

TEST REPORT

Reference No. : WTS18S03106959-2W
FCC ID..... : NZ3-WN575A2
Applicant : Winstars Technology Limited
Address : Block 4, TaiSong Industrial Park, DaLang Street, LongHua Town,
Bao'an district,Shenzhen, China
Manufaturer : Winstars Technology Limited
Address : Block 4, TaiSong Industrial Park, DaLang Street, LongHua Town,
Bao'an district,Shenzhen, China
Product..... : Wireless AP/Router
Model(s) : WS-WN575A2, WL-WN575A2
Standards..... : FCC CFR47 Part 15 C Section 15.407: 2017
Date of Receipt sample..... : 2018-03-30
Date of Test..... : 2018-04-02 to 2018-04-09
Date of Issue : 2018-04-10
Test Result : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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2 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation) of USA, Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), IC(Industry Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.



Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. ElectroMagnetic Compatibility(EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

2.1 Test Facility

A. Accreditations for Conformity Assessment (International)

Accreditations for Conformity Assessment (International)			
Country/Region	Accreditation Body	Scope	Note
USA	A2LA (Certificate No.: 4243.01)	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India		International Services	WPC
Thailand	NTC		-
Singapore	IDA		-
Note:			
1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.			
2. IC Canada Registration No.: 7760A			

B.TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of ...	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

3 Revision History

Test report #	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS18S03106959-2W	2018-03-30	2018-04-02 to 2018-04-09	2018-04-10	Original	-	Valid

4 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207(a)	PASS
Radiated Emissions	15.407(a) 15.205(a) 15.209(a)	PASS
Duty Cycle	KDB 789033	PASS
6dB Bandwidth	15.407(a)	PASS
26 dB Emission Bandwidth & 99% Occupied Bandwidth	15.407(a)	PASS
Maximum Conducted Output Power	15.407(a)	PASS
Power Spectral Density	15.407(a)	PASS
Restricted bands around fundamental frequency	15.407(a)	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

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6 General Information

6.1 General Description of E.U.T

Product:	Wireless AP/Router
Model(s):	WS-WN575A2, WL-WN575A2
Model Description:	Only the model names are different. The model WS-WN575A2 is the test sample.
Operation Frequency:	IEEE 802.11a/ n(HT20/40)/ac(HT20/40/80): 5150MHz to 5250MHz IEEE 802.11a/ n(HT20/40)/ac(HT20/40/80): 5725MHz to 5850MHz
Type of modulation:	IEEE for 802.11a: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE for 802.11n : OFDM(BPSK/QPSK/16QAM/64QAM) IEEE for 802.11ac : OFDM (BPSK/QPSK/16QAM/64QAM/256QAM)
The Lowest Oscillator:	40MHz
Antenna installation:	Dipole Antenna
Antenna Gain:	ANT3: 3dBi

6.2 Details of E.U.T

Ratings	Input: 100-240V~, 50/60Hz, 0.3A
----------------	---------------------------------

6.3 Channel List

U-NII-1 (5.15-5.25GHz)		U-NII-3 (5.725-5.85GHz)	
channel	Frequency(MHz)	channel	Frequency(MHz)
36	5180	149	5745
38	5190	151	5755
40	5200	153	5765
42	5210	155	5785
44	5220	157	5785
46	5230	159	5795
48	5240	161	5805
		165	5825

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11a/n(HT20)/ac(HT20):

channel	Frequency(MHz)	channel	Frequency(MHz)
36	5180	149	5745
40	5200	157	5785
48	5240	165	5825

For 802.11 n(HT40)/ac(HT40):

channel	Frequency(MHz)	channel	Frequency(MHz)
38	5190	151	5755
46	5230	159	5795

For 802.11 ac(HT80):

channel	Frequency(MHz)	channel	Frequency(MHz)
42	5210	155	5775

Test Mode Description:

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.

Transmitting duty cycle is no less 98%.

The software is installed in operation system, named "MT76xxE_AP", Version 1, date 20140321.

Test Items	Mode	Data Rate	Channel	TX/RX
Radiated Emissions	802.11a	6 Mbps	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-1 42 U-NII-3 155	TX
Duty Cycle	802.11a	6 Mbps	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-1 42 U-NII-3 155	TX
Band Edge	802.11a	6 Mbps	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-1 42 U-NII-3 155	TX

6dB Bandwidth	802.11a	6 Mbps	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-1 42 U-NII-3 155	TX
26dB Bandwidth and 99% Occupied Bandwidth	802.11a	6 Mbps	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-1 42 U-NII-3 155	TX
Conducted Output Power	802.11a	6 Mbps	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11ac(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-1 42 U-NII-3 155	TX
Power Spectral Density	802.11a	6 Mbps	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX
	802.11n(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT20)	MCS0	U-NII-1 36/40/48 U-NII-3 149/155/165	TX

	802.11ac(HT40)	MCS0	U-NII-1 38/46 U-NII-3 151/159	TX
	802.11ac(HT80)	MCS0	U-NII-1 42 U-NII-3 155	TX
Frequency Stability	Un-modulation	/	U-NII-1 36/40/48 U-NII-3 149/155/165	TX

7 Equipment Used during Test

7.1 Equipments List

Conducted Emissions Test Site						
Item	Equipment	Manufaturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	2017-09-12	2018-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2017-09-12	2018-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2017-09-12	2018-09-11
4.	Cable	LARGE	RF300	-	2017-09-12	2018-09-11
3m Semi-anechoic Chamber for Radiation Emissions Test site						
Item	Equipment	Manufaturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP30	100091	2017-04-29	2018-04-28
2	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2018-04-09	2019-04-08
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2017-04-13	2018-04-12
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2017-04-13	2018-04-12
5	Spectrum Analyzer	R&S	FSP40	100501	2017-10-20	2018-10-19
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2017-09-14	2018-09-13
7	Microwave Broadband Preamplifier	SCHWARZBECK	BBV 9721	100472	2017-10-25	2018-10-24
8	Cable	Top	18GHz-40GHz	-	2017-10-25	2018-10-24
3m Semi-anechoic Chamber for Radiation Emissions Test site						
Item	Equipment	Manufaturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2017-04-13	2018-04-12
2	Ative Loop Antenna	Beijing Dazhi	ZN30900A	-	2017-10-17	2018-10-16
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2018-04-08	2019-04-07
4	Amplifier	ANRITSU	MH648A	M43381	2017-04-13	2018-04-12
5	Cable	HUBER+SUHNER	CBL2	525178	2017-04-13	2018-04-12
6	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2017-09-12	2018-09-11
RF Conducted Testing						
Item	Equipment	Manufaturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2017-09-14	2018-09-13
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2017-09-12	2018-09-11
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2017-09-12	2018-09-11

4.	Coaxial Cable (10Hz-30GHz)	/	/	/	2017-09-12	2018-09-11
5.	Antenna Connector*	/	/	/	2017-09-12	2018-09-11

“*”: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

7.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
/	/	/	/

7.3 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (30M~1000MHz)
	± 5.47 dB (1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (A mains 150KHz~30MHz)

7.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

8 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2013
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

8.1 E.U.T. Operation

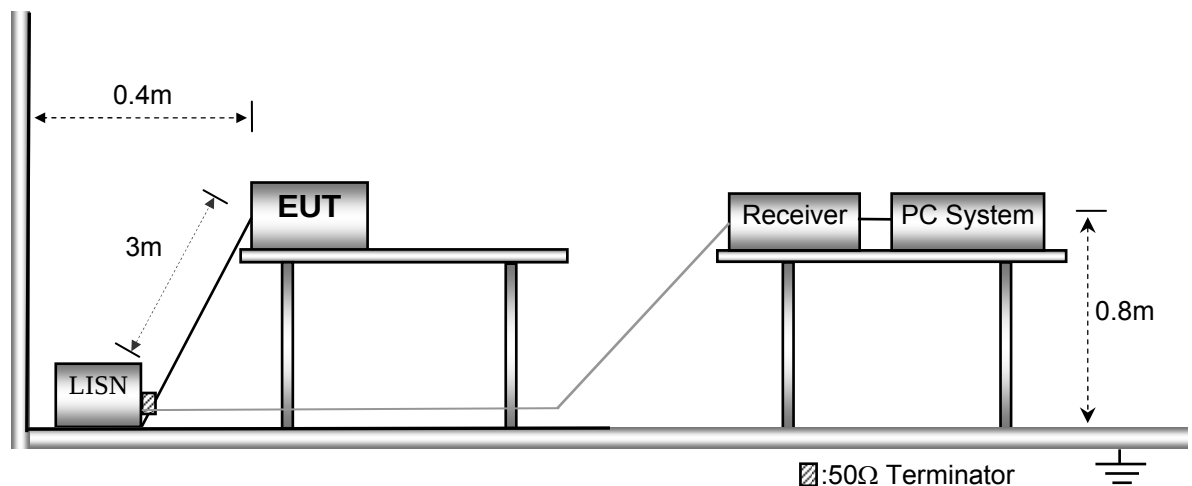
Operating Environment :

Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa
EUT Operation :	Transmitting mode

The test was performed in Transmitting mode(For WIFI), Only the worst case 802.11 mode were record in the report.

8.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



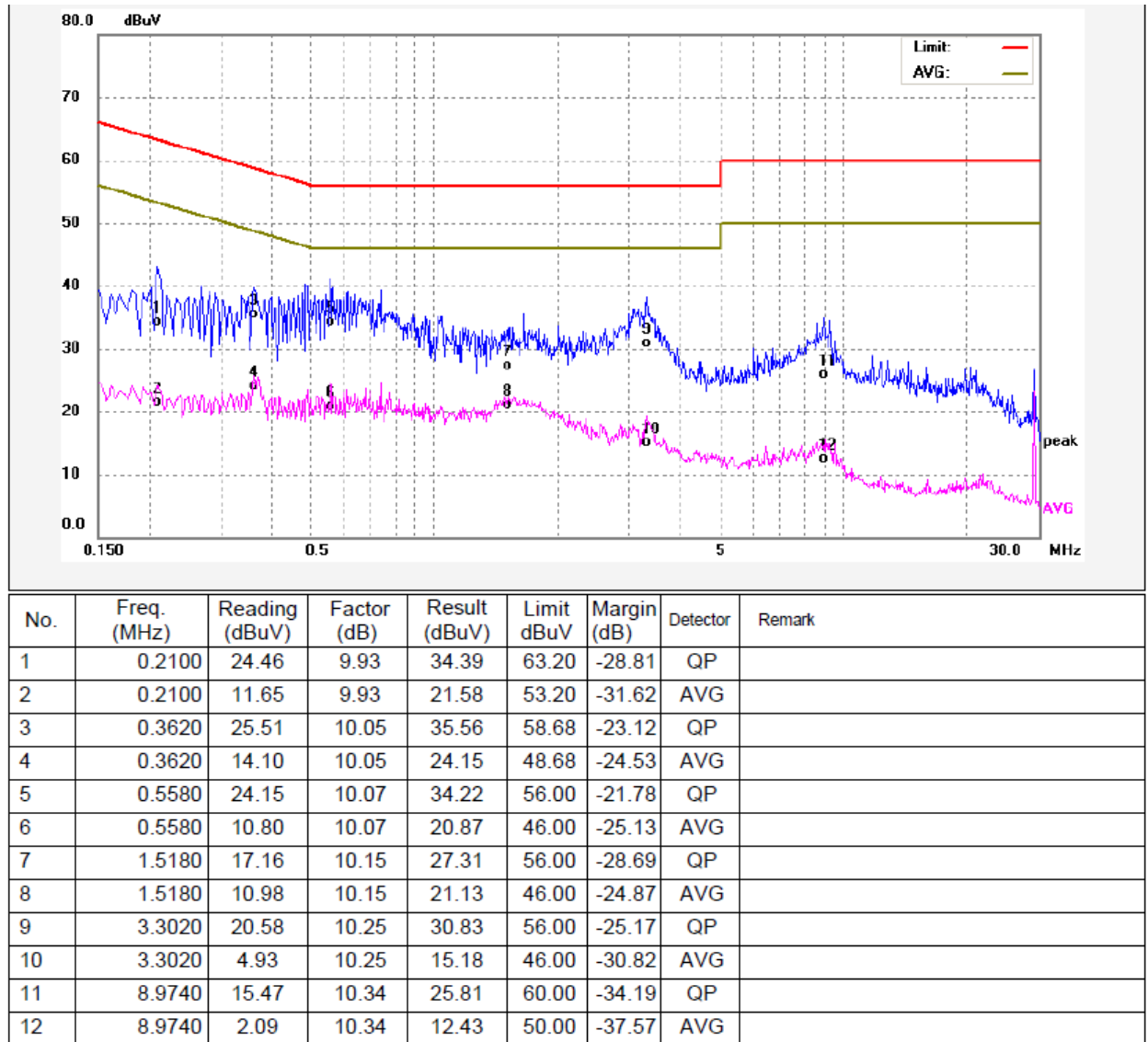
8.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

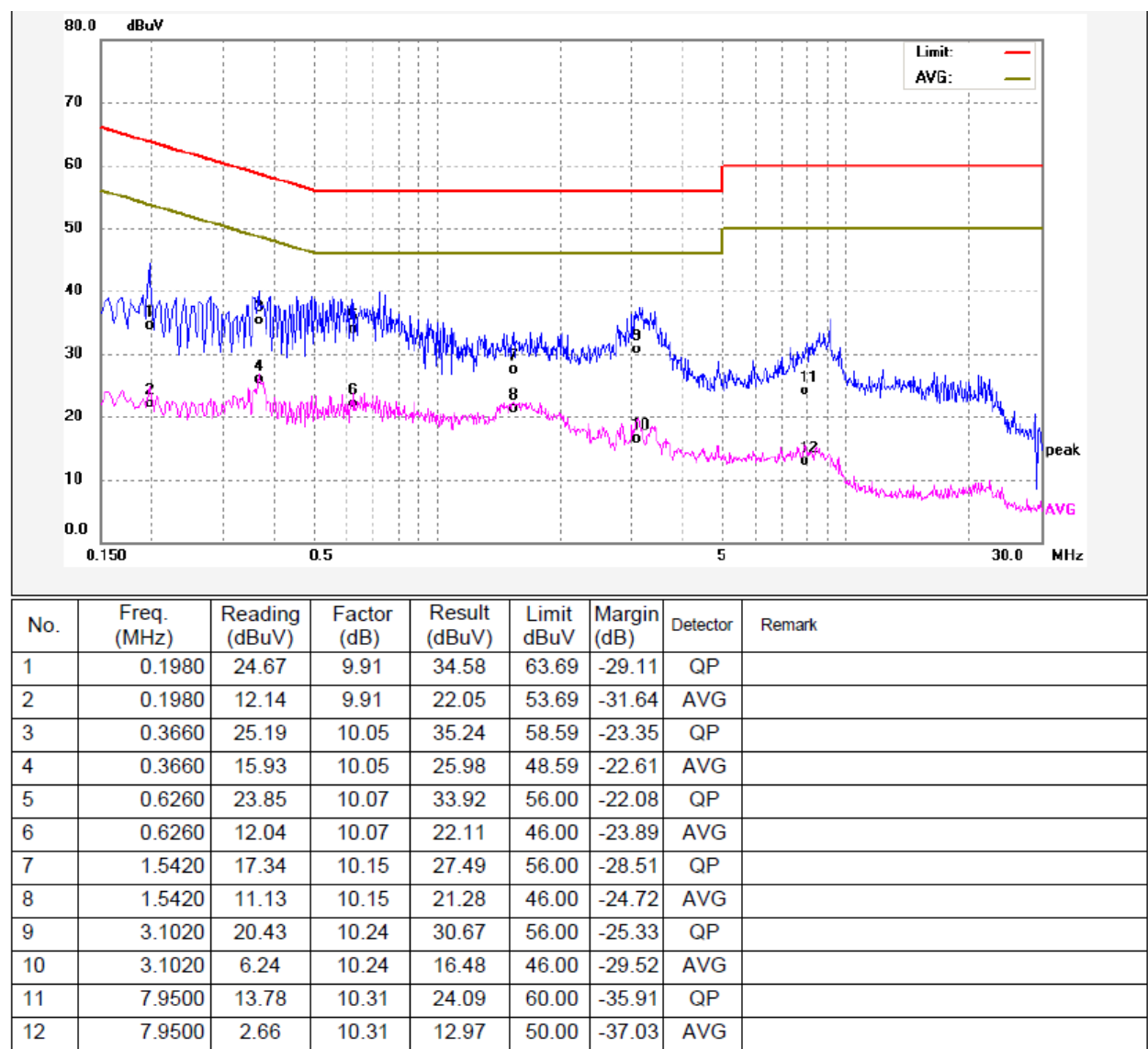
8.4 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

Live line:



Neutral line:



9 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.407

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Distance	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

