

FCC TEST REPORT

For

Lab42 LLC.

TETRA

Model No.: MK5.8

Additional Model No.: Please refer to page 6.

Prepared for : Lab42 LLC.
Address : 340 S LEMON AVE #3231 WALNUT, CA 91789

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : November 17, 2015
Number of tested samples : 1
Sample number : 1451666
Date of Test : November 17, 2015- January 06, 2015
Date of Report : January 22, 2016

FCC TEST REPORT
FCC CFR 47 PART 15 C(15.247): 2015

Report Reference No. : **LCS1511171326E**

Date of Issue..... : January 22, 2016

Testing Laboratory Name : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address..... : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,
Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure : Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method

Applicant's Name : **Lab42 LLC.**

Address..... : 340 S LEMON AVE #3231 WALNUT, CA 91789

Test Specification

Standard..... : FCC CFR 47 PART 15 C(15.247): 2015

Test Report Form No. : LCSEMC-1.0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test Item Description : **TETRA**

Trade Mark..... : TETRA

Model/ Type reference : MK5.8

Ratings..... : AC Input: 100-240V, 50/60Hz 0.5A Output: 12V/2.5A

Micro USB input 5V/4A

Recharged Voltage: DC 12V/2.5A

Result : **Positive**

Compiled by:



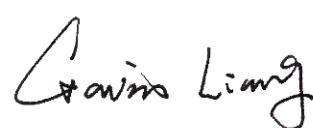
Kyle Yin / File administrators

Supervised by:



Glin Lu / Technique principal

Approved by:



Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS1511171326E	<u>January 22, 2016</u> Date of issue
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Type / Model..... : TETRA

EUT..... : MK5.8

Applicant..... : Lab42 LLC.

Address..... : 340 S LEMON AVE #3231 WALNUT, CA 91789

Telephone..... : /

Fax..... : /

Manufacturer..... : GainStrong Industry Co.,Ltd.

Address..... : 3rd Floor, 1st Building, Block E, Minzhu West Industrial Zone, Bao'an Dist., Shenzhen

Telephone..... : /

Fax..... : /

Factory..... : GainStrong Industry Co.,Ltd.

Address..... : 3rd Floor, 1st Building, Block E, Minzhu West Industrial Zone, Bao'an Dist., Shenzhen

Telephone..... : /

Fax..... : /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

TABLE OF CONTENTS

1. GENERAL INFORMATION	5
1.1. DESCRIPTION OF DEVICE (EUT)	5
1.2. SUPPORT EQUIPMENT LIST	6
1.3. EXTERNAL I/O CABLE	6
1.4. DESCRIPTION OF TEST FACILITY	6
1.5. STATEMENT OF THE MEASUREMENT UNCERTAINTY	6
1.6. MEASUREMENT UNCERTAINTY	7
1.7. DESCRIPTION OF TEST MODES	8
2. TEST METHODOLOGY	10
2.1 EUT CONFIGURATION	10
2.2 EUT EXERCISE	10
2.3 GENERAL TEST PROCEDURES	10
3. SYSTEM TEST CONFIGURATION	11
3.1. JUSTIFICATION	11
3.2. EUT EXERCISE SOFTWARE	11
3.3. SPECIAL ACCESSORIES	11
3.4. BLOCK DIAGRAM/SCHEMATICS	11
3.5. EQUIPMENT MODIFICATIONS	11
3.6. TEST SETUP	11
4. SUMMARY OF TEST RESULTS.....	12
5. SUMMARY OF TEST EQUIPMENT	13
6. TEST RESULT	14
6.1. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT	14
6.2. POWER SPECTRAL DENSITY MEASUREMENT	17
6.3. 6 dB SPECTRUM BANDWIDTH MEASUREMENT	44
6.4. OCCUPIED BANDWIDTH	97
6.5. RADIATED EMISSIONS MEASUREMENT	99
6.6. CONDUCTED SPURIOUS EMISSIONS AND BAND EDGES TEST	120
6.7. POWER LINE CONDUCTED EMISSIONS	161
7. ANTENNA REQUIREMENT	164
7.1 STANDARD APPLICABLE	164
7.2 ANTENNA CONNECTED CONSTRUCTION	164

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : TETRA
 Model Number : MK5.8
 Hardware version : MK5.8
 Software version : MK5.8V0.2
 Power Supply : AC Input: 100-240V, 50/60Hz 0.5A Output: 12V/2.5A
 Micro USB input 5V/4A
 Recharged Voltage: DC 12V/2.5A

WIFI

Frequency Range : 2412.00-2462.00MHz
 Channel Spacing : 5MHz
 Channel Number : 11 Channels for 20MHz Bandwidth
 7 Channels for 40MHz Bandwidth
 WIFI module : Module1: AR9344(Chain 0, Chain 1)
 Module2: AR9580(Chain 2, Chain 3)
 Modulation Technology : IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)
 : IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)
 IEEE 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK)
 Antenna Description : External Antenna(Chain 0), 4.0dBi(Max.) For 2.4G Band
 External Antenna(Chain 1), 4.0dBi(Max.) For 2.4G Band
 External Antenna(Chain 0+ Chain 1), 7.0dBi(Max.) For 2.4G Band
 External Antenna(Chain 2), 4.0dBi(Max.) For 2.4G Band
 External Antenna(Chain 3), 4.0dBi(Max.) For 2.4G Band
 External Antenna(Chain 2+ Chain 3), 7.0dBi(Max.) For 2.4G Band



Note: MIMO is 2x2 MIMO and it does not do 2.4 and 5GHz at the same time.

And cross polarization is not used for this device.

Additional models No.

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Remark: PCB board, structure and internal of these model(s) are the same, So no additional models were tested.

1.2. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Phihong Technology Co., Ltd	CHARGER	PSM30C-120	--	VOC

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
RJ45	1	N/A
USB Port	3	N/A
DC 12V IN Port	1	N/A

1.4. Description of Test Facility**Site Description****EMC Lab.**

: CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

Name of Firm

: Shenzhen LCS Compliance Testing Laboratory Ltd.

Site Location

: 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

1.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty	9KHz~30MHz	3.10dB	(1)
	30MHz~200MHz	2.96dB	(1)
	200MHz~1000MHz	3.10dB	(1)
	1GHz~26.5GHz	3.80dB	(1)
	26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	150kHz~30MHz	1.63dB	(1)
Power disturbance	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Description Of Test Modes

The EUT has been tested under operating condition.

The EUT was set to transmit at 100% duty cycle. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in Y position.

There are one test configurations for the pre-testing:

Configuration 1: Configured with Switching Power Adapter (Used For power supply)

For pre-testing, the input Voltage/Frequency AC 120V/60Hz and AC 240V/60Hz were used. We found that the Configuration 2(Input AC 120V/60Hz) was the worst case and used for the full test and recorded in this report.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was determined to be 802.11n(HT20) mode(Low Channel, Chain 0 + Chain 1).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was determined to be 802.11n(HT20) mode(Low Channel, Chain 0 + Chain 1).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:

802.11b Mode : 1 Mbps, DSSS.

802.11g Mode : 6 Mbps, OFDM.

802.11n Mode HT20:.MCS0, OFDM.

802.11n Mode HT40:.MCS0, OFDM.

Antenna & Bandwidth For 2.4G WIFI Part:

Antenna	Chain 0		Chain 1	
Bandwidth	20 MHz	40MHz	20 MHz	40MHz
802.11b	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
802.11g	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
802.11n(HT20)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
802.11n(HT40)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Antenna	Chain 2		Chain 3	
Bandwidth	20 MHz	40MHz	20 MHz	40MHz
802.11b	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
802.11g	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
802.11n(HT20)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
802.11n(HT40)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Channel List & Frequency

802.11b/g/n(HT20)

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
2412~2462MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	--	--

802.11n(HT40)

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
2422~2452MHz	1	--	7	2442
	2	--	8	2447
	3	2422	9	2452
	4	2427	10	--
	5	2432	11	--
	6	2437	--	--

***Note: Using a temporary antenna connector for the EUT when the conducted measurements are performed.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR PART 15C 15.207, 15.209, 15.247.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure KDB558074 D01 DTS Meas Guidance v03r03 and KDB 662911 are required to be used for this kind of FCC 15.247 digital modulation device.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209, 15.247 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table 0.8 meter above ground for below 1GHz and 1.5m for above 1GHz. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013

3. SYSTEM TEST CONFIGURATION

3.1. Justification

Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C		
FCC Rules	Description of Test	Result
§15.247(b)	Maximum Conducted Output Power	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(a)	Occupied Bandwidth	Compliant
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.207(a)	Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant

5. SUMMARY OF TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Sensor	R&S	NRV-Z51	100458	2015-06-18	2016-06-17
2	Power Sensor	R&S	NRV-Z32	10057	2015-06-18	2016-06-17
3	Power Meter	R&S	NRVS	100444	2015-06-18	2016-06-17
4	DC Filter	MPE	23872C	N/A	2015-06-18	2016-06-17
5	RF Cable	Harbour Industries	1452	N/A	2015-06-18	2016-06-17
6	SMA Connector	Harbour Industries	9625	N/A	2015-06-18	2016-06-17
7	Spectrum Analyzer	Agilent	N9020A	MY50510140	2015-10-27	2016-10-26
8	Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	2015-06-18	2016-06-17
9	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2015-06-18	2016-06-17
10	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2015-06-18	2016-06-17
11	Amplifier	SCHAFFNER	COA9231A	18667	2015-06-18	2016-06-17
12	Amplifier	Agilent	8449B	3008A02120	2015-06-18	2016-06-17
13	Amplifier	MITEQ	AMF-6F-2604 00	9121372	2015-06-18	2016-06-17
14	Loop Antenna	R&S	HFH2-Z2	860004/001	2015-06-18	2016-06-17
15	By-log Antenna	SCHWARZBEC K	VULB9163	9163-470	2015-06-18	2016-06-17
16	Horn Antenna	EMCO	3115	6741	2015-06-18	2016-06-17
17	Horn Antenna	SCHWARZBEC K	BBHA9170	BBHA9170154	2015-06-18	2016-06-17
18	RF Cable-R03m	Jye Bao	RG142	CB021	2015-06-18	2016-06-17
19	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2015-06-18	2016-06-17
20	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2015-06-18	2016-06-17
21	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	101840	2015-06-18	2016-06-17
22	Artificial Mains	ROHDE & SCHWARZ	ENV216	101288	2015-06-18	2016-06-17
23	EMI Test Software	AUDIX	E3	N/A	2015-06-18	2016-06-17
24	temporary antenna connector	LCS	LCS-RF-2015 0413	N/A	N/A	N/A

6. TEST RESULT

6.1. Maximum Conducted Output Power Measurement

6.1.1. Standard Applicable

According to §15.247(b): For systems using digital modulation in the 2400-2483.5 MHz and 5725-5850 MHz band, the limit for maximum peak conducted output power is 30dBm. The limit has to be reduced by the amount in dB that the gain of the antenna exceeds 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter peak output power.

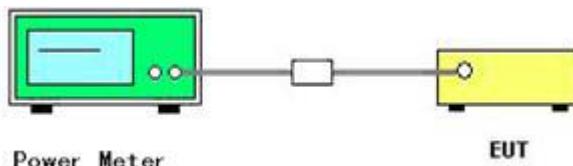
6.1.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

6.1.3. Test Procedures

The transmitter output (antenna port) was connected to the power meter.

6.1.4. Test Setup Layout



6.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

6.1.6. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidity	60%
Test Engineer	Kyle	Configurations	802.11b/g/n

802.11b

Channel	Frequency (MHz)	Conducted Peak Power (dBm)		Max. Limit (dBm)	Result
		Chain 0	Chain 1		
1	2412	25.86	25.73	30	Complies
6	2437	25.93	25.92	30	Complies
11	2462	25.80	25.71	30	Complies

Channel	Frequency (MHz)	Conducted Peak Power (dBm)		Max. Limit (dBm)	Result
		Chain 2	Chain 3		
1	2412	25.21	25.59	30	Complies
6	2437	25.31	25.61	30	Complies
11	2462	25.32	25.59	30	Complies

802.11g

Channel	Frequency (MHz)	Conducted Peak Power (dBm)		Max. Limit (dBm)	Result
		Chain 0	Chain 1		
1	2412	25.20	25.40	30	Complies
6	2437	25.43	25.21	30	Complies
11	2462	25.14	25.39	30	Complies

Channel	Frequency (MHz)	Conducted Peak Power (dBm)		Max. Limit (dBm)	Result
		Chain 2	Chain 3		
0	1	25.33	25.16	30	Complies
6	2437	25.33	25.08	30	Complies
11	2462	25.18	25.21	30	Complies

802.11n HT20

Channel	Frequency (MHz)	Conducted Power(dBm, Peak)			Max. Limit (dBm)	Result
		Chain 0	Chain 1	Chain 0+ Chain 1		
1	2412	25.45	25.10	28.29	29	Complies
6	2437	25.14	25.26	28.21	29	Complies
11	2462	25.23	25.26	28.26	29	Complies

Channel	Frequency (MHz)	Conducted Power(dBm, Peak)			Max. Limit (dBm)	Result
		Chain 2	Chain 3	Chain 2+ Chain 3		
1	2412	25.27	25.05	28.17	29	Complies
6	2437	25.03	25.24	28.15	29	Complies
11	2462	25.15	25.11	28.14	29	Complies

802.11n HT40

Channel	Frequency (MHz)	Conducted Power(dBm, Peak)			Max. Limit (dBm)	Result
		Chain 0	Chain 1	Chain 0+ Chain 1		
3	2422	24.68	24.21	27.46	29	Complies
6	2437	24.76	24.41	27.60	29	Complies
9	2452	24.60	24.88	27.75	29	Complies

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

6.2. Power Spectral Density Measurement

6.2.1. Standard Applicable

According to §15.247(e): 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.

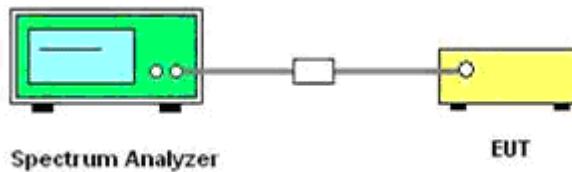
6.2.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

6.2.3. Test Procedures

1. The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2. The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3. Set the RBW = 3 kHz.
4. Set the VBW $\geq 3 \times \text{RBW}$
5. Set the span to 1.5 times the DTS channel bandwidth.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum power level in any 3 kHz band segment within the fundamental EBW.

6.2.4. Test Setup Layout



6.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

6.2.6. Test Result of Power Spectral Density

Temperature	25°C	Humidity	60%
Test Engineer	Kyle	Configurations	802.11b/g/n

802.11b

Channel	Frequency (MHz)	Power Density (dBm/3KHz)		Max. Limit (dBm/3KHz)	Result
		Chain 0	Chain 1		
1	2412	-16.174	-16.221	8	Complies
6	2437	-15.732	-15.212	8	Complies
11	2462	-15.969	-15.816	8	Complies

Channel	Frequency (MHz)	Power Density (dBm/3KHz)		Max. Limit (dBm/3KHz)	Result
		Chain 2	Chain 3		
1	2412	-24.743	-20.592	8	Complies
6	2437	-23.934	-20.551	8	Complies
11	2462	-24.401	-20.792	8	Complies

802.11g

Channel	Frequency (MHz)	Power Density (dBm/3KHz)		Max. Limit (dBm/3KHz)	Result
		Chain 0	Chain 1		
1	2412	-17.893	-16.370	8	Complies
6	2437	-16.079	-16.433	8	Complies
11	2462	-17.157	-16.943	8	Complies

Channel	Frequency (MHz)	Power Density (dBm/3KHz)		Max. Limit (dBm/3KHz)	Result
		Chain 2	Chain 3		
1	2412	-26.334	-22.971	8	Complies
6	2437	-25.495	-22.189	8	Complies
11	2462	-25.984	-22.295	8	Complies

802.11n HT20

Channel	Frequency (MHz)	Power Density (dBm/3KHz)			Max. Limit (dBm/3KHz)	Result
		Chain 0	Chain 1	Chain 0+ Chain 1		
1	2412	-17.029	-16.625	-13.812	8	Complies
6	2437	-16.292	-15.864	-13.062	8	Complies
11	2462	-17.288	-16.007	-13.590	8	Complies

Channel	Frequency (MHz)	Power Density (dBm/3KHz)			Max. Limit (dBm/3KHz)	Result
		Chain 2	Chain 3	Chain 2+ Chain 3		
1	2412	-25.704	-23.335	-21.350	8	Complies
6	2437	-26.063	-23.177	-21.374	8	Complies
11	2462	-25.690	-23.012	-21.137	8	Complies

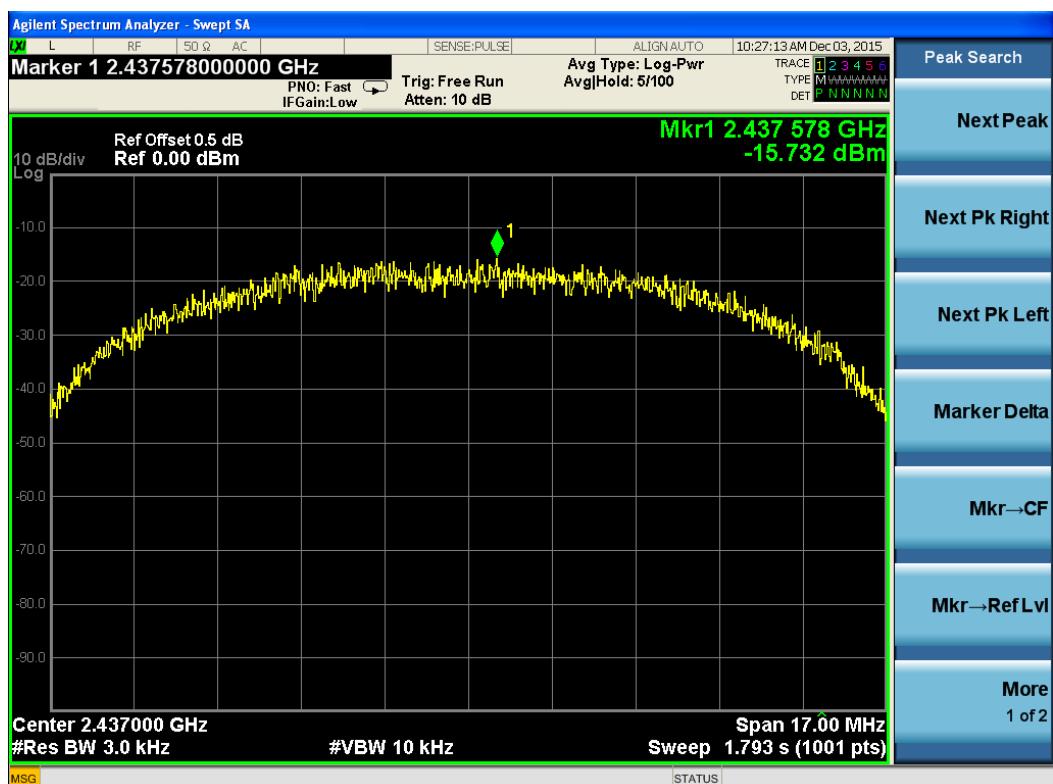
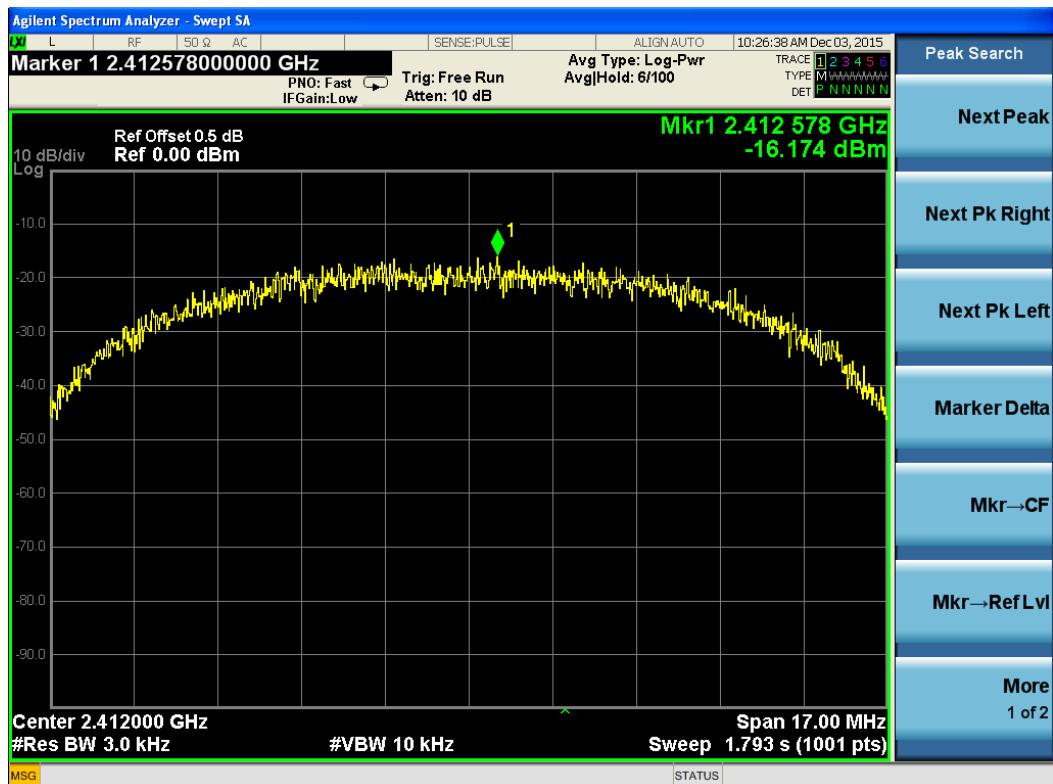
802.11n HT40

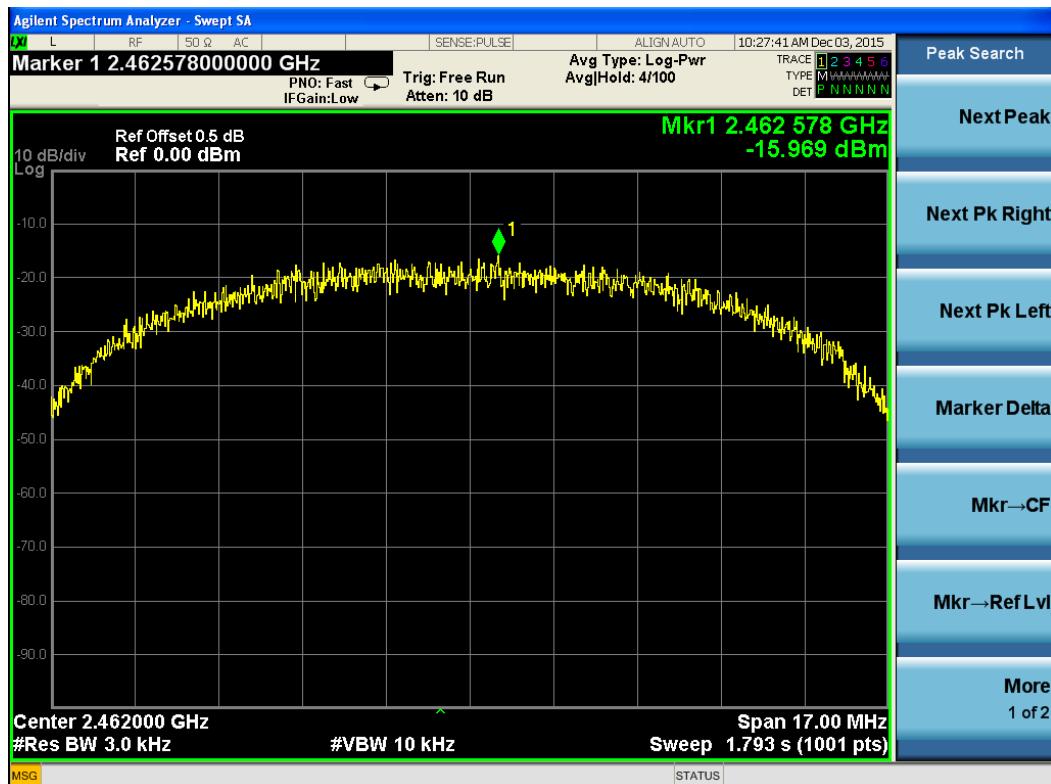
Channel	Frequency (MHz)	Power Density (dBm/3KHz)			Max. Limit (dBm/3KHz)	Result
		Chain 0	Chain 1	Chain 0+ Chain 1		
3	2422	-19.022	-20.255	-16.585	8	Complies
6	2437	-19.572	-19.409	-16.479	8	Complies
9	2452	-19.998	-19.758	-16.866	8	Complies

Channel	Frequency (MHz)	Power Density (dBm/3KHz)			Max. Limit (dBm/3KHz)	Result
		Chain 2	Chain 3	Chain 2+ Chain 3		
3	2422	-30.407	-27.324	-25.587	8	Complies
6	2437	-29.298	-27.536	-25.318	8	Complies
9	2452	-29.504	-27.225	-25.206	8	Complies

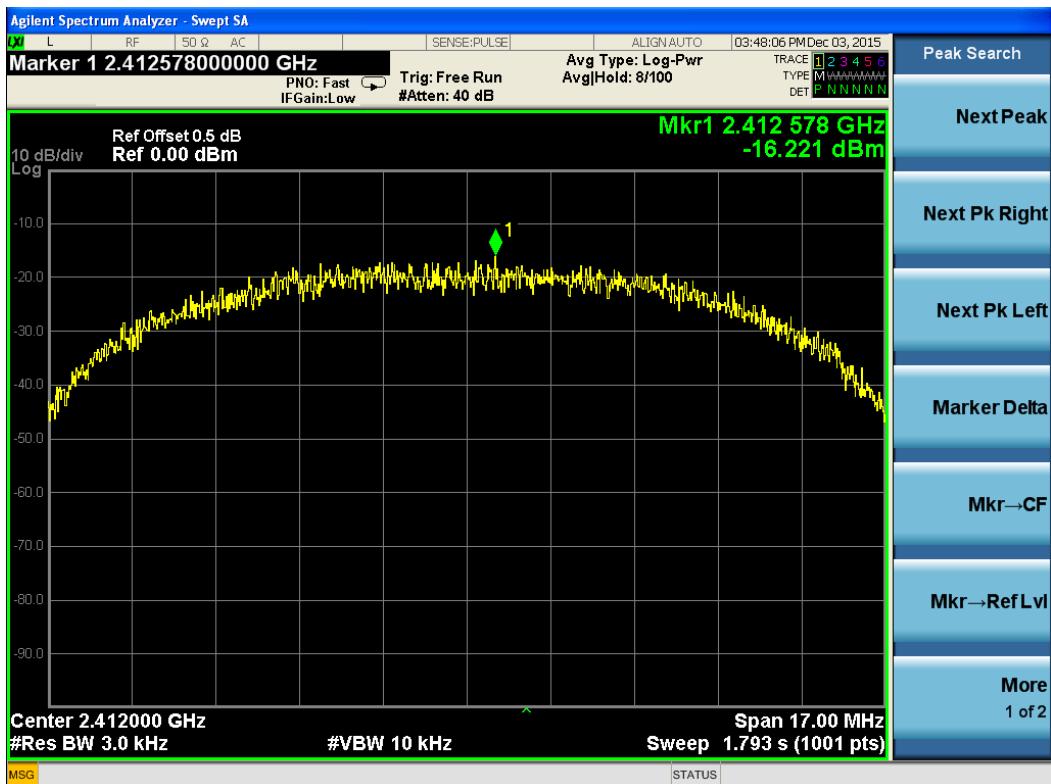
Note: The measured power density (dBm) has the offset with cable loss already.

