

SN54SC8T164-SEP Total Ionizing Dose (TID) Report



ABSTRACT

This report covers the radiation characterization results of the SN54SC8T164-SEP, radiation tolerant 8-bit parallel-out serial shift registers. The study was done to determine Total Ionizing Dose (TID) effects under high dose rate (HDR) to 30krad(Si). Radiation Lot Acceptance Testing (RLAT) was performed using five units at a dose level of 30krad(Si) per MIL-STD-883 TM 1019. All future wafer lots will be tested under the same conditions. The device is manufactured in pure CMOS process. HDR TID response is the worst case. TID HDR characterization was performed per TM 1019.

The SN54SC8T164-SEP is packaged in a space enhanced plastic package for low outgassing characteristics and is Single Event Latch-Up (SEL) immune up to 50MeV-cm²/mg, which makes the device an option for low Earth orbit space applications. Single Event Transient (SET) data is also provided in the Single Event Effects Radiation Report.

For full total ionizing dose characterization results, see [SN54SC8T595-SEP Total Ionizing Dose \(TID\) Report](#).

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1 Device Information

The SN54SC8T164-SEP device contains an 8-bit shift register with AND-gated serial inputs and an asynchronous clear ($\overline{\text{CLR}}$) input. The gated serial (A and B) inputs permit complete control over incoming data; a low at either input inhibits entry of the new data and resets the first flip-flop to the low level at the next clock (CLK) pulse. A high-level input enables the other input, which then determines the state of the first flip-flop. Data at the serial inputs can be changed while CLK is high or low, provided the minimum set-up time requirements are met. Clocking occurs on the low-to-high-level transition of CLK.

The input is designed with a reduced threshold circuit to support up translation when the supply voltage is larger than the input voltage. Additionally, the 5V tolerant input pins enable down translation when the input voltage is larger than the supply voltage. The output level is always referenced to the supply voltage (V_{CC}) and supports 1.8V, 2.5V, 3.3V, and 5V CMOS levels.

1.1 Device Details

[Table 1-1](#) lists the device information used for TID HDR characterization and qualification.

Table 1-1. Device and Exposure Details

TID HDR Details: Up To 30krad(Si)	
TI Device Number	SN54SC8T164-SEP
VID Number	V62/25620
Package	14-pin PW (TSSOP)
Technology	LBC9
Die Lot Number	3272256RFB
A/T Lot Number and Date Code	4613362ML4 / 46CCTFK
Quantity Tested	6 irradiated devices + 4 control
Lot Accept or Reject	Devices passed 30krad(Si)
HDR Radiation Facility	Texas Instruments CLAB in Dallas, Texas
HDR Dose Level	30krad(Si)
HDR Dose Rate	172.35rad(Si)/s ionizing radiation
Effective Dose Rate 30krad(Si) with 72 hour Anneal	115.74mrad(Si)/s ionizing radiation
HDR Radiation Source	Gammacell 220 Excel (GC-220E) Co-60
Irradiation Temperature	Ambient, room temperature

2 Total Dose Test Setup

2.1 Test Overview

The SN54SC8T164-SEP samples were irradiated at a high dose rate of 172.35rad(Si)/s up to 30krad(Si) (115.74mrad(Si)/s effective dose rate for 30krad(Si) with 72 hour anneal) and then put through full electrical parametric testing on the production Automated Test Equipment (ATE). The samples were functional and passed all electrical parametric tests with readings within data sheet electrical specification limits.

2.2 Test Description and Facilities

The SN54SC8T164-SEP HDR exposure was performed on biased devices in a Co-60 gamma cell at TI facility in Dallas, Texas. The un-attenuated dose rate of this cell is 172.35rads(Si)/s (115.74mrad(Si)/s effective dose rate of 30krad(Si) with 72 hour anneal). After exposure, the devices were packed in dry ice (per MIL-STD-883 Method 1019.9 section 3.10) and full post radiation electrical evaluation using Texas Instruments ATE was conducted. ATE test limits are set per data sheet electrical limits based on qualification and characterization data. Post radiation measurements were taken within 30 minutes of removing the devices from the dry ice container. The devices were allowed to reach room temperature prior to electrical post radiation measurements.

2.3 Test Setup Details

The devices were tested in biased conditions as described in the following sections.

2.3.1 Bias Diagram

Figure 2-1 shows the bias conditions for each pin during irradiation.

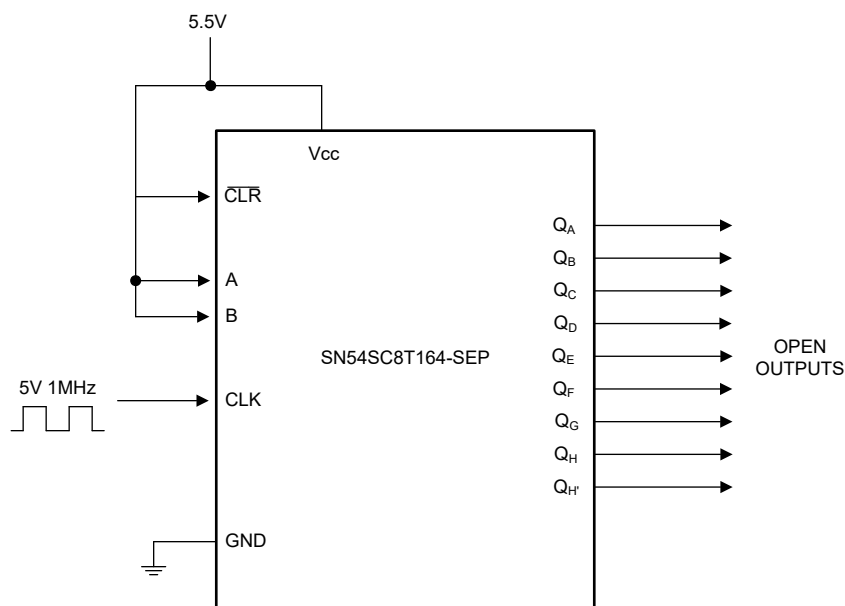


Figure 2-1. SN54SC8T164-SEP Bias Diagram

2.4 Test Configuration and Condition

The HDR RLAT units were irradiated to 30krad(Si), parametrically tested on ATE, and then were annealed at 25°C for 72 hours. The units that were irradiated to 30krad(Si) and were annealed for 72 hours are denoted as 31krad(Si) in [Section 5](#). ATE parametric testing was completed before and after the anneal.

[Table 2-1](#) lists the serialized samples used for TID characterization.

Table 2-1. HDR Device Information

Control Group	HDR Dose Rate = 172.35rad(Si)/s Effective Dose Rate (30krad + Anneal 72 hours) = 115.74mrad(Si)/s	
Total Samples: 4	Total Samples: 6 Biased	
	Exposure Levels	
0krad (Si)	30krad(Si)	
Biased	Biased	Biased + 72 hour anneal
1 - 4	5 - 10	5a - 10a

3 TID Characterization Test Results

3.1 TID Characterization Summary Results

The parametric data for the SN54SC8T164-SEP passes up to 30krad(Si) (with 72 hour room temperature anneal) HDR TID irradiation. The drifts of the electrical parameters through HDR were within the data sheet limits.

Overall, the SN54SC8T164-SEP showed a strong degree of hardness to HDR TID irradiation up to 30krad(Si). The measurements taken post-irradiation for each sample set showed a marginal shift for most parameters at each dose level. The parameters that did show a greater degree of change between pre- and post-irradiation were still within the electrical performance characteristics specified in the data sheet electrical parameters. For the data sheet electrical parameters and associated tests, see [SN54SC8T164-SEP Radiation-Tolerant, 8-Bit Parallel-Out Serial Shift Registers](#).

See [Section 5](#) for HDR report up to 30 krad(Si).

3.2 Specification Compliance Matrix

Table 3-1. Electrical Parameters Table

Parameter	Test Conditions	V _{CC}	T _A = -55°C to +125°C			Unit	Test Name
			MIN	TYP	MAX		
V _{T+} 1	Positive-going input threshold voltage	1.2V to 1.3V	0.31	0.655	1.1	V	VTP_1P2V
		1.65V to 2V	0.39	0.915	1.32		VTP_1P65V
		2.25V to 2.75V	0.51	1.09	1.51		VTP_2P25V
		3V to 3.6V	0.65	1.2	1.7		VTP_3V
		4.5V to 5.5V	0.87	1.51	2.16		VTP_4P5V, VTP_5P5V
V _{T-} 1	Negative-going input threshold voltage	1.2V to 1.3V	0.11	0.349	0.60	V	VTN_1P2V
		1.65V to 2V	0.18	0.455	0.63		VTN_1P65V
		2.25V to 2.75V	0.25	0.545	0.74		VTN_2P25V
		3V to 3.6V	0.33	0.635	0.85		VTN_3V
		4.5V to 5.5V	0.45	0.755	1.14		VTN_4P5V, VTN_5P5V
ΔV _T 1	Hysteresis (V _{T+} – V _{T-})	1.2V to 1.3V	0.2	0.29	0.77	V	DELTA VT_1P2V
		1.65V to 2V	0.21	0.43	0.88		DELTA VT_1P65V
		2.25V to 2.75V	0.25	0.54	0.91		DELTA VT_2P25V
		3V to 3.6V	0.31	0.63	0.91		DELTA VT_3V
		4.5V to 5.5V	0.43	0.75	1.05		DELTA VT_4P5V, DELTA VT_5P5V
V _{IH}	High-level input voltage	1.2V to 1.3V	0.78			V	VIH_1P2V
		1.65V to 2V	1.1				VIH_1P65V
		2.25V to 2.75V	1.28				VIH_2P25V
		3V to 3.6V	1.45				VIH_3V
		4.5V to 5.5V	2				VIH_4P5V, VIH_5P5V
V _{IL}	Low-Level input voltage	1.2V to 1.3V			0.18	V	VIL_1P2V
		1.65V to 2V			0.5		VIL_1P65V
		2.25V to 2.75V			0.65		VIL_2P25V
		3V to 3.6V			0.75		VIL_3V
		4.5V to 5.5V			0.85		VIL_4P5V, VIL_5P5V
V _{OH} 2	I _{OH} = -50μA	1.2V to 5.5V	V _{CC} -0.2			V	VOH_N50UA_1P2V, VOH_N50UA_5P5V
	I _{OH} = -1mA	1.2V	0.8				VOH_N1MA_1P2V
	I _{OH} = -2mA	1.65V to 2V	1.21				VOH_N2MA_1P65V
	I _{OH} = -3mA	2.25V to 2.75V	1.93				VOH_N3MA_2P25V
	I _{OH} = -5.5mA	3V to 3.6V	2.49				VOH_N5P5MA_3V
	I _{OH} = -8mA	4.5V to 5.5V	3.95				VOH_N8MA_4P5V
	I _{OH} = -24mA	4.5V to 5.5V	3.15				VOH_N24MA_5P5V
V _{OL}	I _{OL} = 50μA	1.2V to 5.5V			0.1	V	VOL_50UA_1P2V, VOL_50UA_5P5V
	I _{OL} = 1mA	1.2V			0.2		VOL_1MA_1P2V
	I _{OL} = 2mA	1.65V to 2V			0.25		VOL_2MA_1P65V
	I _{OL} = 3mA	2.25V to 2.75V			0.2		VOL_3MA_2P25V
	I _{OL} = 5.5mA	3V to 3.6V			0.25		VOL_5P5MA_3V
	I _{OL} = 8mA	4.5V to 5.5V			0.35		VOL_8MA_4P5V
	I _{OL} = 24mA	4.5V to 5.5V			0.75		VOL_24MA_5P5V
I _{CC}	V _I = V _{CC} or GND, I _O = 0	1.2V to 5.5V		2	220	μA	ICC_5P5V
ΔI _{CC}	One input at 0.3V or 3.4V, other inputs at V _{CC} or GND	5.5V			1.5	mA	DELTA ICC_5P5V
	One input at 0.3V or 1.1V, other inputs at V _{CC} or GND	1.8V			68	μA	DELTA ICC_1P8V
I _{OZ} 3	V _O = V _{CC} or GND	5.5V			±26	μA	IOZ_5P5V
I _I	V _I = 0V to V _{CC}	V _I = 0V to V _{CC}			±1	μA	II_5P5V

- Schmitt-trigger input devices only.
- Push-pull output devices only.
- 3-State output devices only.

4 Reference Documents

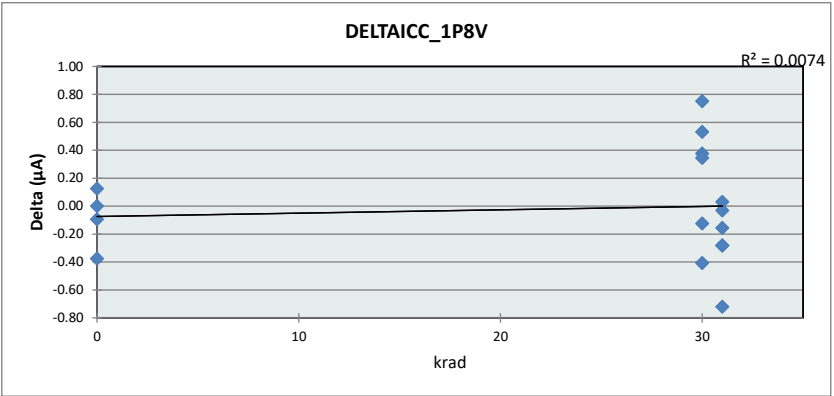
Texas Instruments total ionizing dose radiation (total dose) test procedure follows the standards put forth in MIL-STD-883 TM 1019. The document can be found at the DLA website.

5 Appendix: HDR TID Report Data

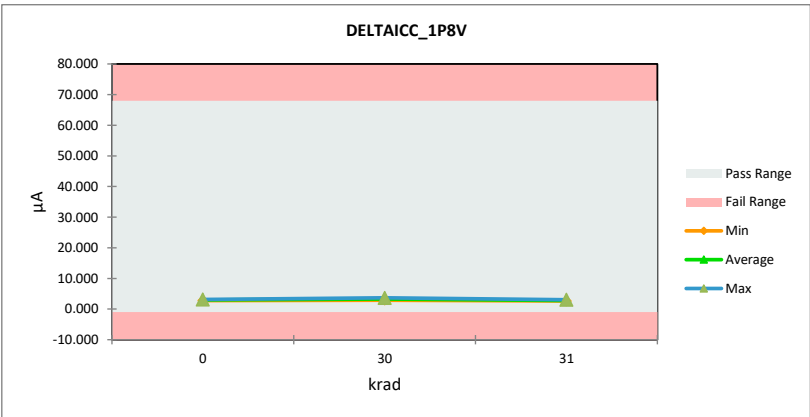
This appendix provides the SN54SC8T164-SEP TID HDR report. The report shows the variation for each parameter up to 30krad(Si).

