FCC - TEST REPORT

Report Number	:	**68.950.19.2758.01**	Date of Issue:	Sept 9, 2019
Model	:	**HVN: ED100, HVN: MD44014**		
Product Type	:	Mobile POS System		
Applicant	:	NumberFour AG		
Address	:	Schoenhauser Allee 8, 10119 Berlin, Germany		
Manufacturer	:	NumberFour AG		
Address	:	Schoenhauser Allee 8, 10119 Berlin, Germany		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**109**		

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Building 12&13, Zhiheng WisdomIand Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

1 Table of Contents

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2,
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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China
FCC Designation Number:	CN5009
FCC Registration Number:	514049
Telephone:	86 755 8828 6998
Fax:	86 755 8828 5299

3 Description of the Equipment Under Test

Product:	Mobile POS System
Model no.:	HVN: ED100, HVN: MD44014
FCC ID:	2ANTM-MD44014
Options and accessories:	Charger and power Cable
Rating:	3.85VDC, 2810mAh, (Supplied by Rechargeable Li-ion Battery) or 5VDC (Supplied by external adapter for Charging rechargeable battery)
Adapter information:	Model: DSA-18QFB FUS A Input:100-240VAC 50/60Hz, 0.8A, Output:5VDC,3A or 9V 2A or 12V 1.5A Manufacturer: Dee Van Enterprise Co., Ltd
RF Transmission Frequency:	13.56MHz for NFC 2402MHz-2480MHz for Bluetooth 2412MHz-2462MHz for 802.11b/g/n20/n40 (WIFI) 5150-5350, 5470-5825MHz for 802.11a/n20/n40/ac20/ac40/ac80 (WIFI)
No. of Operated Channel:	1 for NFC 79 for Bluetooth 11 for 802.11b/g/n20/n40 (WIFI) 43 for for 802.11a/n20/n40/ac20/ac40/ac80 (WIFI)
Modulation:	ASK for NFC GFSK, π/4-DQPSK, 8DPSK for Bluetooth DSSS, OFDM for WIFI
Antenna Type:	FPC antenna
Antenna Gain:	1.2dBi max for 2.4GHz 2.0dBi max for 5GHz
Description of the EUT:	The Equipment Under Test (EUT) is a Mobile POS System which support WIFI at 2.4GHz and 5GHz, Bluetooth function operated at 2.4GHz

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Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart E, 10-1-2018 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart E - Unlicensed National Information Infrastructure Devices
FCC Part 15 Subpart C 10-1-2018 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

Test Method:
FCC KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 789033 D02 General UNII Test Procedures New Rules v02r01
KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices

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5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart E, FCC Part 15 Subpart C			
Test Condition	Test Result		
	Pass	Fail	N/A
15.207 Conducted Emission AC Power Port	☒	☐	☐
15.407(e) Emission bandwidth	☒	☐	☐
15.407(a)(i) Maximum Conducted Output Power	☒	☐	☐
15.407(a)(i) Maximum Power Spectral Density	☒	☐	☐
15.407(b)(1), 15.407(b)(2), 15.407(b)(3), 15.407(b)(4), 15.407(b)(6) 15.407(b)(7) 15.209 Unwanted Emissions	☒	☐	☐
15.407(b)(i), 15.407(b)(5), 15.407(b)(7), 15.209 Band edge compliance	☒	☐	☐
Duty Cycle	☒	☐	☐
15.407(g) Frequencies Stability	☒	☐	☐
15.407(h) Dynamic Frequency Selection (DFS). [a]	☒	☐	☐
15.203 Antenna Requirement	See note 1	☐	☐

Remark: [a] The EUT is Clients Device without Radar Detection.
Note 1: The EUT uses an FPC antenna, which gain is 2.0dBi. In accordance to 15.203, it is considered sufficiently to comply with the provisions of this section.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2ANTM-MD44014, complies with Section 15.207, 15.209, 15.205, 15.247 of the FCC Part 15, Subpart C.
HVN: ED100 is a Mobile POS System with Bluetooth Low Energy/Bluetooth BDR+EDR/WIFI/NFC/GPS/UMTS/LTE function. HVN: ED100 with camera models HZPV4197(Manufacturer: SHENZHEN HEZHONG IMAGE TECHNOLOGY CO. Ltd) and YGA0711(Manufacturer: Shenzhen Yigao Photoelectric Technology Limited), with internal storage models KMQE60013M-B318 (Manufacturer: Sumsung) and H9TQ17ABJTCCUR-KUM (Manufacturer: hynix).
HVN: MD44014 is identical with model: HVN: ED100 except model name and trademark (HVN: MD44014 for MEDION, HVN: ED100 for enforeDonner), unless otherwise Specification the model: HVN: ED100 was choose as representative model to perform all test items, and model: HVN: MD44014 was deemed to fulfil relevant EMC requirements without further testing.

This report is for the 5GHz WIFI band 1/2/3/4.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: August 15, 2019

Testing Start Date: August 15, 2019

Testing End Date: September 6, 2019

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch –

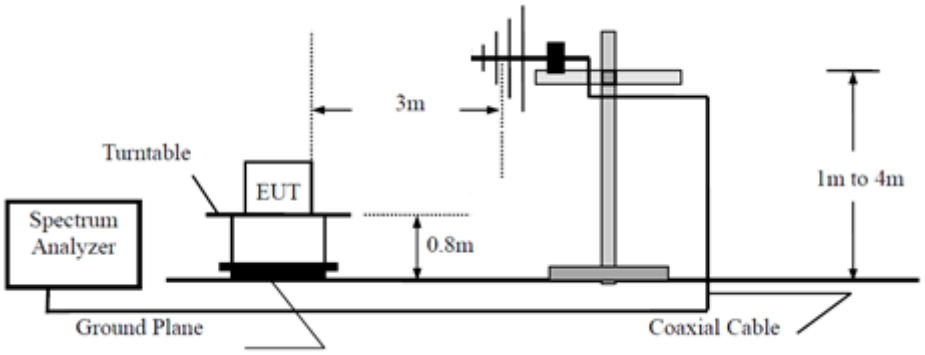
Reviewed by:	Prepared by:	Tested by:
John Zhi	Joe Gu	Tree Zhan
EMC Project Manager	EMC Project Engineer	EMC Test Engineer

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China Tel. +86 755 8828 6998, Fax: +86 755 8828 5299

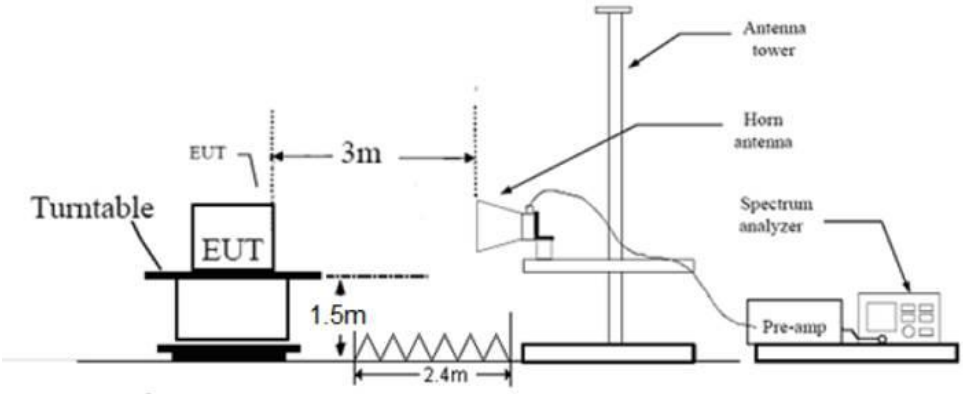
7 Test setups

7.1 Radiated test setups

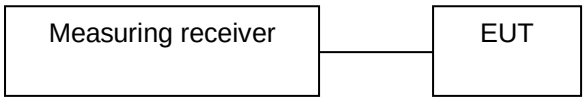
Below 1GHz



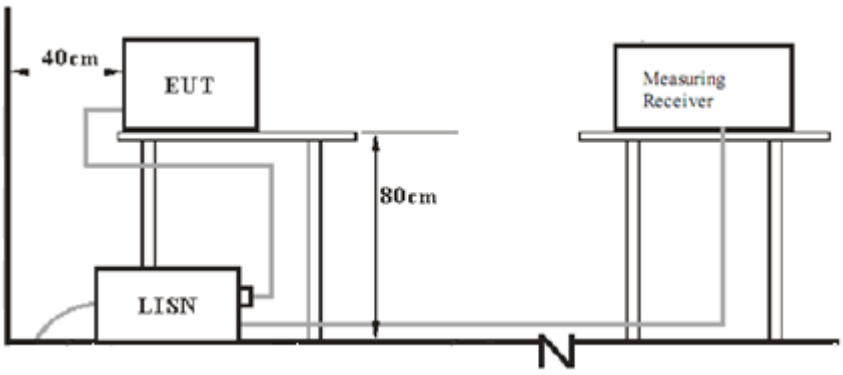
Above 1GHz



7.2 Conducted RF test setups



7.3 AC Power Line Conducted Emission test setups



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8. Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
Laptop	Lenovo	T460S	---

Test software information:

Test Software Version	HVN: ED100-1.x.x-1.x	
Modulation	Setting TX Power	Packet Type
802.11a	14.5	11g 6 Mbps
802.11n HT20	13.5	MCS0 6.5 Mbps
802.11n HT40	13	MCS0 13.5 Mbps (40MHz)
802.11ac VHT20	13	11ac NGI 6.5 Mbps (20MHz)
802.11ac VHT40	12.5	11ac NGI 13.5 Mbps (40MHz)
802.11ac VHT80	12	11ac NGI 29.3 Mbps (80MHz)

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The system was configured to channel:

Test Mode	Channel (MHz)		
802.11a, 802.11n HT20 802.11ac VHT20	5G WIFI-Band 1		
	CH36 (5180MHz)	CH40 (5200MHz)	CH46 (5240MHz)
	5G WIFI-Band 2		
	CH52 (5260MHz)	CH56 (5280MHz)	CH64 (5320MHz)
	5G WIFI-Band 3		
	CH100 (5500MHz)	CH116 (5580MHz)	CH140 (5700MHz)
	CH 142 (5710MHz)		
	5G WIFI-Band 4		
	CH149 (5745MHz),	CH157(5785MHz)	CH165 (5825MHz)

Test Mode	Channel (MHz)		
802.11n HT40 802.11ac VHT40	5G WIFI-Band 1		
	CH38(5190MHz)	CH46 (5230MHz)	
	5G WIFI-Band 2		
	CH54(5270MHz)	CH62(5310MHz)	
	5G WIFI-Band 3		
	CH102(5510MHz)	CH110(5550MHz)	CH134(5670MHz)
	CH 144 (5720MHz)		
	5G WIFI-Band 4		
	CH151(5755MHz)	CH159(5795MHz)	

Test Mode	Channel (MHz)	
802.11ac VHT80	5G WIFI-Band 1	
	CH42(5210MHz)	
	5G WIFI-Band 2	
	CH58(5290MHz)	
	5G WIFI-Band 3	
	CH106(5530MHz)	CH138(5690MHz)
	5G WIFI-Band 4	
	CH155(5775MHz)	

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9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

According to §15.207, conducted emissions limit as below:

Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Remark: “*” Decreasing linearly with logarithm of the frequency

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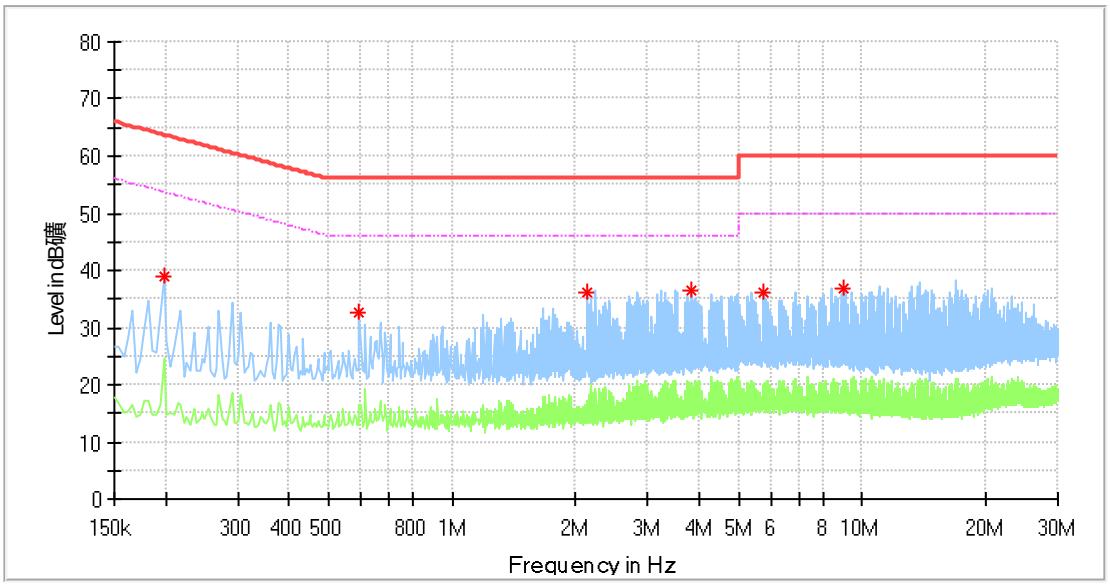
Conducted Emission

Product Type	:	Mobile POS System
M/N	:	HVN: ED100
Operating Condition	:	Charging + TX
Test Specification	:	Power Line, Live
Comment	:	AC 120V/60Hz (External adapter)



Frequency (MHz)	MaxPeak* (dBµV)	Average* (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr.** (dB)
0.198000	38.91	---	63.69	24.78	L1	10.2
0.594000	32.53	---	56.00	23.47	L1	10.3
2.134000	36.11	---	56.00	19.89	L1	10.3
3.814000	36.55	---	56.00	19.45	L1	10.4
5.754000	36.13	---	60.00	23.87	L1	10.5
8.970000	36.97	---	60.00	23.03	L1	10.6

Remark：
*Level=Reading Level + Correction Factor
**Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

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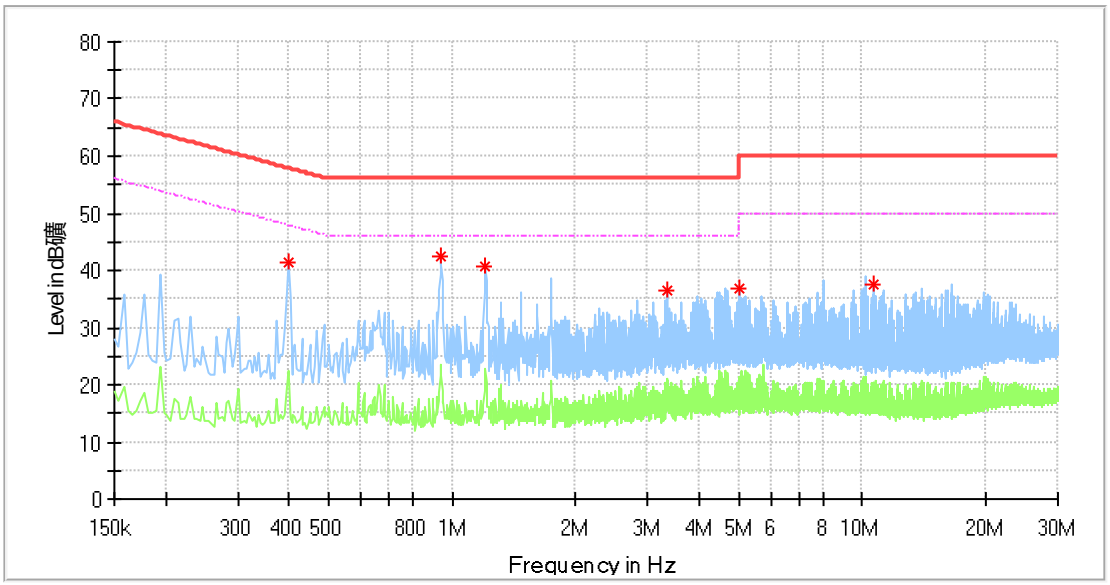
Conducted Emission

Product Type	:	Mobile POS System
M/N	:	HVN: ED100
Operating Condition	:	Charging + TX
Test Specification	:	Power Line, Neutral
Comment	:	AC 120V/60Hz (External adapter)



Frequency (MHz)	MaxPeak* (dBµV)	Average* (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr.** (dB)
0.398000	41.39	---	57.90	16.50	N	10.3
0.938000	42.34	---	56.00	13.66	N	10.3
1.206000	40.73	---	56.00	15.27	N	10.3
3.350000	36.41	---	56.00	19.59	N	10.4
5.034000	36.74	---	60.00	23.26	N	10.5
10.630000	37.67	---	60.00	22.33	N	10.7

Remark：
*Level=Reading Level + Correction Factor
**Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

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9.2 Emission bandwidth

1、Test Method of 26dB Bandwidth

According to KDB789033 D02
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the
emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Limit: No limit

2、Test Method of 6dB Bandwidth

According to KDB789033 D02
a) Set RBW = 100KHz
b) Set the video bandwidth (VBW) ≥ 3 × RBW
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Limit: ≥500KHz

3、Test Method of 99% Bandwidth

According to KDB789033 D02
a) Set center frequency to the nominal EUT channel center frequency
b) Set span = 1.5 times to 5.0 times the OBW.
c) Set RBW = 1 % to 5 % of the OBW
d) Set VBW ≥ 3 · RBW
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99 % power bandwidth function of the instrument (if available).
g) If the instrument does not have a 99 % power bandwidth function, the trace data points are
recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

Limit: No limit

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26dB Bandwidth Test result:

TestMode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	21.560	5169.160	5190.720	---	PASS
		5200	21.760	5189.040	5210.800	---	PASS
		5240	21.520	5229.200	5250.720	---	PASS
		5260	21.360	5249.240	5270.600	---	PASS
		5280	21.720	5269.080	5290.800	---	PASS
		5320	21.520	5308.840	5330.360	---	PASS
		5500	21.600	5489.080	5510.680	---	PASS
		5580	21.440	5569.240	5590.680	---	PASS
		5700	21.560	5689.200	5710.760	---	PASS
		5720	21.360	5709.280	5730.640	---	PASS
		5720_UNII-2C	15.72	5709.280	5725	---	PASS
		5720_UNII-3	5.64	5725	5730.640	---	PASS
		5745	21.520	5734.200	5755.720	---	PASS
		5785	21.520	5774.320	5795.840	---	PASS
		5825	21.840	5813.920	5835.760	---	PASS
11N20SISO	Ant1	5180	22.000	5169.080	5191.080	---	PASS
		5200	21.800	5189.040	5210.840	---	PASS
		5240	21.840	5228.960	5250.800	---	PASS
		5260	22.080	5248.920	5271.000	---	PASS
		5280	21.960	5269.040	5291.000	---	PASS
		5320	21.920	5309.040	5330.960	---	PASS
		5500	21.960	5488.960	5510.920	---	PASS
		5580	22.040	5568.880	5590.920	---	PASS
		5700	21.840	5689.080	5710.920	---	PASS
		5720	21.880	5708.880	5730.760	---	PASS
		5720_UNII-2C	16.12	5708.880	5725	---	PASS
		5720_UNII-3	5.76	5725	5730.760	---	PASS
		5745	22.000	5734.000	5756.000	---	PASS
		5785	21.720	5774.160	5795.880	---	PASS
		5825	21.600	5814.160	5835.760	---	PASS
11N40SISO	Ant1	5190	44.400	5167.520	5211.920	---	PASS
		5230	45.040	5207.280	5252.320	---	PASS
		5270	43.600	5248.400	5292.000	---	PASS
		5310	43.920	5288.320	5332.240	---	PASS
		5510	44.160	5487.920	5532.080	---	PASS
		5550	43.520	5528.000	5571.520	---	PASS
		5670	44.320	5647.760	5692.080	---	PASS
		5710	45.280	5687.600	5732.880	---	PASS
		5710_UNII-2C	37.4	5687.600	5725	---	PASS
		5710_UNII-3	7.88	5725	5732.880	---	PASS
		5755	44.080	5732.840	5776.920	---	PASS
		5795	43.920	5772.920	5816.840	---	PASS
11AC20SISO	Ant1	5180	21.720	5169.080	5190.800	---	PASS
		5200	21.760	5189.080	5210.840	---	PASS
		5240	21.760	5229.120	5250.880	---	PASS
		5260	21.600	5249.200	5270.800	---	PASS
		5280	21.800	5269.040	5290.840	---	PASS
		5320	21.560	5309.200	5330.760	---	PASS
		5500	21.680	5489.160	5510.840	---	PASS
		5580	21.720	5569.080	5590.800	---	PASS
		5700	21.720	5689.080	5710.800	---	PASS
		5720	21.880	5708.960	5730.840	---	PASS

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		5720_UNII-2C	16.04	5708.960	5725	---	PASS
		5720_UNII-3	5.84	5725	5730.840	---	PASS
		5745	21.720	5734.040	5755.760	---	PASS
		5785	21.840	5774.080	5795.920	---	PASS
		5825	21.640	5814.120	5835.760	---	PASS
11AC40SISO	Ant1	5190	42.960	5168.160	5211.120	---	PASS
		5230	43.040	5208.000	5251.040	---	PASS
		5270	43.040	5248.080	5291.120	---	PASS
		5310	43.040	5288.080	5331.120	---	PASS
		5510	43.040	5488.080	5531.120	---	PASS
		5550	42.960	5528.080	5571.040	---	PASS
		5670	42.960	5648.080	5691.040	---	PASS
		5710	43.200	5687.920	5731.120	---	PASS
		5710_UNII-2C	37.08	5687.920	5725	---	PASS
		5710_UNII-3	6.12	5725	5731.120	---	PASS
		5755	43.120	5732.920	5776.040	---	PASS
		5795	43.280	5772.840	5816.120	---	PASS
11AC80SISO	Ant1	5210	84.800	5168.080	5252.880	---	PASS
		5290	85.120	5248.080	5333.200	---	PASS
		5530	84.960	5487.920	5572.880	---	PASS
		5690	85.120	5648.080	5733.200	---	PASS
		5690_UNII-2C	76.92	5648.080	5725	---	PASS
		5690_UNII-3	8.2	5725	5733.200	---	PASS
		5775	84.960	5732.920	5817.880	---	PASS

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99% Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.782	5171.129	5188.911	---	PASS
		5200	17.862	5191.049	5208.911	---	PASS
		5240	17.982	5231.009	5248.991	---	PASS
		5260	17.902	5251.009	5268.911	---	PASS
		5280	17.862	5271.089	5288.951	---	PASS
		5320	17.902	5311.049	5328.951	---	PASS
		5500	17.942	5491.009	5508.951	---	PASS
		5580	17.862	5571.049	5588.911	---	PASS
		5700	17.942	5691.009	5708.951	---	PASS
		5720	17.982	5711.009	5728.991	---	PASS
		5720_UNII-2C	13.991	5711.009	5725	---	PASS
		5720_UNII-3	3.991	5725	5728.991	---	PASS
		5745	17.982	5736.009	5753.991	---	PASS
		5785	17.902	5776.049	5793.951	---	PASS
		5825	17.862	5816.049	5833.911	---	PASS
11N20SISO	Ant1	5180	18.661	5170.689	5189.351	---	PASS
		5200	18.661	5190.689	5209.351	---	PASS
		5240	18.741	5230.649	5249.391	---	PASS
		5260	18.661	5250.689	5269.351	---	PASS
		5280	18.661	5270.689	5289.351	---	PASS
		5320	18.701	5310.689	5329.391	---	PASS
		5500	18.661	5490.689	5509.351	---	PASS
		5580	18.741	5570.609	5589.351	---	PASS
		5700	18.701	5690.689	5709.391	---	PASS
		5720	18.661	5710.689	5729.351	---	PASS
		5720_UNII-2C	14.311	5710.689	5725	---	PASS
		5720_UNII-3	4.351	5725	5729.351	---	PASS
		5745	18.661	5735.649	5754.311	---	PASS
		5785	18.701	5775.649	5794.351	---	PASS
		5825	18.661	5815.649	5834.311	---	PASS
11N40SISO	Ant1	5190	36.763	5171.698	5208.462	---	PASS
		5230	36.843	5211.618	5248.462	---	PASS
		5270	36.843	5251.618	5288.462	---	PASS
		5310	36.843	5291.618	5328.462	---	PASS
		5510	36.923	5491.538	5528.462	---	PASS
		5550	36.923	5531.538	5568.462	---	PASS
		5670	36.923	5651.538	5688.462	---	PASS
		5710	36.923	5691.618	5728.541	---	PASS
		5710_UNII-2C	33.382	5691.618	5725	---	PASS
		5710_UNII-3	3.541	5725	5728.541	---	PASS
		5755	36.923	5736.538	5773.462	---	PASS
		5795	37.003	5776.538	5813.541	---	PASS
11AC20SISO	Ant1	5180	18.541	5170.729	5189.271	---	PASS
		5200	18.581	5190.689	5209.271	---	PASS
		5240	18.541	5230.689	5249.231	---	PASS
		5260	18.581	5250.689	5269.271	---	PASS
		5280	18.581	5270.689	5289.271	---	PASS
		5320	18.581	5310.689	5329.271	---	PASS
		5500	18.581	5490.689	5509.271	---	PASS
		5580	18.581	5570.689	5589.271	---	PASS
		5700	18.581	5690.689	5709.271	---	PASS
		5720	18.661	5710.689	5729.351	---	PASS
		5720_UNII-2C	14.311	5710.689	5725	---	PASS

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		5720_UNII-3	4.351	5725	5729.351	---	PASS
		5745	18.541	5735.689	5754.231	---	PASS
		5785	18.581	5775.689	5794.271	---	PASS
		5825	18.581	5815.689	5834.271	---	PASS
11AC40SISO	Ant1	5190	36.843	5171.538	5208.382	---	PASS
		5230	36.763	5211.538	5248.302	---	PASS
		5270	36.843	5251.538	5288.382	---	PASS
		5310	36.763	5291.538	5328.302	---	PASS
		5510	36.763	5491.538	5528.302	---	PASS
		5550	36.763	5531.538	5568.302	---	PASS
		5670	36.763	5651.538	5688.302	---	PASS
		5710	36.843	5691.538	5728.382	---	PASS
		5710_UNII-2C	33.462	5691.538	5725	---	PASS
		5710_UNII-3	3.382	5725	5728.382	---	PASS
		5755	36.843	5736.459	5773.302	---	PASS
		5795	36.843	5776.538	5813.382	---	PASS
11AC80SISO	Ant1	5210	74.965	5172.757	5247.722	---	PASS
		5290	74.965	5252.757	5327.722	---	PASS
		5530	75.125	5492.597	5567.722	---	PASS
		5690	74.965	5652.757	5727.722	---	PASS
		5690_UNII-2C	72.243	5652.757	5725	---	PASS
		5690_UNII-3	2.722	5725	5727.722	---	PASS
		5775	75.125	5737.597	5812.722	---	PASS

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6dB Bandwidth Test Result

TestMode	Antenna	Channel	6db EBW [MHz]	FL [MHz]	FH [MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	16.440	5736.760	5753.200	0.5	PASS
		5785	16.440	5776.760	5793.200	0.5	PASS
		5825	16.440	5816.760	5833.200	0.5	PASS
11N20SISO	Ant1	5745	17.640	5736.160	5753.800	0.5	PASS
		5785	17.680	5776.160	5793.840	0.5	PASS
		5825	17.680	5816.160	5833.840	0.5	PASS
11N40SISO	Ant1	5755	35.520	5737.160	5772.680	0.5	PASS
		5795	35.520	5777.160	5812.680	0.5	PASS
11AC20SISO	Ant1	5745	17.640	5736.160	5753.800	0.5	PASS
		5785	17.680	5776.160	5793.840	0.5	PASS
		5825	17.640	5816.160	5833.800	0.5	PASS
11AC40SISO	Ant1	5755	35.520	5737.160	5772.680	0.5	PASS
		5795	35.280	5777.400	5812.680	0.5	PASS
11AC80SISO	Ant1	5775	75.520	5737.240	5812.760	0.5	PASS

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9.3 Maximum conducted output power

Test Method
According to KDB789033 D02(E) Method 3

Limits: For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz.
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Note:
1. Maximum Conducted Output Power=Conducted Output Power + Correction Factor
2. EIRP= Maximum Conducted Output Power + ANT Gain

Test result as below table

IEEE 802.11a modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	12.82	24.00
	Middle	5200	13.53	24.00
	High	5240	13.97	24.00
5.2G Band	Low	5260	14.22	24.00
	Middle	5280	14.02	24.00
	High	5320	13.45	24.00
5.5G Band	Low	5500	14.76	24.00
	Middle	5580	15.25	24.00
	High	5700	13.15	24.00
	High	5720	12.44	24.00
5.8G Band	Low	5745	12.46	30.00
	Middle	5785	13.59	30.00
	High	5825	12.88	30.00

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IEEE 802.11n HT20 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	12.81	24.00
	Middle	5200	12.72	24.00
	High	5240	13.21	24.00
5.2G Band	Low	5260	13.47	24.00
	Middle	5280	13.33	24.00
	High	5320	13.74	24.00
5.5G Band	Low	5500	13.65	24.00
	Middle	5580	14.23	24.00
	High	5700	12.54	24.00
	High	5720	11.88	24.00
5.8G Band	Low	5745	11.73	30.00
	Middle	5785	12.84	30.00
	High	5825	12.39	30.00

IEEE 802.11ac VHT20 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	12.67	24.00
	Middle	5200	12.32	24.00
	High	5240	12.78	24.00
5.2G Band	Low	5260	13.01	24.00
	Middle	5280	12.81	24.00
	High	5320	12.24	24.00
5.5G Band	Low	5500	13.21	24.00
	Middle	5580	13.77	24.00
	High	5700	12.07	24.00
	High	5720	11.36	24.00
5.8G Band	Low	5745	11.38	30.00
	Middle	5785	12.44	30.00
	High	5825	11.84	30.00

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IEEE 802.11n HT40 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5190	11.62	24.00
	High	5230	11.72	24.00
5.2G Band	Low	5270	12.14	24.00
	High	5310	11.52	24.00
5.5G Band	Low	5510	11.53	24.00
	Middle	5550	11.42	24.00
	High	5670	12.01	24.00
	High	5710	11.44	24.00
5.8G Band	Low	5755	11.02	30.00
	High	5795	11.65	30.00

IEEE 802.11ac VHT40 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5190	11.32	24.00
	High	5230	11.45	24.00
5.2G Band	Low	5270	11.82	24.00
	High	5310	11.19	24.00
5.5G Band	Low	5510	11.18	24.00
	Middle	5550	11.15	24.00
	High	5670	11.72	24.00
	High	5710	10.75	24.00
5.8G Band	Low	5755	10.71	30.00
	High	5795	11.44	30.00

IEEE 802.11ac VHT80 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5210	9.85	24.00
5.2G Band	High	5290	9.92	24.00
5.5G Band	Low	5530	9.24	24.00
	High	5690	9.86	24.00
5.8G Band	High	5775	9.38	30.00

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9.4 Maximum power spectral density

Test Method
According to KDB789033 D02
For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the
above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth
specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW)
to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of
continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

Limit: The maximum power spectral density shall not exceed 11dBm for the 5.15-5.25GHz, 5.25-5.35GHz, 5.47-5.725 GHz Band and 30dBm for the 5.8GHz Band in any 1 megahertz band.

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Test Result

TestMode	Antenna	Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	7.01	<=11	PASS
		5200	7.48	<=11	PASS
		5240	7.57	<=11	PASS
		5260	7.44	<=11	PASS
		5280	7.35	<=11	PASS
		5320	7.93	<=11	PASS
		5500	8.75	<=11	PASS
		5580	8.87	<=11	PASS
		5700	6.37	<=11	PASS
		5720_UNII-2C	6.76	<=11	PASS
		5720_UNII-3	5.25	<=11	PASS
		5745	5.87	<=30	PASS
		5785	5.19	<=30	PASS
		5825	5.42	<=30	PASS
11N20SISO	Ant1	5180	6.34	<=11	PASS
		5200	6.73	<=11	PASS
		5240	6.67	<=11	PASS
		5260	6.62	<=11	PASS
		5280	6.36	<=11	PASS
		5320	6.49	<=11	PASS
		5500	7.25	<=11	PASS
		5580	7.53	<=11	PASS
		5700	5.68	<=11	PASS
		5720_UNII-2C	5.83	<=11	PASS
		5720_UNII-3	4.29	<=11	PASS
		5745	5.02	<=30	PASS
		5785	4.62	<=30	PASS
		5825	4.50	<=30	PASS
11N40SISO	Ant1	5190	4.78	<=11	PASS
		5230	5.13	<=11	PASS
		5270	5.69	<=11	PASS
		5310	5.33	<=11	PASS
		5510	5.43	<=11	PASS
		5550	4.87	<=11	PASS
		5670	4.42	<=11	PASS
		5710_UNII-2C	3.98	<=11	PASS
		5710_UNII-3	1.30	<=11	PASS
		5755	2.97	<=30	PASS
		5795	4.78	<=30	PASS
11AC20SISO	Ant1	5180	6.56	<=11	PASS
		5200	6.39	<=11	PASS
		5240	6.74	<=11	PASS
		5260	6.53	<=11	PASS
		5280	6.69	<=11	PASS
		5320	6.75	<=11	PASS
		5500	7.44	<=11	PASS
		5580	7.51	<=11	PASS
		5700	5.92	<=11	PASS
		5720_UNII-2C	5.53	<=11	PASS
		5720_UNII-3	4.90	<=11	PASS
		5745	4.38	<=30	PASS
		5785	4.43	<=30	PASS
		5825	5.13	<=30	PASS
11AC40SISO	Ant1	5190	6.33	<=11	PASS
		5230	6.00	<=11	PASS
		5270	5.87	<=11	PASS
		5310	5.99	<=11	PASS
		5510	6.26	<=11	PASS

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		5550	5.91	<=11	PASS
		5670	5.89	<=11	PASS
		5710_UNII-2C	5.40	<=11	PASS
		5710_UNII-3	1.48	<=11	PASS
		5755	4.36	<=30	PASS
		5795	4.31	<=30	PASS
11AC80SISO	Ant1	5210	0.34	<=11	PASS
		5290	-0.06	<=11	PASS
		5530	0.23	<=11	PASS
		5690_UNII-2C	0.35	<=11	PASS
		5690_UNII-3	-6.34	<=11	PASS
		5775	-2.07	<=30	PASS

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9.5 Unwanted emissions

Test Method
According to KBD789033 D02

Limits:
For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
The provisions of §15.205 apply to intentional radiators operating under this section.

