TEST REPORT

Reference No.	:	WTH22X01000806W-1
FCC ID	:	2A5Z3-LST-S02W-W02
Applicant	:	Xi'an SuperHii Network Technology Co.,Ltd
Address	:	A11804,Xi'an National Digital Publishing Base,NO.996,TianGu 7th Road, High-tech Zone,Xi'an,Shaanxi Province,China
Manufacturer	:	The same as Applicant
Address	:	The same as Applicant
Product Name	:	Smart Shopping Cart
Model No.	:	Trolley-S600-XXX
Standards	:	FCC Part 15.407
Date of Receipt sample	:	2022-01-04
Date of Test	:	2022-01-04 to 2022-03-05
Date of Issue	:	2022-03-05
Test Report Form No.	:	WTX_Part 15_407W
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 approver.

Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

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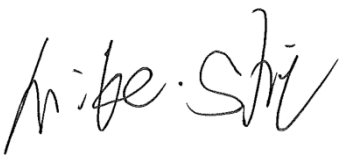
Tested by:



Mike Shi

Approved by:

Silin Chen

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Report version

Version No.	Date of issue	Description
Rev.00	2022-03-05	Original
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Smart Shopping Cart
Trade Name:	/
Model No.:	Trolley-S600-XXX
Adding Model(s):	/
Rated Voltage:	Charging Port:DC36V Battery:DC11.1V
Battery Capacity:	83Wh
Power Adapter:	/
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, 802.11ac-VHT80
Frequency Range:	5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz
RF Output Power:	16.38dBm (Conducted)
Type of Modulation:	BPSK, QPSK,16QAM,64QAM, 256QAM
Quantity of Channels:	15
Type of Antenna:	FPC Antenna
Antenna Gain:	3dBi
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

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

Enter “3646631+=” into the calculator to enter the engineer mode, 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	13	13	13	13	13	13	13	13	13	/	16	16	16
802.11n-HT20 MCS0	12	12	12	12	12	12	12	12	12	/	15	15	15

Mode	NCB: 40MHz									
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795
802.11n-HT40 MCS0	12	12	12	12	12	12	12	/	15	15

Mode	NCB: 80MHz					
	5210	5290	5530	5610	5690	5775
802.11ac-VH80 MCS0/Nss2	12	12	12	12	/	15

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,5260MHz,5280MHz,5320MHz,5500MHz, 5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz,5260MHz,5280MHz,5320MHz,5500MHz, 5600MHz,5700MHz,5745MHz, 5785MHz,5825MHz
TM3	802.11n-HT40	5190MHz,5230MHz,5270MHz,5310MHz,5510MHz,5590MHz,5670MHz, 5755MHz,5795MHz
TM4	802.11ac-VH80	5210MHz,5290MHz,5530MHz,5610MHz,5775MHz
Note: 802.11ac-VHT20, 802.11ac-VHT40 covered by 802.11n-HT20 an802.11n-HT40.		

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / 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
Adapter	/	SPF-3604	/

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-1075	Communication Tester	Rohde & Schwarz	CMW500	148650	2021-03-27	2022-03-26
SEMT-1063	GSM Tester	Rohde & Schwarz	CMU200	114403	2021-03-27	2022-03-26
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2021-03-27	2022-03-26
SEMT-1079	Spectrum Analyzer	Agilent	N9020A	US47140102	2021-03-27	2022-03-26
SEMT-1080	Signal Generator	Agilent	83752A	3610A01453	2021-03-27	2022-03-26
SEMT-1081	Vector Signal Generator	Agilent	N5182A	MY47070202	2021-03-27	2022-03-26
SEMT-1028	Power Divider	Weinschel	1506A	PM204	2021-03-27	2022-03-26
SEMT-1082	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2021-03-27	2022-03-26
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	/	/
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	/	/
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	/	/
SEMT-C004	Cable	Zheng DI	2M0RFC	/	/	/
SEMT-C005	Cable	Zheng DI	1M0RFC	/	/	/
SEMT-C006	Cable	Zheng DI	1M0RFC	/	/	/
☒Chamber A: Below 1GHz						
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2021-03-27	2022-03-26
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2021-03-27	2022-03-26
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2021-04-12	2022-04-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-19	2023-03-18
SEMT-1068	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-19	2023-03-18
☒Chamber A: Above 1GHz						
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2021-03-27	2022-03-26
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2021-03-27	2022-03-26
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2021-04-12	2022-04-11
SEMT-1042	Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA91705	2021-04-27	2023-04-26

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SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2021-04-27	2022-04-26
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2021-03-27	2022-03-26
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2021-03-27	2022-03-26
☐Chamber B:Below 1GHz						
SEMT-1068	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2023-04-08
SEMT-1067	Amplifier	Agilent	8447D	2944A10179	2021-04-12	2022-04-11
SEMT-1066	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2021-05-06	2022-05-05
☐Chamber C:Below 1GHz						
SEMT-1319	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2021-12-03	2022-12-02
SEMT-1343	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2023-05-27
SEMT-1333	Amplifier	HP	8447F	2944A03869	2021-04-15	2022-04-14
☒Conducted Room 1#						
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2021-04-12	2022-04-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2021-04-15	2022-04-14
SEMT-1003	AC LISN	Schwarz beck	NSLK8126	8126-224	2021-04-12	2022-04-11
☐Conducted Room 2#						
SEMT-1334	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2021-04-12	2022-04-11
SEMT-1336	LISN	Rohde & Schwarz	ENV 216	100097	2021-04-12	2022-04-11

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. Antenna Requirement

3.1 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.

3.2 Evaluation Information

This product has an FPC antenna, fulfill the requirement of this section.

4. Automatically Discontinue Transmission

4.1 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.

4.2 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.

5. Power Spectral Density

5.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11 dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, 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 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi 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.

5.2 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 5.15-5.25GHz, 5.25-5.35GHz, and 5.47-5.725GHz, 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 5.725-5.85GHz, the rules specify a measurement bandwidth of 500kHz. Many spectrum analyzers do not have 500kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1MHz, or 500kHz). If

measurements are performed using a reduced resolution bandwidth (< 1MHz, or < 500kHz) 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 500kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500kHz) 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 (< 1MHz) 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 100kHz for the sections 5.c) and 5.d) above, since RBW=100kHZ is available on nearly all spectrum analyzers.

5.3 Summary of Test Results/Plots

Please refer to Appendix A

6. Emission Bandwidth and Occupied Bandwidth

6.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, 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 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi 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 5.725-5.85GHz band, the minimum 6dB bandwidth of U-NII devices shall be at least 500kHz.

6.2 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 26dB 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 5.725-5.85GHz
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
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 6dB 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.

6.3 Summary of Test Results/Plots

Please refer to Appendix B

7. Maximum Conducted Output Power

7.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.
(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm 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 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi.

(3) For the band 5.725-5.85GHz, 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 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi 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 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 = 1MHz.

(iii) Set VBW ≥ 3MHz.

(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 1MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

7.3 Summary of Test Results/Plots

Please refer to Appendix C

8. Radiated Spurious Emissions

8.1 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 5.15-5.25GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(2) For transmitters operating in the 5.25-5.35GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

(3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725GHz band shall not exceed an e.i.r.p. of −27dBm/MHz.

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

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

According to §15.407(b)(6), Unwanted emissions below 1GHz 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.

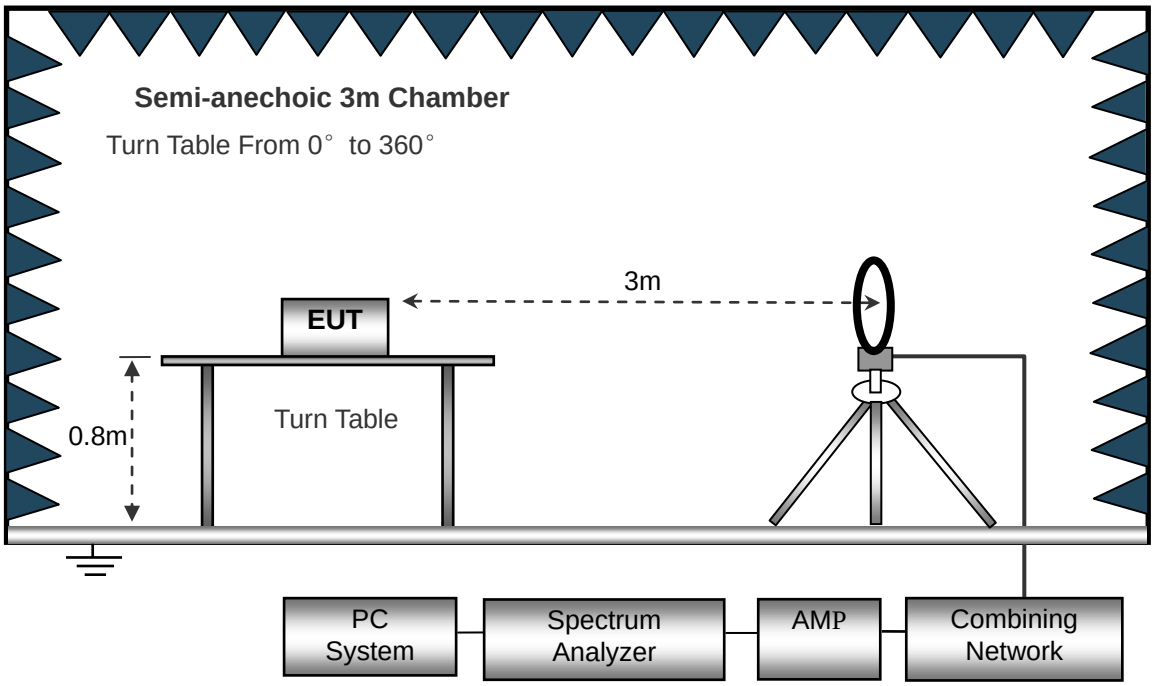
8.2 Test Procedure

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..

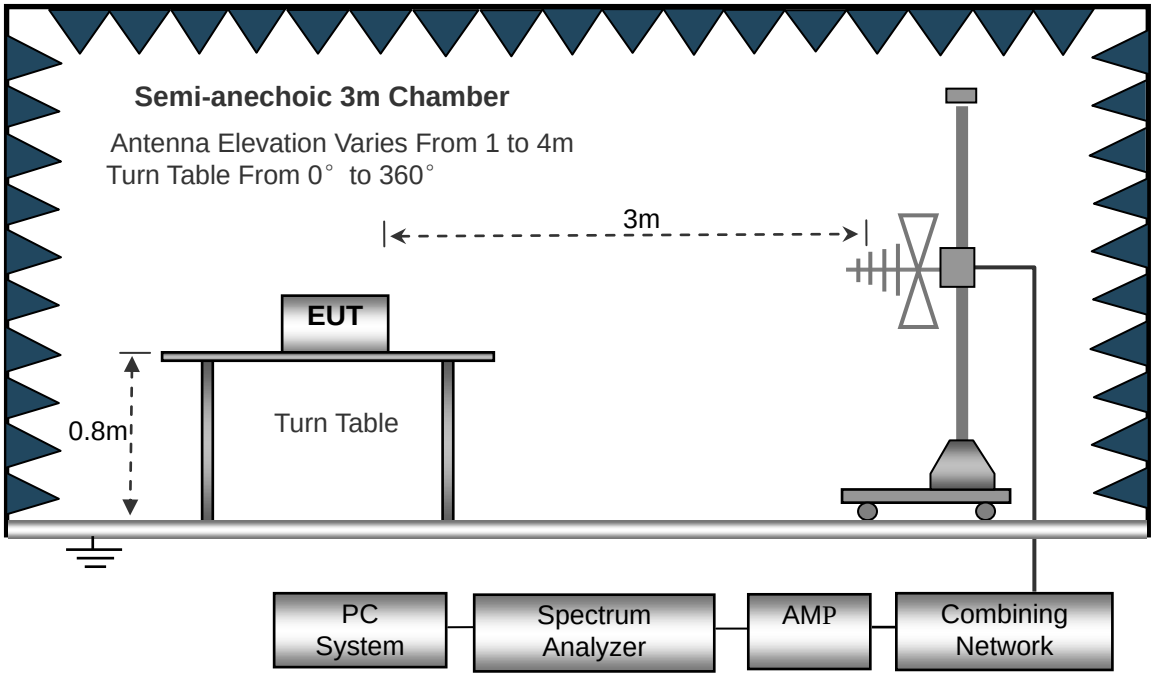
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

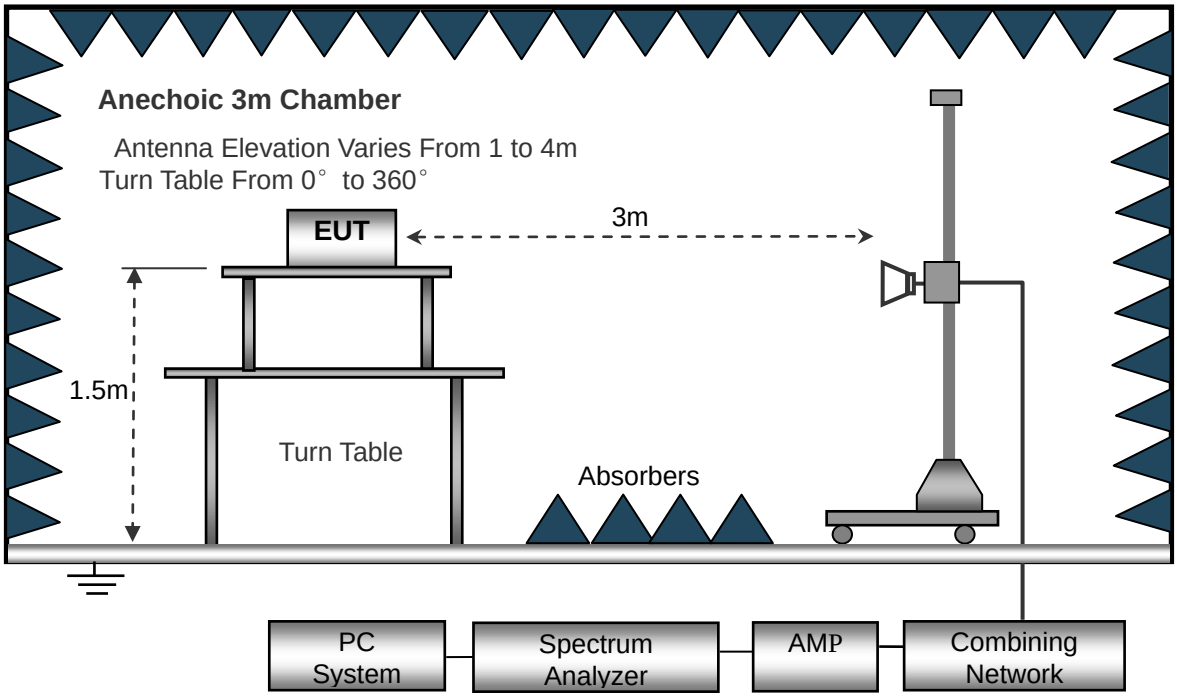
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1GHz.



8.3 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

8.4 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:

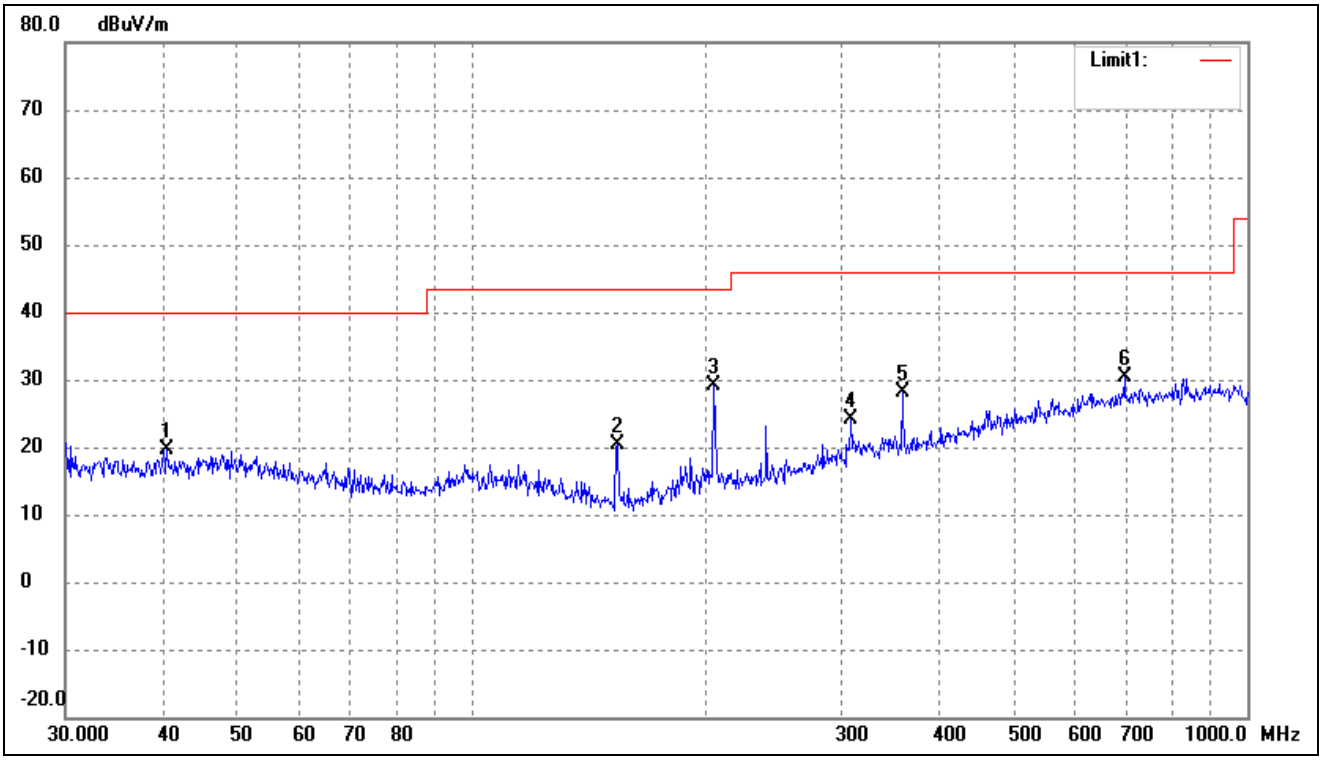
Margin = Corr. Ampl. – FCC Part 15 Limit

8.5 Summary of Test Results/Plots

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

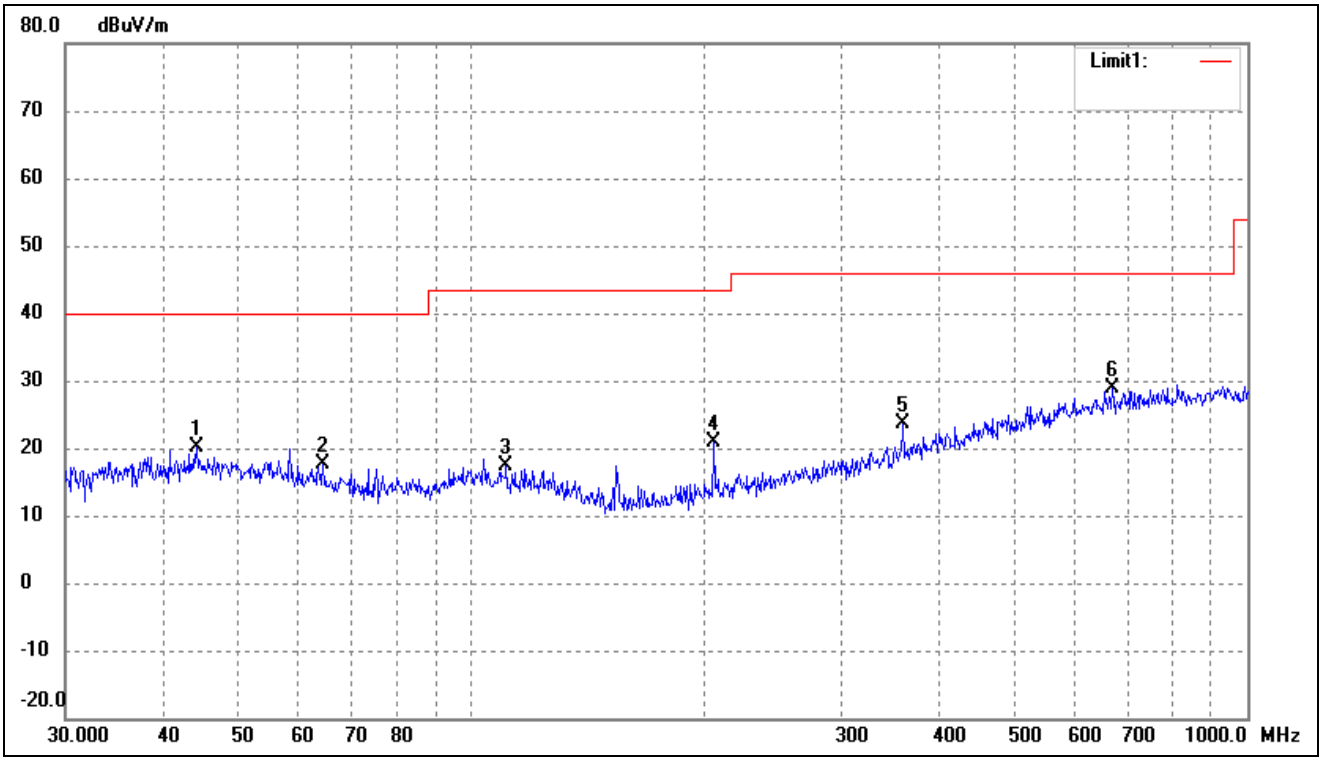
- Spurious Emission From 30MHz to 1GHz
- 5150-5250MHz

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.5591	26.63	-7.00	19.63	40.00	-20.37	-	-	peak
2	154.2786	32.83	-12.42	20.41	43.50	-23.09	-	-	peak
3	204.9551	38.66	-9.56	29.10	43.50	-14.40	-	-	peak
4	308.9126	30.90	-6.68	24.22	46.00	-21.78	-	-	peak
5	359.1860	33.28	-5.12	28.16	46.00	-17.84	-	-	peak
6	694.4174	29.11	1.37	30.48	46.00	-15.52	-	-	peak

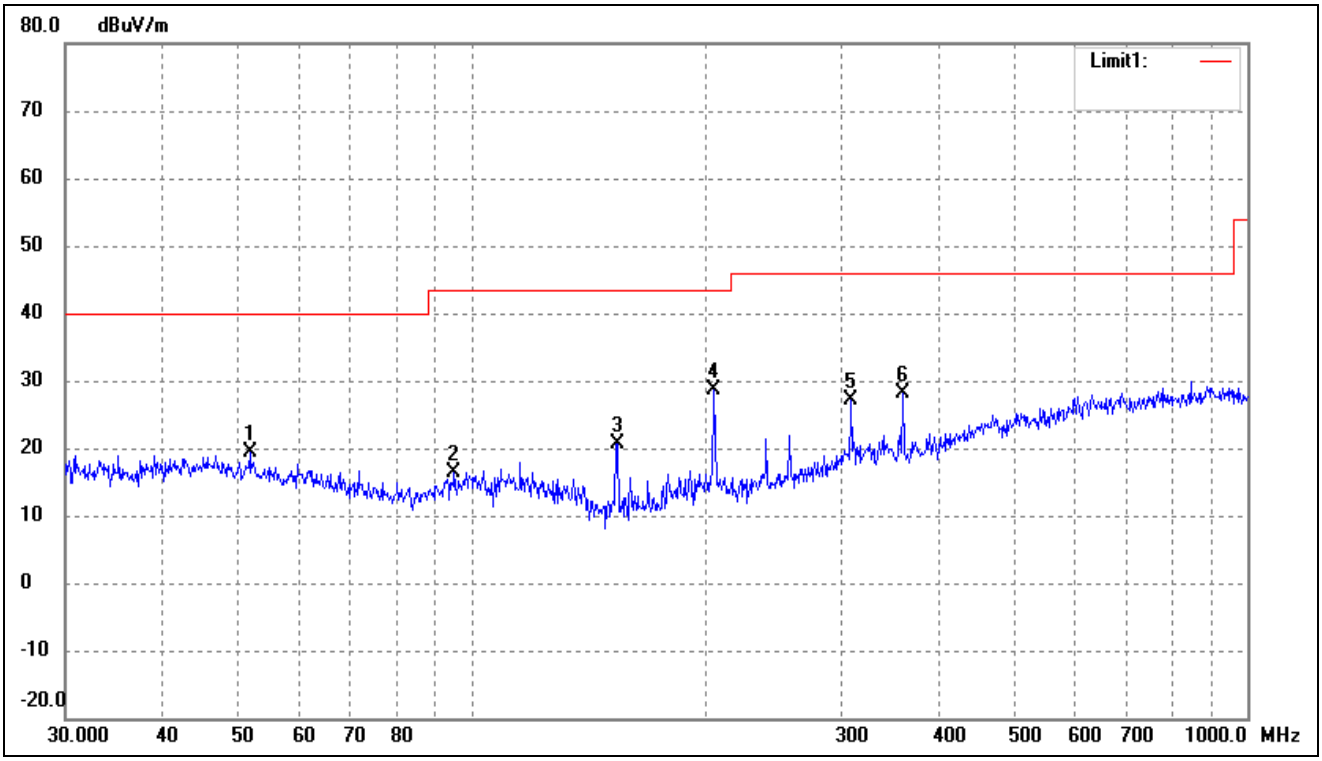
802.11a(Worst case)			
Test Channel	5180MHz(Worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	44.2752	27.00	-6.98	20.02	40.00	-19.98	-	-	peak
2	64.4331	26.88	-9.20	17.68	40.00	-22.32	-	-	peak
3	110.9571	26.25	-8.94	17.31	43.50	-26.19	-	-	peak
4	205.6751	30.51	-9.54	20.97	43.50	-22.53	-	-	peak
5	360.4477	28.76	-5.09	23.67	46.00	-22.33	-	-	peak
6	670.4893	27.68	1.14	28.82	46.00	-17.18	-	-	peak

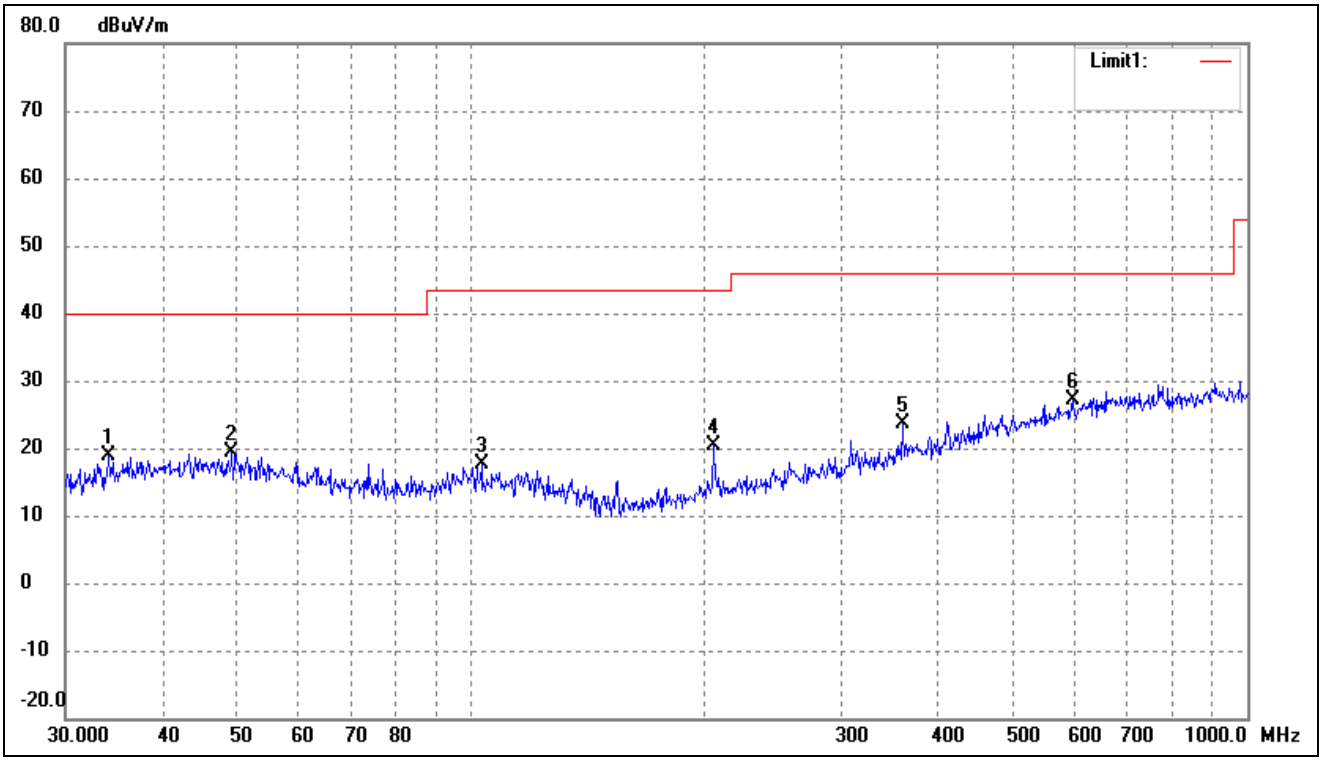
➢ 5250-5350MHz

802.11a(Worst case)			
Test Channel	5260MHz(Worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	51.8430	26.52	-7.23	19.29	40.00	-20.71	-	-	peak
2	95.0930	25.96	-9.64	16.32	43.50	-27.18	-	-	peak
3	154.2786	33.14	-12.42	20.72	43.50	-22.78	-	-	peak
4	205.6751	38.26	-9.54	28.72	43.50	-14.78	-	-	peak
5	308.9126	33.73	-6.68	27.05	46.00	-18.95	-	-	peak
6	360.4477	33.31	-5.09	28.22	46.00	-17.78	-	-	peak

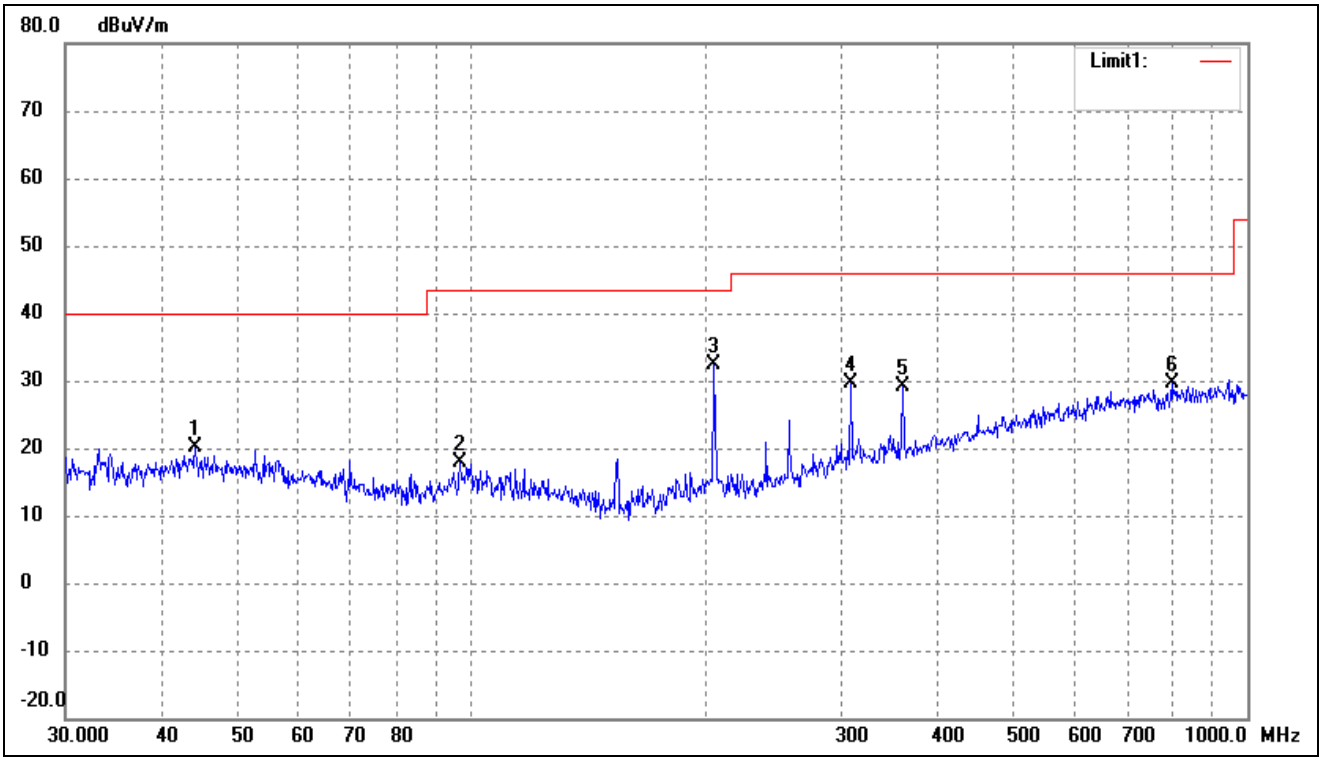
802.11a(Worst case)			
Test Channel	5260MHz(worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	34.1561	27.20	-8.44	18.76	40.00	-21.24	-	-	peak
2	49.1866	26.27	-6.97	19.30	40.00	-20.70	-	-	peak
3	103.0800	26.38	-8.77	17.61	43.50	-25.89	-	-	peak
4	204.9551	30.02	-9.56	20.46	43.50	-23.04	-	-	peak
5	359.1860	28.83	-5.12	23.71	46.00	-22.29	-	-	peak
6	595.1329	26.78	0.29	27.07	46.00	-18.93	-	-	peak

