FCC - TEST REPORT

Report Number	:	**68.950.19.2877.01**	Date of Issue:	**October 30, 2019**

Model	:	MM3SB3350N
Product Type	:	Bluetooth&Wi-Fi dual band Communication Module
Applicant	:	GD Midea Air-Conditioning Equipment Co., Ltd.
Address	:	Building #4, Midea Global Innovation Center, Industry Boulevard, Beijiao, Shunde District, Foshan City, Guangdong Province 528311
Manufacturer&Factory	:	GD Midea Air-Conditioning Equipment Co., Ltd.
Address	:	Building #4, Midea Global Innovation Center, Industry Boulevard, Beijiao, Shunde District, Foshan City, Guangdong Province 528311

Test Result	:	■ **Positive** ☐ **Negative**
Total pages including Appendices	:	71

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1 Table of Contents

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
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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 Registration Number:	514049
Telephone:	86 755 8828 6998
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3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	Bluetooth &Wi-Fi dual band Communication Module
Model no.:	MM3SB3350N
Brand Name:	Midea
FCC ID:	2ADQO3SB3350N5
Rating:	5VDC
RF Transmission Frequency:	5.150GHz~5.250GHz; 5.250GHz~5.350GHz; 5.470GHz~5.725GHz; 5.725GHz~5.850GHz
Modulation:	802.11a: BPSK, QPSK, 16QAM, 64QAM, OFDM 802.11n: BPSK, QPSK, 16QAM, 64QAM 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM
Antenna Type:	Integral Antenna
Antenna Gain:	2.0dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Communication Module which support 2.4G Wi-Fi, 5G Wi-Fi and BLE function. The 2.4G Wi-Fi and BLE operated at 2402MHz to 2480MHz, the EUT have master and client at 2.4G Wi-Fi. The 5G Wi-Fi operation 5150MHz to 5250MHz, 5250MHz to 5350MHz, 5470MHz to 5725MHz, and 5725MHz to 5825Mhz. The EUT acting as a master only operate in UNII-1 and UNII-3 bands. And it acting as a client operate in UNII-1, UNII-2A, UNII-2C and UNII-3 bands.

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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 D01v05 DTS Measurement Guidance and ANSI C63.10 (2013).
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

Test Condition	Test Result		
	Pass	Fail	N/A
15.207Conducted Emission AC Power Port	☒	☐	☐
15.403(a)(5) Emission bandwidth	☒	☐	☐
15.407(a)(1) 15.407(a)(3) Maximum Conducted Output Power	☒	☐	☐
15.407(a)(1) 15.407(a)(3) Peak Power Spectral Density	☒	☐	☐
15.407(b)(1) 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]	☒	☐	☐

NOTE 1"[a]": This result include in this report is only the DFS Slave Mode part of the product.

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6 General Remarks

Remarks
This submittal(s) (test report) is intended for FCC ID: 2ADQO3SB3350N5 complies with Section FCC Part 15 Subpart C Rules and FCC Part 15 Subpart E Rules.

MM3SB3350N is a Communication Module which support 2.4G Wi-Fi, 5G Wi-Fi and BLE function. The 2.4G Wi-Fi and BLE operated at 2402MHz to 2480MHz, The 5G Wi-Fi operation 5150MHz to 5250MHz, 5250MHz to 5350MHz ,5470MHz to 5725MHz, and 5725MHz to 5825Mhz. The EUT acting as a master only operate in UNII-1 and UNII-3 bands. And it acting as a client operate in UNII-1, UNII-2A, UNII-2C and UNII-3 bands.

This report is for 5G Wi-Fi only.

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.

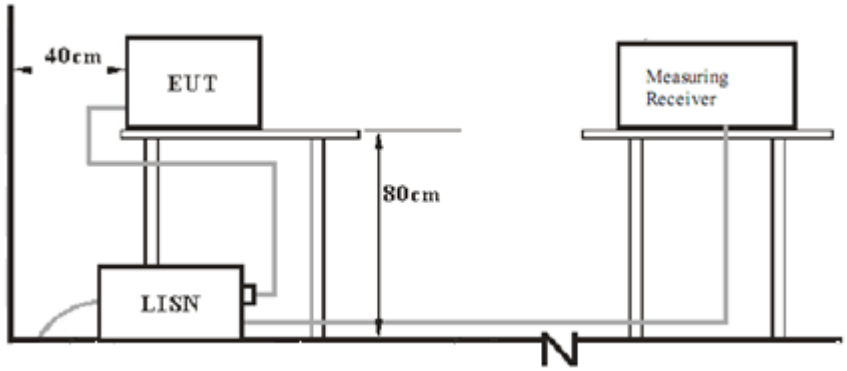
Sample Received Date:	August 2, 2019
Testing Start Date:	September 26, 2019
Testing End Date:	October 24, 2019

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

Reviewed by:	Prepared by:	Tested by:
Zhi John	Warlen Song	Louise Liu
EMC Section Manager	EMC Project Engineer	EMC Test Engineer

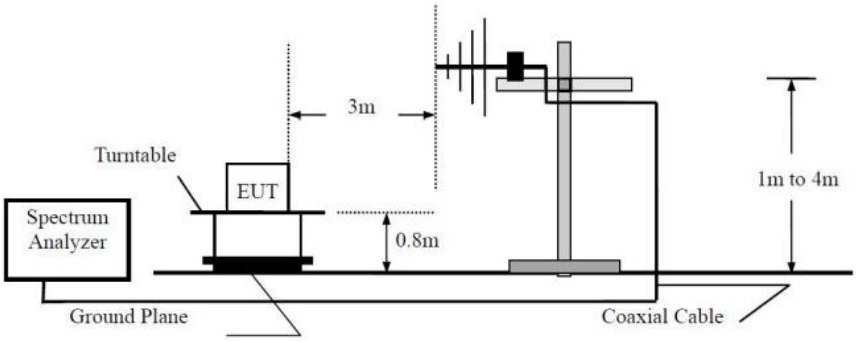
7 Test setups

7.1 AC Power Line Conducted Emission test setups

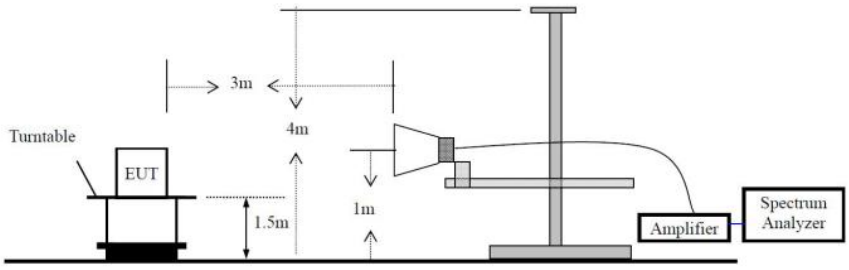


7.2 Radiated test setups

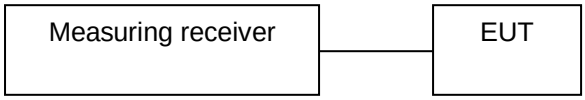
Below 1GHz:



Above 1GHz



7.3 Conducted RF test setups



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8. Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Netobook	Lenovo	X220	---
Adapter	Apple	---	---

The system was configured to channel 36(5180MHz), 64(5320MHz), 100 (5500MHz), 140(5700MHz), 149(5745MHz) and 165(5825MHz) for 802.11a & 802.11n-HT20
Channel 38(5190MHz); 62(5310MHz), 102(5510MHz), 134(5670MHz), 151(5755MHz) and 159(5795MHz) for 802.11n-HT40
.

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9 Technical Requirement

9.1 Conducted Emission Test

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 §15.107, 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

*Decreasing linearly with logarithm of the frequency

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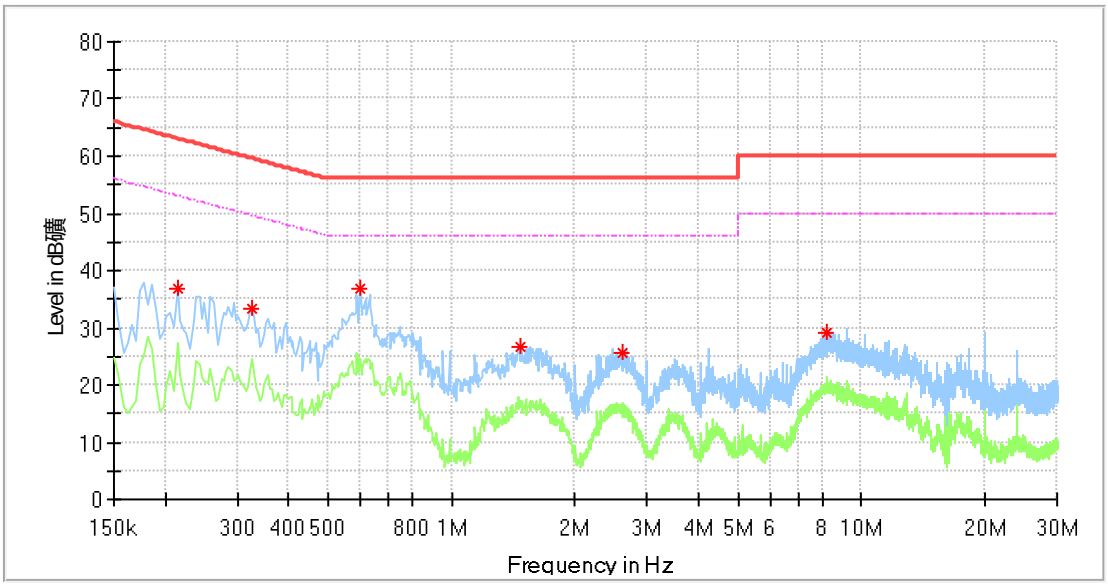
Conducted Emission

Product Type	:	Bluetooth &Wi-Fi dual band Communication Module
M/N	:	MM3SB3350N
Operating Condition	:	STA: Wi-Fi
Test Specification	:	Line
Comment	:	AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)*
0.214000	37.02	---	63.05	26.03	L1	10.3
0.326000	33.45	---	59.55	26.10	L1	10.3
0.598000	36.96	---	56.00	19.04	L1	10.3
1.466000	26.58	---	56.00	29.42	L1	10.3
2.602000	25.54	---	56.00	30.46	L1	10.4
8.206000	29.21	---	60.00	30.79	L1	10.6

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---		---

*Correct factor=cable loss + LISN factor

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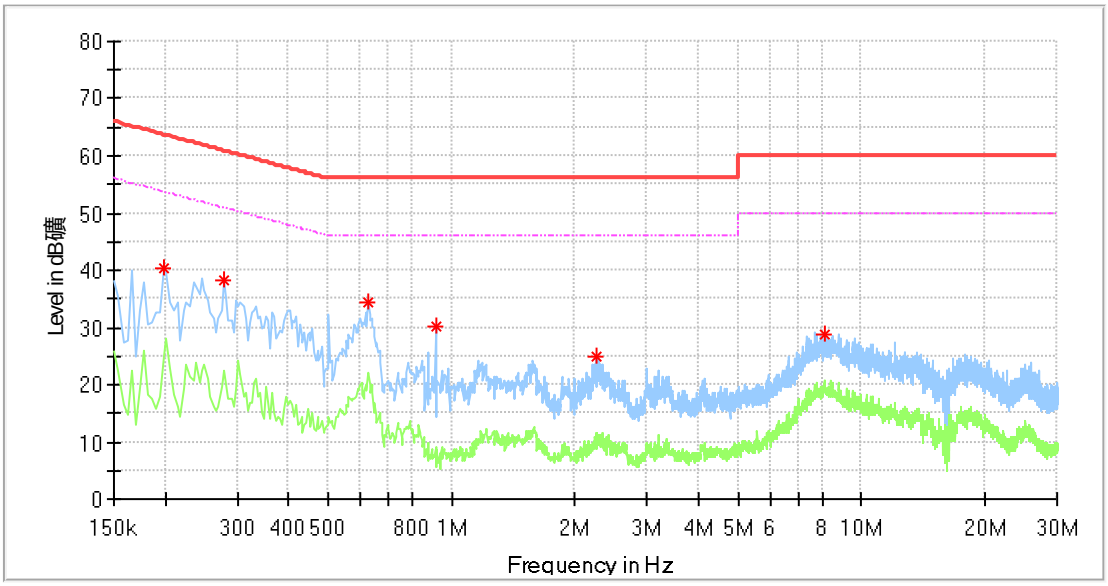
Product Type	:	Bluetooth &Wi-Fi dual band Communication Module
M/N	:	MM3SB3350N
Operating Condition	:	STA: Wi-Fi
Test Specification	:	Neutral
Comment	:	AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)*
0.198000	40.47	---	63.69	23.23	N	10.3
0.278000	38.23	---	60.88	22.64	N	10.3
0.626000	34.48	---	56.00	21.52	N	10.3
0.914000	30.05	---	56.00	25.95	N	10.3
2.246000	25.02	---	56.00	30.98	N	10.4
8.150000	28.87	---	60.00	31.13	N	10.7

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---		---

*Correct factor=cable loss + LISN factor

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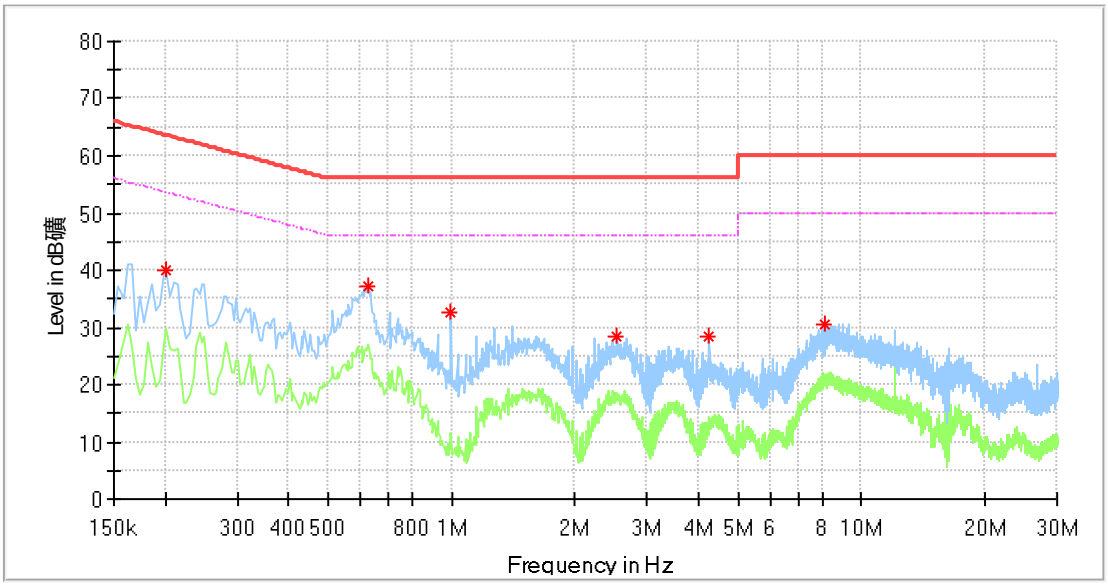
Product Type	:	Bluetooth &Wi-Fi dual band Communication Module
M/N	:	MM3SB3350N
Operating Condition	:	AP: Wi-Fi
Test Specification	:	Line
Comment	:	AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)*
0.202000	39.83	---	63.53	23.70	L1	10.3
0.626000	37.28	---	56.00	18.72	L1	10.3
0.998000	32.51	---	56.00	23.49	L1	10.3
2.538000	28.47	---	56.00	27.53	L1	10.4
4.258000	28.51	---	56.00	27.49	L1	10.4
8.178000	30.54	---	60.00	29.46	L1	10.6

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---		---

*Correct factor=cable loss + LISN factor

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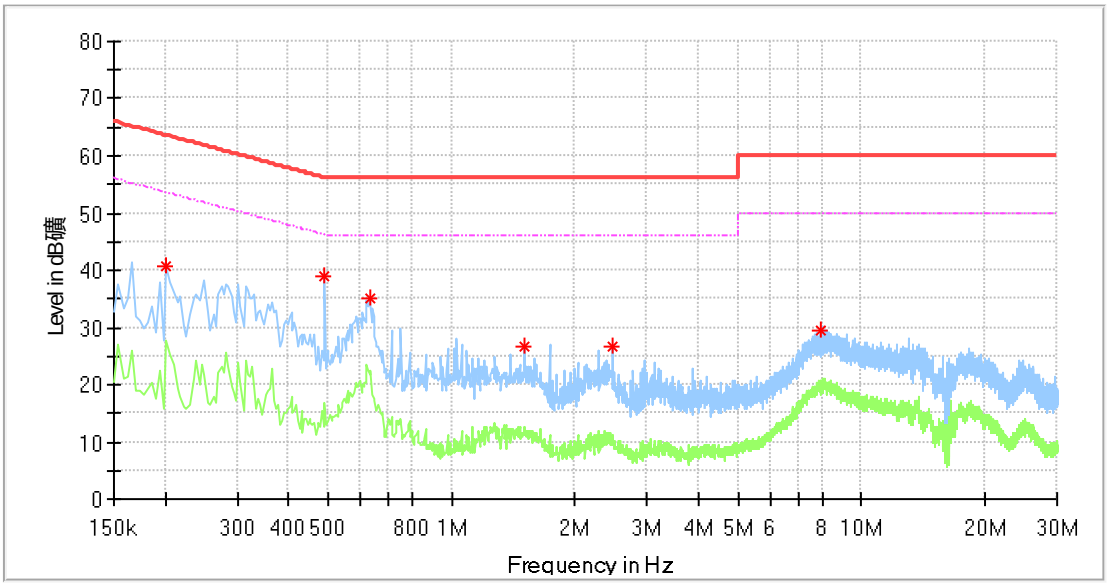
Product Type	:	Bluetooth &Wi-Fi dual band Communication Module
M/N	:	MM3SB3350N
Operating Condition	:	AP: Wi-Fi
Test Specification	:	Neutral
Comment	:	AC 120V/60Hz



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)*
0.202000	40.82	---	63.53	22.71	N	10.3
0.490000	38.78	---	56.17	17.38	N	10.3
0.630000	35.17	---	56.00	20.83	N	10.3
1.502000	26.59	---	56.00	29.41	N	10.3
2.478000	26.81	---	56.00	29.19	N	10.4
7.930000	29.38	---	60.00	30.62	N	10.7

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---		---

*Correct factor=cable loss + LISN factor

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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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Test result as below table:

IEEE 802.11a modulation Test Result

Band	Channel	Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Measured 26dB Bandwidth (MHz)	Measured 6dB Bandwidth (MHz)
5.2G Band	Low	5180	17.103	19.840	N/A
	High	5320	17.263	19.920	N/A
5.5G Band	Low	5500	17.343	20.160	N/A
	High	5700	17.423	21.840	N/A
5.8G Band	Low	5745	17.463	24.640	16.440
	High	5825	17.862	27.400	16.400

IEEE 802.11n-HT20 modulation Test Result

Band	Channel	Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Measured 26dB Bandwidth (MHz)	Measured 6dB Bandwidth (MHz)
5.2G Band	Low	5180	18.222	20.920	N/A
	High	5320	18.102	20.240	N/A
5.5G Band	Low	5500	18.222	20.720	N/A
	High	5700	18.222	22.000	N/A
5.8G Band	Low	5745	18.262	22.320	17.640
	High	5825	18.262	20.400	17.680

IEEE 802.11n-HT40 modulation Test Result

Band	Channel	Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Measured 26dB Bandwidth (MHz)	Measured 6dB Bandwidth (MHz)
5.2G Band	Low	5190	36.444	41.760	N/A
	High	5310	36.364	40.880	N/A
5.5G Band	Low	5510	36.683	41.360	N/A
	High	5670	36.683	41.360	N/A
5.8G Band	Low	5755	36.603	41.840	35.840
	High	5795	36.603	42.320	36.080

Remark: “N/A” means “Not Applicable”

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9.3 Maximum conducted output power

Test Method
According to KDB789033 D02

Limits: The maximum conducted output power over the frequency band of operation shall not exceed 1W for 5.15-5.25GHz Band, 250mW for 5.25-5.35GHz, 5.47-5.725 GHz Band and 1W for 5.725-5.85GHz Band, provided the maximum antenna gain does not exceed 6dBi.

