TEST REPORT

Reference No.	:	WTN20X08051826W
FCC ID	:	2AW74-AERIO-360
Applicant	:	Hong Kong Yunting Trading Co., Limited
Address	:	Unit D, 16/F, One Capital Place, 18 Luard Road, Wan Chai, Hong Kong
Product Name	:	Air Purifier
Test Model	:	Aerio-360
Standards	:	FCC Part 15.407
Date of Receipt sample	:	Aug.03, 2020
Date of Test	:	Aug.03, 2020 to Aug.26, 2020
Date of Issue	:	Aug.26, 2020
Test Result	:	**Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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Jason Su / Project Engineer	Lion Cai / RF Manager	Silin Chen / Manager

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Rev.00	Aug.26, 2020	Original
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Hong Kong Yunting Trading Co., Limited
Address of applicant:	Unit D, 16/F, One Capital Place, 18 Luard Road, Wan Chai, Hong Kong
Manufacturer:	Qingdao Londs Environmental Technology Co.,Ltd
Address of manufacturer:	Eastward 100 meters of Dongwangtuan Community Chengyang District ,Qingdao,266109 ,China

General Description of EUT	
Product Name:	Air Purifier
Trade Name:	/
Model No.:	Aerio-360
Adding Model(s):	/
Rated Voltage:	100-120V~ 60Hz
Battery Capacity:	/
Power Adapter:	/
Software Version:	A
Hardware Version:	A
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20) , 802.11n-HT40,
Frequency Range:	5150-5250MHz, 5725-5850MHz
RF Output Power:	13.63dBm (Conducted)
Type of Modulation:	BPSK, QPSK,16QAM,64QAM, 256QAM
Data Rate:	6-54Mbps, up to 200Mbps
Type of Antenna:	PCB Antenna
Antenna Gain:	2dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
KDB789033 D02 v02r01: GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPARTE.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB789033 D02 v02r01
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Connect to the WIFI module through the USB serial board, open the UI_mptool software, you can start to test. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180	5200	5240	5260	5300	5320	5500	5580	5700	5720	5745	5785	5825
802.11a 6Mbps	45	45	45								45	45	45
802.11n-HT20 MCS0	45	45	45								45	45	45
Mode	NCB: 40MHz									
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795
802.11n-HT40 MCS0	43	43							43	43

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintain ed in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5180MHz,5200MHz,5240MHz, ,5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz, 5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz, 5755MHz,5795MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
DC Cable	1.83	Unshielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.8 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.9 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2020-04-28	2021-04-27
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2020-04-28	2021-04-27
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2020-04-28	2021-04-27
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2020-04-28	2021-04-27
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2020-04-28	2021-04-27
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
SEMT-1042	Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2019-05-05	2021-05-04
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2020-04-28	2021-04-27
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2020-04-28	2021-04-27
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2020-04-28	2021-04-27
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2020-04-28	2021-04-27
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2020-04-28	2021-04-27
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2020-04-28	2021-04-27
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2020-04-28	2021-04-27
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2020-04-28	2021-04-27
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2020-04-28	2021-04-27
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2020-03-17	2021-03-16
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2020-03-17	2021-03-16
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2020-03-17	2021-03-16
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2020-03-17	2021-03-16
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2020-03-17	2021-03-16
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2020-03-17	2021-03-16

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.405	Antenna Requirement	Compliant
15.407 (c)	Automatically Discontinue Transmission	Compliant
§15.207; §15.407(b)(6)	Conducted Emission	Compliant
§15.407(a)(1),(2)	Power Spectral Density	Compliant
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§15.407(a)(1),(2)	Maximum Conducted Output Power	Compliant
§15.407(b)(1),(2),(3),(4)	Undesirable emission	Compliant
§15.205; §15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliant

N/A: Not applicable

3. RF Exposure

3.1 Standard Applicable

According to §1.1307 and §2.1091, the mobile transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the MPE Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has a PCB antenna, fulfill the requirement of this section.

5. Automatically Discontinue Transmission

5.1 Standard Applicable

According to FCC Part 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

5.2 Summary of Test Results

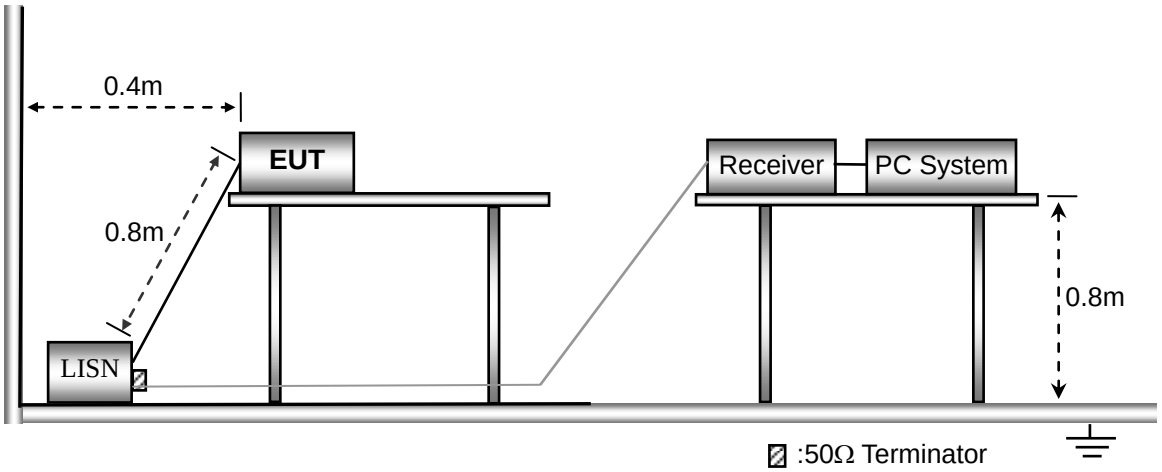
While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

6. Conducted Emissions

6.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.

6.2 Basic Test Setup Block Diagram



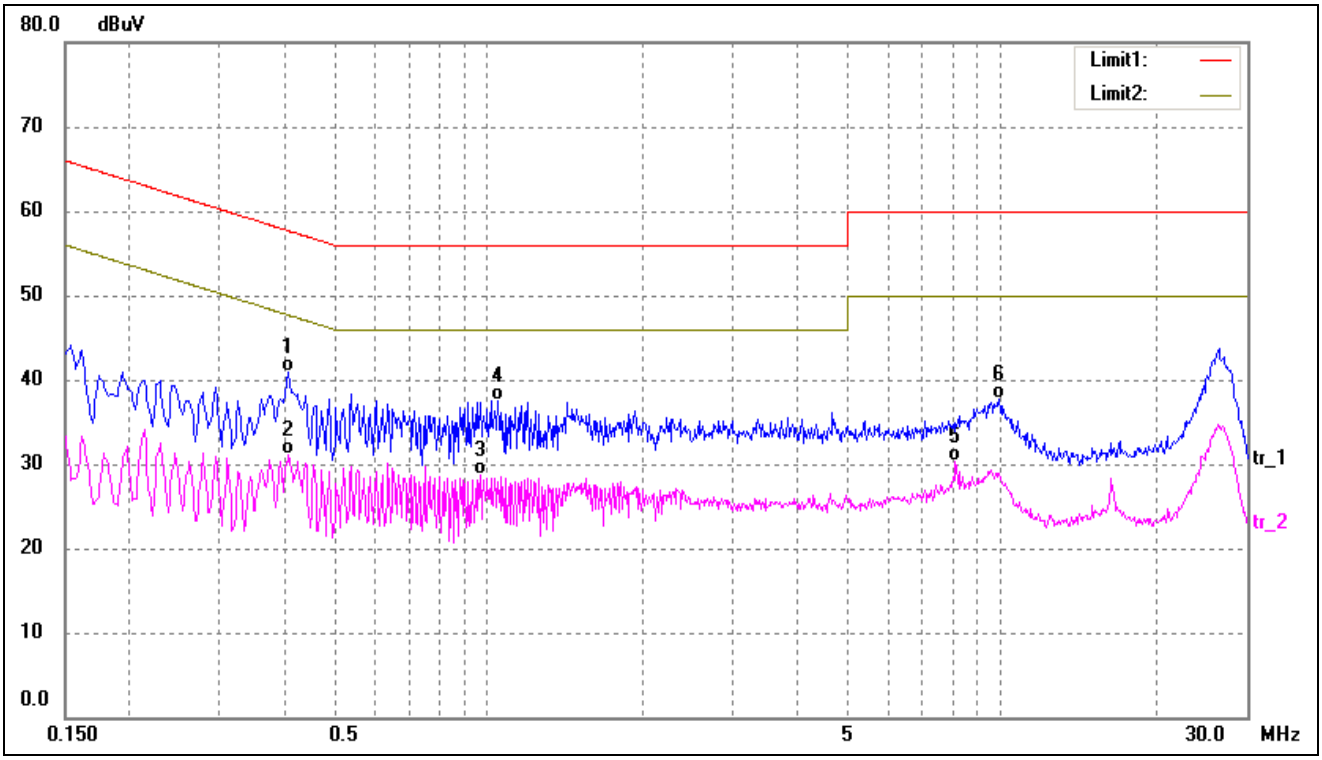
6.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz
Stop Frequency ..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

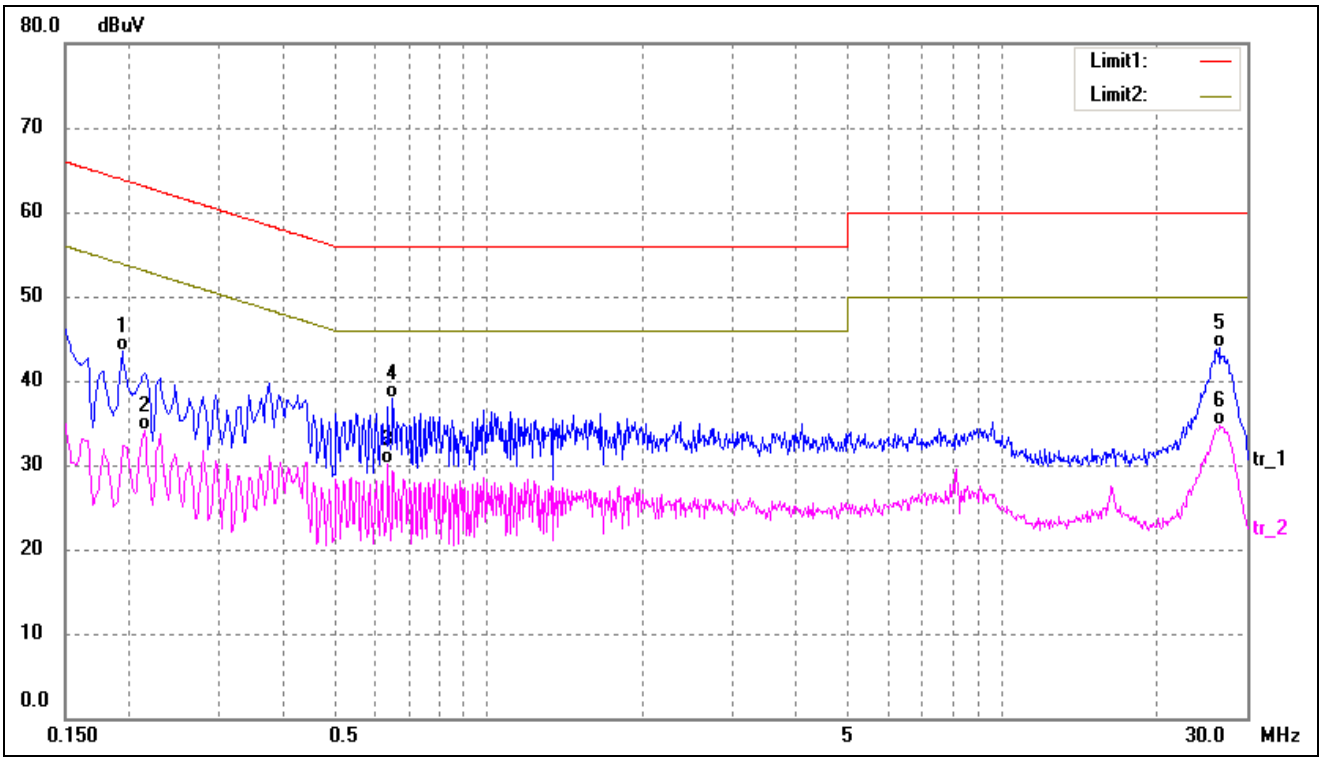
6.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.4100	30.66	10.23	40.89	57.65	-16.76	QP
2*	0.4100	20.79	10.23	31.02	47.65	-16.63	AVG
3	0.9660	18.45	10.20	28.65	46.00	-17.35	AVG
4	1.0460	27.35	10.20	37.55	56.00	-18.45	QP
5	8.1460	20.06	10.27	30.33	50.00	-19.67	AVG
6	9.8620	27.35	10.28	37.63	60.00	-22.37	QP

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1940	33.20	10.27	43.47	63.86	-20.39	QP
2	0.2140	23.92	10.26	34.18	53.04	-18.86	AVG
3	0.6380	19.82	10.19	30.01	46.00	-15.99	AVG
4	0.6540	27.81	10.19	38.00	56.00	-18.00	QP
5	26.4820	33.29	10.64	43.93	60.00	-16.07	QP
6*	26.5780	24.02	10.64	34.66	50.00	-15.34	AVG

7. Power Spectral Density

7.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.
(iv) For mobile and portable 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) 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 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

7.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.
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 500 kHz, “provided that the measured power is integrated over the full reference 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 500kHz 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.

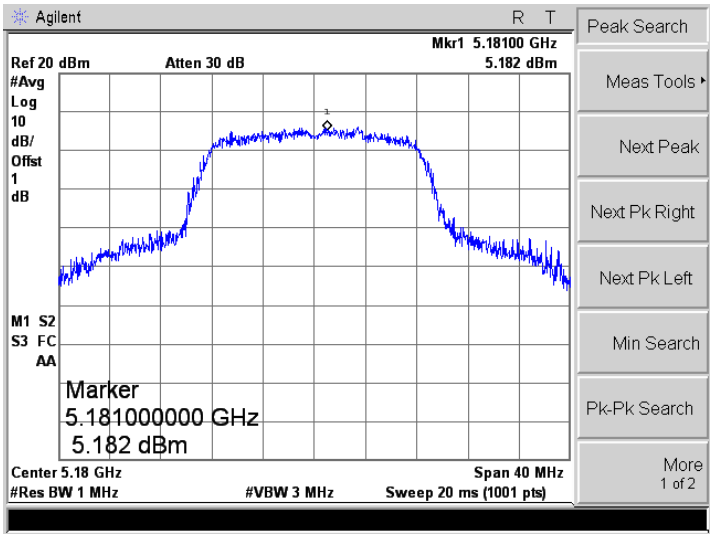
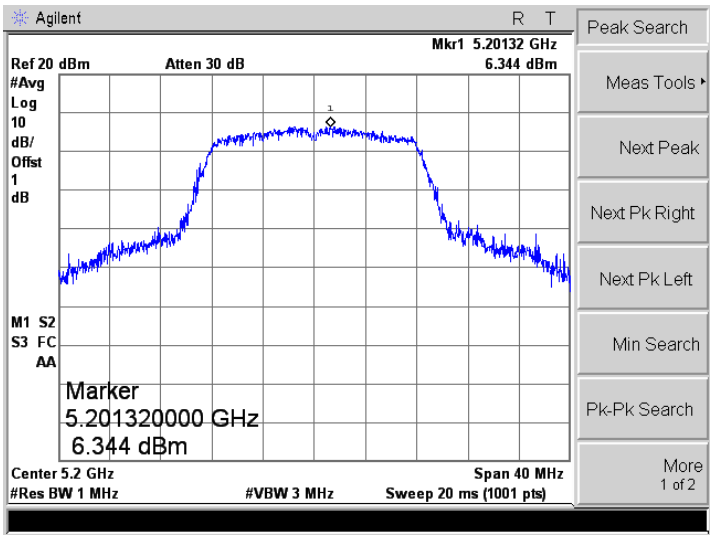
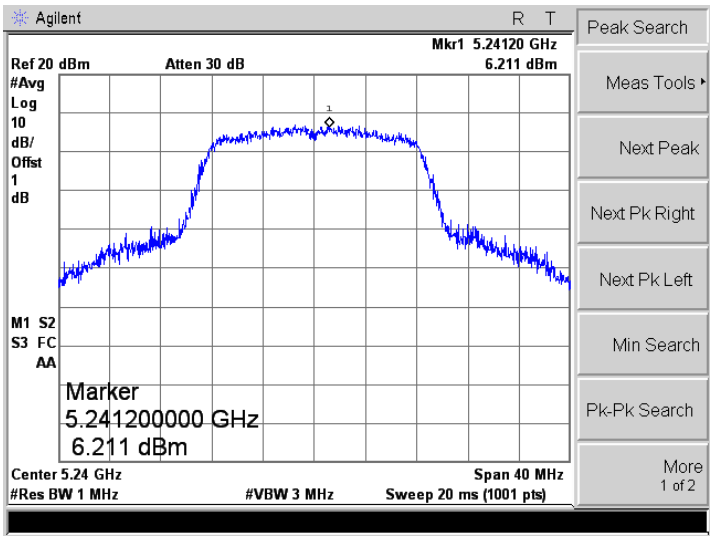
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW=100 kHZ is available on nearly all spectrum analyzers.

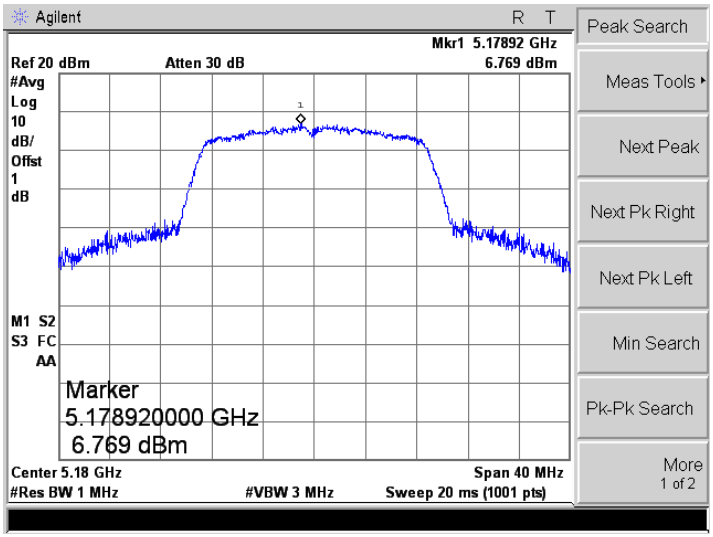
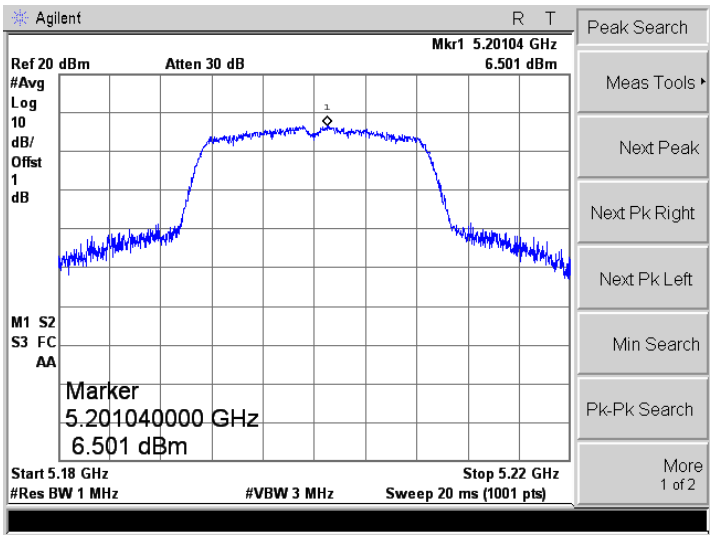
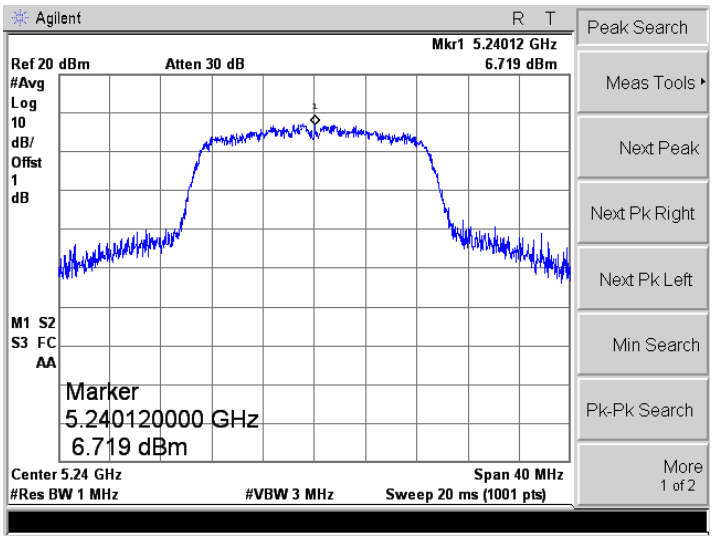
7.3 Summary of Test Results/Plots