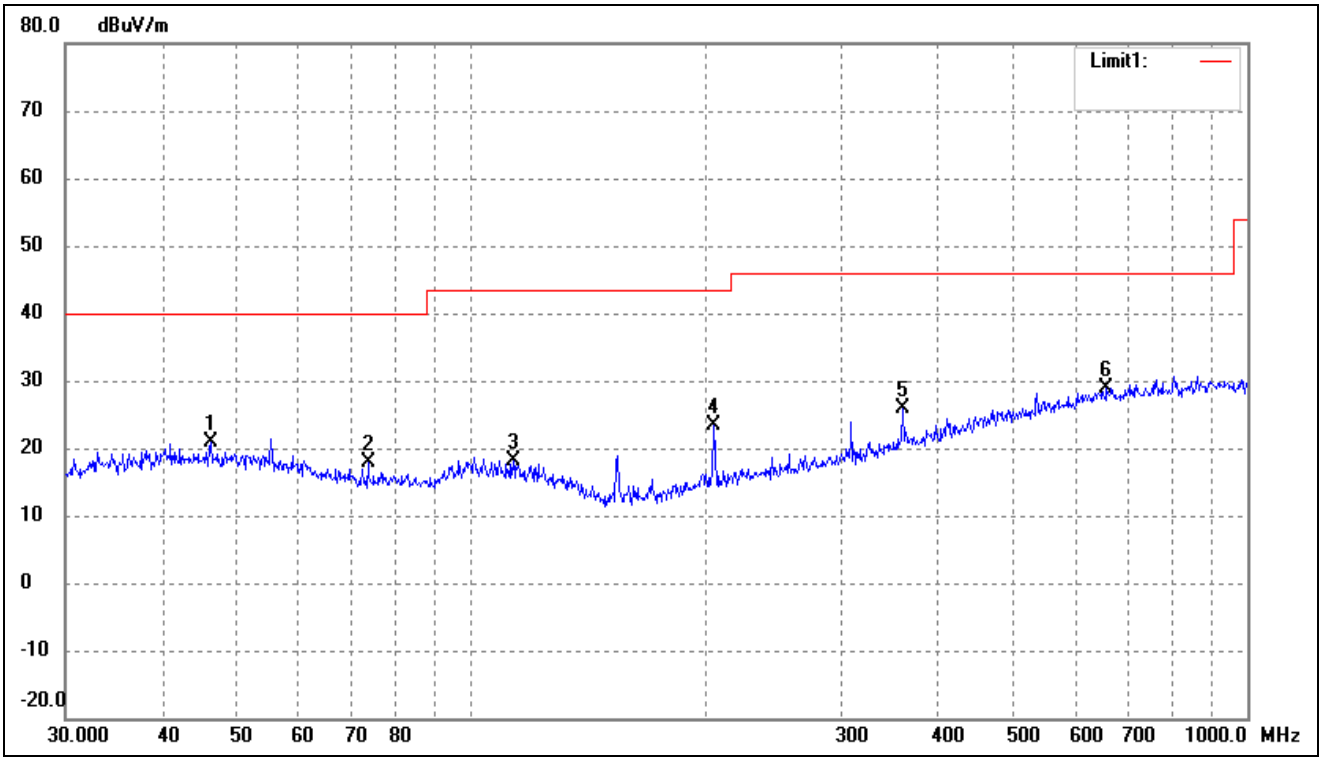
➢ 5470-5725MHz

802.11a(worst case)			
Test Channel	5500MHz(worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	44.1202	27.02	-6.98	20.04	40.00	-19.96	-	-	peak
2	96.7749	27.29	-9.33	17.96	43.50	-25.54	-	-	peak
3	205.6751	41.94	-9.54	32.40	43.50	-11.10	-	-	peak
4	308.9126	36.24	-6.68	29.56	46.00	-16.44	-	-	peak
5	359.1860	34.25	-5.12	29.13	46.00	-16.87	-	-	peak
6	798.9797	27.45	2.09	29.54	46.00	-16.46	-	-	peak

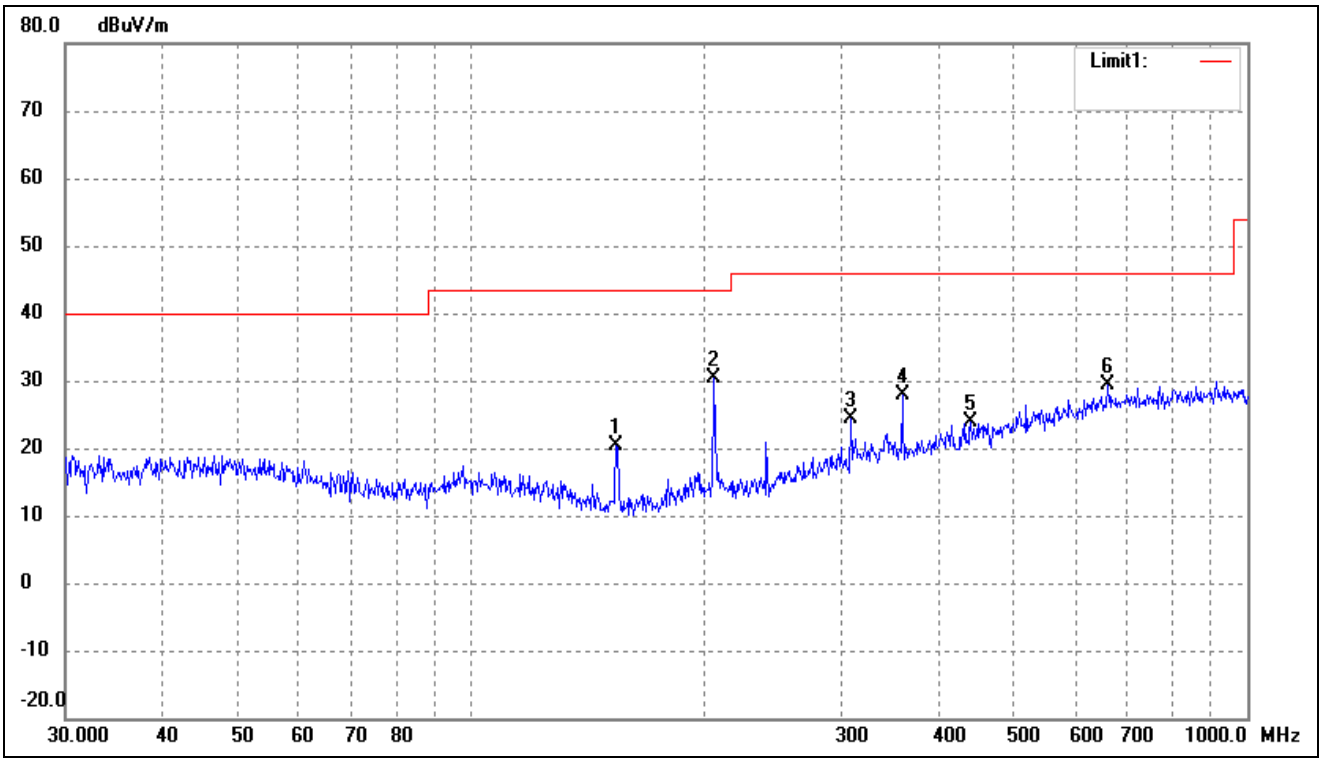
802.11a(worst case)			
Test Channel	5500MHz(worst case)	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	46.1780	27.89	-6.98	20.91	40.00	-19.09	-	-	peak
2	73.6170	28.30	-10.38	17.92	40.00	-22.08	-	-	peak
3	113.3163	27.29	-9.11	18.18	43.50	-25.32	-	-	peak
4	205.6751	33.03	-9.54	23.49	43.50	-20.01	-	-	peak
5	359.1860	30.98	-5.12	25.86	46.00	-20.14	-	-	peak
6	658.8362	27.77	1.01	28.78	46.00	-17.22	-	-	peak

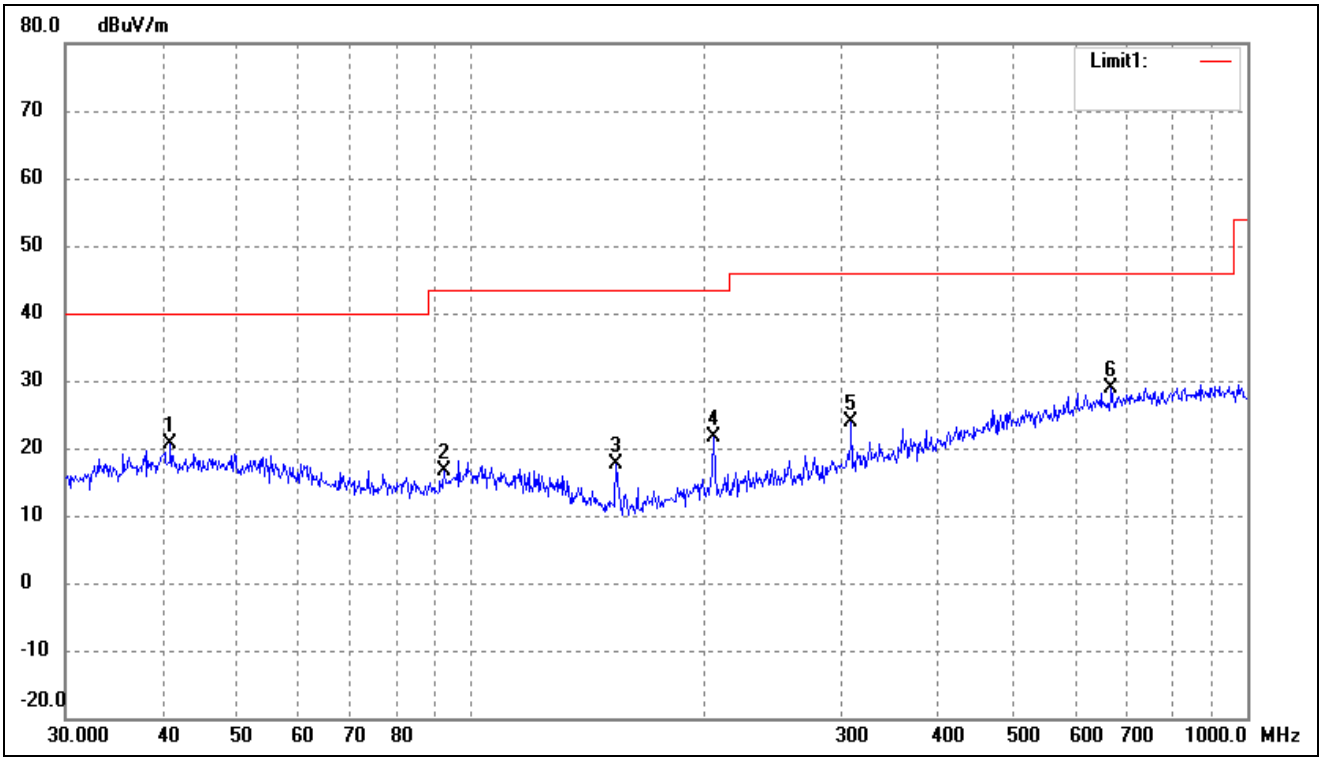
➢ 5725-5850MHz

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	153.7385	32.82	-12.44	20.38	43.50	-23.12	-	-	peak
2	205.6751	39.88	-9.54	30.34	43.50	-13.16	-	-	peak
3	308.9126	30.95	-6.68	24.27	46.00	-21.73	-	-	peak
4	359.1860	33.04	-5.12	27.92	46.00	-18.08	-	-	peak
5	440.1963	26.79	-2.82	23.97	46.00	-22.03	-	-	peak
6	661.1505	28.35	1.04	29.39	46.00	-16.61	-	-	peak

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

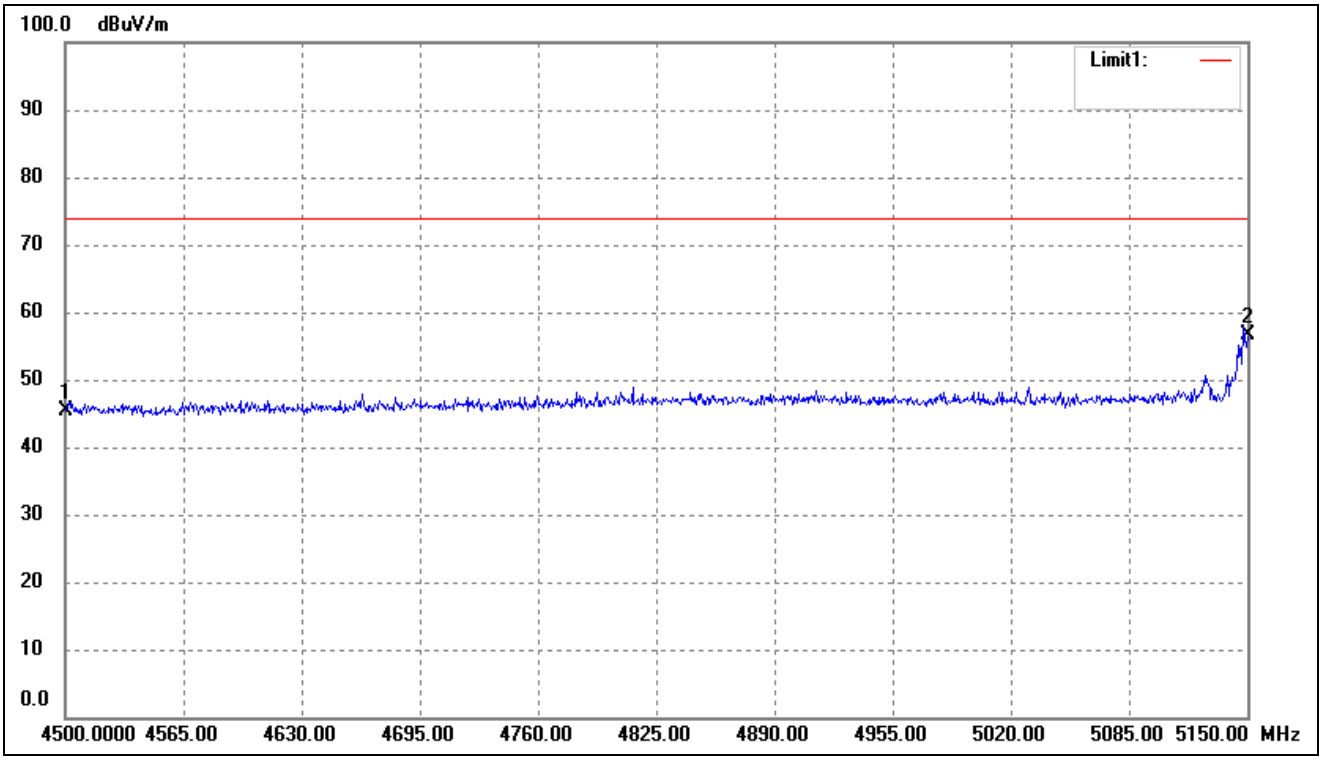


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.9881	27.56	-7.00	20.56	40.00	-19.44	-	-	peak
2	92.1388	26.83	-10.18	16.65	43.50	-26.85	-	-	peak
3	153.7385	30.07	-12.44	17.63	43.50	-25.87	-	-	peak
4	205.6751	31.15	-9.54	21.61	43.50	-21.89	-	-	peak
5	308.9126	30.50	-6.68	23.82	46.00	-22.18	-	-	peak
6	668.1423	27.66	1.11	28.77	46.00	-17.23	-	-	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.

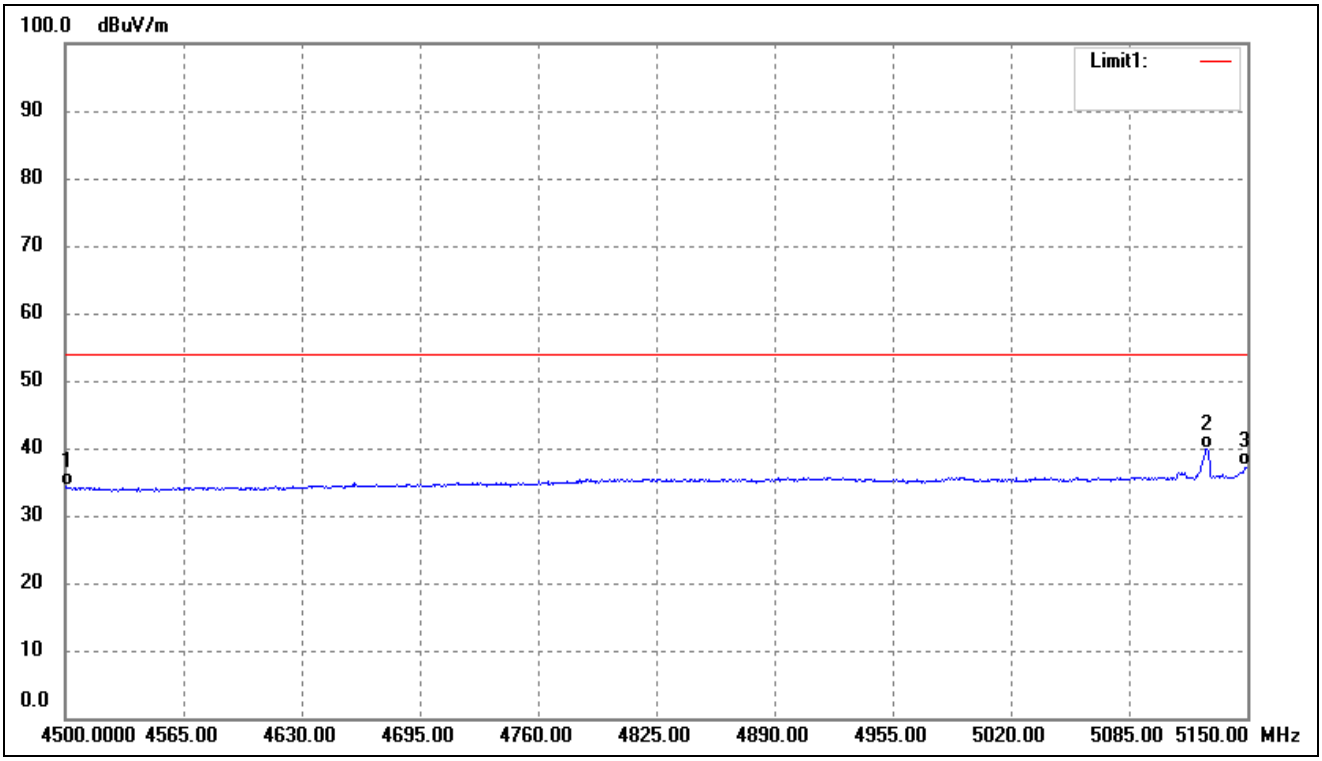
➢ Spurious Emission above 1GHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.50-5.15GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	52.32	-6.92	45.40	74.00	-28.60	-	-	peak
2	5150.000	61.93	-5.33	56.60	74.00	-17.40	-	-	peak

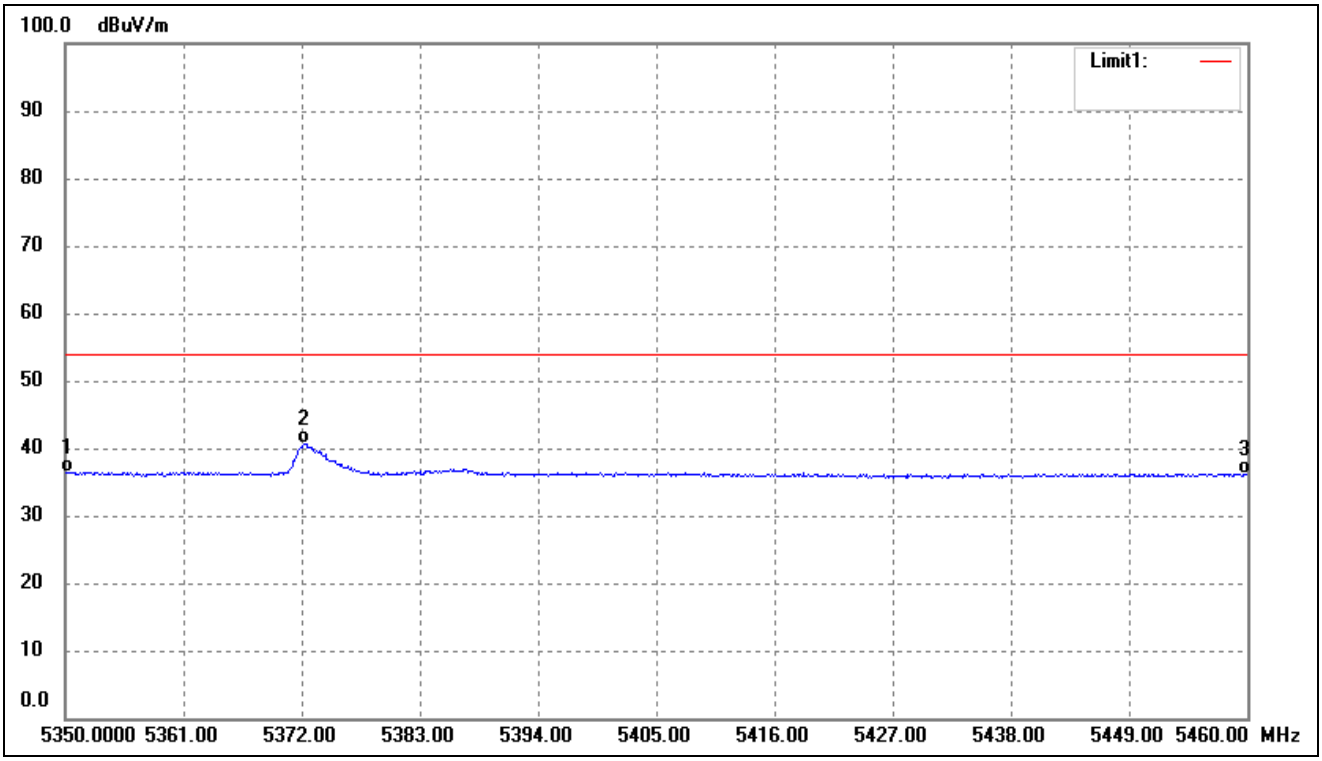
802.11a- Restricted Bandedge (worst case)			
Test Channel	band 4.50-5.15GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	4500.000	41.21	-6.92	34.29	54.00	-19.71	-	-	AVG
2	5127.900	45.33	-5.38	39.95	54.00	-14.05	-	-	AVG
3	5150.000	42.60	-5.33	37.27	54.00	-16.73	-	-	AVG

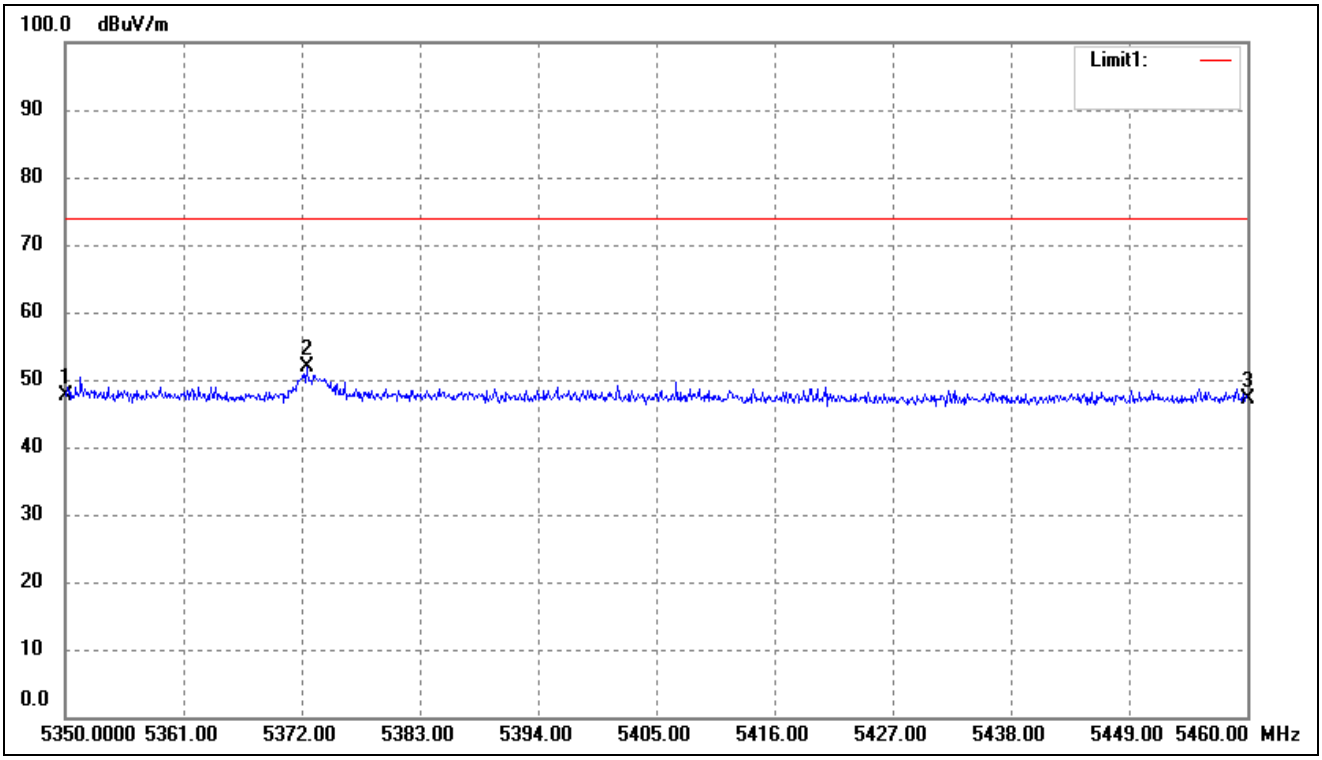
5250-5350MHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	41.34	-4.97	36.37	54.00	-17.63	-	-	AVG
2	5372.220	45.60	-4.92	40.68	54.00	-13.32	-	-	AVG
3	5460.000	40.78	-4.77	36.01	54.00	-17.99	-	-	AVG

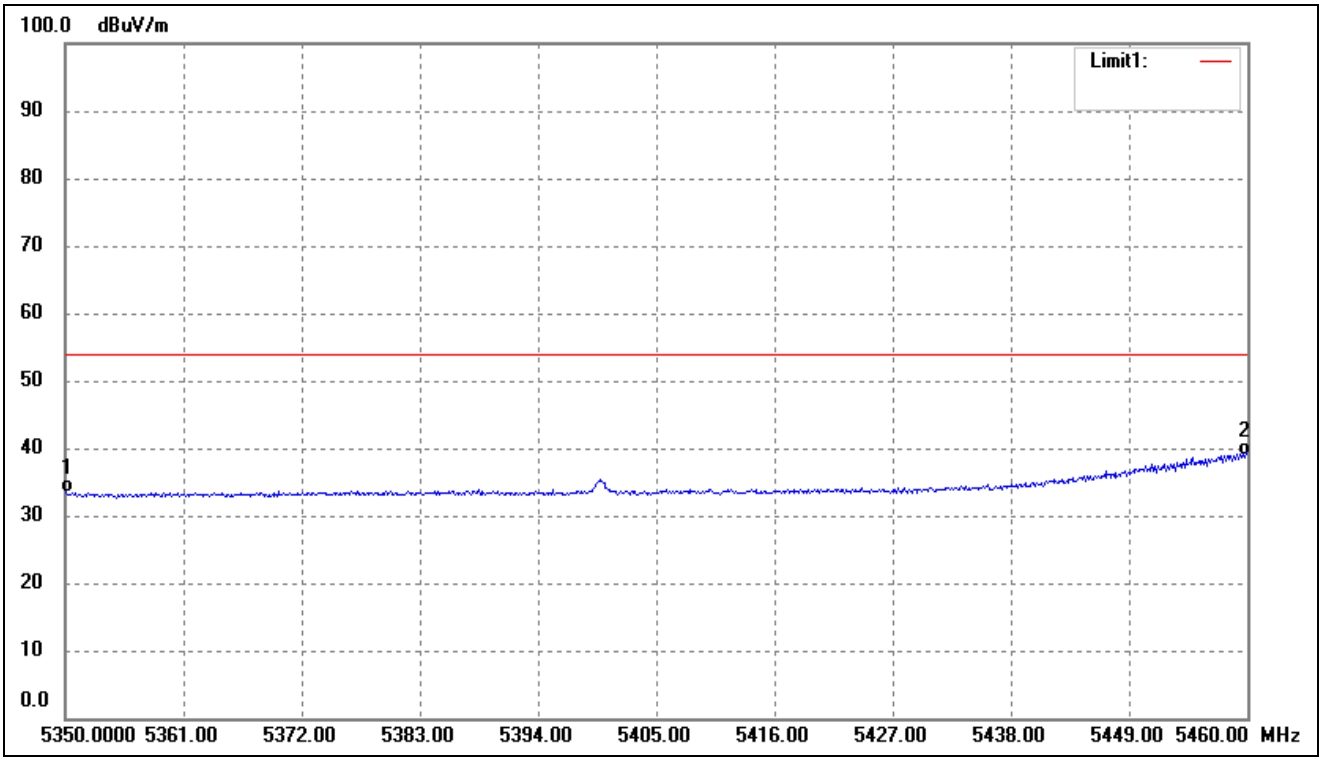
802.11n-HT20- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	52.48	-4.97	47.51	74.00	-26.49	-	-	peak
2	5372.440	56.86	-4.92	51.94	74.00	-22.06	-	-	peak
3	5460.000	51.93	-4.77	47.16	74.00	-26.84	-	-	peak

