

TPS73801-SEP 1-A Low-Noise Fast-Transient-Response Low-Dropout Regulator TID Report

ABSTRACT

This report covers the radiation characterization results of the TPS73801-SEP Low-Dropout Regulator. The study was done to determine Total Ionizing Dose (TID) effects under low dose rate (LDR) up to 30 krad(Si) as a one time characterization. The results show that all samples passed within the specified limits up to 30 krad(Si) and Radiation Lot Acceptance Testing (RLAT) will be performed using 22 units at 20 krad(Si) for future wafer lots. Furthermore, the TPS73801-SEP is packaged in a space enhanced plastic for low outgassing characteristics and is Single Event Latch-Up (SEL) immune up to 43 MeV-cm²/mg making the device suitable for low Earth orbit space applications. The device is ideal for clean analog supply conditions, examples include low noise linear regulator power supply for RF, VCOs, receivers, and amplifiers.

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1 Device Information

The TPS73801-SEP is a 1-A LDO regulator optimized for fast transient response. The device is capable of supplying 1 A at a dropout voltage of 300 mV. The low operating quiescent current (1 mA) drops to less than 1 μ A in shutdown. In addition to the low quiescent current, the TPS73801-SEP regulator incorporates several protection features which makes it ideal for use in battery-powered systems.

The device is protected against both reverse input and reverse output voltages. In battery-backup applications where the output can be held up by a backup battery when the input is pulled to ground, the TPS73801-SEP acts as if it has a diode in series with its output and prevents reverse current flow.

1.1 Device Details

Table 1 lists the device information used in the initial TID characterization and qualification for LDR.

Table 1. Device and Exposure Details

TID LDR Details: up to 30 krad(Si)	
TI Device Number	TPS73801-SEP
Package	6-pin DCQ (SOT-223)
Technology	J11
Die Lot Number	3255028
A/T Lot Number / Date Code	8704872/87Z888H
Quantity Tested	32 irradiated devices + 3 control
Lot Accept/Reject	Devices passed 3 krad(Si), 10 krad(Si), 20 krad(Si), 30 krad(Si)
LDR Radiation Facility	RAD/Aeroflex in Colorado Springs, Colorado
LDR Dose Level	3 krad(Si), 10 krad(Si), 20 krad(Si), 30 krad(Si)
LDR Dose Rate	0.01 rad(Si)/s
LDR Radiation Source	Gammacell JLSA 81-24 Co-60
Irradiation Temperature	Ambient, room temperature



Figure 1. TPS73801-SEP Device Photo

2 Total Dose Test Setup

2.1 Test Overview

The TPS73801-SEP was irradiated at a low dose rate of less than 10 mrad(Si)/s. The product was irradiated up to 30 krad(Si) and then put through full electrical parametric testing on the production Automated Test Equipment (ATE). The device was functional and passed all electrical parametric tests with readings within data sheet electrical specification limits.

2.2 Test Description and Facilities

The TPS73801-SEP LDR exposure was performed on biased and unbiased devices in a Co60 gamma cell under a 10-mrad(Si)/s exposure rate. The dose rate of the irradiator used in the exposure ranges from < 10 mrad(Si)/s to a maximum of approximately 65 rad(Si)/s, determined by the distance from the source. The exposure boards are housed in a lead-aluminum box (as specified in MIL-STD-883 TM 1019.9) to harden the gamma spectrum and minimize dose enhancement effects. The irradiator calibration is maintained by Logmire Laboratories using Thermoluminescence Dosimeters (TLDs) traceable to the National Institute of Standards and Technology (NIST) and the dosimetry was verified using TLDs prior to the radiation exposures. After exposure, the devices were packed in dry ice (per MIL-STD-883 Method 1019.9 section 3.10) and returned to TI Dallas for a full post radiation electrical evaluation using Texas Instruments production Automated Test Equipment (ATE). ATE guard band test limits are set within data sheet electrical limits to ensure 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.

2.3 Test Setup Details

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

2.3.1 Unbiased

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

2.3.2 Biased

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

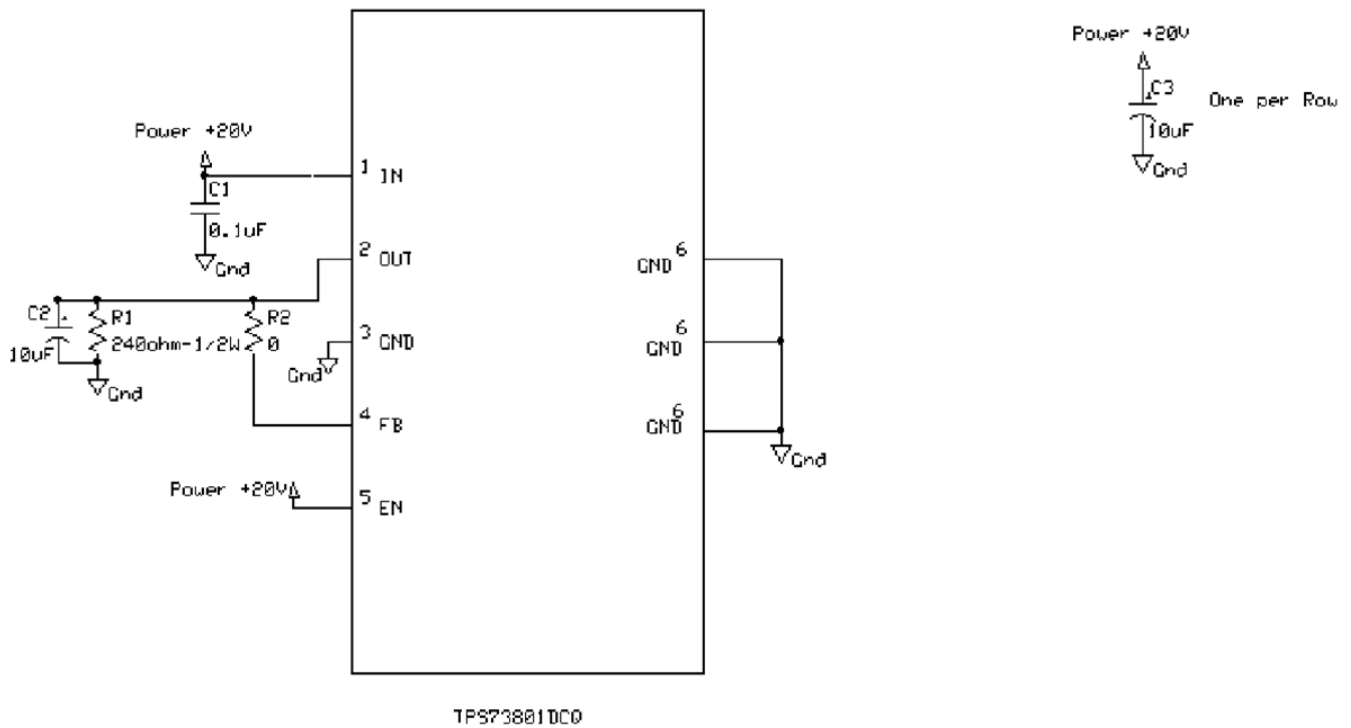


Figure 2. TPS73801-SEP Biased Diagram

2.4 Test Configuration and Condition

A step-stress (3k, 10k, 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. From initial feasibility studies the difference between pre and post irradiation was greater for samples that were biased, hence for RLAT 22 units were used at the 20-krad(Si) dose level with biased setup conditions and this will be repeated for each wafer lot.

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

Table 2. LDR = 10-mrad(Si)/s Biased and Unbiased Device Information

LDR = 10 mrad(Si)/s			
Total Samples: 32			
Exposure Levels			
3 krad(Si)	10 krad(Si)	20 krad(Si)	30 krad(Si)
Biased 001, 002, 003, 004, 005	Biased 001, 002, 003, 004, 005	Biased 011, 012, 013, 014, 015, 016, 017, 018, 019, 020, 021, 022, 023, 024, 025, 026, 027, 028, 029, 030, 031, 032	Biased 001, 002, 003, 004, 005
Unbiased 006, 007, 008, 009, 010	Unbiased 006, 007, 008, 009, 010	Unbiased 006, 007, 008, 009, 010	Unbiased 006, 007, 008, 009, 010

3 Tested Parameters

Table 3 links the test numbers for each test condition with the data sheet parameters.

Table 3. TPS73801-SEP Data Sheet Parameters With Test Numbers

PARAMETER	TEST CONDITION	Data sheet Lit# SLVSER5 - November 2018				Test# or Name
		MIN	TYP	MAX	UNIT	
Reverse output current	T _j = 25°C, V _{out} = 1.21 V, V _{in} < 1.21 V		300	600	µA	4.2__IRO_VOUT_1.21_VIN_0V
Input reverse leakage current	V _{in} = -20 V, V _{out} = 0 V			1	mA	5.1__IIL_VIN_-20V
FB pin bias current	T _j = 25°C		3	10	µA	15.5__I_Adj_pin
Quiescent current in shutdown	T _j = 25°C, V _{in} = 6 V, V _{en} = 0 V		0.01	1	µA	30.1__IQ_SHUTDOWN_VIN_6V
EN pin current	T _j = 25°C, V _{en} = 0 V		0.01	1	µA	15.1__I_SHDN_0V
	T _j = 25°C, V _{en} = 20 V		3	30	µA	15.2__I_SHDN_20V
Dropout voltage	T _j = 25°C, i _{Load} = 1 mA		0.02	0.06	V	50.1__DROPOUT_1MA
	T _j = 25°C, i _{Load} = 1000 mA		0.24	0.3	V	50.4__DROPOUT_1000MA
GND pin current	i _{Load} = 0 mA		1	1.5	mA	55.1__GND_CURRENT_0mA
	i _{Load} = 1000 mA		35	80	mA	55.5__GND_CURRENT_1000mA
FB pin voltage	T _j = 25°C, V _{in} = 2.21 V, i _{Load} = 1 mA	1.192	1.21	1.228	V	60.1__VOUT_1MA_VINMIN
	V _{in} = 20 V, i _{Load} = 1 mA	1.174	1.21	1.246	V	60.2__VOUT_1MA_VINMAX
	V _{in} = 2.5 V, i _{Load} = 1 mA	1.174	1.21	1.246	V	60.3__VOUT_1mA_VINNOM
	V _{in} = 2.5 V, i _{Load} = 1000 mA	1.174	1.21	1.246	V	60.4__VOUT_1A_VINNOM
Line regulation	ΔV _{in} = 2.21 V to 20 V, i _{Load} = 1 mA		1.5	5	mV	60.5__LINE REG
Load regulation	T _j = 25°C, V _{in} = 2.5 V, Δi _{Load} = 1 mA to 1000 mA		2	8	mV	60.6__LOAD REG

4 Total Ionizing Dose (RHA) Characterization Test Results

4.1 Total Ionizing Dose RHA Characterization Summary Results

The parametric data for the TPS73801-SEP is within data sheet limits up to 30 krad(Si) for both biased and unbiased setup conditions. Measurements taken post irradiation showed that the drift for samples that were biased was greater compared to the unbiased samples.

1. Dropout Voltage

This measurement was done with the input and output connected to form a closed loop with 1 mA flowing through to get the dropout voltage. 1-A load condition is presented in the appendix and showed little variation up to 30 krad(Si).

The dropout voltage measured post irradiation with 1-mA load condition was seen to increase with dose level but is still well within data sheet limits. Figure 3 shows the min, average, and max sample measurements post irradiation for each dose level highlighting the gradual increase with dose level.

