FCC TEST REPORT

For

NextVPU (Shanghai) Co., Ltd

AngelEye Controller

Test Model: AngelEye B01

Additional Model No. : /

Prepared for	:	NextVPU (Shanghai) Co., Ltd
Address	:	Rm 501-07, Section A, Bldg. 1, #3000 Longdong Rd, Pudong New District, Shanghai, P.R. China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	Dec 07, 2017
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	Dec 07, 2017~Jan 09, 2018
Date of Report	:	Jan 09, 2018

FCC TEST REPORT

FCC CFR 47 PART 15 E(15.407)

Report Reference No.	:	**LCS171207059AEB**
Date of Issue	:	Jan 09, 2018
Testing Laboratory Name	:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name	:	**NextVPU (Shanghai) Co., Ltd**
Address	:	Rm 501-07, Section A, Bldg. 1, #3000 Longdong Rd, Pudong New District, Shanghai, P.R. China
Test Specification		
Standard	:	FCC CFR 47 PART 15 E(15.407): 2015 / ANSI C63.10: 2013
Test Report Form No.	:	LCSEMC-1.0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

Test Item Description.	:	**AngelEye Controller**
Trade Mark	:	N/A
Test Model	:	AngelEye B01
Ratings	:	DC 3.7V by Li-ion battery(6000mAh) Recharged input: DC 5V/2A by power adapter
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Calvin Weng	Dick Su	Gavin Liang
Calvin Weng/ Administrators	Dick Su/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS171207059AEB	Jan 09, 2018 Date of issue

Test Model.............................	:	AngelEye B01
EUT..	:	AngelEye Controller
Applicant..............................	**:**	**NextVPU (Shanghai) Co., Ltd**
Address.................................	:	Rm 501-07, Section A, Bldg. 1, #3000 Longdong Rd, Pudong New District, Shanghai, P.R. China
Telephone..............................	:	
Fax..	:	
Manufacturer.......................	**:**	**NextVPU (Shanghai) Co., Ltd**
Address..................................	:	Rm 501-07, Section A, Bldg. 1, #3000 Longdong Rd, Pudong New District, Shanghai, P.R. China
Telephone..............................	:	
Fax..	:	
Factory.................................	**:**	**NextVPU (Shanghai) Co., Ltd**
Address..................................	:	Rm 501-07, Section A, Bldg. 1, #3000 Longdong Rd, Pudong New District, Shanghai, P.R. China
Telephone..............................	:	
Fax..	:	

Test Result	**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
000	Jan 09, 2018	Initial Issue	Gavin Liang

TABLE OF CONTENTS

1. GENERAL INFORMATION 6
1.1. DESCRIPTION OF DEVICE (EUT) 6
1.2. SUPPORT EQUIPMENT LIST 7
1.3. EXTERNAL I/O 7
1.4. DESCRIPTION OF TEST FACILITY 7
1.5. STATEMENT OF THE MEASUREMENT UNCERTAINTY 7
1.6. MEASUREMENT UNCERTAINTY 7
1.7. DESCRIPTION OF TEST MODES 8
1.8. LIST OF MEASURING EQUIPMENT 9

2. TEST METHODOLOGY 10
2.1. EUT CONFIGURATION 10
2.2. EUT EXERCISE 10
2.3. GENERAL TEST PROCEDURES 10

3. SYSTEM TEST CONFIGURATION 11
3.1. JUSTIFICATION 11
3.2. EUT EXERCISE SOFTWARE 11
3.3. SPECIAL ACCESSORIES 11
3.4. BLOCK DIAGRAM/SCHEMATICS 11
3.5. EQUIPMENT MODIFICATIONS 11
3.6. TEST SETUP 11

4. SUMMARY OF TEST RESULTS 12

5. TEST RESULT 13
5.1. ON TIME AND DUTY CYCLE 13
5.2. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 15
5.3. POWER SPECTRAL DENSITY MEASUREMENT 17
5.4. 99% AND 26DB OCCUPIED BANDWIDTH MEASUREMENT 24
5.5. RADIATED EMISSIONS MEASUREMENT 30
5.6. POWER LINE CONDUCTED EMISSIONS 40
5.7 UNDESIRABLE EMISSIONS MEASUREMENT 42
5.8. ANTENNA REQUIREMENTS 50

6. TEST SETUP PHOTOGRAPHS OF EUT 52

7. EXTERIOR PHOTOGRAPHS OF THE EUT 52

8. INTERIOR PHOTOGRAPHS OF THE EUT 52

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	AngelEye Controller
Test Model	:	AngelEye B01
Power Supply	:	DC 3.7V by Li-ion battery(6000mAh) Recharged input: DC 5V/2A by power adapter
Hardware Version	:	B01_MB_V02
Software Version	:	V7.0
Bluetooth	:	
Frequency Range	:	2.402-2.480GHz
Channel Number	:	40 channels for Bluetooth V4.1 (BT LE)
Channel Spacing	:	2MHz for Bluetooth V4.1 (BT LE)
Modulation Type	:	GFSK for Bluetooth V4.1 (BT LE)
Bluetooth Version	:	V4.1
Antenna Description	:	PIFA Antenna
Antenna Gain	:	Antenna 0, maximum antenna gain is 2.0dBi
WIFI(2.4G Band)	:	
WLAN	:	Supports IEEE 802.11b/802.11g/802.11n
WLAN FCC Operation Frequency	:	IEEE 802.11b/g/n HT20: 2412 – 2462 MHz IEEE 802.11n HT40: 2422 – 2452 MHz
Channel Spacing	:	5MHz
WLAN Channel Number	:	11 Channels for WIFI 20MHz Bandwidth(IEEE 802.11b/g/n HT20) 7 Channels for WIFI 40MHz Bandwidth(IEEE 802.11n HT40)
Modulation Type	:	IEEE 802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	:	PIFA Antenna
Antenna Gain	:	Antenna 0: maximum antenna gain is 2.0dBi Antenna 1: maximum antenna gain is 2.0dBi
Directional Gain	:	$2.0+10\log_{10}(2)=5.01$dBi for 802.11n mode
WIFI(5G Band)	:	
Frequency Range	:	5180-5240MHz
Channel Number	:	4 Channels for WIFI 20MHz Bandwidth(IEEE 802.11a/n HT20) 2 Channels for WIFI 40MHz Bandwidth(IEEE 802.11n HT40)
Modulation Type	:	IEEE 802.11a/n20/n40: OFDM
Antenna Gain	:	Antenna 0: maximum antenna gain is 2.0dBi Antenna 1: maximum antenna gain is 2.0dBi
Directional Gain	:	$2.0+10\log_{10}(2)=5.01$dBi for 802.11n mode

1.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Chenyang electronics Co., Ltd	ADAPTER	CYSK10-050100-U	---	FCC VoC

1.3. External I/O

I/O Port Description	Quantity	Cable
USB Port(charge)	1	N/A
USB Port(OTG)	1	N/A

1.4. Description of Test Facility

FCC Registration Number. is 254912.

Industry Canada Registration Number. is 9642A-1.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

There is one 3m semi-anechoic chamber and one line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4: 2014, CISPR 32/EN 55032 and CISPR16-1-4 SVSWR requirements.

1.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Description of Test Modes

The EUT has been tested under operating condition.

The EUT was set to transmit at 100% duty cycle. This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in Y position.

For pre-testing, when performed power line conducted emission measurement, the input Voltage/Frequency AC 120V/60Hz and AC 240V/50Hz were used. Only recorded the worst case in this report.

Worst-case mode and channel used for 150 KHz-30 MHz power line conducted emissions was determined to be IEEE 802.11n20 mode (High Channel, 5180-5240MHz Band).

Worst-case mode and channel used for 9 KHz-1000 MHz radiated emissions was determined to be IEEE 802.11n20 mode (High Channel, 5180-5240MHz Band).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:
IEEE 802.11a Mode: 6 Mbps, OFDM.
IEEE 802.11n HT20 Mode: MCS0, OFDM.
IEEE 802.11n HT40 Mode: MCS0, OFDM.

Support Bandwidth For 5G WIFI Part:

Bandwidth Mode	20MHz	40MHz	80MHz
IEEE 802.11a	☑	☐	☐
IEEE 802.11n HT20	☑	☐	☐
IEEE 802.11n HT40	☐	☑	☐

Channel & Frequency:

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
5180~5240MHz	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240
	42	5210	/	/
For IEEE 802.11a/n HT20, Channel 36, 40 and 48 were tested. For IEEE 802.11n HT40, Channel 38 and 46 were tested.				

1.8. List Of Measuring Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Meter	R&S	NRVS	100444	2017-06-17	2018-06-16
2	Power Sensor	R&S	NRV-Z81	100458	2017-06-17	2018-06-16
3	Power Sensor	R&S	NRV-Z32	10057	2017-06-17	2018-06-16
4	EPM Series Power Meter	Agilent	E4419B	MY45104493	2017-06-17	2018-06-16
5	E-SERIES AVG POWER SENSOR	Agilent	E9301H	MY41495234	2017-06-17	2018-06-16
6	ESA-E SERIES SPECTRUM ANALYZER	Agilent	E4407B	MY41440754	2017-11-18	2018-11-17
7	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2017-06-17	2018-06-16
8	SPECTRUM ANALYZER	R&S	FSP	100503	2017-06-17	2018-06-16
9	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2017-06-17	2018-06-16
10	Positioning Controller	MF	MF-7082	/	2017-06-17	2018-06-16
11	EMI Test Software	AUDIX	E3	N/A	2017-06-17	2018-06-16
12	EMI Test Receiver	R&S	ESR 7	101181	2017-06-17	2018-06-16
13	AMPLIFIER	QuieTek	QTK-A2525G	CHM10809065	2017-11-18	2018-11-17
14	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2017-06-23	2018-06-22
15	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2017-05-02	2018-05-01
16	Horn Antenna	EMCO	3115	6741	2017-06-23	2018-06-22
17	RF Cable-R03m	Jye Bao	RG142	CB021	2017-06-17	2018-06-16
18	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2017-06-17	2018-06-16
19	TEST RECEIVER	R&S	ESCI	101142	2017-06-17	2018-06-16
20	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2017-06-17	2018-06-16
21	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-0032	2017-06-17	2018-06-16
22	Artificial Mains	R&S	ENV216	101288	2017-06-17	2018-06-16
23	X-series USB Peak and Average Power Sensor Aglient	Agilent	U2021XA	MY54080022	2017-10-27	2018-10-26
24	4 CH. Simultaneous Sampling 14 Bits 2MS/s	Agilent	U2531A	MY54080016	2017-10-27	2018-10-26
25	Test Software	Ascentest	AT890-SW	20160630	N/A	N/A
26	RF Control Unit	Ascentest	AT890-RFB	N/A	2017-06-17	2018-06-16
27	Universal Radio Communication Tester	R&S	CMU 200	105788	2017-06-17	2018-06-16
28	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2017-06-17	2018-06-16
29	RF Control Unit	Tonscend	JS0806-1	N/A	2017-06-17	2018-06-16
30	DC Power Supply	Agilent	E3642A	N/A	2017-11-18	2018-11-17
31	LTE Test Software	Tonscend	JS1120-1	N/A	N/A	N/A

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure KDB 789033 D02 General UNII Test Procedures New Rules v01 is required to be used for this kind of FCC 15.407 UII device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

2.3. General Test Procedures

2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013.

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

The sample will be controlled by RF test tool to enter RF test mode to control sample change channel, modulation and so on;

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart E		
FCC Rules	Description of Test	Result
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(a)	26dB Bandwidth	Compliant
§15.407(a)	99% Occupied Bandwidth	Compliant
§15.407(e)	6dB Bandwidth	Compliant
§15.407(b)	Radiated Emissions	Compliant
§15.407(b)	Band edge Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.407(g)	Frequency Stability	N/A
§15.207(a)	Line Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant
§2.1093	RF Exposure	Compliant

Note: The customer declared frequency stability is better than 20ppm which ensures that the signal remains in the allocated bands under all operational conditions stated in the user manual.

5. TEST RESULT

5.1. On Time and Duty Cycle

5.1.1. Standard Applicable

None; for reporting purpose only.

5.1.2. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of the spectrum analyzer.

5.1.3. Test Procedures

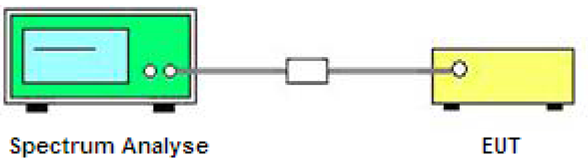
1). Set the Centre frequency of the spectrum analyzer to the transmitting frequency;

2). Set the span=0MHz, RBW=8MHz, VBW=50MHz, Sweep time=5ms;

3). Detector = peak;

4). Trace mode = Single hold.

5.1.4. Test Setup Layout



5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.6. Test result

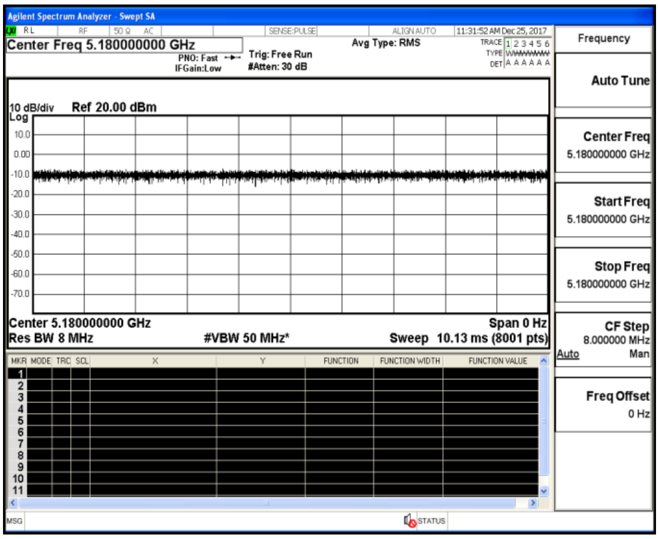
5.1.6.1 Band 1

Mode	On Time B (ms)	Period (ms)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW(KHz)
IEEE 802.11a	5.0	5.0	1	100%	0	0.01
IEEE 802.11n HT20	5.0	5.0	1	100%	0	0.01
IEEE 802.11n HT40	5.0	5.0	1	100%	0	0.01
Note: Duty Cycle Correction Factor=10log(1/Duty cycle)						

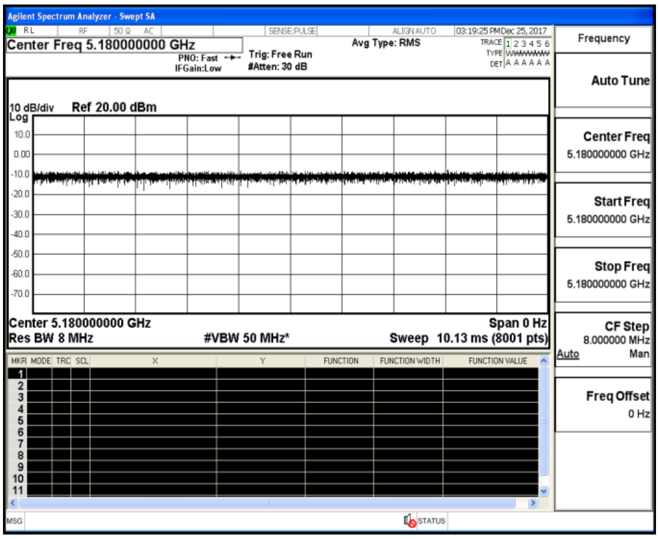
Remark:

1. Measured duty cycle for WLAN at both antenna 0 and antenna 1 port, the two antenna ports results were same, just recorded results at antenna 0;

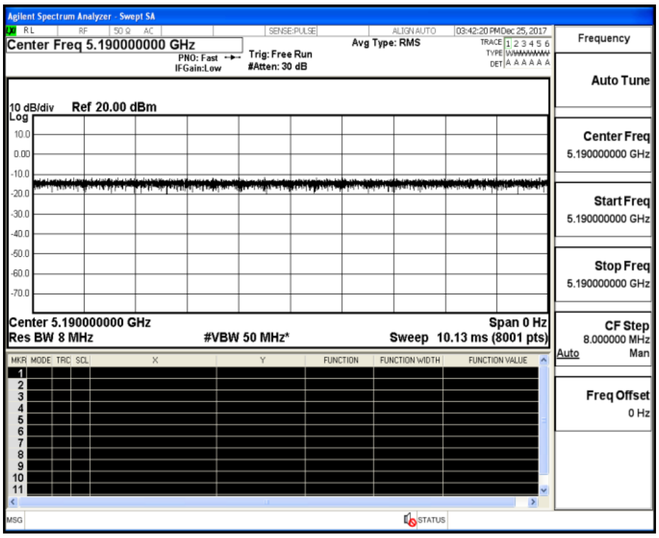
On Time and Duty Cycle



IEEE 802.11a



IEEE 802.11n HT20



IEEE 802.11n HT40

5.2. Maximum Conducted Output Power Measurement

5.2.1. Standard Applicable

(1) For the band 5.15~5.25GHz

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.2. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of the power meter.