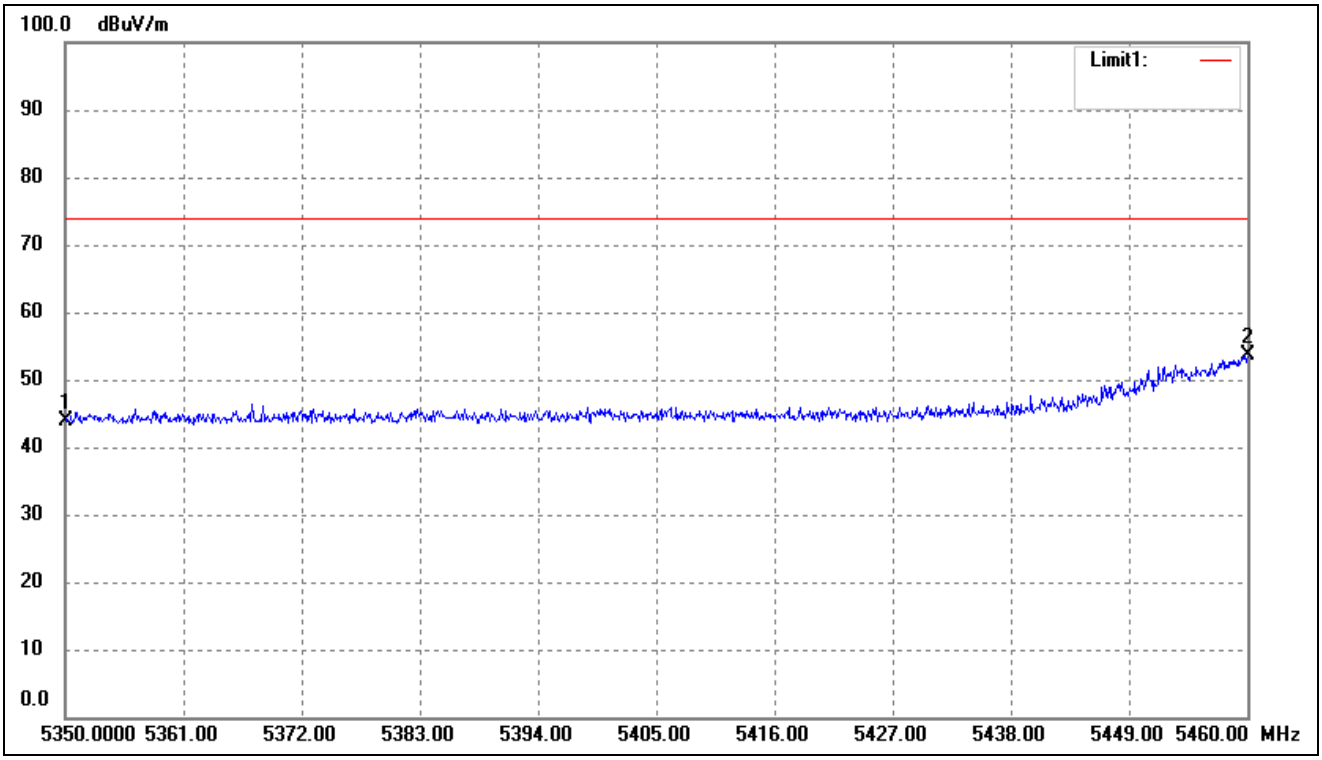
5470-5725MHz

802.11a- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.46GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	38.32	-4.97	33.35	54.00	-20.65	-	-	AVG
2	5460.000	43.63	-4.77	38.86	54.00	-15.14	-	-	AVG

802.11n-HT20- Restricted Bandedge (worst case)			
Test Channel	band 5.35-5.47GHz	Polarity:	Horizontal (worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	5350.000	48.82	-4.97	43.85	74.00	-30.15	-	-	peak
2	5460.000	58.52	-4.77	53.75	74.00	-20.25	-	-	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, 5.250-5.350GHz, 5.470-5.725GHz, 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	61.08	7.11	68.19	74	-5.81	H	PK
15540	39.63	8.22	47.85	54	-6.15	H	AV
10360	59.68	7.11	66.79	74	-7.21	V	PK
15540	40.11	8.22	48.33	54	-5.67	V	AV
Middle Channel (5200MHz)							
10400	57.23	7.22	64.45	74	-9.55	H	PK
15600	35.82	8.67	44.49	54	-9.51	H	AV
10400	59.16	7.22	66.38	74	-7.62	V	PK
15600	37.11	8.67	45.78	54	-8.22	V	AV
High Channel (5240MHz)							
10480	56.83	7.69	64.52	74	-9.48	H	PK
15720	36.33	8.93	45.26	54	-8.74	H	AV
10480	57.40	7.69	65.09	74	-8.91	V	PK
15720	37.32	8.93	46.25	54	-7.75	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5260MHz)							
10520	56.58	7.96	64.54	74	-9.46	H	PK
15780	38.96	9.02	47.98	54	-6.02	H	AV
10520	60.39	7.96	68.35	74	-5.65	V	PK
15780	38.43	9.02	47.45	54	-6.55	V	AV
Middle Channel (5280MHz)							
10560	59.35	8.02	67.37	74	-6.63	H	PK
15840	37.77	9.42	47.19	54	-6.81	H	AV
10560	59.94	8.02	67.96	74	-6.04	V	PK
15840	35.03	9.42	44.45	54	-9.55	V	AV
High Channel (5320MHz)							
10640	57.36	8.35	65.71	74	-8.29	H	PK
15960	35.22	9.63	44.85	54	-9.15	H	AV
10640	58.35	8.35	66.70	74	-7.30	V	PK
15960	34.52	9.63	44.15	54	-9.85	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5500MHz)							
11000	57.54	8.82	66.36	74	-7.64	H	PK
16500	35.98	9.88	45.86	54	-8.14	H	AV
11000	57.69	8.82	66.51	74	-7.49	V	PK
16500	35.71	9.88	45.59	54	-8.41	V	AV
Middle Channel (5600MHz)							
11200	58.70	8.92	67.62	74	-6.38	H	PK
16800	35.81	10.03	45.84	54	-8.16	H	AV
11200	56.13	8.92	65.05	74	-8.95	V	PK
16800	38.81	10.03	48.84	54	-5.16	V	AV
High Channel (5700MHz)							
11400	55.21	9.36	64.57	74	-9.43	H	PK
17100	36.85	10.25	47.10	54	-6.90	H	AV
11400	57.16	9.36	66.52	74	-7.48	V	PK
17100	35.02	10.25	45.27	54	-8.73	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	58.03	9.45	67.48	74	-6.52	H	PK
17235	37.34	10.36	47.70	54	-6.30	H	AV
11490	56.79	9.45	66.24	74	-7.76	V	PK
17235	35.74	10.36	46.10	54	-7.90	V	AV
Middle Channel (5785MHz)							
11570	57.93	9.62	67.55	74	-6.45	H	PK
17355	36.74	10.67	47.41	54	-6.59	H	AV
11570	55.81	9.62	65.43	74	-8.57	V	PK
17355	37.19	10.67	47.86	54	-6.14	V	AV
High Channel (5825MHz)							
11650	57.04	9.84	66.88	74	-7.12	H	PK
17475	33.42	10.95	44.37	54	-9.63	H	AV
11650	55.65	9.84	65.49	74	-8.51	V	PK
17475	36.54	10.95	47.49	54	-6.51	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-38.14	-27
Highest	Above 5350	-43.37	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-33.38	-27
Highest	Above 5350	-34.99	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-36.87	-27
Highest	Above 5725	-32.23	-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	-33.77	-27
	5715 to 5725	-39.56	-17
Highest	5850 to 5860	-42.95	-17
	Above 5860	-41.99	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 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	59.30	7.11	66.41	74	-7.59	H	PK
15540	38.91	8.22	47.13	54	-6.87	H	AV
10360	58.52	7.11	65.63	74	-8.37	V	PK
15540	37.52	8.22	45.74	54	-8.26	V	AV
Middle Channel (5200MHz)							
10400	57.66	7.22	64.88	74	-9.12	H	PK
15600	34.36	8.67	43.03	54	-10.97	H	AV
10400	57.98	7.22	65.20	74	-8.80	V	PK
15600	35.28	8.67	43.95	54	-10.05	V	AV
High Channel (5240MHz)							
10480	57.56	7.69	65.25	74	-8.75	H	PK
15720	36.61	8.93	45.54	54	-8.46	H	AV
10480	58.12	7.69	65.81	74	-8.19	V	PK
15720	37.21	8.93	46.14	54	-7.86	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5260MHz)							
10520	59.54	7.96	67.50	74	-6.50	H	PK
15780	36.29	9.02	45.31	54	-8.69	H	AV
10520	60.56	7.96	68.52	74	-5.48	V	PK
15780	37.58	9.02	46.60	54	-7.40	V	AV
Middle Channel (5280MHz)							
10560	57.79	8.02	65.81	74	-8.19	H	PK
15840	36.27	9.42	45.69	54	-8.31	H	AV
10560	58.74	8.02	66.76	74	-7.24	V	PK
15840	37.32	9.42	46.74	54	-7.26	V	AV
High Channel (5320MHz)							
10640	57.41	8.35	65.76	74	-8.24	H	PK
15960	34.86	9.63	44.49	54	-9.51	H	AV
10640	56.42	8.35	64.77	74	-9.23	V	PK
15960	33.63	9.63	43.26	54	-10.74	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5500MHz)							
11000	56.19	8.82	65.01	74	-8.99	H	PK
16500	38.03	9.88	47.91	54	-6.09	H	AV
11000	55.68	8.82	64.50	74	-9.50	V	PK
16500	35.73	9.88	45.61	54	-8.39	V	AV
Middle Channel (5600MHz)							
11200	59.10	8.92	68.02	74	-5.98	H	PK
16800	37.08	10.03	47.11	54	-6.89	H	AV
11200	55.28	8.92	64.20	74	-9.80	V	PK
16800	37.87	10.03	47.90	54	-6.10	V	AV
High Channel (5700MHz)							
11400	55.54	9.36	64.90	74	-9.10	H	PK
17100	35.37	10.25	45.62	54	-8.38	H	AV
11400	59.61	9.36	68.97	74	-5.03	V	PK
17100	34.90	10.25	45.15	54	-8.85	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	57.52	9.45	66.97	74	-7.03	H	PK
17235	35.24	10.36	45.60	54	-8.40	H	AV
11490	57.93	9.45	67.38	74	-6.62	V	PK
17235	34.92	10.36	45.28	54	-8.72	V	AV
Middle Channel (5785MHz)							
11570	56.01	9.62	65.63	74	-8.37	H	PK
17355	36.97	10.67	47.64	54	-6.36	H	AV
11570	55.15	9.62	64.77	74	-9.23	V	PK
17355	35.25	10.67	45.92	54	-8.08	V	AV
High Channel (5825MHz)							
11650	56.60	9.84	66.44	74	-7.56	H	PK
17475	34.96	10.95	45.91	54	-8.09	H	AV
11650	55.49	9.84	65.33	74	-8.67	V	PK
17475	35.82	10.95	46.77	54	-7.23	V	AV

- Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-29.42	-27
Highest	Above 5350	-36.64	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-41.87	-27
Highest	Above 5350	-36.62	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-38.75	-27
Highest	Above 5725	-40.05	-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	-44.51	-27
	5715 to 5725	-34.75	-17
Highest	5850 to 5860	-33.74	-17
	Above 5860	-39.34	-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, 5.250-5.350GHz, 5.470-5.725GHz, 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	55.78	7.25	63.03	74	-10.97	H	PK
15570	38.49	8.33	46.82	54	-7.18	H	AV
10380	56.92	7.25	64.17	74	-9.83	V	PK
15570	36.83	8.33	45.16	54	-8.84	V	AV
High Channel (5230MHz)							
10460	57.39	7.54	64.93	74	-9.07	H	PK
15690	34.69	8.86	43.55	54	-10.45	H	AV
10460	56.48	7.54	64.02	74	-9.98	V	PK
15690	34.22	8.86	43.08	54	-10.92	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5270MHz)							
10540	56.20	8.12	64.32	74	-9.68	H	PK
15810	33.45	9.24	42.69	54	-11.31	H	AV
10540	58.37	8.12	66.49	74	-7.51	V	PK
15810	33.60	9.24	42.84	54	-11.16	V	AV
High Channel (5310MHz)							
10620	55.78	8.30	64.08	74	-9.92	H	PK
15930	36.58	9.45	46.03	54	-7.97	H	AV
10620	55.77	8.30	64.07	74	-9.93	V	PK
15930	35.88	9.45	45.33	54	-8.67	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5510MHz)							
11020	57.00	8.95	65.95	74	-8.05	H	PK
16530	33.69	9.99	43.68	54	-10.32	H	AV
11020	56.22	8.95	65.17	74	-8.83	V	PK
16530	35.20	9.99	45.19	54	-8.81	V	AV
Middle Channel (5590MHz)							
11180	57.22	9.12	66.34	74	-7.66	H	PK
16770	34.87	10.12	44.99	54	-9.01	H	AV
11180	57.59	9.12	66.71	74	-7.29	V	PK
16770	34.68	10.12	44.80	54	-9.20	V	AV
High Channel (5670MHz)							
11340	56.42	9.39	65.81	74	-8.19	H	PK
17010	33.07	10.22	43.29	54	-10.71	H	AV
11340	54.86	9.39	64.25	74	-9.75	V	PK
17010	33.94	10.22	44.16	54	-9.84	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	55.13	9.65	64.78	74	-9.22	H	PK
17265	33.37	10.87	44.24	54	-9.76	H	AV
11510	57.38	9.65	67.03	74	-6.97	V	PK
17265	32.29	10.87	43.16	54	-10.84	V	AV
High Channel (5795MHz)							
11590	54.97	9.81	64.78	74	-9.22	H	PK
17385	34.24	10.89	45.13	54	-8.87	H	AV
11590	56.18	9.81	65.99	74	-8.01	V	PK
17385	35.17	10.89	46.06	54	-7.94	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-39.41	-27
Highest	Above 5350	-43.90	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.05	-27
Highest	Above 5350	-38.82	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-37.85	-27
Highest	Above 5725	-43.67	-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	-42.10	-27
	5715 to 5725	-39.94	-17
Highest	5850 to 5860	-46.38	-17
	Above 5860	-39.50	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz, 5.250-5.350GHz, 5.470-5.725GHz, 5.725-5.850GHz (802.11ac VH80)
- Harmonics And Spurious Emissions

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5210MHz							
10420	58.21	7.58	65.79	74	-8.21	H	PK
10420	35.78	8.67	44.45	54	-9.55	H	AV
10420	58.14	7.58	65.72	74	-8.28	H	PK
10420	35.34	8.67	44.01	54	-9.99	H	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5290MHz							
10580	55.00	8.35	63.35	74	-10.65	H	PK
10580	36.08	9.64	45.72	54	-8.28	H	AV
10580	57.24	8.35	65.59	74	-8.41	V	PK
10580	33.94	9.64	43.58	54	-10.42	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel (5530MHz)							
11060	55.68	9.05	64.73	74	-9.27	H	PK
11060	34.49	10.25	44.74	54	-9.26	H	AV
11060	56.18	9.05	65.23	74	-8.77	V	PK
11060	33.60	10.25	43.85	54	-10.15	V	AV
High Channel (5610MHz)							
11220	55.48	9.22	64.70	74	-9.30	H	PK
11220	34.33	10.28	44.61	54	-9.39	H	AV
11220	54.94	9.22	64.16	74	-9.84	V	PK
11220	34.67	10.28	44.95	54	-9.05	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
5775MHz							
11550	54.71	9.87	64.58	74	-9.42	H	PK
11550	34.84	11.02	45.86	54	-8.14	H	AV
11550	54.06	9.87	63.93	74	-10.07	V	PK
11550	33.47	11.02	44.49	54	-9.51	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-38.17	-27
Highest	Above 5350	-42.37	-27
Note: the data just list the worst cases			

- Out of Band edge for 5250-5350MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-38.99	-27
Highest	Above 5350	-37.04	-27
Note: the data just list the worst cases			

- Out of Band edge for 5470-5725MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5470	-39.32	-27
Highest	Above 5725	-42.97	-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	-40.81	-27
	5715 to 5725	-38.18	-17
Highest	5850 to 5860	-45.46	-17
	Above 5860	-43.11	-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.

9. Frequency Stability

9.1 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.

9.2 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.

9.3 Summary of Test Results/Plots

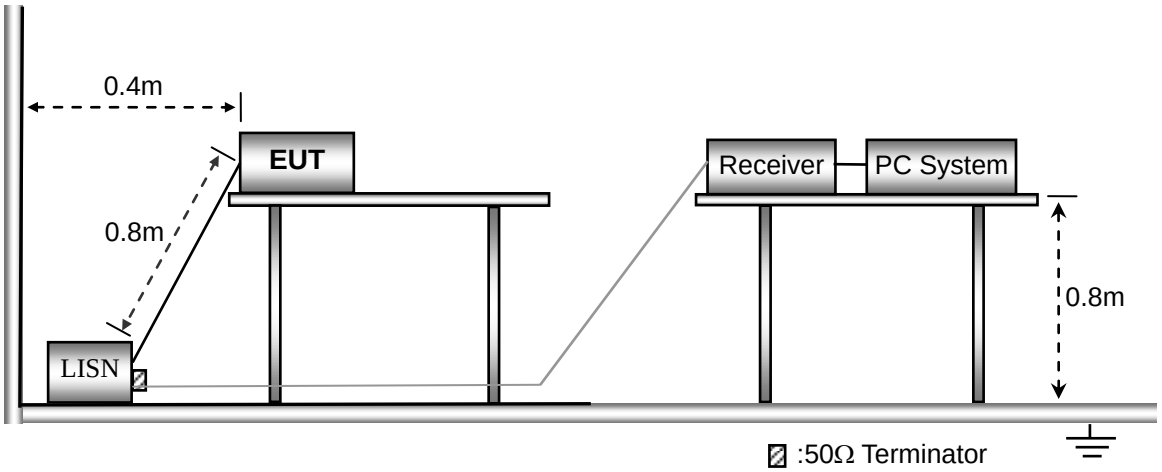
Please refer to Appendix D

10. Conducted Emissions

10.1 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 40cm long in the middle.
The spacing between the peripherals was 10cm.

10.2 Basic Test Setup Block Diagram



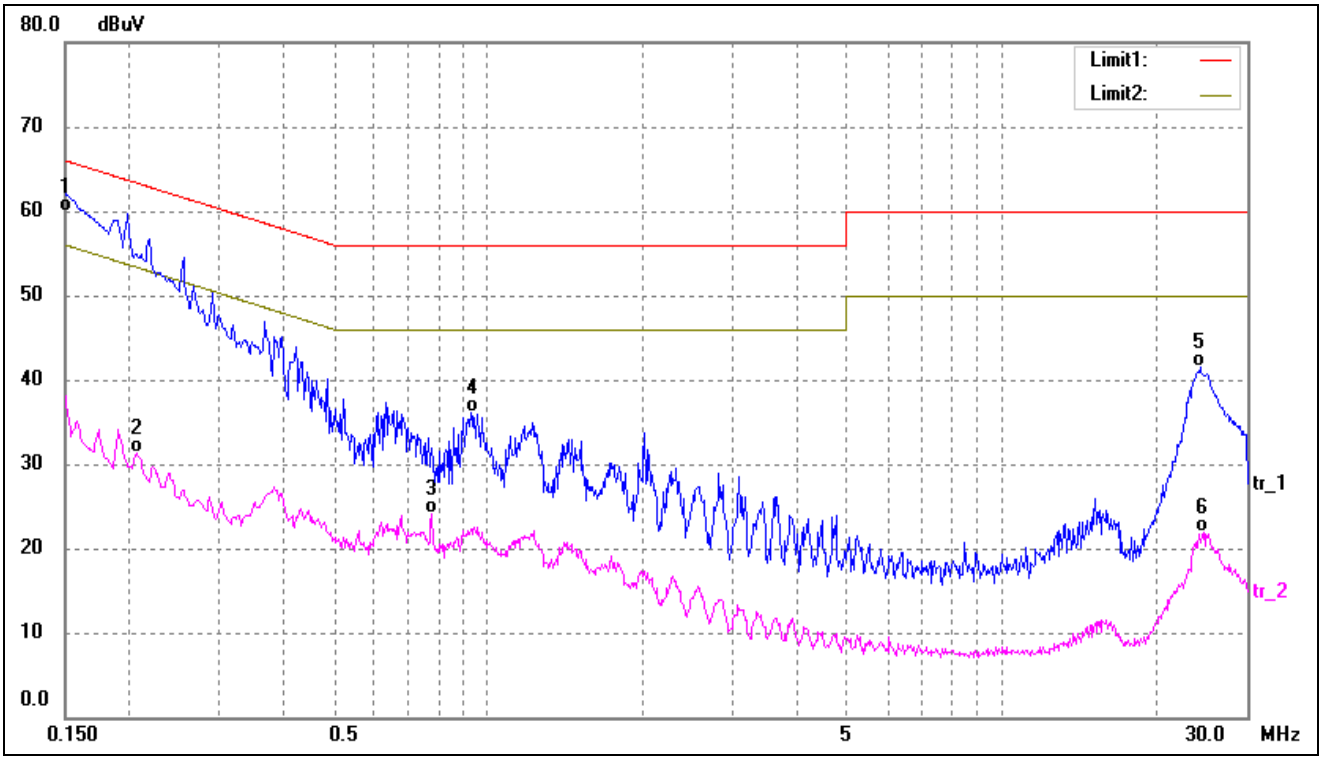
10.3 Test Receiver Setup

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

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

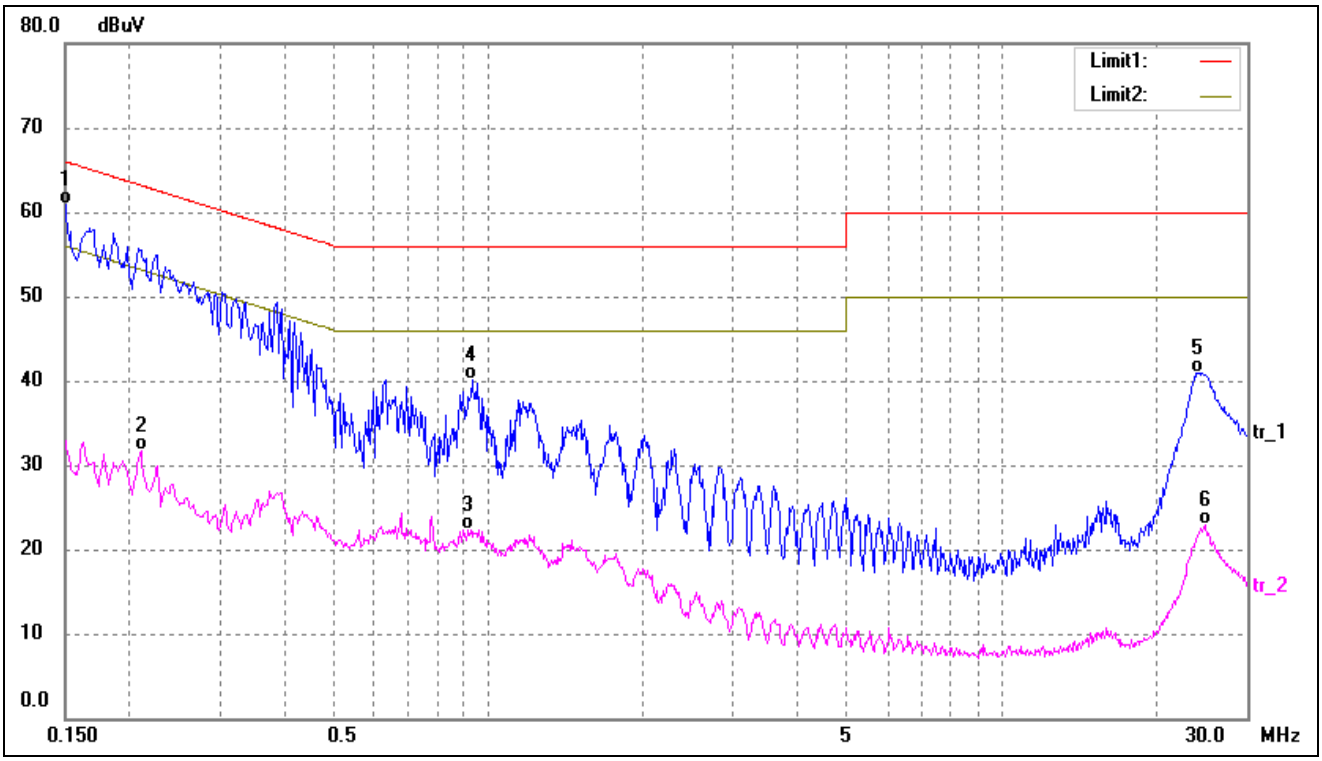
10.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1*	0.1500	49.62	10.38	60.00	66.00	-6.00	QP
2	0.2060	21.02	10.37	31.39	53.37	-21.98	AVG
3	0.7780	13.62	10.43	24.05	46.00	-21.95	AVG
4	0.9260	25.49	10.52	36.01	56.00	-19.99	QP
5	24.3580	31.26	10.22	41.48	60.00	-18.52	QP
6	24.7140	11.79	10.21	22.00	50.00	-28.00	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1*	0.1500	50.56	10.38	60.94	66.00	-5.06	QP
2	0.2100	21.37	10.37	31.74	53.21	-21.47	AVG
3	0.9180	11.80	10.51	22.31	46.00	-23.69	AVG
4	0.9300	29.52	10.52	40.04	56.00	-15.96	QP
5	23.8660	30.73	10.22	40.95	60.00	-19.05	QP
6	24.9300	12.65	10.21	22.86	50.00	-27.14	AVG

APPENDIX SUMMARY

Project No.	WTH22X01000806W	Test Engineer	Dashan
Start date	2022/02/20	Finish date	2022/02/22
Temperature	24.8℃	Humidity	47%
RF specifications	U-NII		

APPENDIX	Description of Test Item	Result
A	Power Spectral Density	Compliant
B	Emission Bandwidth and Occupied Bandwidth	Compliant
C	Maximum Conducted Output Power	Compliant
D	Frequency Stability	Compliant

APPENDIX A

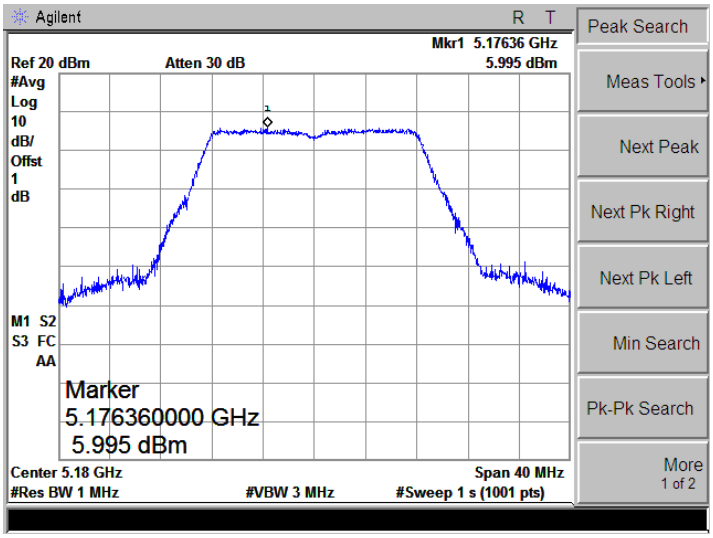
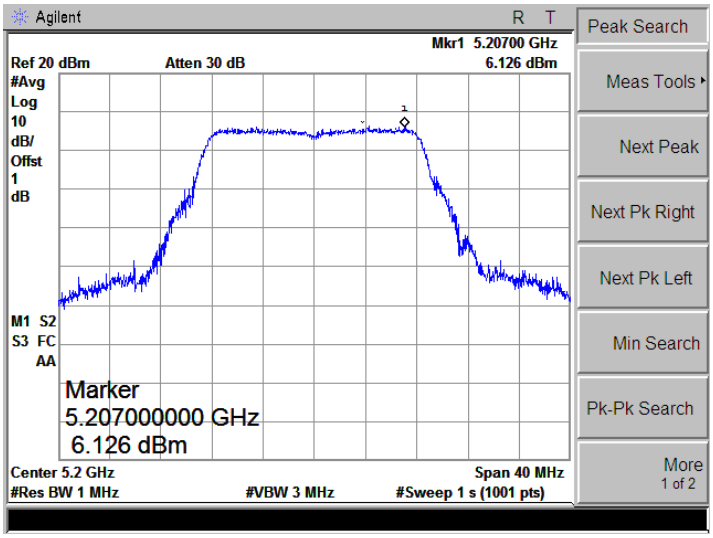
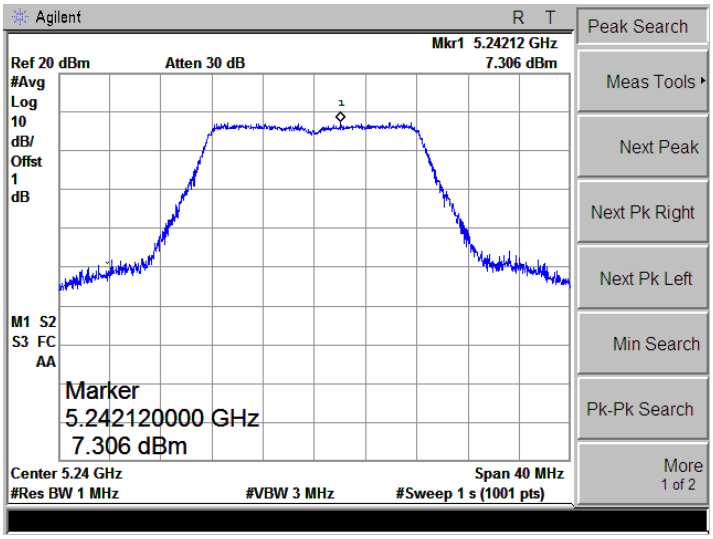
Power Spectral Density			
U-NII-1:5150-5250MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5180	5.995	11
	5200	6.126	11
	5240	7.306	11
802.11n-HT20	5180	4.070	11
	5200	4.471	11
	5240	4.989	11
802.11n-HT40	5190	0.288	11
	5230	0.831	11
802.11ac-HT80	5210	-3.129	11