TID Report
SN54SC8T164-SEP

DELTAICC_1P8V						
Units		μA				
Max Limit		68				
Min Limit		-1				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	2.911	2.911	0.00	0.00%	0.00%
0	2	3.099	3.005	-0.09	-3.03%	0.14%
0	3	3.162	2.786	-0.38	-11.89%	0.54%
0	4	2.974	3.099	0.13	4.20%	0.18%
30	5	2.911	3.662	0.75	25.80%	1.09%
30	6	3.005	3.381	0.38	12.51%	0.54%
30	7	3.005	2.880	-0.13	-4.16%	0.18%
30	8	2.942	3.287	0.35	11.73%	0.50%
30	9	3.381	2.974	-0.41	-12.04%	0.59%
30	10	2.911	3.443	0.53	18.28%	0.77%
31	5a	2.911	2.629	-0.28	-9.69%	0.41%
31	6a	3.005	2.849	-0.16	-5.19%	0.23%
31	7a	3.005	3.036	0.03	1.03%	0.04%
31	8a	2.942	2.661	-0.28	-9.55%	0.41%
31	9a	3.381	2.661	-0.72	-21.30%	1.04%
31	10a	2.911	2.880	-0.03	-1.06%	0.04%
Max		3.381	3.662	0.28	25.80%	1.09%
Average		3.029	3.009	-0.02	-0.27%	0.42%
Min		2.911	2.629	-0.28	-21.30%	0.00%
Std Dev		0.155	0.299	0.14	12.36%	0.34%

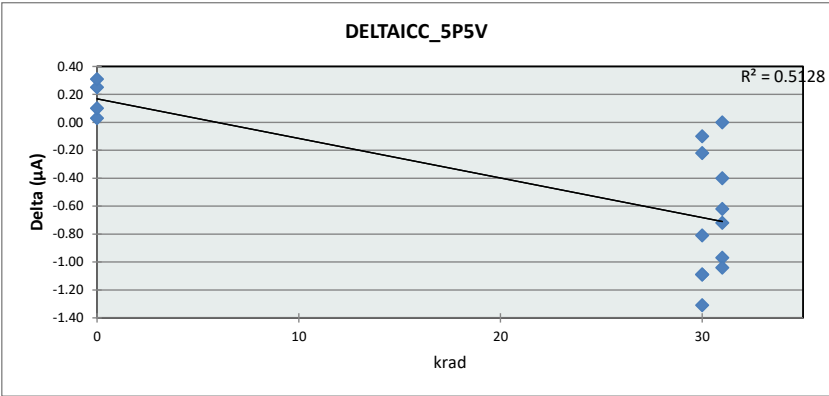


DELTAICC_1P8V			
Units		μA	
Max Limit		68	
Min Limit		-1	
krad	0	30	31
LL	-1.000	-1.000	-1.000
Min	2.786	2.880	2.629
Average	2.950	3.271	2.786
Max	3.099	3.662	3.036
UL	68.000	68.000	68.000

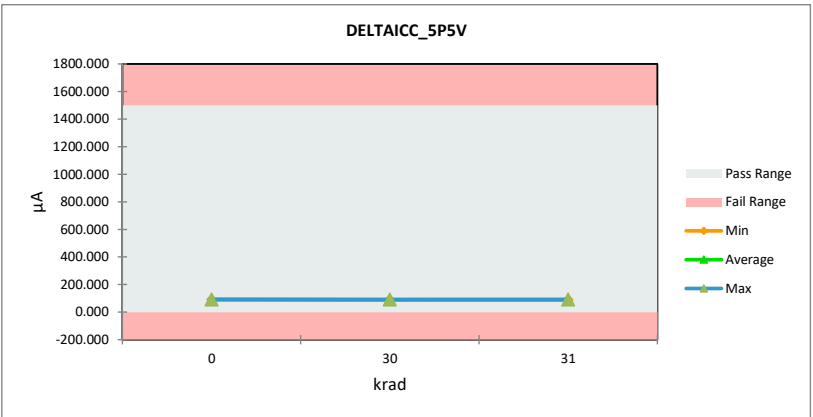


TID Report
SN54SC8T164-SEP

DELTAICC_5P5V						
Units		μA				
Max Limit		1500				
Min Limit		-1				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	90.970	91.220	0.25	0.27%	0.02%
0	2	91.810	91.840	0.03	0.03%	0.00%
0	3	91.340	91.650	0.31	0.34%	0.02%
0	4	90.870	90.970	0.10	0.11%	0.01%
30	5	91.620	90.530	-1.09	-1.19%	0.07%
30	6	91.120	89.810	-1.31	-1.44%	0.09%
30	7	91.030	90.810	-0.22	-0.24%	0.01%
30	8	90.650	89.560	-1.09	-1.20%	0.07%
30	9	91.150	90.340	-0.81	-0.89%	0.05%
30	10	90.500	90.400	-0.10	-0.11%	0.01%
31	5a	91.620	91.000	-0.62	-0.68%	0.04%
31	6a	91.120	90.720	-0.40	-0.44%	0.03%
31	7a	91.030	90.310	-0.72	-0.79%	0.05%
31	8a	90.650	90.650	0.00	0.00%	0.00%
31	9a	91.150	90.180	-0.97	-1.06%	0.06%
31	10a	90.500	89.460	-1.04	-1.15%	0.07%
Max		91.810	91.840	0.03	0.34%	0.09%
Average		91.071	90.591	-0.48	-0.53%	0.04%
Min		90.500	89.460	-1.04	-1.44%	0.00%
Std Dev		0.392	0.671	0.28	0.59%	0.03%

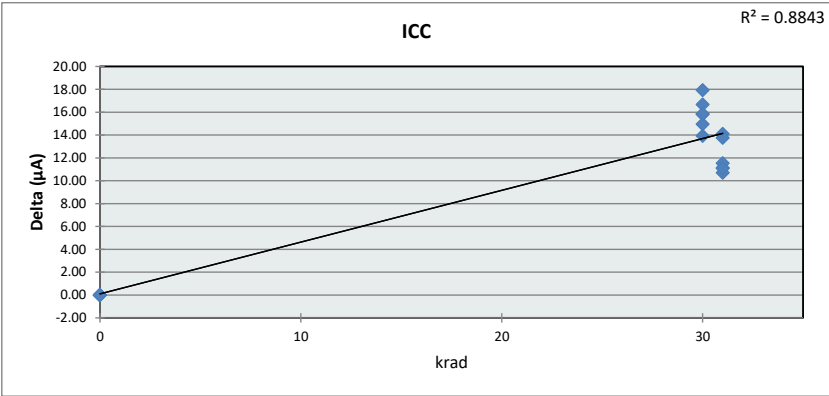


DELTAICC_5P5V			
Units		μA	
Max Limit		1500	
Min Limit		-1	
krad	0	30	31
LL	-1.000	-1.000	-1.000
Min	90.970	89.560	89.460
Average	91.420	90.242	90.387
Max	91.840	90.810	91.000
UL	1500.000	1500.000	1500.000

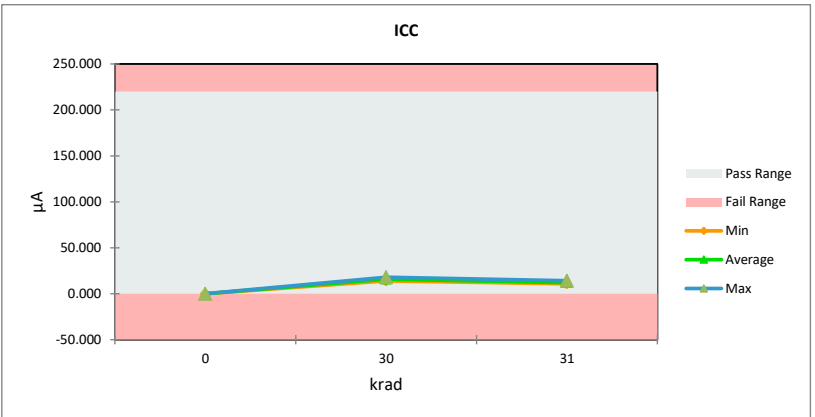


TID Report
SN54SC8T164-SEP

ICC						
Units		μA				
Max Limit		220				
Min Limit		-0.1				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.026	0.017	-0.01	-34.25%	0.00%
0	2	0.022	0.016	-0.01	-26.17%	0.00%
0	3	0.015	0.012	0.00	-22.56%	0.00%
0	4	0.019	0.022	0.00	18.40%	0.00%
30	5	0.022	16.690	16.67	77061.35%	7.57%
30	6	0.022	15.850	15.83	71103.95%	7.19%
30	7	0.022	14.970	14.95	67150.67%	6.79%
30	8	0.019	17.940	17.92	95325.53%	8.14%
30	9	0.021	15.860	15.84	75423.81%	7.20%
30	10	0.020	13.940	13.92	69391.53%	6.32%
31	5a	0.022	11.150	11.13	51448.77%	5.06%
31	6a	0.022	11.550	11.53	51786.79%	5.24%
31	7a	0.022	10.720	10.70	48058.13%	4.86%
31	8a	0.019	14.120	14.10	75006.38%	6.41%
31	9a	0.021	11.100	11.08	52757.14%	5.03%
31	10a	0.020	13.780	13.76	68593.92%	6.25%
Max		0.026	17.940	17.91	95325.53%	8.14%
Average		0.021	10.484	10.46	50190.21%	4.75%
Min		0.015	0.012	0.00	-34.25%	0.00%
Std Dev		0.002	6.574	6.57	32189.28%	2.98%

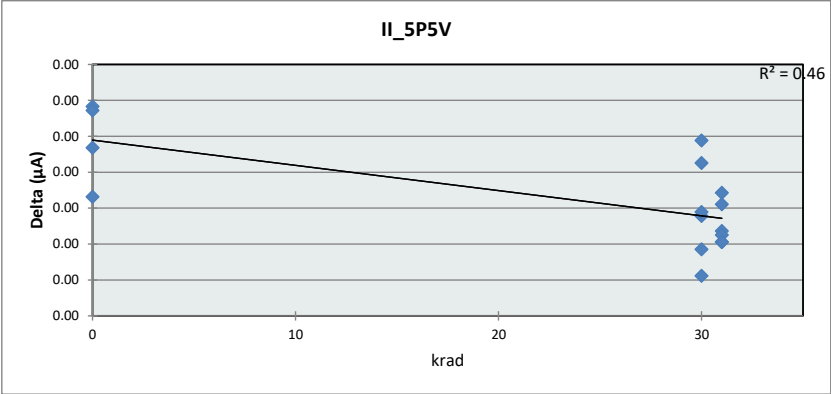


ICC			
Units		μA	
Max Limit		220	
Min Limit		-0.1	
krad	0	30	31
LL	-0.100	-0.100	-0.100
Min	0.012	13.940	10.720
Average	0.017	15.875	12.070
Max	0.022	17.940	14.120
UL	220.000	220.000	220.000

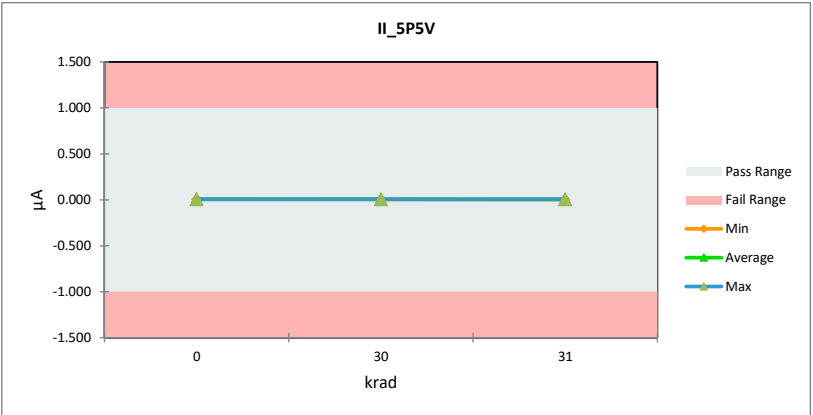


TID Report
SN54SC8T164-SEP

II_5P5V						
Units		μA				
Max Limit		1				
Min Limit		-1				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.004	0.007	0.00	71.88%	0.14%
0	2	0.004	0.006	0.00	37.77%	0.08%
0	3	0.005	0.006	0.00	6.05%	0.02%
0	4	0.003	0.006	0.00	97.67%	0.14%
30	5	0.006	0.007	0.00	21.59%	0.06%
30	6	0.005	0.006	0.00	41.33%	0.09%
30	7	0.005	0.004	0.00	-22.12%	0.06%
30	8	0.006	0.004	0.00	-34.24%	0.09%
30	9	0.005	0.004	0.00	-4.69%	0.01%
30	10	0.007	0.006	0.00	-1.66%	0.01%
31	5a	0.006	0.005	0.00	-16.21%	0.05%
31	6a	0.005	0.005	0.00	9.27%	0.02%
31	7a	0.005	0.005	0.00	-12.33%	0.03%
31	8a	0.006	0.006	0.00	1.98%	0.01%
31	9a	0.005	0.004	0.00	-16.06%	0.04%
31	10a	0.007	0.006	0.00	-14.39%	0.05%
Max		0.007	0.007	0.00	97.67%	0.14%
Average		0.005	0.005	0.00	10.36%	0.06%
Min		0.003	0.004	0.00	-34.24%	0.01%
Std Dev		0.001	0.001	0.00	35.85%	0.04%

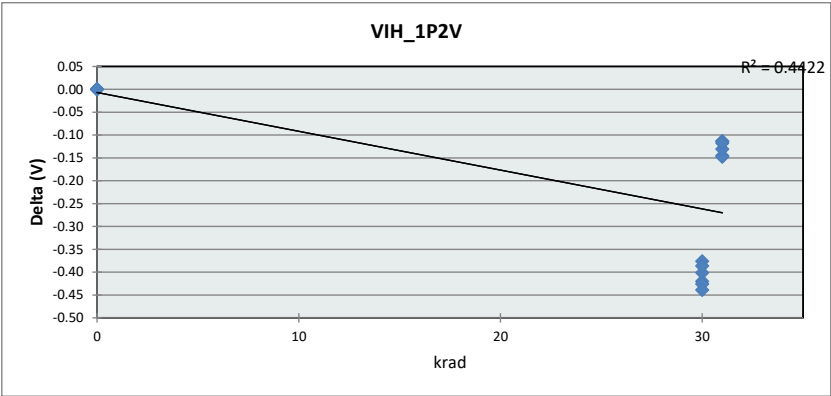


II_5P5V			
Units		μA	
Max Limit		1	
Min Limit		-1	
krad	0	30	31
LL	-1.000	-1.000	-1.000
Min	0.006	0.004	0.004
Average	0.006	0.005	0.005
Max	0.007	0.007	0.006
UL	1.000	1.000	1.000

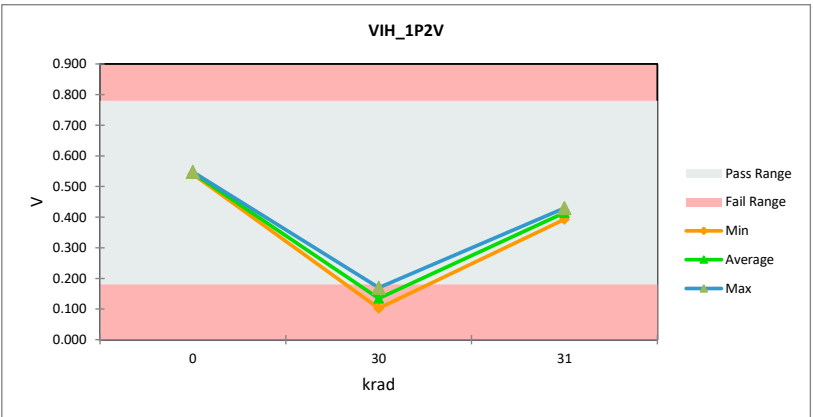


TID Report
SN54SC8T164-SEP

VIH_1P2V						
Units		V				
Max Limit		0.78				
Min Limit		0.18				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.540	0.540	0.00	0.00%	0.00%
0	2	0.547	0.548	0.00	0.11%	0.10%
0	3	0.544	0.544	0.00	0.00%	0.00%
0	4	0.545	0.545	0.00	0.00%	0.00%
30	5	0.546	0.170	-0.38	-68.90%	62.66%
30	6	0.544	0.142	-0.40	-73.81%	66.91%
30	7	0.541	0.121	-0.42	-77.70%	70.04%
30	8	0.543	0.117	-0.43	-78.44%	70.95%
30	9	0.543	0.156	-0.39	-71.18%	64.38%
30	10	0.541	0.102	-0.44	-81.08%	73.18%
31	5a	0.546	0.400	-0.15	-26.67%	24.26%
31	6a	0.544	0.430	-0.11	-20.96%	19.00%
31	7a	0.541	0.393	-0.15	-27.36%	24.66%
31	8a	0.543	0.412	-0.13	-24.14%	21.83%
31	9a	0.543	0.429	-0.11	-20.90%	18.90%
31	10a	0.541	0.424	-0.12	-21.73%	19.61%
Max		0.547	0.548	0.00	0.11%	73.18%
Average		0.543	0.342	-0.20	-37.05%	33.53%
Min		0.540	0.102	-0.44	-81.08%	0.00%
Std Dev		0.002	0.175	0.17	32.10%	29.02%

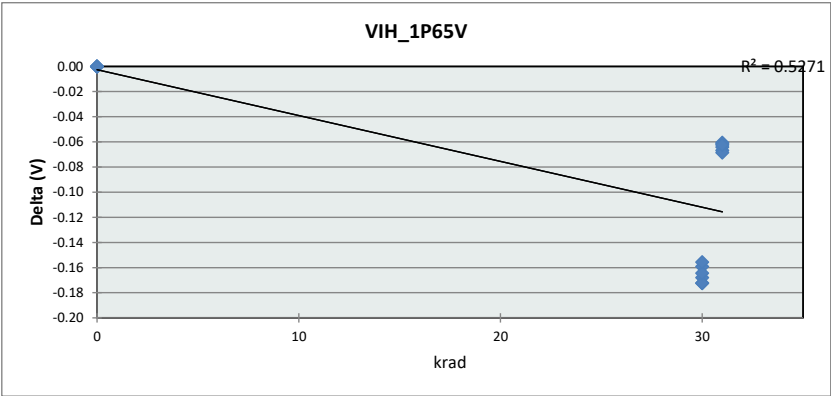


VIH_1P2V			
Units		V	
Max Limit		0.78	
Min Limit		0.18	
krad	0	30	31
LL	0.180	0.180	0.180
Min	0.540	0.102	0.393
Average	0.544	0.135	0.415
Max	0.548	0.170	0.430
UL	0.780	0.780	0.780