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	12.74	24.00
	Middle	5200	13.69	24.00
	High	5240	14.30	24.00
5.2G Band	Low	5260	13.11	24.00
	Middle	5280	13.65	24.00
	High	5320	13.15	24.00
5.5G Band	Low	5500	13.08	24.00
	Middle	5580	13.20	24.00
	High	5700	13.02	24.00
	High	5720	11.03	24.00
5.8G Band	Low	5745	12.43	30.00
	Middle	5785	12.43	30.00
	High	5825	11.54	30.00

IEEE 802.11n-HT20 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	13.87	24.00
	Middle	5200	13.93	24.00
	High	5240	14.17	24.00
5.2G Band	Low	5260	11.88	24.00
	Middle	5280	12.27	24.00
	High	5320	12.80	24.00
5.5G Band	Low	5500	14.03	24.00
	Middle	5580	14.23	24.00
	High	5700	13.99	24.00
	High	5720	13.26	24.00
5.8G Band	Low	5745	14.07	30.00
	Middle	5785	14.21	30.00
	High	5825	13.87	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	12.86	24.00
	High	5230	15.59	24.00
5.2G Band	Low	5270	11.42	24.00
	High	5310	11.87	24.00
5.5G Band	Low	5510	13.49	24.00
	Middle	5550	13.41	24.00
	High	5670	13.50	24.00
	High	5710	12.74	24.00
5.8G Band	Low	5755	13.54	30.00
	High	5795	13.30	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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TestMode	Antenna	Channel(MHz)	Result(dBm)	Limit(dBm)	Verdict
11A	Ant1	5180	8.48	<=11	PASS
		5200	9.5	<=11	PASS
		5240	9.99	<=11	PASS
		5260	8.65	<=11	PASS
		5280	9.58	<=11	PASS
		5320	9.16	<=11	PASS
		5500	9.14	<=11	PASS
		5580	9.07	<=11	PASS
		5700	9	<=11	PASS
		5720_UNII-2C	7.6	<=11	PASS
		5720_UNII-3	5.39	<=11	PASS
		5745	7.11	<=30	PASS
		5785	7.17	<=30	PASS
		5825	6.26	<=30	PASS
11N20SISO	Ant1	5180	9.56	<=11	PASS
		5200	9.45	<=11	PASS
		5240	9.7	<=11	PASS
		5260	7.52	<=11	PASS
		5280	8.21	<=11	PASS
		5320	8.56	<=11	PASS
		5500	10.13	<=11	PASS
		5580	9.71	<=11	PASS
		5700	9.81	<=11	PASS
		5720_UNII-2C	9.84	<=11	PASS
		5720_UNII-3	6.6	<=11	PASS
		5745	8.42	<=30	PASS
		5785	8.66	<=30	PASS
		5825	8.43	<=30	PASS
11N40SISO	Ant1	5190	5.73	<=11	PASS
		5230	8.07	<=11	PASS
		5270	4.73	<=11	PASS
		5310	4.68	<=11	PASS
		5510	6.71	<=11	PASS
		5550	6.08	<=11	PASS
		5670	6.55	<=11	PASS
		5710_UNII-2C	6.22	<=11	PASS
		5710_UNII-3	1	<=11	PASS
		5755	5.2	<=30	PASS
		5795	5.06	<=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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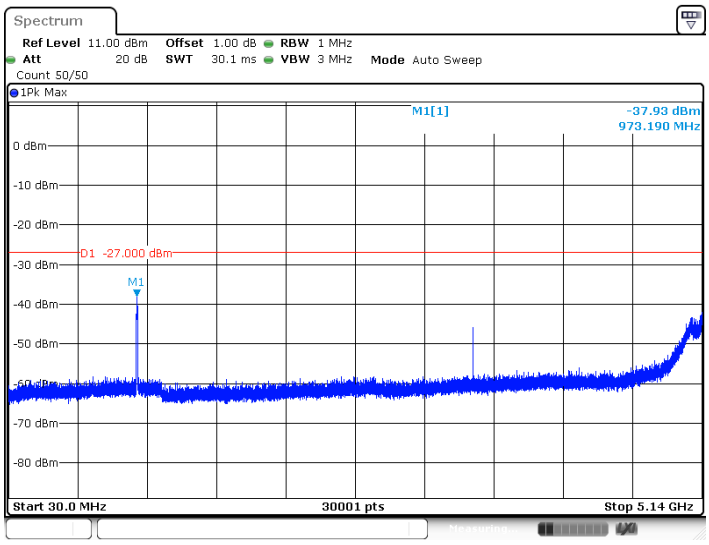
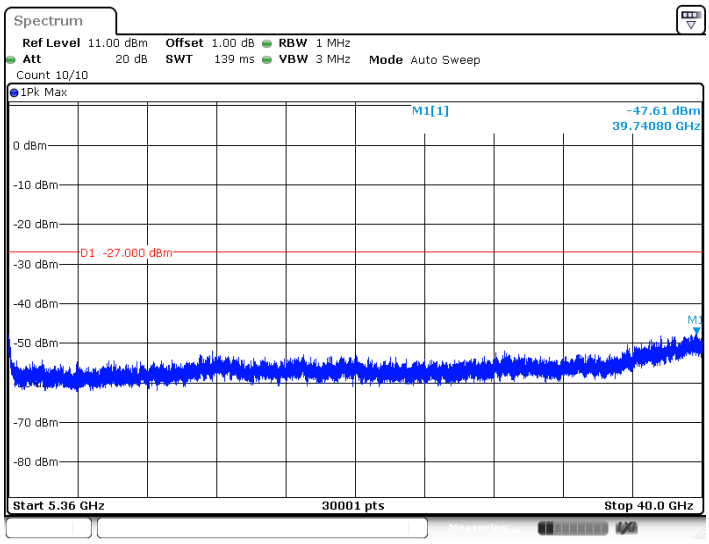
Transmitting spurious emission test result as below (Conducted Mode):

IEEE 802.11a modulation Test Result

5180MHz





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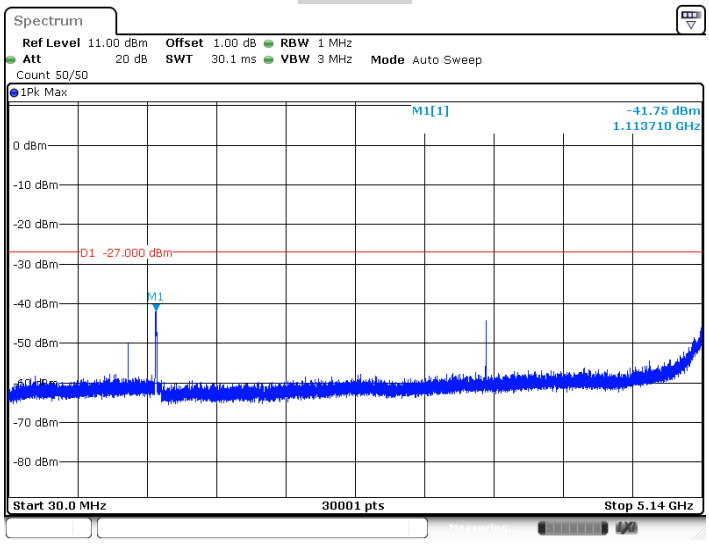
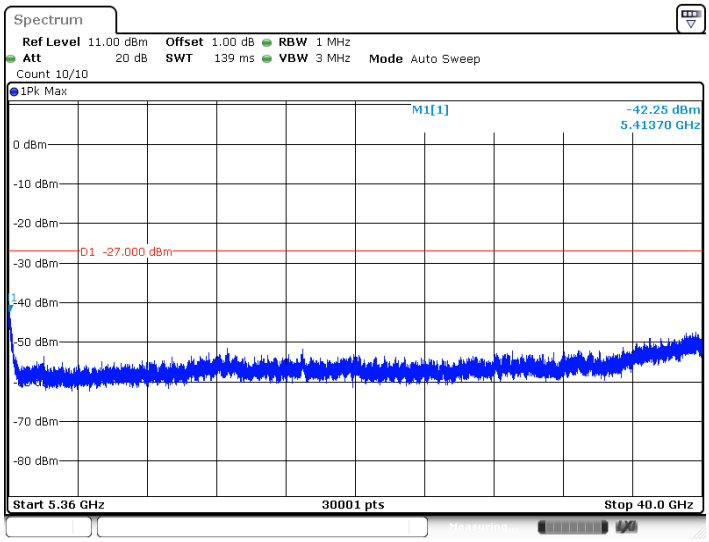
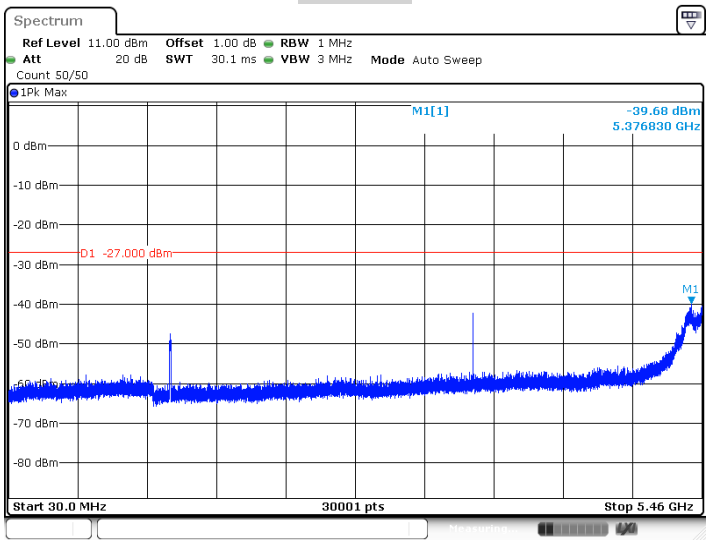
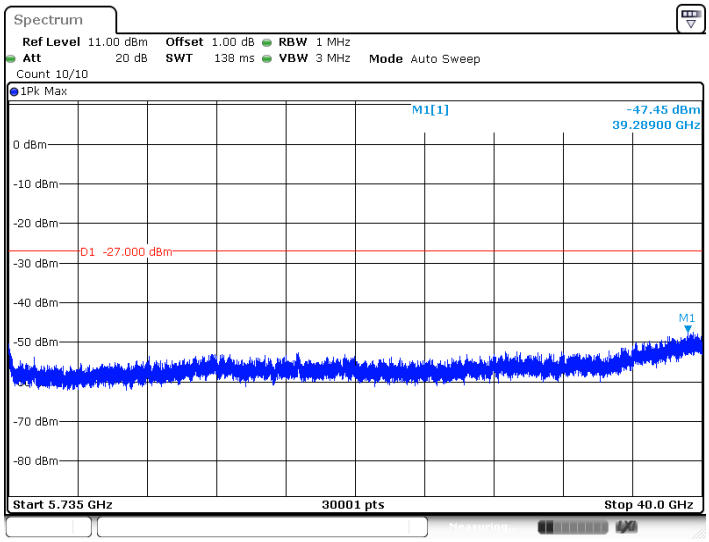
5320MHz


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 30.1 ms VBW 3 MHz Mode Auto Sweep
Count 50/50
1Pk Max
M1[1] -41.75 dBm
1.113710 GHz
D1 -27.000 dBm
M1
Start 30.0 MHz 30001 pts Stop 5.14 GHz
Date: 10.OCT.2019 20:49:57

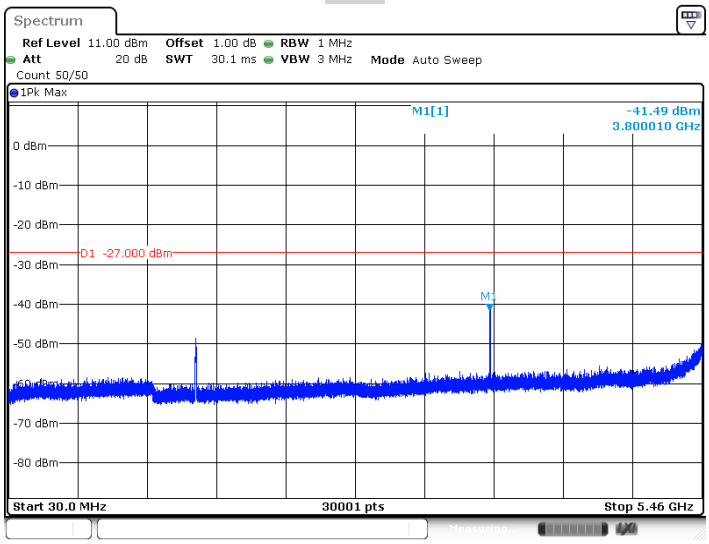

Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 139 ms VBW 3 MHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -42.25 dBm
5.41370 GHz
D1 -27.000 dBm
Start 5.36 GHz 30001 pts Stop 40.0 GHz
Date: 10.OCT.2019 20:50:05

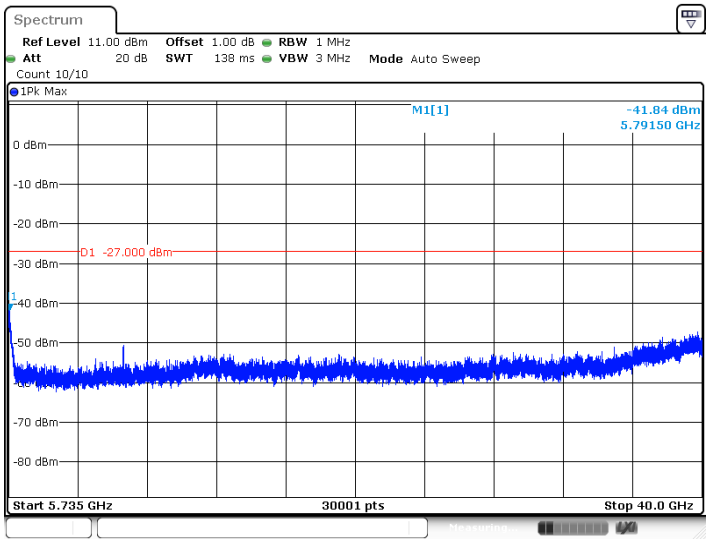
5500MHz


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 30.1 ms VBW 3 MHz Mode Auto Sweep
Count 50/50
1Pk Max
M1[1] -39.68 dBm
5.376830 GHz
D1 -27.000 dBm
M1
Start 30.0 MHz 30001 pts Stop 5.46 GHz
Date: 10.OCT.2019 20:55:36

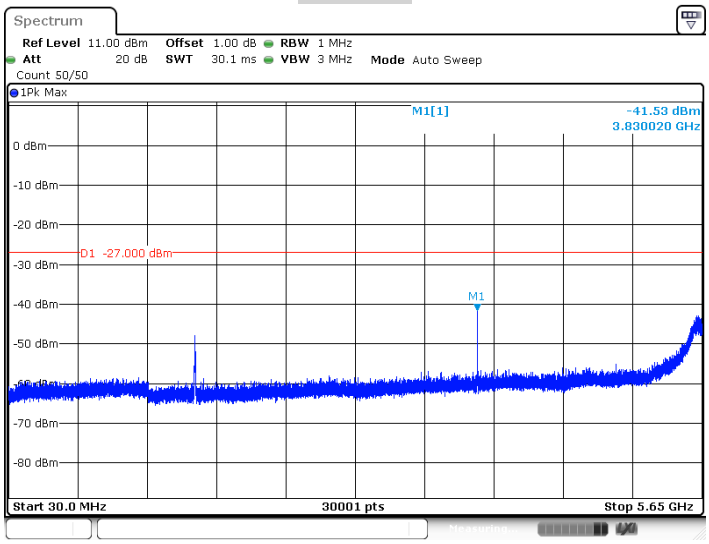

Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 138 ms VBW 3 MHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -47.45 dBm
39.28900 GHz
D1 -27.000 dBm
M1
Start 5.735 GHz 30001 pts Stop 40.0 GHz
Date: 10.OCT.2019 20:55:44

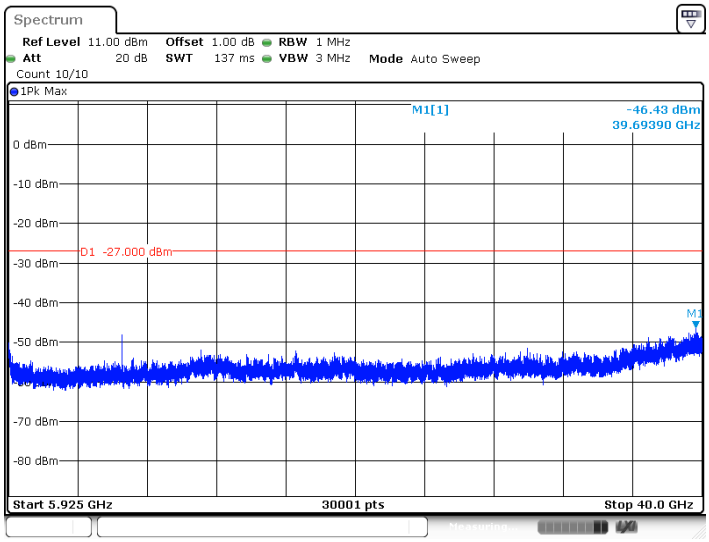
5700


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 30.1 ms VBW 3 MHz Mode Auto Sweep
Count 50/50
1Pk Max
M1[1] -41.49 dBm
3.800010 GHz
D1 -27.000 dBm
Start 30.0 MHz 30001 pts Stop 5.46 GHz
Date: 10.OCT.2019 21:12:12


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 138 ms VBW 3 MHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -41.84 dBm
5.79150 GHz
D1 -27.000 dBm
Start 5.735 GHz 30001 pts Stop 40.0 GHz
Date: 10.OCT.2019 21:12:21