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Test result:

TestMode	Antenna	Channel[MHz]	FreqRange [MHz]	Max. Fre[MHz]	Max. Level[dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	30~5140	30~5140	-42.35	<=-27	PASS
		5180	5360~40000	5360~40000	-47.62	<=-27	PASS
		5200	30~5140	30~5140	-41.96	<=-27	PASS
		5200	5360~40000	5360~40000	-47.57	<=-27	PASS
		5240	30~5140	30~5140	-42.78	<=-27	PASS
		5240	5360~40000	5360~40000	-46.94	<=-27	PASS
		5260	30~5140	30~5140	-43.23	<=-27	PASS
		5260	5360~40000	5360~40000	-47.49	<=-27	PASS
		5280	30~5140	30~5140	-44.99	<=-27	PASS
		5280	5360~40000	5360~40000	-47.43	<=-27	PASS
		5320	30~5140	30~5140	-45.79	<=-27	PASS
		5320	5360~40000	5360~40000	-47.6	<=-27	PASS
		5500	30~5460	30~5460	-44.51	<=-27	PASS
		5500	5735~40000	5735~40000	-46.87	<=-27	PASS
		5580	30~5460	30~5460	-50.2	<=-27	PASS
		5580	5735~40000	5735~40000	-47.38	<=-27	PASS
		5700	30~5460	30~5460	-54.63	<=-27	PASS
		5700	5735~40000	5735~40000	-46.94	<=-27	PASS
		5720	30~5460	30~5460	-54.53	<=-27	PASS
		5720	5925~40000	5925~40000	-47.79	<=-27	PASS
		5745	30~5650	30~5650	-51.03	<=-27	PASS
		5745	5925~40000	5925~40000	-47.03	<=-27	PASS
		5785	30~5650	30~5650	-53.53	<=-27	PASS
		5785	5925~40000	5925~40000	-46.63	<=-27	PASS
		5825	30~5650	30~5650	-52.84	<=-27	PASS
		5825	5925~40000	5925~40000	-47.54	<=-27	PASS
11N20SISO	Ant1	5180	30~5140	30~5140	-44.17	<=-27	PASS
		5180	5360~40000	5360~40000	-47.09	<=-27	PASS
		5200	30~5140	30~5140	-44.38	<=-27	PASS
		5200	5360~40000	5360~40000	-47.61	<=-27	PASS
		5240	30~5140	30~5140	-44.89	<=-27	PASS
		5240	5360~40000	5360~40000	-45.76	<=-27	PASS
		5260	30~5140	30~5140	-45.78	<=-27	PASS
		5260	5360~40000	5360~40000	-47.47	<=-27	PASS
		5280	30~5140	30~5140	-44.5	<=-27	PASS
		5280	5360~40000	5360~40000	-47.81	<=-27	PASS
		5320	30~5140	30~5140	-47.67	<=-27	PASS
		5320	5360~40000	5360~40000	-46.73	<=-27	PASS
		5500	30~5460	30~5460	-45.31	<=-27	PASS
		5500	5735~40000	5735~40000	-47.16	<=-27	PASS
		5580	30~5460	30~5460	-51.97	<=-27	PASS
		5580	5735~40000	5735~40000	-47.25	<=-27	PASS
		5700	30~5460	30~5460	-54.78	<=-27	PASS
		5700	5735~40000	5735~40000	-47.19	<=-27	PASS
		5720	30~5460	30~5460	-54.75	<=-27	PASS
		5720	5925~40000	5925~40000	-47.71	<=-27	PASS
		5745	30~5650	30~5650	-52.77	<=-27	PASS
		5745	5925~40000	5925~40000	-47.62	<=-27	PASS
		5785	30~5650	30~5650	-52.83	<=-27	PASS
		5785	5925~40000	5925~40000	-46.81	<=-27	PASS
		5825	30~5650	30~5650	-52.58	<=-27	PASS
		5825	5925~40000	5925~40000	-47.65	<=-27	PASS
11N40SISO	Ant1	5190	30~5140	30~5140	-47.63	<=-27	PASS
		5190	5360~40000	5360~40000	-47.05	<=-27	PASS
		5230	30~5140	30~5140	-46.81	<=-27	PASS
		5230	5360~40000	5360~40000	-46.56	<=-27	PASS
		5270	30~5140	30~5140	-49.11	<=-27	PASS
		5270	5360~40000	5360~40000	-47.16	<=-27	PASS
		5310	30~5140	30~5140	-48.87	<=-27	PASS

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		5310	5360~40000	5360~40000	-47.15	<=-27	PASS
		5510	30~5460	30~5460	-48.87	<=-27	PASS
		5510	5735~40000	5735~40000	-47.83	<=-27	PASS
		5550	30~5460	30~5460	-49.86	<=-27	PASS
		5550	5735~40000	5735~40000	-48.15	<=-27	PASS
		5670	30~5460	30~5460	-54.99	<=-27	PASS
		5670	5735~40000	5735~40000	-47.36	<=-27	PASS
		5710	30~5460	30~5460	-53.94	<=-27	PASS
		5710	5925~40000	5925~40000	-47.89	<=-27	PASS
		5755	30~5650	30~5650	-50.45	<=-27	PASS
		5755	5925~40000	5925~40000	-47.57	<=-27	PASS
		5795	30~5650	30~5650	-54.69	<=-27	PASS
		5795	5925~40000	5925~40000	-47.25	<=-27	PASS
11AC20SISO	Ant1	5180	30~5140	30~5140	-42.25	<=-27	PASS
		5180	5360~40000	5360~40000	-47.72	<=-27	PASS
		5200	30~5140	30~5140	-42.49	<=-27	PASS
		5200	5360~40000	5360~40000	-47.62	<=-27	PASS
		5240	30~5140	30~5140	-43.63	<=-27	PASS
		5240	5360~40000	5360~40000	-47.6	<=-27	PASS
		5260	30~5140	30~5140	-46	<=-27	PASS
		5260	5360~40000	5360~40000	-47.74	<=-27	PASS
		5280	30~5140	30~5140	-45.52	<=-27	PASS
		5280	5360~40000	5360~40000	-47.06	<=-27	PASS
		5320	30~5140	30~5140	-48.15	<=-27	PASS
		5320	5360~40000	5360~40000	-46.54	<=-27	PASS
		5500	30~5460	30~5460	-44.57	<=-27	PASS
		5500	5735~40000	5735~40000	-47.34	<=-27	PASS
		5580	30~5460	30~5460	-52.71	<=-27	PASS
		5580	5735~40000	5735~40000	-47.63	<=-27	PASS
		5700	30~5460	30~5460	-54.45	<=-27	PASS
		5700	5735~40000	5735~40000	-48.04	<=-27	PASS
		5720	30~5460	30~5460	-55.39	<=-27	PASS
		5720	5925~40000	5925~40000	-46.86	<=-27	PASS
		5745	30~5650	30~5650	-53.47	<=-27	PASS
		5745	5925~40000	5925~40000	-47.99	<=-27	PASS
		5785	30~5650	30~5650	-53.43	<=-27	PASS
		5785	5925~40000	5925~40000	-47.06	<=-27	PASS
		5825	30~5650	30~5650	-52.84	<=-27	PASS
		5825	5925~40000	5925~40000	-47.23	<=-27	PASS
11AC40SISO	Ant1	5190	30~5140	30~5140	-48.54	<=-27	PASS
		5190	5360~40000	5360~40000	-47.52	<=-27	PASS
		5230	30~5140	30~5140	-47.84	<=-27	PASS
		5230	5360~40000	5360~40000	-47.57	<=-27	PASS
		5270	30~5140	30~5140	-49.81	<=-27	PASS
		5270	5360~40000	5360~40000	-47.63	<=-27	PASS
		5310	30~5140	30~5140	-52.91	<=-27	PASS
		5310	5360~40000	5360~40000	-47.44	<=-27	PASS
		5510	30~5460	30~5460	-48.49	<=-27	PASS
		5510	5735~40000	5735~40000	-47.59	<=-27	PASS
		5550	30~5460	30~5460	-49.69	<=-27	PASS
		5550	5735~40000	5735~40000	-47.01	<=-27	PASS
		5670	30~5460	30~5460	-54.36	<=-27	PASS
		5670	5735~40000	5735~40000	-47.62	<=-27	PASS
		5710	30~5460	30~5460	-54.22	<=-27	PASS
		5710	5925~40000	5925~40000	-47.79	<=-27	PASS
		5755	30~5650	30~5650	-51.47	<=-27	PASS
		5755	5925~40000	5925~40000	-47.71	<=-27	PASS
		5795	30~5650	30~5650	-53.17	<=-27	PASS
		5795	5925~40000	5925~40000	-47.65	<=-27	PASS
11AC80SISO	Ant1	5210	30~5140	30~5140	-43.76	<=-27	PASS
		5210	5360~40000	5360~40000	-47.02	<=-27	PASS
		5290	30~5140	30~5140	-53.64	<=-27	PASS
		5290	5360~40000	5360~40000	-46.78	<=-27	PASS
		5530	30~5460	30~5460	-41.41	<=-27	PASS

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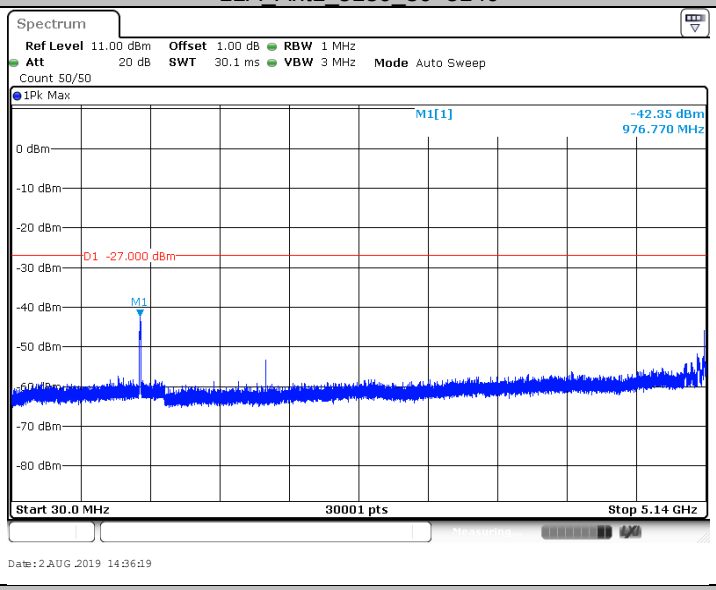
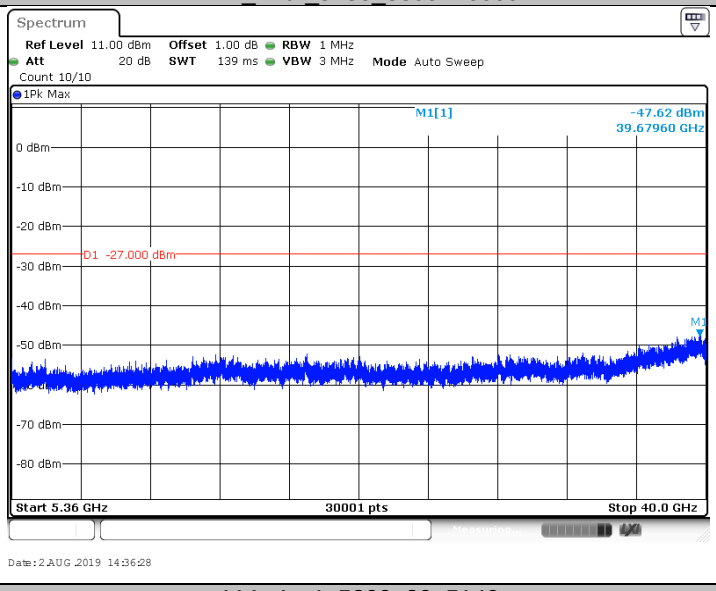
		5530	5735~40000	5735~40000	-46.65	<=-27	PASS
		5690	30~5460	30~5460	-54.35	<=-27	PASS
		5690	5925~40000	5925~40000	-46.42	<=-27	PASS
		5775	30~5650	30~5650	-54.83	<=-27	PASS
		5775	5925~40000	5925~40000	-47.33	<=-27	PASS

Test Graphs

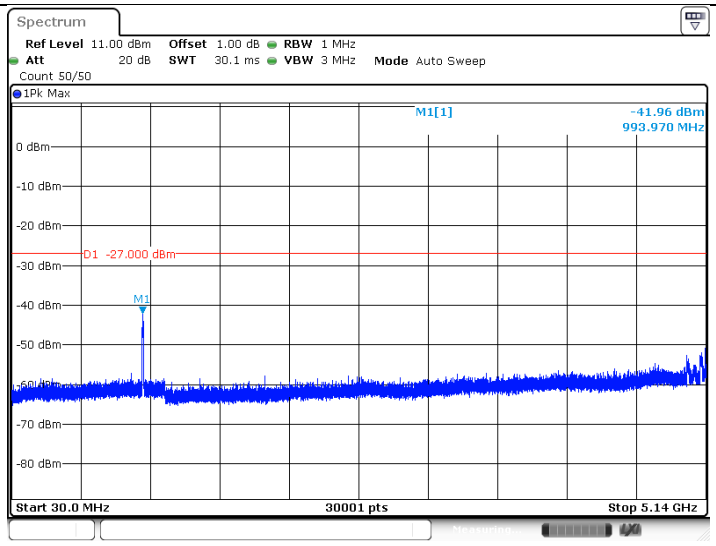
11A_Ant1_5180_30~5140



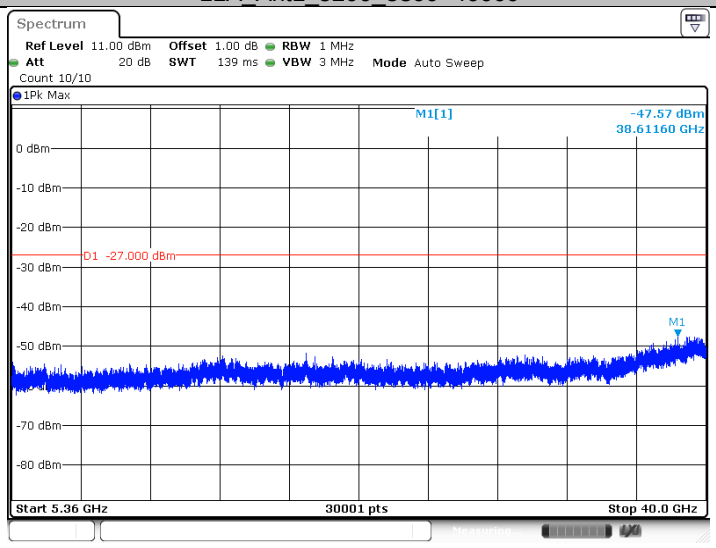
11A_Ant1_5180_5360~40000



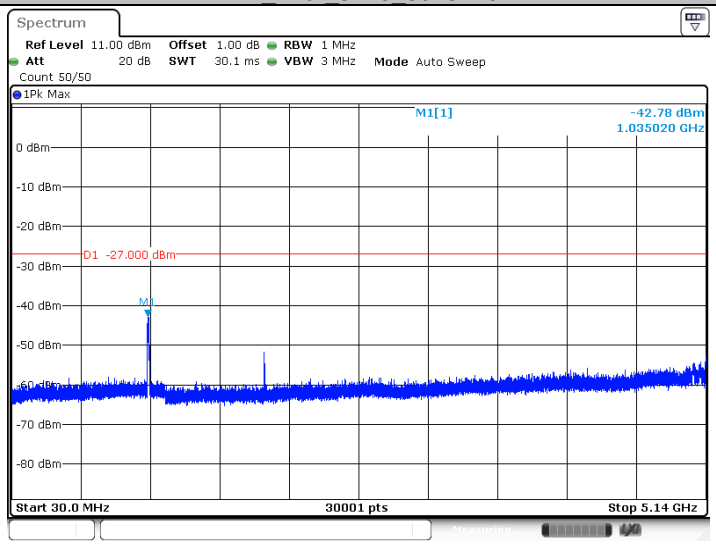
11A_Ant1_5200_30~5140



11A_Ant1_5200_5360~40000



11A_Ant1_5240_30~5140



11A_Ant1_5240_5360~40000

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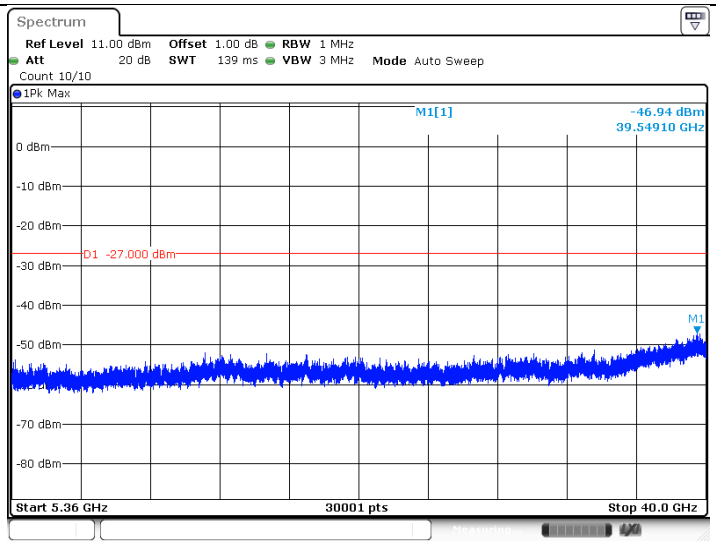
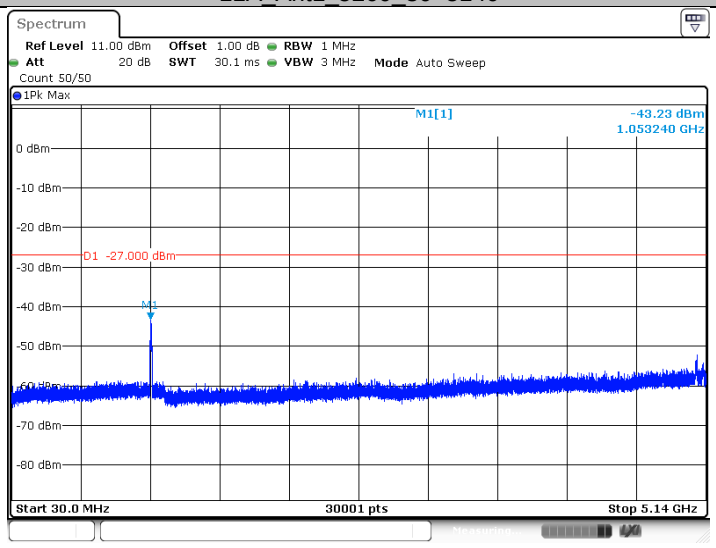
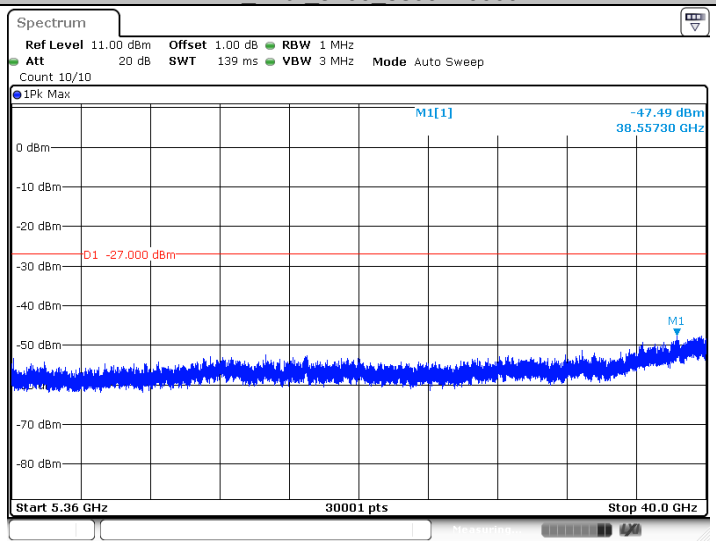


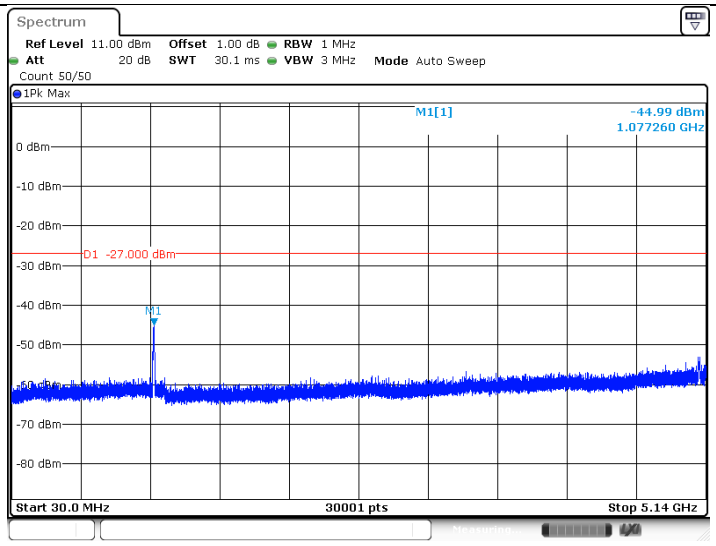
11A_Ant1_5260_30~5140



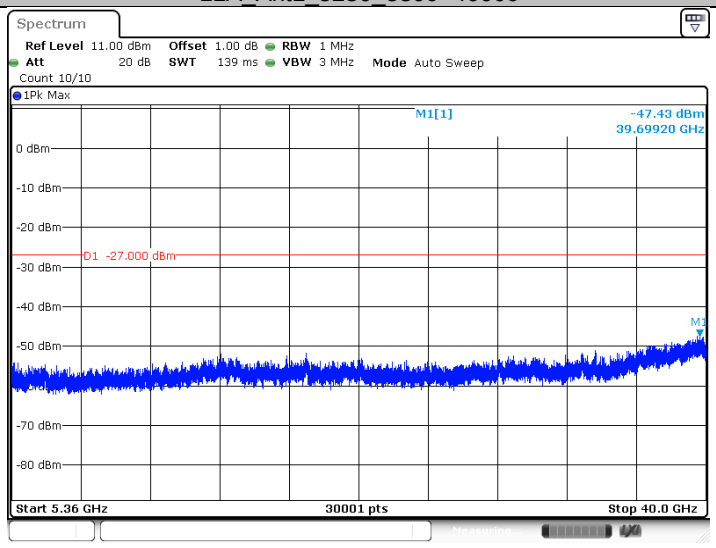
11A_Ant1_5260_5360~40000



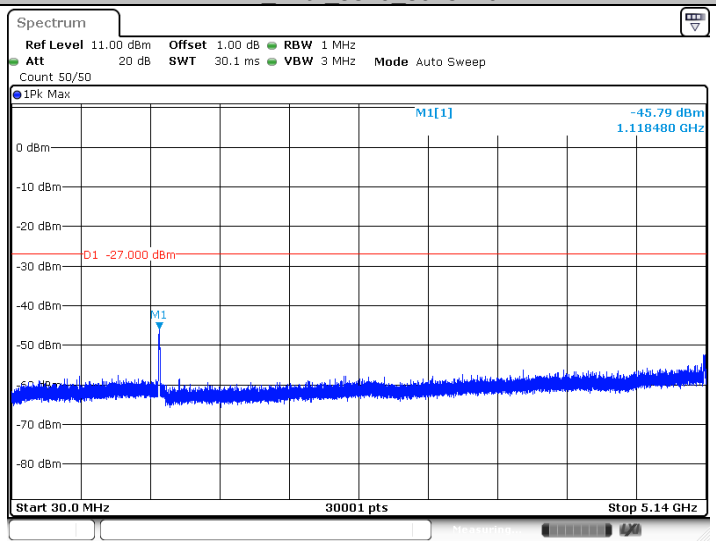
11A_Ant1_5280_30~5140



11A_Ant1_5280_5360~40000



11A_Ant1_5320_30~5140



11A_Ant1_5320_5360~40000

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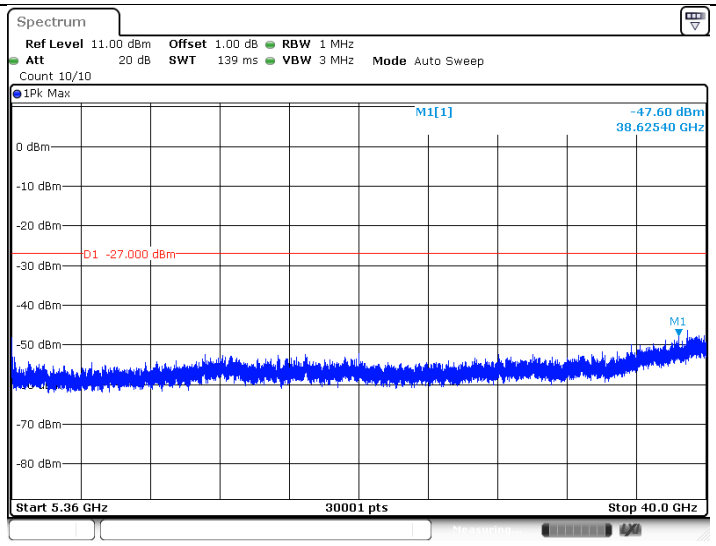
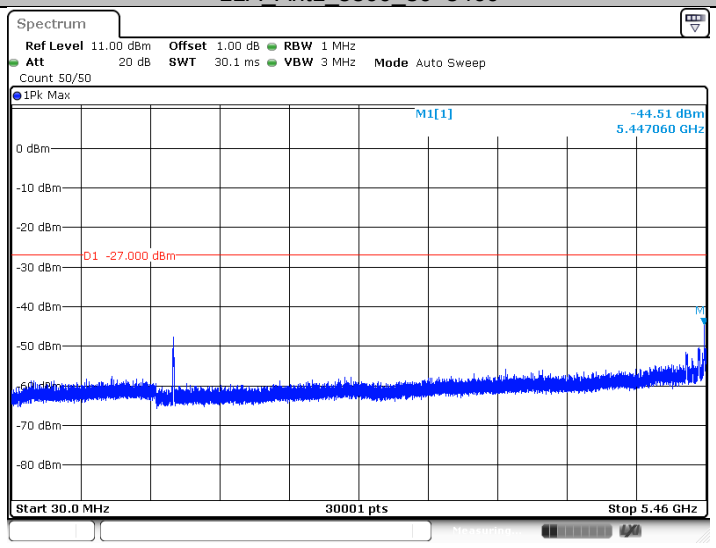
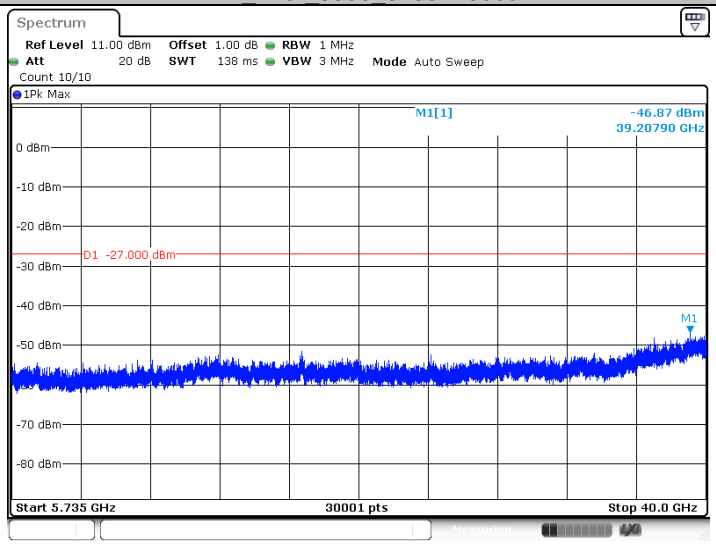


11A_Ant1_5500_30~5460



11A_Ant1_5500_5735~40000



11A_Ant1_5580_30~5460

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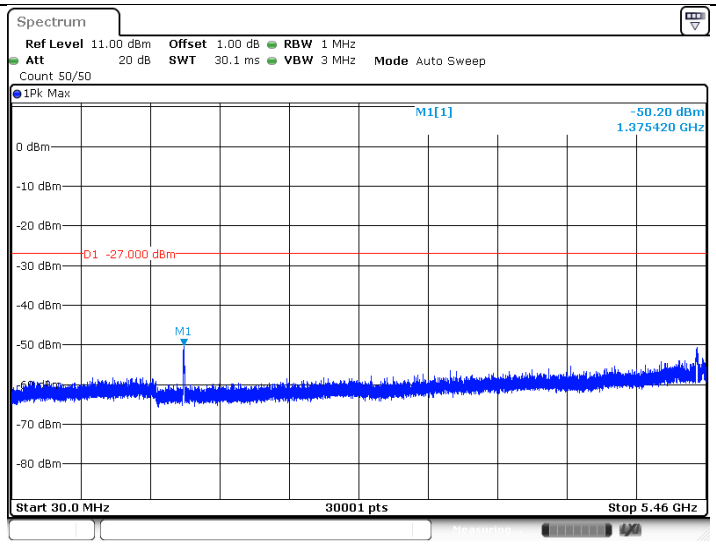
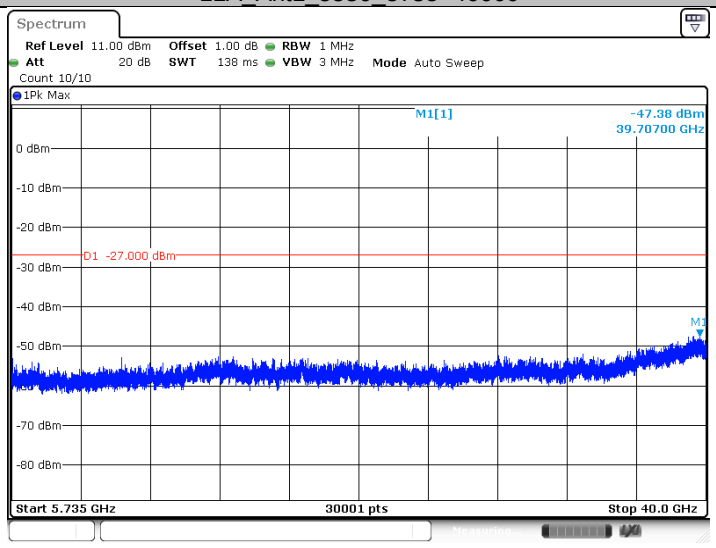
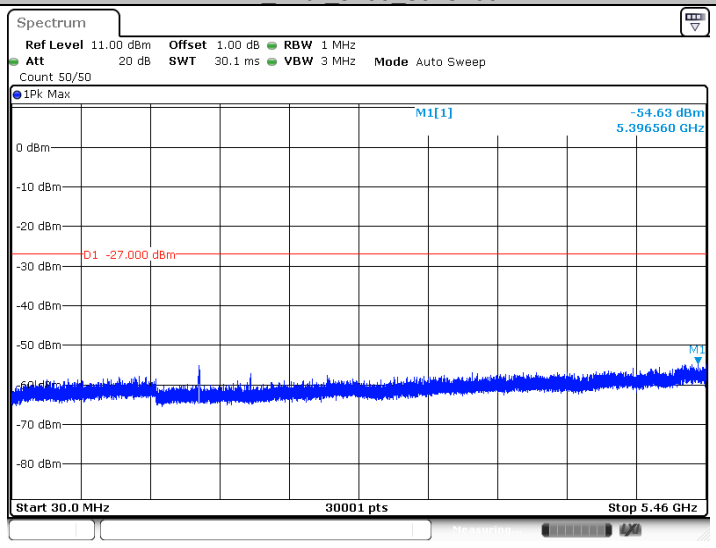


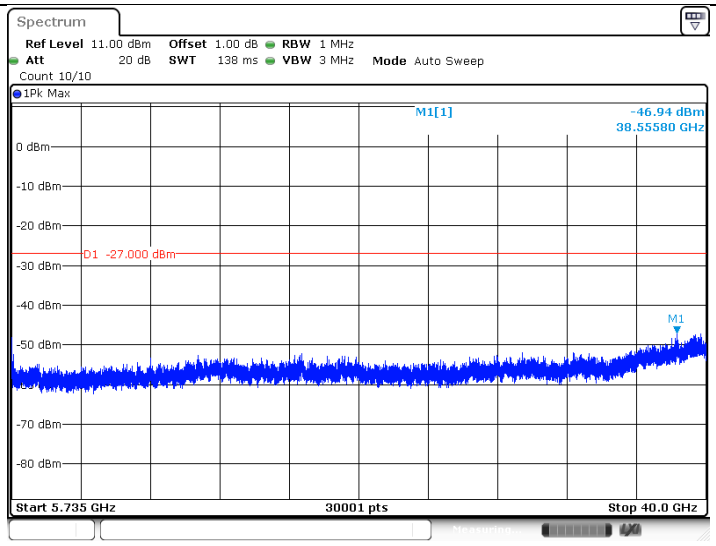
11A_Ant1_5580_5735~40000



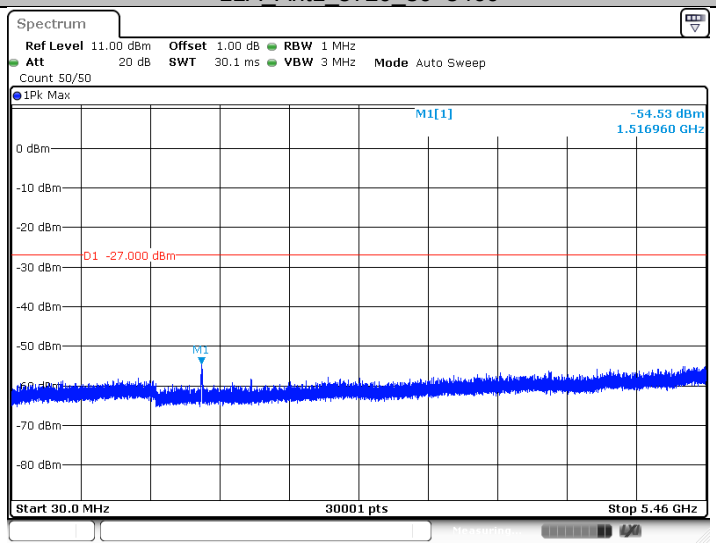
11A_Ant1_5700_30~5460



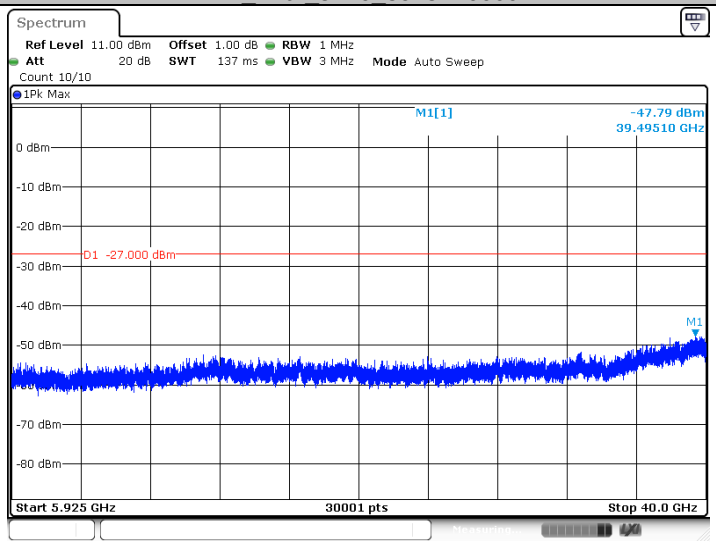
11A_Ant1_5700_5735~40000



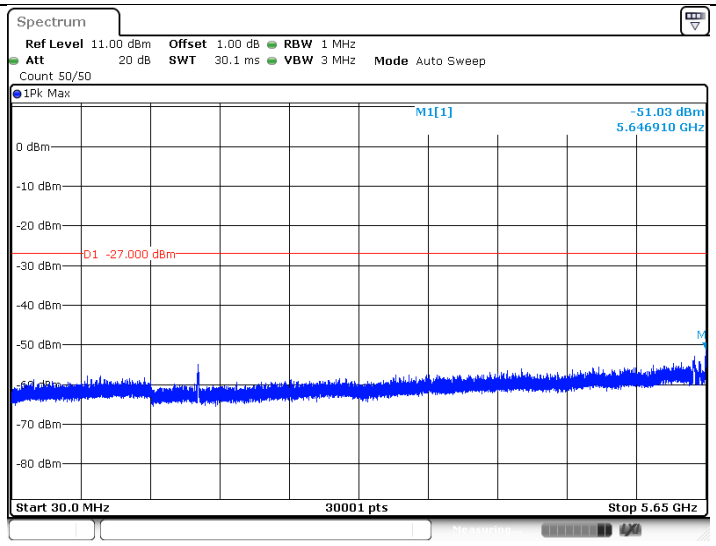
11A_Ant1_5720_30~5460



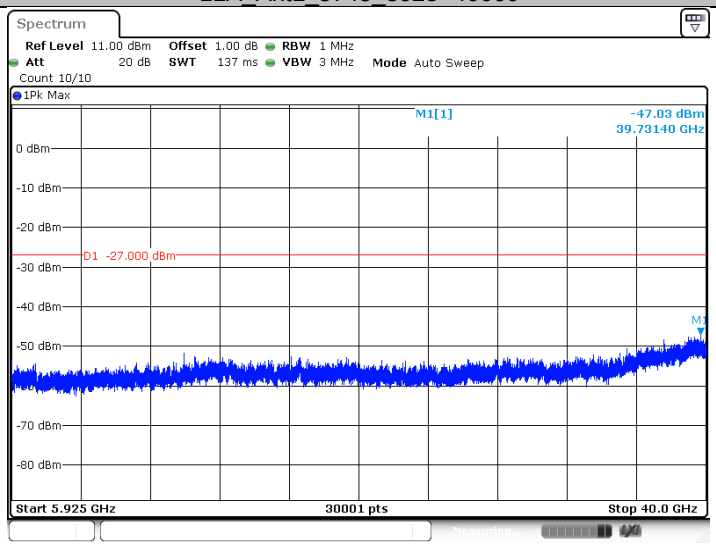
11A_Ant1_5720_5925~40000



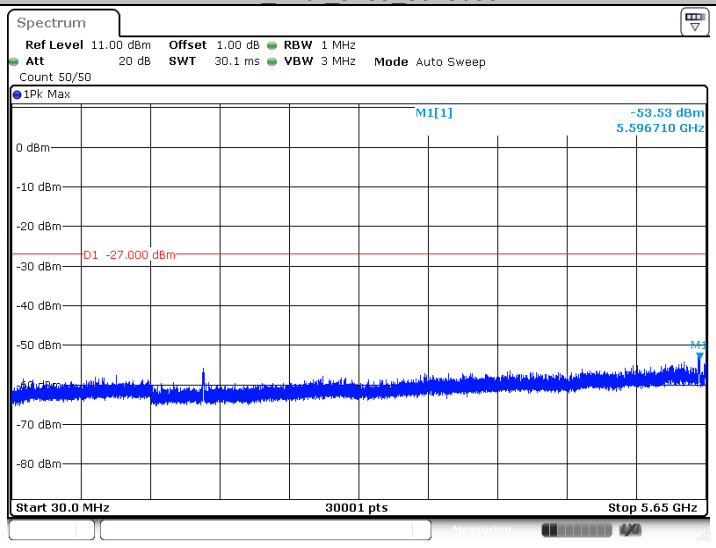
11A_Ant1_5745_30~5650



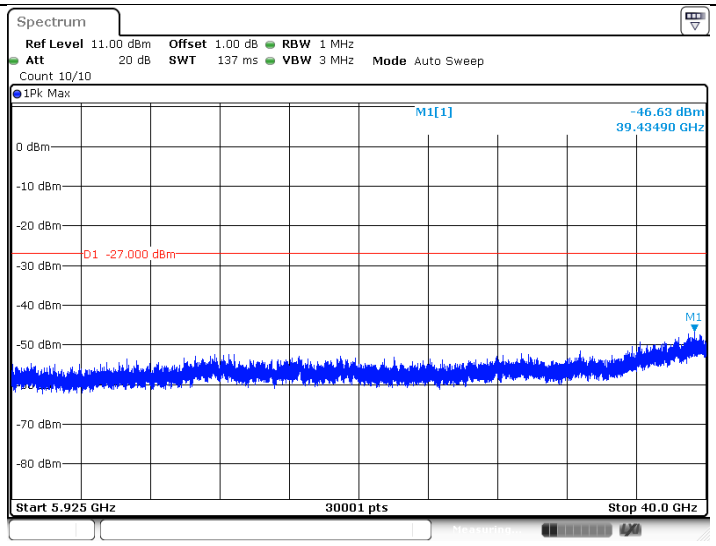
11A_Ant1_5745_5925~40000



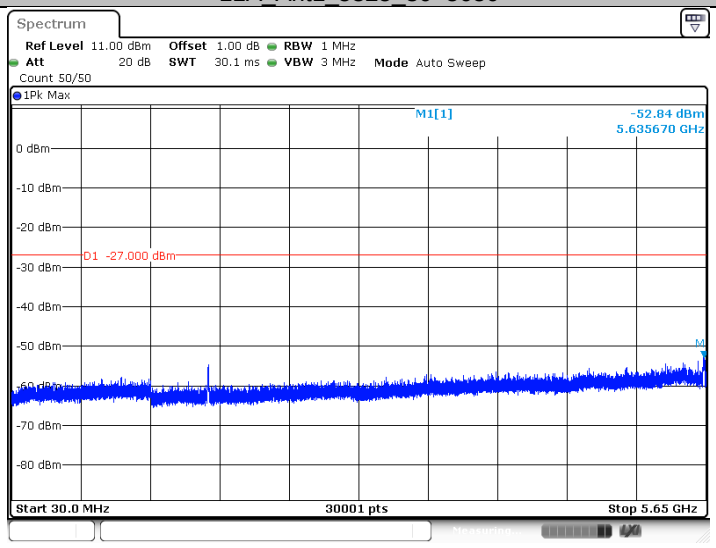
11A_Ant1_5785_30~5650



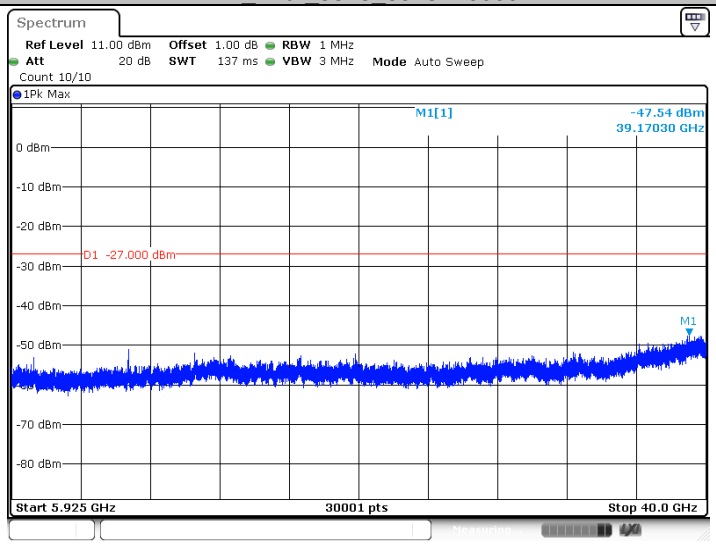
11A_Ant1_5785_5925~40000



11A_Ant1_5825_30~5650



11A_Ant1_5825_5925~40000



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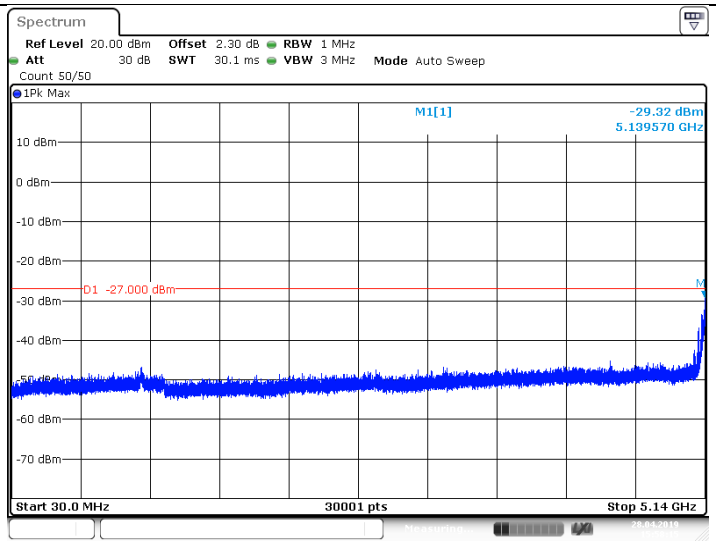
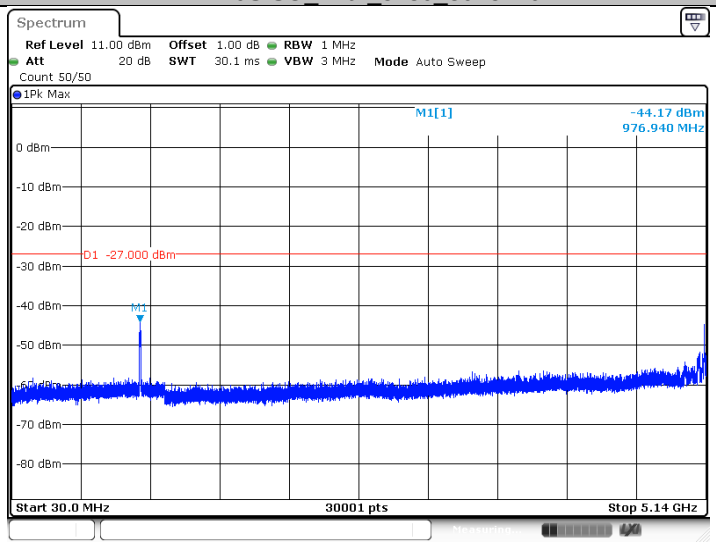
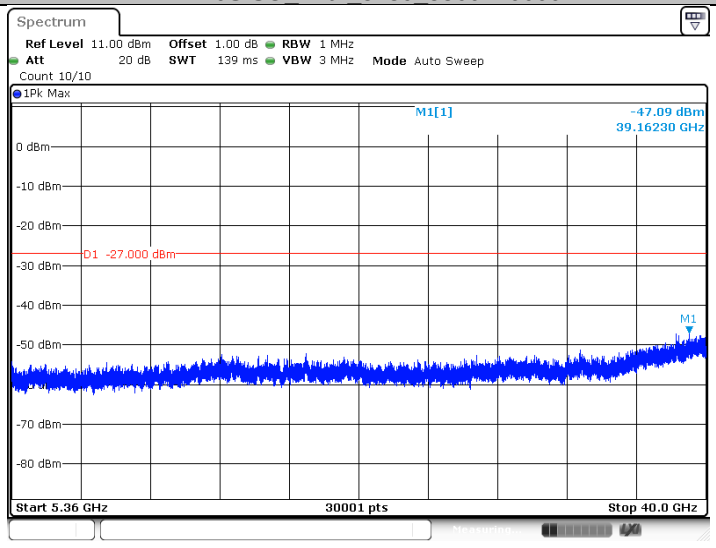


