Radiation Report

TLV4H290-SEP Radiation Tolerant High-Speed Comparator TID Report

Table of Contents

1 TLV4H290-SEP Radiation Tolerant High-Speed Comparator TID Report

This report covers the radiation characterization results of the TLV4H290-SEP, 1.65V to 5.5V comparator. The study was done to determine Total Ionizing Dose (TID) effects of high dose rate (HDR) up to 30krad(Si). The results show that all samples passed well within the specified limits.

2 Trademarks

All trademarks are the property of their respective owners.

3 Device Information

The TLV4H290-SEP is a quad channel comparator which offers low input offset voltage, fault-tolerant inputs with an excellent speed-to- power combination and a propagation delay of 100ns. Operating voltage range of 1.65V to 5.5V with a quiescent supply current of 25µA per channel. The TLV4H290-SEP also feature a no output phase inversion with fault-tolerant inputs that can go up to 6V without damage. The TLV4H290-SEP comparator has an open-drain output stage that can be pulled below or beyond the supply voltage, making it appropriate for level translation.

It has been RHA qualified to 30 krad(Si) under HDR.

3.1 Device Details

Table 3-1 lists the device information used in the initial TID characterization and qualification for HDR.

Table 3-1. Device and Exposure Details

TID HDR Details: up to 30 krad(Si)	
TI Device Number	TLV4H290-SEP
Package	14-pin DYY (SOT-23)
Technology	LBC9
Die Lot Number	2079069
A/T Lot Number / Date Code	4153714 / 43A4Z3W
Quantity Tested	HDR: 6 biased and 6 unbiased units at 20krad(Si) levels 6 biased and 6 unbiased units at 30krad(Si) levels
Lot Accept/Reject	Devices passed 20krad(Si), 30krad(Si)
HDR Radiation Facility	Texas Instruments Inc., CLAB, Dallas Texas
LDR Radiation Facility	N/A
HDR Dose Level	20krad(Si), 30krad(Si)
HDR Dose Rate	265rad(Si)/s ionizing radiation with increments
LDR Dose Level	N/A
LDR Dose Rate	N/A
HDR Radiation Source	CLAB: Gamma rays provided by Hopewell GR420 Co60 source. Dosimetry performed by Hopewell via GEX using GEX Alanine dosimeters
Irradiation Temperature	Ambient, room temperature controlled to 4°C ± 6°C per MILSTD-883 and MIL-STD-750

4 Total Dose Test Setup

4.1 Test Overview

The TLV4H290-SEP was tested according to MIL-STD-883, Test Method 1019.9, Condition A. The product was irradiated up to 30krad(Si) and then put through full electrical parametric testing on the production Automated Test Equipment (ATE).

The TLV4H290-SEP LBC9 process technology contains Bipolar and CMOS components. HDR testing was performed on TLV4H290-SEP. LDR testing was omitted based on MIL-STD-883, Test Method 1019 section 3.13 a3 for LBC9 process technology.

After electrical test, functional units *exhibiting parametric drift* were placed in extended room temperature anneal testing according to MIL-STD-883, Test Method 1019.9, section 3.11.2. Electrical measurements were taken after the 72 hours annealing procedure. Calculated effective dose rates for each dosage level can be seen in Table 4-1 below. See Appendix 2 for electrical measurement data during room temperature anneal testing.

4.2 Test Description and Facilities

TLV4H290-SEP HDR exposure was performed on biased and unbiased devices in a Co60 gamma cell at TI facilities. The un-attenuated dose rate of this cell is 265rad(Si)/s.

After exposure, the devices were packed in dry ice (per MIL-STD-883 Method 1019.9 section 3.10) and returned to TI Santa Clara for a full post radiation electrical evaluation using Texas Instruments ATE. ATE guard band test limits are set within data sheet electrical limits to maintain a minimum Cpk and test error margin based on initial qualification and characterization data. Post radiation measurements were taken within 30 minutes of removal of the devices from the dry ice container. The devices were allowed to reach room temperature prior to electrical post radiation measurements. See Appendix 1 for post HDR radiation electrical measurements.

After electrical test, functional units exhibiting parametric drift were placed in extended room temperature anneal testing according to MIL-STD-883, Test Method 1019.9, section 3.11.2. Electrical measurements were taken at 72 hours after the annealing procedure. Calculated effective dose rates for each dosage level can be seen in Table 4-1 below. See Appendix 2 for electrical measurement data during room temperature anneal testing.

Table 4-1. Calculated Effective Dose Rates

Dosage Level	72 Hours	Units
20krad(Si)	77.2	mrads/sec
30krad(Si)	115.7	mrads/sec

4.3 Test Setup Details

The devices under HDR exposure were tested in both biased and unbiased conditions as described below:

4.3.1 Unbiased

For the unbiased HDR conditions, the exposure was performed with all pins grounded.

4.3.2 Biased

Figure 4-1 shows bias conditions for each pin during HDR exposure and extended room temperature annealing.

Ch1 and Ch2 are biased output high.

Ch3 and Ch4 are biased output low.

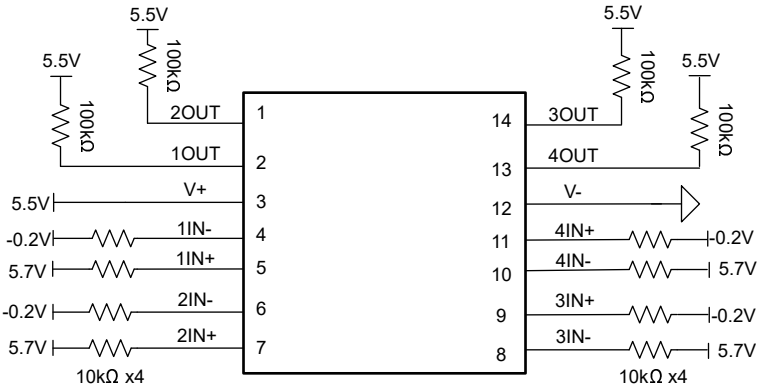


Figure 4-1. TLV4H390-SEP Biased Diagram

4.4 Test Configuration and Condition

A step-stress (20k and 30k) test method was used to determine the TID hardness level.

That is, after a predetermined TID level was reached, an electrical test was performed on a given sample of parts to verify that the units are within specified data sheet electrical test limits. MIL-STD-883, Test Method 1019.9, Condition A was used in this case. If this passes, then the wafer lot can be certified as an RHA wafer lot.

Table 4-2 list the serialized samples that was used during the RHA characterization.

Table 4-2. HDR 256rad(Si)/s Biased and Unbiased Device Information

HDR = 265rad(Si)/s	
Total Samples: 10/dose level (6 biased + 6 unbiased)	
Exposure Levels	
20krad(Si)	30krad(Si)
Biased	Biased
03, 004, 005, 006, 007, 008 (Wafer 1)	015, 016, 017, 018, 019, 020 (Wafer 1)
Unbiased	Unbiased
09, 010, 011, 012, 013, 014 (Wafer 1)	021, 022, 023, 024, 025, 026 (Wafer 1)

5 Tested Parameters

Table 5-1 provides the list of tested parameters, typical at T_A = 25°C (unless otherwise noted).

Table 5-1. TLV4H290-SEP Data Sheet Parameters

PARAMETER	TEST CONDITION	Data sheet Lit# SNOSDF0				Test#
		MIN	TYP	MAX	UNIT	
Total Quiescent current (I_Q)	V_S = 5V, V_{CM} = 0V		100	140	µA	600000
Total Quiescent current (I_Q)	V_S = 1.8V, V_{CM} = 0V		100	140	µA	700000
Output low voltage from V_{EE} (V_{OL}), Ch1	V_S = 5V, I_{SINK} = 4mA		75	125	mV	2000001
Output low voltage from V_{EE} (V_{OL}), Ch2	V_S= 5V, I_{SINK} = 4mA		75	125	mV	2000000
Output low voltage from V_{EE}(V_{OL}), Ch3	V_S= 5V, I_{SINK} = 4mA		75	125	mV	2000003
Output low voltage from V_{EE} (V_{OL}), Ch4	V_S= 5V, I_{SINK} = 4mA		75	125	mV	2000002
Output low short-circuit current sink (ISC_{SINK}), Ch1	V_S = 5V		90	100	mA	4300000
Output low short-circuit current sink (ISC_{SINK}), Ch2	V_S = 5V		90	100	mA	4200000
Output low short-circuit current sink (ISC_{SINK}), Ch3	V_S = 5V		90	100	mA	4200001
Output low short-circuit current sink (ISC_{SINK}), Ch4	V_S = 5V		90	100	mA	4300000
Output high Leakage current (I_{LKG}), Ch1	V_S = 5V, V_{PU} to 5V		10		nA	4400001
Output high Leakage current (I_{LKG}), Ch2	V_S = 5V, V_{PU} to 5V		10		nA	4400000
Output high Leakage current (I_{LKG}), Ch3	V_S = 5V, V_{PU} to 5V		10		nA	4400003
Output high Leakage current (I_{LKG}), Ch4	V_S = 5V, V_{PU} to 5V		10		nA	4400002
Input offset voltage (V_{OS}), Ch1	V_S = 1.8V, V_{CM} = -0.2V	-3	±0.3	3	mV	7000000
Input offset voltage (V_{OS}), Ch2	V_S = 1.8V, V_{CM} = -0.2V	-3	±0.3	3	mV	7000001
Input offset voltage (V_{OS}), Ch3	V_S = 1.8V, V_{CM} = -0.2V	-3	±0.3	3	mV	7000002
Input offset voltage (V_{OS}), Ch4	V_S = 1.8V, V_{CM} = -0.2V	-3	±0.3	3	mV	7000003
Input offset voltage (V_{OS}), Ch1	V_S = 1.8V, V_{CM} = 0V	-3	±0.3	3	mV	8000000
Input offset voltage (V_{OS}), Ch2	V_S = 1.8V, V_{CM} = 0V	-3	±0.3	3	mV	8000001
Input offset voltage (V_{OS}), Ch3	V_S = 1.8V, V_{CM} = 0V	-3	±0.3	3	mV	8000002
Input offset voltage (V_{OS}), Ch4	V_S = 1.8V, V_{CM} = 0V	-3	±0.3	3	mV	8000003
Input offset voltage (V_{OS}), Ch1	V_S = 5V, V_{CM} = 0V	-3	±0.3	3	mV	11000000
Input offset voltage (V_{OS}), Ch2	V_S = 5V, V_{CM} = 0V	-3	±0.3	3	mV	11000001
Input offset voltage (V_{OS}), Ch3	V_S = 5V, V_{CM} = 0V	-3	±0.3	3	mV	11000002
Input offset voltage (V_{OS}), Ch4	V_S = 5V, V_{CM} = 0V	-3	±0.3	3	mV	11000003
Input offset voltage (V_{OS}), Ch1	V_S = 5V, V_{CM} = -0.2V	-3	±0.3	3	mV	12000000
Input offset voltage (V_{OS}), Ch2	V_S = 5V, V_{CM} = -0.2V	-3	±0.3	3	mV	12000001
Input offset voltage (V_{OS}), Ch3	V_S = 5V, V_{CM} = -0.2V	-3	±0.3	3	mV	12000002
Input offset voltage (V_{OS}), Ch4	V_S = 5V, V_{CM} = -0.2V	-3	±0.3	3	mV	12000003
Input bias current (I_B) IN-, Ch1	V_S = 5V, V_{CM} = 0V		5		pA	20200000
Input bias current (I_B) IN-, Ch2	V_S = 5V, V_{CM} = 0V		5		pA	20200001
Input bias current (I_B) IN-, Ch3	V_S = 5V, V_{CM} = 0V		5		pA	20200002
Input bias current (I_B) IN-, Ch4	V_S = 5V, V_{CM} = 0V		5		pA	20200003
Input bias current (I_B) IN+, Ch1	V_S = 5V, V_{CM} = 0V		5		pA	20200004
Input bias current (I_B) IN+, Ch2	V_S = 5V, V_{CM} = 0V		5		pA	20200005
Input bias current (I_B) IN+, Ch3	V_S = 5V, V_{CM} = 0V		5		pA	20200006
Input bias current (I_B) IN+, Ch4	V_S = 5V, V_{CM} = 0V		5		pA	20200007

6 Total Ionizing Dose RHA Characterization Summary Results

6.1 HDR Characterization Results

The parametric data for the TLV4H290-SEP passes up to 30krad(Si) HDR per MIL-STD-883, TM1090 Condition A.

The TLV4H290-SEP passed post electrical test over all conditions listed below indicating that this lot can be certified as 30krad(Si) RHA.

- HDR (265rad(Si)/s) unbiased: Post 20krad(Si), 30krad(Si)
- HDR (265rad(Si)/s) biased: Post 20krad(Si), 30krad(Si)

Please see Appendix 1 and 2 for HDR report up to 30krad(Si).

6.1.1 Input Bias Current

Input bias current (IB) for the TLV4H290-SEP is specified as 5pA typical at T_A = 25°C. The input bias current was measured at V_S = 5V.

The noninverting input of channel 1 for one sample (unit 787) was found to measure –33.95nA, after exposure to 30krad(Si) under HDR.

After annealing under biased conditions (t = 3 days), this value recovered to <1nA, within the typical distribution of the spec prior to radiation.

6.1.2 Output High Leakage

Open-drain output leakage current (ILKG/IOH) for the TLV4H290-SEP is specified as 10nA typical at T_A = 25°C. The output leakage current was measured at V_S = 5V.

During radiation two channels were held output high, while two channels were held output low.

The channels where the outputs were held low showed additional leakage to 10µA post exposure to 30krad(Si) under HDR.

After annealing under biased conditions (t = 3 days), output leakage on channels held low reduced. For example, sample 19 reduced output leakage from 10µA to 6.9µA on channel 3.

6.2 Summary of Results

The parametric data for the TLV4H290-SEP show the device passes up to 30krad(Si) under HDR conditions, under biased and unbiased conditions. No functional failures were observed on any samples. The device exhibited parametric drift of the IB, and output leakage specifications under HDR conditions; of these, both recovered to levels within the data sheet limits after annealing, and IB remained within the specified post-TID exposure limits.

The data suggest that circuit designers seeking to use the TLV4H290-SEP must consider the possible effects of parametric drift of the IB and output high leakage specifications when assessing circuits for fault-planning purposes.

A Appendix A: Total Ionizing Dose HDR Report

Please see the following pages for the TLV4H290-SEP TID HDR report.

Delta Threshold: 10%

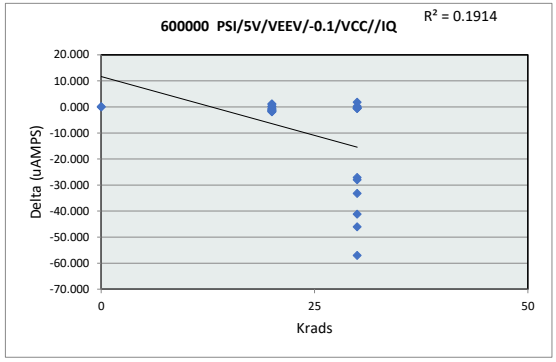
Delta Threshold 10.00%

TID Report - HDR
TLV4H290MDYYTSEP

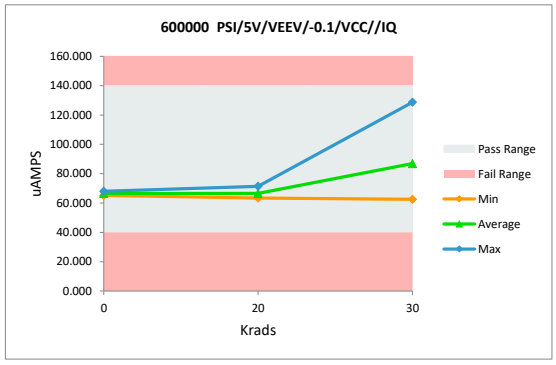
TID Report - HDR
TLV4H290MDYYTSEP

	600000 PSI/5V/VEEV/-0.1/VCC	
Test Site		
Tester		
Test Number		
Unit	uAMPS	uAMPS
Max Limit	140	140
Min Limit	39.99999899	39.99999899

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	65.198	65.186	0.012	0.02%	0.01%
0	2	68.114	68.006	0.107	0.16%	0.11%
20	3	65.164	66.300	-1.136	-1.74%	1.14%
20	4	63.931	64.681	-0.750	-1.17%	0.75%
20	5	64.402	66.025	-1.624	-2.52%	1.62%
20	6	61.518	63.382	-1.864	-3.03%	1.86%
20	7	65.863	67.122	-1.259	-1.91%	1.26%
20	8	67.792	68.949	-1.157	-1.71%	1.16%
20	9 U	69.727	71.343	-1.615	-2.32%	1.62%
20	10 U	69.984	70.470	-0.487	-0.70%	0.49%
20	11 U	64.781	63.630	1.150	1.78%	1.15%
20	12 U	64.945	64.837	0.108	0.17%	0.11%
20	13 U	66.877	66.616	0.261	0.39%	0.26%
20	14 U	66.501	65.407	1.094	1.65%	1.09%
30	15	67.149	95.079	-27.930	-41.59%	27.93%
30	16	65.189	98.367	-33.178	-50.90%	33.18%
30	17	69.360	110.546	-41.185	-59.38%	41.19%
30	18	66.874	93.961	-27.087	-40.50%	27.09%
30	19	71.670	128.672	-57.002	-79.53%	57.00%
30	20	66.176	112.177	-46.001	-69.51%	46.00%
30	21 U	69.776	70.226	-0.449	-0.64%	0.45%
30	22 U	68.613	68.331	0.282	0.41%	0.28%
30	23 U	71.650	69.813	1.837	2.56%	1.84%
30	24 U	66.328	66.607	-0.279	-0.42%	0.28%
30	25 U	65.749	66.374	-0.625	-0.95%	0.62%
30	26 U	62.179	62.541	-0.362	-0.58%	0.36%
	Max	71.670	128.672	1.837	2.56%	57.00%
	Average	66.750	75.948	-9.198	-13.54%	9.57%
	Min	61.518	62.541	-57.002	-79.53%	0.01%
	Std Dev	2.598	18.195	17.317	25.24%	17.11%



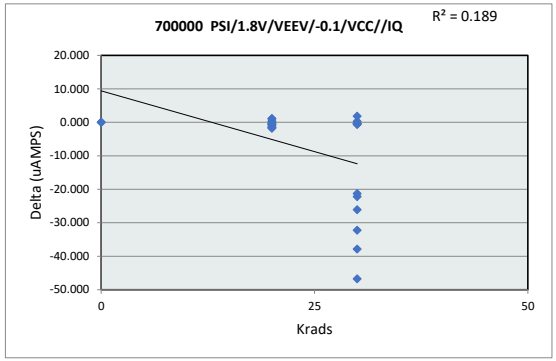
	600000 PSI/5V/VEEV/-0.1/V		
Test Site			
Tester			
Test Number			
Max Limit	140	uAMPS	
Min Limit	39.99999899	uAMPS	
Krads	0	20	30
LL	40.000	40.000	40.000
Min	65.186	63.382	62.541
Average	66.596	66.564	86.891
Max	68.006	71.343	128.672
UL	140.000	140.000	140.000



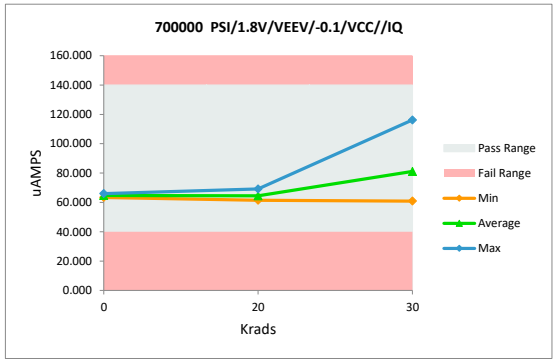
TID Report - HDR
TLV4H290MDYYTSEP

	700000 PSI/1.8V/VEEV/-0.1/VC	
Test Site		
Tester		
Test Number		
Unit	uAMPS	uAMPS
Max Limit	140	140
Min Limit	39.99999899	39.99999899

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	63.375	63.358	0.018	0.03%	0.02%
0	2	66.053	65.968	0.085	0.13%	0.09%
20	3	63.284	64.401	-1.117	-1.77%	1.12%
20	4	62.145	62.505	-0.360	-0.58%	0.36%
20	5	62.634	64.133	-1.499	-2.39%	1.50%
20	6	59.756	61.499	-1.744	-2.92%	1.74%
20	7	63.899	64.429	-0.530	-0.83%	0.53%
20	8	65.776	66.483	-0.707	-1.07%	0.71%
20	9 U	67.602	69.145	-1.543	-2.28%	1.54%
20	10 U	68.010	68.481	-0.472	-0.69%	0.47%
20	11 U	62.954	61.822	1.132	1.80%	1.13%
20	12 U	63.003	62.918	0.086	0.14%	0.09%
20	13 U	64.837	64.472	0.365	0.56%	0.37%
20	14 U	64.502	63.421	1.081	1.68%	1.08%
30	15	65.102	87.268	-22.167	-34.05%	22.17%
30	16	63.382	89.438	-26.055	-41.11%	26.06%
30	17	67.392	99.633	-32.241	-47.84%	32.24%
30	18	65.014	86.258	-21.244	-32.68%	21.24%
30	19	69.445	116.199	-46.754	-67.33%	46.75%
30	20	64.300	102.121	-37.821	-58.82%	37.82%
30	21 U	67.736	68.209	-0.473	-0.70%	0.47%
30	22 U	66.736	66.425	0.311	0.47%	0.31%
30	23 U	69.793	67.959	1.834	2.63%	1.83%
30	24 U	64.314	64.615	-0.301	-0.47%	0.30%
30	25 U	63.857	64.479	-0.622	-0.97%	0.62%
30	26 U	60.494	60.860	-0.367	-0.61%	0.37%
	Max	69.793	116.199	1.834	2.63%	46.75%
	Average	64.823	72.173	-7.350	-11.14%	7.73%
	Min	59.756	60.860	-46.754	-67.33%	0.02%
	Std Dev	2.509	14.855	13.985	20.99%	13.77%



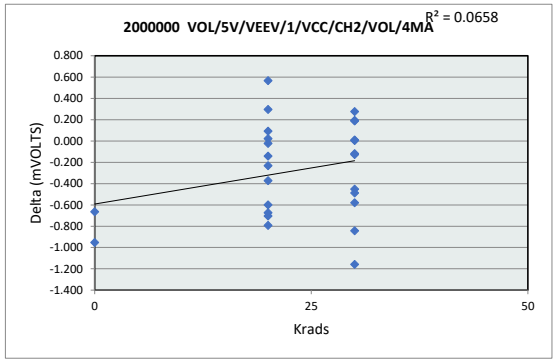
	700000 PSI/1.8V/VEEV/-0.1/		
Test Site			
Tester			
Test Number			
Max Limit	140	uAMPS	
Min Limit	39.99999899	uAMPS	
Krads	0	20	30
LL	40.000	40.000	40.000
Min	63.358	61.499	60.860
Average	64.663	64.476	81.122
Max	65.968	69.145	116.199
UL	140.000	140.000	140.000



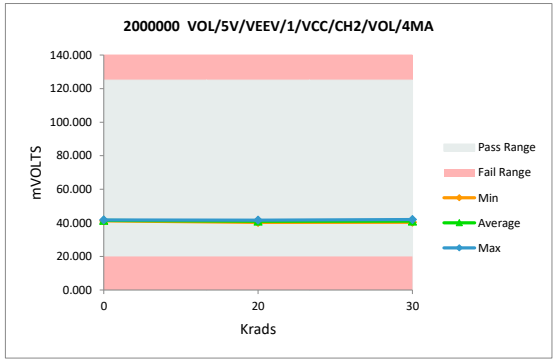
TID Report - HDR
TLV4H290MDYYTSEP

	2000000 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	40.770	41.721	-0.951	-2.33%	0.91%
0	2	40.535	41.199	-0.664	-1.64%	0.63%
20	3	40.569	40.940	-0.371	-0.92%	0.35%
20	4	40.508	41.301	-0.792	-1.96%	0.75%
20	5	41.023	41.045	-0.022	-0.05%	0.02%
20	6	40.728	40.960	-0.231	-0.57%	0.22%
20	7	40.663	41.366	-0.704	-1.73%	0.67%
20	8	40.602	41.201	-0.599	-1.47%	0.57%
20	9 U	40.837	40.270	0.567	1.39%	0.54%
20	10 U	40.977	41.118	-0.141	-0.34%	0.13%
20	11 U	40.551	40.529	0.022	0.05%	0.02%
20	12 U	40.950	40.857	0.093	0.23%	0.09%
20	13 U	40.890	40.593	0.297	0.73%	0.28%
20	14 U	40.923	41.597	-0.673	-1.65%	0.64%
30	15	40.746	40.557	0.189	0.46%	0.18%
30	16	40.652	40.642	0.010	0.02%	0.01%
30	17	40.420	40.907	-0.487	-1.20%	0.46%
30	18	41.063	41.190	-0.127	-0.31%	0.12%
30	19	40.883	40.878	0.004	0.01%	0.00%
30	20	40.670	41.512	-0.842	-2.07%	0.80%
30	21 U	40.572	40.378	0.194	0.48%	0.19%
30	22 U	40.572	41.152	-0.579	-1.43%	0.55%
30	23 U	40.602	41.054	-0.452	-1.11%	0.43%
30	24 U	40.833	41.990	-1.158	-2.83%	1.10%
30	25 U	40.892	41.010	-0.118	-0.29%	0.11%
30	26 U	40.968	40.692	0.276	0.67%	0.26%
	Max	41.063	41.990	0.567	1.39%	1.10%
	Average	40.746	41.025	-0.279	-0.69%	0.39%
	Min	40.420	40.270	-1.158	-2.83%	0.00%
	Std Dev	0.182	0.413	0.442	1.09%	0.31%



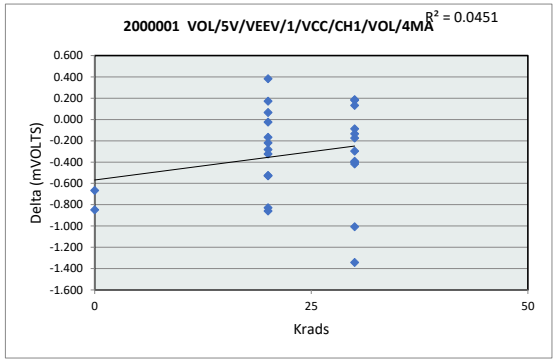
	2000000 VOL/5V/VEEV/1/VC		
Test Site			
Tester			
Test Number			
Max Limit	125	mVOLTS	
Min Limit	19.99999955	mVOLTS	
Krads	0	20	30
LL	20.000	20.000	20.000
Min	41.199	40.270	40.378
Average	41.460	40.981	40.997
Max	41.721	41.597	41.990
UL	125.000	125.000	125.000



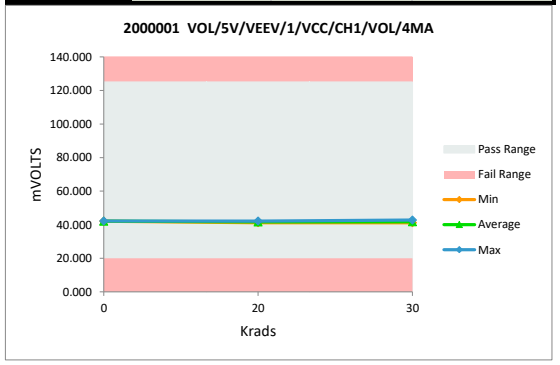
TID Report - HDR
TLV4H290MDYYTSEP

	2000001 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	41.491	42.157	-0.666	-1.61%	0.63%
0	2	41.217	42.065	-0.848	-2.06%	0.81%
20	3	41.289	41.571	-0.282	-0.68%	0.27%
20	4	41.171	42.029	-0.858	-2.09%	0.82%
20	5	41.627	41.793	-0.166	-0.40%	0.16%
20	6	41.293	41.513	-0.220	-0.53%	0.21%
20	7	41.032	41.861	-0.828	-2.02%	0.79%
20	8	41.362	41.891	-0.528	-1.28%	0.50%
20	9 U	41.558	41.174	0.384	0.92%	0.37%
20	10 U	41.581	41.905	-0.324	-0.78%	0.31%
20	11 U	41.252	41.277	-0.025	-0.06%	0.02%
20	12 U	41.632	41.566	0.066	0.16%	0.06%
20	13 U	41.474	41.302	0.172	0.42%	0.16%
20	14 U	41.625	42.150	-0.525	-1.26%	0.50%
30	15	41.448	41.266	0.181	0.44%	0.17%
30	16	41.392	41.527	-0.135	-0.33%	0.13%
30	17	41.141	41.557	-0.417	-1.01%	0.40%
30	18	41.628	41.802	-0.174	-0.42%	0.17%
30	19	41.428	41.724	-0.296	-0.71%	0.28%
30	20	41.371	42.377	-1.006	-2.43%	0.96%
30	21 U	41.313	41.126	0.187	0.45%	0.18%
30	22 U	41.235	41.626	-0.392	-0.95%	0.37%
30	23 U	41.265	41.665	-0.401	-0.97%	0.38%
30	24 U	41.437	42.777	-1.341	-3.24%	1.28%
30	25 U	41.417	41.504	-0.087	-0.21%	0.08%
30	26 U	41.747	41.616	0.132	0.32%	0.13%
	Max	41.747	42.777	0.384	0.92%	1.28%
	Average	41.401	41.724	-0.323	-0.78%	0.39%
	Min	41.032	41.126	-1.341	-3.24%	0.02%
	Std Dev	0.178	0.384	0.419	1.01%	0.32%



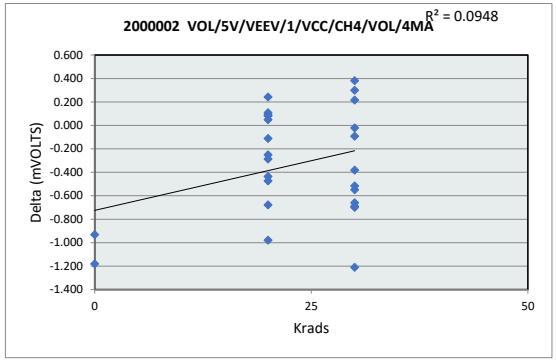
	2000001 VOL/5V/VEEV/1/VC		
Test Site			
Tester			
Test Number			
Max Limit	125	mVOLTS	
Min Limit	19.99999955	mVOLTS	
Krads	0	20	30
LL	20.000	20.000	20.000
Min	42.065	41.174	41.126
Average	42.111	41.669	41.714
Max	42.157	42.150	42.777
UL	125.000	125.000	125.000



