

FCC 47 CFR PART 15 SUBPART C

RF Test Report

Product Type : Simultaneous Dual-Band Wireless AC2350 Ultra HD Media Router

Applicant : ZyXEL Communications Corporation

Address : No.2, Gongye E. 9th Road, Hsinchu Science Park, Hsinchu, Taiwan

Trade Name : ZyXEL

Model Number : NBG6816

Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2014
ANSI C63.10:2009

Receive Date : Jan. 21, 2015

Test Period : Jan. 23 ~ Jan. 30, 2015

Issue Date : Mar. 11, 2015

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Feb. 10, 2015	Initial Issue	
01	Feb. 12, 2015	Revised report information.	Joyce Liao
02	Mar. 03, 2015	Revised report information.	Snow Wang
03	Mar. 11, 2015	Revised report information.	Snow Wang

Verification of Compliance

Issued Date: 03/11/2015

Product Type : Simultaneous Dual-Band Wireless AC2350 Ultra HD Media Router

Applicant : ZyXEL Communications Corporation

Address : No.2, Gongye E. 9th Road, Hsinchu Science Park, Hsinchu, Taiwan

Trade Name : ZyXEL

Model Number : NBG6816

FCC ID : I88NBG6816

EUT Rated Voltage : DC 12V, 4A

Test Voltage : 120 Vac / 60 Hz

Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2014
ANSI C63.10:2009

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.
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Taoyuan County 334, 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 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
15.247			
15.207	AC Power Conducted Emission	PASS	-----
-----	99 % Occupied Bandwidth	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)	Power Spectral Density	PASS	-----
15.247(d)	Out of Band Conducted Spurious Emission	PASS	-----
15.247(d)	Band Edge Measurement	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 ~ 30MHz		± 2.02
Radiated Emission	30MHz ~ 1000MHz	Horizontal	± 3.98
		Vertical	± 3.62
	1000MHz ~ 18000MHz	Horizontal	± 3.11
		Vertical	± 3.07
	18000MHz ~ 40000MHz	Horizontal	± 3.66
		Vertical	± 3.54

2 EUT Description

Product Type	Simultaneous Dual-Band Wireless AC2350 Ultra HD Media Router
Trade Name	ZyXEL
Model No.	NBG6816
Applicant	ZyXEL Communications Corporation No.2, Gongye E. 9th Road, Hsinchu Science Park, Hsinchu, Taiwan
Manufacturer (1)	MitraStar Technology Corporation No. 6, Innovation Rd II, Science-Based Industrial, Hsinchu, Taiwan
Manufacturer (2)	WuXi MitraStar Technology Co. Ltd 60#-E, Minshan Road, New district WuXi, Jiangsu, P.R. China
Hardware Version	80-035-008001ACB
Software Version	3.40(VSI.7)01
Radio Hardware Version	80-035-008001ACB
Radio Software Version	QCA-wifi-10.2.2.60.9
FCC ID	I88NBG6816
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 2412 ~ 2462 MHz IEEE 802.11n 2.4GHz 40MHz: 2422 ~ 2452 MHz
Modulation Type	IEEE 802.11b:DSSS IEEE 802.11g:DSSS + OFDM IEEE 802.11n 2.4GHz 20MHz: OFDM IEEE 802.11n 2.4GHz 40MHz: OFDM
Antenna Type	Dipole Antenna (Reversed-SMA Connector)
Antenna Gain	2.94 dBi
Antenna Delivery	3TX + 3RX
RF Output Power	IEEE 802.11b: 0.941 W / 29.74 dBm IEEE 802.11g: 0.885 W / 29.47 dBm IEEE 802.11n 2.4GHz 20MHz: 0.849 W / 29.29 dBm IEEE 802.11n 2.4GHz 40MHz: 0.738 W / 28.68 dBm

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: Normal Operation Mode
Mode 2: IEEE 802.11b Link Mode
Mode 3: IEEE 802.11g Link Mode
Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode
Mode 5: IEEE 802.11n 2.4GHz 40MHz Link 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 normal link mode only.

Test Mode	ANT-0	ANT-1	ANT-2	ANT-0+1+2
Mode 2: IEEE 802.11b Mode	V	V	V	V
Mode 3: IEEE 802.11g Mode	V	V	V	V
Mode 4: IEEE 802.11n 2.4GHz 20MHz Mode	V	V	V	V
Mode 5: IEEE 802.11n 2.4GHz 40MHz Mode	V	V	V	V

Test Mode	TX/RX Function	Test Channel	Data Rate
Mode 2: IEEE 802.11b Mode	3TX / 3RX	1, 6, 11	1
Mode 3: IEEE 802.11g Mode	3TX / 3RX	1, 6, 11	6
Mode 4: IEEE 802.11n 2.4GHz 20MHz Mode	3TX / 3RX	1, 6, 11	19.5
Mode 5: IEEE 802.11n 2.4GHz 40MHz Mode	3TX / 3RX	3, 6, 9	40.5

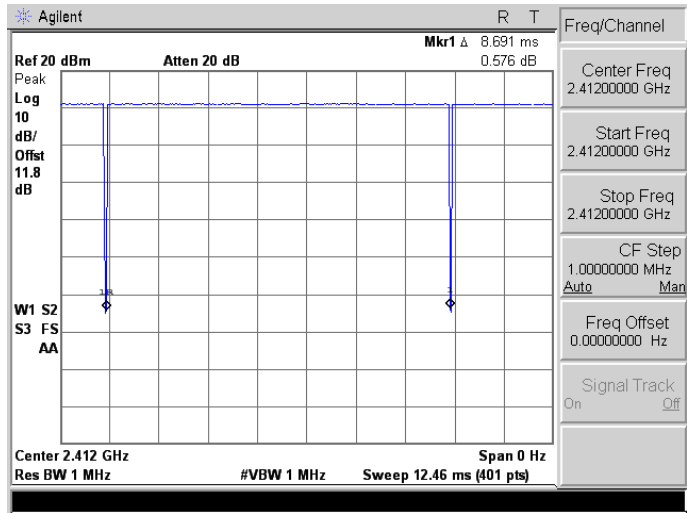
Note :Output Power and Power Density Directional gain = GANT=2.94dBi

Duty cycle of test signal is >98%

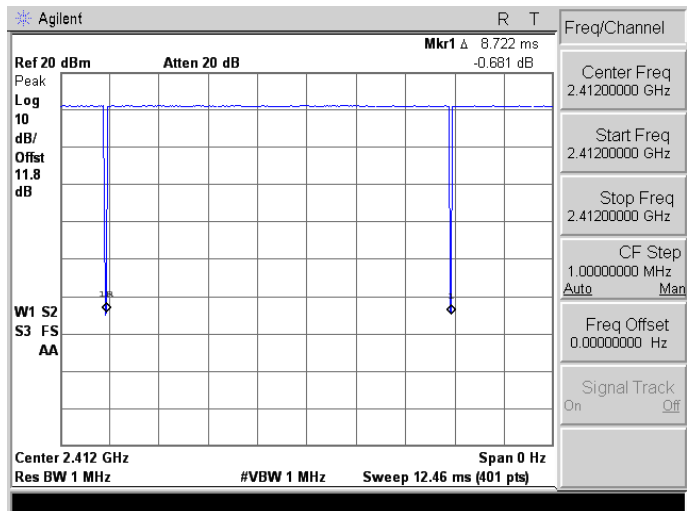
Test Mode	Frequency (MHz)	on time (ms)	on+off time (ms)	Duty cycle (%)
Mode 2: IEEE 802.11b Mode	2412.0	8.691	8.722	0.996
Mode 3: IEEE 802.11g Mode	2412.0	8.650	8.700	0.994
Mode 4: IEEE 802.11n 2.4GHz 20MHz Mode	2412.0	8.650	8.675	0.997
Mode 5: IEEE 802.11n 2.4GHz 40MHz Mode	2422.0	8.675	8.700	0.997

Mode 2: IEEE 802.11b Link Mode

On time

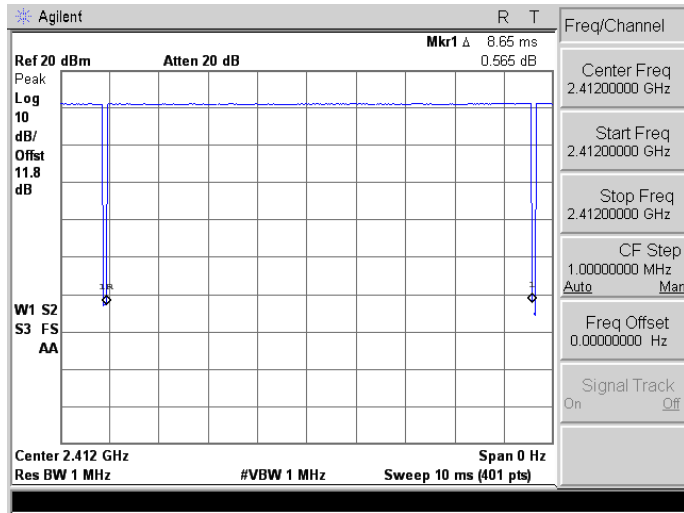


On+off time

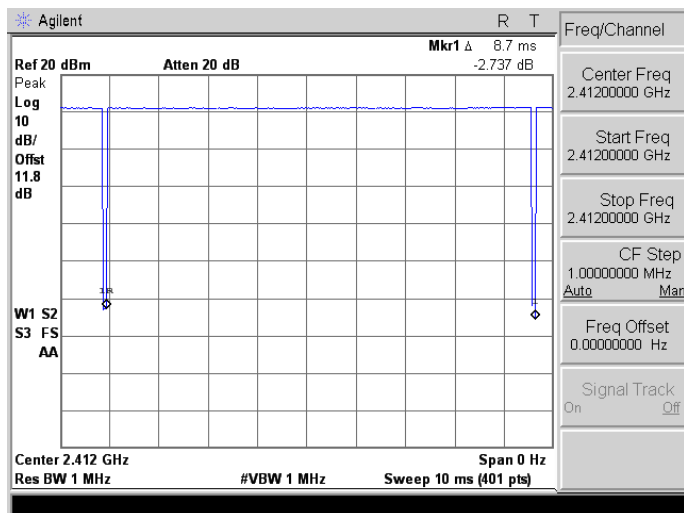


Mode 3: IEEE 802.11g Mode

On time

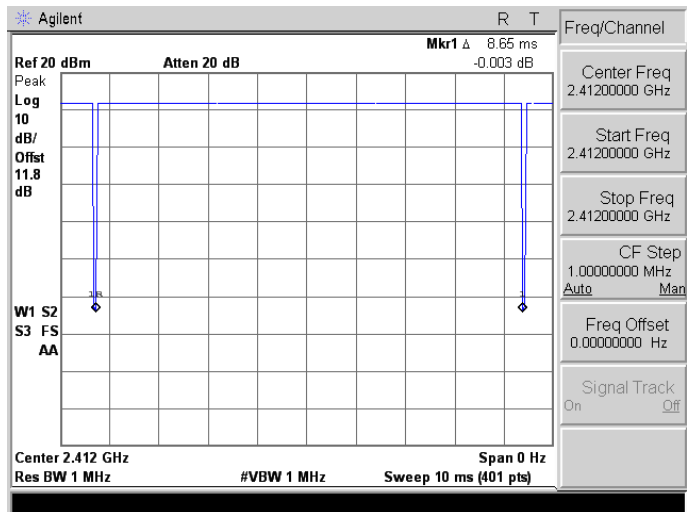


On+off time

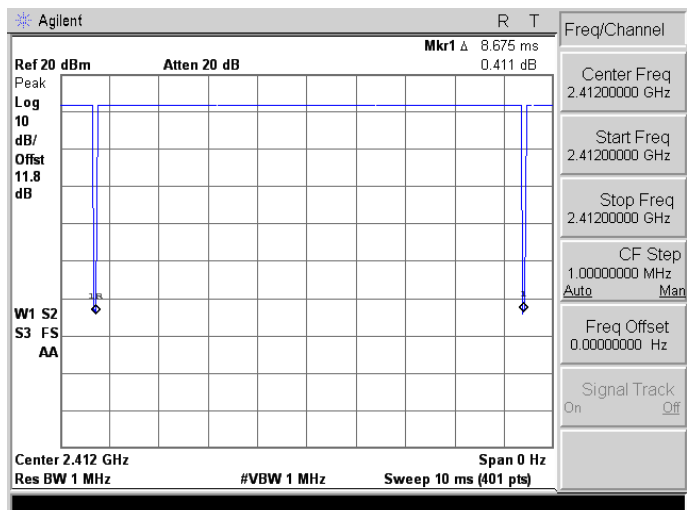


Mode 4: IEEE 802.11n 2.4GHz 20MHz Mode

On time



On+off time



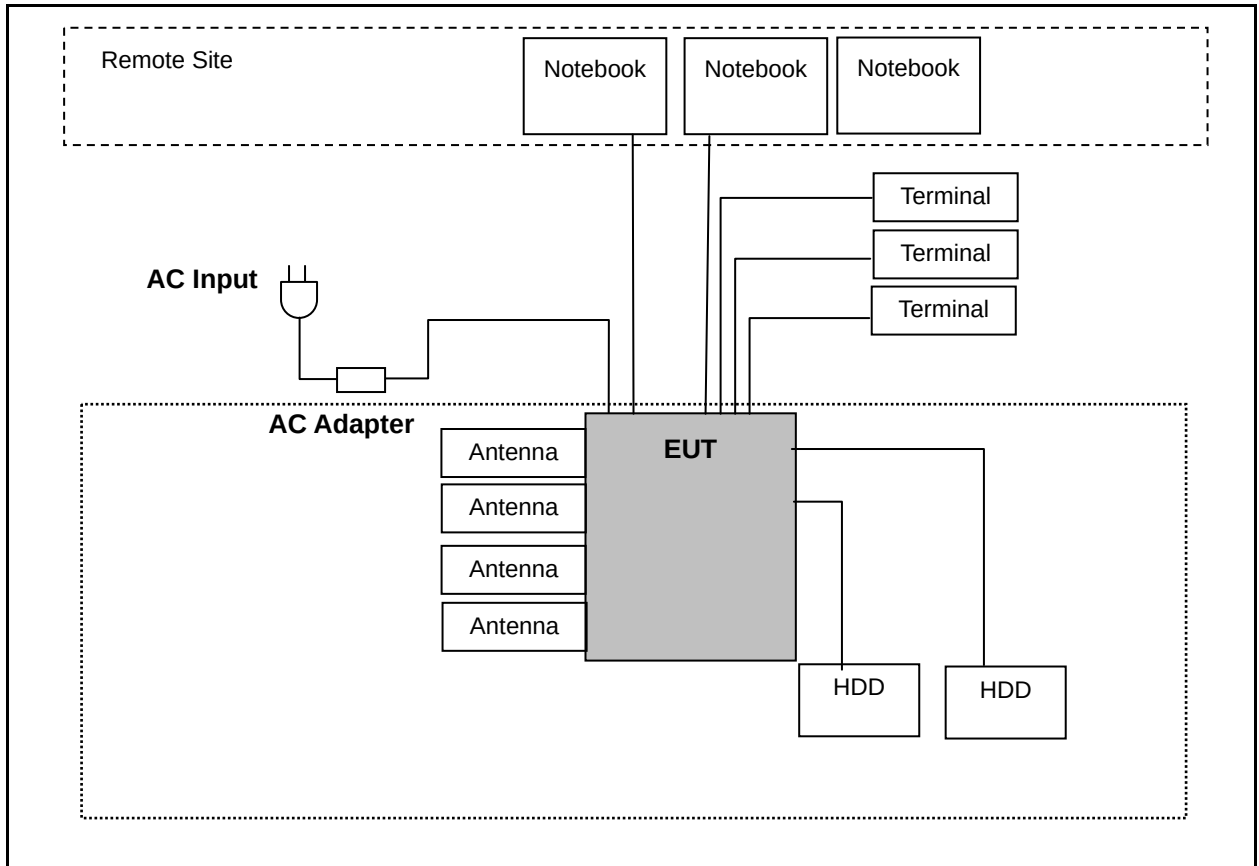


3.2. EUT Exercise Software

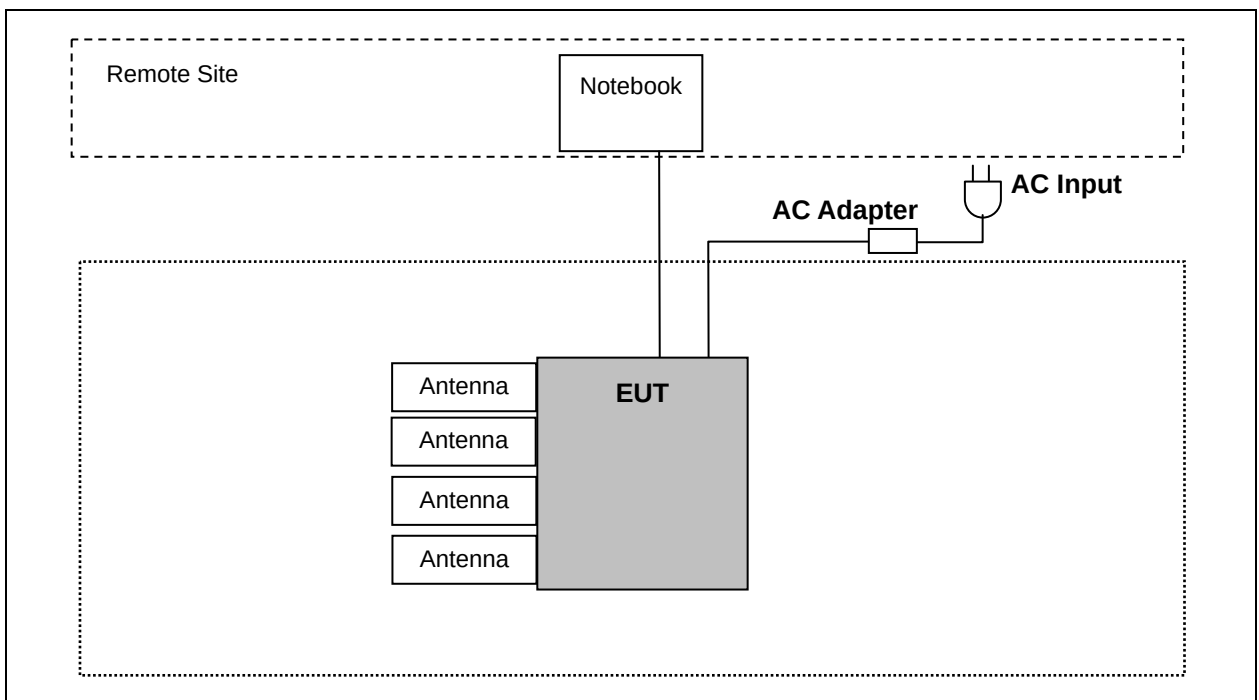
1. Setup the EUT shown on 3.3.
2. Turn on the power of all equipment.
3. Turn on Wi-Fi function link to AP.
4. EUT run test program.

3.3. Configuration of Test System Details

Conducted Emissions



Radiated Emissions



3.4. 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 Conducted Emission Measurement

4.1. 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

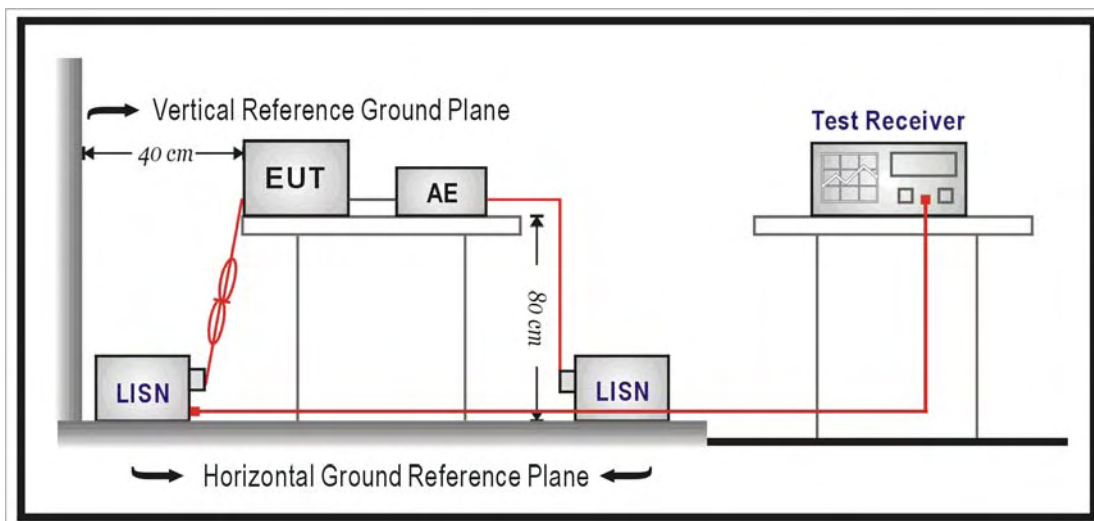
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/12/2014	(1)
LISN	R&S	ENV216	101040	03/07/2014	(1)
LISN	R&S	ENV216	101041	03/07/2014	(1)
RF Cable	EMCI	RG 214/U	TE-02	06/30/2014	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

4.3. Test Setup



4.4. Test Procedure

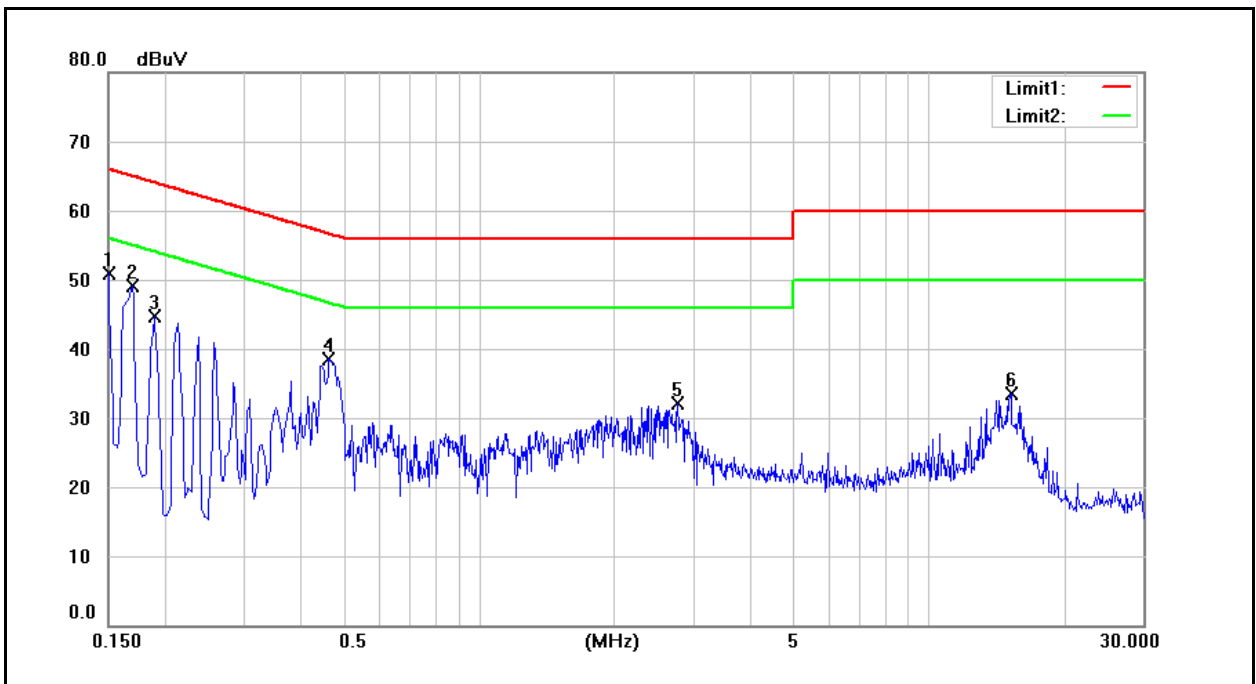
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

4.5. Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	NBG6816	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	01/24/2015
		Test By:	Eric Ou Yang
Description:			



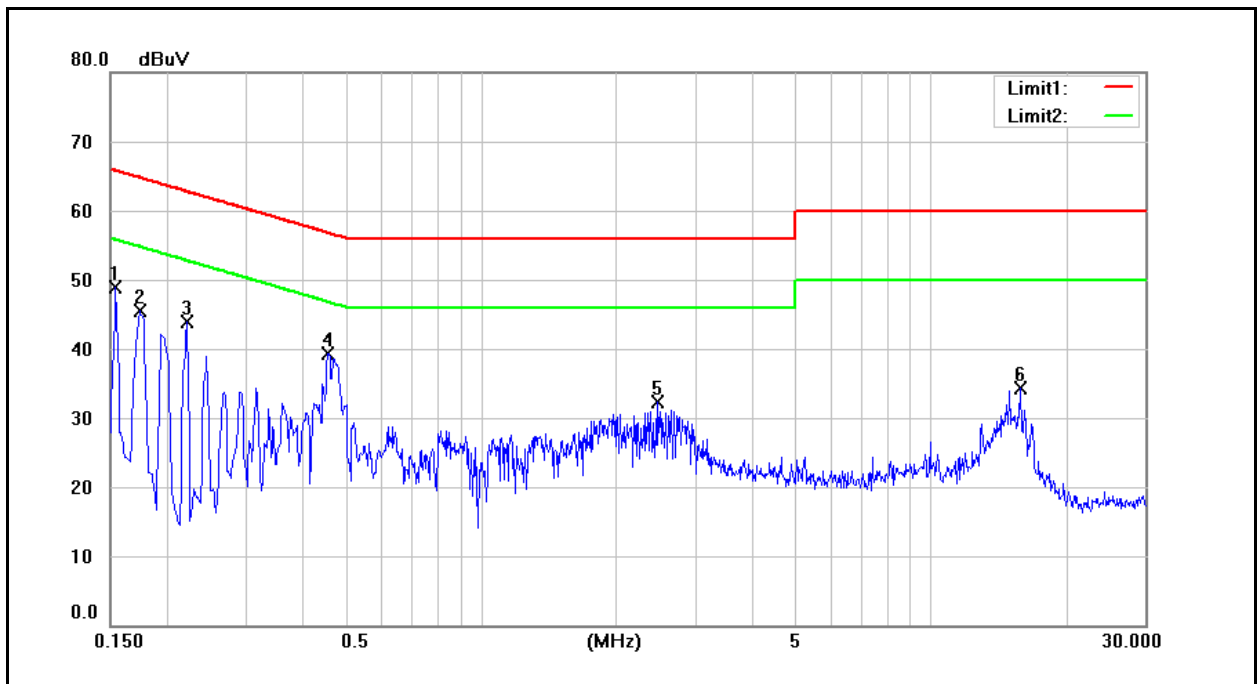
No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1500	38.40	19.81	9.59	47.99	29.40	66.00	56.00	-18.01	-26.60	Pass
2	0.1700	34.55	15.71	9.60	44.15	25.31	64.96	54.96	-20.81	-29.65	Pass
3	0.1900	31.32	13.73	9.60	40.92	23.33	64.04	54.04	-23.12	-30.71	Pass
4	0.4660	27.58	19.77	9.62	37.20	29.39	56.58	46.58	-19.38	-17.19	Pass
5	2.7700	17.01	7.03	9.72	26.73	16.75	56.00	46.00	-29.27	-29.25	Pass
6	15.2660	14.45	4.52	10.10	24.55	14.62	60.00	50.00	-35.45	-35.38	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

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

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	NBG6816	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	01/24/2015
		Test By:	Eric Ou Yang

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	37.38	18.50	9.60	46.98	28.10	65.78	55.78	-18.80	-27.68	Pass
2	0.1740	33.48	14.70	9.60	43.08	24.30	64.77	54.77	-21.69	-30.47	Pass
3	0.2220	26.22	7.46	9.60	35.82	17.06	62.74	52.74	-26.92	-35.68	Pass
4	0.4580	27.66	19.25	9.62	37.28	28.87	56.73	46.73	-19.45	-17.86	Pass
5	2.4660	16.72	6.55	9.73	26.45	16.28	56.00	46.00	-29.55	-29.72	Pass
6	15.8580	13.21	3.62	10.13	23.34	13.75	60.00	50.00	-36.66	-36.25	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

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

5 Radiated Emission Measurement

5.1. 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.

