

RF Test Report

Applicant : Datto, Inc.

Product Type : WiFi Access Point

Trade Name : Open Mesh, Inc.
Datto, Inc.

Model Number : A62, AP62

Applicable Standard : FCC 47 CFR PART 15 SUBPART C
ANSI C63.10:2013

Receive Date : Oct. 17, 2017

Test Period : Jan. 15 ~ Mar. 07, 2018

Issue Date : Apr. 16, 2018

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	Mar. 12, 2018	Initial Issue	Janet Chao
01	Apr. 16, 2018	Revised Report Information	Janet Chao



Verification of Compliance

Issued Date: Apr. 16, 2018

Applicant : Datto, Inc.
Product Type : WiFi Access Point
Trade Name : Open Mesh, Inc.
Datto, Inc.
Model Number : A62, AP62
FCC ID : WT8DNWAP62
EUT Rated Voltage : DC 18V-24V, 1.34A-1A / DC 48V-54V, 0.6A
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.

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Taoyuan City 33465, Taiwan (R.O.C)
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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. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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

(Manager)

(Fly Lu)

Reviewed By

: Eric Ou Yang

(Testing Engineer)

(Eric Ou Yang)



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1 General Information

1.1 Summary of Test Result

Standard	Item	Result	Remark
15.247			
15.207	AC Power Conducted Emission	PASS	-----
Standard	Item	Result	Remark
15.247			
15.247(d)	Transmitter Radiated Emissions	PASS	-----
15.247(b)(3)	Max. Output Power	PASS	-----
15.247(a)(2)	6dB 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. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conducted Emission	9kHz ~ 150KHz	2.7
	150kHz ~ 30MHz	2.7
Radiated Emission	9kHz ~ 30MHz	1.7
	30MHz ~ 1000MHz	5.7
	1000MHz ~ 18000MHz	5.5
	18000MHz ~ 26500MHz	4.8
	26500MHz ~ 40000MHz	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	Datto, Inc. 101 Merritt 7 Norwalk, CT 06851, United States			
Manufacturer	Datto, Inc. 101 Merritt 7 Norwalk, CT 06851, United States			
Product Type	WiFi Access Point			
Trade Name	Open Mesh, Inc. Datto, Inc.			
Model Number	A62, AP62			
Trade Name / Model Number Different Description	Those trade names & model numbers differ from each other in selling region. (A62 for Open Mesh apply, AP62 for Datto apply)			
FCC ID	WT8DNWAP62			
Operate Freq. Band	Frequency Range (MHz)	Modulation	Channel Bandwidth	Data Rate 400GI (ns)
IEEE 802.11b	2412 ~ 2462	DSSS	20MHz	Up to 11Mbps
IEEE 802.11g	2412 ~ 2462	OFDM	20MHz	Up to 54Mbps
IEEE 802.11n 2.4GHz 20MHz	2412 ~ 2462	OFDM (256QAM)	20MHz	Up to 173.4 Mbps
IEEE 802.11n 2.4GHz 40MHz	2422 ~ 2452	OFDM (256QAM)	40MHz	Up to 400Mbps
Antenna information	Antenna	Model Number	Type	Max. Gain (dBi)
	ANT-0	6525A0042300	PIFA antenna	4.1
	ANT-1	6525A0042300	PIFA antenna	2.9
	G _{ANT}			3.54
Antenna Delivery	See section 3.1			
Operate Temp. Range	0 ~ +50 °C			

Frequency Band	Max. RF Output Power (W)
IEEE 802.11b	0.521
IEEE 802.11g	0.485
IEEE 802.11n 2.4GHz 20MHz	0.486
IEEE 802.11n 2.4GHz 40MHz	0.178

Beamforming on

Frequency Band	Max. RF Output Power (W)
IEEE 802.11b	0.238
IEEE 802.11g	0.227
IEEE 802.11n 2.4GHz 20MHz	0.225
IEEE 802.11n 2.4GHz 40MHz	0.082

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 2.4GHz 20MHz Continuous TX mode
Mode 5: IEEE 802.11n 2.4GHz 40MHz 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 as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in TX mode only.

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.

Note: PoE (DC 54V) is worst case.

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

Test Mode	Antenna Delivery	Data Rate	Test Channel
Mode 2	2TX (MIMO/Beamforming on)	1M	1, 6, 11
Mode 3	2TX (MIMO/Beamforming on)	6M	1, 6, 11
Mode 4	2TX (MIMO/Beamforming on)	13M	1, 6, 11
Mode 5	2TX (MIMO/Beamforming on)	27M	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	12.260	12.300	0.997	0.014	0.010
Mode 3	2412	2.050	2.120	0.967	0.146	0.488
Mode 4	2412	5.000	5.060	0.988	0.052	0.010
Mode 5	2422	2.440	2.500	0.976	0.106	0.410

Beamforming on

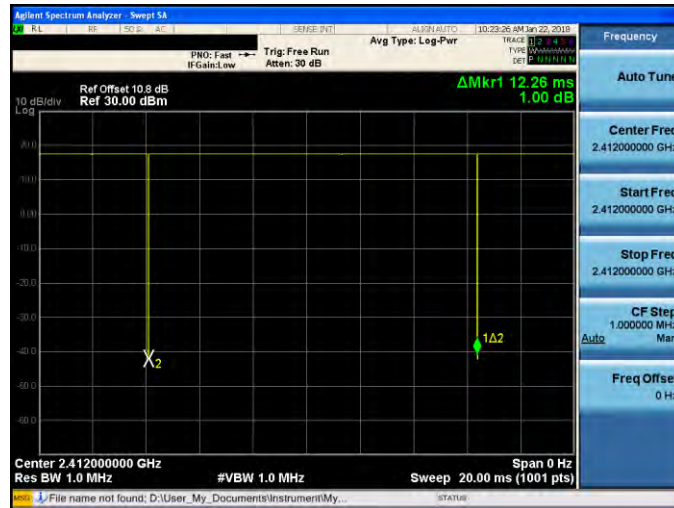
Test Mode	Frequency (MHz)	on time (ms)	on+off time (ms)	Duty cycle	Duty Factor (dB)	1/T Minimum VBW (kHz)
Mode 2	2412	12.260	12.300	0.997	0.014	0.010
Mode 3	2412	2.050	2.120	0.967	0.146	0.488
Mode 4	2412	5.000	5.060	0.988	0.052	0.010
Mode 5	2422	2.440	2.500	0.976	0.106	0.410



Duty Cycle Graphs

Mode 2: IEEE 802.11b Continuous TX mode

On time



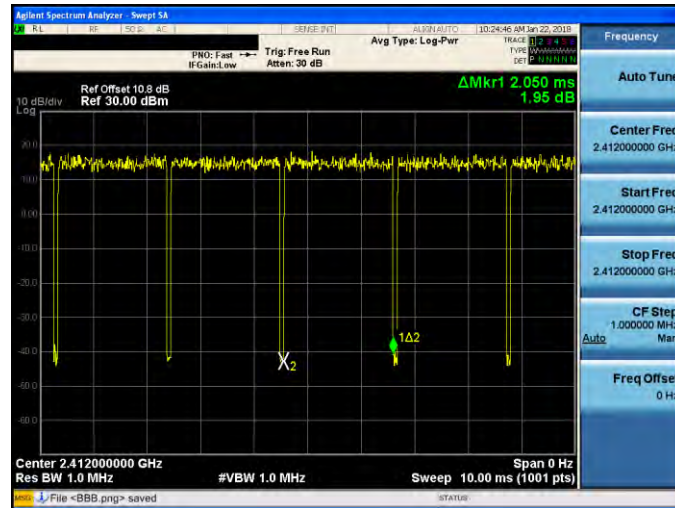
On+off time



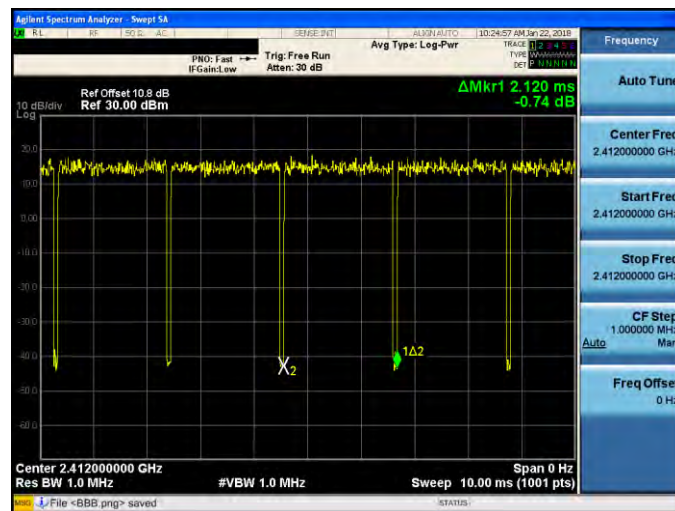


Mode 3: IEEE 802.11g Continuous TX mode

On time



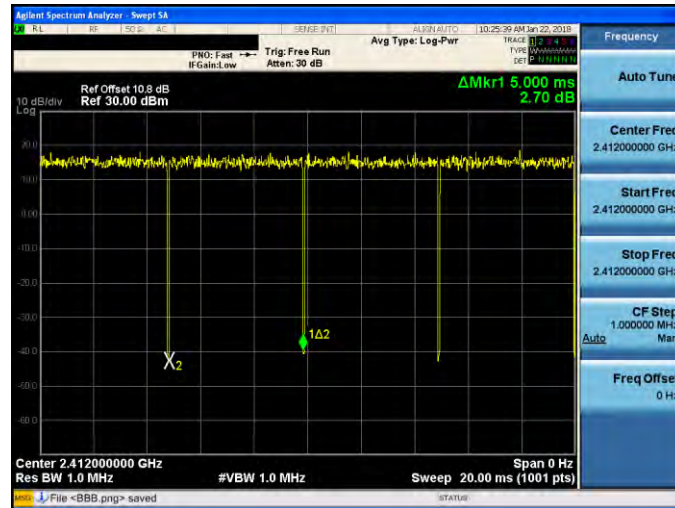
On+off time



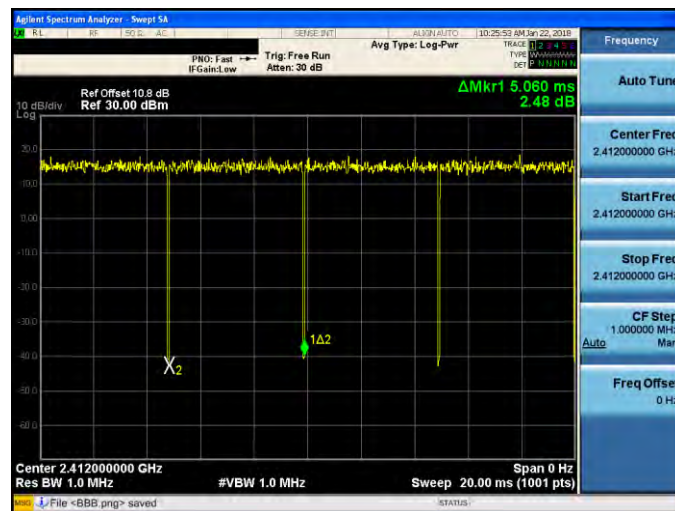


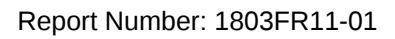
Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode

On time



On+off time



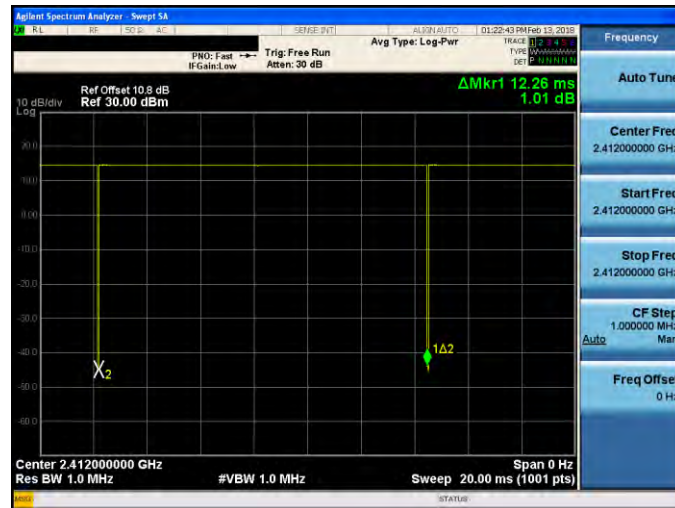




Beamforming on

Mode 2: IEEE 802.11b Continuous TX mode

On time



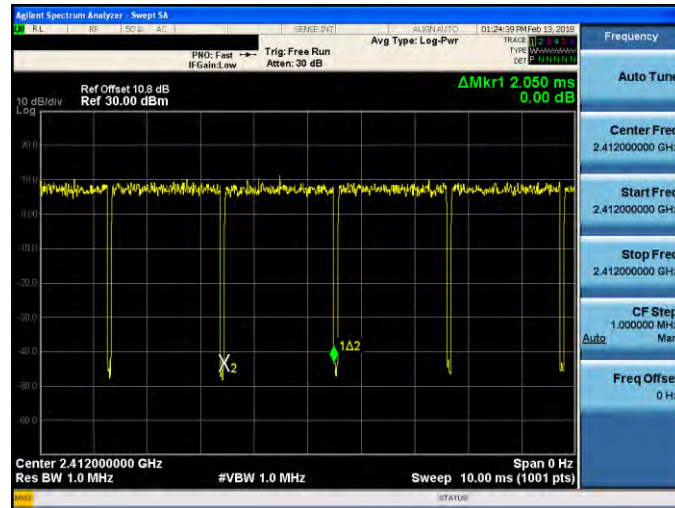
On+off time



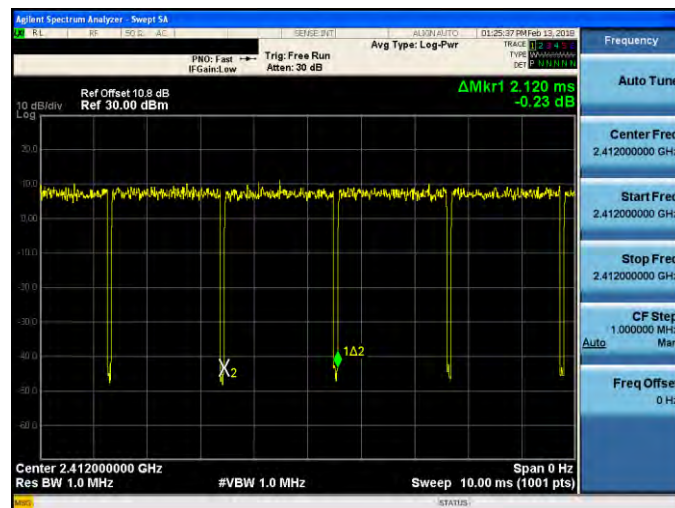


Mode 3: IEEE 802.11g Continuous TX mode

On time



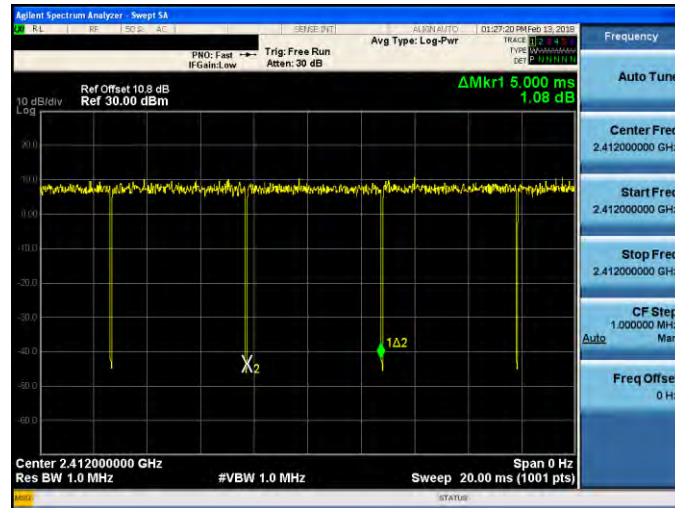
On+off time



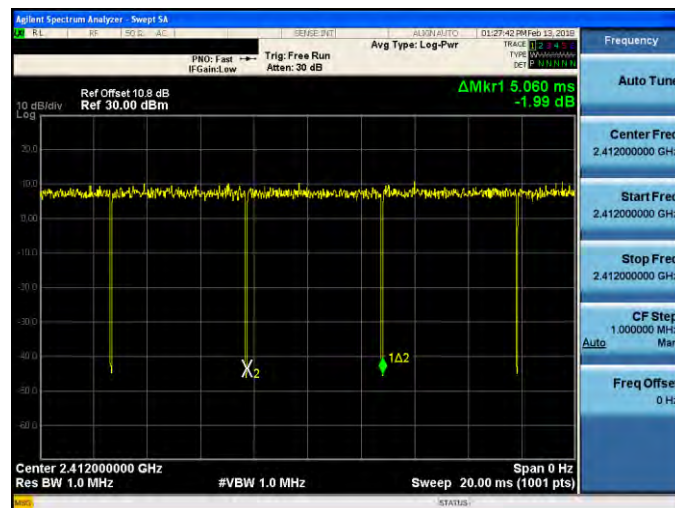


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode

On time

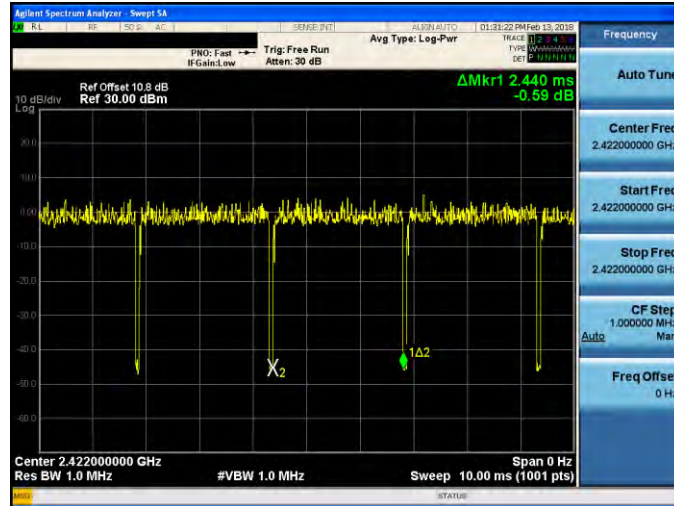


On+off time

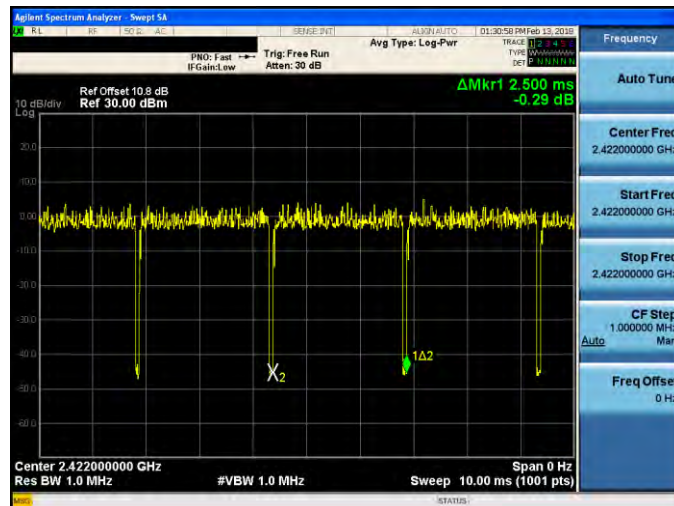


Mode 5: IEEE 802.11n 2.4GHz 40MHz Continuous TX mode

On time



On+off time





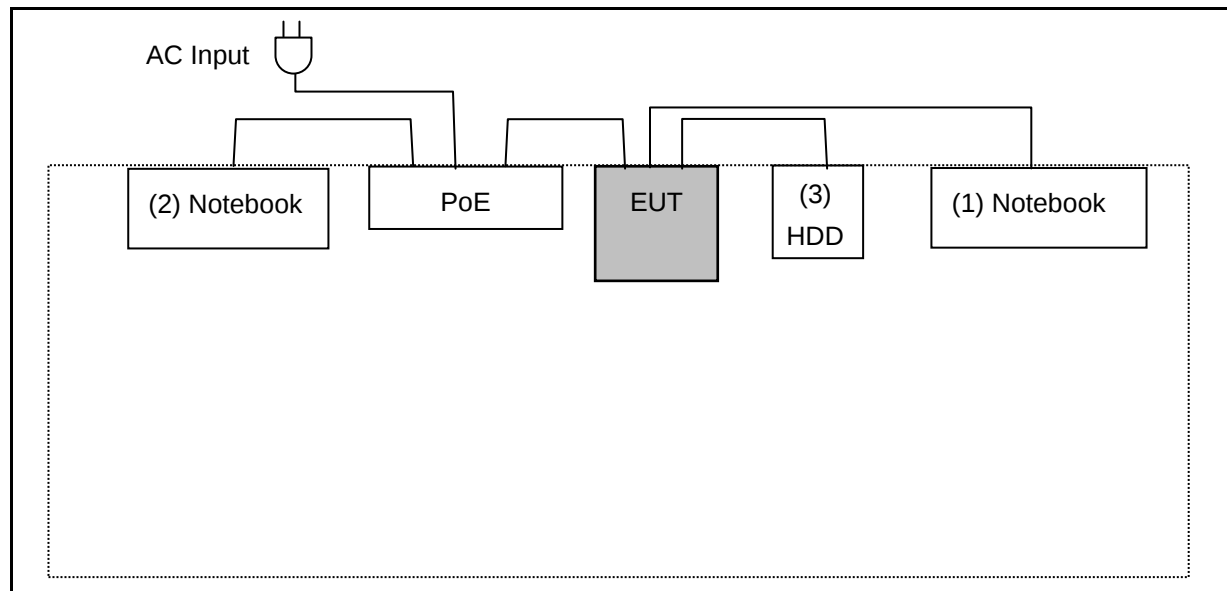
3.2. EUT Exercise Software

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	
1	EZ-EMC Ver. ATL-03A1-1
2	EZ-EMC Ver ATL-ITC-3A1-1