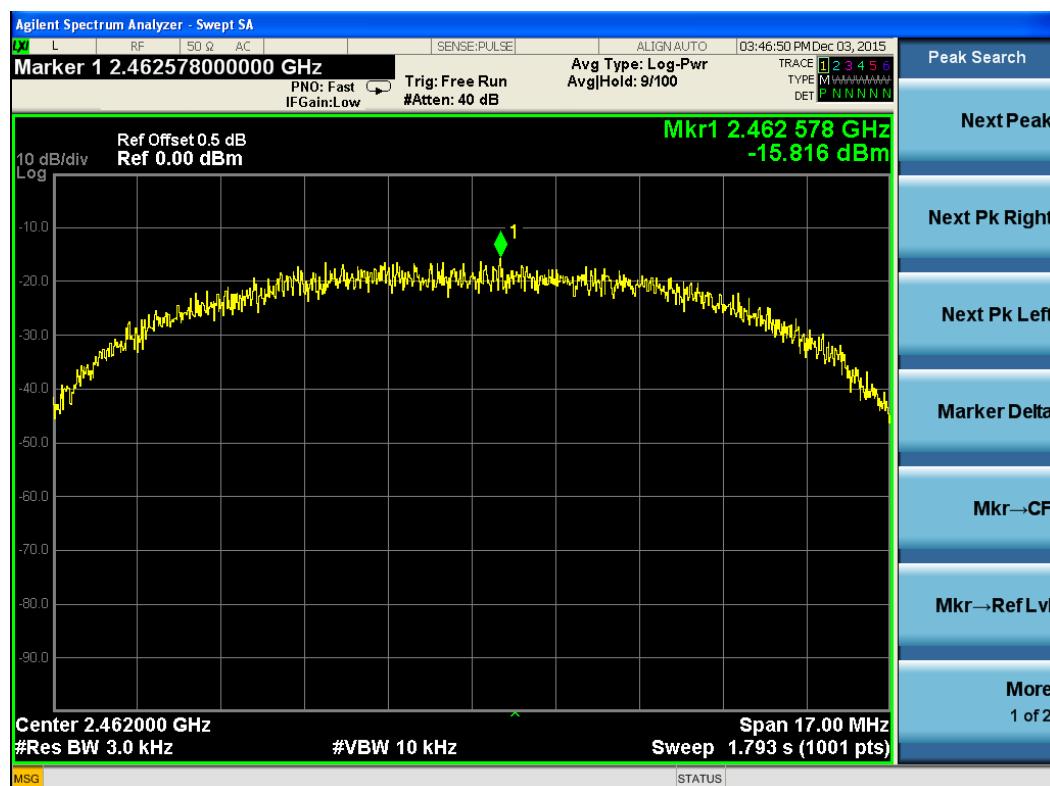
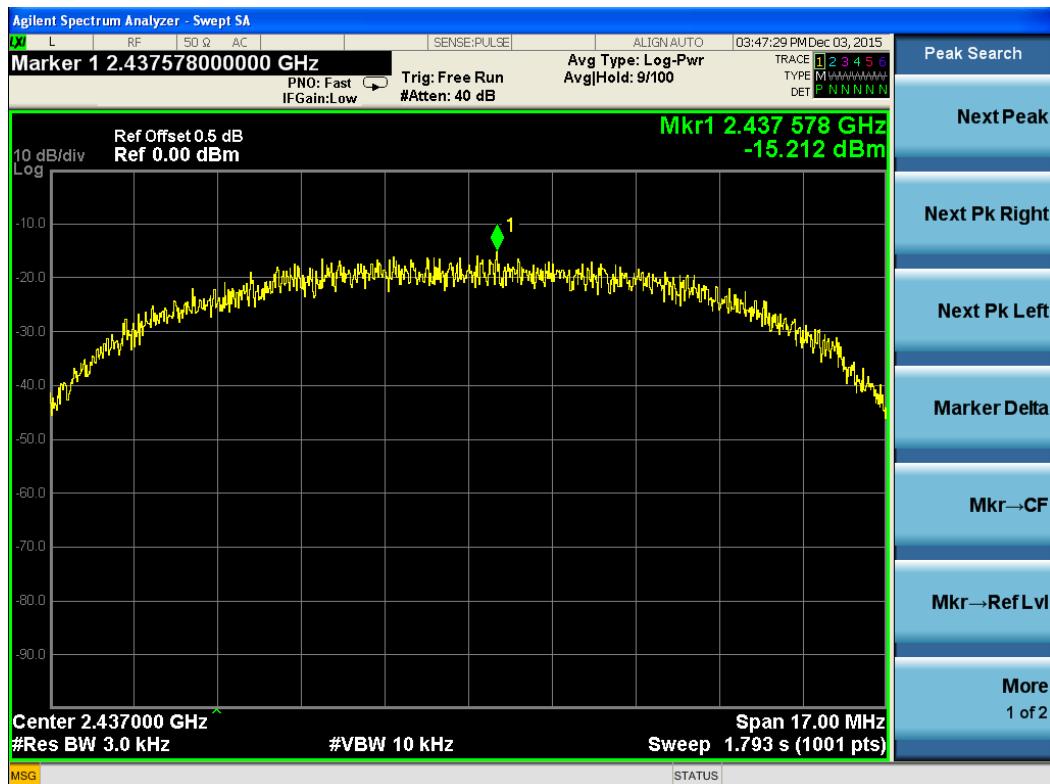
802.11b power density/ Chain 0



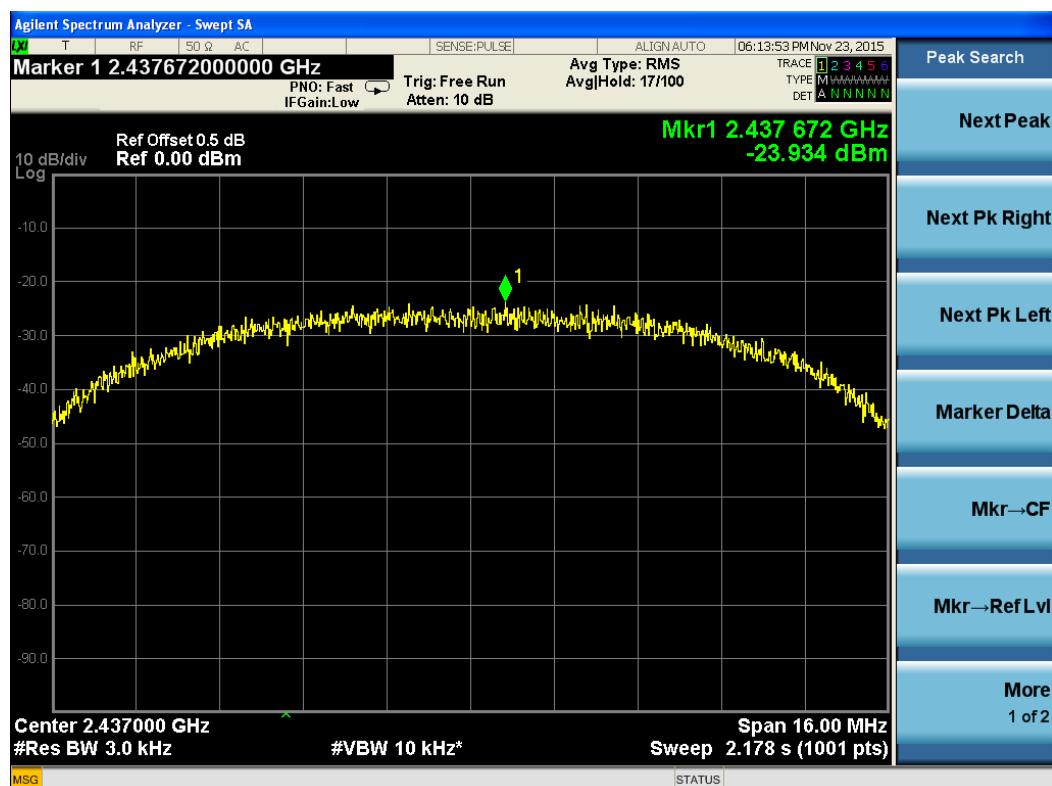


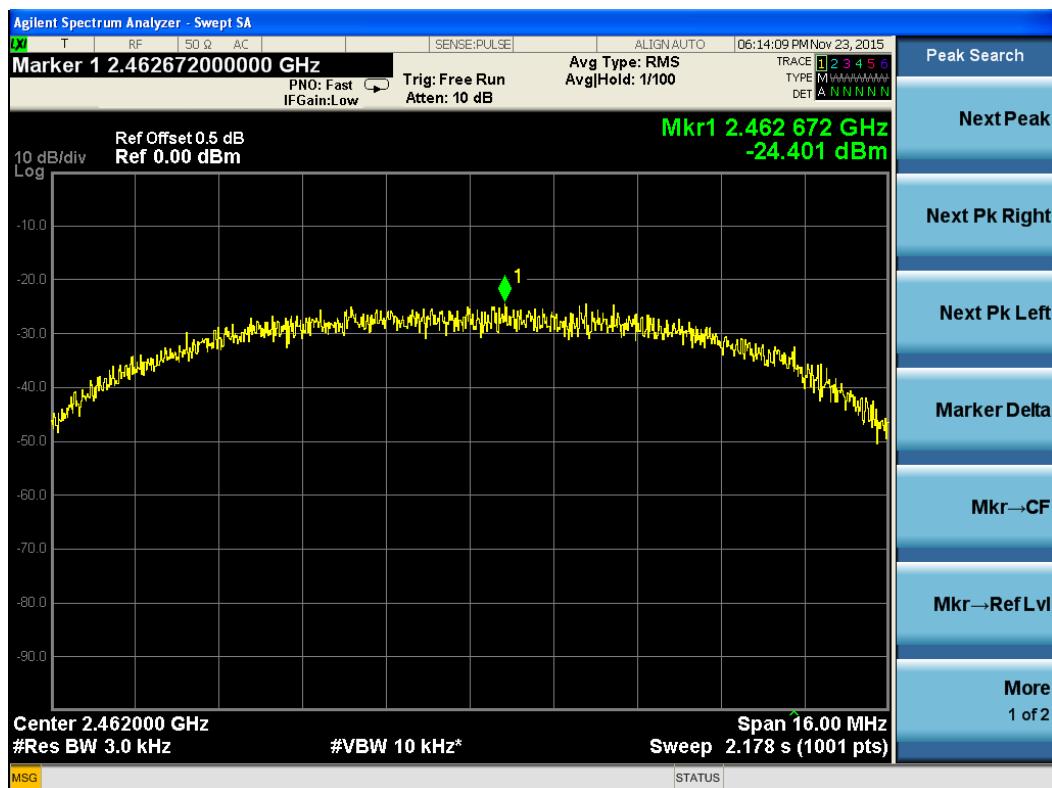
802.11b power density/ Chain 1





802.11b power density/ Chain 2



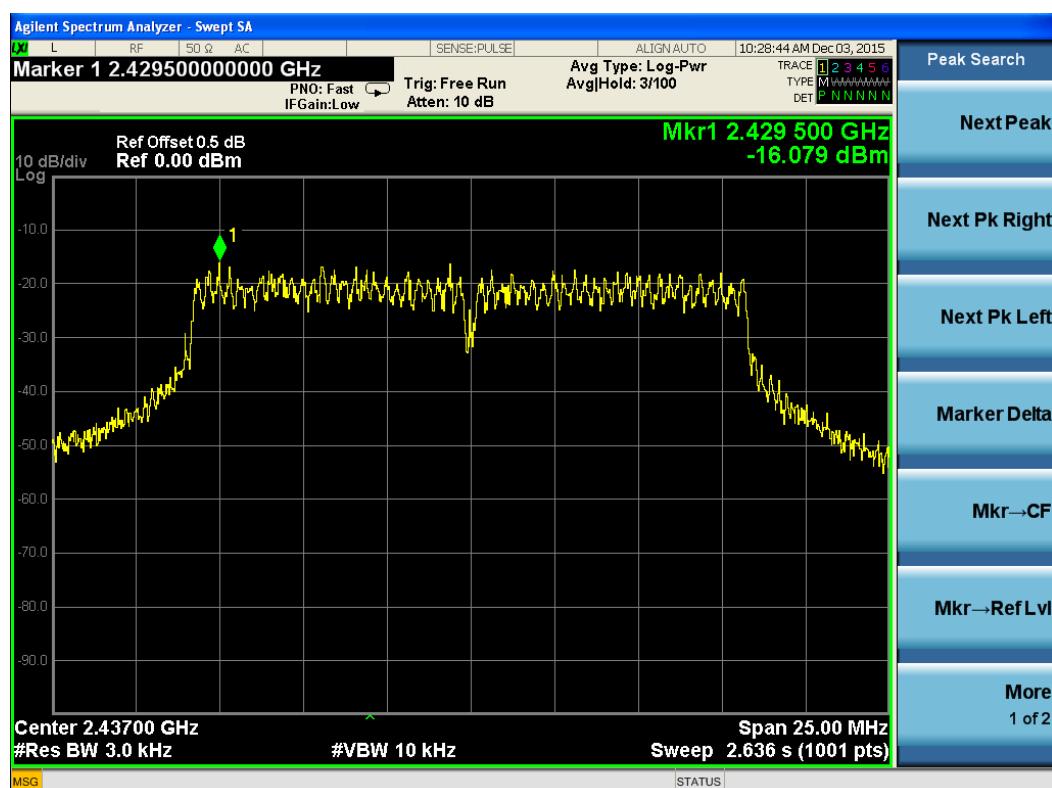
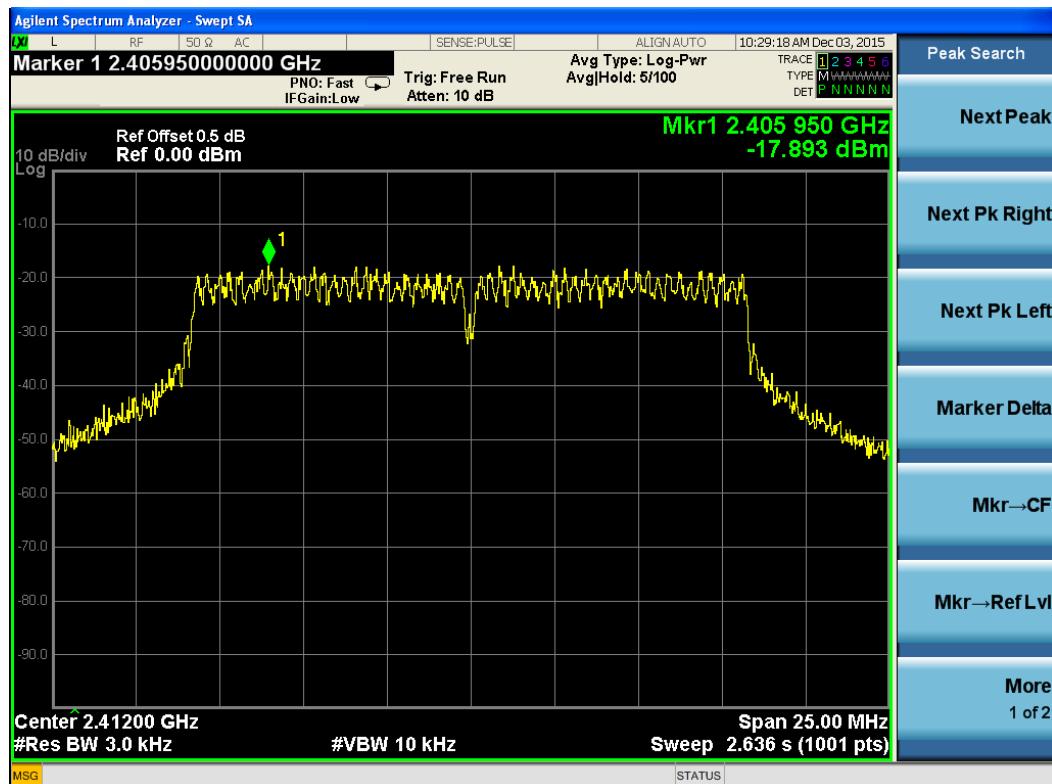


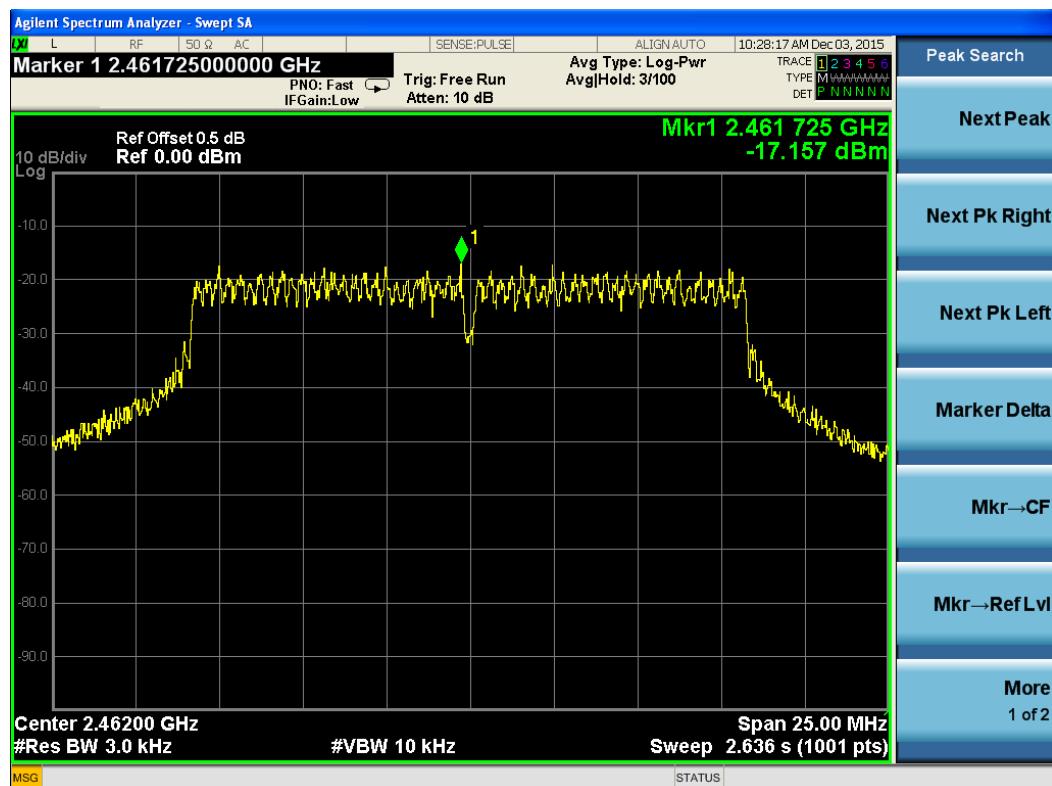
802.11b power density/ Chain 3



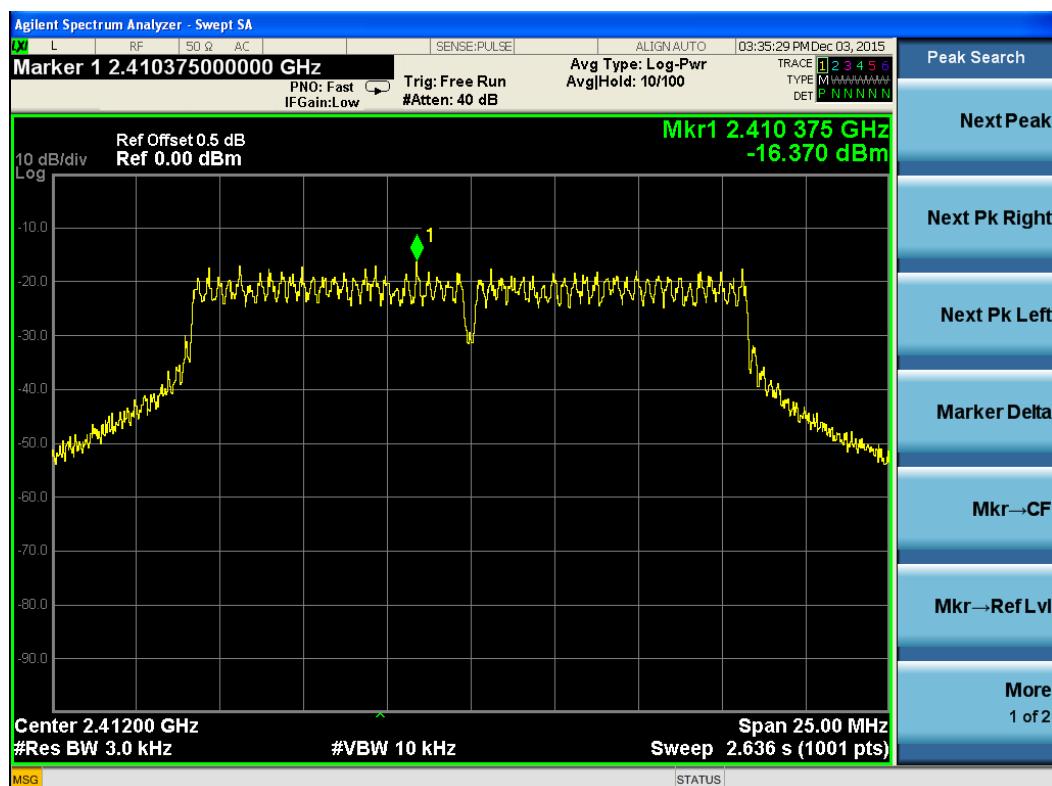


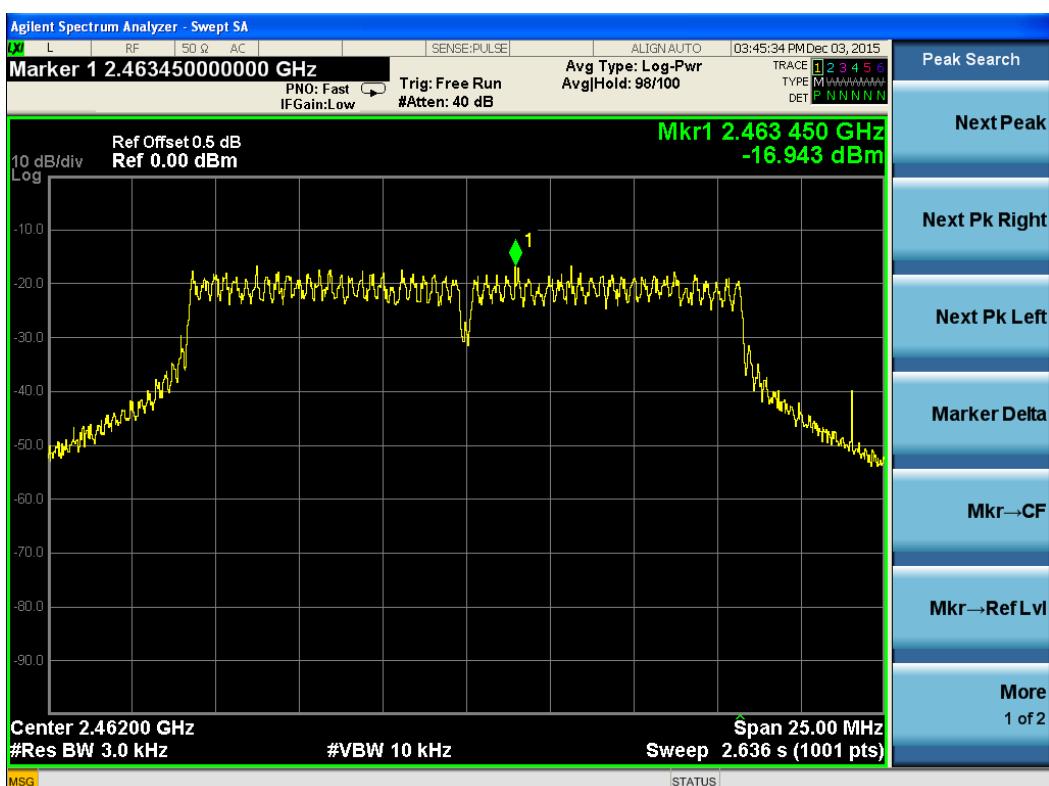
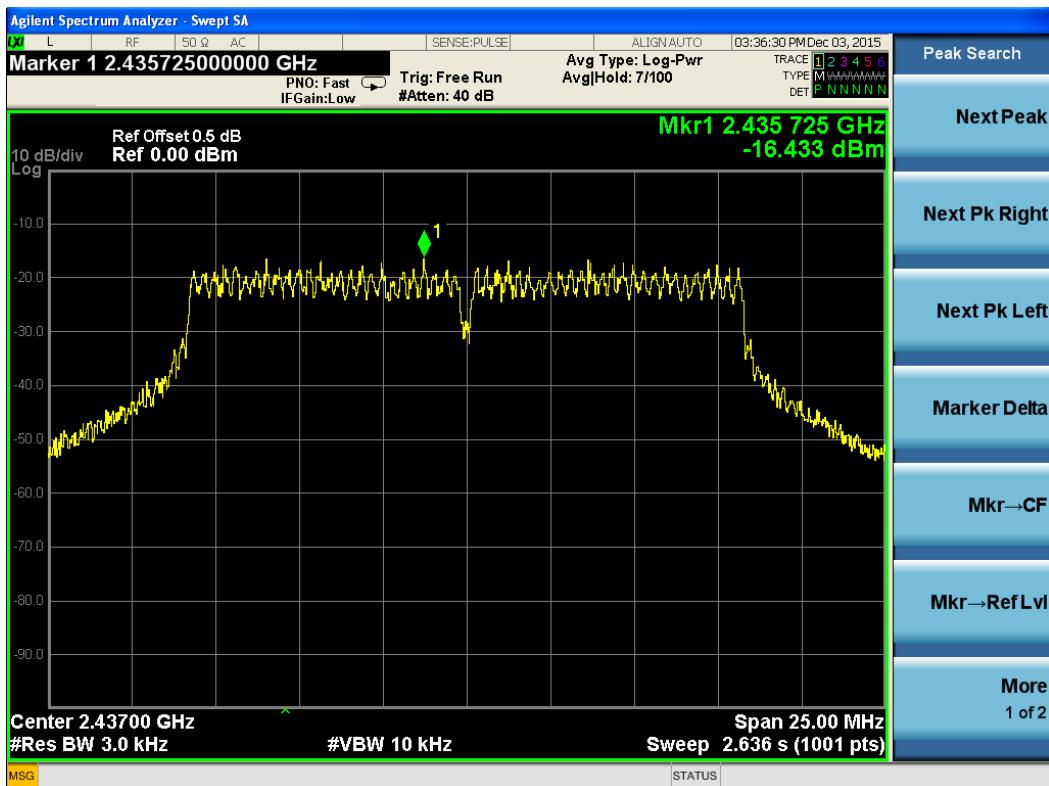
802.11g power density/ Chain 0



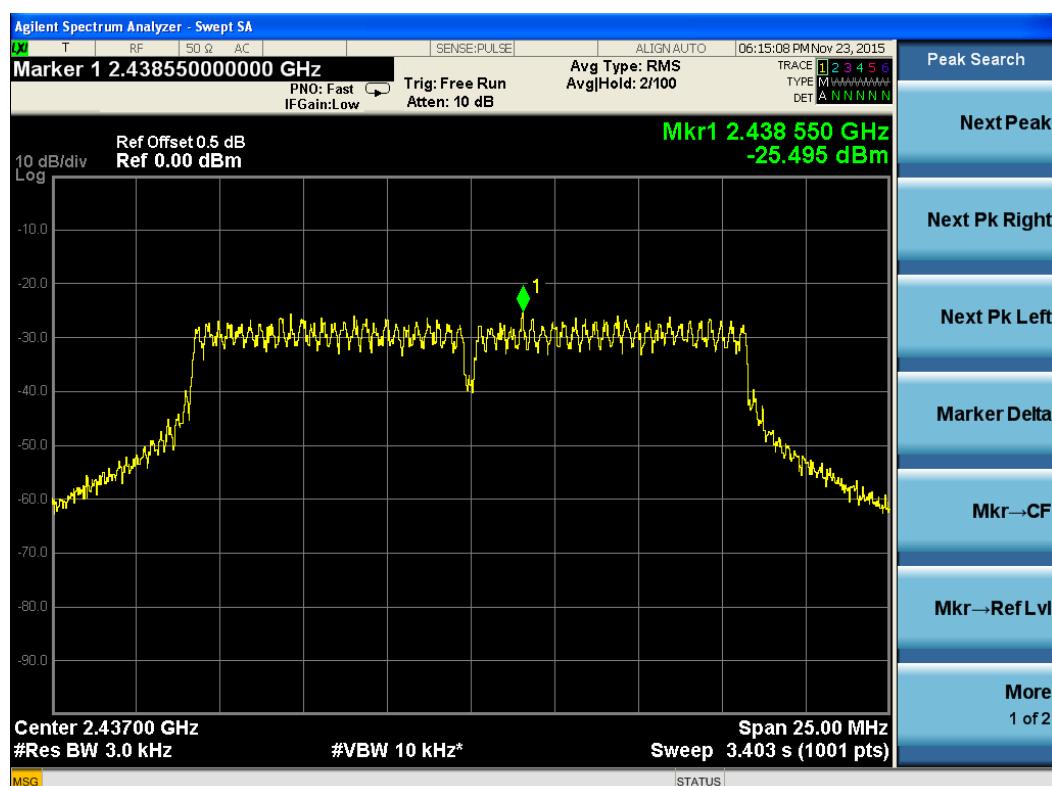
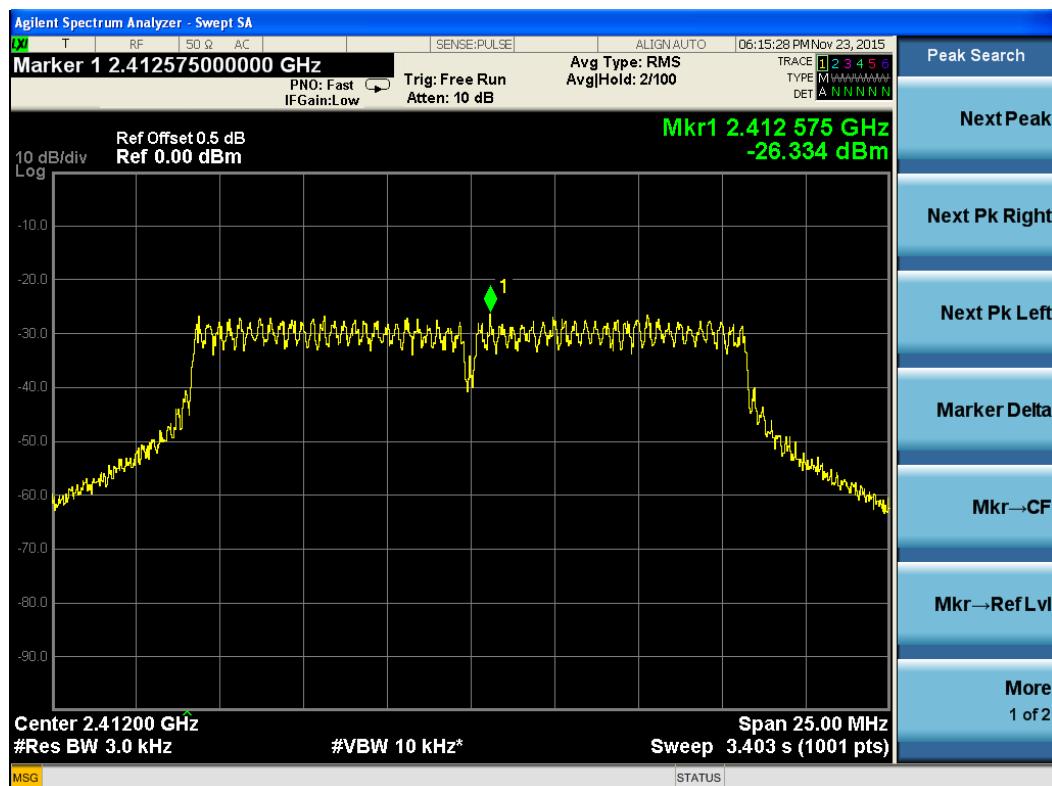