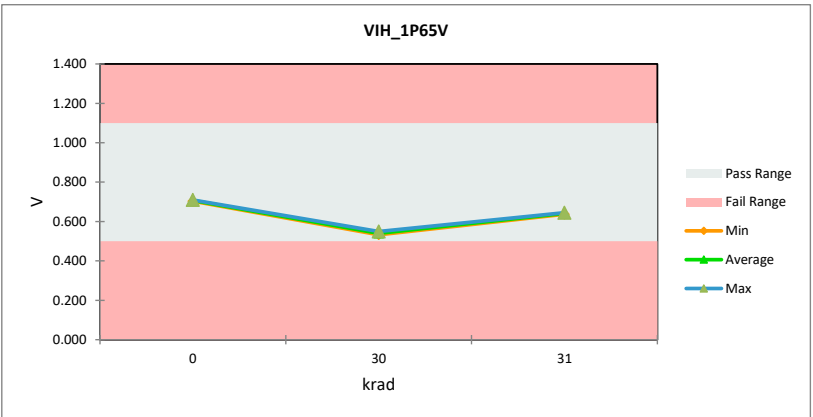


TID Report
SN54SC8T164-SEP

VIH_1P65V						
Units		V				
Max Limit		1.1				
Min Limit		0.5				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.703	0.703	0.00	0.00%	0.00%
0	2	0.709	0.709	0.00	0.00%	0.00%
0	3	0.707	0.707	0.00	0.00%	0.00%
0	4	0.708	0.708	0.00	0.00%	0.00%
30	5	0.708	0.541	-0.17	-23.71%	27.99%
30	6	0.705	0.533	-0.17	-24.45%	28.72%
30	7	0.703	0.544	-0.16	-22.63%	26.53%
30	8	0.705	0.533	-0.17	-24.45%	28.72%
30	9	0.705	0.541	-0.16	-23.32%	27.41%
30	10	0.705	0.549	-0.16	-22.08%	25.94%
31	5a	0.708	0.642	-0.07	-9.43%	11.14%
31	6a	0.705	0.644	-0.06	-8.61%	10.11%
31	7a	0.703	0.639	-0.06	-9.13%	10.70%
31	8a	0.705	0.636	-0.07	-9.73%	11.43%
31	9a	0.705	0.643	-0.06	-8.73%	10.26%
31	10a	0.705	0.643	-0.06	-8.86%	10.41%
Max		0.709	0.709	0.00	0.00%	28.72%
Average		0.706	0.620	-0.09	-12.19%	14.33%
Min		0.703	0.533	-0.17	-24.45%	0.00%
Std Dev		0.002	0.069	0.07	9.72%	11.43%

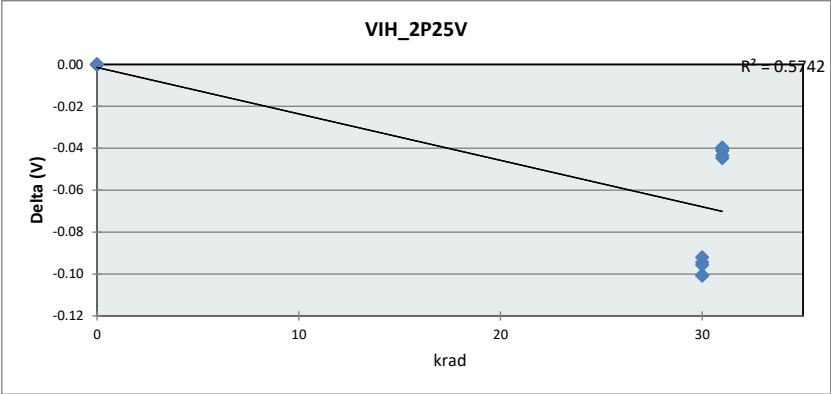


VIH_1P65V			
Units		V	
Max Limit		1.1	
Min Limit		0.5	
krad	0	30	31
LL	0.500	0.500	0.500
Min	0.703	0.533	0.636
Average	0.707	0.540	0.641
Max	0.709	0.549	0.644
UL	1.100	1.100	1.100

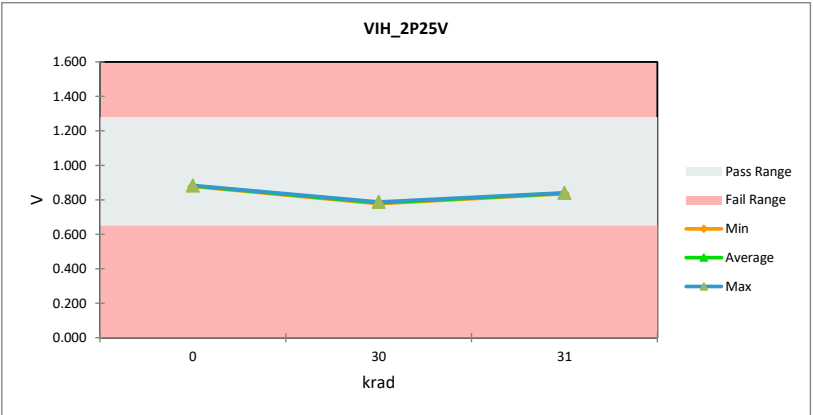


TID Report
SN54SC8T164-SEP

VIH_2P25V						
Units		V				
Max Limit		1.28				
Min Limit		0.65				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.878	0.878	0.00	0.00%	0.00%
0	2	0.883	0.883	0.00	0.00%	0.00%
0	3	0.882	0.882	0.00	0.00%	0.00%
0	4	0.882	0.882	0.00	0.00%	0.00%
30	5	0.884	0.784	-0.10	-11.39%	15.98%
30	6	0.878	0.778	-0.10	-11.47%	15.98%
30	7	0.877	0.783	-0.09	-10.77%	15.00%
30	8	0.881	0.780	-0.10	-11.43%	15.98%
30	9	0.881	0.785	-0.10	-10.87%	15.19%
30	10	0.879	0.787	-0.09	-10.46%	14.60%
31	5a	0.884	0.841	-0.04	-4.92%	6.91%
31	6a	0.878	0.838	-0.04	-4.53%	6.31%
31	7a	0.877	0.836	-0.04	-4.68%	6.51%
31	8a	0.881	0.836	-0.04	-5.08%	7.10%
31	9a	0.881	0.840	-0.04	-4.66%	6.51%
31	10a	0.879	0.840	-0.04	-4.52%	6.31%
Max		0.884	0.883	0.00	0.00%	15.98%
Average		0.880	0.828	-0.05	-5.92%	8.28%
Min		0.877	0.778	-0.10	-11.47%	0.00%
Std Dev		0.002	0.040	0.04	4.54%	6.34%

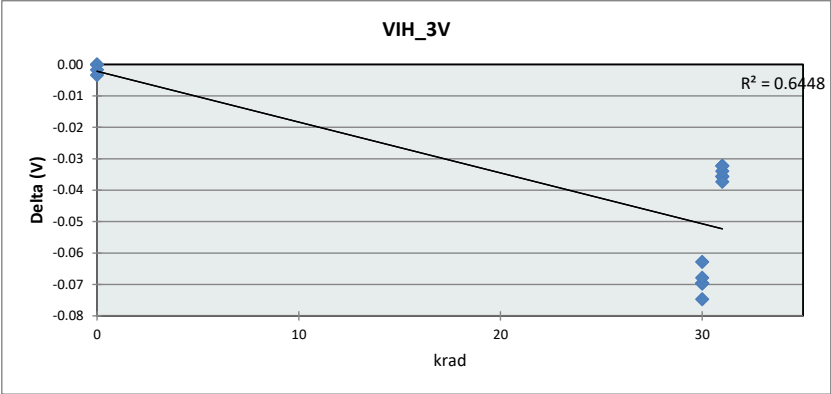


VIH_2P25V			
Units		V	
Max Limit		1.28	
Min Limit		0.65	
krad	0	30	31
LL	0.650	0.650	0.650
Min	0.878	0.778	0.836
Average	0.881	0.783	0.838
Max	0.883	0.787	0.841
UL	1.280	1.280	1.280

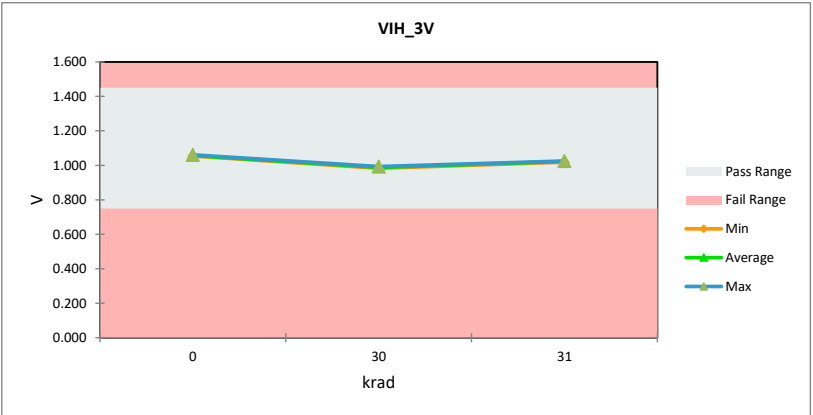


TID Report
SN54SC8T164-SEP

VIH_3V						
Units		V				
Max Limit		1.45				
Min Limit		0.75				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.056	1.056	0.00	0.00%	0.00%
0	2	1.061	1.061	0.00	0.00%	0.00%
0	3	1.058	1.056	0.00	-0.16%	0.24%
0	4	1.058	1.054	0.00	-0.32%	0.49%
30	5	1.061	0.991	-0.07	-6.56%	9.95%
30	6	1.054	0.985	-0.07	-6.60%	9.95%
30	7	1.054	0.985	-0.07	-6.60%	9.95%
30	8	1.058	0.983	-0.07	-7.06%	10.67%
30	9	1.058	0.990	-0.07	-6.42%	9.70%
30	10	1.056	0.993	-0.06	-5.95%	8.98%
31	5a	1.061	1.025	-0.04	-3.36%	5.09%
31	6a	1.054	1.022	-0.03	-3.06%	4.61%
31	7a	1.054	1.019	-0.04	-3.38%	5.09%
31	8a	1.058	1.020	-0.04	-3.53%	5.34%
31	9a	1.058	1.024	-0.03	-3.21%	4.85%
31	10a	1.056	1.024	-0.03	-3.06%	4.61%
Max		1.061	1.061	0.00	0.00%	10.67%
Average		1.057	1.018	-0.04	-3.71%	5.59%
Min		1.054	0.983	-0.07	-7.06%	0.00%
Std Dev		0.002	0.028	0.03	2.60%	3.93%

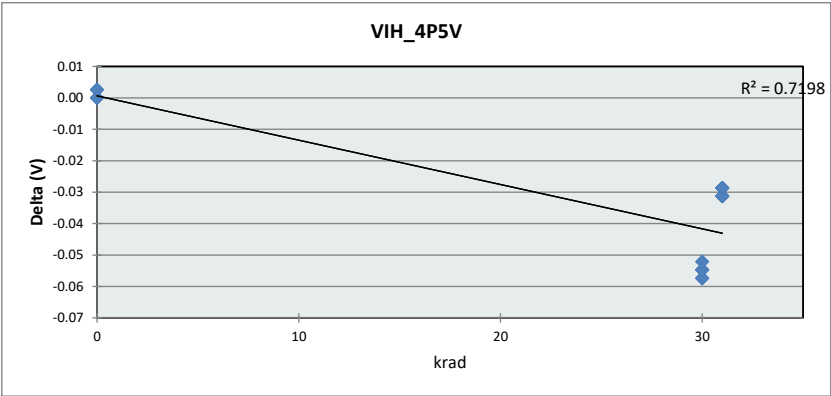


VIH_3V			
Units		V	
Max Limit		1.45	
Min Limit		0.75	
krad	0	30	31
LL	0.750	0.750	0.750
Min	1.054	0.983	1.019
Average	1.057	0.988	1.022
Max	1.061	0.993	1.025
UL	1.450	1.450	1.450

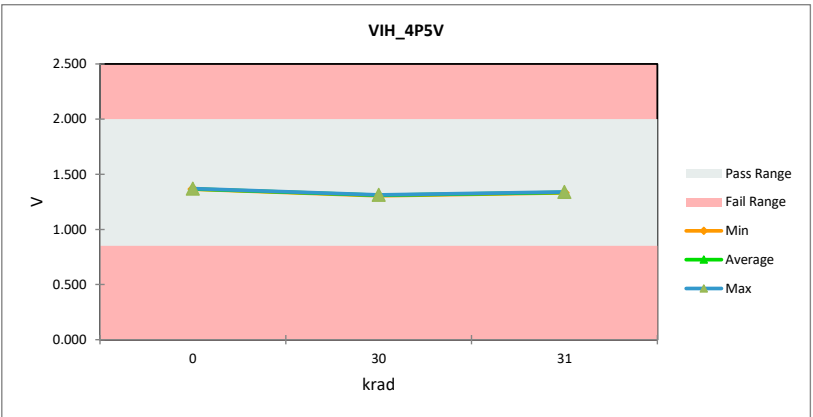


TID Report
SN54SC8T164-SEP

VIH_4P5V						
Units		V				
Max Limit		2				
Min Limit		0.85				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.362	1.365	0.00	0.19%	0.23%
0	2	1.367	1.370	0.00	0.19%	0.23%
0	3	1.367	1.367	0.00	0.00%	0.00%
0	4	1.365	1.365	0.00	0.00%	0.00%
30	5	1.370	1.313	-0.06	-4.19%	4.99%
30	6	1.362	1.305	-0.06	-4.21%	4.99%
30	7	1.362	1.307	-0.05	-4.02%	4.76%
30	8	1.365	1.310	-0.05	-4.01%	4.76%
30	9	1.365	1.310	-0.05	-4.01%	4.76%
30	10	1.365	1.313	-0.05	-3.82%	4.54%
31	5a	1.370	1.339	-0.03	-2.28%	2.72%
31	6a	1.362	1.333	-0.03	-2.11%	2.49%
31	7a	1.362	1.331	-0.03	-2.30%	2.72%
31	8a	1.365	1.333	-0.03	-2.29%	2.72%
31	9a	1.365	1.336	-0.03	-2.10%	2.49%
31	10a	1.365	1.336	-0.03	-2.10%	2.49%
Max		1.370	1.370	0.00	0.19%	4.99%
Average		1.365	1.333	-0.03	-2.32%	2.81%
Min		1.362	1.305	-0.06	-4.21%	0.00%
Std Dev		0.003	0.023	0.02	1.66%	1.89%

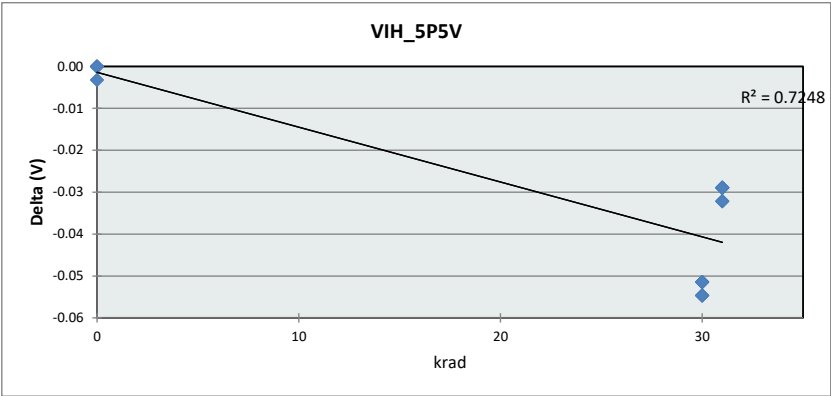


VIH_4P5V			
Units		V	
Max Limit		2	
Min Limit		0.85	
krad	0	30	31
LL	0.850	0.850	0.850
Min	1.365	1.305	1.331
Average	1.367	1.310	1.335
Max	1.370	1.313	1.339
UL	2.000	2.000	2.000

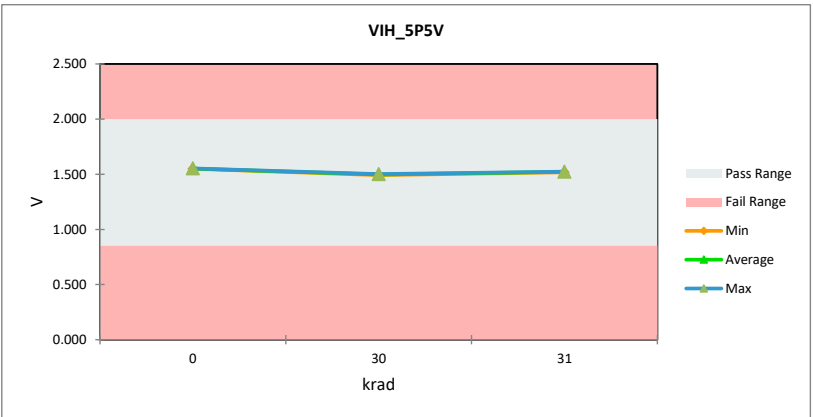


TID Report
SN54SC8T164-SEP

VIH_5P5V						
Units		V				
Max Limit		2				
Min Limit		0.85				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.550	1.550	0.00	0.00%	0.00%
0	2	1.556	1.553	0.00	-0.21%	0.28%
0	3	1.553	1.553	0.00	0.00%	0.00%
0	4	1.550	1.550	0.00	0.00%	0.00%
30	5	1.556	1.501	-0.05	-3.51%	4.75%
30	6	1.546	1.492	-0.05	-3.53%	4.75%
30	7	1.550	1.495	-0.05	-3.53%	4.75%
30	8	1.550	1.498	-0.05	-3.32%	4.47%
30	9	1.550	1.498	-0.05	-3.32%	4.47%
30	10	1.553	1.501	-0.05	-3.31%	4.47%
31	5a	1.556	1.524	-0.03	-2.07%	2.79%
31	6a	1.546	1.517	-0.03	-1.87%	2.52%
31	7a	1.550	1.517	-0.03	-2.07%	2.79%
31	8a	1.550	1.521	-0.03	-1.87%	2.52%
31	9a	1.550	1.521	-0.03	-1.87%	2.52%
31	10a	1.553	1.524	-0.03	-1.86%	2.52%
Max		1.556	1.553	0.00	0.00%	4.75%
Average		1.551	1.520	-0.03	-2.02%	2.72%
Min		1.546	1.492	-0.05	-3.53%	0.00%
Std Dev		0.003	0.022	0.02	1.35%	1.82%