5745MHz





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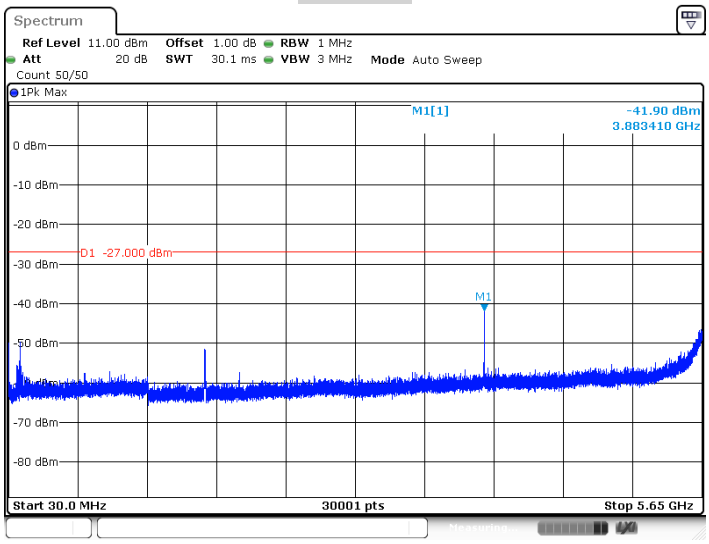
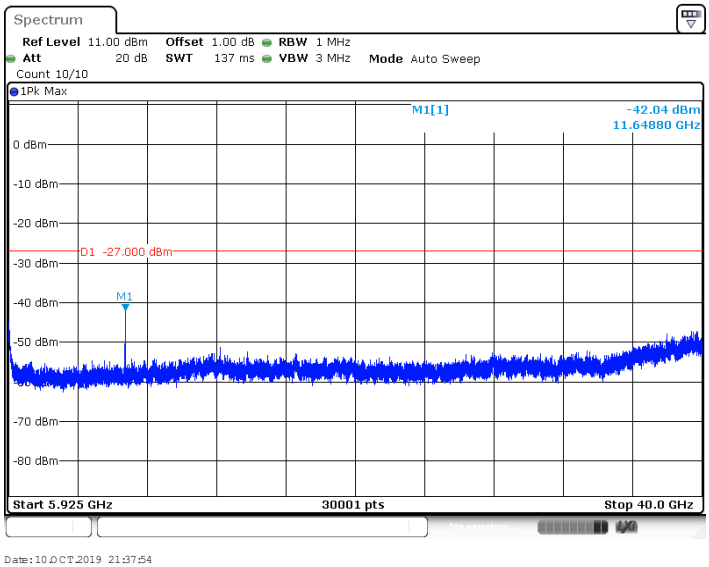
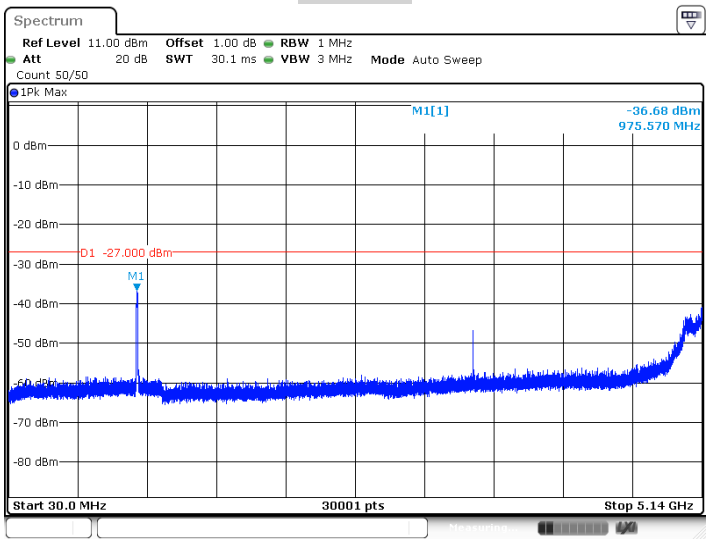
5825MHz

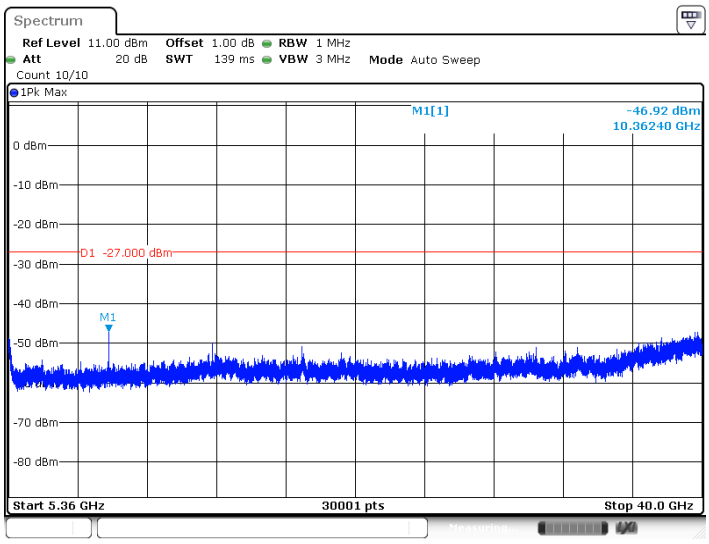

Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 30.1 ms VBW 3 MHz Mode Auto Sweep
Count 50/50
1Pk Max
M1[1] -41.90 dBm
3.883410 GHz
D1 -27.000 dBm
M1
Start 30.0 MHz 30001 pts Stop 5.65 GHz
Date: 10.OCT.2019 21:37:45


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 137 ms VBW 3 MHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -42.04 dBm
11.64880 GHz
D1 -27.000 dBm
M1
Start 5.925 GHz 30001 pts Stop 40.0 GHz
Date: 10.OCT.2019 21:37:54

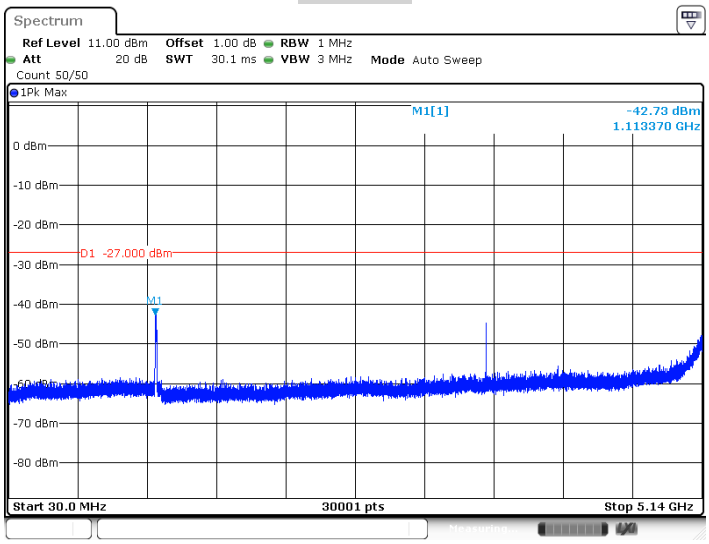
IEEE 802.11n-HT20 modulation Test Result

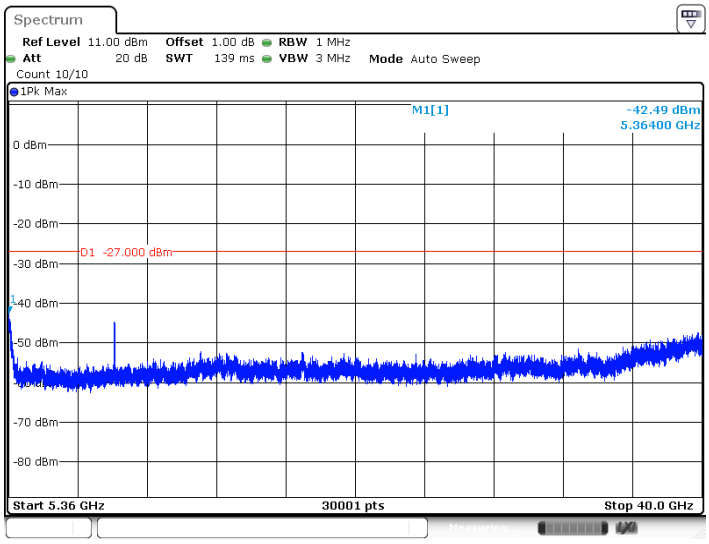
5180MHz





5320MHz





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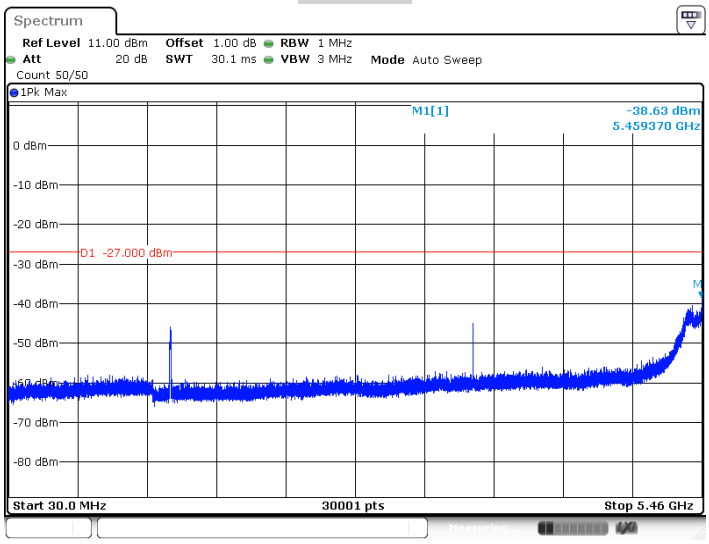
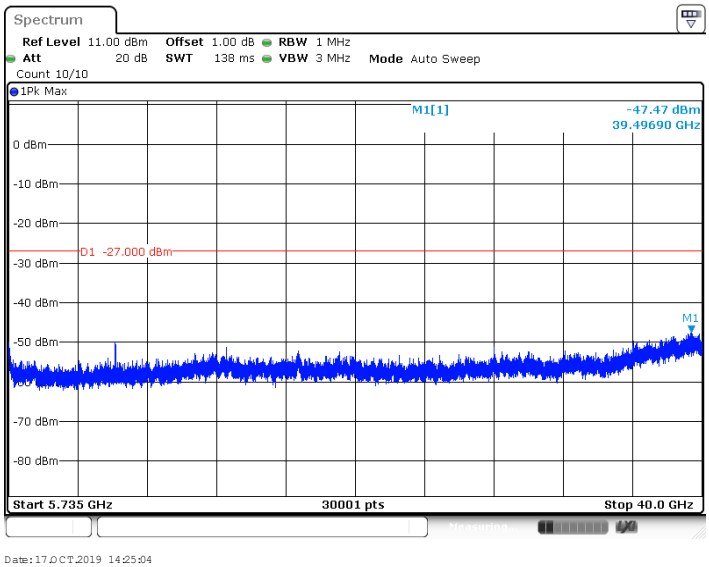
5500MHz





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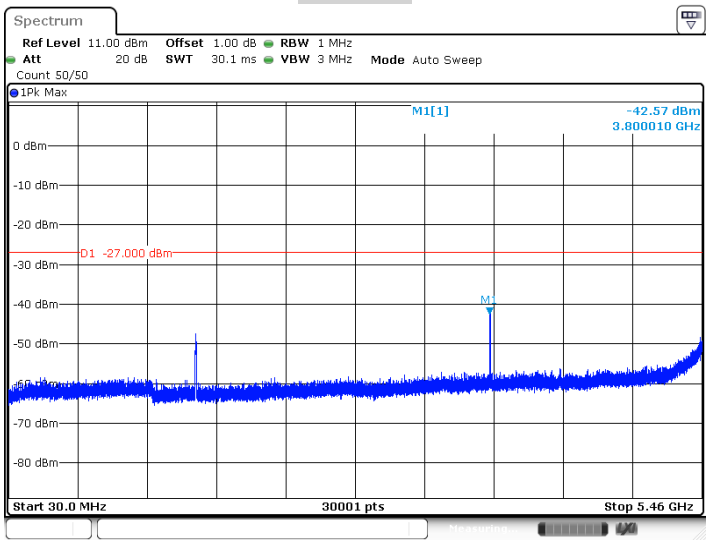
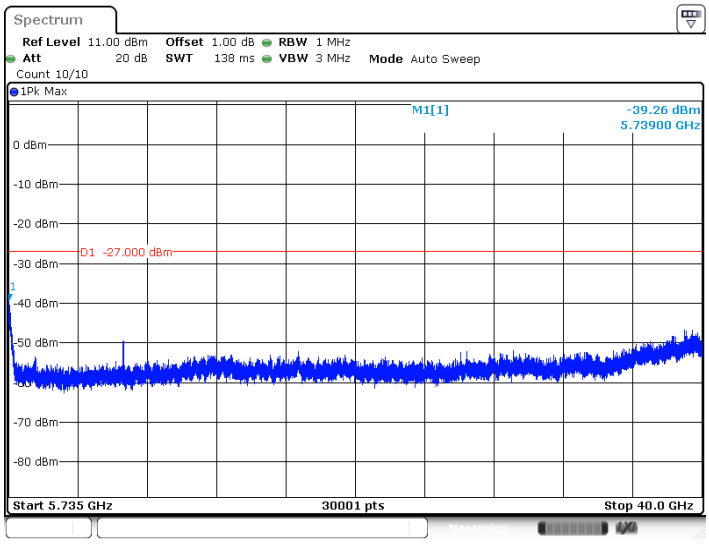
5700MHz





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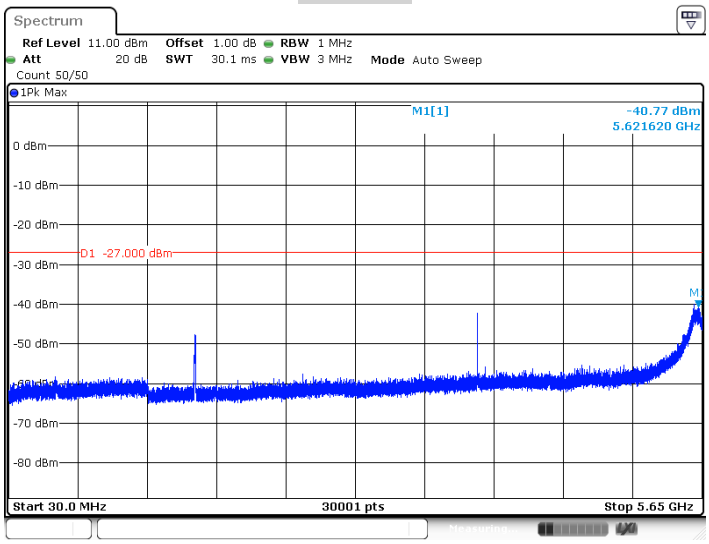
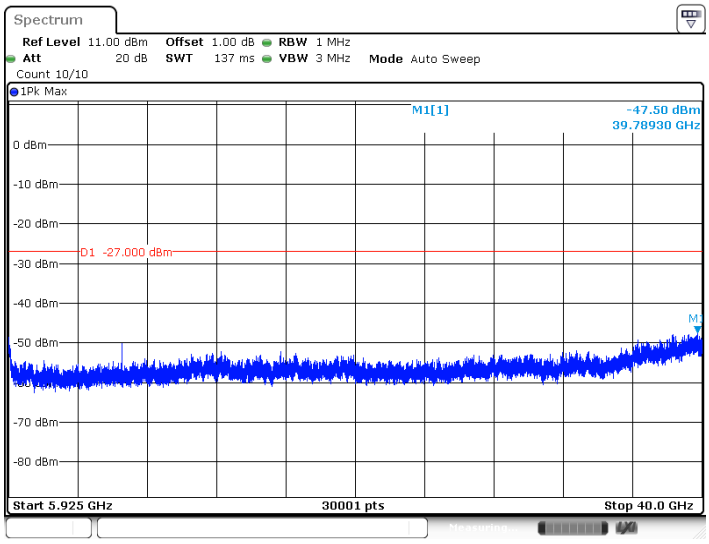
5745MHz





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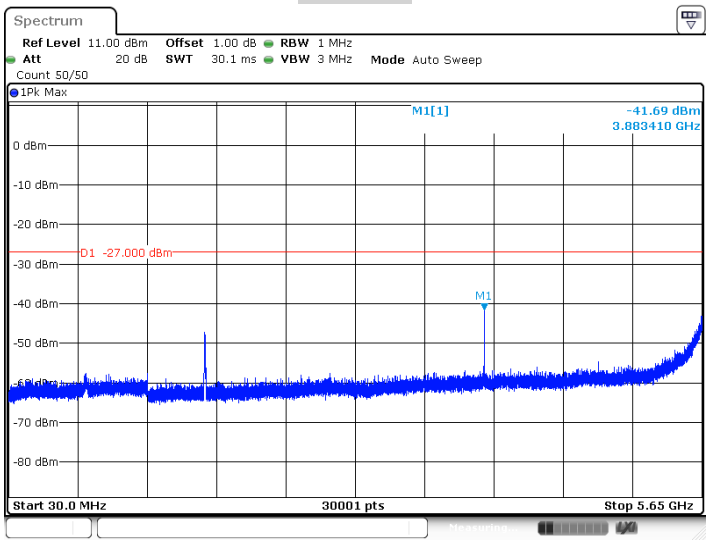
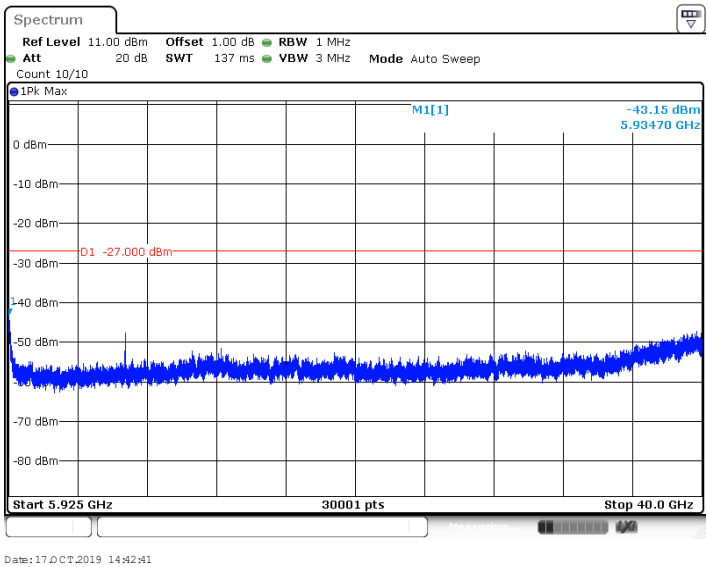
5825MHz





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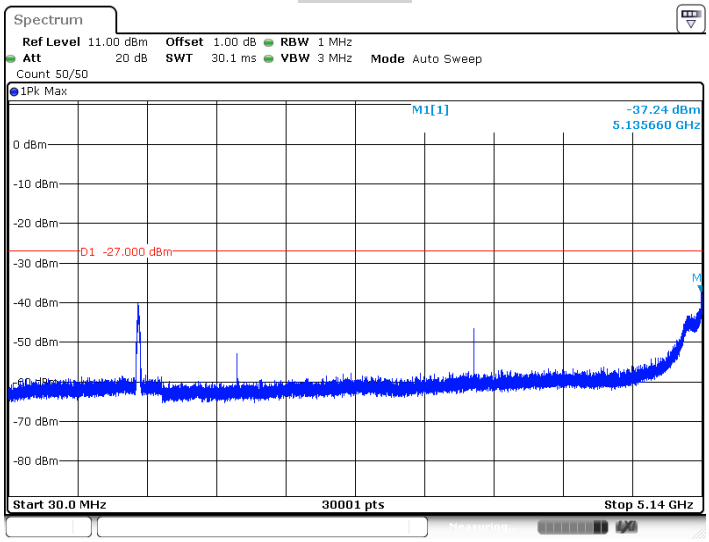
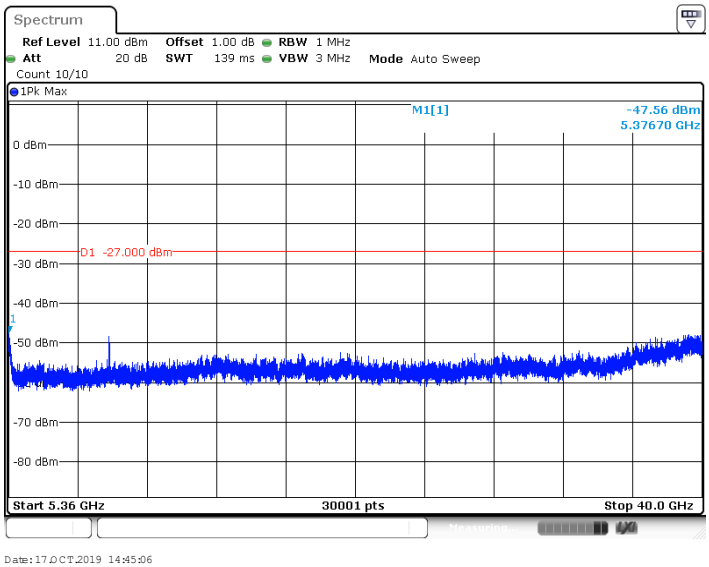
IEEE 802.11n-HT40 modulation Test Result