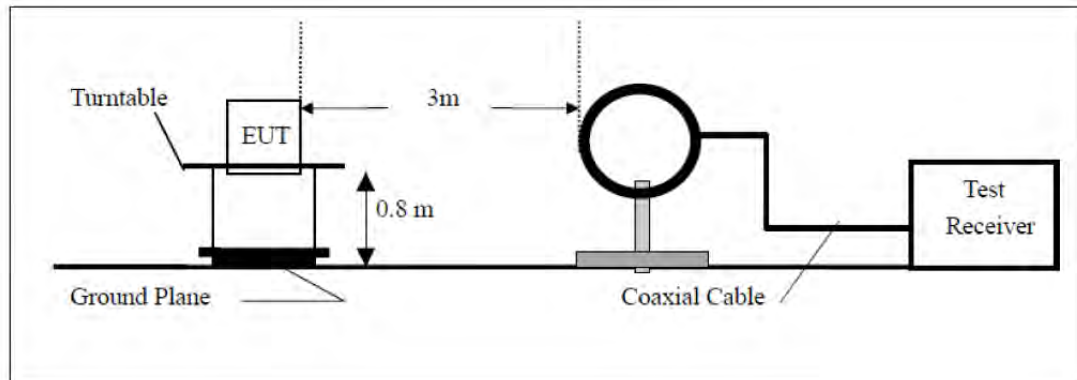
5.2. Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/06/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/06/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2014	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2014	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/22/2014	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/11/2014	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	07/02/2014	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	02/02/2015	(1)
Microwave Cable	EMCI	EMC-104-SM-SM-14000	140202	02/19/2014	(1)
Microwave Cable	EMCI	EMC104-SM-SM-600	140301	03/03/2014	(1)
Test Site	ATL	TE01	888001	08/28/2014	(1)

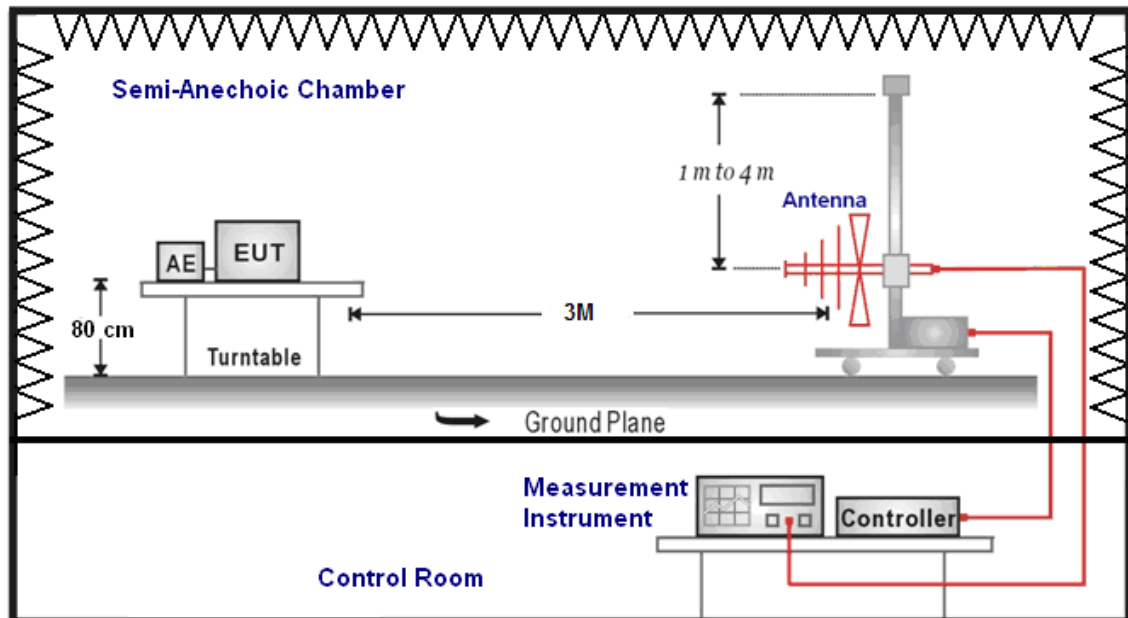
Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

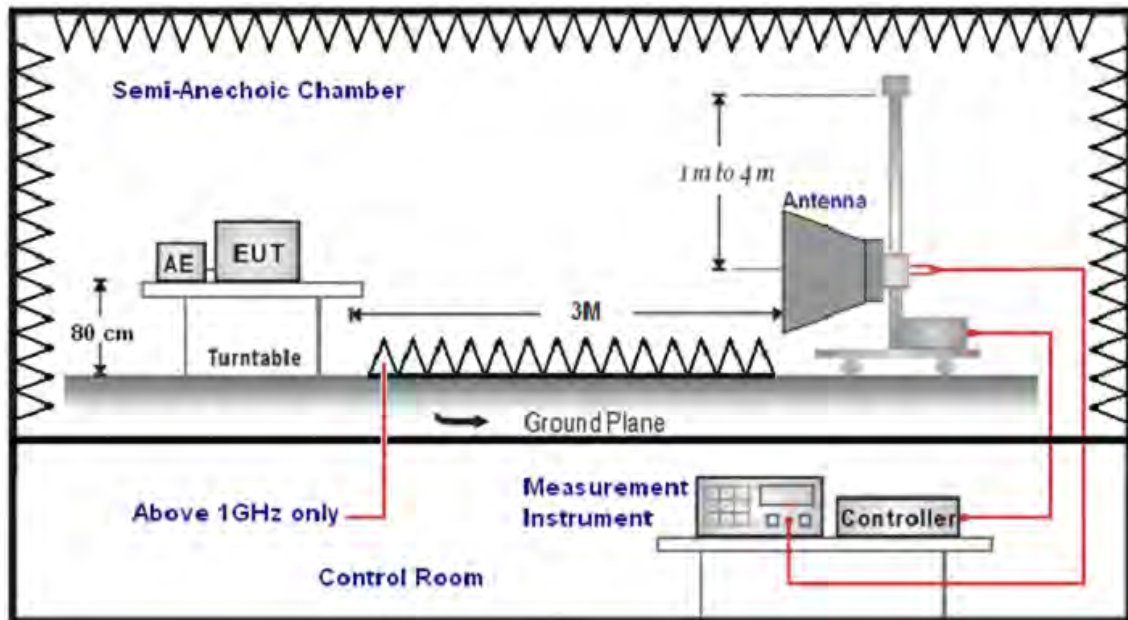
5.3. Setup



Below 1GHz



Above 1GHz



5.4. 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 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.

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 (model VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. 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

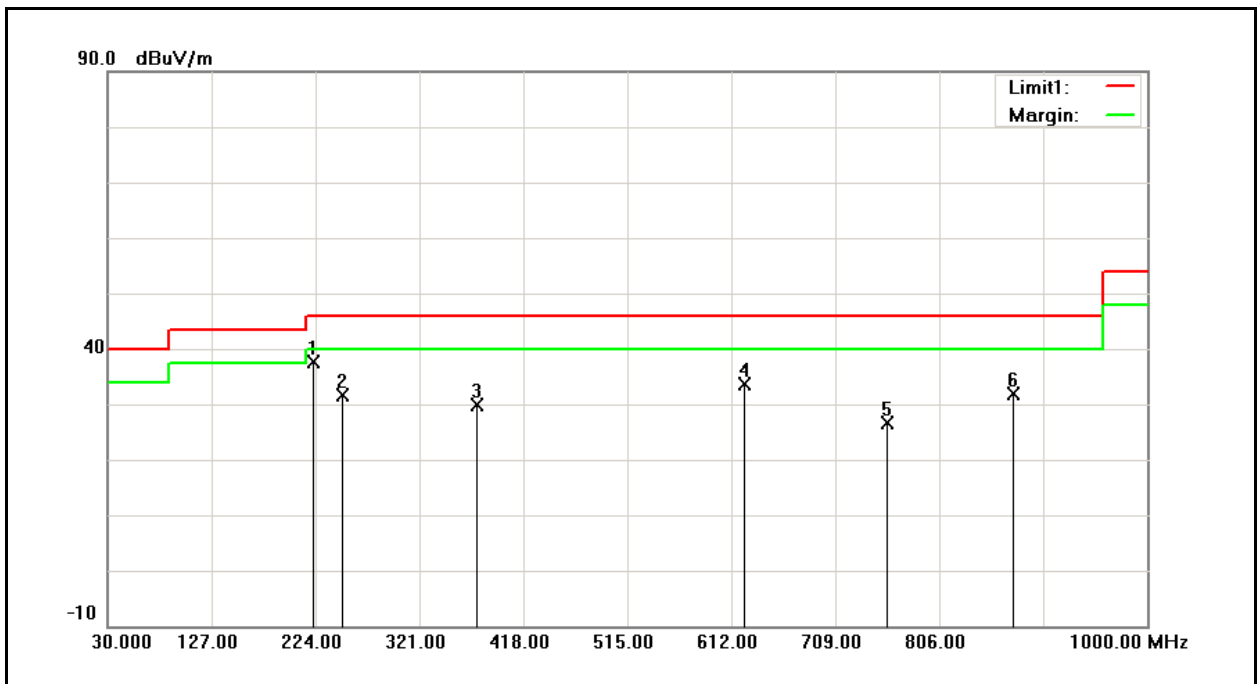
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

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.

5.5. Test Result

Below 1GHz

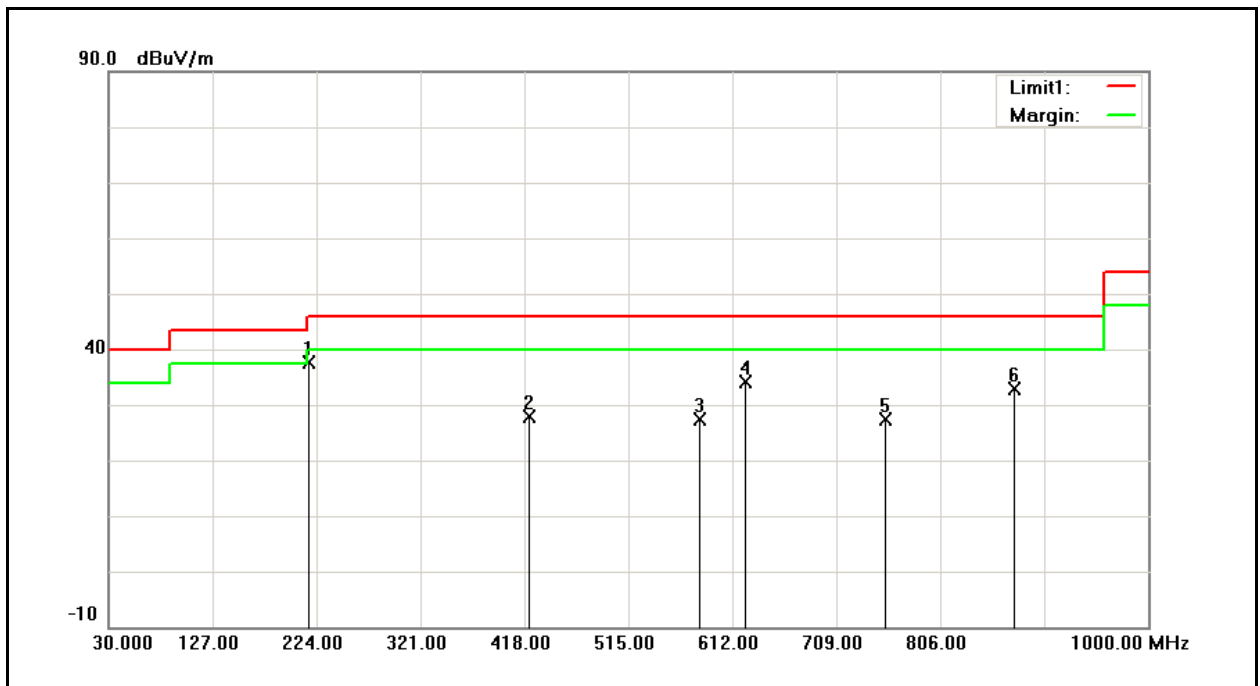
Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NBG6816	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	01/23/2015
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang



Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
222.5000	51.48	-13.87	37.61	46.00	-8.39	QP
250.0000	44.13	-12.39	31.74	46.00	-14.26	QP
375.0000	38.82	-9.03	29.79	46.00	-16.21	QP
625.0000	37.48	-3.89	33.59	46.00	-12.41	QP
757.5000	27.80	-1.25	26.55	46.00	-19.45	QP
875.0000	31.03	0.86	31.89	46.00	-14.11	QP

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NBG6816	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	01/23/2015
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang



Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
216.5000	51.76	-14.12	37.64	46.00	-8.36	QP
423.0000	36.06	-8.06	28.00	46.00	-18.00	QP
581.5000	32.06	-4.76	27.30	46.00	-18.70	QP
625.0000	37.95	-3.89	34.06	46.00	-11.94	QP
755.5000	28.56	-1.29	27.27	46.00	-18.73	QP
875.0000	31.97	0.86	32.83	46.00	-13.17	QP

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Above 1GHz

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	NBG6816			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	01/24/2015		
Frequency:	2412MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	37.89	-0.40	37.49	74.00	-36.51	peak	H
4824.000	37.82	4.61	42.43	74.00	-31.57	peak	H
6705.000	32.54	9.54	42.08	74.00	-31.92	peak	H
3030.000	37.08	-0.45	36.63	74.00	-37.37	peak	V
4824.000	41.08	4.61	45.69	74.00	-28.31	peak	V
7236.000	37.90	10.91	48.81	74.00	-25.19	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	NBG6816			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	01/24/2015		
Frequency:	2437MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3002.000	37.03	-0.54	36.49	74.00	-37.51	peak	H
4874.000	41.61	4.74	46.35	74.00	-27.65	peak	H
6649.000	33.60	9.39	42.99	74.00	-31.01	peak	H
3037.000	37.93	-0.44	37.49	74.00	-36.51	peak	V
4874.000	46.56	4.74	51.30	74.00	-22.70	peak	V
7311.000	40.36	11.09	51.45	74.00	-22.55	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	NBG6816			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	01/24/2015		
Frequency:	2462MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	37.66	-0.40	37.26	74.00	-36.74	peak	H
4570.000	33.92	3.97	37.89	74.00	-36.11	peak	H
6663.000	33.72	9.43	43.15	74.00	-30.85	peak	H
3030.000	36.32	-0.45	35.87	74.00	-38.13	peak	V
4924.000	38.20	4.86	43.06	74.00	-30.94	peak	V
6649.000	34.25	9.39	43.64	74.00	-30.36	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		3		Date:		01/24/2015	
Frequency:		2412MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	37.02	-0.45	36.57	74.00	-37.43	peak	H
4570.000	33.38	3.97	37.35	74.00	-36.65	peak	H
6691.000	32.77	9.50	42.27	74.00	-31.73	peak	H
3058.000	37.07	-0.38	36.69	74.00	-37.31	peak	V
4563.000	34.98	3.95	38.93	74.00	-35.07	peak	V
6663.000	33.70	9.43	43.13	74.00	-30.87	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(℃)/Hum.(%RH):		26(℃)/60%RH	
Mode:		3		Date:		01/24/2015	
Frequency:		2437MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3058.000	36.44	-0.38	36.06	74.00	-37.94	peak	H
4874.000	41.11	4.74	45.85	74.00	-28.15	peak	H
6670.000	34.22	9.45	43.67	74.00	-30.33	peak	H
3030.000	38.03	-0.45	37.58	74.00	-36.42	peak	V
4874.000	42.82	4.74	47.56	74.00	-26.44	peak	V
7311.000	39.86	11.09	50.95	74.00	-23.05	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		3		Date:		01/24/2015	
Frequency:		2462MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3009.000	36.33	-0.51	35.82	74.00	-38.18	peak	H
4577.000	34.68	3.98	38.66	74.00	-35.34	peak	H
6698.000	33.72	9.53	43.25	74.00	-30.75	peak	H
2981.000	36.30	-0.59	35.71	74.00	-38.29	peak	V
4591.000	34.67	4.01	38.68	74.00	-35.32	peak	V
6698.000	33.38	9.53	42.91	74.00	-31.09	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(℃)/Hum.(%RH):		26(℃)/60%RH	
Mode:		4		Date:		01/24/2015	
Frequency:		2412MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	37.31	-0.40	36.91	74.00	-37.09	peak	H
4619.000	33.90	4.10	38.00	74.00	-36.00	peak	H
6698.000	33.58	9.53	43.11	74.00	-30.89	peak	H
3030.000	38.71	-0.45	38.26	74.00	-35.74	peak	V
4605.000	34.37	4.05	38.42	74.00	-35.58	peak	V
6705.000	32.83	9.54	42.37	74.00	-31.63	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		4		Date:		01/24/2015	
Frequency:		2437MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3058.000	37.73	-0.38	37.35	74.00	-36.65	peak	H
4874.000	39.32	4.74	44.06	74.00	-29.94	peak	H
6670.000	33.81	9.45	43.26	74.00	-30.74	peak	H
3051.000	37.10	-0.40	36.70	74.00	-37.30	peak	V
4874.000	42.77	4.74	47.51	74.00	-26.49	peak	V
7311.000	40.79	11.09	51.88	74.00	-22.12	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(℃)/Hum.(%RH):		26(℃)/60%RH	
Mode:		4		Date:		01/24/2015	
Frequency:		2462MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3037.000	36.58	-0.44	36.14	74.00	-37.86	peak	H
4591.000	34.10	4.01	38.11	74.00	-35.89	peak	H
6677.000	33.61	9.46	43.07	74.00	-30.93	peak	H
3030.000	38.06	-0.45	37.61	74.00	-36.39	peak	V
4605.000	34.12	4.05	38.17	74.00	-35.83	peak	V
6670.000	32.99	9.45	42.44	74.00	-31.56	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		5		Date:		01/24/2015	
Frequency:		2422MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	37.44	-0.45	36.99	74.00	-37.01	peak	H
4570.000	34.65	3.97	38.62	74.00	-35.38	peak	H
6677.000	34.55	9.46	44.01	74.00	-29.99	peak	H
3030.000	36.49	-0.45	36.04	74.00	-37.96	peak	V
4570.000	33.73	3.97	37.70	74.00	-36.30	peak	V
6663.000	33.81	9.43	43.24	74.00	-30.76	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	NBG6816			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	01/24/2015		
Frequency:	2437MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3002.000	36.77	-0.54	36.23	74.00	-37.77	peak	H
4874.000	40.21	4.74	44.95	74.00	-29.05	peak	H
6663.000	35.09	9.43	44.52	74.00	-29.48	peak	H
3037.000	36.31	-0.44	35.87	74.00	-38.13	peak	V
4874.000	43.77	4.74	48.51	74.00	-25.49	peak	V
7311.000	40.27	11.09	51.36	74.00	-22.64	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	NBG6816			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	01/24/2015		
Frequency:	2452MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	37.42	-0.45	36.97	74.00	-37.03	peak	H
4563.000	34.28	3.95	38.23	74.00	-35.77	peak	H
6698.000	34.51	9.53	44.04	74.00	-29.96	peak	H
3030.000	37.25	-0.45	36.80	74.00	-37.20	peak	V
4598.000	33.64	4.04	37.68	74.00	-36.32	peak	V
6691.000	33.66	9.50	43.16	74.00	-30.84	peak	V

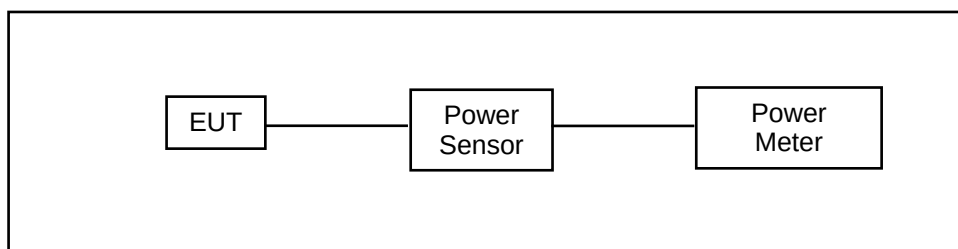
Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(℃)/Hum.(%RH):		26(℃)/60%RH	
Mode:		2.4GHz+5GHz		Date:		01/24/2015	
Simultaneous Transmitting				Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2840.000	36.06	-0.91	35.15	74.00	-38.85	peak	H
4835.000	41.62	4.63	46.25	74.00	-27.75	peak	H
10385.000	29.34	15.67	45.01	68.20	-23.19	peak	H
2831.000	36.57	-0.93	35.64	74.00	-38.36	peak	V
4864.000	43.41	4.71	48.12	74.00	-25.88	peak	V
10405.000	29.57	15.74	45.31	68.20	-22.89	peak	V

6 Maximum Conducted Output Power Measurement

6.1. Limit

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

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Power Sensor	Anritsu	MA2411B	1126022	08/21/2014	(1)
Power Meter	Anritsu	ML2495A	1135009	08/21/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

6.4. Test Procedure

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. The maximum output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

6.5. Test Result

Band	Data Rate	CH	Frequency (MHz)	RF Power setting in Test Software	Test Software Version
IEEE 802.11b	1M	1	2412.0	22.0	ART2-GUI (Ver. 2.3)
		6	2437.0	24.0	
		11	2462.0	20.0	
IEEE 802.11g	6M	1	2412.0	17.5	
		6	2437.0	24.0	
		11	2462.0	17.0	
IEEE 802.11n 20MHz	19.5M	1	2412.0	17.5	
		6	2437.0	24.0	
		11	2462.0	17.0	
IEEE 802.11n 40MHz	40.5M	3	2422.0	13.0	
		6	2437.0	24.0	
		9	2452.0	11.5	

Model Number	NBG6816					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 2: IEEE 802.11b Link Mode					
Date of Test	01/23/2015			Test Site	TE05	
Frequency (MHz)	Data Rate	ANT-0		ANT-1		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2412	1M	22.53	0.179	22.33	0.171	< 30
2437		24.87	0.307	25.05	0.320	< 30
2462		19.50	0.089	19.77	0.095	< 30
2437	2M	24.38	0.274	24.27	0.267	< 30
2437	5.5M	24.25	0.266	24.18	0.262	< 30
2437	11M	24.19	0.262	24.01	0.252	< 30
Frequency (MHz)	Data Rate	ANT-2		ANT-0+1+2		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2412	1M	22.99	0.199	27.40	0.549	< 30
2437		24.97	0.314	29.74	0.941	< 30
2462		19.83	0.096	24.47	0.280	< 30
2437	2M	24.38	0.274	29.11	0.816	< 30
2437	5.5M	24.41	0.276	29.05	0.804	< 30
2437	11M	24.27	0.267	28.93	0.781	< 30

Model Number	NBG6816					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: IEEE 802.11g Link Mode					
Date of Test	01/23/2015			Test Site	TE05	
Frequency (MHz)	Data Rate	ANT-0		ANT-1		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2412	6M	18.15	0.065	17.86	0.061	< 30
2437		24.58	0.287	24.65	0.292	< 30
2462		16.71	0.047	17.01	0.050	< 30
2437	9M	24.56	0.286	24.64	0.291	< 30
2437	12M	24.52	0.283	24.61	0.289	< 30
2437	18M	24.50	0.282	24.57	0.286	< 30
2437	24M	24.48	0.281	24.54	0.284	< 30
2437	36M	24.43	0.277	24.52	0.283	< 30
2437	48M	24.38	0.274	24.49	0.281	< 30
2437	54M	24.32	0.270	24.46	0.279	< 30
Frequency (MHz)	Data Rate	ANT-2		ANT-0+1+2		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2412	6M	18.73	0.075	23.03	0.201	< 30
2437		24.86	0.306	29.47	0.885	< 30
2462		16.97	0.050	21.67	0.147	< 30
2437	9M	24.86	0.306	29.46	0.883	< 30
2437	12M	24.83	0.304	29.43	0.876	< 30
2437	18M	24.80	0.302	29.40	0.870	< 30
2437	24M	24.44	0.278	29.26	0.843	< 30
2437	36M	24.43	0.277	29.23	0.838	< 30
2437	48M	24.40	0.275	29.19	0.831	< 30
2437	54M	24.36	0.273	29.15	0.823	< 30

Model Number	NBG6816					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode					
Date of Test	01/23/2015			Test Site	TE05	
Frequency (MHz)	Data Rate	ANT-0		ANT-1		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2412	19.5M	18.12	0.065	17.97	0.063	< 30
2437		24.34	0.272	24.50	0.282	< 30
2462		16.53	0.045	16.93	0.049	< 30
2437	39M	24.28	0.268	24.47	0.280	< 30
2437	58.5M	24.23	0.265	24.44	0.278	< 30
2437	78M	24.20	0.263	24.41	0.276	< 30
2437	117M	24.17	0.261	24.36	0.273	< 30
2437	156M	24.14	0.259	24.34	0.272	< 30
2437	175.5M	24.11	0.258	24.31	0.270	< 30
2437	195M	24.09	0.256	24.27	0.267	< 30
Frequency (MHz)	Data Rate	ANT-2		ANT-0+1+2		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2412	19.5M	18.67	0.074	23.04	0.201	< 30
2437		24.70	0.295	29.29	0.849	< 30
2462		16.85	0.048	21.54	0.143	< 30
2437	39M	24.67	0.293	29.25	0.841	< 30
2437	58.5M	24.64	0.291	29.21	0.834	< 30
2437	78M	24.59	0.288	29.17	0.827	< 30
2437	117M	24.56	0.286	29.14	0.820	< 30
2437	156M	24.54	0.284	29.11	0.816	< 30
2437	175.5M	24.51	0.282	29.08	0.810	< 30
2437	195M	24.47	0.280	29.05	0.804	< 30

Model Number	NBG6816					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode					
Date of Test	01/23/2015			Test Site	TE05	
Frequency (MHz)	Data Rate	ANT-0		ANT-1		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2422	40.5M	13.11	0.020	12.89	0.019	< 30
2437		23.86	0.243	23.84	0.242	< 30
2452		11.27	0.013	11.11	0.013	< 30
2437	81M	23.83	0.242	23.80	0.240	< 30
2437	121.5M	23.81	0.240	23.76	0.238	< 30
2437	162M	23.77	0.238	23.73	0.236	< 30
2437	243M	23.76	0.238	23.70	0.234	< 30
2437	324M	23.72	0.236	23.67	0.233	< 30
2437	364.5M	23.70	0.234	23.66	0.232	< 30
2437	405M	23.66	0.232	23.64	0.231	< 30
Frequency (MHz)	Data Rate	ANT-2		ANT-0+1+2		Limit (dBm)
		Output Power				
		(dBm)	(W)	(dBm)	(W)	
2422	40.5M	13.73	0.024	18.03	0.064	< 30
2437		24.02	0.252	28.68	0.738	< 30
2452		12.02	0.016	16.26	0.042	< 30
2437	81M	23.98	0.250	28.64	0.731	< 30
2437	121.5M	23.95	0.248	28.61	0.726	< 30
2437	162M	23.94	0.248	28.59	0.722	< 30
2437	243M	23.91	0.246	28.56	0.718	< 30
2437	324M	23.88	0.244	28.53	0.713	< 30
2437	364.5M	23.85	0.243	28.51	0.709	< 30
2437	405M	23.83	0.242	28.48	0.705	< 30

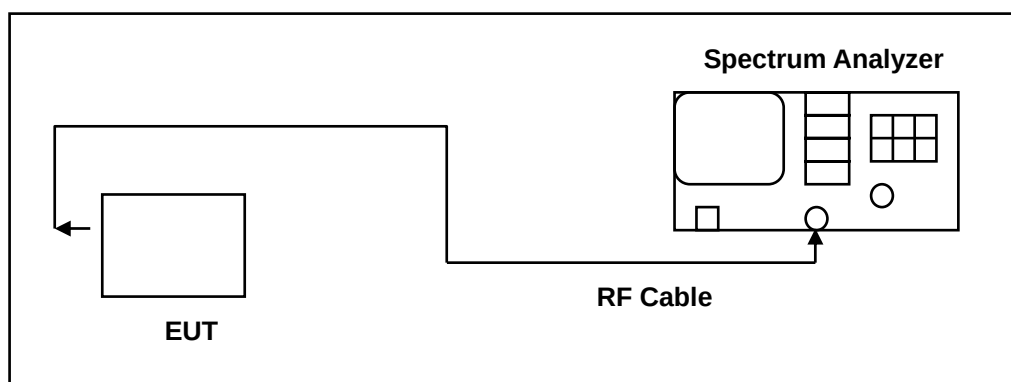
7 6dB RF Bandwidth and 99 % Occupied Bandwidth Measurement

7.1. 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.

99 % Occupied Bandwidth: N/A

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/16/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

dRemark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

7.4. 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 RES BW 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)

99 % Occupied Bandwidth: The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

7.5. Test Result

Model Number	NBG6816						
Test Item	6dB RF Bandwidth and 99 % Occupied Bandwidth						
Test Mode	Mode 2: IEEE 802.11b Link Mode						
Date of Test	01/29/2015					Test Site	TE05
Frequency (MHz)	6dB RF Bandwidth (MHz)			99 % Occupied Bandwidth (MHz)			6dB RF Bandwidth Limit (MHz)
	ANT-0	ANT-1	ANT-2	ANT-0	ANT-1	ANT-2	
2412	10.118	9.611	10.171	14.025	14.019	14.022	> 0.500
2437	9.674	9.625	10.155	13.873	13.877	13.872	> 0.500
2462	10.144	10.121	10.057	13.486	13.489	13.493	> 0.500

Model Number	NBG6816						
Test Item	6dB RF Bandwidth and 99 % Occupied Bandwidth						
Test Mode	Mode 3: IEEE 802.11g Link Mode						
Date of Test	01/29/2015					Test Site	TE05
Frequency (MHz)	6dB RF Bandwidth (MHz)			99 % Occupied Bandwidth (MHz)			6dB RF Bandwidth Limit (MHz)
	ANT-0	ANT-1	ANT-2	ANT-0	ANT-1	ANT-2	
2412	16.339	15.938	16.292	16.484	16.493	16.485	> 0.500
2437	16.309	16.359	15.909	16.685	16.665	16.673	> 0.500
2462	16.388	16.112	16.319	16.548	16.536	16.550	> 0.500

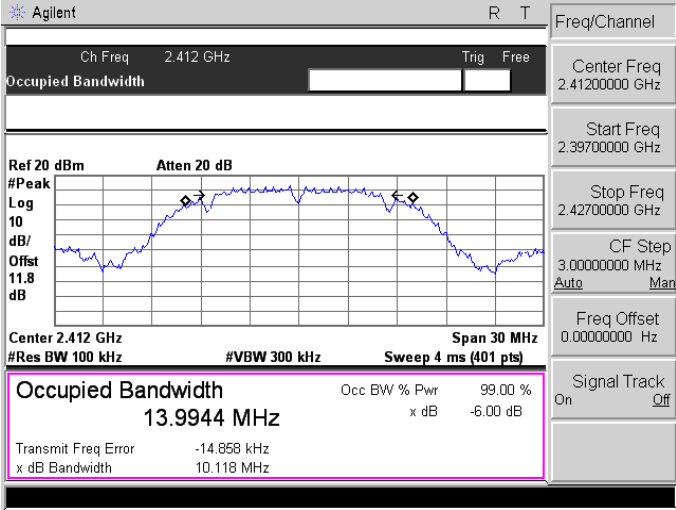
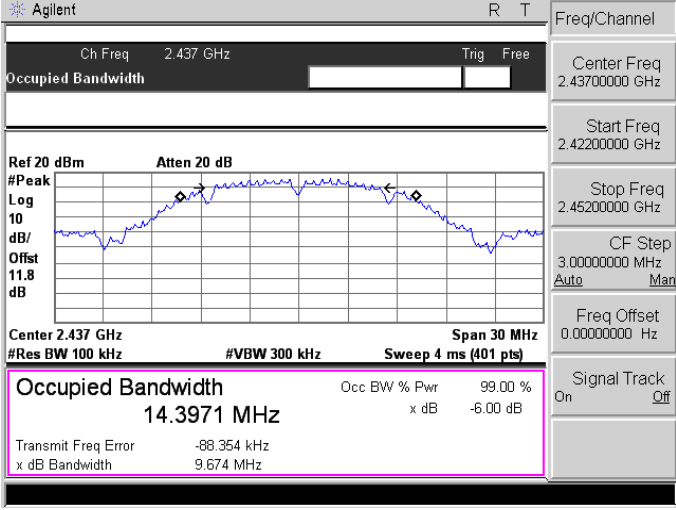
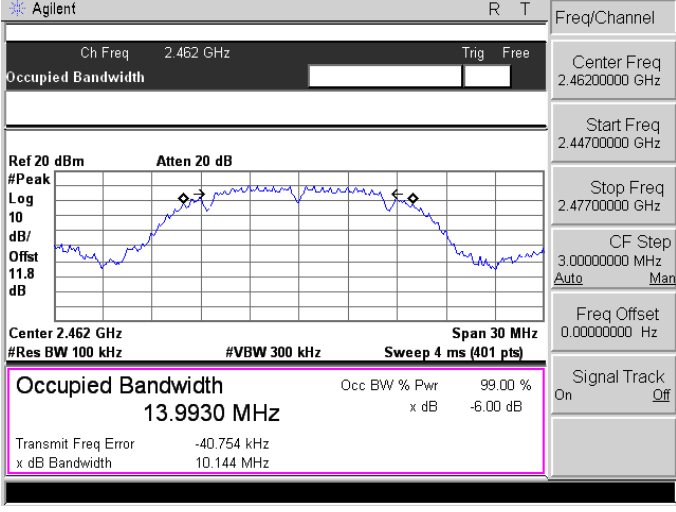
Model Number	NBG6816						
Test Item	6dB RF Bandwidth and 99 % Occupied Bandwidth						
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode						
Date of Test	01/29/2015					Test Site	TE05
Frequency (MHz)	6dB RF Bandwidth (MHz)			99 % Occupied Bandwidth (MHz)			6dB RF Bandwidth Limit (MHz)
	ANT-0	ANT-1	ANT-2	ANT-0	ANT-1	ANT-2	
2412	17.161	17.211	16.506	17.709	17.723	17.690	> 0.500
2437	16.572	16.307	16.385	17.709	17.713	17.721	> 0.500
2462	16.719	17.539	17.512	17.708	17.700	17.698	> 0.500

