

DISPLACEMENT DAMAGE TEST REPORT OP484S

January 2023

Radiation Test Report	
Product:	OP484S
Die:	1447Z
Fluence:	2e12 n/cm ²
Test Method:	MIL-STD-883 TM1017
Facilities:	UMass Lowell
Tested:	January 5, 2023

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		ISY @ VS=+/-5V (A)			Vos (A) (V)			Vos (B) (V)			Vos (C) (V)		
Wafer	SN	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12
CTRL	82	3.76E-03	3.76E-03	3.75E-03	-8.27E-05	-8.36E-05	-8.35E-05	-1.22E-04	-1.22E-04	-1.20E-04	-1.36E-05	-1.46E-05	-1.03E-05
	86	3.75E-03	3.69E-03	3.64E-03	-1.31E-04	-1.55E-04	-1.51E-04	-1.11E-05	-1.34E-05	9.87E-06	-5.96E-06	-9.85E-06	-1.29E-05
	87	3.72E-03	3.66E-03	3.62E-03	-7.08E-05	-4.61E-05	-4.38E-05	-1.55E-05	-2.00E-05	-1.77E-05	-4.31E-05	-4.46E-05	-4.31E-05
	88	3.71E-03	3.65E-03	3.61E-03	-5.82E-05	-6.10E-05	-6.42E-05	4.54E-05	1.40E-05	-1.53E-06	-4.21E-05	-4.27E-05	-6.73E-05
	89	3.75E-03	3.69E-03	3.65E-03	-8.08E-05	-5.73E-05	-8.40E-05	-5.00E-05	-6.04E-05	-7.00E-05	-4.79E-05	-5.46E-05	-4.87E-05
	90	3.75E-03	3.68E-03	3.64E-03	-5.32E-05	-7.77E-05	-7.38E-05	-6.07E-07	-2.41E-05	1.15E-06	-4.40E-05	-4.91E-05	-4.51E-05
	91	3.88E-03	3.83E-03	3.78E-03	-4.16E-05	-3.59E-05	-5.13E-05	-3.30E-05	-1.04E-06	1.82E-06	-1.03E-04	-1.17E-04	-1.26E-04
	92	3.76E-03	3.70E-03	3.66E-03	-7.49E-05	-8.39E-05	-6.85E-05	-1.82E-05	-1.33E-05	-8.80E-06	-3.12E-05	-4.84E-05	-2.32E-05
	93	3.78E-03	3.72E-03	3.68E-03	5.31E-06	9.22E-06	1.34E-05	-1.49E-05	-3.65E-05	-4.40E-05	-3.16E-05	-6.10E-05	-9.09E-05
	94	3.80E-03	3.74E-03	3.70E-03	-3.01E-05	-3.24E-06	4.27E-06	-3.75E-05	-7.13E-05	-6.11E-05	-3.63E-05	-3.95E-05	-5.35E-05
	95	3.89E-03	3.83E-03	3.79E-03	-5.32E-05	-6.97E-05	-7.60E-05	-2.15E-05	-3.00E-05	-2.58E-05	-7.34E-05	-8.18E-05	-6.44E-05
	min	3.71E-03	3.65E-03	3.61E-03	-1.31E-04	-1.55E-04	-1.51E-04	-5.00E-05	-7.13E-05	-7.00E-05	-1.03E-04	-1.17E-04	-1.26E-04
	max	3.89E-03	3.83E-03	3.79E-03	5.31E-06	9.22E-06	1.34E-05	4.54E-05	1.40E-05	9.87E-06	-5.96E-06	-9.85E-06	-1.29E-05
	stdev	6.22E-05	6.26E-05	6.22E-05	3.56E-05	4.55E-05	4.62E-05	2.58E-05	2.57E-05	2.80E-05	2.62E-05	2.82E-05	3.26E-05
	average	3.78E-03	3.72E-03	3.68E-03	-5.88E-05	-5.80E-05	-5.95E-05	-1.57E-05	-2.56E-05	-2.16E-05	-4.59E-05	-5.48E-05	-5.75E-05
