	217.085				214.283	
801	Biased Irradiation	221.682				218.929	
802	Biased Irradiation	219.885				216.472	
803	Biased Irradiation	220.919				217.330	
804	Biased Irradiation	220.532				216.806	
805	Biased Irradiation	219.122				215.435	
816	All GND'd Irradiation	218.206					215.672
817	All GND'd Irradiation	221.185					218.759
818	All GND'd Irradiation	221.910					219.420
819	All GND'd Irradiation	219.866					217.797
820	All GND'd Irradiation	222.154					220.258
811	Biased Irradiation	218.054					217.539
812	Biased Irradiation	221.185					218.810
813	Biased Irradiation	220.385					218.116
814	Biased Irradiation	219.469					216.968
815	Biased Irradiation	219.612					217.039
832	Control Unit	215.503	209.307	209.307	209.307	209.307	209.307
833	Control Unit	218.873	214.259	214.259	214.259	214.259	214.259
All GND'd Irradiation Statistics							
Average All GND'd		219.757	210.814	213.048	215.671	215.823	218.381
Std Dev All GND'd		2.703	4.316	2.027	2.317	2.138	1.762
Ps90%/90% (+KTL) All GND'd		227.170	222.648	218.607	222.024	221.686	223.214
Ps90%/90% (-KTL) All GND'd		212.345	198.979	207.490	209.318	209.961	213.549
Biased Irradiation Statistics							
Average Biased		217.886	206.395	214.975	215.488	216.994	217.694
Std Dev Biased		2.747	4.305	2.050	3.544	1.284	0.775
Ps90%/90% (+KTL) Biased		225.418	218.200	220.597	225.207	220.516	219.820
Ps90%/90% (-KTL) Biased		210.354	194.591	209.353	205.769	213.473	215.568
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

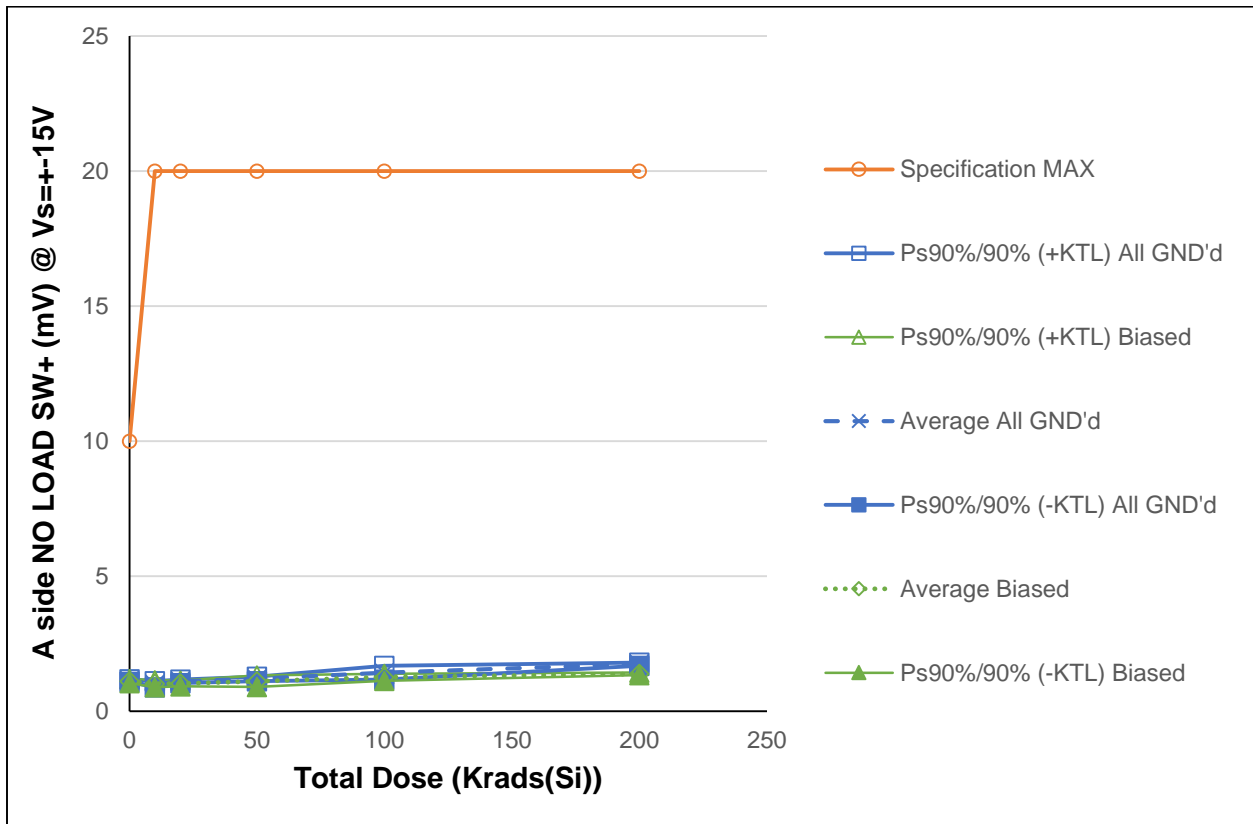


Figure 5.33: Plot of Output Voltage Swing High with No Load and $V_s = \pm 15V$ versus Total Dose (side A)

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 Units	A NO LOAD SW+ @ Vs=+-15V (mV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	1.115	1.006				
777	All GND'd Irradiation	1.136	1.046				
778	All GND'd Irradiation	1.115	0.986				
779	All GND'd Irradiation	1.136	0.934				
780	All GND'd Irradiation	1.155	1.006				
771	Biased Irradiation	1.077	1.010				
772	Biased Irradiation	1.108	1.046				
773	Biased Irradiation	1.136	0.939				
774	Biased Irradiation	1.146	1.046				
775	Biased Irradiation	1.115	1.053				
786	All GND'd Irradiation	1.136		1.084			
787	All GND'd Irradiation	1.115		1.113			
788	All GND'd Irradiation	1.136		1.120			
789	All GND'd Irradiation	1.086		1.139			
790	All GND'd Irradiation	1.115		1.079			
781	Biased Irradiation	1.096		1.053			
782	Biased Irradiation	1.115		0.967			
783	Biased Irradiation	1.136		1.053			
784	Biased Irradiation	1.096		1.062			
785	Biased Irradiation	1.086		1.006			
796	All GND'd Irradiation	1.112			1.205		
797	All GND'd Irradiation	1.115			1.244		
798	All GND'd Irradiation	1.115			1.179		
799	All GND'd Irradiation	1.077			1.189		
800	All GND'd Irradiation	1.136			1.160		
791	Biased Irradiation	1.136			1.227		
792	Biased Irradiation	1.086			1.151		
793	Biased Irradiation	1.136			1.048		
794	Biased Irradiation	1.151			1.053		
795	Biased Irradiation	1.081			1.063		
806	All GND'd Irradiation	1.048				1.367	
807	All GND'd Irradiation	1.086				1.303	
808	All GND'd Irradiation	1.136				1.543	
809	All GND'd Irradiation	1.108				1.427	
810	All GND'd Irradiation	1.108				1.484	
801	Biased Irradiation	1.115				1.236	
802	Biased Irradiation	1.108				1.282	
803	Biased Irradiation	1.115				1.196	
804	Biased Irradiation	1.115				1.320	
805	Biased Irradiation	1.115				1.236	
816	All GND'd Irradiation	1.115					1.712
817	All GND'd Irradiation	1.020					1.729
818	All GND'd Irradiation	1.115					1.765
819	All GND'd Irradiation	1.108					1.748
820	All GND'd Irradiation	1.079					1.760
811	Biased Irradiation	1.155					1.353
812	Biased Irradiation	1.096					1.396
813	Biased Irradiation	1.112					1.391
814	Biased Irradiation	1.096					1.389
815	Biased Irradiation	1.108					1.384
832	Control Unit	1.115	0.922	0.922	0.922	0.922	0.922
833	Control Unit	1.069	1.027	1.027	1.027	1.027	1.027
All GND'd Irradiation Statistics							
Average All GND'd		1.132	0.996	1.107	1.195	1.425	1.743
Std Dev All GND'd		0.017	0.041	0.025	0.031	0.094	0.022
Ps90%/90% (+KTL) All GND'd		1.179	1.107	1.175	1.282	1.684	1.803
Ps90%/90% (-KTL) All GND'd		1.084	0.884	1.038	1.109	1.166	1.683
Biased Irradiation Statistics							
Average Biased		1.116	1.019	1.028	1.108	1.254	1.382
Std Dev Biased		0.027	0.048	0.041	0.078	0.048	0.017
Ps90%/90% (+KTL) Biased		1.190	1.150	1.140	1.323	1.384	1.429
Ps90%/90% (-KTL) Biased		1.043	0.888	0.917	0.894	1.124	1.336
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX		10	20	20	20	20	20
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

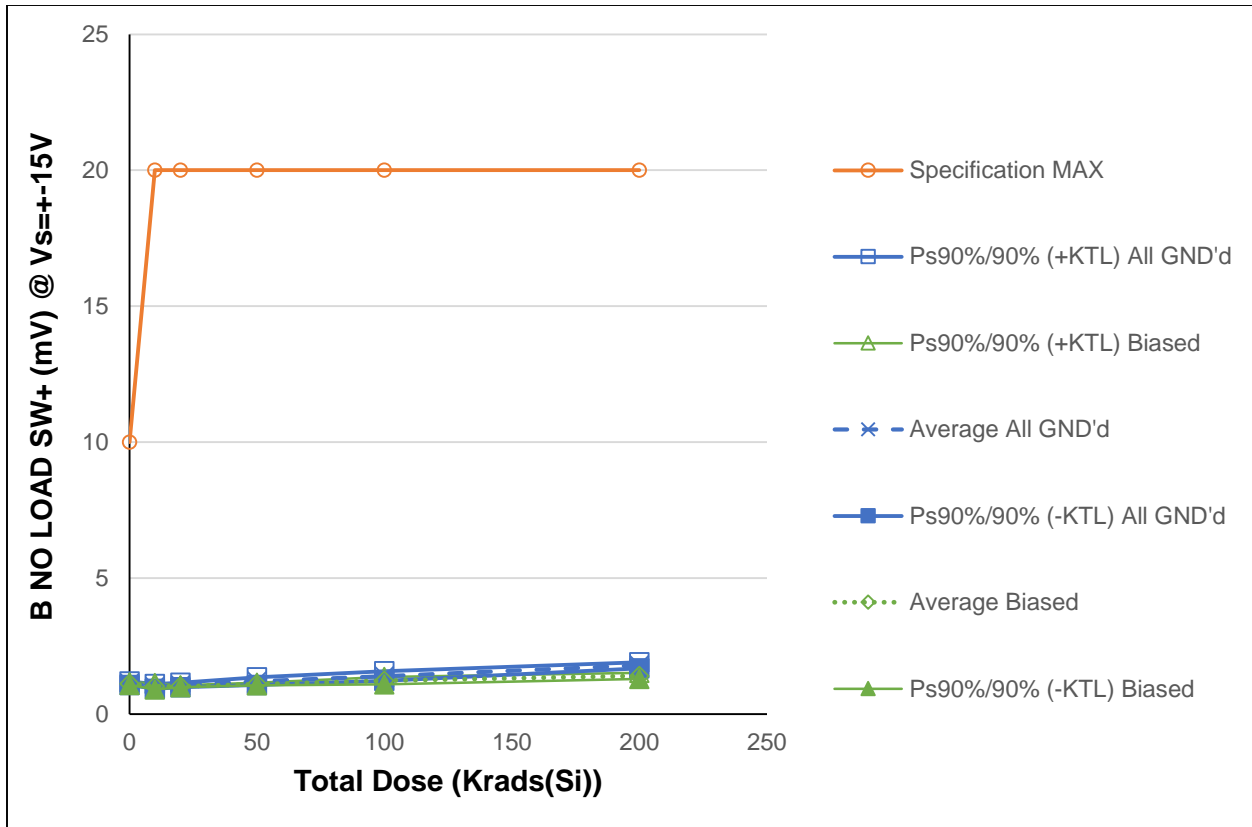


Figure 5.34: Plot of Output Voltage Swing High with No Load and $V_s = \pm 15V$ versus Total Dose (side B)

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 Units (mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	1.096	1.027				
777	All GND'd Irradiation	1.151	0.998				
778	All GND'd Irradiation	1.136	1.062				
779	All GND'd Irradiation	1.120	0.986				
780	All GND'd Irradiation	1.155	0.986				
771	Biased Irradiation	1.115	1.046				
772	Biased Irradiation	1.124	0.951				
773	Biased Irradiation	1.115	1.037				
774	Biased Irradiation	1.136	1.063				
775	Biased Irradiation	1.087	1.010				
786	All GND'd Irradiation	1.163		1.046			
787	All GND'd Irradiation	1.112		1.103			
788	All GND'd Irradiation	1.108		1.084			
789	All GND'd Irradiation	1.115		1.063			
790	All GND'd Irradiation	1.115		1.027			
781	Biased Irradiation	1.153		1.015			
782	Biased Irradiation	1.146		1.027			
783	Biased Irradiation	1.115		1.027			
784	Biased Irradiation	1.115		1.027			
785	Biased Irradiation	1.115		0.998			
796	All GND'd Irradiation	1.115			1.129		
797	All GND'd Irradiation	1.081			1.272		
798	All GND'd Irradiation	1.124			1.215		
799	All GND'd Irradiation	1.061			1.205		
800	All GND'd Irradiation	1.081			1.189		
791	Biased Irradiation	1.115			1.084		
792	Biased Irradiation	1.155			1.113		
793	Biased Irradiation	1.158			1.082		
794	Biased Irradiation	1.112			1.103		
795	Biased Irradiation	1.115			1.117		
806	All GND'd Irradiation	1.115				1.462	
807	All GND'd Irradiation	1.081				1.291	
808	All GND'd Irradiation	1.086				1.422	
809	All GND'd Irradiation	1.108				1.408	
810	All GND'd Irradiation	1.108				1.389	
801	Biased Irradiation	1.155				1.215	
802	Biased Irradiation	1.061				1.239	
803	Biased Irradiation	1.136				1.215	
804	Biased Irradiation	1.155				1.291	
805	Biased Irradiation	1.151				1.155	
816	All GND'd Irradiation	1.136					1.772
817	All GND'd Irradiation	1.112					1.767
818	All GND'd Irradiation	1.115					1.824
819	All GND'd Irradiation	1.096					1.846
820	All GND'd Irradiation	1.041					1.748
811	Biased Irradiation	1.136					1.341
812	Biased Irradiation	1.136					1.455
813	Biased Irradiation	1.086					1.408
814	Biased Irradiation	1.112					1.417
815	Biased Irradiation	1.041					1.384
832	Control Unit	1.136	0.998	0.998	0.998	0.998	0.998
833	Control Unit	1.079	0.965	0.965	0.965	0.965	0.965
All GND'd Irradiation Statistics							
Average All GND'd		1.132	1.012	1.065	1.202	1.394	1.792
Std Dev All GND'd		0.024	0.033	0.030	0.051	0.064	0.041
Ps90%/90% (+KTL) All GND'd		1.198	1.102	1.147	1.343	1.569	1.905
Ps90%/90% (-KTL) All GND'd		1.065	0.923	0.982	1.061	1.220	1.678
Biased Irradiation Statistics							
Average Biased		1.115	1.021	1.019	1.100	1.223	1.401
Std Dev Biased		0.018	0.044	0.013	0.016	0.049	0.042
Ps90%/90% (+KTL) Biased		1.165	1.141	1.053	1.144	1.357	1.517
Ps90%/90% (-KTL) Biased		1.065	0.901	0.984	1.055	1.089	1.285
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

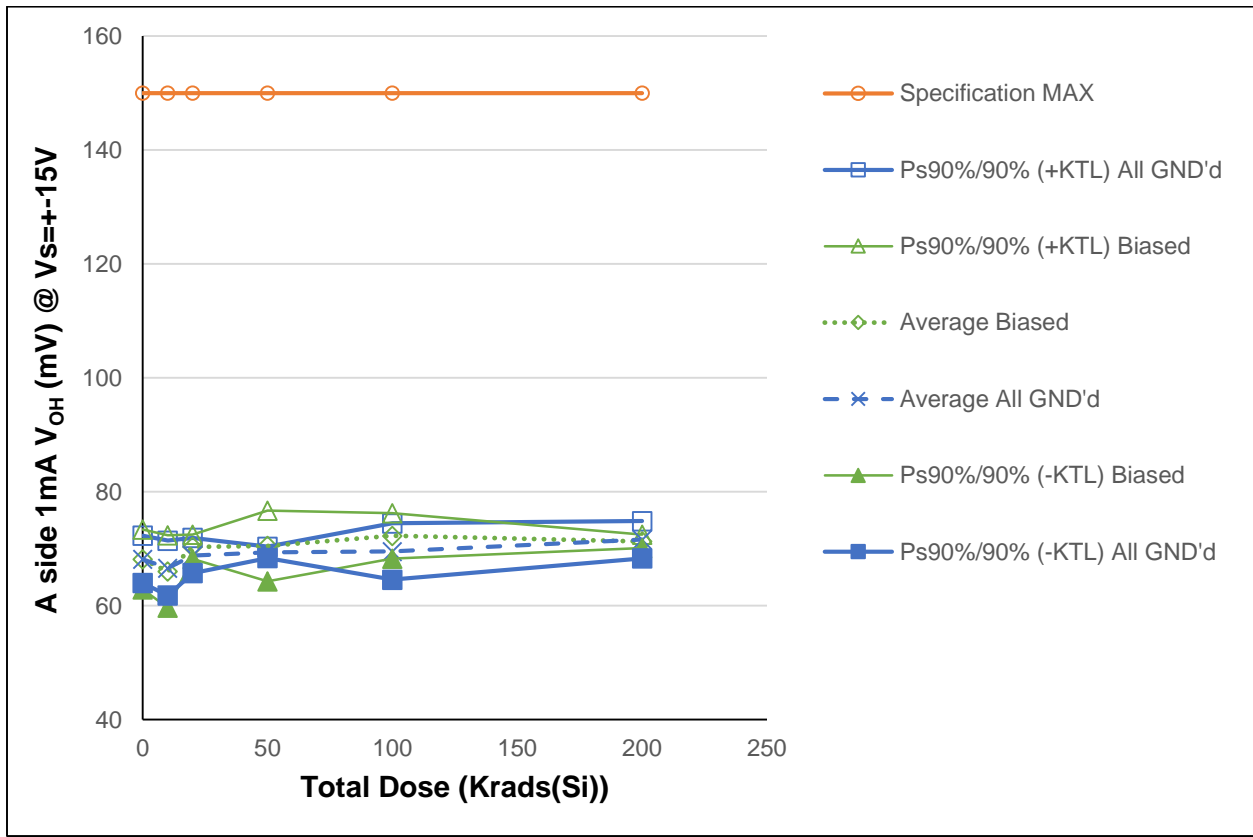


Figure 5.35: Plot of V_{OH} with $I_{SOURCE} = 1\text{ mA}$ and $V_S = \pm 15\text{V}$ versus Total Dose (side A)

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 VOH @ Vs=±15V	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
Units	(mV)						
776	All GND'd Irradiation	66.752	64.974				
777	All GND'd Irradiation	67.065	65.070				
778	All GND'd Irradiation	70.302	68.415				
779	All GND'd Irradiation	67.475	66.091				
780	All GND'd Irradiation	69.146	68.546				
771	Biased Irradiation	70.405	69.165				
772	Biased Irradiation	65.608	63.355				
773	Biased Irradiation	69.391	67.184				
774	Biased Irradiation	68.428	66.141				
775	Biased Irradiation	66.943	64.310				
786	All GND'd Irradiation	71.157		70.405			
787	All GND'd Irradiation	69.038		68.384			
788	All GND'd Irradiation	68.848		68.343			
789	All GND'd Irradiation	67.859		67.510			
790	All GND'd Irradiation	69.572		69.482			
781	Biased Irradiation	70.735		71.174			
782	Biased Irradiation	69.315		69.565			
783	Biased Irradiation	69.515		69.748			
784	Biased Irradiation	70.984		71.186			
785	Biased Irradiation	69.689		70.053			
796	All GND'd Irradiation	68.599			68.882		
797	All GND'd Irradiation	69.048			69.339		
798	All GND'd Irradiation	68.733			69.205		
799	All GND'd Irradiation	69.384			69.722		
800	All GND'd Irradiation	69.022			69.755		
791	Biased Irradiation	71.062			73.031		
792	Biased Irradiation	70.414			72.136		
793	Biased Irradiation	69.632			71.043		
794	Biased Irradiation	66.581			67.910		
795	Biased Irradiation	67.095			68.403		
806	All GND'd Irradiation	66.429				67.758	
807	All GND'd Irradiation	67.322				68.427	
808	All GND'd Irradiation	70.624				72.338	
809	All GND'd Irradiation	68.726				70.174	
810	All GND'd Irradiation	67.648				68.953	
801	Biased Irradiation	70.068				72.593	
802	Biased Irradiation	69.725				72.386	
803	Biased Irradiation	68.810				71.222	
804	Biased Irradiation	72.089				74.462	
805	Biased Irradiation	68.488				70.729	
816	All GND'd Irradiation	67.761					70.231
817	All GND'd Irradiation	68.235					70.831
818	All GND'd Irradiation	70.213					72.889
819	All GND'd Irradiation	68.621					71.234
820	All GND'd Irradiation	70.061					72.803
811	Biased Irradiation	67.344					70.748
812	Biased Irradiation	68.259					71.355
813	Biased Irradiation	68.471					71.881
814	Biased Irradiation	67.980					71.081
815	Biased Irradiation	68.323					71.474
832	Control Unit	66.922	65.682	65.682	65.682	65.682	65.682
833	Control Unit	68.774	67.927	67.927	67.927	67.927	67.927
All GND'd Irradiation Statistics							
Average All GND'd		68.148	66.619	68.825	69.380	69.530	71.598
Std Dev All GND'd		1.517	1.755	1.127	0.367	1.802	1.194
Ps90%/90% (+KTL) All GND'd		72.308	71.431	71.916	70.386	74.472	74.872
Ps90%/90% (-KTL) All GND'd		63.987	61.807	65.733	68.375	64.588	68.323
Biased Irradiation Statistics							
Average Biased		68.155	66.031	70.345	70.505	72.278	71.308
Std Dev Biased		1.912	2.307	0.782	2.263	1.449	0.425
Ps90%/90% (+KTL) Biased		73.397	72.356	72.489	76.710	76.251	72.475
Ps90%/90% (-KTL) Biased		62.913	59.706	68.201	64.300	68.306	70.141
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

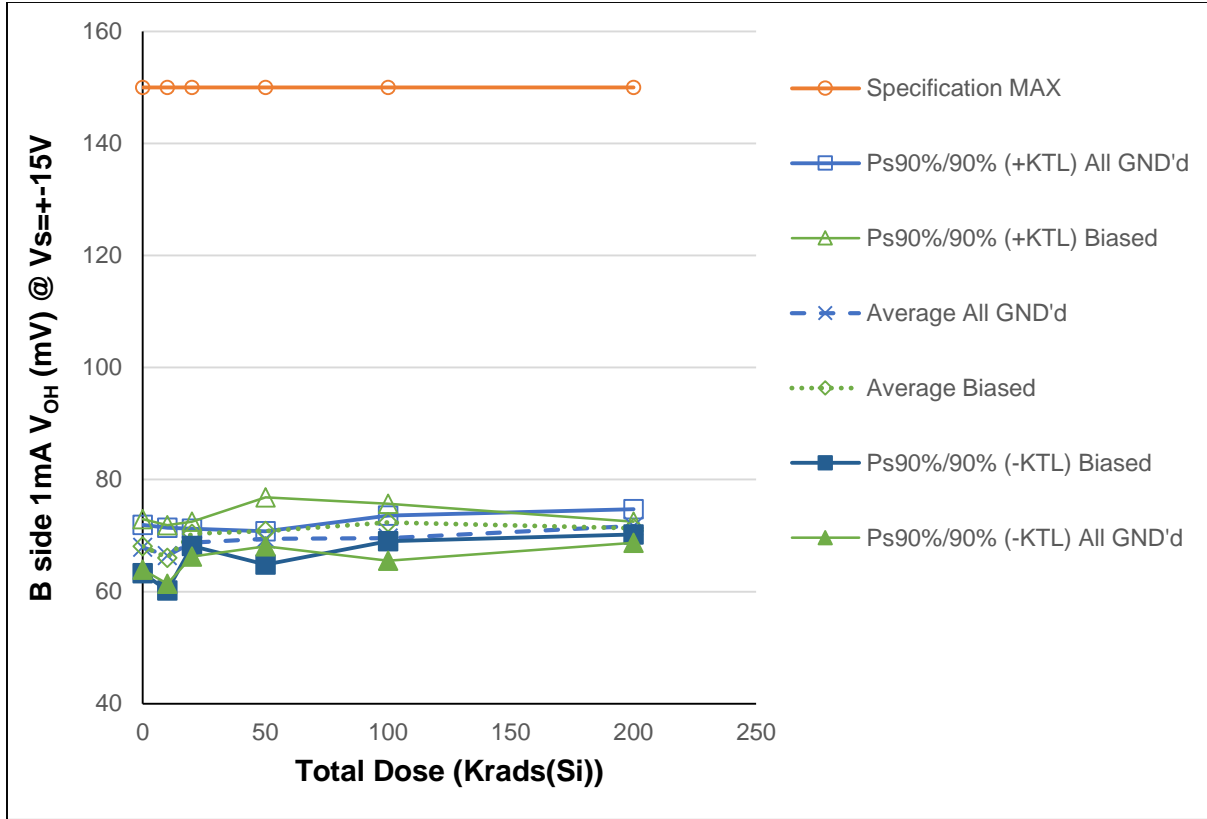


Figure 5.36: Plot of V_{OH} with $I_{SOURCE} = 1\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

Table 5.36: Raw data table for output voltage swing high with I_{SOURCE} = 1 mA @ 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 1mA VOH @ Vs=+-15V (mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	66.712	64.884				
777	All GND'd Irradiation	66.950	64.919				
778	All GND'd Irradiation	69.632	67.805				
779	All GND'd Irradiation	66.829	65.537				
780	All GND'd Irradiation	69.343	68.872				
771	Biased Irradiation	70.040	68.872				
772	Biased Irradiation	65.930	63.775				
773	Biased Irradiation	69.668	67.424				
774	Biased Irradiation	67.878	65.837				
775	Biased Irradiation	66.922	64.313				
786	All GND'd Irradiation	70.605		69.950			
787	All GND'd Irradiation	69.310		68.651			
788	All GND'd Irradiation	68.955		68.577			
789	All GND'd Irradiation	67.725		67.472			
790	All GND'd Irradiation	69.153		69.146			
781	Biased Irradiation	70.984		71.467			
782	Biased Irradiation	69.363		69.643			
783	Biased Irradiation	69.210		69.565			
784	Biased Irradiation	70.487		70.713			
785	Biased Irradiation	69.870		70.231			
796	All GND'd Irradiation	68.395			68.758		
797	All GND'd Irradiation	68.955			69.413		
798	All GND'd Irradiation	68.676			69.177		
799	All GND'd Irradiation	69.489			69.950		
800	All GND'd Irradiation	69.079			69.814		
791	Biased Irradiation	71.005			73.138		
792	Biased Irradiation	70.671			72.405		
793	Biased Irradiation	70.013			71.462		
794	Biased Irradiation	66.864			68.193		
795	Biased Irradiation	67.496			68.858		
806	All GND'd Irradiation	66.962				68.291	
807	All GND'd Irradiation	67.420				68.508	
808	All GND'd Irradiation	69.937				71.577	
809	All GND'd Irradiation	69.079				70.653	
810	All GND'd Irradiation	67.322				68.724	
801	Biased Irradiation	69.820				72.464	
802	Biased Irradiation	69.499				72.212	
803	Biased Irradiation	69.057				71.581	
804	Biased Irradiation	71.827				74.293	
805	Biased Irradiation	68.738				71.146	
816	All GND'd Irradiation	67.828					70.348
817	All GND'd Irradiation	68.574					71.196
818	All GND'd Irradiation	70.319					73.091
819	All GND'd Irradiation	68.697					71.374
820	All GND'd Irradiation	69.785					72.481
811	Biased Irradiation	67.553					71.043
812	Biased Irradiation	68.693					71.881
813	Biased Irradiation	68.345					71.660
814	Biased Irradiation	67.734					70.898
815	Biased Irradiation	68.030					71.196
832	Control Unit	67.379	66.234	66.234	66.234	66.234	66.234
833	Control Unit	68.585	67.822	67.822	67.822	67.822	67.822
All GND'd Irradiation Statistics							
	Average All GND'd	67.893	66.404	68.759	69.422	69.550	71.698
	Std Dev All GND'd	1.461	1.825	0.904	0.483	1.473	1.088
	Ps90%/90% (+KTL) All GND'd	71.901	71.408	71.238	70.748	73.589	74.680
	Ps90%/90% (-KTL) All GND'd	63.886	61.399	66.280	68.097	65.512	68.716
Biased Irradiation Statistics							
	Average Biased	68.087	66.044	70.324	70.811	72.339	71.336
	Std Dev Biased	1.758	2.127	0.791	2.182	1.209	0.418
	Ps90%/90% (+KTL) Biased	72.908	71.876	72.494	76.795	75.655	72.483
	Ps90%/90% (-KTL) Biased	63.266	60.212	68.154	64.828	69.024	70.189
Specification MIN							
	Status (Measurements) All GND'd						
	Status (Measurements) Biased						
Specification MAX							
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) All GND'd						
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) Biased						
	Status (+KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS

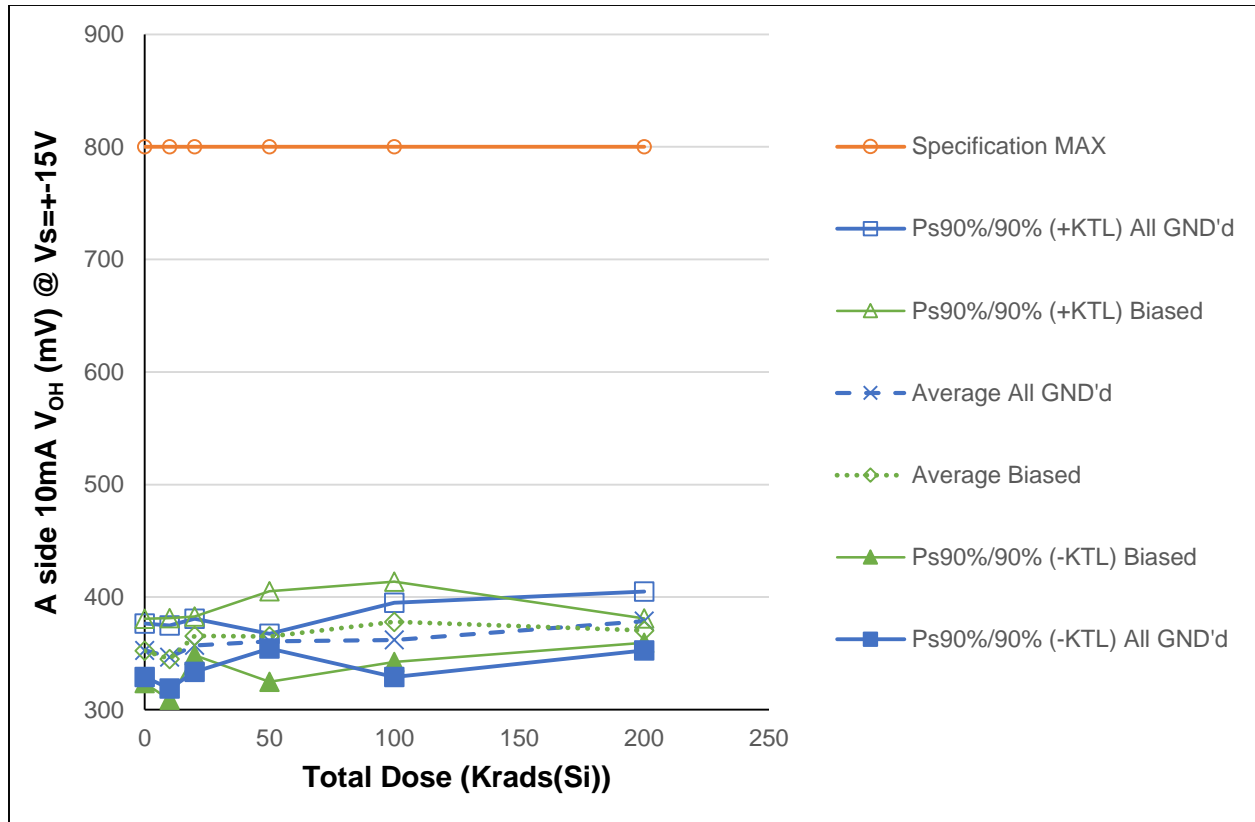


Figure 5.37: Plot of V_{OH} with $I_{SOURCE} = 10\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side A)

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

Parameter	A 10mA Voh @ Vs=+-15V	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		Units (mV)					
Units	(mV)	0	10	20	50	100	200
776	All GND'd Irradiation	344.762	336.994				
777	All GND'd Irradiation	346.854	339.232				
778	All GND'd Irradiation	365.530	360.348				
779	All GND'd Irradiation	349.052	342.818				
780	All GND'd Irradiation	357.577	354.687				
771	Biased Irradiation	365.052	361.696				
772	Biased Irradiation	338.272	328.766				
773	Biased Irradiation	358.492	353.111				
774	Biased Irradiation	353.191	346.207				
775	Biased Irradiation	346.358	335.642				
786	All GND'd Irradiation	-370.283		370.381			
787	All GND'd Irradiation	-356.604		354.492			
788	All GND'd Irradiation	-355.017		353.640			
789	All GND'd Irradiation	-349.644		347.450			
790	All GND'd Irradiation	-359.870		359.715			
781	Biased Irradiation	-367.603		370.794			
782	Biased Irradiation	358.372		359.425			
783	Biased Irradiation	359.298		361.219			
784	Biased Irradiation	369.814		373.537			
785	Biased Irradiation	360.985		362.439			
796	All GND'd Irradiation	355.254			358.520		
797	All GND'd Irradiation	356.051			359.967		
798	All GND'd Irradiation	355.136			359.044		
799	All GND'd Irradiation	360.323			363.848		
800	All GND'd Irradiation	357.705			362.968		
791	Biased Irradiation	369.629			381.636		
792	Biased Irradiation	364.857			375.495		
793	Biased Irradiation	360.571			368.795		
794	Biased Irradiation	344.714			348.678		
795	Biased Irradiation	346.459			351.045		
806	All GND'd Irradiation	343.364				350.555	
807	All GND'd Irradiation	349.185				356.135	
808	All GND'd Irradiation	366.291				381.450	
809	All GND'd Irradiation	355.103				364.833	
810	All GND'd Irradiation	349.104				357.025	
801	Biased Irradiation	-364.003				379.688	
802	Biased Irradiation	-361.239				378.546	
803	Biased Irradiation	-355.397				368.128	
804	Biased Irradiation	-376.757				398.620	
805	Biased Irradiation	-353.739				365.529	
816	All GND'd Irradiation	350.134					368.552
817	All GND'd Irradiation	353.248					372.951
818	All GND'd Irradiation	364.570					390.777
819	All GND'd Irradiation	354.935					374.890
820	All GND'd Irradiation	363.807					386.759
811	Biased Irradiation	347.626					364.576
812	Biased Irradiation	353.334					371.428
813	Biased Irradiation	353.986					375.199
814	Biased Irradiation	351.221					368.890
815	Biased Irradiation	353.339					371.842
832	Control Unit	344.151	338.090	338.090	338.090	338.090	338.090
833	Control Unit	354.945	350.512	350.512	350.512	350.512	350.512
All GND'd Irradiation Statistics							
Average All GND'd		352.755	346.816	357.136	360.869	362.000	378.786
Std Dev All GND'd		8.644	10.186	8.589	2.395	12.005	9.504
Ps90%/90% (+KTL) All GND'd		376.456	374.747	380.688	367.436	394.918	404.846
Ps90%/90% (-KTL) All GND'd		329.053	318.885	333.584	354.303	329.081	352.725
Biased Irradiation Statistics							
Average Biased		352.273	345.084	365.483	365.130	378.102	370.387
Std Dev Biased		10.414	13.201	6.269	14.683	13.050	3.949
Ps90%/90% (+KTL) Biased		380.829	381.281	382.673	405.391	413.887	381.215
Ps90%/90% (-KTL) Biased		323.717	308.888	348.292	324.869	342.318	359.560
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

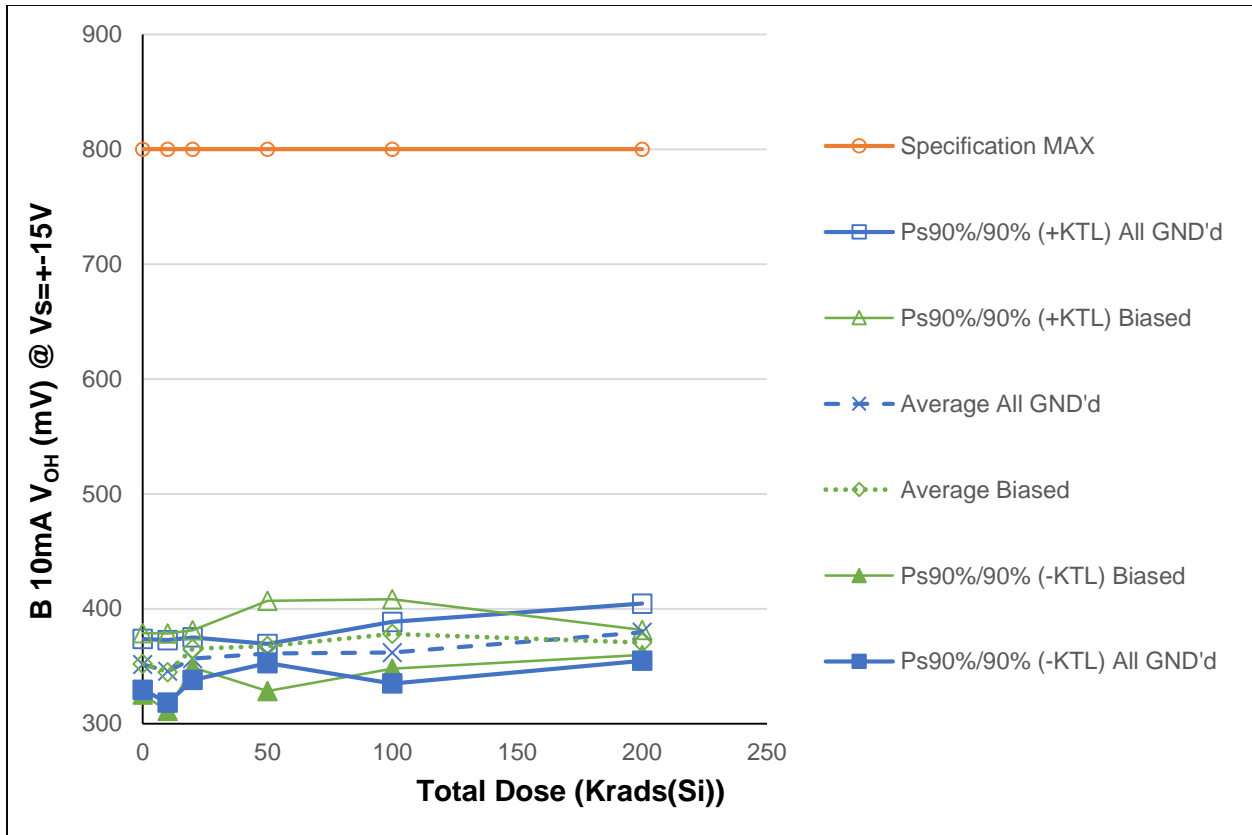


Figure 5.38: Plot of V_{OH} with $I_{SOURCE} = 10\text{ mA}$ and $V_s = \pm 15\text{V}$ versus Total Dose (side B)

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

Parameter	B 10mA Voh @ Vs=+-15V Units (mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	344.719	336.861				
777	All GND'd Irradiation	346.286	338.365				
778	All GND'd Irradiation	361.543	355.992				
779	All GND'd Irradiation	346.153	339.470				
780	All GND'd Irradiation	359.059	356.496				
771	Biased Irradiation	363.026	359.158				
772	Biased Irradiation	340.064	330.862				
773	Biased Irradiation	360.595	355.373				
774	Biased Irradiation	350.020	343.108				
775	Biased Irradiation	345.867	335.318				
786	All GND'd Irradiation	366.844		366.452			
787	All GND'd Irradiation	358.068		356.192			
788	All GND'd Irradiation	355.931		354.840			
789	All GND'd Irradiation	349.452		347.540			
790	All GND'd Irradiation	357.534		357.287			
781	Biased Irradiation	368.971		372.680			
782	Biased Irradiation	358.755		359.615			
783	Biased Irradiation	357.762		359.487			
784	Biased Irradiation	366.616		369.519			
785	Biased Irradiation	362.373		364.114			
796	All GND'd Irradiation	354.411			357.716		
797	All GND'd Irradiation	355.931			359.848		
798	All GND'd Irradiation	354.873			358.782		
799	All GND'd Irradiation	360.628			364.723		
800	All GND'd Irradiation	358.221			363.538		
791	Biased Irradiation	369.596			382.284		
792	Biased Irradiation	366.650			378.017		
793	Biased Irradiation	363.141			372.304		
794	Biased Irradiation	346.015			350.421		
795	Biased Irradiation	348.880			354.211		
806	All GND'd Irradiation	345.523				353.177	
807	All GND'd Irradiation	349.605				356.954	
808	All GND'd Irradiation	362.721				375.846	
809	All GND'd Irradiation	356.999				367.885	
810	All GND'd Irradiation	347.121				354.764	
801	Biased Irradiation	363.331				378.851	
802	Biased Irradiation	359.427				376.432	
803	Biased Irradiation	357.496				371.218	
804	Biased Irradiation	375.275				396.149	
805	Biased Irradiation	354.950				367.466	
816	All GND'd Irradiation	350.287					369.019
817	All GND'd Irradiation	355.036					375.560
818	All GND'd Irradiation	365.638					392.301
819	All GND'd Irradiation	355.689					375.961
820	All GND'd Irradiation	362.416					384.722
811	Biased Irradiation	348.780					366.505
812	Biased Irradiation	355.860					375.390
813	Biased Irradiation	353.248					374.047
814	Biased Irradiation	350.120					367.499
815	Biased Irradiation	351.602					369.447
832	Control Unit	347.011	341.060	341.060	341.060	341.060	341.060
833	Control Unit	354.163	349.755	349.755	349.755	349.755	349.755
All GND'd Irradiation Statistics							
Average All GND'd		351.552	345.437	356.462	360.921	361.725	379.512
Std Dev All GND'd		8.058	9.910	6.760	3.054	9.768	9.069
Ps90%/90% (+KTL) All GND'd		373.648	372.611	374.998	369.296	388.509	404.381
Ps90%/90% (-KTL) All GND'd		329.456	318.263	337.926	352.547	334.942	354.644
Biased Irradiation Statistics							
Average Biased		351.915	344.764	365.083	367.448	378.023	370.578
Std Dev Biased		9.739	12.298	5.906	14.322	11.062	3.954
Ps90%/90% (+KTL) Biased		378.619	378.485	381.278	406.719	408.356	381.419
Ps90%/90% (-KTL) Biased		325.210	311.042	348.888	328.176	347.690	359.736
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

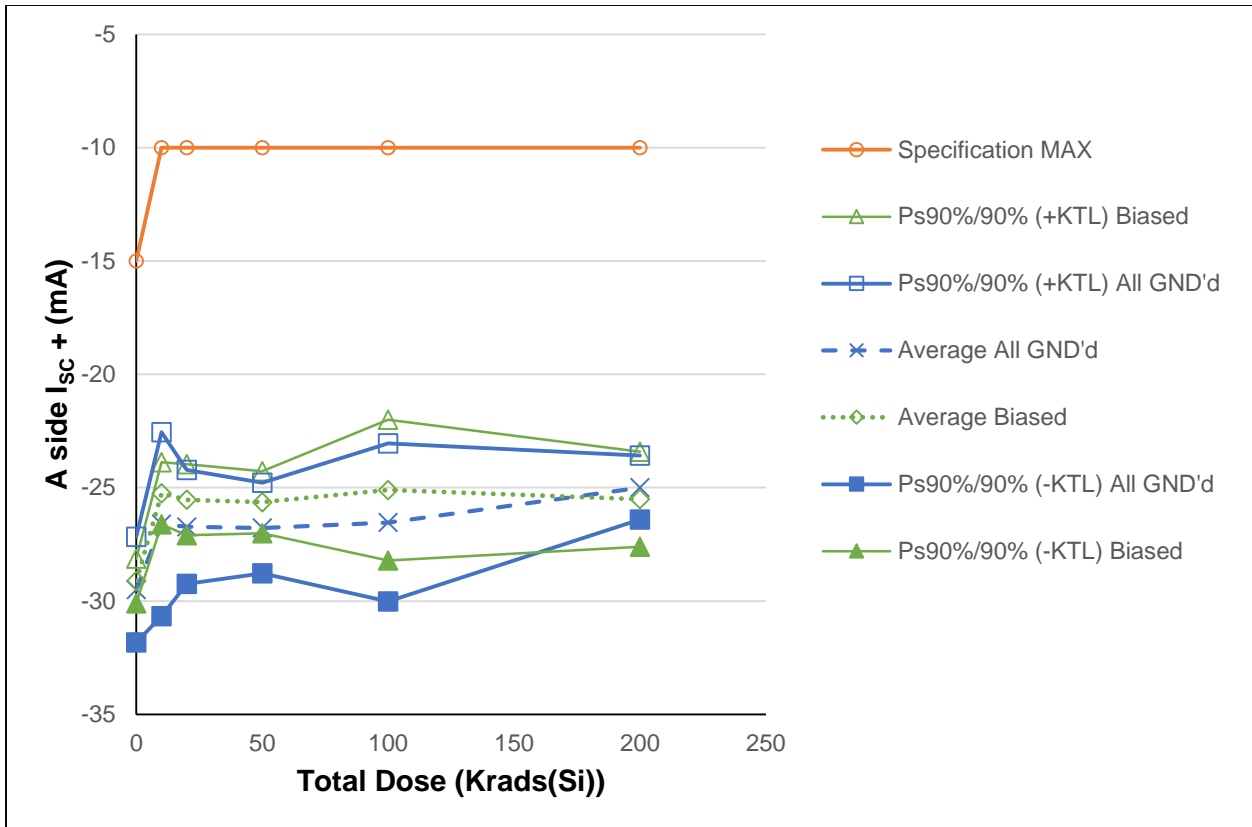


Figure 5.39: Plot of Output Short Circuit Current I_{sc+} at $V_s = \pm 15V$ versus Total Dose (side A)

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-29.544	-26.258				
777	All GND'd Irradiation	-28.541	-24.907				
778	All GND'd Irradiation	-28.980	-25.593				
779	All GND'd Irradiation	-30.799	-28.055				
780	All GND'd Irradiation	-29.591	-28.230				
771	Biased Irradiation	-28.614	-25.953				
772	Biased Irradiation	-29.120	-25.316				
773	Biased Irradiation	-29.530	-25.221				
774	Biased Irradiation	-28.937	-24.552				
775	Biased Irradiation	-29.367	-25.181				
786	All GND'd Irradiation	-27.699		-25.407			
787	All GND'd Irradiation	-28.947		-26.563			
788	All GND'd Irradiation	-28.785		-26.459			
789	All GND'd Irradiation	-29.387		-27.559			
790	All GND'd Irradiation	-28.920		-27.636			
781	Biased Irradiation	-27.993		-25.350			
782	Biased Irradiation	-28.727		-25.774			
783	Biased Irradiation	-28.451		-25.301			
784	Biased Irradiation	-27.993		-24.863			
785	Biased Irradiation	-29.282		-26.372			
796	All GND'd Irradiation	-29.214			-26.639		
797	All GND'd Irradiation	-28.547			-25.991		
798	All GND'd Irradiation	-29.204			-26.621		
799	All GND'd Irradiation	-30.264			-27.979		
800	All GND'd Irradiation	-28.767			-26.651		
791	Biased Irradiation	-28.242			-25.445		
792	Biased Irradiation	-28.099			-24.859		
793	Biased Irradiation	-29.443			-26.098		
794	Biased Irradiation	-28.871			-25.828		
795	Biased Irradiation	-29.108			-25.968		
806	All GND'd Irradiation	-30.198				-26.850	
807	All GND'd Irradiation	-31.514				-28.401	
808	All GND'd Irradiation	-27.955				-24.887	
809	All GND'd Irradiation	-28.929				-26.126	
810	All GND'd Irradiation	-29.005				-26.401	
801	Biased Irradiation	-29.315				-25.810	
802	Biased Irradiation	-27.861				-24.116	
803	Biased Irradiation	-30.369				-26.457	
804	Biased Irradiation	-27.306				-23.777	
805	Biased Irradiation	-28.967				-25.353	
816	All GND'd Irradiation	-28.523					-24.378
817	All GND'd Irradiation	-30.199					-25.680
818	All GND'd Irradiation	-28.957					-24.630
819	All GND'd Irradiation	-29.148					-25.032
820	All GND'd Irradiation	-29.243					-25.274
811	Biased Irradiation	-30.083					-26.601
812	Biased Irradiation	-29.951					-25.750
813	Biased Irradiation	-29.033					-24.602
814	Biased Irradiation	-29.888					-25.581
815	Biased Irradiation	-29.133					-25.001
832	Control Unit	-29.432	-27.943	-27.943	-27.943	-27.943	-27.943
833	Control Unit	-28.745	-27.854	-27.854	-27.854	-27.854	-27.854
All GND'd Irradiation Statistics							
Average All GND'd		-29.491	-26.608	-26.725	-26.776	-26.533	-24.999
Std Dev All GND'd		0.849	1.481	0.917	0.728	1.273	0.515
Ps90%/90% (+KTL) All GND'd		-27.162	-22.548	-24.212	-24.780	-23.042	-23.587
Ps90%/90% (-KTL) All GND'd		-31.820	-30.669	-29.238	-28.773	-30.024	-26.411
Biased Irradiation Statistics							
Average Biased		-29.114	-25.245	-25.532	-25.640	-25.103	-25.507
Std Dev Biased		0.360	0.498	0.570	0.500	1.132	0.764
Ps90%/90% (+KTL) Biased		-28.127	-23.879	-23.969	-24.269	-21.998	-23.411
Ps90%/90% (-KTL) Biased		-30.100	-26.610	-27.095	-27.010	-28.208	-27.603
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

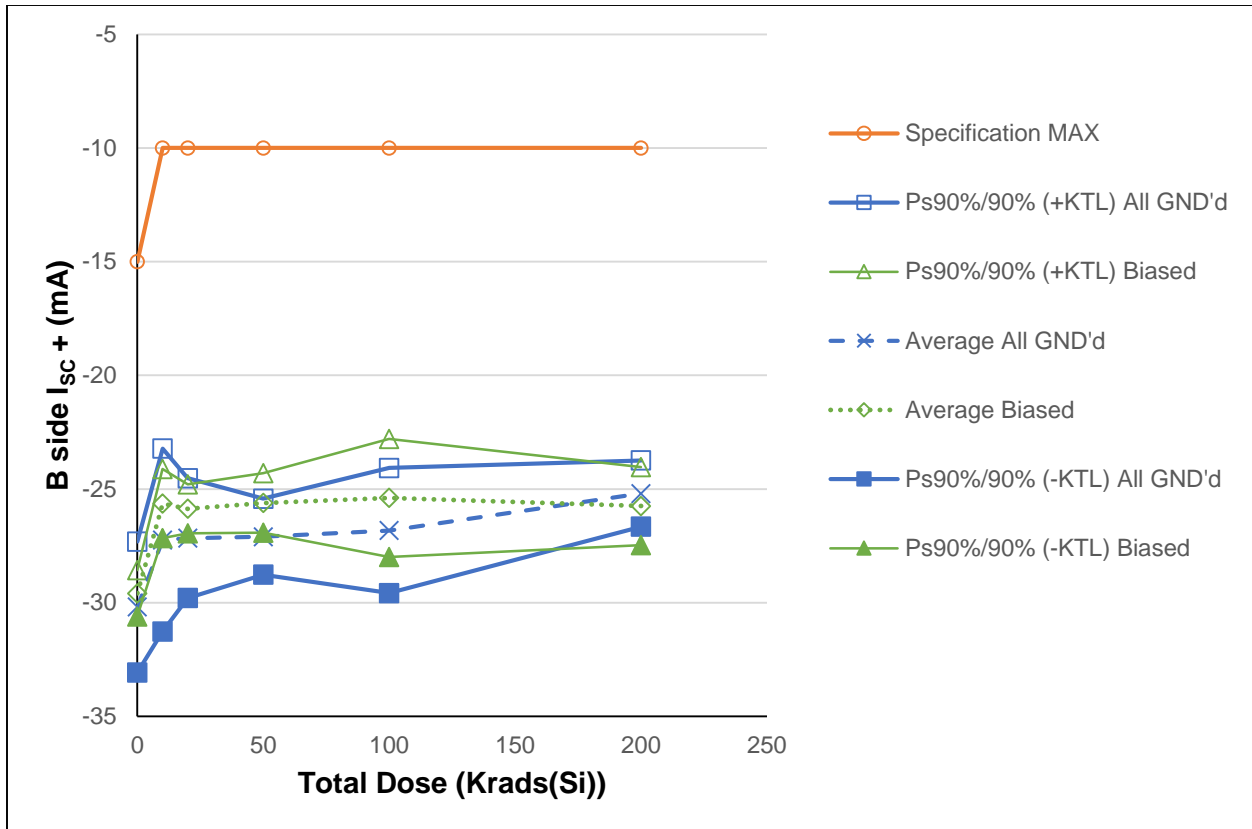


Figure 5.40: Plot of Output Short Circuit Current I_{sc+} at $V_s = \pm 15V$ versus Total Dose (side B)