5.2.3. Test Procedures

The transmitter output (antenna port) was connected to the power meter.

According to KDB 789033 D02 Section 3 (a) Method PM (Measurement using an RF average power meter):

(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

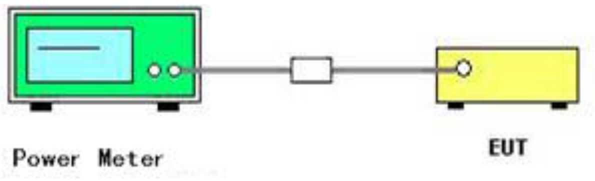
- The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
- At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
- The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.

(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

(iv) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25%).

5.2.4. Test Setup Layout



5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.6. Test Result of Maximum Conducted Output Power

5.2.6.1 Band 1

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)			Duty Cycle Factor (dB)	Report Conducted Power (dBm)			Maximum Limit (dBm)	Result
			Ant 0	Ant 1	Sum		Ant 0	Ant 1	Sum		
IEEE 802.11a	36	5180	3.93	3.88	-/-	0.00	3.93	3.88	-/-	24	Complies
	40	5200	4.07	3.87	-/-	0.00	4.07	3.87	-/-		
	48	5240	4.03	3.87	-/-	0.00	4.03	3.87	-/-		
IEEE 802.11n HT20	36	5180	3.51	3.55	6.54	0.00	3.51	3.55	6.54	24	Complies
	40	5200	3.53	3.51	6.53	0.00	3.53	3.51	6.53		
	48	5240	3.55	3.57	6.57	0.00	3.55	3.57	6.57		
IEEE 802.11n HT40	38	5190	3.49	3.56	6.54	0.00	3.49	3.56	6.54	24	Complies
	46	5230	3.43	3.63	6.54	0.00	3.43	3.63	6.54		

Remark:
1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40;*
4. *Report conducted power = Measured conducted average power + Duty Cycle factor;*

Remark:
1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40;*
4. *Report conducted power = Measured conducted average power + Duty Cycle factor;*

5.3. Power Spectral Density Measurement

5.3.1. Standard Applicable

For 5.15~5.25GHz

(i) For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.note1
(ii) For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.note1
(iii) For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
(iv) For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band. note1
Note1: If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For 5725~5850MHz

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

5.3.2. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of Spectrum Analyzer.

5.3.3. Test Procedures

5.3.3.1 UNII Band 1

1). The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2). The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3). Set the RBW = 1MHz.
4). Set the VBW ≥ 3MHz
5). Span=Encompass the entire emissions bandwidth (EBW) of the signal (or, alternatively, the entire 99% occupied bandwidth) of the signal.
6). 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.)
7). Manually set sweep time ≥ 10 × (number of points in sweep) × (total on/off period of the transmitted signal).
8). Set detector = power averaging (rms).
9). Sweep time = auto couple.
10). Trace mode = max hold.
11). Allow trace to fully stabilize.
12). Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, levels (in power units) at 1 MHz intervals extending across the EBW (or,

alternatively.

13). Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log (1/0.25) = 6 dB if the duty cycle is 25%.

14). Use the peak marker function to determine the maximum power level in any 1MHz band segment within the fundamental EBW.

5.3.3.2 UNII Band 3

1). The transmitter was connected directly to a Spectrum Analyzer through a directional couple.

2). The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.

3). Set the RBW = 300 kHz

4). Set the VBW ≥ 3*RBW

5). Span=Encompass the entire emissions bandwidth (EBW) of the signal

6). Detector = RMS.

7). Sweep time = auto couple.

8). Trace mode = max hold.

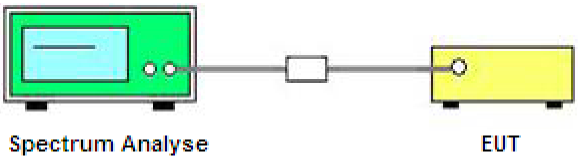
9). Allow trace to fully stabilize.

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

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

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

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of Power Spectral Density

5.3.6.1 UNII Band 1

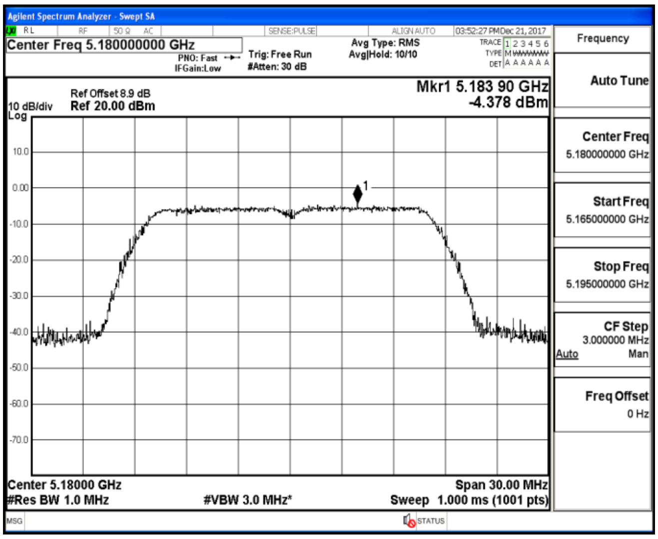
Test Mode	Channel	Frequency (MHz)	Power Density (dBm/MHz)			Duty cycle factor (dB)	Report conducted PSD (dBm/MHz)			Max. Limit (dBm/MHz)	Result
			Ant 0	Ant 1	Sum		Ant 0	Ant 1	Sum		
IEEE 802.11a	36	5180	-4.38	-4.35	-/-	0.000	-4.38	-4.35	-/-	11.00	Complies
	40	5200	-3.45	-5.25	-/-	0.000	-3.45	-5.25	-/-		
	48	5240	-2.98	-4.33	-/-	0.000	-2.98	-4.33	-/-		
IEEE 802.11n HT20	36	5180	-3.71	-4.96	-1.28	0.000	-3.71	-4.96	-1.28	11.00	Complies
	40	5200	-4.14	-5.25	-1.65	0.000	-4.14	-5.25	-1.65		
	48	5240	-3.15	-4.30	-0.68	0.000	-3.15	-4.30	-0.68		
IEEE 802.11n HT40	38	5190	-7.07	-7.36	-4.20	0.000	-7.07	-7.36	-4.20	11.00	Complies
	46	5230	-5.96	-6.85	-3.37	0.000	-5.96	-6.85	-3.37		

Remark:

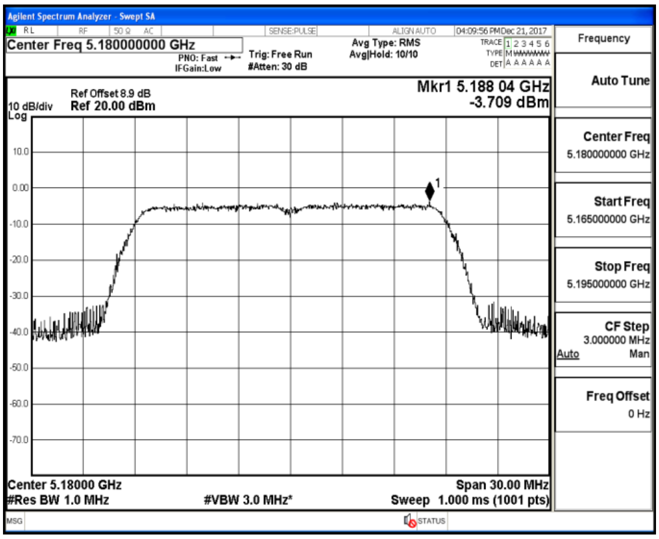
1. *Measured power spectrum density at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40;*
4. *Report conducted PSD = Measured conducted average power + Duty Cycle factor;*
5. *Please refer to following test plots;*

Power Spectral Density-ant 0

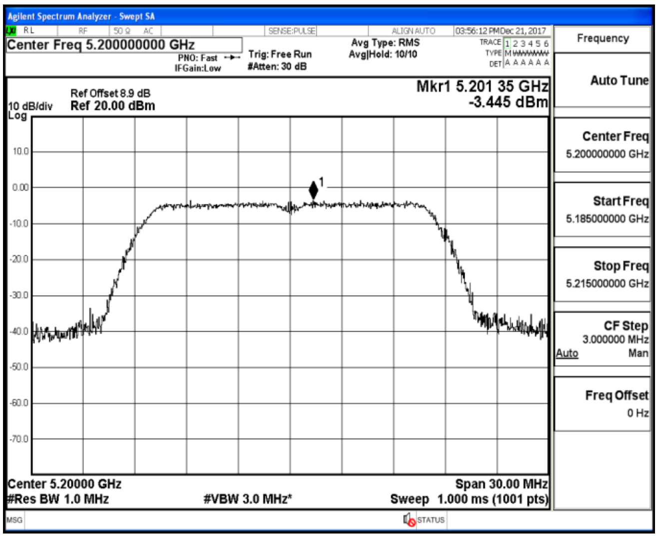
IEEE 802.11a	IEEE 802.11n HT20



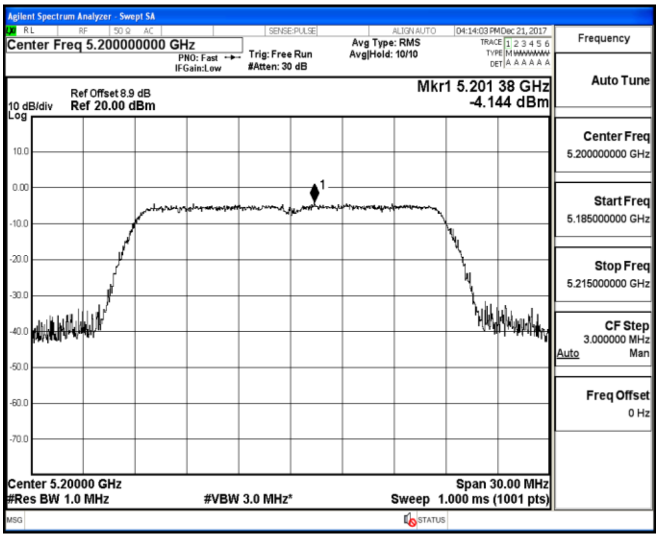
Channel 36 / 5180 MHz



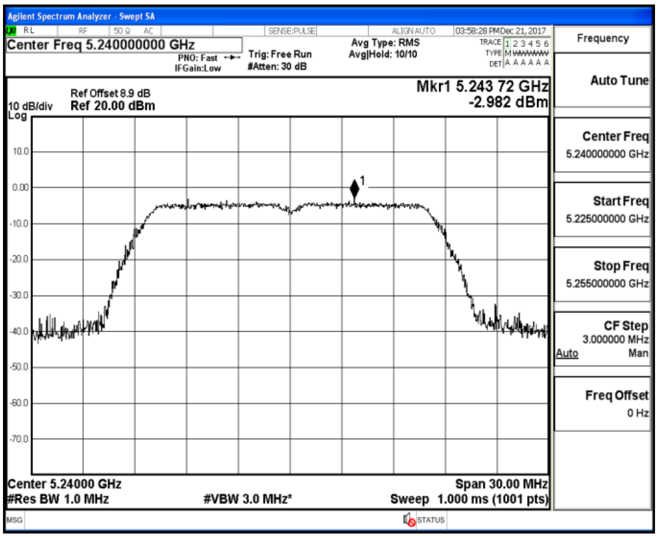
Channel 36 / 5180 MHz



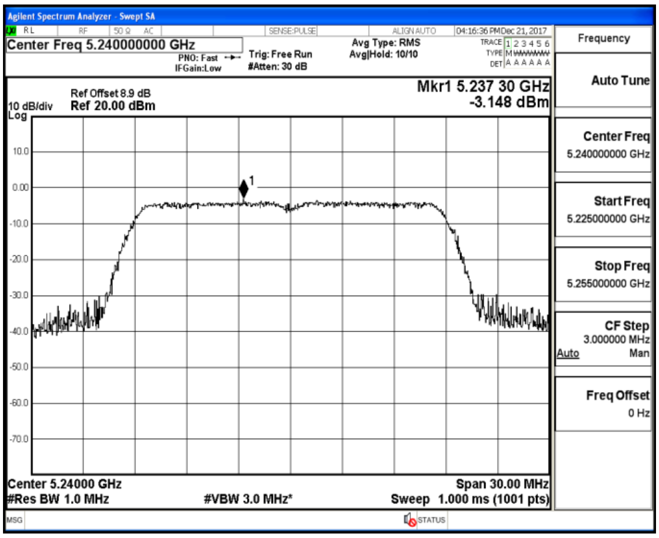
Channel 40 / 5200 MHz



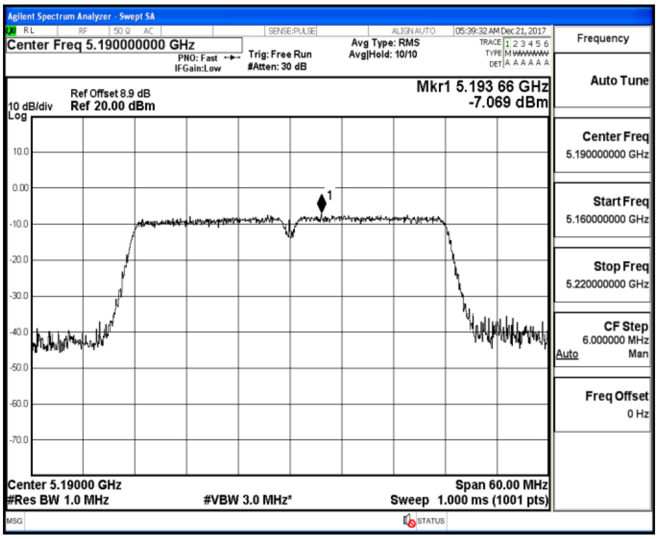
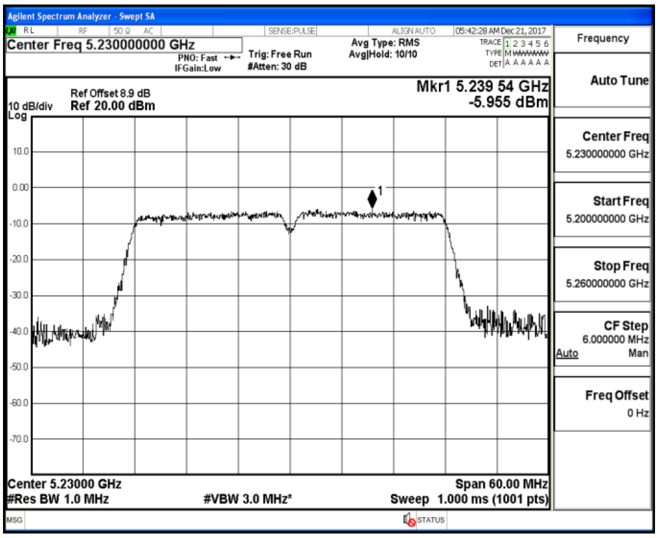
Channel 40 / 5200 MHz



