Radiation Report

ADC3683-SP Total Ionizing Dose (TID) Radiation Report

ABSTRACT

This report covers the radiation characterization results of the ADC3683-SP which is a space grade 18-Bit 65MSPS, Low Noise, Ultra-low Power Dual Channel ADC. The study was done to determine Total Ionizing Dose (TID) effects under high dose rate (HDR) up to 300krad(Si) as a one-time characterization. The results show that all samples passed within the specified limits up to 300krad(Si).

In production, the Radiation Lot Acceptance Testing (RLAT) is performed using 5 units on every fab-lot to the specified rating of 300krad(Si). Furthermore, the ADC3683-SP has a Single Event Latch-Up (SEL) immunization up to 78MeV-cm2/mg which makes ADC3683-SP suitable for Radiation Hardness Assured Space Applications.

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Trademarks

1 Device Information

The ADC3683-SP is a low noise, ultra-low power 18-bit 65MSPS high-speed dual channel ADC family. Designed for lowest noise performance, the device delivers a noise spectral density of -160dBFS/Hz combined with excellent linearity and dynamic range. The ADC3683-SP offers DC precision together with IF sampling support making the device an excellent choice for a wide range of applications. High-speed control loops benefit from the short latency as low as only 1 clock cycle. The ADC consumes only 94mW/ch at 65Msps and the power consumption scales well with lower sampling rates.

The device uses a serial LVDS (SLVDS) interface to output the data which minimizes the number of digital interconnects. The device supports two-lane, one-lane, and half-lane options. ADC3683-SP comes in a 64-pin CFP package (10.9 × 10.9mm) and supports a temperature range from -55 to +105°C.

1.1 Device Details

Table 1-1. Device and Exposure Details

TID HDR Details	
TI device number	5962F2320401VXC
Package	64-HBP
Technology	C021
Die lot number	2350924DM6
Device / package lot number	3007958MTT
Lot trace code (LTC)	2331A
Quantity tested	5 biased and 5 un-biased units at 10krad(Si) 5 biased and 5 un-biased units at 30krad(Si) 5 biased and 5 un-biased units at 50krad(Si) 5 biased and 5 un-biased units at 100krad(Si) 5 biased and 5 un-biased units at 300krad(Si) 5 biased annealing 168hr/100°C post 300krad(Si) 5 biased annealing 168hr/25°C post 300krad(Si)
Lot accept / reject	5 / 0
HDR radiation facility	Texas Instruments CLAB, Dallas, TX
HDR dose level	300krad(Si)
HDR dose rate	200rad(Si) / sec, Gamma (GR420) Co-60
HDR irradiation temperature	Ambient, room temperature
Radiation test date	4/24/2024
Test Method	MIL-STD-883 and MIL-STD-750

2 Total Dose Test Setup

2.1 Test Overview

The ADC3683-SP was tested according to MIL-STD-883, Test Method 1019.9, Conditions A. For this test, the product was irradiated up to the target radiation level, and then put through full electrical parametric testing on the production Automated Test Equipment (ATE). All devices remained functional passing all parametric test limits.

2.2 Test Description and Facilities

The ADC3683-SP HDR exposure was performed on biased devices and un-biased devices at TI CLAB facility in Dallas, Texas. The dose rate of the exposure was between 200-260 rad(Si)/s. After the exposure, the devices were electrically tested at TI CLAB facility. The electrical test guard-band limits were set within the data sheet electrical specifications to maintain a minimum Cpk and test error margin based on initial qualification and characterization data.

2.3 Test Setup Details

The devices were tested in biased conditions as described below.

2.3.1 Biased

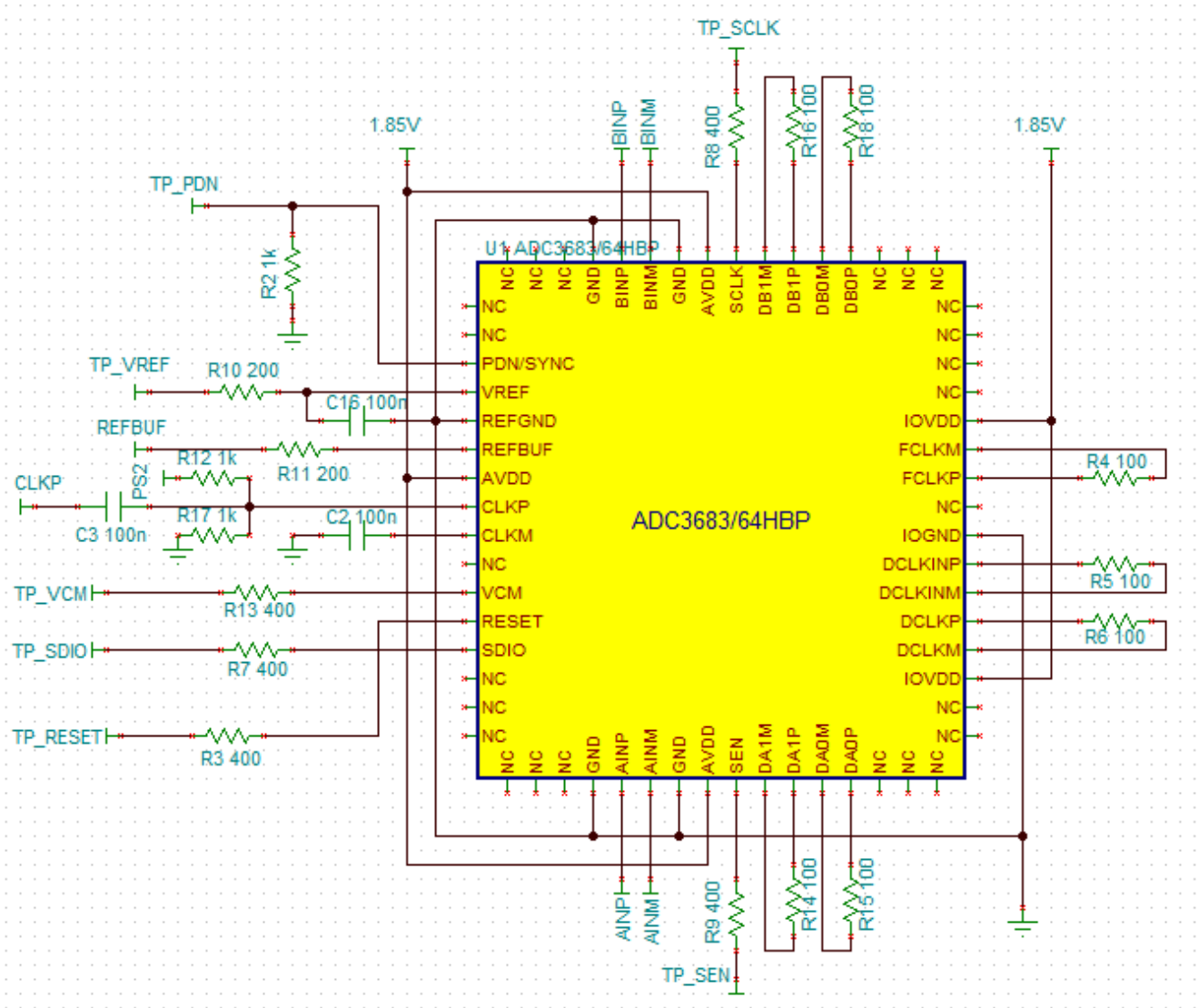

Figure 2-1. Device Biased Conditions During Radiation

2.4 Test Configuration and Condition

Table 2-1. HDR Biased Conditions

Total Samples: 35					
Exposure Levels					
10krad(Si), 5 ea.	30krad(Si), 5 ea.	50krad(Si), 5 ea.	100krad(Si), 5 ea.	300krad(Si), 5 ea.	300krad(Si), 10 ea. 168hrs Annealing
Passed	Passed	Passed	Passed	Passed	Passed

Table 2-2. HDR Un-Biased Conditions

Total Samples: 25				
Exposure Levels				
10krad(Si), 5 ea.	30krad(Si), 5 ea.	50krad(Si), 5 ea.	100krad(Si), 5 ea.	300krad(Si), 5 ea.
Passed	Passed	Passed	Passed	Passed

A Total Ionizing Dose HDR Report Appendix

This appendix provides the ADC3683-SP TID HDR report. The report shows the variation for critical parameters up to 300 krad(Si). ADC3683-SP passed HDR up to 300krad(Si) at maximum recommended operating conditions. The drifts of critical parameters were within the specification. Biased annealing was performed on 5 samples each for 168hrs at 100°C and 25°C. The recovery rate of the units biased at 25°C is slightly worse than units bake at 100°C. All units passed.