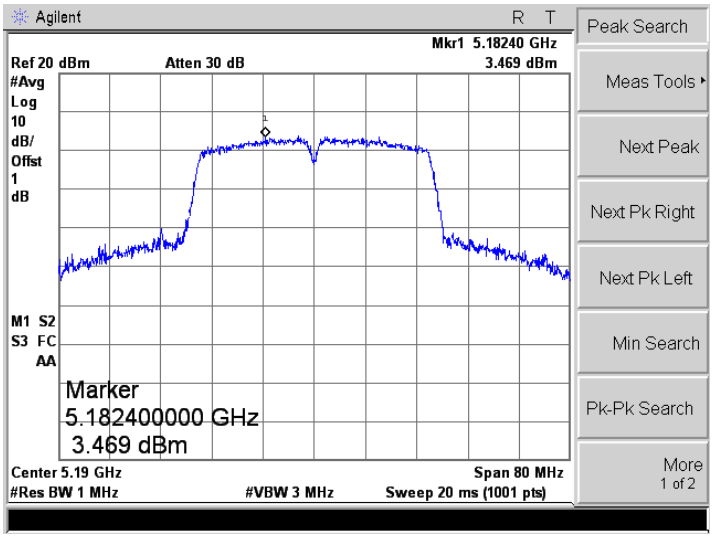
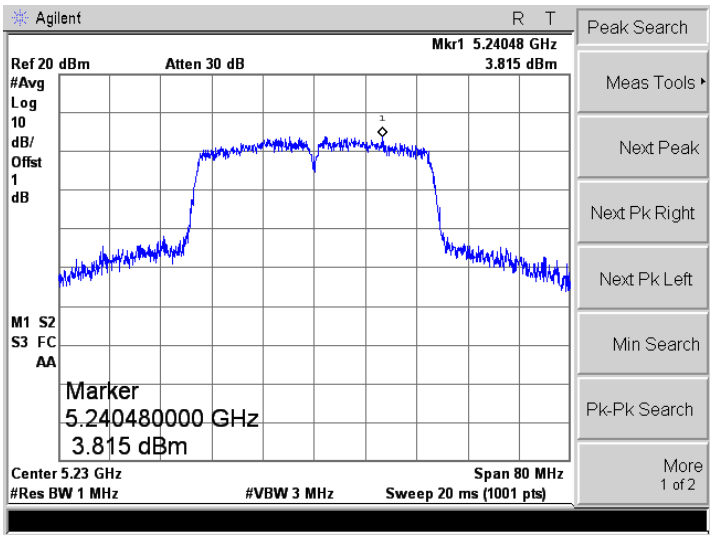
U-NII-1:5150-5250MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	5.182	11
	5200	6.344	11
	5240	6.211	11
802.11n-HT20	5180	6.769	11
	5200	6.501	11
	5240	6.719	11
802.11n-HT40	5190	3.469	11
	5230	3.815	11

U-NII-3: 5725-5850MHz					
Operating mode	Test Channel	Power Spectral Density dBm/300kHz	Factor	Power Spectral Density* dBm/500kHz	Limit dBm/500kHz
802.11a	5745	-1.327	2.22	0.893	30
	5785	-2.759	2.22	-0.539	30
	5825	-1.399	2.22	0.821	30
802.11n-HT20	5745	-2.005	2.22	0.215	30
	5785	-1.754	2.22	0.466	30
	5825	-1.763	2.22	0.457	30
802.11n HT40	5755	-5.355	2.22	-3.135	30
	5795	-5.299	2.22	-3.079	30
*Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)=2.22					

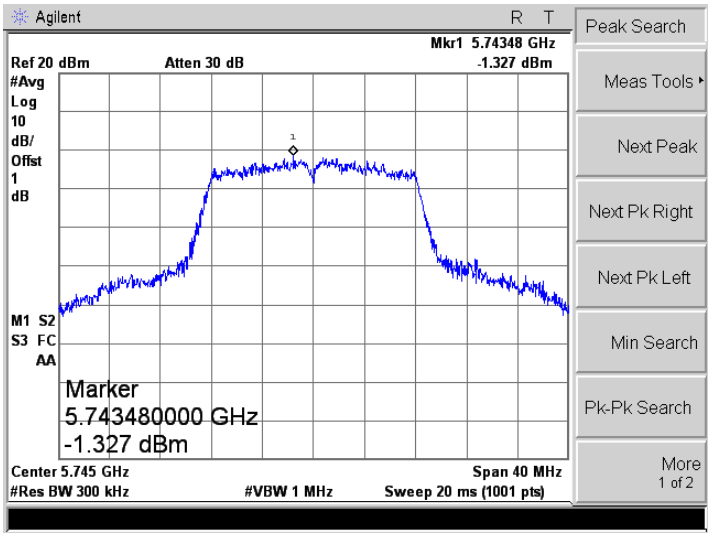
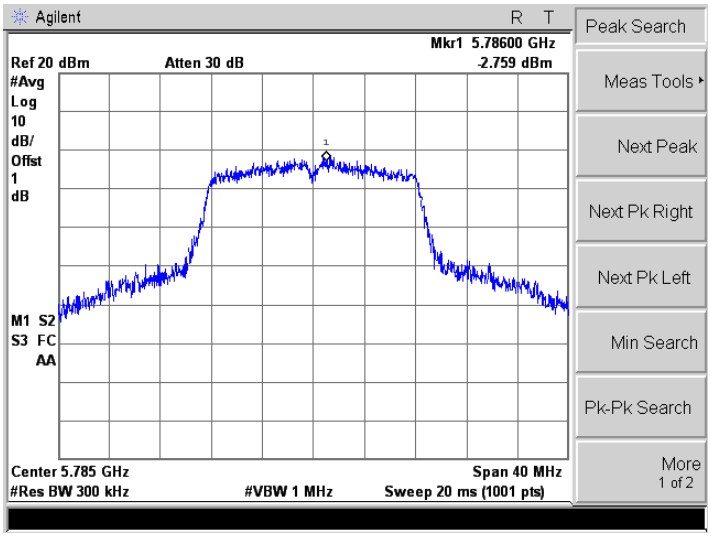
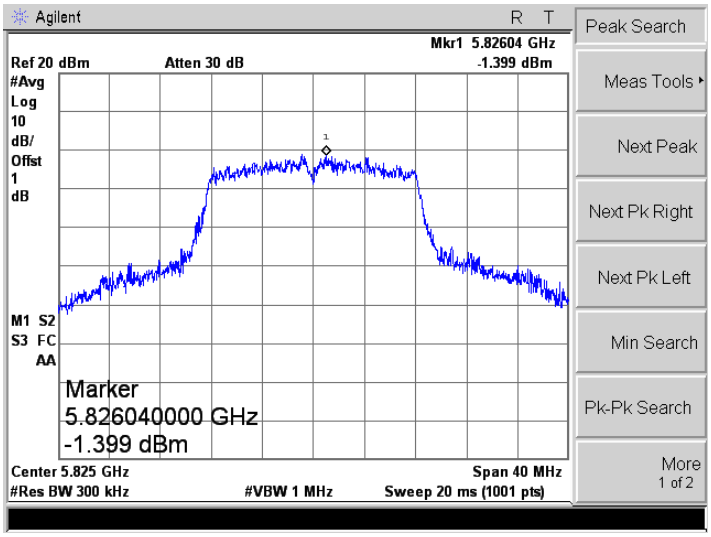
➢ 5150-5250MHz

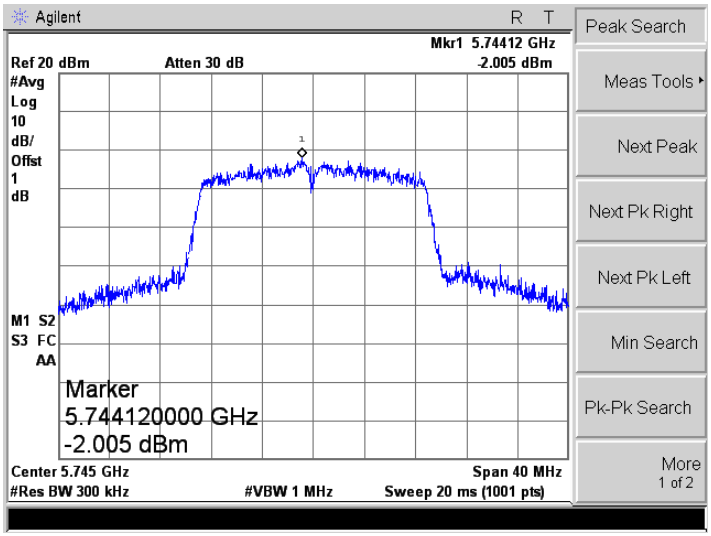
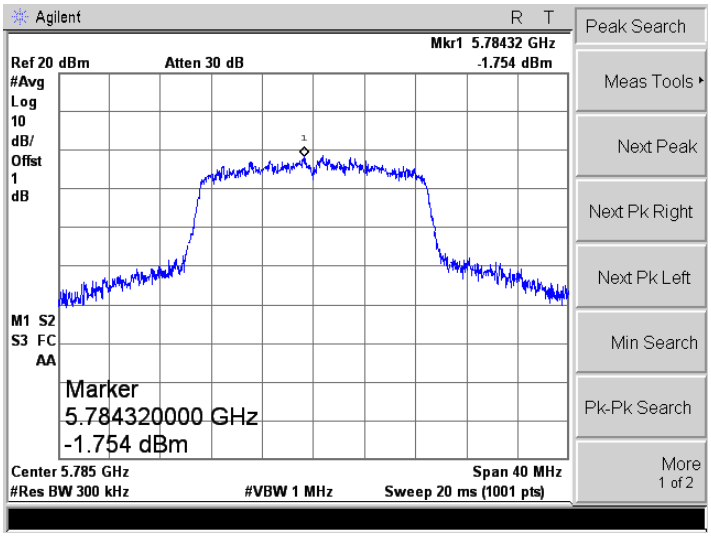
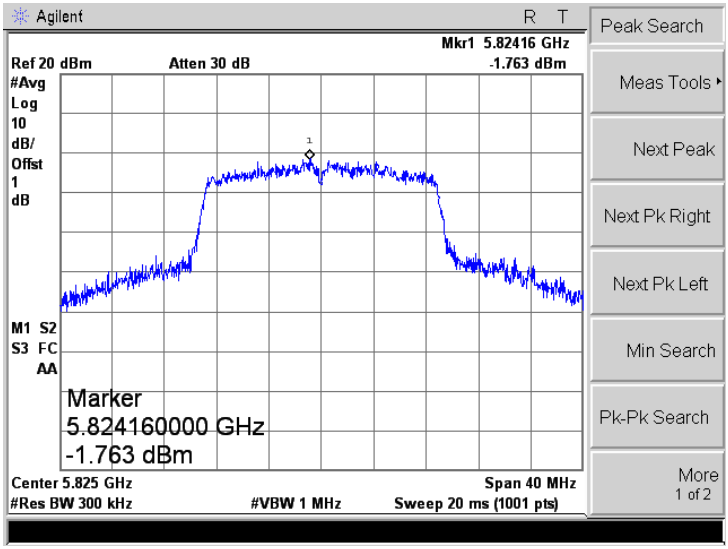
Mode:	802.11a
5180MHz	
5200MHz	
5240MHz	

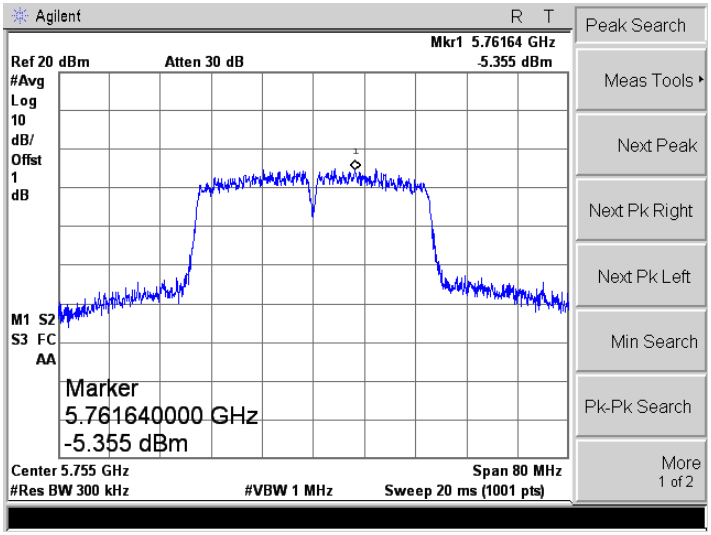
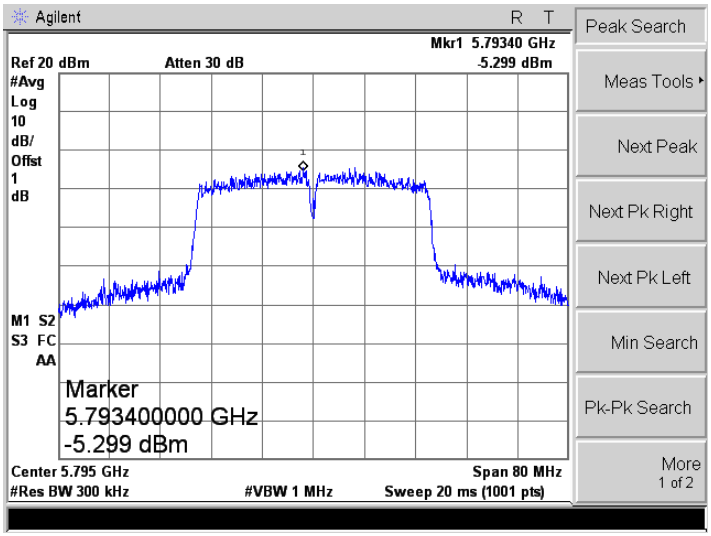
Mode:	802.11n-HT20
5180MHz	
5200MHz	
5240MHz	

Mode:	802.11n-HT40
5190 MHz	
5230 MHz	

➢ 5725-5850MHz

Mode:	**802.11a**
5745MHz	
5785MHz	
5825MHz	

Mode:	802.11n-HT20
5745MHz	
5785MHz	
5825MHz	

Mode:	802.11n-HT40
5755 MHz	
5795 MHz	

8. Emission Bandwidth and Occupied Bandwidth

8.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25 GHz.
(iv) For mobile and portable 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) 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 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
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%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
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.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth
The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

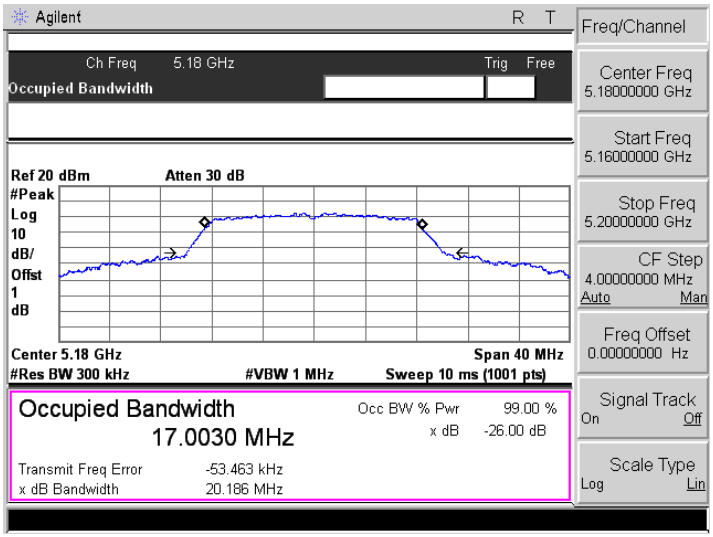
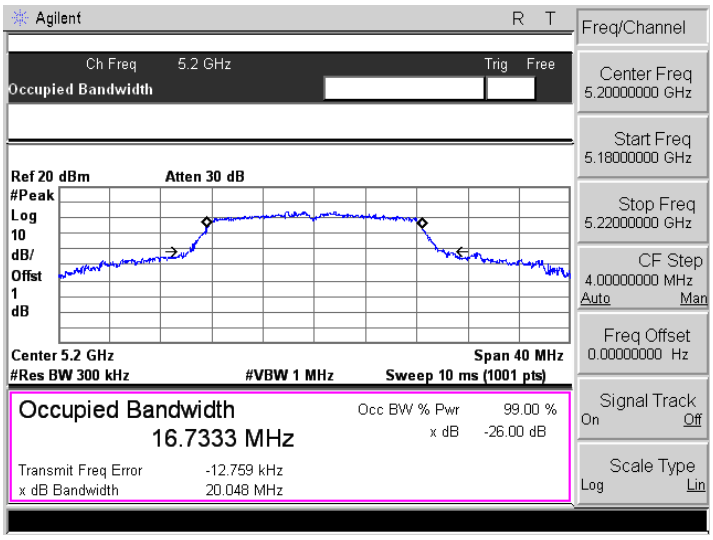
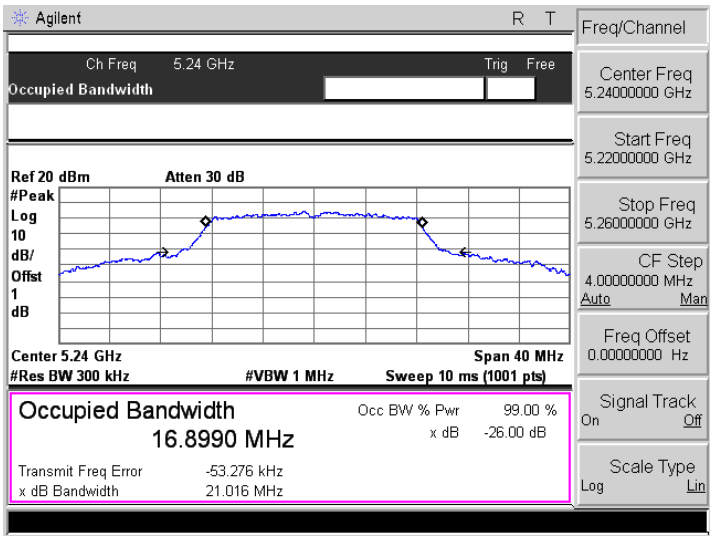
The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 * RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. 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.