9.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

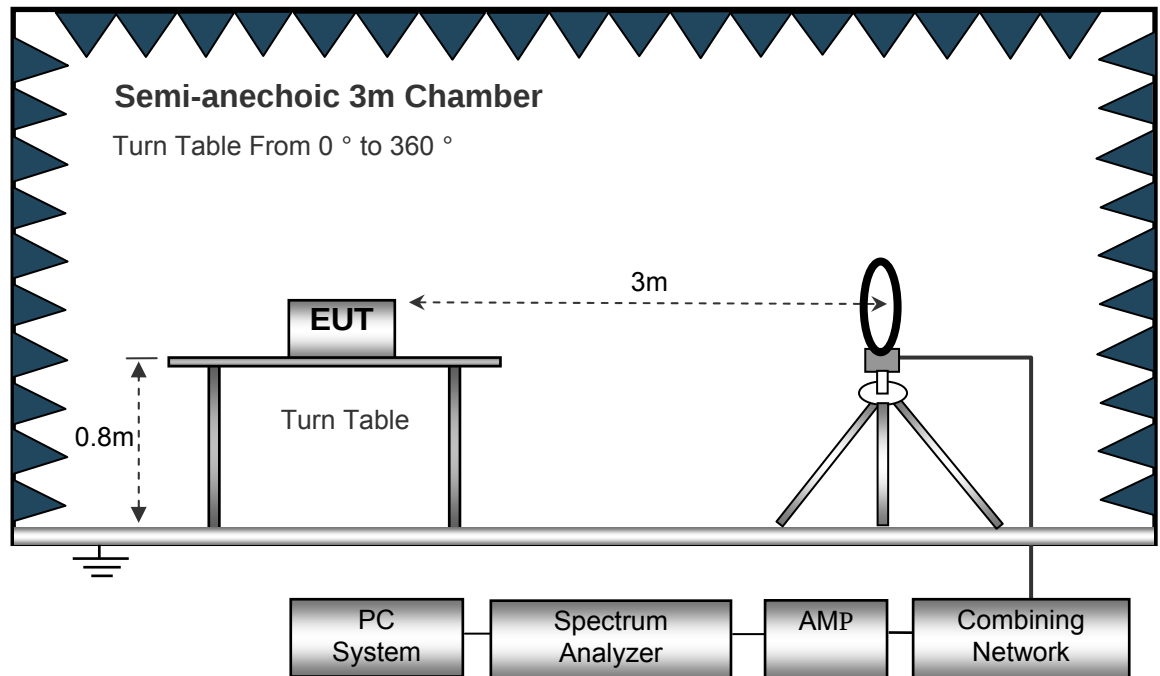
EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

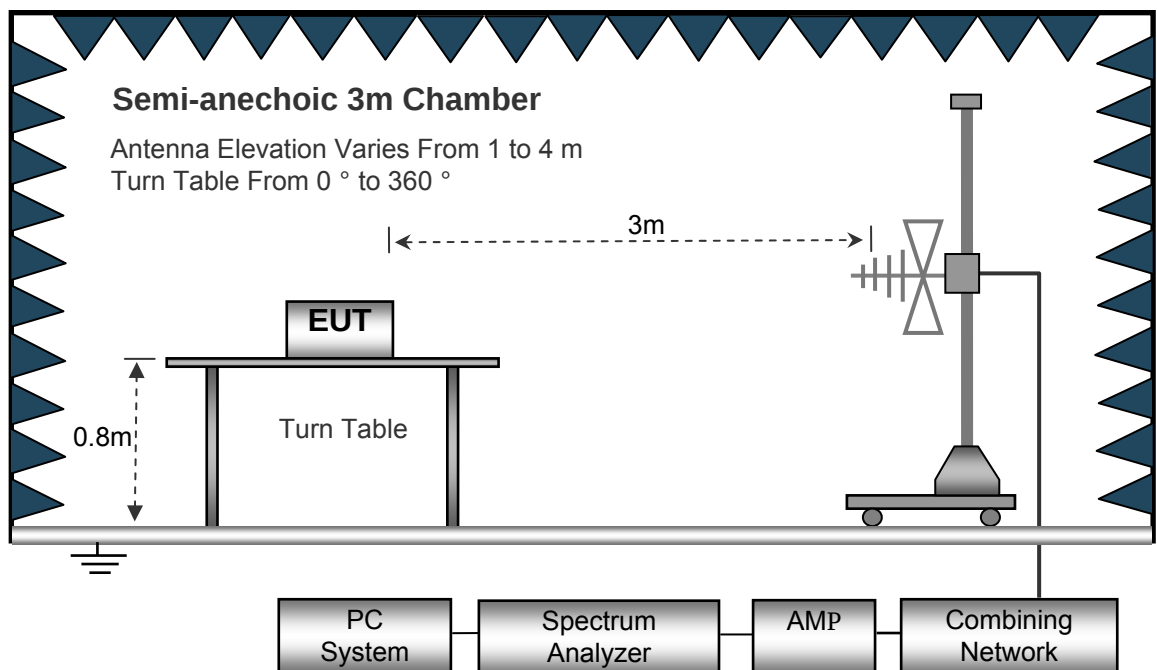
9.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

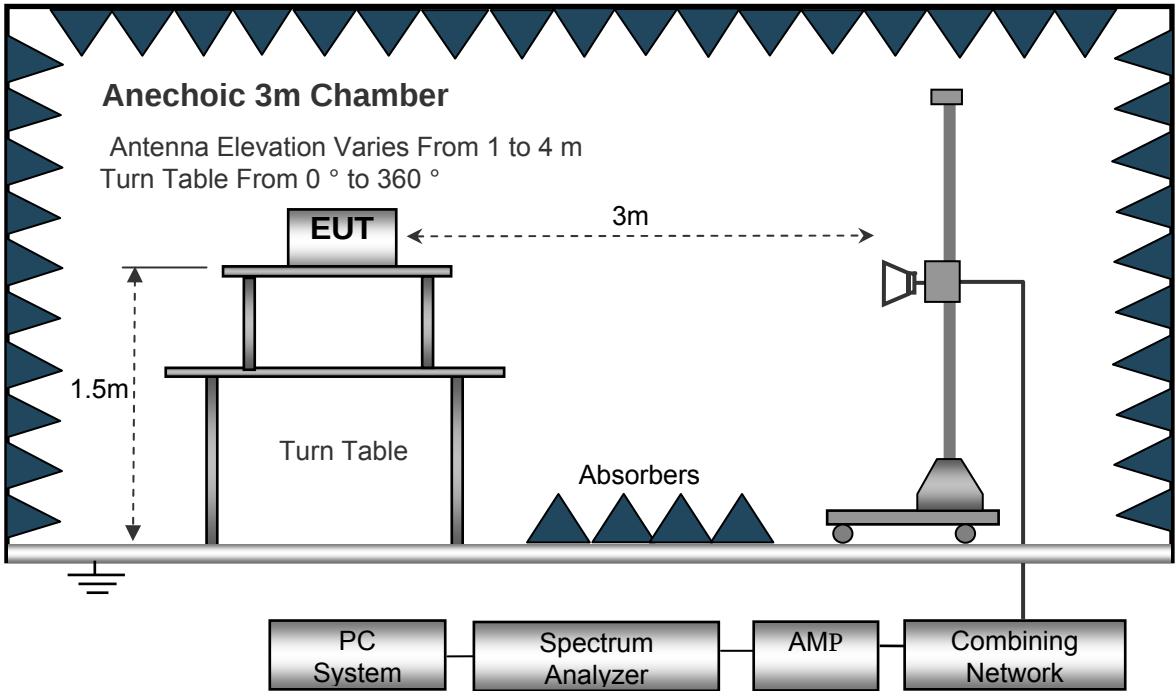
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



9.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed Auto
IF Bandwidth.....10kHz
Video Bandwidth.....10kHz
Resolution Bandwidth.....10kHz

30MHz ~ 1GHz

Sweep Speed Auto
DetectorPK
Resolution Bandwidth.....100kHz
Video Bandwidth.....300kHz

Above 1GHz

Sweep Speed Auto
DetectorPK
Resolution Bandwidth.....1MHz
Video Bandwidth.....3MHz
DetectorAve.
Resolution Bandwidth.....1MHz
Video Bandwidth.....10Hz

9.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.
8. A 2.4GHz high -pass filter is used during radiated emissions above 1GHz measurement.

9.5 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

9.6 Summary of Test Results

FCC Part15.33: For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph: If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Test Frequency : 30MHz ~ 18GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Fator	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT20) U-NII-1 low Channel 5180MHz									
226.37	45.86	QP	305	1.6	H	-11.25	34.61	46.00	-11.39
226.37	46.40	QP	305	1.9	V	-11.25	35.15	46.00	-10.85
4503.87	44.13	PK	146	1.1	H	-1.54	42.59	74.00	-31.41
4503.87	41.09	Ave	146	1.1	H	-1.54	39.55	54.00	-14.45
5135.31	43.67	PK	95	1.9	H	-0.75	42.92	74.00	-31.08
5135.31	43.87	Ave	95	1.9	H	-0.75	43.12	54.00	-10.88
10360.00	40.25	PK	265	1.7	H	5.33	45.58	74.00	-28.42
10360.00	23.45	Ave	265	1.7	H	5.33	28.78	54.00	-25.22
15540.00	45.82	PK	30	1.5	H	5.29	51.11	74.00	-22.89
15540.00	38.31	Ave	30	1.5	H	5.29	43.60	54.00	-10.40
802.11n(HT20) U-NII-1 middle channel 5200MHz									
226.96	44.50	QP	339	2.0	H	-10.96	33.54	46.00	-12.46
226.93	45.34	QP	249	1.7	V	-10.96	34.38	46.00	-11.62
4509.34	44.86	PK	290	1.4	H	-1.64	43.22	74.00	-30.78
4509.34	42.34	Ave	290	1.4	H	-1.64	40.70	54.00	-13.30
5133.92	43.50	PK	72	1.9	H	-0.91	42.59	74.00	-31.41
5133.92	43.07	Ave	72	1.9	H	-0.91	42.16	54.00	-11.84
10400.00	40.45	PK	198	1.4	H	5.21	45.66	74.00	-28.34
10400.00	23.68	Ave	198	1.4	H	5.21	28.89	54.00	-25.11
15600.00	46.09	PK	166	1.9	H	5.30	51.39	74.00	-22.61
15600.00	37.29	Ave	166	1.9	H	5.30	42.59	54.00	-11.41

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Fator	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT20) U-NII-1 High channel 5240MHz									
226.72	45.42	QP	5	1.9	H	-10.97	34.45	46.00	-11.55
226.72	44.80	QP	235	1.4	V	-10.97	33.83	46.00	-12.17
4510.86	43.05	PK	319	1.1	H	-1.56	41.49	74.00	-32.51
4510.86	44.24	Ave	319	1.1	H	-1.56	42.68	54.00	-11.32
5128.19	44.01	PK	168	1.4	H	-0.81	43.20	74.00	-30.80
5128.19	44.76	Ave	168	1.4	H	-0.81	43.95	54.00	-10.05
10480.00	40.63	PK	179	1.3	H	5.14	45.77	74.00	-28.23
10480.00	22.36	Ave	179	1.3	H	5.14	27.50	54.00	-26.50
15720.00	45.48	PK	193	1.1	H	5.10	50.58	74.00	-23.42
15720.00	39.64	Ave	193	1.1	H	5.10	44.74	54.00	-9.26
802.11n(HT20) U-NII-3 low Channel 5745MHz									
227.13	45.61	QP	351	1.1	H	-10.99	34.62	46.00	-11.38
227.13	43.78	QP	206	1.6	V	-10.99	32.79	46.00	-13.21
4529.50	44.29	PK	194	1.1	H	-1.80	42.49	74.00	-31.51
4529.50	41.49	Ave	194	1.1	H	-1.80	39.69	54.00	-14.31
5141.42	41.13	PK	164	1.9	H	-0.96	40.17	74.00	-33.83
5141.42	22.13	Ave	164	1.9	H	-0.96	21.17	54.00	-32.83
11490.00	46.42	PK	353	1.4	H	5.93	52.35	74.00	-21.65
11490.00	38.05	Ave	353	1.4	H	5.93	43.98	54.00	-10.02
17235.00	45.45	PK	270	1.9	H	10.35	55.80	74.00	-18.20
17235.00	37.94	Ave	270	1.9	H	10.35	48.29	54.00	-5.71

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Fator	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT20) U-NII-3 middle channel 5785MHz									
227.27	46.62	QP	23	1.7	H	-11.13	35.49	46.00	-10.51
227.27	45.76	QP	185	1.8	V	-11.13	34.63	46.00	-11.37
4510.77	42.95	PK	304	1.1	H	-1.59	41.36	74.00	-32.64
4510.77	41.87	Ave	304	1.1	H	-1.59	40.28	54.00	-13.72
5111.59	39.60	PK	127	1.1	H	-0.95	38.65	74.00	-35.35
5111.59	21.66	Ave	127	1.1	H	-0.95	20.71	54.00	-33.29
11570.00	45.39	PK	109	1.7	H	5.81	51.20	74.00	-22.80
11570.00	37.27	Ave	109	1.7	H	5.81	43.08	54.00	-10.92
17355.00	45.17	PK	1	1.9	H	10.37	55.54	74.00	-18.46
17355.00	38.70	Ave	1	1.9	H	10.37	49.07	54.00	-4.93
802.11n(HT20) U-NII-3 High channel 5825MHz									
227.11	44.88	QP	111	1.4	H	-11.03	33.85	46.00	-12.15
227.11	45.58	QP	19	1.5	V	-11.03	34.55	46.00	-11.45
4527.43	43.41	PK	248	1.7	H	-1.68	41.73	74.00	-32.27
4527.43	42.73	Ave	248	1.7	H	-1.68	41.05	54.00	-12.95
5127.10	39.62	PK	21	1.7	H	-0.96	38.66	74.00	-35.34
5127.10	22.50	Ave	21	1.7	H	-0.96	21.54	54.00	-32.46
11650.00	45.82	PK	124	1.5	H	5.84	51.66	74.00	-22.34
11650.00	38.11	Ave	124	1.5	H	5.84	43.95	54.00	-10.05
17475.00	45.75	PK	236	1.7	H	10.41	56.16	74.00	-17.84
17475.00	39.41	Ave	236	1.7	H	10.41	49.82	54.00	-4.18

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Fator	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11a(HT20) U-NII-1 low Channel 5180MHz									
227.03	47.13	QP	256	1.9	H	-11.20	35.93	46.00	-10.07
227.03	44.46	QP	114	1.7	V	-11.20	33.26	46.00	-12.74
4501.64	43.04	PK	265	1.0	H	-1.80	41.24	74.00	-32.76
4501.64	44.59	Ave	265	1.0	H	-1.80	42.79	54.00	-11.21
5115.99	39.88	PK	219	1.2	H	-0.94	38.94	74.00	-35.06
5115.99	32.58	Ave	219	1.2	H	-0.94	31.64	54.00	-22.36
10360.00	41.93	PK	59	1.3	H	5.33	47.26	74.00	-26.74
10360.00	23.33	Ave	59	1.3	H	5.33	28.66	54.00	-25.34
15540.00	45.96	PK	339	1.5	H	5.29	51.25	74.00	-22.75
15540.00	38.21	Ave	339	1.5	H	5.29	43.50	54.00	-10.50
802.11a(HT20) U-NII-1 middle channel 5200MHz									
226.96	46.37	QP	243	1.9	H	-11.15	35.22	46.00	-10.78
226.96	43.29	QP	38	1.9	V	-11.15	32.14	46.00	-13.86
4513.25	43.98	PK	84	1.4	H	-1.69	42.29	74.00	-31.71
4513.25	43.01	Ave	84	1.4	H	-1.69	41.32	54.00	-12.68
5138.47	42.22	PK	223	1.7	H	-0.91	41.31	74.00	-32.69
5138.47	44.55	Ave	223	1.7	H	-0.91	43.64	54.00	-10.36
10400.00	41.51	PK	113	1.4	H	5.21	46.72	74.00	-27.28
10400.00	23.49	Ave	113	1.4	H	5.21	28.70	54.00	-25.30
15600.00	46.52	PK	9	1.9	H	5.30	51.82	74.00	-22.18
15600.00	39.03	Ave	9	1.9	H	5.30	44.33	54.00	-9.67

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Fator	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11a(HT20) U-NII-1 High channel 5240MHz									
226.95	46.45	QP	274	1.7	H	-11.18	35.27	46.00	-10.73
226.95	44.12	QP	187	1.4	V	-11.18	32.94	46.00	-13.06
4501.22	42.80	PK	2	1.9	H	-1.77	41.03	74.00	-32.97
4501.22	43.75	Ave	2	1.9	H	-1.77	41.98	54.00	-12.02
5119.62	43.64	PK	171	1.0	H	-0.79	42.85	74.00	-31.15
5119.62	43.57	Ave	171	1.0	H	-0.79	42.78	54.00	-11.22
10480.00	41.72	PK	348	2.0	H	5.14	46.86	74.00	-27.14
10480.00	21.85	Ave	348	2.0	H	5.14	26.99	54.00	-27.01
15720.00	46.16	PK	333	2.0	H	5.10	51.26	74.00	-22.74
15720.00	38.01	Ave	333	2.0	H	5.10	43.11	54.00	-10.89
802.11a(HT20) U-NII-3 low Channel 5745MHz									
226.76	46.64	QP	87	1.6	H	-11.15	35.49	46.00	-10.51
226.76	45.66	QP	332	1.9	V	-11.15	34.51	46.00	-11.49
4520.92	41.54	PK	197	1.4	H	-1.64	39.90	74.00	-34.10
4520.92	41.33	Ave	197	1.4	H	-1.64	39.69	54.00	-14.31
5111.84	39.94	PK	62	1.5	H	-0.84	39.10	74.00	-34.90
5111.84	20.99	Ave	62	1.5	H	-0.84	20.15	54.00	-33.85
11490.00	46.66	PK	109	2.0	H	5.93	52.59	74.00	-21.41
11490.00	37.68	Ave	109	2.0	H	5.93	43.61	54.00	-10.39
17235.00	46.51	PK	234	1.1	H	10.35	56.86	74.00	-17.14
17235.00	38.65	Ave	234	1.1	H	10.35	49.00	54.00	-5.00