Channel 48 / 5240 MHz

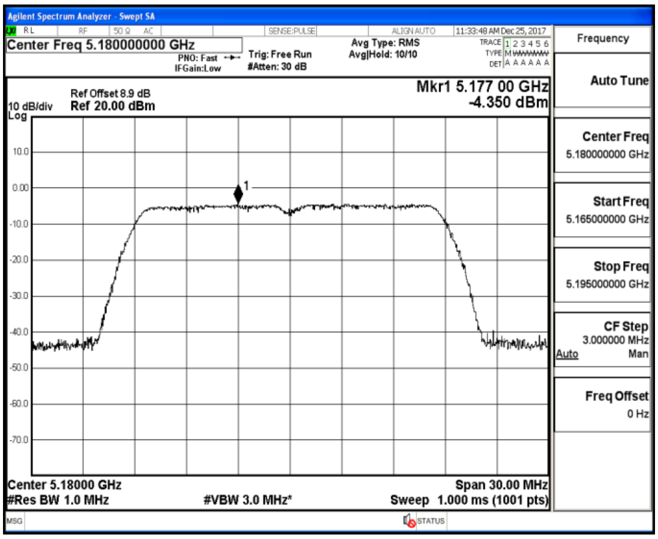


Channel 48 / 5240 MHz

Power Spectral Density-ant 0	
IEEE 802.11n HT40	
	
Channel 38 / 5190 MHz	
	
Channel 46 / 5230 MHz	

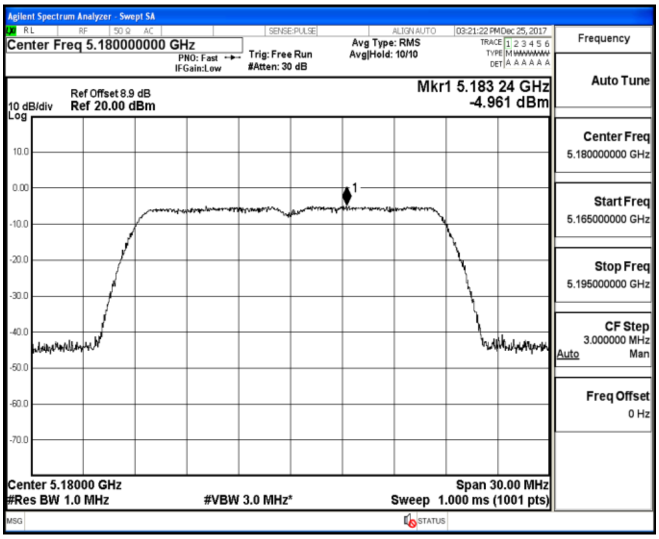
Power Spectral Density-ant 1

IEEE 802.11a

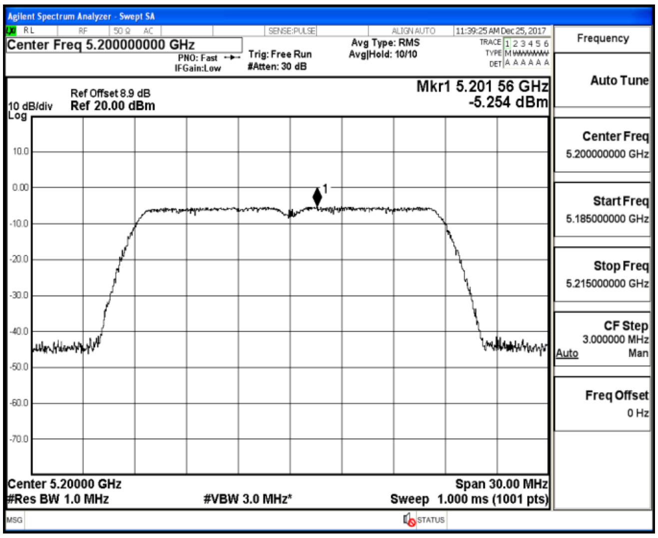


Channel 36 / 5180 MHz

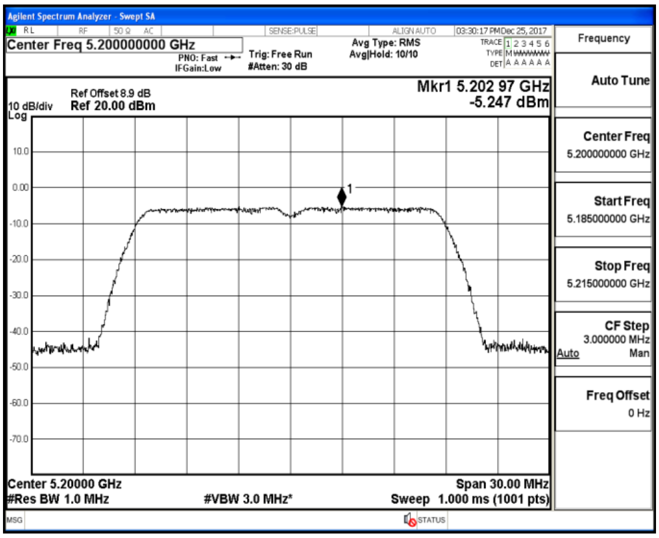
IEEE 802.11n HT20



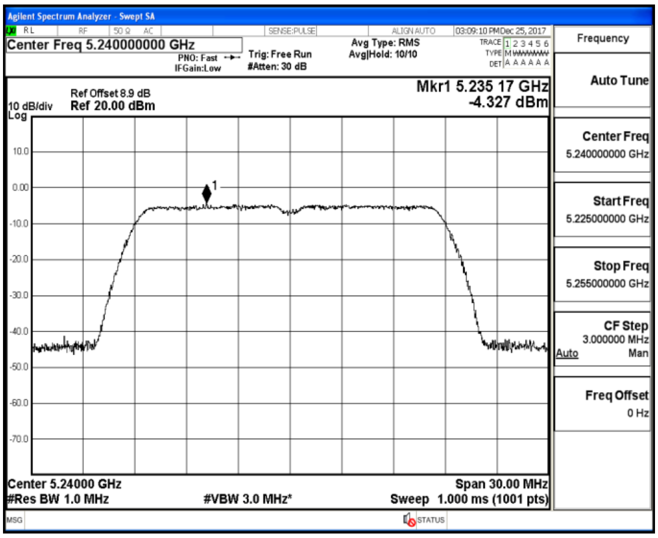
Channel 36 / 5180 MHz



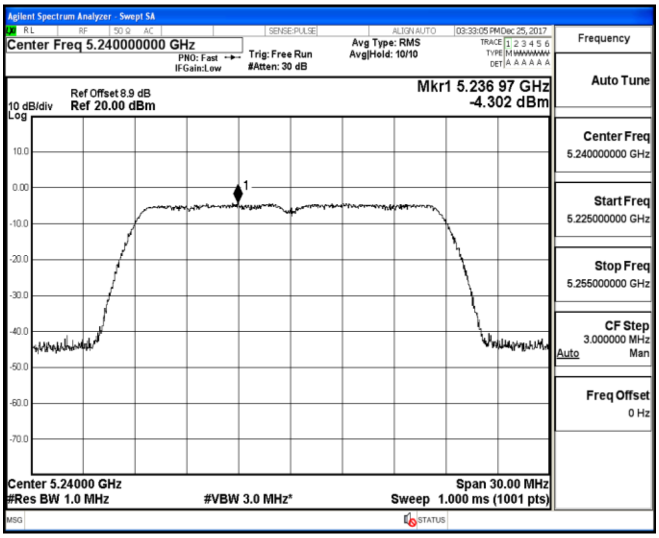
Channel 40 / 5200 MHz



Channel 40 / 5200 MHz



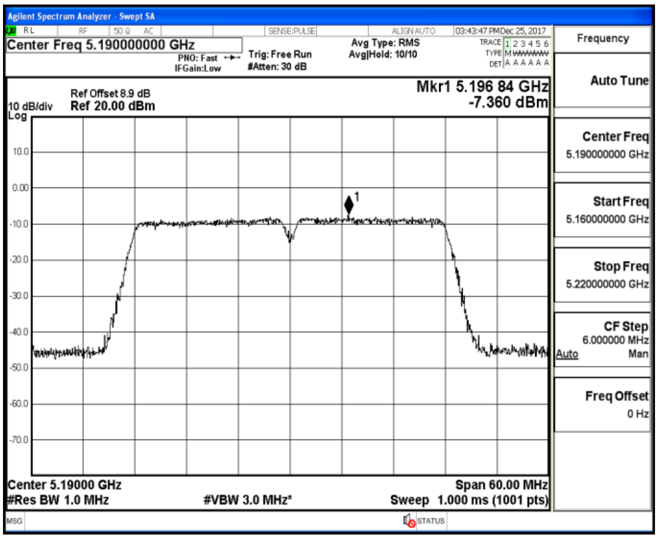
Channel 48 / 5240 MHz



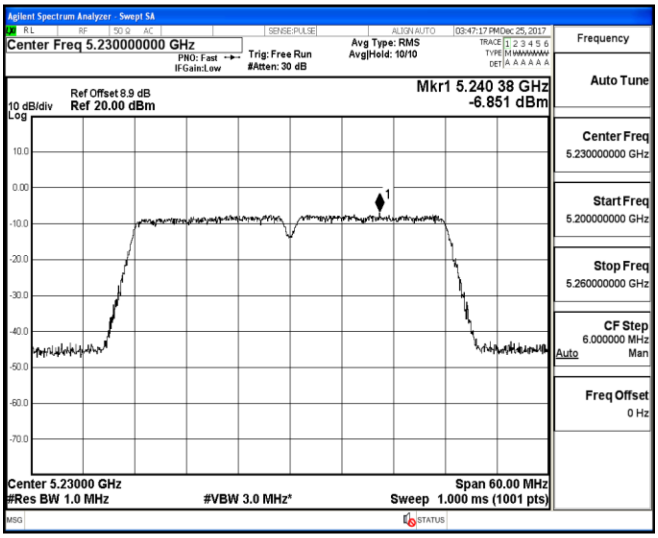
Channel 48 / 5240 MHz

Power Spectral Density-ant 1

IEEE 802.11n HT40



Channel 38 / 5190 MHz



Channel 46 / 5230 MHz

Remark:

1. *Measured power spectrum density at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20;*
4. *Report conducted PSD = measured conducted PSD + Duty Cycle factor + RBW factor;*
5. *RBW factor = 10 log (500 KHz / 300 KHz) = 2.218 dB;*
6. *Please refer to following test plots;*

5.4. 99% and 26dB Occupied Bandwidth Measurement

5.4.1. Standard Applicable

No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99% occupied bandwidth.

99% and 26dB occupied bandwidth not applicable for UNII Band 3;

5.4.2. Measuring Instruments and Setting

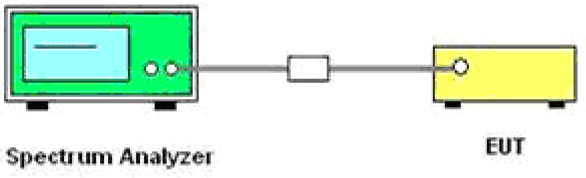
Please refer to equipment list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span	> 26dB Bandwidth
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The RBW = 1% - 3% of occupied bandwidth, VBW = 3*RBW;
3. Measured the spectrum width with power higher than 26dB below carrier.

5.4.4. Test Setup Layout



5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.6. Test Result of 99% and 26dB Occupied Bandwidth

5.4.6.1 UNII Band 1

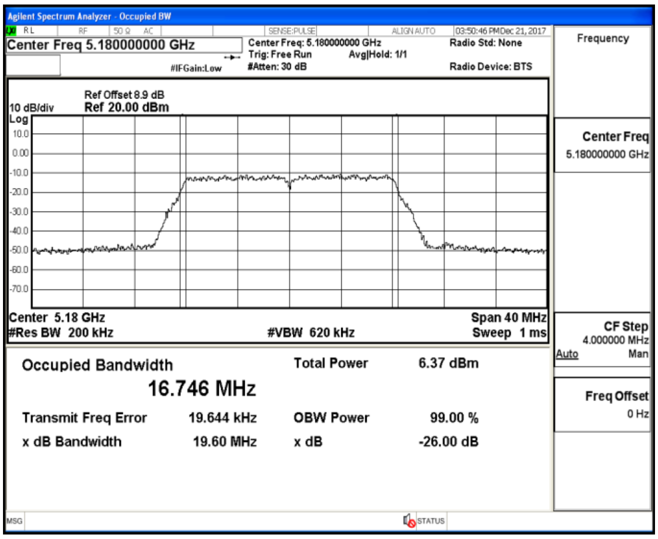
Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)		99% Bandwidth (MHz)		Limits (MHz)	Verdict
			Ant 0	Ant 1	Ant 0	Ant 1		
IEEE 802.11a	36	5180	19.60	19.94	16.75	17.74	No Limit	PASS
	40	5200	19.64	19.93	16.70	17.75		
	48	5240	19.85	20.02	16.73	17.74		
IEEE 802.11n HT20	36	5180	19.96	19.89	17.72	17.75	No Limit	PASS
	40	5200	20.03	19.96	17.76	17.74		
	48	5240	19.98	19.98	17.73	17.74		
IEEE 802.11n HT40	38	5190	39.81	39.88	36.22	36.21	No Limit	PASS
	46	5230	39.88	40.17	36.26	36.16		

Remark:

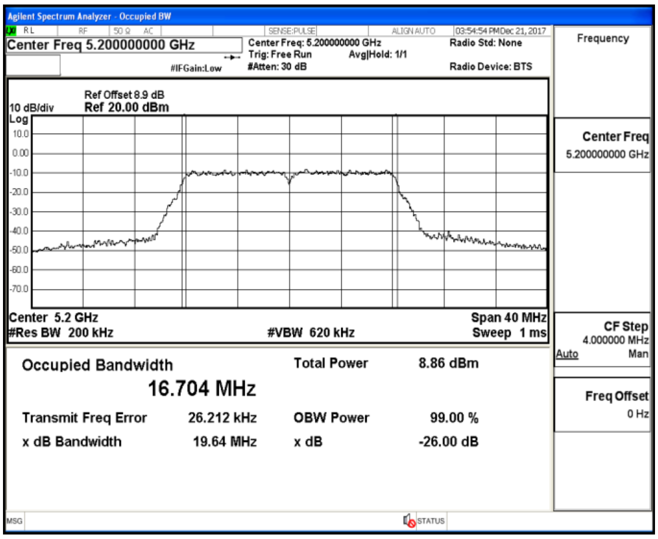
1. *Measured 99% and 26dB bandwidth at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20;*
4. *Please refer to following test plots;*

