FCC TEST REPORT

Product Name:	Arm-mounted Tablet
Trade Mark:	Oneview or Oneview
Model No.:	OV2219
Report Number:	201110043RFC-4
Test Standards:	FCC 47 CFR Part 15 Subpart E
FCC ID:	2AX57OV2219
Test Result:	PASS
Date of Issue:	February 3, 2021

Prepared for:

Oneview Healthcare Inc
Block 2, Blackrock Business Park, Blackrock, Co. Dublin, A94 H2X4
Ireland

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.
Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China
TEL: +86-755-2823 0888
FAX: +86-755-2823 0886

Prepared by:	Ryan Zhou Senior Project Engineer	Reviewed by:	Kevin Liang Assistant Manager
Approved by:	Billy Li Technical Director	Date:	February 3, 2021

UnionTrust Laboratories Certified

Version

Version No.	Date	Description
V1.0	February 3, 2021	Original

CONTENTS

1. GENERAL INFORMATION 4
   1.1 CLIENT INFORMATION 4
   1.2 EUT INFORMATION 4
      1.2.1 GENERAL DESCRIPTION OF EUT 4
      1.2.2 DESCRIPTION OF ACCESSORIES 4
   1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD 4
   1.4 OTHER INFORMATION 6
   1.5 DESCRIPTION OF SUPPORT UNITS 6
   1.6 TEST LOCATION 6
   1.7 TEST FACILITY 7
   1.8 DEVIATION FROM STANDARDS 7
   1.9 ABNORMALITIES FROM STANDARD CONDITIONS 7
   1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER 7
   1.11 MEASUREMENT UNCERTAINTY 7
2. TEST SUMMARY 8
3. EQUIPMENT LIST 9
4. TEST CONFIGURATION 10
   4.1 ENVIRONMENTAL CONDITIONS FOR TESTING 10
      4.1.1 NORMAL OR EXTREME TEST CONDITIONS 10
      4.1.2 RECORD OF NORMAL ENVIRONMENT 10
   4.2 TEST CHANNELS 10
   4.3 EUT TEST STATUS 11
   4.4 PRE-SCAN 11
   4.5 TEST SETUP 12
      4.5.1 FOR RADIATED EMISSIONS TEST SETUP 12
      4.5.2 FOR CONDUCTED EMISSIONS TEST SETUP 13
      4.5.3 FOR CONDUCTED RF TEST SETUP 14
   4.6 SYSTEM TEST CONFIGURATION 15
   4.7 DUTY CYCLE 16
5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION 20
   5.1 REFERENCE DOCUMENTS FOR TESTING 20
   5.2 ANTENNA REQUIREMENT 20
   5.3 26 DB BANDWIDTH 21
   5.4 6 DB BANDWIDTH 32
   5.5 MAXIMUM CONDUCTED OUTPUT POWER 36
   5.6 PEAK POWER SPECTRAL DENSITY 40
   5.7 RADIATED EMISSIONS AND BAND EDGE MEASUREMENT 55
   5.8 DYNAMIC FREQUENCY SELECTION 96
   5.9 AC POWER LINE CONDUCTED EMISSION 106

APPENDIX 1 PHOTOS OF TEST SETUP 109
APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS 109

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Oneview Healthcare Inc
Address of Applicant:	Block 2, Blackrock Business Park, Blackrock, Co. Dublin, A94 H2X4 Ireland
Manufacturer:	Oneview Healthcare Inc
Address of Manufacturer:	Block 2, Blackrock Business Park, Blackrock, Co. Dublin, A94 H2X4 Ireland

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Arm-mounted Tablet		
Model No.:	OV2219		
Trade Mark:	Oneview or Oneview		
DUT Stage:	Identical Prototype		
EUT Supports Function:	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth V4.2	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 250 MHz to 5 350 MHz	IEEE 802.11a/n/ac
		5 470 MHz to 5 725 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
	RFID:	125 kHz, 13.56 MHz	
Sample Received Date:	November 11, 2020		
Sample Tested Date:	November 17, 2020 to December 16, 2020		

1.2.2 Description of Accessories

Adapter	
Model No.:	UES48-130369SPA3
Input:	100-240 V~50/60 Hz 1.1A
Output:	13.0V ⎓ 3.69A
AC Cable:	3.00 Meter, Unshielded without ferrite
DC Cable:	1.50 Meter, Shielded without ferrite
Manufacturer:	DONGGUAN SHILONG FUHUA ELECTRONIC CO., LTD.

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Bands:	5150 MHz to 5250 MHz (U-NII-1)
	5250 MHz to 5350 MHz (U-NII-2A)
	5470 MHz to 5725 MHz (U-NII-2C)
	5 725 MHz to 5 850 MHz (U-NII-3)
Frequency Ranges:	5180 MHz to 5240 MHz
	5260 MHz to 5320 MHz
	5500 MHz to 5700 MHz
	5 745 MHz to 5 825 MHz
Support Standards:	IEEE 802.11a/n/ac
TPC Function:	Not Support
DFS Operational mode:	Slave without radar Interference detection function
Type of Modulation:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)

	IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK)	
	IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)	
Channel Spacing:	IEEE 802.11a/n-HT20/ac-VHT20: 20 MHz	
	IEEE 802.11n-HT40/ac-VHT40: 40 MHz	
	IEEE 802.11ac-VHT80: 80 MHz	
Data Rate:	IEEE 802.11a: Up to 54 Mbps	
	IEEE 802.11n-HT20: Up to MCS7	
	IEEE 802.11n-HT40: Up to MCS7	
	IEEE 802.11ac-VHT20: Up to MCS8	
	IEEE 802.11ac-VHT40: Up to MCS9	
	IEEE 802.11ac-VHT80: Up to MCS9	
Number of Channels:	5150 MHz to 5250 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40)/ac-VHT40 1 for IEEE 802.11acVHT80	
	5250 MHz to 5350 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40)/ac-VHT40 1 for IEEE 802.11acVHT80	
	5470 MHz to 5725 MHz: 11 for IEEE 802.11a/n-HT20/ac-VHT20 5 for IEEE 802.11n-HT40/ac-VHT40 2 for IEEE 802.11ac-VHT80	
	5725 MHz to 5850 MHz: 5 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11ac-VHT80	
Antenna Type:	PIFA Antenna	
Antenna Gain:	5150 MHz to 5250 MHz	0.8 dBi
	5250 MHz to 5350 MHz	0.6 dBi
	5470 MHz to 5725 MHz	0.8 dBi
	5725 MHz to 5850 MHz	0.7 dBi

		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
Maximum conducted output power (dBm):	IEEE 802.11a:	15.73	15.53	15.67	13.18
	IEEE 802.11n-HT20:	15.36	15.31	15.29	12.61
	IEEE 802.11n-HT40:	15.61	15.18	15.31	12.50
	IEEE 802.11ac-VHT20	15.40	15.29	15.25	12.56
	IEEE 802.11ac-VHT40	15.56	15.20	15.25	12.40
	IEEE 802.11ac-VHT80:	11.90	11.80	14.72	12.25
Normal Test Voltage:	120V~60Hz				

1.4 OTHER INFORMATION

Operation Frequency Each of Channel				
	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
IEEE 802.11a, IEEE 802.11n-HT20, IEEE 802.11ac-VHT20	f = 5000 + 5k, k = 32 + 4n			f = 5000 + 5k, k = 145 + 4n
	n = 1,…, 4	n = 5,…, 8	n = 17,…, 27	n = 1,…, 5
IEEE 802.11n-HT40, IEEE 802.11ac-VHT40	f = 5000 + 5k, k = 30 + 8n			f = 5000 + 5k, k = 143 + 8n
	n = 1, 2	n = 1,…, 5	n = 9,…, 13	n = 1, 2
IEEE 802.11ac-VHT80	f = 5000 + 5k, k = 26 + 16n			f = 5000 + 5k, k = 155
	n = 1	n = 1, 2	n = 5, 6	

Note:
f is the operating frequency (MHz);
k is the operating channel.

1.5 DESCRIPTION OF SUPPORT UNITS

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	FCC ID	Supplied by
Notebook	Lenovo	E450	SL10G10780	N/A	UnionTrust
Wireless Home Router	SAGEMCOM	FAST5280	N/A	VW3FAST5280	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.30 Meter	UnionTrust

1.6 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China 518109
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.7 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories
CAB identifier: CN0032

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 150kHz-30MHz	±2.7 dB
2	Radiated emission 9kHz-30MHz	± 4.7 dB
3	Radiated emission 30MHz-1GHz	± 4.6 dB
4	Radiated emission 1GHz-18GHz	± 4.4 dB
5	Radiated emission 18GHz-26GHz	± 4.6 dB
6	Conducted peak output power	± 0.9 dB
7	Bandwidth	± 1.8 %
8	Power spectral density	± 0.6 dB
9	Conducted out of band emission	± 2.7 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart E Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Antenna Requirement	FCC 47 CFR Part 15 Subpart C Section 15.203 FCC 47 CFR Part 15 Subpart E Section 15.407(a)(1) (2)	N/A	PASS
26 dB emission bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(2)(5)	KDB 789033 D02 v02r01 Section C.1	PASS
6 dB bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (e)	KDB 789033 D02 v02r01 Section C.2	PASS
Maximum conducted output power	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)	KDB 789033 D02 v02r01 Section E.3.a (Method PM)	PASS
Peak Power Spectral Density	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)	KDB 789033 D02 v02r01 Section F	PASS
Radiated Emissions and Band Edge Measurement	FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(4)(6) FCC 47 CFR Part 15 Subpart C Section 15.209/205	KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6	PASS
Dynamic Frequency Selection	FCC 47 CFR Part 15 Subpart E Section 15.407 (h)	KDB 905462 D03 Client Without DFS New Rules v01r02	PASS
AC Power Line Conducted Emission	FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(6) FCC 47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013, Section 6.2.	PASS
Note: 1) N/A: In this whole report not applicable.			

