

RF Test Report

Applicant : Araknis Networks
Product Type : WAVE 2 AC WIRELESS ACCESS POINT
Trade Name : Araknis Networks
Model Number : AN-810-AP-I-AC
Applicable Standard : FCC 47 CFR PART 15 SUBPART C
ANSI C63.10:2013
Receive Date : Nov. 26, 2018
Test Period : Dec. 04, 2018 ~ Jan. 07, 2019
Issue Date : Feb. 13, 2019

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade District,
Taoyuan City 33465, Taiwan (R.O.C)
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330
Test Firm MRA designation number: TW0010

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Feb. 13, 2019	Initial Issue	Janet Chao

Verification of Compliance

Issued Date: Feb. 13, 2019

Applicant : Araknis Networks
Product Type : WAVE 2 AC WIRELESS ACCESS POINT
Trade Name : Araknis Networks
Model Number : AN-810-AP-I-AC
FCC ID : 2AG6R-AN810APIAC
EUT Rated Voltage : DC 12 V, 2 A
Test Voltage : 120 Vac / 60 Hz
Applicable Standard : FCC 47 CFR PART 15 SUBPART C
ANSI C63.10:2013
Test Result : Complied
Performing Lab. : A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade District,
Taoyuan City 33465, Taiwan (R.O.C)
Tel : +886-3-2710188 / Fax : +886-3-2710190
Taiwan Accreditation Foundation accreditation number: 1330
<http://www.atl-lab.com.tw/e-index.htm>



A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By : Fly Lu Reviewed By : Eric Ou Yang
(Manager) (Fly Lu) (Testing Engineer) (Eric Ou Yang)

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1 General Information

1.1 Summary of Test Result

Standard	Item	Result	Remark
FCC			
15.207	AC Power Conducted Emission	PASS	-----
15.247(d)	Transmitter Radiated Emissions	PASS	-----
15.247(b)(3)	Max. Output Power	PASS	-----
15.247(a)(2)	6 dB RF Bandwidth	PASS	-----
15.247(e)	Maximum Power Spectral Density	PASS	-----
15.247(d)	Out of Band Conducted Spurious Emission	PASS	-----
15.203	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report.

Standard	Description
CFR47, Part 15, Subpart C	Intentional Radiators
ANSI C63. 10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074 D01 v05	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES
KDB 662911 D01 v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)

1.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conducted Emission	9 kHz ~ 150 kHz	2.7
	150 kHz ~ 30 MHz	2.7
Radiated Emission	9 kHz ~ 30 MHz	1.7
	30 MHz ~ 1000 MHz	5.7
	1000 MHz ~ 18000 MHz	5.5
	18000 MHz ~ 26500 MHz	4.8
	26500 MHz ~ 40000 MHz	4.8
Conducted Output Power	+0.27 dB / -0.28 dB	
RF Bandwidth	4.96 %	
Power Spectral Density	+0.71 dB / -0.77 dB	

2 EUT Description

Applicant	Araknis Networks 1800 Continental Blvd. Suite 300, Charlotte, North Carolina, 28273, United States			
Manufacturer	Emplus Technologies Inc. No. 42, Sec. 1, Minsheng N. Rd., Guishan Dist., Taoyuan City 333, Taiwan			
Product Type	WAVE 2 AC WIRELESS ACCESS POINT			
Trade Name	Araknis Networks			
Model Number	AN-810-AP-I-AC			
FCC ID	2AG6R-AN810APIAC			
Operate Freq. Band	Frequency Range (MHz)	Modulation	Channel Bandwidth	Data Rate 400 GI (ns)
IEEE 802.11b	2412 ~ 2462	DSSS	20 MHz	Up to 11 Mbps
IEEE 802.11g	2412 ~ 2462	OFDM	20 MHz	Up to 54 Mbps
IEEE 802.11n 2.4 GHz 20 MHz	2412 ~ 2462	OFDM (256QAM)	20 MHz	Up to 346.8 Mbps
IEEE 802.11n 2.4 GHz 40 MHz	2422 ~ 2452	OFDM (256QAM)	40 MHz	Up to 800 Mbps
Antenna information	ANT	Model Number	Type	Max. Gain (dBi)
	ANT-0	5718A0346300	Metal PIFA Antenna	2.86
	ANT-1	5718A0347300	Metal PIFA Antenna	3.12
	ANT-2	5718A0348300	Metal PIFA Antenna	3.14
	ANT-3	5718A0349300	Metal PIFA Antenna	3.29
	G_{ANT}			3.11
Antenna Delivery	See section 3.1			
Operate Temp. Range	0 ~ +50 °C			

Frequency Band	Max. RF Output Power (W)
IEEE 802.11b	0.487
IEEE 802.11g	0.650
IEEE 802.11n 2.4 GHz 20 MHz	0.902
IEEE 802.11n 2.4 GHz 40 MHz	0.899

Beamforming on

Frequency Band	Max. RF Output Power (W)
IEEE 802.11n 2.4 GHz 20 MHz	0.354
IEEE 802.11n 2.4 GHz 40 MHz	0.186

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit mode
Mode 2: IEEE 802.11b Continuous TX mode
Mode 3: IEEE 802.11g Continuous TX mode
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

Test Mode	ANT-0	ANT-1	ANT-2	ANT-3	ANT-0+1+2+3
Mode 2	V	V	V	V	V
Mode 3	V	V	V	V	V
Mode 4	V	V	V	V	V
Mode 5	V	V	V	V	V

Test Mode	Antenna Delivery	Data Rate	Test Channel
Mode 2	4TX (CDD)	1 M	1, 6, 11
Mode 3	4TX (CDD)	6 M	1, 6, 11
Mode 4	4TX (STBC/Beamforming on)	26 M	1, 6, 11
Mode 5	4TX (STBC/Beamforming on)	54 M	3, 6, 9

Duty cycle

Test Mode	Frequency (MHz)	on time (ms)	on+off time (ms)	Duty cycle	Duty Factor (dB)	1/T Minimum VBW (kHz)
Mode 2	2412	12.240	12.290	0.996	0.018	0.010
Mode 3	2412	2.050	2.100	0.976	0.105	0.488
Mode 4	2412	5.010	5.040	0.994	0.026	0.010
Mode 5	2422	2.450	2.500	0.980	0.088	0.408

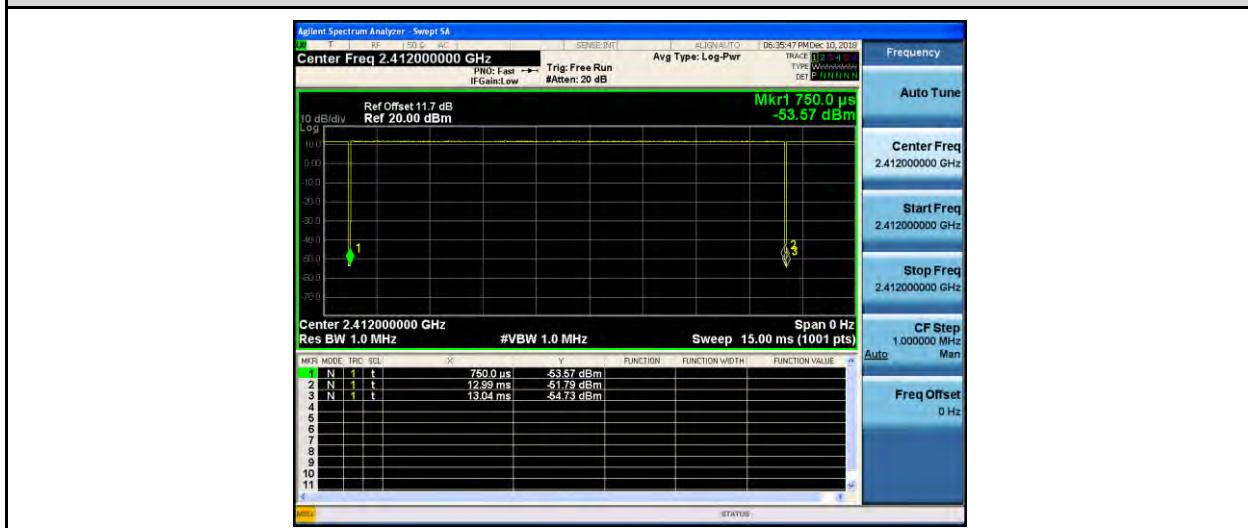
Beamforming on

Duty cycle

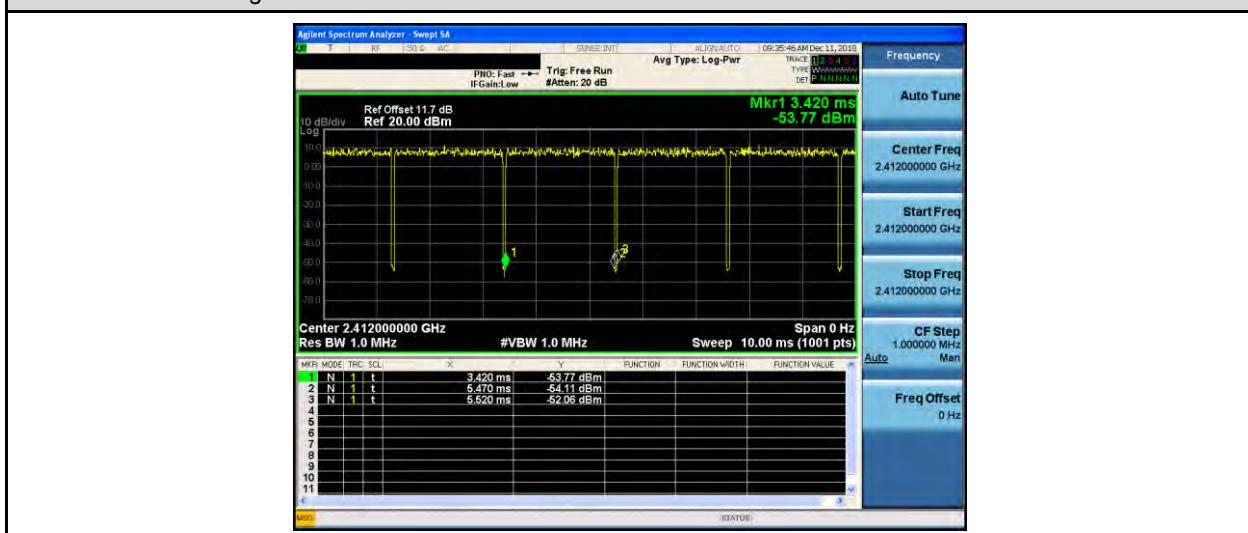
Test Mode	Frequency (MHz)	on time (ms)	on+off time (ms)	Duty cycle	Duty Factor (dB)	1/T Minimum VBW (kHz)
Mode 4	2412	5.015	5.055	0.992	0.035	0.010
Mode 5	2422	2.445	2.495	0.980	0.088	0.409

Duty Cycle Graphs

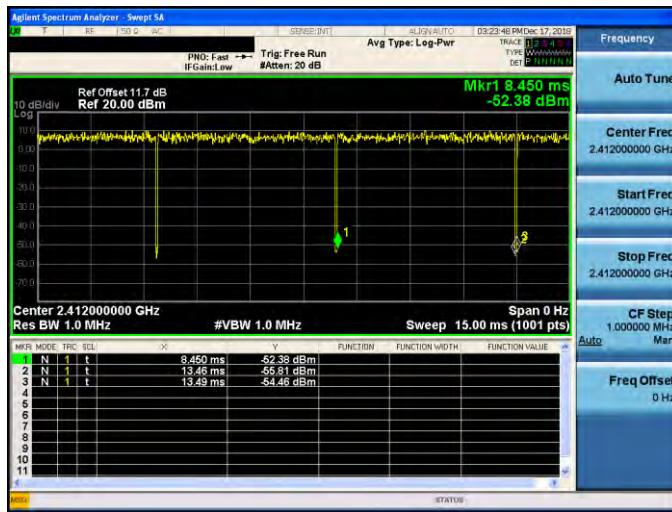
Mode 2: IEEE 802.11b Continuous TX mode



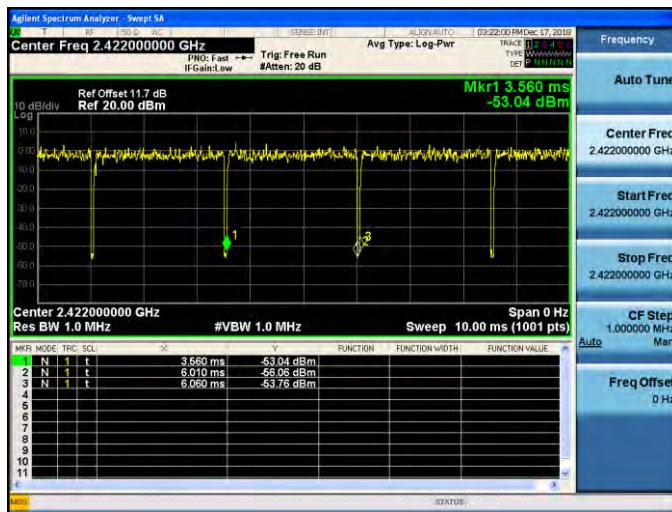
Mode 3: IEEE 802.11g Continuous TX mode



Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode



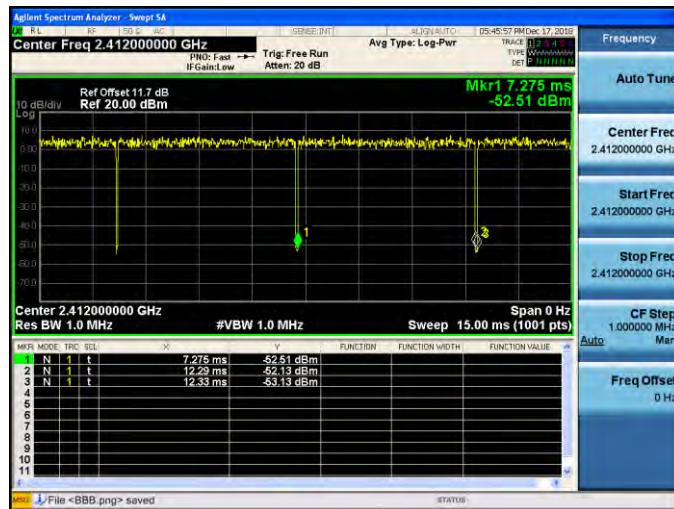
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode



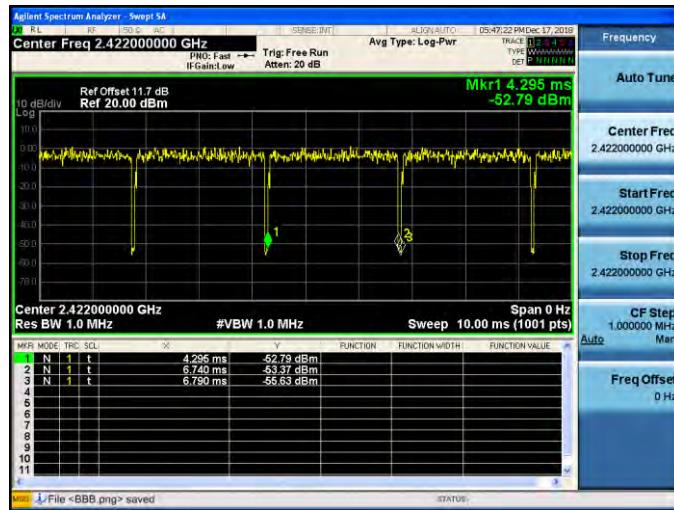
Beamforming on

Duty Cycle Graphs

Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode



Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode

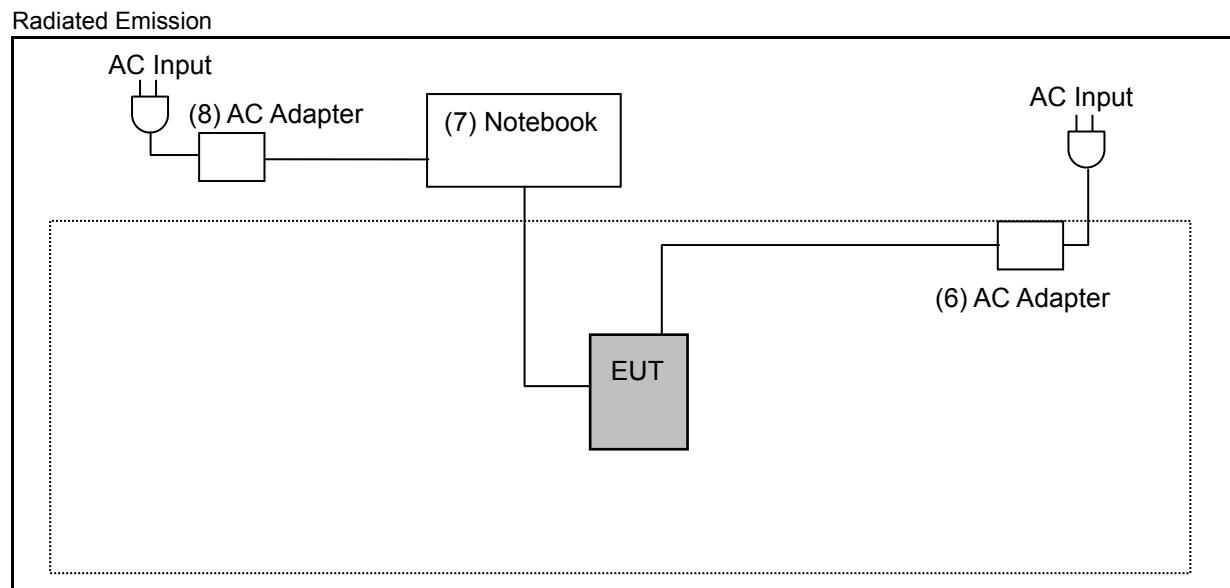
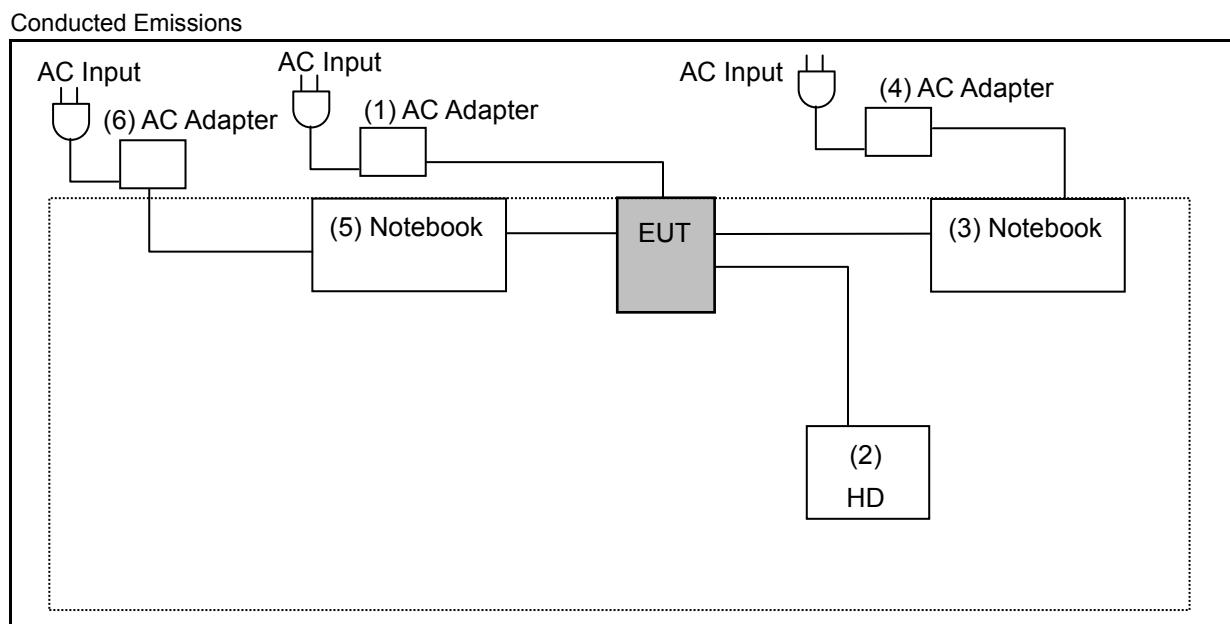


3.2. EUT Test Step

1.	Setup the EUT shown on "Configuration of Test System Details".
2.	Turn on the power of all equipment.
3.	Turn on TX function
4.	EUT run test program.

Measurement Software			
No.	Description	Software	Version
1	Conducted Emission	EZ EMC	1.1.4.3
2	Radiated Emission	EZ EMC	1.1.4.4

3.3. Configuration of Test System Details





Devices Description						
Product		Manufacturer	Model Number	Serial Number	Power Cord	Remark
(1)	AC Adapter	Powertron Electronics Corp.	PA1024-120HUB200	---	Non-Shielded, 1.5 m	Input: 100-240 VAC, 50-60 Hz, 0.6 A Output: 12 V, 2 A
(2)	HD	Transcend	TS1TSJ25A3K-RU	D72654-0611	---	---
(3)	Notebook	DELL	LATITUDE E6440	5HZBD72	---	---
(4)	AC Adapter	DELL	HA65NM130	---	Non-Shielded, 1.7 m	---
(5)	Notebook	DELL	LATITUDE E6440	48GBD72	---	---
(6)	AC Adapter	DELL	HA65NM130	---	Non-Shielded, 0.8 m	---
(7)	Notebook	HP	PROBOOK 4421s	CNF1182X1G	---	---
(8)	AC Adapter	HP	Series PPP012H-S	---	Non-shielded, 1.7 m	---

3.4. Test Instruments

For Conducted Emission

Test Period: Jan. 07, 2019

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Test Receiver	R&S	ESCI	100367	05/21/2018	1 year
LISN	R&S	ENV216	101040	04/11/2018	1 year
LISN	R&S	ENV216	101041	03/23/2018	1 year
RF Cable	Woken	00100D1380194M	TE-02-03	05/17/2018	1 year

For Radiated Emissions

Test Period: Dec. 04 ~ Dec. 05, 2018

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Spectrum Analyzer (10 Hz~44 GHz)	Keysight	N9010A	MY52221312	01/15/2018	1 year
Pre Amplifier (1~26.5 GHz)	Agilent	8449B	3008A02237	10/16/2018	1 year
Pre Amplifier (100 kHz~1.3 GHz)	Agilent	8447D	2944A11119	01/10/2018	1 year
Broadband Antenna	Schwarzbeck	VULB9168	416	10/19/2018	1 year
Horn Antenna (1~18 GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	08/23/2018	1 year
Horn Antenna (18~40 GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	08/07/2018	1 year
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	03/13/2018	1 year
RF Cable	EMCI	EMC104-N-N-6000	TE01-1	02/20/2018	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1 3000	170814	10/30/2018	1 year
Microwave Cable	EMCI	EMC102-KM-KM-1 4000	151001	02/20/2018	1 year

Note: N.C.R. = No Calibration Request.

For Conducted

Test Period: Dec. 10 ~ Dec. 17, 2018

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Power Sensor	Anritsu	MA2411B	1126022	08/29/2018	1 year
Power Meter	Anritsu	ML2495A	1135009	08/29/2018	1 year
Spectrum Analyzer (3 Hz~50 GHz)	Agilent	N9030A	MY53120541	01/02/2018	1 year
Microwave Cable	EMCI	EMC102-SM-SM15 00	001	11/21/2018	1 year

Note: N.C.R. = No Calibration Request.

3.5. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	990

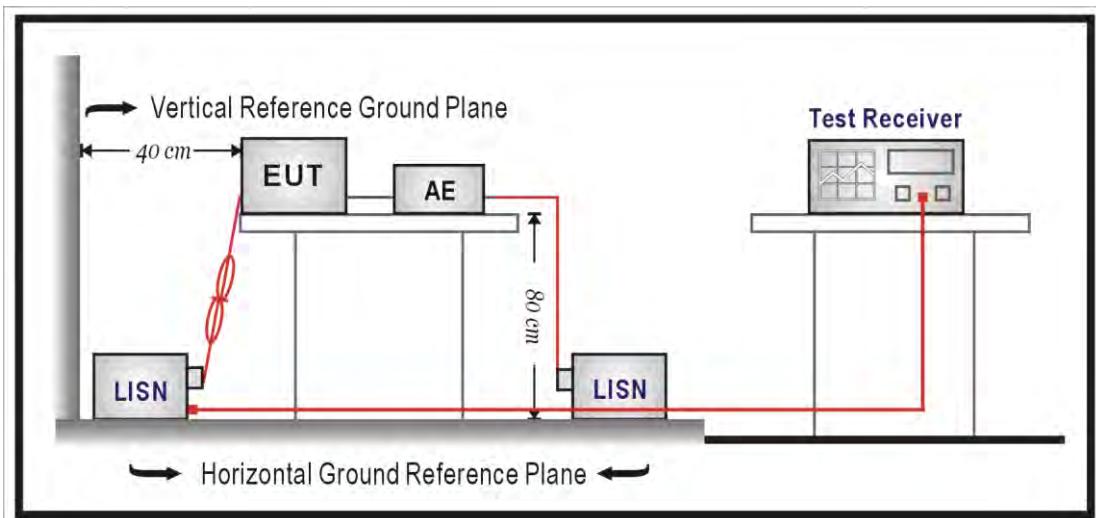
4 Measurement Procedure

4.1. AC Power Line Conducted Emission Measurement

■ Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

■ Test Setup



■ Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a $50 \Omega // 50 \mu\text{H}$ coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a $50 \Omega // 50 \mu\text{H}$ coupling impedance with 50 ohm termination.

Tabletop device shall be placed on a non-conducting platform, of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The wall of screened room shall be located 40 cm to the rear of the EUT. Other surfaces of tabletop or floor standing EUT shall be at least 80 cm from any other ground conducting surface including one or more LISNs. For floor-standing device shall be placed under the EUT with a 12 mm insulating material.

Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a resolution bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1, as applicable, including the average limit and the quasi-peak limit when using respectively, an average detector and quasi-peak detector measured in accordance with the methods described of related standard. When all of peak value were complied with quasi-peak and average limit from 150 kHz to 30 MHz then quasi-peak and average measurement was unnecessary.