99% and 26dB Occupied Bandwidth-ant 0

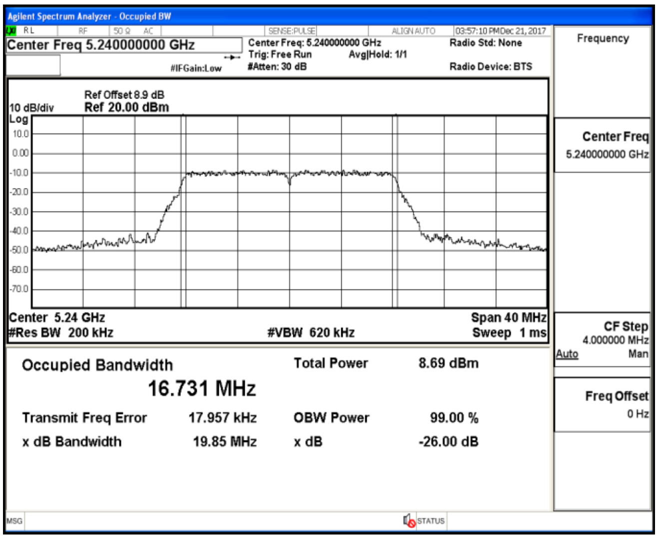
IEEE 802.11a



Channel 36 / 5180 MHz

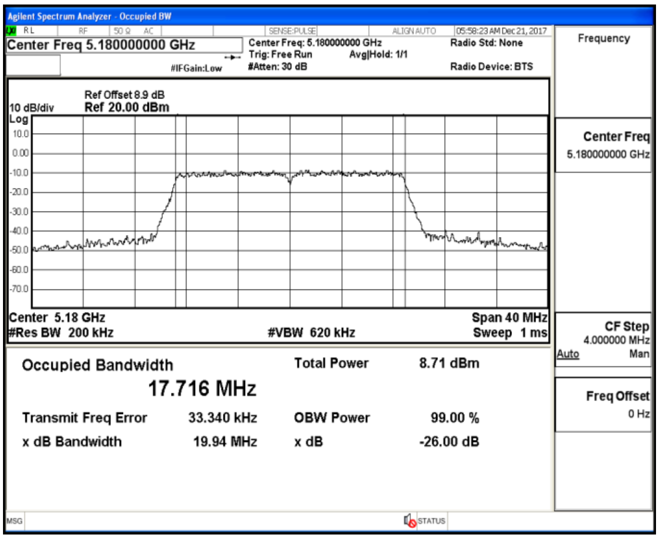


Channel 40 / 5200 MHz

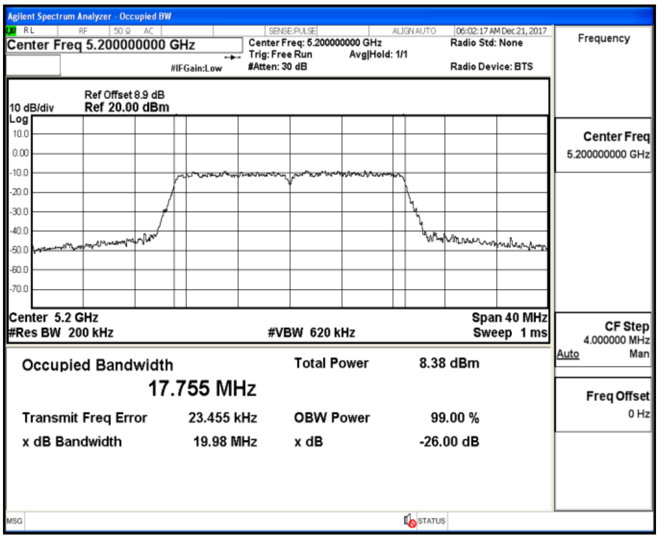


Channel 48 / 5240 MHz

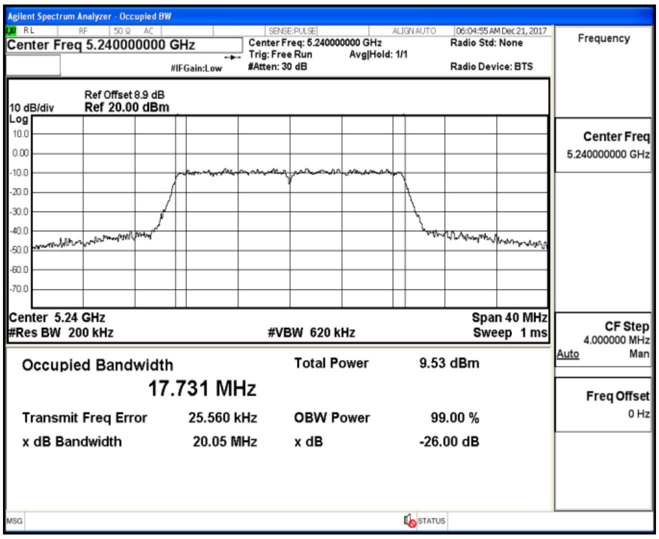
IEEE 802.11n HT20



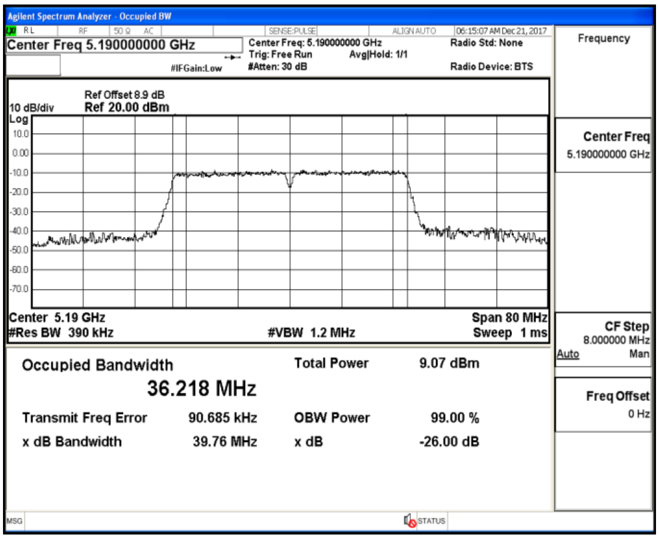
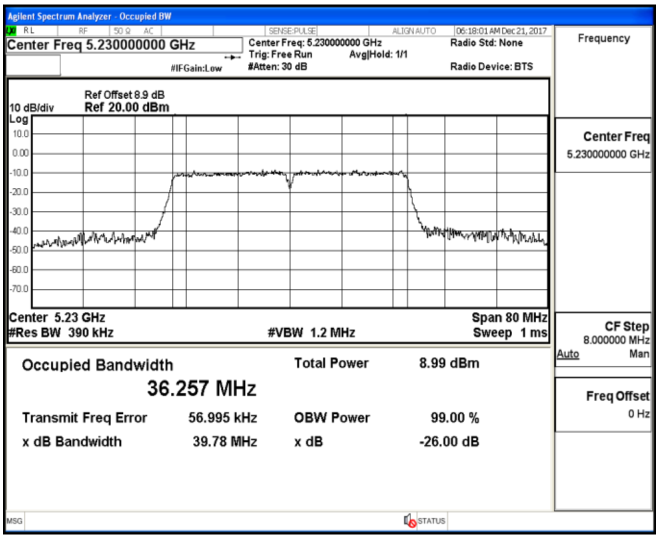
Channel 36 / 5180 MHz



Channel 40 / 5200 MHz

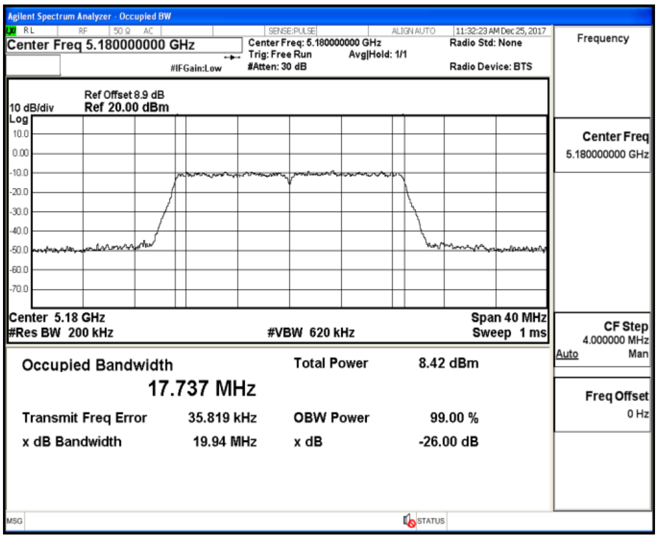


Channel 48 / 5240 MHz

99% and 26dB Occupied Bandwidth-ant 0	
IEEE 802.11n HT40	
	
Channel 38 / 5190 MHz	
	
Channel 46 / 5230 MHz	

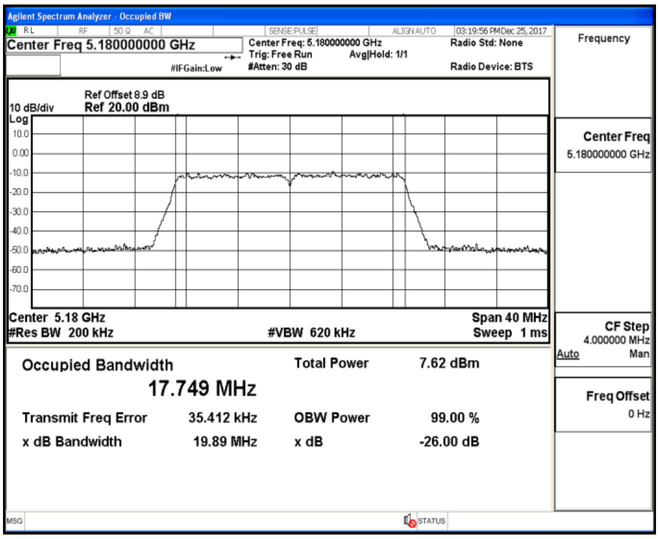
99% and 26dB Occupied Bandwidth-ant 1

IEEE 802.11a

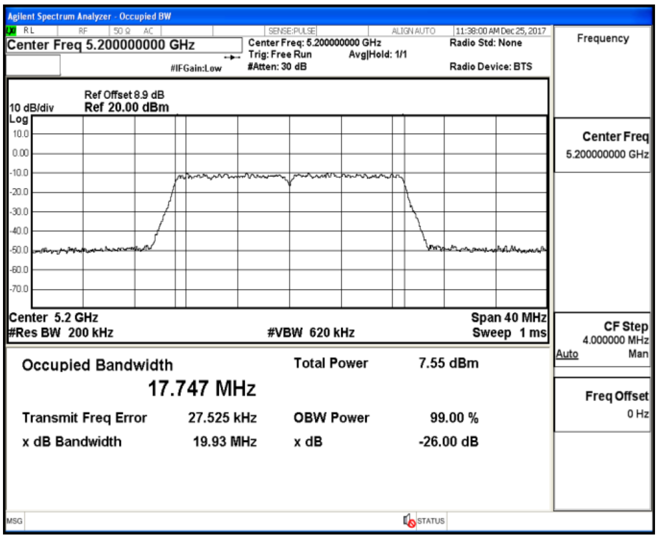


Channel 36 / 5180 MHz

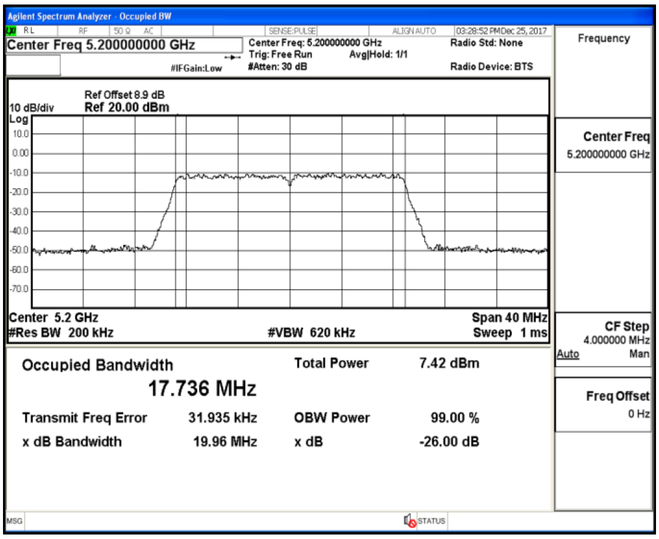
IEEE 802.11n HT20



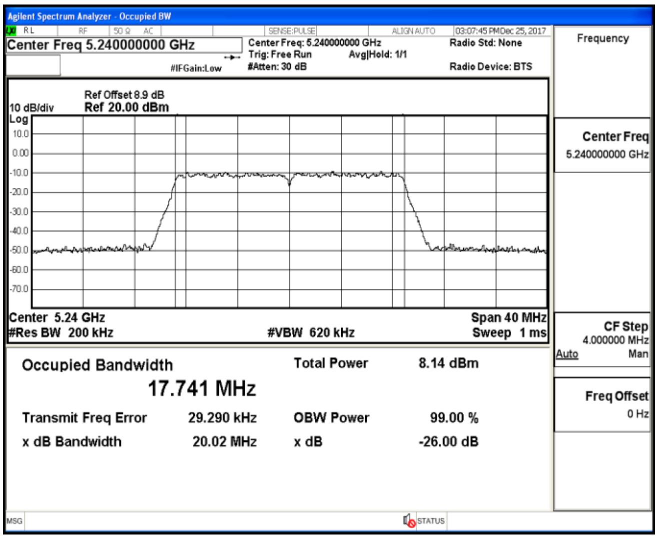
Channel 36 / 5180 MHz



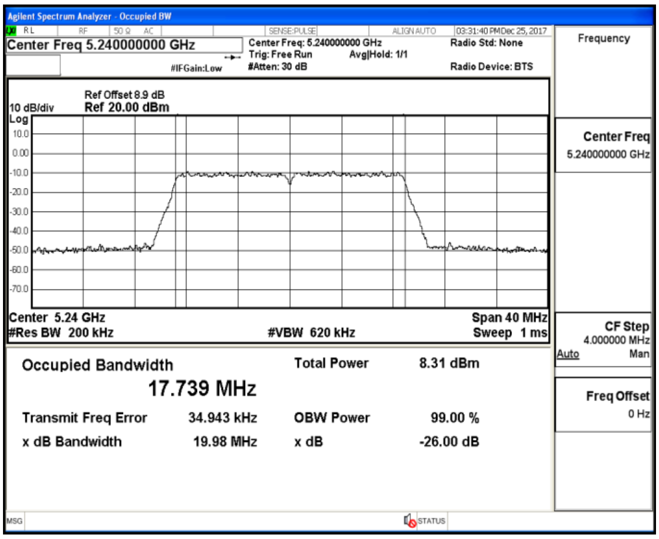
Channel 40 / 5200 MHz



Channel 40 / 5200 MHz

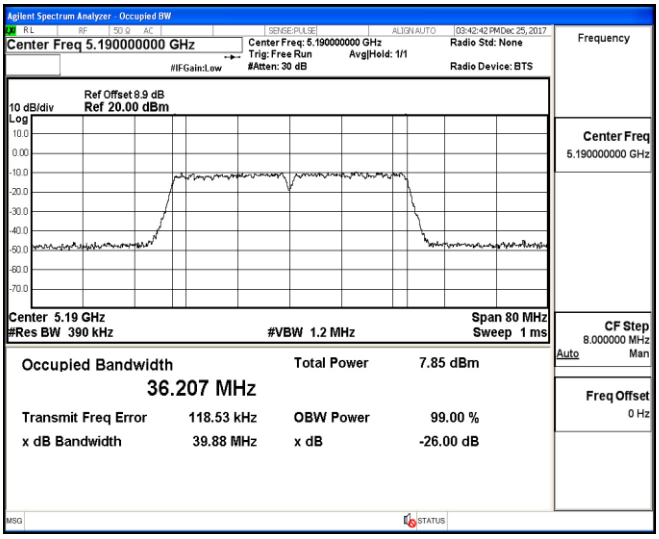


Channel 48 / 5240 MHz

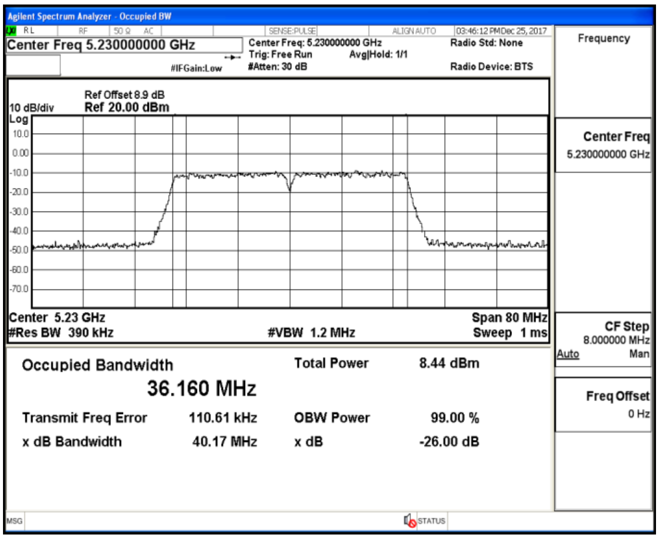


Channel 48 / 5240 MHz

99% and 26dB Occupied Bandwidth-ant 1	
IEEE 802.11n HT40	



Channel 38 / 5190 MHz



Channel 46 / 5230 MHz

5.5. Radiated Emissions Measurement

5.5.1. Standard Applicable

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
\2\ Above 38.6

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz (68.2dBuV/m at 3m).