+3 Sigma	3.97E-03	3.91E-03	3.86E-03	4.80E-05	7.86E-05	7.91E-05	6.16E-05	5.15E-05	6.24E-05	3.28E-05	2.99E-05	4.04E-05	
-3 Sigma	3.59E-03	3.53E-03	3.49E-03	-1.66E-04	-1.95E-04	-1.98E-04	-9.30E-05	-1.03E-04	-1.06E-04	-1.25E-04	-1.40E-04	-1.55E-04	

		Vos (D) (V)			Ios (A) (A)			Ios (B) (A)			Ios (C) (A)		
Wafer	SN	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12
CTRL	82	-7.31E-05	-7.34E-05	-7.30E-05	5.65E-09	4.88E-09	5.45E-09	-7.23E-11	-2.10E-10	-2.82E-10	-2.80E-09	-2.83E-09	-2.84E-09
	86	-1.23E-04	-1.02E-04	-8.47E-05	3.73E-09	6.18E-09	1.34E-08	4.13E-09	2.84E-08	2.19E-08	-1.32E-10	3.36E-09	4.37E-09
	87	-6.35E-05	-7.65E-05	-9.10E-05	6.83E-09	1.16E-08	2.36E-08	3.52E-09	-2.58E-09	8.96E-09	-5.16E-09	-6.97E-10	1.38E-08
	88	-6.89E-05	-3.56E-05	-1.68E-05	3.93E-09	-3.11E-09	-1.09E-08	2.78E-09	-1.11E-08	-1.33E-08	-6.16E-09	-1.22E-08	-7.99E-09
	89	-5.18E-05	-2.19E-05	-1.36E-05	5.77E-09	1.10E-08	4.51E-09	2.56E-09	-3.64E-09	-6.21E-09	-5.46E-10	-1.04E-09	1.62E-08
	90	-6.65E-05	-3.82E-05	-3.94E-05	2.65E-09	-4.93E-09	3.02E-09	3.11E-10	-2.57E-09	-4.37E-09	-3.20E-09	-5.33E-09	-1.58E-09
	91	-4.10E-05	-6.49E-05	-6.65E-05	2.87E-09	-9.62E-09	-2.23E-08	1.45E-09	8.20E-09	1.64E-08	-6.60E-09	-1.97E-08	-1.74E-08
	92	-9.69E-05	-9.77E-05	-8.95E-05	6.18E-09	-6.71E-09	-1.98E-08	-1.25E-09	-8.98E-09	-6.75E-09	6.72E-10	-8.83E-09	7.69E-09
	93	-8.50E-05	-7.65E-05	-8.17E-05	5.31E-09	1.39E-09	-3.18E-08	2.16E-09	8.88E-10	1.69E-09	1.30E-09	2.88E-10	6.18E-09
	94	-9.07E-05	-9.53E-05	-9.34E-05	5.48E-09	7.15E-09	1.44E-08	2.36E-09	4.95E-09	-6.94E-10	-3.82E-09	5.93E-09	-9.02E-09
	95	-5.65E-05	-6.73E-05	-4.00E-05	4.92E-09	-1.54E-08	-1.66E-08	2.29E-09	-2.21E-09	-1.13E-08	-8.46E-09	-1.04E-08	-5.41E-09
	min	-1.23E-04	-1.02E-04	-9.34E-05	2.65E-09	-1.54E-08	-3.18E-08	-1.25E-09	-1.11E-08	-1.33E-08	-8.46E-09	-1.97E-08	-1.74E-08
	max	-4.10E-05	-6.49E-05	-1.36E-05	6.83E-09	1.16E-08	2.36E-08	4.13E-09	2.84E-08	2.19E-08	1.30E-09	5.93E-09	1.62E-08
	stdev	2.44E-05	2.79E-05	3.14E-05	1.41E-09	9.15E-09	1.85E-08	1.55E-09	1.12E-08	1.17E-08	3.40E-09	7.91E-09	1.08E-08
	average	-7.43E-05	-6.76E-05	-6.17E-05	4.77E-09	-2.41E-10	-4.25E-09	2.03E-09	1.14E-09	6.37E-10	-3.21E-09	-4.86E-09	6.87E-10