The AMN shall be placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for AMNs mounted on top of the ground reference plane. This distance is between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8 m from the AMN. If the mains power cable is longer than 1 m then the cable shall be folded back and forth at the centre of the lead to form a bundle no longer than 0.4 m. All of interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long. All of EUT and AE shall be separate place more than 0.1 m. All 50Ω ports of the LISN shall be resistively terminated into 50Ω loads when not connected to the measuring instrument.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

4.2. Radiated Emission Measurement

■ Limit

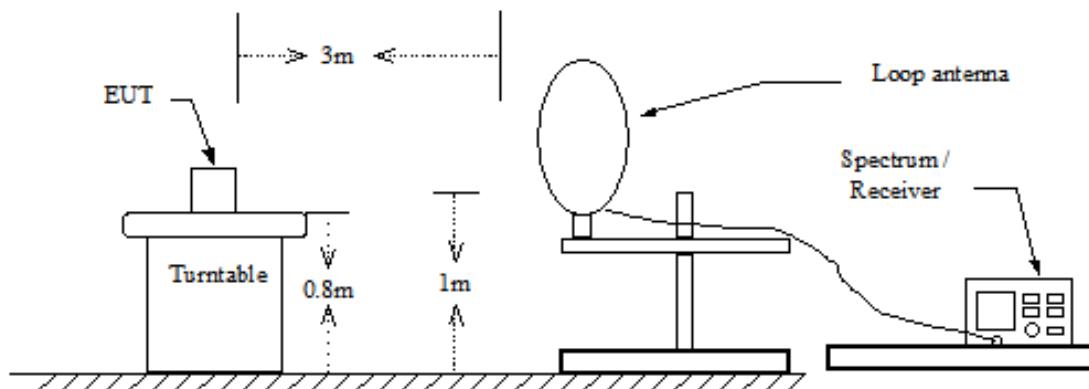
According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μ V/m at meter)	Measurement Distance (meters)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

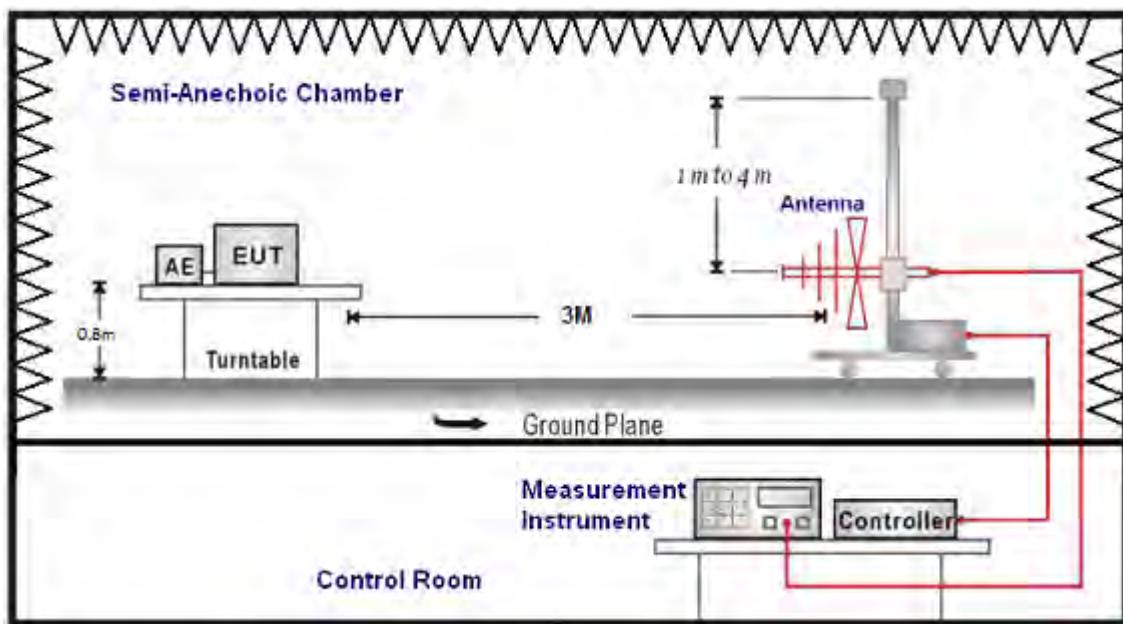
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

■ Setup

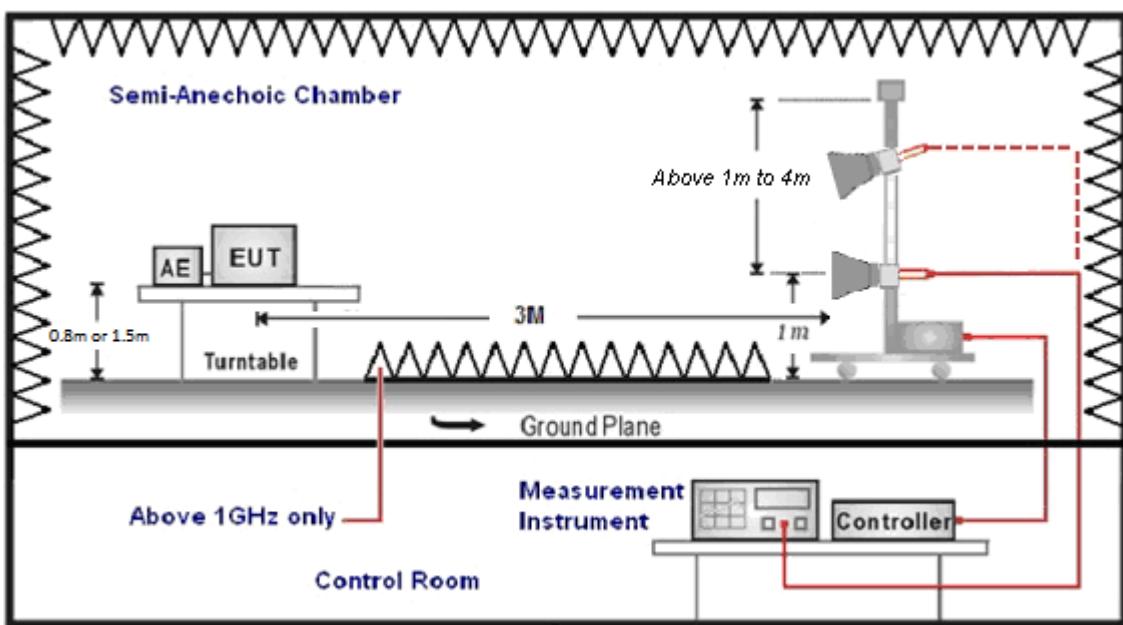
9 kHz ~ 30 MHz



Below 1 GHz



Above 1 GHz



■ Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 or 1.5 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 3 MHz for peak measurements and 10 Hz for average measurements when Duty cycle $>0.98 / 1/T$ for average measurements when Duty cycle <0.98 . A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna was used in frequencies 1 –26.5 GHz at a distance of 3 meter. The antenna at an angle toward the source of the emission. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20 dB/decade).

For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dB_{uV}) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dB_{uV/m}).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

- (1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

- (2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30 dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.

4.3. Maximum Conducted Output Power Measurement

■ Limit

For systems using digital modulation in the 2400-2483.5 MHz, the limit for maximum output power is 30 dBm.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

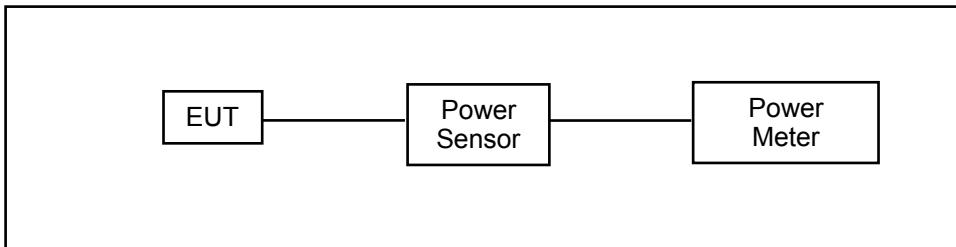
STBC/CDD mode :

- * Directional Gain = $G_{ANT} = 10 \cdot \log\{[10^{(G1/10)} + 10^{(G2/10)} + \dots + 10^{(Gn/10)}]/NANT\} = 3.11 \text{ dBi} < 6 \text{ dBi}$
power limit shall be reduced = $30 - 0 = 30 \text{ dBm}$

Beamforming on mode :

- * Directional Gain = $10 \cdot \log\{[10^{(G1/20)} + 10^{(G2/20)} + \dots + 10^{(Gn/20)}]^2/NANT\} = 9.12 \text{ dBi} > 6 \text{ dBi}$
power limit shall be reduced = $30 - 3.12 = 26.88 \text{ dBm}$

■ Test Setup



■ Test Procedure

The testing follows the Measurement Procedure of ANSI C63.10:2013 section 11.9.2.3.2 Method AVGPM.

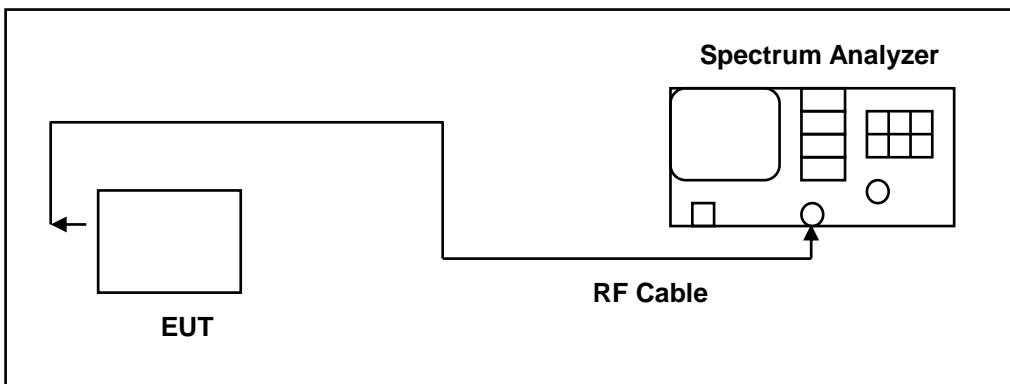
The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor.

4.4. 6 dB RF Bandwidth Measurement

- **Limit**

6 dB RF Bandwidth: Systems using digital modulation techniques may operate in the 2400–2483.5 MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.

- **Test Setup**



- **Test Procedure**

The EUT tested to DTS test procedure of ANSI C63.10:2013 section 11.8.2 option2 for compliance to FCC 47CFR 15.247 requirements.

6 dB RF Bandwidth: The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels (Channel low, middle, high)

4.5. Maximum Power Spectral Density Measurement

■ Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

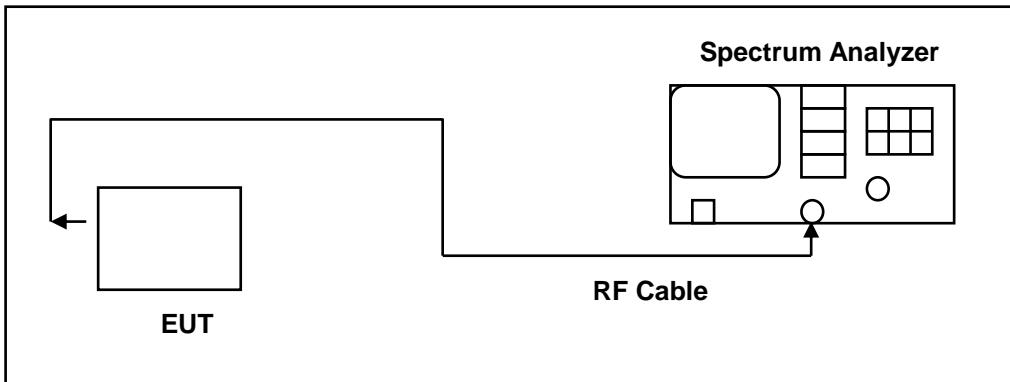
STBC mode :

- * Directional Gain = $G_{ANT} = 10 \cdot \log \{ [10^{(G1/10)} + 10^{(G2/10)} + \dots + 10^{(Gn/10)}] / N_{ANT} \} = 3.11 \text{ dBi} < 6 \text{ dBi}$
power limit shall be reduced = $8 - 0 = 8 \text{ dBm}/3 \text{ kHz}$

CDD/Beamforming on mode :

- * Directional Gain = $10 \cdot \log \{ [10^{(G1/20)} + 10^{(G2/20)} + \dots + 10^{(Gn/20)}]^2 / N_{ANT} \} = 9.12 \text{ dBi} > 6 \text{ dBi}$
power limit shall be reduced = $8 - 3.12 = 4.88 \text{ dBm}/3 \text{ kHz}$

■ Test Setup



■ Test Procedure

The EUT tested to DTS test procedure of ANSI C63.10:2013 section 11.10.2 Method PKPSD for compliance to FCC 47CFR 15.247 requirements.

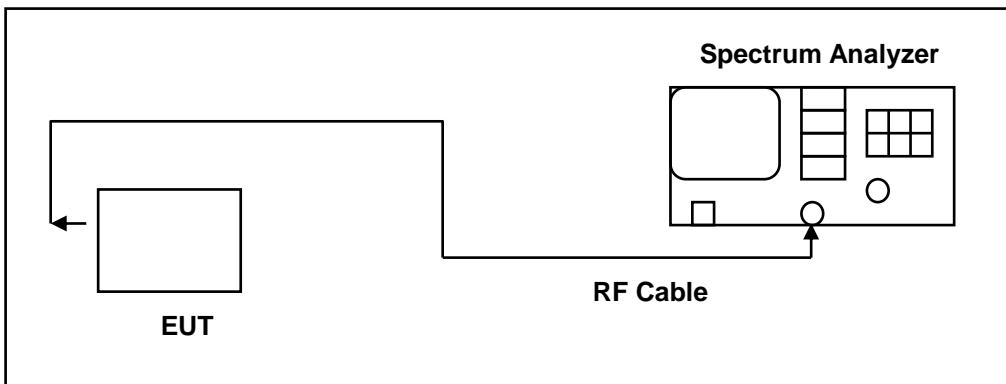
1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.6. Out of Band Conducted Emissions Measurement

■ Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

■ Test Setup



■ Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band.
The test was performed at 3 channels.

4.7. Antenna Measurement

■ Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ Antenna Description

See section 2 – antenna information.

■ Directional Gain Calculated

For Maximum Conducted Output Power

Operate Freq. Band	Directional Gain (dBi)
IEEE 802.11b	3.11
IEEE 802.11g	3.11
IEEE 802.11n 2.4 GHz 20 MHz	3.11
IEEE 802.11n 2.4 GHz 40 MHz	3.11

For Maximum Power Density

Operate Freq. Band	Directional Gain (dBi)
IEEE 802.11b	9.12
IEEE 802.11g	9.12
IEEE 802.11n 2.4 GHz 20 MHz	3.11
IEEE 802.11n 2.4 GHz 40 MHz	3.11

Beamforming on

For Maximum Conducted Output Power

Operate Freq. Band	Directional Gain (dBi)
IEEE 802.11n 2.4 GHz 20 MHz	9.12
IEEE 802.11n 2.4 GHz 40 MHz	9.12

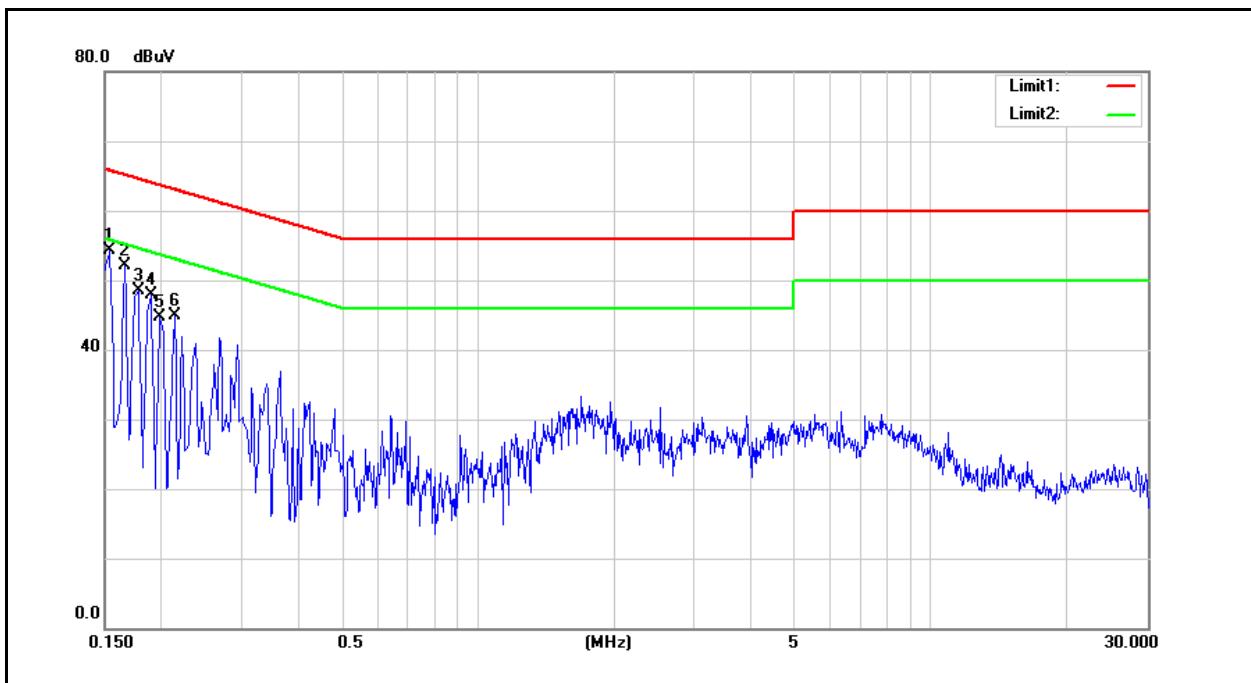
For Maximum Power Density

Operate Freq. Band	Directional Gain (dBi)
IEEE 802.11n 2.4 GHz 20 MHz	9.12
IEEE 802.11n 2.4 GHz 40 MHz	9.12

5 Test Results

Annex A. Conducted Emission

Standard:	FCC Part 15.247	Line:	L1
Test item:	Conducted Emission	Power:	AC 120 V/60 Hz
Mode:	Mode 1	Temp.(°C)/Hum.(%RH):	26(°C)/60 %RH
Description:			

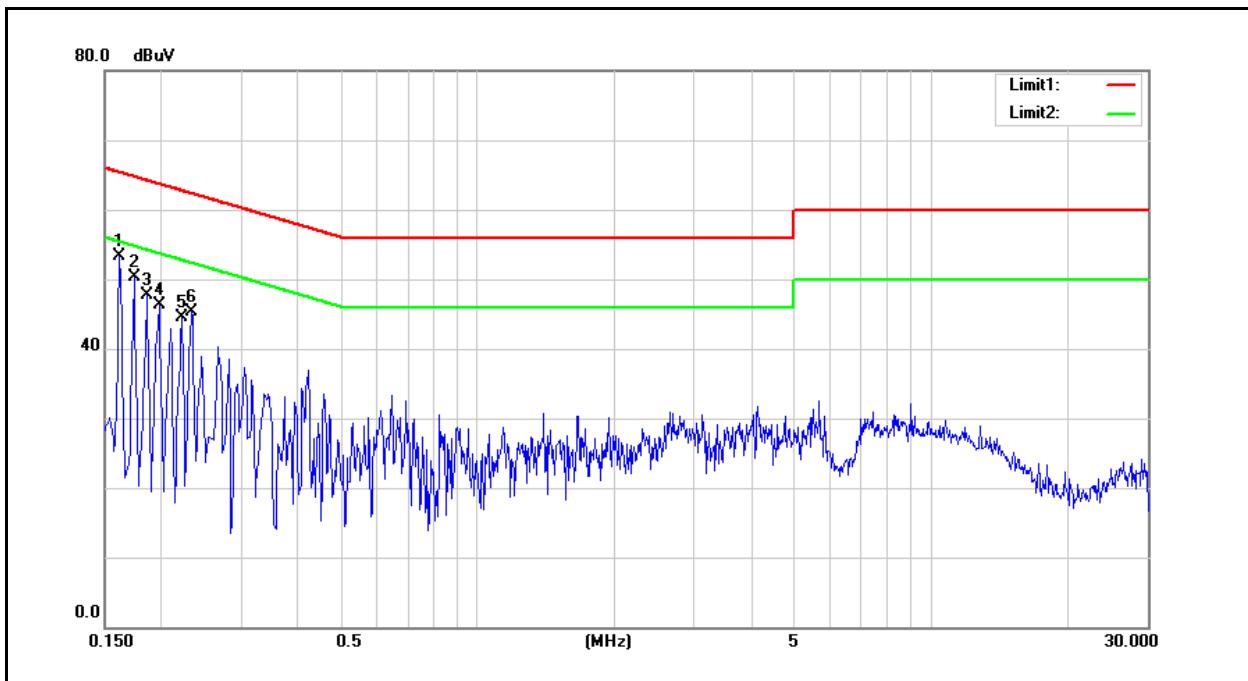


No.	Frequency (MHz)	QP reading (dBuV)	Avg reading (dBuV)	Correction factor (dB)	QP result (dBuV)	Avg result (dBuV)	QP limit (dBuV)	Avg limit (dBuV)	QP margin (dB)	Avg margin (dB)	Remark
1	0.1540	44.09	25.66	9.60	53.69	35.26	65.78	55.78	-12.09	-20.52	Pass
2	0.1660	41.55	22.50	9.60	51.15	32.10	65.16	55.16	-14.01	-23.06	Pass
3	0.1780	35.08	15.79	9.60	44.68	25.39	64.58	54.58	-19.90	-29.19	Pass
4	0.1900	37.21	18.29	9.60	46.81	27.89	64.04	54.04	-17.23	-26.15	Pass
5	0.1980	34.26	16.61	9.60	43.86	26.21	63.69	53.69	-19.83	-27.48	Pass
6	0.2140	30.18	12.15	9.60	39.78	21.75	63.05	53.05	-23.27	-31.30	Pass

Note: 1. Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	FCC Part 15.247	Line:	N
Test item:	Conducted Emission	Power:	AC 120 V/60 Hz
Mode:	Mode 1	Temp.(°C)/Hum.(%RH):	26(°C)/60 %RH
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1620	39.60	20.63	9.71	49.31	30.34	65.36	55.36	-16.05	-25.02	Pass
2	0.1740	36.21	16.82	9.71	45.92	26.53	64.77	54.77	-18.85	-28.24	Pass
3	0.1860	35.99	17.31	9.70	45.69	27.01	64.21	54.21	-18.52	-27.20	Pass
4	0.1980	34.36	16.19	9.70	44.06	25.89	63.69	53.69	-19.63	-27.80	Pass
5	0.2220	31.24	13.80	9.70	40.94	23.50	62.74	52.74	-21.80	-29.24	Pass
6	0.2340	29.70	12.45	9.70	39.40	22.15	62.31	52.31	-22.91	-30.16	Pass

Note: 1. Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Annex B. Conducted Test Results

Maximum Conducted Output Power Measurement

ANT-0						
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power	
			Measurement Results		Measurement Results	
			dBm	W	dBm	dBm
Mode 2	2412	1 M	18.04	0.064	20.26	0.106
	2437		18.23	0.067	20.24	0.106
	2462		18.57	0.072	21.08	0.128
	2437	2 M	17.91	0.062	20.20	0.105
	2437	5.5 M	17.90	0.062	20.05	0.101
	2437	11 M	17.88	0.061	20.03	0.101
Mode 3	2412	6 M	16.61	0.046	22.33	0.171
	2437		16.56	0.045	22.09	0.162
	2462		15.95	0.039	21.55	0.143
	2437	9 M	16.50	0.045	21.93	0.156
	2437	12 M	16.51	0.045	21.95	0.157
	2437	18 M	16.52	0.045	21.96	0.157
	2437	24 M	16.49	0.045	21.95	0.157
	2437	36 M	16.53	0.045	21.90	0.155
	2437	48 M	16.51	0.045	21.95	0.157
	2437	54 M	16.52	0.045	21.93	0.156

Note: The relevant measured result has the offset with cable loss already.

ANT-0							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 4	2412	26M	13.91	0.025	23.68	0.233	≤ 30
	2437		16.21	0.042	23.56	0.227	≤ 30
	2462		13.45	0.022	22.65	0.184	≤ 30
	2437	57.6M	16.05	0.040	23.35	0.216	≤ 30
	2437	86.8M	16.05	0.040	23.38	0.218	≤ 30
	2437	115.6M	16.06	0.040	23.28	0.213	≤ 30
	2437	173.2M	16.02	0.040	23.41	0.219	≤ 30
	2437	231.2M	16.10	0.041	23.30	0.214	≤ 30
	2437	260M	16.02	0.040	23.23	0.210	≤ 30
	2437	288.8M	16.07	0.040	23.25	0.211	≤ 30
Mode 5	2437	346.8M	16.05	0.040	23.46	0.222	≤ 30
	2422	54M	12.38	0.017	21.29	0.135	≤ 30
	2437		15.38	0.035	23.58	0.228	≤ 30
	2452		12.40	0.017	21.37	0.137	≤ 30
	2437	120M	15.20	0.033	23.47	0.222	≤ 30
	2437	180M	15.23	0.033	23.45	0.221	≤ 30
	2437	240M	15.30	0.034	23.52	0.225	≤ 30
	2437	360M	15.29	0.034	23.50	0.224	≤ 30
	2437	480M	15.18	0.033	23.39	0.218	≤ 30
	2437	540M	15.18	0.033	23.50	0.224	≤ 30
	2437	600M	15.26	0.034	23.38	0.218	≤ 30
	2437	720M	15.28	0.034	23.45	0.221	≤ 30
	2437	800M	15.31	0.034	23.24	0.211	≤ 30

Note: The relevant measured result has the offset with cable loss already.

ANT-1							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 2	2412	1 M	17.65	0.058	19.86	0.097	≤ 30
	2437		17.93	0.062	19.81	0.096	≤ 30
	2462		18.45	0.070	20.72	0.118	≤ 30
	2437	2 M	17.82	0.061	19.82	0.096	≤ 30
	2437	5.5 M	17.80	0.060	19.81	0.096	≤ 30
	2437	11 M	17.85	0.061	19.83	0.096	≤ 30
Mode 3	2412	6 M	16.45	0.044	21.82	0.152	≤ 30
	2437		16.56	0.045	22.02	0.159	≤ 30
	2462		15.90	0.039	21.05	0.127	≤ 30
	2437	9 M	16.50	0.045	21.98	0.158	≤ 30
	2437	12 M	16.49	0.045	22.01	0.159	≤ 30
	2437	18 M	16.51	0.045	21.95	0.157	≤ 30
	2437	24 M	16.49	0.045	21.96	0.157	≤ 30
	2437	36 M	16.52	0.045	21.91	0.155	≤ 30
	2437	48 M	16.51	0.045	21.95	0.157	≤ 30
	2437	54 M	16.50	0.045	21.95	0.157	≤ 30

Note: The relevant measured result has the offset with cable loss already.

ANT-1							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 4	2412	26M	13.76	0.024	23.27	0.212	≤ 30
	2437		16.03	0.040	23.28	0.213	≤ 30
	2462		13.62	0.023	22.45	0.176	≤ 30
	2437	57.6M	16.00	0.040	23.20	0.209	≤ 30
	2437	86.8M	15.99	0.040	23.17	0.207	≤ 30
	2437	115.6M	15.98	0.040	23.10	0.204	≤ 30
	2437	173.2M	15.97	0.040	23.16	0.207	≤ 30
	2437	231.2M	16.00	0.040	23.20	0.209	≤ 30
	2437	260M	15.99	0.040	23.23	0.210	≤ 30
	2437	288.8M	15.97	0.040	23.24	0.211	≤ 30
Mode 5	2437	346.8M	15.96	0.039	23.24	0.211	≤ 30
	2422	54M	12.26	0.017	22.24	0.167	≤ 30
	2437		15.15	0.033	23.59	0.229	≤ 30
	2452		12.24	0.017	21.72	0.149	≤ 30
	2437	120M	15.10	0.032	23.50	0.224	≤ 30
	2437	180M	15.02	0.032	23.48	0.223	≤ 30
	2437	240M	15.03	0.032	23.50	0.224	≤ 30
	2437	360M	15.06	0.032	23.53	0.225	≤ 30
	2437	480M	15.11	0.032	23.40	0.219	≤ 30
	2437	540M	15.10	0.032	23.39	0.218	≤ 30
	2437	600M	15.08	0.032	23.48	0.223	≤ 30
	2437	720M	15.09	0.032	23.46	0.222	≤ 30
	2437	800M	14.92	0.031	23.45	0.221	≤ 30

Note: The relevant measured result has the offset with cable loss already.

ANT-2						
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power	
			Measurement Results		Measurement Results	
			dBm	W	dBm	W
Mode 2	2412	1 M	17.92	0.062	20.32	0.108
	2437		17.97	0.063	20.13	0.103
	2462		18.19	0.066	20.60	0.115
	2437	2 M	17.87	0.061	19.86	0.097
	2437	5.5 M	17.82	0.061	19.93	0.098
	2437	11 M	17.86	0.061	20.03	0.101
Mode 3	2412	6 M	16.55	0.045	22.05	0.160
	2437		16.65	0.046	22.12	0.163
	2462		15.88	0.039	21.24	0.133
	2437	9 M	16.50	0.045	21.92	0.156
	2437	12 M	16.49	0.045	21.95	0.157
	2437	18 M	16.51	0.045	21.90	0.155
	2437	24 M	16.52	0.045	21.98	0.158
	2437	36 M	16.49	0.045	21.99	0.158
	2437	48 M	16.48	0.044	22.04	0.160
	2437	54 M	16.47	0.044	22.01	0.159

Note: The relevant measured result has the offset with cable loss already.

ANT-2							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 4	2412	26M	13.83	0.024	23.72	0.236	≤ 30
	2437		16.08	0.041	23.68	0.233	≤ 30
	2462		13.59	0.023	22.55	0.180	≤ 30
	2437	57.6M	16.00	0.040	23.21	0.209	≤ 30
	2437	86.8M	16.02	0.040	23.23	0.210	≤ 30
	2437	115.6M	16.01	0.040	23.25	0.211	≤ 30
	2437	173.2M	15.99	0.040	23.20	0.209	≤ 30
	2437	231.2M	15.97	0.040	23.19	0.208	≤ 30
	2437	260M	15.99	0.040	23.10	0.204	≤ 30
	2437	288.8M	16.00	0.040	23.18	0.208	≤ 30
Mode 5	2437	346.8M	16.01	0.040	23.28	0.213	≤ 30
	2422	54M	12.32	0.017	21.59	0.144	≤ 30
	2437		15.26	0.034	23.73	0.236	≤ 30
	2452		12.29	0.017	21.48	0.141	≤ 30
	2437	120M	15.21	0.033	23.50	0.224	≤ 30
	2437	180M	15.20	0.033	23.57	0.228	≤ 30
	2437	240M	15.18	0.033	23.39	0.218	≤ 30
	2437	360M	15.17	0.033	23.42	0.220	≤ 30
	2437	480M	15.15	0.033	23.45	0.221	≤ 30
	2437	540M	15.10	0.032	23.52	0.225	≤ 30
	2437	600M	15.18	0.033	23.39	0.218	≤ 30
	2437	720M	15.16	0.033	23.52	0.225	≤ 30
	2437	800M	15.21	0.033	23.58	0.228	≤ 30

Note: The relevant measured result has the offset with cable loss already.

ANT-3							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 2	2412	1 M	17.93	0.062	20.21	0.105	≤ 30
	2437		18.27	0.067	20.86	0.122	≤ 30
	2462		18.71	0.074	21.00	0.126	≤ 30
	2437	2 M	18.01	0.063	20.51	0.112	≤ 30
	2437	5.5 M	18.03	0.064	20.30	0.107	≤ 30
	2437	11 M	17.94	0.062	20.45	0.111	≤ 30
Mode 3	2412	6 M	16.57	0.045	22.22	0.167	≤ 30
	2437		16.61	0.046	22.14	0.164	≤ 30
	2462		16.04	0.040	21.44	0.139	≤ 30
	2437	9 M	16.50	0.045	22.12	0.163	≤ 30
	2437	12 M	16.52	0.045	22.10	0.162	≤ 30
	2437	18 M	16.55	0.045	22.13	0.163	≤ 30
	2437	24 M	16.56	0.045	22.12	0.163	≤ 30
	2437	36 M	16.50	0.045	22.12	0.163	≤ 30
	2437	48 M	16.55	0.045	22.16	0.164	≤ 30
	2437	54 M	16.53	0.045	22.24	0.167	≤ 30

Note: The relevant measured result has the offset with cable loss already.