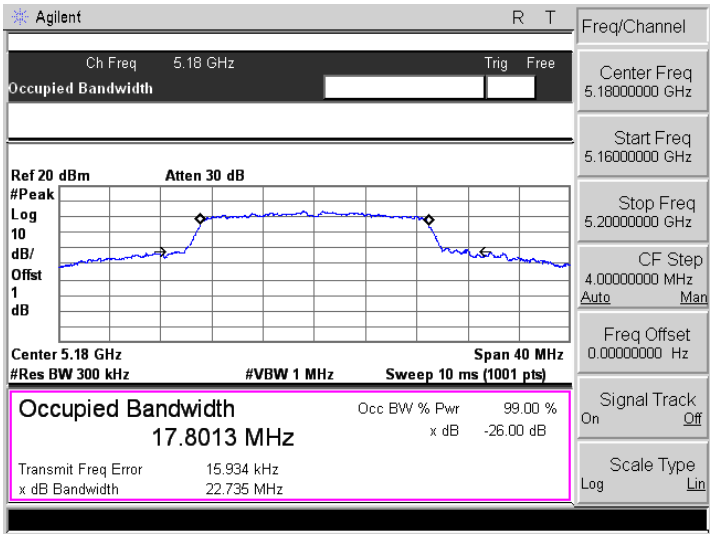
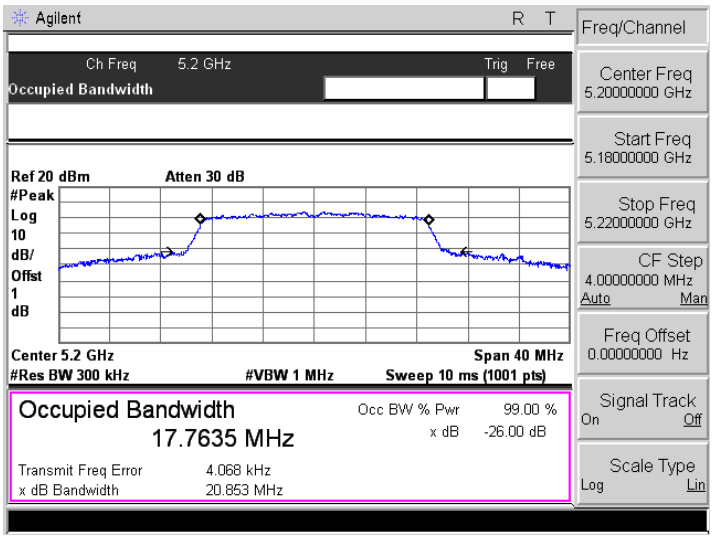
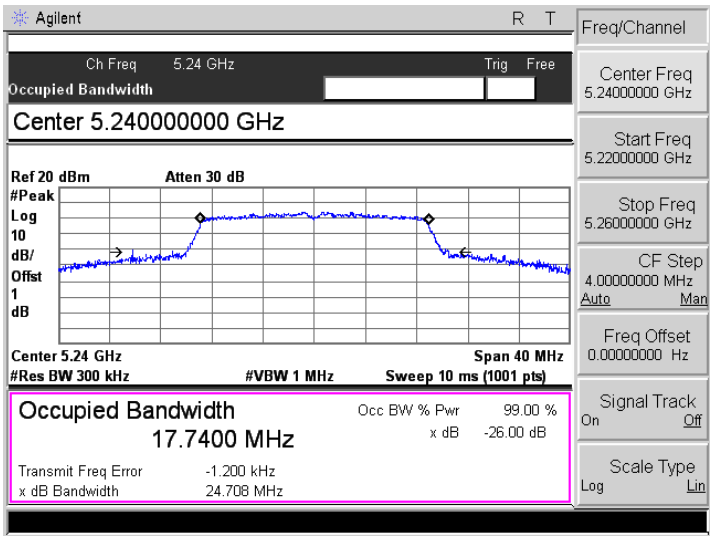
8.3 Summary of Test Results/Plots

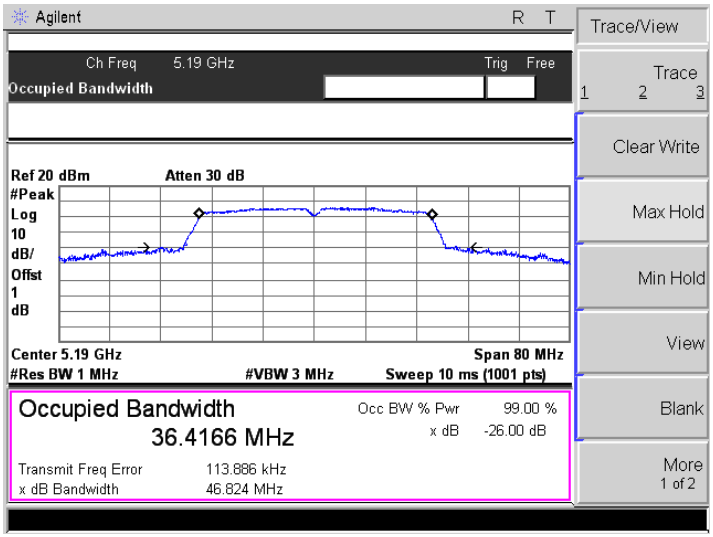
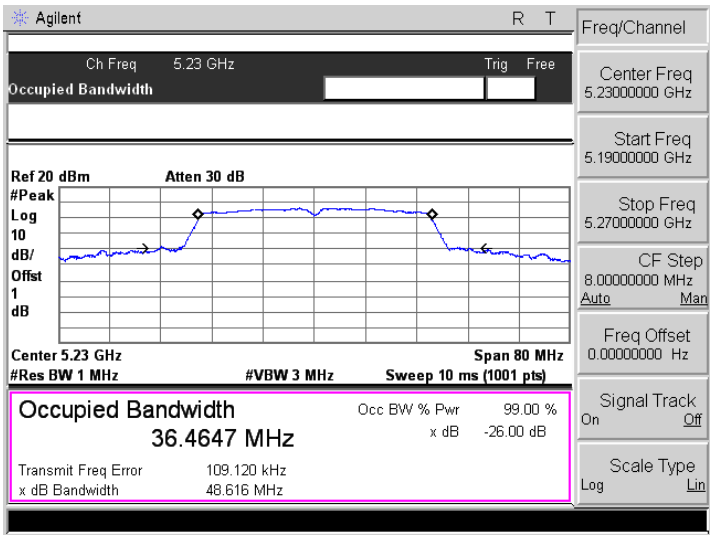
U-NII-1:5150-5250MHz				
Test Mode	**Test Channel MHz**	**26 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5180	20.186	17.0030	Pass
	5200	20.048	16.7333	Pass
	5240	21.016	16.8990	Pass
802.11n-HT20	5180	22.735	17.8013	Pass
	5200	20.853	17.7635	Pass
	5240	24.708	17.7400	Pass
802.11n-HT40	5190	46.824	36.4166	Pass
	5230	48.616	36.4647	Pass

U-NII-3: 5725-5850MHz				
Test Mode	**Test Channel MHz**	**6 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5745	16.342	16.8245	≥500
	5785	16.342	16.7816	≥500
	5825	16.363	16.8855	≥500
802.11n-HT20	5745	17.610	17.7291	≥500
	5785	17.609	17.8078	≥500
	5825	17.598	17.8044	≥500
802.11n-HT40	5755	36.339	36.3711	≥500
	5795	36.163	36.4205	≥500

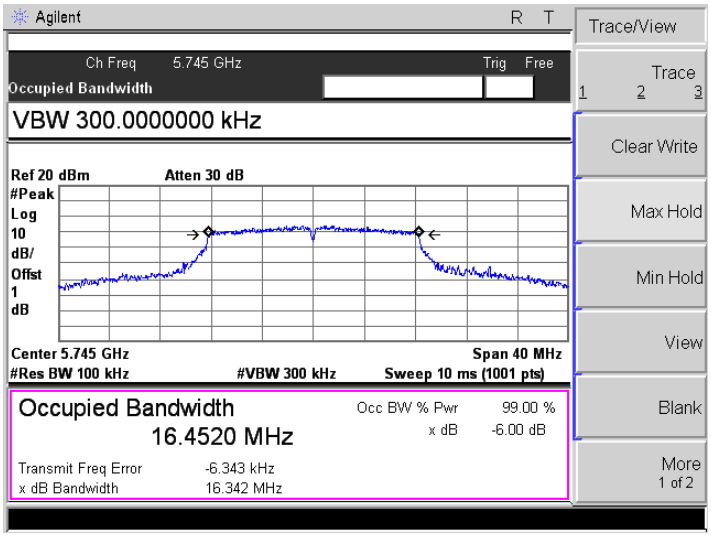
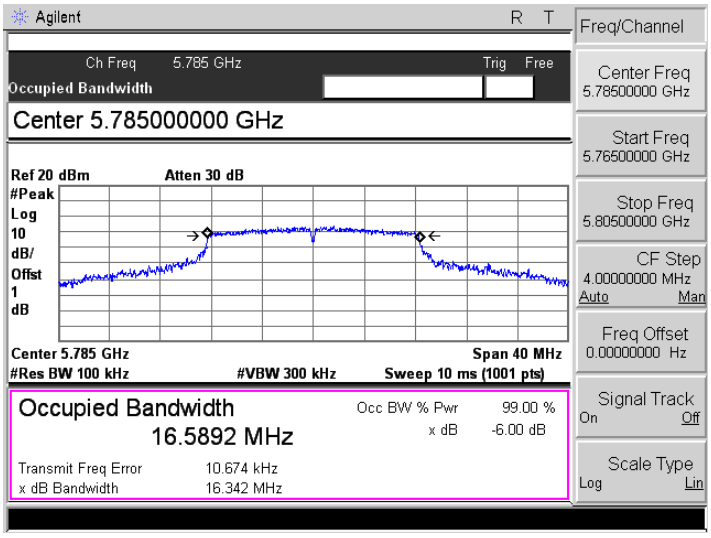
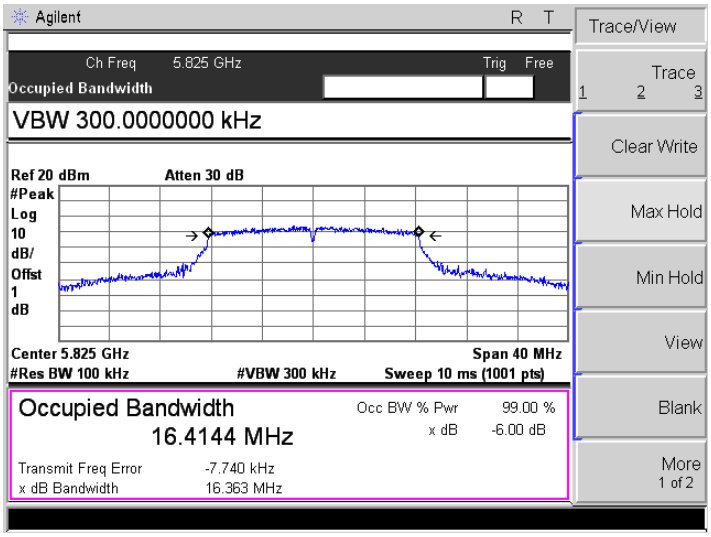
➢ 5150-5250MHz

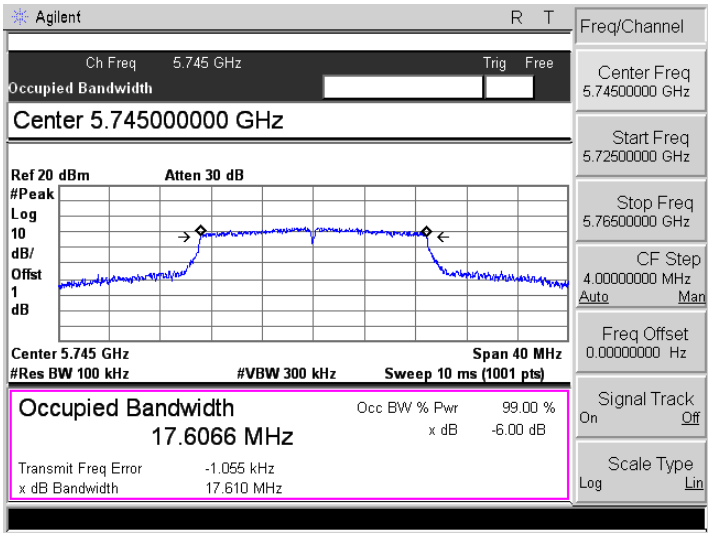
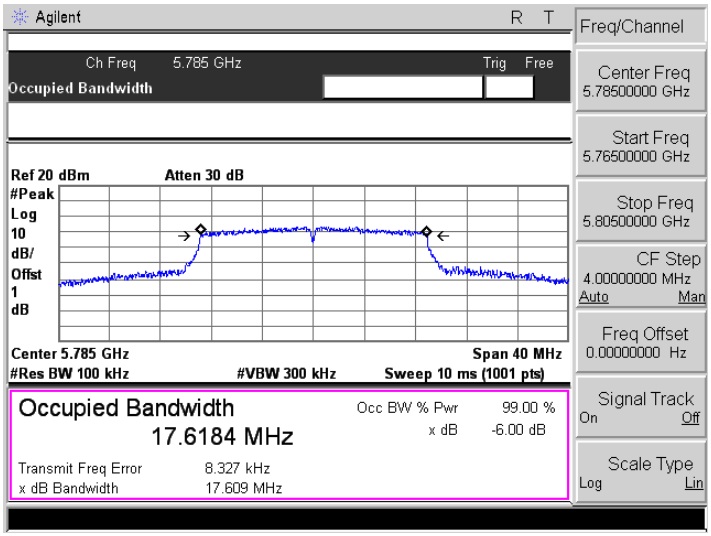
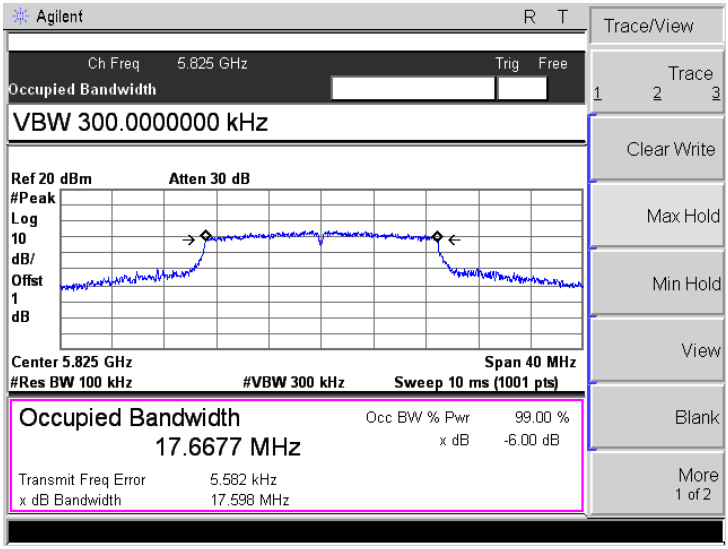
Mode:	**802.11a**
5180MHz	
5200MHz	
5240MHz	

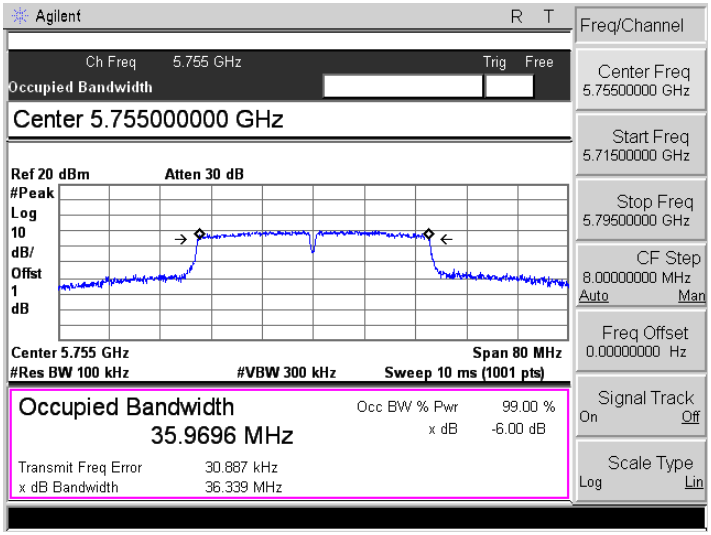
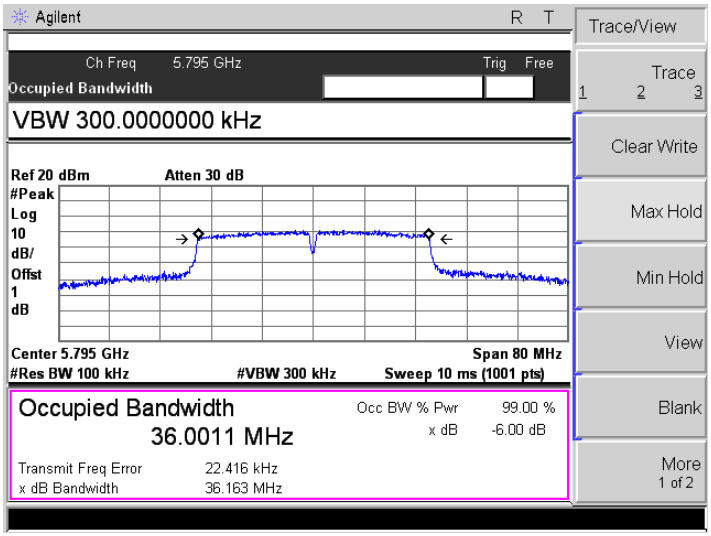
Mode:	802.11n-HT20
5180MHz	
5200MHz	
5240MHz	

Mode:	802.11n-HT40
5190 MHz	
5230 MHz	

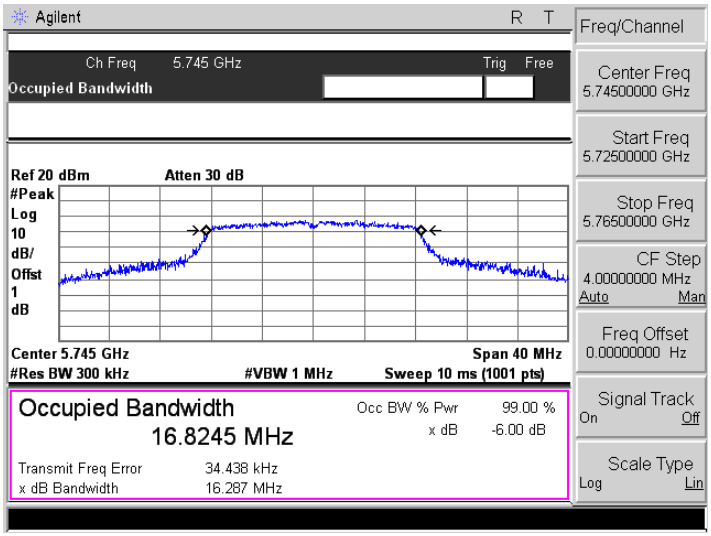
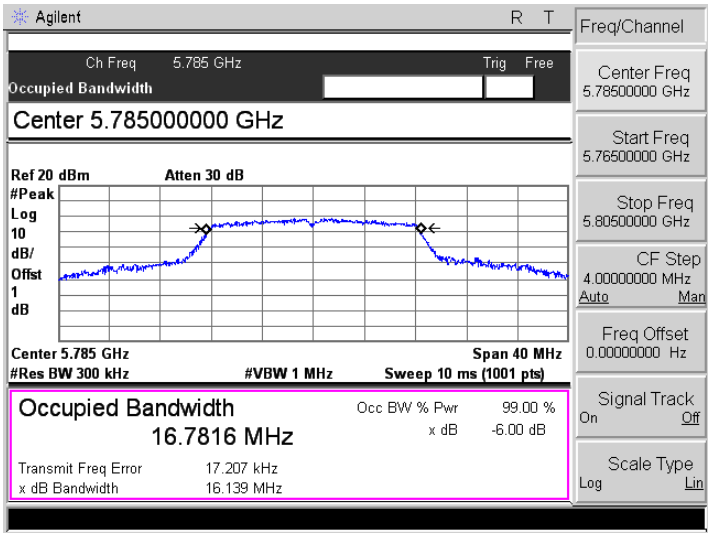
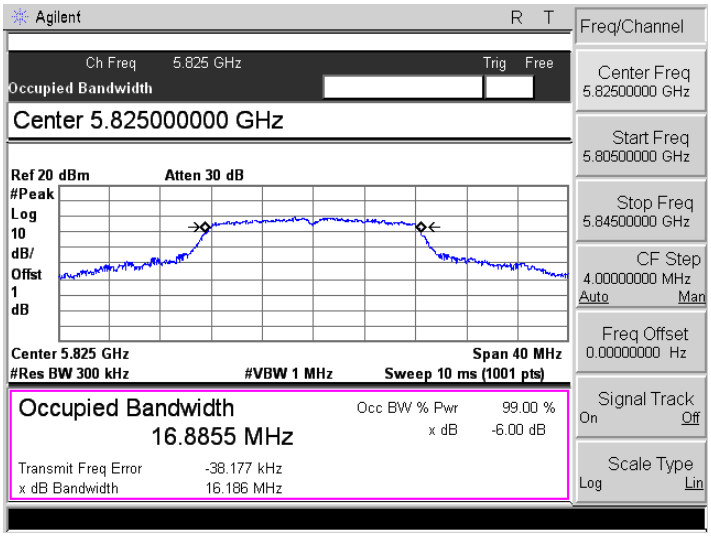
➢ 5725-5850MHz: 6 dB Bandwidth