Device and Exposure Details

TID HDR Details:	
TI Device Number	5962F2320401VXC
Package	64-HBP
Technology	C021
Die Lot Number	2350924DM6
A/T Lot Number / Lot Trace Code	3007958MTT
Quantity Tested	25 units + 2 control units
Lot Accept/Reject	300 Krad(Si)
HDR Radiation Facility	Texas Instruments CLAB, Dallas, TX
HDR Dose Level	10-300 Krad(Si)
HDR Dose Rate	200-260 rad(Si)/s ionizing radiation with increments
HDR Radiation Source	Gammacell (GR420) Co-60
Irradiation Temperature	Ambient, room temperature controlled to 24°C ±6°C per MIL-STD-883 and MIL-STD-750

HDR = 260 rad(Si)/s Device Information

Total Samples: 25				
Exposure Levels:				
10 Krad(Si), 5 ea.	30 Krad(Si), 5 ea.	50 Krad(Si), 5 ea.	100 Krad(Si), 5 ea.	300 Krad(Si), 5 ea.
Pass	Pass	Pass	Pass	Pass

Delta Threshold 10.00%

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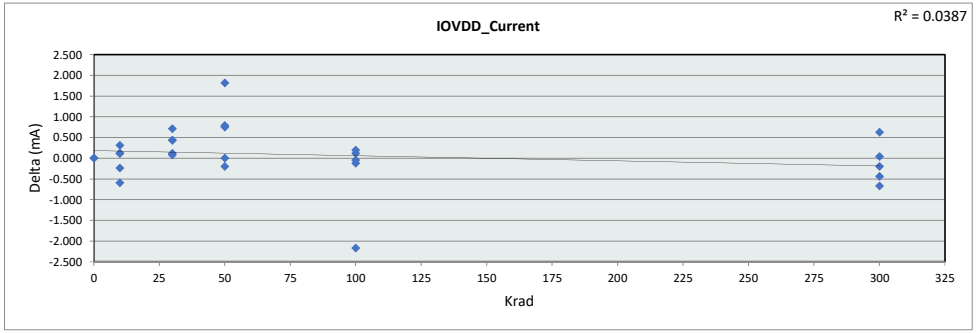
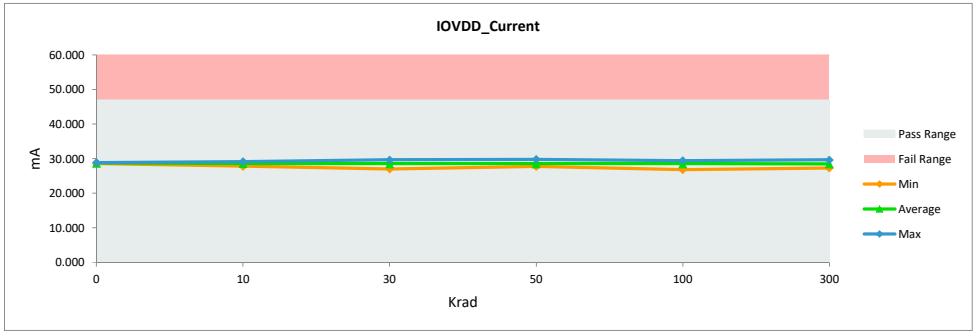
	IOVDD_Current	
Test Site		
Tester		
Test Number		
Unit	mA	mA
Max Limit	47	47
Min Limit	0	0

Krad	Serial #	Pre	Post	Delta
10	1	28.837	28.521	0.316
10	2	28.285	28.877	-0.592
10	3	27.929	27.811	0.118
10	4	29.271	29.153	0.118
10	5	28.364	28.600	-0.237
30	6	28.877	28.758	0.118
30	7	30.337	29.627	0.710
30	8	28.127	28.048	0.079
30	9	27.456	27.022	0.434
30	10	29.706	29.271	0.434
50	11	29.548	27.732	1.816
50	12	28.995	28.206	0.789
50	13	29.587	29.784	-0.197
50	14	28.719	27.969	0.750
50	15	28.916	28.916	0.000
100	16	28.640	28.758	-0.118
100	17	29.508	29.390	0.118
100	18	28.600	28.640	-0.039
100	19	27.061	26.864	0.197
100	20	26.903	29.074	-2.171
300	21	28.245	28.443	-0.197
300	22	30.298	29.666	0.632
300	23	26.627	27.298	-0.671
300	24	27.850	28.285	-0.434
300	25	28.916	28.877	0.039
0	26	28.600	28.600	0.000
0	27	28.877	28.877	0.000
Max		30.337	29.784	1.816
Average		28.633	28.558	0.075
Min		26.627	26.864	-2.171
Std Dev		0.936	0.762	0.670



	IOVDD_Current					
Test Site						
Tester						
Test Number						
Max Limit	47	mA				
Min Limit	0	mA				
Krad	0	10	30	50	100	300
LL	0.000	0.000	0.000	0.000	0.000	0.000
Min	28.600	27.811	27.022	27.732	26.864	27.298
Average	28.739	28.593	28.545	28.521	28.545	28.514
Max	28.877	29.153	29.627	29.784	29.390	29.666
UL	47.000	47.000	47.000	47.000	47.000	47.000



TID Report
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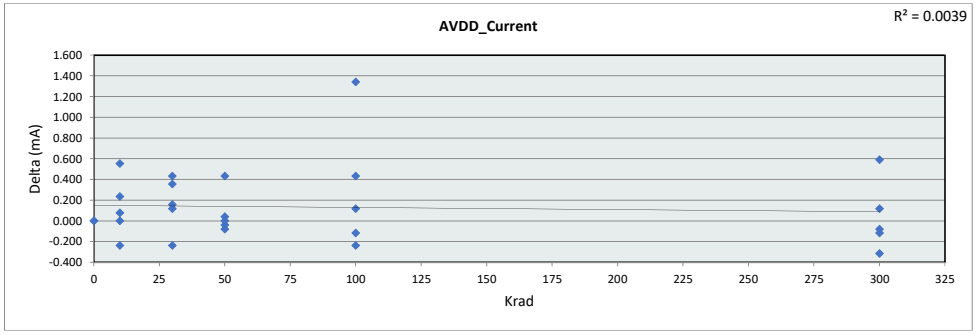
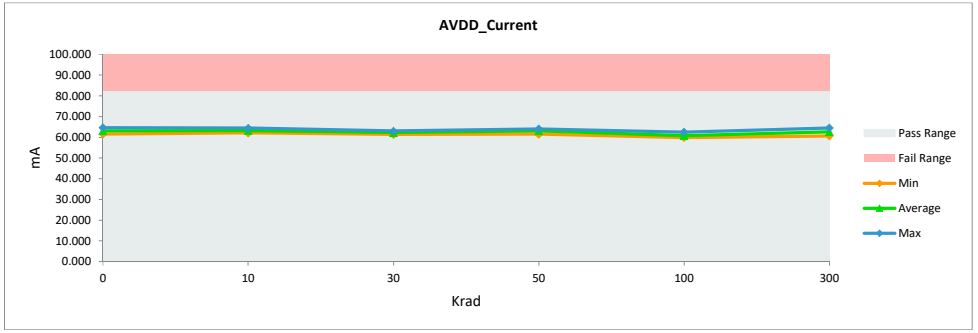
	AVDD_Current	
Test Site		
Tester		
Test Number		
Unit	mA	mA
Max Limit	82	82
Min Limit	0	0

Krad	Serial #	Pre	Post	Delta
10	1	63.216	63.137	0.079
10	2	63.965	63.413	0.552
10	3	63.334	63.334	0.000
10	4	64.162	64.398	-0.237
10	5	62.348	62.112	0.236
30	6	62.703	62.585	0.118
30	7	63.334	62.900	0.434
30	8	61.481	61.323	0.158
30	9	61.087	61.323	-0.237
30	10	63.334	62.979	0.355
50	11	63.965	64.044	-0.079
50	12	61.915	61.481	0.434
50	13	63.373	63.413	-0.039
50	14	62.388	62.388	0.000
50	15	63.965	63.925	0.039
100	16	62.309	62.427	-0.118
100	17	60.653	60.219	0.434
100	18	60.732	60.969	-0.237
100	19	60.062	59.944	0.118
100	20	61.560	60.220	1.340
300	21	64.359	64.438	-0.079
300	22	61.994	61.402	0.591
300	23	60.259	60.574	-0.315
300	24	62.230	62.112	0.118
300	25	64.241	64.359	-0.118
0	26	64.595	64.595	0.000
0	27	61.560	61.560	0.000
Max		64.595	64.595	1.340
Average		62.560	62.429	0.131
Min		60.062	59.944	-0.315
Std Dev		1.336	1.412	0.346



	AVDD_Current					
Test Site						
Tester						
Test Number						
Max Limit	82	mA				
Min Limit	0	mA				
Krad	0	10	30	50	100	300
LL	0.000	0.000	0.000	0.000	0.000	0.000
Min	61.560	62.112	61.323	61.481	59.944	60.574
Average	63.078	63.279	62.222	63.050	60.756	62.577
Max	64.595	64.398	62.979	64.044	62.427	64.438
UL	82.000	82.000	82.000	82.000	82.000	82.000



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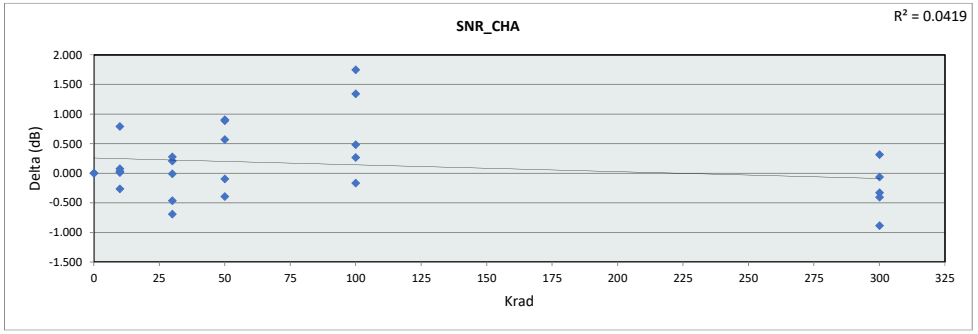
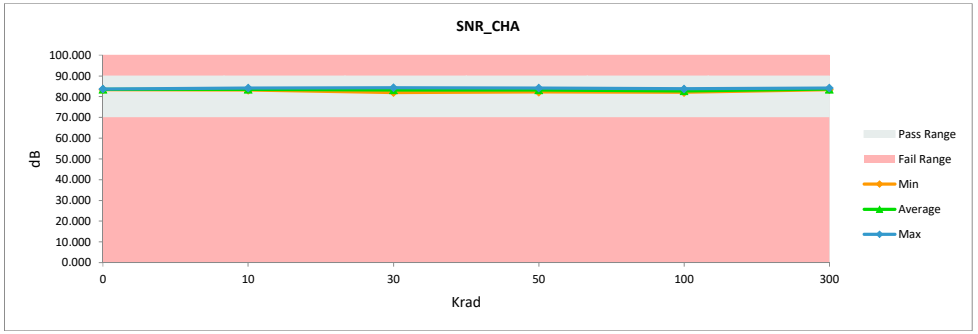
	SNR_CHA	
Test Site		
Tester		
Test Number		
Unit	dB	dB
Max Limit	90	90
Min Limit	70	70