ANT-3							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 4	2412	26M	13.87	0.024	23.17	0.207	≤ 30
	2437		16.16	0.041	23.60	0.229	≤ 30
	2462		13.54	0.023	22.38	0.173	≤ 30
	2437	57.6M	16.10	0.041	22.90	0.195	≤ 30
	2437	86.8M	16.00	0.040	23.65	0.232	≤ 30
	2437	115.6M	16.07	0.040	23.56	0.227	≤ 30
	2437	173.2M	16.11	0.041	23.50	0.224	≤ 30
	2437	231.2M	16.13	0.041	23.62	0.230	≤ 30
	2437	260M	16.05	0.040	23.45	0.221	≤ 30
	2437	288.8M	16.09	0.041	23.56	0.227	≤ 30
Mode 5	2437	346.8M	16.11	0.041	23.25	0.211	≤ 30
	2422	54M	12.27	0.017	21.72	0.149	≤ 30
	2437		15.33	0.034	23.15	0.207	≤ 30
	2452		12.35	0.017	21.05	0.127	≤ 30
	2437	120M	15.29	0.034	23.10	0.204	≤ 30
	2437	180M	15.22	0.033	23.15	0.207	≤ 30
	2437	240M	15.23	0.033	23.12	0.205	≤ 30
	2437	360M	15.18	0.033	23.13	0.206	≤ 30
	2437	480M	15.15	0.033	23.08	0.203	≤ 30
	2437	540M	15.19	0.033	23.09	0.204	≤ 30
	2437	600M	15.21	0.033	23.10	0.204	≤ 30
	2437	720M	15.20	0.033	23.10	0.204	≤ 30
	2437	800M	15.19	0.033	23.07	0.203	≤ 30

Note: The relevant measured result has the offset with cable loss already.

ANT-0+1+2+3							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 2	2412	1 M	23.91	0.246	26.19	0.416	≤ 30
	2437		24.12	0.258	26.30	0.426	≤ 30
	2462		24.50	0.282	26.88	0.487	≤ 30
	2437	2 M	23.92	0.247	26.13	0.410	≤ 30
	2437	5.5 M	23.91	0.246	26.05	0.402	≤ 30
	2437	11 M	23.90	0.246	26.11	0.408	≤ 30
Mode 3	2412	6 M	22.57	0.181	28.13	0.650	≤ 30
	2437		22.62	0.183	28.11	0.648	≤ 30
	2462		21.96	0.157	27.34	0.543	≤ 30
	2437	9 M	22.52	0.179	28.01	0.632	≤ 30
	2437	12 M	22.52	0.179	28.02	0.634	≤ 30
	2437	18 M	22.54	0.180	28.01	0.632	≤ 30
	2437	24 M	22.54	0.179	28.02	0.634	≤ 30
	2437	36 M	22.53	0.179	28.00	0.631	≤ 30
	2437	48 M	22.53	0.179	28.05	0.638	≤ 30
	2437	54 M	22.53	0.179	28.05	0.639	≤ 30

Note: The relevant measured result has the offset with cable loss already.

ANT-0+1+2+3							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 4	2412	26M	19.86	0.097	29.49	0.889	≤ 30
	2437		22.14	0.164	29.55	0.902	≤ 30
	2462		19.57	0.091	28.53	0.713	≤ 30
	2437	57.6M	22.06	0.161	29.19	0.830	≤ 30
	2437	86.8M	22.04	0.160	29.38	0.867	≤ 30
	2437	115.6M	22.05	0.160	29.32	0.855	≤ 30
	2437	173.2M	22.04	0.160	29.34	0.859	≤ 30
	2437	231.2M	22.07	0.161	29.35	0.861	≤ 30
	2437	260M	22.03	0.160	29.27	0.846	≤ 30
	2437	288.8M	22.05	0.160	29.33	0.857	≤ 30
Mode 5	2422	54M	18.33	0.068	27.74	0.595	≤ 30
	2437		21.30	0.135	29.54	0.899	≤ 30
	2452		18.34	0.068	27.43	0.554	≤ 30
	2437	120M	21.22	0.132	29.42	0.874	≤ 30
	2437	180M	21.19	0.131	29.44	0.878	≤ 30
	2437	240M	21.21	0.132	29.41	0.872	≤ 30
	2437	360M	21.20	0.132	29.42	0.875	≤ 30
	2437	480M	21.17	0.131	29.35	0.862	≤ 30
	2437	540M	21.16	0.131	29.40	0.871	≤ 30
	2437	600M	21.20	0.132	29.36	0.863	≤ 30
	2437	720M	21.20	0.132	29.41	0.872	≤ 30
	2437	800M	21.18	0.131	29.36	0.863	≤ 30

Note: The relevant measured result has the offset with cable loss already.

Beamforming on

ANT-0							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 4	2412	13M	7.46	0.006	17.00	0.050	≤ 26.88
	2437		9.71	0.009	19.28	0.085	≤ 26.88
	2462		6.94	0.005	16.94	0.049	≤ 26.88
	2437	28.8M	9.67	0.009	19.19	0.083	≤ 26.88
	2437	43.4M	9.65	0.009	19.18	0.083	≤ 26.88
	2437	57.8M	9.64	0.009	19.20	0.083	≤ 26.88
	2437	86.6M	9.63	0.009	19.21	0.083	≤ 26.88
	2437	115.6M	9.65	0.009	19.19	0.083	≤ 26.88
	2437	130M	9.66	0.009	19.18	0.083	≤ 26.88
	2437	144.4M	9.64	0.009	19.19	0.083	≤ 26.88
Mode 5	2422	27M	5.82	0.004	16.24	0.042	≤ 26.88
	2437		8.68	0.007	16.59	0.046	≤ 26.88
	2452		5.72	0.004	15.96	0.039	≤ 26.88
	2437	60M	8.58	0.007	16.50	0.045	≤ 26.88
	2437	90M	8.57	0.007	16.49	0.045	≤ 26.88
	2437	120M	8.56	0.007	16.47	0.044	≤ 26.88
	2437	180M	8.60	0.007	16.48	0.044	≤ 26.88
	2437	240M	8.61	0.007	16.51	0.045	≤ 26.88
	2437	270M	8.56	0.007	16.52	0.045	≤ 26.88
	2437	300M	8.61	0.007	16.54	0.045	≤ 26.88
	2437	360M	8.60	0.007	16.50	0.045	≤ 26.88
	2437	400M	8.59	0.007	16.49	0.045	≤ 26.88

Note: The relevant measured result has the offset with cable loss already.

ANT-1						
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power	
			Measurement Results		Measurement Results	
			dBm	W	dBm	dBm
Mode 4	2412	13M	7.32	0.005	17.26	0.053
	2437		9.69	0.009	19.66	0.092
	2462		7.13	0.005	17.03	0.050
	2437	28.8M	9.61	0.009	19.55	0.090
	2437	43.4M	9.60	0.009	19.60	0.091
	2437	57.8M	9.59	0.009	19.63	0.092
	2437	86.6M	9.64	0.009	19.61	0.091
	2437	115.6M	9.57	0.009	19.60	0.091
	2437	130M	9.56	0.009	19.55	0.090
	2437	144.4M	9.58	0.009	19.56	0.090
	2437	173.4M	9.61	0.009	19.59	0.091
Mode 5	2422	27M	5.90	0.004	16.57	0.045
	2437		8.54	0.007	16.71	0.047
	2452		5.67	0.004	16.13	0.041
	2437	60M	8.44	0.007	16.60	0.046
	2437	90M	8.45	0.007	16.62	0.046
	2437	120M	8.50	0.007	16.63	0.046
	2437	180M	8.46	0.007	16.65	0.046
	2437	240M	8.47	0.007	16.62	0.046
	2437	270M	8.46	0.007	16.68	0.047
	2437	300M	8.46	0.007	16.60	0.046
	2437	360M	8.45	0.007	16.66	0.046
	2437	400M	8.44	0.007	16.67	0.046

Note: The relevant measured result has the offset with cable loss already.

ANT-2							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		
			dBm	W	dBm	dBm	
Mode 4	2412	13M	7.52	0.006	17.05	0.051	≤ 26.88
	2437		9.72	0.009	19.73	0.094	≤ 26.88
	2462		7.16	0.005	16.97	0.050	≤ 26.88
	2437	28.8M	9.64	0.009	19.63	0.092	≤ 26.88
	2437	43.4M	9.64	0.009	19.60	0.091	≤ 26.88
	2437	57.8M	9.63	0.009	19.70	0.093	≤ 26.88
	2437	86.6M	9.68	0.009	19.65	0.092	≤ 26.88
	2437	115.6M	9.66	0.009	19.66	0.092	≤ 26.88
	2437	130M	9.60	0.009	19.68	0.093	≤ 26.88
	2437	144.4M	9.61	0.009	19.69	0.093	≤ 26.88
Mode 5	2422	27M	5.79	0.004	16.54	0.045	≤ 26.88
	2437		8.63	0.007	16.67	0.046	≤ 26.88
	2452		5.85	0.004	16.05	0.040	≤ 26.88
	2437	60M	8.53	0.007	16.60	0.046	≤ 26.88
	2437	90M	8.50	0.007	16.59	0.046	≤ 26.88
	2437	120M	8.54	0.007	16.57	0.045	≤ 26.88
	2437	180M	8.57	0.007	16.59	0.046	≤ 26.88
	2437	240M	8.58	0.007	16.60	0.046	≤ 26.88
	2437	270M	8.55	0.007	16.61	0.046	≤ 26.88
	2437	300M	8.54	0.007	16.62	0.046	≤ 26.88
	2437	360M	8.55	0.007	16.59	0.046	≤ 26.88
	2437	400M	8.58	0.007	16.63	0.046	≤ 26.88

Note: The relevant measured result has the offset with cable loss already.

ANT-3						
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power	
			Measurement Results		Measurement Results	
			dBm	W	dBm	dBm
Mode 4	2412	13M	7.22	0.005	16.98	0.050
	2437		9.63	0.009	19.18	0.083
	2462		7.00	0.005	16.68	0.047
	2437	28.8M	9.53	0.009	19.10	0.081
	2437	43.4M	9.54	0.009	19.12	0.082
	2437	57.8M	9.57	0.009	19.15	0.082
	2437	86.6M	9.55	0.009	19.08	0.081
	2437	115.6M	9.56	0.009	19.09	0.081
	2437	130M	9.54	0.009	19.10	0.081
	2437	144.4M	9.53	0.009	19.12	0.082
	2437	173.4M	9.54	0.009	19.16	0.082
Mode 5	2437	27M	5.88	0.004	16.67	0.046
	2437		8.55	0.007	16.71	0.047
	2452		5.55	0.004	15.89	0.039
	2437	60M	8.50	0.007	16.60	0.046
	2437	90M	8.47	0.007	16.59	0.046
	2437	120M	8.46	0.007	16.58	0.045
	2437	180M	8.47	0.007	16.62	0.046
	2437	240M	8.45	0.007	16.63	0.046
	2437	270M	8.46	0.007	16.58	0.045
	2437	300M	8.44	0.007	16.59	0.046
	2437	360M	8.46	0.007	16.64	0.046
	2437	400M	8.50	0.007	16.62	0.046

Note: The relevant measured result has the offset with cable loss already.

ANT-0+1+2+3							
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		Peak Output Power		
			Measurement Results		Measurement Results		Limit
			dBm	W	dBm	W	dBm
Mode 4	2412	13M	13.40	0.022	23.09	0.204	≤ 26.88
	2437		15.71	0.037	25.49	0.354	≤ 26.88
	2462		13.08	0.020	22.93	0.196	≤ 26.88
	2437	28.8M	15.63	0.037	25.39	0.346	≤ 26.88
	2437	43.4M	15.63	0.037	25.40	0.347	≤ 26.88
	2437	57.8M	15.63	0.037	25.45	0.351	≤ 26.88
	2437	86.6M	15.65	0.037	25.42	0.348	≤ 26.88
	2437	115.6M	15.63	0.037	25.41	0.348	≤ 26.88
	2437	130M	15.61	0.036	25.40	0.347	≤ 26.88
	2437	144.4M	15.61	0.036	25.42	0.348	≤ 26.88
Mode 5	2422	27M	11.87	0.015	22.53	0.179	≤ 26.88
	2437		14.62	0.029	22.69	0.186	≤ 26.88
	2452		11.72	0.015	22.03	0.160	≤ 26.88
	2437	60M	14.53	0.028	22.60	0.182	≤ 26.88
	2437	90M	14.52	0.028	22.59	0.182	≤ 26.88
	2437	120M	14.54	0.028	22.58	0.181	≤ 26.88
	2437	180M	14.55	0.028	22.61	0.182	≤ 26.88
	2437	240M	14.55	0.029	22.61	0.182	≤ 26.88
	2437	270M	14.53	0.028	22.62	0.183	≤ 26.88
	2437	300M	14.53	0.028	22.61	0.182	≤ 26.88
	2437	360M	14.54	0.028	22.62	0.183	≤ 26.88
	2437	400M	14.55	0.029	22.62	0.183	≤ 26.88

Note: The relevant measured result has the offset with cable loss already.

6 dB RF Bandwidth Measurement

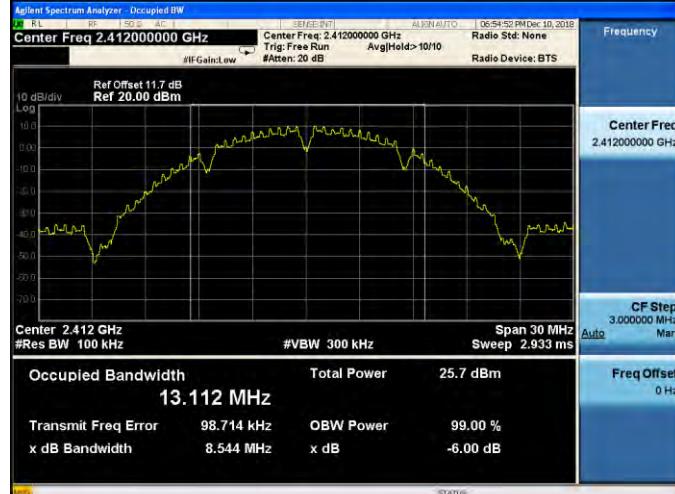
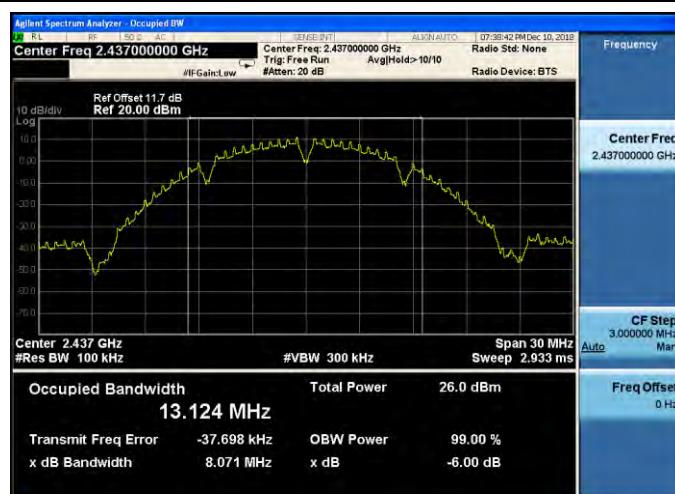
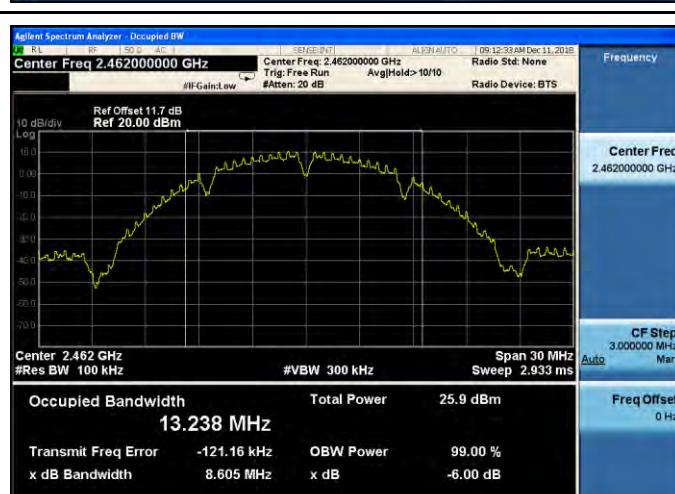
Test Mode	Frequency (MHz)	Measurement (kHz)				Limit (kHz)
		ANT-0	ANT-1	ANT-2	ANT-3	
Mode 2	2412	8544	8088	7590	8539	≥ 500
	2437	8071	8581	8073	8102	≥ 500
	2462	8605	8081	8075	8028	≥ 500
Mode 3	2412	16280	16340	16310	16370	≥ 500
	2437	16300	16330	16380	16330	≥ 500
	2462	16290	16340	15940	16310	≥ 500
Mode 4	2412	17710	17760	17720	17750	≥ 500
	2437	17710	17690	17710	17700	≥ 500
	2462	17690	17690	17680	17710	≥ 500
Mode 5	2422	36350	36420	36430	36350	≥ 500
	2437	36010	36420	36410	36380	≥ 500
	2452	36400	36330	36360	36320	≥ 500

Beamforming on

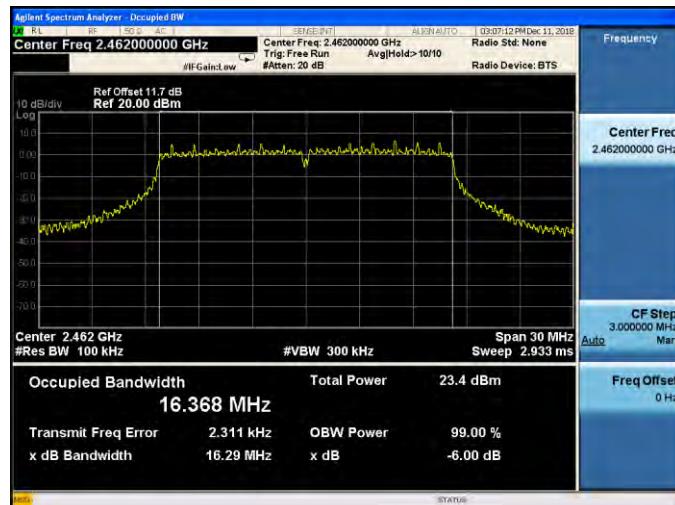
Test Mode	Frequency (MHz)	Measurement (kHz)				Limit (kHz)
		ANT-0	ANT-1	ANT-2	ANT-3	
Mode 4	2412	17710	17700	17700	17700	≥ 500
	2437	17690	17710	17680	17690	≥ 500
	2462	17680	17710	17720	17700	≥ 500
Mode 5	2422	35980	36390	36200	36240	≥ 500
	2437	36340	36370	36440	36220	≥ 500
	2452	36010	36400	36190	36330	≥ 500

■ Test Graphs

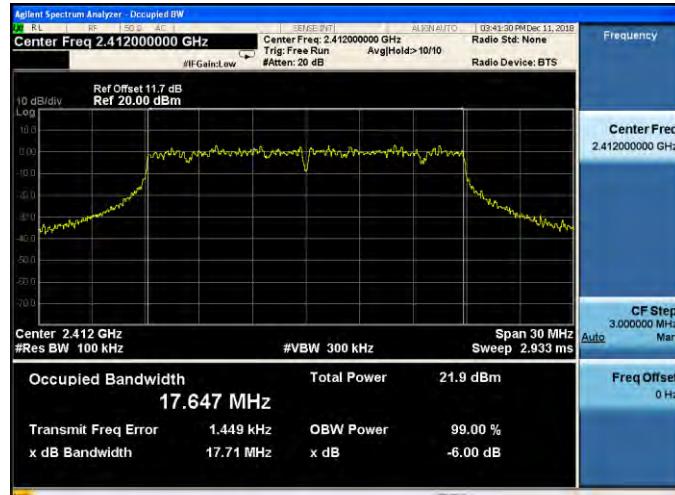
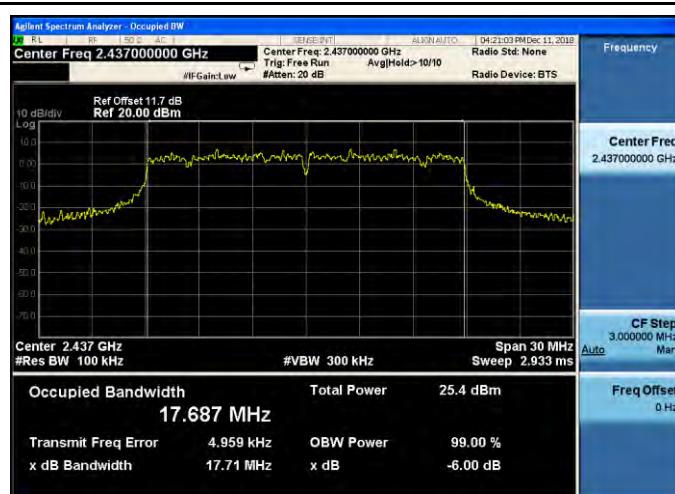
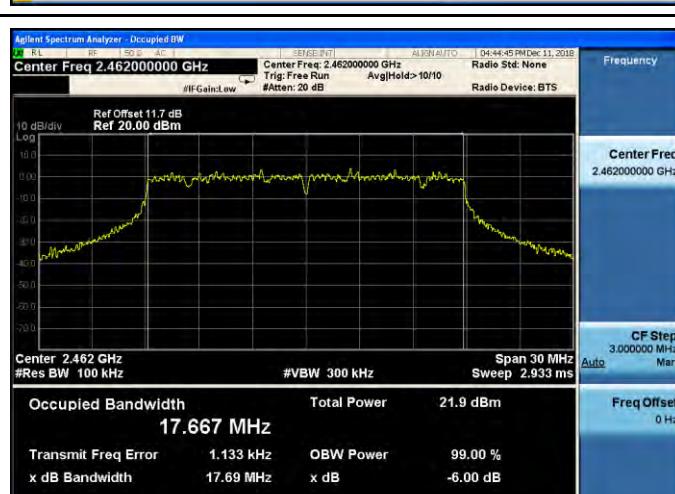
Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

2412 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.412000000 GHz Trig: Free Run Avg Hold>10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm #VBW 300 kHz Sweep 2.933 ms</p> <p>Frequency: 2.412000000 GHz CF Step: 3.000000 MHz Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 13.112 MHz Total Power: 25.7 dBm</p> <p>Transmit Freq Error: 98.714 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 8.544 MHz x dB: -6.00 dB</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.437000000 GHz Trig: Free Run Avg Hold>10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm #VBW 300 kHz Sweep 2.933 ms</p> <p>Frequency: 2.437000000 GHz CF Step: 3.000000 MHz Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 13.124 MHz Total Power: 26.0 dBm</p> <p>Transmit Freq Error: -37.698 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 8.071 MHz x dB: -6.00 dB</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 2.462000000 GHz Trig: Free Run Avg Hold>10/10 Radio Std: None Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm #VBW 300 kHz Sweep 2.933 ms</p> <p>Frequency: 2.462000000 GHz CF Step: 3.000000 MHz Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 13.238 MHz Total Power: 25.9 dBm</p> <p>Transmit Freq Error: -121.16 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 8.605 MHz x dB: -6.00 dB</p>

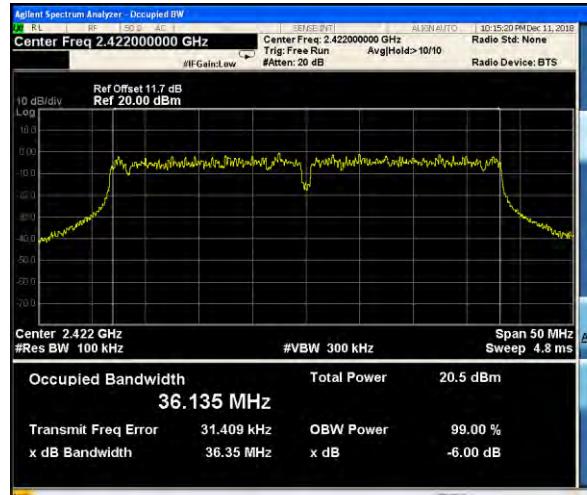
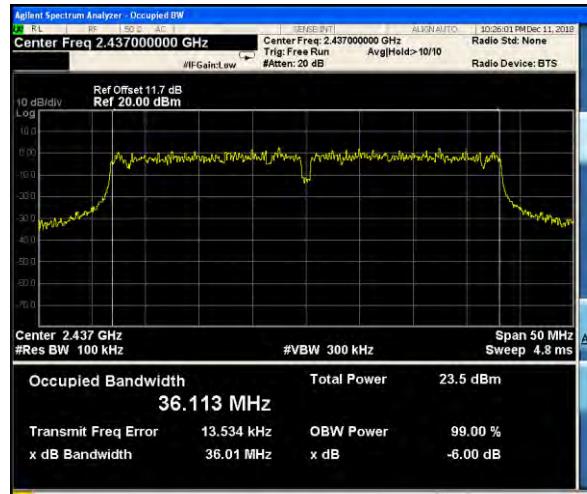
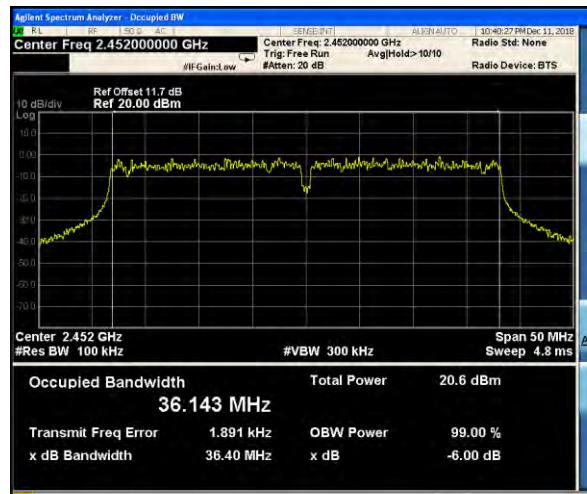
Mode 3: IEEE 802.11g Continuous TX mode_ANT-0

<p>2412 MHz</p> 
<p>2437 MHz</p> 
<p>2462 MHz</p> 

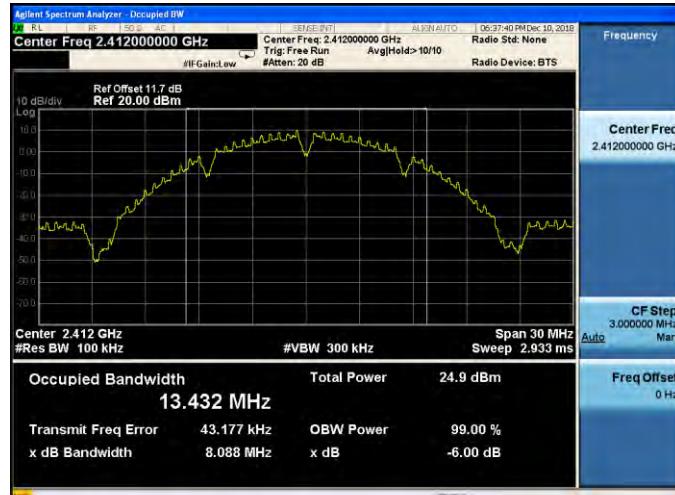
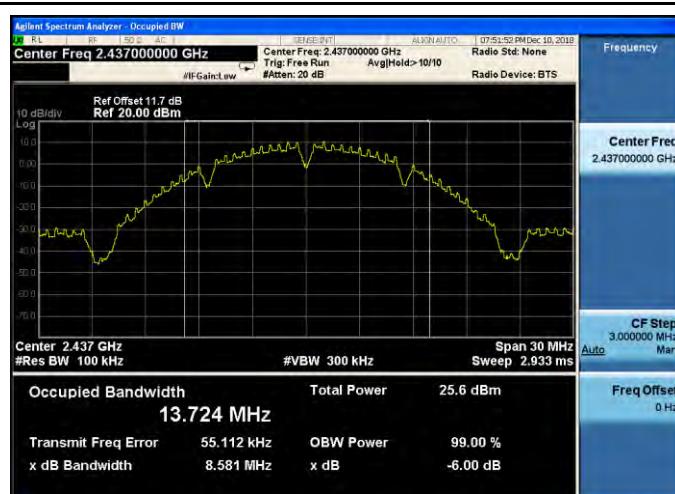
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-0

<p>2412 MHz</p>  <p>Occupied Bandwidth 17.647 MHz</p> <p>Transmit Freq Error 1.449 kHz x dB Bandwidth 17.71 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 17.687 MHz</p> <p>Transmit Freq Error 4.959 kHz x dB Bandwidth 17.71 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2462 MHz</p>  <p>Occupied Bandwidth 17.667 MHz</p> <p>Transmit Freq Error 1.133 kHz x dB Bandwidth 17.69 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>