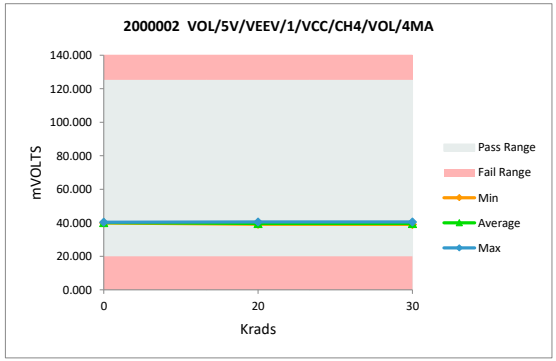
TID Report - HDR
TLV4H290MDYYTSEP

	2000002 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	39.152	40.332	-1.180	-3.01%	1.12%
0	2	38.957	39.888	-0.932	-2.39%	0.89%
20	3	39.127	39.414	-0.287	-0.73%	0.27%
20	4	39.243	39.716	-0.473	-1.21%	0.45%
20	5	39.680	39.792	-0.112	-0.28%	0.11%
20	6	39.424	39.375	0.049	0.12%	0.05%
20	7	39.143	39.821	-0.677	-1.73%	0.65%
20	8	39.259	39.695	-0.436	-1.11%	0.41%
20	9 U	39.493	39.250	0.243	0.62%	0.23%
20	10 U	39.595	39.845	-0.251	-0.63%	0.24%
20	11 U	39.285	39.178	0.108	0.27%	0.10%
20	12 U	39.568	39.487	0.081	0.21%	0.08%
20	13 U	39.253	39.164	0.090	0.23%	0.09%
20	14 U	39.463	40.442	-0.979	-2.48%	0.93%
30	15	39.344	39.128	0.216	0.55%	0.21%
30	16	39.269	39.291	-0.022	-0.06%	0.02%
30	17	39.369	39.751	-0.382	-0.97%	0.36%
30	18	39.271	39.821	-0.549	-1.40%	0.52%
30	19	39.109	39.625	-0.516	-1.32%	0.49%
30	20	39.326	40.025	-0.699	-1.78%	0.67%
30	21 U	39.346	39.046	0.300	0.76%	0.29%
30	22 U	39.444	40.133	-0.690	-1.75%	0.66%
30	23 U	39.024	39.684	-0.660	-1.69%	0.63%
30	24 U	39.294	40.504	-1.210	-3.08%	1.15%
30	25 U	39.197	39.288	-0.091	-0.23%	0.09%
30	26 U	39.566	39.185	0.381	0.96%	0.36%
	Max	39.680	40.504	0.381	0.96%	1.15%
	Average	39.316	39.649	-0.334	-0.85%	0.43%
	Min	38.957	39.046	-1.210	-3.08%	0.02%
	Std Dev	0.179	0.414	0.461	1.17%	0.33%



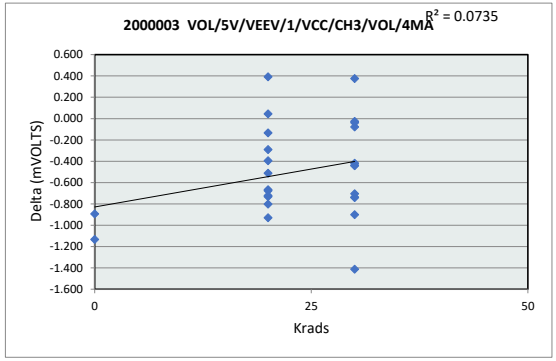
	2000002 VOL/5V/VEEV/1/VC		
Test Site			
Tester			
Test Number			
Max Limit	125	mVOLTS	
Min Limit	19.99999955	mVOLTS	
Krads	0	20	30
LL	20.000	20.000	20.000
Min	39.888	39.164	39.046
Average	40.110	39.598	39.623
Max	40.332	40.442	40.504
UL	125.000	125.000	125.000



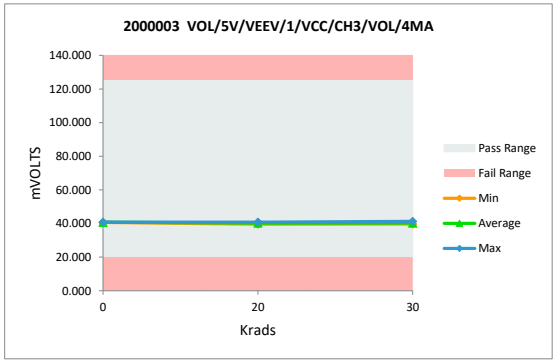
TID Report - HDR
TLV4H290MDYYTSEP

	2000003 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	39.737	40.631	-0.894	-2.25%	0.85%
0	2	39.717	40.851	-1.133	-2.85%	1.08%
20	3	39.575	40.377	-0.801	-2.02%	0.76%
20	4	39.573	40.503	-0.929	-2.35%	0.89%
20	5	39.815	40.481	-0.666	-1.67%	0.63%
20	6	39.755	39.888	-0.134	-0.34%	0.13%
20	7	39.611	40.334	-0.723	-1.83%	0.69%
20	8	39.824	40.501	-0.677	-1.70%	0.64%
20	9 U	39.961	39.569	0.392	0.98%	0.37%
20	10 U	40.023	40.535	-0.512	-1.28%	0.49%
20	11 U	39.577	39.867	-0.290	-0.73%	0.28%
20	12 U	39.742	40.137	-0.395	-0.99%	0.38%
20	13 U	39.799	39.755	0.044	0.11%	0.04%
20	14 U	40.048	40.780	-0.732	-1.83%	0.70%
30	15	39.714	39.739	-0.025	-0.06%	0.02%
30	16	39.639	40.078	-0.439	-1.11%	0.42%
30	17	39.641	40.382	-0.741	-1.87%	0.71%
30	18	39.954	40.373	-0.419	-1.05%	0.40%
30	19	39.655	40.393	-0.737	-1.86%	0.70%
30	20	39.872	40.577	-0.705	-1.77%	0.67%
30	21 U	39.735	39.775	-0.039	-0.10%	0.04%
30	22 U	39.677	40.119	-0.443	-1.12%	0.42%
30	23 U	39.589	40.490	-0.901	-2.28%	0.86%
30	24 U	39.860	41.272	-1.412	-3.54%	1.34%
30	25 U	40.035	40.114	-0.078	-0.20%	0.07%
30	26 U	40.092	39.718	0.375	0.93%	0.36%
	Max	40.092	41.272	0.392	0.98%	1.34%
	Average	39.778	40.278	-0.501	-1.26%	0.54%
	Min	39.573	39.569	-1.412	-3.54%	0.02%
	Std Dev	0.161	0.407	0.439	1.10%	0.34%



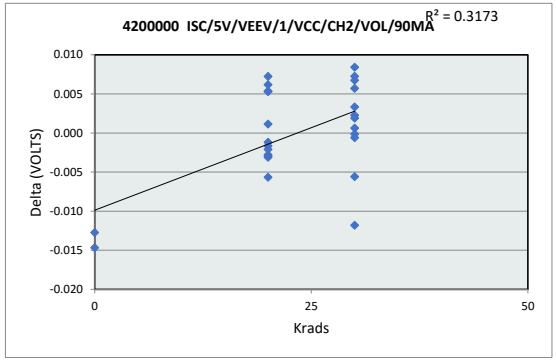
	2000003 VOL/5V/VEEV/1/VC		
Test Site			
Tester			
Test Number			
Max Limit	125	mVOLTS	
Min Limit	19.99999955	mVOLTS	
Krads	0	20	30
LL	20.000	20.000	20.000
Min	40.631	39.569	39.718
Average	40.741	40.227	40.252
Max	40.851	40.780	41.272
UL	125.000	125.000	125.000



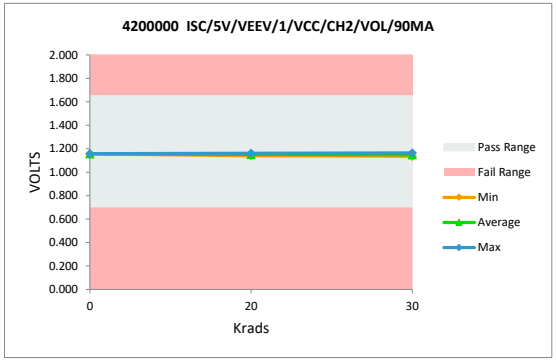
TID Report - HDR
TLV4H290MDYYTSEP

	4200000 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	1.141	1.155	-0.015	-1.29%	1.54%
0	2	1.145	1.158	-0.013	-1.11%	1.34%
20	3	1.151	1.154	-0.003	-0.26%	0.31%
20	4	1.146	1.151	-0.006	-0.49%	0.60%
20	5	1.153	1.156	-0.003	-0.27%	0.33%
20	6	1.148	1.150	-0.002	-0.14%	0.17%
20	7	1.153	1.154	-0.001	-0.10%	0.12%
20	8	1.151	1.154	-0.002	-0.18%	0.22%
20	9 U	1.148	1.141	0.007	0.63%	0.76%
20	10 U	1.156	1.155	0.001	0.10%	0.12%
20	11 U	1.146	1.140	0.006	0.54%	0.65%
20	12 U	1.154	1.149	0.005	0.46%	0.56%
20	13 U	1.150	1.144	0.005	0.46%	0.56%
20	14 U	1.159	1.162	-0.003	-0.24%	0.29%
30	15	1.146	1.141	0.006	0.50%	0.60%
30	16	1.149	1.146	0.003	0.29%	0.35%
30	17	1.139	1.139	0.000	-0.01%	0.01%
30	18	1.156	1.156	0.001	0.05%	0.07%
30	19	1.152	1.150	0.002	0.20%	0.24%
30	20	1.152	1.157	-0.006	-0.48%	0.59%
30	21 U	1.143	1.136	0.007	0.59%	0.71%
30	22 U	1.151	1.149	0.002	0.17%	0.20%
30	23 U	1.151	1.151	-0.001	-0.05%	0.06%
30	24 U	1.152	1.164	-0.012	-1.02%	1.24%
30	25 U	1.160	1.153	0.007	0.63%	0.76%
30	26 U	1.154	1.145	0.008	0.73%	0.89%
	Max	1.160	1.164	0.008	0.73%	1.54%
	Average	1.150	1.150	0.000	-0.01%	0.51%
	Min	1.139	1.136	-0.015	-1.29%	0.01%
	Std Dev	0.005	0.007	0.006	0.55%	0.40%



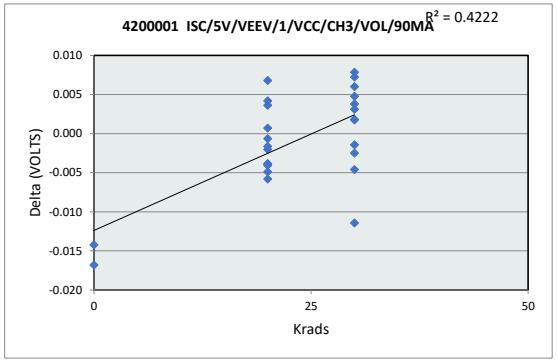
	4200000 ISC/5V/VEEV/1/VCC		
Test Site			
Tester			
Test Number			
Max Limit	1.649999976	VOLTS	
Min Limit	0.699999988	VOLTS	
Krads	0	20	30
LL	0.700	0.700	0.700
Min	1.155	1.140	1.136
Average	1.156	1.151	1.149
Max	1.158	1.162	1.164
UL	1.650	1.650	1.650



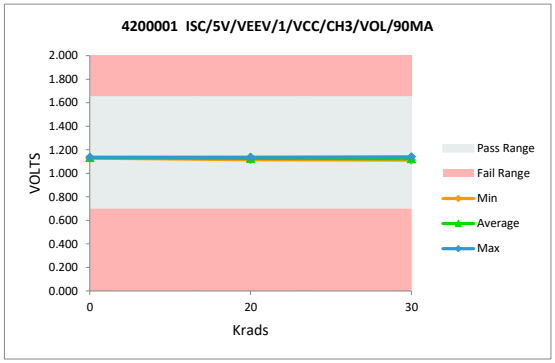
TID Report - HDR
TLV4H290MDYYTSEP

	4200001 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	1.115	1.129	-0.014	-1.28%	1.50%
0	2	1.120	1.137	-0.017	-1.50%	1.77%
20	3	1.126	1.132	-0.006	-0.52%	0.61%
20	4	1.120	1.124	-0.005	-0.44%	0.51%
20	5	1.125	1.127	-0.002	-0.18%	0.21%
20	6	1.118	1.119	-0.002	-0.15%	0.17%
20	7	1.124	1.128	-0.004	-0.36%	0.43%
20	8	1.129	1.133	-0.004	-0.34%	0.40%
20	9 U	1.123	1.116	0.007	0.60%	0.71%
20	10 U	1.130	1.130	-0.001	-0.06%	0.07%
20	11 U	1.123	1.119	0.004	0.32%	0.38%
20	12 U	1.130	1.130	0.001	0.06%	0.07%
20	13 U	1.125	1.121	0.004	0.37%	0.44%
20	14 U	1.133	1.137	-0.004	-0.35%	0.41%
30	15	1.122	1.115	0.007	0.64%	0.76%
30	16	1.123	1.118	0.005	0.43%	0.50%
30	17	1.115	1.112	0.003	0.28%	0.33%
30	18	1.130	1.128	0.002	0.16%	0.19%
30	19	1.122	1.120	0.002	0.16%	0.18%
30	20	1.129	1.133	-0.005	-0.41%	0.48%
30	21 U	1.122	1.118	0.004	0.34%	0.40%
30	22 U	1.123	1.125	-0.002	-0.22%	0.26%
30	23 U	1.125	1.126	-0.001	-0.13%	0.15%
30	24 U	1.128	1.140	-0.011	-1.01%	1.20%
30	25 U	1.134	1.128	0.006	0.53%	0.63%
30	26 U	1.130	1.122	0.008	0.70%	0.83%
	Max	1.134	1.140	0.008	0.70%	1.77%
	Average	1.125	1.126	-0.001	-0.09%	0.52%
	Min	1.115	1.112	-0.017	-1.50%	0.07%
	Std Dev	0.005	0.007	0.006	0.57%	0.42%



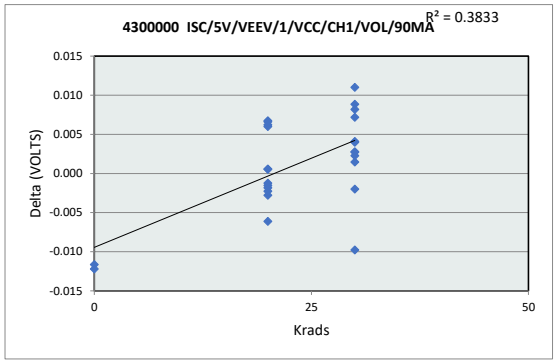
	4200001 ISC/5V/VEEV/1/VCC		
Test Site			
Tester			
Test Number			
Max Limit	1.649999976	VOLTS	
Min Limit	0.699999988	VOLTS	
Krads	0	20	30
LL	0.700	0.700	0.700
Min	1.129	1.116	1.112
Average	1.133	1.126	1.124
Max	1.137	1.137	1.140
UL	1.650	1.650	1.650



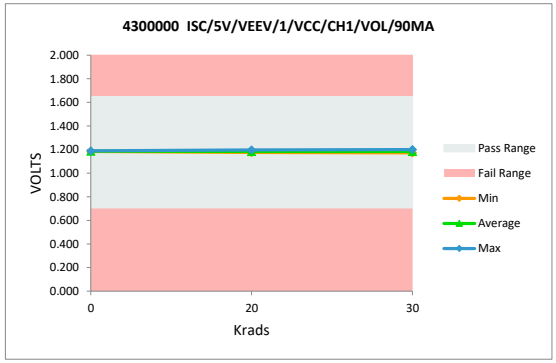
TID Report - HDR
TLV4H290MDYYTSEP

	4300000 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	1.173	1.184	-0.012	-0.99%	1.22%
0	2	1.177	1.190	-0.012	-1.04%	1.29%
20	3	1.182	1.184	-0.002	-0.15%	0.19%
20	4	1.181	1.187	-0.006	-0.52%	0.64%
20	5	1.186	1.189	-0.003	-0.23%	0.29%
20	6	1.177	1.176	0.001	0.05%	0.06%
20	7	1.180	1.182	-0.002	-0.19%	0.24%
20	8	1.187	1.188	-0.001	-0.10%	0.13%
20	9 U	1.185	1.179	0.007	0.57%	0.71%
20	10 U	1.189	1.188	0.001	0.05%	0.06%
20	11 U	1.184	1.178	0.007	0.56%	0.70%
20	12 U	1.192	1.186	0.006	0.50%	0.63%
20	13 U	1.181	1.175	0.006	0.53%	0.66%
20	14 U	1.195	1.197	-0.002	-0.13%	0.16%
30	15	1.186	1.178	0.007	0.61%	0.76%
30	16	1.186	1.182	0.004	0.35%	0.43%
30	17	1.175	1.173	0.002	0.19%	0.24%
30	18	1.194	1.191	0.003	0.23%	0.29%
30	19	1.187	1.184	0.003	0.23%	0.29%
30	20	1.188	1.190	-0.002	-0.17%	0.21%
30	21 U	1.181	1.172	0.009	0.75%	0.93%
30	22 U	1.187	1.183	0.004	0.34%	0.42%
30	23 U	1.187	1.186	0.001	0.12%	0.16%
30	24 U	1.190	1.200	-0.010	-0.82%	1.03%
30	25 U	1.191	1.183	0.008	0.69%	0.86%
30	26 U	1.197	1.186	0.011	0.92%	1.16%
	Max	1.197	1.200	0.011	0.92%	1.29%
	Average	1.185	1.184	0.001	0.09%	0.53%
	Min	1.173	1.172	-0.012	-1.04%	0.06%
	Std Dev	0.006	0.007	0.006	0.52%	0.38%



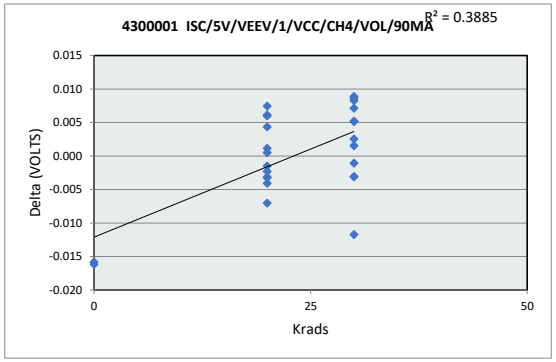
	4300000 ISC/5V/VEEV/1/VCC		
Test Site			
Tester			
Test Number			
Max Limit	1.649999976	VOLTS	
Min Limit	0.699999988	VOLTS	
Krads	0	20	30
LL	0.700	0.700	0.700
Min	1.184	1.175	1.172
Average	1.187	1.184	1.184
Max	1.190	1.197	1.200
UL	1.650	1.650	1.650



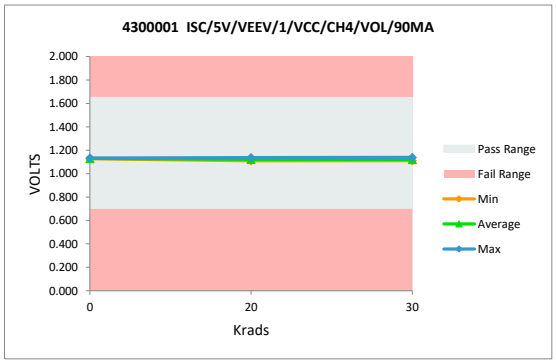
TID Report - HDR
TLV4H290MDYYTSEP

	4300001 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	1.117	1.133	-0.016	-1.45%	1.70%
0	2	1.112	1.127	-0.016	-1.42%	1.67%
20	3	1.120	1.123	-0.003	-0.28%	0.33%
20	4	1.119	1.123	-0.004	-0.36%	0.43%
20	5	1.128	1.129	-0.002	-0.13%	0.16%
20	6	1.119	1.118	0.000	0.04%	0.05%
20	7	1.116	1.119	-0.003	-0.29%	0.34%
20	8	1.124	1.126	-0.002	-0.20%	0.24%
20	9 U	1.126	1.118	0.007	0.66%	0.78%
20	10 U	1.131	1.130	0.001	0.10%	0.12%
20	11 U	1.118	1.112	0.006	0.53%	0.63%
20	12 U	1.126	1.122	0.004	0.39%	0.46%
20	13 U	1.116	1.110	0.006	0.55%	0.65%
20	14 U	1.130	1.137	-0.007	-0.62%	0.74%
30	15	1.117	1.110	0.007	0.64%	0.75%
30	16	1.121	1.116	0.005	0.46%	0.54%
30	17	1.118	1.113	0.005	0.46%	0.55%
30	18	1.127	1.125	0.002	0.14%	0.16%
30	19	1.120	1.117	0.003	0.23%	0.27%
30	20	1.123	1.126	-0.003	-0.28%	0.33%
30	21 U	1.123	1.114	0.009	0.79%	0.93%
30	22 U	1.129	1.132	-0.003	-0.27%	0.32%
30	23 U	1.121	1.122	-0.001	-0.09%	0.11%
30	24 U	1.127	1.139	-0.012	-1.04%	1.23%
30	25 U	1.128	1.119	0.009	0.77%	0.91%
30	26 U	1.129	1.120	0.008	0.73%	0.87%
	Max	1.131	1.139	0.009	0.79%	1.70%
	Average	1.122	1.122	0.000	0.00%	0.59%
	Min	1.112	1.110	-0.016	-1.45%	0.05%
	Std Dev	0.005	0.008	0.007	0.63%	0.44%



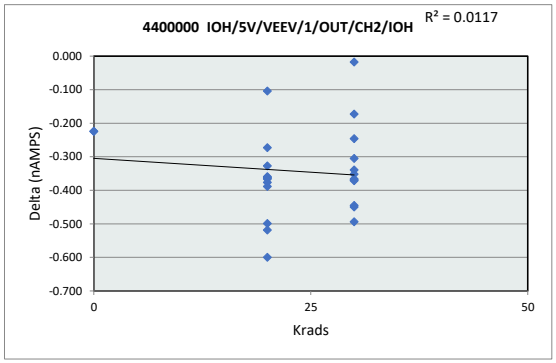
	4300001 ISC/5V/VEEV/1/VCC		
Test Site			
Tester			
Test Number			
Max Limit	1.649999976	VOLTS	
Min Limit	0.699999988	VOLTS	
Krads	0	20	30
LL	0.700	0.700	0.700
Min	1.127	1.110	1.110
Average	1.130	1.122	1.121
Max	1.133	1.137	1.139
UL	1.650	1.650	1.650



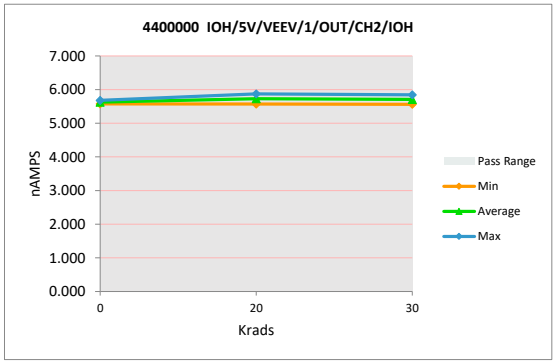
TID Report - HDR
TLV4H290MDYYTSEP

	4400000 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	50.00000058	50.00000058
Min Limit	-50.00000058	-50.00000058

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	5.351	5.575	-0.224	-4.19%	0.22%
0	2	5.457	5.681	-0.224	-4.11%	0.22%
20	3	5.415	5.774	-0.359	-6.63%	0.36%
20	4	5.412	5.774	-0.362	-6.68%	0.36%
20	5	5.223	5.722	-0.499	-9.55%	0.50%
20	6	5.390	5.664	-0.273	-5.07%	0.27%
20	7	5.331	5.659	-0.327	-6.14%	0.33%
20	8	5.469	5.573	-0.104	-1.90%	0.10%
20	9 U	5.346	5.735	-0.389	-7.27%	0.39%
20	10 U	5.307	5.683	-0.376	-7.09%	0.38%
20	11 U	5.371	5.737	-0.366	-6.82%	0.37%
20	12 U	5.273	5.872	-0.600	-11.37%	0.60%
20	13 U	5.329	5.848	-0.519	-9.73%	0.52%
20	14 U	5.341	5.705	-0.364	-6.81%	0.36%
30	15	5.430	5.602	-0.172	-3.18%	0.17%
30	16	5.307	5.673	-0.366	-6.90%	0.37%
30	17	5.368	5.737	-0.369	-6.87%	0.37%
30	18	5.474	5.779	-0.305	-5.57%	0.31%
30	19	5.319	5.769	-0.450	-8.46%	0.45%
30	20	5.349	5.843	-0.494	-9.24%	0.49%
30	21 U	5.354	5.725	-0.371	-6.94%	0.37%
30	22 U	5.363	5.703	-0.339	-6.33%	0.34%
30	23 U	5.545	5.563	-0.018	-0.32%	0.02%
30	24 U	5.388	5.740	-0.352	-6.53%	0.35%
30	25 U	5.287	5.732	-0.445	-8.42%	0.44%
30	26 U	5.383	5.629	-0.246	-4.57%	0.25%
	Max	5.545	5.872	-0.018	-0.32%	0.60%
	Average	5.369	5.711	-0.343	-6.41%	0.34%
	Min	5.223	5.563	-0.600	-11.37%	0.02%
	Std Dev	0.070	0.082	0.128	2.44%	0.13%



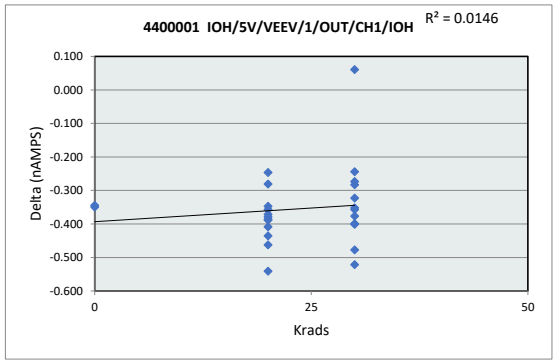
	4400000 IOH/5V/VEEV/1/OU		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	5.575	5.573	5.563
Average	5.628	5.729	5.708
Max	5.681	5.872	5.843
UL			



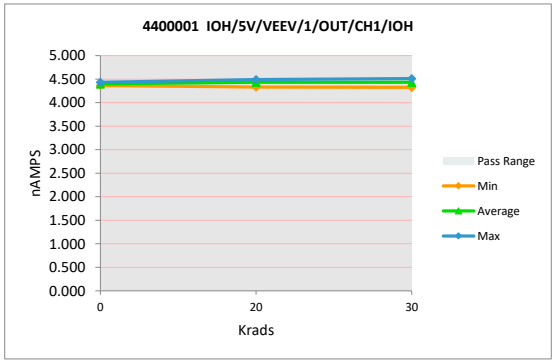
TID Report - HDR
TLV4H290MDYYTSEP

	4400001 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	50.00000058	50.00000058
Min Limit	-50.00000058	-50.00000058

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	4.085	4.434	-0.349	-8.56%	0.35%
0	2	4.021	4.365	-0.345	-8.57%	0.34%
20	3	4.080	4.466	-0.386	-9.47%	0.39%
20	4	4.048	4.419	-0.372	-9.18%	0.37%
20	5	4.058	4.414	-0.357	-8.79%	0.36%
20	6	3.989	4.451	-0.462	-11.59%	0.46%
20	7	4.131	4.412	-0.281	-6.80%	0.28%
20	8	4.058	4.493	-0.435	-10.73%	0.44%
20	9 U	3.952	4.331	-0.379	-9.59%	0.38%
20	10 U	4.023	4.432	-0.408	-10.15%	0.41%
20	11 U	4.104	4.351	-0.246	-6.00%	0.25%
20	12 U	4.077	4.466	-0.389	-9.54%	0.39%
20	13 U	3.940	4.481	-0.541	-13.73%	0.54%
20	14 U	4.136	4.483	-0.347	-8.39%	0.35%
30	15	4.136	4.513	-0.377	-9.10%	0.38%
30	16	4.075	4.348	-0.273	-6.71%	0.27%
30	17	4.043	4.326	-0.283	-7.00%	0.28%
30	18	4.136	4.459	-0.323	-7.80%	0.32%
30	19	4.036	4.392	-0.357	-8.84%	0.36%
30	20	4.141	4.385	-0.244	-5.89%	0.24%
30	21 U	4.099	4.498	-0.399	-9.72%	0.40%
30	22 U	4.001	4.478	-0.477	-11.92%	0.48%
30	23 U	4.467	4.407	0.060	1.35%	0.06%
30	24 U	4.129	4.481	-0.352	-8.52%	0.35%
30	25 U	4.036	4.437	-0.401	-9.94%	0.40%
30	26 U	3.959	4.481	-0.521	-13.17%	0.52%
	Max	4.467	4.513	0.060	1.35%	0.54%
	Average	4.075	4.431	-0.356	-8.78%	0.36%
	Min	3.940	4.326	-0.541	-13.73%	0.06%
	Std Dev	0.100	0.055	0.113	2.85%	0.10%



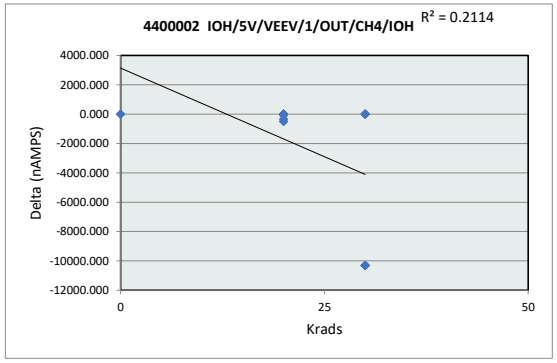
	4400001 IOH/5V/VEEV/1/OU		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	4.365	4.331	4.326
Average	4.400	4.433	4.434
Max	4.434	4.493	4.513
UL			



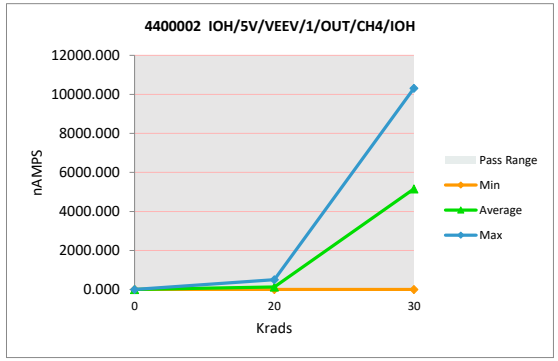
TID Report - HDR
TLV4H290MDYYTSEP

	4400002 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	50.00000058	50.00000058
Min Limit	-50.00000058	-50.00000058

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	3.662	1.983	1.678	45.83%	1.68%
0	2	3.224	1.708	1.515	47.01%	1.52%
20	3	3.115	42.571	-39.456	-1266.56%	39.46%
20	4	2.987	505.800	-502.813	-16832.18%	502.81%
20	5	2.820	50.643	-47.823	-1695.96%	47.82%
20	6	3.674	71.766	-68.092	-1853.38%	68.09%
20	7	3.019	346.069	-343.050	-11362.24%	343.05%
20	8	3.046	501.988	-498.942	-16378.68%	498.94%
20	9 U	3.263	1.865	1.398	42.83%	1.40%
20	10 U	2.950	1.733	1.218	41.27%	1.22%
20	11 U	3.519	1.455	2.064	58.65%	2.06%
20	12 U	3.455	1.652	1.803	52.20%	1.80%
20	13 U	2.948	2.010	0.937	31.80%	0.94%
20	14 U	3.366	1.865	1.501	44.59%	1.50%
30	15	3.738	10310.169	-10306.431	-275723.23%	10306.43%
30	16	3.521	10310.169	-10306.648	-292690.02%	10306.65%
30	17	2.985	10310.169	-10307.184	-345328.19%	10307.18%
30	18	3.113	10310.169	-10307.056	-331124.13%	10307.06%
30	19	3.118	10310.169	-10307.051	-330601.12%	10307.05%
30	20	3.396	10310.169	-10306.773	-303513.77%	10306.77%
30	21 U	3.502	2.055	1.447	41.32%	1.45%
30	22 U	2.977	1.991	0.987	33.14%	0.99%
30	23 U	3.529	1.671	1.858	52.64%	1.86%
30	24 U	2.815	1.892	0.922	32.77%	0.92%
30	25 U	2.977	1.959	1.019	34.21%	1.02%
30	26 U	2.987	2.010	0.977	32.70%	0.98%
	Max	3.738	10310.169	2.064	58.65%	10307.18%
	Average	3.219	2438.681	-2435.461	-74145.33%	2436.95%
	Min	2.815	1.455	-10307.184	-345328.19%	0.92%
	Std Dev	0.282	4399.129	4399.080	134127.71%	4398.22%