Krad	Serial #	Pre	Post	Delta
10	1	83.026	83.288	-0.262
10	2	83.913	83.122	0.791
10	3	83.546	83.536	0.011
10	4	84.160	84.083	0.076
10	5	84.005	83.974	0.031
30	6	84.028	83.750	0.279
30	7	82.573	82.367	0.206
30	8	83.669	84.361	-0.692
30	9	83.715	83.725	-0.011
30	10	81.466	81.928	-0.462
50	11	84.228	83.326	0.902
50	12	83.098	83.495	-0.396
50	13	83.791	82.901	0.890
50	14	82.728	82.160	0.569
50	15	84.019	84.113	-0.094
100	16	83.995	83.731	0.265
100	17	83.273	82.789	0.484
100	18	83.769	82.024	1.745
100	19	82.749	82.915	-0.166
100	20	84.005	82.663	1.342
300	21	82.772	83.659	-0.887
300	22	83.762	84.090	-0.329
300	23	83.387	83.452	-0.065
300	24	83.025	83.428	-0.403
300	25	83.642	83.326	0.316
0	26	83.331	83.331	0.000
0	27	83.700	83.700	0.000
	Max	84.228	84.361	1.745
	Average	83.458	83.305	0.153
	Min	81.466	81.928	-0.887
	Std Dev	0.625	0.655	0.598



	SNR_CHA					
Test Site						
Tester						
Test Number						
Max Limit	90	dB				
Min Limit	70	dB				
Krad	0	10	30	50	100	300
LL	70.000	70.000	70.000	70.000	70.000	70.000
Min	83.331	83.122	81.928	82.160	82.024	83.326
Average	83.515	83.601	83.226	83.199	82.824	83.591
Max	83.700	84.083	84.361	84.113	83.731	84.090
UL	90.000	90.000	90.000	90.000	90.000	90.000



TID Report
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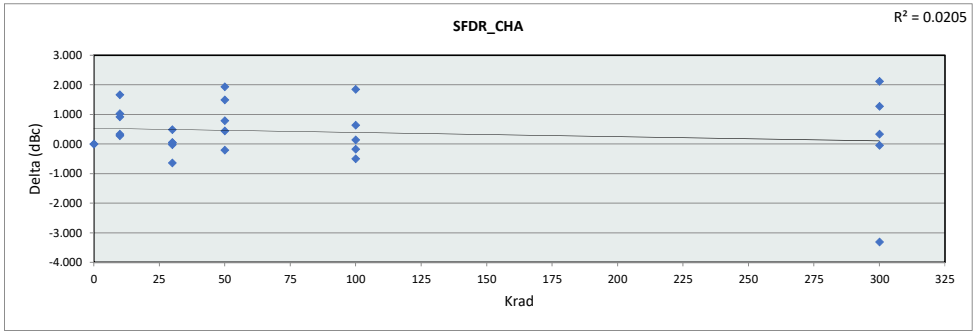
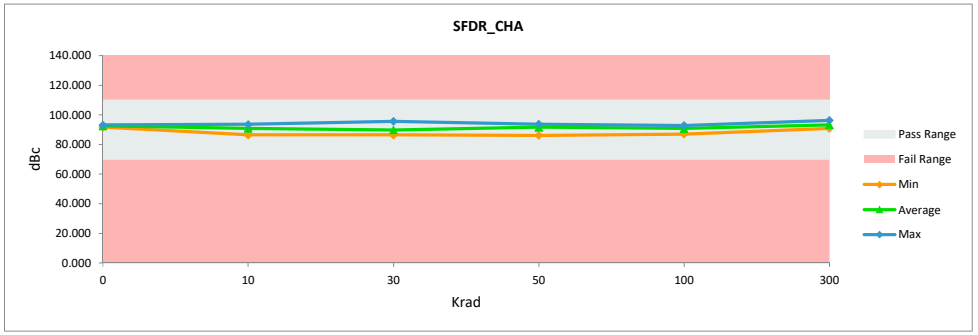
	SFDR_CHA	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	69.5	69.5

Krad	Serial #	Pre	Post	Delta
10	1	92.808	91.784	1.024
10	2	87.286	86.363	0.923
10	3	91.315	91.037	0.278
10	4	91.470	91.132	0.337
10	5	95.196	93.526	1.670
30	6	95.585	95.611	-0.027
30	7	86.486	86.437	0.049
30	8	93.115	93.073	0.042
30	9	86.445	87.082	-0.637
30	10	87.383	86.900	0.483
50	11	94.680	92.741	1.938
50	12	92.942	92.154	0.788
50	13	93.840	93.395	0.445
50	14	85.844	86.049	-0.205
50	15	95.084	93.589	1.495
100	16	91.224	91.403	-0.179
100	17	92.337	92.839	-0.502
100	18	87.070	86.926	0.144
100	19	92.726	92.090	0.636
100	20	92.033	90.186	1.847
300	21	90.784	90.825	-0.041
300	22	92.945	96.253	-3.308
300	23	94.832	92.714	2.118
300	24	94.183	93.852	0.331
300	25	93.965	92.684	1.280
0	26	91.769	91.769	0.000
0	27	93.111	93.111	0.000
Max		95.585	96.253	2.118
Average		91.721	91.316	0.405
Min		85.844	86.049	-3.308
Std Dev		2.994	2.871	1.061



	SFDR_CHA					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	69.5	dBc				
Krad	0	10	30	50	100	300
LL	69.500	69.500	69.500	69.500	69.500	69.500
Min	91.769	86.363	86.437	86.049	86.926	90.825
Average	92.440	90.768	89.821	91.586	90.689	93.266
Max	93.111	93.526	95.611	93.589	92.839	96.253
UL	110.000	110.000	110.000	110.000	110.000	110.000



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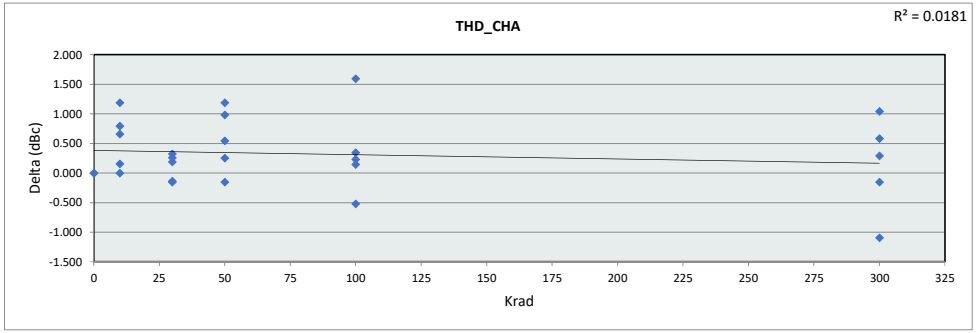
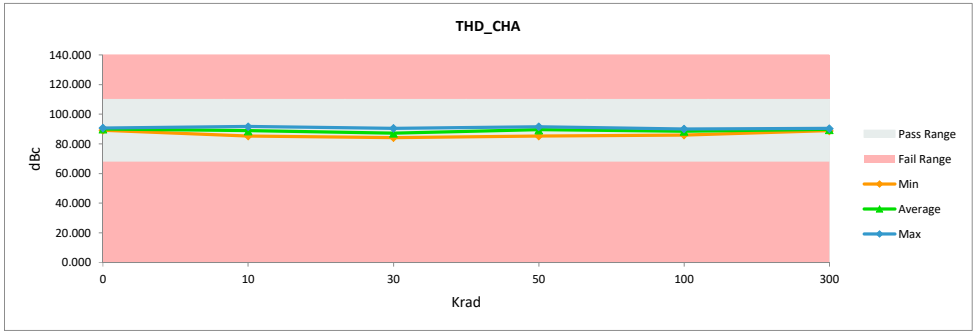
ADC3683-SP

	THD_CHA	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	68	68

Krad	Serial #	Pre	Post	Delta
10	1	89.656	89.502	0.154
10	2	86.485	85.297	1.187
10	3	88.906	88.906	-0.001
10	4	89.810	89.019	0.792
10	5	92.253	91.592	0.660
30	6	90.043	89.854	0.189
30	7	84.033	84.171	-0.138
30	8	90.790	90.467	0.323
30	9	85.320	85.471	-0.152
30	10	86.395	86.135	0.260
50	11	90.232	89.247	0.985
50	12	90.946	90.696	0.250
50	13	90.835	90.293	0.543
50	14	85.121	85.274	-0.153
50	15	92.794	91.609	1.185
100	16	88.630	89.148	-0.518
100	17	90.352	90.122	0.230
100	18	86.206	85.863	0.342
100	19	89.961	89.816	0.145
100	20	88.979	87.384	1.595
300	21	88.712	88.867	-0.155
300	22	88.457	89.551	-1.094
300	23	91.331	90.288	1.043
300	24	89.962	89.673	0.290
300	25	90.763	90.183	0.580
0	26	89.234	89.234	0.000
0	27	90.686	90.686	0.000
Max		92.794	91.609	1.595
Average		89.144	88.828	0.316
Min		84.033	84.171	-1.094
Std Dev		2.221	2.086	0.573



	THD_CHA					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	68	dBc				
Krad	0	10	30	50	100	300
LL	68.000	68.000	68.000	68.000	68.000	68.000
Min	89.234	85.297	84.171	85.274	85.863	88.867
Average	89.960	88.863	87.220	89.424	88.467	89.712
Max	90.686	91.592	90.467	91.609	90.122	90.288
UL	110.000	110.000	110.000	110.000	110.000	110.000