For Dynamic Frequency Selection

Test Case	Result
Channel Availability Check Time	N/A[1]
U-NII Detection Bandwidth	N/A[1]
Channel Closing Transmission Time	PASS
Channel Move Time	PASS
DFS Detection Threshold	N/A[1]
Non- Occupancy Period	N/A[1]
Note: 1) The EUT is slave, NA In this whole report not applicable.	

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
☒	3m Chamber & Accessory Equipment	ETS-LINDGREN	3m	N/A	Dec. 03, 2018	Dec. 03, 2021
☒	Receiver	R&S	ESIB26	100114	Nov. 18, 2020	Nov. 17, 2021
☒	Loop Antenna	ETS-LINDGREN	6502	00202525	Nov. 14, 2020	Nov. 13, 2021
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Nov. 14, 2020	Nov. 13, 2021
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	Nov. 14, 2020	Nov. 13, 2021
☒	Preamplifier	HP	8447F	2805A02960	Nov. 10, 2020	Nov. 09, 2021
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	May. 30, 2020	May. 29, 2021
☒	Pre-amplifier	ETS-LINDGREN	118385	00201874	Nov. 10, 2020	Nov. 09, 2021
☒	Horn Antenna	ETS-LINDGREN	3116C	00200180	Jun.19, 2020	Jun. 18, 2021
☒	Pre-amplifier	ETS-LINDGREN	118384	00202652	Nov. 14, 2020	Nov.13, 2021
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

Conducted Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
☒	Receiver	R&S	ESR7	1316.3003K07 -101181-K3	Nov. 18, 2020	Nov.17, 2021
☒	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Nov. 18, 2020	Nov.17, 2021
☒	LISN	R&S	ESH2-Z5	860014/024	Nov. 18, 2020	Nov.17, 2021
☒	Test Software	Audix	e3	Software Version: 9.160323		

Conducted RF test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
☒	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Nov. 10, 2020	Nov. 09, 2021
☒	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430035	Nov. 10, 2020	Nov. 09, 2021
☒	MXG X-Series RF Vector Signal Generator	KEYSIGHT	N5182B	MY51350267	Nov. 10, 2020	Nov. 09, 2021

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage	Relative Humidity (%)
NT/NV	+15 to +35	1.120V~60Hz 2.240V~50Hz	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (kPa)	Tested by
AC Power Line Conducted Emission	25.8	47.0	99.8	Tripp Jiang
26 dB emission bandwidth	25.4	52.0	100.2	Gavin Xu
Maximum conducted output power	25.4	52.0	100.2	Gavin Xu
Peak Power Spectral Density	25.4	52.0	100.2	Gavin Xu
6 dB bandwidth	25.4	52.0	100.2	Gavin Xu
Dynamic Frequency Selection	25.4	52.0	100.2	Gavin Xu
Radiated Emissions and Band Edge Measurement	25.6	52.0	100.0	Andy Lin

4.2 TEST CHANNELS

Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11a IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5150 MHz to 5250 MHz	Channel 36	Channel 44	Channel 48
		5180 MHz	5220 MHz	5240 MHz
	5250 MHz to 5350 MHz	Channel 52	Channel 60	Channel 64
		5260 MHz	5300 MHz	5320 MHz
	5470 MHz to 5725 MHz	Channel 100	Channel 116	Channel 140
		5500 MHz	5580 MHz	5700 MHz
	5725 MHz to 5850 MHz	Channel 149	Channel 157	Channel 165
		5745 MHz	5785 MHz	5825 MHz
IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5150 MHz to 5250 MHz	Channel 38	--	Channel 46
		5190 MHz	--	5230 MHz
	5250 MHz to 5350 MHz	Channel 54	--	Channel 62
		5270 MHz	--	5310 MHz
	5470 MHz to 5725 MHz	Channel 102	Channel 110	Channel 134
		5510 MHz	5550 MHz	5670 MHz
	5725 MHz to 5850 MHz	Channel 151	--	Channel 159
		5755 MHz	--	5795 MHz
IEEE 802.11ac-VHT80	5150 MHz to 5250 MHz	--	Channel 42	--
		--	5210 MHz	--
	5250 MHz to 5350 MHz	--	Channel 58	--

		--	5290 MHz	--
	5470 MHz to 5725 MHz	Channel 106	--	Channel 122
		5530 MHz	--	5610 MHz
	5725 MHz to 5850 MHz	--	Channel 155	--
		--	5775 MHz	--

4.3 EUT TEST STATUS

Mode	Tx/Rx Function	Description
IEEE 802.11a/n/ac	1Tx/1Rx	1. Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

Power Setting
Power Setting: not applicable, test used software default power level.

Test Software
Test software name: Ampak RFTestTool, VER: 7.0

4.4 PRE-SCAN

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate. Following data rate was (were) selected for the final test as listed below

Mode	Worst-case data rates
IEEE 802.11a	6 Mbps
IEEE 802.11n-HT20	MCS0
IEEE 802.11n-HT40	MCS0
IEEE 802.11ac-VHT20	MCS0
IEEE 802.11ac-VHT40	MCS0
IEEE 802.11ac-VHT80	MCS0