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-30.064	-26.721				
777	All GND'd Irradiation	-29.204	-25.548				
778	All GND'd Irradiation	-29.968	-26.440				
779	All GND'd Irradiation	-31.972	-29.122				
780	All GND'd Irradiation	-29.743	-28.379				
771	Biased Irradiation	-29.273	-26.612				
772	Biased Irradiation	-29.138	-25.350				
773	Biased Irradiation	-29.678	-25.352				
774	Biased Irradiation	-29.977	-25.312				
775	Biased Irradiation	-29.893	-25.572				
786	All GND'd Irradiation	-28.632		-26.210			
787	All GND'd Irradiation	-28.934		-26.563			
788	All GND'd Irradiation	-29.023		-26.654			
789	All GND'd Irradiation	-29.913		-27.993			
790	All GND'd Irradiation	-29.735		-28.379			
781	Biased Irradiation	-28.107		-25.430			
782	Biased Irradiation	-29.035		-26.082			
783	Biased Irradiation	-29.072		-25.834			
784	Biased Irradiation	-28.832		-25.587			
785	Biased Irradiation	-29.321		-26.417			
796	All GND'd Irradiation	-29.659			-27.030		
797	All GND'd Irradiation	-29.072			-26.444		
798	All GND'd Irradiation	-29.740			-27.064		
799	All GND'd Irradiation	-30.464			-28.095		
800	All GND'd Irradiation	-28.972			-26.850		
791	Biased Irradiation	-28.480			-25.593		
792	Biased Irradiation	-28.026			-24.793		
793	Biased Irradiation	-29.243			-25.915		
794	Biased Irradiation	-28.967			-25.883		
795	Biased Irradiation	-29.023			-25.877		
806	All GND'd Irradiation	-29.997				-26.688	
807	All GND'd Irradiation	-31.494				-28.368	
808	All GND'd Irradiation	-29.109				-26.002	
809	All GND'd Irradiation	-28.776				-25.907	
810	All GND'd Irradiation	-29.833				-27.155	
801	Biased Irradiation	-29.801				-26.231	
802	Biased Irradiation	-28.476				-24.607	
803	Biased Irradiation	-30.425				-26.459	
804	Biased Irradiation	-27.950				-24.335	
805	Biased Irradiation	-28.977				-25.316	
816	All GND'd Irradiation	-28.853					-24.620
817	All GND'd Irradiation	-30.120					-25.606
818	All GND'd Irradiation	-29.072					-24.707
819	All GND'd Irradiation	-29.438					-25.241
820	All GND'd Irradiation	-29.926					-25.821
811	Biased Irradiation	-30.264					-26.688
812	Biased Irradiation	-29.692					-25.453
813	Biased Irradiation	-29.587					-25.077
814	Biased Irradiation	-30.430					-26.036
815	Biased Irradiation	-29.735					-25.483
832	Control Unit	-29.148	-27.663	-27.663	-27.663	-27.663	-27.663
833	Control Unit	-29.109	-28.229	-28.229	-28.229	-28.229	-28.229
All GND'd Irradiation Statistics							
Average All GND'd		-30.190	-27.242	-27.160	-27.097	-26.824	-25.199
Std Dev All GND'd		1.050	1.467	0.961	0.610	1.004	0.532
Ps90%/90% (+KTL) All GND'd		-27.311	-23.220	-24.525	-25.423	-24.072	-23.740
Ps90%/90% (-KTL) All GND'd		-33.070	-31.264	-29.795	-28.770	-29.576	-26.658
Biased Irradiation Statistics							
Average Biased		-29.592	-25.639	-25.870	-25.612	-25.390	-25.747
Std Dev Biased		0.372	0.553	0.393	0.476	0.946	0.627
Ps90%/90% (+KTL) Biased		-28.571	-24.123	-24.791	-24.306	-22.795	-24.028
Ps90%/90% (-KTL) Biased		-30.612	-27.156	-26.949	-26.918	-27.984	-27.467
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

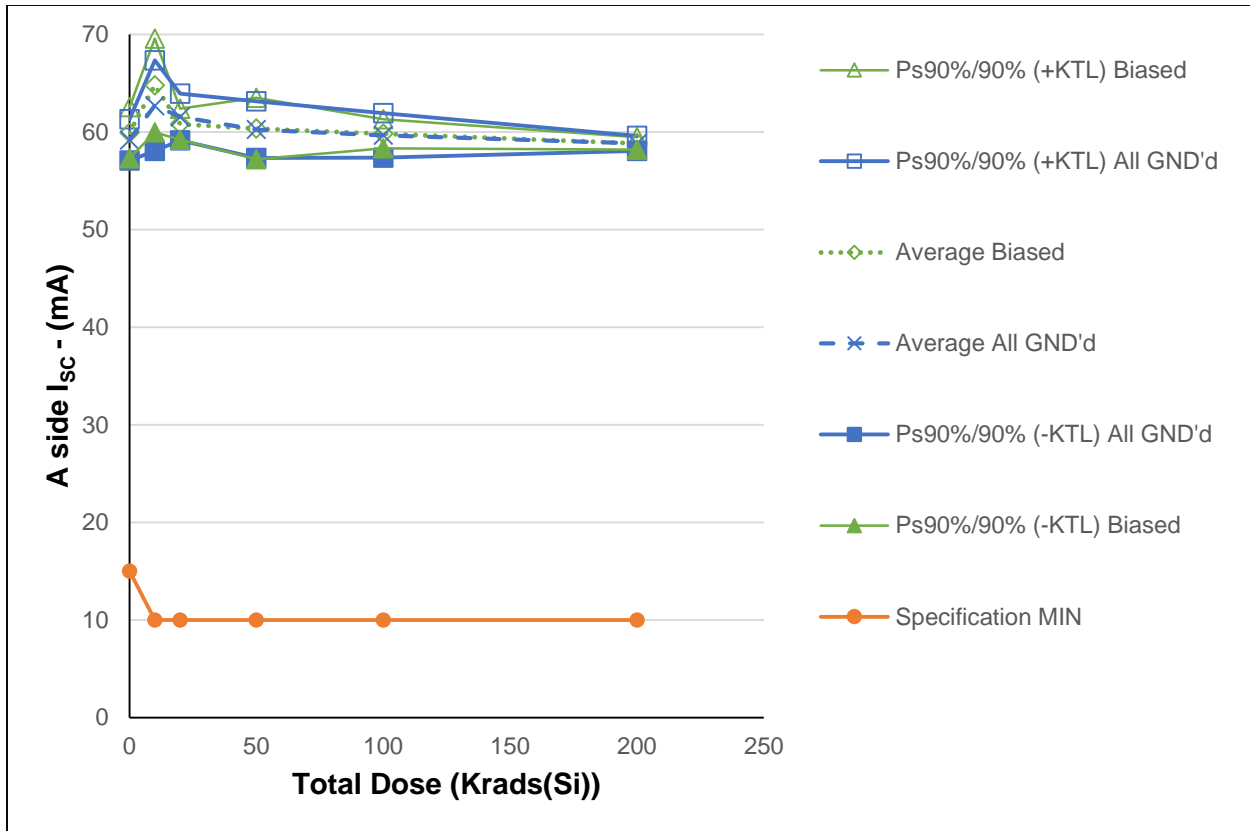


Figure 5.41: Plot of Output Short Circuit Current I_{sc-} at $V_s = \pm 15V$ versus Total Dose (side A)

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	60.048	64.182				
777	All GND'd Irradiation	59.844	64.544				
778	All GND'd Irradiation	58.212	62.429				
779	All GND'd Irradiation	58.684	61.847				
780	All GND'd Irradiation	59.085	60.452				
771	Biased Irradiation	58.695	61.782				
772	Biased Irradiation	61.275	66.381				
773	Biased Irradiation	60.326	65.415				
774	Biased Irradiation	59.552	64.910				
775	Biased Irradiation	59.732	65.348				
786	All GND'd Irradiation	60.035		62.337			
787	All GND'd Irradiation	59.514		61.829			
788	All GND'd Irradiation	59.848		61.952			
789	All GND'd Irradiation	59.878		61.491			
790	All GND'd Irradiation	59.183		60.071			
781	Biased Irradiation	58.351		60.221			
782	Biased Irradiation	59.181		61.390			
783	Biased Irradiation	59.048		61.428			
784	Biased Irradiation	58.206		60.648			
785	Biased Irradiation	58.246		60.315			
796	All GND'd Irradiation	58.285			59.599		
797	All GND'd Irradiation	60.412			61.695		
798	All GND'd Irradiation	59.524			60.677		
799	All GND'd Irradiation	59.261			60.310		
800	All GND'd Irradiation	58.342			58.905		
791	Biased Irradiation	58.313			58.781		
792	Biased Irradiation	58.560			59.628		
793	Biased Irradiation	59.361			60.513		
794	Biased Irradiation	60.124			61.309		
795	Biased Irradiation	60.283			61.497		
806	All GND'd Irradiation	60.201				60.789	
807	All GND'd Irradiation	59.257				59.799	
808	All GND'd Irradiation	58.378				58.543	
809	All GND'd Irradiation	59.142				59.252	
810	All GND'd Irradiation	59.792				59.887	
801	Biased Irradiation	59.237				59.366	
802	Biased Irradiation	59.010				59.361	
803	Biased Irradiation	59.085				59.599	
804	Biased Irradiation	60.058				60.610	
805	Biased Irradiation	59.658				60.116	
816	All GND'd Irradiation	59.428					59.171
817	All GND'd Irradiation	58.989					58.706
818	All GND'd Irradiation	59.123					58.769
819	All GND'd Irradiation	59.371					58.985
820	All GND'd Irradiation	58.924					58.432
811	Biased Irradiation	59.581					58.432
812	Biased Irradiation	59.138					59.010
813	Biased Irradiation	59.065					58.805
814	Biased Irradiation	59.065					58.924
815	Biased Irradiation	59.128					58.979
832	Control Unit	60.607	62.887	62.887	62.887	62.887	62.887
833	Control Unit	59.640	61.037	61.037	61.037	61.037	61.037
All GND'd Irradiation Statistics							
Average All GND'd		59.174	62.691	61.536	60.237	59.654	58.813
Std Dev All GND'd		0.772	1.692	0.873	1.061	0.830	0.281
Ps90%/90% (+KTL) All GND'd		61.293	67.330	63.931	63.147	61.931	59.583
Ps90%/90% (-KTL) All GND'd		57.056	58.051	59.141	57.327	57.377	58.042
Biased Irradiation Statistics							
Average Biased		59.916	64.767	60.800	60.346	59.810	58.830
Std Dev Biased		0.958	1.753	0.578	1.145	0.542	0.236
Ps90%/90% (+KTL) Biased		62.543	69.574	62.385	63.485	61.298	59.476
Ps90%/90% (-KTL) Biased		57.289	59.960	59.215	57.206	58.323	58.184
Specification MIN		15	10	10	10	10	10
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

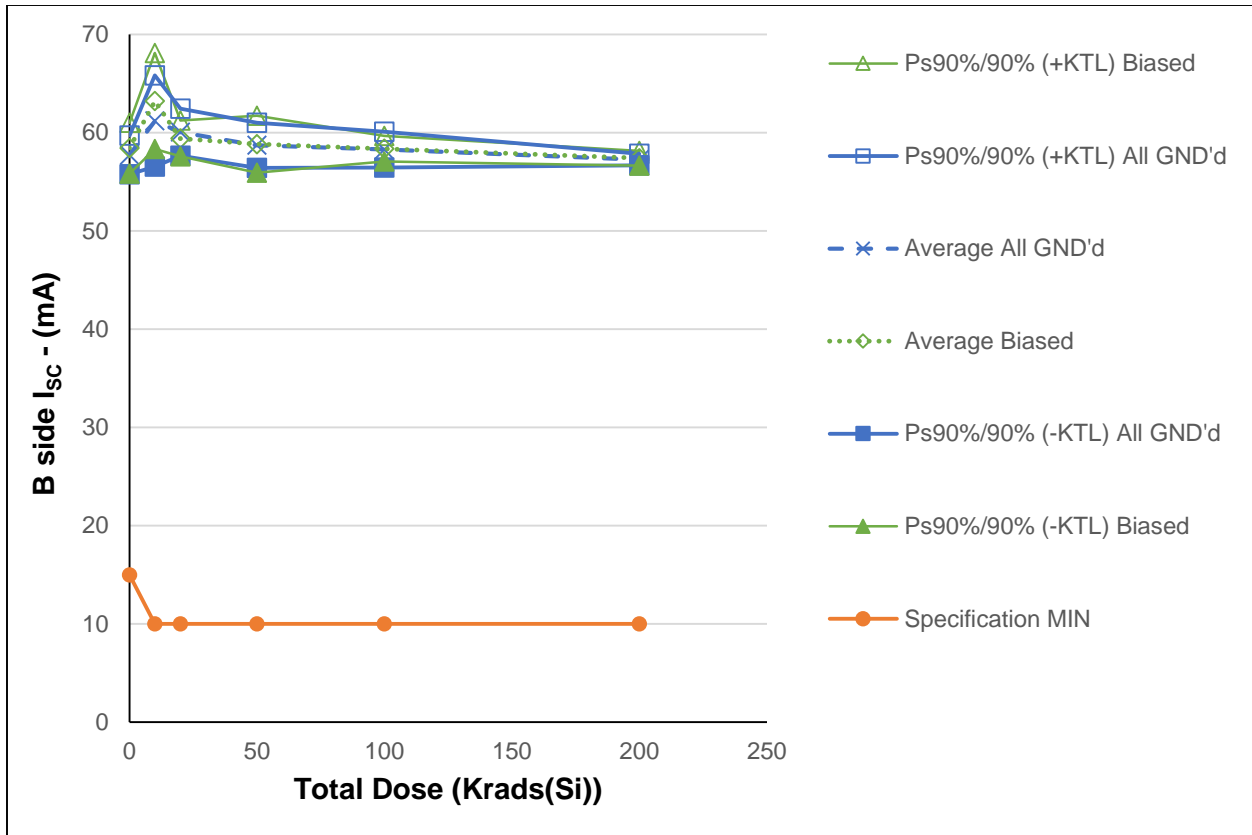


Figure 5.42: Plot of Output Short Circuit Current I_{sc-} at $V_s = \pm 15V$ versus Total Dose (side B)

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	58.496	62.522				
777	All GND'd Irradiation	58.437	63.116				
778	All GND'd Irradiation	56.892	61.067				
779	All GND'd Irradiation	57.233	60.291				
780	All GND'd Irradiation	57.579	58.924				
771	Biased Irradiation	57.110	60.162				
772	Biased Irradiation	59.763	64.839				
773	Biased Irradiation	58.587	63.591				
774	Biased Irradiation	58.318	63.576				
775	Biased Irradiation	58.351	63.904				
786	All GND'd Irradiation	58.321		60.572			
787	All GND'd Irradiation	58.184		60.496			
788	All GND'd Irradiation	58.441		60.506			
789	All GND'd Irradiation	58.547		60.115			
790	All GND'd Irradiation	57.678		58.524			
781	Biased Irradiation	56.773		58.608			
782	Biased Irradiation	57.860		60.028			
783	Biased Irradiation	57.797		60.163			
784	Biased Irradiation	56.792		59.175			
785	Biased Irradiation	57.016		59.055			
796	All GND'd Irradiation	56.816			58.106		
797	All GND'd Irradiation	58.606			59.878		
798	All GND'd Irradiation	58.040			59.169		
799	All GND'd Irradiation	57.597			58.619		
800	All GND'd Irradiation	57.198			57.770		
791	Biased Irradiation	56.800			57.248		
792	Biased Irradiation	57.216			58.286		
793	Biased Irradiation	57.997			59.171		
794	Biased Irradiation	58.542			59.735		
795	Biased Irradiation	58.479			59.686		
806	All GND'd Irradiation	58.479				59.048	
807	All GND'd Irradiation	57.767				58.304	
808	All GND'd Irradiation	57.099				57.289	
809	All GND'd Irradiation	57.987				58.083	
810	All GND'd Irradiation	58.560				58.667	
801	Biased Irradiation	57.917				58.057	
802	Biased Irradiation	57.536				57.914	
803	Biased Irradiation	57.588				58.113	
804	Biased Irradiation	58.473				59.036	
805	Biased Irradiation	58.189				58.685	
816	All GND'd Irradiation	57.768					57.537
817	All GND'd Irradiation	57.444					57.189
818	All GND'd Irradiation	57.741					57.384
819	All GND'd Irradiation	57.520					57.148
820	All GND'd Irradiation	57.453					56.990
811	Biased Irradiation	58.113					57.001
812	Biased Irradiation	57.353					57.257
813	Biased Irradiation	57.593					57.389
814	Biased Irradiation	57.779					57.705
815	Biased Irradiation	57.683					57.589
832	Control Unit	58.980	61.170	61.170	61.170	61.170	61.170
833	Control Unit	58.136	59.510	59.510	59.510	59.510	59.510
All GND'd Irradiation Statistics							
Average All GND'd		57.727	61.184	60.042	58.708	58.278	57.250
Std Dev All GND'd		0.717	1.691	0.868	0.841	0.663	0.213
Ps90%/90% (+KTL) All GND'd		59.694	65.822	62.422	61.015	60.097	57.835
Ps90%/90% (-KTL) All GND'd		55.760	56.546	57.663	56.402	56.459	56.665
Biased Irradiation Statistics							
Average Biased		58.426	63.215	59.406	58.825	58.361	57.388
Std Dev Biased		0.944	1.782	0.666	1.057	0.478	0.277
Ps90%/90% (+KTL) Biased		61.014	68.101	61.231	61.723	59.671	58.149
Ps90%/90% (-KTL) Biased		55.838	58.328	57.580	55.927	57.051	56.628
Specification MIN		15	10	10	10	10	10
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

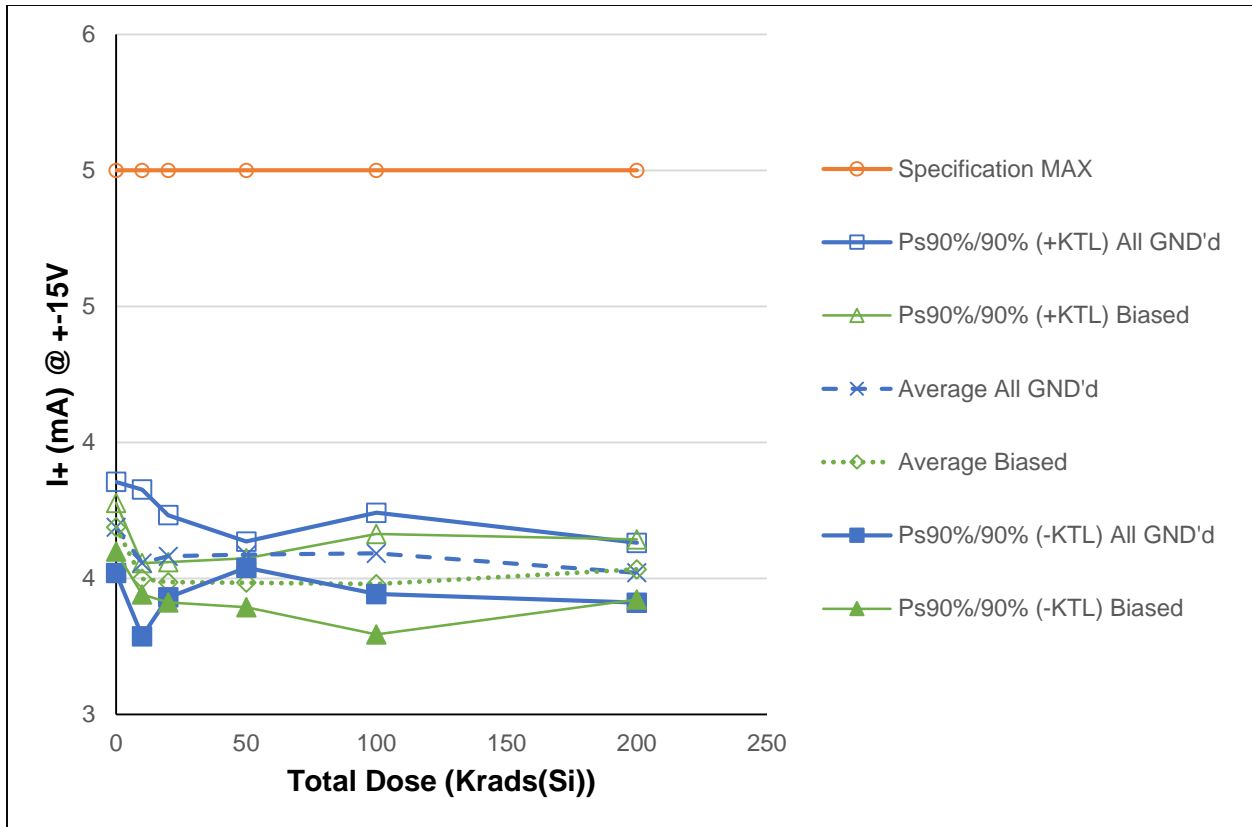


Figure 5.43: Plot of Device Supply Current I_{SC-} at $V_s = \pm 15V$ versus Total Dose

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 Units	I+ @ +-15V (mA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	3.702	3.551				
777	All GND'd Irradiation	3.631	3.458				
778	All GND'd Irradiation	3.627	3.462				
779	All GND'd Irradiation	3.775	3.659				
780	All GND'd Irradiation	3.704	3.654				
771	Biased Irradiation	3.633	3.509				
772	Biased Irradiation	3.712	3.528				
773	Biased Irradiation	3.685	3.478				
774	Biased Irradiation	3.711	3.482				
775	Biased Irradiation	3.699	3.496				
786	All GND'd Irradiation	3.602		3.502			
787	All GND'd Irradiation	3.658		3.559			
788	All GND'd Irradiation	3.682		3.582			
789	All GND'd Irradiation	3.716		3.645			
790	All GND'd Irradiation	3.660		3.619			
781	Biased Irradiation	3.581		3.459			
782	Biased Irradiation	3.642		3.510			
783	Biased Irradiation	3.633		3.487			
784	Biased Irradiation	3.607		3.458			
785	Biased Irradiation	3.644		3.515			
796	All GND'd Irradiation	3.659			3.570		
797	All GND'd Irradiation	3.687			3.592		
798	All GND'd Irradiation	3.704			3.609		
799	All GND'd Irradiation	3.669			3.596		
800	All GND'd Irradiation	3.637			3.568		
791	Biased Irradiation	3.583			3.461		
792	Biased Irradiation	3.587			3.440		
793	Biased Irradiation	3.638			3.495		
794	Biased Irradiation	3.652			3.519		
795	Biased Irradiation	3.639			3.505		
806	All GND'd Irradiation	3.735				3.617	
807	All GND'd Irradiation	3.742				3.647	
808	All GND'd Irradiation	3.608				3.503	
809	All GND'd Irradiation	3.675				3.588	
810	All GND'd Irradiation	3.689				3.605	
801	Biased Irradiation	3.647				3.496	
802	Biased Irradiation	3.622				3.448	
803	Biased Irradiation	3.719				3.550	
804	Biased Irradiation	3.535				3.379	
805	Biased Irradiation	3.683				3.522	
816	All GND'd Irradiation	3.641					3.500
817	All GND'd Irradiation	3.721					3.573
818	All GND'd Irradiation	3.611					3.466
819	All GND'd Irradiation	3.662					3.529
820	All GND'd Irradiation	3.665					3.535
811	Biased Irradiation	3.719					3.578
812	Biased Irradiation	3.699					3.519
813	Biased Irradiation	3.669					3.472
814	Biased Irradiation	3.730					3.538
815	Biased Irradiation	3.732					3.558
832	Control Unit	3.728	3.665	3.665	3.665	3.665	3.665
833	Control Unit	3.661	3.630	3.630	3.630	3.630	3.630
All GND'd Irradiation Statistics							
Average All GND'd		3.688	3.557	3.581	3.587	3.592	3.521
Std Dev All GND'd		0.061	0.098	0.055	0.018	0.054	0.040
Ps90%/90% (+KTL) All GND'd		3.855	3.827	3.733	3.635	3.741	3.631
Ps90%/90% (-KTL) All GND'd		3.520	3.287	3.430	3.539	3.443	3.411
Biased Irradiation Statistics							
Average Biased		3.688	3.499	3.486	3.484	3.479	3.533
Std Dev Biased		0.033	0.021	0.027	0.033	0.067	0.040
Ps90%/90% (+KTL) Biased		3.777	3.556	3.560	3.574	3.664	3.644
Ps90%/90% (-KTL) Biased		3.599	3.441	3.411	3.394	3.294	3.422
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX		5	5	5	5	5	5
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

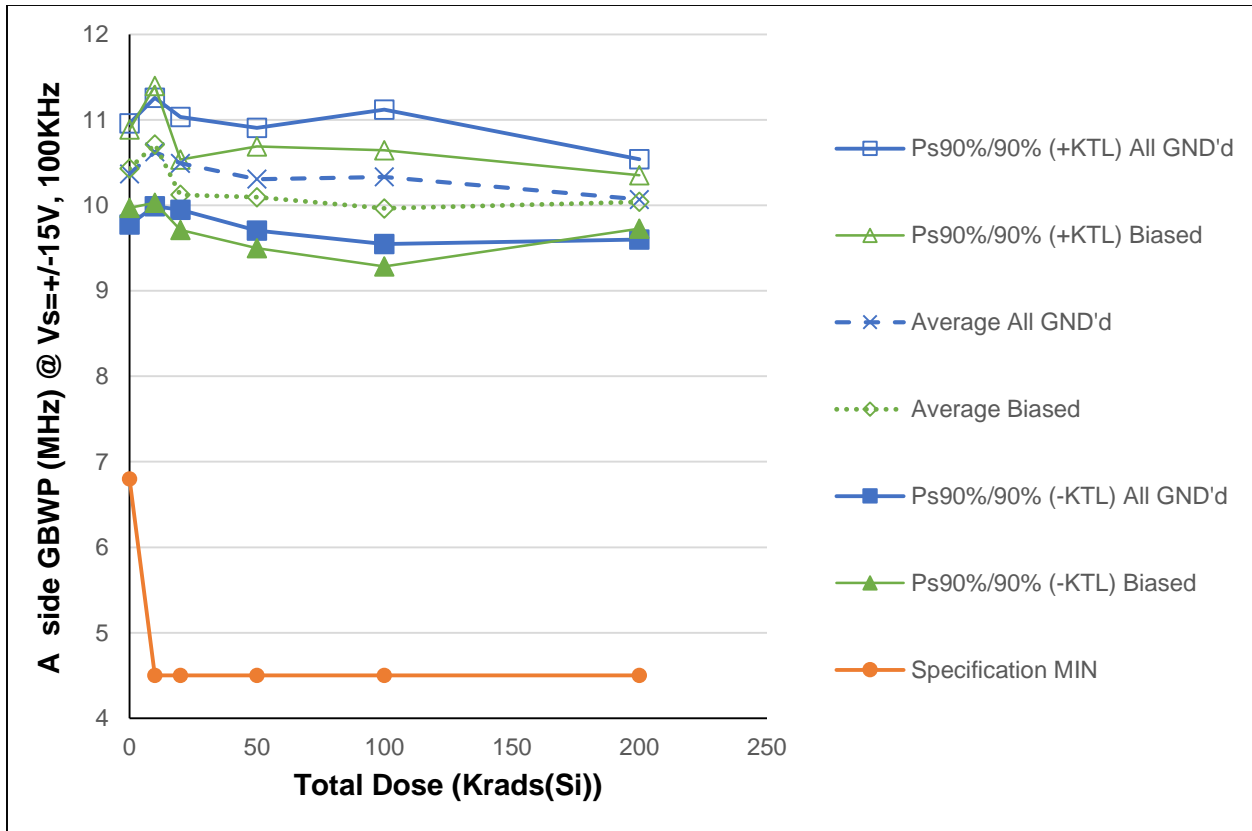


Figure 5.44: Plot of Gain Bandwidth Product (GBWP) at $V_s = \pm 15V$ versus Total Dose (side A)

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 Units	A GBWP @ Vs=+/-15V, 100KHz (MHz)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	10.521	10.783				
777	All GND'd Irradiation	10.327	10.616				
778	All GND'd Irradiation	10.017	10.244				
779	All GND'd Irradiation	10.556	10.837				
780	All GND'd Irradiation	10.415	10.636				
771	Biased Irradiation	10.177	10.367				
772	Biased Irradiation	10.637	11.041				
773	Biased Irradiation	10.425	10.634				
774	Biased Irradiation	10.412	10.689				
775	Biased Irradiation	10.494	10.830				
786	All GND'd Irradiation	10.043		10.234			
787	All GND'd Irradiation	10.247		10.429			
788	All GND'd Irradiation	10.443		10.728			
789	All GND'd Irradiation	10.480		10.649			
790	All GND'd Irradiation	10.177		10.416			
781	Biased Irradiation	9.924		9.956			
782	Biased Irradiation	10.172		10.226			
783	Biased Irradiation	10.197		10.277			
784	Biased Irradiation	9.903		9.969			
785	Biased Irradiation	10.138		10.188			
796	All GND'd Irradiation	10.162			10.233		
797	All GND'd Irradiation	10.525			10.612		
798	All GND'd Irradiation	10.376			10.439		
799	All GND'd Irradiation	10.078			10.178		
800	All GND'd Irradiation	10.010			10.064		
791	Biased Irradiation	9.983			9.858		
792	Biased Irradiation	10.072			9.935		
793	Biased Irradiation	10.131			10.035		
794	Biased Irradiation	10.328			10.298		
795	Biased Irradiation	10.347			10.344		
806	All GND'd Irradiation	10.715				10.672	
807	All GND'd Irradiation	10.340				10.347	
808	All GND'd Irradiation	9.947				9.880	
809	All GND'd Irradiation	10.340				10.341	
810	All GND'd Irradiation	10.397				10.424	
801	Biased Irradiation	10.031				9.803	
802	Biased Irradiation	10.121				9.876	
803	Biased Irradiation	10.395				10.272	
804	Biased Irradiation	9.863				9.694	
805	Biased Irradiation	10.397				10.175	
816	All GND'd Irradiation	10.293					10.138
817	All GND'd Irradiation	10.466					10.254
818	All GND'd Irradiation	10.019					9.798
819	All GND'd Irradiation	10.308					10.124
820	All GND'd Irradiation	10.220					10.031
811	Biased Irradiation	10.493					10.150
812	Biased Irradiation	10.414					10.062
813	Biased Irradiation	10.248					9.851
814	Biased Irradiation	10.401					10.040
815	Biased Irradiation	10.422					10.094
832	Control Unit	10.688	10.998	10.998	10.998	10.998	10.998
833	Control Unit	10.289	10.576	10.576	10.576	10.576	10.576
All GND'd Irradiation Statistics							
Average All GND'd		10.367	10.623	10.491	10.305	10.333	10.069
Std Dev All GND'd		0.215	0.232	0.198	0.219	0.287	0.171
Ps90%/90% (+KTL) All GND'd		10.958	11.259	11.034	10.906	11.119	10.538
Ps90%/90% (-KTL) All GND'd		9.776	9.987	9.949	9.705	9.547	9.600
Biased Irradiation Statistics							
Average Biased		10.429	10.712	10.123	10.094	9.964	10.039
Std Dev Biased		0.167	0.249	0.150	0.217	0.248	0.113
Ps90%/90% (+KTL) Biased		10.886	11.395	10.536	10.689	10.644	10.351
Ps90%/90% (-KTL) Biased		9.971	10.030	9.711	9.499	9.284	9.728
Specification MIN		6.8	4.5	4.5	4.5	4.5	4.5
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

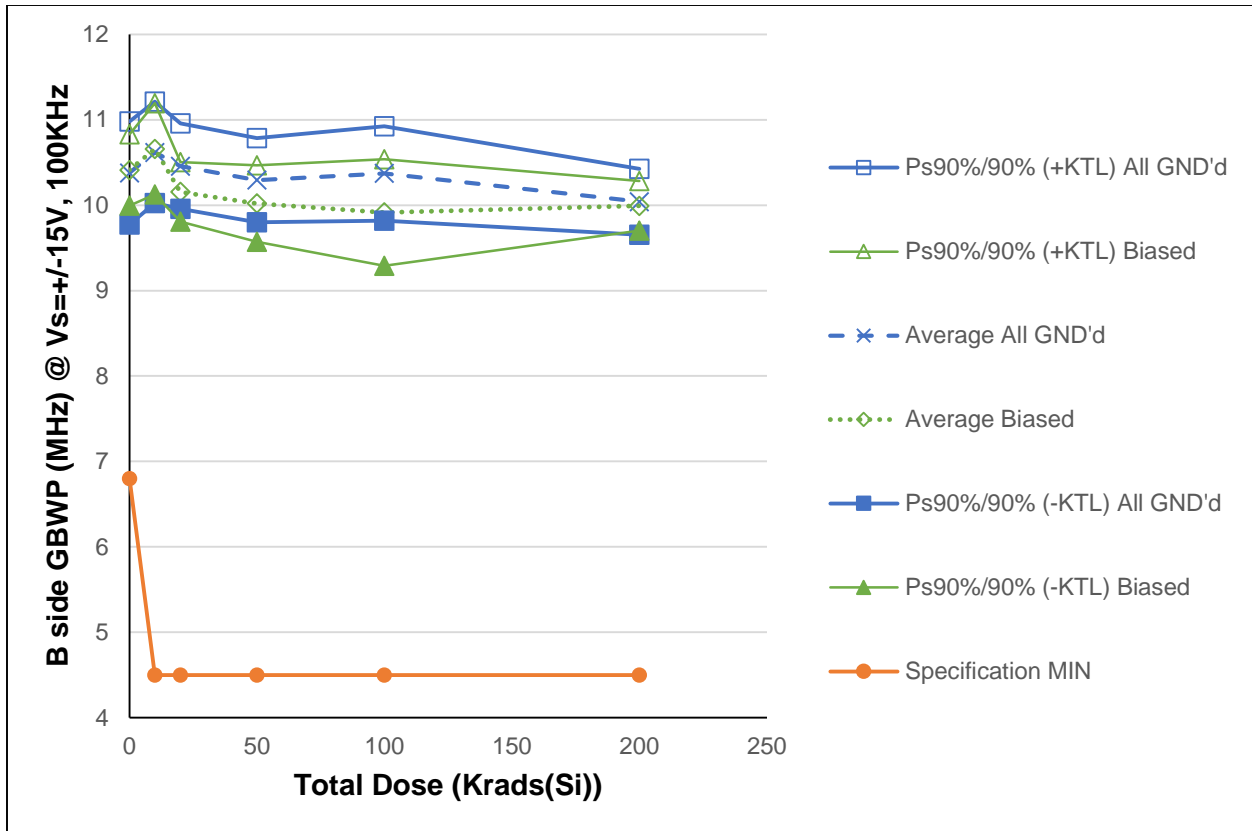


Figure 5.45: Plot of Gain Bandwidth Product (GBWP) at $V_s = \pm 15V$ versus Total Dose (side B)

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 Units	B GBWP @ Vs=+/-15V, 100KHz (MHz)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	10.398	10.657				
777	All GND'd Irradiation	10.258	10.535				
778	All GND'd Irradiation	10.087	10.317				
779	All GND'd Irradiation	10.667	10.911				
780	All GND'd Irradiation	10.481	10.670				
771	Biased Irradiation	10.191	10.379				
772	Biased Irradiation	10.567	10.871				
773	Biased Irradiation	10.329	10.554				
774	Biased Irradiation	10.522	10.712				
775	Biased Irradiation	10.448	10.781				
786	All GND'd Irradiation	10.079		10.233			
787	All GND'd Irradiation	10.347		10.535			
788	All GND'd Irradiation	10.335		10.486			
789	All GND'd Irradiation	10.545		10.701			
790	All GND'd Irradiation	10.182		10.329			
781	Biased Irradiation	9.991		10.009			
782	Biased Irradiation	10.268		10.323			
783	Biased Irradiation	10.118		10.152			
784	Biased Irradiation	10.043		10.063			
785	Biased Irradiation	10.179		10.232			
796	All GND'd Irradiation	10.172			10.242		
797	All GND'd Irradiation	10.403			10.482		
798	All GND'd Irradiation	10.433			10.485		
799	All GND'd Irradiation	10.022			10.108		
800	All GND'd Irradiation	10.107			10.152		
791	Biased Irradiation	9.975			9.824		
792	Biased Irradiation	10.030			9.897		
793	Biased Irradiation	10.119			10.025		
794	Biased Irradiation	10.269			10.219		
795	Biased Irradiation	10.193			10.134		
806	All GND'd Irradiation	10.594				10.548	
807	All GND'd Irradiation	10.363				10.366	
808	All GND'd Irradiation	10.111				10.043	
809	All GND'd Irradiation	10.421				10.375	
810	All GND'd Irradiation	10.538				10.523	
801	Biased Irradiation	10.134				9.900	
802	Biased Irradiation	10.053				9.761	
803	Biased Irradiation	10.377				10.139	
804	Biased Irradiation	9.861				9.630	
805	Biased Irradiation	10.367				10.141	
816	All GND'd Irradiation	10.229					10.017
817	All GND'd Irradiation	10.454					10.243
818	All GND'd Irradiation	10.084					9.845
819	All GND'd Irradiation	10.242					10.040
820	All GND'd Irradiation	10.258					10.053
811	Biased Irradiation	10.520					10.145
812	Biased Irradiation	10.383					10.018
813	Biased Irradiation	10.278					9.869
814	Biased Irradiation	10.382					10.007
815	Biased Irradiation	10.284					9.922
832	Control Unit	10.610	10.862	10.862	10.862	10.862	10.862
833	Control Unit	10.282	10.513	10.513	10.513	10.513	10.513
All GND'd Irradiation Statistics							
Average All GND'd		10.378	10.618	10.457	10.294	10.371	10.040
Std Dev All GND'd		0.220	0.217	0.182	0.180	0.201	0.141
Ps90%/90% (+KTL) All GND'd		10.981	11.212	10.957	10.787	10.923	10.427
Ps90%/90% (-KTL) All GND'd		9.775	10.024	9.957	9.801	9.819	9.652
Biased Irradiation Statistics							
Average Biased		10.411	10.659	10.156	10.020	9.914	9.992
Std Dev Biased		0.152	0.195	0.127	0.163	0.227	0.105
Ps90%/90% (+KTL) Biased		10.829	11.195	10.503	10.467	10.538	10.281
Ps90%/90% (-KTL) Biased		9.993	10.124	9.809	9.573	9.291	9.703
Specification MIN		6.8	4.5	4.5	4.5	4.5	4.5
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

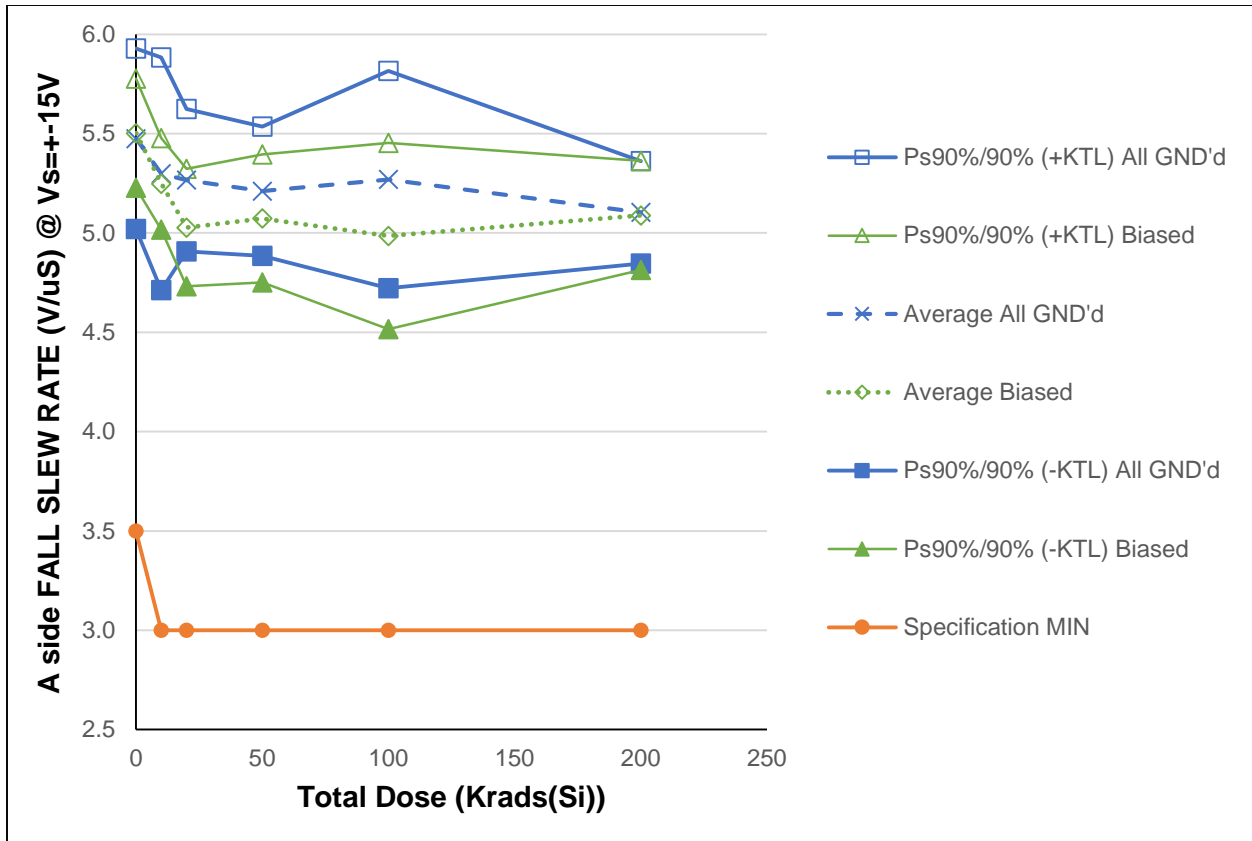


Figure 5.46: Plot of Falling Slew Rate at Vs = +-15V versus Total Dose (side A)

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 Units	A FALL SLEW RATE @ Vs=+-15V (V/uS)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	5.525	5.319				
777	All GND'd Irradiation	5.405	5.181				
778	All GND'd Irradiation	5.236	5.000				
779	All GND'd Irradiation	5.682	5.525				
780	All GND'd Irradiation	5.525	5.464				
771	Biased Irradiation	5.348	5.181				
772	Biased Irradiation	5.587	5.348				
773	Biased Irradiation	5.525	5.236				
774	Biased Irradiation	5.464	5.155				
775	Biased Irradiation	5.587	5.319				
786	All GND'd Irradiation	5.208		5.076			
787	All GND'd Irradiation	5.376		5.236			
788	All GND'd Irradiation	5.464		5.319			
789	All GND'd Irradiation	5.556		5.435			
790	All GND'd Irradiation	5.348		5.263			
781	Biased Irradiation	5.155		4.950			
782	Biased Irradiation	5.319		5.102			
783	Biased Irradiation	5.348		5.128			
784	Biased Irradiation	5.128		4.878			
785	Biased Irradiation	5.291		5.076			
796	All GND'd Irradiation	5.348			5.181		
797	All GND'd Irradiation	5.494			5.348		
798	All GND'd Irradiation	5.494			5.319		
799	All GND'd Irradiation	5.263			5.128		
800	All GND'd Irradiation	5.208			5.076		
791	Biased Irradiation	5.208			4.975		
792	Biased Irradiation	5.236			4.950		
793	Biased Irradiation	5.319			5.050		
794	Biased Irradiation	5.405			5.181		
795	Biased Irradiation	5.435			5.208		
806	All GND'd Irradiation	5.747				5.525	
807	All GND'd Irradiation	5.435				5.263	
808	All GND'd Irradiation	5.155				4.975	
809	All GND'd Irradiation	5.435				5.236	
810	All GND'd Irradiation	5.525				5.348	
801	Biased Irradiation	5.263				4.950	
802	Biased Irradiation	5.236				4.902	
803	Biased Irradiation	5.525				5.181	
804	Biased Irradiation	5.076				4.762	
805	Biased Irradiation	5.435				5.128	
816	All GND'd Irradiation	5.376					5.128
817	All GND'd Irradiation	5.525					5.236
818	All GND'd Irradiation	5.236					4.975
819	All GND'd Irradiation	5.348					5.076
820	All GND'd Irradiation	5.348					5.102
811	Biased Irradiation	5.556					5.236
812	Biased Irradiation	5.525					5.128
813	Biased Irradiation	5.376					4.975
814	Biased Irradiation	5.464					5.076
815	Biased Irradiation	5.405					5.025
832	Control Unit	5.587	5.525	5.525	5.525	5.525	5.525
833	Control Unit	5.348	5.319	5.319	5.319	5.319	5.319
All GND'd Irradiation Statistics							
Average All GND'd		5.474	5.298	5.266	5.210	5.269	5.103
Std Dev All GND'd		0.166	0.213	0.131	0.119	0.199	0.094
Ps90%/90% (+KTL) All GND'd		5.929	5.883	5.624	5.536	5.816	5.361
Ps90%/90% (-KTL) All GND'd		5.020	4.713	4.907	4.885	4.722	4.846
Biased Irradiation Statistics							
Average Biased		5.502	5.248	5.027	5.073	4.985	5.088
Std Dev Biased		0.100	0.084	0.108	0.117	0.171	0.100
Ps90%/90% (+KTL) Biased		5.776	5.478	5.322	5.395	5.454	5.363
Ps90%/90% (-KTL) Biased		5.228	5.017	4.732	4.751	4.516	4.813
Specification MIN		3.5	3.0	3.0	3.0	3.0	3.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

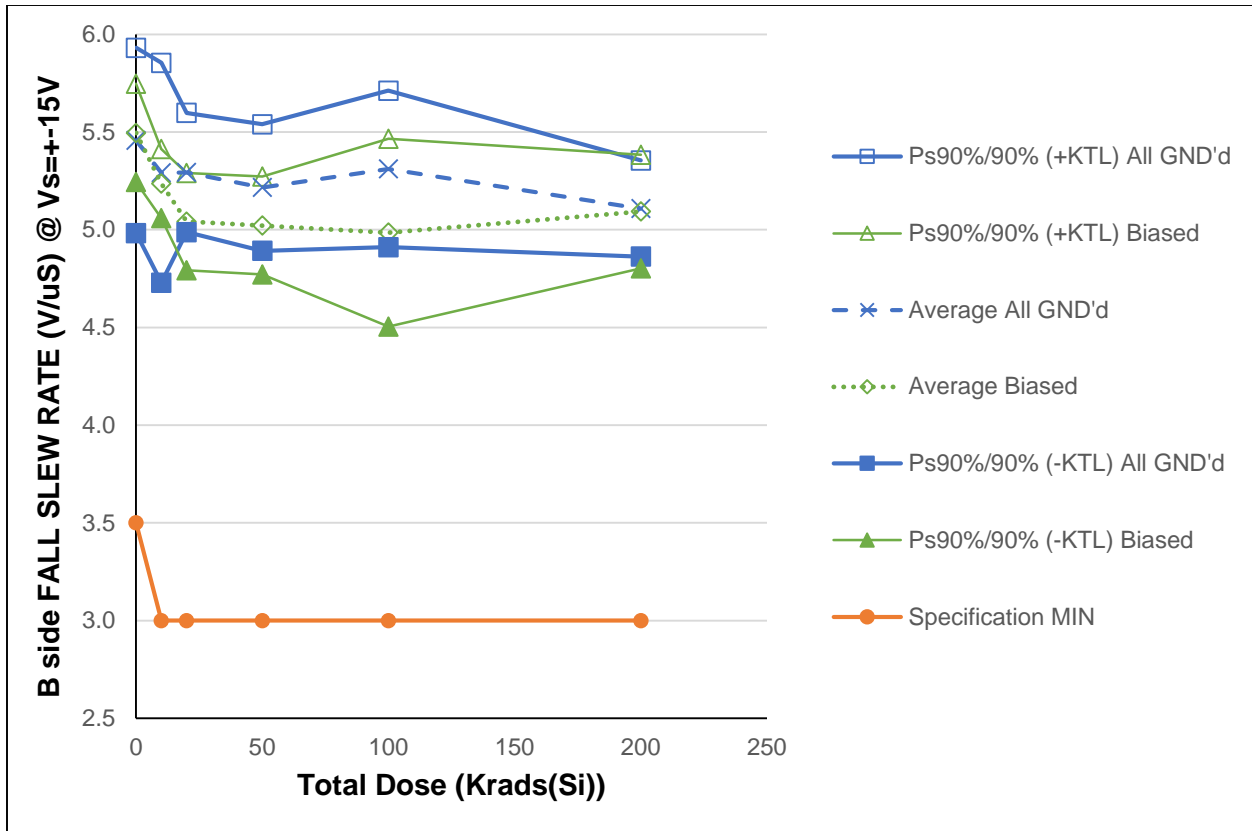


Figure 5.47: Plot of Falling Slew Rate at Vs = +-15V versus Total Dose (side B)

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 Units	B FALL SLEW RATE @ Vs=+-15V (V/uS)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	5.464	5.263				
777	All GND'd Irradiation	5.405	5.181				
778	All GND'd Irradiation	5.208	5.025				
779	All GND'd Irradiation	5.682	5.525				
780	All GND'd Irradiation	5.525	5.464				
771	Biased Irradiation	5.348	5.181				
772	Biased Irradiation	5.556	5.319				
773	Biased Irradiation	5.464	5.181				
774	Biased Irradiation	5.556	5.208				
775	Biased Irradiation	5.556	5.291				
786	All GND'd Irradiation	5.291		5.155			
787	All GND'd Irradiation	5.405		5.291			
788	All GND'd Irradiation	5.464		5.291			
789	All GND'd Irradiation	5.587		5.464			
790	All GND'd Irradiation	5.348		5.263			
781	Biased Irradiation	5.208		4.975			
782	Biased Irradiation	5.376		5.128			
783	Biased Irradiation	5.291		5.050			
784	Biased Irradiation	5.155		4.926			
785	Biased Irradiation	5.291		5.128			
796	All GND'd Irradiation	5.319			5.181		
797	All GND'd Irradiation	5.435			5.291		
798	All GND'd Irradiation	5.525			5.376		
799	All GND'd Irradiation	5.181			5.076		
800	All GND'd Irradiation	5.263			5.155		
791	Biased Irradiation	5.181			4.926		
792	Biased Irradiation	5.181			4.926		
793	Biased Irradiation	5.291			5.050		
794	Biased Irradiation	5.376			5.128		
795	Biased Irradiation	5.319			5.076		
806	All GND'd Irradiation	5.682				5.464	
807	All GND'd Irradiation	5.464				5.291	
808	All GND'd Irradiation	5.291				5.102	
809	All GND'd Irradiation	5.464				5.263	
810	All GND'd Irradiation	5.587				5.435	
801	Biased Irradiation	5.291				5.000	
802	Biased Irradiation	5.181				4.831	
803	Biased Irradiation	5.525				5.181	
804	Biased Irradiation	5.102				4.785	
805	Biased Irradiation	5.435				5.128	
816	All GND'd Irradiation	5.348					5.076
817	All GND'd Irradiation	5.525					5.236
818	All GND'd Irradiation	5.291					5.000
819	All GND'd Irradiation	5.319					5.076
820	All GND'd Irradiation	5.435					5.155
811	Biased Irradiation	5.587					5.263
812	Biased Irradiation	5.464					5.102
813	Biased Irradiation	5.376					4.975
814	Biased Irradiation	5.464					5.076
815	Biased Irradiation	5.405					5.050
832	Control Unit	5.618	5.525	5.525	5.525	5.525	5.525
833	Control Unit	5.435	5.376	5.376	5.376	5.376	5.376
All GND'd Irradiation Statistics							
Average All GND'd		5.457	5.292	5.293	5.216	5.311	5.108
Std Dev All GND'd		0.173	0.205	0.111	0.118	0.146	0.090
Ps90%/90% (+KTL) All GND'd		5.931	5.854	5.598	5.540	5.711	5.354
Ps90%/90% (-KTL) All GND'd		4.983	4.729	4.988	4.892	4.911	4.863
Biased Irradiation Statistics							
Average Biased		5.496	5.236	5.042	5.021	4.985	5.093
Std Dev Biased		0.092	0.065	0.091	0.091	0.175	0.106
Ps90%/90% (+KTL) Biased		5.747	5.413	5.290	5.272	5.466	5.384
Ps90%/90% (-KTL) Biased		5.244	5.059	4.793	4.771	4.504	4.802
Specification MIN		3.5	3.0	3.0	3.0	3.0	3.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

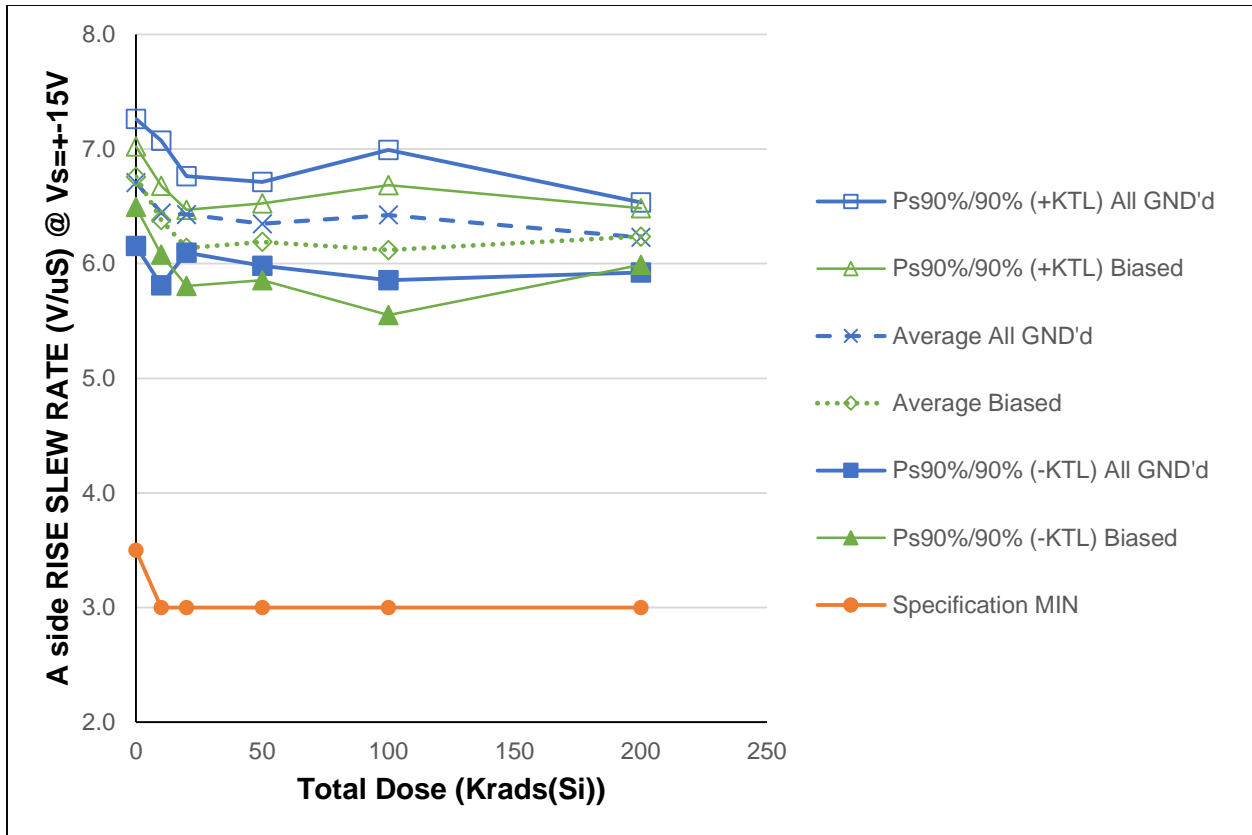


Figure 5.48: Plot of Rising Slew Rate at Vs = +/- 15V versus Total Dose (side A)