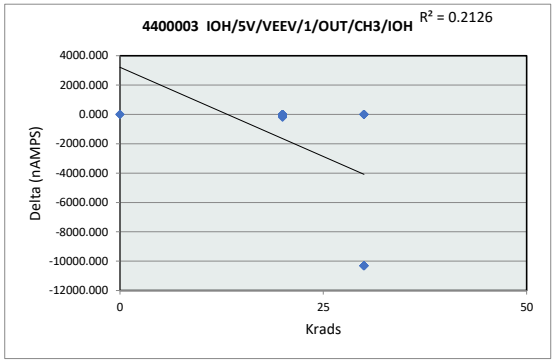
	4400002 IOH/5V/VEEV/1/OU		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	1.708	1.455	1.671
Average	1.846	127.452	5156.049
Max	1.983	505.800	10310.169
UL			



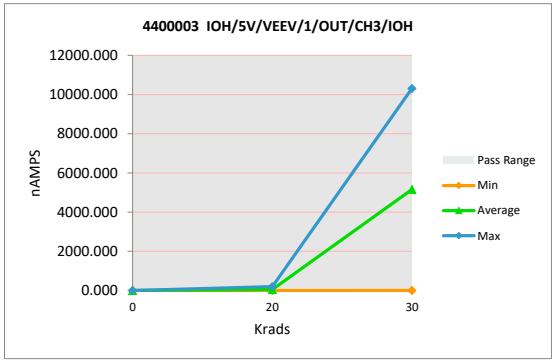
TID Report - HDR
TLV4H290MDYYTSEP

	4400003 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	50.00000058	50.00000058
Min Limit	-50.00000058	-50.00000058

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	2.999	1.500	1.499	49.99%	1.50%
0	2	2.430	1.426	1.003	41.29%	1.00%
20	3	2.388	136.396	-134.008	-5611.81%	134.01%
20	4	2.661	202.903	-200.242	-7526.31%	200.24%
20	5	2.474	104.379	-101.906	-4119.20%	101.91%
20	6	2.778	9.410	-6.632	-238.68%	6.63%
20	7	2.381	51.888	-49.507	-2079.62%	49.51%
20	8	2.611	76.257	-73.645	-2820.10%	73.65%
20	9 U	2.567	1.417	1.151	44.82%	1.15%
20	10 U	2.494	1.525	0.969	38.85%	0.97%
20	11 U	2.771	1.235	1.536	55.44%	1.54%
20	12 U	2.749	1.372	1.377	50.08%	1.38%
20	13 U	2.442	1.458	0.984	40.28%	0.98%
20	14 U	2.648	1.547	1.101	41.59%	1.10%
30	15	2.835	10309.225	-10306.390	-363549.00%	10306.39%
30	16	2.801	10309.225	-10306.424	-368013.60%	10306.42%
30	17	2.496	10309.225	-10306.729	-412926.63%	10306.73%
30	18	2.523	10309.225	-10306.702	-408504.18%	10306.70%
30	19	2.766	10309.225	-10306.458	-372589.19%	10306.46%
30	20	2.887	10309.225	-10306.338	-357051.51%	10306.34%
30	21 U	2.823	1.370	1.453	51.47%	1.45%
30	22 U	2.449	1.407	1.043	42.57%	1.04%
30	23 U	2.918	1.289	1.630	55.84%	1.63%
30	24 U	2.521	1.424	1.097	43.51%	1.10%
30	25 U	2.368	1.306	1.062	44.86%	1.06%
30	26 U	2.692	1.404	1.288	47.84%	1.29%
	Max	2.999	10309.225	1.630	55.84%	10306.73%
	Average	2.634	2402.164	-2399.530	-88630.05%	2400.85%
	Min	2.368	1.235	-10306.729	-412926.63%	0.97%
	Std Dev	0.185	4416.921	4416.874	163361.49%	4416.13%



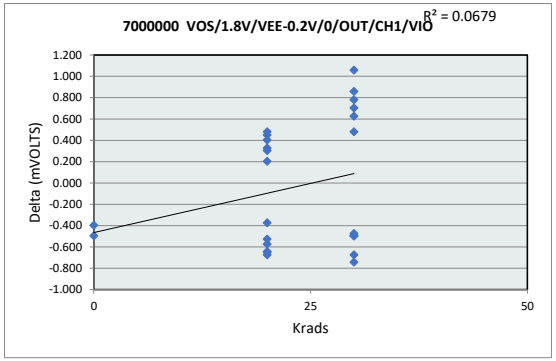
	4400003 IOH/5V/VEEV/1/OU		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	1.426	1.235	1.289
Average	1.463	49.149	5155.296
Max	1.500	202.903	10309.225
UL			



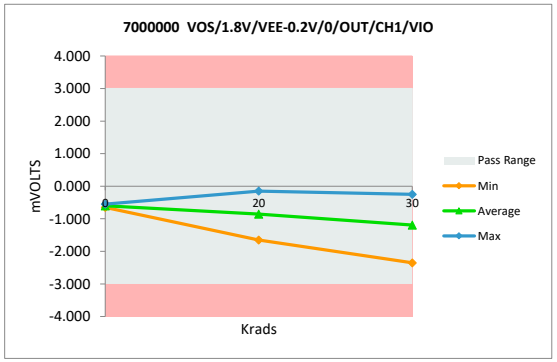
TID Report - HDR
TLV4H290MDYYTSEP

	7000000 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-1.046	-0.550	-0.496	47.44%	8.27%
0	2	-1.046	-0.650	-0.396	37.88%	6.61%
20	3	-1.046	-1.250	0.204	-19.46%	3.39%
20	4	-0.923	-1.250	0.327	-35.39%	5.45%
20	5	-1.046	-1.350	0.304	-29.02%	5.06%
20	6	-0.800	-1.250	0.450	-56.22%	7.50%
20	7	-1.046	-1.450	0.404	-38.57%	6.73%
20	8	-1.169	-1.650	0.481	-41.09%	8.01%
20	9 U	-0.923	-0.250	-0.673	72.92%	11.22%
20	10 U	-0.800	-0.150	-0.650	81.25%	10.84%
20	11 U	-0.677	-0.150	-0.527	77.85%	8.78%
20	12 U	-0.923	-0.550	-0.373	40.43%	6.22%
20	13 U	-1.293	-0.650	-0.643	49.71%	10.71%
20	14 U	-0.923	-0.350	-0.573	62.09%	9.55%
30	15	-1.169	-1.950	0.781	-66.74%	13.01%
30	16	-1.169	-1.650	0.481	-41.09%	8.01%
30	17	-1.293	-2.151	0.858	-66.41%	14.31%
30	18	-0.923	-1.550	0.627	-67.88%	10.45%
30	19	-1.293	-2.351	1.058	-81.89%	17.64%
30	20	-1.046	-1.750	0.704	-67.25%	11.73%
30	21 U	-1.293	-0.550	-0.743	57.45%	12.38%
30	22 U	-0.923	-0.450	-0.473	51.26%	7.89%
30	23 U	-1.046	-0.550	-0.496	47.44%	8.27%
30	24 U	-0.923	-0.250	-0.673	72.92%	11.22%
30	25 U	-1.046	-0.550	-0.496	47.44%	8.27%
30	26 U	-1.046	-0.550	-0.496	47.44%	8.27%
	Max	-0.677	-0.150	1.058	81.25%	17.64%
	Average	-1.032	-0.992	-0.040	7.02%	9.22%
	Min	-1.293	-2.351	-0.743	-81.89%	3.39%
	Std Dev	0.161	0.664	0.593	57.11%	3.10%



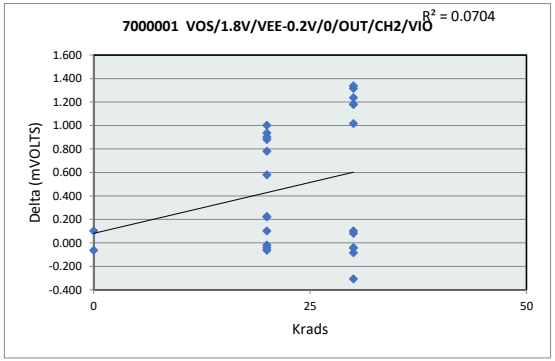
	7000000 VOS/1.8V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.650	-1.650	-2.351
Average	-0.600	-0.858	-1.192
Max	-0.550	-0.150	-0.250
UL	3.000	3.000	3.000



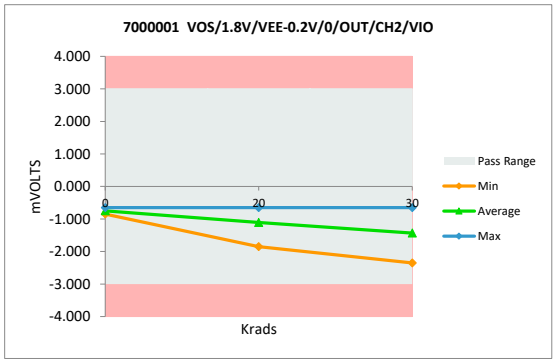
TID Report - HDR
TLV4H290MDYYTSEP

	7000001 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.548	-0.650	0.102	-18.66%	1.70%
0	2	-0.913	-0.850	-0.063	6.90%	1.05%
20	3	-0.913	-1.850	0.937	-102.63%	15.62%
20	4	-0.670	-1.550	0.880	-131.50%	14.67%
20	5	-0.670	-1.450	0.780	-116.57%	13.01%
20	6	-0.548	-1.450	0.902	-164.69%	15.04%
20	7	-0.670	-1.250	0.580	-86.70%	9.67%
20	8	-0.548	-1.550	1.002	-182.95%	16.70%
20	9 U	-0.426	-0.650	0.224	-52.56%	3.73%
20	10 U	-0.548	-0.650	0.102	-18.66%	1.70%
20	11 U	-0.670	-0.650	-0.020	2.92%	0.33%
20	12 U	-0.426	-0.650	0.224	-52.56%	3.73%
20	13 U	-0.791	-0.750	-0.041	5.22%	0.69%
20	14 U	-0.913	-0.850	-0.063	6.90%	1.05%
30	15	-0.670	-1.850	1.180	-176.31%	19.67%
30	16	-0.913	-2.251	1.338	-146.55%	22.30%
30	17	-1.035	-2.051	1.016	-98.21%	16.94%
30	18	-0.913	-2.151	1.238	-135.60%	20.63%
30	19	-1.035	-2.351	1.316	-127.21%	21.94%
30	20	-0.670	-1.850	1.180	-176.31%	19.67%
30	21 U	-1.035	-0.950	-0.085	8.19%	1.41%
30	22 U	-0.791	-0.750	-0.041	5.22%	0.69%
30	23 U	-1.156	-0.850	-0.306	26.50%	5.11%
30	24 U	-0.670	-0.750	0.080	-12.02%	1.34%
30	25 U	-0.548	-0.650	0.102	-18.66%	1.70%
30	26 U	-0.791	-0.750	-0.041	5.22%	0.69%
	Max	-0.426	-0.650	1.338	26.50%	22.30%
	Average	-0.749	-1.231	0.482	-67.36%	8.88%
	Min	-1.156	-2.351	-0.306	-182.95%	0.33%
	Std Dev	0.201	0.591	0.548	71.30%	8.28%



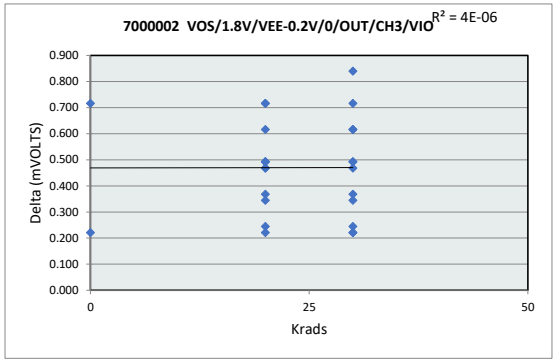
	7000001 VOS/1.8V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.850	-1.850	-2.351
Average	-0.750	-1.108	-1.434
Max	-0.650	-0.650	-0.650
UL	3.000	3.000	3.000



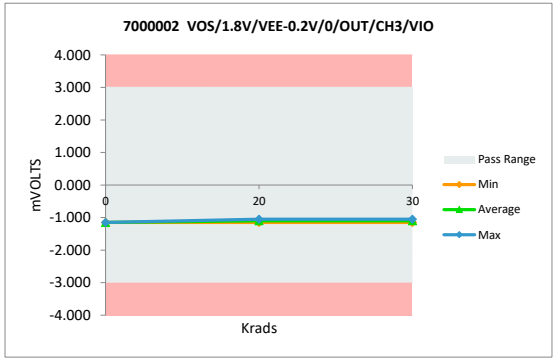
TID Report - HDR
TLV4H290MDYYTSEP

	7000002 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.929	-1.150	0.221	-23.73%	3.68%
0	2	-0.434	-1.150	0.716	-165.13%	11.94%
20	3	-0.558	-1.050	0.492	-88.28%	8.21%
20	4	-0.806	-1.050	0.244	-30.35%	4.07%
20	5	-0.682	-1.050	0.368	-54.05%	6.14%
20	6	-0.434	-1.050	0.616	-142.08%	10.27%
20	7	-0.558	-1.050	0.492	-88.28%	8.21%
20	8	-0.558	-1.050	0.492	-88.28%	8.21%
20	9 U	-0.434	-1.150	0.716	-165.13%	11.94%
20	10 U	-0.806	-1.150	0.344	-42.76%	5.74%
20	11 U	-0.682	-1.150	0.468	-68.72%	7.81%
20	12 U	-0.434	-1.150	0.716	-165.13%	11.94%
20	13 U	-0.682	-1.150	0.468	-68.72%	7.81%
20	14 U	-0.929	-1.150	0.221	-23.73%	3.68%
30	15	-0.682	-1.050	0.368	-54.05%	6.14%
30	16	-0.558	-1.050	0.492	-88.28%	8.21%
30	17	-0.434	-1.050	0.616	-142.08%	10.27%
30	18	-0.806	-1.050	0.244	-30.35%	4.07%
30	19	-0.434	-1.050	0.616	-142.08%	10.27%
30	20	-0.558	-1.050	0.492	-88.28%	8.21%
30	21 U	-0.929	-1.150	0.221	-23.73%	3.68%
30	22 U	-0.929	-1.150	0.221	-23.73%	3.68%
30	23 U	-0.682	-1.150	0.468	-68.72%	7.81%
30	24 U	-0.310	-1.150	0.840	-271.19%	14.00%
30	25 U	-0.806	-1.150	0.344	-42.76%	5.74%
30	26 U	-0.434	-1.150	0.716	-165.13%	11.94%
	Max	-0.310	-1.050	0.840	-23.73%	14.00%
	Average	-0.634	-1.104	0.470	-90.57%	7.83%
	Min	-0.929	-1.150	0.221	-271.19%	3.68%
	Std Dev	0.189	0.051	0.184	62.17%	3.07%



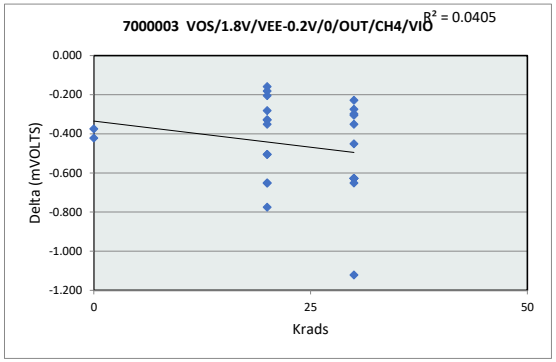
	7000002 VOS/1.8V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-1.150	-1.150	-1.150
Average	-1.150	-1.100	-1.100
Max	-1.150	-1.050	-1.050
UL	3.000	3.000	3.000



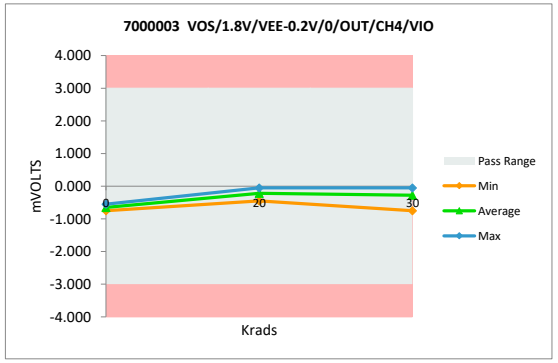
TID Report - HDR
TLV4H290MDYYTSEP

	7000003 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.925	-0.550	-0.375	40.53%	6.25%
0	2	-1.171	-0.750	-0.421	35.97%	7.02%
20	3	-0.308	-0.150	-0.158	51.34%	2.64%
20	4	-0.925	-0.150	-0.775	83.78%	12.91%
20	5	-0.801	-0.150	-0.651	81.28%	10.86%
20	6	-0.555	-0.050	-0.505	90.99%	8.41%
20	7	-0.555	-0.050	-0.505	90.99%	8.41%
20	8	-0.801	-0.150	-0.651	81.28%	10.86%
20	9 U	-0.678	-0.350	-0.328	48.39%	5.47%
20	10 U	-0.678	-0.350	-0.328	48.39%	5.47%
20	11 U	-0.432	-0.250	-0.182	42.07%	3.03%
20	12 U	-0.801	-0.450	-0.351	43.85%	5.86%
20	13 U	-0.555	-0.350	-0.205	36.92%	3.41%
20	14 U	-0.432	-0.150	-0.282	65.24%	4.69%
30	15	-0.801	-0.150	-0.651	81.28%	10.86%
30	16	-0.678	-0.050	-0.628	92.63%	10.47%
30	17	-0.678	-0.050	-0.628	92.63%	10.47%
30	18	-0.678	-0.050	-0.628	92.63%	10.47%
30	19	-1.171	-0.050	-1.121	95.73%	18.69%
30	20	-0.678	-0.050	-0.628	92.63%	10.47%
30	21 U	-0.801	-0.350	-0.451	56.33%	7.52%
30	22 U	-0.555	-0.250	-0.305	54.94%	5.08%
30	23 U	-1.048	-0.750	-0.298	28.44%	4.97%
30	24 U	-0.801	-0.450	-0.351	43.85%	5.86%
30	25 U	-0.678	-0.450	-0.228	33.64%	3.80%
30	26 U	-0.925	-0.650	-0.275	29.71%	4.58%
	Max	-0.308	-0.050	-0.158	95.73%	18.69%
	Average	-0.735	-0.277	-0.458	62.90%	7.64%
	Min	-1.171	-0.750	-1.121	28.44%	2.64%
	Std Dev	0.213	0.222	0.222	24.09%	3.70%



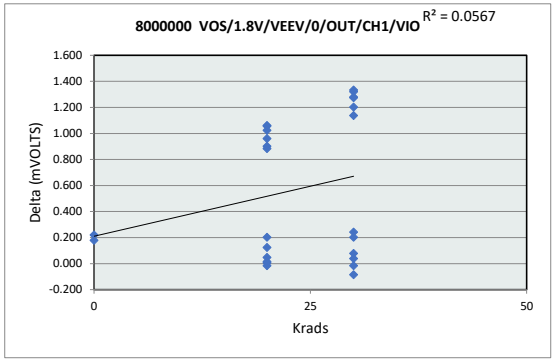
	7000003 VOS/1.8V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.750	-0.450	-0.750
Average	-0.650	-0.217	-0.275
Max	-0.550	-0.050	-0.050
UL	3.000	3.000	3.000



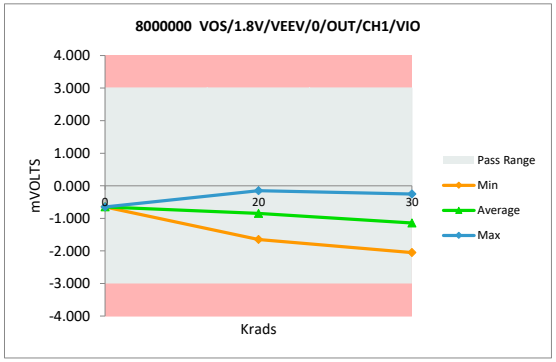
TID Report - HDR
TLV4H290MDYYTSEP

	8000000 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.430	-0.650	0.220	-51.27%	3.67%
0	2	-0.471	-0.650	0.179	-38.11%	2.99%
20	3	-0.348	-1.250	0.902	-259.34%	15.04%
20	4	-0.266	-1.150	0.884	-332.32%	14.73%
20	5	-0.389	-1.350	0.961	-247.24%	16.02%
20	6	-0.225	-1.250	1.025	-455.35%	17.08%
20	7	-0.389	-1.450	1.061	-272.96%	17.69%
20	8	-0.593	-1.650	1.057	-178.06%	17.61%
20	9 U	-0.266	-0.250	-0.016	6.02%	0.27%
20	10 U	-0.102	-0.150	0.048	-46.61%	0.79%
20	11 U	-0.143	-0.150	0.007	-4.72%	0.11%
20	12 U	-0.348	-0.550	0.202	-58.11%	3.37%
20	13 U	-0.634	-0.650	0.016	-2.47%	0.26%
20	14 U	-0.225	-0.350	0.125	-55.50%	2.08%
30	15	-0.471	-1.750	1.279	-271.84%	21.32%
30	16	-0.512	-1.650	1.138	-222.55%	18.97%
30	17	-0.716	-2.051	1.335	-186.38%	22.25%
30	18	-0.348	-1.550	1.202	-345.58%	20.04%
30	19	-0.675	-1.950	1.275	-188.78%	21.25%
30	20	-0.430	-1.750	1.320	-307.25%	22.00%
30	21 U	-0.634	-0.550	-0.084	13.29%	1.41%
30	22 U	-0.307	-0.550	0.243	-79.19%	4.05%
30	23 U	-0.512	-0.550	0.038	-7.52%	0.64%
30	24 U	-0.266	-0.250	-0.016	6.02%	0.27%
30	25 U	-0.471	-0.550	0.079	-16.86%	1.32%
30	26 U	-0.348	-0.550	0.202	-58.11%	3.37%
	Max	-0.102	-0.150	1.335	13.29%	22.25%
	Average	-0.405	-0.969	0.565	-140.80%	9.56%
	Min	-0.716	-2.051	-0.084	-455.35%	0.11%
	Std Dev	0.162	0.610	0.540	136.75%	8.84%



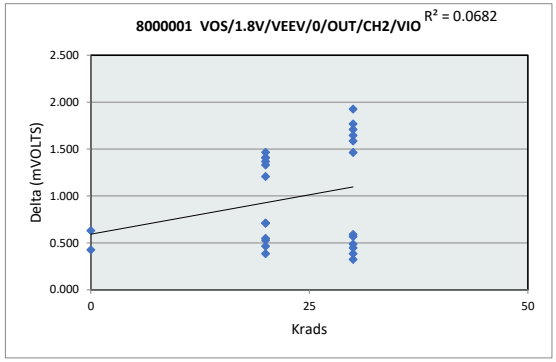
	8000000 VOS/1.8V/VEEV/0/C		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.650	-1.650	-2.051
Average	-0.650	-0.850	-1.142
Max	-0.650	-0.150	-0.250
UL	3.000	3.000	3.000



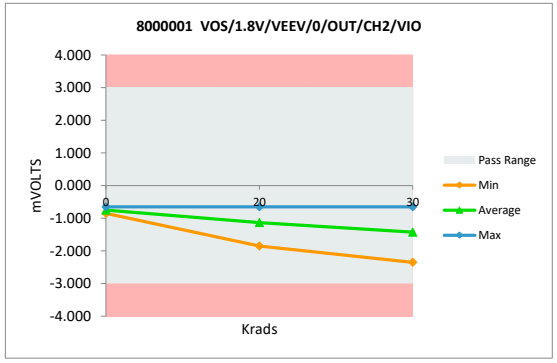
TID Report - HDR
TLV4H290MDYYTSEP

	8000001 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.020	-0.650	0.630	-3112.24%	10.50%
0	2	-0.425	-0.850	0.425	-100.03%	7.08%
20	3	-0.384	-1.850	1.466	-381.19%	24.43%
20	4	-0.182	-1.550	1.368	-751.12%	22.80%
20	5	-0.142	-1.550	1.408	-994.30%	23.47%
20	6	-0.020	-1.350	1.330	-6571.58%	22.16%
20	7	-0.142	-1.350	1.208	-853.10%	20.14%
20	8	-0.142	-1.550	1.408	-994.30%	23.47%
20	9 U	0.061	-0.650	0.711	1170.76%	11.85%
20	10 U	-0.101	-0.650	0.549	-542.45%	9.15%
20	11 U	-0.223	-0.750	0.527	-236.95%	8.79%
20	12 U	0.061	-0.650	0.711	1170.76%	11.85%
20	13 U	-0.384	-0.850	0.466	-121.09%	7.76%
20	14 U	-0.465	-0.850	0.385	-82.64%	6.41%
30	15	-0.182	-1.950	1.768	-970.76%	29.46%
30	16	-0.425	-2.351	1.926	-453.27%	32.10%
30	17	-0.506	-2.151	1.645	-325.21%	27.42%
30	18	-0.465	-2.051	1.586	-340.70%	26.43%
30	19	-0.587	-2.051	1.464	-249.52%	24.40%
30	20	-0.142	-1.850	1.708	-1206.09%	28.47%
30	21 U	-0.465	-0.850	0.385	-82.64%	6.41%
30	22 U	-0.182	-0.750	0.568	-311.83%	9.46%
30	23 U	-0.627	-0.950	0.323	-51.45%	5.38%
30	24 U	-0.263	-0.750	0.487	-185.11%	8.12%
30	25 U	-0.061	-0.650	0.589	-970.76%	9.82%
30	26 U	-0.304	-0.750	0.446	-147.10%	7.44%
	Max	0.061	-0.650	1.926	1170.76%	32.10%
	Average	-0.258	-1.239	0.980	-680.53%	16.34%
	Min	-0.627	-2.351	0.323	-6571.58%	5.38%
	Std Dev	0.198	0.577	0.538	1433.31%	8.97%



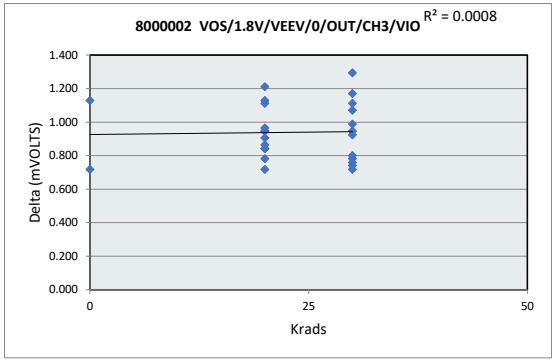
	8000001 VOS/1.8V/VEEV/0/C		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.850	-1.850	-2.351
Average	-0.750	-1.133	-1.425
Max	-0.650	-0.650	-0.650
UL	3.000	3.000	3.000



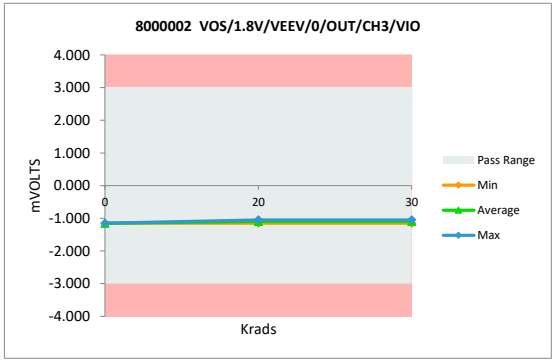
TID Report - HDR
TLV4H290MDYYTSEP

	8000002 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.433	-1.150	0.717	-165.84%	11.96%
0	2	-0.021	-1.150	1.129	-5482.63%	18.82%
20	3	-0.144	-1.050	0.906	-628.18%	15.10%
20	4	-0.268	-1.050	0.782	-292.10%	13.04%
20	5	-0.185	-1.050	0.865	-466.36%	14.41%
20	6	0.062	-1.050	1.112	1799.09%	18.53%
20	7	-0.103	-1.050	0.947	-919.45%	15.78%
20	8	-0.103	-1.050	0.947	-919.45%	15.78%
20	9 U	0.062	-1.150	1.212	1960.91%	20.20%
20	10 U	-0.309	-1.150	0.841	-272.18%	14.02%
20	11 U	-0.185	-1.150	0.965	-520.30%	16.08%
20	12 U	-0.021	-1.150	1.129	-5482.63%	18.82%
20	13 U	-0.309	-1.150	0.841	-272.18%	14.02%
20	14 U	-0.433	-1.150	0.717	-165.84%	11.96%
30	15	-0.268	-1.050	0.782	-292.10%	13.04%
30	16	-0.103	-1.050	0.947	-919.45%	15.78%
30	17	0.021	-1.050	1.071	5197.19%	17.84%
30	18	-0.309	-1.050	0.741	-239.82%	12.35%
30	19	0.062	-1.050	1.112	1799.09%	18.53%
30	20	-0.062	-1.050	0.988	-1599.09%	16.47%
30	21 U	-0.391	-1.150	0.759	-193.83%	12.64%
30	22 U	-0.433	-1.150	0.717	-165.84%	11.96%
30	23 U	-0.227	-1.150	0.923	-407.52%	15.39%
30	24 U	0.144	-1.150	1.294	897.53%	21.57%
30	25 U	-0.350	-1.150	0.800	-228.40%	13.33%
30	26 U	0.021	-1.150	1.171	5682.63%	19.51%
	Max	0.144	-1.050	1.294	5682.63%	21.57%
	Average	-0.165	-1.104	0.939	-88.34%	15.65%
	Min	-0.433	-1.150	0.717	-5482.63%	11.96%
	Std Dev	0.176	0.051	0.170	2341.23%	2.83%



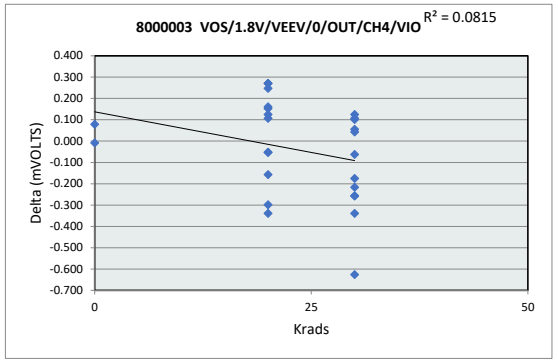
	8000002 VOS/1.8V/VEEV/0/C		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-1.150	-1.150	-1.150
Average	-1.150	-1.100	-1.100
Max	-1.150	-1.050	-1.050
UL	3.000	3.000	3.000