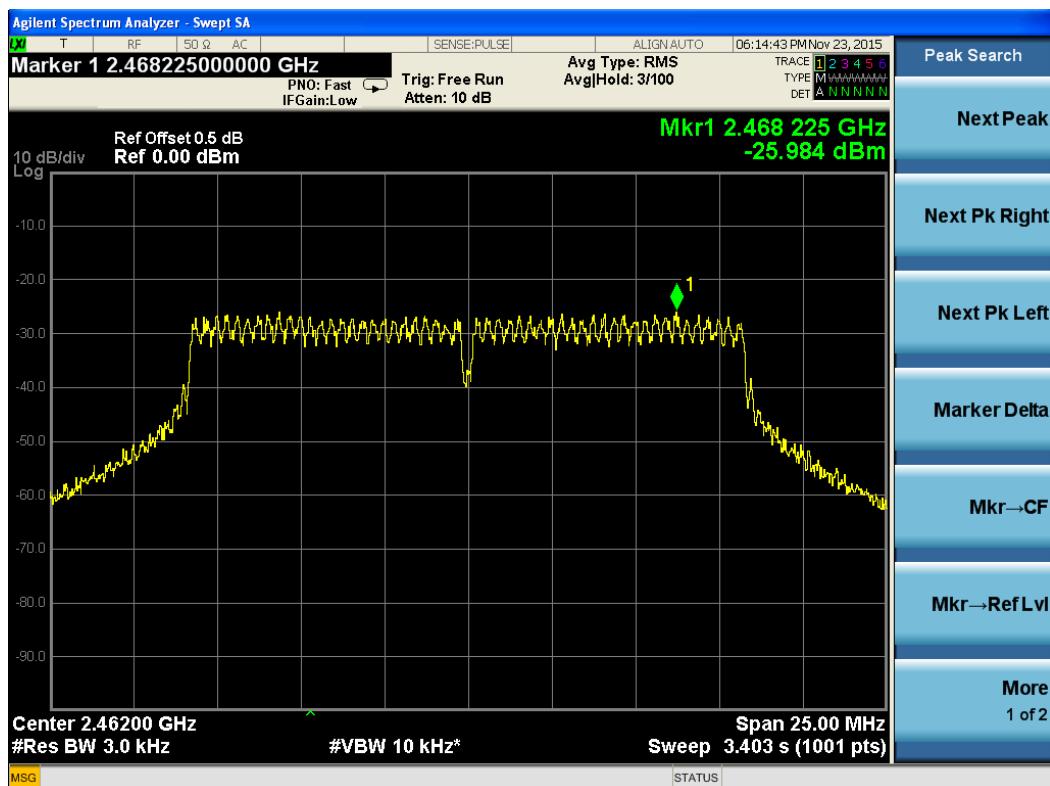
802.11g power density/ Chain 1



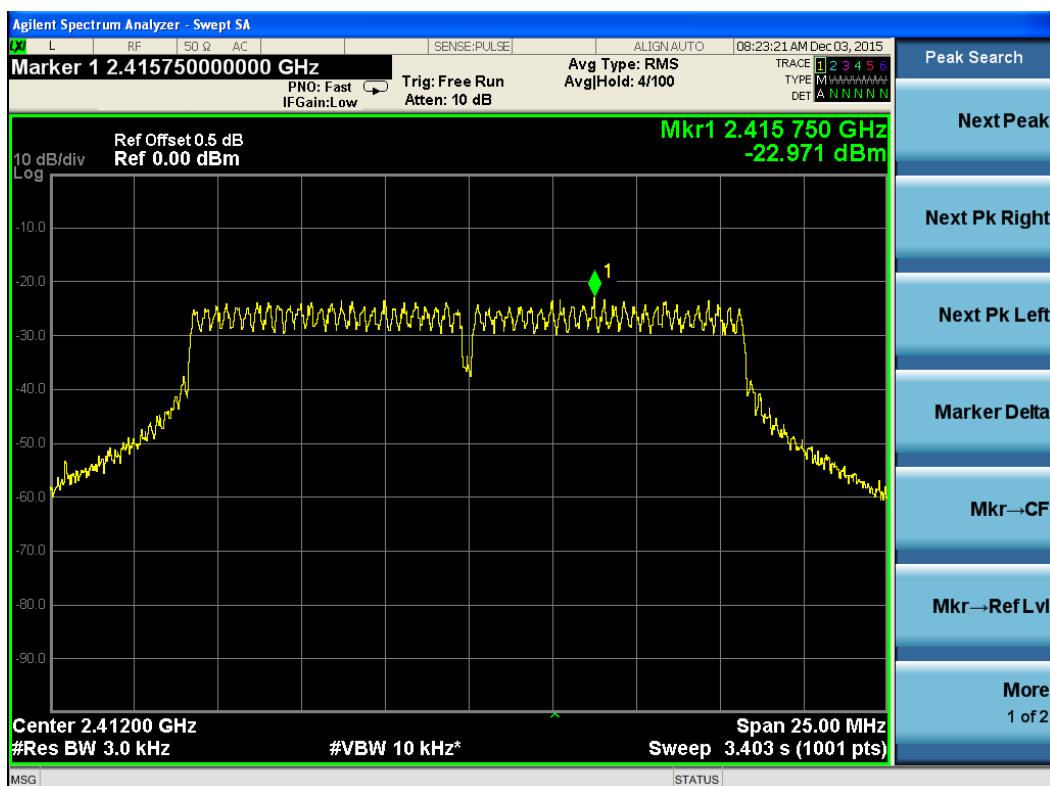


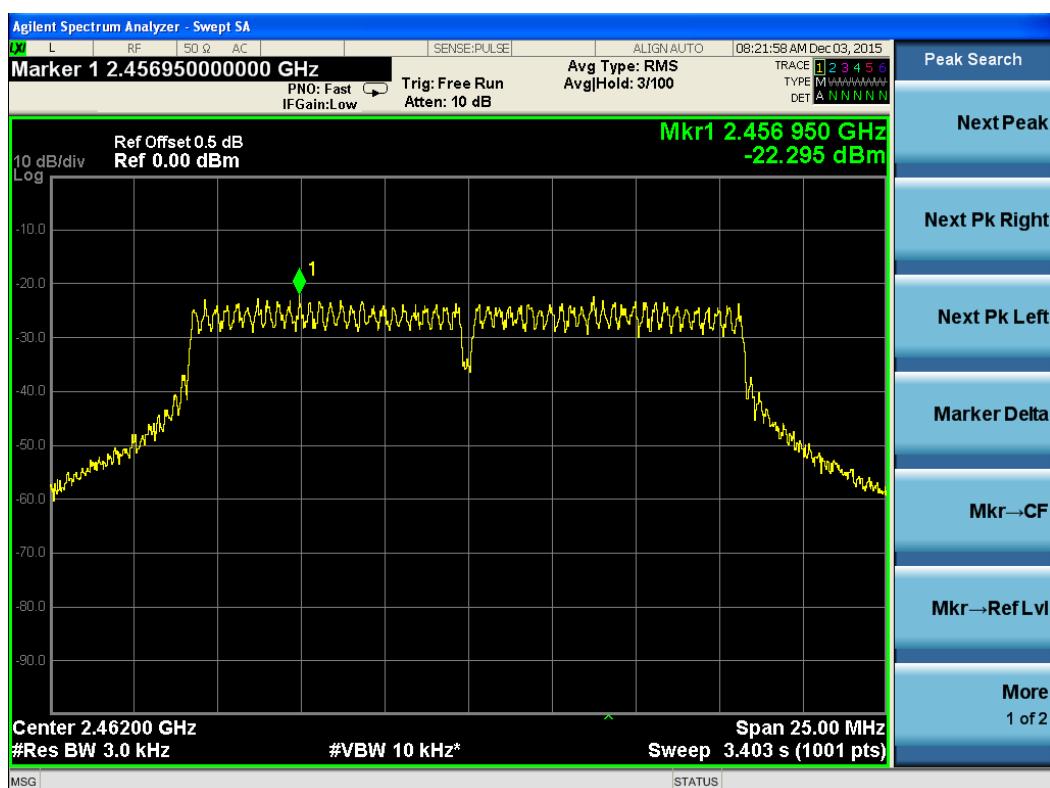
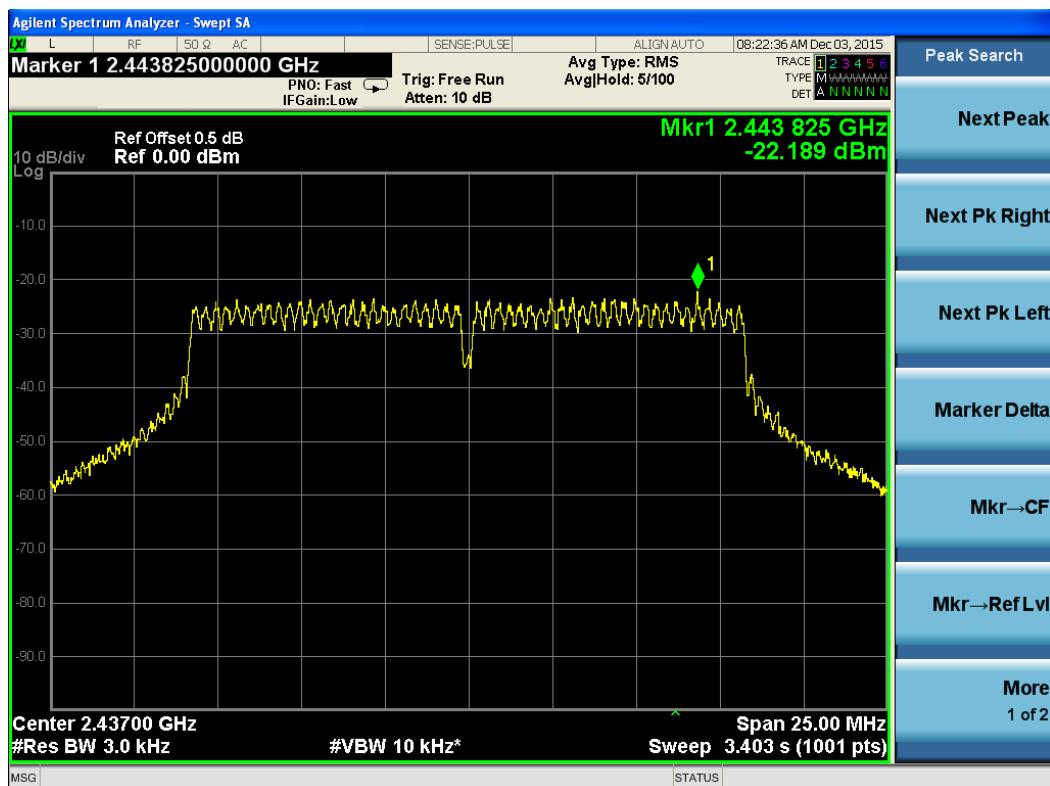
802.11g power density/ Chain 2



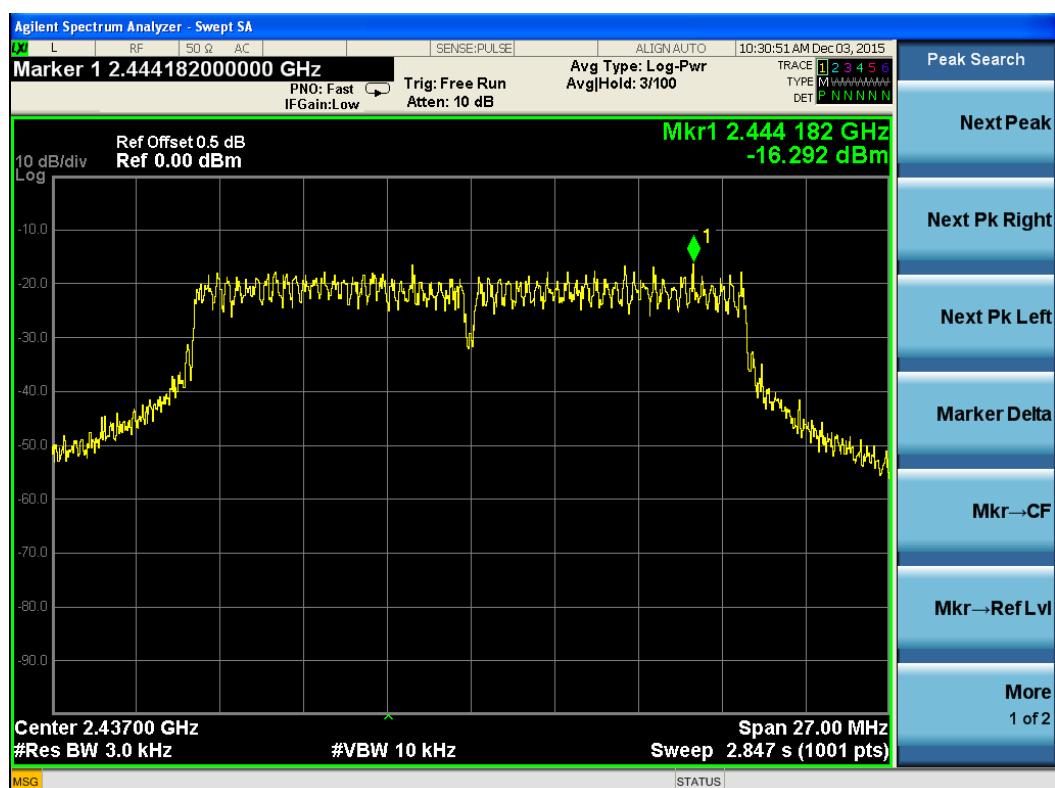
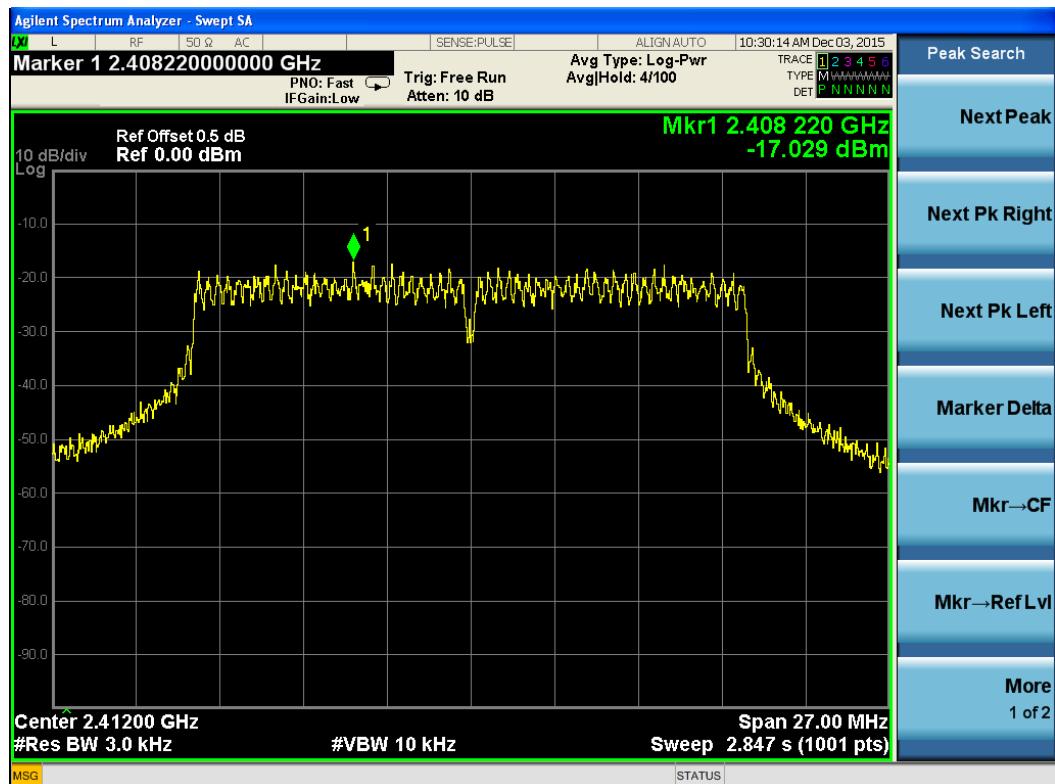


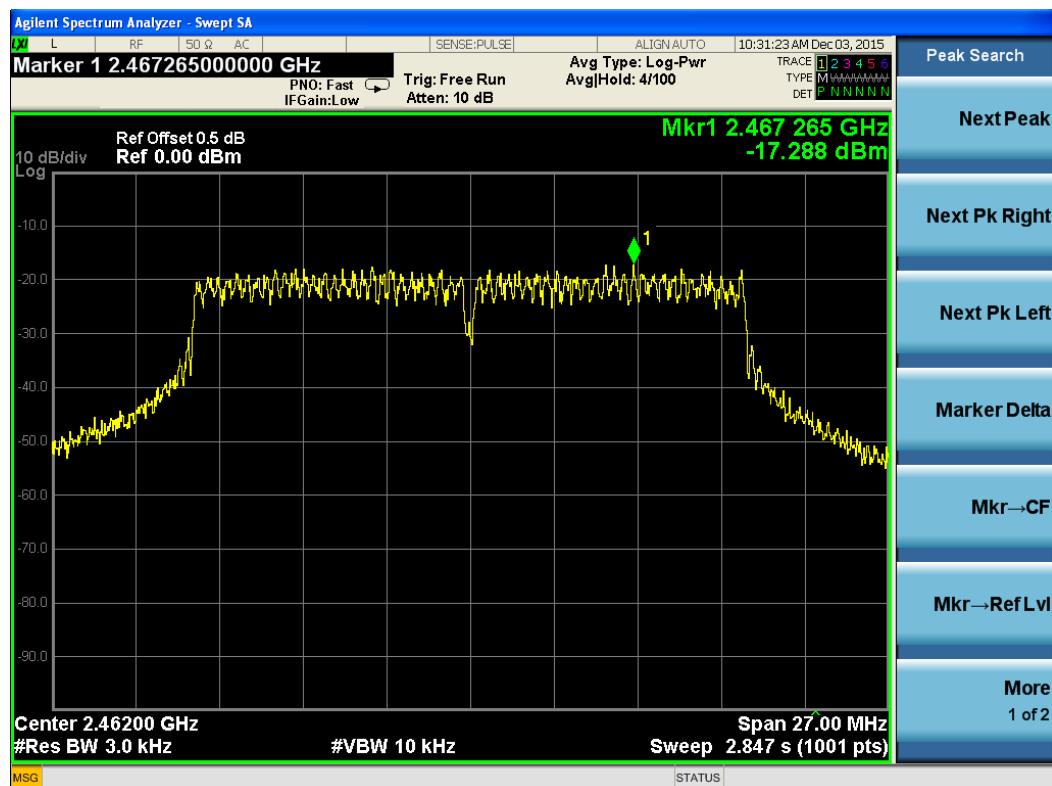
802.11g power density / Chain 3



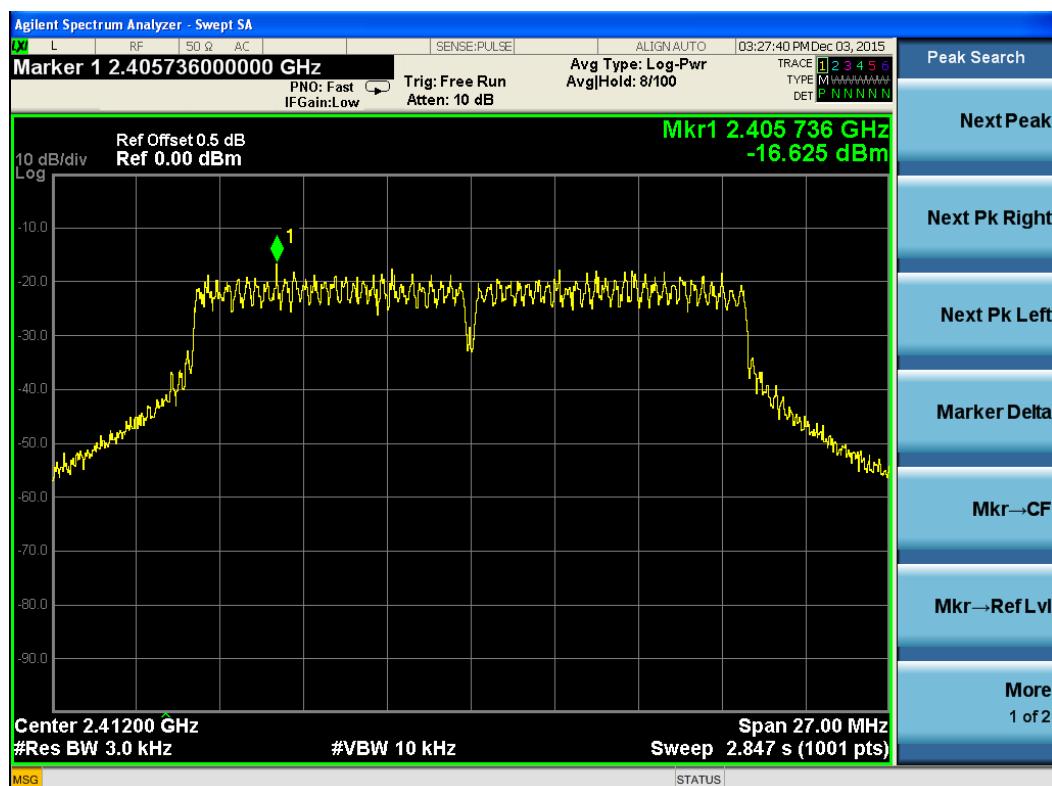


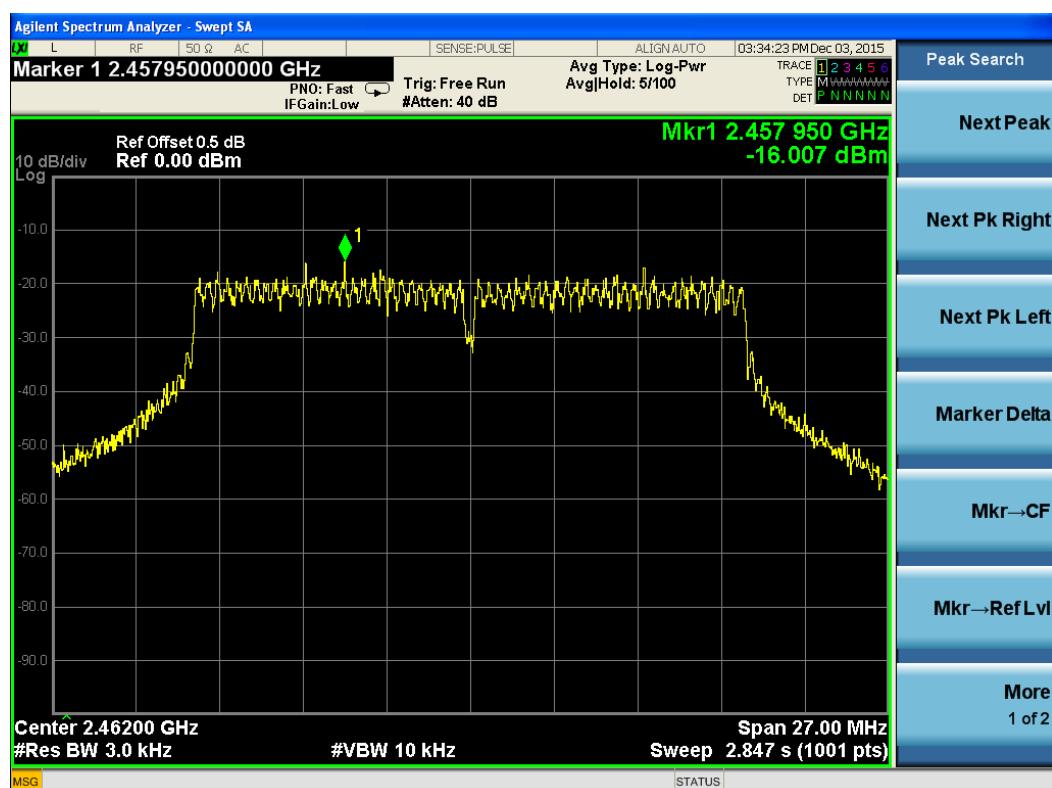
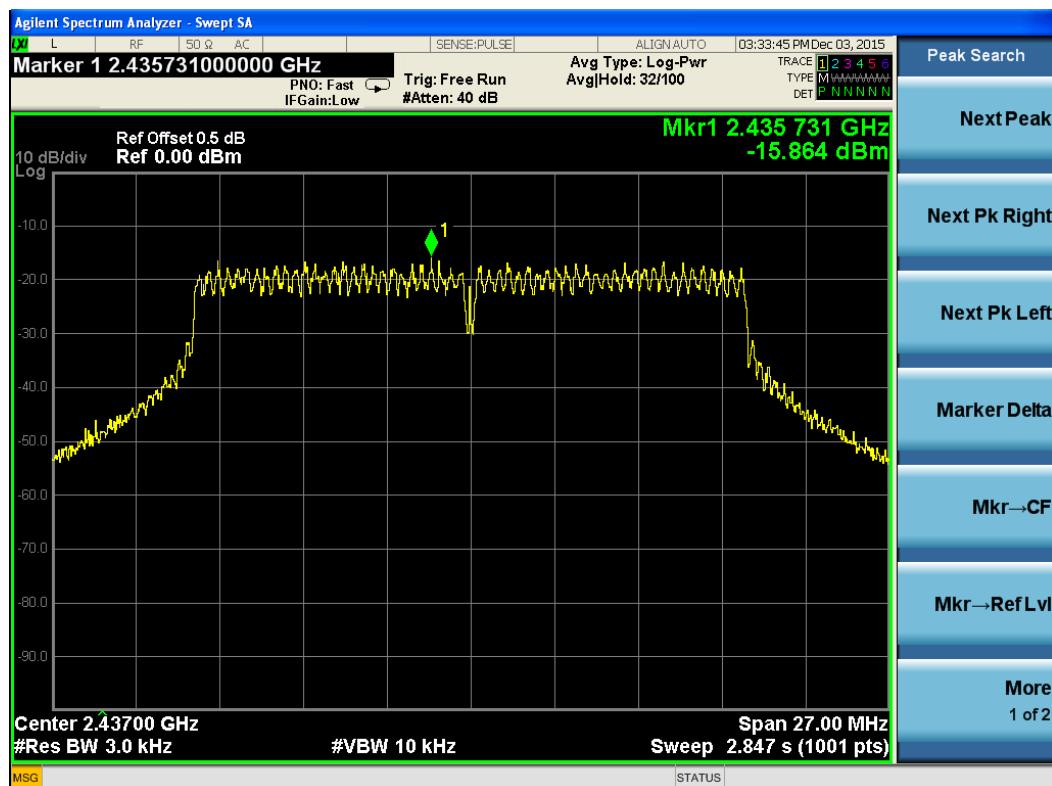
802.11n HT20 power density / Chain 0



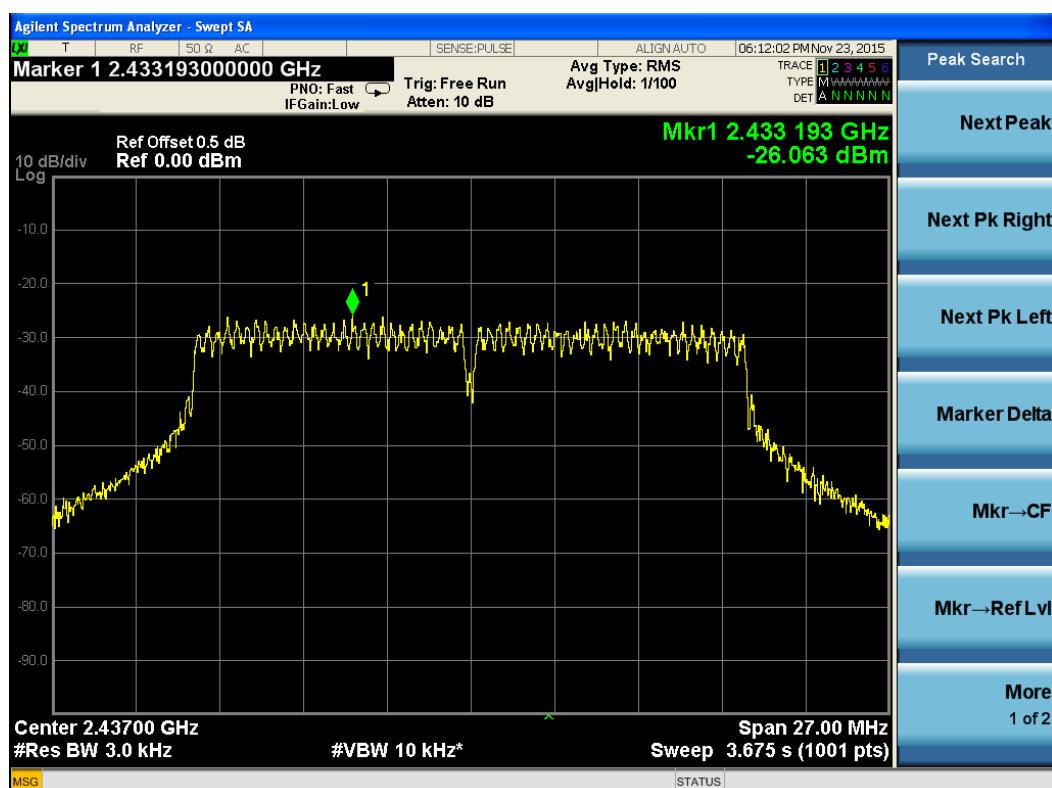
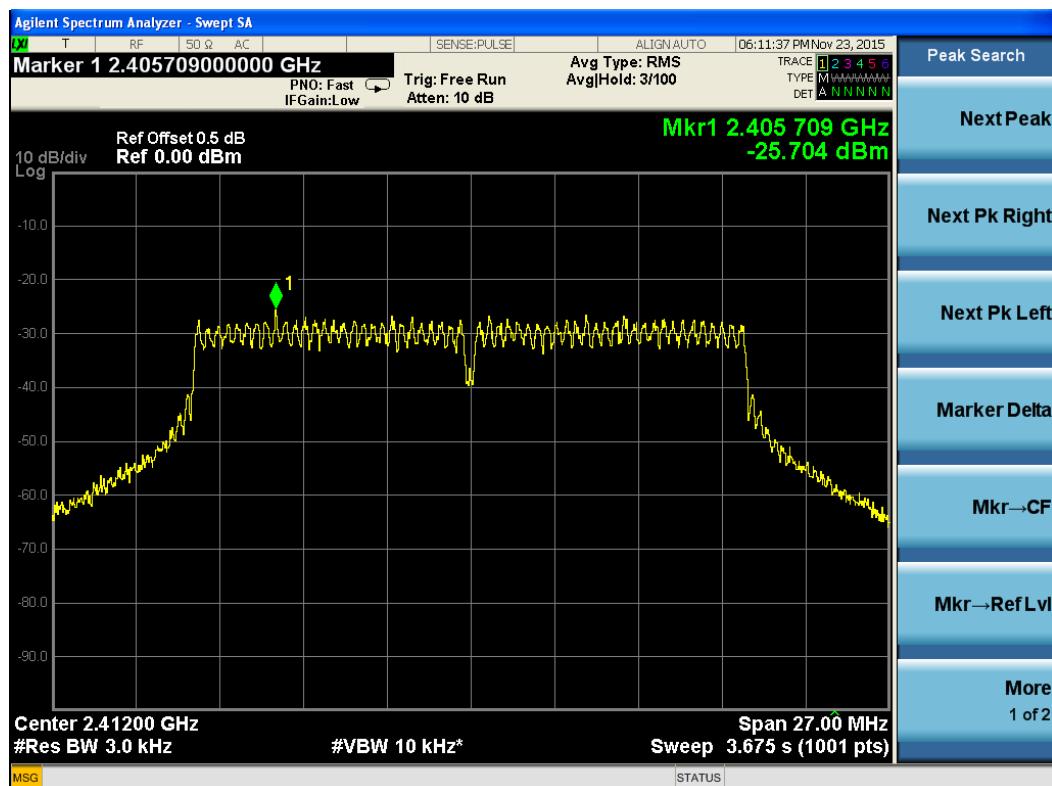