5190MHz





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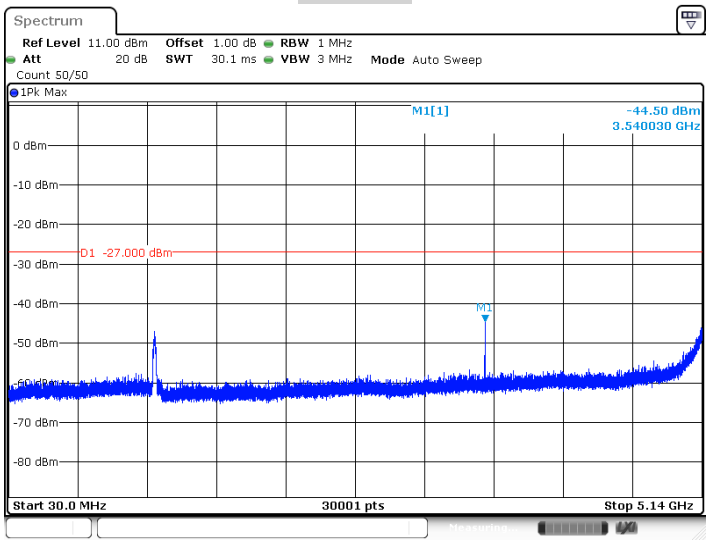
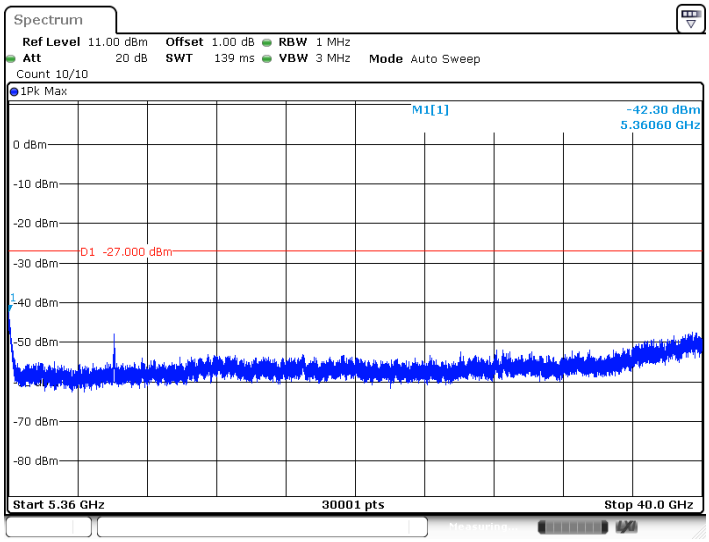
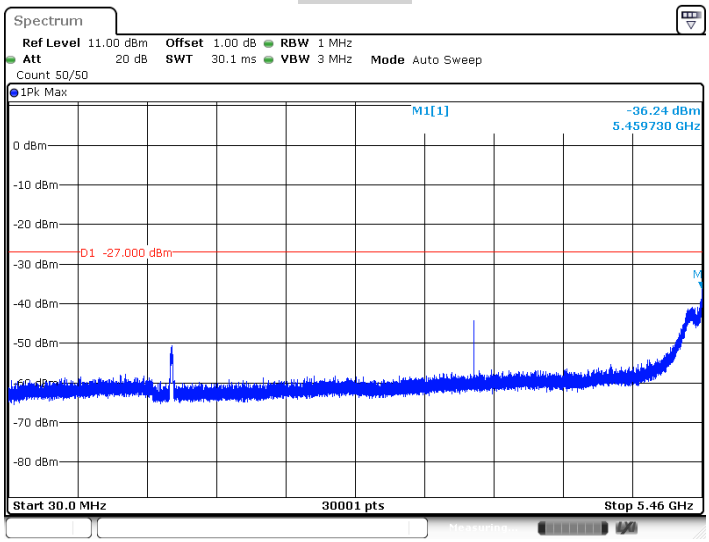
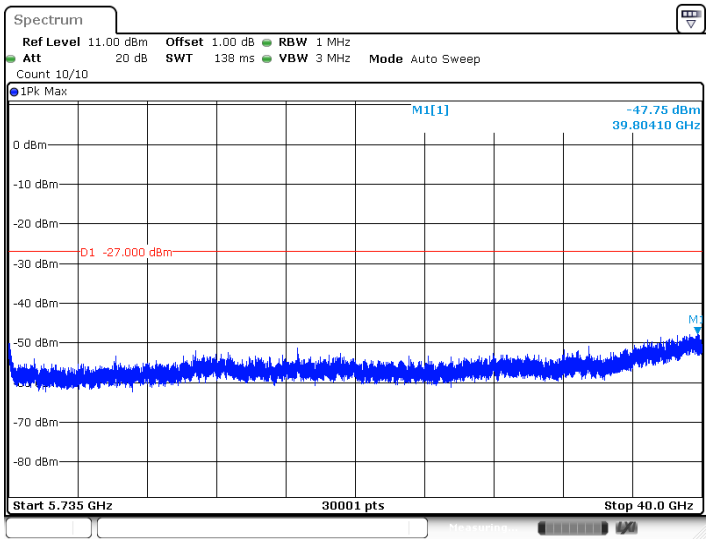
5310MHz


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 30.1 ms VBW 3 MHz Mode Auto Sweep
Count 50/50
1Pk Max
M1[1] -44.50 dBm
3.540030 GHz
D1 -27.000 dBm
M1
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
Start 30.0 MHz
30001 pts
Stop 5.14 GHz
Date: 17.OCT.2019 14:59:07


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 139 ms VBW 3 MHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -42.30 dBm
5.36060 GHz
D1 -27.000 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
Start 5.36 GHz
30001 pts
Stop 40.0 GHz
Date: 17.OCT.2019 14:59:15

5510MHz





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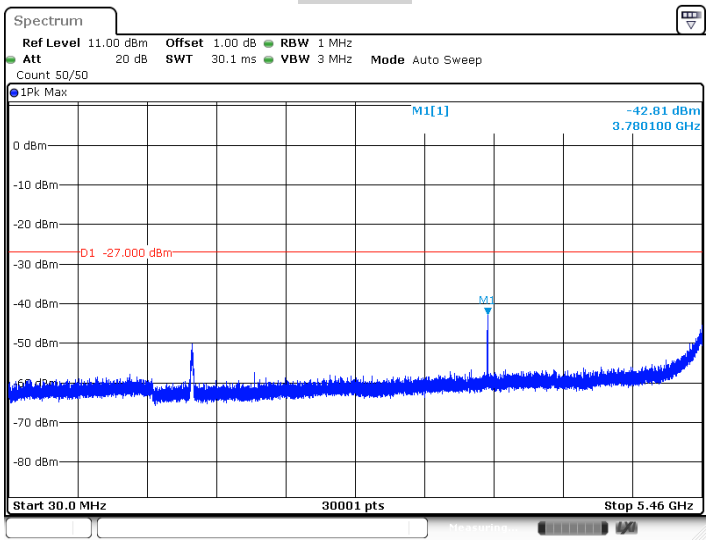
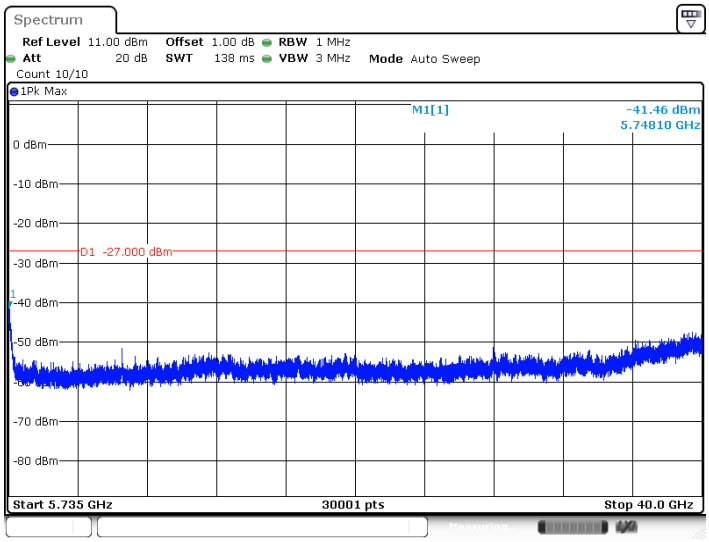
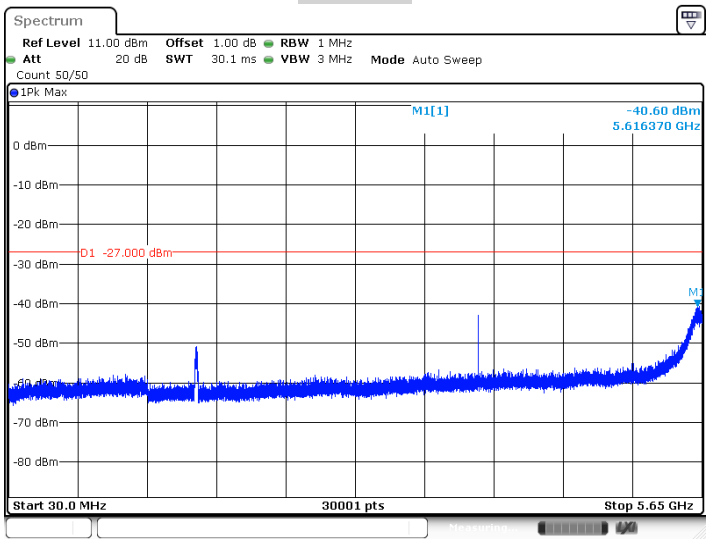
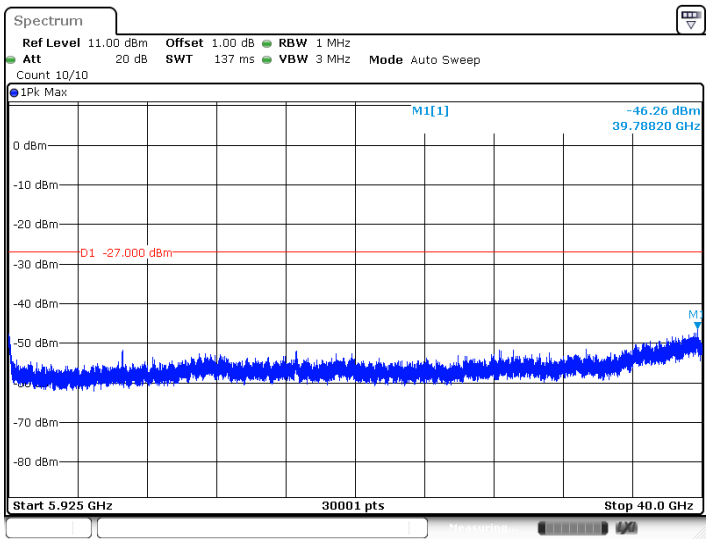
5670MHz


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 30.1 ms VBW 3 MHz Mode Auto Sweep
Count 50/50
1Pk Max
M1[1] -42.81 dBm
3.780100 GHz
D1 -27.000 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
Start 30.0 MHz
30001 pts
Stop 5.46 GHz
Date: 17.OCT.2019 15:05:39


Spectrum
Ref Level 11.00 dBm Offset 1.00 dB RBW 1 MHz
Att 20 dB SWT 138 ms VBW 3 MHz Mode Auto Sweep
Count 10/10
1Pk Max
M1[1] -41.46 dBm
5.74810 GHz
D1 -27.000 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
Start 5.735 GHz
30001 pts
Stop 40.0 GHz
Date: 17.OCT.2019 15:05:47

5755MHz





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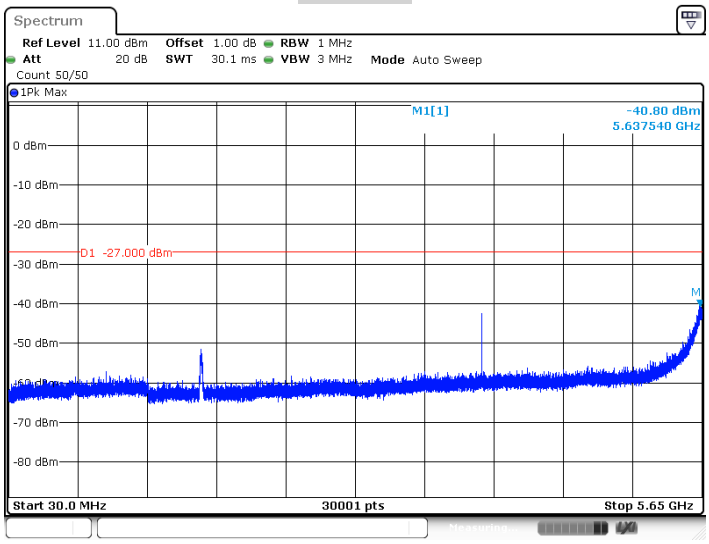
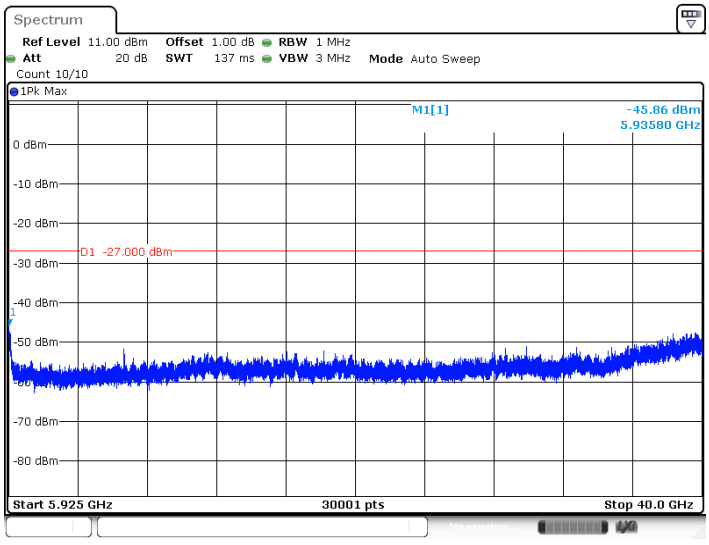
5795MHz





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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 3 meter 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 from 0 degrees to 360 degrees to find the maximum reading.
5: Use the following spectrum analyzer settings According to C63.10:
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 to 120KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Peak unwanted emissions 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 ,Sweep = auto, Detector function = peak, Trace = max hold.
Procedures for average unwanted emissions measurements above 1000 MHz
a) RBW = 1 MHz.
b) VBW \ [3 × RBW].
c) Detector = RMS (power averaging), if [span / (# of points in sweep)] \ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
e) Sweep time = auto.
f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D,where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)
g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
1) If power averaging (rms) mode was used in the preceding step e), then the correction

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factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.
2) If linear voltage averaging mode was used in the preceding step e), then the correction
factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Limit

According to part 15.247(d), 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.

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		
204.007222	32.29	Horizontal	43.50	11.21	-28.5	QP	Pass
612.107778*	34.56	Horizontal	46.00	11.44	-19.7	QP	Pass
888.126667	36.22	Horizontal	46.00	9.78	-15.8	QP	Pass
96.013889	25.58	Vertical	43.50	17.92	-29.0	QP	Pass
119.994444	28.60	Vertical	43.50	14.90	-30.3	QP	Pass
888.126667	35.83	Vertical	46.00	10.17	-15.8	QP	Pass
3453.25	45.03	Horizontal	74.00	28.97	-2.7	PK	Pass
15925.812500*	48.73	Horizontal	74. 00	25.27	20.5	PK	Pass
31039.125000	46.35	Horizontal	74. 00	27.65	2.5	PK	Pass
1969.187500	35.59	Vertical	74.00	38.41	-8.0	PK	Pass
10489.750000	39.59	Vertical	74.00	34.41	9.0	PK	Pass
36397.500000	44.37	Vertical	74.00	29.63	4.3	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		
3546.625000	48.33	Horizontal	74	25.67	-2.4	PK	Pass
15928.562500*	48.80	Horizontal	74	25.20	20.6	PK	Pass
36213.250000	45.48	Horizontal	74	28.52	4.8	PK	Pass
3546.625000	42.53	Vertical	74	31.47	-2.4	PK	Pass
15930.968750*	49.47	Vertical	74	24.53	20.6	PK	Pass
35132.500000	44.95	Vertical	74	29.05	3.9	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		
3666.625000*	48.89	Horizontal	74	25.11	-1.9	PK	Pass
15938.531250*	48.49	Horizontal	74	25.51	20.9	PK	Pass
35122.875000	45.25	Horizontal	74	28.75	4.4	PK	Pass
3666.625000*	47.09	Vertical	74	26.91	-1.9	PK	Pass
15926.500000*	47.84	Vertical	74	26.16	20.5	PK	Pass
37883.187500	44.81	Vertical	74	29.19	5.3	PK	Pass

802.11A Modulation 5700MHz Test Result

Frequency	Emission Level	Polarization	Limit	Margin	Corr. Factor	Detector	Result
MHz	dBuV/m		dBµV/m	dB	dB		
3799.937500*	51.42	Horizontal	74	22.58	3.0	PK	Pass
15920.312500*	49.10	Horizontal	74	24.90	20.3	PK	Pass
36229.750000	45.51	Horizontal	74	28.49	4.9	PK	Pass
3799.937500*	49.10	Vertical	74	24.90	-1.6	PK	Pass
15976.343750*	48.33	Vertical	74	25.67	20.2	PK	Pass
36228.375000	45.09	Vertical	74	28.91	4.1	PK	Pass

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802.11A Modulation 5745MHz Test Result

Frequency	Emission Level	Polarization	Limit	Margin	Corr. Factor	Detector	Result
MHz	dBuV/m		dBµV/m	dB	dB		
3829.937500*	50.57	Horizontal	74	23.43	-1.5	PK	Pass
15916.187500*	48.58	Horizontal	74	25.42	20.2	PK	Pass
37967.062500	45.59	Horizontal	74	28.41	6.0	PK	Pass
3829.937500*	49.58	Vertical	74	24.42	-1.5	PK	Pass
15921.343750*	48.93	Vertical	74	25.07	20.3	PK	Pass
36208.437500	45.06	Vertical	74	28.94	4.1	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		
3883.375000*	49.15	Horizontal	74	24.85	-1.3	PK	Pass
15939.562500*	47.95	Horizontal	74	26.05	20.9	PK	Pass
35164.125000	44.95	Horizontal	74	29.05	4.4	PK	Pass
3883.375000*	48.49	Vertical	74	25.51	-1.3	PK	Pass
15930.281250*	48.53	Vertical	74	25.47	20.6	PK	Pass
36200.875000	44.60	Vertical	74	29.40	4.1	PK	Pass

Remark:

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

(2) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(3) Level=Reading Level + Correction 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)

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9.6 Band Edge

Test Method

According to KBD789033 D02

The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.