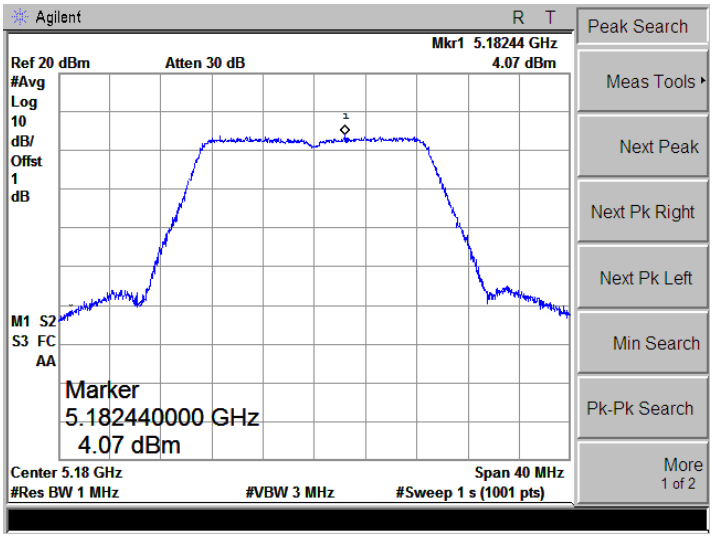
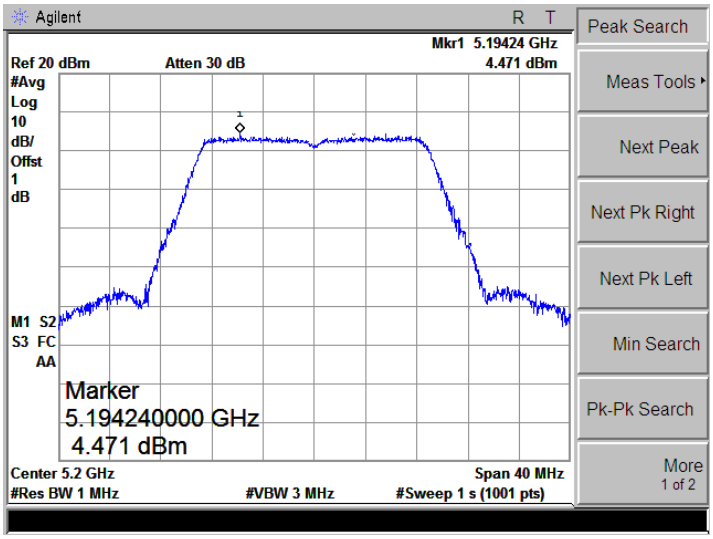
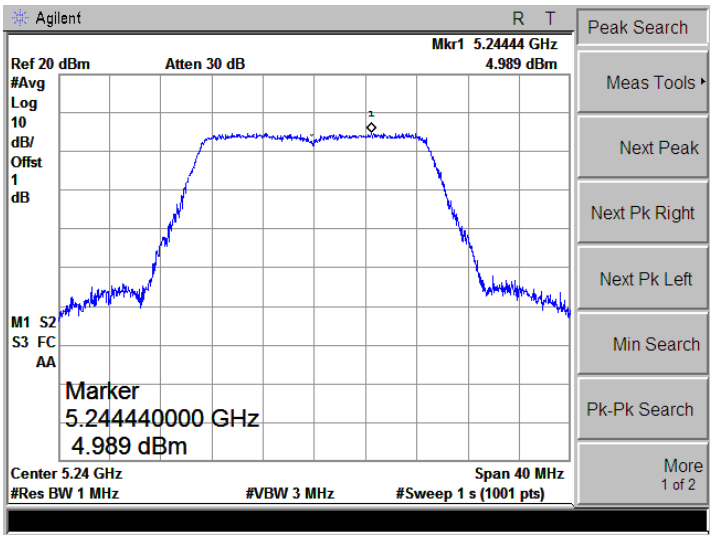
U-NII-2A: 5250-5350MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5260	7.838	11
	5280	7.426	11
	5320	7.116	11
802.11n-HT20	5260	5.358	11
	5280	5.109	11
	5320	4.924	11
802.11n-HT40	5270	1.344	11
	5310	1.312	11
802.11ac-HT80	5290	-2.481	11

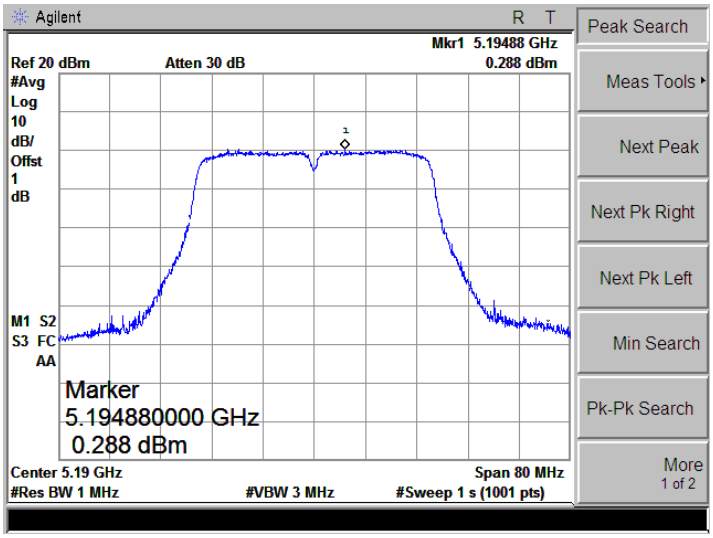
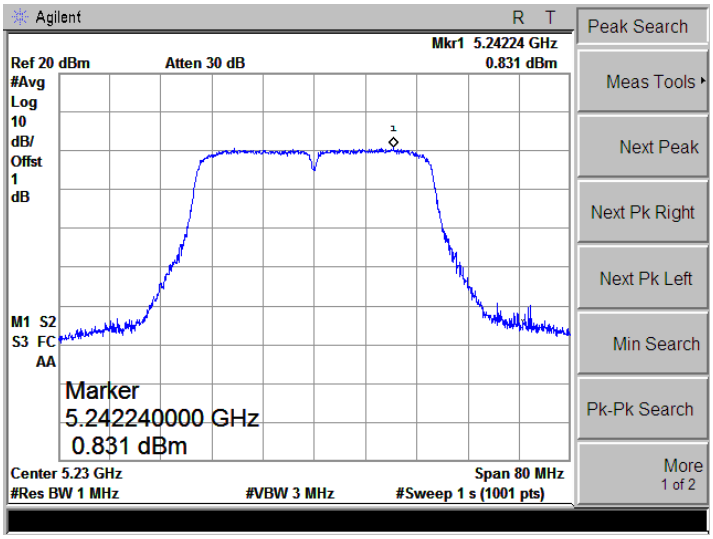
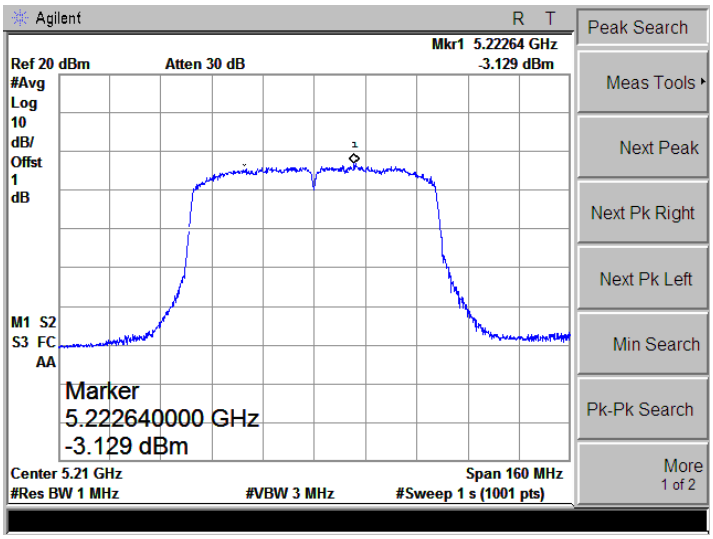
U-NII-2C: 5470-5725MHz			
Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5500	6.463	11
	5600	6.516	11
	5700	5.287	11
802.11n-HT20	5500	4.646	11
	5600	4.592	11
	5700	3.382	11
802.11n-HT40	5510	1.098	11
	5590	1.662	11
	5670	0.670	11
802.11ac-HT80	5530	-2.689	11
	5610	-2.967	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	6.482	2.22	8.702	30
	5785	5.303	2.22	7.523	30
	5825	4.292	2.22	6.512	30
802.11n-HT20	5745	4.712	2.22	6.932	30
	5785	3.987	2.22	6.207	30
	5825	3.033	2.22	5.253	30
802.11n HT40	5755	0.810	2.22	3.030	30
	5795	-0.061	2.22	2.159	30
802.11ac VH80	5775	-3.157	2.22	-0.937	30
*Note: Factor=10log(500kHz/300kHz)=2.22 *Note: Maximum PSD=PSD(dBm/300kHz)+10log(500kHz/300kHz)					

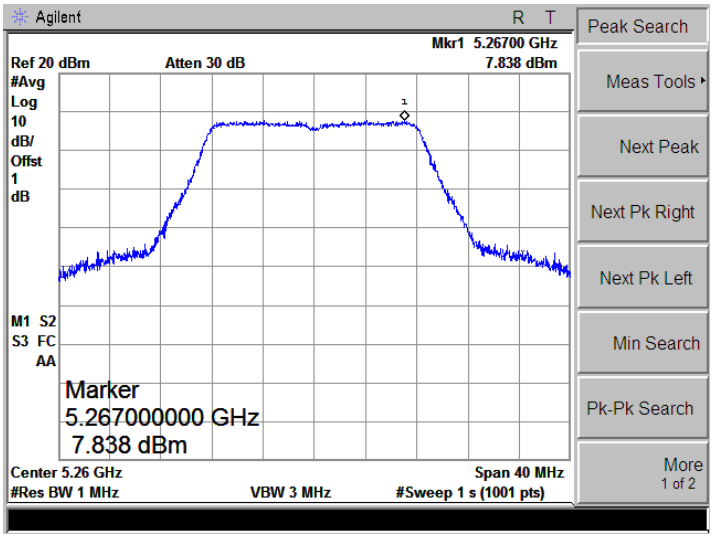
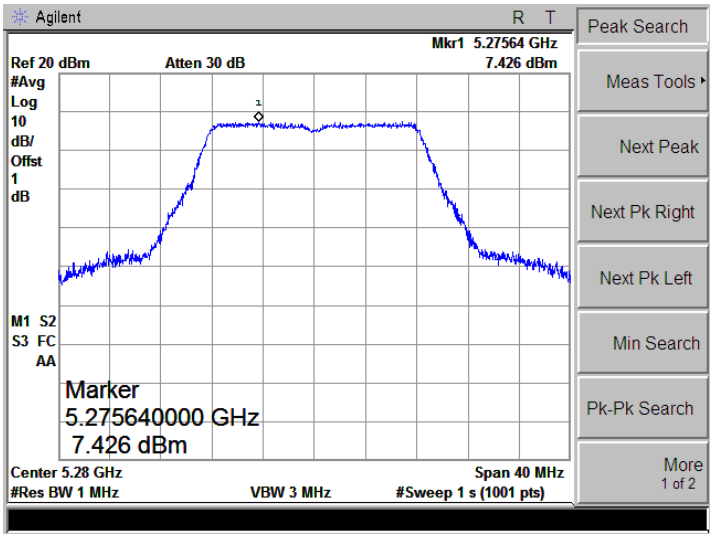
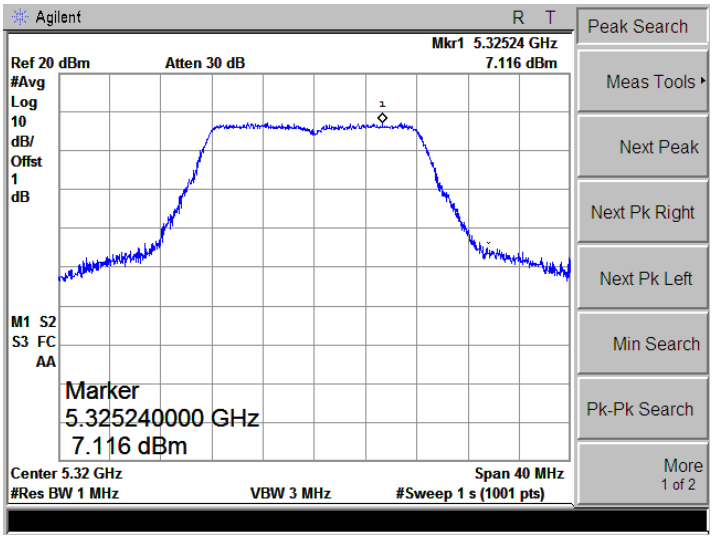
5150-5250MHz

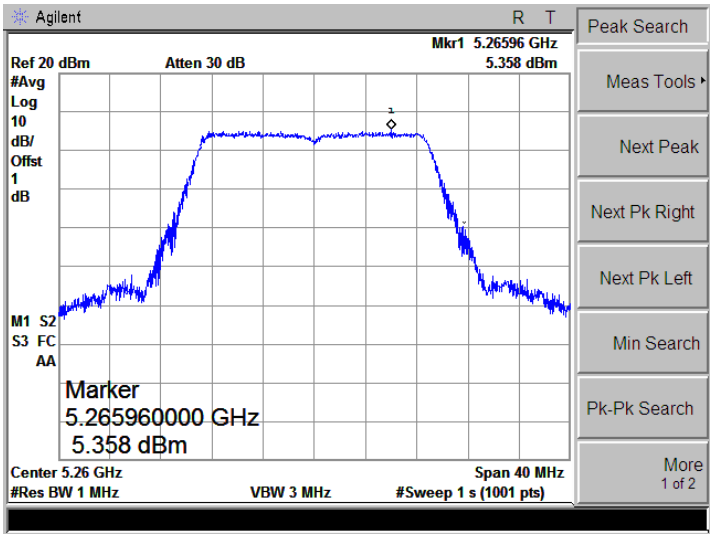
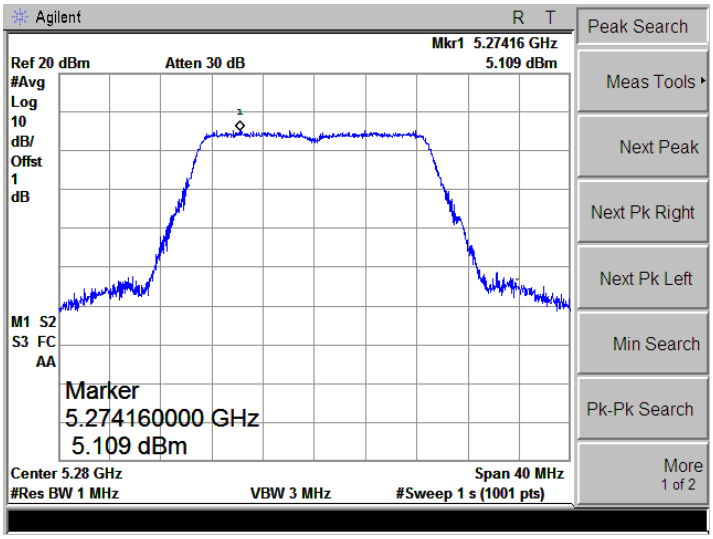
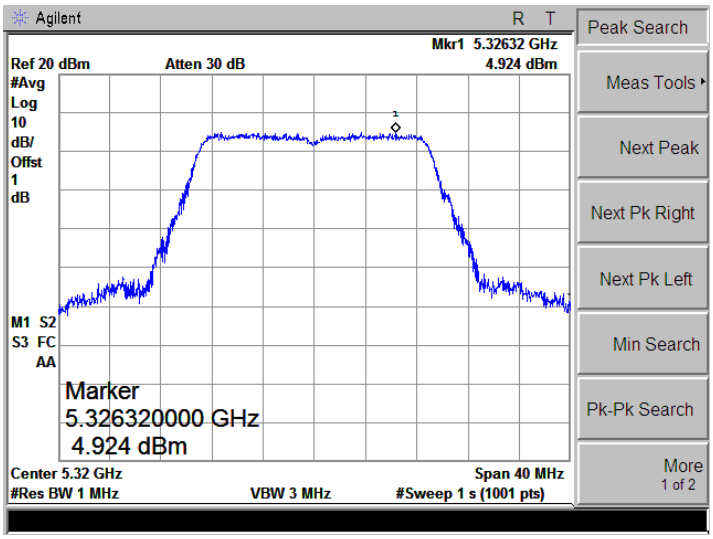
802.11a-Low	
802.11a-Middle	
802.11a-High	

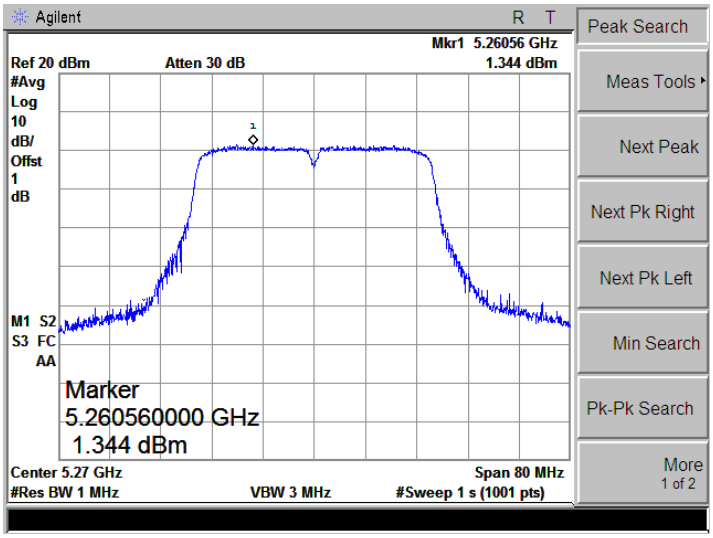
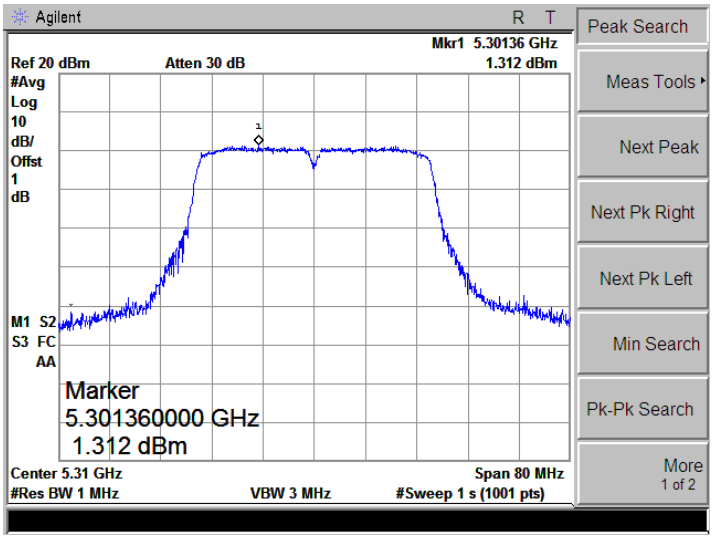
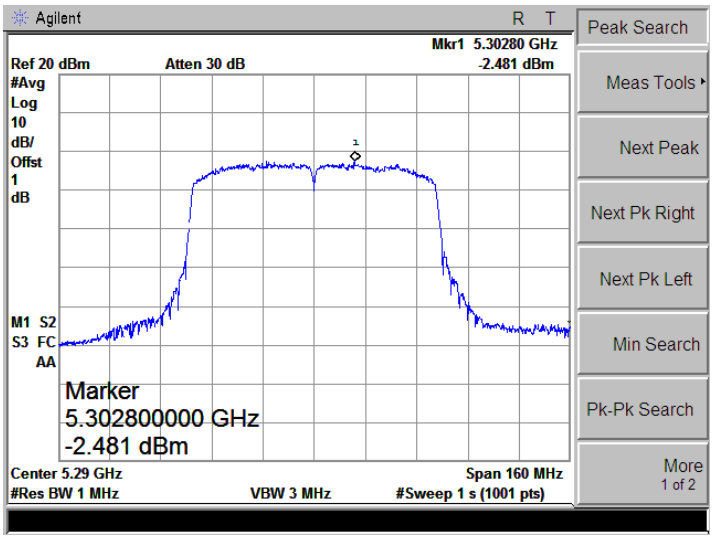
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

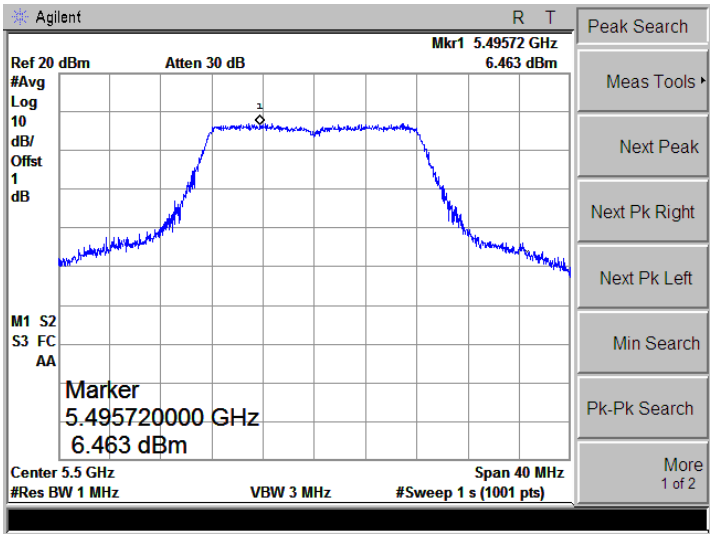
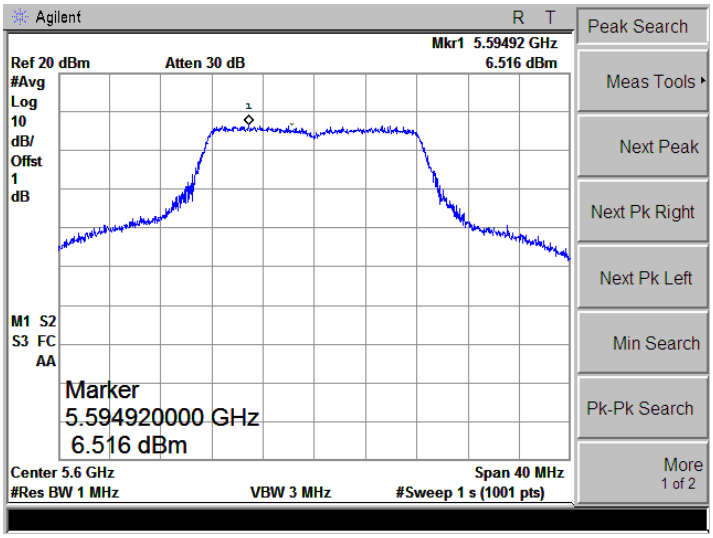
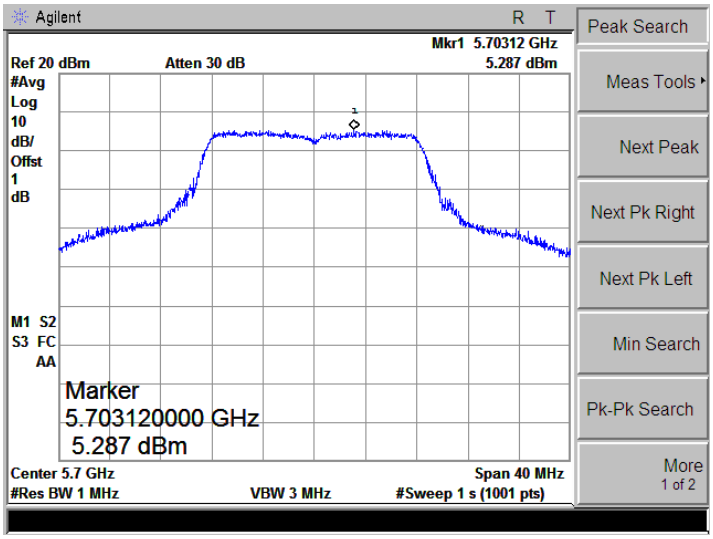
5250-5350MHz

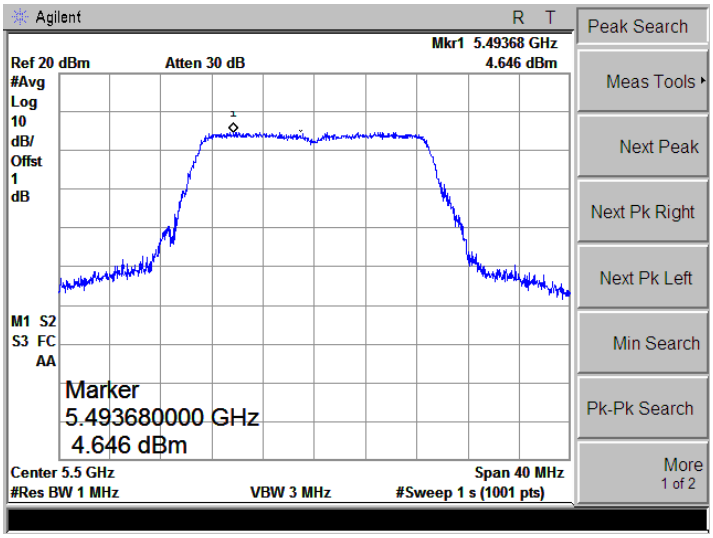
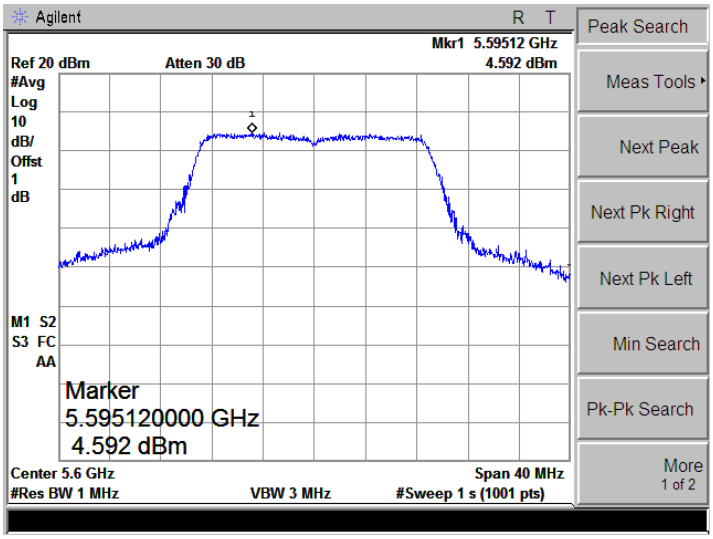
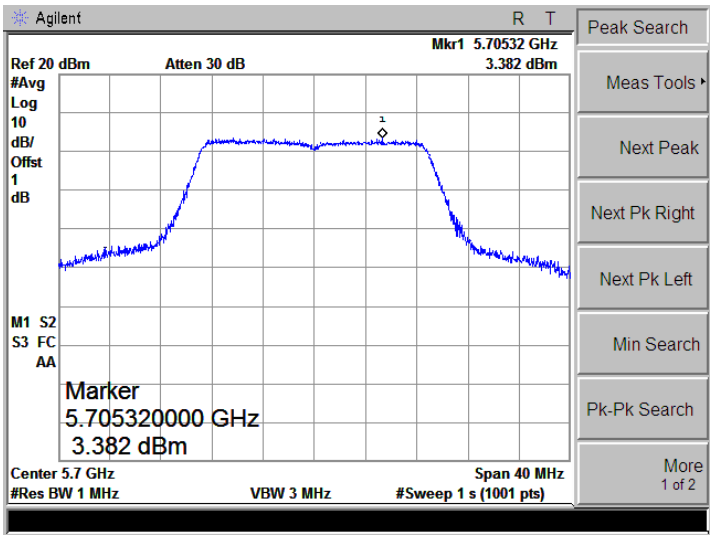
802.11a-Low	
802.11a-Middle	
802.11a-High	

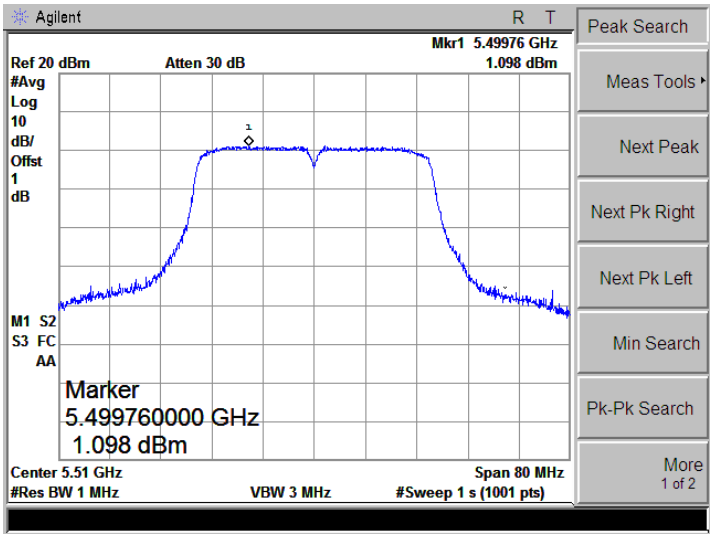
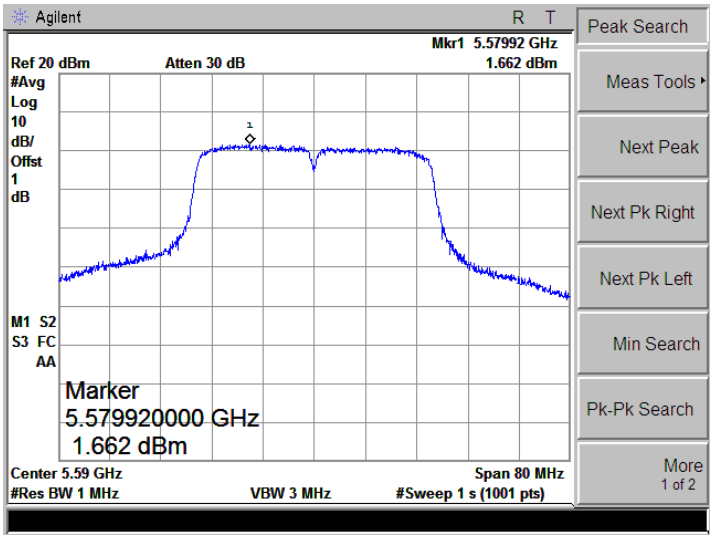
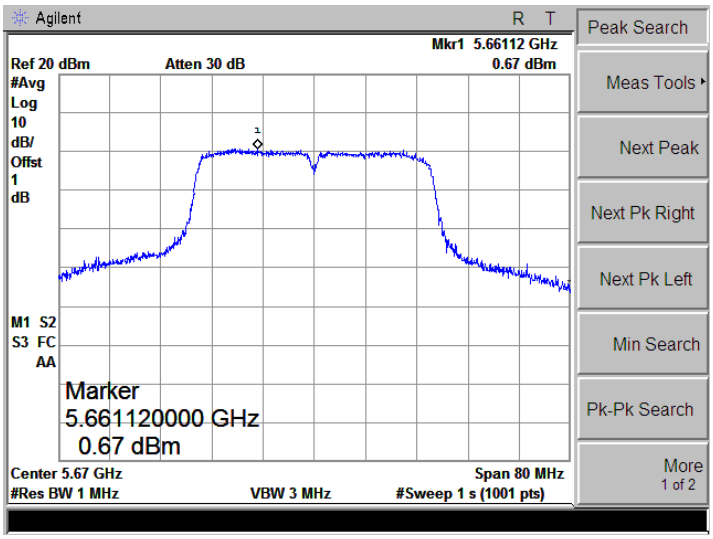
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

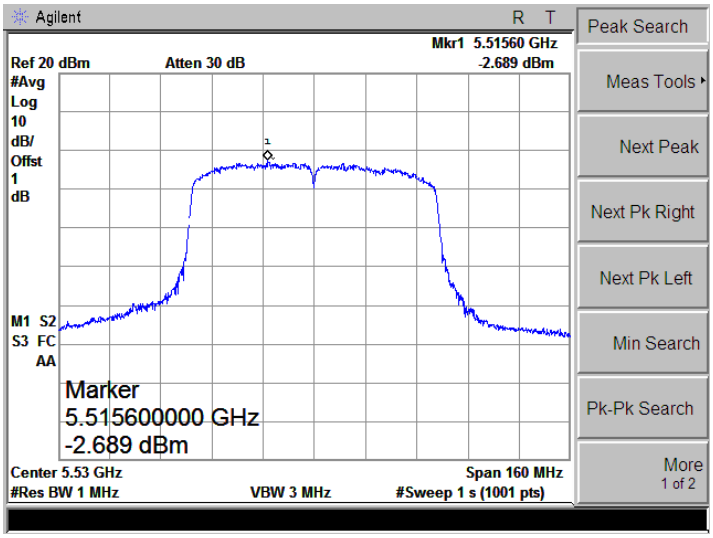
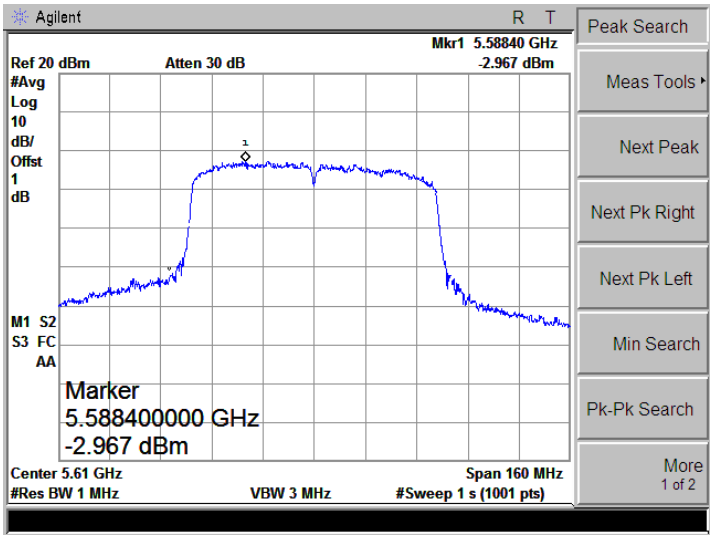
802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