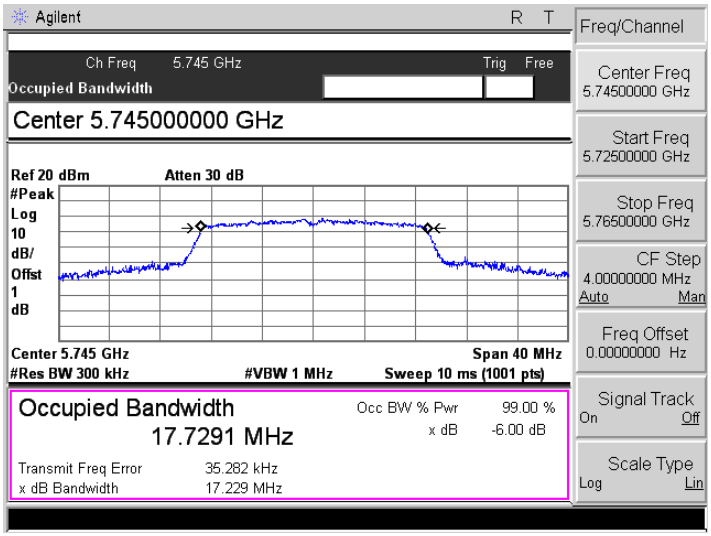
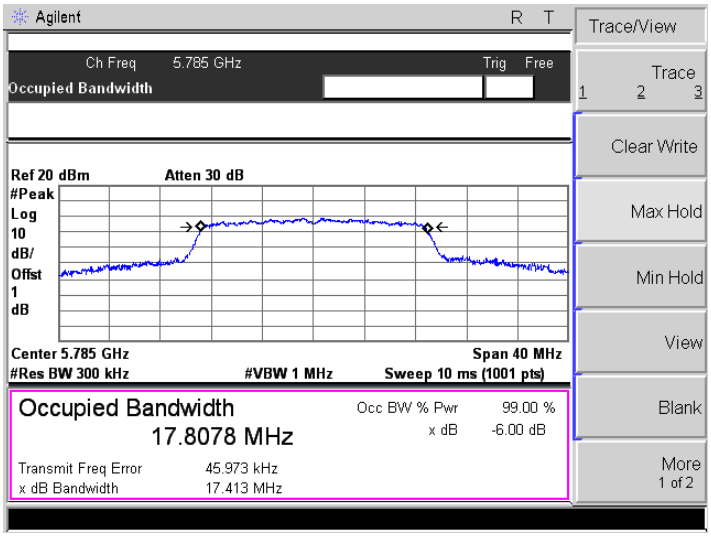
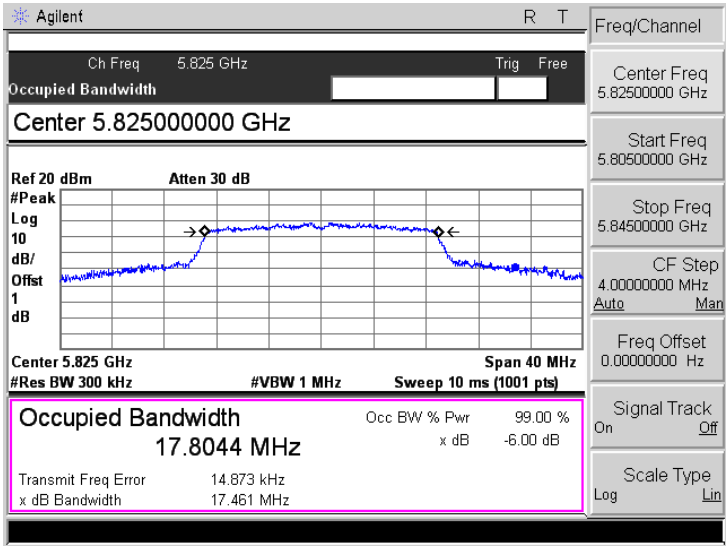
Mode:	**802.11a**
5745MHz	
5785MHz	
5825MHz	

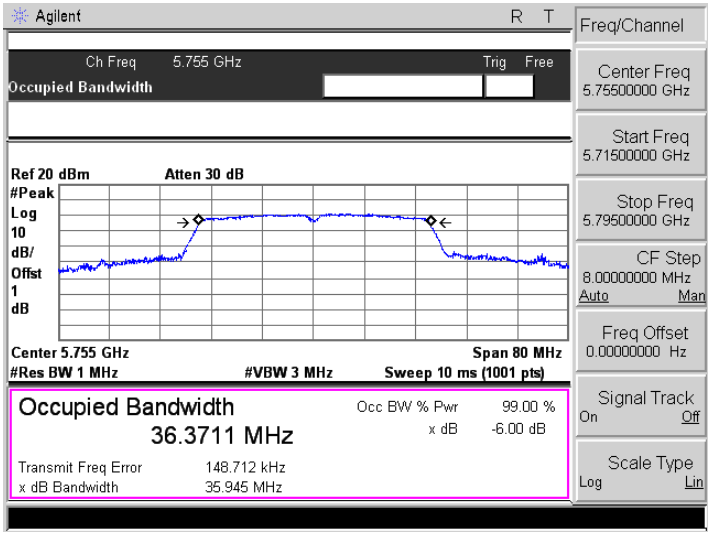
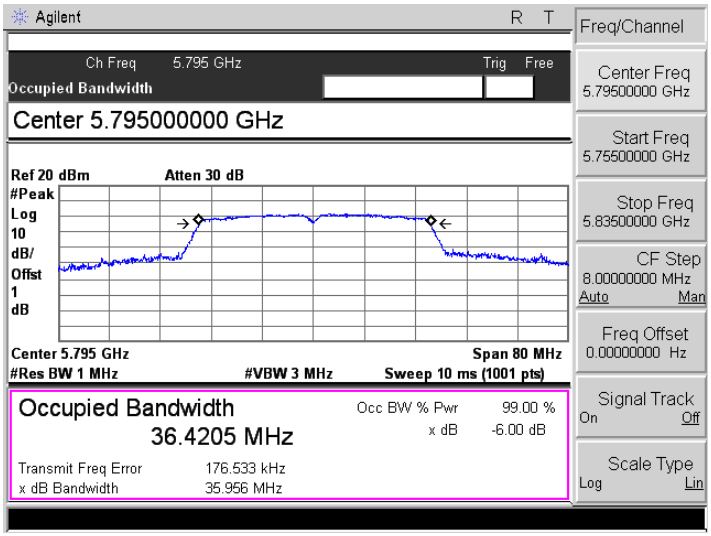
Mode:	802.11n-HT20
5745MHz	
5785MHz	
5825MHz	

Mode:	**802.11n-HT40**
5755 MHz	
5795 MHz	

➢ 5725-5850MHz: 99% Bandwidth

Mode:	**802.11a**
5745MHz	
5785MHz	
5825MHz	

Mode:	802.11n-HT20
5745MHz	
5785MHz	
5825MHz	

Mode:	**802.11n-HT40**
5755 MHz	
5795 MHz	

9. Maximum Conducted Output Power

9.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.
(iv) For mobile and portable 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) 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 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

9.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

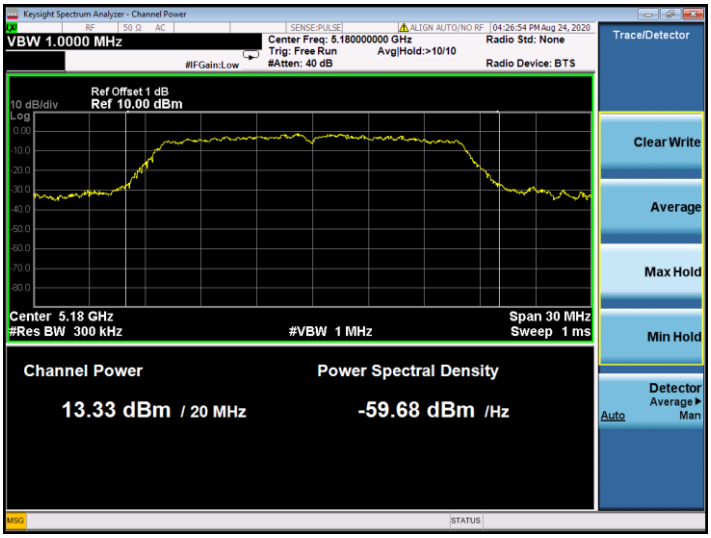
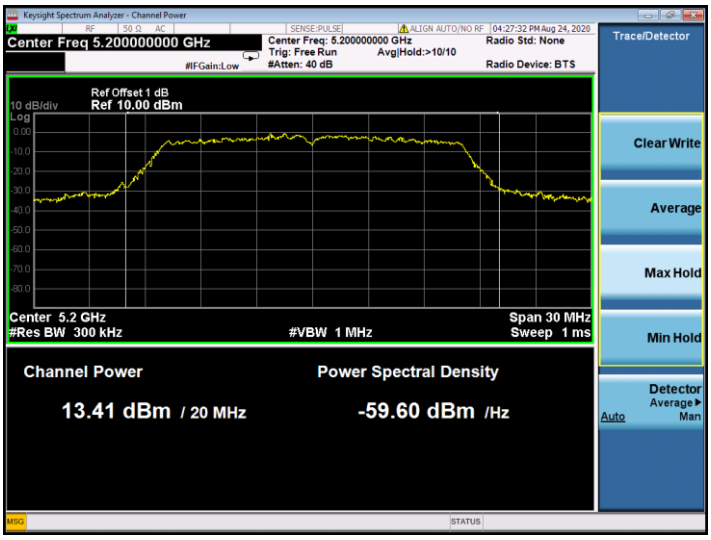
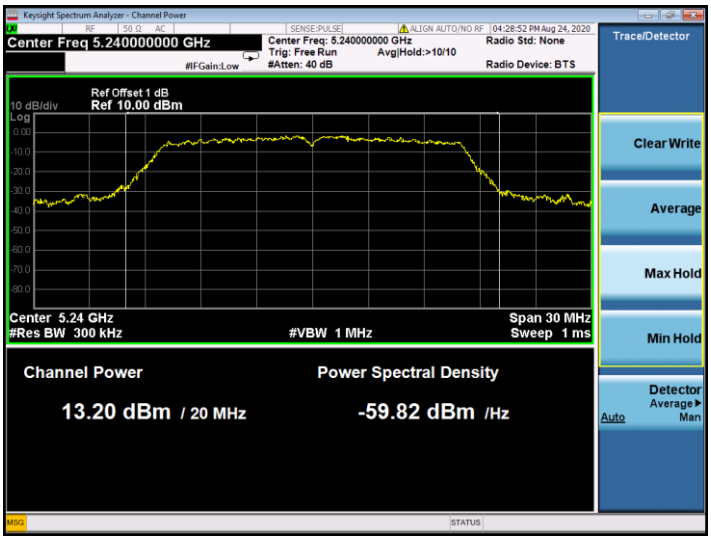
(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

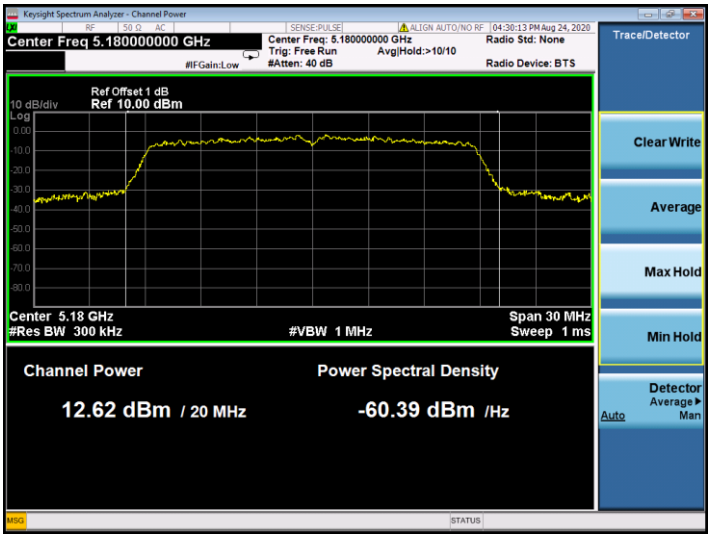
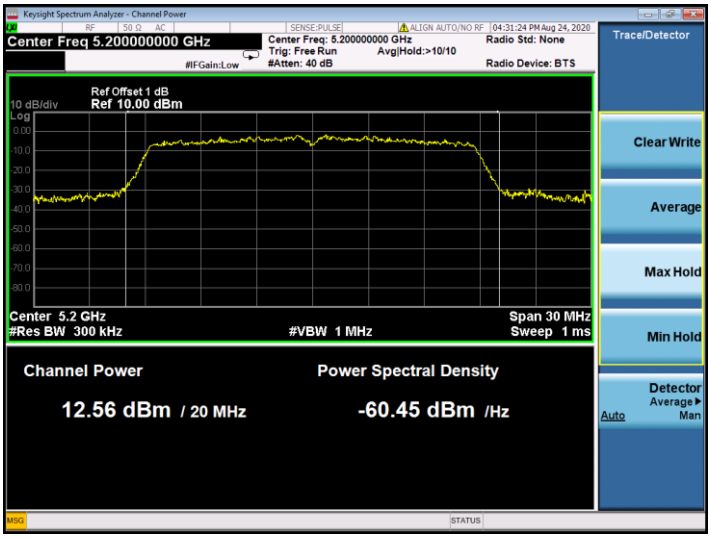
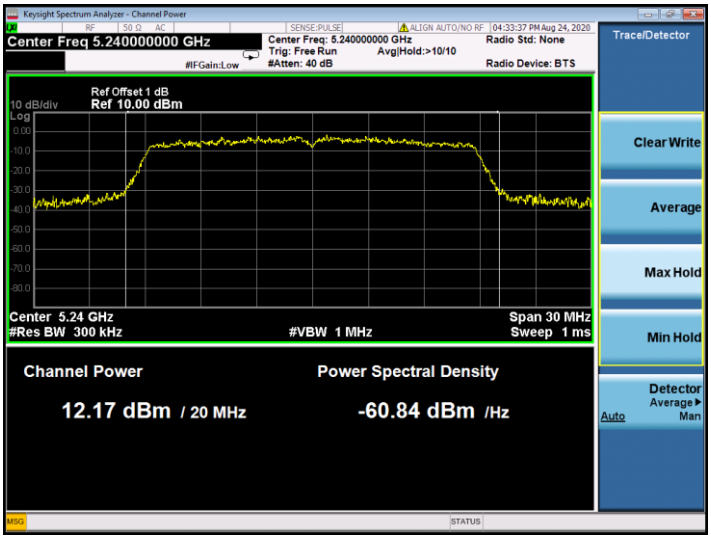
9.3 Summary of Test Results/Plots

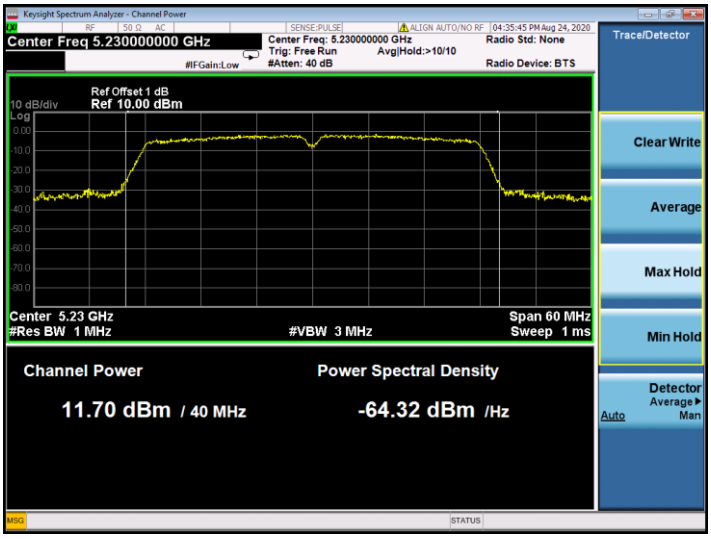
U-NII-1:5150-5250MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5180	13.33	21.53	250
	5200	13.41	21.93	250
	5240	13.20	20.89	250
802.11n-HT20	5180	12.62	18.28	250
	5200	12.56	18.03	250
	5240	12.17	16.48	250
802.11n-HT40	5190	11.68	14.72	250
	5230	11.70	14.79	250

U-NII-3: 5725-5850MHz				
Test mode	Frequency MHz	Output Power dBm	Output Power mW	Limit mW
802.11a	5745	13.34	21.58	1000
	5785	13.51	22.44	1000
	5825	13.63	23.07	1000
802.11n-HT20	5745	12.72	18.71	1000
	5785	12.83	19.19	1000
	5825	12.17	16.48	1000
802.11n-HT40	5755	11.61	14.49	1000
	5795	11.28	13.43	1000

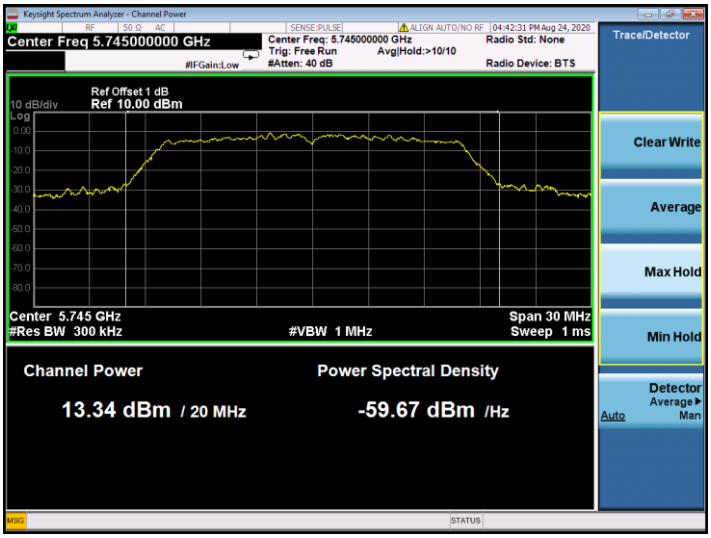
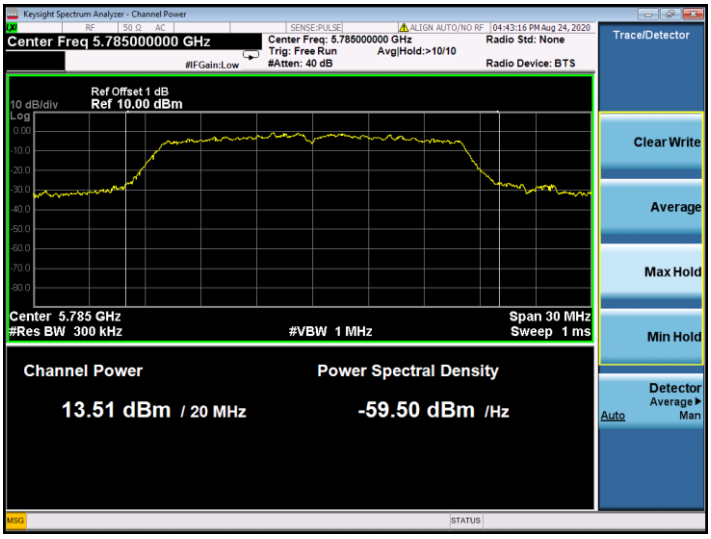
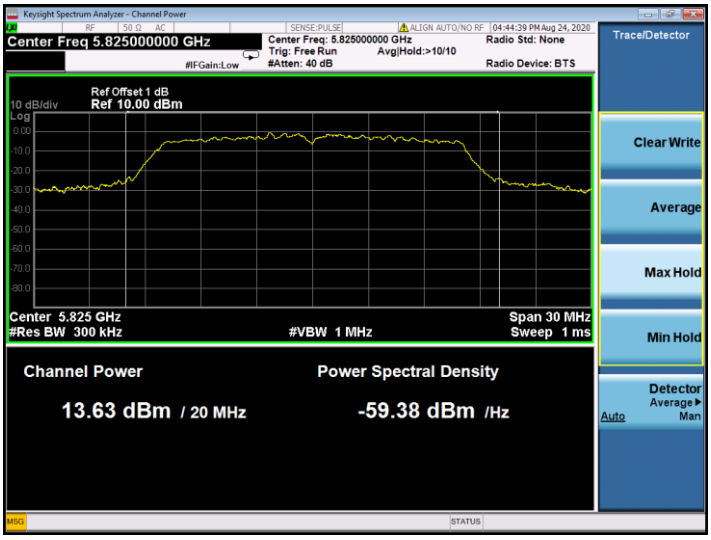
➢ 5150-5250MHz

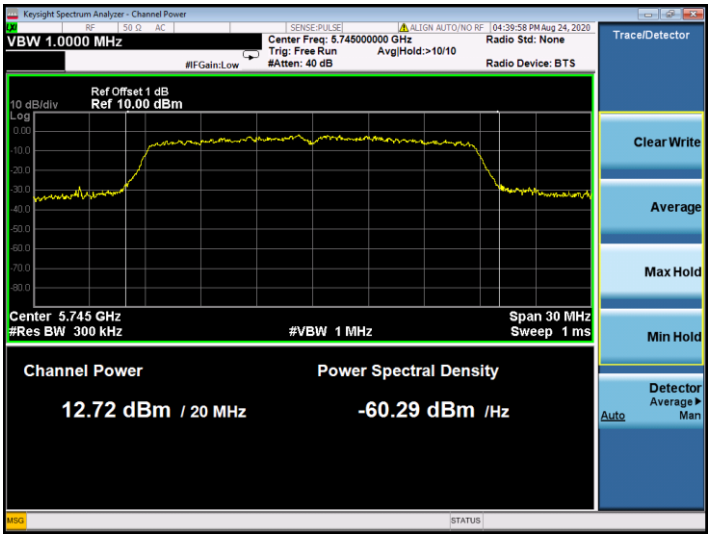
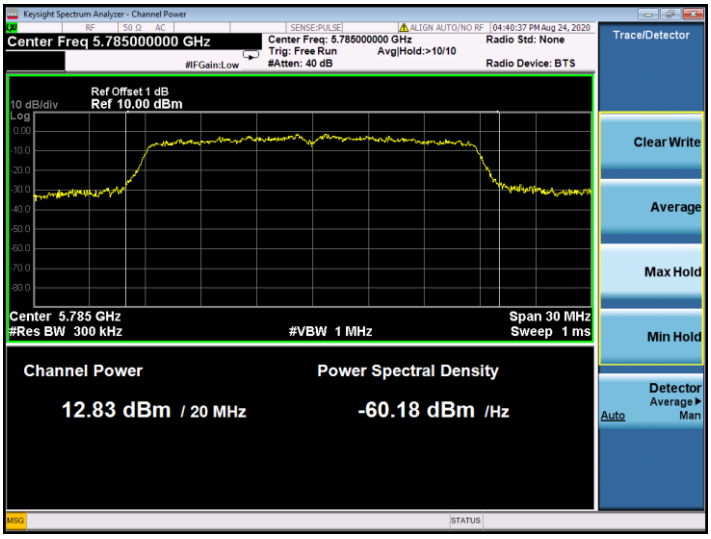
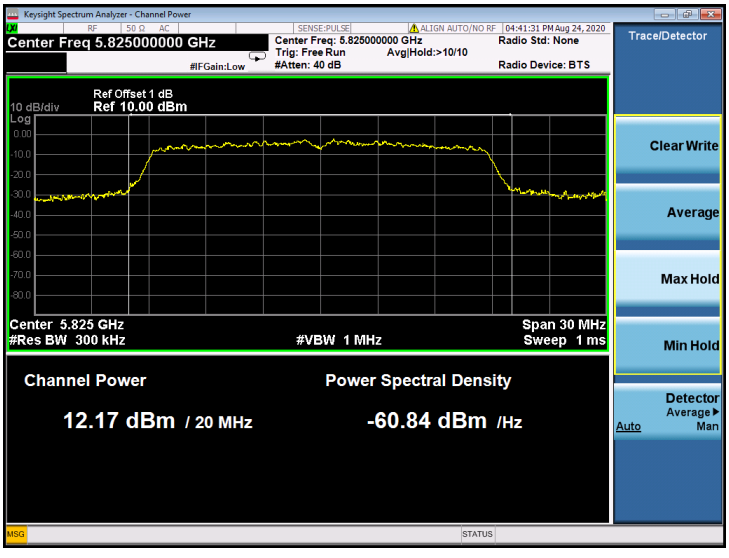
Mode:	802.11a
5180MHz	
5200MHz	
5240MHz	

Mode:	802.11n-HT20
5180MHz	
5200MHz	
5240MHz	

Mode:	802.11n-HT40
5190 MHz	
5230 MHz	

➢ 5725-5850MHz

Mode:	**802.11a**
5745MHz	
5785MHz	
5825MHz	

Mode:	802.11n-HT20
5745MHz	
5785MHz	
5825MHz	

Mode:	802.11n-HT40
5755 MHz	
5795 MHz	

10. Radiated Spurious Emissions

10.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) 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.

