TEST REPORT

Reference No.	:	WTN16S0447850-2E
FCC ID	:	2AFOYL434FCNN
Applicant	:	Le Shi Zhi Xin Electronic Technology（Tian jin） Limited
Address	:	201-427 2F B1 District, Anime building,No.126 Anime Middle Road, Eco-city Tianjin, China
Manufacturer	:	Goertek.Inc
Address	:	West of Weian Road, North of Yingqian Street, High-tech Industrial Development Zone, Weifang, Shandong Province, China., ShenZhen, China
Product Name	:	LED TV
Model No. .	:	L434FCNN
Brand.		LeEco
Standards	:	FCC CFR47 Part 15 C Section 15.407:2015
Date of Receipt sample	:	Apr. 15, 2016
Date of Test	:	Apr. 16 – May. 11, 2016
Date of Issue	:	Jun. 01, 2016
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.

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Compiled by:

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Approved by:

Philo Zhong / Manager

2 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	--
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
Frequency Stability	15.407(g)	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

3 Contents

4 General Information

4.1 General Description of E.U.T.

Product Name:	LED TV
Model No.:	L434FCNN
Model Description:	N/A
Operation Frequency:	IEEE 802.11b/g/n(HT20):2412MHz ~ 2462MHz IEEE 802.11n(HT40):2422MHz~2452MHz 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 BT: 2402-2480MHz SRD: 2403-2480MHz
The Lowest Oscillator:	32.768KHz
Antenna Gain:	ANT 0 2.4GHz WIFI:3.2 dBi 5.2GHz WIFI:4.1 dBi 5.8GHz WIFI:4.0 dBi ANT 1 2.4GHz WIFI:3.2 dBi 5.2GHz WIFI:3.3 dBi 5.8GHz WIFI:3.4 dBi ANT 2 2.4GHz BT:3.2 dBi ANT 3 2.4GHz SRD:3.0 dBi
Type of modulation:	IEEE 802.11b DSSS(CCK/QPSK/BPSK) IEEE 802.11g OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11n OFDM(BPSK/QPSK/16QAM/64QAM) 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) BT: GFSK,PI/4-DQPSK,8DPSK SRD: GFSK
Number of transmitter chains	WIFI:2*2 (MIMO) BT: 1 SRD: 1

The device supports MIMO 2*2, and the MIMO works with STBC(Space-Time Block Coding).The antenna is omnidirectional, does not support any directional gain in any modes.

TX power for MIMO rate, the wifi chip has a power/rate table that controls TX power from chipout, it's preset in nvram, FW don't need to calculate it again when MIMO rate is fixed. Of course the real radiation power is also related to antenna efficient.

Two transmitter signals are not correlated with each other.

4.2 Details of E.U.T.

Technical Data: AC 120V~60Hz, 73W

4.3 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 “RFTestTool.apk” ,Version 1,date 20160518.

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

4.4 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A-1**

  Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A-1,July 12, 2012.

- **FCC Test Site 1#– Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.14,2015	Sep.13,2016
2.	LISN	R&S	ENV216	101215	Sep.14,2015	Sep.13,2016
3.	Cable	Top	TYPE16(3.5M)	-	Sep.14,2015	Sep.13,2016
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.14,2015	Sep.13,2016
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.14,2015	Sep.13,2016
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.14,2015	Sep.13,2016
4.	Cable	LARGE	RF300	-	Sep.14,2015	Sep.13,2016
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.14,2015	Sep.13,2016
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.14,2015	Sep.13,2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Sep.14,2015	Sep.13,2016
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.14,2015	Sep.13,2016
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Sep.14,2015	Sep.13,2016
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Sep.14,2015	Sep.13,2016
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Sep.14,2015	Sep.13,2016
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Sep.14,2015	Sep.13,2016
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	Sep.14,2015	Sep.13,2016
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.14,2015	Sep.13,2016
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.14,2015	Sep.13,2016
4	Cable	HUBER+SUHNER	CBL2	525178	Sep.14,2015	Sep.13,2016
RF Conducted Testing						

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.14,2015	Sep.13,2016
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.14,2015	Sep.13,2016
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.14,2015	Sep.13,2016

5.2 Description of Support Units

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

5.3 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 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 (AC mains 150KHz~30MHz)

5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2009
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

6.1 E.U.T. Operation

Operating Environment **:**

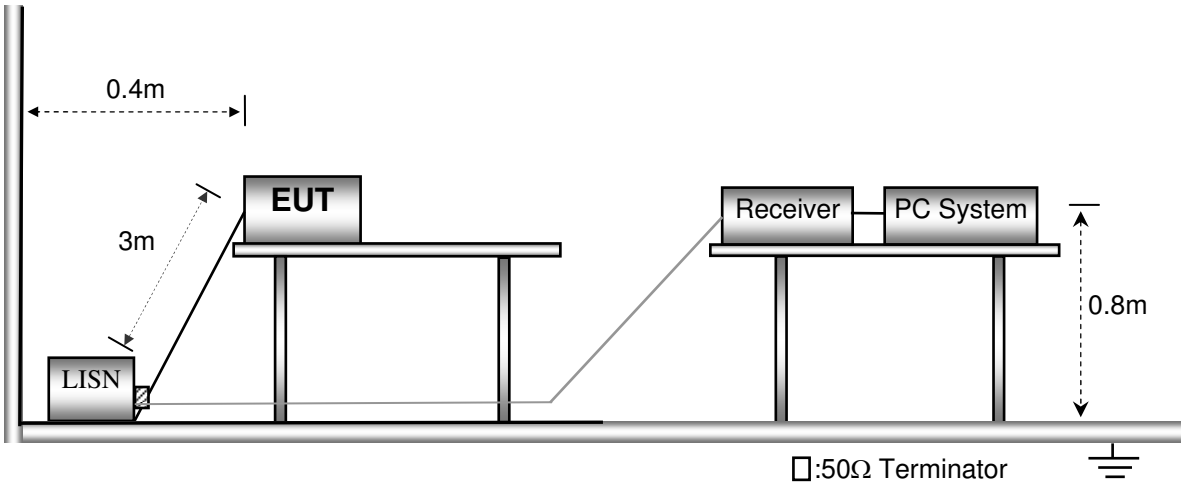
Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation **:**

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

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2009.



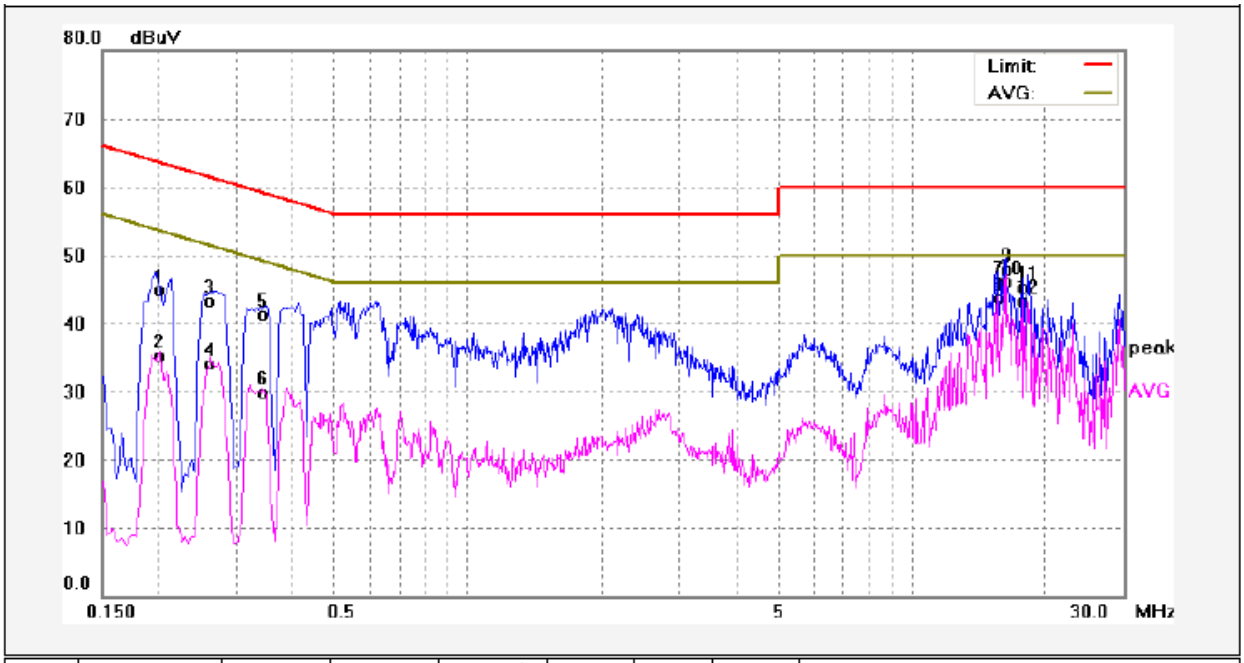
6.3 Measurement Description

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.

6.4 Conducted Emission Test Result

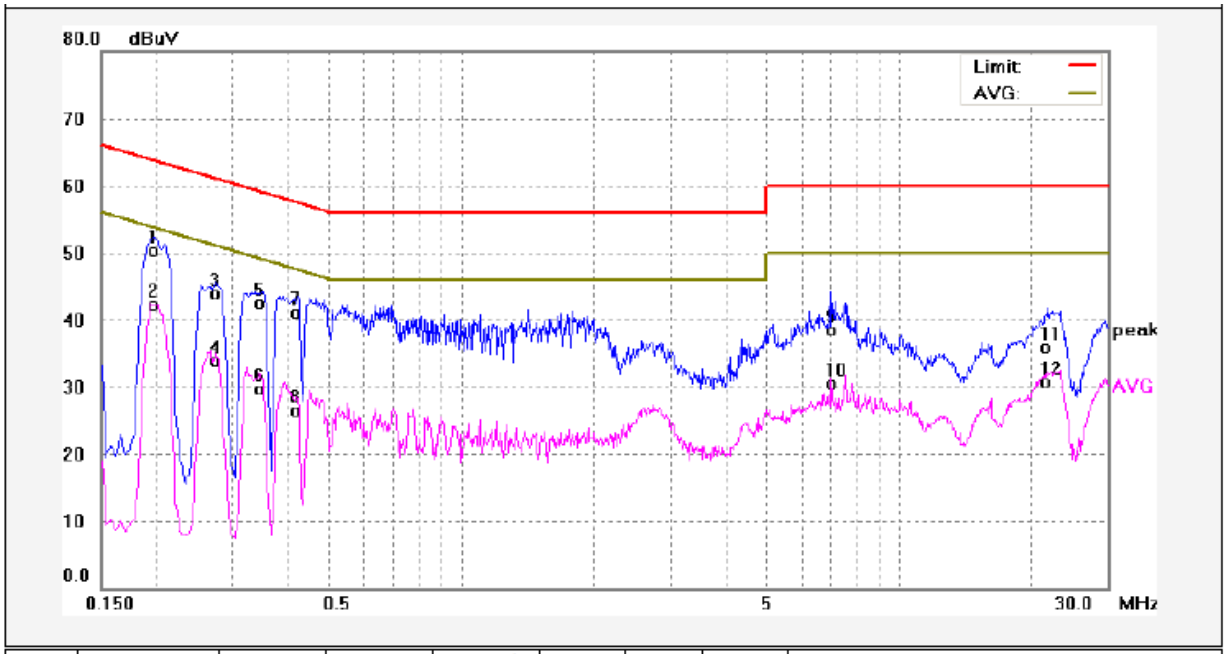
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	35.14	9.76	44.90	63.52	-18.62	QP	
2	0.2020	25.62	9.76	35.38	53.52	-18.14	AVG	
3	0.2620	33.52	9.74	43.26	61.36	-18.10	QP	
4	0.2620	24.45	9.74	34.19	51.36	-17.17	AVG	
5	0.3460	31.64	9.75	41.39	59.06	-17.67	QP	
6	0.3460	20.09	9.75	29.84	49.06	-19.22	AVG	
7	15.6180	35.72	10.45	46.17	60.00	-13.83	QP	
8	15.6180	33.33	10.45	43.78	50.00	-6.22	AVG	
9	16.1660	37.45	10.48	47.93	60.00	-12.07	QP	
10	16.1660	35.71	10.48	46.19	50.00	-3.81	AVG	
11	17.6940	34.81	10.57	45.38	60.00	-14.62	QP	
12	17.6940	32.83	10.57	43.40	50.00	-6.60	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1980	40.50	9.76	50.26	63.69	-13.43	QP	
2	0.1980	32.45	9.76	42.21	53.69	-11.48	AVG	
3	0.2740	34.12	9.74	43.86	60.99	-17.13	QP	
4	0.2740	24.25	9.74	33.99	50.99	-17.00	AVG	
5	0.3500	32.74	9.75	42.49	58.96	-16.47	QP	
6	0.3500	20.03	9.75	29.78	48.96	-19.18	AVG	
7	0.4220	31.32	9.75	41.07	57.41	-16.34	QP	
8	0.4220	16.66	9.75	26.41	47.41	-21.00	AVG	
9	7.0060	28.49	10.09	38.58	60.00	-21.42	QP	
10	7.0060	20.36	10.09	30.45	50.00	-19.55	AVG	
11	21.8660	25.17	10.83	36.00	60.00	-24.00	QP	
12	21.8660	19.91	10.83	30.74	50.00	-19.26	AVG	

7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.407

Test Method: ANSI C63.10:2009

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(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

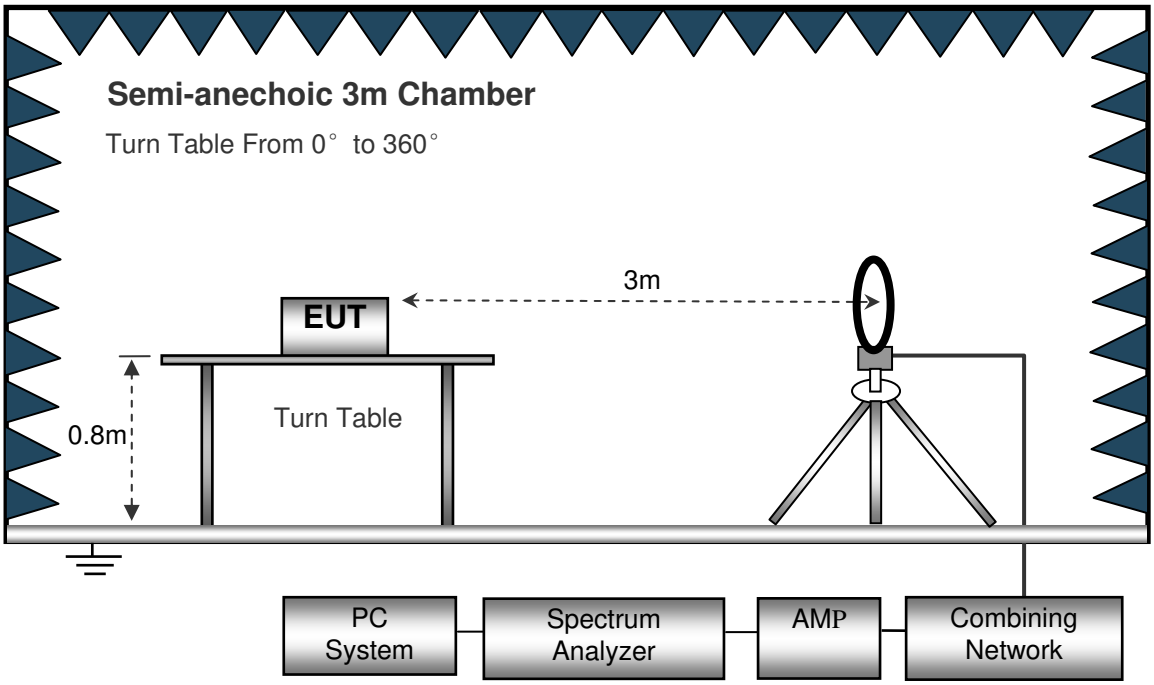
EUT Operation **:**

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

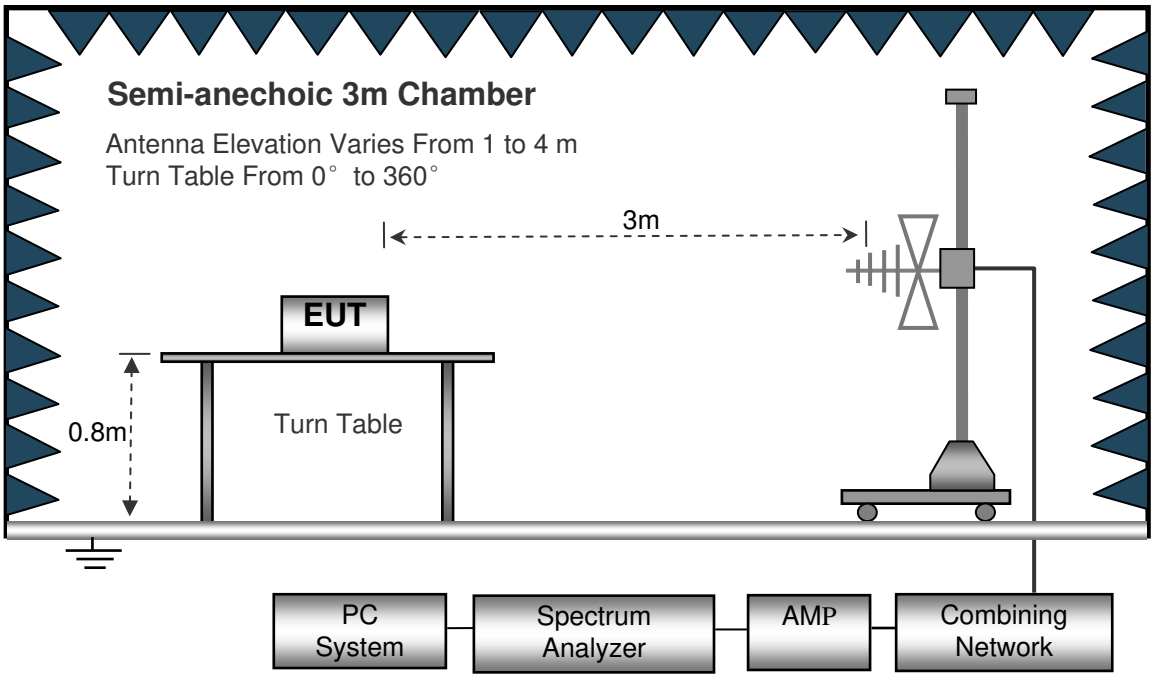
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2009.

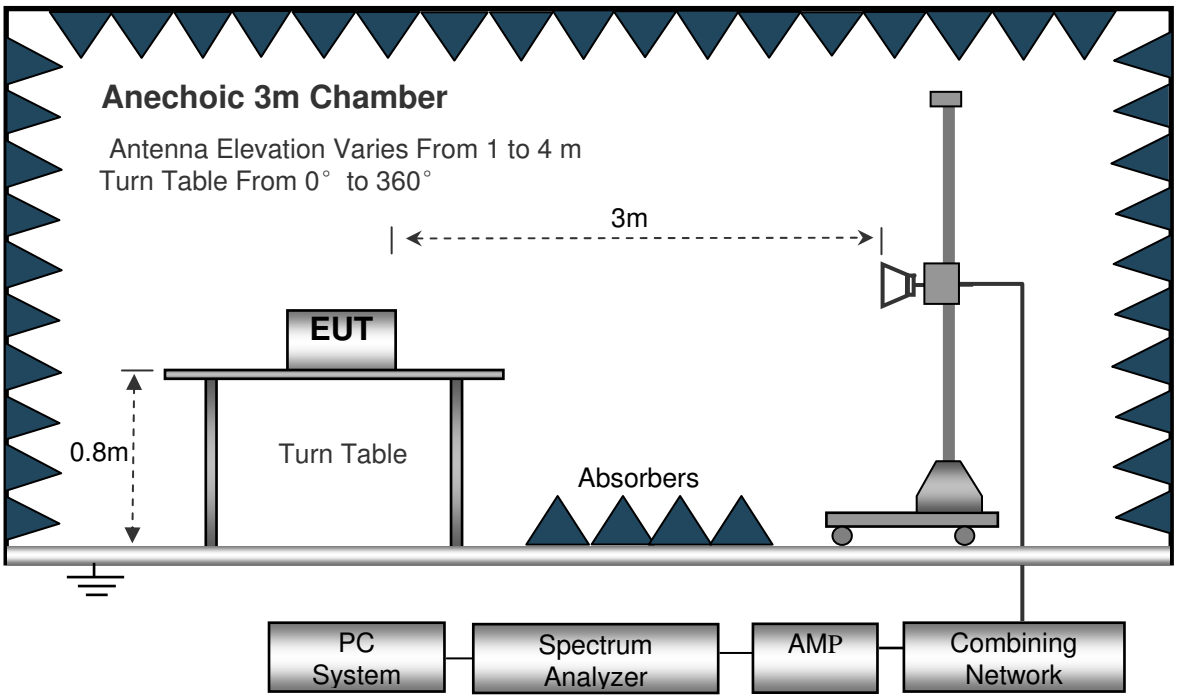
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

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

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
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 druing radiated emissions above 1GHz measurement.

7.5 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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - 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:

Margin = Corr. Ampl. – Limit

7.6 Summary of Test Results

Test Frequency: 32.768kHz~30MHz

Frequency (MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
	dBμV @3m	PK/QP	dB/m	dB	dBμV/m @30m	dBμV/m @30m	dB
25.860	26.21	QP	19.90	40.00	6.11	29.54	-23.43

Test Frequency : 30MHz ~ 18GHz

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)
802.11a U-NII-1 Low Channel 5180MHz									
223.45	41.05	QP	347	1.7	H	-11.62	29.43	46.00	-16.57
223.45	36.26	QP	170	1.9	V	-11.62	24.64	46.00	-21.36
4504.93	50.44	PK	20	1.1	H	-2.03	48.41	74.00	-25.59
4504.93	46.32	Ave	20	1.1	H	-2.03	44.29	54.00	-9.71
5124.02	52.53	PK	56	1.1	H	-1.02	51.51	74.00	-22.49
5124.02	48.18	Ave	56	1.1	H	-1.02	47.16	54.00	-6.84
10360.00	41.08	PK	292	1.5	H	5.33	46.41	74.00	-27.59
10360.00	36.85	Ave	292	1.5	H	5.33	42.18	54.00	-11.82
802.11a U-NII-1 middle channel 5200MHz									
223.45	41.08	QP	70	1.7	H	-11.62	29.46	46.00	-16.54
223.45	36.18	QP	18	1.9	V	-11.62	24.56	46.00	-21.44
4511.48	51.61	PK	291	1.3	H	-1.94	49.67	74.00	-24.33
4511.48	47.28	Ave	291	1.3	H	-1.94	45.34	54.00	-8.66
5124.70	53.05	PK	294	1.4	H	-1.06	51.99	74.00	-22.01
5124.70	48.45	Ave	294	1.4	H	-1.06	47.39	54.00	-6.61
10400.00	39.98	PK	352	1.3	H	5.21	45.19	74.00	-28.81
10400.00	35.50	Ave	352	1.3	H	5.21	40.71	54.00	-13.29

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)
802.11a U-NII-1 High channel 5240MHz									
223.45	41.81	QP	214	1.0	H	-11.62	30.19	46.00	-15.81
223.45	35.67	QP	196	1.0	V	-11.62	24.05	46.00	-21.95
4530.02	52.62	PK	51	1.7	H	-2.24	50.38	74.00	-23.62
4530.02	48.76	Ave	51	1.7	H	-2.24	46.52	54.00	-7.48
5148.53	54.17	PK	231	1.5	H	-1.09	53.08	74.00	-20.92
5148.53	49.54	Ave	231	1.5	H	-1.09	48.45	54.00	-5.55
10480.00	42.43	PK	189	1.6	H	5.14	47.57	74.00	-26.43
10480.00	37.07	Ave	189	1.6	H	5.14	42.21	54.00	-11.79
802.11a U-NII-3 low Channel 5745MHz									
223.45	40.85	QP	249	1.4	H	-11.62	29.23	46.00	-16.77
223.45	34.92	QP	310	1.9	V	-11.62	23.30	46.00	-22.70
4506.62	53.20	PK	352	1.4	H	-2.06	51.14	74.00	-22.86
4506.62	49.34	Ave	352	1.4	H	-2.06	47.28	54.00	-6.72
11490.00	40.61	PK	166	1.4	H	5.93	46.54	74.00	-27.46
11490.00	37.11	Ave	166	1.4	H	5.93	43.04	54.00	-10.96
5387.48	45.06	PK	190	1.4	H	-1.25	43.81	74.00	-30.19
5387.48	37.37	Ave	190	1.4	H	-1.25	36.12	54.00	-17.88

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)
802.11a U-NII-3 middle channel 5785MHz									
223.45	39.36	QP	351	1.5	H	-11.62	27.74	46.00	-18.26
223.45	33.79	QP	231	1.8	V	-11.62	22.17	46.00	-23.83
4532.85	51.85	PK	79	1.3	H	-2.03	49.82	74.00	-24.18
4532.85	50.23	Ave	79	1.3	H	-2.03	48.20	54.00	-5.80
11570.00	40.60	PK	9	1.6	H	5.81	46.41	74.00	-27.59
11570.00	37.18	Ave	9	1.6	H	5.81	42.99	54.00	-11.01
5389.94	46.19	PK	106	1.4	H	-1.22	44.97	74.00	-29.03
5389.94	38.73	Ave	106	1.4	H	-1.22	37.51	54.00	-16.49
802.11a U-NII-3 High channel 5825MHz									
223.45	38.92	QP	121	1.2	H	-11.62	27.30	46.00	-18.70
223.45	35.23	QP	107	1.7	V	-11.62	23.61	46.00	-22.39
4535.68	53.30	PK	179	1.8	H	-1.84	51.46	74.00	-22.54
4535.68	50.27	Ave	179	1.8	H	-1.84	48.43	54.00	-5.57
11650.00	42.41	PK	200	1.5	H	5.84	48.25	74.00	-25.75
11650.00	37.70	Ave	200	1.5	H	5.84	43.54	54.00	-10.46
5383.64	45.36	PK	65	1.5	H	-1.30	44.06	74.00	-29.94
5383.64	37.26	Ave	65	1.5	H	-1.30	35.96	54.00	-18.04

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)
802.11n(HT20) U-NII-1 low Channel 5180MHz									
223.45	39.56	QP	130	1.7	H	-11.62	27.94	46.00	-18.06
223.45	36.43	QP	197	1.2	V	-11.62	24.81	46.00	-21.19
4506.25	53.59	PK	112	1.9	H	-2.14	51.45	74.00	-22.55
4506.25	50.37	Ave	112	1.9	H	-2.14	48.23	54.00	-5.77
5115.34	45.47	PK	321	1.2	H	-1.06	44.41	74.00	-29.59
5115.34	36.57	Ave	321	1.2	H	-1.06	35.51	54.00	-18.49
10360.00	42.10	PK	209	1.4	H	5.33	47.43	74.00	-26.57
10360.00	37.19	Ave	209	1.4	H	5.33	42.52	54.00	-11.48
802.11n(HT20) U-NII-1 middle channel 5200MHz									
223.45	38.25	QP	199	1.5	H	-11.62	26.63	46.00	-19.37
223.45	35.04	QP	209	1.1	V	-11.62	23.42	46.00	-22.58
4504.04	54.05	PK	236	1.0	H	-2.12	51.93	74.00	-22.07
4504.04	51.84	Ave	236	1.0	H	-2.12	49.72	54.00	-4.28
5134.01	45.58	PK	2	2.0	H	-1.06	44.52	74.00	-29.48
5134.01	38.40	Ave	2	2.0	H	-1.06	37.34	54.00	-16.66
10400.00	40.53	PK	321	1.9	H	5.21	45.74	74.00	-28.26
10400.00	36.68	Ave	321	1.9	H	5.21	41.89	54.00	-12.11

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(HT20) U-NII-1 High channel 5240MHz									
223.45	39.68	QP	83	1.7	H	-11.62	28.06	46.00	-17.94
223.45	33.75	QP	212	1.2	V	-11.62	22.13	46.00	-23.87
4531.40	53.52	PK	121	1.2	H	-1.96	51.56	74.00	-22.44
4531.40	50.38	Ave	121	1.2	H	-1.96	48.42	54.00	-5.58
5148.87	45.64	PK	274	1.9	H	-1.06	44.58	74.00	-29.42
5148.87	39.07	Ave	274	1.9	H	-1.06	38.01	54.00	-15.99
10480.00	41.17	PK	162	1.4	H	5.14	46.31	74.00	-27.69
10480.00	36.78	Ave	162	1.4	H	5.14	41.92	54.00	-12.08
802.11n(HT20) U-NII-3 low Channel 5745MHz									
223.45	38.31	QP	102	1.7	H	-11.62	26.69	46.00	-19.31
223.45	33.53	QP	93	1.7	V	-11.62	21.91	46.00	-24.09
4521.42	50.77	PK	101	1.5	H	-1.85	48.92	74.00	-25.08
4521.42	49.32	Ave	101	1.5	H	-1.85	47.47	54.00	-6.53
11490.00	38.09	PK	9	1.2	H	5.93	44.02	74.00	-29.98
11490.00	35.44	Ave	9	1.2	H	5.93	41.37	54.00	-12.63
5383.77	46.83	PK	104	1.9	H	-1.01	45.82	74.00	-28.18
5383.77	38.19	Ave	104	1.9	H	-1.01	37.18	54.00	-16.82

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(HT20) U-NII-3 middle channel 5785MHz									
223.45	37.86	QP	2	1.4	H	-11.62	26.24	46.00	-19.76
223.45	34.20	QP	298	2.0	V	-11.62	22.58	46.00	-23.42
4515.03	50.68	PK	333	1.7	H	-1.89	48.79	74.00	-25.21
4515.03	49.87	Ave	333	1.7	H	-1.89	47.98	54.00	-6.02
11570.00	41.12	PK	359	1.8	H	5.81	46.93	74.00	-27.07
11570.00	37.23	Ave	359	1.8	H	5.81	43.04	54.00	-10.96
5374.25	45.74	PK	304	1.5	H	-1.04	44.70	74.00	-29.30
5374.25	38.33	Ave	304	1.5	H	-1.04	37.29	54.00	-16.71
802.11n(HT20) U-NII-3 High channel 5825MHz									
223.45	38.26	QP	208	1.3	H	-11.62	26.64	46.00	-19.36
223.45	34.33	QP	349	1.6	V	-11.62	22.71	46.00	-23.29
4514.12	51.45	PK	68	1.8	H	-1.97	49.48	74.00	-24.52
4514.12	48.95	Ave	68	1.8	H	-1.97	46.98	54.00	-7.02
11650.00	40.49	PK	57	1.5	H	5.84	46.33	74.00	-27.67
11650.00	36.41	Ave	57	1.5	H	5.84	42.25	54.00	-11.75
5373.31	45.76	PK	149	1.8	H	-1.12	44.64	74.00	-29.36
5373.31	38.87	Ave	149	1.8	H	-1.12	37.75	54.00	-16.25

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(HT20) U-NII-1 low Channel 5180MHz									
223.45	38.48	QP	168	1.2	H	-11.62	26.86	46.00	-19.14
223.45	34.56	QP	314	1.7	V	-11.62	22.94	46.00	-23.06
4513.30	49.26	PK	50	1.6	H	-1.86	47.40	74.00	-26.60
4513.30	46.64	Ave	50	1.6	H	-1.86	44.78	54.00	-9.22
5123.67	48.19	PK	289	1.8	H	-1.06	47.13	74.00	-26.87
5123.67	39.76	Ave	289	1.8	H	-1.06	38.70	54.00	-15.30
10360.00	38.54	PK	177	1.9	H	5.33	43.87	74.00	-30.13
10360.00	34.91	Ave	177	1.9	H	5.33	40.24	54.00	-13.76
802.11ac(HT20) U-NII-1 middle channel 5200MHz									
223.45	38.80	QP	210	1.6	H	-11.62	27.18	46.00	-18.82
223.45	34.03	QP	338	1.4	V	-11.62	22.41	46.00	-23.59
4532.34	50.18	PK	244	1.3	H	-1.82	48.36	74.00	-25.64
4532.34	45.99	Ave	244	1.3	H	-1.82	44.17	54.00	-9.83
5138.10	47.24	PK	115	2.0	H	-1.06	46.18	74.00	-27.82
5138.10	39.54	Ave	115	2.0	H	-1.06	38.48	54.00	-15.52
10400.00	41.23	PK	101	1.2	H	5.21	46.44	74.00	-27.56
10400.00	35.90	Ave	101	1.2	H	5.21	41.11	54.00	-12.89