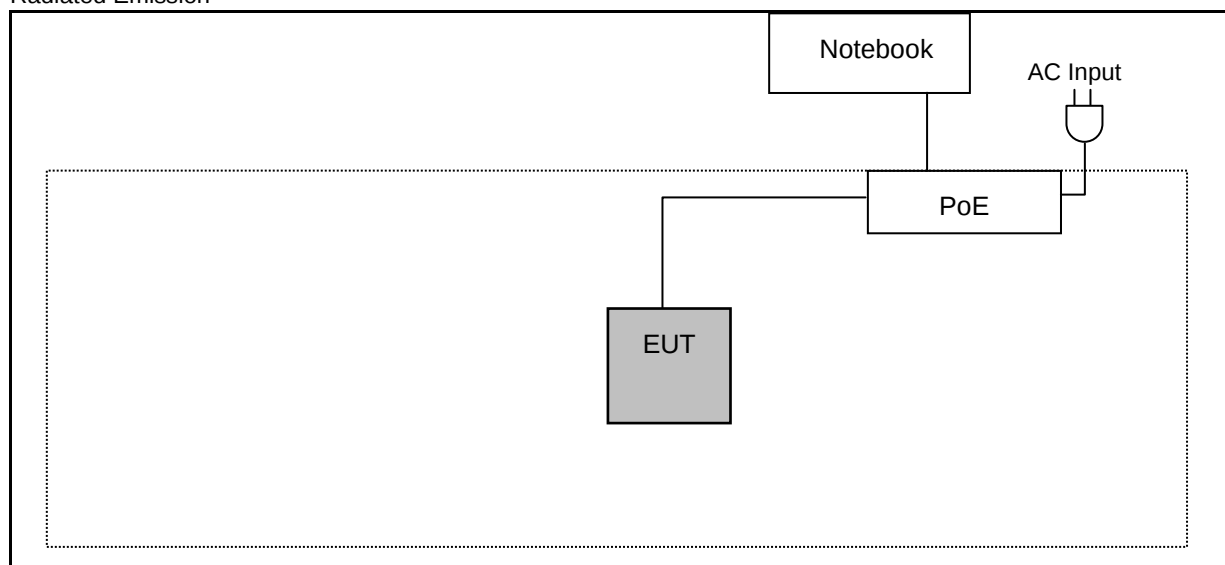
3.3. Configuration of Test System Details

Conducted Emissions



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
(1)	Notebook	DELL	LAPTITU	25627158361	Non-Shielded, 1.8m
(2)	Notebook	DELL	LAPTITU E5440	6699565657	Non-Shielded, 1.8m
(3)	HDD	WD	My Passport	WX81AA3M6482	Power by EUT
(4)	PoE	EnGenius	EPA5006GP	N/A	Non-shielded, 0.6m

Radiated Emission



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
(1)	Notebook	DELL	LAPTITU E5440	6699565657	Non-Shielded, 1.8m
(2)	PoE	EnGenius	EPA5006GP	N/A	Non-shielded, 0.6m



3.4. Test Instruments

For Conducted Emission

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Test Receiver	R&S	ESCI	100367	05/18/2017	1 year
LISN	R&S	ENV216	101040	04/01/2017	1 year
LISN	R&S	ENV216	101041	03/15/2017	1 year
RF Cable	Woken	00100D1380194M	TE-02-02	05/19/2017	1 year

For Radiated Emissions

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
RF Pre-selector (9KHz~1GHz)	Agilent	N9039A	MY46520256	04/24/2017	1 year
Spectrum Analyzer (3Hz~44GHz)	Agilent	E4446A	MY46180578	04/24/2017	1 year
Pre Amplifier (1~26.5GHz)	Agilent	8449B	3008A02237	10/16/2017	1 year
Pre Amplifier (100KHz~1.3GHz)	Agilent	8447D	2944A11119	01/10/2018	1 year
Pre Amplifier (26.5~40GHz)	EMCI	EMC2654045	980028	08/29/2017	1 year
Pre Amplifier (1~26.5GHz)	EMCI	EMC012645SE	980289	01/17/2018	1 year
Broadband Antenna	Schwarzbeck	VULB9168	416	10/26/2017	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/22/2017	1 year
Horn Antenna (18~40GHz)	ETS	3116	86467	09/11/2017	1 year
Microwave Cable	EMCI	EMC102-KM-KM-1 4000	151001	02/20/2017	1 year
				02/19/2018	1 year
Microwave Cable	EMCI	EMC-104-SM-SM- 14000	140202	02/20/2017	1 year
				02/19/2018	1 year
Microwave Cable	EMCI	EMC104-SM-SM-6 00	140301	02/20/2017	1 year
				02/19/2018	1 year
Test Site	ATL	TE01	888001	08/29/2017	1 year

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



For Conducted

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Power Sensor	Anritsu	MA2411B	1126022	08/28/2017	1 year
Power Meter	Anritsu	ML2495A	1135009	08/28/2017	1 year
Spectrum Analyzer (20Hz~26.5GHz)	Agilent	N9020A	US47520902	09/21/2017	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	950

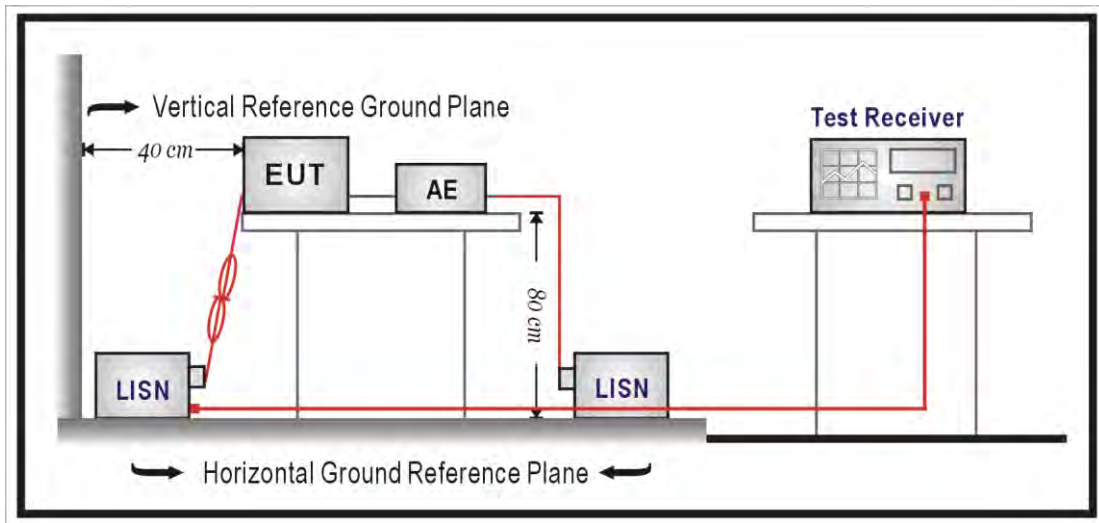
4 Measurement Procedure

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 50ohm 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 40cm to the rear of the EUT. Other surfaces of tabletop or floor standing EUT shall be at least 80cm from any other ground conducting surface including one or more LISNs. For floor-standing device shall be placed under the EUT with a 12mm 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 150kHz to 30MHz 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 1m then the cable shall be folded back and forth at the centre of the lead to form a bundle no longer than 0.4m. All of interconnecting cables that hang closer than 40cm 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 0.1m. All 50 Ω ports of the LISN shall be resistively terminated into 50 Ω 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. Transmitter Radiated Emissions Measurement

■ Limit

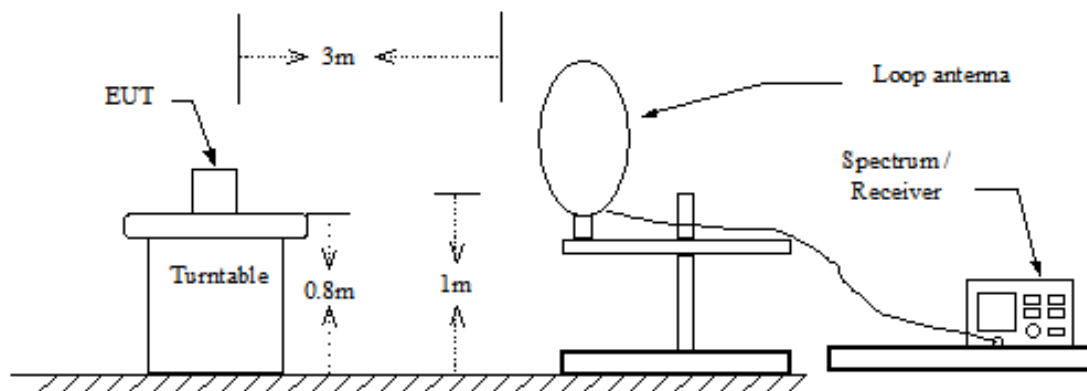
According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ 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

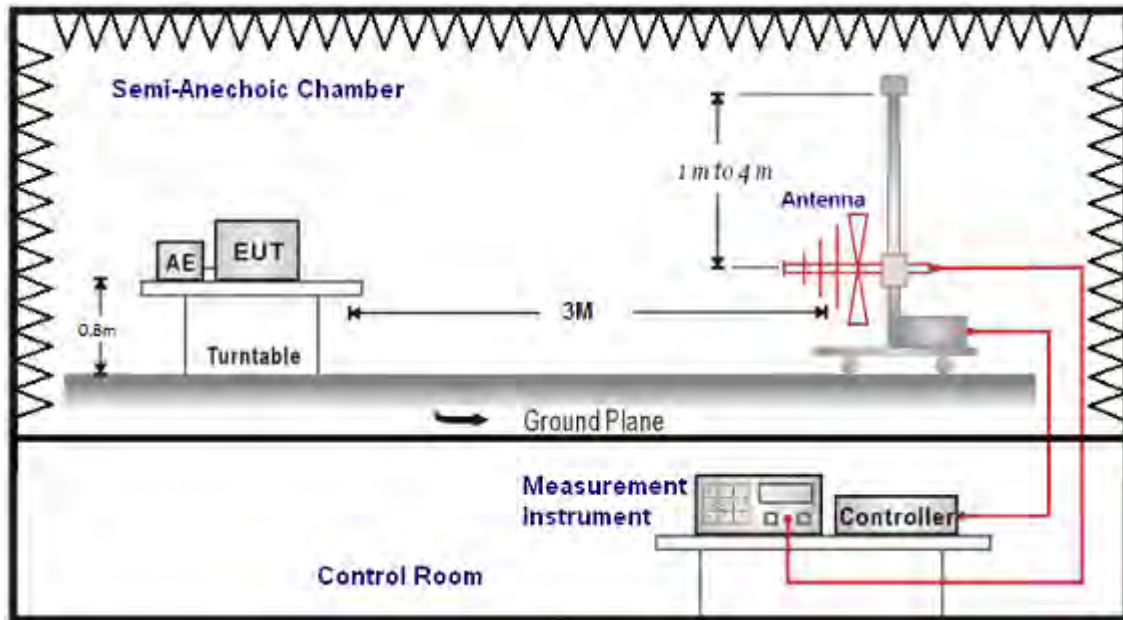
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this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

■ Setup

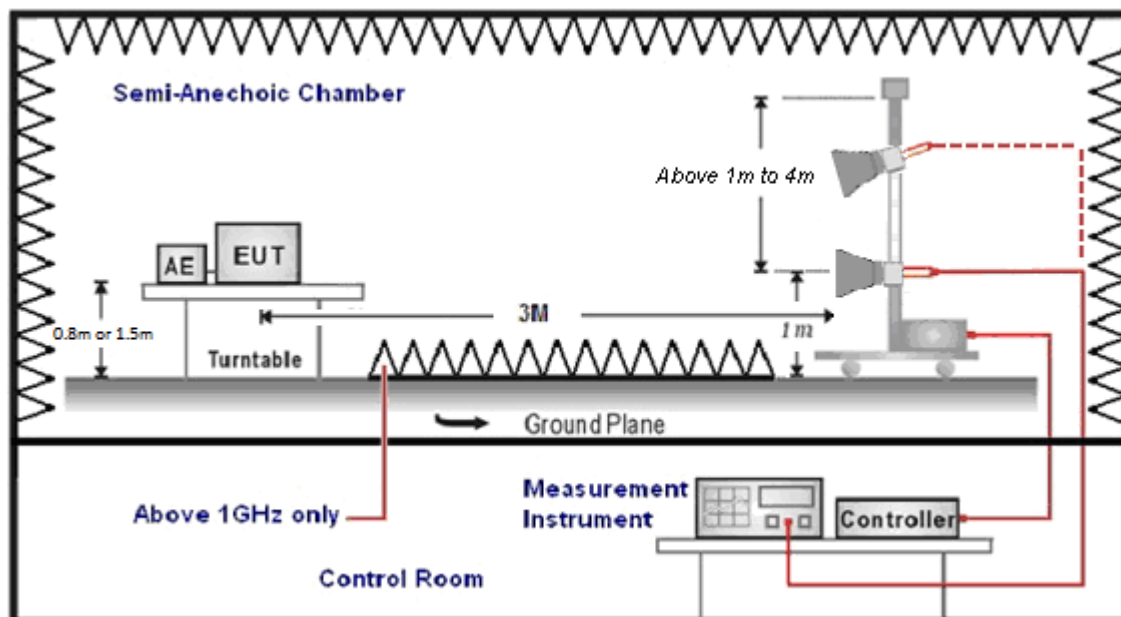
9kHz ~ 30MHz



Below 1GHz



Above 1GHz





■ 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 1 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 three 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 (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB 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 (dBuV) into field intensity in micro volts per meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/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) $\text{Amplitude (dBuV/m)} = \text{FI (dBuV)} + \text{AF (dBuV)} + \text{CL (dBuV)} - \text{Gain (dB)}$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) $\text{Actual Amplitude (dBuV/m)} = \text{Amplitude (dBuV)} - \text{Dis(dB)}$

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

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

(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 20dB below the permissible limits or the field strength is too small to be measured.

4.3. Maximum Conducted Output Power Measurement

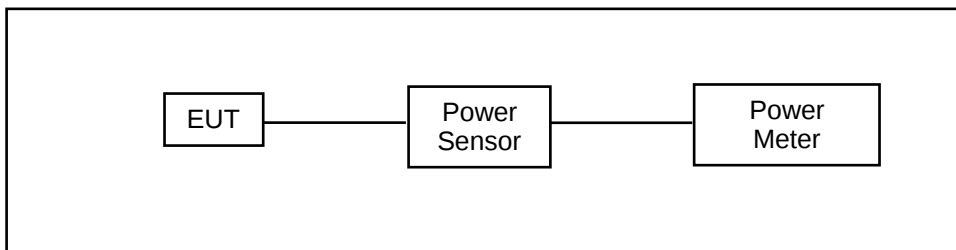
■ Limit

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

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 6dBi.

- * MIMO/BF mode : Directional Gain = $10 \cdot \log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.53 \text{ dBi} > 6\text{dBi}$
- * MIMO/BF mode power limit shall be reduced = $30 - 0.53 = 29.47 \text{ dBm}$.

■ Test Setup



■ Test Procedure

The testing follows the Measurement Procedure of ANSI C63.10-2013 section 11.9.2.3 Method AVGPM.

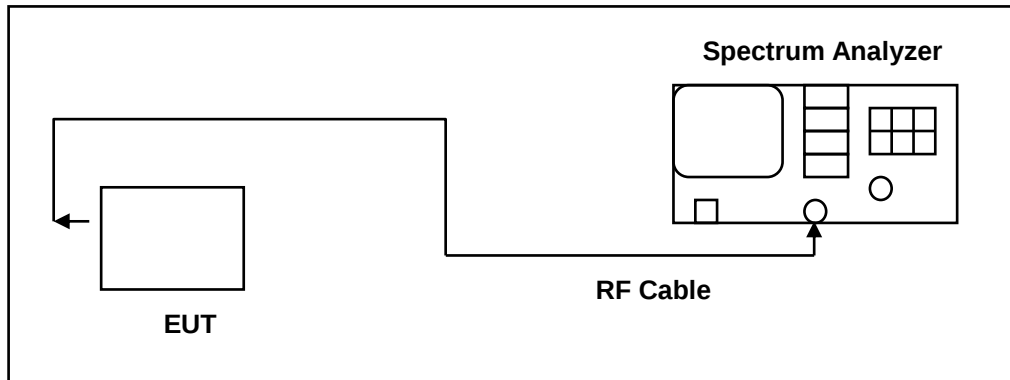
The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor.