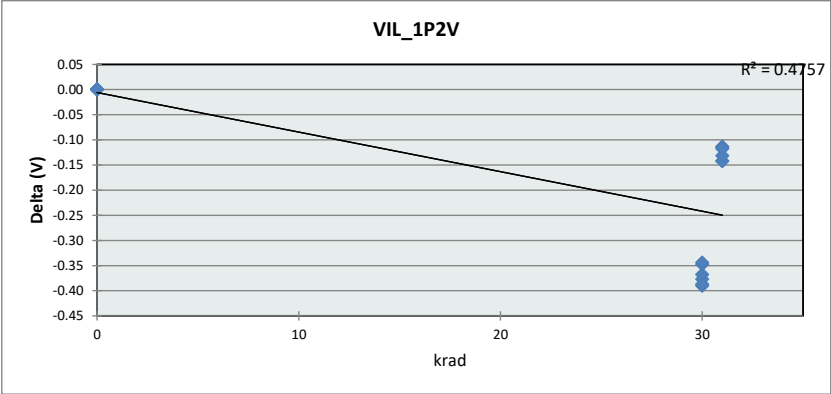


VIH_5P5V			
Units		V	
Max Limit		2	
Min Limit		0.85	
krad	0	30	31
LL	0.850	0.850	0.850
Min	1.550	1.492	1.517
Average	1.551	1.498	1.521
Max	1.553	1.501	1.524
UL	2.000	2.000	2.000

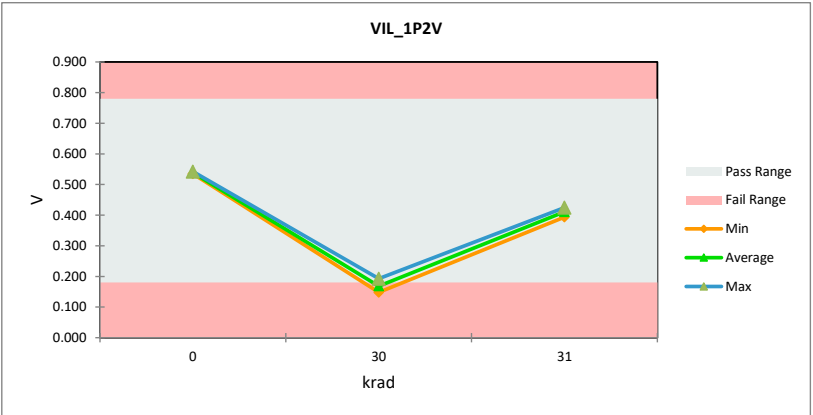


TID Report
SN54SC8T164-SEP

VIL_1P2V						
Units		V				
Max Limit		0.78				
Min Limit		0.18				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.535	0.535	0.00	0.00%	0.00%
0	2	0.542	0.542	0.00	0.12%	0.11%
0	3	0.538	0.538	0.00	0.12%	0.11%
0	4	0.539	0.539	0.00	0.00%	0.00%
30	5	0.540	0.192	-0.35	-64.41%	57.93%
30	6	0.538	0.148	-0.39	-72.50%	65.04%
30	7	0.536	0.168	-0.37	-68.63%	61.26%
30	8	0.537	0.193	-0.34	-64.11%	57.37%
30	9	0.537	0.160	-0.38	-70.20%	62.82%
30	10	0.536	0.149	-0.39	-72.15%	64.49%
31	5a	0.540	0.398	-0.14	-26.33%	23.68%
31	6a	0.538	0.424	-0.11	-21.19%	19.01%
31	7a	0.536	0.394	-0.14	-26.53%	23.68%
31	8a	0.537	0.406	-0.13	-24.48%	21.90%
31	9a	0.537	0.424	-0.11	-21.12%	18.90%
31	10a	0.536	0.419	-0.12	-21.89%	19.57%
Max		0.542	0.542	0.00	0.12%	65.04%
Average		0.538	0.352	-0.19	-34.58%	30.99%
Min		0.535	0.148	-0.39	-72.50%	0.00%
Std Dev		0.002	0.156	0.15	28.98%	25.91%

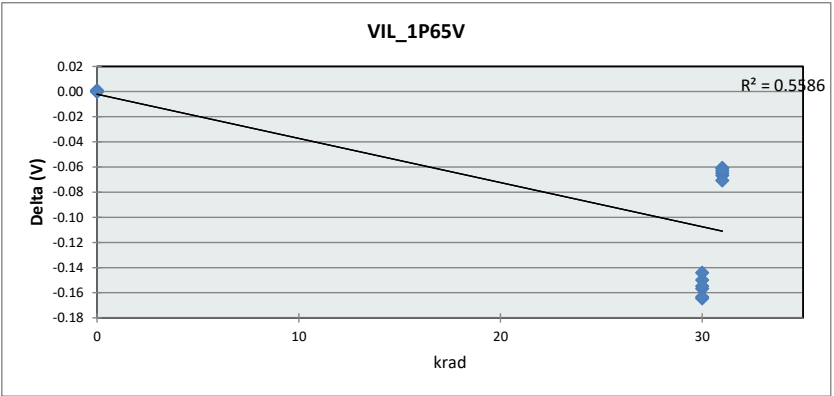


VIL_1P2V			
Units		V	
Max Limit		0.78	
Min Limit		0.18	
krad	0	30	31
LL	0.180	0.180	0.180
Min	0.535	0.148	0.394
Average	0.539	0.168	0.411
Max	0.542	0.193	0.424
UL	0.780	0.780	0.780

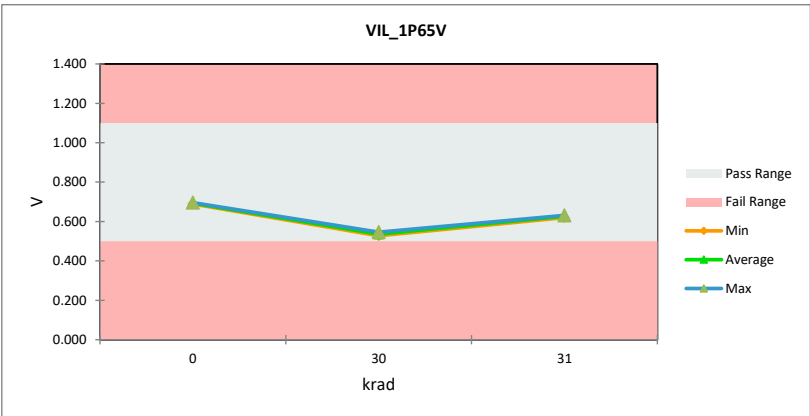


TID Report
SN54SC8T164-SEP

VIL_1P65V						
Units		V				
Max Limit		1.1				
Min Limit		0.5				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.689	0.689	0.00	0.00%	0.00%
0	2	0.696	0.696	0.00	0.00%	0.00%
0	3	0.692	0.693	0.00	0.14%	0.16%
0	4	0.694	0.694	0.00	0.00%	0.00%
30	5	0.694	0.537	-0.16	-22.58%	26.12%
30	6	0.692	0.528	-0.16	-23.76%	27.41%
30	7	0.690	0.540	-0.15	-21.73%	24.99%
30	8	0.691	0.528	-0.16	-23.66%	27.25%
30	9	0.691	0.536	-0.15	-22.40%	25.79%
30	10	0.690	0.546	-0.14	-20.89%	24.02%
31	5a	0.694	0.627	-0.07	-9.62%	11.12%
31	6a	0.692	0.631	-0.06	-8.81%	10.16%
31	7a	0.690	0.625	-0.06	-9.39%	10.80%
31	8a	0.691	0.620	-0.07	-10.22%	11.77%
31	9a	0.691	0.630	-0.06	-8.82%	10.16%
31	10a	0.690	0.627	-0.06	-9.11%	10.48%
Max		0.696	0.696	0.00	0.14%	27.41%
Average		0.692	0.609	-0.08	-11.93%	13.76%
Min		0.689	0.528	-0.16	-23.76%	0.00%
Std Dev		0.002	0.065	0.06	9.28%	10.67%

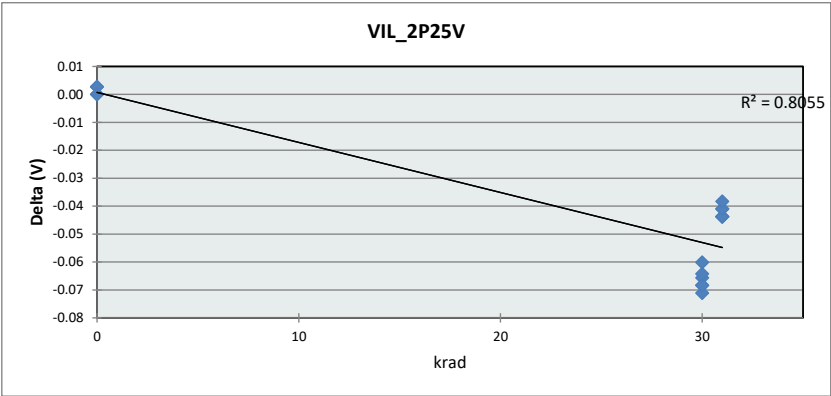


VIL_1P65V			
Units		V	
Max Limit		1.1	
Min Limit		0.5	
krad	0	30	31
LL	0.500	0.500	0.500
Min	0.689	0.528	0.620
Average	0.693	0.536	0.627
Max	0.696	0.546	0.631
UL	1.100	1.100	1.100

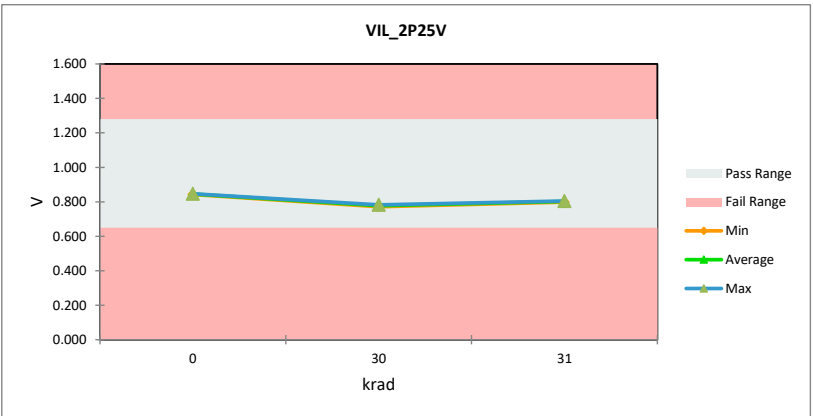


TID Report
SN54SC8T164-SEP

VIL_2P25V						
Units		V				
Max Limit		1.28				
Min Limit		0.65				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.840	0.843	0.00	0.33%	0.43%
0	2	0.847	0.847	0.00	0.00%	0.00%
0	3	0.843	0.845	0.00	0.32%	0.43%
0	4	0.845	0.845	0.00	0.00%	0.00%
30	5	0.847	0.778	-0.07	-8.08%	10.85%
30	6	0.843	0.771	-0.07	-8.44%	11.29%
30	7	0.843	0.777	-0.07	-7.79%	10.42%
30	8	0.844	0.776	-0.07	-8.10%	10.85%
30	9	0.844	0.780	-0.06	-7.62%	10.20%
30	10	0.843	0.782	-0.06	-7.14%	9.55%
31	5a	0.847	0.803	-0.04	-5.17%	6.95%
31	6a	0.843	0.802	-0.04	-4.87%	6.51%
31	7a	0.843	0.799	-0.04	-5.19%	6.95%
31	8a	0.844	0.800	-0.04	-5.19%	6.95%
31	9a	0.844	0.803	-0.04	-4.86%	6.51%
31	10a	0.843	0.804	-0.04	-4.54%	6.08%
Max		0.847	0.847	0.00	0.33%	11.29%
Average		0.844	0.803	-0.04	-4.77%	6.50%
Min		0.840	0.771	-0.07	-8.44%	0.00%
Std Dev		0.002	0.027	0.03	3.23%	4.15%

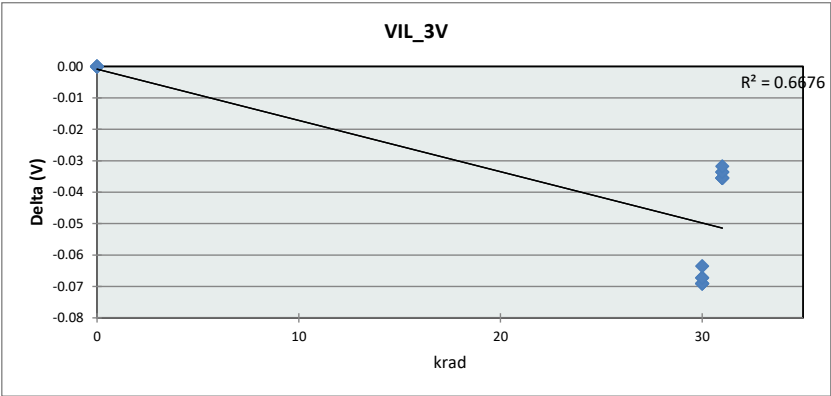


VIL_2P25V			
Units		V	
Max Limit		1.28	
Min Limit		0.65	
krad	0	30	31
LL	0.650	0.650	0.650
Min	0.843	0.771	0.799
Average	0.845	0.777	0.802
Max	0.847	0.782	0.804
UL	1.280	1.280	1.280

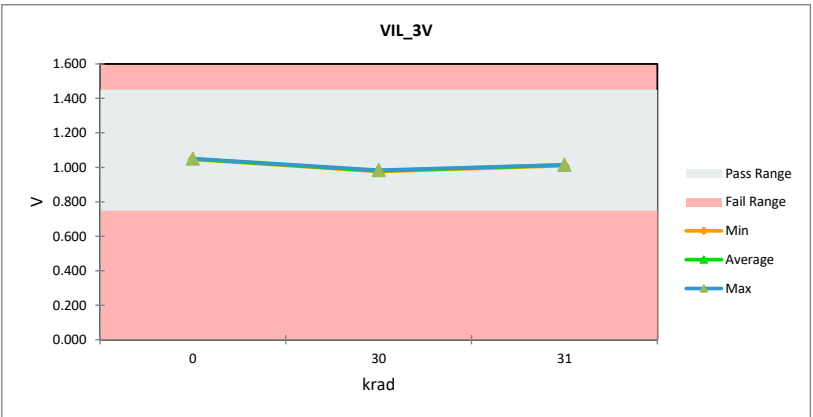


TID Report
SN54SC8T164-SEP

VIL_3V						
Units		V				
Max Limit		1.45				
Min Limit		0.75				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.047	1.047	0.00	0.00%	0.00%
0	2	1.051	1.051	0.00	0.00%	0.00%
0	3	1.049	1.049	0.00	0.00%	0.00%
0	4	1.049	1.049	0.00	0.00%	0.00%
30	5	1.051	0.982	-0.07	-6.58%	9.87%
30	6	1.045	0.976	-0.07	-6.61%	9.87%
30	7	1.045	0.978	-0.07	-6.43%	9.61%
30	8	1.047	0.978	-0.07	-6.60%	9.87%
30	9	1.049	0.982	-0.07	-6.41%	9.61%
30	10	1.047	0.984	-0.06	-6.07%	9.07%
31	5a	1.051	1.015	-0.04	-3.38%	5.07%
31	6a	1.045	1.010	-0.04	-3.40%	5.07%
31	7a	1.045	1.012	-0.03	-3.22%	4.80%
31	8a	1.047	1.012	-0.04	-3.39%	5.07%
31	9a	1.049	1.015	-0.03	-3.21%	4.80%
31	10a	1.047	1.015	-0.03	-3.03%	4.54%
Max		1.051	1.051	0.00	0.00%	9.87%
Average		1.048	1.010	-0.04	-3.64%	5.45%
Min		1.045	0.976	-0.07	-6.61%	0.00%
Std Dev		0.002	0.028	0.03	2.60%	3.89%

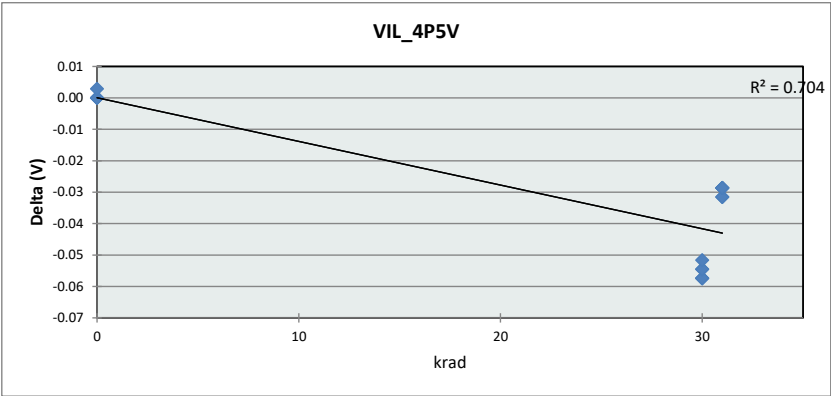


VIL_3V			
Units		V	
Max Limit		1.45	
Min Limit		0.75	
krad	0	30	31
LL	0.750	0.750	0.750
Min	1.047	0.976	1.010
Average	1.049	0.980	1.013
Max	1.051	0.984	1.015
UL	1.450	1.450	1.450