5470-5725MHz

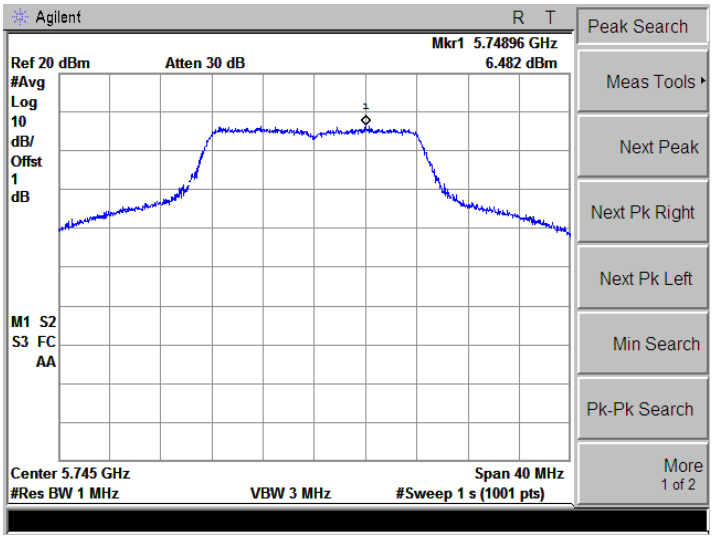
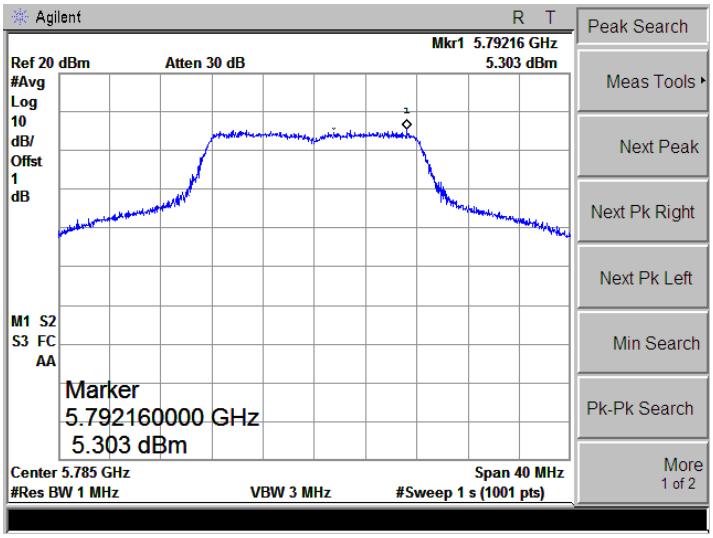
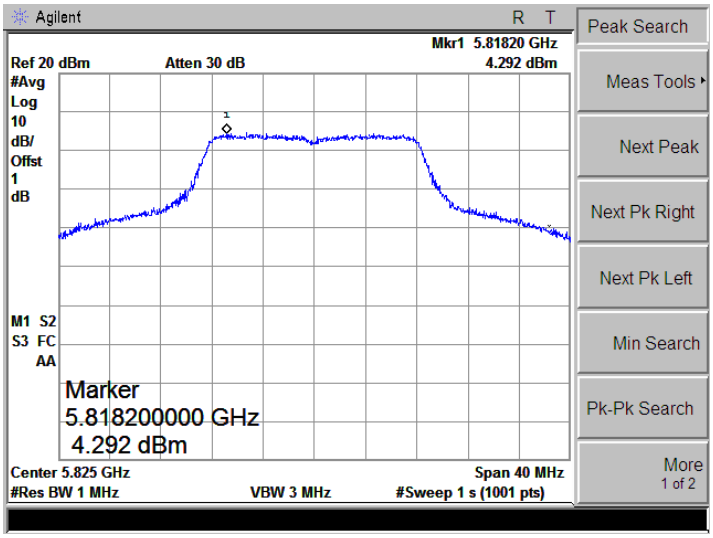
802.11a-Low	
802.11a-Middle	
802.11a-High	

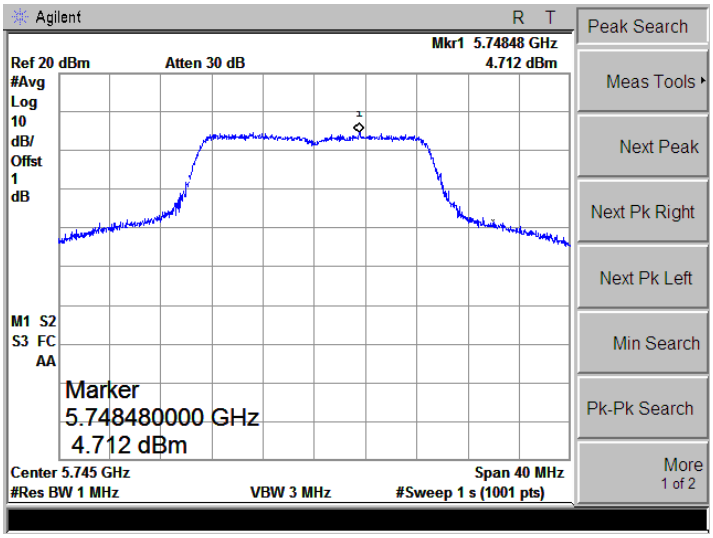
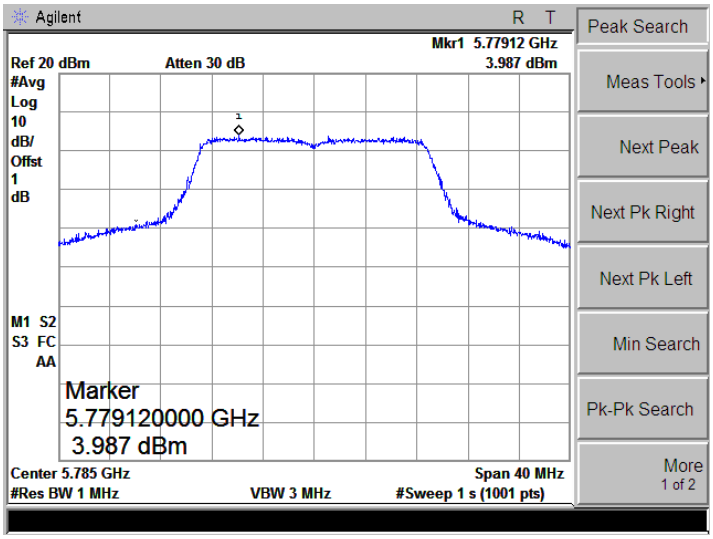
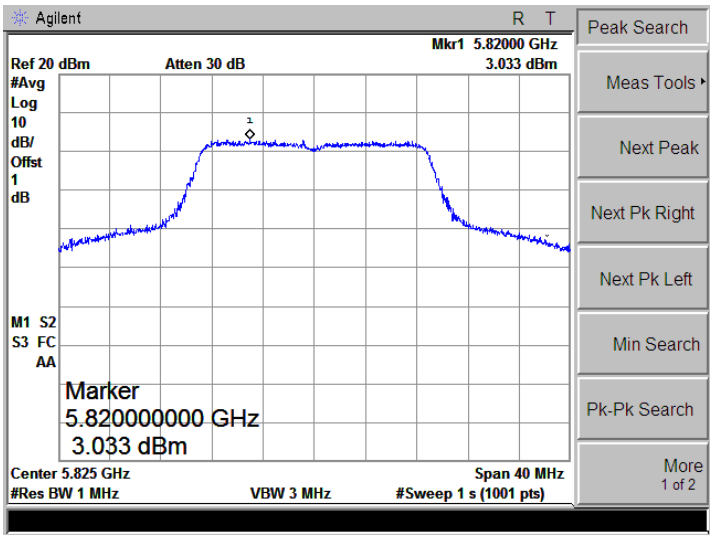
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

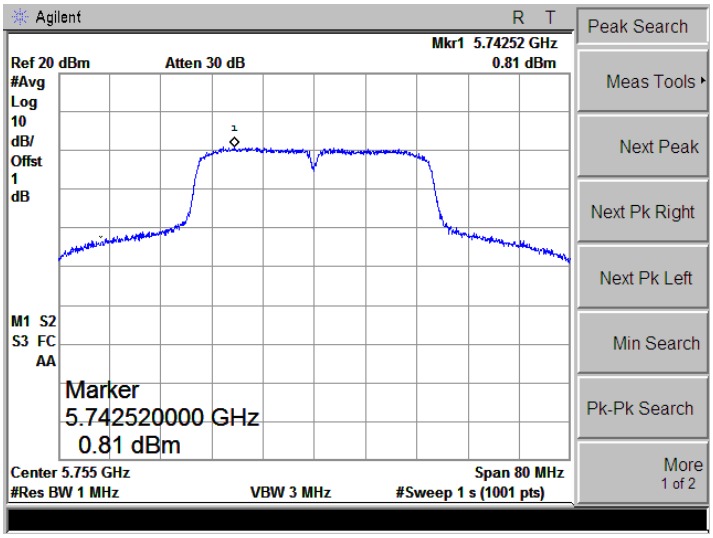
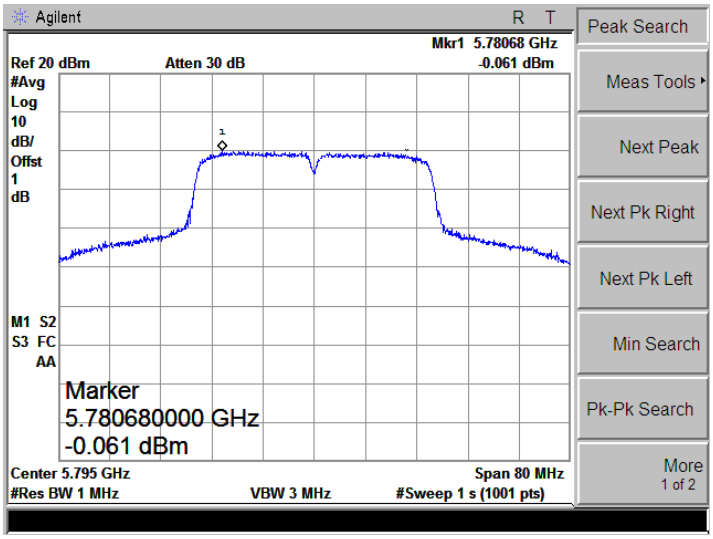
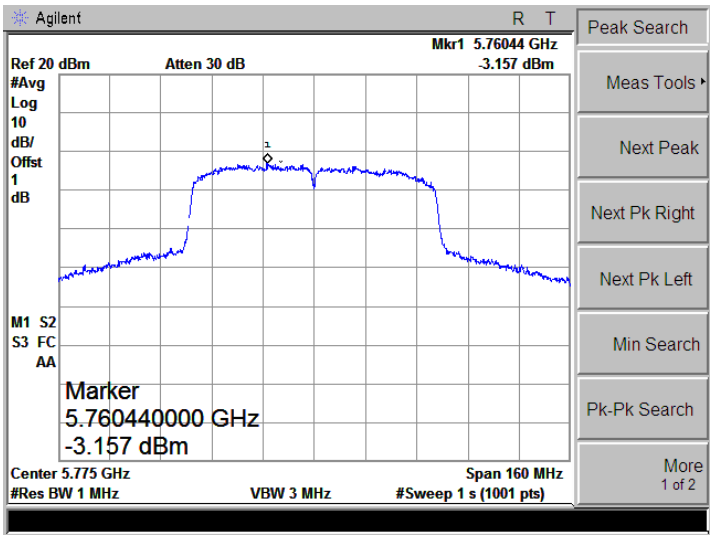
802.11n-HT40-Low	
802.11n-HT40- Middle	
802.11n-HT40-High	

802.11ac-HT80	
802.11ac-HT80	

5725-5850MHz

802.11a-Low	
802.11a-Middle	
802.11a-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

APPENDIX B

Emission Bandwidth and Occupied Bandwidth

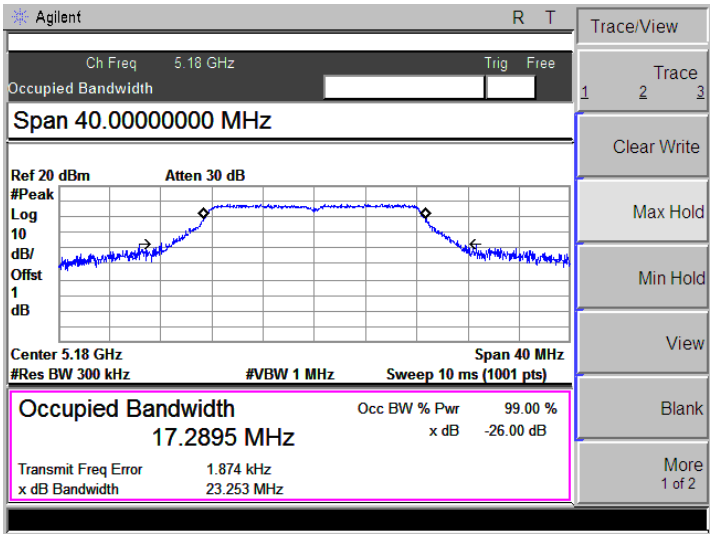
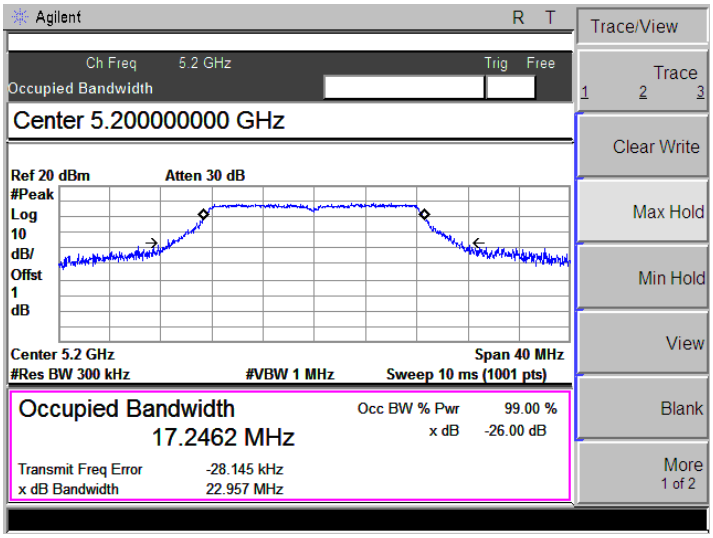
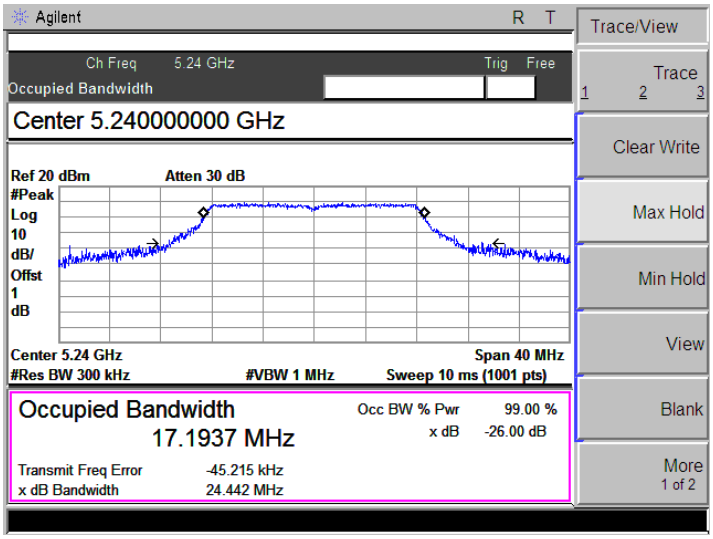
U-NII-1:5150-5250MHz				
Test Mode	**Test Channel MHz**	**26 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5180	23.253	17.290	Pass
	5200	22.957	17.246	Pass
	5240	24.442	17.194	Pass
802.11n-HT20	5180	22.780	18.156	Pass
	5200	22.517	18.144	Pass
	5240	22.732	18.222	Pass
802.11n-HT40	5190	43.341	36.082	Pass
	5230	43.485	36.075	Pass
802.11ac-HT80	5210	84.614	74.650	Pass

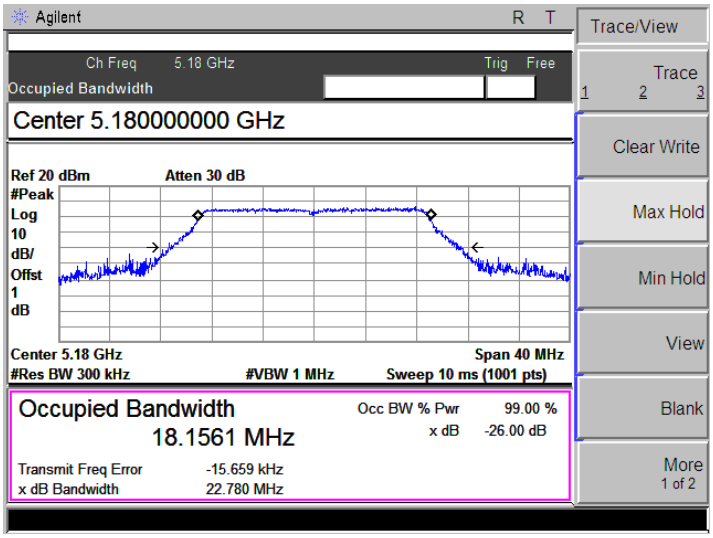
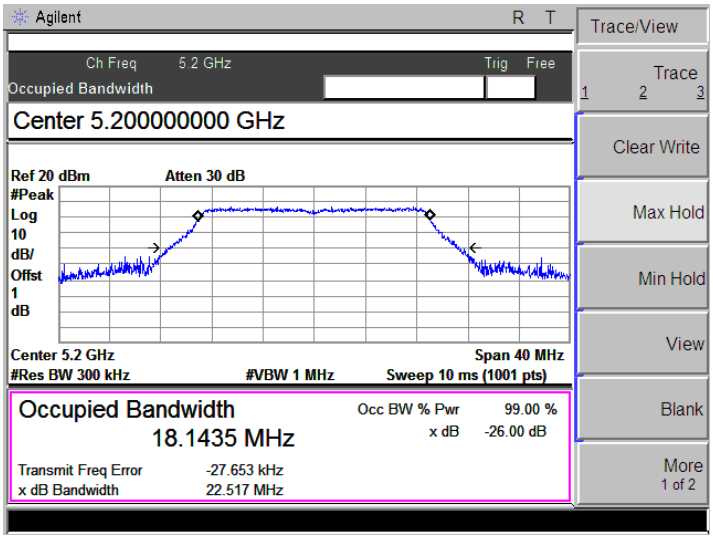
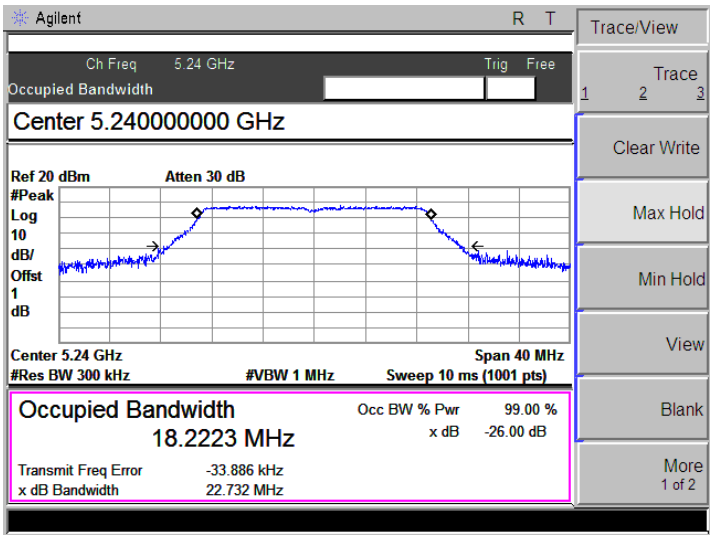
U-NII-2A: 5250-5350MHz				
Test Mode	**Test Channel MHz**	**26 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5260	22.556	17.277	Pass
	5280	22.539	17.165	Pass
	5320	22.159	17.114	Pass
802.11n-HT20	5260	22.598	18.078	Pass
	5280	22.505	18.208	Pass
	5320	23.028	18.175	Pass
802.11n-HT40	5270	43.726	36.132	Pass
	5310	43.266	36.074	Pass
802.11ac-HT80	5290	84.956	74.721	Pass

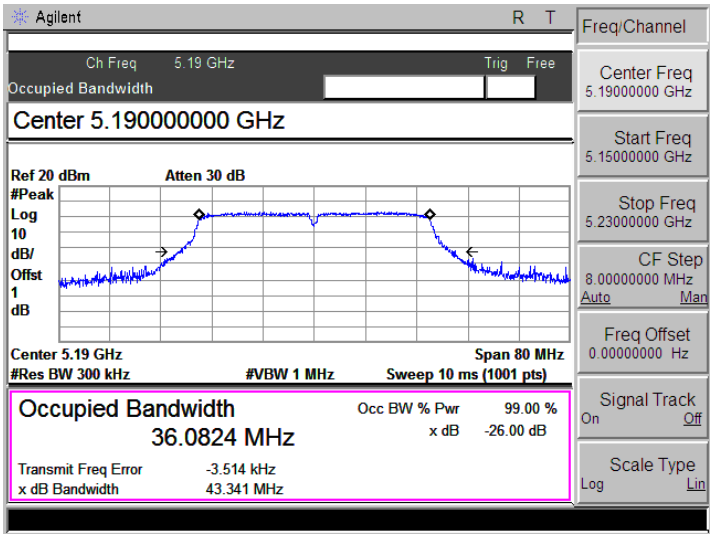
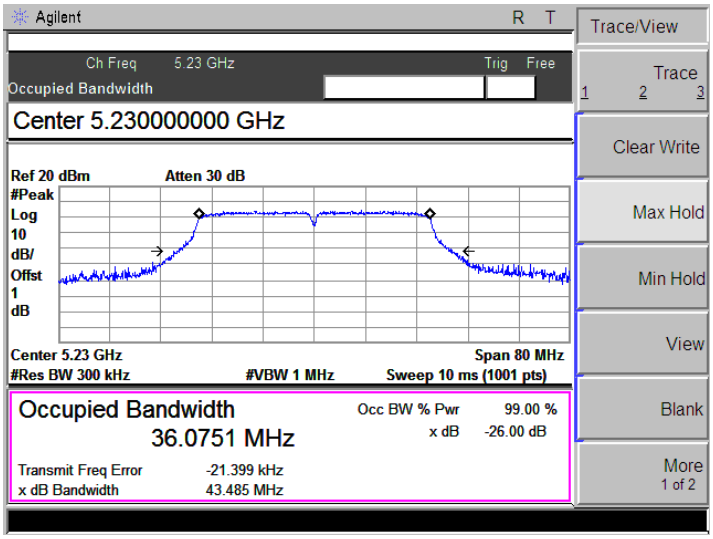
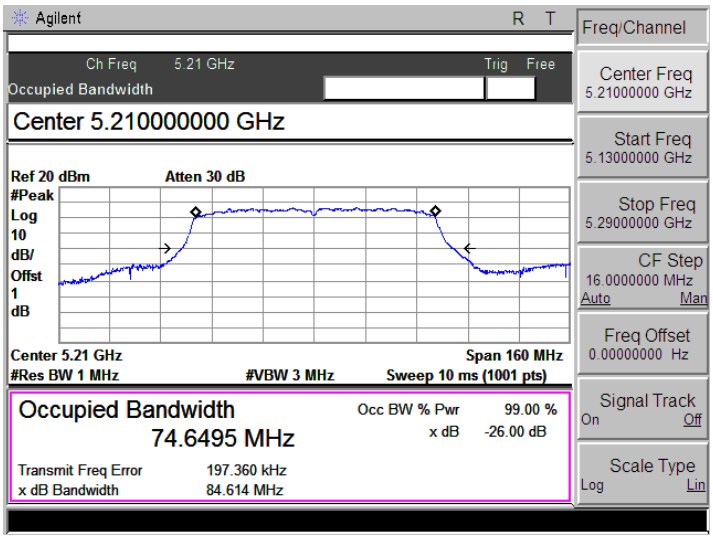
U-NII-2C: 5470-5725MHz				
Test Mode	**Test Channel MHz**	**26 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5500	22.491	17.230	Pass
	5600	22.694	17.231	Pass
	5700	22.267	17.107	Pass
802.11n-HT20	5500	22.588	18.115	Pass
	5600	22.614	18.174	Pass
	5700	22.710	18.151	Pass
802.11n-HT40	5510	42.595	36.051	Pass
	5590	42.730	36.086	Pass
	5670	42.544	36.040	Pass
802.11ac-HT80	5530	83.507	74.671	Pass
	5610	82.842	74.727	Pass

U-NII-3: 5725-5850MHz				
Test Mode	**Test Channel MHz**	**6 dB Bandwidth MHz**	**99% Bandwidth MHz**	**Limit MHz**
802.11a	5745	16.382	17.124	≥500
	5785	16.376	17.116	≥500
	5825	16.411	17.147	≥500
802.11n-HT20	5745	17.613	18.123	≥500
	5785	17.602	18.138	≥500
	5825	17.594	18.150	≥500
802.11n-HT40	5755	35.241	36.438	≥500
	5795	35.323	36.437	≥500
802.11ac VH80	5775	75.092	74.738	≥500

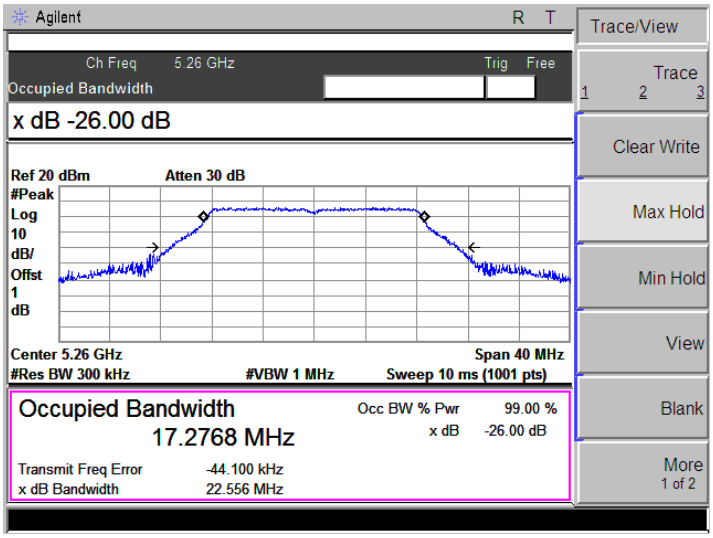
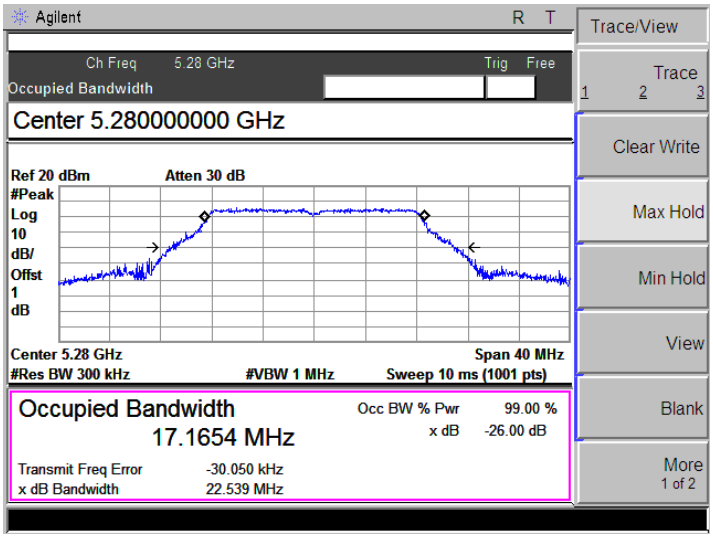
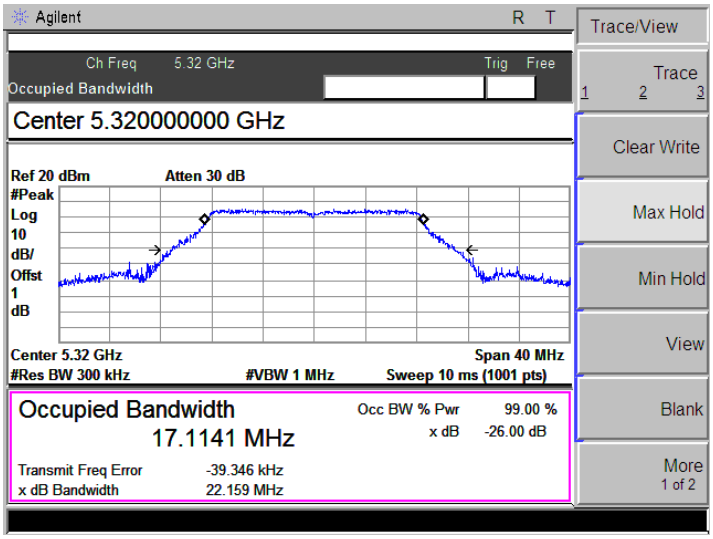
5150-5250MHz

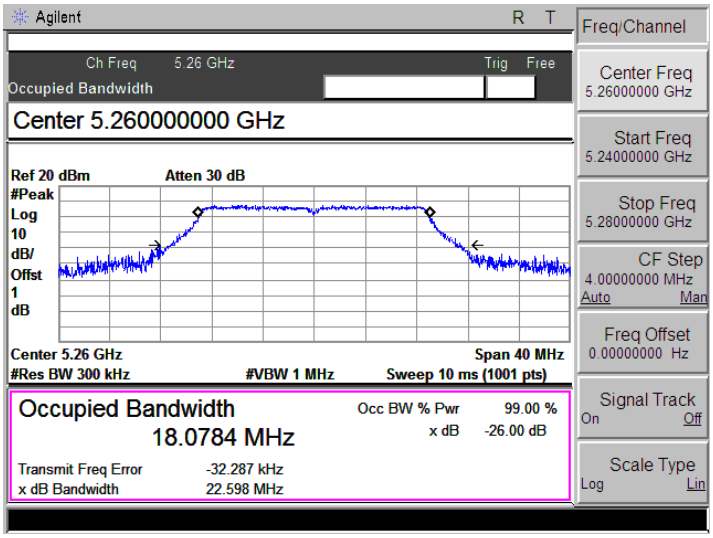
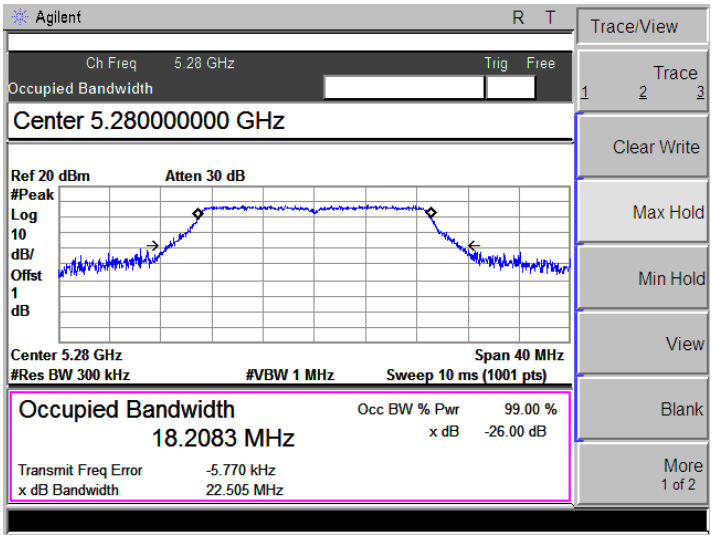
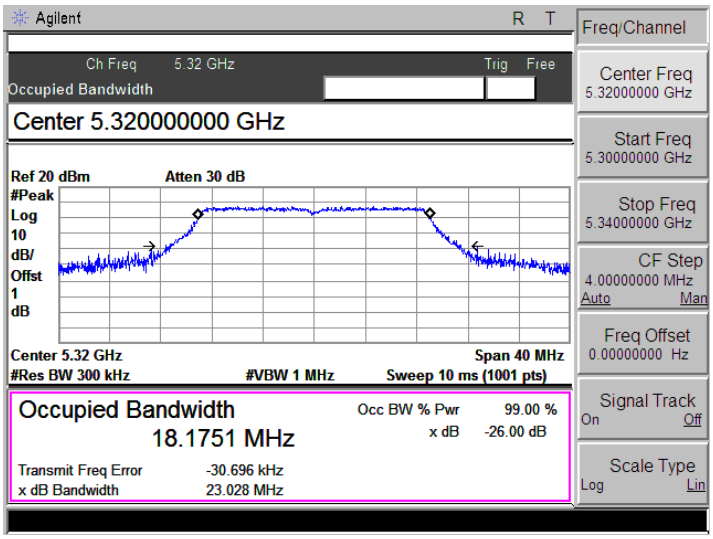
802.11a-Low	
802.11a-Middle	
802.11a-High	