For transmitters operating in the 5.725-5.85 GHz band:

All emissions shall be limited to a level of −27 dBm/MHz(68.2dBuV/m at 3m) at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz(105.2dBuV/m at 3m) at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6(110.8dBuV/m at 3m) dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz(122.2dBuV/m at 3m) at the band edge

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

5.5.2. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

5.5.3. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Premeasurement:

--- The antenna is moved spherical over the EUT in different polarizations of the antenna.

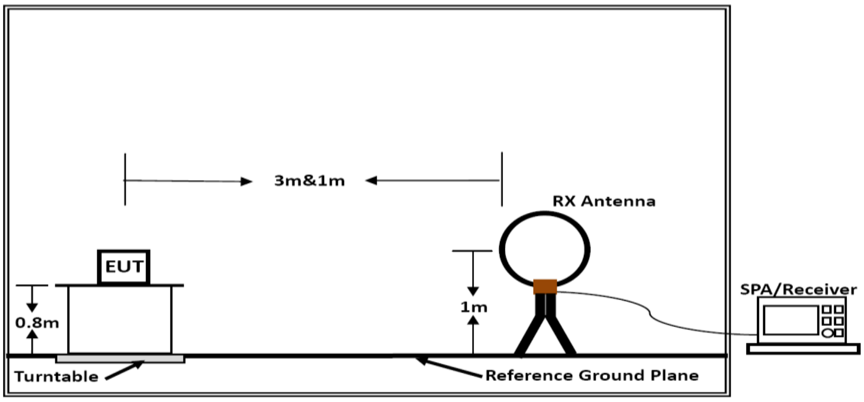
Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

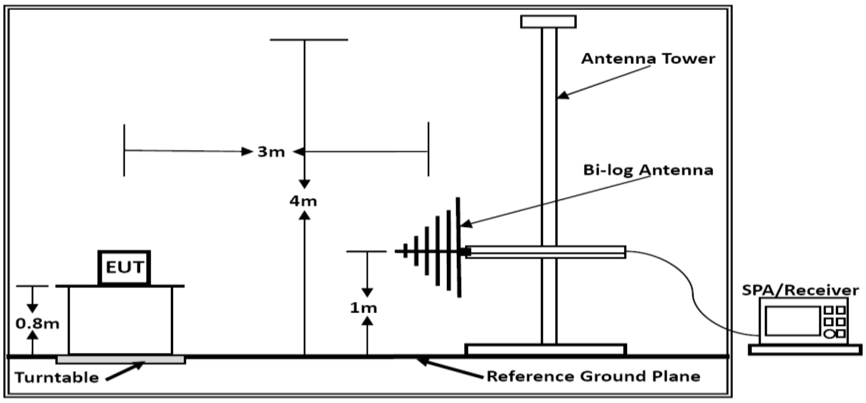
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

5.5.4. Test Setup Layout

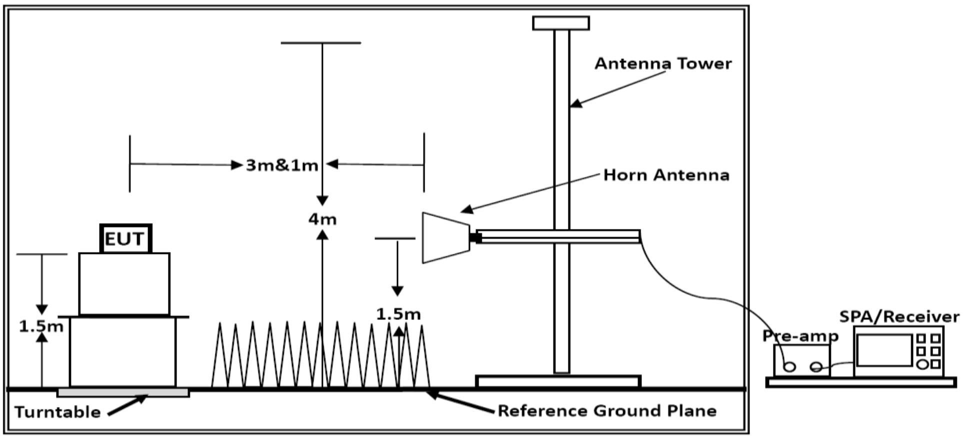
For radiated emissions below 30MHz



Below 30MHz



Below 1GHz



Above 1GHz

Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Results of Radiated Emissions (9 KHz~30MHz)

Temperature	25℃	Humidity	60%
Test Engineer	Tom Liu	Configurations	IEEE 802.11a/n

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dB)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

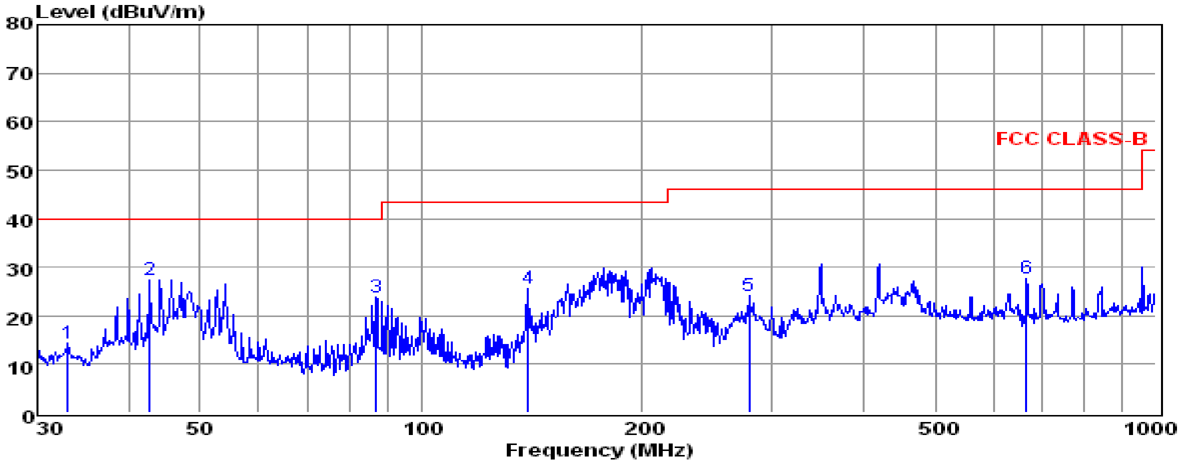
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

5.5.7. Results of Radiated Emissions (30MHz~1GHz)

Test result for IEEE 802.11n20

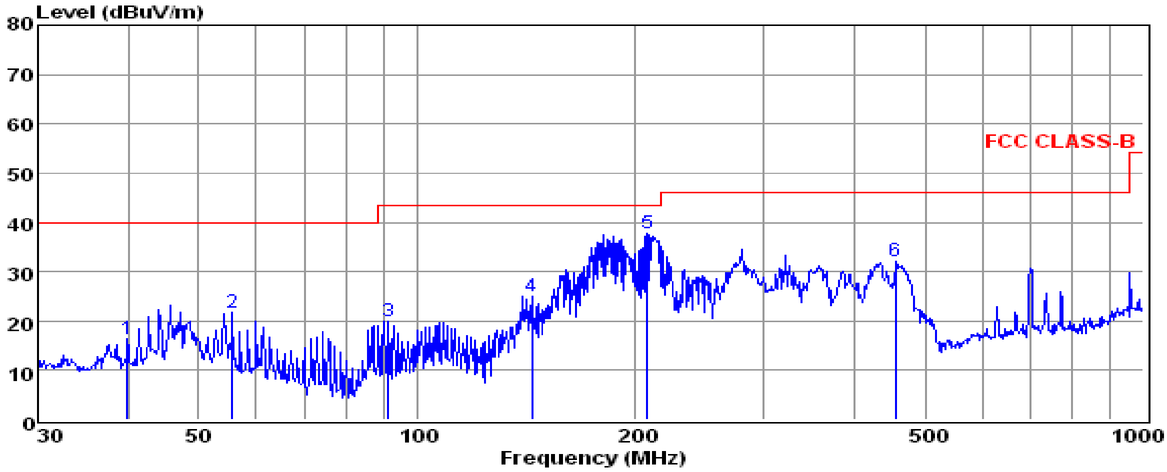
Vertical



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	32.98	1.53	0.37	12.31	14.21	40.00	-25.79	QP
2	42.75	13.39	0.50	13.56	27.45	40.00	-12.55	QP
3	86.81	12.35	0.47	10.88	23.70	40.00	-16.30	QP
4	139.85	16.56	0.75	8.20	25.51	43.50	-17.99	QP
5	279.04	10.58	1.01	12.64	24.23	46.00	-21.77	QP
6	665.80	7.31	1.55	18.69	27.55	46.00	-18.45	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Horizontal



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	39.85	2.31	0.38	13.54	16.23	40.00	-23.77	QP
2	55.61	8.39	0.47	12.98	21.84	40.00	-18.16	QP
3	91.17	7.28	0.56	12.12	19.96	43.50	-23.54	QP
4	143.83	16.12	0.71	8.22	25.05	43.50	-18.45	QP
5	207.12	26.10	0.86	10.79	37.75	43.50	-5.75	QP
6	455.91	15.23	1.39	15.58	32.20	46.00	-13.80	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

****Note:*

Pre-scan all mode and recorded the worst case results in this report (IEEE 802.11n20 mode (High Channel, 5240 MHz).

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level = Level.

Only recorded the worst test case data in this report.

5.5.8. Results for Radiated Emissions (Above 1GHz)

Note: Only recorded the worst test result in this report.

5.5.8.1 UNII Band 1

IEEE 802.11a

Channel 36 / 5180 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.36	45.73	33.21	35.82	9.52	52.64	74.00	-21.36	Peak	Horizontal
10.36	34.83	33.21	35.82	9.52	41.74	54.00	-12.26	Average	Horizontal
10.36	46.57	32.82	35.82	9.52	53.09	74.00	-20.91	Peak	Vertical
10.36	35.34	32.82	35.82	9.52	41.86	54.00	-12.14	Average	Vertical

Channel 40 / 5200 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.44	45.86	33.21	35.82	9.52	52.77	74.00	-21.23	Peak	Horizontal
10.44	35.31	33.21	35.82	9.52	42.22	54.00	-11.78	Average	Horizontal
10.44	47.01	32.82	35.82	9.52	53.53	74.00	-20.47	Peak	Vertical
10.44	35.75	32.82	35.82	9.52	42.27	54.00	-11.73	Average	Vertical

Channel 48 / 5240 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.48	46.53	33.21	35.82	9.52	53.44	74.00	-20.56	Peak	Horizontal
10.48	35.69	33.21	35.82	9.52	42.60	54.00	-11.40	Average	Horizontal
10.48	47.66	32.82	35.82	9.52	54.18	74.00	-19.82	Peak	Vertical
10.48	36.23	32.82	35.82	9.52	42.75	54.00	-11.25	Average	Vertical

IEEE 802.11n HT20

Channel 36 / 5180 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.36	45.33	33.21	35.82	9.52	52.24	74.00	-21.76	Peak	Horizontal
10.36	34.50	33.21	35.82	9.52	41.41	54.00	-12.59	Average	Horizontal
10.36	46.51	32.82	35.82	9.52	53.03	74.00	-20.97	Peak	Vertical
10.36	34.67	32.82	35.82	9.52	41.19	54.00	-12.81	Average	Vertical

Channel 40 / 5200 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.44	45.79	33.21	35.82	9.52	52.70	74.00	-21.30	Peak	Horizontal
10.44	34.95	33.21	35.82	9.52	41.86	54.00	-12.14	Average	Horizontal
10.44	47.06	32.82	35.82	9.52	53.58	74.00	-20.42	Peak	Vertical
10.44	35.50	32.82	35.82	9.52	42.02	54.00	-11.98	Average	Vertical

Channel 48 / 5240 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.48	46.36	33.21	35.82	9.52	53.27	74.00	-20.73	Peak	Horizontal
10.48	35.46	33.21	35.82	9.52	42.37	54.00	-11.63	Average	Horizontal
10.48	47.37	32.82	35.82	9.52	53.89	74.00	-20.11	Peak	Vertical
10.48	35.96	32.82	35.82	9.52	42.48	54.00	-11.52	Average	Vertical

IEEE 802.11n HT40

Channel 38 / 5190 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.38	45.86	33.21	35.82	9.52	52.77	74.00	-21.23	Peak	Horizontal
10.38	34.89	33.21	35.82	9.52	41.80	54.00	-12.20	Average	Horizontal
10.38	46.96	32.82	35.82	9.52	53.48	74.00	-20.52	Peak	Vertical
10.38	35.54	32.82	35.82	9.52	42.06	54.00	-11.94	Average	Vertical

Channel 46 / 5230 MHz

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.46	46.04	33.21	35.82	9.52	52.95	74.00	-21.05	Peak	Horizontal
10.46	35.52	33.21	35.82	9.52	42.43	54.00	-11.57	Average	Horizontal
10.46	47.44	32.82	35.82	9.52	53.96	74.00	-20.04	Peak	Vertical
10.46	35.66	32.82	35.82	9.52	42.18	54.00	-11.82	Average	Vertical

Notes:

1). Measuring frequencies from 9 KHz ~ 40 GHz, No emission found between lowest internal used/generated frequency to 30MHz.
2). Radiated emissions measured in frequency range from 9 KHz ~ 40 GHz were made with an instrument using Peak detector mode.
3). 18~40GHz at least have 20dB margin. No recording in the test report.
4). Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40;
5). Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.6. Power line conducted emissions

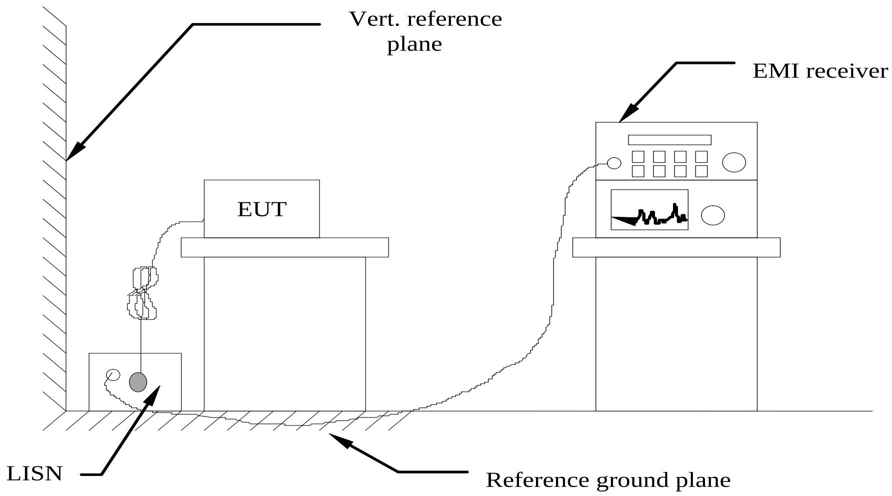
5.6.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

5.6.2 Block Diagram of Test Setup



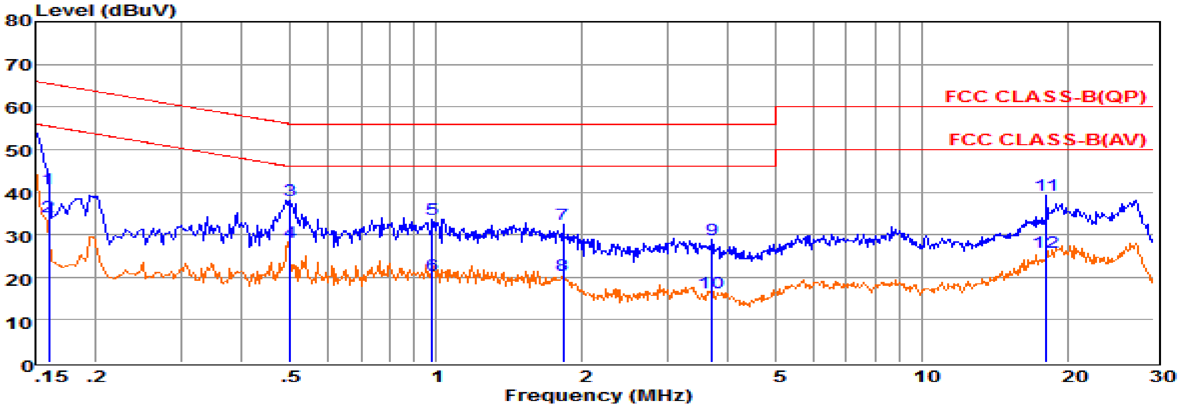
5.6.3 Test Results

PASS.