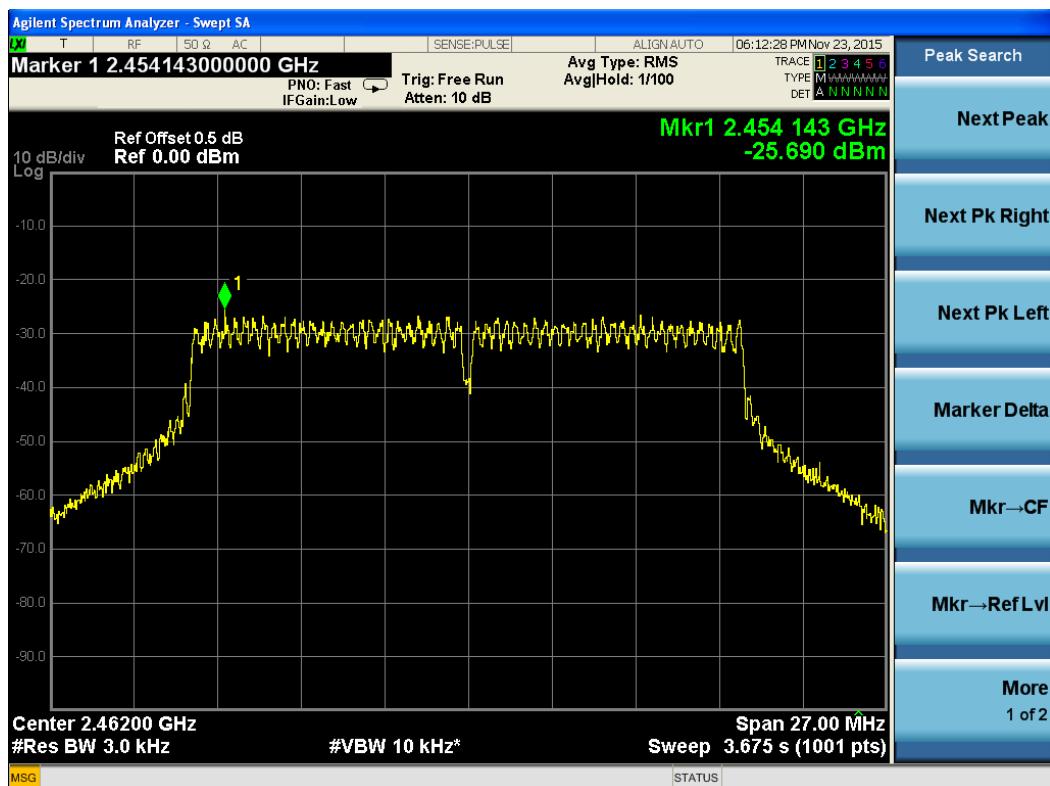
802.11n HT20 power density / Chain 1



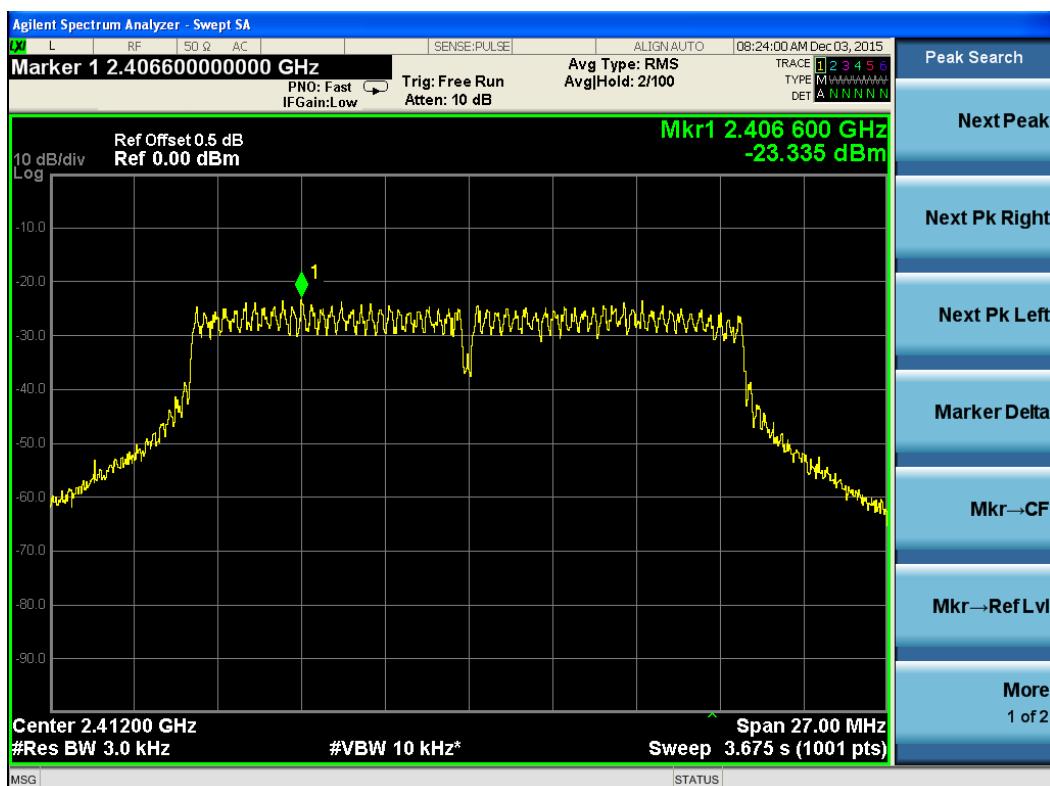


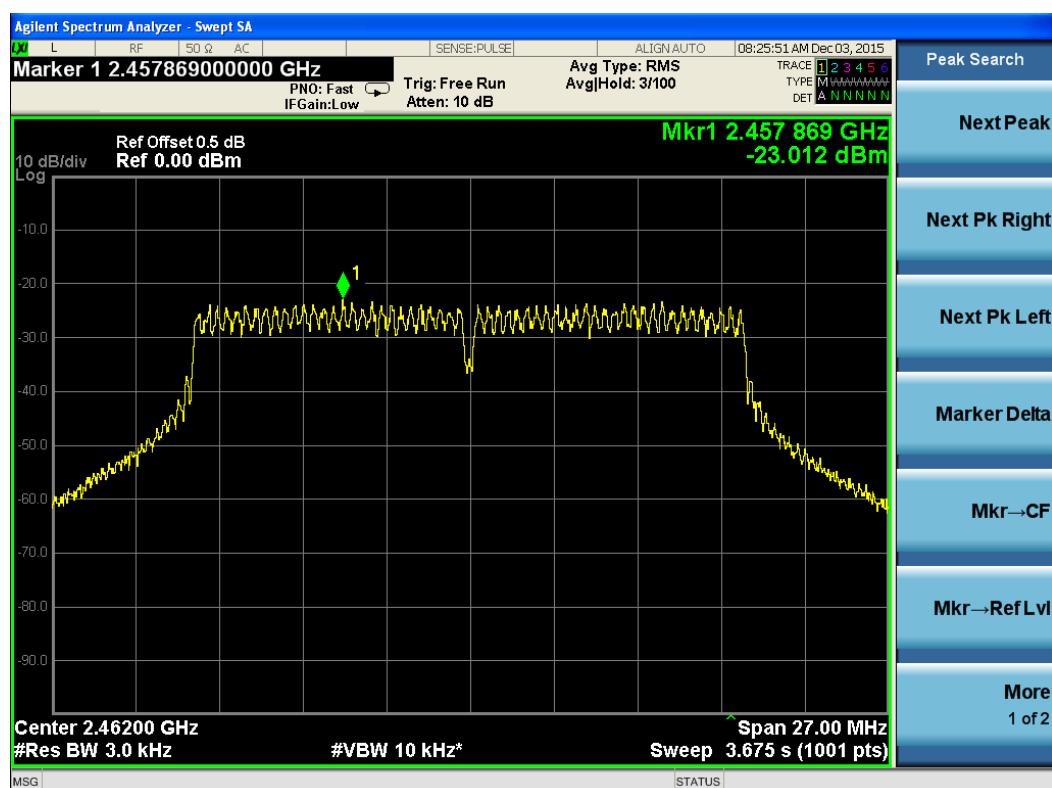
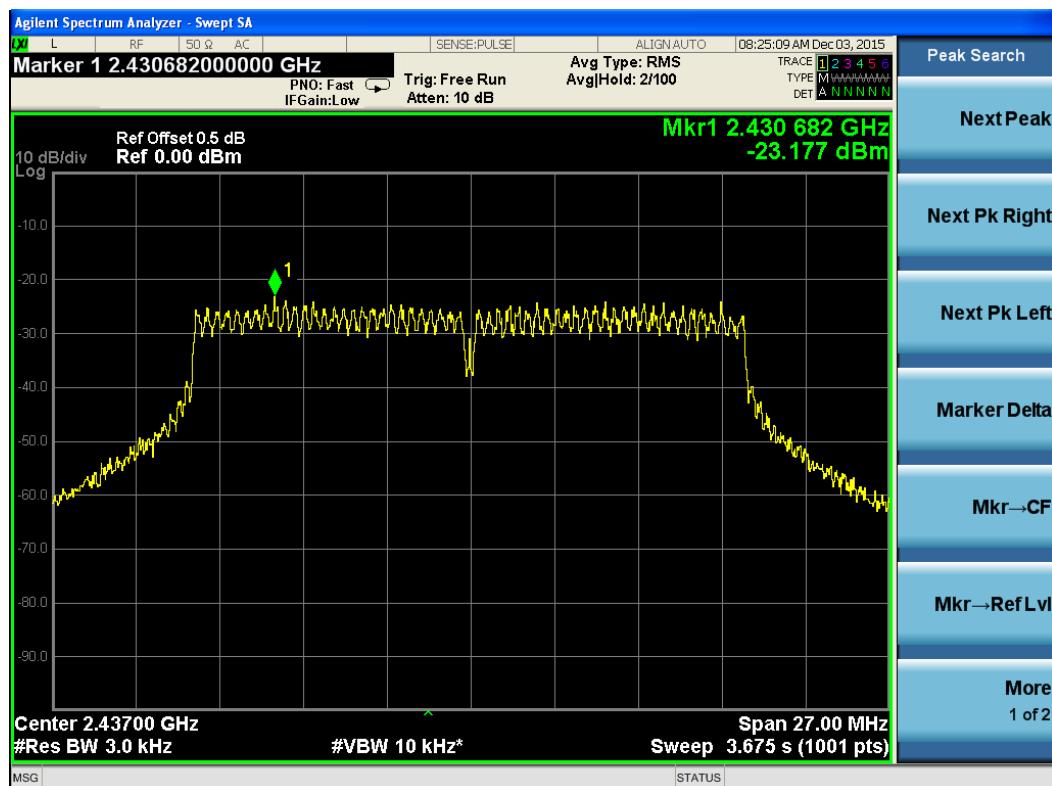
802.11n HT20 power density / Chain 2



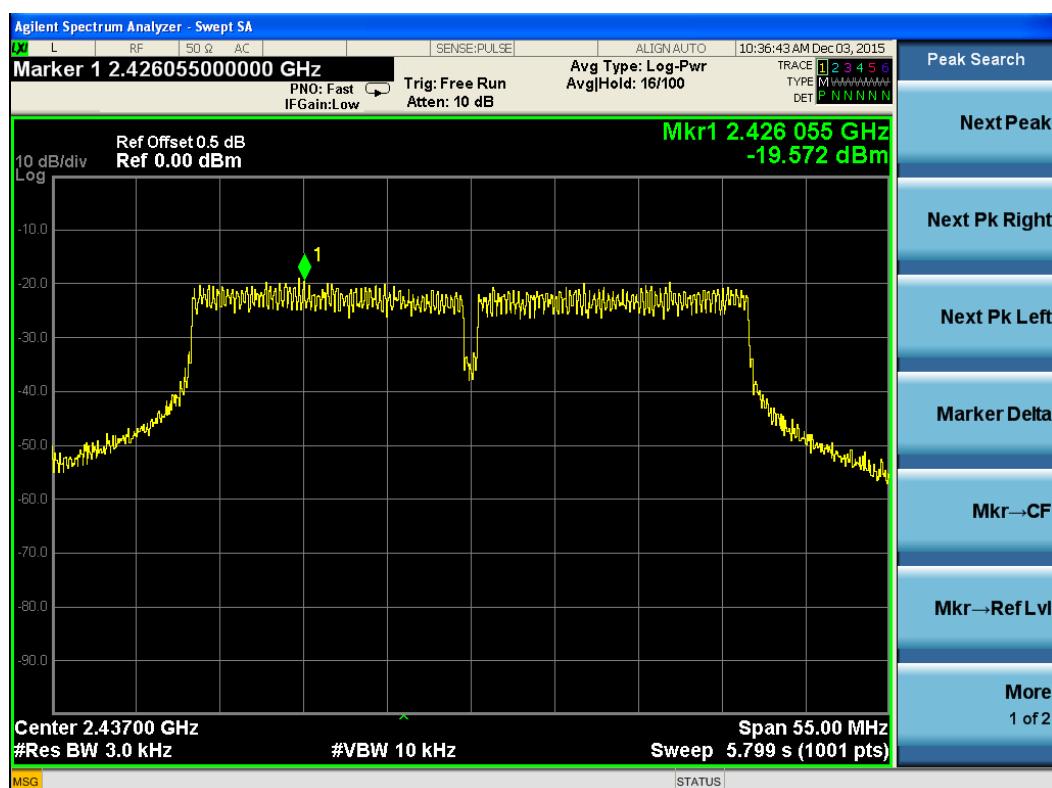
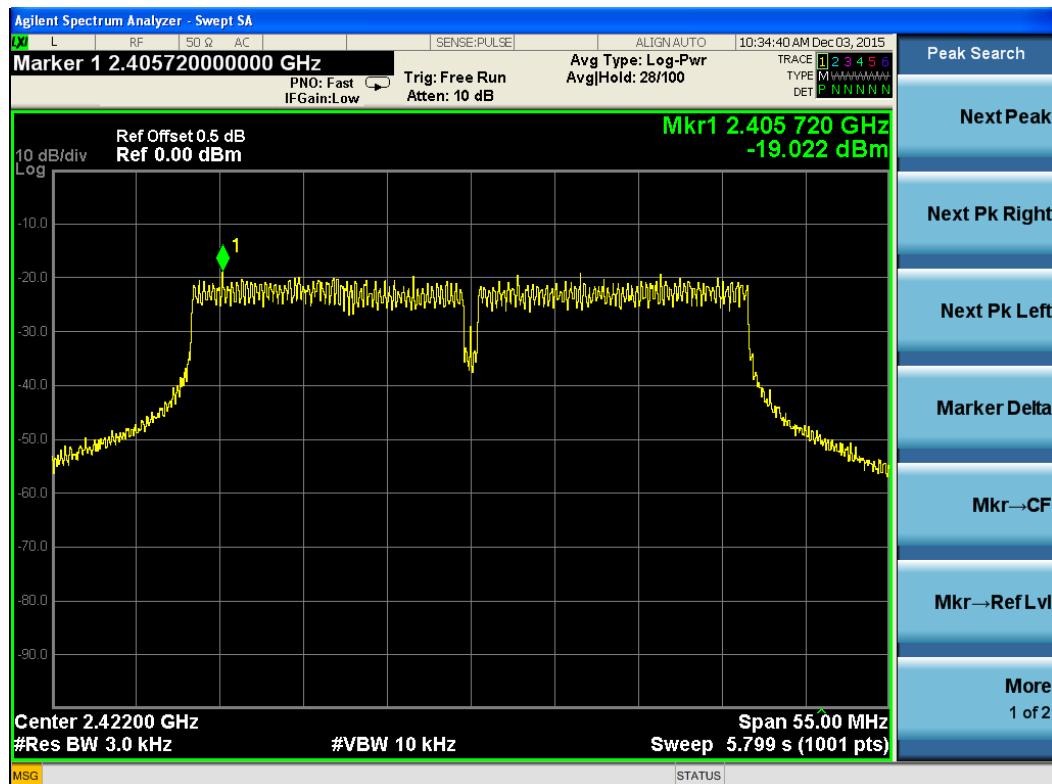


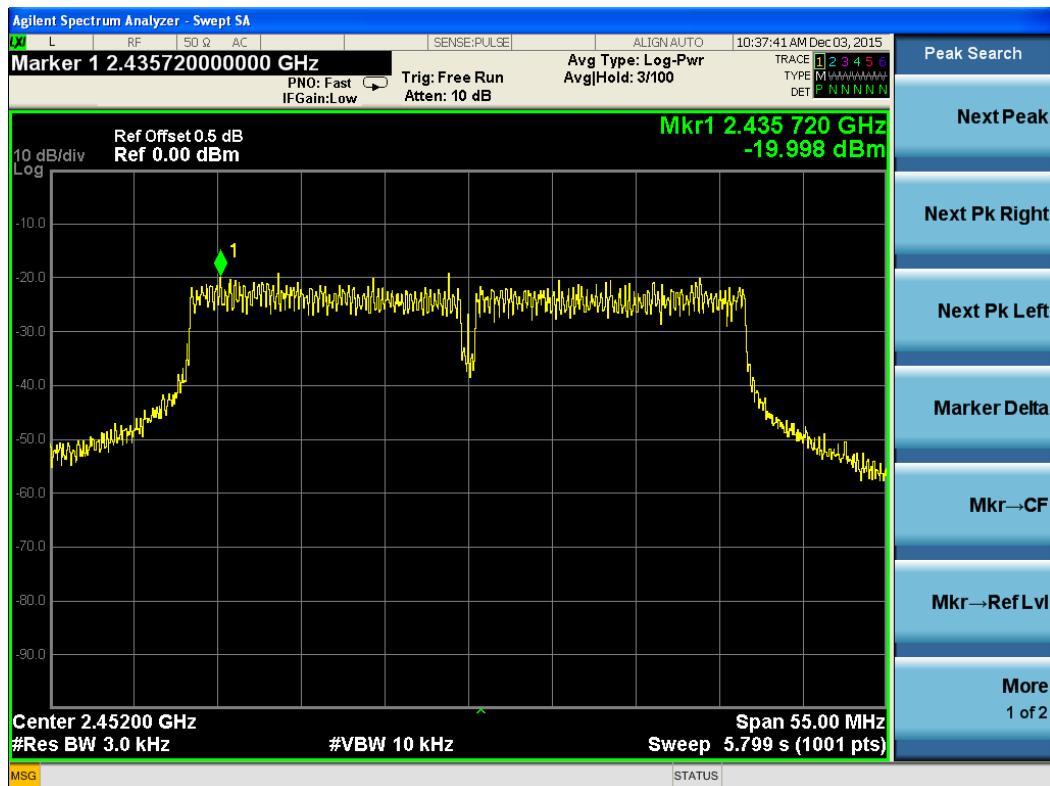
802.11n HT20 power density / Chain 3





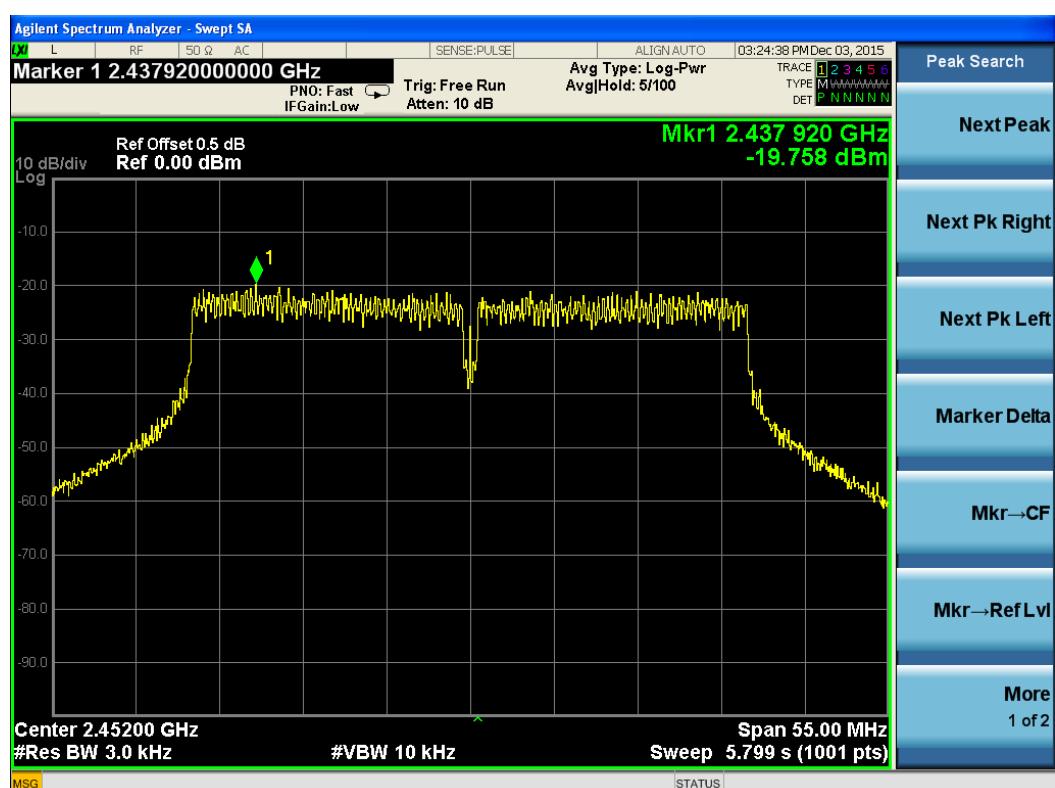
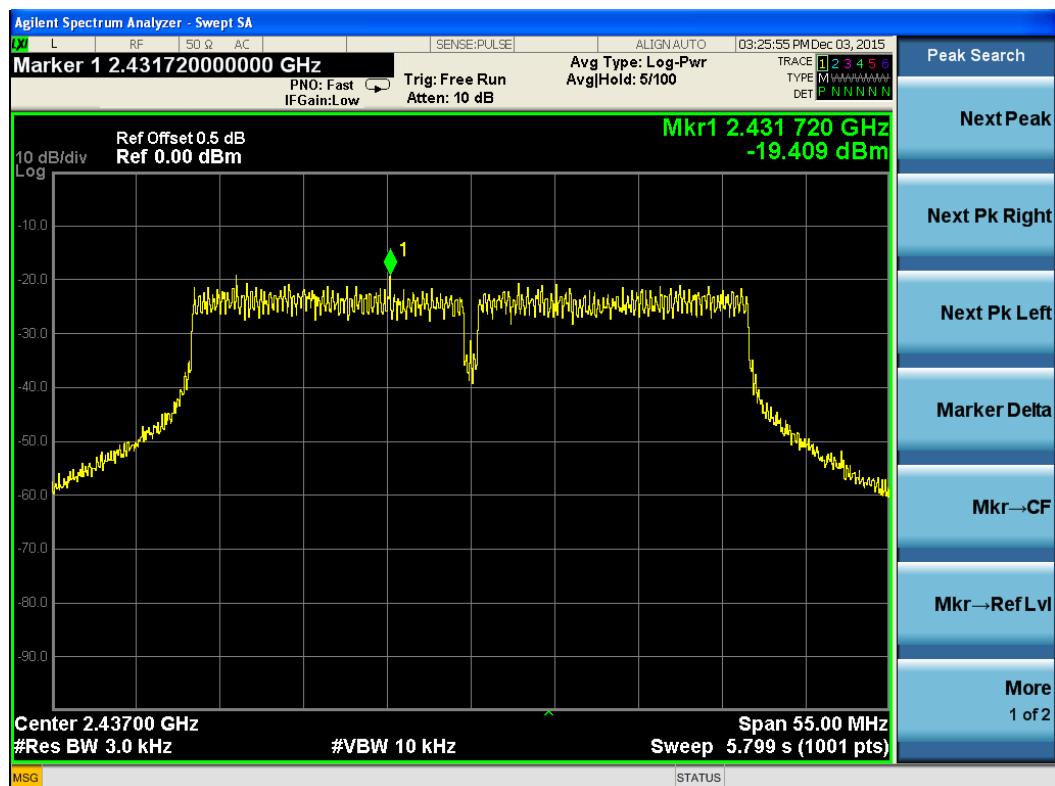
802.11n HT40 power density / Chain 0



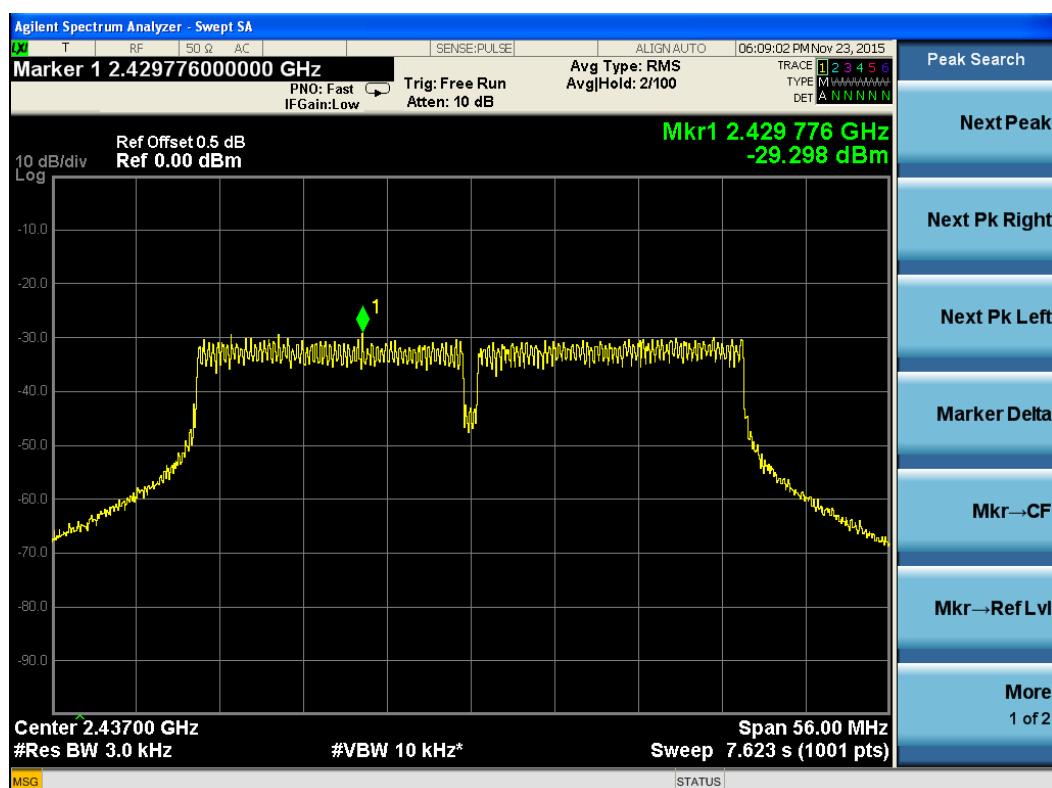
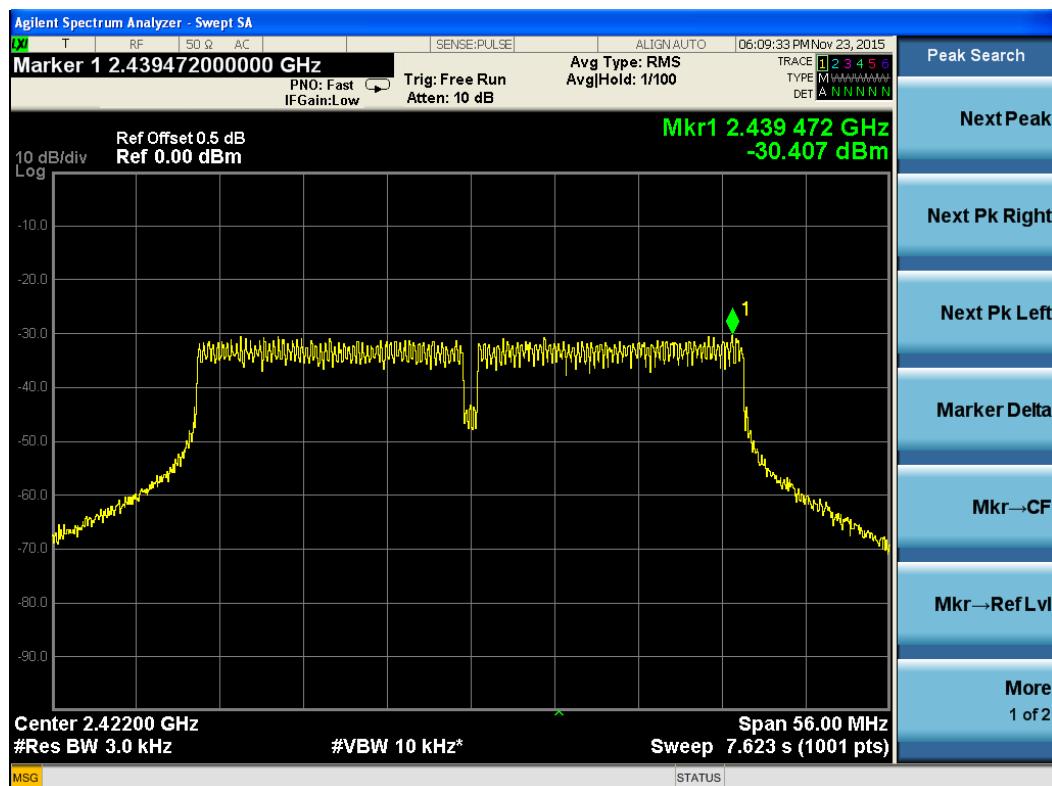