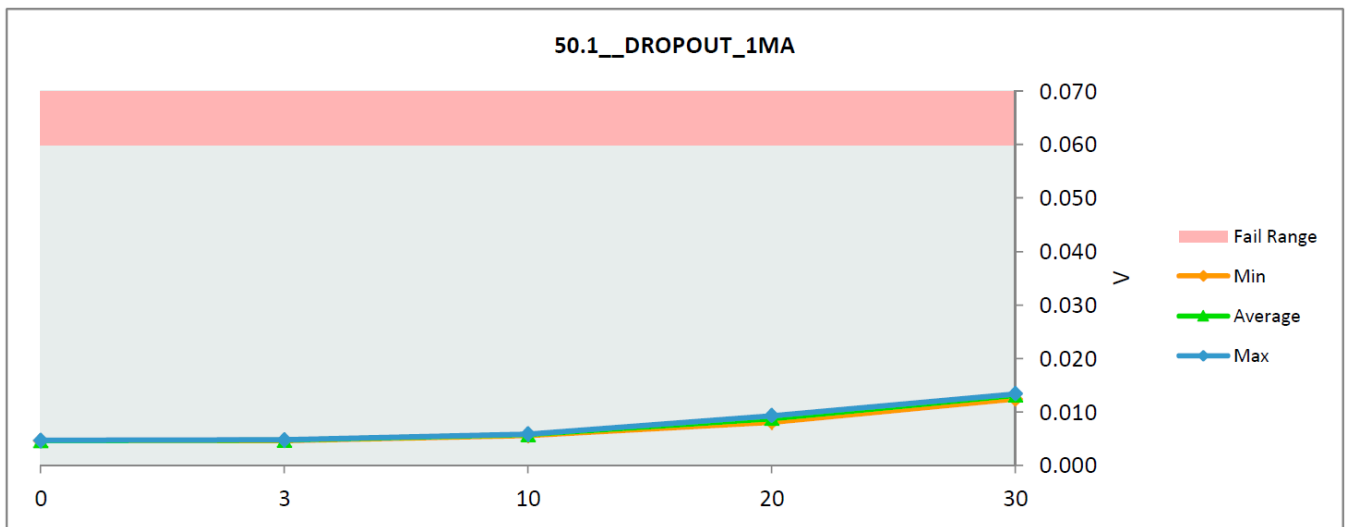


Figure 3. Radiation Exposure Effect on Dropout Voltage

2. Line Regulation

Line regulation was measured with an output load of 1 mA and the input voltage supply at 2.5 V and 20 V.

This parameter averaged around 1 mV at each dose level post irradiation and performed well up to 30 krad(Si) with respect to the data sheet limit. See Figure 4 for min, average and max sample measurements post irradiation at each dose level.

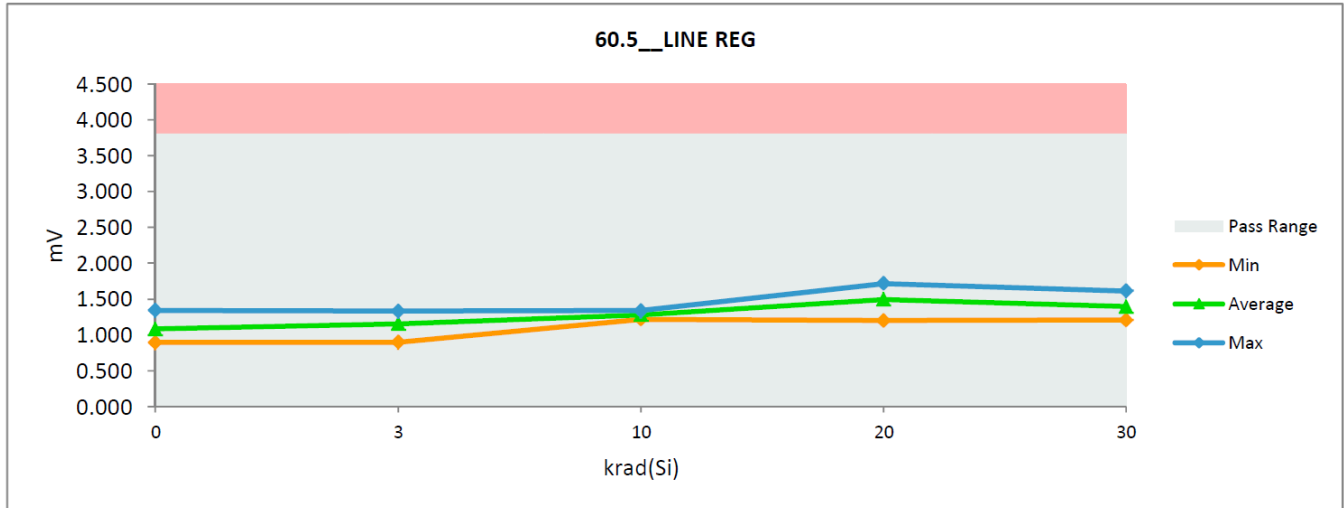


Figure 4. Radiation Exposure Effect on Load Regulation

Total Ionizing Dose LDR Report

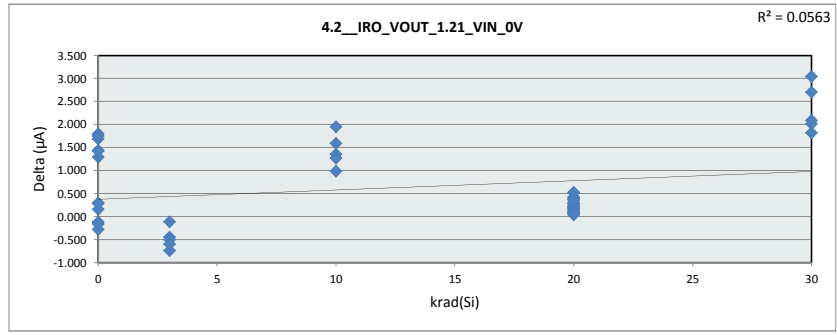
This appendix provides the TPS73801-SEP TID LDR report. The report shows the variation for each parameter up to 30 krad(Si).

TID LDR Biased Data
TPS73801-SEP

TID LDR Biased Data
TPS73801-SEP

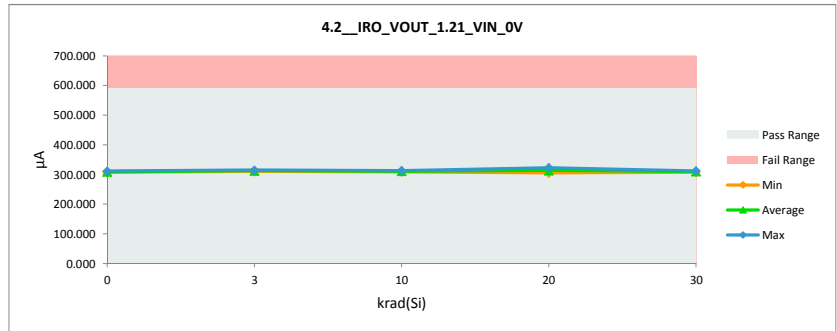
4.2_IRO_VOUT_1.21_VIN_0V		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	µA	µA
Max Limit	590	590
Min Limit	0.02	0.02

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	311.214	310.913	0.300
0	3C34	309.526	309.238	0.288
0	3C35	309.162	309.000	0.162
0	10C33	311.214	309.924	1.290
0	10C34	309.526	308.086	1.440
0	10C35	309.162	307.737	1.425
0	20C33	311.214	311.493	-0.279
0	20C34	309.526	309.641	-0.115
0	20C35	309.162	309.323	-0.160
0	30C33	311.214	309.525	1.689
0	30C34	309.526	307.729	1.797
0	30C35	309.162	307.412	1.750
3	3B1	314.861	314.972	-0.111
3	3B2	312.547	313.285	-0.737
3	3B3	312.016	312.463	-0.447
3	3B4	312.246	312.748	-0.502
3	3B5	310.111	310.710	-0.600
10	10B1	314.861	313.270	1.591
10	10B2	312.547	311.558	0.990
10	10B3	312.016	310.061	1.955
10	10B4	312.246	310.893	1.353
10	10B5	310.111	308.842	1.268
20	20B11	315.855	315.653	0.203
20	20B12	314.872	314.447	0.425
20	20B13	319.145	318.926	0.219
20	20B14	313.816	313.706	0.110
20	20B15	319.438	318.928	0.511
20	20B16	307.904	307.489	0.415
20	20B17	306.750	306.478	0.272
20	20B18	313.094	312.919	0.175
20	20B19	311.342	311.034	0.308
20	20B20	305.471	305.316	0.155
20	20B21	313.796	313.642	0.155
20	20B22	308.434	308.062	0.372
20	20B23	311.774	311.676	0.098
20	20B24	315.191	315.152	0.039
20	20B25	318.431	318.353	0.078
20	20B26	317.421	317.320	0.100
20	20B27	319.492	319.262	0.230
20	20B28	323.546	323.167	0.378
20	20B29	317.558	317.266	0.292
20	20B30	316.460	316.098	0.362
20	20B31	309.793	309.726	0.067
20	20B32	313.984	313.454	0.530
30	30B1	314.861	312.156	2.705
30	30B2	312.547	310.725	1.823
30	30B3	312.016	308.970	3.046
30	30B4	312.246	310.231	2.015
30	30B5	310.111	308.017	2.094
Max		323.546	323.167	3.046
Average		312.623	311.980	0.643
Min		305.471	305.316	-0.737
Std Dev		3.662	3.860	0.881



4.2_IRO_VOUT_1.21_VIN_0V				
Test Site	Junkins Dallas			
Tester	ETS09			
Test Number	EB062203			
Max Limit	590 µA			
Min Limit	0.02 µA			

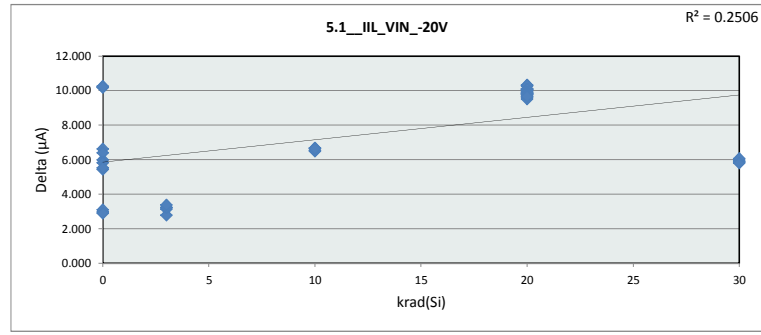
krad(Si)	0	3	10	20	30
LL	0.020	0.020	0.020	0.020	0.020
Min	307.412	310.710	308.842	305.316	308.017
Average	309.168	312.836	310.925	314.003	310.020
Max	311.493	314.972	313.270	323.167	312.156
UL	590.000	590.000	590.000	590.000	590.000



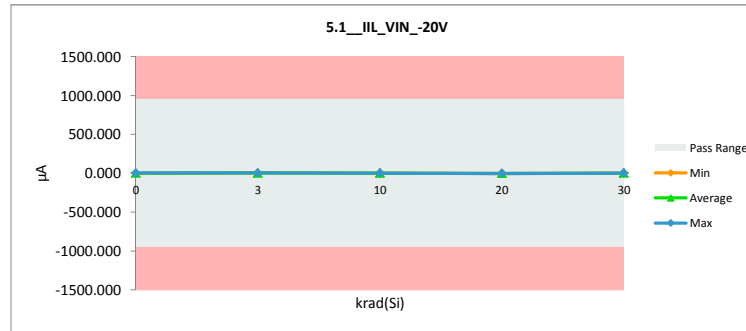
TID LDR Biased Data
TPS73801-SEP

5.1_IIL_VIN_-20V		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	µA	µA
Max Limit	950	950
Min Limit	-950	-950