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 Units (V/uS)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	6.803	6.493				
777	All GND'd Irradiation	6.623	6.289				
778	All GND'd Irradiation	6.410	6.135				
779	All GND'd Irradiation	6.944	6.711				
780	All GND'd Irradiation	6.757	6.579				
771	Biased Irradiation	6.623	6.329				
772	Biased Irradiation	6.849	6.493				
773	Biased Irradiation	6.757	6.329				
774	Biased Irradiation	6.711	6.250				
775	Biased Irradiation	6.849	6.493				
786	All GND'd Irradiation	6.493		6.250			
787	All GND'd Irradiation	6.667		6.410			
788	All GND'd Irradiation	6.711		6.493			
789	All GND'd Irradiation	6.803		6.579			
790	All GND'd Irradiation	6.579		6.410			
781	Biased Irradiation	6.329		6.024			
782	Biased Irradiation	6.536		6.250			
783	Biased Irradiation	6.579		6.211			
784	Biased Irradiation	6.329		5.988			
785	Biased Irradiation	6.493		6.211			
796	All GND'd Irradiation	6.493			6.250		
797	All GND'd Irradiation	6.757			6.493		
798	All GND'd Irradiation	6.757			6.493		
799	All GND'd Irradiation	6.493			6.250		
800	All GND'd Irradiation	6.452			6.250		
791	Biased Irradiation	6.369			6.024		
792	Biased Irradiation	6.493			6.098		
793	Biased Irradiation	6.579			6.250		
794	Biased Irradiation	6.667			6.289		
795	Biased Irradiation	6.667			6.289		
806	All GND'd Irradiation	6.944				6.667	
807	All GND'd Irradiation	6.667				6.452	
808	All GND'd Irradiation	6.410				6.098	
809	All GND'd Irradiation	6.711				6.410	
810	All GND'd Irradiation	6.757				6.493	
801	Biased Irradiation	6.536				6.098	
802	Biased Irradiation	6.369				5.917	
803	Biased Irradiation	6.849				6.329	
804	Biased Irradiation	6.369				5.917	
805	Biased Irradiation	6.757				6.329	
816	All GND'd Irradiation	6.667					6.211
817	All GND'd Irradiation	6.803					6.369
818	All GND'd Irradiation	6.452					6.061
819	All GND'd Irradiation	6.667					6.250
820	All GND'd Irradiation	6.623					6.250
811	Biased Irradiation	6.849					6.369
812	Biased Irradiation	6.757					6.250
813	Biased Irradiation	6.711					6.135
814	Biased Irradiation	6.757					6.250
815	Biased Irradiation	6.711					6.173
832	Control Unit	6.944	6.757	6.757	6.757	6.757	6.757
833	Control Unit	6.623	6.493	6.493	6.493	6.493	6.493
All GND'd Irradiation Statistics							
	Average All GND'd	6.707	6.442	6.429	6.347	6.424	6.228
	Std Dev All GND'd	0.202	0.230	0.122	0.133	0.207	0.111
	Ps90%/90% (+KTL) All GND'd	7.261	7.072	6.763	6.713	6.991	6.533
	Ps90%/90% (-KTL) All GND'd	6.153	5.811	6.094	5.982	5.857	5.924
Biased Irradiation Statistics							
	Average Biased	6.758	6.379	6.137	6.190	6.118	6.235
	Std Dev Biased	0.096	0.109	0.121	0.122	0.206	0.090
	Ps90%/90% (+KTL) Biased	7.022	6.679	6.469	6.524	6.684	6.482
	Ps90%/90% (-KTL) Biased	6.493	6.079	5.805	5.856	5.552	5.989
	Specification MIN	3.5	3.0	3.0	3.0	3.0	3.0
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	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	PASS
	Status (+KTL) All GND'd						
	Status (-KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Status (+KTL) Biased						

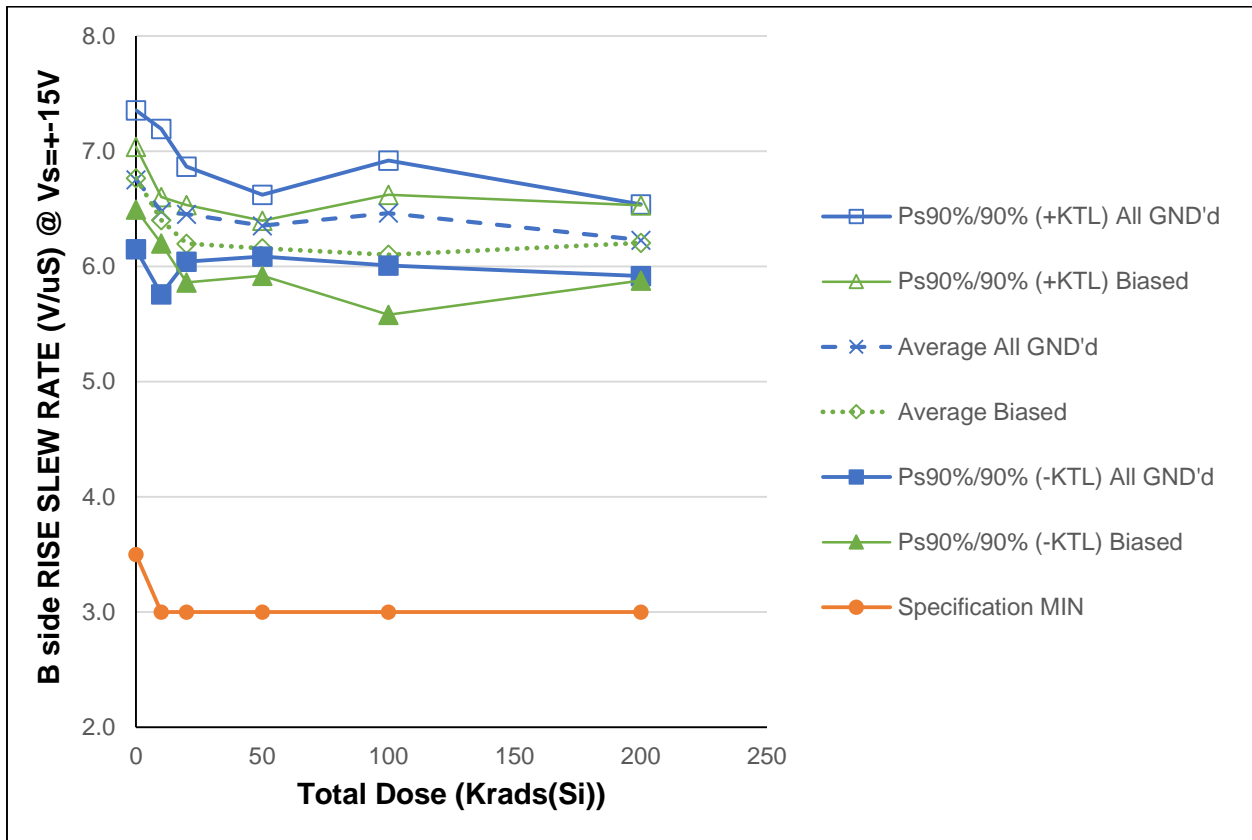


Figure 5.49: Plot of Rising Slew Rate at Vs = +-15V versus Total Dose (side B)

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 RISE SLEW RATE @ Vs=+-15V Units (V/uS)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	6.803	6.493				
777	All GND'd Irradiation	6.579	6.211				
778	All GND'd Irradiation	6.493	6.211				
779	All GND'd Irradiation	7.042	6.757				
780	All GND'd Irradiation	6.849	6.711				
771	Biased Irradiation	6.623	6.329				
772	Biased Irradiation	6.757	6.452				
773	Biased Irradiation	6.757	6.329				
774	Biased Irradiation	6.897	6.410				
775	Biased Irradiation	6.803	6.493				
786	All GND'd Irradiation	6.493		6.250			
787	All GND'd Irradiation	6.757		6.493			
788	All GND'd Irradiation	6.667		6.410			
789	All GND'd Irradiation	6.849		6.667			
790	All GND'd Irradiation	6.579		6.452			
781	Biased Irradiation	6.410		6.135			
782	Biased Irradiation	6.667		6.329			
783	Biased Irradiation	6.536		6.211			
784	Biased Irradiation	6.369		6.024			
785	Biased Irradiation	6.579		6.289			
796	All GND'd Irradiation	6.579			6.329		
797	All GND'd Irradiation	6.711			6.410		
798	All GND'd Irradiation	6.849			6.493		
799	All GND'd Irradiation	6.493			6.289		
800	All GND'd Irradiation	6.493			6.250		
791	Biased Irradiation	6.493			6.098		
792	Biased Irradiation	6.493			6.061		
793	Biased Irradiation	6.536			6.135		
794	Biased Irradiation	6.667			6.250		
795	Biased Irradiation	6.579			6.250		
806	All GND'd Irradiation	6.849				6.536	
807	All GND'd Irradiation	6.757				6.452	
808	All GND'd Irradiation	6.493				6.211	
809	All GND'd Irradiation	6.711				6.452	
810	All GND'd Irradiation	6.897				6.667	
801	Biased Irradiation	6.536				6.098	
802	Biased Irradiation	6.410				5.952	
803	Biased Irradiation	6.849				6.329	
804	Biased Irradiation	6.329				5.882	
805	Biased Irradiation	6.757				6.250	
816	All GND'd Irradiation	6.579					6.211
817	All GND'd Irradiation	6.849					6.410
818	All GND'd Irradiation	6.493					6.098
819	All GND'd Irradiation	6.579					6.211
820	All GND'd Irradiation	6.623					6.211
811	Biased Irradiation	6.897					6.410
812	Biased Irradiation	6.667					6.135
813	Biased Irradiation	6.667					6.135
814	Biased Irradiation	6.757					6.211
815	Biased Irradiation	6.667					6.135
832	Control Unit	6.849	6.667	6.667	6.667	6.667	6.667
833	Control Unit	6.667	6.536	6.536	6.536	6.536	6.536
All GND'd Irradiation Statistics							
Average All GND'd		6.753	6.477	6.454	6.354	6.463	6.228
Std Dev All GND'd		0.220	0.262	0.150	0.098	0.166	0.113
Ps90%/90% (+KTL) All GND'd		7.356	7.195	6.866	6.623	6.919	6.538
Ps90%/90% (-KTL) All GND'd		6.151	5.758	6.042	6.086	6.008	5.918
Biased Irradiation Statistics							
Average Biased		6.767	6.403	6.198	6.159	6.102	6.205
Std Dev Biased		0.099	0.073	0.122	0.087	0.190	0.119
Ps90%/90% (+KTL) Biased		7.038	6.604	6.533	6.398	6.623	6.532
Ps90%/90% (-KTL) Biased		6.496	6.202	5.862	5.919	5.582	5.878
Specification MIN		3.5	3.0	3.0	3.0	3.0	3.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

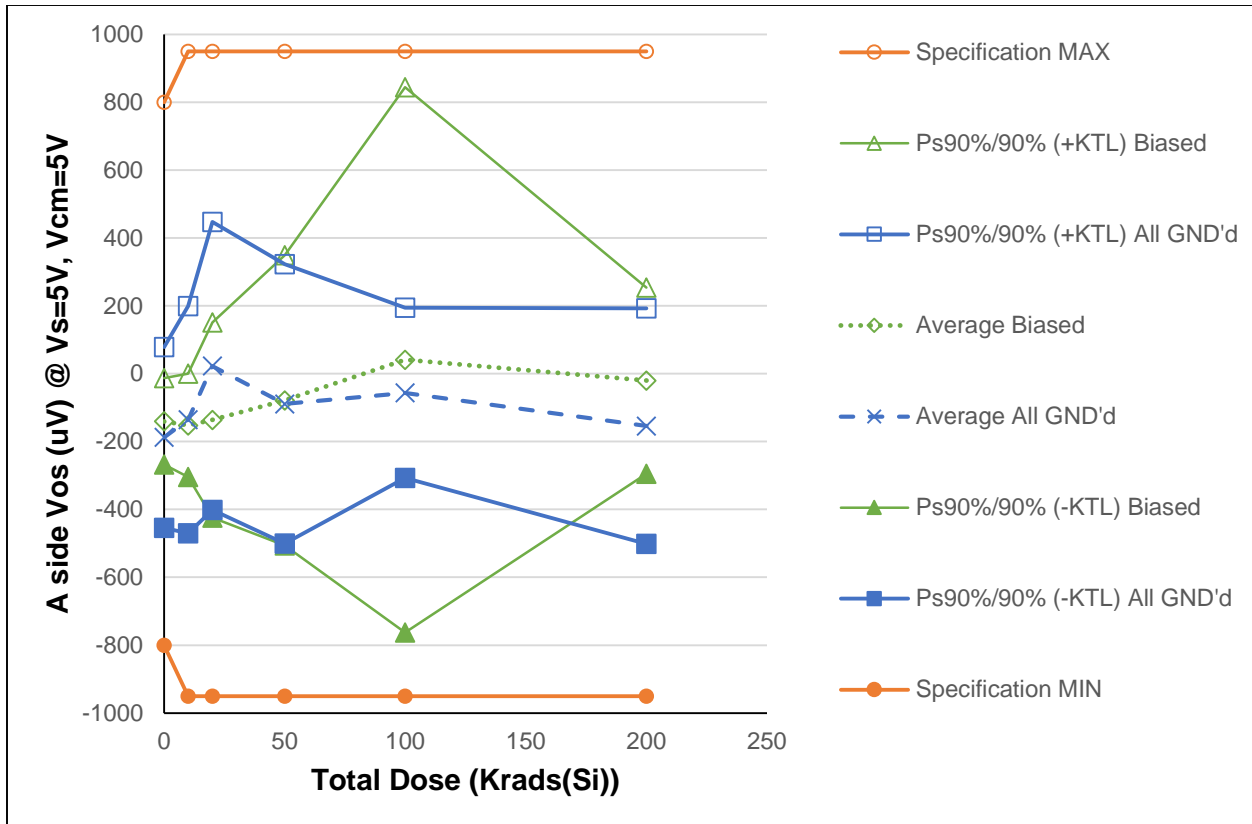


Figure 5.50: Plot of V_{os} (side A) @ $V_{cm} = 5V$ versus Total Dose

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 Units	A Vos @ Vs=5V, Vcm=5V (uV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-32.718	53.112				
777	All GND'd Irradiation	-207.553	-172.641				
778	All GND'd Irradiation	-200.537	-167.764				
779	All GND'd Irradiation	-196.279	-110.677				
780	All GND'd Irradiation	-302.249	-279.988				
771	Biased Irradiation	-111.075	-109.747				
772	Biased Irradiation	-182.889	-182.829				
773	Biased Irradiation	-191.989	-180.638				
774	Biased Irradiation	-133.013	-209.462				
775	Biased Irradiation	-82.990	-78.001				
786	All GND'd Irradiation	1.097		-12.132			
787	All GND'd Irradiation	68.480		21.046			
788	All GND'd Irradiation	-19.726		-86.204			
789	All GND'd Irradiation	-90.031		-94.933			
790	All GND'd Irradiation	269.953		285.066			
781	Biased Irradiation	-105.084		-117.692			
782	Biased Irradiation	46.444		14.629			
783	Biased Irradiation	-191.962		-238.217			
784	Biased Irradiation	-259.906		-234.228			
785	Biased Irradiation	-128.892		-106.805			
796	All GND'd Irradiation	-106.407			-104.131		
797	All GND'd Irradiation	-194.676			-187.150		
798	All GND'd Irradiation	-263.069			-252.894		
799	All GND'd Irradiation	8.867			-37.679		
800	All GND'd Irradiation	114.063			136.485		
791	Biased Irradiation	-285.368			-315.998		
792	Biased Irradiation	9.600			27.770		
793	Biased Irradiation	-100.989			-131.963		
794	Biased Irradiation	-46.683			-57.198		
795	Biased Irradiation	72.849			84.081		
806	All GND'd Irradiation	22.211				57.113	
807	All GND'd Irradiation	-133.578				-116.495	
808	All GND'd Irradiation	-245.074				-176.435	
809	All GND'd Irradiation	-29.223				-11.781	
810	All GND'd Irradiation	-31.203				-34.508	
801	Biased Irradiation	215.255				274.088	
802	Biased Irradiation	-275.463				-308.031	
803	Biased Irradiation	-66.465				-65.523	
804	Biased Irradiation	-70.700				-104.078	
805	Biased Irradiation	385.561				408.284	
816	All GND'd Irradiation	-289.306					-301.203
817	All GND'd Irradiation	-344.165					-284.526
818	All GND'd Irradiation	-28.124					-63.313
819	All GND'd Irradiation	-36.809					-54.992
820	All GND'd Irradiation	-94.758					-67.916
811	Biased Irradiation	-76.126					-68.754
812	Biased Irradiation	32.173					21.632
813	Biased Irradiation	27.106					128.121
814	Biased Irradiation	-18.798					-48.861
815	Biased Irradiation	-121.621					-134.703
832	Control Unit	-213.739	-181.034	-181.034	-181.034	-181.034	-181.034
833	Control Unit	20.315	39.963	39.963	39.963	39.963	39.963
All GND'd Irradiation Statistics							
Average All GND'd		-187.867	-135.592	22.568	-89.074	-56.421	-154.390
Std Dev All GND'd		97.177	121.951	154.717	150.167	91.344	126.631
Ps90%/90% (+KTL) All GND'd		78.591	198.797	446.802	322.685	194.044	192.834
Ps90%/90% (-KTL) All GND'd		-454.325	-469.980	-401.665	-500.832	-306.887	-501.613
Biased Irradiation Statistics							
Average Biased		-140.391	-152.135	-136.462	-78.662	40.948	-20.513
Std Dev Biased		46.576	55.528	104.848	156.079	293.021	100.048
Ps90%/90% (+KTL) Biased		-12.681	0.123	151.031	349.308	844.411	253.819
Ps90%/90% (-KTL) Biased		-268.101	-304.393	-423.956	-506.631	-762.515	-294.845
Specification MIN		-800	-950	-950	-950	-950	-950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		800	950	950	950	950	950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

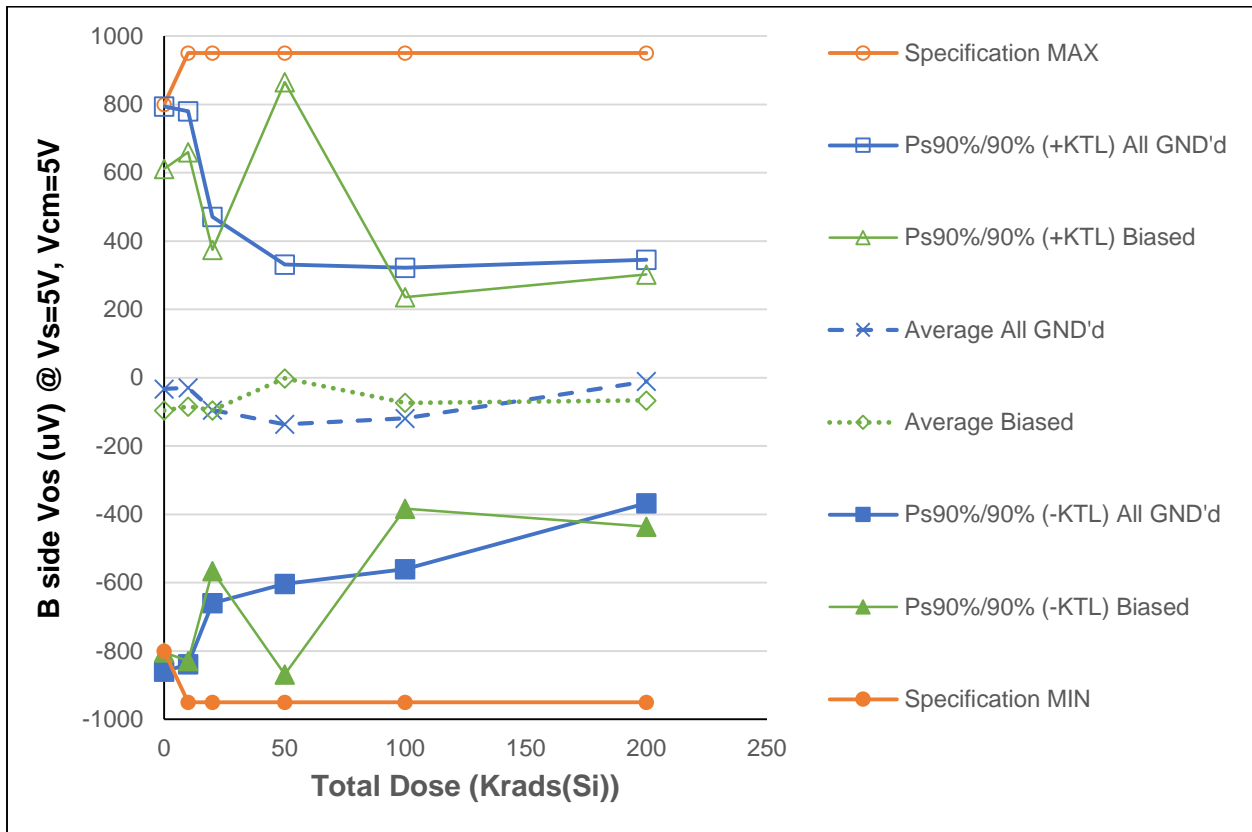


Figure 5.51: Plot of Vos (side B) @ Vcm = 5V versus Total Dose

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 Vos @ Vs=5V, Vcm=5V	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
Units	(uV)	0	10	20	50	100	200
776	All GND'd Irradiation	230.608	229.136				
777	All GND'd Irradiation	-293.377	-267.430				
778	All GND'd Irradiation	343.906	338.049				
779	All GND'd Irradiation	-301.451	-308.153				
780	All GND'd Irradiation	-144.613	-140.296				
771	Biased Irradiation	-191.711	-176.100				
772	Biased Irradiation	-440.263	-421.328				
773	Biased Irradiation	272.449	331.020				
774	Biased Irradiation	-78.064	-98.027				
775	Biased Irradiation	-43.632	-58.573				
786	All GND'd Irradiation	-304.172		-287.514			
787	All GND'd Irradiation	-224.224		-256.724			
788	All GND'd Irradiation	66.335		76.003			
789	All GND'd Irradiation	-121.995		-176.142			
790	All GND'd Irradiation	239.675		171.309			
781	Biased Irradiation	30.384		50.673			
782	Biased Irradiation	13.873		19.933			
783	Biased Irradiation	-52.396		-6.470			
784	Biased Irradiation	-403.841		-352.129			
785	Biased Irradiation	-204.120		-191.276			
796	All GND'd Irradiation	-343.745			-322.962		
797	All GND'd Irradiation	-113.841			-113.812		
798	All GND'd Irradiation	-304.962			-267.155		
799	All GND'd Irradiation	71.750			111.971		
800	All GND'd Irradiation	-68.754			-89.500		
791	Biased Irradiation	134.304			153.040		
792	Biased Irradiation	-223.092			-195.642		
793	Biased Irradiation	-108.617			-1.863		
794	Biased Irradiation	-347.836			-393.232		
795	Biased Irradiation	313.258			428.539		
806	All GND'd Irradiation	-340.100				-273.115	
807	All GND'd Irradiation	-120.877				-139.130	
808	All GND'd Irradiation	135.963				145.461	
809	All GND'd Irradiation	-145.128				-112.353	
810	All GND'd Irradiation	-262.322				-216.758	
801	Biased Irradiation	12.594				3.412	
802	Biased Irradiation	-98.269				-167.565	
803	Biased Irradiation	-49.519				-28.789	
804	Biased Irradiation	-85.486				-217.703	
805	Biased Irradiation	55.575				42.627	
816	All GND'd Irradiation	-11.182					20.516
817	All GND'd Irradiation	36.405					82.560
818	All GND'd Irradiation	-219.275					-199.715
819	All GND'd Irradiation	83.132					121.755
820	All GND'd Irradiation	-120.579					-78.832
811	Biased Irradiation	-64.877					-69.242
812	Biased Irradiation	-296.526					-285.654
813	Biased Irradiation	51.759					46.627
814	Biased Irradiation	52.111					41.651
815	Biased Irradiation	-55.231					-67.474
832	Control Unit	-197.175	-220.328	-220.328	-220.328	-220.328	-220.328
833	Control Unit	231.288	134.046	134.046	134.046	134.046	134.046
All GND'd Irradiation Statistics							
Average All GND'd		-32.985	-29.739	-94.613	-136.292	-119.179	-10.743
Std Dev All GND'd		301.607	295.177	206.132	170.514	161.010	129.986
Ps90%/90% (+KTL) All GND'd		794.021	779.637	470.601	331.258	322.311	345.677
Ps90%/90% (-KTL) All GND'd		-859.992	-839.114	-659.828	-603.842	-560.669	-367.164
Biased Irradiation Statistics							
Average Biased		-96.244	-84.602	-95.854	-1.832	-73.604	-66.818
Std Dev Biased		258.116	271.733	171.500	316.212	112.963	134.658
Ps90%/90% (+KTL) Biased		611.510	660.490	374.398	865.222	236.141	302.413
Ps90%/90% (-KTL) Biased		-803.998	-829.694	-566.106	-868.886	-383.348	-436.050
Specification MIN		-800	-950	-950	-950	-950	-950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		800	950	950	950	950	950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		FAIL	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		FAIL	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

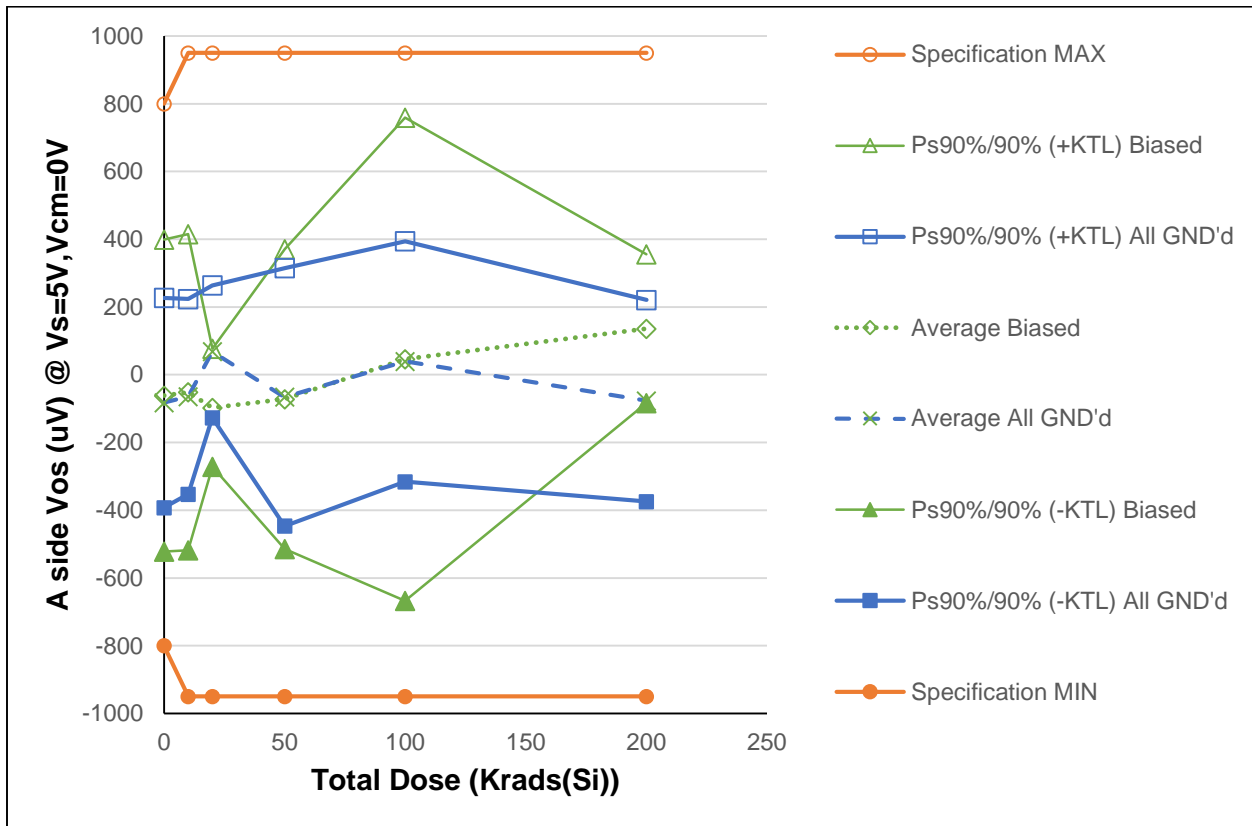


Figure 5.52: Plot of V_{os} (side A) @ $V_{cm} = 0V$ versus Total Dose

Table 5.52: Raw data for offset voltage (side A) @ 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 Vos @ Vs=5V,Vcm=0V	Total Dose (Krads(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
Units	(uV)						
776	All GND'd Irradiation	-90.977	-35.053				
777	All GND'd Irradiation	-272.979	-244.271				
778	All GND'd Irradiation	-39.514	-47.707				
779	All GND'd Irradiation	14.060	32.385				
780	All GND'd Irradiation	-23.636	-27.787				
771	Biased Irradiation	-83.655	-63.336				
772	Biased Irradiation	-136.188	-126.065				
773	Biased Irradiation	-112.098	-49.516				
774	Biased Irradiation	-203.891	-240.999				
775	Biased Irradiation	228.045	221.009				
786	All GND'd Irradiation	103.592		69.895			
787	All GND'd Irradiation	255.442		177.649			
788	All GND'd Irradiation	110.182		36.595			
789	All GND'd Irradiation	50.340		75.276			
790	All GND'd Irradiation	-7.516		-17.134			
781	Biased Irradiation	-176.051		-202.771			
782	Biased Irradiation	-32.535		-73.707			
783	Biased Irradiation	-34.626		-82.878			
784	Biased Irradiation	-22.835		-32.055			
785	Biased Irradiation	-116.618		-95.989			
796	All GND'd Irradiation	10.886			13.879		
797	All GND'd Irradiation	-236.221			-235.816		
798	All GND'd Irradiation	56.262			-6.432		
799	All GND'd Irradiation	-147.436			-188.212		
800	All GND'd Irradiation	78.073			87.160		
791	Biased Irradiation	-266.407			-304.590		
792	Biased Irradiation	65.385			38.142		
793	Biased Irradiation	12.163			17.941		
794	Biased Irradiation	57.922			65.525		
795	Biased Irradiation	-209.083			-176.191		
806	All GND'd Irradiation	-65.515				-57.537	
807	All GND'd Irradiation	-119.729				-133.761	
808	All GND'd Irradiation	136.289				144.905	
809	All GND'd Irradiation	53.831				82.149	
810	All GND'd Irradiation	136.532				160.622	
801	Biased Irradiation	224.870				206.667	
802	Biased Irradiation	-346.084				-372.544	
803	Biased Irradiation	-19.985				-0.625	
804	Biased Irradiation	126.438				94.440	
805	Biased Irradiation	401.468				301.281	
816	All GND'd Irradiation	-157.083					-149.684
817	All GND'd Irradiation	-209.721					-151.608
818	All GND'd Irradiation	24.393					20.288
819	All GND'd Irradiation	84.113					61.281
820	All GND'd Irradiation	-189.895					-164.837
811	Biased Irradiation	175.971					169.226
812	Biased Irradiation	134.960					131.257
813	Biased Irradiation	234.979					222.384
814	Biased Irradiation	37.382					5.900
815	Biased Irradiation	172.244					150.899
832	Control Unit	200.355	155.844	155.844	155.844	155.844	155.844
833	Control Unit	-23.088	-11.206	-11.206	-11.206	-11.206	-11.206
All GND'd Irradiation Statistics							
Average All GND'd		-82.609	-64.487	68.456	-65.884	39.275	-76.912
Std Dev All GND'd		112.905	105.121	71.261	138.889	129.455	108.572
Ps90%/90% (+KTL) All GND'd		226.977	223.754	263.853	314.948	394.242	220.791
Ps90%/90% (-KTL) All GND'd		-392.196	-352.727	-126.941	-446.717	-315.691	-374.616
Biased Irradiation Statistics							
Average Biased		-61.557	-51.781	-97.480	-71.835	45.844	135.933
Std Dev Biased		167.884	170.202	63.536	161.313	260.135	80.213
Ps90%/90% (+KTL) Biased		398.782	414.911	76.736	370.485	759.135	355.877
Ps90%/90% (-KTL) Biased		-521.896	-518.474	-271.696	-514.155	-667.447	-84.011
Specification MIN		-800	-950	-950	-950	-950	-950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		800	950	950	950	950	950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

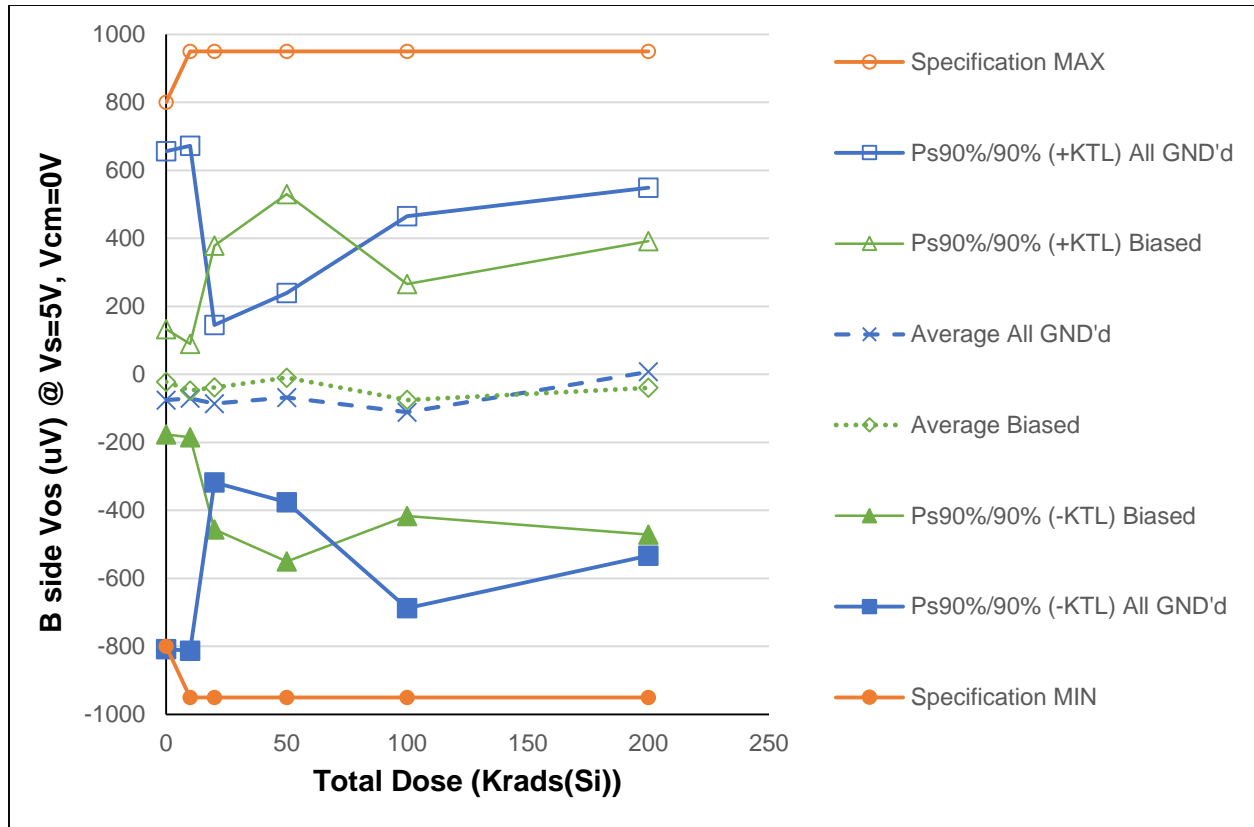


Figure 5.53: Plot of Vos (side B) @ Vcm = 0V versus Total Dose

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 Units	B Vos @ Vs=5V, Vcm=0V (uV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	183.935	173.062				
777	All GND'd Irradiation	-469.957	-464.192				
778	All GND'd Irradiation	62.958	64.599				
779	All GND'd Irradiation	-224.668	-236.941				
780	All GND'd Irradiation	68.057	111.338				
771	Biased Irradiation	-31.997	-47.341				
772	Biased Irradiation	-93.911	-131.232				
773	Biased Irradiation	-52.755	-36.208				
774	Biased Irradiation	43.258	1.313				
775	Biased Irradiation	25.824	-24.016				
786	All GND'd Irradiation	21.158		27.508			
787	All GND'd Irradiation	-145.193		-181.126			
788	All GND'd Irradiation	-53.239		-54.504			
789	All GND'd Irradiation	-65.854		-157.777			
790	All GND'd Irradiation	-23.331		-65.141			
781	Biased Irradiation	-77.790		-70.000			
782	Biased Irradiation	156.157		112.402			
783	Biased Irradiation	28.564		18.139			
784	Biased Irradiation	-335.369		-285.109			
785	Biased Irradiation	17.201		31.622			
796	All GND'd Irradiation	-129.194			-106.897		
797	All GND'd Irradiation	-48.543			-43.169		
798	All GND'd Irradiation	-244.590			-188.472		
799	All GND'd Irradiation	97.472			109.928		
800	All GND'd Irradiation	-110.299			-113.116		
791	Biased Irradiation	290.108			290.823		
792	Biased Irradiation	-44.178			-49.733		
793	Biased Irradiation	-137.878			-157.948		
794	Biased Irradiation	-166.607			-198.931		
795	Biased Irradiation	46.475			65.426		
806	All GND'd Irradiation	-452.656				-422.704	
807	All GND'd Irradiation	-26.693				-68.407	
808	All GND'd Irradiation	127.157				153.219	
809	All GND'd Irradiation	-56.101				-46.937	
810	All GND'd Irradiation	-200.014				-172.077	
801	Biased Irradiation	-195.790				-261.631	
802	Biased Irradiation	-51.870				-107.328	
803	Biased Irradiation	-26.781				-35.362	
804	Biased Irradiation	-22.751				-51.818	
805	Biased Irradiation	73.159				79.391	
816	All GND'd Irradiation	63.814					143.301
817	All GND'd Irradiation	209.626					270.061
818	All GND'd Irradiation	-59.317					-29.887
819	All GND'd Irradiation	-143.163					-144.556
820	All GND'd Irradiation	-242.841					-201.929
811	Biased Irradiation	8.566					2.670
812	Biased Irradiation	-313.940					-307.558
813	Biased Irradiation	71.368					43.575
814	Biased Irradiation	109.114					96.422
815	Biased Irradiation	-14.384					-33.057
832	Control Unit	-266.473	-310.320	-310.320	-310.320	-310.320	-310.320
833	Control Unit	-12.006	-11.431	-11.431	-11.431	-11.431	-11.431
All GND'd Irradiation Statistics							
Average All GND'd		-75.935	-70.427	-86.208	-68.345	-111.381	7.398
Std Dev All GND'd		266.895	270.802	84.427	112.179	210.130	197.332
Ps90%/90% (+KTL) All GND'd		655.891	672.113	145.291	239.249	464.796	548.482
Ps90%/90% (-KTL) All GND'd		-807.761	-812.966	-317.707	-375.939	-687.558	-533.686
Biased Irradiation Statistics							
Average Biased		-21.916	-47.497	-38.589	-10.073	-75.350	-39.590
Std Dev Biased		56.486	50.182	152.237	197.070	124.319	157.362
Ps90%/90% (+KTL) Biased		132.969	90.101	378.845	530.292	265.533	391.897
Ps90%/90% (-KTL) Biased		-176.801	-185.095	-456.024	-550.437	-416.232	-471.076
Specification MIN		-800	-950	-950	-950	-950	-950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		800	950	950	950	950	950
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		FAIL	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

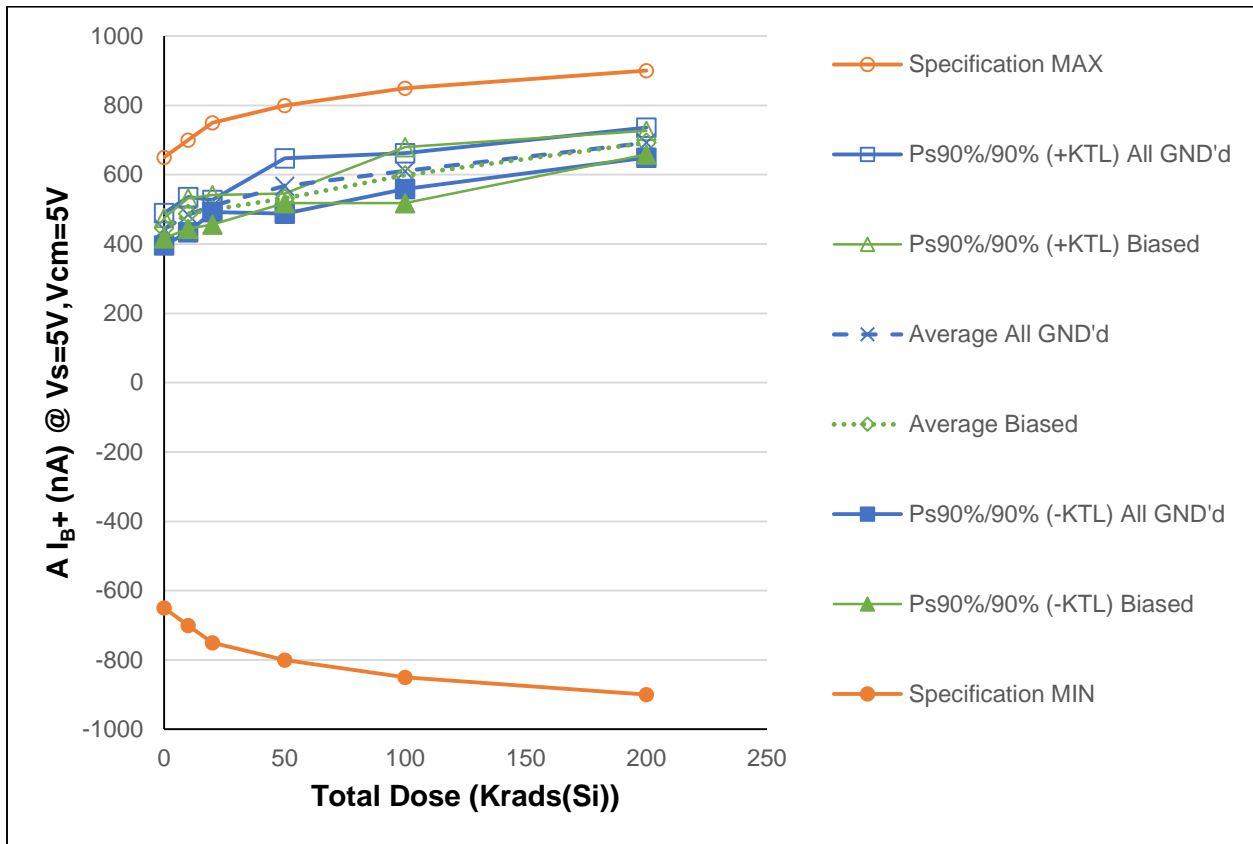


Figure 5.54: Plot of Positive Input Bias Current I_{B+} (side A) @ $V_{cm} = 5V$ versus Total Dose

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 Units	A _{IB+} @ Vs=5V,Vcm=5V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	442.332	485.423				
777	All GND'd Irradiation	421.255	461.314				
778	All GND'd Irradiation	431.918	473.942				
779	All GND'd Irradiation	461.121	509.468				
780	All GND'd Irradiation	458.371	494.119				
771	Biased Irradiation	430.886	462.872				
772	Biased Irradiation	454.533	499.644				
773	Biased Irradiation	442.542	486.551				
774	Biased Irradiation	458.402	503.527				
775	Biased Irradiation	445.188	488.042				
786	All GND'd Irradiation	443.849		500.909			
787	All GND'd Irradiation	454.292		515.563			
788	All GND'd Irradiation	456.586		514.112			
789	All GND'd Irradiation	453.732		505.809			
790	All GND'd Irradiation	459.351		513.230			
781	Biased Irradiation	469.548		518.405			
782	Biased Irradiation	434.145		483.510			
783	Biased Irradiation	458.771		512.732			
784	Biased Irradiation	439.346		488.266			
785	Biased Irradiation	446.535		492.092			
796	All GND'd Irradiation	441.653			559.305		
797	All GND'd Irradiation	447.019			559.334		
798	All GND'd Irradiation	487.343			614.612		
799	All GND'd Irradiation	422.805			535.145		
800	All GND'd Irradiation	457.673			567.606		
791	Biased Irradiation	435.966			529.314		
792	Biased Irradiation	429.565			530.036		
793	Biased Irradiation	435.254			538.651		
794	Biased Irradiation	427.409			526.245		
795	Biased Irradiation	434.539			535.273		
806	All GND'd Irradiation	434.426				600.146	
807	All GND'd Irradiation	463.489				637.339	
808	All GND'd Irradiation	432.028				606.073	
809	All GND'd Irradiation	458.153				620.694	
810	All GND'd Irradiation	432.633				588.472	
801	Biased Irradiation	430.780				590.328	
802	Biased Irradiation	431.669				588.112	
803	Biased Irradiation	480.964				649.905	
804	Biased Irradiation	428.031				573.142	
805	Biased Irradiation	447.093				593.140	
816	All GND'd Irradiation	428.567					677.844
817	All GND'd Irradiation	461.279					716.910
818	All GND'd Irradiation	432.906					689.619
819	All GND'd Irradiation	438.670					680.420
820	All GND'd Irradiation	458.986					697.623
811	Biased Irradiation	459.272					686.440
812	Biased Irradiation	441.870					674.714
813	Biased Irradiation	461.499					699.453
814	Biased Irradiation	460.947					695.108
815	Biased Irradiation	475.824					707.449
832	Control Unit	462.381	472.101	472.101	472.101	472.101	472.101
833	Control Unit	465.350	472.161	472.161	472.161	472.161	472.161
All GND'd Irradiation Statistics							
Average All GND'd		442.999	484.853	509.924	567.201	610.545	692.483
Std Dev All GND'd		17.035	18.474	6.294	29.154	18.949	15.741
Ps90%/90% (+KTL) All GND'd		489.709	535.510	527.183	647.140	662.503	735.645
Ps90%/90% (-KTL) All GND'd		396.289	434.196	492.665	487.261	558.586	649.321
Biased Irradiation Statistics							
Average Biased		446.310	488.127	499.001	531.904	598.925	692.633
Std Dev Biased		10.807	15.891	15.556	4.977	29.530	12.566
Ps90%/90% (+KTL) Biased		475.943	531.700	541.657	545.552	679.895	727.088
Ps90%/90% (-KTL) Biased		416.677	444.554	456.346	518.256	517.955	658.177
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

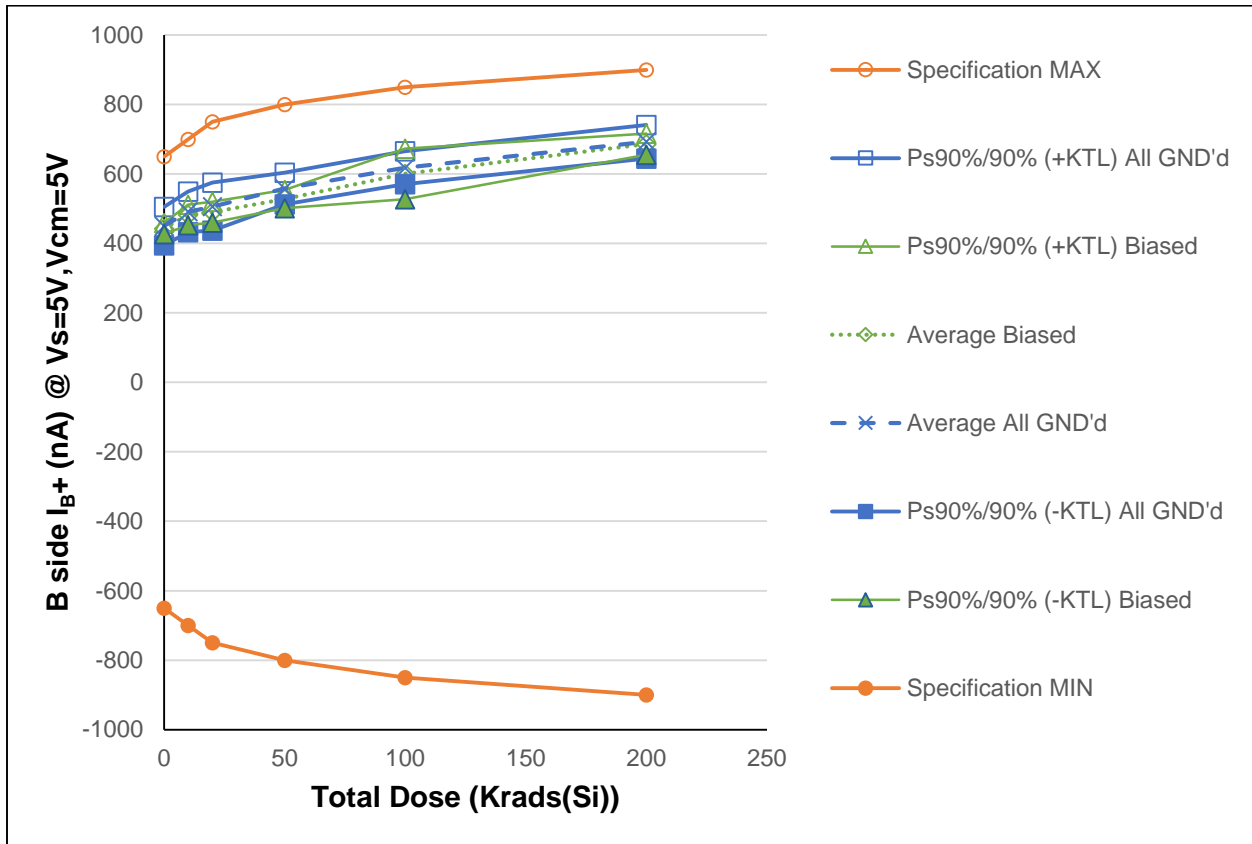


Figure 5.55: Plot of Positive Input Bias Current I_{B+} (side B) @ $V_{cm} = 5V$ versus Total Dose

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 Units	B I _{B+} @ Vs=5V,Vcm=5V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	441.695	480.542				
777	All GND'd Irradiation	427.493	468.364				
778	All GND'd Irradiation	438.657	480.325				
779	All GND'd Irradiation	467.970	506.489				
780	All GND'd Irradiation	474.474	520.105				
771	Biased Irradiation	434.088	464.801				
772	Biased Irradiation	448.191	491.812				
773	Biased Irradiation	447.569	489.418				
774	Biased Irradiation	440.609	479.870				
775	Biased Irradiation	444.015	485.896				
786	All GND'd Irradiation	438.384		495.359			
787	All GND'd Irradiation	450.804		510.918			
788	All GND'd Irradiation	485.577		547.089			
789	All GND'd Irradiation	429.416		481.144			
790	All GND'd Irradiation	443.595		496.347			
781	Biased Irradiation	448.889		495.248			
782	Biased Irradiation	445.861		495.219			
783	Biased Irradiation	449.267		501.789			
784	Biased Irradiation	436.182		483.302			
785	Biased Irradiation	431.090		474.926			
796	All GND'd Irradiation	453.137			566.208		
797	All GND'd Irradiation	447.267			563.484		
798	All GND'd Irradiation	457.947			577.624		
799	All GND'd Irradiation	428.804			534.785		
800	All GND'd Irradiation	441.207			548.286		
791	Biased Irradiation	428.313			521.082		
792	Biased Irradiation	435.614			534.116		
793	Biased Irradiation	424.768			529.838		
794	Biased Irradiation	433.501			539.784		
795	Biased Irradiation	418.962			516.240		
806	All GND'd Irradiation	443.824				611.901	
807	All GND'd Irradiation	474.554				645.134	
808	All GND'd Irradiation	438.937				609.188	
809	All GND'd Irradiation	458.087				624.393	
810	All GND'd Irradiation	439.795				600.089	
801	Biased Irradiation	432.113				585.135	
802	Biased Irradiation	444.440				604.649	
803	Biased Irradiation	465.026				631.945	
804	Biased Irradiation	415.596				563.659	
805	Biased Irradiation	462.256				615.850	
816	All GND'd Irradiation	454.921					713.259
817	All GND'd Irradiation	456.011					708.769
818	All GND'd Irradiation	433.760					687.512
819	All GND'd Irradiation	441.290					683.954
820	All GND'd Irradiation	437.437					670.805
811	Biased Irradiation	456.062					689.680
812	Biased Irradiation	447.680					674.988
813	Biased Irradiation	442.756					676.988
814	Biased Irradiation	472.131					702.560
815	Biased Irradiation	452.881					686.878
832	Control Unit	451.155	458.106	458.106	458.106	458.106	458.106
833	Control Unit	450.288	455.639	455.639	455.639	455.639	455.639
All GND'd Irradiation Statistics							
Average All GND'd		450.058	491.165	506.171	558.077	618.141	692.860
Std Dev All GND'd		20.162	21.346	25.182	16.702	17.412	17.773
Ps90%/90% (+KTL) All GND'd		505.343	549.696	575.221	603.874	665.884	741.595
Ps90%/90% (-KTL) All GND'd		394.773	432.634	437.122	512.281	570.398	644.125
Biased Irradiation Statistics							
Average Biased		442.894	482.359	490.097	528.212	600.247	686.219
Std Dev Biased		5.786	10.796	10.791	9.560	26.621	11.077
Ps90%/90% (+KTL) Biased		458.761	511.961	519.687	554.426	673.241	716.592
Ps90%/90% (-KTL) Biased		427.028	452.757	460.507	501.998	527.254	655.846
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

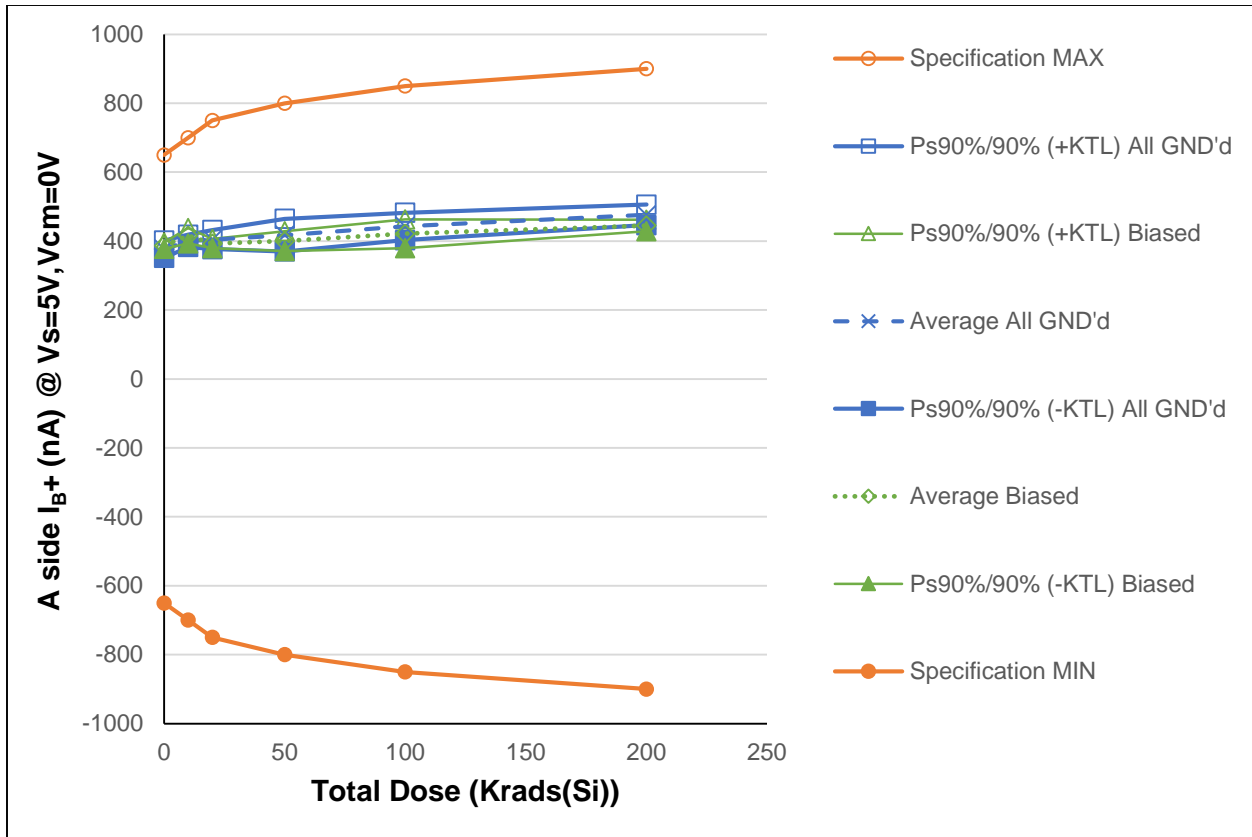


Figure 5.56: Plot of Positive Input Bias Current I_{B+} (side A) @ $V_{cm} = 0V$ versus Total Dose