4.4. 6dB RF Bandwidth Measurement

■ Limit

6dB 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 KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

6dB 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)

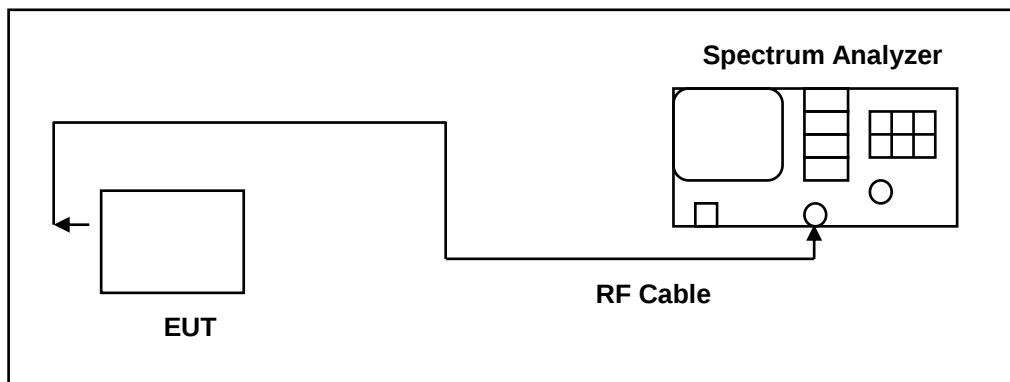
4.5. Maximum Power Spectral Density Measurement

■ 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.

- * MIMO/BF mode : Directional Gain = $10 \cdot \log [(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / N_{ANT}] = 6.53 \text{ dBi} > 6 \text{ dBi}$
- * MIMO/BF mode power limit shall be reduced = $8 - 0.53 = 7.47 \text{ dBm/3KHz}$

■ Test Setup



■ Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 section 10.2 Method PKPSD for compliance to FCC 47CFR 15.247 requirements.

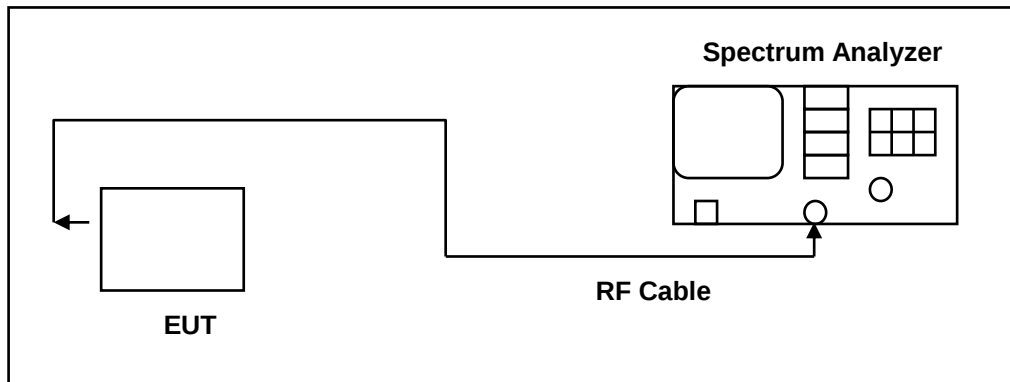
1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
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 30 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 30 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 6dBi.

■ Antenna Description

See section 2 – antenna information.

■ Directional Gain Calculated

For Maximum Conducted Output Power / Maximum Power Density

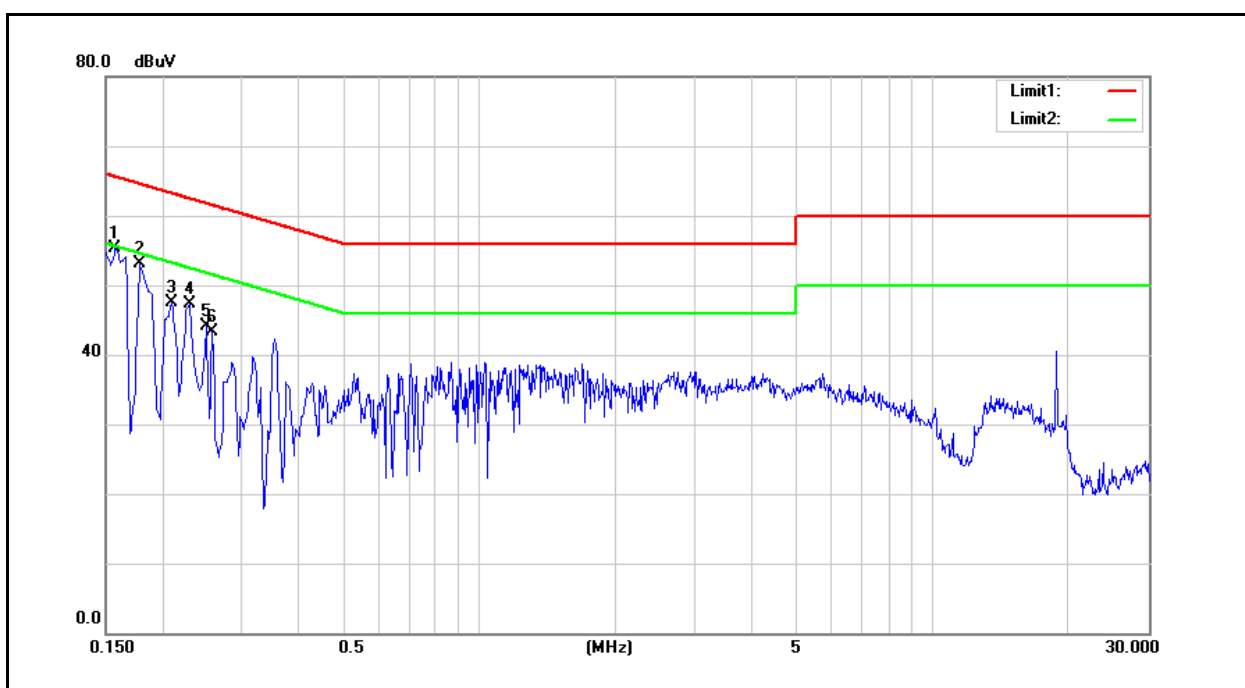
Directional Gain = $10 \cdot \log \left[\left(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20} \right)^2 / N_{ANT} \right] = 6.53 \text{ dBi} > 6\text{dBi}$

Operate Freq. Band	Directional Gain (dBi)
IEEE 802.11b	6.53
IEEE 802.11g	6.53
IEEE 802.11n 2.4GHz 20MHz	6.53
IEEE 802.11n 2.4GHz 40MHz	6.53

5 Test Results

Annex A. AC Power Line Conducted Emission Test Results

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

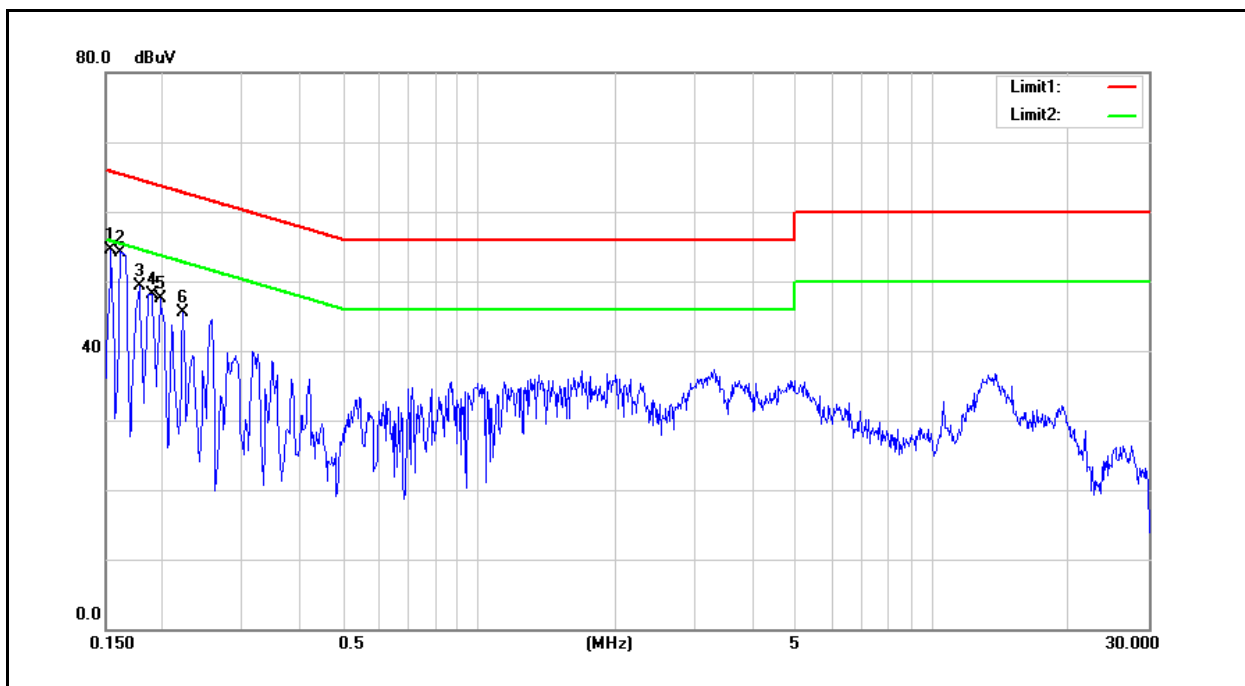


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1580	44.40	27.85	9.54	53.94	37.39	65.57	55.57	-11.63	-18.18	Pass
2	0.1780	39.10	20.93	9.53	48.63	30.46	64.58	54.58	-15.95	-24.12	Pass
3	0.2100	31.91	18.19	9.53	41.44	27.72	63.21	53.21	-21.77	-25.49	Pass
4	0.2300	33.10	19.79	9.53	42.63	29.32	62.45	52.45	-19.82	-23.13	Pass
5	0.2500	33.41	22.65	9.53	42.94	32.18	61.76	51.76	-18.82	-19.58	Pass
6	0.2580	32.76	19.92	9.53	42.29	29.45	61.50	51.50	-19.21	-22.05	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 120V/60Hz
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	43.25	28.11	9.63	52.88	37.74	65.78	55.78	-12.90	-18.04	Pass
2	0.1620	43.38	27.99	9.63	53.01	37.62	65.36	55.36	-12.35	-17.74	Pass
3	0.1780	36.62	19.50	9.63	46.25	29.13	64.58	54.58	-18.33	-25.45	Pass
4	0.1900	39.01	23.27	9.63	48.64	32.90	64.04	54.04	-15.40	-21.14	Pass
5	0.1980	35.60	21.66	9.63	45.23	31.29	63.69	53.69	-18.46	-22.40	Pass
6	0.2220	36.16	23.44	9.63	45.79	33.07	62.74	52.74	-16.95	-19.67	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		
			Measurement Results		Limit
			dBm	W	dBm
Mode 2	2412	1M	24.02	0.252	< 29.47
	2437		24.10	0.257	< 29.47
	2462		23.22	0.210	< 29.47
	2437	2M	24.05	0.254	< 29.47
	2437	5.5M	24.08	0.256	< 29.47
	2437	11M	23.98	0.250	< 29.47
Mode 3	2412	6M	19.03	0.080	< 29.47
	2437		24.08	0.256	< 29.47
	2462		19.14	0.082	< 29.47
	2437	9M	24.00	0.251	< 29.47
	2437	12M	23.98	0.250	< 29.47
	2437	18M	23.85	0.243	< 29.47
	2437	24M	23.91	0.246	< 29.47
	2437	36M	23.86	0.243	< 29.47
	2437	48M	23.80	0.240	< 29.47
	2437	54M	23.82	0.241	< 29.47

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

ANT-0					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 4	2412	13M	18.99	0.079	< 29.47
	2437		24.05	0.254	< 29.47
	2462		18.27	0.067	< 29.47
	2437	28.8M	24.04	0.254	< 29.47
	2437	43.4M	24.00	0.251	< 29.47
	2437	57.8M	23.93	0.247	< 29.47
	2437	86.6M	23.91	0.246	< 29.47
	2437	115.6M	23.97	0.249	< 29.47
	2437	130M	23.90	0.245	< 29.47
	2437	144.4M	23.84	0.242	< 29.47
	2437	173.4M	23.81	0.240	< 29.47
Mode 5	2422	27M	17.09	0.051	< 29.47
	2437		19.41	0.087	< 29.47
	2452		16.64	0.046	< 29.47
	2437	60M	19.36	0.086	< 29.47
	2437	90M	19.33	0.086	< 29.47
	2437	120M	19.28	0.085	< 29.47
	2437	180M	19.30	0.085	< 29.47
	2437	240M	19.21	0.083	< 29.47
	2437	270M	19.19	0.083	< 29.47
	2437	300M	19.24	0.084	< 29.47
	2437	360M	19.15	0.082	< 29.47
	2437	400M	19.13	0.082	< 29.47

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

ANT-1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 2	2412	1M	23.62	0.230	< 29.47
	2437		24.21	0.264	< 29.47
	2462		23.44	0.221	< 29.47
	2437	2M	24.14	0.259	< 29.47
	2437	5.5M	24.13	0.259	< 29.47
	2437	11M	24.10	0.257	< 29.47
Mode 3	2412	6M	18.79	0.076	< 29.47
	2437		23.60	0.229	< 29.47
	2462		19.29	0.085	< 29.47
	2437	9M	23.56	0.227	< 29.47
	2437	12M	23.54	0.226	< 29.47
	2437	18M	23.50	0.224	< 29.47
	2437	24M	23.42	0.220	< 29.47
	2437	36M	23.48	0.223	< 29.47
	2437	48M	23.40	0.219	< 29.47
	2437	54M	23.39	0.218	< 29.47

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

ANT-1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 4	2412	13M	18.77	0.075	< 29.47
	2437		23.65	0.232	< 29.47
	2462		18.44	0.070	< 29.47
	2437	28.8M	23.62	0.230	< 29.47
	2437	43.4M	23.63	0.231	< 29.47
	2437	57.8M	23.55	0.226	< 29.47
	2437	86.6M	23.51	0.224	< 29.47
	2437	115.6M	23.54	0.226	< 29.47
	2437	130M	23.48	0.223	< 29.47
	2437	144.4M	23.46	0.222	< 29.47
	2437	173.4M	23.39	0.218	< 29.47
Mode 5	2422	27M	16.70	0.047	< 29.47
	2437		19.57	0.091	< 29.47
	2452		16.86	0.049	< 29.47
	2437	60M	19.56	0.090	< 29.47
	2437	90M	19.50	0.089	< 29.47
	2437	120M	19.47	0.089	< 29.47
	2437	180M	19.42	0.087	< 29.47
	2437	240M	19.45	0.088	< 29.47
	2437	270M	19.40	0.087	< 29.47
	2437	300M	19.32	0.086	< 29.47
	2437	360M	19.35	0.086	< 29.47
	2437	400M	19.33	0.086	< 29.47

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

ANT-0+1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 2	2412	1M	26.83	0.482	< 29.47
	2437		27.17	0.521	< 29.47
	2462		26.34	0.431	< 29.47
	2437	2M	27.11	0.514	< 29.47
	2437	5.5M	27.12	0.515	< 29.47
	2437	11M	27.05	0.507	< 29.47
Mode 3	2412	6M	21.92	0.156	< 29.47
	2437		26.86	0.485	< 29.47
	2462		22.23	0.167	< 29.47
	2437	9M	26.80	0.478	< 29.47
	2437	12M	26.78	0.476	< 29.47
	2437	18M	26.69	0.467	< 29.47
	2437	24M	26.68	0.466	< 29.47
	2437	36M	26.68	0.466	< 29.47
	2437	48M	26.61	0.459	< 29.47
	2437	54M	26.62	0.459	< 29.47

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

ANT-0+1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 4	2412	13M	21.89	0.155	< 29.47
	2437		26.86	0.486	< 29.47
	2462		21.37	0.137	< 29.47
	2437	28.8M	26.85	0.484	< 29.47
	2437	43.4M	26.83	0.482	< 29.47
	2437	57.8M	26.75	0.474	< 29.47
	2437	86.6M	26.72	0.470	< 29.47
	2437	115.6M	26.77	0.475	< 29.47
	2437	130M	26.71	0.468	< 29.47
	2437	144.4M	26.66	0.464	< 29.47
	2437	173.4M	26.62	0.459	< 29.47
Mode 5	2422	27M	19.91	0.098	< 29.47
	2437		22.50	0.178	< 29.47
	2452		19.76	0.095	< 29.47
	2437	60M	22.47	0.177	< 29.47
	2437	90M	22.43	0.175	< 29.47
	2437	120M	22.39	0.173	< 29.47
	2437	180M	22.37	0.173	< 29.47
	2437	240M	22.34	0.171	< 29.47
	2437	270M	22.31	0.170	< 29.47
	2437	300M	22.29	0.169	< 29.47
	2437	360M	22.26	0.168	< 29.47
	2437	400M	22.24	0.168	< 29.47

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		
			Measurement Results		Limit
			dBm	W	dBm
Mode 2	2412	1M	20.58	0.114	< 29.47
	2437		20.75	0.119	< 29.47
	2462		19.86	0.097	< 29.47
	2437	2M	20.72	0.118	< 29.47
	2437	5.5M	20.70	0.117	< 29.47
	2437	11M	20.65	0.116	< 29.47
Mode 3	2412	6M	15.84	0.038	< 29.47
	2437		20.61	0.115	< 29.47
	2462		15.89	0.039	< 29.47
	2437	9M	20.58	0.114	< 29.47
	2437	12M	20.52	0.113	< 29.47
	2437	18M	20.43	0.110	< 29.47
	2437	24M	20.44	0.111	< 29.47
	2437	36M	20.40	0.110	< 29.47
	2437	48M	20.35	0.108	< 29.47
	2437	54M	20.33	0.108	< 29.47

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

ANT-0					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 4	2412	13M	15.67	0.037	< 29.47
	2437		20.52	0.113	< 29.47
	2462		14.88	0.031	< 29.47
	2437	28.8M	20.50	0.112	< 29.47
	2437	43.4M	20.48	0.112	< 29.47
	2437	57.8M	20.42	0.110	< 29.47
	2437	86.6M	20.34	0.108	< 29.47
	2437	115.6M	20.36	0.109	< 29.47
	2437	130M	20.38	0.109	< 29.47
	2437	144.4M	20.28	0.107	< 29.47
	2437	173.4M	20.22	0.105	< 29.47
Mode 5	2422	27M	13.88	0.024	< 29.47
	2437		16.03	0.040	< 29.47
	2452		13.48	0.022	< 29.47
	2437	60M	16.00	0.040	< 29.47
	2437	90M	15.99	0.040	< 29.47
	2437	120M	15.93	0.039	< 29.47
	2437	180M	15.81	0.038	< 29.47
	2437	240M	15.89	0.039	< 29.47
	2437	270M	15.83	0.038	< 29.47
	2437	300M	15.78	0.038	< 29.47
	2437	360M	15.73	0.037	< 29.47
	2437	400M	15.67	0.037	< 29.47

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

ANT-1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 2	2412	1M	20.15	0.104	< 29.47
	2437		20.76	0.119	< 29.47
	2462		19.94	0.099	< 29.47
	2437	2M	20.74	0.119	< 29.47
	2437	5.5M	20.72	0.118	< 29.47
	2437	11M	20.67	0.117	< 29.47
Mode 3	2412	6M	15.48	0.035	< 29.47
	2437		20.50	0.112	< 29.47
	2462		16.16	0.041	< 29.47
	2437	9M	20.47	0.111	< 29.47
	2437	12M	20.42	0.110	< 29.47
	2437	18M	20.40	0.110	< 29.47
	2437	24M	20.34	0.108	< 29.47
	2437	36M	20.28	0.107	< 29.47
	2437	48M	20.23	0.105	< 29.47
	2437	54M	20.30	0.107	< 29.47