	+3 Sigma	-1.03E-06	1.62E-05	3.26E-05	9.00E-09	2.72E-08	5.13E-08	6.69E-09	3.46E-08	3.58E-08	6.98E-09	1.89E-08	3.31E-08
	-3 Sigma	-1.48E-04	-1.51E-04	-1.56E-04	5.34E-10	-2.77E-08	-5.98E-08	-2.63E-09	-3.23E-08	-3.46E-08	-1.34E-08	-2.86E-08	-3.17E-08

		Ios (D) (A)			+Ibias (A) (A)			+Ibias (B) (A)			+Ibias (C) (A)		
Wafer	SN	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12
CTRL	82	-7.96E-09	-7.95E-09	-8.04E-09	-1.36E-07	-1.36E-07	-1.36E-07	-1.41E-07	-1.42E-07	-1.41E-07	-1.45E-07	-1.46E-07	-1.45E-07
	86	-4.05E-09	9.46E-09	3.50E-09	-1.62E-07	-2.81E-07	-3.38E-07	-1.32E-07	-2.33E-07	-3.15E-07	-1.49E-07	-2.75E-07	-3.50E-07
	87	-5.31E-09	-1.17E-08	1.18E-08	-1.42E-07	-2.62E-07	-3.21E-07	-1.39E-07	-2.49E-07	-3.09E-07	-1.45E-07	-2.67E-07	-3.29E-07
	88	-6.84E-09	-1.08E-08	-1.37E-08	-1.38E-07	-2.52E-07	-3.24E-07	-1.33E-07	-2.50E-07	-3.41E-07	-1.36E-07	-2.50E-07	-3.23E-07
	89	-4.61E-09	1.46E-08	2.79E-08	-1.44E-07	-2.63E-07	-3.41E-07	-1.41E-07	-2.55E-07	-3.28E-07	-1.44E-07	-2.65E-07	-3.24E-07
	90	-6.90E-09	9.87E-09	1.46E-08	-1.46E-07	-2.65E-07	-3.35E-07	-1.36E-07	-2.70E-07	-3.27E-07	-1.39E-07	-2.67E-07	-3.43E-07
	91	-4.02E-09	-2.08E-08	-2.48E-08	-1.45E-07	-2.80E-07	-3.55E-07	-1.41E-07	-2.50E-07	-3.21E-07	-1.38E-07	-2.57E-07	-3.24E-07
	92	-4.18E-09	8.75E-09	2.57E-08	-1.34E-07	-2.62E-07	-3.39E-07	-1.18E-07	-2.36E-07	-3.06E-07	-1.46E-07	-2.80E-07	-3.47E-07
	93	-5.17E-09	-9.66E-09	-2.16E-08	-1.35E-07	-2.58E-07	-3.48E-07	-1.33E-07	-2.50E-07	-3.21E-07	-1.34E-07	-2.41E-07	-3.10E-07
	94	-5.28E-09	-7.87E-09	-1.31E-08	-1.39E-07	-2.67E-07	-3.21E-07	-1.33E-07	-2.35E-07	-3.08E-07	-1.38E-07	-2.36E-07	-3.08E-07
	95	-5.59E-09	-6.89E-09	-3.74E-08	-1.38E-07	-2.55E-07	-3.27E-07	-1.53E-07	-2.78E-07	-3.50E-07	-1.40E-07	-2.70E-07	-3.32E-07
	min	-6.90E-09	-2.08E-08	-3.74E-08	-1.62E-07	-2.81E-07	-3.55E-07	-1.53E-07	-2.78E-07	-3.50E-07	-1.49E-07	-2.80E-07	-3.50E-07
	max	-4.02E-09	1.46E-08	2.79E-08	-1.34E-07	-2.52E-07	-3.21E-07	-1.18E-07	-2.33E-07	-3.06E-07	-1.34E-07	-2.36E-07	-3.08E-07
stdev	1.05E-09	1.20E-08	2.25E-08	7.89E-09	9.47E-09	1.18E-08	8.92E-09	1.46E-08	1.44E-08	4.79E-09	1.46E-08	1.43E-08	
average	-5.19E-09	-2.52E-09	-2.70E-09	-1.42E-07	-2.64E-07	-3.35E-07	-1.36E-07	-2.50E-07	-3.22E-07	-1.41E-07	-2.61E-07	-3.29E-07	