The test data please refer to following page.

AC Conducted Emission of power by adapter @ AC 120V/60Hz @ IEEE 802.11n20 (worst case)

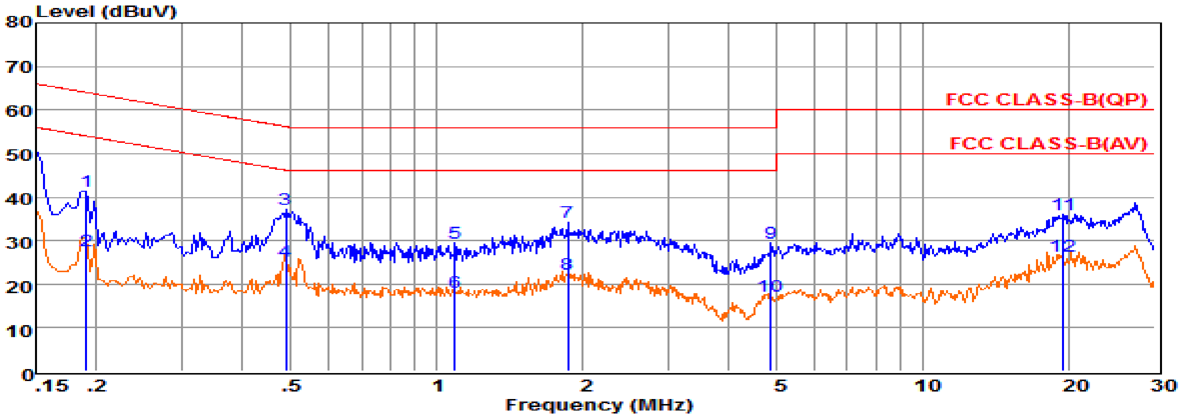
Line



	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.16	21.15	9.58	0.02	10.00	40.75	65.47	-24.72	QP
2	0.16	14.53	9.58	0.02	10.00	34.13	65.47	-31.34	Average
3	0.50	18.35	9.62	0.04	10.00	38.01	56.00	-17.99	QP
4	0.50	8.66	9.62	0.04	10.00	28.32	56.00	-27.68	Average
5	0.98	13.95	9.63	0.05	10.00	33.63	56.00	-22.37	QP
6	0.98	0.84	9.63	0.05	10.00	20.52	56.00	-35.48	Average
7	1.83	12.65	9.64	0.05	10.00	32.34	56.00	-23.66	QP
8	1.83	0.84	9.64	0.05	10.00	20.53	56.00	-35.47	Average
9	3.70	9.11	9.65	0.06	10.00	28.82	56.00	-27.18	QP
10	3.70	-3.50	9.65	0.06	10.00	16.21	56.00	-39.79	Average
11	18.04	19.28	9.74	0.11	10.00	39.13	60.00	-20.87	QP
12	18.04	5.98	9.74	0.11	10.00	25.83	60.00	-34.17	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

Neutral



	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.19	21.84	9.61	0.02	10.00	41.47	64.02	-22.55	QP
2	0.19	7.95	9.61	0.02	10.00	27.58	64.02	-36.44	Average
3	0.49	17.39	9.62	0.04	10.00	37.05	56.19	-19.14	QP
4	0.49	5.73	9.62	0.04	10.00	25.39	56.18	-30.79	Average
5	1.09	9.66	9.63	0.05	10.00	29.34	56.00	-26.66	QP
6	1.09	-1.59	9.63	0.05	10.00	18.09	56.00	-37.91	Average
7	1.86	14.65	9.63	0.05	10.00	34.33	56.00	-21.67	QP
8	1.86	2.63	9.63	0.05	10.00	22.31	56.00	-33.69	Average
9	4.87	9.70	9.66	0.06	10.00	29.42	56.00	-26.58	QP
10	4.87	-2.56	9.66	0.06	10.00	17.16	56.00	-38.84	Average
11	19.43	16.09	9.87	0.12	10.00	36.08	60.00	-23.92	QP
12	19.43	6.57	9.87	0.12	10.00	26.56	60.00	-33.44	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

****Note: Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11n20).*

5.7 Undesirable Emissions Measurement

5.7.1 Limit

According to ξ15.407 (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:

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

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

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

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

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

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

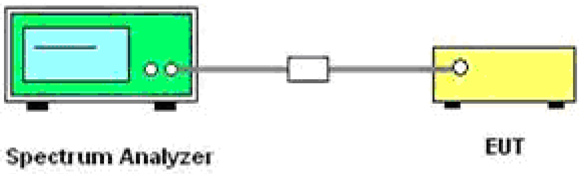
(e) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(f) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(g) The provisions of §15.205 apply to intentional radiators operating under this section.

(h) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

5.7.2 Test Configuration



5.7.3 Test Procedure

According to KDB789033 D02 General UNII Test Procedures New Rules Section G: Unwanted Emission Measurement

1. Unwanted Emissions in the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”

b) At frequencies below 1000 MHz, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements below 1000 MHz.”

c) At frequencies above 1000 MHz, measurements performed using the peak and average measurement procedures described in sections II.G.5. and II.G.6, respectively, must satisfy the respective peak and average limits. If all peak measurements satisfy the average limit, then average measurements are not required.

d) For conducted measurements above 1000 MHz, EIRP shall be computed as specified in section II.G.3.b) and then field strength shall be computed as follows (see KDB Publication 412172):

i) E[dBμV/m] = EIRP[dBm] - 20 log (d[meters]) + 104.77, where E = field strength and d = distance at which field strength limit is specified in the rules;

ii) E[dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters

e) For conducted measurements below 1000 MHz, the field strength shall be computed as specified in d), above, and then an additional 4.7 dB shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30 MHz and 1000 MHz, or an additional 6 dB shall be added for frequencies below 30 MHz.

2. Unwanted Emissions that fall Outside of the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”

b) At frequencies below 1000 MHz, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements below 1000 MHz.”

c) At frequencies above 1000 MHz, use the procedure for maximum emissions described in section II.G.5., “Procedure for Unwanted Maximum Unwanted Emissions Measurements Above 1000 MHz.”

d) Section 15.407(b) (1-3) specifies the unwanted emissions limit for the U-NII-1 and 2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz. However, an out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz dBm/MHz peak emission limit.

i) Section 15.407(b) (4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b) (4) (i). An alternative to the band emissions mask is specified in Section 15.407(b) (4) (ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the alternative limit.

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

i) 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 isotopically radiated power in watts;

ii) Working in dB units, the above equation is equivalent to:

EIRP [dBm] = E [dBμV/m] + 20 log (d [meters]) - 104.77

iii) Or, if d is 3 meters:

EIRP [dBm] = E [dBμV/m] - 95.23

3) Radiated versus Conducted Measurements.

The unwanted emission limits in both the restricted and non-restricted bands are based on radiated measurements; however, as an alternative, antenna-port conducted measurements in conjunction with cabinet emissions tests will be permitted to demonstrate compliance provided that the following steps are performed:

(i) Cabinet emissions measurements. A radiated test shall be performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna may be replaced by a termination matching the nominal impedance of the antenna.

(ii) Impedance matching. Conducted tests shall be performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT.

(iii) EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.3 However, for devices that operate in multiple bands using the same transmit antenna, the highest gain of the antenna within the operating band nearest to the out-of-band frequency being measured may be used in lieu of the overall highest gain when measuring emissions at frequencies within 20% of the absolute frequency at the nearest edge of that band, but in no case shall a value less than 2 dBi be selected.

(iv) EIRP adjustments for multiple outputs. For devices with multiple outputs occupying the same or overlapping frequency ranges in the same band (e.g., MIMO or beamforming devices), compute the total EIRP as follows:

- Compute EIRP for each output, as described in (iii), above.
- Follow the procedures specified in KDB Publication 662911 for summing emissions across the outputs or adjusting emission levels measured on individual outputs by 10 log (N_{ANT}), where N_{ANT} is the number of outputs.
- Add the array gain term specified in KDB Publication 662911 for out-of-band and spurious signals.

(v) Direction of maximum emission.

For all radiated emissions tests, measurements shall correspond to the direction of maximum emission level for each measured emission (see ANSI C63.10 for guidance).

5.7.4 Test Results

5.7.4.1 UNII Band 1

IEEE 802.11a									
Frequency (MHz)	Conducted Power (dBm)		Antenna Gain (dBi)	Ground Reflection Factor (dB)	Convert Radiated E Level At 3m (dBuV/m)		Detector	Limit (dBuV/m)	Verdict
	Ant 0	Ant 1			Ant 0	Ant 1			
4500.000	-43.11	-43.35	2.000	0.000	54.09	53.85	Peak	74.00	PASS
4500.000	-52.72	-52.76	2.000	0.000	44.48	44.44	Average	54.00	PASS
5150.000	-40.99	-41.18	2.000	0.000	56.21	56.02	Peak	74.00	PASS
5150.000	-51.27	-51.12	2.000	0.000	45.93	46.08	Average	54.00	PASS
5350.000	-42.38	-41.10	2.000	0.000	54.82	56.10	Peak	74.00	PASS
5350.000	-52.79	-52.73	2.000	0.000	44.41	44.47	Average	54.00	PASS
5460.000	-42.77	-42.32	2.000	0.000	54.43	54.88	Peak	74.00	PASS
5460.000	-53.02	-53.03	2.000	0.000	44.18	44.17	Average	54.00	PASS

IEEE 802.11n HT20												
Frequency (MHz)	Conducted Power (dBm)			Antenna Gain(dBi)	Directional Gain(dBi)	Ground Reflection Factor (dB)	Convert Radiated E Level At 3m (dBuV/m)			Detector	Limit (dBuV/m)	Verdict
	Ant 0	Ant 1	Sum				Ant 0	Ant 1	Sum			
4500.000	-42.96	-43.58	-40.25	2.00	5.01	0.00	54.24	53.62	59.96	Peak	74.00	PASS
4500.000	-52.72	-52.80	-49.75	2.00	5.01	0.00	44.48	44.40	50.46	Average	54.00	PASS
5150.000	-40.81	-41.25	-38.01	2.00	5.01	0.00	56.39	55.95	62.20	Peak	74.00	PASS
5150.000	-51.19	-51.21	-48.19	2.00	5.01	0.00	46.01	45.99	52.02	Average	54.00	PASS
5350.000	-43.06	-41.96	-39.46	2.00	5.01	0.00	54.14	55.24	60.75	Peak	74.00	PASS
5350.000	-52.77	-52.83	-49.79	2.00	5.01	0.00	44.43	44.37	50.42	Average	54.00	PASS
5460.000	-42.47	-42.63	-39.54	2.00	5.01	0.00	54.73	54.57	60.67	Peak	74.00	PASS
5460.000	-53.08	-53.11	-50.08	2.00	5.01	0.00	44.12	44.09	50.13	Average	54.00	PASS

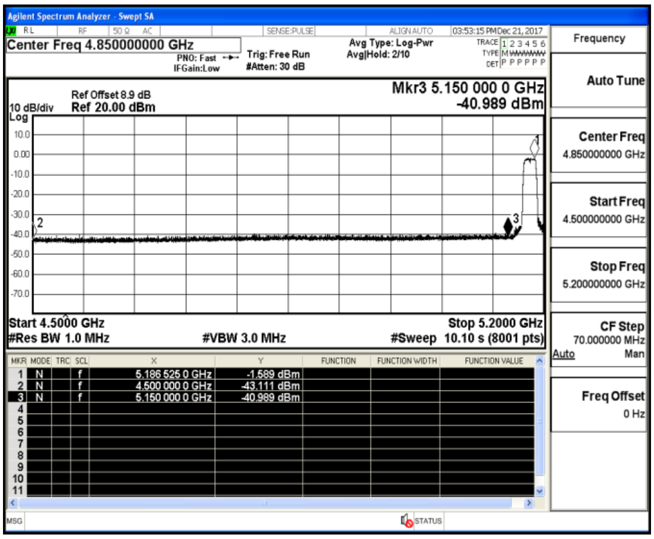
IEEE 802.11n HT40												
Frequency (MHz)	Conducted Power (dBm)			Antenna Gain(dBi)	Directional Gain(dBi)	Ground Reflection Factor (dB)	Convert Radiated E Level At 3m (dBuV/m)			Detector	Limit (dBuV/m)	Verdict
	Ant 0	Ant 1	Sum				Ant 0	Ant 1	Sum			
4500.000	-43.30	-43.98	-40.62	2.00	5.01	0.00	53.90	53.22	59.59	Peak	74.00	PASS
4500.000	-52.72	-52.82	-49.76	2.00	5.01	0.00	44.48	44.38	50.45	Average	54.00	PASS
5150.000	-41.68	-41.03	-38.33	2.00	5.01	0.00	55.52	56.17	61.88	Peak	74.00	PASS
5150.000	-51.19	-51.28	-48.22	2.00	5.01	0.00	46.01	45.92	51.99	Average	54.00	PASS
5350.000	-42.31	-41.92	-39.10	2.00	5.01	0.00	54.89	55.28	61.11	Peak	74.00	PASS
5350.000	-52.87	-52.55	-49.70	2.00	5.01	0.00	44.33	44.65	50.51	Average	54.00	PASS
5460.000	-42.56	-42.72	-39.63	2.00	5.01	0.00	54.64	54.48	60.58	Peak	74.00	PASS
5460.000	-53.09	-52.79	-49.93	2.00	5.01	0.00	44.11	44.41	50.28	Average	54.00	PASS