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

ANT-1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 4	2412	13M	15.38	0.035	< 29.47
	2437		20.51	0.112	< 29.47
	2462		15.18	0.033	< 29.47
	2437	28.8M	20.48	0.112	< 29.47
	2437	43.4M	20.42	0.110	< 29.47
	2437	57.8M	20.33	0.108	< 29.47
	2437	86.6M	20.38	0.109	< 29.47
	2437	115.6M	20.30	0.107	< 29.47
	2437	130M	20.28	0.107	< 29.47
	2437	144.4M	20.21	0.105	< 29.47
	2437	173.4M	20.18	0.104	< 29.47
Mode 5	2422	27M	13.64	0.023	< 29.47
	2437		16.20	0.042	< 29.47
	2452		13.82	0.024	< 29.47
	2437	60M	16.18	0.041	< 29.47
	2437	90M	16.11	0.041	< 29.47
	2437	120M	16.07	0.040	< 29.47
	2437	180M	15.90	0.039	< 29.47
	2437	240M	16.03	0.040	< 29.47
	2437	270M	15.98	0.040	< 29.47
	2437	300M	15.90	0.039	< 29.47
	2437	360M	15.83	0.038	< 29.47
	2437	400M	15.77	0.038	< 29.47

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



ANT-0+1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 2	2412	1M	23.38	0.218	< 29.47
	2437		23.77	0.238	< 29.47
	2462		22.91	0.195	< 29.47
	2437	2M	23.74	0.237	< 29.47
	2437	5.5M	23.72	0.236	< 29.47
	2437	11M	23.67	0.233	< 29.47
Mode 3	2412	6M	18.67	0.074	< 29.47
	2437		23.57	0.227	< 29.47
	2462		19.04	0.080	< 29.47
	2437	9M	23.54	0.226	< 29.47
	2437	12M	23.48	0.223	< 29.47
	2437	18M	23.43	0.220	< 29.47
	2437	24M	23.40	0.219	< 29.47
	2437	36M	23.35	0.216	< 29.47
	2437	48M	23.30	0.214	< 29.47
	2437	54M	23.33	0.215	< 29.47

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

ANT-0+1					
Test Mode	Frequency (MHz)	Data Rate	Average Output Power		
			Measurement Results		Limit
			dBm	W	dBm
Mode 4	2412	13M	18.54	0.071	< 29.47
	2437		23.53	0.225	< 29.47
	2462		18.04	0.064	< 29.47
	2437	28.8M	23.50	0.224	< 29.47
	2437	43.4M	23.46	0.222	< 29.47
	2437	57.8M	23.39	0.218	< 29.47
	2437	86.6M	23.37	0.217	< 29.47
	2437	115.6M	23.34	0.216	< 29.47
	2437	130M	23.34	0.216	< 29.47
	2437	144.4M	23.26	0.212	< 29.47
	2437	173.4M	23.21	0.209	< 29.47
Mode 5	2422	27M	16.77	0.048	< 29.47
	2437		19.13	0.082	< 29.47
	2452		16.66	0.046	< 29.47
	2437	60M	19.10	0.081	< 29.47
	2437	90M	19.06	0.081	< 29.47
	2437	120M	19.01	0.080	< 29.47
	2437	180M	18.87	0.077	< 29.47
	2437	240M	18.97	0.079	< 29.47
	2437	270M	18.92	0.078	< 29.47
	2437	300M	18.85	0.077	< 29.47
	2437	360M	18.79	0.076	< 29.47
	2437	400M	18.73	0.075	< 29.47

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

**6dB RF Bandwidth Measurement**

Test Mode	Frequency (MHz)	Measurement (kHz)		Limit (kHz)
		ANT-0	ANT-1	
Mode 2	2412	9091	9097	> 500
	2437	9092	9093	> 500
	2462	9059	9059	> 500
Mode 3	2412	16370	16390	> 500
	2437	16370	16370	> 500
	2462	16370	16380	> 500
Mode 4	2412	17600	17600	> 500
	2437	17630	17600	> 500
	2462	17600	17590	> 500
Mode 5	2422	35200	35140	> 500
	2437	35360	35160	> 500
	2452	35180	35180	> 500

Beamforming on

Test Mode	Frequency (MHz)	Measurement (kHz)		Limit (kHz)
		ANT-0	ANT-1	
Mode 2	2412	8561	8087	> 500
	2437	8102	8566	> 500
	2462	8098	8110	> 500
Mode 3	2412	16370	16400	> 500
	2437	16370	16380	> 500
	2462	16390	16380	> 500
Mode 4	2412	17600	17610	> 500
	2437	17590	17590	> 500
	2462	17610	17630	> 500
Mode 5	2422	35360	35150	> 500
	2437	35360	35170	> 500
	2452	35310	35200	> 500