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(HT20) U-NII-1 High channel 5240MHz									
223.45	38.70	QP	358	1.7	H	-11.62	27.08	46.00	-18.92
223.45	34.46	QP	155	1.1	V	-11.62	22.84	46.00	-23.16
4527.39	50.37	PK	342	1.3	H	-1.81	48.56	74.00	-25.44
4527.39	45.13	Ave	342	1.3	H	-1.81	43.32	54.00	-10.68
5129.08	47.00	PK	175	2.0	H	-1.06	45.94	74.00	-28.06
5129.08	38.99	Ave	175	2.0	H	-1.06	37.93	54.00	-16.07
10480.00	40.74	PK	109	1.9	H	5.14	45.88	74.00	-28.12
10480.00	36.86	Ave	109	1.9	H	5.14	42.00	54.00	-12.00
802.11ac(HT20) U-NII-3 low Channel 5745MHz									
223.45	39.21	QP	47	1.4	H	-11.62	27.59	46.00	-18.41
223.45	35.89	QP	181	1.3	V	-11.62	24.27	46.00	-21.73
4505.19	47.81	PK	25	1.1	H	-1.92	45.89	74.00	-28.11
4505.19	43.22	Ave	25	1.1	H	-1.92	41.30	54.00	-12.70
11490.00	38.55	PK	146	1.1	H	5.93	44.48	74.00	-29.52
11490.00	34.91	Ave	146	1.1	H	5.93	40.84	54.00	-13.16
5364.81	45.64	PK	81	1.1	H	-1.03	44.61	74.00	-29.39
5364.81	38.43	Ave	81	1.1	H	-1.03	37.40	54.00	-16.60

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(HT20) U-NII-3 middle channel 5785MHz									
223.45	39.83	QP	3	1.3	H	-11.62	28.21	46.00	-17.79
223.45	35.38	QP	298	1.3	V	-11.62	23.76	46.00	-22.24
4512.92	47.40	PK	201	1.3	H	-1.97	45.43	74.00	-28.57
4512.92	42.58	Ave	201	1.3	H	-1.97	40.61	54.00	-13.39
11570.00	40.47	PK	297	1.2	H	5.81	46.28	74.00	-27.72
11570.00	37.14	Ave	297	1.2	H	5.81	42.95	54.00	-11.05
5383.66	46.74	PK	122	1.5	H	-1.05	45.69	74.00	-28.31
5383.66	37.56	Ave	122	1.5	H	-1.05	36.51	54.00	-17.49
802.11ac(HT20) U-NII-3 High channel 5825MHz									
223.45	39.87	QP	202	1.0	H	-11.62	28.25	46.00	-17.75
223.45	35.65	QP	324	1.2	V	-11.62	24.03	46.00	-21.97
4504.82	47.53	PK	327	1.9	H	-1.88	45.65	74.00	-28.35
4504.82	43.38	Ave	327	1.9	H	-1.88	41.50	54.00	-12.50
11650.00	40.36	PK	186	1.4	H	5.84	46.20	74.00	-27.80
11650.00	36.12	Ave	186	1.4	H	5.84	41.96	54.00	-12.04
5375.56	46.13	PK	112	1.5	H	-1.06	45.07	74.00	-28.93
5375.56	37.57	Ave	112	1.5	H	-1.06	36.51	54.00	-17.49

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									
223.45	40.28	QP	112	1.2	H	-11.62	28.66	46.00	-17.34
223.45	37.00	QP	32	1.9	V	-11.62	25.38	46.00	-20.62
4516.92	45.17	PK	72	1.1	H	-1.89	43.28	74.00	-30.72
4516.92	41.43	Ave	72	1.1	H	-1.89	39.54	54.00	-14.46
5112.42	47.37	PK	14	1.8	H	-1.06	46.31	74.00	-27.69
5112.42	39.14	Ave	14	1.8	H	-1.06	38.08	54.00	-15.92
10380.00	39.73	PK	133	2.0	H	5.26	44.99	74.00	-29.01
10380.00	35.24	Ave	133	2.0	H	5.26	40.50	54.00	-13.50
802.11n(HT40) U-NII-1 High channel 5230MHz									
223.45	40.75	QP	86	1.5	H	-11.62	29.13	46.00	-16.87
223.45	36.52	QP	234	1.5	V	-11.62	24.90	46.00	-21.10
4535.48	44.48	PK	249	1.2	H	-1.94	42.54	74.00	-31.46
4535.48	40.88	Ave	249	1.2	H	-1.94	38.94	54.00	-15.06
5146.24	48.72	PK	165	1.0	H	-1.06	47.66	74.00	-26.34
5146.24	41.07	Ave	165	1.0	H	-1.06	40.01	54.00	-13.99
10460.00	41.69	PK	97	1.7	H	5.28	46.97	74.00	-27.03
10480.00	36.25	Ave	97	1.7	H	5.28	41.53	54.00	-12.47

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									
223.45	40.40	QP	196	2.0	H	-11.62	28.78	74.00	-45.22
223.45	37.89	QP	223	1.8	V	-11.62	26.27	74.00	-47.73
4502.89	43.01	PK	157	1.2	H	-1.96	41.05	74.00	-32.95
4502.89	39.21	Ave	157	1.2	H	-1.96	37.25	54.00	-16.75
11510.00	38.34	PK	43	1.5	H	5.88	44.22	74.00	-29.78
11510.00	35.48	Ave	43	1.5	H	5.88	41.36	54.00	-12.64
5363.90	45.73	PK	138	1.4	H	-1.01	44.72	74.00	-29.28
5363.90	39.96	Ave	138	1.4	H	-1.01	38.95	54.00	-15.05
802.11n(HT40) U-NII-3 High channel 5795MHz									
223.45	39.75	QP	29	1.9	H	-11.62	28.13	74.00	-45.87
223.45	37.85	QP	312	1.8	V	-11.62	26.23	74.00	-47.77
4534.76	42.39	PK	338	1.5	H	-1.92	40.47	74.00	-33.53
4534.76	39.87	Ave	338	1.5	H	-1.92	37.95	54.00	-16.05
11590.00	40.85	PK	312	1.8	H	5.63	46.48	74.00	-27.52
11590.00	37.64	Ave	312	1.8	H	5.63	43.27	54.00	-10.73
5367.23	45.64	PK	28	1.3	H	-1.04	44.60	74.00	-29.40
5367.23	37.64	Ave	28	1.3	H	-1.04	36.60	54.00	-17.40

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									
223.45	40.19	QP	287	1.4	H	-11.62	28.57	74.00	-45.43
223.45	37.70	QP	221	1.0	V	-11.62	26.08	74.00	-47.92
4514.35	40.22	PK	98	1.1	H	-1.91	38.31	74.00	-35.69
4514.35	37.14	Ave	98	1.1	H	-1.91	35.23	54.00	-18.77
5141.72	45.89	PK	114	1.4	H	-1.06	44.83	74.00	-29.17
5141.72	37.31	Ave	114	1.4	H	-1.06	36.25	54.00	-17.75
10380.00	39.43	PK	89	1.8	H	5.26	44.69	74.00	-29.31
10380.00	33.98	Ave	89	1.8	H	5.26	39.24	54.00	-14.76
802.11ac(HT40) U-NII-1 High channel 5230MHz									
223.45	39.49	QP	151	1.7	H	-11.62	27.87	74.00	-46.13
223.45	38.26	QP	295	1.7	V	-11.62	26.64	74.00	-47.36
4504.82	40.85	PK	13	1.0	H	-1.93	38.92	74.00	-35.08
4504.82	36.54	Ave	13	1.0	H	-1.93	34.61	54.00	-19.39
5122.93	45.39	PK	314	1.8	H	-1.06	44.33	74.00	-29.67
5122.93	39.26	Ave	314	1.8	H	-1.06	38.20	54.00	-15.80
10460.00	41.10	PK	186	1.9	H	5.28	46.38	74.00	-27.62
10480.00	36.81	Ave	186	1.9	H	5.28	42.09	54.00	-11.91

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									
223.45	40.49	QP	243	1.2	H	-11.62	28.87	74.00	-45.13
223.45	38.73	QP	300	2.0	V	-11.62	27.11	74.00	-46.89
4527.99	37.91	PK	273	1.7	H	-1.92	35.99	74.00	-38.01
4527.99	33.84	Ave	273	1.7	H	-1.92	31.92	54.00	-22.08
11510.00	38.86	PK	264	1.5	H	5.88	44.74	74.00	-29.26
11510.00	34.38	Ave	264	1.5	H	5.88	40.26	54.00	-13.74
5379.50	46.26	PK	348	1.1	H	-1.07	45.19	74.00	-28.81
5379.50	37.14	Ave	348	1.1	H	-1.07	36.07	54.00	-17.93
802.11ac(HT40) U-NII-3 High channel 5795MHz									
223.45	40.65	QP	326	1.1	H	-11.62	29.03	74.00	-44.97
223.45	38.95	QP	81	2.0	V	-11.62	27.33	74.00	-46.67
4536.82	37.49	PK	59	1.6	H	-1.86	35.63	74.00	-38.37
4536.82	34.36	Ave	59	1.6	H	-1.86	32.50	54.00	-21.50
11590.00	40.32	PK	111	1.3	H	5.63	45.95	74.00	-28.05
11590.00	36.00	Ave	111	1.3	H	5.63	41.63	54.00	-12.37
5381.04	45.52	PK	227	1.6	H	-1.03	44.49	74.00	-29.51
5381.04	37.70	Ave	227	1.6	H	-1.03	36.67	54.00	-17.33

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									
223.45	39.16	QP	293	1.0	H	-11.62	27.54	54.00	-26.46
4536.82	36.73	QP	146	1.9	V	-11.62	25.11	54.00	-28.89
4525.18	33.65	PK	6	1.8	H	-1.88	31.77	74.00	-42.23
4525.18	40.19	Ave	6	1.8	H	-1.88	38.31	54.00	-15.69
5110.72	36.21	PK	25	1.3	H	-1.06	35.15	74.00	-38.85
5110.72	46.11	Ave	25	1.3	H	-1.06	45.05	54.00	-8.95
10420.00	40.33	PK	76	1.9	H	4.65	44.98	74.00	-29.02
10420.00	37.09	Ave	76	1.9	H	4.65	41.74	54.00	-12.26
802.11ac(HT80) U-NII-3 low Channel 5775MHz									
4536.82	37.63	QP	82	1.9	H	-11.62	26.01	74.00	-47.99
4525.18	32.68	QP	293	1.0	V	-11.62	21.06	74.00	-52.94
4521.37	39.93	PK	266	1.1	H	-1.85	38.08	74.00	-35.92
4521.37	41.04	Ave	266	1.1	H	-1.85	39.19	54.00	-14.81
11550.00	40.26	PK	359	1.9	H	4.83	45.09	74.00	-28.91
11550.00	36.23	Ave	359	1.9	H	4.83	41.06	54.00	-12.94
5387.64	45.84	PK	268	1.5	H	-1.14	44.70	74.00	-29.30
5387.64	39.67	Ave	268	1.5	H	-1.14	38.53	54.00	-15.47

Test Frequency: 18GHz~40GHz

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

8 Duty cycle

Test Requirement:	47 CFR Part 15C 15.407 and 789033 D02 General UNII Test Procedures New Rules v01, Section (B)
Test Method:	ANSI C63.10: 2009
Test Limit:	N/A
Test Result:	PASS
Remark:	Through Pre-scan, and found 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.

8.1 Summary of Test Results

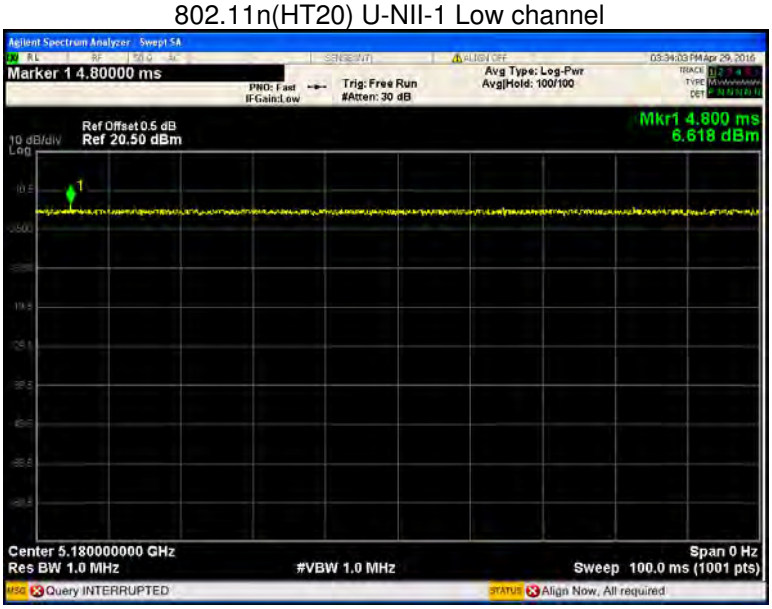
802.11a mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11n(HT20) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
36	100	100	100
149	100	100	100
802.11n(HT40) mode			
channel	On time(ms)	Period(ms)	Duty Cycle(%)
38	100	100	100
151	100	100	100
802.11ac(HT20)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

ANT0

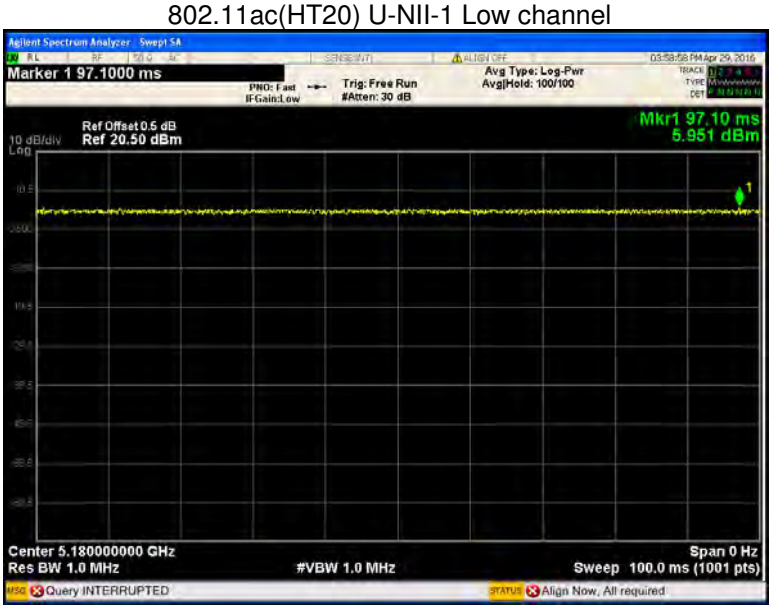
802.11a U-NII-1 Low channel

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



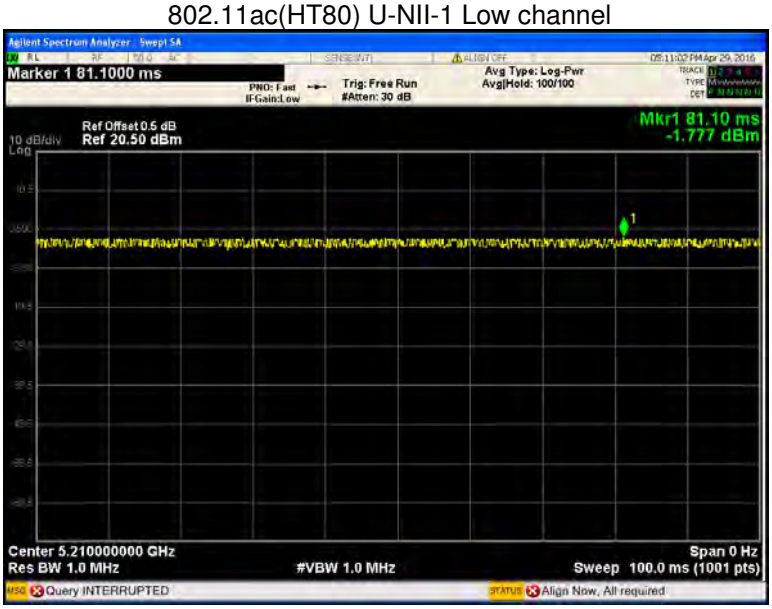
802.11n(HT40) U-NII-1 Low channel

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



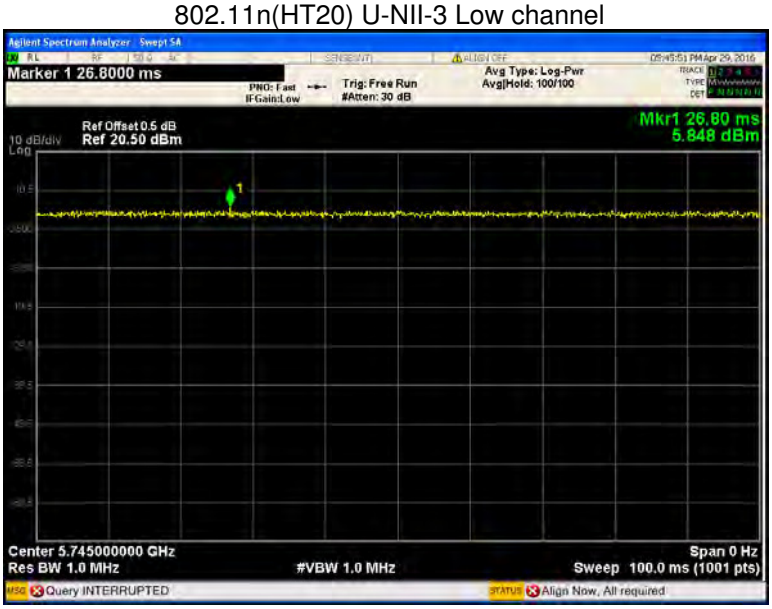
802.11ac(HT40) U-NII-1 Low channel

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

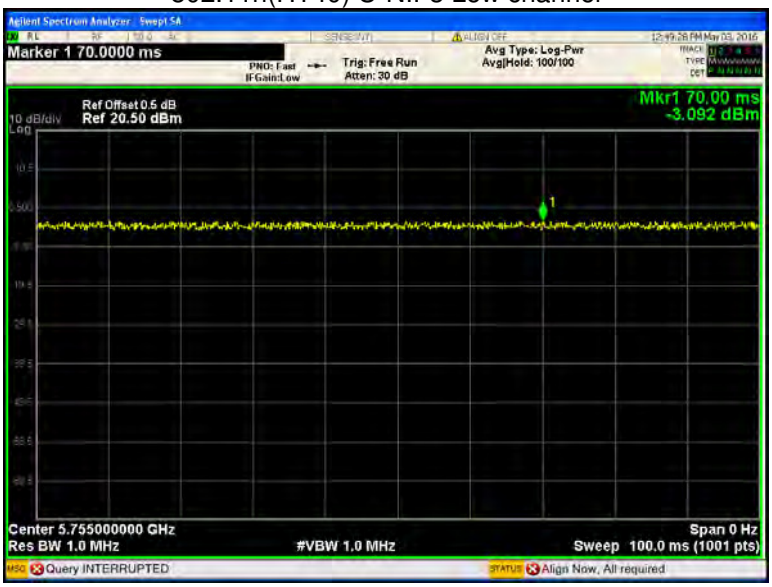


802.11a U-NII-3 Low channel

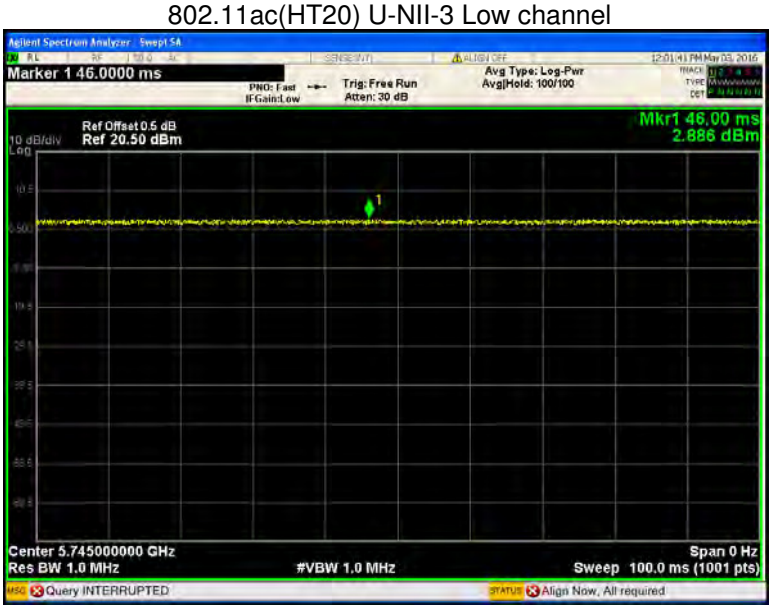
802.11n(HT20) U-NII-3 Low channel



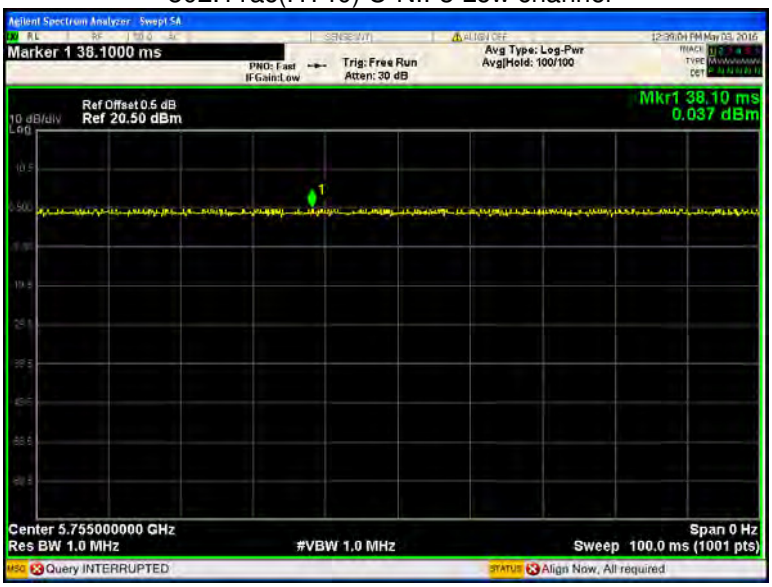
802.11n(HT40) U-NII-3 Low channel



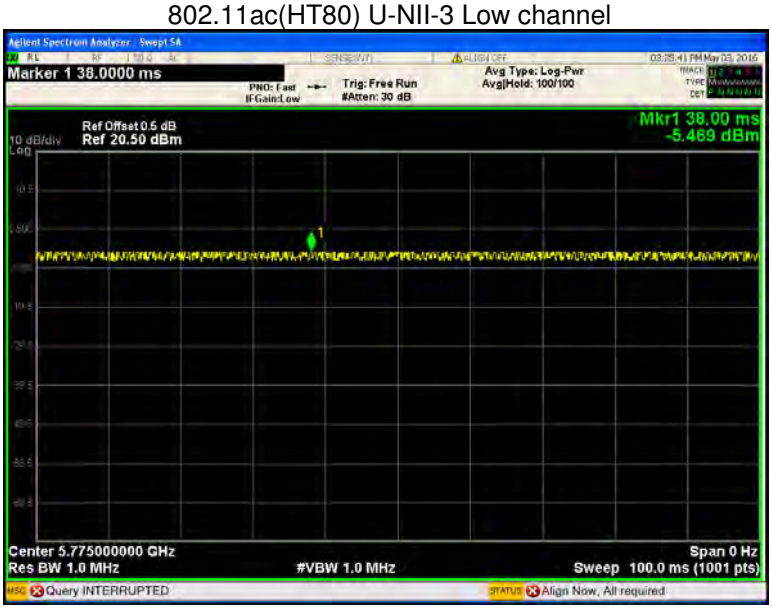
802.11ac(HT20) U-NII-3 Low channel



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



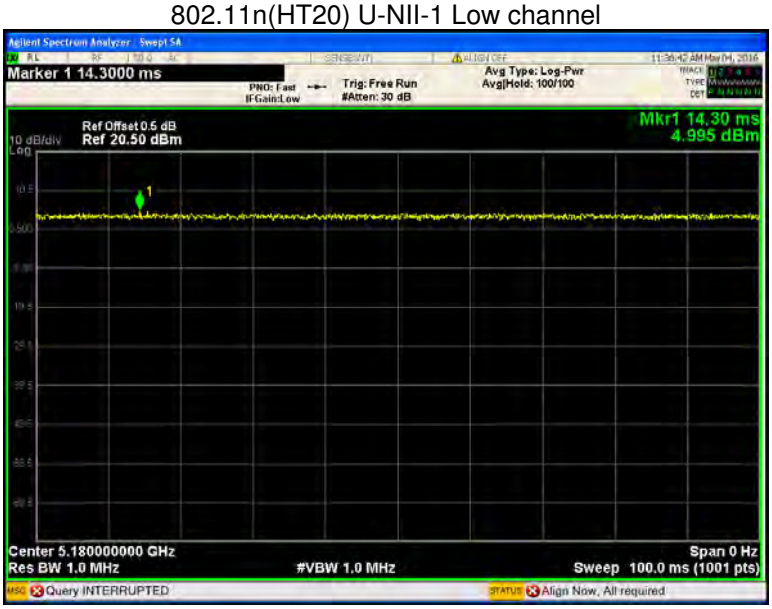
802.11ac(HT80) U-NII-3 Low channel



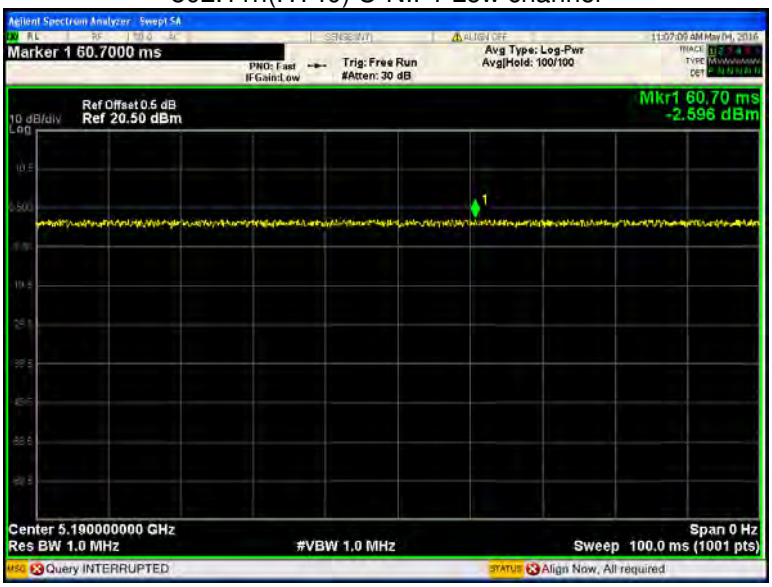
ANT1

802.11a U-NII-1 Low channel

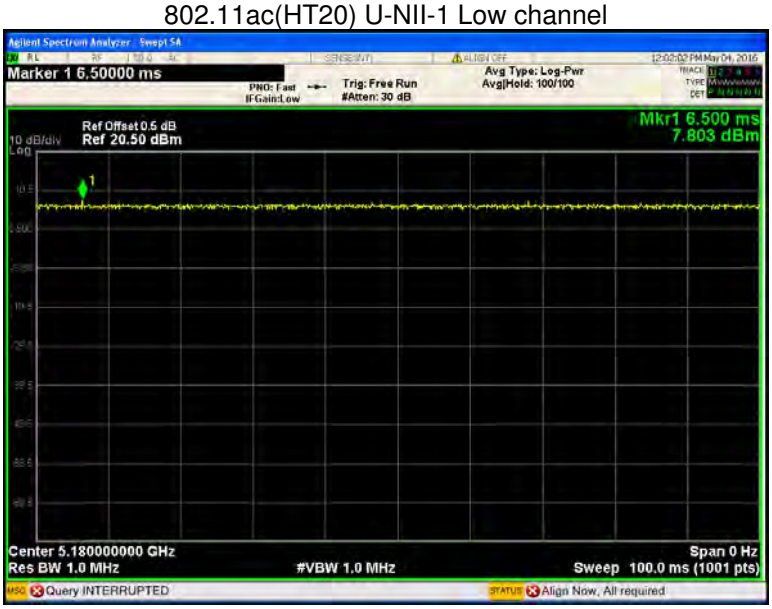
802.11n(HT20) U-NII-1 Low channel



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

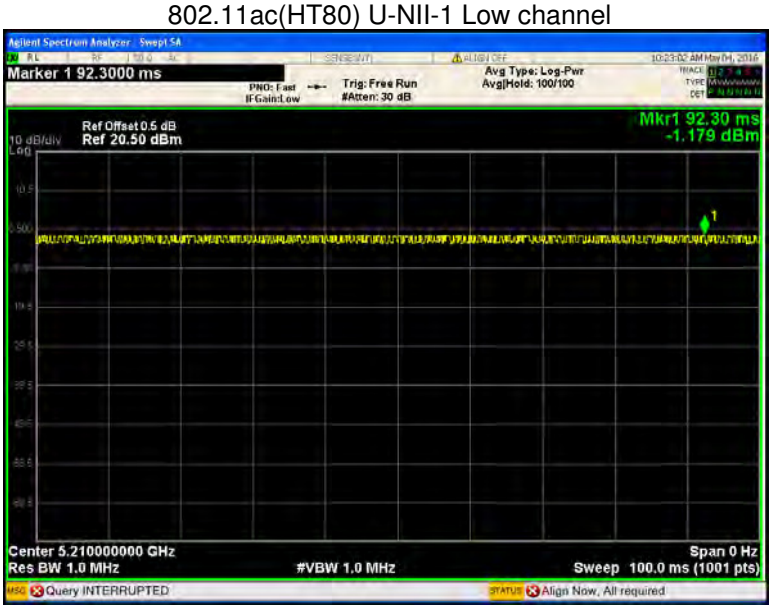


802.11ac(HT20) U-NII-1 Low channel



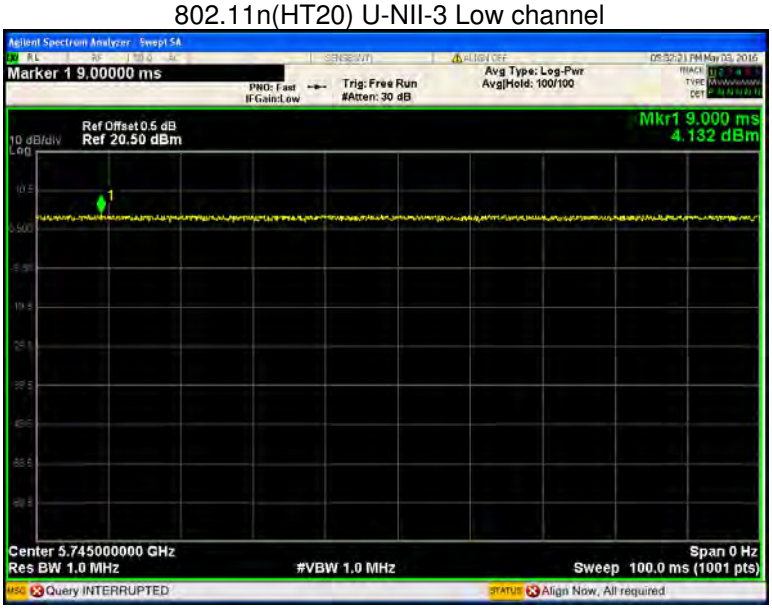
802.11ac(HT40) U-NII-1 Low channel

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

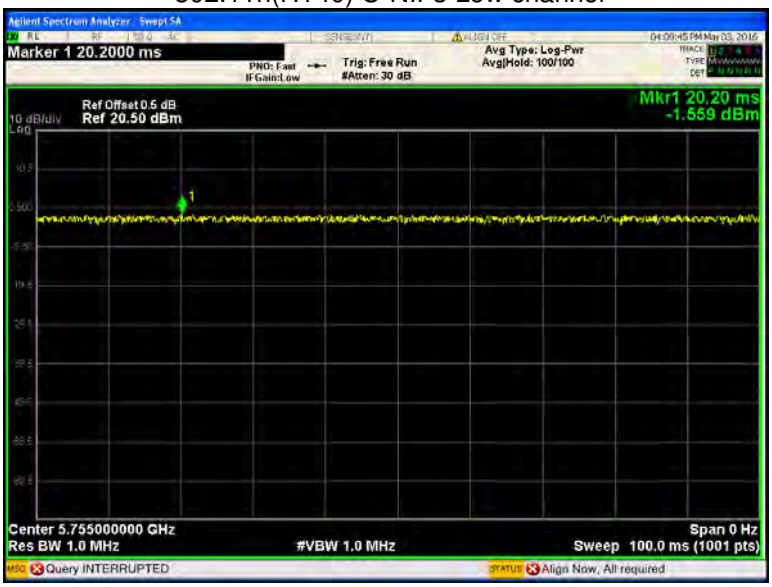


802.11a U-NII-3 Low channel

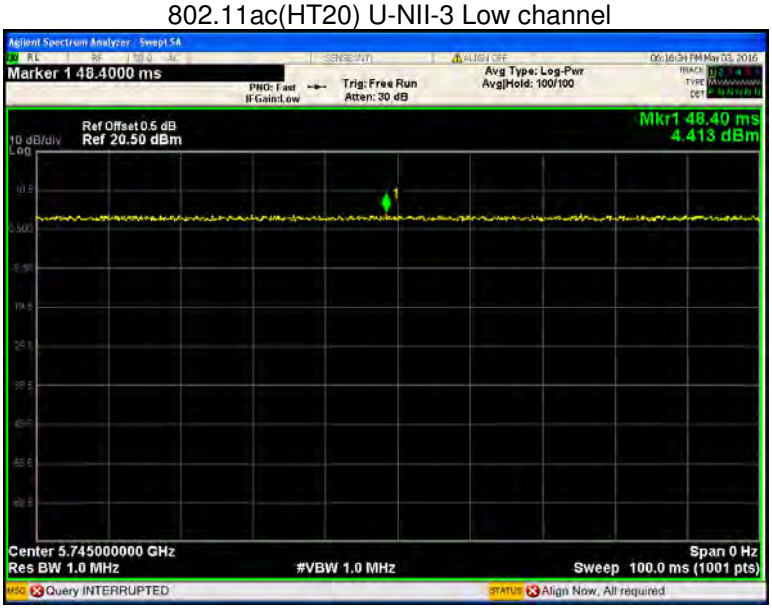
802.11n(HT20) U-NII-3 Low channel



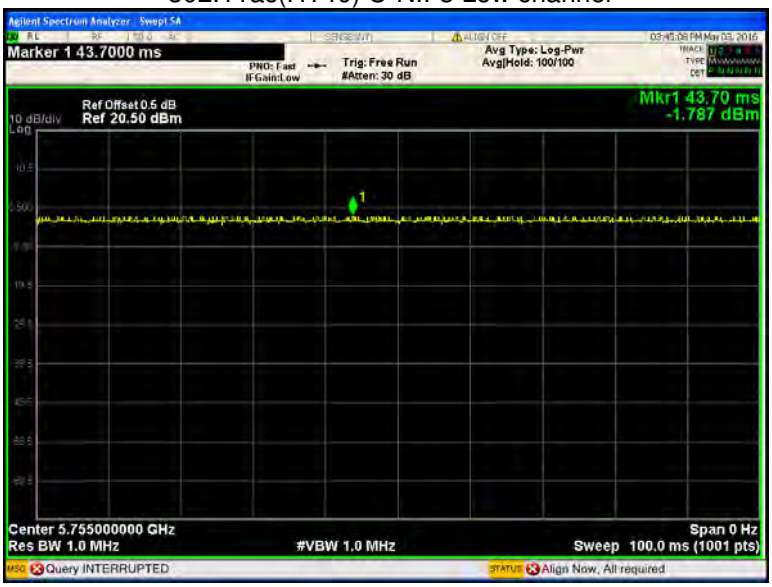
802.11n(HT40) U-NII-3 Low channel



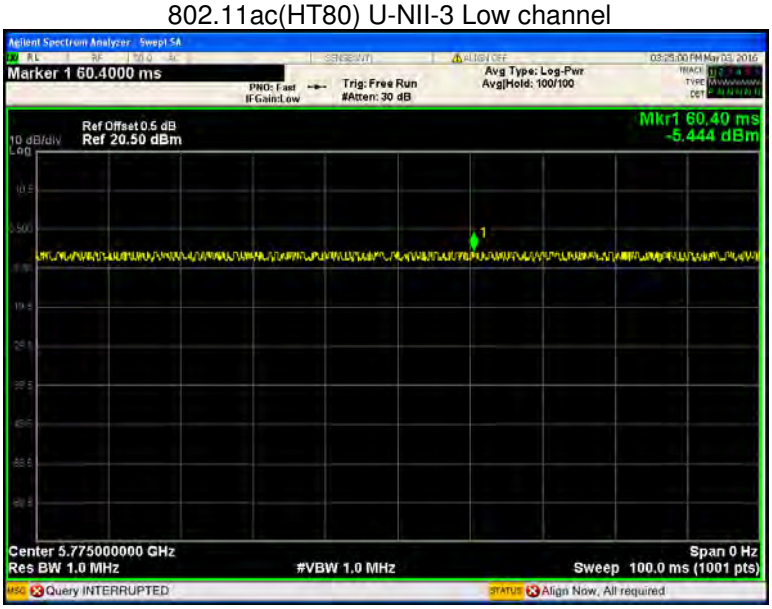
802.11ac(HT20) U-NII-3 Low channel



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



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



9 Band Edge

Test Requirement:	FCC CFR47 Part 15 Section 15.407
Test Method:	ANSI C63.10 2009
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

9.1 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.