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	7.732	4.764	2.968
0	3C34	7.702	4.615	3.086
0	3C35	7.486	4.597	2.889
0	10C33	7.732	1.739	5.993
0	10C34	7.702	1.079	6.623
0	10C35	7.486	1.098	6.389
0	20C33	7.732	-2.436	10.168
0	20C34	7.702	-2.538	10.239
0	20C35	7.486	-2.730	10.216
0	30C33	7.732	2.312	5.420
0	30C34	7.702	1.889	5.812
0	30C35	7.486	1.975	5.512
3	3B1	7.914	4.780	3.134
3	3B2	7.575	4.792	2.783
3	3B3	7.875	4.661	3.214
3	3B4	7.767	4.543	3.224
3	3B5	7.785	4.417	3.368
10	10B1	7.914	1.242	6.672
10	10B2	7.575	1.098	6.476
10	10B3	7.875	1.228	6.647
10	10B4	7.767	1.253	6.514
10	10B5	7.785	1.156	6.629
20	20B11	7.670	-2.437	10.107
20	20B12	7.807	-2.296	10.103
20	20B13	7.802	-2.481	10.284
20	20B14	7.911	-2.365	10.275
20	20B15	7.630	-2.328	9.958
20	20B16	7.888	-2.437	10.325
20	20B17	7.787	-2.280	10.066
20	20B18	7.666	-2.363	10.030
20	20B19	7.557	-2.442	9.999
20	20B20	7.186	-2.484	9.670
20	20B21	7.462	-2.407	9.869
20	20B22	7.466	-2.132	9.598
20	20B23	7.422	-2.407	9.829
20	20B24	7.425	-2.371	9.797
20	20B25	7.694	-2.375	10.070
20	20B26	7.226	-2.580	9.807
20	20B27	7.376	-2.393	9.768
20	20B28	7.503	-2.343	9.846
20	20B29	7.285	-2.223	9.508
20	20B30	7.650	-2.252	9.902
20	20B31	7.399	-2.363	9.762
20	20B32	7.415	-2.239	9.654
30	30B1	7.914	1.939	5.975
30	30B2	7.575	1.713	5.862
30	30B3	7.875	2.000	5.875
30	30B4	7.767	1.716	6.051
30	30B5	7.785	1.980	5.806
	Max	7.914	4.792	10.325
	Average	7.646	0.059	7.587
	Min	7.186	-2.730	2.783
	Std Dev	0.190	2.733	2.661



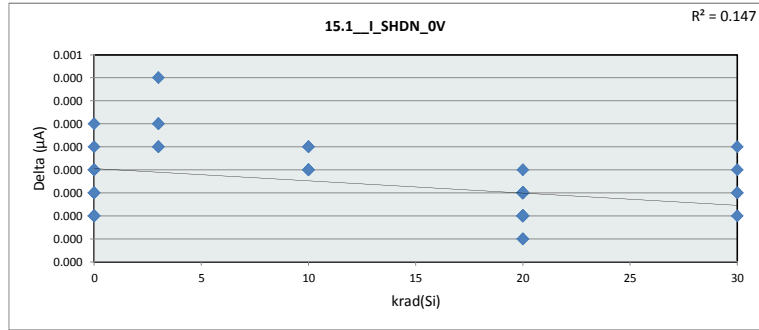
5.1_IIL_VIN_-20V					
Test Site	Junkins Dallas				
Tester	ETS09				
Test Number	EB062203				
Max Limit	950 µA				
Min Limit	-950 µA				
krad(Si)	0	3	10	20	30
LL	-950.000	-950.000	-950.000	-950.000	-950.000
Min	-2.730	4.417	1.098	-2.580	1.713
Average	1.364	4.639	1.195	-2.363	1.870
Max	4.764	4.792	1.253	-2.132	2.000
UL	950.000	950.000	950.000	950.000	950.000



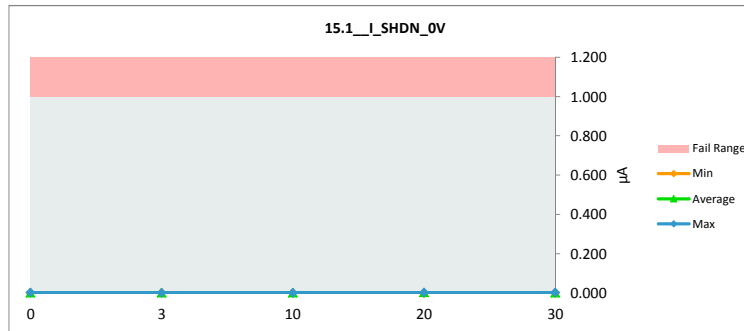
TID LDR Biased Data
TPS73801-SEP

15.1_I_SHDN_0V		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	µA	µA
Max Limit	1	1
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	0.001	0.001	0.000
0	3C34	0.001	0.001	0.000
0	3C35	0.001	0.001	0.000
0	10C33	0.001	0.001	0.000
0	10C34	0.001	0.001	0.000
0	10C35	0.001	0.001	0.000
0	20C33	0.001	0.001	0.000
0	20C34	0.001	0.001	0.000
0	20C35	0.001	0.001	0.000
0	30C33	0.001	0.001	0.000
0	30C34	0.001	0.001	0.000
0	30C35	0.001	0.001	0.000
3	3B1	0.001	0.001	0.000
3	3B2	0.001	0.001	0.000
3	3B3	0.001	0.001	0.000
3	3B4	0.001	0.001	0.000
3	3B5	0.001	0.001	0.000
10	10B1	0.001	0.001	0.000
10	10B2	0.001	0.001	0.000
10	10B3	0.001	0.001	0.000
10	10B4	0.001	0.001	0.000
10	10B5	0.001	0.001	0.000
20	20B11	0.001	0.001	0.000
20	20B12	0.001	0.001	0.000
20	20B13	0.001	0.001	0.000
20	20B14	0.001	0.001	0.000
20	20B15	0.001	0.001	0.000
20	20B16	0.001	0.001	0.000
20	20B17	0.001	0.001	0.000
20	20B18	0.001	0.001	0.000
20	20B19	0.001	0.001	0.000
20	20B20	0.001	0.001	0.000
20	20B21	0.001	0.001	0.000
20	20B22	0.001	0.001	0.000
20	20B23	0.001	0.001	0.000
20	20B24	0.001	0.001	0.000
20	20B25	0.001	0.001	0.000
20	20B26	0.001	0.001	0.000
20	20B27	0.001	0.001	0.000
20	20B28	0.001	0.001	0.000
20	20B29	0.001	0.001	0.000
20	20B30	0.001	0.001	0.000
20	20B31	0.001	0.001	0.000
20	20B32	0.001	0.001	0.000
30	30B1	0.001	0.001	0.000
30	30B2	0.001	0.001	0.000
30	30B3	0.001	0.001	0.000
30	30B4	0.001	0.001	0.000
30	30B5	0.001	0.001	0.000
	Max	0.001	0.001	0.000
	Average	0.001	0.001	0.000
	Min	0.001	0.001	0.000
	Std Dev	0.000	0.000	0.000



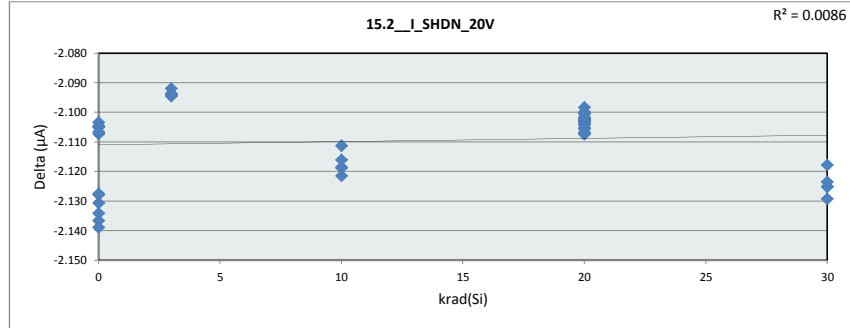
15.1_I_SHDN_0V					
Test Site	Junkins Dallas				
Tester	ETS09				
Test Number	EB062203				
Max Limit	1	µA			
Min Limit		µA			
krad(Si)	0	3	10	20	30
LL					
Min	0.001	0.001	0.001	0.001	0.001
Average	0.001	0.001	0.001	0.001	0.001
Max	0.001	0.001	0.001	0.001	0.001
UL	1.000	1.000	1.000	1.000	1.000



TID LDR Biased Data
TPS73801-SEP

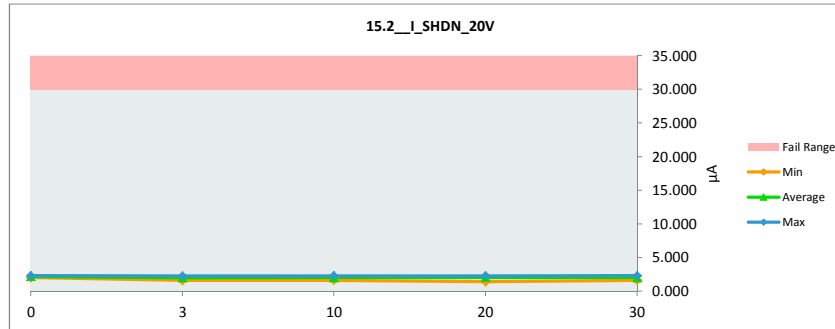
15.2 I_SHDN_20V		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	µA	µA
Max Limit	30	30
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	0.075	2.180	-2.105
0	3C34	0.176	2.281	-2.105
0	3C35	-0.084	2.019	-2.103
0	10C33	0.075	2.203	-2.128
0	10C34	0.176	2.307	-2.131
0	10C35	-0.084	2.043	-2.128
0	20C33	0.075	2.180	-2.105
0	20C34	0.176	2.283	-2.107
0	20C35	-0.084	2.022	-2.107
0	30C33	0.075	2.212	-2.137
0	30C34	0.176	2.315	-2.139
0	30C35	-0.084	2.050	-2.134
3	3B1	-0.169	1.925	-2.095
3	3B2	-0.032	2.062	-2.094
3	3B3	-0.491	1.601	-2.092
3	3B4	0.012	2.106	-2.094
3	3B5	0.169	2.263	-2.094
10	10B1	-0.169	1.947	-2.116
10	10B2	-0.032	2.086	-2.118
10	10B3	-0.491	1.621	-2.111
10	10B4	0.012	2.131	-2.119
10	10B5	0.169	2.291	-2.121
20	20B11	-0.085	2.017	-2.102
20	20B12	-0.207	1.895	-2.102
20	20B13	0.154	2.255	-2.102
20	20B14	-0.394	1.709	-2.103
20	20B15	-0.070	2.037	-2.107
20	20B16	0.092	2.195	-2.102
20	20B17	0.155	2.255	-2.100
20	20B18	0.181	2.286	-2.105
20	20B19	0.073	2.174	-2.101
20	20B20	0.143	2.241	-2.098
20	20B21	0.003	2.103	-2.100
20	20B22	0.065	2.168	-2.102
20	20B23	0.044	2.147	-2.103
20	20B24	0.083	2.187	-2.104
20	20B25	-0.060	2.043	-2.103
20	20B26	0.041	2.145	-2.104
20	20B27	-0.702	1.401	-2.104
20	20B28	-0.031	2.077	-2.107
20	20B29	-0.486	1.620	-2.106
20	20B30	-0.373	1.729	-2.102
20	20B31	-0.161	1.946	-2.107
20	20B32	-0.022	2.078	-2.100
30	30B1	-0.169	1.956	-2.125
30	30B2	-0.032	2.093	-2.125
30	30B3	-0.491	1.627	-2.118
30	30B4	0.012	2.135	-2.124
30	30B5	0.169	2.299	-2.129
	Max	0.181	2.315	-2.092
	Average	-0.049	2.060	-2.110
	Min	-0.702	1.401	-2.139
	Std Dev	0.214	0.216	0.012