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 Units	A _{IS+} @ Vs=5V,Vcm=0V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	378.918	405.737				
777	All GND'd Irradiation	371.722	401.001				
778	All GND'd Irradiation	362.602	390.282				
779	All GND'd Irradiation	383.105	406.789				
780	All GND'd Irradiation	384.895	399.769				
771	Biased Irradiation	382.158	401.731				
772	Biased Irradiation	391.338	421.633				
773	Biased Irradiation	386.280	415.932				
774	Biased Irradiation	388.995	419.020				
775	Biased Irradiation	386.579	420.690				
786	All GND'd Irradiation	371.614		396.355			
787	All GND'd Irradiation	371.991		397.233			
788	All GND'd Irradiation	386.945		410.593			
789	All GND'd Irradiation	397.796		419.060			
790	All GND'd Irradiation	379.344		398.264			
781	Biased Irradiation	366.104		386.443			
782	Biased Irradiation	375.136		396.378			
783	Biased Irradiation	376.907		399.034			
784	Biased Irradiation	366.831		391.187			
785	Biased Irradiation	370.289		390.986			
796	All GND'd Irradiation	366.425			409.233		
797	All GND'd Irradiation	389.080			430.401		
798	All GND'd Irradiation	394.633			439.124		
799	All GND'd Irradiation	355.337			396.664		
800	All GND'd Irradiation	370.389			409.896		
791	Biased Irradiation	361.226			387.041		
792	Biased Irradiation	365.493			394.867		
793	Biased Irradiation	364.913			397.774		
794	Biased Irradiation	385.269			414.484		
795	Biased Irradiation	375.340			406.072		
806	All GND'd Irradiation	401.566				461.916	
807	All GND'd Irradiation	364.863				434.700	
808	All GND'd Irradiation	361.214				423.975	
809	All GND'd Irradiation	387.591				450.013	
810	All GND'd Irradiation	387.248				443.151	
801	Biased Irradiation	369.798				414.487	
802	Biased Irradiation	368.500				410.847	
803	Biased Irradiation	392.812				442.099	
804	Biased Irradiation	357.167				406.255	
805	Biased Irradiation	389.421				432.449	
816	All GND'd Irradiation	374.497					470.647
817	All GND'd Irradiation	386.631					495.476
818	All GND'd Irradiation	367.088					472.681
819	All GND'd Irradiation	371.750					470.922
820	All GND'd Irradiation	373.871					471.595
811	Biased Irradiation	386.711					447.973
812	Biased Irradiation	370.041					439.376
813	Biased Irradiation	378.254					443.420
814	Biased Irradiation	385.722					454.298
815	Biased Irradiation	375.469					440.278
832	Control Unit	400.376	410.779	410.779	410.779	410.779	410.779
833	Control Unit	381.090	386.915	386.915	386.915	386.915	386.915
All GND'd Irradiation Statistics							
Average All GND'd		376.248	400.715	404.301	417.064	442.751	476.264
Std Dev All GND'd		9.160	6.556	10.087	17.273	14.470	10.768
Ps90%/90% (+KTL) All GND'd		401.365	418.693	431.959	464.425	482.429	505.790
Ps90%/90% (-KTL) All GND'd		351.132	382.738	376.643	369.702	403.073	446.737
Biased Irradiation Statistics							
Average Biased		387.070	415.801	392.805	400.048	421.227	445.069
Std Dev Biased		3.424	8.159	4.949	10.558	15.321	6.158
Ps90%/90% (+KTL) Biased		396.460	438.172	406.376	428.998	463.237	461.954
Ps90%/90% (-KTL) Biased		377.680	393.430	379.235	371.098	379.218	428.184
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

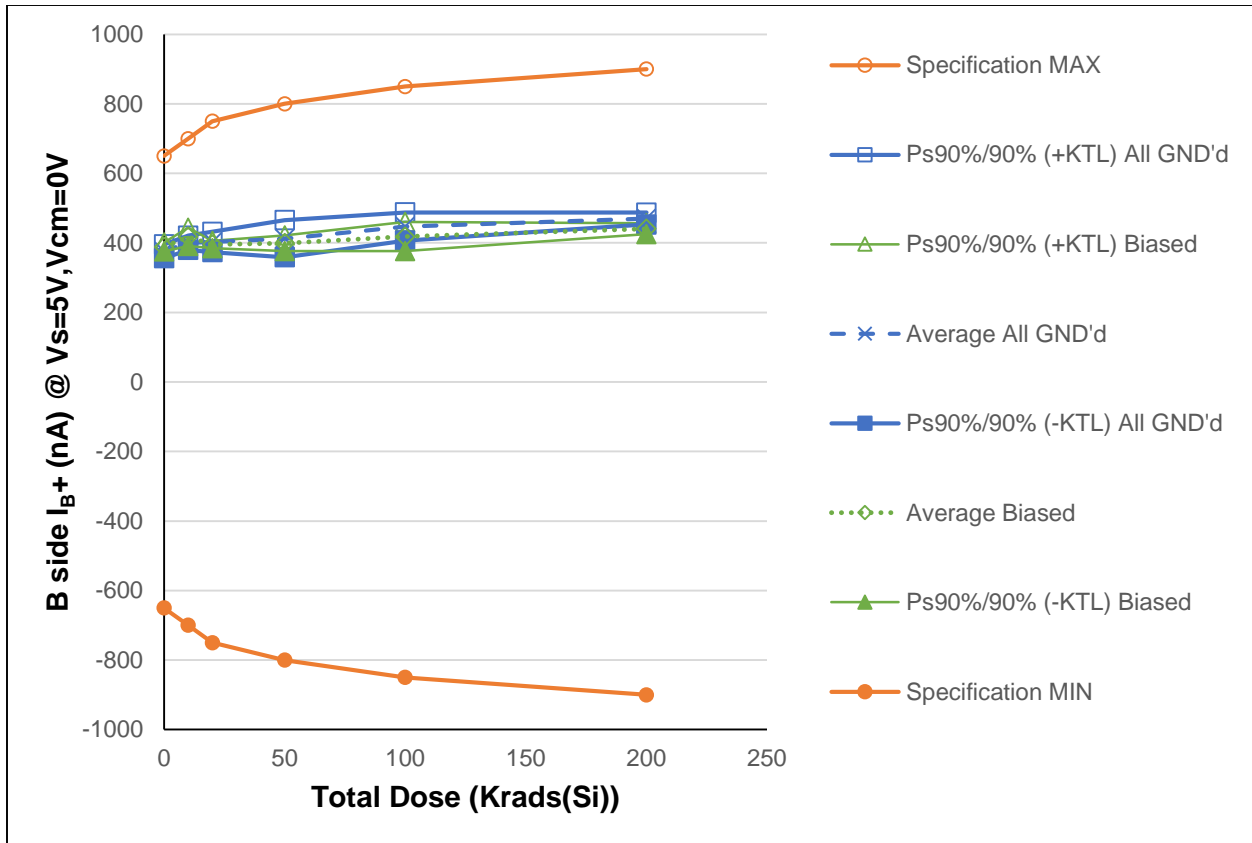


Figure 5.57: Plot of Positive Input Bias Current I_{B+} (side B) @ $V_{cm} = 0V$ versus Total Dose

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 Units	B Ib+ @ Vs=5V,Vcm=0V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	378.225	405.340				
777	All GND'd Irradiation	379.274	408.861				
778	All GND'd Irradiation	362.982	390.222				
779	All GND'd Irradiation	378.282	401.356				
780	All GND'd Irradiation	380.601	395.945				
771	Biased Irradiation	380.724	401.026				
772	Biased Irradiation	390.793	422.325				
773	Biased Irradiation	389.387	420.390				
774	Biased Irradiation	392.498	420.848				
775	Biased Irradiation	388.984	424.704				
786	All GND'd Irradiation	372.074		397.115			
787	All GND'd Irradiation	368.044		392.794			
788	All GND'd Irradiation	388.623		413.833			
789	All GND'd Irradiation	394.155		414.890			
790	All GND'd Irradiation	377.018		395.244			
781	Biased Irradiation	372.208		391.832			
782	Biased Irradiation	377.895		399.995			
783	Biased Irradiation	376.091		397.815			
784	Biased Irradiation	373.687		397.237			
785	Biased Irradiation	371.741		391.400			
796	All GND'd Irradiation	365.168			405.101		
797	All GND'd Irradiation	389.449			433.936		
798	All GND'd Irradiation	388.370			431.582		
799	All GND'd Irradiation	351.935			391.129		
800	All GND'd Irradiation	363.514			398.946		
791	Biased Irradiation	361.532			387.026		
792	Biased Irradiation	370.153			399.990		
793	Biased Irradiation	366.301			396.966		
794	Biased Irradiation	374.469			403.177		
795	Biased Irradiation	379.475			409.032		
806	All GND'd Irradiation	397.949				460.301	
807	All GND'd Irradiation	368.824				435.151	
808	All GND'd Irradiation	363.857				427.476	
809	All GND'd Irradiation	395.471				457.590	
810	All GND'd Irradiation	399.398				454.910	
801	Biased Irradiation	360.586				403.825	
802	Biased Irradiation	372.653				415.194	
803	Biased Irradiation	386.614				434.466	
804	Biased Irradiation	356.895				403.371	
805	Biased Irradiation	389.932				433.424	
816	All GND'd Irradiation	373.951					470.881
817	All GND'd Irradiation	380.234					479.372
818	All GND'd Irradiation	363.447					462.219
819	All GND'd Irradiation	372.990					469.647
820	All GND'd Irradiation	374.339					467.807
811	Biased Irradiation	387.562					445.601
812	Biased Irradiation	372.142					435.441
813	Biased Irradiation	371.328					435.411
814	Biased Irradiation	383.419					447.537
815	Biased Irradiation	376.962					439.322
832	Control Unit	393.574	404.046	404.046	404.046	404.046	404.046
833	Control Unit	387.941	394.461	394.461	394.461	394.461	394.461
All GND'd Irradiation Statistics							
Average All GND'd		375.873	400.345	402.775	412.139	447.086	469.985
Std Dev All GND'd		7.270	7.422	10.694	19.481	14.775	6.207
Ps90%/90% (+KTL) All GND'd		395.808	420.695	432.097	465.557	487.598	487.004
Ps90%/90% (-KTL) All GND'd		355.937	379.994	373.453	358.721	406.573	452.967
Biased Irradiation Statistics							
Average Biased		388.477	417.859	395.656	399.238	418.056	440.662
Std Dev Biased		4.548	9.559	3.832	8.159	15.263	5.663
Ps90%/90% (+KTL) Biased		400.947	444.069	406.162	421.611	459.907	456.191
Ps90%/90% (-KTL) Biased		376.007	391.648	385.150	376.865	376.205	425.134
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

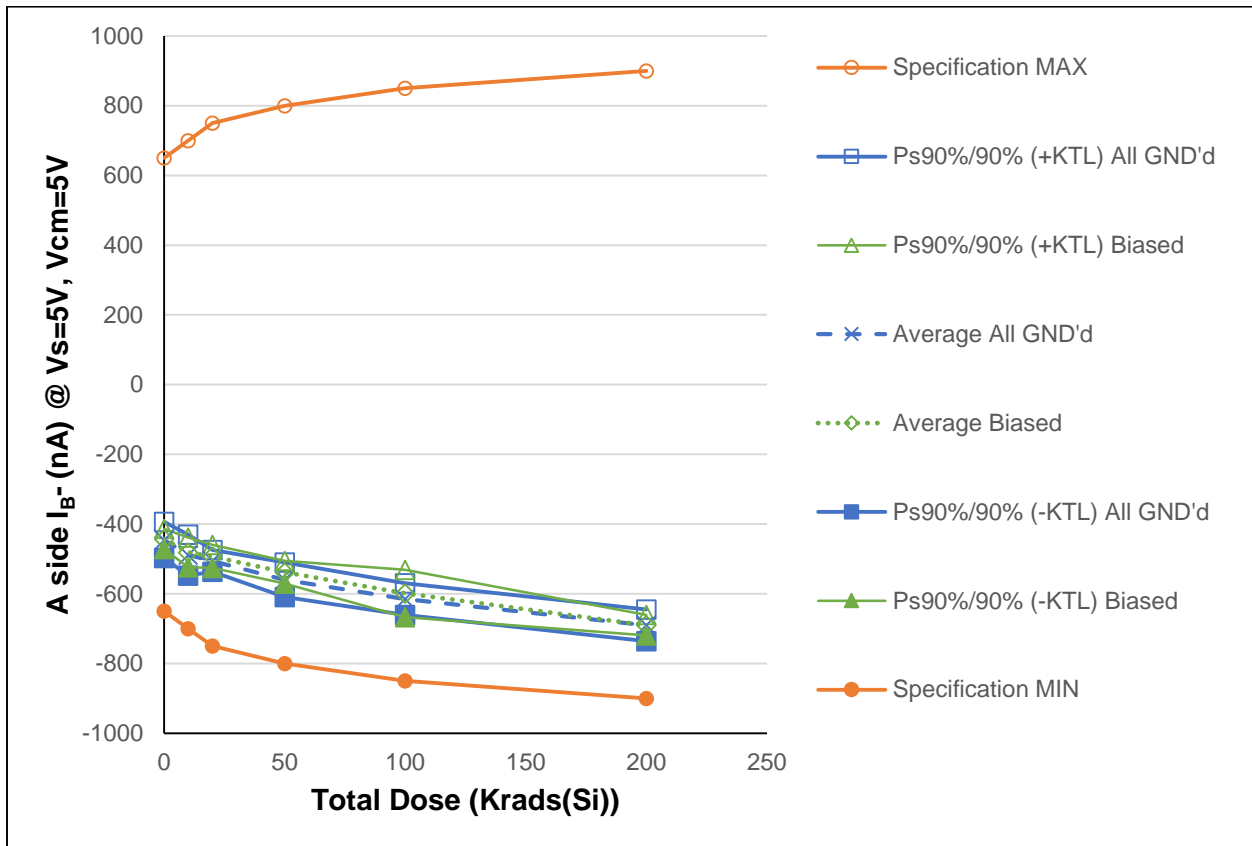


Figure 5.58: Plot of Negative Input Bias Current I_{B-} - (side A) @ $V_{cm} = 5V$ versus Total Dose

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 Units	A _{I_B} @ Vs=5V, Vcm=5V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-444.876	-489.567				
777	All GND'd Irradiation	-419.051	-459.969				
778	All GND'd Irradiation	-439.564	-485.261				
779	All GND'd Irradiation	-470.338	-520.185				
780	All GND'd Irradiation	-453.843	-488.572				
771	Biased Irradiation	-427.507	-459.912				
772	Biased Irradiation	-439.717	-475.343				
773	Biased Irradiation	-456.236	-502.522				
774	Biased Irradiation	-446.094	-484.567				
775	Biased Irradiation	-444.270	-484.990				
786	All GND'd Irradiation	-435.414		-492.458			
787	All GND'd Irradiation	-443.178		-502.724			
788	All GND'd Irradiation	-457.968		-513.781			
789	All GND'd Irradiation	-446.220		-499.012			
790	All GND'd Irradiation	-465.699		-520.532			
781	Biased Irradiation	-447.254		-496.573			
782	Biased Irradiation	-434.253		-485.631			
783	Biased Irradiation	-458.063		-511.875			
784	Biased Irradiation	-438.206		-487.825			
785	Biased Irradiation	-436.634		-481.607			
796	All GND'd Irradiation	-452.351			-570.109		
797	All GND'd Irradiation	-442.526			-554.137		
798	All GND'd Irradiation	-463.161			-584.127		
799	All GND'd Irradiation	-420.388			-536.093		
800	All GND'd Irradiation	-443.778			-554.137		
791	Biased Irradiation	-429.426			-523.873		
792	Biased Irradiation	-452.962			-554.054		
793	Biased Irradiation	-439.439			-545.572		
794	Biased Irradiation	-432.204			-537.312		
795	Biased Irradiation	-428.759			-531.189		
806	All GND'd Irradiation	-456.603				-621.413	
807	All GND'd Irradiation	-453.531				-630.629	
808	All GND'd Irradiation	-428.202				-601.444	
809	All GND'd Irradiation	-462.933				-628.476	
810	All GND'd Irradiation	-436.940				-593.706	
801	Biased Irradiation	-431.079				-591.172	
802	Biased Irradiation	-429.064				-585.003	
803	Biased Irradiation	-463.570				-636.077	
804	Biased Irradiation	-422.409				-572.883	
805	Biased Irradiation	-459.589				-610.425	
816	All GND'd Irradiation	-424.115					-673.695
817	All GND'd Irradiation	-460.815					-713.378
818	All GND'd Irradiation	-442.506					-702.225
819	All GND'd Irradiation	-435.852					-679.319
820	All GND'd Irradiation	-448.754					-683.598
811	Biased Irradiation	-448.063					-683.281
812	Biased Irradiation	-446.952					-683.354
813	Biased Irradiation	-467.222					-708.276
814	Biased Irradiation	-457.942					-692.757
815	Biased Irradiation	-448.295					-684.695
832	Control Unit	-455.259	-464.507	-464.507	-464.507	-464.507	-464.507
833	Control Unit	-447.452	-453.629	-453.629	-453.629	-453.629	-453.629
All GND'd Irradiation Statistics							
Average All GND'd		-445.535	-488.711	-505.701	-559.721	-615.134	-690.443
Std Dev All GND'd		18.853	21.386	11.338	18.195	16.614	16.703
Ps90%/90% (+KTL) All GND'd		-393.840	-430.072	-474.612	-509.830	-569.577	-644.644
Ps90%/90% (-KTL) All GND'd		-497.229	-547.350	-536.791	-609.612	-660.690	-736.242
Biased Irradiation Statistics							
Average Biased		-442.765	-481.467	-492.702	-538.400	-599.112	-690.473
Std Dev Biased		10.451	15.552	12.036	11.839	24.721	10.700
Ps90%/90% (+KTL) Biased		-414.108	-438.824	-459.699	-505.936	-531.328	-661.134
Ps90%/90% (-KTL) Biased		-471.421	-524.110	-525.705	-570.864	-666.896	-719.812
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

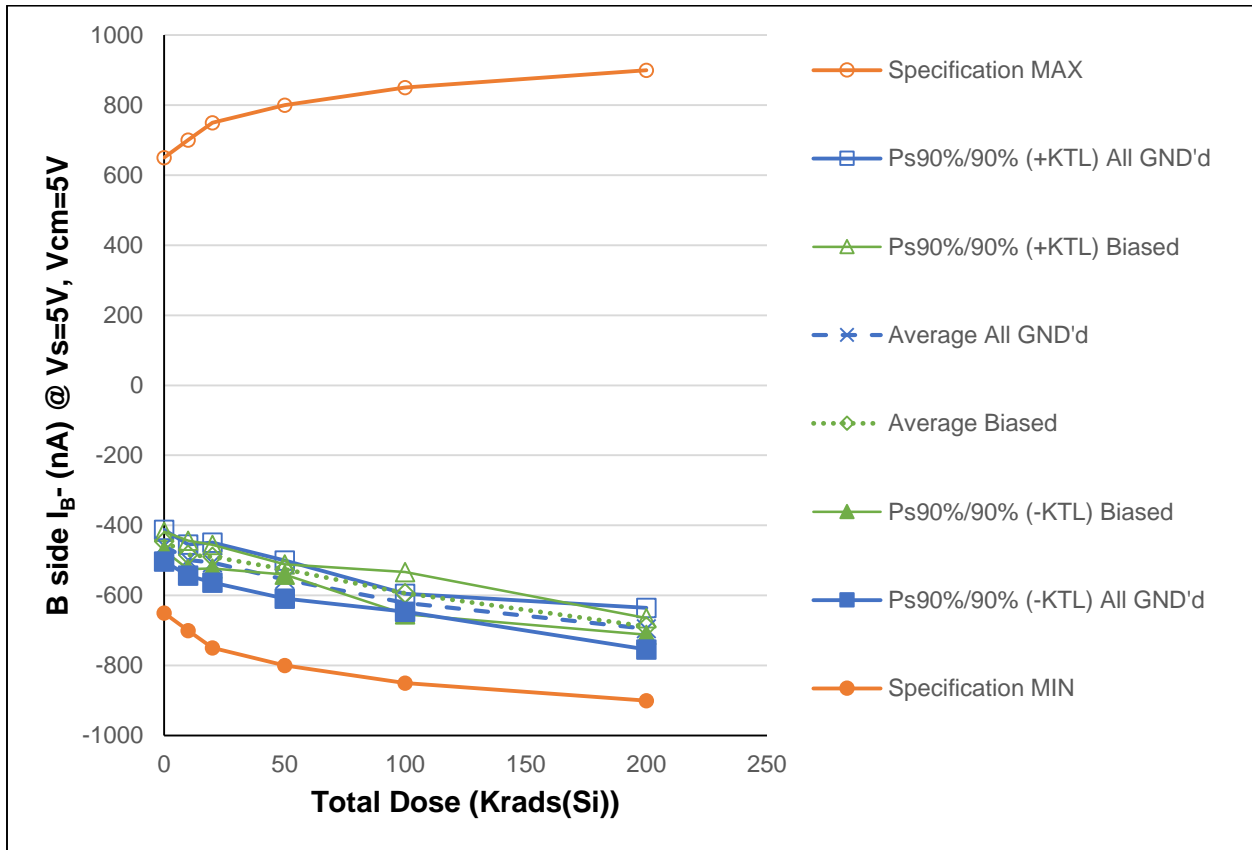


Figure 5.59: Plot of Negative Input Bias Current I_{B-} - (side B) @ $V_{cm} = 5V$ versus Total Dose

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 Units	B _{Ib} - @ Vs=5V, Vcm=5V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-448.463	-489.136				
777	All GND'd Irradiation	-436.146	-477.187				
778	All GND'd Irradiation	-458.613	-505.760				
779	All GND'd Irradiation	-478.329	-519.454				
780	All GND'd Irradiation	-467.492	-502.000				
771	Biased Irradiation	-431.579	-462.922				
772	Biased Irradiation	-449.512	-492.089				
773	Biased Irradiation	-448.231	-488.743				
774	Biased Irradiation	-438.905	-475.876				
775	Biased Irradiation	-456.503	-500.925				
786	All GND'd Irradiation	-438.653		-495.800			
787	All GND'd Irradiation	-440.786		-497.762			
788	All GND'd Irradiation	-482.755		-543.016			
789	All GND'd Irradiation	-440.545		-493.411			
790	All GND'd Irradiation	-448.662		-500.856			
781	Biased Irradiation	-440.206		-485.722			
782	Biased Irradiation	-456.258		-509.788			
783	Biased Irradiation	-435.101		-486.412			
784	Biased Irradiation	-429.735		-476.475			
785	Biased Irradiation	-442.125		-488.199			
796	All GND'd Irradiation	-439.882			-550.422		
797	All GND'd Irradiation	-446.829			-561.716		
798	All GND'd Irradiation	-457.697			-578.644		
799	All GND'd Irradiation	-420.949			-524.068		
800	All GND'd Irradiation	-450.154			-557.220		
791	Biased Irradiation	-435.990			-529.543		
792	Biased Irradiation	-423.085			-521.618		
793	Biased Irradiation	-427.716			-531.768		
794	Biased Irradiation	-419.204			-519.172		
795	Biased Irradiation	-425.310			-526.053		
806	All GND'd Irradiation	-450.436				-615.923	
807	All GND'd Irradiation	-464.153				-631.734	
808	All GND'd Irradiation	-450.765				-621.684	
809	All GND'd Irradiation	-462.470				-627.394	
810	All GND'd Irradiation	-448.281				-607.815	
801	Biased Irradiation	-435.730				-591.126	
802	Biased Irradiation	-436.787				-597.055	
803	Biased Irradiation	-455.159				-618.010	
804	Biased Irradiation	-415.312				-558.138	
805	Biased Irradiation	-448.647				-602.866	
816	All GND'd Irradiation	-442.460					-703.254
817	All GND'd Irradiation	-473.383					-727.982
818	All GND'd Irradiation	-434.849					-689.603
819	All GND'd Irradiation	-444.021					-684.093
820	All GND'd Irradiation	-445.915					-671.150
811	Biased Irradiation	-458.457					-696.648
812	Biased Irradiation	-447.685					-680.214
813	Biased Irradiation	-445.243					-689.911
814	Biased Irradiation	-466.214					-697.104
815	Biased Irradiation	-450.795					-679.285
832	Control Unit	-449.363	-456.430	-456.430	-456.430	-456.430	-456.430
833	Control Unit	-460.196	-465.303	-465.303	-465.303	-465.303	-465.303
All GND'd Irradiation Statistics							
Average All GND'd		-457.808	-498.707	-506.169	-554.414	-620.910	-695.216
Std Dev All GND'd		16.372	16.169	20.778	19.907	9.436	21.637
Ps90%/90% (+KTL) All GND'd		-412.917	-454.372	-449.196	-499.829	-595.036	-635.888
Ps90%/90% (-KTL) All GND'd		-502.699	-543.042	-563.142	-608.999	-646.784	-754.545
Biased Irradiation Statistics							
Average Biased		-444.946	-484.111	-489.319	-525.631	-593.439	-688.632
Std Dev Biased		9.752	14.871	12.314	5.267	22.120	8.601
Ps90%/90% (+KTL) Biased		-418.207	-443.335	-455.553	-511.188	-532.786	-665.049
Ps90%/90% (-KTL) Biased		-471.685	-524.887	-523.085	-540.073	-654.092	-712.216
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

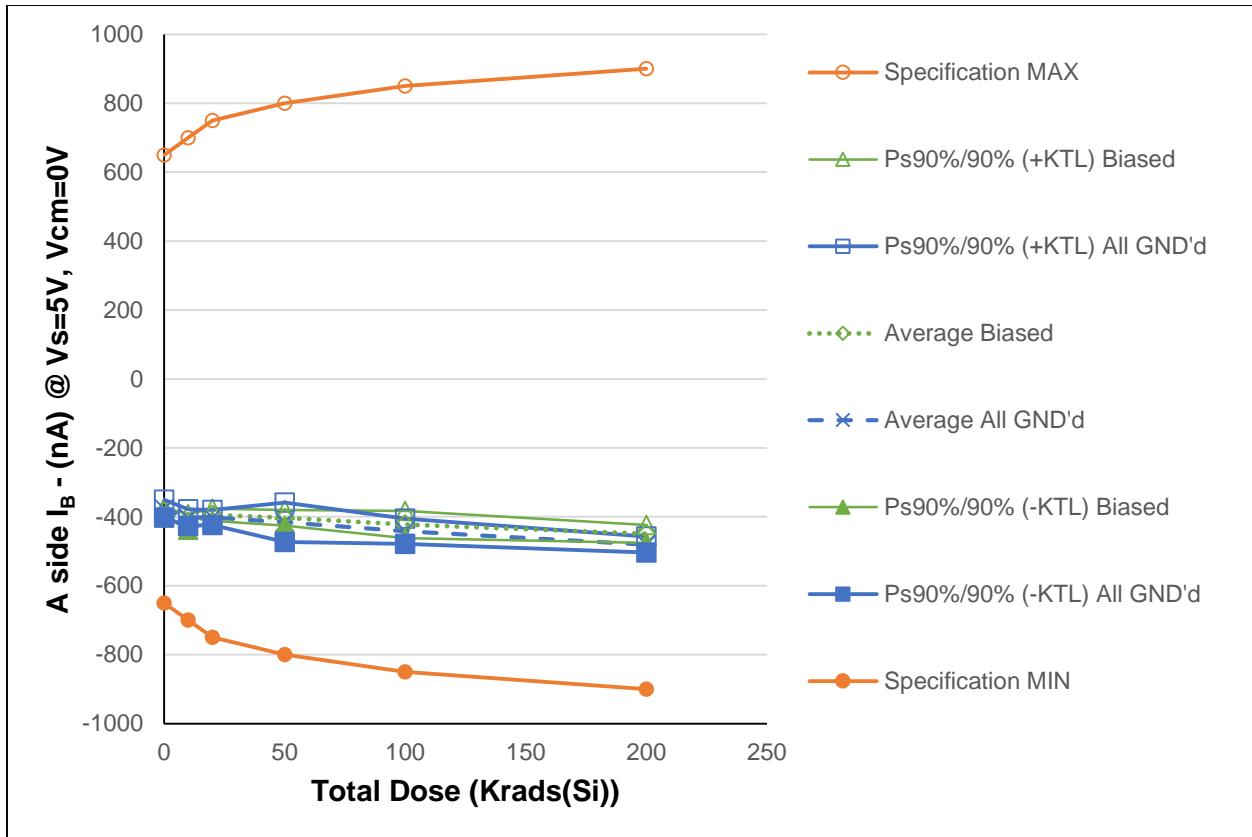


Figure 5.60: Plot of Negative Input Bias Current I_B - (side A) @ $V_{cm} = 0V$ versus Total Dose

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 Units	A _{Ib} @ Vs=5V, Vcm=0V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-380.179	-407.459				
777	All GND'd Irradiation	-376.216	-406.575				
778	All GND'd Irradiation	-360.535	-388.713				
779	All GND'd Irradiation	-384.808	-409.993				
780	All GND'd Irradiation	-381.523	-397.865				
771	Biased Irradiation	-381.035	-401.489				
772	Biased Irradiation	-391.959	-423.287				
773	Biased Irradiation	-385.553	-415.087				
774	Biased Irradiation	-388.181	-419.964				
775	Biased Irradiation	-381.897	-416.626				
786	All GND'd Irradiation	-369.005		-395.671			
787	All GND'd Irradiation	-371.264		-397.789			
788	All GND'd Irradiation	-381.863		-407.006			
789	All GND'd Irradiation	-391.142		-413.655			
790	All GND'd Irradiation	-376.612		-395.785			
781	Biased Irradiation	-368.399		-388.767			
782	Biased Irradiation	-369.380		-392.181			
783	Biased Irradiation	-380.367		-405.058			
784	Biased Irradiation	-368.516		-394.360			
785	Biased Irradiation	-369.490		-390.969			
796	All GND'd Irradiation	-362.961			-406.202		
797	All GND'd Irradiation	-395.622			-440.828		
798	All GND'd Irradiation	-390.803			-435.693		
799	All GND'd Irradiation	-351.167			-394.052		
800	All GND'd Irradiation	-364.121			-403.992		
791	Biased Irradiation	-361.728			-389.849		
792	Biased Irradiation	-368.154			-400.174		
793	Biased Irradiation	-372.123			-406.552		
794	Biased Irradiation	-379.909			-410.481		
795	Biased Irradiation	-375.544			-407.951		
806	All GND'd Irradiation	-395.718				-458.184	
807	All GND'd Irradiation	-364.930				-434.530	
808	All GND'd Irradiation	-359.759				-424.064	
809	All GND'd Irradiation	-386.590				-450.380	
810	All GND'd Irradiation	-385.663				-442.124	
801	Biased Irradiation	-363.938				-410.267	
802	Biased Irradiation	-373.588				-418.776	
803	Biased Irradiation	-391.238				-442.177	
804	Biased Irradiation	-359.008				-408.240	
805	Biased Irradiation	-387.449				-431.577	
816	All GND'd Irradiation	-378.257					-477.474
817	All GND'd Irradiation	-384.869					-495.279
818	All GND'd Irradiation	-368.472					-476.537
819	All GND'd Irradiation	-373.314					-473.790
820	All GND'd Irradiation	-376.639					-479.394
811	Biased Irradiation	-386.961					-451.421
812	Biased Irradiation	-372.337					-443.095
813	Biased Irradiation	-382.748					-449.120
814	Biased Irradiation	-395.626					-464.799
815	Biased Irradiation	-375.295					-440.097
832	Control Unit	-396.790	-406.644	-406.644	-406.644	-406.644	-406.644
833	Control Unit	-383.019	-388.412	-388.412	-388.412	-388.412	-388.412
All GND'd Irradiation Statistics							
Average All GND'd		-376.652	-402.121	-401.981	-416.153	-441.856	-480.495
Std Dev All GND'd		9.522	8.778	8.020	20.773	13.319	8.508
Ps90%/90% (+KTL) All GND'd		-350.543	-378.053	-379.989	-359.194	-405.336	-457.167
Ps90%/90% (-KTL) All GND'd		-402.761	-426.189	-423.973	-473.113	-478.376	-503.823
Biased Irradiation Statistics							
Average Biased		-385.725	-415.291	-394.267	-403.001	-422.208	-449.706
Std Dev Biased		4.516	8.338	6.363	8.277	14.457	9.580
Ps90%/90% (+KTL) Biased		-373.343	-392.427	-376.820	-380.306	-382.567	-423.438
Ps90%/90% (-KTL) Biased		-398.107	-438.154	-411.714	-425.697	-461.848	-475.975
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

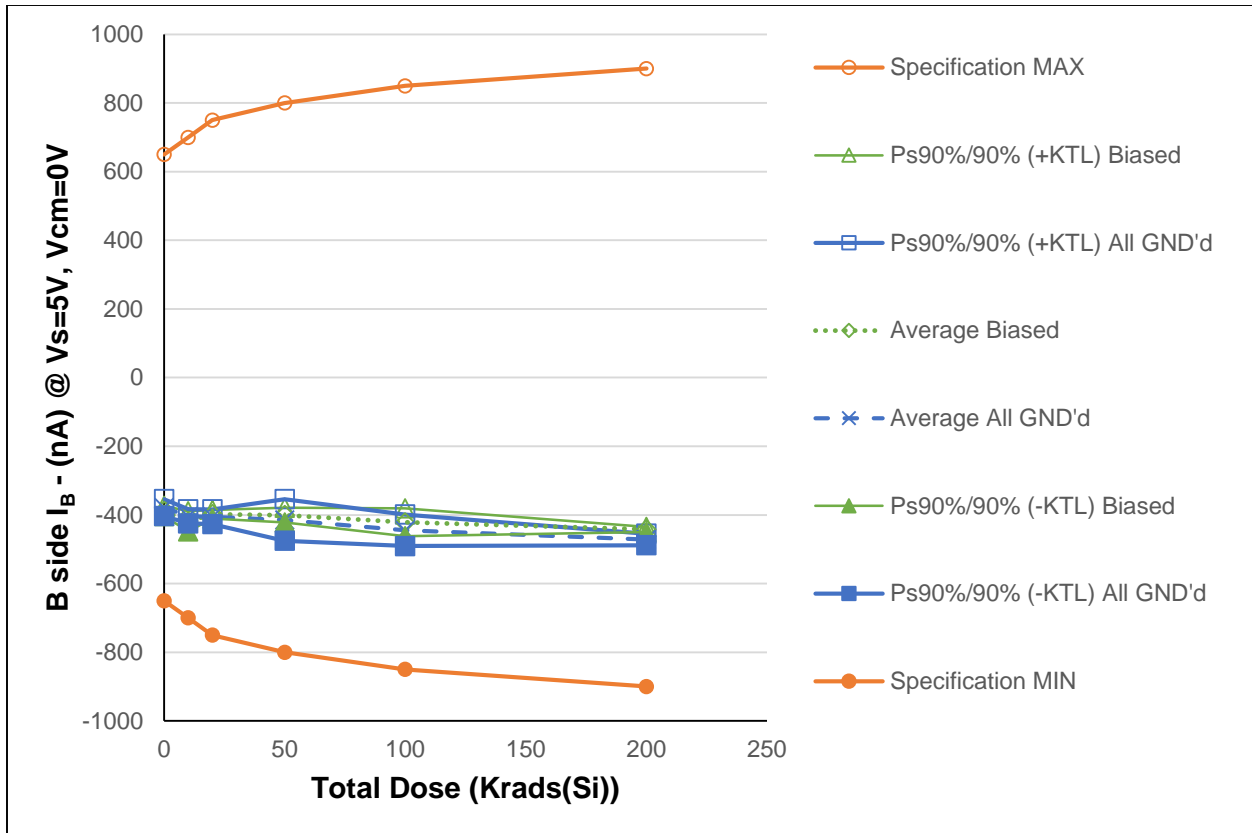


Figure 5.61: Plot of Negative Input Bias Current I_B - (side B) @ $V_{cm} = 0V$ versus Total Dose

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 Units	B Ib- @ Vs=5V, Vcm=0V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-375.921	-402.860				
777	All GND'd Irradiation	-380.657	-411.148				
778	All GND'd Irradiation	-364.503	-392.466				
779	All GND'd Irradiation	-385.846	-409.887				
780	All GND'd Irradiation	-386.804	-403.474				
771	Biased Irradiation	-380.089	-400.791				
772	Biased Irradiation	-390.101	-422.064				
773	Biased Irradiation	-386.193	-418.299				
774	Biased Irradiation	-394.454	-424.597				
775	Biased Irradiation	-391.035	-427.844				
786	All GND'd Irradiation	-372.638		-398.460			
787	All GND'd Irradiation	-380.005		-407.063			
788	All GND'd Irradiation	-385.216		-410.115			
789	All GND'd Irradiation	-394.008		-415.087			
790	All GND'd Irradiation	-376.952		-396.650			
781	Biased Irradiation	-372.027		-391.773			
782	Biased Irradiation	-380.474		-403.348			
783	Biased Irradiation	-376.708		-400.045			
784	Biased Irradiation	-376.810		-400.376			
785	Biased Irradiation	-374.075		-394.482			
796	All GND'd Irradiation	-366.700			-406.518		
797	All GND'd Irradiation	-390.101			-434.793		
798	All GND'd Irradiation	-396.241			-441.454		
799	All GND'd Irradiation	-354.078			-392.749		
800	All GND'd Irradiation	-361.561			-397.755		
791	Biased Irradiation	-364.747			-389.769		
792	Biased Irradiation	-366.551			-396.353		
793	Biased Irradiation	-368.215			-400.456		
794	Biased Irradiation	-378.321			-407.799		
795	Biased Irradiation	-379.817			-407.981		
806	All GND'd Irradiation	-395.596				-455.471	
807	All GND'd Irradiation	-368.585				-436.927	
808	All GND'd Irradiation	-358.309				-419.168	
809	All GND'd Irradiation	-397.614				-460.443	
810	All GND'd Irradiation	-395.187				-451.768	
801	Biased Irradiation	-366.869				-412.192	
802	Biased Irradiation	-374.125				-416.870	
803	Biased Irradiation	-391.051				-441.694	
804	Biased Irradiation	-357.482				-405.268	
805	Biased Irradiation	-387.170				-431.116	
816	All GND'd Irradiation	-375.758					-469.278
817	All GND'd Irradiation	-379.355					-482.511
818	All GND'd Irradiation	-365.651					-468.959
819	All GND'd Irradiation	-372.668					-469.587
820	All GND'd Irradiation	-374.471					-467.652
811	Biased Irradiation	-387.449					-445.123
812	Biased Irradiation	-376.044					-440.653
813	Biased Irradiation	-380.794					-444.128
814	Biased Irradiation	-377.971					-442.276
815	Biased Irradiation	-377.281					-438.539
832	Control Unit	-394.439	-405.025	-405.025	-405.025	-405.025	-405.025
833	Control Unit	-385.892	-393.243	-393.243	-393.243	-393.243	-393.243
All GND'd Irradiation Statistics							
Average All GND'd		-378.746	-403.967	-405.475	-414.654	-444.755	-471.598
Std Dev All GND'd		9.081	7.422	7.803	22.110	16.779	6.145
Ps90%/90% (+KTL) All GND'd		-353.847	-383.616	-384.080	-354.028	-398.748	-454.747
Ps90%/90% (-KTL) All GND'd		-403.646	-424.318	-426.871	-475.280	-490.763	-488.448
Biased Irradiation Statistics							
Average Biased		-388.374	-418.719	-398.005	-400.471	-421.428	-442.144
Std Dev Biased		5.487	10.614	4.732	7.772	14.763	2.648
Ps90%/90% (+KTL) Biased		-373.329	-389.617	-385.028	-379.161	-380.948	-434.883
Ps90%/90% (-KTL) Biased		-403.420	-447.821	-410.981	-421.781	-461.908	-449.405
Specification MIN		-650	-700	-750	-800	-850	-900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		650	700	750	800	850	900
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

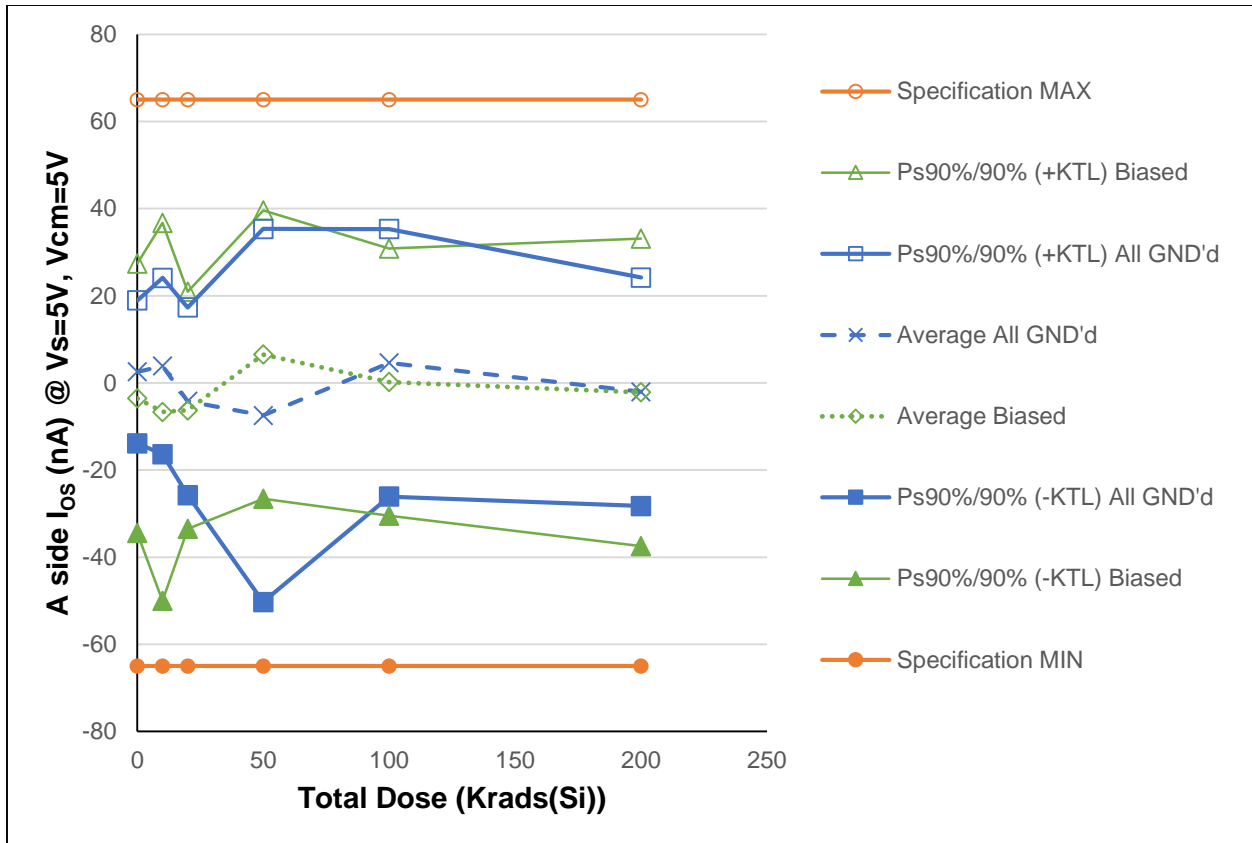


Figure 5.62: Plot of Input Offset Current I_{os} (side A) @ $V_{cm} = 5V$ versus Total Dose

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 Units	A _{los} @ Vs=5V, Vcm=5V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	2.544	4.144				
777	All GND'd Irradiation	-2.204	-1.345				
778	All GND'd Irradiation	7.646	11.319				
779	All GND'd Irradiation	9.218	10.717				
780	All GND'd Irradiation	-4.528	-5.547				
771	Biased Irradiation	-3.379	-2.960				
772	Biased Irradiation	-14.815	-24.301				
773	Biased Irradiation	13.694	15.971				
774	Biased Irradiation	-12.308	-18.959				
775	Biased Irradiation	-0.918	-3.052				
786	All GND'd Irradiation	-8.435		-8.451			
787	All GND'd Irradiation	-11.114		-12.840			
788	All GND'd Irradiation	1.382		-0.331			
789	All GND'd Irradiation	-7.512		-6.797			
790	All GND'd Irradiation	6.348		7.302			
781	Biased Irradiation	-22.293		-21.832			
782	Biased Irradiation	0.108		2.121			
783	Biased Irradiation	-0.708		-0.857			
784	Biased Irradiation	-1.140		-0.442			
785	Biased Irradiation	-9.901		-10.485			
796	All GND'd Irradiation	10.698			10.804		
797	All GND'd Irradiation	-4.494			-5.197		
798	All GND'd Irradiation	-24.182			-30.485		
799	All GND'd Irradiation	-2.418			0.947		
800	All GND'd Irradiation	-13.895			-13.469		
791	Biased Irradiation	-6.539			-5.441		
792	Biased Irradiation	23.397			24.018		
793	Biased Irradiation	4.186			6.921		
794	Biased Irradiation	4.795			11.067		
795	Biased Irradiation	-5.779			-4.084		
806	All GND'd Irradiation	22.176				21.267	
807	All GND'd Irradiation	-9.958				-6.709	
808	All GND'd Irradiation	-3.826				-4.629	
809	All GND'd Irradiation	4.780				7.782	
810	All GND'd Irradiation	4.307				5.234	
801	Biased Irradiation	0.299				0.845	
802	Biased Irradiation	-2.605				-3.109	
803	Biased Irradiation	-17.394				-13.827	
804	Biased Irradiation	-5.622				-0.259	
805	Biased Irradiation	12.496				17.285	
816	All GND'd Irradiation	-4.452					-4.149
817	All GND'd Irradiation	-0.464					-3.532
818	All GND'd Irradiation	9.600					12.606
819	All GND'd Irradiation	-2.818					-1.101
820	All GND'd Irradiation	-10.232					-14.025
811	Biased Irradiation	-11.209					-3.159
812	Biased Irradiation	5.082					8.640
813	Biased Irradiation	5.722					8.823
814	Biased Irradiation	-3.006					-2.351
815	Biased Irradiation	-27.529					-22.754
832	Control Unit	-7.122	-7.594	-7.594	-7.594	-7.594	-7.594
833	Control Unit	-17.898	-18.532	-18.532	-18.532	-18.532	-18.532
All GND'd Irradiation Statistics							
Average All GND'd		2.535	3.857	-4.223	-7.480	4.589	-2.040
Std Dev All GND'd		5.982	7.388	7.854	15.618	11.196	9.562
Ps90%/90% (+KTL) All GND'd		18.937	24.115	17.312	35.343	35.288	24.178
Ps90%/90% (-KTL) All GND'd		-13.867	-16.400	-25.758	-50.303	-26.111	-28.259
Biased Irradiation Statistics							
Average Biased		-3.545	-6.660	-6.299	6.496	0.187	-2.160
Std Dev Biased		11.269	15.822	9.920	12.068	11.183	12.869
Ps90%/90% (+KTL) Biased		27.353	36.724	20.901	39.586	30.851	33.126
Ps90%/90% (-KTL) Biased		-34.444	-50.044	-33.499	-26.593	-30.477	-37.446
Specification MIN		-65	-65	-65	-65	-65	-65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		65	65	65	65	65	65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

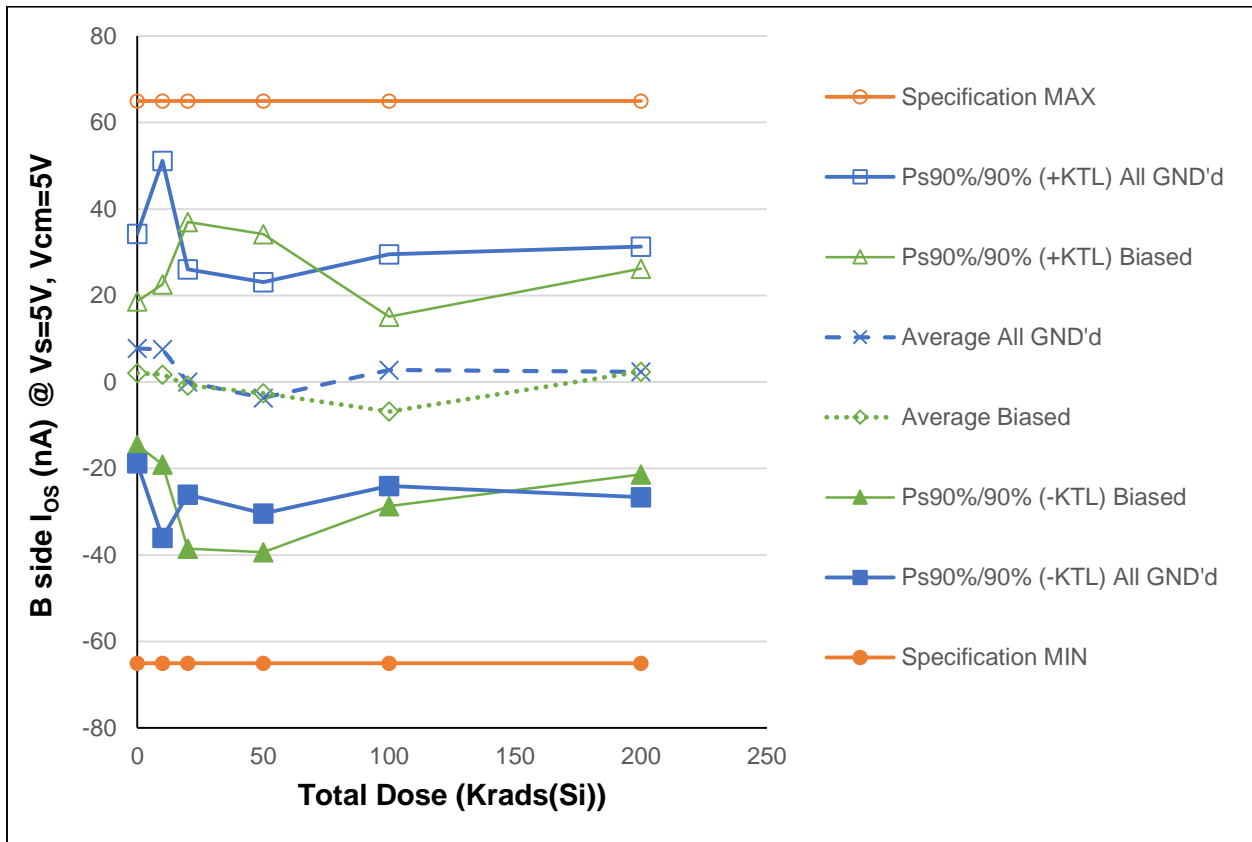


Figure 5.63: Plot of Input Offset Current I_{os} (side B) @ $V_{cm} = 5V$ versus Total Dose

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 Units	B Ios @ Vs=5V, Vcm=5V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	6.768	8.594				
777	All GND'd Irradiation	8.653	8.823				
778	All GND'd Irradiation	19.955	25.435				
779	All GND'd Irradiation	10.359	12.964				
780	All GND'd Irradiation	-6.982	-18.106				
771	Biased Irradiation	-2.510	-1.879				
772	Biased Irradiation	1.321	0.277				
773	Biased Irradiation	0.662	-0.674				
774	Biased Irradiation	-1.704	-3.993				
775	Biased Irradiation	12.489	15.029				
786	All GND'd Irradiation	0.269		0.440			
787	All GND'd Irradiation	-10.018		-13.156			
788	All GND'd Irradiation	-2.822		-4.073			
789	All GND'd Irradiation	11.129		12.267			
790	All GND'd Irradiation	5.067		4.510			
781	Biased Irradiation	-8.683		-9.525			
782	Biased Irradiation	10.397		14.569			
783	Biased Irradiation	-14.166		-15.378			
784	Biased Irradiation	-6.447		-6.828			
785	Biased Irradiation	11.035		13.273			
796	All GND'd Irradiation	-13.255			-15.785		
797	All GND'd Irradiation	-0.437			-1.768		
798	All GND'd Irradiation	-0.250			1.020		
799	All GND'd Irradiation	-7.855			-10.718		
800	All GND'd Irradiation	8.947			8.934		
791	Biased Irradiation	7.677			8.461		
792	Biased Irradiation	-12.529			-12.498		
793	Biased Irradiation	2.949			1.930		
794	Biased Irradiation	-14.296			-20.612		
795	Biased Irradiation	6.348			9.813		
806	All GND'd Irradiation	6.612				4.022	
807	All GND'd Irradiation	-10.401				-13.400	
808	All GND'd Irradiation	11.828				12.496	
809	All GND'd Irradiation	4.383				3.001	
810	All GND'd Irradiation	8.486				7.725	
801	Biased Irradiation	3.617				5.992	
802	Biased Irradiation	-7.653				-7.594	
803	Biased Irradiation	-9.866				-13.934	
804	Biased Irradiation	-0.284				-5.521	
805	Biased Irradiation	-13.609				-12.985	
816	All GND'd Irradiation	-12.460					-10.005
817	All GND'd Irradiation	17.373					19.213
818	All GND'd Irradiation	1.089					2.090
819	All GND'd Irradiation	2.732					0.139
820	All GND'd Irradiation	8.478					0.345
811	Biased Irradiation	2.395					6.967
812	Biased Irradiation	0.005					5.226
813	Biased Irradiation	2.487					12.923
814	Biased Irradiation	-5.917					-5.456
815	Biased Irradiation	-2.086					-7.594
832	Control Unit	-1.792	-1.676	-1.676	-1.676	-1.676	-1.676
833	Control Unit	9.909	9.665	9.665	9.665	9.665	9.665
All GND'd Irradiation Statistics							
Average All GND'd		7.751	7.542	-0.002	-3.663	2.769	2.357
Std Dev All GND'd		9.677	15.891	9.496	9.759	9.776	10.559
Ps90%/90% (+KTL) All GND'd		34.285	51.116	26.035	23.094	29.573	31.310
Ps90%/90% (-KTL) All GND'd		-18.784	-36.031	-26.040	-30.421	-24.036	-26.596
Biased Irradiation Statistics							
Average Biased		2.052	1.752	-0.778	-2.581	-6.808	2.413
Std Dev Biased		6.048	7.592	13.777	13.410	7.985	8.677
Ps90%/90% (+KTL) Biased		18.635	22.569	36.998	34.190	15.087	26.206
Ps90%/90% (-KTL) Biased		-14.531	-19.065	-38.554	-39.353	-28.703	-21.379
Specification MIN		-65	-65	-65	-65	-65	-65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		65	65	65	65	65	65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