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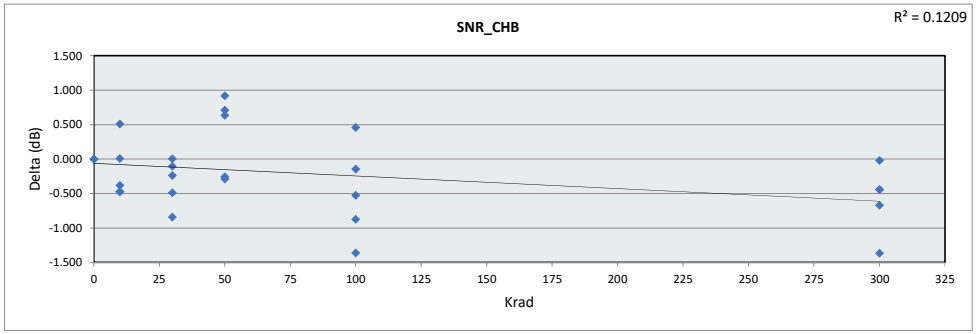
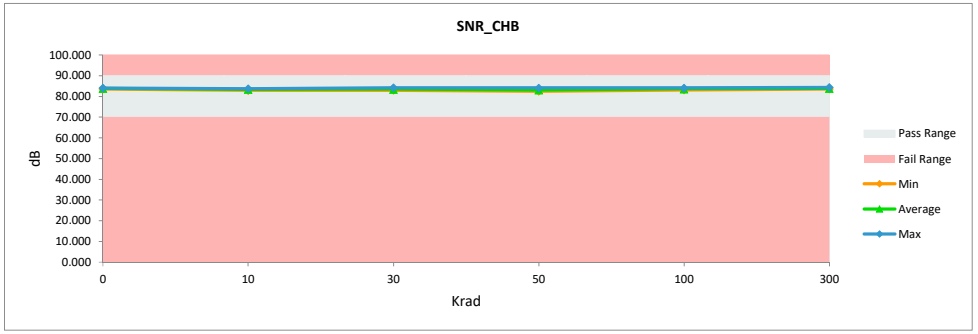
	SNR_CHB	
Test Site		
Tester		
Test Number		
Unit	dB	dB
Max Limit	90	90
Min Limit	70	70

Krad	Serial #	Pre	Post	Delta
10	1	82.450	82.829	-0.379
10	2	83.812	83.303	0.509
10	3	83.312	83.787	-0.475
10	4	83.085	83.556	-0.471
10	5	83.648	83.640	0.008
30	6	83.557	83.662	-0.105
30	7	82.792	83.029	-0.237
30	8	83.615	83.612	0.003
30	9	83.649	84.137	-0.488
30	10	82.051	82.893	-0.842
50	11	83.408	82.491	0.917
50	12	84.134	83.426	0.708
50	13	83.112	83.370	-0.257
50	14	83.204	82.569	0.635
50	15	83.789	84.078	-0.289
100	16	82.986	83.130	-0.143
100	17	83.136	84.008	-0.872
100	18	82.711	84.073	-1.363
100	19	83.176	83.699	-0.524
100	20	83.579	83.118	0.461
300	21	83.119	83.561	-0.442
300	22	82.896	83.566	-0.670
300	23	83.825	83.845	-0.021
300	24	82.921	84.286	-1.365
300	25	83.493	83.933	-0.440
0	26	84.030	84.030	0.000
0	27	83.648	83.648	0.000
	Max	84.134	84.286	0.917
	Average	83.301	83.529	-0.227
	Min	82.051	82.491	-1.365
	Std Dev	0.485	0.480	0.561



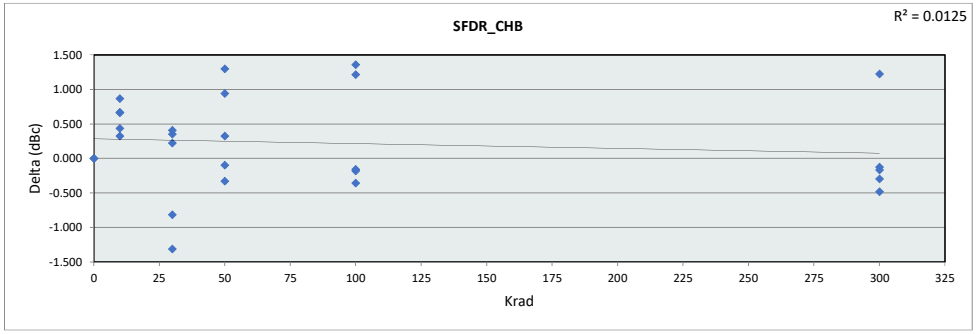
	SNR_CHB					
Test Site						
Tester						
Test Number						
Max Limit	90	dB				
Min Limit	70	dB				
Krad	0	10	30	50	100	300
LL	70.000	70.000	70.000	70.000	70.000	70.000
Min	83.648	82.829	82.893	82.491	83.118	83.561
Average	83.839	83.423	83.466	83.187	83.606	83.838
Max	84.030	83.787	84.137	84.078	84.073	84.286
UL	90.000	90.000	90.000	90.000	90.000	90.000



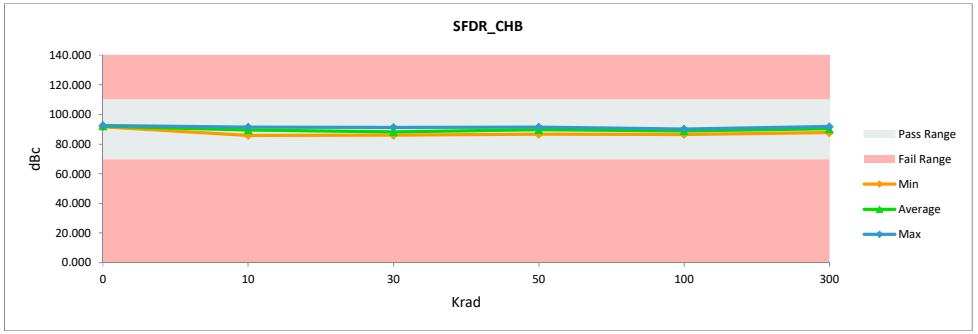
TID Report
ADC3683-SP

	SFDR_CHB	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	69.5	69.5

Krad	Serial #	Pre	Post	Delta
10	1	90.512	89.851	0.662
10	2	86.667	85.799	0.868
10	3	91.848	91.414	0.434
10	4	91.603	90.936	0.667
10	5	89.677	89.353	0.323
30	6	90.660	90.253	0.407
30	7	86.446	86.226	0.220
30	8	91.535	91.182	0.353
30	9	86.096	87.410	-1.315
30	10	85.091	85.908	-0.818
50	11	89.755	88.458	1.297
50	12	91.499	91.174	0.325
50	13	91.368	91.464	-0.097
50	14	87.506	86.565	0.941
50	15	90.085	90.414	-0.328
100	16	89.211	89.392	-0.180
100	17	88.265	88.423	-0.158
100	18	86.065	86.424	-0.358
100	19	91.512	90.154	1.357
100	20	91.154	89.937	1.216
300	21	90.421	90.903	-0.482
300	22	87.505	87.630	-0.125
300	23	92.270	91.048	1.222
300	24	91.531	91.697	-0.166
300	25	89.580	89.876	-0.296
0	26	91.608	91.608	0.000
0	27	92.526	92.526	0.000
Max		92.526	92.526	1.357
Average		89.704	89.482	0.221
Min		85.091	85.799	-1.315
Std Dev		2.202	2.017	0.665



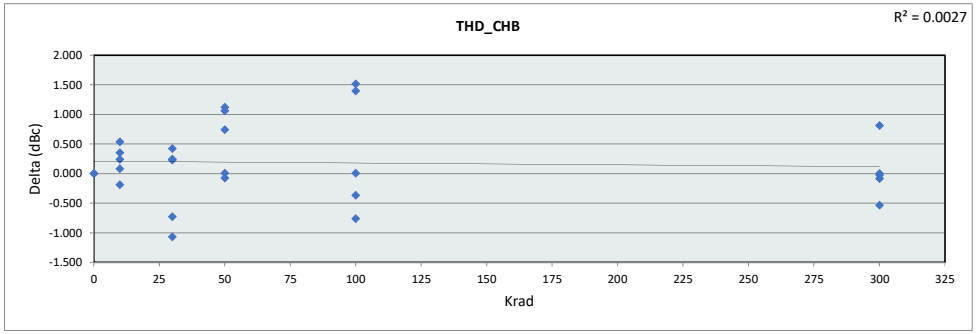
	SFDR_CHB					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	69.5	dBc				
Krad	0	10	30	50	100	300
LL	69.500	69.500	69.500	69.500	69.500	69.500
Min	91.608	85.799	85.908	86.565	86.424	87.630
Average	92.067	89.471	88.196	89.615	88.866	90.231
Max	92.526	91.414	91.182	91.464	90.154	91.697
UL	110.000	110.000	110.000	110.000	110.000	110.000