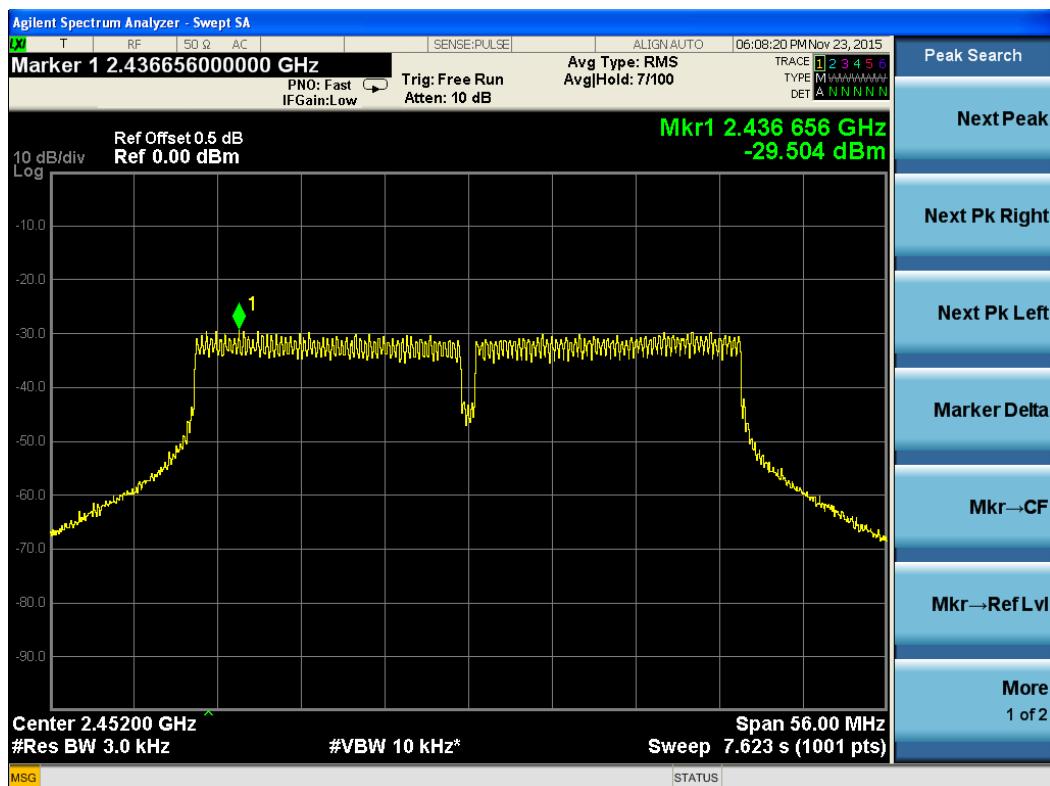
802.11n HT40 power density / Chain 1



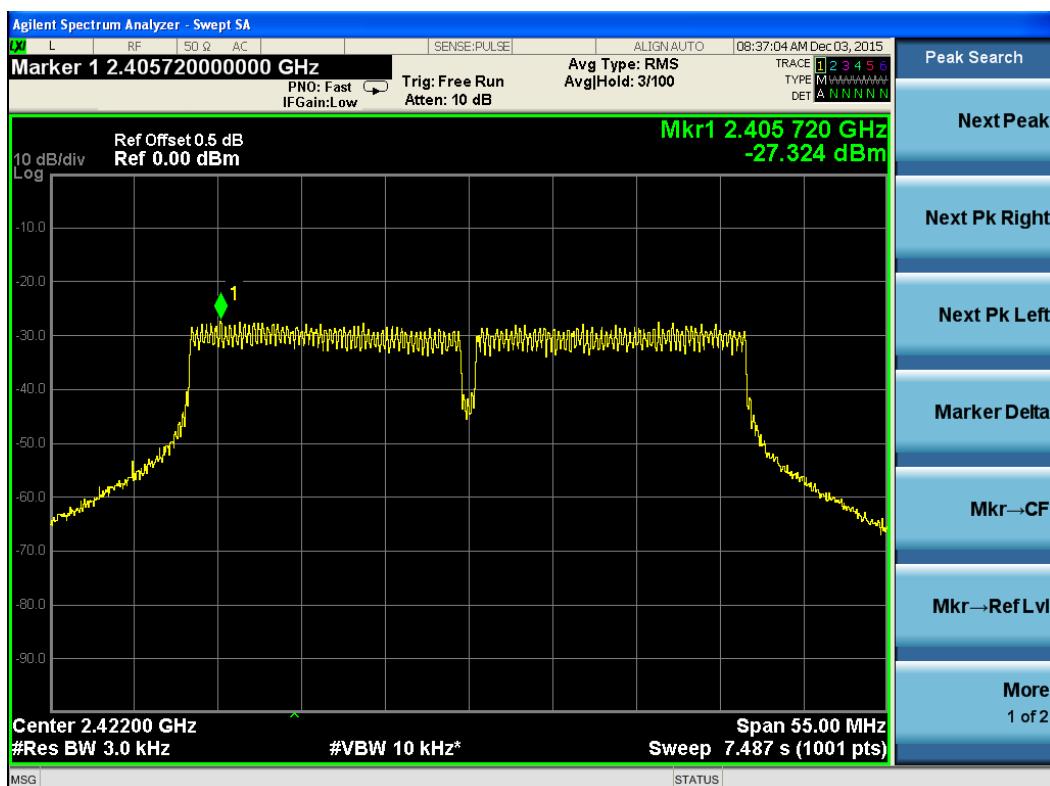


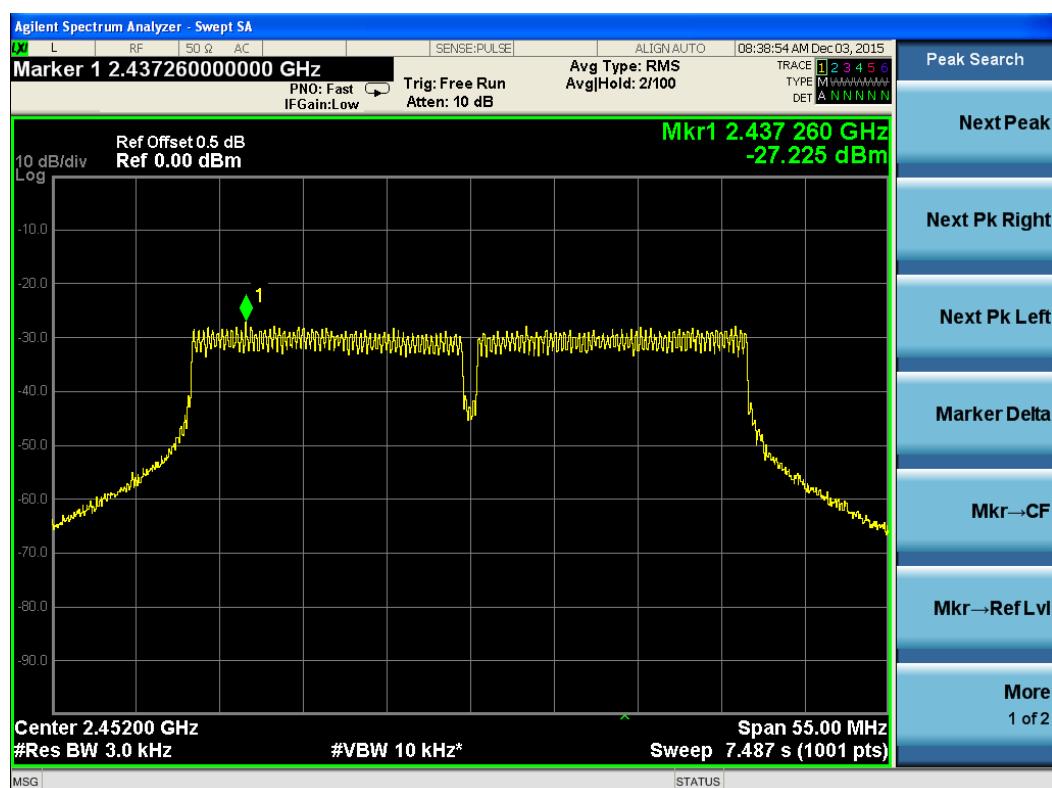
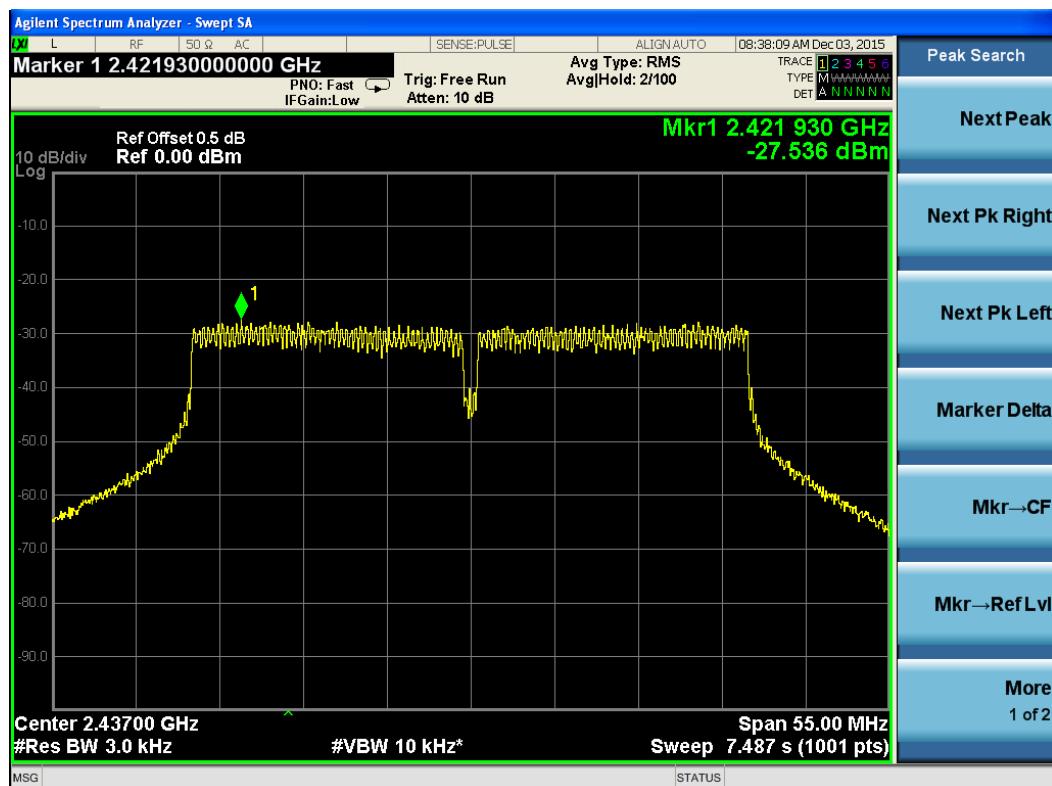
802.11n HT40 power density / Chain 2





802.11n HT40 power density / Chain 3





6.3. 6 dB Spectrum Bandwidth Measurement

6.3.1. Standard Applicable

According to §15.247(a)(2): For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

6.3.2. Measuring Instruments and Setting

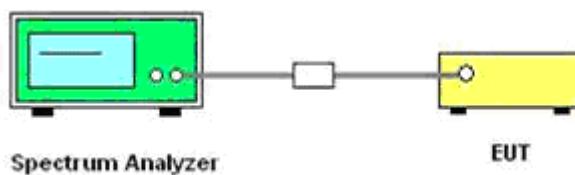
Please refer to section 6 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> RBW
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

6.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth and the video bandwidth were set according to KDB558074.
3. Measured the spectrum width with power higher than 6dB below carrier.

6.3.4. Test Setup Layout



6.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

6.3.6. Test Result of 6dB Spectrum Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Kyle	Configurations	802.11b/g/n

802.11b

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Result
		Chain 0	Chain 1		
1	2412	10.06	10.07	500	Complies
6	2437	10.07	10.06	500	Complies
11	2462	10.09	9.818	500	Complies

802.11g

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Result
		Chain 0	Chain 1		
1	2412	16.41	16.42	500	Complies
6	2437	16.38	16.41	500	Complies
11	2462	16.43	16.41	500	Complies

802.11n HT20

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Result
		Chain 0	Chain 1		
1	2412	17.59	17.62	500	Complies
6	2437	17.59	17.63	500	Complies
11	2462	17.59	17.60	500	Complies

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Result
		Chain 2	Chain 3		
1	2412	17.62	17.64	500	Complies
6	2437	17.64	17.60	500	Complies
11	2462	17.62	17.64	500	Complies

802.11n HT40

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Result
		Chain 0	Chain 1		
3	2422	36.43	36.44	500	Complies
6	2437	36.41	36.42	500	Complies
9	2452	36.42	36.42	500	Complies

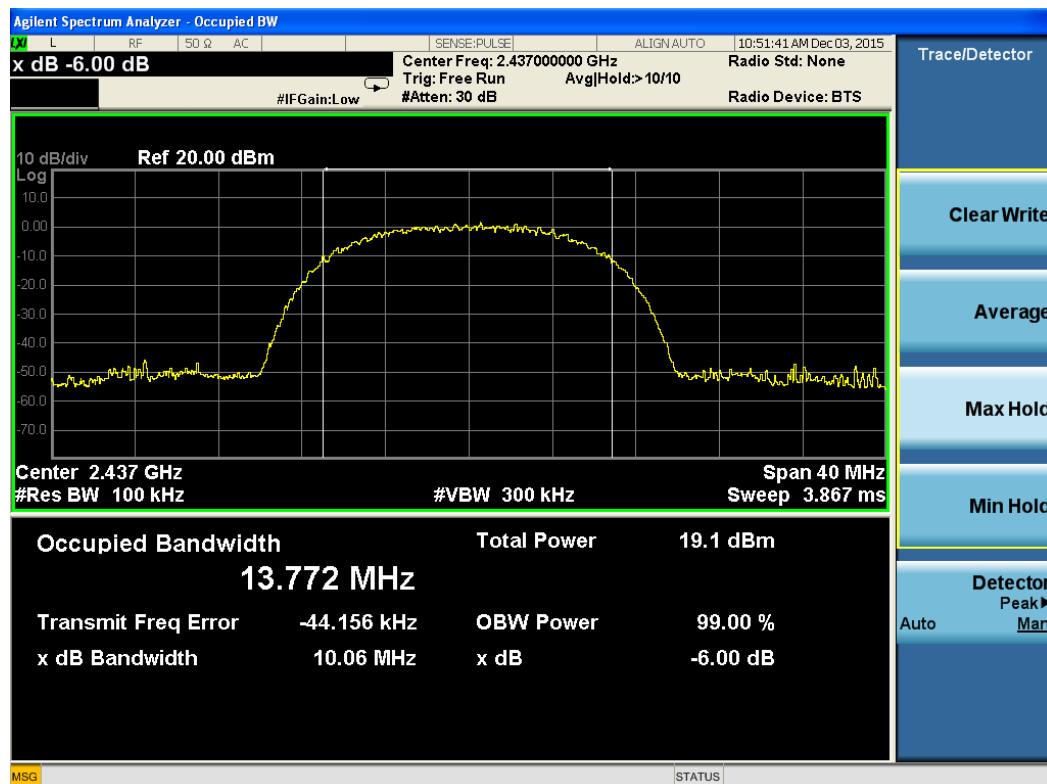
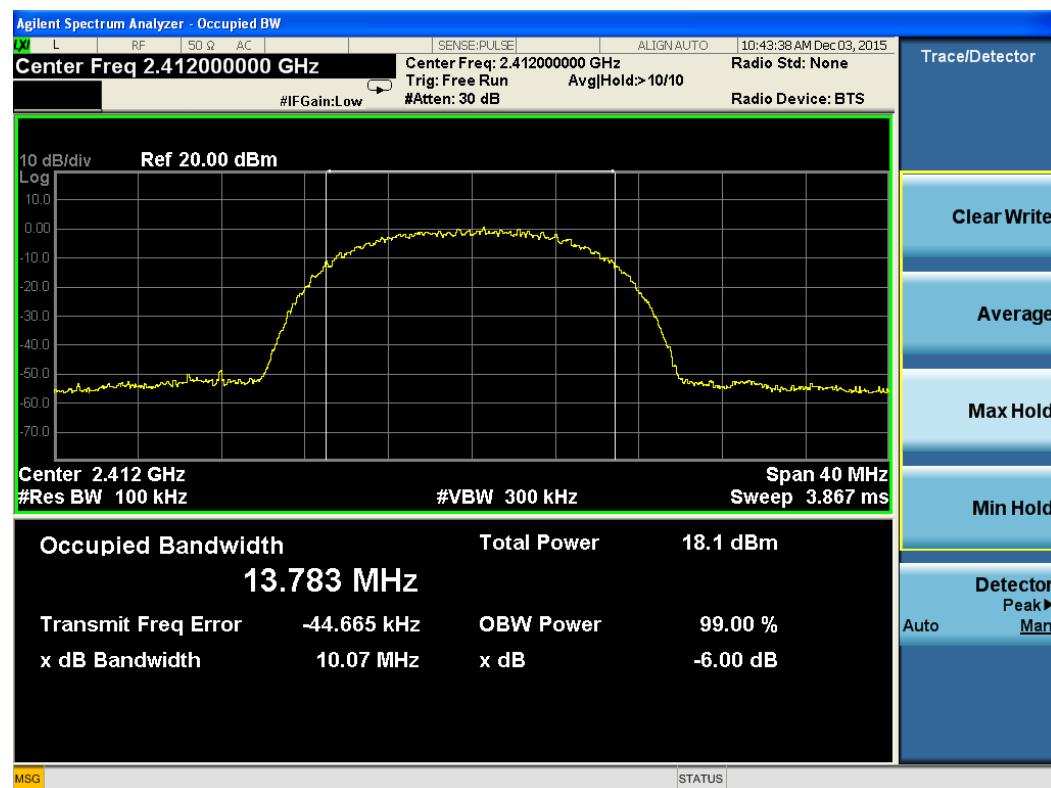
Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Result
		Chain 2	Chain 3		
3	2422	36.46	36.52	500	Complies
6	2437	36.46	36.44	500	Complies
9	2452	36.42	36.51	500	Complies

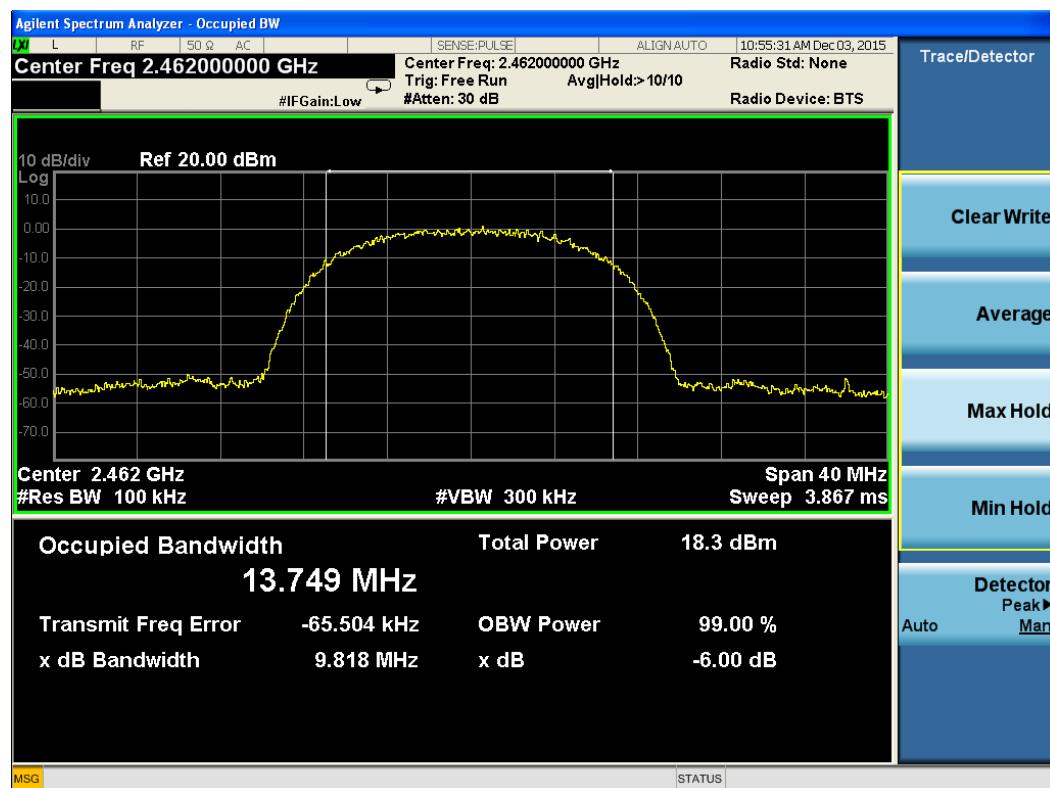
802.11b channel, 6dB bandwidth / Chain 0





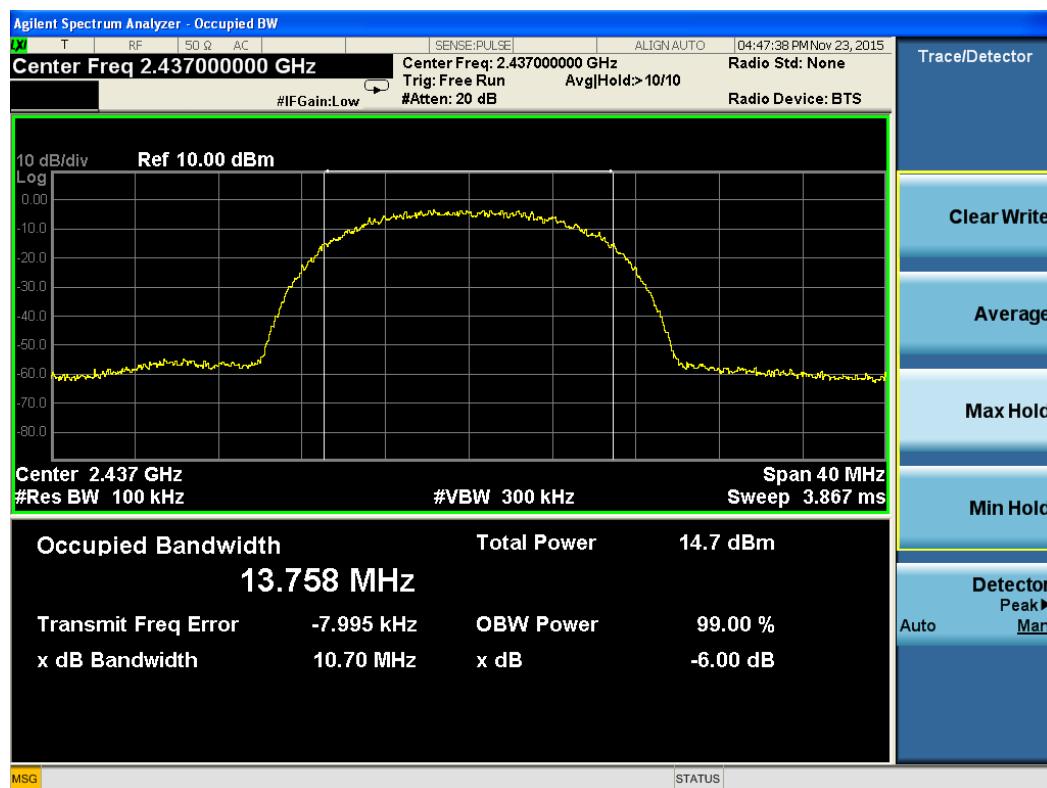
802.11b channel, 6dB bandwidth / Chain 1



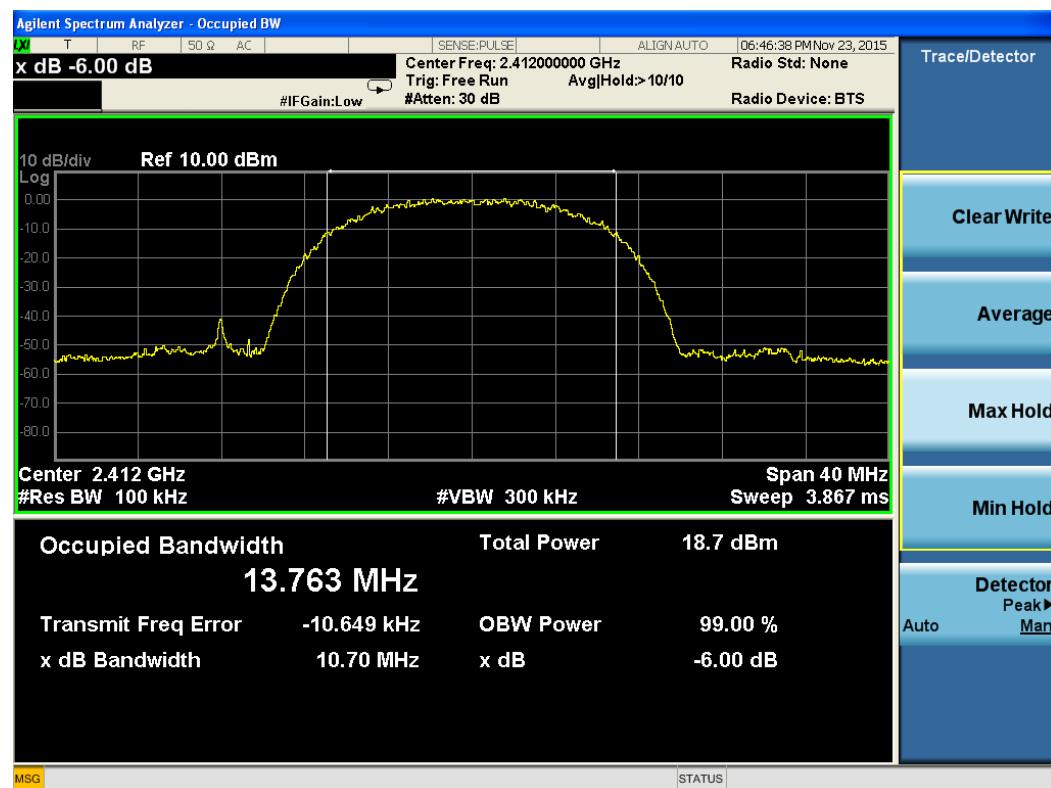


802.11b channel, 6dB bandwidth / Chain 2





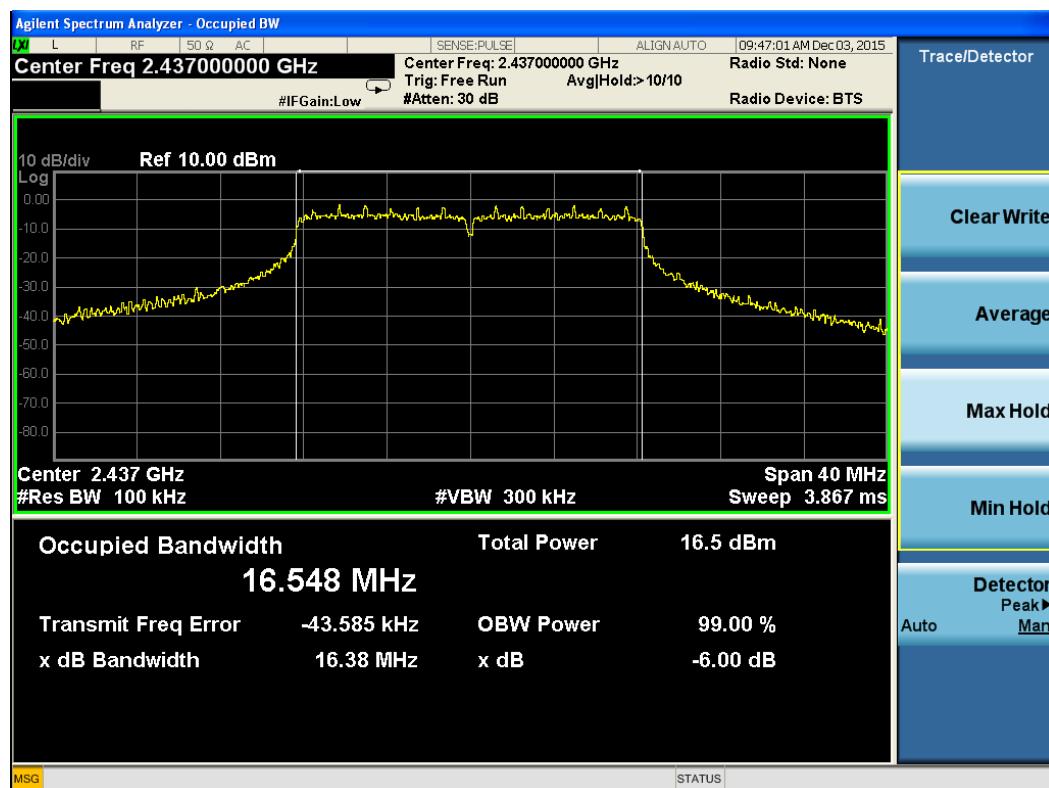
802.11b channel, 6dB bandwidth / Chain 3