Model Number	NBG6816						
Test Item	6dB RF Bandwidth and 99 % Occupied Bandwidth						
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode						
Date of Test	01/29/2015					Test Site	TE05
Frequency (MHz)	6dB RF Bandwidth (MHz)			99 % Occupied Bandwidth (MHz)			6dB RF Bandwidth Limit (MHz)
	ANT-0	ANT-1	ANT-2	ANT-0	ANT-1	ANT-2	
2422	35.239	35.268	35.363	36.678	36.591	36.613	> 0.500
2437	35.217	36.260	35.167	36.531	36.552	36.548	> 0.500
2452	35.235	35.308	35.217	36.594	36.533	36.551	> 0.500

7.6. Test Graphs

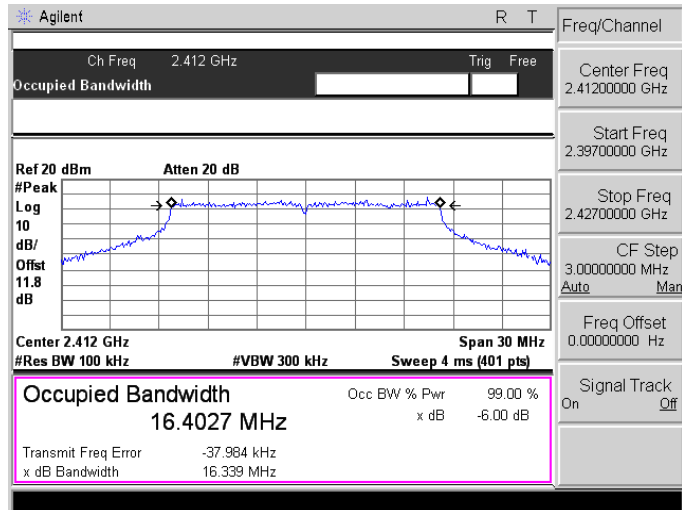
6dB RF Bandwidth

Mode 2: IEEE 802.11b Link Mode_ANT-0

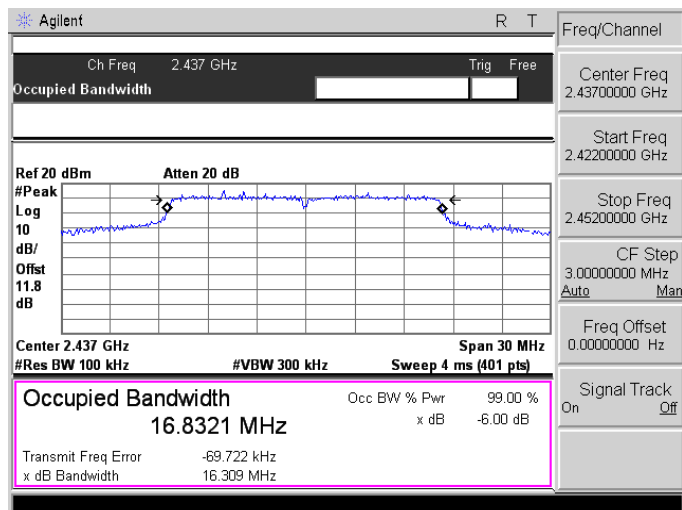
2412	 Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 20 dB #Peak Log 10 dB/Offset 11.8 dB Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.9944 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -14.858 kHz x dB Bandwidth 10.118 MHz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
2437	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 20 dB #Peak Log 10 dB/Offset 11.8 dB Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 14.3971 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -88.354 kHz x dB Bandwidth 9.674 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
2462	 Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 20 dB #Peak Log 10 dB/Offset 11.8 dB Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.9930 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -40.754 kHz x dB Bandwidth 10.144 MHz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off

Mode 3: IEEE 802.11g Link Mode_ANT-0

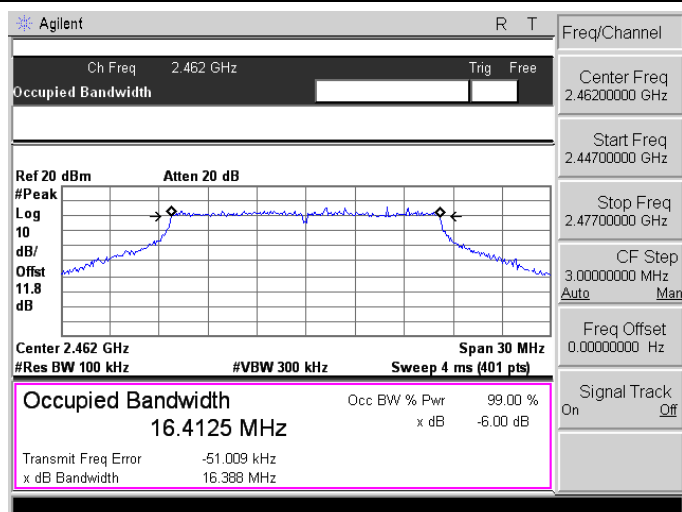
2412



2437



2462



Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-0

2412

Agilent R T

Ch Freq 2.412 GHz Trig Free

Occupied Bandwidth

Ref 20 dBm Atten 20 dB

#Peak Log 10 dB/Offset 11.8 dB

Center 2.412 GHz Span 30 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)

Occupied Bandwidth 17.5619 MHz

Occ BW % Pwr 99.00 % x dB -6.00 dB

Transmit Freq Error -44.551 kHz

x dB Bandwidth 17.161 MHz

Freq/Channel

Center Freq 2.41200000 GHz

Start Freq 2.39700000 GHz

Stop Freq 2.42700000 GHz

CF Step 3.00000000 MHz Auto Man

Freq Offset 0.00000000 Hz

Signal Track On Off

2437

Agilent R T

Ch Freq 2.437 GHz Trig Free

Occupied Bandwidth

Ref 20 dBm Atten 20 dB

#Peak Log 10 dB/Offset 11.8 dB

Center 2.437 GHz Span 30 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)

Occupied Bandwidth 17.7389 MHz

Occ BW % Pwr 99.00 % x dB -6.00 dB

Transmit Freq Error -58.030 kHz

x dB Bandwidth 16.572 MHz

Freq/Channel

Center Freq 2.43700000 GHz

Start Freq 2.42200000 GHz

Stop Freq 2.45200000 GHz

CF Step 3.00000000 MHz Auto Man

Freq Offset 0.00000000 Hz

Signal Track On Off

2462

Agilent R T

Ch Freq 2.462 GHz Trig Free

Occupied Bandwidth

Ref 20 dBm Atten 20 dB

#Peak Log 10 dB/Offset 11.8 dB

Center 2.462 GHz Span 30 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)

Occupied Bandwidth 17.5647 MHz

Occ BW % Pwr 99.00 % x dB -6.00 dB

Transmit Freq Error -58.336 kHz

x dB Bandwidth 16.719 MHz

Freq/Channel

Center Freq 2.46200000 GHz

Start Freq 2.44700000 GHz

Stop Freq 2.47700000 GHz

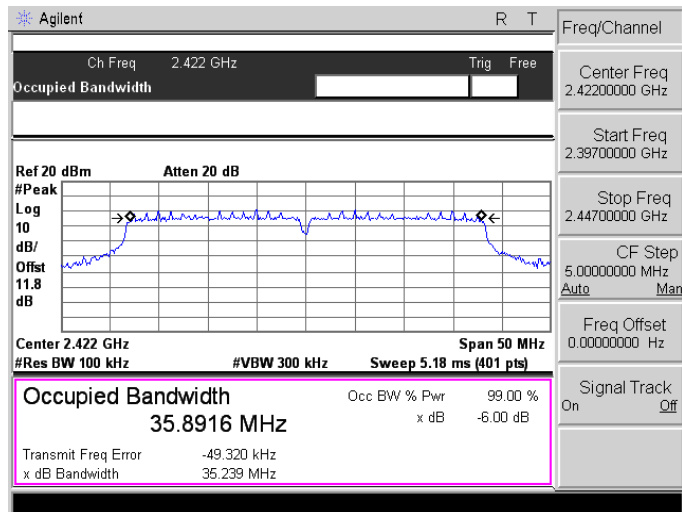
CF Step 3.00000000 MHz Auto Man

Freq Offset 0.00000000 Hz

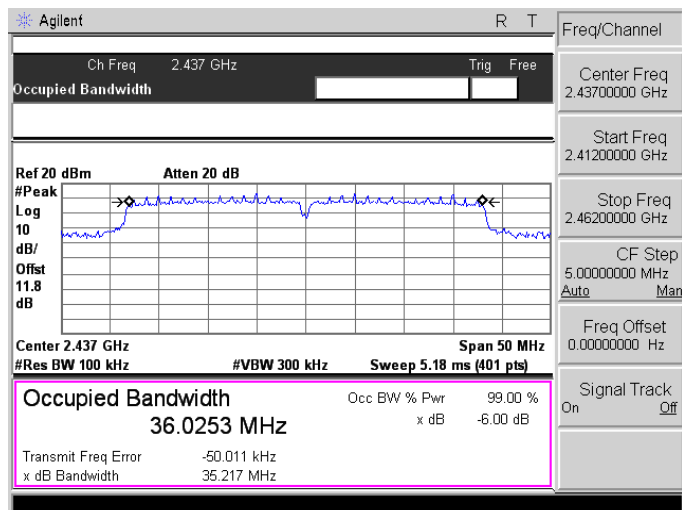
Signal Track On Off

Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-0

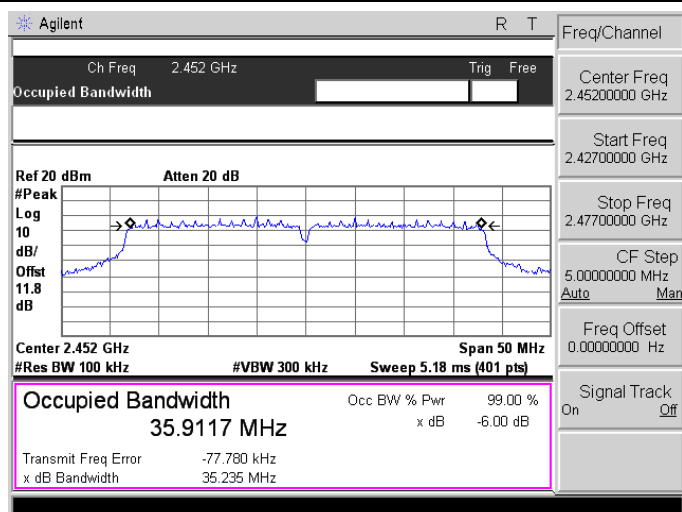
2422



2437

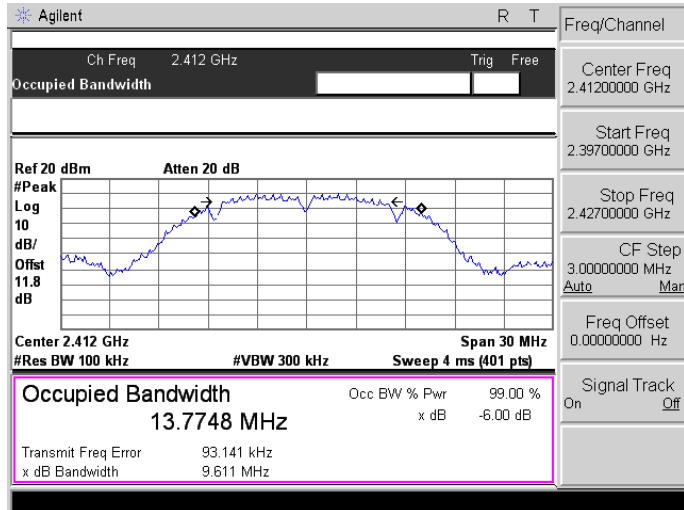


2452

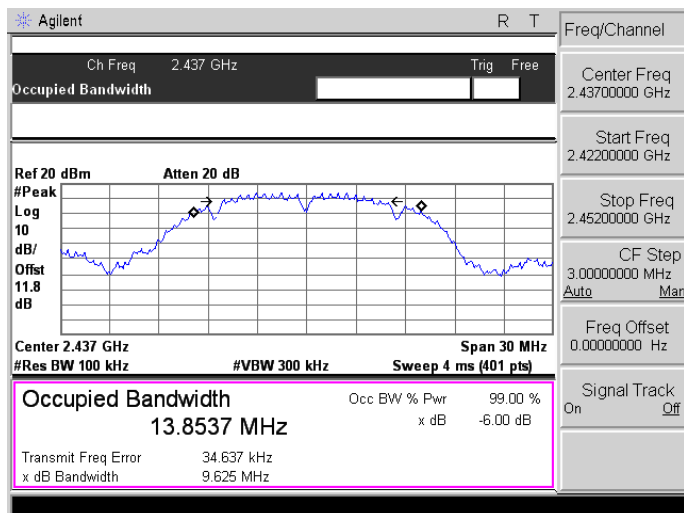


Mode 2: IEEE 802.11b Link Mode_ANT-1

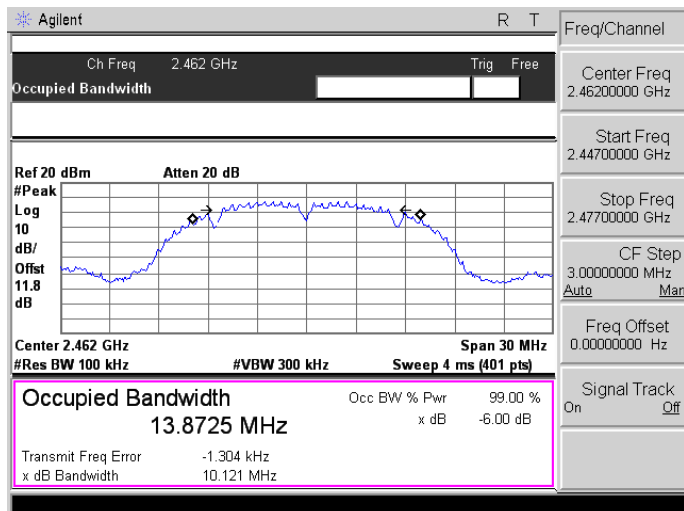
2412



2437

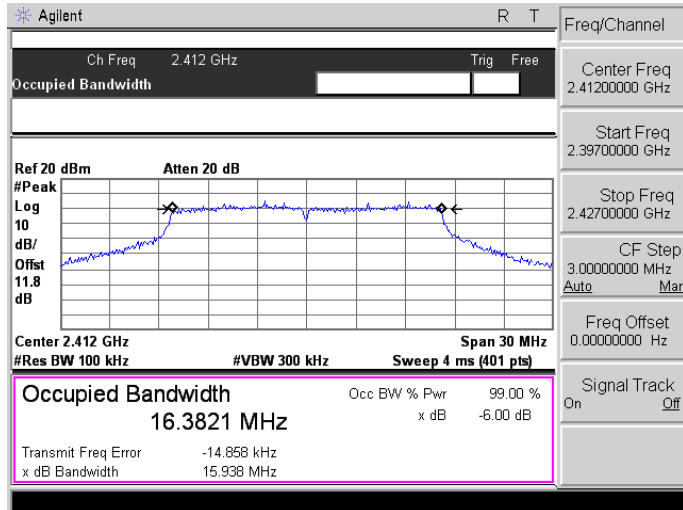


2462

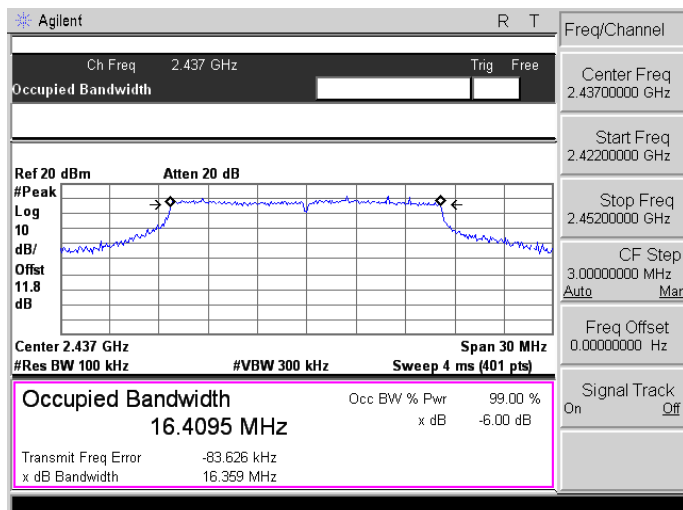


Mode 3: IEEE 802.11g Link Mode_ANT-1

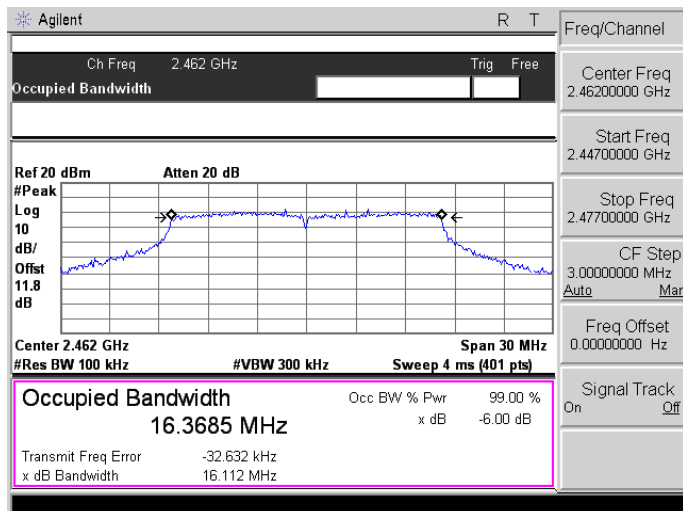
2412



2437

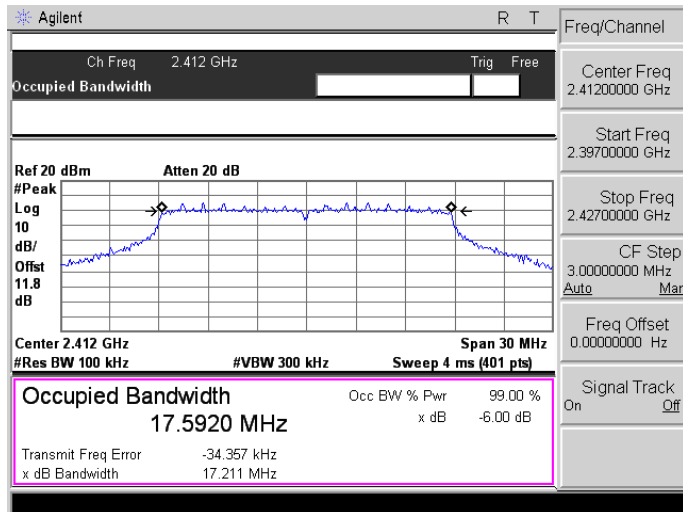


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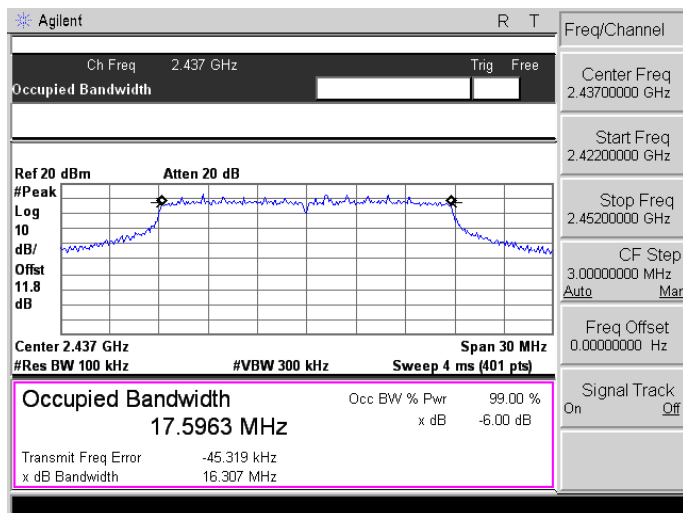