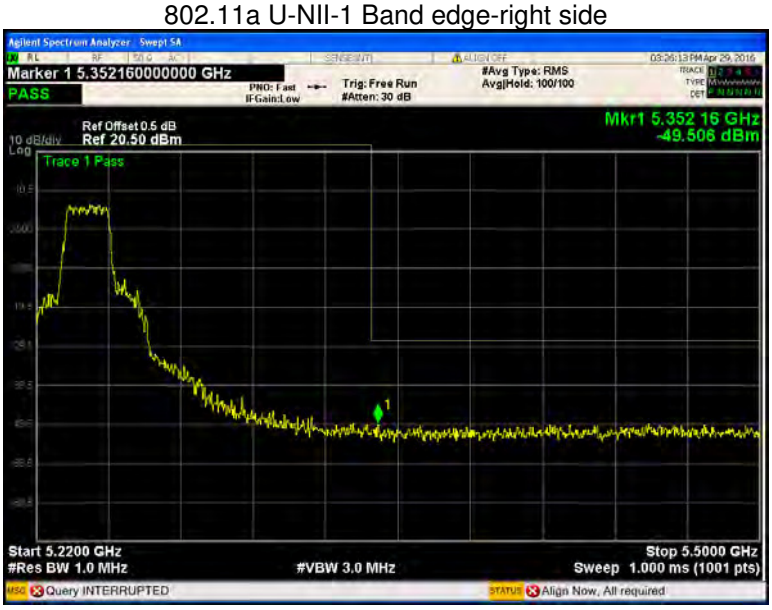
9.2 Test Result

Test result plots shown as follows:

ANT0

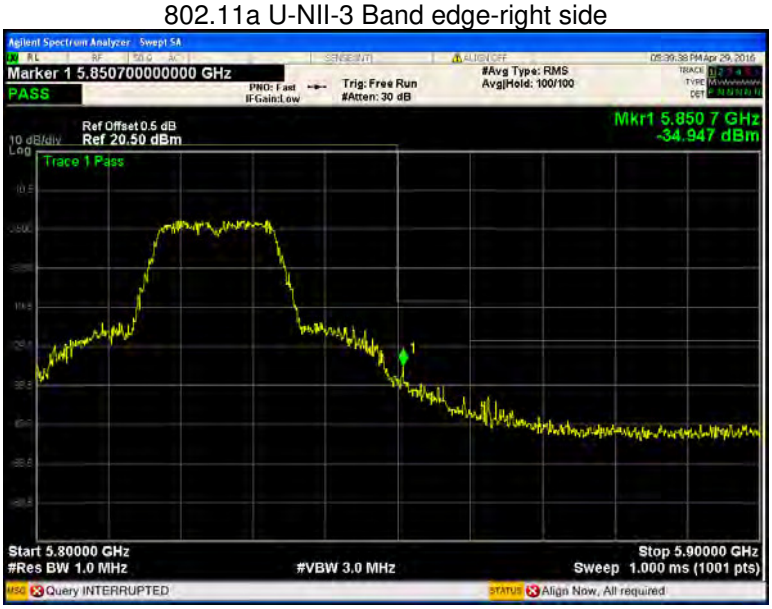
802.11a U-NII-1 Band edge-left side

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

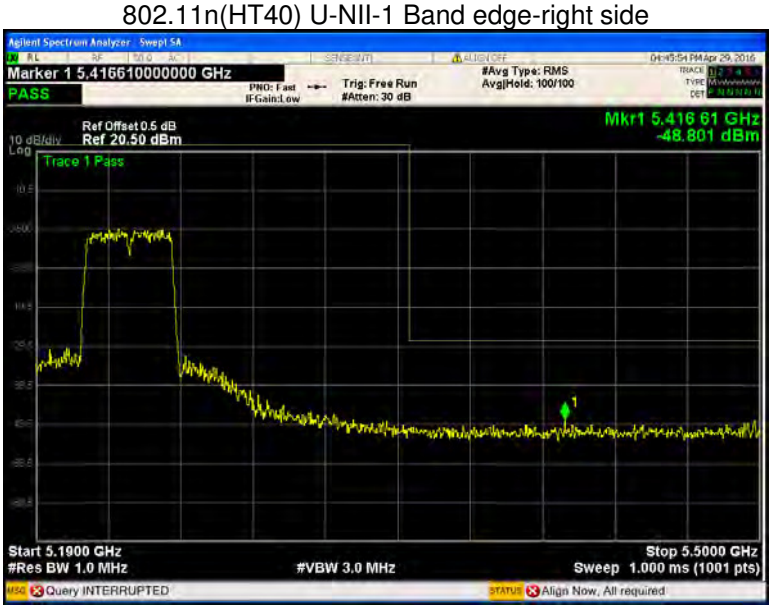
802.11n(HT20) U-NII-1 Band edge-right side

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

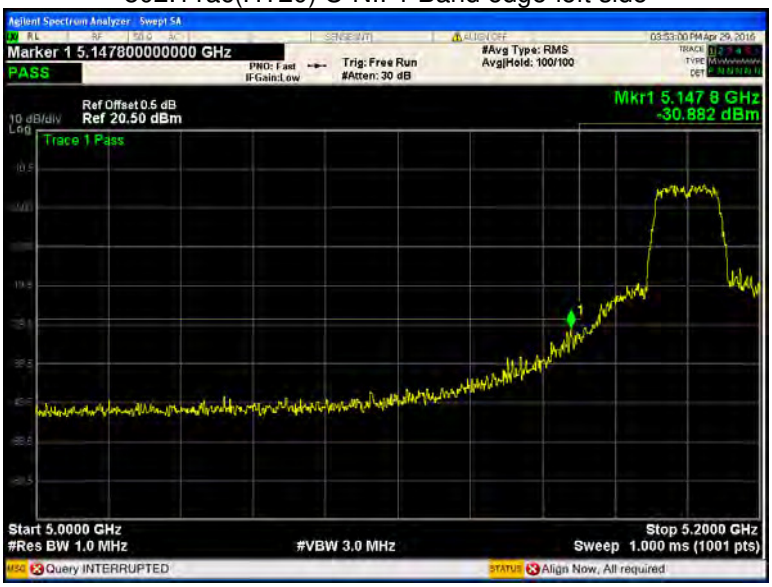
802.11n(HT40) U-NII-1 Band edge-right side



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

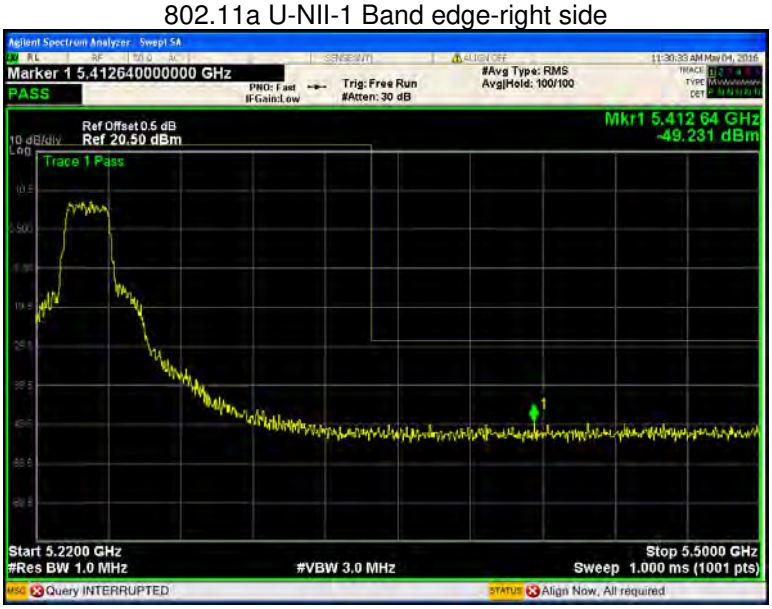
802.11ac(HT80) U-NII-3 Band edge-left side

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

ANT1

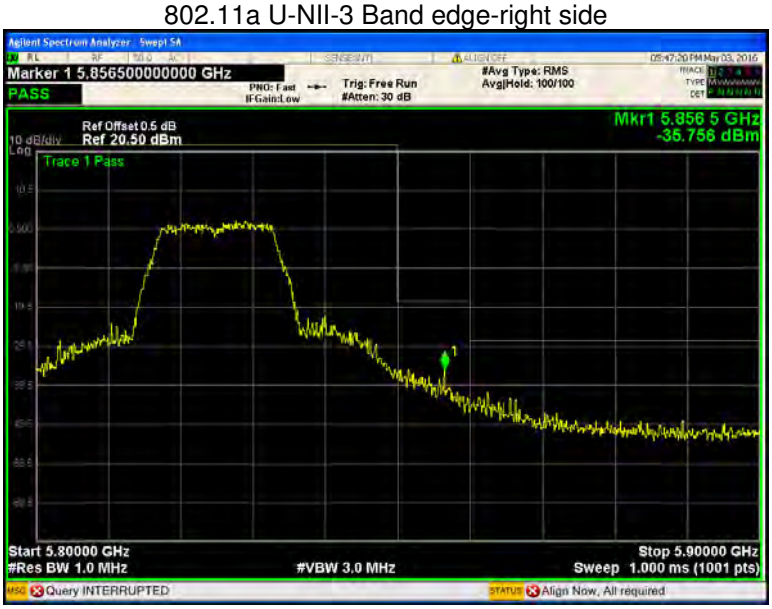
802.11a U-NII-1 Band edge-left side

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

10 6 dB Bandwidth

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01 Section C
Test Limit:	≥ 500 kHz
Test Result:	PASS

10.1 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

10.2 Test Result:

Band	Operation mode	6 dB Bandwidth (MHz)		
		Low	Middle	High
ANT0 U-NII-3	802.11a	16.41	15.72	16.44
	802.11n(HT20)	17.61	17.67	17.61
	802.11n(HT40)	35.76	/	36.06
	802.11ac(HT20)	17.61	17.67	17.64
	802.11ac(HT40)	35.82	/	35.82
	802.11ac(HT80)	75.64	/	/
ANT1 U-NII-3	802.11a	16.44	16.41	16.44
	802.11n(HT20)	17.61	17.64	17.67
	802.11n(HT40)	36.36	/	36.42
	802.11ac(HT20)	17.64	17.64	17.70
	802.11ac(HT40)	36.36	/	36.30
	802.11ac(HT80)	75.84	/	/

Test result plots shown as follows:

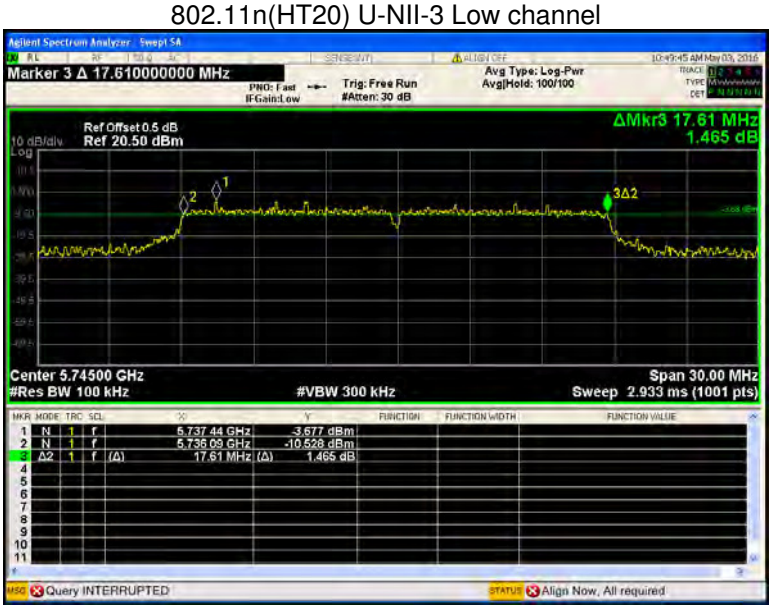
ANT0

802.11a U-NII-3 Low channel

802.11a U-NII-3 Middle channel

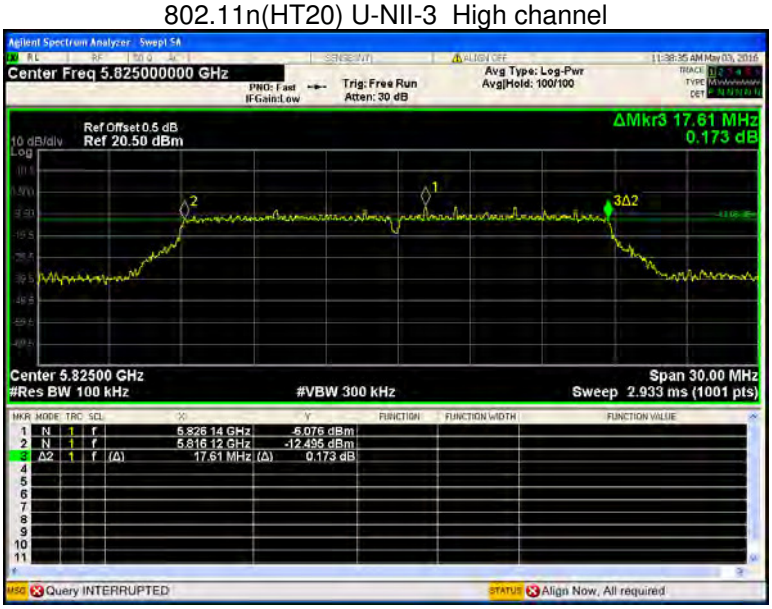
802.11a U-NII-3 High channel

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

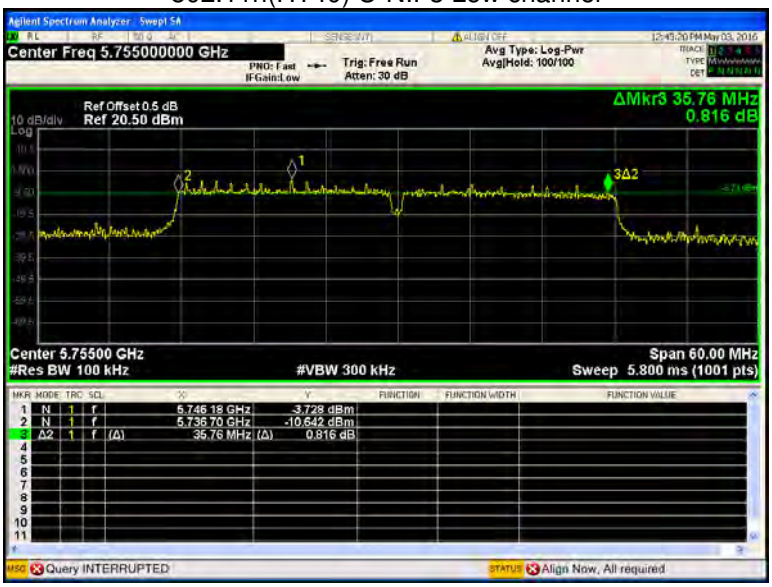


802.11n(HT20) U-NII-3 Middle channel

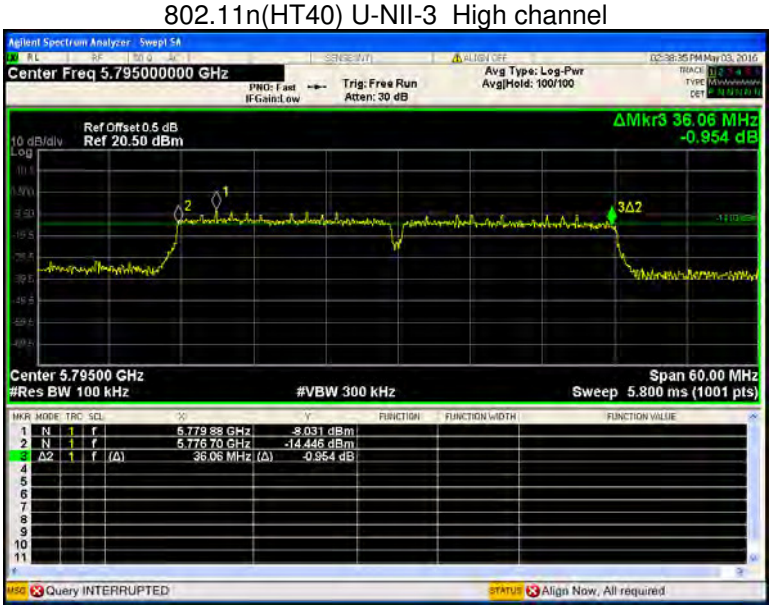
802.11n(HT20) U-NII-3 High channel



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

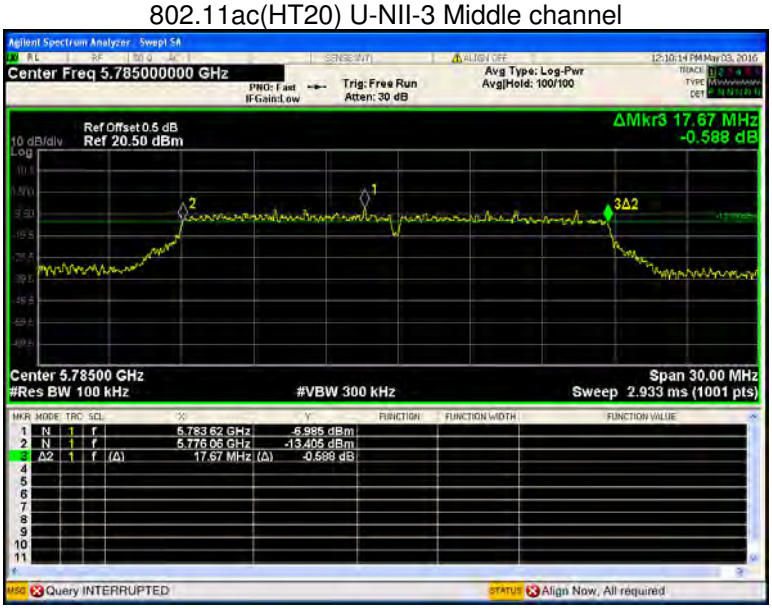


802.11n(HT40) U-NII-3 High channel



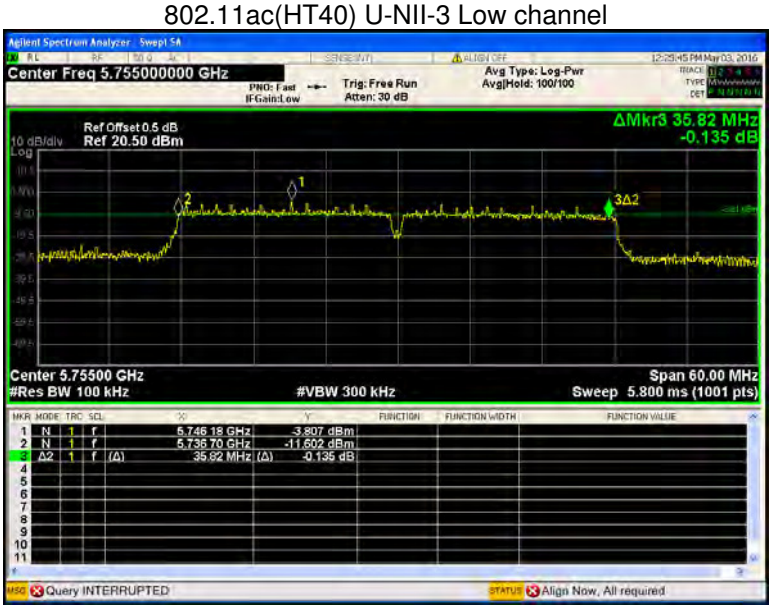
802.11ac(HT20) U-NII-3 Low channel

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



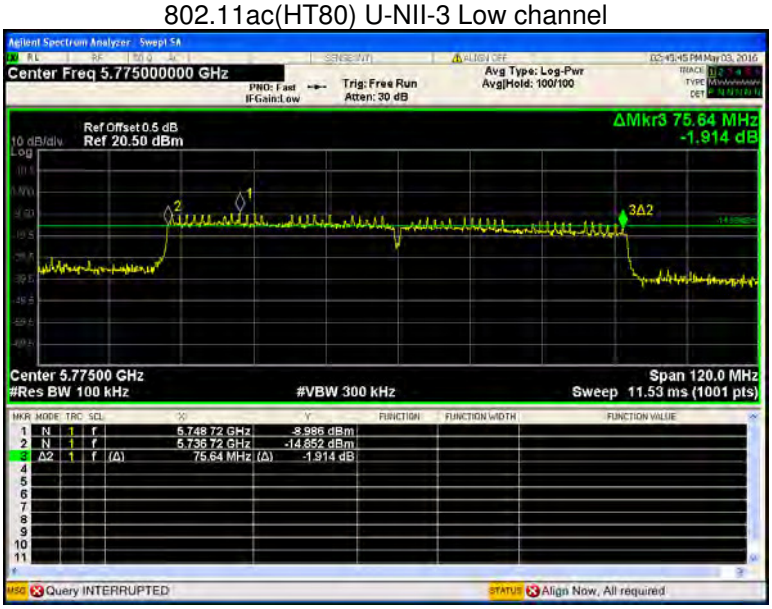
802.11ac(HT20) U-NII-3 High channel

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



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

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



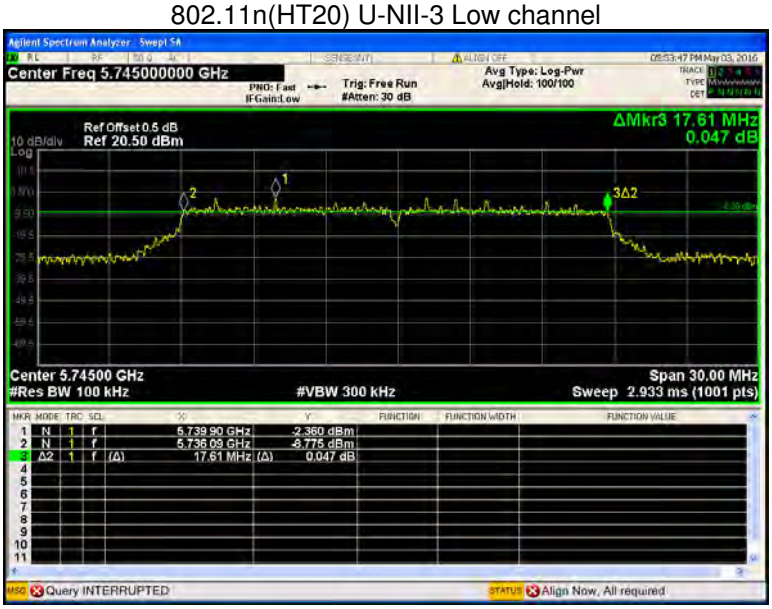
ANT1

802.11a U-NII-3 Low channel

802.11a U-NII-3 Middle channel

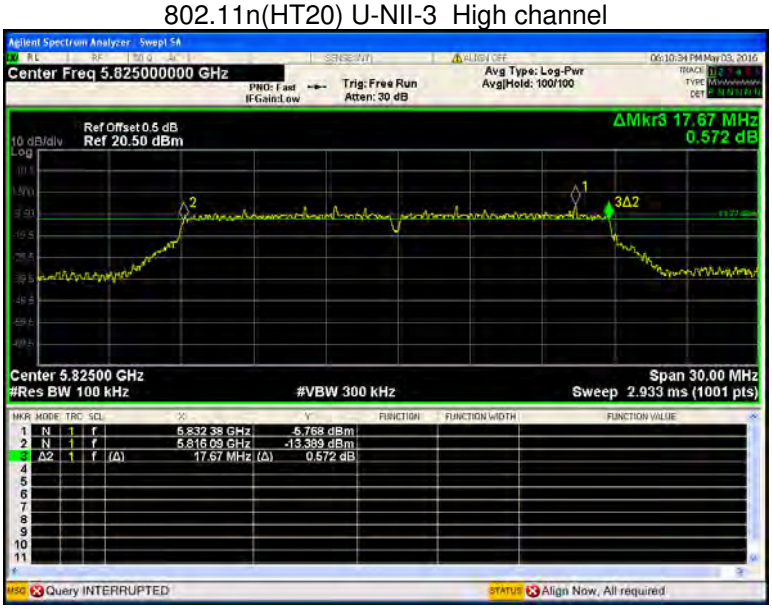
802.11a U-NII-3 High channel

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



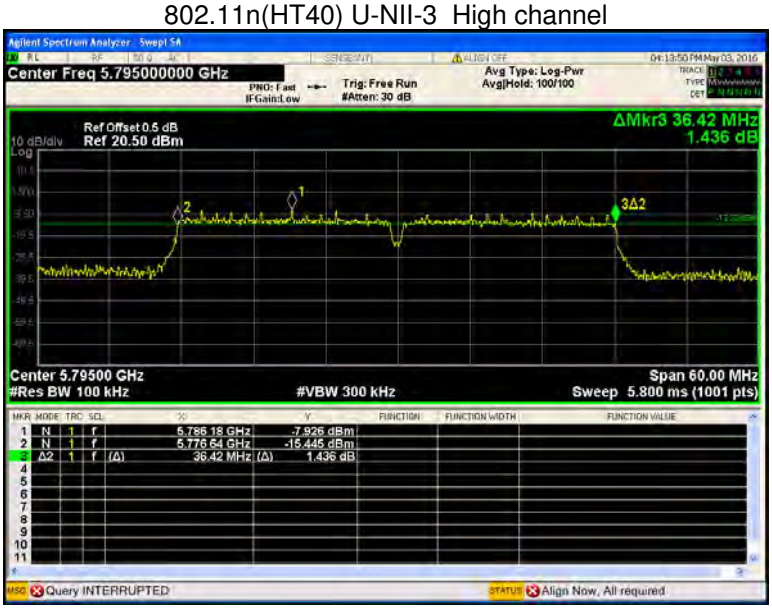
802.11n(HT20) U-NII-3 Middle channel

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



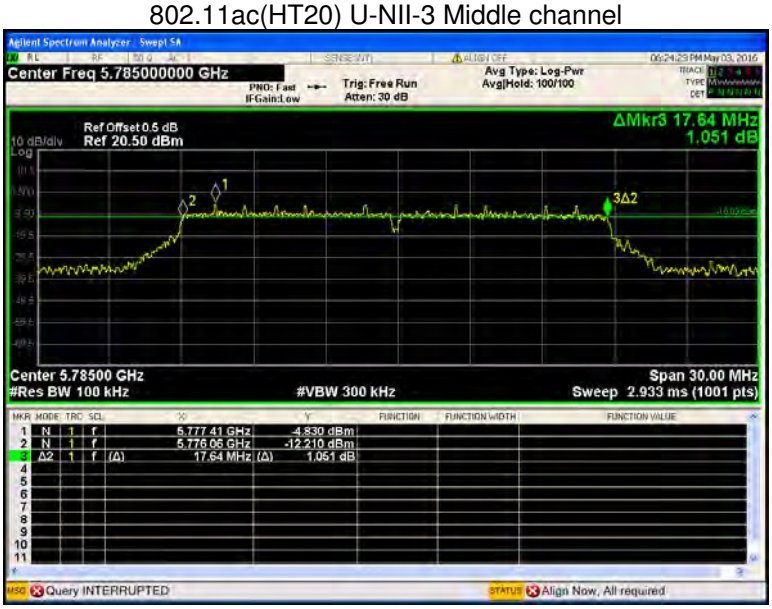
802.11n(HT40) U-NII-3 Low channel

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



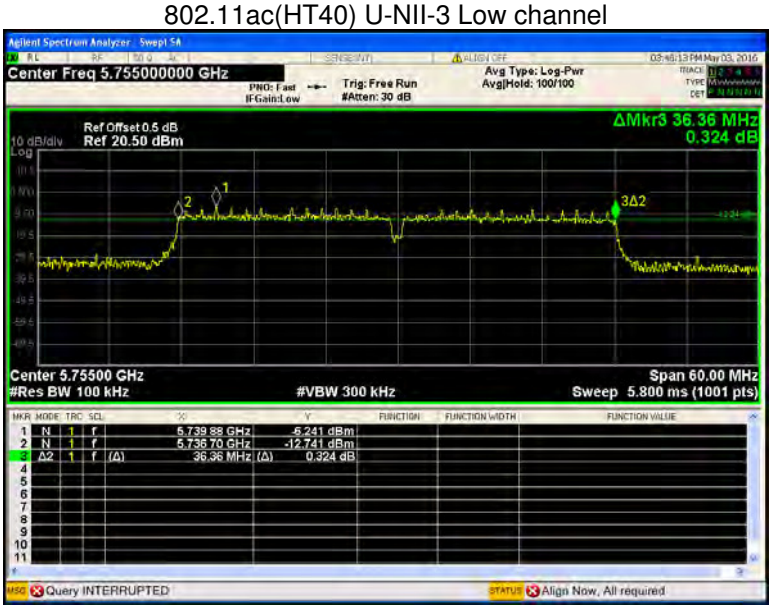
802.11ac(HT20) U-NII-3 Low channel

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



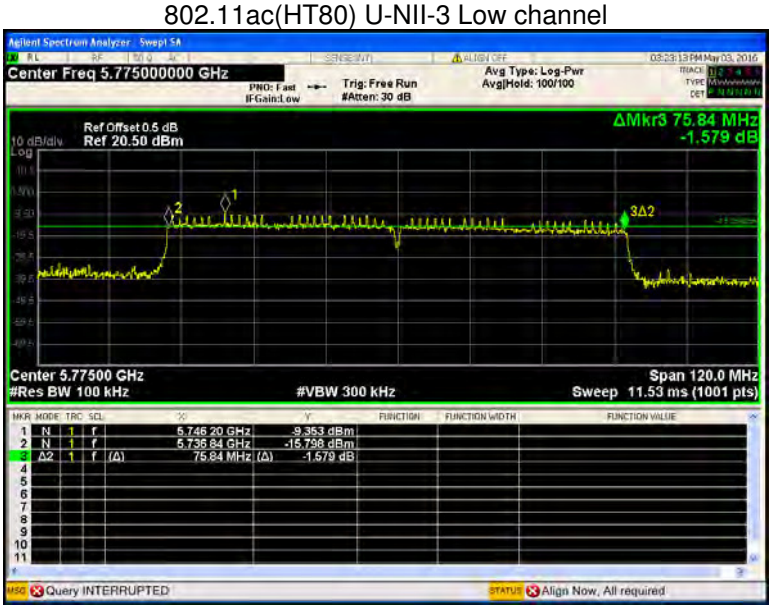
802.11ac(HT20) U-NII-3 High channel

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



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

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



11 26 dB Bandwidth and 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.407 (a)
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01 Section D
Test Limit:	No restriction limits
Test Result:	PASS