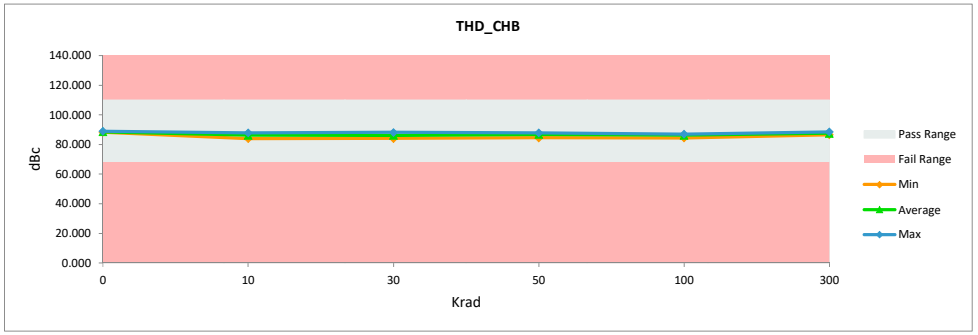
TID Report
ADC3683-SP

	THD_CHB	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	68	68

Krad	Serial #	Pre	Post	Delta
10	1	86.380	86.142	0.238
10	2	84.535	83.997	0.538
10	3	86.514	86.432	0.082
10	4	87.565	87.755	-0.190
10	5	87.148	86.794	0.355
30	6	88.073	87.652	0.422
30	7	85.001	84.774	0.227
30	8	88.311	88.066	0.244
30	9	84.601	85.670	-1.069
30	10	83.312	84.039	-0.727
50	11	87.281	86.162	1.119
50	12	88.821	87.760	1.061
50	13	87.676	87.666	0.010
50	14	85.188	84.444	0.743
50	15	87.715	87.790	-0.076
100	16	86.307	86.298	0.009
100	17	86.244	86.610	-0.366
100	18	83.609	84.368	-0.759
100	19	88.369	86.970	1.399
100	20	88.385	86.869	1.516
300	21	86.844	87.377	-0.533
300	22	86.372	86.459	-0.087
300	23	88.570	87.757	0.813
300	24	88.386	88.413	-0.027
300	25	87.544	87.539	0.005
0	26	88.205	88.205	0.000
0	27	88.944	88.944	0.000
	Max	88.944	88.944	1.516
	Average	86.885	86.702	0.183
	Min	83.312	83.997	-1.069
	Std Dev	1.608	1.391	0.633



	THD_CHB					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	68	dBc				
Krad	0	10	30	50	100	300
LL	68.000	68.000	68.000	68.000	68.000	68.000
Min	88.205	83.997	84.039	84.444	84.368	86.459
Average	88.574	86.224	86.040	86.765	86.223	87.509
Max	88.944	87.755	88.066	87.790	86.970	88.413
UL	110.000	110.000	110.000	110.000	110.000	110.000



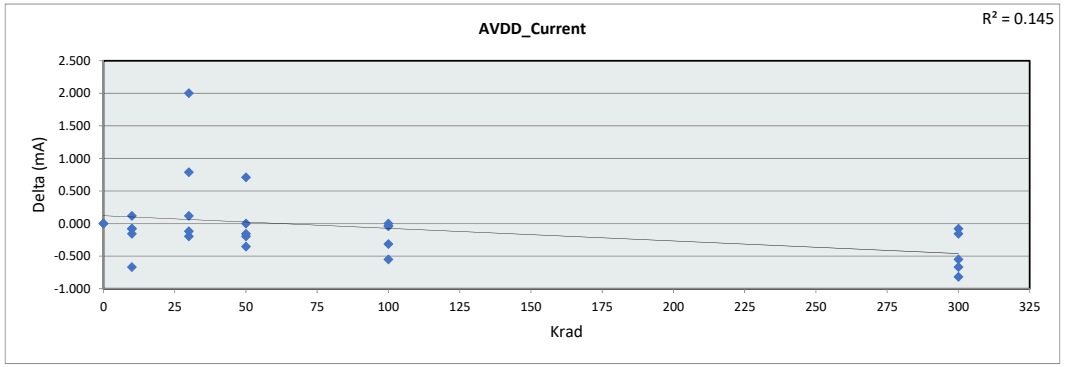
Delta Threshold 10.00%

unBiased TID Report
ADC3683

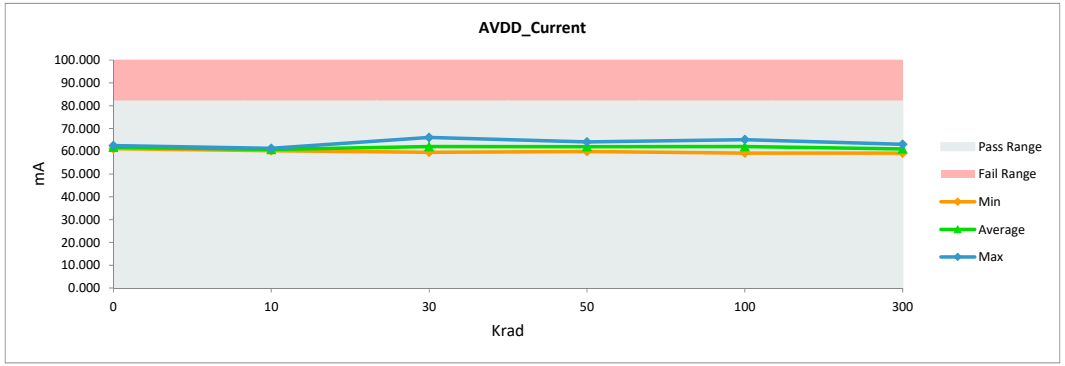
unBiased TID Report
ADC3683

	AVDD_Current	
Test Site		
Tester		
Test Number		
Unit	mA	mA
Max Limit	82	82
Min Limit	0	0

Krad	Serial #	Pre	Post uBiased	Delta
10	1	61.204	61.283	-0.079
10	2	60.142	60.220	-0.079
10	3	60.339	60.496	-0.157
10	4	60.535	61.204	-0.669
10	5	60.811	60.693	0.118
30	6	63.250	63.368	-0.118
30	7	61.912	61.125	0.787
30	8	59.355	59.552	-0.197
30	9	66.161	66.044	0.118
30	10	62.227	60.227	2.000
50	11	61.912	62.109	-0.197
50	12	63.643	63.998	-0.354
50	13	60.653	59.945	0.708
50	14	59.906	59.906	0.000
50	15	63.919	64.076	-0.157
100	16	59.827	59.866	-0.039
100	17	59.158	59.198	-0.039
100	18	61.716	62.030	-0.315
100	19	63.447	63.998	-0.551
100	20	65.099	65.099	0.000
300	21	59.001	59.158	-0.157
300	22	59.755	60.575	-0.820
300	23	62.345	63.014	-0.669
300	24	58.883	59.434	-0.551
300	25	62.857	62.935	-0.079
0	26	62.463	62.463	0.000
0	27	61.125	61.125	0.000
	Max	66.161	66.044	2.000
	Average	61.542	61.598	-0.055
	Min	58.883	59.158	-0.820
	Std Dev	1.896	1.907	0.543



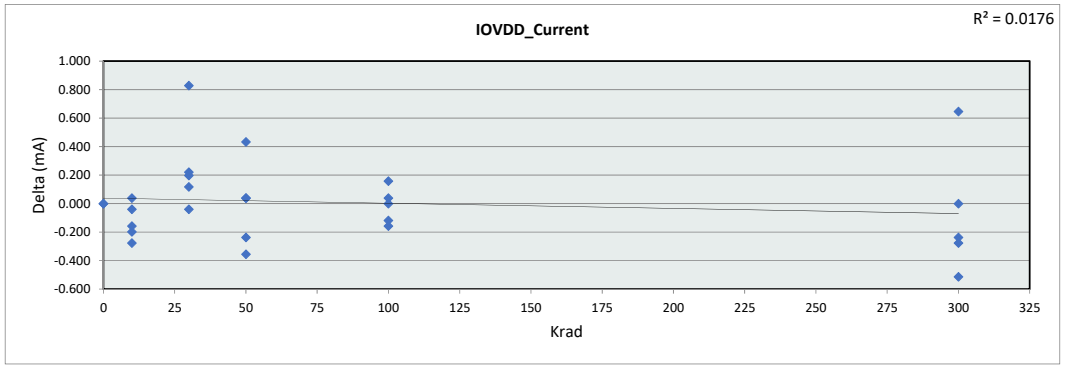
	AVDD_Current					
Test Site						
Tester						
Test Number						
Max Limit	82	mA				
Min Limit	0	mA				
Krad	0	10	30	50	100	300
LL	0.000	0.000	0.000	0.000	0.000	0.000
Min	61.125	60.220	59.552	59.906	59.198	59.158
Average	61.794	60.779	62.063	62.007	62.038	61.023
Max	62.463	61.283	66.044	64.076	65.099	63.014
UL	82.000	82.000	82.000	82.000	82.000	82.000



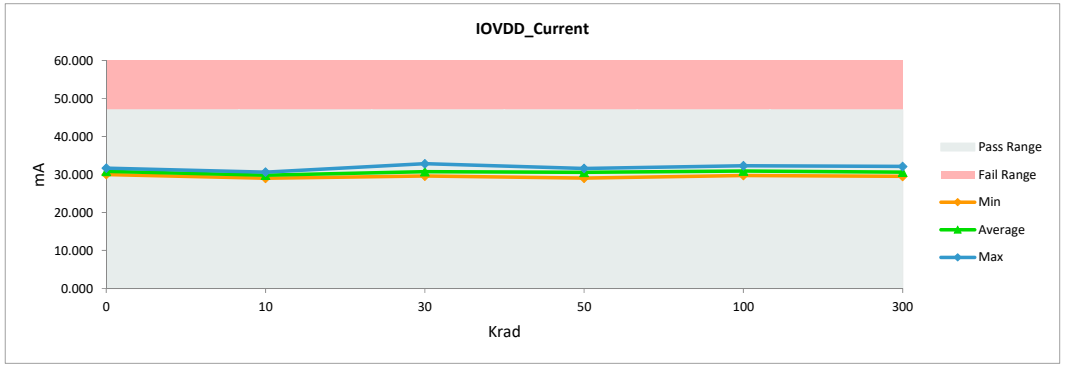
unBiased TID Report
ADC3683

	IOVDD_Current	
Test Site		
Tester		
Test Number		
Unit	mA	mA
Max Limit	47	47
Min Limit	0	0