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-1

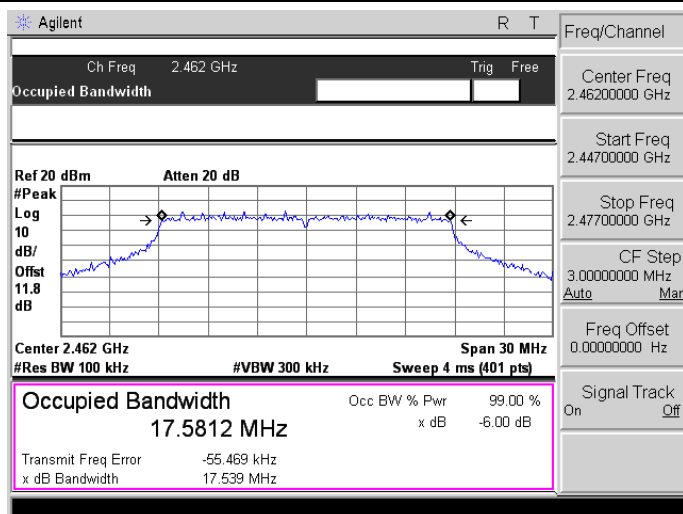
2412



2437

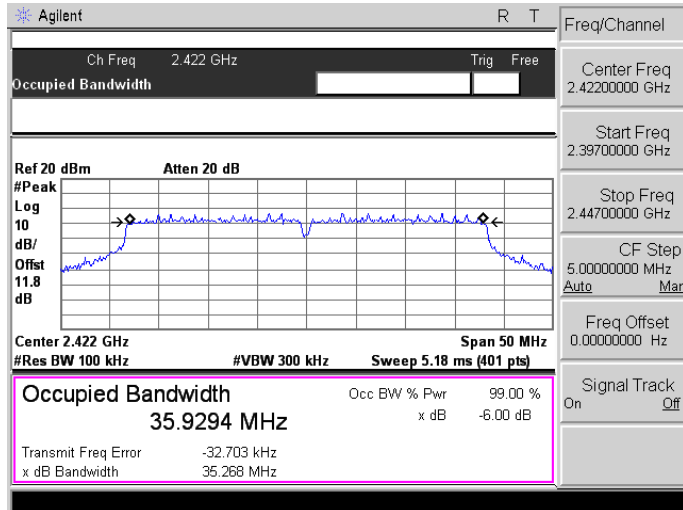


2462

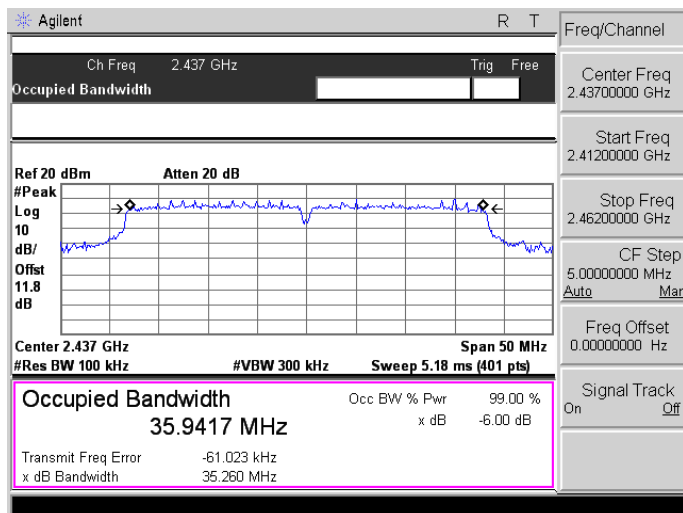


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-1

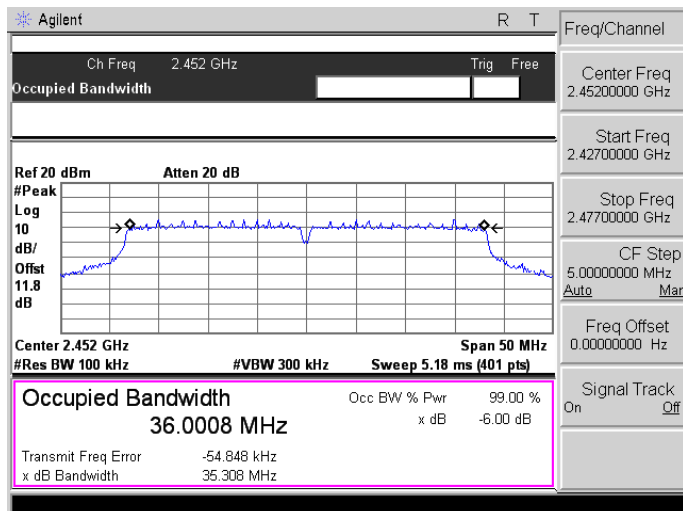
2422



2437

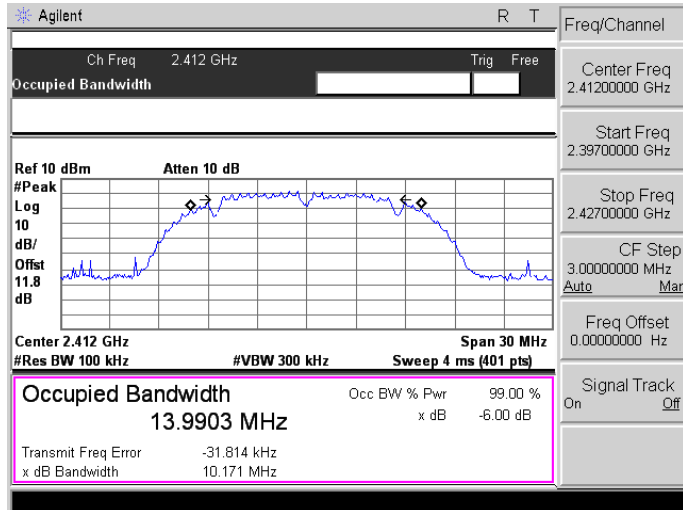


2452

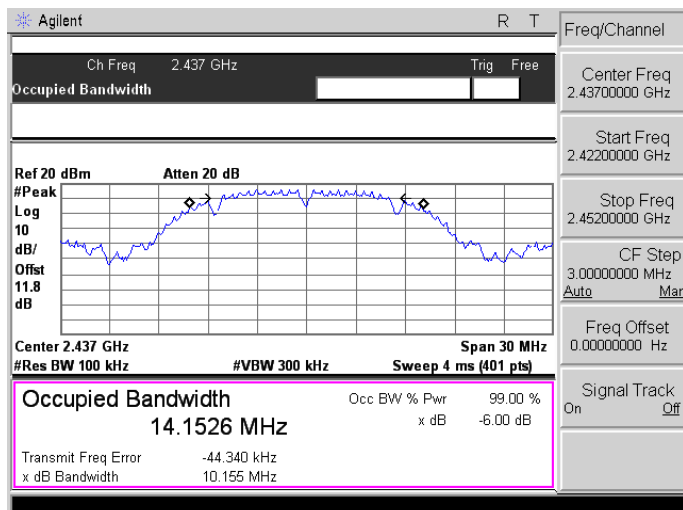


Mode 2: IEEE 802.11b Link Mode_ANT-2

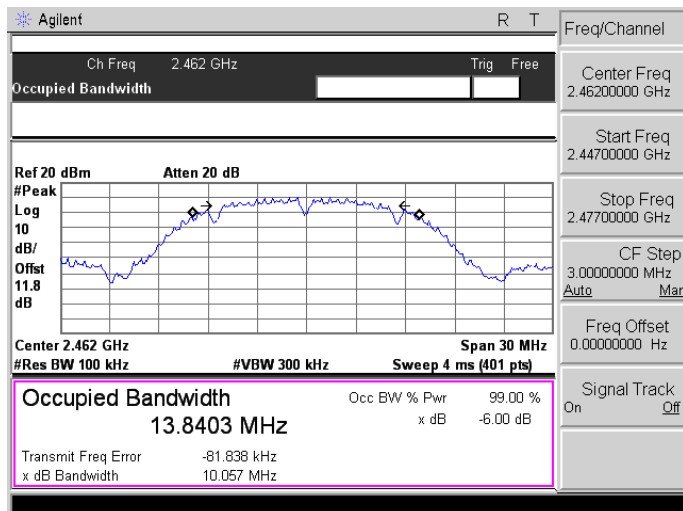
2412



2437

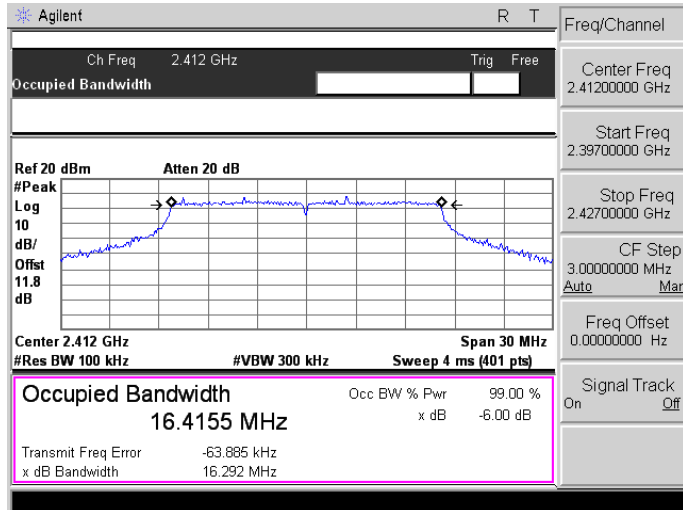


2462

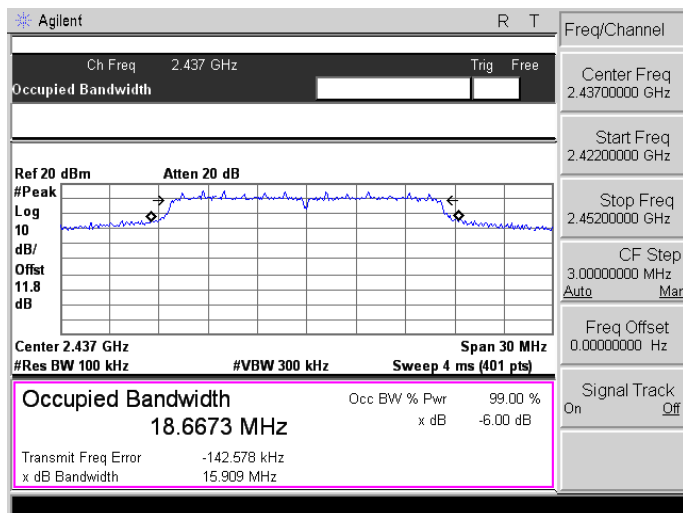


Mode 3: IEEE 802.11g Link Mode_ANT-2

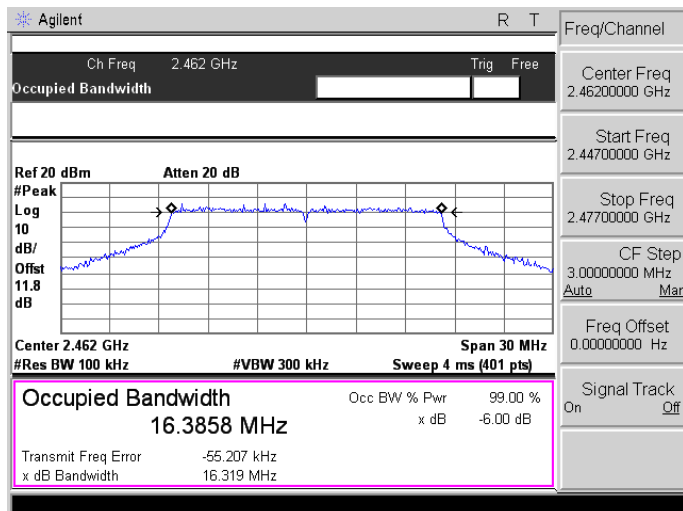
2412



2437

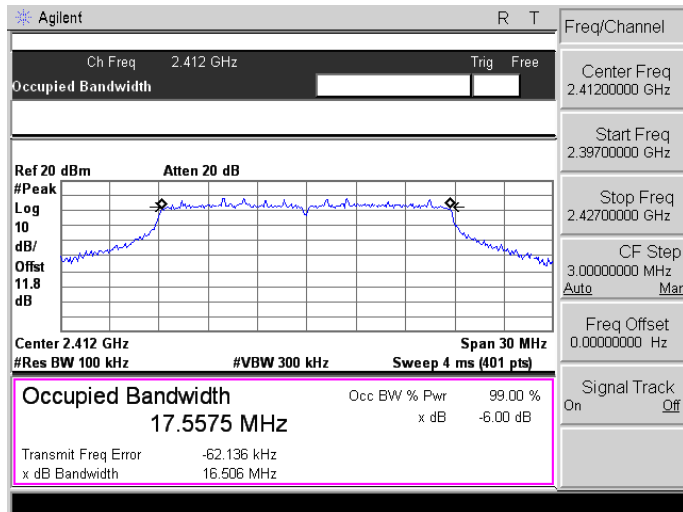


2462

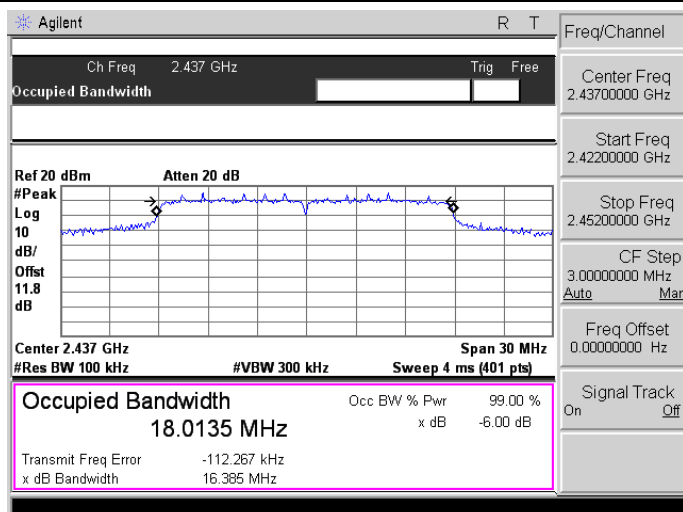


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-2

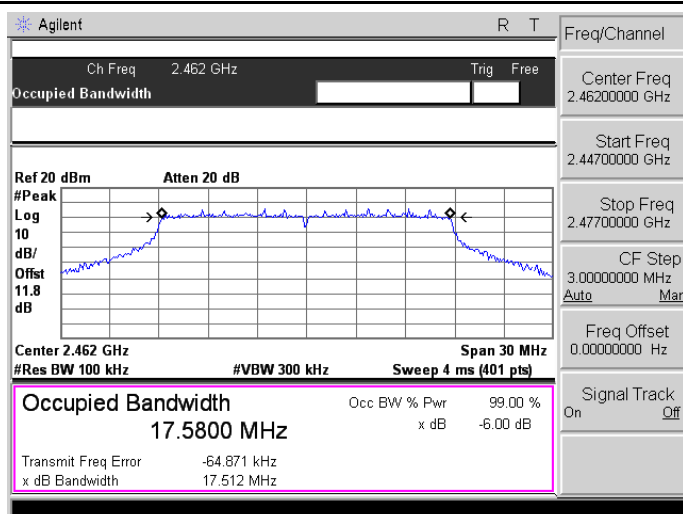
2412



2437

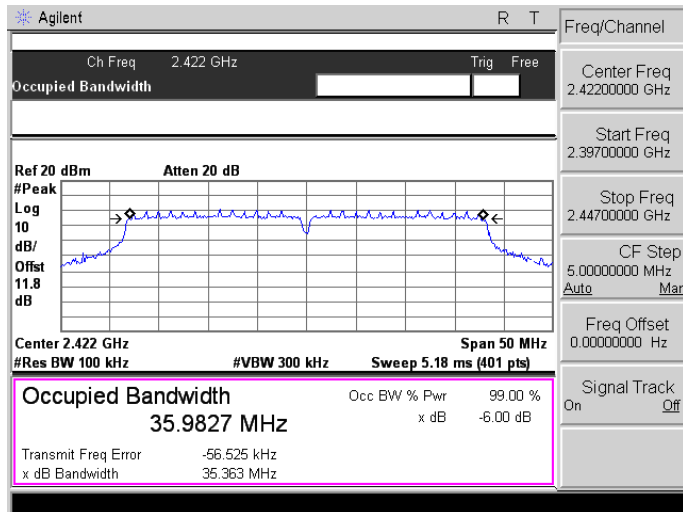


2462

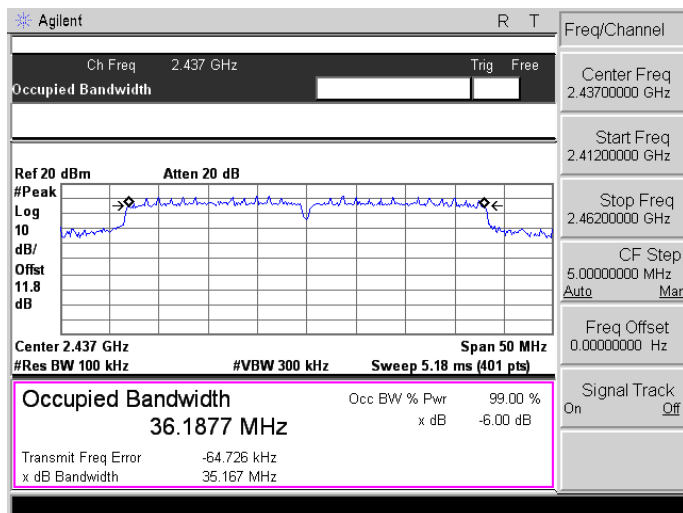


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-2

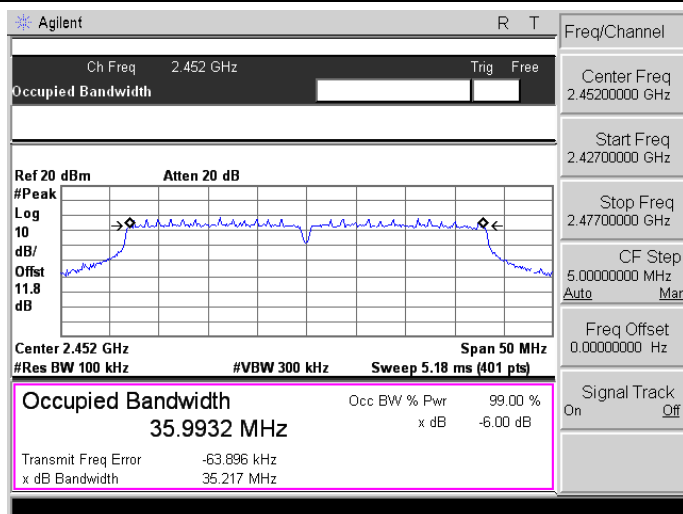
2422



2437



2452



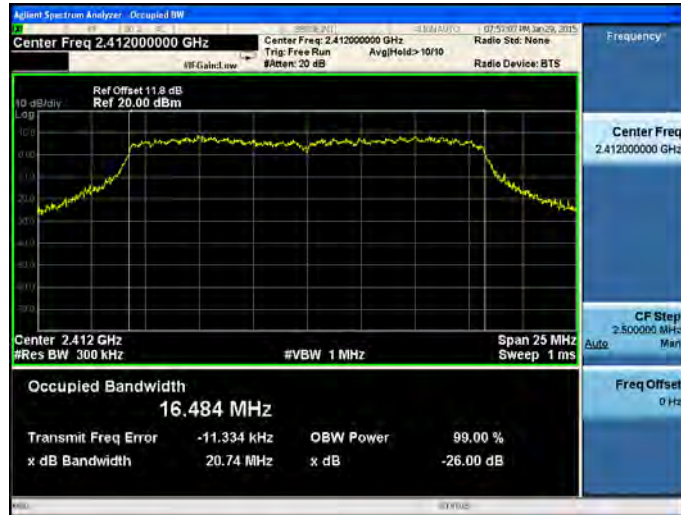
99 % Occupied Bandwidth

Mode 2: IEEE 802.11b Link Mode_ANT-0

2412	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Ref Offset 11.8 dB Ref 20.00 dBm Center 2.412 GHz #Res BW 300 kHz #VBW 1 MHz Span 25 MHz Sweep 1 ms Occupied Bandwidth 14.025 MHz Transmit Freq Error 4.134 kHz OBW Power 99.00 % x dB Bandwidth 17.16 MHz x dB -26.00 dB
2437	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Ref Offset 11.8 dB Ref 20.00 dBm Center 2.437 GHz #Res BW 300 kHz #VBW 1 MHz Span 25 MHz Sweep 1 ms Occupied Bandwidth 13.873 MHz Transmit Freq Error 8.015 kHz OBW Power 99.00 % x dB Bandwidth 17.16 MHz x dB -26.00 dB
2462	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Ref Offset 11.8 dB Ref 20.00 dBm Center 2.462 GHz #Res BW 300 kHz #VBW 1 MHz Span 25 MHz Sweep 1 ms Occupied Bandwidth 13.486 MHz Transmit Freq Error -88.056 kHz OBW Power 99.00 % x dB Bandwidth 17.11 MHz x dB -26.00 dB

Mode 3: IEEE 802.11g Link Mode_ANT-0

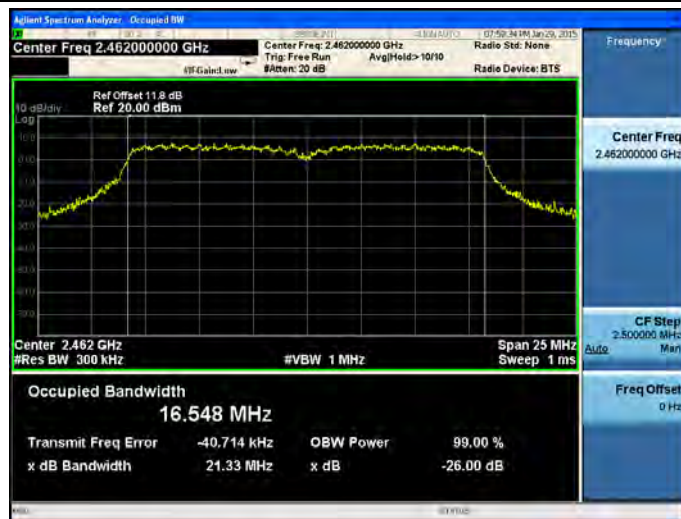
2412



2437



2462

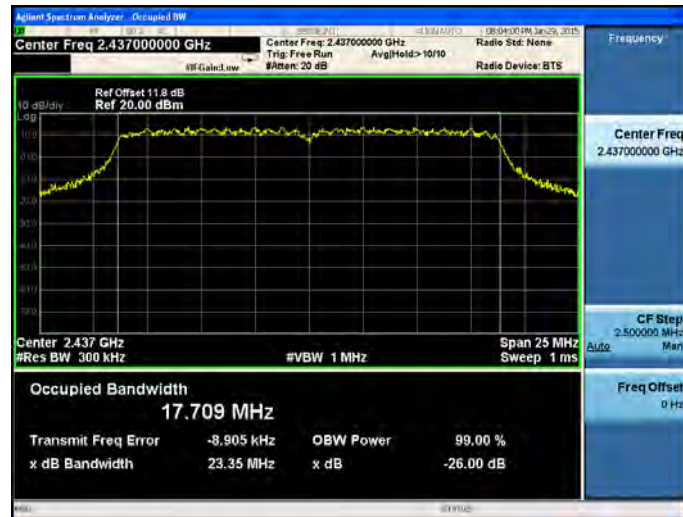


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-0

2412



2437



2462



Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-0

2422



2437



2452



Mode 2: IEEE 802.11b Link Mode_ANT-1

2412



2437



2462



Mode 3: IEEE 802.11g Link Mode_ANT-1

2412



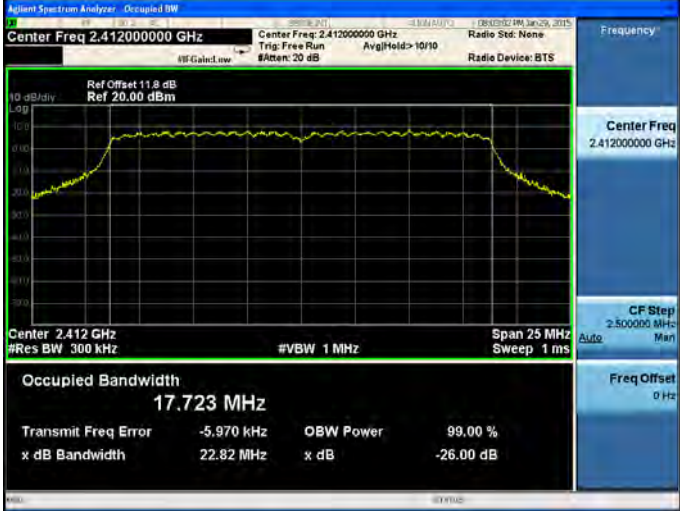
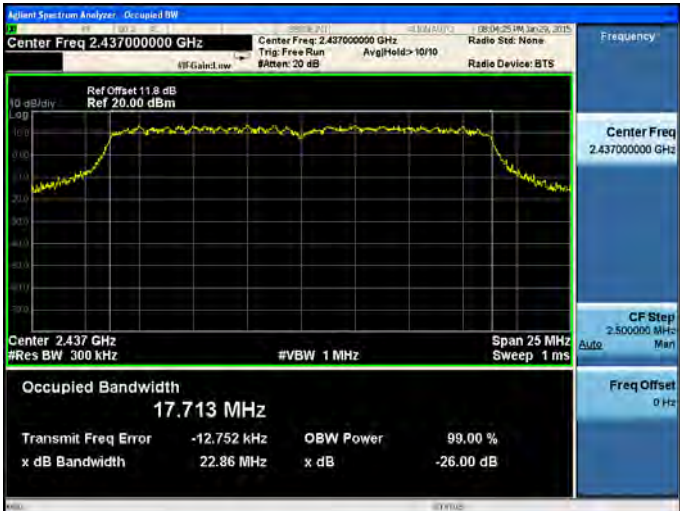
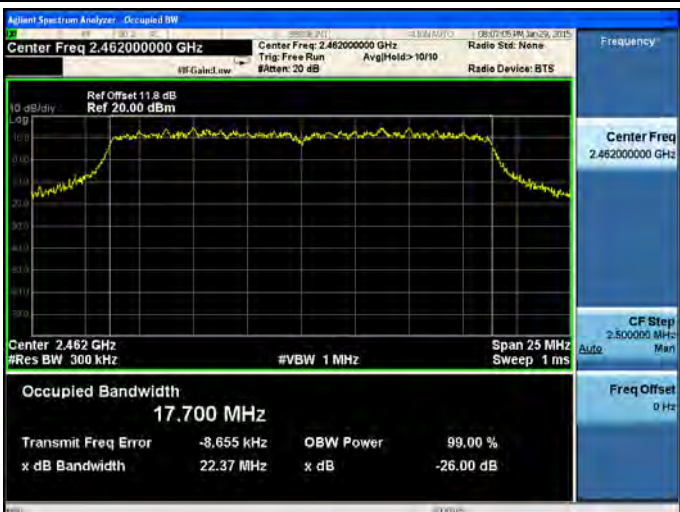
2437



2462



Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-1

2412	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Radio Std: None Trig: Free Run Avg/Hold: 10/10 Radio Device: BTS 40 dB Gain Ref Offset 11.8 dB Ref 20.00 dBm Center 2.412 GHz Span 25 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 1 ms Occupied Bandwidth 17.723 MHz Transmit Freq Error -5.970 kHz OBW Power 99.00 % x dB Bandwidth 22.82 MHz x dB -26.00 dB
2437	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run Avg/Hold: 10/10 Radio Device: BTS 40 dB Gain Ref Offset 11.8 dB Ref 20.00 dBm Center 2.437 GHz Span 25 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 1 ms Occupied Bandwidth 17.713 MHz Transmit Freq Error -12.752 kHz OBW Power 99.00 % x dB Bandwidth 22.86 MHz x dB -26.00 dB
2462	 Agilent Spectrum Analyzer - Occupied BW Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Radio Std: None Trig: Free Run Avg/Hold: 10/10 Radio Device: BTS 40 dB Gain Ref Offset 11.8 dB Ref 20.00 dBm Center 2.462 GHz Span 25 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 1 ms Occupied Bandwidth 17.700 MHz Transmit Freq Error -8.655 kHz OBW Power 99.00 % x dB Bandwidth 22.37 MHz x dB -26.00 dB

Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-1

2422



2437



2452



Mode 2: IEEE 802.11b Link Mode_ANT-2

2412



2437



2462



Mode 3: IEEE 802.11g Link Mode_ANT-2

2412



2437



2462



Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-2

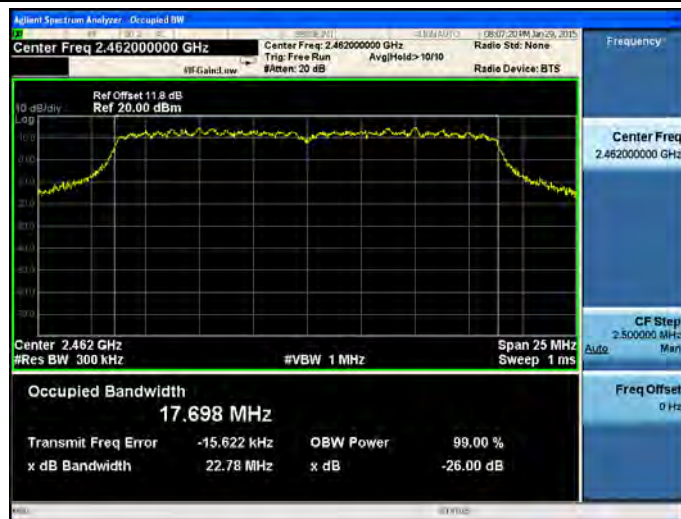
2412



2437



2462



Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-2

2422



2437



2452

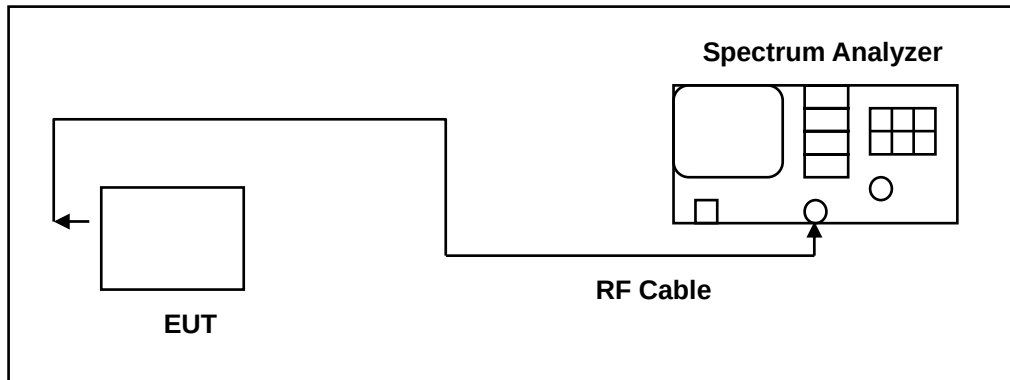


8 Maximum Power Density Measurement

8.1. 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.

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/16/2014	(2)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

8.4. Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 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.

8.5. Test Result

Model Number	NBG6816				
Test Item	Maximum Power Density				
Test Mode	Mode 2: IEEE 802.11b Link Mode				
Date of Test	01/24/2015			Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)				Limit (dBm/3KHz)
	ANT-0	ANT-1	ANT-2	ANT-0+1+2	
2412	-1.084	-1.001	-0.221	4.020	< 8
2437	-0.489	-0.905	-0.932	4.001	< 8
2462	-3.574	-3.425	-3.118	1.403	< 8

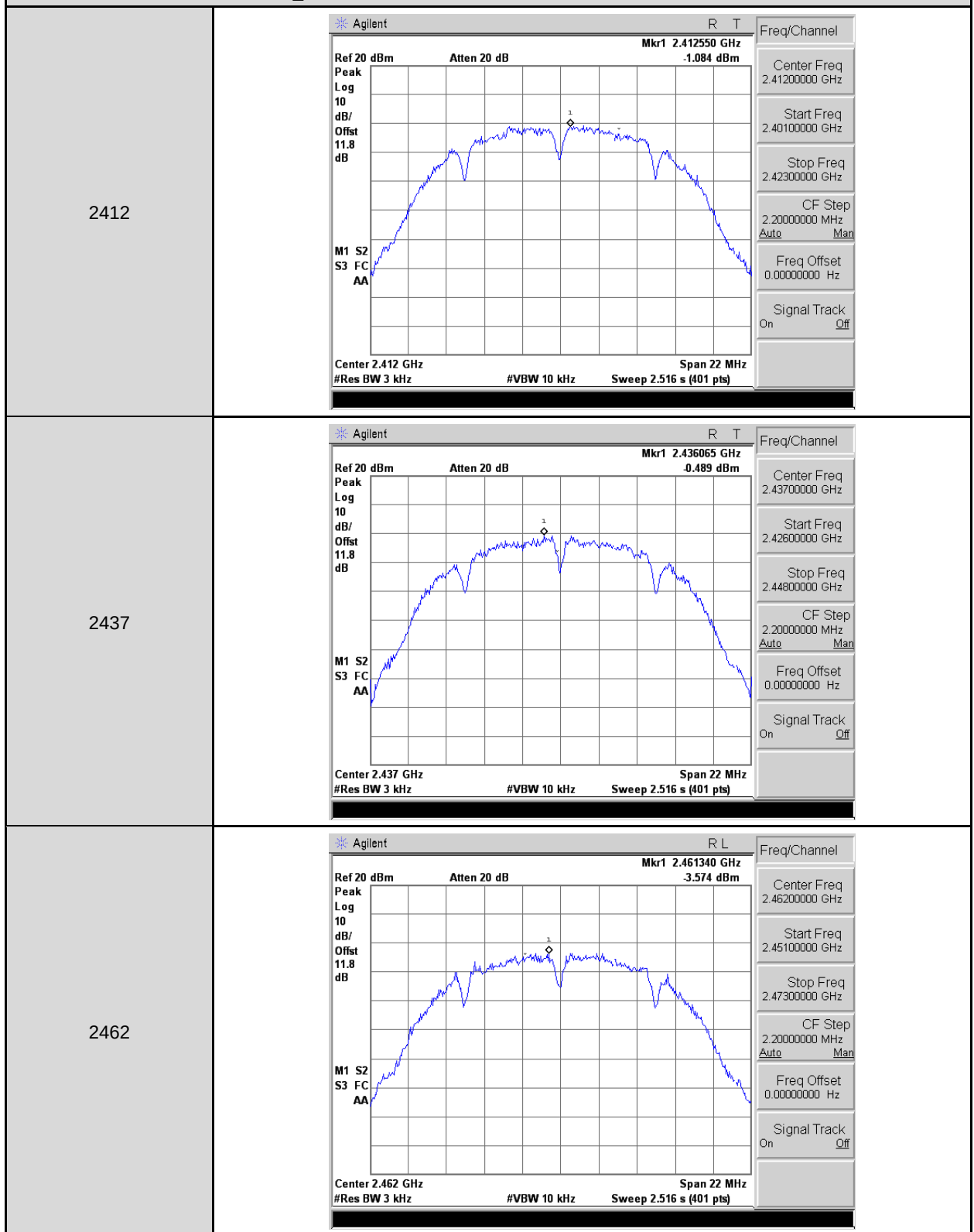
Model Number	NBG6816				
Test Item	Maximum Power Density				
Test Mode	Mode 3: IEEE 802.11g Link Mode				
Date of Test	01/24/2015			Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)				Limit (dBm/3KHz)
	ANT-0	ANT-1	ANT-2	ANT-0+1+2	
2412	-5.599	-6.820	-6.279	-1.433	< 8
2437	-3.747	-3.820	-2.665	1.393	< 8
2462	-7.405	-8.446	-7.218	-2.886	< 8

Model Number	NBG6816				
Test Item	Maximum Power Density				
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode				
Date of Test	01/24/2015			Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)				Limit (dBm/3KHz)
	ANT-0	ANT-1	ANT-2	ANT-0+1+2	
2412	-6.283	-7.875	-6.370	-2.013	< 8
2437	-3.195	-3.448	-2.580	1.712	< 8
2462	-8.989	-8.588	-8.246	-3.826	< 8

Model Number	NBG6816				
Test Item	Maximum Power Density				
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode				
Date of Test	01/24/2015			Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)				Limit (dBm/3KHz)
	ANT-0	ANT-1	ANT-2	ANT-0+1+2	
2422	-15.110	-15.120	-14.150	-9.998	< 8
2437	-6.502	-7.807	-6.851	-2.248	< 8
2452	-16.820	-17.930	-16.780	-12.374	< 8