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:

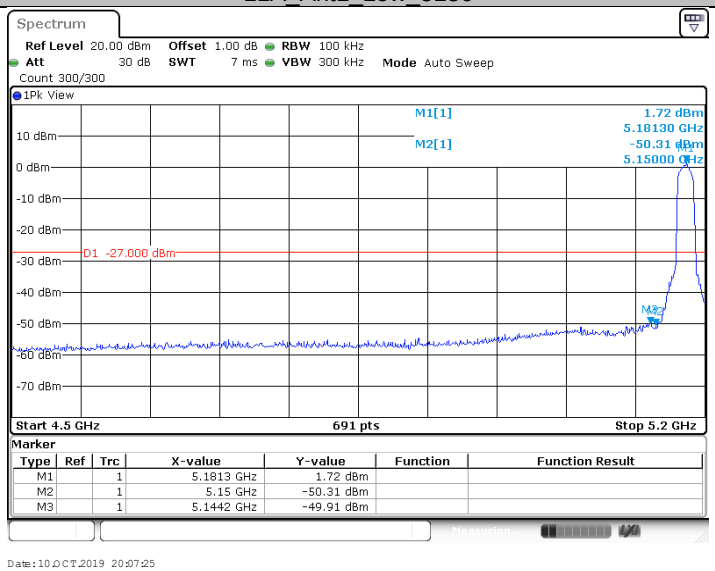
TestMode	Antenna	Ch Name	Channel(MHz)	Result(dBm)	Limit(dBm)	Verdict
11A	Ant1	Low	5180	-49.91	<=-27	PASS
		High	5320	-48.58	<=-27	PASS
		Low	5500	-48.8	<=-27	PASS
		High	5700	-46.88	<=-27	PASS
		Low	5720	-55.92	<=-27	PASS
		High	5720	-53.37	<=-27	PASS
11N20SISO	Ant1	Low	5180	-47.38	<=-27	PASS
		High	5320	-50.02	<=-27	PASS
		Low	5500	-47.47	<=-27	PASS
		High	5700	-43.21	<=-27	PASS
		Low	5720	-55.03	<=-27	PASS
		High	5720	-51.89	<=-27	PASS
11N40SISO	Ant1	Low	5190	-42.96	<=-27	PASS
		High	5310	-45.34	<=-27	PASS
		Low	5510	-40.75	<=-27	PASS
		High	5670	-46.23	<=-27	PASS
		Low	5710	-54.22	<=-27	PASS
		High	5710	-52.39	<=-27	PASS

TestMode	Antenna	ChName	Channel(MHz)	Freq Range	Result	Limit	Verdict
11A	Ant1	Low	5745	5650~5700	-51.44	8.15	PASS
		Low	5745	5700~5720	-48.94	14.85	PASS
		Low	5745	5720~5725	-39.3	27.00	PASS
		Low	5745	5760~5650	-53.27	-27	PASS
		High	5825	5850~5855	-47.01	15.80	PASS
		High	5825	5855~5875	-49.33	10.93	PASS
		High	5825	5875~5925	-51.17	-24.59	PASS
		High	5825	5925~5935	-52.33	-27	PASS
11N20SISO	Ant1	Low	5745	5650~5700	-49.4	10.00	PASS
		Low	5745	5700~5720	-44.06	15.41	PASS
		Low	5745	5720~5725	-35.13	25.86	PASS
		Low	5745	5760~5650	-50.92	-27	PASS
		High	5825	5850~5855	-45.16	18.03	PASS
		High	5825	5855~5875	-47.57	10.16	PASS

		High	5825	5875~5925	-49.58	-5.19	PASS
		High	5825	5925~5935	-51.61	-27	PASS
11N40SISO	Ant1	Low	5755	5650~5700	-48.73	6.36	PASS
		Low	5755	5700~5720	-38.61	15.58	PASS
		Low	5755	5720~5725	-35.42	21.25	PASS
		Low	5755	5780~5650	-50.88	-27	PASS
		High	5795	5850~5855	-46.33	20.21	PASS
		High	5795	5855~5875	-47.6	10.64	PASS
		High	5795	5875~5925	-48.98	-23.65	PASS
		High	5795	5925~5935	-51.23	-27	PASS

Test Graphs

11A_Ant1_Low_5180



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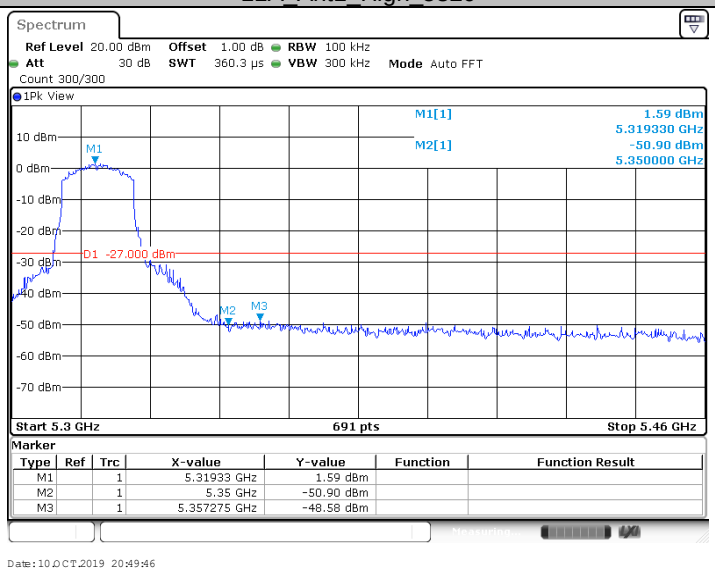

11A_Ant1_Low_5500

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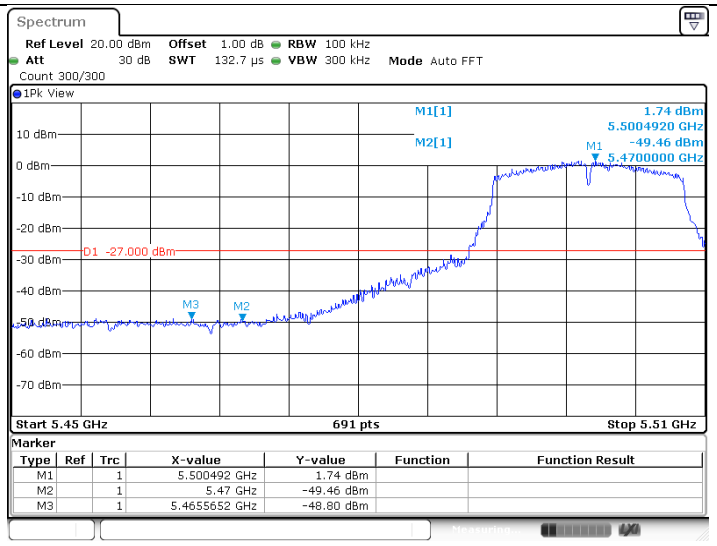

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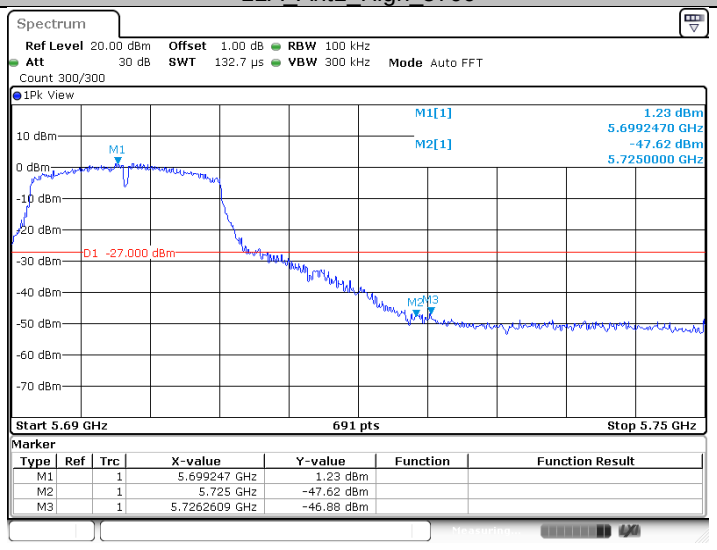

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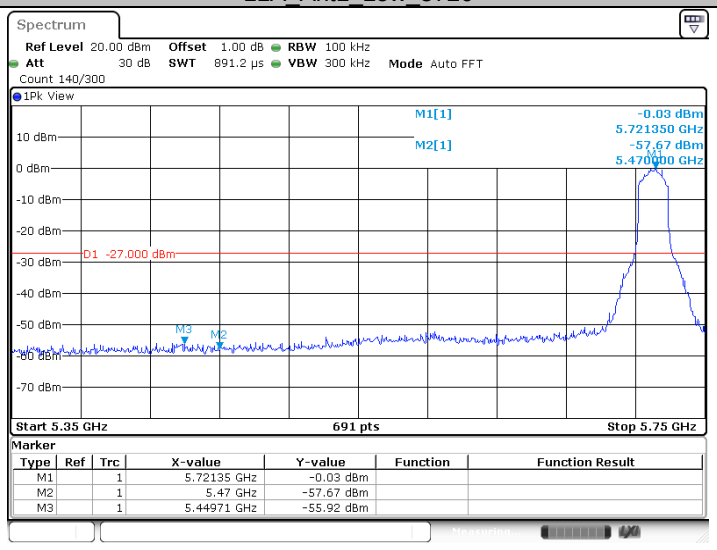

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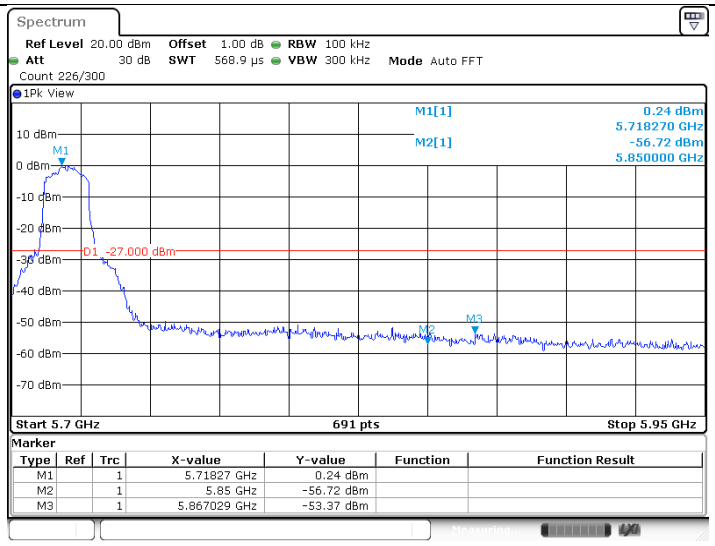

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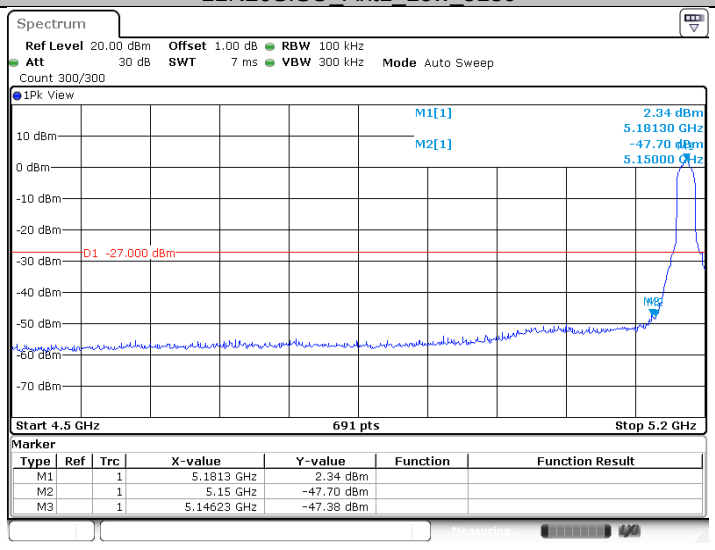

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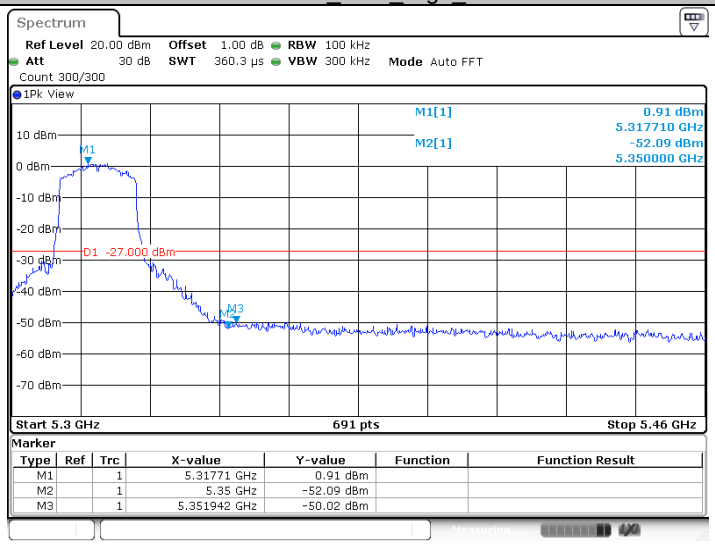

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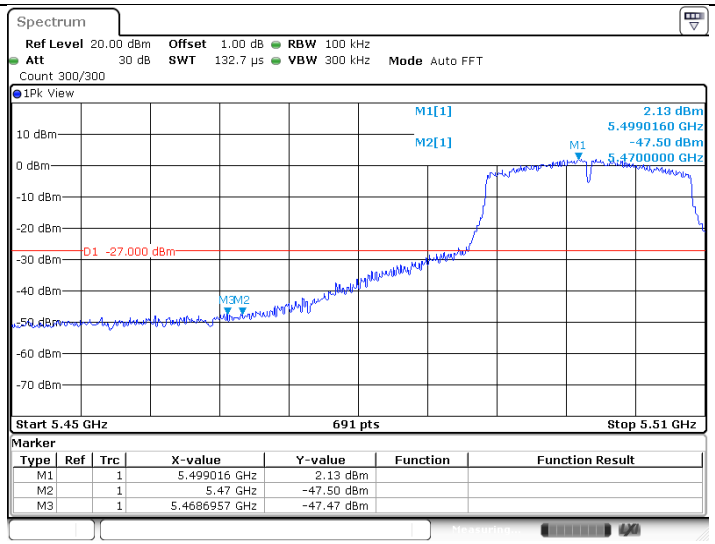

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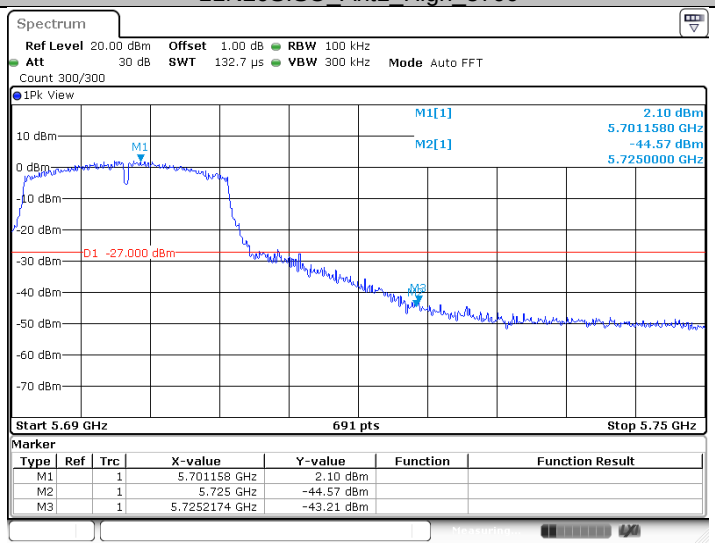

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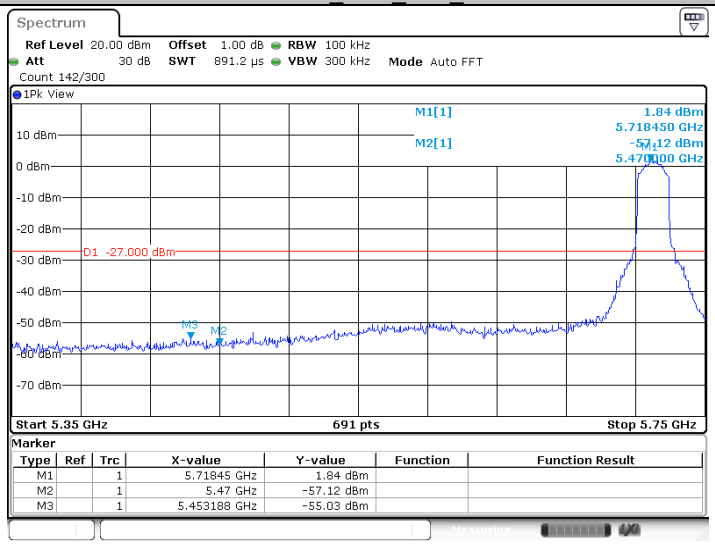

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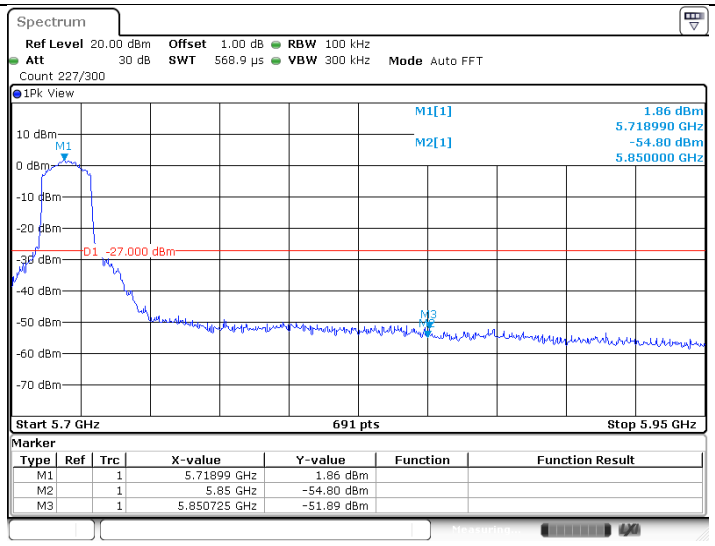

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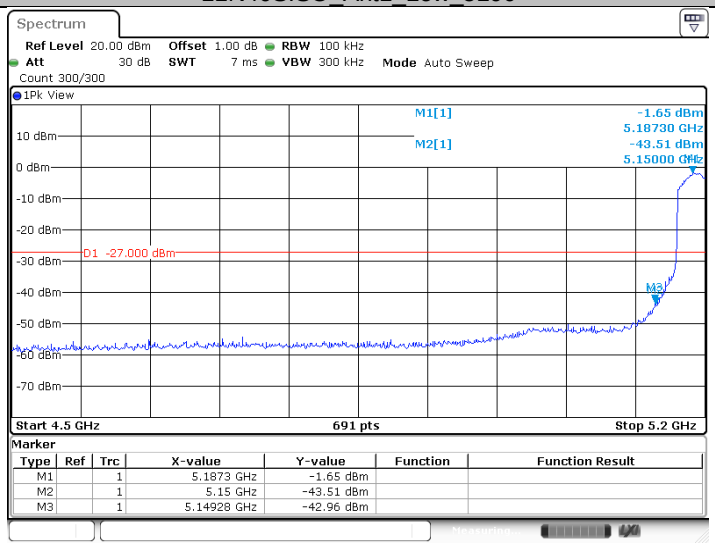

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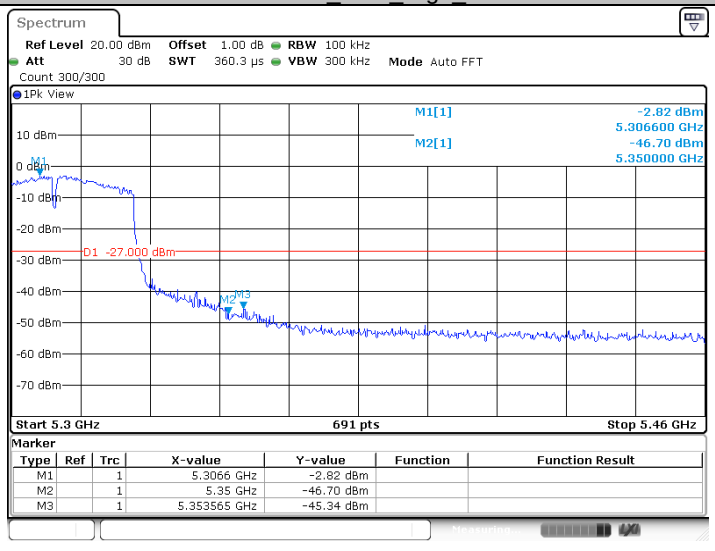
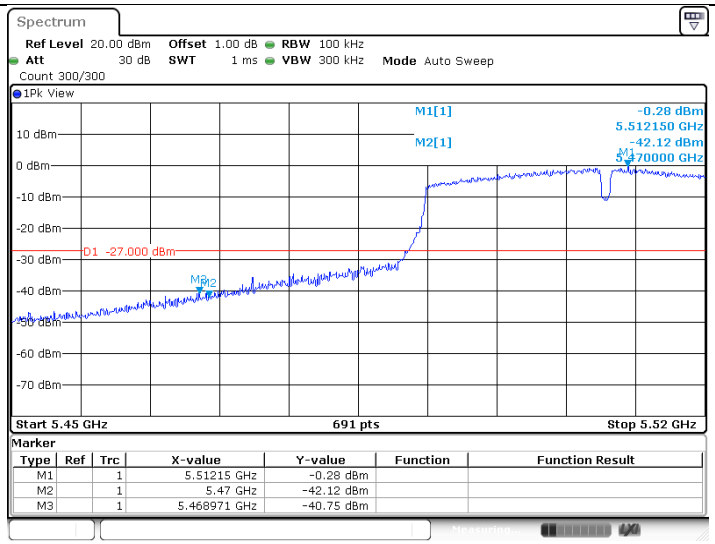