■ Test Graphs

Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

2412 MHz



2437 MHz



2462 MHz





Mode 3: IEEE 802.11g Continuous TX mode_ANT-0

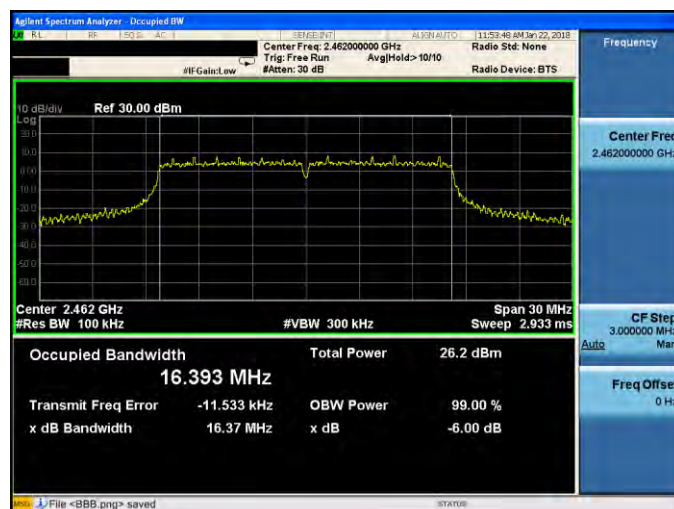
2412 MHz



2437 MHz



2462 MHz





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

2412 MHz



2437 MHz



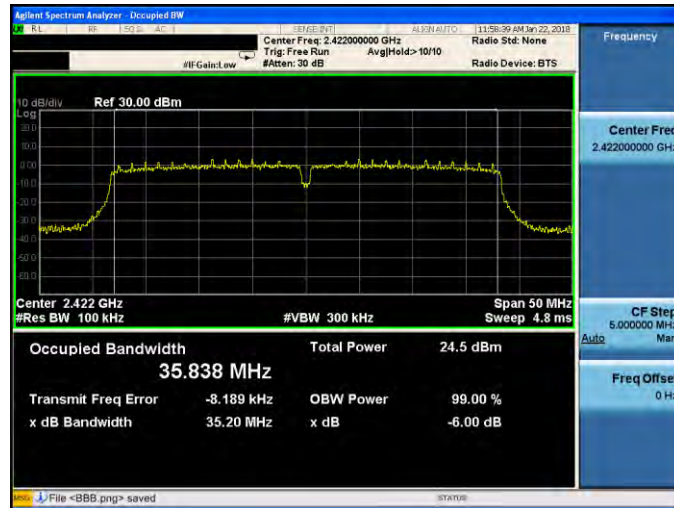
2462 MHz





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

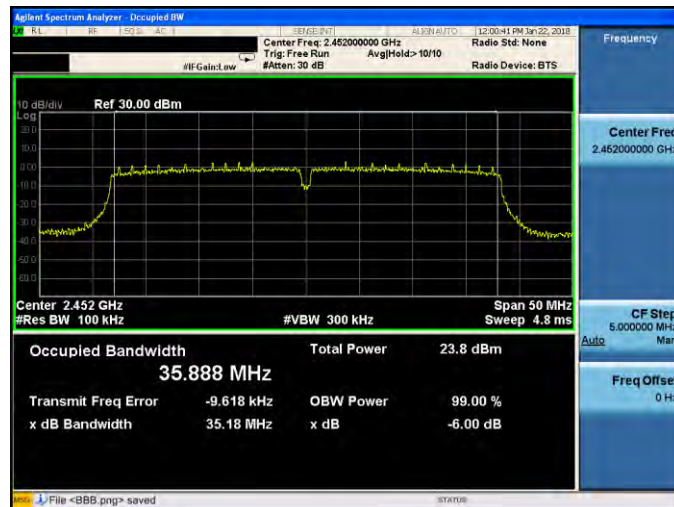
2422 MHz



2437 MHz



2452 MHz





Mode 2: IEEE 802.11b Continuous TX mode_ANT-1

2412 MHz



2437 MHz



2462 MHz





Mode 3: IEEE 802.11g Continuous TX mode_ANT-1

2412 MHz



2437 MHz



2462 MHz





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

2412 MHz



2437 MHz



2462 MHz



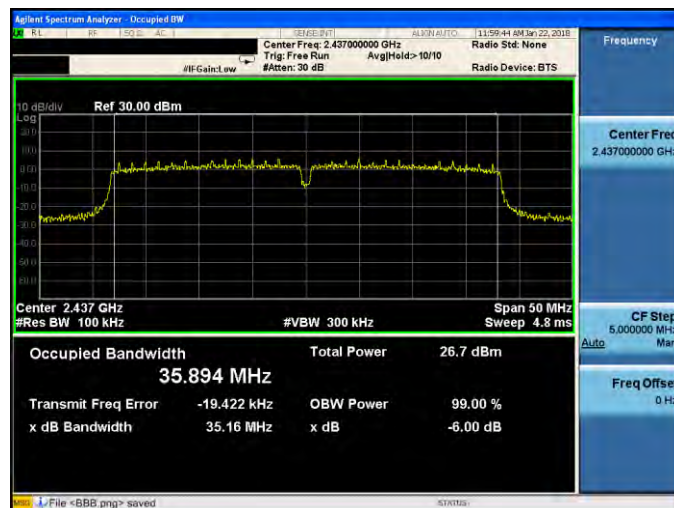


Mode 5: IEEE 802.11n 2.4GHz 40MHz Continuous TX mode_ANT-1

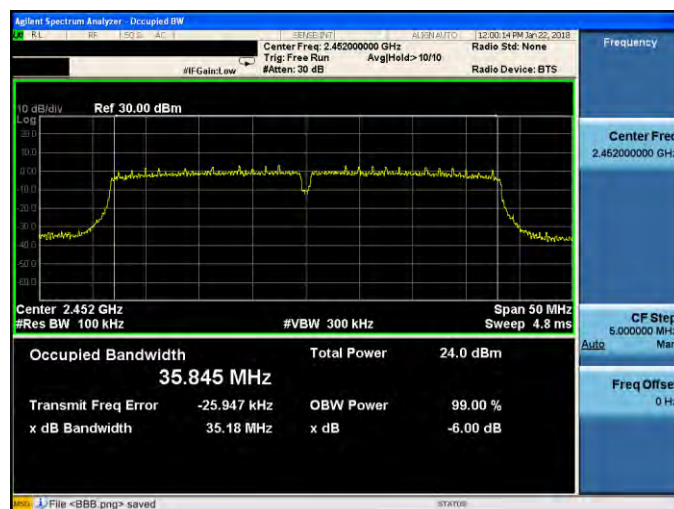
2422 MHz



2437 MHz



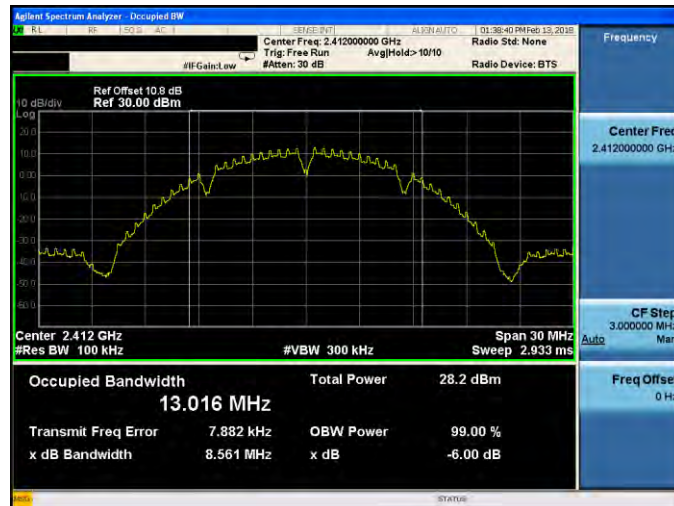
2452 MHz



Beamforming on

Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

2412 MHz



2437 MHz

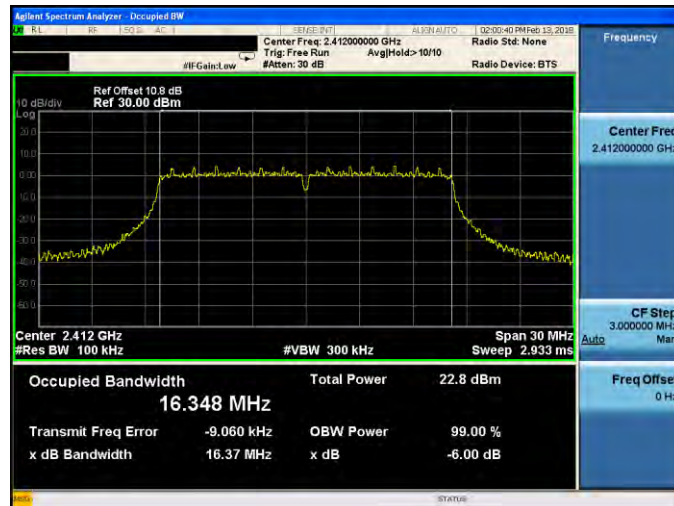


2462 MHz



Mode 3: IEEE 802.11g Continuous TX mode_ANT-0

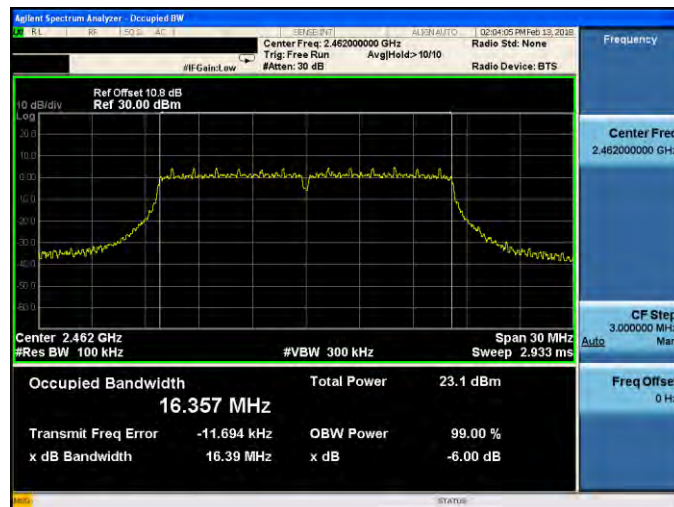
2412 MHz



2437 MHz



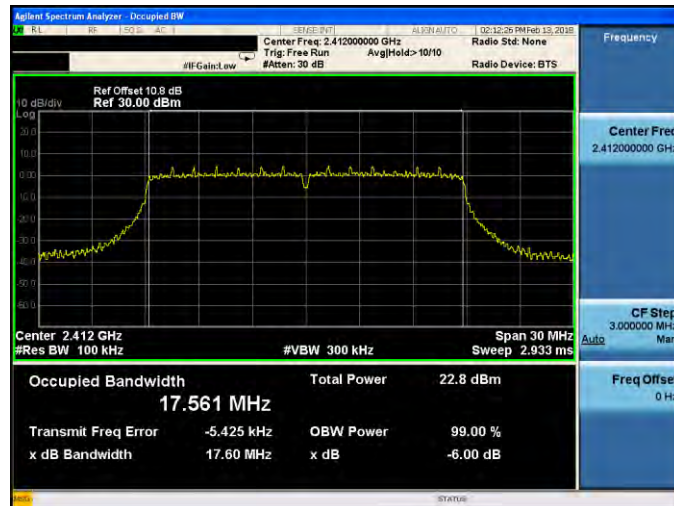
2462 MHz



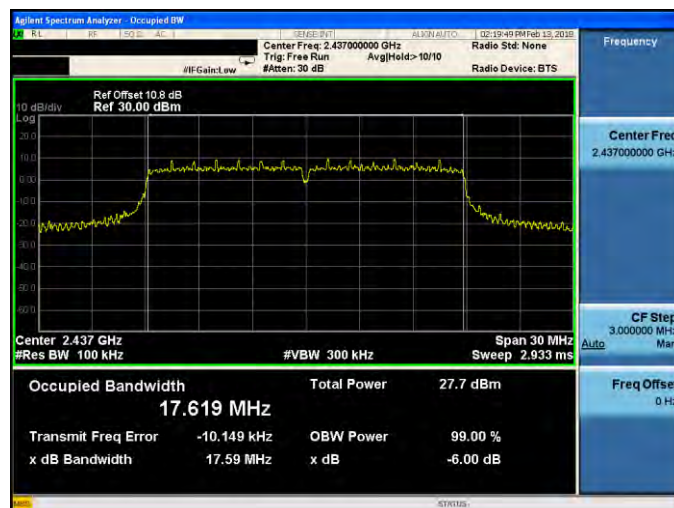


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode_ANT-0

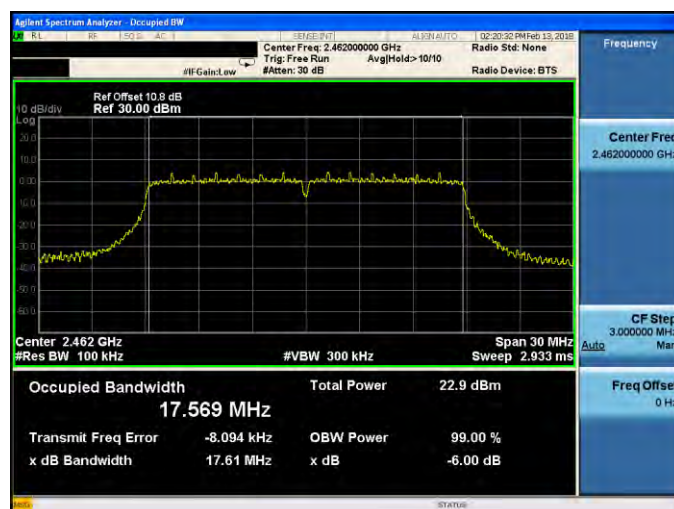
2412 MHz



2437 MHz



2462 MHz



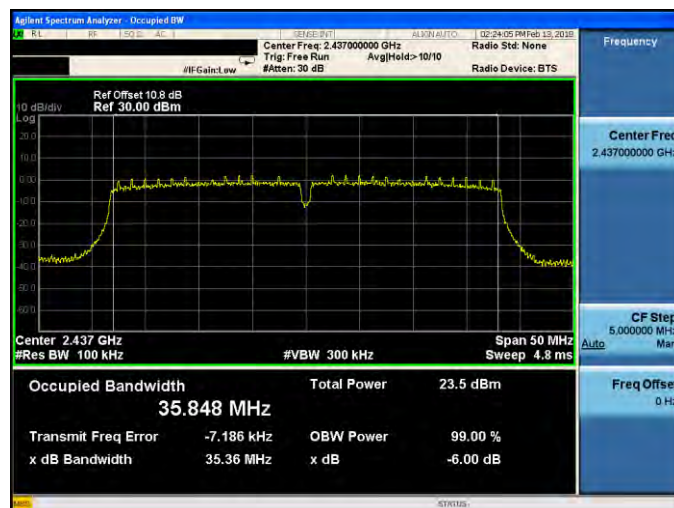


Mode 5: IEEE 802.11n 2.4GHz 40MHz Continuous TX mode_ANT-0

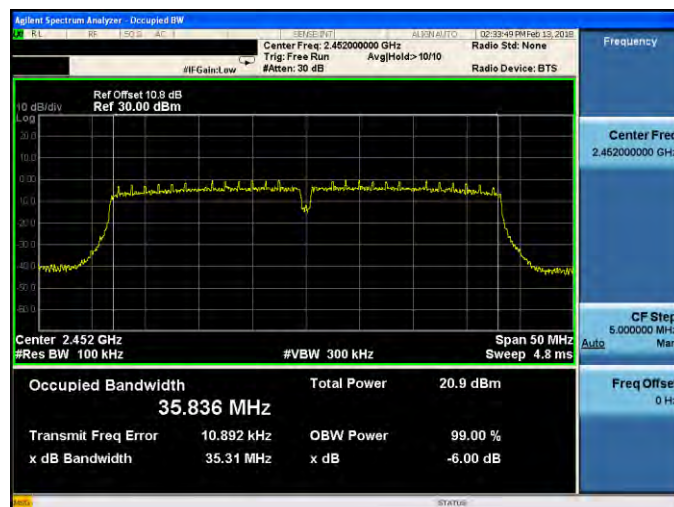
2422 MHz



2437 MHz



2452 MHz



Mode 2: IEEE 802.11b Continuous TX mode_ANT-1

2412 MHz



2437 MHz



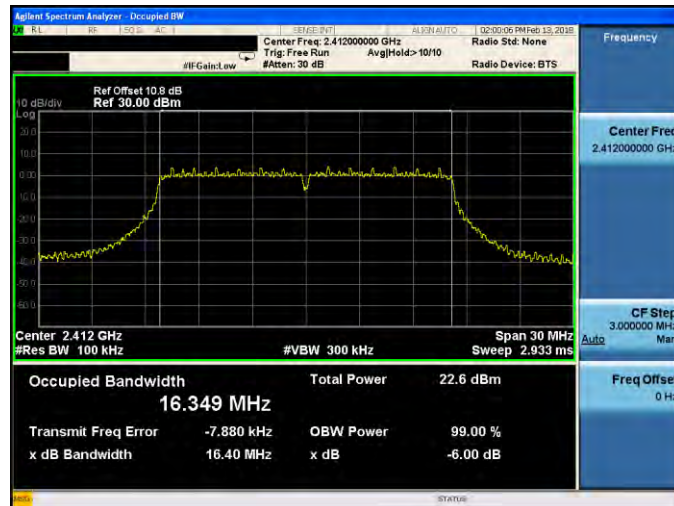
2462 MHz



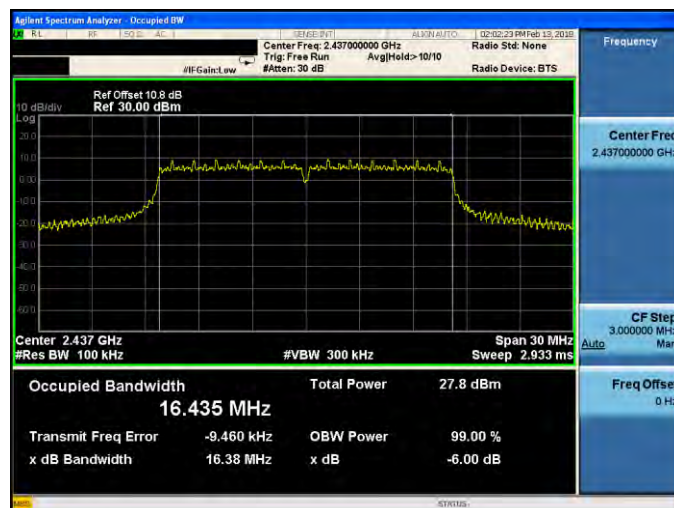


Mode 3: IEEE 802.11g Continuous TX mode_ANT-1

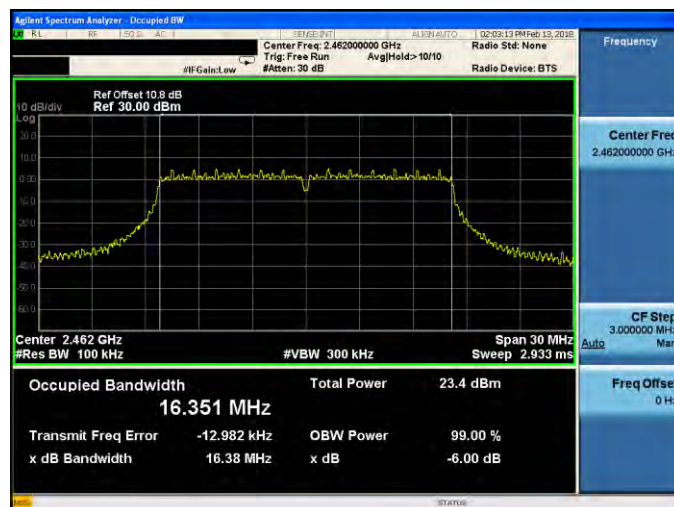
2412 MHz



2437 MHz

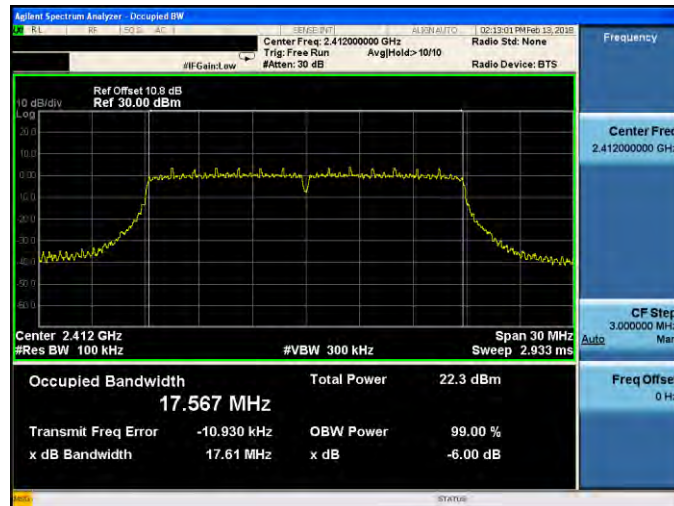


2462 MHz



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

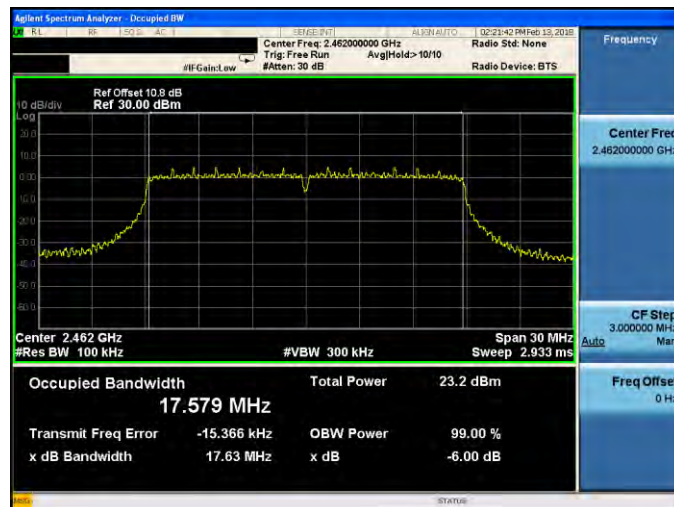
2412 MHz



2437 MHz



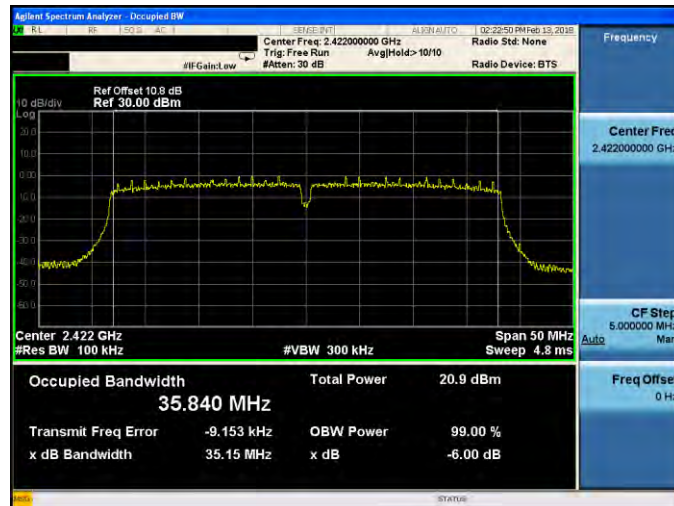
2462 MHz





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

2422 MHz



2437 MHz



2452 MHz

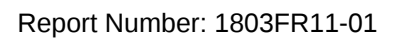


Maximum Power Spectral Density Measurement

Test Mode	Frequency (MHz)	Measurement (dBm/3KHz)			Limit (dBm/3KHz)
		ANT-0	ANT-1	ANT-0+1	
Mode 2	2412	2.041	1.848	4.956	< 7.47
	2437	2.221	2.235	5.238	< 7.47
	2462	1.280	1.466	4.384	< 7.47
Mode 3	2412	-5.237	-5.979	-2.465	< 7.47
	2437	-0.062	-0.633	2.672	< 7.47
	2462	-5.243	-4.912	-2.064	< 7.47
Mode 4	2412	-6.122	-6.227	-3.164	< 7.47
	2437	-0.253	-1.522	2.169	< 7.47
	2462	-6.776	-6.716	-3.736	< 7.47
Mode 5	2422	-9.474	-10.341	-6.876	< 7.47
	2437	-7.635	-8.640	-5.098	< 7.47
	2452	-10.969	-10.010	-7.453	< 7.47

Beamforming on

Test Mode	Frequency (MHz)	Measurement (dBm/3KHz)			Limit (dBm/3KHz)
		ANT-0	ANT-1	ANT-0+1+2	
Mode 2	2412	-0.180	-0.840	2.513	< 7.47
	2437	0.045	-0.766	2.669	< 7.47
	2462	-1.233	-1.885	1.464	< 7.47
Mode 3	2412	-8.621	-8.711	-5.655	< 7.47
	2437	-2.695	-3.433	-0.038	< 7.47
	2462	-7.535	-8.156	-4.824	< 7.47
Mode 4	2412	-8.802	-9.340	-6.052	< 7.47
	2437	-4.543	-5.270	-1.881	< 7.47
	2462	-9.522	-9.495	-6.498	< 7.47
Mode 5	2422	-13.199	-13.618	-10.393	< 7.47
	2437	-10.715	-10.931	-7.811	< 7.47
	2452	-13.969	-13.550	-10.744	< 7.47



Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

Agilent Spectrum Analyzer - Swept FA

File Edit View Window Help

MODE: FWTW FREQ: 103.4015 GHz JAN 20, 2019

PRN: Fast IF Gain: Low Trig: Free Run Att: 30 dB

Avg Type: Log-Pwr Avg Hold: 44/100

TRACE 1 0 2 4 1 0 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

TYPE: M Math Mode

SET: 10.000000

Frequency

Auto Tune

Center Freq: 2.412000000 GHz

Start Freq: 2.405000000 GHz

Stop Freq: 2.419000000 GHz

CF Step: 1.400000 MHz

Auto

Freq Offset: 0 Hz

Ref Offset 10.9 dB
Ref 30.00 dBm

Mkr1 2.411 367 20 GHz
2.041 dBm

10 dB/div
Log

Center 2.412000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 14.00 MHz
Sweep 1.477 s (40001 pts)

STATUS

File <BBB.png> saved

Agilent Spectrum Analyzer - Swept SA

RL | F | M | I | B | E | AC |

1 | REFERENCE | 03-04-22 PM 3h22:2019

PN0: Fast IF Gain1.ew Trig: Free Run Avg Type: Log-Pwr AvgHld: 30100 Type: M Mod:MANA Det: P

Ref Offset: 10.9 dB Ref 30.00 dBm

Mkr1 2.438 907 50 GHz 2.221 dBm

10 dBmV Log

Center 2.437000 GHz #Res BW 3.0 kHz Span 14.00 MHz Sweep 1.477 s (40001 pts)

File <BBB.png> saved

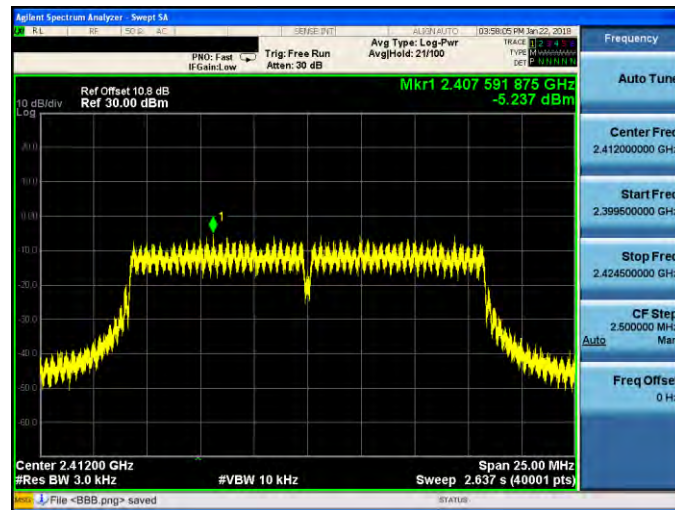
STAT123

[illegible]