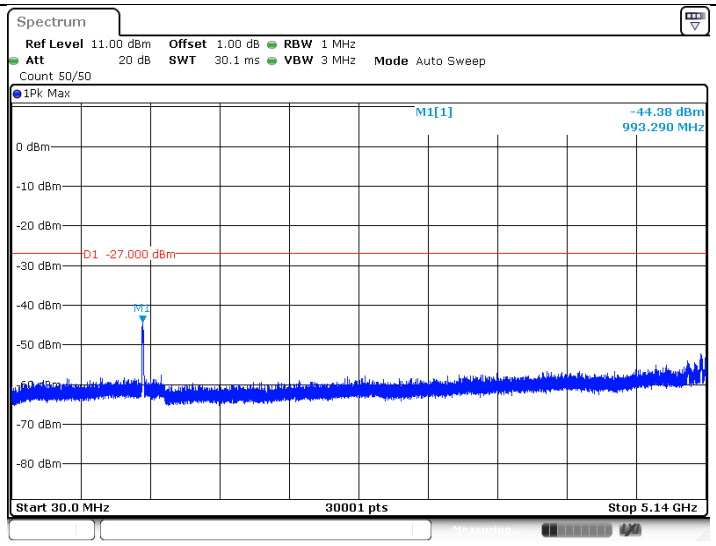
11N20SISO_Ant1_5180_30~5140



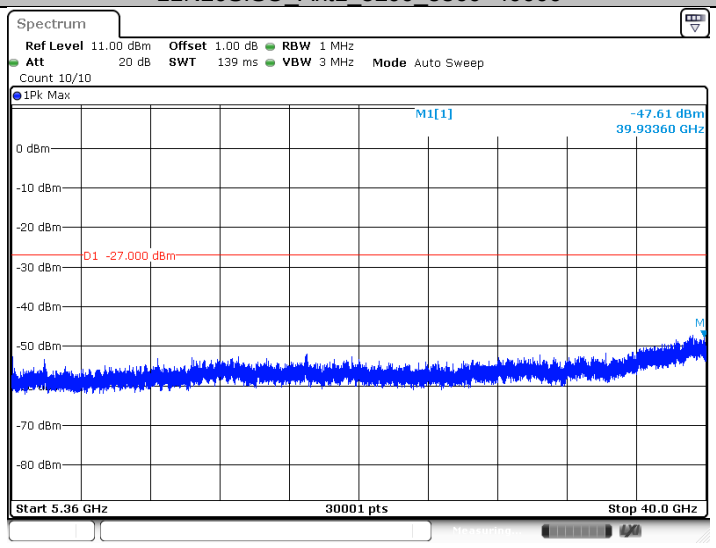
11N20SISO_Ant1_5180_5360~40000



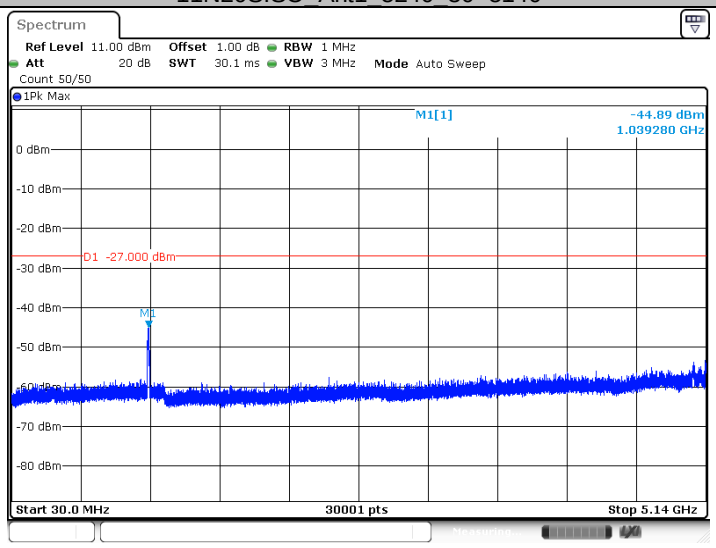
11N20SISO_Ant1_5200_30~5140



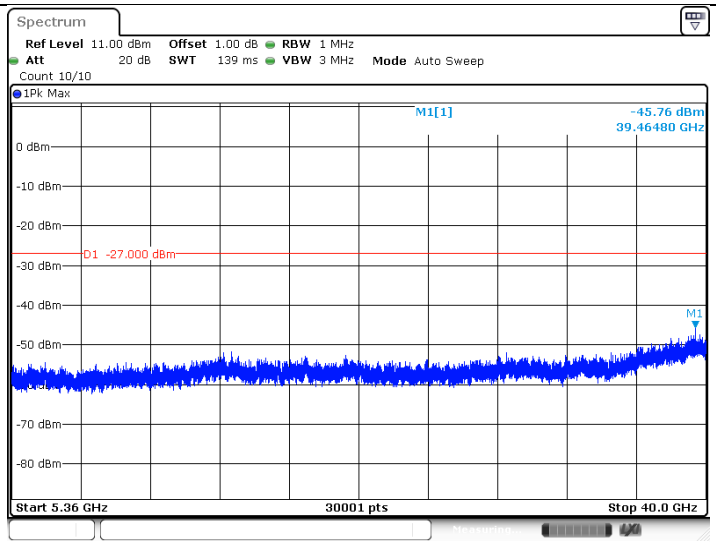
11N20SISO_Ant1_5200_5360~40000



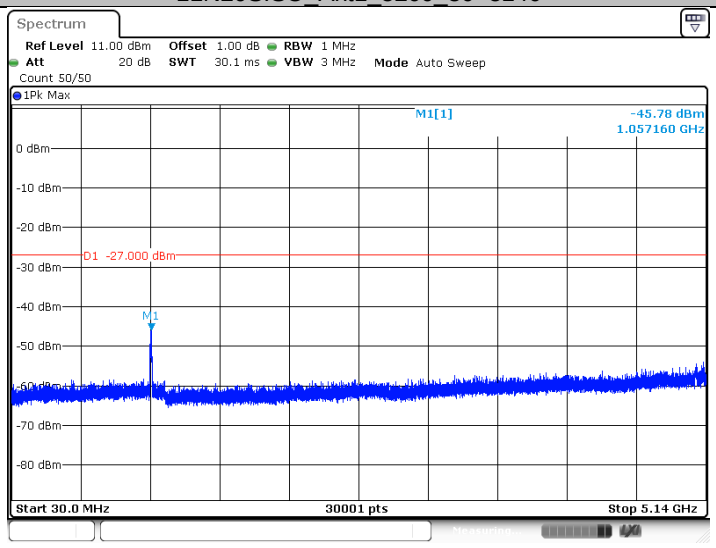
11N20SISO_Ant1_5240_30~5140



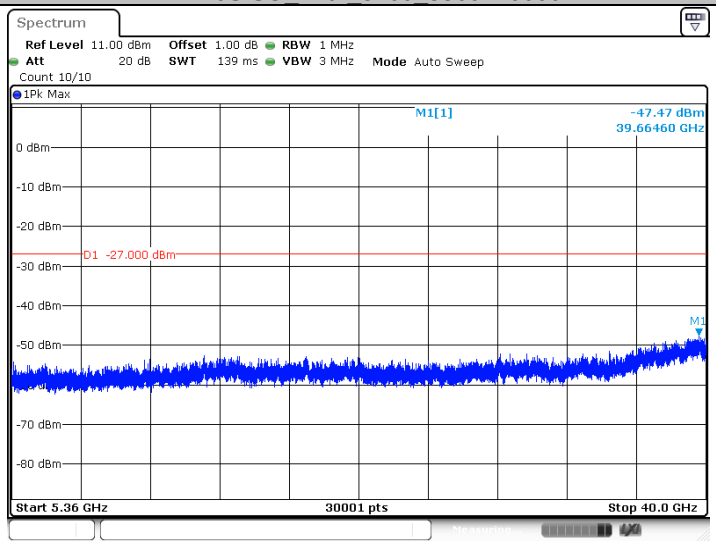
11N20SISO_Ant1_5240_5360~40000



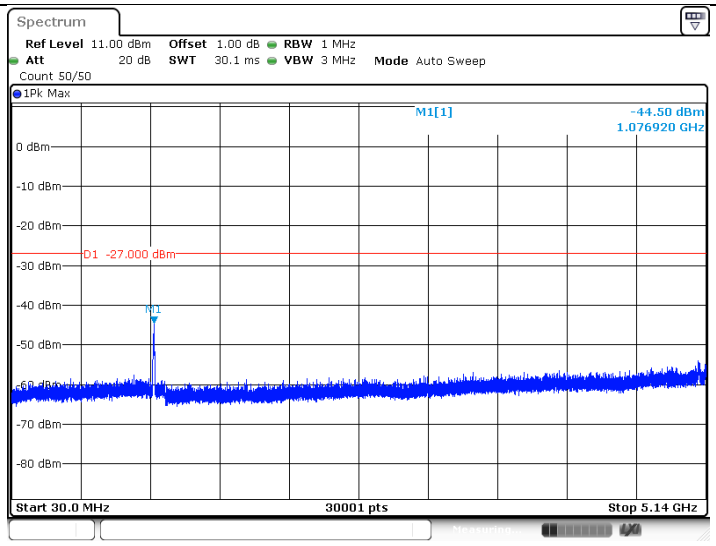
11N20SISO_Ant1_5260_30~5140



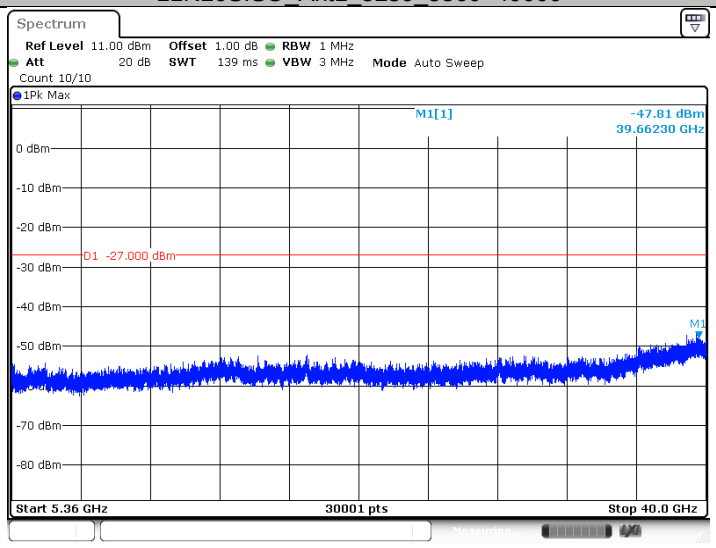
11N20SISO_Ant1_5260_5360~40000



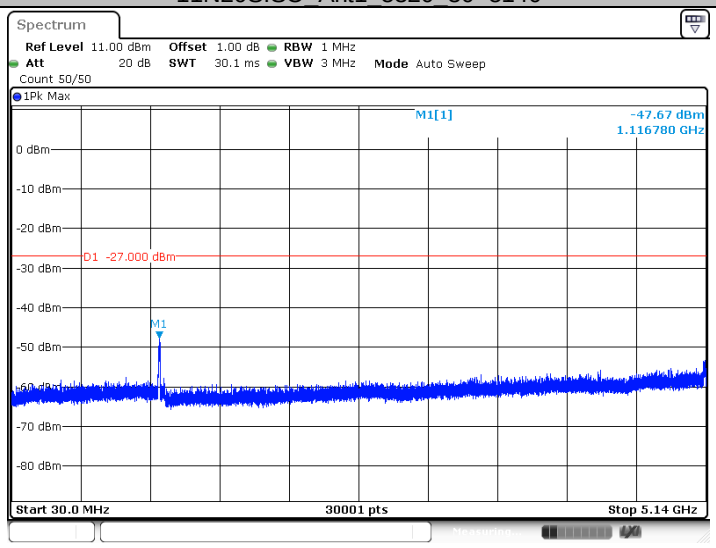
11N20SISO_Ant1_5280_30~5140



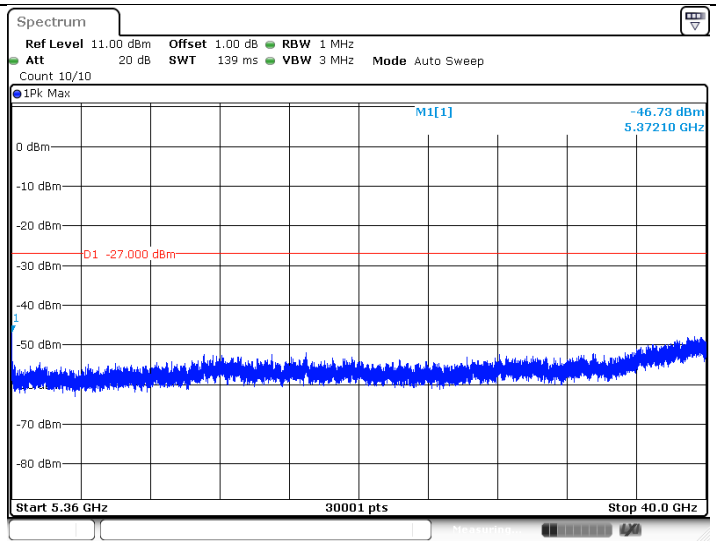
11N20SISO_Ant1_5280_5360~40000



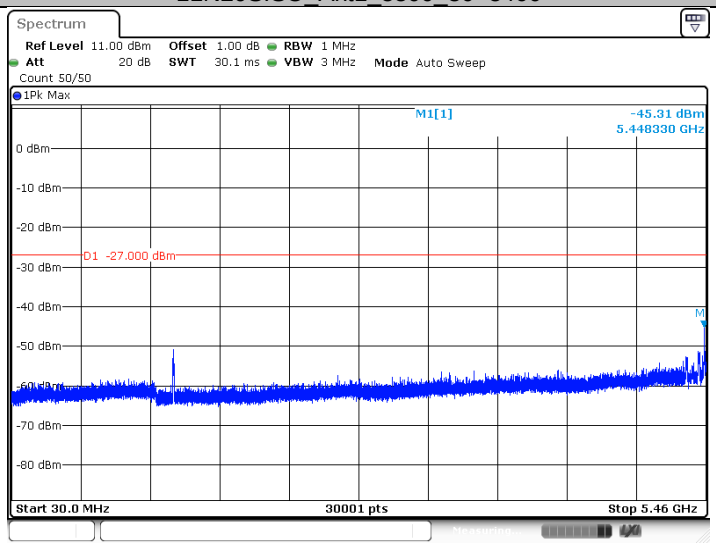
11N20SISO_Ant1_5320_30~5140



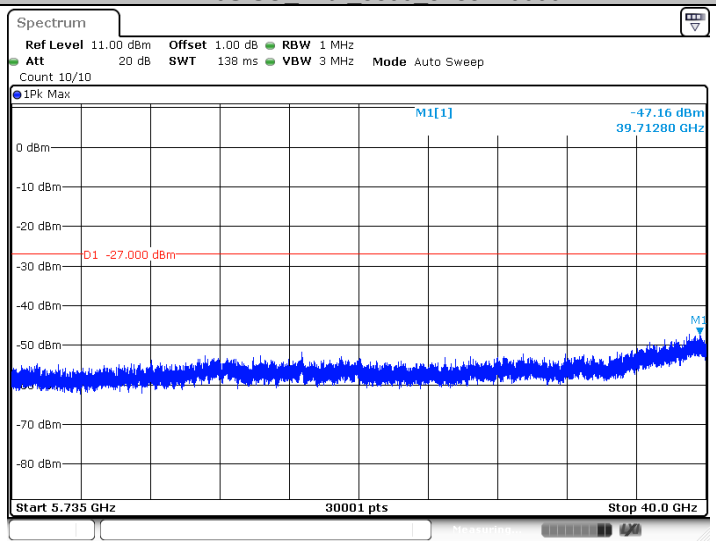
11N20SISO_Ant1_5320_5360~40000



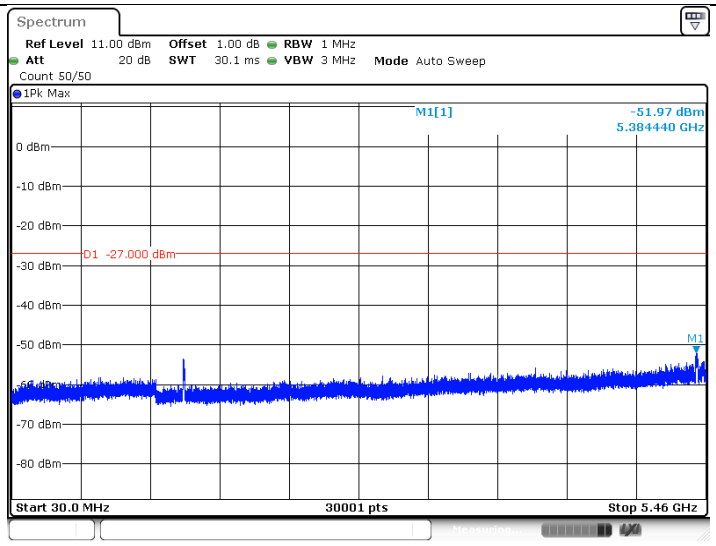
11N20SISO_Ant1_5500_30~5460



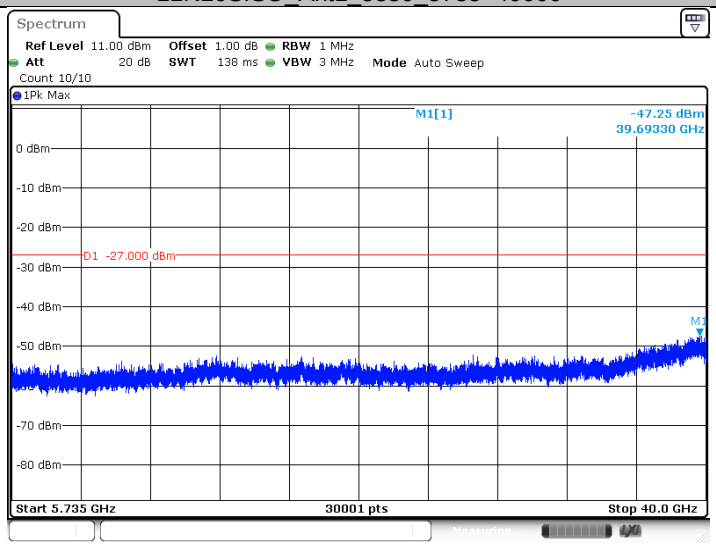
11N20SISO_Ant1_5500_5735~40000



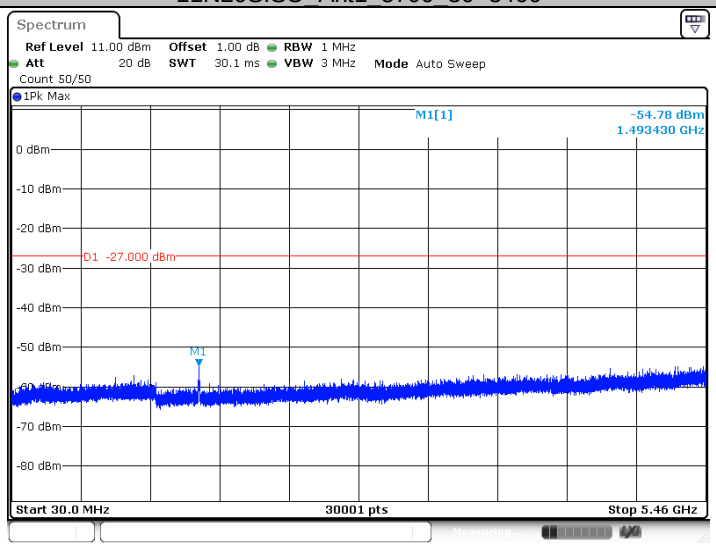
11N20SISO_Ant1_5580_30~5460



11N20SISO_Ant1_5580_5735~40000



11N20SISO_Ant1_5700_30~5460



11N20SISO_Ant1_5700_5735~40000

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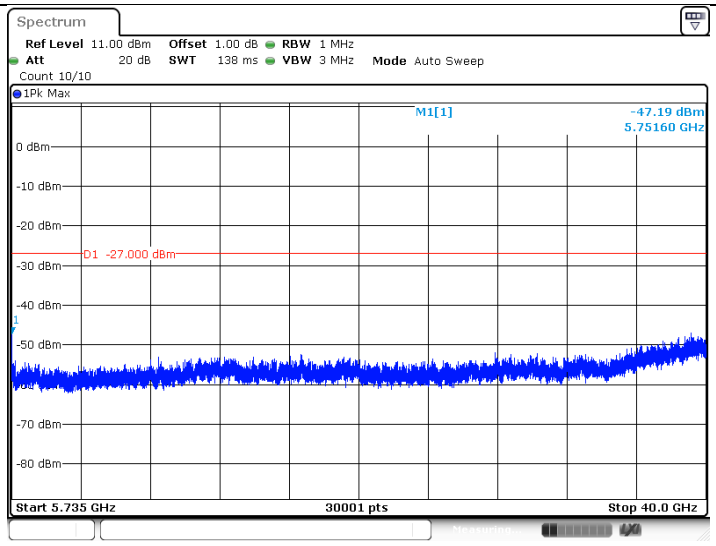
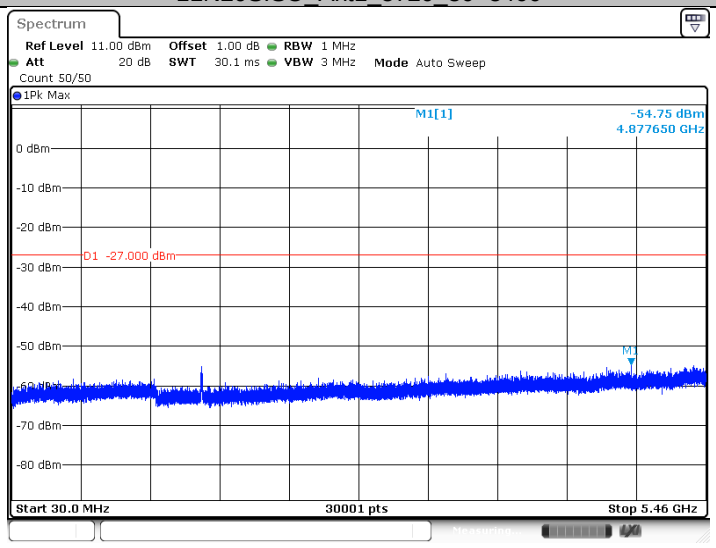
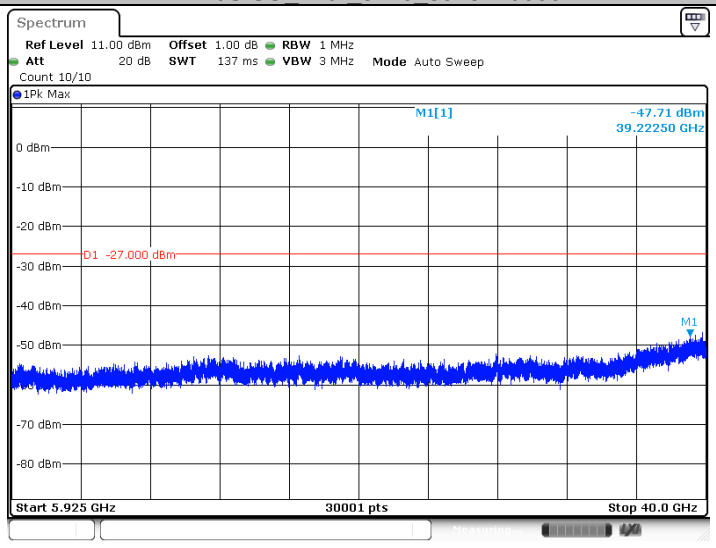


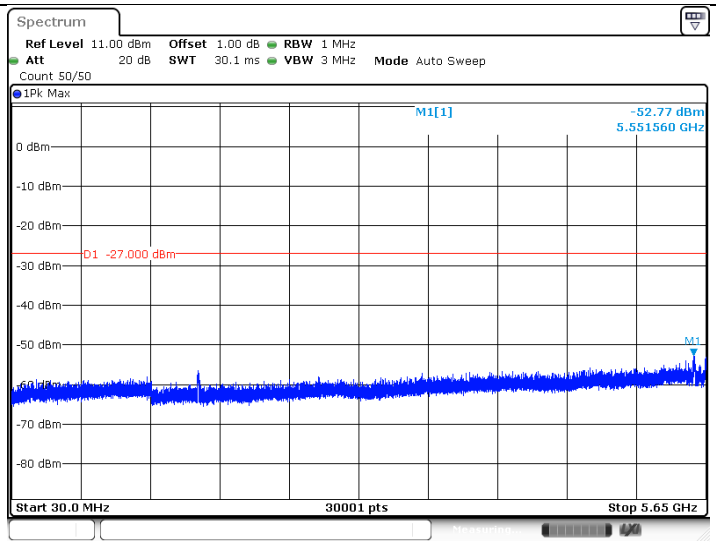
11N20SISO_Ant1_5720_30~5460



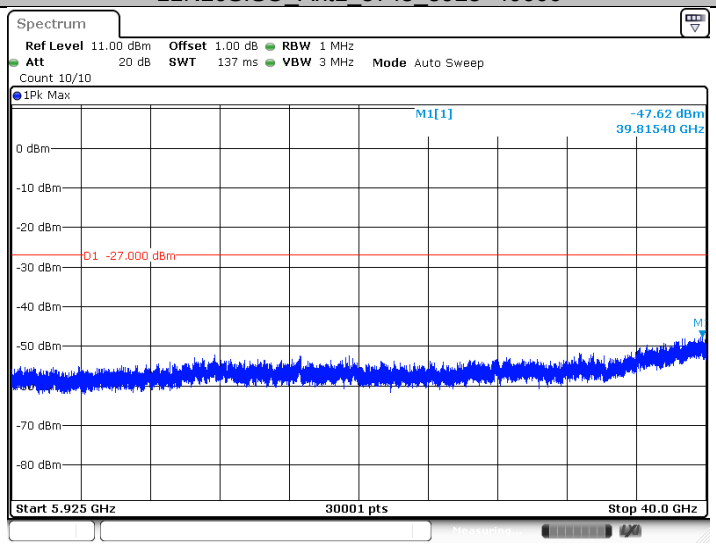
11N20SISO_Ant1_5720_5925~40000



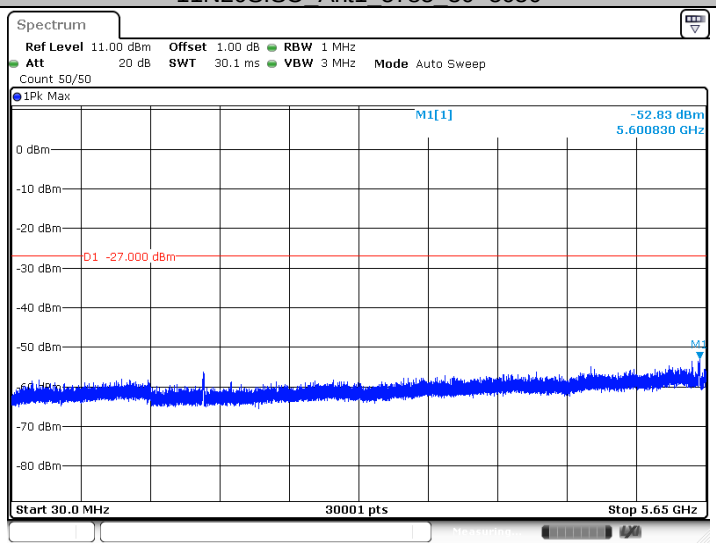
11N20SISO_Ant1_5745_30~5650



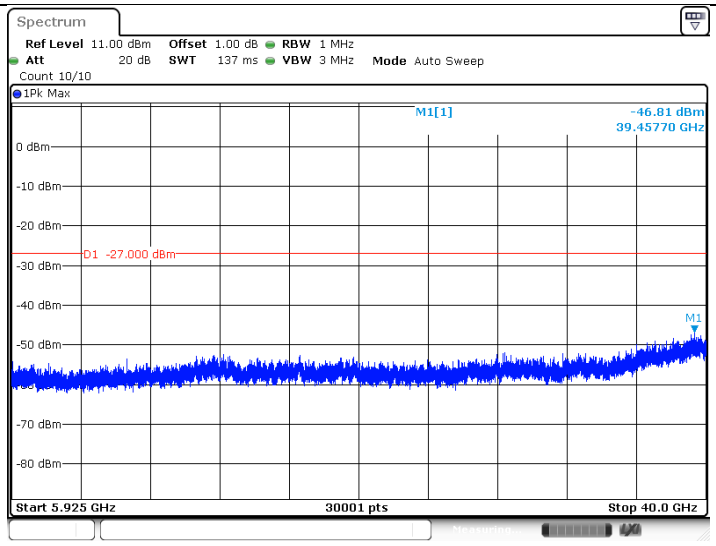
11N20SISO_Ant1_5745_5925~40000



11N20SISO_Ant1_5785_30~5650



11N20SISO_Ant1_5785_5925~40000



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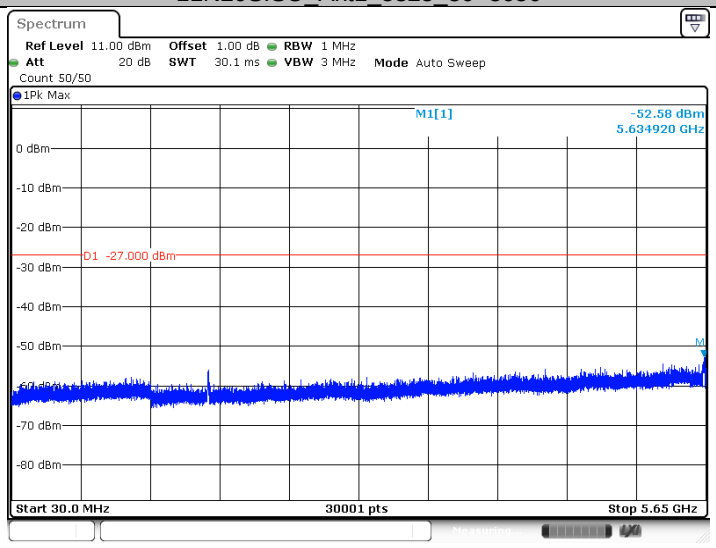
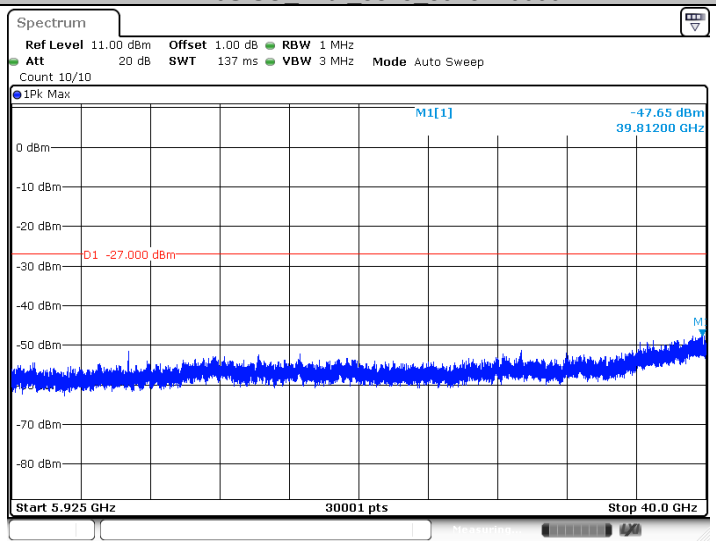