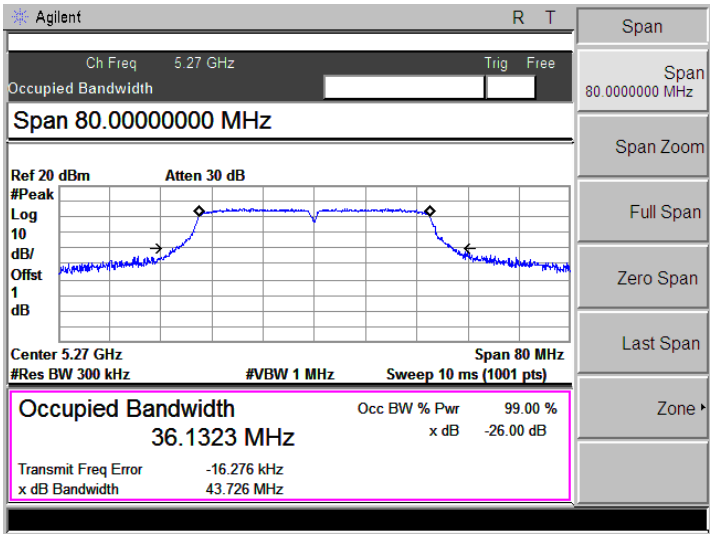
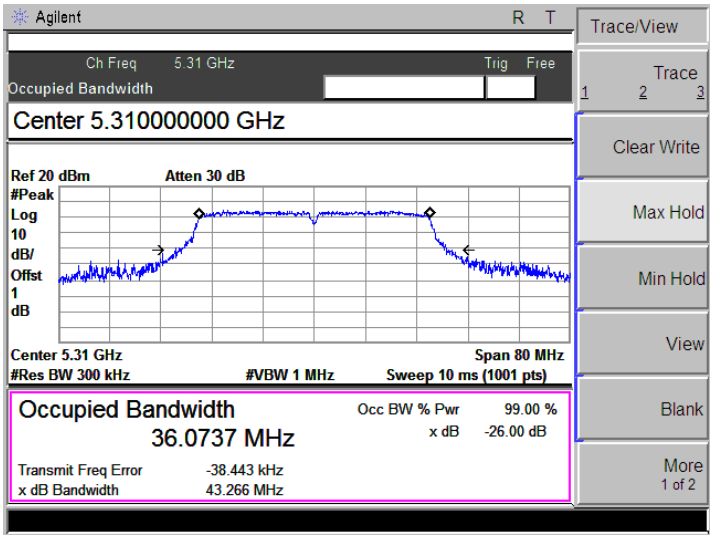
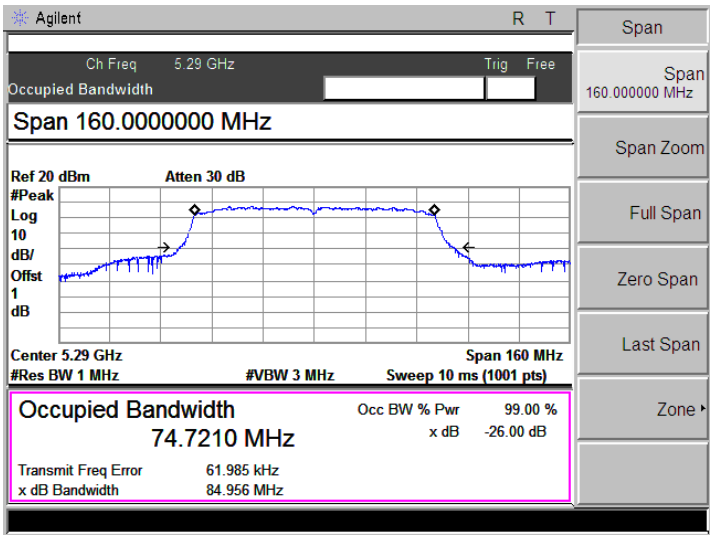
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

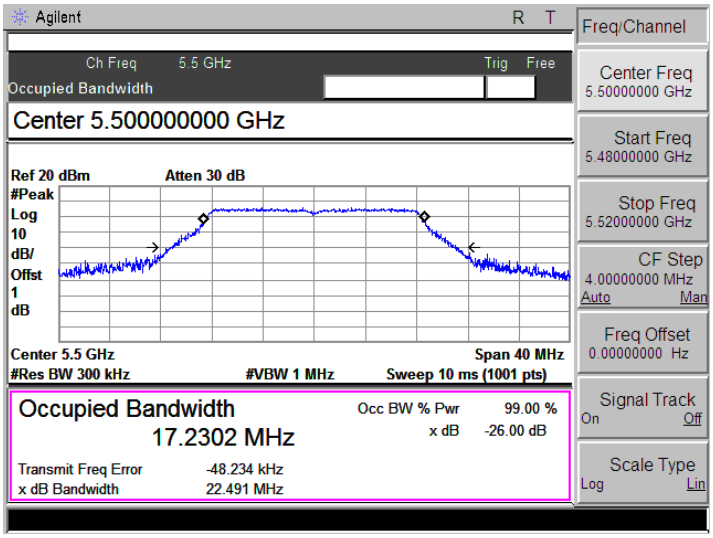
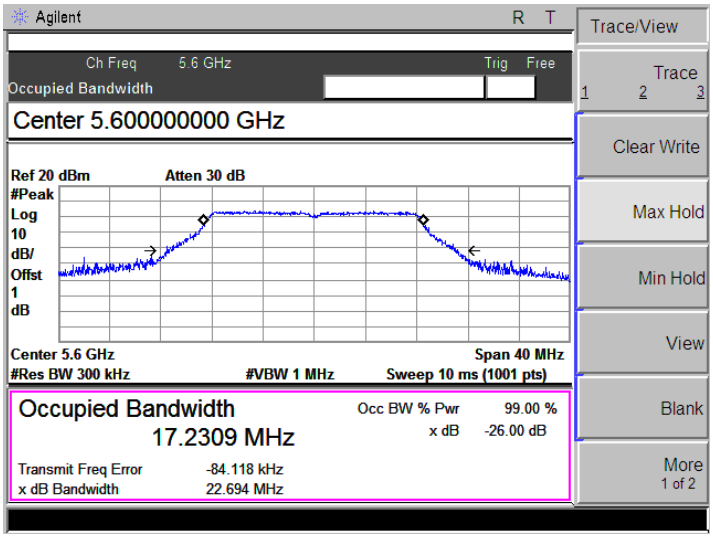
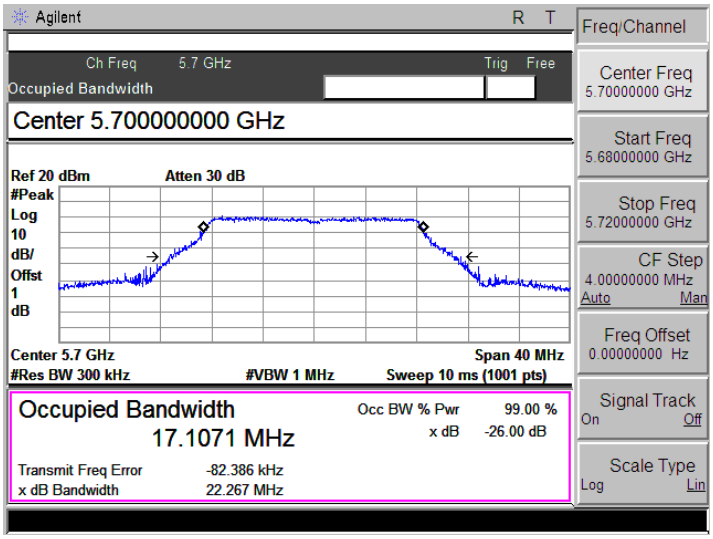
5250-5350MHz

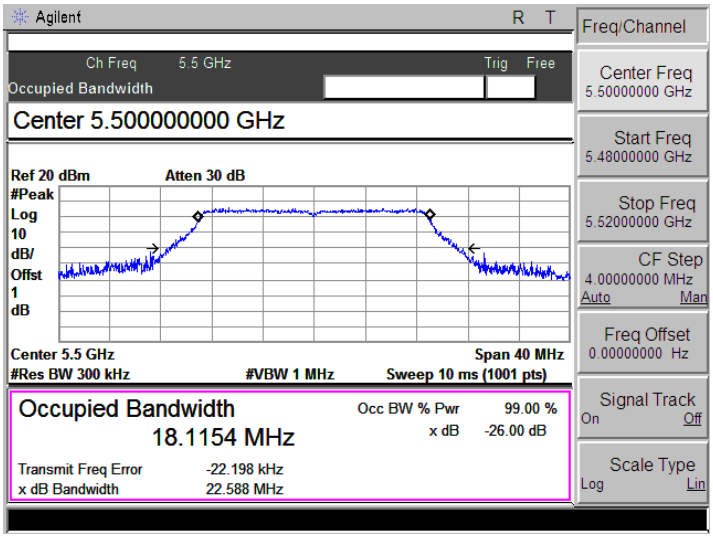
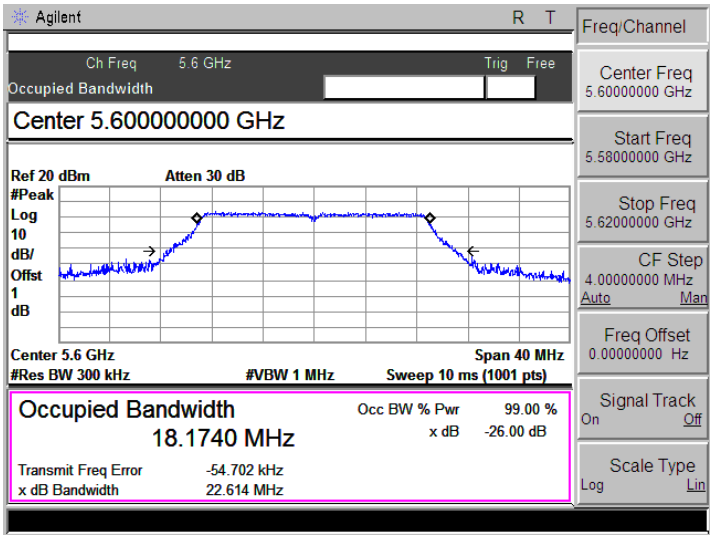
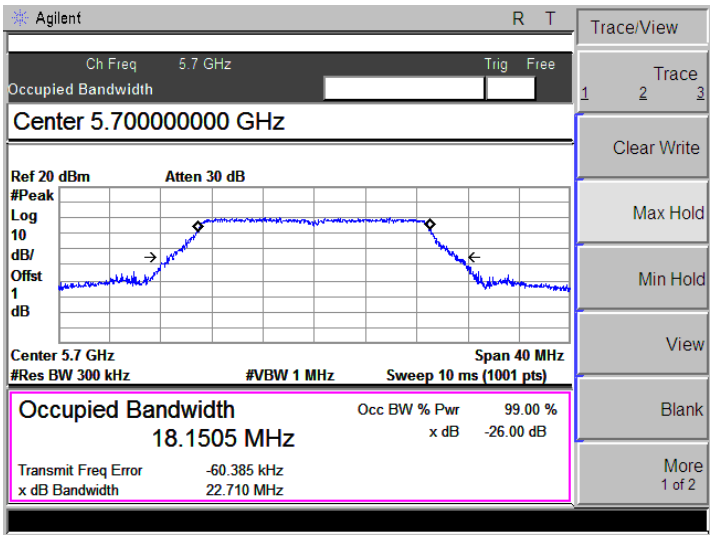
802.11a-Low	
802.11a-Middle	
802.11a-High	

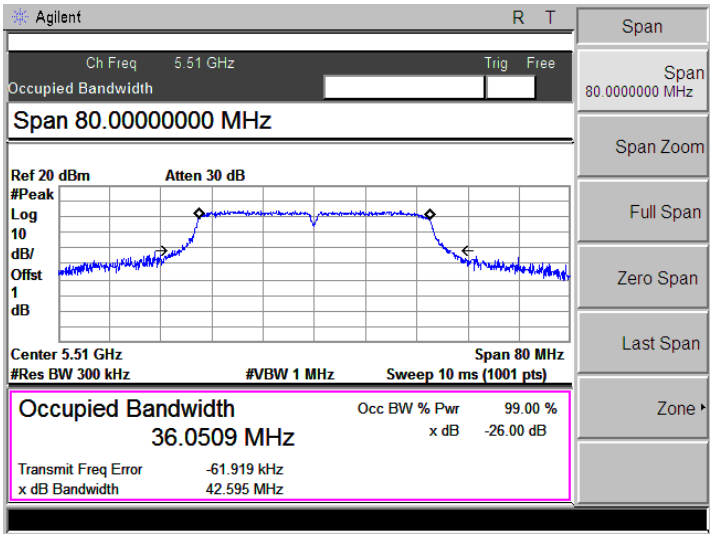
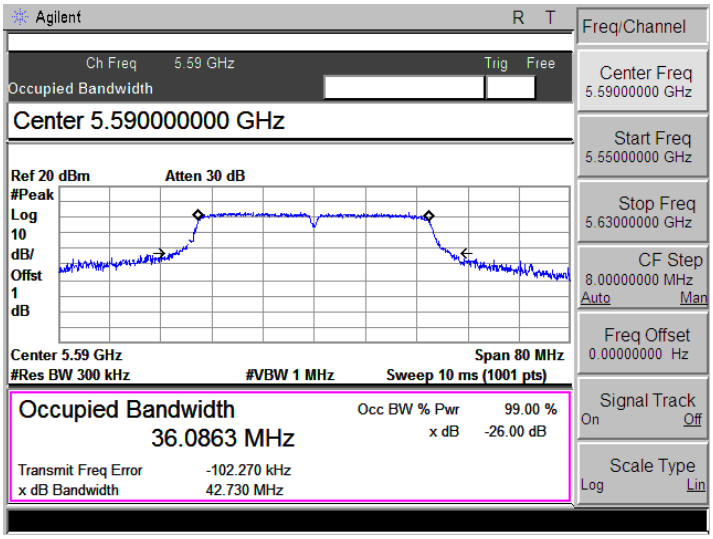
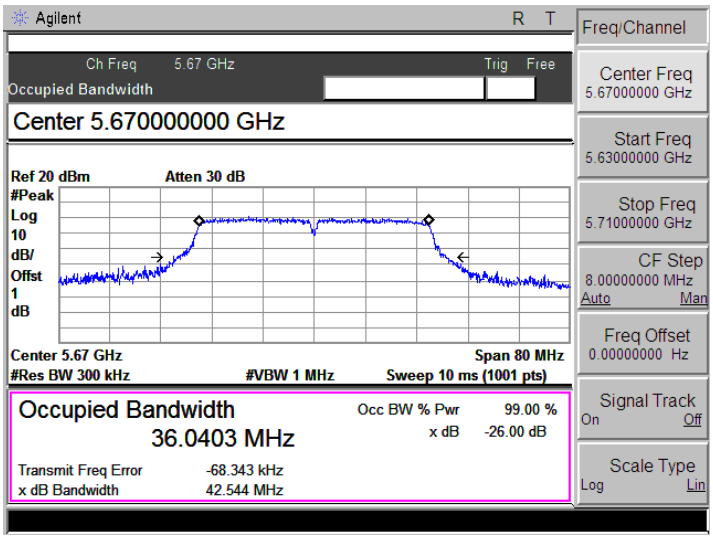
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

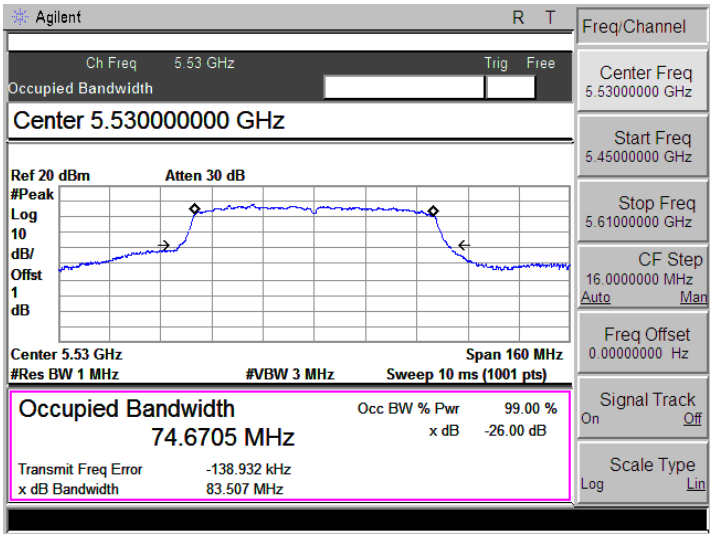
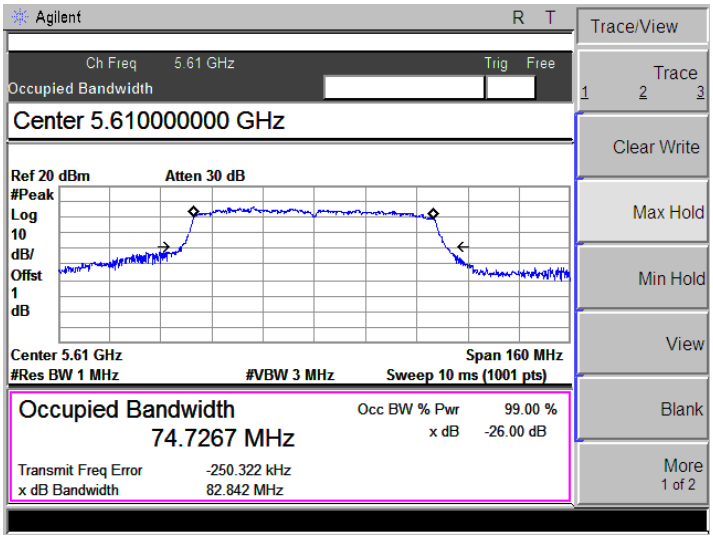
802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

5470-5725MHz

802.11a-Low	
802.11a-Middle	
802.11a-High	

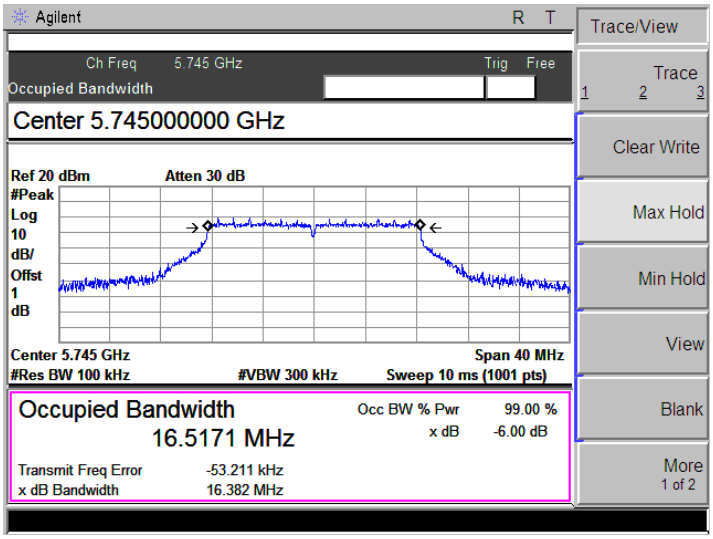
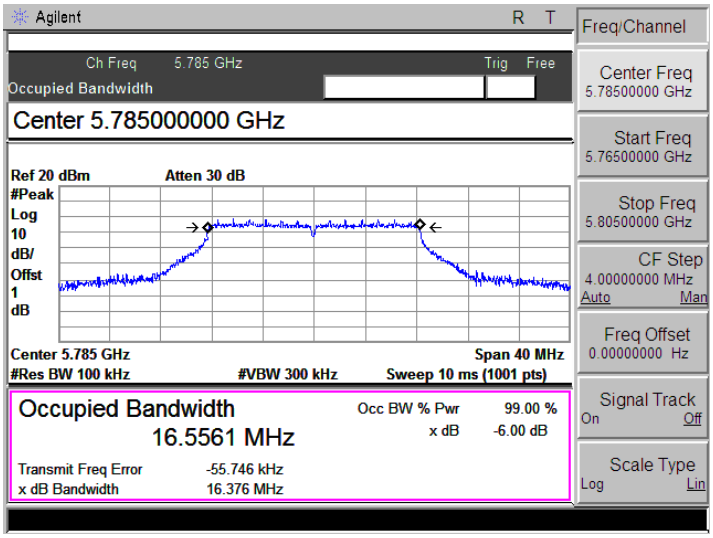
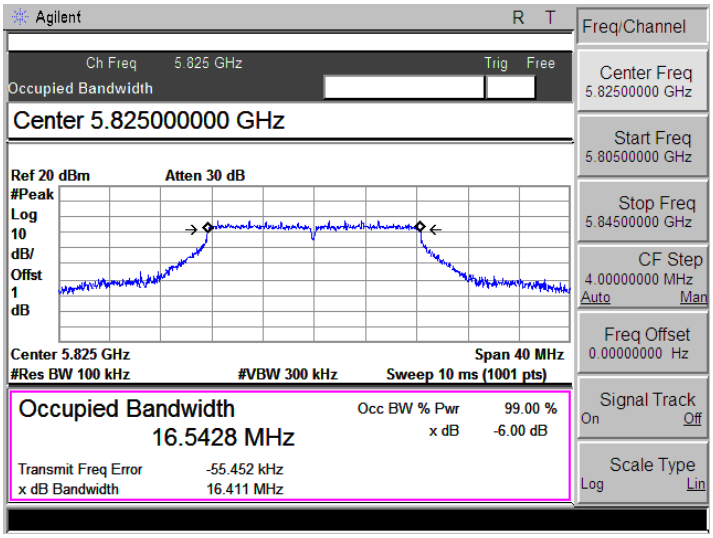
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

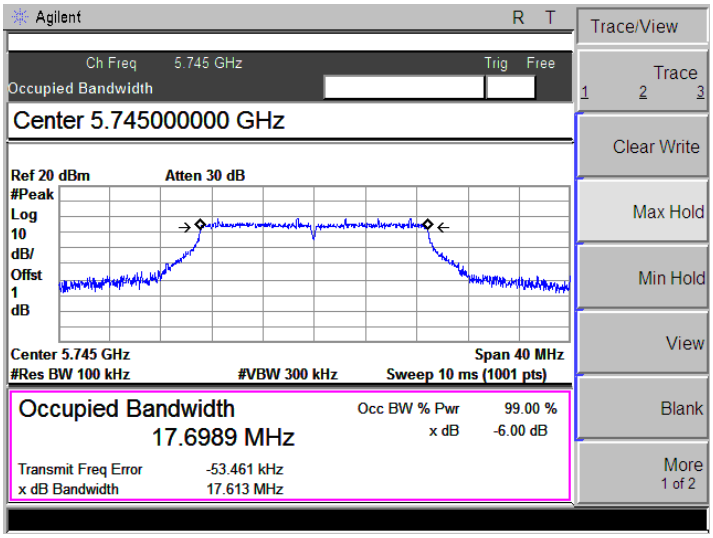
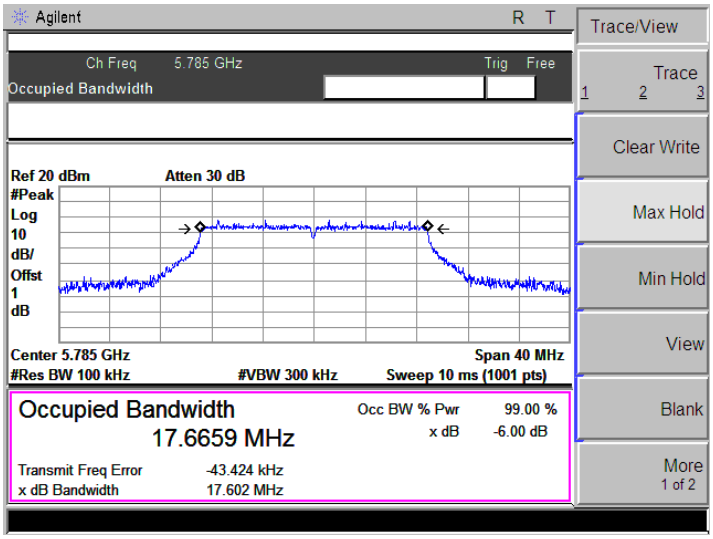
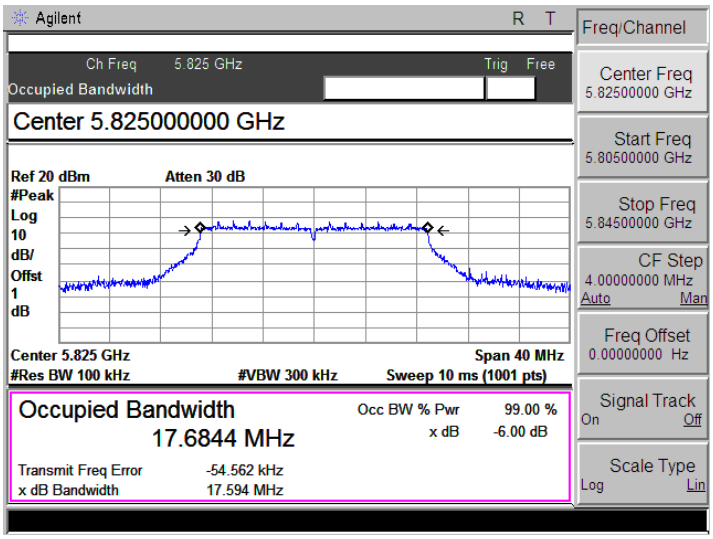
802.11n-HT40-Low	
802.11n-HT40- Middle	
802.11n-HT40-High	

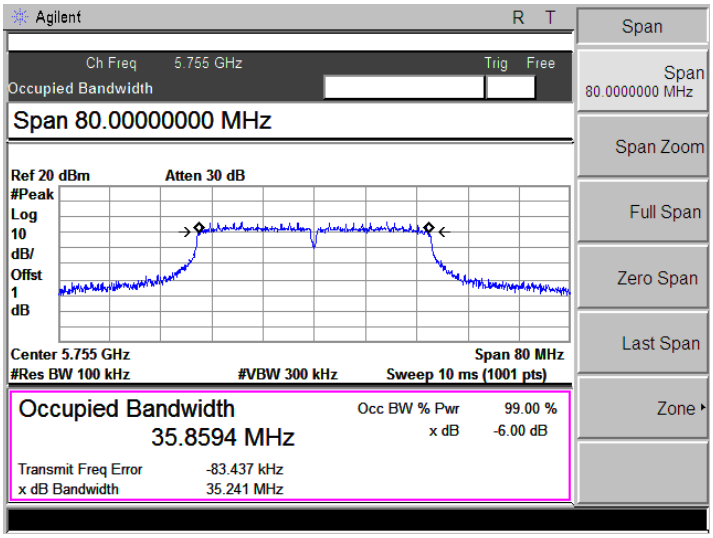
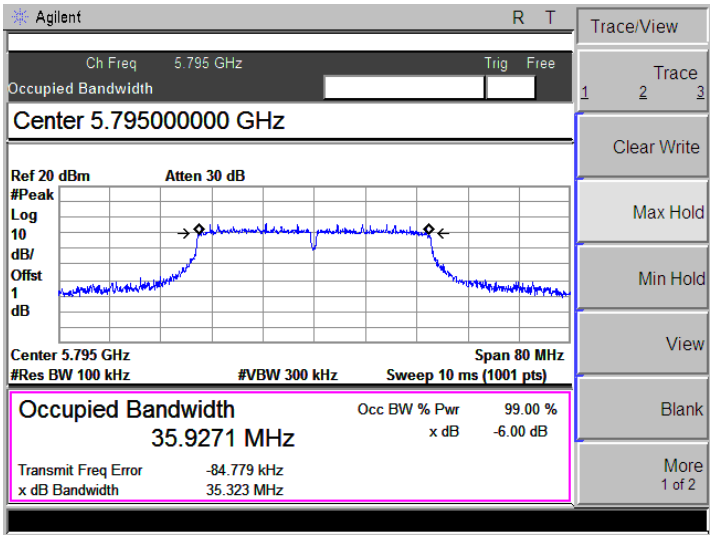
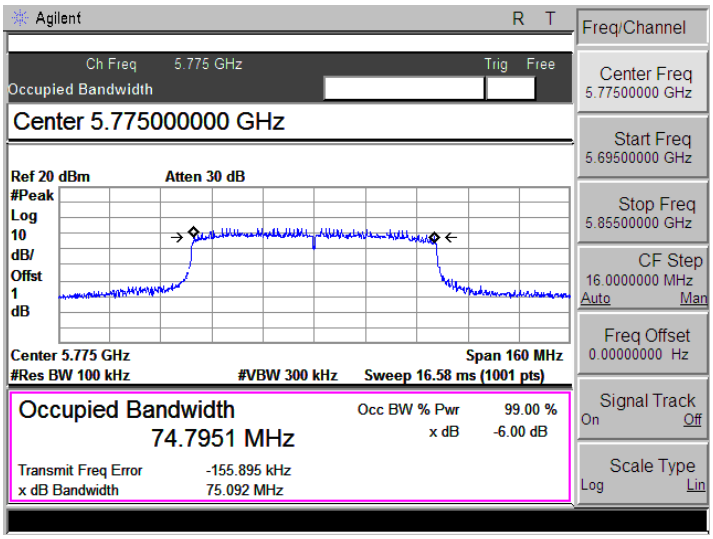
802.11ac-HT80	
802.11ac-HT80	