15.2 I_SHDN_20V		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	30	µA
Min Limit		µA

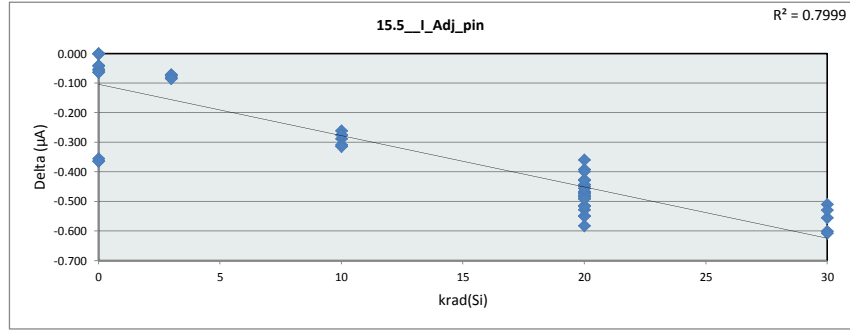
krad(Si)	0	3	10	20	30
LL					
Min	2.019	1.601	1.621	1.401	1.627
Average	2.175	1.992	2.015	2.032	2.022
Max	2.315	2.264	2.291	2.286	2.299
UL	30.000	30.000	30.000	30.000	30.000



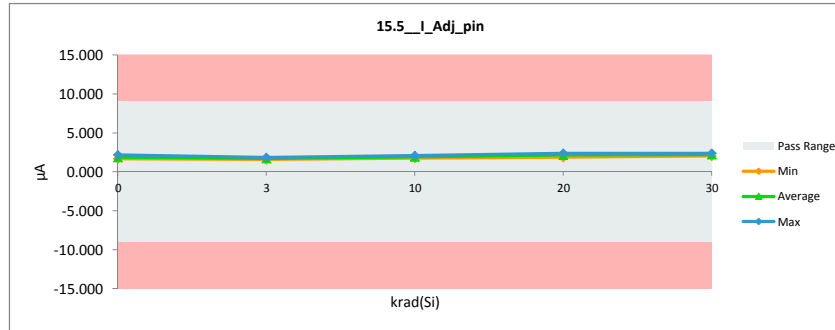
TID LDR Biased Data
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15.5 I Adj_pin		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	µA	µA
Max Limit	9	9
Min Limit	-9	-9

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.791	1.792	-0.001
0	3C34	1.808	1.808	0.000
0	3C35	1.676	1.677	-0.001
0	10C33	1.791	1.845	-0.054
0	10C34	1.808	2.171	-0.364
0	10C35	1.676	1.732	-0.056
0	20C33	1.791	1.834	-0.043
0	20C34	1.808	2.163	-0.355
0	20C35	1.676	1.717	-0.041
0	30C33	1.791	1.855	-0.063
0	30C34	1.808	2.172	-0.364
0	30C35	1.676	1.739	-0.063
3	3B1	1.603	1.678	-0.074
3	3B2	1.682	1.762	-0.080
3	3B3	1.515	1.587	-0.072
3	3B4	1.672	1.744	-0.072
3	3B5	1.771	1.857	-0.085
10	10B1	1.603	1.891	-0.288
10	10B2	1.682	1.990	-0.309
10	10B3	1.515	1.776	-0.261
10	10B4	1.672	1.948	-0.276
10	10B5	1.771	2.085	-0.314
20	20B11	1.634	2.118	-0.484
20	20B12	1.647	2.196	-0.549
20	20B13	1.809	2.391	-0.582
20	20B14	1.543	2.014	-0.470
20	20B15	1.671	2.221	-0.550
20	20B16	1.739	2.267	-0.528
20	20B17	1.793	2.308	-0.514
20	20B18	1.830	2.279	-0.449
20	20B19	1.689	2.178	-0.490
20	20B20	1.788	2.180	-0.392
20	20B21	1.716	2.075	-0.359
20	20B22	1.737	2.210	-0.472
20	20B23	1.727	2.244	-0.516
20	20B24	1.750	2.217	-0.467
20	20B25	1.624	2.105	-0.482
20	20B26	1.775	2.218	-0.443
20	20B27	1.436	1.862	-0.426
20	20B28	1.660	2.139	-0.479
20	20B29	1.523	1.980	-0.456
20	20B30	1.577	2.006	-0.429
20	20B31	1.595	1.993	-0.398
20	20B32	1.682	2.173	-0.491
30	30B1	1.603	2.159	-0.556
30	30B2	1.682	2.283	-0.601
30	30B3	1.515	2.025	-0.510
30	30B4	1.672	2.201	-0.529
30	30B5	1.771	2.378	-0.607
	Max	1.830	2.391	0.000
	Average	1.689	2.025	-0.336
	Min	1.436	1.587	-0.607
	Std Dev	0.097	0.212	0.199



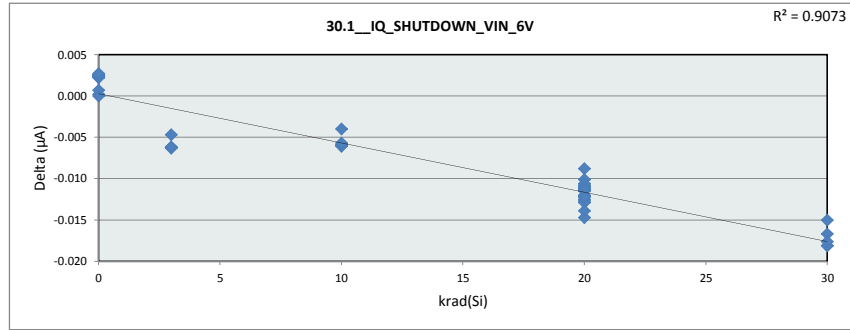
15.5 I Adj_pin					
Test Site	Junkins Dallas				
Tester	ETS09				
Test Number	EB062203				
Max Limit	9	µA			
Min Limit	-9	µA			
krad(Si)	0	3	10	20	30
LL	-9.000	-9.000	-9.000	-9.000	-9.000
Min	1.677	1.587	1.776	1.862	2.025
Average	1.875	1.725	1.938	2.153	2.209
Max	2.172	1.857	2.085	2.391	2.378
UL	9.000	9.000	9.000	9.000	9.000



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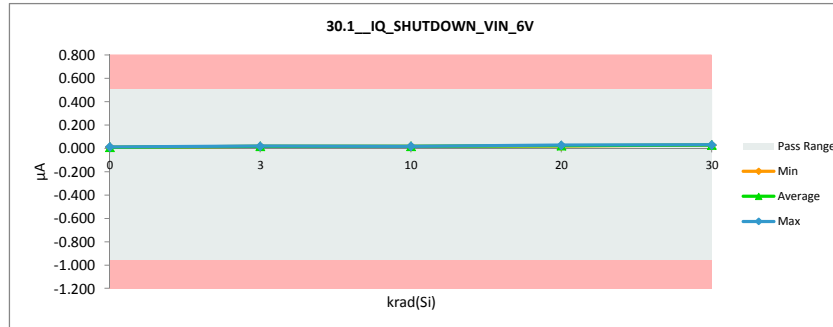
30.1 IQ SHUTDOWN_VIN_6V		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	µA	µA
Max Limit	0.5	0.5
Min Limit	-0.95	-0.95

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	0.012	0.012	0.000
0	3C34	0.012	0.012	0.001
0	3C35	0.012	0.012	0.000
0	10C33	0.012	0.010	0.002
0	10C34	0.012	0.010	0.002
0	10C35	0.012	0.010	0.002
0	20C33	0.012	0.010	0.002
0	20C34	0.012	0.010	0.002
0	20C35	0.012	0.010	0.002
0	30C33	0.012	0.010	0.003
0	30C34	0.012	0.010	0.003
0	30C35	0.012	0.010	0.003
3	3B1	0.012	0.019	-0.006
3	3B2	0.012	0.018	-0.006
3	3B3	0.012	0.017	-0.005
3	3B4	0.012	0.019	-0.006
3	3B5	0.012	0.019	-0.006
10	10B1	0.012	0.019	-0.006
10	10B2	0.012	0.018	-0.006
10	10B3	0.012	0.016	-0.004
10	10B4	0.012	0.018	-0.006
10	10B5	0.012	0.018	-0.006
20	20B11	0.013	0.025	-0.012
20	20B12	0.013	0.025	-0.013
20	20B13	0.012	0.024	-0.011
20	20B14	0.012	0.023	-0.010
20	20B15	0.012	0.023	-0.011
20	20B16	0.012	0.023	-0.011
20	20B17	0.012	0.023	-0.011
20	20B18	0.012	0.023	-0.011
20	20B19	0.013	0.024	-0.011
20	20B20	0.012	0.023	-0.011
20	20B21	0.013	0.024	-0.011
20	20B22	0.012	0.023	-0.011
20	20B23	0.012	0.024	-0.012
20	20B24	0.012	0.024	-0.012
20	20B25	0.012	0.025	-0.013
20	20B26	0.012	0.021	-0.009
20	20B27	0.013	0.025	-0.013
20	20B28	0.013	0.025	-0.012
20	20B29	0.013	0.024	-0.011
20	20B30	0.013	0.025	-0.012
20	20B31	0.013	0.027	-0.015
20	20B32	0.012	0.026	-0.014
30	30B1	0.012	0.031	-0.018
30	30B2	0.012	0.029	-0.017
30	30B3	0.012	0.027	-0.015
30	30B4	0.012	0.031	-0.018
30	30B5	0.012	0.030	-0.018
	Max	0.013	0.031	0.003
	Average	0.012	0.020	-0.008
	Min	0.012	0.010	-0.018
	Std Dev	0.000	0.006	0.006



30.1 IQ SHUTDOWN_VIN_6V		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	0.5	µA
Min Limit	-0.95	µA

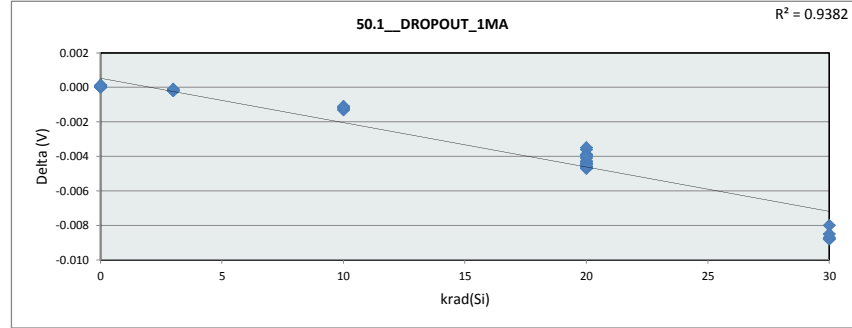
krad(Si)	0	3	10	20	30
LL	-0.950	-0.950	-0.950	-0.950	-0.950
Min	0.010	0.017	0.016	0.021	0.027
Average	0.010	0.018	0.018	0.024	0.029
Max	0.012	0.019	0.019	0.027	0.031
UL	0.500	0.500	0.500	0.500	0.500