11N20SISO_Ant1_5825_5925~40000



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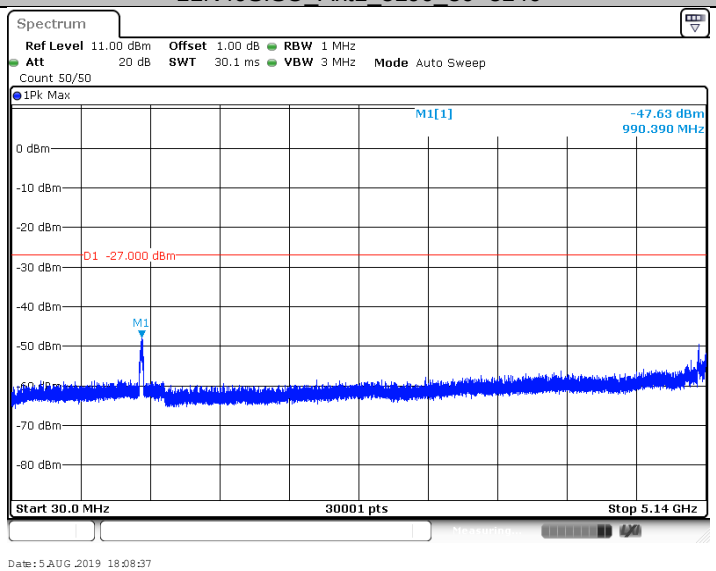
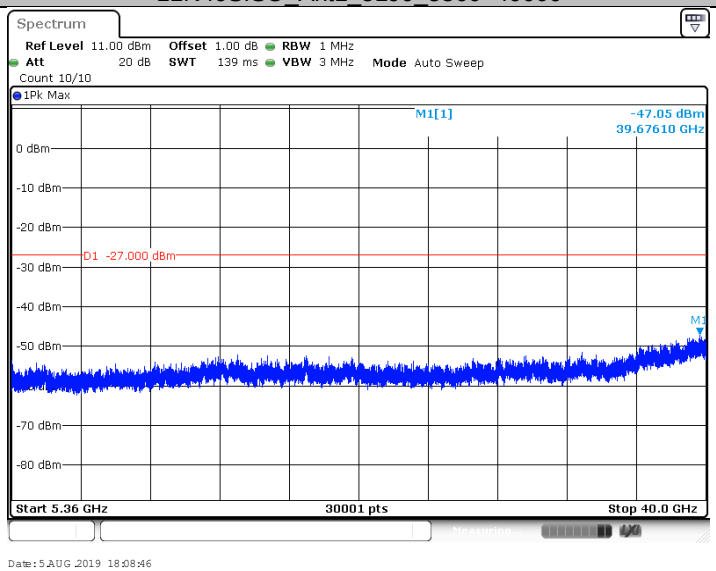
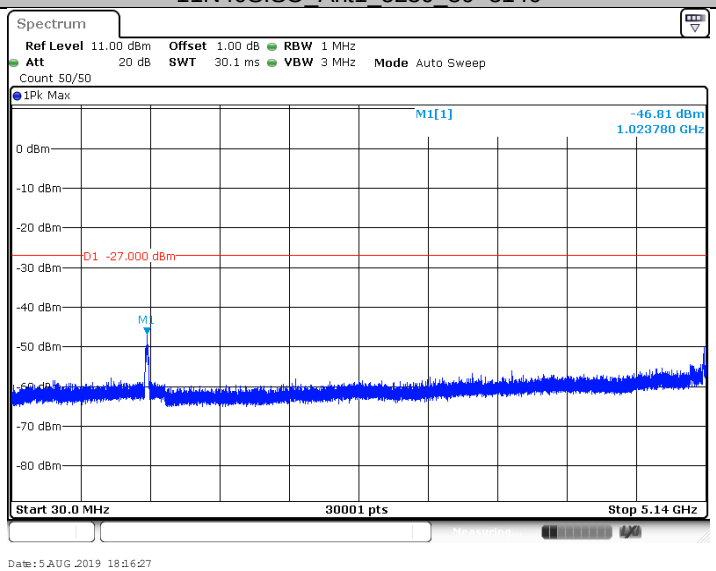
11N40SISO_Ant1_5190_30~5140



11N40SISO_Ant1_5190_5360~40000



11N40SISO_Ant1_5230_30~5140



11N40SISO_Ant1_5230_5360~40000

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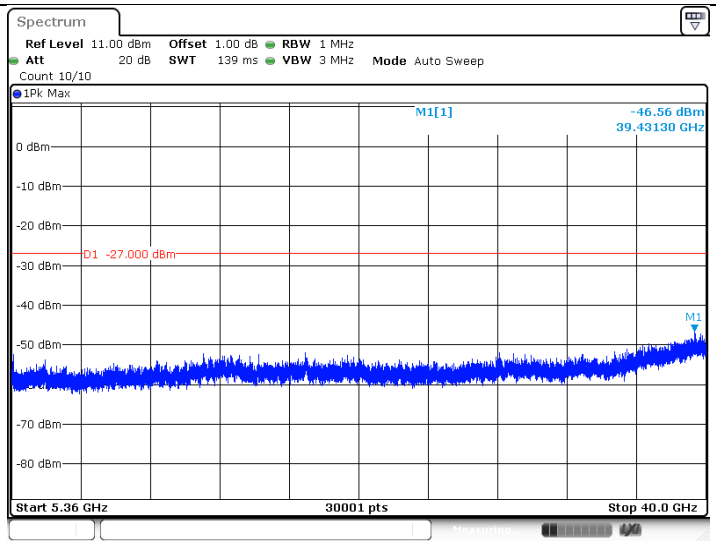
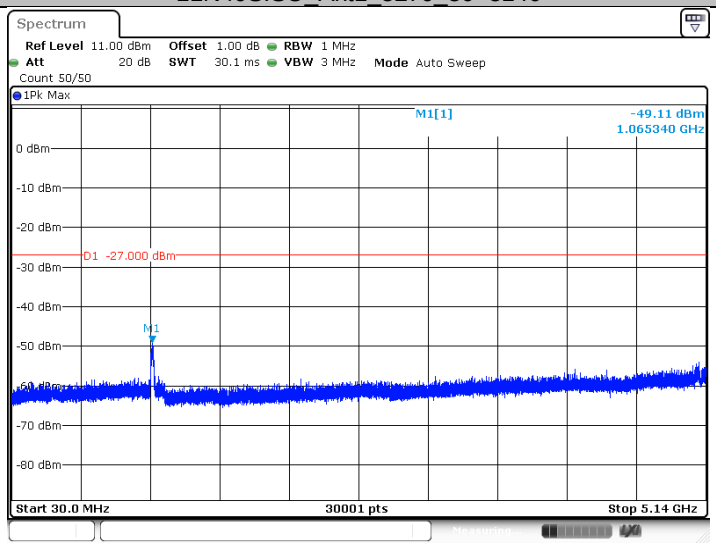
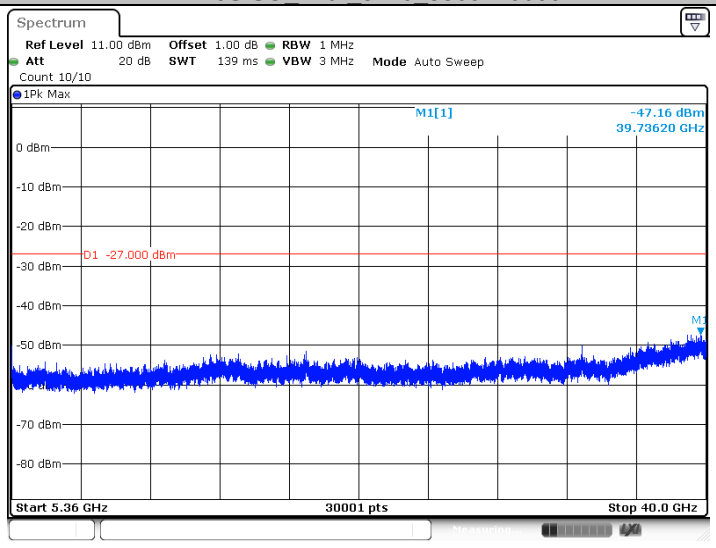


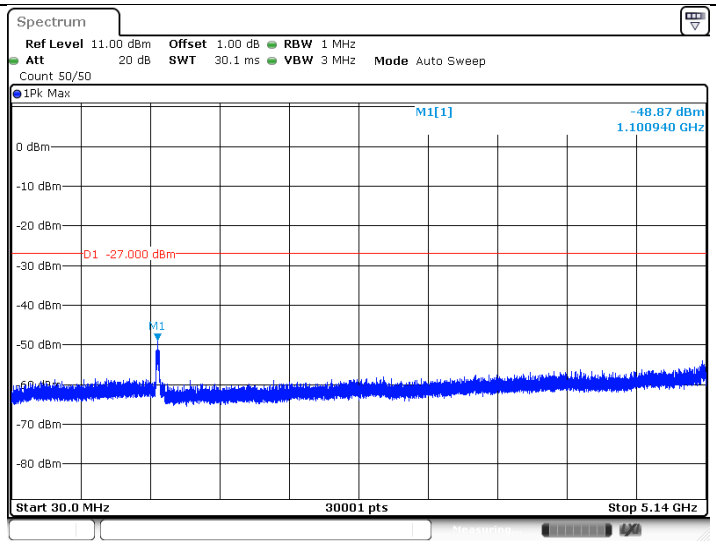
11N40SISO_Ant1_5270_30~5140



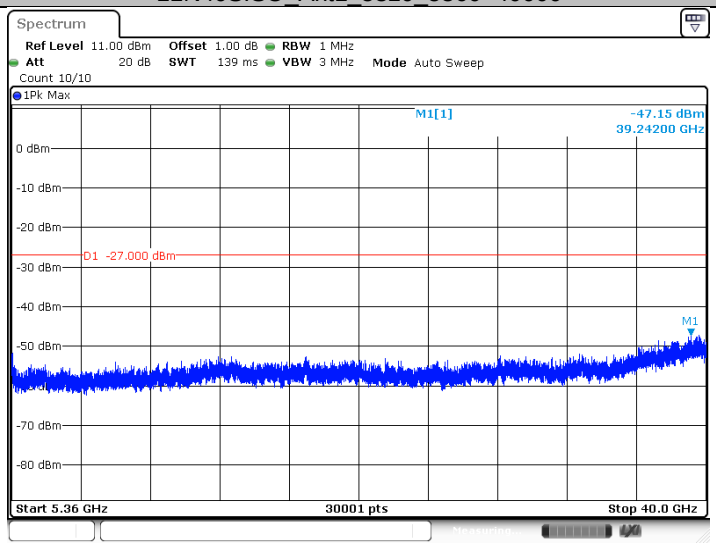
11N40SISO_Ant1_5270_5360~40000



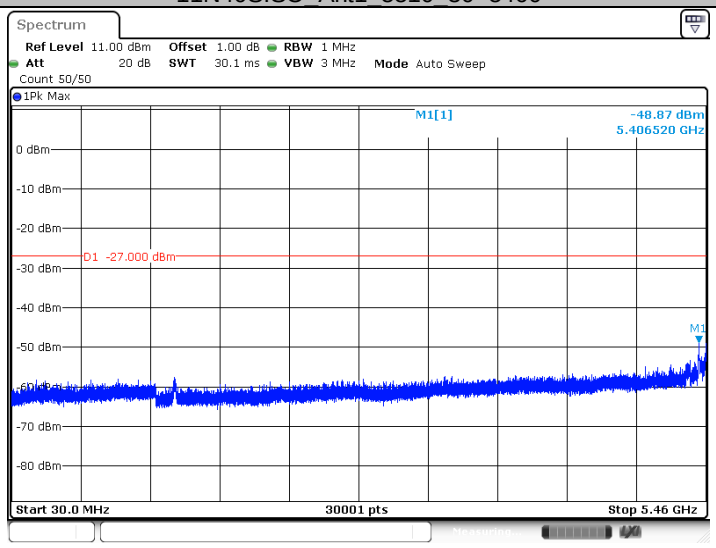
11N40SISO_Ant1_5310_30~5140



11N40SISO_Ant1_5310_5360~40000



11N40SISO_Ant1_5510_30~5460



11N40SISO_Ant1_5510_5735~40000

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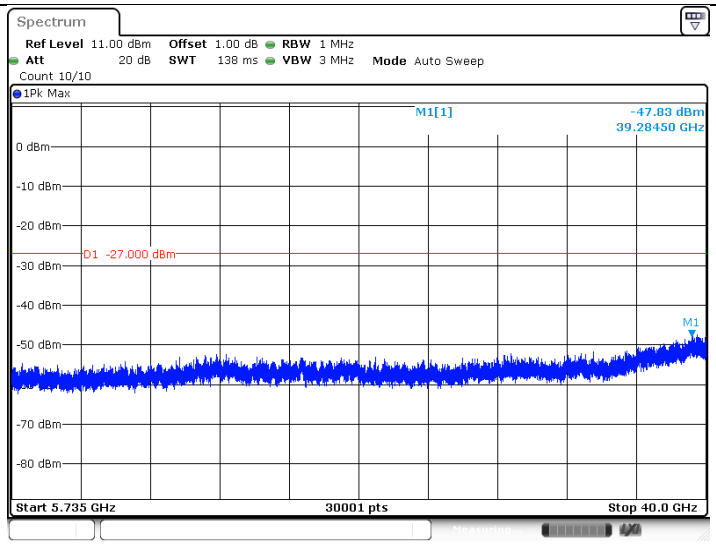
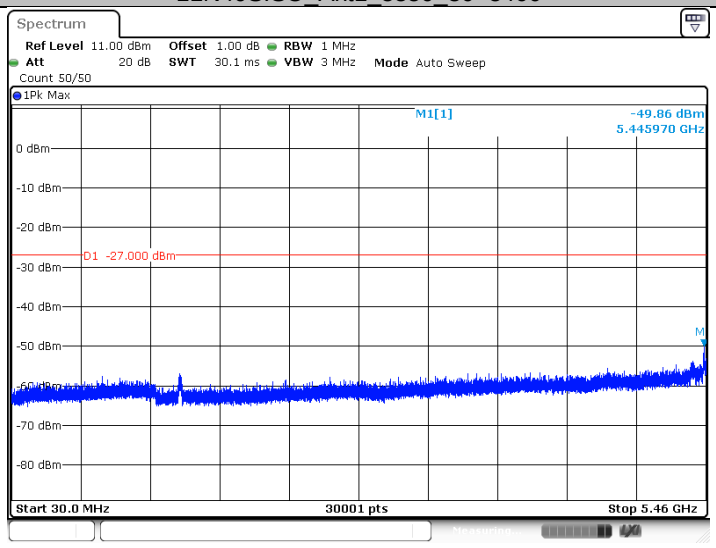
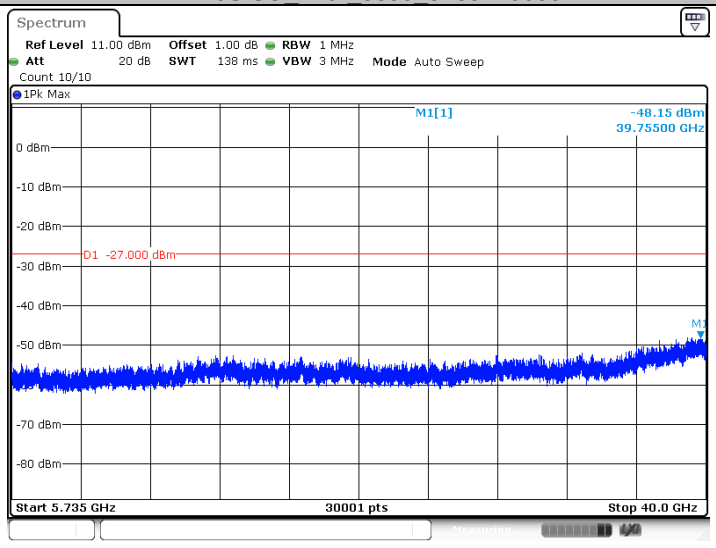


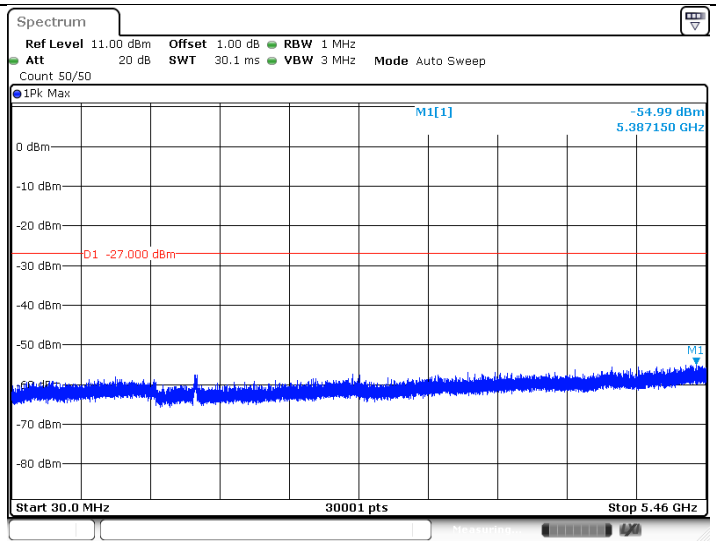
11N40SISO_Ant1_5550_30~5460



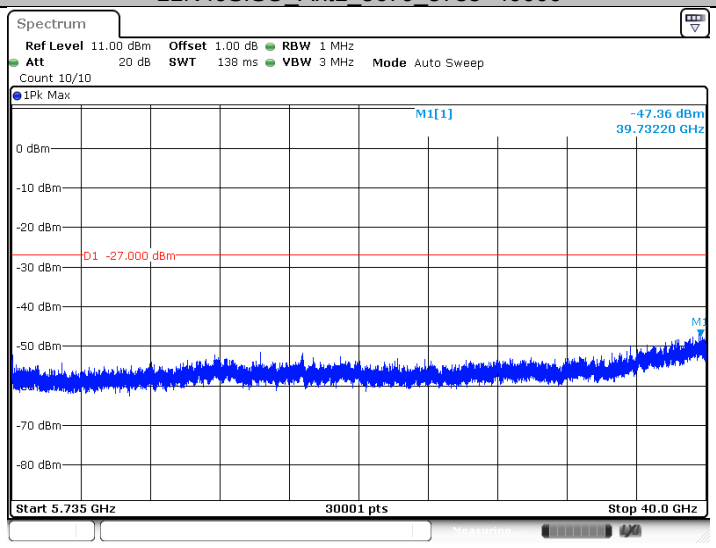
11N40SISO_Ant1_5550_5735~40000



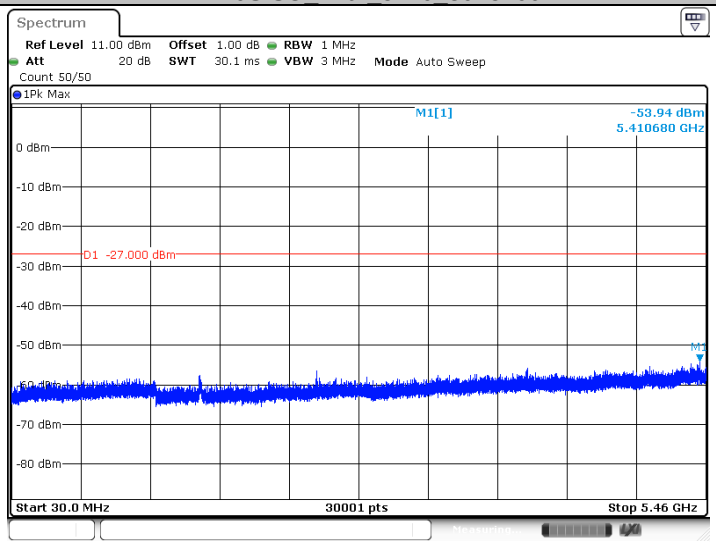
11N40SISO_Ant1_5670_30~5460



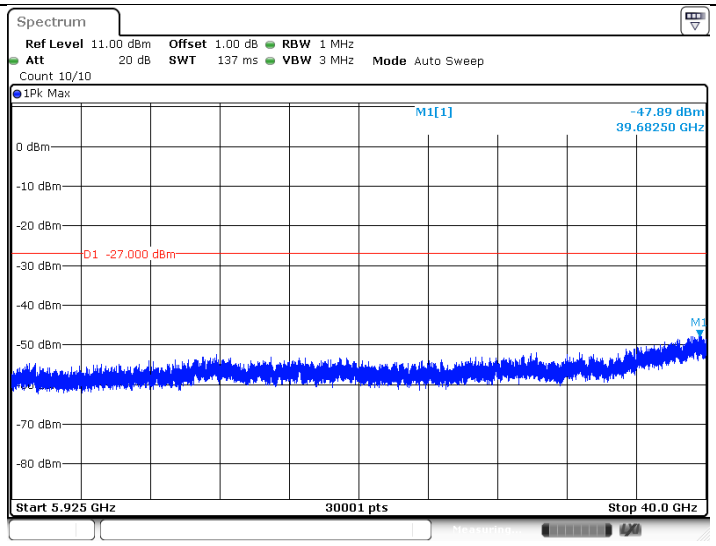
11N40SISO_Ant1_5670_5735~40000



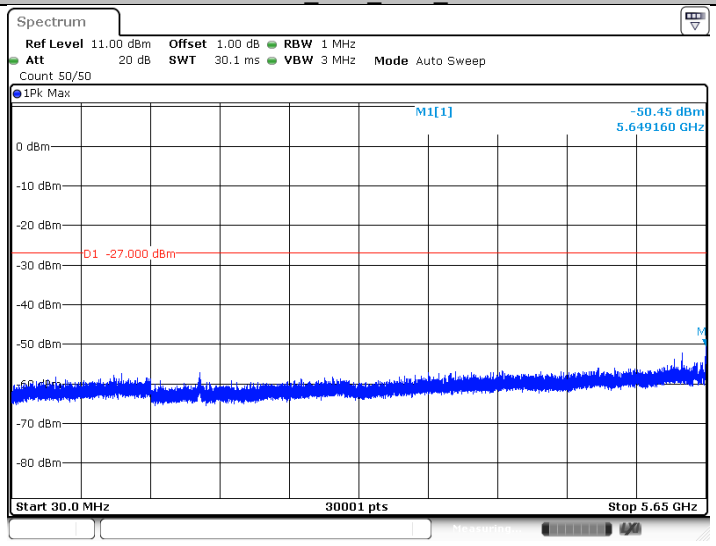
11N40SISO_Ant1_5710_30~5460



11N40SISO_Ant1_5710_5925~40000



11N40SISO_Ant1_5755_30~5650



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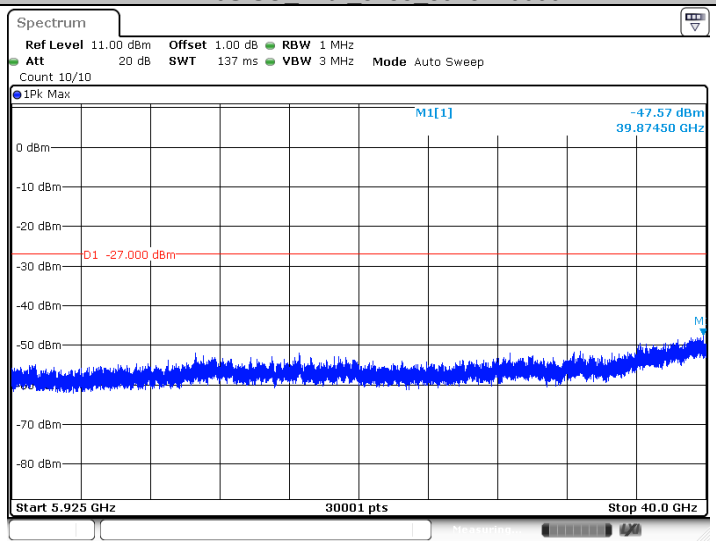

11N40SISO_Ant1_5795_30~5650

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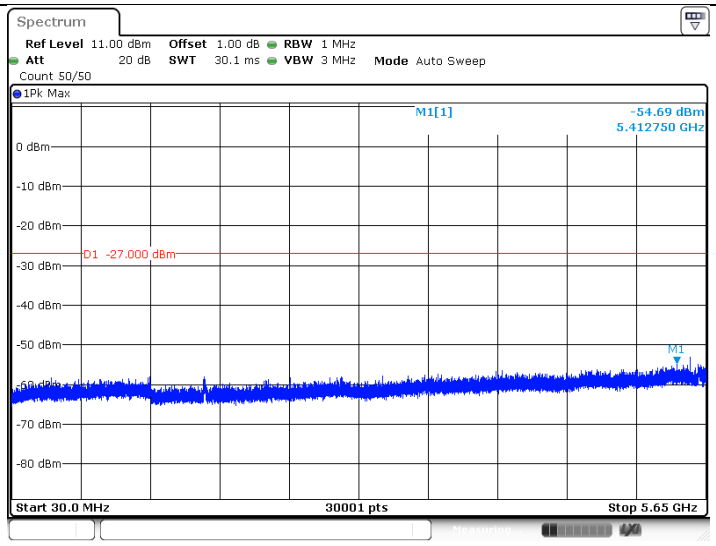
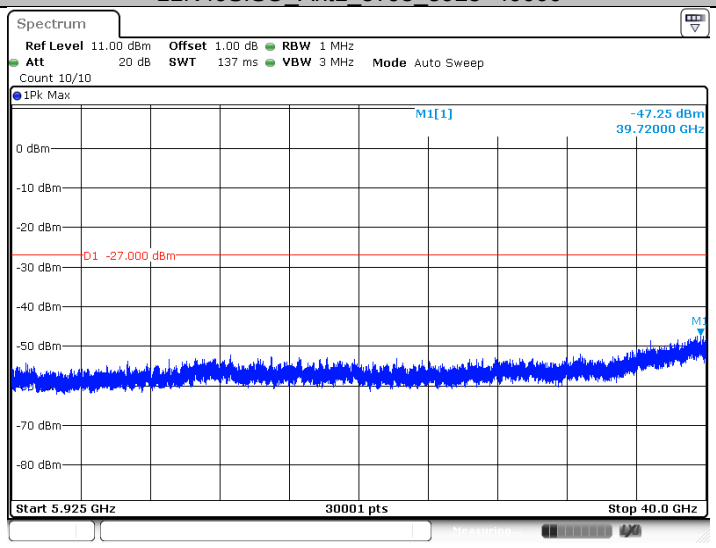
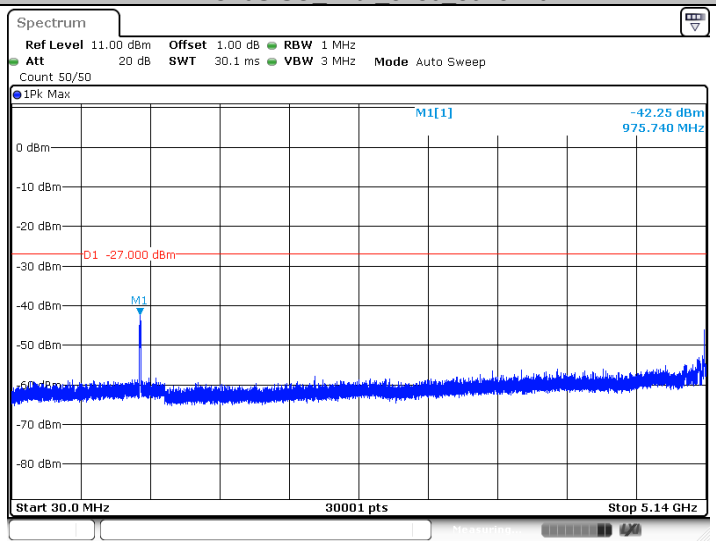


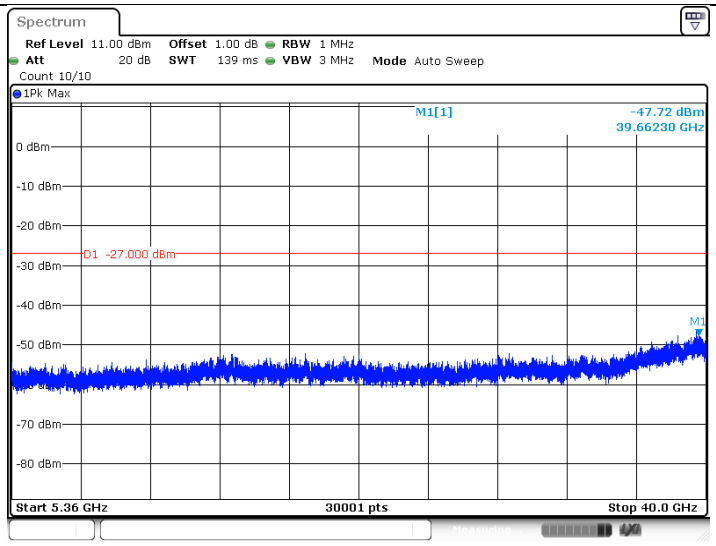
11N40SISO_Ant1_5795_5925~40000



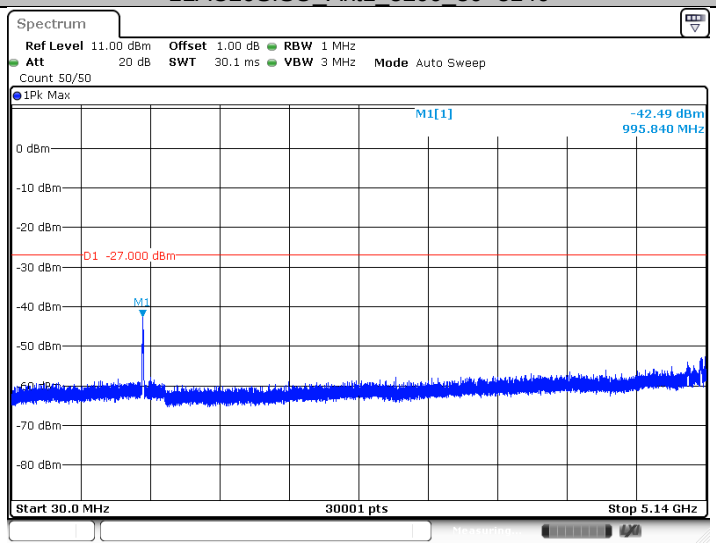
11AC20SISO_Ant1_5180_30~5140



11AC20SISO_Ant1_5180_5360~40000



11AC20SISO_Ant1_5200_30~5140



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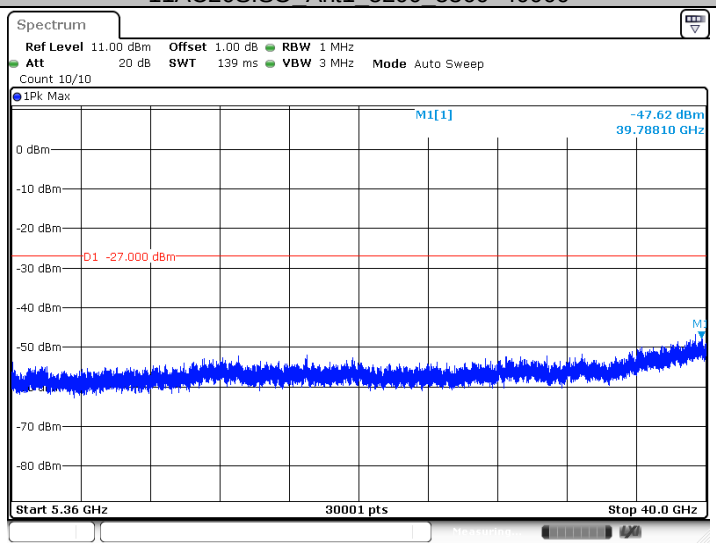
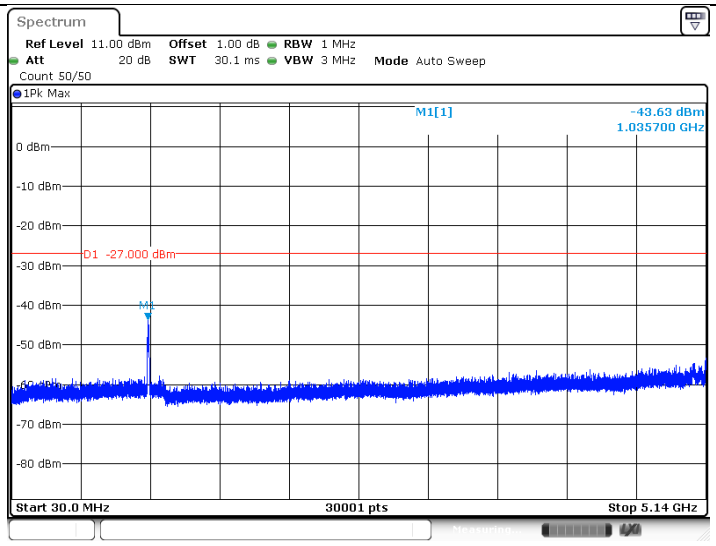


11AC20SISO_Ant1_5240_30~5140



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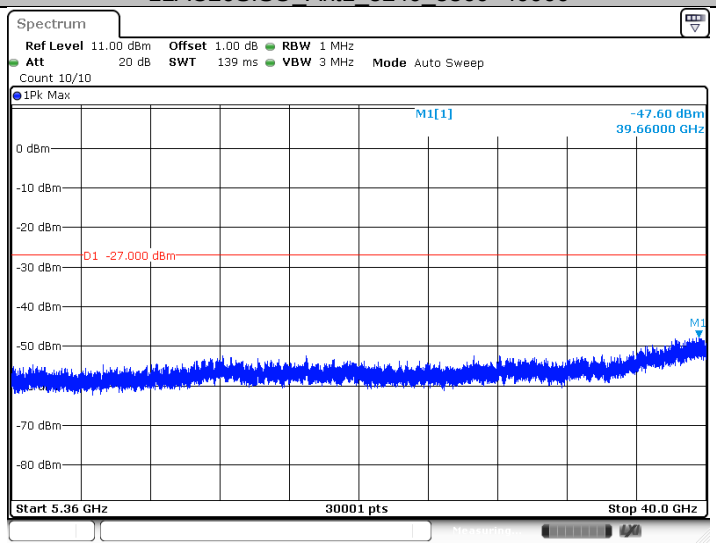
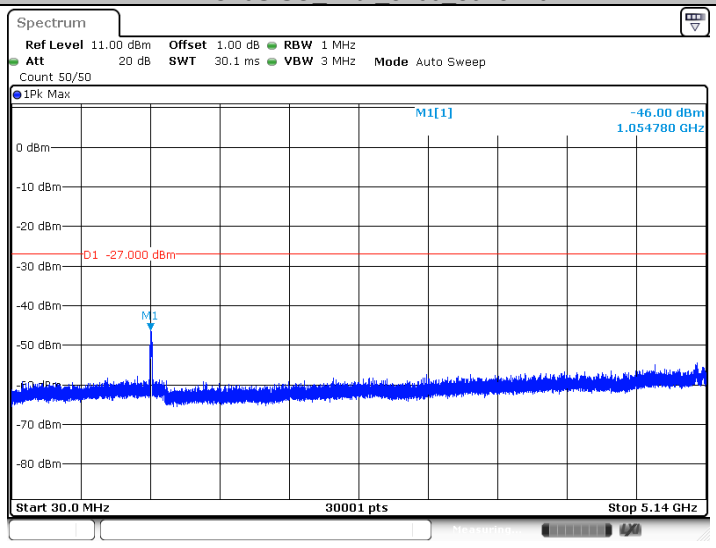
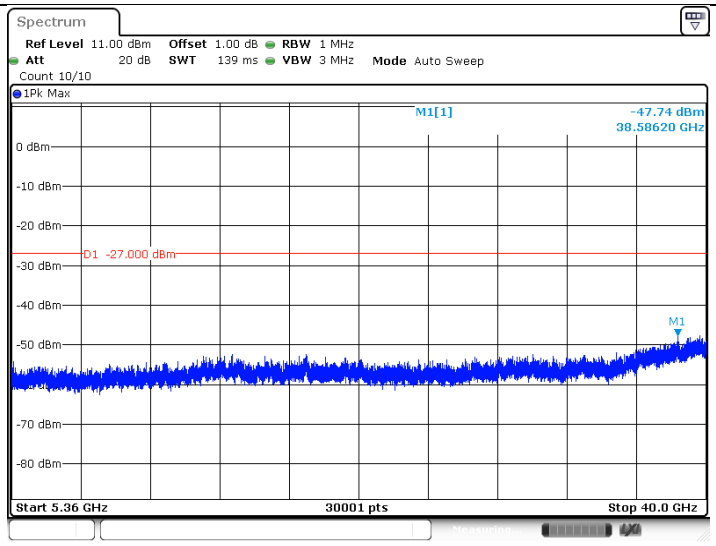


11AC20SISO_Ant1_5260_30~5140



11AC20SISO_Ant1_5260_5360~40000



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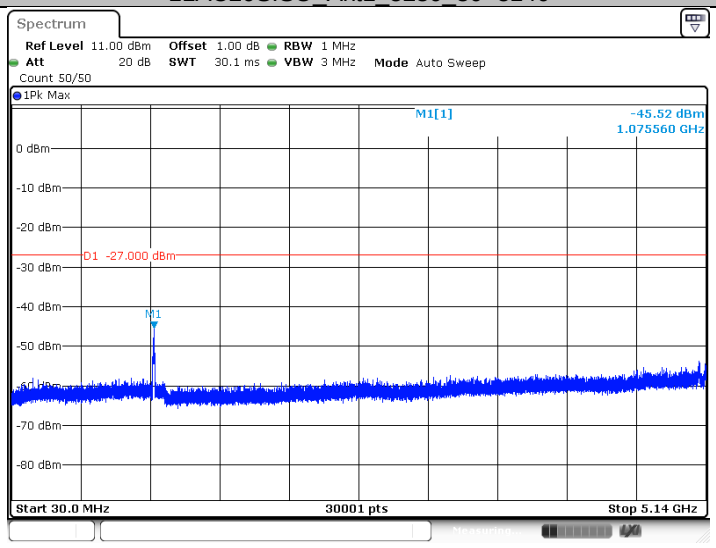

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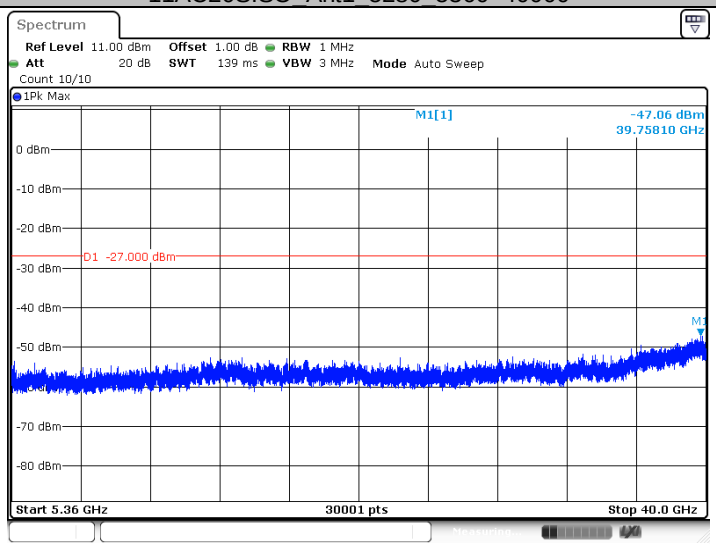