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Fator	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11a(HT20) U-NII-3 middle channel 5785MHz									
226.82	46.13	QP	39	1.6	H	-11.02	35.11	46.00	-10.89
226.82	44.33	QP	202	1.3	V	-11.02	33.31	46.00	-12.69
4500.57	43.60	PK	339	2.0	H	-1.63	41.97	74.00	-32.03
4500.57	42.94	Ave	339	2.0	H	-1.63	41.31	54.00	-12.69
5113.80	40.75	PK	229	1.8	H	-0.73	40.02	74.00	-33.98
5113.80	22.49	Ave	229	1.8	H	-0.73	21.76	54.00	-32.24
11570.00	46.77	PK	277	1.3	H	5.81	52.58	74.00	-21.42
11570.00	39.15	Ave	277	1.3	H	5.81	44.96	54.00	-9.04
17355.00	46.77	PK	253	1.4	H	10.37	57.14	74.00	-16.86
17355.00	37.54	Ave	253	1.4	H	10.37	47.91	54.00	-6.09
802.11a(HT20) U-NII-3 High channel 5825MHz									
227.15	45.89	QP	194	1.4	H	-11.25	34.64	46.00	-11.36
227.15	44.58	QP	212	1.3	V	-11.25	33.33	46.00	-12.67
4520.84	43.23	PK	180	1.4	H	-1.67	41.56	74.00	-32.44
4520.84	43.21	Ave	180	1.4	H	-1.67	41.54	54.00	-12.46
5111.23	41.04	PK	57	1.5	H	-0.83	40.21	74.00	-33.79
5111.23	23.46	Ave	57	1.5	H	-0.83	22.63	54.00	-31.37
11650.00	46.54	PK	120	1.4	H	5.84	52.38	74.00	-21.62
11650.00	37.95	Ave	120	1.4	H	5.84	43.79	54.00	-10.21
17475.00	46.71	PK	228	1.2	H	10.41	57.12	74.00	-16.88
17475.00	38.38	Ave	228	1.2	H	10.41	48.79	54.00	-5.21

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT40) U-NII-1 low Channel 5190MHz									
227.27	45.10	QP	272	1.3	H	-11.20	33.90	46.00	-12.10
227.27	45.70	QP	10	1.4	V	-11.20	34.50	46.00	-11.50
4510.10	42.48	PK	141	1.8	H	-1.50	40.98	74.00	-33.02
4510.10	41.78	Ave	141	1.8	H	-1.50	40.28	54.00	-13.72
5122.62	41.69	PK	29	1.4	H	-0.86	40.83	74.00	-33.17
5122.62	32.29	Ave	29	1.4	H	-0.86	31.43	54.00	-22.57
10380.00	38.18	PK	335	2.0	H	5.26	43.44	74.00	-30.56
10380.00	20.87	Ave	335	2.0	H	5.26	26.13	54.00	-27.87
15570.00	46.87	PK	100	1.3	H	5.13	52.00	74.00	-22.00
15570.00	38.25	Ave	100	1.3	H	5.13	43.38	54.00	-10.62
802.11n(HT40) U-NII-1 High channel 5230MHz									
227.13	45.31	QP	211	1.3	H	-11.12	34.19	46.00	-11.81
227.13	44.16	QP	266	1.3	V	-11.12	33.04	46.00	-12.96
4511.33	43.61	PK	69	1.8	H	-1.63	41.98	74.00	-32.02
4511.33	42.43	Ave	69	1.8	H	-1.63	40.80	54.00	-13.20
5134.64	42.34	PK	158	1.0	H	-0.90	41.44	74.00	-32.56
5134.64	43.47	Ave	158	1.0	H	-0.90	42.57	54.00	-11.43
10460.00	40.78	PK	308	1.3	H	5.28	46.06	74.00	-27.94
10460.00	22.01	Ave	308	1.3	H	5.28	27.29	54.00	-26.71
15690.00	46.34	PK	315	1.5	H	5.02	51.36	74.00	-22.64
15690.00	39.50	Ave	315	1.5	H	5.02	44.52	54.00	-9.48

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT40) U-NII-3 low Channel 5755MHz									
227.05	47.12	QP	18	1.4	H	-10.98	36.14	46.00	-9.86
227.05	45.42	QP	338	1.6	V	-10.98	34.44	46.00	-11.56
4501.62	41.71	PK	221	1.4	H	-1.69	40.02	74.00	-33.98
4501.62	41.01	Ave	221	1.4	H	-1.69	39.32	54.00	-14.68
5117.93	38.25	PK	185	1.7	H	-0.74	37.51	74.00	-36.49
5117.93	20.30	Ave	185	1.7	H	-0.74	19.56	54.00	-34.44
11510.00	45.47	PK	231	1.5	H	5.88	51.35	74.00	-22.65
11510.00	39.90	Ave	231	1.5	H	5.88	45.78	54.00	-8.22
17265.00	45.73	PK	101	1.3	H	10.42	56.15	74.00	-17.85
17265.00	38.68	Ave	101	1.3	H	10.42	49.10	54.00	-4.90
802.11n(HT40) U-NII-3 High channel 5795MHz									
227.01	44.94	QP	69	1.6	H	-11.19	33.75	46.00	-12.25
227.01	43.91	QP	288	1.9	V	-11.19	32.72	46.00	-13.28
4520.20	45.21	PK	54	1.3	H	-1.69	43.52	74.00	-30.48
4520.20	41.80	Ave	54	1.3	H	-1.69	40.11	54.00	-13.89
5111.73	40.62	PK	107	1.2	H	-0.89	39.73	74.00	-34.27
5111.73	22.99	Ave	107	1.2	H	-0.89	22.10	54.00	-31.90
11590.00	45.86	PK	313	1.8	H	5.63	51.49	74.00	-22.51
11590.00	37.05	Ave	313	1.8	H	5.63	42.68	54.00	-11.32
17385.00	45.96	PK	241	1.4	H	10.63	56.59	74.00	-17.41
17385.00	38.42	Ave	241	1.4	H	10.63	49.05	54.00	-4.95

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT40) U-NII-1 low Channel 5190MHz									
226.89	46.28	QP	24	1.1	H	-11.09	35.19	46.00	-10.81
226.89	43.92	QP	149	1.9	V	-11.09	32.83	46.00	-13.17
4518.08	41.07	PK	110	1.3	H	-1.70	39.37	74.00	-34.63
4518.08	40.91	Ave	110	1.3	H	-1.70	39.21	54.00	-14.79
5110.62	40.62	PK	211	1.1	H	-0.78	39.84	74.00	-34.16
5110.62	31.42	Ave	211	1.1	H	-0.78	30.64	54.00	-23.36
10380.00	39.59	PK	44	1.8	H	5.26	44.85	74.00	-29.15
10380.00	20.37	Ave	44	1.8	H	5.26	25.63	54.00	-28.37
15570.00	46.14	PK	258	1.1	H	5.13	51.27	74.00	-22.73
15570.00	37.34	Ave	258	1.1	H	5.13	42.47	54.00	-11.53
802.11ac(HT40) U-NII-1 High channel 5230MHz									
226.80	45.13	QP	79	2.0	H	-11.25	33.88	46.00	-12.12
226.80	45.76	QP	84	1.9	V	-11.25	34.51	46.00	-11.49
4538.32	43.37	PK	124	1.9	H	-1.50	41.87	74.00	-32.13
4538.32	43.16	Ave	124	1.9	H	-1.50	41.66	54.00	-12.34
5132.63	45.29	PK	328	1.1	H	-0.85	44.44	74.00	-29.56
5132.63	43.77	Ave	328	1.1	H	-0.85	42.92	54.00	-11.08
10460.00	40.49	PK	252	2.0	H	5.28	45.77	74.00	-28.23
10460.00	23.81	Ave	252	2.0	H	5.28	29.09	54.00	-24.91
15690.00	45.85	PK	266	1.5	H	5.02	50.87	74.00	-23.13
15690.00	38.94	Ave	266	1.5	H	5.02	43.96	54.00	-10.04

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT40) U-NII-3 low Channel 5755MHz									
227.24	46.46	QP	199	1.6	H	-10.99	35.47	46.00	-10.53
227.24	45.20	QP	194	1.2	V	-10.99	34.21	46.00	-11.79
4531.13	41.53	PK	308	1.9	H	-1.79	39.74	74.00	-34.26
4531.13	41.59	Ave	308	1.9	H	-1.79	39.80	54.00	-14.20
5147.09	39.41	PK	170	1.8	H	-0.81	38.60	74.00	-35.40
5147.09	20.36	Ave	170	1.8	H	-0.81	19.55	54.00	-34.45
11510.00	46.40	PK	266	1.2	H	5.88	52.28	74.00	-21.72
11510.00	37.73	Ave	266	1.2	H	5.88	43.61	54.00	-10.39
17265.00	45.97	PK	210	1.5	H	10.42	56.39	74.00	-17.61
17265.00	38.16	Ave	210	1.5	H	10.42	48.58	54.00	-5.42
802.11ac(HT40) U-NII-3 High channel 5795MHz									
227.22	45.64	QP	266	1.2	H	-10.99	34.65	46.00	-11.35
227.22	45.13	QP	324	1.3	V	-10.99	34.14	46.00	-11.86
4503.50	43.99	PK	292	1.5	H	-1.54	42.45	74.00	-31.55
4503.50	42.72	Ave	292	1.5	H	-1.54	41.18	54.00	-12.82
5111.11	40.50	PK	89	1.1	H	-0.89	39.61	74.00	-34.39
5111.11	22.32	Ave	89	1.1	H	-0.89	21.43	54.00	-32.57
11590.00	46.91	PK	11	1.3	H	5.63	52.54	74.00	-21.46
11590.00	37.48	Ave	11	1.3	H	5.63	43.11	54.00	-10.89
17385.00	46.48	PK	122	1.9	H	10.63	57.11	74.00	-16.89
17385.00	38.32	Ave	122	1.9	H	10.63	48.95	54.00	-5.05

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.407/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11ac(HT80) U-NII-1 low Channel 5210MHz									
226.43	45.27	QP	173	1.3	H	-11.18	34.09	46.00	-11.91
226.43	44.79	QP	180	1.2	V	-11.18	33.61	46.00	-12.39
4530.92	44.50	PK	278	1.3	H	-1.77	42.73	74.00	-31.27
4530.92	42.77	Ave	278	1.3	H	-1.77	41.00	54.00	-13.00
5135.16	43.30	PK	83	2.0	H	-0.82	42.48	74.00	-31.52
5135.16	43.34	Ave	83	2.0	H	-0.82	42.52	54.00	-11.48
10420.00	40.42	PK	167	1.4	H	4.65	45.07	74.00	-28.93
10420.00	22.83	Ave	167	1.4	H	4.65	27.48	54.00	-26.52
15630.00	41.45	PK	55	1.7	H	5.10	46.55	74.00	-27.45
15630.00	31.35	Ave	55	1.7	H	5.10	36.45	54.00	-17.55
802.11ac(HT80) U-NII-3 low Channel 5775MHz									
226.57	46.74	QP	93	1.3	H	-11.13	35.61	46.00	-10.39
226.57	44.67	QP	308	1.8	V	-11.13	33.54	46.00	-12.46
4514.66	43.09	PK	293	1.1	H	-1.75	41.34	74.00	-32.66
4514.66	43.09	Ave	293	1.1	H	-1.75	41.34	54.00	-12.66
5119.11	43.09	PK	323	1.3	H	-0.95	42.14	74.00	-31.86
5119.11	43.85	Ave	323	1.3	H	-0.95	42.90	54.00	-11.10
11550.00	40.97	PK	73	1.9	H	4.83	45.80	74.00	-28.20
11550.00	22.48	Ave	73	1.9	H	4.83	27.31	54.00	-26.69
17325.00	39.45	PK	58	1.0	H	10.55	50.00	74.00	-24.00
17325.00	31.52	Ave	58	1.0	H	10.55	42.07	54.00	-11.93

Test Frequency: 18GHz~40GHz

The measurements were more than 20 dB below the limit and not reported.

10 Duty cycle

Test Requirement:	47 CFR Part 15C 15.407 and 789033 D02 General UNII Test Procedures New Rules v02r01, Section (B)
Test Method:	ANSI C63.10: 2013
Test Limit:	N/A
Test Result:	PASS
Remark:	Only the worst case is recorded in the report.

10.1 Summary of Test Results

802.11a mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11n(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11n(HT40) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
38	100	100	100
151	100	100	100
802.11ac(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11ac(HT40) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
38	100	100	100
151	100	100	100
802.11ac(HT80) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
42	100	100	100
155	100	100	100

Test result plots shown as follows:

ANT3

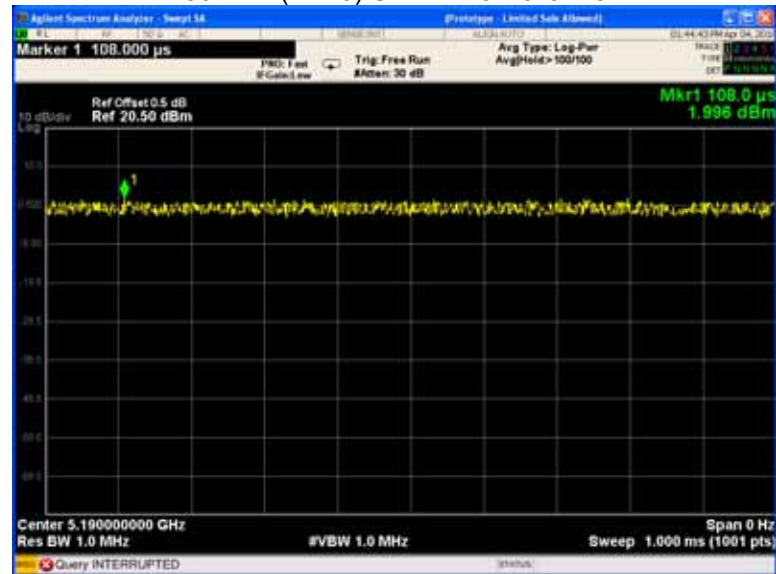
802.11a U-NII-1 Low channel



802.11n(HT20) U-NII-1 Low channel



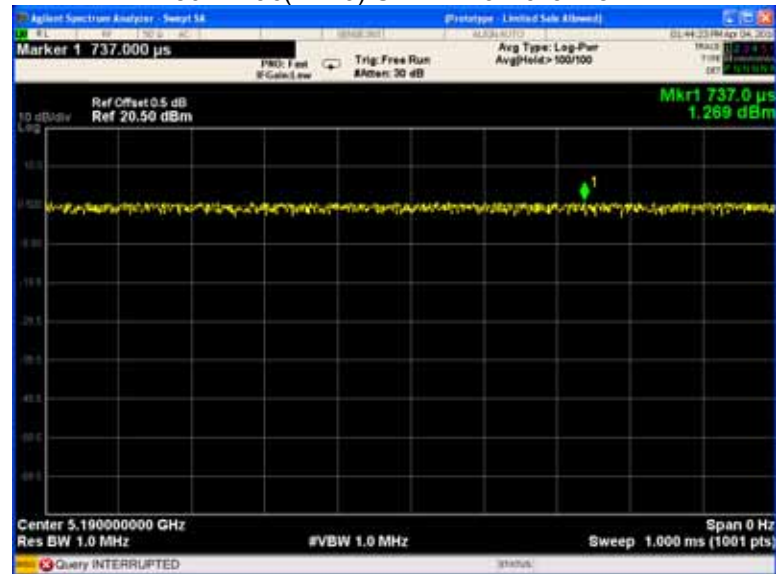
802.11n(HT40) U-NII-1 Low channel



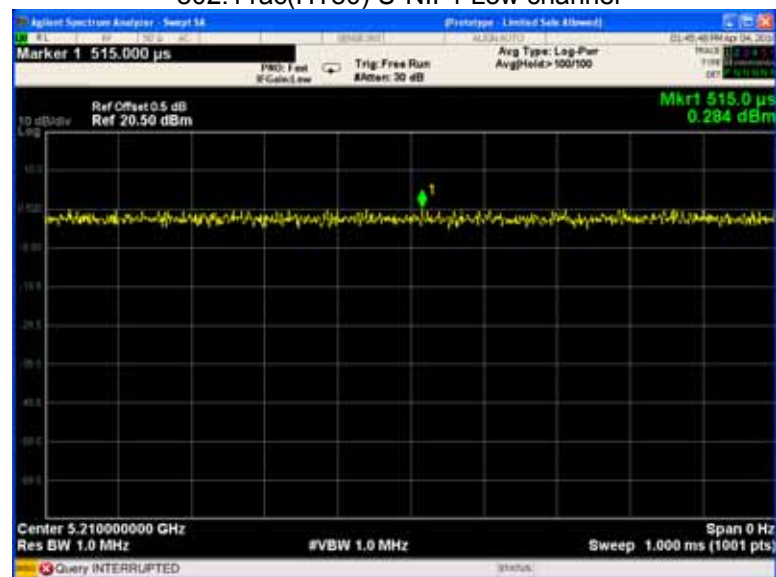
802.11ac(HT20) U-NII-1 Low channel



802.11ac(HT40) U-NII-1 Low channel



802.11ac(HT80) U-NII-1 Low channel



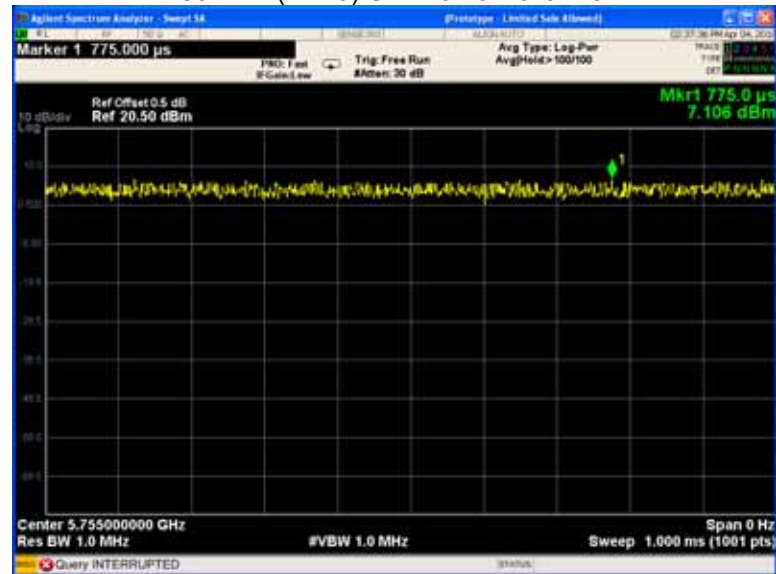
802.11a U-NII-3 Low channel



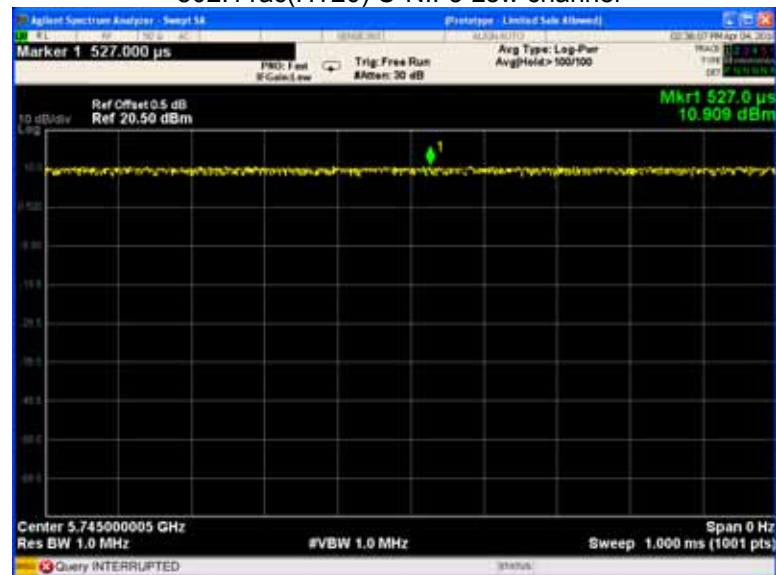
802.11n(HT20) U-NII-3 Low channel



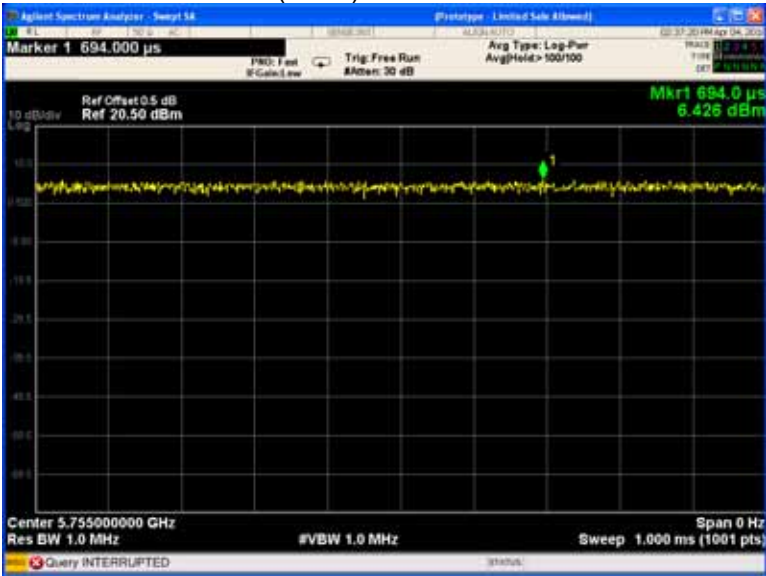
802.11n(HT40) U-NII-3 Low channel



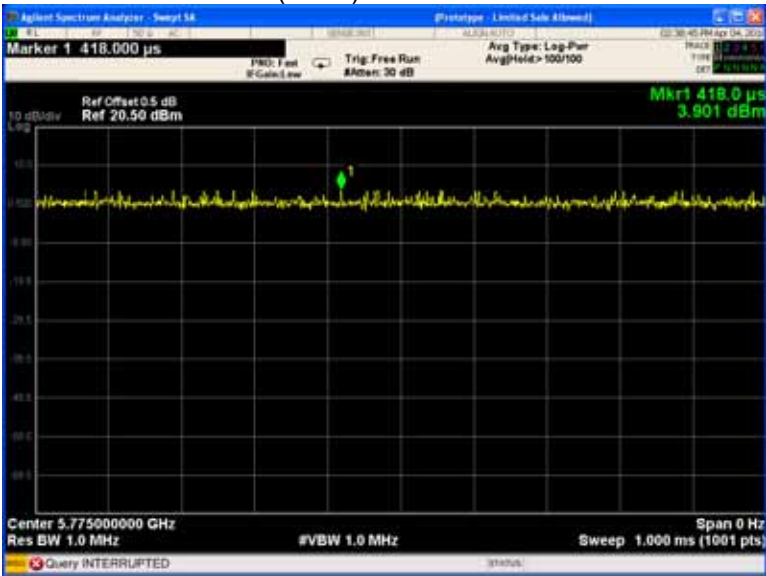
802.11ac(HT20) U-NII-3 Low channel



802.11ac(HT40) U-NII-3 Low channel



802.11ac(HT80) U-NII-3 Low channel



11 Band Edge

Test Requirement:	FCC CFR47 Part 15 Section 15.407
Test Method:	ANSI C63.10 2013
Test Limit:	(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27dBm/MHz. (2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.
Test Result:	PASS

11.1 Test Produce

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.2 Test Result

Test result plots shown as follows:

ANT3

802.11a U-NII-1 Band edge-left side



802.11a U-NII-1 Band edge-right side



802.11a U-NII-3 Band edge-left side



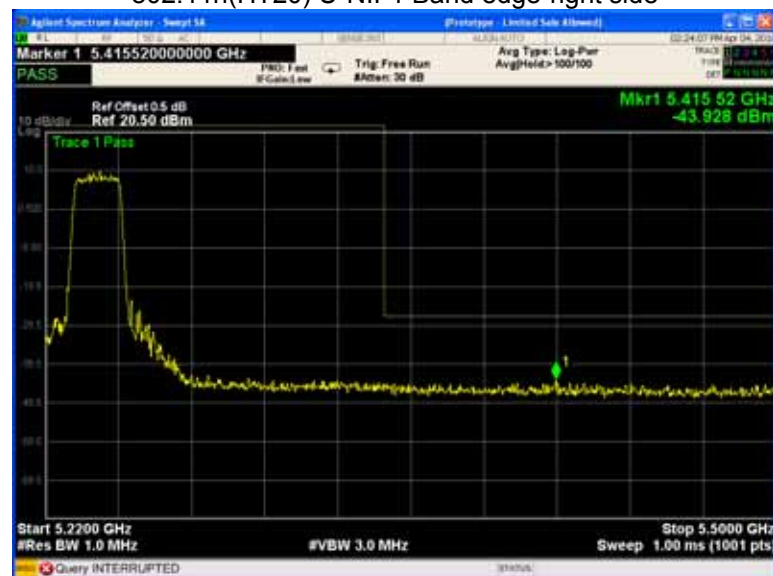
802.11a U-NII-3 Band edge-right side



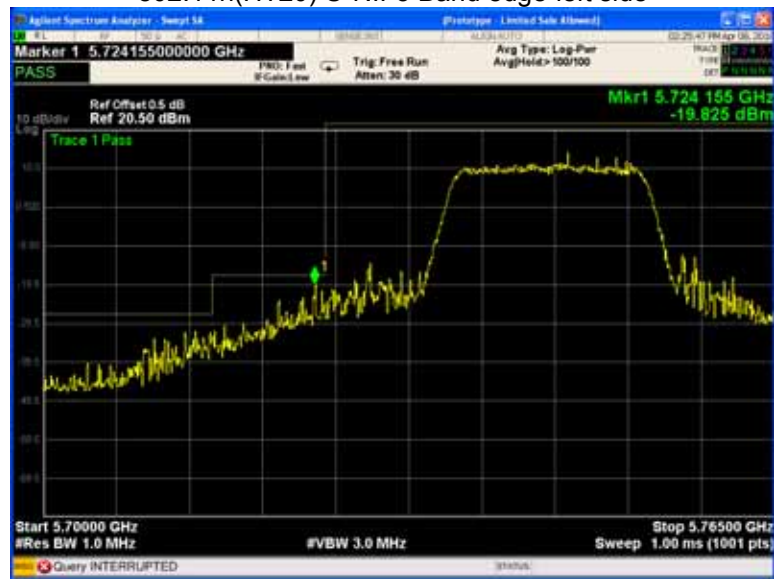
802.11n(HT20) U-NII-1 Band edge-left side



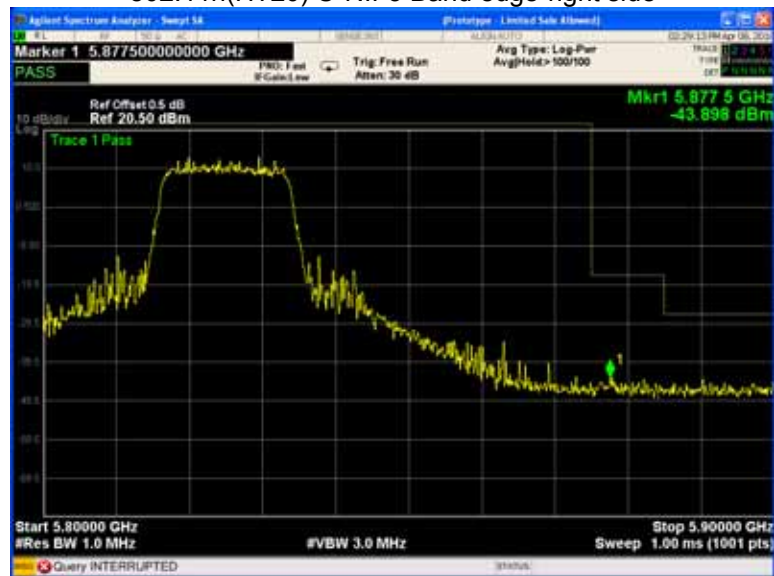
802.11n(HT20) U-NII-1 Band edge-right side



802.11n(HT20) U-NII-3 Band edge-left side



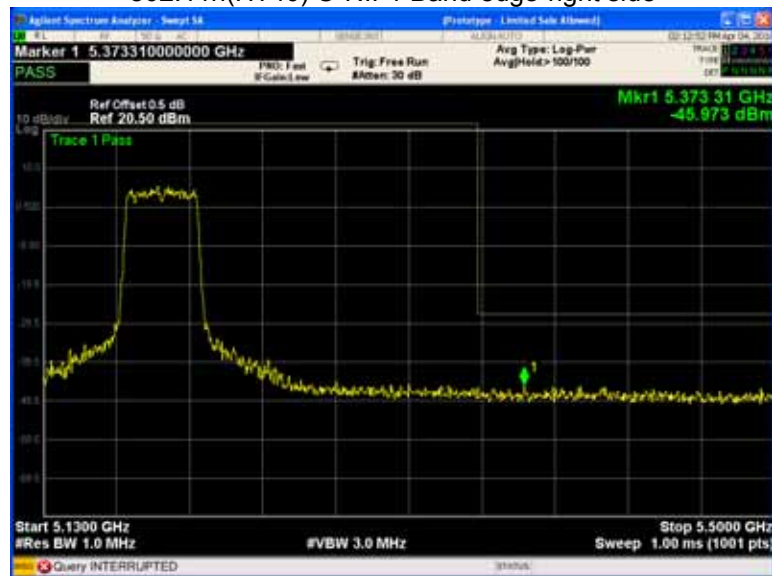
802.11n(HT20) U-NII-3 Band edge-right side



802.11n(HT40) U-NII-1 Band edge-left side



802.11n(HT40) U-NII-1 Band edge-right side



802.11n(HT40) U-NII-3 Band edge-left side



802.11n(HT40) U-NII-3 Band edge-right side



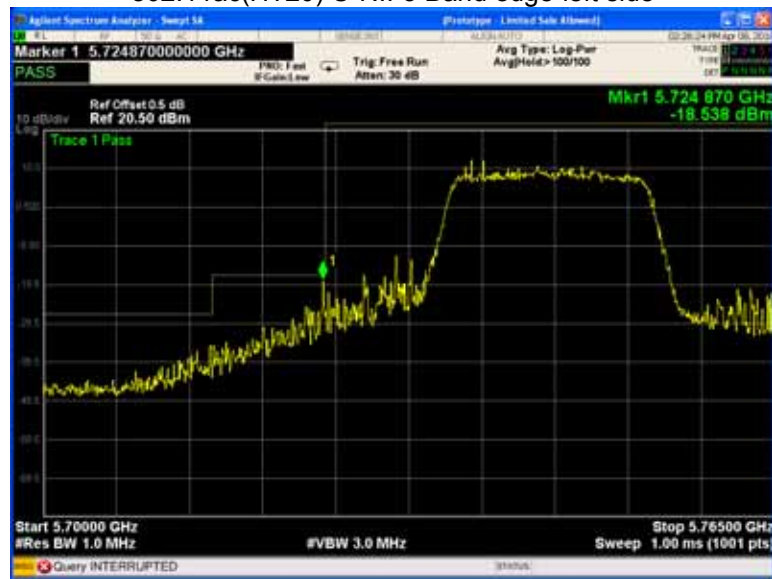
802.11ac(HT20) U-NII-1 Band edge-left side



802.11ac(HT20) U-NII-1 Band edge-right side



802.11ac(HT20) U-NII-3 Band edge-left side



802.11ac(HT20) U-NII-3 Band edge-right side



802.11ac(HT40) U-NII-1 Band edge-left side



802.11ac(HT40) U-NII-1 Band edge-right side



802.11ac(HT40) U-NII-3 Band edge-left side



802.11ac(HT40) U-NII-3 Band edge-right side



802.11ac(HT80) U-NII-1 Band edge-left side



802.11ac(HT80) U-NII-1 Band edge-right side



802.11ac(HT80) U-NII-3 Band edge-left side



802.11ac(HT80) U-NII-3 Band edge-right side



12 6 dB Bandwidth

Test Requirement: FCC CFR47 Part 15 Section 15.407(e)
 789033 D02 General UNII Test Procedures New Rules v02r01 ,
 Test Method: Section C
 Test Limit: ≥ 500 kHz
 Test Result: PASS

12.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

12.2 Test Result:

Band	Operation mode	6 dB Bandwidth (MHz)		
		Low	Middle	High
ANT3 U-NII-3	802.11a	16.29	17.59	16.30
	802.11n(HT20)	17.61	17.69	17.53
	802.11n(HT40)	36.21	/	36.22
	802.11ac(HT20)	17.61	17.59	17.53
	802.11ac(HT40)	36.21	/	36.22
	802.11ac(HT80)	75.45	/	/

Test result plots shown as follows:

ANT3

802.11a U-NII-3 Low channel



802.11a U-NII-3 Middle channel



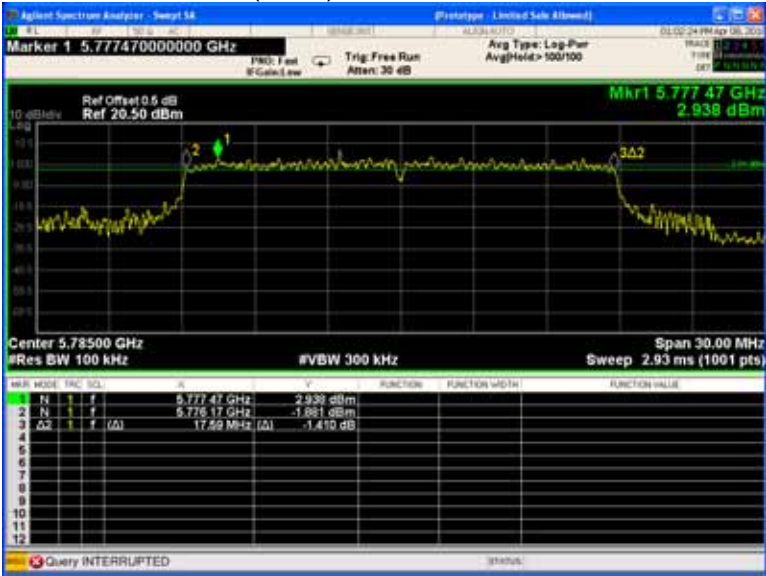
802.11a U-NII-3 High channel



802.11n(HT20) U-NII-3 Low channel



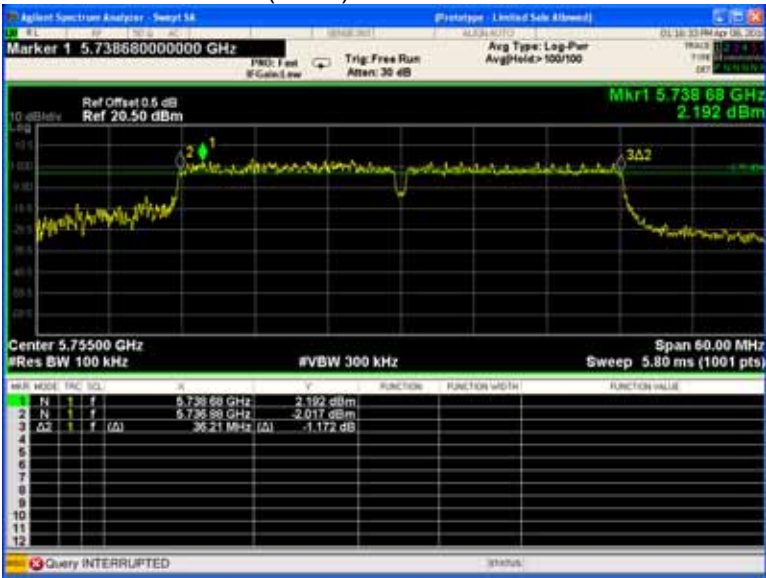
802.11n(HT20) U-NII-3 Middle channel



802.11n(HT20) U-NII-3 High channel



802.11n(HT40) U-NII-3 Low channel



802.11n(HT40) U-NII-3 High channel



802.11ac(HT20) U-NII-3 Low channel



802.11ac(HT20) U-NII-3 Middle channel



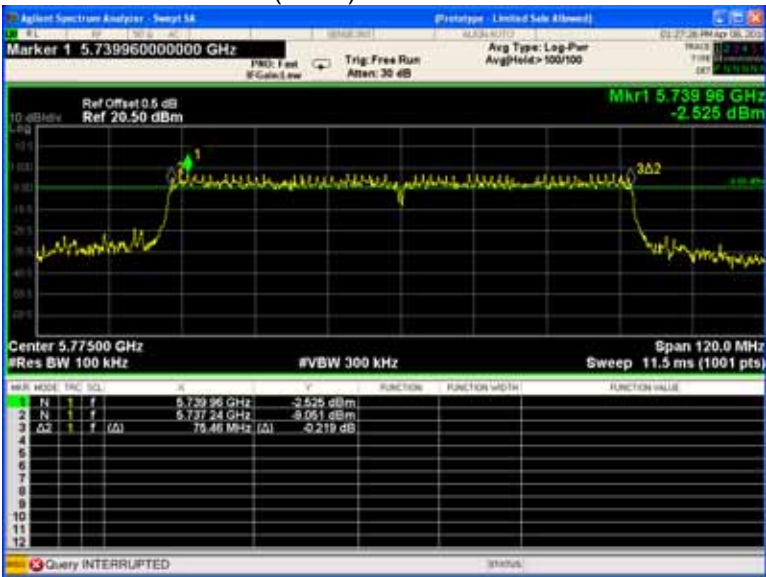
802.11ac(HT20) U-NII-3 High channel



802.11ac(HT40) U-NII-3 High channel



802.11ac(HT80) U-NII-3 Low channel



13 26 dB Bandwidth and 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.407 (a)
Test Method:	789033 D02 General UNII Test Procedures New Rules v02r01, Section D
Test Limit:	No restriction limits
Test Result:	PASS