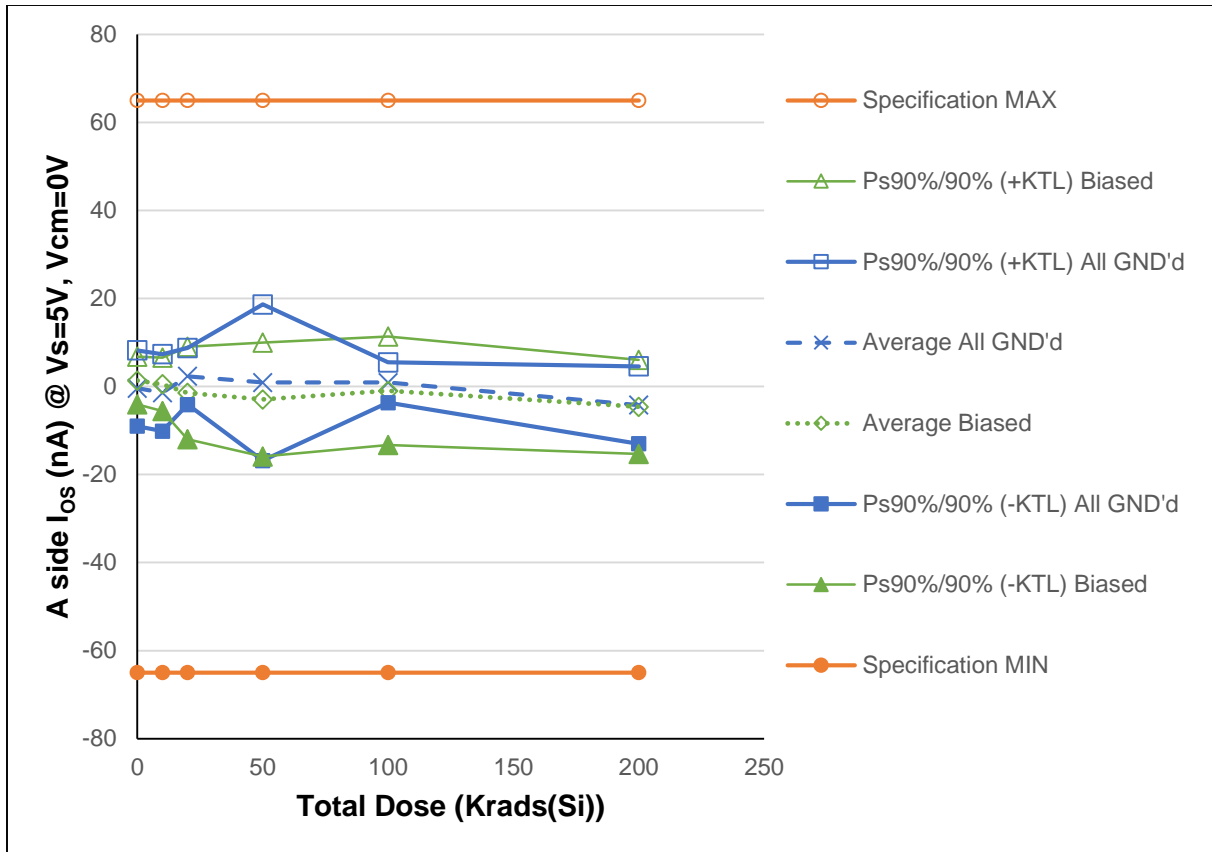


Figure 5.64: Plot of Input Offset Current I_{os} (side A) @ $V_{cm} = 0V$ versus Total Dose

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 Units	A _{Ios} @ Vs=5V, Vcm=0V (nA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-1.261	-1.722				
777	All GND'd Irradiation	-4.494	-5.574				
778	All GND'd Irradiation	2.067	1.568				
779	All GND'd Irradiation	-1.704	-3.204				
780	All GND'd Irradiation	3.372	1.903				
771	Biased Irradiation	1.124	0.242				
772	Biased Irradiation	-0.621	-1.654				
773	Biased Irradiation	0.727	0.845				
774	Biased Irradiation	0.814	-0.945				
775	Biased Irradiation	4.682	4.063				
786	All GND'd Irradiation	2.609		0.684			
787	All GND'd Irradiation	0.727		-0.556			
788	All GND'd Irradiation	5.082		3.588			
789	All GND'd Irradiation	6.653		5.405			
790	All GND'd Irradiation	2.732		2.479			
781	Biased Irradiation	-2.295		-2.324			
782	Biased Irradiation	5.757		4.197			
783	Biased Irradiation	-3.460		-6.024			
784	Biased Irradiation	-1.686		-3.174			
785	Biased Irradiation	0.798		0.017			
796	All GND'd Irradiation	3.464			3.031		
797	All GND'd Irradiation	-6.542			-10.428		
798	All GND'd Irradiation	3.830			3.431		
799	All GND'd Irradiation	4.170			2.613		
800	All GND'd Irradiation	6.268			5.904		
791	Biased Irradiation	-0.502			-2.808		
792	Biased Irradiation	-2.661			-5.307		
793	Biased Irradiation	-7.210			-8.778		
794	Biased Irradiation	5.360			4.003		
795	Biased Irradiation	-0.204			-1.879		
806	All GND'd Irradiation	5.848				3.732	
807	All GND'd Irradiation	-0.067				0.170	
808	All GND'd Irradiation	1.455				-0.089	
809	All GND'd Irradiation	1.001				-0.367	
810	All GND'd Irradiation	1.585				1.028	
801	Biased Irradiation	5.860				4.220	
802	Biased Irradiation	-5.088				-7.929	
803	Biased Irradiation	1.574				-0.078	
804	Biased Irradiation	-1.841				-1.985	
805	Biased Irradiation	1.972				0.871	
816	All GND'd Irradiation	-3.761					-6.828
817	All GND'd Irradiation	1.761					0.197
818	All GND'd Irradiation	-1.384					-3.856
819	All GND'd Irradiation	-1.563					-2.869
820	All GND'd Irradiation	-2.768					-7.800
811	Biased Irradiation	-0.250					-3.448
812	Biased Irradiation	-2.295					-3.719
813	Biased Irradiation	-4.494					-5.700
814	Biased Irradiation	-9.905					-10.500
815	Biased Irradiation	0.174					0.181
832	Control Unit	3.586	4.136	4.136	4.136	4.136	4.136
833	Control Unit	-1.929	-1.497	-1.497	-1.497	-1.497	-1.497
All GND'd Irradiation Statistics							
Average All GND'd		-0.404	-1.406	2.320	0.910	0.895	-4.231
Std Dev All GND'd		3.143	3.182	2.350	6.466	1.670	3.205
Ps90%/90% (+KTL) All GND'd		8.215	7.320	8.765	18.640	5.474	4.556
Ps90%/90% (-KTL) All GND'd		-9.022	-10.131	-4.125	-16.820	-3.684	-13.018
Biased Irradiation Statistics							
Average Biased		1.345	0.510	-1.462	-2.954	-0.980	-4.637
Std Dev Biased		1.982	2.214	3.831	4.718	4.488	3.905
Ps90%/90% (+KTL) Biased		6.779	6.581	9.042	9.983	11.327	6.069
Ps90%/90% (-KTL) Biased		-4.089	-5.560	-11.966	-15.890	-13.287	-15.343
Specification MIN		-65	-65	-65	-65	-65	-65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		65	65	65	65	65	65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

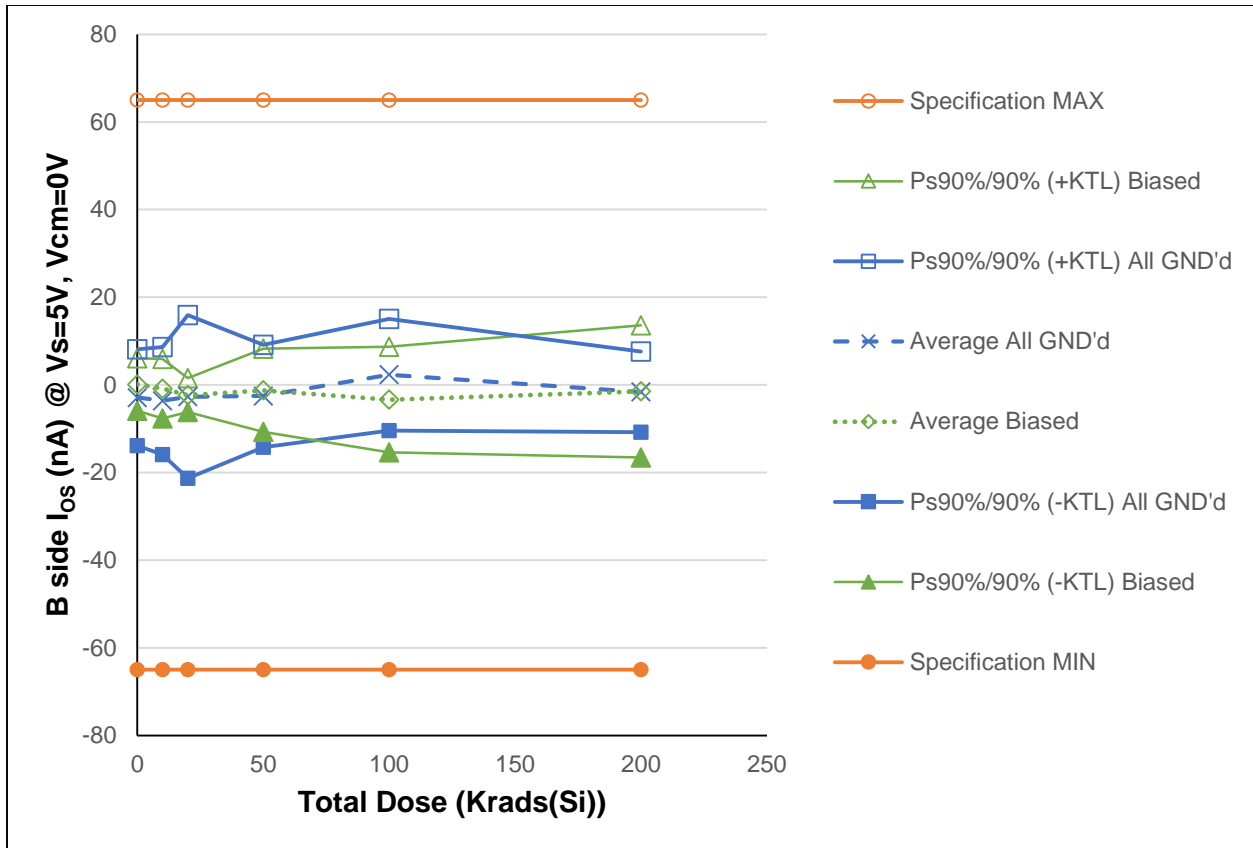


Figure 5.65: Plot of Input Offset Current I_{os} (side B) @ $V_{cm} = 0V$ versus Total Dose

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 Units	B _{los} @ Vs=5V, Vcm=0V (nA)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	2.303	2.479				
777	All GND'd Irradiation	-1.384	-2.286				
778	All GND'd Irradiation	-1.521	-2.245				
779	All GND'd Irradiation	-7.565	-8.531				
780	All GND'd Irradiation	-6.203	-7.529				
771	Biased Irradiation	0.635	0.235				
772	Biased Irradiation	0.693	0.261				
773	Biased Irradiation	3.193	2.090				
774	Biased Irradiation	-1.956	-3.749				
775	Biased Irradiation	-2.052	-3.139				
786	All GND'd Irradiation	-0.564		-1.345			
787	All GND'd Irradiation	-11.960		-14.269			
788	All GND'd Irradiation	3.406		3.717			
789	All GND'd Irradiation	0.147		-0.198			
790	All GND'd Irradiation	0.066		-1.406			
781	Biased Irradiation	0.181		0.059			
782	Biased Irradiation	-2.578		-3.353			
783	Biased Irradiation	-0.617		-2.229			
784	Biased Irradiation	-3.123		-3.139			
785	Biased Irradiation	-2.334		-3.082			
796	All GND'd Irradiation	-1.533			-1.417		
797	All GND'd Irradiation	-0.651			-0.857		
798	All GND'd Irradiation	-7.871			-9.872		
799	All GND'd Irradiation	-2.143			-1.619		
800	All GND'd Irradiation	1.953			1.191		
791	Biased Irradiation	-3.215			-2.743		
792	Biased Irradiation	3.601			3.637		
793	Biased Irradiation	-1.914			-3.490		
794	Biased Irradiation	-3.852			-4.622		
795	Biased Irradiation	-0.342			1.050		
806	All GND'd Irradiation	2.353				4.830	
807	All GND'd Irradiation	0.239				-1.776	
808	All GND'd Irradiation	5.547				8.308	
809	All GND'd Irradiation	-2.143				-2.853	
810	All GND'd Irradiation	4.211				3.142	
801	Biased Irradiation	-6.283				-8.367	
802	Biased Irradiation	-1.471				-1.676	
803	Biased Irradiation	-4.436				-7.228	
804	Biased Irradiation	-0.586				-1.898	
805	Biased Irradiation	2.762				2.308	
816	All GND'd Irradiation	-1.807					1.603
817	All GND'd Irradiation	0.879					-3.139
818	All GND'd Irradiation	-2.204					-6.740
819	All GND'd Irradiation	0.322					0.059
820	All GND'd Irradiation	-0.132					0.155
811	Biased Irradiation	0.112					0.478
812	Biased Irradiation	-3.902					-5.212
813	Biased Irradiation	-9.466					-8.718
814	Biased Irradiation	5.448					5.260
815	Biased Irradiation	-0.319					0.783
832	Control Unit	-0.865	-0.979	-0.979	-0.979	-0.979	-0.979
833	Control Unit	2.048	1.218	1.218	1.218	1.218	1.218
All GND'd Irradiation Statistics							
Average All GND'd		-2.874	-3.622	-2.700	-2.515	2.330	-1.613
Std Dev All GND'd		3.998	4.480	6.797	4.261	4.647	3.349
Ps90%/90% (+KTL) All GND'd		8.089	8.661	15.938	9.168	15.072	7.572
Ps90%/90% (-KTL) All GND'd		-13.836	-15.905	-21.338	-14.198	-10.411	-10.797
Biased Irradiation Statistics							
Average Biased		0.103	-0.860	-2.349	-1.233	-3.372	-1.481
Std Dev Biased		2.183	2.485	1.413	3.457	4.391	5.493
Ps90%/90% (+KTL) Biased		6.089	5.954	1.525	8.244	8.668	13.581
Ps90%/90% (-KTL) Biased		-5.883	-7.675	-6.223	-10.711	-15.412	-16.544
Specification MIN		-65	-65	-65	-65	-65	-65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX		65	65	65	65	65	65
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

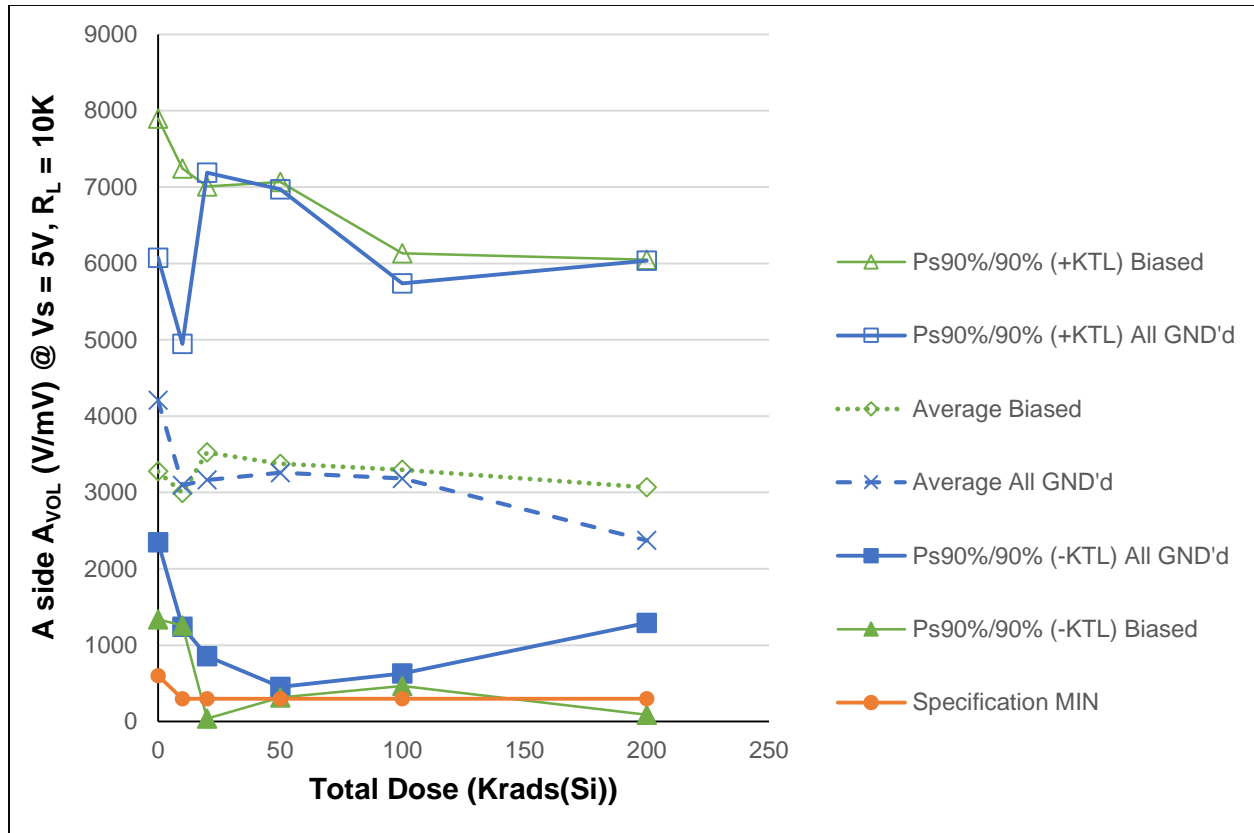


Figure 5.66: Plot of Large Signal Voltage Gain A_{VOL} (side A) @ $V_s = 5V$ versus Total Dose

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 Units	A-side GAIN ($R_L = 10\text{ K}\Omega$) (V/mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	3847	2536				
777	All GND'd Irradiation	4569	2918				
778	All GND'd Irradiation	4725	2451				
779	All GND'd Irradiation	4725	4024				
780	All GND'd Irradiation	3183	3542				
771	Biased Irradiation	3824	931				
772	Biased Irradiation	4725	4576				
773	Biased Irradiation	2247	4370				
774	Biased Irradiation	4725	2016				
775	Biased Irradiation	870	3069				
786	All GND'd Irradiation	2639		2437			
787	All GND'd Irradiation	4725		4725			
788	All GND'd Irradiation	2095		2380			
789	All GND'd Irradiation	4725		1554			
790	All GND'd Irradiation	4076		4725			
781	Biased Irradiation	2901		4725			
782	Biased Irradiation	4725		3770			
783	Biased Irradiation	2833		4725			
784	Biased Irradiation	4725		2120			
785	Biased Irradiation	2092		2279			
796	All GND'd Irradiation	3285			2366		
797	All GND'd Irradiation	4725			4725		
798	All GND'd Irradiation	1988			1884		
799	All GND'd Irradiation	4725			4699		
800	All GND'd Irradiation	4725			2616		
791	Biased Irradiation	4725			3229		
792	Biased Irradiation	4725			4725		
793	Biased Irradiation	4725			4725		
794	Biased Irradiation	4725			2510		
795	Biased Irradiation	3526			1689		
806	All GND'd Irradiation	1501				3108	
807	All GND'd Irradiation	4725				3124	
808	All GND'd Irradiation	4725				4725	
809	All GND'd Irradiation	4725				2263	
810	All GND'd Irradiation	3042				2696	
801	Biased Irradiation	3111				4725	
802	Biased Irradiation	4725				1870	
803	Biased Irradiation	4299				3637	
804	Biased Irradiation	4006				3246	
805	Biased Irradiation	4725				3017	
816	All GND'd Irradiation	4062					1580
817	All GND'd Irradiation	4725					2050
818	All GND'd Irradiation	4637					1514
819	All GND'd Irradiation	3042					4725
820	All GND'd Irradiation	2652					1994
811	Biased Irradiation	4045					3574
812	Biased Irradiation	4725					2199
813	Biased Irradiation	3088					4725
814	Biased Irradiation	2941					2168
815	Biased Irradiation	4725					2672
832	Control Unit	4085	4321	4321	4321	4321	4321
833	Control Unit	2089	4234	4234	4234	4234	4234
All GND'd Irradiation Statistics							
Average All GND'd		4210	3094	3164	3258	3183	2373
Std Dev All GND'd		679	675	1467	1353	931	1337
Ps90%/90% (+KTL) All GND'd		6072	4945	7187	6968	5737	6038
Ps90%/90% (-KTL) All GND'd		2348	1243	858	452	629	1293
Biased Irradiation Statistics							
Average Biased		3278	2992	3524	3376	3299	3068
Std Dev Biased		1684	1550	1271	1347	1033	1087
Ps90%/90% (+KTL) Biased		7896	7243	7010	7069	6133	6048
Ps90%/90% (-KTL) Biased		1340	1258	37	317	466	88
Specification MIN		600	300	300	300	300	300
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	FAIL	PASS	PASS	FAIL
Status (+KTL) Biased							

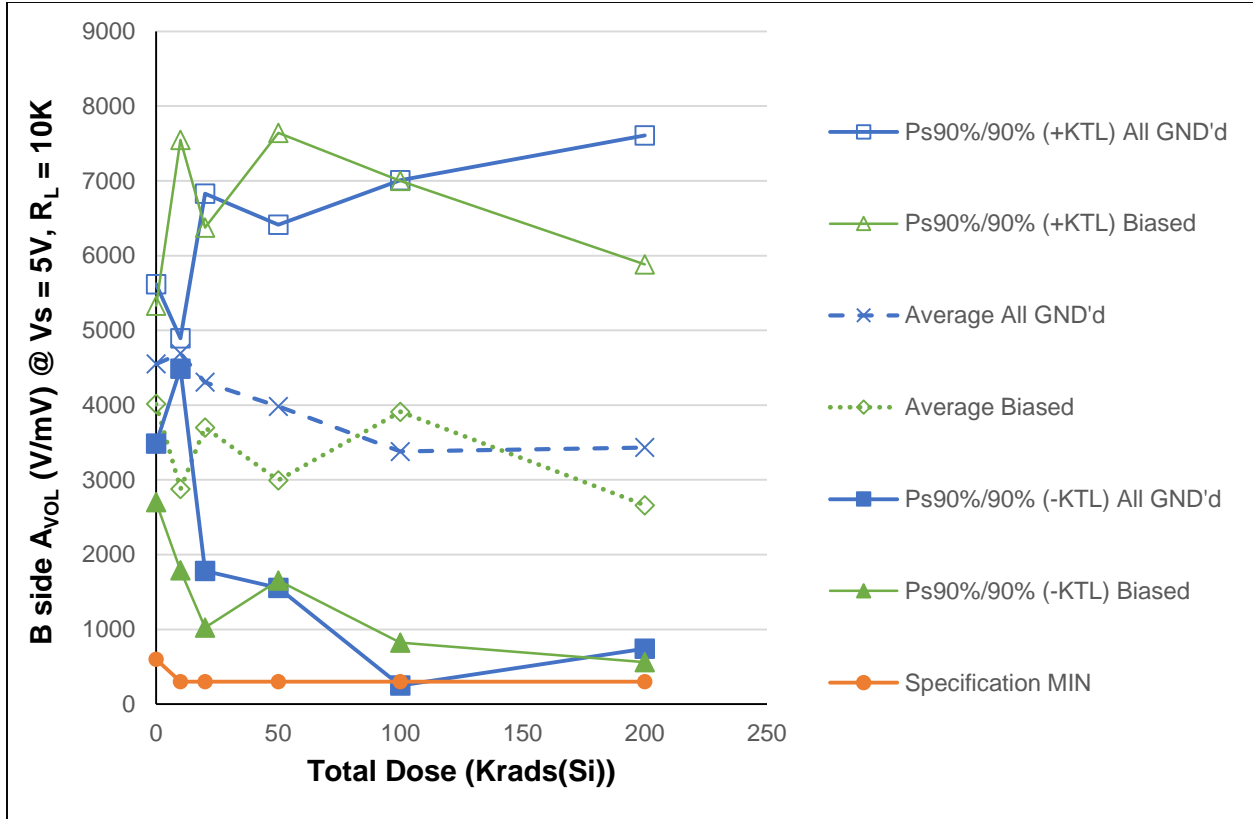


Figure 5.67: Plot of Large Signal Voltage Gain A_{VOL} (side B) @ $V_s = 5V$ versus Total Dose

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 (RL = 10 K Ω)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
Units	(V/mV)	0	10	20	50	100	200
776	All GND'd Irradiation	4725	4559				
777	All GND'd Irradiation	4725	4725				
778	All GND'd Irradiation	3856	4725				
779	All GND'd Irradiation	4725	4725				
780	All GND'd Irradiation	4725	4725				
771	Biased Irradiation	3871	3875				
772	Biased Irradiation	4240	3513				
773	Biased Irradiation	3489	527				
774	Biased Irradiation	3754	4725				
775	Biased Irradiation	4725	1754				
786	All GND'd Irradiation	4725		2661			
787	All GND'd Irradiation	1749		4725			
788	All GND'd Irradiation	2675		4699			
789	All GND'd Irradiation	4725		4725			
790	All GND'd Irradiation	3765		4725			
781	Biased Irradiation	4254		3380			
782	Biased Irradiation	4019		3063			
783	Biased Irradiation	4725		2605			
784	Biased Irradiation	2346		4725			
785	Biased Irradiation	4725		4725			
796	All GND'd Irradiation	4569			3648		
797	All GND'd Irradiation	3285			2578		
798	All GND'd Irradiation	4725			4493		
799	All GND'd Irradiation	4725			4725		
800	All GND'd Irradiation	3665			4475		
791	Biased Irradiation	2962			4725		
792	Biased Irradiation	4725			1865		
793	Biased Irradiation	4422			4725		
794	Biased Irradiation	4725			960		
795	Biased Irradiation	4725			2696		
806	All GND'd Irradiation	4725				4725	
807	All GND'd Irradiation	4725				3092	
808	All GND'd Irradiation	4725				2627	
809	All GND'd Irradiation	2531				1725	
810	All GND'd Irradiation	4725				4725	
801	Biased Irradiation	4725				4725	
802	Biased Irradiation	3191				2925	
803	Biased Irradiation	3225				2456	
804	Biased Irradiation	4099				4725	
805	Biased Irradiation	3374				4725	
816	All GND'd Irradiation	4725					1456
817	All GND'd Irradiation	4603					4725
818	All GND'd Irradiation	4725					4092
819	All GND'd Irradiation	4725					2172
820	All GND'd Irradiation	3127					4725
811	Biased Irradiation	3208					2595
812	Biased Irradiation	4672					1392
813	Biased Irradiation	4725					4561
814	Biased Irradiation	3859					2644
815	Biased Irradiation	4725					2110
832	Control Unit	3698	4725	4725	4725	4725	4725
833	Control Unit	3294	4725	4725	4725	4725	4725
All GND'd Irradiation Statistics							
Average All GND'd		4551	4692	4307	3984	3379	3434
Std Dev All GND'd		389	74	920	886	1324	1523
Ps90%/90% (+KTL) All GND'd		5617	4895	6831	6412	7008	7609
Ps90%/90% (-KTL) All GND'd		3485	4488	1783	1555	251	741
Biased Irradiation Statistics							
Average Biased		4016	2879	3700	2994	3911	2660
Std Dev Biased		480	1703	976	1695	1127	1176
Ps90%/90% (+KTL) Biased		5331	7548	6375	7642	7001	5884
Ps90%/90% (-KTL) Biased		2701	1790	1024	1654	821	564
Specification MIN		600	300	300	300	300	300
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	FAIL	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

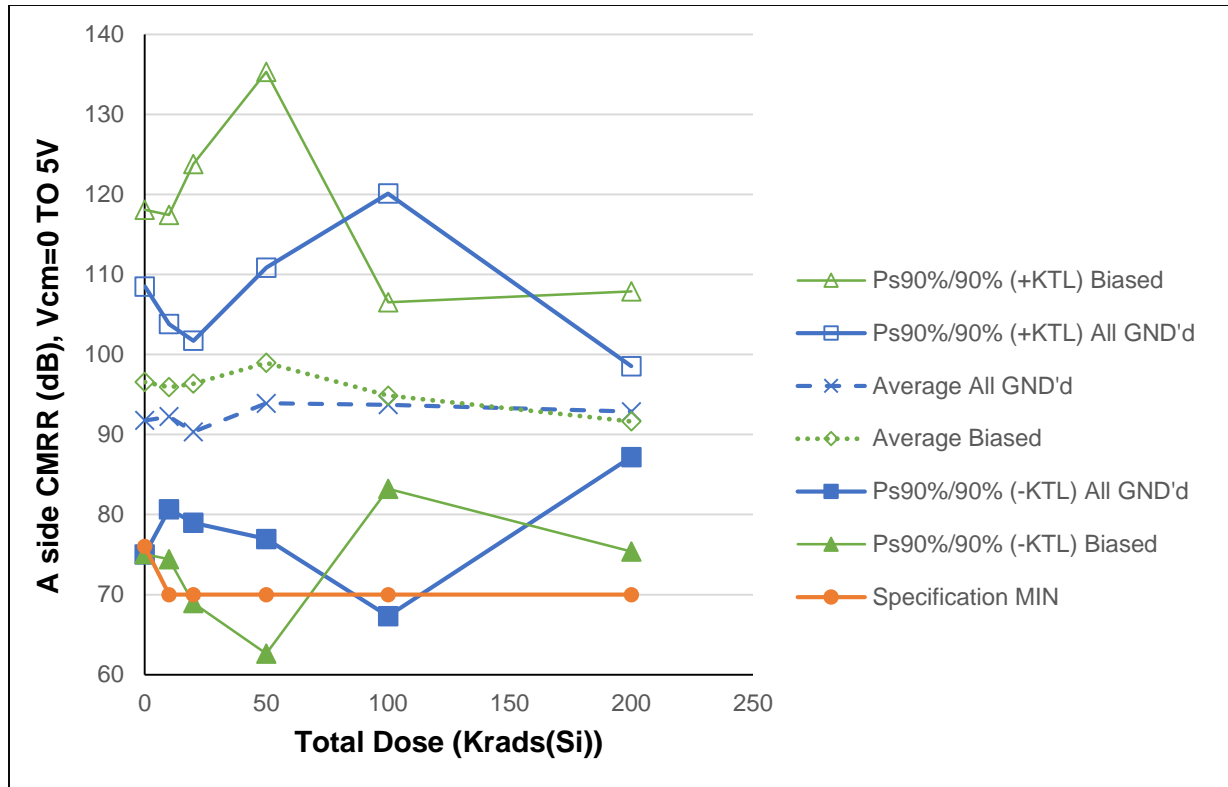


Figure 5.68: Plot of CMRR (side A) @ $V_s = 5V$ versus Total Dose

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

Note: The computed – KTL point of Biased Irradiation at 20, 50, 100 Krad(Si) are 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 Units	A CMRR, Vcm=0 TO 5V (dB)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	98.672	95.073				
777	All GND'd Irradiation	97.664	96.877				
778	All GND'd Irradiation	89.842	92.392				
779	All GND'd Irradiation	87.521	90.869				
780	All GND'd Irradiation	85.079	85.944				
771	Biased Irradiation	105.218	100.647				
772	Biased Irradiation	100.593	98.898				
773	Biased Irradiation	95.929	91.626				
774	Biased Irradiation	96.969	104.003				
775	Biased Irradiation	84.123	84.466				
786	All GND'd Irradiation	93.765		95.700			
787	All GND'd Irradiation	88.544		90.083			
788	All GND'd Irradiation	91.707		92.195			
789	All GND'd Irradiation	91.034		89.360			
790	All GND'd Irradiation	85.115		84.374			
781	Biased Irradiation	96.958		95.383			
782	Biased Irradiation	96.029		95.057			
783	Biased Irradiation	90.043		90.154			
784	Biased Irradiation	86.482		87.865			
785	Biased Irradiation	112.200		113.298			
796	All GND'd Irradiation	92.594			92.541		
797	All GND'd Irradiation	101.609			100.235		
798	All GND'd Irradiation	83.895			86.144		
799	All GND'd Irradiation	90.100			90.427		
800	All GND'd Irradiation	102.856			100.118		
791	Biased Irradiation	108.423			112.835		
792	Biased Irradiation	99.049			113.663		
793	Biased Irradiation	92.906			90.463		
794	Biased Irradiation	93.588			92.201		
795	Biased Irradiation	84.977			85.671		
806	All GND'd Irradiation	95.117				92.792	
807	All GND'd Irradiation	111.151				109.235	
808	All GND'd Irradiation	82.353				83.840	
809	All GND'd Irradiation	95.592				94.523	
810	All GND'd Irradiation	89.487				88.173	
801	Biased Irradiation	114.320				97.403	
802	Biased Irradiation	97.001				97.786	
803	Biased Irradiation	100.634				97.735	
804	Biased Irradiation	88.084				88.023	
805	Biased Irradiation	109.948				93.391	
816	All GND'd Irradiation	91.553					90.370
817	All GND'd Irradiation	91.409					91.508
818	All GND'd Irradiation	99.573					95.535
819	All GND'd Irradiation	92.329					92.670
820	All GND'd Irradiation	94.412					94.251
811	Biased Irradiation	85.948					86.449
812	Biased Irradiation	93.741					93.181
813	Biased Irradiation	87.623					94.493
814	Biased Irradiation	98.988					99.210
815	Biased Irradiation	84.616					84.864
832	Control Unit	81.637	83.430	83.430	83.430	83.430	83.430
833	Control Unit	101.229	99.799	99.799	99.799	99.799	99.799
All GND'd Irradiation Statistics							
Average All GND'd		91.756	92.231	90.342	93.893	93.713	92.867
Std Dev All GND'd		6.102	4.215	4.147	6.182	9.626	2.071
Ps90%/90% (+KTL) All GND'd		108.486	103.789	101.714	110.843	120.106	98.545
Ps90%/90% (-KTL) All GND'd		75.025	80.673	78.971	76.943	67.319	87.188
Biased Irradiation Statistics							
Average Biased		96.567	95.928	96.351	98.967	94.868	91.639
Std Dev Biased		7.850	7.845	10.003	13.259	4.248	5.930
Ps90%/90% (+KTL) Biased		118.090	117.440	123.779	135.322	106.517	107.900
Ps90%/90% (-KTL) Biased		75.043	74.416	68.923	62.611	83.219	75.378
Specification MIN		76	70	70	70	70	70
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		FAIL	PASS	PASS	PASS	FAIL	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		FAIL	PASS	FAIL	FAIL	PASS	PASS
Status (+KTL) Biased							

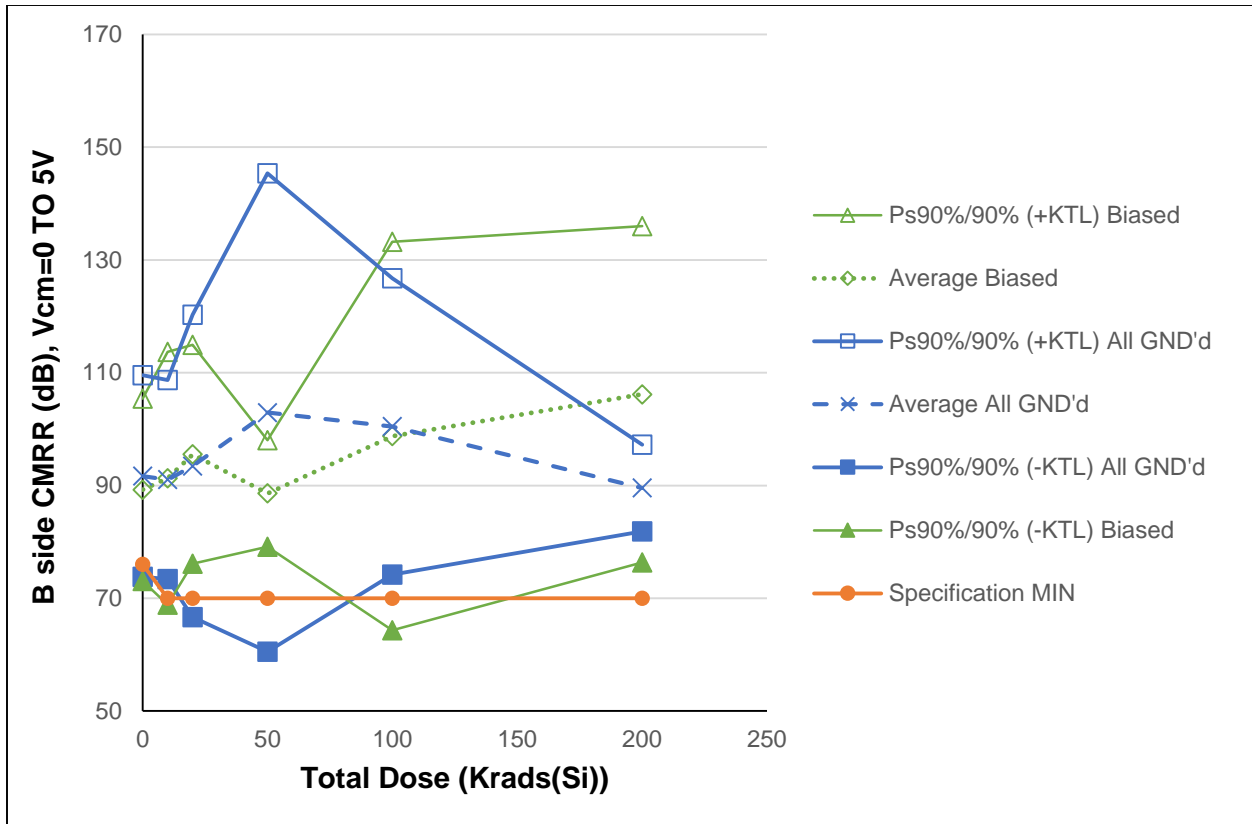


Figure 5.69: Plot of CMRR (side B) @ $V_s = 5V$ versus Total Dose

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

Note: The computed – KTL of both All GND'd and Biased Irradiation are lower than the MIN limit due to the small sample size.

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 Units	B CMRR, Vcm=0 TO 5V (dB)	Total Dose (Krads(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	100.598	99.004				
777	All GND'd Irradiation	89.041	88.101				
778	All GND'd Irradiation	85.007	85.242				
779	All GND'd Irradiation	96.274	96.928				
780	All GND'd Irradiation	87.425	85.964				
771	Biased Irradiation	89.913	91.784				
772	Biased Irradiation	83.189	84.729				
773	Biased Irradiation	83.736	82.681				
774	Biased Irradiation	92.301	94.037				
775	Biased Irradiation	97.145	103.209				
786	All GND'd Irradiation	83.733		84.013			
787	All GND'd Irradiation	96.023		96.409			
788	All GND'd Irradiation	92.427		91.667			
789	All GND'd Irradiation	98.994		108.700			
790	All GND'd Irradiation	85.580		86.505			
781	Biased Irradiation	93.297		92.347			
782	Biased Irradiation	90.916		94.660			
783	Biased Irradiation	95.814		106.158			
784	Biased Irradiation	97.269		97.455			
785	Biased Irradiation	87.079		87.017			
796	All GND'd Irradiation	87.349			87.288		
797	All GND'd Irradiation	97.681			96.998		
798	All GND'd Irradiation	98.363			96.062		
799	All GND'd Irradiation	105.773			127.775		
800	All GND'd Irradiation	101.609			106.516		
791	Biased Irradiation	90.128			91.195		
792	Biased Irradiation	88.927			90.698		
793	Biased Irradiation	104.654			90.112		
794	Biased Irradiation	88.815			88.210		
795	Biased Irradiation	85.456			82.779		
806	All GND'd Irradiation	92.952				90.481	
807	All GND'd Irradiation	94.500				96.988	
808	All GND'd Irradiation	115.083				116.185	
809	All GND'd Irradiation	94.989				97.666	
810	All GND'd Irradiation	98.089				100.977	
801	Biased Irradiation	87.602				85.513	
802	Biased Irradiation	100.649				98.382	
803	Biased Irradiation	106.844				117.625	
804	Biased Irradiation	98.029				89.583	
805	Biased Irradiation	109.077				102.671	
816	All GND'd Irradiation	96.479					92.197
817	All GND'd Irradiation	89.207					88.519
818	All GND'd Irradiation	89.899					89.379
819	All GND'd Irradiation	86.886					85.472
820	All GND'd Irradiation	92.234					92.174
811	Biased Irradiation	96.660					96.843
812	Biased Irradiation	109.161					107.169
813	Biased Irradiation	108.130					124.288
814	Biased Irradiation	98.862					99.208
815	Biased Irradiation	101.756					103.244
832	Control Unit	97.165	94.895	94.895	94.895	94.895	94.895
833	Control Unit	86.257	90.724	90.724	90.724	90.724	90.724
All GND'd Irradiation Statistics							
Average All GND'd		91.669	91.048	93.459	102.928	100.459	89.548
Std Dev All GND'd		6.524	6.444	9.770	15.469	9.578	2.811
Ps90%/90% (+KTL) All GND'd		109.557	108.719	120.247	145.344	126.723	97.257
Ps90%/90% (-KTL) All GND'd		73.781	73.377	66.670	60.511	74.196	81.839
Biased Irradiation Statistics							
Average Biased		89.257	91.288	95.527	88.599	98.755	106.150
Std Dev Biased		5.899	8.170	7.071	3.445	12.560	10.877
Ps90%/90% (+KTL) Biased		105.433	113.691	114.917	98.044	133.194	135.976
Ps90%/90% (-KTL) Biased		73.080	68.885	76.138	79.153	64.316	76.325
Specification MIN		76	70	70	70	70	70
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		FAIL	PASS	FAIL	FAIL	PASS	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		FAIL	FAIL	PASS	PASS	FAIL	PASS
Status (+KTL) Biased							

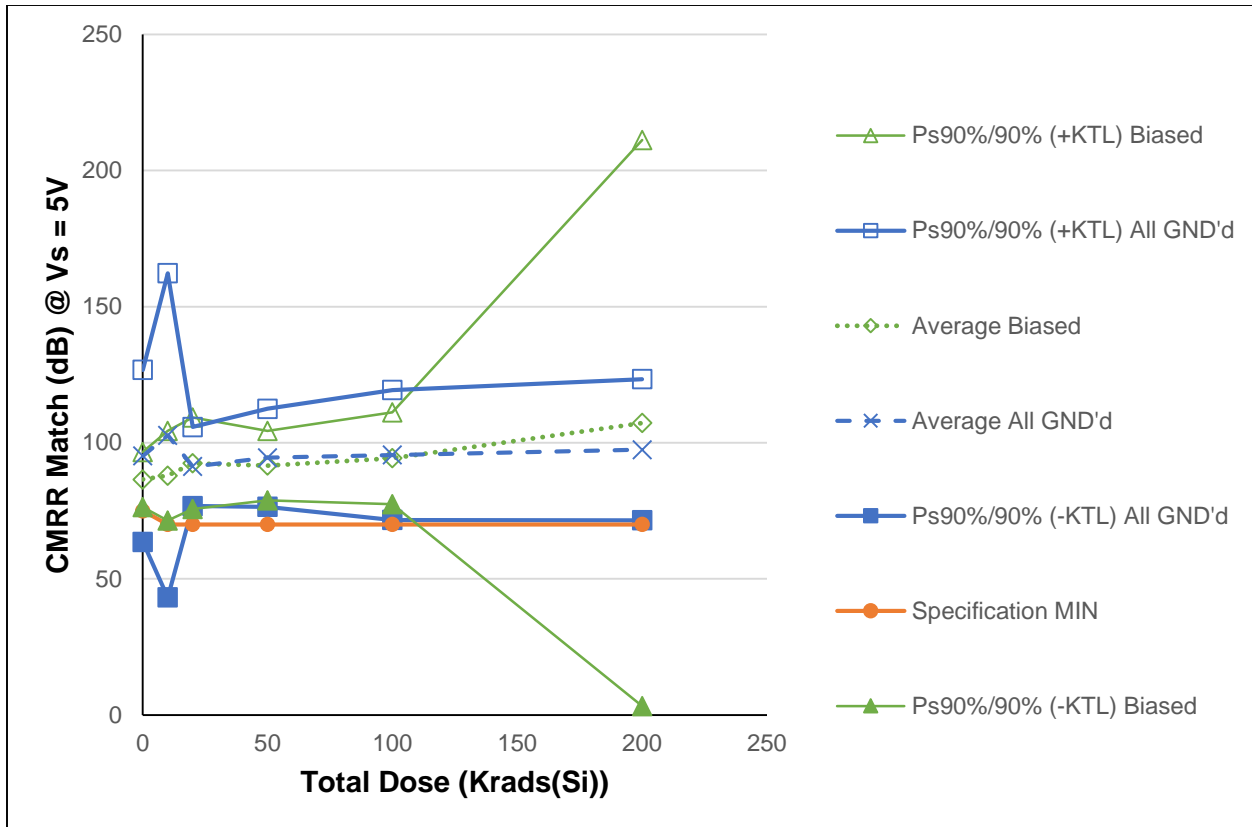


Figure 5.70: Plot of CMRR Match @ Vs = 5V versus Total Dose

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

Note: The computed – KTL data points of both All GND'd and Biased Irradiation are lower than the limit at 0, 10, and 200 Krad(Si).

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 @ Vs = 5V (dB)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	112.701	103.852				
777	All GND'd Irradiation	93.061	92.032				
778	All GND'd Irradiation	81.072	82.080				
779	All GND'd Irradiation	91.466	96.851				
780	All GND'd Irradiation	97.596	138.909				
771	Biased Irradiation	91.549	95.666				
772	Biased Irradiation	84.447	86.620				
773	Biased Irradiation	81.828	80.029				
774	Biased Irradiation	88.304	91.642				
775	Biased Irradiation	86.318	85.532				
786	All GND'd Irradiation	87.020		86.632			
787	All GND'd Irradiation	93.316		95.809			
788	All GND'd Irradiation	86.039		85.906			
789	All GND'd Irradiation	95.470		90.351			
790	All GND'd Irradiation	110.775		97.622			
781	Biased Irradiation	102.567		102.952			
782	Biased Irradiation	87.081		88.835			
783	Biased Irradiation	96.320		91.652			
784	Biased Irradiation	89.442		91.363			
785	Biased Irradiation	87.575		87.449			
796	All GND'd Irradiation	94.221			94.150		
797	All GND'd Irradiation	93.404			92.446		
798	All GND'd Irradiation	85.715			89.485		
799	All GND'd Irradiation	88.777			90.545		
800	All GND'd Irradiation	119.084			105.777		
791	Biased Irradiation	91.255			91.946		
792	Biased Irradiation	92.172			91.338		
793	Biased Irradiation	90.908			84.265		
794	Biased Irradiation	96.292			96.884		
795	Biased Irradiation	110.372			93.736		
806	All GND'd Irradiation	106.080				103.113	
807	All GND'd Irradiation	95.881				95.091	
808	All GND'd Irradiation	82.154				84.052	
809	All GND'd Irradiation	118.456				104.878	
810	All GND'd Irradiation	93.520				90.432	
801	Biased Irradiation	87.210				88.063	
802	Biased Irradiation	92.614				92.059	
803	Biased Irradiation	106.469				96.897	
804	Biased Irradiation	91.411				103.706	
805	Biased Irradiation	129.490				90.826	
816	All GND'd Irradiation	98.828					104.812
817	All GND'd Irradiation	102.208					99.238
818	All GND'd Irradiation	93.356					95.266
819	All GND'd Irradiation	83.167					82.325
820	All GND'd Irradiation	105.312					105.621
811	Biased Irradiation	88.939					89.574
812	Biased Irradiation	92.381					91.599
813	Biased Irradiation	88.484					94.216
814	Biased Irradiation	135.679					174.803
815	Biased Irradiation	85.916					85.980
832	Control Unit	80.293	81.373	81.373	81.373	81.373	81.373
833	Control Unit	87.964	94.488	94.488	94.488	94.488	94.488
All GND'd Irradiation Statistics							
Average All GND'd		95.179	102.745	91.264	94.481	95.513	97.453
Std Dev All GND'd		11.513	21.712	5.293	6.563	8.701	9.456
Ps90%/90% (+KTL) All GND'd		126.747	162.278	105.778	112.477	119.371	123.382
Ps90%/90% (-KTL) All GND'd		63.612	43.212	76.751	76.484	71.656	71.523
Biased Irradiation Statistics							
Average Biased		86.489	87.898	92.450	91.634	94.310	107.234
Std Dev Biased		3.702	5.990	6.127	4.649	6.149	37.892
Ps90%/90% (+KTL) Biased		96.640	104.323	109.252	104.382	111.169	211.134
Ps90%/90% (-KTL) Biased		76.339	71.473	75.649	78.886	77.451	3.335
Specification MIN		75	70	70	70	70	70
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		FAIL	FAIL	PASS	PASS	PASS	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	FAIL
Status (+KTL) Biased							

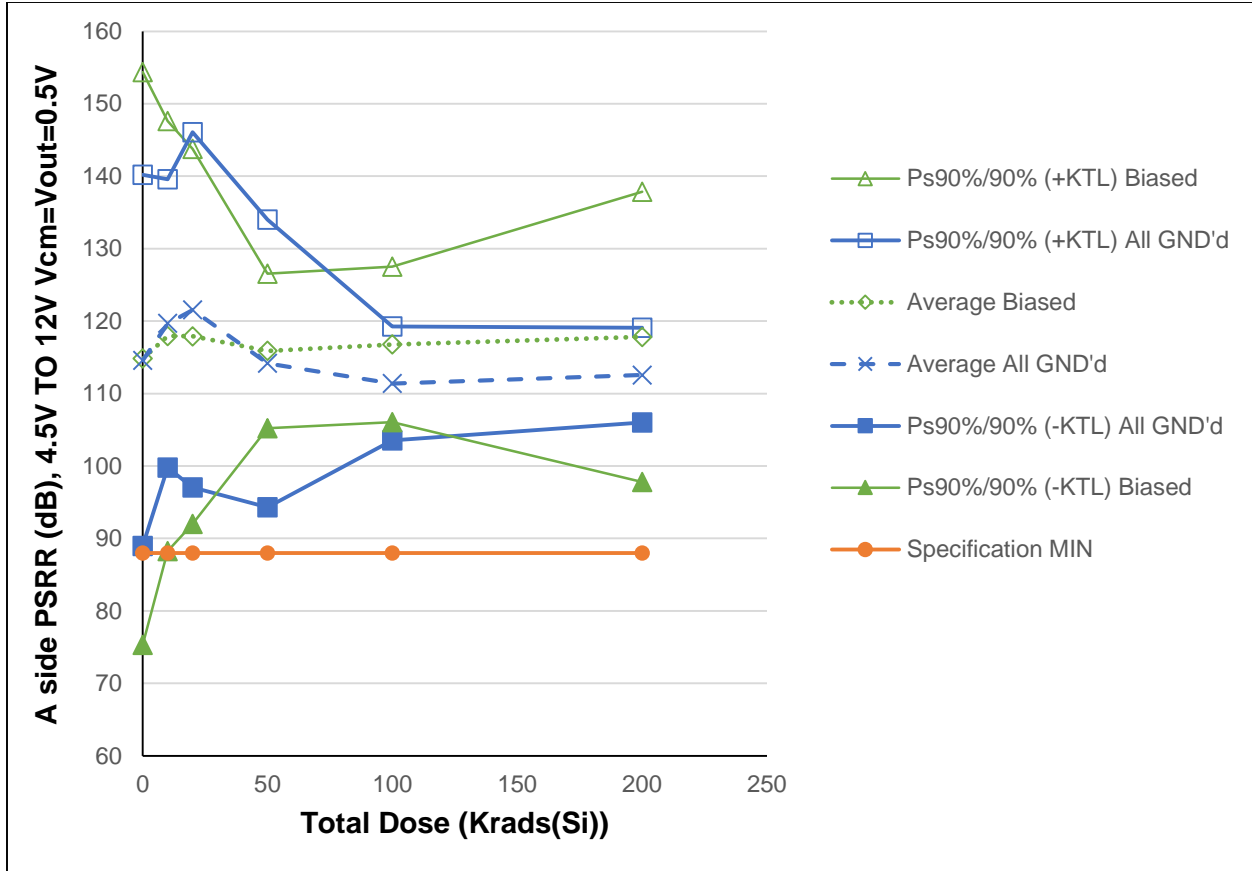


Figure 5.71: Plot of PSRR (side A) @ $V_s = 5V$ versus Total Dose

All fifty samples pass the PSRR test.

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	PSRR, 4.5V TO 12V Vcm=Vout=0.4	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
Units	(dB)	0	10	20	50	100	200
776	All GND'd Irradiation	130.436	117.369				
777	All GND'd Irradiation	107.055	112.642				
778	All GND'd Irradiation	113.273	126.138				
779	All GND'd Irradiation	113.779	128.525				
780	All GND'd Irradiation	108.356	113.725				
771	Biased Irradiation	108.417	114.300				
772	Biased Irradiation	139.825	117.578				
773	Biased Irradiation	106.844	111.576				
774	Biased Irradiation	114.315	136.556				
775	Biased Irradiation	104.766	109.670				
786	All GND'd Irradiation	114.900		136.811			
787	All GND'd Irradiation	108.275		113.318			
788	All GND'd Irradiation	110.987		118.720			
789	All GND'd Irradiation	111.294		120.431			
790	All GND'd Irradiation	131.264		118.460			
781	Biased Irradiation	107.216		113.043			
782	Biased Irradiation	104.527		108.394			
783	Biased Irradiation	116.573		132.764			
784	Biased Irradiation	111.329		120.938			
785	Biased Irradiation	108.282		114.390			
796	All GND'd Irradiation	123.291			126.486		
797	All GND'd Irradiation	105.642			109.880		
798	All GND'd Irradiation	108.675			114.931		
799	All GND'd Irradiation	105.912			109.899		
800	All GND'd Irradiation	105.551			109.593		
791	Biased Irradiation	107.744			112.756		
792	Biased Irradiation	110.525			118.375		
793	Biased Irradiation	107.017			112.290		
794	Biased Irradiation	108.045			114.628		
795	Biased Irradiation	111.636			121.365		
806	All GND'd Irradiation	128.050				113.866	
807	All GND'd Irradiation	107.890				113.652	
808	All GND'd Irradiation	103.515				106.858	
809	All GND'd Irradiation	106.577				110.576	
810	All GND'd Irradiation	106.917				111.977	
801	Biased Irradiation	111.235				120.635	
802	Biased Irradiation	127.512				115.172	
803	Biased Irradiation	111.003				121.089	
804	Biased Irradiation	108.920				114.863	
805	Biased Irradiation	116.739				112.122	
816	All GND'd Irradiation	105.945					110.711
817	All GND'd Irradiation	106.321					111.233
818	All GND'd Irradiation	109.548					116.460
819	All GND'd Irradiation	107.580					113.139
820	All GND'd Irradiation	107.029					111.186
811	Biased Irradiation	108.956					116.174
812	Biased Irradiation	120.086					125.380
813	Biased Irradiation	104.583					108.450
814	Biased Irradiation	112.414					125.027
815	Biased Irradiation	107.869					114.064
832	Control Unit	105.617	109.911	109.911	109.911	109.911	109.911
833	Control Unit	136.039	114.725	114.725	114.725	114.725	114.725
All GND'd Irradiation Statistics							
Average All GND'd		114.580	119.680	121.548	114.158	111.386	112.546
Std Dev All GND'd		9.342	7.251	8.937	7.243	2.864	2.378
Ps90%/90% (+KTL) All GND'd		140.196	139.561	146.053	134.019	119.238	119.066
Ps90%/90% (-KTL) All GND'd		88.963	99.799	97.043	94.297	103.534	106.026
Biased Irradiation Statistics							
Average Biased		114.833	117.936	117.906	115.883	116.776	117.819
Std Dev Biased		14.415	10.826	9.440	3.890	3.917	7.309
Ps90%/90% (+KTL) Biased		154.359	147.621	143.789	126.549	127.518	137.861
Ps90%/90% (-KTL) Biased		75.307	88.251	92.022	105.216	106.034	97.777
Specification MIN		88	88	88	88	88	88
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		FAIL	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

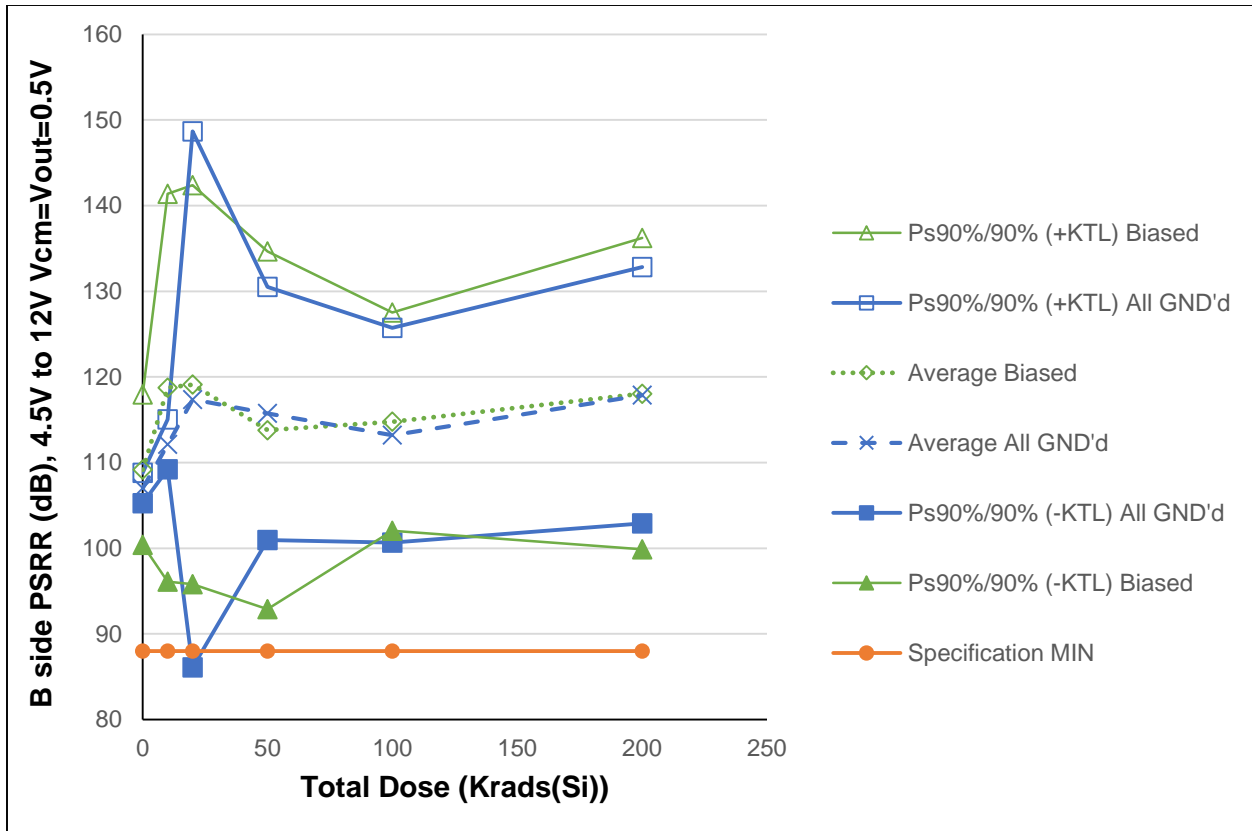


Figure 5.72: Plot of PSRR (side B) @ $V_s = 5V$ versus Total Dose

All fifty samples pass the PSRR test.

