

**TEST REPORT**  
of  
**FCC Part 15 Subpart C**  
**AND CANADA RSS-210**

New Application;     Class I PC;     Class II PC  
Limited Modular Approval

**Product :**                    **USB WiFi adapter**  
**Brand:**                    **acer**  
**Model:**                    **UWA2**  
**Model Difference:**    **N/A**  
**FCC ID:**                    **HLZUWA2**  
**IC:**                         **1754F-UWA2**  
**FCC Rule Part:**         **§15.247, Cat: DTS**  
**IC Rule Part:**            **RSS-210 issue 8 :2010, Annex 8**  
**Applicant:**               **Acer Incorporated**  
**Address:**                 **8F, 88, Sec 1, Hsin Tai Wu Rd, Hsichih, New Taipei City 22181, Taiwan, R.O.C.**

**Test Performed by:**

**International Standards Laboratory**

<Lung-Tan LAB>

\*Site Registration No.

BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;

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Report No.: **ISL-13LR039FC**

Issue Date : **2013/04/19**

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report MUST not be used to claim product endorsement by TAF, NVLAP or any agency of the Government.

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### VERIFICATION OF COMPLIANCE

**Applicant:** Acer Incorporated  
**Product Description:** USB WiFi adapter  
**Brand Name:** acer  
**Model No.:** UWA2  
**Model Difference:** N/A  
**FCC ID:** HLZUWA2  
**IC:** 1754F-UWA2  
**FCC Rule Part:** §15.247, Cat: DTS  
**IC Rule Part** RSS-210 issue 8:2010, Annex 8  
**Date of test:** 2013/03/07 ~ 2013/04/18  
**Date of EUT Received:** 2013/03/07

**We hereby certify that:**

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

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*Dion Chang / Engineer*

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**Approved By:** Vincent Su **Date:** 2013/04/19  
*Vincent Su / Technical Manager*

## Version

Version No.	Date	Description
00	2013/04/17	Initial creation of document
01	2013/04/19	Re-test 6dB Band Width

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## 1 GENERAL INFORMATION

### 1.1. Product Description

General:

Product Name:	USB WiFi adapter
Brand Name:	acer
Model Name:	UWA2
Model Difference:	N/A
Power Supply:	5VDC form USB Port
Hardware Version:	N/A
Software Version:	N/A
Adhoc Mode	No
DFS Mode	N/A
TPC	No
Operation Environment	Indoor, the USB dongle with laptops/notebooks is prohibited.

WLAN: 2X2 SM-MIMO

Wi-Fi	Frequency Range (MHz)	Channels	Peak Rated Power	Modulation Technology
802.11b	2412 – 2462(DTS)	11	19.83dBm	DSSS
802.11g	2412 – 2462(DTS)	11	24.31dBm	DSSS, OFDM
802.11n	HT20 2412 – 2462(DTS)	11	25.99dBm	OFDM
	HT40 2422 – 2452(DTS)	7	26.09dBm	
802.11a	5180 – 5240(NII)	4	10.03dBm	OFDM
	5745 – 5825(DTS)	5	20.09dBm	
802.11n	HT20 5180 – 5240(NII)	4	13.66dBm	OFDM
	HT20 5745 – 5825(DTS)	5	20.42dBm	
	HT40 5190 – 5230(NII)	2	12.29dBm	
	HT40 5755 – 5795(DTS)	2	22.89dBm	
Modulation type		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM		
Transition Rate:		Upto 72Mbps		
Antenna Designation:		PCB Antenna 2.4GHz: -5.2dBi; 5GHz: 5.9dBi According to KDB662911 D01 SM-MIMO signals could be considered uncorrelated for purposes of directional gain computation.  Directional gain = $G_{ANT}$		

The EUT is compliance with IEEE 802.11 a/b/g/n Standard. This report is applied for band 2412-2464MHz and 5745-5825MHz.

**Remark:** The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

### 1.1 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: HLZUWA2** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. And **IC: 1754F-UWA2** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 8. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

### 1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

KDB Document:

558074 D01 DTS Meas Guidance v03r01

### 1.3 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd., Lung-Tan Hsiang, Tao Yuan County 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number is: TW1036, Canada Registration Number: 4067B-3.

### 1.4 Special Accessories

Not available for this EUT intended for grant.

### 1.5 Equipment Modifications

Not available for this EUT intended for grant.



## **2 SYSTEM TEST CONFIGURATION**

### **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 which intends to maximize its emission characteristics in a continuous normal application.

### **2.2 EUT Exercise**

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

### **2.3 Test Procedure**

#### **2.3.1 Conducted Emissions**

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

#### **2.3.2 Radiated Emissions**

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table 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 max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

## 2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

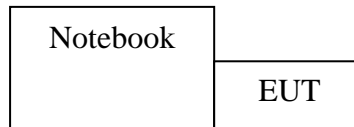


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Notebook	IBM	X40	N/A	Shield	Non-shield

### 3 SUMMARY OF TEST RESULTS

FCC /IC Rules	Description Of Test	Result
§15.207(a)/ RSS-Gen §7.2.4	AC Power Line Conducted Emission	Compliant
§15.247(b) (3),(4)/ RSS-210 §A8.4(4)	Peak Output Power	Compliant
§15.247(a)(2) §A8.2(a) RSS-Gen §4.6.1	6dB Bandwidth & 99% Power Bandwidth	Compliant
§15.247(d)/ RSS-210 §A8.5	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(d)/ RSS-210 §A8.5	Spurious Emission	Compliant
§15.247(e)/ RSS-210 §A8.2(b) & §A8.3(2)	Peak Power Density	Compliant
§15.203/ RSS-210 issue 8, §A8.4	Antenna Requirement	Compliant
MPE	Maximum Permissible Exposure	Compliant

#### 4 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering operating condition.

Test program used to control the EUT for staying in continuous transmitting mode is programmed.

2.4GHz:

802.11 b mode: Channel low (2412MHz)、 mid (2437MHz) and high (2462MHz) with 1Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 g mode: Channel low (2412MHz)、 mid (2437MHz) and high (2462MHz) with 6Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT20: Channel low (2412MHz)、 mid (2437MHz) and high (2462MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT40: Channel low (2422MHz)、 mid (2437MHz) and high (2452MHz) with 13.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

5745-5825MHz:

802.11a mode: Channel low (5745MHz)、 mid (5785MHz) and high (5825MHz) with 6Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT20: Channel low (5745MHz)、 mid (5785MHz) and high (5825MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT40: Channel low (5755MHz) and high (5795MHz) with 13.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

The worst case 802.11 g mode was reported for Radiated Emission.

## 5 CONDUCTED EMISSION TEST

### 5.1 Standard Applicable:

According to §15.207, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

- The lower limit shall apply at the transition frequencies
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 5.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
LISN 20	R&S	ENV216	101477	05/09/2012	05/09/2013
LISN 06	ROHDE&SCHWARZ	ESH3/Z5	828874/009	01/19/2013	01/19/2014
Conduction 02-1 Cable	WOKEN	CFD 300-NL	Conduction 02-1	06/28/2012	06/28/2013
EMI Receiver 14	ROHDE&SCHWARZ	ESCI	101034	02/21/2013	02/21/2014
ISN T2 01	FCC	FCC-TLISN-T2-02	20253	11/10/2012	11/10/2013
ISN T4 03	FCC	FCC-TLISN-T4-02	20254	11/10/2012	11/10/2013
ISN T8 05	Teseq GmbH	ISN T800	30305	04/06/2012	04/06/2013

### 5.3 EUT Setup:

- The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
- The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- The LISN was connected with 120Vac/60Hz power source.

#### **5.4 Measurement Procedure:**

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

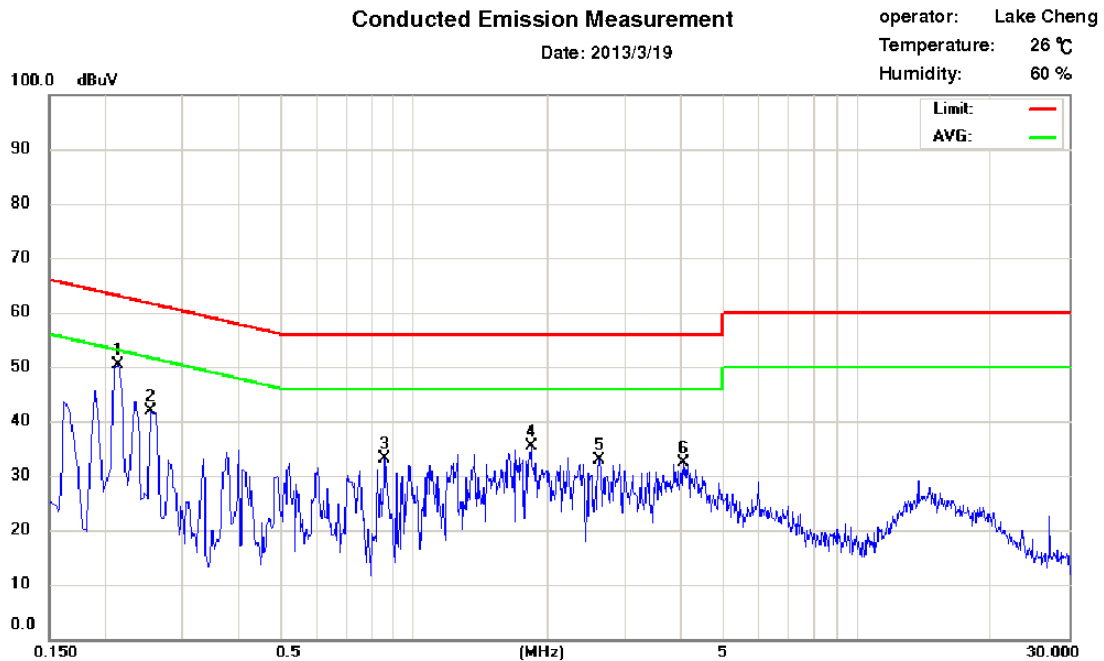
#### **5.5 Measurement Result:**

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.

### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	Test Date:	2013/03/19
Test By:	Dino		



Site: Conduction 02 Phase: *L1*  
Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.2140	9.74	41.85	63.05	-21.20	27.47	53.05	-25.58	
2	0.2540	9.74	37.45	61.63	-24.18	20.29	51.63	-31.34	
3	0.8580	9.66	28.33	56.00	-27.67	18.50	46.00	-27.50	
4	1.8300	9.74	29.68	56.00	-26.32	18.65	46.00	-27.35	
5	2.6140	9.77	30.09	56.00	-25.91	24.46	46.00	-21.54	
6	4.0620	9.79	27.17	56.00	-28.83	20.22	46.00	-25.78	

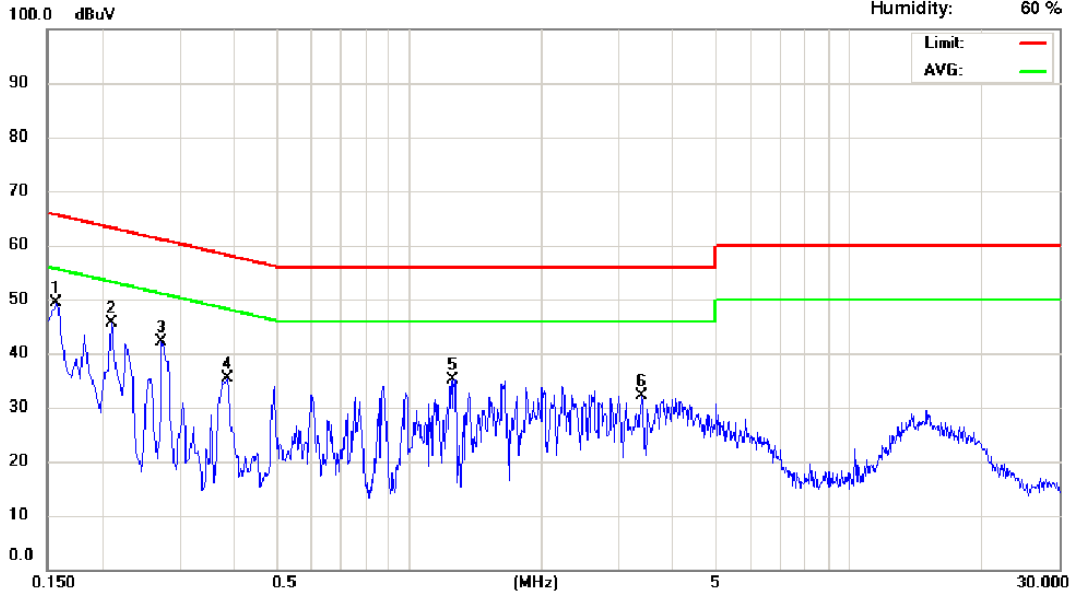
Conducted Emission Measurement

Date: 2013/3/19

operator: Lake Cheng

Temperature: 26 °C

Humidity: 60 %



Site: Conduction 02

Phase: N

Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1580	9.53	47.66	65.57	-17.91	32.54	55.57	-23.03	
2	0.2100	9.78	44.14	63.21	-19.07	34.32	53.21	-18.89	
3	0.2740	9.76	37.41	61.00	-23.59	23.96	51.00	-27.04	
4	0.3860	9.71	35.69	58.15	-22.46	34.21	48.15	-13.94	
5	1.2620	9.72	35.99	56.00	-20.01	32.19	46.00	-13.81	
6	3.3780	9.76	27.52	56.00	-28.48	20.15	46.00	-25.85	



## 6 PEAK /AVERAGE OUTPUT POWER MEASUREMENT

### 6.1 Standard Applicable:

According to §15.247(b)(3),(4)(b)

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

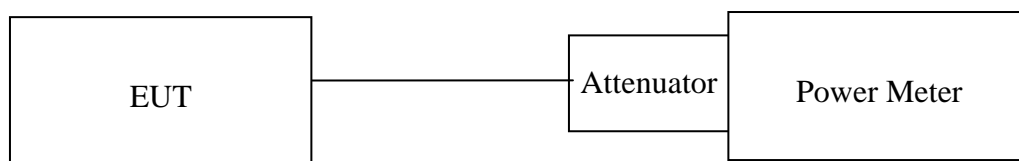
(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

According to RSS-210 issue 8, §A8.4(4), For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section A8.4(5), the e.i.r.p. shall not exceed 4 W.