(2) 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.

(3) 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.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

According to §15.407(b)(6), 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.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.

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If radiated measurements are performed, field strength is then converted to EIRP as follows:

EIRP = ((E*d)^2) / 30

where:

- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

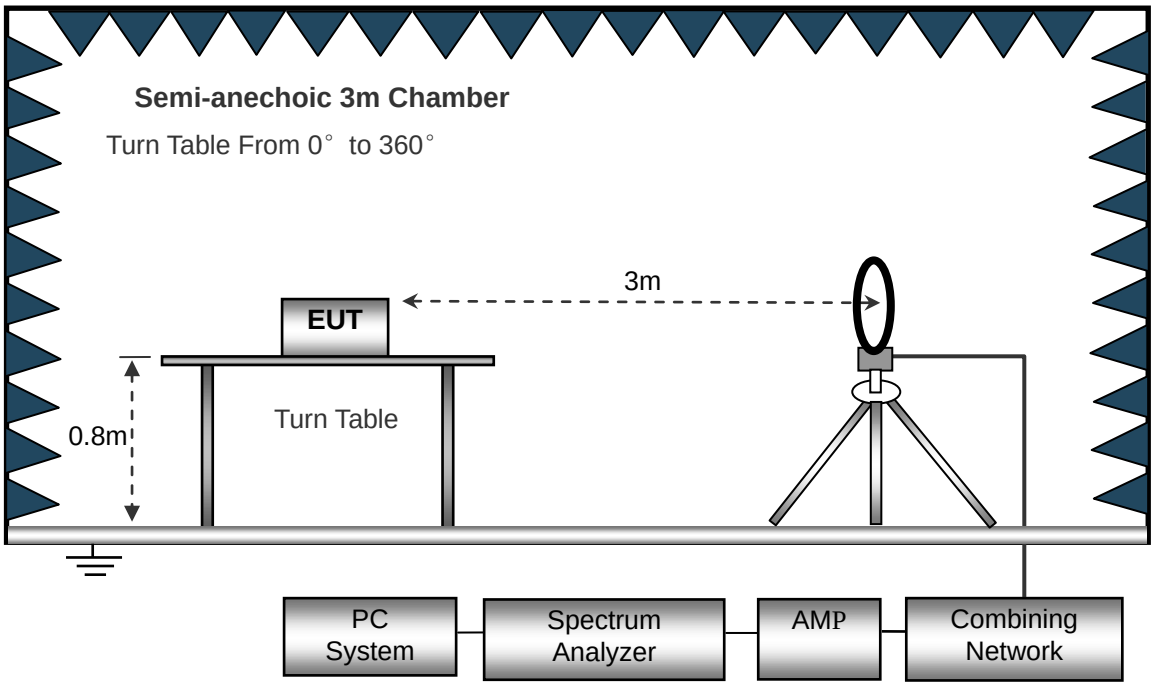
10.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

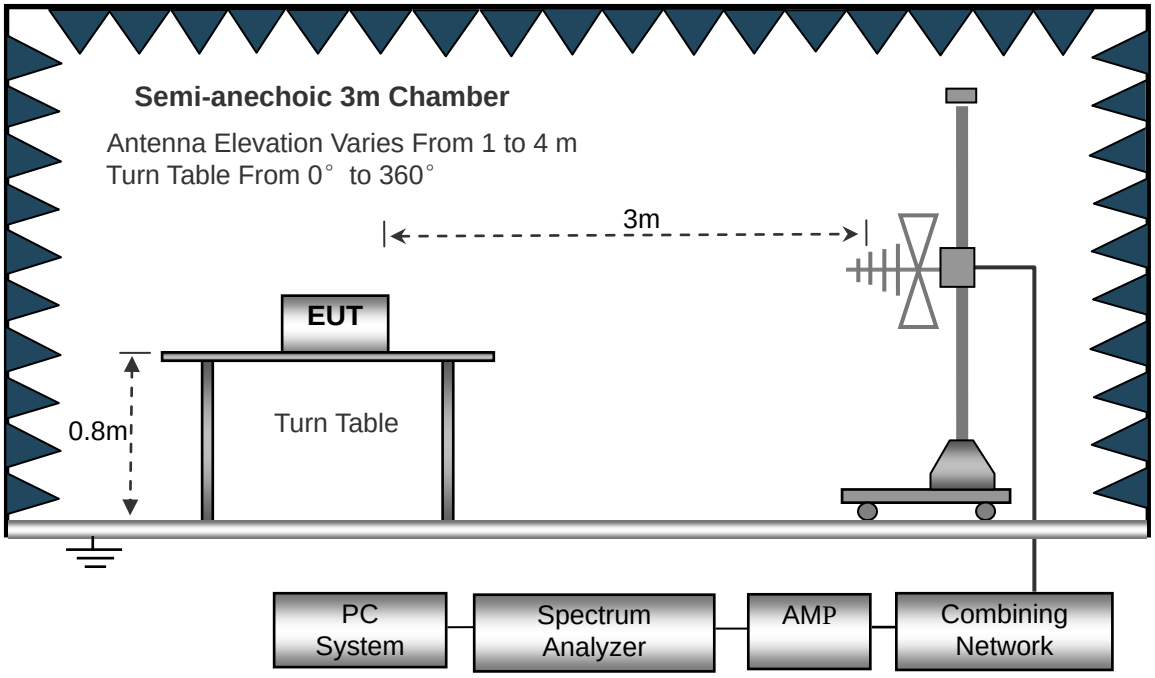
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

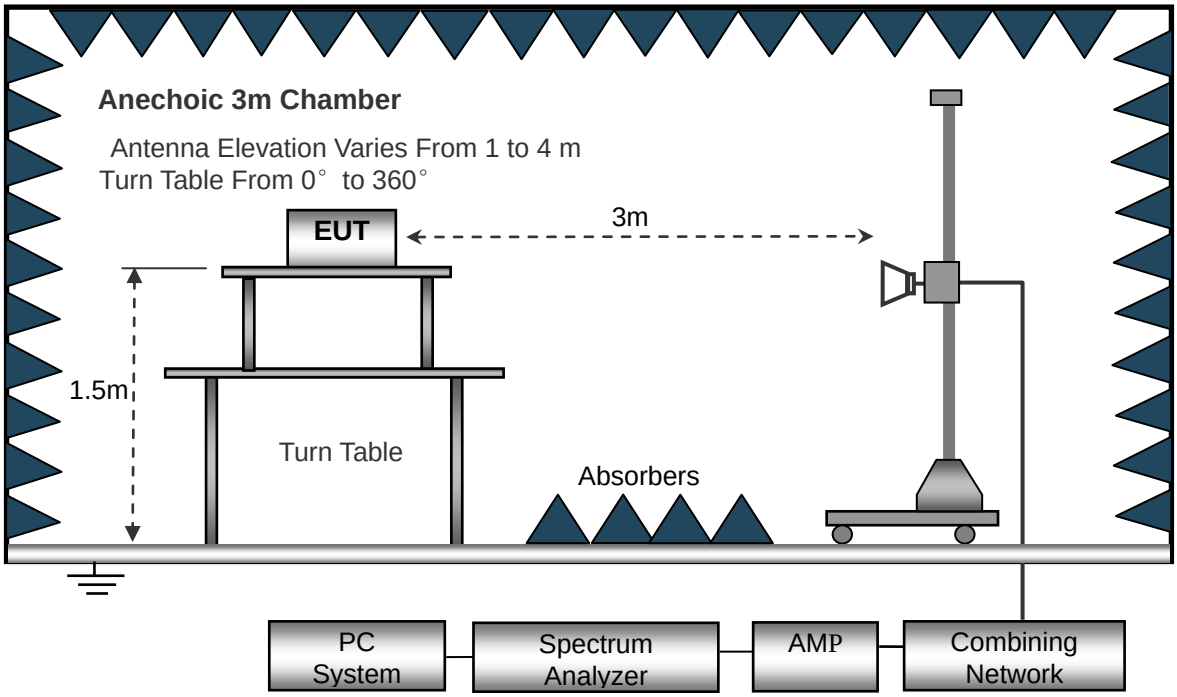
The test setup for emission measurement below 30MHz..



The test setup for emission measurement from 30 MHz to 1 GHz..



The test setup for emission measurement above 1 GHz..



10.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

10.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

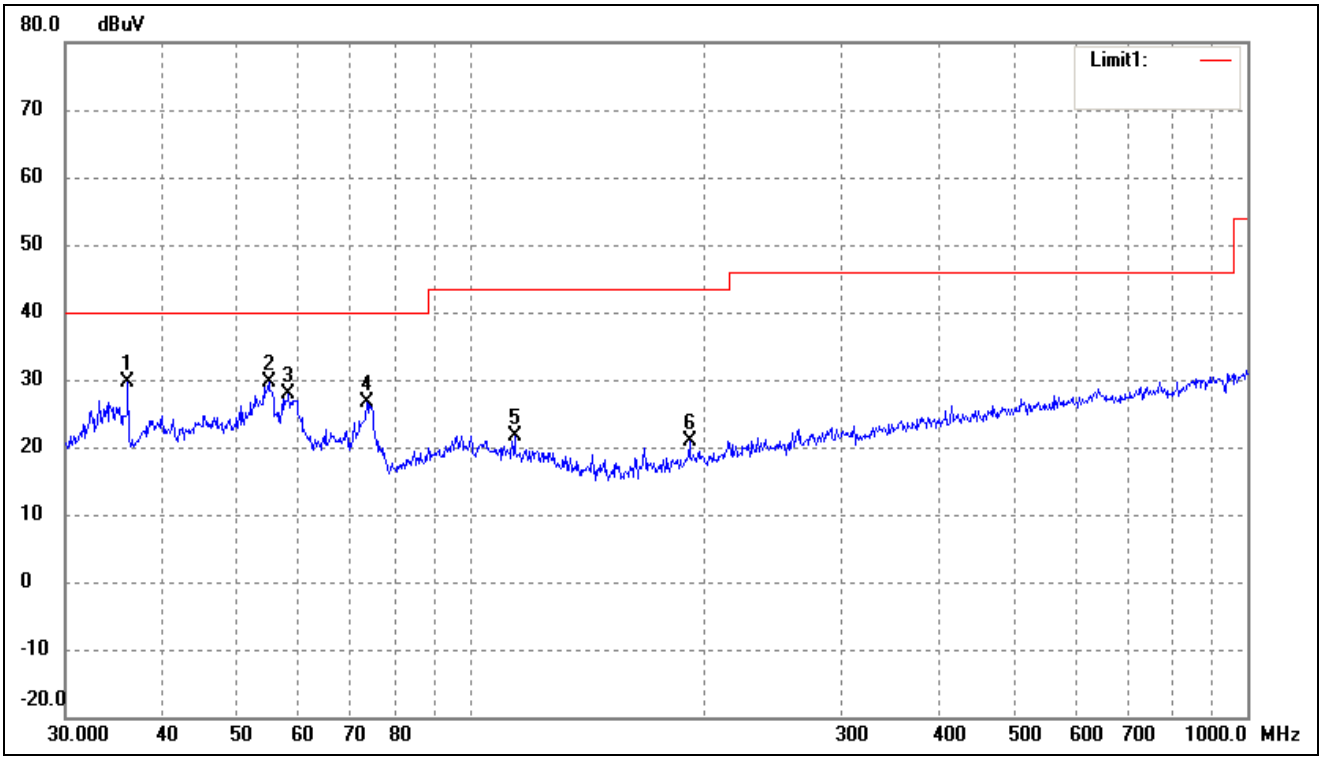
Margin = Corr. Ampl. – FCC Part 15 Limit

10.5 Summary of Test Results/Plots

Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

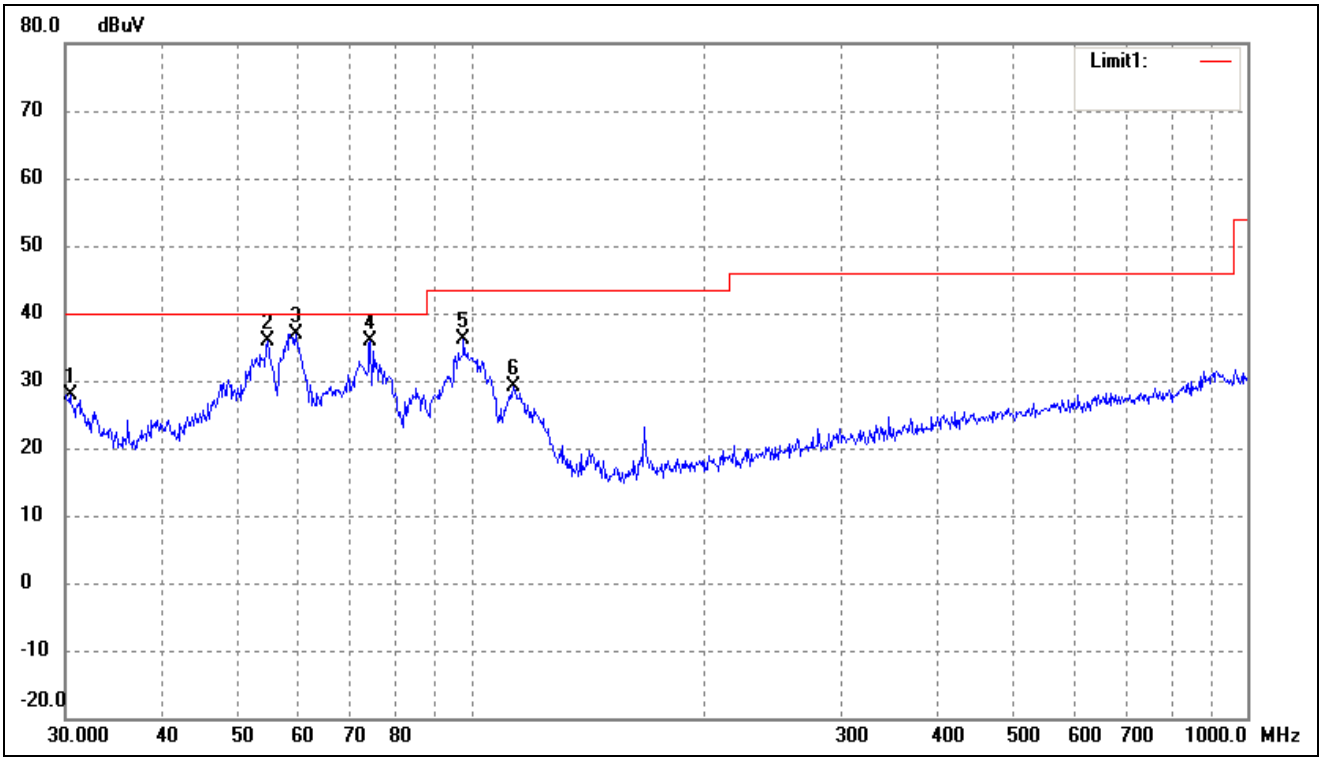
- Spurious Emission From 30 MHz to 1 GHz
- 5150-5250MHz

802.11a			
Test Channel	5180MHz(Worst case)	Polarity:	Horizontal



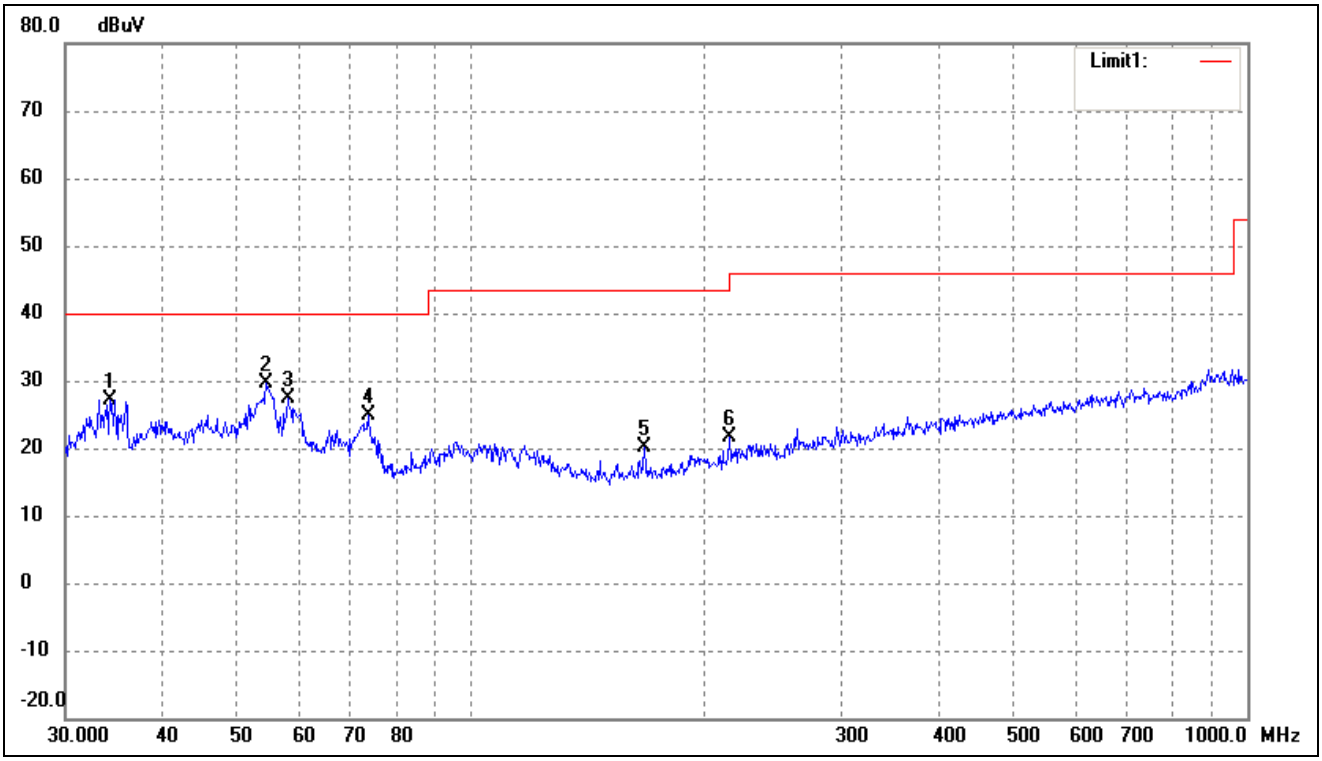
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	36.1272	42.98	-13.45	29.53	40.00	-10.47	-	-	peak
2	54.8348	42.42	-12.89	29.53	40.00	-10.47	-	-	peak
3	58.2030	40.73	-12.97	27.76	40.00	-12.24	-	-	peak
4	73.3593	42.30	-15.57	26.73	40.00	-13.27	-	-	peak
5	113.7143	35.35	-13.68	21.67	43.50	-21.83	-	-	peak
6	191.0738	33.93	-13.05	20.88	43.50	-22.62	-	-	peak