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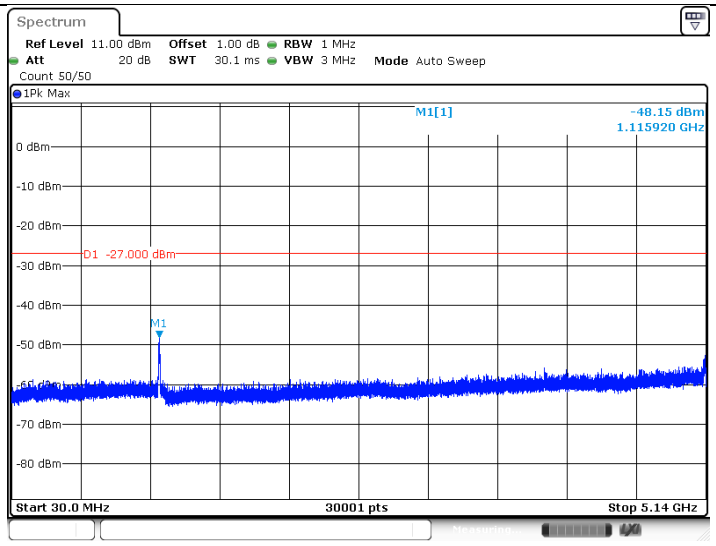

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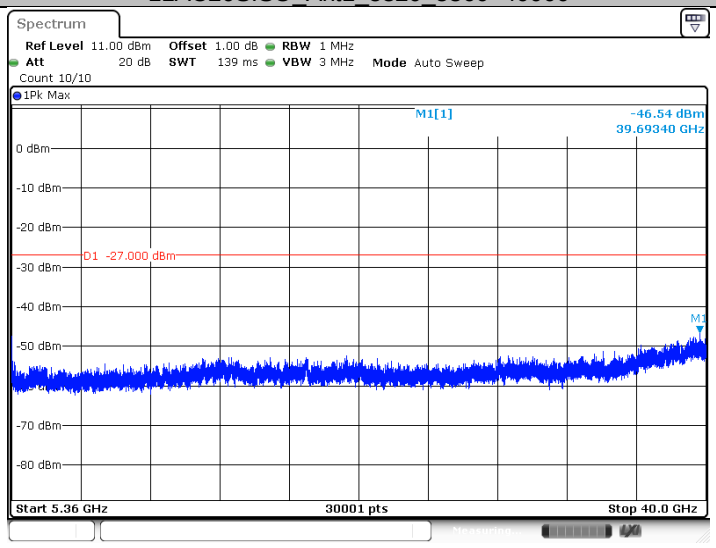
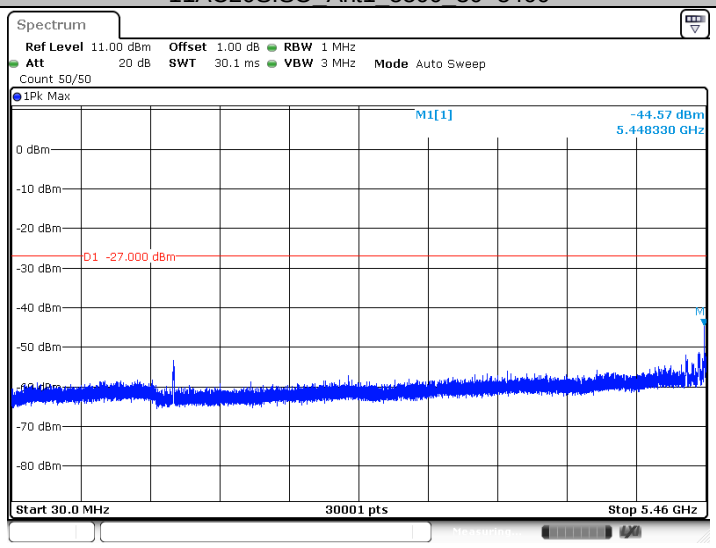


11AC20SISO_Ant1_5500_30~5460



11AC20SISO_Ant1_5500_5735~40000

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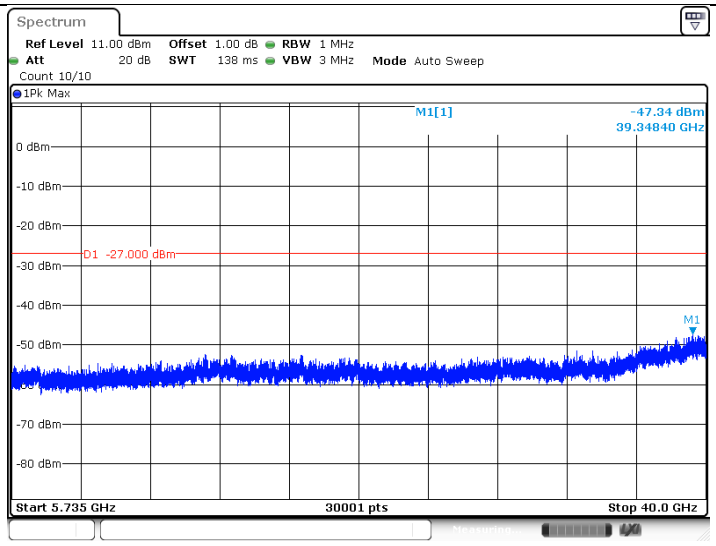

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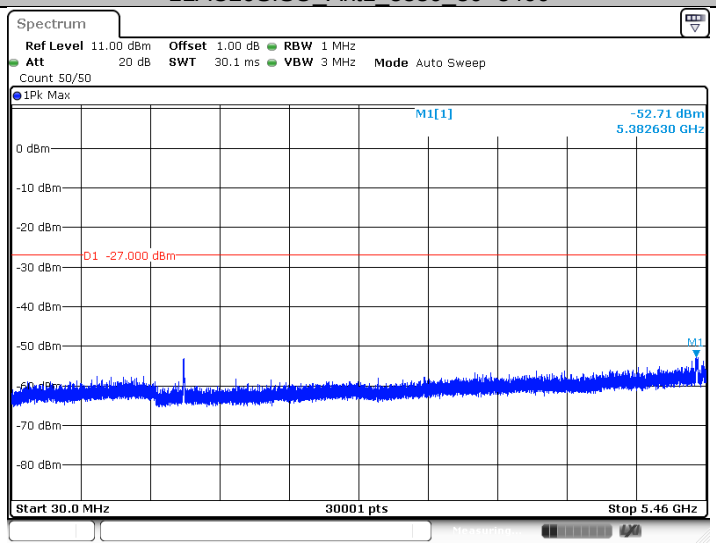

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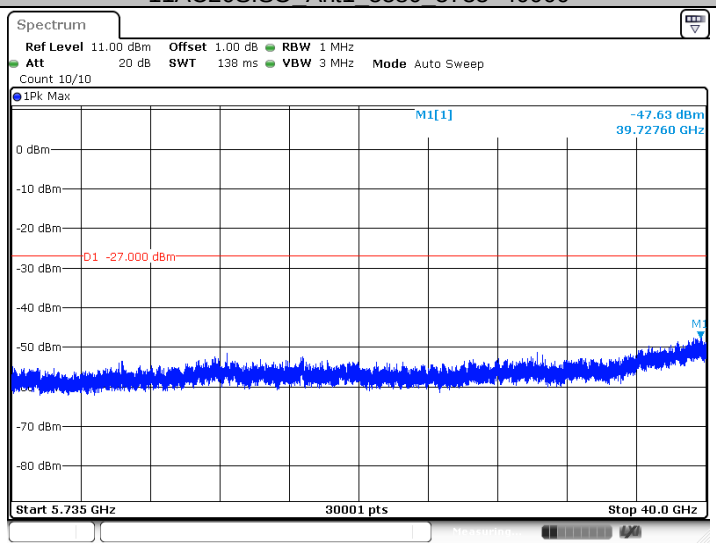

11AC20SISO_Ant1_5700_30~5460

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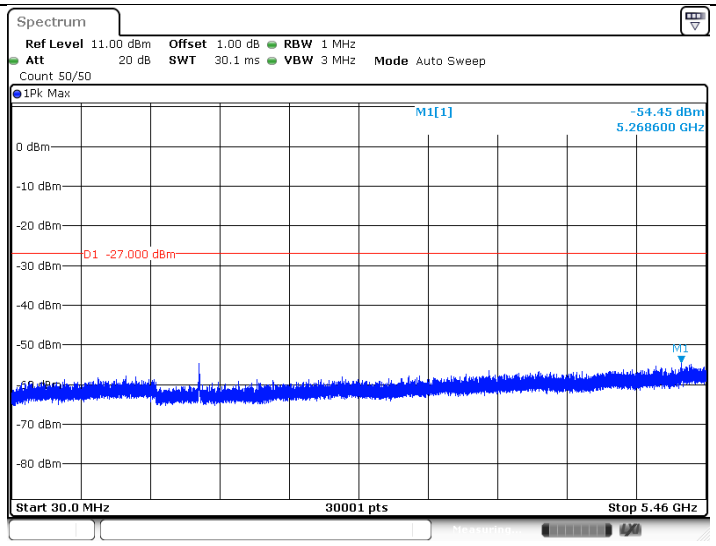

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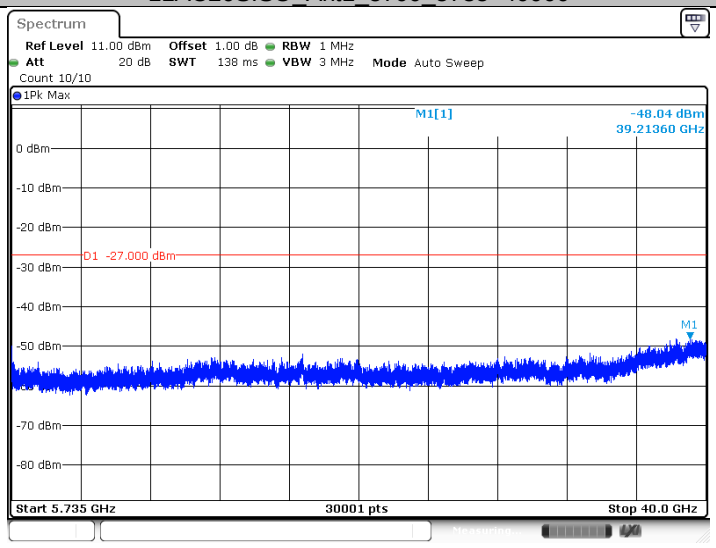

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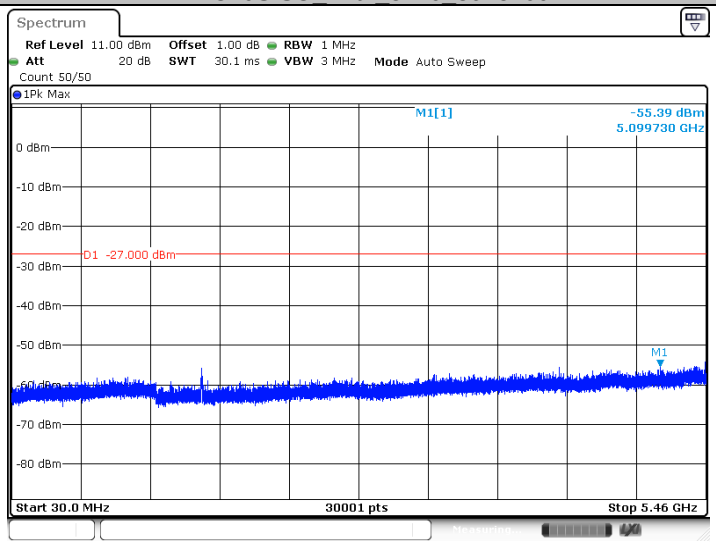

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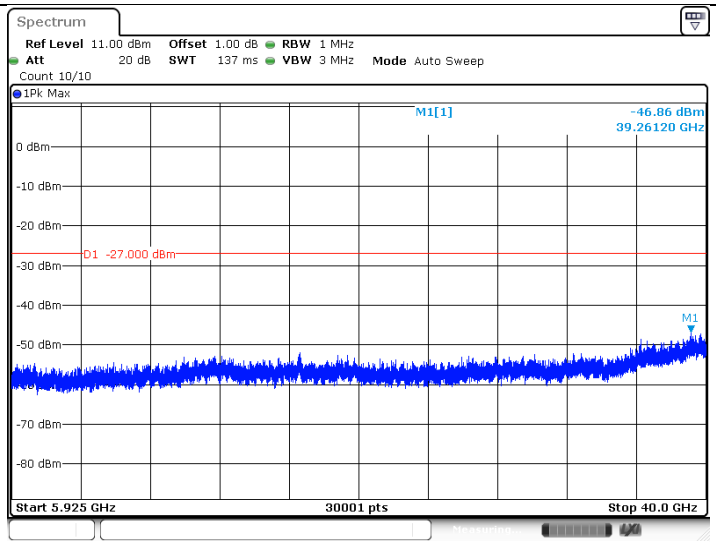

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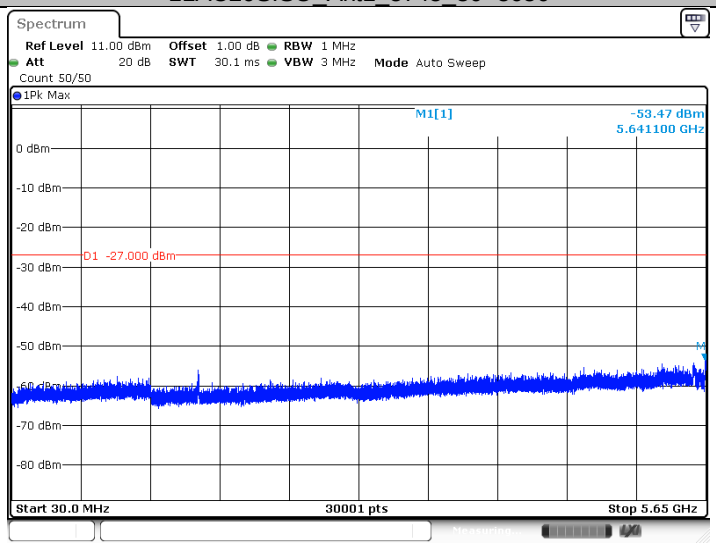

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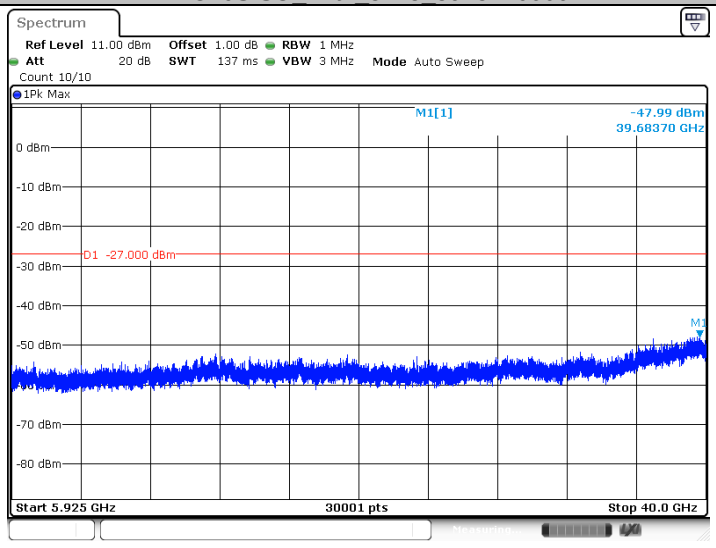

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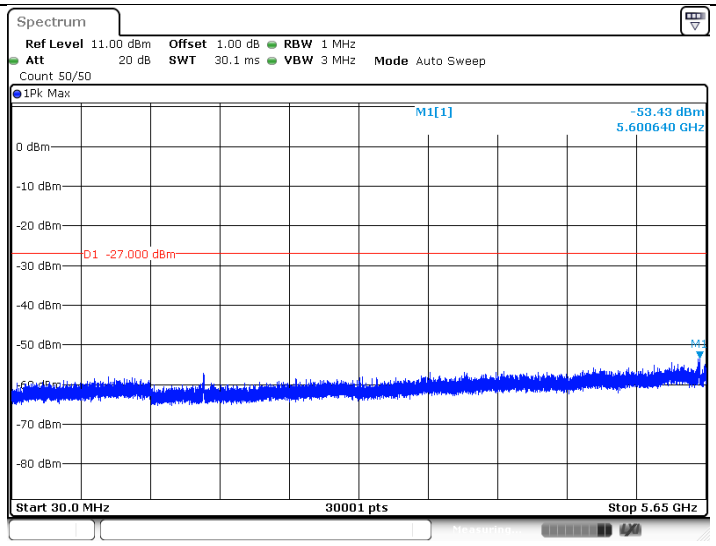

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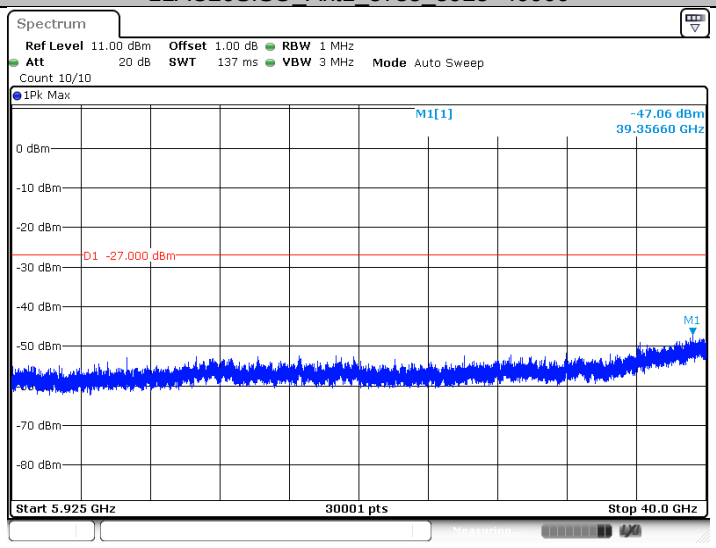

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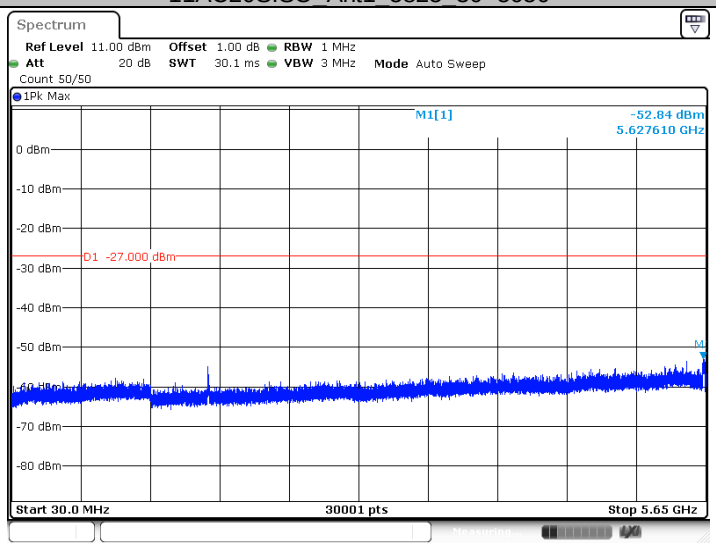

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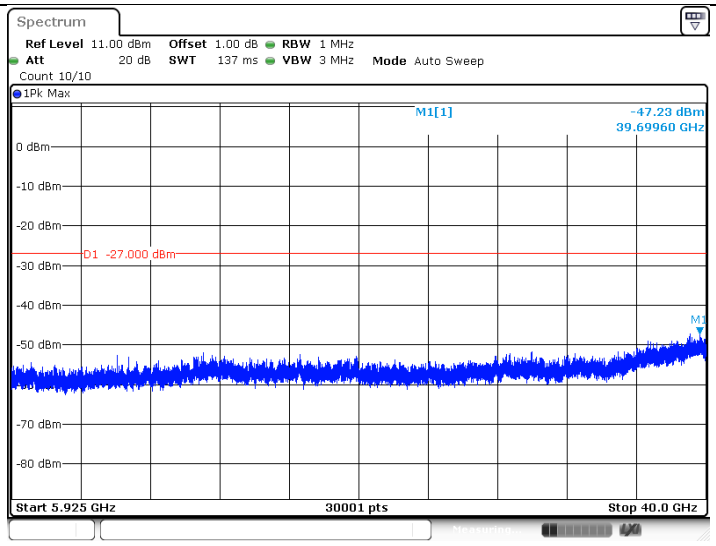

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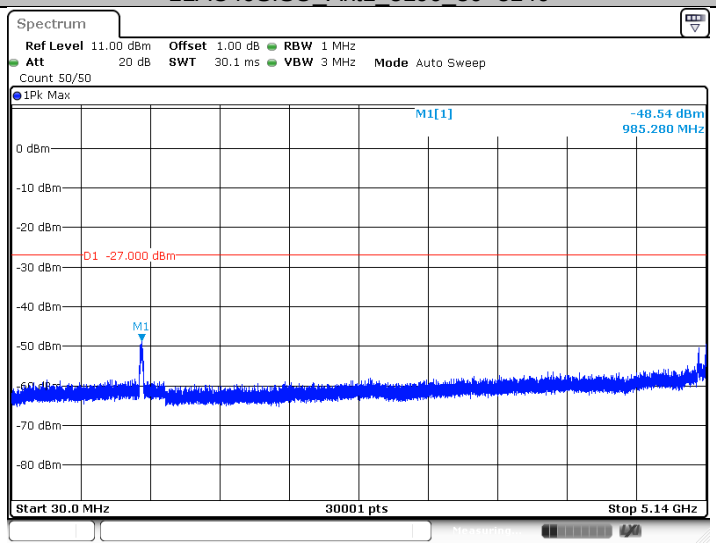

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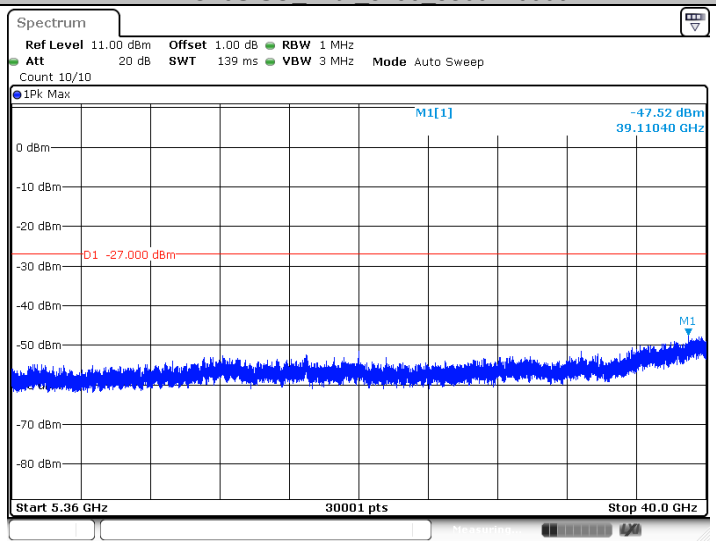

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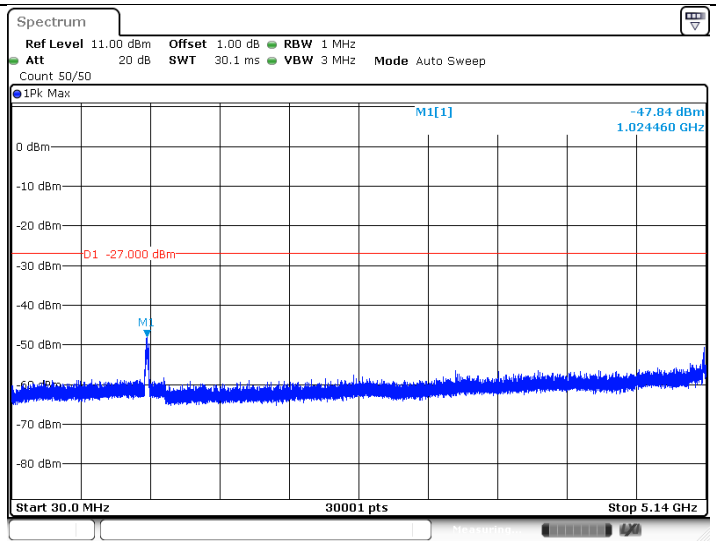

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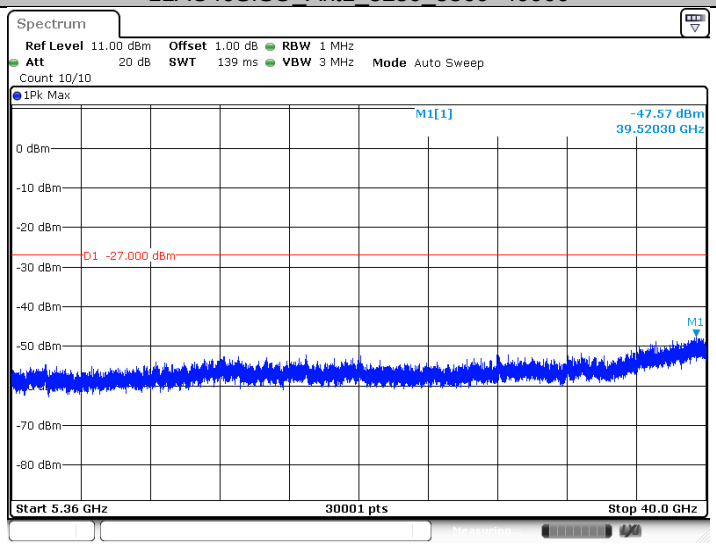

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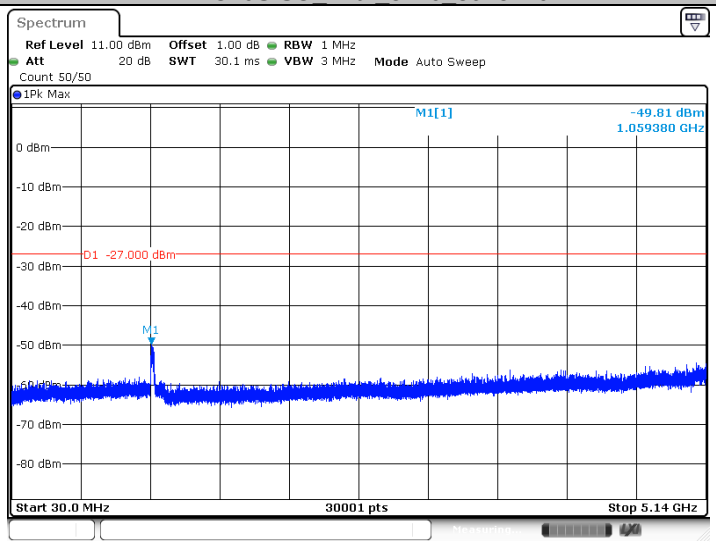

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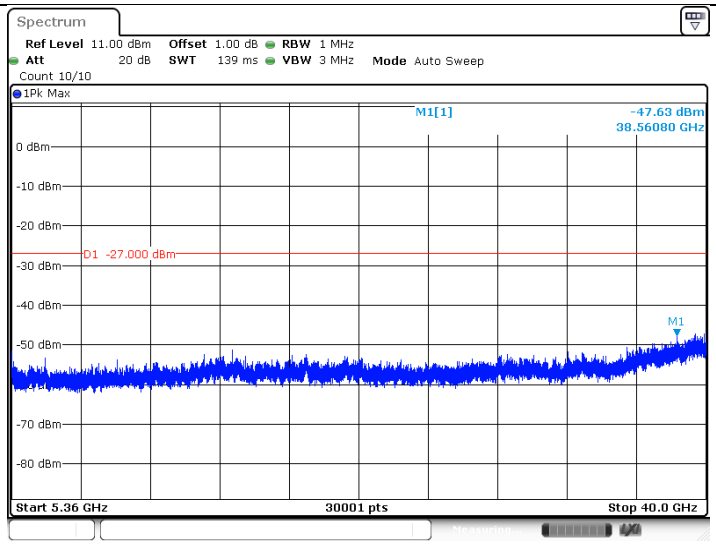

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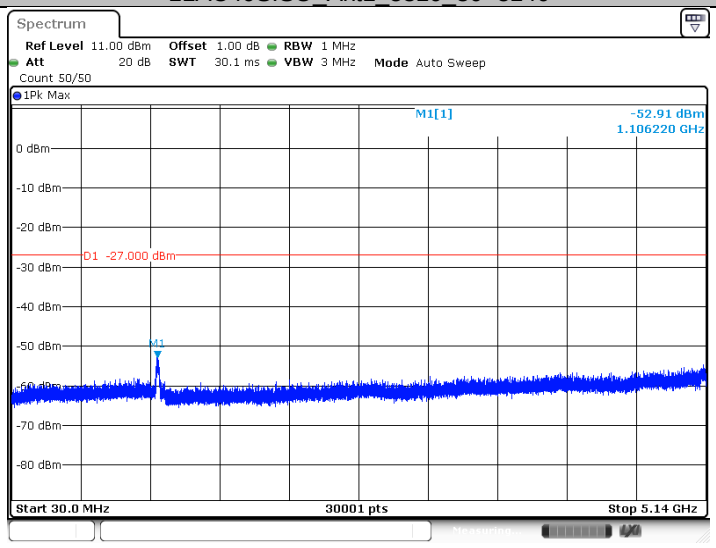

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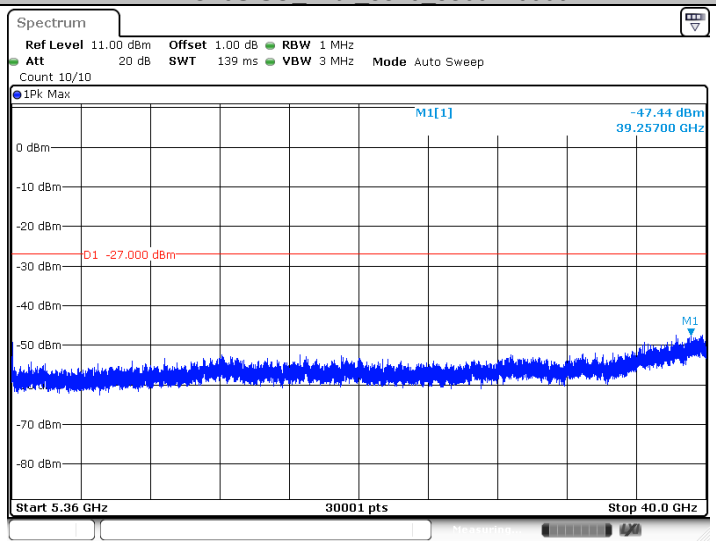

11AC40SISO_Ant1_5510_30~5460

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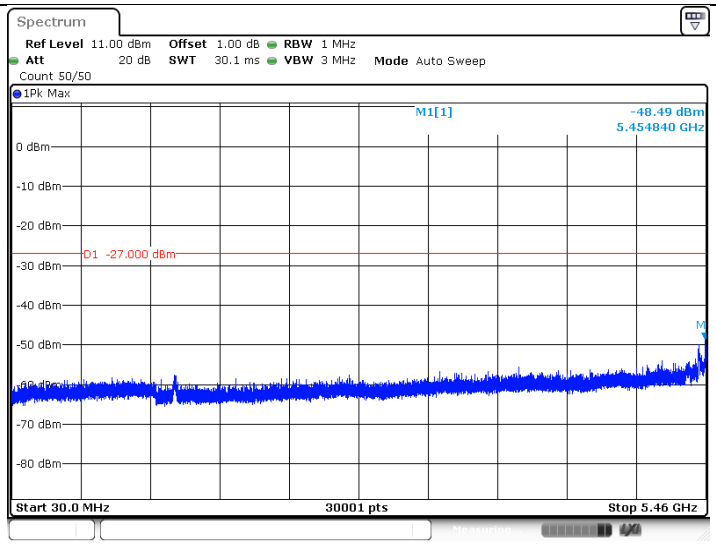

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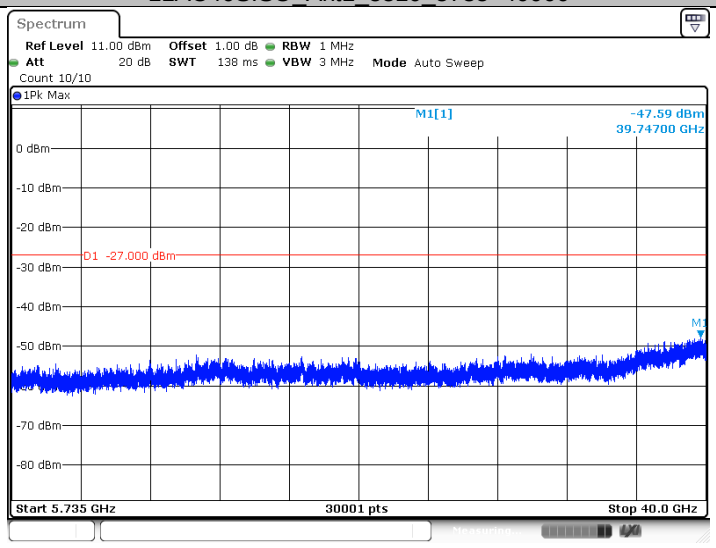

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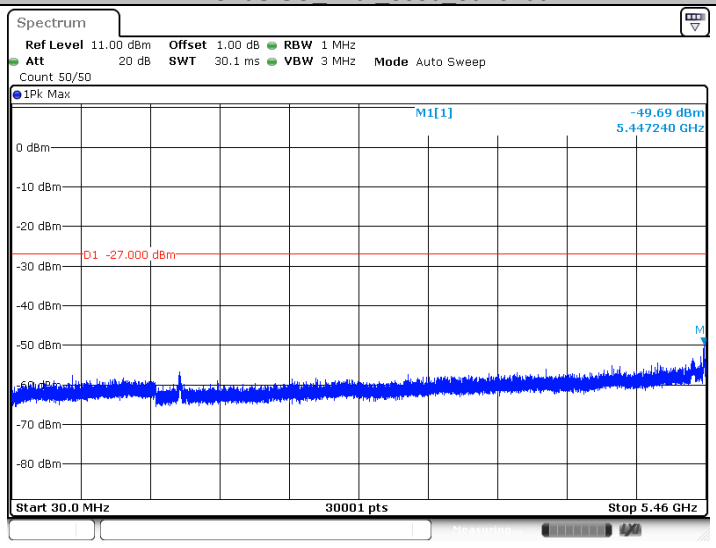

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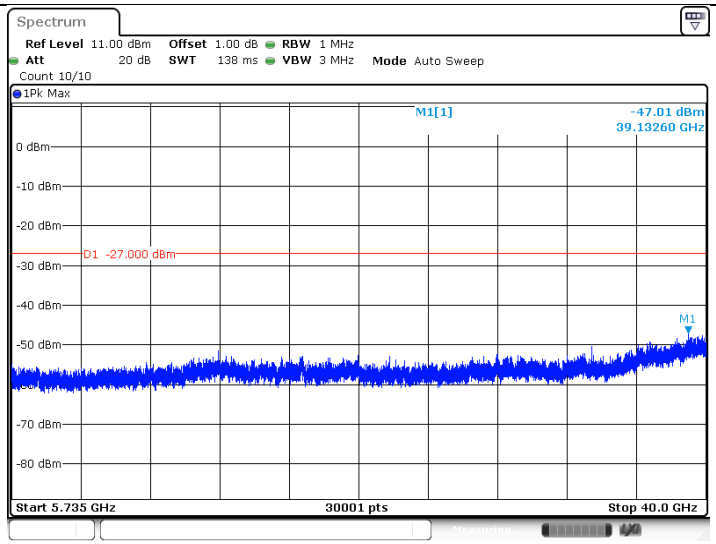

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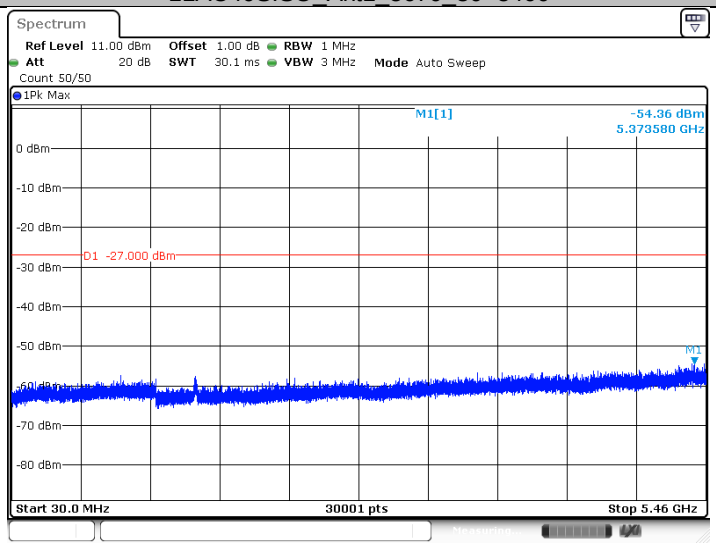

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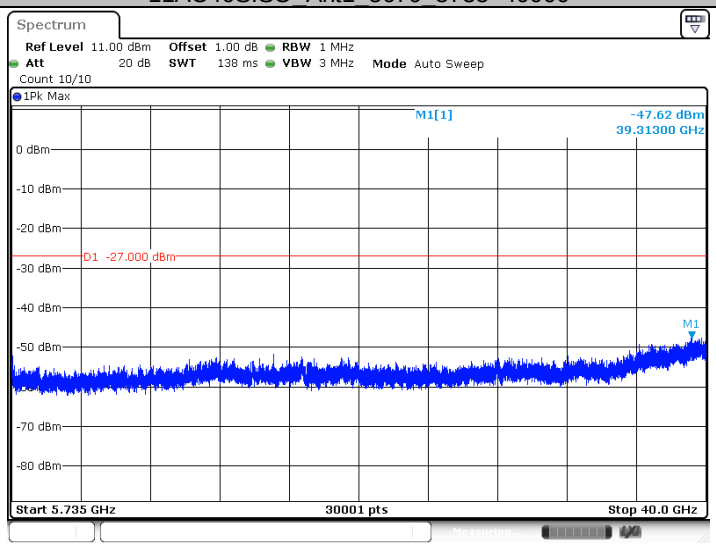