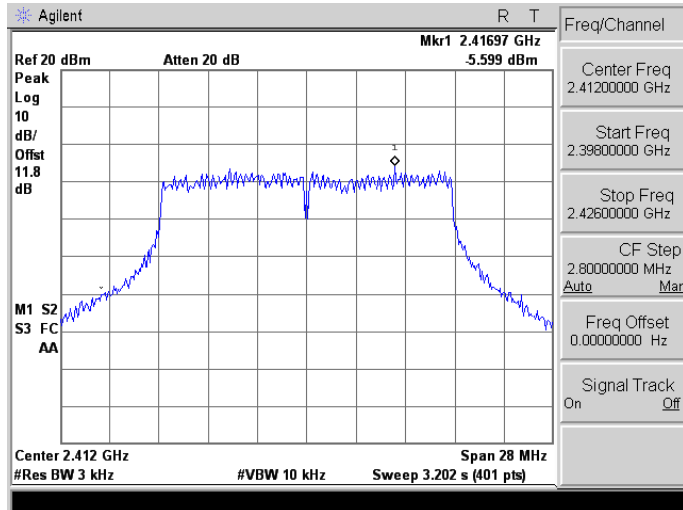
8.6. Test Graphs

Mode 2: IEEE 802.11b Link Mode_ANT-0

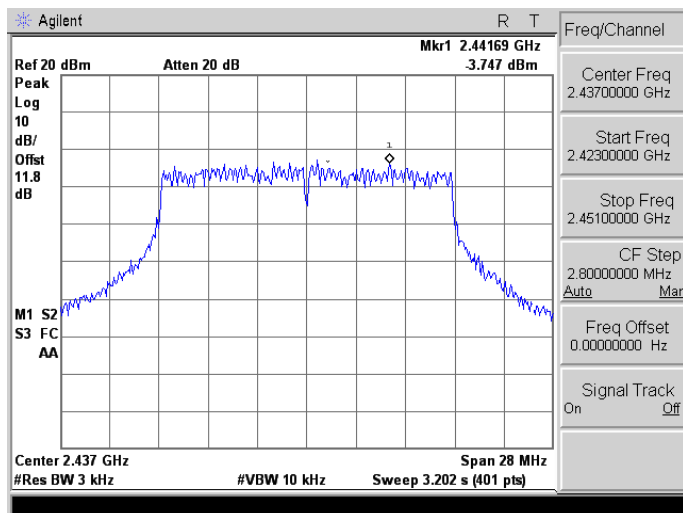


Mode 3: IEEE 802.11g Link Mode_ANT-0

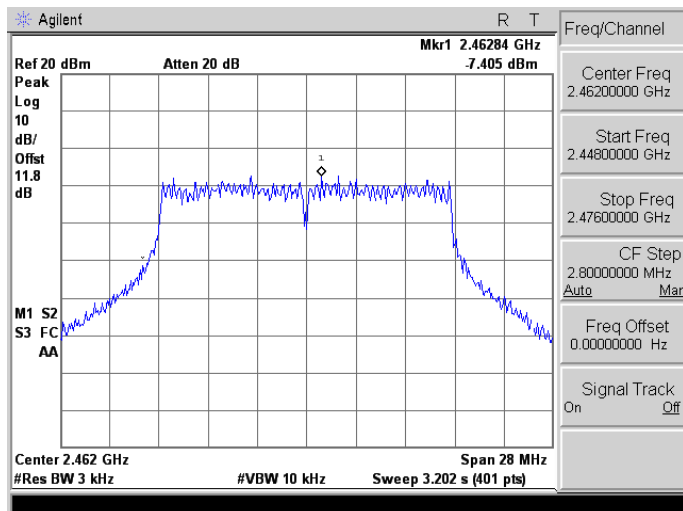
2412



2437

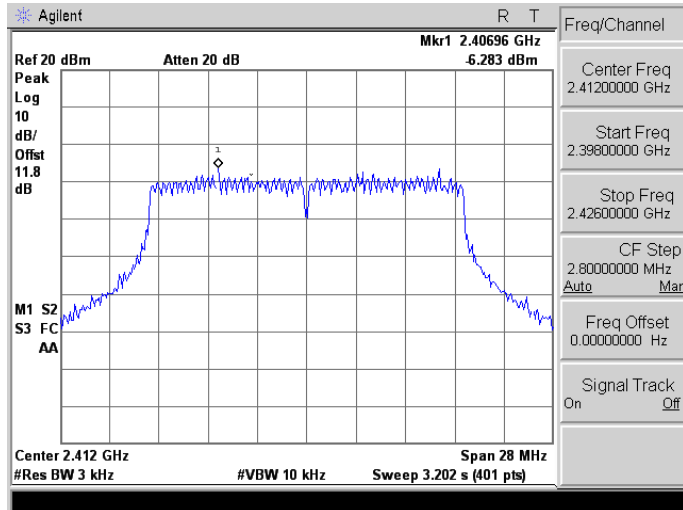


2462

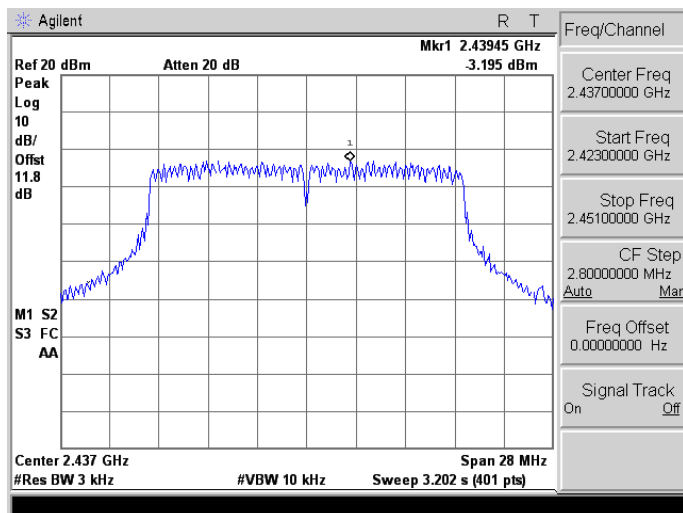


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-0

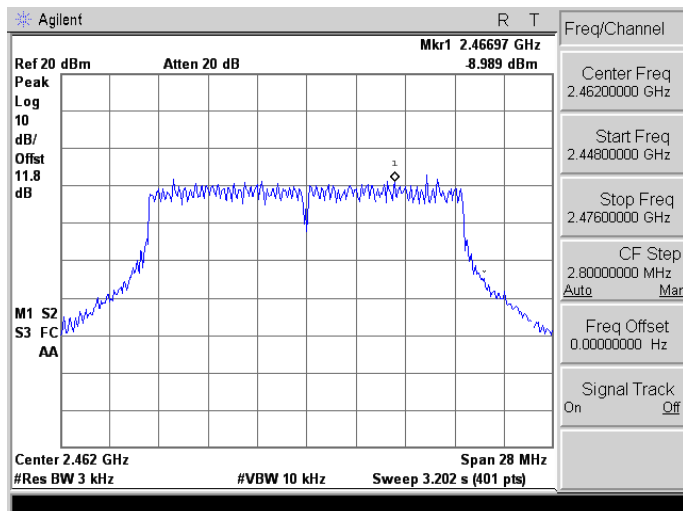
2412



2437

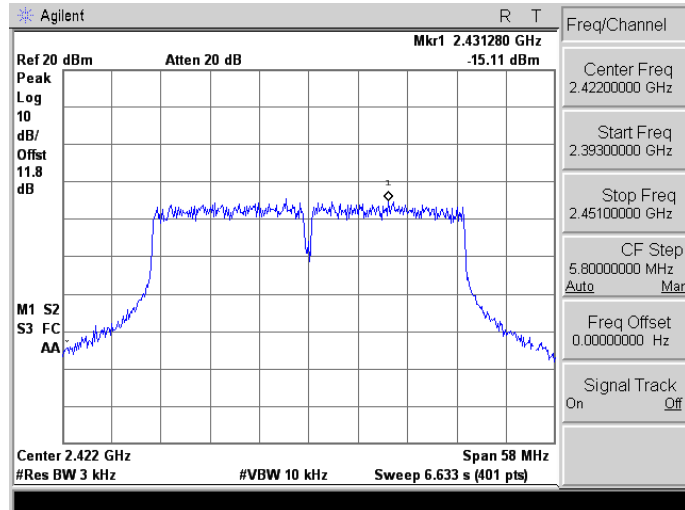


2462

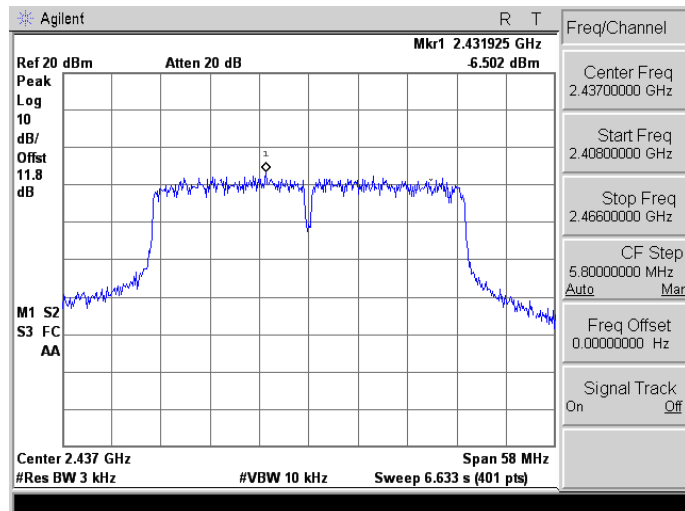


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-0

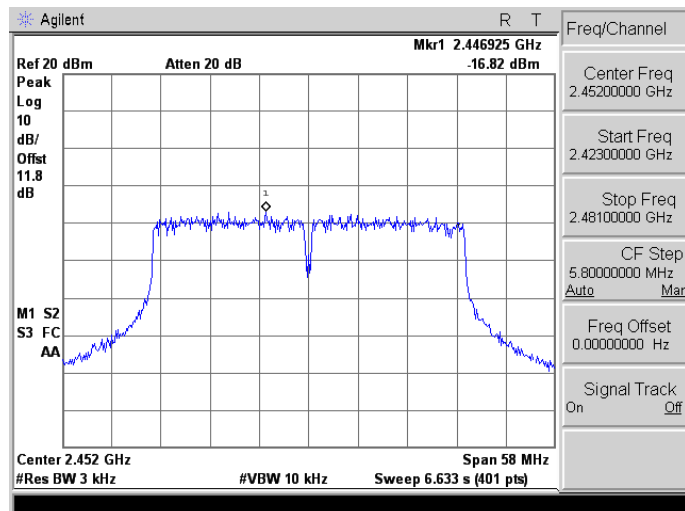
2422



2437

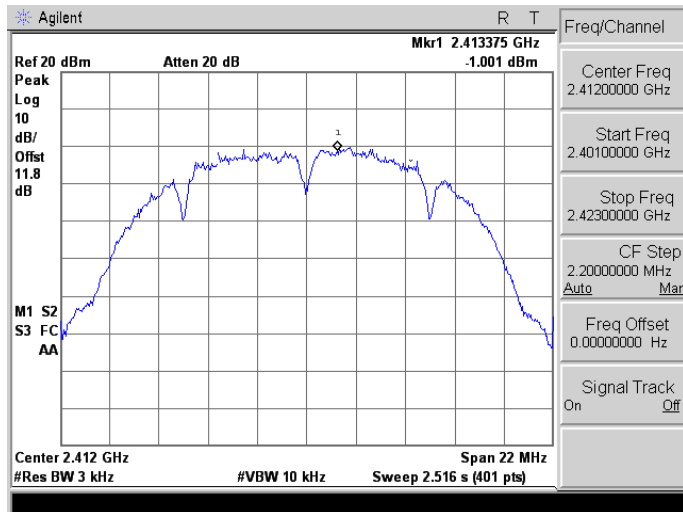


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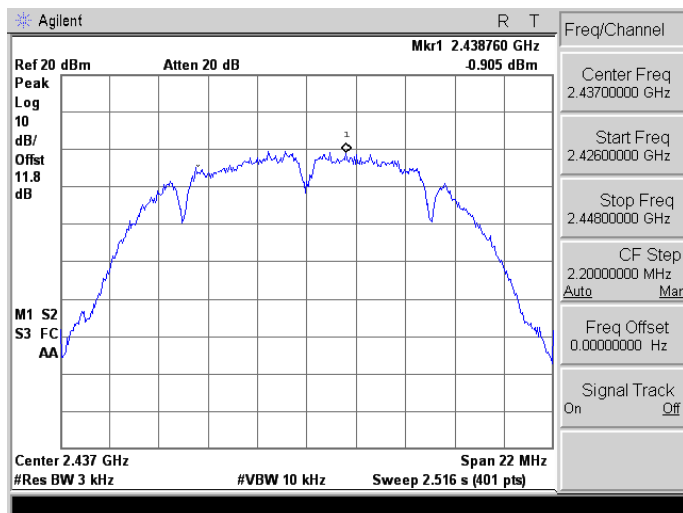


Mode 2: IEEE 802.11b Link Mode_ANT-1

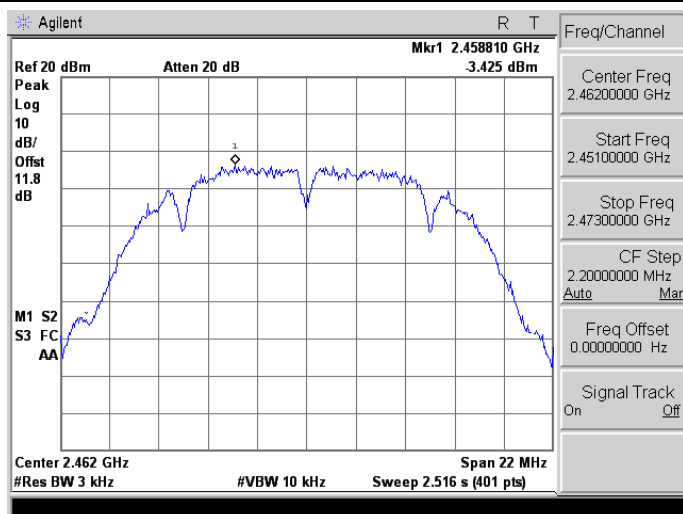
2412



2437

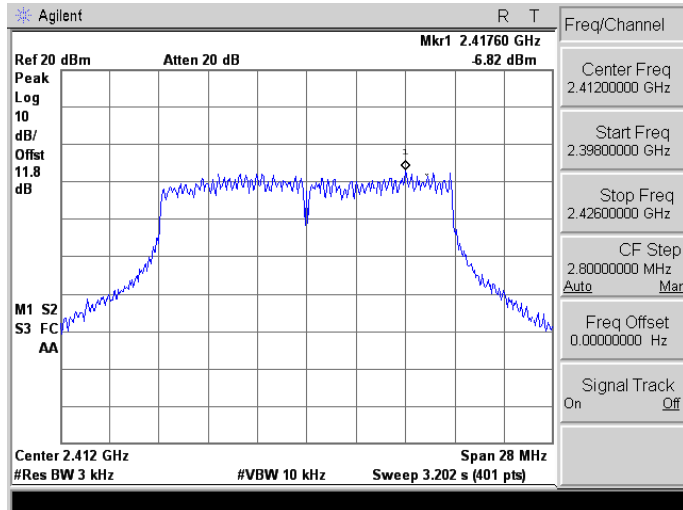


2462

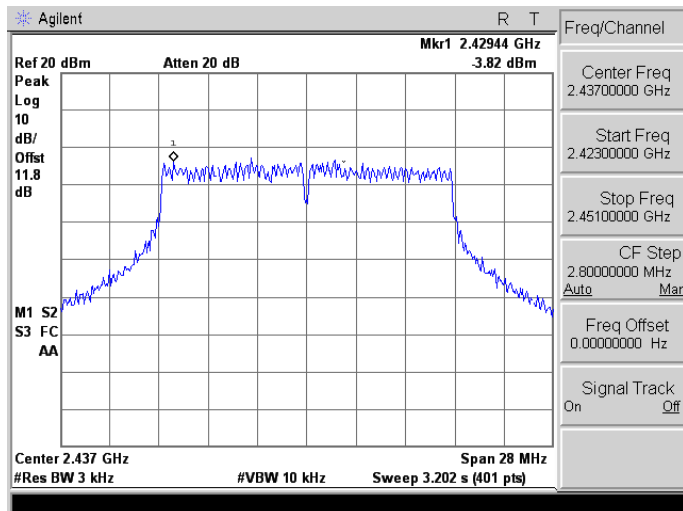


Mode 3: IEEE 802.11g Link Mode_ANT-1

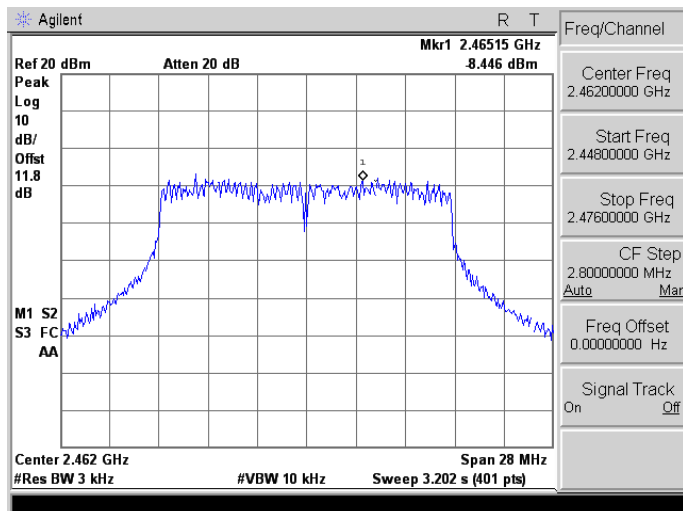
2412



2437

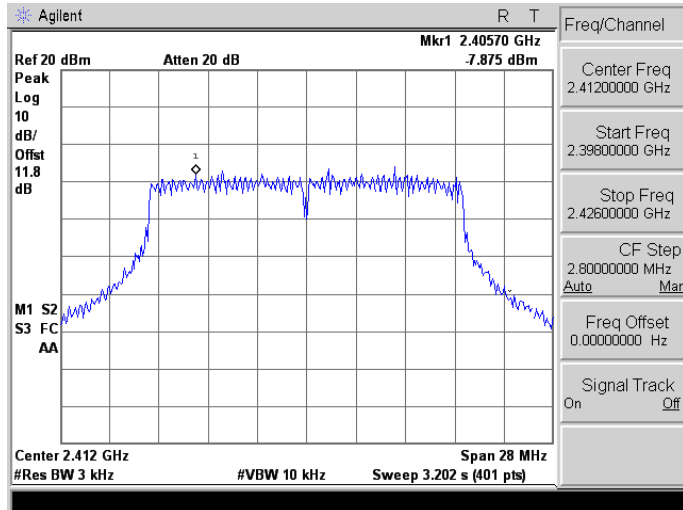


2462

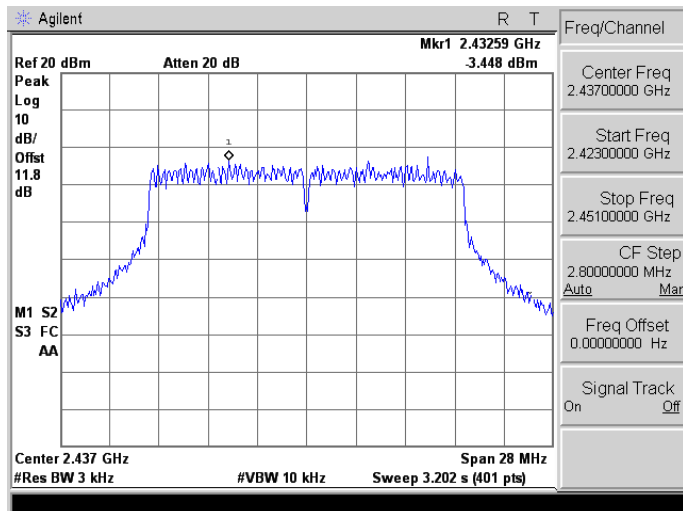


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-1

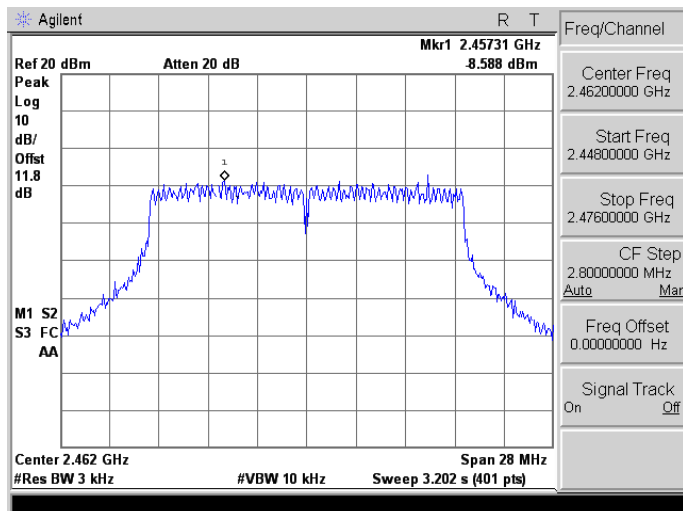
2412



2437

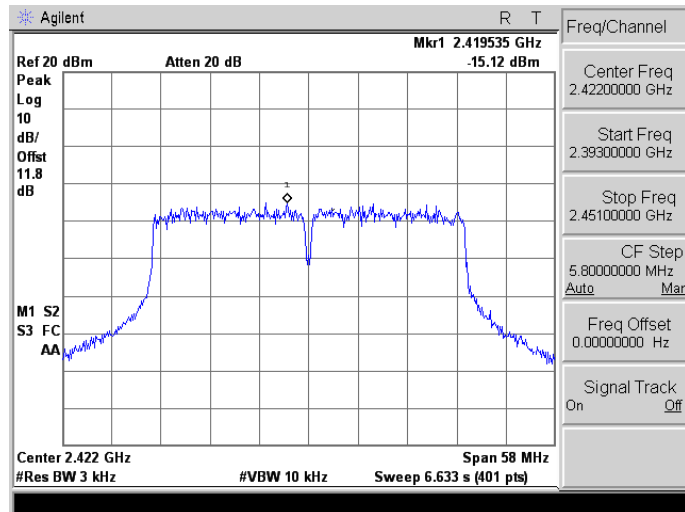


2462

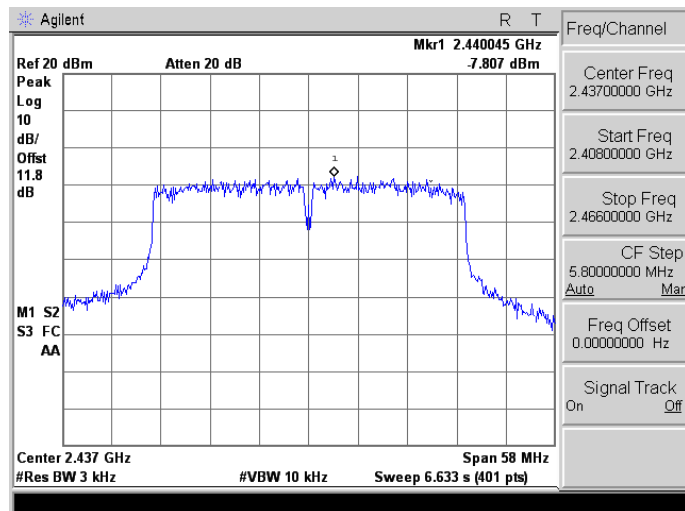


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-1

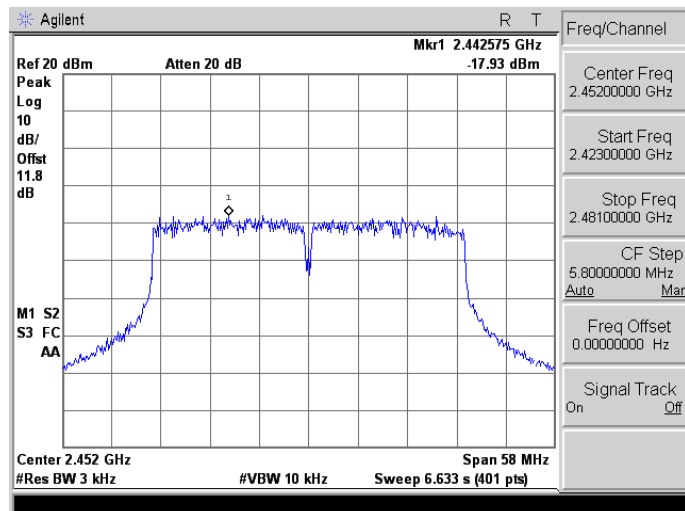
2422



2437

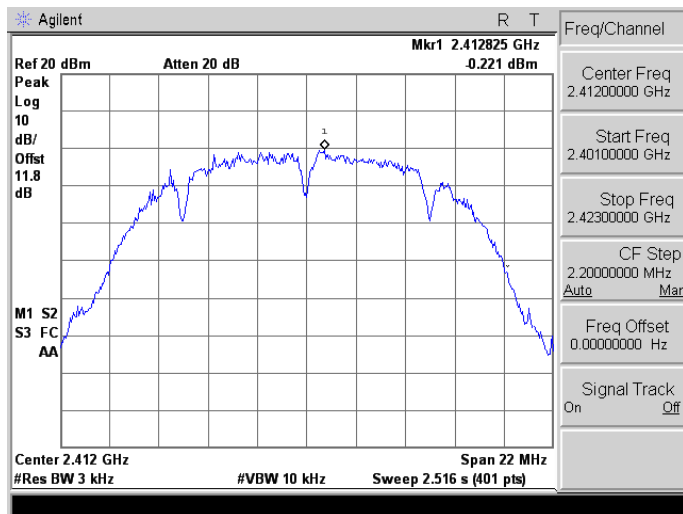


2452

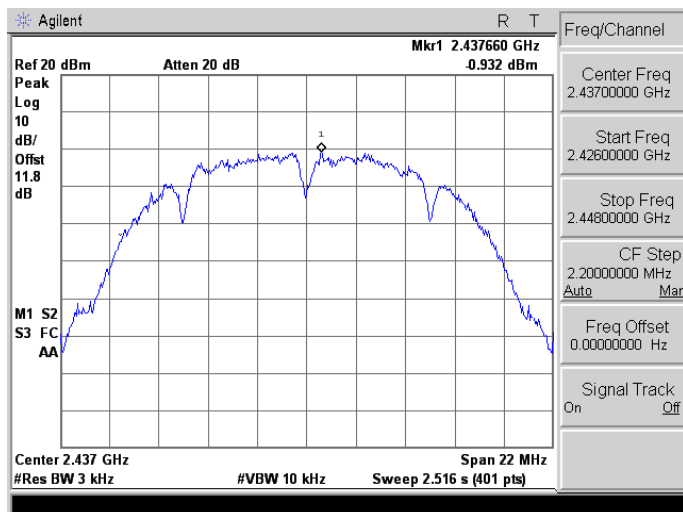


Mode 2: IEEE 802.11b Link Mode_ANT-2

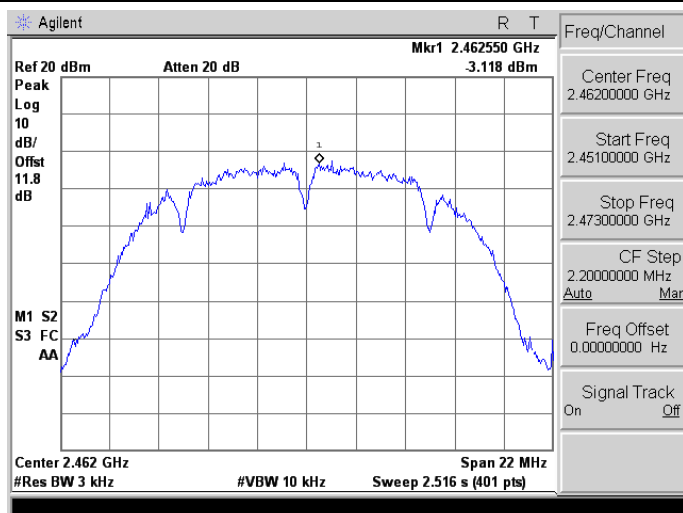
2412



2437

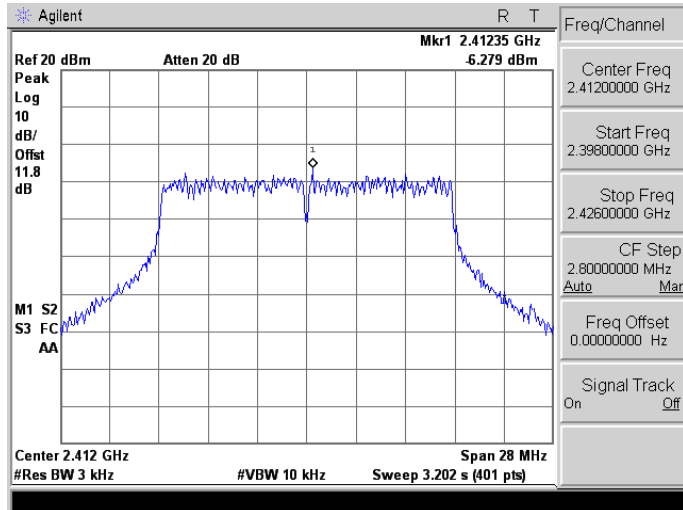


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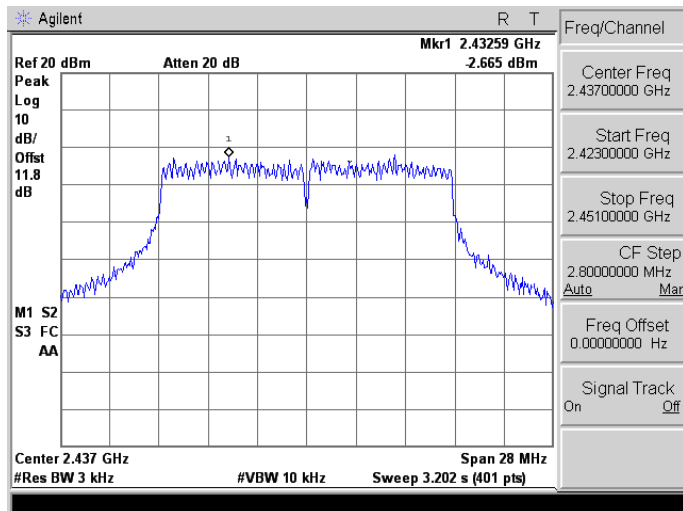


Mode 3: IEEE 802.11g Link Mode_ANT-2

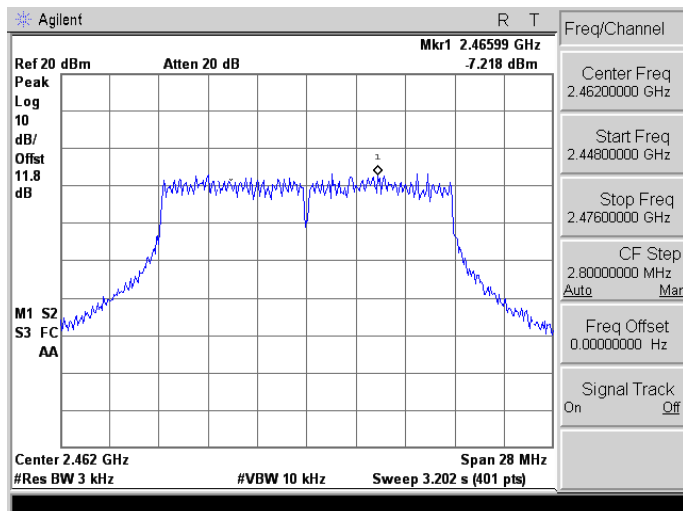
2412



2437

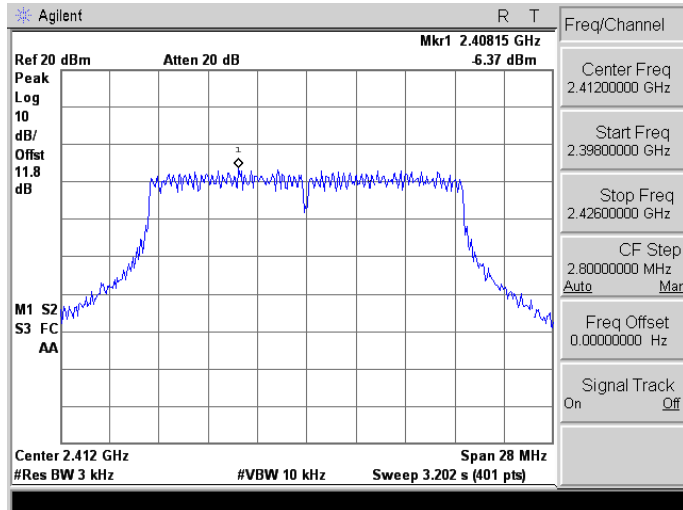


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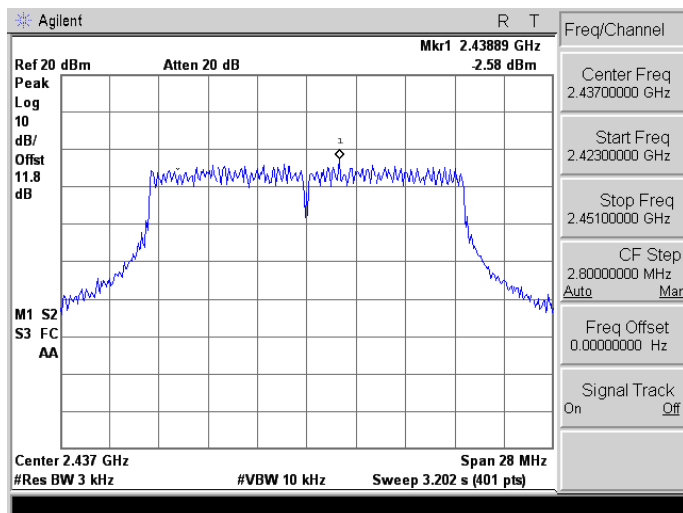