11N40SISO_Ant1_Low_5510



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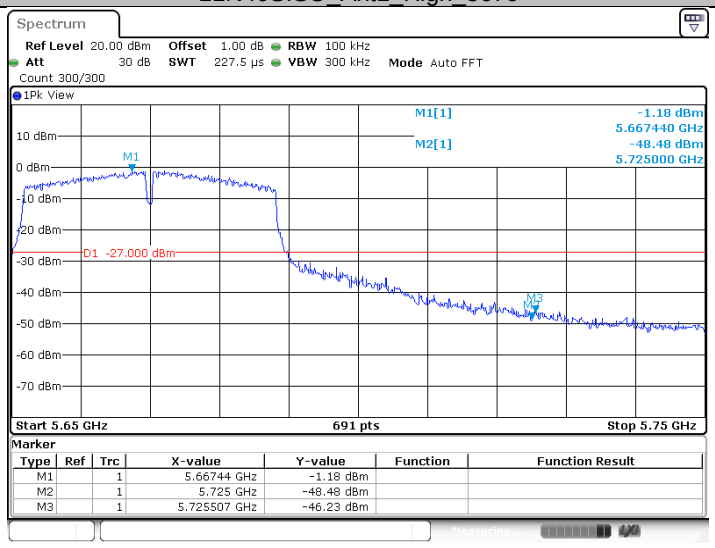

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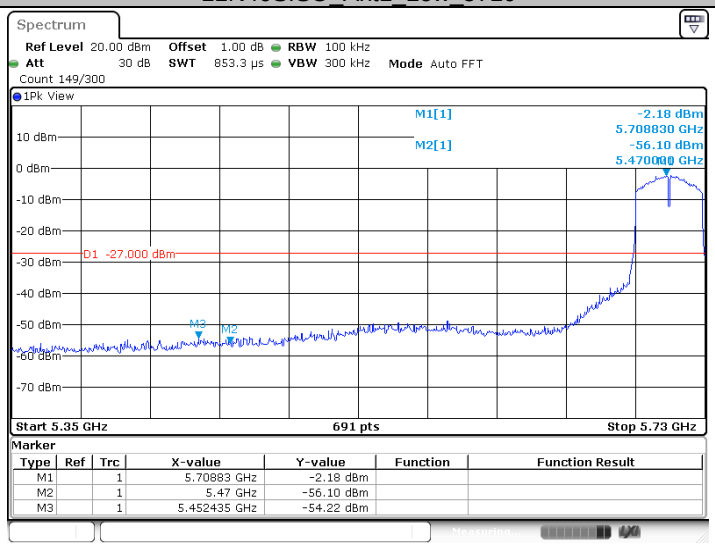
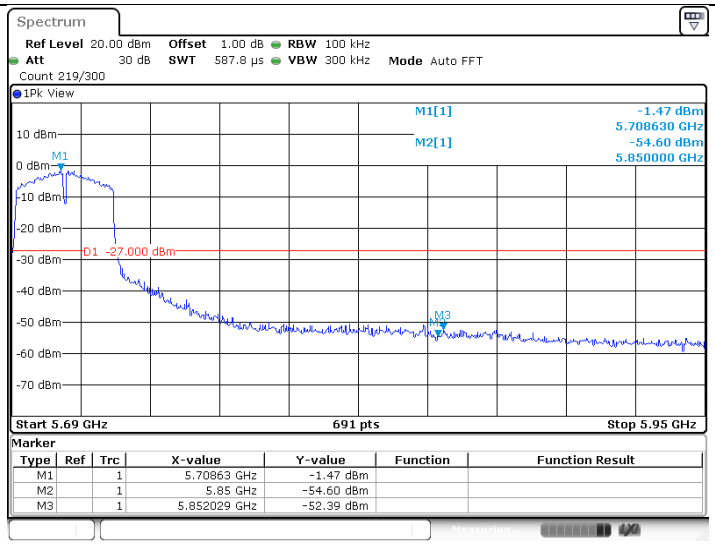


11N40SISO_Ant1_High_5710



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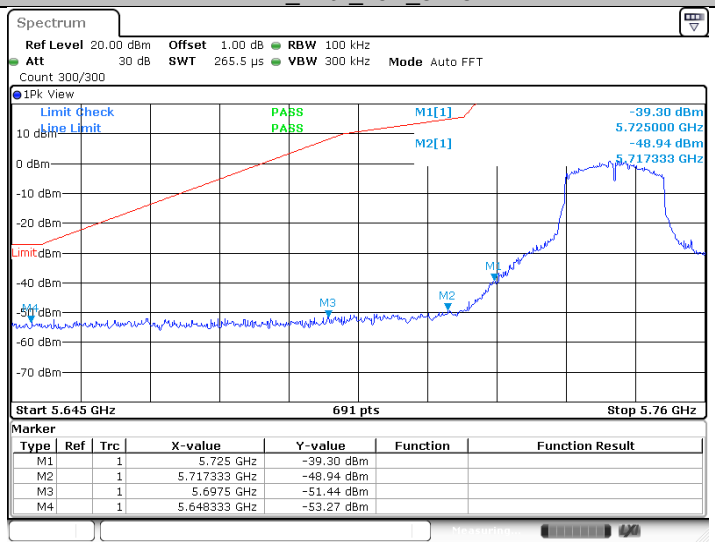

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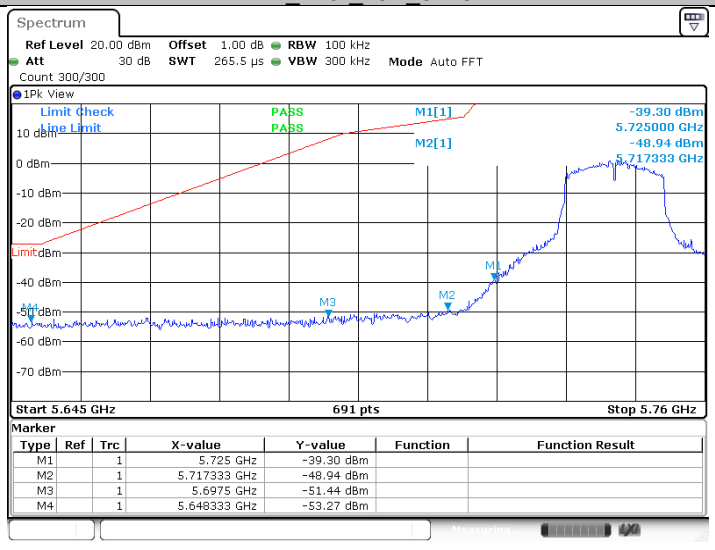

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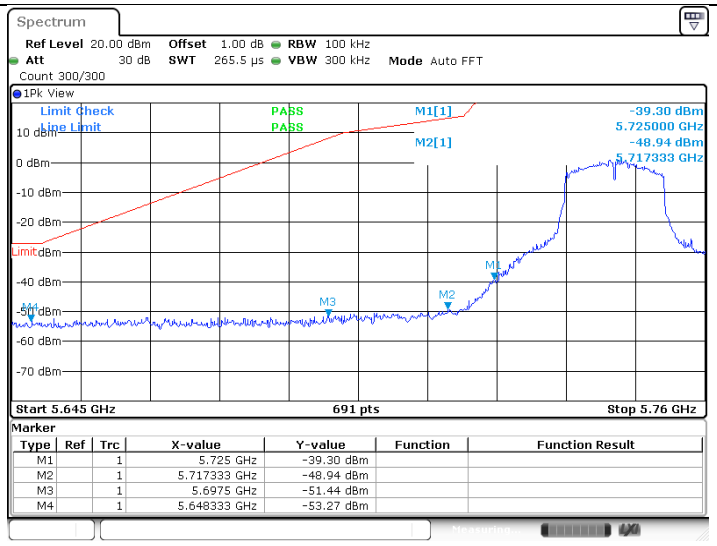

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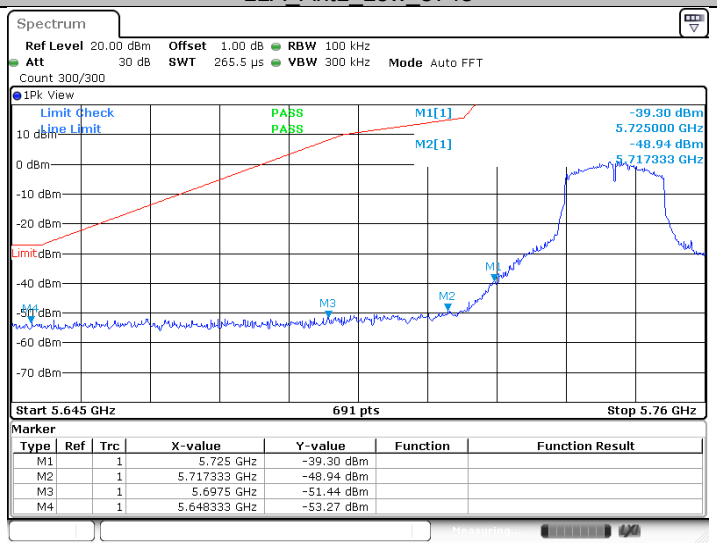

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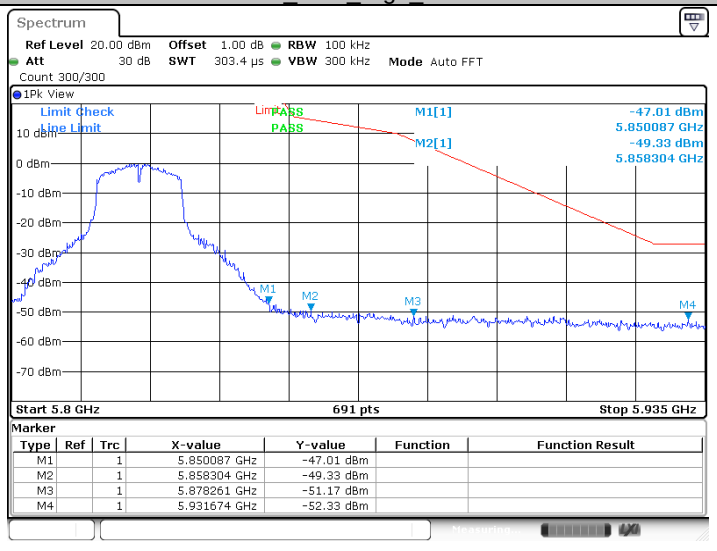

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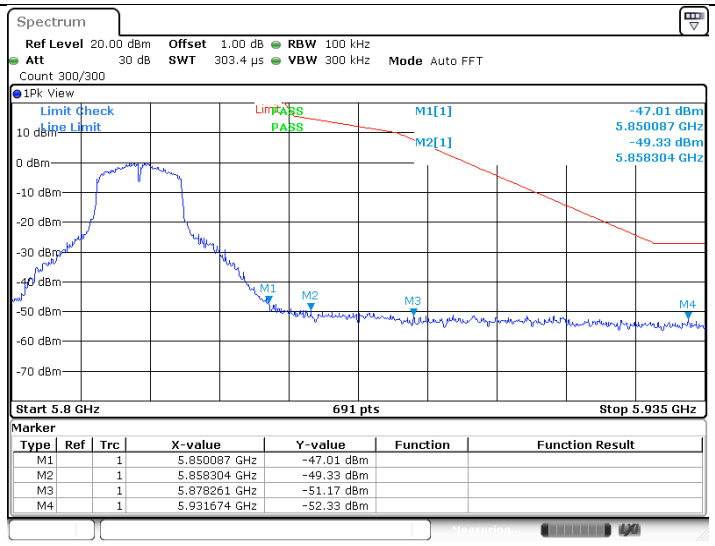

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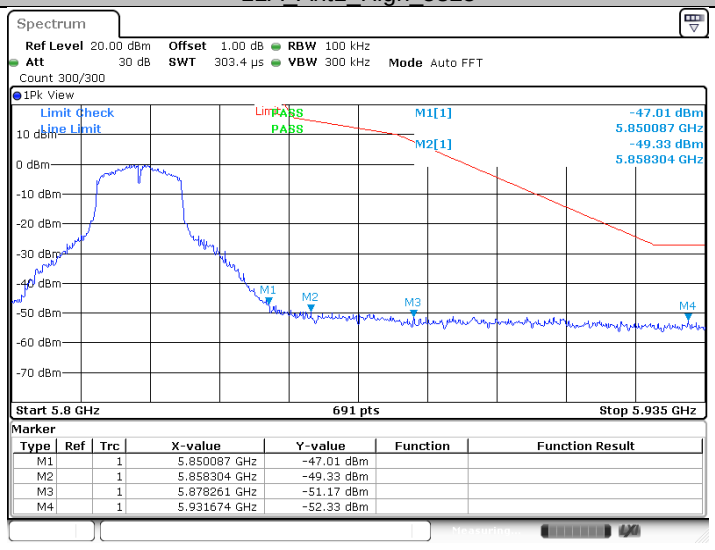

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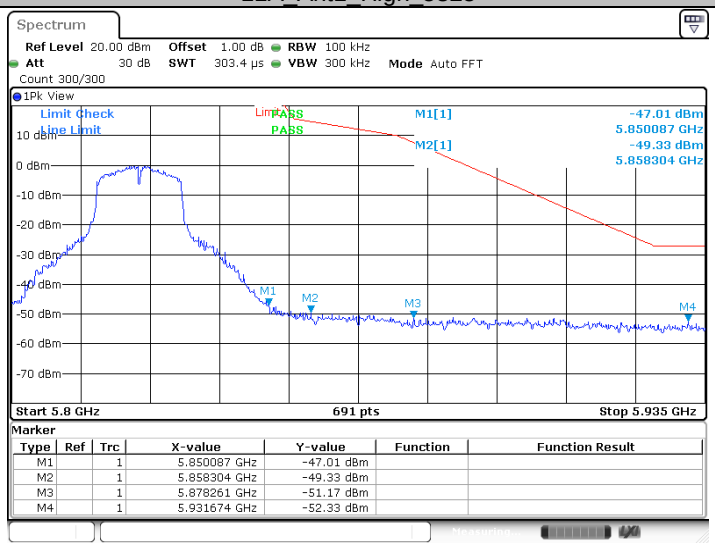

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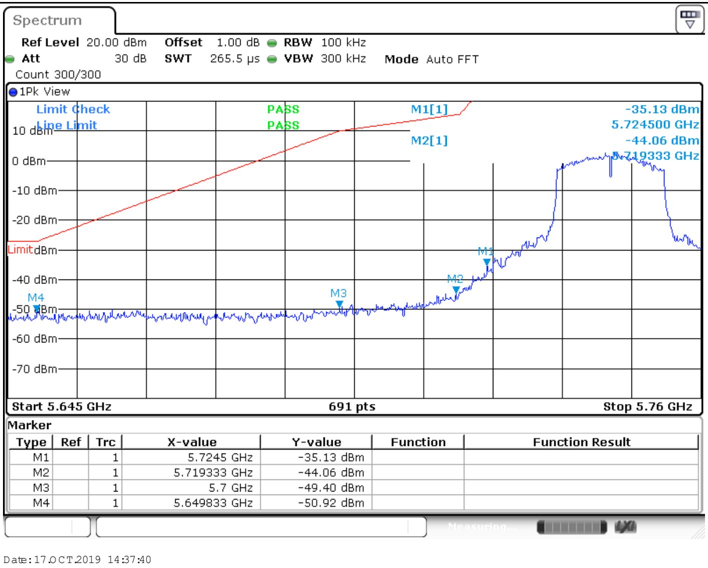

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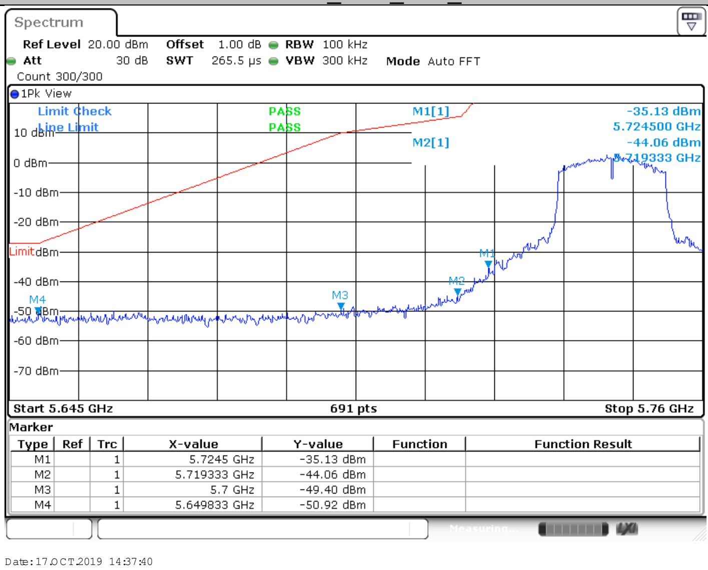

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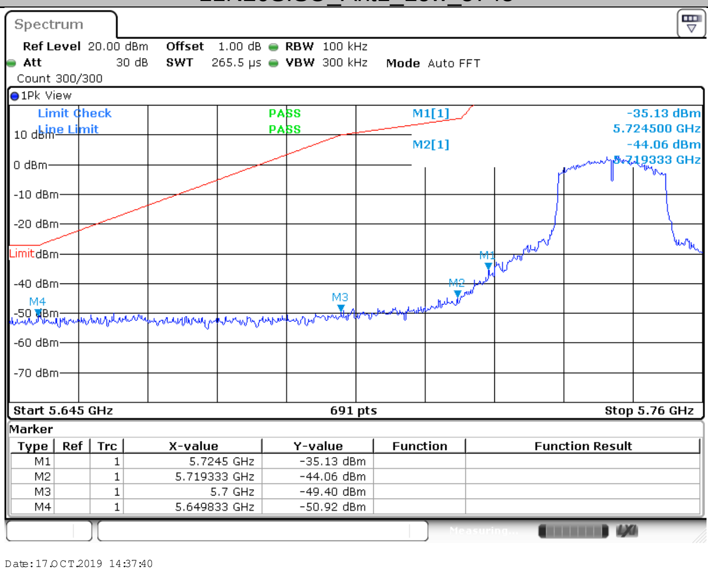