Remark:

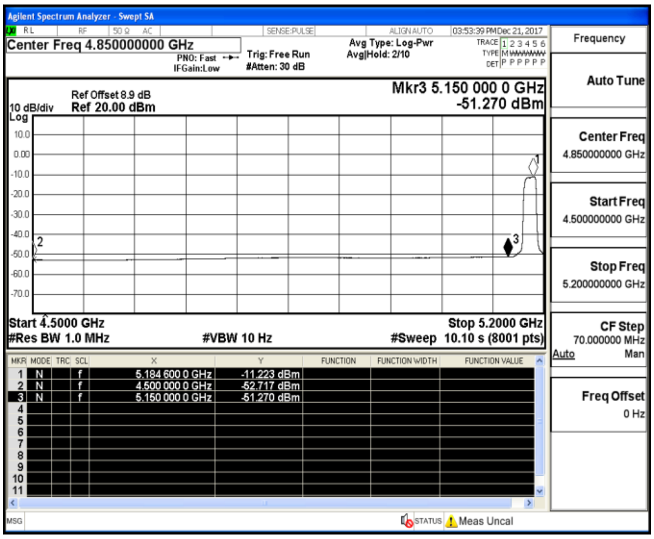
1. *Measured Undesirable emission at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40;*
4. *Covert Radiated E Level At 3m = Conducted average power + Directional Gain + 104.77-20*log(3);*
5. *Please refer to following test plots;*