Krad	Serial #	Pre	Post uBiased	Delta
10	1	29.504	29.661	-0.158
10	2	29.859	30.056	-0.197
10	3	30.569	30.608	-0.039
10	4	29.464	29.740	-0.276
10	5	29.030	28.991	0.039
30	6	31.279	31.161	0.118
30	7	29.740	29.780	-0.039
30	8	29.780	29.583	0.197
30	9	33.646	32.817	0.828
30	10	30.569	30.348	0.221
50	11	30.884	30.845	0.039
50	12	30.293	30.648	-0.355
50	13	31.200	30.766	0.434
50	14	29.070	29.030	0.039
50	15	31.358	31.595	-0.237
100	16	29.740	29.740	0.000
100	17	30.490	30.332	0.158
100	18	30.608	30.727	-0.118
100	19	31.239	31.397	-0.158
100	20	32.344	32.305	0.039
300	21	29.504	29.504	0.000
300	22	30.782	30.135	0.647
300	23	31.871	32.107	-0.237
300	24	29.819	30.332	-0.513
300	25	30.766	31.042	-0.276
0	26	31.673	31.673	0.000
0	27	29.977	29.977	0.000
	Max	33.646	32.817	0.828
	Average	30.558	30.552	0.006
	Min	29.030	28.991	-0.513
	Std Dev	1.061	0.978	0.290



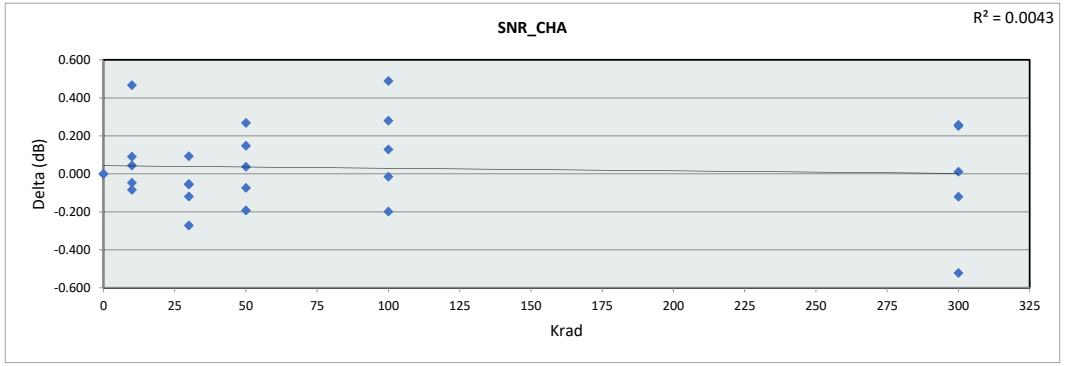
	IOVDD_Current					
Test Site						
Tester						
Test Number						
Max Limit	47	mA				
Min Limit	0	mA				
Krad	0	10	30	50	100	300
LL	0.000	0.000	0.000	0.000	0.000	0.000
Min	29.977	28.991	29.583	29.030	29.740	29.504
Average	30.825	29.811	30.738	30.577	30.900	30.624
Max	31.673	30.608	32.817	31.595	32.305	32.107
UL	47.000	47.000	47.000	47.000	47.000	47.000



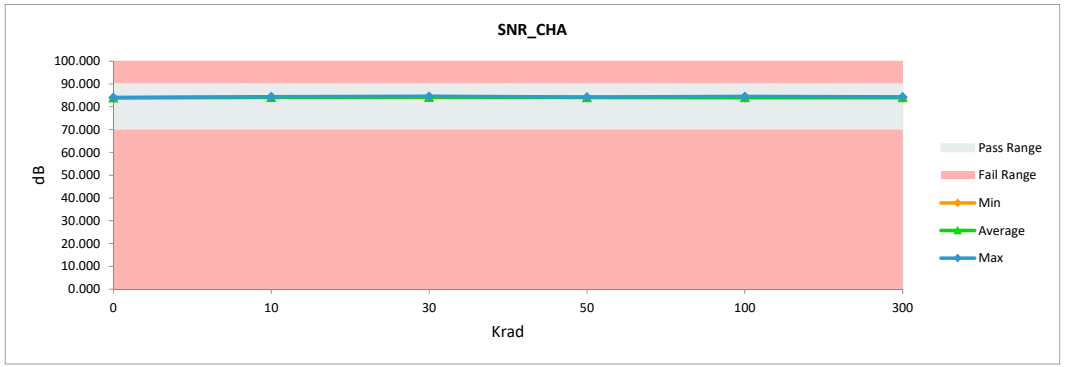
unBiased TID Report
ADC3683

	SNR_CHA	
Test Site		
Tester		
Test Number		
Unit	dB	dB
Max Limit	90	90
Min Limit	70	70

Krad	Serial #	Pre	Post uBiased	Delta
10	1	84.437	84.346	0.091
10	2	84.212	84.167	0.045
10	3	84.379	84.426	-0.046
10	4	84.590	84.123	0.467
10	5	83.967	84.051	-0.083
30	6	84.215	84.121	0.093
30	7	84.339	84.610	-0.271
30	8	84.131	84.184	-0.053
30	9	84.173	84.228	-0.055
30	10	84.235	84.354	-0.119
50	11	84.214	84.066	0.148
50	12	84.333	84.295	0.038
50	13	84.338	84.070	0.268
50	14	84.240	84.313	-0.073
50	15	84.063	84.255	-0.192
100	16	84.318	84.189	0.128
100	17	84.233	83.953	0.280
100	18	84.264	84.278	-0.014
100	19	84.435	83.946	0.489
100	20	84.358	84.557	-0.198
300	21	84.220	83.968	0.252
300	22	84.150	84.139	0.011
300	23	84.115	84.234	-0.120
300	24	84.251	83.992	0.259
300	25	83.882	84.403	-0.521
0	26	83.963	83.963	0.000
0	27	84.081	84.081	0.000
	Max	84.590	84.610	0.489
	Average	84.227	84.197	0.031
	Min	83.882	83.946	-0.521
	Std Dev	0.157	0.179	0.219



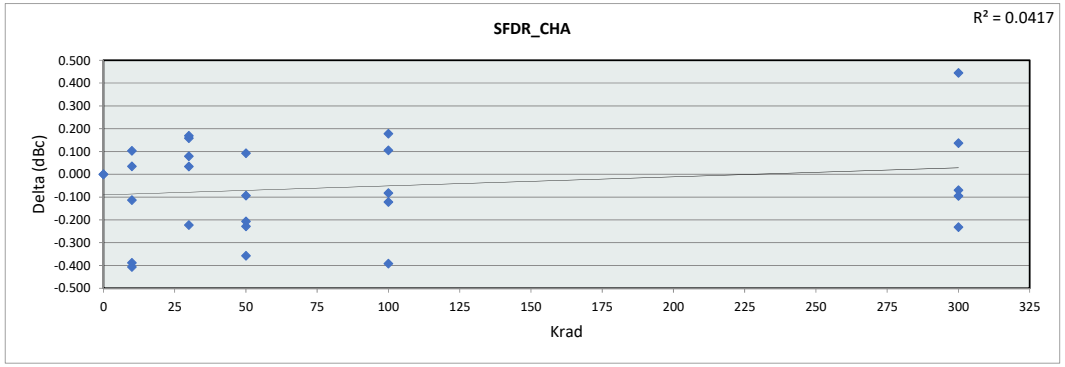
	SNR_CHA					
Test Site						
Tester						
Test Number						
Max Limit	90	dB				
Min Limit	70	dB				
Krad	0	10	30	50	100	300
LL	70.000	70.000	70.000	70.000	70.000	70.000
Min	83.963	84.051	84.121	84.066	83.946	83.968
Average	84.022	84.223	84.300	84.200	84.185	84.147
Max	84.081	84.426	84.610	84.313	84.557	84.403
UL	90.000	90.000	90.000	90.000	90.000	90.000



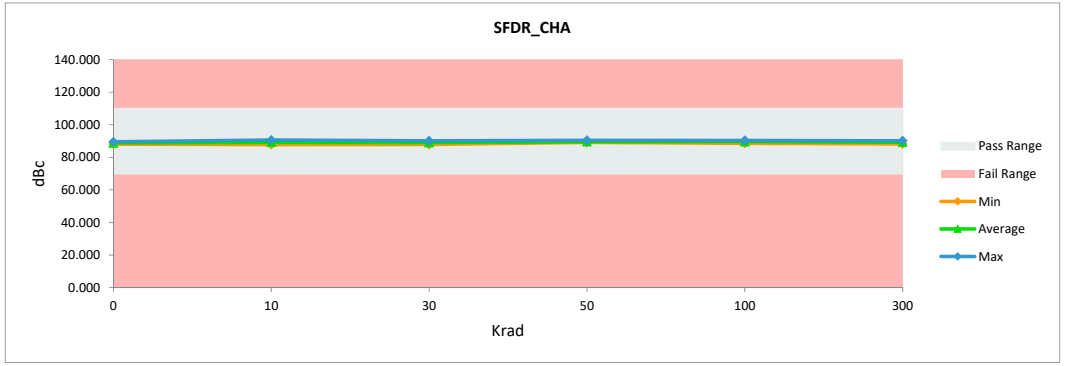
unBiased TID Report
ADC3683

	SFDR_CHA	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	69.5	69.5

Krad	Serial #	Pre	Post uBiased	Delta
10	1	90.223	90.611	-0.388
10	2	90.041	89.938	0.103
10	3	88.978	89.384	-0.406
10	4	88.268	88.381	-0.113
10	5	87.885	87.850	0.035
30	6	88.808	89.031	-0.223
30	7	88.663	88.505	0.158
30	8	87.928	87.849	0.079
30	9	89.950	89.781	0.169
30	10	90.232	90.198	0.034
50	11	89.345	89.551	-0.206
50	12	90.398	90.491	-0.094
50	13	89.226	89.454	-0.228
50	14	89.481	89.388	0.093
50	15	88.776	89.134	-0.358
100	16	88.502	88.585	-0.083
100	17	89.441	89.263	0.178
100	18	89.921	90.042	-0.122
100	19	89.610	90.002	-0.392
100	20	90.513	90.408	0.105
300	21	88.296	88.366	-0.070
300	22	89.412	89.644	-0.232
300	23	88.150	88.245	-0.095
300	24	90.156	90.019	0.136
300	25	90.685	90.240	0.445
0	26	88.179	88.179	0.000
0	27	89.561	89.561	0.000
	Max	90.685	90.611	0.445
	Average	89.282	89.337	-0.055
	Min	87.885	87.849	-0.406
	Std Dev	0.851	0.833	0.207