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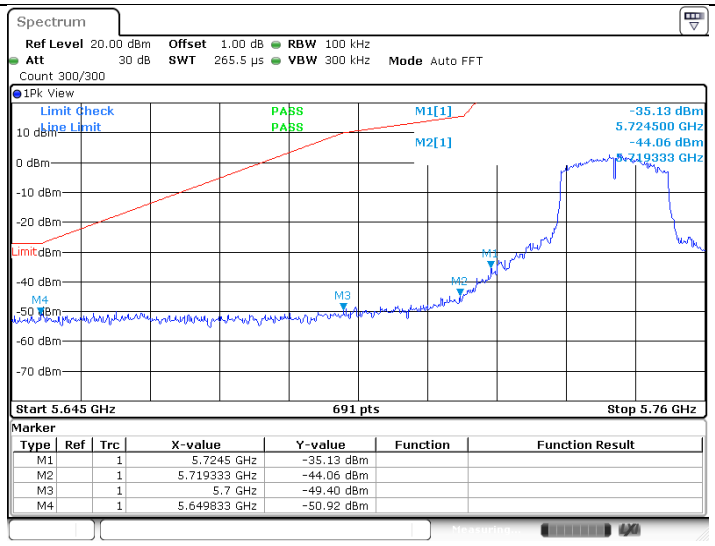

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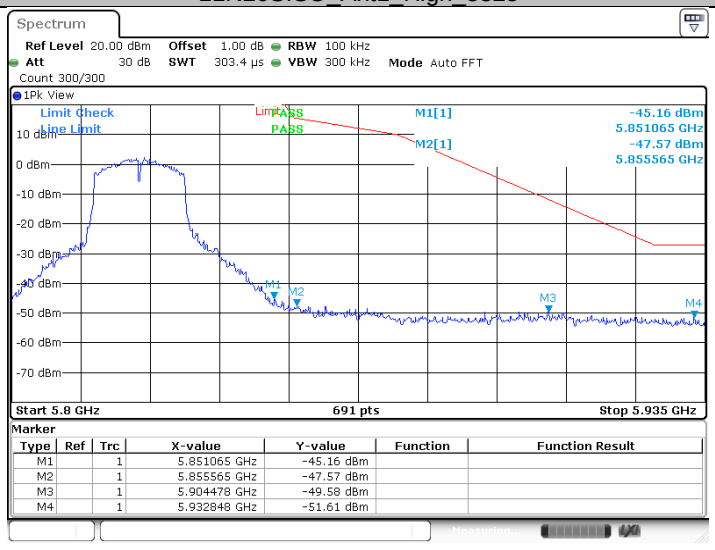

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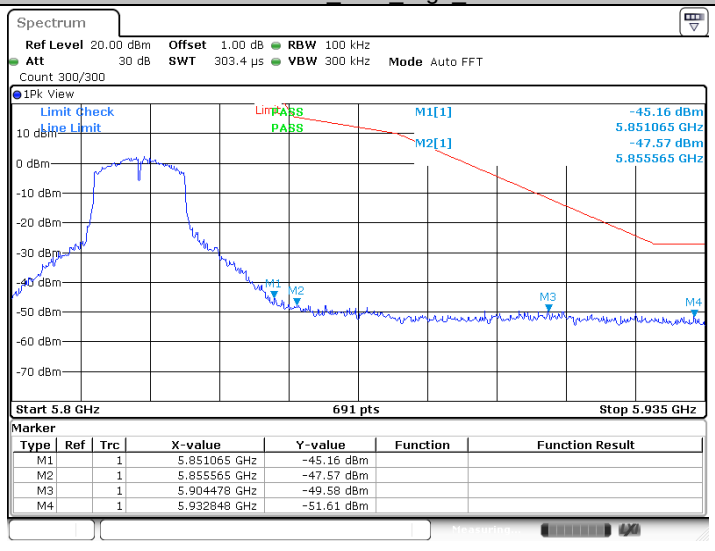

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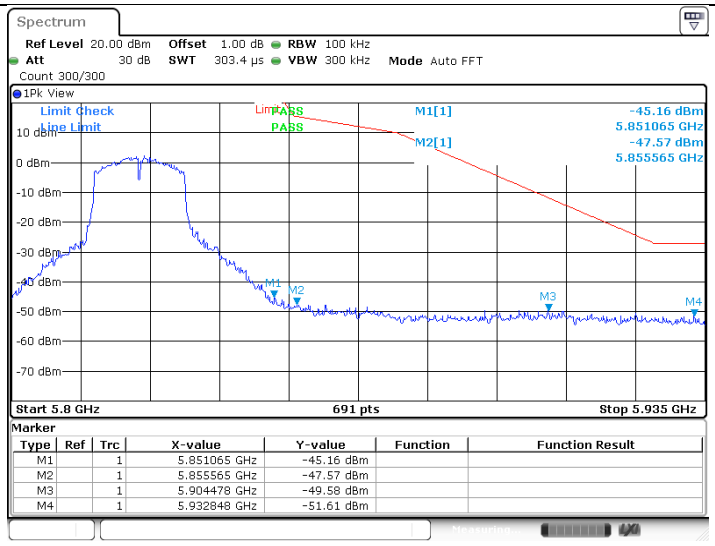

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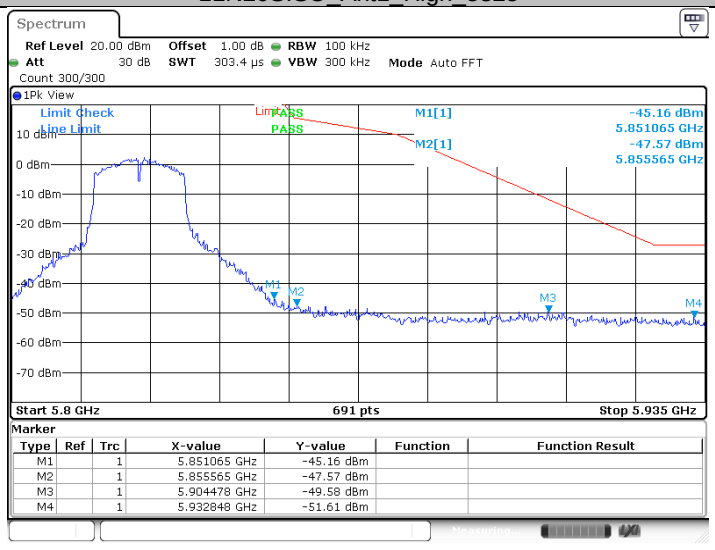

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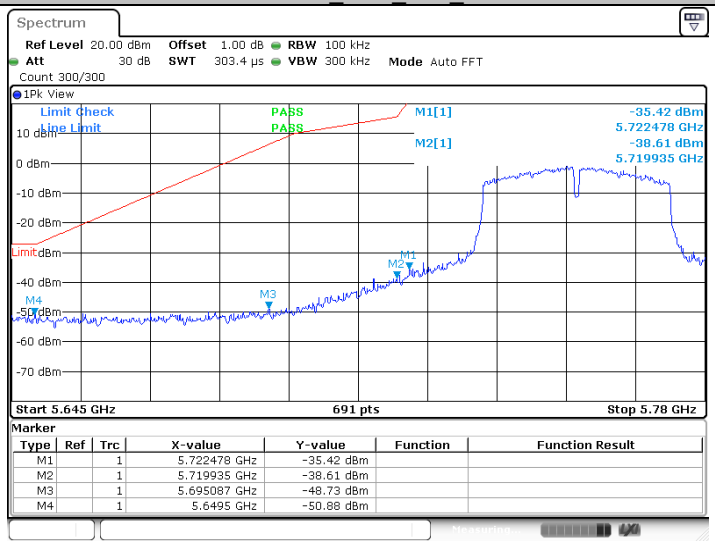

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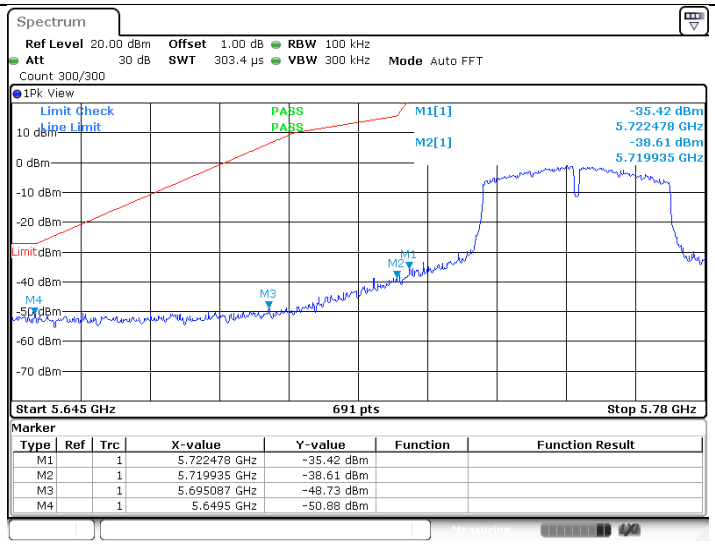

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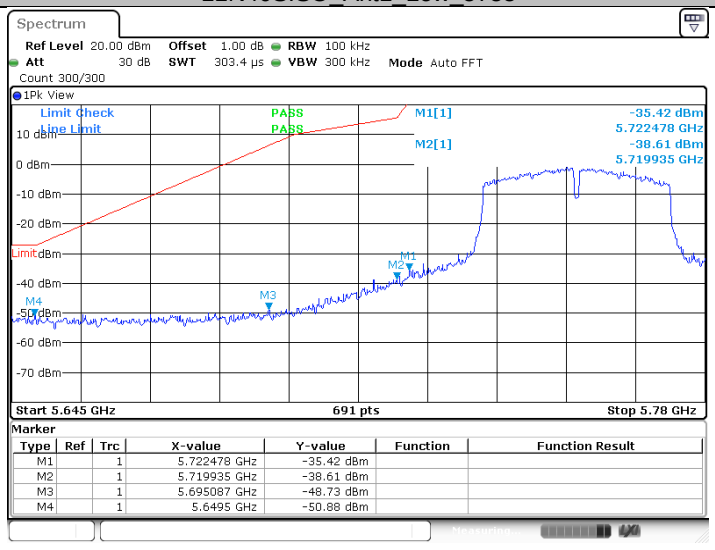

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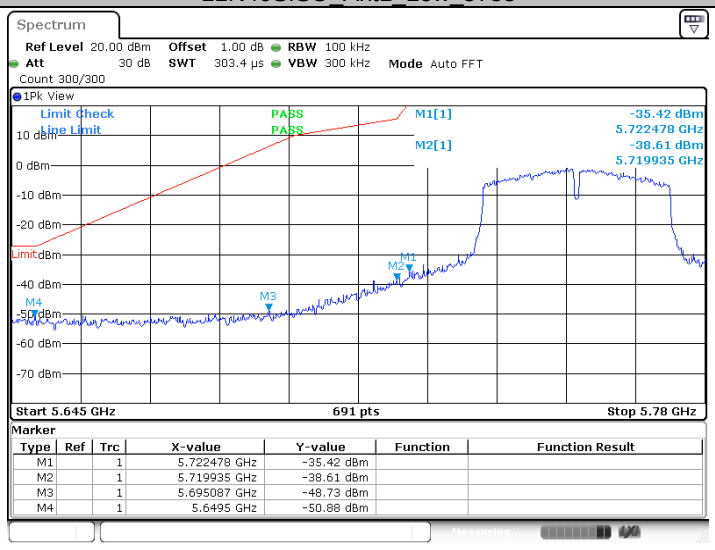

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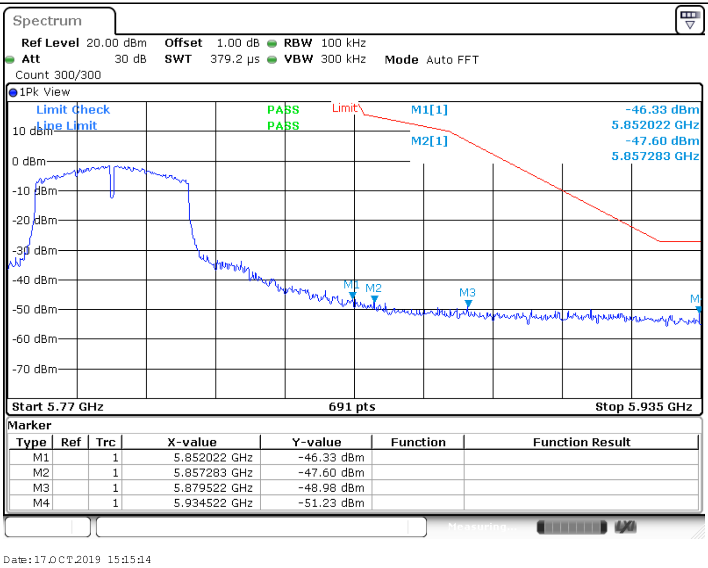

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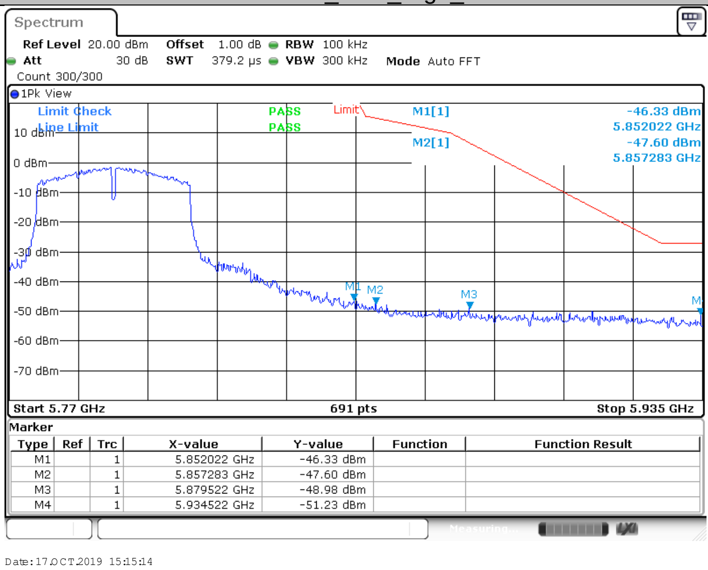

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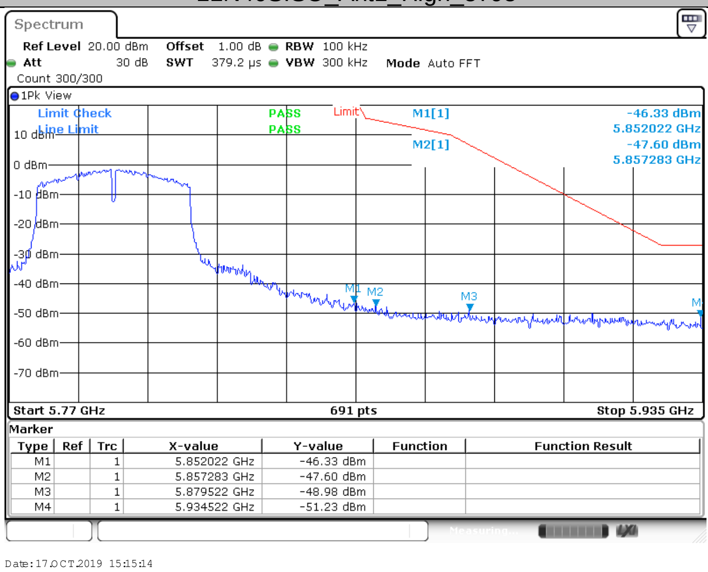
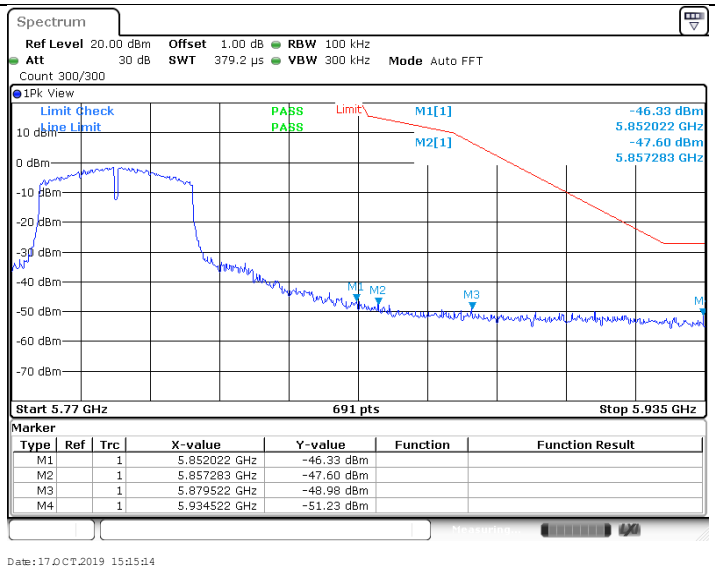


11N40SISO_Ant1_High_5795



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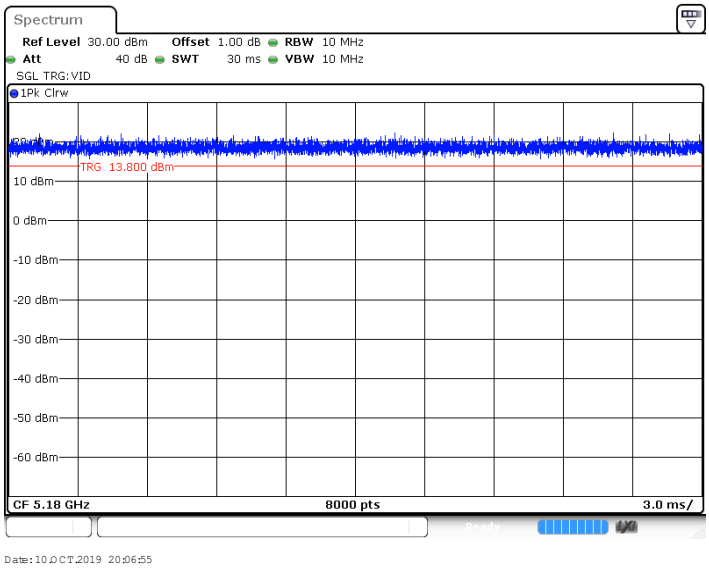
9.7 Duty Cycle

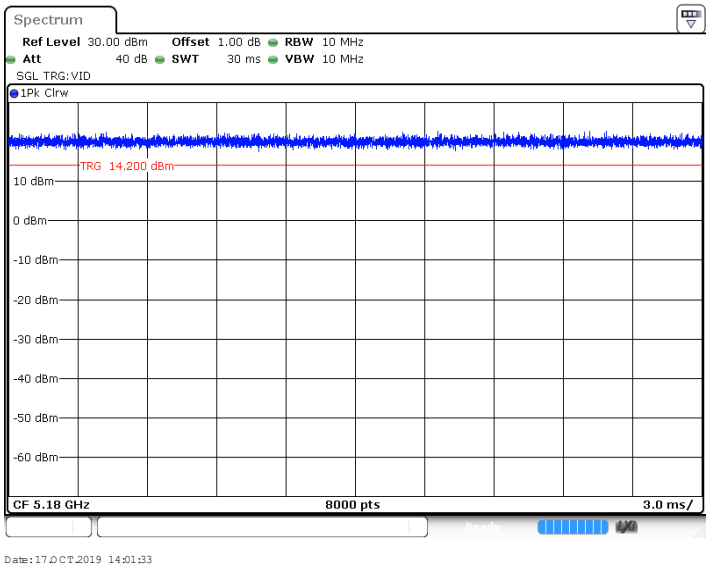
Test Data:

Mode	ON Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11a	/	/	/	100%	0
802.11n HT20	/	/	/	100%	0
802.11n HT40	/	/	/	100%	0

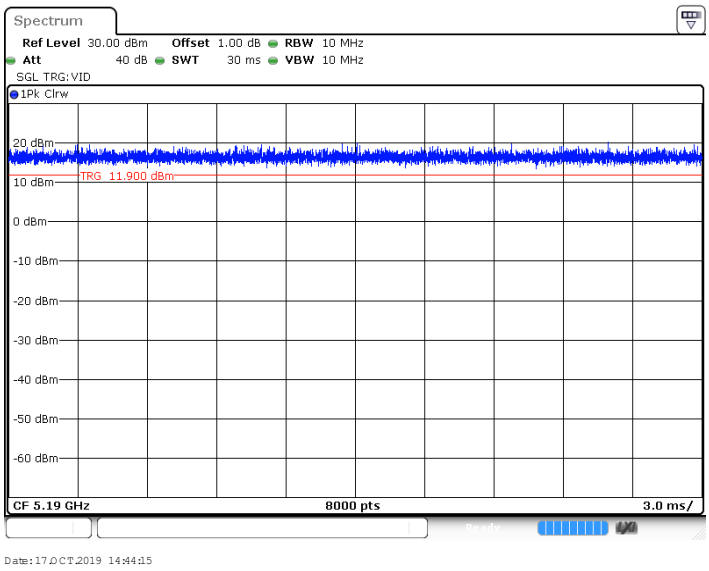
802.11a



802.11n HT20



802.11n HT40



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9.8 Frequencies Stability

Frequency Error vs. Voltage:

Test Conditions	Deviation(ppm)
	5180
V nom(V)	18.706564
V max(V)	19.092664
V min(V)	18.899614
Max. Deviation Frequency	0.0989
Max. Frequency Error (ppm)	19.092664

Frequency Error vs. Temperature:

Test Conditions (°C)	Deviation(ppm)
	5180
0	18.513514
40	18.706564
Max. Deviation Frequency	0.0969
Max. Frequency Error (ppm)	18.706564

Frequency Error vs. Voltage:

Test Conditions	Deviation(ppm)
	5500
V nom(V)	18.709091
V max(V)	18.890909
V min(V)	19.072727
Max. Deviation Frequency	0.1049
Max. Frequency Error (ppm)	19.072727

Frequency Error vs. Temperature:

Test Conditions (°C)	Deviation(ppm)
	5500
0	18.890909
40	19.072727
Max. Deviation Frequency	0.1049
Max. Frequency Error (ppm)	19.072727

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Frequency Error vs. Voltage:

Test Conditions	Deviation(ppm)
	5745
V nom(V)	18.607485
V max(V)	18.955614
V min(V)	19.303742
Max. Deviation Frequency	0.1109
Max. Frequency Error (ppm)	19.303742

Frequency Error vs. Temperature:

Test Conditions (°C)	Deviation(ppm)
	5745
0	18.781549
40	19.129678
Max. Deviation Frequency	0.1099
Max. Frequency Error (ppm)	19.129678

Remark: V min(V) = 85% of the nominal supply voltage
V max(V)=115% of the nominal supply voltage

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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.