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)) @ 50 rad(Si)/s					
Units	(dB)	0	10	20	50	100	200
776	All GND'd Irradiation	107.637	113.595				
777	All GND'd Irradiation	107.148	112.672				
778	All GND'd Irradiation	106.651	111.561				
779	All GND'd Irradiation	106.097	110.807				
780	All GND'd Irradiation	107.564	111.988				
771	Biased Irradiation	113.198	126.334				
772	Biased Irradiation	107.730	113.986				
773	Biased Irradiation	106.895	112.683				
774	Biased Irradiation	111.971	129.052				
775	Biased Irradiation	106.062	111.706				
786	All GND'd Irradiation	108.067		113.847			
787	All GND'd Irradiation	105.516		110.090			
788	All GND'd Irradiation	106.373		110.911			
789	All GND'd Irradiation	108.584		114.494			
790	All GND'd Irradiation	117.032		137.501			
781	Biased Irradiation	112.994		125.537			
782	Biased Irradiation	136.510		116.943			
783	Biased Irradiation	114.831		129.769			
784	Biased Irradiation	108.254		114.600			
785	Biased Irradiation	104.488		108.685			
796	All GND'd Irradiation	105.460			110.046		
797	All GND'd Irradiation	119.971			122.837		
798	All GND'd Irradiation	107.266			112.962		
799	All GND'd Irradiation	111.642			119.957		
800	All GND'd Irradiation	107.462			112.923		
791	Biased Irradiation	112.011			122.207		
792	Biased Irradiation	104.198			108.393		
793	Biased Irradiation	112.258			121.531		
794	Biased Irradiation	102.547			105.757		
795	Biased Irradiation	106.924			111.050		
806	All GND'd Irradiation	108.242				114.833	
807	All GND'd Irradiation	107.061				112.629	
808	All GND'd Irradiation	108.243				114.142	
809	All GND'd Irradiation	109.230				118.427	
810	All GND'd Irradiation	102.795				105.974	
801	Biased Irradiation	104.444				107.949	
802	Biased Irradiation	107.851				113.001	
803	Biased Irradiation	108.892				117.354	
804	Biased Irradiation	111.493				120.221	
805	Biased Irradiation	108.913				115.334	
816	All GND'd Irradiation	112.242					120.244
817	All GND'd Irradiation	108.697					115.155
818	All GND'd Irradiation	108.983					117.736
819	All GND'd Irradiation	112.787					125.382
820	All GND'd Irradiation	106.508					110.830
811	Biased Irradiation	107.720					113.524
812	Biased Irradiation	115.527					127.408
813	Biased Irradiation	110.805					122.772
814	Biased Irradiation	107.814					113.327
815	Biased Irradiation	108.021					113.222
832	Control Unit	114.646	132.977	132.977	132.977	132.977	132.977
833	Control Unit	106.291	110.582	110.582	110.582	110.582	110.582
All GND'd Irradiation Statistics							
Average All GND'd		107.019	112.125	117.369	115.745	113.201	117.869
Std Dev All GND'd		0.648	1.065	11.409	5.391	4.567	5.455
Ps90%/90% (+KTL) All GND'd		108.796	115.044	148.652	130.526	125.722	132.826
Ps90%/90% (-KTL) All GND'd		105.242	109.206	86.085	100.964	100.680	102.912
Biased Irradiation Statistics							
Average Biased		109.171	118.752	119.107	113.788	114.772	118.051
Std Dev Biased		3.201	8.258	8.495	7.614	4.647	6.633
Ps90%/90% (+KTL) Biased		117.948	141.396	142.399	134.666	127.513	136.237
Ps90%/90% (-KTL) Biased		100.394	96.109	95.815	92.909	102.030	99.864
Specification MIN		88	88	88	88	88	88
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Specification MAX							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Status (-KTL) All GND'd		PASS	PASS	FAIL	PASS	PASS	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

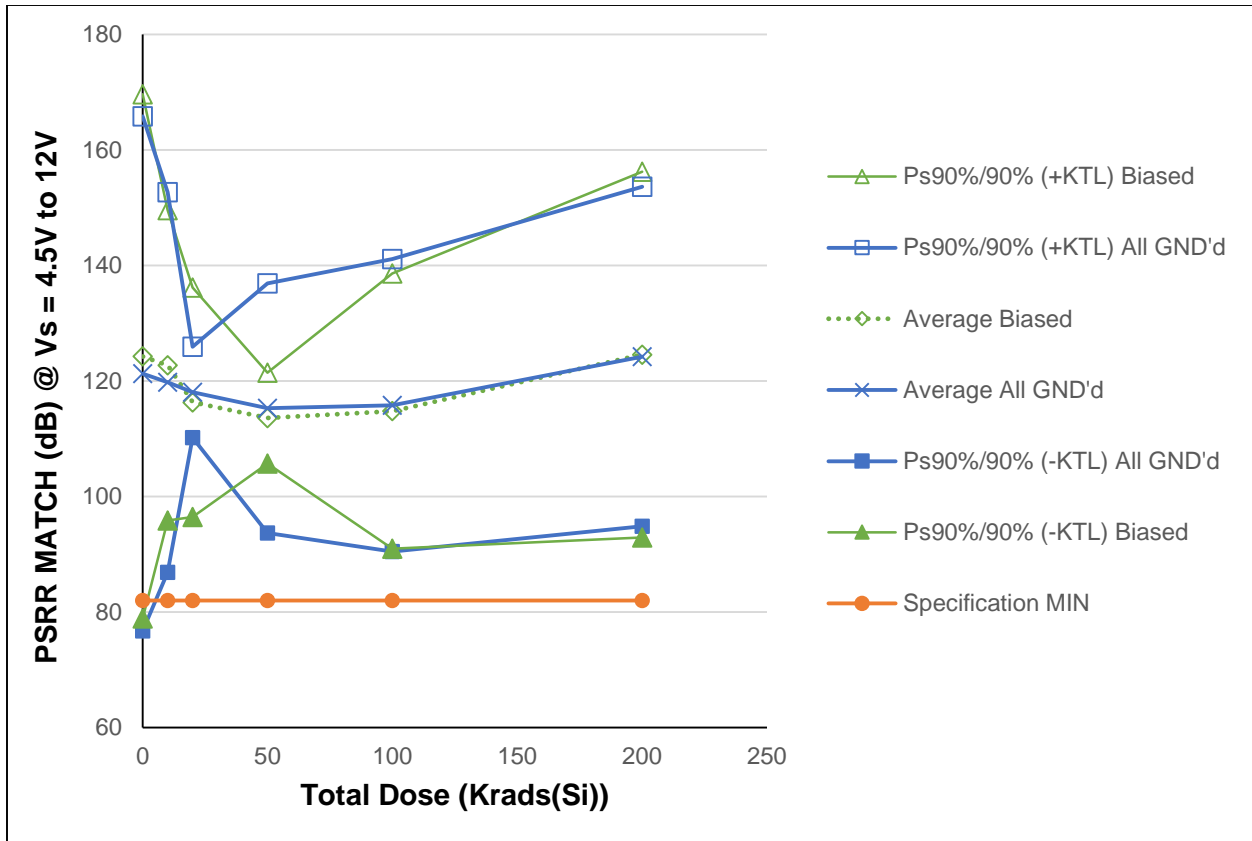


Figure 5.73: Plot of PSRR Match @ Vs = 5V versus Total Dose

All fifty samples pass the PSRR Match test.

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 @ Vs = 4.5V to 12V (dB)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	108.290	109.258				
777	All GND'd Irradiation	146.499	137.501				
778	All GND'd Irradiation	112.109	113.356				
779	All GND'd Irradiation	110.723	112.017				
780	All GND'd Irradiation	128.749	126.826				
771	Biased Irradiation	115.885	116.801				
772	Biased Irradiation	107.517	109.577				
773	Biased Irradiation	151.459	130.018				
774	Biased Irradiation	124.494	133.807				
775	Biased Irradiation	121.933	123.273				
786	All GND'd Irradiation	113.344		114.487			
787	All GND'd Irradiation	116.823		120.251			
788	All GND'd Irradiation	114.074		115.450			
789	All GND'd Irradiation	120.023		120.599			
790	All GND'd Irradiation	118.908		119.489			
781	Biased Irradiation	113.487		115.396			
782	Biased Irradiation	104.311		105.636			
783	Biased Irradiation	129.642		125.117			
784	Biased Irradiation	118.766		120.315			
785	Biased Irradiation	113.511		115.033			
796	All GND'd Irradiation	106.654			108.827		
797	All GND'd Irradiation	107.495			108.117		
798	All GND'd Irradiation	123.761			126.820		
799	All GND'd Irradiation	112.234			113.174		
800	All GND'd Irradiation	119.640			119.534		
791	Biased Irradiation	115.962			116.324		
792	Biased Irradiation	109.923			111.704		
793	Biased Irradiation	113.894			115.967		
794	Biased Irradiation	109.123			109.636		
795	Biased Irradiation	114.486			114.210		
806	All GND'd Irradiation	107.396				108.316	
807	All GND'd Irradiation	127.884				131.715	
808	All GND'd Irradiation	111.054				111.775	
809	All GND'd Irradiation	118.171				115.085	
810	All GND'd Irradiation	111.249				112.013	
801	Biased Irradiation	109.758				110.243	
802	Biased Irradiation	106.992				107.998	
803	Biased Irradiation	122.213				126.485	
804	Biased Irradiation	120.740				121.600	
805	Biased Irradiation	105.953				107.559	
816	All GND'd Irradiation	111.698					114.237
817	All GND'd Irradiation	118.739					120.026
818	All GND'd Irradiation	133.006					133.753
819	All GND'd Irradiation	114.498					115.572
820	All GND'd Irradiation	131.202					137.501
811	Biased Irradiation	125.269					125.125
812	Biased Irradiation	123.305					137.501
813	Biased Irradiation	110.406					110.305
814	Biased Irradiation	115.535					115.943
815	Biased Irradiation	143.097					133.916
832	Control Unit	109.408	110.544	110.544	110.544	110.544	110.544
833	Control Unit	106.012	106.388	106.388	106.388	106.388	106.388
All GND'd Irradiation Statistics							
Average All GND'd		121.274	119.792	118.055	115.294	115.781	124.218
Std Dev All GND'd		16.249	11.999	2.866	7.884	9.224	10.716
Ps90%/90% (+KTL) All GND'd		165.828	152.694	125.915	136.912	141.073	153.600
Ps90%/90% (-KTL) All GND'd		76.719	86.890	110.195	93.676	90.488	94.835
Biased Irradiation Statistics							
Average Biased		124.258	122.695	116.299	113.568	114.777	124.558
Std Dev Biased		16.551	9.801	7.246	2.859	8.692	11.541
Ps90%/90% (+KTL) Biased		169.640	149.569	136.167	121.408	138.611	156.204
Ps90%/90% (-KTL) Biased		78.875	95.821	96.432	105.728	90.942	92.912
Specification MIN		82	82	82	82	82	82
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		FAIL	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

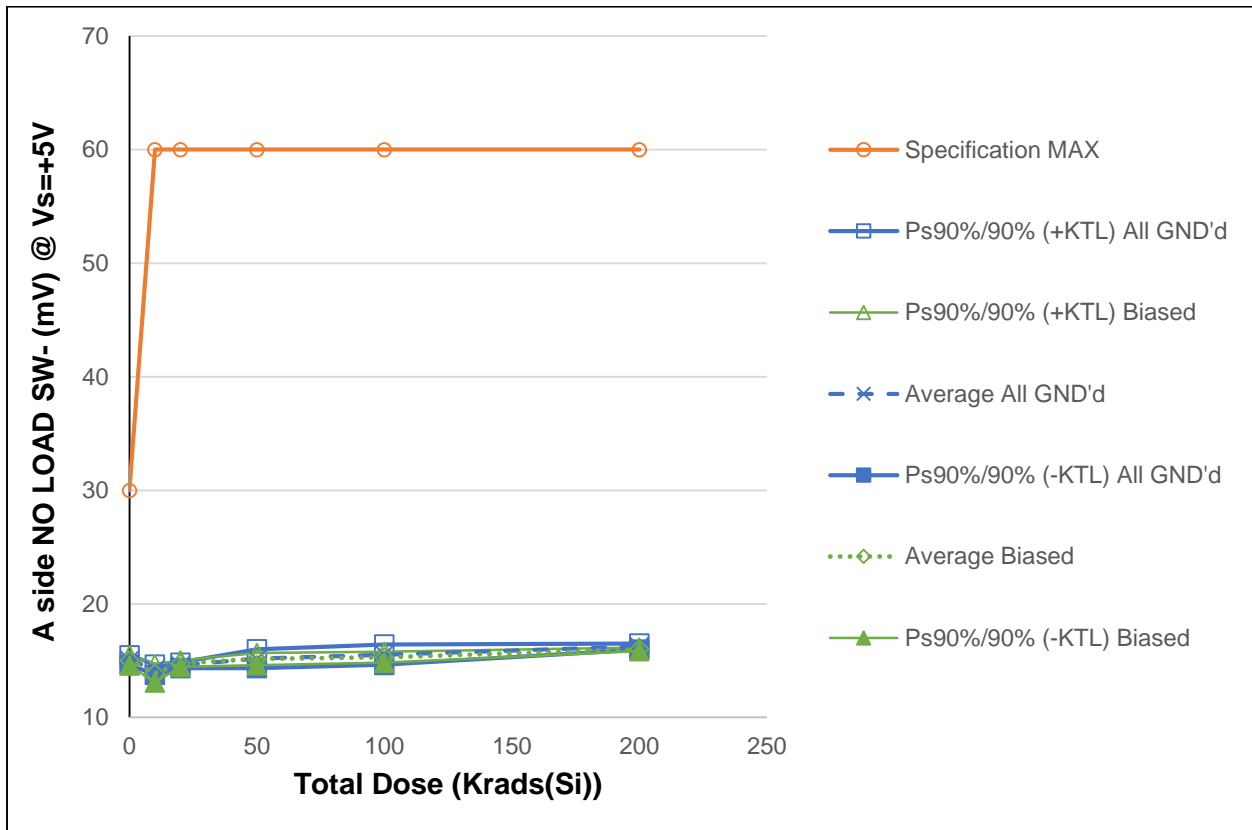


Figure 5.74: Plot of Output Voltage Swing Low with No Load @ $V_s = 5V$ versus Total Dose (side A)

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)) @ 50 rad(Si)/s					
Units	(mV)	0	10	20	50	100	200
776	All GND'd Irradiation	15.009	14.058				
777	All GND'd Irradiation	15.147	14.082				
778	All GND'd Irradiation	15.278	14.232				
779	All GND'd Irradiation	15.030	14.210				
780	All GND'd Irradiation	14.877	14.463				
771	Biased Irradiation	15.119	14.344				
772	Biased Irradiation	14.994	13.739				
773	Biased Irradiation	14.802	13.613				
774	Biased Irradiation	15.242	13.982				
775	Biased Irradiation	14.954	13.717				
786	All GND'd Irradiation	15.030		14.468			
787	All GND'd Irradiation	15.182		14.653			
788	All GND'd Irradiation	15.107		14.570			
789	All GND'd Irradiation	14.899		14.544			
790	All GND'd Irradiation	14.973		14.696			
781	Biased Irradiation	15.278		14.849			
782	Biased Irradiation	15.166		14.632			
783	Biased Irradiation	15.125		14.653			
784	Biased Irradiation	15.299		14.832			
785	Biased Irradiation	15.173		14.784			
796	All GND'd Irradiation	15.473			15.353		
797	All GND'd Irradiation	14.899			14.849		
798	All GND'd Irradiation	14.877			14.870		
799	All GND'd Irradiation	15.357			15.277		
800	All GND'd Irradiation	15.452			15.524		
791	Biased Irradiation	15.249			15.353		
792	Biased Irradiation	15.357			15.372		
793	Biased Irradiation	15.030			15.001		
794	Biased Irradiation	15.071			15.013		
795	Biased Irradiation	15.030			15.001		
806	All GND'd Irradiation	14.868				15.267	
807	All GND'd Irradiation	15.211				15.572	
808	All GND'd Irradiation	15.471				16.079	
809	All GND'd Irradiation	14.918				15.372	
810	All GND'd Irradiation	14.877				15.372	
801	Biased Irradiation	14.994				15.353	
802	Biased Irradiation	15.299				15.582	
803	Biased Irradiation	14.894				15.165	
804	Biased Irradiation	15.011				15.184	
805	Biased Irradiation	15.021				15.220	
816	All GND'd Irradiation	15.211					16.372
817	All GND'd Irradiation	15.107					16.308
818	All GND'd Irradiation	15.168					16.213
819	All GND'd Irradiation	15.071					16.115
820	All GND'd Irradiation	15.166					16.249
811	Biased Irradiation	15.030					15.927
812	Biased Irradiation	15.211					16.003
813	Biased Irradiation	15.119					16.060
814	Biased Irradiation	15.223					15.984
815	Biased Irradiation	15.271					16.051
832	Control Unit	15.030	14.315	14.315	14.315	14.315	14.315
833	Control Unit	15.052	14.501	14.501	14.501	14.501	14.501
All GND'd Irradiation Statistics							
	Average All GND'd	15.068	14.209	14.586	15.175	15.533	16.251
	Std Dev All GND'd	0.151	0.161	0.091	0.302	0.325	0.097
	Ps90%/90% (+KTL) All GND'd	15.483	14.651	14.834	16.002	16.424	16.518
	Ps90%/90% (-KTL) All GND'd	14.653	13.767	14.338	14.348	14.642	15.985
Biased Irradiation Statistics							
	Average Biased	15.022	13.879	14.750	15.148	15.301	16.005
	Std Dev Biased	0.167	0.293	0.101	0.196	0.173	0.054
	Ps90%/90% (+KTL) Biased	15.481	14.682	15.027	15.686	15.776	16.153
	Ps90%/90% (-KTL) Biased	14.564	13.076	14.473	14.610	14.825	15.857
Specification MIN							
	Status (Measurements) All GND'd						
	Status (Measurements) Biased						
Specification MAX							
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) All GND'd						
	Status (+KTL) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (-KTL) Biased						
	Status (+KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS

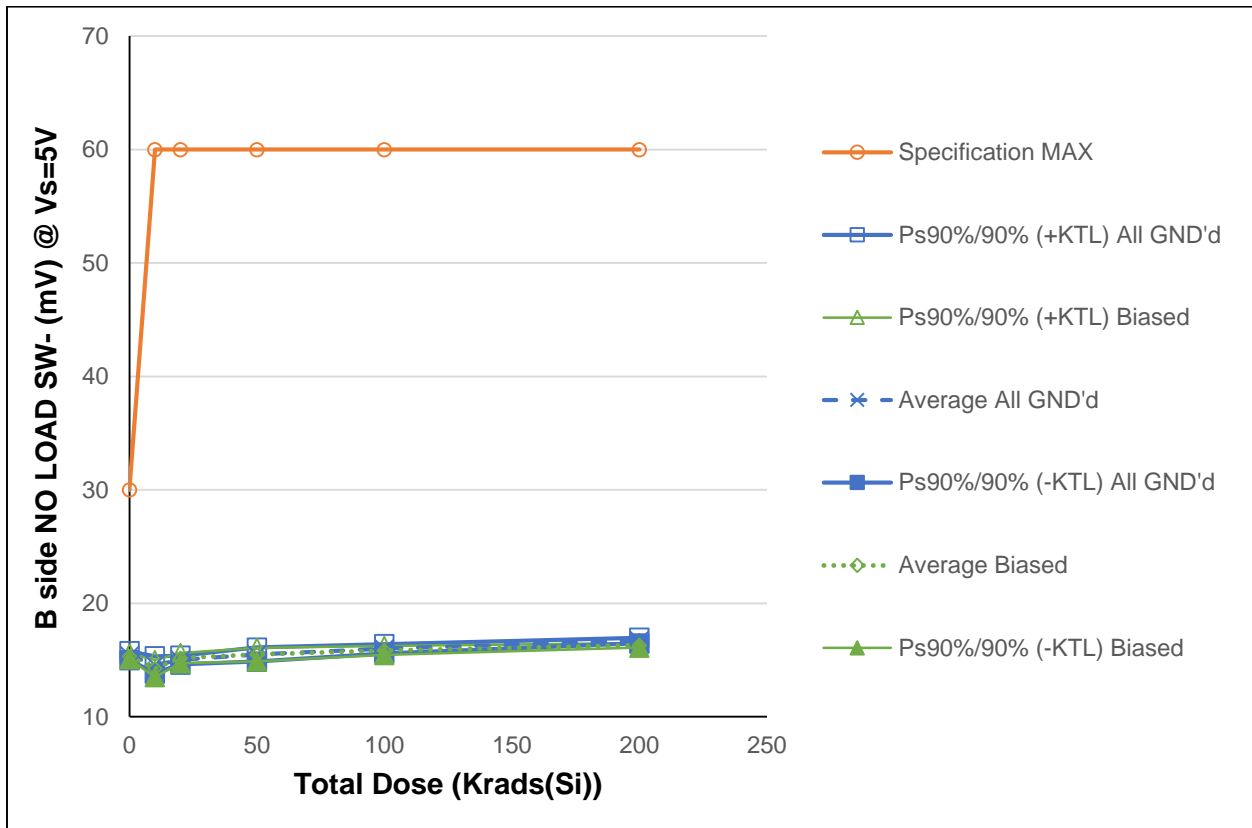


Figure 5.75: Plot of Output Voltage Swing Low with No Load @ $V_s = 5V$ versus Total Dose (side B)

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
Units	(mV)						
776	All GND'd Irradiation	15.376	14.479				
777	All GND'd Irradiation	15.233	14.210				
778	All GND'd Irradiation	15.626	14.591				
779	All GND'd Irradiation	15.390	14.620				
780	All GND'd Irradiation	15.390	14.972				
771	Biased Irradiation	15.473	14.727				
772	Biased Irradiation	15.357	14.260				
773	Biased Irradiation	15.204	14.070				
774	Biased Irradiation	15.357	14.153				
775	Biased Irradiation	15.309	14.079				
786	All GND'd Irradiation	15.390		14.844			
787	All GND'd Irradiation	15.576		15.034			
788	All GND'd Irradiation	15.583		15.098			
789	All GND'd Irradiation	15.271		14.879			
790	All GND'd Irradiation	15.411		15.174			
781	Biased Irradiation	15.669		15.370			
782	Biased Irradiation	15.461		15.089			
783	Biased Irradiation	15.428		14.963			
784	Biased Irradiation	15.766		15.296			
785	Biased Irradiation	15.504		15.146			
796	All GND'd Irradiation	15.583			15.572		
797	All GND'd Irradiation	15.276			15.277		
798	All GND'd Irradiation	15.156			15.220		
799	All GND'd Irradiation	15.729			15.675		
800	All GND'd Irradiation	15.605			15.708		
791	Biased Irradiation	15.605			15.791		
792	Biased Irradiation	15.528			15.505		
793	Biased Irradiation	15.516			15.505		
794	Biased Irradiation	15.423			15.429		
795	Biased Irradiation	15.233			15.191		
806	All GND'd Irradiation	15.364				15.810	
807	All GND'd Irradiation	15.757				16.115	
808	All GND'd Irradiation	15.605				16.156	
809	All GND'd Irradiation	15.504				16.020	
810	All GND'd Irradiation	15.357				15.872	
801	Biased Irradiation	15.423				15.822	
802	Biased Irradiation	15.698				16.089	
803	Biased Irradiation	15.385				15.713	
804	Biased Irradiation	15.516				15.801	
805	Biased Irradiation	15.509				15.801	
816	All GND'd Irradiation	15.545					16.801
817	All GND'd Irradiation	15.504					16.715
818	All GND'd Irradiation	15.538					16.708
819	All GND'd Irradiation	15.640					16.801
820	All GND'd Irradiation	15.452					16.584
811	Biased Irradiation	15.326					16.267
812	Biased Irradiation	15.640					16.410
813	Biased Irradiation	15.424					16.324
814	Biased Irradiation	15.488					16.215
815	Biased Irradiation	15.538					16.286
832	Control Unit	15.335	14.746	14.746	14.746	14.746	14.746
833	Control Unit	15.461	14.951	14.951	14.951	14.951	14.951
All GND'd Irradiation Statistics							
Average All GND'd		15.403	14.575	15.006	15.490	15.995	16.722
Std Dev All GND'd		0.141	0.275	0.141	0.227	0.150	0.089
Ps90%/90% (+KTL) All GND'd		15.790	15.328	15.394	16.114	16.406	16.965
Ps90%/90% (-KTL) All GND'd		15.016	13.821	14.618	14.867	15.583	16.478
Biased Irradiation Statistics							
Average Biased		15.340	14.258	15.173	15.485	15.845	16.301
Std Dev Biased		0.097	0.273	0.163	0.215	0.143	0.073
Ps90%/90% (+KTL) Biased		15.606	15.007	15.619	16.073	16.236	16.500
Ps90%/90% (-KTL) Biased		15.073	13.509	14.726	14.896	15.454	16.101
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

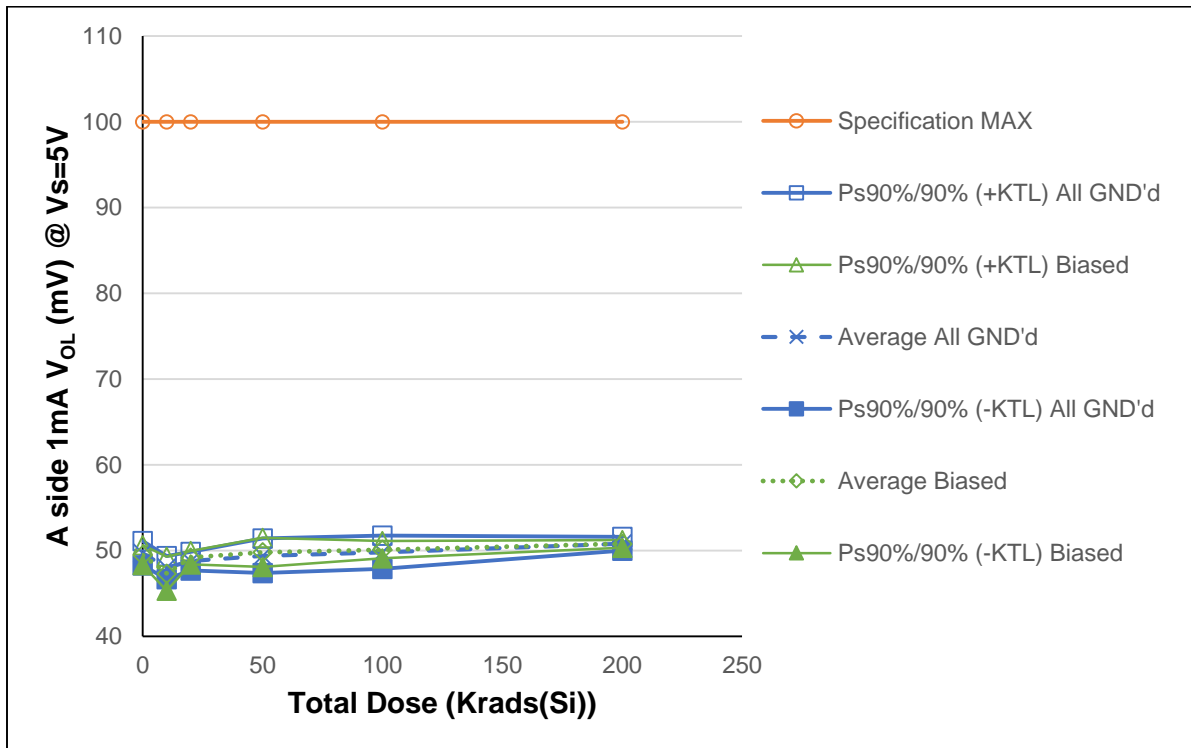


Figure 5.76: Plot of Output Voltage Swing Low with $I_{SINK} = 1mA$ @ $V_s = 5V$ versus Total Dose (side A)

Table 5.76: Raw data for output voltage swing low with $I_{SINK} = 1mA$ (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 1mA Vol @ Vs=5V	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
Units	(mV)	0	10	20	50	100	200
776	All GND'd Irradiation	49.354	47.456				
777	All GND'd Irradiation	49.836	47.732				
778	All GND'd Irradiation	50.539	48.518				
779	All GND'd Irradiation	49.394	47.849				
780	All GND'd Irradiation	49.354	48.554				
771	Biased Irradiation	50.117	48.594				
772	Biased Irradiation	48.992	46.808				
773	Biased Irradiation	49.218	47.058				
774	Biased Irradiation	49.564	47.199				
775	Biased Irradiation	49.488	46.956				
786	All GND'd Irradiation	49.888		48.763			
787	All GND'd Irradiation	50.146		49.087			
788	All GND'd Irradiation	49.480		48.475			
789	All GND'd Irradiation	49.223		48.306			
790	All GND'd Irradiation	49.793		49.235			
781	Biased Irradiation	50.422		49.661			
782	Biased Irradiation	49.888		49.001			
783	Biased Irradiation	49.993		48.951			
784	Biased Irradiation	50.367		49.220			
785	Biased Irradiation	49.993		49.089			
796	All GND'd Irradiation	50.193			49.734		
797	All GND'd Irradiation	48.937			48.494		
798	All GND'd Irradiation	49.202			48.763		
799	All GND'd Irradiation	50.184			49.763		
800	All GND'd Irradiation	50.515			50.246		
791	Biased Irradiation	50.539			50.601		
792	Biased Irradiation	50.443			50.296		
793	Biased Irradiation	49.862			49.618		
794	Biased Irradiation	49.659			49.299		
795	Biased Irradiation	49.507			49.197		
806	All GND'd Irradiation	49.111				49.125	
807	All GND'd Irradiation	49.812				49.801	
808	All GND'd Irradiation	50.777				50.994	
809	All GND'd Irradiation	49.318				49.525	
810	All GND'd Irradiation	49.449				49.582	
801	Biased Irradiation	49.929				50.313	
802	Biased Irradiation	49.929				50.380	
803	Biased Irradiation	49.480				49.773	
804	Biased Irradiation	50.212				50.439	
805	Biased Irradiation	49.471				49.656	
816	All GND'd Irradiation	49.683					50.551
817	All GND'd Irradiation	49.833					50.723
818	All GND'd Irradiation	50.365					51.237
819	All GND'd Irradiation	49.714					50.580
820	All GND'd Irradiation	50.095					50.972
811	Biased Irradiation	49.421					50.720
812	Biased Irradiation	50.021					50.932
813	Biased Irradiation	49.862					50.999
814	Biased Irradiation	49.716					50.668
815	Biased Irradiation	49.776					50.644
832	Control Unit	49.166	47.858	47.858	47.858	47.858	47.858
833	Control Unit	49.659	48.763	48.763	48.763	48.763	48.763
All GND'd Irradiation Statistics							
Average All GND'd		49.695	48.022	48.773	49.400	49.805	50.812
Std Dev All GND'd		0.514	0.491	0.393	0.739	0.708	0.290
Ps90%/90% (+KTL) All GND'd		51.104	49.367	49.852	51.427	51.746	51.608
Ps90%/90% (-KTL) All GND'd		48.287	46.676	47.694	47.373	47.865	50.017
Biased Irradiation Statistics							
Average Biased		49.476	47.323	49.185	49.802	50.112	50.792
Std Dev Biased		0.424	0.725	0.285	0.620	0.368	0.162
Ps90%/90% (+KTL) Biased		50.638	49.310	49.966	51.502	51.122	51.236
Ps90%/90% (-KTL) Biased		48.313	45.336	48.403	48.103	49.102	50.349
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

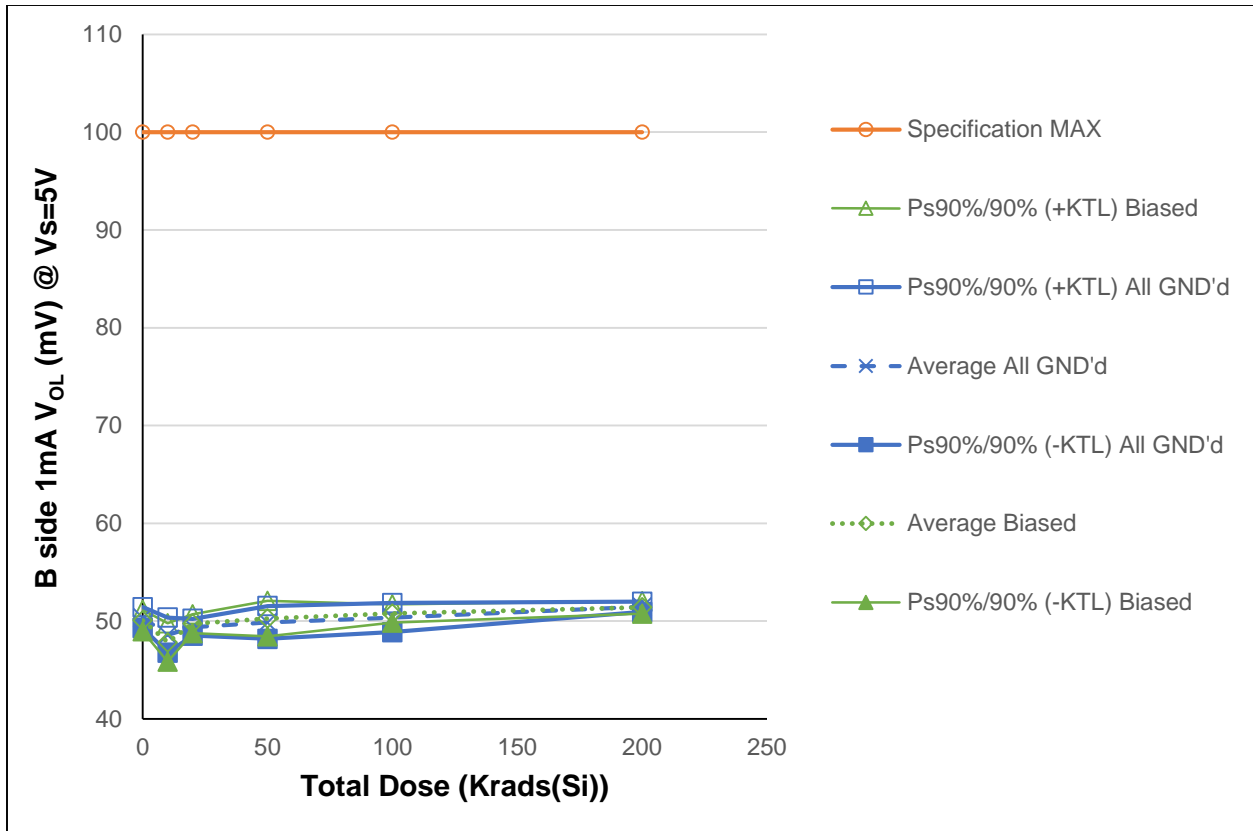


Figure 5.77: Plot of Output Voltage Swing Low with $I_{SINK} = 1mA$ @ $V_s = 5V$ versus Total Dose (side B)

Table 5.77: Raw data for output voltage swing low with $I_{SINK} = 1mA$ (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 1mA Vol @ $V_s=5V$ (mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	50.031	48.037				
777	All GND'd Irradiation	50.098	47.849				
778	All GND'd Irradiation	51.013	48.937				
779	All GND'd Irradiation	50.253	48.611				
780	All GND'd Irradiation	50.367	49.446				
771	Biased Irradiation	50.756	49.087				
772	Biased Irradiation	49.716	47.401				
773	Biased Irradiation	49.938	47.680				
774	Biased Irradiation	49.954	47.592				
775	Biased Irradiation	49.964	47.371				
786	All GND'd Irradiation	50.479		49.256			
787	All GND'd Irradiation	50.667		49.525			
788	All GND'd Irradiation	50.518		49.372			
789	All GND'd Irradiation	49.833		48.942			
790	All GND'd Irradiation	50.422		49.789			
781	Biased Irradiation	51.061		50.211			
782	Biased Irradiation	50.479		49.501			
783	Biased Irradiation	50.422		49.322			
784	Biased Irradiation	51.054		49.932			
785	Biased Irradiation	50.727		49.742			
796	All GND'd Irradiation	50.701			50.068		
797	All GND'd Irradiation	49.836			49.180		
798	All GND'd Irradiation	49.797			49.247		
799	All GND'd Irradiation	50.903			50.363		
800	All GND'd Irradiation	50.691			50.456		
791	Biased Irradiation	51.168			51.049		
792	Biased Irradiation	50.972			50.723		
793	Biased Irradiation	50.672			50.347		
794	Biased Irradiation	50.253			49.849		
795	Biased Irradiation	49.833			49.399		
806	All GND'd Irradiation	49.985				49.925	
807	All GND'd Irradiation	50.565				50.418	
808	All GND'd Irradiation	51.054				51.261	
809	All GND'd Irradiation	50.157				50.296	
810	All GND'd Irradiation	49.833				49.942	
801	Biased Irradiation	50.636				50.951	
802	Biased Irradiation	50.663				50.972	
803	Biased Irradiation	50.252				50.344	
804	Biased Irradiation	50.946				51.106	
805	Biased Irradiation	50.403				50.466	
816	All GND'd Irradiation	50.539					51.363
817	All GND'd Irradiation	50.477					51.258
818	All GND'd Irradiation	50.996					51.760
819	All GND'd Irradiation	50.596					51.389
820	All GND'd Irradiation	50.727					51.506
811	Biased Irradiation	50.107					51.354
812	Biased Irradiation	50.586					51.515
813	Biased Irradiation	50.557					51.684
814	Biased Irradiation	50.107					51.063
815	Biased Irradiation	50.510					51.429
832	Control Unit	49.735	48.382	48.382	48.382	48.382	48.382
833	Control Unit	50.443	49.351	49.351	49.351	49.351	49.351
All GND'd Irradiation Statistics							
Average All GND'd		50.352	48.576	49.377	49.863	50.368	51.455
Std Dev All GND'd		0.392	0.654	0.315	0.610	0.544	0.192
Ps90%/90% (+KTL) All GND'd		51.427	50.368	50.240	51.536	51.859	51.982
Ps90%/90% (-KTL) All GND'd		49.277	46.784	48.514	48.189	48.877	50.929
Biased Irradiation Statistics							
Average Biased		50.066	47.826	49.742	50.273	50.768	51.409
Std Dev Biased		0.399	0.717	0.350	0.662	0.339	0.229
Ps90%/90% (+KTL) Biased		51.160	49.791	50.701	52.089	51.698	52.038
Ps90%/90% (-KTL) Biased		48.971	45.861	48.782	48.458	49.837	50.781
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

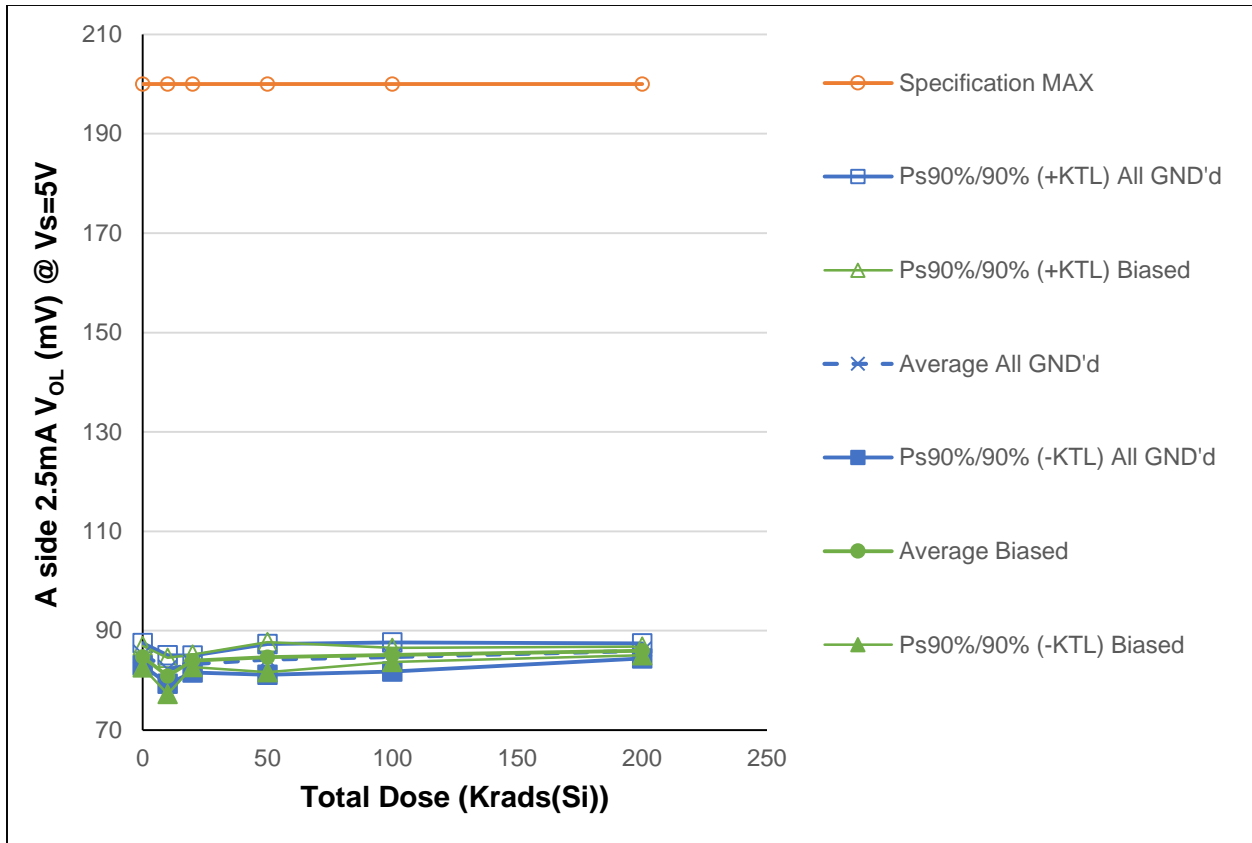


Figure 5.78: Plot of Output Voltage Swing Low with $I_{SINK} = 2.5mA$ @ $V_s = 5V$ versus Total Dose (side A)

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 Units	A 2.5mA Vol @ $V_s=5V$ (mV)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	84.518	81.058				
777	All GND'd Irradiation	85.073	81.280				
778	All GND'd Irradiation	86.654	83.077				
779	All GND'd Irradiation	84.995	82.196				
780	All GND'd Irradiation	85.053	83.415				
771	Biased Irradiation	85.911	83.218				
772	Biased Irradiation	83.730	79.830				
773	Biased Irradiation	84.518	80.573				
774	Biased Irradiation	84.840	80.613				
775	Biased Irradiation	84.842	80.296				
786	All GND'd Irradiation	85.398		83.263			
787	All GND'd Irradiation	85.653		83.534			
788	All GND'd Irradiation	84.788		82.832			
789	All GND'd Irradiation	84.433		82.670			
790	All GND'd Irradiation	85.424		84.241			
781	Biased Irradiation	86.339		84.651			
782	Biased Irradiation	85.491		83.584			
783	Biased Irradiation	85.531		83.508			
784	Biased Irradiation	86.323		84.127			
785	Biased Irradiation	85.856		83.891			
796	All GND'd Irradiation	85.951			84.651		
797	All GND'd Irradiation	84.121			82.763		
798	All GND'd Irradiation	84.537			83.315		
799	All GND'd Irradiation	86.044			84.839		
800	All GND'd Irradiation	86.272			85.489		
791	Biased Irradiation	86.695			86.175		
792	Biased Irradiation	86.256			85.394		
793	Biased Irradiation	85.510			84.425		
794	Biased Irradiation	84.921			83.870		
795	Biased Irradiation	84.652			83.534		
806	All GND'd Irradiation	84.204				83.529	
807	All GND'd Irradiation	85.474				84.829	
808	All GND'd Irradiation	86.752				86.430	
809	All GND'd Irradiation	84.731				84.401	
810	All GND'd Irradiation	84.695				84.334	
801	Biased Irradiation	85.703				85.613	
802	Biased Irradiation	85.488				85.358	
803	Biased Irradiation	85.169				84.863	
804	Biased Irradiation	85.856				85.468	
805	Biased Irradiation	84.814				84.367	
816	All GND'd Irradiation	84.921					85.218
817	All GND'd Irradiation	85.572					85.879
818	All GND'd Irradiation	86.264					86.556
819	All GND'd Irradiation	85.229					85.591
820	All GND'd Irradiation	85.996					86.420
811	Biased Irradiation	84.807					85.851
812	Biased Irradiation	85.739					86.363
813	Biased Irradiation	85.398					86.175
814	Biased Irradiation	85.205					85.737
815	Biased Irradiation	85.195					85.620
832	Control Unit	84.047	81.813	81.813	81.813	81.813	81.813
833	Control Unit	85.093	83.487	83.487	83.487	83.487	83.487
All GND'd Irradiation Statistics							
Average All GND'd		85.259	82.205	83.308	84.211	84.705	85.933
Std Dev All GND'd		0.813	1.048	0.624	1.131	1.073	0.561
Ps90%/90% (+KTL) All GND'd		87.487	85.080	85.019	87.314	87.646	87.470
Ps90%/90% (-KTL) All GND'd		83.031	79.331	81.597	81.109	81.764	84.396
Biased Irradiation Statistics							
Average Biased		84.768	80.906	83.952	84.679	85.134	85.949
Std Dev Biased		0.784	1.330	0.462	1.093	0.513	0.310
Ps90%/90% (+KTL) Biased		86.917	84.551	85.220	87.676	86.540	86.800
Ps90%/90% (-KTL) Biased		82.619	77.260	82.684	81.683	83.728	85.098
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

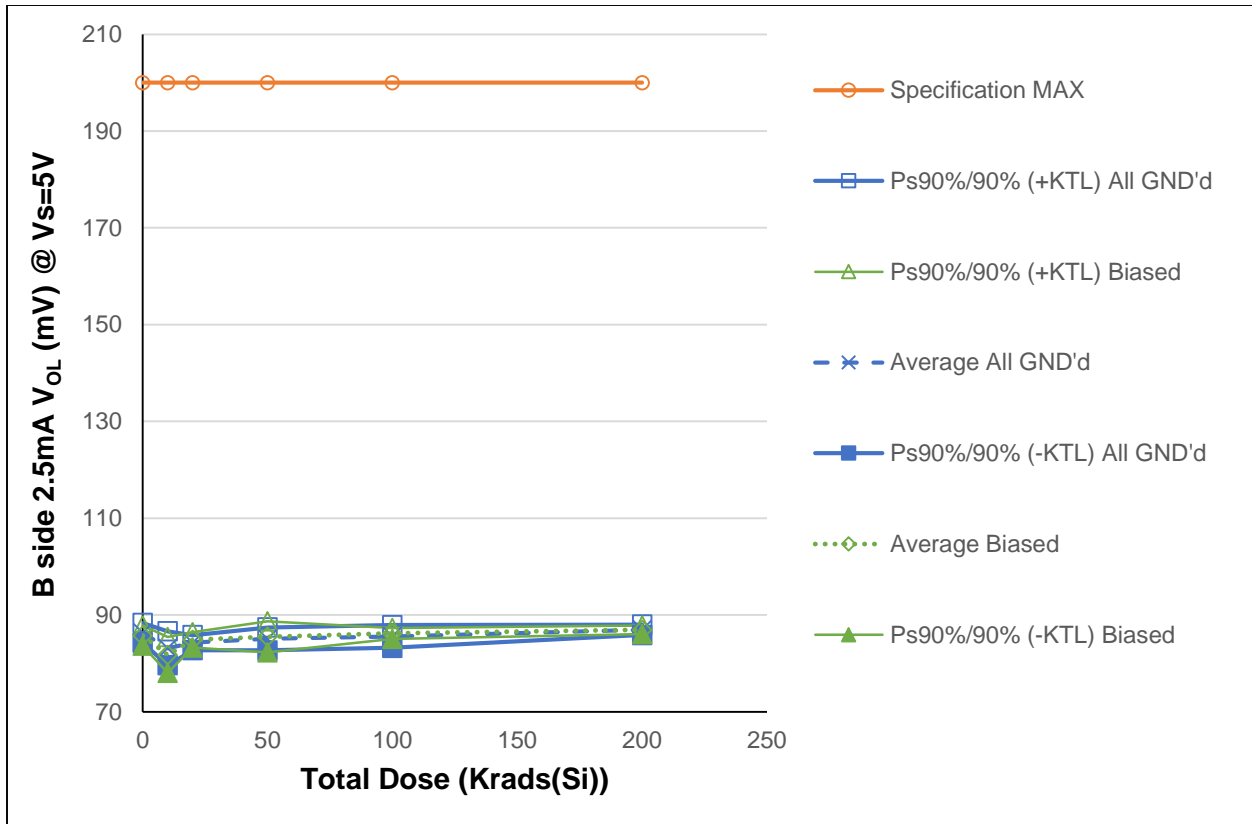


Figure 5.79: Plot of Output Voltage Swing Low with $I_{SINK} = 2.5mA$ @ $V_s = 5V$ versus Total Dose (side B)

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 Units	B 2.5mA Vol @ $V_s=5V$ (mV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	85.551	82.042				
777	All GND'd Irradiation	85.684	81.699				
778	All GND'd Irradiation	87.417	83.670				
779	All GND'd Irradiation	86.272	83.370				
780	All GND'd Irradiation	86.475	84.851				
771	Biased Irradiation	86.943	84.063				
772	Biased Irradiation	84.823	80.737				
773	Biased Irradiation	85.723	81.604				
774	Biased Irradiation	85.531	81.244				
775	Biased Irradiation	85.627	81.008				
786	All GND'd Irradiation	86.295		84.051			
787	All GND'd Irradiation	86.502		84.346			
788	All GND'd Irradiation	86.216		84.144			
789	All GND'd Irradiation	85.386		83.632			
790	All GND'd Irradiation	86.425		85.165			
781	Biased Irradiation	87.362		85.591			
782	Biased Irradiation	86.389		84.410			
783	Biased Irradiation	86.313		84.144			
784	Biased Irradiation	87.436		85.168			
785	Biased Irradiation	87.000		84.956			
796	All GND'd Irradiation	86.797			85.337		
797	All GND'd Irradiation	85.379			84.013		
798	All GND'd Irradiation	85.577			84.270		
799	All GND'd Irradiation	87.112			85.829		
800	All GND'd Irradiation	86.752			85.810		
791	Biased Irradiation	87.555			86.991		
792	Biased Irradiation	87.210			86.227		
793	Biased Irradiation	86.673			85.525		
794	Biased Irradiation	85.856			84.622		
795	Biased Irradiation	85.281			84.096		
806	All GND'd Irradiation	85.474				84.727	
807	All GND'd Irradiation	86.447				85.677	
808	All GND'd Irradiation	87.131				86.917	
809	All GND'd Irradiation	85.911				85.504	
810	All GND'd Irradiation	85.398				84.939	
801	Biased Irradiation	86.826				86.603	
802	Biased Irradiation	86.521				86.287	
803	Biased Irradiation	86.247				85.829	
804	Biased Irradiation	87.014				86.496	
805	Biased Irradiation	86.187				85.677	
816	All GND'd Irradiation	86.264					86.460
817	All GND'd Irradiation	86.562					86.767
818	All GND'd Irradiation	87.217					87.403
819	All GND'd Irradiation	86.502					86.765
820	All GND'd Irradiation	86.978					87.289
811	Biased Irradiation	85.815					86.896
812	Biased Irradiation	86.704					87.153
813	Biased Irradiation	86.600					87.267
814	Biased Irradiation	85.958					86.420
815	Biased Irradiation	86.416					86.848
832	Control Unit	84.995	82.708	82.708	82.708	82.708	82.708
833	Control Unit	86.237	84.470	84.470	84.470	84.470	84.470
All GND'd Irradiation Statistics							
Average All GND'd		86.280	83.126	84.268	85.052	85.553	86.937
Std Dev All GND'd		0.745	1.279	0.565	0.859	0.857	0.396
Ps90%/90% (+KTL) All GND'd		88.322	86.633	85.818	87.407	87.903	88.022
Ps90%/90% (-KTL) All GND'd		84.238	79.619	82.718	82.697	83.203	85.852
Biased Irradiation Statistics							
Average Biased		85.730	81.731	84.854	85.492	86.178	86.917
Std Dev Biased		0.765	1.342	0.582	1.172	0.408	0.328
Ps90%/90% (+KTL) Biased		87.828	85.411	86.449	88.706	87.298	87.816
Ps90%/90% (-KTL) Biased		83.631	78.052	83.259	82.279	85.059	86.017
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