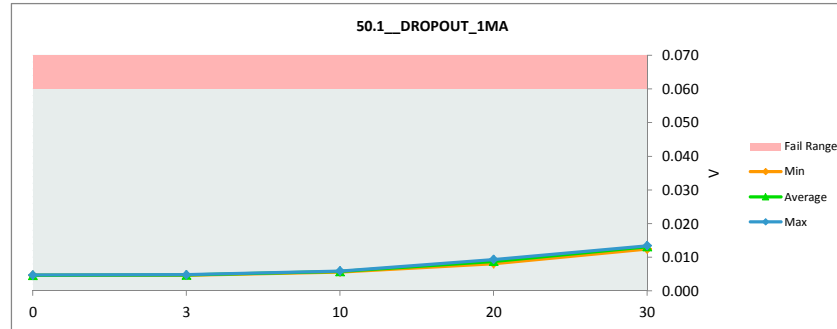
TID LDR Biased Data
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50.1 DROPOUT_1MA		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	V	V
Max Limit	0.06	0.06
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	0.005	0.005	0.000
0	3C34	0.005	0.005	0.000
0	3C35	0.005	0.005	0.000
0	10C33	0.005	0.005	0.000
0	10C34	0.005	0.005	0.000
0	10C35	0.005	0.005	0.000
0	20C33	0.005	0.005	0.000
0	20C34	0.005	0.005	0.000
0	20C35	0.005	0.005	0.000
0	30C33	0.005	0.005	0.000
0	30C34	0.005	0.005	0.000
0	30C35	0.005	0.005	0.000
3	3B1	0.005	0.005	0.000
3	3B2	0.004	0.005	0.000
3	3B3	0.004	0.005	0.000
3	3B4	0.005	0.005	0.000
3	3B5	0.005	0.005	0.000
10	10B1	0.005	0.006	-0.001
10	10B2	0.004	0.006	-0.001
10	10B3	0.004	0.006	-0.001
10	10B4	0.005	0.006	-0.001
10	10B5	0.005	0.006	-0.001
20	20B11	0.005	0.009	-0.005
20	20B12	0.004	0.009	-0.005
20	20B13	0.004	0.009	-0.005
20	20B14	0.004	0.009	-0.005
20	20B15	0.004	0.009	-0.005
20	20B16	0.005	0.009	-0.004
20	20B17	0.005	0.009	-0.004
20	20B18	0.005	0.009	-0.004
20	20B19	0.004	0.008	-0.004
20	20B20	0.005	0.008	-0.004
20	20B21	0.005	0.008	-0.004
20	20B22	0.005	0.009	-0.004
20	20B23	0.005	0.009	-0.005
20	20B24	0.005	0.009	-0.004
20	20B25	0.004	0.009	-0.005
20	20B26	0.005	0.009	-0.004
20	20B27	0.004	0.009	-0.004
20	20B28	0.004	0.009	-0.005
20	20B29	0.004	0.009	-0.004
20	20B30	0.004	0.008	-0.004
20	20B31	0.005	0.009	-0.004
20	20B32	0.004	0.009	-0.004
30	30B1	0.005	0.013	-0.009
30	30B2	0.004	0.013	-0.009
30	30B3	0.004	0.012	-0.008
30	30B4	0.005	0.013	-0.009
30	30B5	0.005	0.013	-0.008
	Max	0.005	0.013	0.000
	Average	0.005	0.007	-0.003
	Min	0.004	0.005	-0.009
	Std Dev	0.000	0.003	0.003



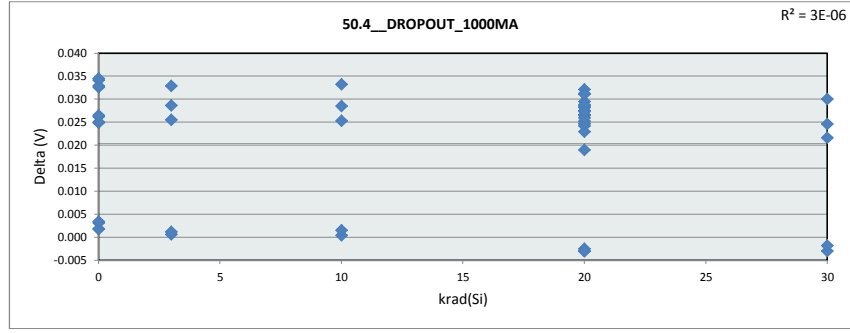
50.1 DROPOUT_1MA					
Test Site	Junkins Dallas				
Tester	ETS09				
Test Number	EB062203				
Max Limit	0.06				
Min Limit		V			
		V			
krad(Si)	0	3	10	20	30
LL					
Min	0.005	0.005	0.006	0.008	0.012
Average	0.005	0.005	0.006	0.009	0.013
Max	0.005	0.005	0.006	0.009	0.013
UL	0.060	0.060	0.060	0.060	0.060



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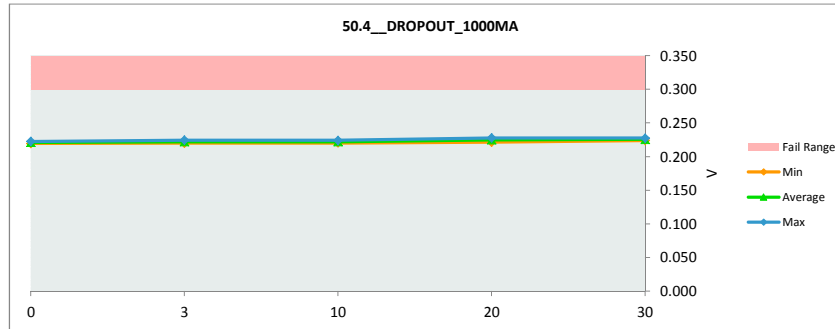
50.4_DROPOUT_1000MA		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	V	V
Max Limit	0.3	0.3
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	0.248	0.222	0.025
0	3C34	0.254	0.221	0.033
0	3C35	0.224	0.222	0.002
0	10C33	0.248	0.221	0.026
0	10C34	0.254	0.220	0.034
0	10C35	0.224	0.221	0.003
0	20C33	0.248	0.223	0.025
0	20C34	0.254	0.221	0.033
0	20C35	0.224	0.222	0.002
0	30C33	0.248	0.221	0.027
0	30C34	0.254	0.219	0.035
0	30C35	0.224	0.220	0.003
3	3B1	0.224	0.223	0.001
3	3B2	0.250	0.221	0.029
3	3B3	0.245	0.220	0.025
3	3B4	0.226	0.224	0.001
3	3B5	0.254	0.221	0.033
10	10B1	0.224	0.224	0.000
10	10B2	0.250	0.221	0.028
10	10B3	0.245	0.220	0.025
10	10B4	0.226	0.224	0.002
10	10B5	0.254	0.221	0.033
20	20B11	0.224	0.227	-0.002
20	20B12	0.251	0.227	0.025
20	20B13	0.256	0.224	0.032
20	20B14	0.222	0.225	-0.003
20	20B15	0.250	0.226	0.024
20	20B16	0.250	0.227	0.023
20	20B17	0.252	0.223	0.029
20	20B18	0.256	0.225	0.031
20	20B19	0.247	0.222	0.025
20	20B20	0.253	0.225	0.028
20	20B21	0.254	0.224	0.029
20	20B22	0.253	0.226	0.027
20	20B23	0.252	0.226	0.027
20	20B24	0.253	0.225	0.028
20	20B25	0.248	0.223	0.025
20	20B26	0.257	0.228	0.029
20	20B27	0.221	0.224	-0.003
20	20B28	0.250	0.223	0.027
20	20B29	0.250	0.224	0.026
20	20B30	0.252	0.221	0.031
20	20B31	0.243	0.224	0.019
20	20B32	0.253	0.226	0.027
30	30B1	0.224	0.227	-0.003
30	30B2	0.250	0.225	0.025
30	30B3	0.245	0.224	0.022
30	30B4	0.226	0.227	-0.002
30	30B5	0.254	0.224	0.030
	Max	0.257	0.228	0.035
	Average	0.244	0.223	0.020
	Min	0.221	0.219	-0.003
	Std Dev	0.012	0.002	0.013



50.4_DROPOUT_1000MA		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	0.3	V
Min Limit		V

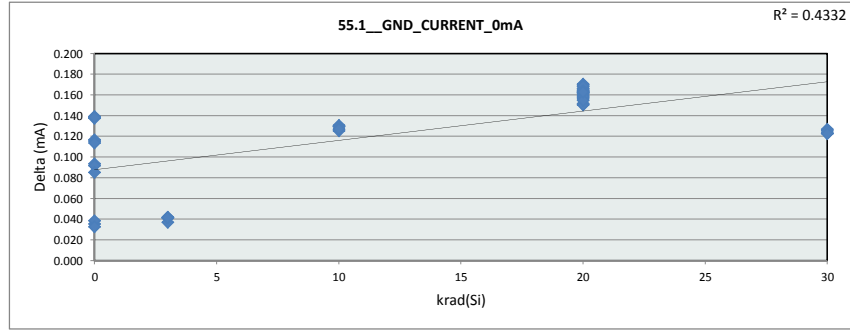
krad(Si)	0	3	10	20	30
LL					
Min	0.219	0.220	0.220	0.221	0.224
Average	0.221	0.222	0.222	0.225	0.226
Max	0.223	0.224	0.224	0.228	0.227
UL	0.300	0.300	0.300	0.300	0.300



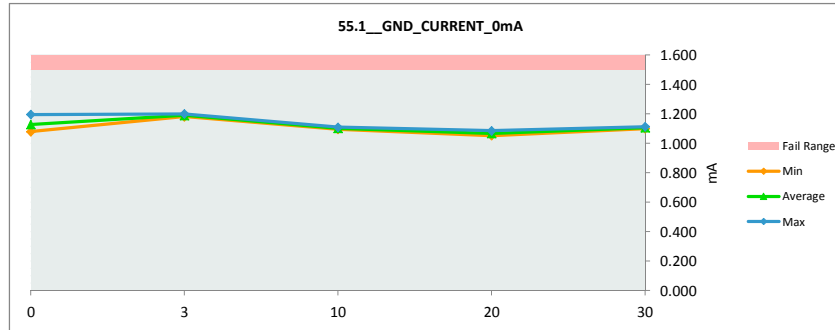
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55.1_GND_CURRENT_0mA		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	mA	mA
Max Limit	1.5	1.5
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.223	1.187	0.035
0	3C34	1.218	1.179	0.038
0	3C35	1.228	1.196	0.033
0	10C33	1.223	1.106	0.117
0	10C34	1.218	1.102	0.115
0	10C35	1.228	1.115	0.114
0	20C33	1.223	1.085	0.137
0	20C34	1.218	1.079	0.139
0	20C35	1.228	1.090	0.138
0	30C33	1.223	1.129	0.094
0	30C34	1.218	1.126	0.092
0	30C35	1.228	1.143	0.085
3	3B1	1.240	1.199	0.041
3	3B2	1.231	1.194	0.037
3	3B3	1.231	1.189	0.042
3	3B4	1.229	1.187	0.042
3	3B5	1.223	1.181	0.042
10	10B1	1.240	1.110	0.131
10	10B2	1.231	1.102	0.130
10	10B3	1.231	1.102	0.129
10	10B4	1.229	1.103	0.125
10	10B5	1.223	1.096	0.127
20	20B11	1.235	1.072	0.163
20	20B12	1.231	1.061	0.170
20	20B13	1.231	1.063	0.168
20	20B14	1.236	1.066	0.170
20	20B15	1.238	1.071	0.166
20	20B16	1.219	1.057	0.162
20	20B17	1.218	1.057	0.161
20	20B18	1.217	1.059	0.158
20	20B19	1.242	1.077	0.165
20	20B20	1.205	1.053	0.152
20	20B21	1.220	1.069	0.151
20	20B22	1.225	1.074	0.150
20	20B23	1.224	1.064	0.160
20	20B24	1.227	1.061	0.166
20	20B25	1.246	1.077	0.169
20	20B26	1.209	1.052	0.156
20	20B27	1.249	1.085	0.164
20	20B28	1.245	1.082	0.163
20	20B29	1.235	1.073	0.162
20	20B30	1.227	1.068	0.158
20	20B31	1.223	1.068	0.155
20	20B32	1.228	1.065	0.163
30	30B1	1.240	1.113	0.127
30	30B2	1.231	1.109	0.123
30	30B3	1.231	1.108	0.123
30	30B4	1.229	1.103	0.125
30	30B5	1.223	1.100	0.122
	Max	1.249	1.199	0.170
	Average	1.228	1.102	0.126
	Min	1.205	1.052	0.033
	Std Dev	0.009	0.044	0.044