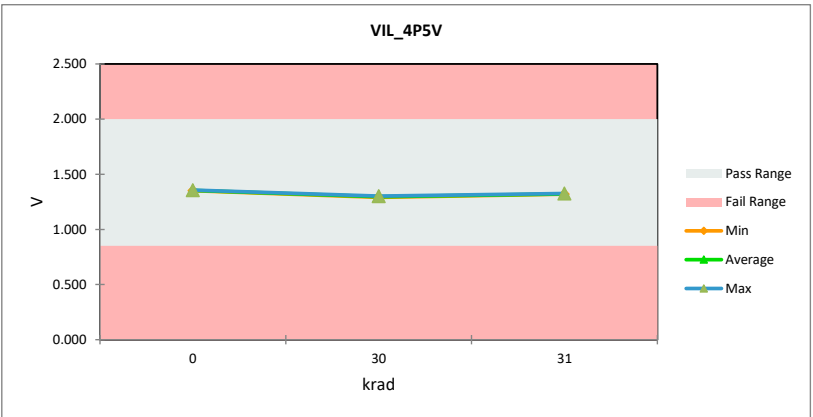


TID Report
SN54SC8T164-SEP

VIL_4P5V						
Units		V				
Max Limit		2				
Min Limit		0.85				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.351	1.351	0.00	0.00%	0.00%
0	2	1.356	1.356	0.00	0.00%	0.00%
0	3	1.354	1.354	0.00	0.00%	0.00%
0	4	1.351	1.354	0.00	0.21%	0.25%
30	5	1.356	1.299	-0.06	-4.23%	4.99%
30	6	1.348	1.290	-0.06	-4.26%	4.99%
30	7	1.351	1.293	-0.06	-4.25%	4.99%
30	8	1.351	1.296	-0.05	-4.04%	4.74%
30	9	1.351	1.296	-0.05	-4.04%	4.74%
30	10	1.354	1.302	-0.05	-3.81%	4.49%
31	5a	1.356	1.325	-0.03	-2.33%	2.74%
31	6a	1.348	1.319	-0.03	-2.13%	2.49%
31	7a	1.351	1.319	-0.03	-2.34%	2.74%
31	8a	1.351	1.322	-0.03	-2.12%	2.49%
31	9a	1.351	1.322	-0.03	-2.12%	2.49%
31	10a	1.354	1.325	-0.03	-2.12%	2.49%
Max		1.356	1.356	0.00	0.21%	4.99%
Average		1.352	1.320	-0.03	-2.35%	2.79%
Min		1.348	1.290	-0.06	-4.26%	0.00%
Std Dev		0.003	0.023	0.02	1.67%	1.92%

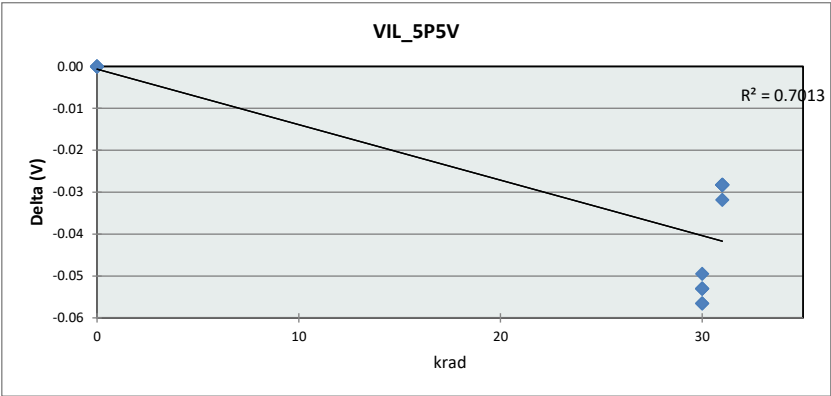


VIL_4P5V			
Units		V	
Max Limit		2	
Min Limit		0.85	
krad	0	30	31
LL	0.850	0.850	0.850
Min	1.351	1.290	1.319
Average	1.354	1.296	1.322
Max	1.356	1.302	1.325
UL	2.000	2.000	2.000

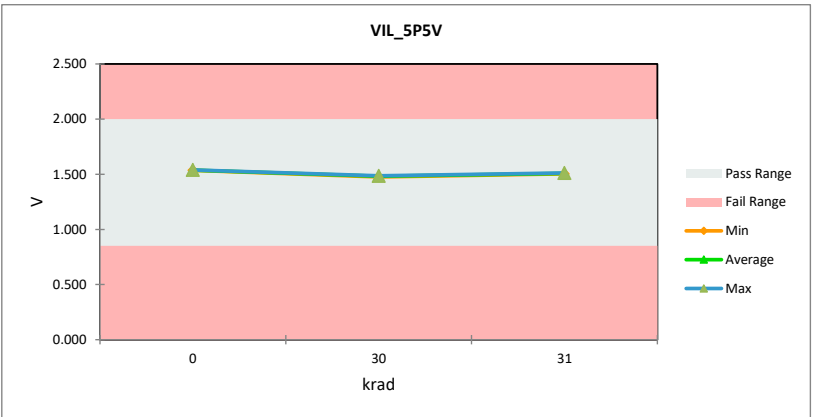


TID Report
SN54SC8T164-SEP

VIL_5P5V						
Units		V				
Max Limit		2				
Min Limit		0.85				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.535	1.535	0.00	0.00%	0.00%
0	2	1.539	1.539	0.00	0.00%	0.00%
0	3	1.539	1.539	0.00	0.00%	0.00%
0	4	1.535	1.535	0.00	0.00%	0.00%
30	5	1.543	1.486	-0.06	-3.67%	4.92%
30	6	1.532	1.475	-0.06	-3.69%	4.92%
30	7	1.532	1.479	-0.05	-3.46%	4.61%
30	8	1.535	1.482	-0.05	-3.45%	4.61%
30	9	1.535	1.482	-0.05	-3.45%	4.61%
30	10	1.535	1.486	-0.05	-3.22%	4.30%
31	5a	1.543	1.511	-0.03	-2.06%	2.77%
31	6a	1.532	1.504	-0.03	-1.85%	2.46%
31	7a	1.532	1.504	-0.03	-1.85%	2.46%
31	8a	1.535	1.507	-0.03	-1.84%	2.46%
31	9a	1.535	1.507	-0.03	-1.84%	2.46%
31	10a	1.535	1.507	-0.03	-1.84%	2.46%
Max		1.543	1.539	0.00	0.00%	4.92%
Average		1.536	1.505	-0.03	-2.01%	2.69%
Min		1.532	1.475	-0.06	-3.69%	0.00%
Std Dev		0.003	0.022	0.02	1.41%	1.88%

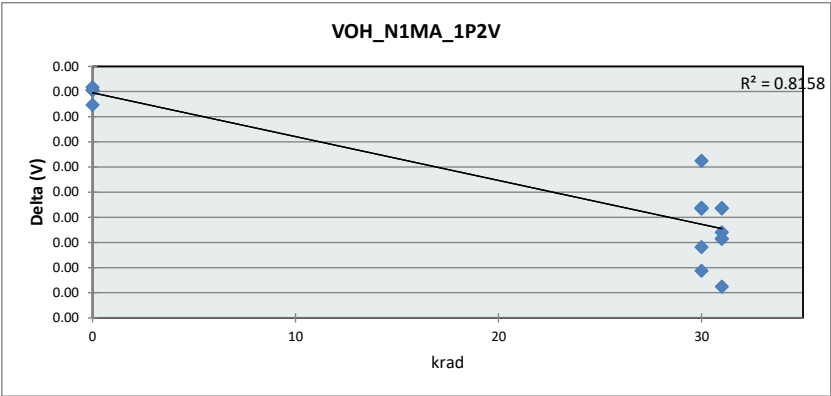


VIL_5P5V			
Units		V	
Max Limit		2	
Min Limit		0.85	
krad	0	30	31
LL	0.850	0.850	0.850
Min	1.535	1.475	1.504
Average	1.537	1.482	1.507
Max	1.539	1.486	1.511
UL	2.000	2.000	2.000

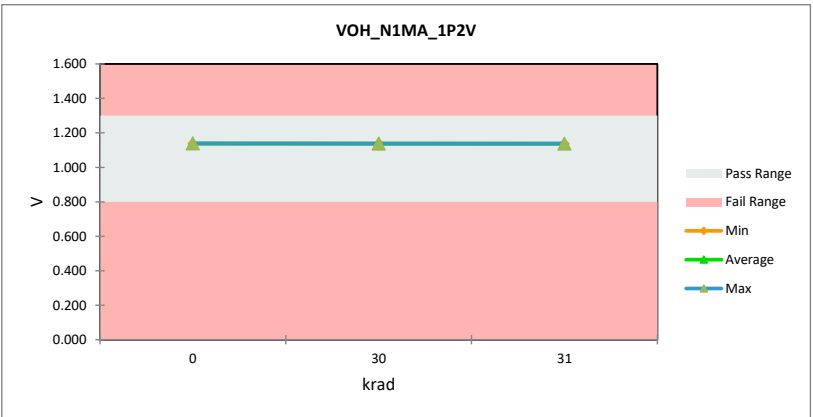


TID Report
SN54SC8T164-SEP

VOH_N1MA_1P2V						
Units		V				
Max Limit		1.3				
Min Limit		0.8				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.138	1.138	0.00	-0.01%	0.03%
0	2	1.139	1.139	0.00	-0.01%	0.02%
0	3	1.138	1.138	0.00	-0.01%	0.02%
0	4	1.138	1.138	0.00	-0.01%	0.02%
30	5	1.139	1.138	0.00	-0.07%	0.16%
30	6	1.138	1.138	0.00	-0.05%	0.11%
30	7	1.138	1.138	0.00	-0.05%	0.11%
30	8	1.139	1.138	0.00	-0.06%	0.14%
30	9	1.138	1.138	0.00	-0.05%	0.11%
30	10	1.138	1.137	0.00	-0.03%	0.08%
31	5a	1.139	1.138	0.00	-0.06%	0.14%
31	6a	1.138	1.138	0.00	-0.05%	0.11%
31	7a	1.138	1.137	0.00	-0.06%	0.13%
31	8a	1.139	1.138	0.00	-0.08%	0.18%
31	9a	1.138	1.138	0.00	-0.05%	0.11%
31	10a	1.138	1.137	0.00	-0.06%	0.14%
Max		1.139	1.139	0.00	-0.01%	0.18%
Average		1.138	1.138	0.00	-0.04%	0.10%
Min		1.138	1.137	0.00	-0.08%	0.02%
Std Dev		0.000	0.000	0.00	0.02%	0.05%

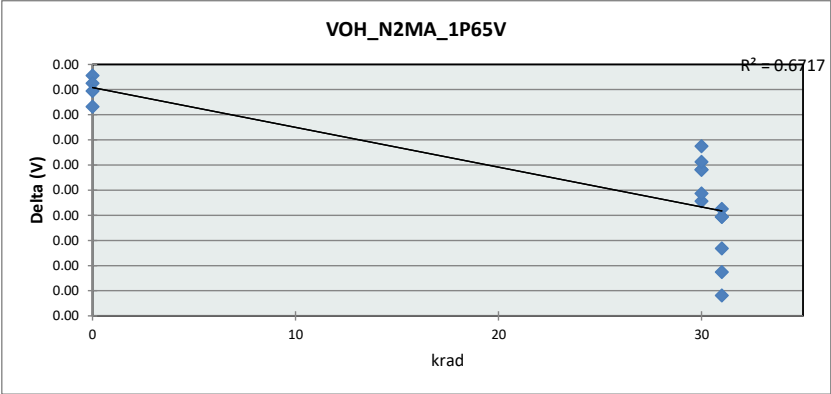


VOH_N1MA_1P2V			
Units		V	
Max Limit		1.3	
Min Limit		0.8	
krad	0	30	31
LL	0.800	0.800	0.800
Min	1.138	1.137	1.137
Average	1.138	1.138	1.138
Max	1.139	1.138	1.138
UL	1.300	1.300	1.300

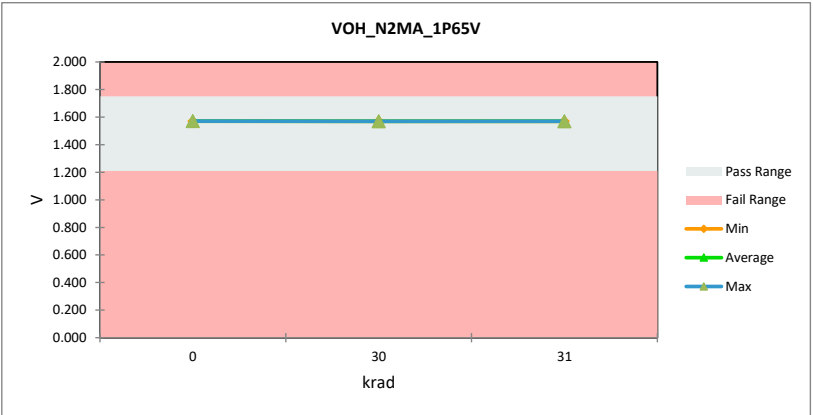


TID Report
SN54SC8T164-SEP

VOH_N2MA_1P65V						
Units		V				
Max Limit		1.75				
Min Limit		1.21				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.570	1.570	0.00	0.01%	0.03%
0	2	1.571	1.571	0.00	0.01%	0.02%
0	3	1.570	1.570	0.00	0.00%	0.01%
0	4	1.570	1.570	0.00	0.01%	0.02%
30	5	1.570	1.570	0.00	-0.01%	0.04%
30	6	1.570	1.570	0.00	-0.01%	0.04%
30	7	1.570	1.570	0.00	-0.01%	0.03%
30	8	1.571	1.570	0.00	-0.02%	0.06%
30	9	1.570	1.570	0.00	-0.02%	0.06%
30	10	1.570	1.570	0.00	-0.01%	0.02%
31	5a	1.570	1.570	0.00	-0.03%	0.08%
31	6a	1.570	1.570	0.00	-0.02%	0.07%
31	7a	1.570	1.569	0.00	-0.04%	0.12%
31	8a	1.571	1.570	0.00	-0.05%	0.13%
31	9a	1.570	1.570	0.00	-0.03%	0.10%
31	10a	1.570	1.569	0.00	-0.03%	0.08%
Max		1.571	1.571	0.00	0.01%	0.13%
Average		1.570	1.570	0.00	-0.02%	0.06%
Min		1.570	1.569	0.00	-0.05%	0.01%
Std Dev		0.000	0.000	0.00	0.02%	0.04%

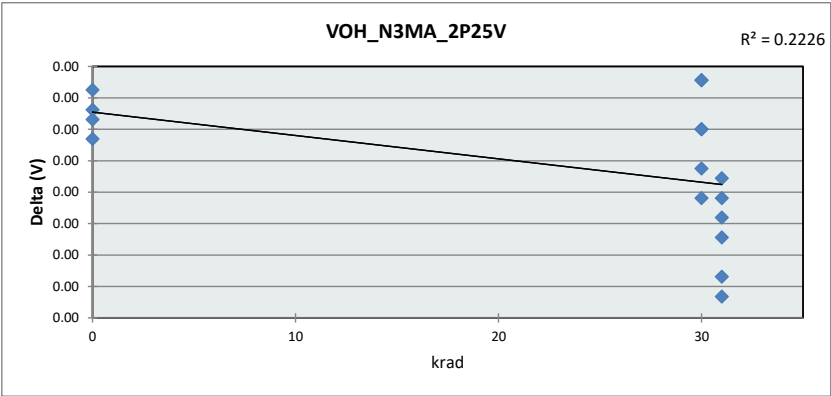


VOH_N2MA_1P65V			
Units		V	
Max Limit		1.75	
Min Limit		1.21	
krad	0	30	31
LL	1.210	1.210	1.210
Min	1.570	1.570	1.569
Average	1.570	1.570	1.570
Max	1.571	1.570	1.570
UL	1.750	1.750	1.750

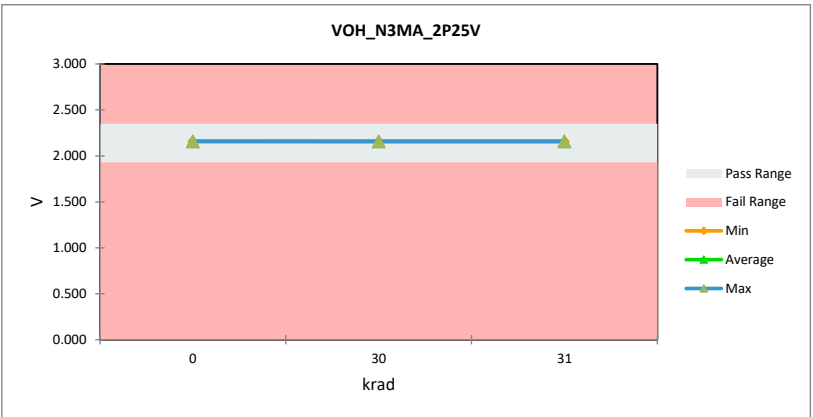


TID Report
SN54SC8T164-SEP

VOH_N3MA_2P25V						
Units		V				
Max Limit		2.35				
Min Limit		1.93				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	2.157	2.158	0.00	0.01%	0.03%
0	2	2.158	2.158	0.00	0.00%	0.01%
0	3	2.158	2.158	0.00	0.00%	0.01%
0	4	2.158	2.158	0.00	0.00%	0.01%
30	5	2.158	2.158	0.00	0.00%	0.00%
30	6	2.158	2.158	0.00	0.01%	0.04%
30	7	2.158	2.157	0.00	-0.01%	0.03%
30	8	2.158	2.158	0.00	-0.01%	0.05%
30	9	2.158	2.158	0.00	0.00%	0.00%
30	10	2.157	2.157	0.00	0.01%	0.04%
31	5a	2.158	2.158	0.00	-0.01%	0.04%
31	6a	2.158	2.158	0.00	-0.01%	0.07%
31	7a	2.158	2.157	0.00	-0.02%	0.11%
31	8a	2.158	2.158	0.00	-0.02%	0.13%
31	9a	2.158	2.158	0.00	-0.01%	0.05%
31	10a	2.157	2.157	0.00	-0.02%	0.08%
Max		2.158	2.158	0.00	0.01%	0.13%
Average		2.158	2.158	0.00	-0.01%	0.04%
Min		2.157	2.157	0.00	-0.02%	0.00%
Std Dev		0.000	0.000	0.00	0.01%	0.04%