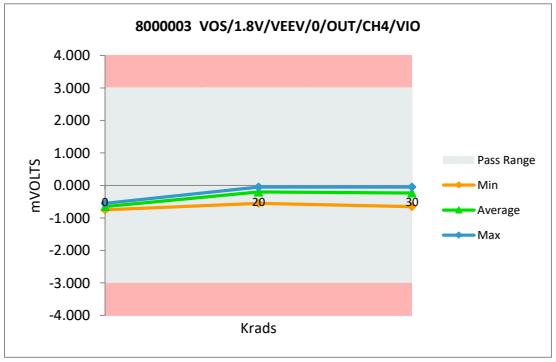
TID Report - HDR
TLV4H290MDYYTSEP

	8000003 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.471	-0.550	0.079	-16.67%	1.31%
0	2	-0.758	-0.750	-0.008	1.10%	0.14%
20	3	0.102	-0.050	0.152	148.79%	2.54%
20	4	-0.389	-0.050	-0.339	87.16%	5.66%
20	5	-0.307	-0.150	-0.157	51.21%	2.62%
20	6	-0.102	-0.050	-0.052	51.21%	0.87%
20	7	-0.102	-0.050	-0.052	51.21%	0.87%
20	8	-0.348	-0.050	-0.298	85.65%	4.97%
20	9 U	-0.225	-0.350	0.125	-55.24%	2.08%
20	10 U	-0.143	-0.250	0.107	-74.25%	1.78%
20	11 U	0.020	-0.250	0.270	1319.75%	4.51%
20	12 U	-0.389	-0.550	0.161	-41.24%	2.68%
20	13 U	-0.102	-0.350	0.248	-241.53%	4.13%
20	14 U	0.020	-0.250	0.270	1319.75%	4.51%
30	15	-0.389	-0.050	-0.339	87.16%	5.66%
30	16	-0.266	-0.050	-0.216	81.23%	3.61%
30	17	-0.307	-0.050	-0.257	83.74%	4.29%
30	18	-0.307	-0.050	-0.257	83.74%	4.29%
30	19	-0.676	-0.050	-0.626	92.61%	10.44%
30	20	-0.225	-0.050	-0.175	77.82%	2.92%
30	21 U	-0.348	-0.450	0.102	-29.15%	1.69%
30	22 U	-0.143	-0.250	0.107	-74.25%	1.78%
30	23 U	-0.594	-0.650	0.056	-9.36%	0.93%
30	24 U	-0.307	-0.350	0.043	-13.84%	0.71%
30	25 U	-0.225	-0.350	0.125	-55.24%	2.08%
30	26 U	-0.512	-0.450	-0.062	12.18%	1.04%
	Max	0.102	-0.050	0.270	1319.75%	10.44%
	Average	-0.289	-0.250	-0.039	116.29%	3.00%
	Min	-0.758	-0.750	-0.626	-241.53%	0.14%
	Std Dev	0.209	0.215	0.224	363.23%	2.22%



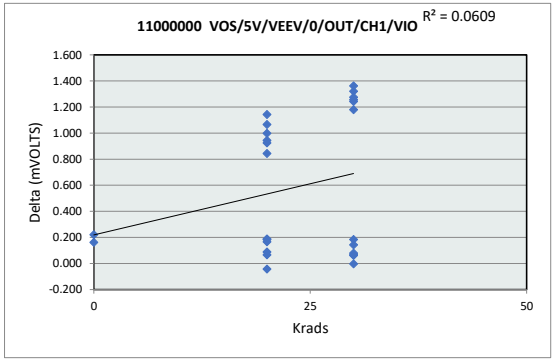
	8000003 VOS/1.8V/VEEV/0/C		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.750	-0.550	-0.650
Average	-0.650	-0.200	-0.233
Max	-0.550	-0.050	-0.050
UL	3.000	3.000	3.000



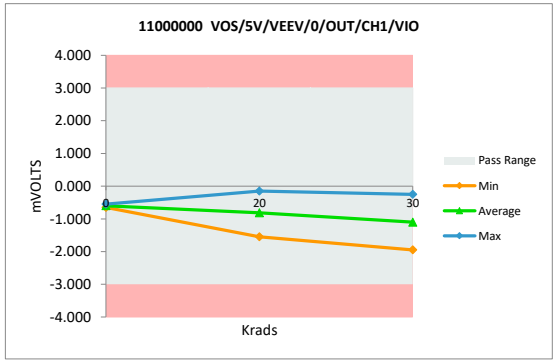
TID Report - HDR
TLV4H290MDYYTSEP

	11000000 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.389	-0.550	0.161	-41.47%	2.69%
0	2	-0.430	-0.650	0.220	-51.27%	3.67%
20	3	-0.307	-1.150	0.843	-274.67%	14.05%
20	4	-0.225	-1.150	0.925	-410.92%	15.42%
20	5	-0.307	-1.250	0.943	-307.25%	15.72%
20	6	-0.184	-1.250	1.066	-578.76%	17.76%
20	7	-0.307	-1.450	1.143	-372.41%	19.05%
20	8	-0.552	-1.550	0.998	-180.55%	16.63%
20	9 U	-0.184	-0.250	0.066	-35.75%	1.10%
20	10 U	-0.061	-0.250	0.189	-307.26%	3.14%
20	11 U	-0.061	-0.150	0.089	-144.35%	1.48%
20	12 U	-0.266	-0.450	0.184	-69.17%	3.07%
20	13 U	-0.593	-0.550	-0.043	7.31%	0.72%
20	14 U	-0.184	-0.350	0.166	-90.05%	2.76%
30	15	-0.430	-1.750	1.320	-307.25%	22.00%
30	16	-0.471	-1.650	1.179	-250.59%	19.66%
30	17	-0.675	-1.950	1.275	-188.78%	21.25%
30	18	-0.307	-1.550	1.243	-404.99%	20.72%
30	19	-0.593	-1.850	1.257	-211.76%	20.94%
30	20	-0.389	-1.750	1.361	-350.12%	22.69%
30	21 U	-0.552	-0.550	-0.002	0.45%	0.04%
30	22 U	-0.266	-0.450	0.184	-69.17%	3.07%
30	23 U	-0.471	-0.550	0.079	-16.86%	1.32%
30	24 U	-0.184	-0.250	0.066	-35.75%	1.10%
30	25 U	-0.389	-0.450	0.061	-15.75%	1.02%
30	26 U	-0.307	-0.450	0.143	-46.61%	2.38%
	Max	-0.061	-0.150	1.361	7.31%	22.69%
	Average	-0.349	-0.931	0.581	-182.84%	9.75%
	Min	-0.675	-1.950	-0.043	-578.76%	0.04%
	Std Dev	0.163	0.600	0.533	160.33%	8.81%



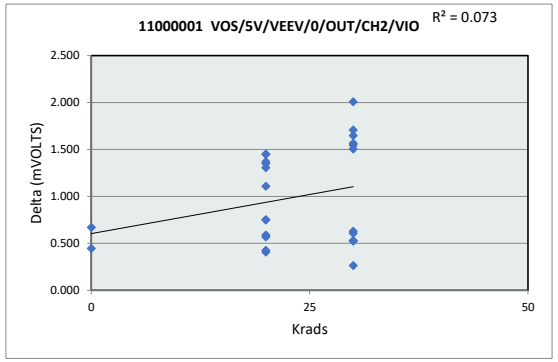
	11000000 VOS/5V/VEEV/0/O		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.650	-1.550	-1.950
Average	-0.600	-0.817	-1.100
Max	-0.550	-0.150	-0.250
UL	3.000	3.000	3.000



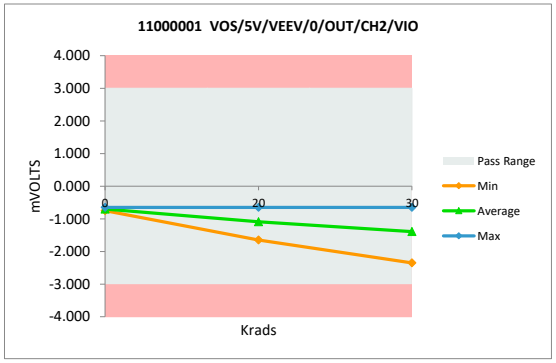
TID Report - HDR
TLV4H290MDYYTSEP

	11000001 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	0.020	-0.650	0.670	3312.24%	11.17%
0	2	-0.304	-0.750	0.446	-147.10%	7.44%
20	3	-0.344	-1.650	1.306	-379.66%	21.77%
20	4	-0.101	-1.550	1.449	-1432.01%	24.15%
20	5	-0.101	-1.450	1.349	-1333.17%	22.48%
20	6	0.020	-1.350	1.370	6771.58%	22.84%
20	7	-0.142	-1.250	1.108	-782.50%	18.47%
20	8	-0.101	-1.550	1.449	-1432.01%	24.15%
20	9 U	0.101	-0.650	0.751	742.45%	12.52%
20	10 U	-0.061	-0.650	0.589	-970.76%	9.82%
20	11 U	-0.182	-0.750	0.568	-311.83%	9.46%
20	12 U	0.101	-0.650	0.751	742.45%	12.52%
20	13 U	-0.344	-0.750	0.406	-118.03%	6.77%
20	14 U	-0.425	-0.850	0.425	-100.03%	7.08%
30	15	-0.142	-1.850	1.708	-1206.09%	28.47%
30	16	-0.344	-2.351	2.007	-583.45%	33.45%
30	17	-0.506	-2.051	1.545	-305.44%	25.75%
30	18	-0.384	-1.950	1.566	-407.20%	26.09%
30	19	-0.546	-2.051	1.505	-275.41%	25.08%
30	20	-0.101	-1.750	1.649	-1629.69%	27.48%
30	21 U	-0.425	-0.950	0.525	-123.57%	8.75%
30	22 U	-0.142	-0.750	0.608	-429.50%	10.14%
30	23 U	-0.587	-0.850	0.263	-44.85%	4.39%
30	24 U	-0.223	-0.750	0.527	-236.95%	8.79%
30	25 U	-0.020	-0.650	0.630	-3112.24%	10.50%
30	26 U	-0.223	-0.750	0.527	-236.95%	8.79%
	Max	0.101	-0.650	2.007	6771.58%	33.45%
	Average	-0.212	-1.200	0.988	-154.99%	16.47%
	Min	-0.587	-2.351	0.263	-3112.24%	4.39%
	Std Dev	0.195	0.552	0.516	1786.72%	8.60%



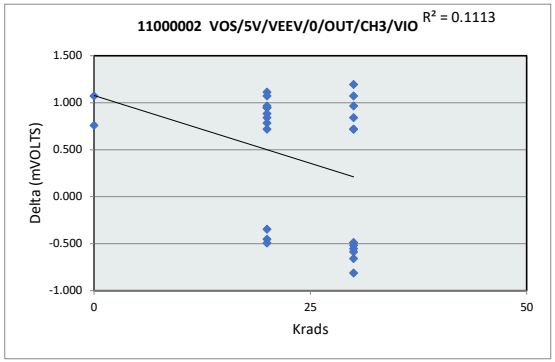
	11000001 VOS/5V/VEEV/0/O		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.750	-1.650	-2.351
Average	-0.700	-1.092	-1.392
Max	-0.650	-0.650	-0.650
UL	3.000	3.000	3.000



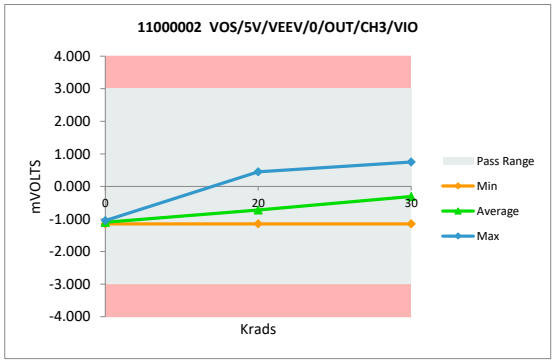
TID Report - HDR
TLV4H290MDYYTSEP

	11000002 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.391	-1.150	0.759	-193.83%	12.64%
0	2	0.021	-1.050	1.071	5197.19%	17.84%
20	3	-0.103	-1.050	0.947	-919.45%	15.78%
20	4	-0.268	-1.050	0.782	-292.10%	13.04%
20	5	-0.144	0.350	-0.494	342.73%	8.24%
20	6	0.103	0.450	-0.347	-336.91%	5.78%
20	7	-0.103	-1.050	0.947	-919.45%	15.78%
20	8	-0.103	0.350	-0.453	439.82%	7.55%
20	9 U	0.062	-1.050	1.112	1799.09%	18.53%
20	10 U	-0.268	-1.150	0.882	-329.44%	14.70%
20	11 U	-0.185	-1.150	0.965	-520.30%	16.08%
20	12 U	0.021	-1.050	1.071	5197.19%	17.84%
20	13 U	-0.309	-1.150	0.841	-272.18%	14.02%
20	14 U	-0.433	-1.150	0.717	-165.84%	11.96%
30	15	-0.268	0.250	-0.518	193.36%	8.63%
30	16	-0.062	0.750	-0.812	1313.64%	13.53%
30	17	0.062	0.550	-0.488	-790.00%	8.14%
30	18	-0.309	0.350	-0.659	213.27%	10.98%
30	19	0.062	0.650	-0.588	-951.82%	9.80%
30	20	-0.103	0.450	-0.553	536.91%	9.22%
30	21 U	-0.433	-1.150	0.717	-165.84%	11.96%
30	22 U	-0.433	-1.150	0.717	-165.84%	11.96%
30	23 U	-0.185	-1.150	0.965	-520.30%	16.08%
30	24 U	0.144	-1.050	1.194	828.18%	19.90%
30	25 U	-0.309	-1.150	0.841	-272.18%	14.02%
30	26 U	0.021	-1.050	1.071	5197.19%	17.84%
	Max	0.144	0.750	1.194	5197.19%	19.90%
	Average	-0.151	-0.562	0.411	555.50%	13.15%
	Min	-0.433	-1.150	-0.812	-951.82%	5.78%
	Std Dev	0.180	0.765	0.724	1829.51%	3.83%



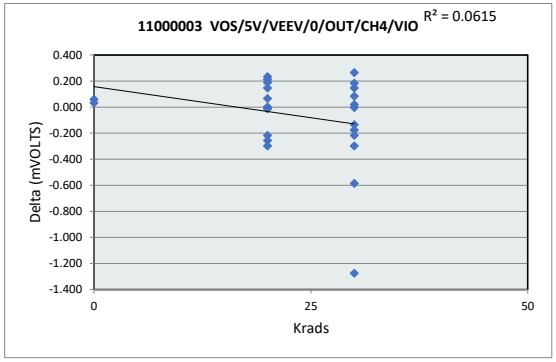
	11000002 VOS/5V/VEEV/0/O		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-1.150	-1.150	-1.150
Average	-1.100	-0.725	-0.308
Max	-1.050	0.450	0.750
UL	3.000	3.000	3.000



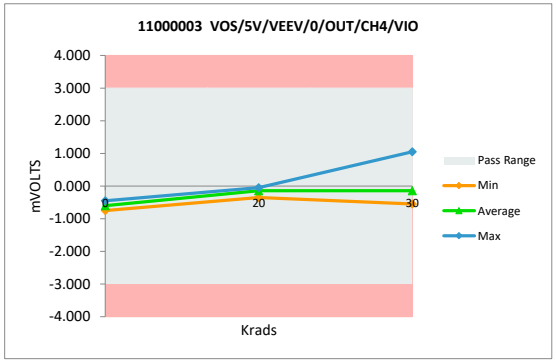
TID Report - HDR
TLV4H290MDYYTSEP

	11000003 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.389	-0.450	0.061	-15.56%	1.01%
0	2	-0.717	-0.750	0.033	-4.55%	0.54%
20	3	0.184	-0.050	0.234	127.11%	3.91%
20	4	-0.348	-0.050	-0.298	85.65%	4.97%
20	5	-0.266	-0.050	-0.216	81.23%	3.61%
20	6	-0.061	-0.050	-0.011	18.68%	0.19%
20	7	-0.061	-0.050	-0.011	18.68%	0.19%
20	8	-0.307	-0.050	-0.257	83.74%	4.29%
20	9 U	-0.184	-0.250	0.066	-35.53%	1.09%
20	10 U	-0.102	-0.250	0.148	-143.95%	2.46%
20	11 U	0.061	-0.150	0.211	343.95%	3.52%
20	12 U	-0.348	-0.350	0.002	-0.45%	0.03%
20	13 U	-0.061	-0.250	0.189	-306.59%	3.14%
20	14 U	0.061	-0.150	0.211	343.95%	3.52%
30	15	-0.348	-0.050	-0.298	85.65%	4.97%
30	16	-0.225	-0.050	-0.175	77.82%	2.92%
30	17	-0.266	-0.050	-0.216	81.23%	3.61%
30	18	-0.225	1.050	-1.275	565.73%	21.26%
30	19	-0.635	-0.050	-0.585	92.13%	9.76%
30	20	-0.184	-0.050	-0.134	72.89%	2.24%
30	21 U	-0.266	-0.350	0.084	-31.36%	1.39%
30	22 U	-0.102	-0.250	0.148	-143.95%	2.46%
30	23 U	-0.553	-0.550	-0.003	0.61%	0.06%
30	24 U	-0.266	-0.450	0.184	-68.89%	3.06%
30	25 U	-0.184	-0.450	0.266	-143.95%	4.43%
30	26 U	-0.430	-0.450	0.020	-4.55%	0.33%
	Max	0.184	1.050	0.266	565.73%	21.26%
	Average	-0.240	-0.177	-0.063	45.37%	3.42%
	Min	-0.717	-0.750	-1.275	-306.59%	0.03%
	Std Dev	0.209	0.318	0.322	171.83%	4.22%



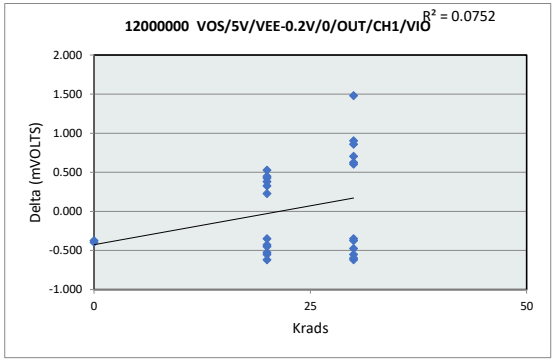
	11000003 VOS/5V/VEEV/0/O		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.750	-0.350	-0.550
Average	-0.600	-0.142	-0.142
Max	-0.450	-0.050	1.050
UL	3.000	3.000	3.000



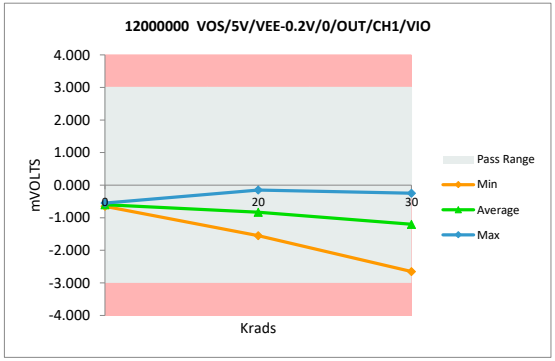
TID Report - HDR
TLV4H290MDYYTSEP

	12000000 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.923	-0.550	-0.373	40.43%	6.22%
0	2	-1.046	-0.650	-0.396	37.88%	6.61%
20	3	-0.923	-1.150	0.227	-24.56%	3.78%
20	4	-0.923	-1.250	0.327	-35.39%	5.45%
20	5	-0.923	-1.350	0.427	-46.22%	7.11%
20	6	-0.800	-1.250	0.450	-56.22%	7.50%
20	7	-0.923	-1.450	0.527	-57.05%	8.78%
20	8	-1.169	-1.550	0.381	-32.54%	6.34%
20	9 U	-0.800	-0.250	-0.550	68.76%	9.17%
20	10 U	-0.677	-0.250	-0.427	63.08%	7.12%
20	11 U	-0.677	-0.150	-0.527	77.85%	8.78%
20	12 U	-0.800	-0.450	-0.350	43.76%	5.84%
20	13 U	-1.169	-0.550	-0.619	52.97%	10.32%
20	14 U	-0.800	-0.350	-0.450	56.26%	7.50%
30	15	-1.046	-1.950	0.904	-86.36%	15.06%
30	16	-1.046	-1.650	0.604	-57.69%	10.06%
30	17	-1.293	-2.151	0.858	-66.41%	14.31%
30	18	-0.923	-1.550	0.627	-67.88%	10.45%
30	19	-1.169	-2.651	1.482	-126.68%	24.69%
30	20	-1.046	-1.750	0.704	-67.25%	11.73%
30	21 U	-1.169	-0.550	-0.619	52.97%	10.32%
30	22 U	-0.800	-0.450	-0.350	43.76%	5.84%
30	23 U	-1.046	-0.450	-0.596	56.99%	9.94%
30	24 U	-0.800	-0.250	-0.550	68.76%	9.17%
30	25 U	-0.923	-0.450	-0.473	51.26%	7.89%
30	26 U	-0.923	-0.550	-0.373	40.43%	6.22%
	Max	-0.677	-0.150	1.482	77.85%	24.69%
	Average	-0.952	-0.985	0.033	1.19%	9.08%
	Min	-1.293	-2.651	-0.619	-126.68%	3.78%
	Std Dev	0.161	0.692	0.608	61.48%	4.13%



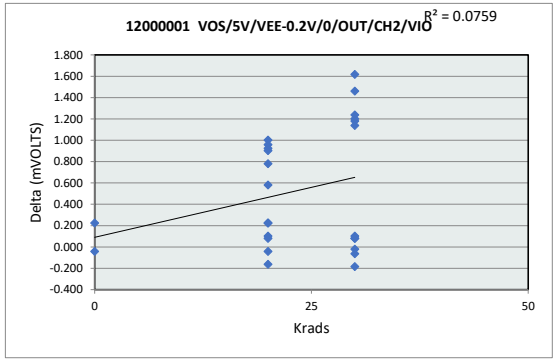
	12000000 VOS/5V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.650	-1.550	-2.651
Average	-0.600	-0.833	-1.200
Max	-0.550	-0.150	-0.250
UL	3.000	3.000	3.000



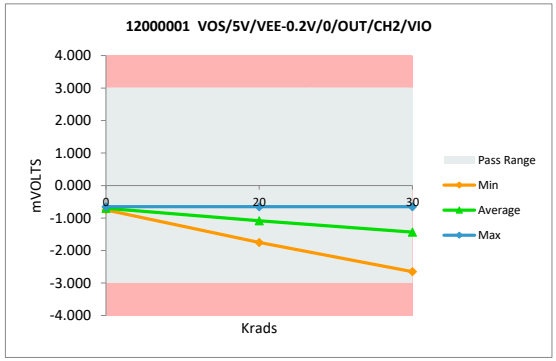
TID Report - HDR
TLV4H290MDYYTSEP

	12000001 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.426	-0.650	0.224	-52.56%	3.73%
0	2	-0.791	-0.750	-0.041	5.22%	0.69%
20	3	-0.791	-1.750	0.959	-121.16%	15.98%
20	4	-0.670	-1.450	0.780	-116.57%	13.01%
20	5	-0.548	-1.450	0.902	-164.69%	15.04%
20	6	-0.426	-1.350	0.924	-216.85%	15.40%
20	7	-0.670	-1.250	0.580	-86.70%	9.67%
20	8	-0.548	-1.550	1.002	-182.95%	16.70%
20	9 U	-0.426	-0.650	0.224	-52.56%	3.73%
20	10 U	-0.548	-0.650	0.102	-18.66%	1.70%
20	11 U	-0.670	-0.750	0.080	-12.02%	1.34%
20	12 U	-0.426	-0.650	0.224	-52.56%	3.73%
20	13 U	-0.791	-0.750	-0.041	5.22%	0.69%
20	14 U	-0.913	-0.750	-0.163	17.85%	2.72%
30	15	-0.670	-1.850	1.180	-176.31%	19.67%
30	16	-0.791	-2.251	1.460	-184.48%	24.33%
30	17	-0.913	-2.151	1.238	-135.60%	20.63%
30	18	-0.913	-2.051	1.138	-124.64%	18.97%
30	19	-1.035	-2.651	1.616	-156.20%	26.94%
30	20	-0.548	-1.750	1.202	-219.46%	20.04%
30	21 U	-0.913	-0.850	-0.063	6.90%	1.05%
30	22 U	-0.670	-0.750	0.080	-12.02%	1.34%
30	23 U	-1.035	-0.850	-0.185	17.85%	3.08%
30	24 U	-0.670	-0.750	0.080	-12.02%	1.34%
30	25 U	-0.548	-0.650	0.102	-18.66%	1.70%
30	26 U	-0.670	-0.650	-0.020	2.92%	0.33%
	Max	-0.426	-0.650	1.616	17.85%	26.94%
	Average	-0.693	-1.216	0.523	-79.26%	9.37%
	Min	-1.035	-2.651	-0.185	-219.46%	0.33%
	Std Dev	0.185	0.613	0.569	80.46%	8.81%



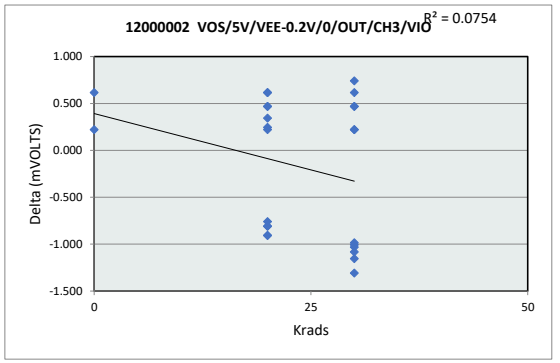
	12000001 VOS/5V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.750	-1.750	-2.651
Average	-0.700	-1.083	-1.434
Max	-0.650	-0.650	-0.650
UL	3.000	3.000	3.000



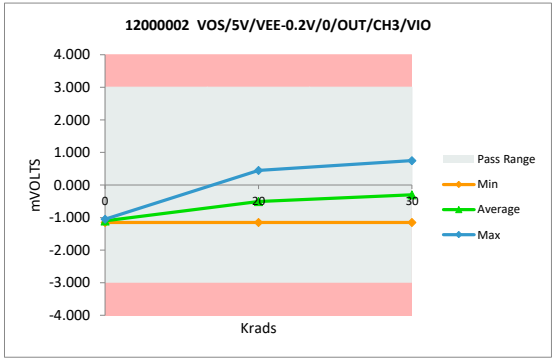
TID Report - HDR
TLV4H290MDYYTSEP

	12000002 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.929	-1.150	0.221	-23.73%	3.68%
0	2	-0.434	-1.050	0.616	-142.08%	10.27%
20	3	-0.558	0.250	-0.808	144.83%	13.46%
20	4	-0.806	-1.050	0.244	-30.35%	4.07%
20	5	-0.558	0.350	-0.908	162.76%	15.13%
20	6	-0.310	0.450	-0.760	245.25%	12.66%
20	7	-0.558	0.250	-0.808	144.83%	13.46%
20	8	-0.558	0.350	-0.908	162.76%	15.13%
20	9 U	-0.434	-1.050	0.616	-142.08%	10.27%
20	10 U	-0.806	-1.150	0.344	-42.76%	5.74%
20	11 U	-0.682	-1.150	0.468	-68.72%	7.81%
20	12 U	-0.434	-1.050	0.616	-142.08%	10.27%
20	13 U	-0.682	-1.150	0.468	-68.72%	7.81%
20	14 U	-0.929	-1.150	0.221	-23.73%	3.68%
30	15	-0.682	0.350	-1.032	151.35%	17.19%
30	16	-0.558	0.750	-1.308	234.49%	21.79%
30	17	-0.434	0.550	-0.984	226.80%	16.40%
30	18	-0.806	0.350	-1.156	143.45%	19.26%
30	19	-0.434	0.650	-1.084	249.86%	18.06%
30	20	-0.558	0.450	-1.008	180.69%	16.79%
30	21 U	-0.929	-1.150	0.221	-23.73%	3.68%
30	22 U	-0.929	-1.150	0.221	-23.73%	3.68%
30	23 U	-0.682	-1.150	0.468	-68.72%	7.81%
30	24 U	-0.310	-1.050	0.740	-238.91%	12.34%
30	25 U	-0.682	-1.150	0.468	-68.72%	7.81%
30	26 U	-0.434	-1.050	0.616	-142.08%	10.27%
	Max	-0.310	0.750	0.740	249.86%	21.79%
	Average	-0.620	-0.458	-0.162	30.65%	11.10%
	Min	-0.929	-1.150	-1.308	-238.91%	3.68%
	Std Dev	0.193	0.784	0.733	146.61%	5.36%



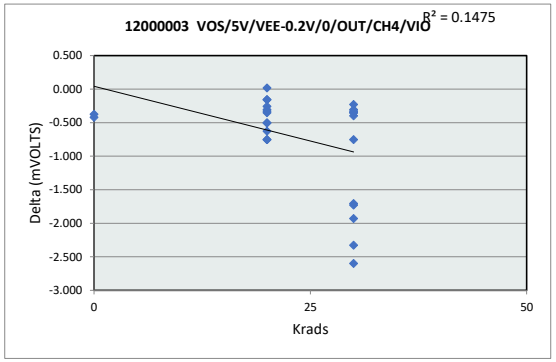
	12000002 VOS/5V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-1.150	-1.150	-1.150
Average	-1.100	-0.508	-0.300
Max	-1.050	0.450	0.750
UL	3.000	3.000	3.000



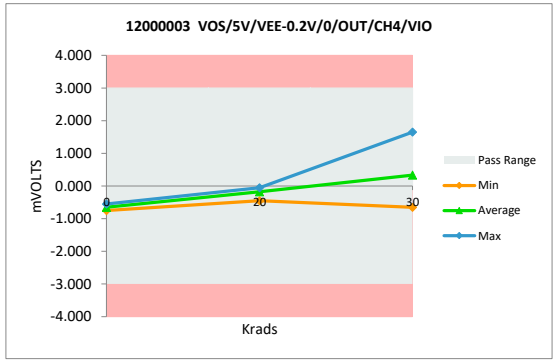
TID Report - HDR
TLV4H290MDYYTSEP

	12000003 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.925	-0.550	-0.375	40.53%	6.25%
0	2	-1.171	-0.750	-0.421	35.97%	7.02%
20	3	-0.308	-0.050	-0.258	83.78%	4.30%
20	4	-0.801	-0.050	-0.751	93.76%	12.52%
20	5	-0.678	-0.050	-0.628	92.63%	10.47%
20	6	-0.555	-0.050	-0.505	90.99%	8.41%
20	7	-0.555	-0.050	-0.505	90.99%	8.41%
20	8	-0.801	-0.050	-0.751	93.76%	12.52%
20	9 U	-0.678	-0.350	-0.328	48.39%	5.47%
20	10 U	-0.555	-0.250	-0.305	54.94%	5.08%
20	11 U	-0.308	-0.150	-0.158	51.34%	2.64%
20	12 U	-0.801	-0.450	-0.351	43.85%	5.86%
20	13 U	-0.432	-0.450	0.018	-4.27%	0.31%
20	14 U	-0.308	-0.150	-0.158	51.34%	2.64%
30	15	-0.801	-0.050	-0.751	93.76%	12.52%
30	16	-0.678	1.050	-1.728	254.83%	28.80%
30	17	-0.678	1.650	-2.328	343.30%	38.80%
30	18	-0.678	1.250	-1.928	284.32%	32.14%
30	19	-1.048	1.550	-2.598	247.89%	43.30%
30	20	-0.555	1.150	-1.705	307.26%	28.41%
30	21 U	-0.678	-0.450	-0.228	33.64%	3.80%
30	22 U	-0.555	-0.250	-0.305	54.94%	5.08%
30	23 U	-1.048	-0.650	-0.398	37.98%	6.63%
30	24 U	-0.801	-0.450	-0.351	43.85%	5.86%
30	25 U	-0.678	-0.350	-0.328	48.39%	5.47%
30	26 U	-0.801	-0.450	-0.351	43.85%	5.86%
	Max	-0.308	1.650	0.018	343.30%	43.30%
	Average	-0.688	0.023	-0.711	102.39%	11.87%
	Min	-1.171	-0.750	-2.598	-4.27%	0.31%
	Std Dev	0.220	0.688	0.712	96.49%	11.84%