**6.2 Measurement Equipment Used:**

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter 05	Anritsu	ML2495A	1116010	04/17/2012	04/16/2013
Power Sensor 05	Anritsu	MA2411B	34NKF50	04/16/2012	04/15/2013
Temperature Chamber	KSON	THS-B4H100	2287	03/15/2013	03/14/2014
DC Power supply	ABM	51850	N/A	06/17/2012	06/16/2013
AC Power supply	EXTECH	CFC105W	NA	12/19/2012	12/18/2013
Splitter	MCLI	PS4-199	12465	07/18/2012	07/17/2013
Spectrum analyzer	Agilent	N9030A	MY51360021	03/11/2013	03/10/2014

**6.3 Test Set-up:**



**6.4 Measurement Procedure:**

Refer to section 9.1.3 and 9.2.3 Peak and Average Conducted Output Power Measurement Procedure of KDB Document: 558074 D01 DTS Meas Guidance v03r01

**6.5 Measurement Result:**

802.11b

Cable loss = 0		Output Power		Limit (dBm)
CH	Frequency (MHz)	Detector		
		PK (dBm)	AV (dBm)	
1	2412	19.24	16.84	30
6	2437	19.83	17.53	
11	2462	19.23	16.92	

802.11g

Cable loss = 0		Output Power		Limit (dBm)
CH	Frequency (MHz)	Detector		
		PK (dBm)	AV (dBm)	
1	2412	23.95	14.42	30
6	2437	24.31	15.15	
11	2462	23.97	14.86	

802.11n for 2.4GHz

Peak Measurement:

2\*2 MIMO

Channel		Frequency (MHz)	Output Chain (dBm)		Combine Output Power (dBm)	Limit(dBm)	Result
			Chain A	chain B			
AN HT20	1	2412	21.88	23.11	25.55	30	Pass
	6	2437	22.22	23.62	25.99	30	Pass
	11	2462	21.62	23.21	25.50	30	Pass
AN HT40	3	2422	22.01	23.25	25.68	30	Pass
	6	2437	22.32	23.72	26.09	30	Pass
	9	2452	21.95	23.48	25.79	30	Pass

Average Measurement

2\*2 MIMO

Channel		Frequency (MHz)	Output Chain (dBm)		Combine Output Power (dBm)	Limit(dBm)	Result
			Chain A	chain B			
AN HT20	1	2412	13.15	13.75	16.47	30	Pass
	6	2437	13.84	14.23	17.05	30	Pass
	11	2462	13.48	13.92	16.72	30	Pass
AN HT40	3	2422	13.13	13.52	16.34	30	Pass
	6	2437	13.42	13.97	16.71	30	Pass
	9	2452	13.41	13.72	16.58	30	Pass

802.11a(5G)

Cable loss = 0		Output Power		Limit (dBm)
CH	Frequency (MHz)	Detector		
		PK (dBm)	AV (dBm)	
149	5745	20.09	11.64	30
157	5785	19.53	10.81	
165	5825	18.51	9.82	

802.11n for 5GHz

Peak Measurement:

2\*2 MIMO

Channel	Frequency (MHz)	Output Chain (dBm)		Combine Output Power (dBm)	Limit(dBm)	Result	
		Chain A	chain B				
AN HT20	149	5745	15.85	15.52	20.42	30	Pass
	157	5785	15.88	15.53	18.72	30	Pass
	165	5825	16.12	16.01	19.08	30	Pass
AN HT40	151	5755	19.61	20.13	22.89	30	Pass
	155	5775	18.72	19.07	21.91	30	Pass

Average Measurement

2\*2 MIMO

Channel	Frequency (MHz)	Output Chain (dBm)		Combine Output Power (dBm)	Limit(dBm)	Result	
		Chain A	chain B				
AN HT20	149	5745	6.91	11.69	12.94	30	Pass
	157	5785	7.12	10.52	12.15	30	Pass
	165	5825	7.11	9.67	11.59	30	Pass
AN HT40	151	5755	5.84	10.61	11.86	30	Pass
	155	5775	6.65	9.92	11.60	30	Pass

## **7 6dB /99% Bandwidth(EBW)**

### **7.1 Standard Applicable:**

According to §15.247(a)(2), Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

According to RSS 210 issue 8, §8.2(a) Systems employing digital modulation techniques (which includes direct sequence) can now be certified under RSS-210 provided they comply with the following requirements: The minimum -6 dB bandwidth shall be at least 500 kHz.

### **7.2 Measurement Equipment Used:**

Refer to section 6.2 for details.

### **7.3 Test Set-up:**

Refer to section 6.3 for details.

### **7.4 Measurement Procedure:**

Refer to section 8.1 DTS bandwidth Measurement Procedure of KDB Document: 558074 D01 DTS Meas Guidance v03r01

1. Set resolution bandwidth (RBW) = 100KHz.
2. Set the video bandwidth (VBW) = 300KHz.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer.

**7.5 Measurement Result:**

**2.4GHz**

802.11b

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	10.10	15.22	> 500	PASS
2437	10.09	15.22	> 500	PASS
2462	10.10	15.31	> 500	PASS

802.11g

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	16.56	17.07	> 500	PASS
2437	16.56	17.12	> 500	PASS
2462	16.56	17.17	> 500	PASS

802.11n HT20 chain a

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.74	18.11	> 500	PASS
2437	17.74	18.14	> 500	PASS
2462	17.72	18.16	> 500	PASS

802.11n HT20 chain b

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.75	18.04	> 500	PASS
2437	17.75	18.08	> 500	PASS
2462	17.74	18.08	> 500	PASS

802.11n HT20 Combine

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.75	17.80	> 500	PASS
2437	17.74	17.90	> 500	PASS
2462	17.74	17.90	> 500	PASS

802.11n HT40 china a

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2422	36.42	36.77	> 500	PASS
2437	36.41	36.75	> 500	PASS
2452	36.40	36.79	> 500	PASS

802.11n HT40 china b

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2422	36.42	36.65	> 500	PASS
2437	36.41	36.74	> 500	PASS
2452	36.41	36.72	> 500	PASS

802.11n HT40 Combine

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2422	36.44	36.42	> 500	PASS
2437	36.41	36.51	> 500	PASS
2452	36.39	36.53	> 500	PASS



**5GHz**

802.11a

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	16.56	16.86	> 500	PASS
5785	16.54	16.92	> 500	PASS
5825	16.54	16.94	> 500	PASS

802.11n 20MHz china a

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	17.77	18.11	> 500	PASS
5785	17.69	18.14	> 500	PASS
5825	17.80	18.16	> 500	PASS

802.11n 20MHz china b

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	17.69	18.04	> 500	PASS
5785	17.78	18.08	> 500	PASS
5825	17.70	18.08	> 500	PASS

802.11n 20MHz Combine

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	17.72	17.80	> 500	PASS
5785	17.73	17.90	> 500	PASS
5825	17.70	17.90	> 500	PASS

802.11n 40MHz chain a

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5755	36.37	36.77	> 500	PASS
5775	36.35	36.75	> 500	PASS
5815	36.38	36.79	> 500	PASS

802.11n 40MHz chain b

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5755	36.40	36.65	> 500	PASS
5775	36.38	36.74	> 500	PASS
5815	36.36	36.72	> 500	PASS

802.11n 40MHz Combine

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5755	36.14	36.42	> 500	PASS
5775	36.11	36.51	> 500	PASS
5815	36.10	36.53	> 500	PASS

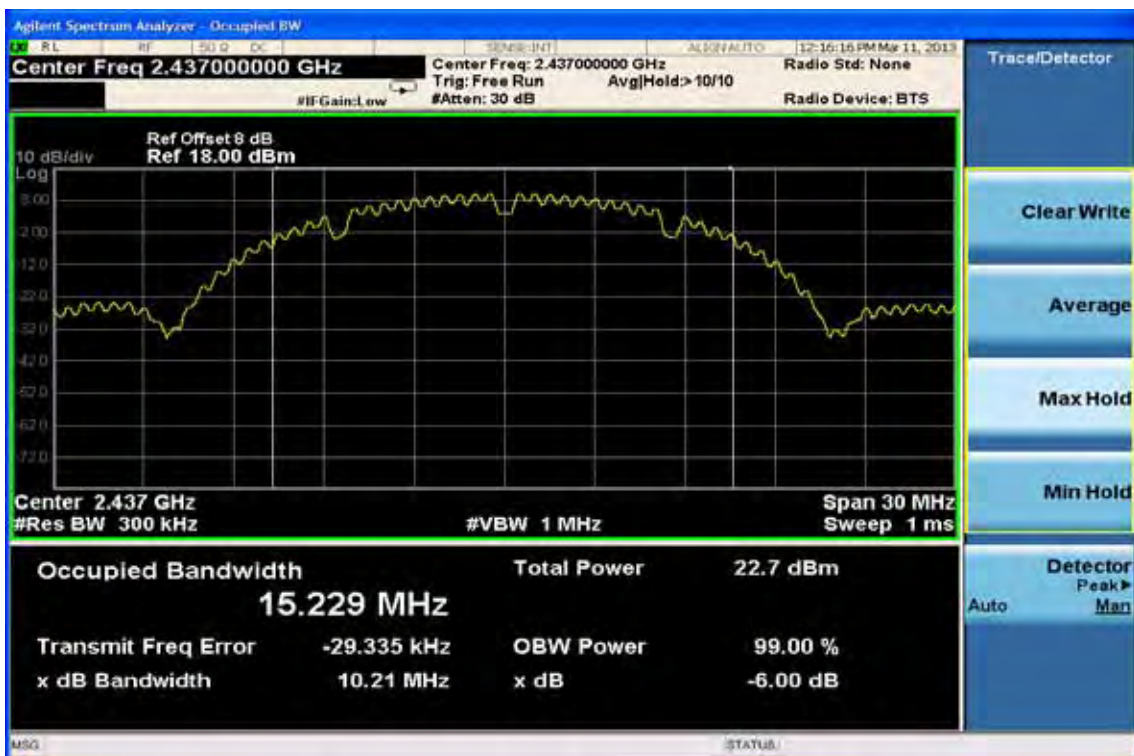
Note: Refer to next page for plots.