802.11a			
Test Channel	5180MHz(Worst case)	Polarity:	Vertical



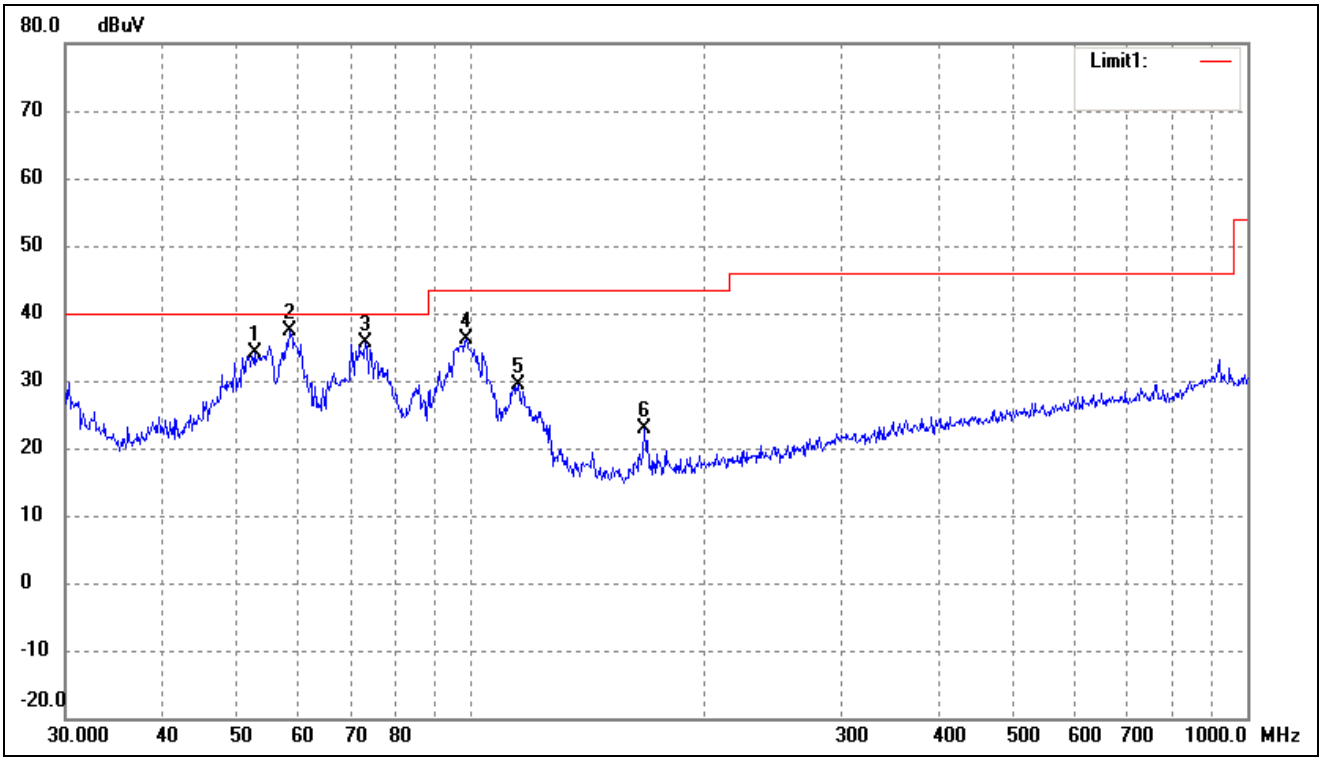
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	30.4238	42.05	-14.12	27.93	40.00	-12.07	-	-	peak
2	54.6429	48.77	-12.84	35.93	40.00	-4.07	-	-	peak
3	59.4405	49.82	-12.98	36.84	40.00	-3.16	-	-	peak
4	74.1351	51.66	-15.79	35.87	40.00	-4.13	-	-	peak
5	97.7983	49.75	-13.69	36.06	43.50	-7.44	-	-	peak
6	113.3163	42.73	-13.63	29.10	43.50	-14.40	-	-	peak

802.11n-HT20			
Test Channel	5180MHz(worst case)	Polarity:	Horizontal



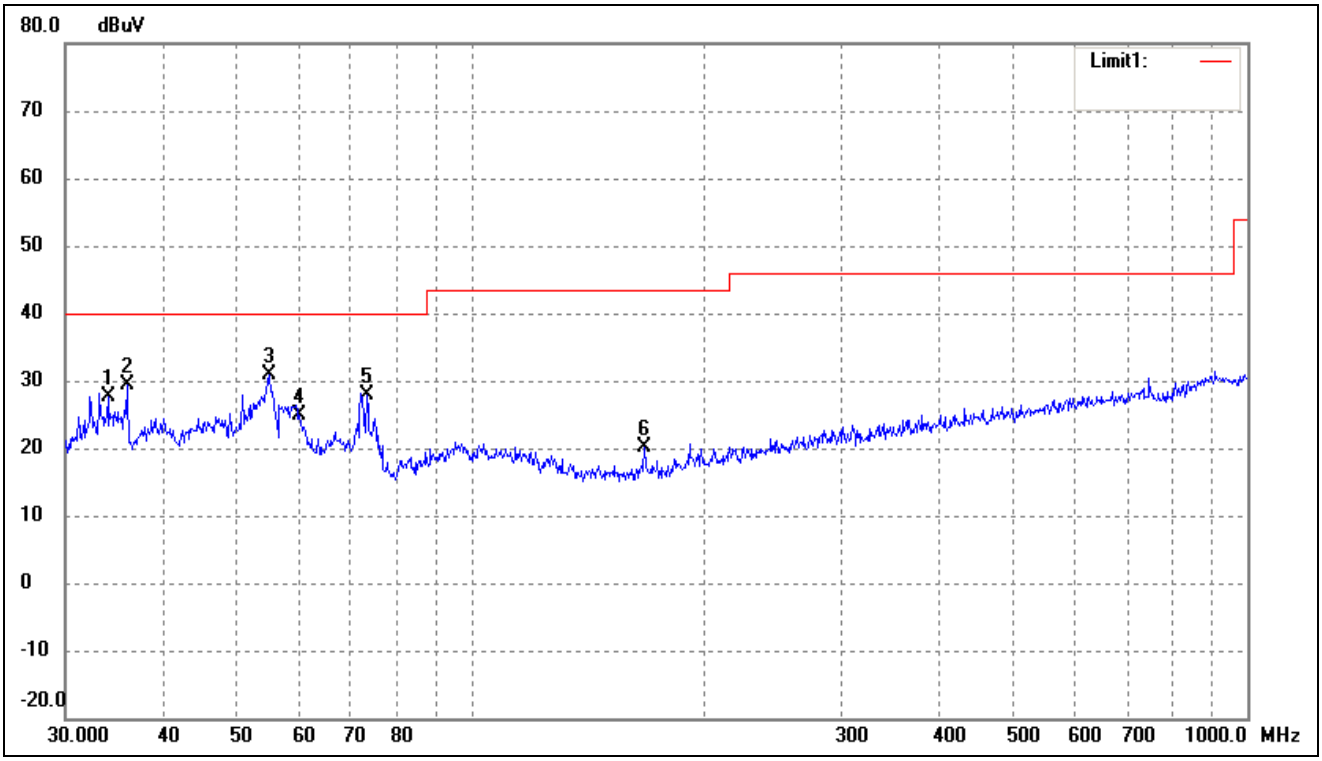
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	34.2760	41.01	-13.91	27.10	40.00	-12.90	-	-	peak
2	54.4516	42.41	-12.79	29.62	40.00	-10.38	-	-	peak
3	57.9993	40.46	-12.97	27.49	40.00	-12.51	-	-	peak
4	73.6170	40.42	-15.65	24.77	40.00	-15.23	-	-	peak
5	167.2368	35.24	-15.16	20.08	43.50	-23.42	-	-	peak
6	215.2678	33.83	-12.24	21.59	43.50	-21.91	-	-	peak

802.11n-HT20			
Test Channel	5180MHz(worst case)	Polarity:	Vertical



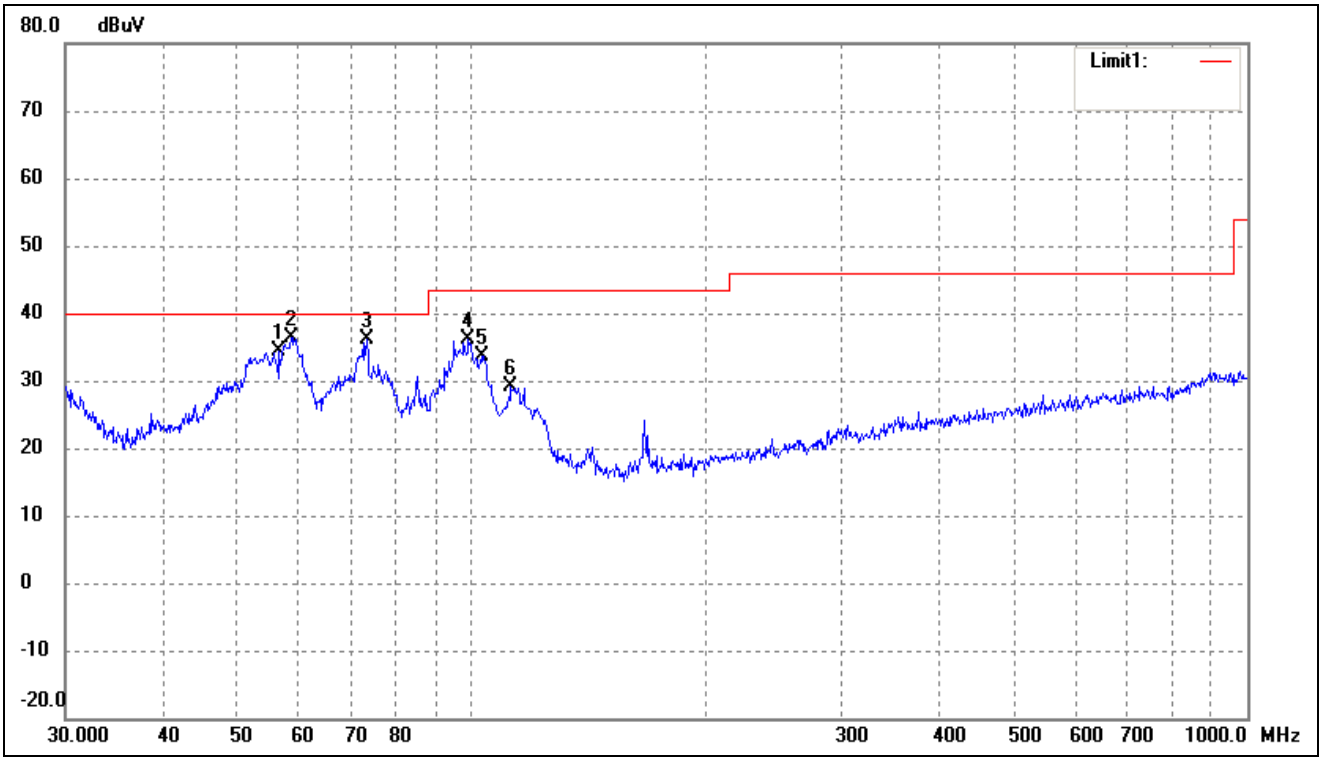
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	52.5753	46.41	-12.25	34.16	40.00	-5.84	-	-	peak
2	58.4074	50.25	-12.98	37.27	40.00	-2.73	-	-	peak
3	73.1025	51.09	-15.50	35.59	40.00	-4.41	-	-	peak
4	98.4866	49.70	-13.57	36.13	43.50	-7.37	-	-	peak
5	114.9169	43.05	-13.79	29.26	43.50	-14.24	-	-	peak
6	167.2368	38.09	-15.16	22.93	43.50	-20.57	-	-	peak

802.11n-HT40			
Test Channel	5190MHz(worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	34.0365	41.50	-13.93	27.57	40.00	-12.43	-	-	peak
2	36.0007	42.87	-13.50	29.37	40.00	-10.63	-	-	peak
3	55.0274	43.75	-12.94	30.81	40.00	-9.19	-	-	peak
4	60.0691	37.81	-13.00	24.81	40.00	-15.19	-	-	peak
5	73.3593	43.51	-15.57	27.94	40.00	-12.06	-	-	peak
6	167.2368	35.24	-15.16	20.08	43.50	-23.42	-	-	peak

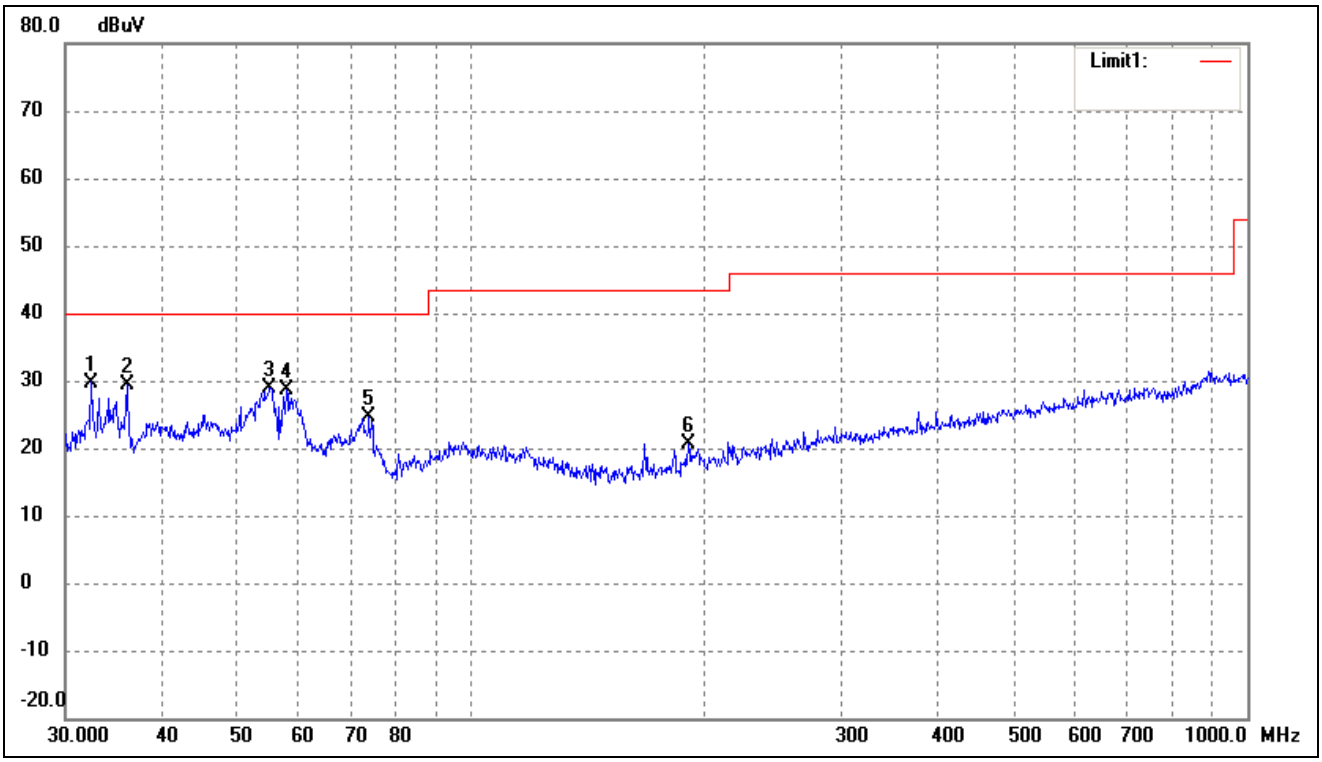
802.11n-HT40			
Test Channel	5190MHz(worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	56.5929	47.26	-12.95	34.31	40.00	-5.69	-	-	peak
2	58.6126	49.39	-12.98	36.41	40.00	-3.59	-	-	peak
3	73.3593	51.59	-15.57	36.02	40.00	-3.98	-	-	peak
4	99.1797	49.58	-13.45	36.13	43.50	-7.37	-	-	peak
5	103.4421	46.97	-13.31	33.66	43.50	-9.84	-	-	peak
6	112.5244	42.74	-13.56	29.18	43.50	-14.32	-	-	peak

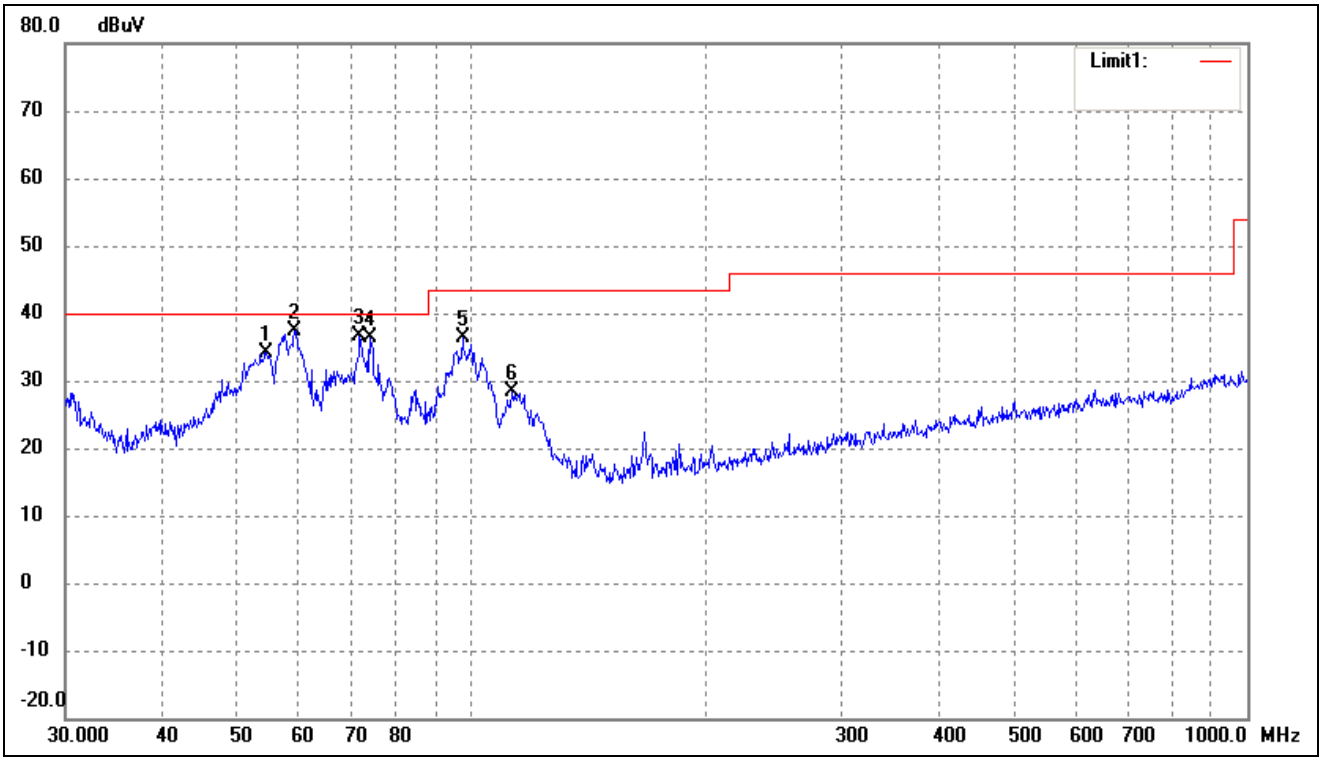
➢ 5725-5850MHz

802.11a			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



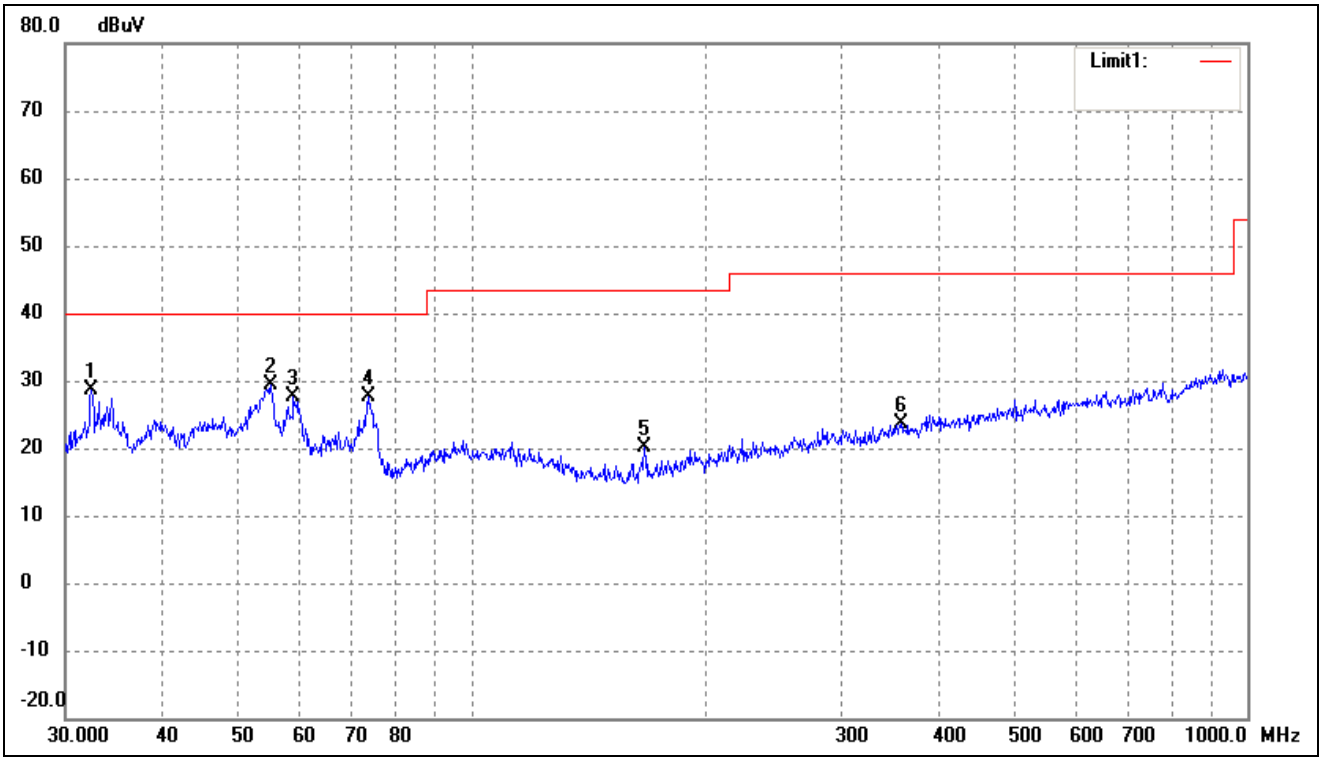
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	32.4059	43.77	-14.02	29.75	40.00	-10.25	-	-	peak
2	36.0007	42.94	-13.50	29.44	40.00	-10.56	-	-	peak
3	55.0274	41.76	-12.94	28.82	40.00	-11.18	-	-	peak
4	57.7962	41.66	-12.97	28.69	40.00	-11.31	-	-	peak
5	73.8756	40.30	-15.72	24.58	40.00	-15.42	-	-	peak
6	190.4050	33.70	-13.09	20.61	43.50	-22.89	-	-	peak