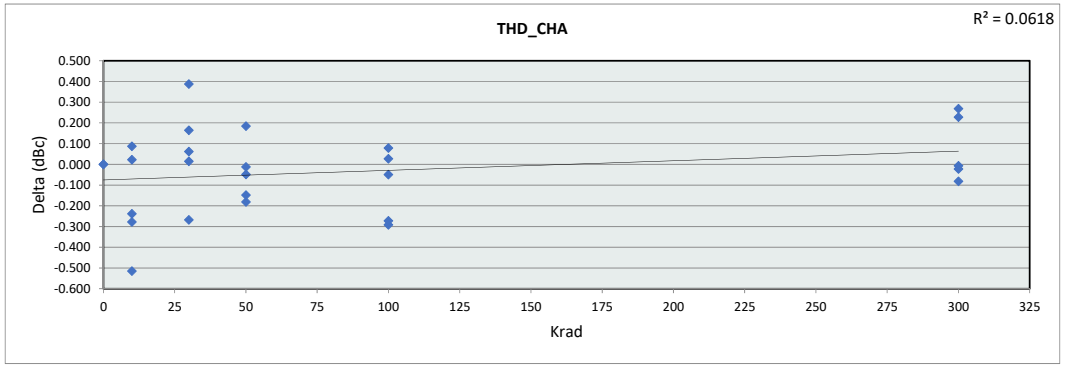
	SFDR_CHA					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	69.5	dBc				
Krad	0	10	30	50	100	300
LL	69.500	69.500	69.500	69.500	69.500	69.500
Min	88.179	87.850	87.849	89.134	88.585	88.245
Average	88.870	89.233	89.073	89.604	89.660	89.303
Max	89.561	90.611	90.198	90.491	90.408	90.240
UL	110.000	110.000	110.000	110.000	110.000	110.000



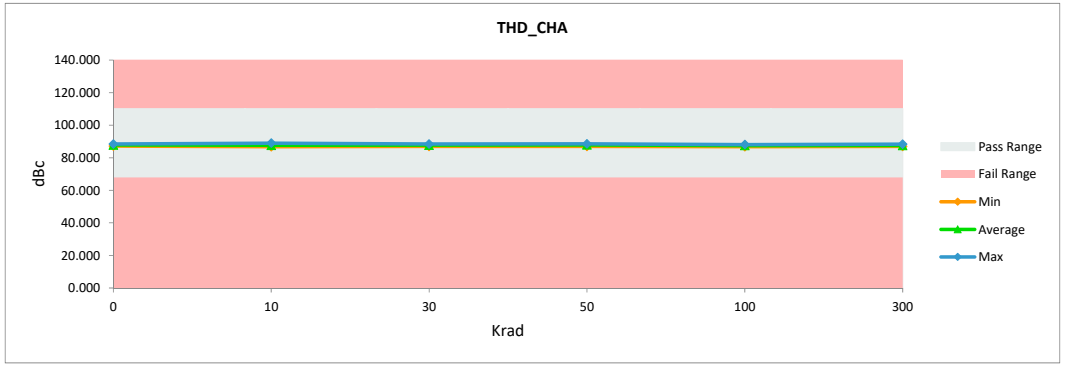
unBiased TID Report
ADC3683

	THD_CHA	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	68	68

Krad	Serial #	Pre	Post uBiased	Delta
10	1	88.729	88.967	-0.239
10	2	87.927	87.840	0.087
10	3	87.105	87.620	-0.515
10	4	86.547	86.825	-0.279
10	5	86.809	86.787	0.022
30	6	87.711	87.979	-0.268
30	7	87.337	87.276	0.061
30	8	87.150	86.986	0.164
30	9	88.512	88.125	0.388
30	10	88.409	88.394	0.015
50	11	87.907	87.919	-0.012
50	12	88.415	88.465	-0.049
50	13	87.800	87.949	-0.149
50	14	88.429	88.244	0.184
50	15	86.804	86.986	-0.182
100	16	86.713	86.762	-0.049
100	17	88.133	88.106	0.027
100	18	87.494	87.767	-0.273
100	19	87.459	87.752	-0.292
100	20	87.282	87.204	0.078
300	21	87.056	87.064	-0.007
300	22	87.522	87.545	-0.023
300	23	86.854	86.937	-0.082
300	24	88.318	88.050	0.268
300	25	88.515	88.287	0.228
0	26	87.182	87.182	0.000
0	27	88.405	88.405	0.000
	Max	88.729	88.967	0.388
	Average	87.649	87.682	-0.033
	Min	86.547	86.762	-0.515
	Std Dev	0.663	0.611	0.198



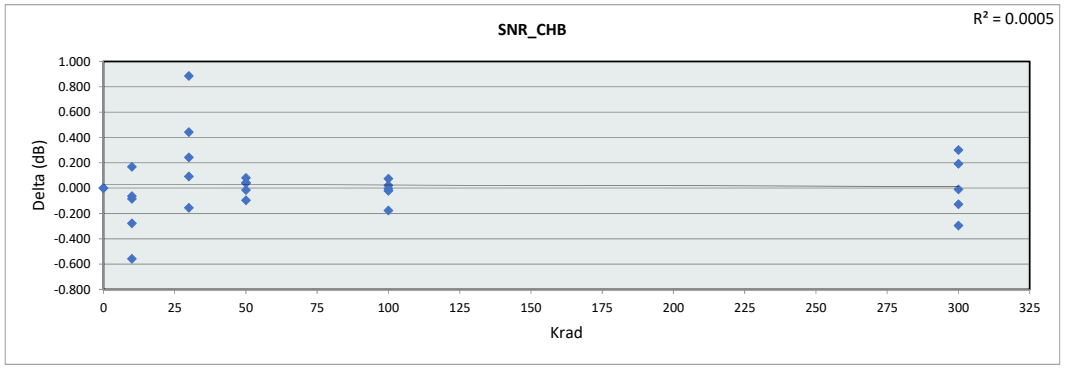
	THD_CHA					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	68	dBc				
Krad	0	10	30	50	100	300
LL	68.000	68.000	68.000	68.000	68.000	68.000
Min	87.182	86.787	86.986	86.986	86.762	86.937
Average	87.794	87.608	87.752	87.913	87.518	87.577
Max	88.405	88.967	88.394	88.465	88.106	88.287
UL	110.000	110.000	110.000	110.000	110.000	110.000



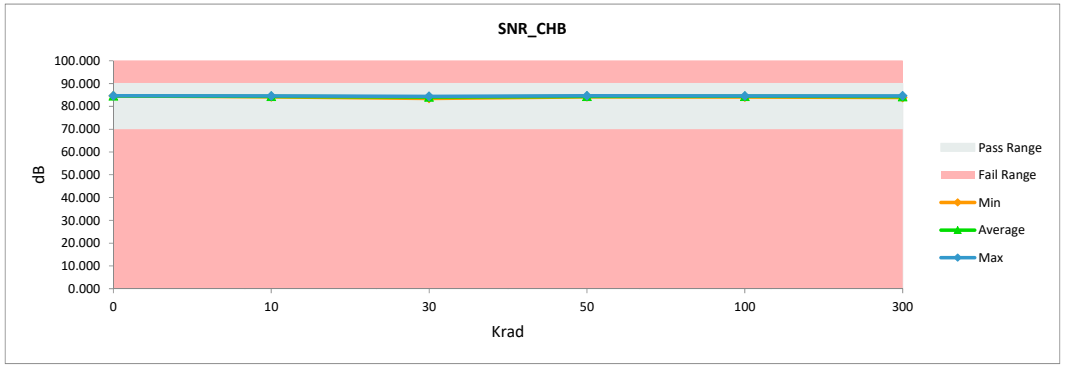
unBiased TID Report
ADC3683

	SNR_CHB	
Test Site		
Tester		
Test Number		
Unit	dB	dB
Max Limit	90	90
Min Limit	70	70

Krad	Serial #	Pre	Post uBiased	Delta
10	1	84.275	84.553	-0.278
10	2	84.299	84.132	0.167
10	3	83.821	84.380	-0.559
10	4	84.343	84.429	-0.086
10	5	84.401	84.465	-0.064
30	6	84.225	84.134	0.091
30	7	84.642	84.400	0.242
30	8	84.151	84.307	-0.156
30	9	84.629	84.187	0.441
30	10	84.388	83.502	0.886
50	11	84.600	84.616	-0.016
50	12	84.425	84.384	0.041
50	13	84.442	84.539	-0.097
50	14	84.327	84.288	0.040
50	15	84.258	84.177	0.081
100	16	84.163	84.089	0.074
100	17	84.610	84.589	0.021
100	18	84.314	84.320	-0.006
100	19	84.251	84.428	-0.177
100	20	84.570	84.592	-0.022
300	21	84.391	84.519	-0.128
300	22	84.301	84.312	-0.011
300	23	84.070	83.879	0.192
300	24	84.338	84.039	0.300
300	25	84.310	84.606	-0.296
0	26	84.663	84.663	0.000
0	27	84.562	84.562	0.000
	Max	84.663	84.663	0.886
	Average	84.362	84.337	0.025
	Min	83.821	83.502	-0.559
	Std Dev	0.194	0.262	0.261