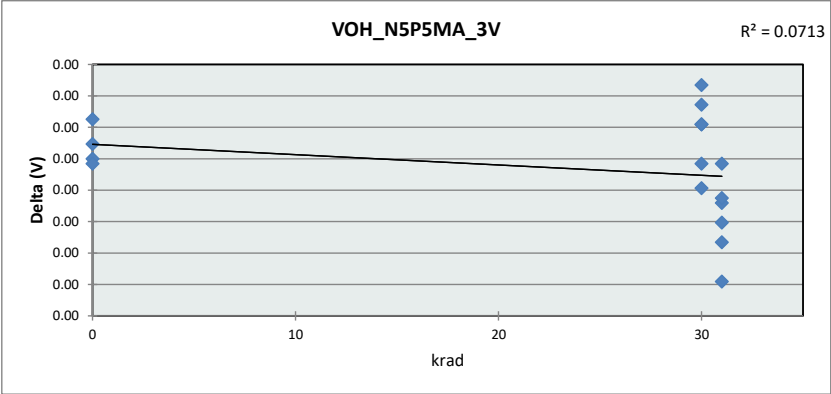


VOH_N3MA_2P25V			
Units		V	
Max Limit		2.35	
Min Limit		1.93	
krad	0	30	31
LL	1.930	1.930	1.930
Min	2.158	2.157	2.157
Average	2.158	2.158	2.157
Max	2.158	2.158	2.158
UL	2.350	2.350	2.350

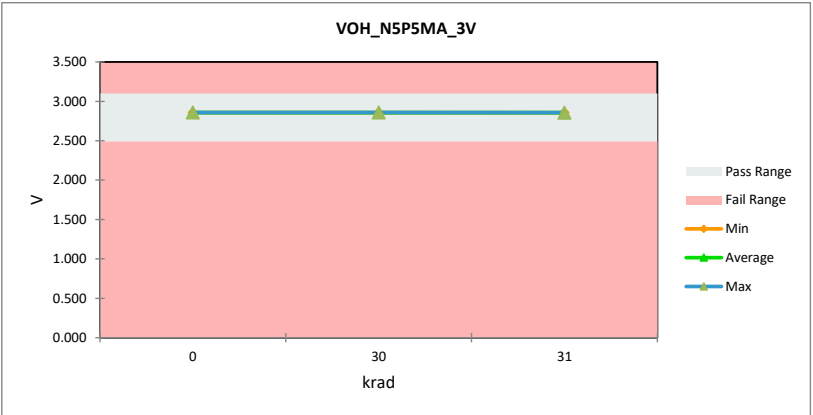


TID Report
SN54SC8T164-SEP

VOH_N5P5MA_3V						
Units		V				
Max Limit		3.1				
Min Limit		2.49				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	2.856	2.856	0.00	0.00%	0.00%
0	2	2.858	2.858	0.00	0.00%	0.02%
0	3	2.857	2.858	0.00	0.01%	0.04%
0	4	2.857	2.857	0.00	0.00%	0.01%
30	5	2.858	2.858	0.00	0.00%	0.01%
30	6	2.857	2.858	0.00	0.01%	0.06%
30	7	2.857	2.857	0.00	0.01%	0.04%
30	8	2.857	2.857	0.00	-0.01%	0.03%
30	9	2.857	2.857	0.00	0.01%	0.04%
30	10	2.855	2.856	0.00	0.02%	0.08%
31	5a	2.858	2.857	0.00	-0.01%	0.07%
31	6a	2.857	2.857	0.00	0.00%	0.01%
31	7a	2.857	2.856	0.00	-0.02%	0.09%
31	8a	2.857	2.857	0.00	-0.03%	0.13%
31	9a	2.857	2.857	0.00	-0.01%	0.05%
31	10a	2.855	2.855	0.00	-0.01%	0.04%
Max		2.858	2.858	0.00	0.02%	0.13%
Average		2.857	2.857	0.00	0.00%	0.04%
Min		2.855	2.855	0.00	-0.03%	0.00%
Std Dev		0.001	0.001	0.00	0.01%	0.03%

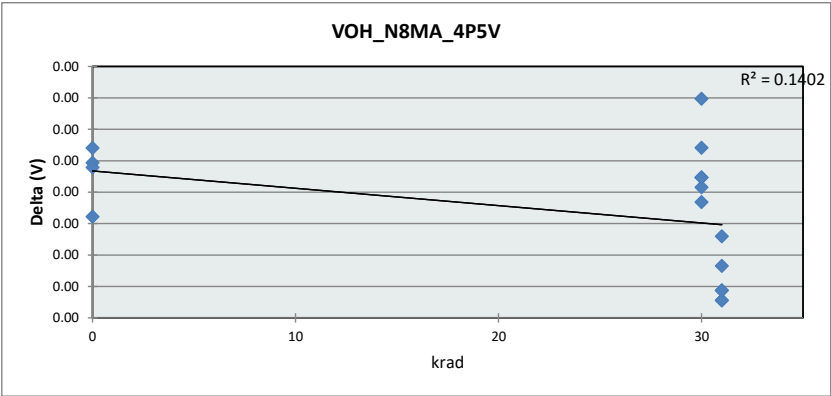


VOH_N5P5MA_3V			
Units		V	
Max Limit		3.1	
Min Limit		2.49	
krad	0	30	31
LL	2.490	2.490	2.490
Min	2.856	2.856	2.855
Average	2.857	2.857	2.856
Max	2.858	2.858	2.857
UL	3.100	3.100	3.100

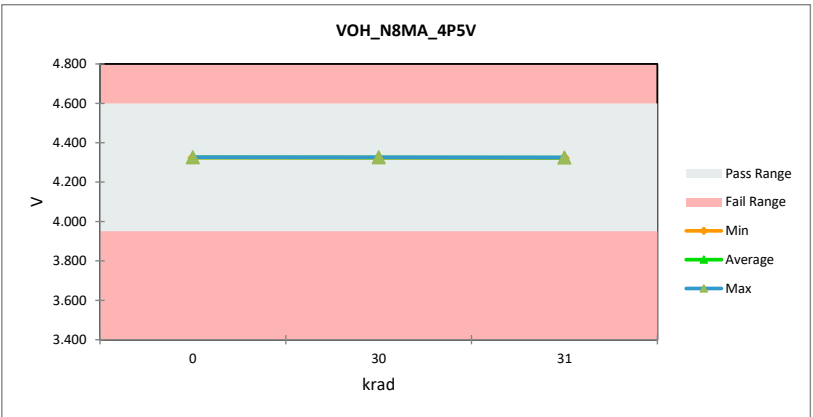


TID Report
SN54SC8T164-SEP

VOH_N8MA_4P5V						
Units		V				
Max Limit		4.6				
Min Limit		3.95				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	4.324	4.324	0.00	0.01%	0.04%
0	2	4.326	4.326	0.00	0.00%	0.03%
0	3	4.326	4.326	0.00	0.00%	0.02%
0	4	4.325	4.325	0.00	0.00%	0.02%
30	5	4.326	4.326	0.00	0.00%	0.01%
30	6	4.326	4.326	0.00	0.00%	0.00%
30	7	4.325	4.325	0.00	0.00%	0.01%
30	8	4.326	4.326	0.00	0.00%	0.01%
30	9	4.325	4.325	0.00	0.01%	0.04%
30	10	4.323	4.324	0.00	0.01%	0.09%
31	5a	4.326	4.325	0.00	-0.02%	0.11%
31	6a	4.326	4.325	0.00	-0.01%	0.07%
31	7a	4.325	4.324	0.00	-0.02%	0.11%
31	8a	4.326	4.325	0.00	-0.01%	0.10%
31	9a	4.325	4.324	0.00	-0.01%	0.10%
31	10a	4.323	4.323	0.00	-0.01%	0.04%
Max		4.326	4.326	0.00	0.01%	0.11%
Average		4.325	4.325	0.00	0.00%	0.05%
Min		4.323	4.323	0.00	-0.02%	0.00%
Std Dev		0.001	0.001	0.00	0.01%	0.04%

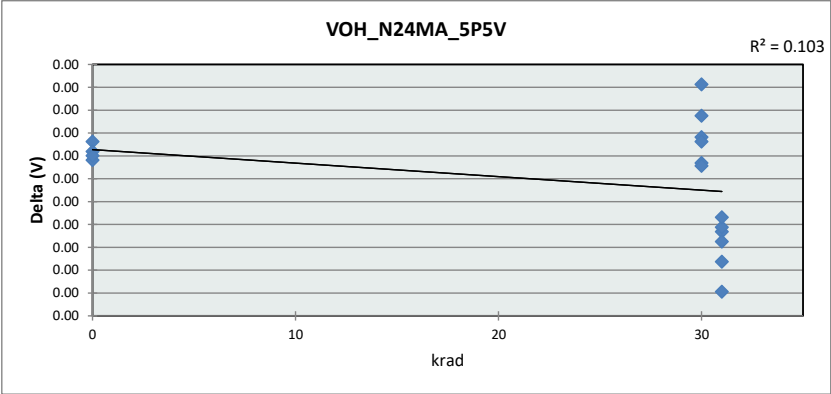


VOH_N8MA_4P5V			
Units		V	
Max Limit		4.6	
Min Limit		3.95	
krad	0	30	31
LL	3.950	3.950	3.950
Min	4.324	4.324	4.323
Average	4.325	4.325	4.324
Max	4.326	4.326	4.325
UL	4.600	4.600	4.600

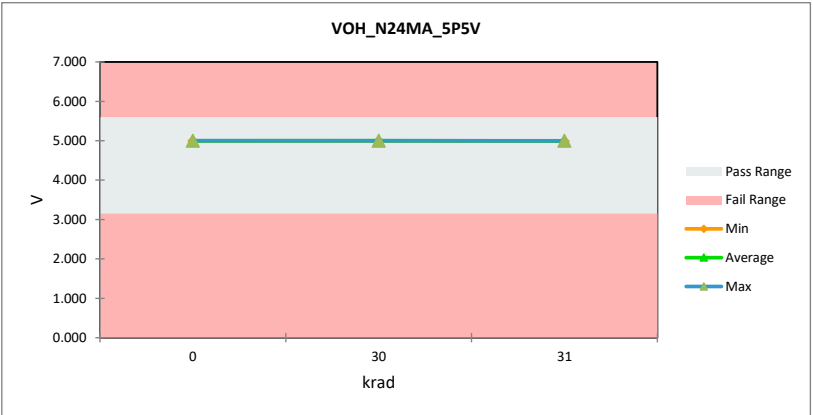


TID Report
SN54SC8T164-SEP

VOH_N24MA_5P5V						
Units		V				
Max Limit		5.6				
Min Limit		3.15				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	4.994	4.995	0.00	0.02%	0.03%
0	2	5.001	5.001	0.00	0.01%	0.02%
0	3	4.998	4.999	0.00	0.01%	0.02%
0	4	4.998	4.998	0.00	0.01%	0.02%
30	5	4.999	5.000	0.00	0.02%	0.04%
30	6	4.998	4.999	0.00	0.02%	0.03%
30	7	4.996	4.996	0.00	0.01%	0.01%
30	8	4.999	4.999	0.00	0.01%	0.01%
30	9	4.997	4.998	0.00	0.03%	0.06%
30	10	4.991	4.993	0.00	0.04%	0.08%
31	5a	4.999	4.998	0.00	-0.02%	0.05%
31	6a	4.998	4.997	0.00	-0.02%	0.04%
31	7a	4.996	4.994	0.00	-0.04%	0.07%
31	8a	4.999	4.997	0.00	-0.05%	0.10%
31	9a	4.997	4.995	0.00	-0.03%	0.06%
31	10a	4.991	4.990	0.00	-0.02%	0.03%
Max		5.001	5.001	0.00	0.04%	0.10%
Average		4.997	4.997	0.00	0.00%	0.04%
Min		4.991	4.990	0.00	-0.05%	0.01%
Std Dev		0.003	0.003	0.00	0.03%	0.03%

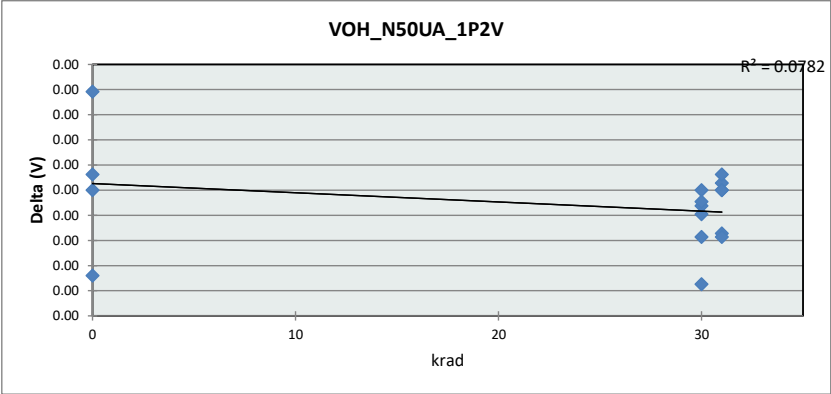


VOH_N24MA_5P5V			
Units		V	
Max Limit		5.6	
Min Limit		3.15	
krad	0	30	31
LL	3.150	3.150	3.150
Min	4.995	4.993	4.990
Average	4.998	4.998	4.995
Max	5.001	5.000	4.998
UL	5.600	5.600	5.600

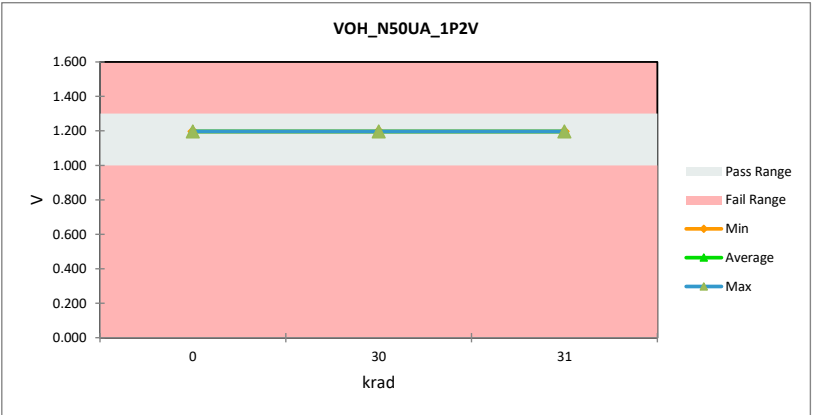


TID Report
SN54SC8T164-SEP

VOH_N50UA_1P2V						
Units		V				
Max Limit		1.3				
Min Limit		1				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	1.197	1.196	0.00	-0.01%	0.06%
0	2	1.196	1.196	0.00	0.02%	0.07%
0	3	1.196	1.196	0.00	0.00%	0.00%
0	4	1.196	1.196	0.00	0.00%	0.01%
30	5	1.196	1.196	0.00	0.00%	0.00%
30	6	1.196	1.196	0.00	0.00%	0.02%
30	7	1.197	1.196	0.00	-0.02%	0.06%
30	8	1.196	1.196	0.00	0.00%	0.01%
30	9	1.196	1.196	0.00	0.00%	0.01%
30	10	1.196	1.196	0.00	-0.01%	0.03%
31	5a	1.196	1.196	0.00	0.00%	0.00%
31	6a	1.196	1.196	0.00	0.00%	0.00%
31	7a	1.197	1.197	0.00	-0.01%	0.03%
31	8a	1.196	1.196	0.00	0.00%	0.01%
31	9a	1.196	1.196	0.00	0.00%	0.00%
31	10a	1.196	1.196	0.00	-0.01%	0.03%
Max		1.197	1.197	0.00	0.02%	0.07%
Average		1.196	1.196	0.00	0.00%	0.02%
Min		1.196	1.196	0.00	-0.02%	0.00%
Std Dev		0.000	0.000	0.00	0.01%	0.02%