802.11b

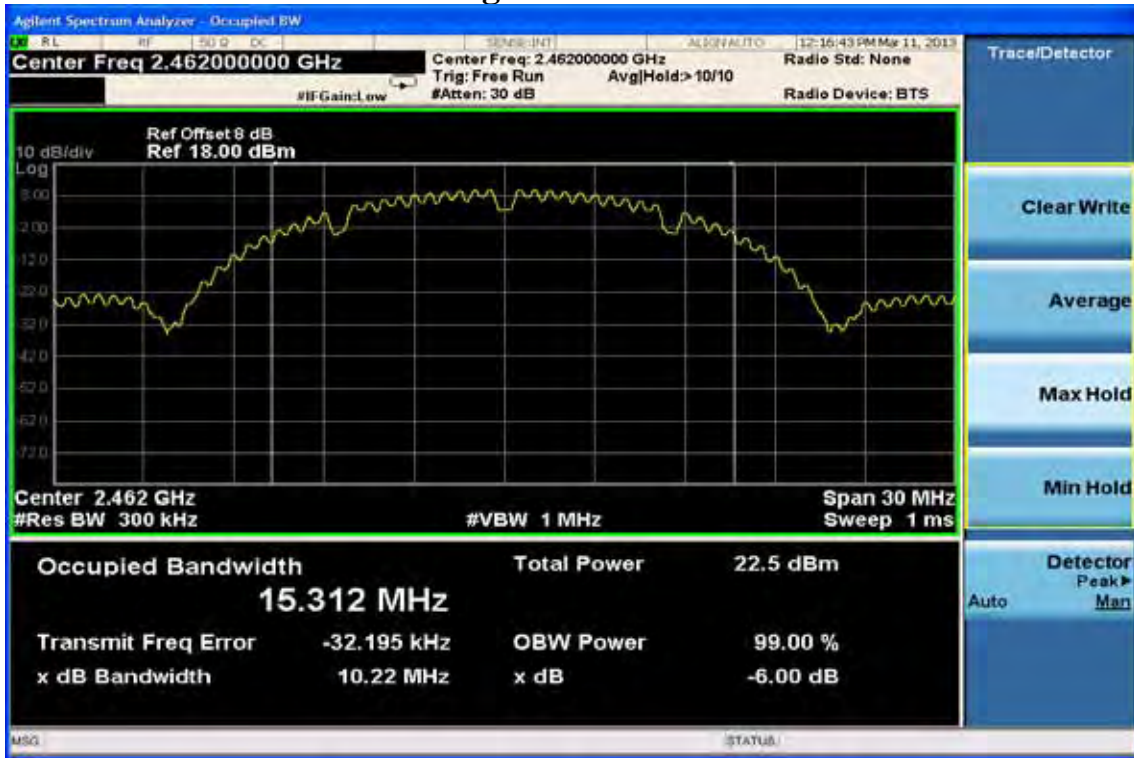
99% Band Width Test Data CH-Low



99%Band Width Test Data CH-Mid

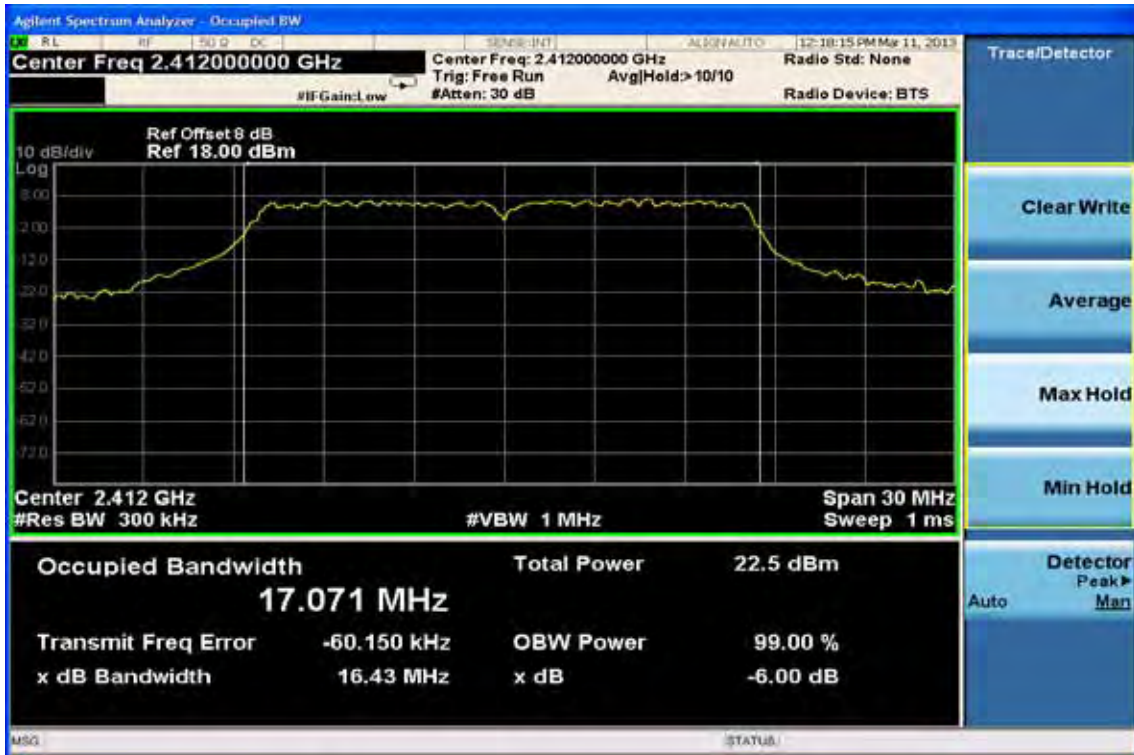


### 99%Band Width Test Data CH-High

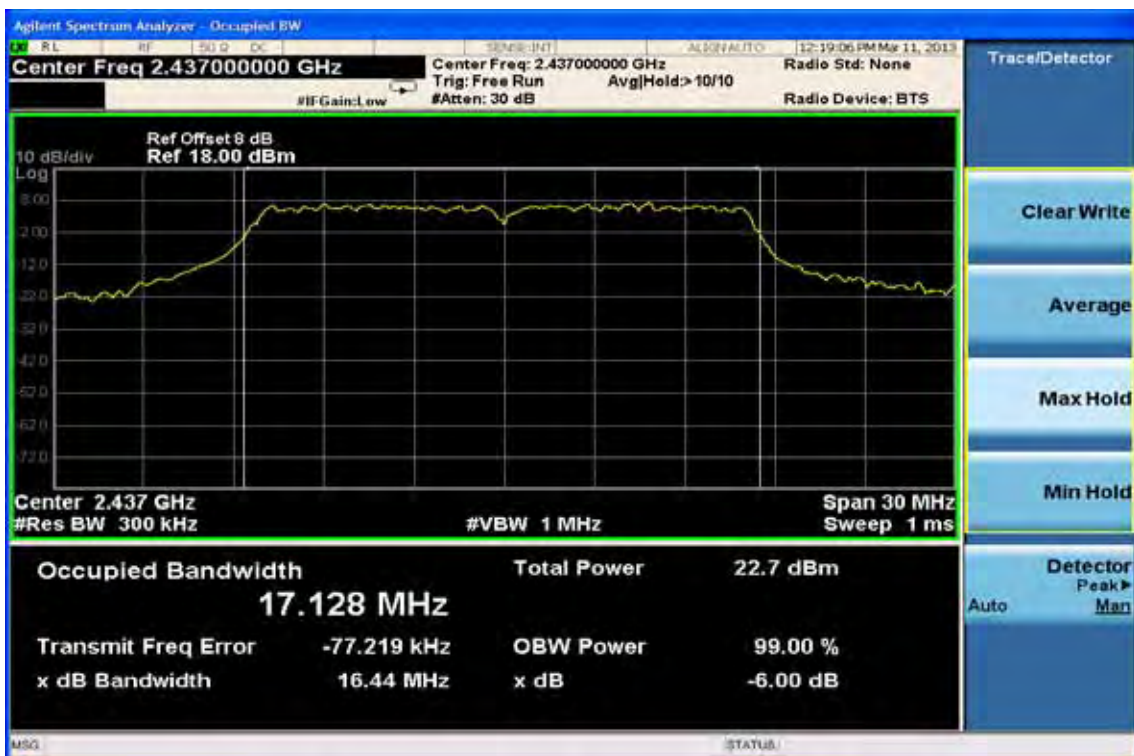


802.11g

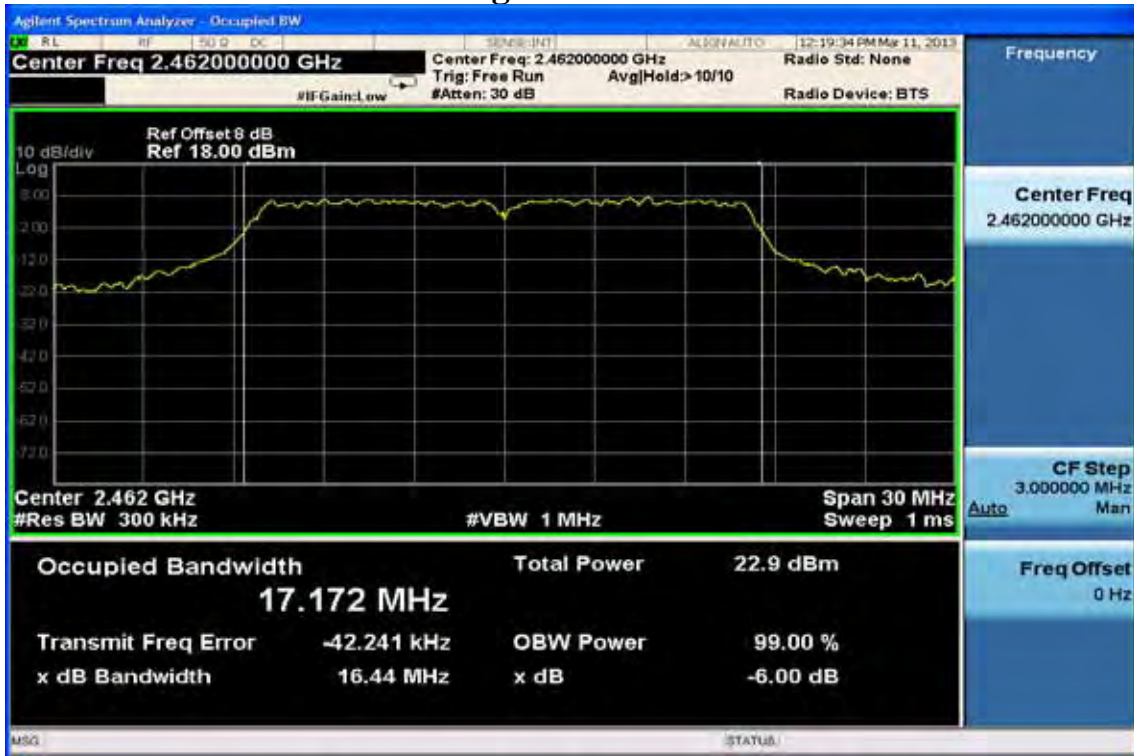
99% Band Width Test Data CH-Low



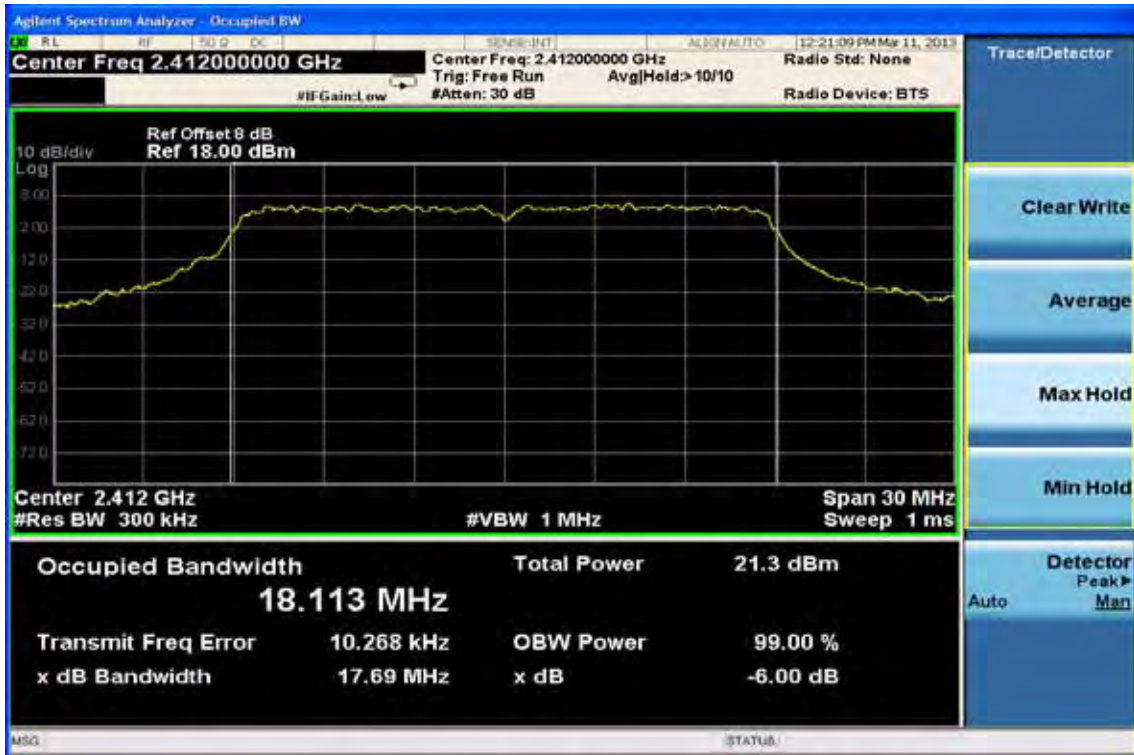
99% Band Width Test Data CH-Mid



### 99% Band Width Test Data CH-High



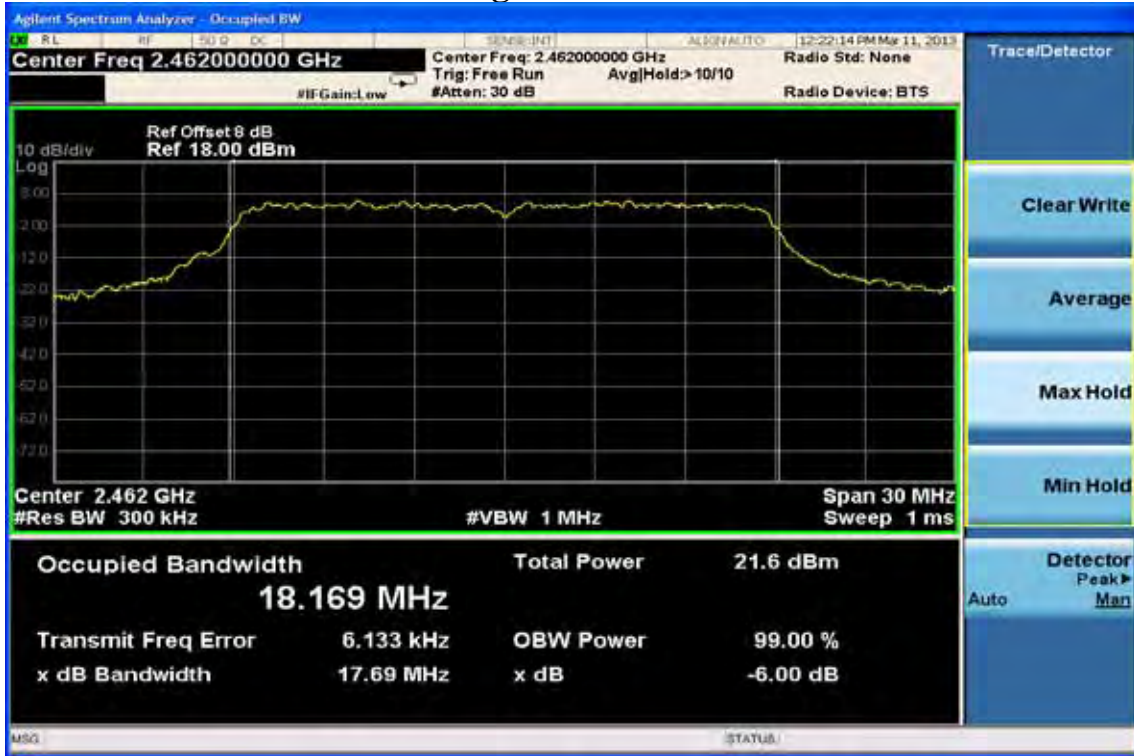
802.11n\_20M for 2.4GHz chain a  
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