13.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. RBW = approximately 1% of the emission bandwidth,
 $VBW \geq 3 \times RBW$

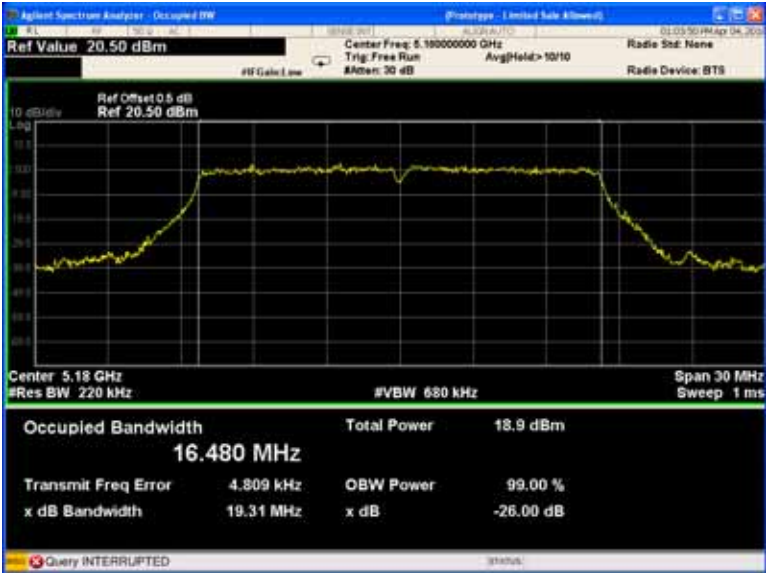
13.2 Test Result:

Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
ANT3 U-NII-1	802.11a	19.31	19.28	19.33	16.480	16.474	16.463
	802.11n(HT20)	19.44	19.84	19.53	17.527	17.457	17.548
	802.11n(HT40)	39.63	/	39.78	36.161	/	36.100
	802.11ac(HT20)	19.94	19.56	19.91	17.511	17.519	17.528
	802.11ac(HT40)	40.29	/	40.23	36.152	/	36.163
	802.11ac(HT80)	81.19	/	/	75.503	/	/
ANT3 U-NII-3	802.11a	18.22	19.30	19.33	16.442	16.451	16.493
	802.11n(HT20)	19.45	19.15	19.35	17.490	17.500	17.510
	802.11n(HT40)	39.58	/	39.40	36.180	/	36.121
	802.11ac(HT20)	19.21	19.78	19.61	17.523	17.548	17.535
	802.11ac(HT40)	40.28	/	40.16	36.185	/	36.119
	802.11ac(HT80)	81.41	/	/	75.555	/	/

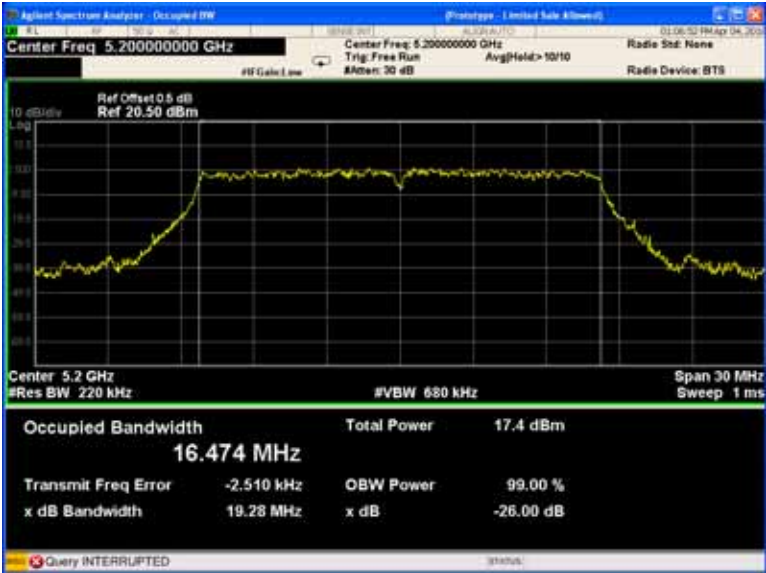
Test result plots shown as follows:

ANT3

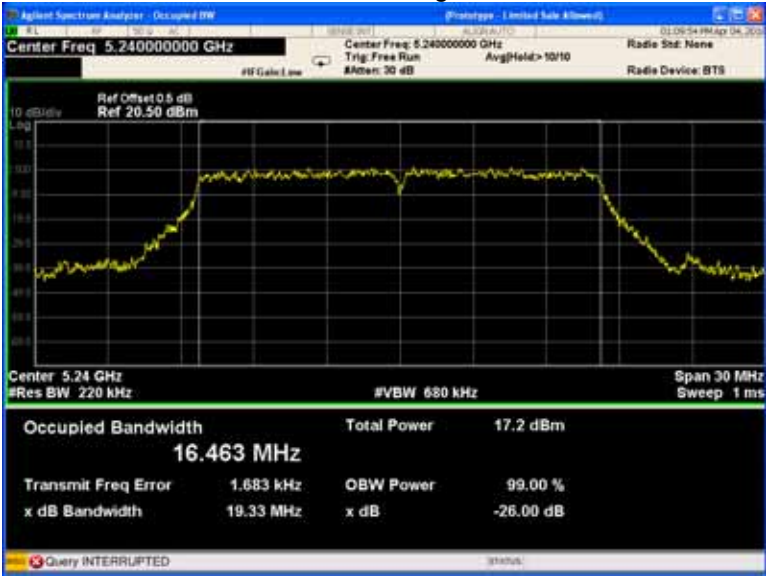
802.11a U-NII-1 Low channel



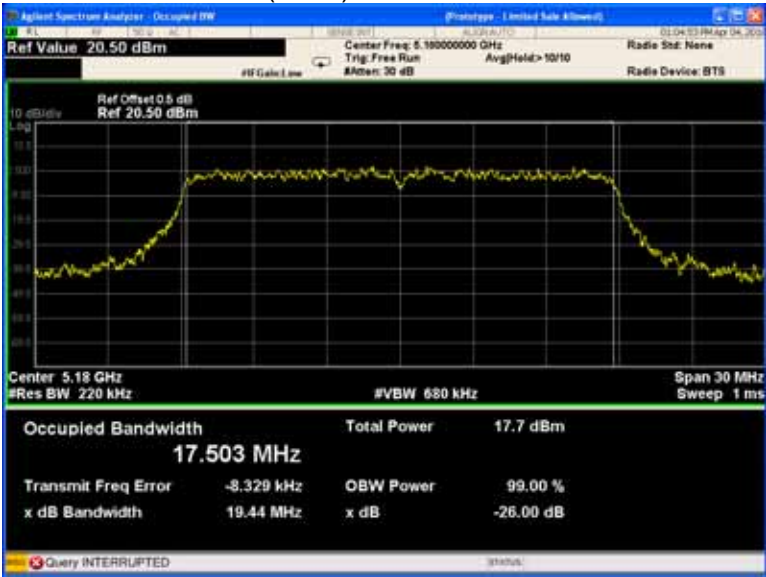
802.11a U-NII-1 Middle channel



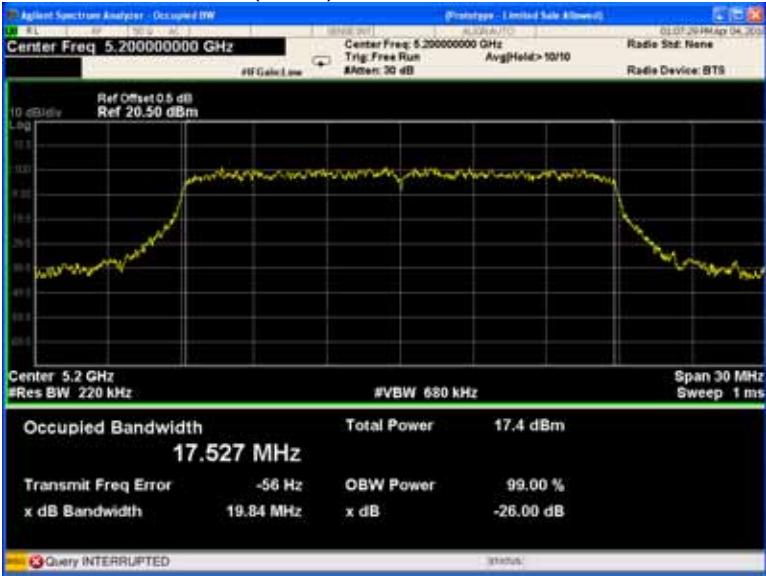
802.11a U-NII-1 High channel



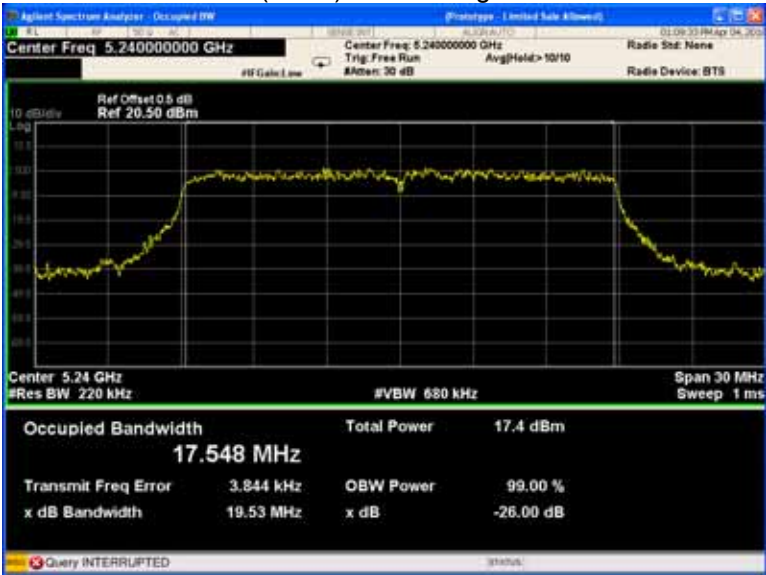
802.11n(HT20) U-NII-1 Low channel



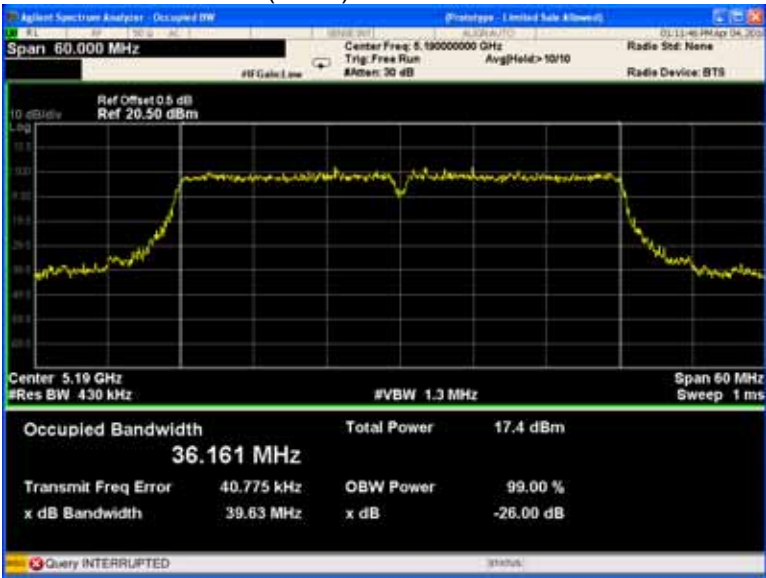
802.11n(HT20) U-NII-1 Middle channel



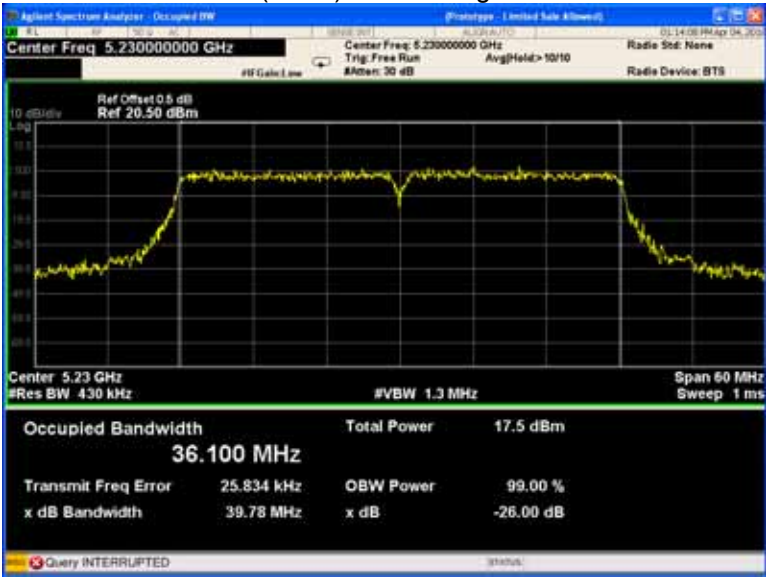
802.11n(HT20) U-NII-1 High channel



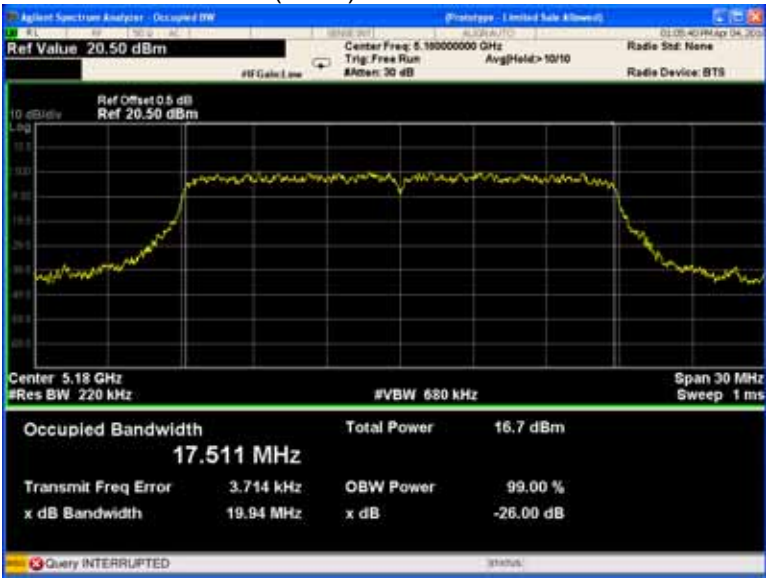
802.11n(HT40) U-NII-1 Low channel



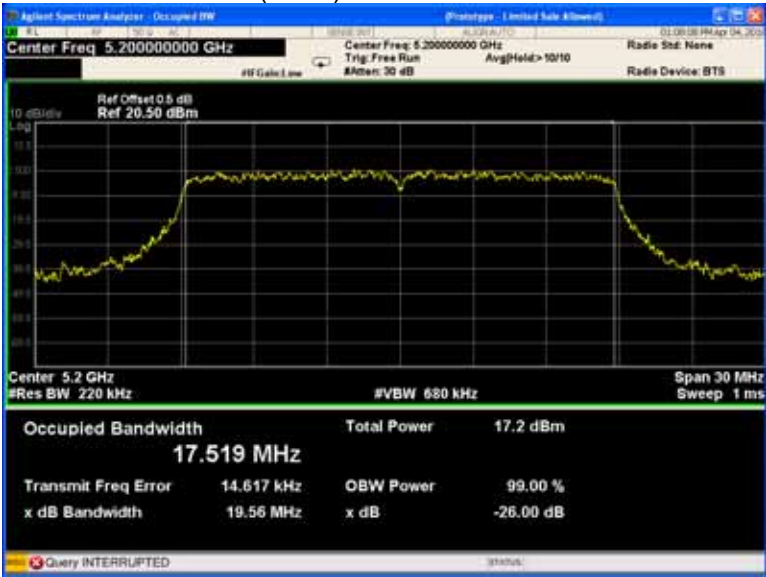
802.11n(HT40) U-NII-1 High channel



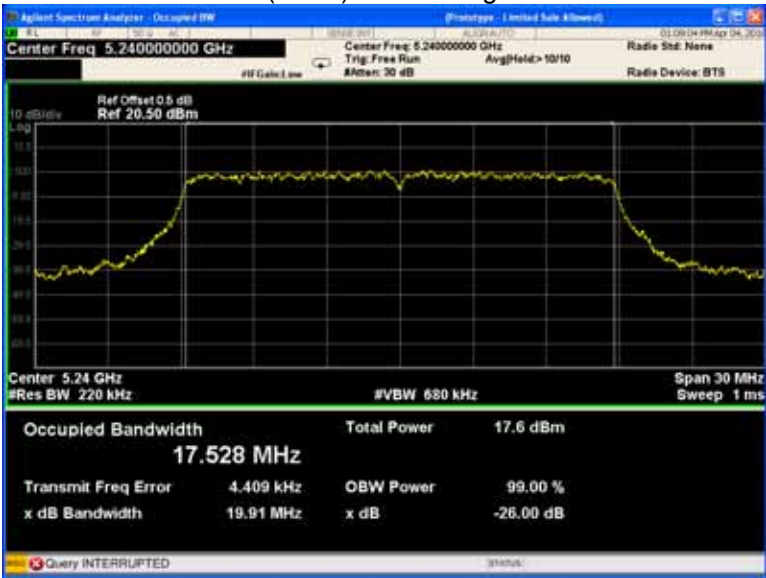
802.11ac(HT20) U-NII-1 Low channel



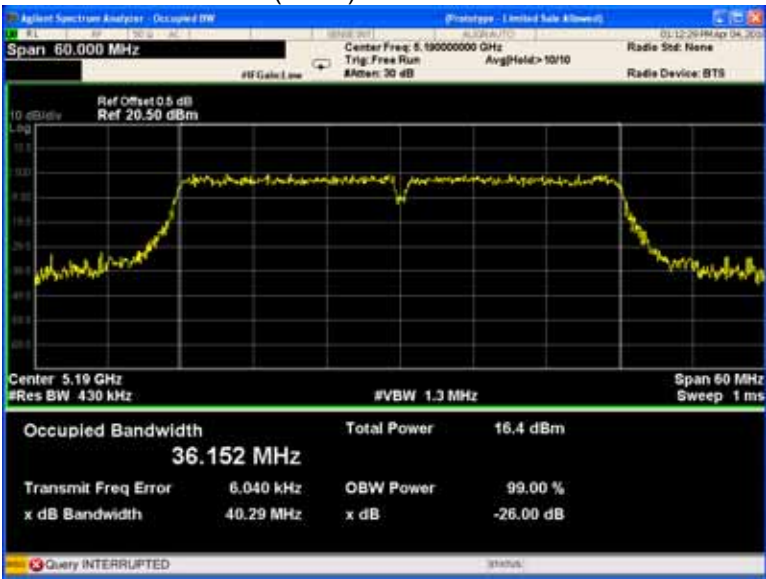
802.11ac(HT20) U-NII-1 Middle channel



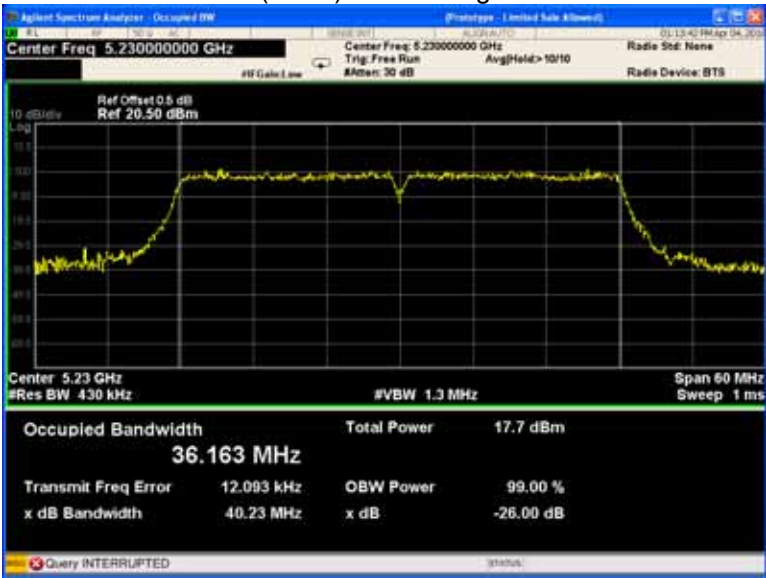
802.11ac(HT20) U-NII-1 High channel



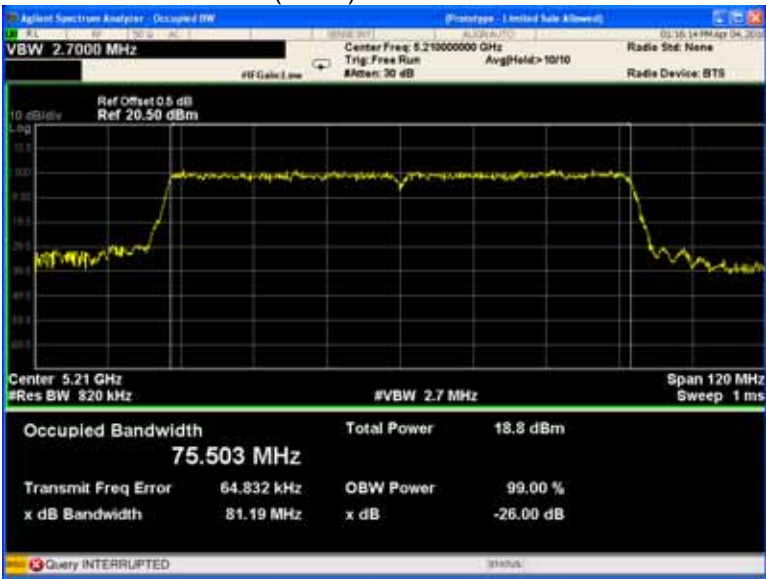
802.11ac(HT40) U-NII-1 Low channel



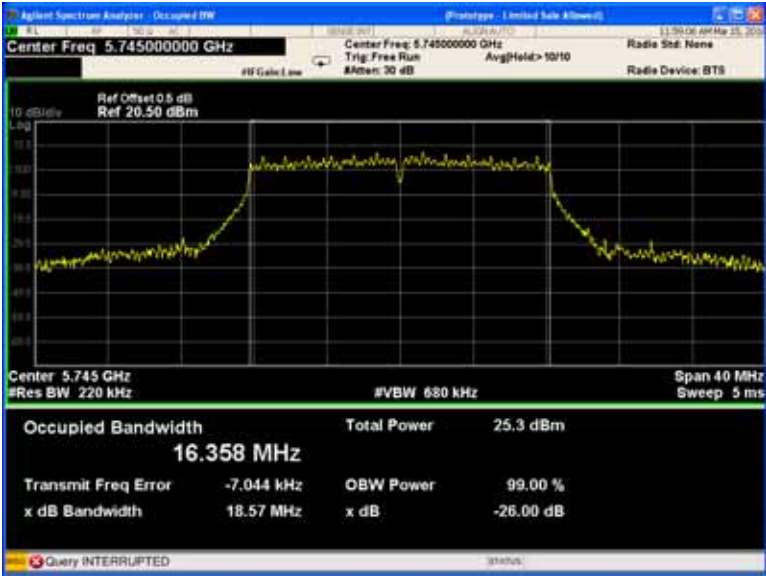
802.11n(HT40) U-NII-1 High channel



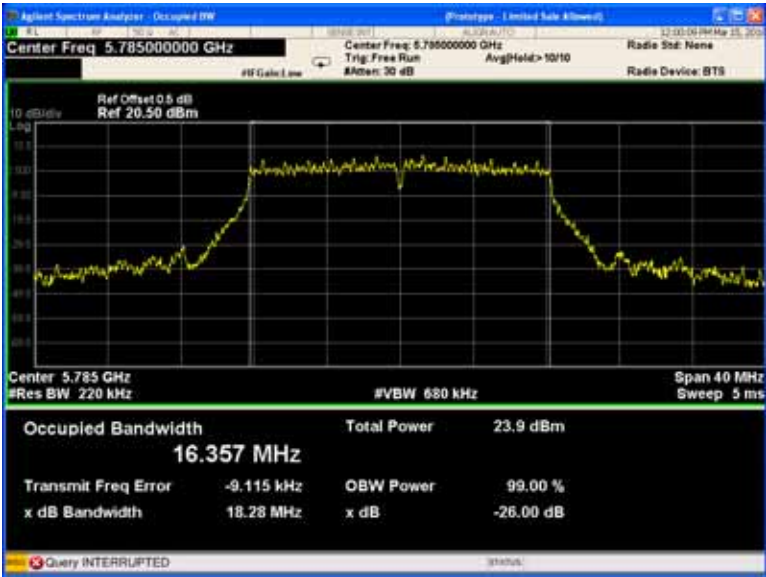
802.11ac(HT80) U-NII-1 Low channel



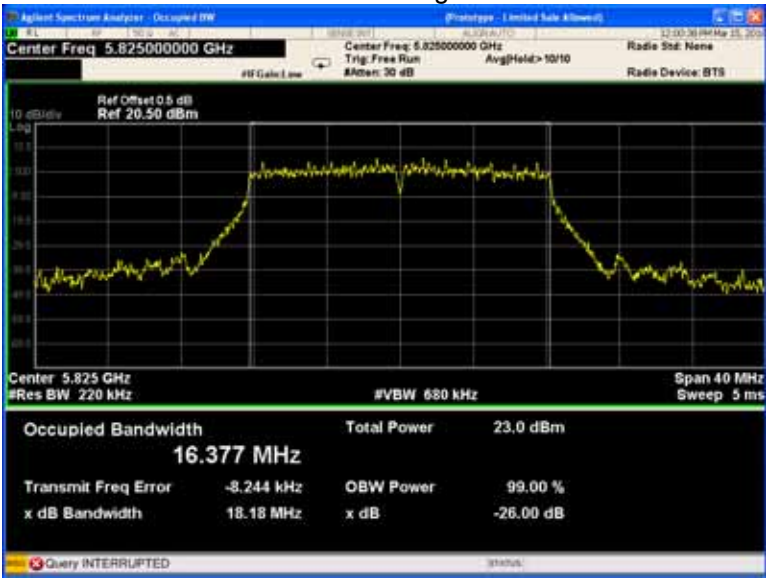
802.11a U-NII-3 Low channel



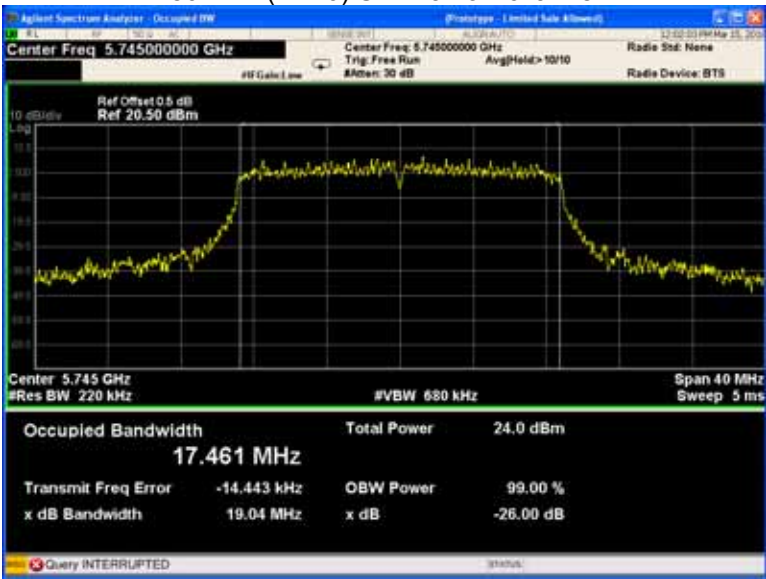
802.11a U-NII-3 Middle channel



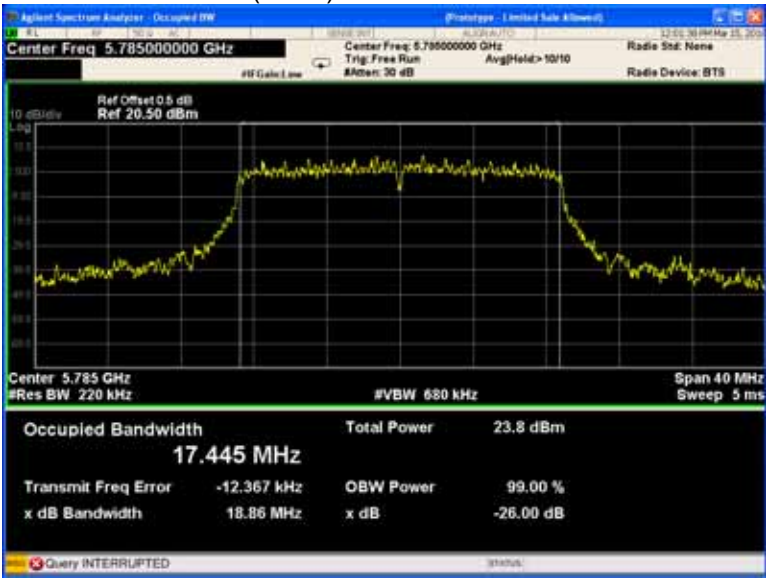
802.11a U-NII-3 High channel



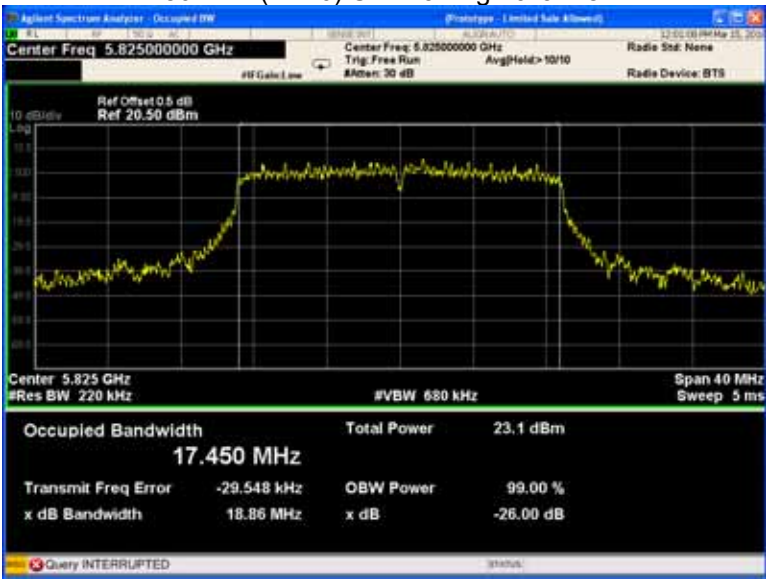
802.11n(HT20) U-NII-3 Low channel



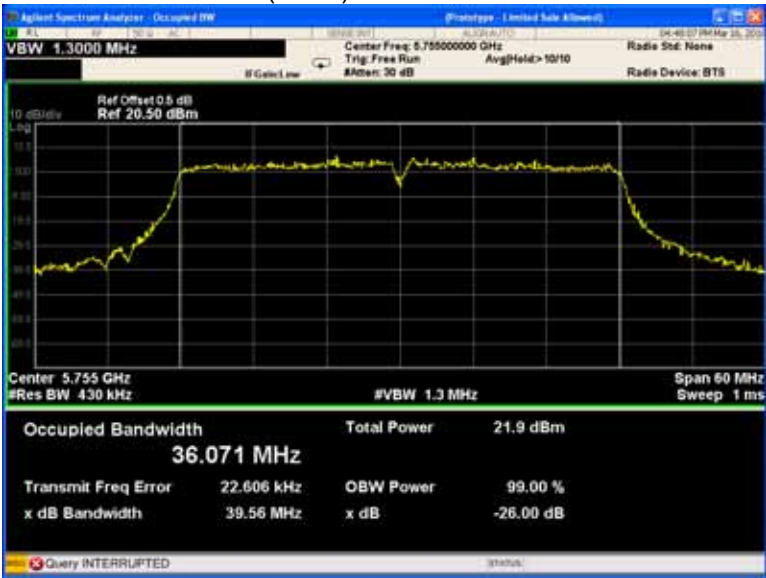
802.11n(HT20) U-NII-3 Middle channel



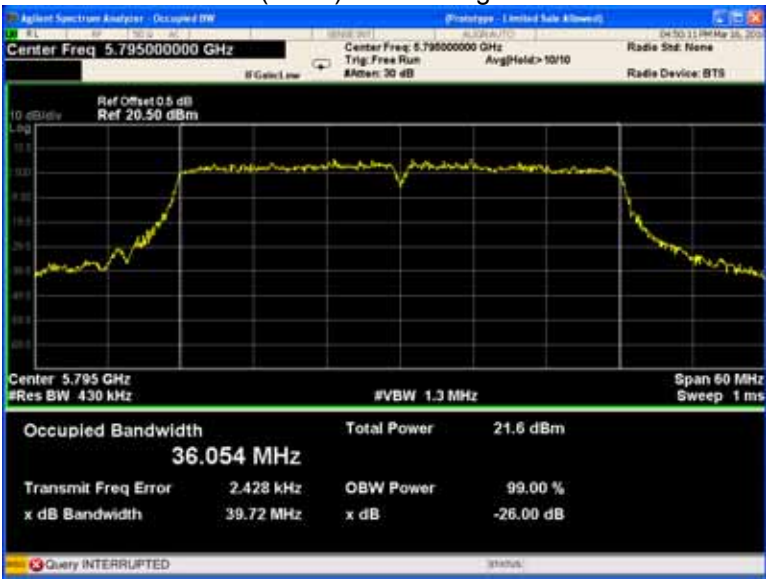
802.11n(HT20) U-NII-3 High channel



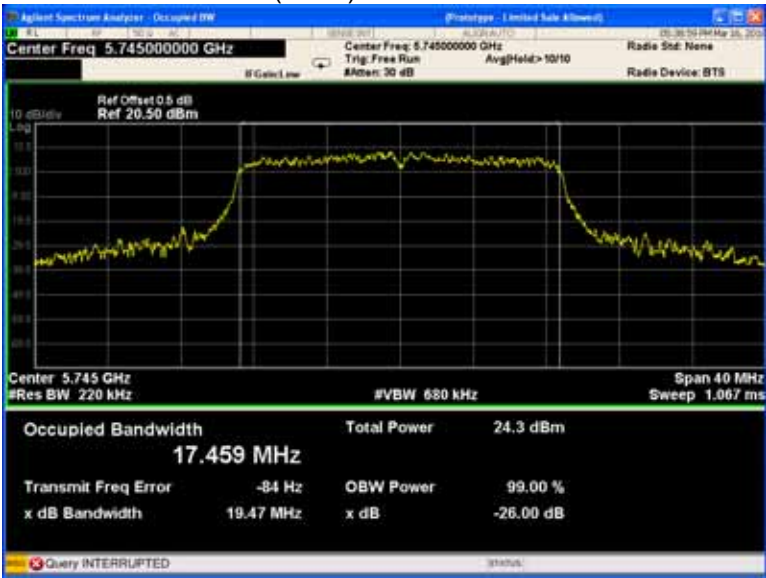
802.11n(HT40) U-NII-3 Low channel



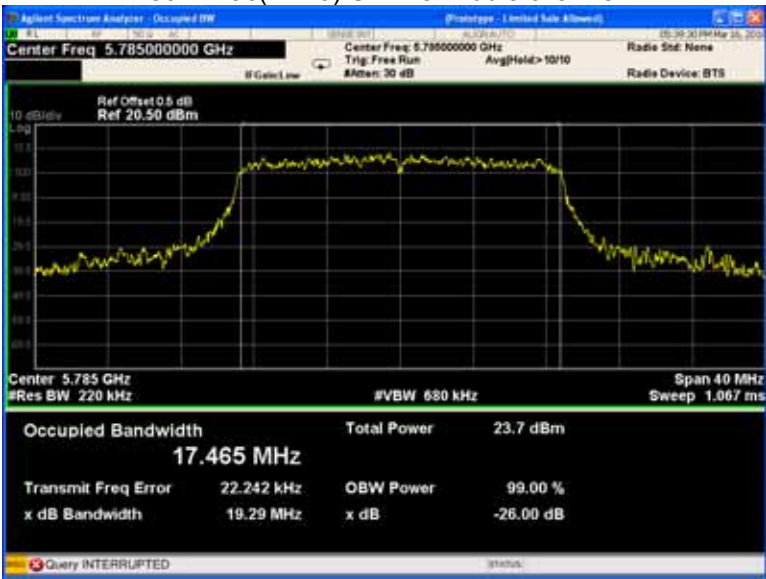