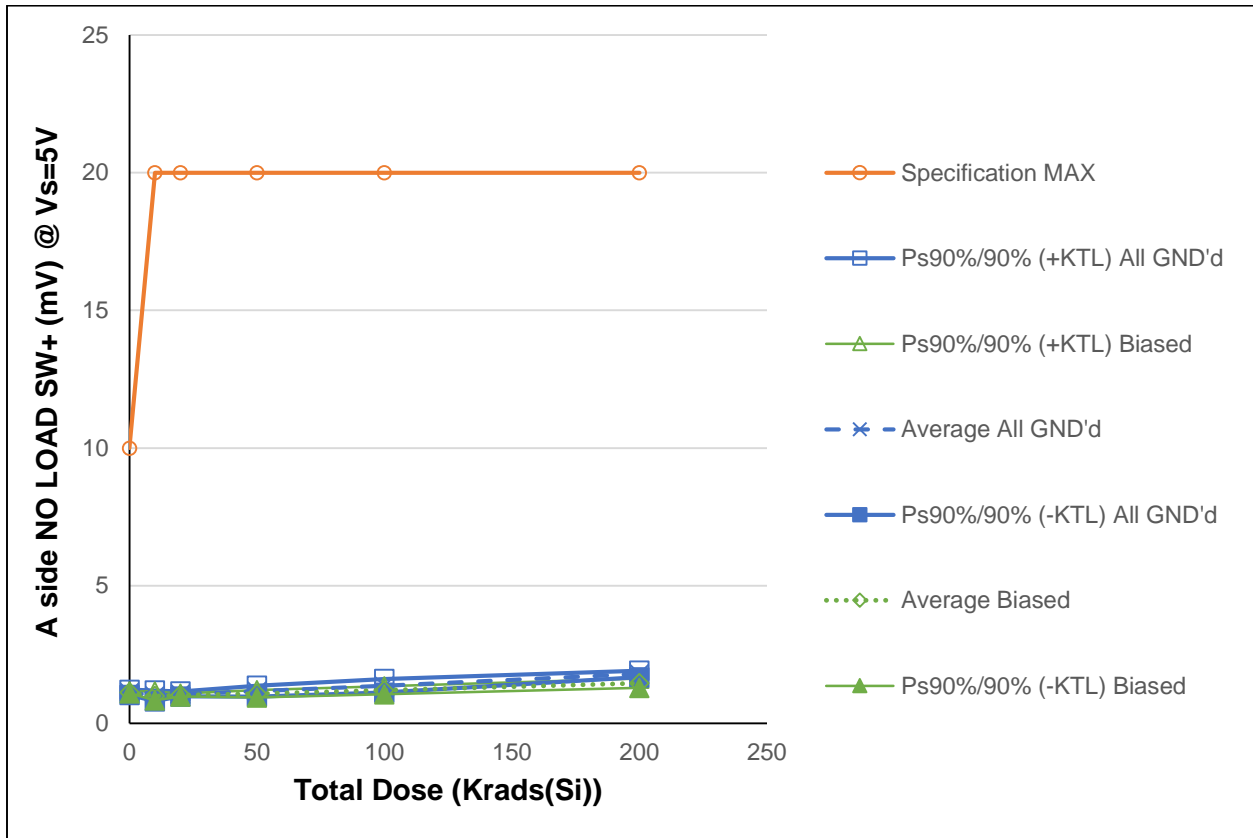


Figure 5.80: Plot of Output Voltage Swing High with No Load @ $V_s = 5V$ versus Total Dose (side A)

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)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
Units	(mV)						
776	All GND'd Irradiation	1.086	1.015				
777	All GND'd Irradiation	1.151	1.008				
778	All GND'd Irradiation	1.096	0.967				
779	All GND'd Irradiation	1.155	0.908				
780	All GND'd Irradiation	1.155	1.103				
771	Biased Irradiation	1.136	0.951				
772	Biased Irradiation	1.136	0.951				
773	Biased Irradiation	1.136	1.062				
774	Biased Irradiation	1.115	0.965				
775	Biased Irradiation	1.115	1.063				
786	All GND'd Irradiation	1.151		1.062			
787	All GND'd Irradiation	1.115		1.084			
788	All GND'd Irradiation	1.096		1.074			
789	All GND'd Irradiation	1.086		1.103			
790	All GND'd Irradiation	1.136		1.015			
781	Biased Irradiation	1.136		1.046			
782	Biased Irradiation	1.146		1.037			
783	Biased Irradiation	1.115		1.015			
784	Biased Irradiation	1.136		1.010			
785	Biased Irradiation	1.086		1.048			
796	All GND'd Irradiation	1.096			1.179		
797	All GND'd Irradiation	1.115			1.215		
798	All GND'd Irradiation	1.146			1.205		
799	All GND'd Irradiation	1.079			1.046		
800	All GND'd Irradiation	1.115			1.215		
791	Biased Irradiation	1.155			1.139		
792	Biased Irradiation	1.096			1.103		
793	Biased Irradiation	1.115			1.053		
794	Biased Irradiation	1.136			1.075		
795	Biased Irradiation	1.096			1.015		
806	All GND'd Irradiation	1.079				1.331	
807	All GND'd Irradiation	1.112				1.255	
808	All GND'd Irradiation	1.086				1.498	
809	All GND'd Irradiation	1.115				1.351	
810	All GND'd Irradiation	1.136				1.396	
801	Biased Irradiation	1.136				1.255	
802	Biased Irradiation	1.136				1.227	
803	Biased Irradiation	1.146				1.158	
804	Biased Irradiation	1.115				1.236	
805	Biased Irradiation	1.146				1.139	
816	All GND'd Irradiation	1.108					1.798
817	All GND'd Irradiation	1.146					1.853
818	All GND'd Irradiation	1.158					1.824
819	All GND'd Irradiation	1.061					1.748
820	All GND'd Irradiation	1.136					1.760
811	Biased Irradiation	1.155					1.365
812	Biased Irradiation	1.115					1.443
813	Biased Irradiation	1.136					1.519
814	Biased Irradiation	1.079					1.484
815	Biased Irradiation	1.096					1.493
832	Control Unit	1.115	0.951	0.951	0.951	0.951	0.951
833	Control Unit	1.096	1.027	1.027	1.027	1.027	1.027
All GND'd Irradiation Statistics							
Average All GND'd		1.129	1.000	1.068	1.172	1.366	1.797
Std Dev All GND'd		0.035	0.071	0.033	0.072	0.089	0.044
Ps90%/90% (+KTL) All GND'd		1.224	1.196	1.158	1.370	1.611	1.917
Ps90%/90% (-KTL) All GND'd		1.034	0.804	0.977	0.975	1.121	1.677
Biased Irradiation Statistics							
Average Biased		1.128	0.998	1.031	1.077	1.203	1.461
Std Dev Biased		0.012	0.059	0.018	0.047	0.052	0.060
Ps90%/90% (+KTL) Biased		1.160	1.160	1.080	1.206	1.344	1.626
Ps90%/90% (-KTL) Biased		1.095	0.837	0.983	0.948	1.062	1.296
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
		10	20	20	20	20	20
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

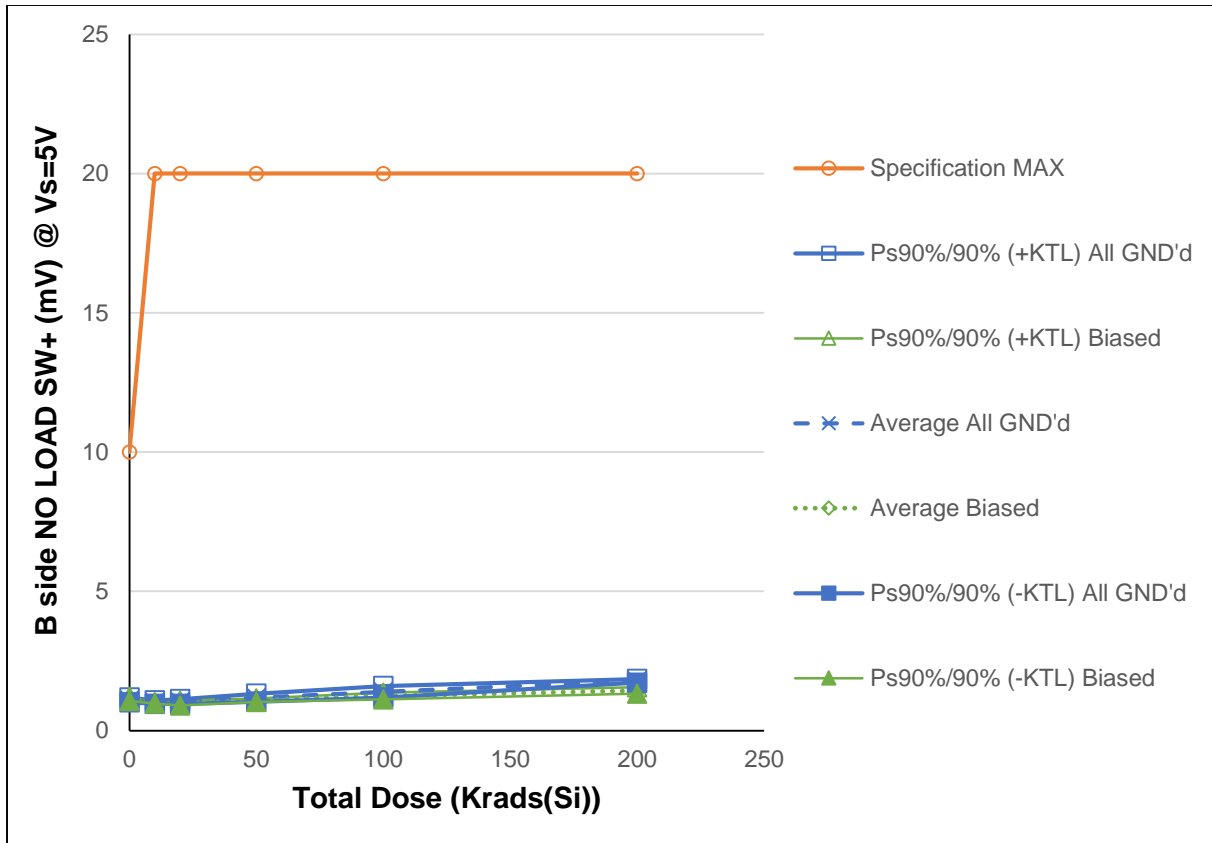


Figure 5.81: Plot of Output Voltage Swing High with No Load @ Vs = 5V versus Total Dose (side B)

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 Units	B NO LOAD SW+ @ Vs=5V (mV)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	1.070	1.053				
777	All GND'd Irradiation	1.079	1.006				
778	All GND'd Irradiation	1.136	1.027				
779	All GND'd Irradiation	1.096	0.998				
780	All GND'd Irradiation	1.136	1.037				
771	Biased Irradiation	1.115	1.006				
772	Biased Irradiation	1.146	0.986				
773	Biased Irradiation	1.172	0.998				
774	Biased Irradiation	1.108	0.986				
775	Biased Irradiation	1.146	0.998				
786	All GND'd Irradiation	1.086		1.091			
787	All GND'd Irradiation	1.115		1.037			
788	All GND'd Irradiation	1.079		1.053			
789	All GND'd Irradiation	1.096		1.046			
790	All GND'd Irradiation	1.096		1.003			
781	Biased Irradiation	1.158		1.006			
782	Biased Irradiation	1.115		1.006			
783	Biased Irradiation	1.115		0.960			
784	Biased Irradiation	1.158		0.951			
785	Biased Irradiation	1.108		1.027			
796	All GND'd Irradiation	1.115			1.158		
797	All GND'd Irradiation	1.112			1.167		
798	All GND'd Irradiation	1.115			1.151		
799	All GND'd Irradiation	1.061			1.163		
800	All GND'd Irradiation	1.115			1.277		
791	Biased Irradiation	1.086			1.113		
792	Biased Irradiation	1.136			1.087		
793	Biased Irradiation	1.115			1.075		
794	Biased Irradiation	1.120			1.120		
795	Biased Irradiation	1.079			1.063		
806	All GND'd Irradiation	1.086				1.367	
807	All GND'd Irradiation	1.096				1.310	
808	All GND'd Irradiation	1.079				1.484	
809	All GND'd Irradiation	1.136				1.462	
810	All GND'd Irradiation	1.079				1.346	
801	Biased Irradiation	1.115				1.189	
802	Biased Irradiation	1.155				1.236	
803	Biased Irradiation	1.136				1.227	
804	Biased Irradiation	1.115				1.303	
805	Biased Irradiation	1.096				1.265	
816	All GND'd Irradiation	1.115					1.789
817	All GND'd Irradiation	1.096					1.815
818	All GND'd Irradiation	1.096					1.815
819	All GND'd Irradiation	1.075					1.765
820	All GND'd Irradiation	1.086					1.767
811	Biased Irradiation	1.115					1.443
812	Biased Irradiation	1.115					1.396
813	Biased Irradiation	1.136					1.408
814	Biased Irradiation	1.115					1.472
815	Biased Irradiation	1.096					1.493
832	Control Unit	1.115	1.048	1.048	1.048	1.048	1.048
833	Control Unit	1.112	0.891	0.891	0.891	0.891	0.891
All GND'd Irradiation Statistics							
Average All GND'd		1.103	1.024	1.046	1.183	1.394	1.790
Std Dev All GND'd		0.031	0.022	0.032	0.053	0.076	0.024
Ps90%/90% (+KTL) All GND'd		1.189	1.086	1.133	1.328	1.601	1.857
Ps90%/90% (-KTL) All GND'd		1.018	0.963	0.959	1.038	1.187	1.723
Biased Irradiation Statistics							
Average Biased		1.137	0.995	0.990	1.091	1.244	1.442
Std Dev Biased		0.026	0.008	0.033	0.024	0.043	0.041
Ps90%/90% (+KTL) Biased		1.209	1.018	1.079	1.158	1.362	1.556
Ps90%/90% (-KTL) Biased		1.065	0.972	0.900	1.024	1.127	1.329
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
		10	20	20	20	20	20
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (-KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

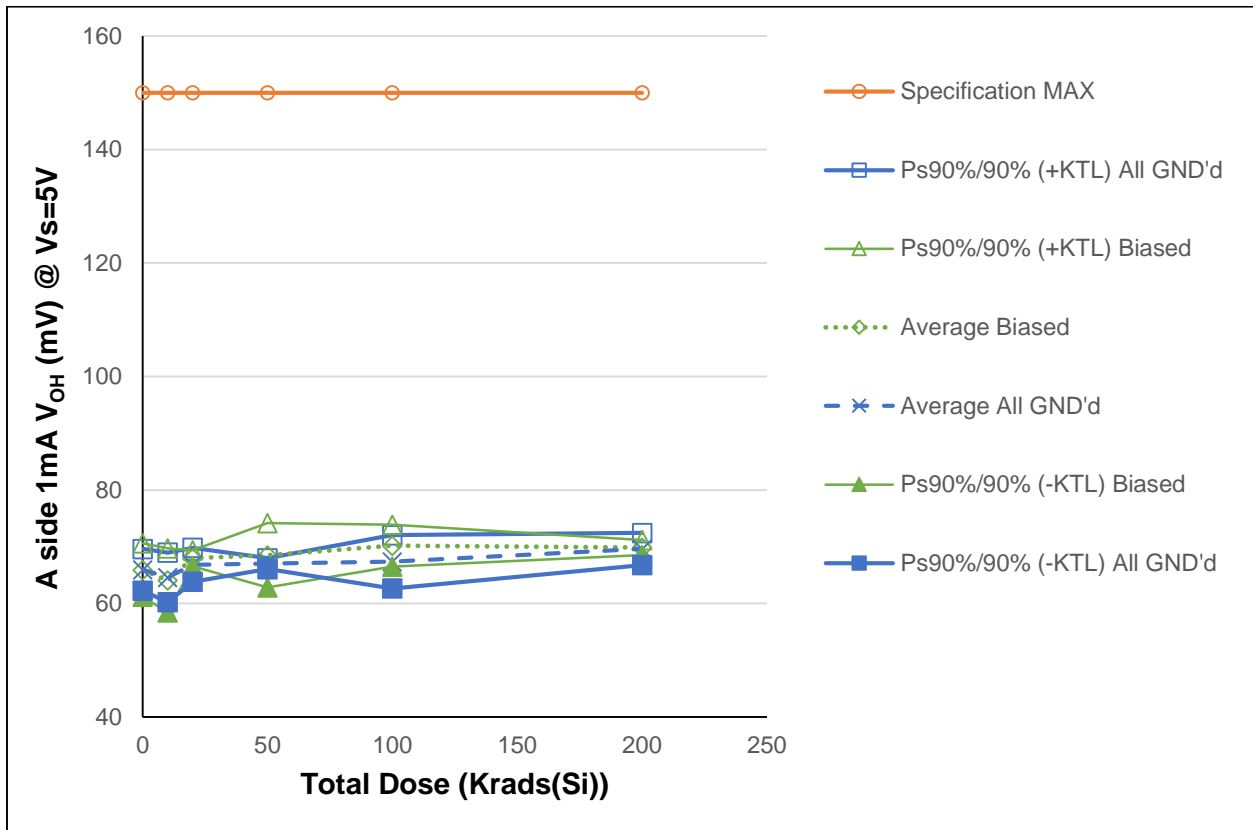


Figure 5.82: Plot of Output Voltage Swing High with $I_{SOURCE} = 1\text{ mA}$ @ $V_s = 5\text{ V}$ versus Total Dose (side A)

Table 5.82: Raw data for output voltage swing high with I_{SOURCE} = 1 mA (side A) @ 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 1mA VOH @ Vs=5V	Total Dose (Krads(Si)) @ 50 rads(Si)/s					
	Units (mV)	0	10	20	50	100	200
776	All GND'd Irradiation	64.633	63.070				
777	All GND'd Irradiation	65.015	63.263				
778	All GND'd Irradiation	67.773	66.060				
779	All GND'd Irradiation	65.377	64.153				
780	All GND'd Irradiation	66.943	66.510				
771	Biased Irradiation	68.018	66.908				
772	Biased Irradiation	63.661	61.753				
773	Biased Irradiation	66.943	65.079				
774	Biased Irradiation	66.102	64.127				
775	Biased Irradiation	64.827	62.510				
786	All GND'd Irradiation	68.676		68.148			
787	All GND'd Irradiation	67.734		67.317			
788	All GND'd Irradiation	66.581		66.179			
789	All GND'd Irradiation	65.625		65.341			
790	All GND'd Irradiation	67.141		67.174			
781	Biased Irradiation	68.259		68.851			
782	Biased Irradiation	67.017		67.517			
783	Biased Irradiation	67.205		67.739			
784	Biased Irradiation	67.684		67.986			
785	Biased Irradiation	67.248		67.870			
796	All GND'd Irradiation	66.235			66.691		
797	All GND'd Irradiation	66.429			66.869		
798	All GND'd Irradiation	66.290			66.843		
799	All GND'd Irradiation	66.769			67.241		
800	All GND'd Irradiation	66.598			67.555		
791	Biased Irradiation	68.543			70.701		
792	Biased Irradiation	67.980			69.976		
793	Biased Irradiation	67.379			69.186		
794	Biased Irradiation	64.502			66.139		
795	Biased Irradiation	64.882			66.515		
806	All GND'd Irradiation	64.271				65.803	
807	All GND'd Irradiation	65.005				66.291	
808	All GND'd Irradiation	68.183				70.184	
809	All GND'd Irradiation	65.949				67.565	
810	All GND'd Irradiation	65.485				66.996	
801	Biased Irradiation	67.553				70.460	
802	Biased Irradiation	67.284				70.286	
803	Biased Irradiation	66.369				69.063	
804	Biased Irradiation	69.489				72.288	
805	Biased Irradiation	66.221				68.927	
816	All GND'd Irradiation	65.615					68.443
817	All GND'd Irradiation	66.006					68.996
818	All GND'd Irradiation	67.675					70.783
819	All GND'd Irradiation	66.276					69.253
820	All GND'd Irradiation	67.703					70.629
811	Biased Irradiation	65.132					69.155
812	Biased Irradiation	66.405					70.222
813	Biased Irradiation	66.180					70.308
814	Biased Irradiation	65.838					69.622
815	Biased Irradiation	66.142					70.003
832	Control Unit	64.767	63.627	63.627	63.627	63.627	63.627
833	Control Unit	66.540	65.734	65.734	65.734	65.734	65.734
All GND'd Irradiation Statistics							
Average All GND'd		65.948	64.611	66.832	67.040	67.368	69.621
Std Dev All GND'd		1.346	1.590	1.088	0.352	1.711	1.035
Ps90%/90% (+KTL) All GND'd		69.639	68.970	69.815	68.005	72.060	72.458
Ps90%/90% (-KTL) All GND'd		62.258	60.252	63.849	66.075	62.675	66.784
Biased Irradiation Statistics							
Average Biased		65.910	64.076	67.992	68.503	70.205	69.862
Std Dev Biased		1.716	2.054	0.510	2.062	1.356	0.476
Ps90%/90% (+KTL) Biased		70.616	69.707	69.392	74.158	73.922	71.166
Ps90%/90% (-KTL) Biased		61.205	58.444	66.593	62.849	66.488	68.558
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

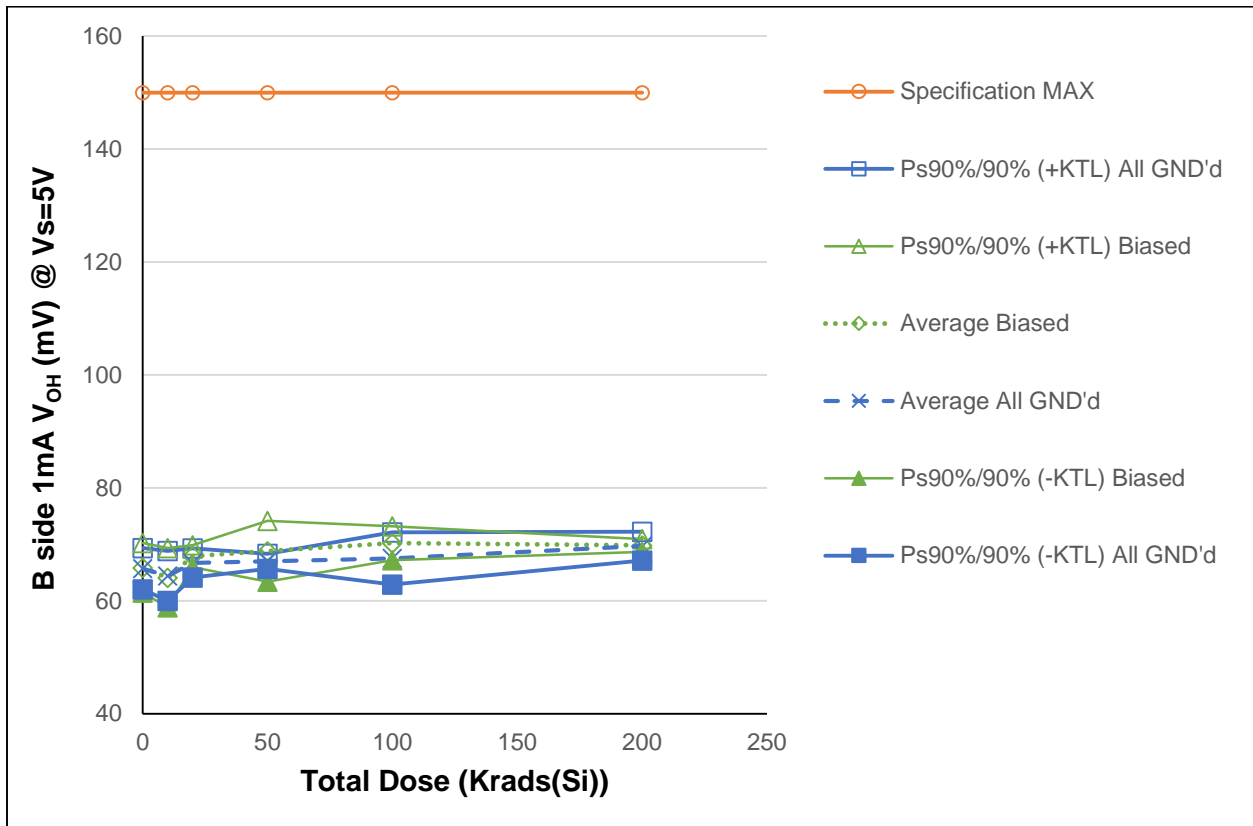


Figure 5.83: Plot of Output Voltage Swing High with $I_{SOURCE} = 1\text{ mA}$ @ $V_s = 5\text{ V}$ versus Total Dose (side B)

Table 5.83: Raw data for output voltage swing high with I_{SOURCE} = 1 mA (side B) @ 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 1mA VOH @ Vs=5V	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
Units	(mV)	0	10	20	50	100	200
776	All GND'd Irradiation	64.538	63.051				
777	All GND'd Irradiation	64.836	63.137				
778	All GND'd Irradiation	67.167	65.549				
779	All GND'd Irradiation	64.767	63.615				
780	All GND'd Irradiation	67.134	66.663				
771	Biased Irradiation	67.684	66.615				
772	Biased Irradiation	63.966	62.092				
773	Biased Irradiation	67.256	65.396				
774	Biased Irradiation	65.589	63.796				
775	Biased Irradiation	64.710	62.515				
786	All GND'd Irradiation	68.106		67.581			
787	All GND'd Irradiation	67.914		67.517			
788	All GND'd Irradiation	66.710		66.365			
789	All GND'd Irradiation	65.513		65.298			
790	All GND'd Irradiation	66.759		66.822			
781	Biased Irradiation	68.447		69.144			
782	Biased Irradiation	67.039		67.546			
783	Biased Irradiation	66.900		67.453			
784	Biased Irradiation	67.248		67.501			
785	Biased Irradiation	67.446		67.957			
796	All GND'd Irradiation	66.028			66.489		
797	All GND'd Irradiation	66.369			66.822		
798	All GND'd Irradiation	66.064			66.700		
799	All GND'd Irradiation	66.781			67.393		
800	All GND'd Irradiation	66.705			67.641		
791	Biased Irradiation	68.390			70.781		
792	Biased Irradiation	68.192			70.174		
793	Biased Irradiation	67.725			69.520		
794	Biased Irradiation	64.738			66.451		
795	Biased Irradiation	65.284			66.936		
806	All GND'd Irradiation	64.776				66.332	
807	All GND'd Irradiation	65.055				66.365	
808	All GND'd Irradiation	68.313				70.320	
809	All GND'd Irradiation	66.142				67.817	
810	All GND'd Irradiation	65.141				66.708	
801	Biased Irradiation	67.353				70.222	
802	Biased Irradiation	67.039				70.136	
803	Biased Irradiation	66.598				69.393	
804	Biased Irradiation	69.210				71.984	
805	Biased Irradiation	66.492				69.231	
816	All GND'd Irradiation	65.666					68.536
817	All GND'd Irradiation	66.292					69.317
818	All GND'd Irradiation	67.777					70.841
819	All GND'd Irradiation	66.362					69.339
820	All GND'd Irradiation	67.446					70.396
811	Biased Irradiation	65.320					69.444
812	Biased Irradiation	66.429					70.320
813	Biased Irradiation	66.047					70.167
814	Biased Irradiation	65.548					69.415
815	Biased Irradiation	65.778					69.622
832	Control Unit	65.261	64.177	64.177	64.177	64.177	64.177
833	Control Unit	66.333	65.549	65.549	65.549	65.549	65.549
All GND'd Irradiation Statistics							
Average All GND'd		65.688	64.403	66.717	67.009	67.508	69.686
Std Dev All GND'd		1.339	1.618	0.940	0.487	1.683	0.924
Ps90%/90% (+KTL) All GND'd		69.361	68.839	69.294	68.344	72.123	72.220
Ps90%/90% (-KTL) All GND'd		62.016	59.967	64.139	65.674	62.893	67.152
Biased Irradiation Statistics							
Average Biased		65.841	64.083	67.920	68.772	70.193	69.793
Std Dev Biased		1.601	1.913	0.713	1.957	1.093	0.422
Ps90%/90% (+KTL) Biased		70.232	69.329	69.875	74.139	73.189	70.950
Ps90%/90% (-KTL) Biased		61.450	58.837	65.965	63.406	67.197	68.637
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

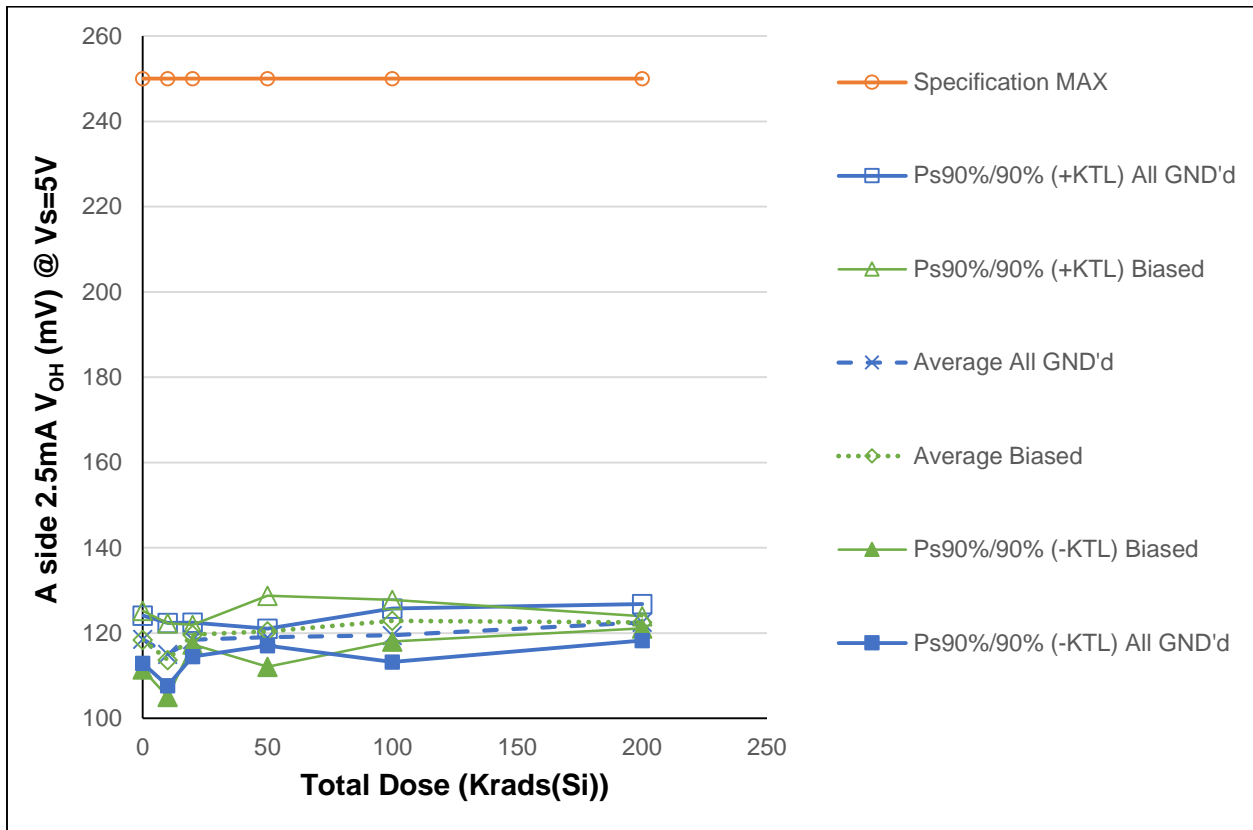


Figure 5.84: Plot of Output Voltage Swing High with $I_{SOURCE} = 2.5 \text{ mA}$ @ $V_s = 5V$ versus Total Dose (side A)

Table 5.84: Raw data for output voltage swing high with I_{SOURCE} = 2.5 mA (side A) @ 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 2.5mA VOH @ Vs=5V	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
Units	(mV)	0	10	20	50	100	200
776	All GND'd Irradiation	116.578	112.540				
777	All GND'd Irradiation	116.907	112.464				
778	All GND'd Irradiation	121.272	116.918				
779	All GND'd Irradiation	117.875	114.757				
780	All GND'd Irradiation	120.035	118.538				
771	Biased Irradiation	121.396	118.245				
772	Biased Irradiation	114.920	110.174				
773	Biased Irradiation	119.880	114.997				
774	Biased Irradiation	118.693	113.509				
775	Biased Irradiation	117.055	111.509				
786	All GND'd Irradiation	122.111		120.026			
787	All GND'd Irradiation	120.738		118.778			
788	All GND'd Irradiation	119.191		117.419			
789	All GND'd Irradiation	118.045		116.557			
790	All GND'd Irradiation	120.204		119.578			
781	Biased Irradiation	121.739		121.016			
782	Biased Irradiation	120.001		118.980			
783	Biased Irradiation	120.128		119.007			
784	Biased Irradiation	121.138		119.721			
785	Biased Irradiation	120.469		119.493			
796	All GND'd Irradiation	118.908			118.426		
797	All GND'd Irradiation	118.998			118.473		
798	All GND'd Irradiation	118.943			118.654		
799	All GND'd Irradiation	119.925			119.692		
800	All GND'd Irradiation	119.496			119.950		
791	Biased Irradiation	122.175			123.849		
792	Biased Irradiation	121.272			122.368		
793	Biased Irradiation	120.585			121.461		
794	Biased Irradiation	116.407			117.014		
795	Biased Irradiation	116.832			117.454		
806	All GND'd Irradiation	116.248				117.156	
807	All GND'd Irradiation	117.534				118.350	
808	All GND'd Irradiation	121.577				123.159	
809	All GND'd Irradiation	118.602				119.873	
810	All GND'd Irradiation	117.706				118.938	
801	Biased Irradiation	120.976				123.594	
802	Biased Irradiation	120.240				122.871	
803	Biased Irradiation	119.348				121.488	
804	Biased Irradiation	123.236				125.511	
805	Biased Irradiation	118.927				121.071	
816	All GND'd Irradiation	117.818					120.607
817	All GND'd Irradiation	118.831					121.661
818	All GND'd Irradiation	121.003					124.099
819	All GND'd Irradiation	119.117					122.042
820	All GND'd Irradiation	121.167					124.149
811	Biased Irradiation	117.341					121.838
812	Biased Irradiation	119.289					123.057
813	Biased Irradiation	118.886					122.997
814	Biased Irradiation	118.466					122.235
815	Biased Irradiation	118.831					122.521
832	Control Unit	116.619	114.055	114.055	114.055	114.055	114.055
833	Control Unit	119.191	117.492	117.492	117.492	117.492	117.492
All GND'd Irradiation Statistics							
Average All GND'd		118.533	115.044	118.471	119.039	119.495	122.512
Std Dev All GND'd		2.040	2.680	1.458	0.725	2.273	1.563
Ps90%/90% (+KTL) All GND'd		124.128	122.391	122.470	121.026	125.726	126.798
Ps90%/90% (-KTL) All GND'd		112.938	107.696	114.472	117.052	113.264	118.225
Biased Irradiation Statistics							
Average Biased		118.389	113.687	119.643	120.429	122.907	122.529
Std Dev Biased		2.509	3.147	0.830	3.043	1.778	0.515
Ps90%/90% (+KTL) Biased		125.268	122.315	121.920	128.773	127.781	123.942
Ps90%/90% (-KTL) Biased		111.510	105.059	117.367	112.086	118.032	121.117
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

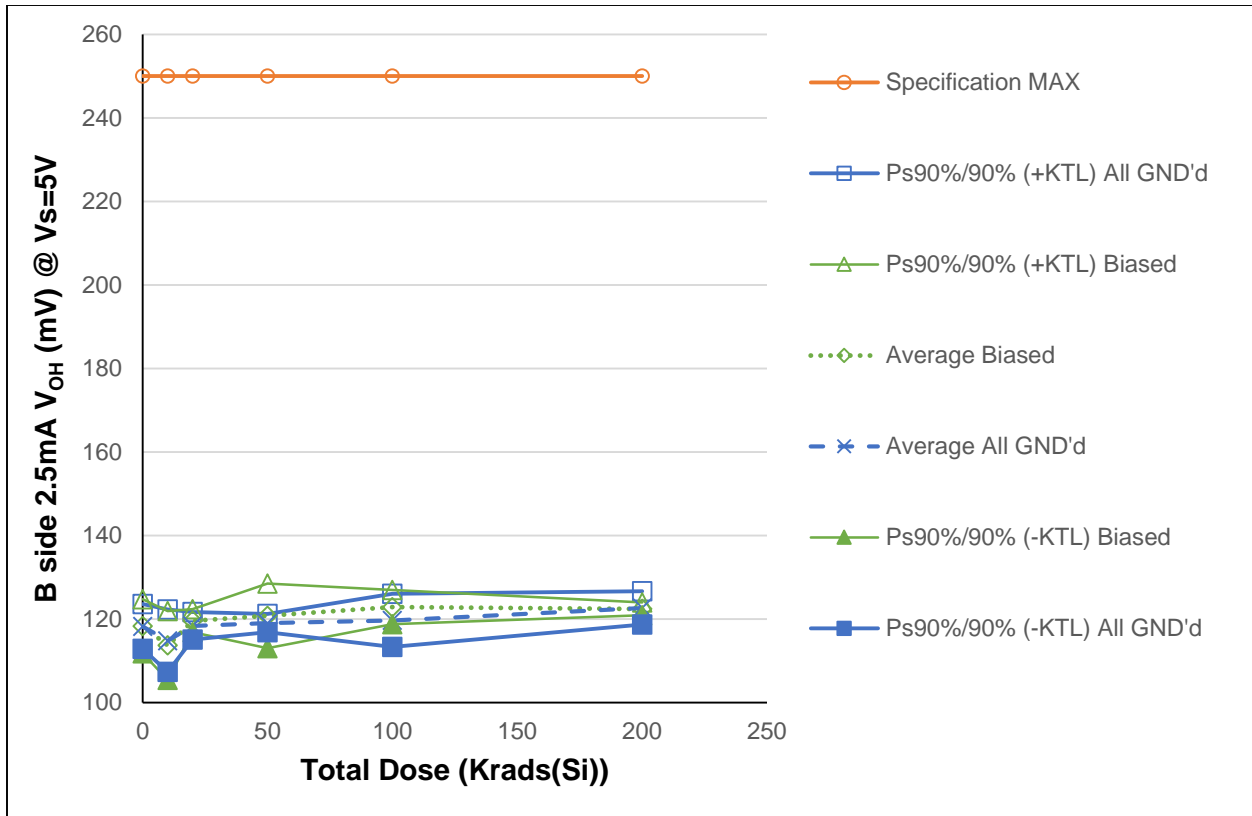


Figure 5.85: Plot of Output Voltage Swing High with $I_{SOURCE} = 2.5 \text{ mA}$ @ $V_s = 5V$ versus Total Dose (side B)

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
Units	(mV)						
776	All GND'd Irradiation	116.467	112.559				
777	All GND'd Irradiation	116.798	112.464				
778	All GND'd Irradiation	120.443	116.195				
779	All GND'd Irradiation	117.200	114.033				
780	All GND'd Irradiation	120.259	118.864				
771	Biased Irradiation	120.984	117.950				
772	Biased Irradiation	115.349	110.614				
773	Biased Irradiation	120.345	115.426				
774	Biased Irradiation	118.011	113.119				
775	Biased Irradiation	116.857	111.376				
786	All GND'd Irradiation	121.450		119.469			
787	All GND'd Irradiation	120.948		118.995			
788	All GND'd Irradiation	119.417		117.712			
789	All GND'd Irradiation	117.904		116.585			
790	All GND'd Irradiation	119.727		119.095			
781	Biased Irradiation	121.959		121.271			
782	Biased Irradiation	120.040		119.045			
783	Biased Irradiation	119.782		118.783			
784	Biased Irradiation	120.509		119.128			
785	Biased Irradiation	120.662		119.814			
796	All GND'd Irradiation	118.679			118.283		
797	All GND'd Irradiation	118.965			118.538		
798	All GND'd Irradiation	118.755			118.594		
799	All GND'd Irradiation	119.935			119.814		
800	All GND'd Irradiation	119.577			120.014		
791	Biased Irradiation	122.016			123.854		
792	Biased Irradiation	121.510			122.642		
793	Biased Irradiation	120.984			121.838		
794	Biased Irradiation	116.645			117.492		
795	Biased Irradiation	117.382			118.092		
806	All GND'd Irradiation	116.791				117.793	
807	All GND'd Irradiation	117.458				118.309	
808	All GND'd Irradiation	121.841				123.518	
809	All GND'd Irradiation	118.867				120.226	
810	All GND'd Irradiation	117.294				118.595	
801	Biased Irradiation	120.738				123.318	
802	Biased Irradiation	119.989				122.604	
803	Biased Irradiation	119.670				121.906	
804	Biased Irradiation	122.976				125.190	
805	Biased Irradiation	119.227				121.368	
816	All GND'd Irradiation	117.897					120.699
817	All GND'd Irradiation	119.172					122.159
818	All GND'd Irradiation	121.195					124.271
819	All GND'd Irradiation	119.232					122.235
820	All GND'd Irradiation	120.774					123.911
811	Biased Irradiation	117.647					122.159
812	Biased Irradiation	119.341					123.197
813	Biased Irradiation	118.660					122.816
814	Biased Irradiation	118.087					121.875
815	Biased Irradiation	118.383					122.071
832	Control Unit	117.153	114.693	114.693	114.693	114.693	114.693
833	Control Unit	118.908	117.156	117.156	117.156	117.156	117.156
All GND'd Irradiation Statistics							
Average All GND'd		118.233	114.823	118.371	119.048	119.688	122.655
Std Dev All GND'd		1.951	2.717	1.198	0.802	2.326	1.452
Ps90%/90% (+KTL) All GND'd		123.584	122.272	121.656	121.247	126.067	126.637
Ps90%/90% (-KTL) All GND'd		112.883	107.374	115.086	116.850	113.309	118.673
Biased Irradiation Statistics							
Average Biased		118.309	113.697	119.608	120.784	122.877	122.423
Std Dev Biased		2.359	3.012	1.004	2.831	1.486	0.558
Ps90%/90% (+KTL) Biased		124.777	121.957	122.362	128.547	126.953	123.955
Ps90%/90% (-KTL) Biased		111.841	105.437	116.854	113.020	118.802	120.892
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

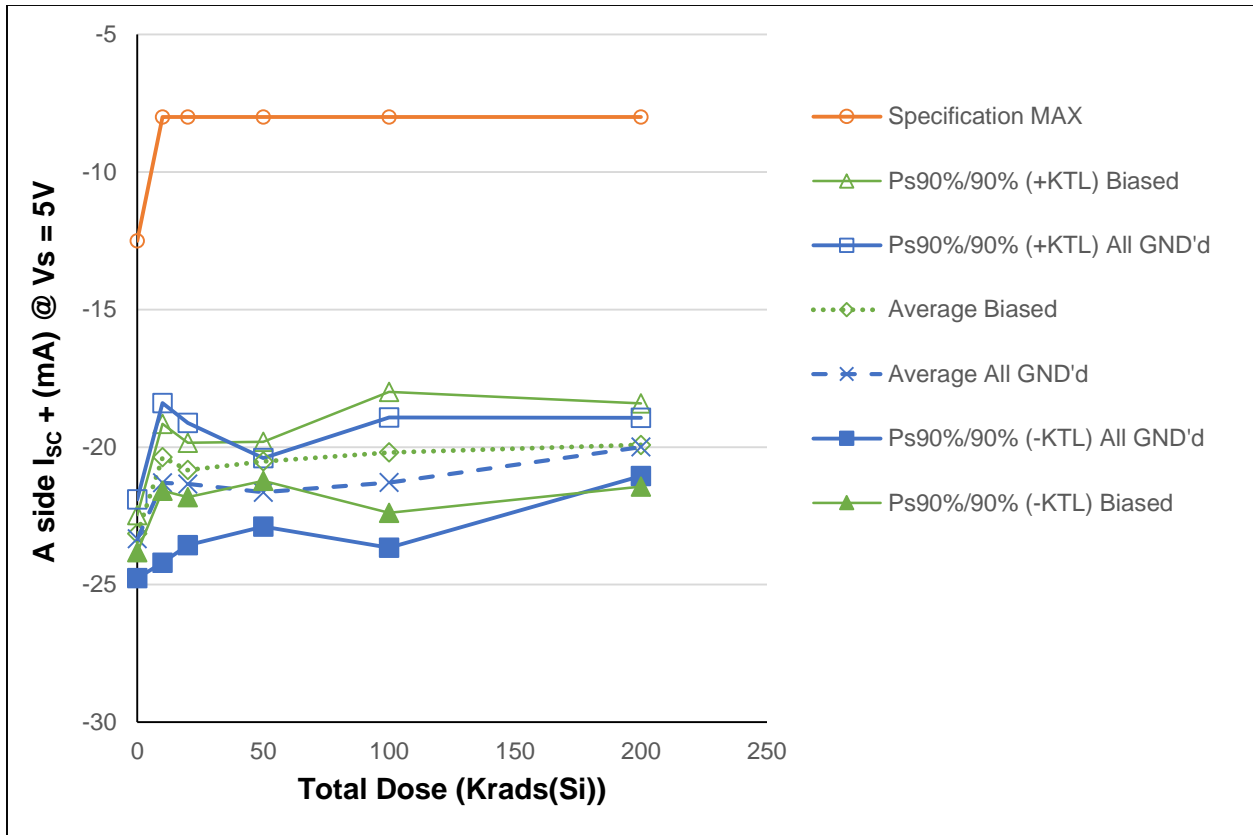


Figure 5.86: Plot of Output Short Circuit Current I_{sc+} @ $V_s = 5V$ versus Total Dose (side A)

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 Units	A I_{SC+} @ $V_s = 5V$ (mA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-23.426	-20.995				
777	All GND'd Irradiation	-22.666	-19.933				
778	All GND'd Irradiation	-23.109	-20.835				
779	All GND'd Irradiation	-24.096	-22.258				
780	All GND'd Irradiation	-23.386	-22.481				
771	Biased Irradiation	-22.824	-21.049				
772	Biased Irradiation	-23.003	-20.098				
773	Biased Irradiation	-23.448	-20.553				
774	Biased Irradiation	-23.134	-19.932				
775	Biased Irradiation	-23.320	-20.206				
786	All GND'd Irradiation	-22.284		-20.678			
787	All GND'd Irradiation	-22.193		-20.416			
788	All GND'd Irradiation	-23.004		-21.304			
789	All GND'd Irradiation	-23.442		-22.113			
790	All GND'd Irradiation	-23.091		-22.192			
781	Biased Irradiation	-22.509		-20.595			
782	Biased Irradiation	-22.967		-20.802			
783	Biased Irradiation	-22.726		-20.401			
784	Biased Irradiation	-23.181		-21.050			
785	Biased Irradiation	-23.320		-21.314			
796	All GND'd Irradiation	-23.310			-21.406		
797	All GND'd Irradiation	-23.178			-21.295		
798	All GND'd Irradiation	-23.524			-21.673		
799	All GND'd Irradiation	-23.893			-22.416		
800	All GND'd Irradiation	-23.015			-21.430		
791	Biased Irradiation	-22.621			-20.563		
792	Biased Irradiation	-22.566			-20.113		
793	Biased Irradiation	-23.167			-20.762		
794	Biased Irradiation	-22.892			-20.457		
795	Biased Irradiation	-23.185			-20.716		
806	All GND'd Irradiation	-23.893				-21.325	
807	All GND'd Irradiation	-24.609				-22.454	
808	All GND'd Irradiation	-22.437				-20.058	
809	All GND'd Irradiation	-23.643				-21.529	
810	All GND'd Irradiation	-23.109				-21.067	
801	Biased Irradiation	-23.338				-20.739	
802	Biased Irradiation	-22.499				-19.458	
803	Biased Irradiation	-24.036				-21.202	
804	Biased Irradiation	-22.041				-19.349	
805	Biased Irradiation	-23.138				-20.229	
816	All GND'd Irradiation	-22.799					-19.420
817	All GND'd Irradiation	-23.854					-20.435
818	All GND'd Irradiation	-23.120					-19.872
819	All GND'd Irradiation	-23.257					-20.039
820	All GND'd Irradiation	-23.167					-20.229
811	Biased Irradiation	-23.846					-20.824
812	Biased Irradiation	-23.349					-19.781
813	Biased Irradiation	-23.197					-19.420
814	Biased Irradiation	-23.654					-20.019
815	Biased Irradiation	-23.153					-19.567
832	Control Unit	-23.386	-22.327	-22.327	-22.327	-22.327	-22.327
833	Control Unit	-22.967	-22.378	-22.378	-22.378	-22.378	-22.378
All GND'd Irradiation Statistics							
Average All GND'd		-23.337	-21.301	-21.340	-21.644	-21.287	-19.999
Std Dev All GND'd		0.522	1.059	0.809	0.453	0.863	0.386
Ps90%/90% (+KTL) All GND'd		-21.906	-18.396	-19.122	-20.402	-18.920	-18.941
Ps90%/90% (-KTL) All GND'd		-24.768	-24.205	-23.559	-22.886	-23.653	-21.057
Biased Irradiation Statistics							
Average Biased		-23.146	-20.367	-20.833	-20.522	-20.195	-19.922
Std Dev Biased		0.248	0.444	0.361	0.259	0.801	0.552
Ps90%/90% (+KTL) Biased		-22.467	-19.151	-19.842	-19.812	-17.998	-18.407
Ps90%/90% (-KTL) Biased		-23.825	-21.584	-21.824	-21.232	-22.393	-21.437
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

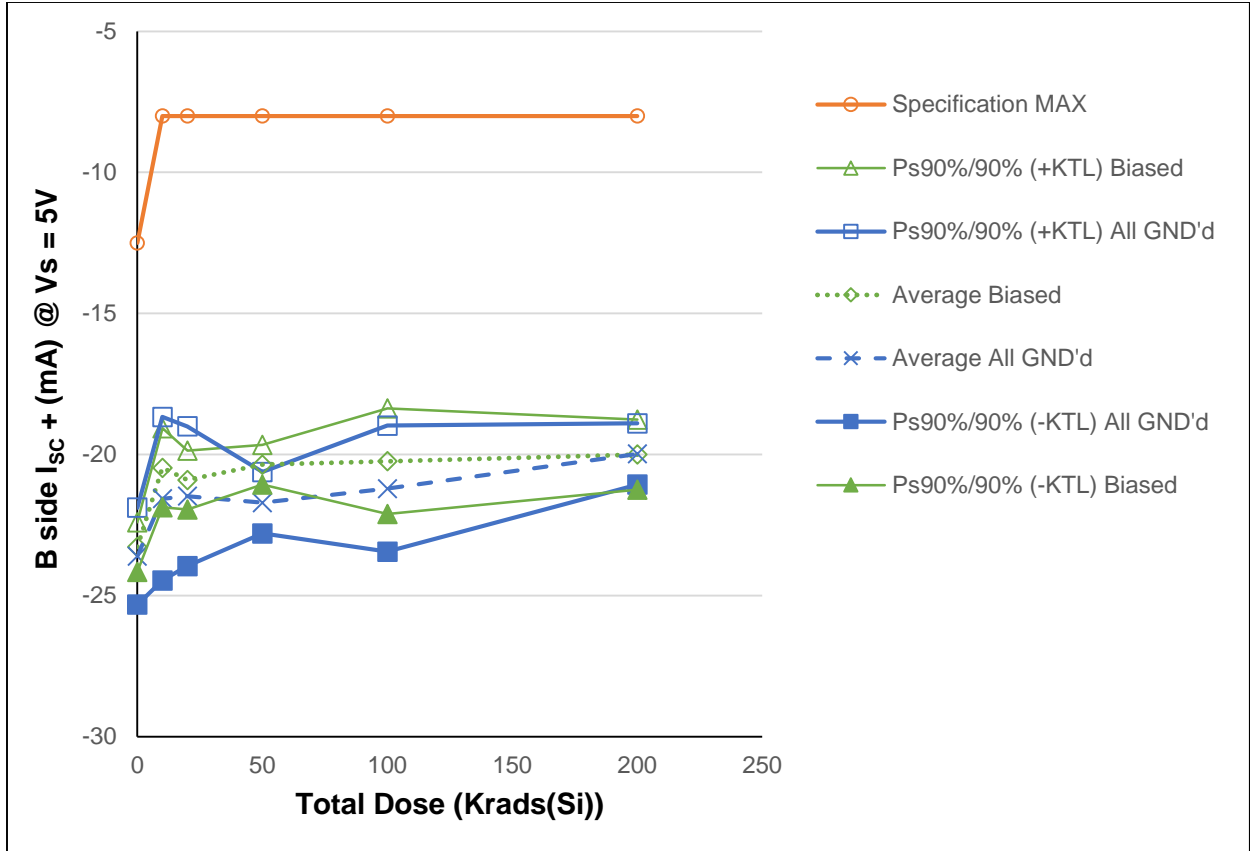


Figure 5.87: Plot of Output Short Circuit Current I_{sc+} @ $V_s = 5V$ versus Total Dose (side B)

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 Units	B I_{SC+} @ $V_s = 5V$ (mA)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	-23.596	-21.153				
777	All GND'd Irradiation	-22.947	-20.193				
778	All GND'd Irradiation	-23.522	-21.249				
779	All GND'd Irradiation	-24.631	-22.811				
780	All GND'd Irradiation	-23.320	-22.435				
771	Biased Irradiation	-23.071	-21.330				
772	Biased Irradiation	-22.852	-19.967				
773	Biased Irradiation	-23.333	-20.449				
774	Biased Irradiation	-23.614	-20.287				
775	Biased Irradiation	-23.538	-20.324				
786	All GND'd Irradiation	-22.736		-21.115			
787	All GND'd Irradiation	-22.055		-20.276			
788	All GND'd Irradiation	-22.957		-21.267			
789	All GND'd Irradiation	-23.578		-22.210			
790	All GND'd Irradiation	-23.442		-22.530			
781	Biased Irradiation	-22.422		-20.487			
782	Biased Irradiation	-23.015		-20.849			
783	Biased Irradiation	-22.971		-20.625			
784	Biased Irradiation	-23.557		-21.425			
785	Biased Irradiation	-23.167		-21.143			
796	All GND'd Irradiation	-23.453			-21.516		
797	All GND'd Irradiation	-23.349			-21.448		
798	All GND'd Irradiation	-23.747			-21.869		
799	All GND'd Irradiation	-23.859			-22.334		
800	All GND'd Irradiation	-22.967			-21.376		
791	Biased Irradiation	-22.642			-20.519		
792	Biased Irradiation	-22.346			-19.916		
793	Biased Irradiation	-22.939			-20.542		
794	Biased Irradiation	-22.842			-20.374		
795	Biased Irradiation	-22.918			-20.456		
806	All GND'd Irradiation	-23.596				-21.076	
807	All GND'd Irradiation	-24.417				-22.249	
808	All GND'd Irradiation	-22.346				-19.982	
809	All GND'd Irradiation	-23.491				-21.325	
810	All GND'd Irradiation	-23.483				-21.411	
801	Biased Irradiation	-23.459				-20.868	
802	Biased Irradiation	-22.719				-19.619	
803	Biased Irradiation	-23.897				-21.044	
804	Biased Irradiation	-22.328				-19.605	
805	Biased Irradiation	-22.952				-20.058	
816	All GND'd Irradiation	-22.824					-19.430
817	All GND'd Irradiation	-23.614					-20.227
818	All GND'd Irradiation	-23.047					-19.771
819	All GND'd Irradiation	-23.257					-20.035
820	All GND'd Irradiation	-23.396					-20.449
811	Biased Irradiation	-23.767					-20.729
812	Biased Irradiation	-23.350					-19.754
813	Biased Irradiation	-23.387					-19.582
814	Biased Irradiation	-23.827					-20.144
815	Biased Irradiation	-23.410					-19.810
832	Control Unit	-23.028	-21.948	-21.948	-21.948	-21.948	-21.948
833	Control Unit	-23.053	-22.462	-22.462	-22.462	-22.462	-22.462
All GND'd Irradiation Statistics							
Average All GND'd		-23.603	-21.568	-21.480	-21.709	-21.209	-19.982
Std Dev All GND'd		0.627	1.056	0.903	0.398	0.815	0.397
Ps90%/90% (+KTL) All GND'd		-21.883	-18.672	-19.003	-20.618	-18.973	-18.894
Ps90%/90% (-KTL) All GND'd		-25.323	-24.464	-23.956	-22.799	-23.444	-21.071
Biased Irradiation Statistics							
Average Biased		-23.282	-20.471	-20.906	-20.361	-20.239	-20.004
Std Dev Biased		0.320	0.512	0.382	0.258	0.683	0.454
Ps90%/90% (+KTL) Biased		-22.405	-19.068	-19.859	-19.655	-18.367	-18.760
Ps90%/90% (-KTL) Biased		-24.158	-21.875	-21.953	-21.068	-22.110	-21.248
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX							
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