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-2

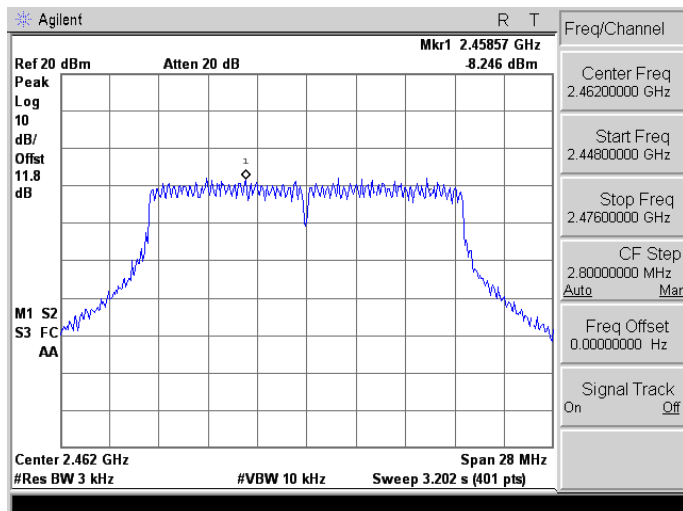
2412



2437

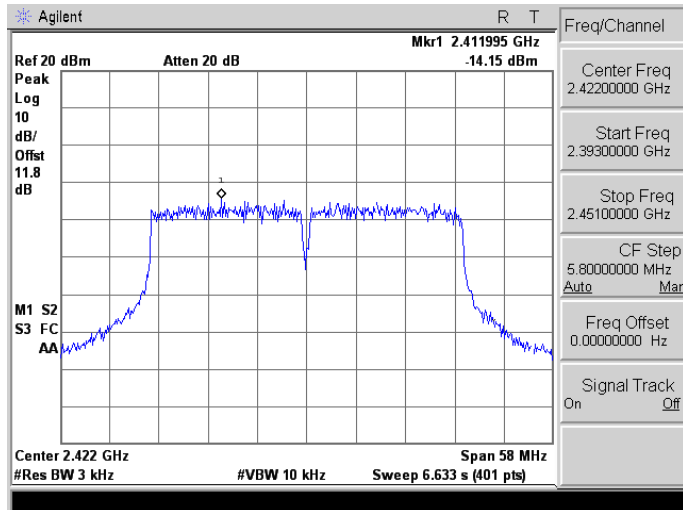


2462

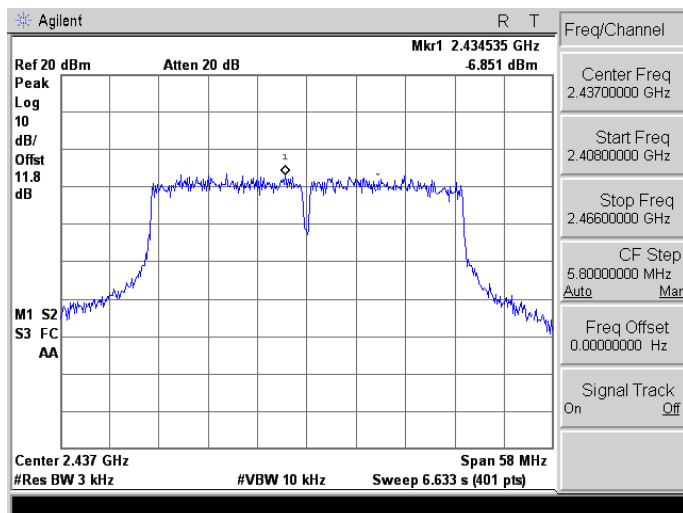


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-2

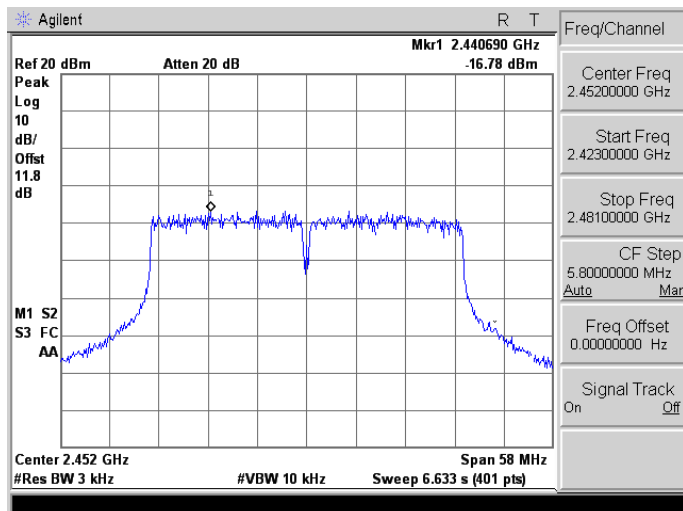
2422



2437



2452

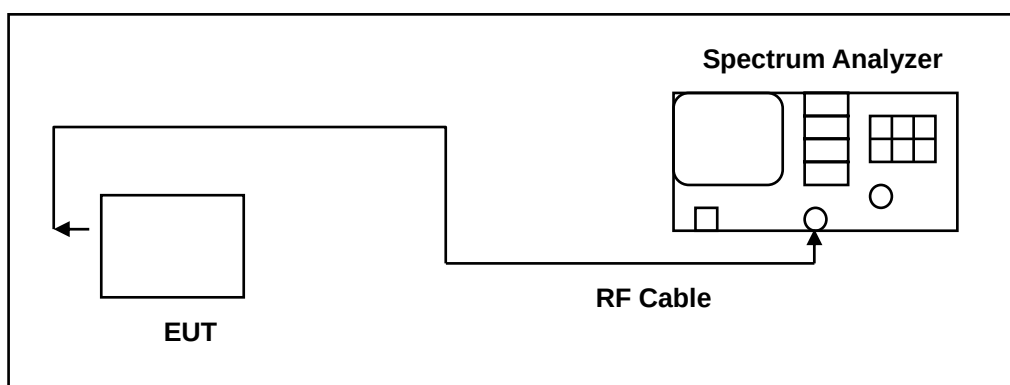


9 Out of Band Conducted Emissions Measurement

9.1. 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

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/16/2014	(2)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/24/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

9.4. 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.

9.5. Test Graphs

Reference level

Mode 2: IEEE 802.11b Link Mode_ANT-0

2412



2437



2462

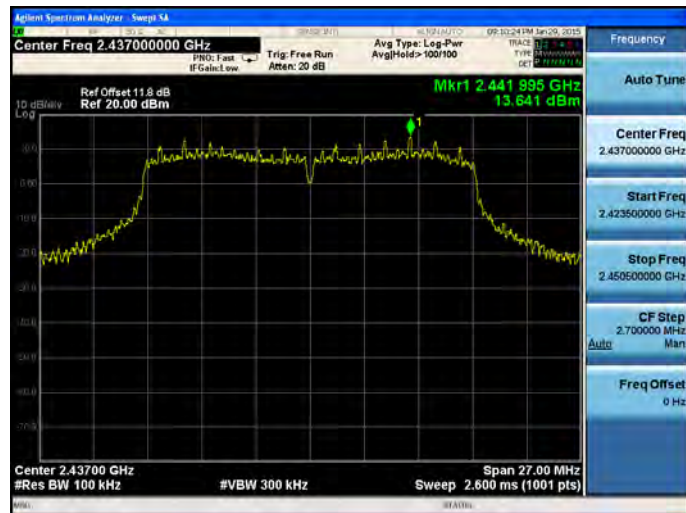


Mode 3: IEEE 802.11g Link Mode_ANT-0

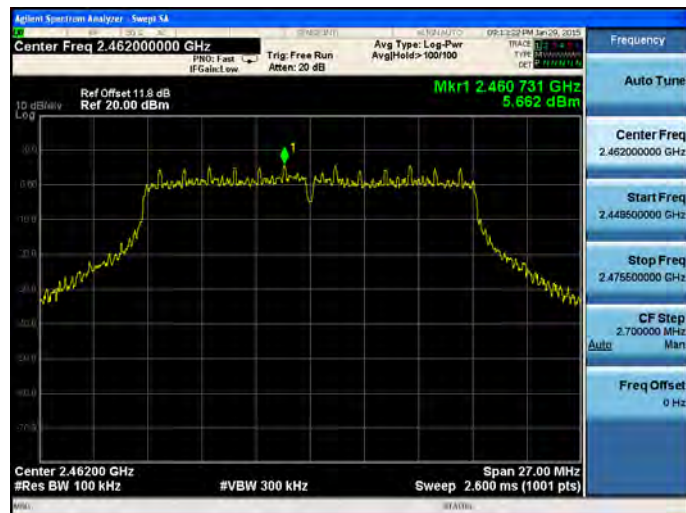
2412



2437



2462



Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-0

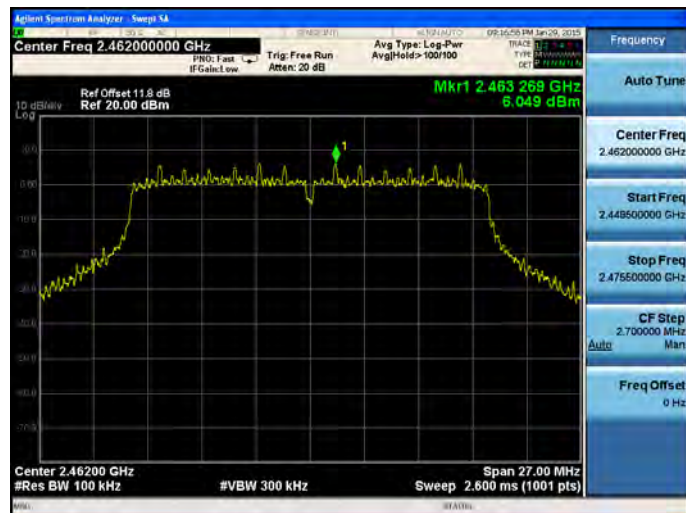
2412



2437

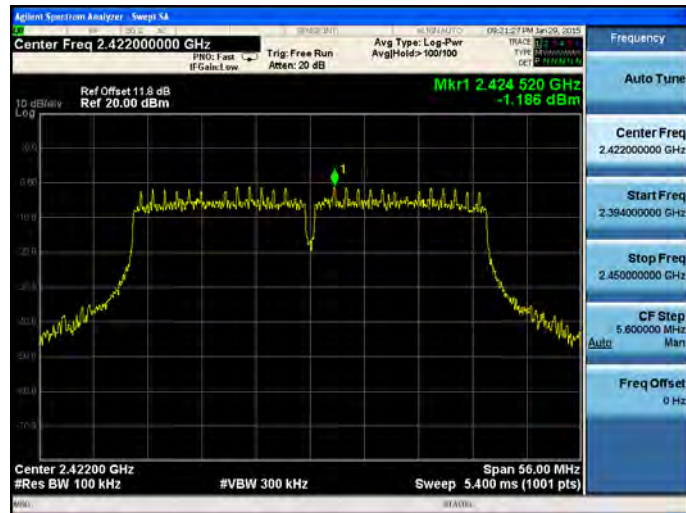


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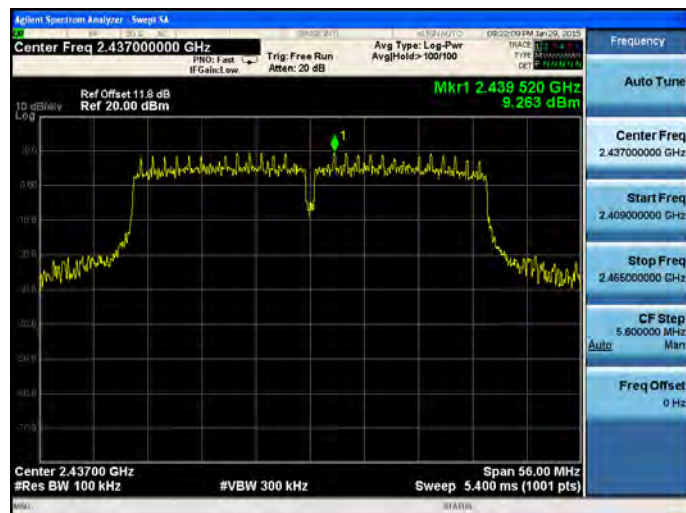


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-0

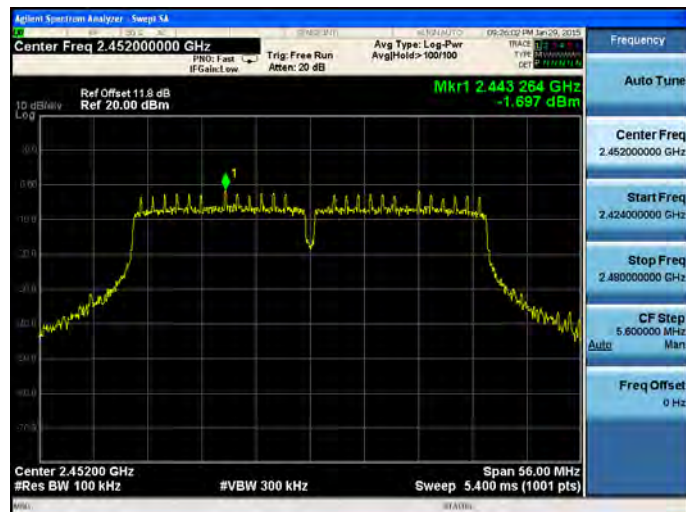
2422



2437



2452



Mode 2: IEEE 802.11b Link Mode_ANT-1

2412



2437



2462



Mode 3: IEEE 802.11g Link Mode_ANT-1

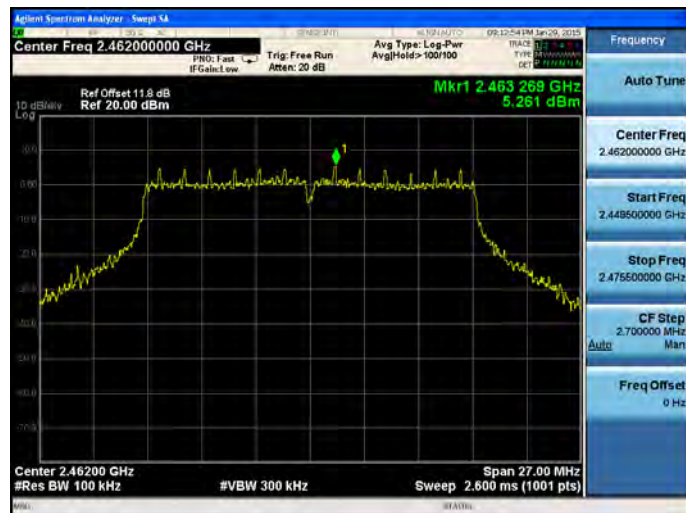
2412



2437



2462

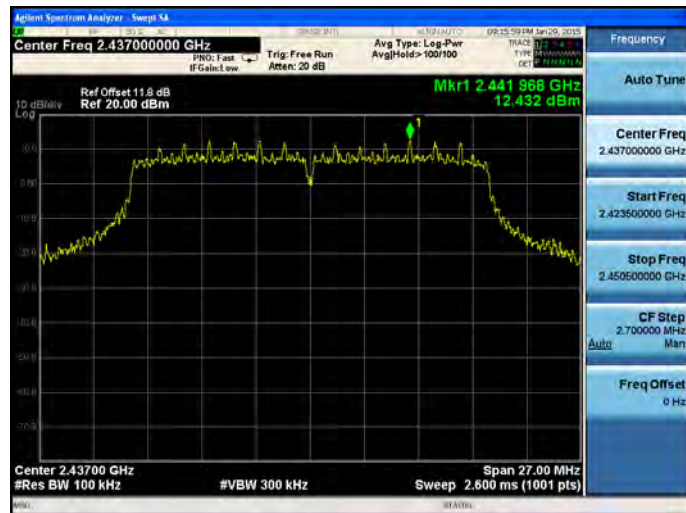


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode _ANT-1

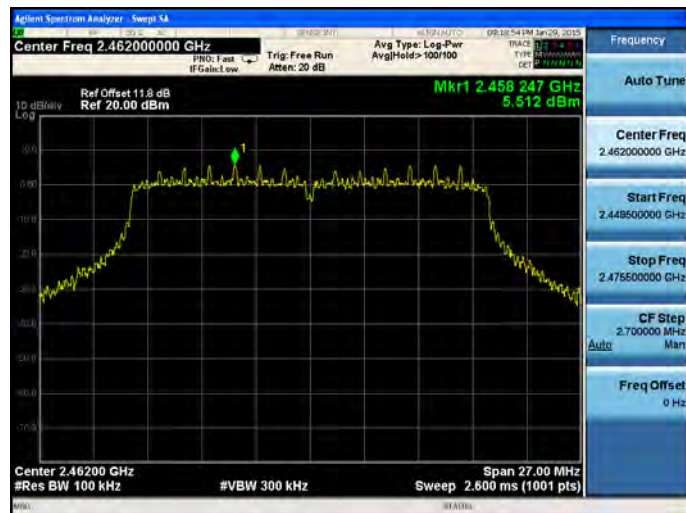
2412



2437



2462

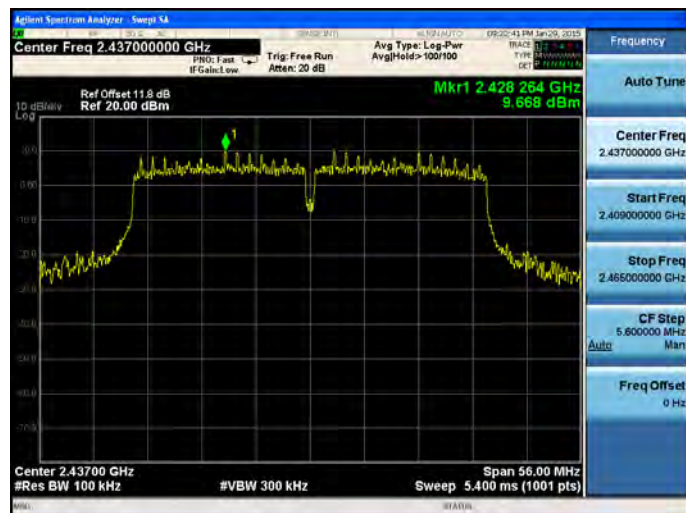


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-1

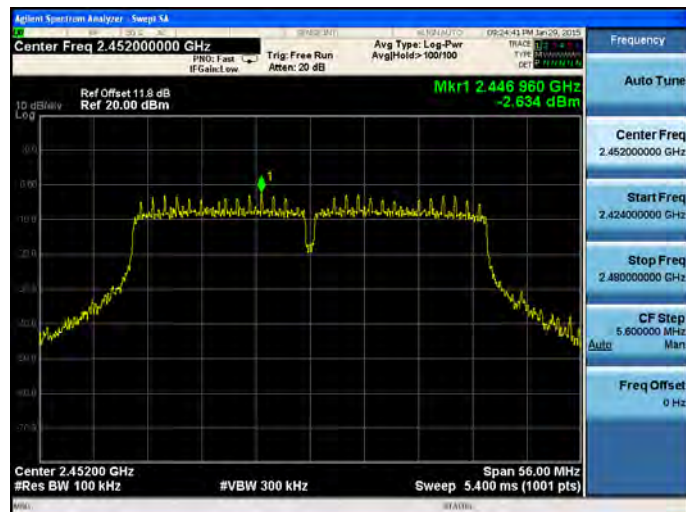
2422



2437



2452



Mode 2: IEEE 802.11b Link Mode_ANT-2

2412



2437

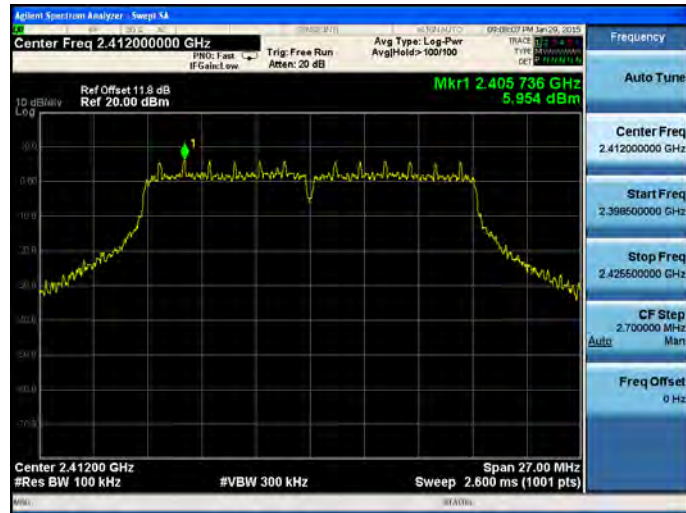


2462



Mode 3: IEEE 802.11g Link Mode_ANT-2

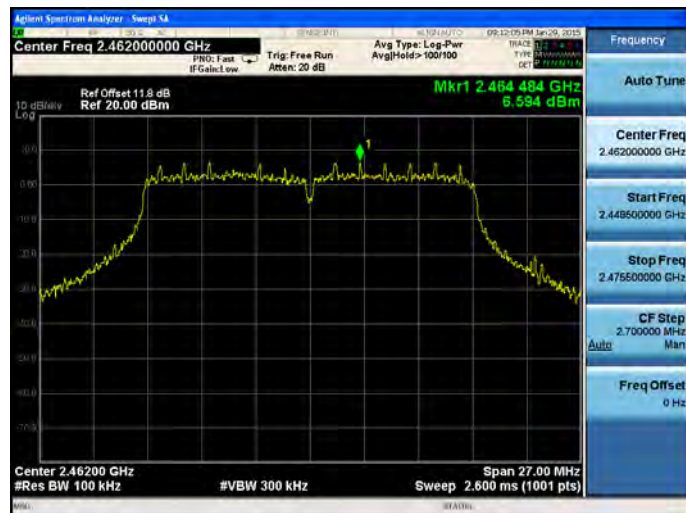
2412



2437

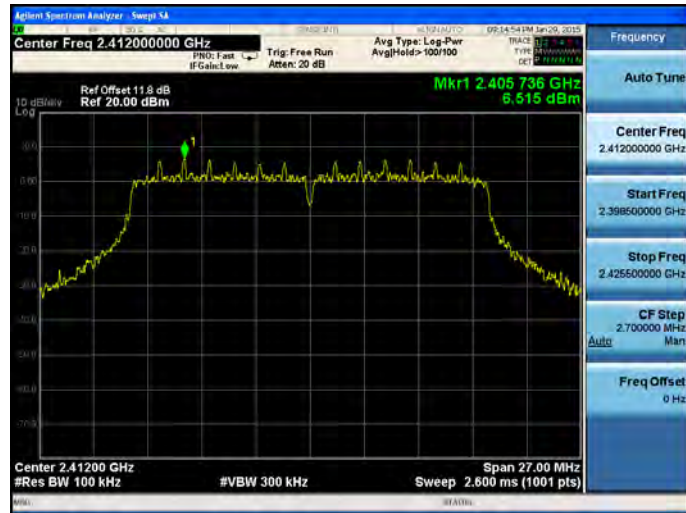


2462



Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-2

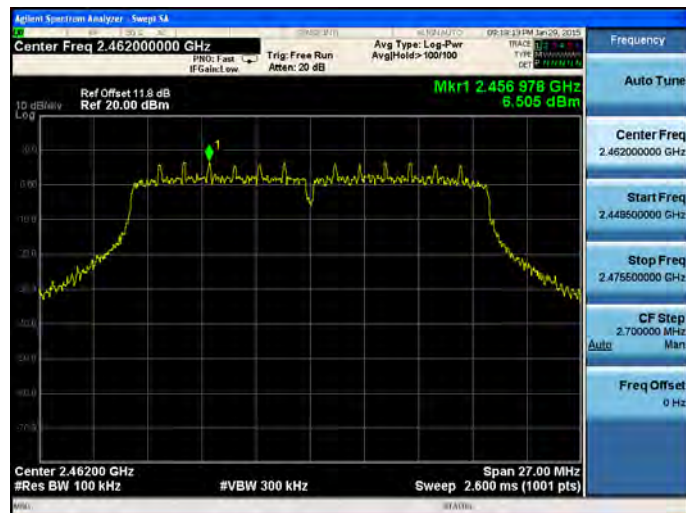
2412



2437



2462

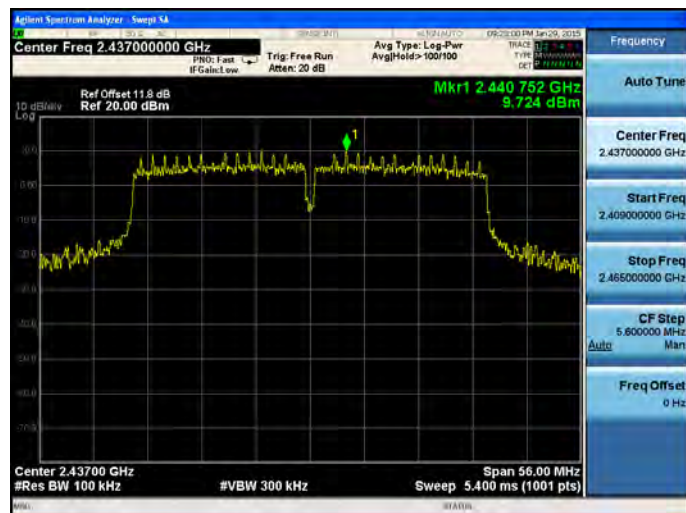


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-2

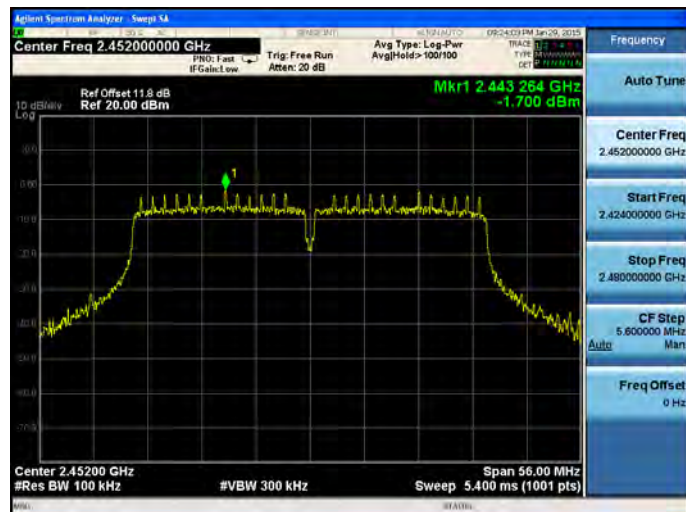
2422



2437



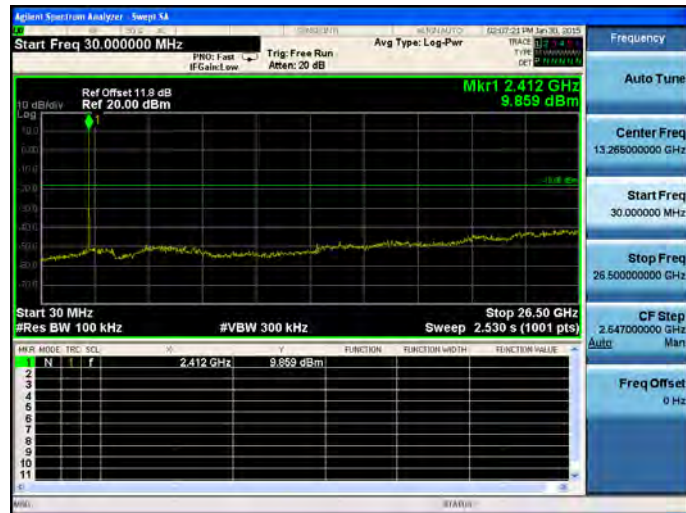
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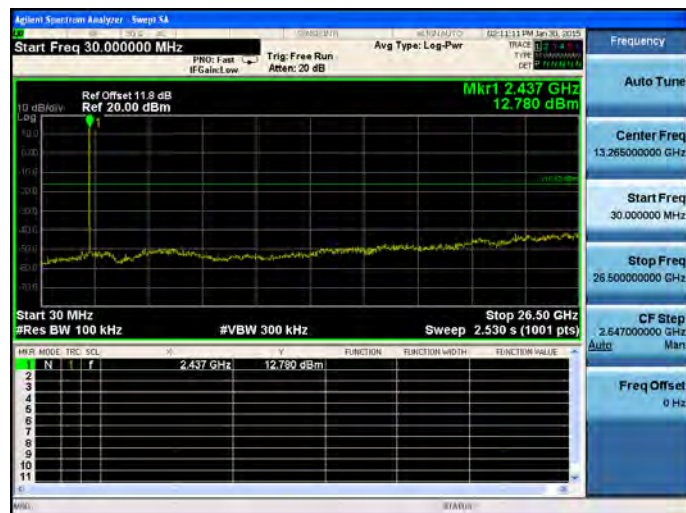
Out of Band Conducted Emissions

Mode 2: IEEE 802.11b Link Mode_ANT-0

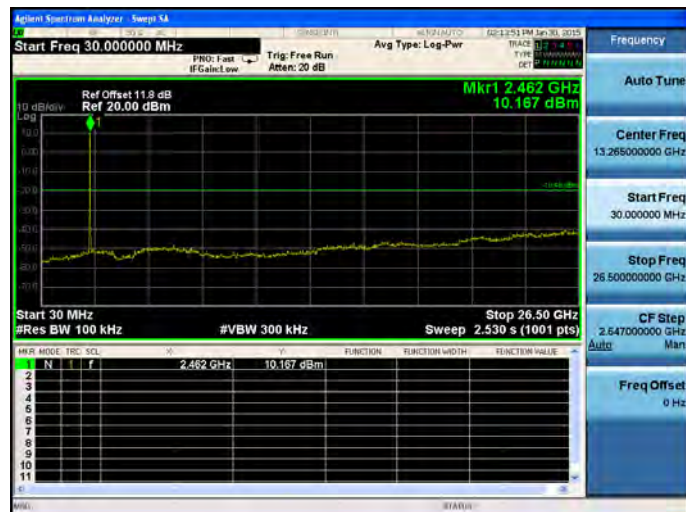
2412



2437

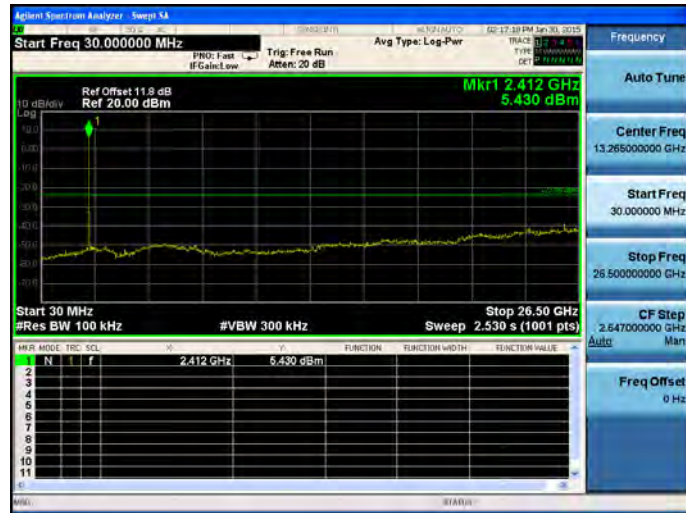


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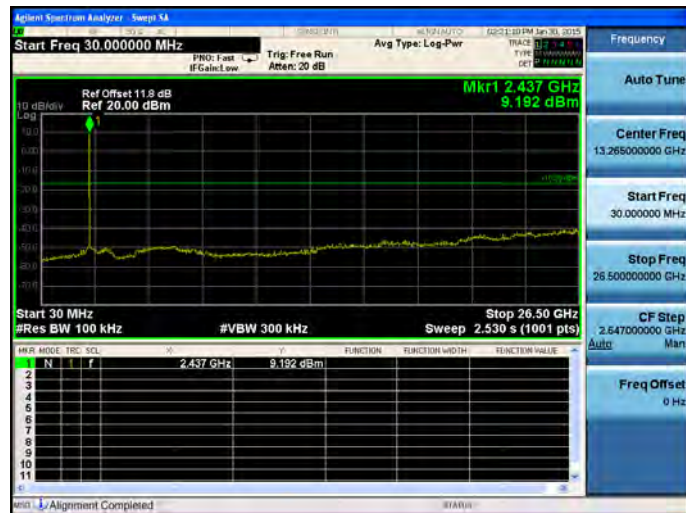