Mode 3: IEEE 802.11g Continuous TX mode_ANT-0

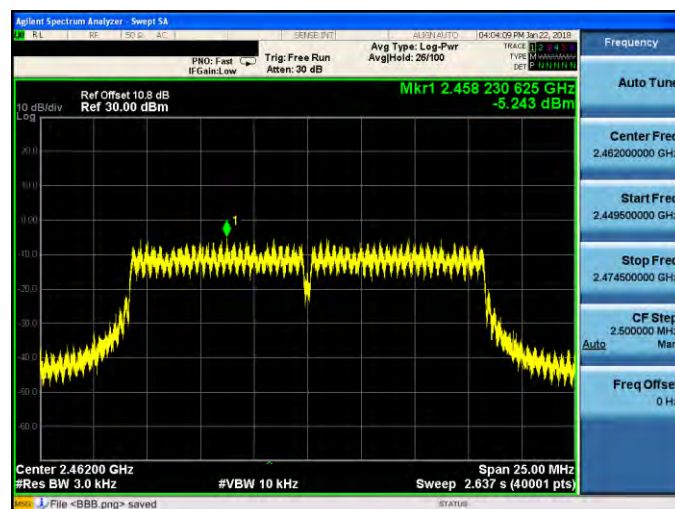
2412 MHz



2437 MHz



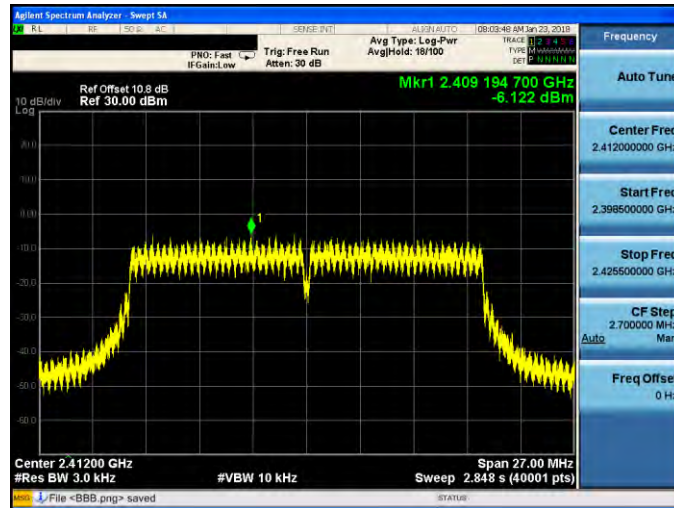
2462 MHz



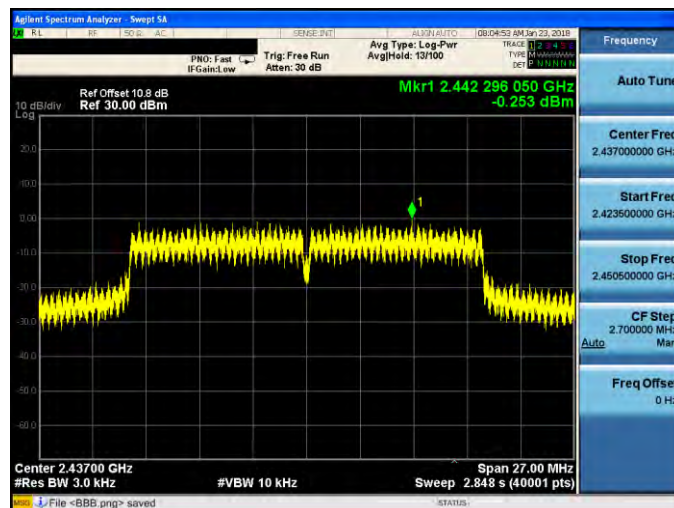


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode_ANT-0

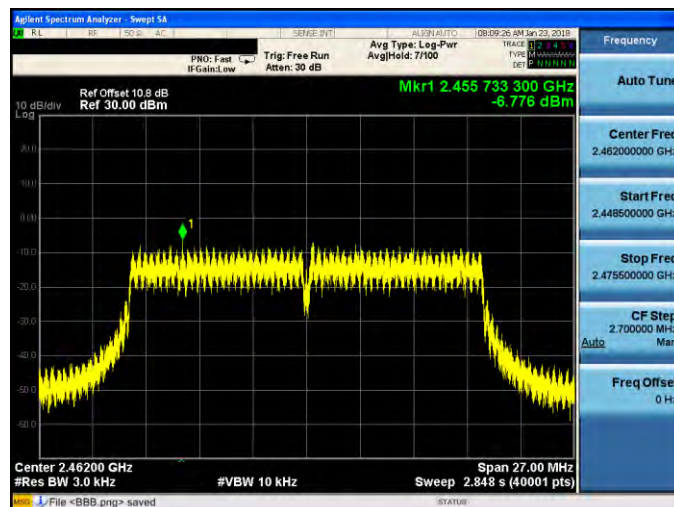
2412 MHz

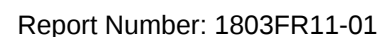


2437 MHz



2462 MHz



68 of 230



Mode 2: IEEE 802.11b Continuous TX mode_ANT-1

2412 MHz



2437 MHz



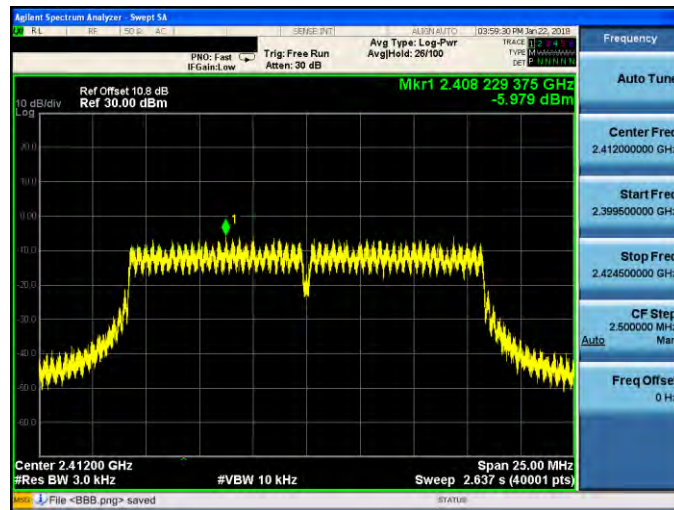
2462 MHz





Mode 3: IEEE 802.11g Continuous TX mode_ANT-1

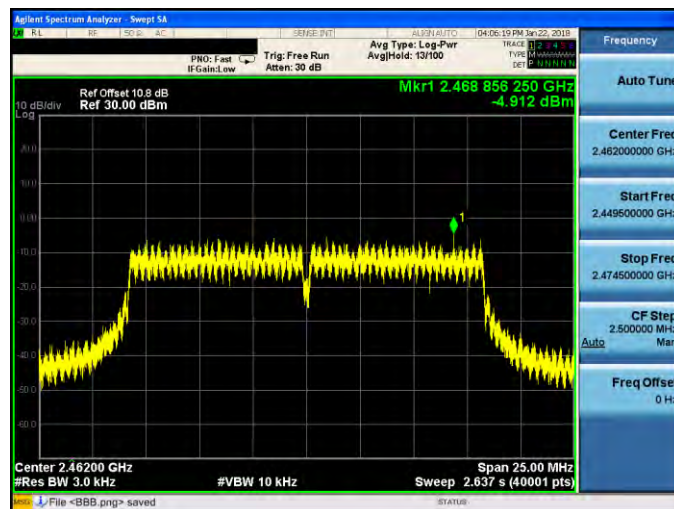
2412 MHz



2437 MHz



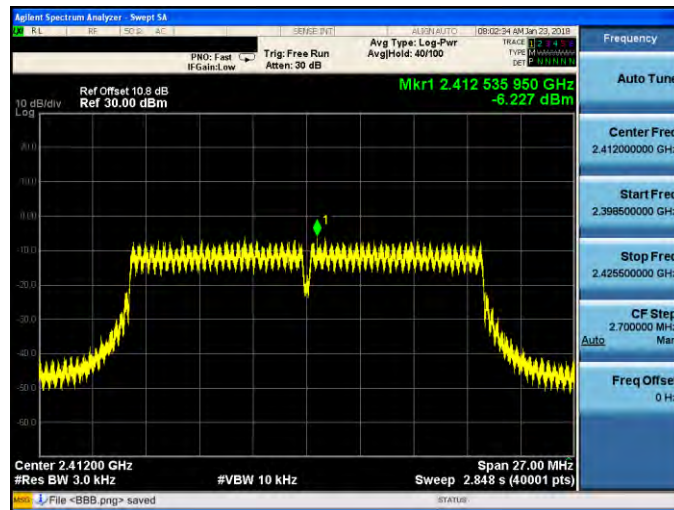
2462 MHz



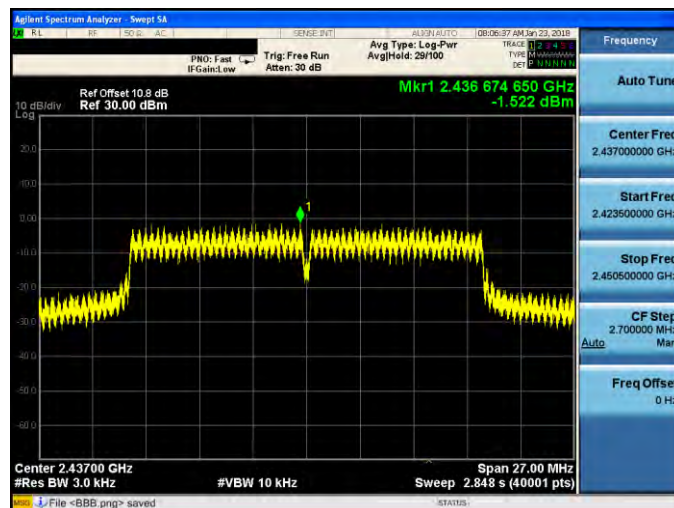


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode_ANT-1

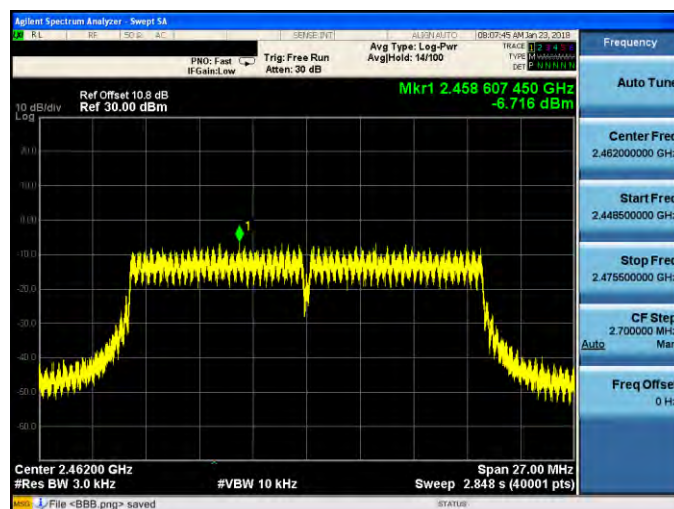
2412 MHz



2437 MHz



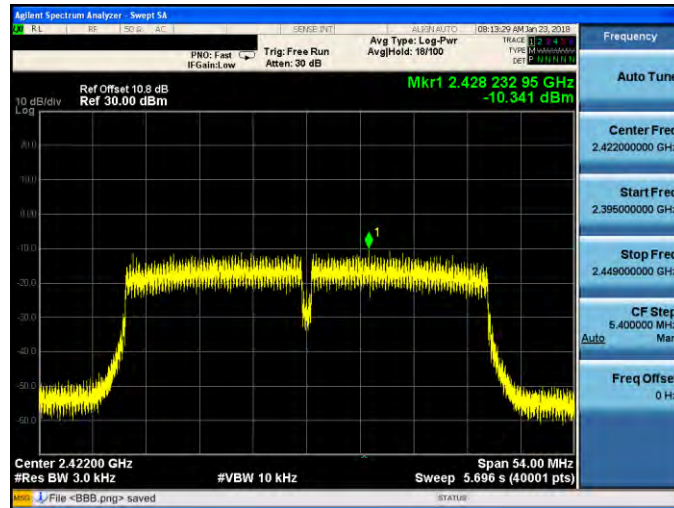
2462 MHz



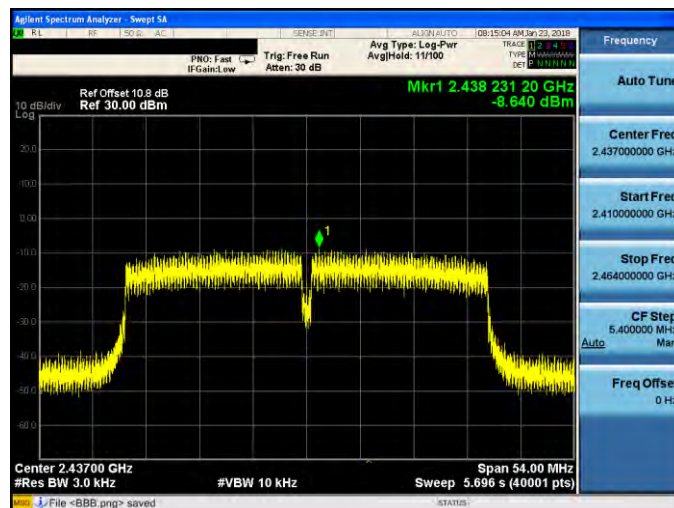


Mode 5: IEEE 802.11n 2.4GHz 40MHz Continuous TX mode_ANT-1

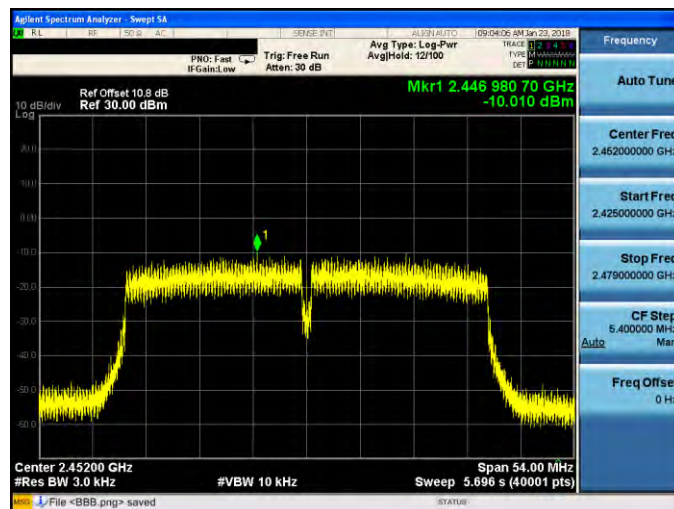
2422 MHz



2437 MHz



2452 MHz

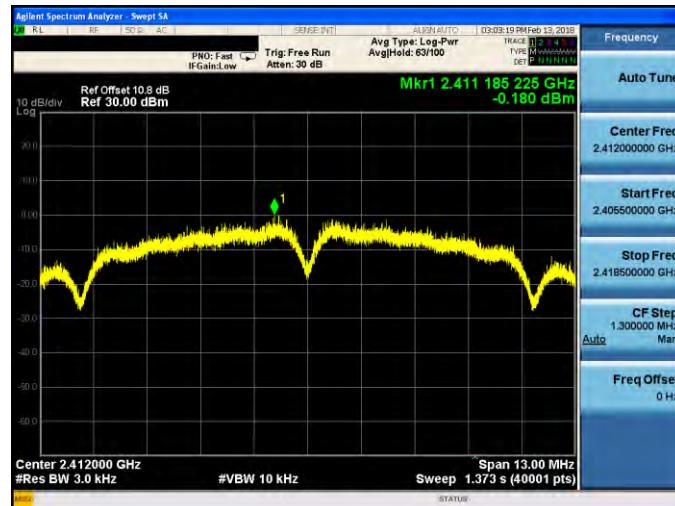




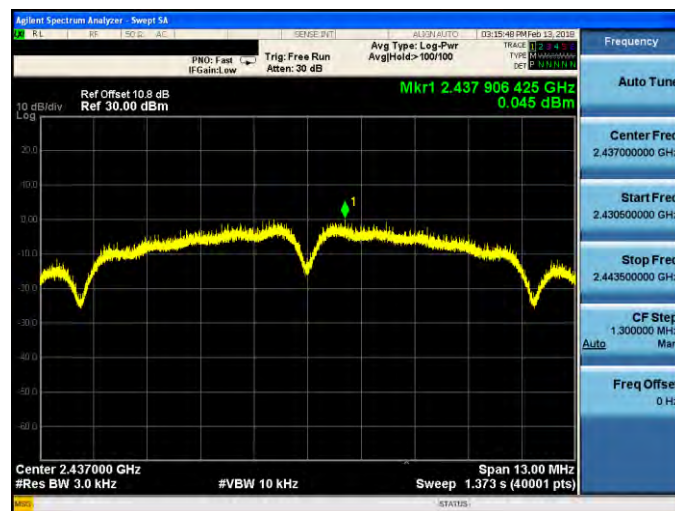
Beamforming on

Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

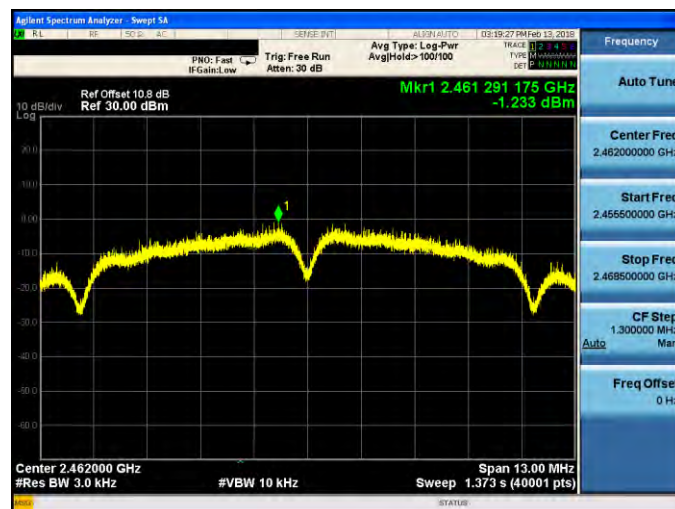
2412 MHz



2437 MHz



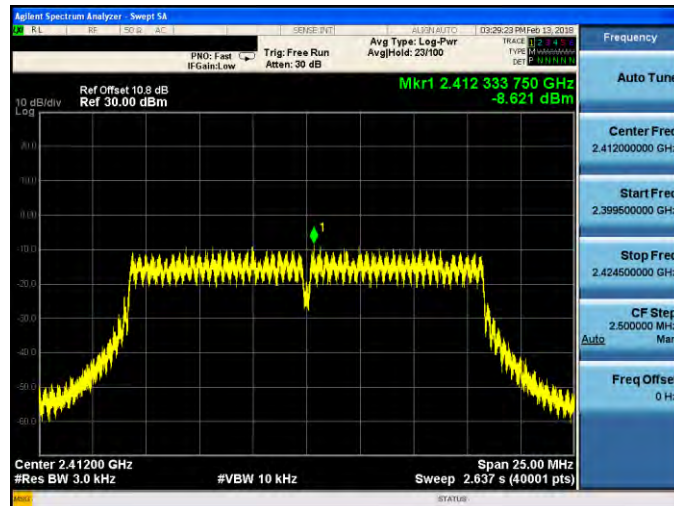
2462 MHz



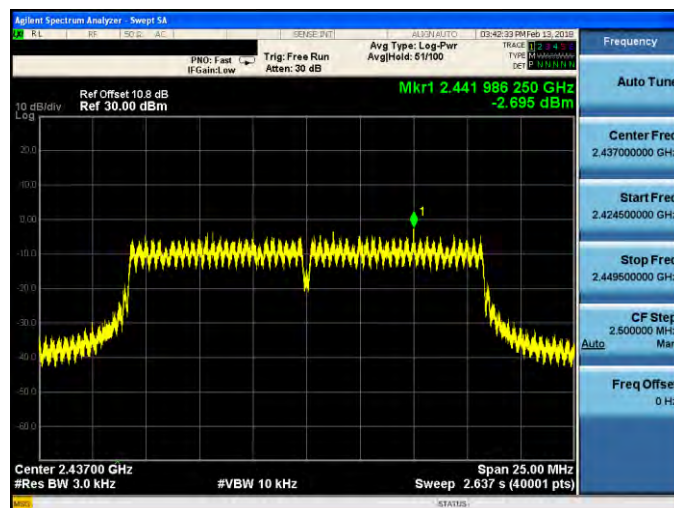


Mode 3: IEEE 802.11g Continuous TX mode_ANT-0

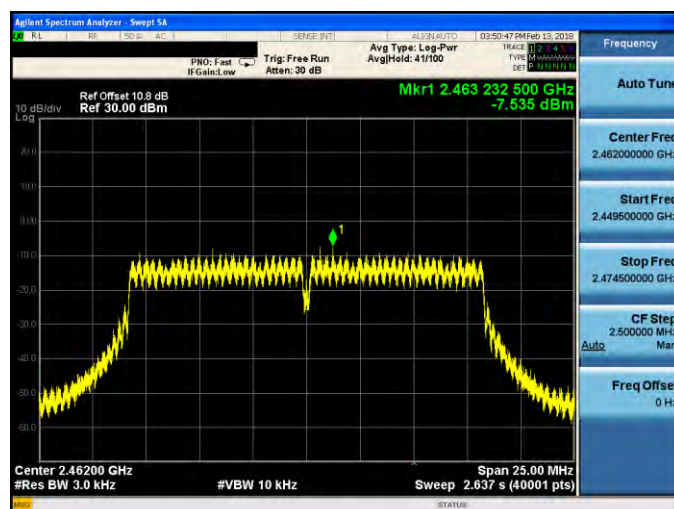
2412 MHz



2437 MHz