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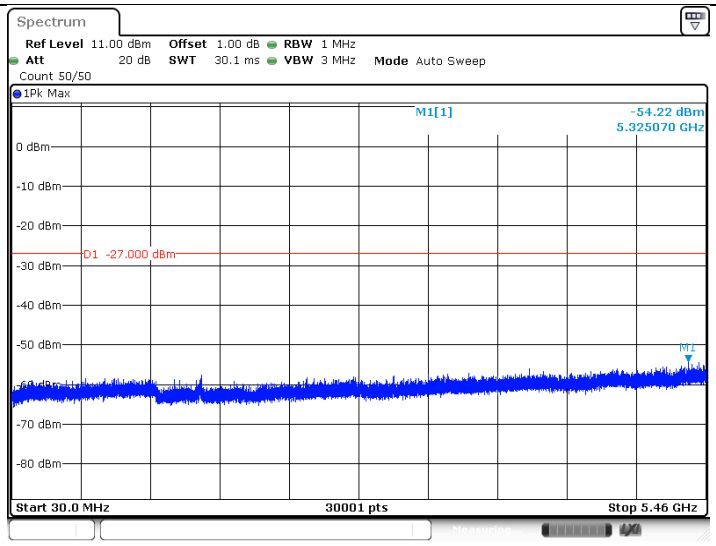

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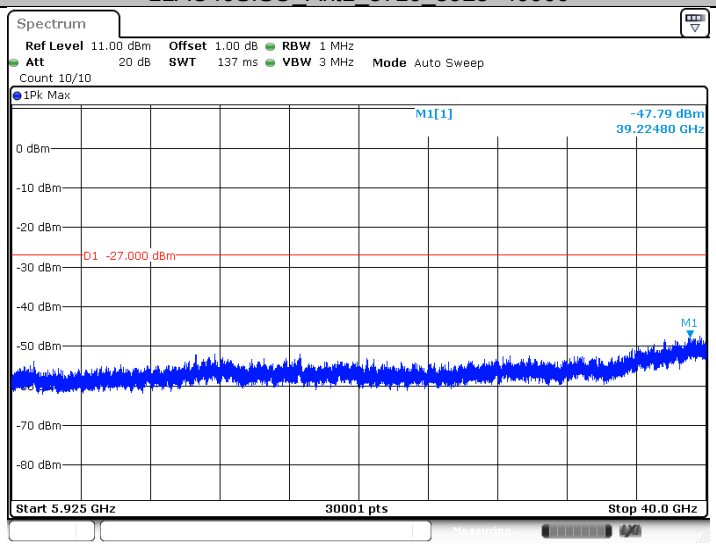

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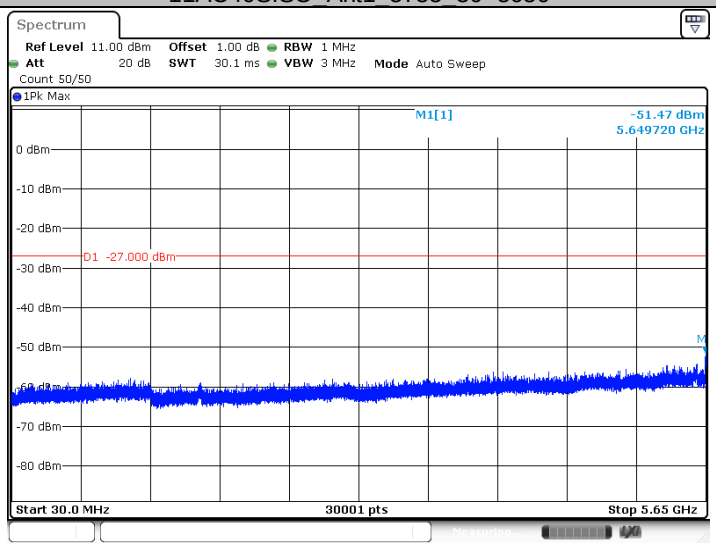

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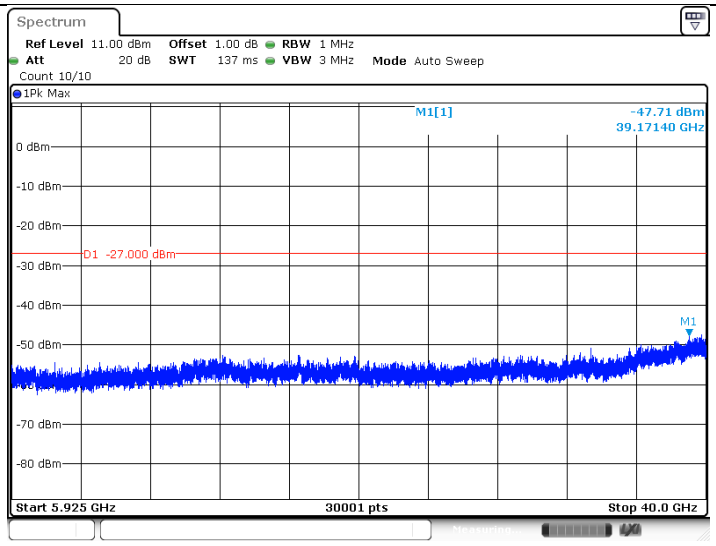

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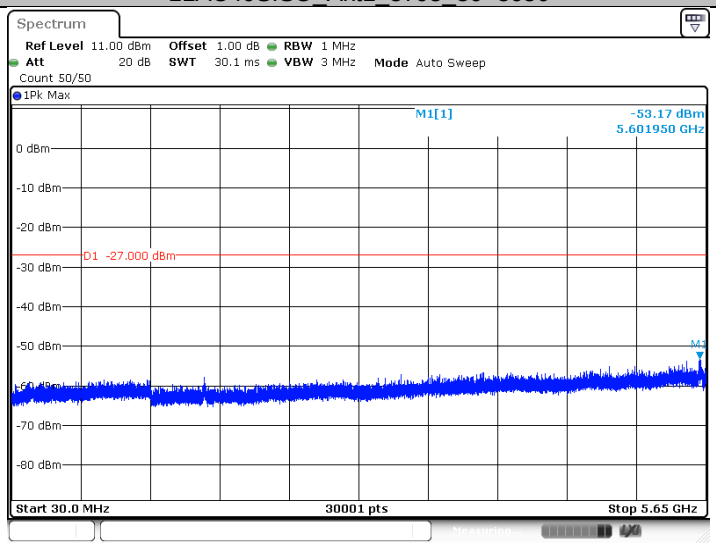

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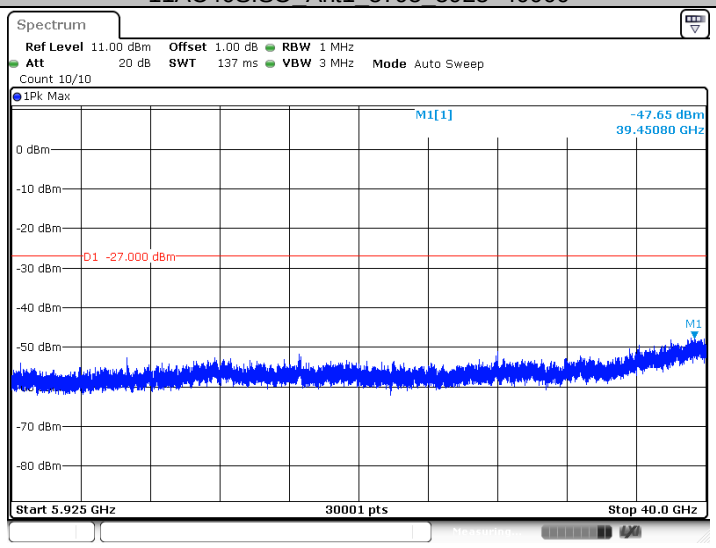

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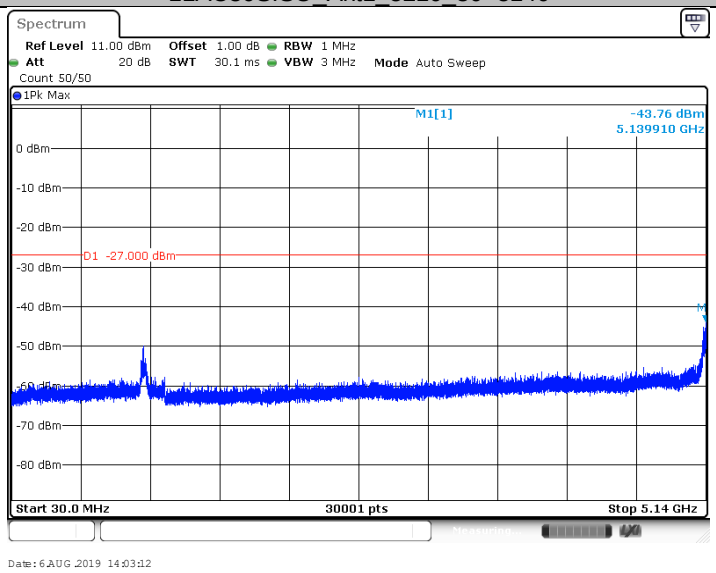

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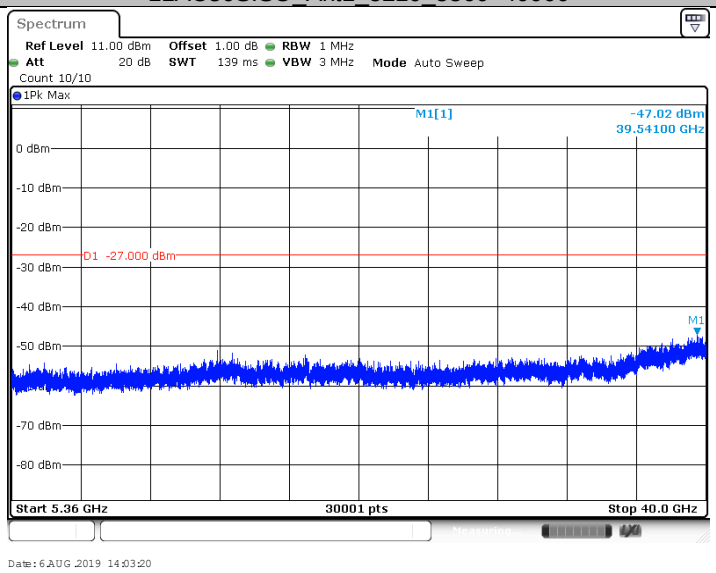

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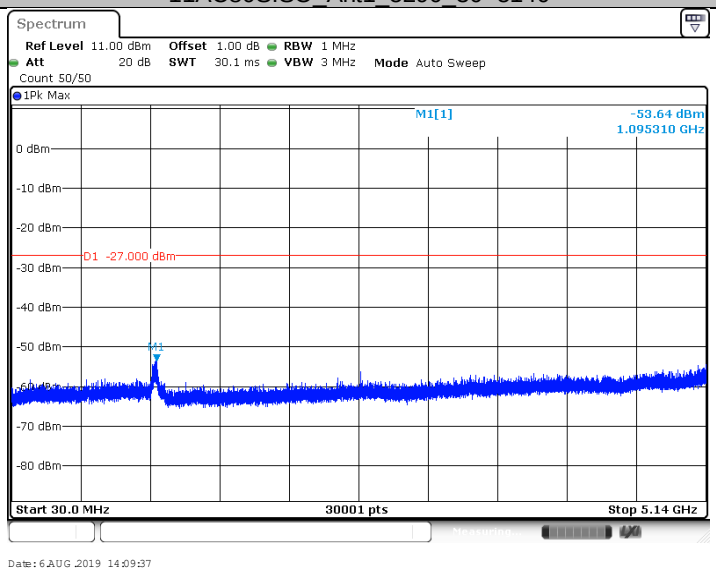

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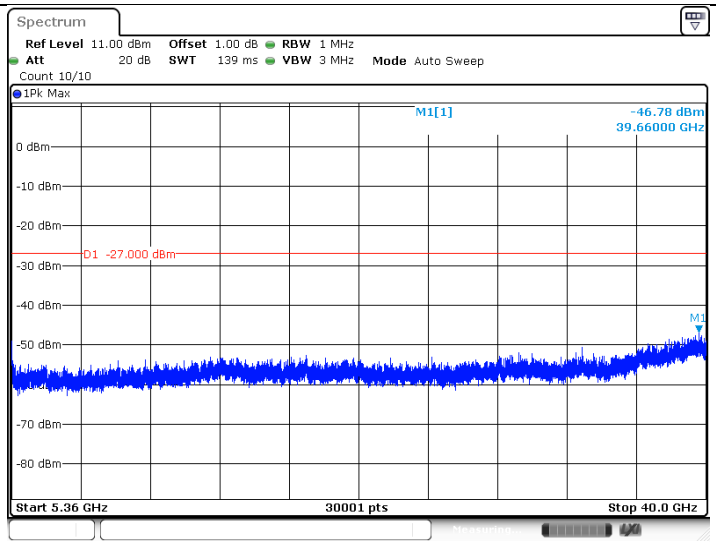

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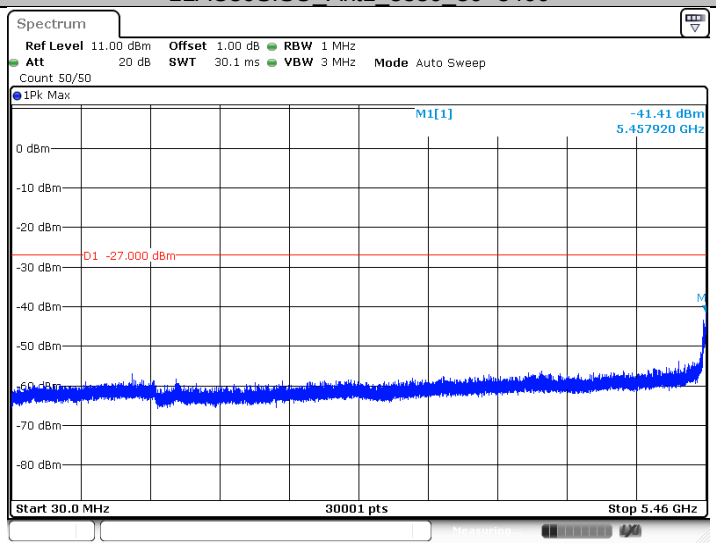

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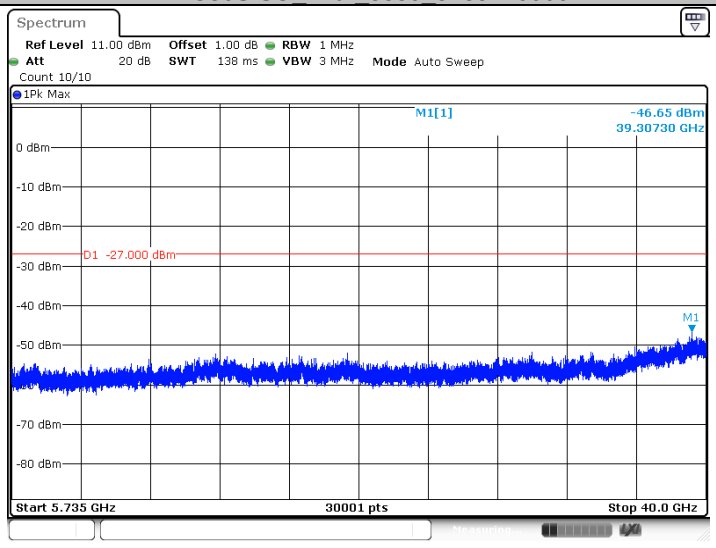

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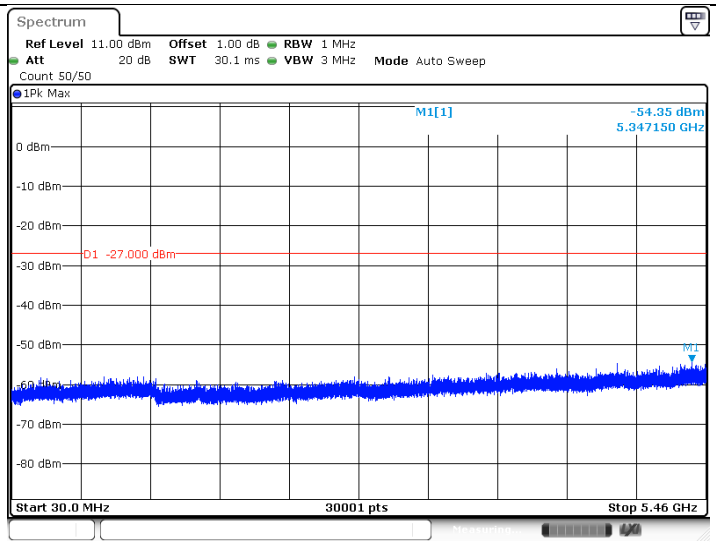

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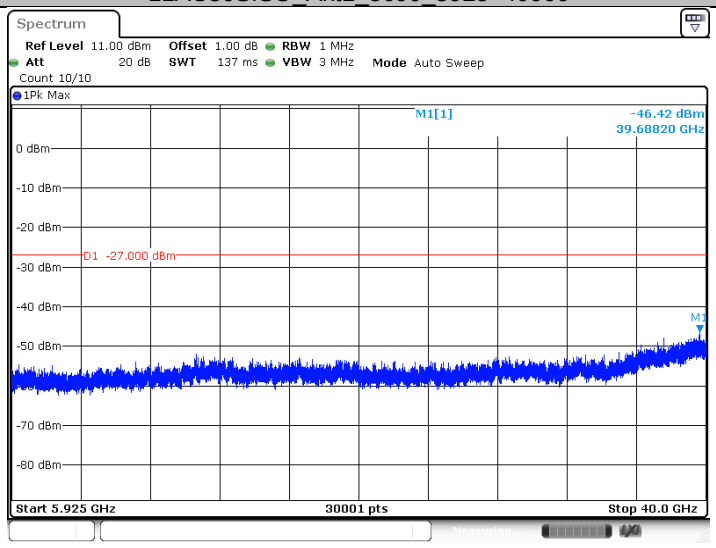

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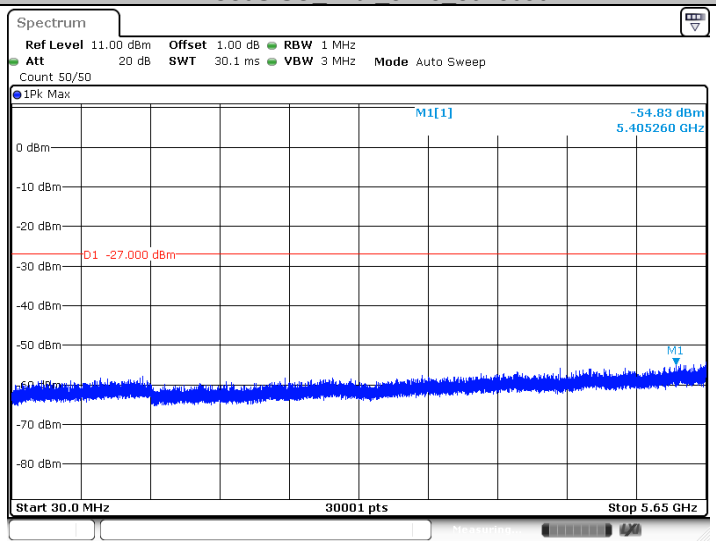

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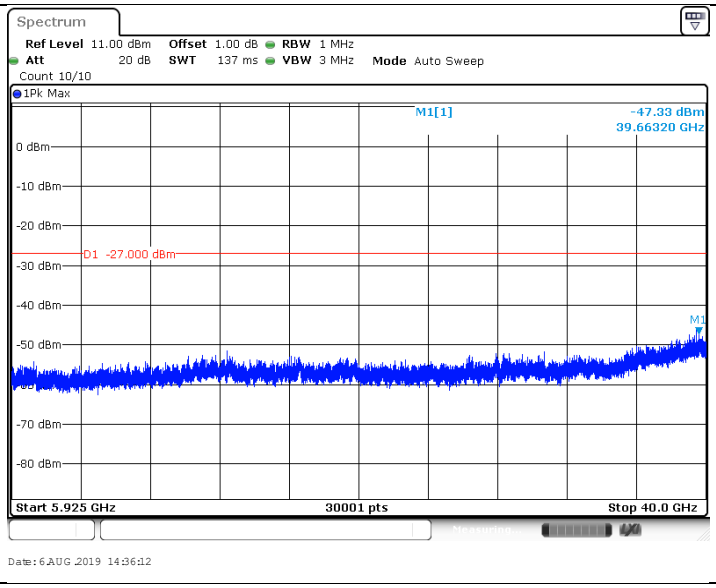

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Transmitting spurious emission test result as below (Radiated Mode):

Test Method

1. The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz
   and 0.8m above ground for below 1GHz at 3meter chamber room for test. The table was
   rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference – receiving antenna, which was
   mounted on the top of a variable – height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the
   antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned
5. Use the following spectrum analyzer settings According to C63.10:
   For Above 1GHz
   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 1MHz, VBW≥RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.
   For Below 1GHz
   Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 100 KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function =
   peak, Trace = max hold.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

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Limit

According to part 15.407b (6), the radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

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According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worse case (802.11a modulation) test result is listed in the report.

Transmitting spurious emission test result as below:

802.11a modulation 5180MHz Test Result

Frequency	Emission Level	Polarization	Limit	Margin	Corr. Factor	Detector	Result
MHz	dBuV/m		dBµV/m	dB	dB		
44.23	30.31	Horizontal	40.00	9.69	-24.8	QP	Pass
173.21	32.23	Horizontal	43.50	11.27	-29.7	QP	Pass
*37.46	34.69	Vertical	40.00	5.31	-26.8	QP	Pass
59.94	32.24	Vertical	40.00	7.76	-26.8	QP	Pass
*9368.09	41.35	Horizontal	74.00	32.65	8.6	PK	Pass
15041.00	47.88	Horizontal	74.00	26.12	17.1	PK	Pass
17152.31	49.75	Horizontal	74.00	24.25	20.4	PK	Pass
*7550.34	38.18	Vertical	74.00	35.82	6.0	PK	Pass
*11944.15	41.58	Vertical	74.00	32.42	10.7	PK	Pass
*17945.69	49.45	Vertical	74.00	24.55	21.5	PK	Pass

802.11a modulation 5320MHz Test Result

Frequency	Emission Level	Polarization	Limit	Margin	Corr. Factor	Detector	Result
MHz	dBuV/m		dBµV/m	dB	dB		
9525.53	40.73	Horizontal	74	33.27	9.0	PK	Pass
13135.25	44.64	Horizontal	74	29.36	13.9	PK	Pass
*17893.09	49.31	Horizontal	74	24.69	21.4	PK	Pass
9553.72	42.07	Vertical	74	31.93	8.9	PK	Pass
13121.84	44.39	Vertical	74	29.61	13.8	PK	Pass
*17791.69	50.33	Vertical	74	23.67	21.3	PK	Pass

802.11a modulation 5500MHz Test Result

Frequency	Emission Level	Polarization	Limit	Margin	Corr. Factor	Detector	Result
MHz	dBuV/m		dBµV/m	dB	dB		
9554.06	41.18	Horizontal	74	32.82	8.9	PK	Pass
*12697.66	43.44	Horizontal	74	30.56	12.8	PK	Pass
*17736.00	51.00	Horizontal	74	23.00	21.3	PK	Pass
*9495.28	41.12	Vertical	74	32.88	9.2	PK	Pass
13241.47	43.76	Vertical	74	30.24	13.8	PK	Pass
17695.44	49.58	Vertical	74	24.42	21.3	PK	Pass

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802.11a modulation 5700MHz Test Result

Frequency	Emission Level	Polarization	Limit	Margin	Corr. Factor	Detector	Result
MHz	dBuV/m		dBµV/m	dB	dB		
9532.41	41.40	Horizontal	74	32.60	9.0	PK	Pass
13009.78	43.35	Horizontal	74	30.65	13.5	PK	Pass
*17733.59	50.17	Horizontal	74	23.83	21.3	PK	Pass
9526.22	41.72	Vertical	74	32.28	9.0	PK	Pass
13134.56	43.99	Vertical	74	30.01	13.9	PK	Pass
*17770.72	49.69	Vertical	74	24.31	21.3	PK	Pass

802.11a modulation 5825MHz Test Result

Frequency	Emission Level	Polarization	Limit	Margin	Corr. Factor	Detector	Result
MHz	dBuV/m		dBµV/m	dB	dB		
9964.16	41.08	Horizontal	74	32.92	8.5	PK	Pass
*13298.88	44.60	Horizontal	74	29.40	13.6	PK	Pass
*17556.22	49.86	Horizontal	74	24.14	21.1	PK	Pass
9971.38	40.95	Vertical	74	33.05	8.6	PK	Pass
*13128.03	44.05	Vertical	74	29.95	13.9	PK	Pass
*17535.59	50.13	Vertical	74	23.87	21.1	PK	Pass

Remark:

(1) Corrected Amplitude = Read level + Corrector factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain.
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss.
(The Reading Level is recorded by software which is not shown in the sheet)

(2) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

(3) We test all modes and only the worst case recorded in the report.

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9.6 Band Edge

Test Method
According to KBD789033 D02

Limits:
For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

Test Result:

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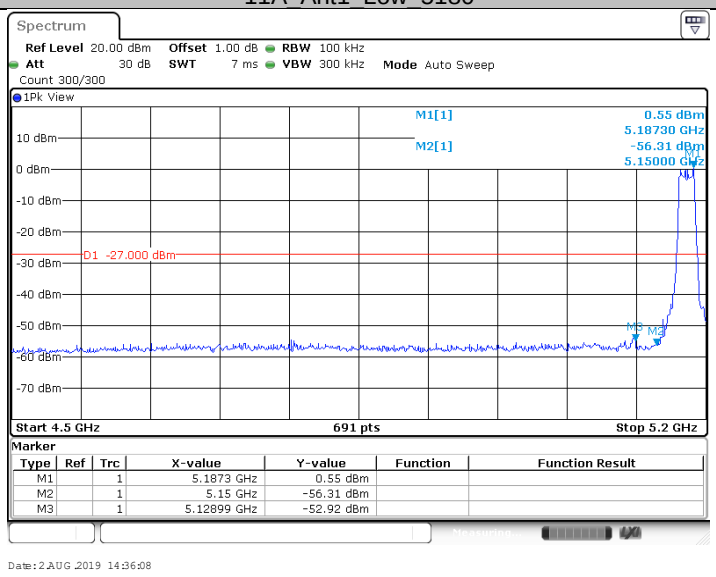

11A_Ant1_High_5320

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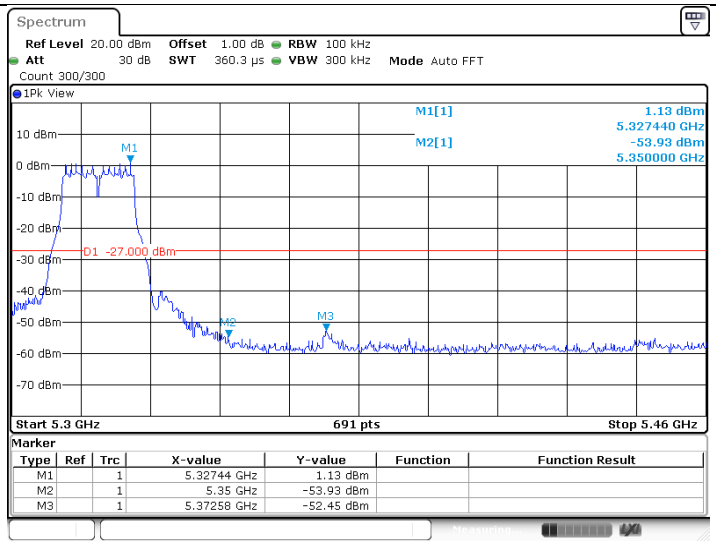

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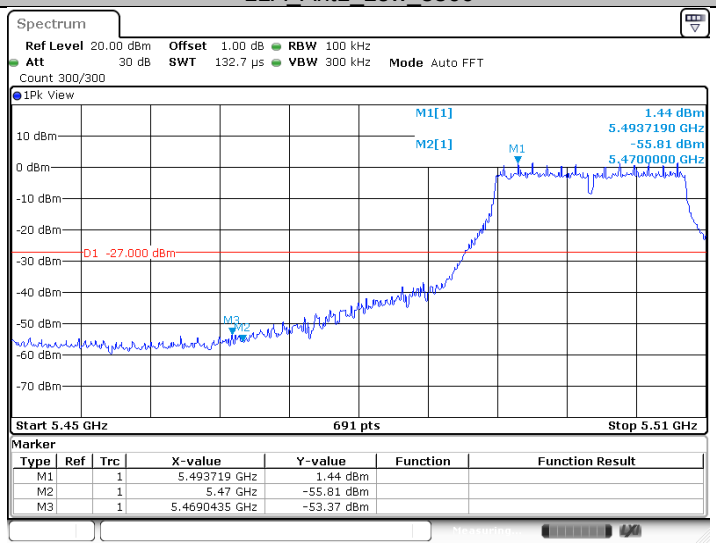

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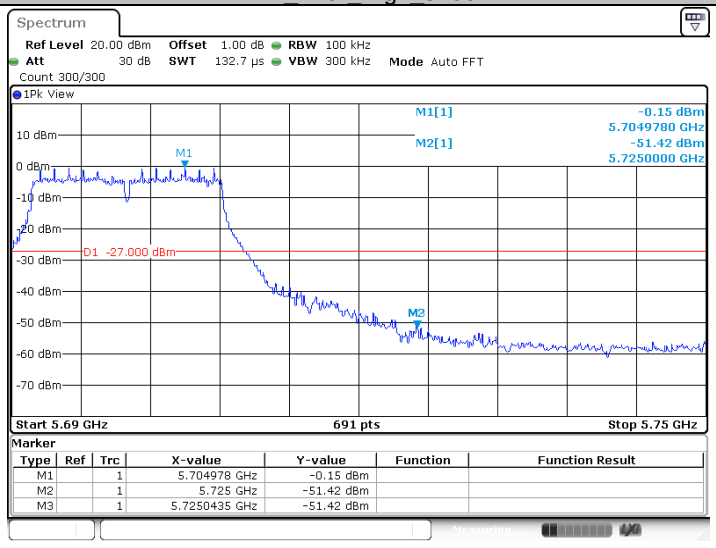

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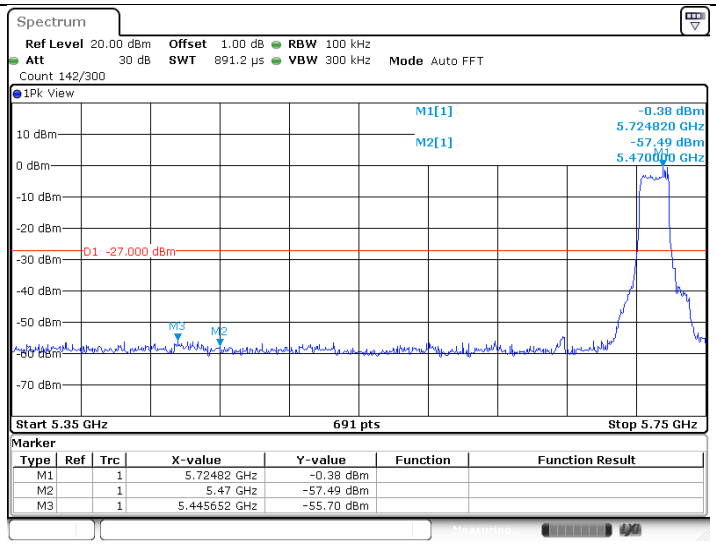

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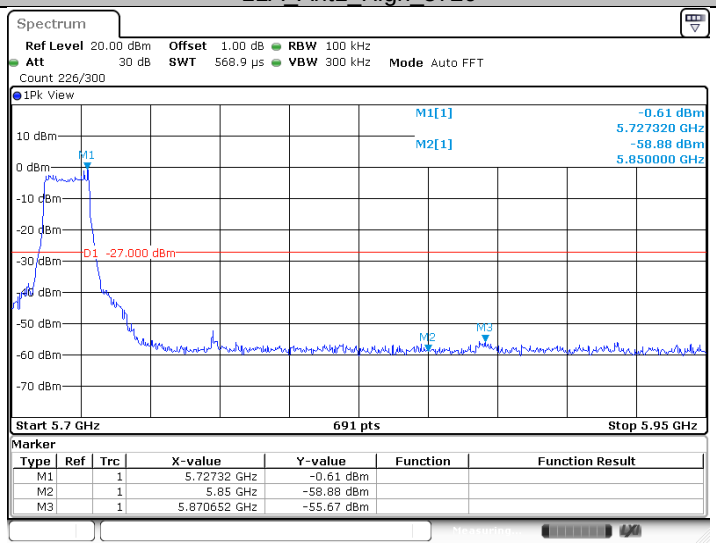

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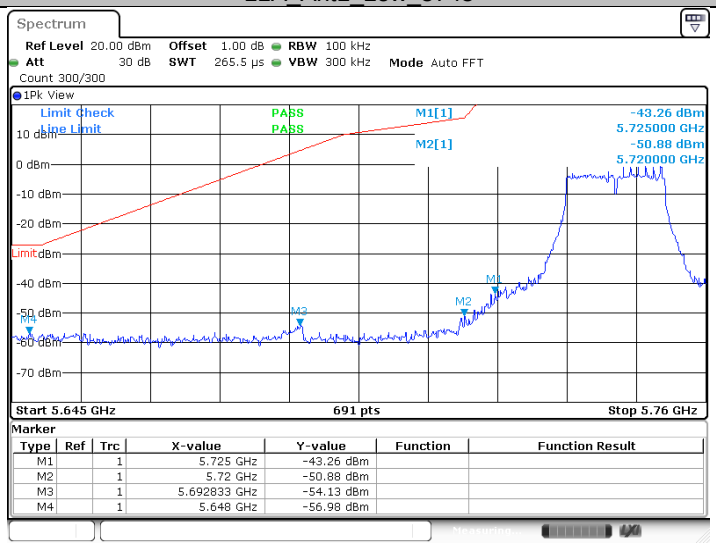

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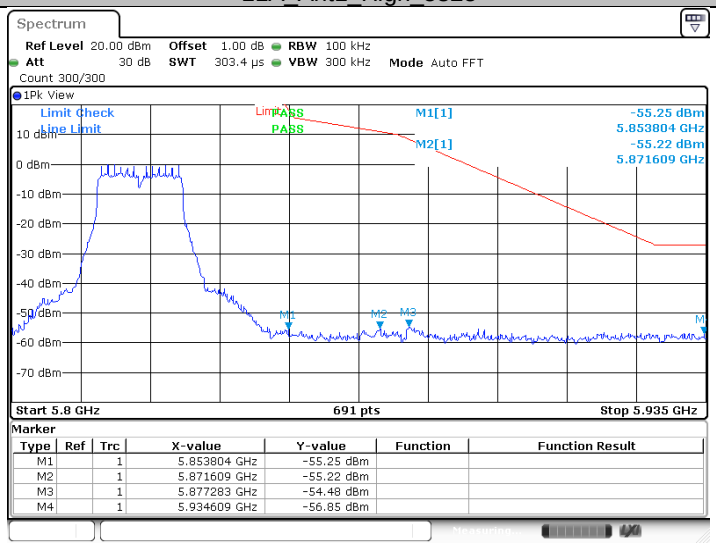

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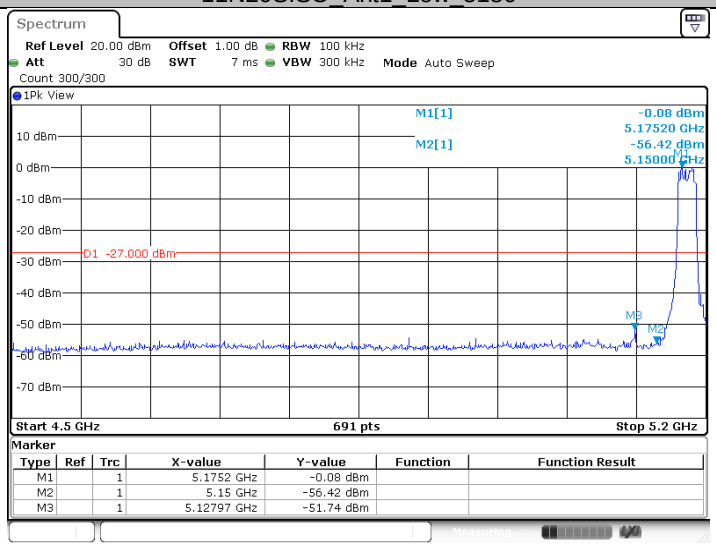

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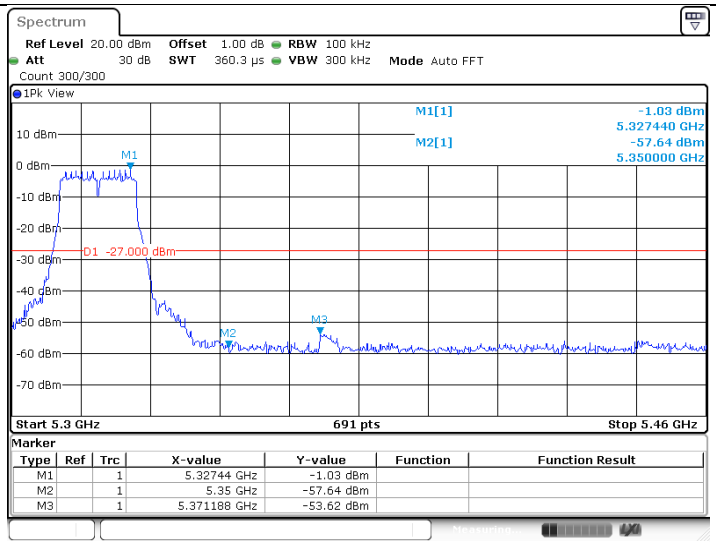

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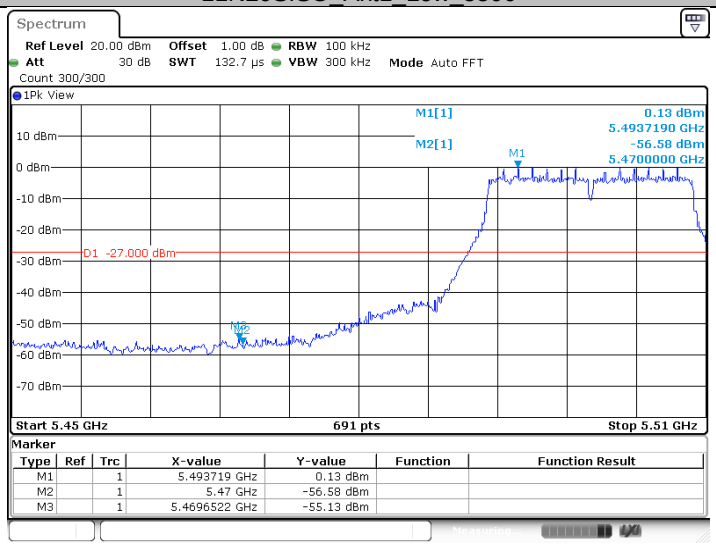