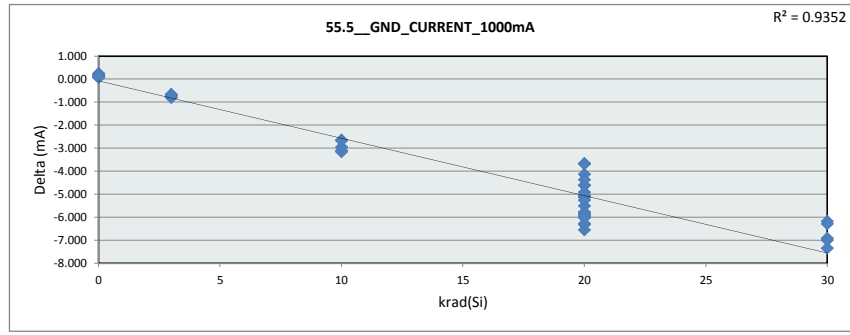
55.1_GND_CURRENT_0mA					
Test Site	Junkins Dallas				
Tester	ETS09				
Test Number	EB062203				
Max Limit	1.5				
Min Limit					
		mA			
			mA		
krad(Si)	0	3	10	20	30
LL					
Min	1.079	1.181	1.096	1.052	1.100
Average	1.128	1.190	1.102	1.067	1.107
Max	1.196	1.199	1.110	1.085	1.113
UL	1.500	1.500	1.500	1.500	1.500



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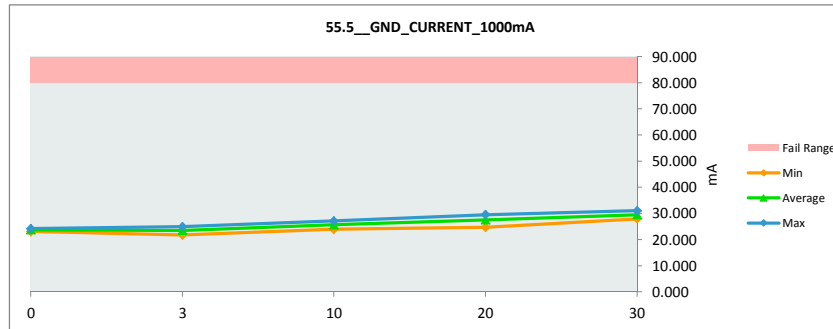
55.5_GND_CURRENT_1000mA		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	mA	mA
Max Limit	80	80
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	23.999	23.788	0.211
0	3C34	23.290	23.076	0.214
0	3C35	24.281	24.037	0.244
0	10C33	23.999	23.871	0.128
0	10C34	23.290	23.174	0.116
0	10C35	24.281	24.138	0.143
0	20C33	23.999	23.881	0.118
0	20C34	23.290	23.186	0.104
0	20C35	24.281	24.153	0.128
0	30C33	23.999	23.917	0.082
0	30C34	23.290	23.222	0.069
0	30C35	24.281	24.188	0.093
3	3B1	24.029	24.823	-0.794
3	3B2	21.897	22.697	-0.800
3	3B3	20.972	21.700	-0.728
3	3B4	24.222	24.880	-0.658
3	3B5	22.648	23.345	-0.697
10	10B1	24.029	27.132	-3.104
10	10B2	21.897	25.059	-3.162
10	10B3	20.972	23.925	-2.953
10	10B4	24.222	26.877	-2.655
10	10B5	22.648	25.329	-2.681
20	20B11	23.735	29.516	-5.781
20	20B12	21.643	27.970	-6.326
20	20B13	22.346	28.240	-5.894
20	20B14	23.418	29.445	-6.028
20	20B15	21.713	28.269	-6.557
20	20B16	23.970	29.487	-5.516
20	20B17	22.749	27.369	-4.620
20	20B18	23.229	27.372	-4.143
20	20B19	21.425	26.523	-5.098
20	20B20	23.768	27.430	-3.662
20	20B21	22.293	25.986	-3.693
20	20B22	23.279	28.415	-5.136
20	20B23	22.604	28.890	-6.285
20	20B24	22.419	27.486	-5.067
20	20B25	20.525	26.487	-5.963
20	20B26	23.997	28.607	-4.610
20	20B27	20.857	26.672	-5.814
20	20B28	20.670	26.559	-5.889
20	20B29	20.237	26.245	-6.007
20	20B30	19.781	24.693	-4.912
20	20B31	23.040	27.410	-4.370
20	20B32	21.918	27.175	-5.258
30	30B1	24.029	31.029	-7.000
30	30B2	21.897	29.250	-7.354
30	30B3	20.972	27.885	-6.913
30	30B4	24.222	30.404	-6.182
30	30B5	22.648	28.936	-6.288
	Max	24.281	31.029	0.244
	Average	22.800	26.207	-3.407
	Min	19.781	21.700	-7.354
	Std Dev	1.284	2.338	2.656



55.5_GND_CURRENT_1000m		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	80	mA
Min Limit		mA

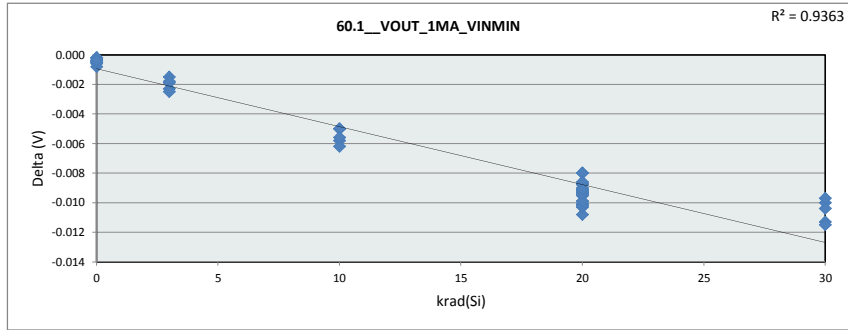
krad(Si)	0	3	10	20	30
LL					
Min	23.076	21.700	23.925	24.693	27.886
Average	23.719	23.489	25.665	27.557	29.501
Max	24.188	24.880	27.132	29.516	31.029
UL	80.000	80.000	80.000	80.000	80.000



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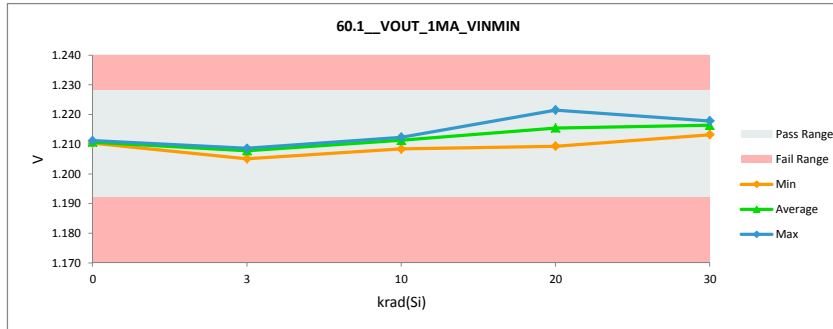
60.1_VOUT_1MA_VINMIN		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	V	V
Max Limit	1.228	1.228
Min Limit	1.192	1.192

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.210	1.211	-0.001
0	3C34	1.210	1.211	-0.001
0	3C35	1.210	1.211	0.000
0	10C33	1.210	1.211	-0.001
0	10C34	1.210	1.211	-0.001
0	10C35	1.210	1.210	0.000
0	20C33	1.210	1.211	0.000
0	20C34	1.210	1.211	0.000
0	20C35	1.210	1.210	0.000
0	30C33	1.210	1.211	0.000
0	30C34	1.210	1.211	0.000
0	30C35	1.210	1.211	0.000
3	3B1	1.207	1.209	-0.002
3	3B2	1.207	1.208	-0.002
3	3B3	1.207	1.208	-0.002
3	3B4	1.203	1.205	-0.002
3	3B5	1.206	1.209	-0.003
10	10B1	1.207	1.212	-0.005
10	10B2	1.207	1.212	-0.006
10	10B3	1.207	1.212	-0.005
10	10B4	1.203	1.208	-0.006
10	10B5	1.206	1.212	-0.006
20	20B11	1.205	1.214	-0.009
20	20B12	1.201	1.211	-0.010
20	20B13	1.206	1.217	-0.010
20	20B14	1.211	1.220	-0.010
20	20B15	1.203	1.213	-0.010
20	20B16	1.209	1.218	-0.009
20	20B17	1.211	1.221	-0.011
20	20B18	1.204	1.213	-0.009
20	20B19	1.211	1.222	-0.010
20	20B20	1.209	1.217	-0.008
20	20B21	1.203	1.211	-0.008
20	20B22	1.209	1.218	-0.009
20	20B23	1.209	1.219	-0.010
20	20B24	1.203	1.213	-0.010
20	20B25	1.205	1.215	-0.010
20	20B26	1.202	1.212	-0.009
20	20B27	1.207	1.216	-0.009
20	20B28	1.203	1.213	-0.010
20	20B29	1.205	1.215	-0.009
20	20B30	1.204	1.214	-0.009
20	20B31	1.211	1.219	-0.009
20	20B32	1.200	1.209	-0.009
30	30B1	1.207	1.217	-0.010
30	30B2	1.207	1.218	-0.011
30	30B3	1.207	1.216	-0.010
30	30B4	1.203	1.213	-0.010
30	30B5	1.206	1.217	-0.012
	Max	1.211	1.222	0.000
	Average	1.207	1.213	-0.006
	Min	1.200	1.205	-0.012
	Std Dev	0.003	0.004	0.004



60.1_VOUT_1MA_VINMIN		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	1.228	V
Min Limit	1.192	V

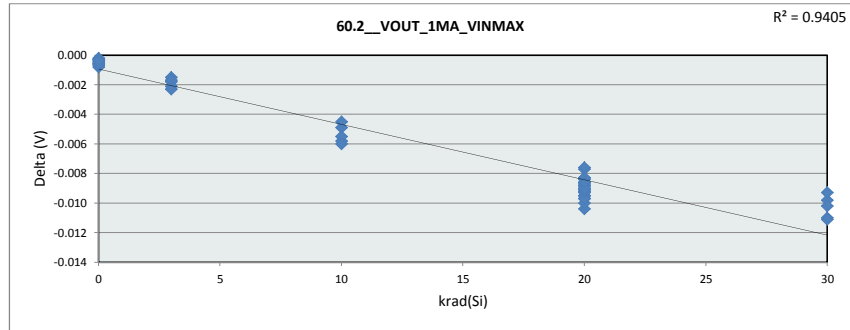
krad(Si)	0	3	10	20	30
LL	1.192	1.192	1.192	1.192	1.192
Min	1.210	1.205	1.208	1.209	1.213
Average	1.211	1.208	1.211	1.215	1.216
Max	1.211	1.209	1.212	1.222	1.218
UL	1.228	1.228	1.228	1.228	1.228