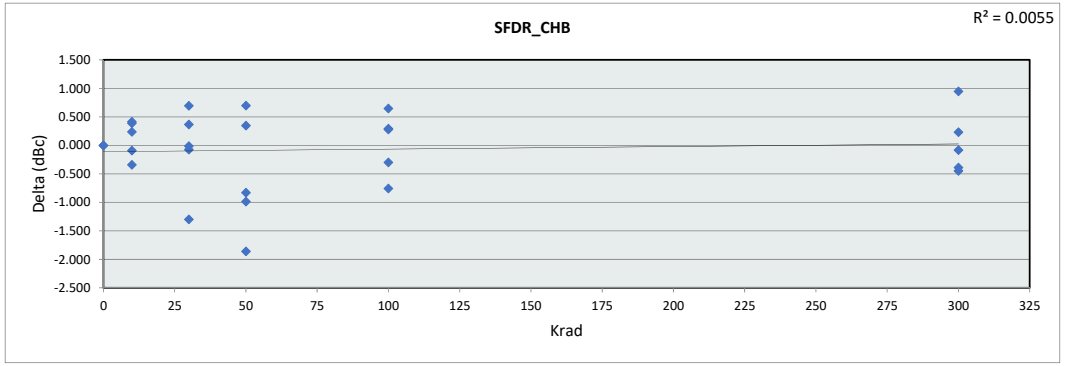
	SNR_CHB					
Test Site						
Tester						
Test Number						
Max Limit	90	dB				
Min Limit	70	dB				
Krad	0	10	30	50	100	300
LL	70.000	70.000	70.000	70.000	70.000	70.000
Min	84.562	84.132	83.502	84.177	84.089	83.879
Average	84.612	84.392	84.106	84.401	84.404	84.271
Max	84.663	84.553	84.400	84.616	84.592	84.606
UL	90.000	90.000	90.000	90.000	90.000	90.000



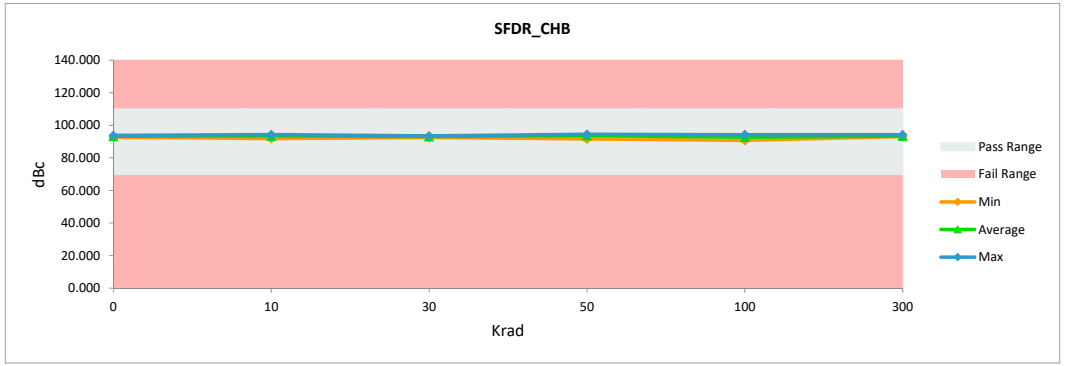
unBiased TID Report
ADC3683

	SFDR_CHB	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	69.5	69.5

Krad	Serial #	Pre	Post uBiased	Delta
10	1	94.463	94.048	0.415
10	2	94.652	94.261	0.391
10	3	93.842	94.182	-0.341
10	4	93.004	93.094	-0.091
10	5	92.093	91.855	0.238
30	6	93.300	93.374	-0.074
30	7	93.224	92.529	0.695
30	8	93.699	93.333	0.367
30	9	91.493	92.791	-1.298
30	10	93.490	93.503	-0.013
50	11	93.333	94.161	-0.828
50	12	92.626	94.486	-1.860
50	13	93.268	94.253	-0.985
50	14	94.669	93.971	0.698
50	15	91.963	91.616	0.347
100	16	92.955	93.712	-0.757
100	17	94.493	94.213	0.280
100	18	91.061	90.766	0.295
100	19	92.238	91.591	0.647
100	20	92.957	93.255	-0.298
300	21	93.004	93.086	-0.082
300	22	92.749	93.137	-0.388
300	23	92.882	93.331	-0.448
300	24	95.174	94.225	0.949
300	25	93.606	93.374	0.232
0	26	93.768	93.768	0.000
0	27	92.753	92.753	0.000
	Max	95.174	94.486	0.949
	Average	93.213	93.284	-0.071
	Min	91.061	90.766	-1.860
	Std Dev	0.978	0.949	0.649



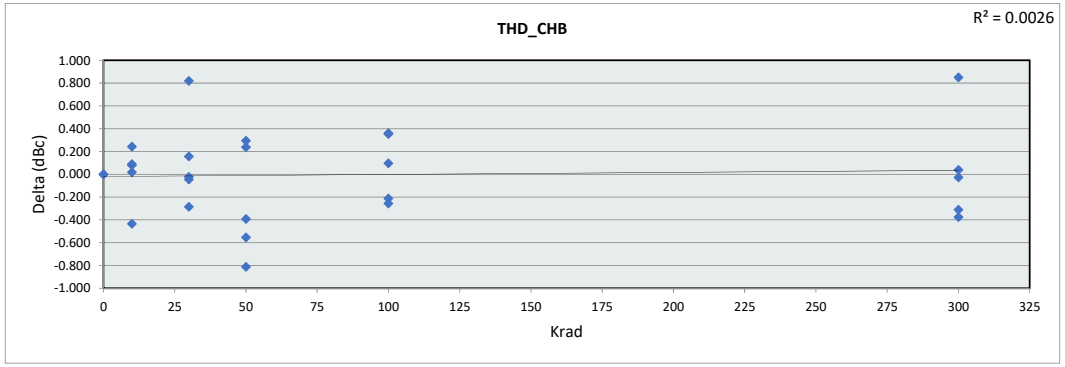
	SFDR_CHB					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	69.5	dBc				
Krad	0	10	30	50	100	300
LL	69.500	69.500	69.500	69.500	69.500	69.500
Min	92.753	91.855	92.529	91.616	90.766	93.086
Average	93.260	93.488	93.106	93.698	92.707	93.430
Max	93.768	94.261	93.503	94.486	94.213	94.225
UL	110.000	110.000	110.000	110.000	110.000	110.000



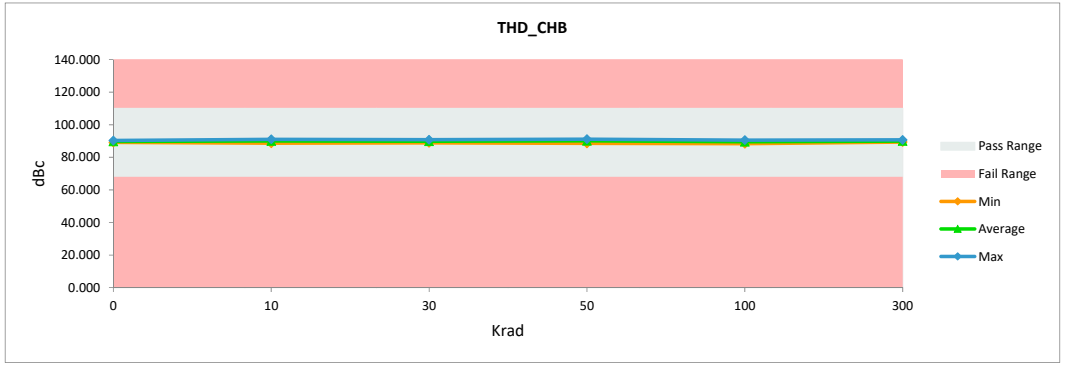
unBiased TID Report
ADC3683

	THD_CHB	
Test Site		
Tester		
Test Number		
Unit	dBc	dBc
Max Limit	110	110
Min Limit	68	68

Krad	Serial #	Pre	Post uBiased	Delta
10	1	90.435	90.356	0.079
10	2	90.187	90.097	0.090
10	3	90.632	91.067	-0.435
10	4	89.964	89.946	0.018
10	5	88.864	88.622	0.242
30	6	89.977	90.022	-0.045
30	7	90.314	89.494	0.820
30	8	90.795	90.817	-0.022
30	9	88.607	88.892	-0.285
30	10	90.027	89.870	0.157
50	11	89.225	89.778	-0.553
50	12	90.332	91.143	-0.812
50	13	90.285	90.677	-0.392
50	14	90.717	90.479	0.238
50	15	88.844	88.550	0.294
100	16	90.068	90.324	-0.256
100	17	90.929	90.568	0.361
100	18	88.441	88.345	0.096
100	19	89.420	89.067	0.354
100	20	89.285	89.498	-0.213
300	21	89.454	89.765	-0.311
300	22	89.002	89.376	-0.375
300	23	89.609	89.636	-0.027
300	24	91.284	90.433	0.851
300	25	90.739	90.700	0.039
0	26	90.308	90.308	0.000
0	27	89.159	89.159	0.000
	Max	91.284	91.143	0.851
	Average	89.885	89.889	-0.003
	Min	88.441	88.345	-0.812
	Std Dev	0.771	0.772	0.374



	THD_CHB					
Test Site						
Tester						
Test Number						
Max Limit	110	dBc				
Min Limit	68	dBc				
Krad	0	10	30	50	100	300
LL	68.000	68.000	68.000	68.000	68.000	68.000
Min	89.159	88.622	88.892	88.550	88.345	89.376
Average	89.734	90.018	89.819	90.125	89.560	89.982
Max	90.308	91.067	90.817	91.143	90.568	90.700
UL	110.000	110.000	110.000	110.000	110.000	110.000



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