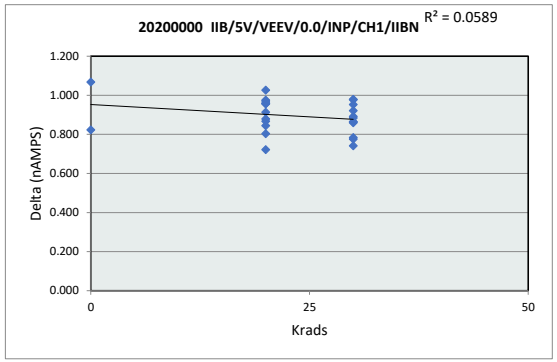
	12000003 VOS/5V/VEE-0.2V/		
Test Site			
Tester			
Test Number			
Max Limit	3	mVOLTS	
Min Limit	-3	mVOLTS	
Krads	0	20	30
LL	-3.000	-3.000	-3.000
Min	-0.750	-0.450	-0.650
Average	-0.650	-0.175	0.333
Max	-0.550	-0.050	1.650
UL	3.000	3.000	3.000



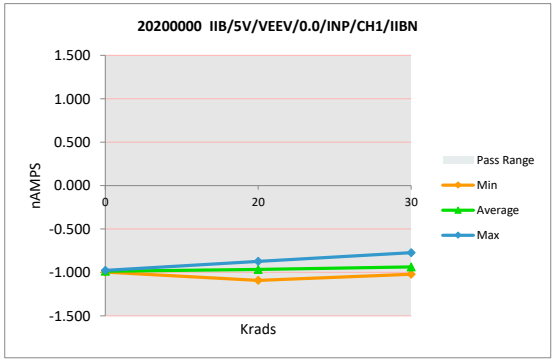
TID Report - HDR
TLV4H290MDYYTSEP

	20200000 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	0.092	-0.976	1.068	1163.86%	2.14%
0	2	-0.173	-0.996	0.823	-474.61%	1.65%
20	3	-0.051	-0.964	0.914	-1805.34%	1.83%
20	4	-0.041	-1.016	0.975	-2390.53%	1.95%
20	5	-0.006	-0.962	0.955	-14892.87%	1.91%
20	6	-0.132	-1.092	0.960	-729.56%	1.92%
20	7	-0.019	-1.045	1.026	-5492.48%	2.05%
20	8	-0.090	-0.935	0.845	-939.92%	1.69%
20	9 U	-0.029	-0.986	0.958	-3359.50%	1.92%
20	10 U	-0.026	-0.996	0.970	-3723.16%	1.94%
20	11 U	-0.171	-0.893	0.722	-422.52%	1.44%
20	12 U	0.006	-0.873	0.879	15002.67%	1.76%
20	13 U	-0.063	-0.930	0.867	-1378.73%	1.73%
20	14 U	-0.102	-0.905	0.803	-786.13%	1.61%
30	15	-0.060	-0.925	0.864	-1430.68%	1.73%
30	16	-0.041	-1.021	0.980	-2402.57%	1.96%
30	17	-0.024	-1.001	0.977	-4141.68%	1.95%
30	18	-0.141	-0.917	0.776	-548.72%	1.55%
30	19	-0.016	-0.876	0.859	-5294.68%	1.72%
30	20	-0.117	-1.008	0.891	-762.68%	1.78%
30	21 U	-0.046	-0.910	0.864	-1891.87%	1.73%
30	22 U	-0.038	-0.959	0.921	-2402.72%	1.84%
30	23 U	-0.078	-0.861	0.783	-1009.50%	1.57%
30	24 U	-0.110	-0.994	0.884	-807.24%	1.77%
30	25 U	-0.031	-0.773	0.742	-2395.39%	1.48%
30	26 U	-0.041	-0.994	0.953	-2336.35%	1.91%
	Max	0.092	-0.773	1.068	15002.67%	2.14%
	Average	-0.059	-0.954	0.895	-1755.88%	1.79%
	Min	-0.173	-1.092	0.722	-14892.87%	1.44%
	Std Dev	0.059	0.068	0.087	4529.05%	0.17%



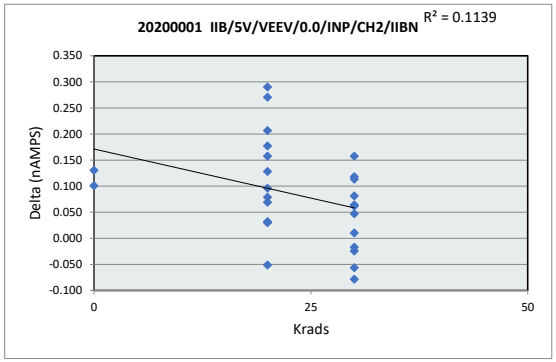
	20200000 IIB/5V/VEEV/0.0/I		
Test Site			
Tester			
Test Number			
Max Limit	25.00000029	nAMPS	
Min Limit	-25.00000029	nAMPS	
Krads	0	20	30
LL			
Min	-0.996	-1.092	-1.021
Average	-0.986	-0.966	-0.936
Max	-0.976	-0.873	-0.773
UL			



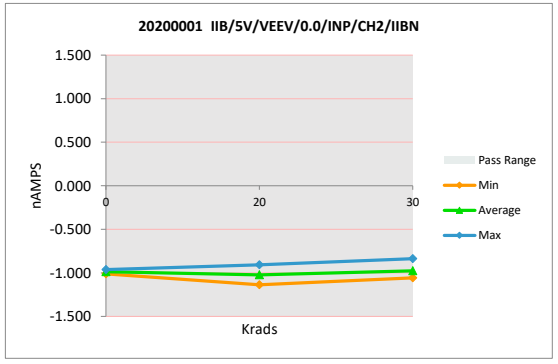
TID Report - HDR
TLV4H290MDYYTSEP

	20200001 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.911	-1.012	0.101	-11.09%	0.20%
0	2	-0.832	-0.963	0.130	-15.67%	0.26%
20	3	-0.960	-0.909	-0.051	5.34%	0.10%
20	4	-0.938	-1.096	0.158	-16.80%	0.32%
20	5	-0.867	-1.073	0.207	-23.84%	0.41%
20	6	-0.960	-1.137	0.177	-18.46%	0.35%
20	7	-0.960	-0.990	0.030	-3.11%	0.06%
20	8	-0.891	-0.924	0.032	-3.62%	0.06%
20	9 U	-0.837	-1.108	0.271	-32.31%	0.54%
20	10 U	-0.901	-1.029	0.128	-14.21%	0.26%
20	11 U	-0.886	-0.955	0.069	-7.79%	0.14%
20	12 U	-0.884	-0.963	0.079	-8.93%	0.16%
20	13 U	-0.916	-1.012	0.096	-10.50%	0.19%
20	14 U	-0.793	-1.083	0.290	-36.58%	0.58%
30	15	-0.877	-0.938	0.062	-7.04%	0.12%
30	16	-0.972	-1.037	0.064	-6.61%	0.13%
30	17	-0.936	-1.017	0.081	-8.70%	0.16%
30	18	-0.877	-0.995	0.118	-13.49%	0.24%
30	19	-0.985	-0.960	-0.024	2.46%	0.05%
30	20	-0.874	-0.987	0.113	-12.96%	0.23%
30	21 U	-0.999	-0.983	-0.017	1.68%	0.03%
30	22 U	-0.953	-1.000	0.047	-4.94%	0.09%
30	23 U	-0.894	-0.838	-0.056	6.29%	0.11%
30	24 U	-0.901	-1.059	0.158	-17.48%	0.32%
30	25 U	-0.992	-0.914	-0.078	7.89%	0.16%
30	26 U	-0.990	-1.000	0.010	-1.03%	0.02%
	Max	-0.793	-0.838	0.290	7.89%	0.58%
	Average	-0.915	-0.999	0.084	-9.67%	0.20%
	Min	-0.999	-1.137	-0.078	-36.58%	0.02%
	Std Dev	0.054	0.068	0.093	10.91%	0.15%



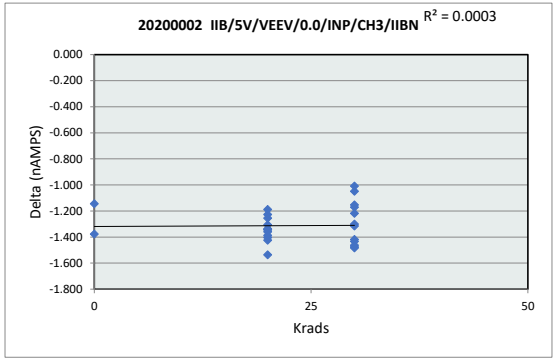
	20200001 IIB/5V/VEEV/0.0/I		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	-1.012	-1.137	-1.059
Average	-0.987	-1.023	-0.977
Max	-0.963	-0.909	-0.838
UL			



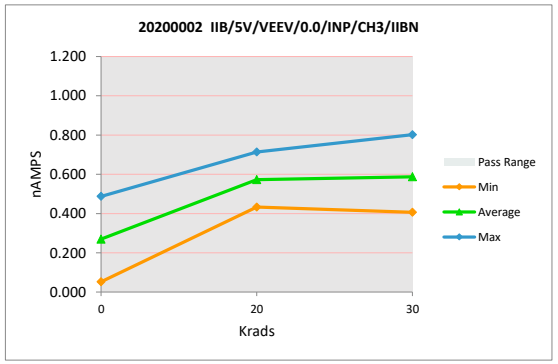
TID Report - HDR
TLV4H290MDYYTSEP

	20200002 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-1.325	0.052	-1.377	103.93%	2.75%
0	2	-0.657	0.487	-1.144	174.20%	2.29%
20	3	-0.757	0.667	-1.424	188.03%	2.85%
20	4	-0.718	0.588	-1.306	181.89%	2.61%
20	5	-0.760	0.495	-1.254	165.09%	2.51%
20	6	-0.878	0.482	-1.360	154.95%	2.72%
20	7	-0.743	0.662	-1.404	189.11%	2.81%
20	8	-0.632	0.713	-1.345	212.86%	2.69%
20	9 U	-0.755	0.433	-1.188	157.37%	2.38%
20	10 U	-0.718	0.509	-1.227	170.93%	2.45%
20	11 U	-0.831	0.706	-1.537	184.96%	3.07%
20	12 U	-0.851	0.536	-1.387	163.05%	2.77%
20	13 U	-0.801	0.536	-1.338	166.92%	2.68%
20	14 U	-0.799	0.541	-1.340	167.74%	2.68%
30	15	-0.733	0.701	-1.434	195.68%	2.87%
30	16	-0.797	0.679	-1.475	185.23%	2.95%
30	17	-0.632	0.585	-1.218	192.64%	2.44%
30	18	-0.779	0.522	-1.301	166.92%	2.60%
30	19	-0.681	0.802	-1.483	217.72%	2.97%
30	20	-0.816	0.647	-1.463	179.26%	2.93%
30	21 U	-0.669	0.485	-1.154	172.47%	2.31%
30	22 U	-0.728	0.443	-1.171	160.86%	2.34%
30	23 U	-0.745	0.674	-1.419	190.47%	2.84%
30	24 U	-0.573	0.475	-1.048	182.86%	2.10%
30	25 U	-0.689	0.627	-1.316	191.11%	2.63%
30	26 U	-0.603	0.406	-1.009	167.39%	2.02%
	Max	-0.573	0.802	-1.009	217.72%	3.07%
	Average	-0.756	0.556	-1.312	176.29%	2.62%
	Min	-1.325	0.052	-1.537	103.93%	2.02%
	Std Dev	0.139	0.146	0.136	21.56%	0.27%



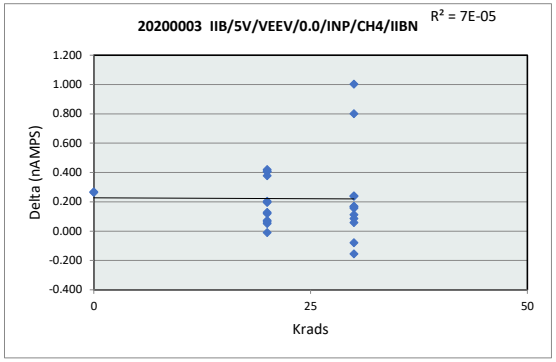
	20200002 IIB/5V/VEEV/0.0/		
Test Site			
Tester			
Test Number			
Max Limit	25.00000029	nAMPS	
Min Limit	-25.00000029	nAMPS	
Krads	0	20	30
LL			
Min	0.052	0.433	0.406
Average	0.270	0.572	0.587
Max	0.487	0.713	0.802
UL			



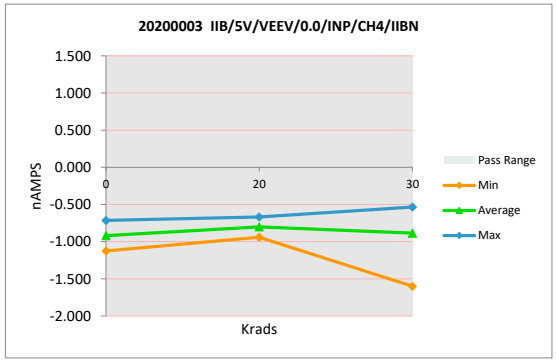
TID Report - HDR
TLV4H290MDYYTSEP

	20200003 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.857	-1.125	0.268	-31.28%	0.54%
0	2	-0.449	-0.714	0.265	-58.91%	0.53%
20	3	-0.469	-0.847	0.378	-80.57%	0.76%
20	4	-0.599	-0.795	0.196	-32.74%	0.39%
20	5	-0.594	-0.667	0.073	-12.31%	0.15%
20	6	-0.737	-0.788	0.051	-6.97%	0.10%
20	7	-0.535	-0.940	0.405	-75.67%	0.81%
20	8	-0.606	-0.810	0.204	-33.56%	0.41%
20	9 U	-0.322	-0.741	0.419	-130.35%	0.84%
20	10 U	-0.518	-0.928	0.410	-79.12%	0.82%
20	11 U	-0.710	-0.699	-0.010	1.44%	0.02%
20	12 U	-0.776	-0.839	0.064	-8.21%	0.13%
20	13 U	-0.697	-0.817	0.120	-17.23%	0.24%
20	14 U	-0.614	-0.741	0.127	-20.74%	0.25%
30	15	-0.614	-0.535	-0.079	12.91%	0.16%
30	16	-0.754	-0.598	-0.155	20.59%	0.31%
30	17	-0.597	-1.599	1.003	-168.07%	2.01%
30	18	-0.530	-0.771	0.240	-45.30%	0.48%
30	19	-0.754	-1.555	0.801	-106.33%	1.60%
30	20	-0.687	-0.852	0.164	-23.91%	0.33%
30	21 U	-0.739	-0.825	0.086	-11.61%	0.17%
30	22 U	-0.668	-0.837	0.169	-25.34%	0.34%
30	23 U	-0.756	-0.815	0.059	-7.77%	0.12%
30	24 U	-0.555	-0.793	0.238	-42.87%	0.48%
30	25 U	-0.606	-0.763	0.157	-25.86%	0.31%
30	26 U	-0.562	-0.675	0.112	-20.00%	0.22%
	Max	-0.322	-0.535	1.003	20.59%	2.01%
	Average	-0.627	-0.849	0.222	-39.61%	0.48%
	Min	-0.857	-1.599	-0.155	-168.07%	0.02%
	Std Dev	0.120	0.242	0.248	44.20%	0.46%



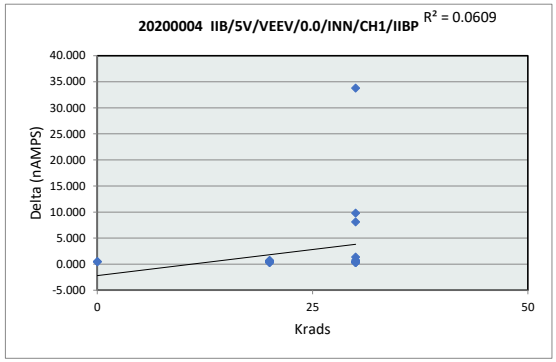
	20200003 IIB/5V/VEEV/0.0/I		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	-1.125	-0.940	-1.599
Average	-0.919	-0.801	-0.885
Max	-0.714	-0.667	-0.535
UL			



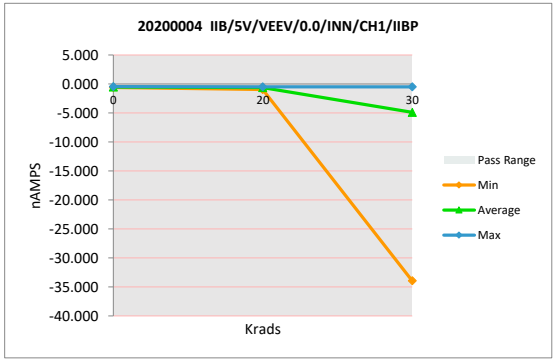
TID Report - HDR
TLV4H290MDYYTSEP

	20200004 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-0.091	-0.603	0.512	-563.96%	1.02%
0	2	0.003	-0.455	0.458	18157.84%	0.92%
20	3	-0.115	-0.558	0.443	-384.27%	0.89%
20	4	-0.255	-0.961	0.706	-276.60%	1.41%
20	5	-0.206	-0.615	0.409	-198.30%	0.82%
20	6	-0.218	-0.703	0.485	-222.02%	0.97%
20	7	-0.184	-0.482	0.298	-162.04%	0.60%
20	8	-0.206	-0.588	0.382	-185.19%	0.76%
20	9 U	-0.029	-0.495	0.465	-1582.65%	0.93%
20	10 U	-0.137	-0.625	0.487	-354.67%	0.97%
20	11 U	-0.128	-0.509	0.382	-299.18%	0.76%
20	12 U	-0.231	-0.585	0.355	-153.78%	0.71%
20	13 U	-0.123	-0.620	0.497	-405.26%	0.99%
20	14 U	-0.017	-0.716	0.699	-4080.59%	1.40%
30	15	-0.272	-8.364	8.092	-2970.28%	16.18%
30	16	-0.250	-1.602	1.352	-540.08%	2.70%
30	17	-0.221	-10.037	9.816	-4444.19%	19.63%
30	18	-0.172	-0.546	0.374	-217.94%	0.75%
30	19	-0.177	-33.950	33.773	-19115.22%	67.55%
30	20	-0.078	-0.858	0.780	-993.25%	1.56%
30	21 U	-0.179	-0.689	0.509	-284.40%	1.02%
30	22 U	-0.216	-0.499	0.284	-131.28%	0.57%
30	23 U	-0.083	-0.539	0.455	-546.02%	0.91%
30	24 U	-0.236	-0.600	0.365	-154.75%	0.73%
30	25 U	-0.135	-0.526	0.392	-290.14%	0.78%
30	26 U	-0.204	-0.504	0.301	-147.63%	0.60%
	Max	0.003	-0.455	33.773	18157.84%	67.55%
	Average	-0.160	-2.586	2.426	-790.22%	4.85%
	Min	-0.272	-33.950	0.284	-19115.22%	0.57%
	Std Dev	0.076	6.813	6.801	5402.00%	13.60%



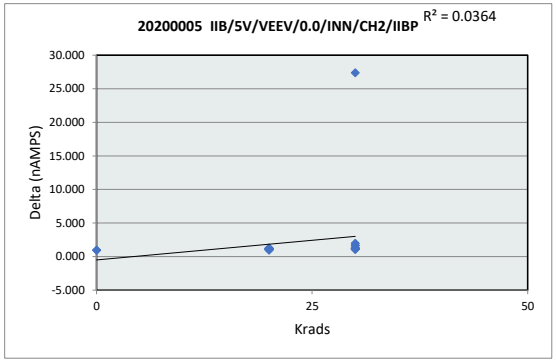
	20200004 IIB/5V/VEEV/0.0/I		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	-0.603	-0.961	-33.950
Average	-0.529	-0.621	-4.893
Max	-0.455	-0.482	-0.499
UL			



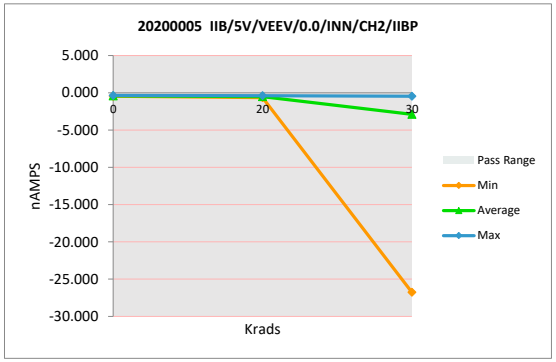
TID Report - HDR
TLV4H290MDYYTSEP

	20200005 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	0.488	-0.460	0.948	194.25%	1.90%
0	2	0.586	-0.352	0.939	160.05%	1.88%
20	3	0.604	-0.544	1.147	190.09%	2.29%
20	4	0.481	-0.647	1.128	234.52%	2.26%
20	5	0.577	-0.401	0.978	169.59%	1.96%
20	6	0.523	-0.603	1.125	215.32%	2.25%
20	7	0.572	-0.578	1.150	201.13%	2.30%
20	8	0.537	-0.431	0.968	180.16%	1.94%
20	9 U	0.616	-0.485	1.101	178.72%	2.20%
20	10 U	0.574	-0.571	1.145	199.41%	2.29%
20	11 U	0.655	-0.502	1.157	176.62%	2.31%
20	12 U	0.682	-0.590	1.273	186.56%	2.55%
20	13 U	0.591	-0.524	1.115	188.63%	2.23%
20	14 U	0.648	-0.460	1.108	171.05%	2.22%
30	15	0.724	-0.895	1.619	223.66%	3.24%
30	16	0.638	-1.330	1.968	308.47%	3.94%
30	17	0.508	-0.598	1.106	217.70%	2.21%
30	18	0.594	-0.679	1.273	214.33%	2.55%
30	19	0.604	-26.763	27.366	4533.93%	54.73%
30	20	0.584	-1.070	1.653	283.15%	3.31%
30	21 U	0.643	-0.458	1.101	171.21%	2.20%
30	22 U	0.611	-0.568	1.179	193.02%	2.36%
30	23 U	0.645	-0.605	1.250	193.78%	2.50%
30	24 U	0.589	-0.598	1.187	201.52%	2.37%
30	25 U	0.584	-0.578	1.162	199.00%	2.32%
30	26 U	0.545	-0.504	1.049	192.61%	2.10%
	Max	0.724	-0.352	27.366	4533.93%	54.73%
	Average	0.592	-1.607	2.200	368.40%	4.40%
	Min	0.481	-26.763	0.939	160.05%	1.88%
	Std Dev	0.058	5.135	5.138	850.25%	10.28%



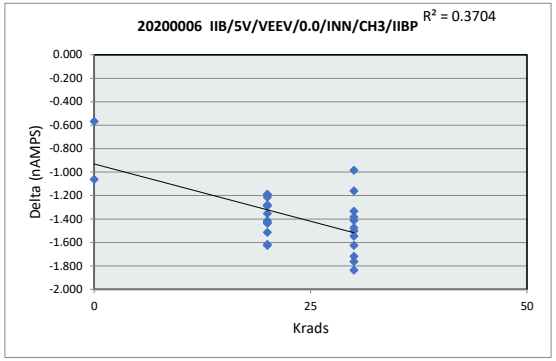
	20200005 IIB/5V/VEEV/0.0/		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	-0.460	-0.647	-26.763
Average	-0.406	-0.528	-2.887
Max	-0.352	-0.401	-0.458
UL			



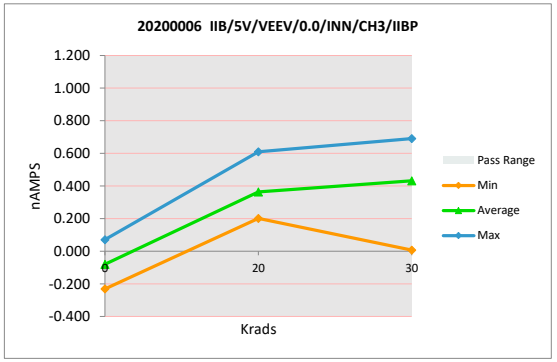
TID Report - HDR
TLV4H290MDYYTSEP

	20200006 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	-1.293	-0.231	-1.061	82.10%	2.12%
0	2	-0.496	0.071	-0.567	114.31%	1.13%
20	3	-0.968	0.221	-1.189	122.82%	2.38%
20	4	-1.057	0.373	-1.430	135.34%	2.86%
20	5	-1.008	0.609	-1.617	160.49%	3.23%
20	6	-1.089	0.201	-1.290	118.49%	2.58%
20	7	-1.044	0.371	-1.415	135.52%	2.83%
20	8	-1.128	0.226	-1.354	120.03%	2.71%
20	9 U	-0.764	0.450	-1.214	158.84%	2.43%
20	10 U	-0.941	0.339	-1.280	136.02%	2.56%
20	11 U	-1.162	0.351	-1.514	130.22%	3.03%
20	12 U	-1.138	0.487	-1.624	142.76%	3.25%
20	13 U	-1.025	0.413	-1.438	140.28%	2.88%
20	14 U	-0.872	0.319	-1.192	136.61%	2.38%
30	15	-1.084	0.251	-1.334	123.11%	2.67%
30	16	-1.138	0.580	-1.718	150.97%	3.44%
30	17	-1.096	0.450	-1.546	141.02%	3.09%
30	18	-1.113	0.649	-1.762	158.28%	3.52%
30	19	-1.145	0.691	-1.836	160.30%	3.67%
30	20	-0.934	0.541	-1.474	157.89%	2.95%
30	21 U	-0.953	0.206	-1.160	121.63%	2.32%
30	22 U	-0.998	0.415	-1.413	141.62%	2.83%
30	23 U	-1.000	0.383	-1.383	138.32%	2.77%
30	24 U	-0.978	0.007	-0.985	100.73%	1.97%
30	25 U	-1.086	0.538	-1.624	149.54%	3.25%
30	26 U	-1.030	0.472	-1.501	145.82%	3.00%
	Max	-0.496	0.691	-0.567	160.49%	3.67%
	Average	-1.021	0.361	-1.382	135.50%	2.76%
	Min	-1.293	-0.231	-1.836	82.10%	1.13%
	Std Dev	0.150	0.208	0.269	19.05%	0.54%



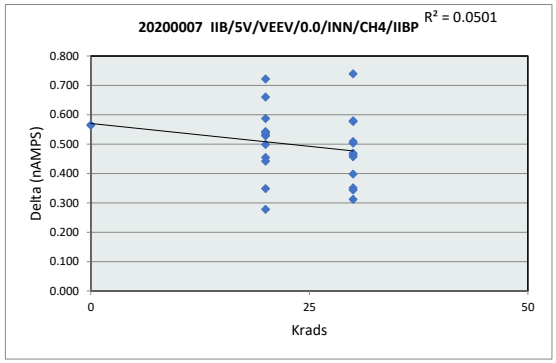
	20200006 IIB/5V/VEEV/0.0/I		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	-0.231	0.201	0.007
Average	-0.080	0.363	0.432
Max	0.071	0.609	0.691
UL			



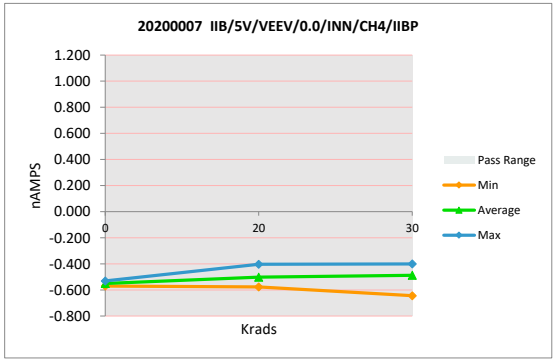
TID Report - HDR
TLV4H290MDYYTSEP

	20200007 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit	25.00000029	25.00000029
Min Limit	-25.00000029	-25.00000029

Krads	Serial #	HDR_PRE	HDR_POST	Delta	Delta %	% of Limit Range
0	1	0.034	-0.531	0.565	1682.82%	1.13%
0	2	-0.006	-0.570	0.565	-9859.52%	1.13%
20	3	-0.028	-0.560	0.533	-1914.78%	1.07%
20	4	0.102	-0.438	0.540	527.96%	1.08%
20	5	-0.033	-0.487	0.454	-1387.49%	0.91%
20	6	0.107	-0.553	0.660	616.01%	1.32%
20	7	-0.079	-0.428	0.349	-439.14%	0.70%
20	8	0.019	-0.524	0.542	2882.31%	1.08%
20	9 U	0.122	-0.465	0.587	481.18%	1.17%
20	10 U	0.144	-0.578	0.722	501.13%	1.44%
20	11 U	-0.126	-0.403	0.277	-220.10%	0.55%
20	12 U	0.034	-0.494	0.528	1573.04%	1.06%
20	13 U	-0.077	-0.575	0.498	-647.88%	1.00%
20	14 U	-0.077	-0.519	0.442	-574.46%	0.88%
30	15	-0.092	-0.560	0.469	-511.61%	0.94%
30	16	-0.146	-0.489	0.344	-235.94%	0.69%
30	17	-0.047	-0.504	0.457	-962.06%	0.91%
30	18	0.107	-0.472	0.579	540.43%	1.16%
30	19	0.041	-0.423	0.464	1133.87%	0.93%
30	20	-0.104	-0.416	0.312	-299.97%	0.62%
30	21 U	-0.067	-0.644	0.577	-859.79%	1.15%
30	22 U	-0.050	-0.401	0.351	-703.22%	0.70%
30	23 U	0.031	-0.472	0.503	1618.26%	1.01%
30	24 U	0.011	-0.497	0.508	4434.98%	1.02%
30	25 U	0.205	-0.533	0.739	359.75%	1.48%
30	26 U	-0.045	-0.443	0.398	-883.59%	0.80%
	Max	0.205	-0.401	0.739	4434.98%	1.48%
	Average	-0.001	-0.499	0.498	-121.07%	1.00%
	Min	-0.146	-0.644	0.277	-9859.52%	0.55%
	Std Dev	0.090	0.063	0.117	2412.54%	0.23%



	20200007 IIB/5V/VEEV/0.0/I		
Test Site			
Tester			
Test Number			
Max Limit		nAMPS	
Min Limit		nAMPS	
Krads	0	20	30
LL			
Min	-0.570	-0.578	-0.644
Average	-0.551	-0.502	-0.488
Max	-0.531	-0.403	-0.401
UL			



B Appendix B: Total Ionizing Dose HDR Report - Post-Anneal

Please see the following pages for the TLV4H290-SEP TID HDR report for post-room temperature annealing test data.