802.11a			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



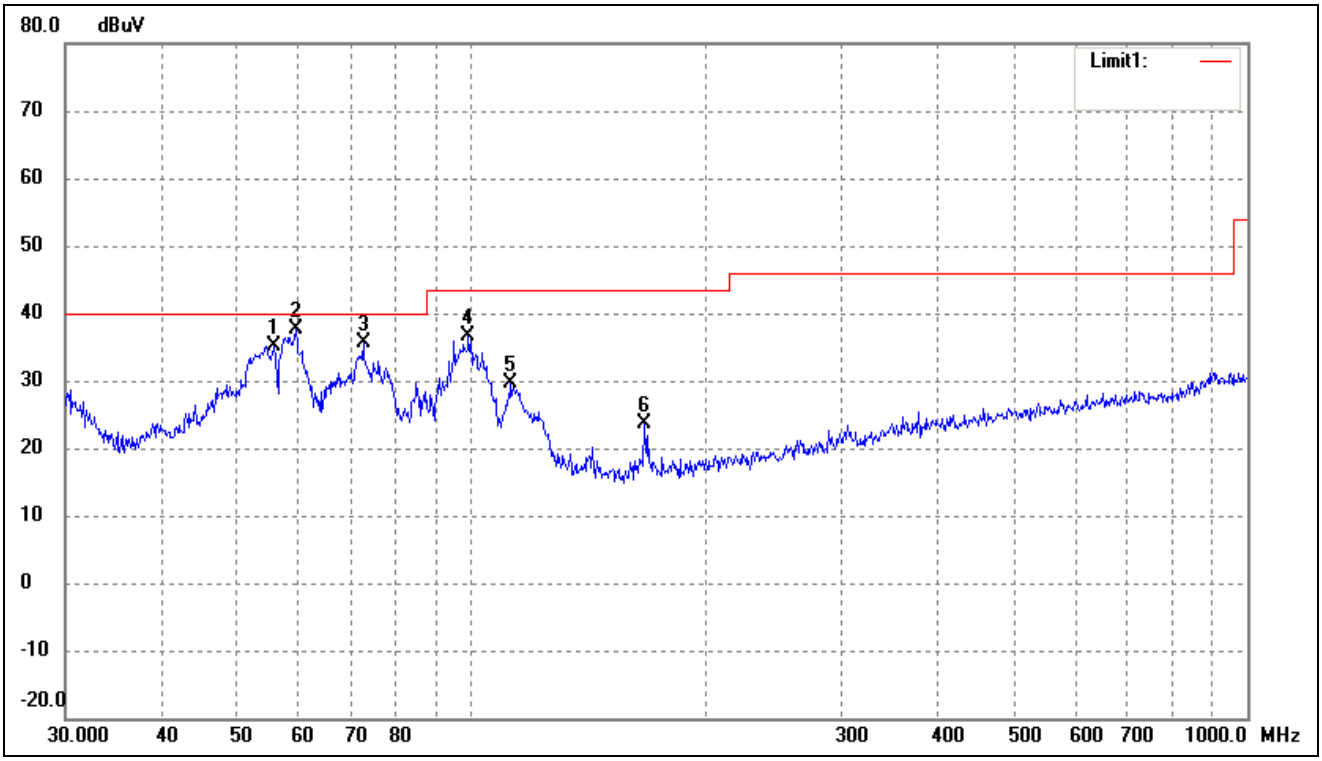
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	54.4516	46.90	-12.79	34.11	40.00	-5.89	-	-	peak
2	59.2325	50.39	-12.98	37.41	40.00	-2.59	-	-	peak
3	71.8320	51.90	-15.15	36.75	40.00	-3.25	-	-	peak
4	74.1351	52.19	-15.79	36.40	40.00	-3.60	-	-	peak
5	97.4560	50.21	-13.75	36.46	43.50	-7.04	-	-	peak
6	112.9196	42.04	-13.60	28.44	43.50	-15.06	-	-	peak

802.11n-HT20			
Test Channel	5745MHz(worst case)	Polarity:	Horizontal



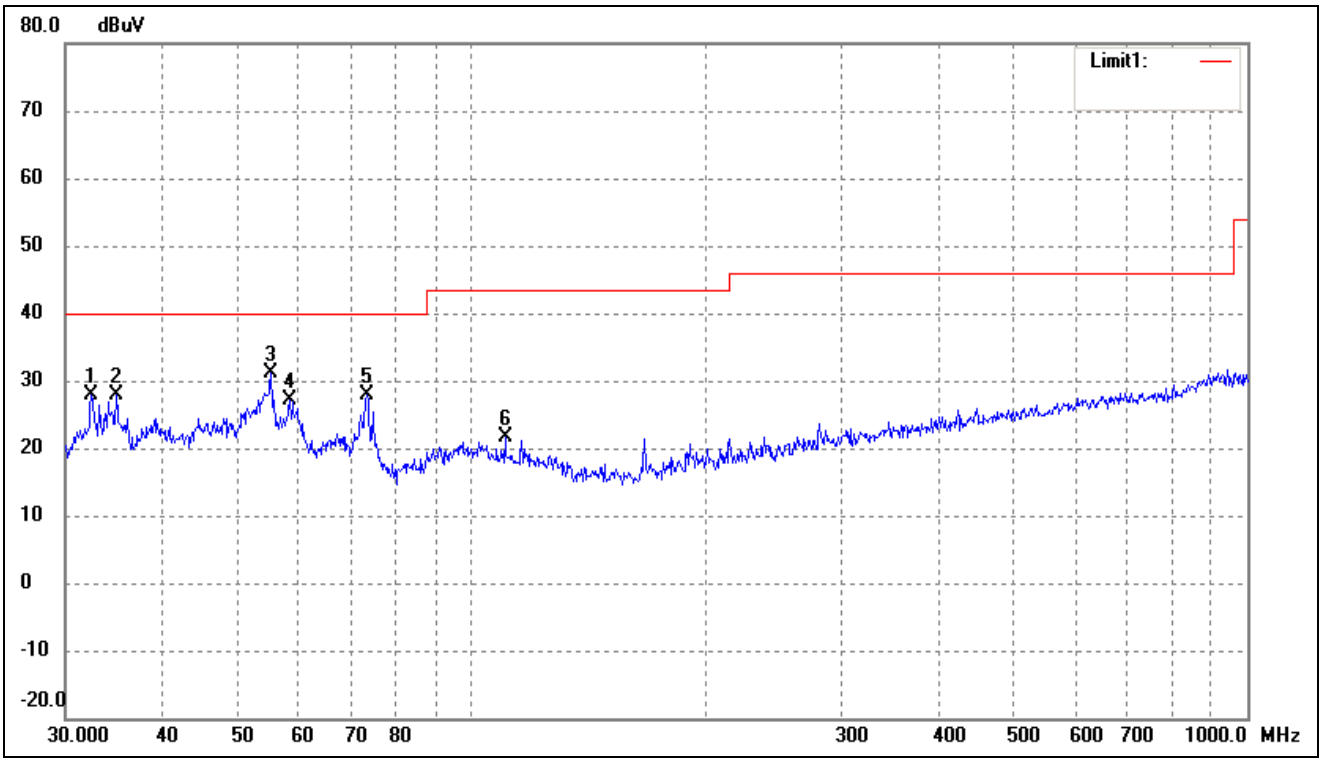
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	32.4059	42.66	-14.02	28.64	40.00	-11.36	-	-	peak
2	55.2207	42.21	-12.95	29.26	40.00	-10.74	-	-	peak
3	59.0251	40.66	-12.97	27.69	40.00	-12.31	-	-	peak
4	73.6170	43.20	-15.65	27.55	40.00	-12.45	-	-	peak
5	167.2368	35.39	-15.16	20.23	43.50	-23.27	-	-	peak
6	357.9287	31.10	-7.36	23.74	46.00	-22.26	-	-	peak

802.11n-HT20			
Test Channel	5745MHz(worst case)	Polarity:	Vertical



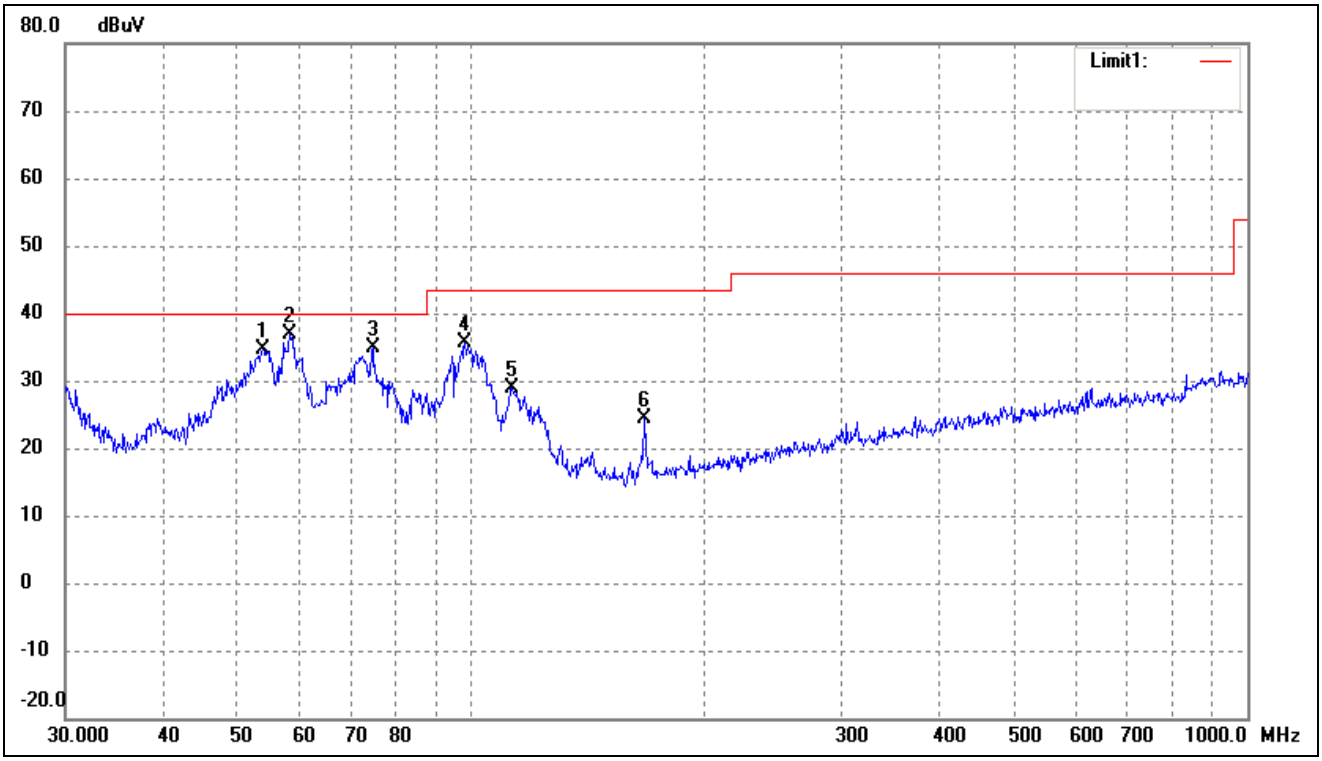
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	55.8047	48.11	-12.95	35.16	40.00	-4.84	-	-	peak
2	59.4405	50.51	-12.98	37.53	40.00	-2.47	-	-	peak
3	72.5917	51.10	-15.36	35.74	40.00	-4.26	-	-	peak
4	99.1797	50.08	-13.45	36.63	43.50	-6.87	-	-	peak
5	112.5244	43.24	-13.56	29.68	43.50	-13.82	-	-	peak
6	167.2368	38.71	-15.16	23.55	43.50	-19.95	-	-	peak

802.11n-HT40			
Test Channel	5755MHz(worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	32.4059	41.78	-14.02	27.76	40.00	-12.24	-	-	peak
2	34.8823	41.79	-13.87	27.92	40.00	-12.08	-	-	peak
3	55.2207	44.13	-12.95	31.18	40.00	-8.82	-	-	peak
4	58.4074	40.00	-12.98	27.02	40.00	-12.98	-	-	peak
5	73.3593	43.48	-15.57	27.91	40.00	-12.09	-	-	peak
6	110.5687	35.05	-13.36	21.69	43.50	-21.81	-	-	peak

802.11n-HT40			
Test Channel	5755MHz(worst case)	Polarity:	Vertical

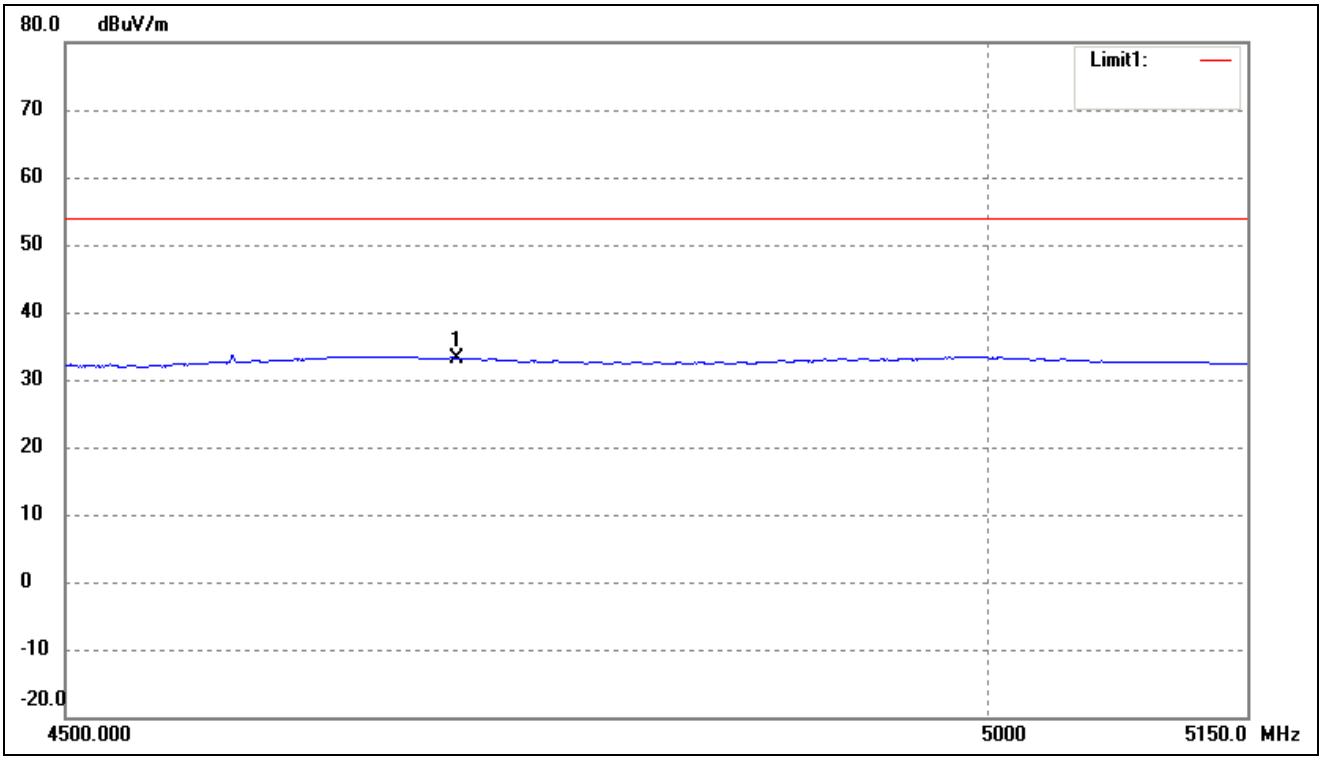


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	( )	(cm)	
1	53.8818	47.14	-12.63	34.51	40.00	-5.49	-	-	peak
2	58.4074	49.94	-12.98	36.96	40.00	-3.04	-	-	peak
3	74.6569	50.85	-15.94	34.91	40.00	-5.09	-	-	peak
4	98.1419	49.28	-13.62	35.66	43.50	-7.84	-	-	peak
5	112.9196	42.42	-13.60	28.82	43.50	-14.68	-	-	peak
6	167.2368	39.43	-15.16	24.27	43.50	-19.23	-	-	peak