99% Band Width Test Data CH-High





802.11n\_20M for 2.4GHz chain b  
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



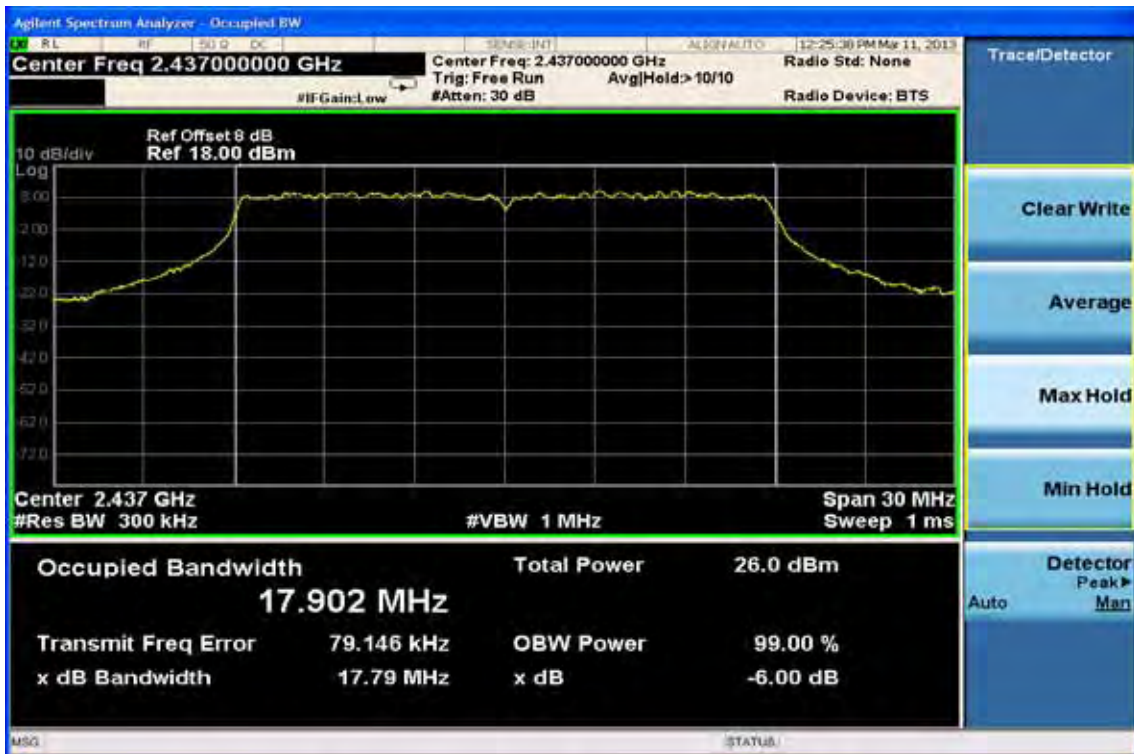
### 99% Band Width Test Data CH-High



**802.11n\_20M for 2.4GHz Combine  
99% Band Width Test Data CH-Low**



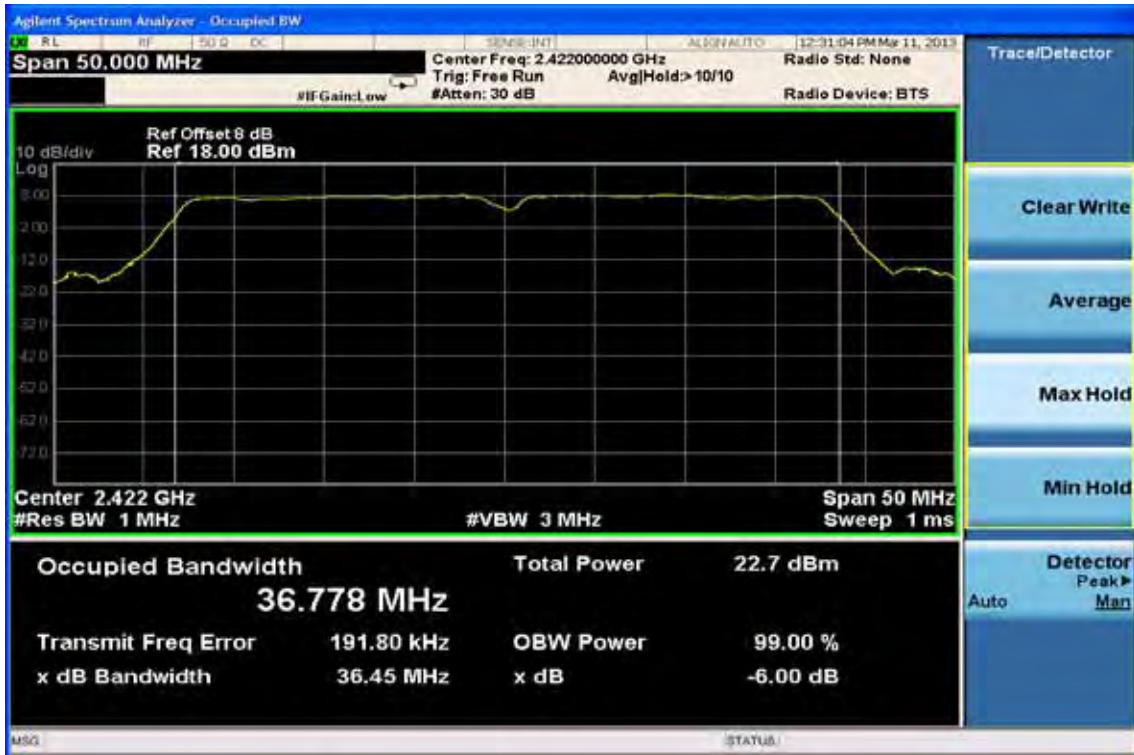
**99% Band Width Test Data CH-Mid**



### 99% Band Width Test Data CH-High



802.11n\_40M for 2.4GHz chain a  
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



### 99% Band Width Test Data CH-High



802.11n\_40M for 2.4GHz chain b  
 99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

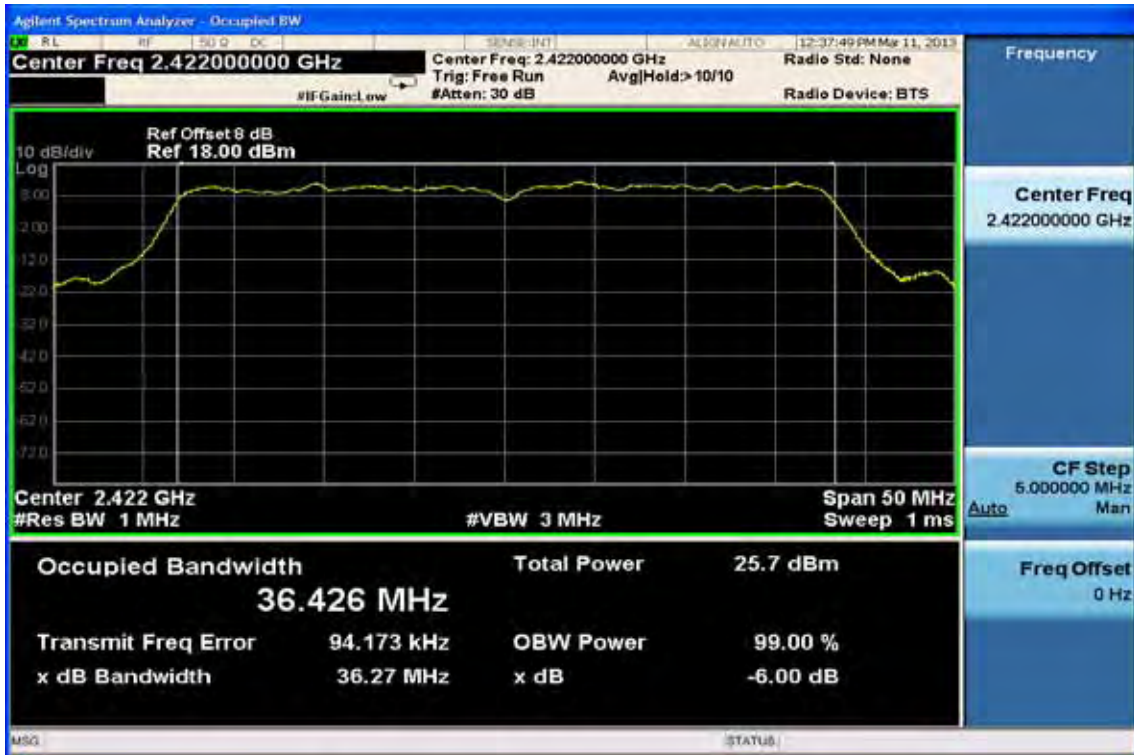


### 99% Band Width Test Data CH-High

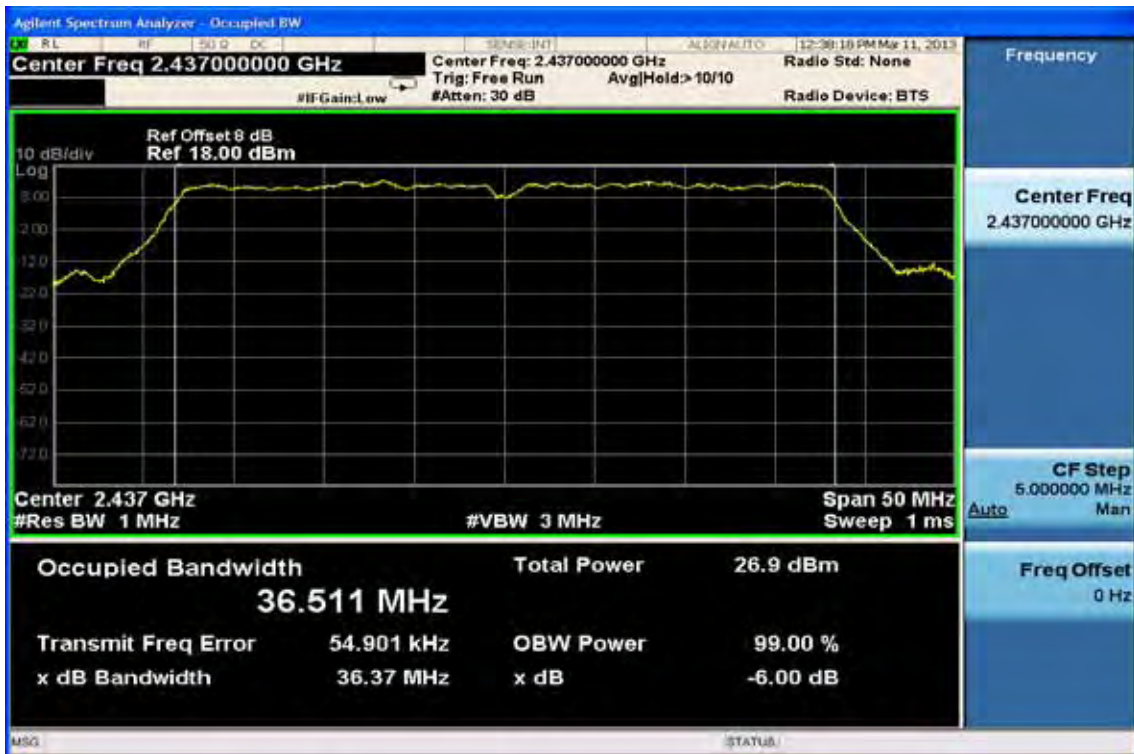




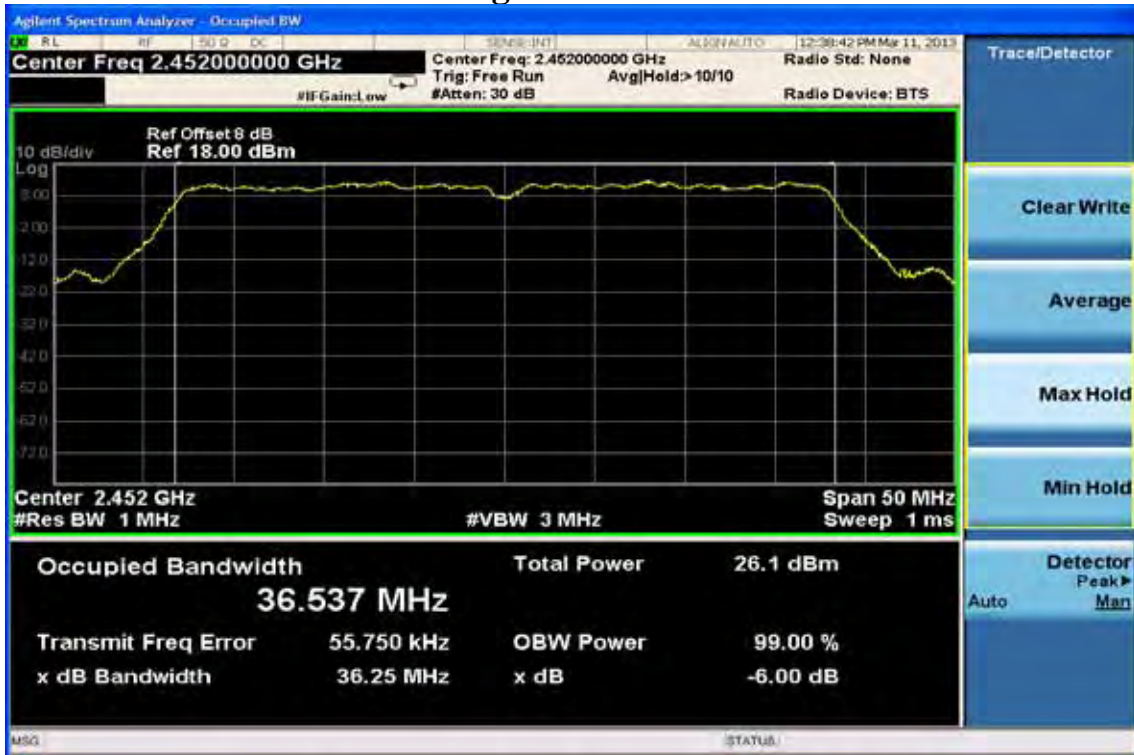
**802.11n\_40M for 2.4GHz Combine  
99% Band Width Test Data CH-Low**