11.1 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

11.2 Test Result:

Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
ANT0 U-NII-1	802.11a	25.82	25.82	30.00	17.08	17.19	17.83
	802.11n(HT20)	29.53	29.32	29.90	18.157	18.189	18.67
	802.11n(HT40)	59.96	/	60.00	36.62	/	36.914
	802.11ac(HT20)	28.77	28.29	30.00	18.21	18.17	18.64
	802.11ac(HT40)	60.00	/	60.00	36.60	/	36.82
	802.11ac(HT80)	11.37	/	/	76.01	/	/
ANT0 U-NII-3	802.11a	30.00	26.78	21.54	18.72	17.22	16.842
	802.11n(HT20)	30.00	29.59	21.76	19.52	18.29	17.93
	802.11n(HT40)	60.00	/	59.76	37.07	/	36.63
	802.11ac(HT20)	30.00	29.57	21.55	19.31	18.22	18.01
	802.11ac(HT40)	60.00	/	59.31	36.983	/	36.67
	802.11ac(HT80)	113.60	/	/	76.30	/	/
ANT1 U-NII-1	802.11a	29.85	29.74	29.82	17.37	17.90	17.60
	802.11n(HT20)	29.41	29.63	29.90	18.29	18.35	18.68
	802.11n(HT40)	60.00	/	60.00	36.99	/	37.43
	802.11ac(HT20)	28.77	30.00	28.68	18.21	18.37	18.23
	802.11ac(HT40)	60.00	/	60.00	36.81	/	37.34
	802.11ac(HT80)	116.9	/	/	76.10	/	/
ANT1 U-NII-3	802.11a	30.00	21.53	21.49	17.93	16.90	16.88
	802.11n(HT20)	29.92	29.31	25.05	18.38	18.13	18.02
	802.11n(HT40)	59.83	/	59.75	36.95	/	36.63
	802.11ac(HT20)	29.99	25.81	21.72	18.41	18.12	17.99
	802.11ac(HT40)	60.00	/	58.57	36.69	/	36.61
	802.11ac(HT80)	106.00	/	/	76.22	/	/

Test result plots shown as follows:

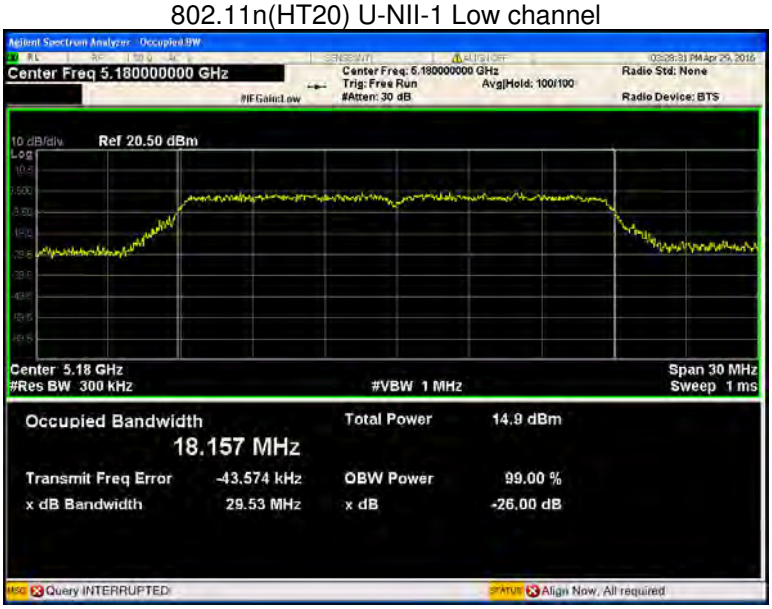
ANT0

802.11a U-NII-1 Low channel

802.11a U-NII-1 Middle channel

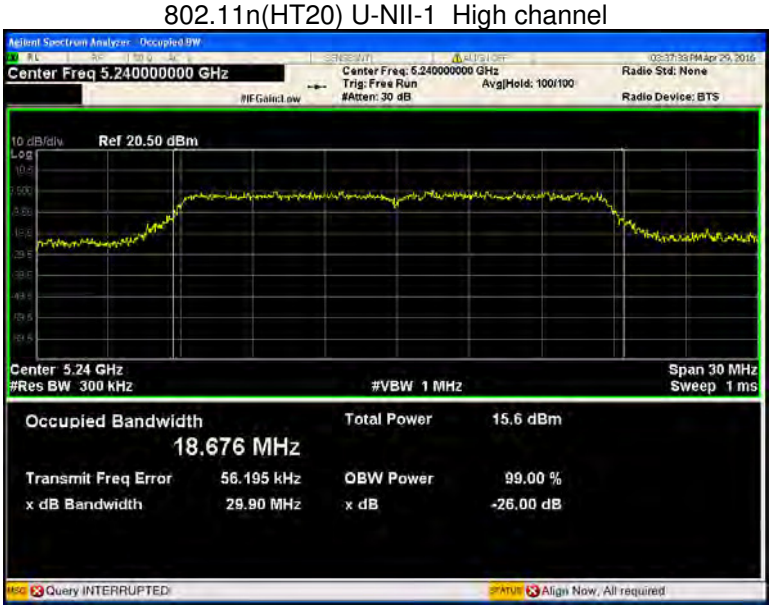
802.11a U-NII-1 High channel

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



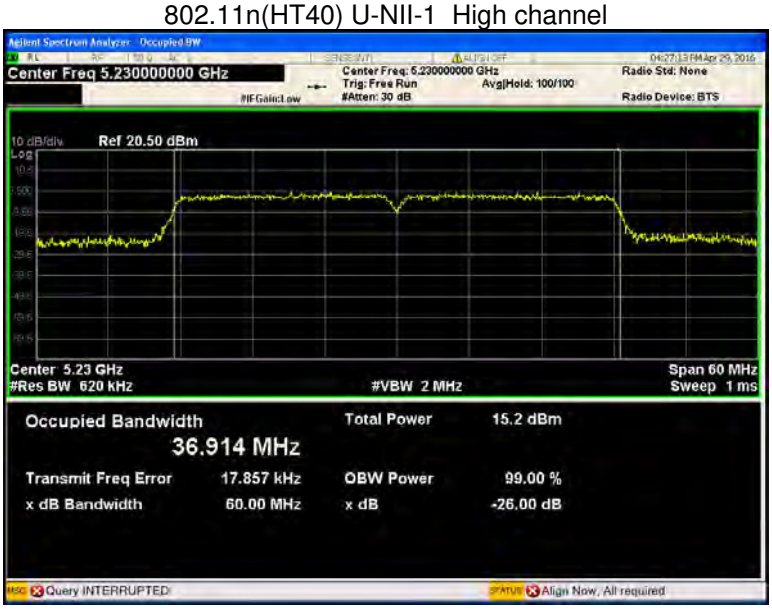
802.11n(HT20) U-NII-1 Middle channel

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



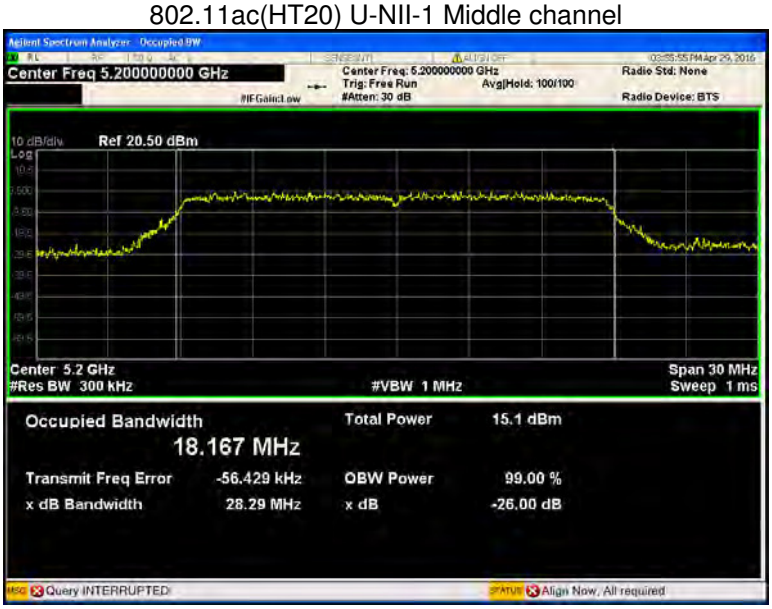
802.11n(HT40) U-NII-1 Low channel

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



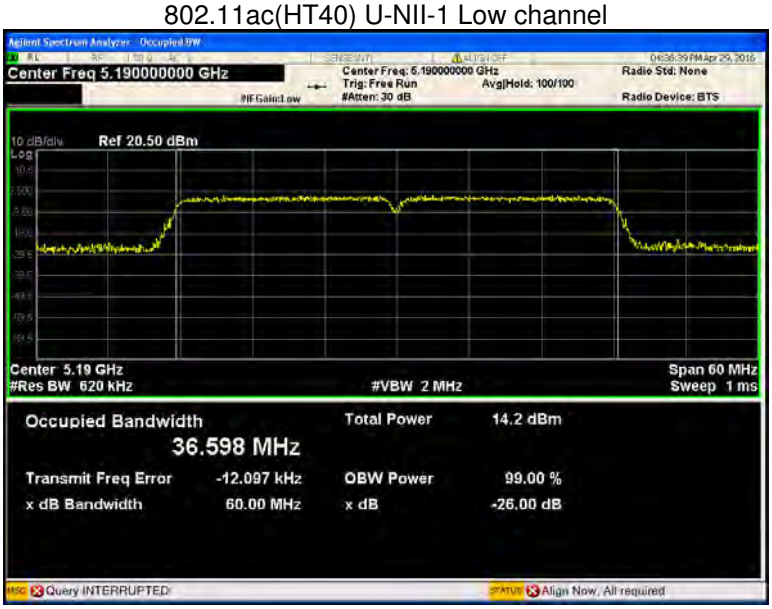
802.11ac(HT20) U-NII-1 Low channel

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



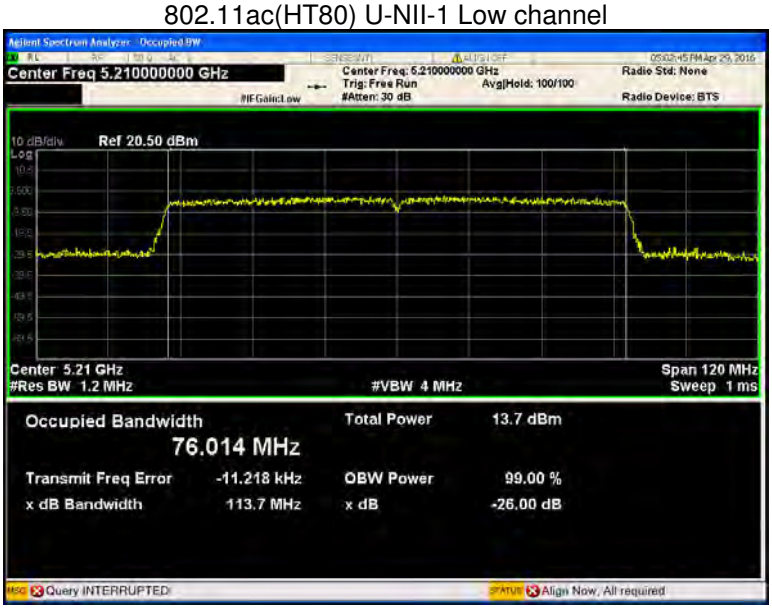
802.11ac(HT20) U-NII-1 High channel

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



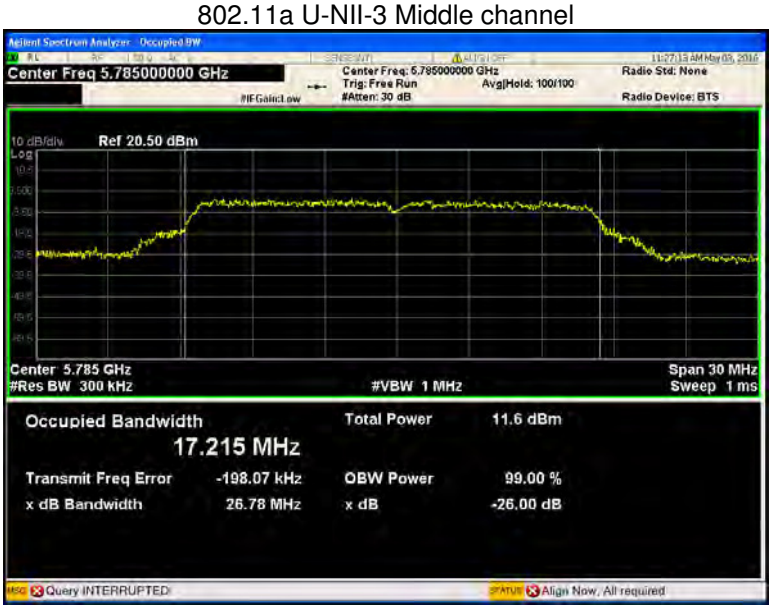
802.11n(HT40) U-NII-1 High channel

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



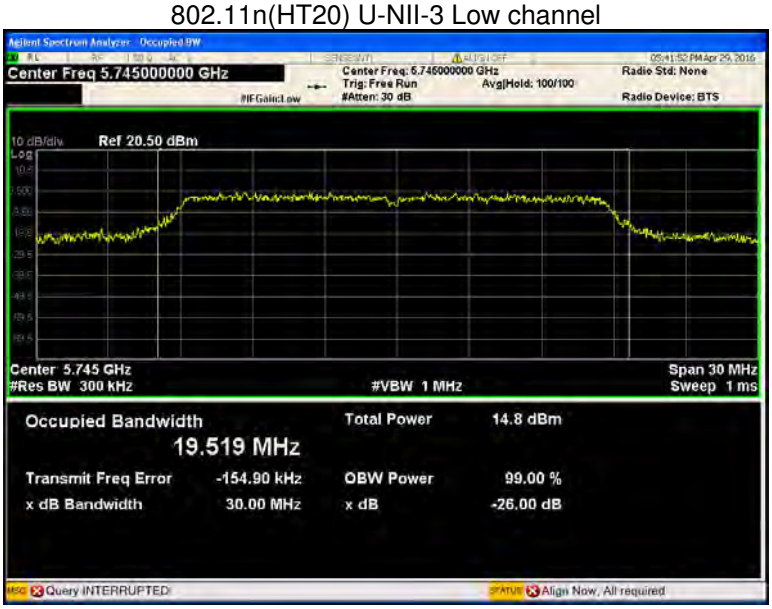
802.11a U-NII-3 Low channel

802.11a U-NII-3 Middle channel



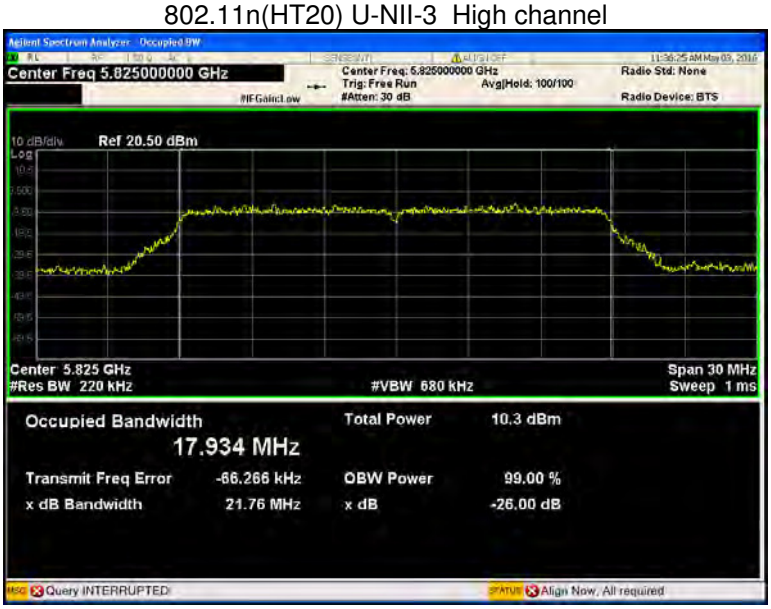
802.11a U-NII-3 High channel

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



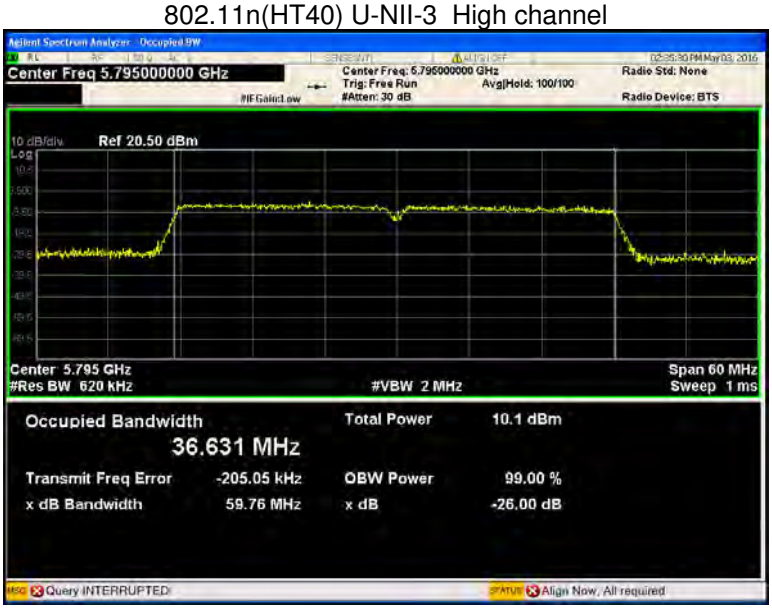
802.11n(HT20) U-NII-3 Middle channel

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



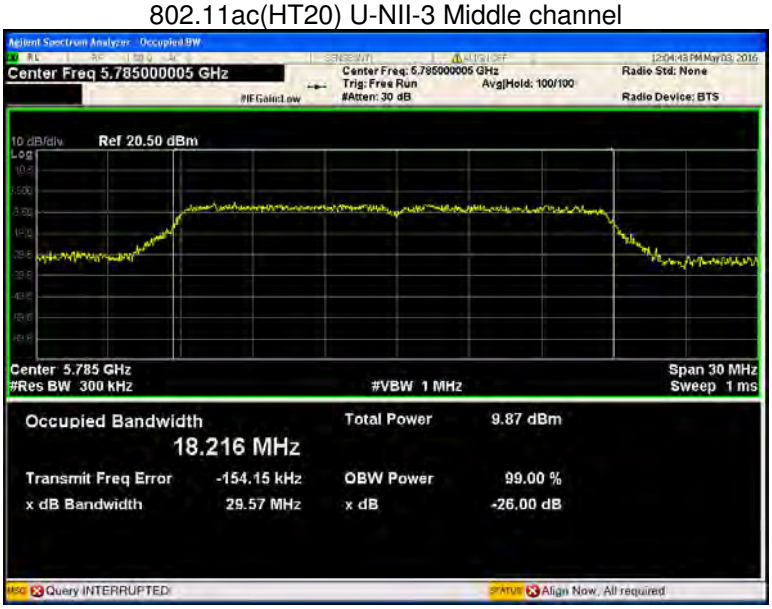
802.11n(HT40) U-NII-3 Low channel

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



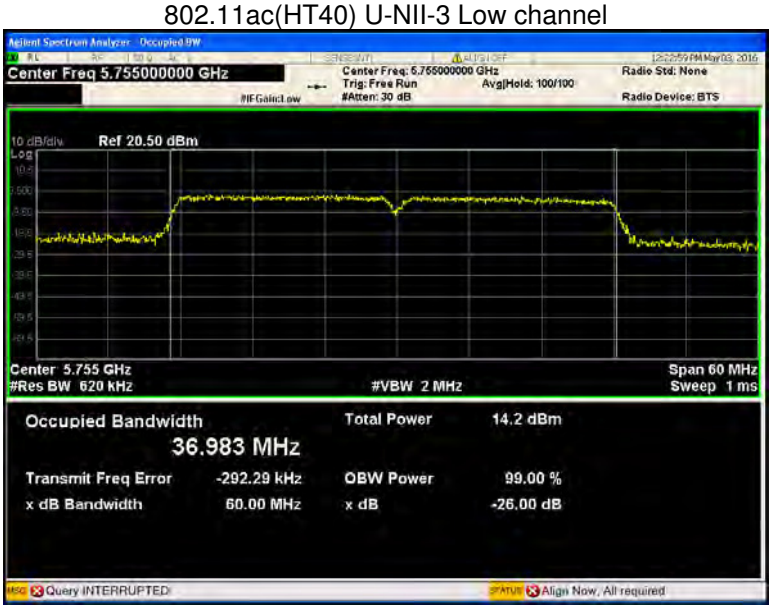
802.11ac(HT20) U-NII-3 Low channel

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



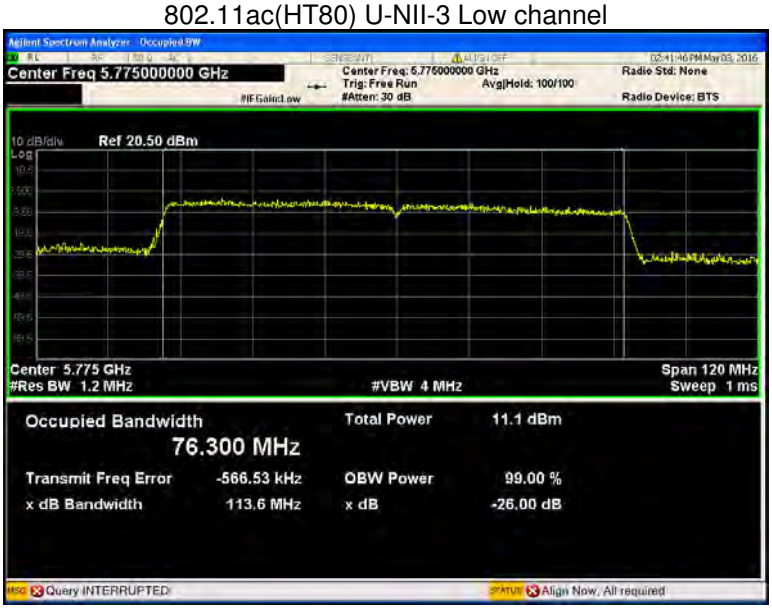
802.11ac(HT20) U-NII-3 High channel

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



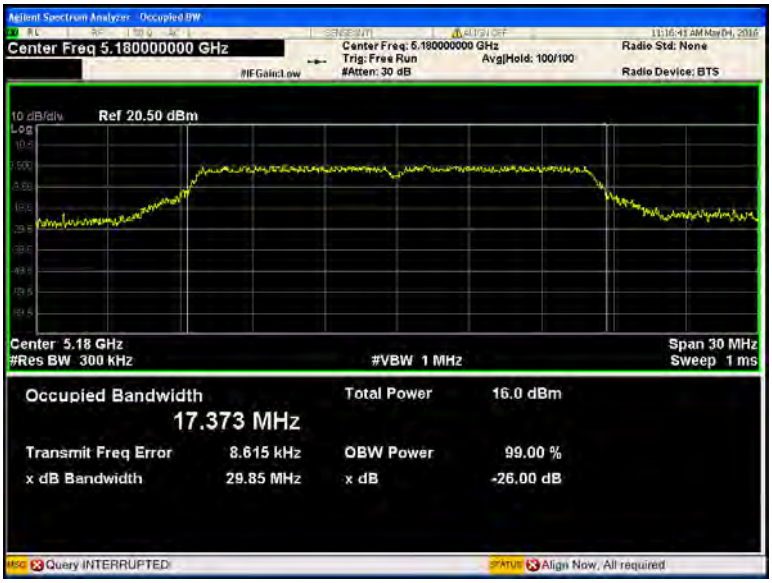
802.11n(HT40) U-NII-3 High channel

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

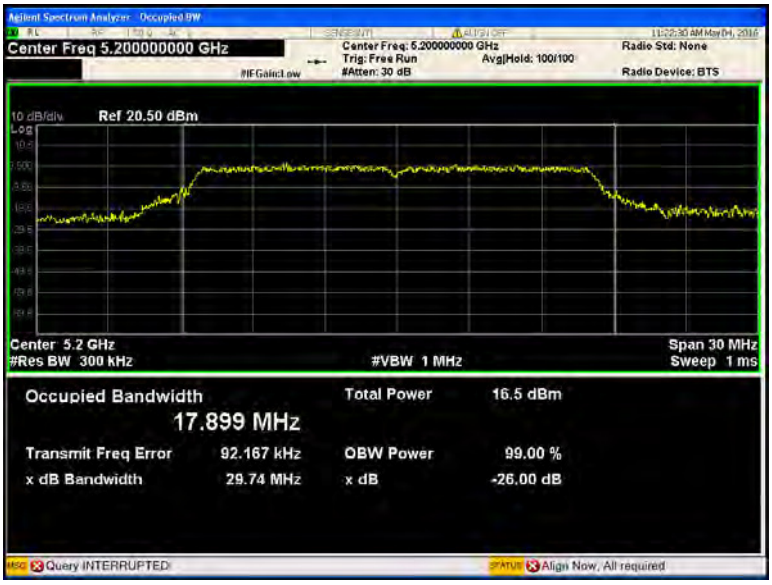


ANT1

802.11a U-NII-1 Low channel

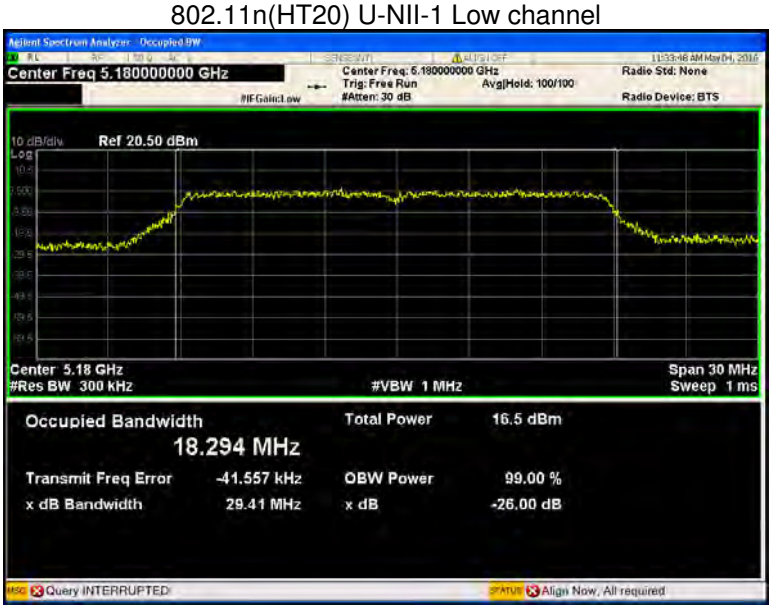


802.11a U-NII-1 Middle channel



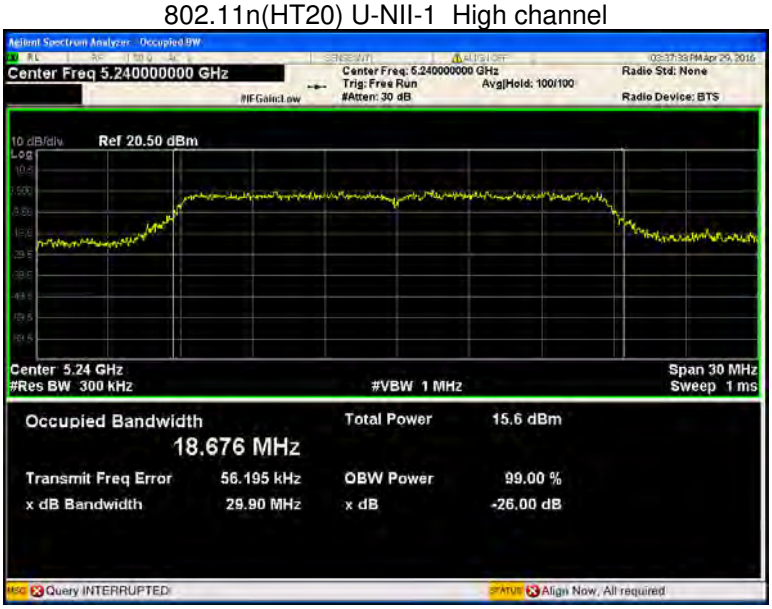
802.11a U-NII-1 High channel

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



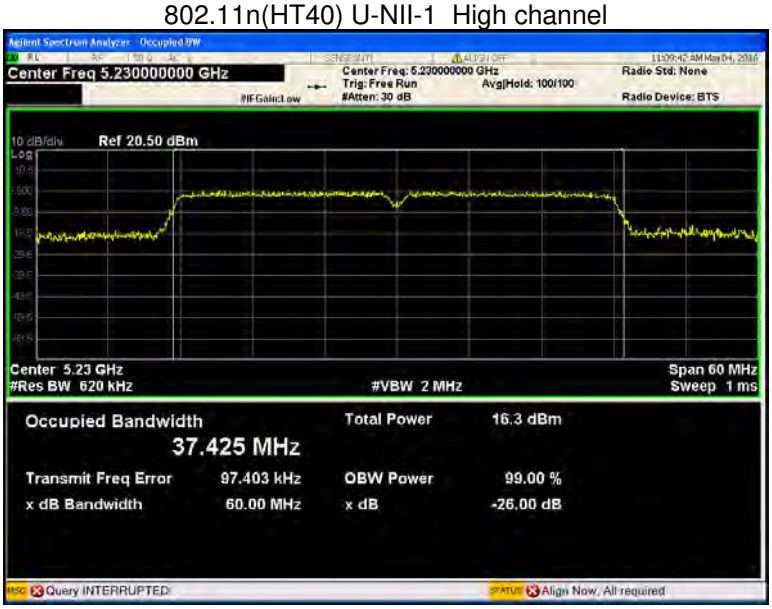
802.11n(HT20) U-NII-1 Middle channel

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



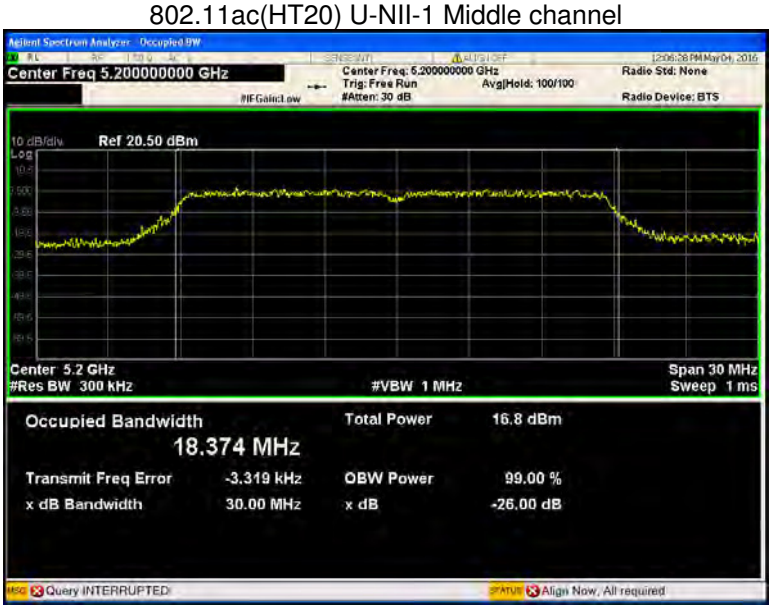
802.11n(HT40) U-NII-1 Low channel

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



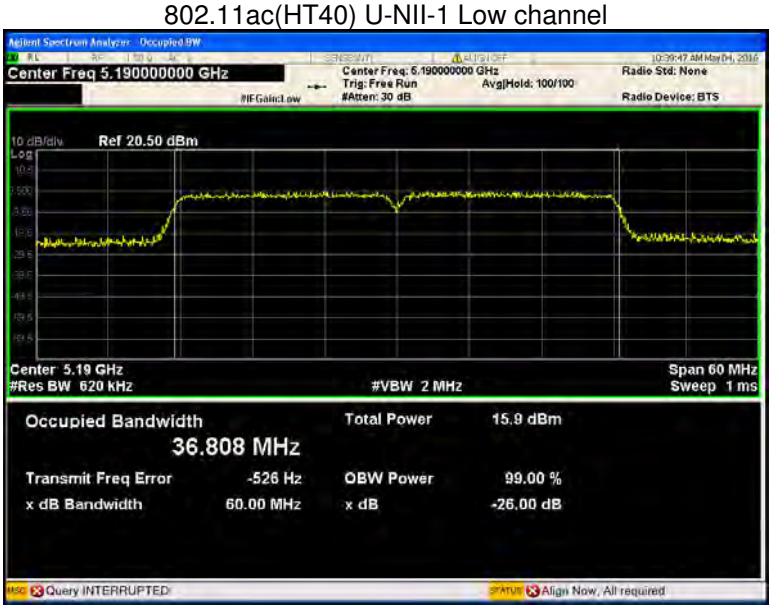
802.11ac(HT20) U-NII-1 Low channel

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



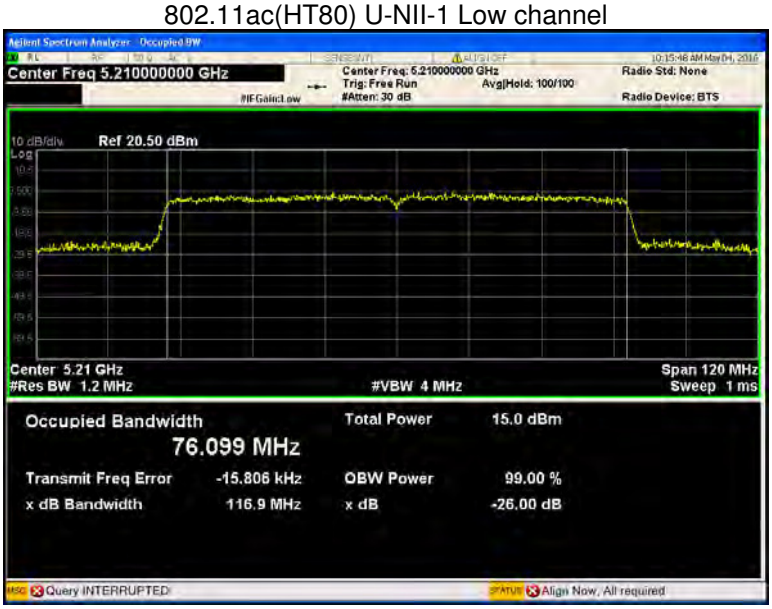
802.11ac(HT20) U-NII-1 High channel

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



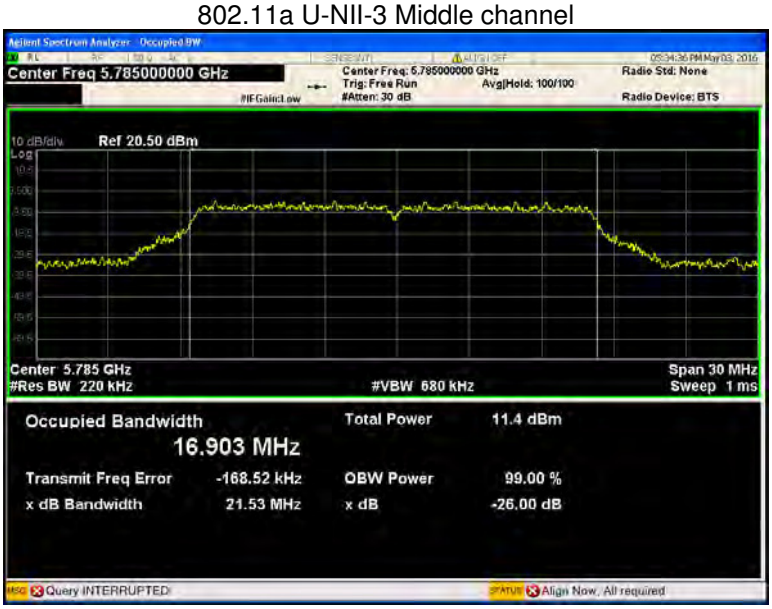
802.11n(HT40) U-NII-1 High channel

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



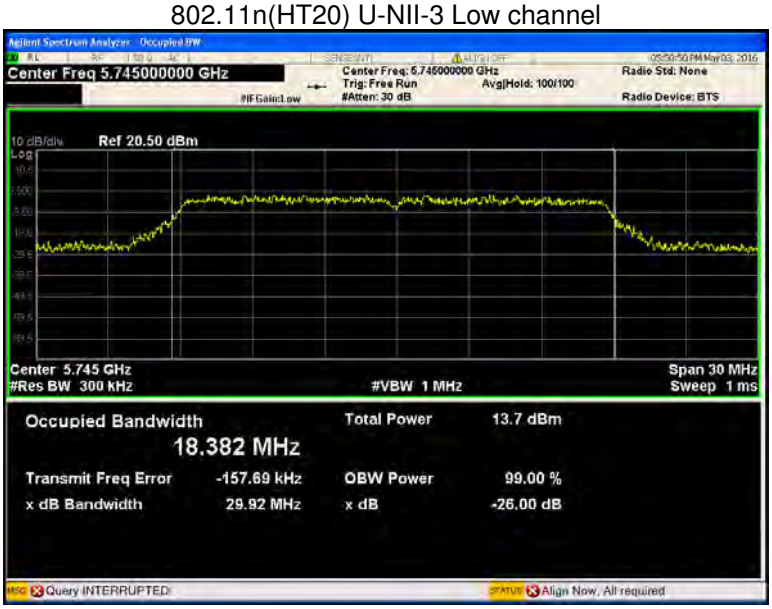
802.11a U-NII-3 Low channel

802.11a U-NII-3 Middle channel



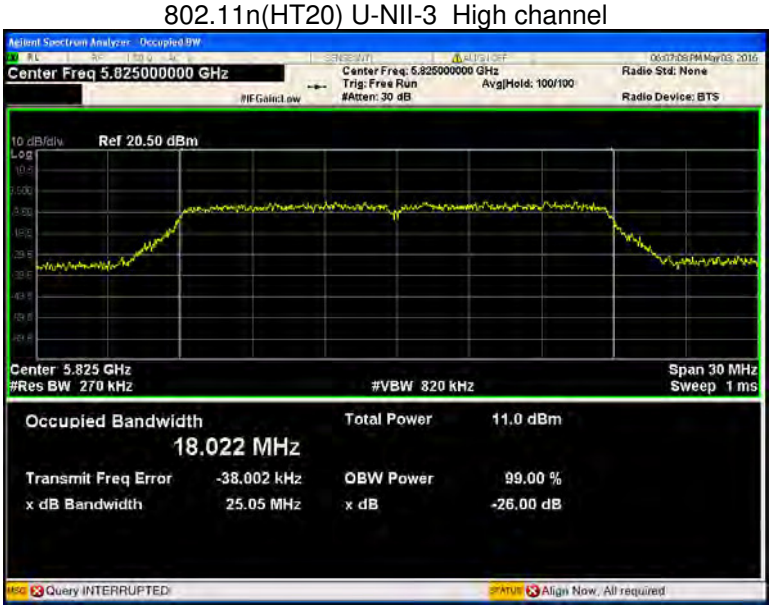
802.11a U-NII-3 High channel

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



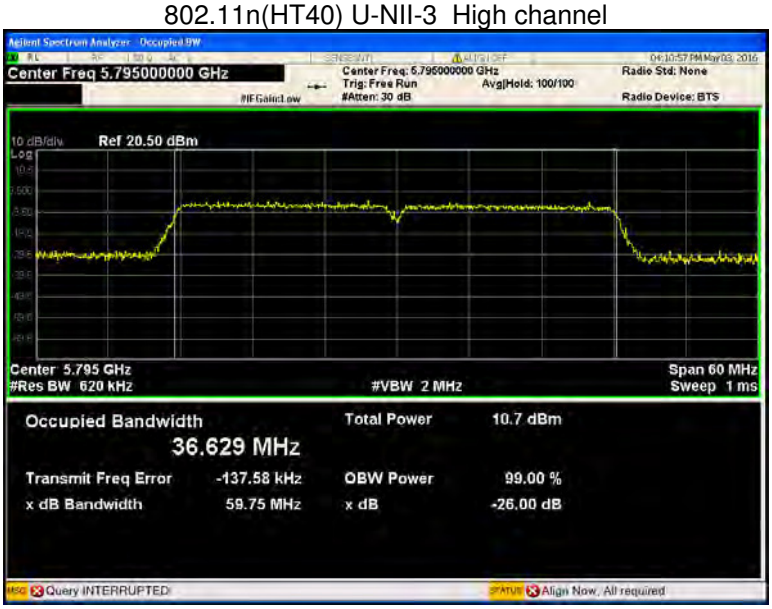
802.11n(HT20) U-NII-3 Middle channel

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



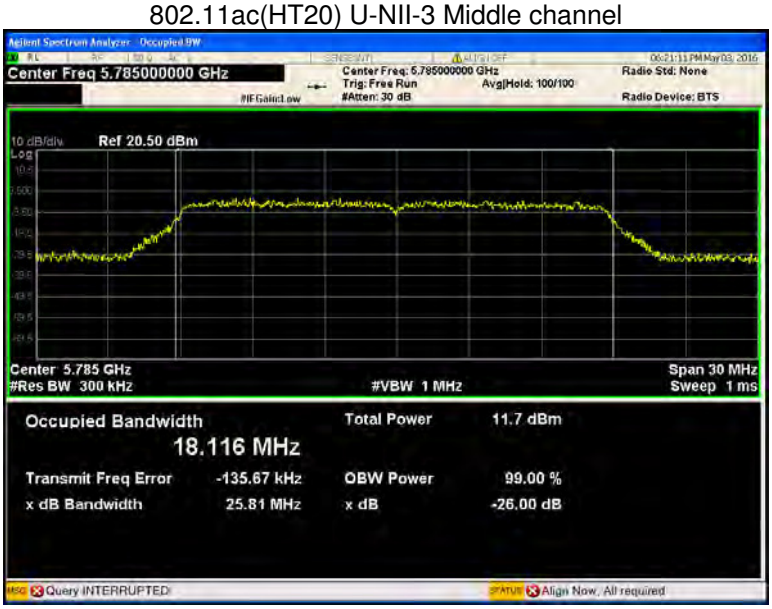
802.11n(HT40) U-NII-3 Low channel

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



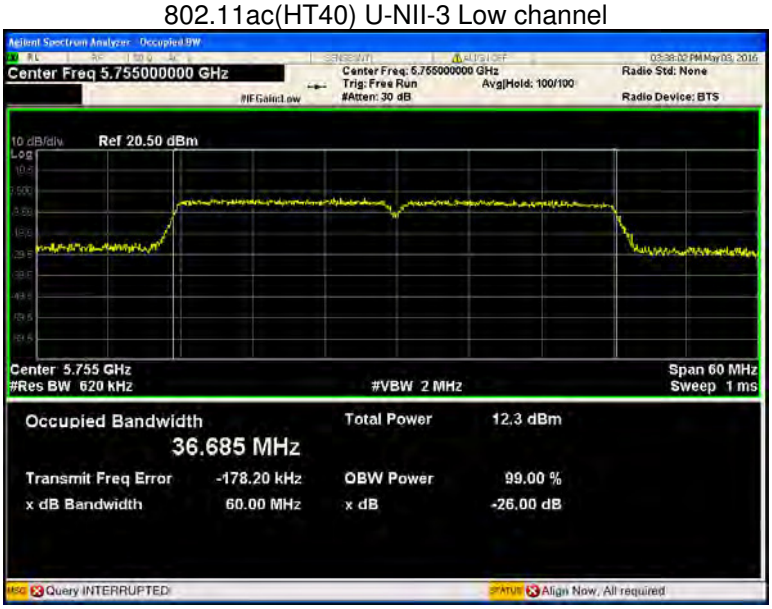
802.11ac(HT20) U-NII-3 Low channel

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



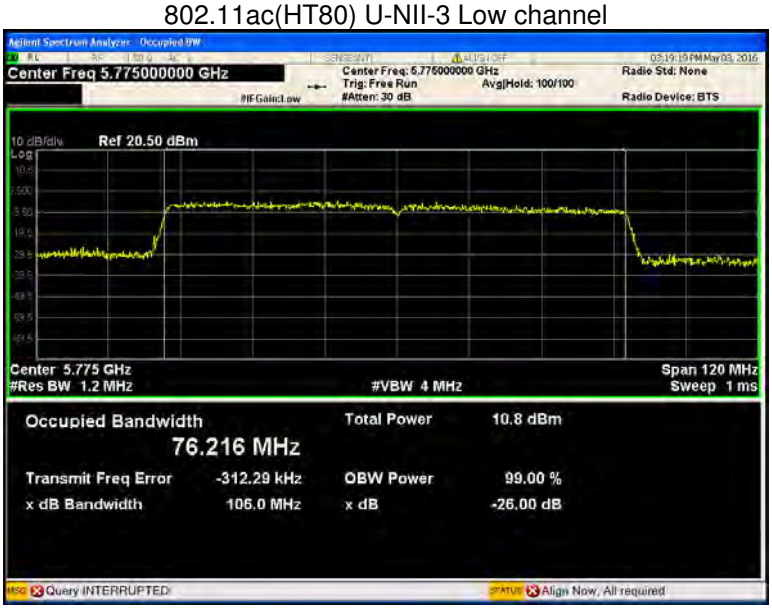
802.11ac(HT20) U-NII-3 High channel

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



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

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



12 Conducted Output Power

Test Requirement:	FCC CFR47 Part 15 Section 15.407(a)
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01 Section E
Test Limit:	U-NII-1 250mW(24dBm) U-NII-3 1W(30dBm)
Test Result:	PASS
Remark:	Conducted output power= measurement power+10log(1/x) X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power

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 = 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.

12.2 Test Result :

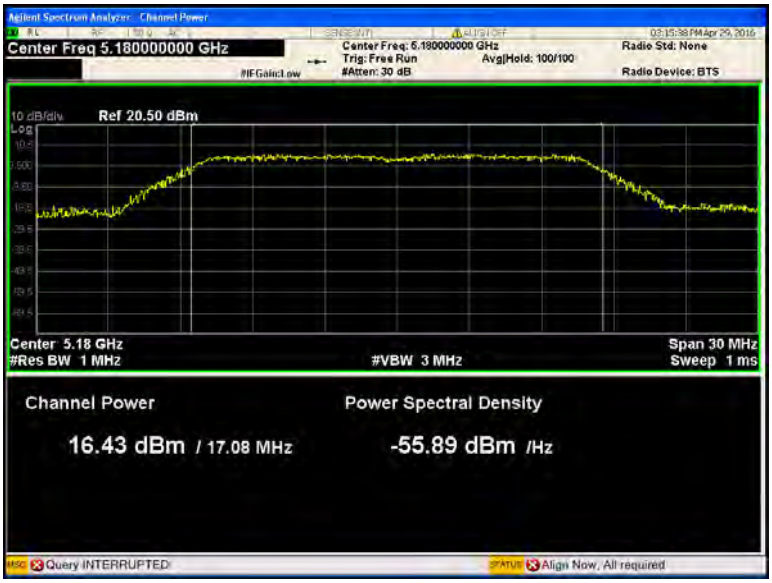
Band	Operation mode	CH	Conducted Output Power (dBm)		
			ANT0	ANT1	Total
U-NII-1	802.11a	Low	16.43	15.20	18.87
		Middle	16.75	15.59	19.22
		High	17.15	15.02	19.22
	802.11n(HT20)	Low	16.74	15.47	19.16
		Middle	16.88	15.82	19.39
		High	17.42	17.42	**20.43**
	802.11n(HT40)	Low	16.82	15.67	19.29
		Middle	/	/	/
		High	17.40	15.85	19.70
	802.11ac(HT20)	Low	16.80	16.80	19.81
		Middle	16.97	15.76	19.42
		High	17.42	14.90	19.35
	802.11ac(HT40)	Low	16.87	15.49	19.24
		Middle	/	/	/
		High	17.32	15.89	19.67
	802.11ac(HT80)	Low	16.49	15.00	18.82
		Middle	/	/	/
		High	/	/	/
U-NII-3	802.11a	Low	16.21	15.85	19.04
		Middle	16.35	15.88	19.13
		High	16.09	15.68	18.90
	802.11n(HT20)	Low	16.01	16.11	19.07
		Middle	15.88	15.77	18.84
		High	15.91	15.59	18.76
	802.11n(HT40)	Low	16.12	16.52	**19.33**
		Middle	/	/	/
		High	15.70	15.51	18.62
	802.11ac(HT20)	Low	16.27	15.56	18.94
		Middle	16.01	15.61	18.82
		High	15.91	15.62	18.78
	802.11ac(HT40)	Low	16.15	16.03	19.10
		Middle	/	/	/
		High	16.00	15.80	18.91
	802.11ac(HT80)	Low	16.67	15.79	19.26
		Middle	/	/	/
		High	/	/	/

* All transmit signals are completely uncorrelated with each other, Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

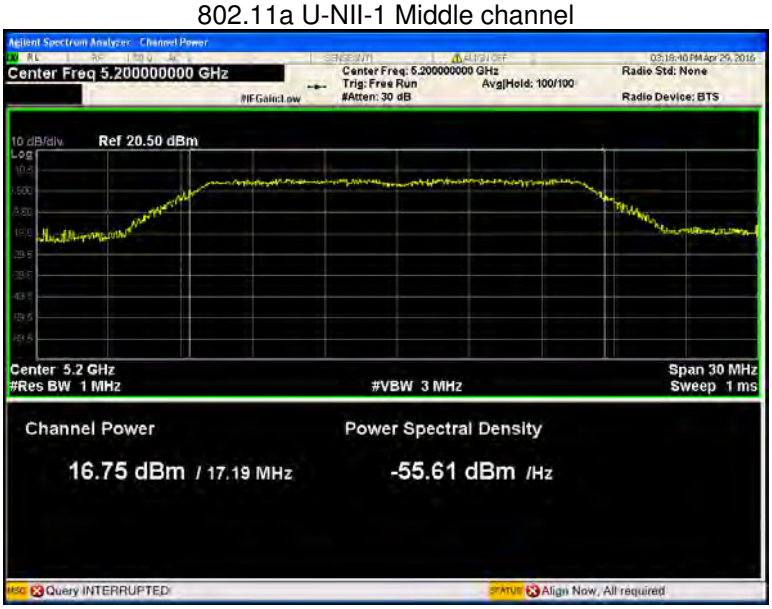
Test result plots shown as follows:

ANT0

802.11a U-NII-1 Low channel

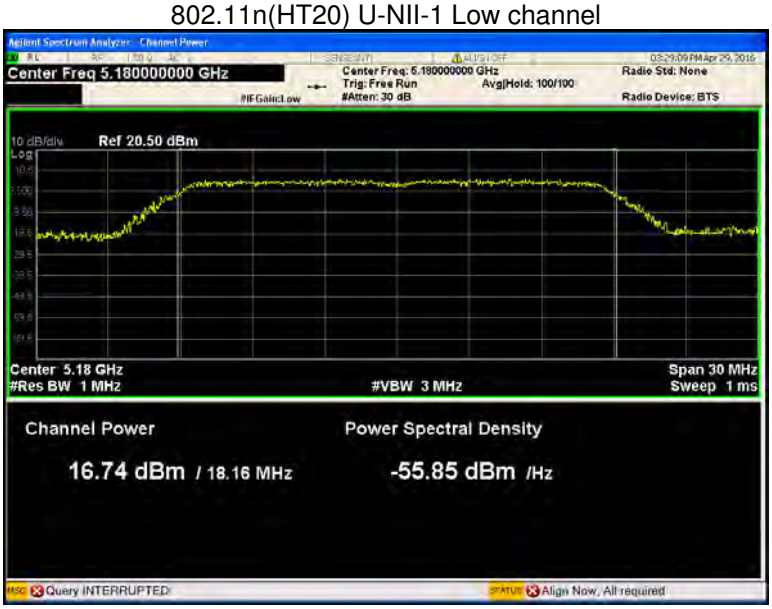


802.11a U-NII-1 Middle channel



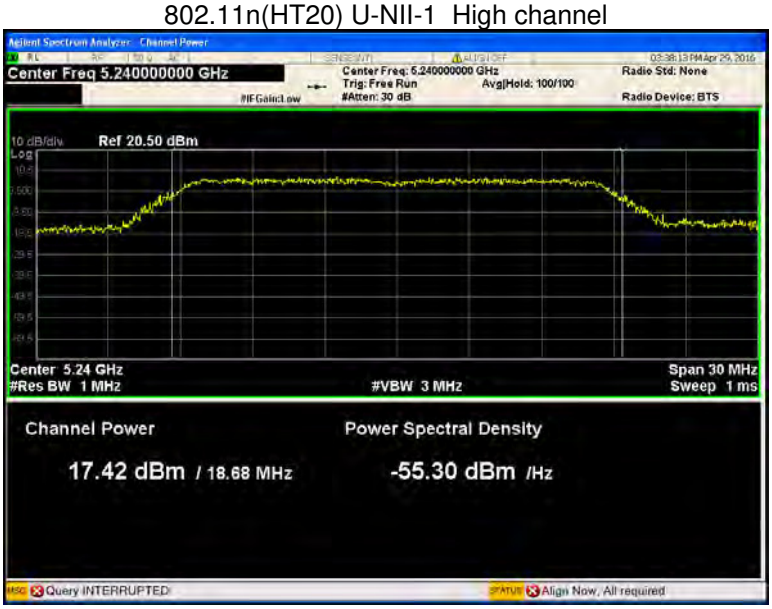
802.11a U-NII-1 High channel

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

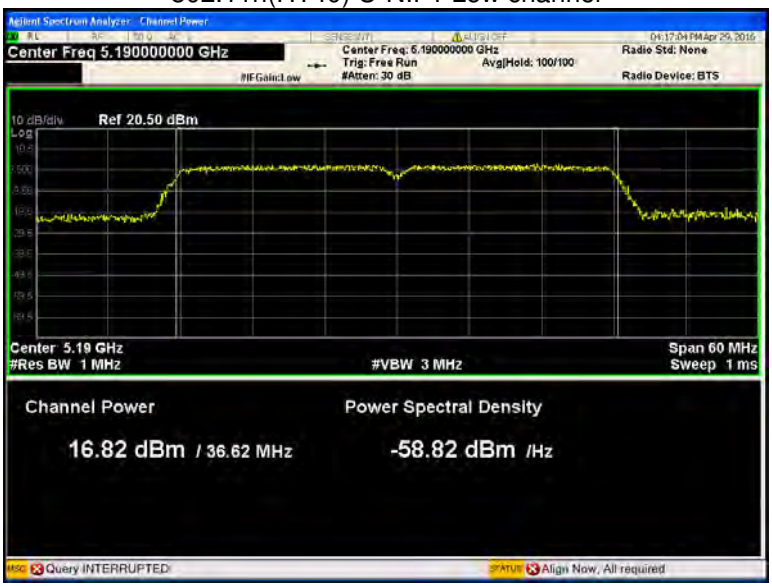


802.11n(HT20) U-NII-1 Middle channel

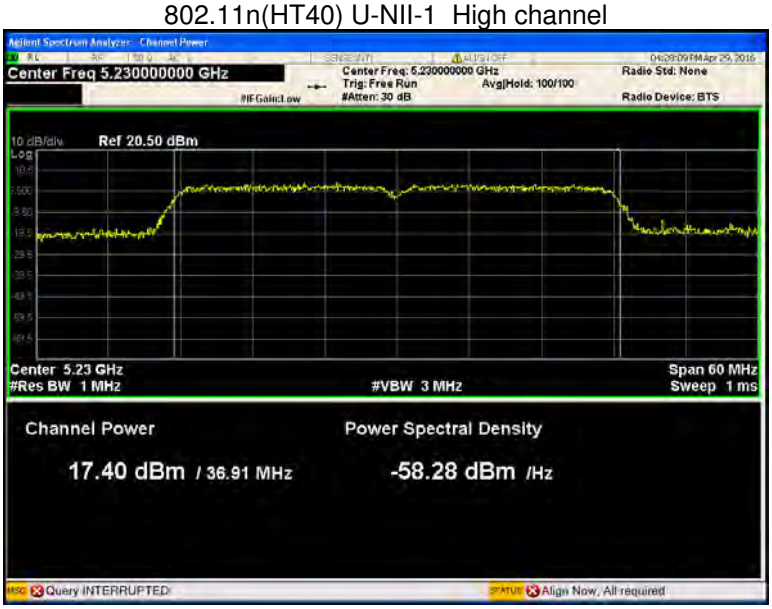
802.11n(HT20) U-NII-1 High channel



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

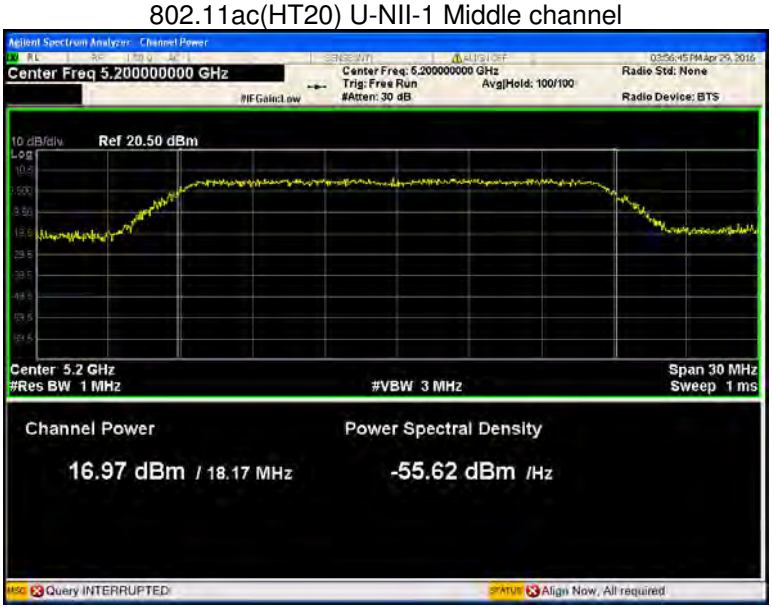


802.11n(HT40) U-NII-1 High channel



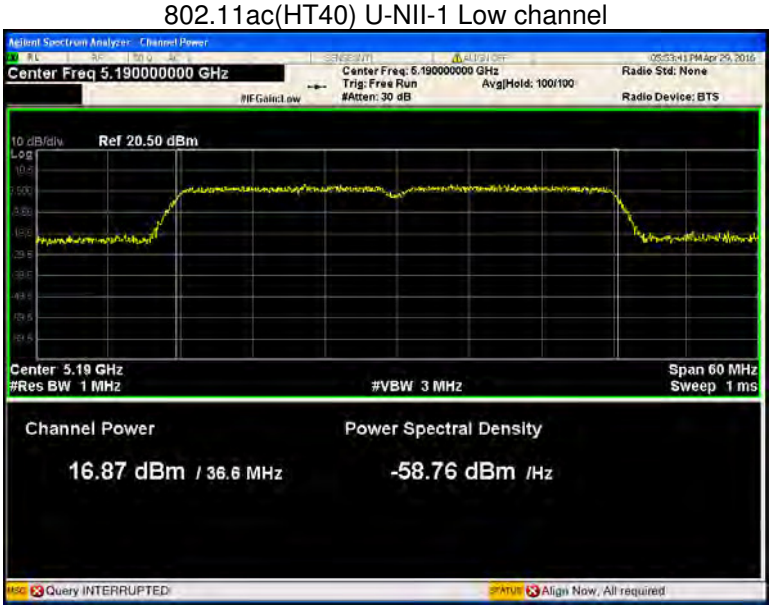
802.11ac(HT20) U-NII-1 Low channel

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



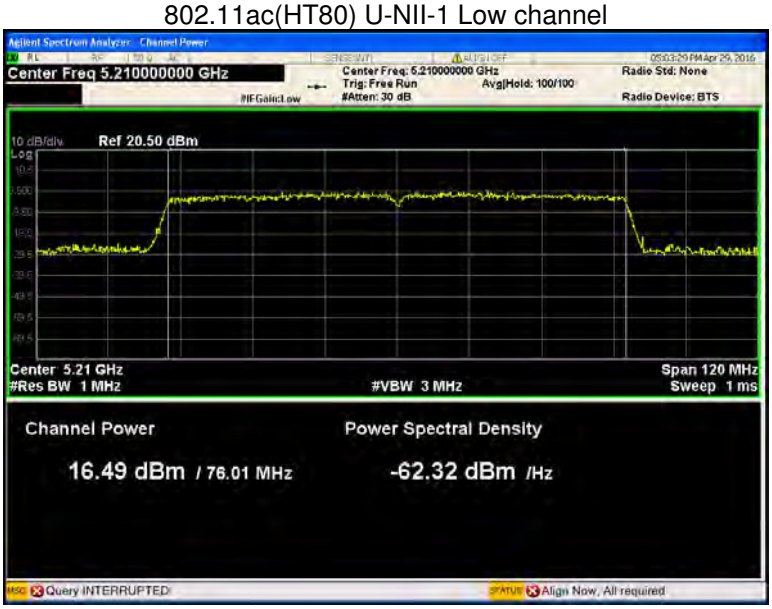
802.11ac(HT20) U-NII-1 High channel

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

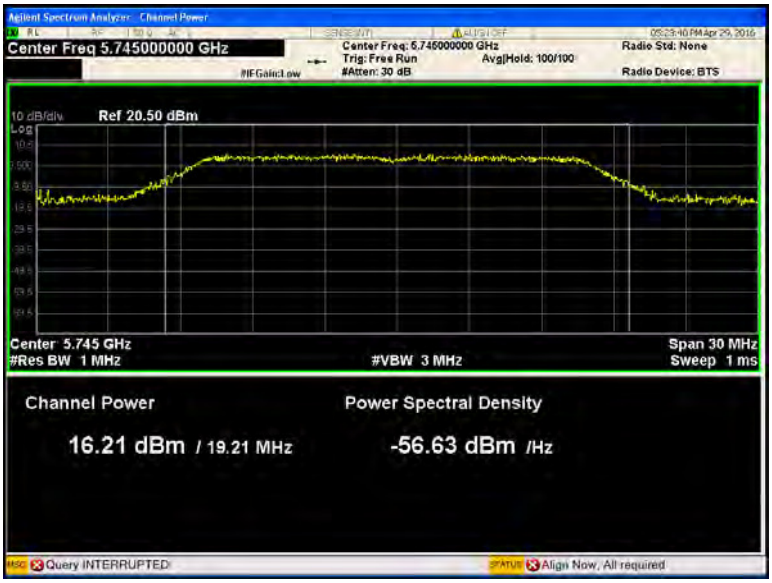


802.11n(HT40) U-NII-1 High channel

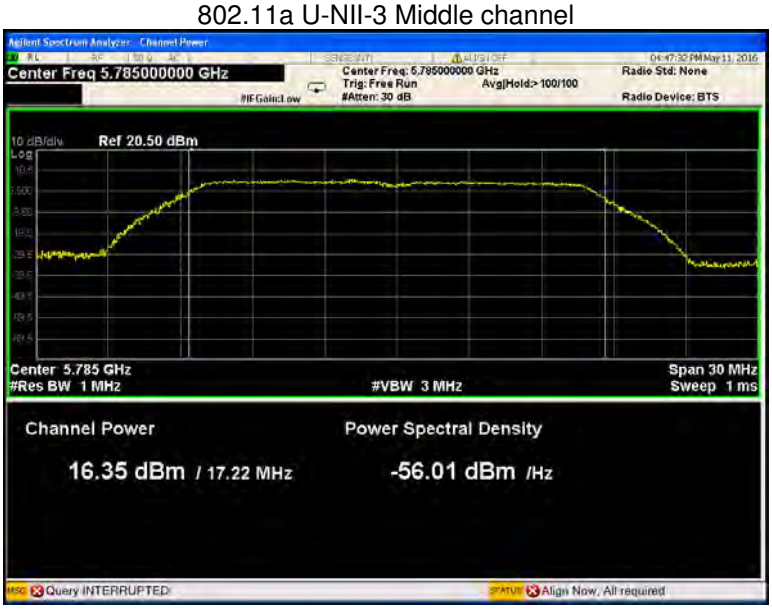
802.11ac(HT80) U-NII-1 Low channel



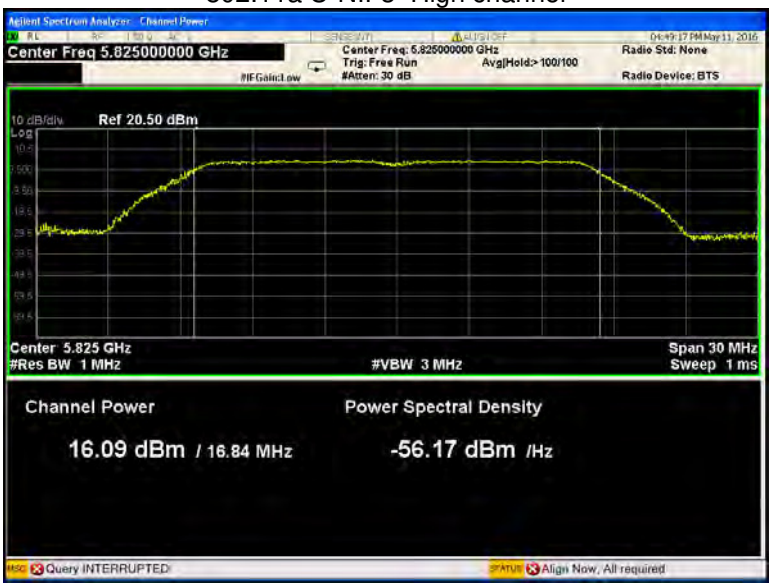
802.11a U-NII-3 Low channel



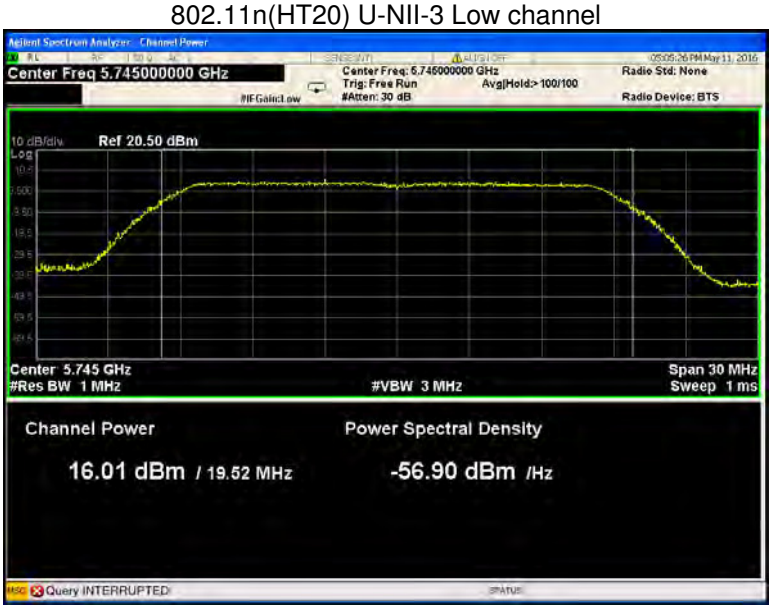
802.11a U-NII-3 Middle channel



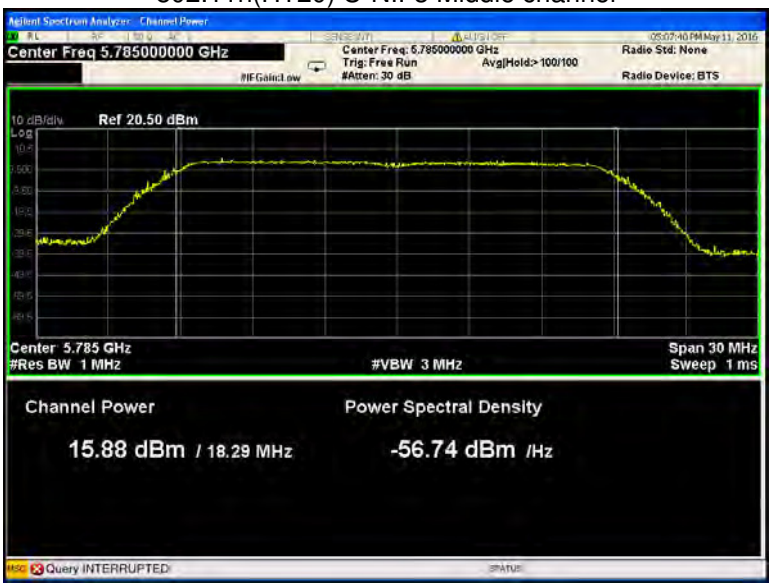
802.11a U-NII-3 High channel



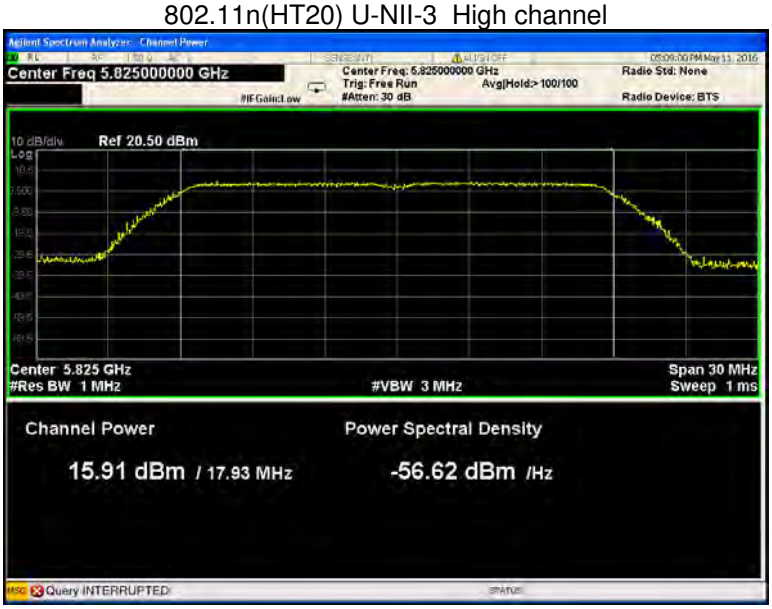
802.11n(HT20) U-NII-3 Low channel



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

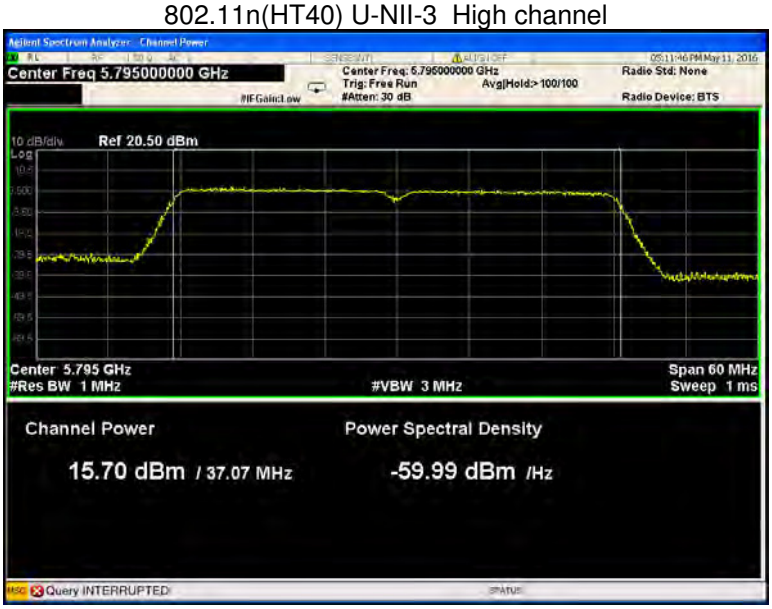


802.11n(HT20) U-NII-3 High channel

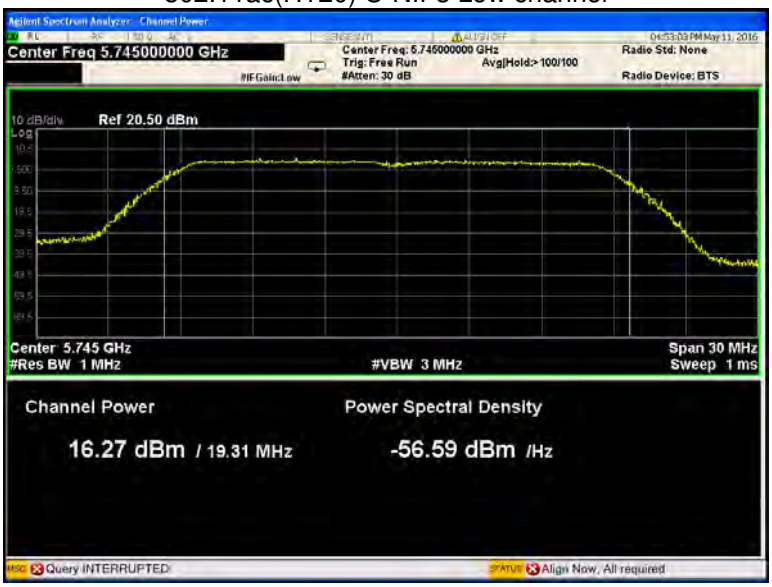


802.11n(HT40) U-NII-3 Low channel

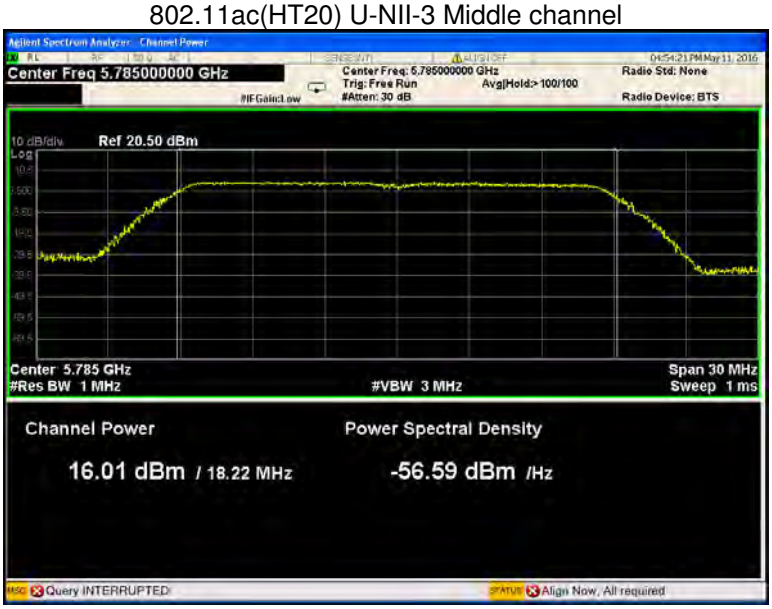
802.11n(HT40) U-NII-3 High channel



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

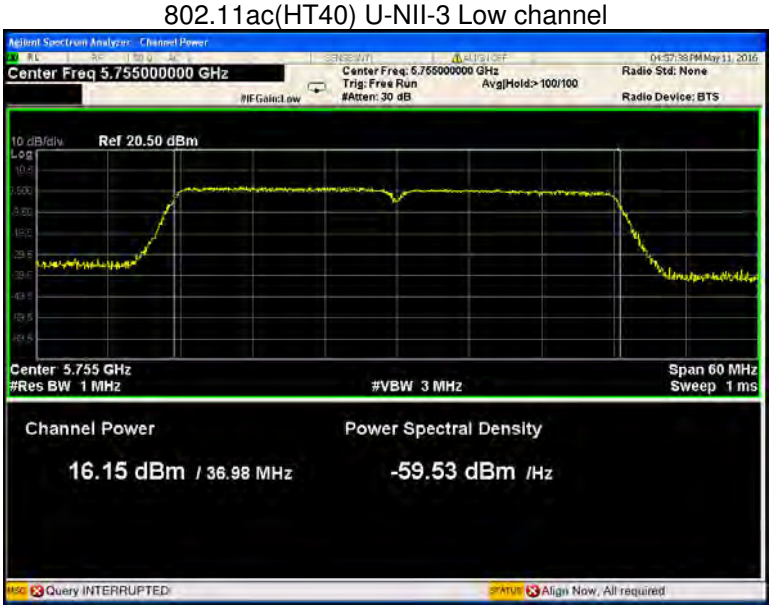


802.11ac(HT20) U-NII-3 Middle channel



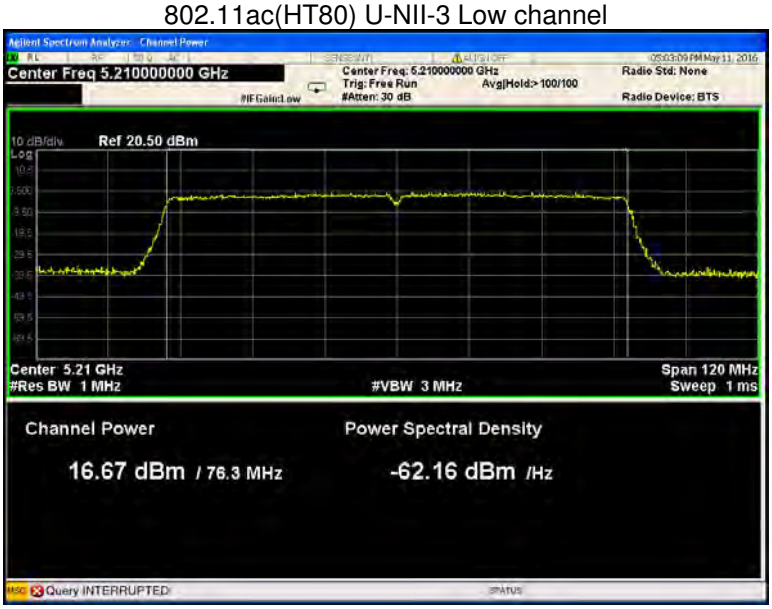
802.11ac(HT20) U-NII-3 High channel

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



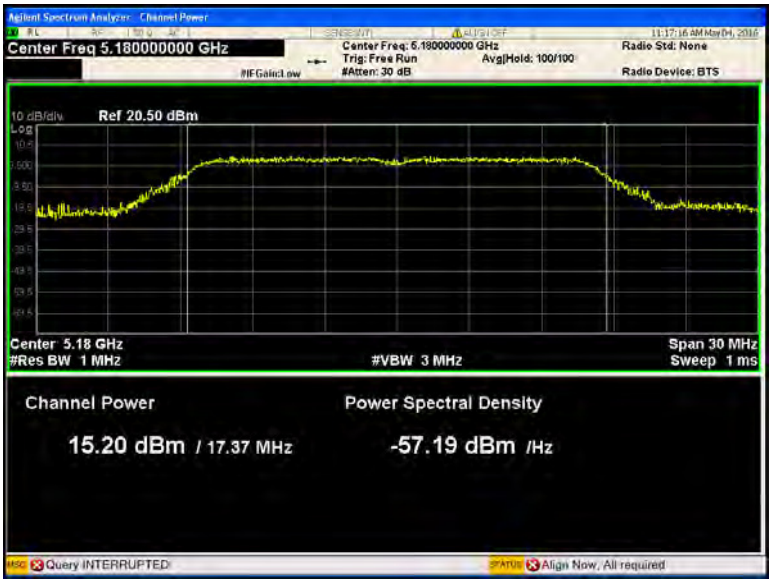
802.11n(HT40) U-NII-3 High channel

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

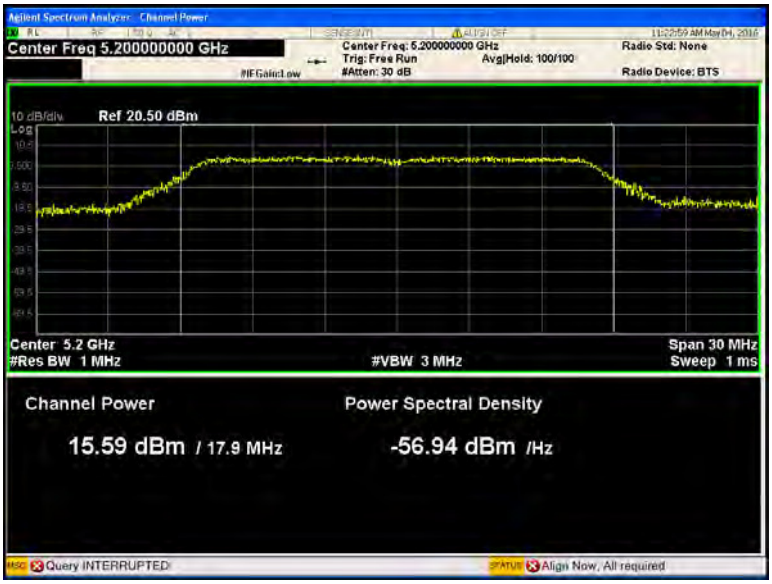


ANT1

802.11a U-NII-1 Low channel

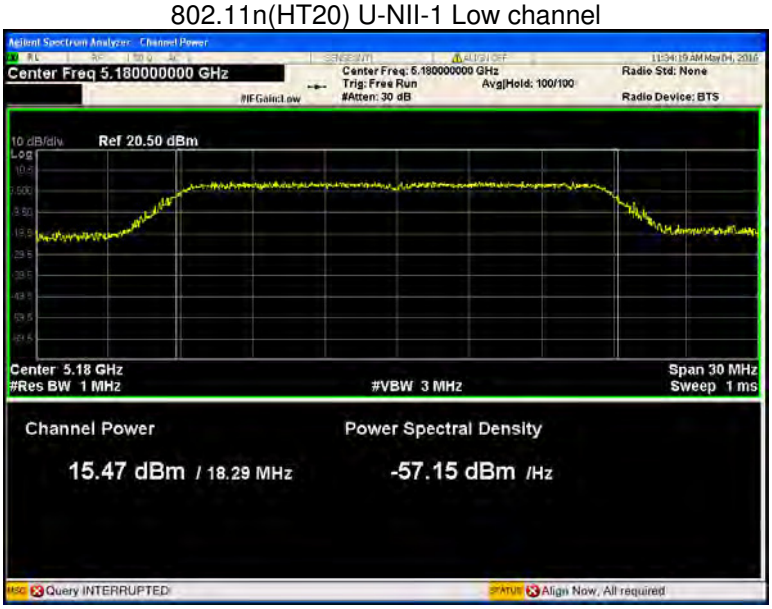


802.11a U-NII-1 Middle channel

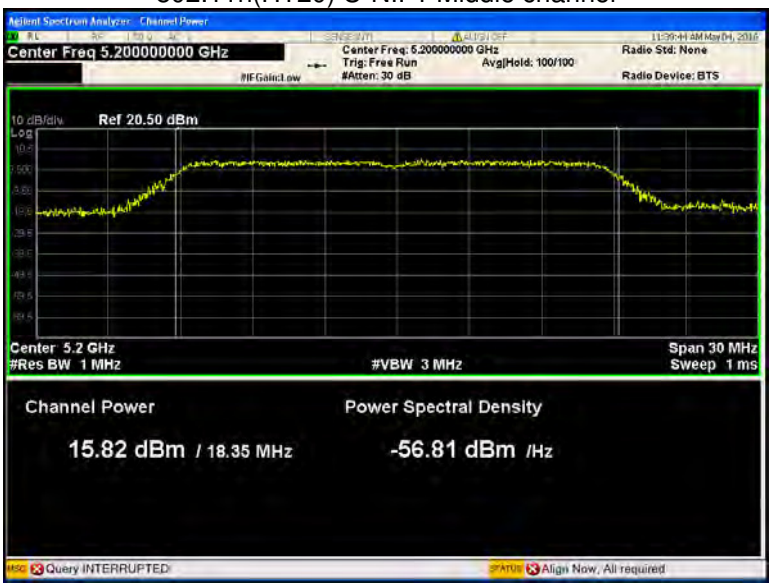


802.11a U-NII-1 High channel

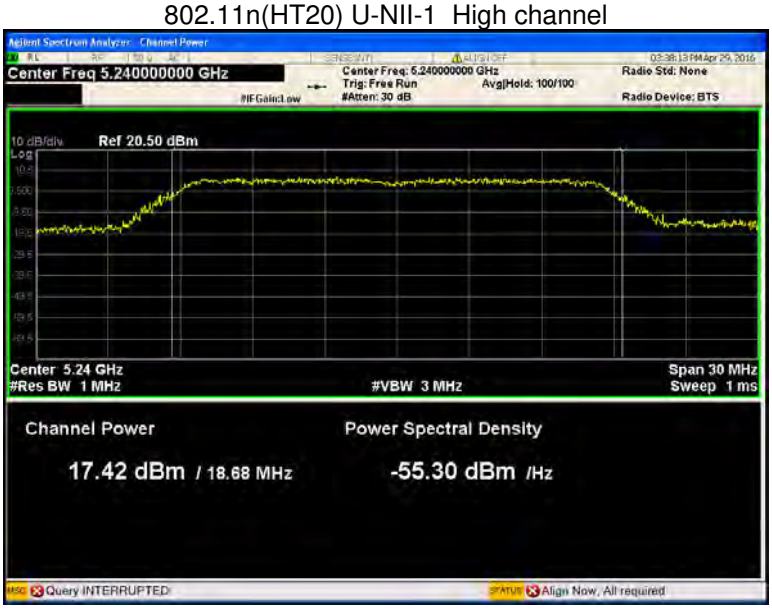
802.11n(HT20) U-NII-1 Low channel



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

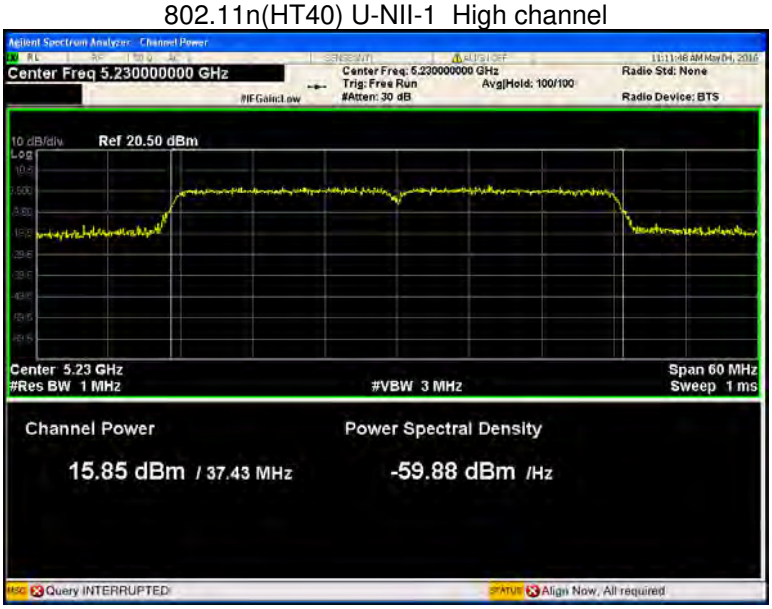


802.11n(HT20) U-NII-1 High channel



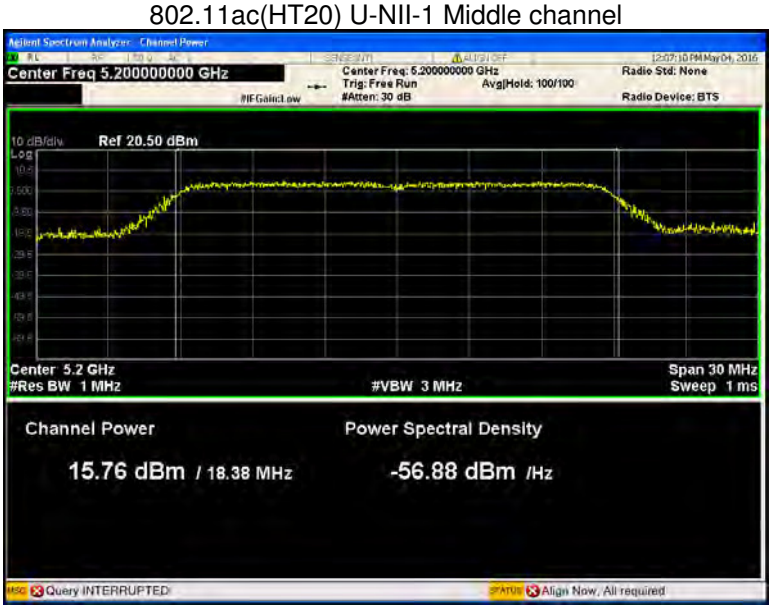
802.11n(HT40) U-NII-1 Low channel

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



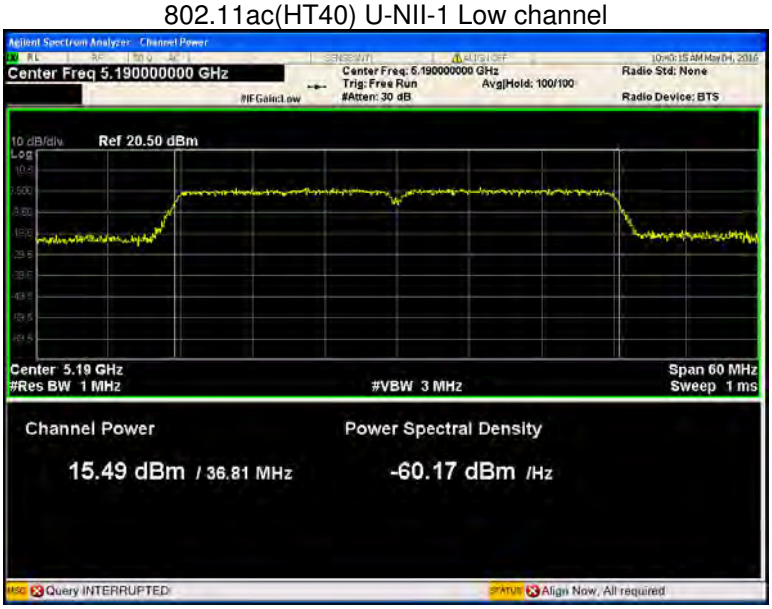
802.11ac(HT20) U-NII-1 Low channel

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



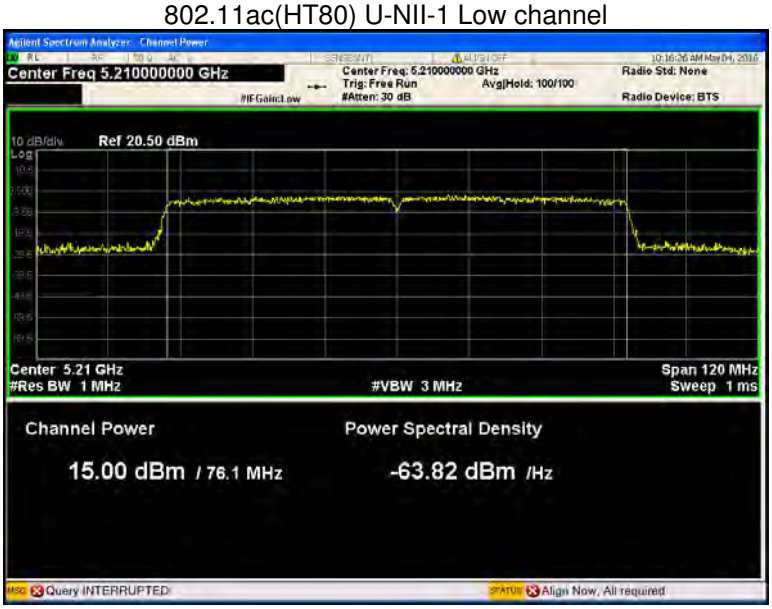
802.11ac(HT20) U-NII-1 High channel

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

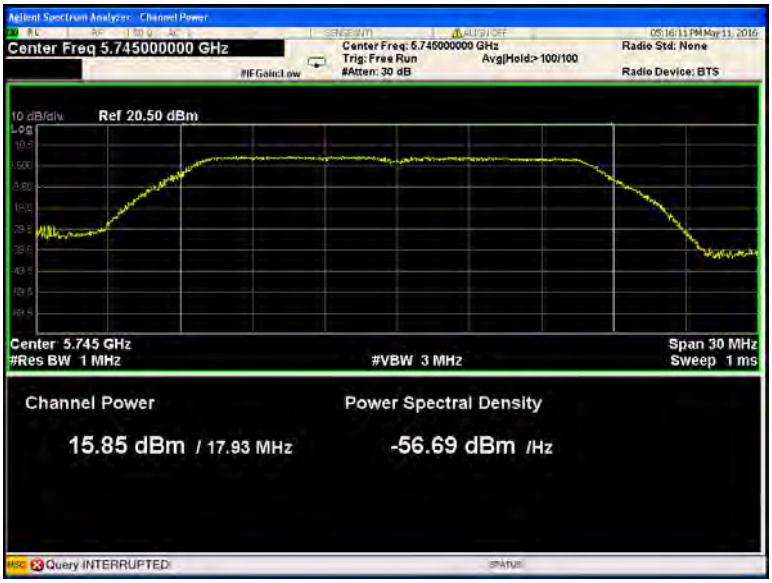


802.11n(HT40) U-NII-1 High channel

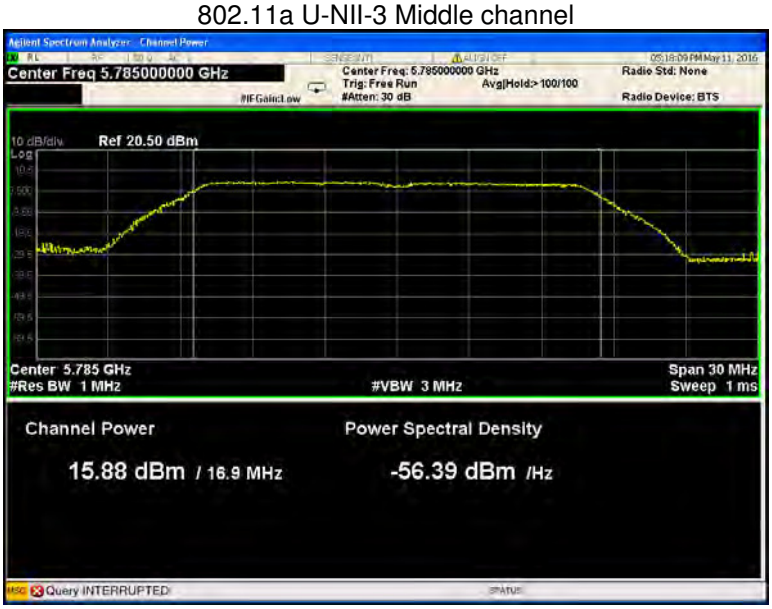
802.11ac(HT80) U-NII-1 Low channel



802.11a U-NII-3 Low channel

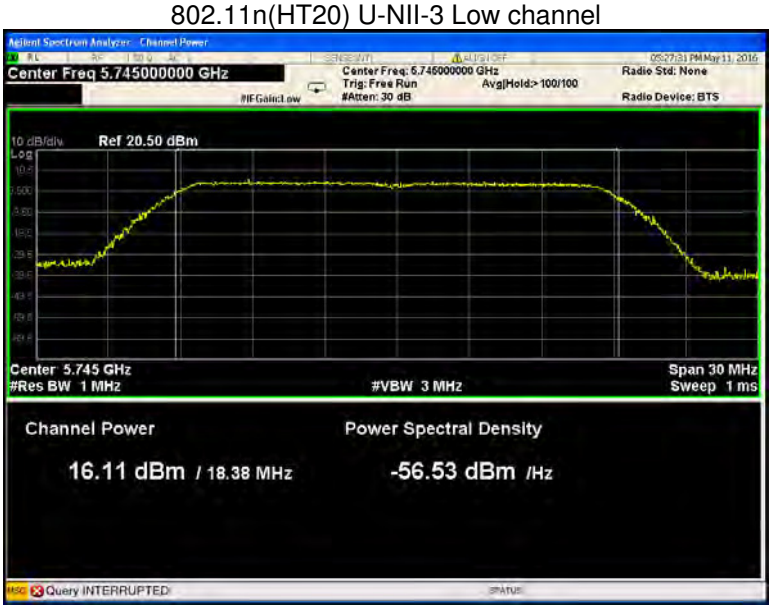