-6dB

5725-5850MHz

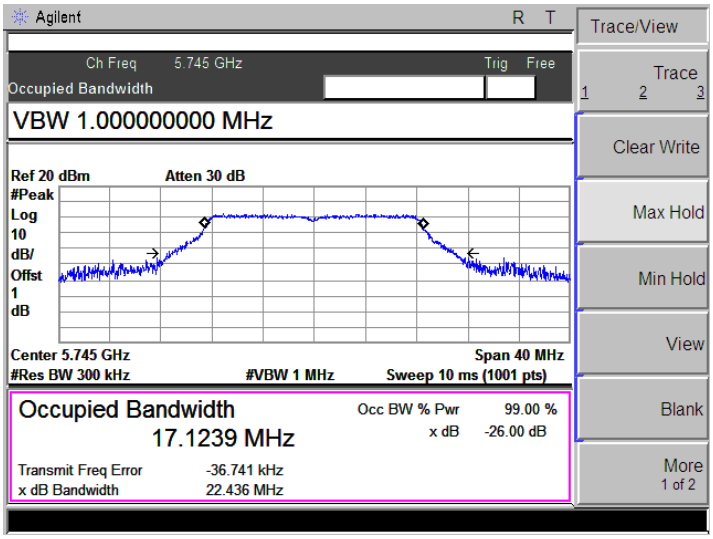
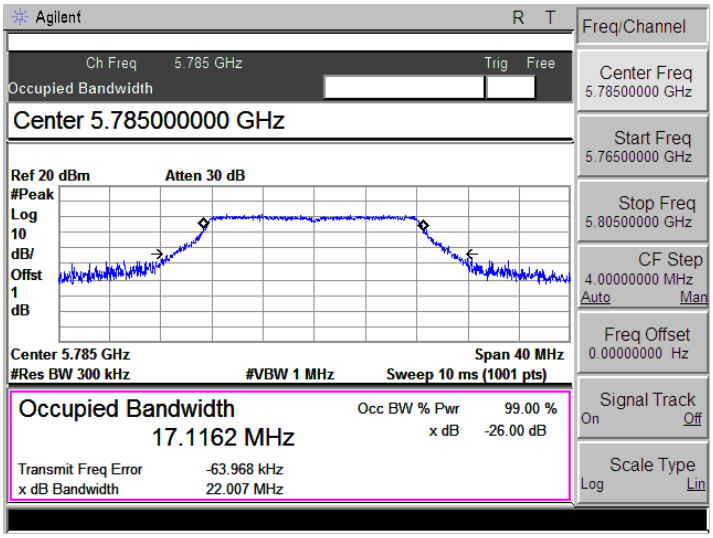
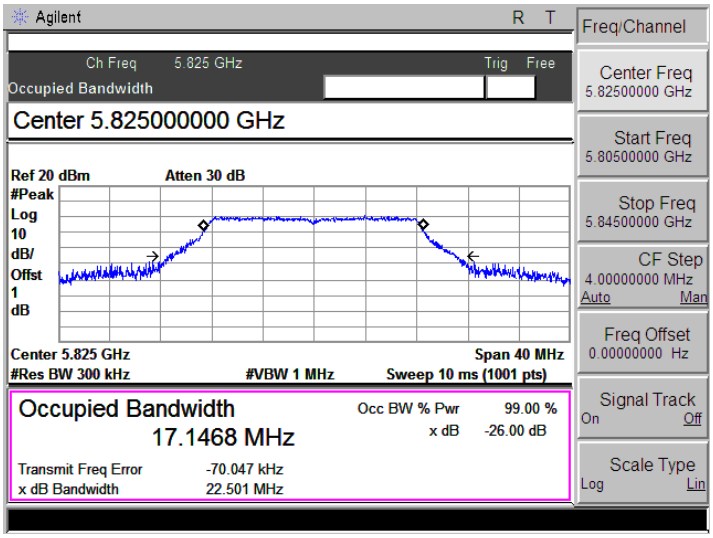
802.11a-Low	
802.11a-Middle	
802.11a-High	

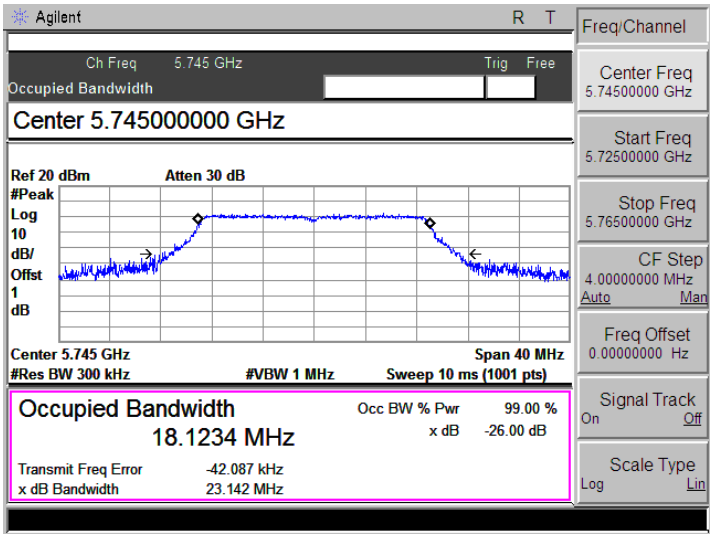
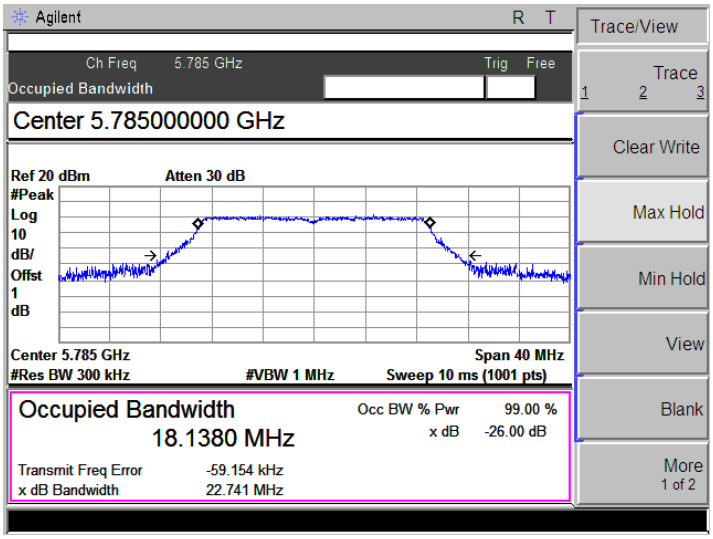
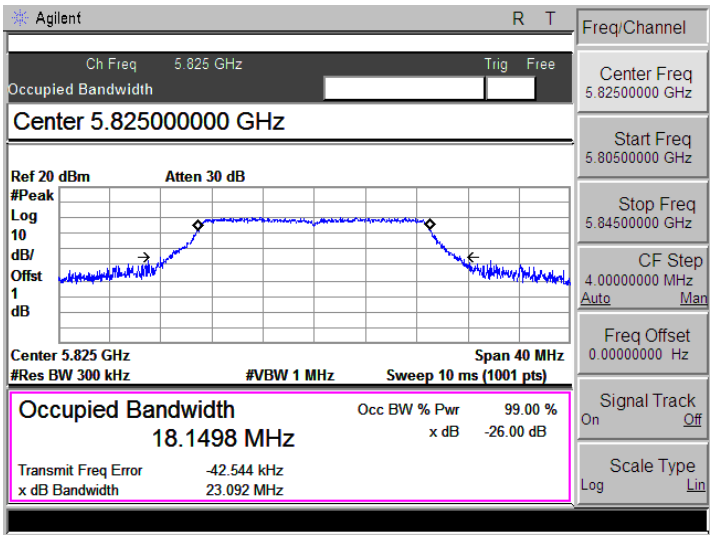
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

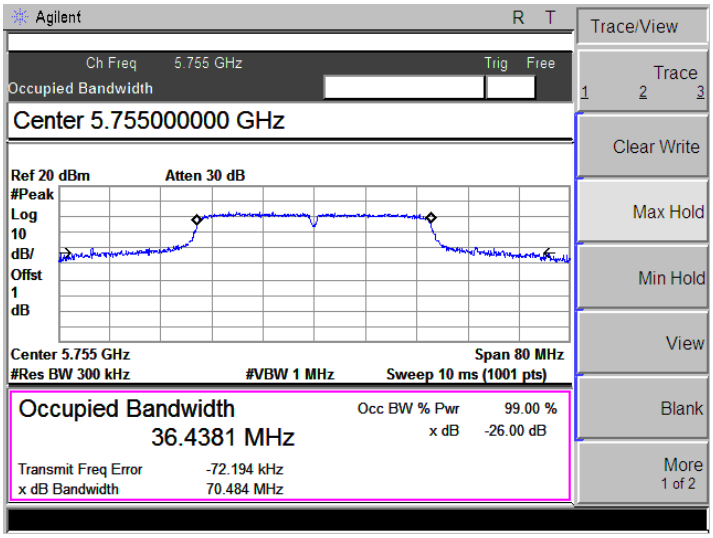
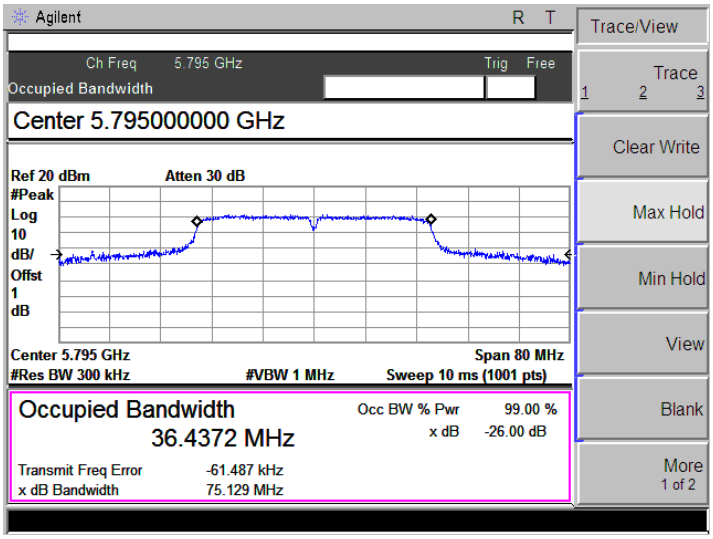
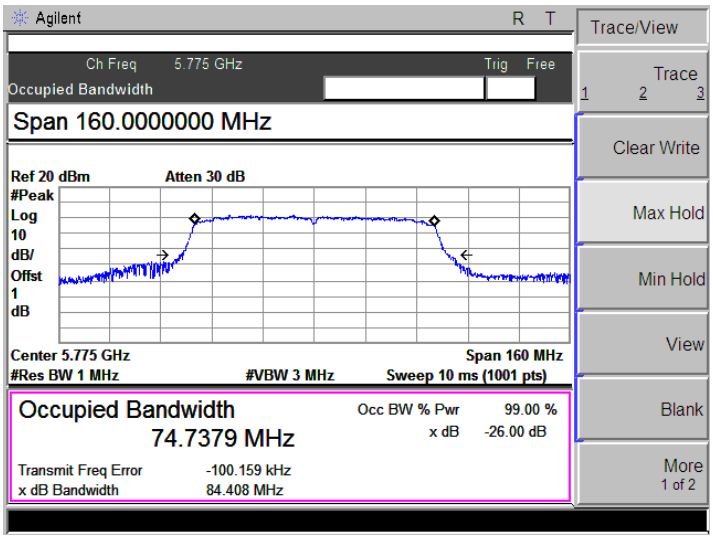
802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

99%OBW

5725-5850MHz

802.11a-Low	
802.11a-Middle	
802.11a-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

APPENDIX C

Maximum Conducted Output Power

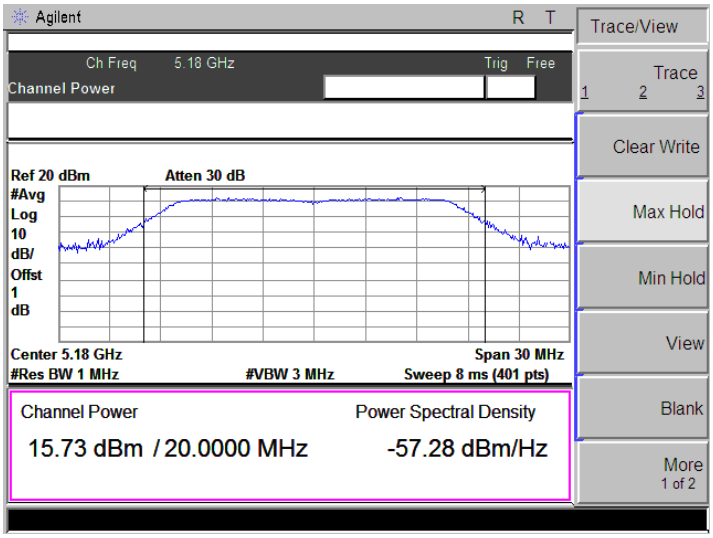
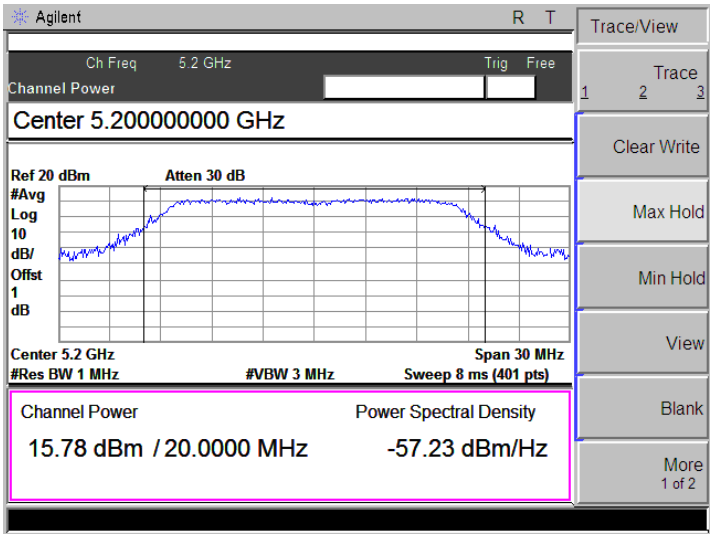
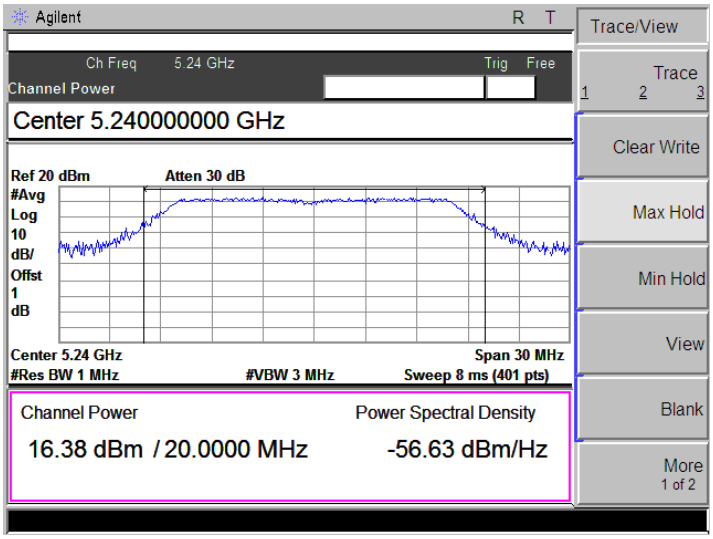
U-NII-1:5150-5250MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5180	15.73	23.98
	5200	15.78	23.98
	5240	16.38	23.98
802.11n-HT20	5180	13.27	23.98
	5200	13.81	23.98
	5240	14.71	23.98
802.11n-HT40	5190	12.98	23.98
	5230	13.37	23.98
802.11ac VH80	5210	11.84	23.98

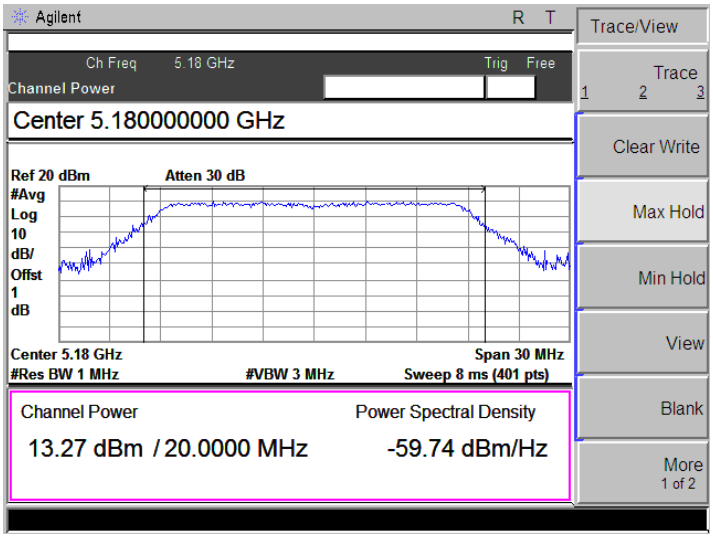
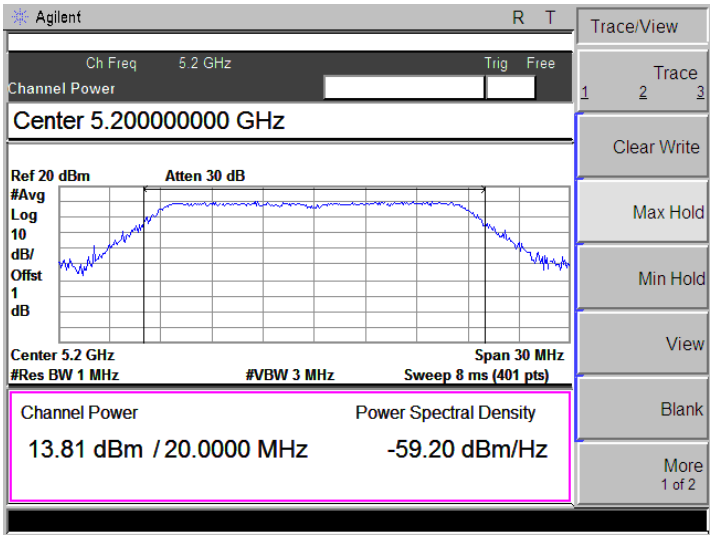
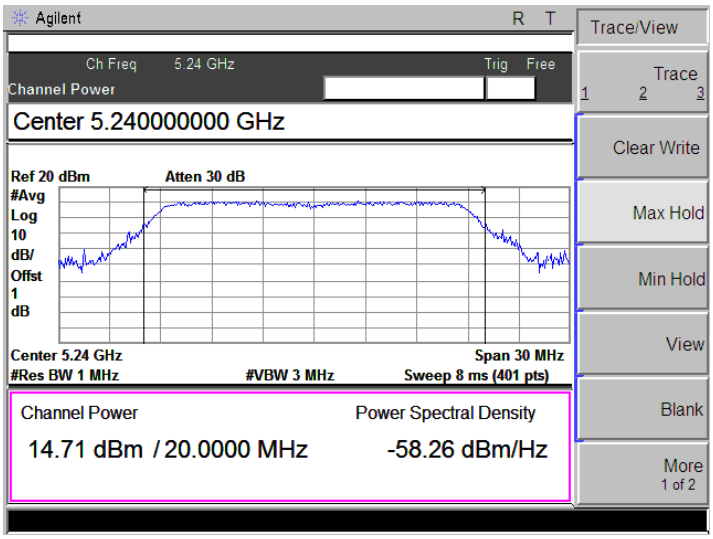
U-NII-2A: 5250-5350MHz			
Test mode	Frequency MHz	Output Power DBm	Limit dBm
802.11a	5260	15.95	23.98
	5280	16.19	23.98
	5320	15.78	23.98
802.11n-HT20	5260	14.54	23.98
	5280	14.36	23.98
	5320	13.91	23.98
802.11n-HT40	5270	13.74	23.98
	5310	13.30	23.98
802.11ac VH80	5290	12.06	23.98

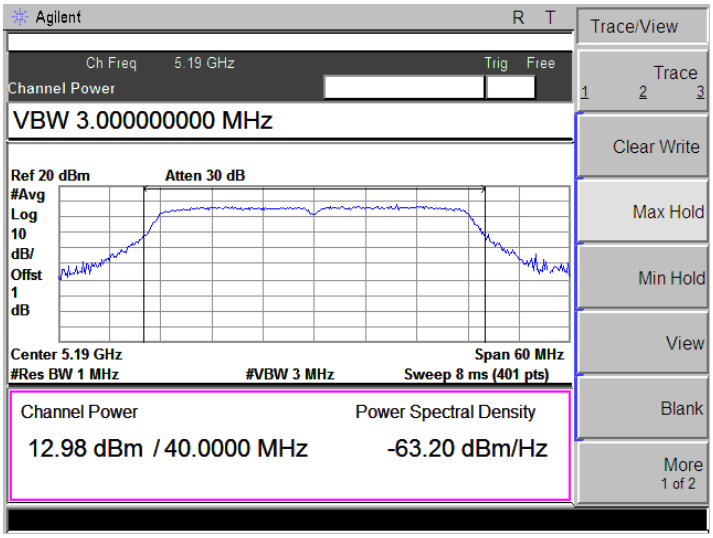
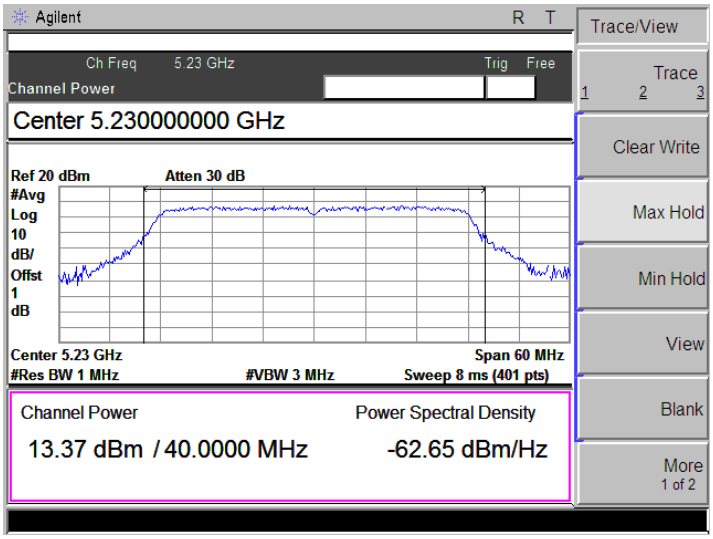
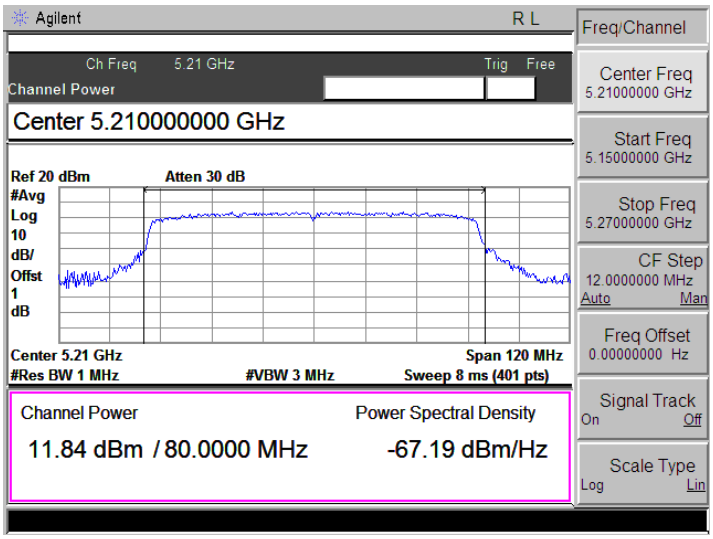
U-NII-2C: 5470-5725MHz			
Test mode	Frequency MHz	Output Power DBm	Limit dBm
802.11a	5500	15.79	23.98
	5600	15.41	23.98
	5700	14.20	23.98
802.11n-HT20	5500	14.23	23.98
	5600	14.12	23.98
	5700	12.75	23.98
802.11n-HT40	5510	13.65	23.98
	5590	13.70	23.98
	5670	13.18	23.98
802.11ac VH80	5530	11.63	23.98
	5610	11.88	23.98

U-NII-3: 5725-5850MHz			
Test mode	Frequency MHz	Output Power dBm	Limit dBm
802.11a	5745	14.93	30.00
	5785	14.28	30.00
	5825	13.71	30.00
802.11n-HT20	5745	13.95	30.00
	5785	13.01	30.00
	5825	12.27	30.00
802.11n-HT40	5755	12.97	30.00
	5795	12.33	30.00
802.11ac VH80	5775	11.55	30.00

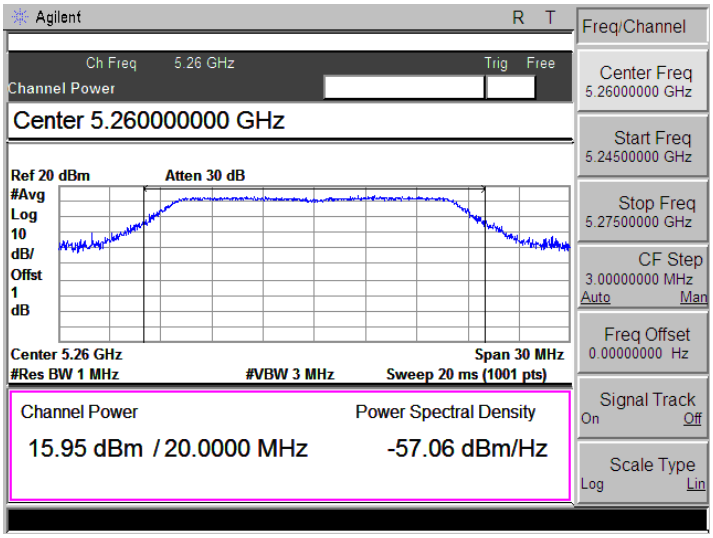
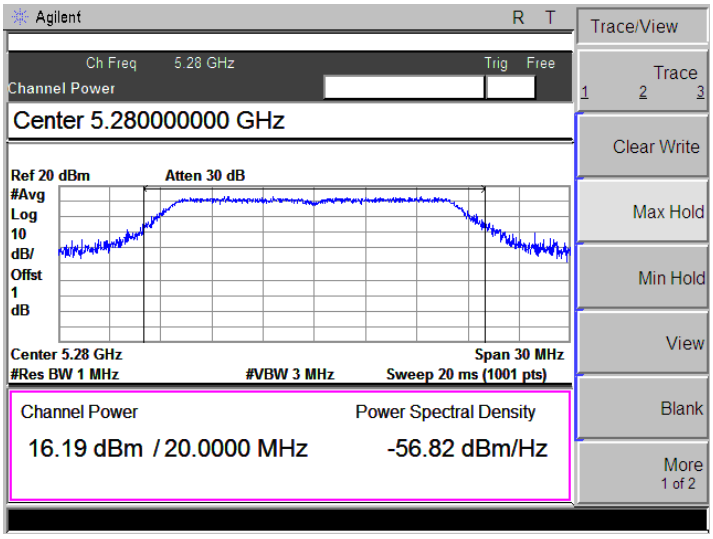
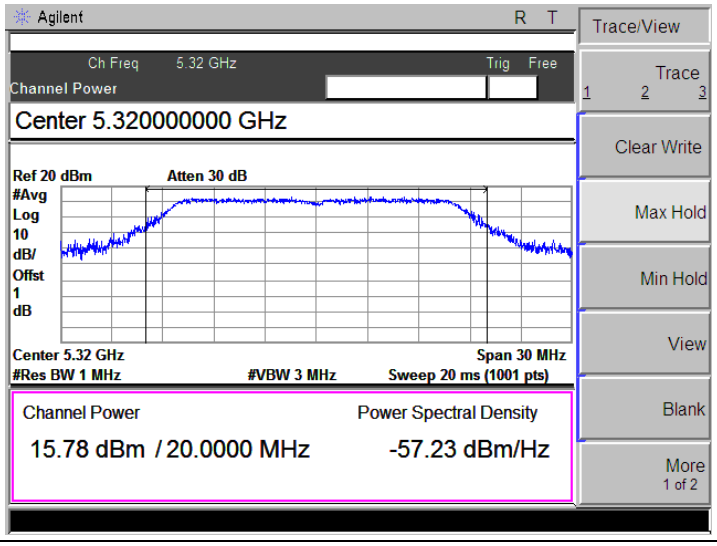
5150-5250MHz

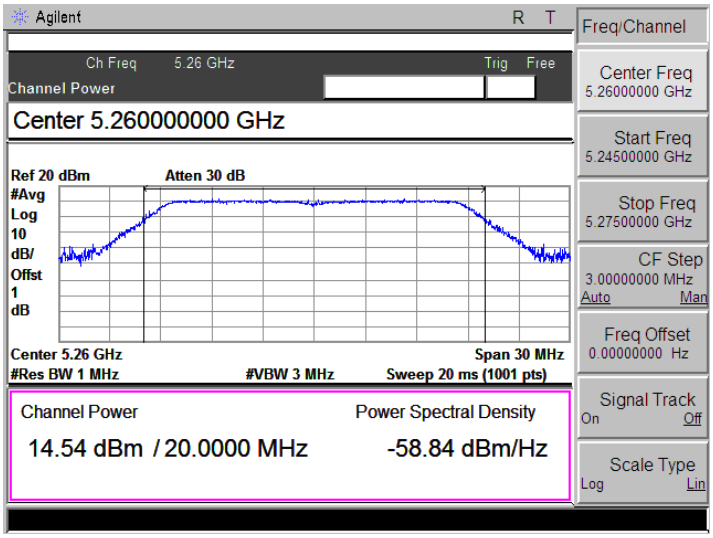
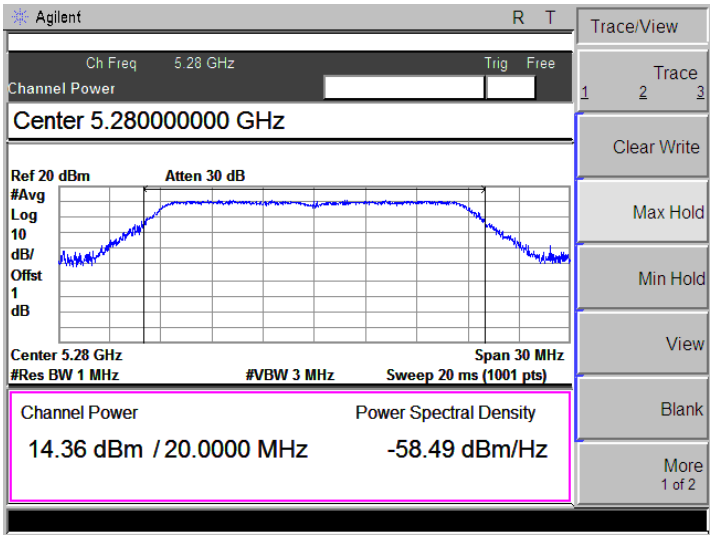
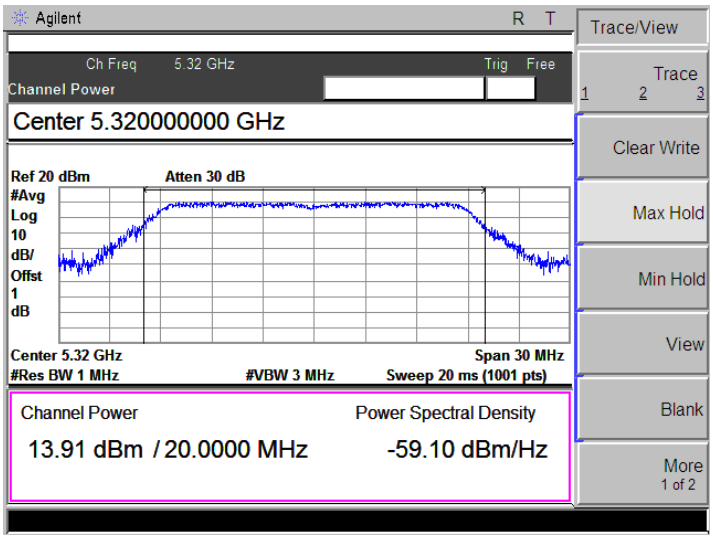
802.11a-Low	
802.11a-Middle	
802.11a-High	