Mode 3: IEEE 802.11g Link Mode_ANT-0

2412



2437

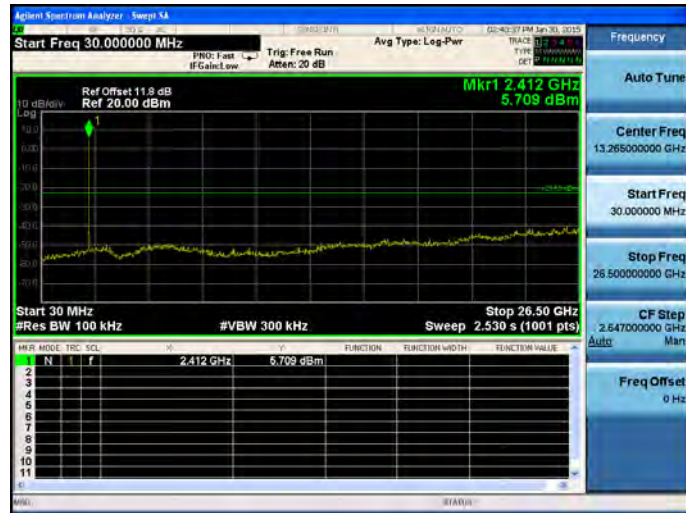


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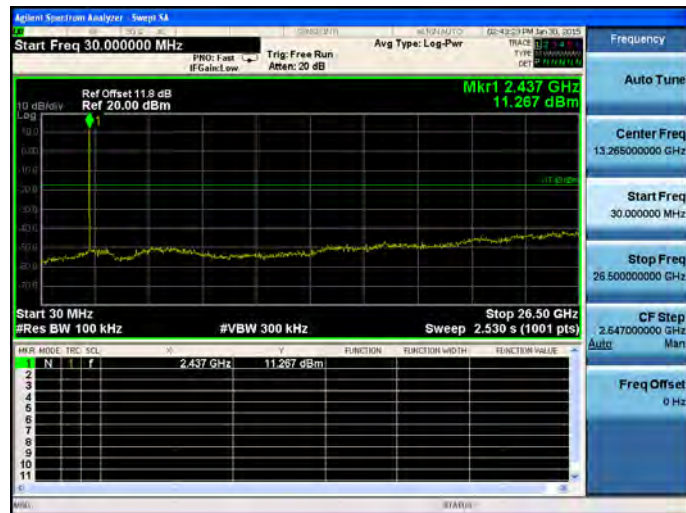


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-0

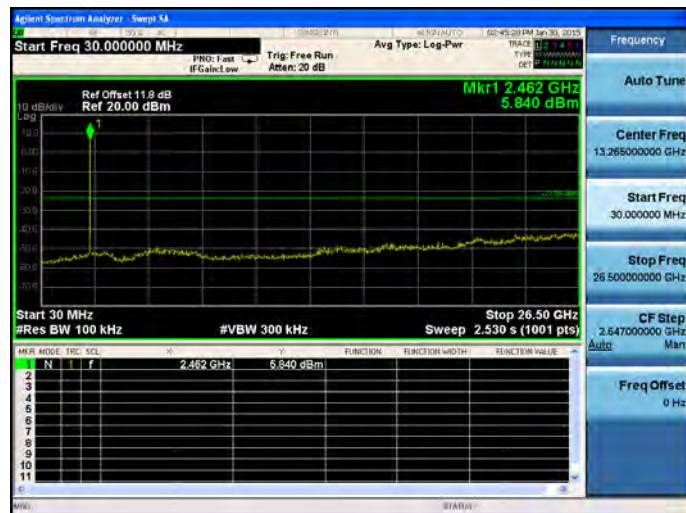
2412



2437

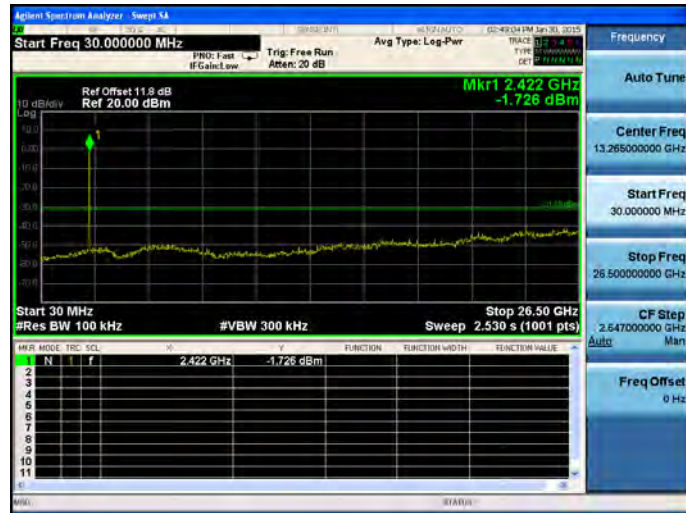


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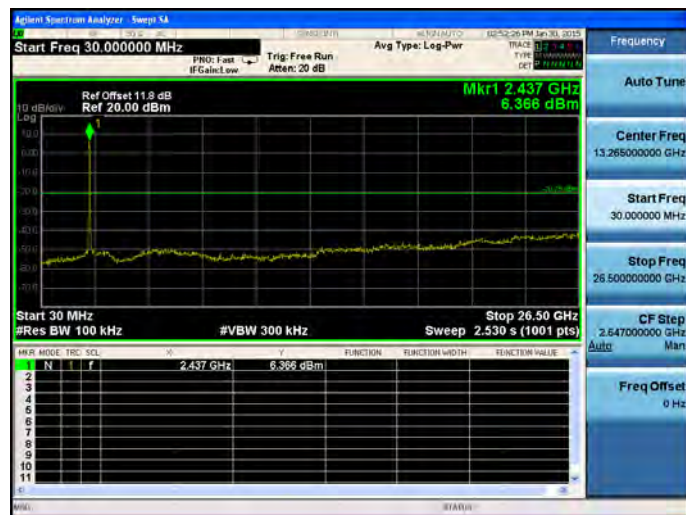


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-0

2422



2437

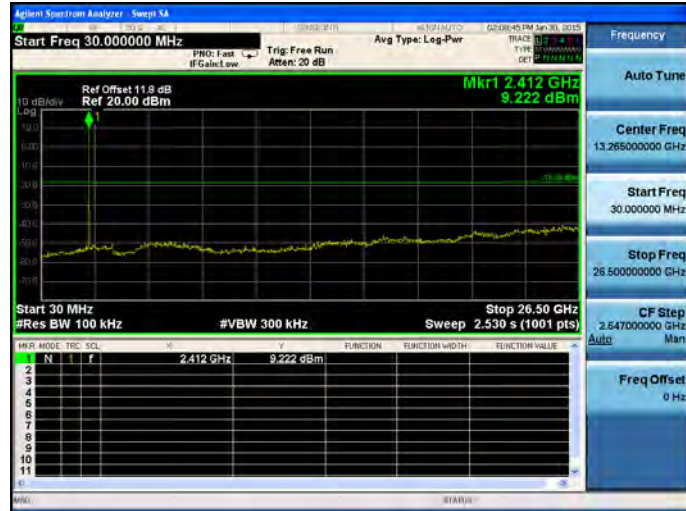


2452

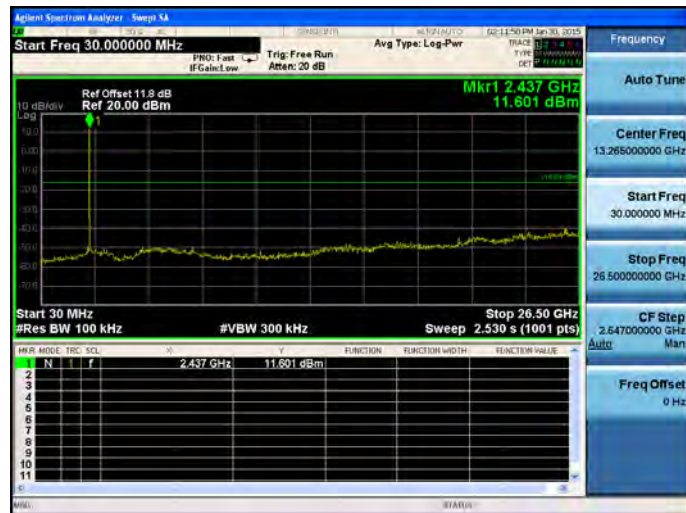


Mode 2: IEEE 802.11b Link Mode_ANT-1

2412



2437

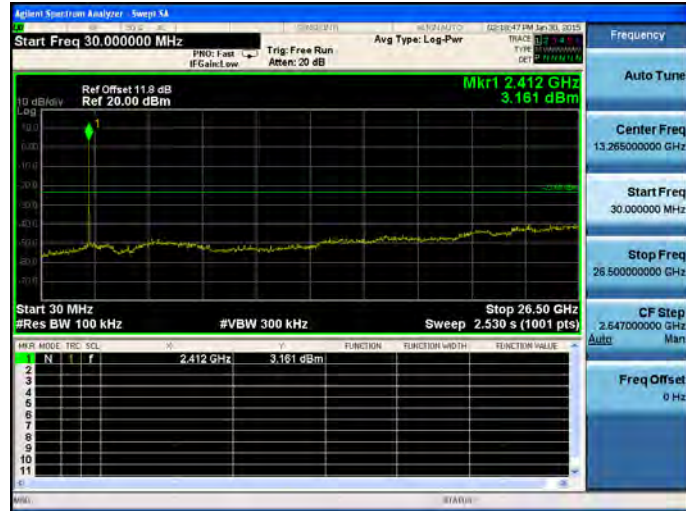


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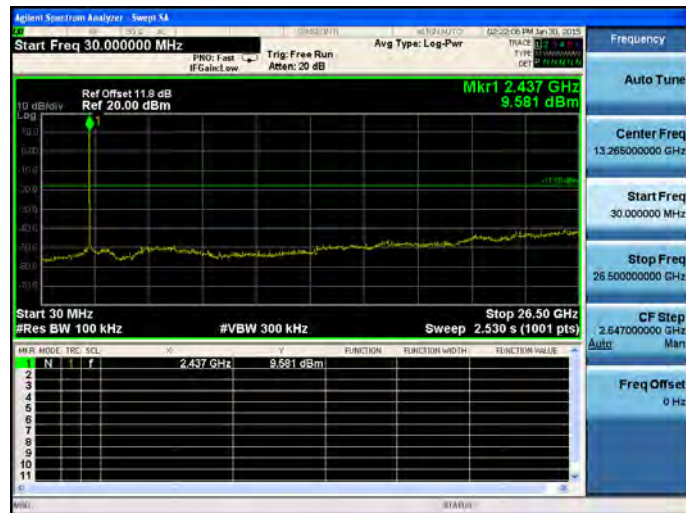


Mode 3: IEEE 802.11g Link Mode_ANT-1

2412



2437

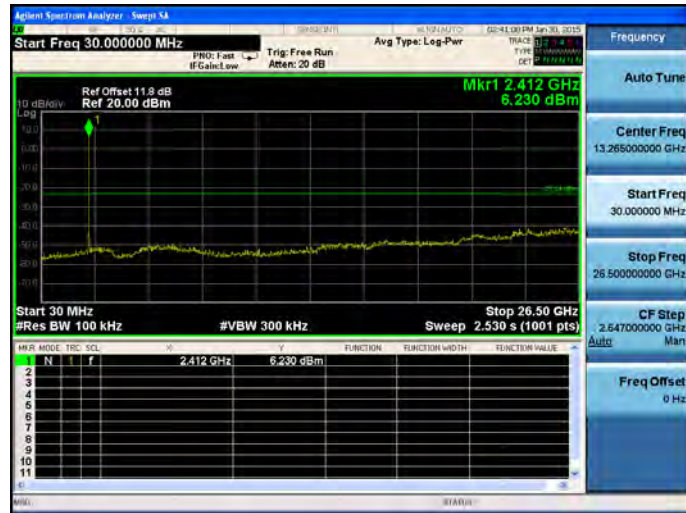


2462

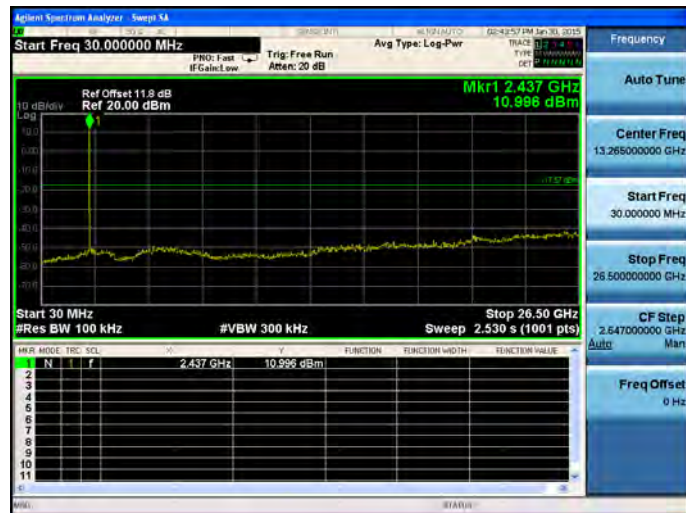


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-1

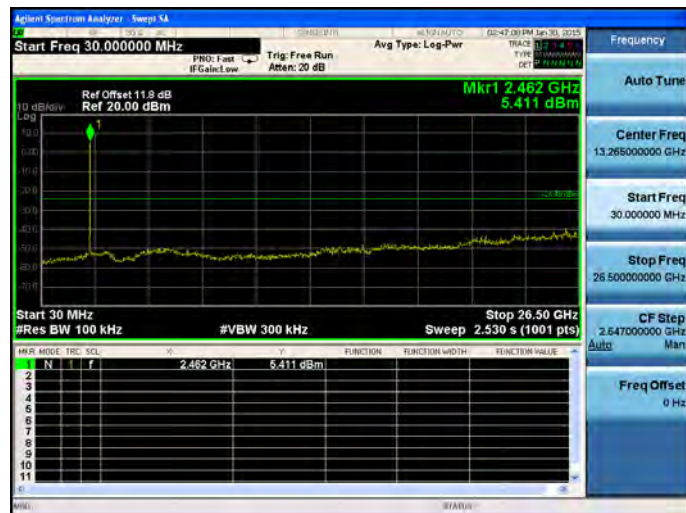
2412



2437



2462

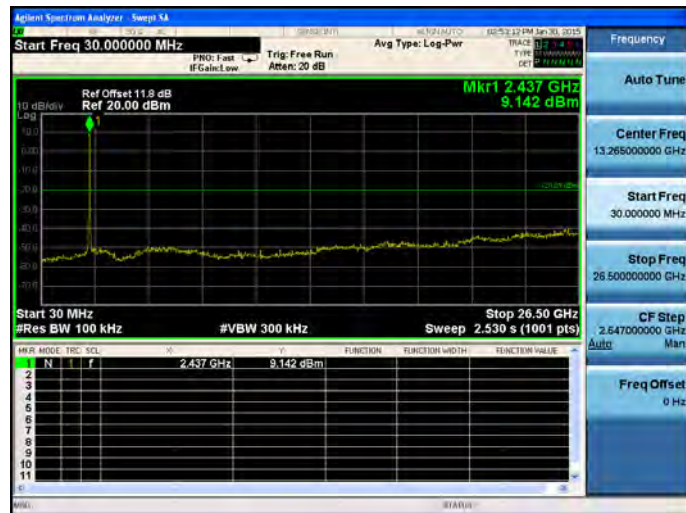


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-1

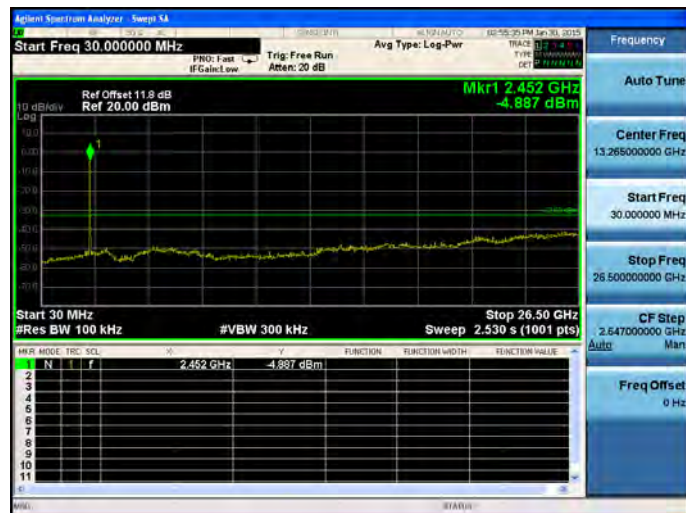
2422



2437

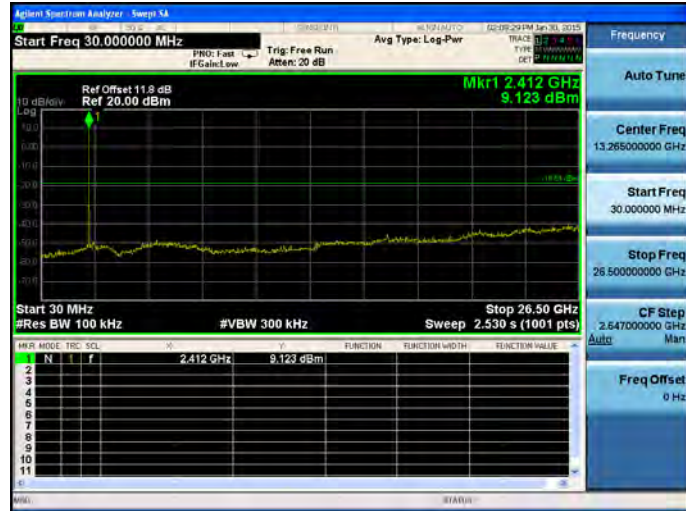


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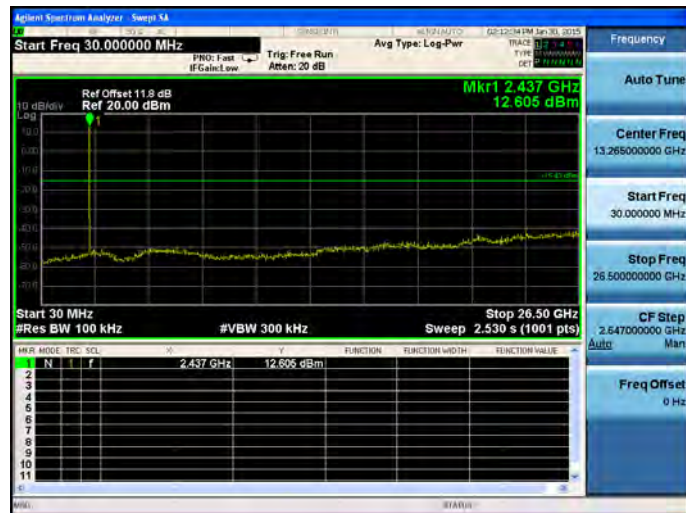


Mode 2: IEEE 802.11b Link Mode_ANT-2

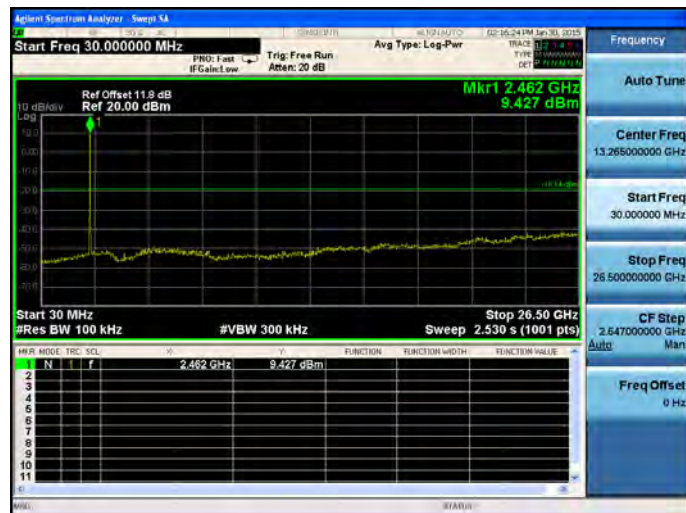
2412



2437



2462

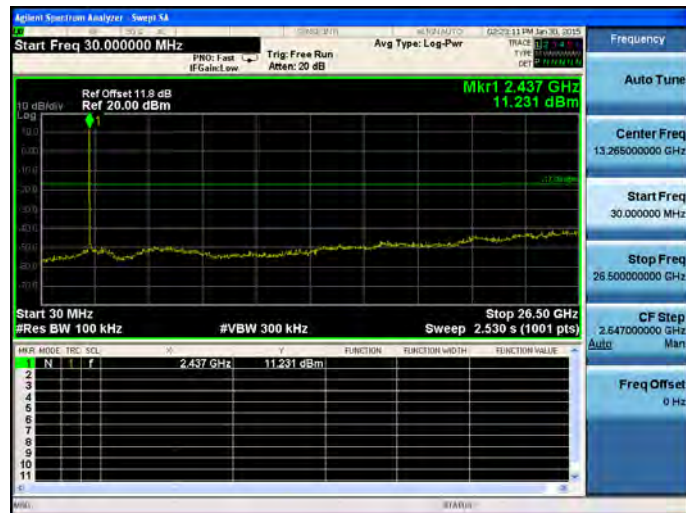


Mode 3: IEEE 802.11g Link Mode_ANT-2

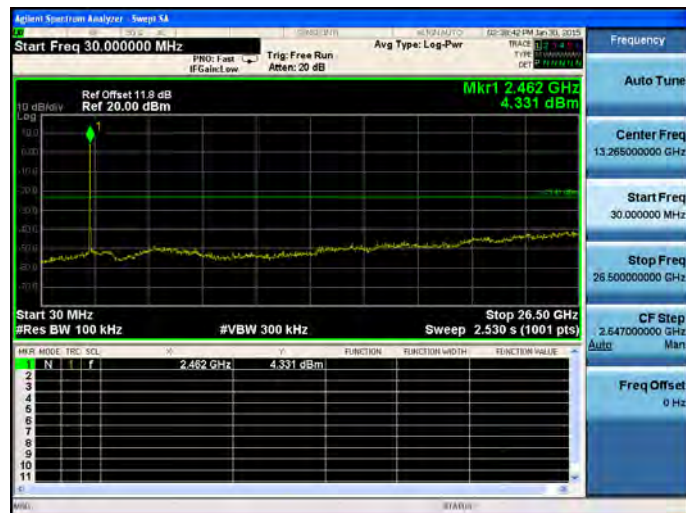
2412



2437

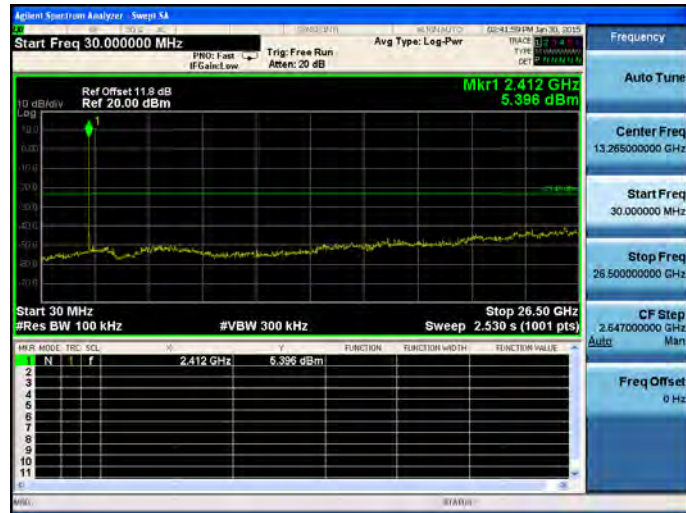


2462



Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-2

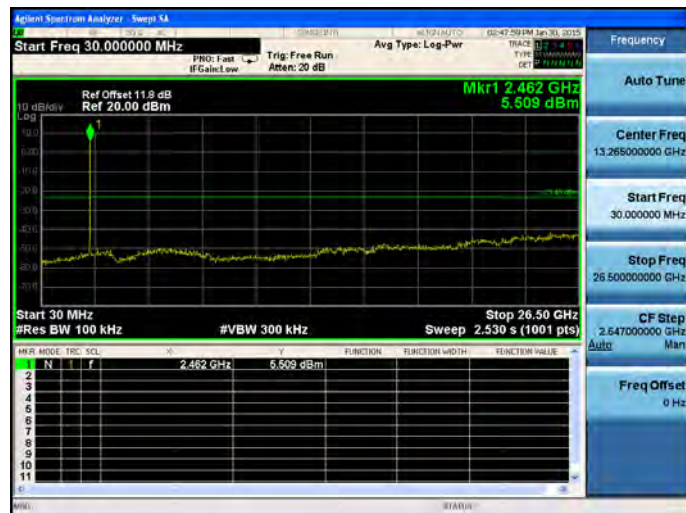
2412



2437

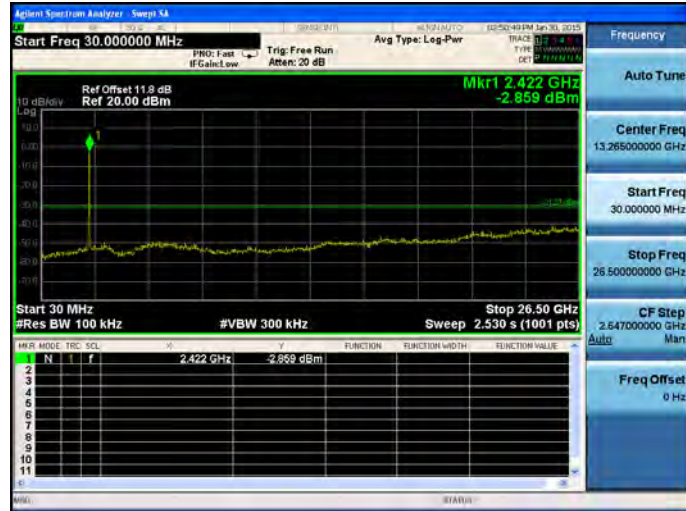


2462

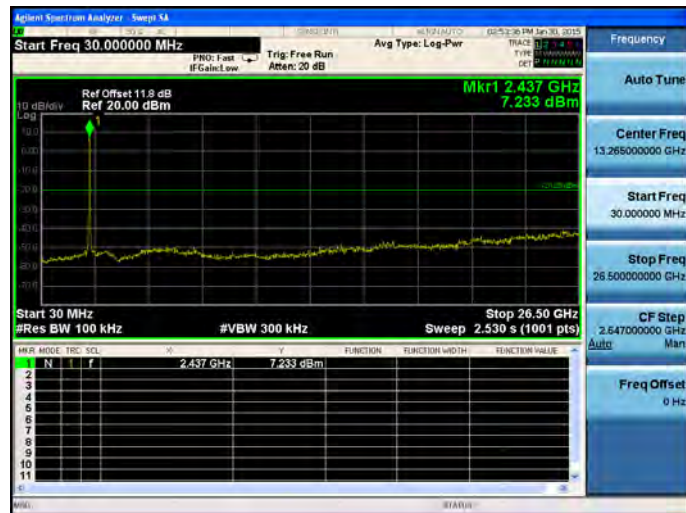


Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-2

2422



2437



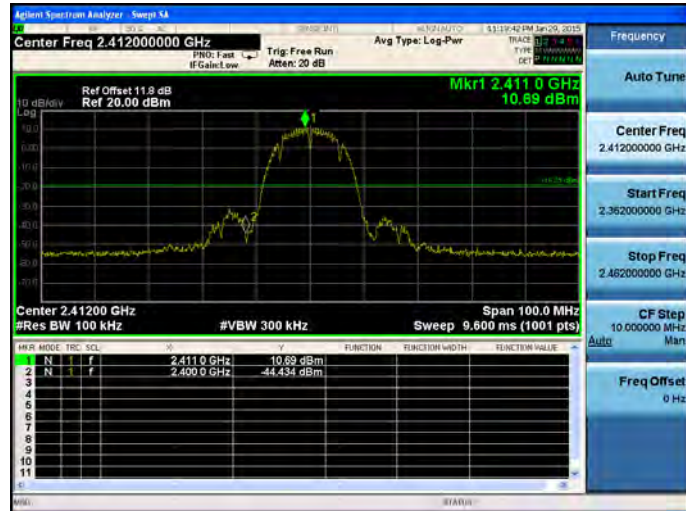
2452



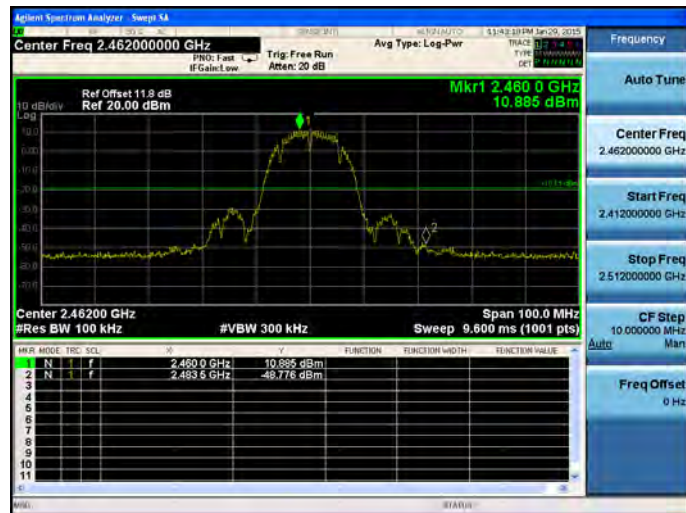
Conducted Band Edge

Mode 2: IEEE 802.11b Link Mode_ANT-0

2412

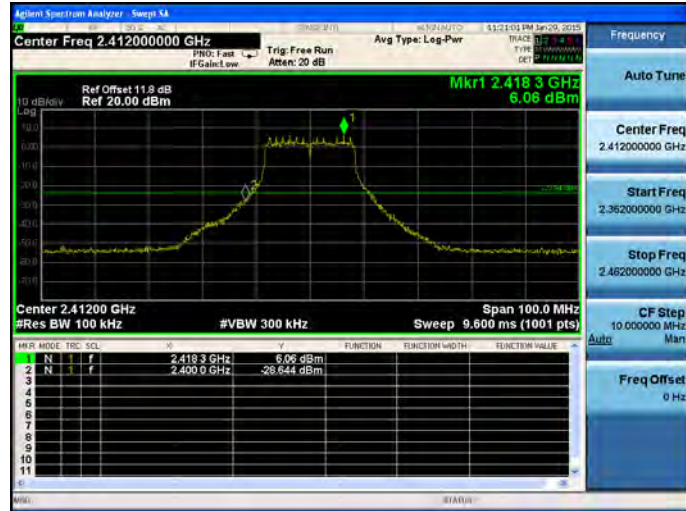


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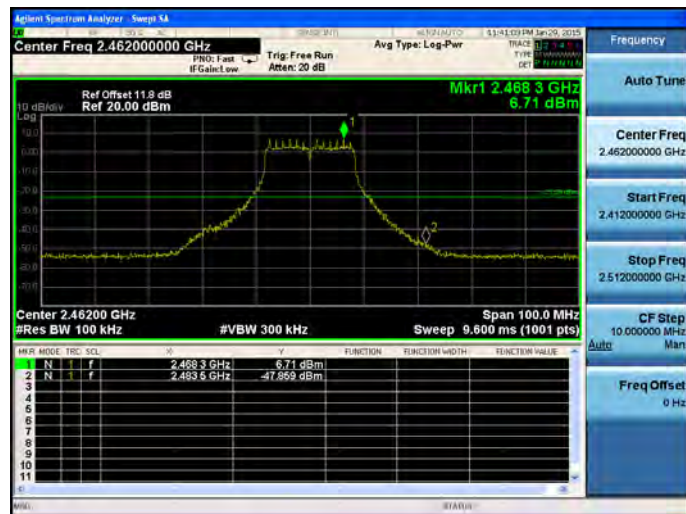