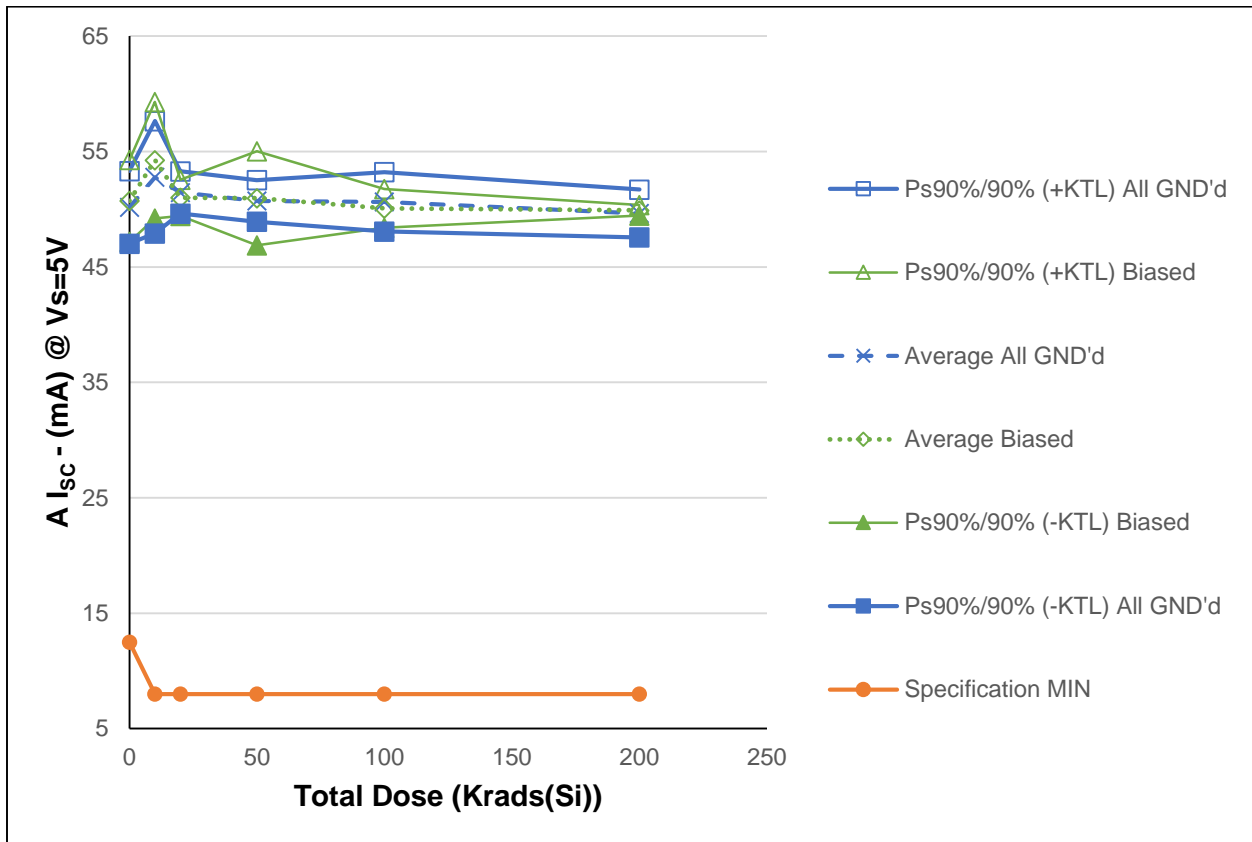


Figure 5.88: Plot of Output Short Circuit Current I_{sc-} @ $V_s = 5V$ versus Total Dose (side A)

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)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	51.331	54.379				
777	All GND'd Irradiation	51.382	54.851				
778	All GND'd Irradiation	48.774	51.847				
779	All GND'd Irradiation	49.719	52.055				
780	All GND'd Irradiation	49.618	50.694				
771	Biased Irradiation	49.194	51.483				
772	Biased Irradiation	52.600	56.322				
773	Biased Irradiation	49.985	53.617				
774	Biased Irradiation	50.558	54.476				
775	Biased Irradiation	51.273	55.341				
786	All GND'd Irradiation	49.695		51.390			
787	All GND'd Irradiation	49.881		51.585			
788	All GND'd Irradiation	50.385		51.961			
789	All GND'd Irradiation	50.772		51.993			
790	All GND'd Irradiation	49.657		50.350			
781	Biased Irradiation	49.089		50.501			
782	Biased Irradiation	50.013		51.656			
783	Biased Irradiation	49.773		51.547			
784	Biased Irradiation	48.937		50.760			
785	Biased Irradiation	48.945		50.485			
796	All GND'd Irradiation	49.585			50.556		
797	All GND'd Irradiation	50.748			51.712		
798	All GND'd Irradiation	50.119			51.003		
799	All GND'd Irradiation	49.451			50.247		
800	All GND'd Irradiation	49.644			50.084		
791	Biased Irradiation	48.859			49.236		
792	Biased Irradiation	49.360			50.188		
793	Biased Irradiation	49.423			50.302		
794	Biased Irradiation	51.761			52.654		
795	Biased Irradiation	51.453			52.374		
806	All GND'd Irradiation	51.387				51.827	
807	All GND'd Irradiation	50.080				50.522	
808	All GND'd Irradiation	49.167				49.312	
809	All GND'd Irradiation	50.271				50.385	
810	All GND'd Irradiation	51.058				51.153	
801	Biased Irradiation	49.250				49.381	
802	Biased Irradiation	50.013				50.285	
803	Biased Irradiation	49.472				49.876	
804	Biased Irradiation	49.414				49.821	
805	Biased Irradiation	50.630				50.999	
816	All GND'd Irradiation	50.899					50.674
817	All GND'd Irradiation	49.746					49.555
818	All GND'd Irradiation	49.313					49.076
819	All GND'd Irradiation	50.352					50.064
820	All GND'd Irradiation	49.127					48.793
811	Biased Irradiation	50.572					49.705
812	Biased Irradiation	49.899					49.760
813	Biased Irradiation	50.233					50.012
814	Biased Irradiation	50.118					49.968
815	Biased Irradiation	50.270					50.086
832	Control Unit	51.569	53.266	53.266	53.266	53.266	53.266
833	Control Unit	50.501	51.585	51.585	51.585	51.585	51.585
All GND'd Irradiation Statistics							
	Average All GND'd	50.165	52.765	51.456	50.720	50.639	49.632
	Std Dev All GND'd	1.148	1.774	0.669	0.656	0.937	0.757
	Ps90%/90% (+KTL) All GND'd	53.313	57.630	53.289	52.518	53.209	51.708
	Ps90%/90% (-KTL) All GND'd	47.017	47.900	49.623	48.923	48.069	47.557
Biased Irradiation Statistics							
	Average Biased	50.722	54.248	50.990	50.951	50.072	49.906
	Std Dev Biased	1.297	1.843	0.570	1.489	0.609	0.165
	Ps90%/90% (+KTL) Biased	54.279	59.302	52.553	55.034	51.742	50.359
	Ps90%/90% (-KTL) Biased	47.164	49.194	49.426	46.867	48.403	49.453
	Specification MIN	12.5	8.0	8.0	8.0	8.0	8.0
	Status (Measurements) All GND'd	PASS	PASS	PASS	PASS	PASS	PASS
	Status (Measurements) Biased	PASS	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	PASS
	Status (+KTL) All GND'd						
	Status (-KTL) Biased	PASS	PASS	PASS	PASS	PASS	PASS
	Status (+KTL) Biased						

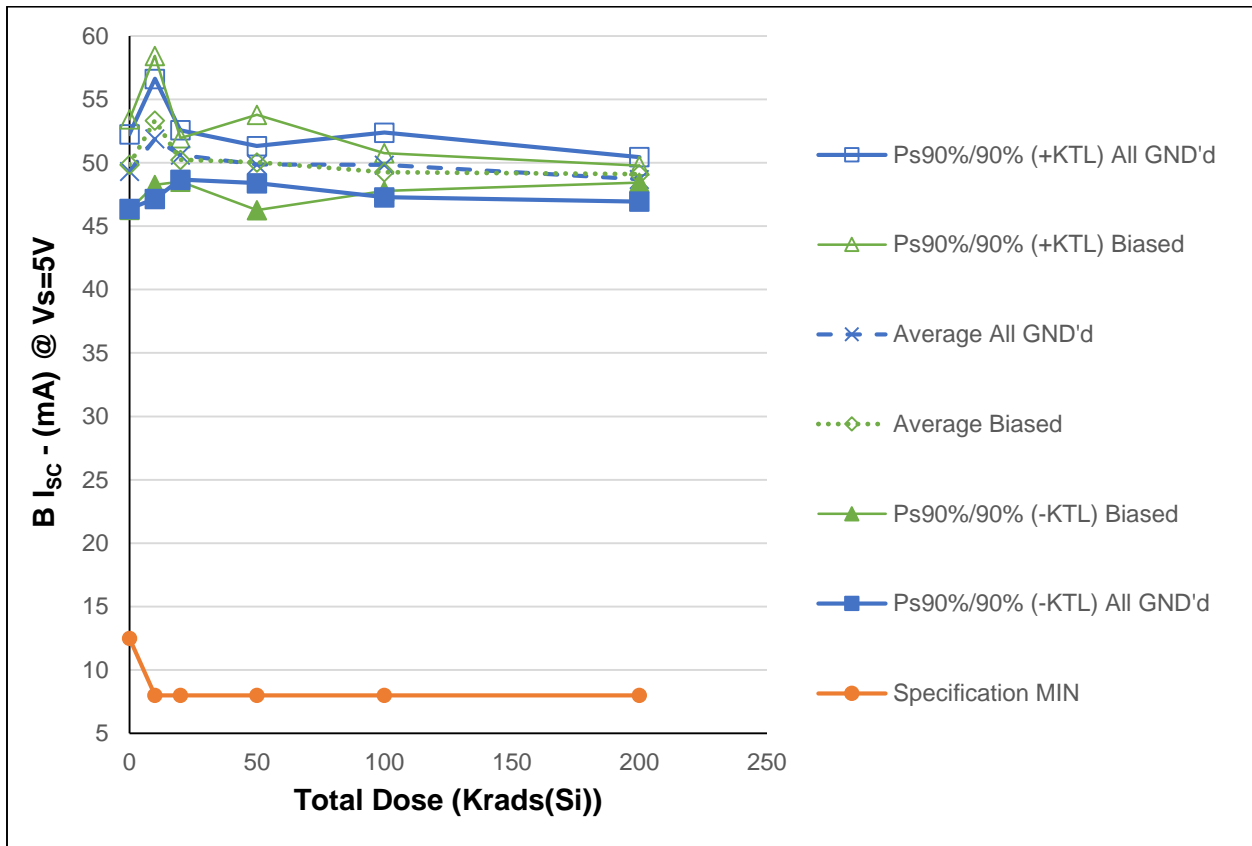


Figure 5.89: Plot of Output Short Circuit Current I_{sc-} @ $V_s = 5V$ versus Total Dose (side B)

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)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	50.356	53.365				
777	All GND'd Irradiation	50.529	53.971				
778	All GND'd Irradiation	48.077	51.152				
779	All GND'd Irradiation	48.868	51.161				
780	All GND'd Irradiation	48.760	49.807				
771	Biased Irradiation	48.330	50.599				
772	Biased Irradiation	51.692	55.397				
773	Biased Irradiation	48.983	52.560				
774	Biased Irradiation	49.852	53.704				
775	Biased Irradiation	50.426	54.484				
786	All GND'd Irradiation	48.754		50.437			
787	All GND'd Irradiation	49.144		50.836			
788	All GND'd Irradiation	49.555		51.117			
789	All GND'd Irradiation	50.043		51.244			
790	All GND'd Irradiation	48.804		49.475			
781	Biased Irradiation	48.169		49.552			
782	Biased Irradiation	49.300		50.918			
783	Biased Irradiation	49.127		50.894			
784	Biased Irradiation	48.196		49.998			
785	Biased Irradiation	48.334		49.845			
796	All GND'd Irradiation	48.745			49.724		
797	All GND'd Irradiation	49.678			50.638		
798	All GND'd Irradiation	49.279			50.145		
799	All GND'd Irradiation	48.537			49.302		
800	All GND'd Irradiation	49.069			49.495		
791	Biased Irradiation	47.964			48.293		
792	Biased Irradiation	48.601			49.436		
793	Biased Irradiation	48.727			49.612		
794	Biased Irradiation	50.748			51.645		
795	Biased Irradiation	50.310			51.209		
806	All GND'd Irradiation	50.395				50.818	
807	All GND'd Irradiation	49.326				49.751	
808	All GND'd Irradiation	48.253				48.384	
809	All GND'd Irradiation	49.642				49.762	
810	All GND'd Irradiation	50.365				50.448	
801	Biased Irradiation	48.635				48.778	
802	Biased Irradiation	49.186				49.479	
803	Biased Irradiation	48.622				49.013	
804	Biased Irradiation	48.556				48.969	
805	Biased Irradiation	49.738				50.120	
816	All GND'd Irradiation	49.837					49.631
817	All GND'd Irradiation	48.902					48.702
818	All GND'd Irradiation	48.554					48.289
819	All GND'd Irradiation	49.207					48.931
820	All GND'd Irradiation	48.296					47.960
811	Biased Irradiation	49.757					48.893
812	Biased Irradiation	48.956					48.812
813	Biased Irradiation	49.417					49.189
814	Biased Irradiation	49.432					49.302
815	Biased Irradiation	49.474					49.345
832	Control Unit	50.606	52.255	52.255	52.255	52.255	52.255
833	Control Unit	49.646	50.730	50.730	50.730	50.730	50.730
All GND'd Irradiation Statistics							
Average All GND'd		49.318	51.891	50.622	49.861	49.833	48.703
Std Dev All GND'd		1.072	1.726	0.712	0.536	0.930	0.640
Ps90%/90% (+KTL) All GND'd		52.259	56.624	52.574	51.331	52.382	50.456
Ps90%/90% (-KTL) All GND'd		46.378	47.158	48.670	48.391	47.283	46.949
Biased Irradiation Statistics							
Average Biased		49.857	53.349	50.242	50.039	49.272	49.108
Std Dev Biased		1.303	1.857	0.627	1.373	0.540	0.242
Ps90%/90% (+KTL) Biased		53.429	58.441	51.962	53.805	50.751	49.772
Ps90%/90% (-KTL) Biased		46.285	48.257	48.521	46.273	47.792	48.444
Specification MIN		12.5	8.0	8.0	8.0	8.0	8.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

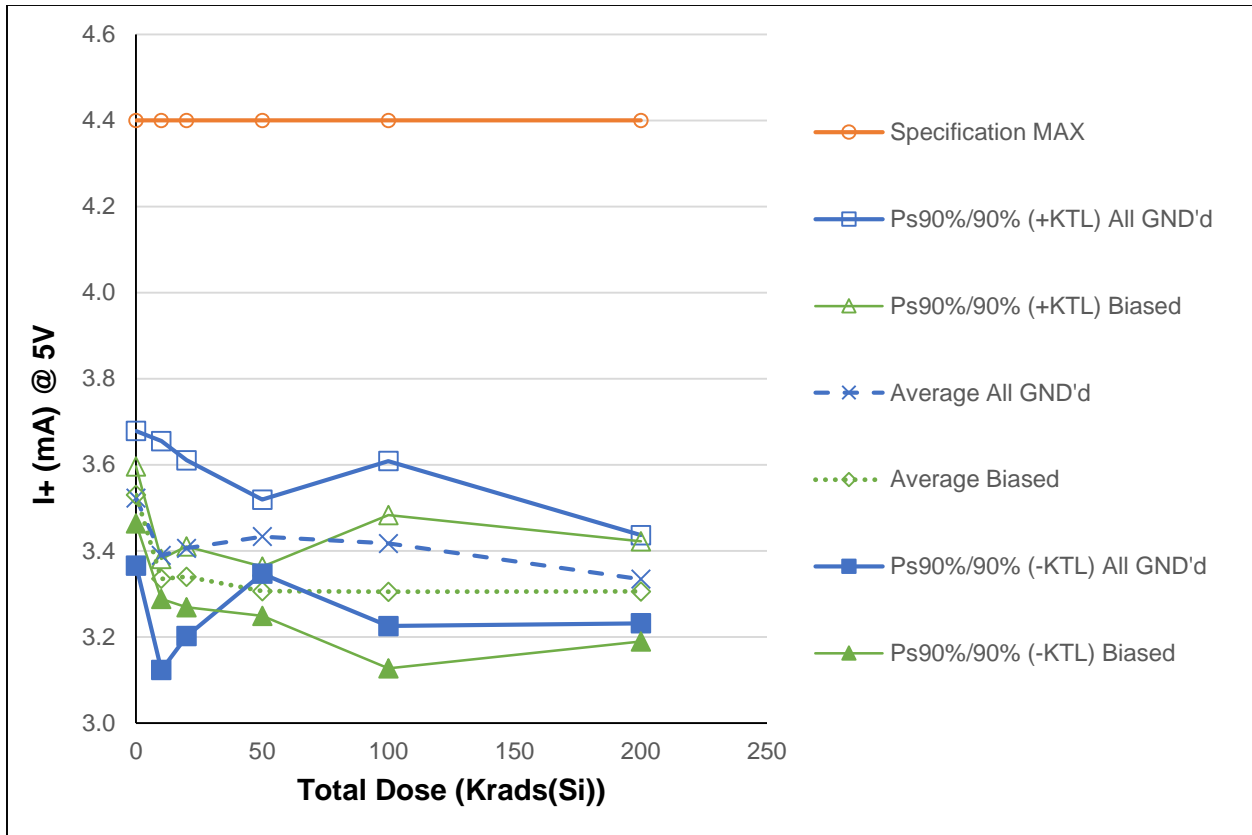


Figure 5.90: Plot of Device Supply Current @ $V_s = 5V$ versus Total Dose

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)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	3.530	3.374				
777	All GND'd Irradiation	3.457	3.280				
778	All GND'd Irradiation	3.479	3.314				
779	All GND'd Irradiation	3.602	3.484				
780	All GND'd Irradiation	3.542	3.493				
771	Biased Irradiation	3.489	3.362				
772	Biased Irradiation	3.532	3.340				
773	Biased Irradiation	3.539	3.328				
774	Biased Irradiation	3.554	3.319				
775	Biased Irradiation	3.534	3.325				
786	All GND'd Irradiation	3.458		3.354			
787	All GND'd Irradiation	3.420		3.308			
788	All GND'd Irradiation	3.520		3.418			
789	All GND'd Irradiation	3.556		3.481			
790	All GND'd Irradiation	3.511		3.470			
781	Biased Irradiation	3.438		3.307			
782	Biased Irradiation	3.485		3.345			
783	Biased Irradiation	3.479		3.320			
784	Biased Irradiation	3.524		3.369			
785	Biased Irradiation	3.494		3.357			
796	All GND'd Irradiation	3.505			3.399		
797	All GND'd Irradiation	3.560			3.457		
798	All GND'd Irradiation	3.572			3.465		
799	All GND'd Irradiation	3.526			3.443		
800	All GND'd Irradiation	3.480			3.400		
791	Biased Irradiation	3.443			3.301		
792	Biased Irradiation	3.439			3.273		
793	Biased Irradiation	3.473			3.309		
794	Biased Irradiation	3.477			3.327		
795	Biased Irradiation	3.472			3.319		
806	All GND'd Irradiation	3.571				3.435	
807	All GND'd Irradiation	3.577				3.465	
808	All GND'd Irradiation	3.421				3.295	
809	All GND'd Irradiation	3.563				3.462	
810	All GND'd Irradiation	3.523				3.427	
801	Biased Irradiation	3.504				3.327	
802	Biased Irradiation	3.473				3.266	
803	Biased Irradiation	3.583				3.383	
804	Biased Irradiation	3.396				3.215	
805	Biased Irradiation	3.523				3.332	
816	All GND'd Irradiation	3.472					3.298
817	All GND'd Irradiation	3.559					3.381
818	All GND'd Irradiation	3.470					3.295
819	All GND'd Irradiation	3.503					3.339
820	All GND'd Irradiation	3.514					3.356
811	Biased Irradiation	3.560					3.372
812	Biased Irradiation	3.519					3.280
813	Biased Irradiation	3.517					3.265
814	Biased Irradiation	3.563					3.321
815	Biased Irradiation	3.520					3.288
832	Control Unit	3.561	3.497	3.497	3.497	3.497	3.497
833	Control Unit	3.502	3.473	3.473	3.473	3.473	3.473
All GND'd Irradiation Statistics							
Average All GND'd		3.522	3.389	3.406	3.433	3.417	3.334
Std Dev All GND'd		0.057	0.097	0.074	0.031	0.070	0.037
Ps90%/90% (+KTL) All GND'd		3.678	3.655	3.610	3.519	3.609	3.436
Ps90%/90% (-KTL) All GND'd		3.366	3.123	3.202	3.347	3.225	3.231
Biased Irradiation Statistics							
Average Biased		3.530	3.335	3.340	3.306	3.305	3.305
Std Dev Biased		0.024	0.017	0.026	0.021	0.065	0.042
Ps90%/90% (+KTL) Biased		3.596	3.381	3.410	3.363	3.483	3.422
Ps90%/90% (-KTL) Biased		3.463	3.288	3.269	3.249	3.127	3.189
Specification MIN							
Status (Measurements) All GND'd							
Status (Measurements) Biased							
Specification MAX		4.4	4.4	4.4	4.4	4.4	4.4
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) All GND'd							
Status (+KTL) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (-KTL) Biased							
Status (+KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS

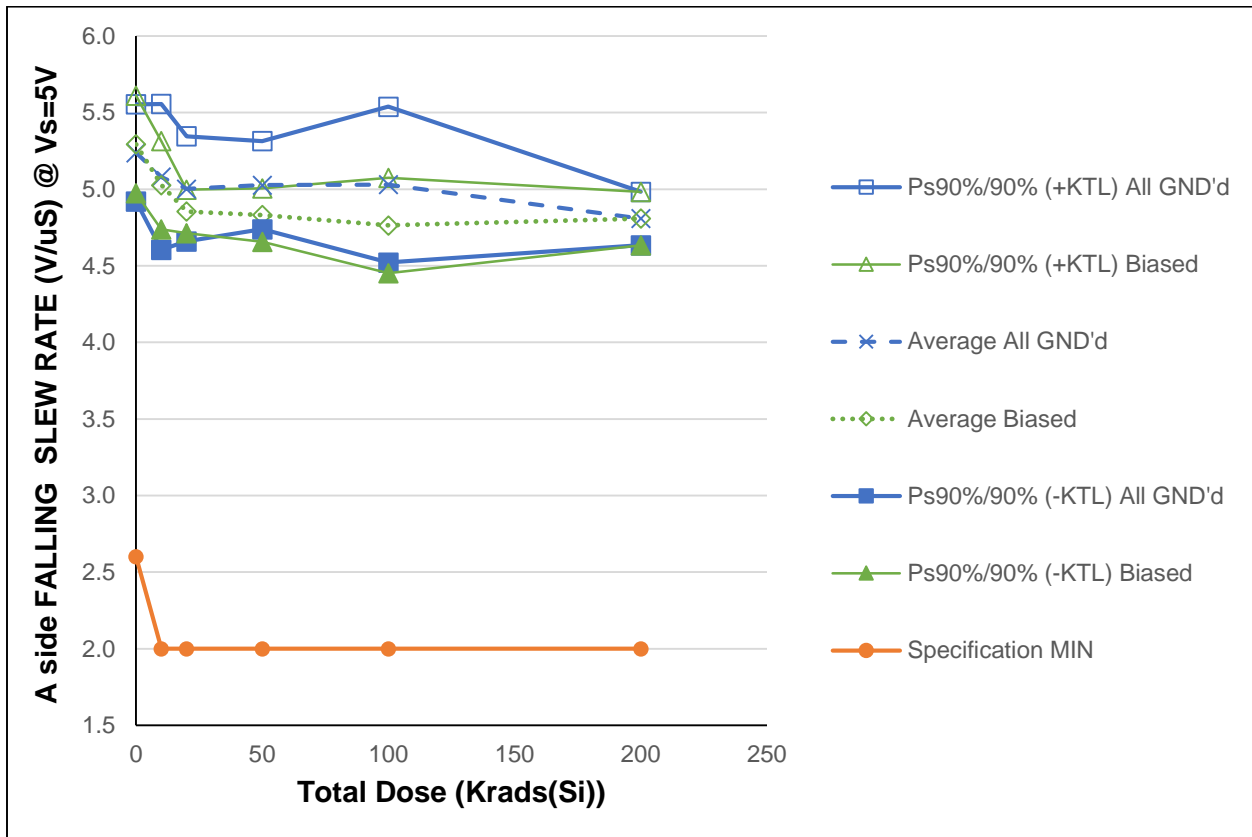


Figure 5.91: Plot of A-side Slew Rate (Falling) @ Vs = 5V versus Total Dose

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 FALLING SLEW RATE @ Vs=5V Units (V/uS)	Total Dose (Krad(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	5.263	5.000				
777	All GND'd Irradiation	5.128	5.000				
778	All GND'd Irradiation	5.128	4.878				
779	All GND'd Irradiation	5.405	5.263				
780	All GND'd Irradiation	5.263	5.263				
771	Biased Irradiation	5.263	5.000				
772	Biased Irradiation	5.263	5.128				
773	Biased Irradiation	5.405	5.000				
774	Biased Irradiation	5.128	4.878				
775	Biased Irradiation	5.405	5.128				
786	All GND'd Irradiation	5.128		4.878			
787	All GND'd Irradiation	4.878		4.878			
788	All GND'd Irradiation	5.263		5.128			
789	All GND'd Irradiation	5.405		5.128			
790	All GND'd Irradiation	5.128		5.000			
781	Biased Irradiation	5.000		4.762			
782	Biased Irradiation	5.128		4.878			
783	Biased Irradiation	5.128		4.878			
784	Biased Irradiation	5.128		4.878			
785	Biased Irradiation	5.128		4.878			
796	All GND'd Irradiation	5.128			5.000		
797	All GND'd Irradiation	5.405			5.128		
798	All GND'd Irradiation	5.263			5.128		
799	All GND'd Irradiation	5.128			5.000		
800	All GND'd Irradiation	5.128			4.878		
791	Biased Irradiation	5.000			4.878		
792	Biased Irradiation	5.128			4.762		
793	Biased Irradiation	5.128			4.762		
794	Biased Irradiation	5.128			4.878		
795	Biased Irradiation	5.263			4.878		
806	All GND'd Irradiation	5.405				5.263	
807	All GND'd Irradiation	5.263				5.000	
808	All GND'd Irradiation	5.000				4.762	
809	All GND'd Irradiation	5.263				5.128	
810	All GND'd Irradiation	5.263				5.000	
801	Biased Irradiation	5.128				4.762	
802	Biased Irradiation	5.128				4.651	
803	Biased Irradiation	5.263				4.878	
804	Biased Irradiation	4.878				4.651	
805	Biased Irradiation	5.263				4.878	
816	All GND'd Irradiation	5.128					4.762
817	All GND'd Irradiation	5.263					4.878
818	All GND'd Irradiation	5.128					4.762
819	All GND'd Irradiation	5.128					4.878
820	All GND'd Irradiation	5.128					4.762
811	Biased Irradiation	5.405					4.878
812	Biased Irradiation	5.263					4.762
813	Biased Irradiation	5.263					4.762
814	Biased Irradiation	5.263					4.878
815	Biased Irradiation	5.128					4.762
832	Control Unit	5.263	5.263	5.263	5.263	5.263	5.263
833	Control Unit	5.128	5.128	5.128	5.128	5.128	5.128
All GND'd Irradiation Statistics							
Average All GND'd		5.238	5.081	5.002	5.027	5.031	4.808
Std Dev All GND'd		0.116	0.174	0.125	0.105	0.186	0.064
Ps90%/90% (+KTL) All GND'd		5.554	5.557	5.345	5.315	5.539	4.983
Ps90%/90% (-KTL) All GND'd		4.921	4.605	4.660	4.739	4.522	4.634
Biased Irradiation Statistics							
Average Biased		5.293	5.027	4.855	4.832	4.764	4.808
Std Dev Biased		0.116	0.105	0.052	0.064	0.113	0.064
Ps90%/90% (+KTL) Biased		5.612	5.315	4.997	5.006	5.075	4.983
Ps90%/90% (-KTL) Biased		4.974	4.739	4.712	4.657	4.453	4.634
Specification MIN		2.6	2.0	2.0	2.0	2.0	2.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

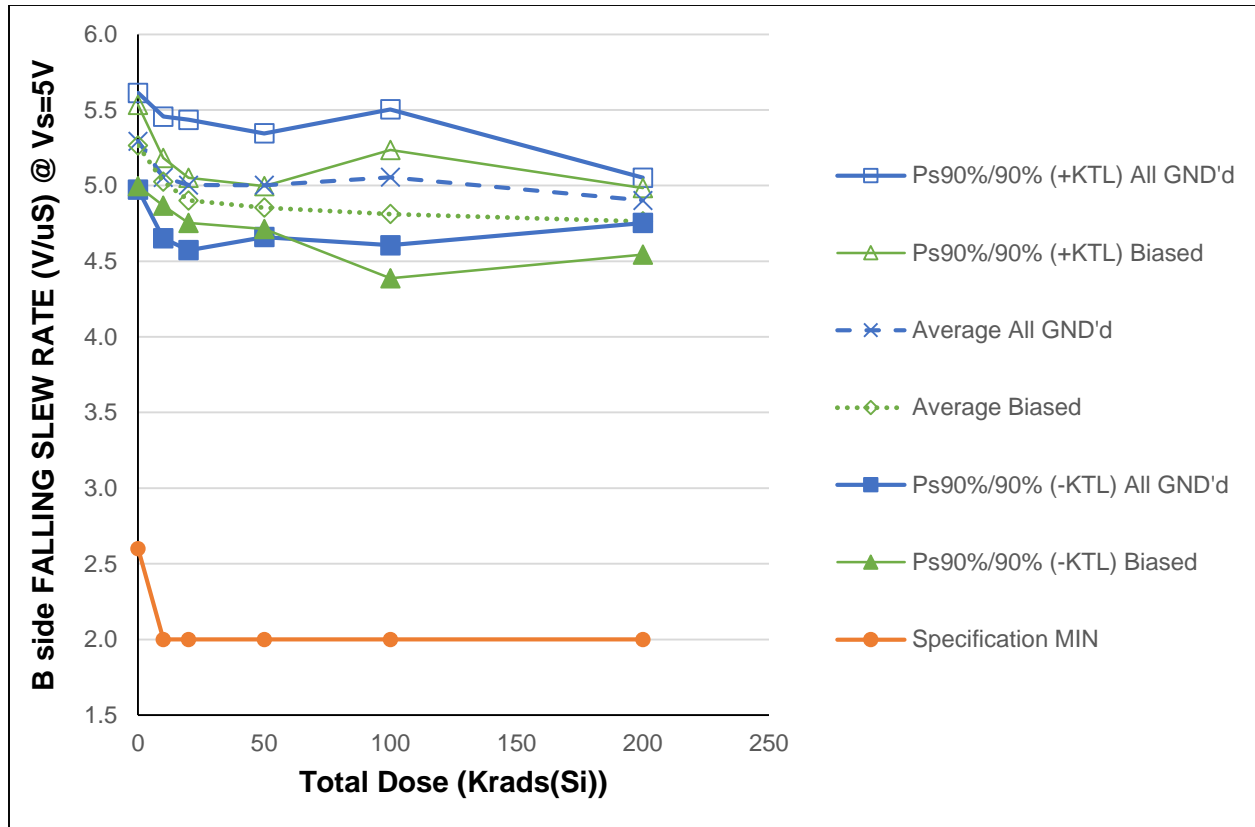


Figure 5.92: Plot of B-side Slew Rate (Falling) @ Vs = 5V versus Total Dose

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 FALLING SLEW RATE @ Vs=5V Units (V/uS)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	5.263	5.000				
777	All GND'd Irradiation	5.263	5.000				
778	All GND'd Irradiation	5.128	4.878				
779	All GND'd Irradiation	5.405	5.263				
780	All GND'd Irradiation	5.405	5.128				
771	Biased Irradiation	5.128	5.000				
772	Biased Irradiation	5.263	5.128				
773	Biased Irradiation	5.263	5.000				
774	Biased Irradiation	5.405	5.000				
775	Biased Irradiation	5.263	5.000				
786	All GND'd Irradiation	5.128		4.878			
787	All GND'd Irradiation	5.000		4.878			
788	All GND'd Irradiation	5.128		5.000			
789	All GND'd Irradiation	5.405		5.263			
790	All GND'd Irradiation	5.128		5.000			
781	Biased Irradiation	5.000		4.878			
782	Biased Irradiation	5.128		4.878			
783	Biased Irradiation	5.128		4.878			
784	Biased Irradiation	5.263		5.000			
785	Biased Irradiation	5.128		4.878			
796	All GND'd Irradiation	5.128			5.000		
797	All GND'd Irradiation	5.263			5.128		
798	All GND'd Irradiation	5.405			5.128		
799	All GND'd Irradiation	5.000			4.878		
800	All GND'd Irradiation	5.128			4.878		
791	Biased Irradiation	5.128			4.878		
792	Biased Irradiation	5.000			4.762		
793	Biased Irradiation	5.128			4.878		
794	Biased Irradiation	5.128			4.878		
795	Biased Irradiation	5.128			4.878		
806	All GND'd Irradiation	5.405				5.128	
807	All GND'd Irradiation	5.405				5.128	
808	All GND'd Irradiation	5.000				4.762	
809	All GND'd Irradiation	5.405				5.128	
810	All GND'd Irradiation	5.405				5.128	
801	Biased Irradiation	5.128				4.878	
802	Biased Irradiation	5.128				4.651	
803	Biased Irradiation	5.263				5.000	
804	Biased Irradiation	4.878				4.651	
805	Biased Irradiation	5.128				4.878	
816	All GND'd Irradiation	5.128					4.878
817	All GND'd Irradiation	5.263					5.000
818	All GND'd Irradiation	5.128					4.878
819	All GND'd Irradiation	5.128					4.878
820	All GND'd Irradiation	5.263					4.878
811	Biased Irradiation	5.405					4.878
812	Biased Irradiation	5.263					4.762
813	Biased Irradiation	5.128					4.762
814	Biased Irradiation	5.263					4.762
815	Biased Irradiation	5.128					4.651
832	Control Unit	5.128	5.405	5.405	5.405	5.405	5.405
833	Control Unit	5.128	5.128	5.128	5.128	5.128	5.128
All GND'd Irradiation Statistics							
Average All GND'd		5.293	5.054	5.004	5.002	5.055	4.902
Std Dev All GND'd		0.116	0.147	0.157	0.125	0.164	0.055
Ps90%/90% (+KTL) All GND'd		5.612	5.456	5.435	5.345	5.504	5.052
Ps90%/90% (-KTL) All GND'd		4.974	4.652	4.573	4.660	4.606	4.753
Biased Irradiation Statistics							
Average Biased		5.265	5.026	4.902	4.855	4.812	4.763
Std Dev Biased		0.098	0.057	0.055	0.052	0.155	0.080
Ps90%/90% (+KTL) Biased		5.533	5.183	5.052	4.997	5.236	4.983
Ps90%/90% (-KTL) Biased		4.996	4.868	4.753	4.712	4.387	4.543
Specification MIN		2.6	2.0	2.0	2.0	2.0	2.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

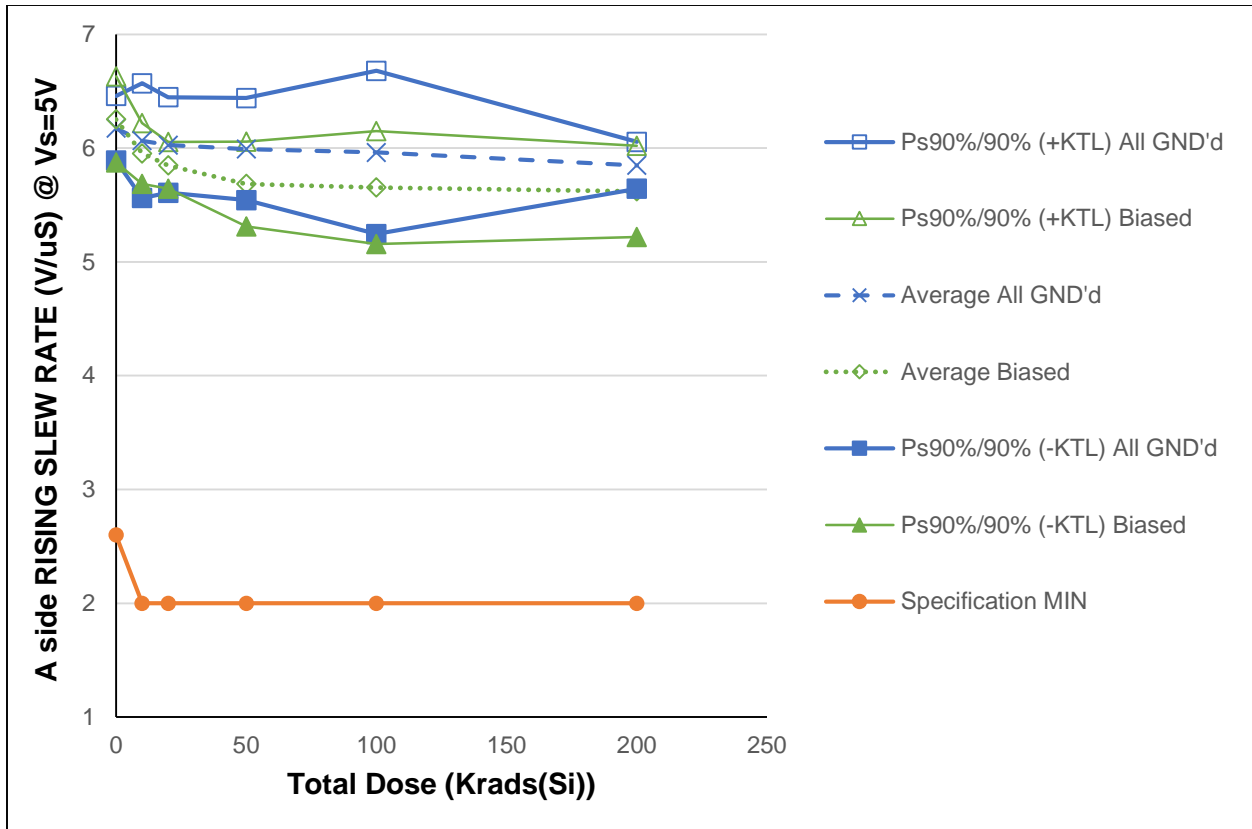


Figure 5.93: Plot of A-side Slew Rate (Rising) @ Vs = 5V versus Total Dose

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 Units	A RISING SLEW RATE @ Vs=5V (V/uS)	Total Dose (Krads(Si)) @ 50 rads(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	6.250	6.061				
777	All GND'd Irradiation	6.061	5.882				
778	All GND'd Irradiation	6.061	5.882				
779	All GND'd Irradiation	6.250	6.250				
780	All GND'd Irradiation	6.250	6.250				
771	Biased Irradiation	6.061	5.882				
772	Biased Irradiation	6.250	5.882				
773	Biased Irradiation	6.250	6.061				
774	Biased Irradiation	6.250	5.882				
775	Biased Irradiation	6.452	6.061				
786	All GND'd Irradiation	6.061		5.882			
787	All GND'd Irradiation	5.882		5.882			
788	All GND'd Irradiation	6.250		6.061			
789	All GND'd Irradiation	6.250		6.061			
790	All GND'd Irradiation	6.061		6.250			
781	Biased Irradiation	5.882		5.714			
782	Biased Irradiation	6.061		5.882			
783	Biased Irradiation	6.250		5.882			
784	Biased Irradiation	6.250		5.882			
785	Biased Irradiation	6.061		5.882			
796	All GND'd Irradiation	6.061			5.882		
797	All GND'd Irradiation	6.452			6.250		
798	All GND'd Irradiation	6.250			6.061		
799	All GND'd Irradiation	6.061			5.882		
800	All GND'd Irradiation	6.061			5.882		
791	Biased Irradiation	5.882			5.556		
792	Biased Irradiation	6.061			5.556		
793	Biased Irradiation	6.061			5.882		
794	Biased Irradiation	6.061			5.714		
795	Biased Irradiation	6.250			5.714		
806	All GND'd Irradiation	6.452				6.061	
807	All GND'd Irradiation	6.250				5.882	
808	All GND'd Irradiation	6.061				5.556	
809	All GND'd Irradiation	6.250				6.250	
810	All GND'd Irradiation	6.250				6.061	
801	Biased Irradiation	6.250				5.714	
802	Biased Irradiation	6.061				5.405	
803	Biased Irradiation	6.250				5.882	
804	Biased Irradiation	5.882				5.556	
805	Biased Irradiation	6.250				5.714	
816	All GND'd Irradiation	6.250					5.882
817	All GND'd Irradiation	6.250					5.882
818	All GND'd Irradiation	6.061					5.714
819	All GND'd Irradiation	6.250					5.882
820	All GND'd Irradiation	6.061					5.882
811	Biased Irradiation	6.452					5.882
812	Biased Irradiation	6.250					5.556
813	Biased Irradiation	6.250					5.556
814	Biased Irradiation	6.250					5.556
815	Biased Irradiation	6.250					5.556
832	Control Unit	6.452	6.250	6.250	6.250	6.250	6.250
833	Control Unit	6.061	6.061	6.061	6.061	6.061	6.061
All GND'd Irradiation Statistics							
Average All GND'd		6.174	6.065	6.027	5.992	5.962	5.849
Std Dev All GND'd		0.104	0.184	0.153	0.164	0.262	0.075
Ps90%/90% (+KTL) All GND'd		6.459	6.569	6.447	6.441	6.679	6.055
Ps90%/90% (-KTL) All GND'd		5.890	5.561	5.607	5.542	5.244	5.643
Biased Irradiation Statistics							
Average Biased		6.252	5.954	5.849	5.684	5.654	5.621
Std Dev Biased		0.138	0.098	0.075	0.136	0.181	0.146
Ps90%/90% (+KTL) Biased		6.632	6.221	6.055	6.058	6.150	6.022
Ps90%/90% (-KTL) Biased		5.873	5.686	5.643	5.311	5.158	5.220
Specification MIN		2.6	2.0	2.0	2.0	2.0	2.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	PASS	PASS	PASS	PASS	PASS
Status (+KTL) Biased							

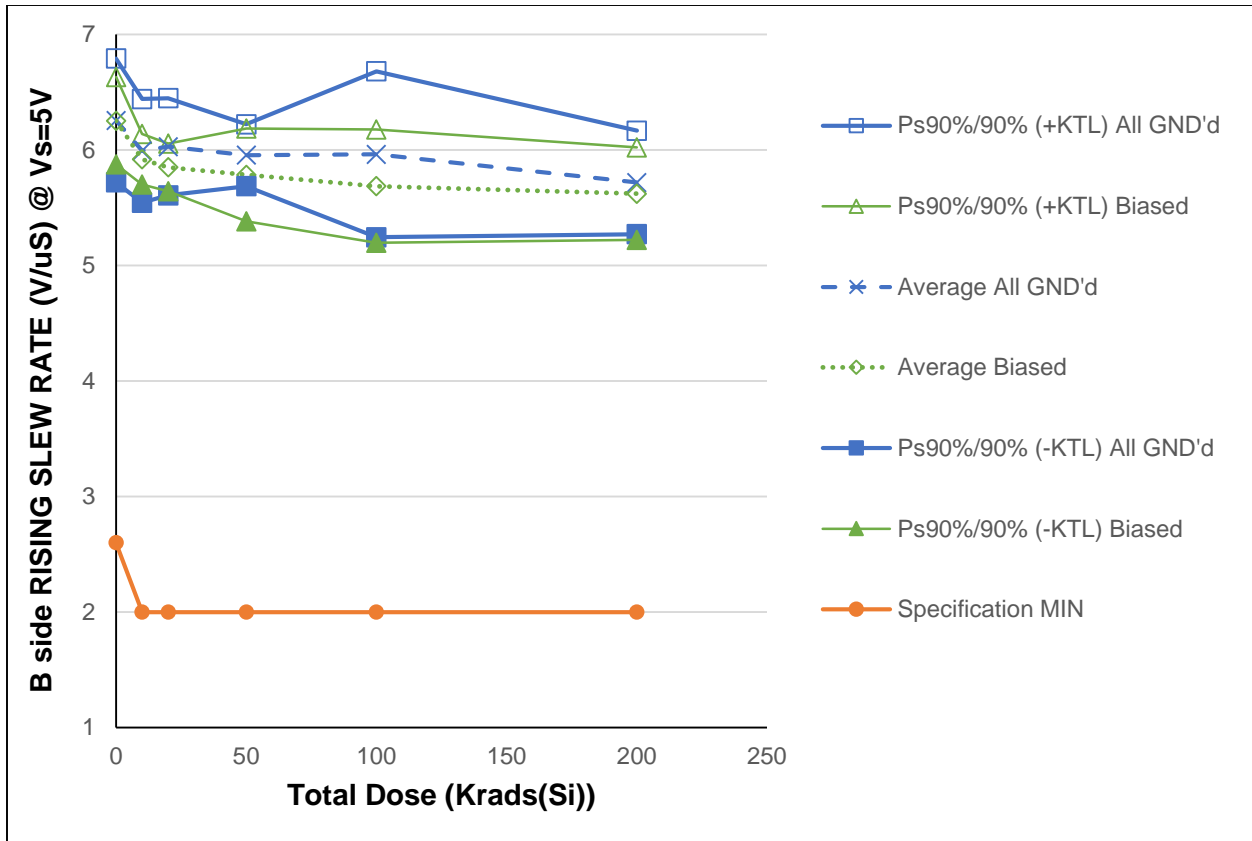


Figure 5.94: Plot of B-side Slew Rate (Rising) @ Vs = 5V versus Total Dose

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 Units	B RISING SLEW RATE @ Vs=5V (V/uS)	Total Dose (Krad(Si)) @ 50 rad(Si)/s					
		0	10	20	50	100	200
776	All GND'd Irradiation	6.250	5.882				
777	All GND'd Irradiation	6.061	5.882				
778	All GND'd Irradiation	6.061	5.882				
779	All GND'd Irradiation	6.452	6.250				
780	All GND'd Irradiation	6.452	6.061				
771	Biased Irradiation	6.061	5.882				
772	Biased Irradiation	6.250	5.882				
773	Biased Irradiation	6.250	5.882				
774	Biased Irradiation	6.452	6.061				
775	Biased Irradiation	6.250	5.882				
786	All GND'd Irradiation	6.061		5.882			
787	All GND'd Irradiation	6.061		5.882			
788	All GND'd Irradiation	6.061		6.061			
789	All GND'd Irradiation	6.250		6.250			
790	All GND'd Irradiation	6.061		6.061			
781	Biased Irradiation	6.061		5.714			
782	Biased Irradiation	6.061		5.882			
783	Biased Irradiation	6.061		5.882			
784	Biased Irradiation	6.061		5.882			
785	Biased Irradiation	6.061		5.882			
796	All GND'd Irradiation	6.061			5.882		
797	All GND'd Irradiation	6.250			6.061		
798	All GND'd Irradiation	6.452			6.061		
799	All GND'd Irradiation	6.061			5.882		
800	All GND'd Irradiation	6.061			5.882		
791	Biased Irradiation	6.061			5.882		
792	Biased Irradiation	6.061			5.714		
793	Biased Irradiation	6.061			5.556		
794	Biased Irradiation	6.061			5.882		
795	Biased Irradiation	6.061			5.882		
806	All GND'd Irradiation	6.250				5.882	
807	All GND'd Irradiation	6.250				6.061	
808	All GND'd Irradiation	5.882				5.556	
809	All GND'd Irradiation	6.452				6.250	
810	All GND'd Irradiation	6.250				6.061	
801	Biased Irradiation	6.061				5.556	
802	Biased Irradiation	6.061				5.556	
803	Biased Irradiation	6.250				5.882	
804	Biased Irradiation	6.061				5.556	
805	Biased Irradiation	6.061				5.882	
816	All GND'd Irradiation	6.061					5.714
817	All GND'd Irradiation	6.250					5.882
818	All GND'd Irradiation	6.061					5.556
819	All GND'd Irradiation	6.061					5.556
820	All GND'd Irradiation	6.061					5.882
811	Biased Irradiation	6.250					5.882
812	Biased Irradiation	6.250					5.556
813	Biased Irradiation	6.250					5.556
814	Biased Irradiation	6.250					5.556
815	Biased Irradiation	6.061					5.556
832	Control Unit	6.452	6.250	6.250	6.250	6.250	6.250
833	Control Unit	6.250	6.061	6.061	6.061	6.061	6.061
All GND'd Irradiation Statistics							
Average All GND'd		6.255	5.992	6.027	5.954	5.962	5.718
Std Dev All GND'd		0.196	0.164	0.153	0.098	0.262	0.163
Ps90%/90% (+KTL) All GND'd		6.791	6.441	6.447	6.221	6.679	6.166
Ps90%/90% (-KTL) All GND'd		5.719	5.542	5.607	5.686	5.244	5.270
Biased Irradiation Statistics							
Average Biased		6.252	5.918	5.849	5.783	5.686	5.621
Std Dev Biased		0.138	0.080	0.075	0.147	0.179	0.146
Ps90%/90% (+KTL) Biased		6.632	6.137	6.055	6.186	6.177	6.022
Ps90%/90% (-KTL) Biased		5.873	5.699	5.643	5.381	5.195	5.220
Specification MIN		2.6	2.0	2.0	2.0	2.0	2.0
Status (Measurements) All GND'd		PASS	PASS	PASS	PASS	PASS	PASS
Status (Measurements) Biased		PASS	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	PASS
Status (+KTL) All GND'd							
Status (-KTL) Biased		PASS	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

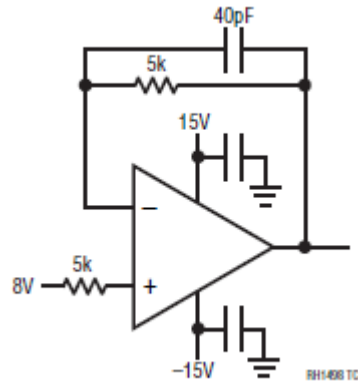


Figure B1: Total Dose Bias Circuit

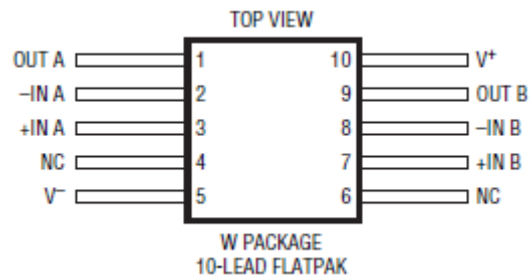


Figure B2: Pin-Out

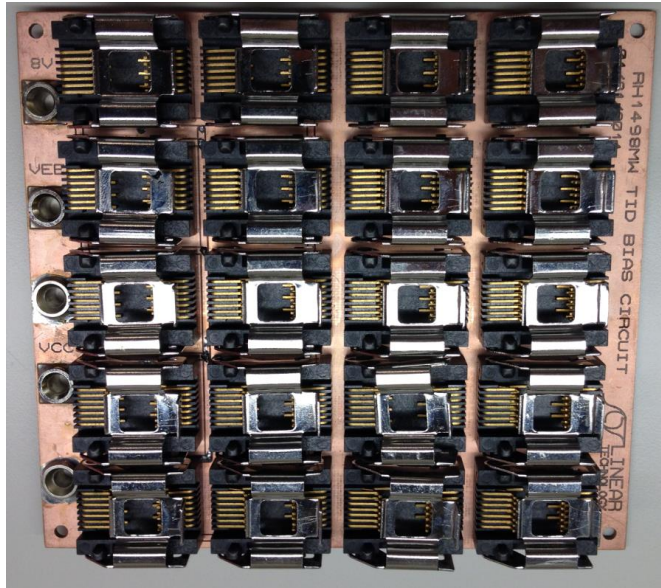


Figure B3: Bias Board (top)

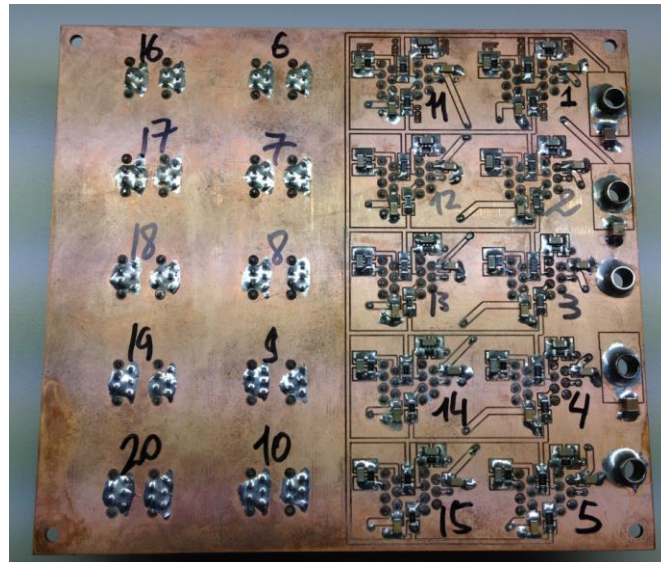




Figure B4: Bias Board (back)

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:	SHEPHERD THOMAS J. 125523594	SHEPHERD THOMAS J. 125523594	ARSHAD MOHAMMAD 1231956693	MELINE CARY 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

4.	Test Performed		Results of Test			Experiment #:	2014-NRC-005		Page 2 of 3	Step No.
	Sample Result	Requirements								
	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:

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: ± 8.56% (Step Nos. 1-2, 5-6)
± 2.52% (Step Nos. 3-4)
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. Total number of irradiation steps was 15 instead of 13 per customer request.
 - b. 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. 90X5-0.18 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.

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) $V_S = 5V$; $V_{CM} = V_{OUT} =$ 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