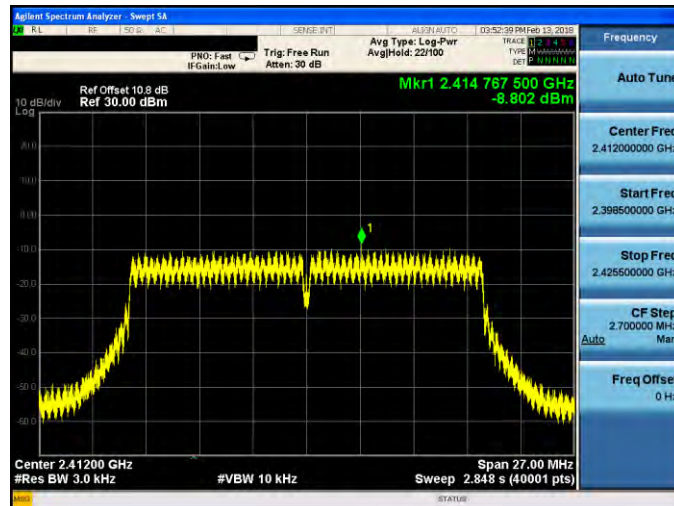
2462 MHz



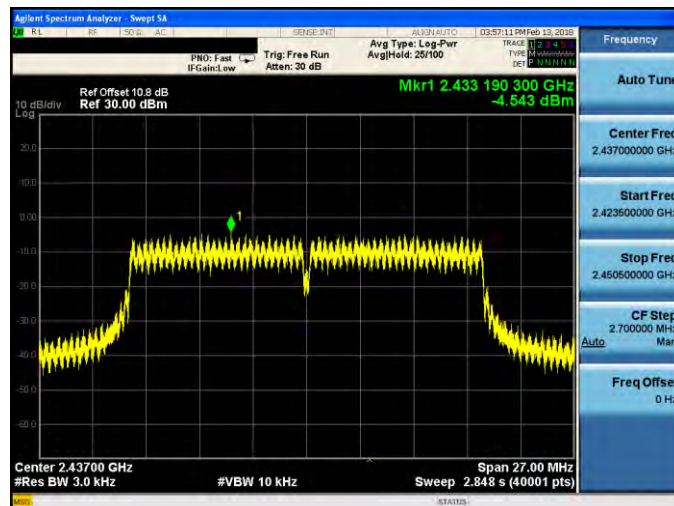


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode_ANT-0

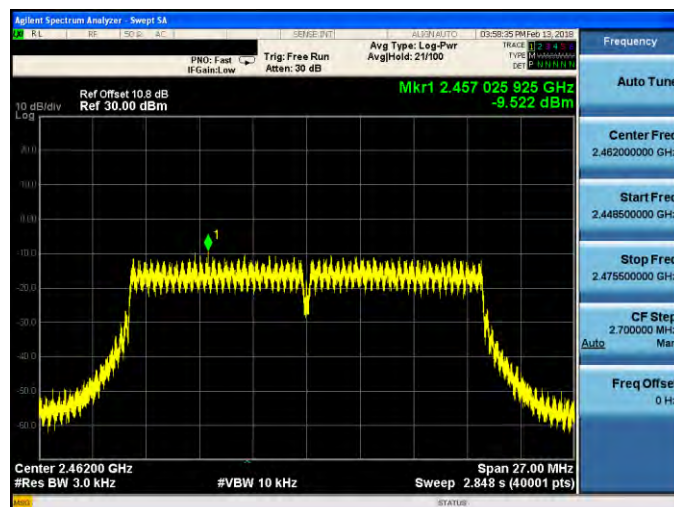
2412 MHz



2437 MHz



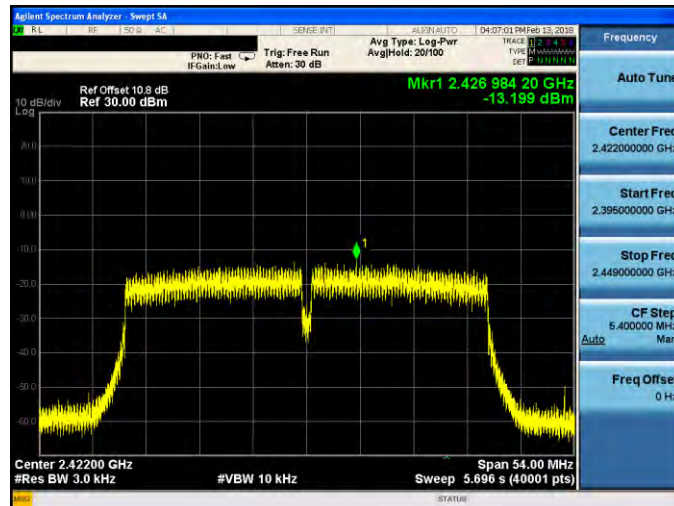
2462 MHz



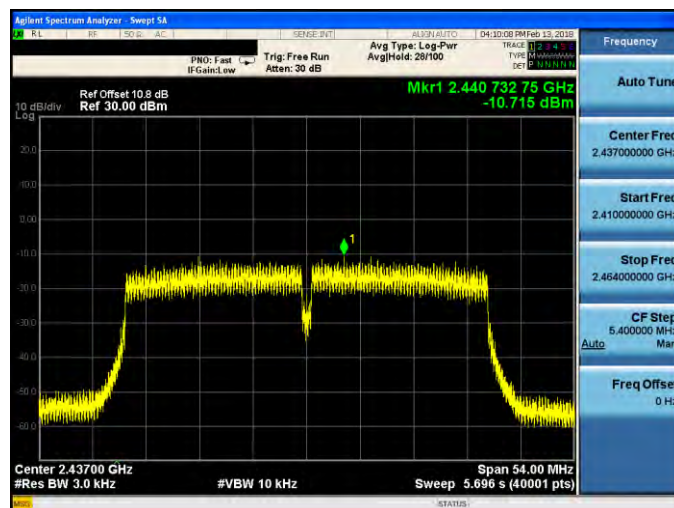


Mode 5: IEEE 802.11n 2.4GHz 40MHz Continuous TX mode_ANT-0

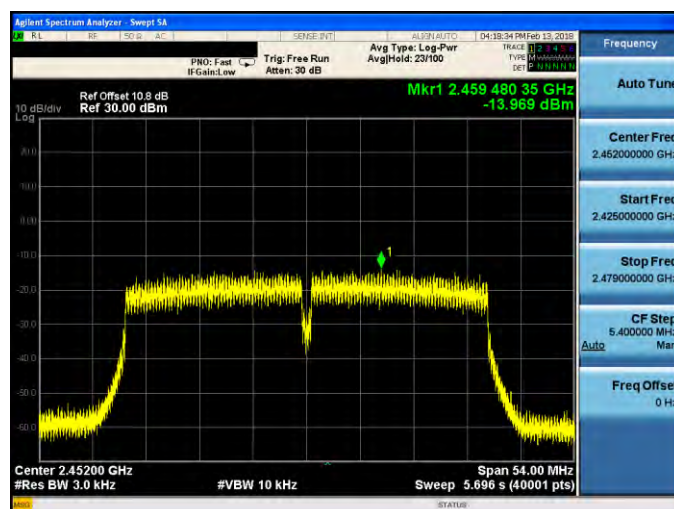
2422 MHz



2437 MHz



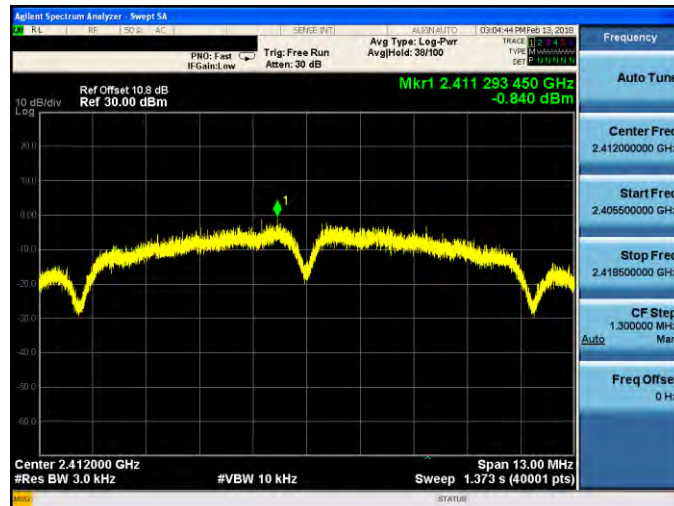
2452 MHz



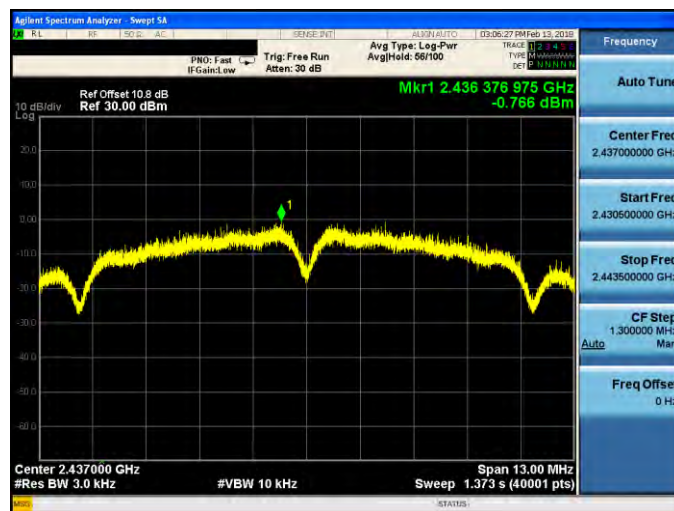


Mode 2: IEEE 802.11b Continuous TX mode_ANT-1

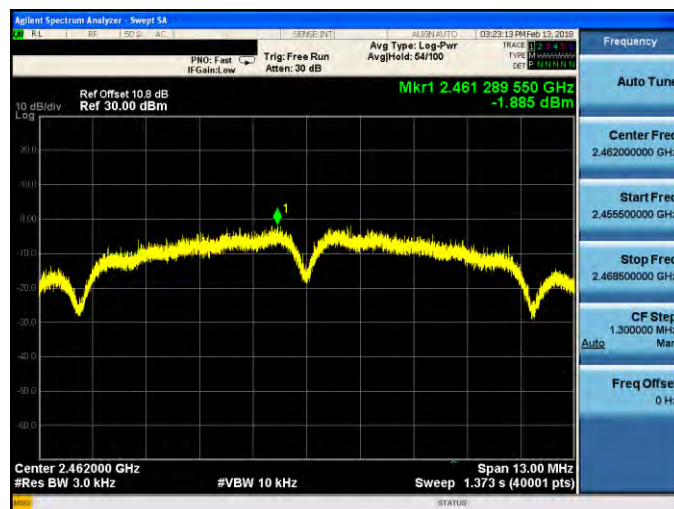
2412 MHz



2437 MHz



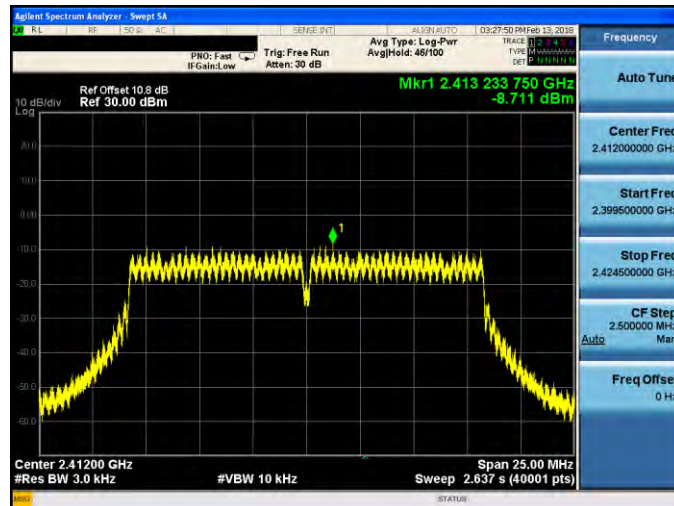
2462 MHz



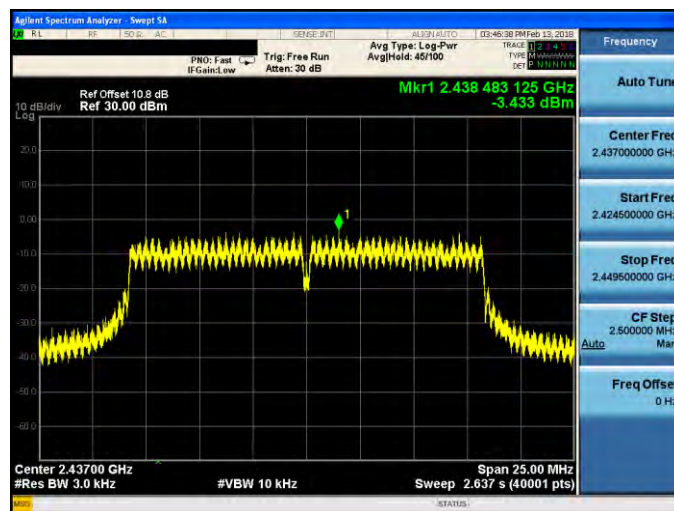


Mode 3: IEEE 802.11g Continuous TX mode_ANT-1

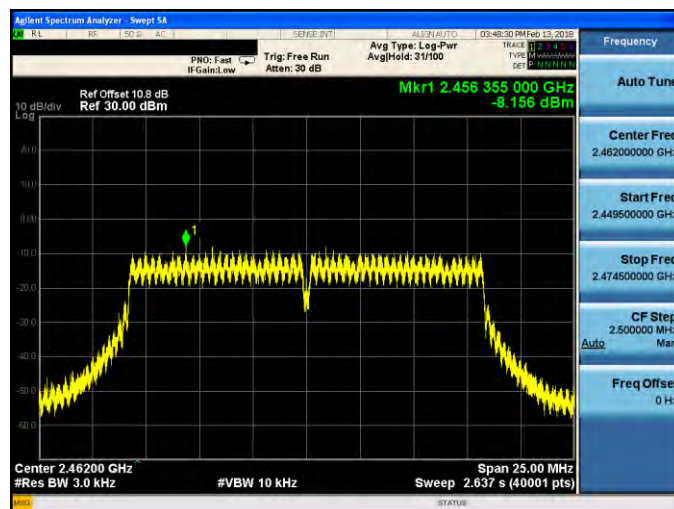
2412 MHz



2437 MHz



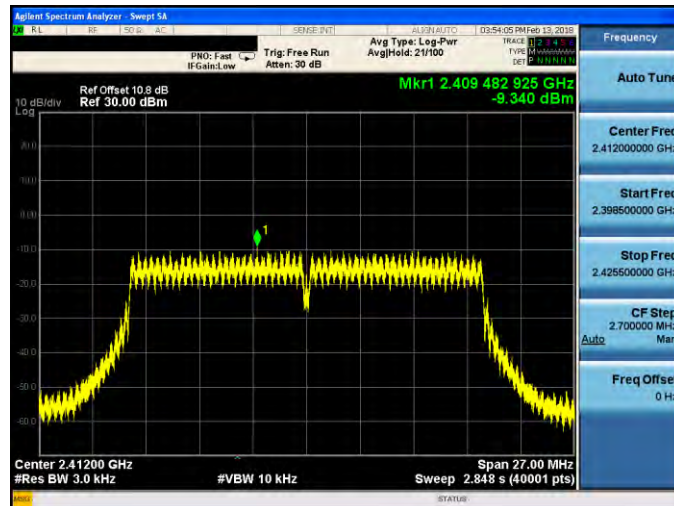
2462 MHz



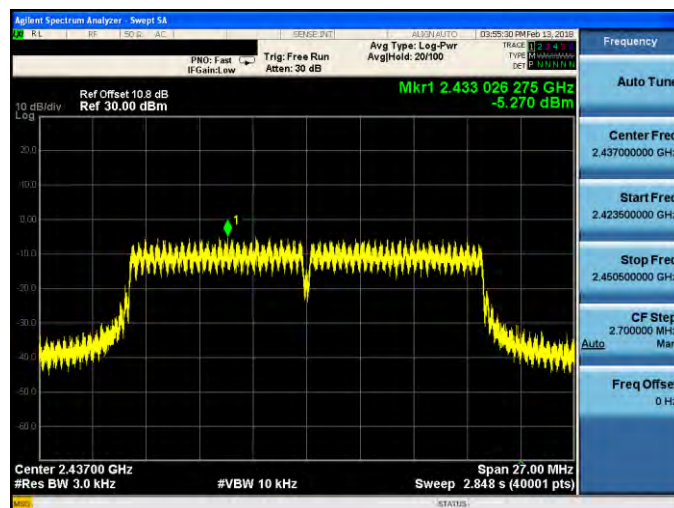


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode_ANT-1

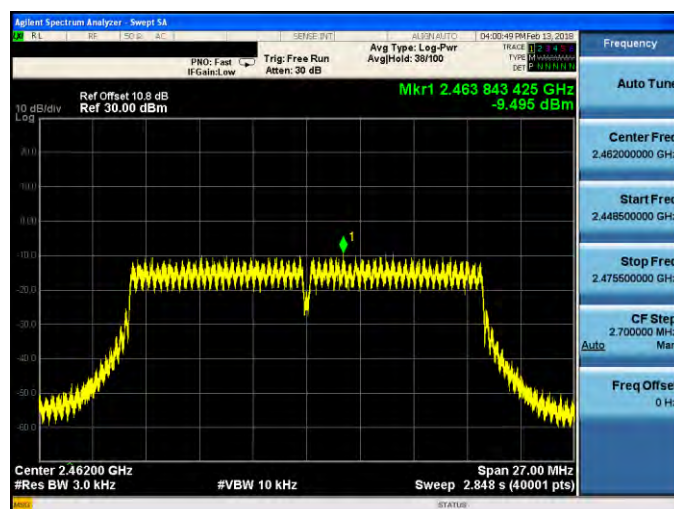
2412 MHz



2437 MHz



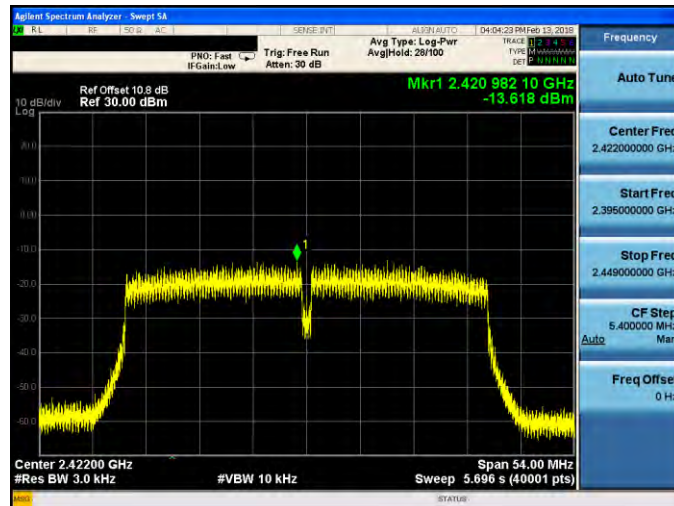
2462 MHz



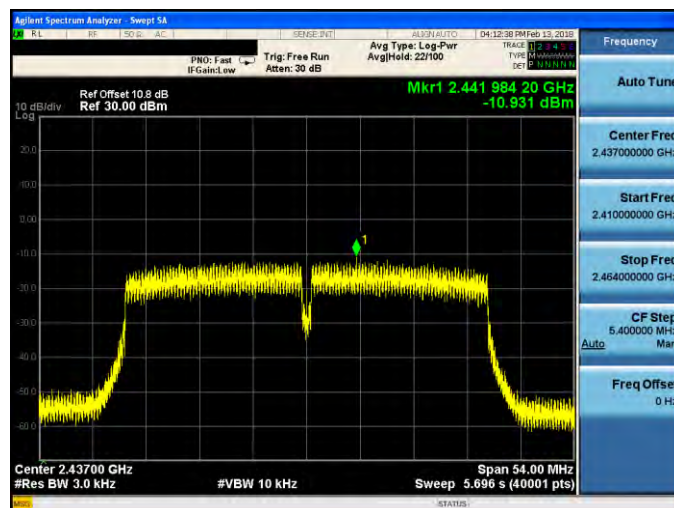


Mode 5: IEEE 802.11n 2.4GHz 40MHz Continuous TX mode_ANT-1

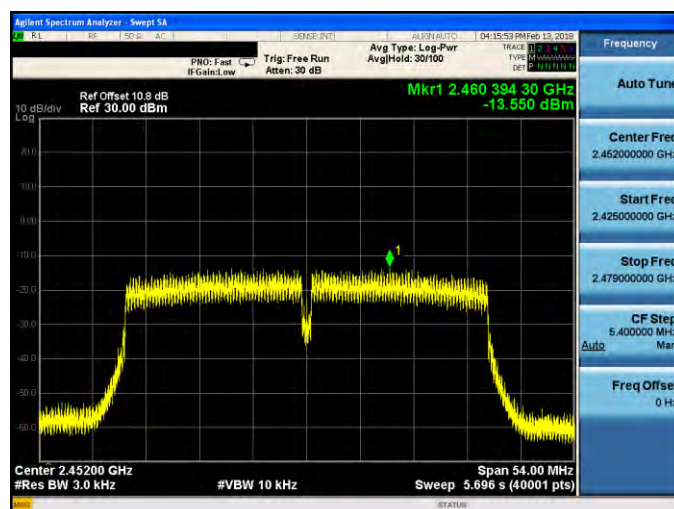
2422 MHz



2437 MHz



2452 MHz



Out of Band Conducted Emissions Measurement

■ Test Graphs

Reference level

Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

2412 MHz



2437 MHz



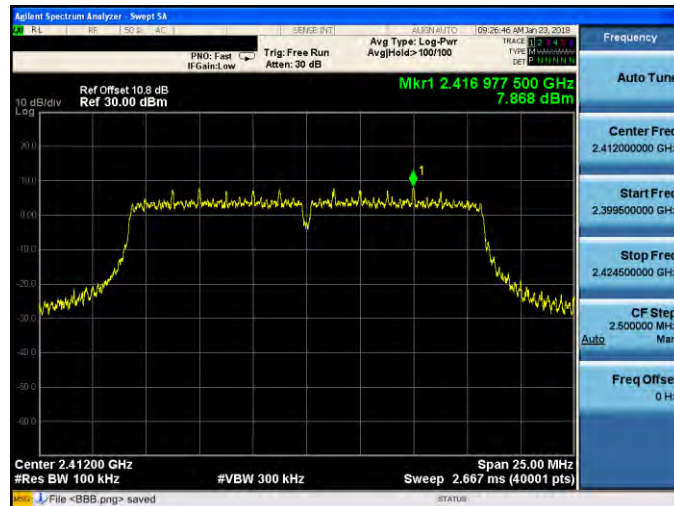
2462 MHz