4.5 TEST SETUP

4.5.1 For Radiated Emissions test setup

Figure 1. Below 30MHz

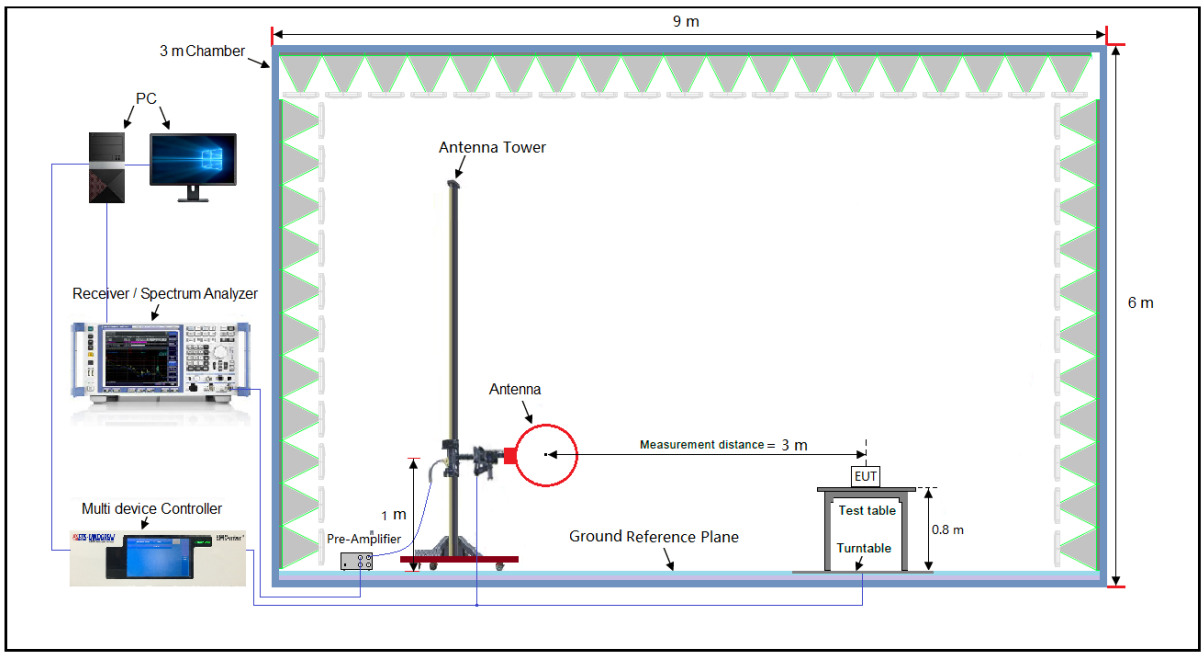


Figure 2. 30MHz to 1GHz

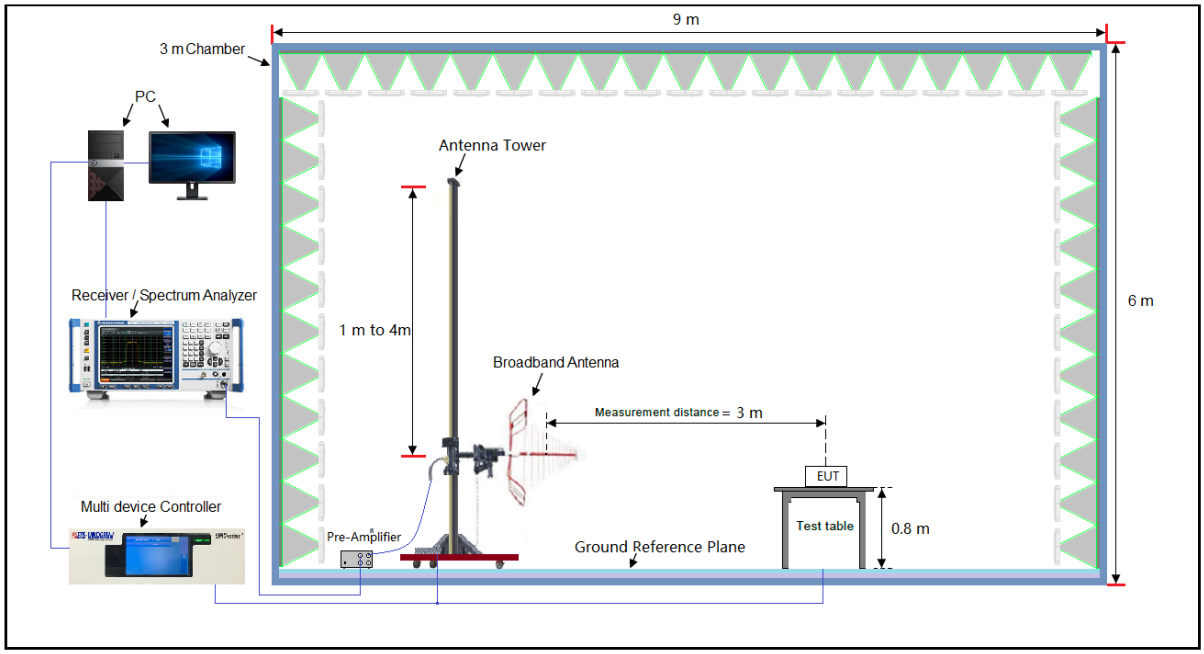
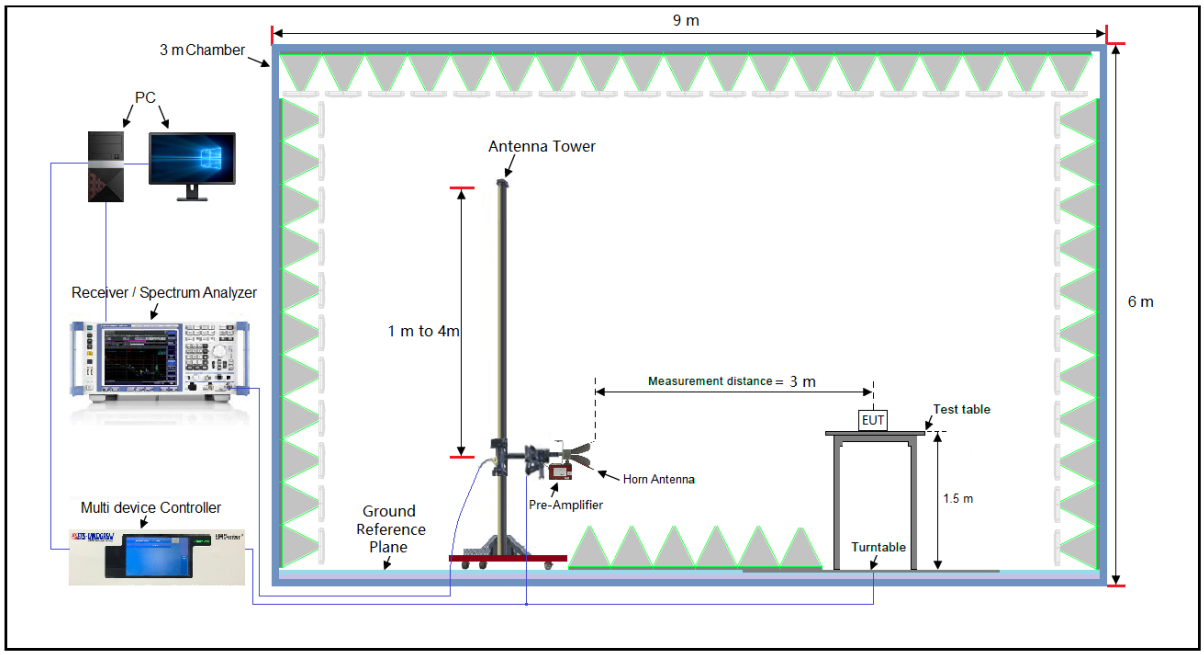
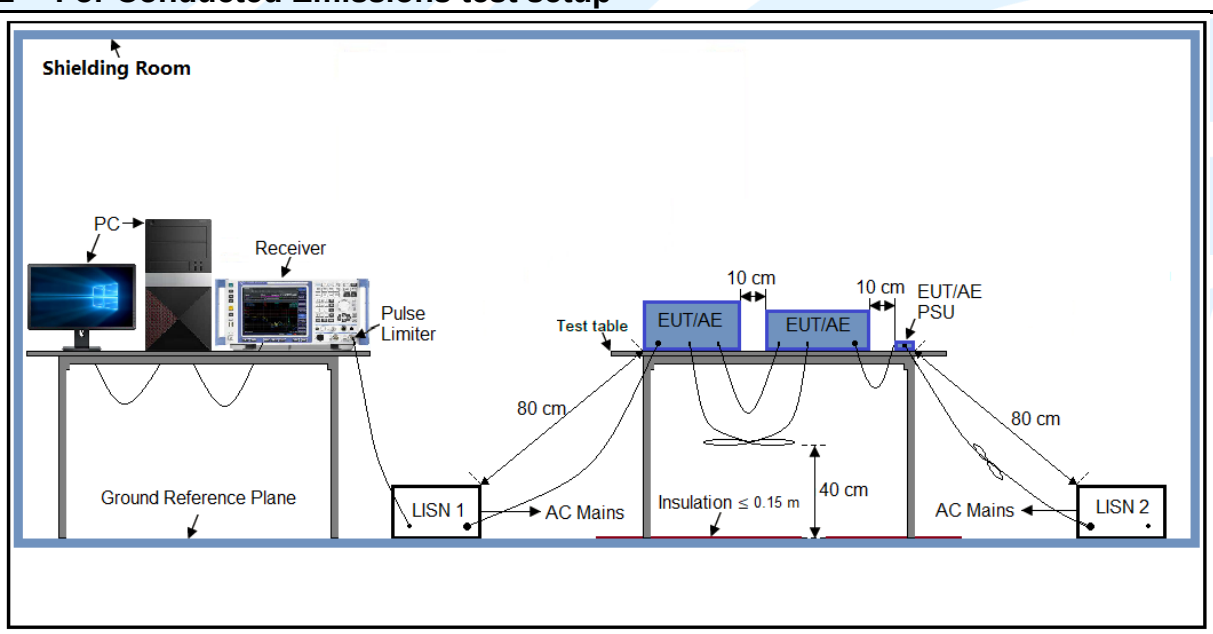


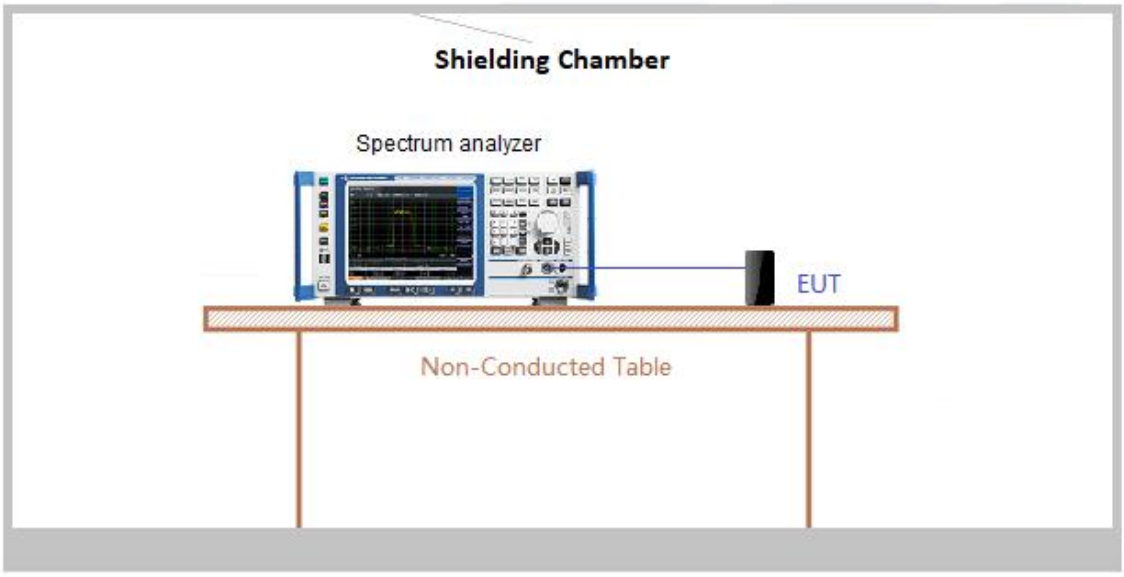
Figure 3. Above 1GHz



4.5.2 For Conducted Emissions test setup



4.5.3 For Conducted RF test setup



Normal Environment

4.6 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by 120V~ 60Hz. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Therefore, all final radiated testing was performed with the EUT in (see table below) orientation.

Frequency	Mode	Antenna Port	Worst-case axis positioning
Above 1GHz	1TX	Chain 0	Y axis

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4.7 DUTY CYCLE

Test Procedure: ANSI C63.10-2013 Clause 12.2.