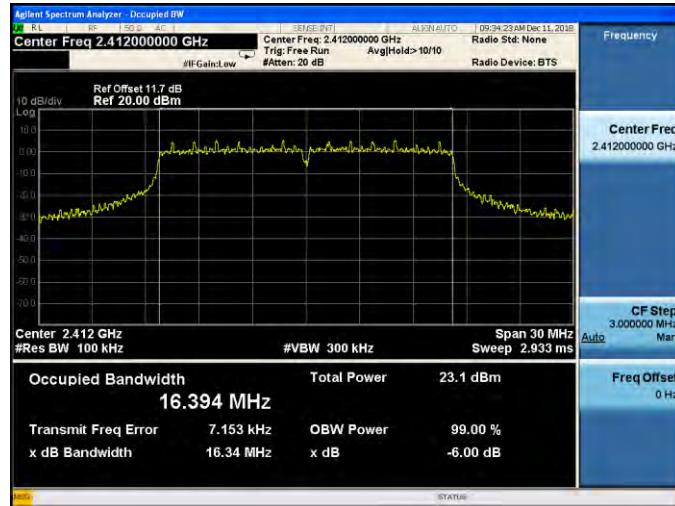
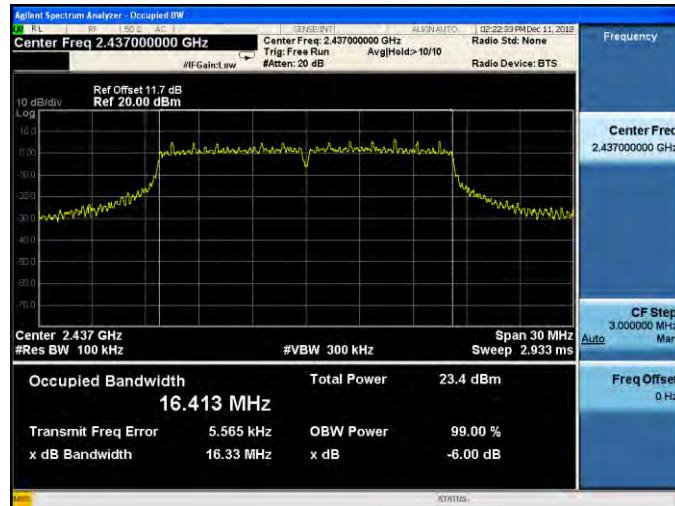
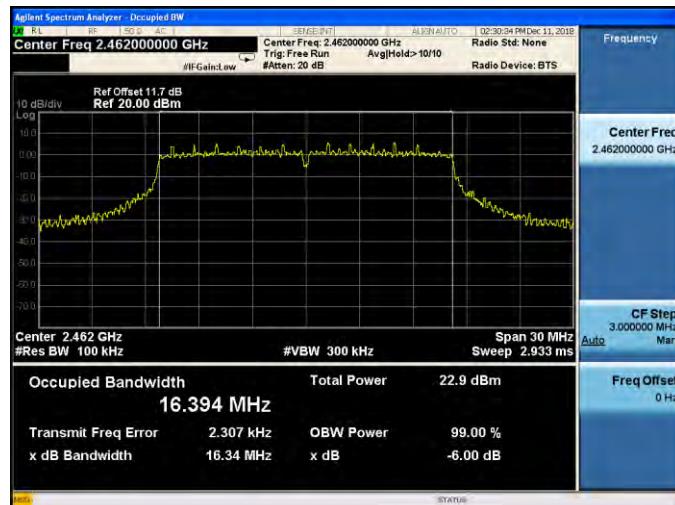
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-0

<p>2422 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.422000000 GHz ALGN AUTO 10:25:20 PM Dec 11, 2018</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 50 MHz Sweep 4.8 ms</p> <p>Occupied Bandwidth 36.135 MHz</p> <p>Total Power 20.5 dBm</p> <p>Transmit Freq Error 31.409 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 36.35 MHz x dB -6.00 dB</p>  <p>Frequency Center Freq 2.422000000 GHz CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p>
<p>2437 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz ALGN AUTO 10:26:01 PM Dec 11, 2018</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 50 MHz Sweep 4.8 ms</p> <p>Occupied Bandwidth 36.113 MHz</p> <p>Total Power 23.5 dBm</p> <p>Transmit Freq Error 13.534 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 36.01 MHz x dB -6.00 dB</p>  <p>Frequency Center Freq 2.437000000 GHz CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p>
<p>2452 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.452000000 GHz ALGN AUTO 10:40:27 PM Dec 11, 2018</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 50 MHz Sweep 4.8 ms</p> <p>Occupied Bandwidth 36.143 MHz</p> <p>Total Power 20.6 dBm</p> <p>Transmit Freq Error 1.891 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 36.40 MHz x dB -6.00 dB</p>  <p>Frequency Center Freq 2.452000000 GHz CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p>

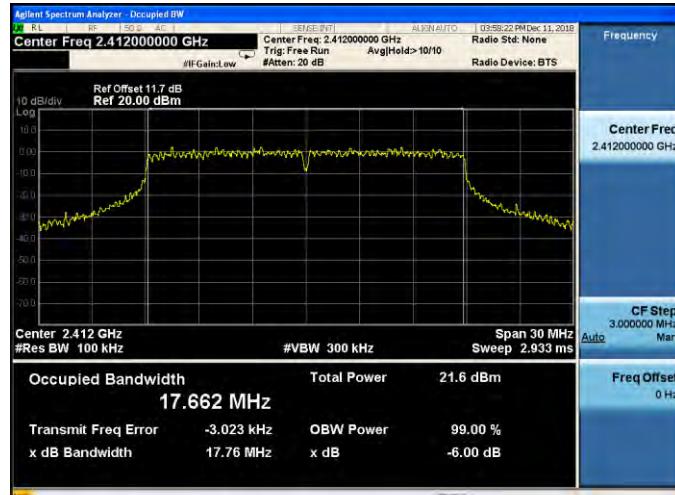
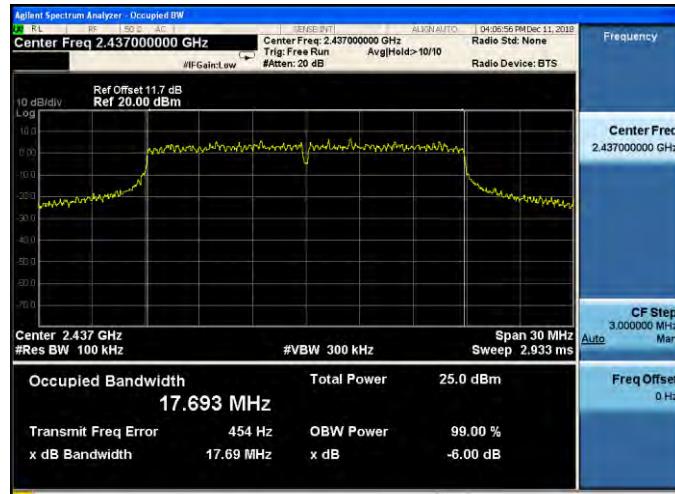
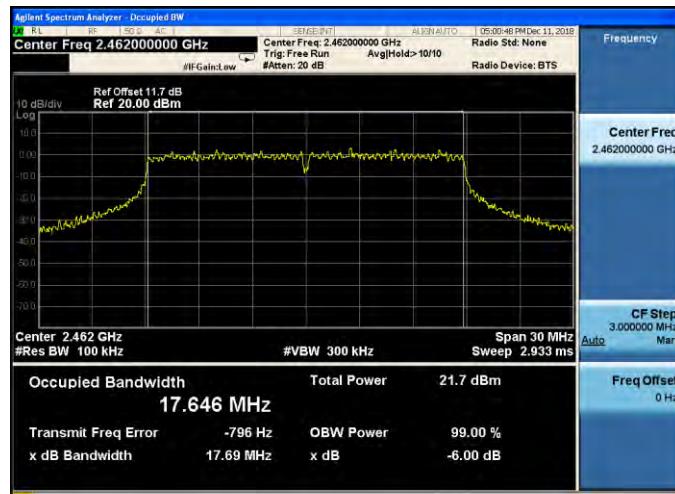
Mode 2: IEEE 802.11b Continuous TX mode_ANT-1

2412 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 13.432 MHz</p> <p>Transmit Freq Error 43.177 kHz x dB Bandwidth 8.088 MHz</p> <p>Total Power 24.9 dBm OBW Power 99.00 % x dB 0 dB</p> <p>Freq Offset 0 Hz</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 30 MHz Sweep 2.033 ms</p> <p>Occupied Bandwidth 13.724 MHz</p> <p>Transmit Freq Error 55.112 kHz x dB Bandwidth 8.581 MHz</p> <p>Total Power 25.6 dBm OBW Power 99.00 % x dB 0 dB</p> <p>Freq Offset 0 Hz</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 13.340 MHz</p> <p>Transmit Freq Error 16.728 kHz x dB Bandwidth 8.081 MHz</p> <p>Total Power 25.4 dBm OBW Power 99.00 % x dB 0 dB</p> <p>Freq Offset 0 Hz</p>

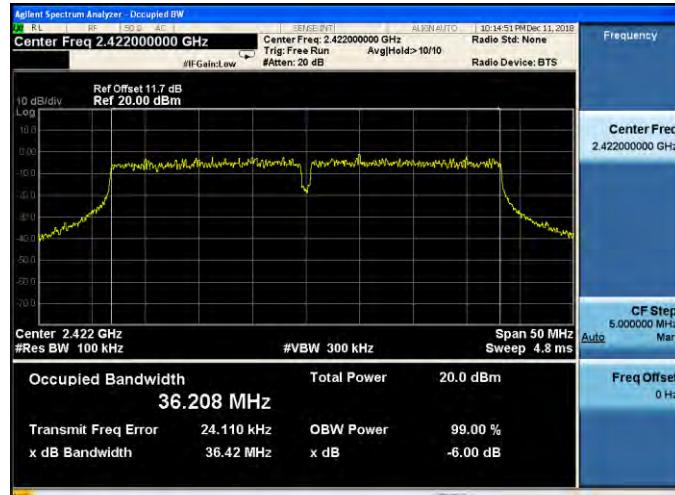
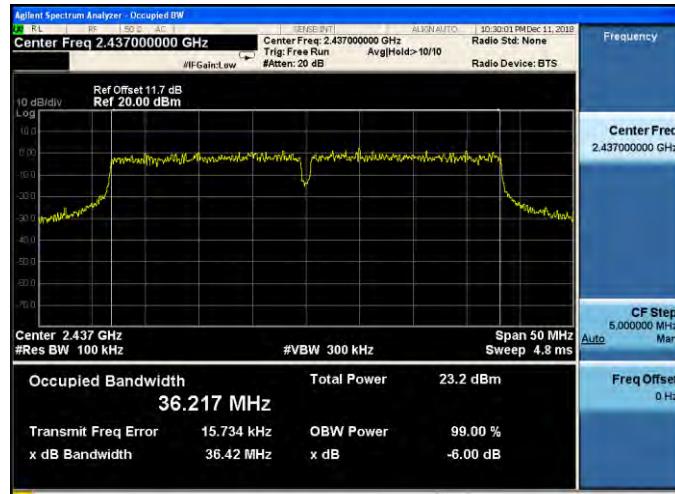
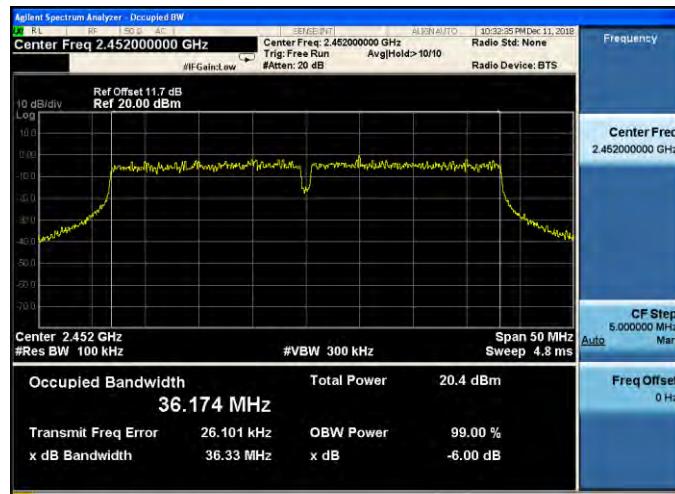
Mode 3: IEEE 802.11g Continuous TX mode_ANT-1

<p>2412 MHz</p> 
<p>2437 MHz</p> 
<p>2462 MHz</p> 

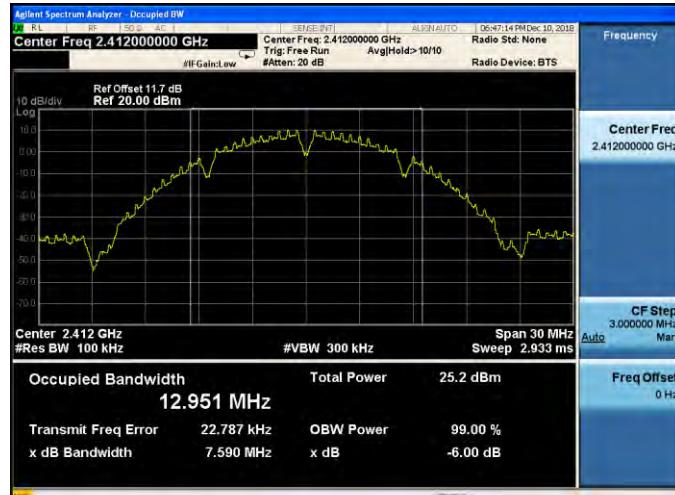
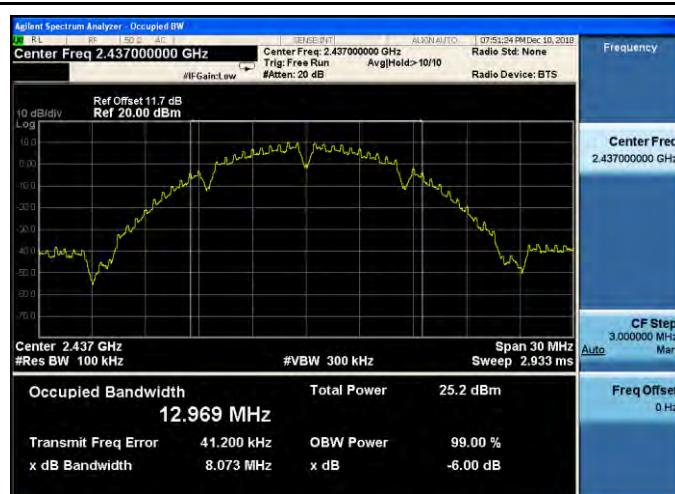
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-1

2412 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.662 MHz</p> <p>Transmit Freq Error -3.023 kHz x dB Bandwidth 17.76 MHz</p> <p>Total Power 21.6 dBm OBW Power 99.00 % x dB 21.6 dB</p> <p>Freq Offset 0 Hz</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.693 MHz</p> <p>Transmit Freq Error 454 Hz x dB Bandwidth 17.69 MHz</p> <p>Total Power 25.0 dBm OBW Power 99.00 % x dB 25.0 dB</p> <p>Freq Offset 0 Hz</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.646 MHz</p> <p>Transmit Freq Error -796 Hz x dB Bandwidth 17.69 MHz</p> <p>Total Power 21.7 dBm OBW Power 99.00 % x dB 21.7 dB</p> <p>Freq Offset 0 Hz</p>

Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-1

<p>2422 MHz</p>  <p>Occupied Bandwidth 36.208 MHz</p> <p>Transmit Freq Error 24.110 kHz</p> <p>x dB Bandwidth 36.42 MHz</p> <p>Total Power 20.0 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 36.217 MHz</p> <p>Transmit Freq Error 15.734 kHz</p> <p>x dB Bandwidth 36.42 MHz</p> <p>Total Power 23.2 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>
<p>2452 MHz</p>  <p>Occupied Bandwidth 36.174 MHz</p> <p>Transmit Freq Error 26.101 kHz</p> <p>x dB Bandwidth 36.33 MHz</p> <p>Total Power 20.4 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>

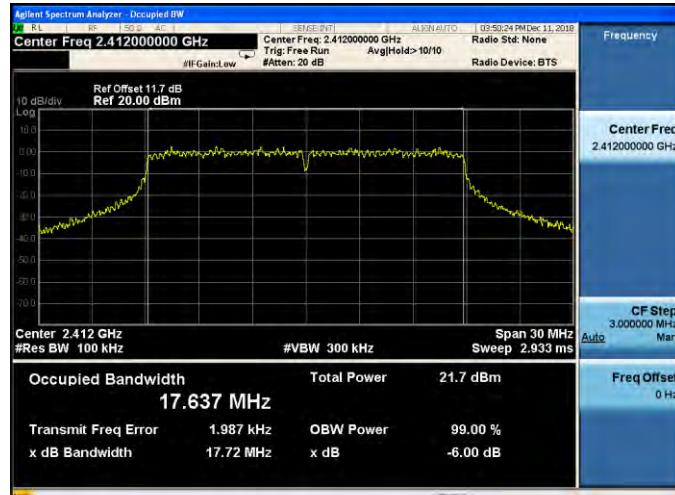
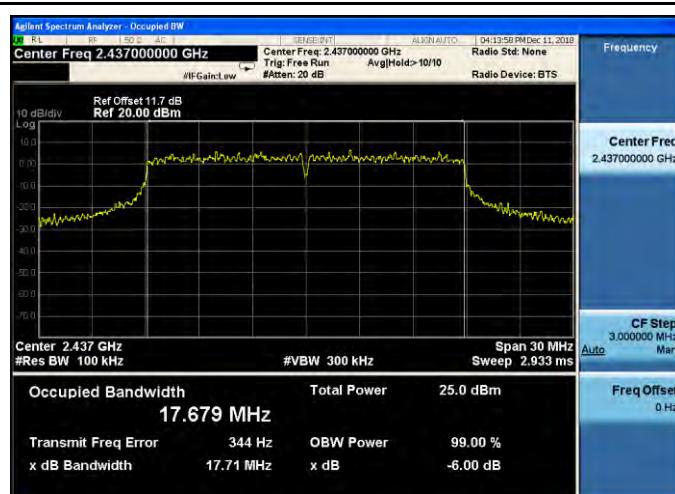
Mode 2: IEEE 802.11b Continuous TX mode_ANT-2

2412 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz 07:51:14 PM Dec 10, 2018 ALIGN AUTO Radio Std: None Trig: Free Run Avg Hold>10/10 Radio Device: BTS #IF Gain Low #Atten: 20 dB</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0</p> <p>Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth Total Power 25.2 dBm 12.951 MHz</p> <p>Transmit Freq Error OBW Power 99.00 % x dB Bandwidth 7.590 MHz x dB -6.00 dB</p> <p>STATUS</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz 07:51:24 PM Dec 10, 2018 ALIGN AUTO Radio Std: None Trig: Free Run Avg Hold>10/10 Radio Device: BTS #IF Gain Low #Atten: 20 dB</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0</p> <p>Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.033 ms</p> <p>Occupied Bandwidth Total Power 25.2 dBm 12.969 MHz</p> <p>Transmit Freq Error OBW Power 99.00 % x dB Bandwidth 8.073 MHz x dB -6.00 dB</p> <p>STATUS</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz 09:20:07 AM Dec 11, 2018 ALIGN AUTO Radio Std: None Trig: Free Run Avg Hold>10/10 Radio Device: BTS #IF Gain Low #Atten: 20 dB</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0</p> <p>Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth Total Power 25.4 dBm 12.962 MHz</p> <p>Transmit Freq Error OBW Power 99.00 % x dB Bandwidth 8.075 MHz x dB -6.00 dB</p> <p>STATUS</p>

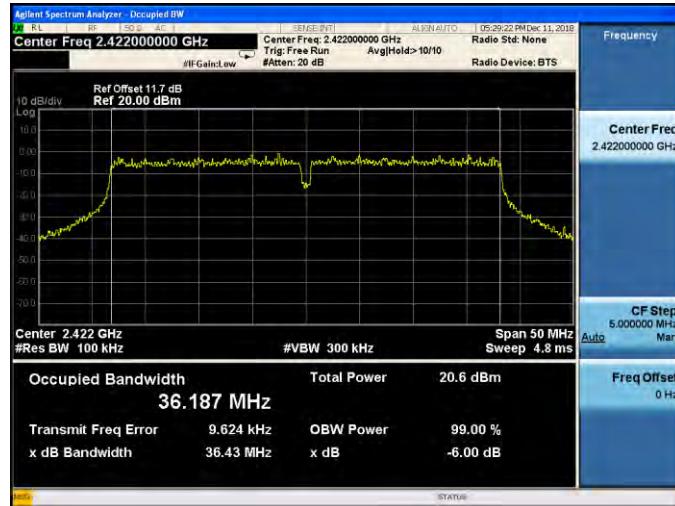
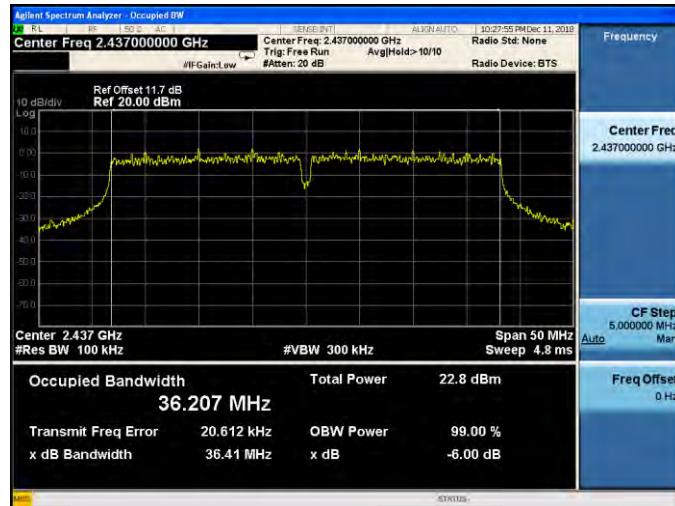
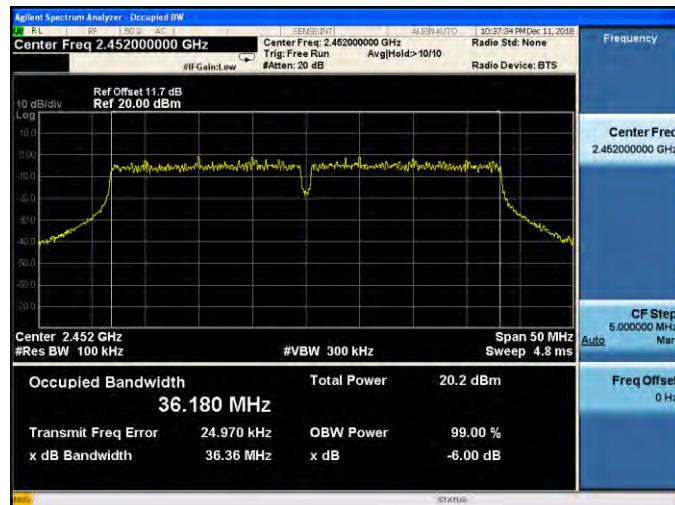
Mode 3: IEEE 802.11g Continuous TX mode_ANT-2

2412 MHz	 <p>Occupied Bandwidth 16.350 MHz</p> <p>Transmit Freq Error 3.497 kHz x dB Bandwidth 16.31 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
2437 MHz	 <p>Occupied Bandwidth 16.433 MHz</p> <p>Transmit Freq Error 3.452 kHz x dB Bandwidth 16.38 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
2462 MHz	 <p>Occupied Bandwidth 16.331 MHz</p> <p>Transmit Freq Error -2.700 kHz x dB Bandwidth 15.94 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>

Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-2

<p>2412 MHz</p>  <p>Occupied Bandwidth 17.637 MHz</p> <p>Transmit Freq Error 1.987 kHz x dB Bandwidth 17.72 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 17.679 MHz</p> <p>Transmit Freq Error 344 Hz x dB Bandwidth 17.71 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2462 MHz</p>  <p>Occupied Bandwidth 17.653 MHz</p> <p>Transmit Freq Error -181 Hz x dB Bandwidth 17.68 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>

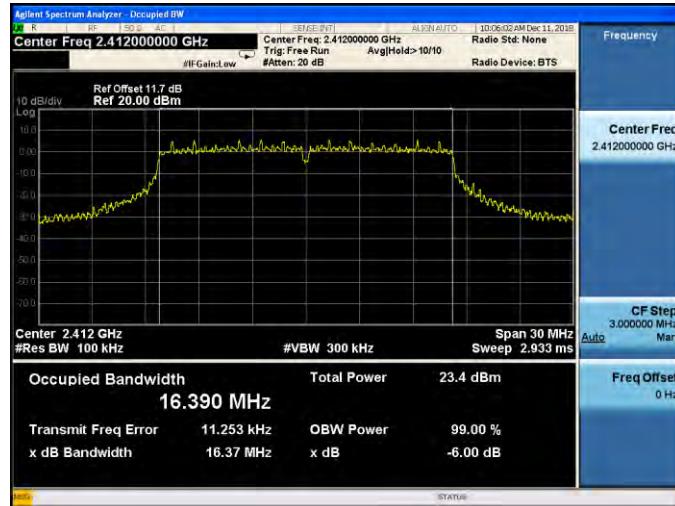
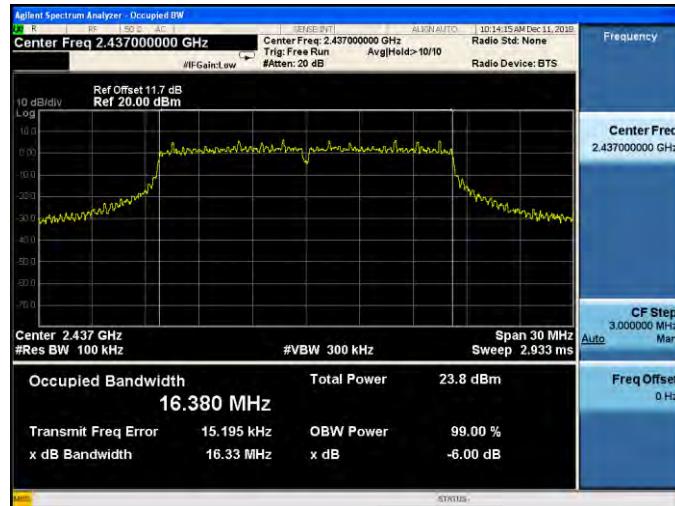
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-2

<p>2422 MHz</p>  <p>Occupied Bandwidth 36.187 MHz</p> <p>Transmit Freq Error 9.624 kHz</p> <p>x dB Bandwidth 36.43 MHz</p> <p>Total Power 20.6 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 36.207 MHz</p> <p>Transmit Freq Error 20.612 kHz</p> <p>x dB Bandwidth 36.41 MHz</p> <p>Total Power 22.8 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>
<p>2452 MHz</p>  <p>Occupied Bandwidth 36.180 MHz</p> <p>Transmit Freq Error 24.970 kHz</p> <p>x dB Bandwidth 36.36 MHz</p> <p>Total Power 20.2 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>

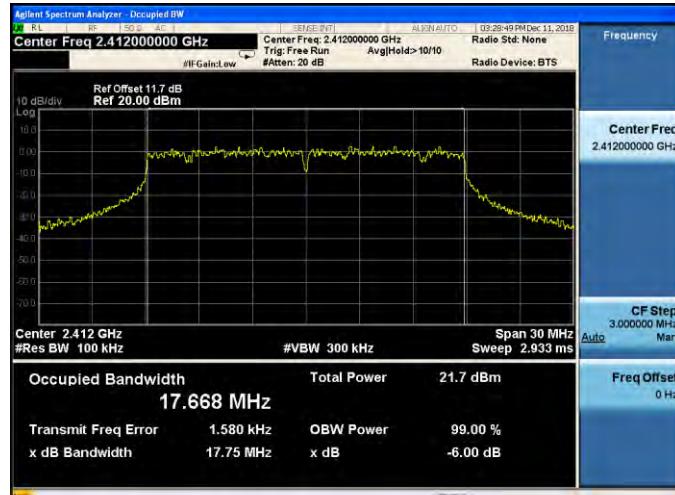
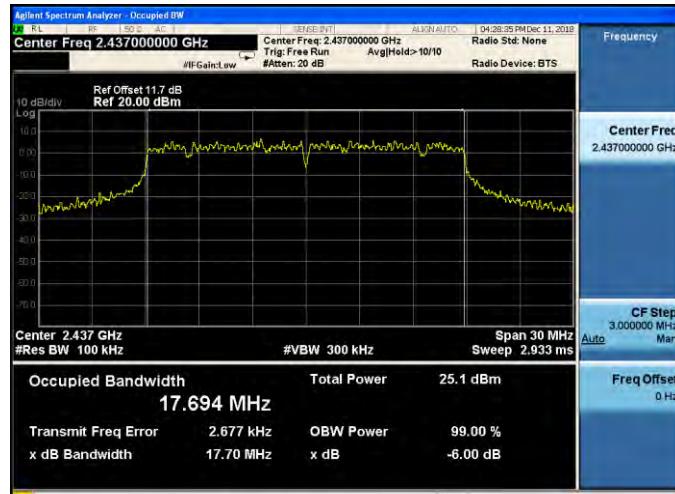
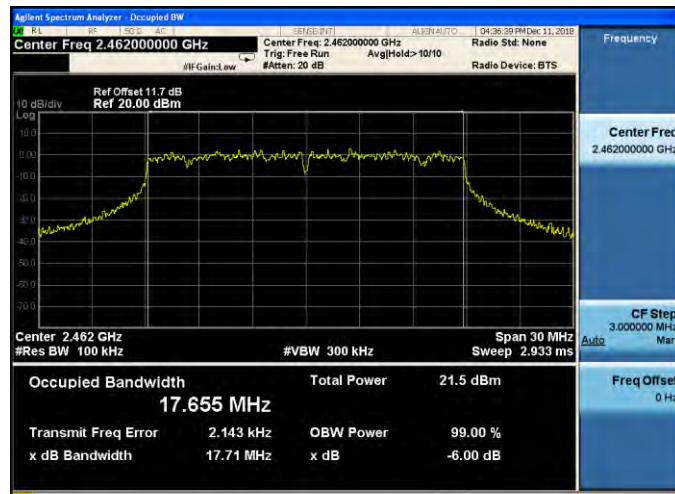
Mode 2: IEEE 802.11b Continuous TX mode_ANT-3