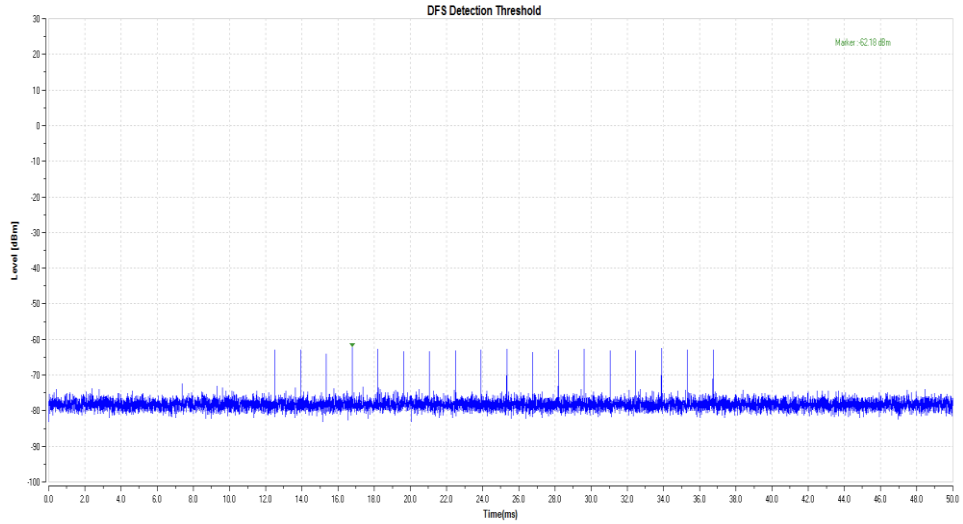
4、Test Result

Clause	Test Parameter	Remarks	Pass/Fail
15.407	Non-Occupancy Period	Not Applicable	/
15.407	DFS Detection Threshold	Not Applicable	/
15.407	Channel Availability Check Time	Not Applicable	/
15.407	U-NII Detection Bandwidth	Not Applicable	/
15.407	Channel Closing Transmission Time	Applicable	Pass
15.407	Channel Move Time	Applicable	Pass

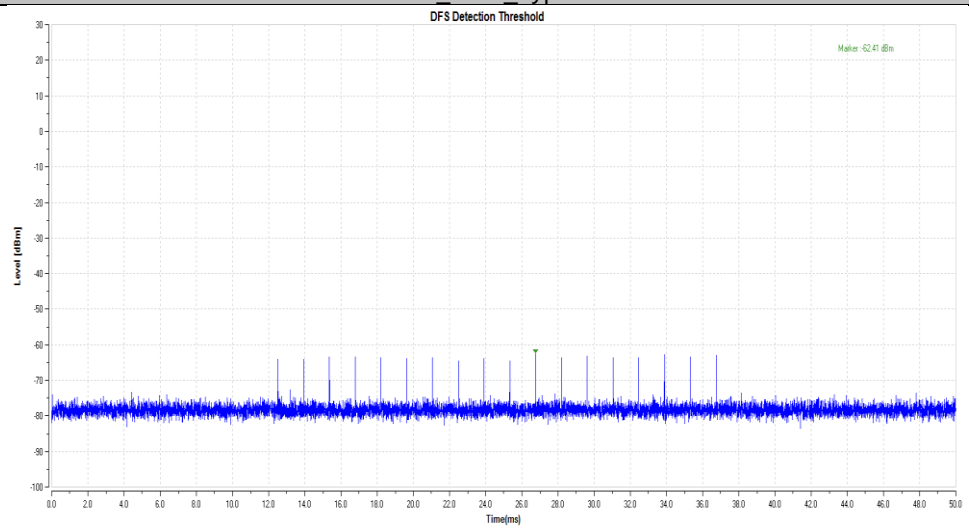
DFS Detection Thresholds:

TestMode	Channel	Radar Type	Result	Limit[dbm]	Verdict
11A	5280	Type0	-62.18	-61.00	PASS
	5500	Type0	-62.41	-61.00	PASS
11N40SISO	5270	Type0	-62.13	-61.00	PASS
	5510	Type0	-62.67	-61.00	PASS

11A_5280_Type0



11A_5500_Type0



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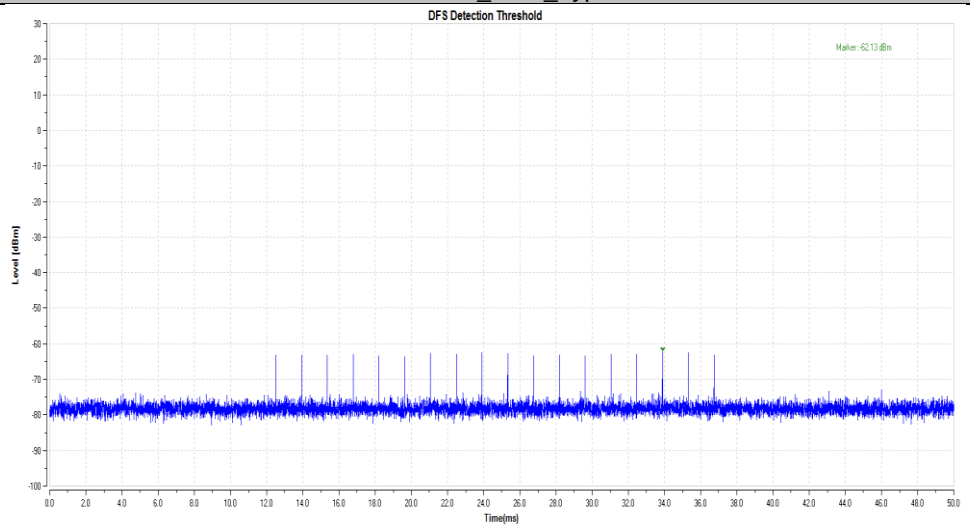
11N40SISO_5270_Type0

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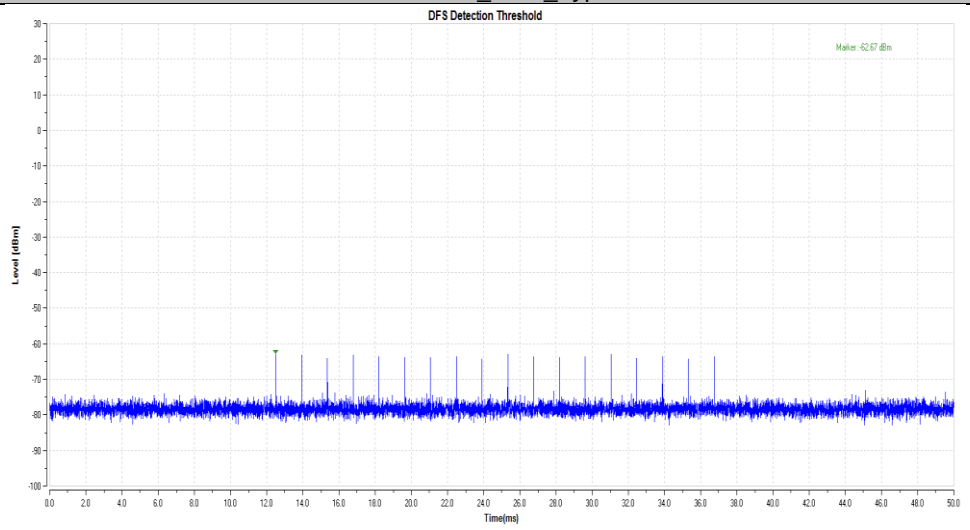

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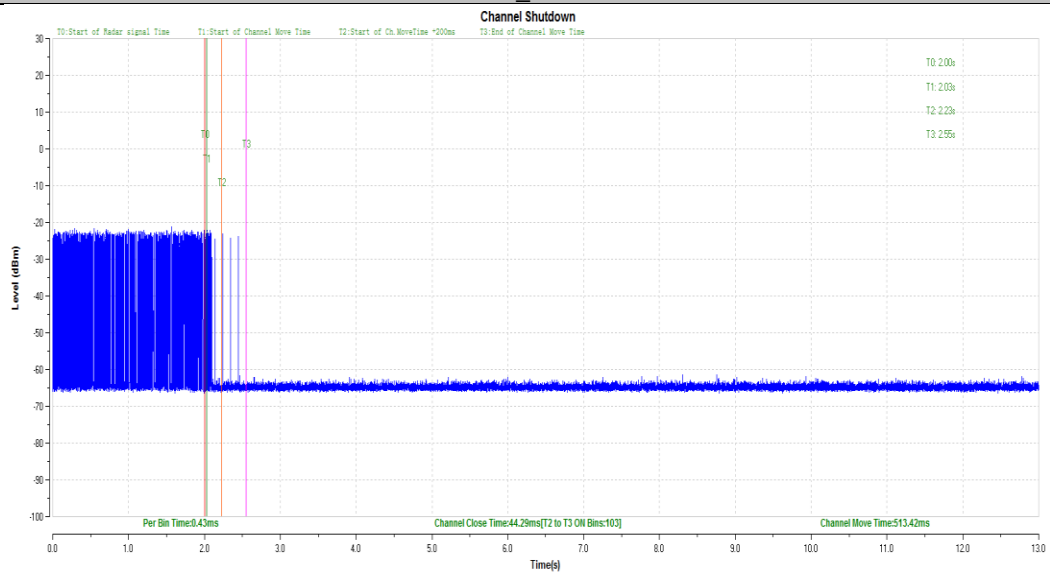
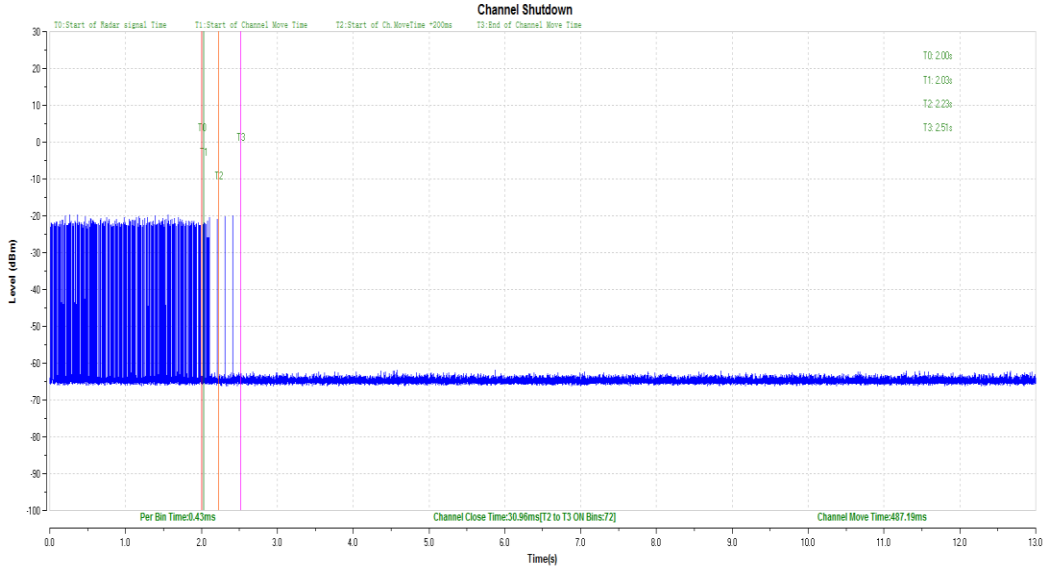
TestMode	Channel	CCT[s]	Limit[s]	CMT[ms]	Limit[ms]	Verdict
11A	5280	44.29	60	513.42	10000	PASS
	5500	30.96	60	487.19	10000	PASS
11N40SISO	5270	46.87	60	574.48	10000	PASS
	5510	46.01	60	565.02	10000	PASS

11A_5280



11A_5500



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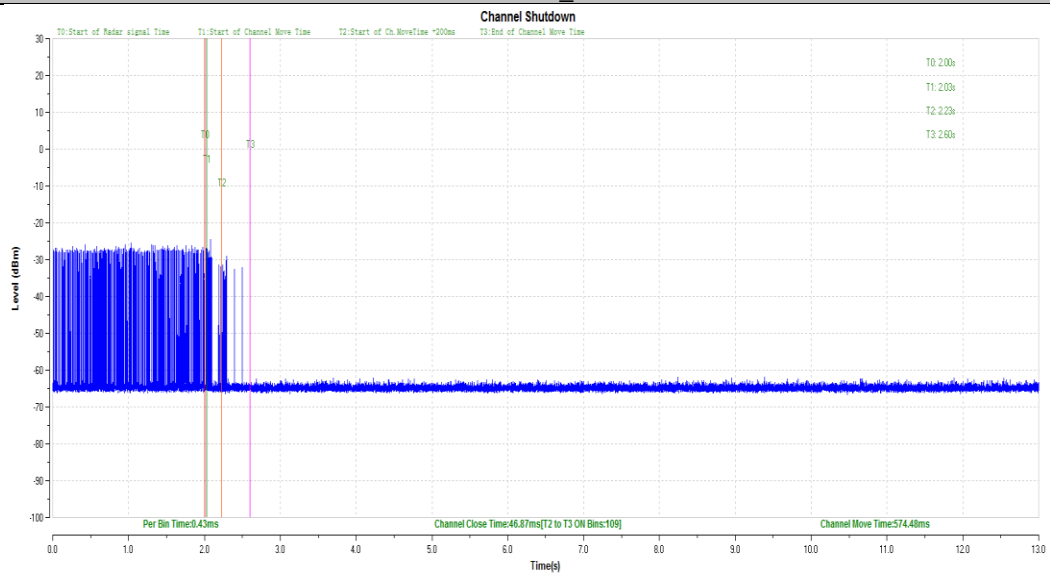
11N40SISO_5270

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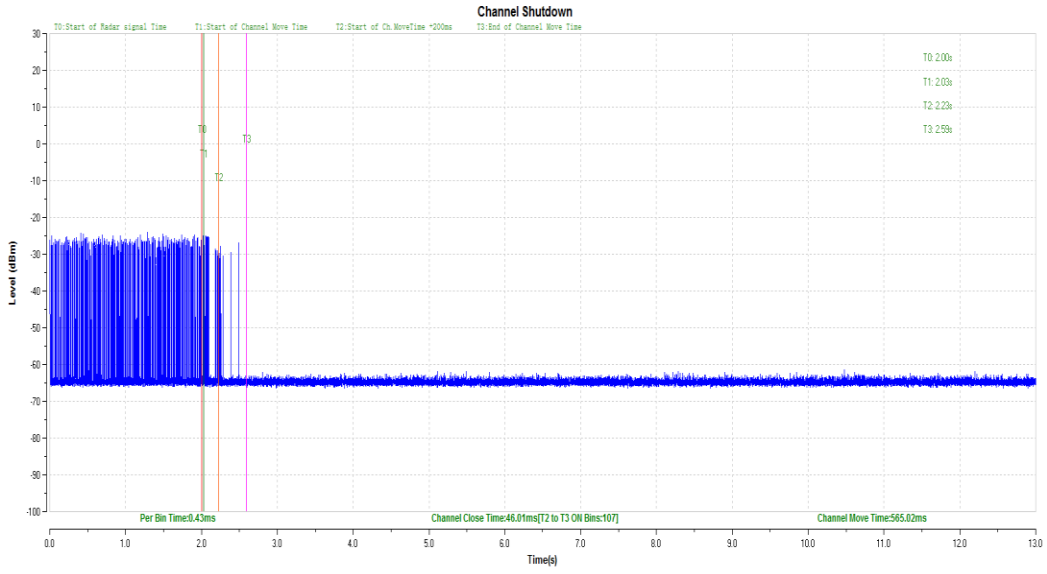

10 Test Equipment List

List of Test Instruments

Conducted RF test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	2020-6-28
Vector Signal Generator	Rohde & Schwarz	SMBV100A	262825	2020-6-28
Communication Synthetical Test Instrument	Rohde & Schwarz	CMW 270	101251	2020-5-31
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2020-6-28
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2020-6-28
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2020-6-28
Power Splitter	Weinschel	1580	SC319	2020-7-7
10dB Attenuator	Weinschel	4M-10	43152	2020-7-6
10dB Attenuator	R&S	DNF	DNF-001	2020-6-28
10dB Attenuator	R&S	DNF	DNF-002	2020-6-28
10dB Attenuator	R&S	DNF	DNF-003	2020-6-28
10dB Attenuator	R&S	DNF	DNF-004	2020-6-28
Test software	Tonscend	System for BT/WIFI	Version 2.5.77.0418	N/A

Radiated Spurious 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	2020-6-28
Horn Antenna	Rohde & Schwarz	HF907	102294	2020-6-22
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100398	2020-7-7
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2020-6-28
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2020-6-28
Attenuator	Agilent	8491A	MY39264334	2020-6-28
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

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
LISN	Rohde & Schwarz	ENV432	101318	2020-3-20
LISN	Rohde & Schwarz	ENV216	100326	2020-6-28
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2020-6-28
Test software	Rohde & Schwarz	EMC32	Version9.15.00	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:

Items	Extended Uncertainty
Uncertainty for Conducted Emission 150kHz-30MHz (for test using High Voltage Probe TK9420(VT9420))	3.21 dB
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.80dB; Vertical: 4.89dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.69dB; Vertical: 4.68dB;
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 4.89dB; Vertical: 4.87dB;
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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