**99% Band Width Test Data CH-Mid**



### 99% Band Width Test Data CH-High

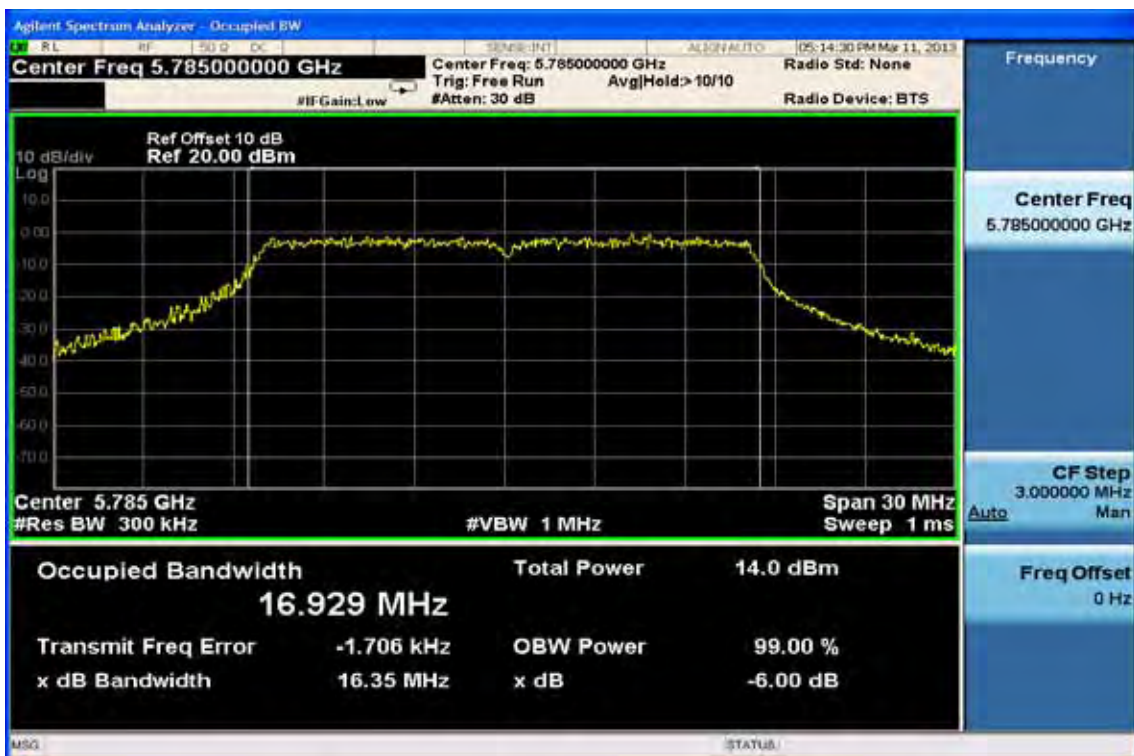


802.11a

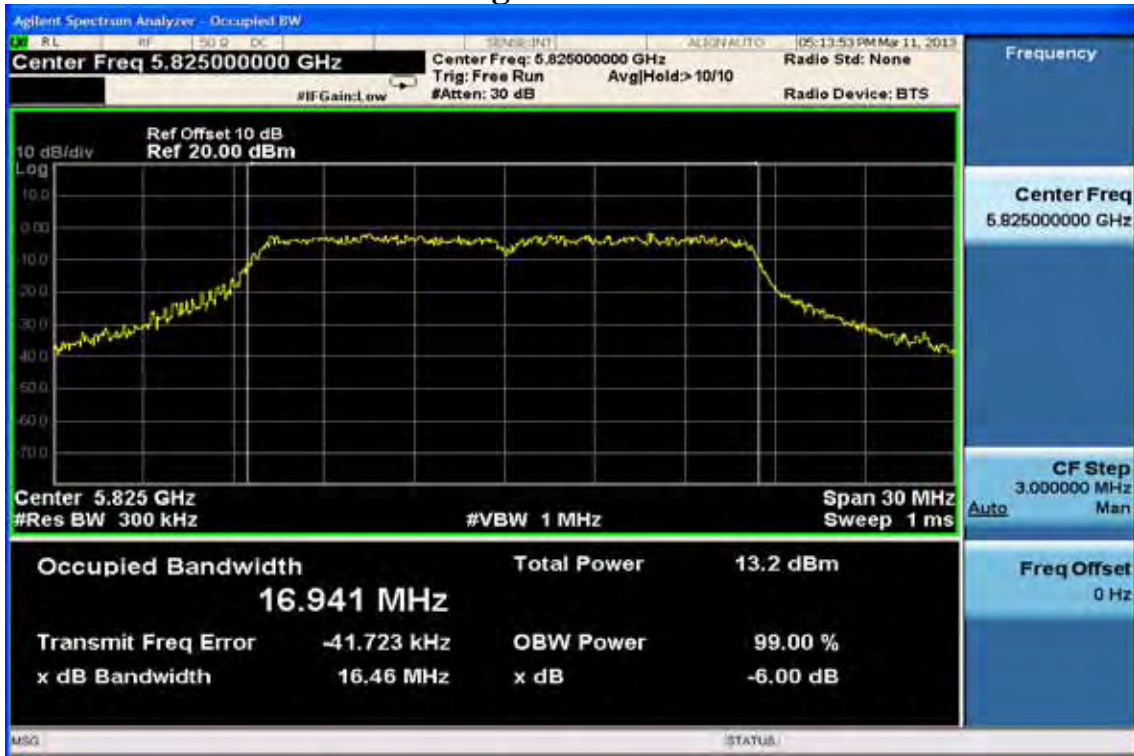
99% Band Width Test Data CH-Low



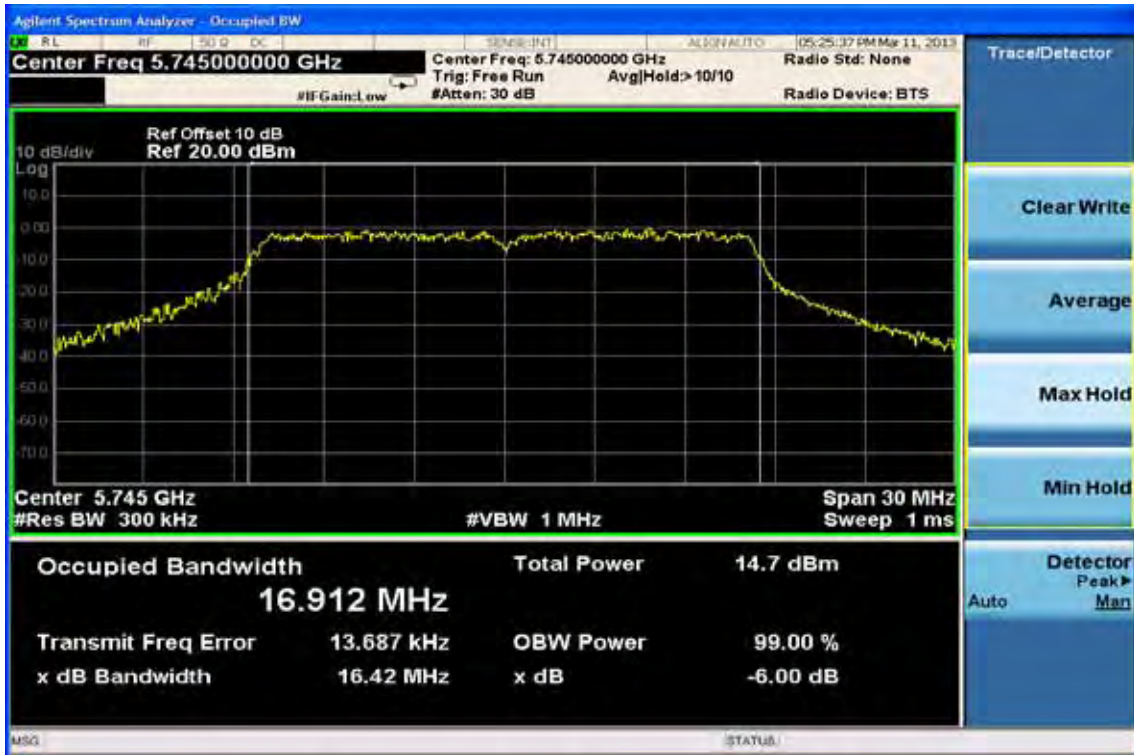
99% Band Width Test Data CH-Mid



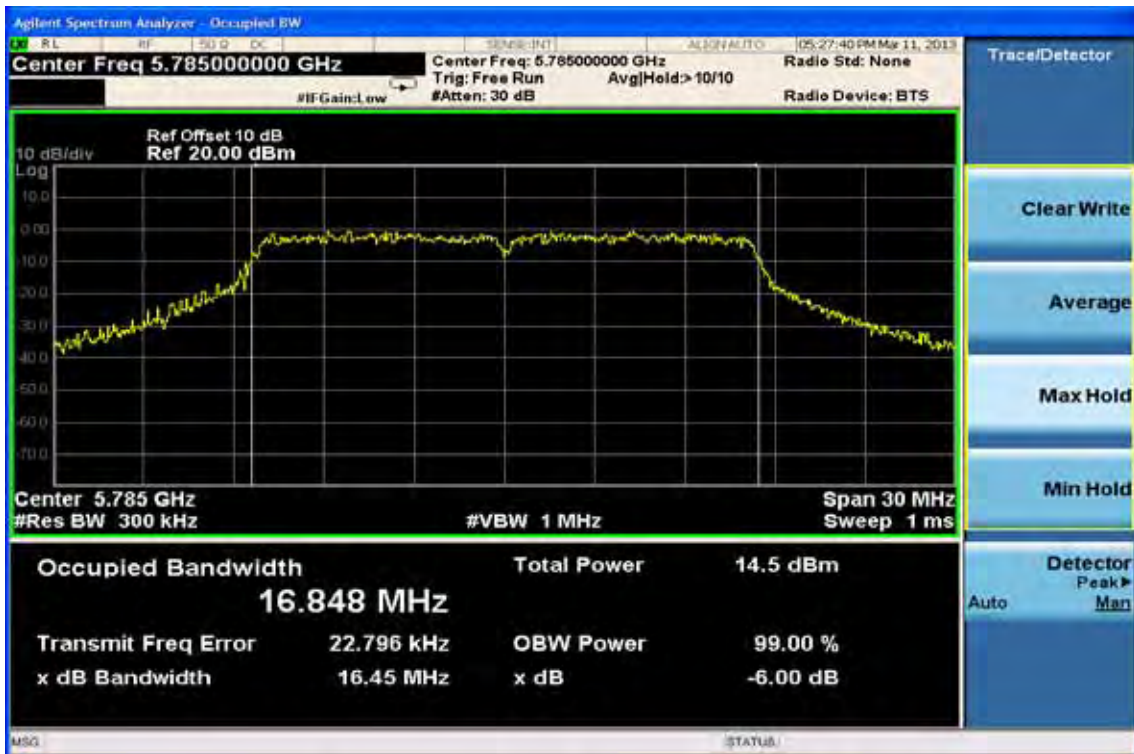
### 99% Band Width Test Data CH-High



802.11n\_20M for 5GHz chain a  
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid