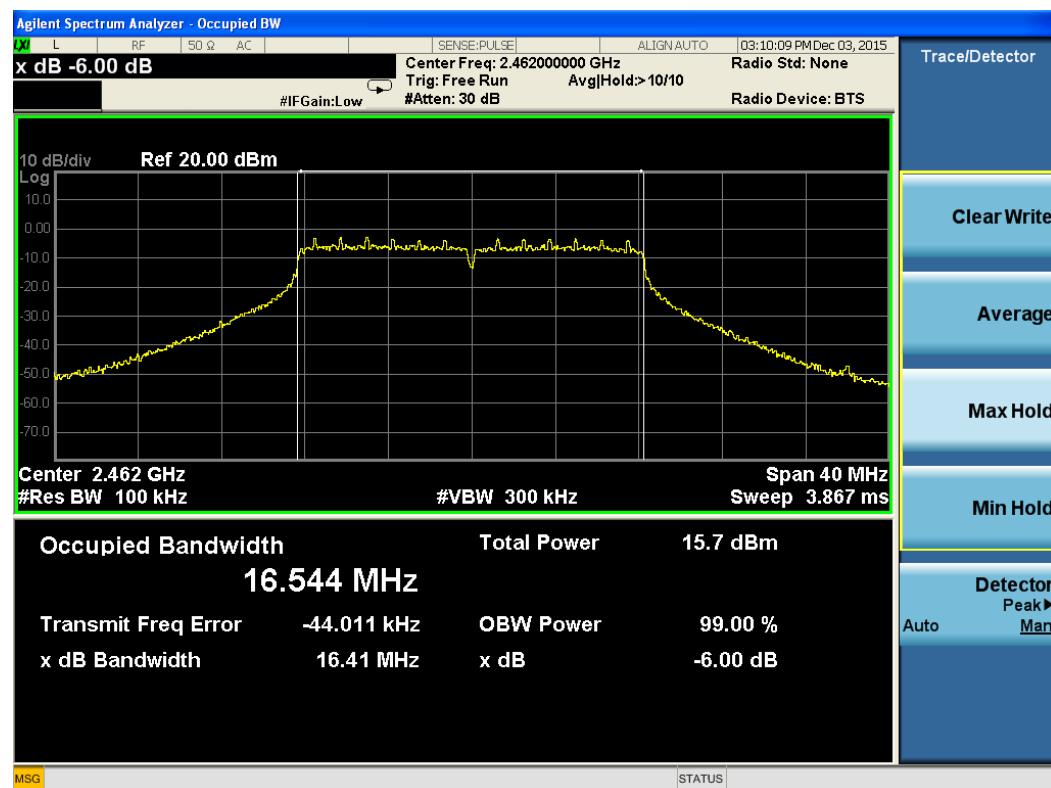
802.11g channel, 6dB bandwidth / Chain 0



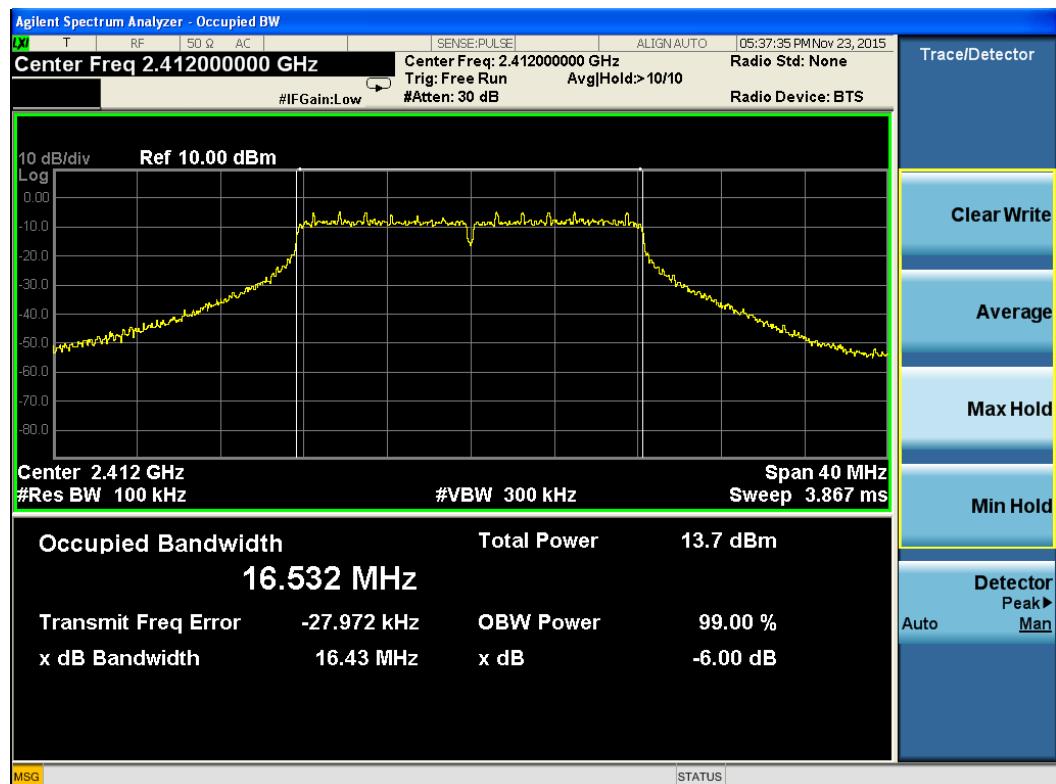


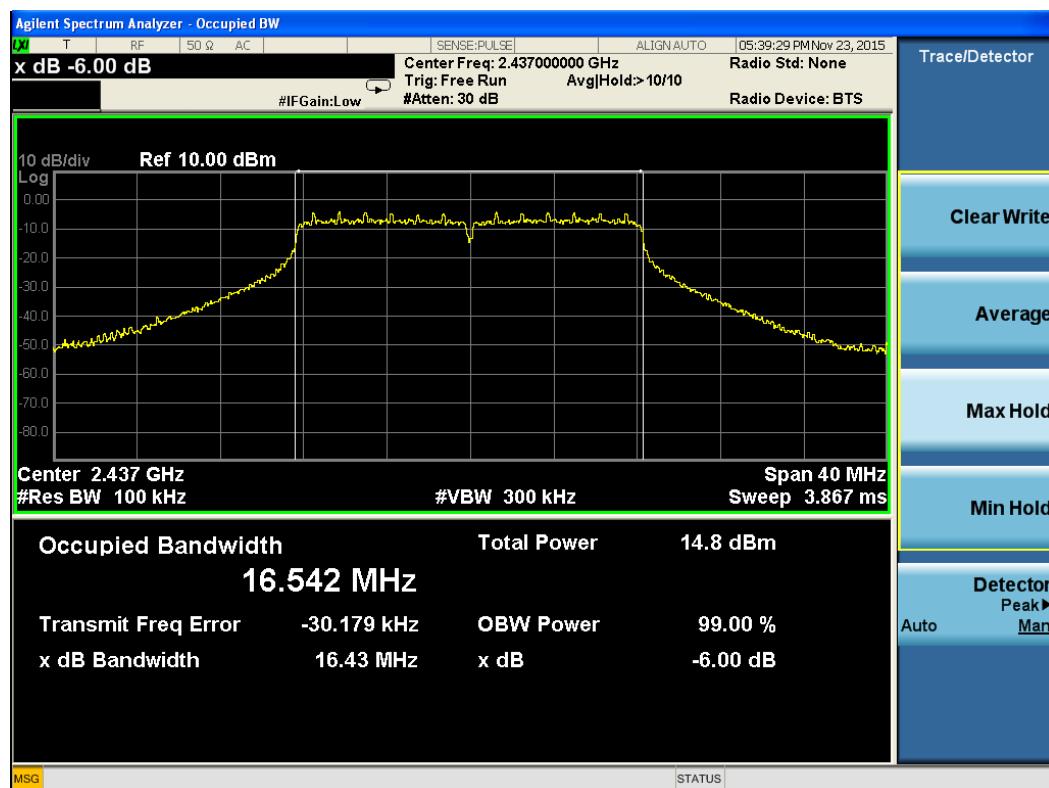
802.11g channel, 6dB bandwidth / Chain 1



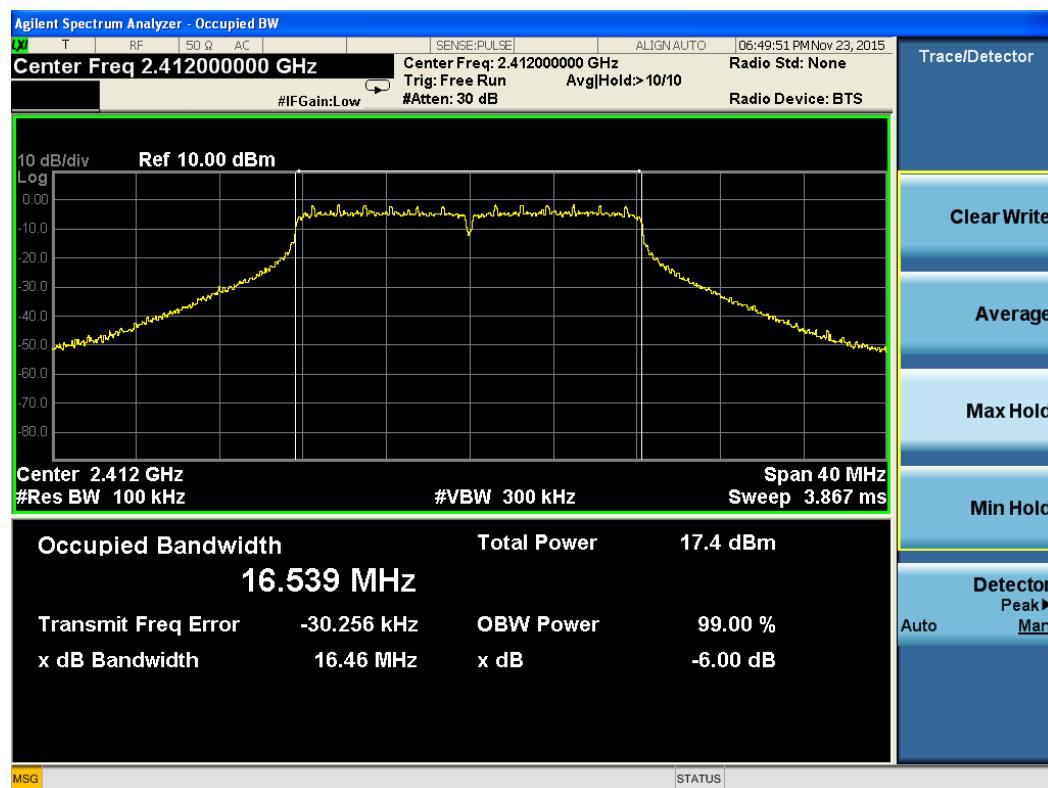


802.11g channel, 6dB bandwidth / Chain 2





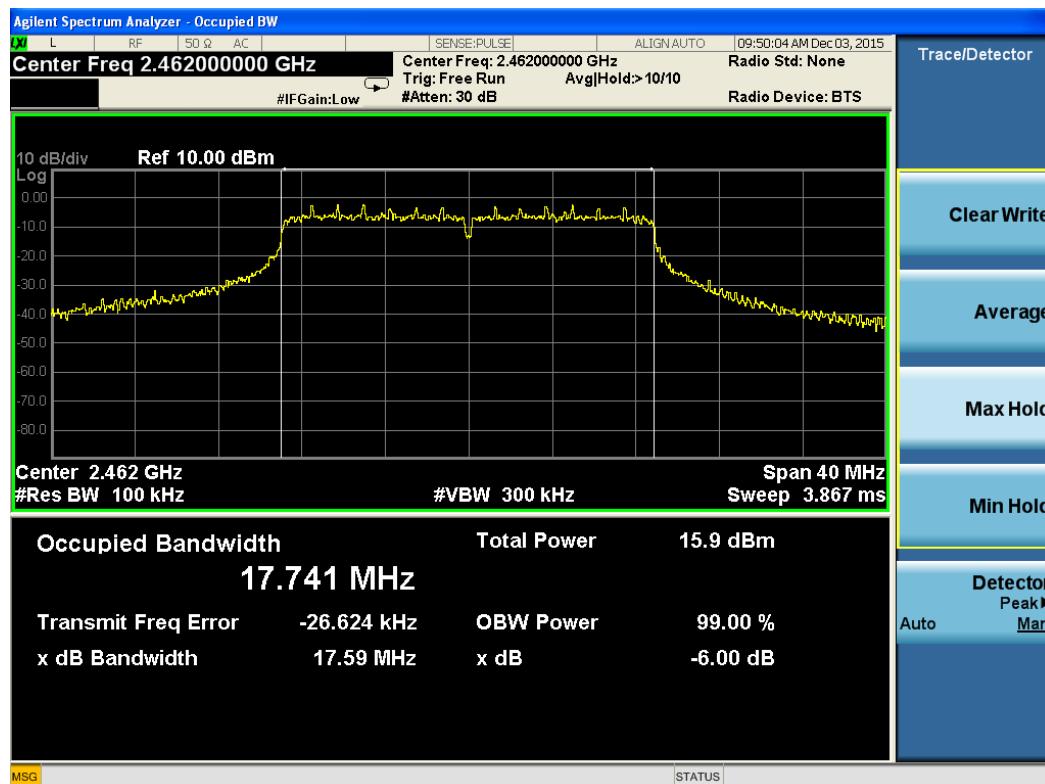
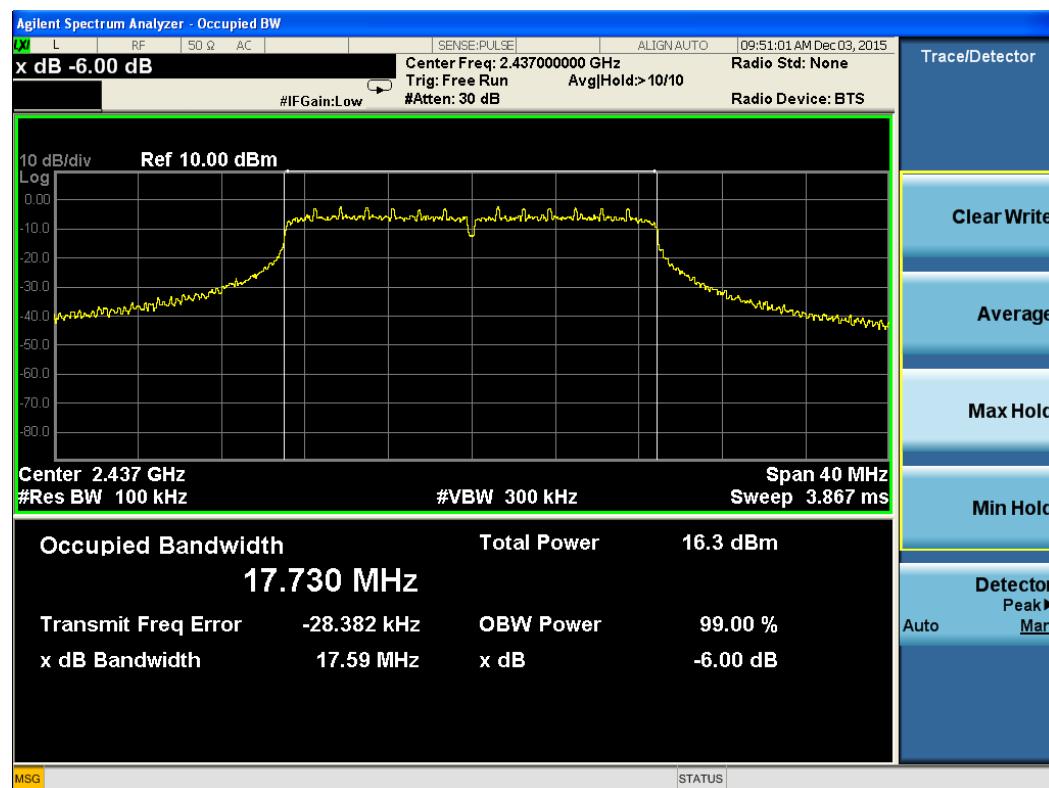
802.11n HT20 channel, 6dB bandwidth / Chain 3





802.11n HT20 channel, 6dB bandwidth / Chain 0





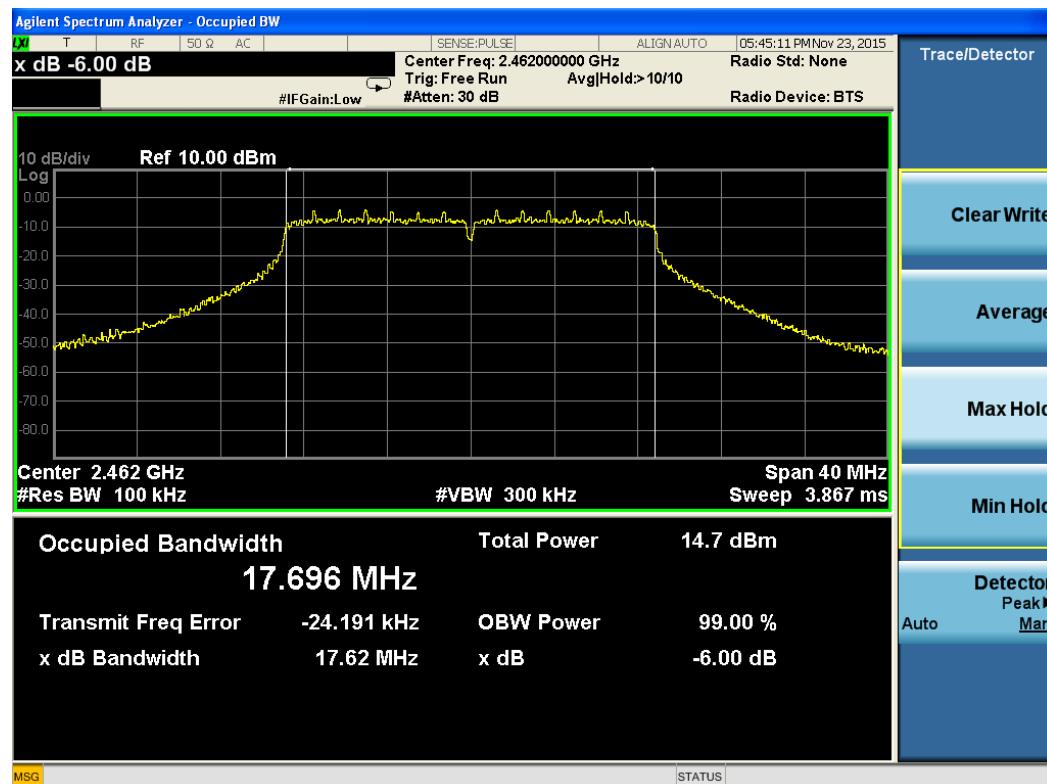
802.11n HT20 channel, 6dB bandwidth / Chain 1



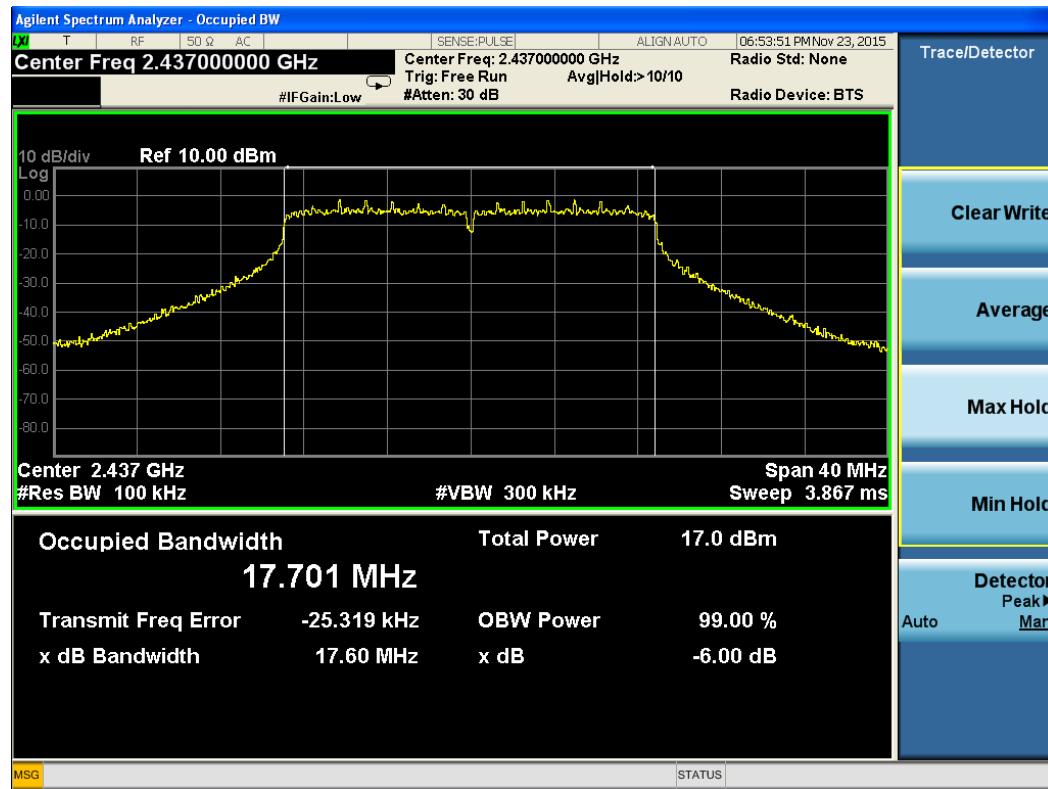
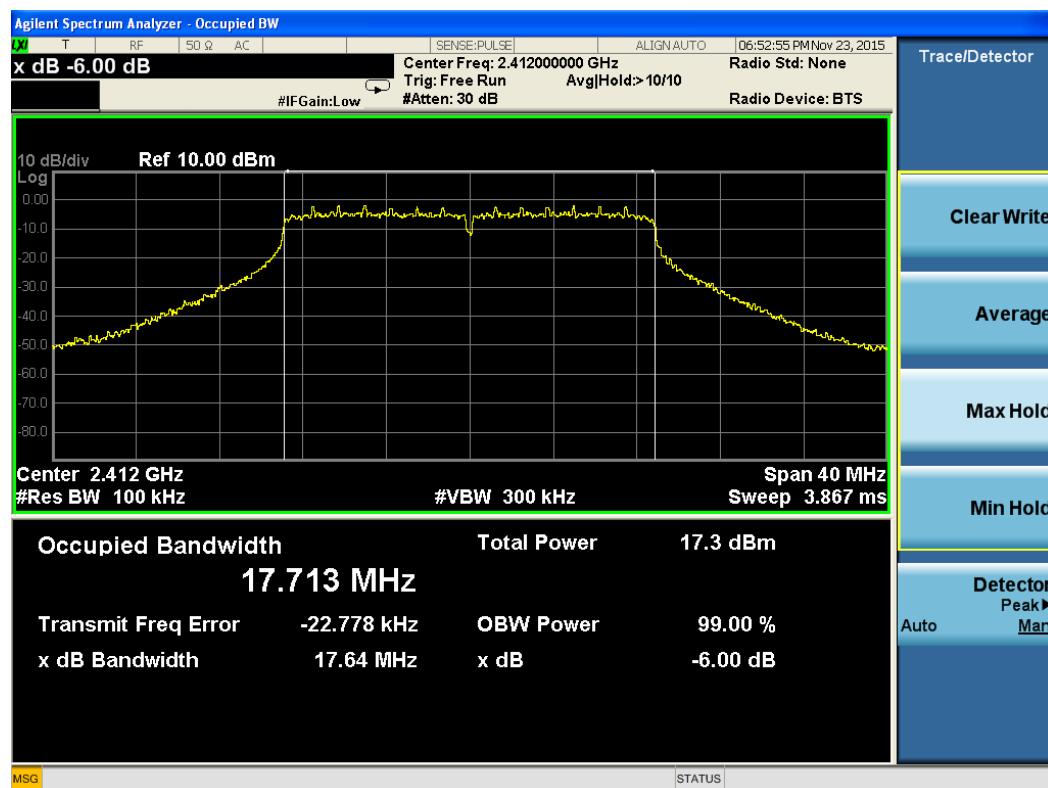


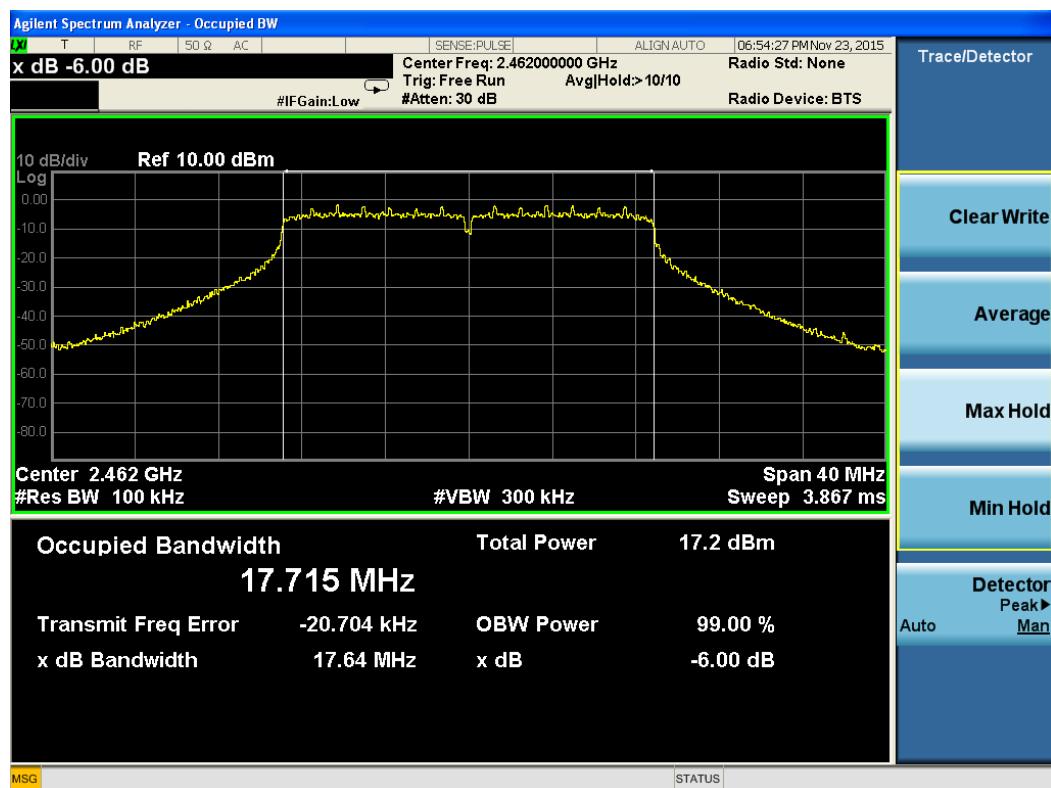
802.11n HT20 channel, 6dB bandwidth / Chain 2



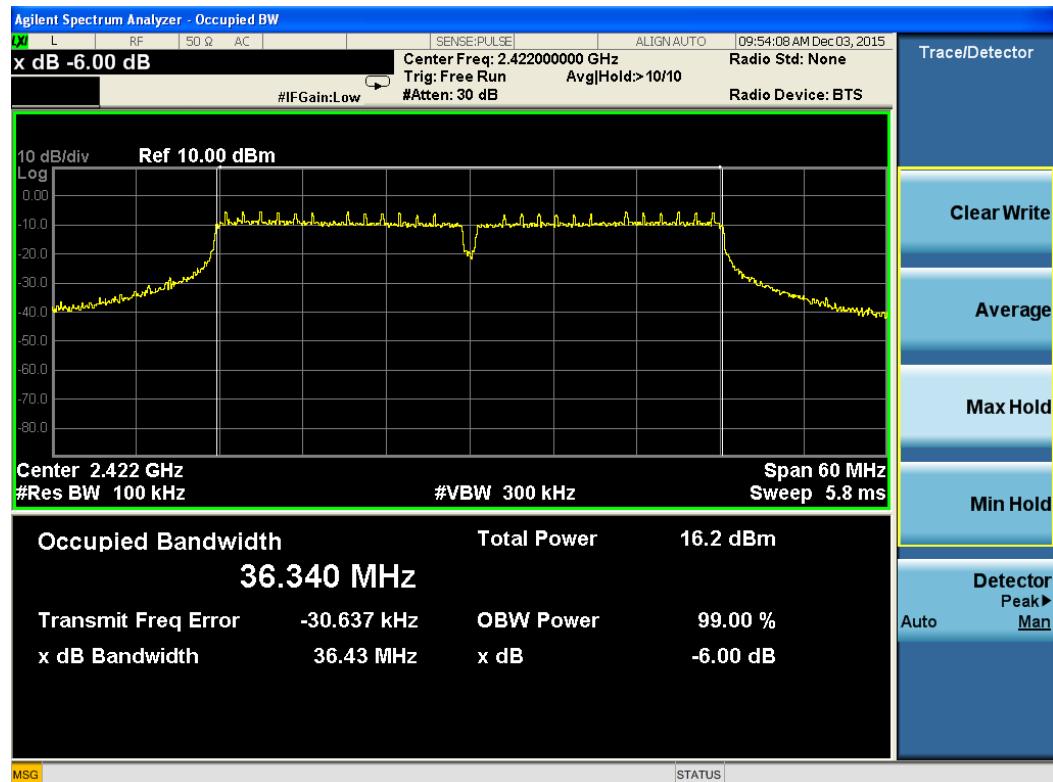


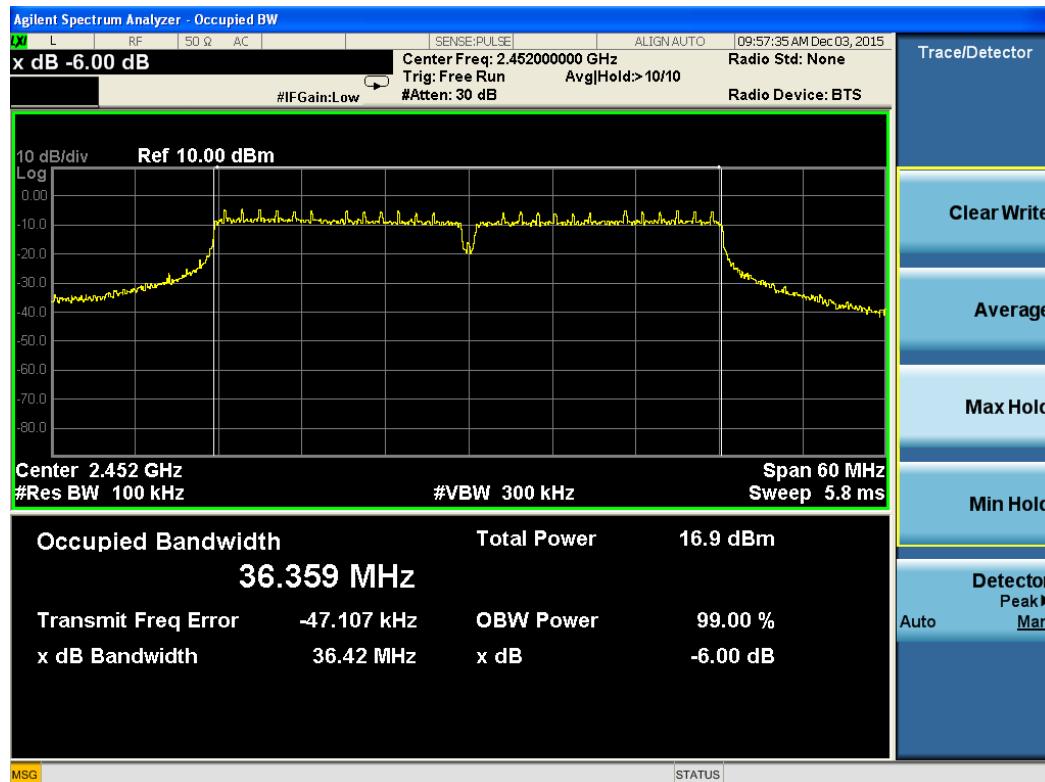
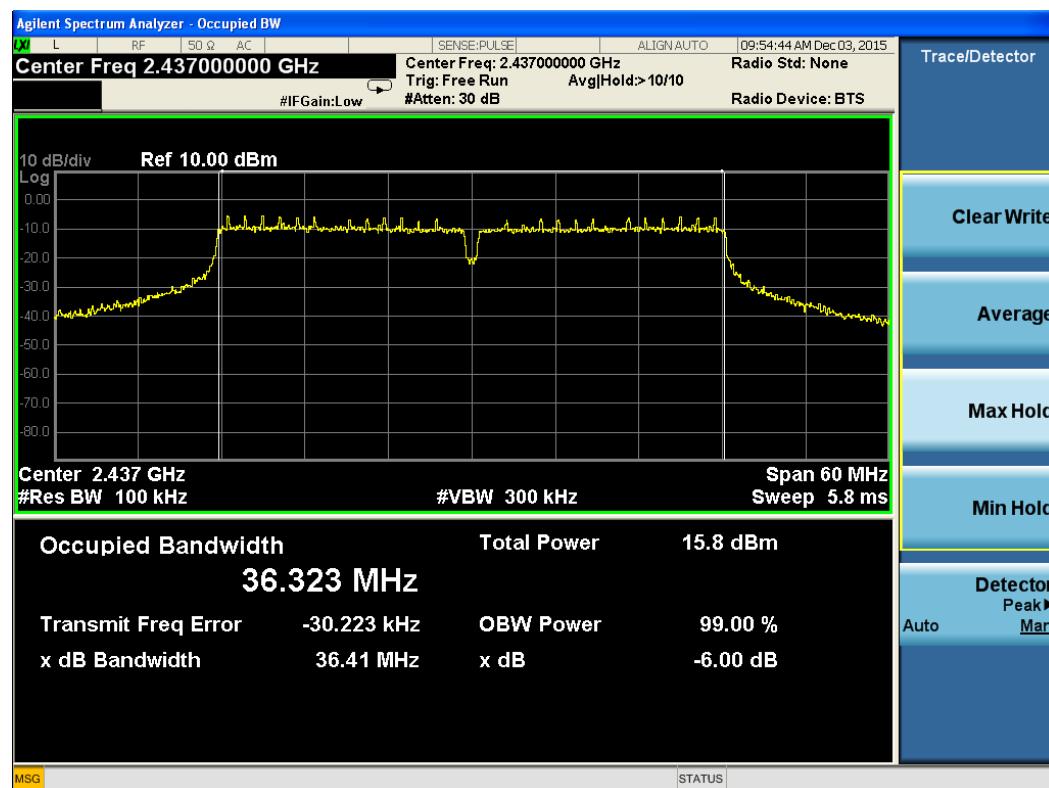
802.11n HT20 channel, 6dB bandwidth / Chain 3