<p>2412 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz 07:30:47 PM Dec 10, 2018 ALGN AUTO Radio Std: None Trig: Free Run Avg Hold>10/10 Radio Device: BTS</p> <p>#IFGain:Low #Atten: 20 dB</p> <p>Frequency</p> <p>Center Freq 2.412000000 GHz</p> <p>CF Step 3.000000 MHz Auto</p> <p>Freq Offset 0 Hz</p>  <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz</p> <p>Occupied Bandwidth 13.225 MHz Total Power 25.1 dBm</p> <p>Transmit Freq Error 51.985 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 8.539 MHz x dB -6.00 dB</p> <p>STATUS</p>
<p>2437 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz 07:17:29 PM Dec 10, 2018 ALGN AUTO Radio Std: None Trig: Free Run Avg Hold>10/10 Radio Device: BTS</p> <p>#IFGain:Low #Atten: 20 dB</p> <p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 3.000000 MHz Auto</p> <p>Freq Offset 0 Hz</p>  <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Span 30 MHz Sweep 2.033 ms</p> <p>Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz</p> <p>Occupied Bandwidth 13.284 MHz Total Power 25.7 dBm</p> <p>Transmit Freq Error 21.617 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 8.102 MHz x dB -6.00 dB</p> <p>STATUS</p>
<p>2462 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz 09:04:55 AM Dec 11, 2018 ALGN AUTO Radio Std: None Trig: Free Run Avg Hold>10/10 Radio Device: BTS</p> <p>#IFGain:Low #Atten: 20 dB</p> <p>Frequency</p> <p>Center Freq 2.462000000 GHz</p> <p>CF Step 3.000000 MHz Auto</p> <p>Freq Offset 0 Hz</p>  <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz</p> <p>Occupied Bandwidth 13.162 MHz Total Power 25.7 dBm</p> <p>Transmit Freq Error 65.183 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 8.028 MHz x dB -6.00 dB</p> <p>STATUS</p>

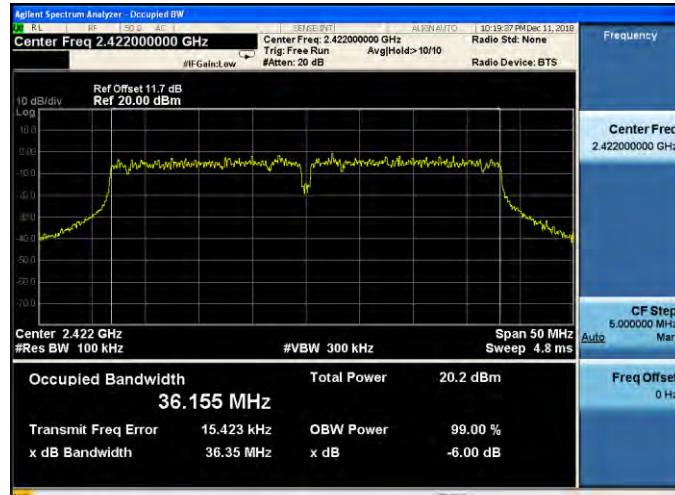
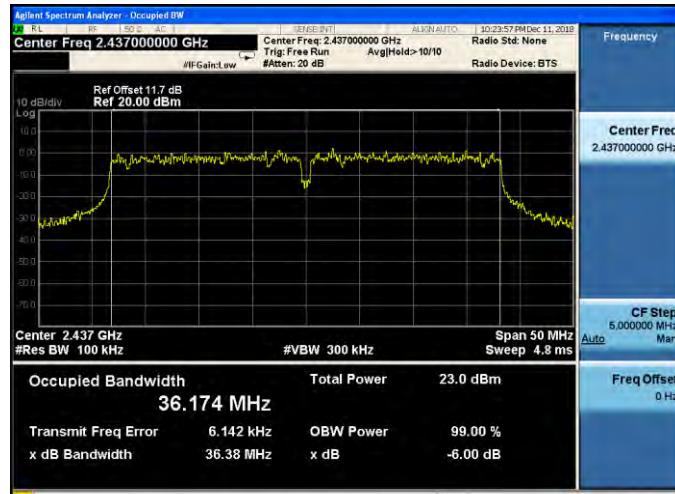
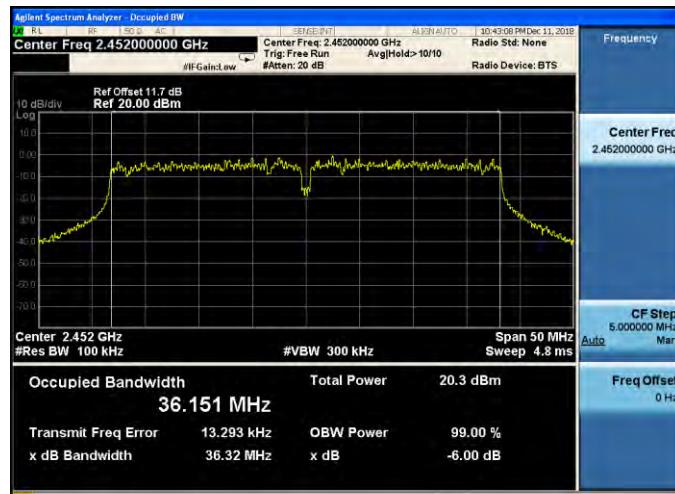
Mode 3: IEEE 802.11g Continuous TX mode_ANT-3

<p>2412 MHz</p>  <p>Occupied Bandwidth 16.390 MHz</p> <p>Transmit Freq Error 11.253 kHz x dB Bandwidth 16.37 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 16.380 MHz</p> <p>Transmit Freq Error 15.195 kHz x dB Bandwidth 16.33 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2462 MHz</p>  <p>Occupied Bandwidth 16.377 MHz</p> <p>Transmit Freq Error -3.955 kHz x dB Bandwidth 16.31 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>

Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-3

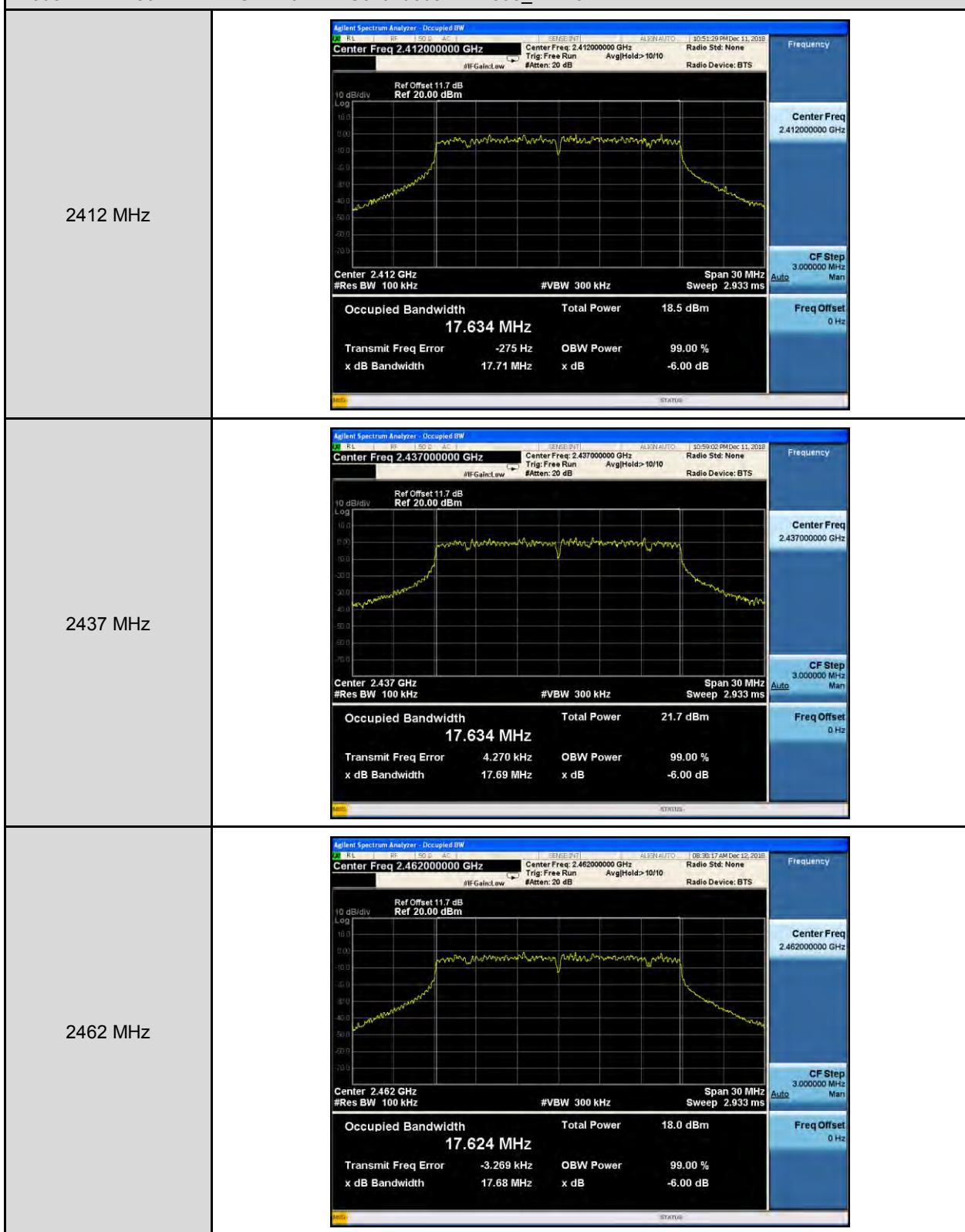
2412 MHz	 <p>Occupied Bandwidth 17.668 MHz</p> <table border="1"> <tr> <td>Transmit Freq Error</td> <td>1.580 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>17.75 MHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table>	Transmit Freq Error	1.580 kHz	OBW Power	99.00 %	x dB Bandwidth	17.75 MHz	x dB	-6.00 dB
Transmit Freq Error	1.580 kHz	OBW Power	99.00 %						
x dB Bandwidth	17.75 MHz	x dB	-6.00 dB						
2437 MHz	 <p>Occupied Bandwidth 17.694 MHz</p> <table border="1"> <tr> <td>Transmit Freq Error</td> <td>2.677 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>17.70 MHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table>	Transmit Freq Error	2.677 kHz	OBW Power	99.00 %	x dB Bandwidth	17.70 MHz	x dB	-6.00 dB
Transmit Freq Error	2.677 kHz	OBW Power	99.00 %						
x dB Bandwidth	17.70 MHz	x dB	-6.00 dB						
2462 MHz	 <p>Occupied Bandwidth 17.655 MHz</p> <table border="1"> <tr> <td>Transmit Freq Error</td> <td>2.143 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>17.71 MHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table>	Transmit Freq Error	2.143 kHz	OBW Power	99.00 %	x dB Bandwidth	17.71 MHz	x dB	-6.00 dB
Transmit Freq Error	2.143 kHz	OBW Power	99.00 %						
x dB Bandwidth	17.71 MHz	x dB	-6.00 dB						

Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-3

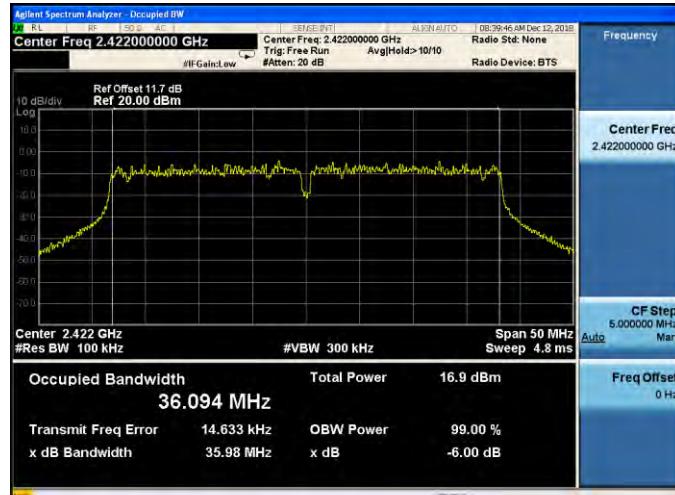
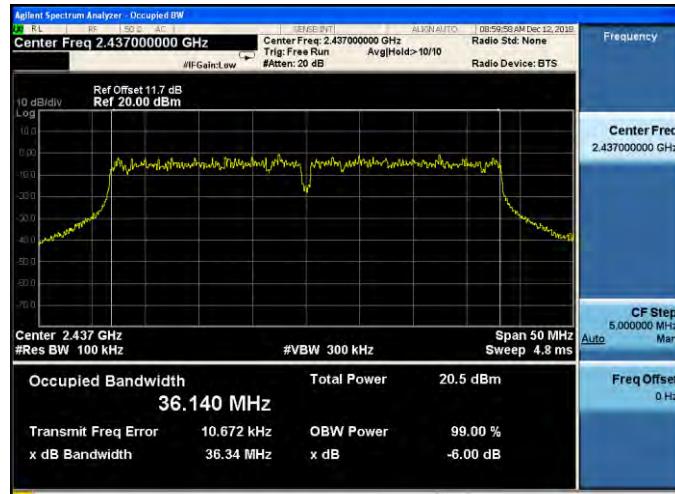
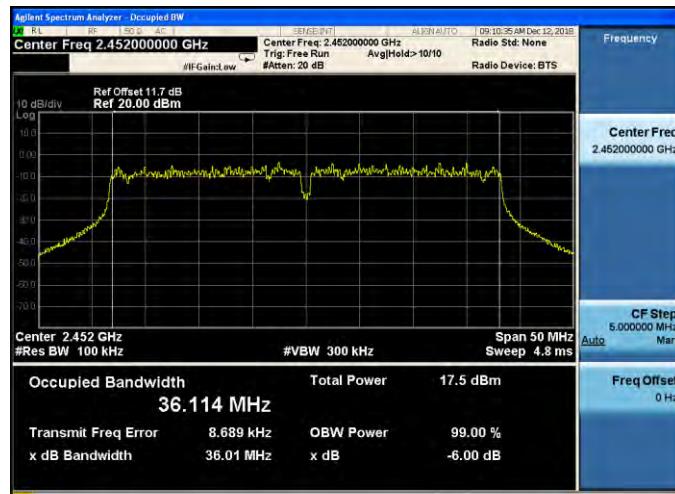
<p>2422 MHz</p>  <p>Occupied Bandwidth Total Power 36.155 MHz 20.2 dBm</p> <p>Transmit Freq Error OBW Power 15.423 kHz 99.00% $x \text{ dB Bandwidth}$ $x \text{ dB}$ 36.35 MHz -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth Total Power 36.174 MHz 23.0 dBm</p> <p>Transmit Freq Error OBW Power 6.142 kHz 99.00% $x \text{ dB Bandwidth}$ $x \text{ dB}$ 36.38 MHz -6.00 dB</p>
<p>2452 MHz</p>  <p>Occupied Bandwidth Total Power 36.151 MHz 20.3 dBm</p> <p>Transmit Freq Error OBW Power 13.293 kHz 99.00% $x \text{ dB Bandwidth}$ $x \text{ dB}$ 36.32 MHz -6.00 dB</p>

Beamforming on

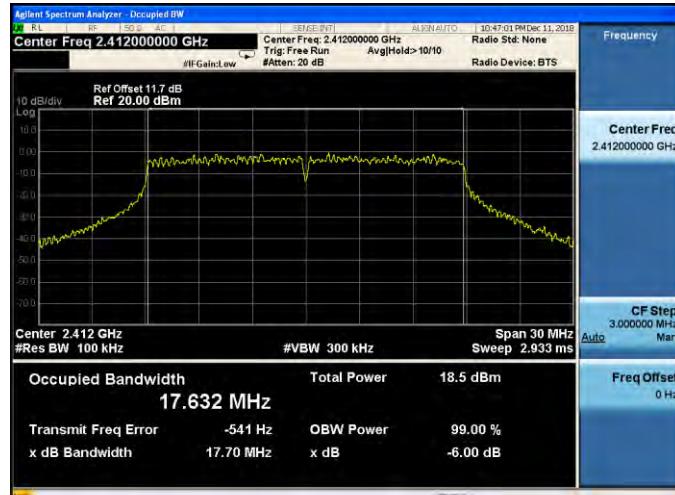
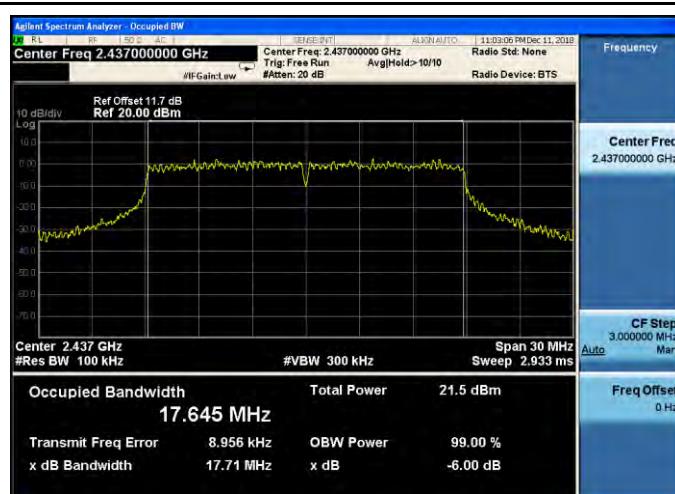
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-0



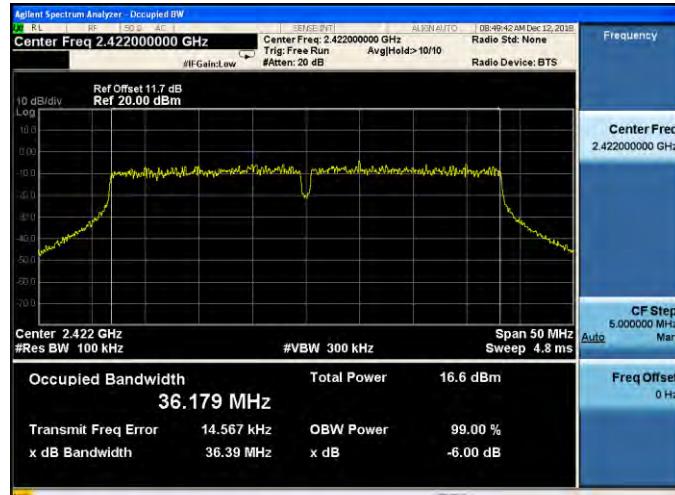
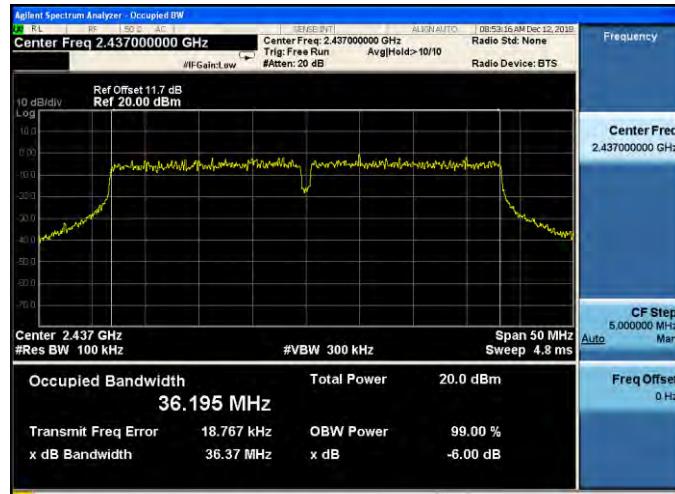
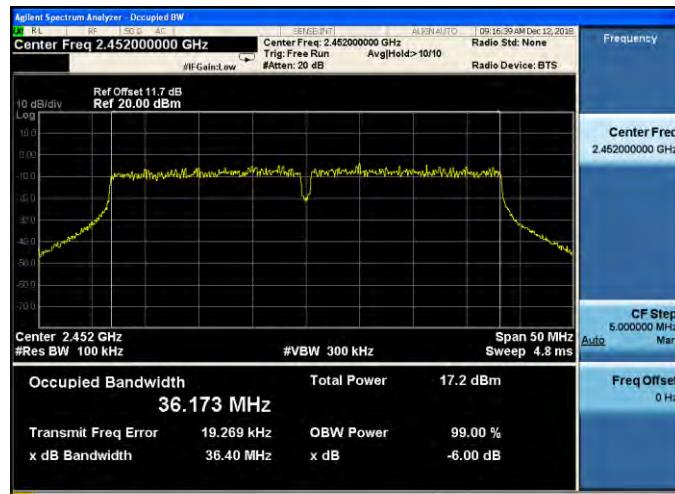
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-0

<p>2422 MHz</p>	 <p>Occupied Bandwidth 36.094 MHz</p> <p>Transmit Freq Error 14.633 kHz x dB Bandwidth 35.98 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2437 MHz</p>	 <p>Occupied Bandwidth 36.140 MHz</p> <p>Transmit Freq Error 10.672 kHz x dB Bandwidth 36.34 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>
<p>2452 MHz</p>	 <p>Occupied Bandwidth 36.114 MHz</p> <p>Transmit Freq Error 8.689 kHz x dB Bandwidth 36.01 MHz</p> <p>OBW Power 99.00 % x dB -6.00 dB</p>

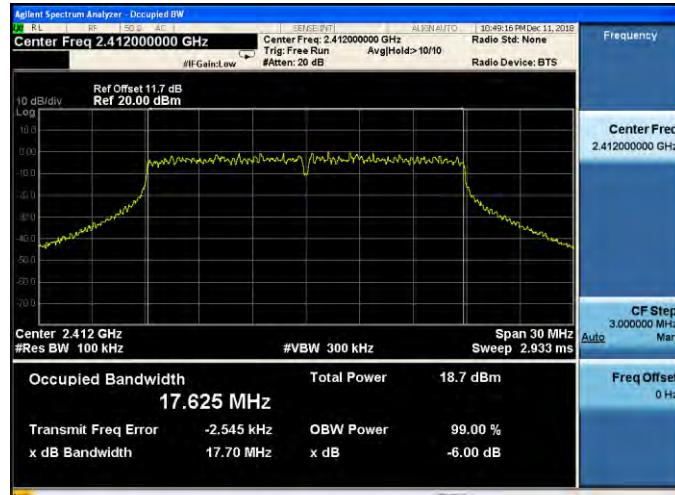
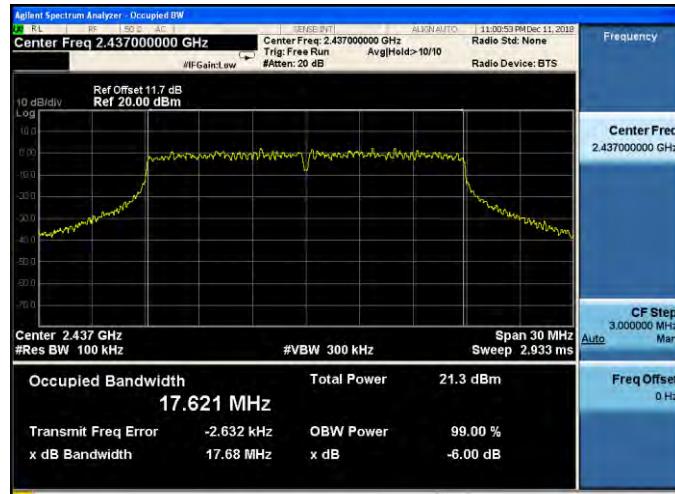
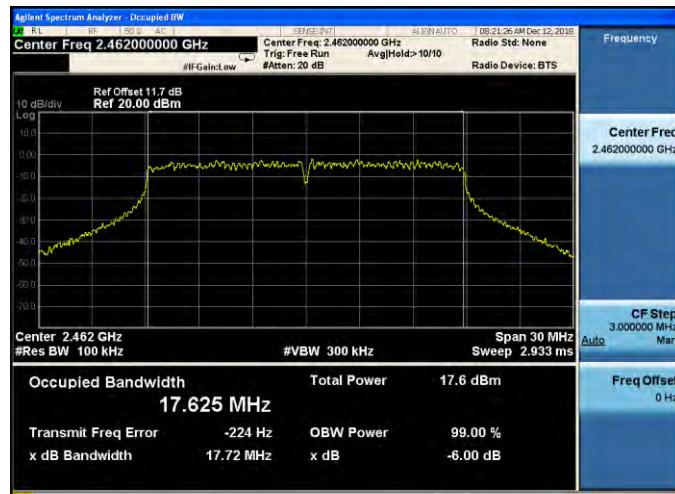
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-1

<p>2412 MHz</p>  <p>Occupied Bandwidth 17.632 MHz</p> <p>Transmit Freq Error -541 Hz OBW Power 99.00 %</p> <p>x dB Bandwidth 17.70 MHz x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 17.645 MHz</p> <p>Transmit Freq Error 8.956 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 17.71 MHz x dB -6.00 dB</p>
<p>2462 MHz</p>  <p>Occupied Bandwidth 17.638 MHz</p> <p>Transmit Freq Error 9.067 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 17.71 MHz x dB -6.00 dB</p>

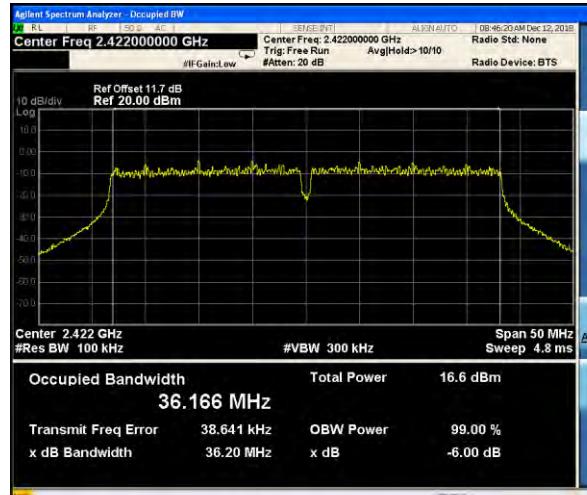
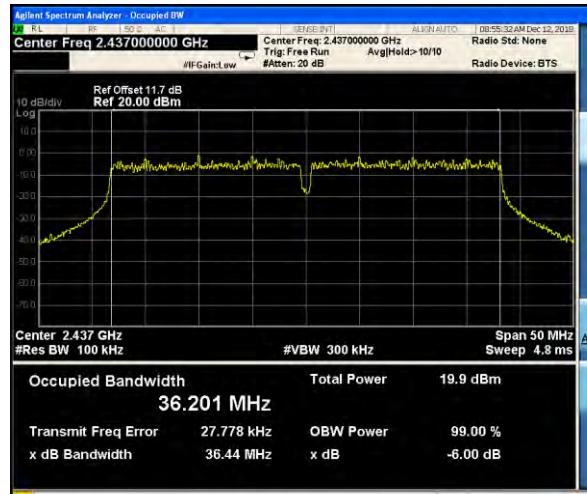
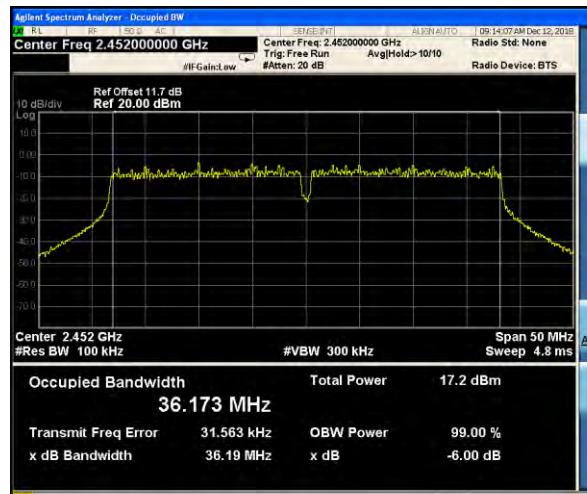
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-1

<p>2422 MHz</p>  <p>Occupied Bandwidth 36.179 MHz</p> <p>Transmit Freq Error 14.567 kHz</p> <p>x dB Bandwidth 36.39 MHz</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 36.195 MHz</p> <p>Transmit Freq Error 18.767 kHz</p> <p>x dB Bandwidth 36.37 MHz</p>
<p>2452 MHz</p>  <p>Occupied Bandwidth 36.173 MHz</p> <p>Transmit Freq Error 19.269 kHz</p> <p>x dB Bandwidth 36.40 MHz</p>