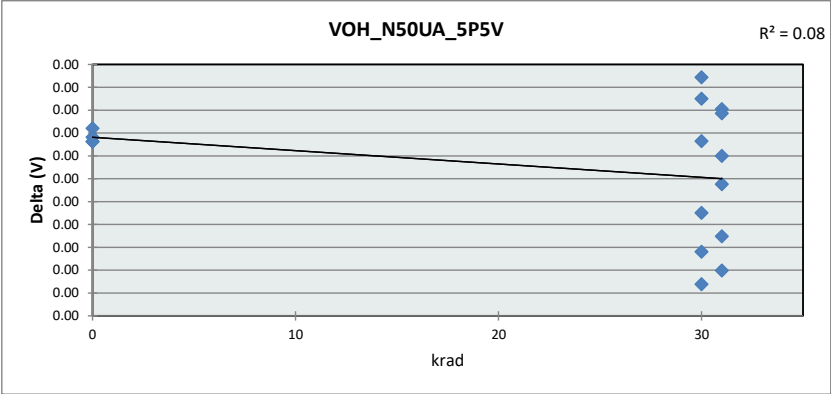


VOH_N50UA_1P2V			
Units		V	
Max Limit		1.3	
Min Limit		1	
krad	0	30	31
LL	1.000	1.000	1.000
Min	1.196	1.196	1.196
Average	1.196	1.196	1.196
Max	1.196	1.196	1.197
UL	1.300	1.300	1.300

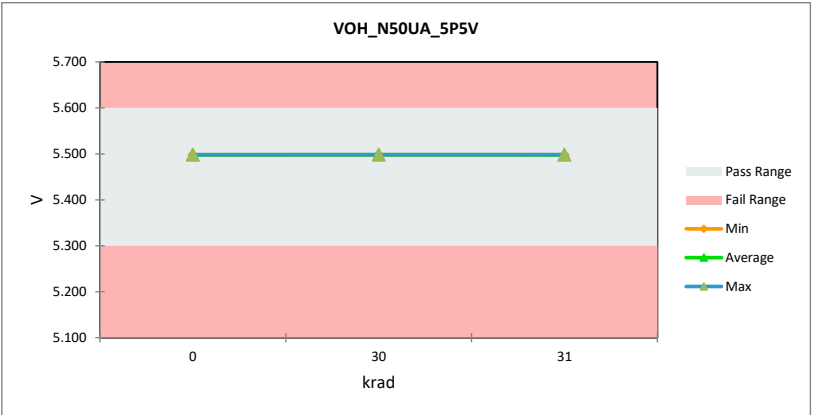


TID Report
SN54SC8T164-SEP

VOH_N50UA_5P5V						
Units		V				
Max Limit		5.6				
Min Limit		5.3				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	5.498	5.498	0.00	0.00%	0.01%
0	2	5.498	5.498	0.00	0.00%	0.02%
0	3	5.498	5.498	0.00	0.00%	0.01%
0	4	5.498	5.498	0.00	0.00%	0.01%
30	5	5.498	5.498	0.00	0.00%	0.04%
30	6	5.498	5.498	0.00	0.00%	0.06%
30	7	5.498	5.498	0.00	0.00%	0.07%
30	8	5.498	5.498	0.00	-0.01%	0.09%
30	9	5.498	5.498	0.00	0.00%	0.01%
30	10	5.498	5.498	0.00	0.00%	0.04%
31	5a	5.498	5.498	0.00	0.00%	0.00%
31	6a	5.498	5.498	0.00	0.00%	0.03%
31	7a	5.498	5.498	0.00	0.00%	0.08%
31	8a	5.498	5.498	0.00	0.00%	0.06%
31	9a	5.498	5.498	0.00	0.00%	0.02%
31	10a	5.498	5.498	0.00	0.00%	0.03%
Max		5.498	5.498	0.00	0.00%	0.09%
Average		5.498	5.498	0.00	0.00%	0.04%
Min		5.498	5.498	0.00	-0.01%	0.00%
Std Dev		0.000	0.000	0.00	0.00%	0.03%

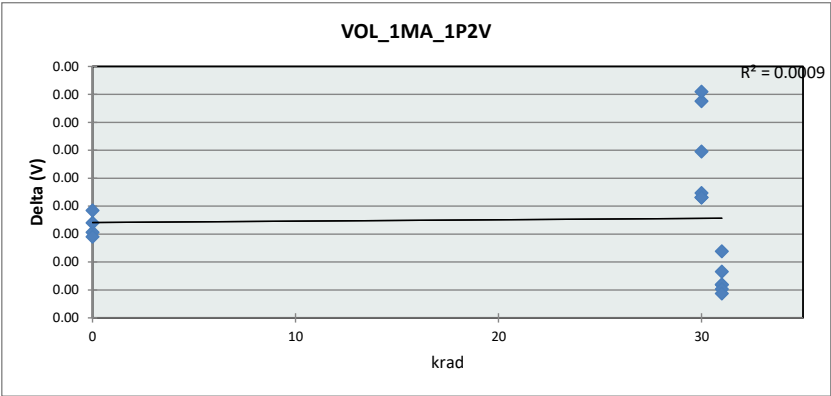


VOH_N50UA_5P5V			
Units		V	
Max Limit		5.6	
Min Limit		5.3	
krad	0	30	31
LL	5.300	5.300	5.300
Min	5.498	5.498	5.498
Average	5.498	5.498	5.498
Max	5.498	5.498	5.498
UL	5.600	5.600	5.600

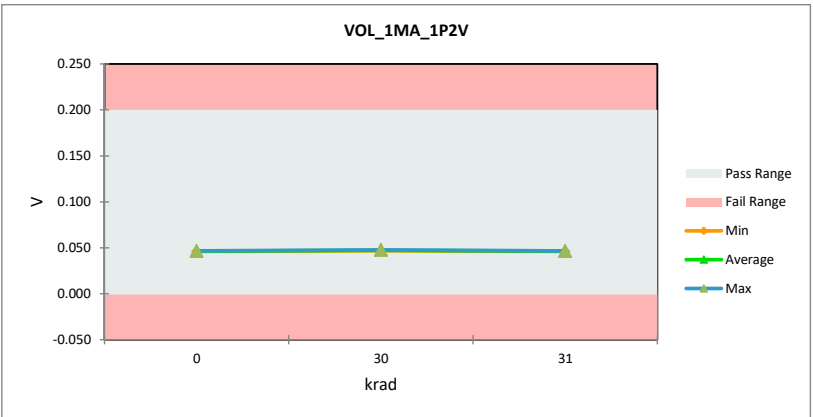


TID Report
SN54SC8T164-SEP

VOL_1MA_1P2V						
Units		V				
Max Limit		0.2				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.046	0.046	0.00	-0.41%	0.09%
0	2	0.047	0.047	0.00	-0.25%	0.06%
0	3	0.047	0.047	0.00	-0.07%	0.02%
0	4	0.047	0.047	0.00	-0.47%	0.11%
30	5	0.047	0.048	0.00	1.60%	0.37%
30	6	0.047	0.048	0.00	1.75%	0.41%
30	7	0.047	0.047	0.00	0.20%	0.05%
30	8	0.047	0.047	0.00	0.83%	0.19%
30	9	0.047	0.047	0.00	0.13%	0.03%
30	10	0.047	0.047	0.00	0.13%	0.03%
31	5a	0.047	0.046	0.00	-1.00%	0.23%
31	6a	0.047	0.046	0.00	-1.20%	0.28%
31	7a	0.047	0.046	0.00	-1.20%	0.28%
31	8a	0.047	0.047	0.00	-0.69%	0.16%
31	9a	0.047	0.046	0.00	-1.27%	0.30%
31	10a	0.047	0.046	0.00	-1.34%	0.31%
Max		0.047	0.048	0.00	1.75%	0.41%
Average		0.047	0.047	0.00	-0.20%	0.18%
Min		0.046	0.046	0.00	-1.34%	0.02%
Std Dev		0.000	0.001	0.00	0.96%	0.13%

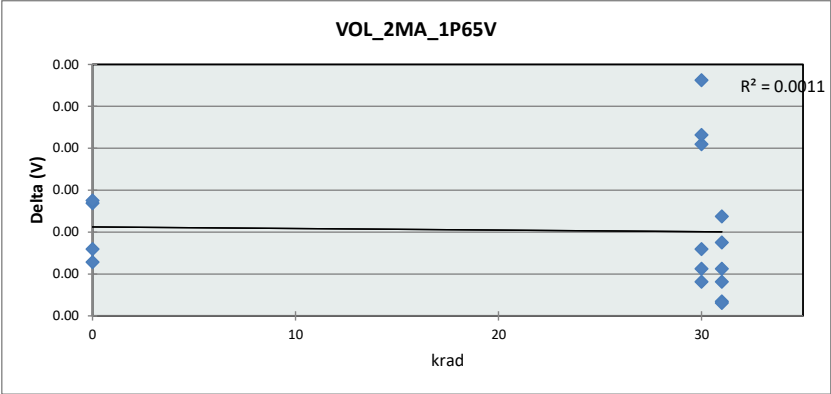


VOL_1MA_1P2V			
Units		V	
Max Limit		0.2	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.046	0.047	0.046
Average	0.046	0.047	0.046
Max	0.047	0.048	0.047
UL	0.200	0.200	0.200

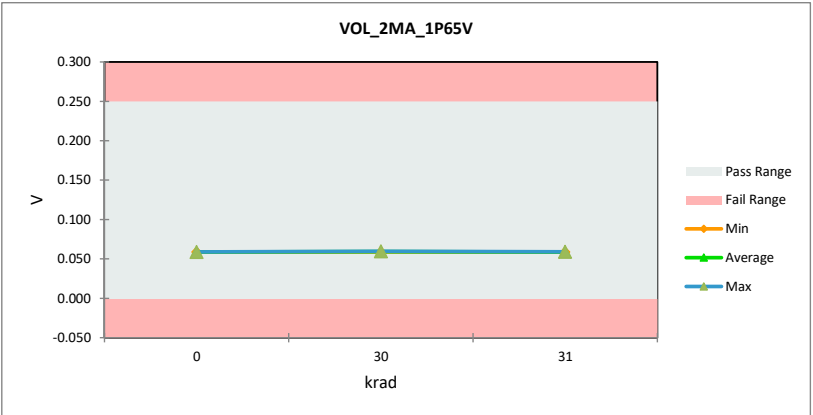


TID Report
SN54SC8T164-SEP

VOL_2MA_1P65V						
Units		V				
Max Limit		0.25				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.059	0.059	0.00	-0.11%	0.02%
0	2	0.059	0.059	0.00	-0.48%	0.11%
0	3	0.059	0.059	0.00	-0.08%	0.02%
0	4	0.059	0.059	0.00	-0.58%	0.14%
30	5	0.059	0.059	0.00	0.37%	0.09%
30	6	0.059	0.059	0.00	0.45%	0.11%
30	7	0.059	0.059	0.00	-0.63%	0.15%
30	8	0.059	0.060	0.00	0.89%	0.21%
30	9	0.059	0.059	0.00	-0.47%	0.11%
30	10	0.060	0.059	0.00	-0.74%	0.17%
31	5a	0.059	0.059	0.00	-0.74%	0.17%
31	6a	0.059	0.059	0.00	-0.42%	0.10%
31	7a	0.059	0.059	0.00	-0.63%	0.15%
31	8a	0.059	0.059	0.00	-0.21%	0.05%
31	9a	0.059	0.059	0.00	-0.89%	0.21%
31	10a	0.060	0.059	0.00	-0.90%	0.21%
Max		0.060	0.060	0.00	0.89%	0.21%
Average		0.059	0.059	0.00	-0.32%	0.13%
Min		0.059	0.059	0.00	-0.90%	0.02%
Std Dev		0.000	0.000	0.00	0.51%	0.06%

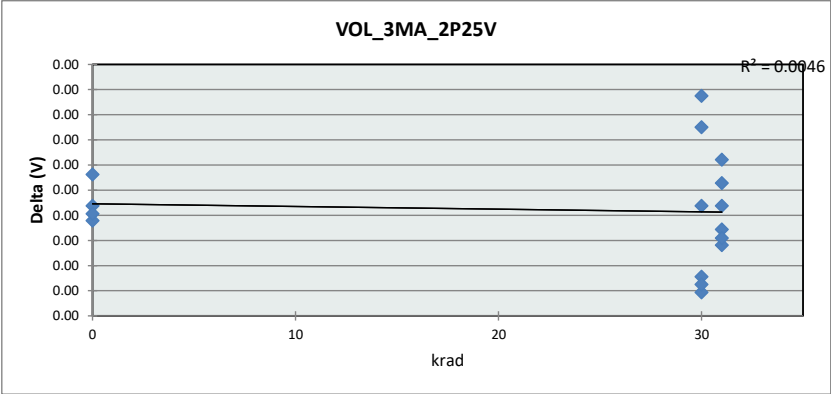


VOL_2MA_1P65V			
Units		V	
Max Limit		0.25	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.059	0.059	0.059
Average	0.059	0.059	0.059
Max	0.059	0.060	0.059
UL	0.250	0.250	0.250

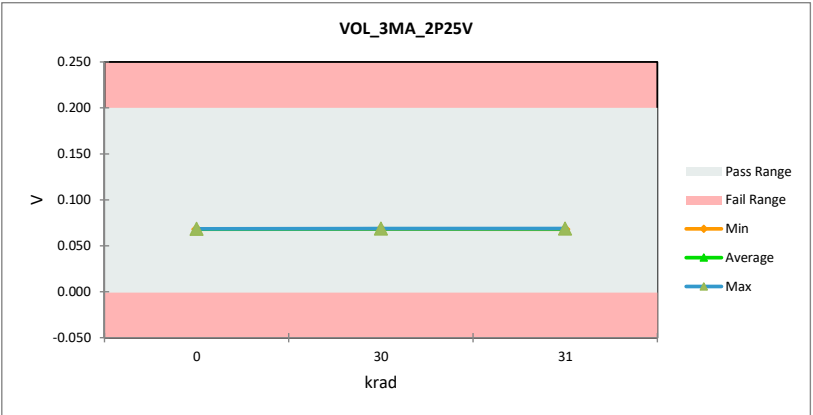


TID Report
SN54SC8T164-SEP

VOL_3MA_2P25V						
Units		V				
Max Limit		0.2				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.068	0.068	0.00	0.09%	0.03%
0	2	0.068	0.068	0.00	-0.18%	0.06%
0	3	0.068	0.068	0.00	-0.09%	0.03%
0	4	0.068	0.068	0.00	-0.14%	0.05%
30	5	0.068	0.068	0.00	-0.09%	0.03%
30	6	0.068	0.069	0.00	0.37%	0.12%
30	7	0.068	0.068	0.00	-0.50%	0.17%
30	8	0.068	0.069	0.00	0.55%	0.19%
30	9	0.069	0.068	0.00	-0.59%	0.20%
30	10	0.069	0.069	0.00	-0.54%	0.19%
31	5a	0.068	0.068	0.00	0.04%	0.01%
31	6a	0.068	0.068	0.00	-0.32%	0.11%
31	7a	0.068	0.068	0.00	-0.23%	0.08%
31	8a	0.068	0.068	0.00	0.18%	0.06%
31	9a	0.069	0.069	0.00	-0.09%	0.03%
31	10a	0.069	0.069	0.00	-0.28%	0.10%
Max		0.069	0.069	0.00	0.55%	0.20%
Average		0.068	0.068	0.00	-0.11%	0.09%
Min		0.068	0.068	0.00	-0.59%	0.01%
Std Dev		0.000	0.000	0.00	0.31%	0.06%

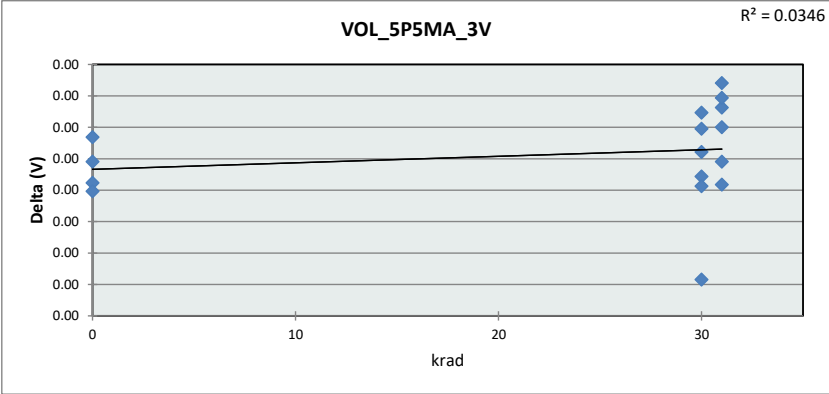


VOL_3MA_2P25V			
Units		V	
Max Limit		0.2	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.068	0.068	0.068
Average	0.068	0.068	0.068
Max	0.068	0.069	0.069
UL	0.200	0.200	0.200