Undesirable emission-ant 0

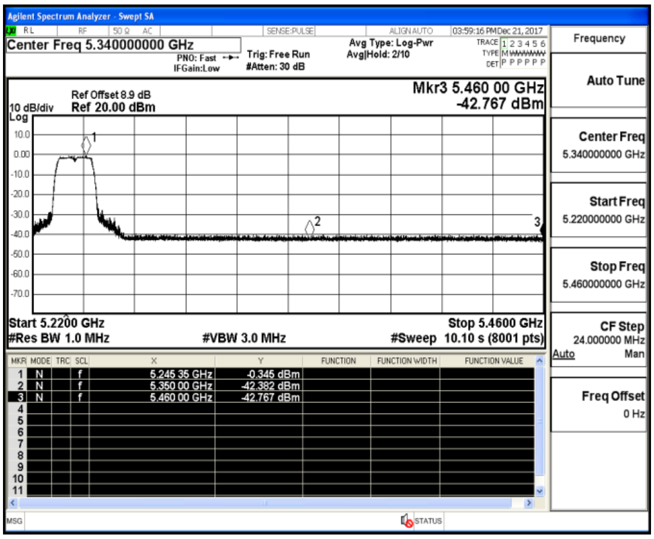
IEEE 802.11a



Channel 36 / 5180 MHz – Peak

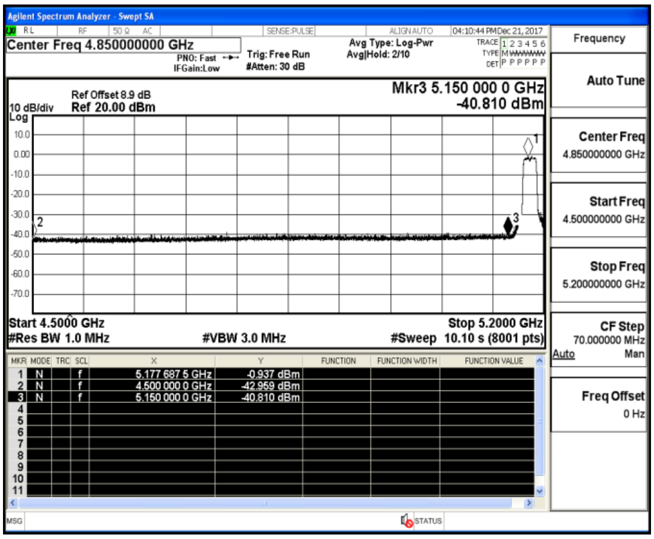


Channel 36 / 5180 MHz – Average

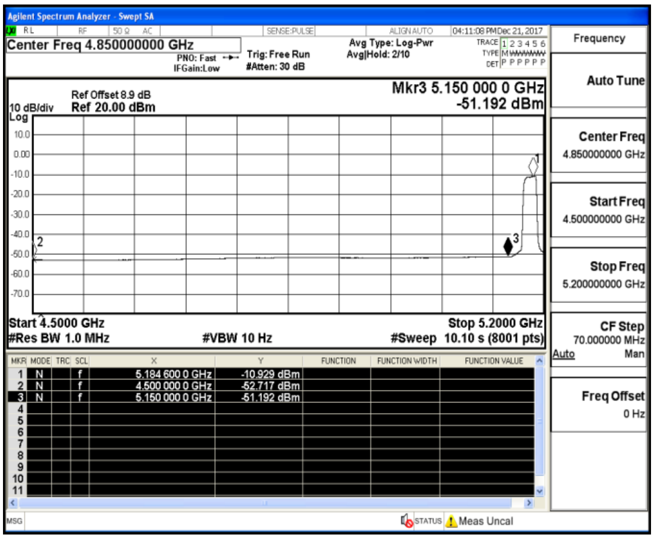


Channel 48 / 5240 MHz – Peak

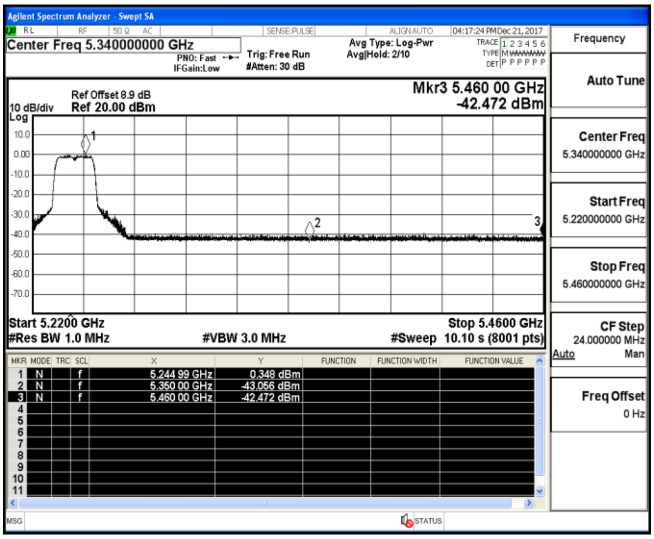
IEEE 802.11n HT20



Channel 36 / 5180 MHz – Peak



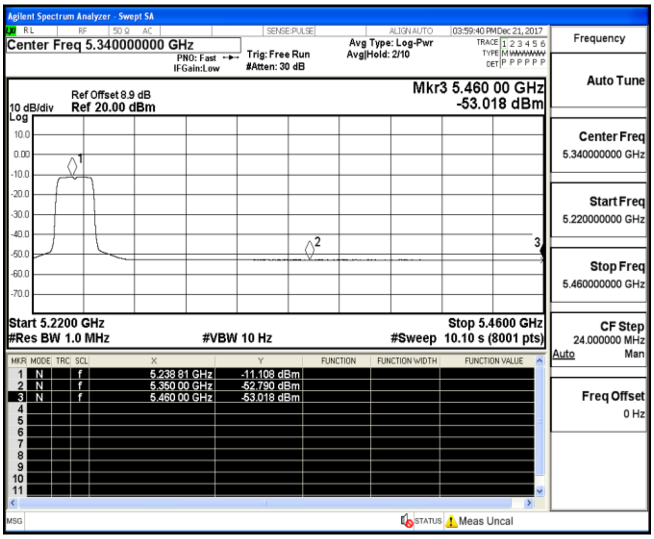
Channel 36 / 5180 MHz – Average



Channel 48 / 5240 MHz – Peak

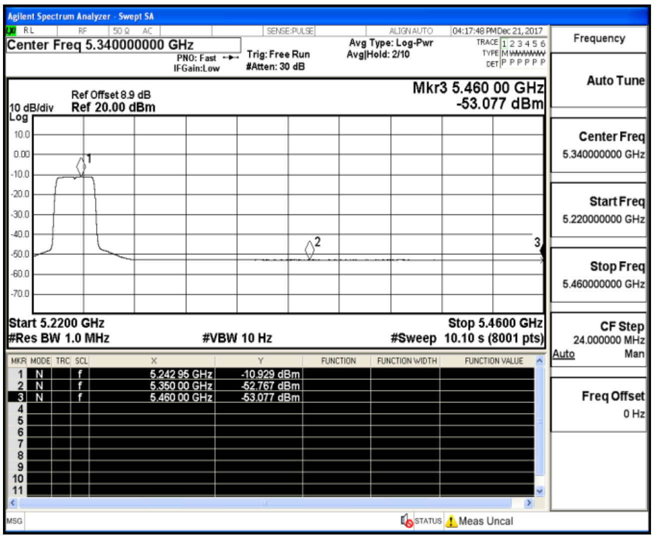
Undesirable emission-ant 0

IEEE 802.11a



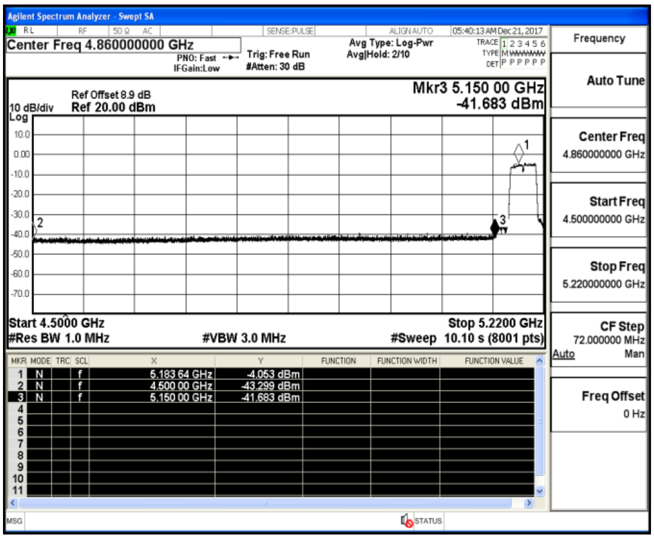
Channel 48 / 5240 MHz – Average

IEEE 802.11n HT20



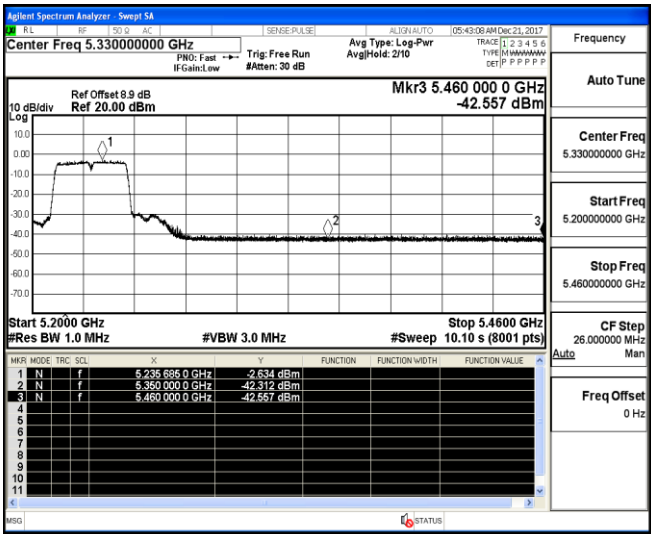
Channel 48 / 5240 MHz – Average

IEEE 802.11n HT40

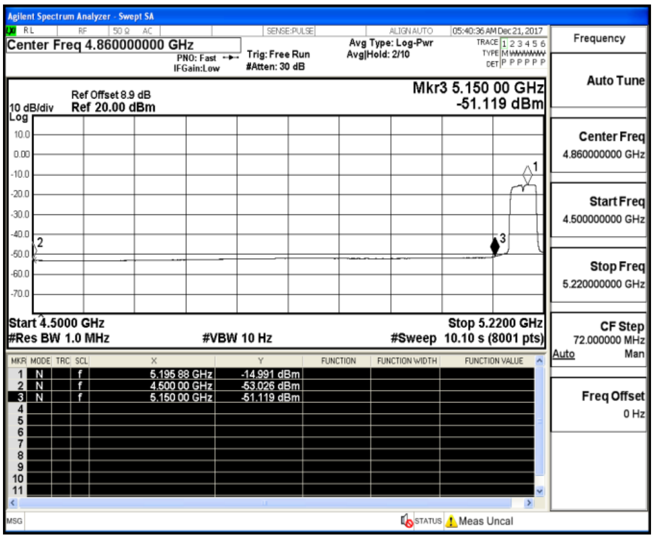


Channel 38 / 5190 MHz – Peak

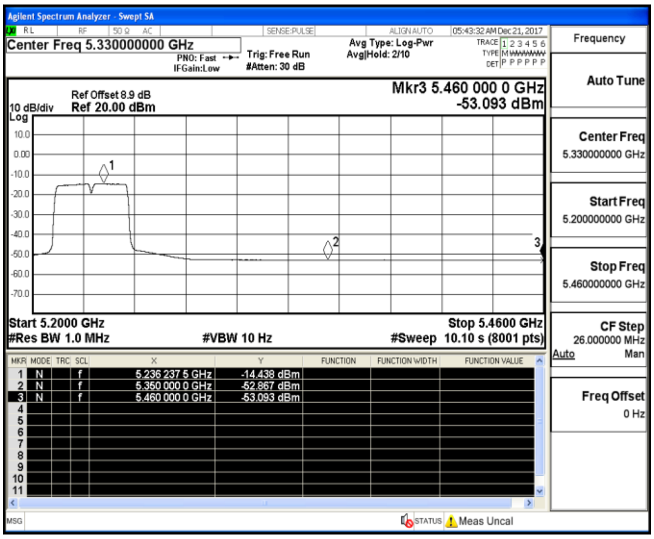
IEEE 802.11n HT40



Channel 46 / 5230 MHz – Peak



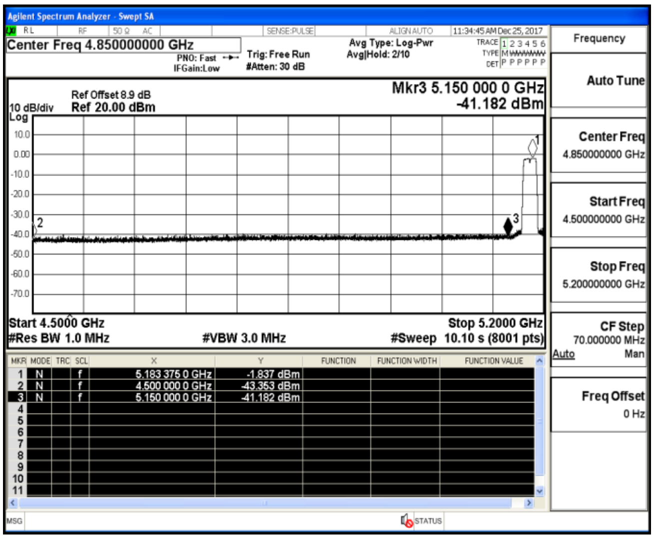
Channel 38 / 5190 MHz – Average



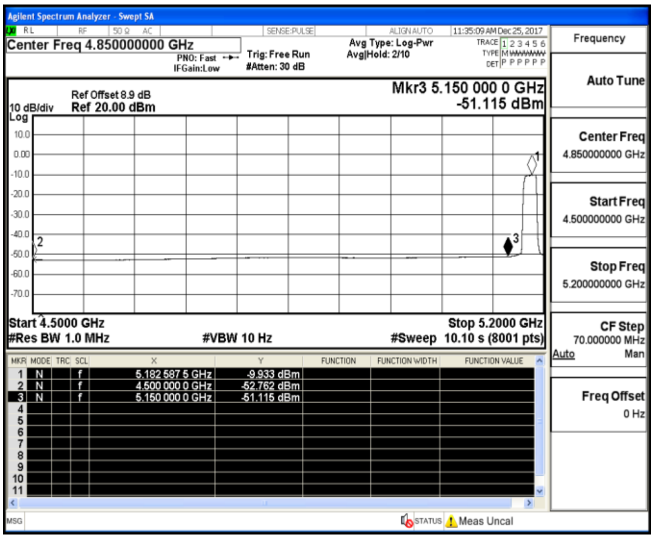
Channel 46 / 5230 MHz – Average

Undesirable emission-ant 1

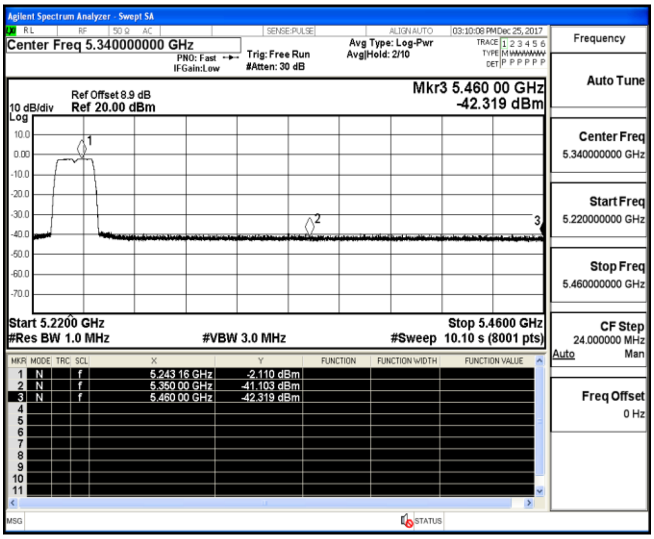
IEEE 802.11a



Channel 36 / 5180 MHz – Peak

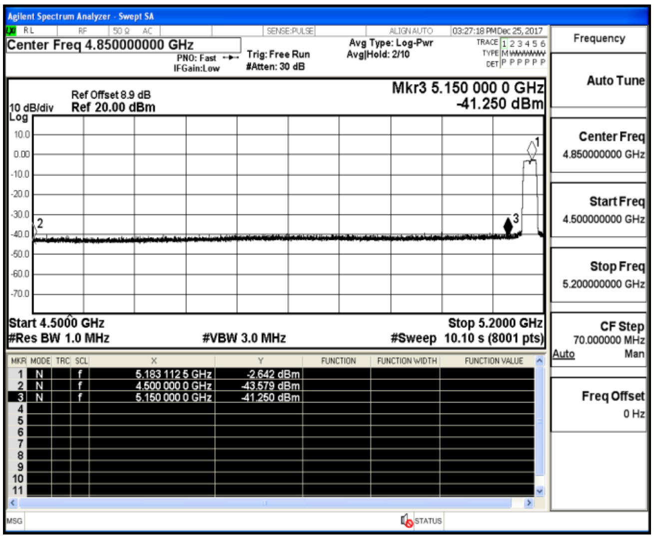


Channel 36 / 5180 MHz – Average

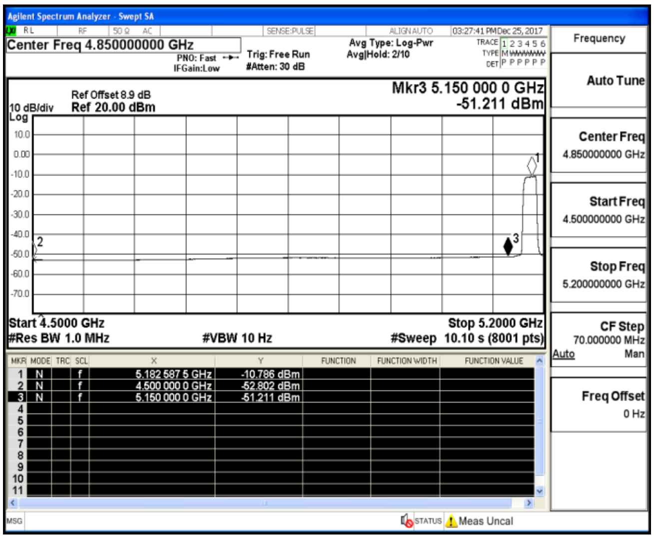


Channel 48 / 5240 MHz – Peak

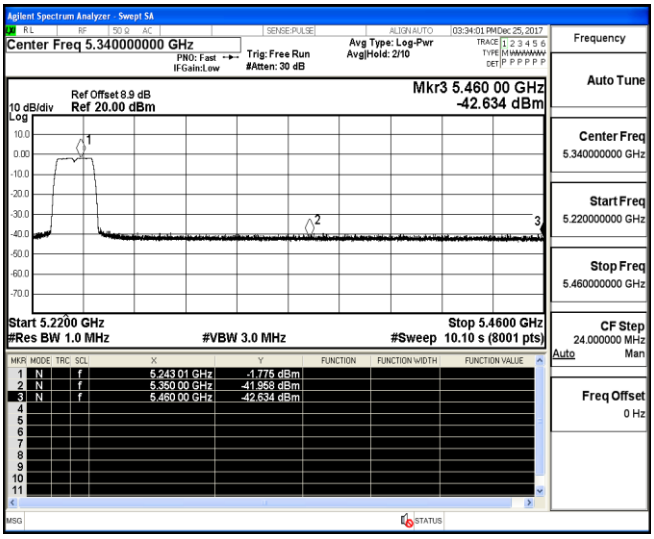
IEEE 802.11n HT20



Channel 36 / 5180 MHz – Peak



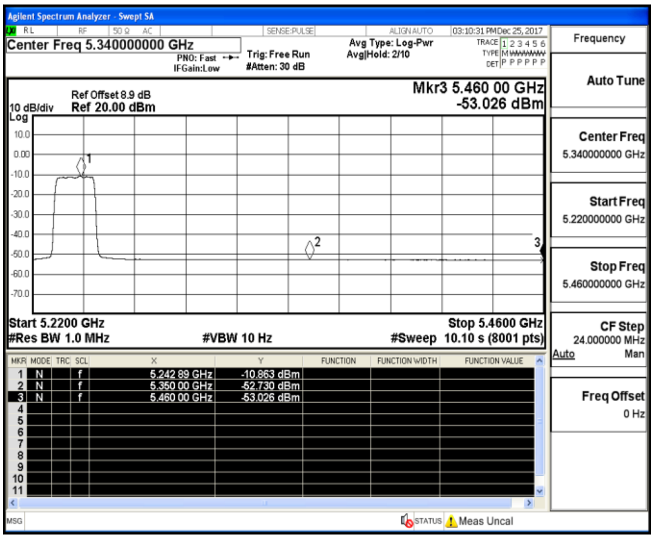
Channel 36 / 5180 MHz – Average



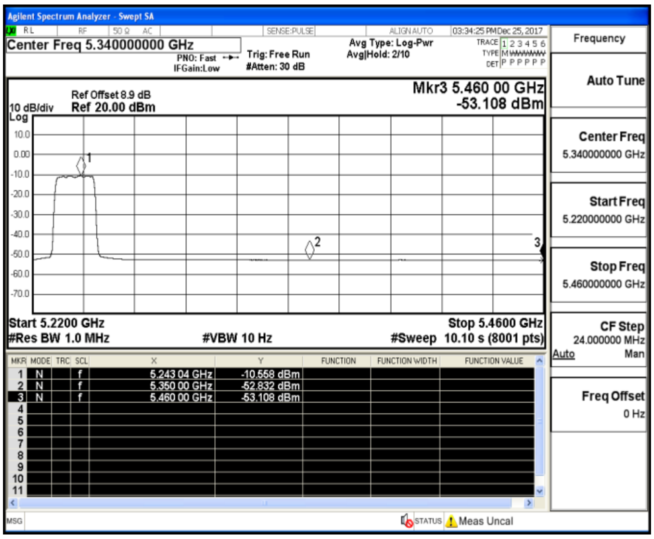
Channel 48 / 5240 MHz – Peak

Undesirable emission-ant 1

IEEE 802.11a	IEEE 802.11n HT20

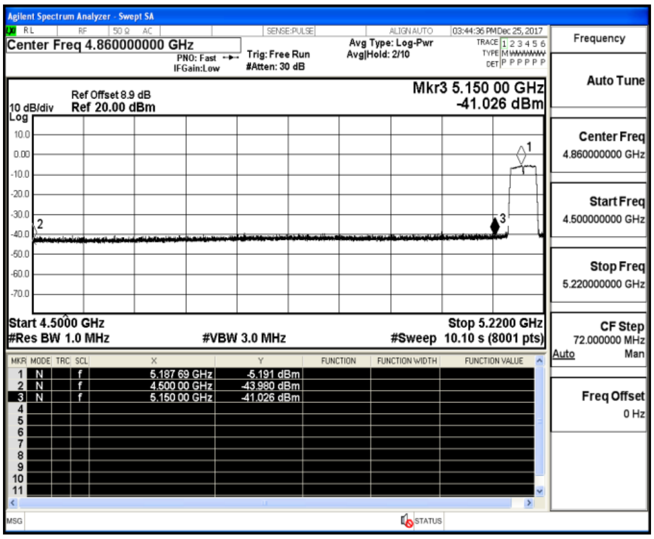


Channel 48 / 5240 MHz – Average

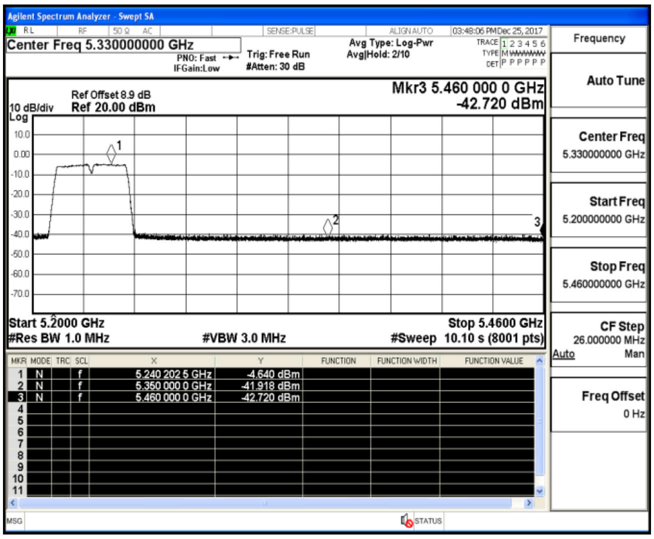


Channel 48 / 5240 MHz – Average

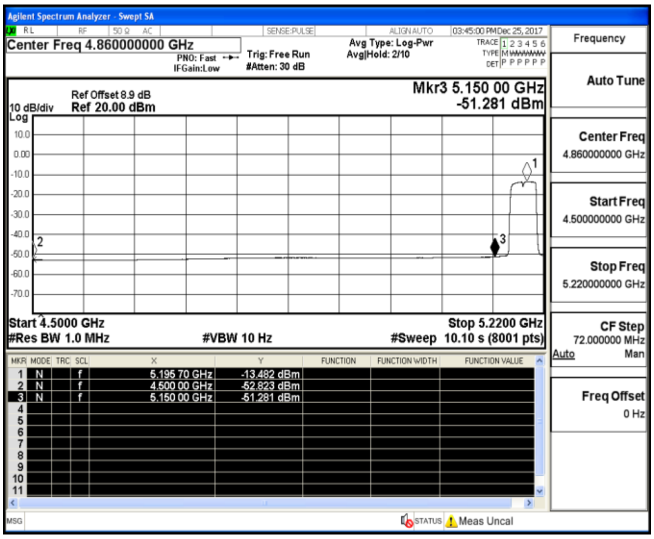
IEEE 802.11n HT40	IEEE 802.11n HT40



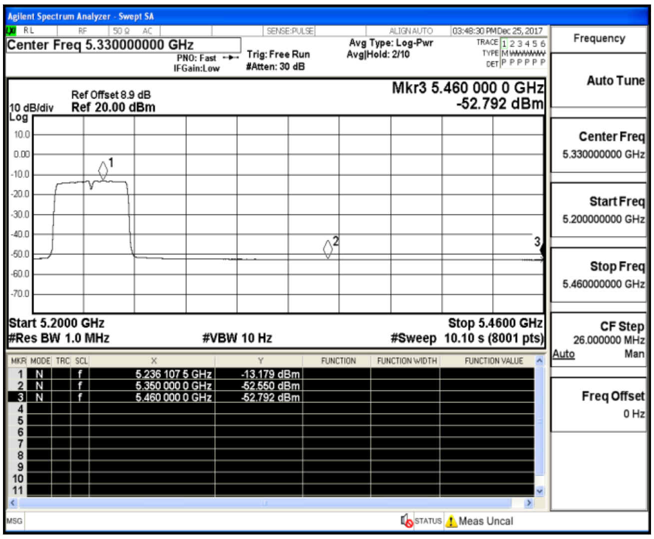
Channel 38 / 5190 MHz – Peak



Channel 46 / 5230 MHz – Peak



Channel 38 / 5190 MHz – Average



Channel 46 / 5230 MHz – Average

Remark:

1. *Measured unwanted emission at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40;*
4. *EIRP = Conducted power + Directional Gain*
5. *EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.3 However, for devices that operate in multiple bands using the same transmit antenna, the highest gain of the antenna within the operating band nearest to the out-of-band frequency being measured may be used in lieu of the overall highest gain when measuring emissions at frequencies within 20% of the absolute frequency at the nearest edge of that band, but in no case shall a value less than 2 dBi be selected.*
6. *Over limit = EIRP - Limit*
7. *Please refer to following test plots;*

5.8. Antenna Requirements

5.8.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.8.2 Antenna Connected Construction

5.8.2.1. Standard Applicable

According to § 15.203 & RSS-Gen, 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.

5.8.2.2. Antenna Connector Construction

The antenna gain of each antenna used for transmitting is 2.0dBi, the directional gain is 5.01dBi for 802.11n mode, the antennas are two PIFA antennas connect to PCB board and no consideration of replacement. Please see EUT photo for details.

The WLAN and BT share same modular and same antenna;

5.8.2.3. Results: Compliance.

Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.
Conducted power refers ANSI C63.10:2013 Output power test procedure for NII devices.
Radiated power refers to ANSI C63.10:2013 Radiated emissions tests.

Measurement parameters

Measurement parameter	
Detector:	Peak
Sweep Time:	Auto
Resolution bandwidth:	1MHz
Video bandwidth:	3MHz
Trace-Mode:	Max hold

Limits

FCC	ISED
Antenna Gain	
6 dBi	

Note: The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For WLAN devices, the OFDM (IEEE 802.11a) mode is used;

T_{nom}	V_{nom}	Lowest Channel 5180 MHz	Middle Channel 5220 MHz	Highest Channel 5240 MHz
Conducted power [dBm] Measured with DSSS modulation		1.105	1.142	1.282
Radiated power [dBm] Measured with DSSS modulation		1.975	1.997	2.128
Gain [dBi] Calculated		0.870	0.885	0.846
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

T_{nom}	V_{nom}	Lowest Channel 5180 MHz	Middle Channel 5220 MHz	Highest Channel 5240 MHz
Conducted power [dBm] Measured with DSSS modulation		0.948	0.961	0.986
Radiated power [dBm] Measured with DSSS modulation		1.771	1.648	1.805
Gain [dBi] Calculated		0.823	0.687	0.819
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

6. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separate file for test setup photos.

7. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separate file for exterior photos of eut.

8. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separate file for interior photos of eut.

----------------THE END OF REPORT---------------