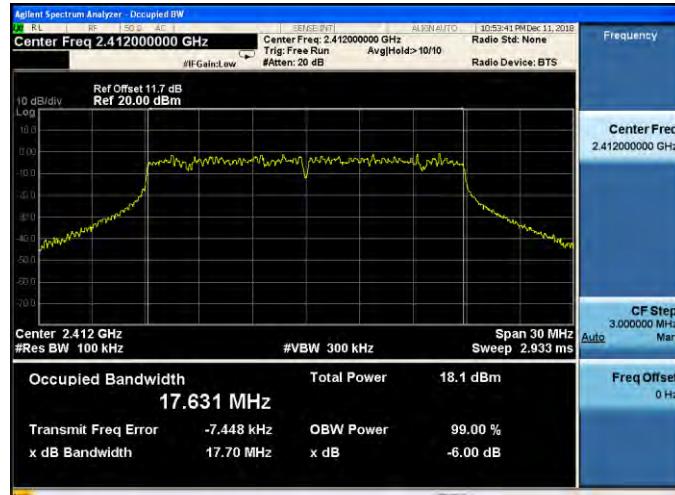
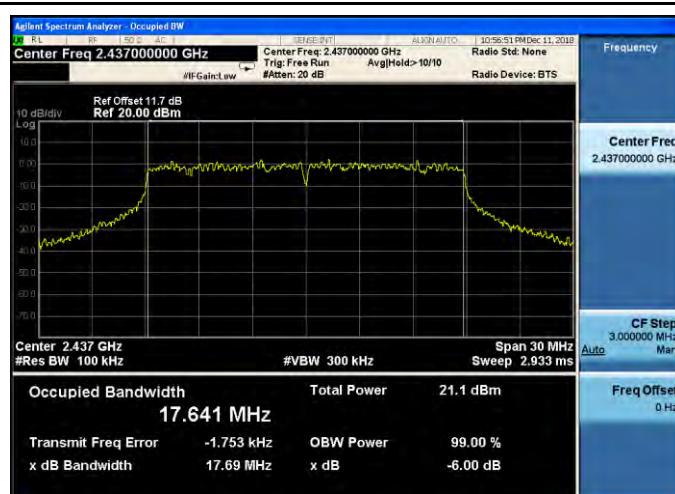
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-2

<p>2412 MHz</p>  <p>17.625 MHz</p> <p>Occupied Bandwidth Total Power 18.7 dBm 17.625 MHz</p> <p>Transmit Freq Error -2.545 kHz OBW Power 99.00 % x dB Bandwidth 17.70 MHz x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>17.621 MHz</p> <p>Occupied Bandwidth Total Power 21.3 dBm 17.621 MHz</p> <p>Transmit Freq Error -2.632 kHz OBW Power 99.00 % x dB Bandwidth 17.68 MHz x dB -6.00 dB</p>
<p>2462 MHz</p>  <p>17.625 MHz</p> <p>Occupied Bandwidth Total Power 17.6 dBm 17.625 MHz</p> <p>Transmit Freq Error -224 Hz OBW Power 99.00 % x dB Bandwidth 17.72 MHz x dB -6.00 dB</p>

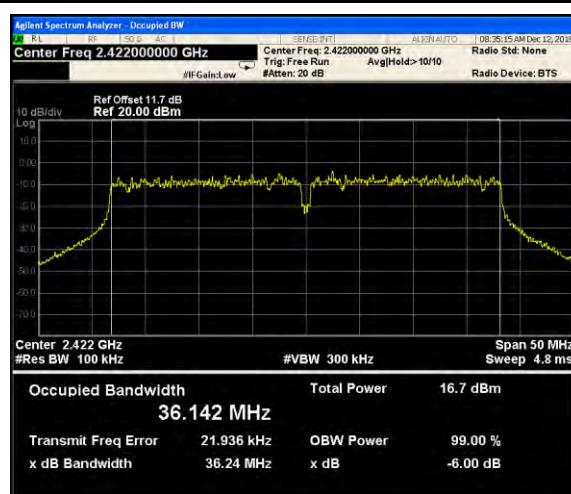
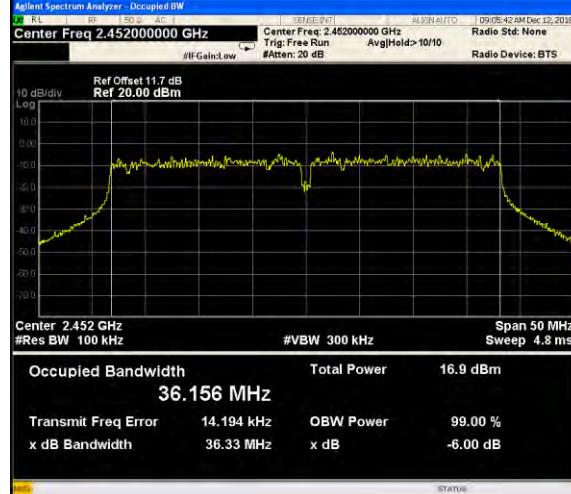
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-2

<p>2422 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.422000000 GHz 08:45:20 AM Dec 12, 2018 ALIN AUTO Radio Std: None Trig: Free Run Avg Hold> 10/10 Radio Device: BTS #IFGain Low #Atten: 20 dB</p>  <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0</p> <p>Center 2.422 GHz #Res BW 100 kHz #VBW 300 kHz Span 50 MHz Sweep 4.8 ms</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>16.6 dBm</td> </tr> <tr> <td colspan="2">36.166 MHz</td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>38.641 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>36.20 MHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table> <p>CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p> <p>STATUS</p>	Occupied Bandwidth	Total Power	16.6 dBm	36.166 MHz			Transmit Freq Error	38.641 kHz	OBW Power	99.00 %	x dB Bandwidth	36.20 MHz	x dB	-6.00 dB
Occupied Bandwidth	Total Power	16.6 dBm													
36.166 MHz															
Transmit Freq Error	38.641 kHz	OBW Power	99.00 %												
x dB Bandwidth	36.20 MHz	x dB	-6.00 dB												
<p>2437 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz 08:55:32 AM Dec 12, 2018 ALIN AUTO Radio Std: None Trig: Free Run Avg Hold> 10/10 Radio Device: BTS #IFGain Low #Atten: 20 dB</p>  <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0</p> <p>Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 50 MHz Sweep 4.8 ms</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>19.9 dBm</td> </tr> <tr> <td colspan="2">36.201 MHz</td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>27.778 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>36.44 MHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table> <p>CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p> <p>STATUS</p>	Occupied Bandwidth	Total Power	19.9 dBm	36.201 MHz			Transmit Freq Error	27.778 kHz	OBW Power	99.00 %	x dB Bandwidth	36.44 MHz	x dB	-6.00 dB
Occupied Bandwidth	Total Power	19.9 dBm													
36.201 MHz															
Transmit Freq Error	27.778 kHz	OBW Power	99.00 %												
x dB Bandwidth	36.44 MHz	x dB	-6.00 dB												
<p>2452 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.452000000 GHz 09:14:07 AM Dec 12, 2018 ALIN AUTO Radio Std: None Trig: Free Run Avg Hold> 10/10 Radio Device: BTS #IFGain Low #Atten: 20 dB</p>  <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0</p> <p>Center 2.452 GHz #Res BW 100 kHz #VBW 300 kHz Span 50 MHz Sweep 4.8 ms</p> <table border="1"> <tr> <td>Occupied Bandwidth</td> <td>Total Power</td> <td>17.2 dBm</td> </tr> <tr> <td colspan="2">36.173 MHz</td> <td></td> </tr> <tr> <td>Transmit Freq Error</td> <td>31.563 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>36.19 MHz</td> <td>x dB</td> <td>-6.00 dB</td> </tr> </table> <p>CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p> <p>STATUS</p>	Occupied Bandwidth	Total Power	17.2 dBm	36.173 MHz			Transmit Freq Error	31.563 kHz	OBW Power	99.00 %	x dB Bandwidth	36.19 MHz	x dB	-6.00 dB
Occupied Bandwidth	Total Power	17.2 dBm													
36.173 MHz															
Transmit Freq Error	31.563 kHz	OBW Power	99.00 %												
x dB Bandwidth	36.19 MHz	x dB	-6.00 dB												

Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-3

<p>2412 MHz</p>  <p>Occupied Bandwidth 17.631 MHz</p> <p>Transmit Freq Error -7.448 kHz</p> <p>x dB Bandwidth 17.70 MHz</p> <p>Total Power 18.1 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>
<p>2437 MHz</p>  <p>Occupied Bandwidth 17.641 MHz</p> <p>Transmit Freq Error -1.753 kHz</p> <p>x dB Bandwidth 17.69 MHz</p> <p>Total Power 21.1 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>
<p>2462 MHz</p>  <p>Occupied Bandwidth 17.631 MHz</p> <p>Transmit Freq Error -6.748 kHz</p> <p>x dB Bandwidth 17.70 MHz</p> <p>Total Power 17.7 dBm</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>

Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-3

<p>2422 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.422000000 GHz 08:25:15 AM Dec 12, 2018 ALGN AUTO 08:25:15 AM Dec 12, 2018 Radio Std: None #IFGainLow Center Freq: 2.422000000 GHz Trig: Free Run Avg Hold>10/10 Radio Device: BTS #Atten: 20 dB</p>  <p>Frequency Center Freq 2.422000000 GHz CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p> <p>Occupied Bandwidth Total Power 16.7 dBm 36.142 MHz</p> <p>Transmit Freq Error 21.936 kHz OBW Power 99.00 % x dB Bandwidth 36.24 MHz x dB -6.00 dB</p> <p>Span 50 MHz Sweep 4.8 ms #Res BW 100 kHz #VBW 300 kHz</p>
<p>2437 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz 09:08:42 AM Dec 12, 2018 ALGN AUTO 09:08:42 AM Dec 12, 2018 Radio Std: None #IFGainLow Center Freq: 2.437000000 GHz Trig: Free Run Avg Hold>10/10 Radio Device: BTS #Atten: 20 dB</p>  <p>Frequency Center Freq 2.437000000 GHz CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p> <p>Occupied Bandwidth Total Power 19.8 dBm 36.153 MHz</p> <p>Transmit Freq Error 16.973 kHz OBW Power 99.00 % x dB Bandwidth 36.22 MHz x dB -6.00 dB</p> <p>Span 50 MHz Sweep 4.8 ms #Res BW 100 kHz #VBW 300 kHz</p>
<p>2452 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.452000000 GHz 09:08:42 AM Dec 12, 2018 ALGN AUTO 09:08:42 AM Dec 12, 2018 Radio Std: None #IFGainLow Center Freq: 2.452000000 GHz Trig: Free Run Avg Hold>10/10 Radio Device: BTS #Atten: 20 dB</p>  <p>Frequency Center Freq 2.452000000 GHz CF Step 5.000000 MHz Auto Freq Offset 0 Hz</p> <p>Occupied Bandwidth Total Power 16.9 dBm 36.156 MHz</p> <p>Transmit Freq Error 14.194 kHz OBW Power 99.00 % x dB Bandwidth 36.33 MHz x dB -6.00 dB</p> <p>Span 50 MHz Sweep 4.8 ms #Res BW 100 kHz #VBW 300 kHz</p>

Maximum Power Spectral Density Measurement

Test Mode	Frequency (MHz)	Measurement (dBm/3 kHz)					Limit (dBm/ 3 kHz)
		ANT-0	ANT-1	ANT-2	ANT-3	ANT-0+1+2+3	
Mode 2	2412	-2.071	-3.567	-2.824	-2.736	3.253	≤ 4.88
	2437	-1.941	-2.992	-2.555	-2.207	3.615	≤ 4.88
	2462	-2.044	-2.737	-3.125	-2.819	3.358	≤ 4.88
Mode 3	2412	-6.946	-7.002	-7.114	-7.228	-1.051	≤ 4.88
	2437	-6.384	-6.787	-7.632	-6.691	-0.829	≤ 4.88
	2462	-6.898	-6.711	-7.467	-7.299	-1.063	≤ 4.88
Mode 4	2412	-10.168	-10.496	-10.633	-10.209	-4.352	≤ 8
	2437	-6.509	-7.397	-7.990	-7.320	-1.251	≤ 8
	2462	-10.254	-10.639	-11.410	-10.806	-4.737	≤ 8
Mode 5	2422	-14.704	-14.617	-15.160	-15.245	-8.902	≤ 8
	2437	-11.187	-12.597	-11.867	-12.379	-5.952	≤ 8
	2452	-14.942	-15.434	-15.385	-15.277	-9.235	≤ 8

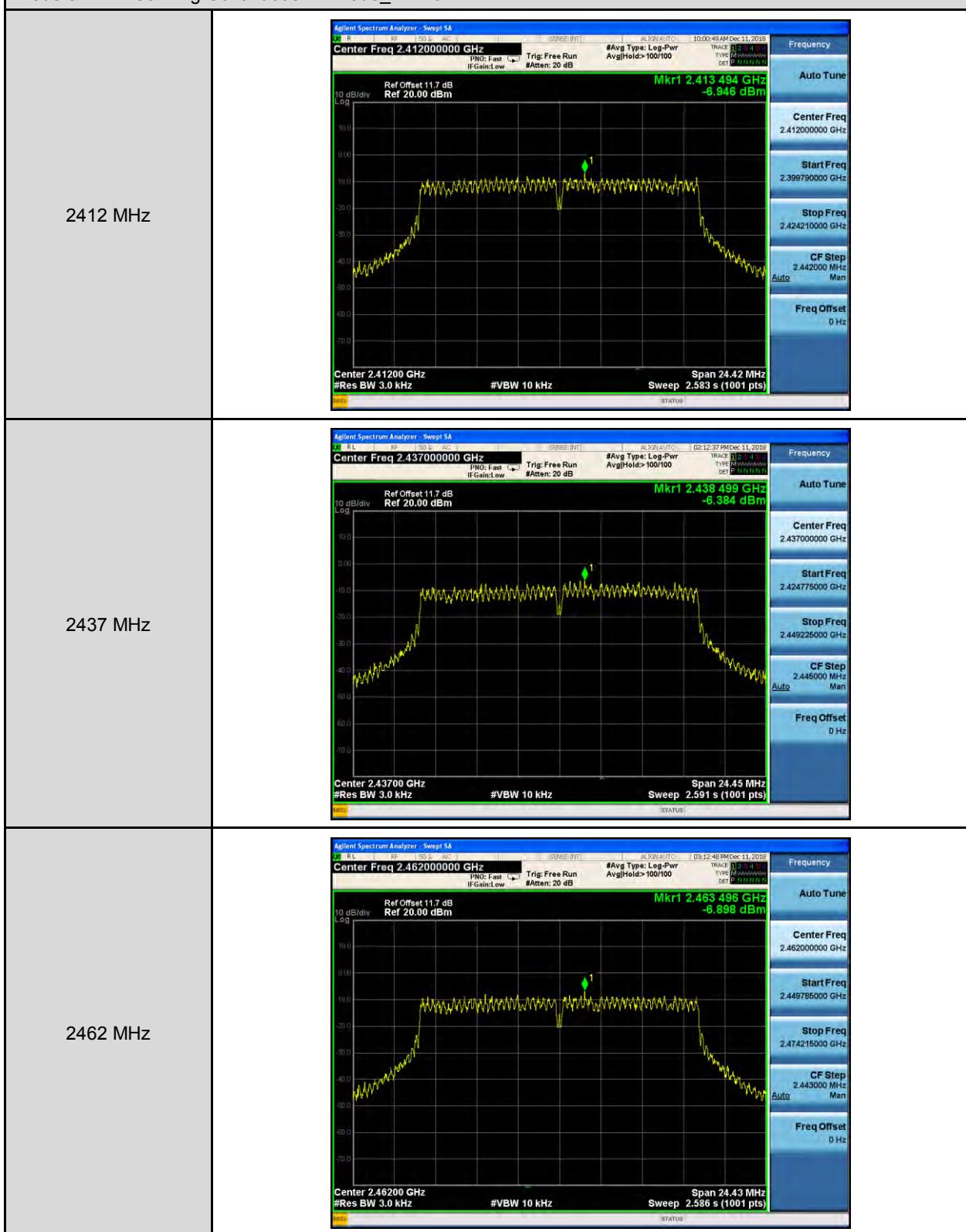
Beamforming on

Test Mode	Frequency (MHz)	Measurement (dBm/3 kHz)					Limit (dBm/ 3 kHz)
		ANT-0	ANT-1	ANT-2	ANT-3	ANT-0+1+2+3	
Mode 4	2412	-18.513	-18.194	-18.371	-19.265	-12.547	≤ 4.88
	2437	-14.536	-14.419	-15.922	-16.073	-9.150	≤ 4.88
	2462	-17.887	-17.667	-18.189	-18.040	-11.921	≤ 4.88
Mode 5	2422	-20.623	-19.489	-21.024	-22.059	-14.681	≤ 4.88
	2437	-17.833	-16.766	-18.190	-19.093	-11.870	≤ 4.88
	2452	-20.821	-19.929	-20.909	-21.665	-14.767	≤ 4.88

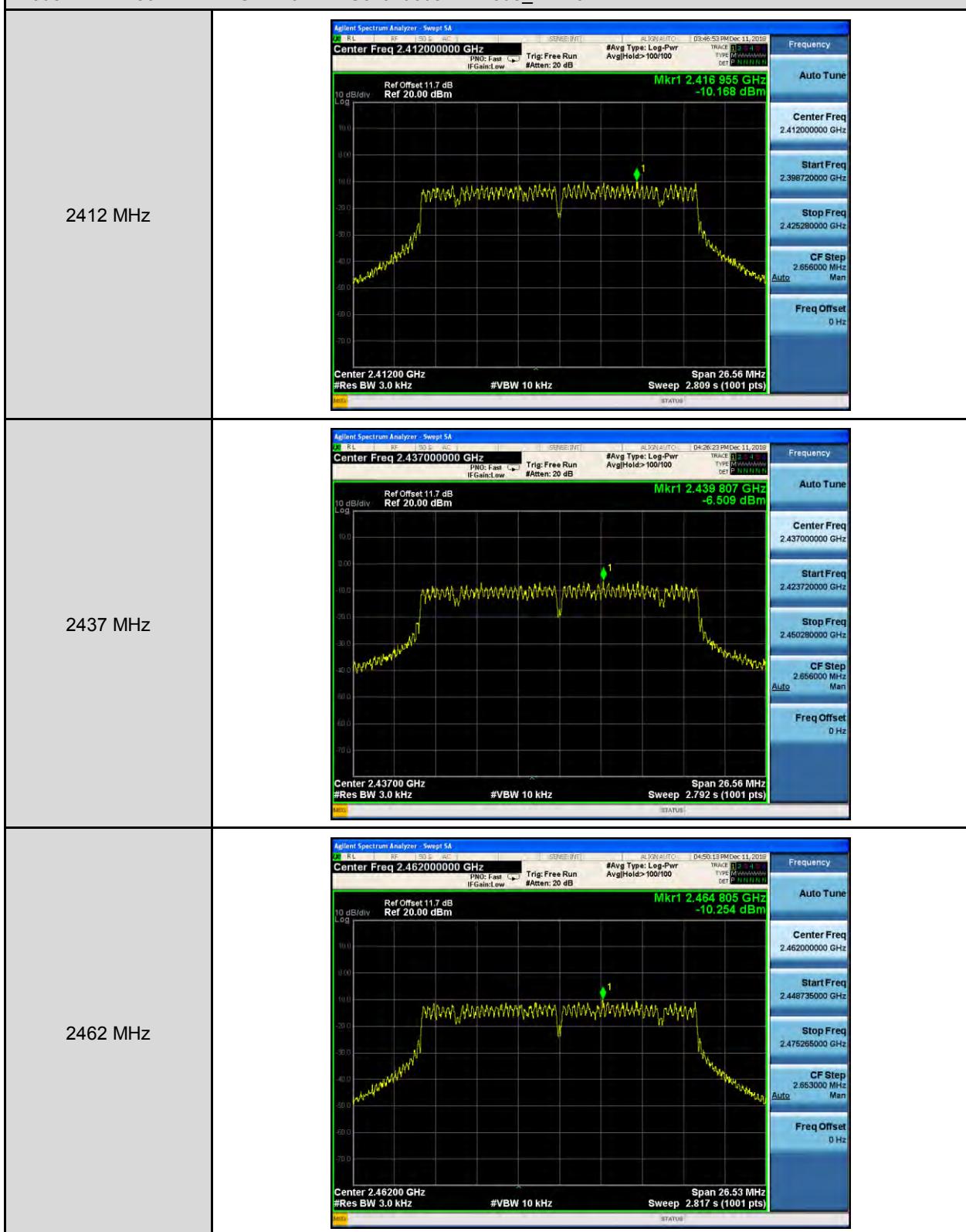
Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

2412 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.412000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 12.81 MHz</p> <p>#VBW 10 kHz</p> <p>Sweep 1.365 s (1001 pts)</p> <p>Mkr1 2.412 932 GHz -2.071 dBm</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.405595000 GHz</p> <p>Stop Freq 2.418405000 GHz</p> <p>CF Step 1.281000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.437000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 12.10 MHz</p> <p>#VBW 10 kHz</p> <p>Sweep 1.295 s (1001 pts)</p> <p>Mkr1 2.436 190 GHz -1.941 dBm</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.430960000 GHz</p> <p>Stop Freq 2.443056000 GHz</p> <p>CF Step 1.210000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.462000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 12.90 MHz</p> <p>#VBW 10 kHz</p> <p>Sweep 1.366 s (1001 pts)</p> <p>Mkr1 2.461 378 GHz -2.044 dBm</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.462000000 GHz</p> <p>Start Freq 2.455560000 GHz</p> <p>Stop Freq 2.468450000 GHz</p> <p>CF Step 1.290000 MHz Auto</p> <p>Freq Offset 0 Hz</p>

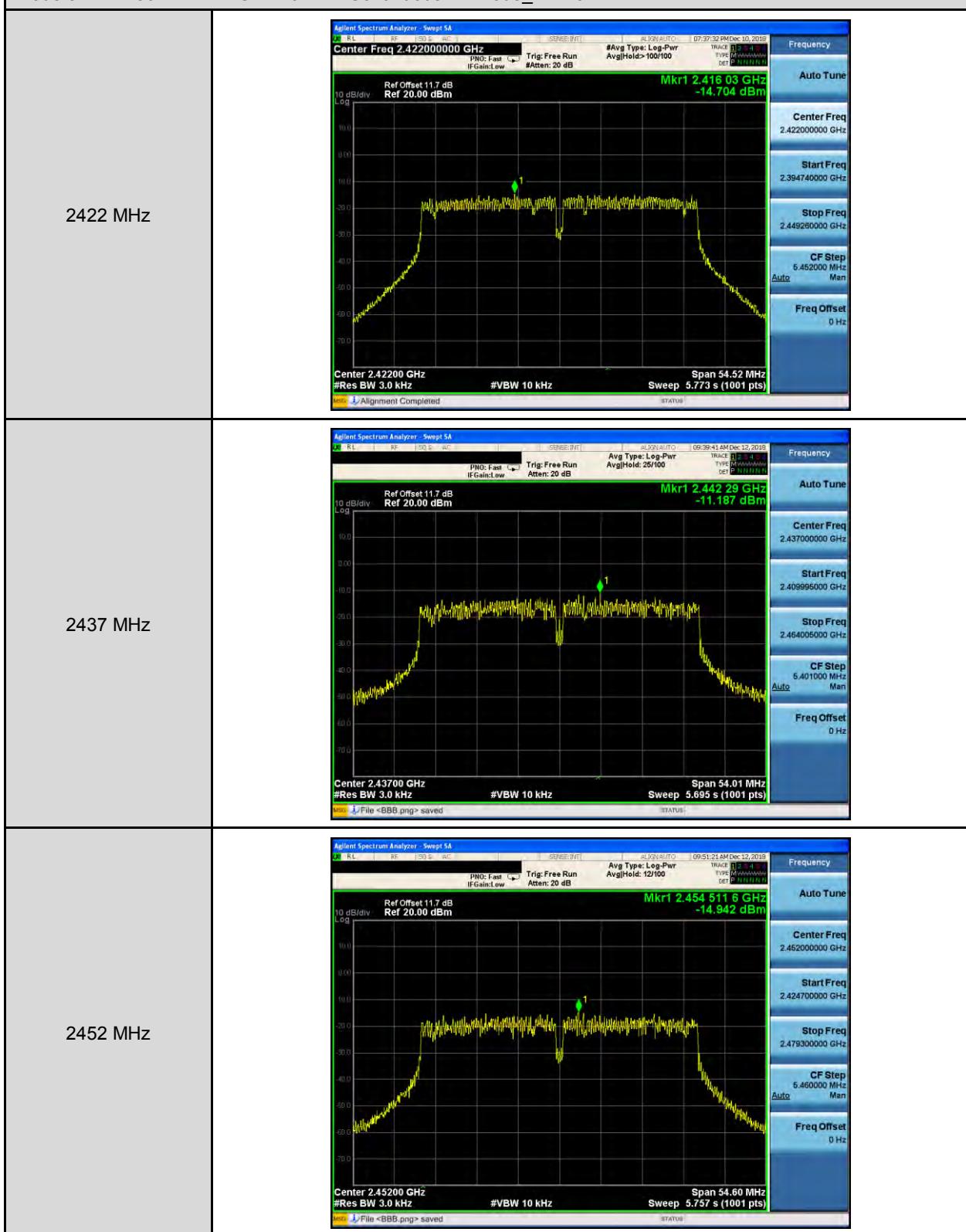
Mode 3: IEEE 802.11g Continuous TX mode_ANT-0



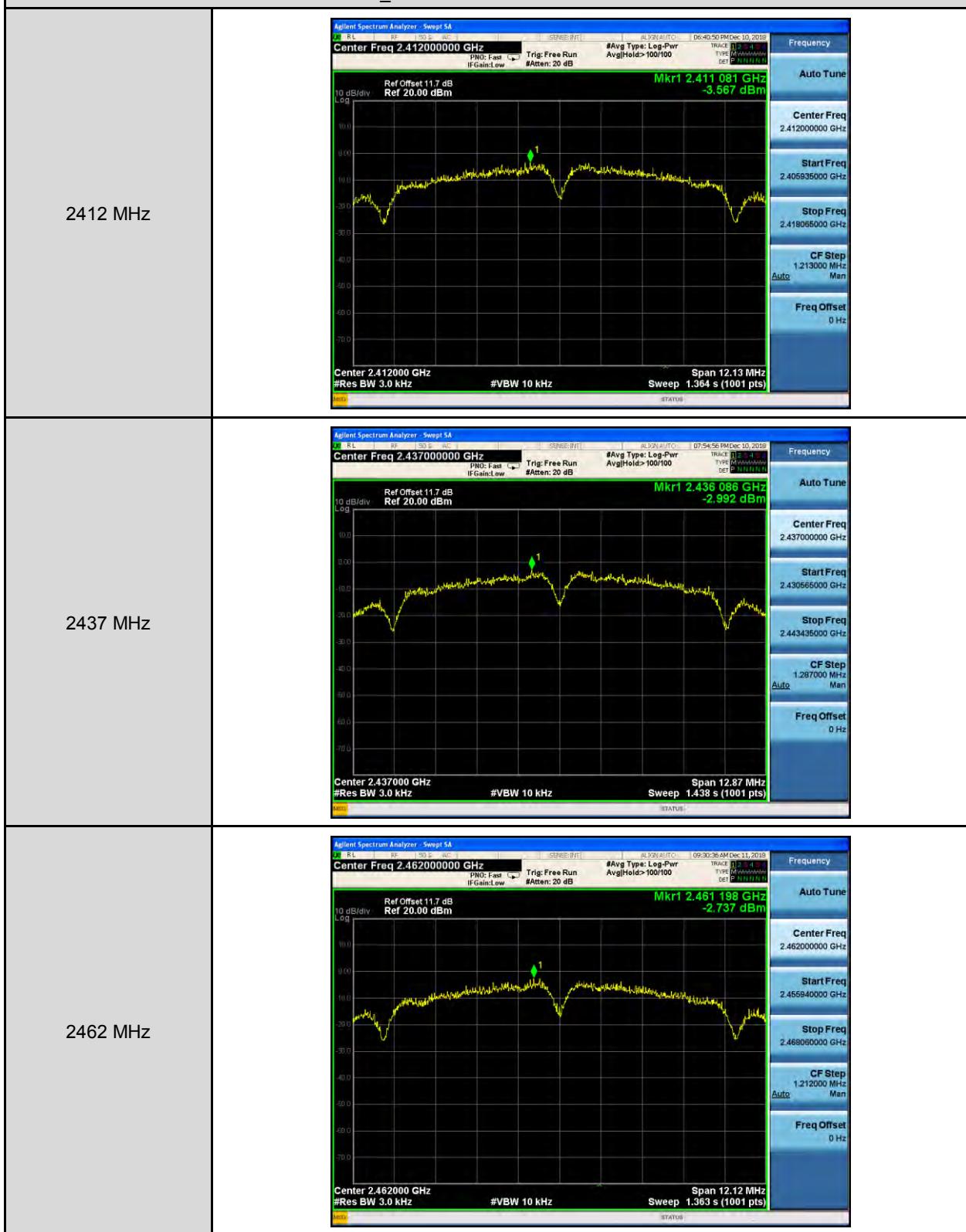
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-0