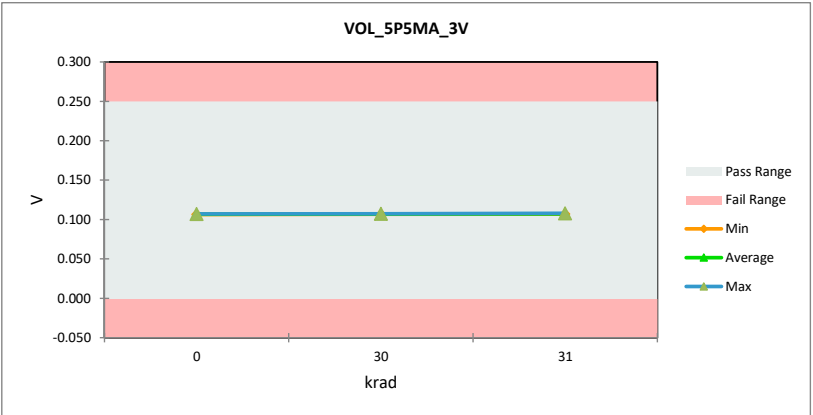


TID Report
SN54SC8T164-SEP

VOL_5P5MA_3V						
Units		V				
Max Limit		0.25				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.107	0.107	0.00	-0.20%	0.09%
0	2	0.107	0.106	0.00	-0.33%	0.14%
0	3	0.107	0.106	0.00	-0.38%	0.16%
0	4	0.107	0.107	0.00	-0.06%	0.02%
30	5	0.107	0.107	0.00	-0.15%	0.06%
30	6	0.107	0.107	0.00	0.09%	0.04%
30	7	0.107	0.107	0.00	-0.29%	0.12%
30	8	0.107	0.107	0.00	-0.01%	0.00%
30	9	0.107	0.107	0.00	-0.35%	0.15%
30	10	0.108	0.107	0.00	-0.90%	0.39%
31	5a	0.107	0.107	0.00	0.12%	0.05%
31	6a	0.107	0.107	0.00	0.26%	0.11%
31	7a	0.107	0.107	0.00	0.00%	0.00%
31	8a	0.107	0.107	0.00	0.18%	0.07%
31	9a	0.107	0.107	0.00	-0.20%	0.09%
31	10a	0.108	0.108	0.00	-0.34%	0.15%
Max		0.108	0.108	0.00	0.26%	0.39%
Average		0.107	0.107	0.00	-0.16%	0.10%
Min		0.107	0.106	0.00	-0.90%	0.00%
Std Dev		0.000	0.000	0.00	0.28%	0.09%

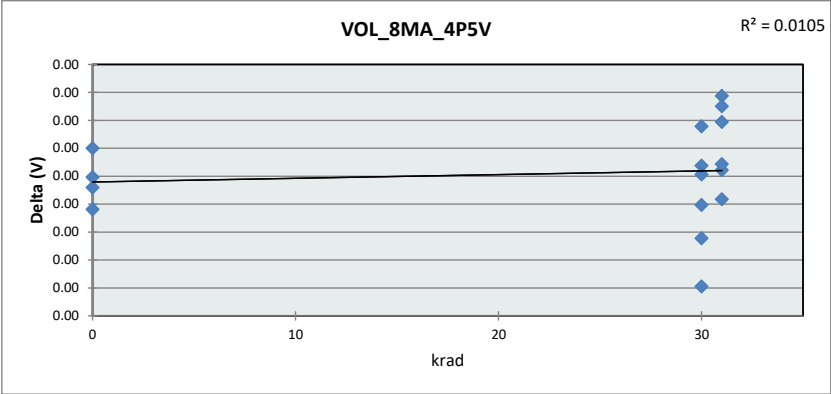


VOL_5P5MA_3V			
Units		V	
Max Limit		0.25	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.106	0.107	0.107
Average	0.107	0.107	0.107
Max	0.107	0.107	0.108
UL	0.250	0.250	0.250

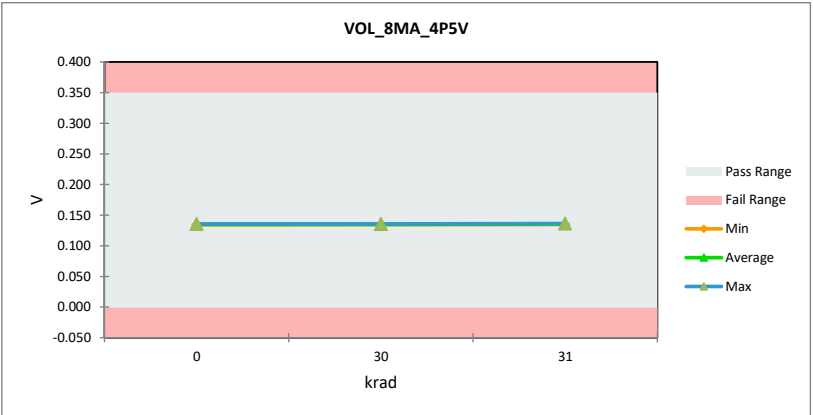


TID Report
SN54SC8T164-SEP

VOL_8MA_4P5V						
Units		V				
Max Limit		0.35				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.136	0.136	0.00	0.00%	0.00%
0	2	0.135	0.134	0.00	-0.15%	0.06%
0	3	0.135	0.134	0.00	-0.21%	0.08%
0	4	0.135	0.135	0.00	-0.32%	0.12%
30	5	0.135	0.134	0.00	-0.09%	0.04%
30	6	0.135	0.135	0.00	-0.14%	0.05%
30	7	0.135	0.135	0.00	-0.30%	0.12%
30	8	0.135	0.135	0.00	0.12%	0.04%
30	9	0.136	0.135	0.00	-0.48%	0.18%
30	10	0.137	0.136	0.00	-0.72%	0.28%
31	5a	0.135	0.135	0.00	0.14%	0.05%
31	6a	0.135	0.135	0.00	0.28%	0.11%
31	7a	0.135	0.135	0.00	-0.12%	0.04%
31	8a	0.135	0.135	0.00	0.22%	0.09%
31	9a	0.136	0.135	0.00	-0.08%	0.03%
31	10a	0.137	0.136	0.00	-0.27%	0.10%
Max		0.137	0.136	0.00	0.28%	0.28%
Average		0.135	0.135	0.00	-0.13%	0.09%
Min		0.135	0.134	0.00	-0.72%	0.00%
Std Dev		0.001	0.001	0.00	0.26%	0.07%

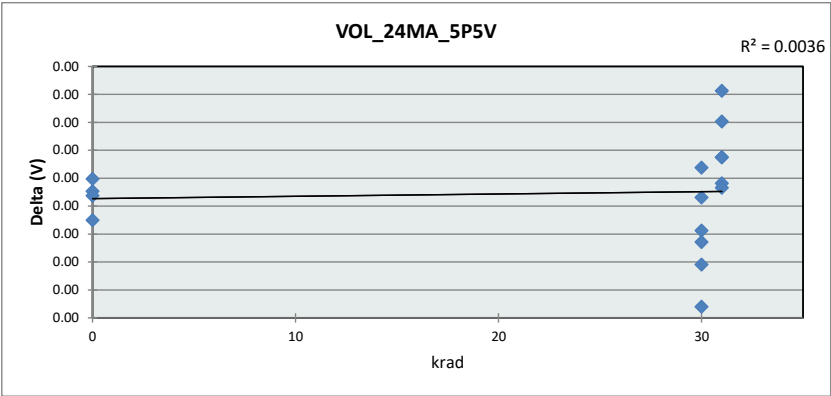


VOL_8MA_4P5V			
Units		V	
Max Limit		0.35	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.134	0.134	0.135
Average	0.135	0.135	0.135
Max	0.136	0.136	0.136
UL	0.350	0.350	0.350

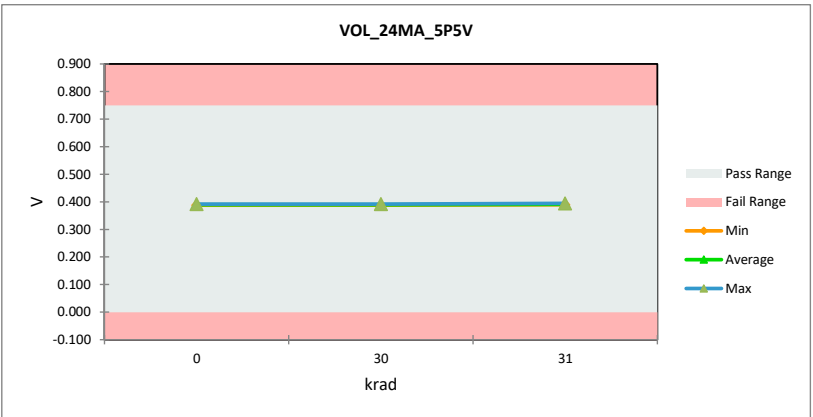


TID Report
SN54SC8T164-SEP

VOL_24MA_5P5V						
Units		V				
Max Limit		0.75				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.392	0.392	0.00	-0.06%	0.03%
0	2	0.388	0.388	0.00	0.00%	0.00%
0	3	0.389	0.389	0.00	-0.08%	0.04%
0	4	0.390	0.390	0.00	-0.19%	0.10%
30	5	0.389	0.388	0.00	-0.29%	0.15%
30	6	0.389	0.389	0.00	-0.09%	0.05%
30	7	0.390	0.389	0.00	-0.24%	0.12%
30	8	0.389	0.389	0.00	0.05%	0.02%
30	9	0.391	0.389	0.00	-0.40%	0.21%
30	10	0.394	0.392	0.00	-0.58%	0.31%
31	5a	0.389	0.389	0.00	0.10%	0.05%
31	6a	0.389	0.391	0.00	0.40%	0.21%
31	7a	0.390	0.390	0.00	-0.02%	0.01%
31	8a	0.389	0.390	0.00	0.26%	0.14%
31	9a	0.391	0.391	0.00	-0.04%	0.02%
31	10a	0.394	0.394	0.00	0.10%	0.05%
Max		0.394	0.394	0.00	0.40%	0.31%
Average		0.390	0.390	0.00	-0.07%	0.09%
Min		0.388	0.388	0.00	-0.58%	0.00%
Std Dev		0.002	0.002	0.00	0.24%	0.09%

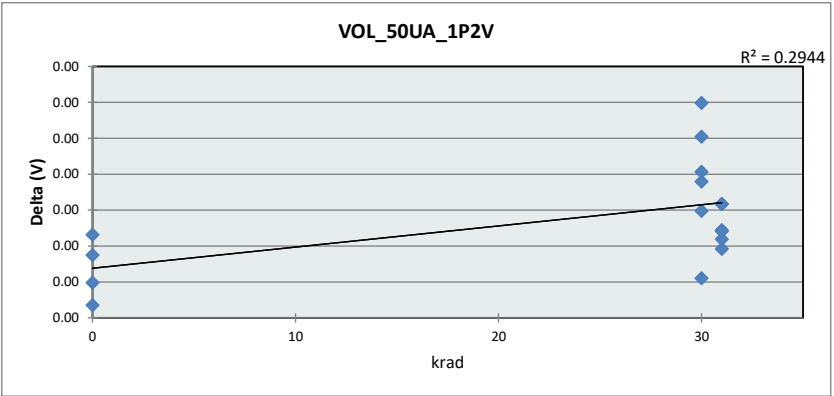


VOL_24MA_5P5V			
Units		V	
Max Limit		0.75	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.388	0.388	0.389
Average	0.389	0.389	0.391
Max	0.392	0.392	0.394
UL	0.750	0.750	0.750

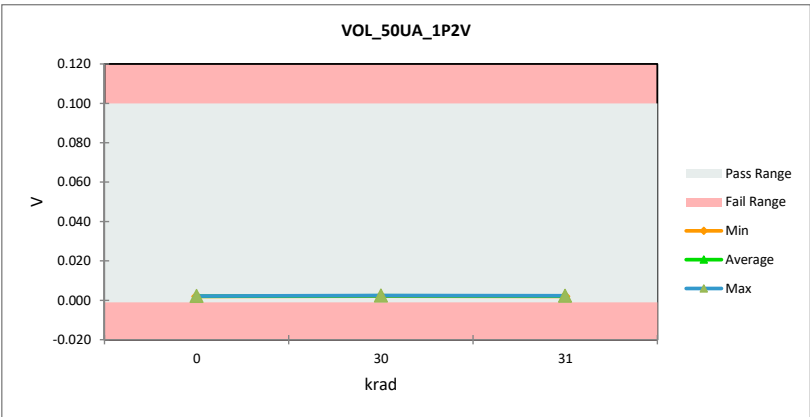


TID Report
SN54SC8T164-SEP

VOL_50UA_1P2V						
Units		V				
Max Limit		0.1				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.002	0.002	0.00	-1.22%	0.03%
0	2	0.002	0.002	0.00	1.47%	0.03%
0	3	0.002	0.002	0.00	-4.95%	0.10%
0	4	0.002	0.002	0.00	-7.53%	0.16%
30	5	0.002	0.002	0.00	14.80%	0.30%
30	6	0.002	0.002	0.00	19.65%	0.39%
30	7	0.002	0.002	0.00	10.04%	0.20%
30	8	0.002	0.002	0.00	4.38%	0.10%
30	9	0.002	0.002	0.00	8.59%	0.18%
30	10	0.002	0.002	0.00	-4.07%	0.09%
31	5a	0.002	0.002	0.00	5.68%	0.12%
31	6a	0.002	0.002	0.00	-0.40%	0.01%
31	7a	0.002	0.002	0.00	5.68%	0.12%
31	8a	0.002	0.002	0.00	1.98%	0.04%
31	9a	0.002	0.002	0.00	0.91%	0.02%
31	10a	0.002	0.002	0.00	1.88%	0.04%
Max		0.002	0.002	0.00	19.65%	0.39%
Average		0.002	0.002	0.00	3.56%	0.12%
Min		0.002	0.002	0.00	-7.53%	0.01%
Std Dev		0.000	0.000	0.00	7.17%	0.11%

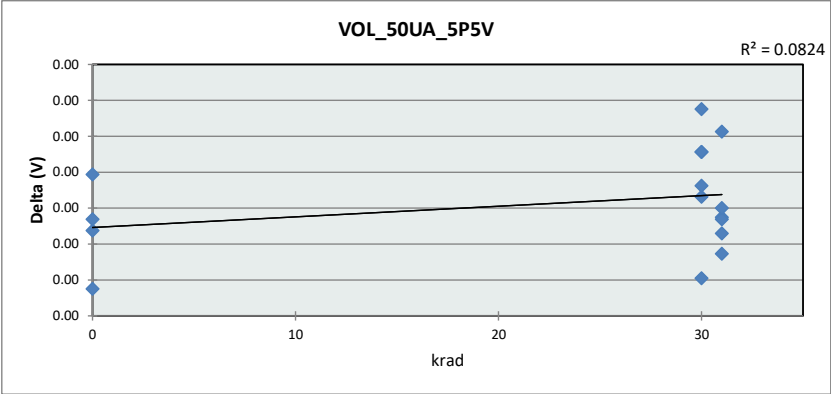


VOL_50UA_1P2V			
Units		V	
Max Limit		0.1	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.002	0.002	0.002
Average	0.002	0.002	0.002
Max	0.002	0.002	0.002
UL	0.100	0.100	0.100

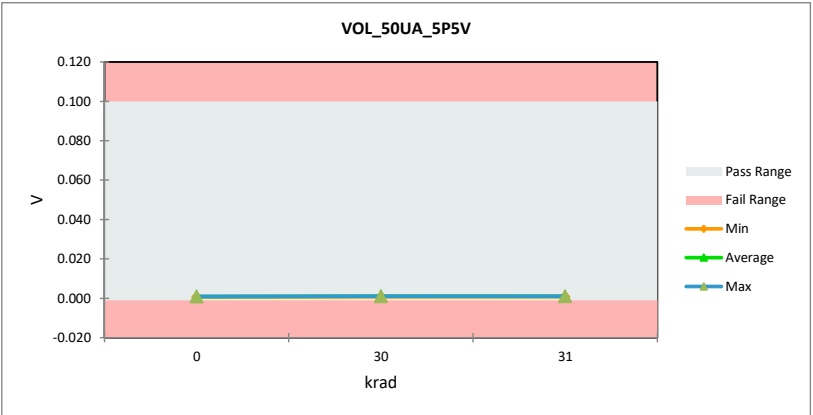


TID Report
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VOL_50UA_5P5V						
Units		V				
Max Limit		0.1				
Min Limit		-0.001				
krad	Serial #	PreTestHDR	PostTestHDR	Delta	Delta %	% of Limit Range
0	1	0.001	0.001	0.00	-6.76%	0.06%
0	2	0.001	0.001	0.00	11.29%	0.09%
0	3	0.001	0.001	0.00	-24.15%	0.22%
0	4	0.001	0.001	0.00	-3.14%	0.03%
30	5	0.001	0.001	0.00	32.86%	0.27%
30	6	0.001	0.001	0.00	-19.65%	0.19%
30	7	0.001	0.001	0.00	2.98%	0.03%
30	8	0.001	0.001	0.00	6.29%	0.06%
30	9	0.001	0.001	0.00	16.77%	0.15%
30	10	0.001	0.001	0.00	17.35%	0.15%
31	5a	0.001	0.001	0.00	25.40%	0.21%
31	6a	0.001	0.001	0.00	-12.78%	0.13%
31	7a	0.001	0.001	0.00	-2.42%	0.03%
31	8a	0.001	0.001	0.00	-3.14%	0.03%
31	9a	0.001	0.001	0.00	0.00%	0.00%
31	10a	0.001	0.001	0.00	-7.82%	0.07%
Max		0.001	0.001	0.00	32.86%	0.27%
Average		0.001	0.001	0.00	2.07%	0.11%
Min		0.001	0.001	0.00	-24.15%	0.00%
Std Dev		0.000	0.000	0.00	15.66%	0.08%



VOL_50UA_5P5V			
Units		V	
Max Limit		0.1	
Min Limit		-0.001	
krad	0	30	31
LL	-0.001	-0.001	-0.001
Min	0.001	0.001	0.001
Average	0.001	0.001	0.001
Max	0.001	0.001	0.001
UL	0.100	0.100	0.100



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