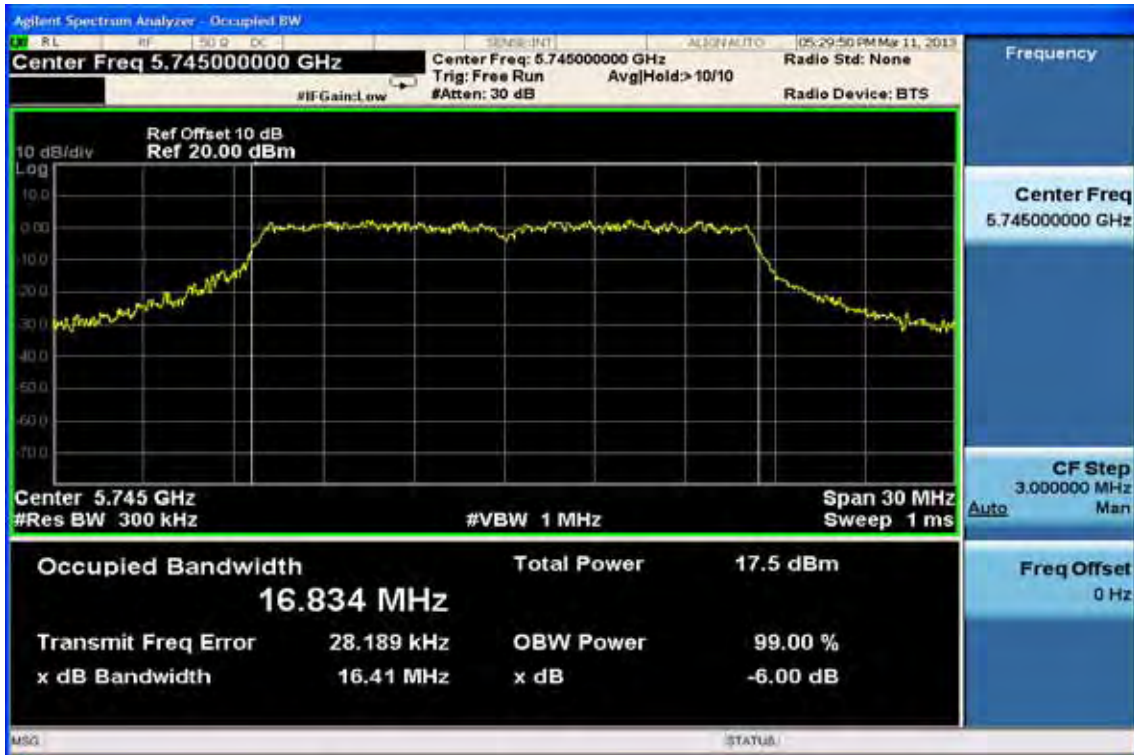


### 99% Band Width Test Data CH-High



802.11n\_20M for 5GHz chain b

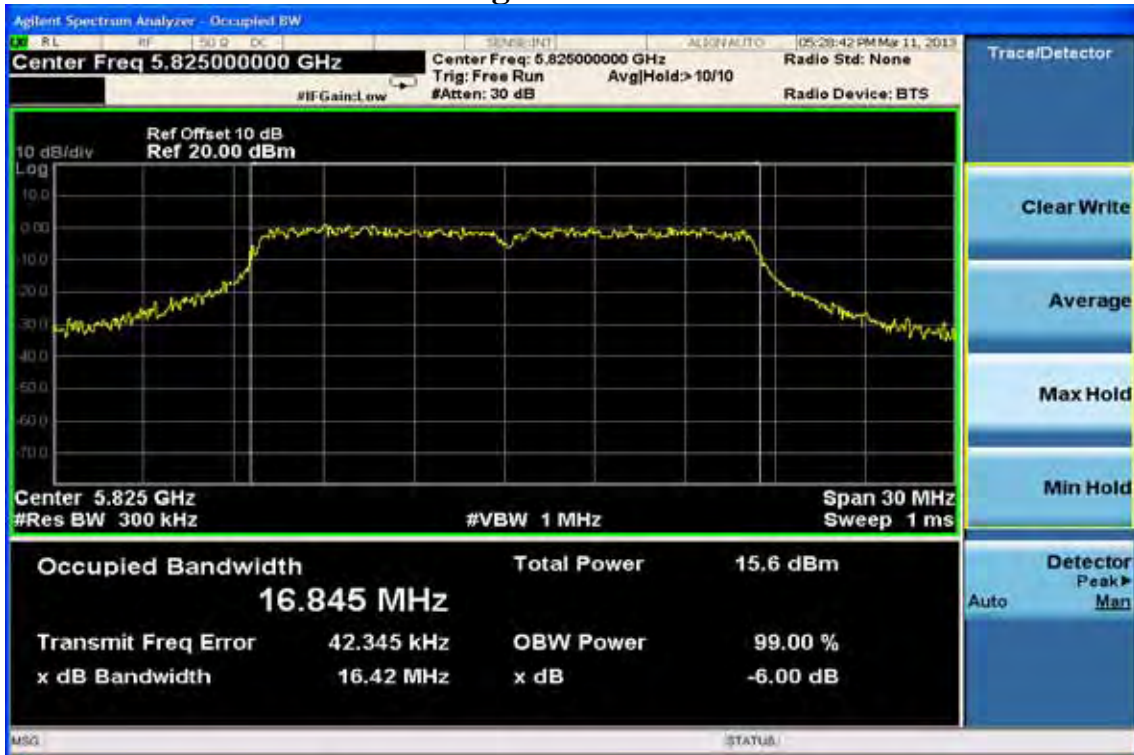
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



### 99% Band Width Test Data CH-High





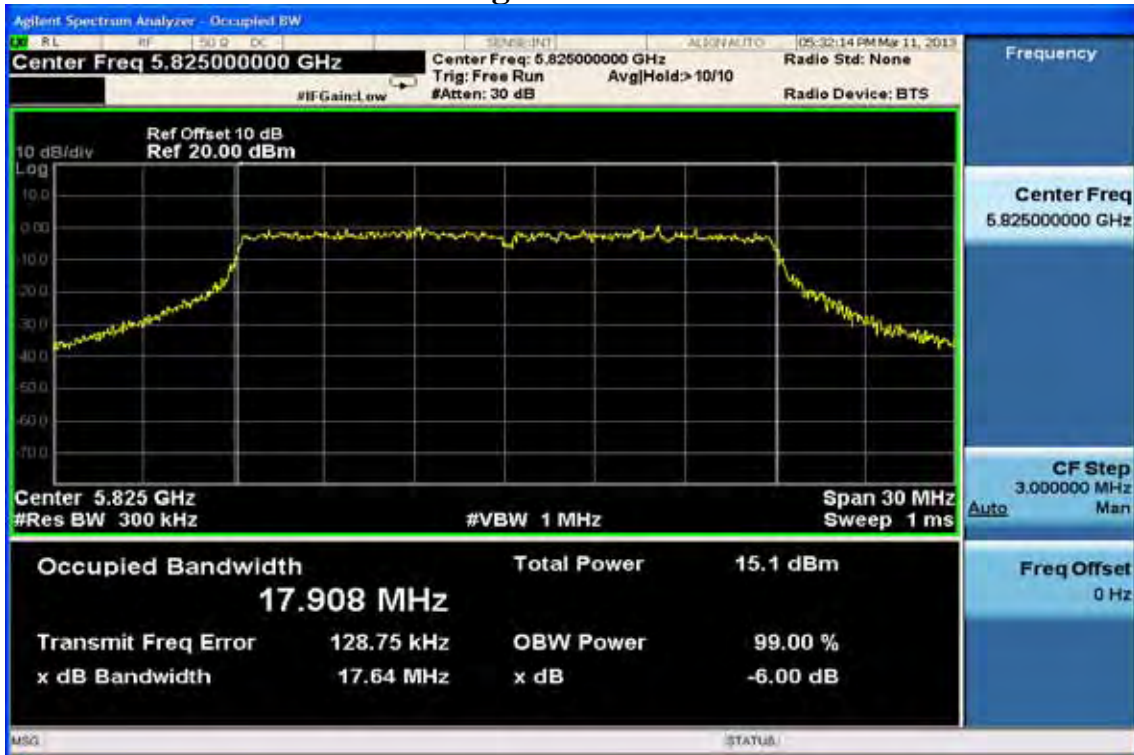
802.11n\_20M for 5GHz Combine  
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



### 99% Band Width Test Data CH-High



802.11n\_40M for 5GHz chain a  
99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



### 99% Band Width Test Data CH-High



802.11n\_40M for 5GHz chain b

99% Band Width Test Data CH-Low



99% Band Width Test Data CH-Mid



### 99% Band Width Test Data CH-High



**802.11n\_40M for 5GHz Combine  
99% Band Width Test Data CH-Low**



**99% Band Width Test Data CH-Mid**



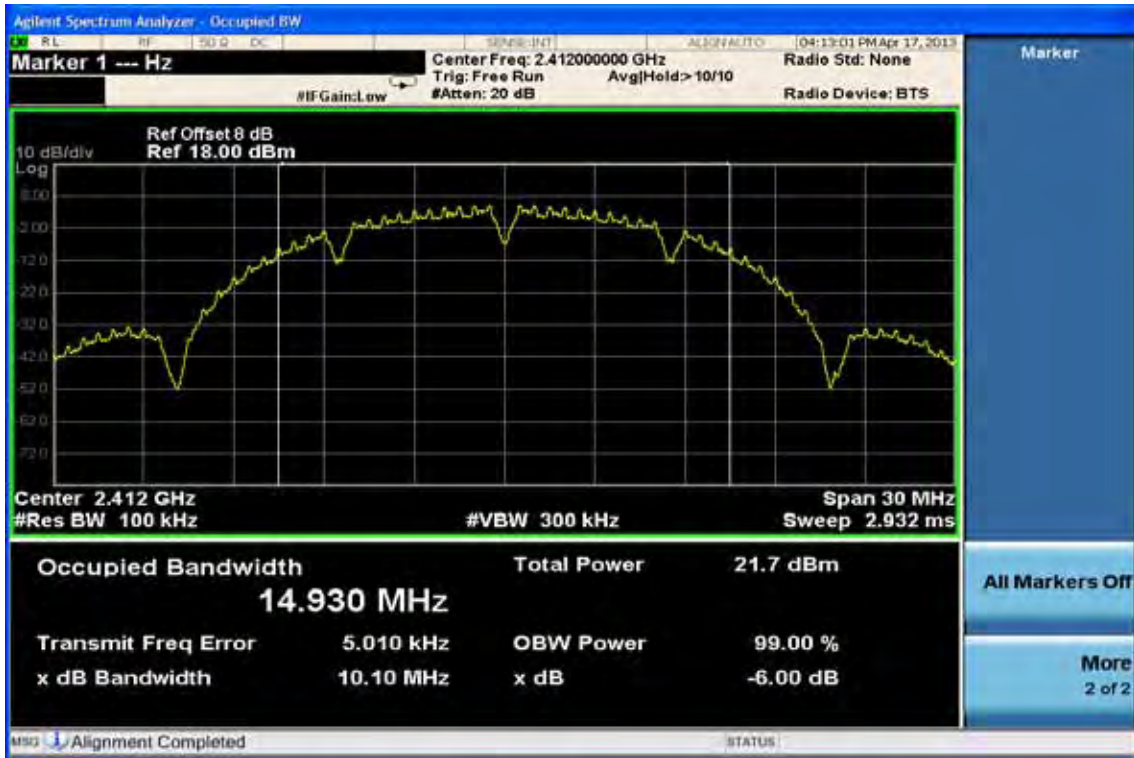
### 99% Band Width Test Data CH-High





802.11b

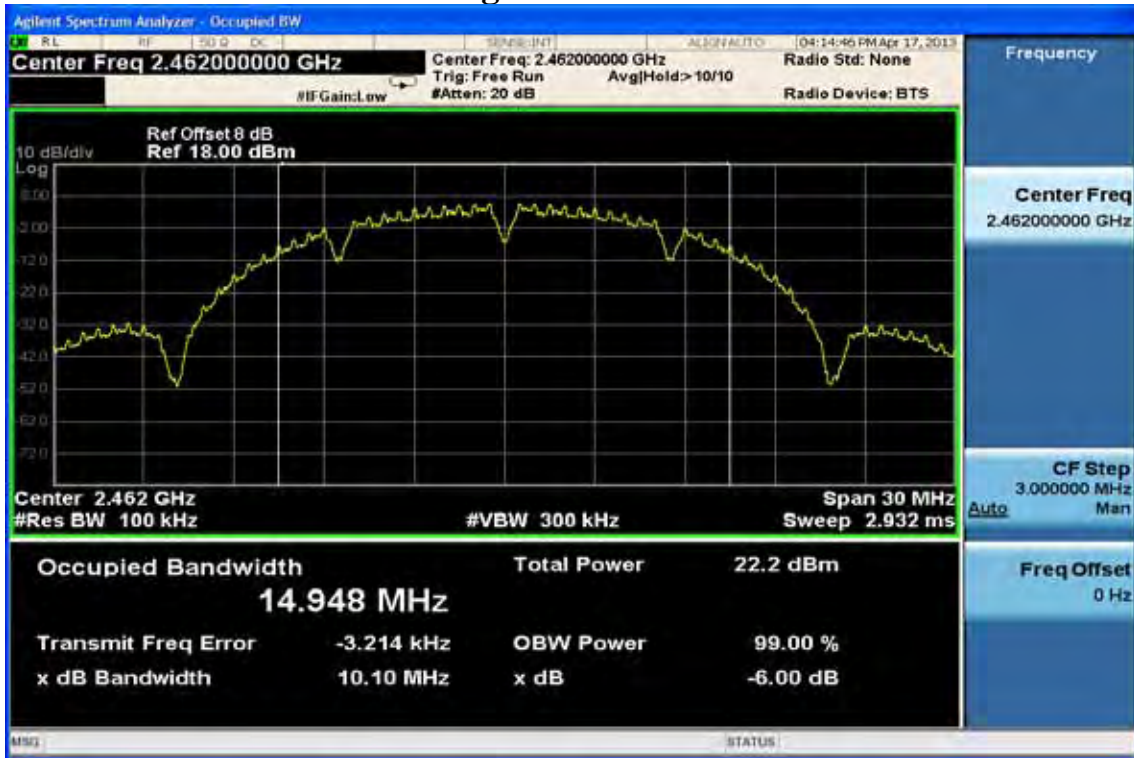
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