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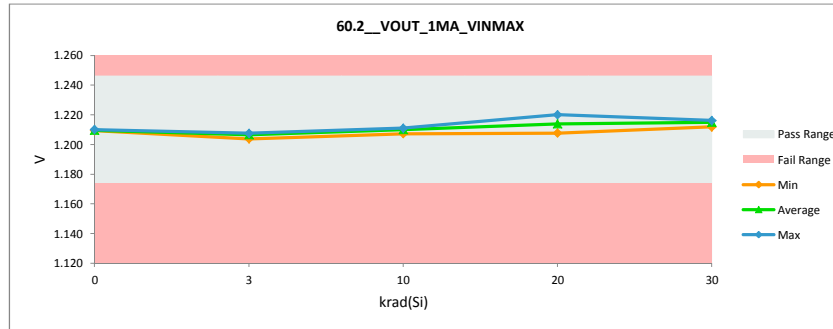
60.2_VOUT_1MA_VINMAX		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	V	V
Max Limit	1.246	1.246
Min Limit	1.174	1.174

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.209	1.210	-0.001
0	3C34	1.209	1.210	-0.001
0	3C35	1.209	1.209	0.000
0	10C33	1.209	1.210	-0.001
0	10C34	1.209	1.210	0.000
0	10C35	1.209	1.209	0.000
0	20C33	1.209	1.209	0.000
0	20C34	1.209	1.209	0.000
0	20C35	1.209	1.209	0.000
0	30C33	1.209	1.210	-0.001
0	30C34	1.209	1.210	-0.001
0	30C35	1.209	1.209	0.000
3	3B1	1.206	1.207	-0.002
3	3B2	1.205	1.207	-0.002
3	3B3	1.206	1.207	-0.002
3	3B4	1.202	1.204	-0.002
3	3B5	1.205	1.207	-0.002
10	10B1	1.206	1.211	-0.005
10	10B2	1.205	1.211	-0.006
10	10B3	1.206	1.210	-0.004
10	10B4	1.202	1.207	-0.006
10	10B5	1.205	1.211	-0.006
20	20B11	1.204	1.212	-0.009
20	20B12	1.200	1.209	-0.009
20	20B13	1.205	1.215	-0.010
20	20B14	1.209	1.219	-0.009
20	20B15	1.202	1.212	-0.010
20	20B16	1.207	1.217	-0.009
20	20B17	1.209	1.220	-0.010
20	20B18	1.203	1.211	-0.008
20	20B19	1.210	1.220	-0.010
20	20B20	1.208	1.216	-0.008
20	20B21	1.202	1.210	-0.008
20	20B22	1.208	1.217	-0.008
20	20B23	1.208	1.217	-0.009
20	20B24	1.202	1.212	-0.010
20	20B25	1.204	1.213	-0.010
20	20B26	1.202	1.210	-0.009
20	20B27	1.206	1.215	-0.009
20	20B28	1.202	1.211	-0.009
20	20B29	1.204	1.213	-0.009
20	20B30	1.204	1.212	-0.009
20	20B31	1.209	1.218	-0.008
20	20B32	1.199	1.208	-0.009
30	30B1	1.206	1.216	-0.010
30	30B2	1.205	1.216	-0.011
30	30B3	1.206	1.215	-0.009
30	30B4	1.202	1.212	-0.010
30	30B5	1.205	1.216	-0.011
	Max	1.210	1.220	0.000
	Average	1.206	1.212	-0.006
	Min	1.199	1.204	-0.011
	Std Dev	0.003	0.004	0.004



60.2_VOUT_1MA_VINMAX		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	1.246	V
Min Limit	1.174	V

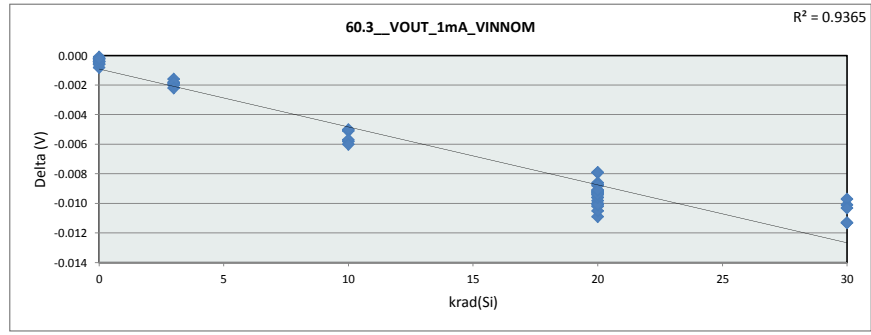
krad(Si)	0	3	10	20	30
LL	1.174	1.174	1.174	1.174	1.174
Min	1.209	1.204	1.207	1.208	1.212
Average	1.210	1.207	1.210	1.214	1.215
Max	1.210	1.208	1.211	1.220	1.216
UL	1.246	1.246	1.246	1.246	1.246



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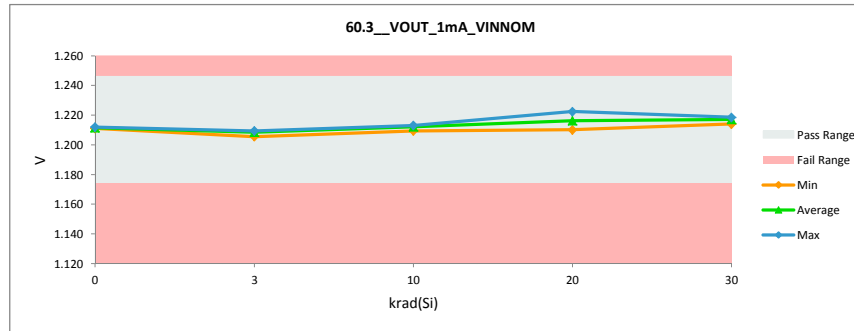
60.3_VOUT_1mA_VINNOM		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	V	V
Max Limit	1.246	1.246
Min Limit	1.174	1.174

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.211	1.212	-0.001
0	3C34	1.211	1.212	0.000
0	3C35	1.211	1.211	0.000
0	10C33	1.211	1.212	-0.001
0	10C34	1.211	1.212	0.000
0	10C35	1.211	1.211	0.000
0	20C33	1.211	1.212	0.000
0	20C34	1.211	1.211	0.000
0	20C35	1.211	1.211	0.000
0	30C33	1.211	1.212	-0.001
0	30C34	1.211	1.212	0.000
0	30C35	1.211	1.211	0.000
3	3B1	1.208	1.209	-0.002
3	3B2	1.207	1.209	-0.002
3	3B3	1.207	1.209	-0.002
3	3B4	1.204	1.206	-0.002
3	3B5	1.207	1.209	-0.002
10	10B1	1.208	1.213	-0.005
10	10B2	1.207	1.213	-0.006
10	10B3	1.207	1.212	-0.005
10	10B4	1.204	1.209	-0.006
10	10B5	1.207	1.213	-0.006
20	20B11	1.206	1.215	-0.009
20	20B12	1.202	1.212	-0.010
20	20B13	1.207	1.217	-0.010
20	20B14	1.212	1.221	-0.009
20	20B15	1.204	1.214	-0.010
20	20B16	1.209	1.219	-0.009
20	20B17	1.211	1.222	-0.011
20	20B18	1.205	1.214	-0.009
20	20B19	1.212	1.222	-0.010
20	20B20	1.210	1.218	-0.008
20	20B21	1.204	1.212	-0.008
20	20B22	1.211	1.219	-0.009
20	20B23	1.210	1.219	-0.010
20	20B24	1.204	1.214	-0.010
20	20B25	1.206	1.216	-0.010
20	20B26	1.203	1.212	-0.009
20	20B27	1.208	1.217	-0.009
20	20B28	1.204	1.214	-0.010
20	20B29	1.206	1.216	-0.009
20	20B30	1.205	1.215	-0.009
20	20B31	1.211	1.220	-0.009
20	20B32	1.201	1.210	-0.009
30	30B1	1.208	1.218	-0.010
30	30B2	1.207	1.219	-0.011
30	30B3	1.207	1.217	-0.010
30	30B4	1.204	1.214	-0.010
30	30B5	1.207	1.218	-0.011
	Max	1.212	1.222	0.000
	Average	1.208	1.214	-0.006
	Min	1.201	1.206	-0.011
	Std Dev	0.003	0.004	0.004



60.3_VOUT_1mA_VINNOM		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	1.246	V
Min Limit	1.174	V

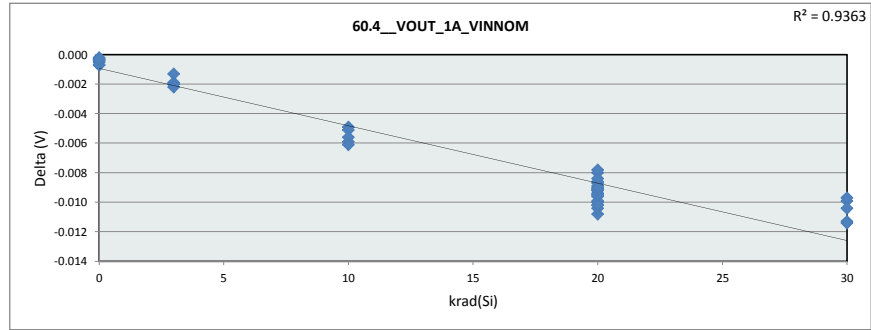
krad(Si)	0	3	10	20	30
LL	1.174	1.174	1.174	1.174	1.174
Min	1.211	1.206	1.209	1.210	1.214
Average	1.211	1.209	1.212	1.216	1.217
Max	1.212	1.209	1.213	1.222	1.219
UL	1.246	1.246	1.246	1.246	1.246



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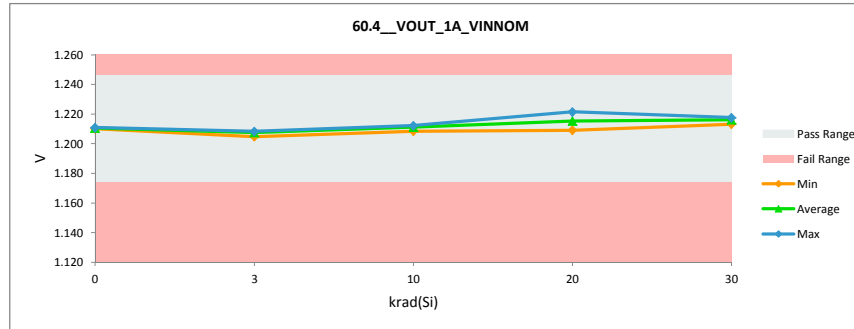
60.4_VOUT_1A_VINNM		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	V	V
Max Limit	1.246	1.246
Min Limit	1.174	1.174