802.11n(HT40) U-NII-3 High channel



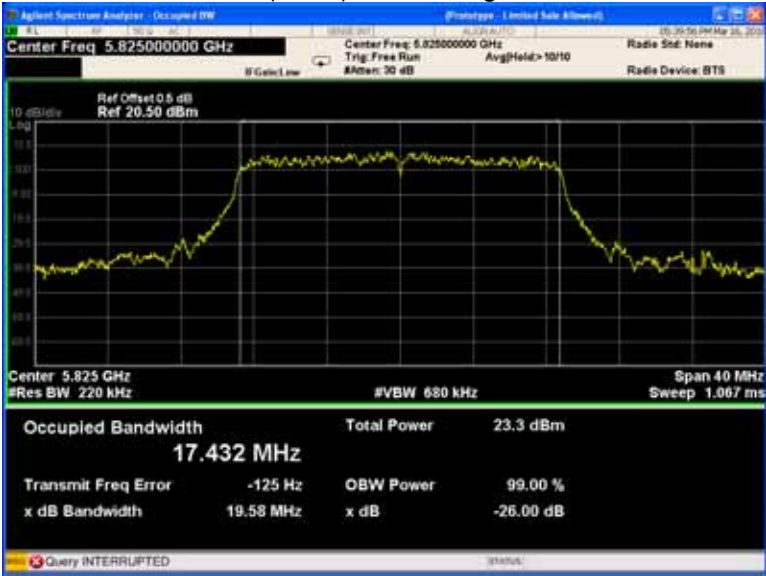
802.11ac(HT20) U-NII-3 Low channel



802.11ac(HT20) U-NII-3 Middle channel



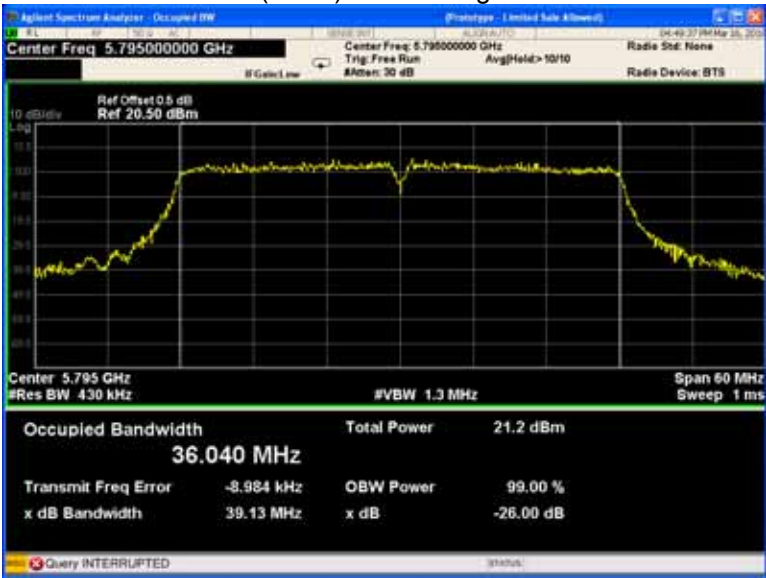
802.11ac(HT20) U-NII-3 High channel



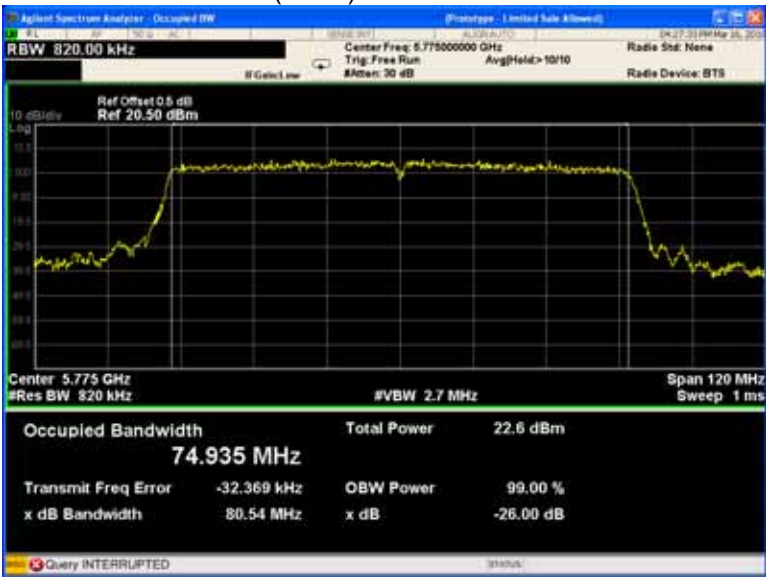
802.11ac(HT40) U-NII-3 Low channel



802.11n(HT40) U-NII-3 High channel



802.11ac(HT80) U-NII-3 Low channel



14 Conducted Output Power

Test Requirement:	FCC CFR47 Part 15 Section 15.407(a) 789033 D02 General UNII Test Procedures New Rules v02r01,
Test Method:	Section E
Test Limit:	U-NII-1 250mW(24dBm) U-NII-3 1W(30dBm)
Test Result:	PASS Conducted output power= measurement power+10log(1/x)
Remark:	X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power

14.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the DTS bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

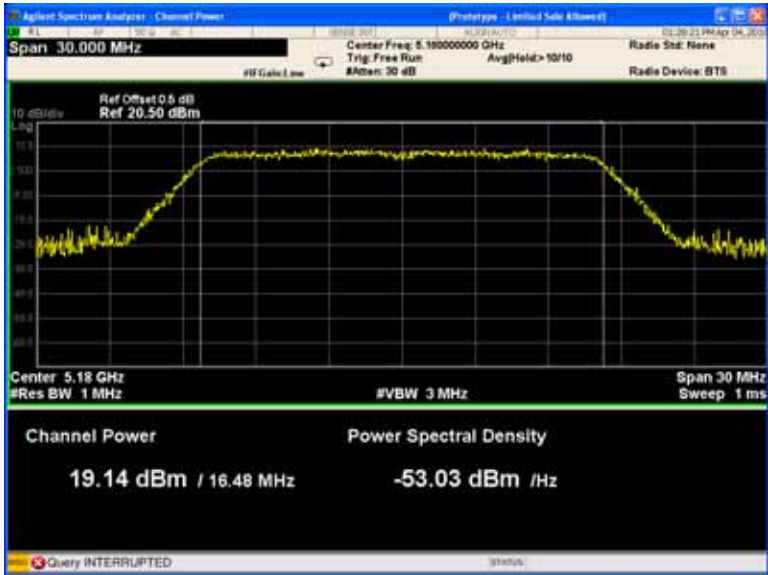
14.2 Test Result :

Band	Operation mode	CH	Conducted Output Power (dBm)
			ANT3
U-NII-1	802.11a	Low	19.14
		Middle	19.23
		High	20.18
	802.11n(HT20)	Low	18.52
		Middle	19.16
		High	19.64
	802.11n(HT40)	Low	18.72
		Middle	/
		High	18.91
	802.11ac(HT20)	Low	18.42
		Middle	18.70
		High	18.78
	802.11ac(HT40)	Low	19.32
		Middle	/
		High	18.64
	802.11ac(HT80)	Low	19.01
		Middle	/
		High	/
U-NII-3	802.11a	Low	24.57
		Middle	23.23
		High	23.04
	802.11n(HT20)	Low	24.59
		Middle	23.15
		High	22.50
	802.11n(HT40)	Low	23.44
		Middle	/
		High	23.80
	802.11ac(HT20)	Low	24.60
		Middle	22.79
		High	20.44
	802.11ac(HT40)	Low	23.15
		Middle	/
		High	24.35
	802.11ac(HT80)	Low	23.94
		Middle	/
		High	/

Test result plots shown as follows:

ANT3

802.11a U-NII-1 Low channel



802.11a U-NII-1 Middle channel



802.11a U-NII-1 High channel



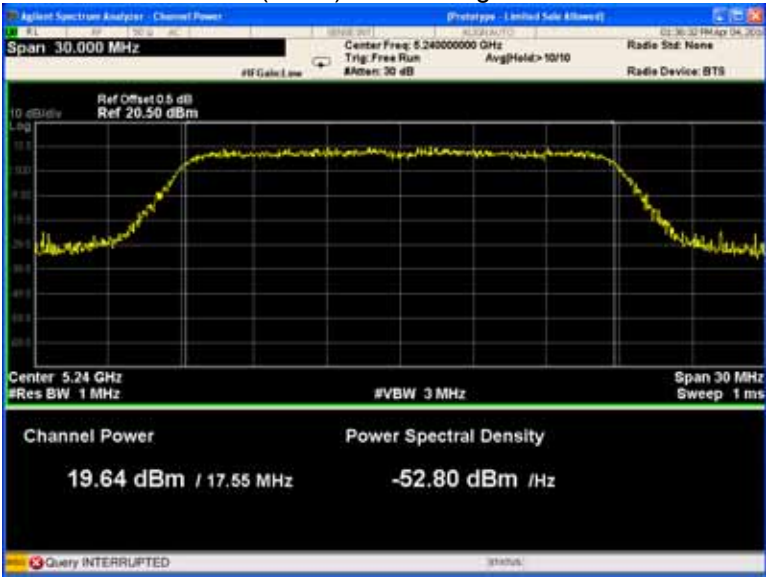
802.11n(HT20) U-NII-1 Low channel



802.11n(HT20) U-NII-1 Middle channel



802.11n(HT20) U-NII-1 High channel



802.11n(HT40) U-NII-1 Low channel



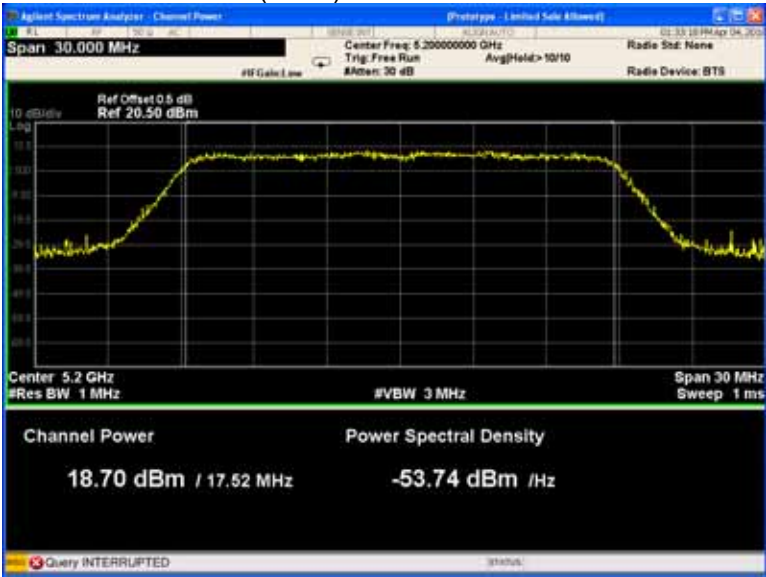
802.11n(HT40) U-NII-1 High channel



802.11ac(HT20) U-NII-1 Low channel



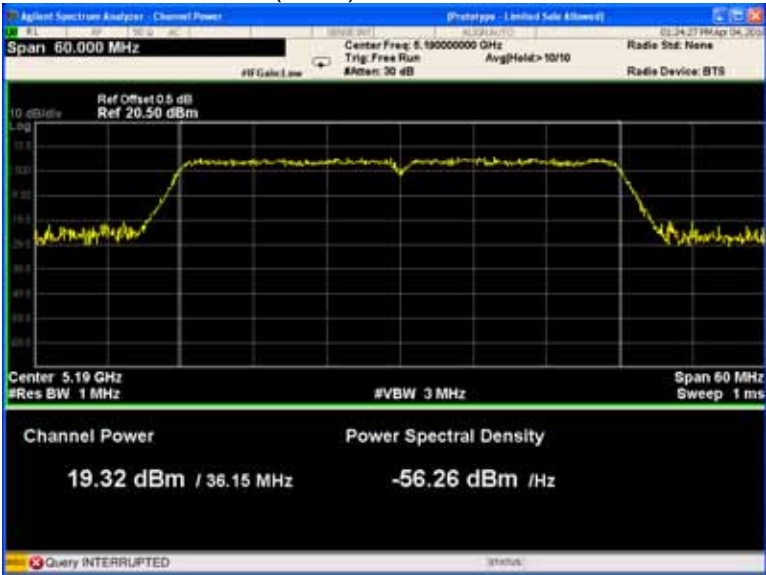
802.11ac(HT20) U-NII-1 Middle channel



802.11ac(HT20) U-NII-1 High channel



802.11ac(HT40) U-NII-1 Low channel



802.11n(HT40) U-NII-1 High channel



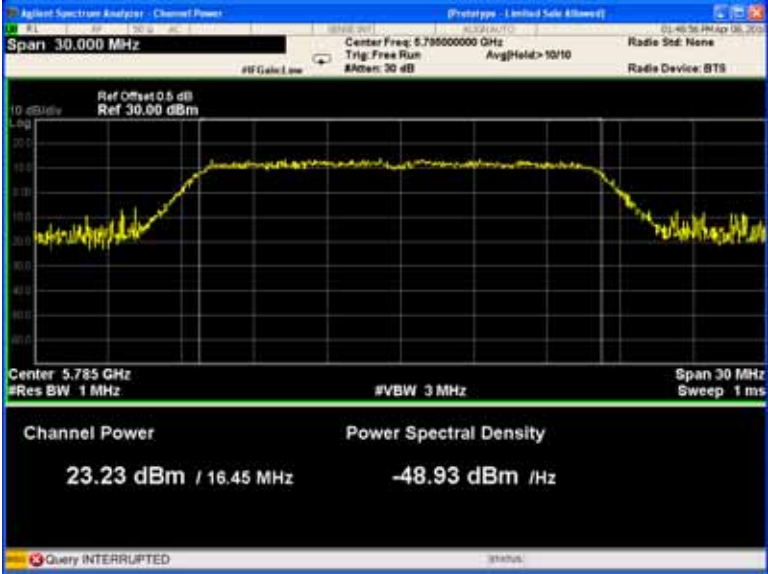
802.11ac(HT80) U-NII-1 Low channel



802.11a U-NII-3 Low channel



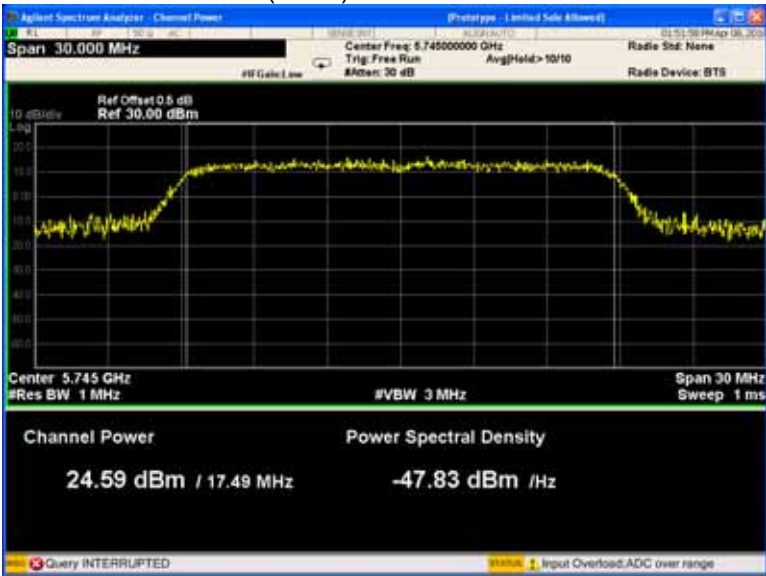
802.11a U-NII-3 Middle channel



802.11a U-NII-3 High channel



802.11n(HT20) U-NII-3 Low channel



802.11n(HT20) U-NII-3 Middle channel



802.11n(HT20) U-NII-3 High channel



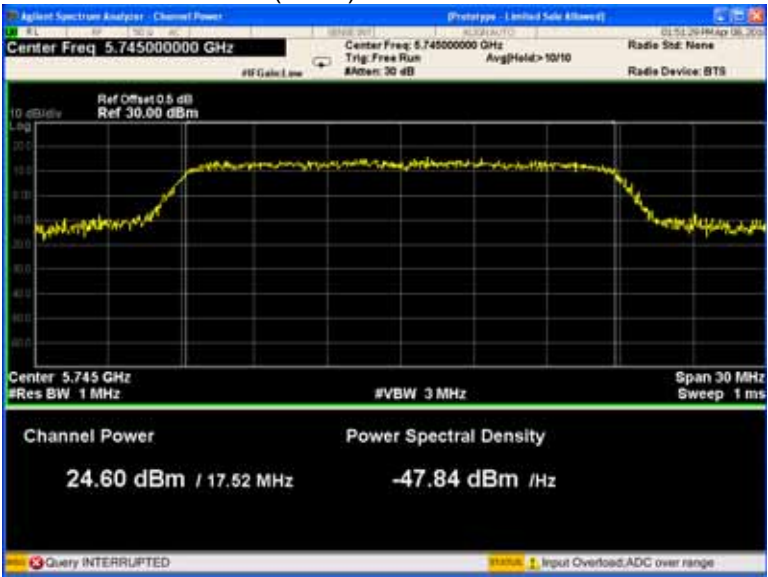
802.11n(HT40) U-NII-3 Low channel



802.11n(HT40) U-NII-3 High channel



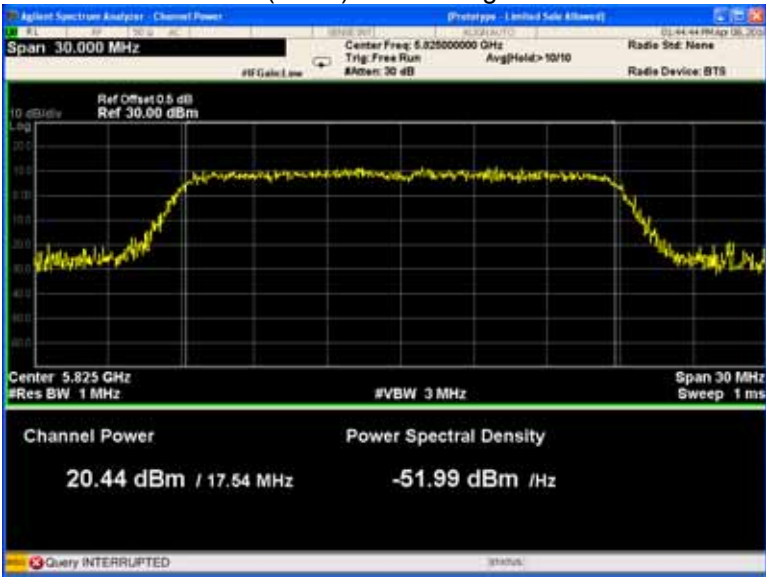
802.11ac(HT20) U-NII-3 Low channel



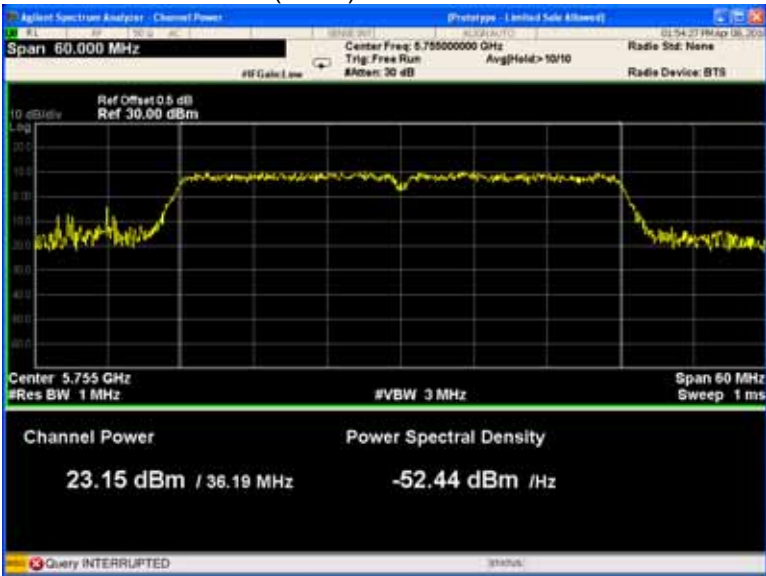
802.11ac(HT20) U-NII-3 Middle channel



802.11ac(HT20) U-NII-3 High channel



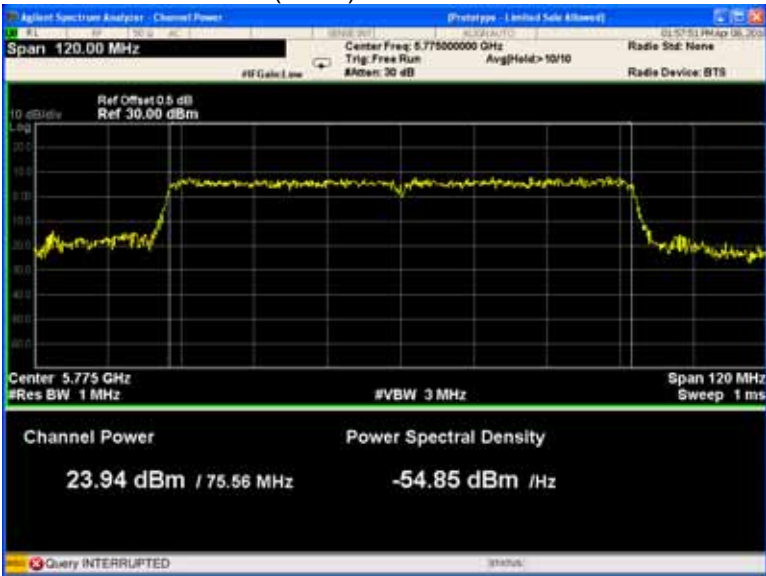
802.11ac(HT40) U-NII-3 Low channel



802.11n(HT40) U-NII-3 High channel



802.11ac(HT80) U-NII-3 Low channel



15 Power Spectral density

Test Requirement:	FCC CFR47 Part 15 Section 15.407(a)
Test Method:	789033 D02 General UNII Test Procedures New Rules v02r01, Section F
Test Limit:	$\leq 11.00\text{dBm/MHz}$ for Operation in the U-NII-1(5150MHz-5250MHz)of mobile device $\leq 30.00\text{dBm/500KHz}$ for Operation in the U-NII-3(5725MHz-5850MHz)of device
Test Result:	PASS

15.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer:
U-NII-1
RBW = 1MHz, VBW $\geq 3 \times$ RBW Sweep = auto; Detector Function = Peak. Trae = Max hold.
U-NII-3
RBW = 510KHz, VBW $\geq 3 \times$ RBW Sweep = auto; Detector Function = Peak. Trae = Max hold.
3. Allow the trae to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjaent channels. The limit is specified in one of the subparagraphs of this Section
Submit this plot.

15.2 Test Result:

Band	Operation mode	CH	Power Spectral Density (dBm/MHz)
			ANT3
U-NII-1	802.11a	Low	9.335
		Middle	9.448
		High	9.592
	802.11n(HT20)	Low	8.704
		Middle	8.661
		High	9.278
	802.11n(HT40)	Low	5.389
		Middle	/
		High	6.346
	802.11ac(HT20)	Low	8.837
		Middle	8.540
		High	8.155
	802.11ac(HT40)	Low	4.599
		Middle	/
		High	5.365
	802.11ac(HT80)	Low	2.523
		Middle	/
		High	/
	Limit	$\leq 11.00\text{dBm/MHz}$	

Band	Operation mode	CH	Power Spectral Density (dBm/MHz)
			ANT3
U-NII-3	802.11a	Low	13.480
		Middle	13.836
		High	13.686
	802.11n(HT20)	Low	14.320
		Middle	14.688
		High	14.509
	802.11n(HT40)	Low	11.015
		Middle	/
		High	10.859
	802.11ac(HT20)	Low	13.182
		Middle	13.189
		High	13.229
	802.11ac(HT40)	Low	11.169
		Middle	/
		High	9.046
	802.11ac(HT80)	Low	6.975
		Middle	/
		High	/
	Limit	≤30.00dBm/500KHz	

Test result plots shown as follows:

ANT3

802.11a U-NII-1 Low channel



802.11a U-NII-1 Middle channel



802.11a U-NII-1 High channel



802.11n(HT20) U-NII-1 Low channel



802.11n(HT20) U-NII-1 Middle channel



802.11n(HT20) U-NII-1 High channel



802.11n(HT40) U-NII-1 Low channel



802.11n(HT40) U-NII-1 High channel



802.11ac(HT20) U-NII-1 Low channel



802.11ac(HT20) U-NII-1 Middle channel



802.11ac(HT20) U-NII-1 High channel



802.11ac(HT40) U-NII-1 Low channel



802.11n(HT40) U-NII-1 High channel



802.11ac(HT80) U-NII-1 Low channel



802.11a U-NII-3 Low channel



802.11a U-NII-3 Middle channel



802.11a U-NII-3 High channel



802.11n(HT20) U-NII-3 Low channel



802.11n(HT20) U-NII-3 Middle channel



802.11n(HT20) U-NII-3 High channel



802.11n(HT40) U-NII-3 Low channel



802.11n(HT40) U-NII-3 High channel



802.11ac(HT20) U-NII-3 Low channel



802.11ac(HT20) U-NII-3 Middle channel



802.11ac(HT20) U-NII-3 High channel



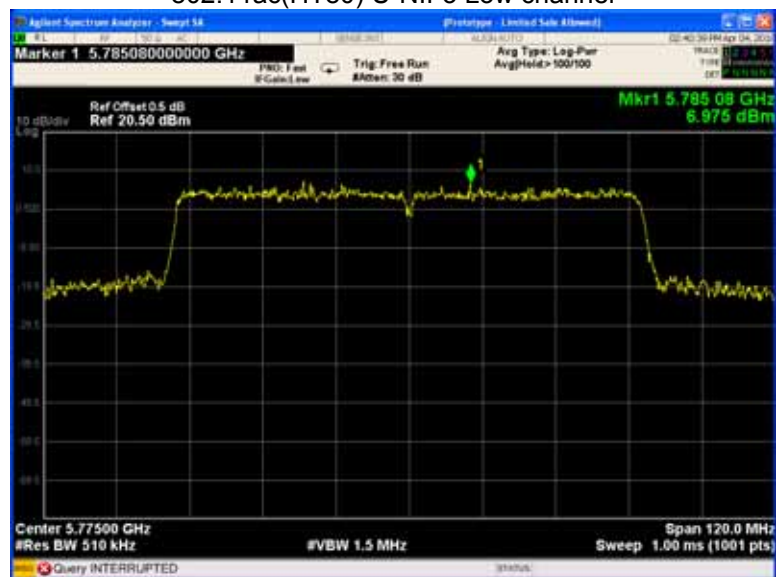
802.11ac(HT40) U-NII-3 Low channel



802.11n(HT40) U-NII-3 High channel



802.11ac(HT80) U-NII-3 Low channel



16 Frequency Stability

Test Requirement:	FCC CFR47 Part 15 Section 15.407(g)
Test Method:	ANSI C63.10:2013
Test Limit:	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 or 20ppm.
Test Result:	PASS

16.1 Test setup:



16.2 Test Procedure:

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
EUT have transmitted absence of unmodulation signal and fixed channelise. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 20 ppm The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
2. Extreme temperature rule is 0°C~ 40°C.

16.3 Test Result:

U-NII-1 Test Frequency:5180MHz				
Temperature ()	Power Supply (VAC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	120	/	/	/
40		1859	0.3589	20
30		1868	0.3606	20
20		1810	0.3494	20
10		1864	0.3598	20
0		1863	0.3597	20
-10		1861	0.3593	20
-15		1859	0.3589	20
-30		/	/	/
20	108	1872	0.3614	20
20	132	1870	0.3610	20

U-NII-3 Test Frequency:5785MHz				
Temperature ()	Power Supply (VAC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	120	/	/	/
40		1910	0.3302	20
30		1907	0.3296	20
20		1894	0.3274	20
10		1911	0.3303	20
0		1901	0.3286	20
-10		1907	0.3296	20
-15		1809	0.3127	20
-30		/	/	/
20	108	1916	0.3312	20
20	132	1901	0.3286	20

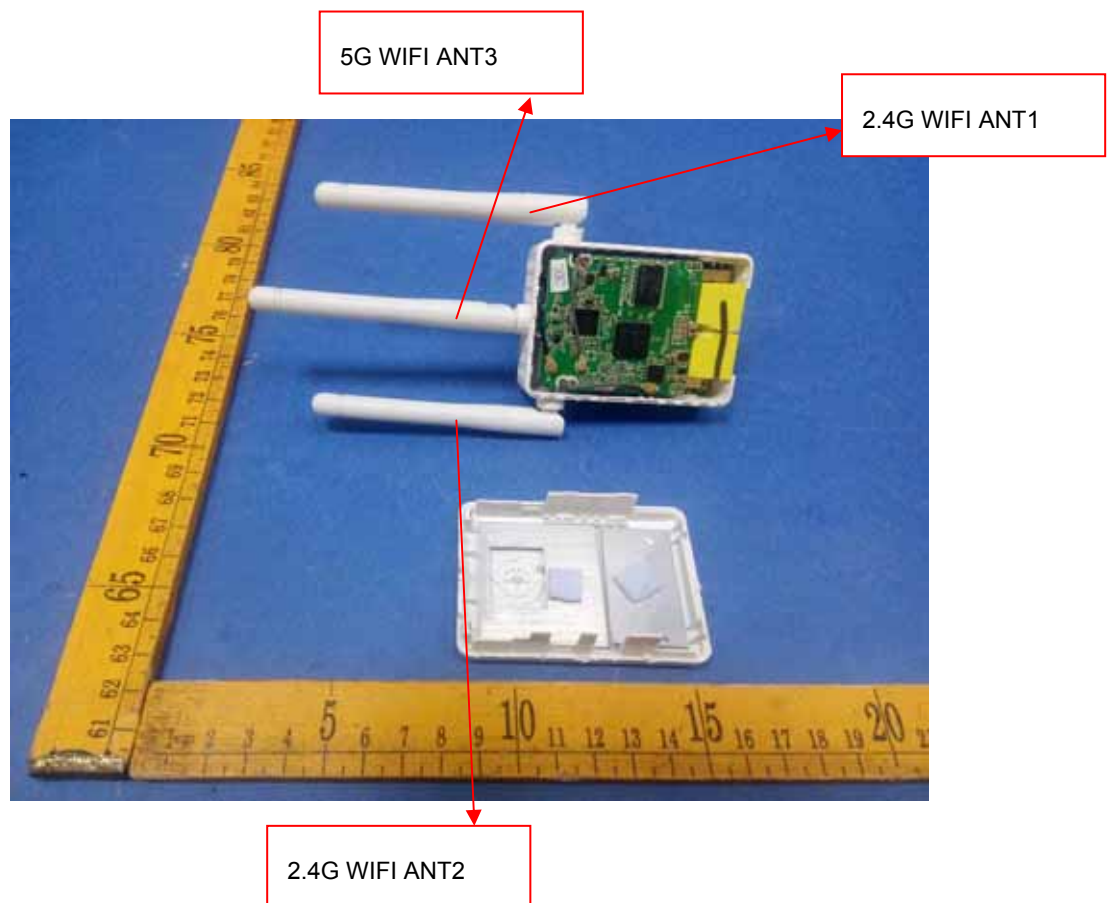
17 Antenna Requirement

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. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

This device uses two antennas that use a specified coupling to the intentional radiator. Antenna connectors complied with the requirement.

Result:

The EUT have three Dipole Antenna, meets the requirements of FCC 15.203.



18 SAR Evaluation

Please refer to SAR report.

19 Photographs of test setup and EUT.

Refer to the file WS-WN575A2_Ext Photos, WS-WN575A2_Int Photos and WS-WN575A2_Tsup Photos.

=====End of Report=====