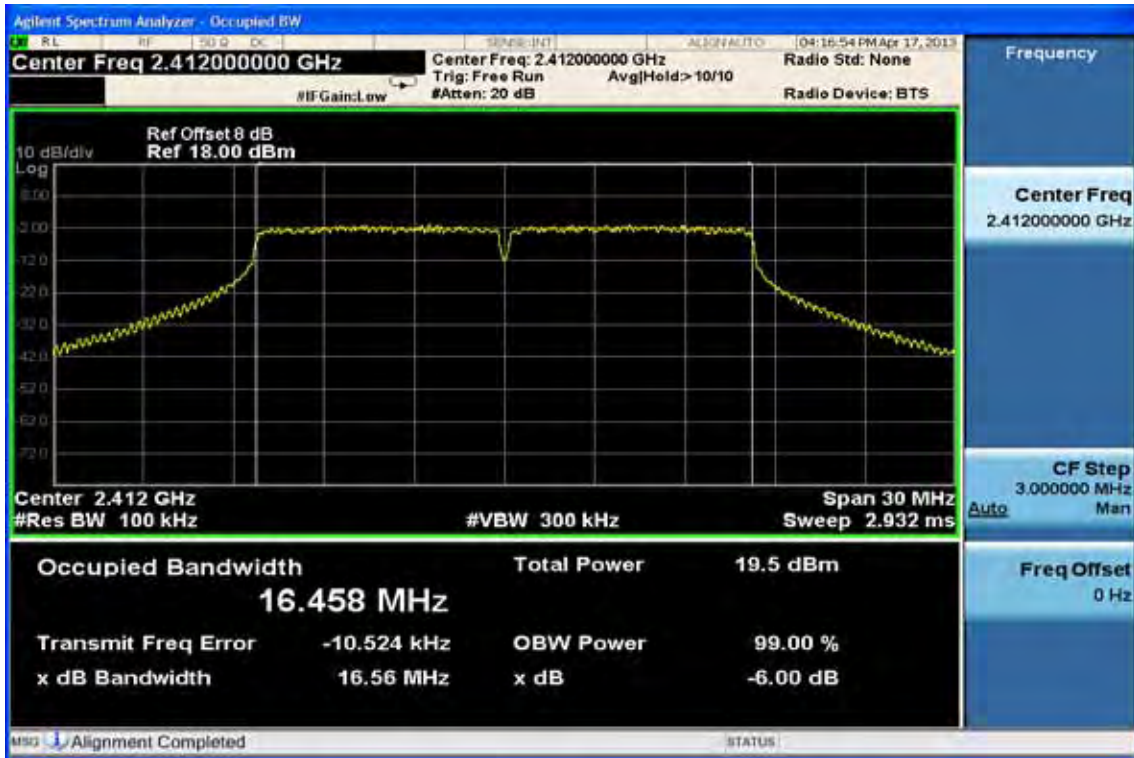


### 6dB Band Width Test Data CH-High

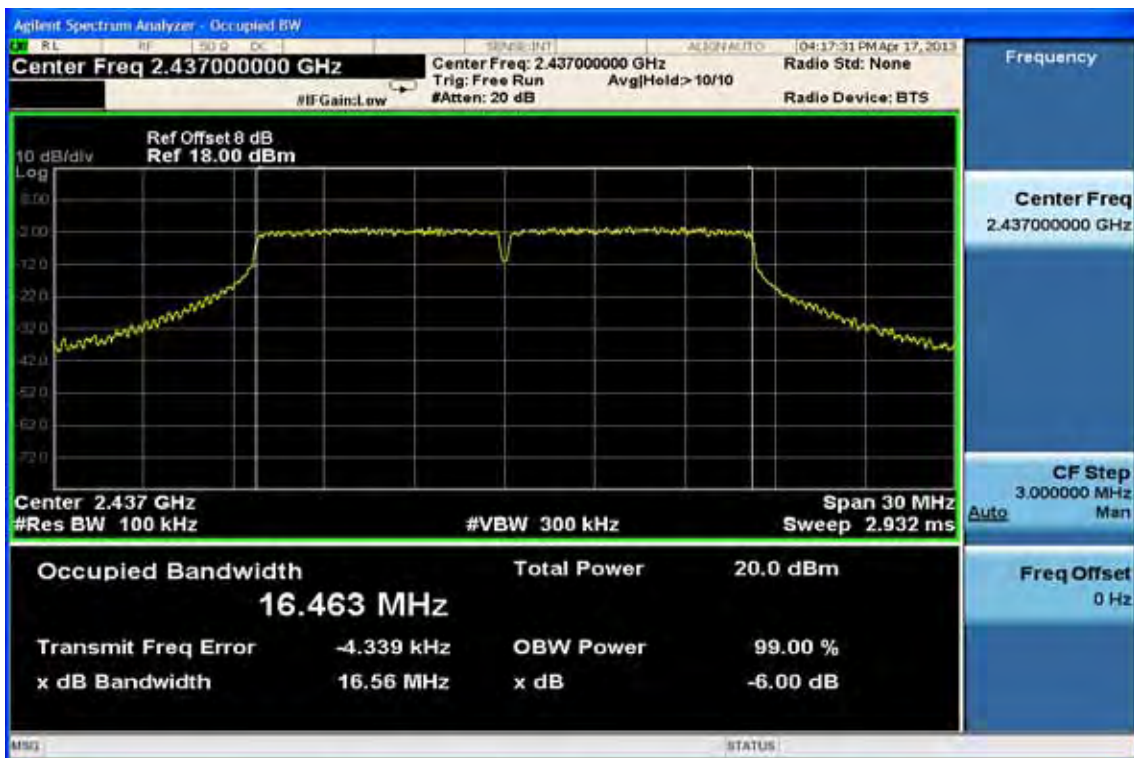


802.11g

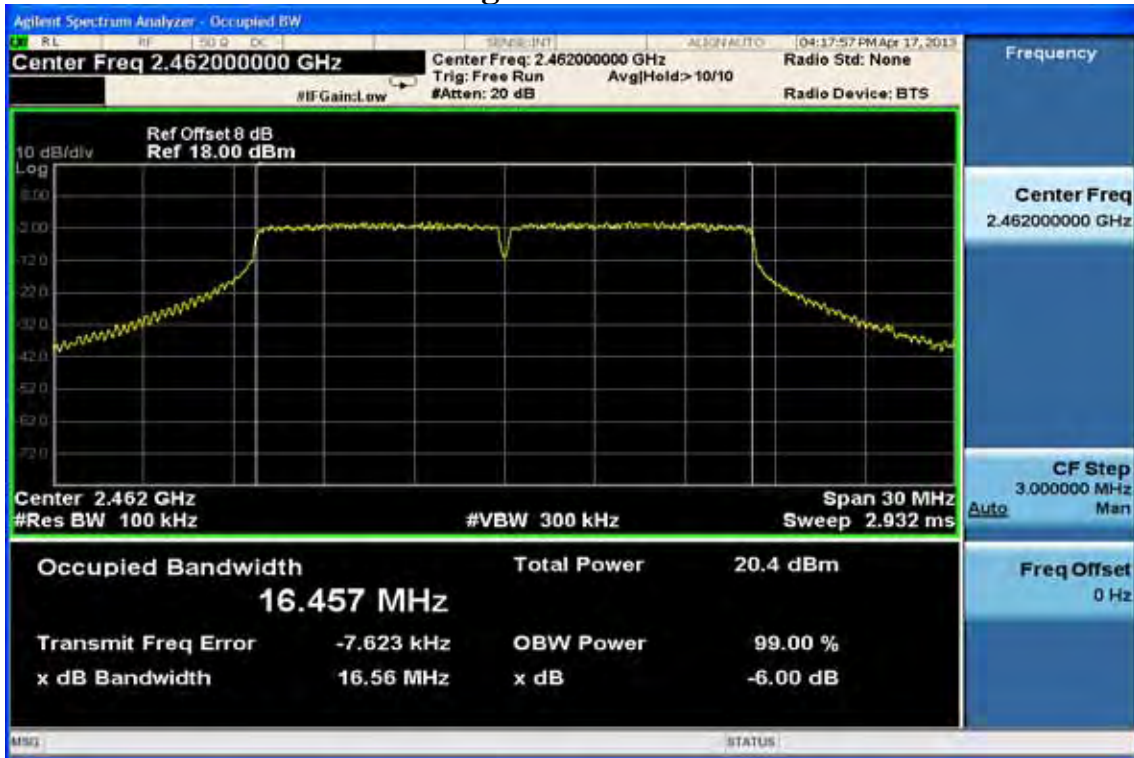
6dB Band Width Test Data CH-Low



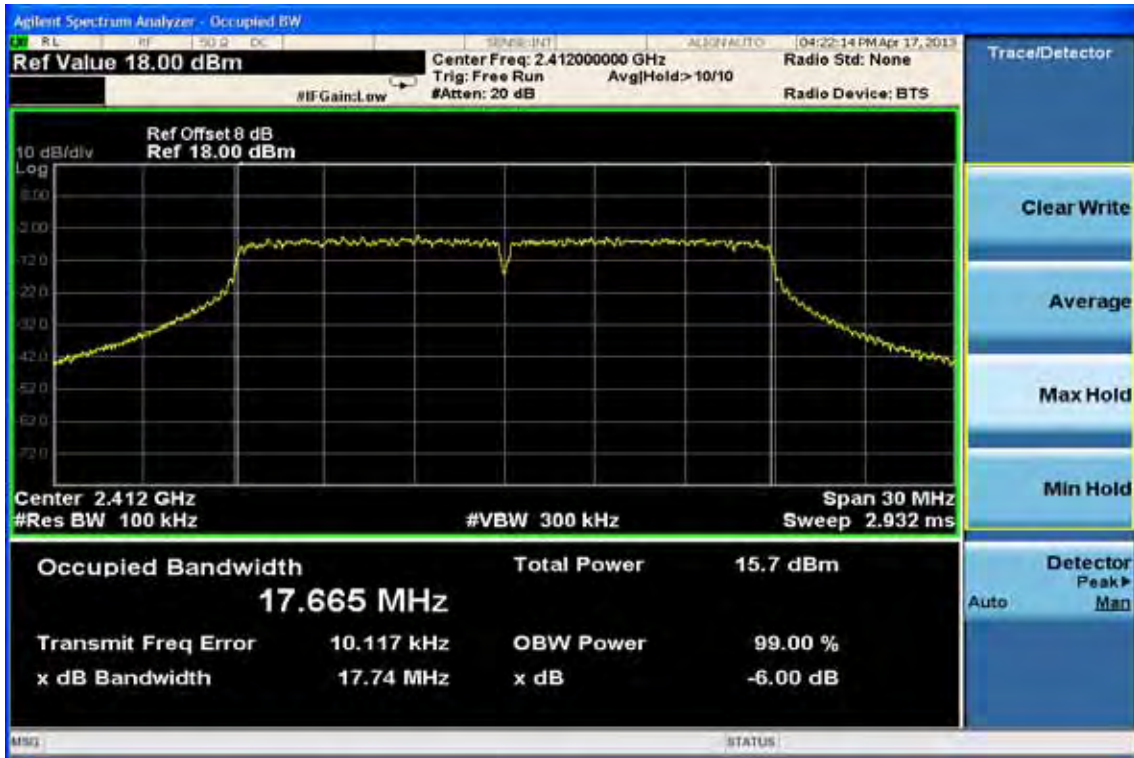
6dB Band Width Test Data CH-Mid



### 6dB Band Width Test Data CH-High



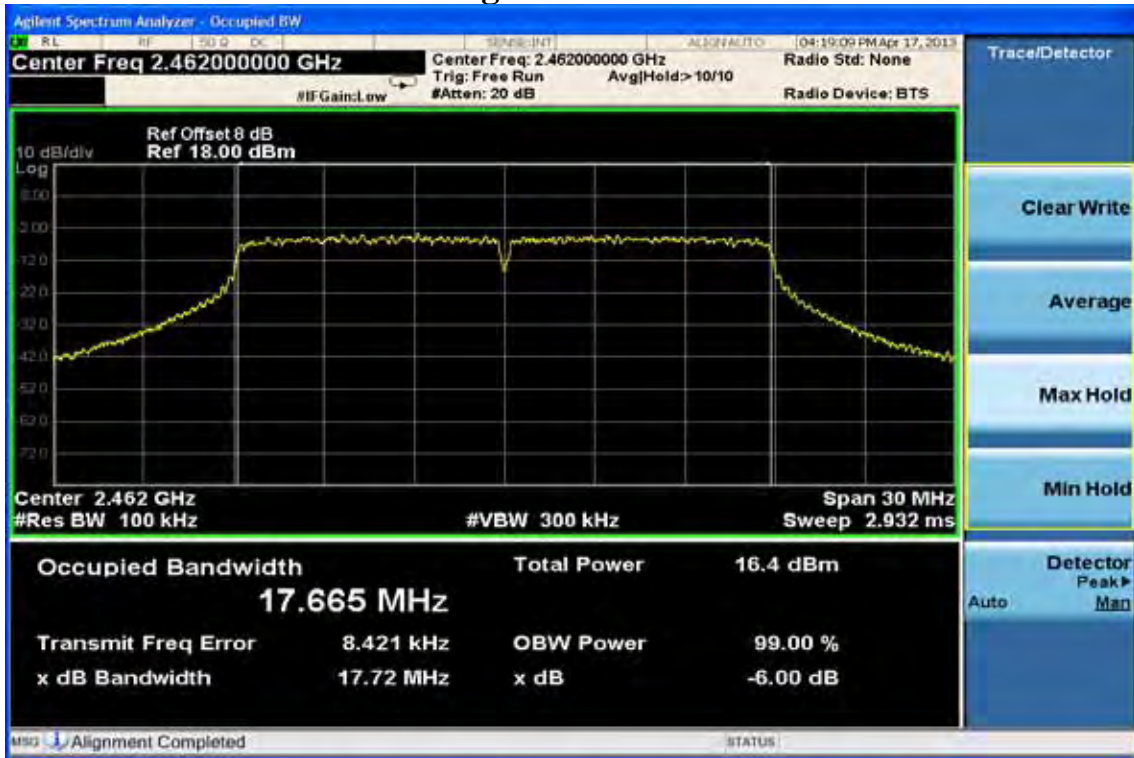
802.11n\_20M for 2.4GHz chain a  
6dB Band Width Test Data CH-Low