Mode 3: IEEE 802.11g Continuous TX mode_ANT-0

2412 MHz



2437 MHz



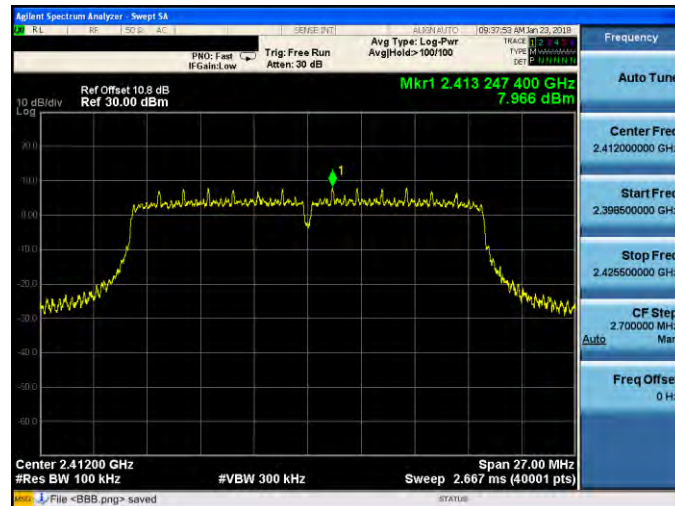
2462 MHz



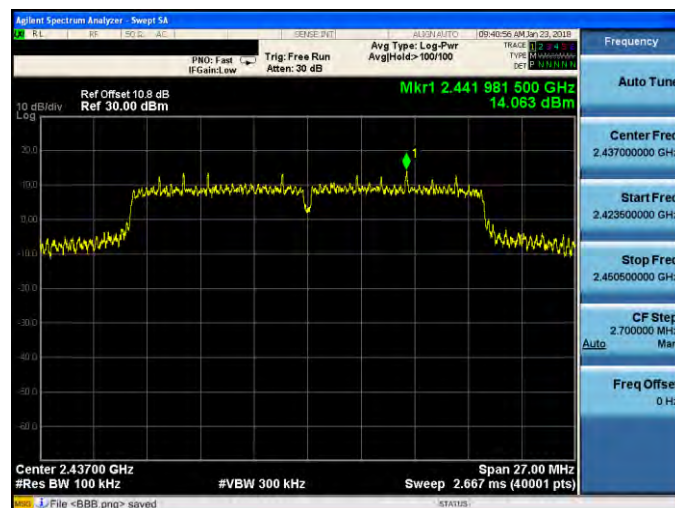


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode_ANT-0

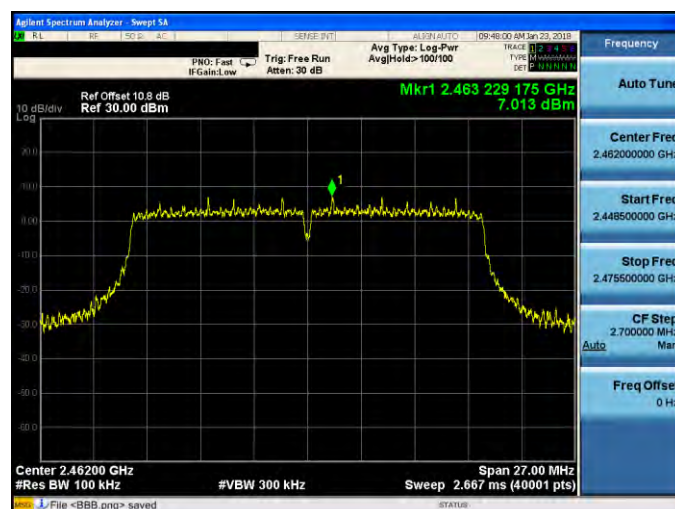
2412 MHz



2437 MHz



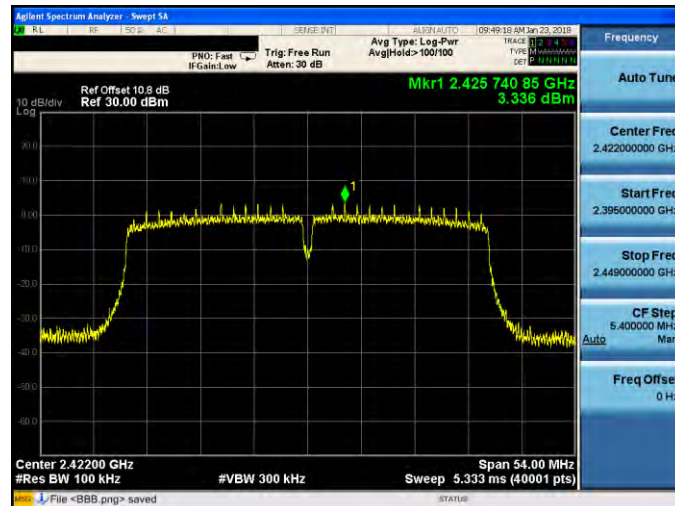
2462 MHz





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

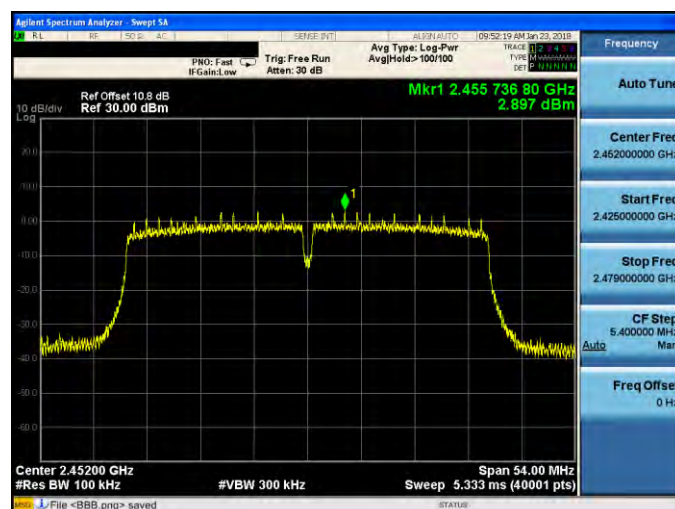
2422 MHz



2437 MHz



2452 MHz





Mode 2: IEEE 802.11b Continuous TX mode_ANT-1

2412 MHz



2437 MHz



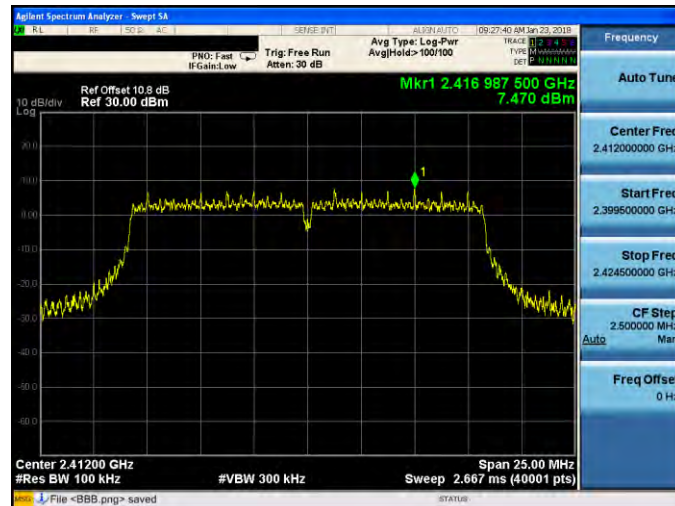
2462 MHz



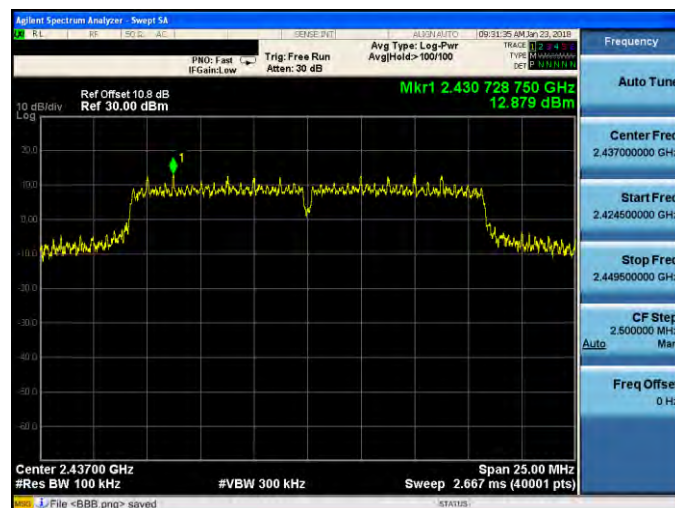


Mode 3: IEEE 802.11g Continuous TX mode_ANT-1

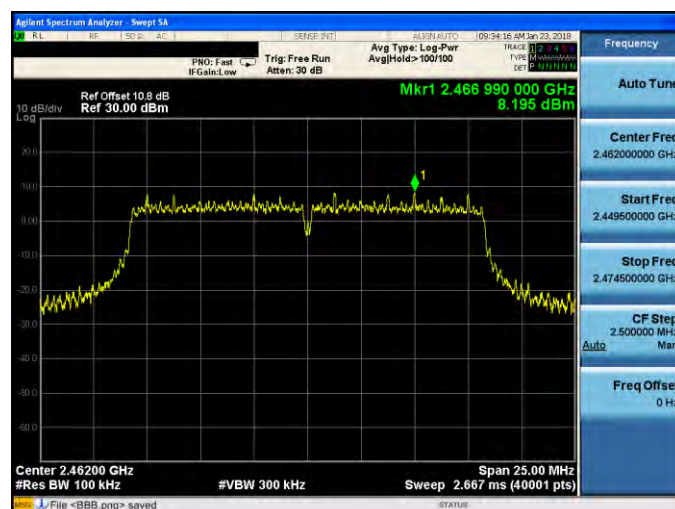
2412 MHz



2437 MHz



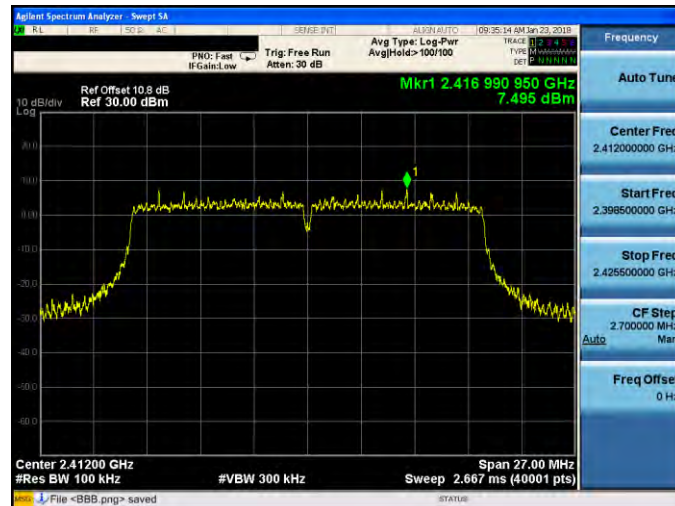
2462 MHz



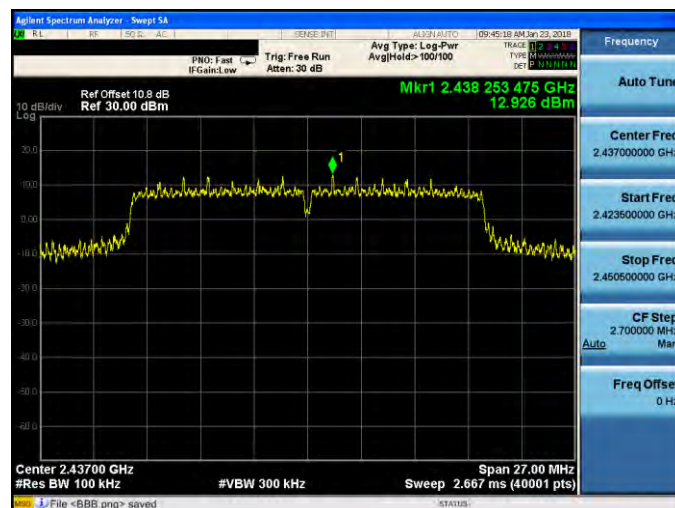


Mode 4: IEEE 802.11n 2.4GHz 20MHz Continuous TX mode_ANT-1

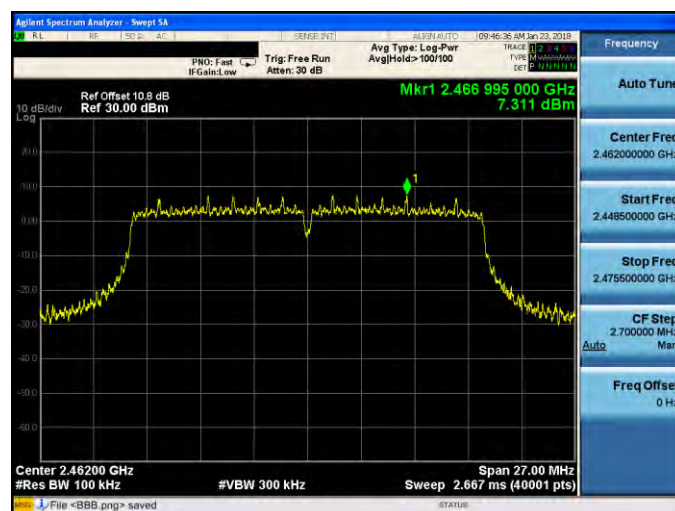
2412 MHz



2437 MHz



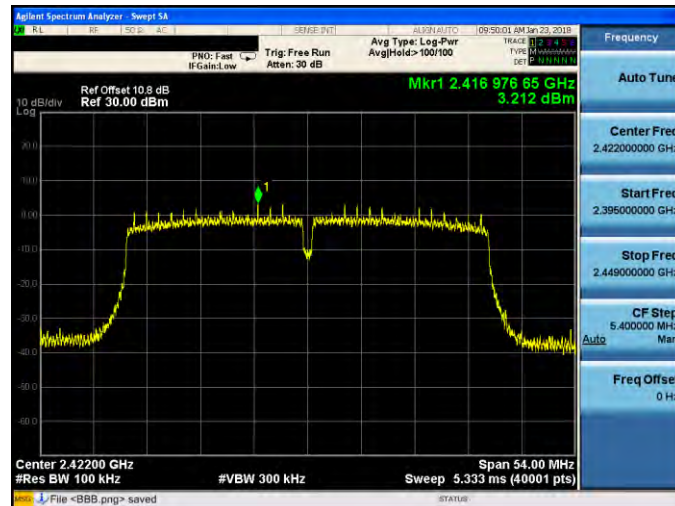
2462 MHz



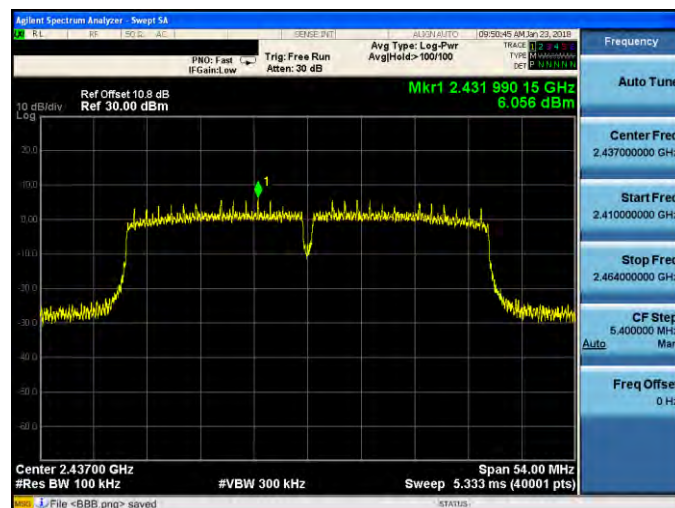


Mode 5: IEEE 802.11n 2.4GHz 40MHz Continuous TX mode_ANT-1

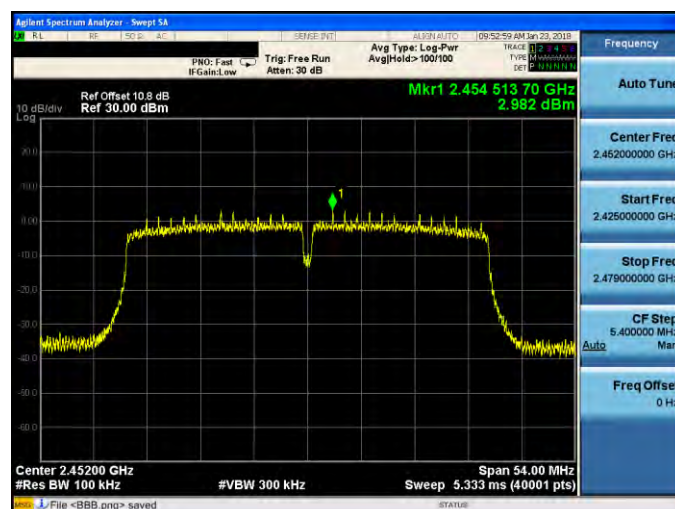
2422 MHz



2437 MHz



2452 MHz

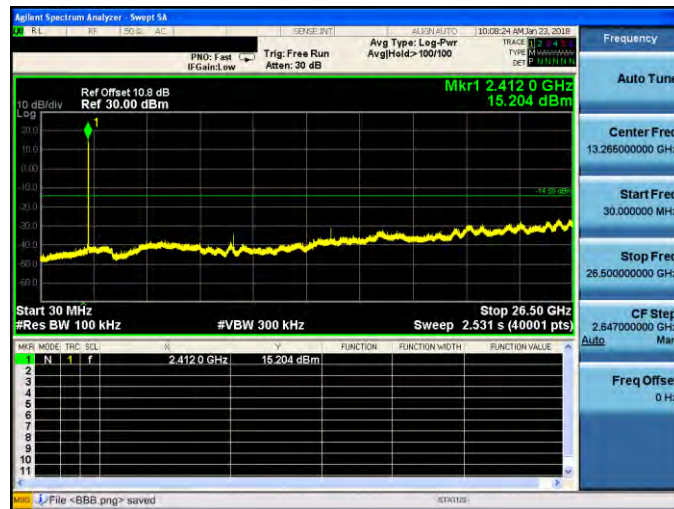




Out of Band Conducted Emissions

Mode 2: IEEE 802.11b Continuous TX mode_ANT-0

2412 MHz



2437 MHz



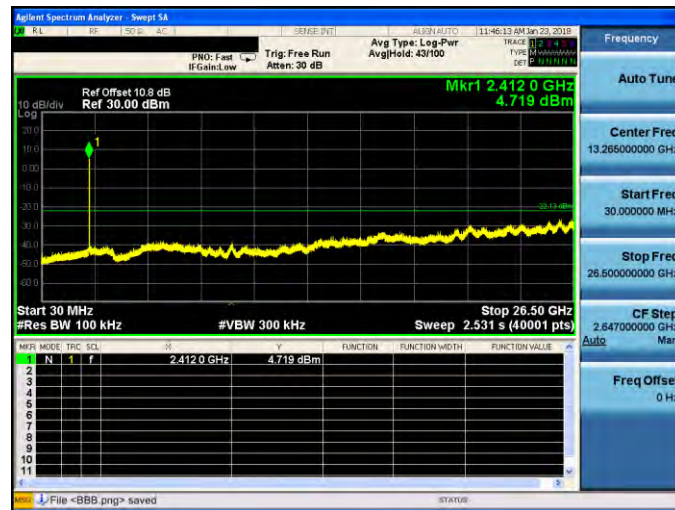
2462 MHz



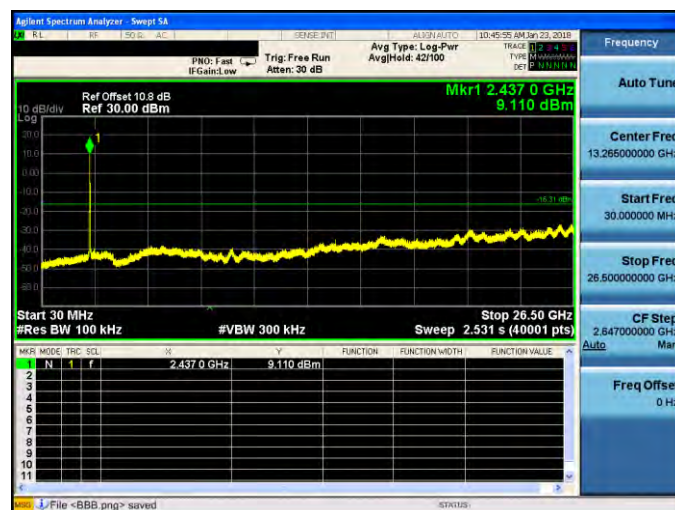


Mode 3: IEEE 802.11g Continuous TX mode_ANT-0

2412 MHz



2437 MHz



2462 MHz