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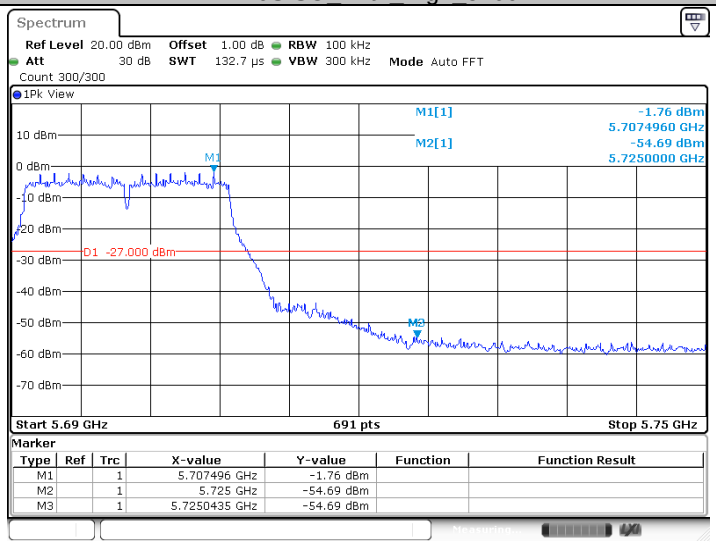

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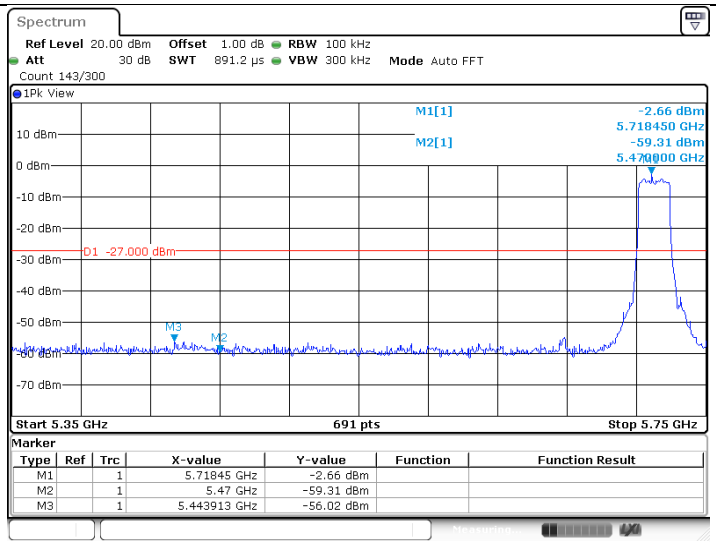

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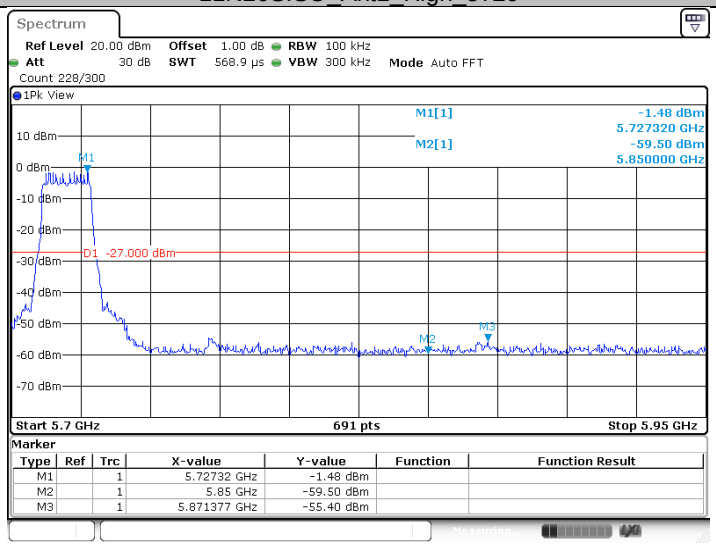

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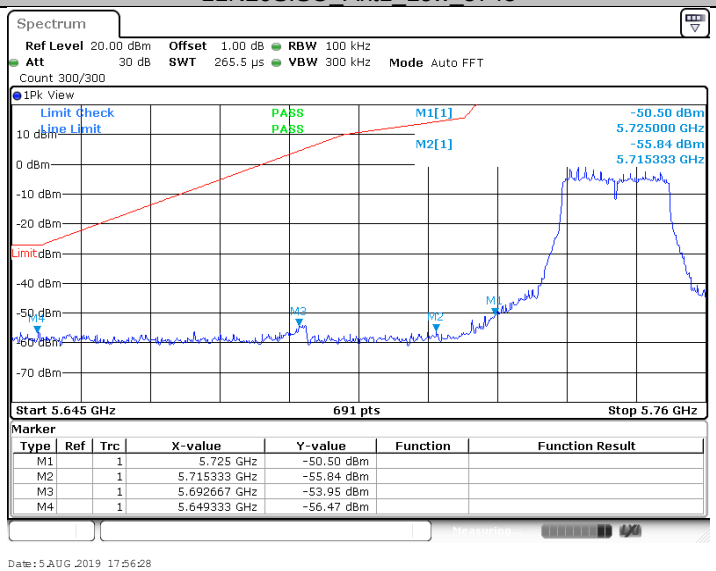

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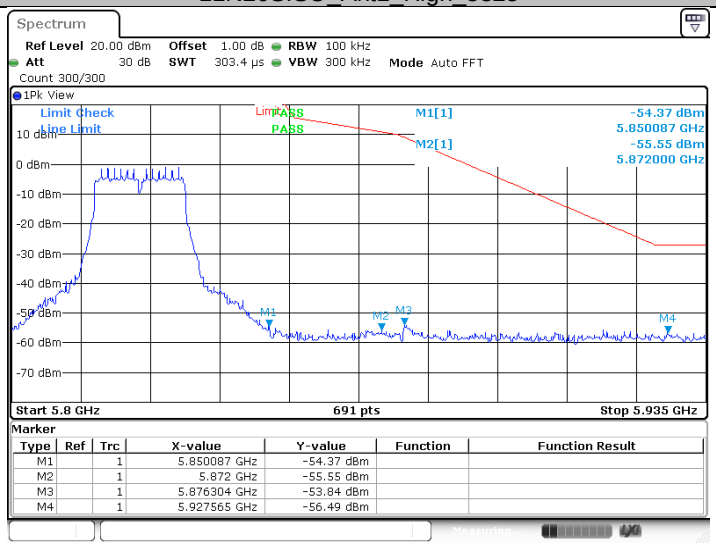

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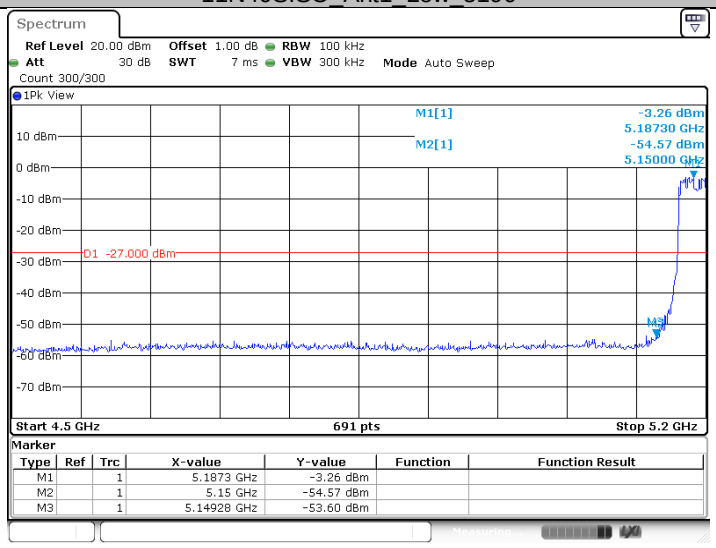

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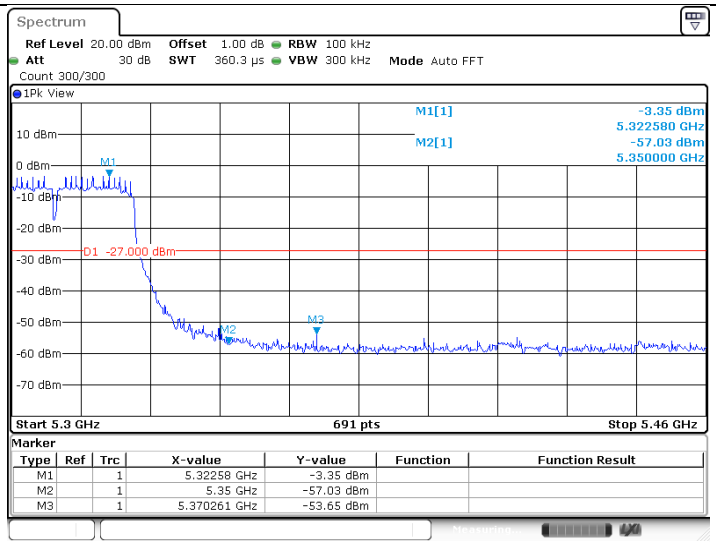

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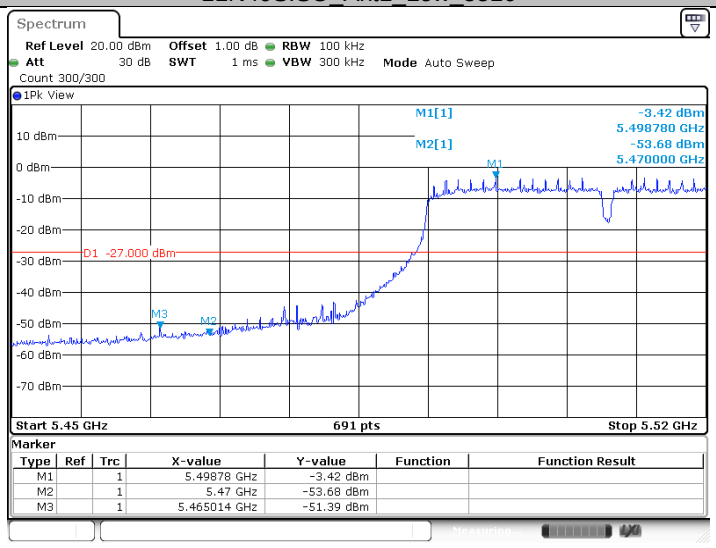

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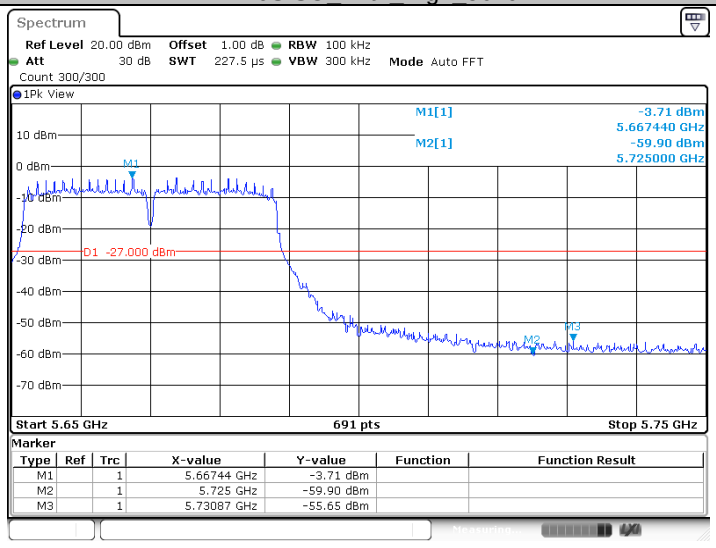

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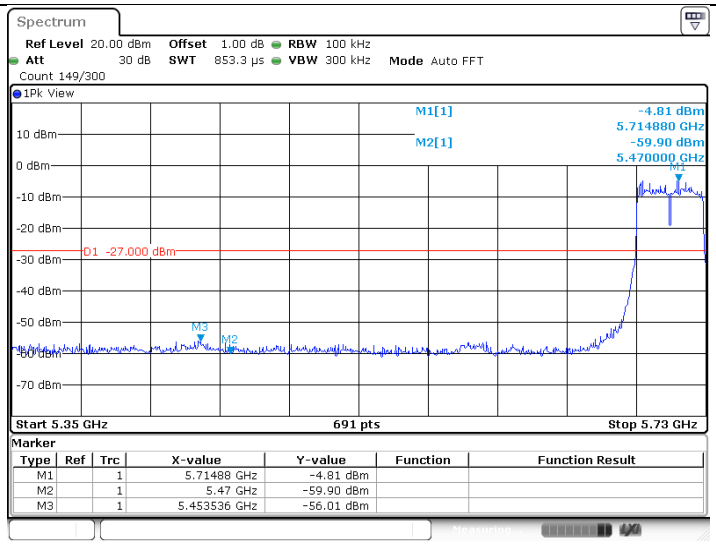

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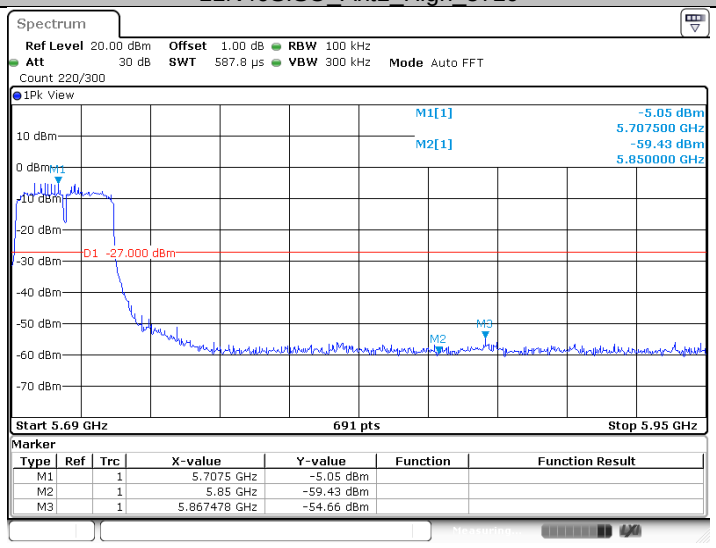

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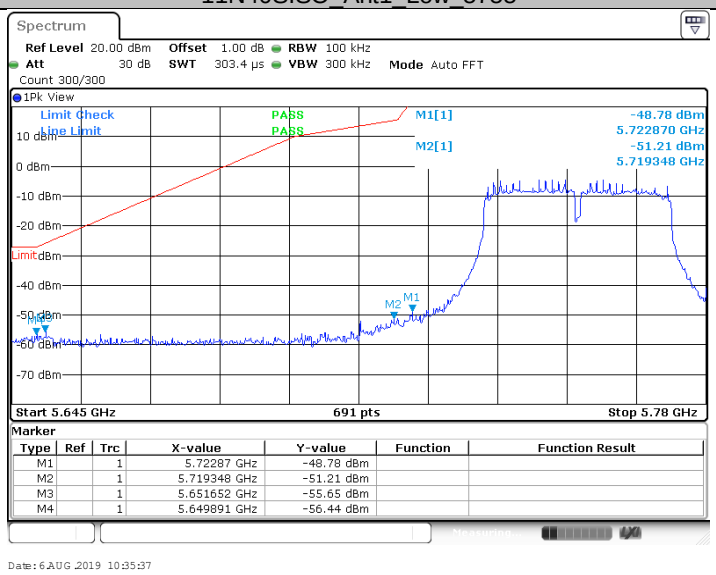

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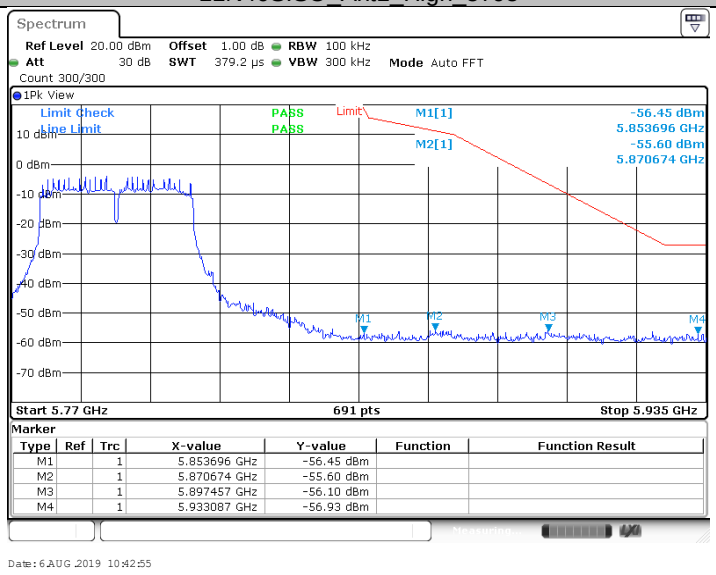

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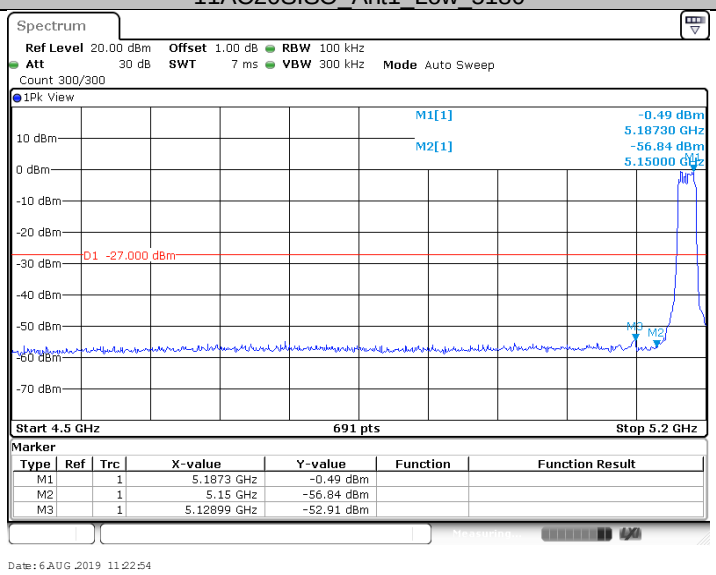

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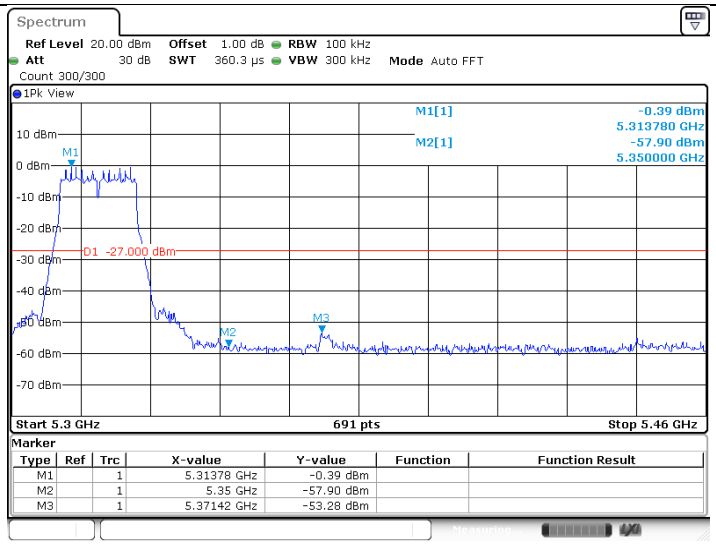

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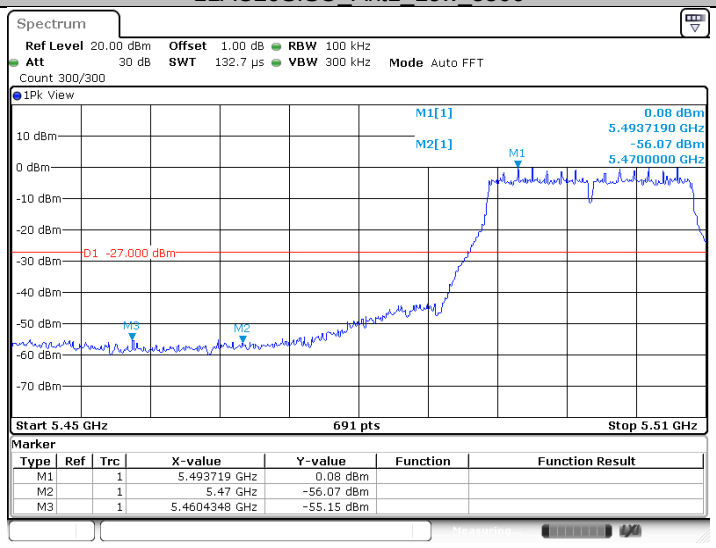

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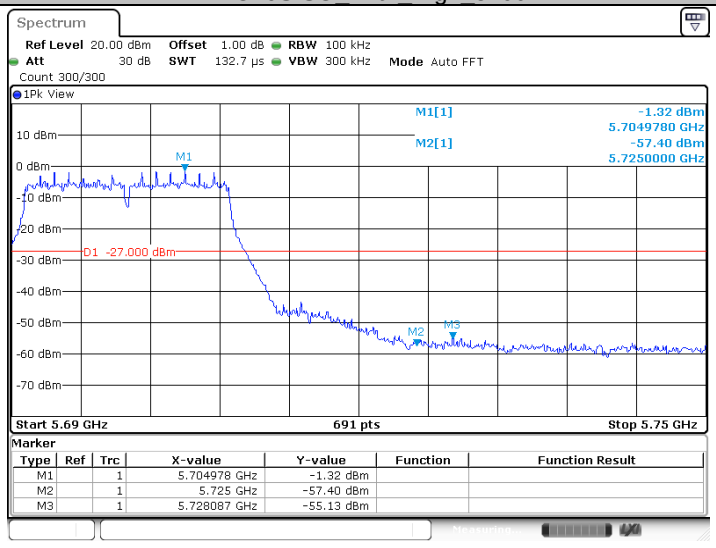

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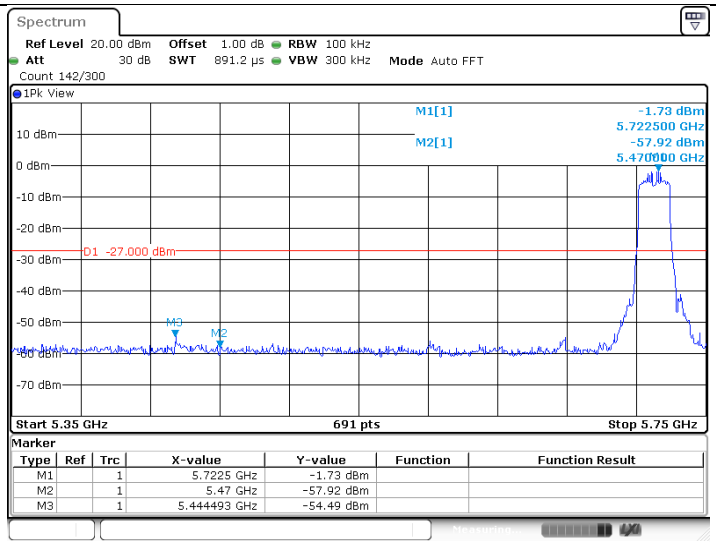

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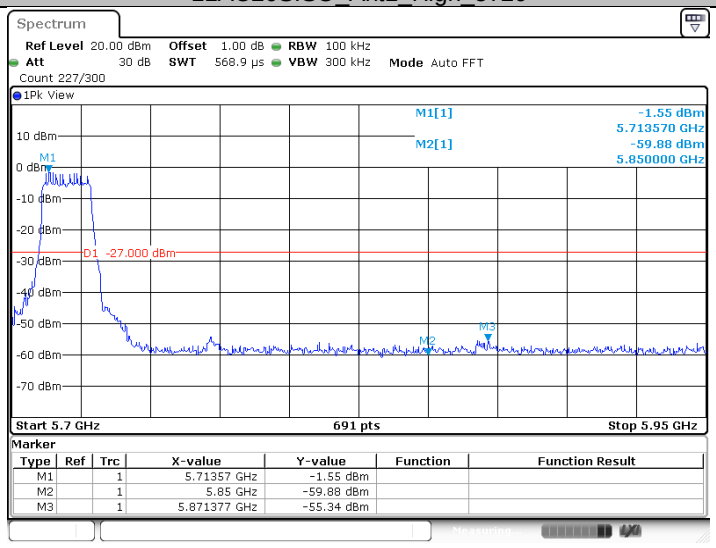

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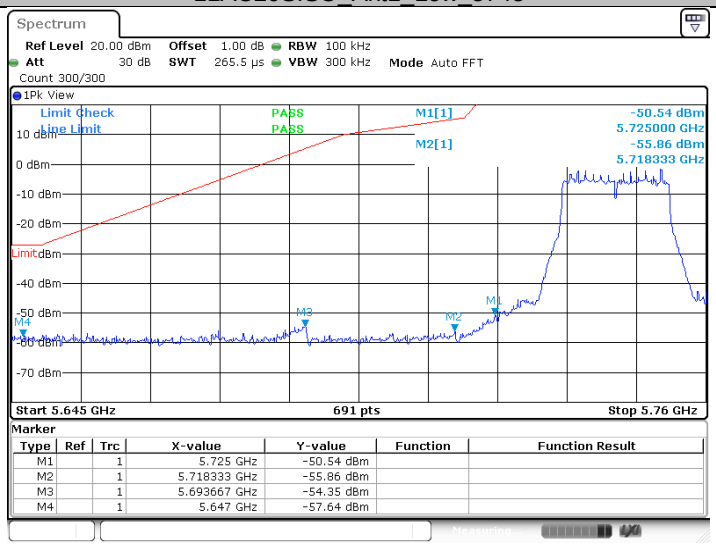

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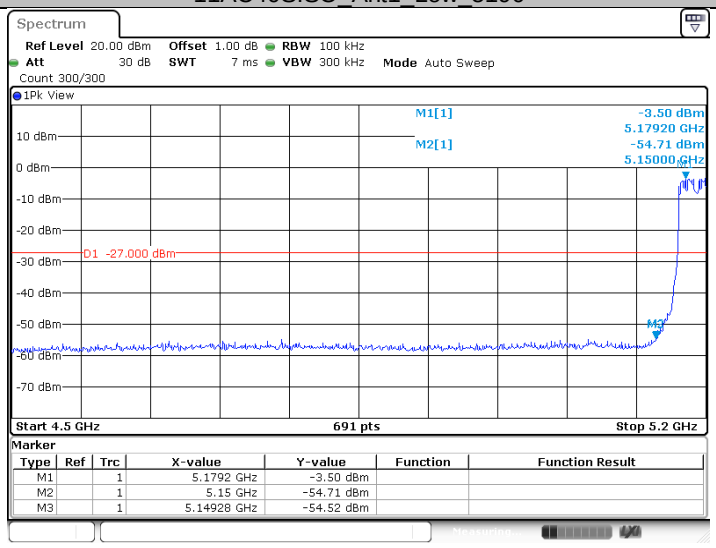

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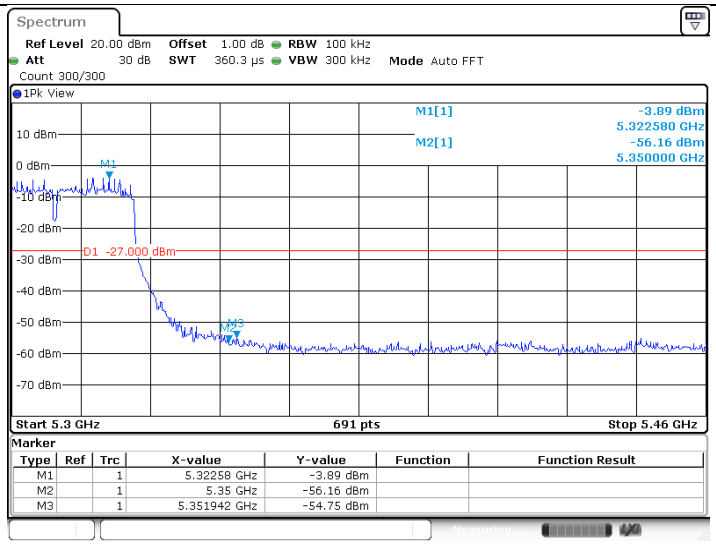

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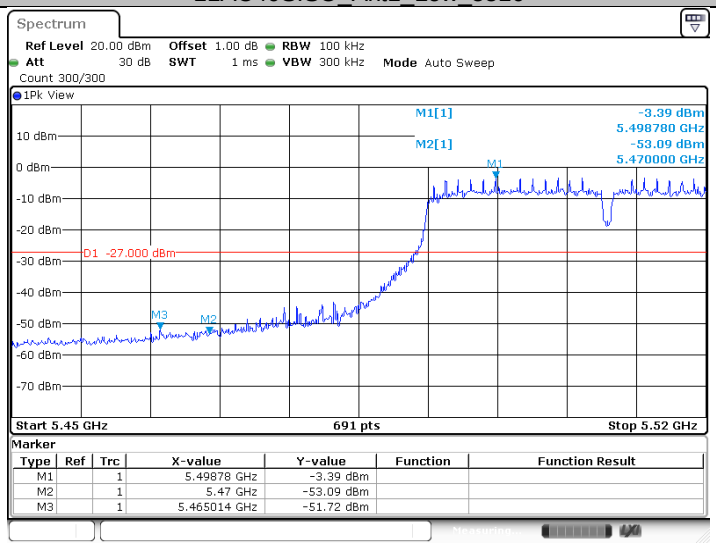
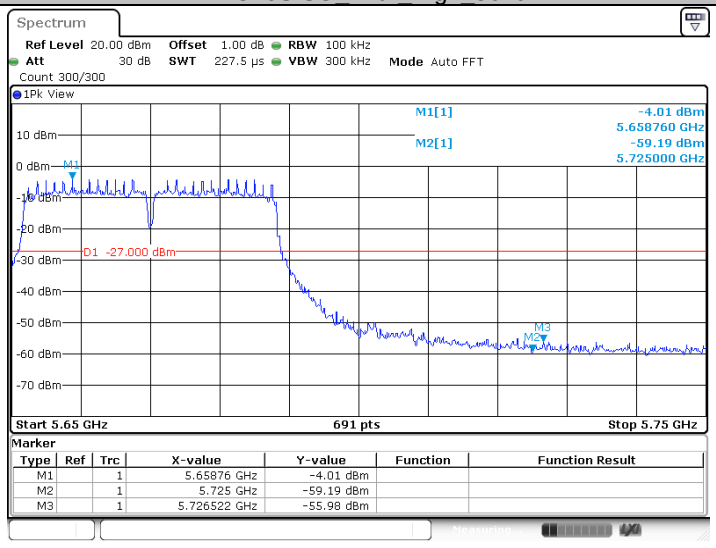


11AC40SISO_Ant1_High_5670



11AC40SISO_Ant1_Low_5710

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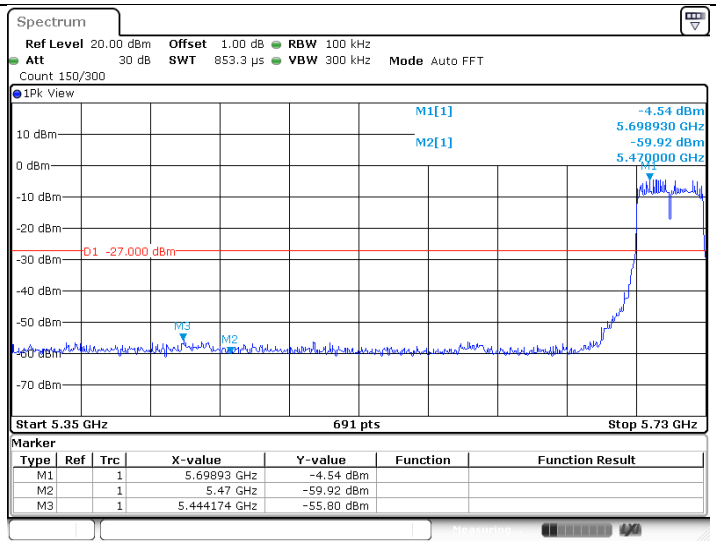

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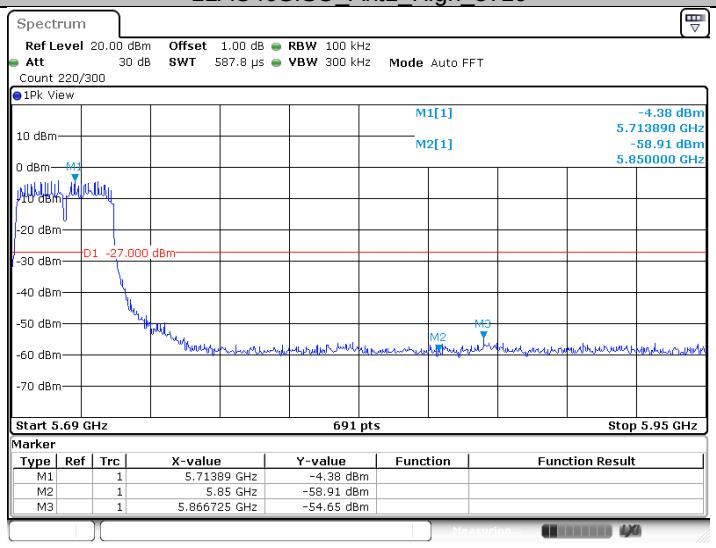

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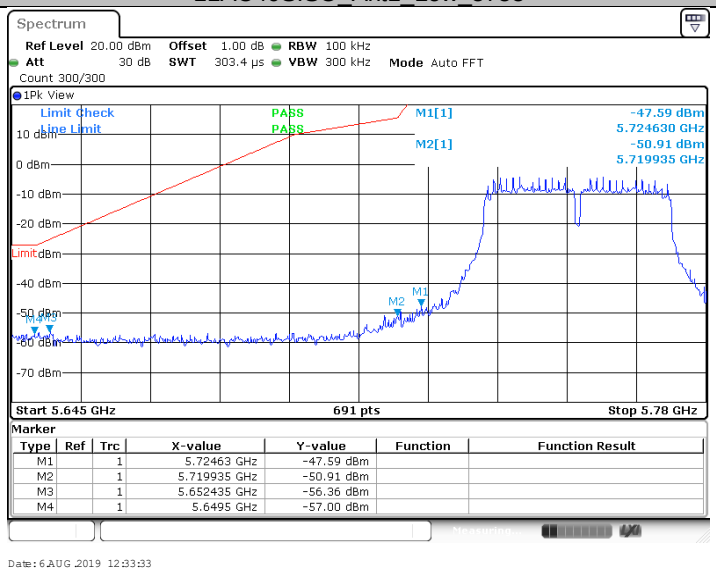
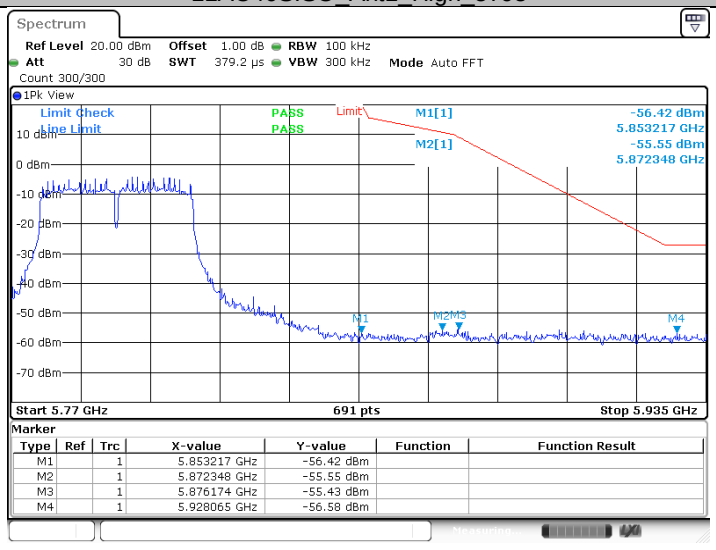
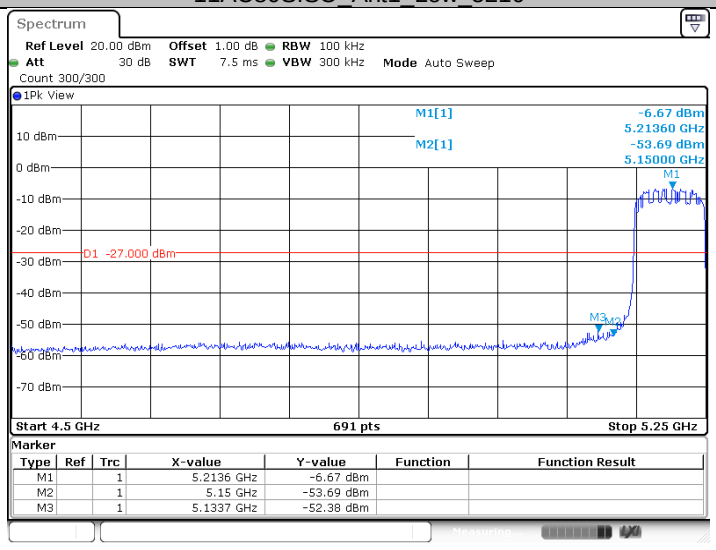
11AC40SISO_Ant1_Low_5755