Delta Threshold: 10%

Delta Threshold 10.00%

TID Report - HDR Annealing
TLV4H290MDYYTSEP

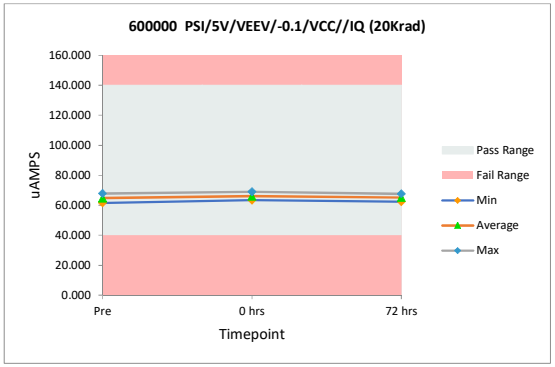
TID Report - HDR Annealing
TLV4H290MDYYTSEP

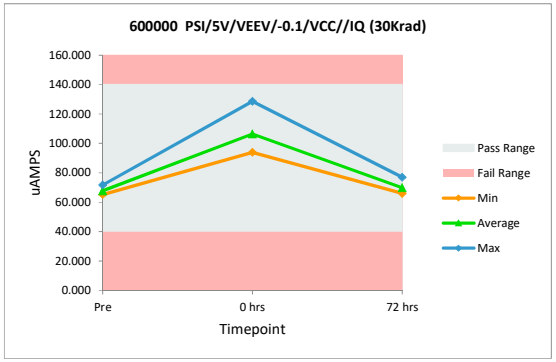
	600000 PSI/5V/VEEV/-0.1/VCC	
Test Site		
Tester		
Test Number		
Unit	uAMPS	uAMPS
Max Limit	140	140
Min Limit	39.99999899	39.99999899

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	65.198	65.186	65.142
0	2	68.114	68.006	67.904
20	3	65.164	66.300	65.820
20	4	63.931	64.681	63.655
20	5	64.402	66.025	65.684
20	6	61.518	63.382	62.299
20	7	65.863	67.122	65.872
20	8	67.792	68.949	67.552
30	15	67.149	95.079	68.167
30	16	65.189	98.367	65.909
30	17	69.360	110.546	72.318
30	18	66.874	93.961	65.938
30	19	71.670	128.672	76.947
30	20	66.176	112.177	69.611
	Max	71.670	128.672	76.947
	Average	66.314	83.461	67.344
	Min	61.518	63.382	62.299
	Std Dev	2.493	22.317	3.704

20 Krads	Pre	0 hrs	72 hrs
LL	40.000	40.000	40.000
Min	61.518	63.382	62.299
Average	64.778	66.077	65.147
Max	67.792	68.949	67.552
UL	140.000	140.000	140.000

30 Krads	Pre	0 hrs	72 hrs
LL	40.000	40.000	40.000
Min	65.189	93.961	65.909
Average	67.736	106.467	69.815
Max	71.670	128.672	76.947
UL	140.000	140.000	140.000





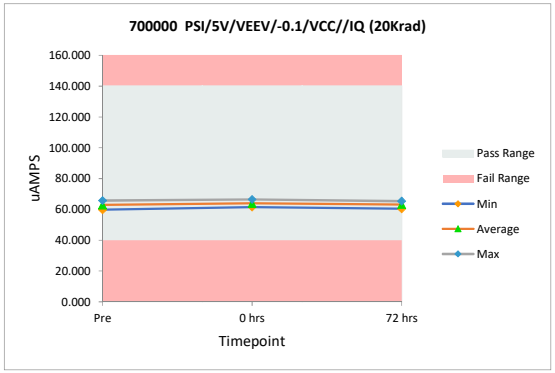
TID Report - HDR Annealing
TLV4H290MDYYTSEP

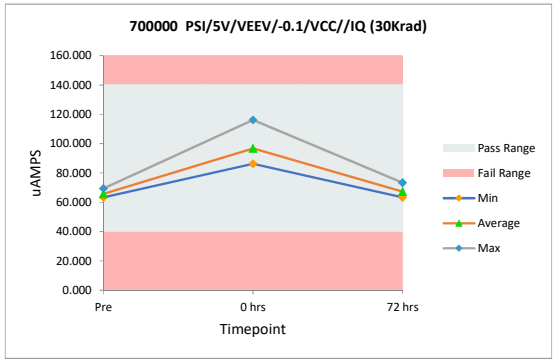
	700000 PSI/1.8V/VEEV/-0.1/V	
Test Site		
Tester		
Test Number		
Unit	uAMPS	uAMPS
Max Limit	140	140
Min Limit	39.99999899	39.99999899

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	63.375	63.358	63.304
0	2	66.053	65.968	65.879
20	3	63.284	64.401	63.864
20	4	62.145	62.505	61.719
20	5	62.634	64.133	63.675
20	6	59.756	61.499	60.369
20	7	63.899	64.429	63.670
20	8	65.776	66.483	65.346
30	15	65.102	87.268	65.988
30	16	63.382	89.438	63.433
30	17	67.392	99.633	69.975
30	18	65.014	86.258	63.960
30	19	69.445	116.199	73.292
30	20	64.300	102.121	67.294
	Max	69.445	116.199	73.292
	Average	64.397	78.121	65.126
	Min	59.756	61.499	60.369
	Std Dev	2.374	18.312	3.327

20 Krads	Pre	0 hrs	72 hrs
LL	40.000	40.000	40.000
Min	59.756	61.499	60.369
Average	62.916	63.909	63.107
Max	65.776	66.483	65.346
UL	140.000	140.000	140.000

30 Krads	Pre	0 hrs	72 hrs
LL	40.000	40.000	40.000
Min	63.382	86.258	63.433
Average	65.773	96.819	67.324
Max	69.445	116.199	73.292
UL	140.000	140.000	140.000





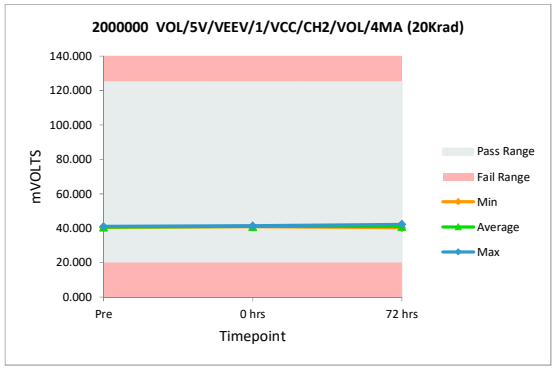
TID Report - HDR Annealing
TLV4H290MDYYTSEP

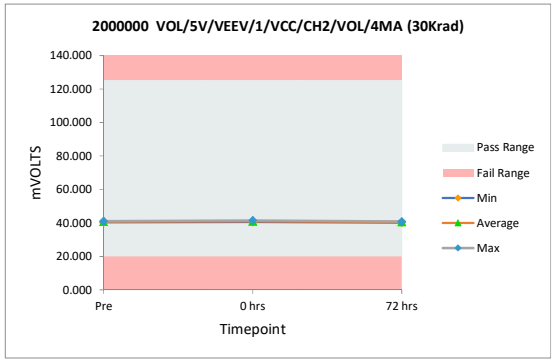
	2000000 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	40.770	41.721	40.981
0	2	40.535	41.199	40.324
20	3	40.569	40.940	41.107
20	4	40.508	41.301	42.262
20	5	41.023	41.045	40.805
20	6	40.728	40.960	41.222
20	7	40.663	41.366	40.564
20	8	40.602	41.201	40.310
30	15	40.746	40.557	40.849
30	16	40.652	40.642	40.762
30	17	40.420	40.907	40.248
30	18	41.063	41.190	40.361
30	19	40.883	40.878	40.425
30	20	40.670	41.512	40.746
	Max	41.063	41.721	42.262
	Average	40.702	41.101	40.783
	Min	40.420	40.557	40.248
	Std Dev	0.186	0.320	0.526

20 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	40.508	40.940	40.310
Average	40.682	41.136	41.045
Max	41.023	41.366	42.262
UL	125.000	125.000	125.000

30 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	40.420	40.557	40.248
Average	40.739	40.948	40.566
Max	41.063	41.512	40.849
UL	125.000	125.000	125.000





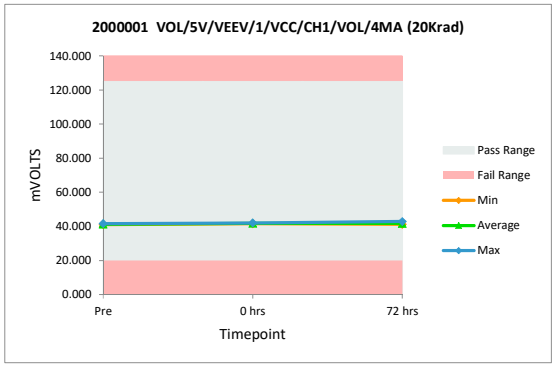
TID Report - HDR Annealing
TLV4H290MDYYTSEP

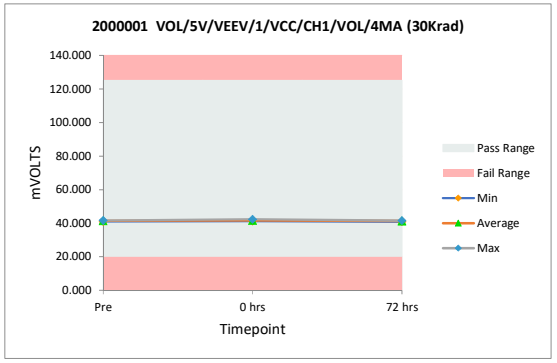
	2000001 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	41.491	42.157	41.468
0	2	41.217	42.065	40.910
20	3	41.289	41.571	41.731
20	4	41.171	42.029	42.847
20	5	41.627	41.793	41.449
20	6	41.293	41.513	41.807
20	7	41.032	41.861	41.169
20	8	41.362	41.891	41.071
30	15	41.448	41.266	41.552
30	16	41.392	41.527	41.562
30	17	41.141	41.557	40.931
30	18	41.628	41.802	41.103
30	19	41.428	41.724	41.206
30	20	41.371	42.377	41.468
	Max	41.628	42.377	42.847
	Average	41.349	41.795	41.448
	Min	41.032	41.266	40.910
	Std Dev	0.174	0.298	0.492

20 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	41.032	41.513	41.071
Average	41.296	41.776	41.679
Max	41.627	42.029	42.847
UL	125.000	125.000	125.000

30 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	41.141	41.266	40.931
Average	41.401	41.709	41.304
Max	41.628	42.377	41.562
UL	125.000	125.000	125.000





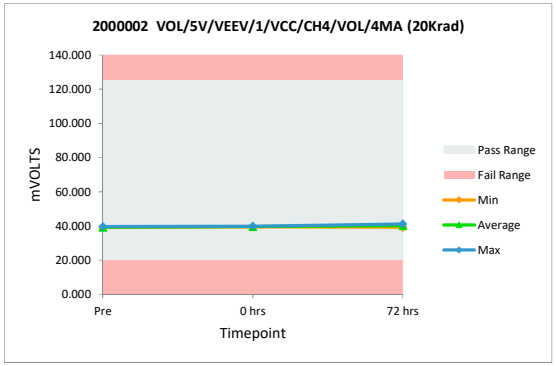
TID Report - HDR Annealing
TLV4H290MDYYTSEP

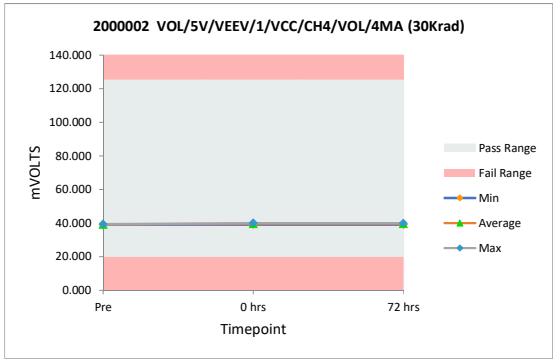
	2000002 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	39.152	40.332	39.864
0	2	38.957	39.888	39.364
20	3	39.127	39.414	40.946
20	4	39.243	39.716	41.203
20	5	39.680	39.792	39.942
20	6	39.424	39.375	40.418
20	7	39.143	39.821	39.369
20	8	39.259	39.695	39.233
30	15	39.344	39.128	39.986
30	16	39.269	39.291	39.958
30	17	39.369	39.751	39.248
30	18	39.271	39.821	39.343
30	19	39.109	39.625	39.114
30	20	39.326	40.025	39.786
	Max	39.680	40.332	41.203
	Average	39.262	39.691	39.841
	Min	38.957	39.128	39.114
	Std Dev	0.172	0.312	0.645

20 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	39.127	39.375	39.233
Average	39.313	39.635	40.185
Max	39.680	39.821	41.203
UL	125.000	125.000	125.000

30 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	39.109	39.128	39.114
Average	39.282	39.607	39.573
Max	39.369	40.025	39.986
UL	125.000	125.000	125.000





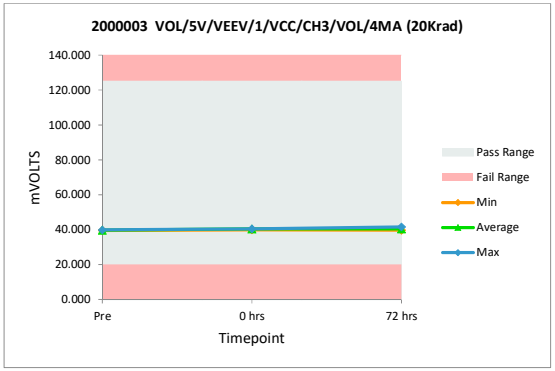
TID Report - HDR Annealing
TLV4H290MDYYTSEP

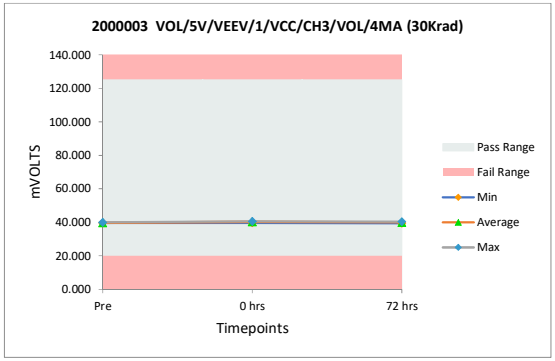
	2000003 VOL/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	125	125
Min Limit	19.99999955	19.99999955

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	39.737	40.631	40.118
0	2	39.717	40.851	40.027
20	3	39.575	40.377	40.829
20	4	39.573	40.503	41.594
20	5	39.815	40.481	40.352
20	6	39.755	39.888	40.808
20	7	39.611	40.334	39.779
20	8	39.824	40.501	39.681
30	15	39.714	39.739	40.396
30	16	39.639	40.078	40.114
30	17	39.641	40.382	39.541
30	18	39.954	40.373	39.772
30	19	39.655	40.393	39.582
30	20	39.872	40.577	40.137
	Max	39.954	40.851	41.594
	Average	39.720	40.365	40.195
	Min	39.573	39.739	39.541
	Std Dev	0.115	0.292	0.573

20 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	39.573	39.888	39.681
Average	39.692	40.347	40.507
Max	39.824	40.503	41.594
UL	125.000	125.000	125.000

30 Krad	Pre	0 hrs	72 hrs
LL	20.000	20.000	20.000
Min	39.639	39.739	39.541
Average	39.746	40.257	39.924
Max	39.954	40.577	40.396
UL	125.000	125.000	125.000

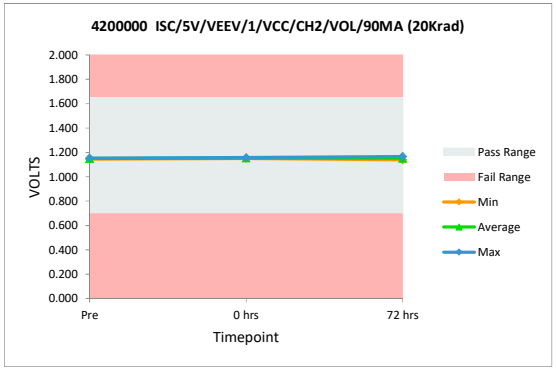




TID Report - HDR Annealing
TLV4H290MDYYTSEP

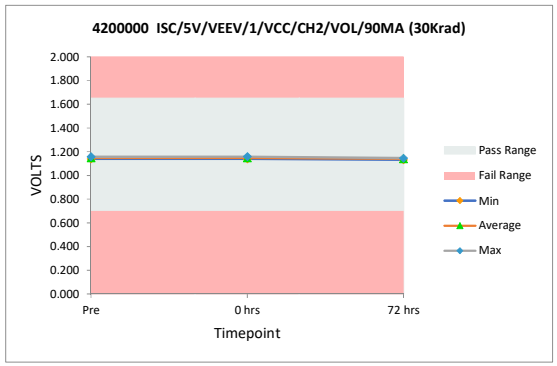
	4200000 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	1.141	1.155	1.149
0	2	1.145	1.158	1.143
20	3	1.151	1.154	1.156
20	4	1.146	1.151	1.167
20	5	1.153	1.156	1.151
20	6	1.148	1.150	1.151
20	7	1.153	1.154	1.144
20	8	1.151	1.154	1.140
30	15	1.146	1.141	1.143
30	16	1.149	1.146	1.143
30	17	1.139	1.139	1.131
30	18	1.156	1.156	1.144
30	19	1.152	1.150	1.138
30	20	1.152	1.157	1.146
	Max	1.156	1.158	1.167
	Average	1.149	1.151	1.146
	Min	1.139	1.139	1.131
	Std Dev	0.005	0.006	0.009



20 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.146	1.150	1.140
Average	1.150	1.153	1.151
Max	1.153	1.156	1.167
UL	1.650	1.650	1.650

30 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.139	1.139	1.131
Average	1.149	1.148	1.141
Max	1.156	1.157	1.146
UL	1.650	1.650	1.650



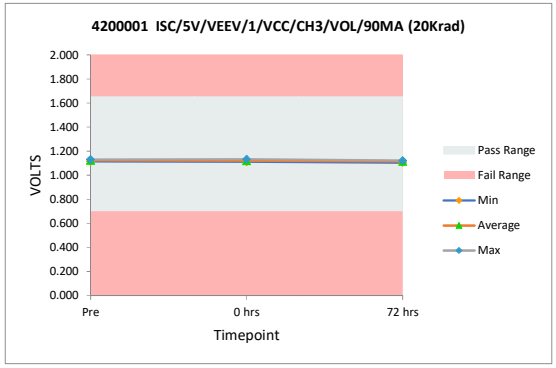
TID Report - HDR Annealing
TLV4H290MDYYTSEP

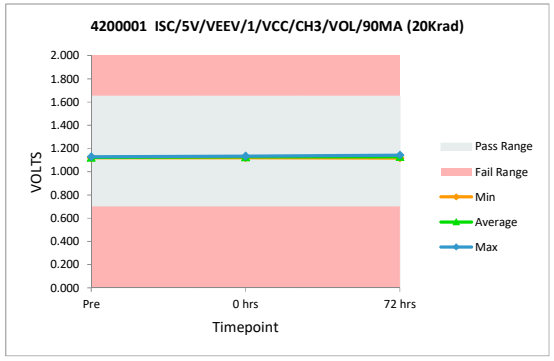
	4200001 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	1.115	1.129	1.121
0	2	1.120	1.137	1.122
20	3	1.126	1.132	1.136
20	4	1.120	1.124	1.142
20	5	1.125	1.127	1.125
20	6	1.118	1.119	1.128
20	7	1.124	1.128	1.116
20	8	1.129	1.133	1.118
30	15	1.122	1.115	1.122
30	16	1.123	1.118	1.118
30	17	1.115	1.112	1.105
30	18	1.130	1.128	1.118
30	19	1.122	1.120	1.109
30	20	1.129	1.133	1.122
	Max	1.130	1.137	1.142
	Average	1.123	1.125	1.122
	Min	1.115	1.112	1.105
	Std Dev	0.005	0.007	0.010

20 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.118	1.119	1.116
Average	1.124	1.127	1.128
Max	1.129	1.133	1.142
UL	1.650	1.650	1.650

30 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.115	1.112	1.105
Average	1.123	1.121	1.116
Max	1.130	1.133	1.122
UL	1.650	1.650	1.650





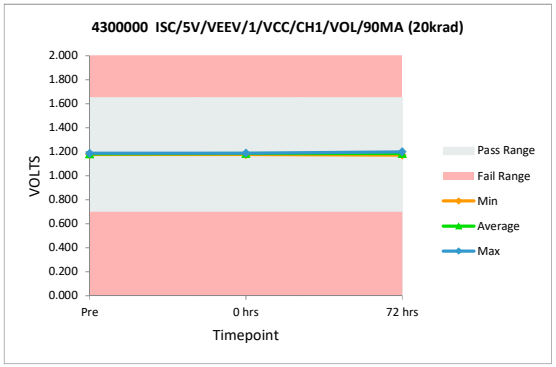
TID Report - HDR Annealing
TLV4H290MDYYTSEP

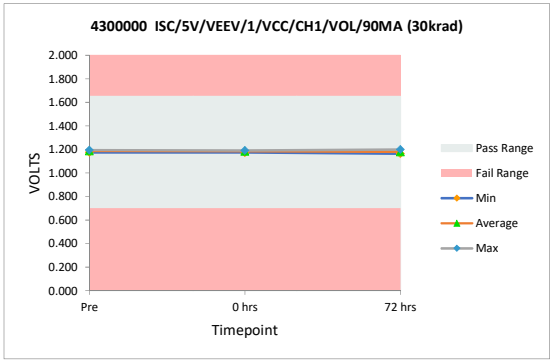
	4300000 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	1.173	1.184	1.177
0	2	1.177	1.190	1.176
20	3	1.182	1.184	1.188
20	4	1.181	1.187	1.200
20	5	1.186	1.189	1.184
20	6	1.177	1.176	1.181
20	7	1.180	1.182	1.173
20	8	1.187	1.188	1.176
30	15	1.186	1.178	1.182
30	16	1.186	1.182	1.180
30	17	1.175	1.173	1.164
30	18	1.194	1.191	1.180
30	19	1.187	1.184	1.174
30	20	1.188	1.190	1.180
	Max	1.194	1.191	1.200
	Average	1.183	1.184	1.179
	Min	1.173	1.173	1.164
	Std Dev	0.006	0.005	0.008

20 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.177	1.176	1.173
Average	1.182	1.184	1.184
Max	1.187	1.189	1.200
UL	1.650	1.650	1.650

30 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.175	1.173	1.164
Average	1.187	1.185	1.179
Max	1.194	1.191	1.200
UL	1.650	1.650	1.650





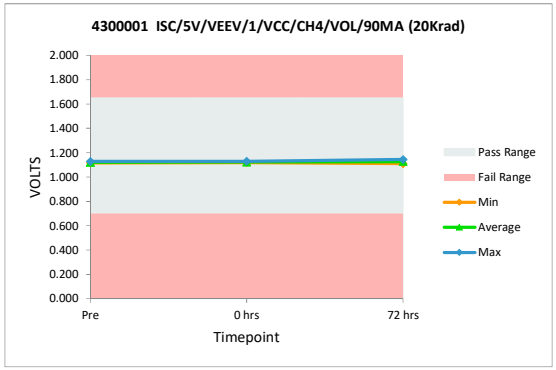
TID Report - HDR Annealing
TLV4H290MDYYTSEP

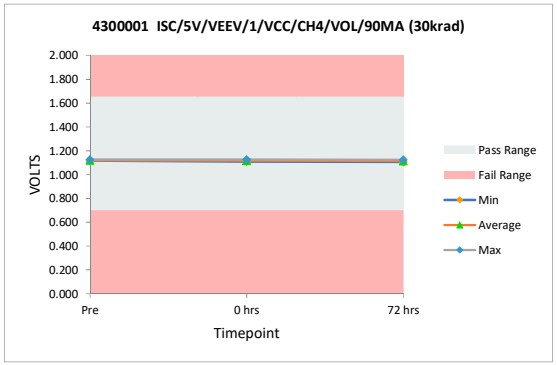
	4300001 ISC/5V/VEEV/1/VCC/	
Test Site		
Tester		
Test Number		
Unit	VOLTS	VOLTS
Max Limit	1.649999976	1.649999976
Min Limit	0.699999988	0.699999988

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	1.117	1.133	1.123
0	2	1.112	1.127	1.115
20	3	1.120	1.123	1.144
20	4	1.119	1.123	1.142
20	5	1.128	1.129	1.129
20	6	1.119	1.118	1.129
20	7	1.116	1.119	1.109
20	8	1.124	1.126	1.112
30	15	1.117	1.110	1.120
30	16	1.121	1.116	1.125
30	17	1.118	1.113	1.108
30	18	1.127	1.125	1.117
30	19	1.120	1.117	1.107
30	20	1.123	1.126	1.118
	Max	1.128	1.133	1.144
	Average	1.120	1.122	1.121
	Min	1.112	1.110	1.107
	Std Dev	0.004	0.006	0.012

20 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.116	1.118	1.109
Average	1.121	1.123	1.127
Max	1.128	1.129	1.144
UL	1.650	1.650	1.650

30 Krad	Pre	0 hrs	72 hrs
LL	0.700	0.700	0.700
Min	1.117	1.110	1.107
Average	1.121	1.118	1.116
Max	1.127	1.126	1.125
UL	1.650	1.650	1.650





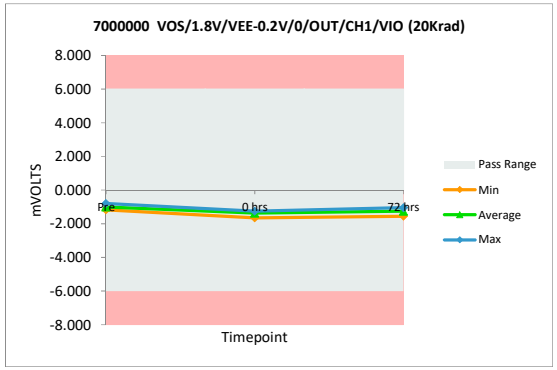
TID Report - HDR Annealing
TLV4H290MDYYTSEP

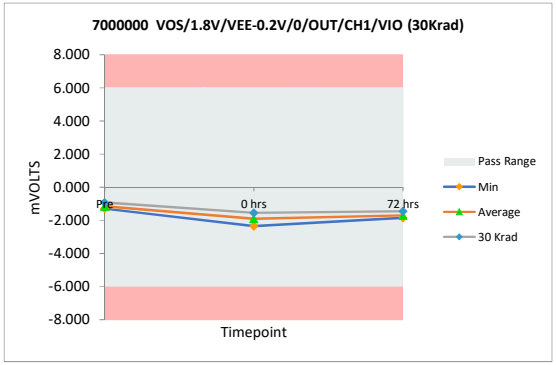
	7000000 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	6.000000052	6.000000052
Min Limit	-6.000000052	-6.000000052

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-1.046	-0.550	-0.650
0	2	-1.046	-0.650	-0.750
20	3	-1.046	-1.250	-1.050
20	4	-0.923	-1.250	-1.150
20	5	-1.046	-1.350	-1.250
20	6	-0.800	-1.250	-1.150
20	7	-1.046	-1.450	-1.350
20	8	-1.169	-1.650	-1.550
30	15	-1.169	-1.950	-1.750
30	16	-1.169	-1.650	-1.650
30	17	-1.293	-2.151	-1.850
30	18	-0.923	-1.550	-1.450
30	19	-1.293	-2.351	-1.850
30	20	-1.046	-1.750	-1.650
	Max	-0.800	-0.550	-0.650
	Average	-1.073	-1.486	-1.364
	Min	-1.293	-2.351	-1.850
	Std Dev	0.138	0.503	0.384

20 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-1.169	-1.650	-1.550
Average	-1.005	-1.367	-1.250
Max	-0.800	-1.250	-1.050
UL	6.000	6.000	6.000

30 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-1.293	-2.351	-1.850
Average	-1.149	-1.900	-1.700
Max	-0.923	-1.550	-1.450
UL	6.000	6.000	6.000





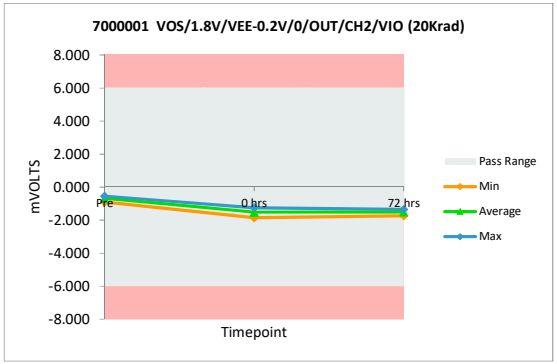
TID Report - HDR Annealing
TLV4H290MDYYTSEP

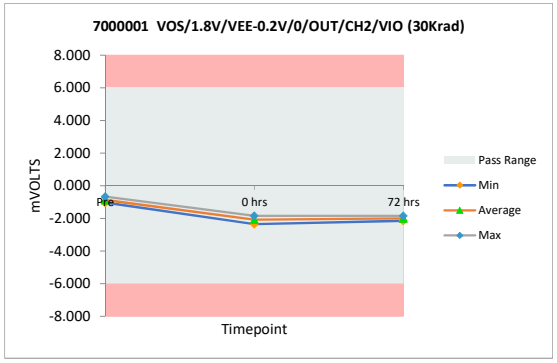
	7000001 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	6.000000052	6.000000052
Min Limit	-6.000000052	-6.000000052

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.548	-0.650	-0.850
0	2	-0.913	-0.850	-1.050
20	3	-0.913	-1.850	-1.750
20	4	-0.670	-1.550	-1.550
20	5	-0.670	-1.450	-1.550
20	6	-0.548	-1.450	-1.350
20	7	-0.670	-1.250	-1.350
20	8	-0.548	-1.550	-1.450
30	15	-0.670	-1.850	-1.850
30	16	-0.913	-2.251	-2.151
30	17	-1.035	-2.051	-2.051
30	18	-0.913	-2.151	-2.051
30	19	-1.035	-2.351	-2.051
30	20	-0.670	-1.850	-1.850
	Max	-0.548	-0.650	-0.850
	Average	-0.765	-1.650	-1.636
	Min	-1.035	-2.351	-2.151
	Std Dev	0.180	0.503	0.398

20 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-0.913	-1.850	-1.750
Average	-0.670	-1.517	-1.500
Max	-0.548	-1.250	-1.350
UL	6.000	6.000	6.000

30 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-1.035	-2.351	-2.151
Average	-0.872	-2.084	-2.001
Max	-0.670	-1.850	-1.850
UL	6.000	6.000	6.000





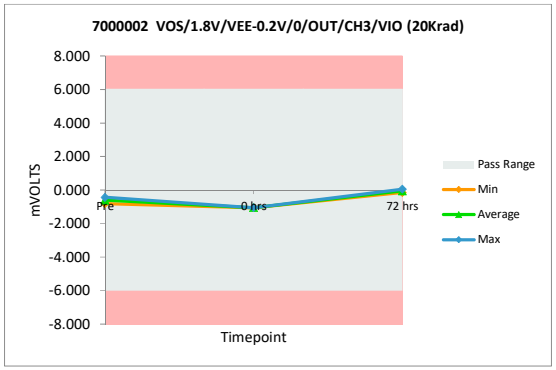
TID Report - HDR Annealing
TLV4H290MDYYTSEP

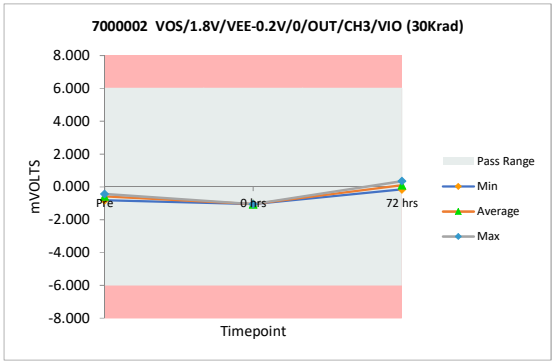
	7000002 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	6.000000052	6.000000052
Min Limit	-6.000000052	-6.000000052