+3 Sigma	-2.06E-09	3.36E-08	6.49E-08	-1.19E-07	-2.36E-07	-3.00E-07	-1.09E-07	-2.07E-07	-2.79E-07	-1.27E-07	-2.17E-07	-2.86E-07	
-3 Sigma	-8.33E-09	-3.86E-08	-7.03E-08	-1.66E-07	-2.93E-07	-3.70E-07	-1.63E-07	-2.94E-07	-3.66E-07	-1.55E-07	-3.04E-07	-3.72E-07	

		+Ibias (D) (A)			-Ibias (A) (A)			-Ibias (B) (A)			-Ibias (C) (A)		
Wafer	SN	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12
CTRL	82	-1.50E-07	-1.50E-07	-1.49E-07	-1.41E-07	-1.41E-07	-1.41E-07	-1.41E-07	-1.41E-07	-1.41E-07	-1.42E-07	-1.43E-07	-1.42E-07
	86	-1.55E-07	-2.76E-07	-3.57E-07	-1.65E-07	-2.87E-07	-3.52E-07	-1.36E-07	-2.61E-07	-3.37E-07	-1.48E-07	-2.79E-07	-3.54E-07
	87	-1.48E-07	-2.84E-07	-3.40E-07	-1.49E-07	-2.73E-07	-3.44E-07	-1.42E-07	-2.46E-07	-3.18E-07	-1.40E-07	-2.66E-07	-3.43E-07
	88	-1.38E-07	-2.58E-07	-3.29E-07	-1.42E-07	-2.49E-07	-3.13E-07	-1.36E-07	-2.39E-07	-3.27E-07	-1.30E-07	-2.38E-07	-3.15E-07
	89	-1.26E-07	-2.37E-07	-3.05E-07	-1.49E-07	-2.74E-07	-3.46E-07	-1.44E-07	-2.51E-07	-3.22E-07	-1.43E-07	-2.64E-07	-3.40E-07
	90	-1.47E-07	-2.59E-07	-3.42E-07	-1.49E-07	-2.60E-07	-3.38E-07	-1.37E-07	-2.67E-07	-3.22E-07	-1.36E-07	-2.62E-07	-3.42E-07
	91	-1.47E-07	-2.76E-07	-3.54E-07	-1.48E-07	-2.70E-07	-3.33E-07	-1.43E-07	-2.58E-07	-3.37E-07	-1.32E-07	-2.37E-07	-3.07E-07
	92	-1.40E-07	-2.59E-07	-3.31E-07	-1.40E-07	-2.55E-07	-3.19E-07	-1.17E-07	-2.27E-07	-2.99E-07	-1.47E-07	-2.71E-07	-3.54E-07
	93	-1.40E-07	-2.54E-07	-3.25E-07	-1.41E-07	-2.59E-07	-3.16E-07	-1.35E-07	-2.51E-07	-3.23E-07	-1.35E-07	-2.41E-07	-3.16E-07
	94	-1.40E-07	-2.51E-07	-3.23E-07	-1.44E-07	-2.74E-07	-3.36E-07	-1.35E-07	-2.40E-07	-3.07E-07	-1.34E-07	-2.42E-07	-2.99E-07
	95	-1.42E-07	-2.48E-07	-3.30E-07	-1.43E-07	-2.40E-07	-3.10E-07	-1.55E-07	-2.75E-07	-3.38E-07	-1.31E-07	-2.59E-07	-3.27E-07
	min	-1.55E-07	-2.84E-07	-3.57E-07	-1.65E-07	-2.87E-07	-3.52E-07	-1.55E-07	-2.75E-07	-3.38E-07	-1.48E-07	-2.79E-07	-3.54E-07
max	-1.26E-07	-2.37E-07	-3.05E-07	-1.40E-07	-2.40E-07	-3.10E-07	-1.17E-07	-2.27E-07	-2.99E-07	-1.30E-07	-2.37E-07	-2.99E-07	
stdev	7.64E-09	1.45E-08	1.52E-08	7.30E-09	1.40E-08	1.49E-08	9.67E-09	1.45E-08	1.29E-08	6.59E-09	1.52E-08	1.97E-08	