11AC40SISO_Ant1_High_5795



11AC80SISO_Ant1_Low_5210



11AC80SISO_Ant1_High_5290

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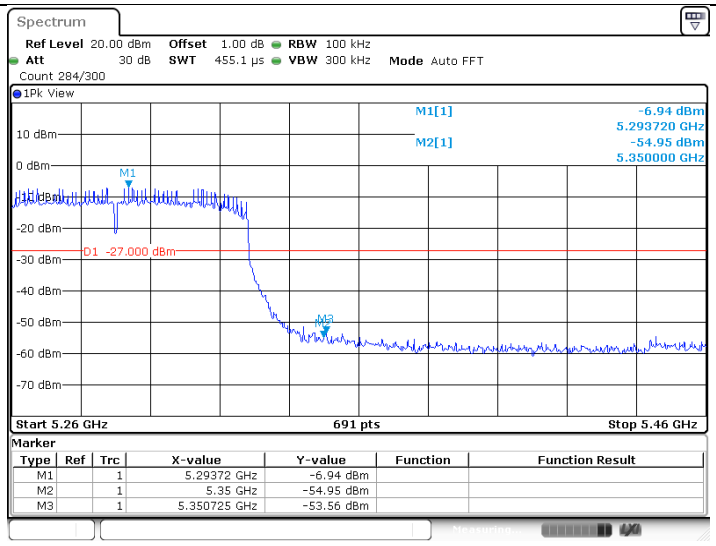
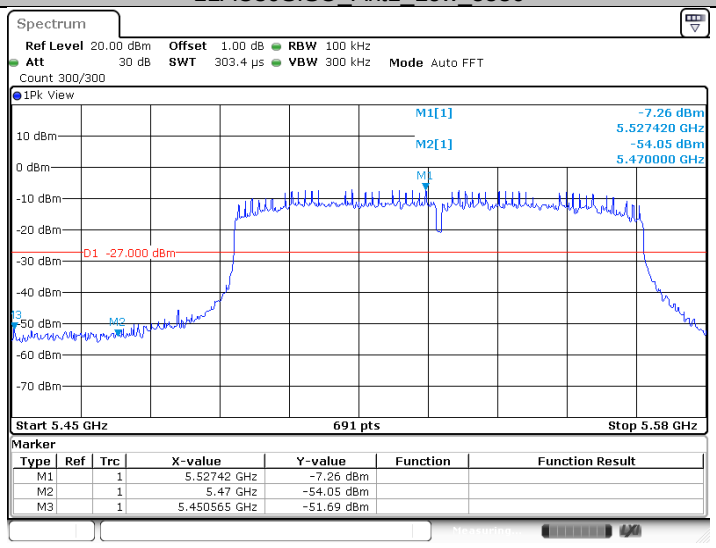
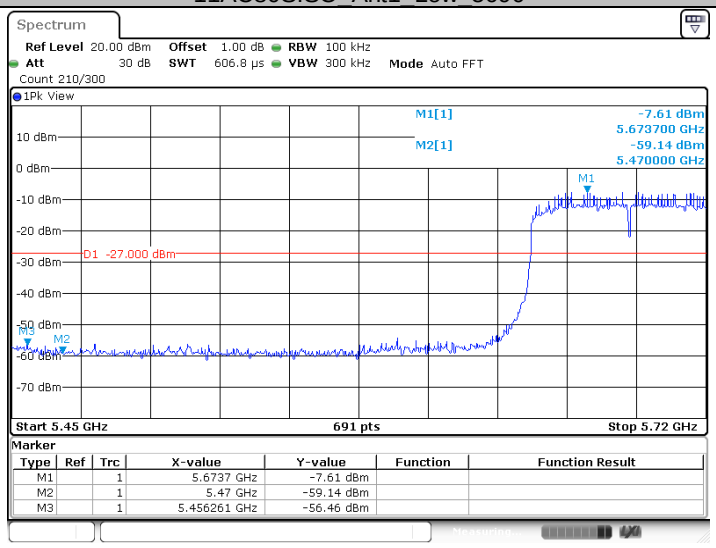


11AC80SISO_Ant1_Low_5530



11AC80SISO_Ant1_Low_5690



11AC80SISO_Ant1_High_5690

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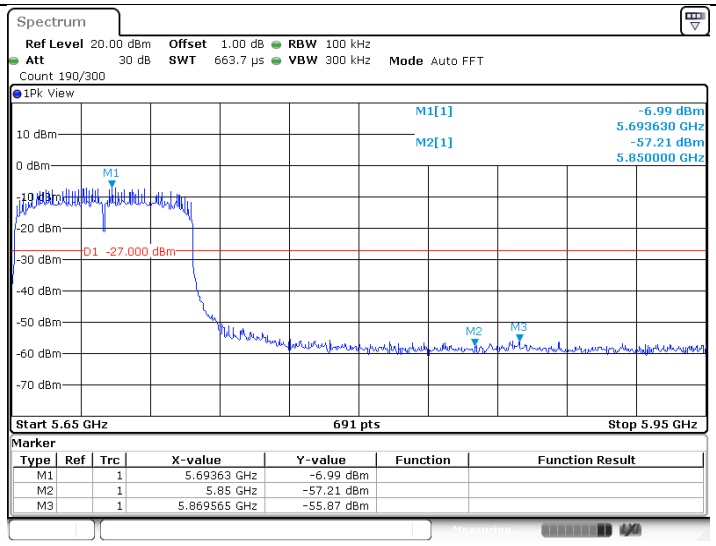
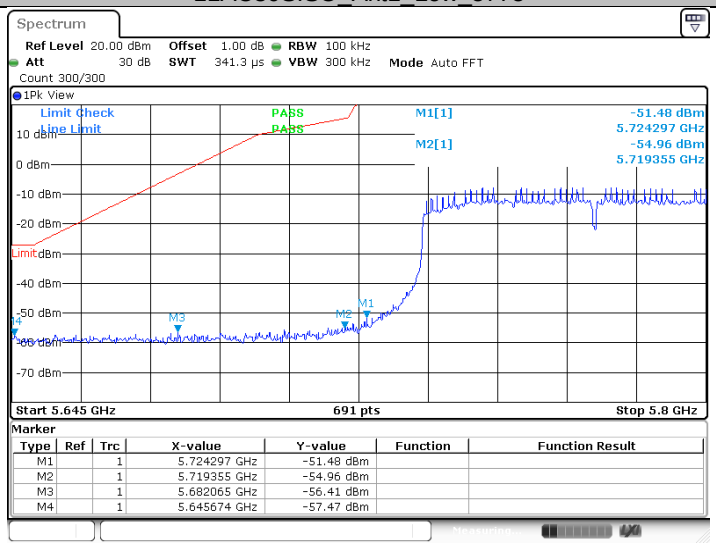
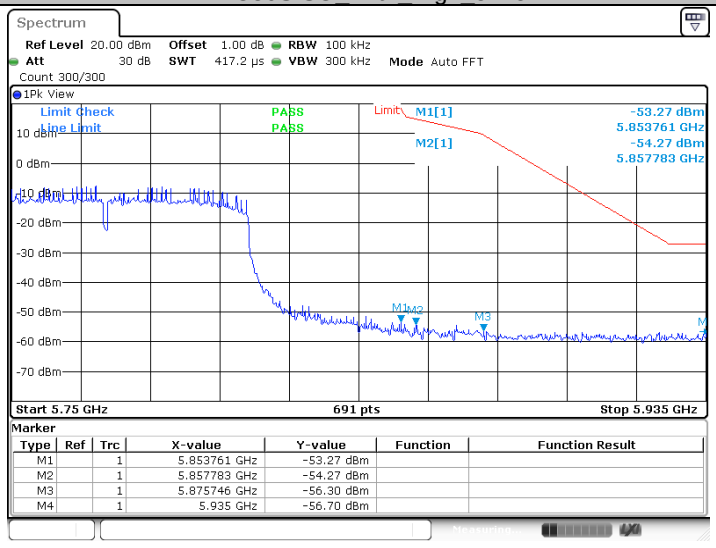


11AC80SISO_Ant1_Low_5775



11AC80SISO_Ant1_High_5775



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9.8 Duty Cycle

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Use the following spectrum analyzer settings:
   Span = 0, RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
3. Allow the trace to stabilize. Mark the OFF time and ON time. and the duty cycle is $T_{on} / T_{on}+T_{off}$
4. Repeat above procedures until all frequencies measured were complete.

TestMode	Antenna	Channel	Duty Cycle [%]
11A	Ant1	5180	87.20
		5200	87.12
		5240	87.12
		5260	87.12
		5280	87.12
		5320	87.12
		5500	87.20
		5580	87.12
		5700	87.12
		5720	87.12
		5745	87.12
		5785	87.12
		5825	87.20
11N20SISO	Ant1	5180	86.35
		5200	86.42
		5240	86.43
		5260	86.35
		5280	86.43
		5320	86.43
		5500	86.35
		5580	86.35
		5700	86.43
		5720	86.43
		5745	86.43
		5785	86.35
		5825	86.35
11N40SISO	Ant1	5190	75.90
		5230	75.90
		5270	75.75
		5310	75.90
		5510	75.75
		5550	75.75
		5670	75.90
		5710	75.90
		5755	75.75
		5795	75.90
11AC20SISO	Ant1	5180	82.87
		5200	82.96
		5240	82.96
		5260	82.96
		5280	82.96
		5320	82.96
		5500	82.96
		5580	82.96
		5700	82.96
		5720	86.43

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		5745	82.96
		5785	82.87
		5825	82.96
11AC40SISO	Ant1	5190	70.91
		5230	70.73
		5270	70.73
		5310	70.86
		5510	70.73
		5550	70.86
		5670	70.73
		5710	70.86
		5755	70.86
		5795	70.73
11AC80SISO	Ant1	5210	54.78
		5290	54.78
		5530	54.78
		5610	55.06
		5690	55.06
		5775	55.06

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9.8 Frequencies Stability

Test Method

1. Connect the UUT to the spectrum analyzer
2. Set Centre Frequency of the channel under test.
3. Set Detector PEAK
4. Set RBW: 10KHz, VBW: 3RBW
5. Set Span: Encompass the entire emissions bandwidth (EBW) of the signal.
6. Allow the trace to stabilize, find the peak value of the power envelope and record the frequency, then calculated the frequency drift.

The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
User manual temperature is 0℃ to 40℃

Limit: 20ppm
Test Results (All conditions and all modes were performed, only list Worst-Case in the report)

Voltage								
TestMode	Antenna	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	NT	-6000	-1.158301	20	PASS
		5180	LV	NT	-6000	-1.158301	20	PASS
		5180	HV	NT	-6000	-1.158301	20	PASS
		5200	NV	NT	-6000	-1.153846	20	PASS
		5200	LV	NT	-6000	-1.153846	20	PASS
		5200	HV	NT	-6000	-1.153846	20	PASS
		5240	NV	NT	-6000	-1.145038	20	PASS
		5240	LV	NT	-6000	-1.145038	20	PASS
		5240	HV	NT	-6000	-1.145038	20	PASS
		5260	NV	NT	-6000	-1.140684	20	PASS
		5260	LV	NT	-6000	-1.140684	20	PASS
		5260	HV	NT	-7000	-1.330798	20	PASS
		5280	NV	NT	-6000	-1.136364	20	PASS
		5280	LV	NT	-6000	-1.136364	20	PASS
		5280	HV	NT	-7000	-1.325758	20	PASS
		5320	NV	NT	-7000	-1.315789	20	PASS
		5320	LV	NT	-7000	-1.315789	20	PASS
		5320	HV	NT	-7000	-1.315789	20	PASS
		5500	NV	NT	-7000	-1.272727	20	PASS
		5500	LV	NT	-7000	-1.272727	20	PASS
		5500	HV	NT	-7000	-1.272727	20	PASS
		5580	NV	NT	-7000	-1.25448	20	PASS
		5580	LV	NT	-7000	-1.25448	20	PASS
		5580	HV	NT	-7000	-1.25448	20	PASS
		5700	NV	NT	-7000	-1.22807	20	PASS
		5700	LV	NT	-7000	-1.22807	20	PASS
		5700	HV	NT	-7000	-1.22807	20	PASS
		5720	NV	NT	-6000	-1.048951	20	PASS
		5720	LV	NT	-7000	-1.223776	20	PASS
		5720	HV	NT	-7000	-1.223776	20	PASS
		5745	NV	NT	-1000	-0.174064	20	PASS
		5745	LV	NT	-2000	-0.348129	20	PASS
		5745	HV	NT	-3000	-0.522193	20	PASS
		5785	NV	NT	-6000	-1.037165	20	PASS
		5785	LV	NT	-7000	-1.210026	20	PASS
		5785	HV	NT	-7000	-1.210026	20	PASS
		5825	NV	NT	-7000	-1.201717	20	PASS

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		5825	LV	NT	-7000	-1.201717	20	PASS
		5825	HV	NT	-8000	-1.373391	20	PASS
11N40SISO	Ant1	5190	NV	NT	-7000	-1.348748	20	PASS
		5190	LV	NT	-7000	-1.348748	20	PASS
		5190	HV	NT	-7000	-1.348748	20	PASS
		5230	NV	NT	-6000	-1.147228	20	PASS
		5230	LV	NT	-7000	-1.338432	20	PASS
		5230	HV	NT	-7000	-1.338432	20	PASS
		5270	NV	NT	-7000	-1.328273	20	PASS
		5270	LV	NT	-7000	-1.328273	20	PASS
		5270	HV	NT	-7000	-1.328273	20	PASS
		5310	NV	NT	0	0	20	PASS
		5310	LV	NT	-1000	-0.188324	20	PASS
		5310	HV	NT	-2000	-0.376648	20	PASS
		5510	NV	NT	-4000	-0.725953	20	PASS
		5510	LV	NT	-5000	-0.907441	20	PASS
		5510	HV	NT	-6000	-1.088929	20	PASS
		5550	NV	NT	-6000	-1.081081	20	PASS
		5550	LV	NT	-7000	-1.261261	20	PASS
		5550	HV	NT	-7000	-1.261261	20	PASS
		5670	NV	NT	-8000	-1.410935	20	PASS
		5670	LV	NT	-8000	-1.410935	20	PASS
		5670	HV	NT	-8000	-1.410935	20	PASS
		5710	NV	NT	-8000	-1.401051	20	PASS
		5710	LV	NT	-8000	-1.401051	20	PASS
		5710	HV	NT	-8000	-1.401051	20	PASS
		5755	NV	NT	-7000	-1.216334	20	PASS
		5755	LV	NT	-8000	-1.390096	20	PASS
		5755	HV	NT	-8000	-1.390096	20	PASS
		5795	NV	NT	-8000	-1.3805	20	PASS
		5795	LV	NT	-8000	-1.3805	20	PASS
		5795	HV	NT	-8000	-1.3805	20	PASS
11AC80SISO	Ant1	5210	NV	NT	-7000	-1.34357	20	PASS
		5210	LV	NT	-7000	-1.34357	20	PASS
		5210	HV	NT	-7000	-1.34357	20	PASS
		5290	NV	NT	-7000	-1.323251	20	PASS
		5290	LV	NT	-7000	-1.323251	20	PASS
		5290	HV	NT	-7000	-1.323251	20	PASS
		5530	NV	NT	-8000	-1.446655	20	PASS
		5530	LV	NT	-8000	-1.446655	20	PASS
		5530	HV	NT	-8000	-1.446655	20	PASS
		5690	NV	NT	-8000	-1.405975	20	PASS
		5690	LV	NT	-8000	-1.405975	20	PASS
		5690	HV	NT	-8000	-1.405975	20	PASS
		5775	NV	NT	-7000	-1.212121	20	PASS
		5775	LV	NT	-8000	-1.385281	20	PASS
		5775	HV	NT	-8000	-1.385281	20	PASS

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Temperature								
TestMode	Antenna	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	0	-6000	-1.158301	20	PASS
		5180	NV	10	-7000	-1.351351	20	PASS
		5180	NV	20	-7000	-1.351351	20	PASS
		5180	NV	30	-7000	-1.351351	20	PASS
		5180	NV	40	-7000	-1.351351	20	PASS
		5200	NV	0	-7000	-1.346154	20	PASS
		5200	NV	10	-7000	-1.346154	20	PASS
		5200	NV	20	-7000	-1.346154	20	PASS
		5200	NV	30	-6000	-1.153846	20	PASS
		5200	NV	40	-6000	-1.153846	20	PASS
		5240	NV	0	-7000	-1.335878	20	PASS
		5240	NV	10	-7000	-1.335878	20	PASS
		5240	NV	20	-7000	-1.335878	20	PASS
		5240	NV	30	-6000	-1.145038	20	PASS
		5240	NV	40	-7000	-1.335878	20	PASS
		5260	NV	0	-7000	-1.330798	20	PASS
		5260	NV	10	-7000	-1.330798	20	PASS
		5260	NV	20	-7000	-1.330798	20	PASS
		5260	NV	30	-7000	-1.330798	20	PASS
		5260	NV	40	-7000	-1.330798	20	PASS
		5280	NV	0	-7000	-1.325758	20	PASS
		5280	NV	10	-7000	-1.325758	20	PASS
		5280	NV	20	-6000	-1.136364	20	PASS
		5280	NV	30	-7000	-1.325758	20	PASS
		5280	NV	40	-7000	-1.325758	20	PASS
		5320	NV	0	-7000	-1.315789	20	PASS
		5320	NV	10	-7000	-1.315789	20	PASS
		5320	NV	20	-7000	-1.315789	20	PASS
		5320	NV	30	-7000	-1.315789	20	PASS
		5320	NV	40	-7000	-1.315789	20	PASS
		5500	NV	0	-7000	-1.272727	20	PASS
		5500	NV	10	-7000	-1.272727	20	PASS
		5500	NV	20	-7000	-1.272727	20	PASS
		5500	NV	30	-7000	-1.272727	20	PASS
		5500	NV	40	-7000	-1.272727	20	PASS
		5580	NV	0	-7000	-1.25448	20	PASS
		5580	NV	10	-7000	-1.25448	20	PASS
		5580	NV	20	-7000	-1.25448	20	PASS
		5580	NV	30	-7000	-1.25448	20	PASS
		5580	NV	40	-7000	-1.25448	20	PASS
		5700	NV	0	-7000	-1.22807	20	PASS
		5700	NV	10	-7000	-1.22807	20	PASS
		5700	NV	20	-7000	-1.22807	20	PASS
		5700	NV	30	-7000	-1.22807	20	PASS
		5700	NV	40	-7000	-1.22807	20	PASS
		5720	NV	0	-7000	-1.223776	20	PASS
		5720	NV	10	-7000	-1.223776	20	PASS
		5720	NV	20	-7000	-1.223776	20	PASS
		5720	NV	30	-7000	-1.223776	20	PASS
		5720	NV	40	-7000	-1.223776	20	PASS
		5745	NV	0	-5000	-0.870322	20	PASS
		5745	NV	10	-4000	-0.696258	20	PASS
		5745	NV	20	-4000	-0.696258	20	PASS
		5745	NV	30	-5000	-0.870322	20	PASS
		5745	NV	40	-5000	-0.870322	20	PASS
		5785	NV	0	-7000	-1.210026	20	PASS
		5785	NV	10	-7000	-1.210026	20	PASS
		5785	NV	20	-7000	-1.210026	20	PASS
		5785	NV	30	-7000	-1.210026	20	PASS

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		5785	NV	40	-7000	-1.210026	20	PASS
		5825	NV	0	-8000	-1.373391	20	PASS
		5825	NV	10	-8000	-1.373391	20	PASS
		5825	NV	20	-8000	-1.373391	20	PASS
		5825	NV	30	-8000	-1.373391	20	PASS
		5825	NV	40	-8000	-1.373391	20	PASS

11N40SISO	Ant1	5190	NV	0	-7000	-1.348748	20	PASS
		5190	NV	10	-7000	-1.348748	20	PASS
		5190	NV	20	-7000	-1.348748	20	PASS
		5190	NV	30	-7000	-1.348748	20	PASS
		5190	NV	40	-7000	-1.348748	20	PASS
		5230	NV	0	-7000	-1.338432	20	PASS
		5230	NV	10	-7000	-1.338432	20	PASS
		5230	NV	20	-7000	-1.338432	20	PASS
		5230	NV	30	-7000	-1.338432	20	PASS
		5230	NV	40	-7000	-1.338432	20	PASS
		5270	NV	0	-7000	-1.328273	20	PASS
		5270	NV	10	-7000	-1.328273	20	PASS
		5270	NV	20	-7000	-1.328273	20	PASS
		5270	NV	30	-7000	-1.328273	20	PASS
		5270	NV	40	-7000	-1.328273	20	PASS
		5310	NV	0	-3000	-0.564972	20	PASS
		5310	NV	10	-3000	-0.564972	20	PASS
		5310	NV	20	-3000	-0.564972	20	PASS
		5310	NV	30	-3000	-0.564972	20	PASS
		5310	NV	40	-4000	-0.753296	20	PASS
		5510	NV	0	-6000	-1.088929	20	PASS
		5510	NV	10	-6000	-1.088929	20	PASS
		5510	NV	20	-6000	-1.088929	20	PASS
		5510	NV	30	-6000	-1.088929	20	PASS
		5510	NV	40	-7000	-1.270417	20	PASS
		5550	NV	0	-7000	-1.261261	20	PASS
		5550	NV	10	-7000	-1.261261	20	PASS
		5550	NV	20	-7000	-1.261261	20	PASS
		5550	NV	30	-8000	-1.441441	20	PASS
		5550	NV	40	-7000	-1.261261	20	PASS
		5670	NV	0	-8000	-1.410935	20	PASS
		5670	NV	10	-8000	-1.410935	20	PASS
		5670	NV	20	-8000	-1.410935	20	PASS
		5670	NV	30	-8000	-1.410935	20	PASS
		5670	NV	40	-8000	-1.410935	20	PASS
		5710	NV	0	-8000	-1.401051	20	PASS
		5710	NV	10	-8000	-1.401051	20	PASS
		5710	NV	20	-8000	-1.401051	20	PASS
		5710	NV	30	-8000	-1.401051	20	PASS
		5710	NV	40	-8000	-1.401051	20	PASS
		5755	NV	0	-8000	-1.390096	20	PASS
		5755	NV	10	-8000	-1.390096	20	PASS
		5755	NV	20	-8000	-1.390096	20	PASS
		5755	NV	30	-8000	-1.390096	20	PASS
		5755	NV	40	-8000	-1.390096	20	PASS
		5795	NV	0	-8000	-1.3805	20	PASS
		5795	NV	10	-8000	-1.3805	20	PASS
		5795	NV	20	-8000	-1.3805	20	PASS
		5795	NV	30	-8000	-1.3805	20	PASS
		5795	NV	40	-8000	-1.3805	20	PASS

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		5210	NV	0	-7000	-1.34357	20	PASS
		5210	NV	10	-7000	-1.34357	20	PASS
		5210	NV	20	-7000	-1.34357	20	PASS
		5210	NV	30	-7000	-1.34357	20	PASS
		5210	NV	40	-7000	-1.34357	20	PASS
		5290	NV	0	-8000	-1.512287	20	PASS
		5290	NV	10	-7000	-1.323251	20	PASS
		5290	NV	20	-7000	-1.323251	20	PASS
		5290	NV	30	-7000	-1.323251	20	PASS
		5290	NV	40	-7000	-1.323251	20	PASS
		5530	NV	0	-8000	-1.446655	20	PASS
		5530	NV	10	-8000	-1.446655	20	PASS
		5530	NV	20	-8000	-1.446655	20	PASS
		5530	NV	30	-7000	-1.265823	20	PASS
		5530	NV	40	-7000	-1.265823	20	PASS
		5690	NV	0	-8000	-1.405975	20	PASS
		5690	NV	10	-8000	-1.405975	20	PASS
		5690	NV	20	-8000	-1.405975	20	PASS
		5690	NV	30	-8000	-1.405975	20	PASS
		5690	NV	40	-8000	-1.405975	20	PASS
		5775	NV	0	-8000	-1.385281	20	PASS
		5775	NV	10	-8000	-1.385281	20	PASS
		5775	NV	20	-8000	-1.385281	20	PASS
		5775	NV	30	-8000	-1.385281	20	PASS
		5775	NV	40	-8000	-1.385281	20	PASS

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9.9 Dynamic Frequency Selection (DFS)

1、General Test Condition

Parameteers of EUT	
Frequency	5250 – 5350 MHz & 5470 – 5725 MHz
Operational Mode	Slave
Modulation:	OFDM
Channel Bandwidth:	20 MHz , 40 MHz，80 MHz

Note: This device was functioned as a Slave device during the DFS

2、Test requirement

The manufacturer shall whether the EUT is capable of operating as a master and a client. Id the EUT is capable of operating in more than one operating mode then each operating mode shall be tested separately.

DFS Applicability

Requirement	Operational Mode		
	Master	Client Without Radar Detection	**Client With Radar Detection**
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

DFS Applicability During Normal Operation

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Yes	Not required
Uniform Spreading	Yes	Yes	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

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3、Test Limited

According to KDB 905462 D02 Table 4 DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. **Note 3:** During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

4、Calibration of Radar Waveform

(1) A 50ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master.
(2) The interference Radar Detection Threshold Level is -62dBm+3.7dB+1.5dB=-55.8dBm that had been taken into account the output power range and antenna gain.
(3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3MHz. The spectrum analyzer had offset -1.5dB to compensate RF cable loss 1.5dB.
(4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was -62dBm+3.7dB+1.5dB=-55.8dBm. Capture the spectrum analyzer plots on short pulse radar waveform.

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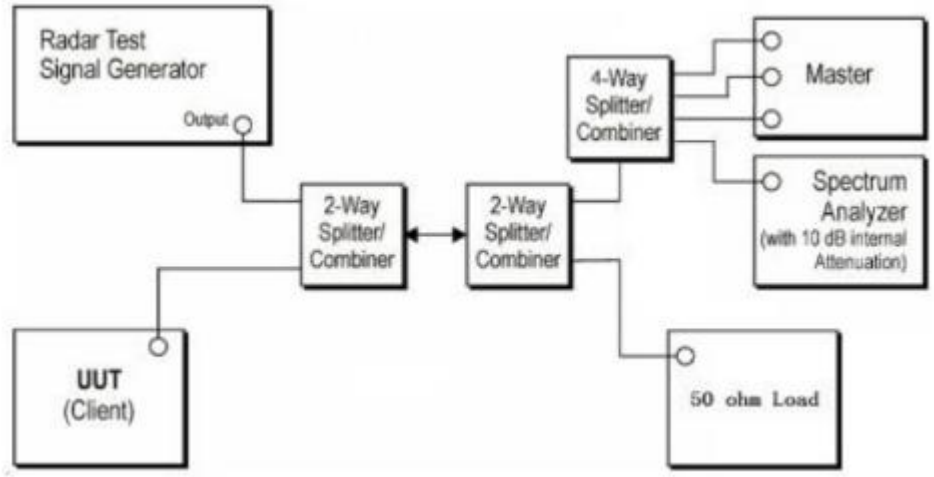
Conducted Calibration Setup:



Radar Waveform Calibration result:

5、Channel Closing Transmission Time, Channel Move Time and Non-Occupancy Period.

Block Diagram of test setup test procedure.

(1) The Radar Pulse generator is setup to provide a pulse at frequency that the master and client are operating, A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
(2) The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -55.8dBm at the antenna of the master device.
(3) A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
(4) EUT will associate with the master at channel. The file “iperf.exe” specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using test software in order to properly load the network for the entire period of the test.
(5) When radar burst with a Level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection threshold +1dB.
(6) Observer the transmissions of the EUT at the end of the radar Burst on the Operating channel. Measure and record the transmissions form the UUT during The observation time (channel move time). One 15 seconds plot is reported for the short pulse radar type 0. The plot for the short pulse radar burst. The channel move time will be calculated based on the zoom in 600ms plot of the short pulse radar type.
(7) Measurement of the aggregate duration of the channel closed transmission time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (3.0)=S(12000ms)/B(4000); where dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of channel closing transmission time is calculated by: C(ms)=N X Dwell (0.3ms); where C is the closing time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and dwell is the dwell time per bin.
(8) Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

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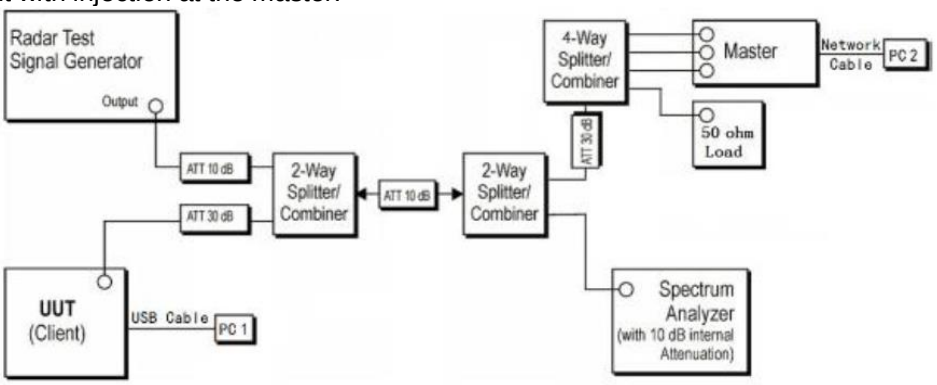
Test Setup:
Setup for client with injection at the master.



6、Test Result

Clause	Test Parameter	Remarks	Pass/Fail
15.407	DFS Detection Threshold	No Applicable	N/A
15.407	Channel Availability Check time	No Applicable	N/A
15.407	Channel Move time	Applicable	Pass
15.407	Channel Closing Transmission Time	Applicable	Pass
15.407	Non-Occupancy Period	Applicable	Pass
15.407	Uniform Spreading	No Applicable	N/A
15.407	U-NII Detection Bandwidth	No Applicable	N/A

TestMode	Channel	CCT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
11AC80SISO	5290	9.03	60	448.06	10000	PASS
	5530	30.1	60	452.79	10000	PASS

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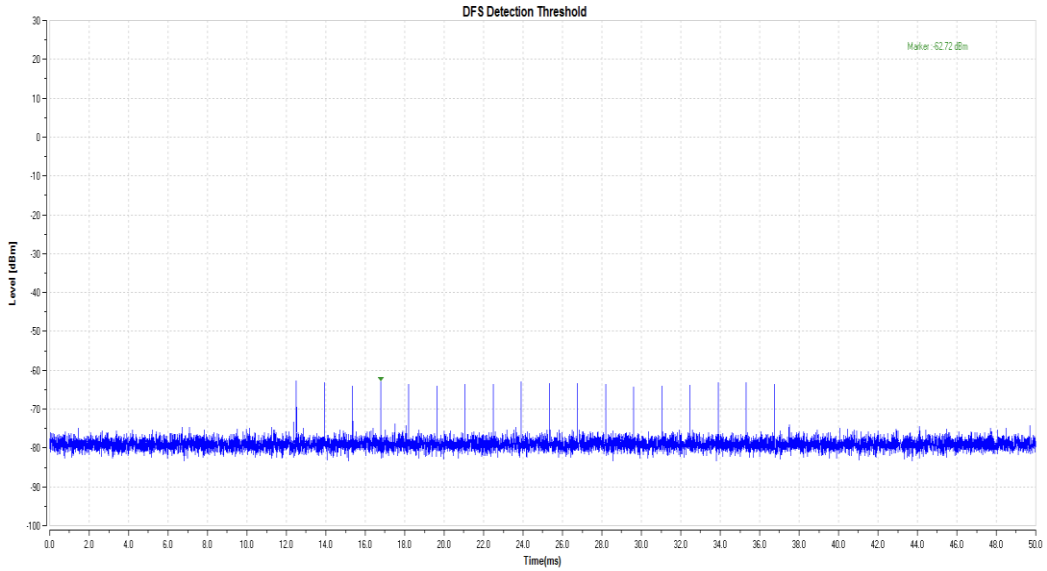
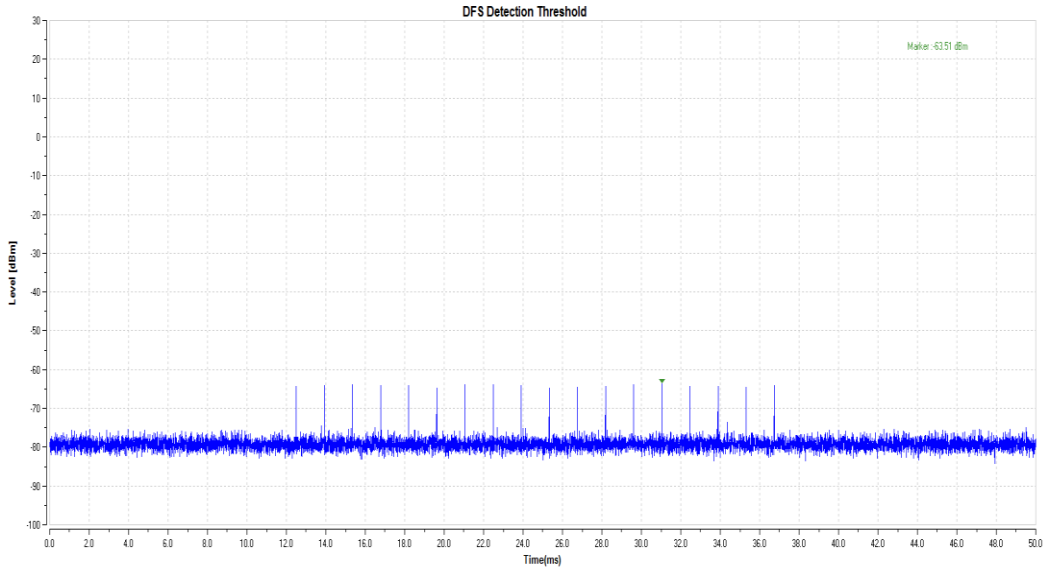
Test Graphs

11AC80SISO_5290



11AC80SISO_5530



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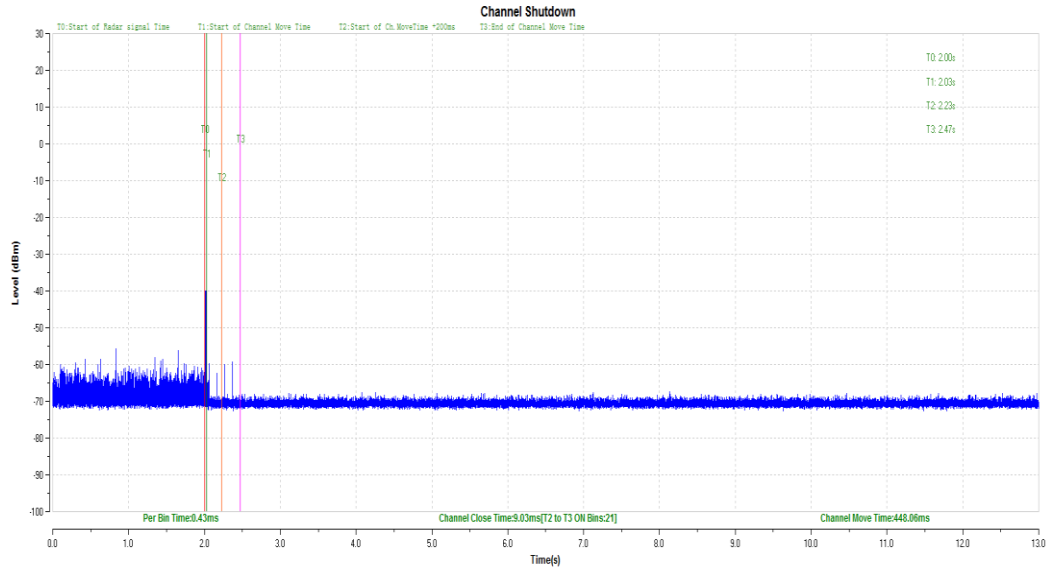
11AC80SISO_5290



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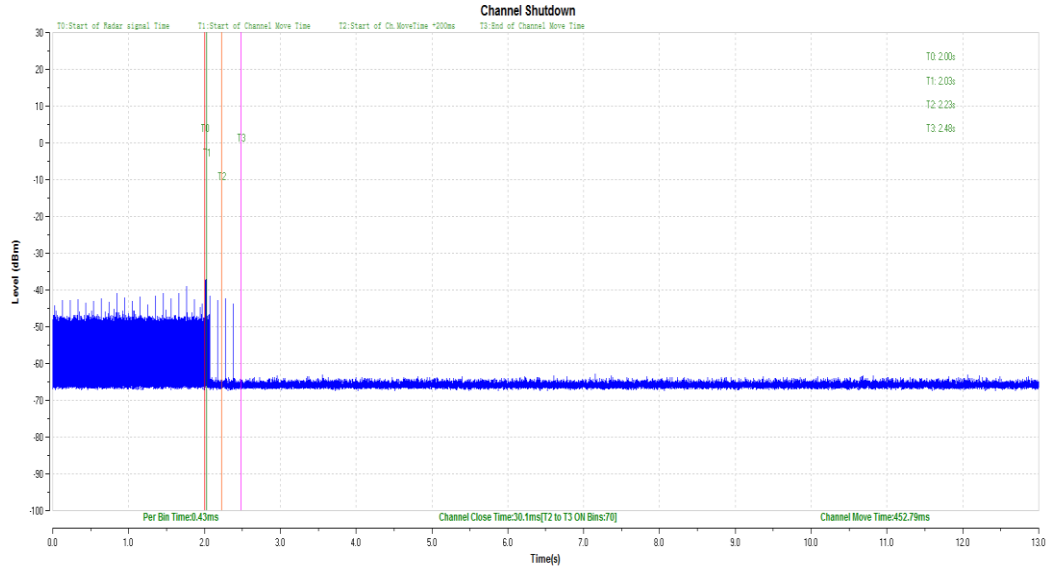

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10 Test Equipment List

Conducted Emission Test

Description	Manufacturer	Model no.	Serial no.	cal. due date
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2020-6-28
LISN	Rohde & Schwarz	ENV4200	100249	2020-6-28
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2020-6-28
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

Radiated Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2020-6-28
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2020-6-29
Horn Antenna	Rohde & Schwarz	HF907	102294	2020-6-22
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG		2020-7-12
Pre-amplifier	Rohde & Schwarz	SCU 40A		2020-6-28
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2020-6-28
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2020-7-7
Attenuator	Agilent	8491A	MY39264334	2020-6-28
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-6-29
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

TS8997 Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2020-6-28
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2020-6-28
Power Splitter	Weinschel	1580	SC319	2020-7-7
Test software	Tonscend	System for BT/WIFI	Version 2.6	N/A

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11 System Measurement Uncertainly

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted Emission 150kHz-30MHz (for test using AMN ENV432 or ENV4200)	3.21dB
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.80dB; Vertical: 4.79dB;
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 5.05dB; Vertical: 5.04dB;
Uncertainty for Conducted RF test with TS 8997	RF Power Conducted: 1.16dB Frequency test involved: 0.6×10^{-7} or 1%

THE END

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