Test Results

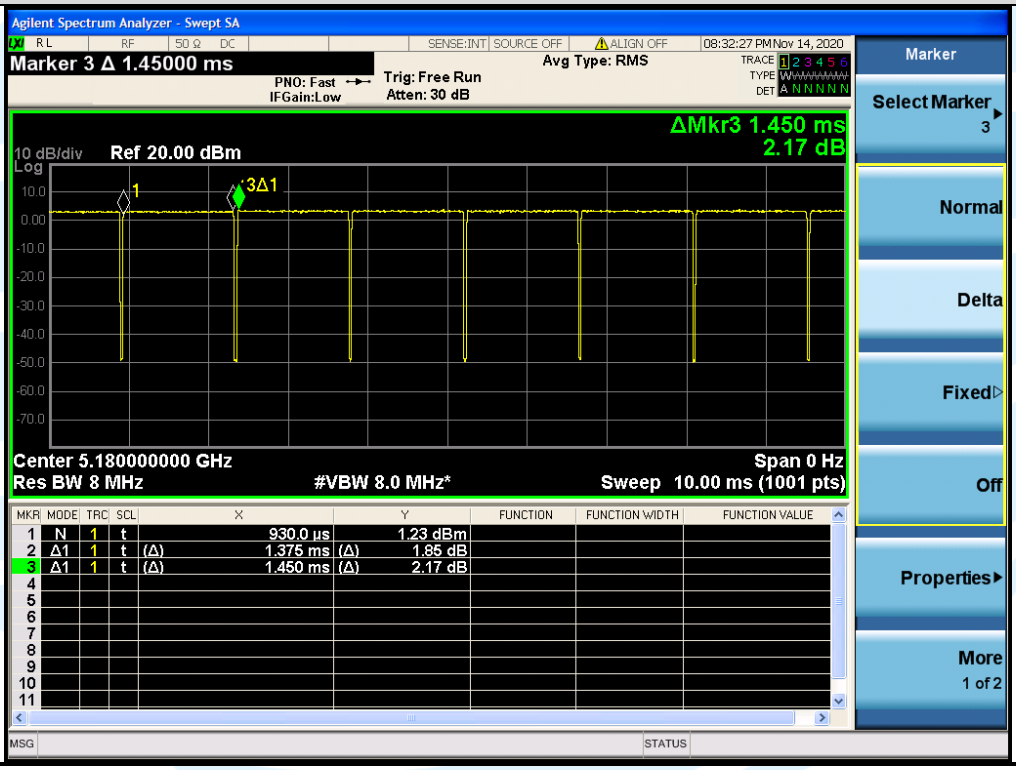
Mode	Data rates (Mbps)	On Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
IEEE 802.11a	6	1.3750	1.4500	0.95	94.83	0.23	0.73	-0.46
IEEE 802.11n-HT20	MCS0	1.2900	1.3500	0.96	95.56	0.20	0.78	-0.39
IEEE 802.11n-HT40	MCS0	0.6350	0.7200	0.88	88.19	0.55	1.57	-1.09
IEEE 802.11ac-VHT20	MCS0	1.3050	1.3600	0.96	95.96	0.18	0.77	-0.36
IEEE 802.11ac-VHT40	MCS0	0.6500	0.7350	0.88	88.44	0.53	1.54	-1.07
IEEE 802.11ac-VHT80	MCS0	0.3200	0.3650	0.88	87.67	0.57	3.13	-1.14

Remark:

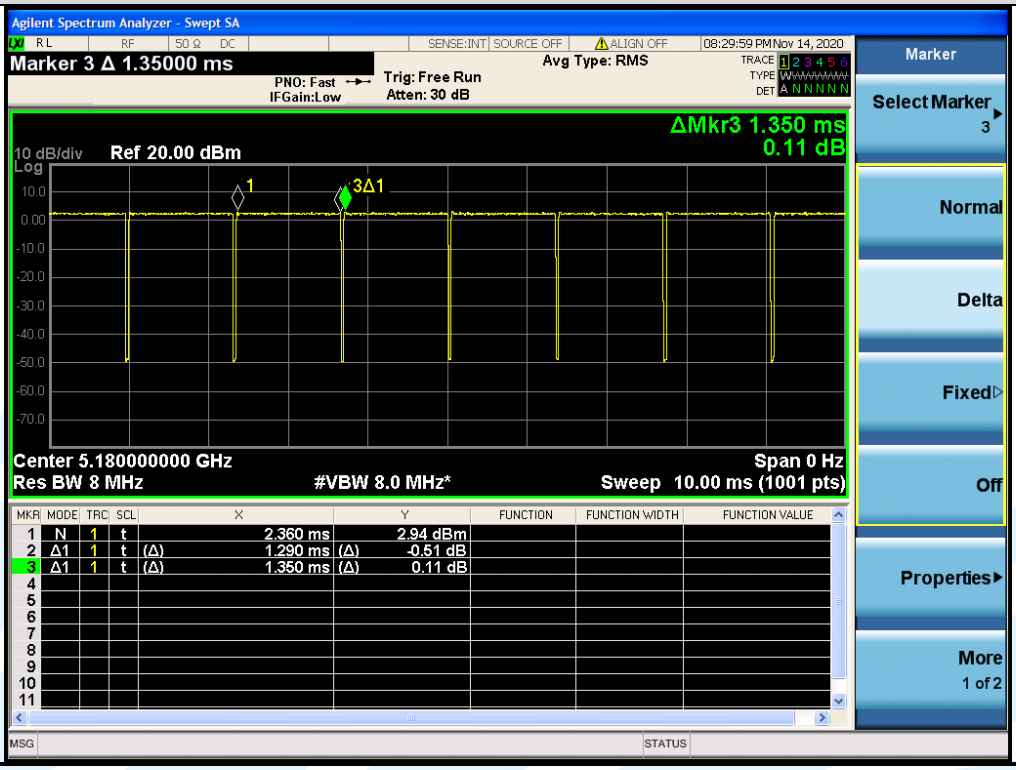
1) Duty cycle= On Time/ Period;
2) Duty Cycle factor = 10 * log(1/ Duty cycle);
3) Average factor = 20 $\log_{10}$ Duty Cycle.