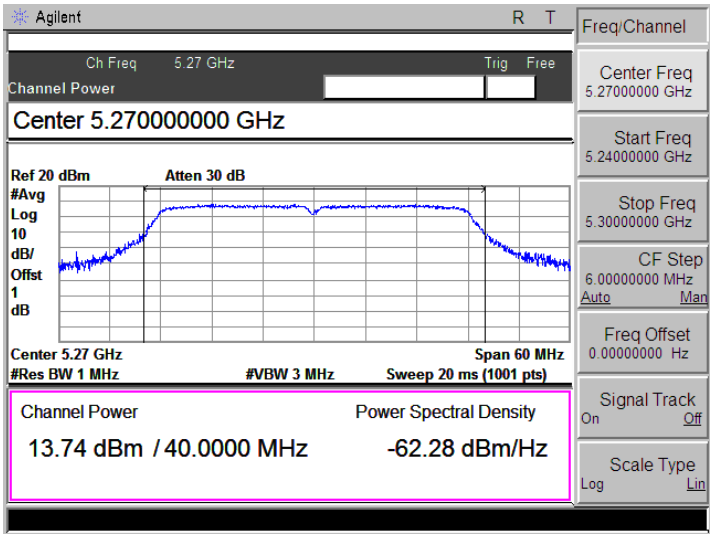
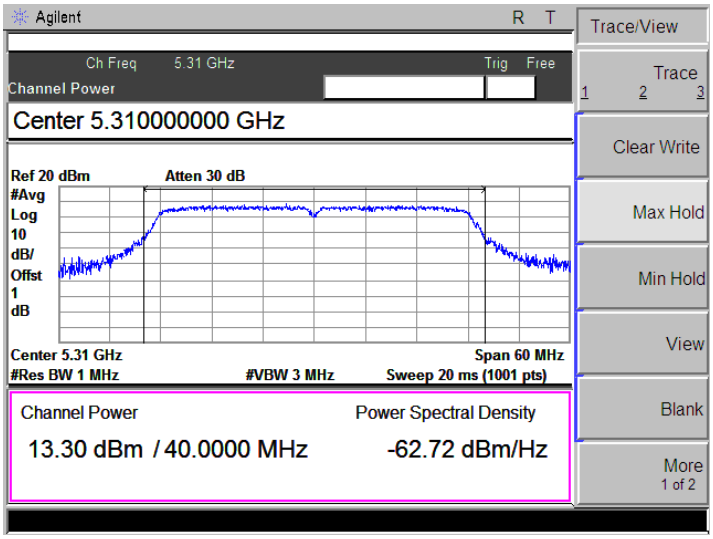
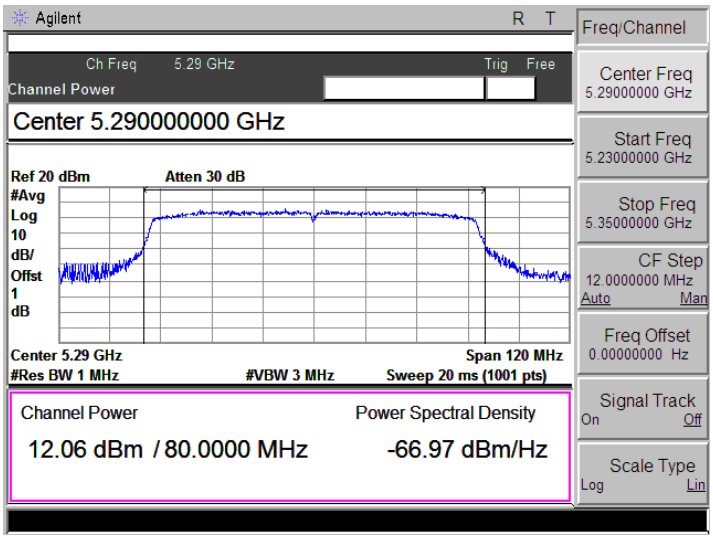
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

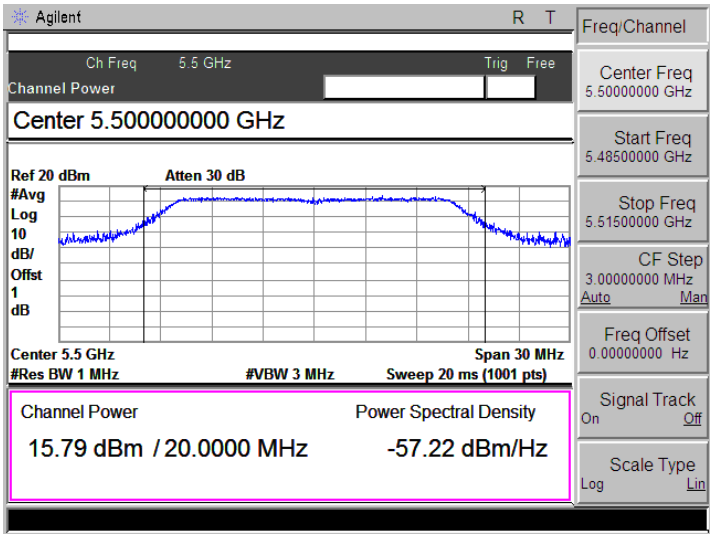
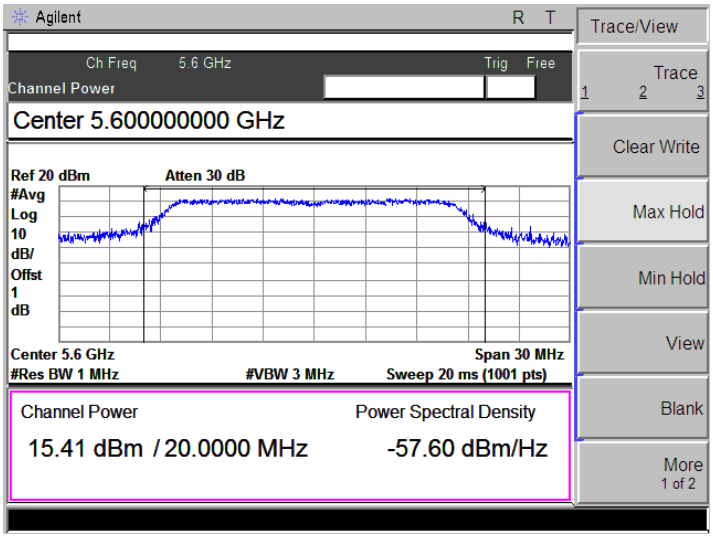
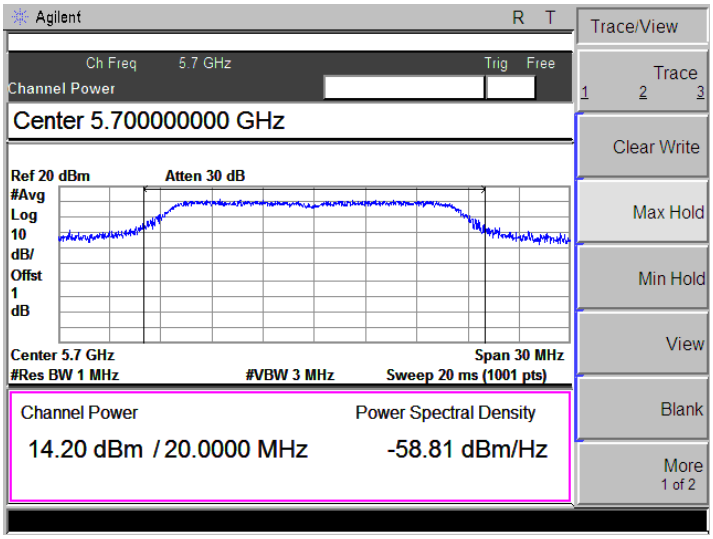
5250-5350MHz

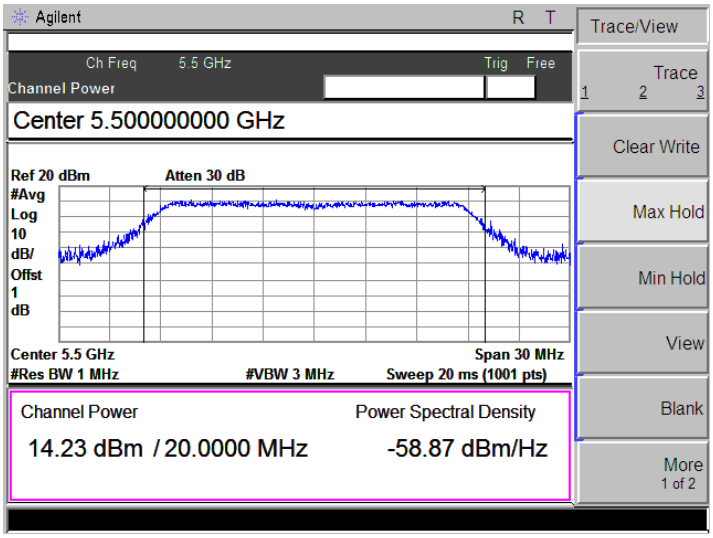
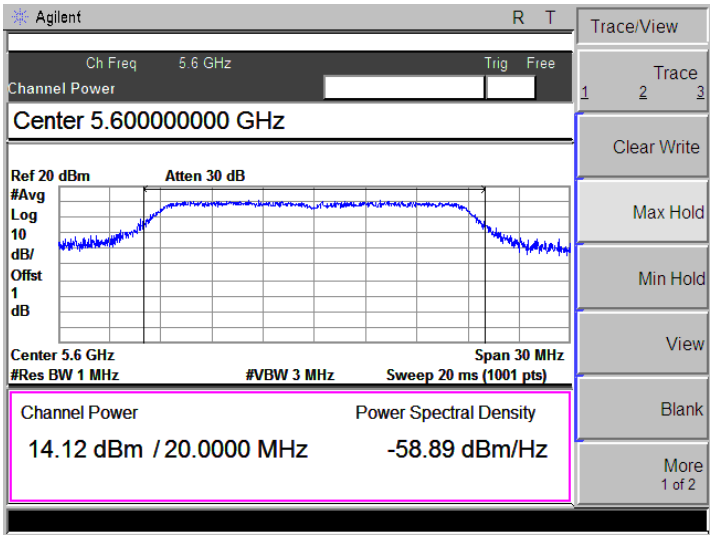
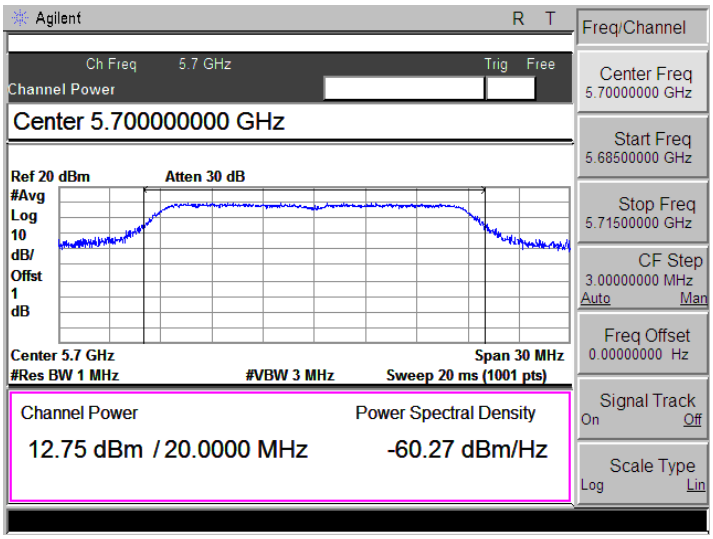
802.11a-Low	
802.11a-Middle	
802.11a-High	

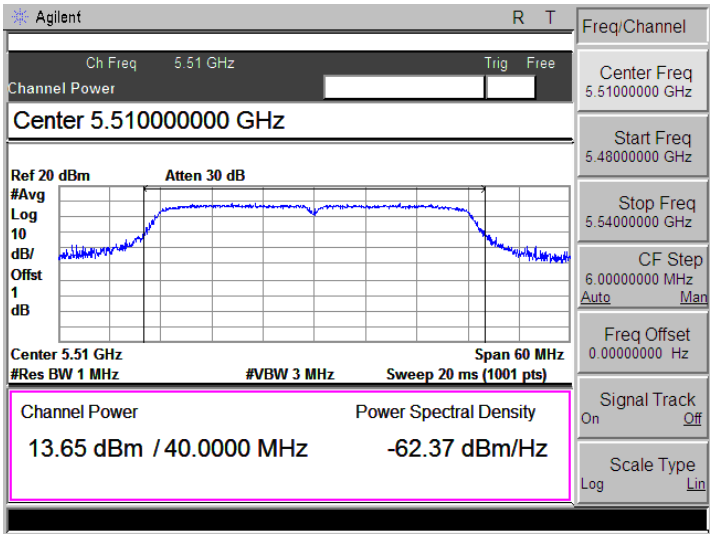
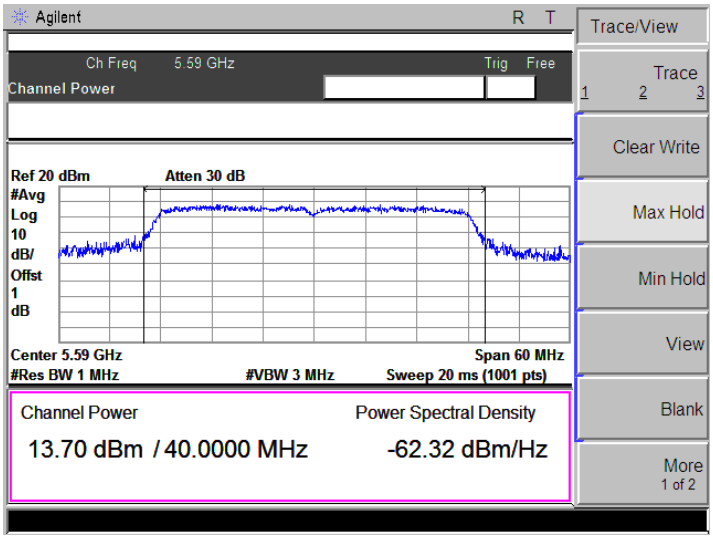
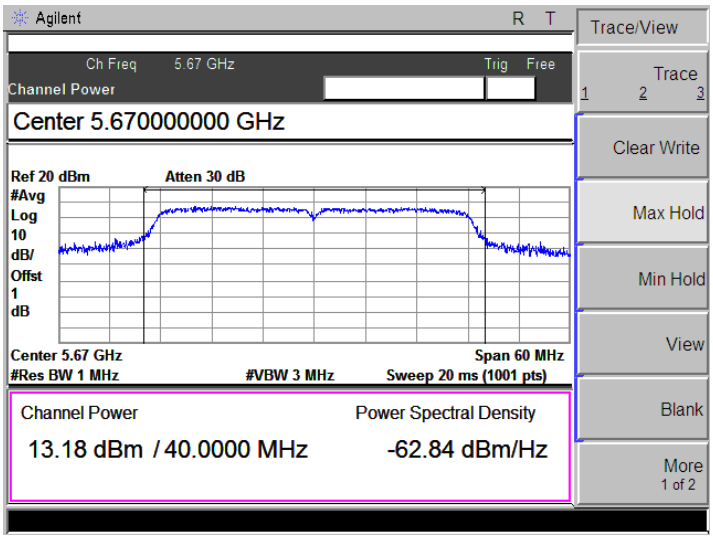
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

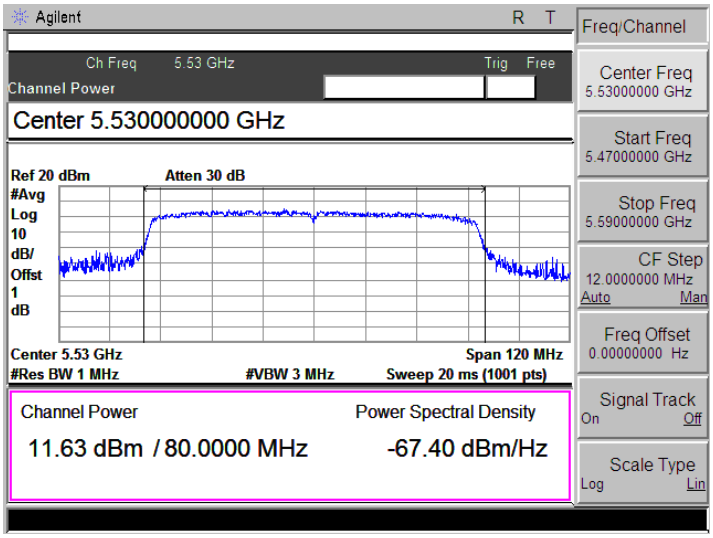
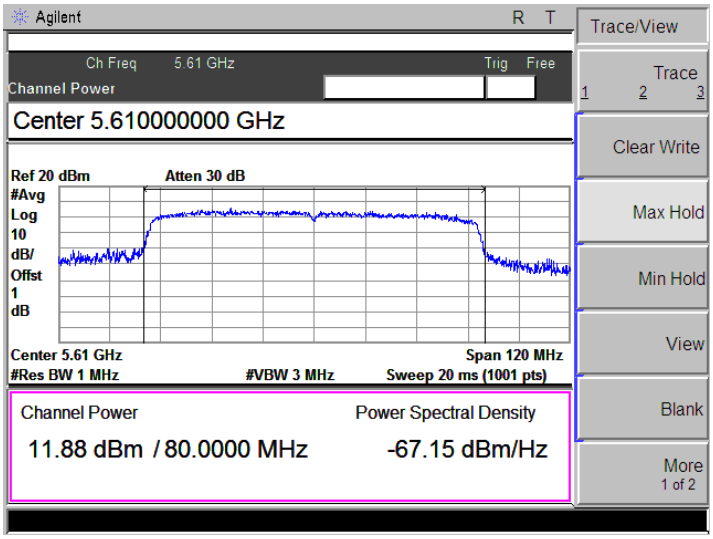
802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

5470-5725MHz

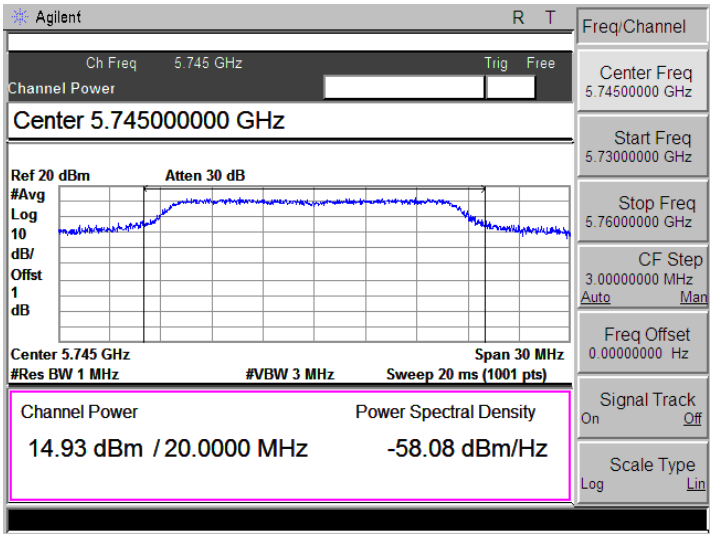
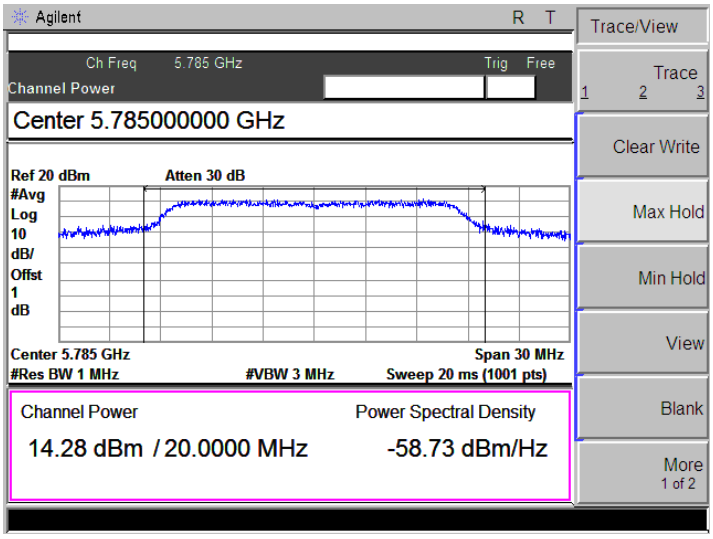
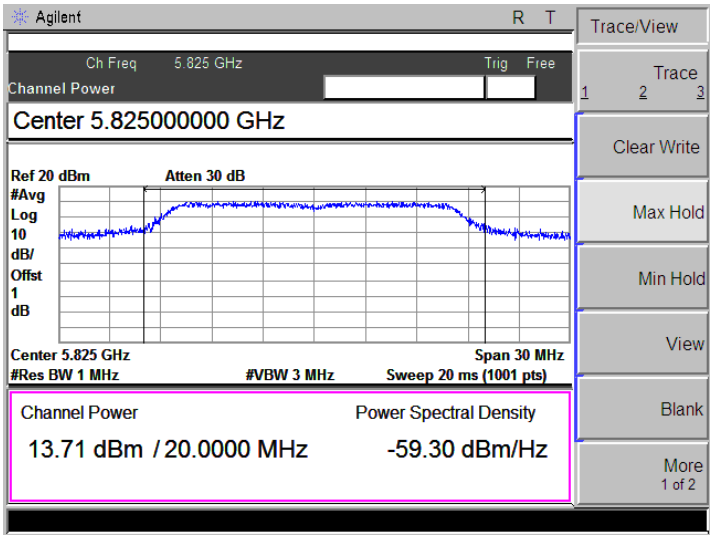
802.11a-Low	
802.11a-Middle	
802.11a-High	

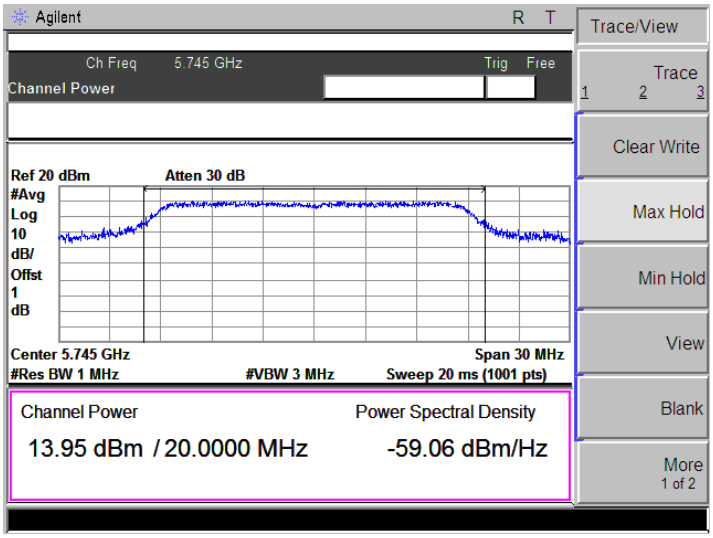
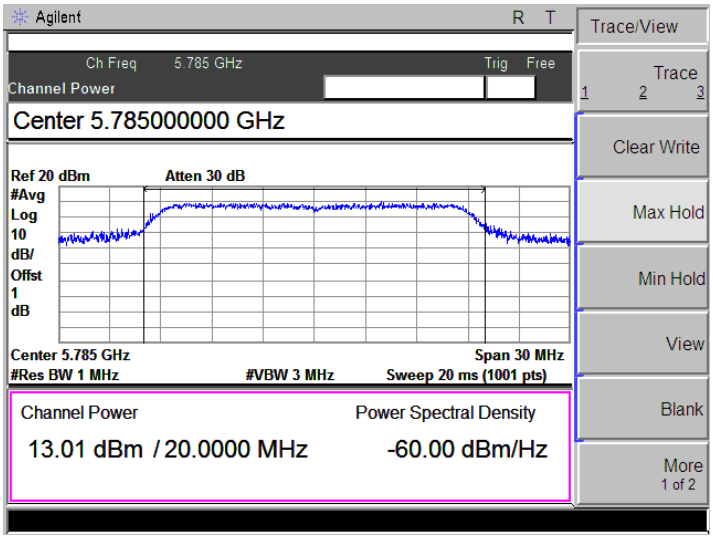
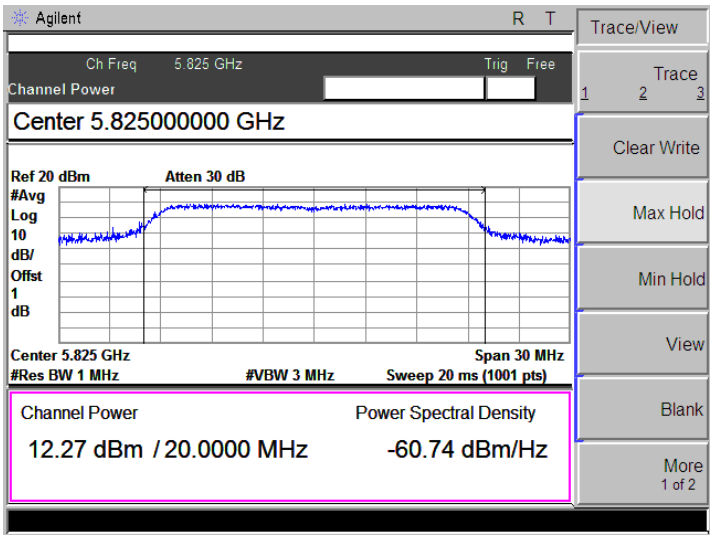
802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

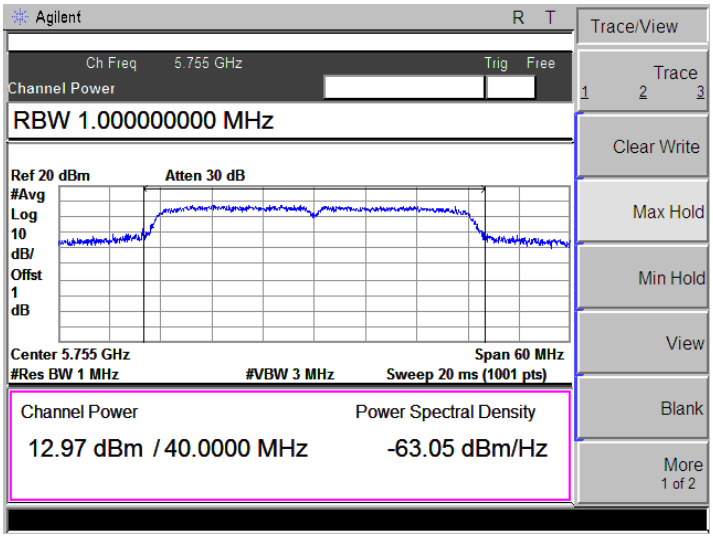
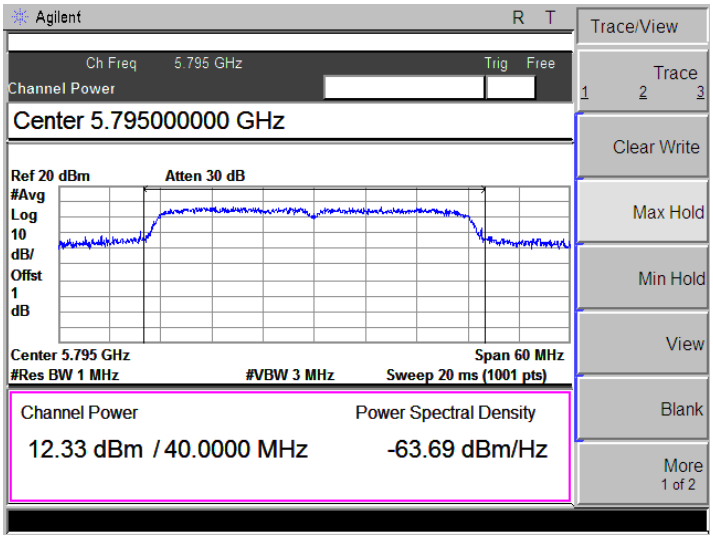
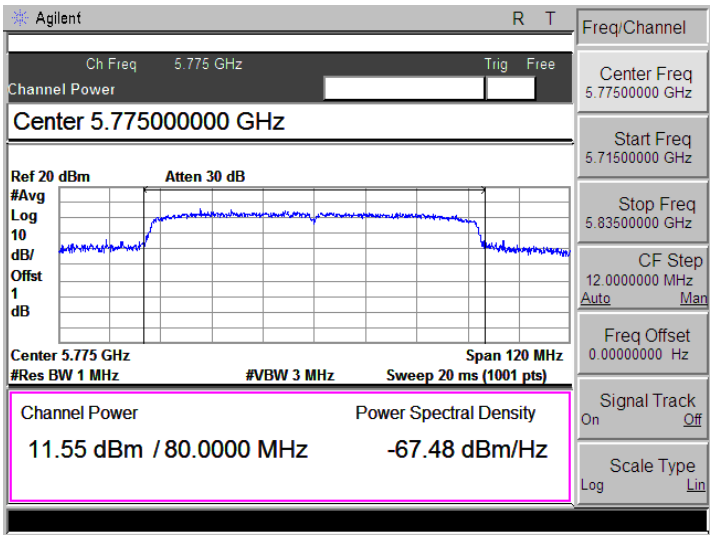
802.11n-HT40-Low	
802.11n-HT40- Middle	
802.11n-HT40-High	

802.11ac-HT80	
802.11ac-HT80	

5725-5850MHz

802.11a-Low	
802.11a-Middle	
802.11a-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

802.11n-HT40-Low	
802.11n-HT40-High	
802.11ac-HT80-Low	

APPENDIX D

Frequency Stability

U-NII-1:5150-5250MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	11.1	-30	1503	0.2891
100%		-20	1510	0.2904
100%		-10	1510	0.2903
100%		0	1507	0.2898
100%		+10	1505	0.2893
100%		+20	1507	0.2897
100%		+30	1510	0.2905
100%		+40	1505	0.2895
100%		+50	1504	0.2893
Low Battery power	12.21	+20	1507	0.2897
High Battery power	9.99	+20	1509	0.2901

U-NII-1: 5250-5350MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	11.1	-30	1508	0.2855
100%		-20	1503	0.2847
100%		-10	1506	0.2853
100%		0	1507	0.2854
100%		+10	1505	0.2850
100%		+20	1504	0.2848
100%		+30	1506	0.2851
100%		+40	1505	0.2849
100%		+50	1504	0.2848
Low Battery power	12.21	+20	1511	0.2863
High Battery power	9.99	+20	1510	0.2859

U-NII-1: 5470-5725MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	11.1	-30	1509	0.2695
100%		-20	1511	0.2698
100%		-10	1503	0.2684
100%		0	1502	0.2683
100%		+10	1503	0.2685
100%		+20	1506	0.2690
100%		+30	1506	0.2689
100%		+40	1502	0.2682
100%		+50	1505	0.2687
Low Battery power	12.21	+20	1510	0.2697
High Battery power	9.99	+20	1502	0.2682

U-NII-1:5725-5850MHz worst case at 802.11a middle channel				
Voltage(%)	Power(VDC)	TEMP(℃)	Freq.Dev(Hz)	Deviation
100%	11.1	-30	1505	0.2606
100%		-20	1509	0.2612
100%		-10	1507	0.2609
100%		0	1506	0.2608
100%		+10	1505	0.2606
100%		+20	1506	0.2608
100%		+30	1505	0.2607
100%		+40	1506	0.2607
100%		+50	1506	0.2608
Low Battery power	12.21	+20	1508	0.2612
High Battery power	9.99	+20	1504	0.2604

APPENDIX PHOTOGRAPHS

Please refer to "ANNEX"

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