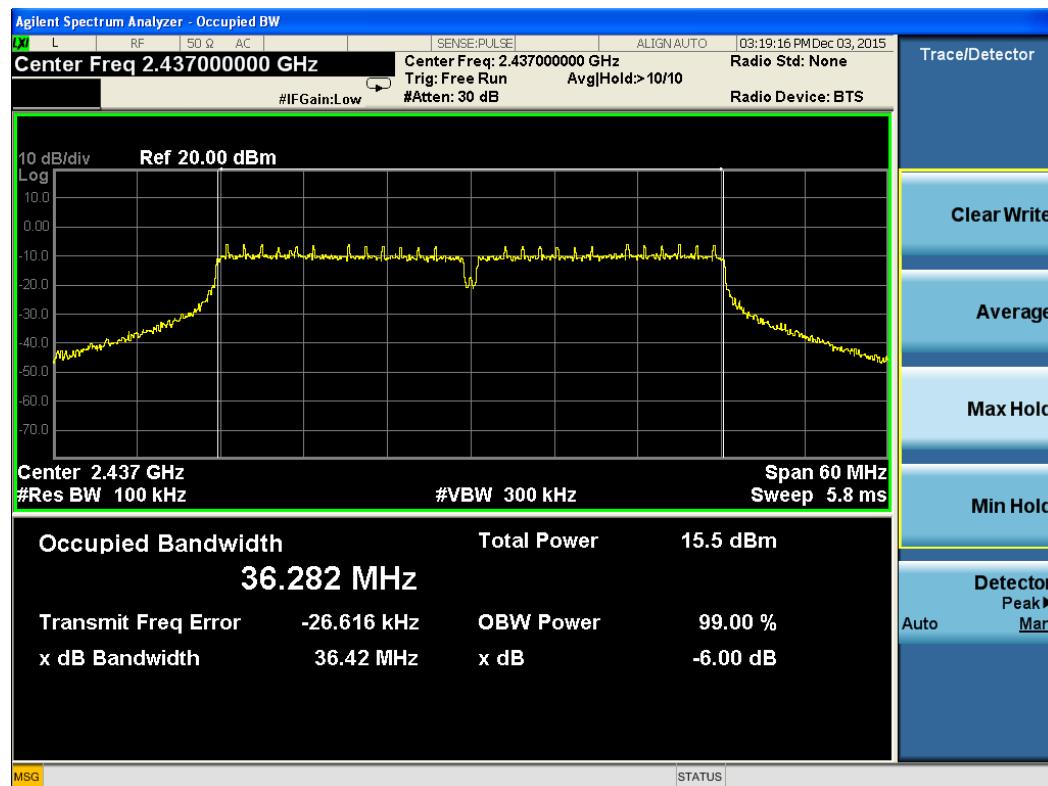
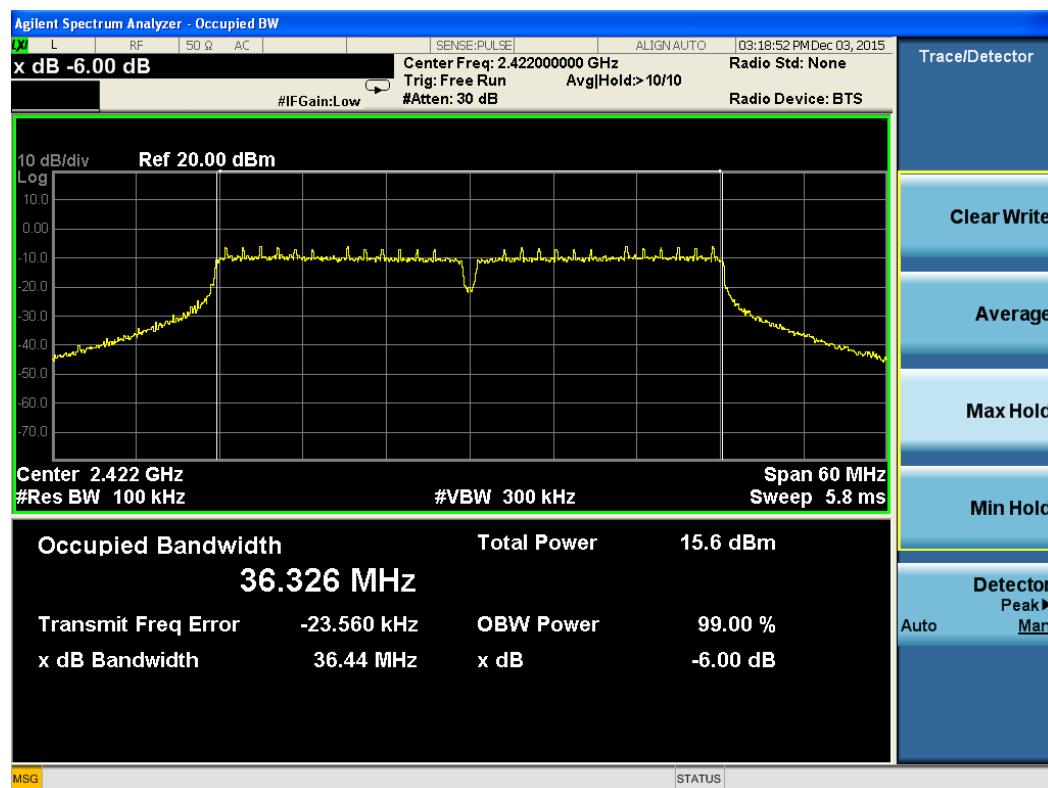


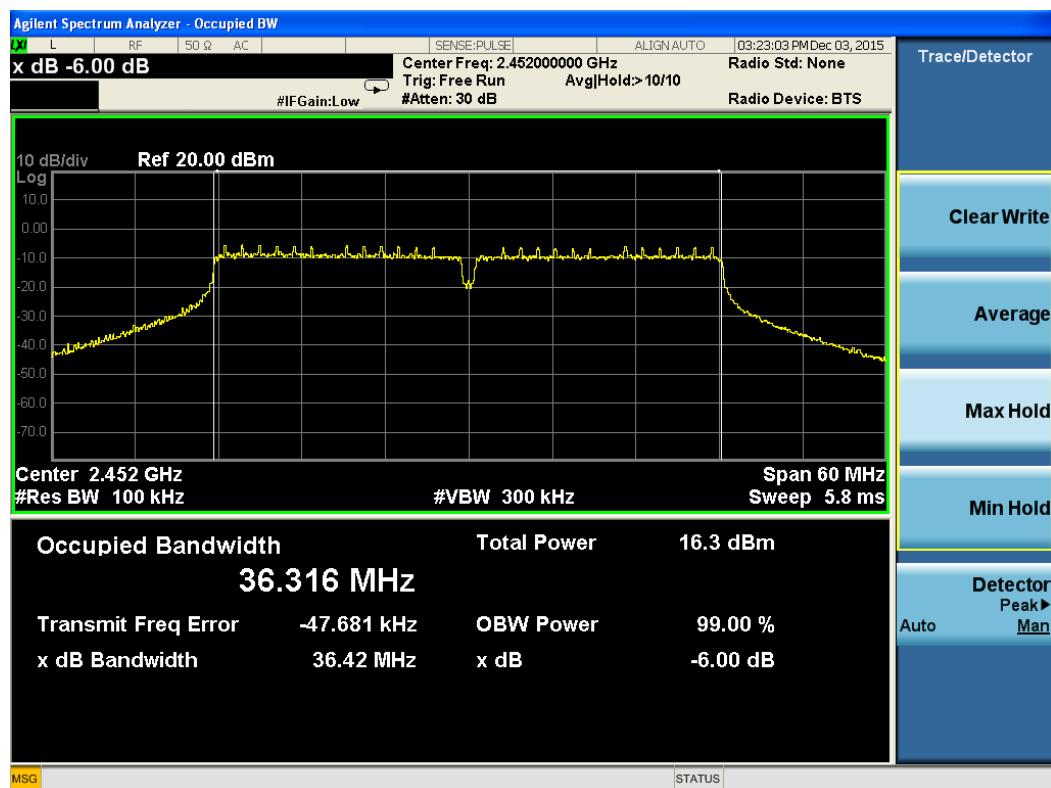
802.11n HT40 channel, 6dB bandwidth / Chain 0



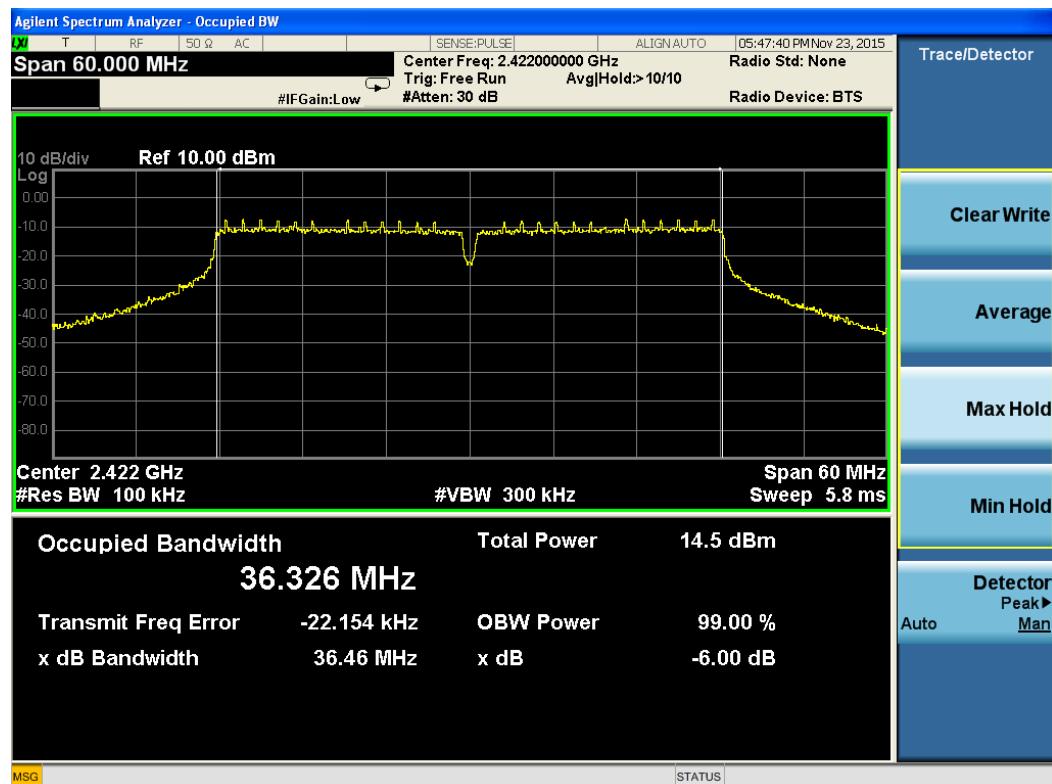


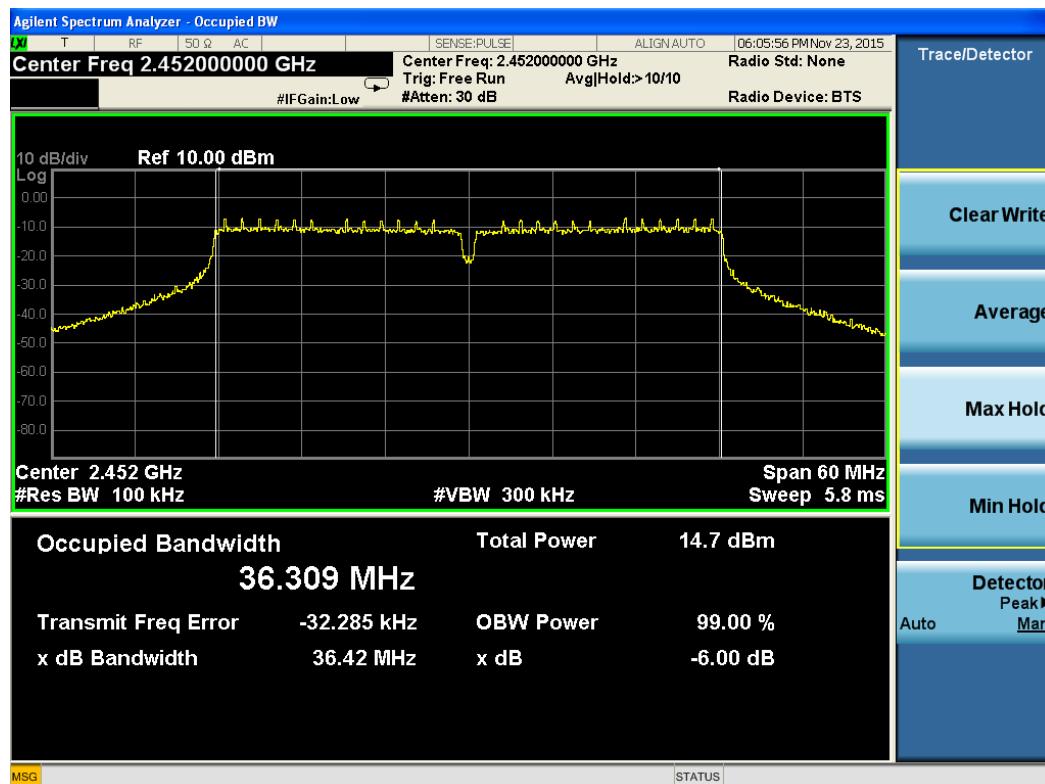
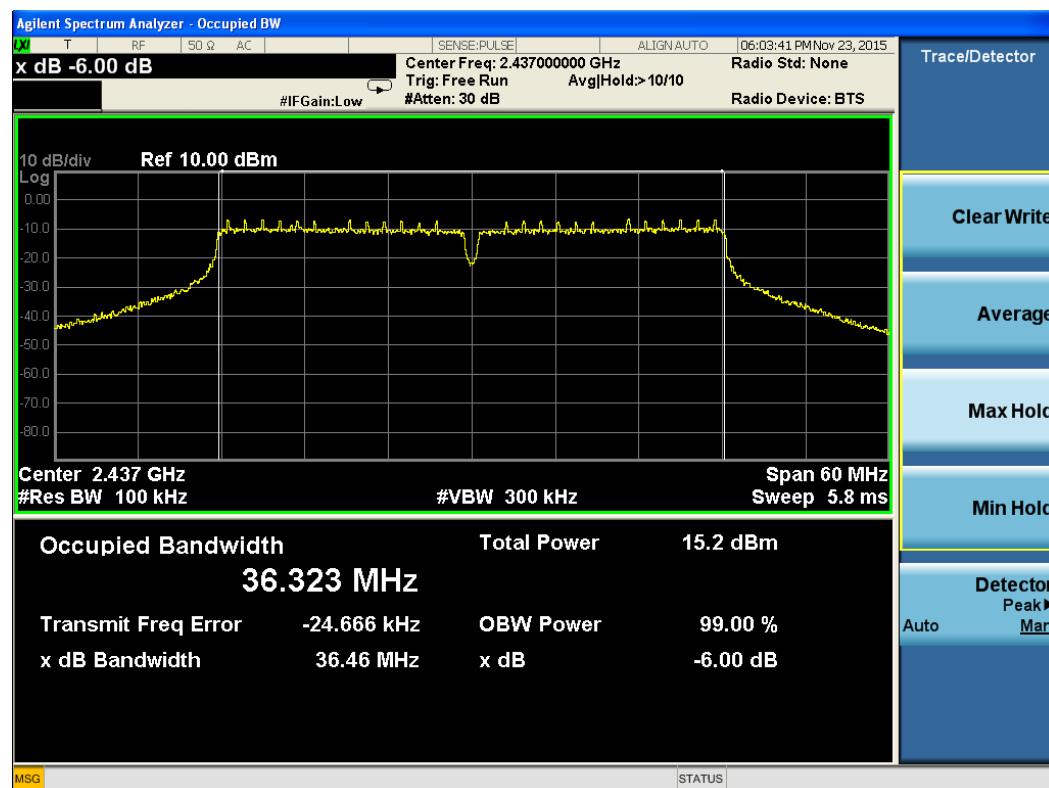
802.11n HT40 channel, 6dB bandwidth / Chain 1



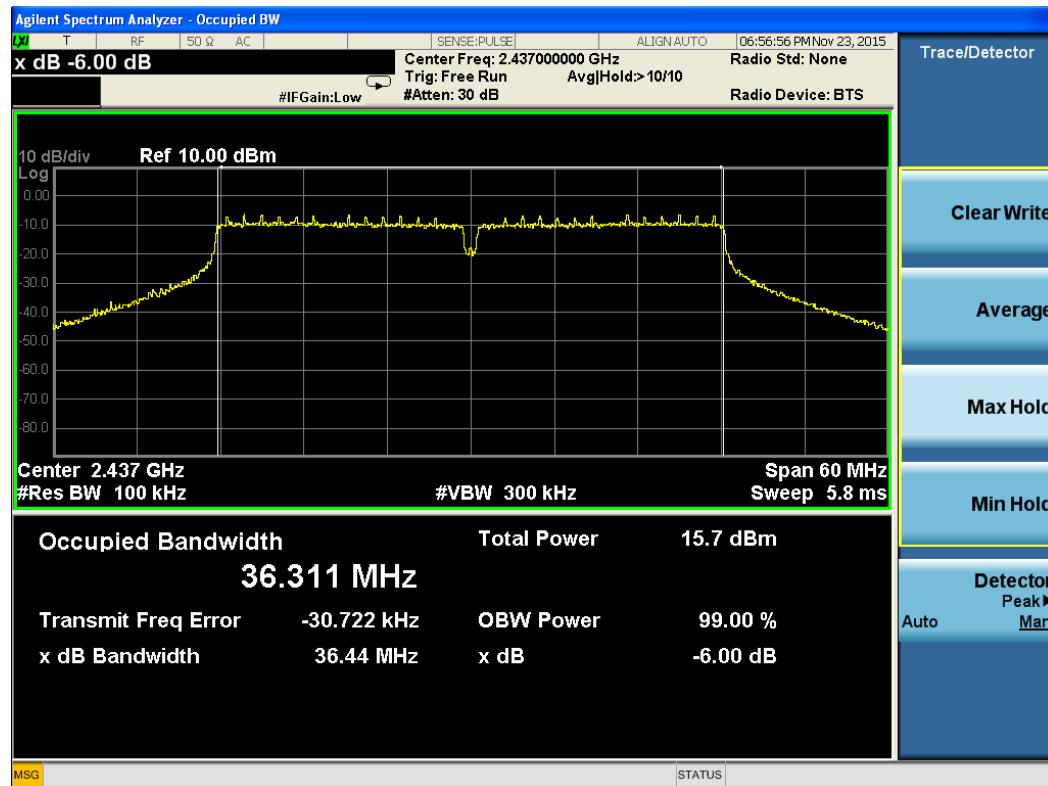
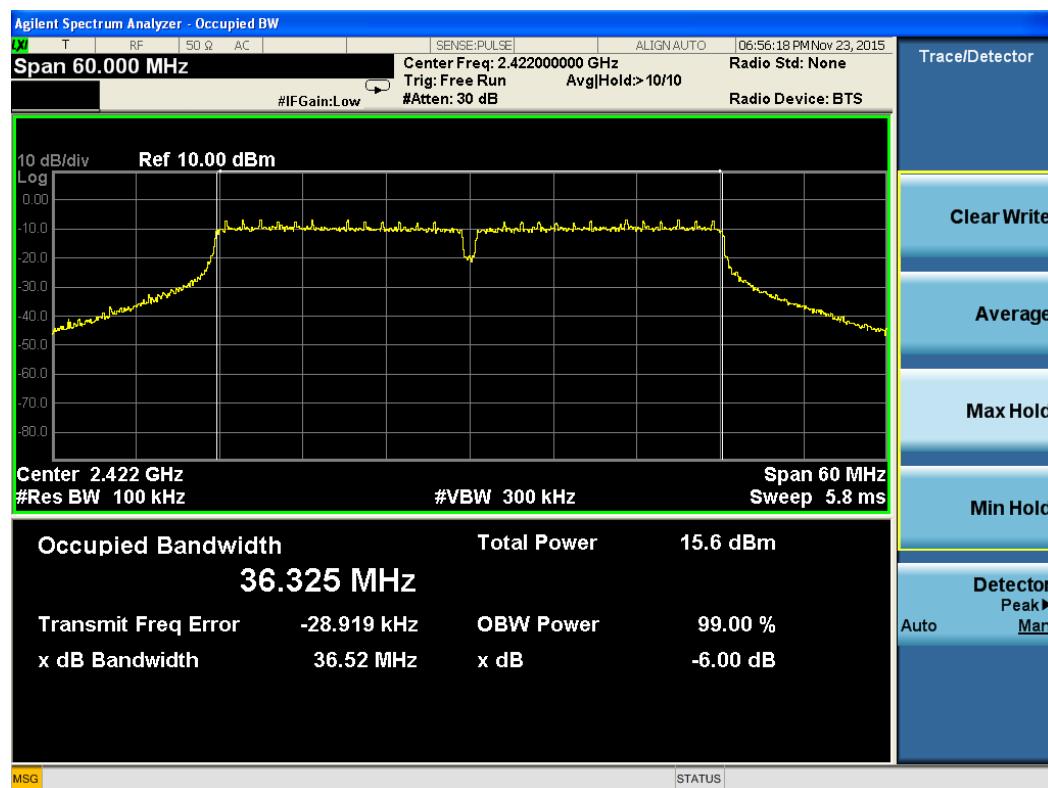


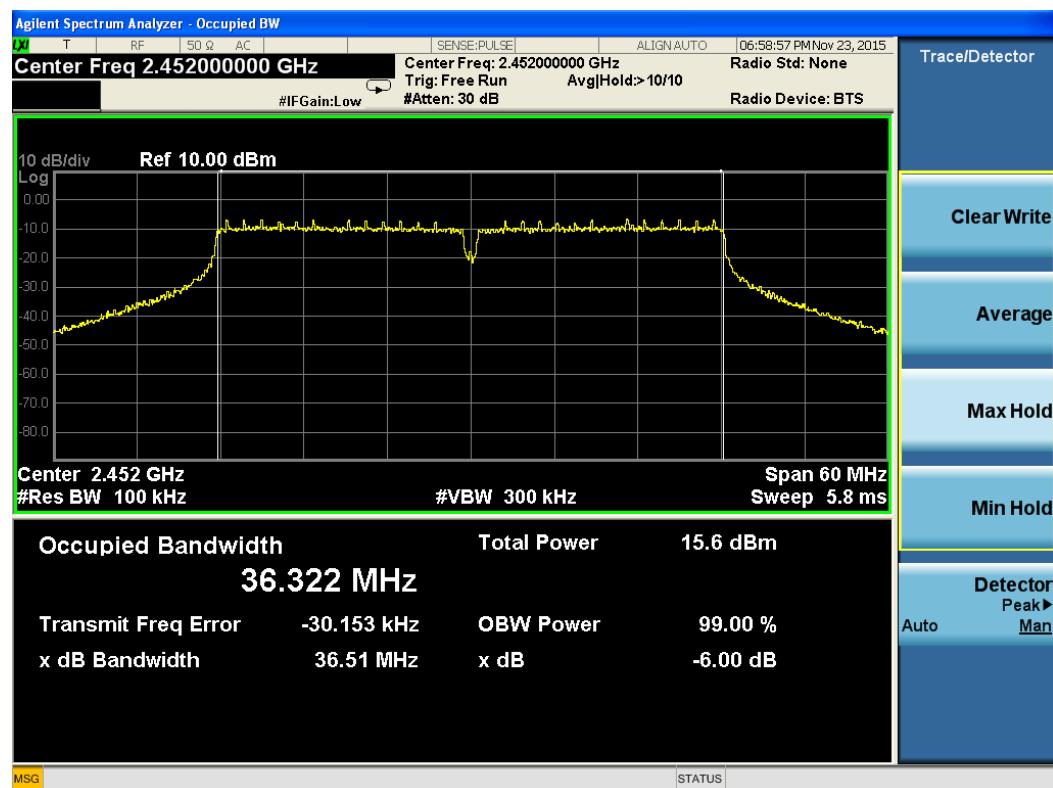
802.11n HT40 channel, 6dB bandwidth / Chain 2





802.11n HT40 channel, 6dB bandwidth / Chain 3





802.11b

Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 0	Chain 1		
1	2412	15.71	15.60	Non-specified	Complies
6	2437	15.70	15.71		Complies
11	2462	15.77	15.67		Complies

Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 2	Chain 3		
1	2412	16.07	16.05	Non-specified	Complies
6	2437	16.05	16.06		Complies
11	2462	16.04	16.06		Complies

802.11g

Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 0	Chain 1		
1	2412	18.34	18.09	Non-specified	Complies
6	2437	18.15	18.34		Complies
11	2462	18.00	18.03		Complies

Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 2	Chain 3		
1	2412	18.54	18.36	Non-specified	Complies
6	2437	18.13	18.11		Complies
11	2462	18.35	18.40		Complies

802.11n HT20

Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 0	Chain 1		
1	2412	19.34	19.36	Non-specified	Complies
6	2437	19.10	19.21		Complies
11	2462	19.26	19.32		Complies

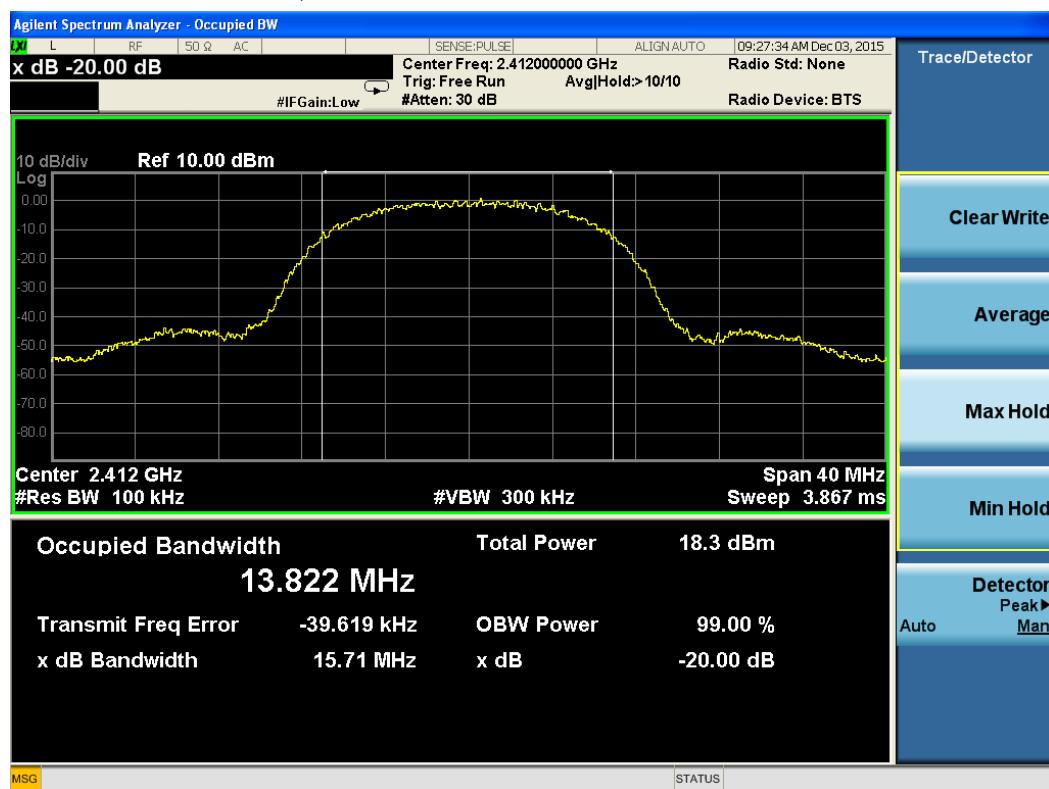
Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 2	Chain 3		
1	2412	19.06	19.23	Non-specified	Complies
6	2437	19.36	19.28		Complies
11	2462	19.07	19.40		Complies