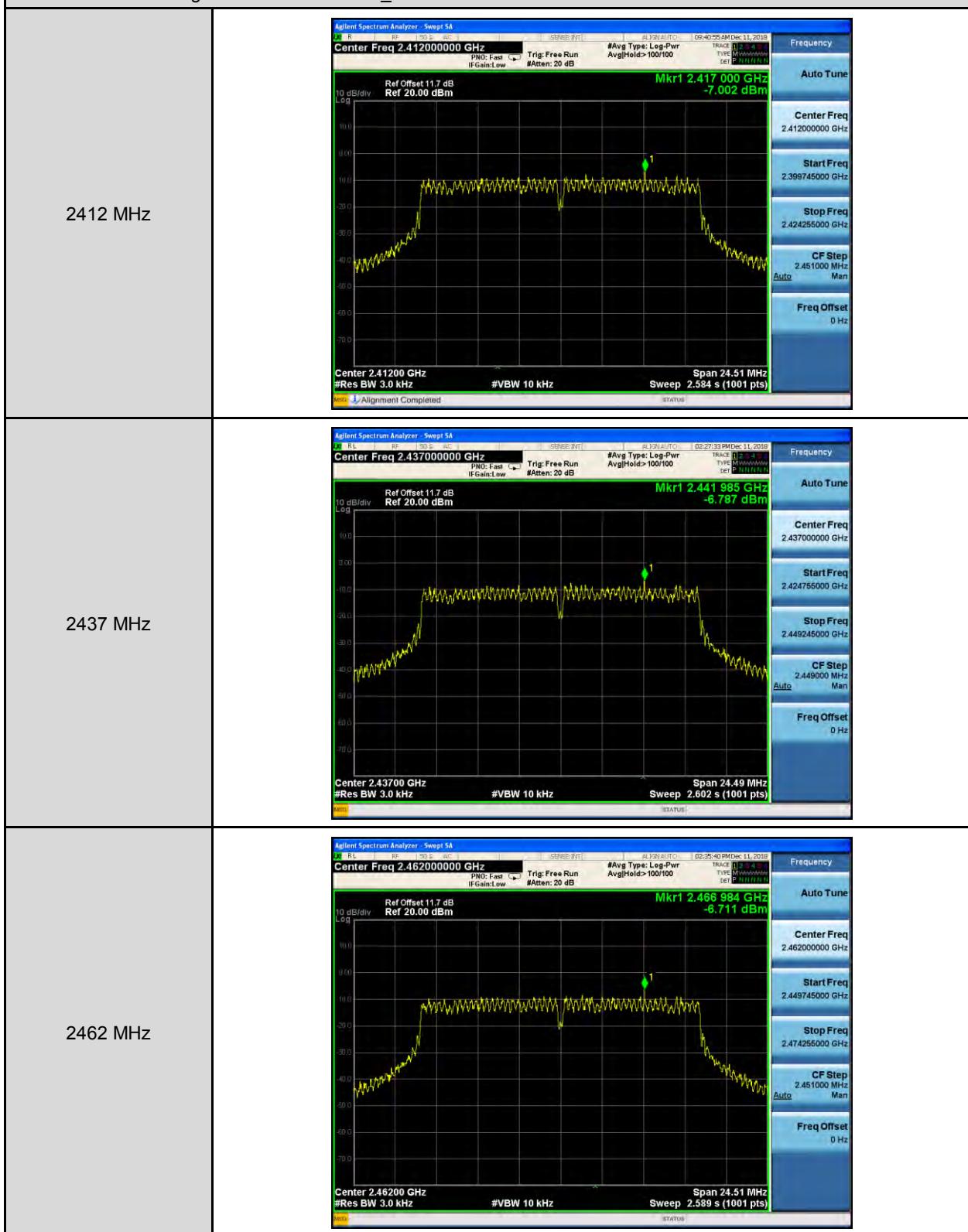
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-0



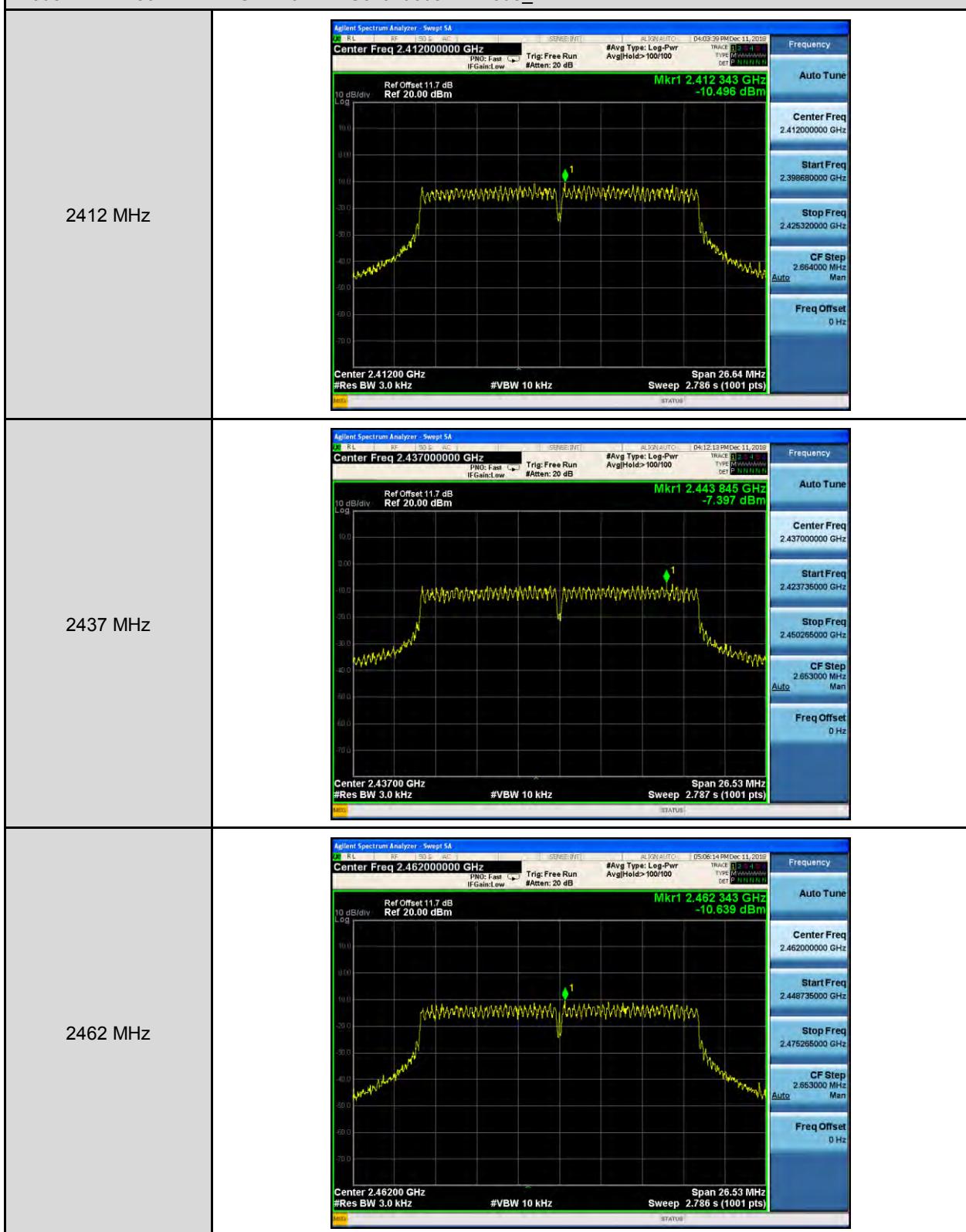
Mode 2: IEEE 802.11b Continuous TX mode_ANT-1



Mode 3: IEEE 802.11g Continuous TX mode_ANT-1



Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-1



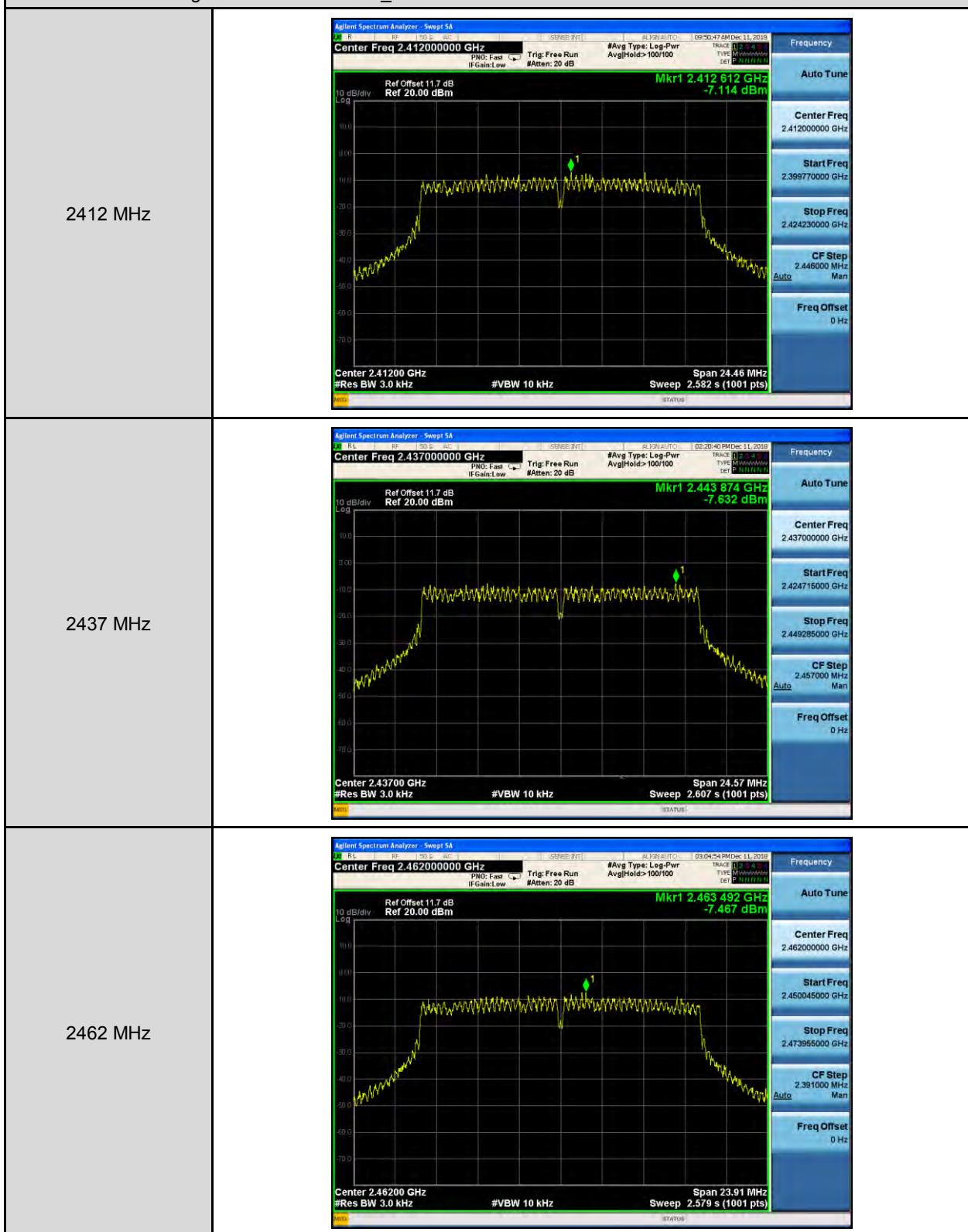
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-1



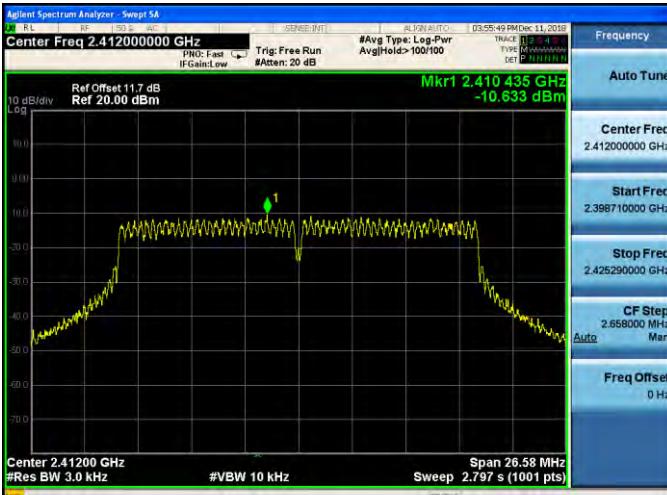
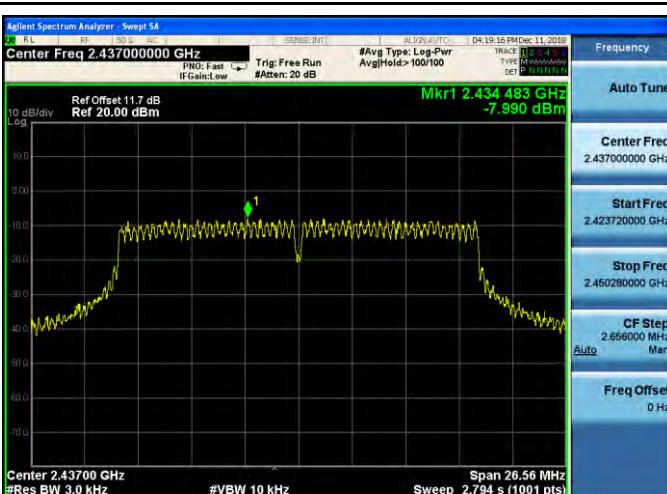
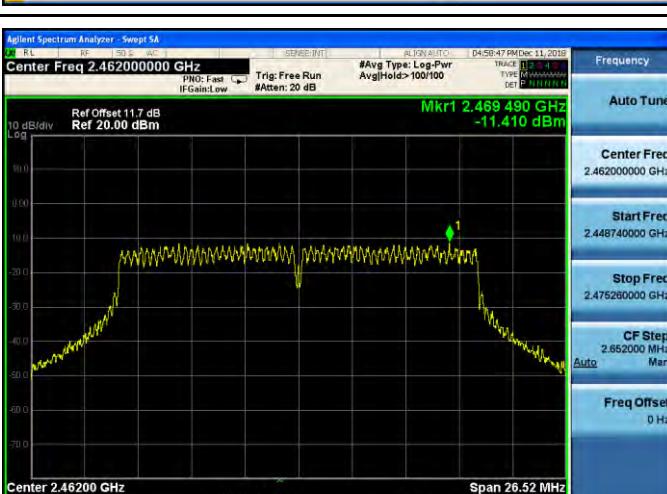
Mode 2: IEEE 802.11b Continuous TX mode_ANT-2

2412 MHz	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.412000000 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.289 s (1001 pts) Mkr1 2.411 318 GHz -2.824 dBm</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.437000000 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.289 s (1001 pts) Mkr1 2.437 929 GHz -2.555 dBm</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.462000000 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.288 s (1001 pts) Mkr1 2.461 072 GHz -3.125 dBm</p>

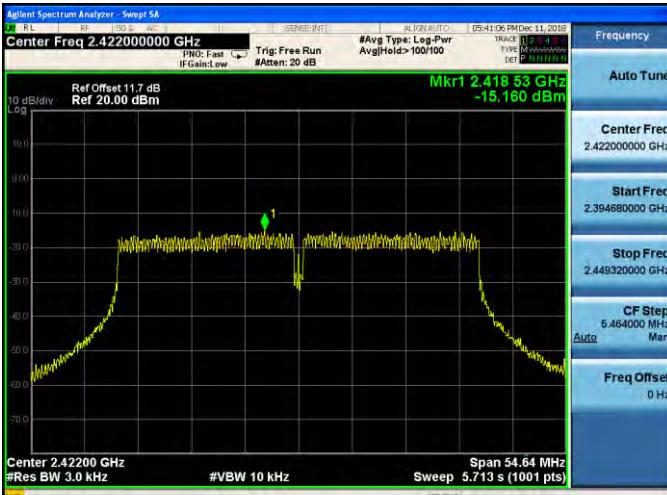
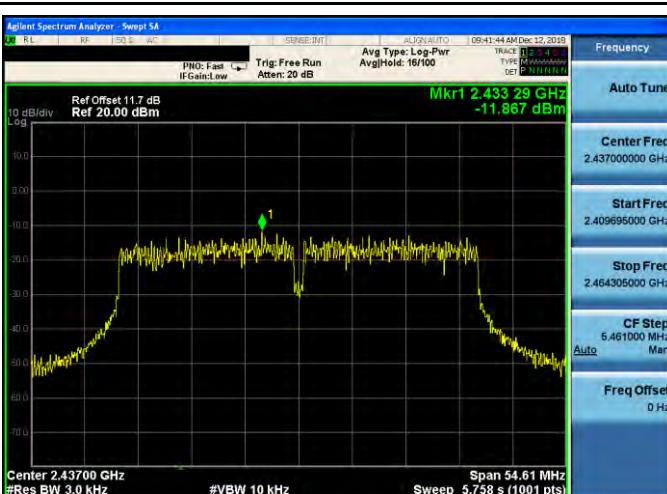
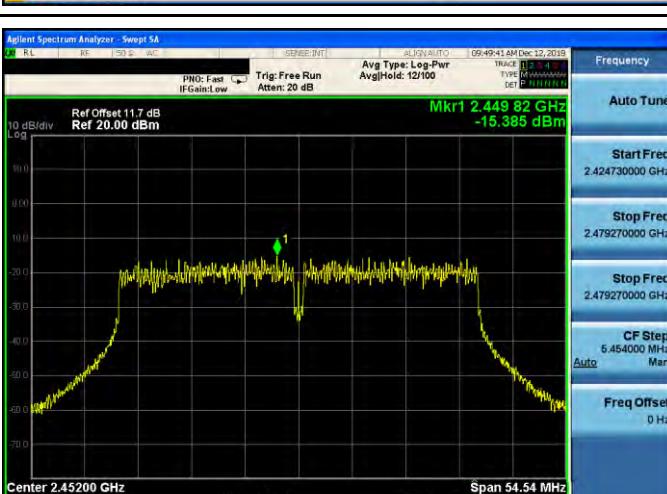
Mode 3: IEEE 802.11g Continuous TX mode_ANT-2



Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-2

2412 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.412000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 20 dB #Avg Type: Log-Pwr Avg/Hold> 100/100 Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Mkr1 2.410 435 GHz -10.633 dBm Center 2.41200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.58 MHz Sweep 2.797 s (1001 pts) STATUS</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.437000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 20 dB #Avg Type: Log-Pwr Avg/Hold> 100/100 Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Mkr1 2.434 483 GHz -7.990 dBm Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.56 MHz Sweep 2.794 s (1001 pts) STATUS</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.462000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 20 dB #Avg Type: Log-Pwr Avg/Hold> 100/100 Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Mkr1 2.469 490 GHz -11.410 dBm Center 2.46200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.52 MHz Sweep 2.800 s (1001 pts) STATUS</p>

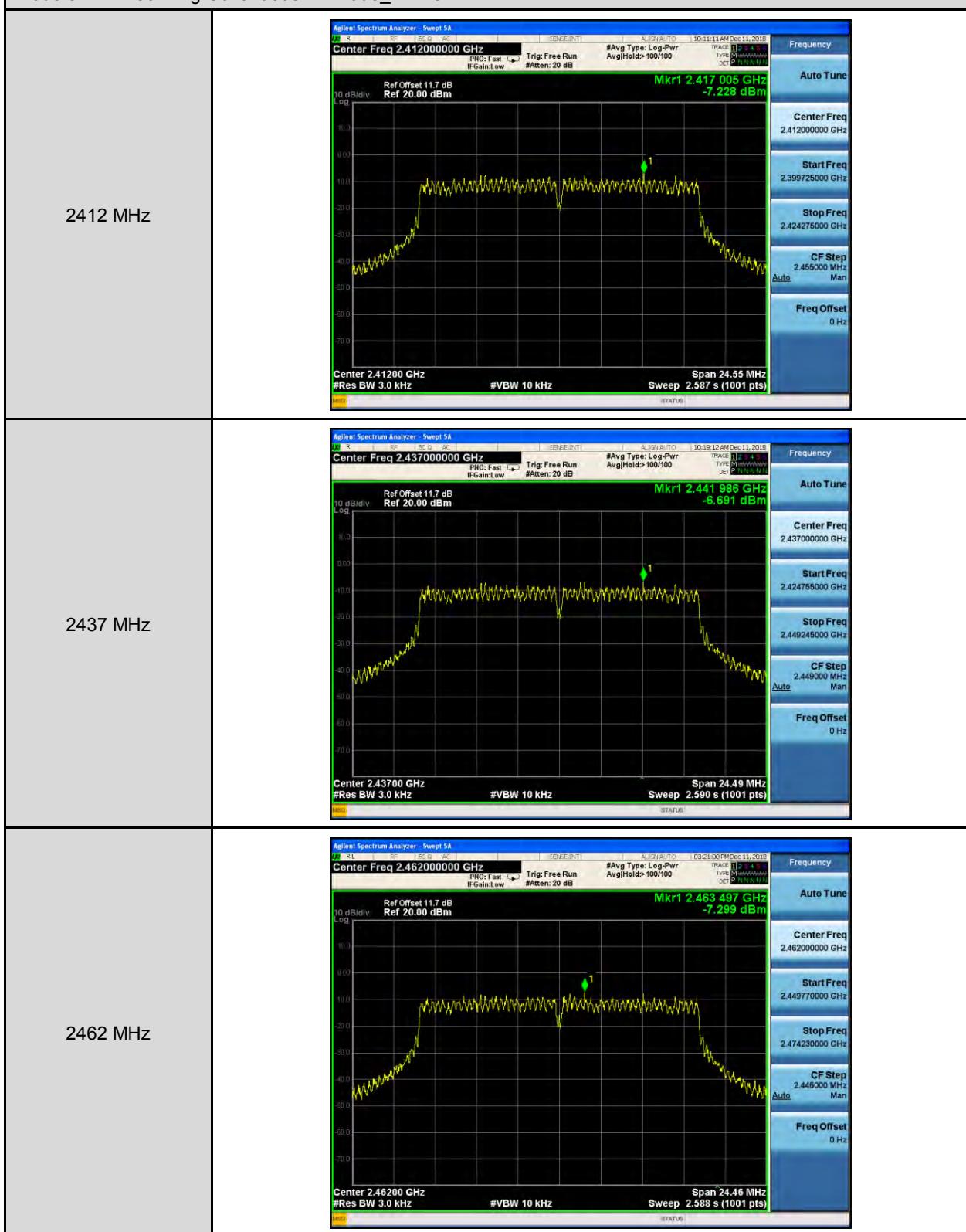
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-2

2422 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.422000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Ave: 100/100 #Res BW 3.0 kHz #VBW 10 kHz Span 54.64 MHz Sweep 5.713 s (1001 pts) Mkr1 2.418 53 GHz -15.160 dBm</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.437000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Ave: 100/100 #Res BW 3.0 kHz #VBW 10 kHz Span 54.61 MHz Sweep 5.758 s (1001 pts) Mkr1 2.433 29 GHz -11.867 dBm</p>
2452 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Center Freq 2.452000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Ave: 12/100 #Res BW 3.0 kHz #VBW 10 kHz Span 54.54 MHz Sweep 5.751 s (1001 pts) Mkr1 2.449 82 GHz -15.385 dBm</p>

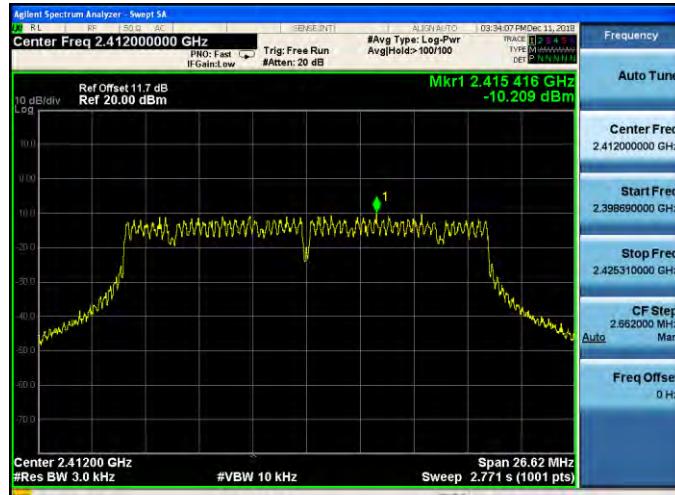
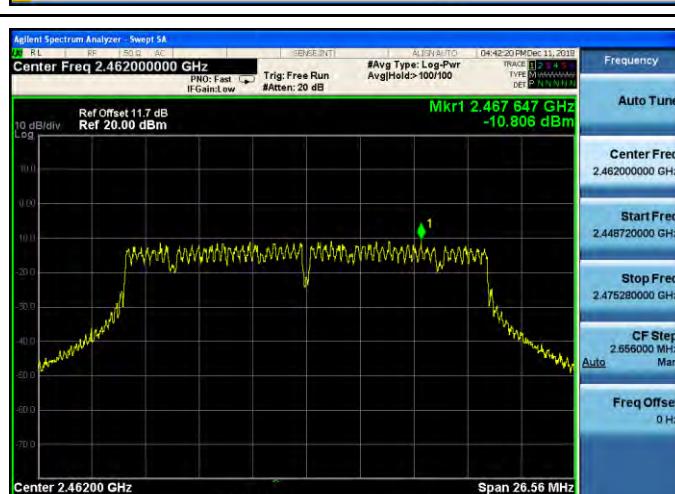
Mode 2: IEEE 802.11b Continuous TX mode_ANT-3

2412 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.412000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 12.08 MHz</p> <p>Center 2.412000 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.363 s (1001 pts)</p> <p>Mkr1 2.412 931 GHz -2.736 dBm</p> <p>Frequency Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.405980000 GHz</p> <p>Stop Freq 2.418040000 GHz</p> <p>CF Step 1.208000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.437000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 12.15 MHz</p> <p>Center 2.437000 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.366 s (1001 pts)</p> <p>Mkr1 2.437 933 GHz -2.207 dBm</p> <p>Frequency Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.430925000 GHz</p> <p>Stop Freq 2.443075000 GHz</p> <p>CF Step 1.215000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.462000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Span 12.04 MHz</p> <p>Center 2.462000 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.362 s (1001 pts)</p> <p>Mkr1 2.460 915 GHz -2.819 dBm</p> <p>Frequency Auto Tune</p> <p>Center Freq 2.462000000 GHz</p> <p>Start Freq 2.455980000 GHz</p> <p>Stop Freq 2.468020000 GHz</p> <p>CF Step 1.204000 MHz Auto</p> <p>Freq Offset 0 Hz</p>

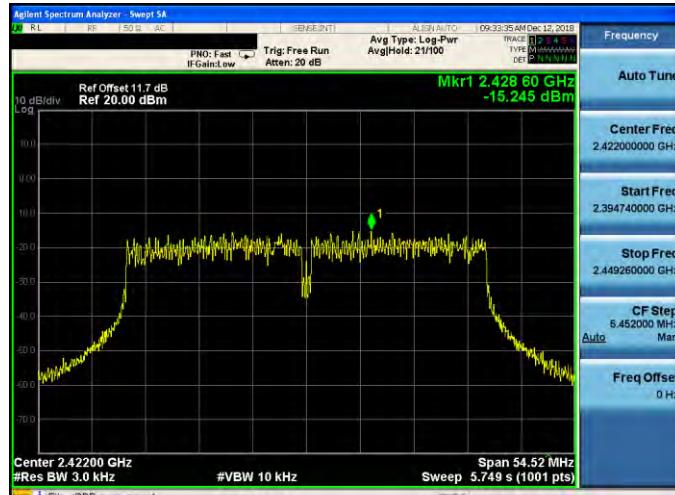
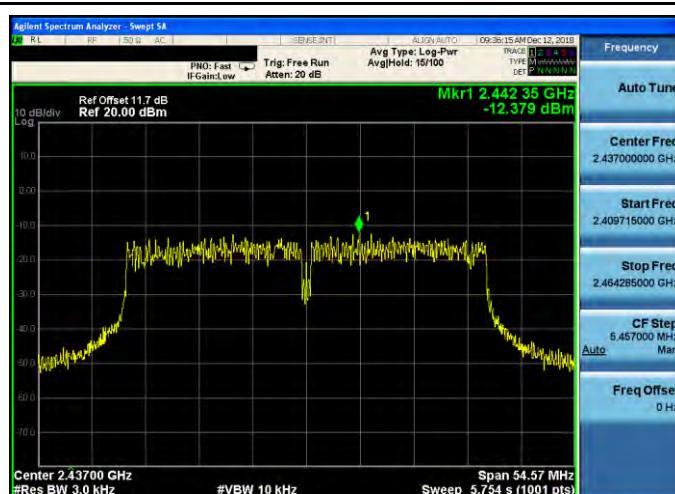
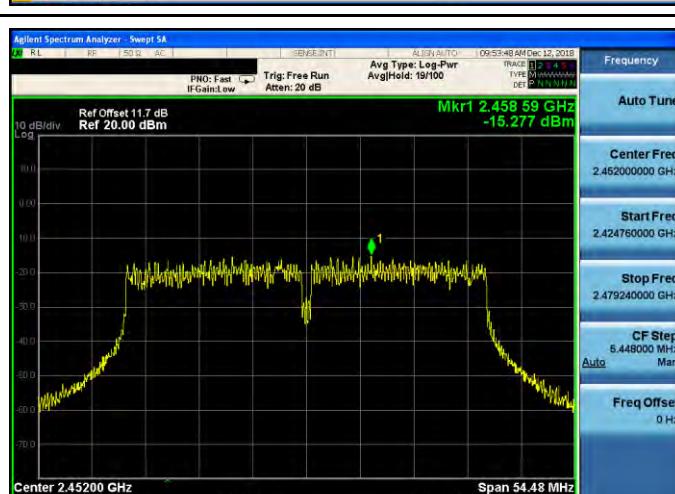
Mode 3: IEEE 802.11g Continuous TX mode_ANT-3



Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-3

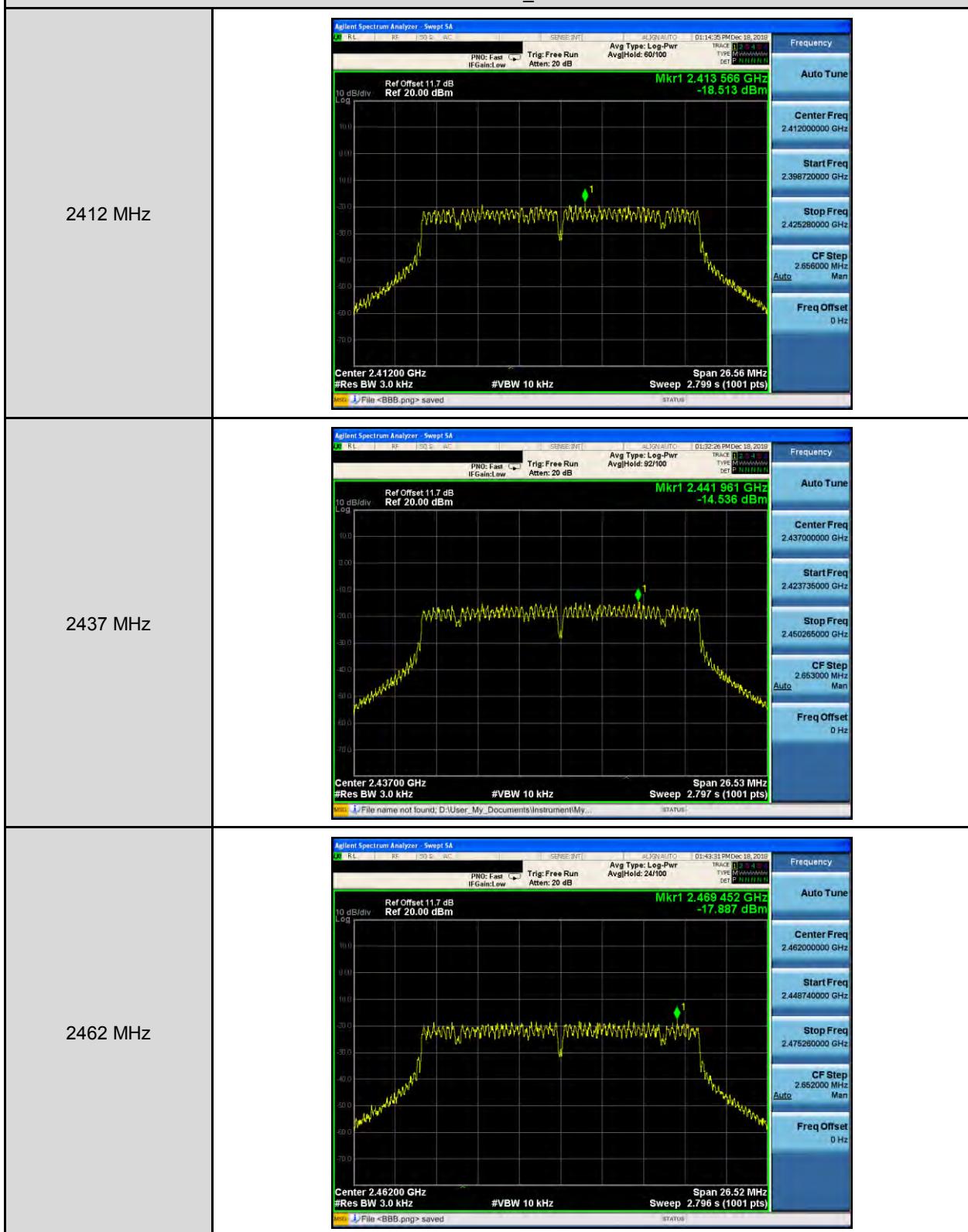
2412 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.412000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Mkr1 2.415 416 GHz -10.209 dBm</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.398690000 GHz</p> <p>Stop Freq 2.425310000 GHz</p> <p>CF Step 2.662000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.437000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Mkr1 2.441 084 GHz -7.320 dBm</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.423725000 GHz</p> <p>Stop Freq 2.450275000 GHz</p> <p>CF Step 2.655000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.462000000 GHz</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Mkr1 2.467 647 GHz -10.806 dBm</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.462000000 GHz</p> <p>Start Freq 2.448720000 GHz</p> <p>Stop Freq 2.475280000 GHz</p> <p>CF Step 2.656000 MHz Auto</p> <p>Freq Offset 0 Hz</p>

Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-3

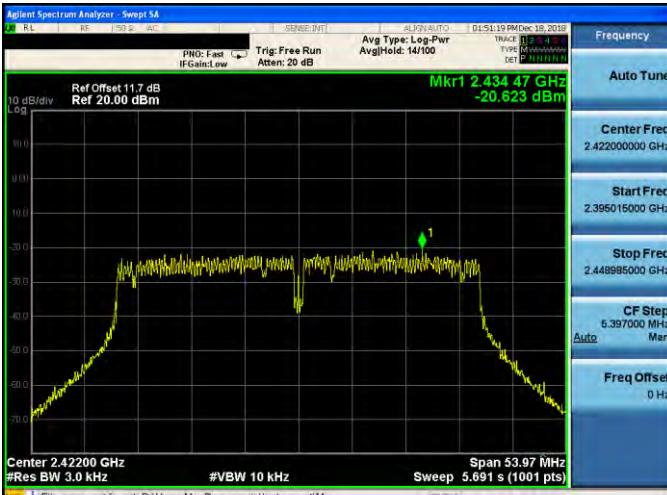
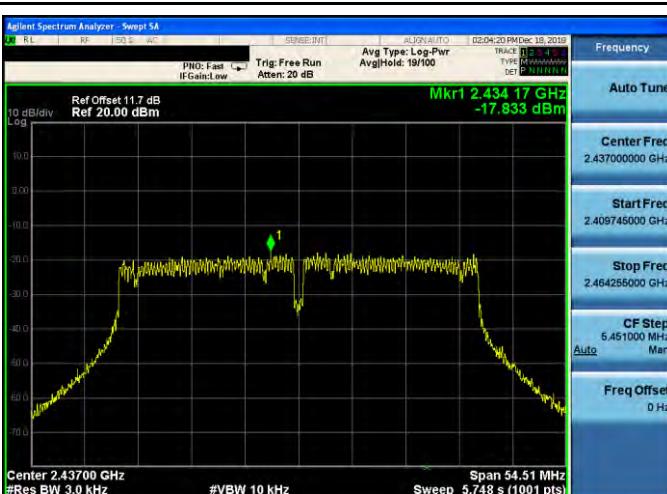
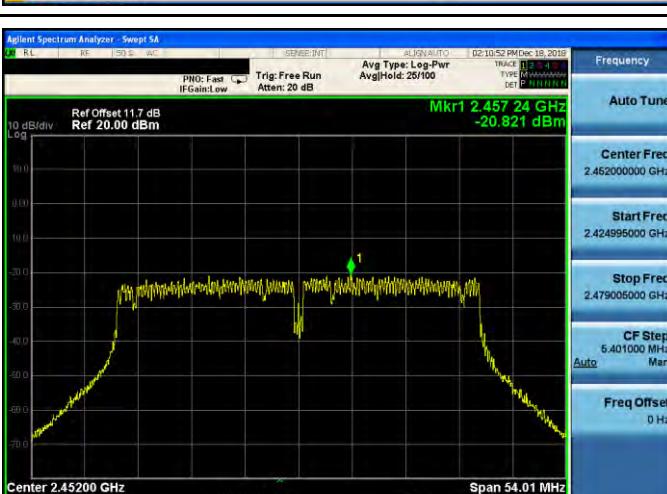
2422 MHz	 <p>Agilent Spectrum Analyzer - Sweep 5A R.L. RF 150 Ω AC SENSE:INTI ALIGN AUTO: 09-22 5:40 PM Dec 12, 2018 PNO: Fast Trig: Free Run Avg Type: Log-Pwr IF Gain:Low Atten: 20 dB AvgHold: 21/100 Mkr1 2.428 60 GHz -15.245 dBm Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.42200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.52 MHz Sweep 5.749 s (1001 pts) File <BBB.png> saved STATUS</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Sweep 5A R.L. RF 150 Ω AC SENSE:INTI ALIGN AUTO: 09-26 15 AM Dec 12, 2018 PNO: Fast Trig: Free Run Avg Type: Log-Pwr IF Gain:Low Atten: 20 dB AvgHold: 15/100 Mkr1 2.442 35 GHz -12.379 dBm Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.57 MHz Sweep 5.754 s (1001 pts) File <BBB.png> saved STATUS</p>
2452 MHz	 <p>Agilent Spectrum Analyzer - Sweep 5A R.L. RF 150 Ω AC SENSE:INTI ALIGN AUTO: 09-26 4:48 AM Dec 12, 2018 PNO: Fast Trig: Free Run Avg Type: Log-Pwr IF Gain:Low Atten: 20 dB AvgHold: 19/100 Mkr1 2.458 59 GHz -15.277 dBm Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.45200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.48 MHz Sweep 5.744 s (1001 pts) File <BBB.png> saved STATUS</p>

Beamforming on

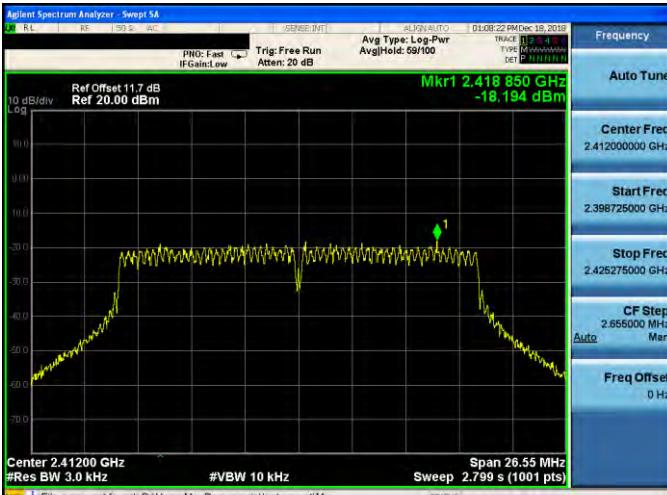
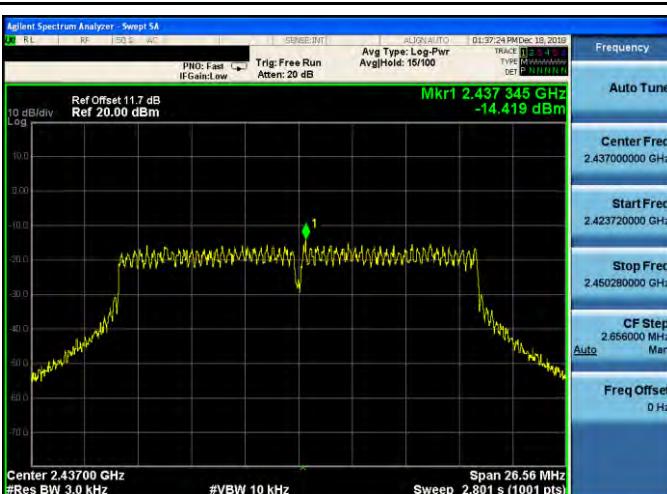
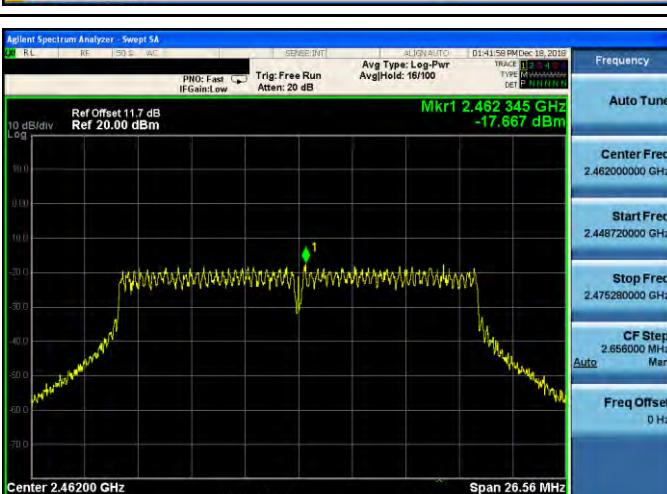
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-0



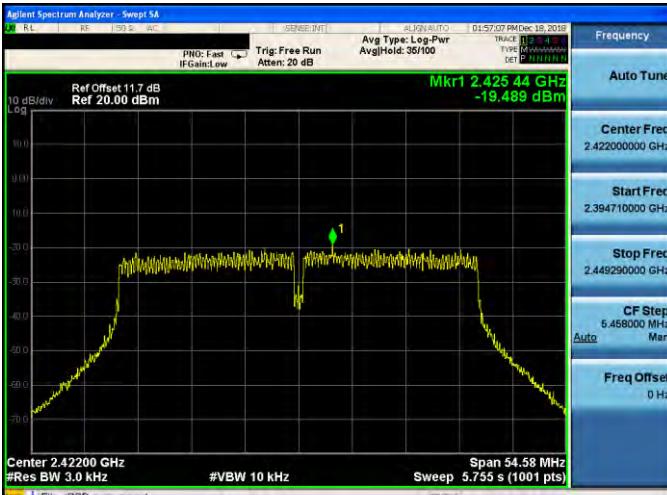
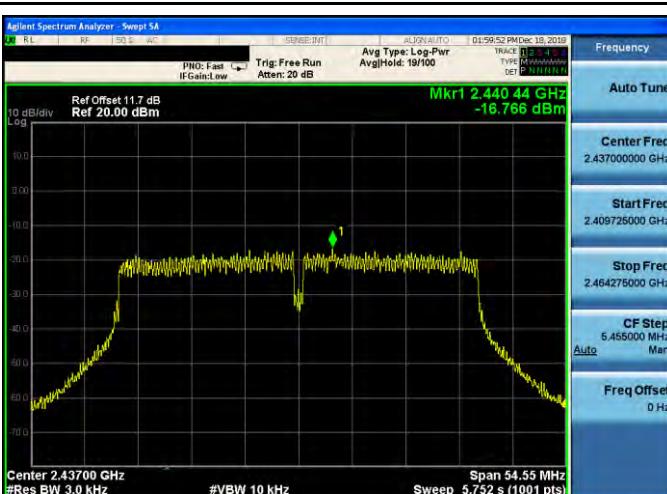
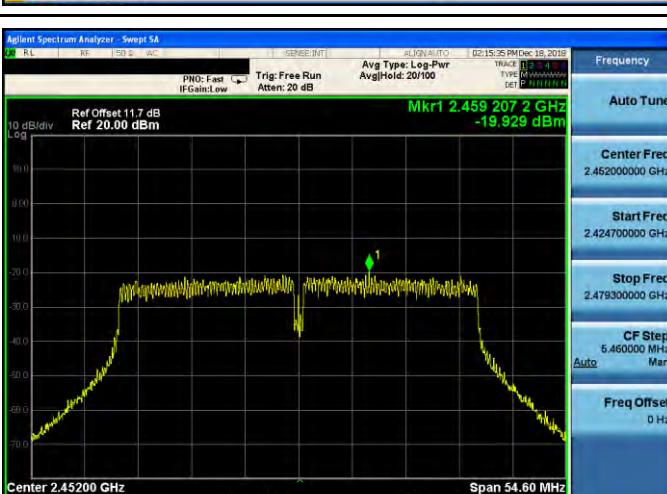
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-0

2422 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm Center 2.42200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 53.97 MHz Sweep 5.691 s (1001 pts) File name not found: D:\User_My_Documents\Instrument\My... STATUS</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.51 MHz Sweep 5.748 s (1001 pts) File <BBB.png> saved STATUS</p>
2452 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm Center 2.45200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.01 MHz Sweep 5.695 s (1001 pts) File name not found: D:\User_My_Documents\Instrument\My... STATUS</p>

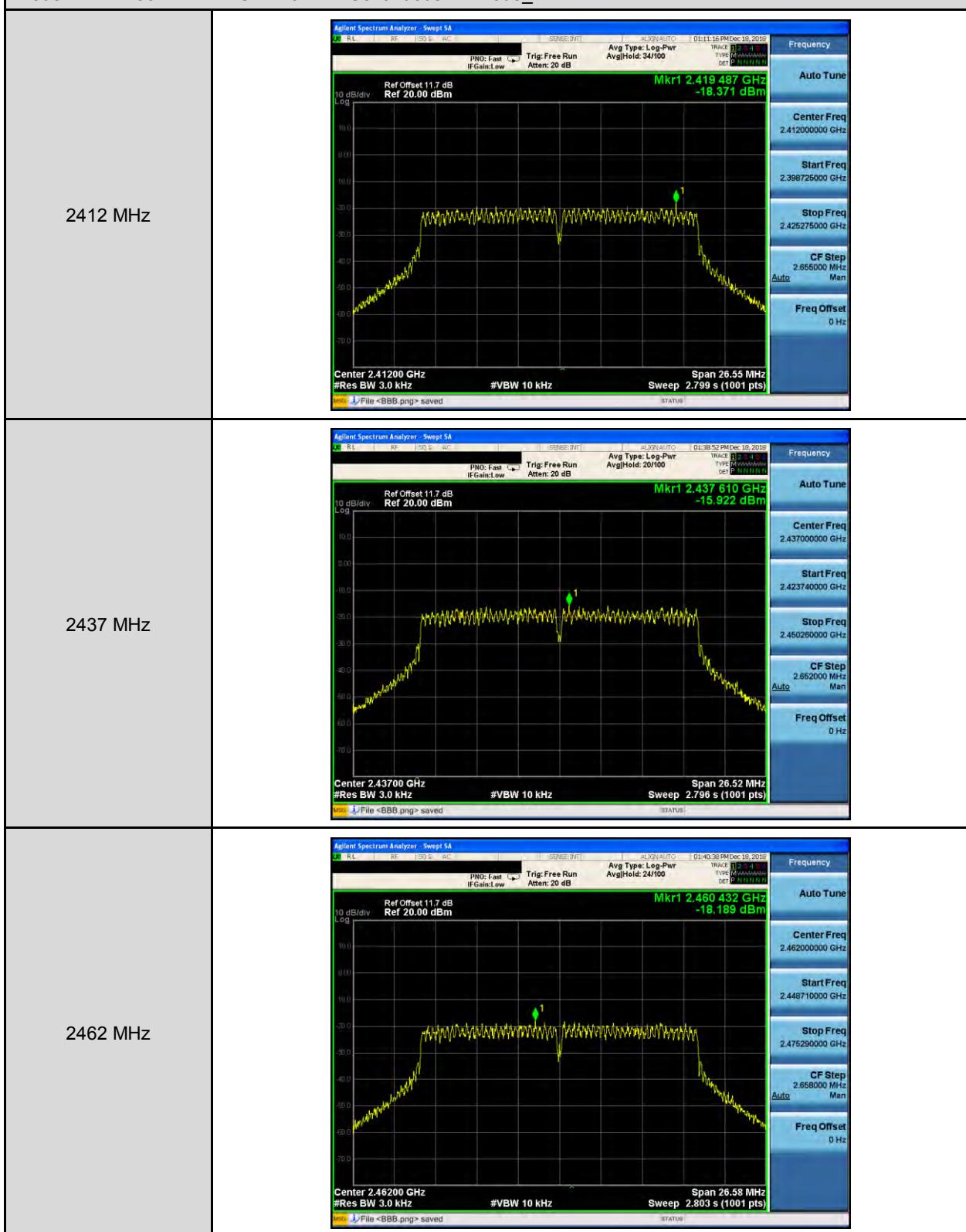
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-1

2412 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm Center 2.41200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.55 MHz Sweep 2.799 s (1001 pts) Mkr1 2.418 850 GHz -18.194 dBm</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.56 MHz Sweep 2.801 s (1001 pts) Mkr1 2.437 345 GHz -14.419 dBm</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm Center 2.46200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.56 MHz Sweep 2.801 s (1001 pts) Mkr1 2.462 345 GHz -17.667 dBm</p>

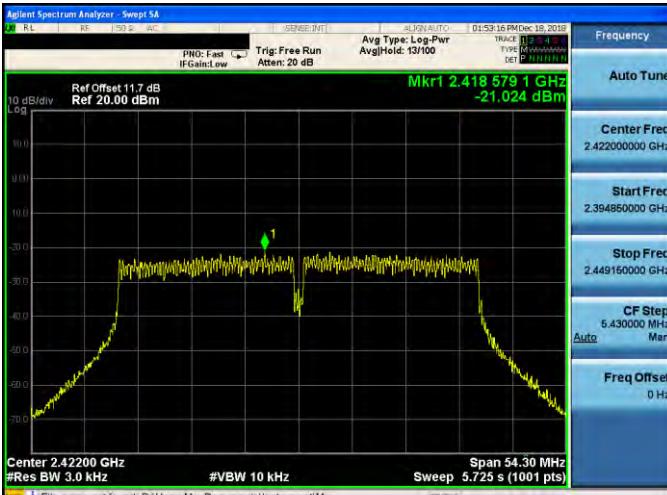
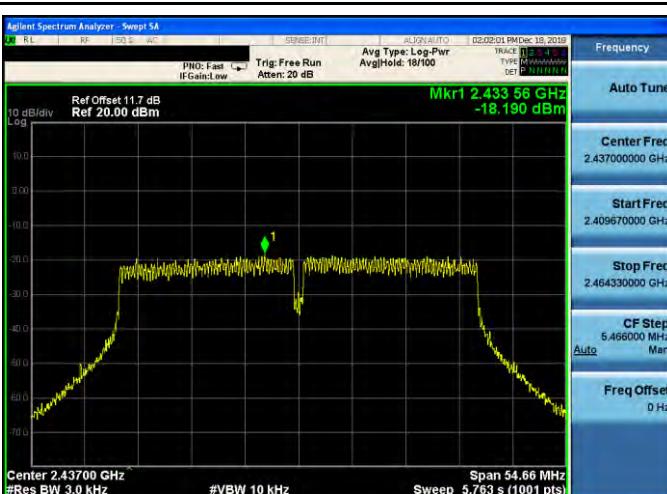
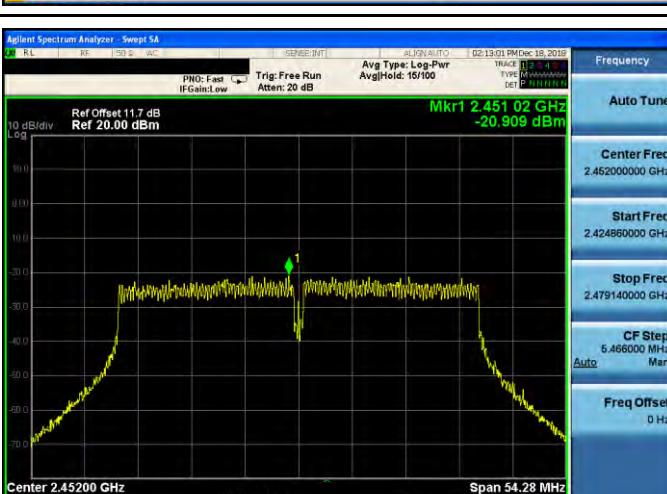
Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-1

2422 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA PNO: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr Atten: 20 dB AvgHold: 35/100 Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.42200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.58 MHz Sweep 5.755 s (1001 pts) File <BBB.png> saved</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA PNO: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr Atten: 20 dB AvgHold: 19/100 Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.55 MHz Sweep 5.752 s (1001 pts) File <BBB.png> saved</p>
2452 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA PNO: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr Atten: 20 dB AvgHold: 20/100 Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.45200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.60 MHz Sweep 5.757 s (1001 pts) File <BBB.png> saved</p>

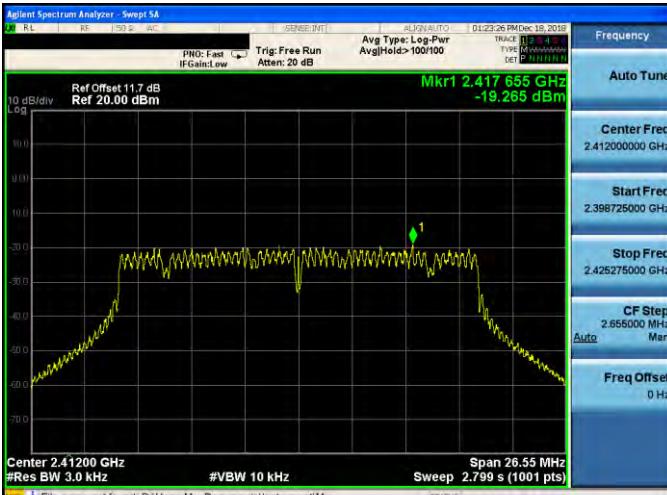
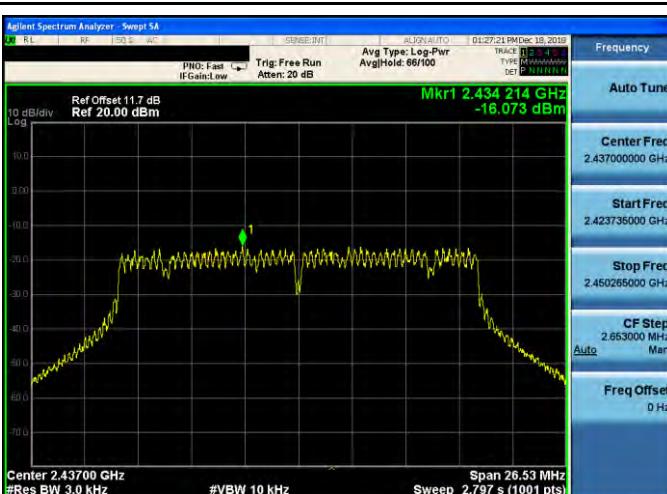
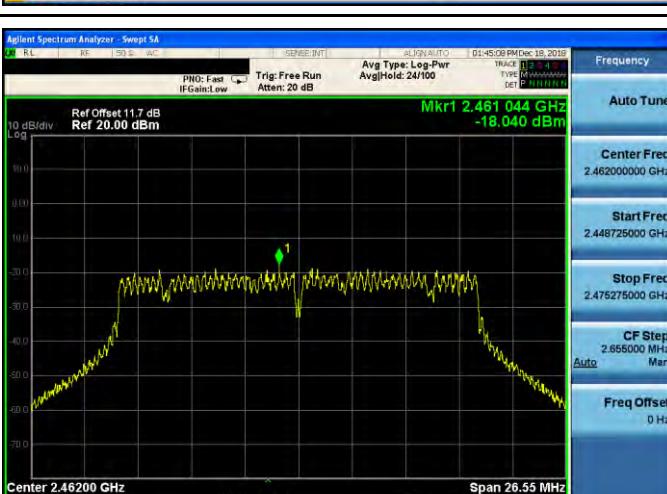
Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-2



Mode 5: IEEE 802.11n 2.4 GHz 40 MHz Continuous TX mode_ANT-2

2422 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Center 2.42200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.30 MHz Sweep 5.725 s (1001 pts)</p> <p>Mkr1 2.418 579 1 GHz -21.024 dBm</p> <p>File name not found: D:\User_My_Documents\Instrument\My...</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.66 MHz Sweep 5.763 s (1001 pts)</p> <p>Mkr1 2.433 58 GHz -18.190 dBm</p> <p>File <BBB.png> saved</p>
2452 MHz	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref Offset 11.7 dB Ref 20.00 dBm</p> <p>Center 2.45200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 54.28 MHz Sweep 5.723 s (1001 pts)</p> <p>Mkr1 2.451 02 GHz -20.909 dBm</p> <p>File <BBB.png> saved</p>

Mode 4: IEEE 802.11n 2.4 GHz 20 MHz Continuous TX mode_ANT-3

2412 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.41200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.55 MHz Sweep 2.799 s (1001 pts) Mkr1 2.417 655 GHz -19.265 dBm</p>
2437 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.53 MHz Sweep 2.797 s (1001 pts) Mkr1 2.434 214 GHz -16.073 dBm</p>
2462 MHz	 <p>Agilent Spectrum Analyzer - Sweep SA Ref Offset 11.7 dB Ref 20.00 dBm 10 dB/div Log Center 2.46200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 26.55 MHz Sweep 2.799 s (1001 pts) Mkr1 2.461 044 GHz -18.040 dBm</p>