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

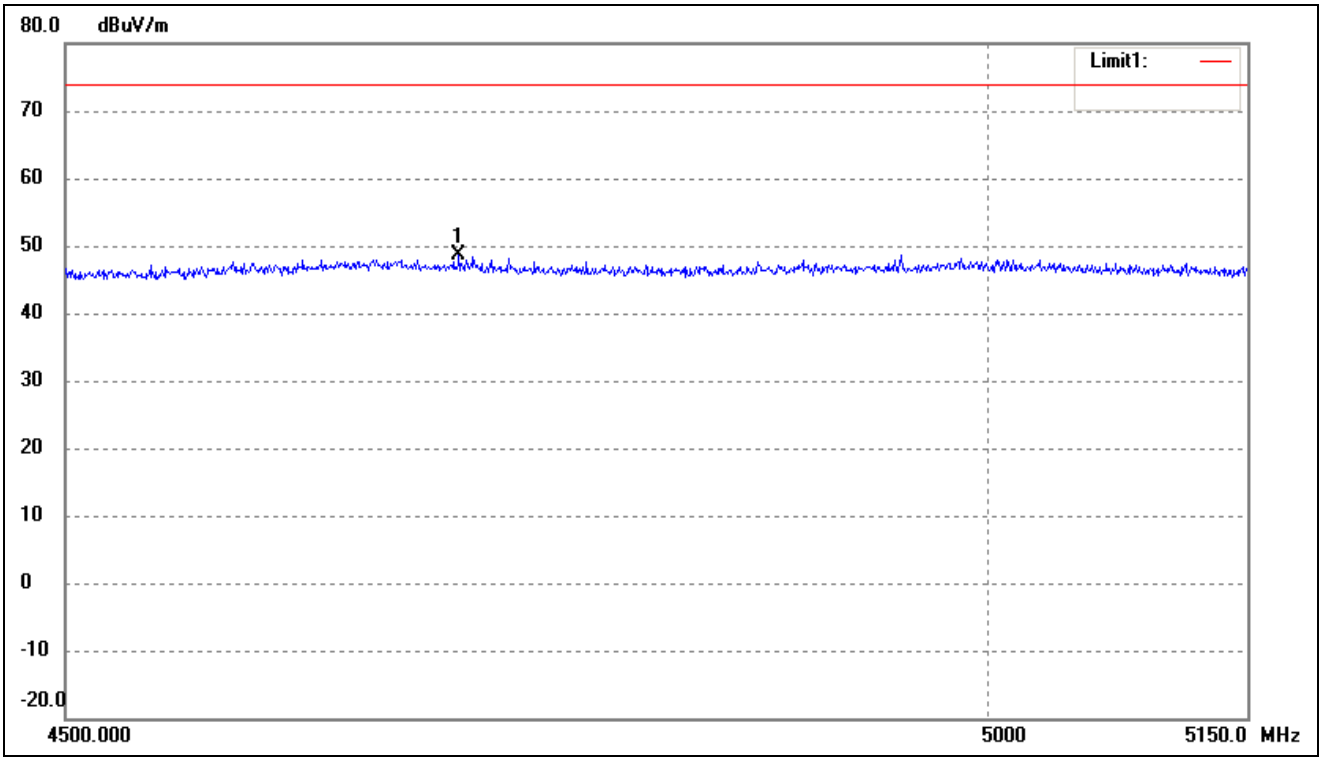
➢ Spurious Emission above 1GHz

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



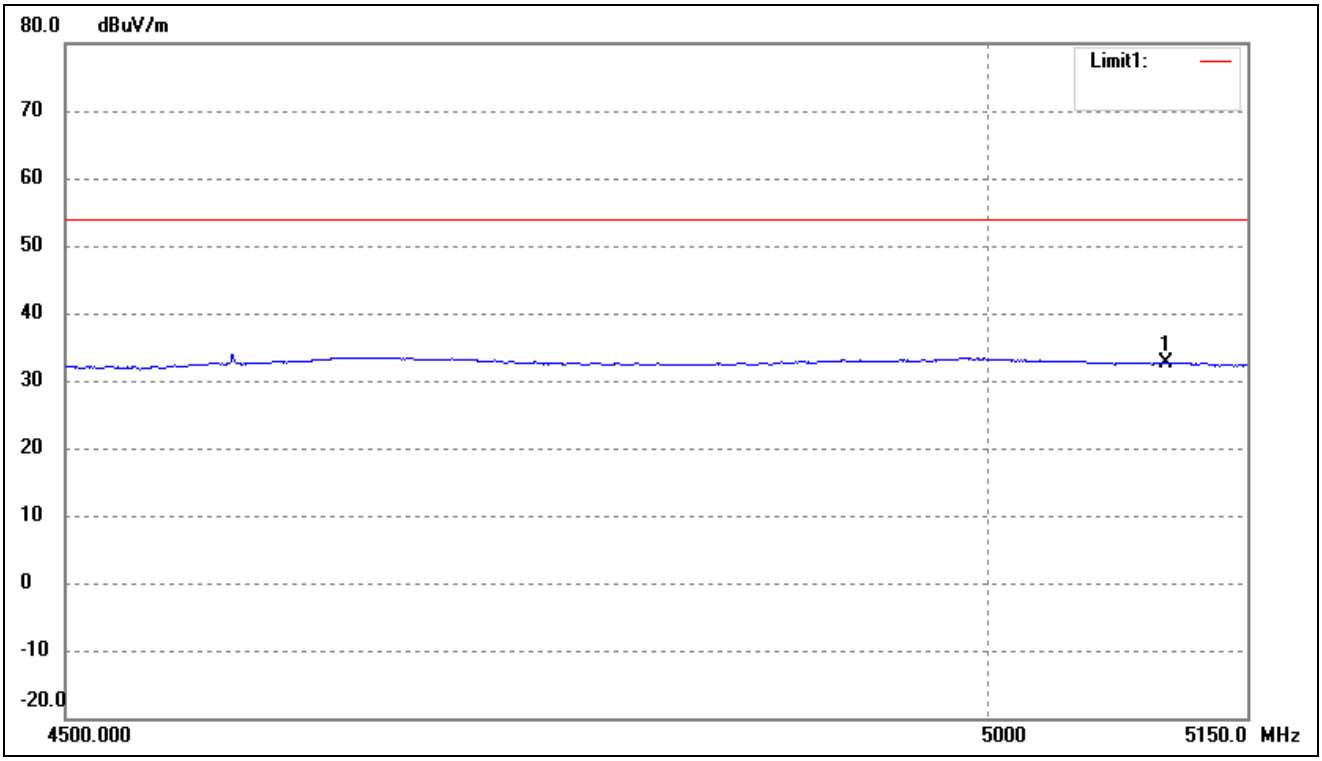
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4706.000	37.76	-4.58	33.18	54.00	-20.82	-	-	AVG

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



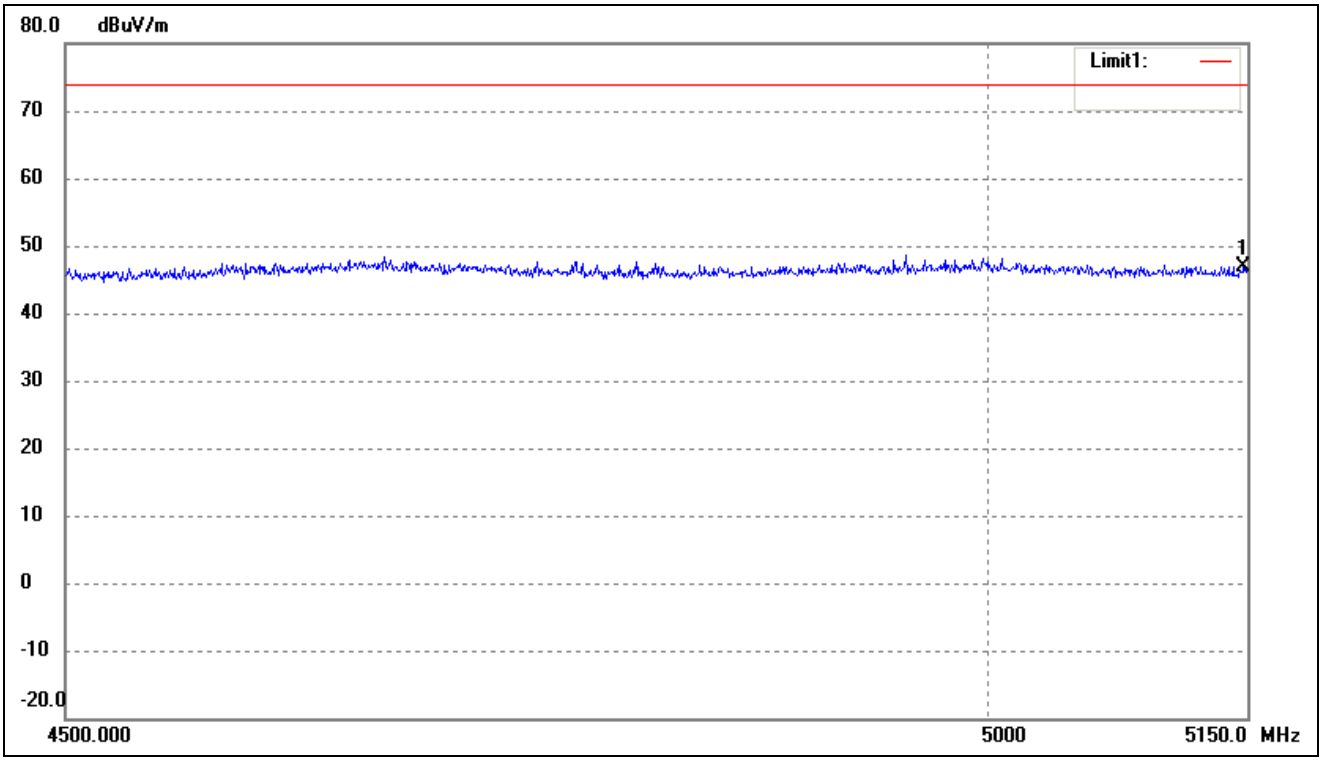
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4706.787	53.31	-4.58	48.73	74.00	-25.27	-	-	peak

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



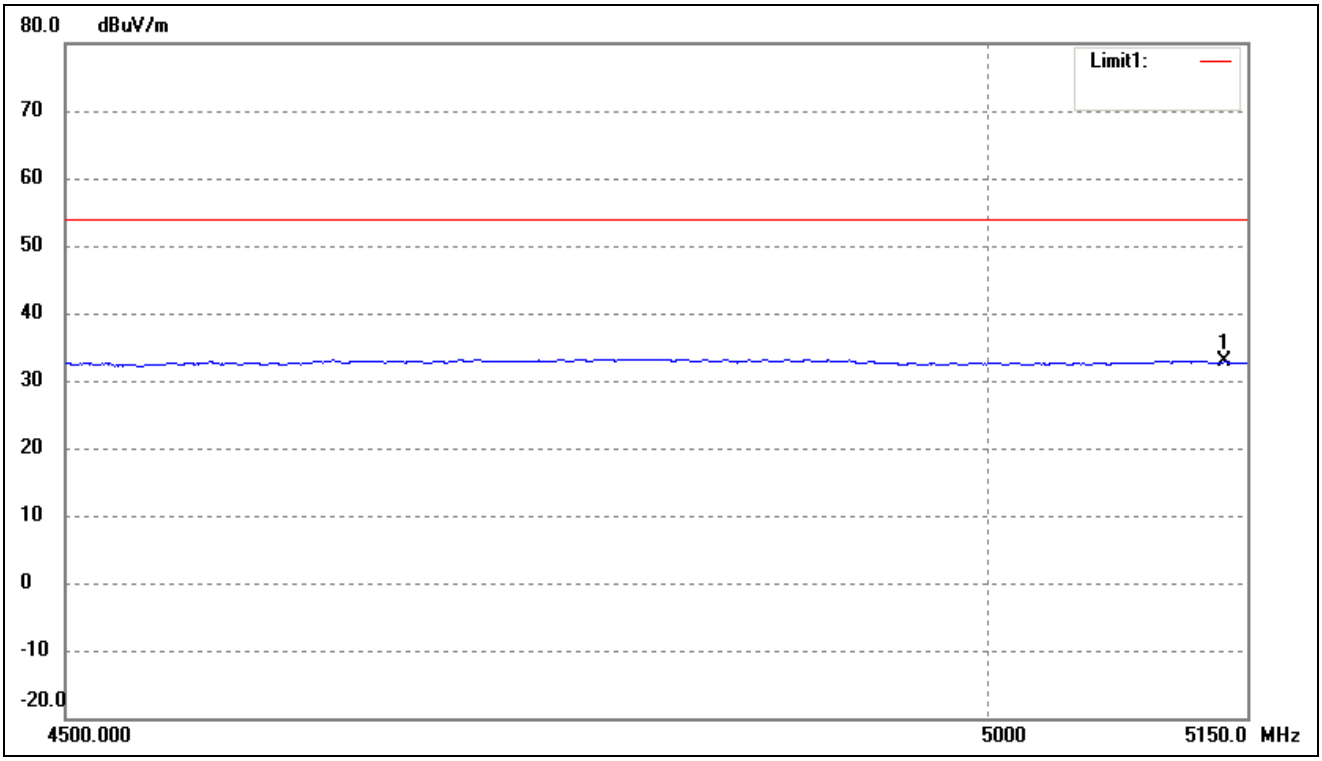
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5102.279	37.02	-4.34	32.68	54.00	-21.32	-	-	AVG

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



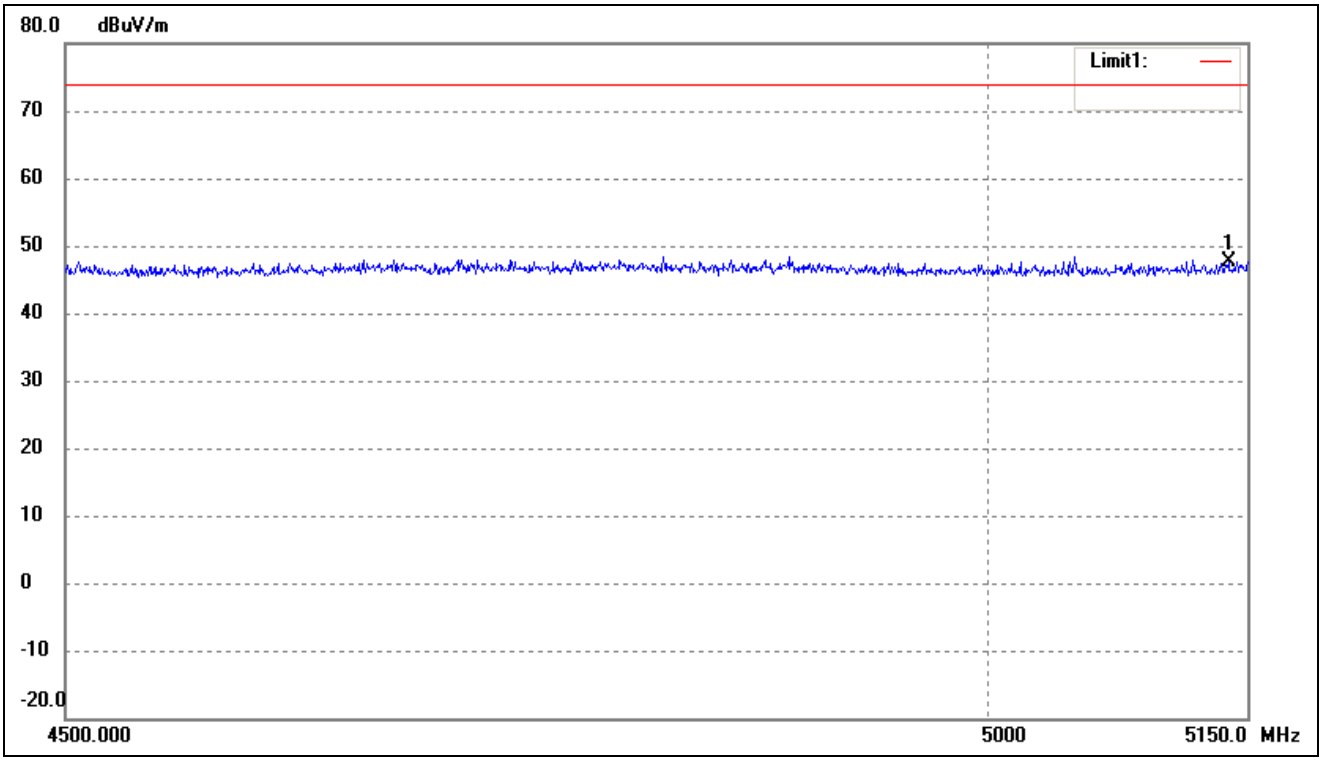
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5147.916	51.29	-4.32	46.97	74.00	-27.03	-	-	peak

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5136.815	37.10	-4.32	32.78	54.00	-21.22	-	-	AVG

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5138.895	51.88	-4.33	47.55	74.00	-26.45	-	-	peak

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

Remark: '-'Means' the test Degree and Height is not recorded by the test software and only show the worst case in the test report.

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11a)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5180MHz)							
10360	56.31	7.11	63.42	74	-10.58	H	PK
10360	37.42	7.11	44.53	54	-9.47	H	AV
10360	56.27	7.11	63.38	74	-10.62	V	PK
10360	39.48	7.11	46.59	54	-7.41	V	AV
High Channel (5240MHz)							
10480	58.14	7.10	65.24	74	-8.76	H	PK
10480	38.46	7.10	45.56	54	-8.44	H	AV
10480	56.62	7.10	63.72	74	-10.28	V	PK
10480	39.02	7.10	46.12	54	-7.88	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	57.56	9.02	66.58	74	-7.42	H	PK
11490	36.32	9.02	45.34	54	-8.66	H	AV
11490	56.14	9.02	65.16	74	-8.84	V	PK
11490	35.32	9.02	44.34	54	-9.66	V	AV
High Channel (5825MHz)							
11610	55.31	8.94	64.25	74	-9.75	H	PK
11610	34.15	8.94	43.09	54	-10.91	H	AV
11610	56.87	8.94	65.81	74	-8.19	V	PK
11610	35.62	8.94	44.56	54	-9.44	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-35.98	-27
Highest	Above 5350	-39.35	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-37.05	-27
	5715 to 5725	-29.53	-17
Highest	5850 to 5860	-28.13	-17
	Above 5860	-40.36	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11n HT20)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5180MHz)							
10360	57.56	7.11	64.67	74	-9.33	H	PK
10360	36.25	7.11	43.36	54	-10.64	H	AV
10360	55.17	7.11	62.28	74	-11.72	V	PK
10360	35.58	7.11	42.69	54	-11.31	V	AV
High Channel (5240MHz)							
10480	56.53	7.10	63.63	74	-10.37	H	PK
10480	34.02	7.10	41.12	54	-12.88	H	AV
10480	57.31	7.10	64.41	74	-9.59	V	PK
10480	35.79	7.10	42.89	54	-11.11	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5745MHz)							
11490	59.31	9.02	68.33	74	-5.67	H	PK
11490	35.52	9.02	44.54	54	-9.46	H	AV
11490	58.39	9.02	67.41	74	-6.59	V	PK
11490	37.01	9.02	46.03	54	-7.97	V	AV
High Channel (5825MHz)							
11610	58.15	8.94	67.09	74	-6.91	H	PK
11610	36.01	8.94	44.95	54	-9.05	H	AV
11610	57.46	8.94	66.4	74	-7.6	V	PK
11610	35.01	8.94	43.95	54	-10.05	V	AV

- Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-38.36	-27
Highest	Above 5350	-39.01	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-41.25	-27
	5715 to 5725	-32.52	-17
Highest	5850 to 5860	-29.47	-17
	Above 5860	-42.31	-27
Note: the data just list the worst cases			

Note: this EUT was tested in the low, high channel and the worst case position data was reported.

- For the frequency band 5.15-5.25GHz, 5.725-5.850GHz (802.11n HT40)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5190MHz)							
10380	55.15	7.11	62.26	74	-11.74	H	PK
10380	36.54	7.11	43.65	54	-10.35	H	AV
10380	57.01	7.11	64.12	74	-9.88	V	PK
10380	37.69	7.11	44.8	54	-9.20	V	AV
High Channel (5230MHz)							
10460	58.56	7.1	65.66	74	-8.34	H	PK
10460	35.35	7.1	42.45	54	-11.55	H	AV
10460	57.13	7.1	64.23	74	-9.77	V	PK
10460	34.08	7.1	41.18	54	-12.82	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5755MHz)							
11510	56.89	9.04	65.93	74	-8.07	H	PK
11510	36.74	9.04	45.78	54	-8.22	H	AV
11510	58.63	9.04	67.67	74	-6.33	V	PK
11510	36.42	9.04	45.46	54	-8.54	V	AV
High Channel (5795MHz)							
11590	59.35	8.96	68.31	74	-5.69	H	PK
11590	37.13	8.96	46.09	54	-7.91	H	AV
11590	58.61	8.96	67.57	74	-6.43	V	PK
11590	36.34	8.96	45.3	54	-8.70	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.27	-27
Highest	Above 5350	-38.93	-27
Note: the data just list the worst cases			

- Out of Band edge for 5725-5850MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5715	-37.42	-27
	5715 to 5725	-28.35	-17
Highest	5850 to 5860	-30.11	-17
	Above 5860	-39.36	-27
Note: the data just list the worst cases			

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

11. Frequency Stability

11.1 Standard Applicable

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

11.2 Test Procedure

According to §2.1055, the following test procedure was performed.
The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.
The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

11.3 Summary of Test Results/Plots

U-NII-1:5150-5250MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	120	-30	105	0.0202
100%		-20	111	0.0213
100%		-10	107	0.0206
100%		0	113	0.0217
100%		+10	102	0.0196
100%		+20	115	0.0221
100%		+30	108	0.0208
100%		+40	118	0.0227
100%		+50	115	0.0221
Low Battery power	100	+20	108	0.0208
High Battery power	240	+20	101	0.0194

U-NII-3: 5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	120	-30	105	0.0182
100%		-20	116	0.0201
100%		-10	117	0.0202
100%		0	112	0.0194
100%		+10	118	0.0204
100%		+20	108	0.0187
100%		+30	109	0.0188
100%		+40	101	0.0175
100%		+50	105	0.0182
Low Battery power	100	+20	106	0.0183
High Battery power	240	+20	108	0.0187

******* END OF REPORT *******