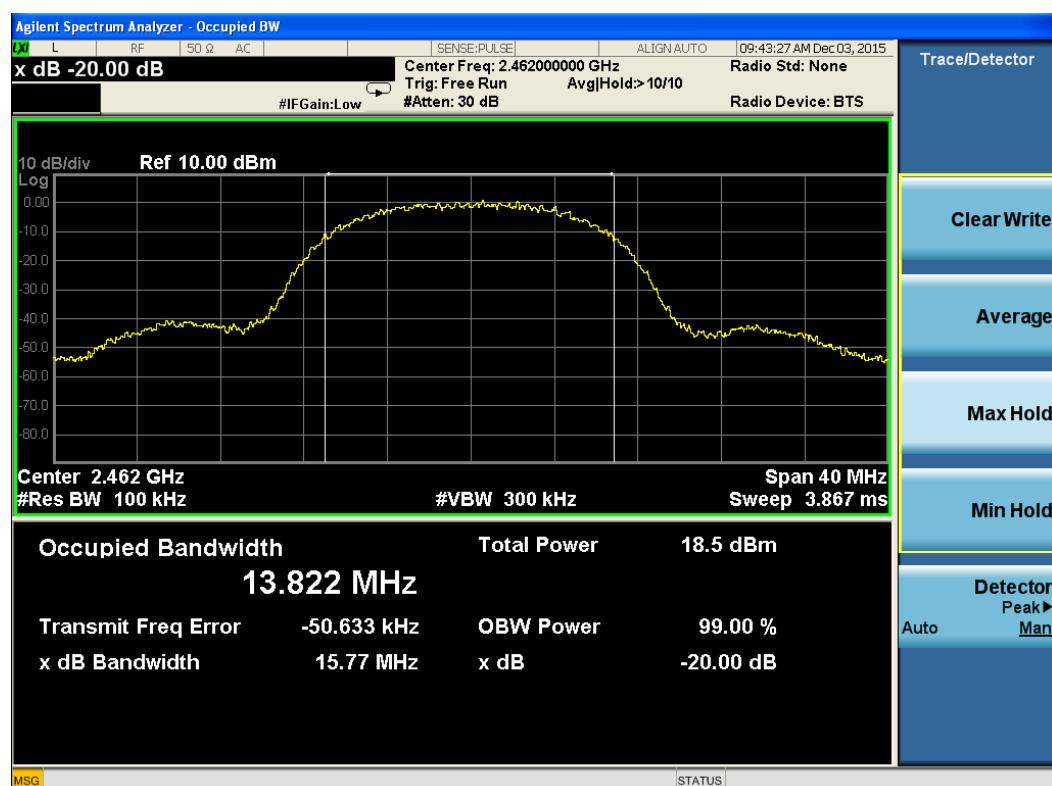
802.11n HT40

Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 0	Chain 1		
3	2422	38.33	38.56	Non-specified	Complies
6	2437	38.56	38.71		Complies
9	2452	38.21	38.36		Complies

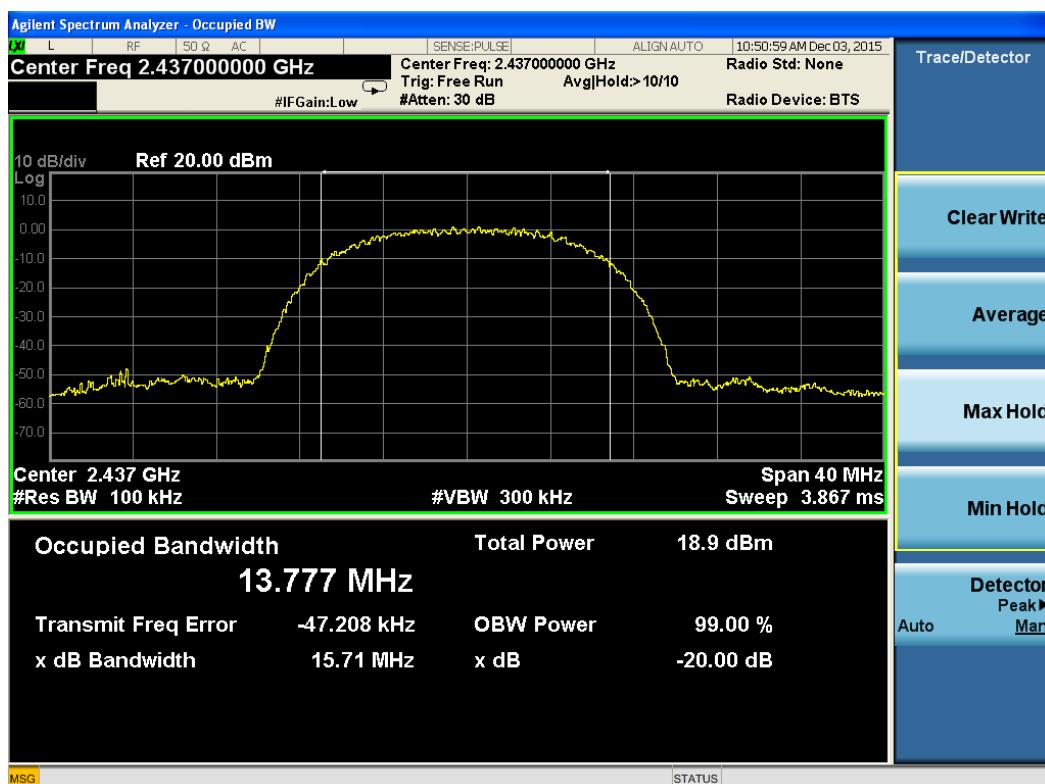
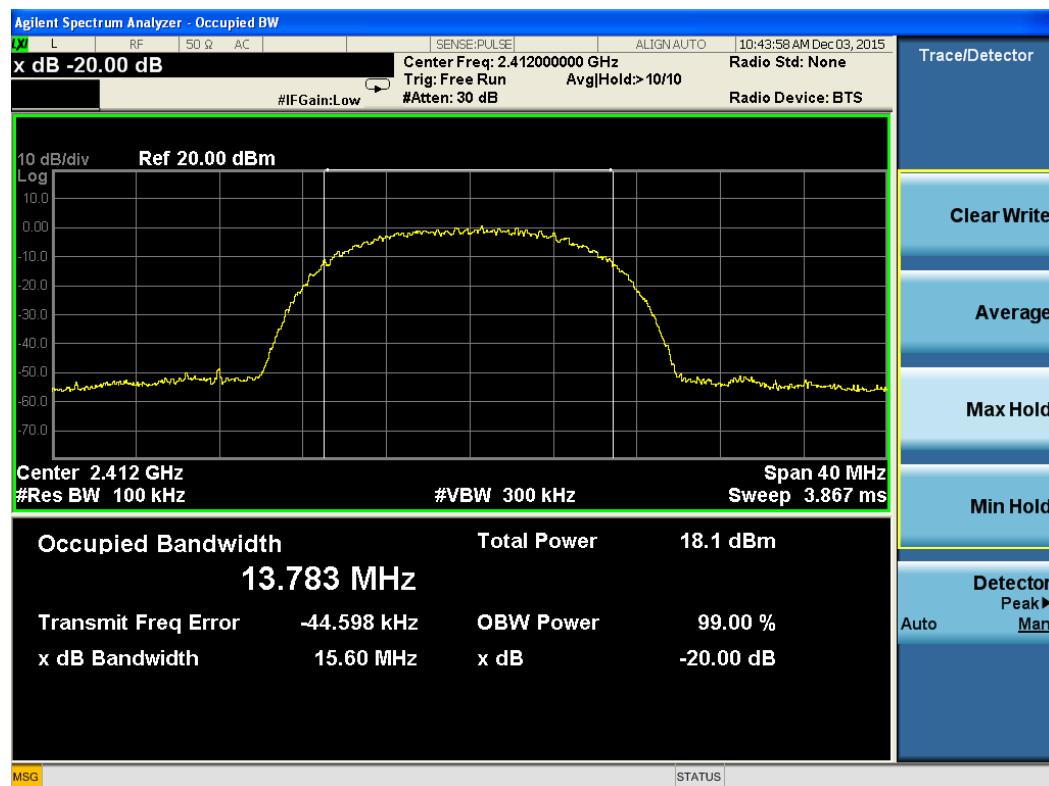
Channel	Frequency	20dB Bandwidth (MHz)		Limit (kHz)	Result
		Chain 2	Chain 3		
3	2422	38.85	39.00	Non-specified	Complies
6	2437	38.68	38.07		Complies
9	2452	38.42	39.32		Complies

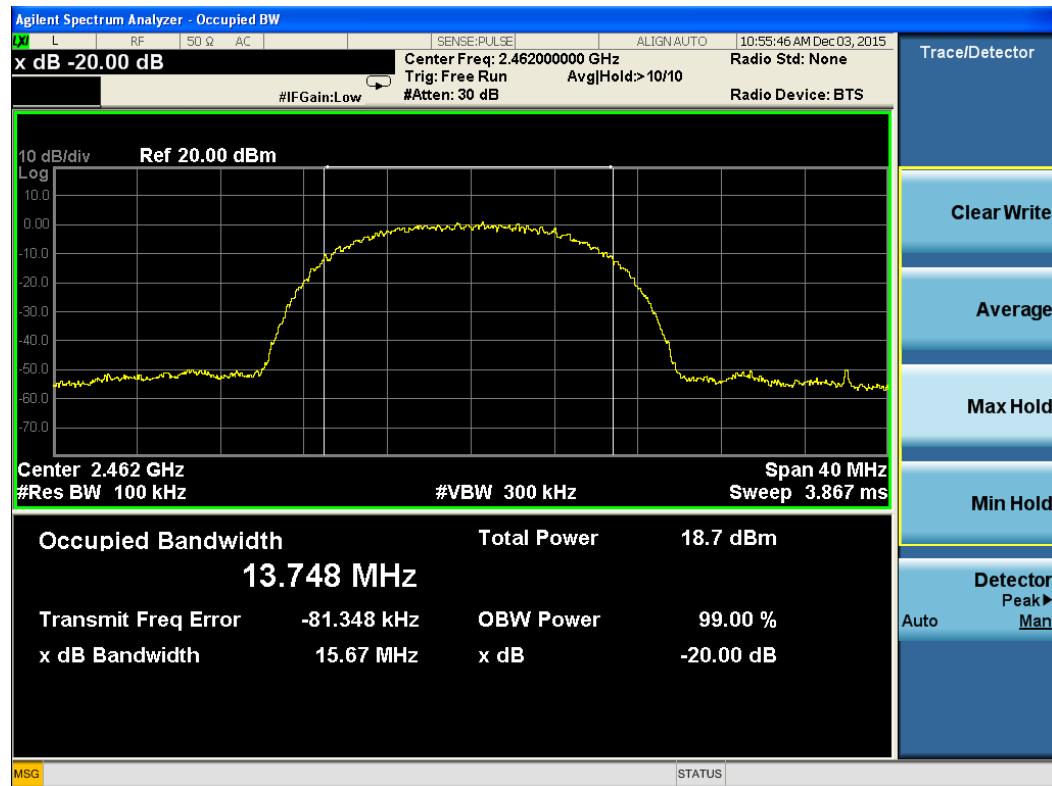
802.11b channel, 20 dB bandwidth / Chain 0



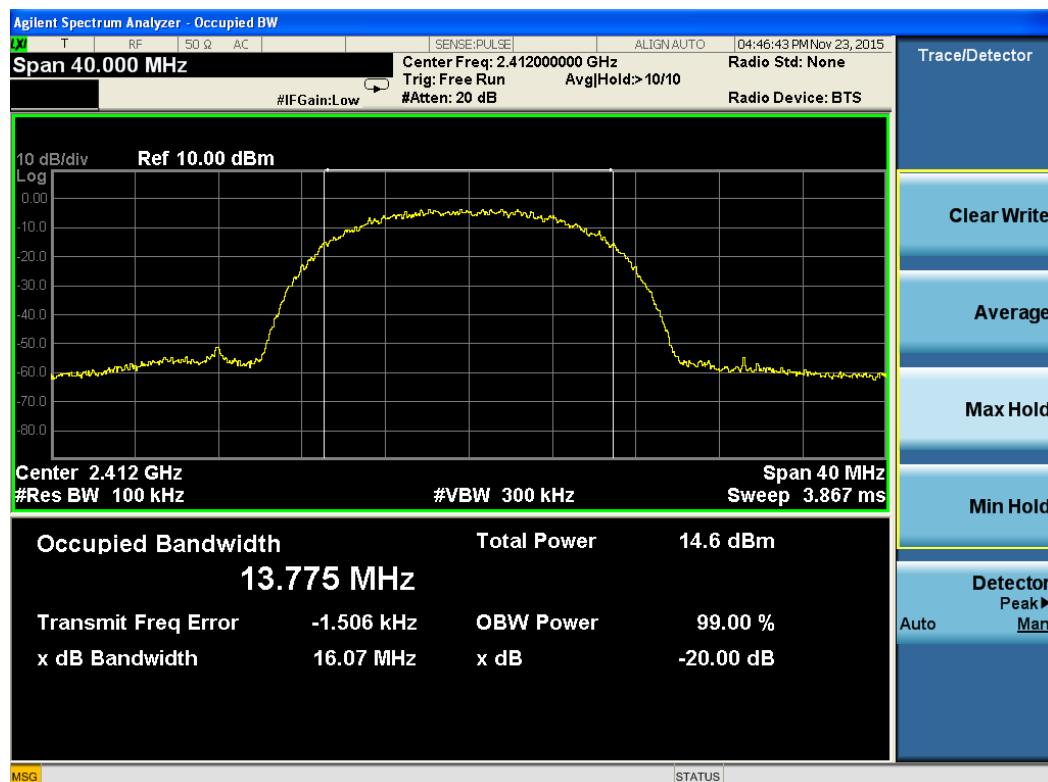


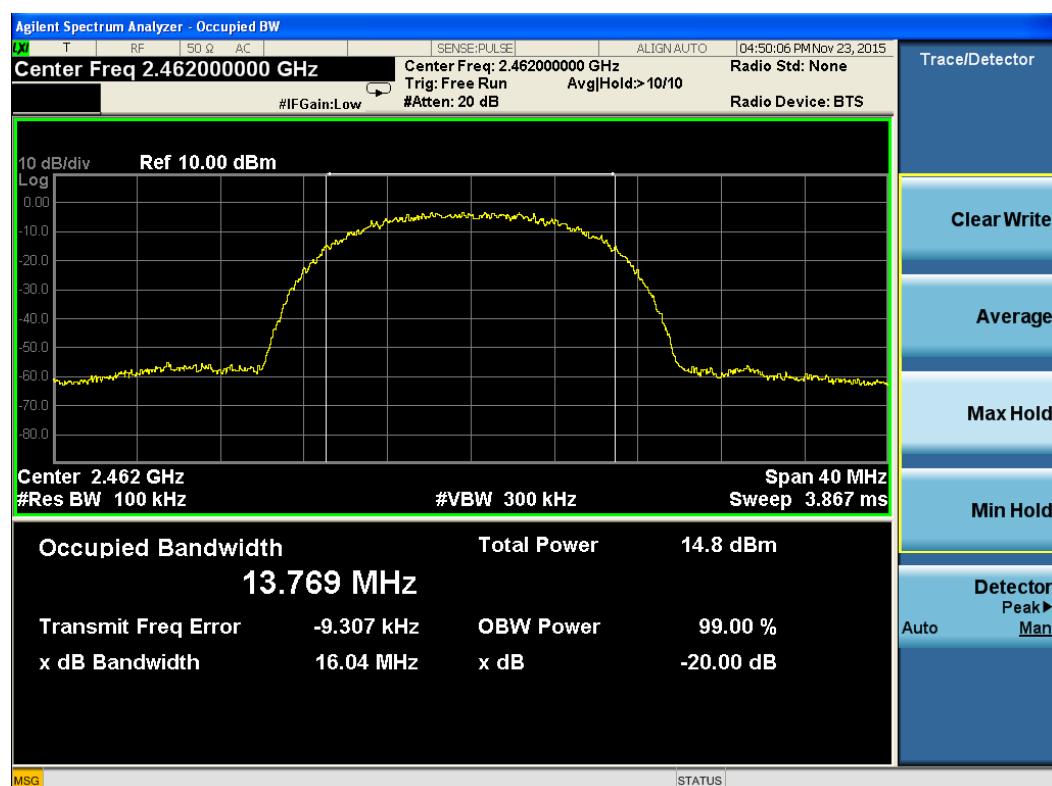
802.11b channel, 20dB bandwidth / Chain 1





802.11b channel, 20dB bandwidth / Chain 2





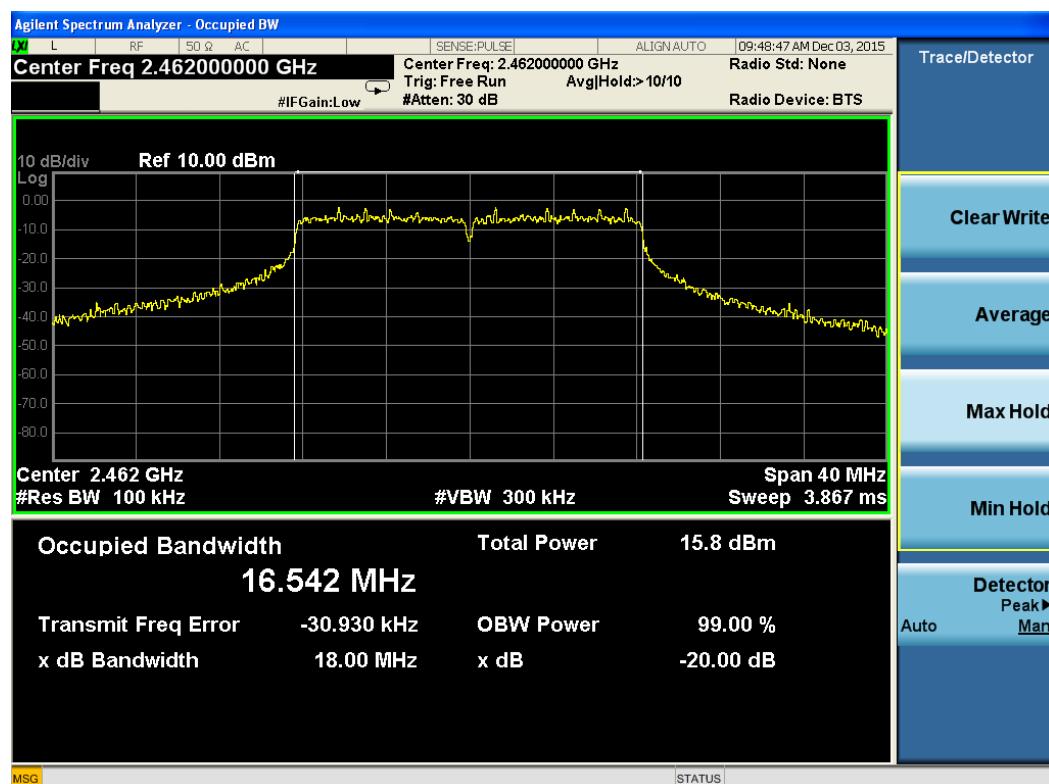
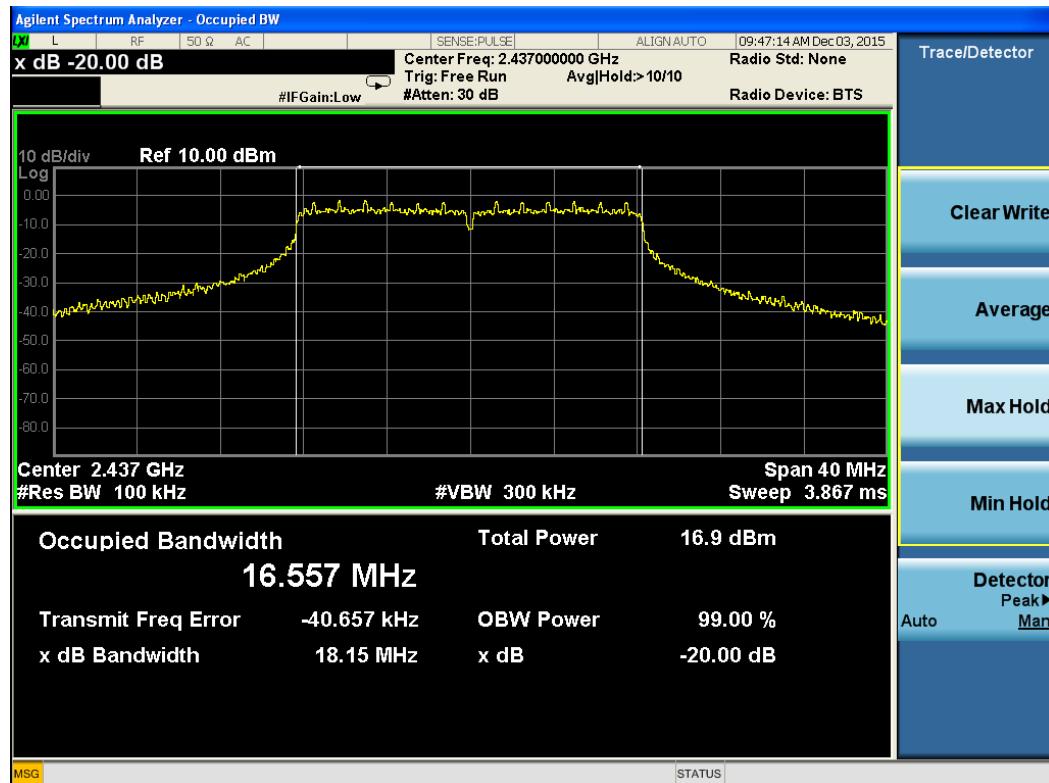
802.11b channel, 20dB bandwidth / Chain 3





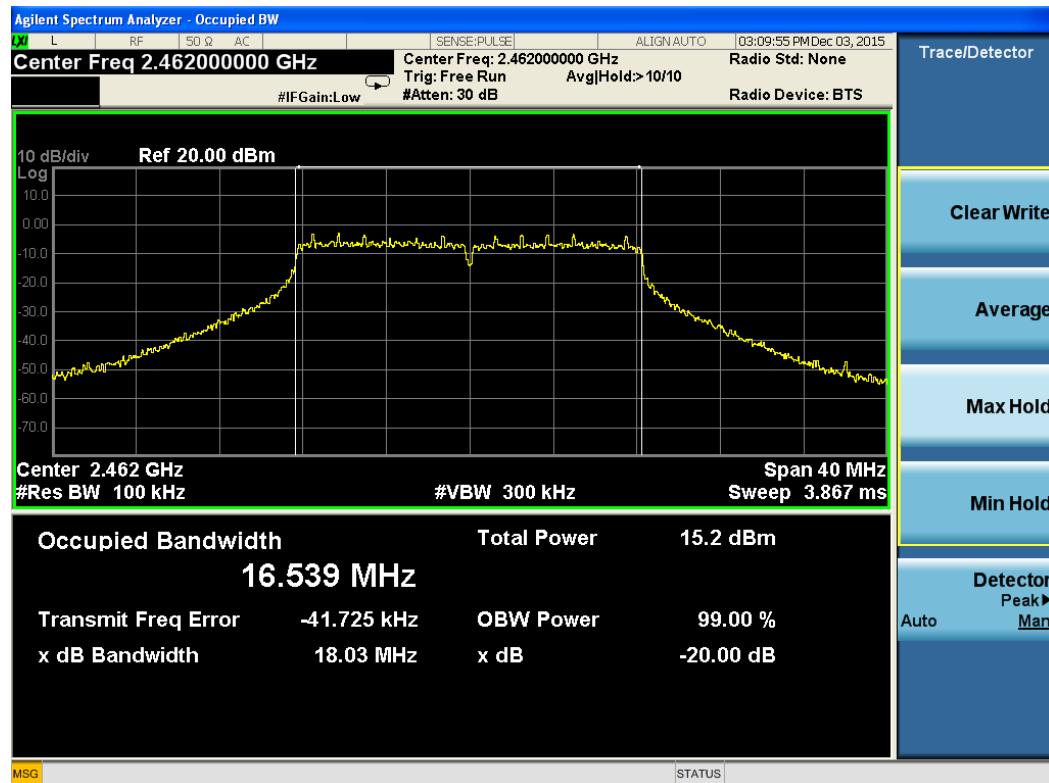
802.11g channel, 20dB bandwidth / Chain 0



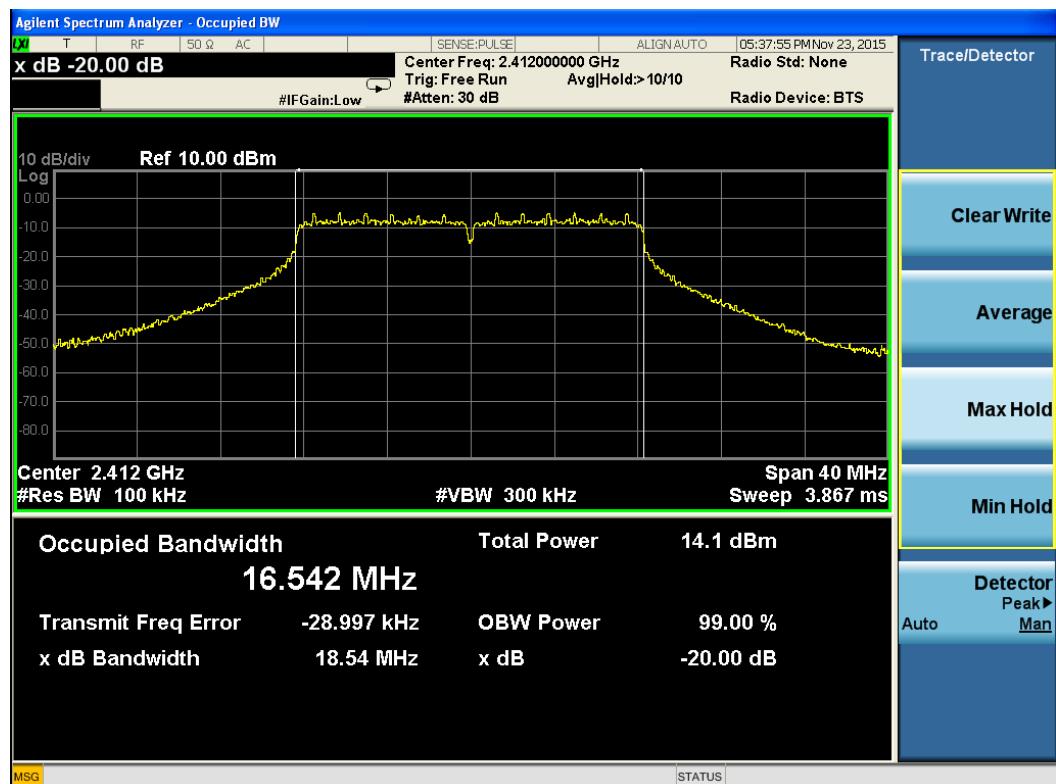


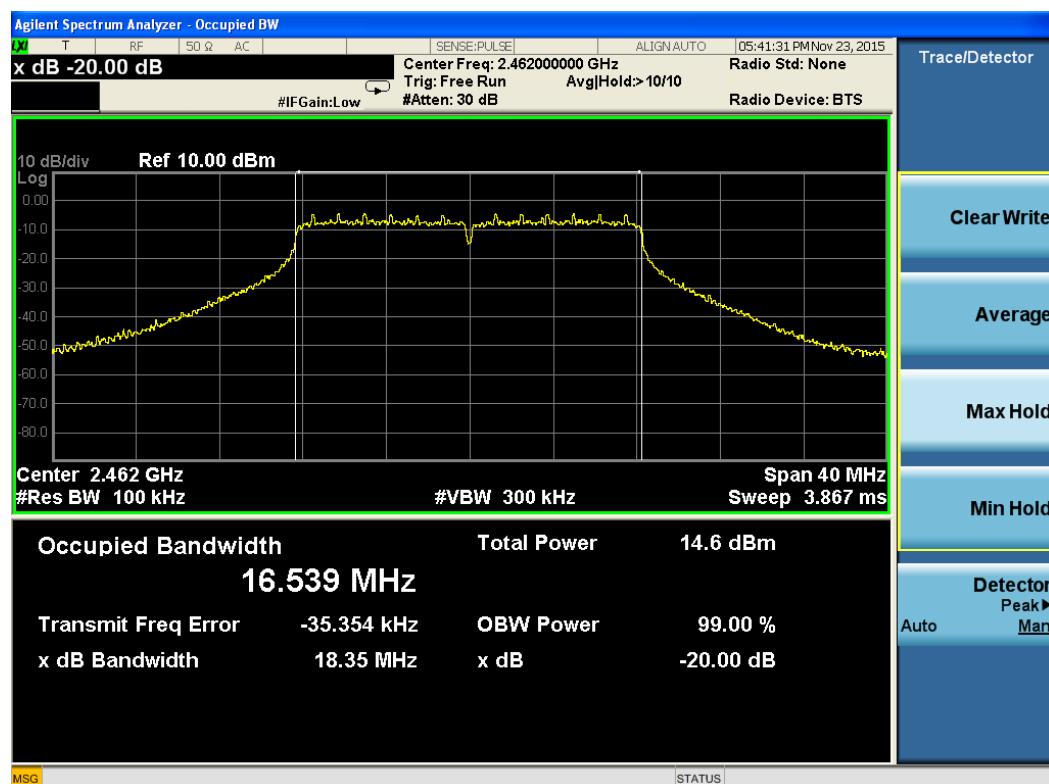
802.11g channel, 20dB bandwidth / Chain 1





802.11g channel, 20dB bandwidth / Chain 2





802.11n HT20 channel, 20dB bandwidth / Chain 3





802.11n HT20 channel, 20dB bandwidth / Chain 0