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.929	-1.150	-1.050
0	2	-0.434	-1.150	-0.750
20	3	-0.558	-1.050	-0.050
20	4	-0.806	-1.050	-0.150
20	5	-0.682	-1.050	-0.150
20	6	-0.434	-1.050	0.050
20	7	-0.558	-1.050	-0.050
20	8	-0.558	-1.050	0.050
30	15	-0.682	-1.050	-0.050
30	16	-0.558	-1.050	0.350
30	17	-0.434	-1.050	0.150
30	18	-0.806	-1.050	-0.150
30	19	-0.434	-1.050	0.150
30	20	-0.558	-1.050	0.150
	Max	-0.434	-1.050	0.350
	Average	-0.602	-1.064	-0.107
	Min	-0.929	-1.150	-1.050
	Std Dev	0.158	0.036	0.369

20 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-0.806	-1.050	-0.150
Average	-0.599	-1.050	-0.050
Max	-0.434	-1.050	0.050
UL	6.000	6.000	6.000

30 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-0.806	-1.050	-0.150
Average	-0.578	-1.050	0.100
Max	-0.434	-1.050	0.350
UL	6.000	6.000	6.000





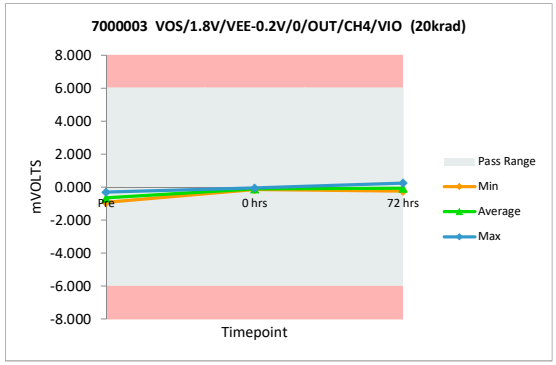
TID Report - HDR Annealing
TLV4H290MDYYTSEP

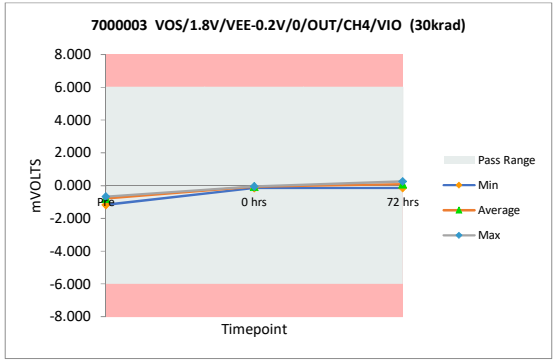
	7000003 VOS/1.8V/VEE-0.2V/0	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	6.000000052	6.000000052
Min Limit	-6.000000052	-6.000000052

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.925	-0.550	-1.050
0	2	-1.171	-0.750	-1.250
20	3	-0.308	-0.150	0.250
20	4	-0.925	-0.150	-0.250
20	5	-0.801	-0.150	-0.250
20	6	-0.555	-0.050	0.050
20	7	-0.555	-0.050	0.050
20	8	-0.801	-0.150	-0.250
30	15	-0.801	-0.150	-0.050
30	16	-0.678	-0.050	0.250
30	17	-0.678	-0.050	0.250
30	18	-0.678	-0.050	0.150
30	19	-1.171	-0.050	-0.150
30	20	-0.678	-0.050	0.050
	Max	-0.308	-0.050	0.250
	Average	-0.766	-0.171	-0.157
	Min	-1.171	-0.750	-1.250
	Std Dev	0.234	0.212	0.460

20 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-0.925	-0.150	-0.250
Average	-0.658	-0.117	-0.067
Max	-0.308	-0.050	0.250
UL	6.000	6.000	6.000

30 Krad	Pre	0 hrs	72 hrs
LL	-6.000	-6.000	-6.000
Min	-1.171	-0.150	-0.150
Average	-0.781	-0.067	0.083
Max	-0.678	-0.050	0.250
UL	6.000	6.000	6.000





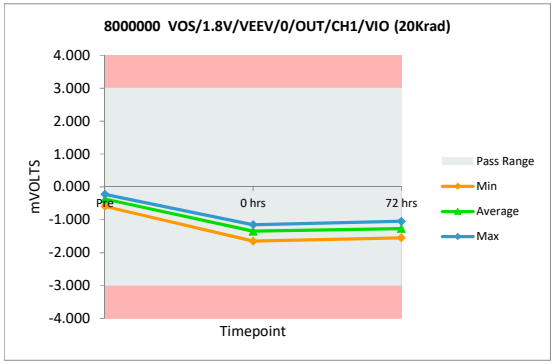
TID Report - HDR Annealing
TLV4H290MDYYTSEP

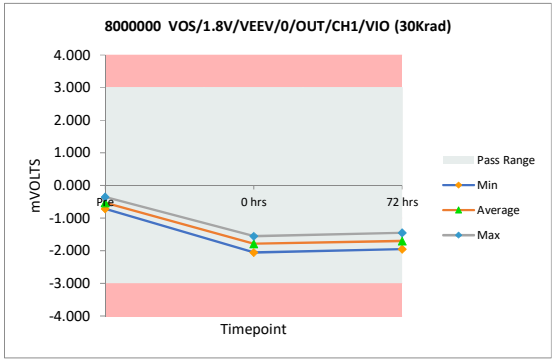
	8000000 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.430	-0.650	-0.650
0	2	-0.471	-0.650	-0.750
20	3	-0.348	-1.250	-1.050
20	4	-0.266	-1.150	-1.150
20	5	-0.389	-1.350	-1.250
20	6	-0.225	-1.250	-1.150
20	7	-0.389	-1.450	-1.450
20	8	-0.593	-1.650	-1.550
30	15	-0.471	-1.750	-1.650
30	16	-0.512	-1.650	-1.650
30	17	-0.716	-2.051	-1.950
30	18	-0.348	-1.550	-1.450
30	19	-0.675	-1.950	-1.850
30	20	-0.430	-1.750	-1.650
	Max	-0.225	-0.650	-0.650
	Average	-0.447	-1.436	-1.371
	Min	-0.716	-2.051	-1.950
	Std Dev	0.142	0.424	0.389

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.593	-1.650	-1.550
Average	-0.368	-1.350	-1.267
Max	-0.225	-1.150	-1.050
UL	3.000	3.000	3.000

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.716	-2.051	-1.950
Average	-0.525	-1.784	-1.700
Max	-0.348	-1.550	-1.450
UL	3.000	3.000	3.000





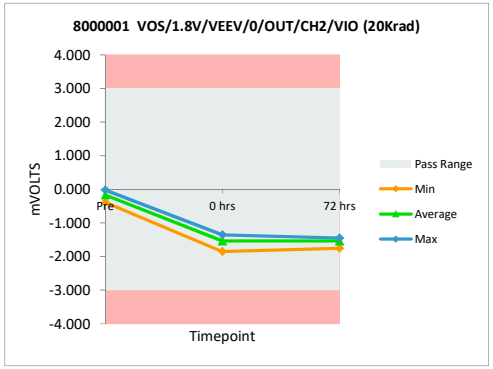
TID Report - HDR Annealing
TLV4H290MDYYTSEP

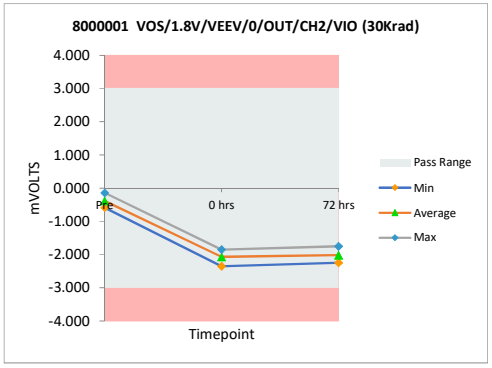
	8000001 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.020	-0.650	-0.850
0	2	-0.425	-0.850	-1.050
20	3	-0.384	-1.850	-1.750
20	4	-0.182	-1.550	-1.550
20	5	-0.142	-1.550	-1.550
20	6	-0.020	-1.350	-1.450
20	7	-0.142	-1.350	-1.450
20	8	-0.142	-1.550	-1.450
30	15	-0.182	-1.950	-1.750
30	16	-0.425	-2.351	-2.251
30	17	-0.506	-2.151	-2.151
30	18	-0.465	-2.051	-2.051
30	19	-0.587	-2.051	-2.051
30	20	-0.142	-1.850	-1.850
	Max	-0.020	-0.650	-0.850
	Average	-0.269	-1.650	-1.657
	Min	-0.587	-2.351	-2.251
	Std Dev	0.188	0.487	0.405

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.384	-1.850	-1.750
Average	-0.169	-1.533	-1.533
Max	-0.020	-1.350	-1.450
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.587	-2.351	-2.251
Average	-0.384	-2.067	-2.017
Max	-0.142	-1.850	-1.750
UL	3.000	3.000	3.000





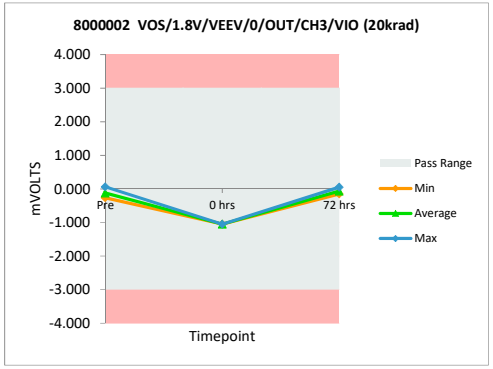
TID Report - HDR Annealing
TLV4H290MDYYTSEP

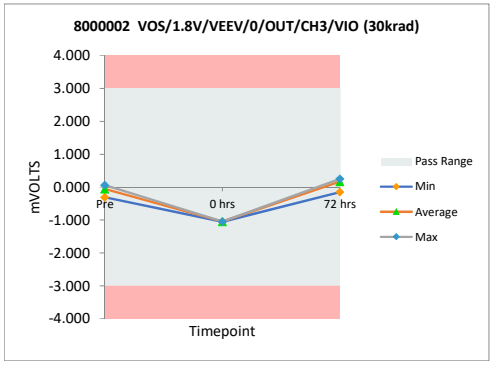
	8000002 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.433	-1.150	-1.050
0	2	-0.021	-1.150	-0.650
20	3	-0.144	-1.050	-0.150
20	4	-0.268	-1.050	-0.150
20	5	-0.185	-1.050	-0.050
20	6	0.062	-1.050	0.050
20	7	-0.103	-1.050	-0.150
20	8	-0.103	-1.050	0.050
30	15	-0.268	-1.050	-0.050
30	16	-0.103	-1.050	0.250
30	17	0.021	-1.050	0.250
30	18	-0.309	-1.050	-0.150
30	19	0.062	-1.050	0.250
30	20	-0.062	-1.050	0.150
	Max	0.062	-1.050	0.250
	Average	-0.132	-1.064	-0.100
	Min	-0.433	-1.150	-1.050
	Std Dev	0.147	0.036	0.361

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.268	-1.050	-0.150
Average	-0.124	-1.050	-0.067
Max	0.062	-1.050	0.050
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.309	-1.050	-0.150
Average	-0.055	-1.050	0.167
Max	0.062	-1.050	0.250
UL	3.000	3.000	3.000





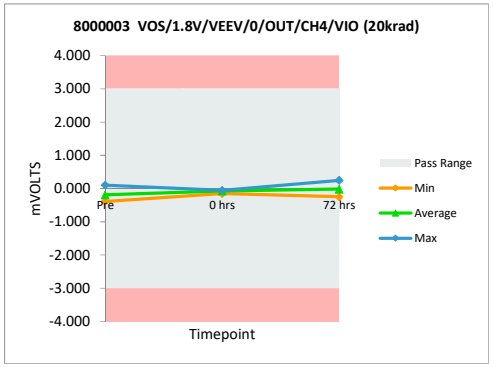
TID Report - HDR Annealing
TLV4H290MDYYTSEP

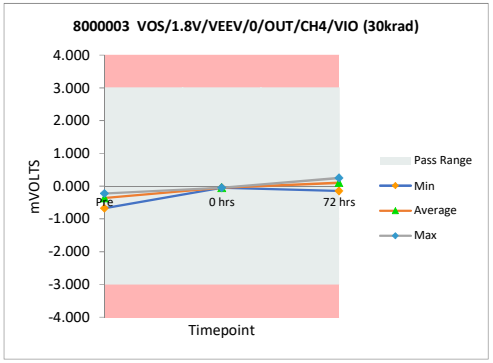
	8000003 VOS/1.8V/VEEV/0/OU	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.471	-0.550	-0.950
0	2	-0.758	-0.750	-1.250
20	3	0.102	-0.050	0.250
20	4	-0.389	-0.050	-0.250
20	5	-0.307	-0.150	-0.150
20	6	-0.102	-0.050	0.050
20	7	-0.102	-0.050	0.150
20	8	-0.348	-0.050	-0.150
30	15	-0.389	-0.050	-0.050
30	16	-0.266	-0.050	0.250
30	17	-0.307	-0.050	0.150
30	18	-0.307	-0.050	0.250
30	19	-0.676	-0.050	-0.150
30	20	-0.225	-0.050	0.150
	Max	0.102	-0.050	0.250
	Average	-0.325	-0.143	-0.121
	Min	-0.758	-0.750	-1.250
	Std Dev	0.221	0.220	0.451

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.389	-0.150	-0.250
Average	-0.191	-0.067	-0.017
Max	0.102	-0.050	0.250
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.676	-0.050	-0.150
Average	-0.362	-0.050	0.100
Max	-0.225	-0.050	0.250
UL	3.000	3.000	3.000





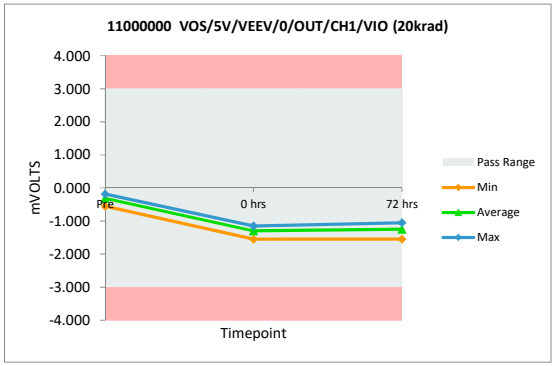
TID Report - HDR Annealing
TLV4H290MDYYTSEP

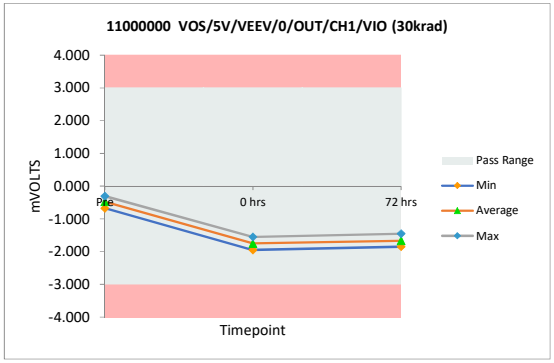
	11000000 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.389	-0.550	-0.650
0	2	-0.430	-0.650	-0.750
20	3	-0.307	-1.150	-1.050
20	4	-0.225	-1.150	-1.150
20	5	-0.307	-1.250	-1.250
20	6	-0.184	-1.250	-1.150
20	7	-0.307	-1.450	-1.350
20	8	-0.552	-1.550	-1.550
30	15	-0.430	-1.750	-1.650
30	16	-0.471	-1.650	-1.650
30	17	-0.675	-1.950	-1.850
30	18	-0.307	-1.550	-1.450
30	19	-0.593	-1.850	-1.850
30	20	-0.389	-1.750	-1.550
	Max	-0.184	-0.550	-0.650
	Average	-0.398	-1.393	-1.350
	Min	-0.675	-1.950	-1.850
	Std Dev	0.140	0.422	0.372

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.552	-1.550	-1.550
Average	-0.314	-1.300	-1.250
Max	-0.184	-1.150	-1.050
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.675	-1.950	-1.850
Average	-0.477	-1.750	-1.667
Max	-0.307	-1.550	-1.450
UL	3.000	3.000	3.000





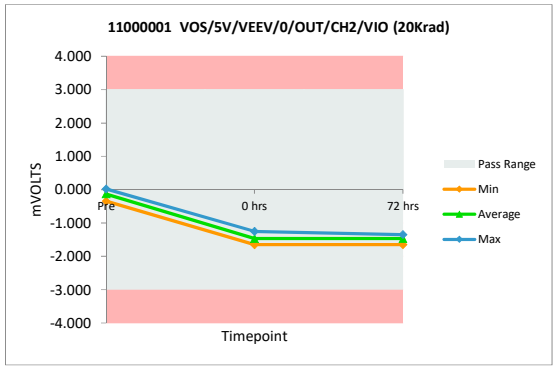
TID Report - HDR Annealing
TLV4H290MDYYTSEP

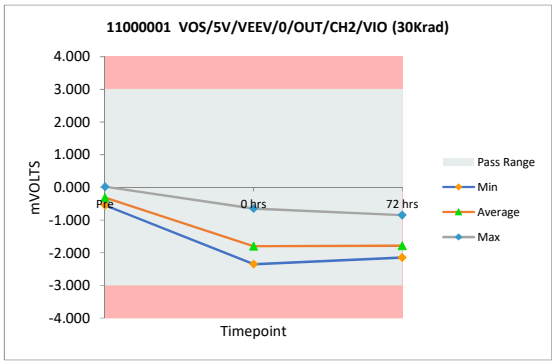
	11000001 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	0.020	-0.650	-0.850
0	2	-0.304	-0.750	-0.950
20	3	-0.344	-1.650	-1.650
20	4	-0.101	-1.550	-1.550
20	5	-0.101	-1.450	-1.450
20	6	0.020	-1.350	-1.350
20	7	-0.142	-1.250	-1.350
20	8	-0.101	-1.550	-1.450
30	15	-0.142	-1.850	-1.750
30	16	-0.344	-2.351	-2.151
30	17	-0.506	-2.051	-2.051
30	18	-0.384	-1.950	-1.950
30	19	-0.546	-2.051	-1.950
30	20	-0.101	-1.750	-1.750
	Max	0.020	-0.650	-0.850
	Average	-0.220	-1.586	-1.586
	Min	-0.546	-2.351	-2.151
	Std Dev	0.183	0.482	0.388

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.344	-1.650	-1.650
Average	-0.128	-1.467	-1.467
Max	0.020	-1.250	-1.350
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.546	-2.351	-2.151
Average	-0.310	-1.801	-1.784
Max	0.020	-0.650	-0.850
UL	3.000	3.000	3.000





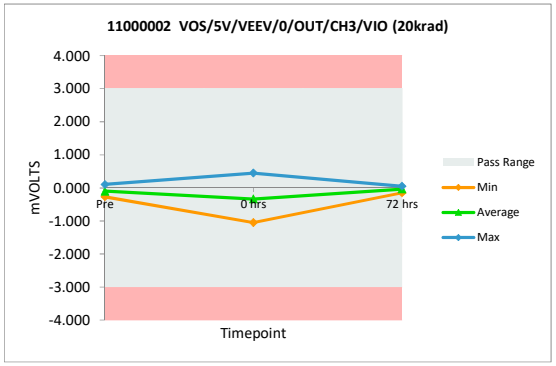
TID Report - HDR Annealing
TLV4H290MDYYTSEP

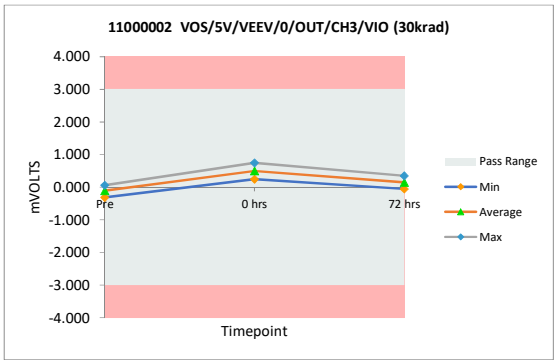
	11000002 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.391	-1.150	-0.950
0	2	0.021	-1.050	-0.550
20	3	-0.103	-1.050	-0.050
20	4	-0.268	-1.050	-0.150
20	5	-0.144	0.350	-0.050
20	6	0.103	0.450	0.050
20	7	-0.103	-1.050	-0.050
20	8	-0.103	0.350	0.050
30	15	-0.268	0.250	-0.050
30	16	-0.062	0.750	0.350
30	17	0.062	0.550	0.250
30	18	-0.309	0.350	-0.050
30	19	0.062	0.650	0.250
30	20	-0.103	0.450	0.150
	Max	0.103	0.750	0.350
	Average	-0.115	-0.086	-0.057
	Min	-0.391	-1.150	-0.950
	Std Dev	0.150	0.772	0.336

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.268	-1.050	-0.150
Average	-0.103	-0.333	-0.033
Max	0.103	0.450	0.050
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.309	0.250	-0.050
Average	-0.103	0.500	0.150
Max	0.062	0.750	0.350
UL	3.000	3.000	3.000





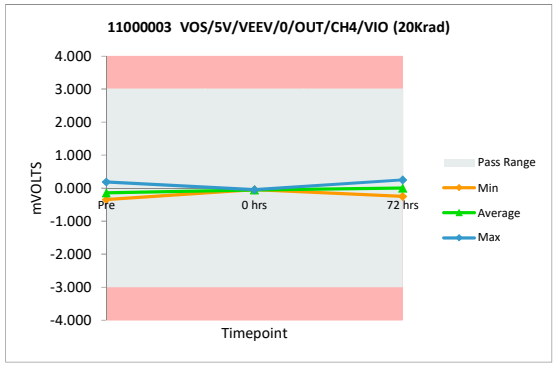
TID Report - HDR Annealing
TLV4H290MDYYTSEP

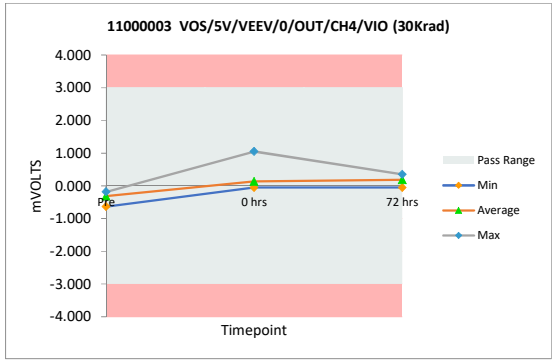
	11000003 VOS/5V/VEEV/0/OUT	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.389	-0.450	-0.950
0	2	-0.717	-0.750	-1.250
20	3	0.184	-0.050	0.250
20	4	-0.348	-0.050	-0.150
20	5	-0.266	-0.050	-0.250
20	6	-0.061	-0.050	0.150
20	7	-0.061	-0.050	0.150
20	8	-0.307	-0.050	-0.150
30	15	-0.348	-0.050	0.050
30	16	-0.225	-0.050	0.350
30	17	-0.266	-0.050	0.250
30	18	-0.225	1.050	0.350
30	19	-0.635	-0.050	-0.050
30	20	-0.184	-0.050	0.150
	Max	0.184	1.050	0.350
	Average	-0.275	-0.050	-0.079
	Min	-0.717	-0.750	-1.250
	Std Dev	0.226	0.378	0.475

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.348	-0.050	-0.250
Average	-0.143	-0.050	0.000
Max	0.184	-0.050	0.250
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.635	-0.050	-0.050
Average	-0.314	0.133	0.183
Max	-0.184	1.050	0.350
UL	3.000	3.000	3.000





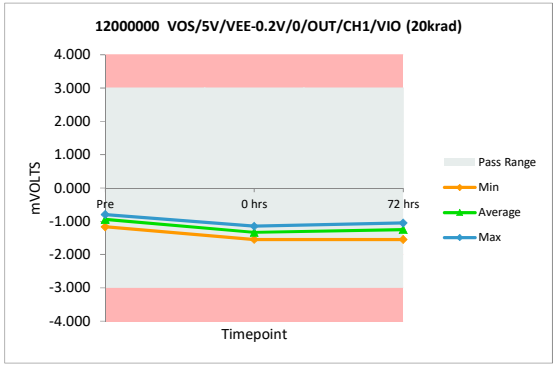
TID Report - HDR Annealing
TLV4H290MDYYTSEP

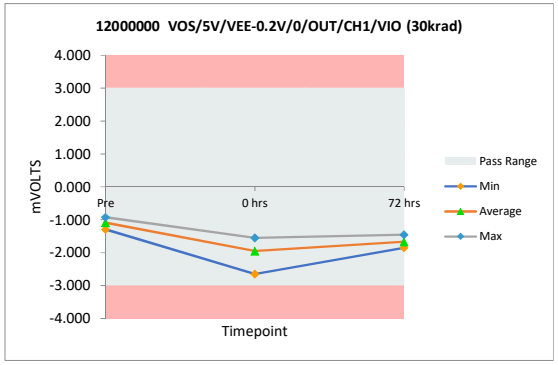
	12000000 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.923	-0.550	-0.650
0	2	-1.046	-0.650	-0.750
20	3	-0.923	-1.150	-1.050
20	4	-0.923	-1.250	-1.150
20	5	-0.923	-1.350	-1.250
20	6	-0.800	-1.250	-1.150
20	7	-0.923	-1.450	-1.350
20	8	-1.169	-1.550	-1.550
30	15	-1.046	-1.950	-1.650
30	16	-1.046	-1.650	-1.550
30	17	-1.293	-2.151	-1.850
30	18	-0.923	-1.550	-1.450
30	19	-1.169	-2.651	-1.850
30	20	-1.046	-1.750	-1.650
	Max	-0.800	-0.550	-0.650
	Average	-1.011	-1.493	-1.350
	Min	-1.293	-2.651	-1.850
	Std Dev	0.132	0.550	0.372

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-1.169	-1.550	-1.550
Average	-0.944	-1.333	-1.250
Max	-0.800	-1.150	-1.050
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-1.293	-2.651	-1.850
Average	-1.087	-1.950	-1.667
Max	-0.923	-1.550	-1.450
UL	3.000	3.000	3.000





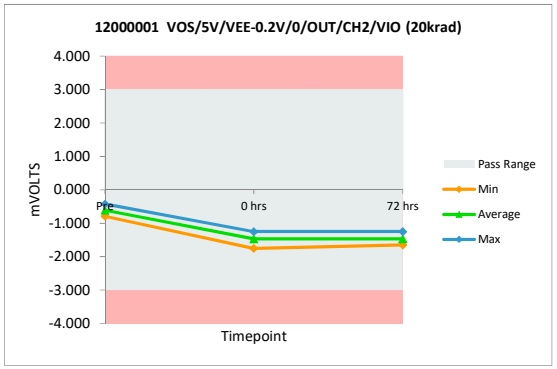
TID Report - HDR Annealing
TLV4H290MDYYTSEP

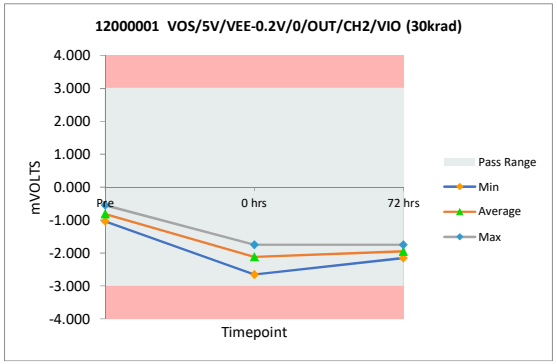
	12000001 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.426	-0.650	-0.850
0	2	-0.791	-0.750	-0.950
20	3	-0.791	-1.750	-1.650
20	4	-0.670	-1.450	-1.450
20	5	-0.548	-1.450	-1.550
20	6	-0.426	-1.350	-1.250
20	7	-0.670	-1.250	-1.350
20	8	-0.548	-1.550	-1.550
30	15	-0.670	-1.850	-1.750
30	16	-0.791	-2.251	-2.151
30	17	-0.913	-2.151	-2.051
30	18	-0.913	-2.051	-1.950
30	19	-1.035	-2.651	-2.051
30	20	-0.548	-1.750	-1.750
	Max	-0.426	-0.650	-0.850
	Average	-0.696	-1.636	-1.593
	Min	-1.035	-2.651	-2.151
	Std Dev	0.186	0.553	0.400

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.791	-1.750	-1.650
Average	-0.609	-1.467	-1.467
Max	-0.426	-1.250	-1.250
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-1.035	-2.651	-2.151
Average	-0.812	-2.117	-1.951
Max	-0.548	-1.750	-1.750
UL	3.000	3.000	3.000





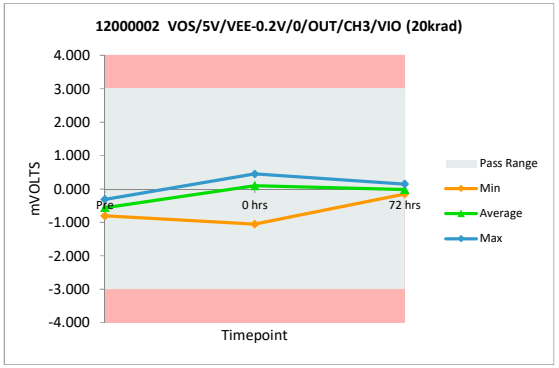
TID Report - HDR Annealing
TLV4H290MDYYTSEP

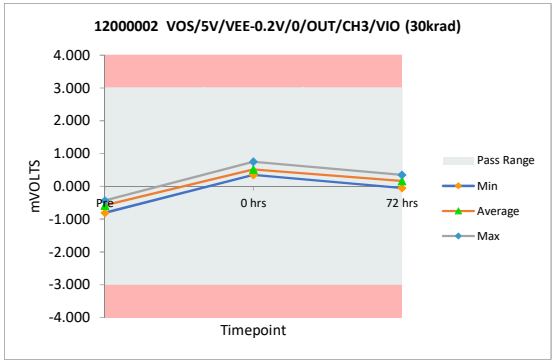
	12000002 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.929	-1.150	-0.950
0	2	-0.434	-1.050	-0.550
20	3	-0.558	0.250	-0.050
20	4	-0.806	-1.050	-0.150
20	5	-0.558	0.350	-0.050
20	6	-0.310	0.450	0.150
20	7	-0.558	0.250	-0.050
20	8	-0.558	0.350	0.050
30	15	-0.682	0.350	0.050
30	16	-0.558	0.750	0.350
30	17	-0.434	0.550	0.250
30	18	-0.806	0.350	-0.050
30	19	-0.434	0.650	0.250
30	20	-0.558	0.450	0.150
	Max	-0.310	0.750	0.350
	Average	-0.584	0.107	-0.043
	Min	-0.929	-1.150	-0.950
	Std Dev	0.170	0.661	0.341

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.806	-1.050	-0.150
Average	-0.558	0.100	-0.017
Max	-0.310	0.450	0.150
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.806	0.350	-0.050
Average	-0.578	0.517	0.167
Max	-0.434	0.750	0.350
UL	3.000	3.000	3.000





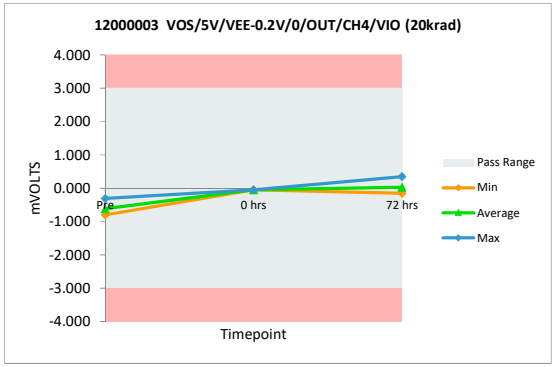
TID Report - HDR Annealing
TLV4H290MDYYTSEP