average	-1.42E-07	-2.60E-07	-3.34E-07	-1.47E-07	-2.64E-07	-3.31E-07	-1.38E-07	-2.52E-07	-3.23E-07	-1.38E-07	-2.56E-07	-3.30E-07	
+3 Sigma	-1.19E-07	-2.17E-07	-2.98E-07	-1.25E-07	-2.22E-07	-2.86E-07	-1.09E-07	-2.08E-07	-2.84E-07	-1.18E-07	-2.10E-07	-2.71E-07	
-3 Sigma	-1.65E-07	-3.04E-07	-3.79E-07	-1.69E-07	-3.06E-07	-3.75E-07	-1.67E-07	-2.95E-07	-3.62E-07	-1.58E-07	-3.02E-07	-3.89E-07	

Wafer	SN	-Ibias (D) (A)			AVO (A) (V/mV)			AVO (B) (V/mV)			AVO (C) (V/mV)		
		Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12
CTRL	82	-1.42E-07	-1.42E-07	-1.41E-07	454.00	467.95	454.74	437.89	451.68	441.51	418.68	418.52	417.24
	86	-1.51E-07	-2.86E-07	-3.60E-07	363.39	305.49	252.52	384.25	279.19	264.16	474.26	401.82	347.03
	87	-1.43E-07	-2.72E-07	-3.51E-07	360.67	363.37	310.51	386.58	368.63	289.55	411.44	330.08	290.95
	88	-1.31E-07	-2.47E-07	-3.15E-07	381.15	312.09	270.70	391.86	295.86	248.32	443.75	348.81	271.41
	89	-1.22E-07	-2.52E-07	-3.33E-07	411.94	388.61	349.88	381.03	349.59	282.52	433.84	377.83	323.96
	90	-1.40E-07	-2.69E-07	-3.57E-07	450.37	326.19	277.84	411.96	364.78	348.80	468.94	394.58	321.84
	91	-1.43E-07	-2.55E-07	-3.29E-07	453.21	427.31	324.64	497.16	425.47	370.04	467.68	376.28	282.53
	92	-1.36E-07	-2.68E-07	-3.57E-07	487.39	319.63	339.72	393.82	353.74	284.05	442.83	323.81	283.60
	93	-1.34E-07	-2.44E-07	-3.04E-07	410.45	322.47	332.73	421.62	311.77	264.72	471.95	393.37	315.66
	94	-1.35E-07	-2.43E-07	-3.10E-07	494.90	427.03	373.67	425.91	316.08	290.36	384.42	320.26	283.50
	95	-1.36E-07	-2.41E-07	-2.92E-07	501.48	377.62	357.54	514.14	415.78	349.35	507.44	407.29	344.34
	min	-1.51E-07	-2.86E-07	-3.60E-07	360.67	305.49	252.52	381.03	279.19	248.32	384.42	320.26	271.41
	max	-1.22E-07	-2.41E-07	-2.92E-07	501.48	427.31	373.67	514.14	425.47	370.04	507.44	407.29	347.03
	stdev	7.83E-09	1.52E-08	2.48E-08	53.63	46.57	40.27	47.49	48.45	41.74	35.24	33.73	27.49
	average	-1.37E-07	-2.58E-07	-3.31E-07	431.49	356.98	318.98	420.83	348.09	299.19	450.65	367.41	306.48
	+3 Sigma	-1.14E-07	-2.12E-07	-2.87E-07	592.38	496.70	439.79	563.31	493.43	424.39	556.37	468.60	388.94
	-3 Sigma	-1.61E-07	-3.03E-07	-4.05E-07	270.61	217.26	198.16	278.35	202.75	173.98	344.93	266.23	224.03