802.11a U-NII-3 Middle channel



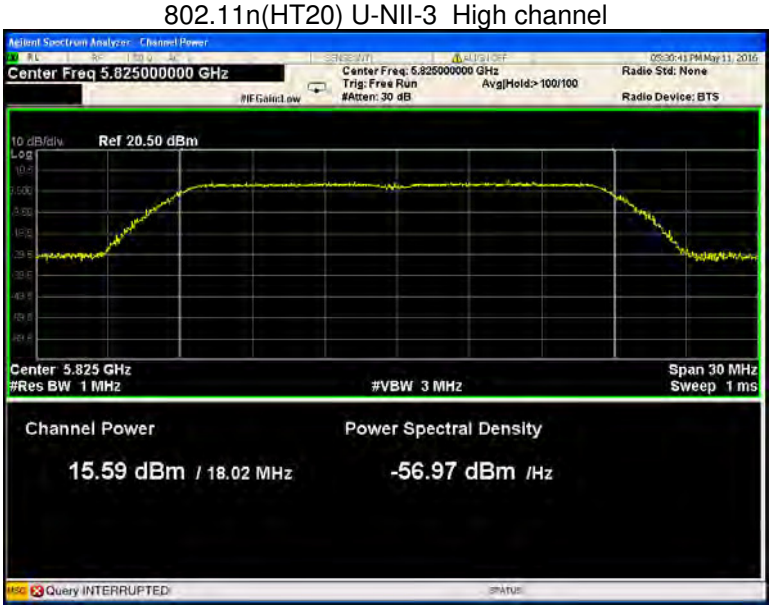
802.11a U-NII-3 High channel

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

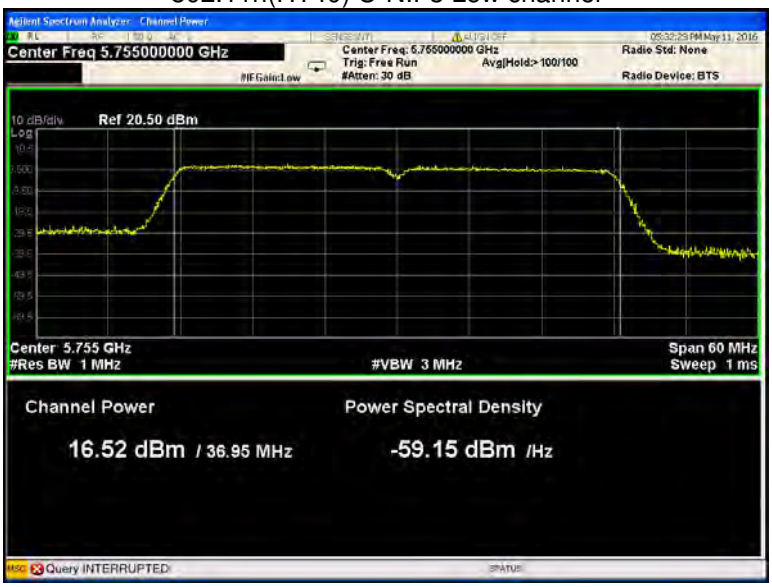


802.11n(HT20) U-NII-3 Middle channel

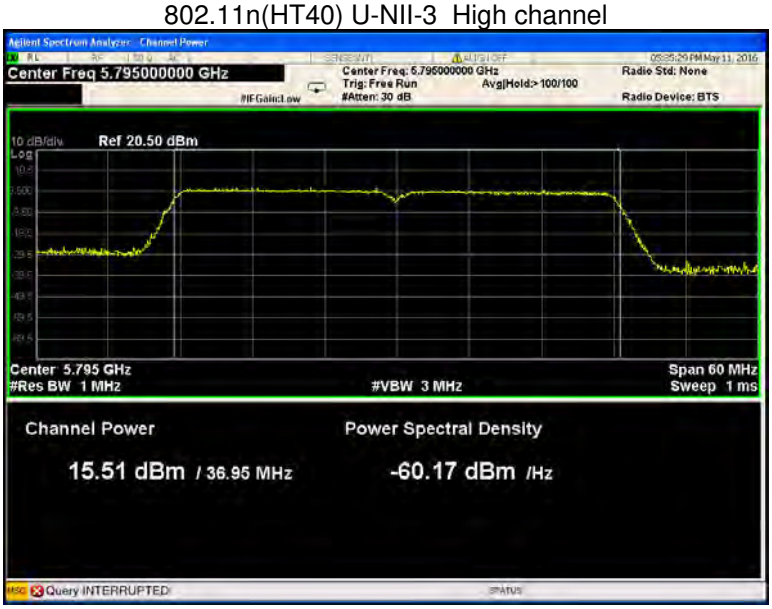
802.11n(HT20) U-NII-3 High channel



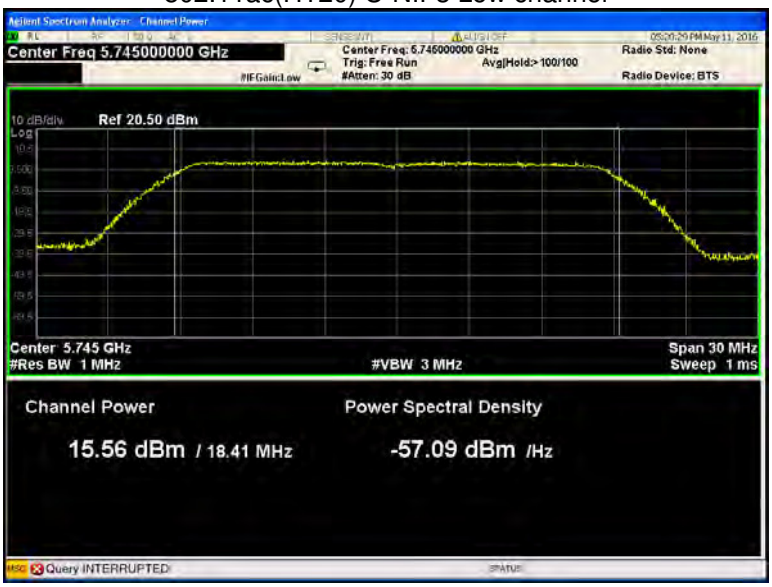
802.11n(HT40) U-NII-3 Low channel



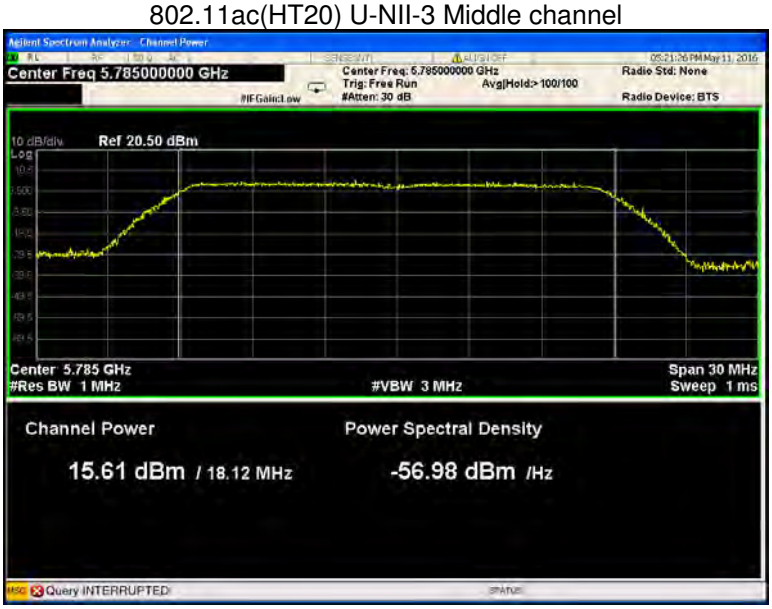
802.11n(HT40) U-NII-3 High channel



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

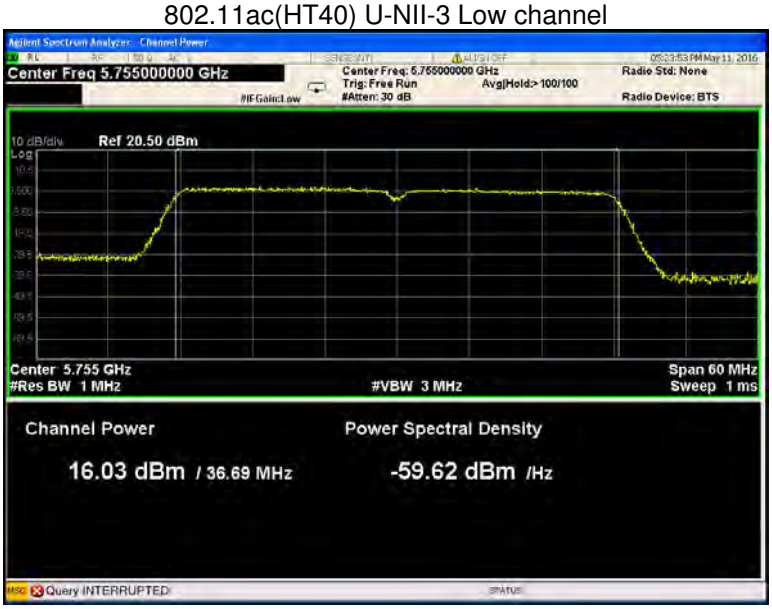


802.11ac(HT20) U-NII-3 Middle channel

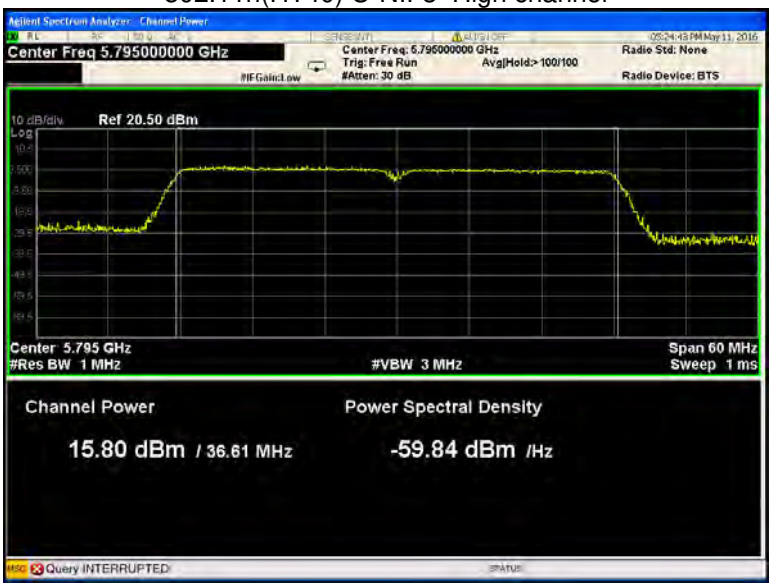


802.11ac(HT20) U-NII-3 High channel

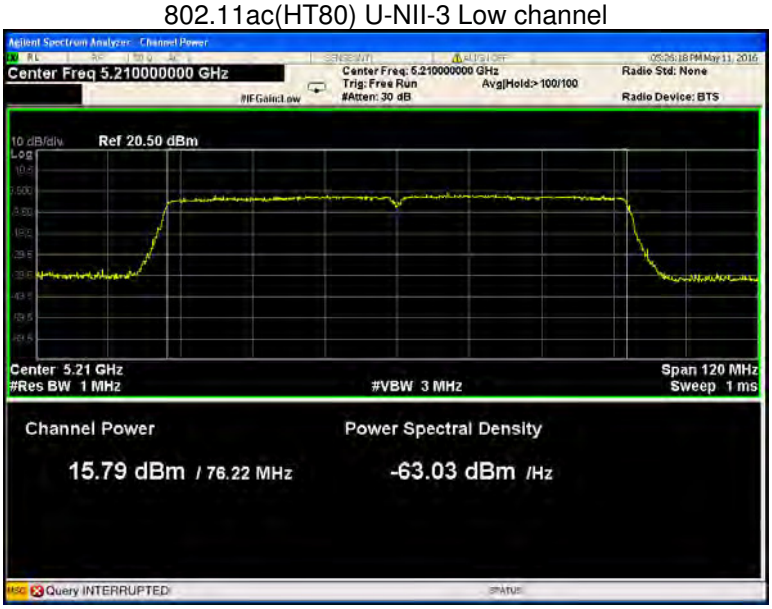
802.11ac(HT40) U-NII-3 Low channel



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



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



13 Power Spectral density

Test Requirement:	FCC CFR47 Part 15 Section 15.407(a) KDB662911 D01 Multiple Transmitter Output v02r01
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v01, Section F
Test Limit:	≤11.00dBm/MHz for Operation in the U-NII-1(5150MHz-5250MHz)of mobile device ≤30.00dBm/500KHz for Operation in the U-NII-3(5725MHz-5850MHz)of device
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. Set the spectrum analyzer:

U-NII-1

RBW = 1MHz, VBW ⩾3* RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.

U-NII-3

RBW = 510KHz, VBW ⩾3* RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

13.2 Test Result:

Band	Operation mode	CH	Power Spectral Density (dBm/MHz)		
			ANT0	ANT1	Total
U-NII-1	802.11a	Low	7.417	6.206	9.86
		Middle	7.337	5.907	9.69
		High	6.497	5.177	8.90
	802.11n(HT20)	Low	7.963	6.787	10.42
		Middle	7.062	6.237	9.68
		High	7.226	5.716	9.55
	802.11n(HT40)	Low	5.084	4.268	7.71
		Middle	/	/	/
		High	4.650	3.829	7.27
	802.11ac(HT20)	Low	7.503	6.929	10.24
		Middle	7.344	6.651	10.02
		High	6.554	6.129	9.36
	802.11ac(HT40)	Low	5.732	4.920	8.36
		Middle	/	/	/
		High	5.061	4.130	7.63
	802.11ac(HT80)	Low	1.920	1.405	4.68
		Middle	/	/	/
		High	/	/	/
	Limit		≤11.00dBm/MHz		

* All transmit signals are completely uncorrelated with each other, Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

Band	Operation mode	CH	Power Spectral Density (dBm/500KHz)		
			ANT0	ANT1	Total
U-NII-3	802.11a	Low	2.237	1.242	4.78
		Middle	0.785	-1.092	2.96
		High	-1.792	-1.192	1.53
	802.11n(HT20)	Low	2.742	1.665	5.25
		Middle	-0.507	-0.443	2.54
		High	-1.665	-0.734	1.84
	802.11n(HT40)	Low	-0.585	-2.356	1.63
		Middle	/	/	/
		High	-4.061	-3.592	-0.81
	802.11ac(HT20)	Low	0.528	1.042	3.80
		Middle	-2.559	-0.191	1.79
		High	-1.368	0.538	2.70
	802.11ac(HT40)	Low	-0.660	-2.473	1.54
		Middle	/	/	/
		High	-2.254	-4.163	-0.09
	802.11ac(HT80)	Low	-5.544	-6.096	-2.80
		Middle	/	/	/
		High	/	/	/
	Limit		≤30.00dBm/500KHz		

* All transmit signals are completely uncorrelated with each other, Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

Test result plots shown as follows:

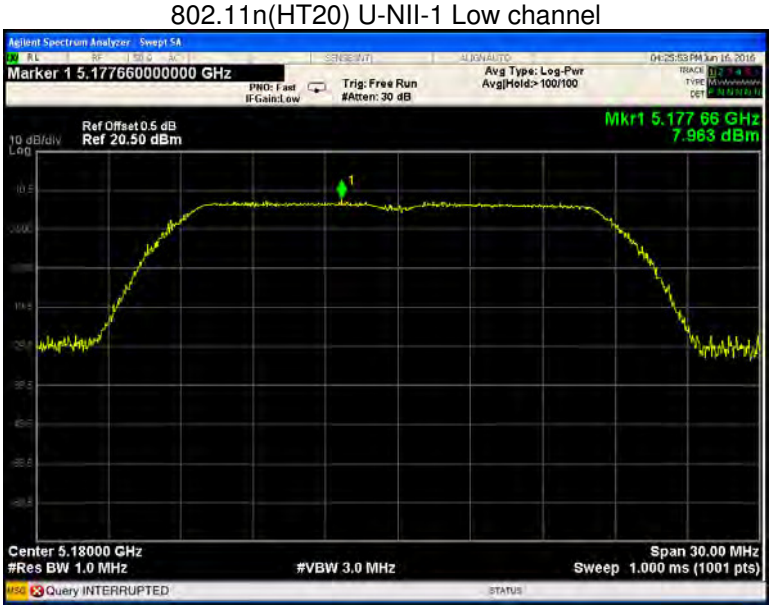
ANT0

802.11a U-NII-1 Low channel

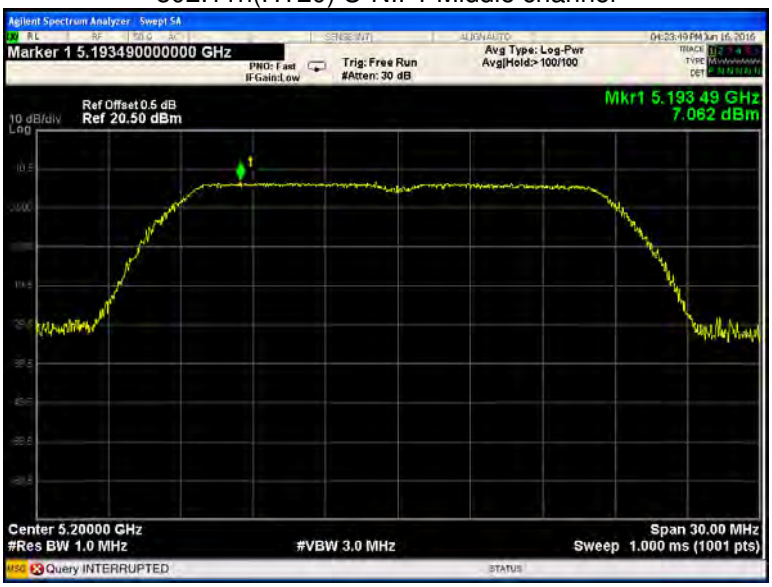
802.11a U-NII-1 Middle channel

802.11a U-NII-1 High channel

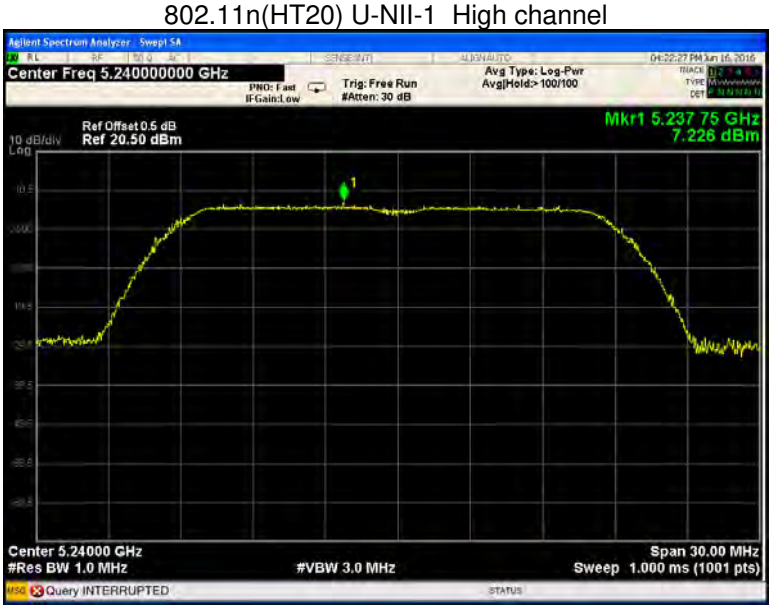
802.11n(HT20) U-NII-1 Low channel



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

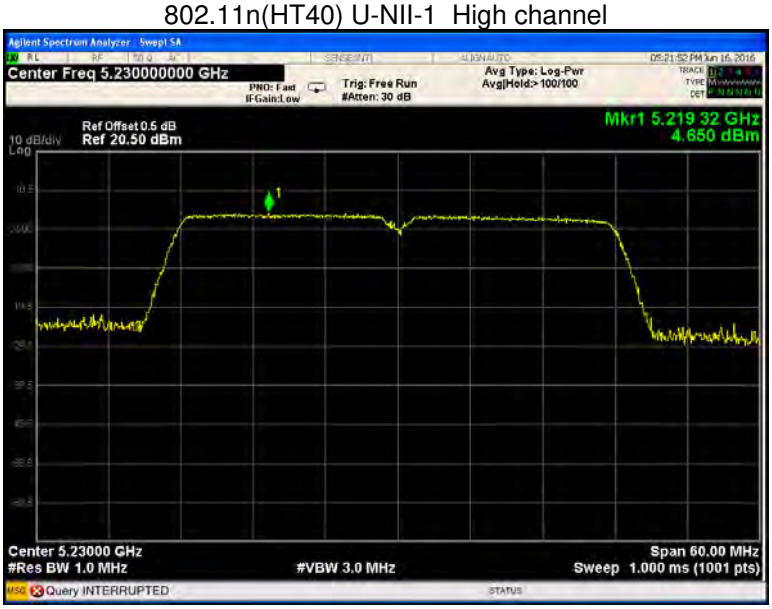


802.11n(HT20) U-NII-1 High channel

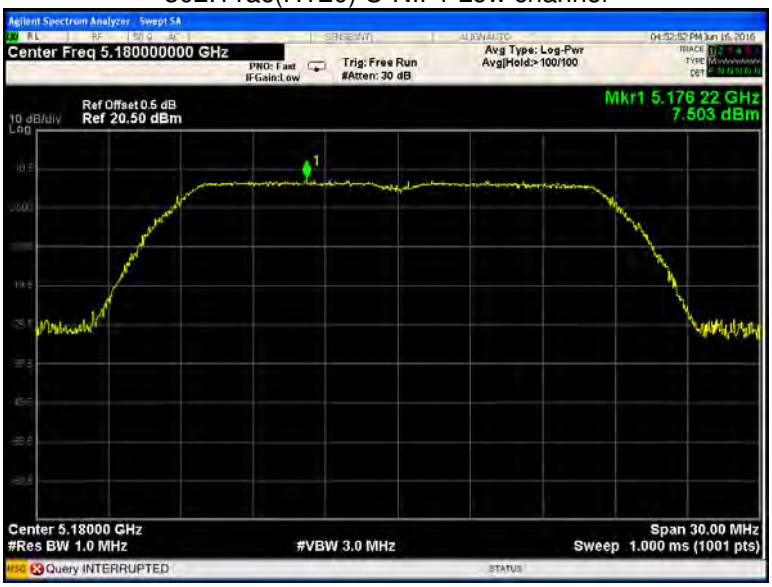


802.11n(HT40) U-NII-1 Low channel

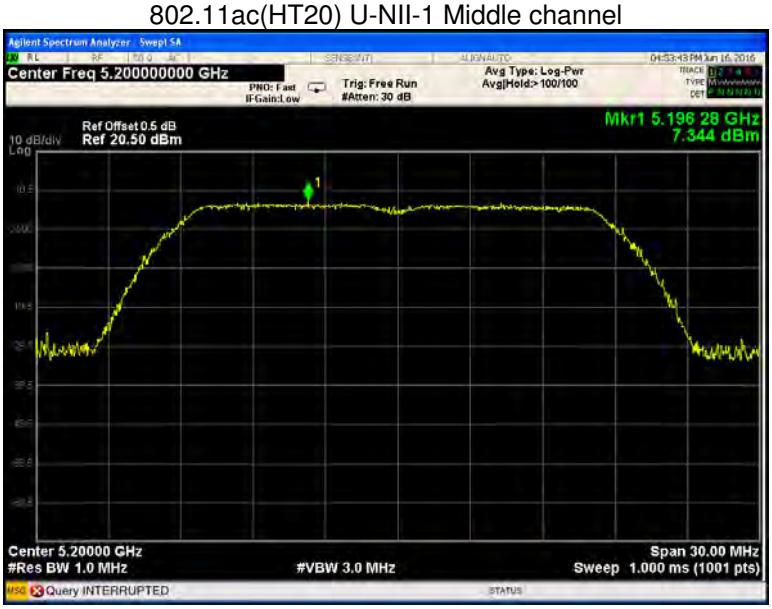
802.11n(HT40) U-NII-1 High channel



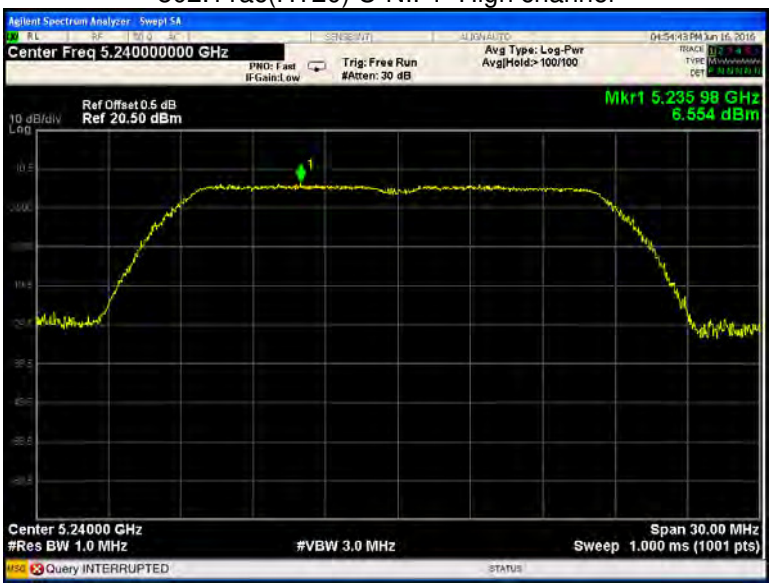
802.11ac(HT20) U-NII-1 Low channel



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



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



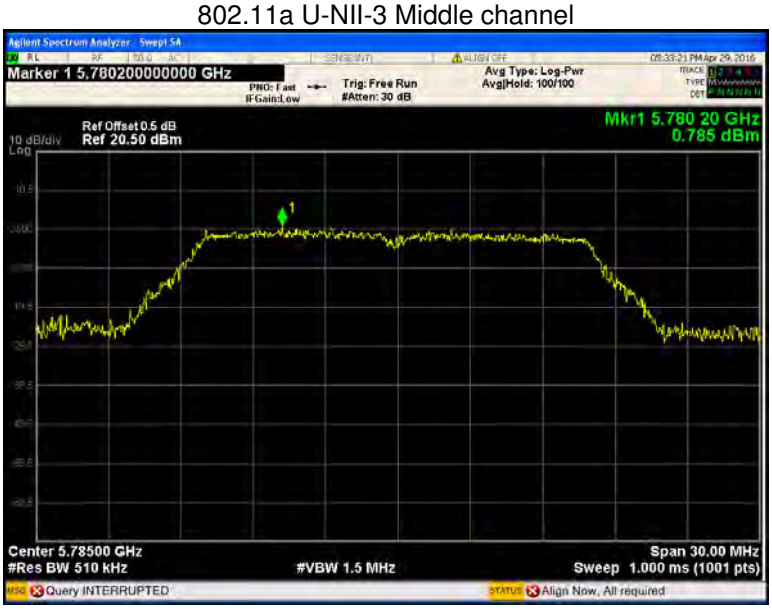
802.11ac(HT40) U-NII-1 Low channel

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

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

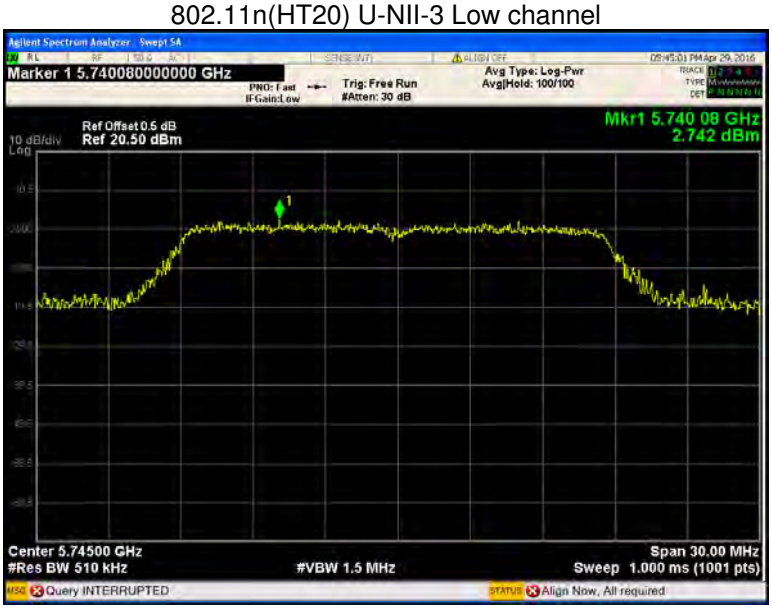
802.11a U-NII-3 Low channel

802.11a U-NII-3 Middle channel



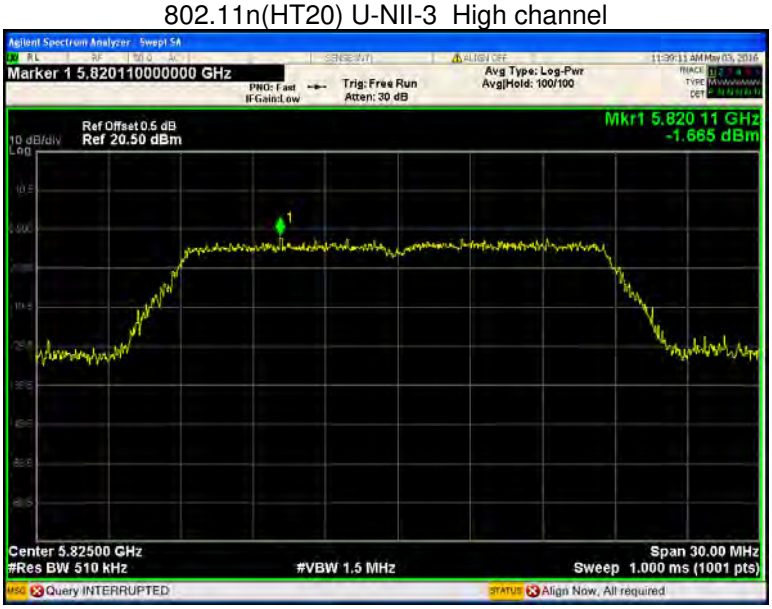
802.11a U-NII-3 High channel

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



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

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

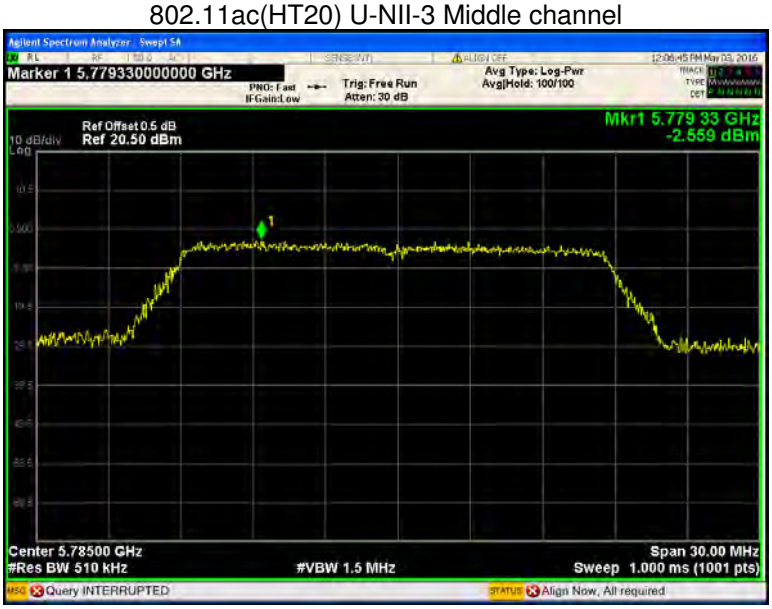


802.11n(HT40) U-NII-3 Low channel

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

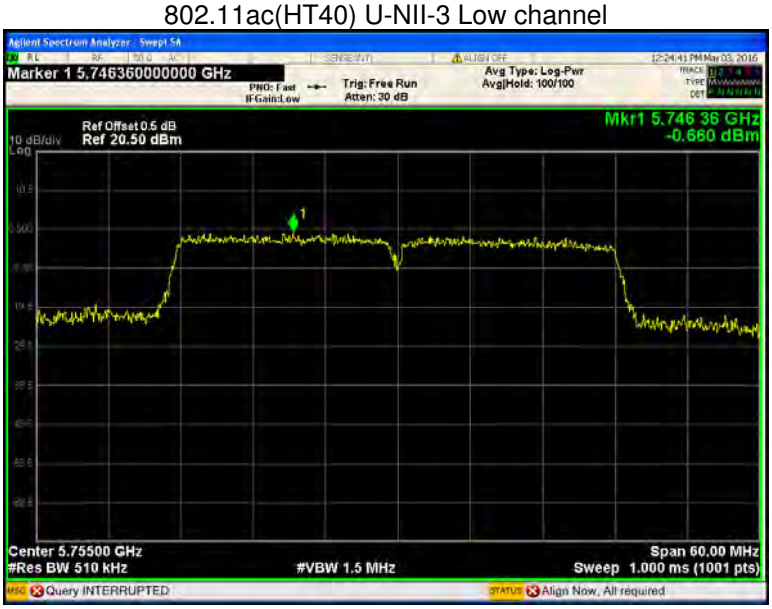
802.11ac(HT20) U-NII-3 Low channel

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

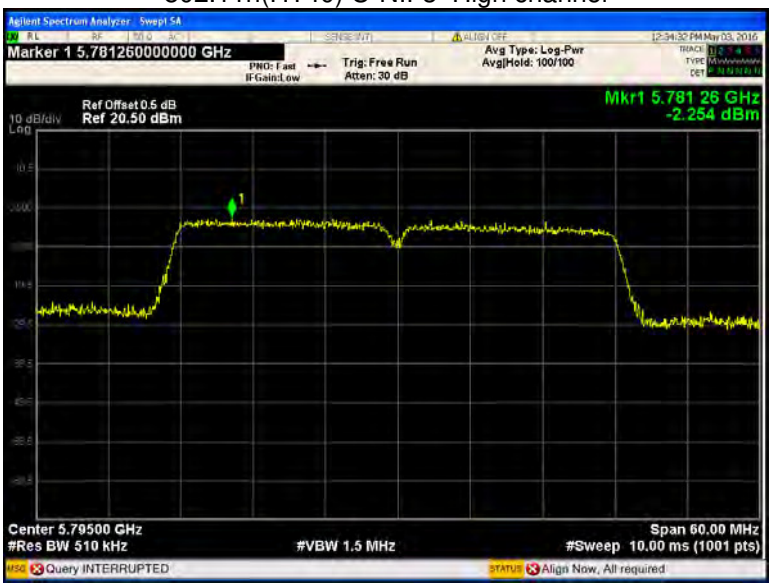


802.11ac(HT20) U-NII-3 High channel

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



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



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

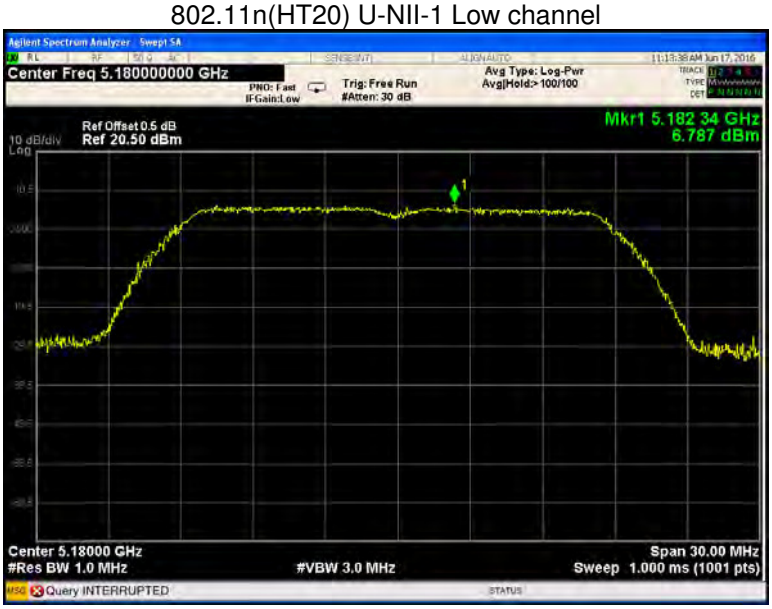
ANT 1

802.11a U-NII-1 Low channel

802.11a U-NII-1 Middle channel

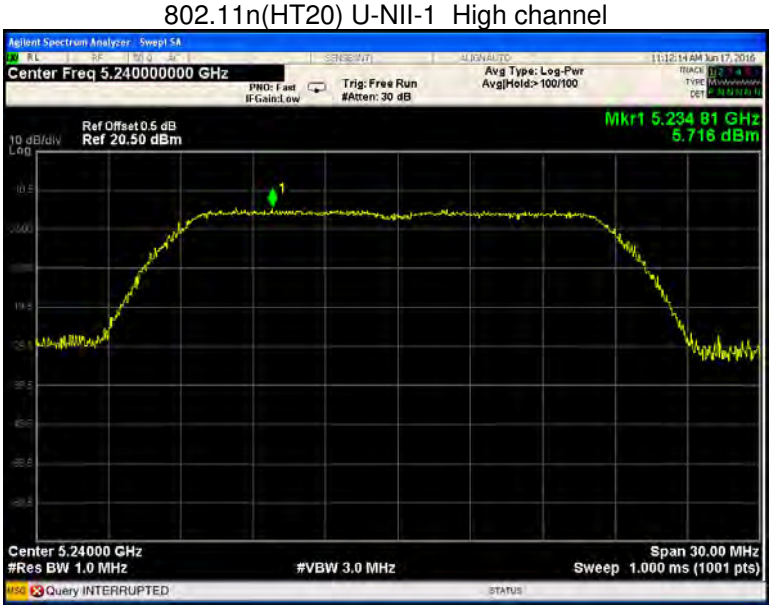
802.11a U-NII-1 High channel

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

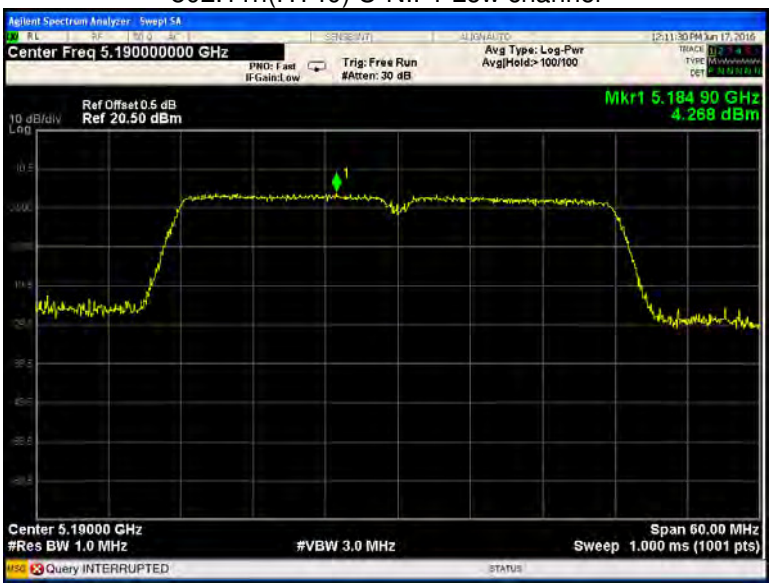


802.11n(HT20) U-NII-1 Middle channel

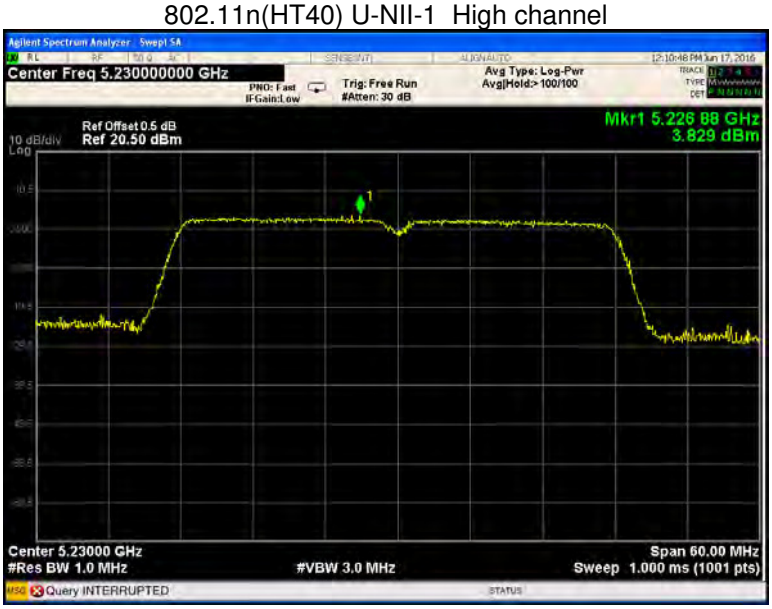
802.11n(HT20) U-NII-1 High channel



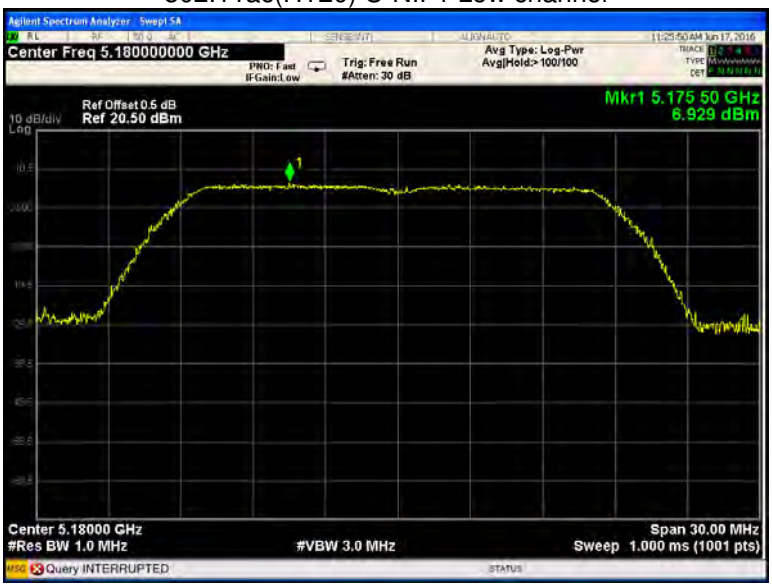
802.11n(HT40) U-NII-1 Low channel



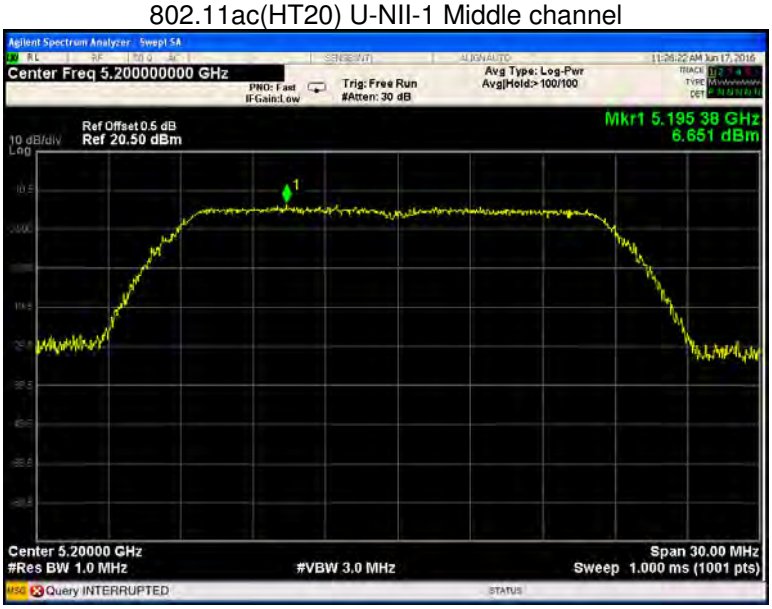
802.11n(HT40) U-NII-1 High channel



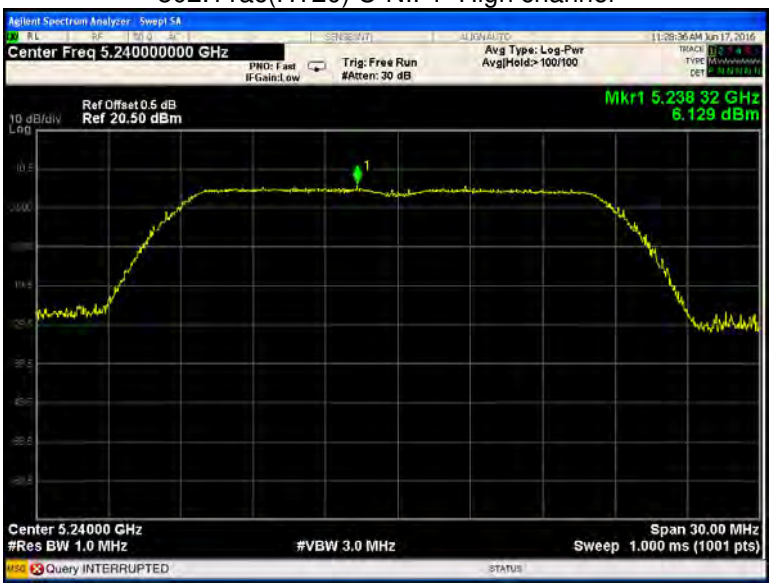
802.11ac(HT20) U-NII-1 Low channel



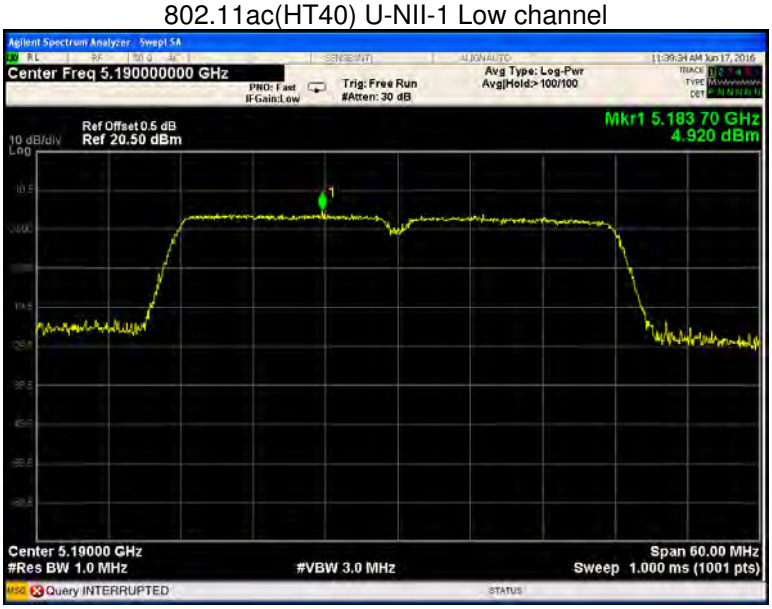
802.11ac(HT20) U-NII-1 Middle channel



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



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

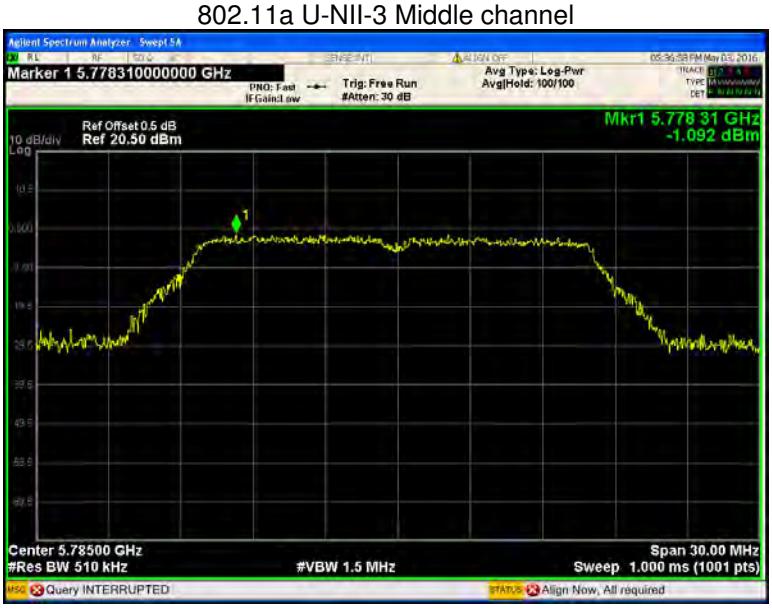


802.11ac(HT40) U-NII-1 High channel

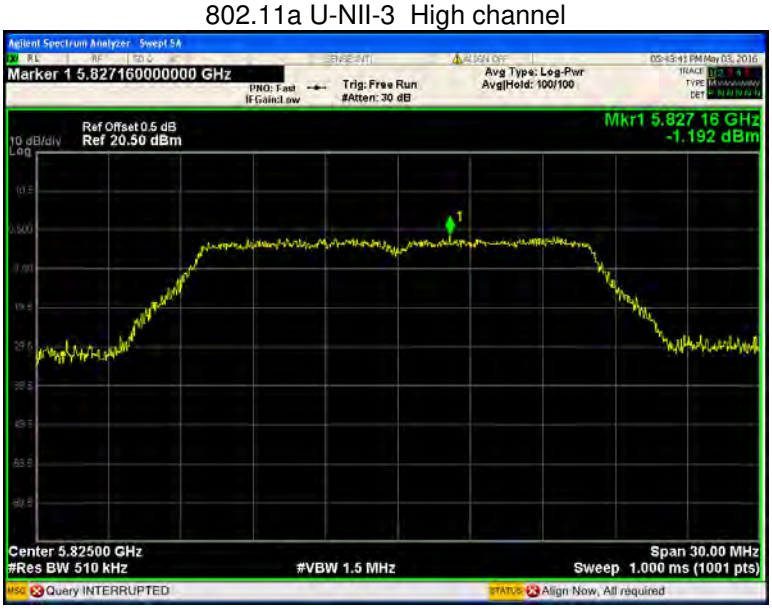
802.11ac(HT80) U-NII-1 Low channel

802.11a U-NII-3 Low channel

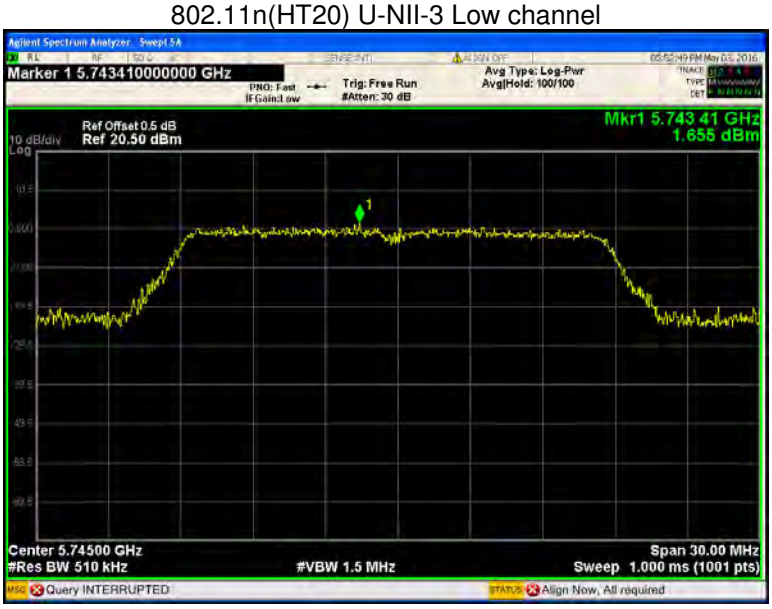
802.11a U-NII-3 Middle channel



802.11a U-NII-3 High channel

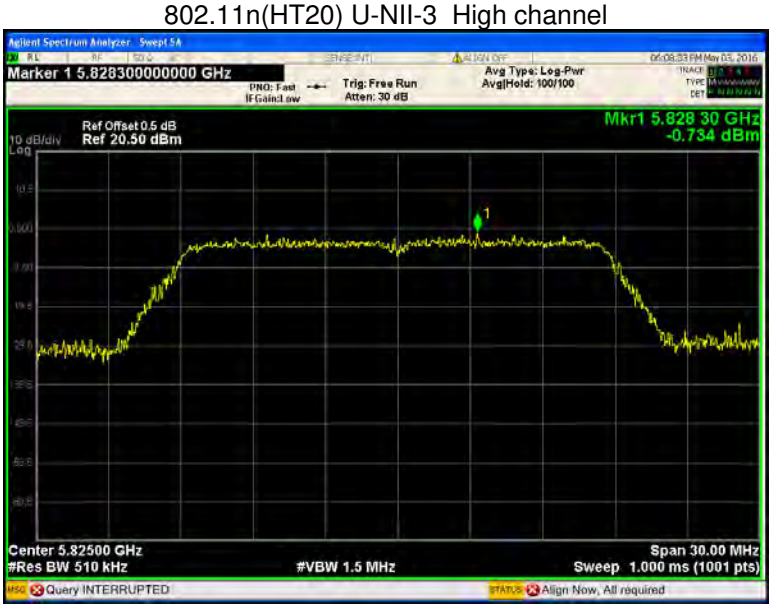


802.11n(HT20) U-NII-3 Low channel

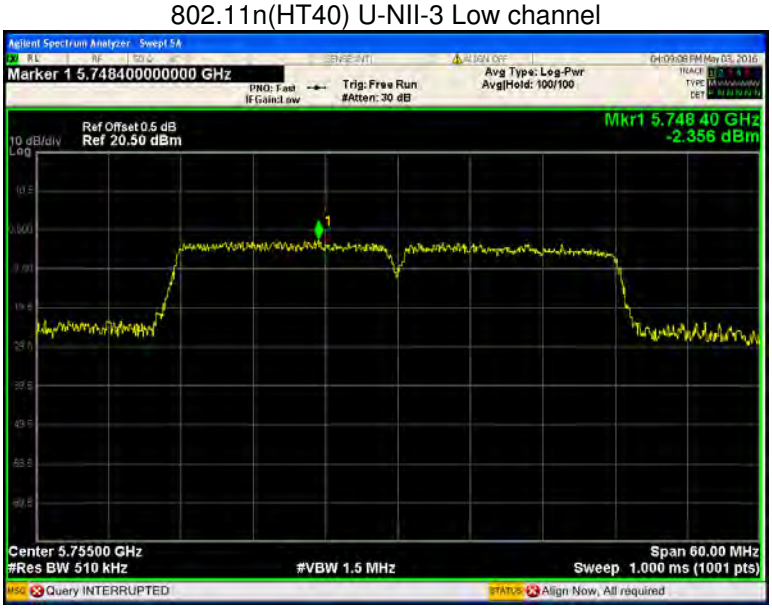


802.11n(HT20) U-NII-3 Middle channel

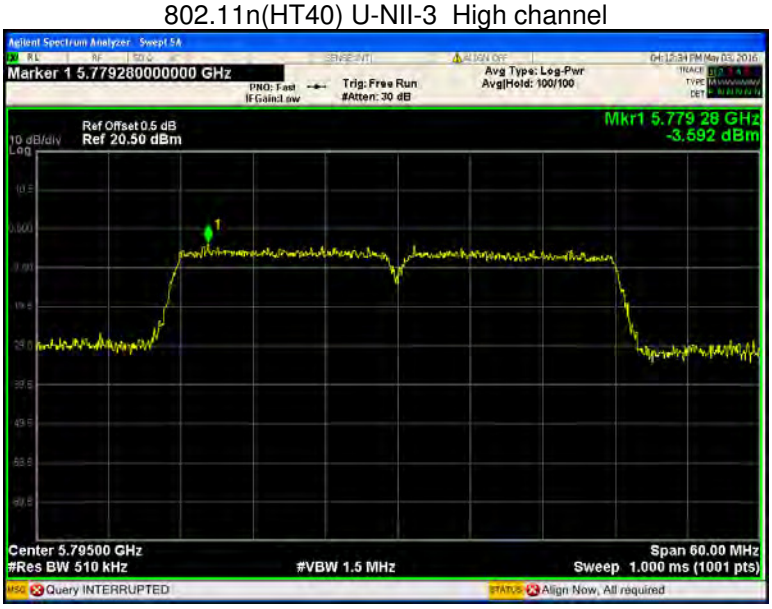
802.11n(HT20) U-NII-3 High channel



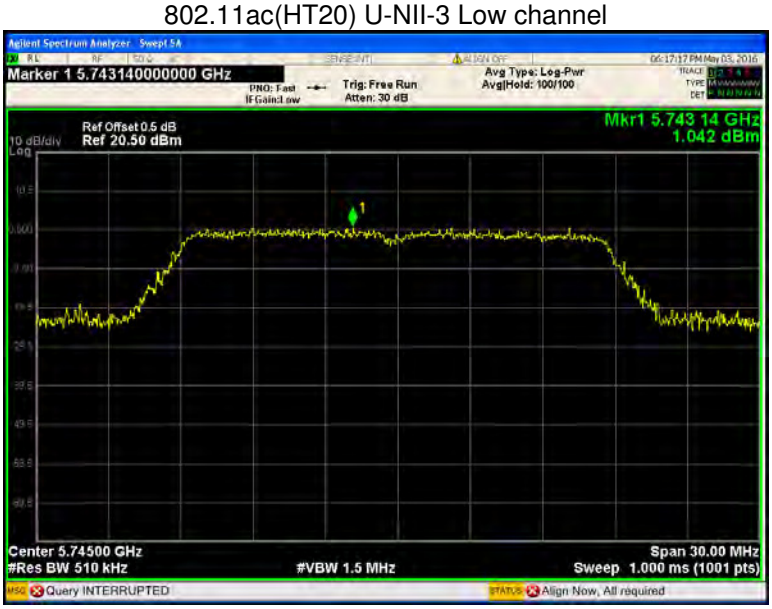
802.11n(HT40) U-NII-3 Low channel



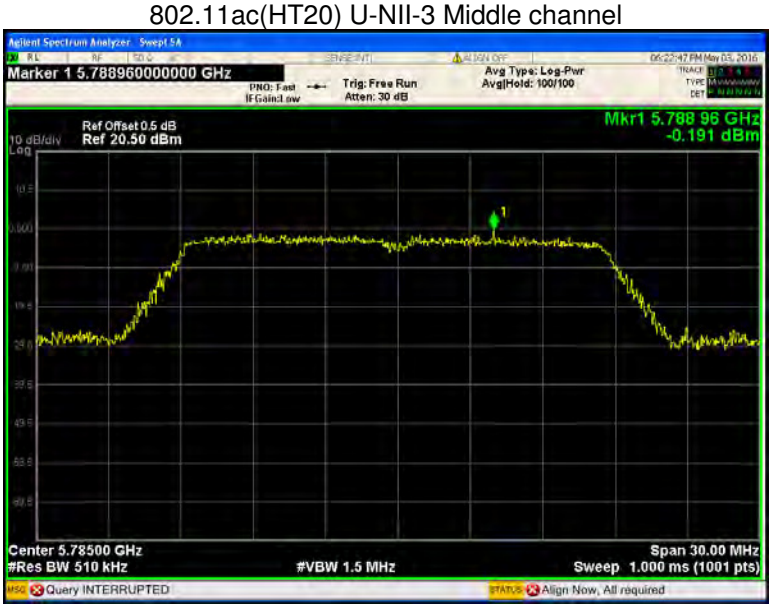
802.11n(HT40) U-NII-3 High channel



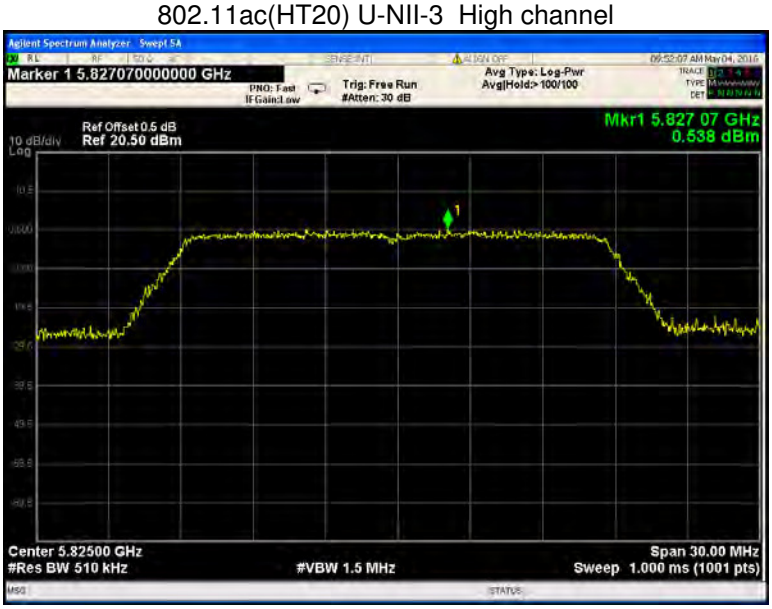
802.11ac(HT20) U-NII-3 Low channel



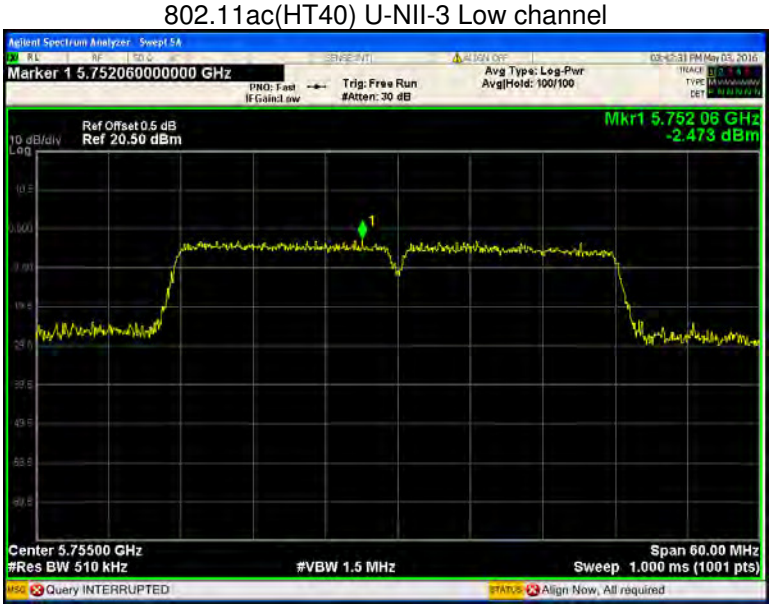
802.11ac(HT20) U-NII-3 Middle channel



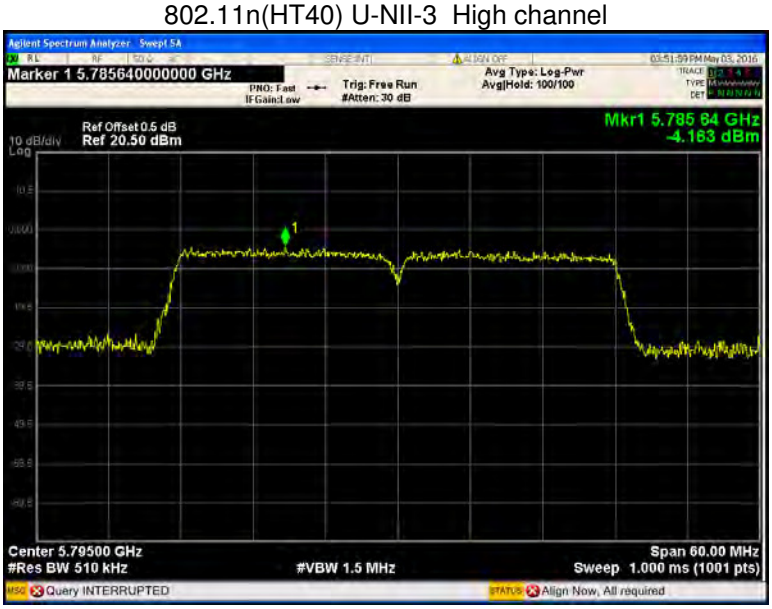
802.11ac(HT20) U-NII-3 High channel



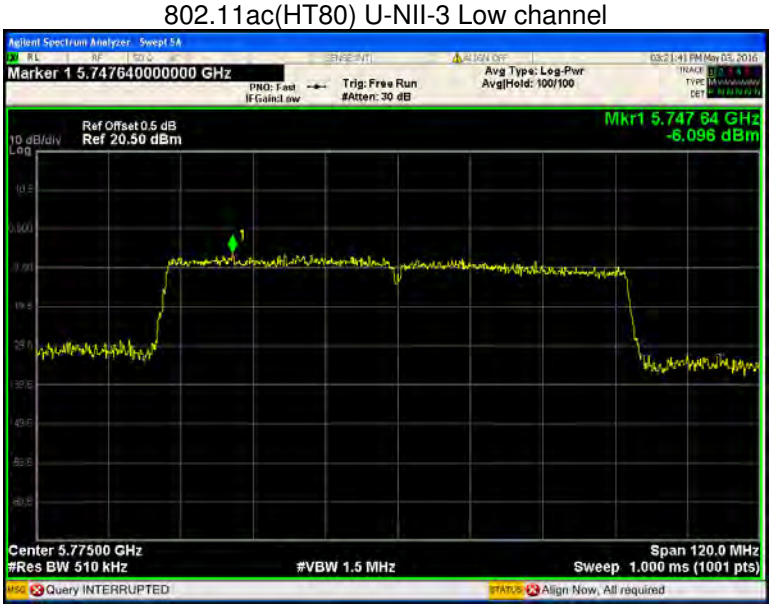
802.11ac(HT40) U-NII-3 Low channel



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



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



14 Frequency Stability

Test Requirement:	FCC CFR47 Part 15 Section 15.407(g)
Test Method:	ANSI C63.10:2009
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

14.1 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. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm 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 -15°C~ 45°C.

14.2 Test Result:

U-NII-1 Test Frequency:5180MHz				
Temperature (℃)	Power Supply (VAC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	120	/	/	/
45		1795	2.1456	20
30		1794	2.1444	20
20		1800	2.1516	20
10		1802	2.1540	20
0		1801	2.1528	20
-10		1798	2.1492	20
-15		1807	2.1599	20
-30		/	/	/
20	108	1808	2.1611	20
20	132	1798	2.1492	20

U-NII-3 Test Frequency:5785MHz				
Temperature (℃)	Power Supply (VAC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	120	/	/	/
45		1918	2.2926	20
30		1913	2.2866	20
20		1910	2.2831	20
10		1910	2.2831	20
0		1912	2.2854	20
-10		1903	2.2747	20
-15		1914	2.2878	20
-30		/	/	/
20	108	1909	2.2819	20
20	132	1910	2.2831	20

15 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 of two antennas that uses a specified coupling to the intentional radiator. Antenna connectors complied with the requirement.

16 RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091

16.1 Requirements

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

16.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

16.3 MPE Calculation Method

$$\text{E (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd\ (\text{W/m}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to

$$\boldsymbol{Pd} = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

5.2G

Directional Gain (dBi)	Directional Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
3.72	2.355	20.43	110.41	0.051727	1

* Directional gain = 10 log[(10^G1 /10 + 10^G2 /10 + … + 10^GN /10)/N_{ANT}] dBi =3.72dBi

5.8G

Directional Gain (dBi)	Directional Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
3.71	2.350	19.33	85.70	0.040061	1

* Directional gain = 10 log[(10^G1 /10 + 10^G2 /10 + … + 10^GN /10)/N_{ANT}] dBi =3.71dBi

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