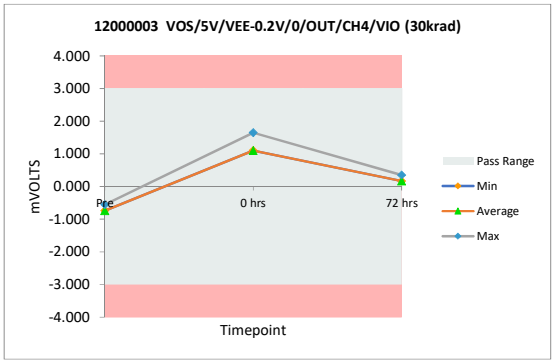
	12000003 VOS/5V/VEE-0.2V/0/	
Test Site		
Tester		
Test Number		
Unit	mVOLTS	mVOLTS
Max Limit	3	3
Min Limit	-3	-3

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.925	-0.550	-0.950
0	2	-1.171	-0.750	-1.150
20	3	-0.308	-0.050	0.350
20	4	-0.801	-0.050	-0.150
20	5	-0.678	-0.050	-0.150
20	6	-0.555	-0.050	0.150
20	7	-0.555	-0.050	0.150
20	8	-0.801	-0.050	-0.150
30	15	-0.801	-0.050	0.050
30	16	-0.678	1.050	0.350
30	17	-0.678	1.650	0.250
30	18	-0.678	1.250	0.250
30	19	-1.048	1.550	-0.050
30	20	-0.555	1.150	0.150
	Max	-0.308	1.650	0.350
	Average	-0.731	0.357	-0.064
	Min	-1.171	-0.750	-1.150
	Std Dev	0.220	0.795	0.454

20 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-0.801	-0.050	-0.150
Average	-0.617	-0.050	0.033
Max	-0.308	-0.050	0.350
UL	3.000	3.000	3.000

30 Krad	Pre	0 hrs	72 hrs
LL	-3.000	-3.000	-3.000
Min	-1.048	-0.050	-0.050
Average	-0.740	1.100	0.167
Max	-0.555	1.650	0.350
UL	3.000	3.000	3.000





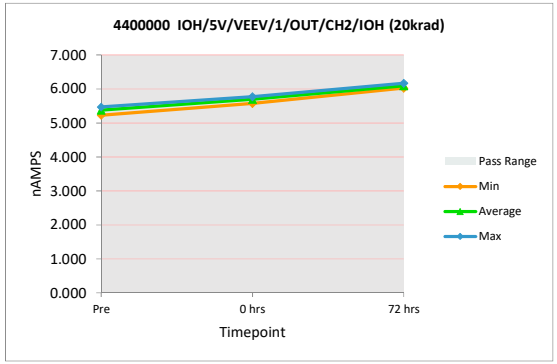
TID Report - HDR Annealing
TLV4H290MDYYTSEP

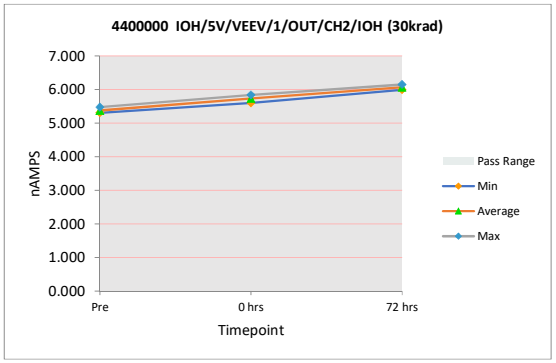
	4400000 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	5.351	5.575	6.059
0	2	5.457	5.681	6.054
20	3	5.415	5.774	6.083
20	4	5.412	5.774	6.167
20	5	5.223	5.722	6.022
20	6	5.390	5.664	6.074
20	7	5.331	5.659	6.113
20	8	5.469	5.573	6.091
30	15	5.430	5.602	5.993
30	16	5.307	5.673	6.074
30	17	5.368	5.737	6.150
30	18	5.474	5.779	6.034
30	19	5.319	5.769	6.076
30	20	5.349	5.843	6.071
	Max	71.670	128.672	76.947
	Average	66.314	83.461	67.344
	Min	61.518	63.382	62.299
	Std Dev	2.493	22.317	3.704

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	5.223	5.573	6.022
Average	5.374	5.694	6.092
Max	5.469	5.774	6.167
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	5.307	5.602	5.993
Average	5.374	5.734	6.066
Max	5.474	5.843	6.150
UL			





Channels 1 and 2 biased in output high (IN+ > IN-) configuration

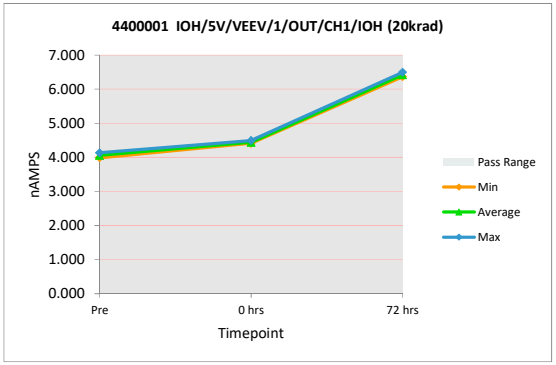
TID Report - HDR Annealing
TLV4H290MDYYTSEP

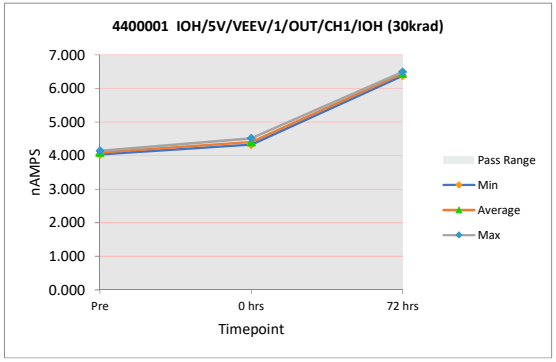
	4400001 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	4.085	4.434	6.342
0	2	4.021	4.365	6.450
20	3	4.080	4.466	6.364
20	4	4.048	4.419	6.381
20	5	4.058	4.414	6.420
20	6	3.989	4.451	6.455
20	7	4.131	4.412	6.497
20	8	4.058	4.493	6.401
30	15	4.136	4.513	6.430
30	16	4.075	4.348	6.462
30	17	4.043	4.326	6.447
30	18	4.136	4.459	6.440
30	19	4.036	4.392	6.492
30	20	4.141	4.385	6.376
	Max	69.445	116.199	73.292
	Average	64.397	78.121	65.126
	Min	59.756	61.499	60.369
	Std Dev	2.374	18.312	3.327

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	3.989	4.412	6.364
Average	4.060	4.443	6.420
Max	4.131	4.493	6.497
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	4.036	4.326	6.376
Average	4.094	4.404	6.441
Max	4.141	4.513	6.492
UL			





Channels 1 and 2 biased in output high (IN+ > IN-) configuration

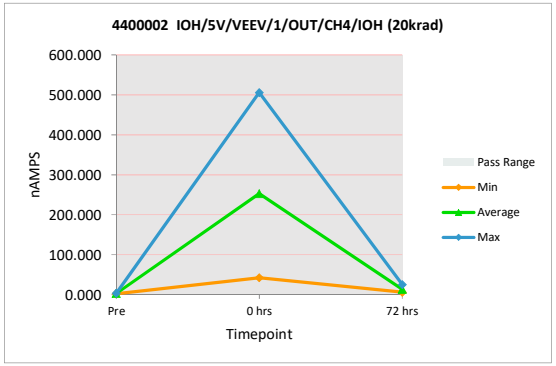
TID Report - HDR Annealing
TLV4H290MDYYTSEP

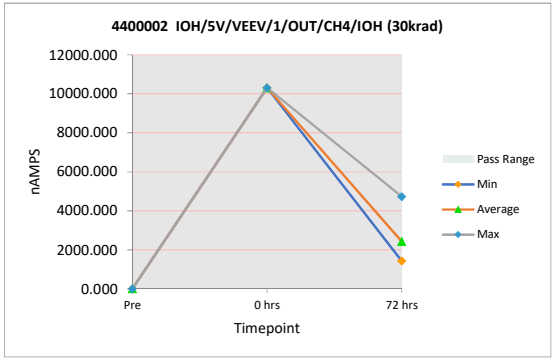
	4400002 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	3.662	1.983	5.230
0	2	3.224	1.708	4.581
20	3	3.115	42.571	7.175
20	4	2.987	505.800	20.989
20	5	2.820	50.643	6.107
20	6	3.674	71.766	6.492
20	7	3.019	346.069	17.714
20	8	3.046	501.988	25.403
30	15	3.738	10310.169	1427.343
30	16	3.521	10310.169	2399.375
30	17	2.985	10310.169	2220.688
30	18	3.113	10310.169	1916.243
30	19	3.118	10310.169	4730.524
30	20	3.396	10310.169	1885.724
	Max	41.063	41.721	42.262
	Average	40.702	41.101	40.783
	Min	40.420	40.557	40.248
	Std Dev	0.186	0.320	0.526

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	2.820	42.571	6.107
Average	3.110	253.140	13.980
Max	3.674	505.800	25.403
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	2.985	10310.169	1427.343
Average	3.312	10310.169	2429.983
Max	3.738	10310.169	4730.524
UL			





Channels 3 and 4 biased in output low (IN+ < IN-) configuration

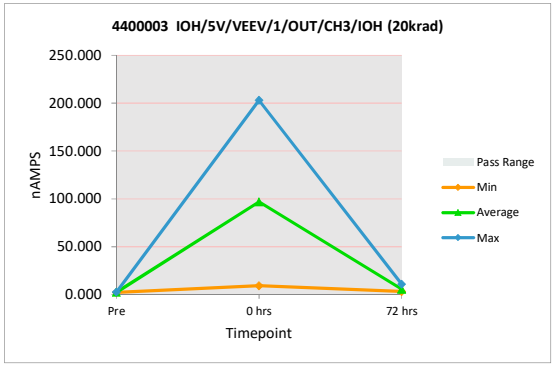
TID Report - HDR Annealing
TLV4H290MDYYTSEP

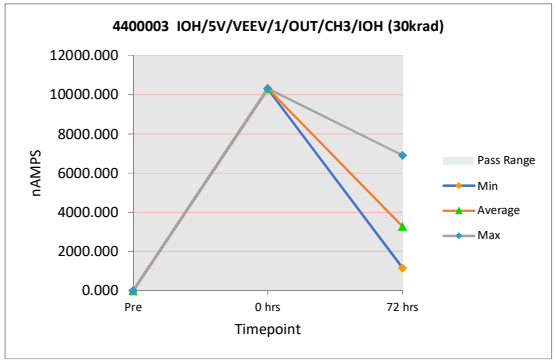
	4400003 IOH/5V/VEEV/1/OUT/	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	2.999	1.500	3.021
0	2	2.430	1.426	2.807
20	3	2.388	136.396	7.081
20	4	2.661	202.903	10.900
20	5	2.474	104.379	5.339
20	6	2.778	9.410	3.416
20	7	2.381	51.888	3.883
20	8	2.611	76.257	3.755
30	15	2.835	10309.225	1831.281
30	16	2.801	10309.225	3147.139
30	17	2.496	10309.225	3034.920
30	18	2.523	10309.225	1153.840
30	19	2.766	10309.225	6906.403
30	20	2.887	10309.225	3564.625
	Max	41.628	42.377	42.847
	Average	41.349	41.795	41.448
	Min	41.032	41.266	40.910
	Std Dev	0.174	0.298	0.492

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	2.381	9.410	3.416
Average	2.549	96.872	5.729
Max	2.778	202.903	10.900
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	2.496	10309.225	1153.840
Average	2.718	10309.225	3273.034
Max	2.887	10309.225	6906.403
UL			





Channels 3 and 4 biased in output low (IN+ < IN-) configuration

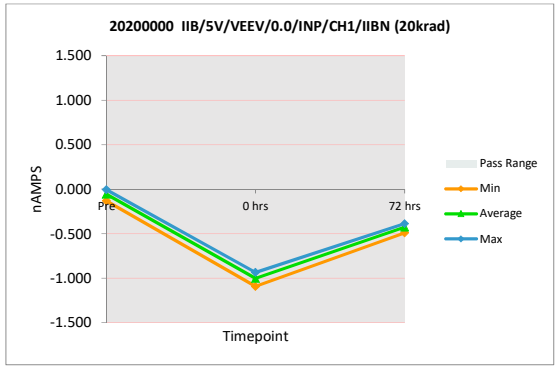
TID Report - HDR Annealing
TLV4H290MDYYTSEP

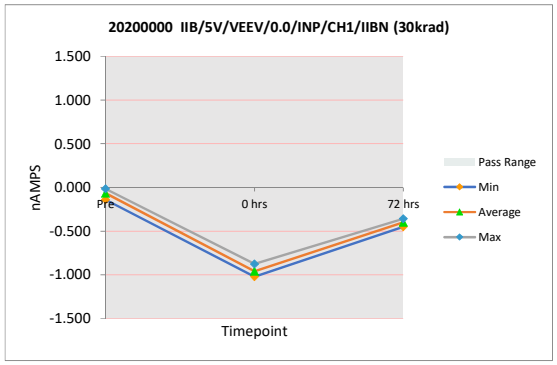
	20200000 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	0.092	-0.976	-0.507
0	2	-0.173	-0.996	-0.360
20	3	-0.051	-0.964	-0.458
20	4	-0.041	-1.016	-0.399
20	5	-0.006	-0.962	-0.387
20	6	-0.132	-1.092	-0.490
20	7	-0.019	-1.045	-0.406
20	8	-0.090	-0.935	-0.411
30	15	-0.060	-0.925	-0.384
30	16	-0.041	-1.021	-0.357
30	17	-0.024	-1.001	-0.387
30	18	-0.141	-0.917	-0.429
30	19	-0.016	-0.876	-0.451
30	20	-0.117	-1.008	-0.375
	Max	39.680	40.332	41.203
	Average	39.262	39.691	39.841
	Min	38.957	39.128	39.114
	Std Dev	0.172	0.312	0.645

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.132	-1.092	-0.490
Average	-0.056	-1.002	-0.425
Max	-0.006	-0.935	-0.387
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.141	-1.021	-0.451
Average	-0.067	-0.958	-0.397
Max	-0.016	-0.876	-0.357
UL			





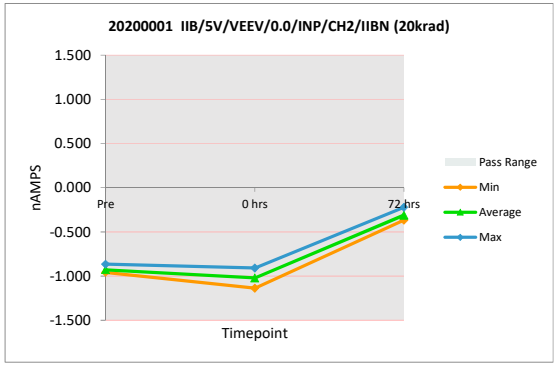
TID Report - HDR Annealing
TLV4H290MDYYTSEP

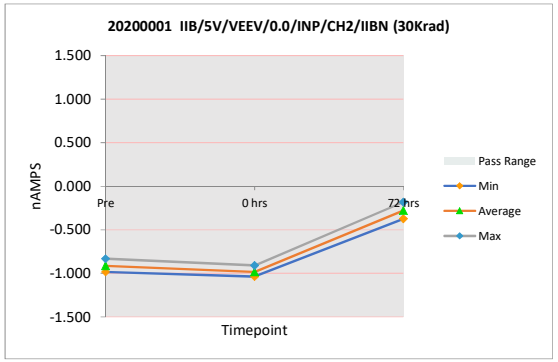
	20200001 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.911	-1.012	-0.343
0	2	-0.832	-0.963	-0.181
20	3	-0.960	-0.909	-0.301
20	4	-0.938	-1.096	-0.319
20	5	-0.867	-1.073	-0.355
20	6	-0.960	-1.137	-0.299
20	7	-0.960	-0.990	-0.223
20	8	-0.891	-0.924	-0.368
30	15	-0.877	-0.938	-0.297
30	16	-0.972	-1.037	-0.272
30	17	-0.936	-1.017	-0.245
30	18	-0.877	-0.995	-0.274
30	19	-0.985	-0.960	-0.373
30	20	-0.874	-0.987	-0.328
	Max	39.954	40.851	41.594
	Average	39.720	40.365	40.195
	Min	39.573	39.739	39.541
	Std Dev	0.115	0.292	0.573

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.960	-1.137	-0.368
Average	-0.929	-1.021	-0.311
Max	-0.867	-0.909	-0.223
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.985	-1.037	-0.373
Average	5.885	5.976	6.684
Max	39.954	40.851	41.594
UL			





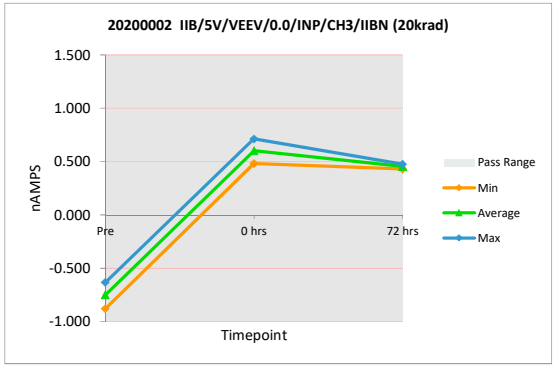
TID Report - HDR Annealing
TLV4H290MDYYTSEP

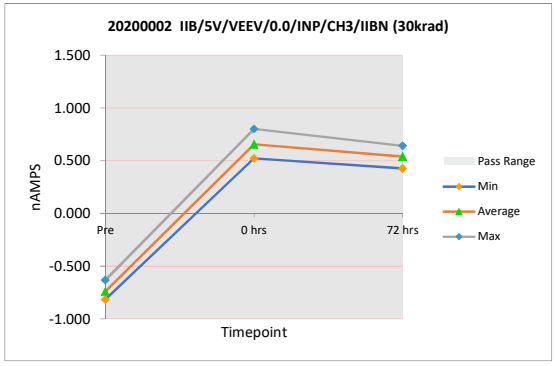
	20200002 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-1.325	0.052	0.340
0	2	-0.657	0.487	0.618
20	3	-0.757	0.667	0.431
20	4	-0.718	0.588	0.431
20	5	-0.760	0.495	0.475
20	6	-0.878	0.482	0.468
20	7	-0.743	0.662	0.446
20	8	-0.632	0.713	0.475
30	15	-0.733	0.701	0.556
30	16	-0.797	0.679	0.426
30	17	-0.632	0.585	0.578
30	18	-0.779	0.522	0.593
30	19	-0.681	0.802	0.438
30	20	-0.816	0.647	0.642
	Max	1.156	1.158	1.167
	Average	1.149	1.151	1.146
	Min	1.139	1.139	1.131
	Std Dev	0.005	0.006	0.009

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.878	0.482	0.431
Average	-0.748	0.601	0.454
Max	-0.632	0.713	0.475
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.816	0.522	0.426
Average	-0.740	0.656	0.539
Max	-0.632	0.802	0.642
UL			





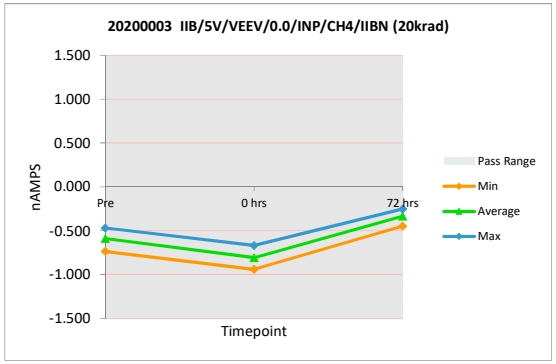
TID Report - HDR Annealing
TLV4H290MDYYTSEP

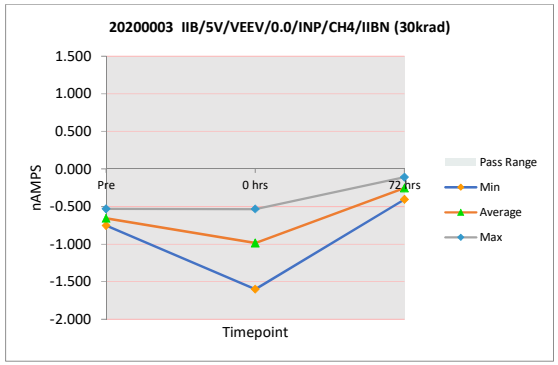
	20200003 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.857	-1.125	-0.895
0	2	-0.449	-0.714	0.070
20	3	-0.469	-0.847	-0.256
20	4	-0.599	-0.795	-0.391
20	5	-0.594	-0.667	-0.251
20	6	-0.737	-0.788	-0.448
20	7	-0.535	-0.940	-0.350
20	8	-0.606	-0.810	-0.308
30	15	-0.614	-0.535	-0.173
30	16	-0.754	-0.598	-0.389
30	17	-0.597	-1.599	-0.227
30	18	-0.530	-0.771	-0.109
30	19	-0.754	-1.555	-0.406
30	20	-0.687	-0.852	-0.220
	Max	1.130	1.137	1.142
	Average	1.123	1.125	1.122
	Min	1.115	1.112	1.105
	Std Dev	0.005	0.007	0.010

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.737	-0.940	-0.448
Average	-0.590	-0.808	-0.334
Max	-0.469	-0.667	-0.251
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.754	-1.599	-0.406
Average	-0.656	-0.985	-0.254
Max	-0.530	-0.535	-0.109
UL			





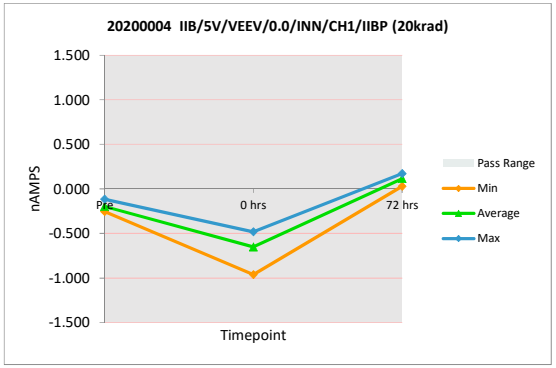
TID Report - HDR Annealing
TLV4H290MDYYTSEP

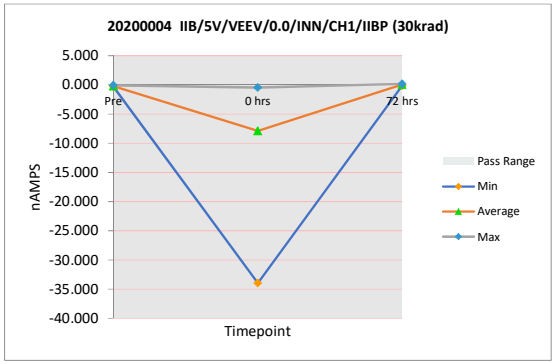
	20200004 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-0.091	-0.603	-0.005
0	2	0.003	-0.455	0.039
20	3	-0.115	-0.558	0.172
20	4	-0.255	-0.961	0.147
20	5	-0.206	-0.615	0.108
20	6	-0.218	-0.703	0.162
20	7	-0.184	-0.482	0.068
20	8	-0.206	-0.588	0.029
30	15	-0.272	-8.364	0.019
30	16	-0.250	-1.602	0.095
30	17	-0.221	-10.037	0.054
30	18	-0.172	-0.546	0.125
30	19	-0.177	-33.950	-0.118
30	20	-0.078	-0.858	0.007
	Max	1.194	1.191	1.200
	Average	1.183	1.184	1.179
	Min	1.173	1.173	1.164
	Std Dev	0.006	0.005	0.008

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.255	-0.961	0.029
Average	-0.198	-0.651	0.114
Max	-0.115	-0.482	0.172
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.272	-33.950	-0.118
Average	-0.195	-7.634	0.227
Max	-0.078	1.191	1.200
UL			





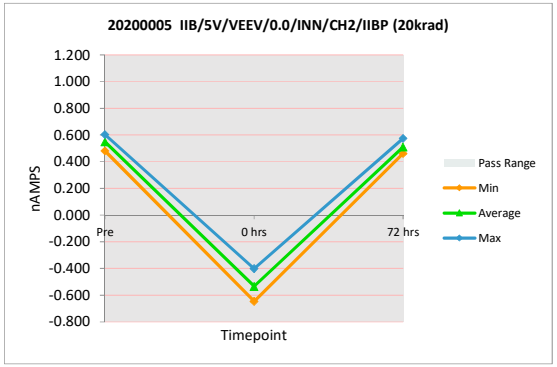
TID Report - HDR Annealing
TLV4H290MDYYTSEP

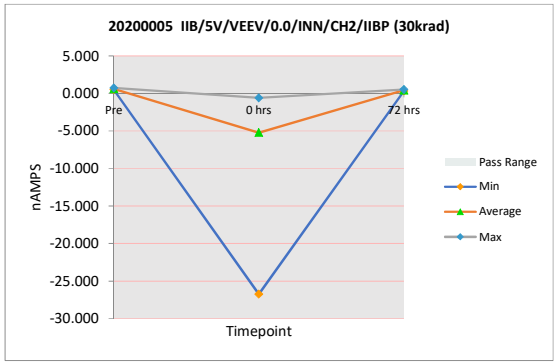
	20200005 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	0.488	-0.460	0.424
0	2	0.586	-0.352	0.397
20	3	0.604	-0.544	0.528
20	4	0.481	-0.647	0.491
20	5	0.577	-0.401	0.461
20	6	0.523	-0.603	0.574
20	7	0.572	-0.578	0.469
20	8	0.537	-0.431	0.535
30	15	0.724	-0.895	0.520
30	16	0.638	-1.330	0.378
30	17	0.508	-0.598	0.510
30	18	0.594	-0.679	0.407
30	19	0.604	-26.763	0.321
30	20	0.584	-1.070	0.410
	Max	1.128	1.133	1.144
	Average	1.120	1.122	1.121
	Min	1.112	1.110	1.107
	Std Dev	0.004	0.006	0.012

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	0.481	-0.647	0.461
Average	0.549	-0.534	0.510
Max	0.604	-0.401	0.574
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	0.508	-26.763	0.321
Average	0.609	-5.222	0.424
Max	0.724	-0.598	0.520
UL			





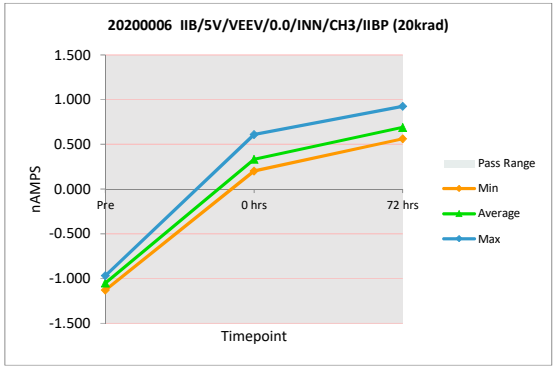
TID Report - HDR Annealing
TLV4H290MDYYTSEP

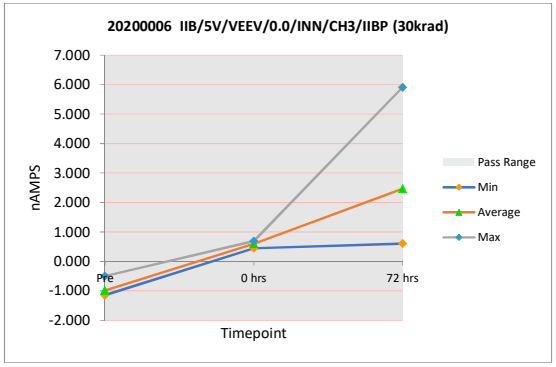
	20200006 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	-1.293	-0.231	0.594
0	2	-0.496	0.071	0.776
20	3	-0.968	0.221	0.926
20	4	-1.057	0.373	0.663
20	5	-1.008	0.609	0.683
20	6	-1.089	0.201	0.725
20	7	-1.044	0.371	0.562
20	8	-1.128	0.226	0.585
30	15	-1.084	0.251	0.789
30	16	-1.138	0.580	5.908
30	17	-1.096	0.450	0.902
30	18	-1.113	0.649	0.764
30	19	-1.145	0.691	0.703
30	20	-0.934	0.541	0.604
	Max	-0.800	-0.550	-0.650
	Average	-1.073	-1.486	-1.364
	Min	-1.293	-2.351	-1.850
	Std Dev	0.138	0.503	0.384

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-1.128	0.201	0.562
Average	-1.049	0.334	0.691
Max	-0.968	0.609	0.926
UL			

30 Krad	Pre	0 hrs	72 hrs
LL			
Min	-1.145	-0.550	-0.650
Average	-1.038	0.393	1.372
Max	-0.800	0.691	5.908
UL			





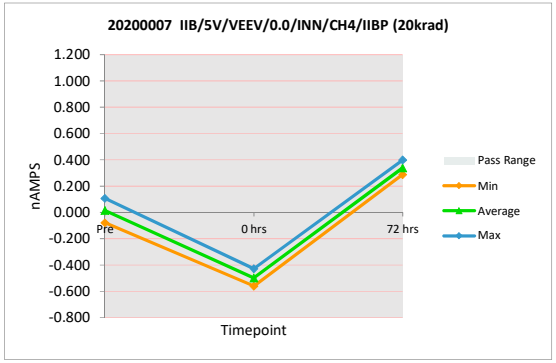
TID Report - HDR Annealing
TLV4H290MDYYTSEP

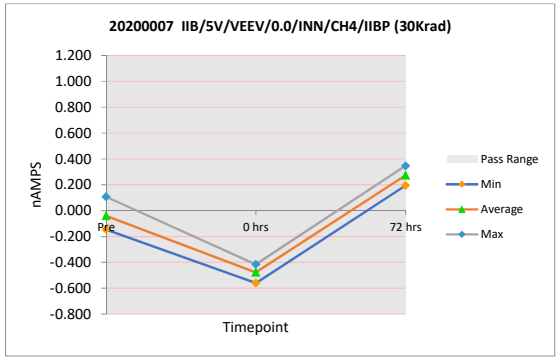
	20200007 IIB/5V/VEEV/0.0/IN	
Test Site		
Tester		
Test Number		
Unit	nAMPS	nAMPS
Max Limit		
Min Limit		

Krads	Serial #	HDR_PRE	HDR_POST	Anneal 72 hrs
0	1	0.034	-0.531	0.280
0	2	-0.006	-0.570	0.307
20	3	-0.028	-0.560	0.398
20	4	0.102	-0.438	0.334
20	5	-0.033	-0.487	0.354
20	6	0.107	-0.553	0.305
20	7	-0.079	-0.428	0.351
20	8	0.019	-0.524	0.287
30	15	-0.092	-0.560	0.324
30	16	-0.146	-0.489	0.194
30	17	-0.047	-0.504	0.297
30	18	0.107	-0.472	0.346
30	19	0.041	-0.423	0.256
30	20	-0.104	-0.416	0.219
	Max	-0.548	-0.650	-0.850
	Average	-0.765	-1.650	-1.636
	Min	-1.035	-2.351	-2.151
	Std Dev	0.180	0.503	0.398

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.079	-0.560	0.287
Average	0.015	-0.498	0.338
Max	0.107	-0.428	0.398
UL			

20 Krad	Pre	0 hrs	72 hrs
LL			
Min	-0.146	-0.560	0.194
Average	-0.040	-0.477	0.273
Max	0.107	-0.416	0.346
UL			





IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265