The test plots as follows

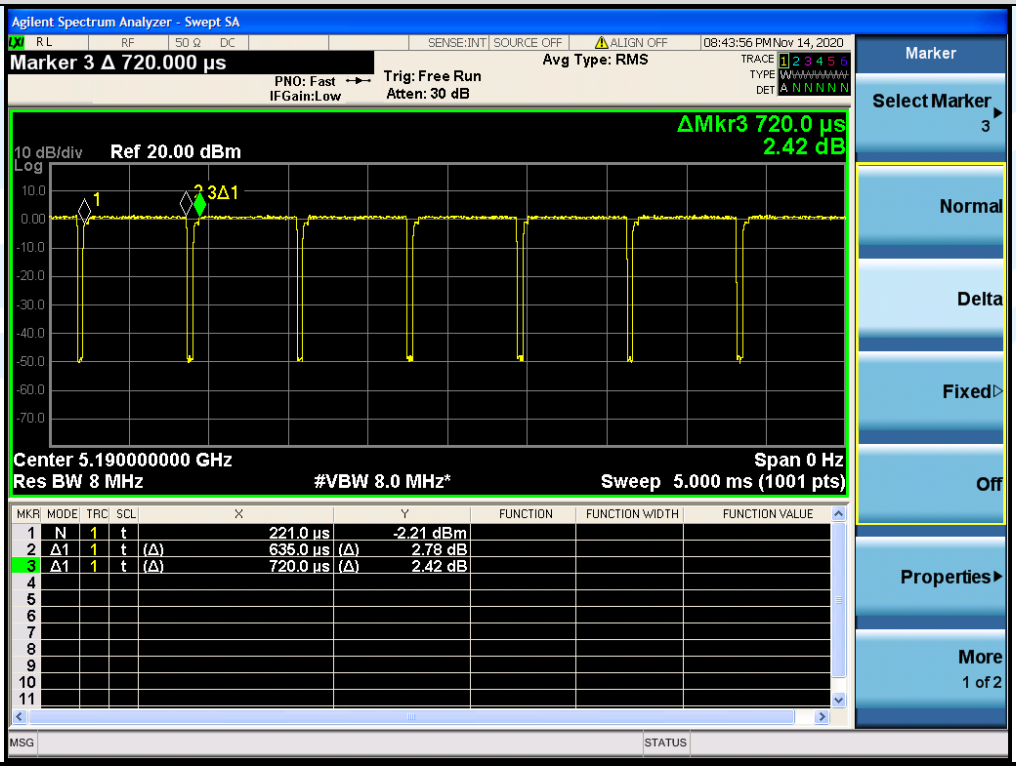
IEEE 802.11a



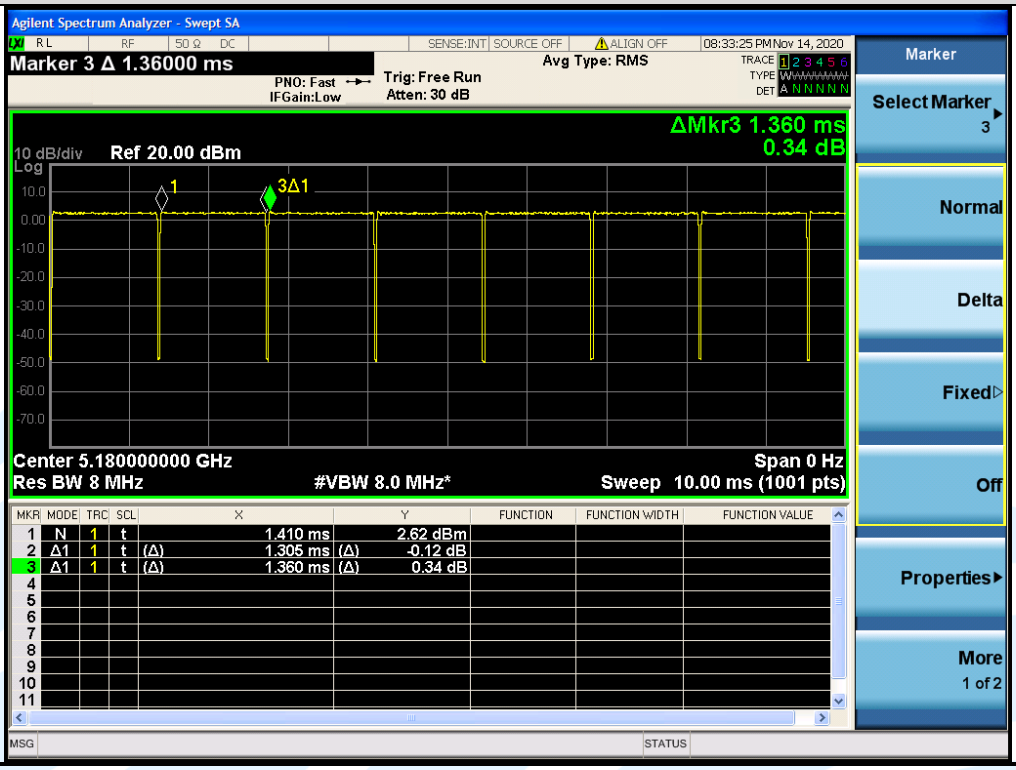
IEEE 802.11n-HT20



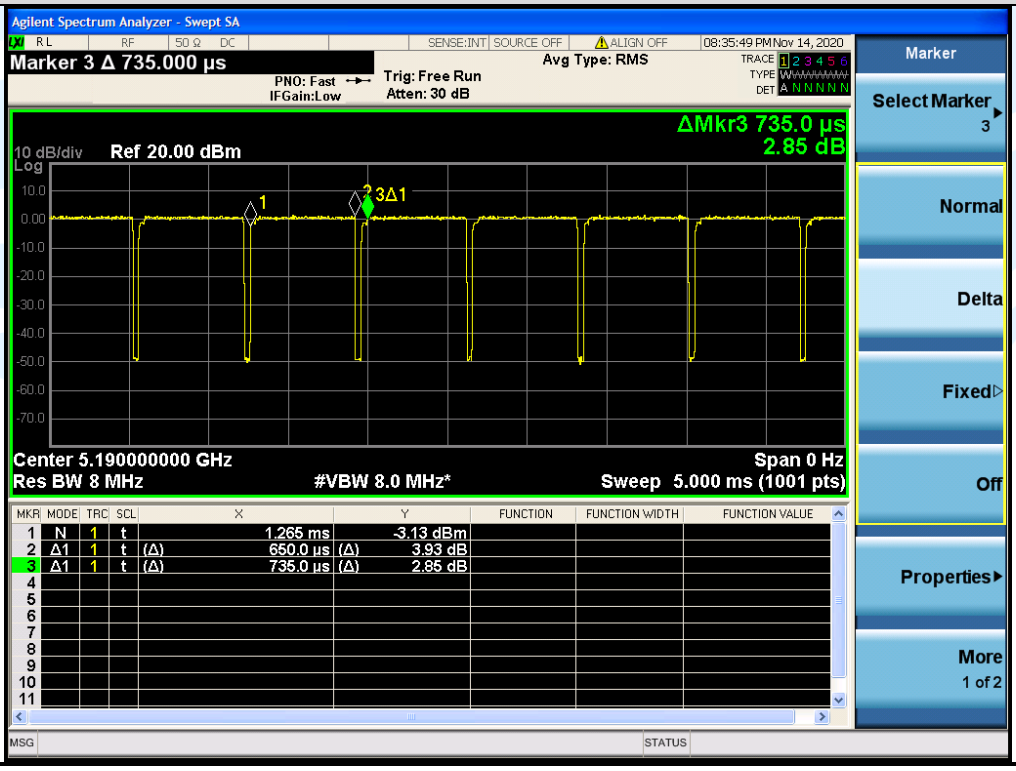
IEEE 802.11n-HT40



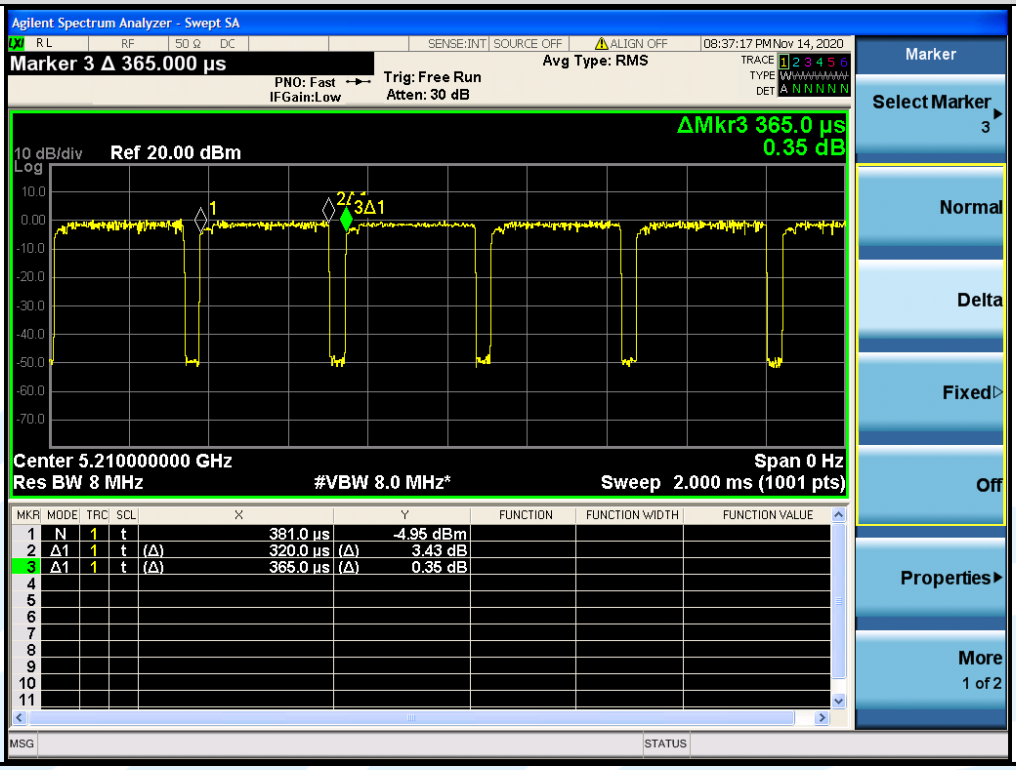
IEEE 802.11ac-VHT20



IEEE 802.11ac-VHT40



IEEE 802.11ac-VHT80



5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices
4	KDB 789033 D02 General UNII Test Procedures New Rules v02r01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15, subpart E
5	KDB 905462 D06 802.11 Channel Plans New Rules v02	Operation in U-NII bands -802.11 channel PLAN(§15.407)
6	KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02	Compliance measurement procedures for Unlicensed –National Information Infrastructure devices operates in the frequency bands 5250 MHz to 5350 MHz and 5470 MHz to 5725 MHz bands incorporating dynamic frequency selection
7	KDB 905462 D03 Client Without DFS New Rules v01r02	U-NII client devices without radar detection capability

5.2 ANTENNA REQUIREMENT

Standard Requirement
15.203 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, 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. **15.407(a)(1) (2) requirement:** The conducted output power limit specified in paragraph (a) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (a) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power and the peak power spectral density shall be reduced by the by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
EUT Antenna:
Antenna in the interior of the equipment and no consideration of replacement. The Max gain of the antenna is 0.8 dBi.

5.3 26 DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a) (2)(5)
Test Method: KDB 789033 D02 v02r01 Section C.1
Limit: None; for reporting purposes only.

Test Procedure:
The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum analyzer.