Wafer	SN	AVO (D) (V/mV)			VOH (A) (V)			VOH (B) (V)			VOH (C) (V)		
		Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12	Pre	1.00E+12	2.00E+12
CTRL	82	487.17	502.08	483.52	4.8756	4.8763	4.8748	4.8822	4.8827	4.8814	4.8786	4.8792	4.8779
	86	561.37	421.17	384.15	4.8781	4.8805	4.8778	4.8825	4.8826	4.8805	4.8794	4.8781	4.8767
	87	458.35	378.83	317.70	4.8767	4.8768	4.8776	4.8827	4.8825	4.8813	4.8795	4.8784	4.8778
	88	461.43	403.42	333.85	4.8765	4.8766	4.8768	4.8809	4.8809	4.8793	4.8773	4.8762	4.8755
	89	442.19	393.15	350.48	4.8758	4.8761	4.8764	4.8809	4.8798	4.8794	4.8774	4.8752	4.8758
	90	482.34	391.11	365.30	4.8754	4.8757	4.8761	4.8809	4.8808	4.8794	4.8770	4.8761	4.8755
	91	465.51	368.48	314.52	4.8757	4.8762	4.8764	4.8817	4.8824	4.8803	4.8782	4.8778	4.8761
	92	499.84	356.44	300.30	4.8768	4.8772	4.8772	4.8815	4.8816	4.8801	4.8775	4.8767	4.8759
	93	476.31	439.36	368.11	4.8771	4.8773	4.8771	4.8809	4.8811	4.8794	4.8768	4.8760	4.8753
	94	472.46	397.86	357.36	4.8751	4.8754	4.8756	4.8801	4.8803	4.8786	4.8762	4.8754	4.8744
	95	428.76	369.78	373.17	4.8739	4.8743	4.8751	4.8802	4.8805	4.8788	4.8762	4.8750	4.8743
	min	428.76	356.44	300.30	4.8739	4.8743	4.8751	4.8801	4.8798	4.8786	4.8762	4.8750	4.8743
	max	561.37	439.36	384.15	4.8781	4.8805	4.8778	4.8827	4.8826	4.8813	4.8795	4.8784	4.8778
	stdev	36.37	25.27	28.34	0.0012	0.0016	0.0009	0.0009	0.0010	0.0008	0.0012	0.0012	0.0010
	average	474.85	391.96	346.49	4.8761	4.8766	4.8766	4.8812	4.8813	4.8797	4.8776	4.8765	4.8757
	+3 Sigma	583.96	467.76	431.52	4.8797	4.8815	4.8792	4.8839	4.8842	4.8822	4.8810	4.8802	4.8788
	-3 Sigma	365.75	316.16	261.47	4.8725	4.8717	4.8740	4.8786	4.8783	4.8772	4.8741	4.8728	4.8727

Wafer	SN	VOH (D) (V)		
		Pre	1.00E+12	2.00E+12
CTRL	82	4.8760	4.8766	4.8751
	86	4.8755	4.8736	4.8740
	87	4.8765	4.8756	4.8751
	88	4.8756	4.8748	4.8740
	89	4.8743	4.8733	4.8733
	90	4.8741	4.8734	4.8729
	91	4.8732	4.8728	4.8726
	92	4.8745	4.8739	4.8734
	93	4.8730	4.8723	4.8723
	94	4.8728	4.8722	4.8717
	95	4.8725	4.8714	4.8715
	min	4.8725	4.8714	4.8715
	max	4.8765	4.8756	4.8751
	stdev	0.0013	0.0013	0.0011
	average	4.8742	4.8733	4.8731
	+3 Sigma	4.8782	4.8771	4.8765
	-3 Sigma	4.8702	4.8696	4.8697