Mode 3: IEEE 802.11g Link Mode_ANT-0

2412

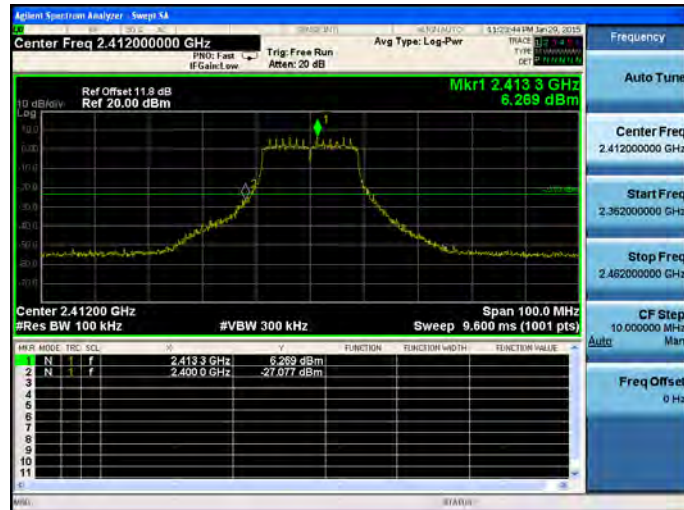


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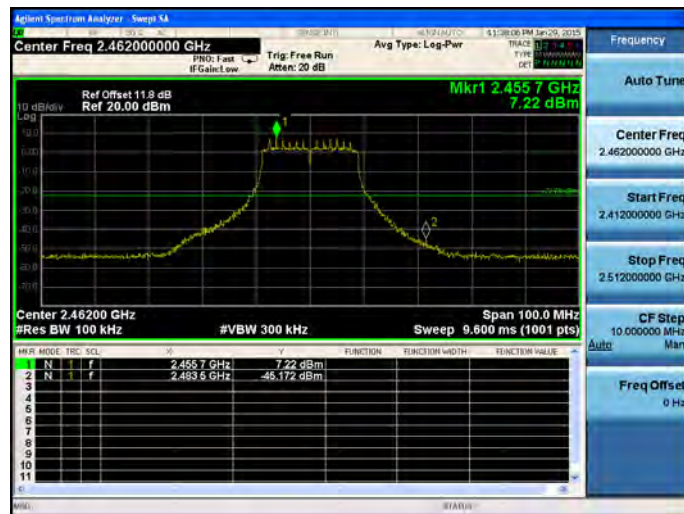


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-0

2412

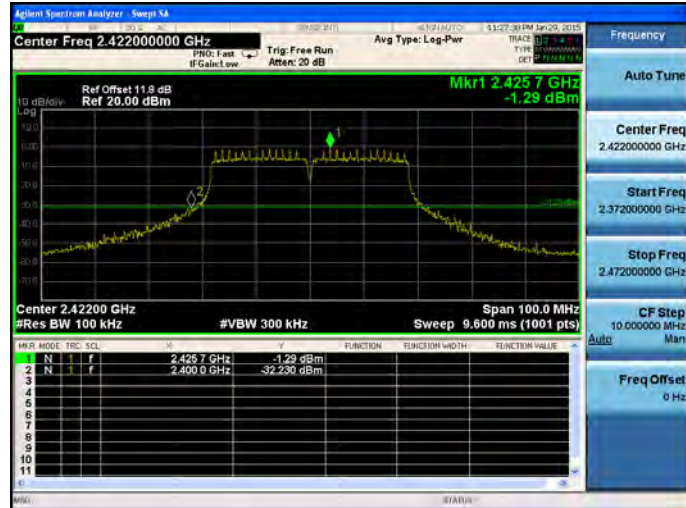


2462



Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-0

2422

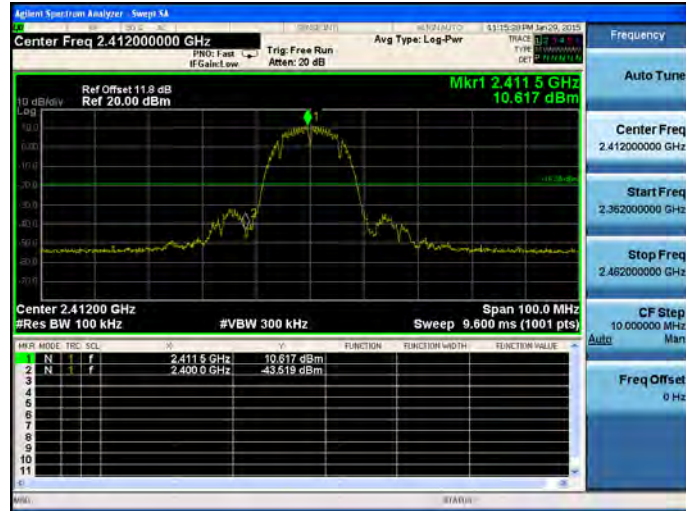


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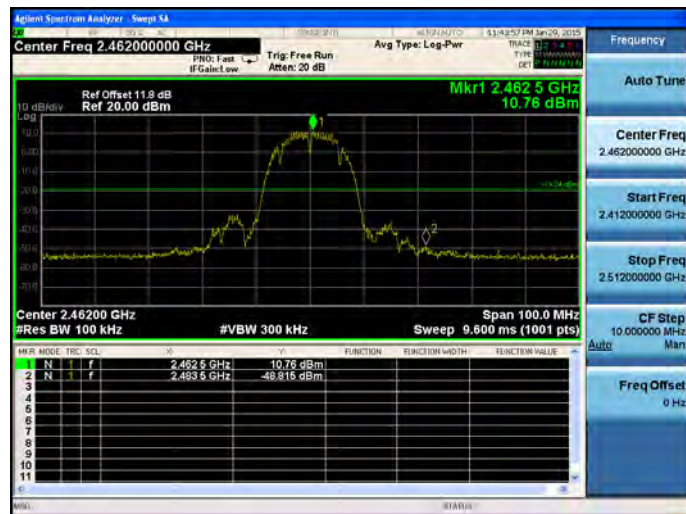


Mode 2: IEEE 802.11b Link Mode_ANT-1

2412

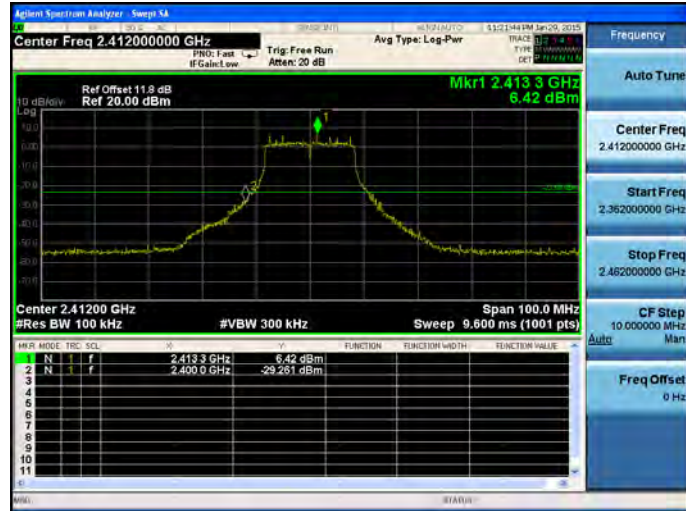


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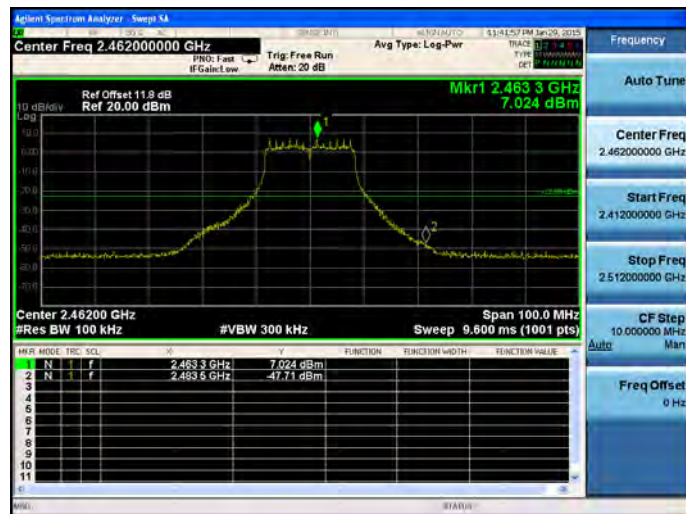


Mode 3: IEEE 802.11g Link Mode_ANT-1

2412

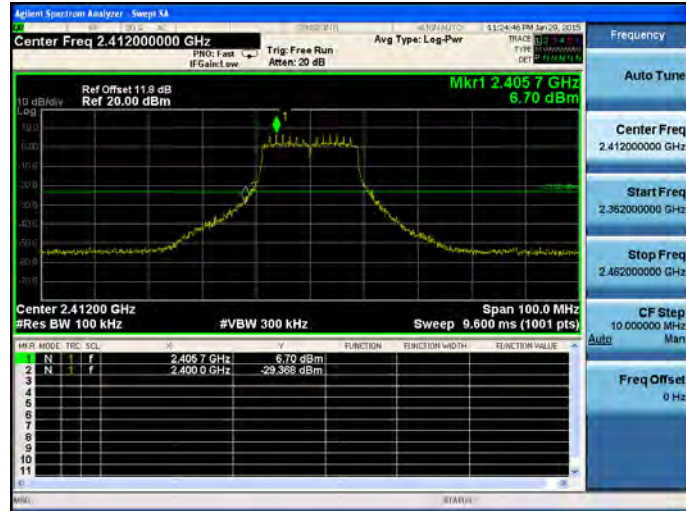


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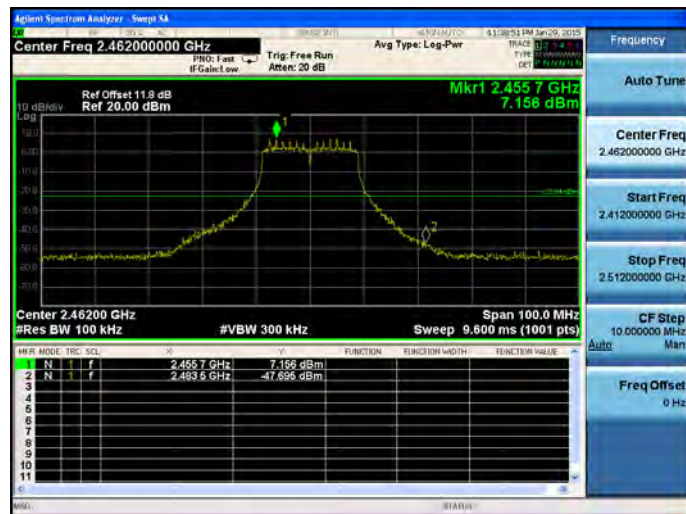


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-1

2412

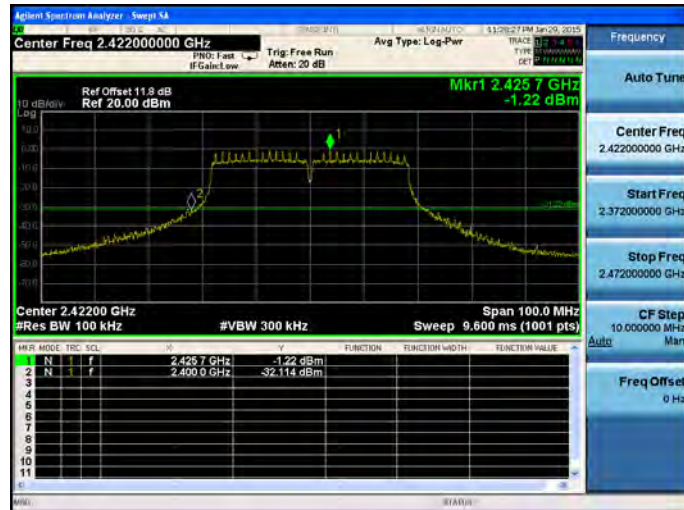


2462



Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-1

2422

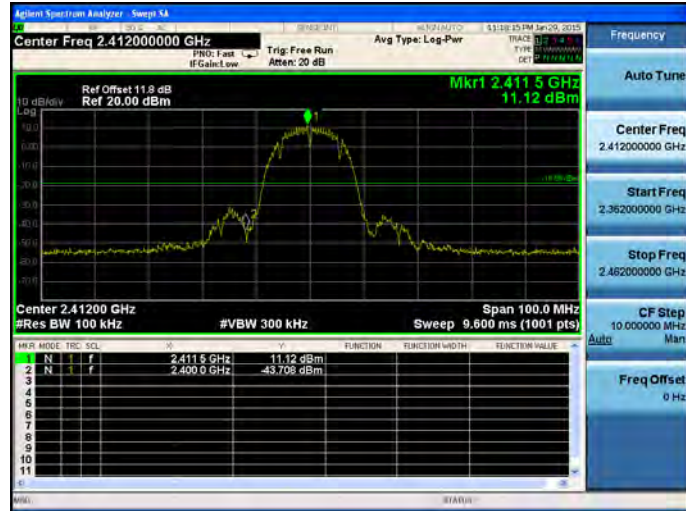


2452

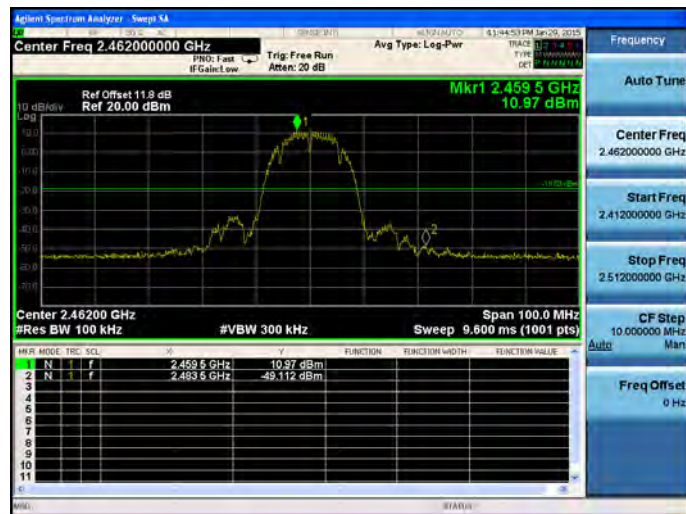


Mode 2: IEEE 802.11b Link Mode_ANT-2

2412

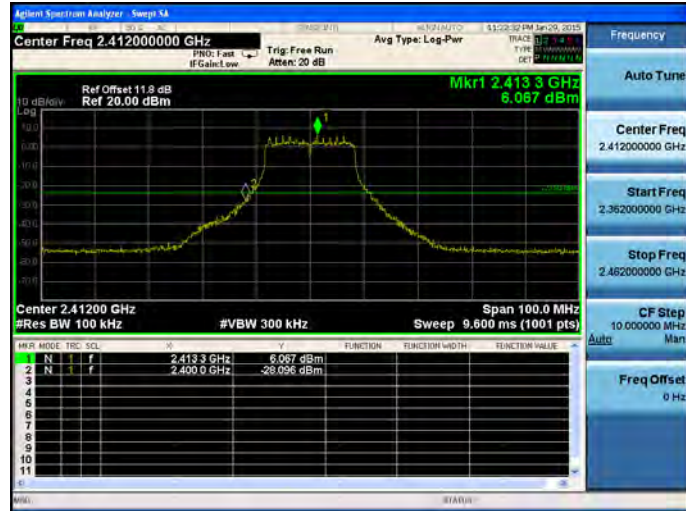


2462

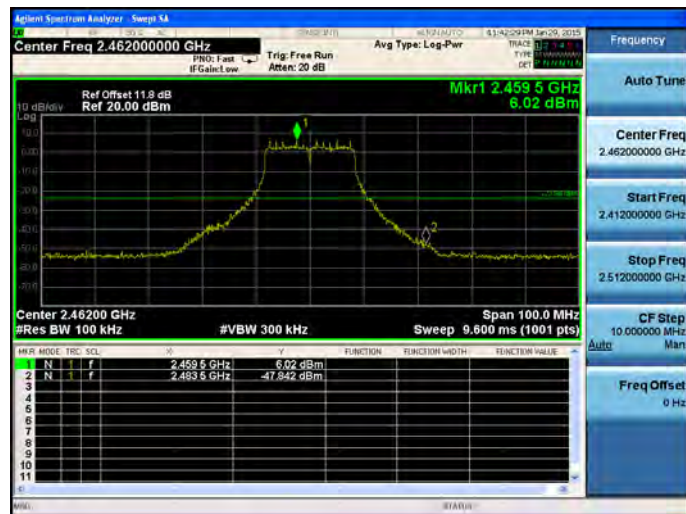


Mode 3: IEEE 802.11g Link Mode_ANT-2

2412

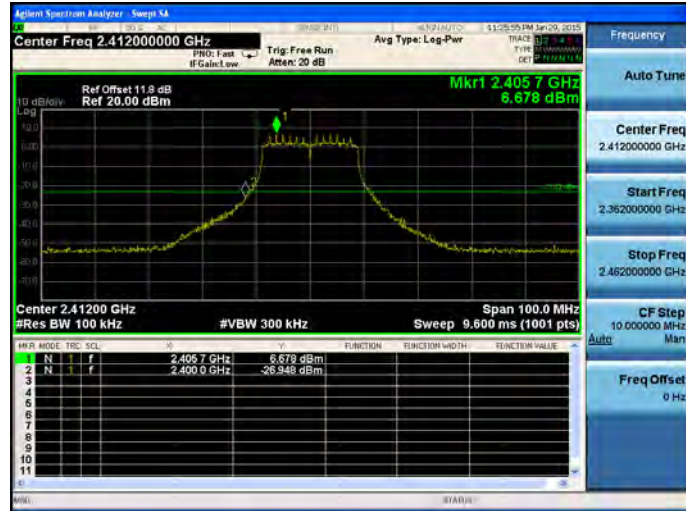


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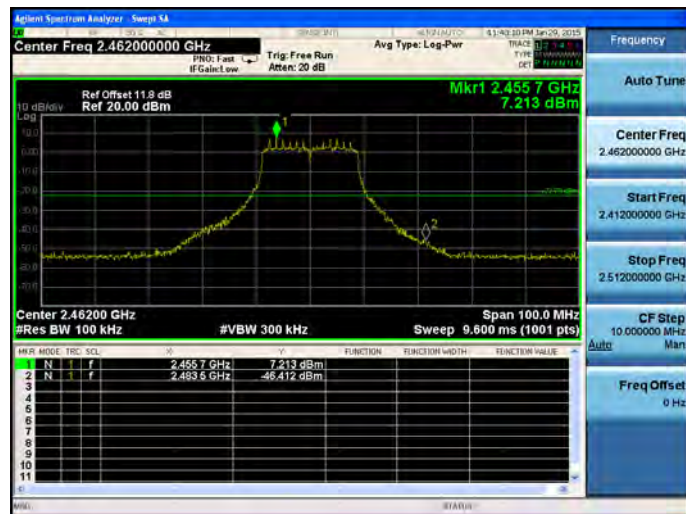


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode_ANT-2

2412

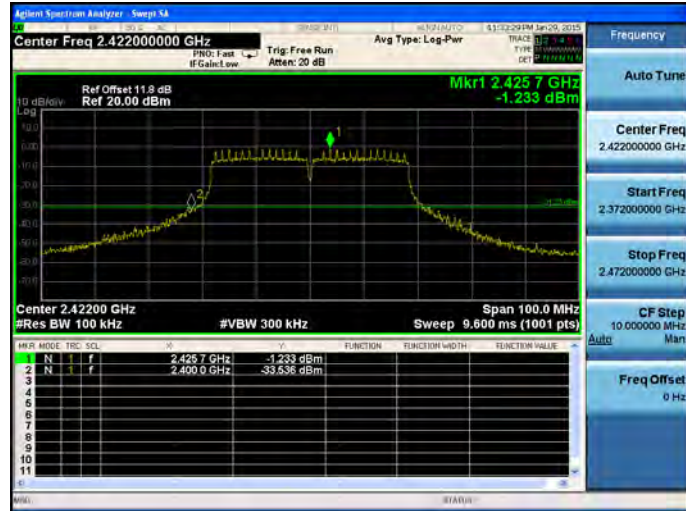


2462



Mode 5: IEEE 802.11n 2.4GHz 40MHz Link Mode_ANT-2

2422



2452

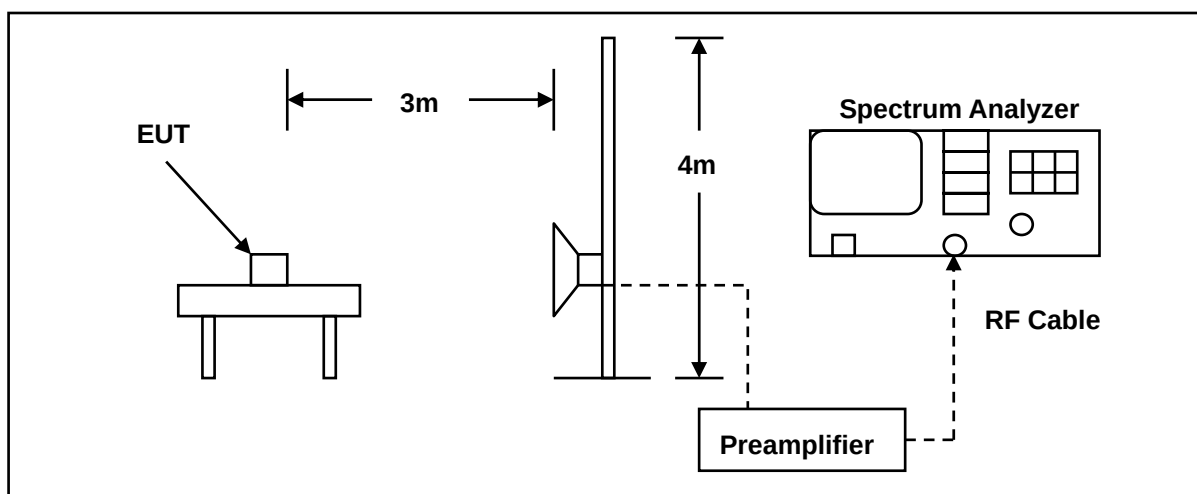


10 Band Edges Measurement

10.1.Limit

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 30 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

10.2.Test Setup



10.3.Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/06/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/06/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2014	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2014	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/11/2014	(1)
Microwave Cable	EMCI	EMC-104-SM-SM-14000	140202	02/19/2014	(1)
Microwave Cable	EMCI	EMC104-SM-SM-600	140301	03/03/2014	(1)
Test Site	ATL	TE01	888001	08/28/2014	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

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

10.4. Test Procedure

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

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements 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.

10.5. Test Result

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		2		Date:		01/23/2015	
Frequency:		2412 MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2387.000	59.53	-2.25	57.28	74.00	-16.72	peak	H
2387.000	46.84	-2.25	44.59	54.00	-9.41	AVG	H
2390.000	53.27	-2.24	51.03	74.00	-22.97	peak	H
2387.660	59.72	-2.25	57.47	74.00	-16.53	peak	V
2387.660	50.13	-2.25	47.88	54.00	-6.12	AVG	V
2390.000	58.33	-2.24	56.09	74.00	-17.91	peak	V
2390.000	49.40	-2.24	47.16	54.00	-6.84	AVG	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		2		Date:		01/23/2015	
Frequency:		2462 MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	52.17	-1.83	50.34	74.00	-23.66	peak	H
2490.320	53.42	-1.79	51.63	74.00	-22.37	peak	H
2483.500	62.09	-1.83	60.26	74.00	-13.74	peak	V
2483.500	54.68	-1.83	52.85	54.00	-1.15	AVG	V
2486.840	60.68	-1.80	58.88	74.00	-15.12	peak	V
2486.840	48.30	-1.80	46.50	54.00	-7.50	AVG	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		3		Date:		01/23/2015	
Frequency:		2412 MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.530	68.73	-2.25	66.48	74.00	-7.52	peak	H
2389.530	51.18	-2.25	48.93	54.00	-5.07	AVG	H
2390.000	69.61	-2.24	67.37	74.00	-6.63	peak	H
2390.000	52.58	-2.24	50.34	54.00	-3.66	AVG	H
2389.310	72.22	-2.25	69.97	74.00	-4.03	peak	V
2389.310	53.28	-2.25	51.03	54.00	-2.97	AVG	V
2390.000	74.22	-2.24	71.98	74.00	-2.02	peak	V
2390.000	54.32	-2.24	52.08	54.00	-1.92	AVG	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		3		Date:		01/23/2015	
Frequency:		2462 MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	57.35	-1.83	55.52	74.00	-18.48	peak	H
2483.500	45.41	-1.83	43.58	54.00	-10.42	AVG	H
2483.720	56.66	-1.83	54.83	74.00	-19.17	peak	H
2483.720	44.99	-1.83	43.16	54.00	-10.84	AVG	H
2483.500	72.54	-1.83	70.71	74.00	-3.29	peak	V
2483.500	53.00	-1.83	51.17	54.00	-2.83	AVG	V
2483.720	72.48	-1.83	70.65	74.00	-3.35	peak	V
2483.720	52.52	-1.83	50.69	54.00	-3.31	AVG	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		4		Date:		01/23/2015	
Frequency:		2412 MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2384.800	64.29	-2.27	62.02	74.00	-11.98	peak	H
2384.800	46.54	-2.27	44.27	54.00	-9.73	AVG	H
2390.000	63.62	-2.24	61.38	74.00	-12.62	peak	H
2390.000	48.77	-2.24	46.53	54.00	-7.47	AVG	H
2389.750	73.69	-2.24	71.45	74.00	-2.55	peak	V
2389.750	54.19	-2.24	51.95	54.00	-2.05	AVG	V
2390.000	71.87	-2.24	69.63	74.00	-4.37	peak	V
2390.000	54.67	-2.24	52.43	54.00	-1.57	AVG	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		NBG6816		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		4		Date:		01/23/2015	
Frequency:		2462 MHz		Test By:		Eric Ou Yang	
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	55.70	-1.83	53.87	74.00	-20.13	peak	H
2483.500	45.26	-1.83	43.43	54.00	-10.57	AVG	H
2483.680	56.89	-1.83	55.06	74.00	-18.94	peak	H
2483.680	45.12	-1.83	43.29	54.00	-10.71	AVG	H
2483.500	67.41	-1.83	65.58	74.00	-8.42	peak	V
2483.500	54.52	-1.83	52.69	54.00	-1.31	AVG	V
2484.800	70.08	-1.82	68.26	74.00	-5.74	peak	V
2484.800	52.68	-1.82	50.86	54.00	-3.14	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	NBG6816			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	01/24/2015		
Frequency:	2422 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2386.200	62.43	-2.27	60.16	74.00	-13.84	peak	H
2386.200	48.61	-2.27	46.34	54.00	-7.66	AVG	H
2390.000	67.81	-2.24	65.57	74.00	-8.43	peak	H
2390.000	49.45	-2.24	47.21	54.00	-6.79	AVG	H
2389.200	74.26	-2.25	72.01	74.00	-1.99	peak	V
2389.200	54.78	-2.25	52.53	54.00	-1.47	AVG	V
2390.000	72.16	-2.24	69.92	74.00	-4.08	peak	V
2390.000	55.33	-2.24	53.09	54.00	-0.91	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	NBG6816			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	5			Date:	01/24/2015		
Frequency:	2452 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	59.83	-1.83	58.00	74.00	-16.00	peak	H
2483.500	46.63	-1.83	44.80	54.00	-9.20	AVG	H
2483.750	60.29	-1.83	58.46	74.00	-15.54	peak	H
2483.750	46.19	-1.83	44.36	54.00	-9.64	AVG	H
2483.500	72.36	-1.83	70.53	74.00	-3.47	peak	V
2483.500	54.77	-1.83	52.94	54.00	-1.06	AVG	V
2483.700	73.85	-1.83	72.02	74.00	-1.98	peak	V
2483.700	54.41	-1.83	52.58	54.00	-1.42	AVG	V

11 Antenna Measurement

11.1.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.

11.2.Antenna Connector Construction

The antenna used in this product is Dipole Antenna (Reversed-SMA Connector). And the maximum Gain of this antenna is only 2.94 dBi.