Spectrum analyzer according to the following Settings:
a) Set RBW = approximately 1 % of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.
Test Setup: Refer to section 4.5.3 for details.
Instruments Used: Refer to section 3 for details
Test Results: Pass

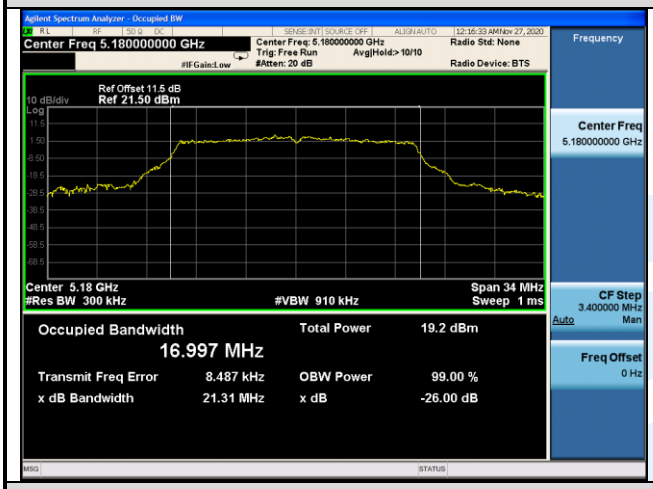
Mode	Channel	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
IEEE 802.11a	36 (5180)	21.31	16.997
	44 (5220)	29.28	17.435
	48 (5240)	29.36	17.588
	52 (5260)	28.01	17.301
	60 (5300)	28.44	17.263
	64 (5320)	27.54	17.294
	100 (5500)	27.03	17.104
	116 (5580)	26.13	17.301
	140 (5700)	26.66	17.212
IEEE 802.11n-HT20	36 (5180)	25.33	18.129
	44 (5220)	29.27	18.381
	48 (5240)	27.20	18.301
	52 (5260)	28.53	18.314
	60 (5300)	29.16	18.285
	64 (5320)	29.09	18.165
	100 (5500)	27.45	18.137
	116 (5580)	27.90	18.195
	140 (5700)	29.02	18.171
IEEE 802.11n-HT40	38 (5190)	50.66	36.327
	46 (5230)	56.61	36.615
	54 (5270)	54.06	36.448
	62 (5310)	46.24	36.353
	102 (5510)	39.93	36.315
	110 (5550)	50.39	36.501
	134 (5670)	52.22	36.407

Mode	Channel	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
IEEE 802.11ac-VHT20	36 (5180)	23.48	18.024
	44 (5220)	27.99	18.241
	48 (5240)	27.19	18.222
	52 (5260)	27.80	18.197
	60 (5300)	29.65	18.195
	64 (5320)	28.15	18.154
	100 (5500)	27.49	18.196
	116 (5580)	25.27	18.134
	140 (5700)	26.24	18.088
IEEE 802.11ac-VHT40	38 (5190)	44.77	36.337
	46 (5230)	56.13	36.495
	54 (5270)	53.02	36.485
	62 (5310)	40.55	36.403
	102 (5510)	40.45	36.310
	110 (5550)	54.43	36.530
	134 (5670)	54.21	36.507
IEEE 802.11ac-VHT80	42 (5230)	87.35	75.686
	58 (5290)	82.22	75.549
	106 (5530)	81.60	75.485
	122 (5610)	108.80	75.868

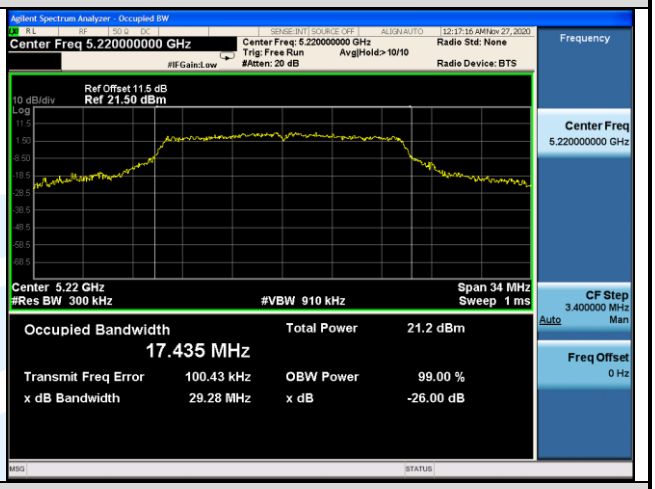
The test plots as follows:

IEEE 802.11a

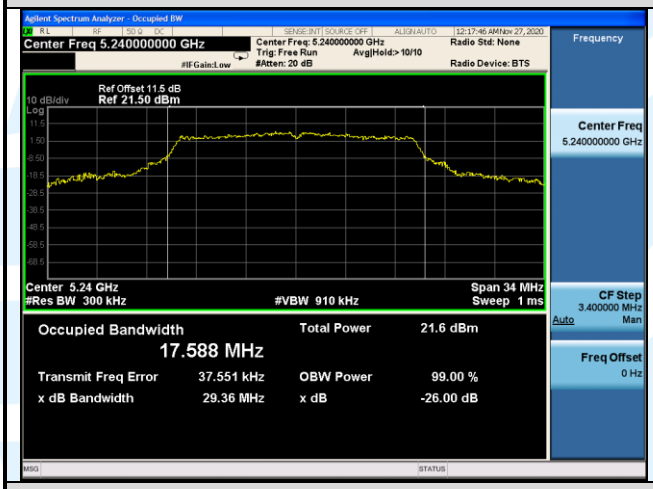
Channel 36



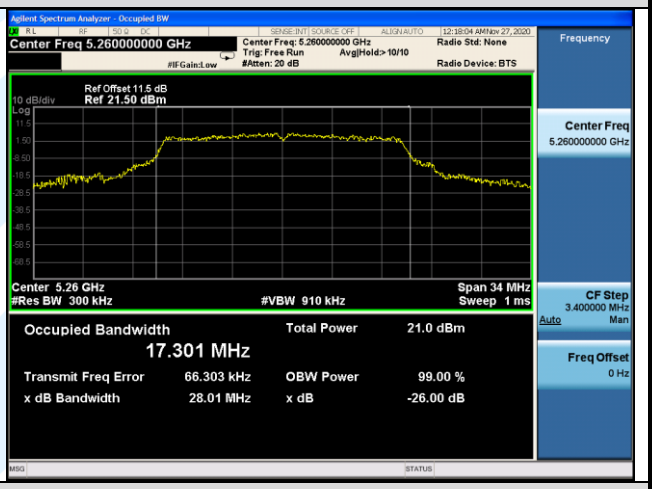
Channel 44



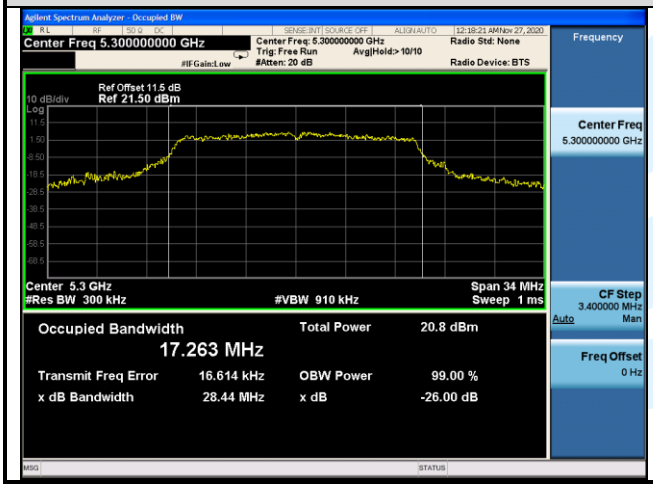
Channel 48



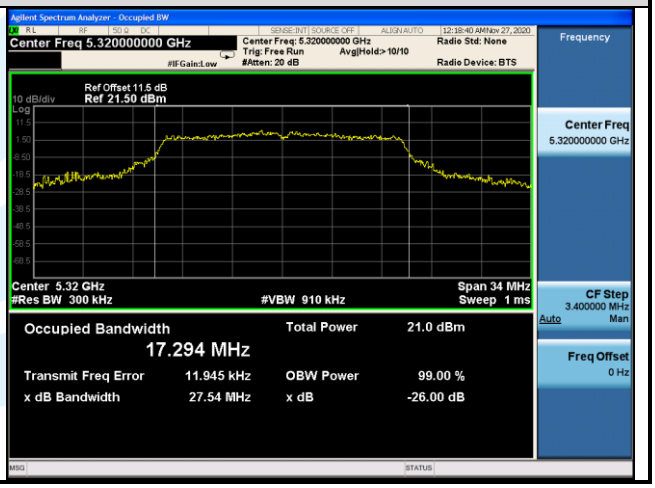
Channel 52



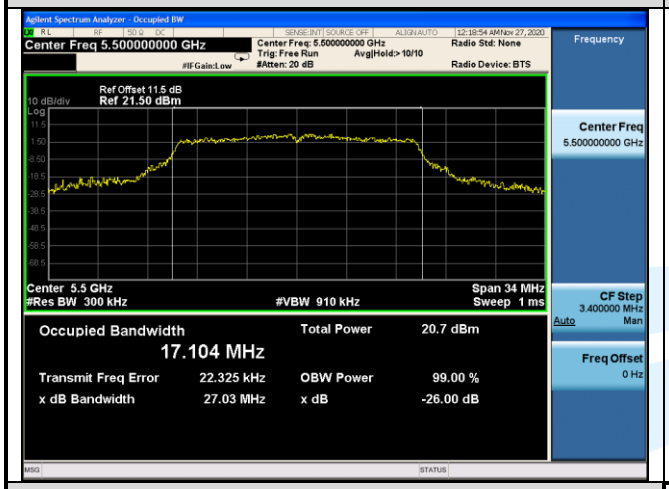
Channel 60



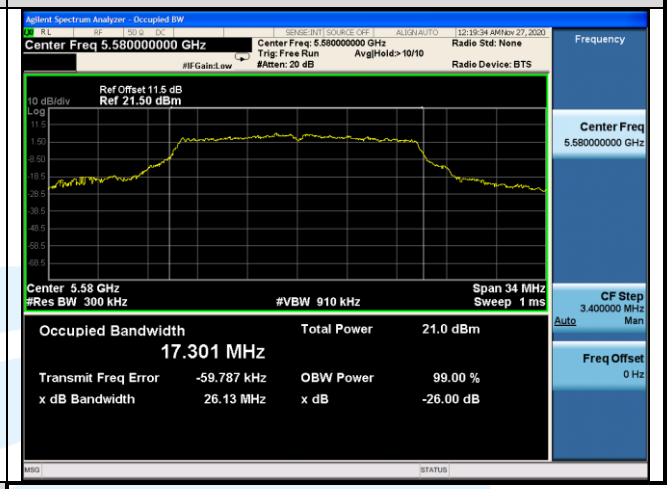
Channel 64



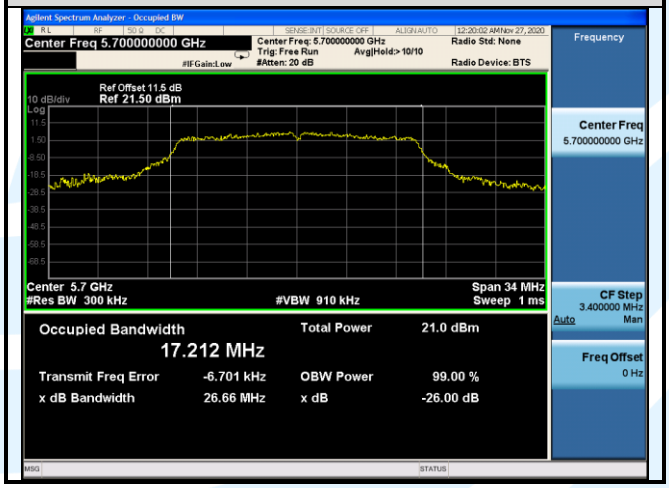
Channel 100



Channel 116

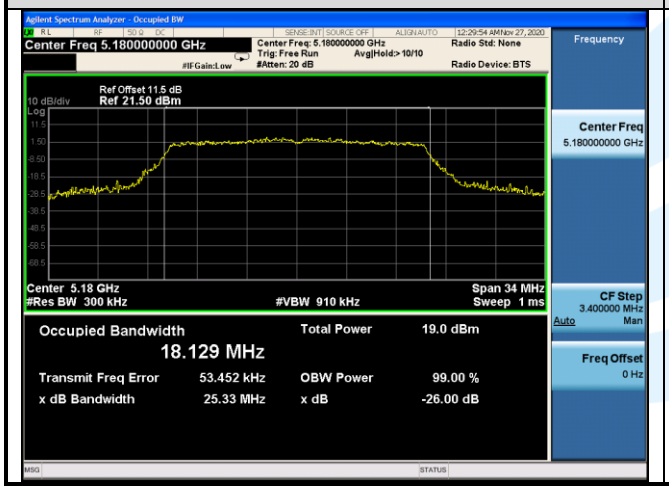


Channel 140

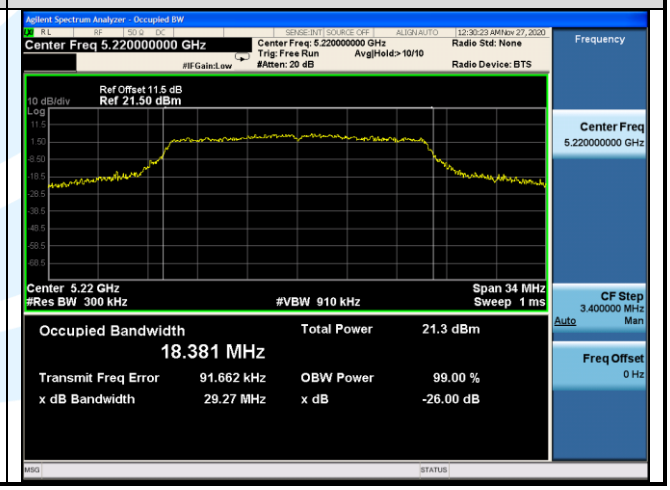


IEEE 802.11n-HT20

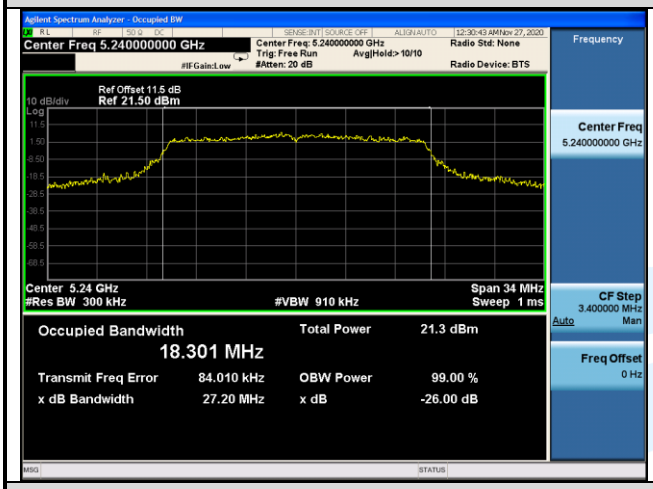
Channel 36



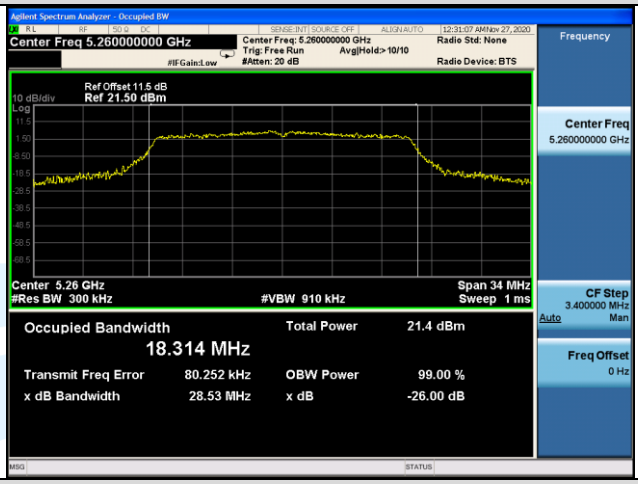
Channel 44



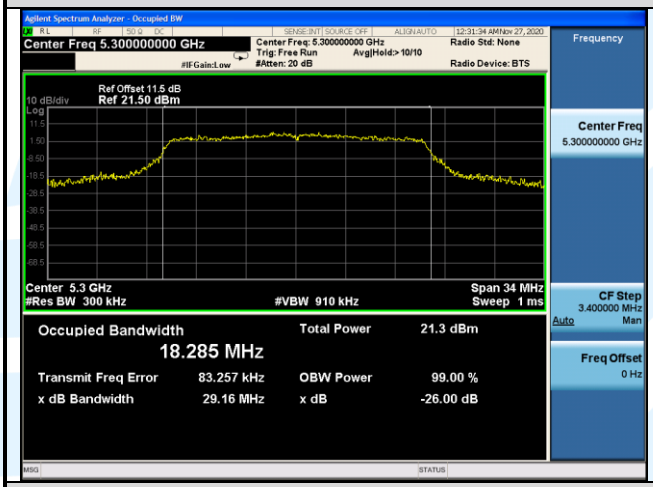