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.210	1.211	-0.001
0	3C34	1.210	1.211	-0.001
0	3C35	1.210	1.211	0.000
0	10C33	1.210	1.211	-0.001
0	10C34	1.210	1.211	0.000
0	10C35	1.210	1.210	0.000
0	20C33	1.210	1.211	0.000
0	20C34	1.210	1.211	0.000
0	20C35	1.210	1.210	0.000
0	30C33	1.210	1.211	-0.001
0	30C34	1.210	1.211	0.000
0	30C35	1.210	1.210	0.000
3	3B1	1.207	1.208	-0.001
3	3B2	1.206	1.208	-0.002
3	3B3	1.206	1.208	-0.002
3	3B4	1.203	1.205	-0.002
3	3B5	1.206	1.208	-0.002
10	10B1	1.207	1.212	-0.005
10	10B2	1.206	1.212	-0.006
10	10B3	1.206	1.212	-0.005
10	10B4	1.203	1.208	-0.006
10	10B5	1.206	1.212	-0.006
20	20B11	1.205	1.214	-0.009
20	20B12	1.201	1.211	-0.010
20	20B13	1.206	1.216	-0.010
20	20B14	1.210	1.220	-0.010
20	20B15	1.203	1.213	-0.010
20	20B16	1.209	1.218	-0.009
20	20B17	1.210	1.221	-0.011
20	20B18	1.204	1.213	-0.009
20	20B19	1.211	1.222	-0.010
20	20B20	1.209	1.217	-0.008
20	20B21	1.203	1.211	-0.008
20	20B22	1.209	1.218	-0.009
20	20B23	1.209	1.219	-0.010
20	20B24	1.203	1.213	-0.010
20	20B25	1.204	1.215	-0.010
20	20B26	1.202	1.212	-0.009
20	20B27	1.207	1.216	-0.009
20	20B28	1.203	1.213	-0.010
20	20B29	1.205	1.215	-0.009
20	20B30	1.205	1.214	-0.009
20	20B31	1.211	1.219	-0.008
20	20B32	1.200	1.209	-0.009
30	30B1	1.207	1.217	-0.010
30	30B2	1.206	1.218	-0.011
30	30B3	1.206	1.216	-0.010
30	30B4	1.203	1.213	-0.010
30	30B5	1.206	1.217	-0.011
	Max	1.211	1.222	0.000
	Average	1.207	1.213	-0.006
	Min	1.200	1.205	-0.011
	Std Dev	0.003	0.004	0.004



60.4_VOUT_1A_VINNM		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	1.246	V
Min Limit	1.174	V

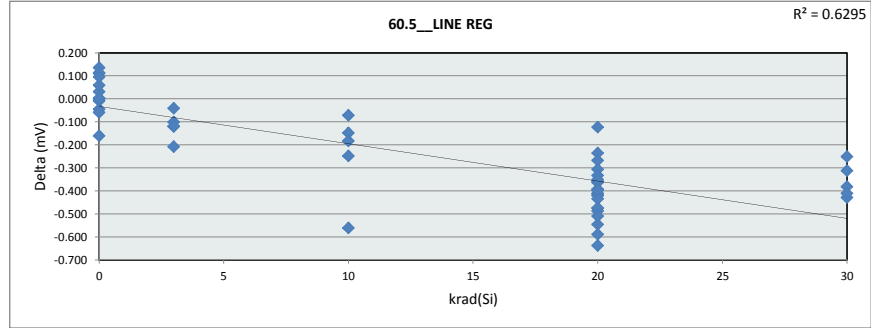
krad(Si)	0	3	10	20	30
LL	1.174	1.174	1.174	1.174	1.174
Min	1.210	1.205	1.208	1.209	1.213
Average	1.211	1.208	1.211	1.215	1.216
Max	1.211	1.208	1.212	1.222	1.218
UL	1.246	1.246	1.246	1.246	1.246



TID LDR Biased Data
TPS73801-SEP

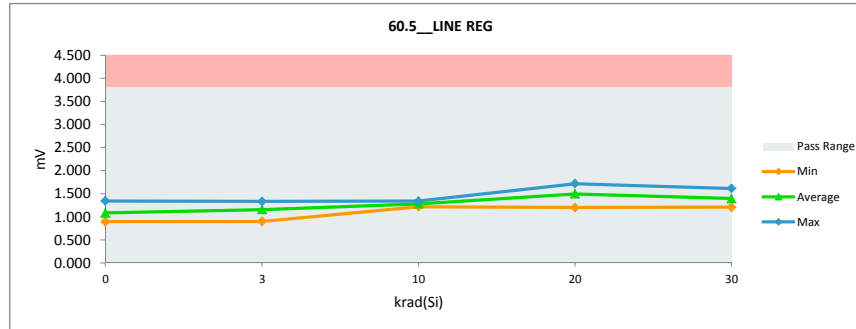
60.5 LINE REG		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	mV	mV
Max Limit	3.8	3.8
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.183	1.343	-0.160
0	3C34	1.123	1.093	0.030
0	3C35	1.005	0.946	0.059
0	10C33	1.183	1.048	0.135
0	10C34	1.123	1.169	-0.046
0	10C35	1.005	1.014	-0.009
0	20C33	1.183	1.242	-0.059
0	20C34	1.123	1.124	-0.001
0	20C35	1.005	0.895	0.110
0	30C33	1.183	1.070	0.113
0	30C34	1.123	1.028	0.096
0	30C35	1.005	1.003	0.003
3	3B1	1.135	1.176	-0.041
3	3B2	1.230	1.331	-0.101
3	3B3	0.779	0.899	-0.120
3	3B4	1.032	1.240	-0.208
3	3B5	1.016	1.135	-0.118
10	10B1	1.135	1.283	-0.148
10	10B2	1.230	1.302	-0.072
10	10B3	0.779	1.341	-0.562
10	10B4	1.032	1.216	-0.184
10	10B5	1.016	1.264	-0.248
20	20B11	1.206	1.441	-0.236
20	20B12	1.092	1.567	-0.475
20	20B13	1.132	1.678	-0.546
20	20B14	1.117	1.425	-0.307
20	20B15	0.924	1.411	-0.487
20	20B16	1.255	1.588	-0.333
20	20B17	1.187	1.600	-0.414
20	20B18	1.010	1.485	-0.475
20	20B19	1.057	1.421	-0.364
20	20B20	1.156	1.549	-0.394
20	20B21	1.113	1.524	-0.411
20	20B22	1.214	1.481	-0.268
20	20B23	1.034	1.544	-0.510
20	20B24	1.139	1.262	-0.123
20	20B25	1.054	1.476	-0.421
20	20B26	1.044	1.632	-0.589
20	20B27	0.842	1.202	-0.359
20	20B28	1.079	1.717	-0.638
20	20B29	0.977	1.411	-0.434
20	20B30	1.027	1.421	-0.394
20	20B31	1.153	1.504	-0.351
20	20B32	1.131	1.529	-0.398
30	30B1	1.135	1.447	-0.312
30	30B2	1.230	1.612	-0.382
30	30B3	0.779	1.208	-0.429
30	30B4	1.032	1.284	-0.252
30	30B5	1.016	1.428	-0.411
	Max	1.255	1.717	0.135
	Average	1.077	1.327	-0.250
	Min	0.779	0.895	-0.638
	Std Dev	0.116	0.215	0.210



60.5 LINE REG		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	3.8	mV
Min Limit		

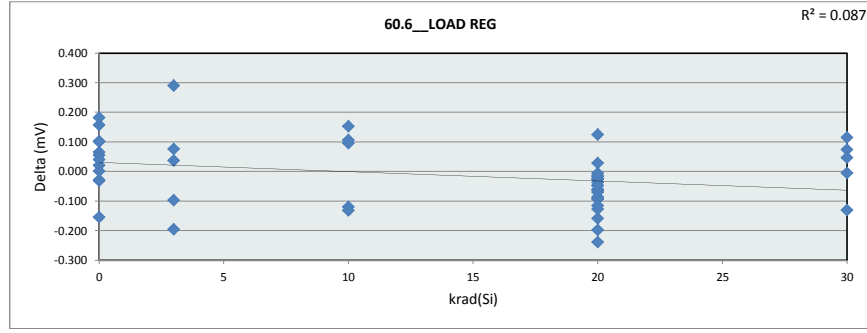
krad(Si)	0	3	10	20	30
LL					
Min	0.895	0.899	1.216	1.202	1.208
Average	1.081	1.156	1.281	1.494	1.396
Max	1.343	1.331	1.341	1.717	1.612
UL	3.800	3.800	3.800	3.800	3.800



TID LDR Biased Data
TPS73801-SEP

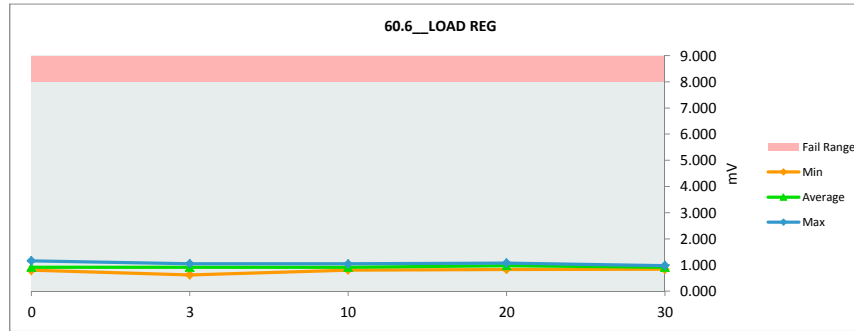
60.6 LOAD REG		
Test Site	Junkins Dallas	Junkins Dallas
Tester	ETS09	ETS09
Test Number	EB062203	EB062203
Unit	mV	mV
Max Limit	8	8
Min Limit		

krad(Si)	Serial #	Pre	Post	Delta
0	3C33	1.009	1.163	-0.154
0	3C34	0.956	0.799	0.157
0	3C35	0.919	0.950	-0.031
0	10C33	1.009	0.944	0.065
0	10C34	0.956	0.985	-0.029
0	10C35	0.919	0.818	0.101
0	20C33	1.009	0.988	0.021
0	20C34	0.956	0.854	0.102
0	20C35	0.919	0.863	0.055
0	30C33	1.009	0.827	0.182
0	30C34	0.956	0.915	0.041
0	30C35	0.919	0.918	0.001
3	3B1	0.849	1.045	-0.195
3	3B2	0.926	1.022	-0.097
3	3B3	1.090	1.053	0.037
3	3B4	0.912	0.622	0.290
3	3B5	0.911	0.835	0.076
10	10B1	0.849	0.969	-0.120
10	10B2	0.926	0.831	0.095
10	10B3	1.090	0.937	0.153
10	10B4	0.912	1.044	-0.132
10	10B5	0.911	0.805	0.106
20	20B11	0.920	1.014	-0.094
20	20B12	0.906	0.992	-0.086
20	20B13	0.867	0.914	-0.048
20	20B14	1.112	0.987	0.125
20	20B15	0.881	0.904	-0.023
20	20B16	0.936	0.964	-0.027
20	20B17	0.933	1.025	-0.092
20	20B18	0.884	1.012	-0.128
20	20B19	0.849	0.914	-0.065
20	20B20	0.965	0.981	-0.016
20	20B21	0.920	0.934	-0.015
20	20B22	1.041	1.065	-0.024
20	20B23	0.976	0.948	0.028
20	20B24	0.827	0.832	-0.006
20	20B25	0.910	0.946	-0.036
20	20B26	0.852	0.922	-0.070
20	20B27	0.855	0.970	-0.115
20	20B28	0.959	1.019	-0.060
20	20B29	0.897	1.056	-0.159
20	20B30	0.761	0.999	-0.238
20	20B31	0.877	1.075	-0.198
20	20B32	0.942	0.989	-0.047
30	30B1	0.849	0.979	-0.130
30	30B2	0.926	0.931	-0.005
30	30B3	1.090	0.975	0.115
30	30B4	0.912	0.839	0.073
30	30B5	0.911	0.864	0.047
	Max	1.112	1.163	0.290
	Average	0.932	0.944	-0.012
	Min	0.761	0.622	-0.238
	Std Dev	0.072	0.093	0.109



60.6 LOAD REG		
Test Site	Junkins Dallas	
Tester	ETS09	
Test Number	EB062203	
Max Limit	8	mV
Min Limit		

krad(Si)	0	3	10	20	30
LL					
Min	0.799	0.622	0.805	0.833	0.839
Average	0.919	0.915	0.917	0.976	0.918
Max	1.163	1.053	1.044	1.075	0.979
UL	8.000	8.000	8.000	8.000	8.000



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