Channel 48



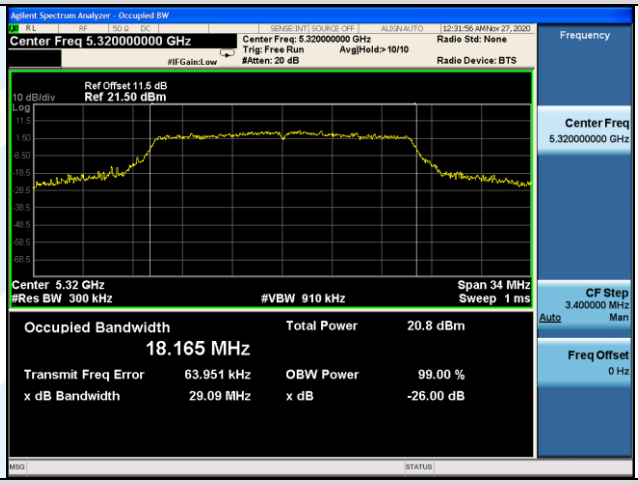
Channel 52



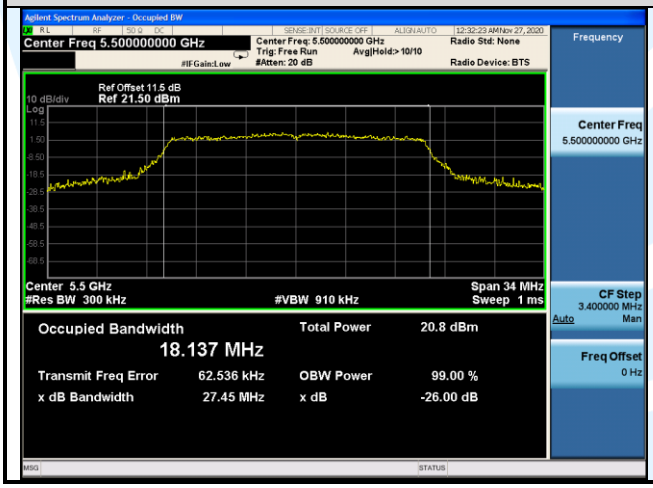
Channel 60



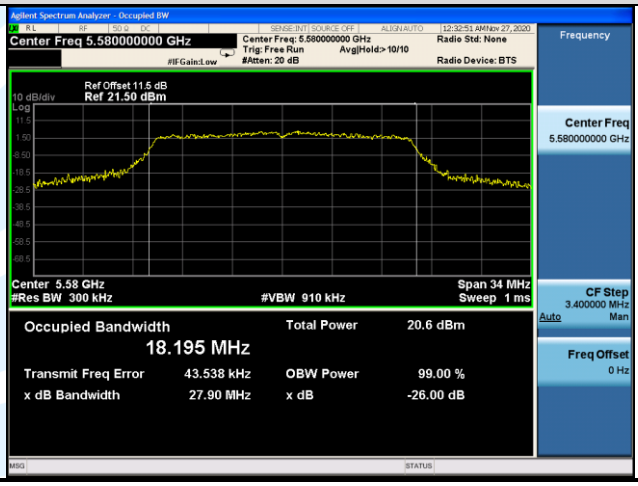
Channel 64



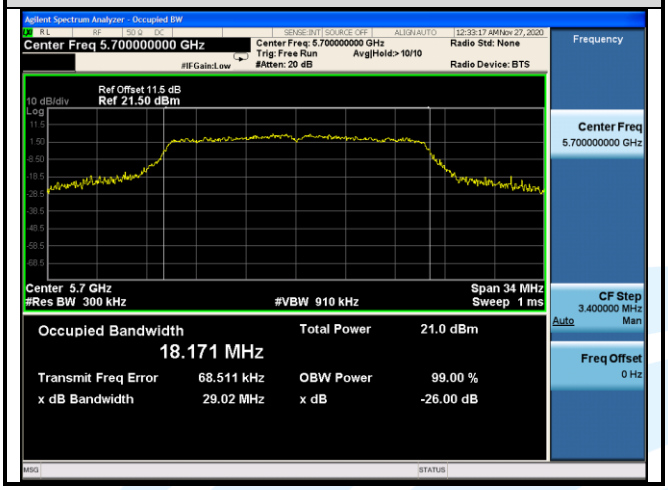
Channel 100



Channel 116

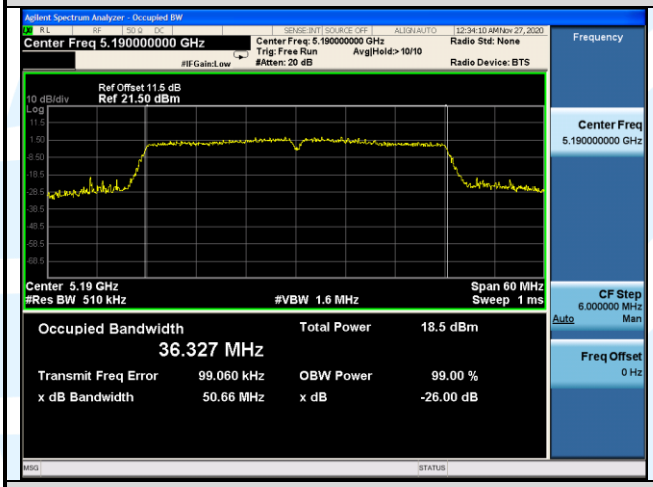


Channel 140

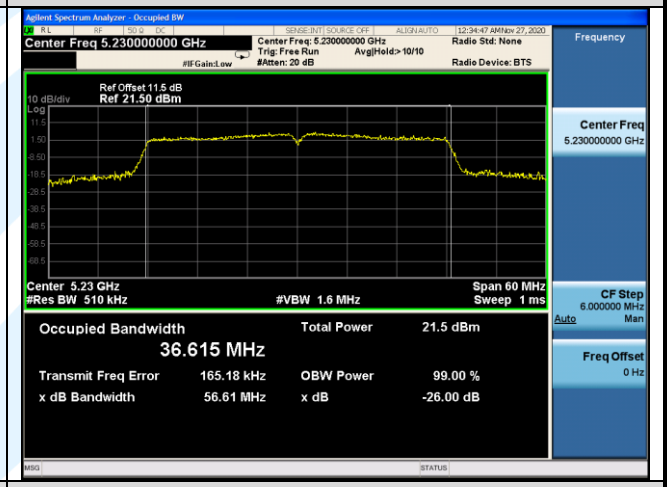


IEEE 802.11n-HT40

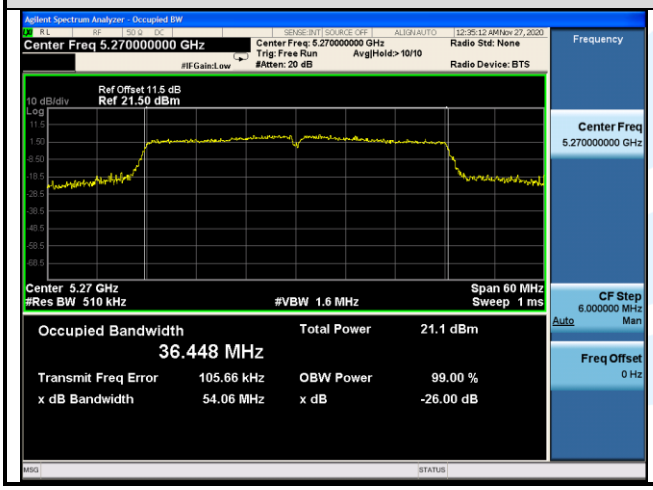
Channel 38



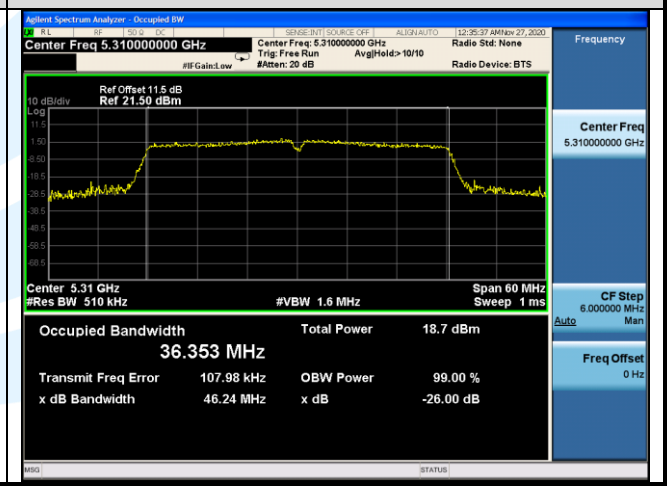
Channel 46



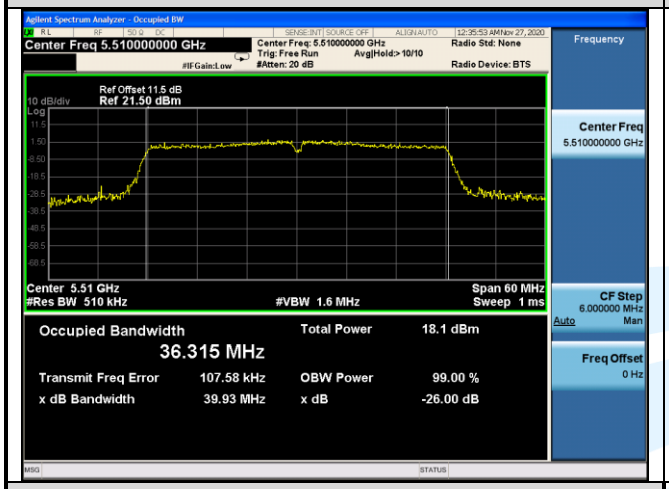
Channel 54



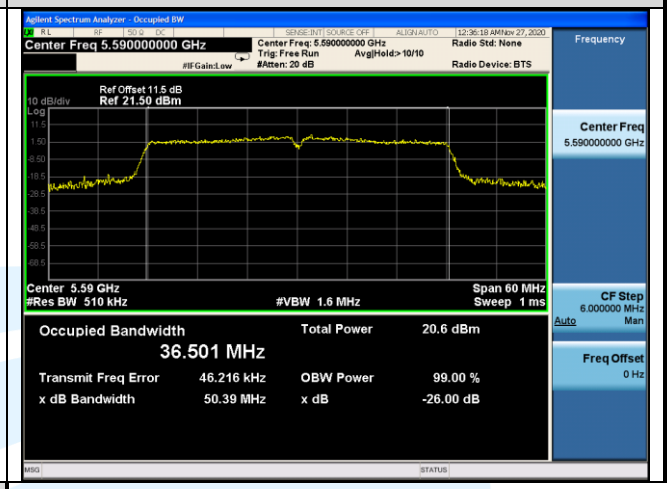
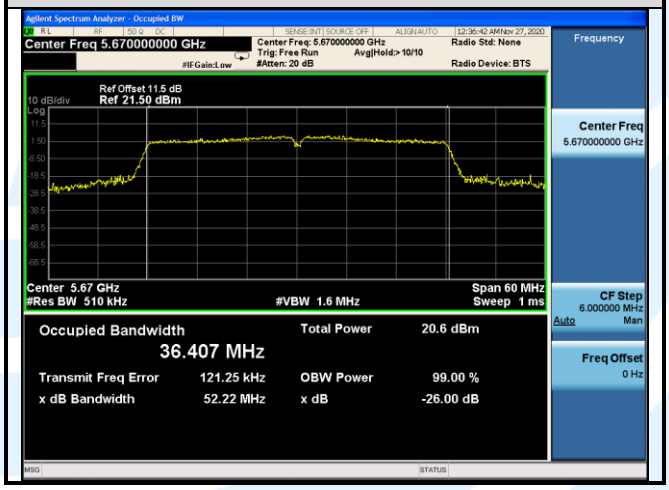
Channel 62



Channel 102



Channel 110



Channel 134