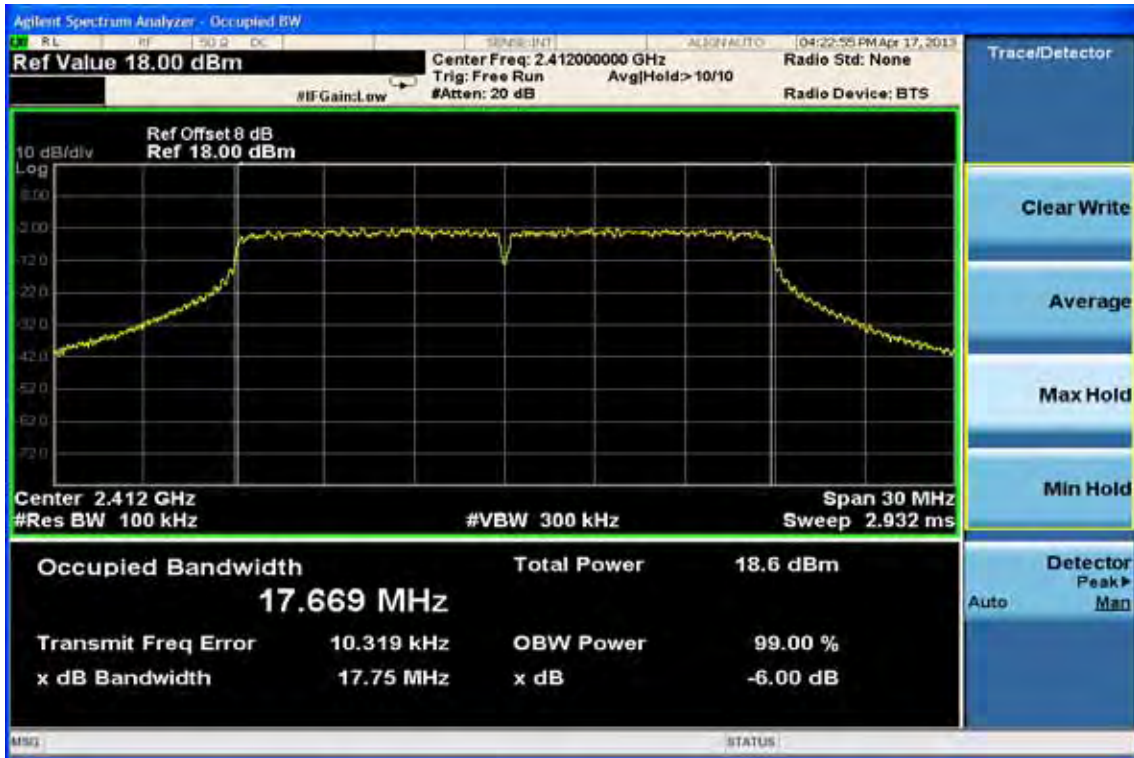
6dB Band Width Test Data CH-Mid



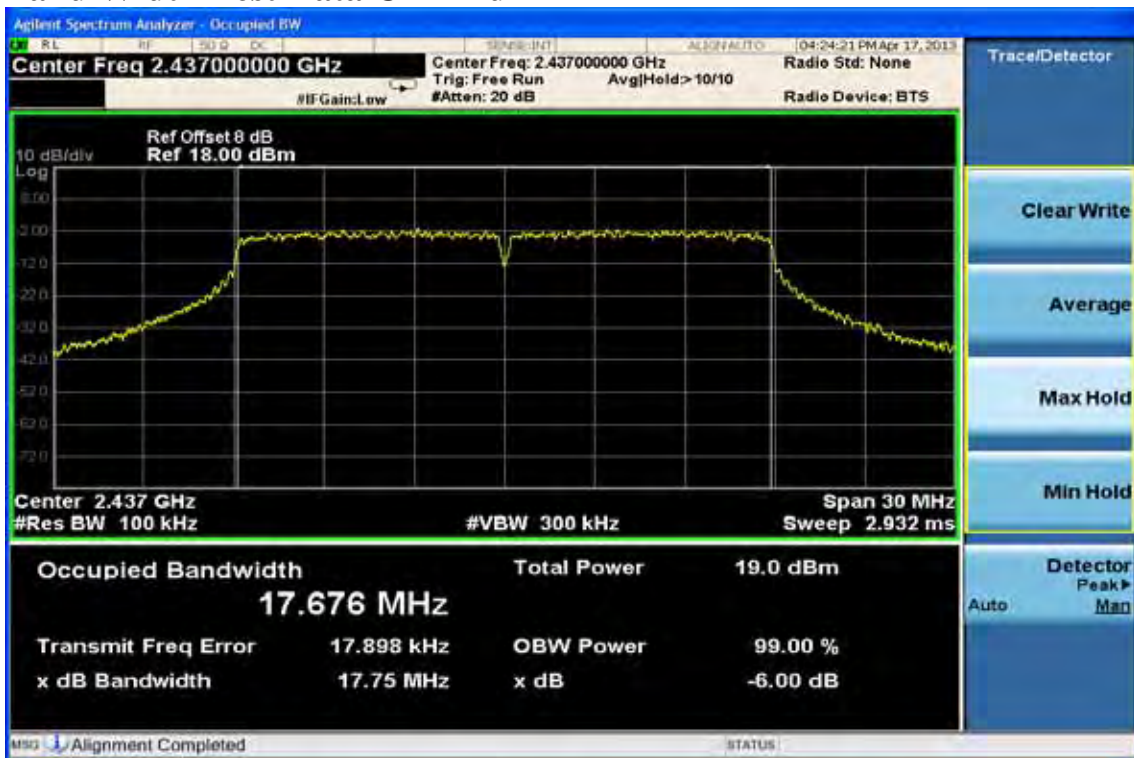
### 6dB Band Width Test Data CH-High



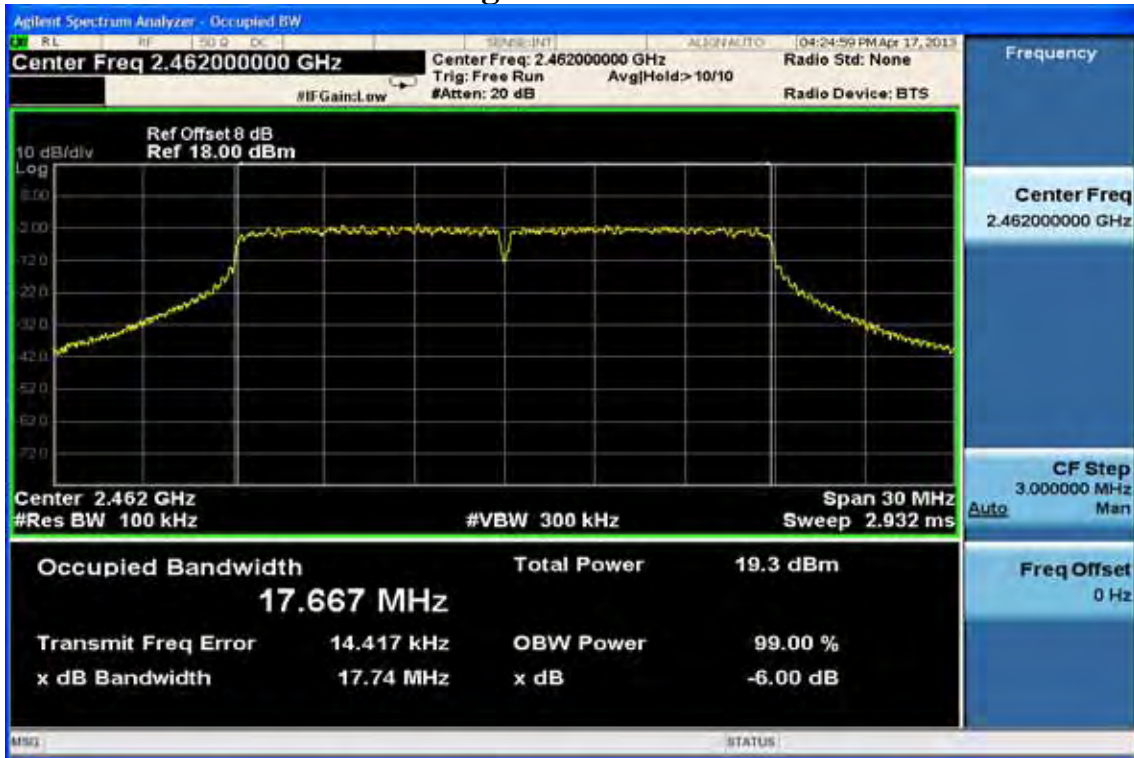
802.11n\_20M for 2.4GHz chain b  
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

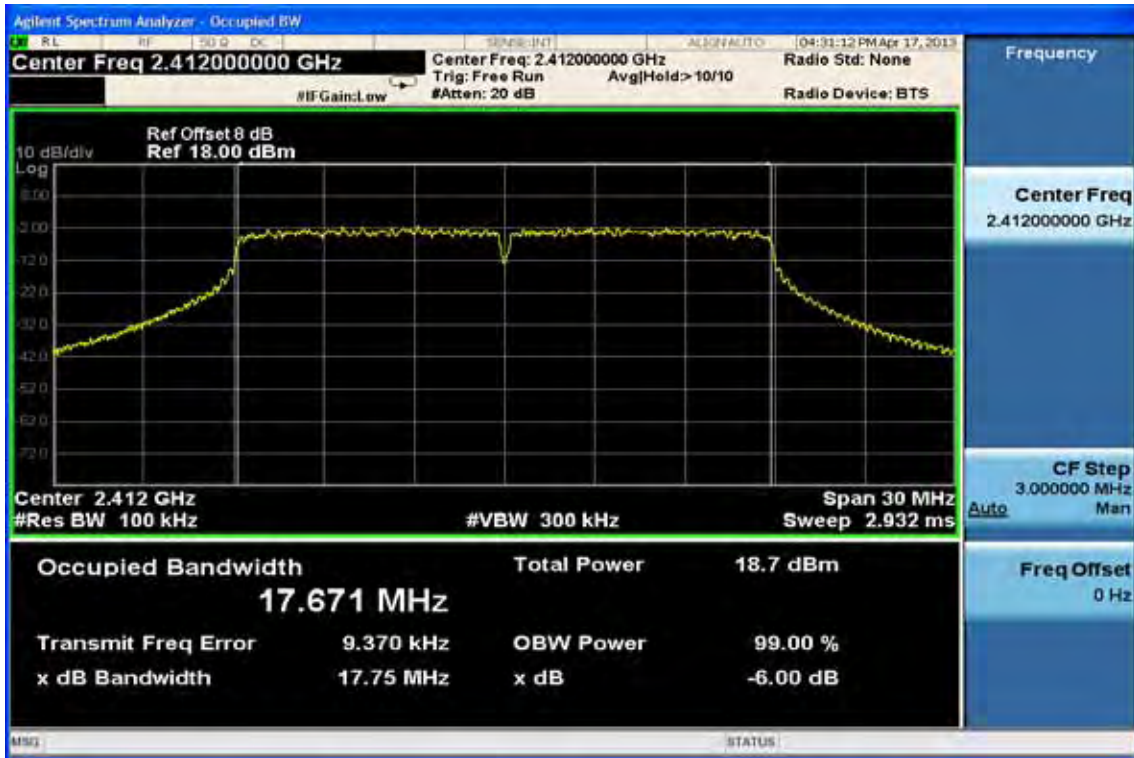


### 6dB Band Width Test Data CH-High

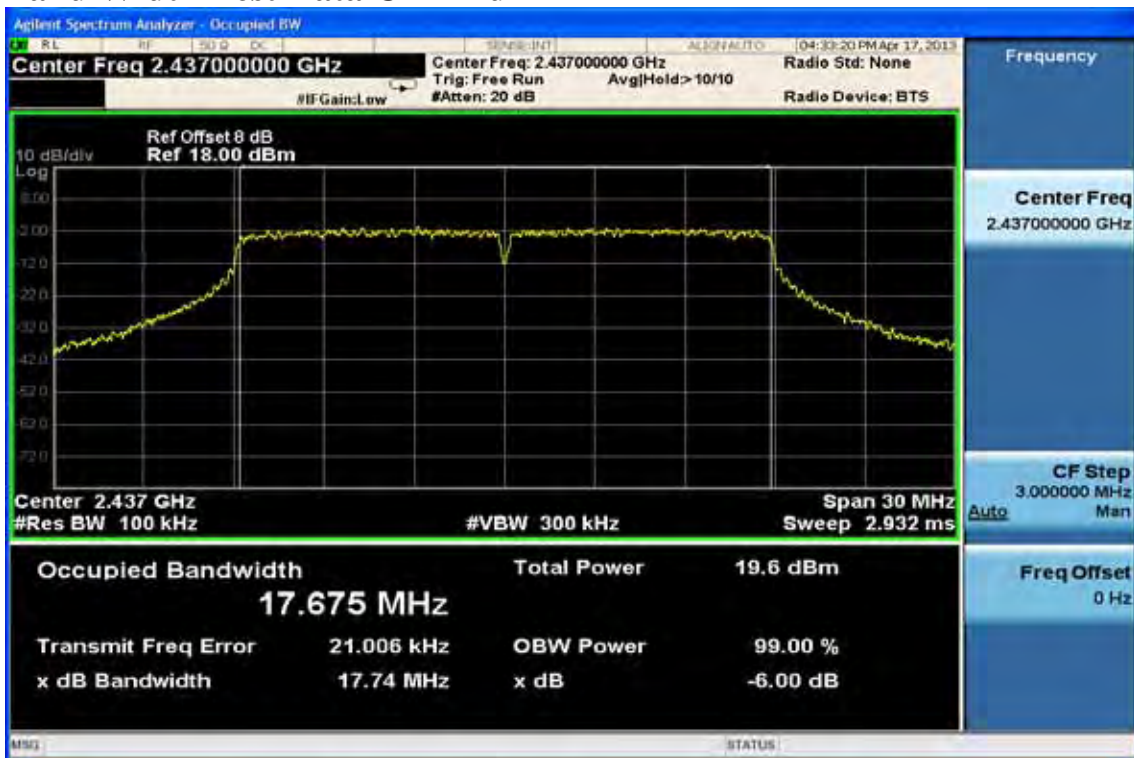




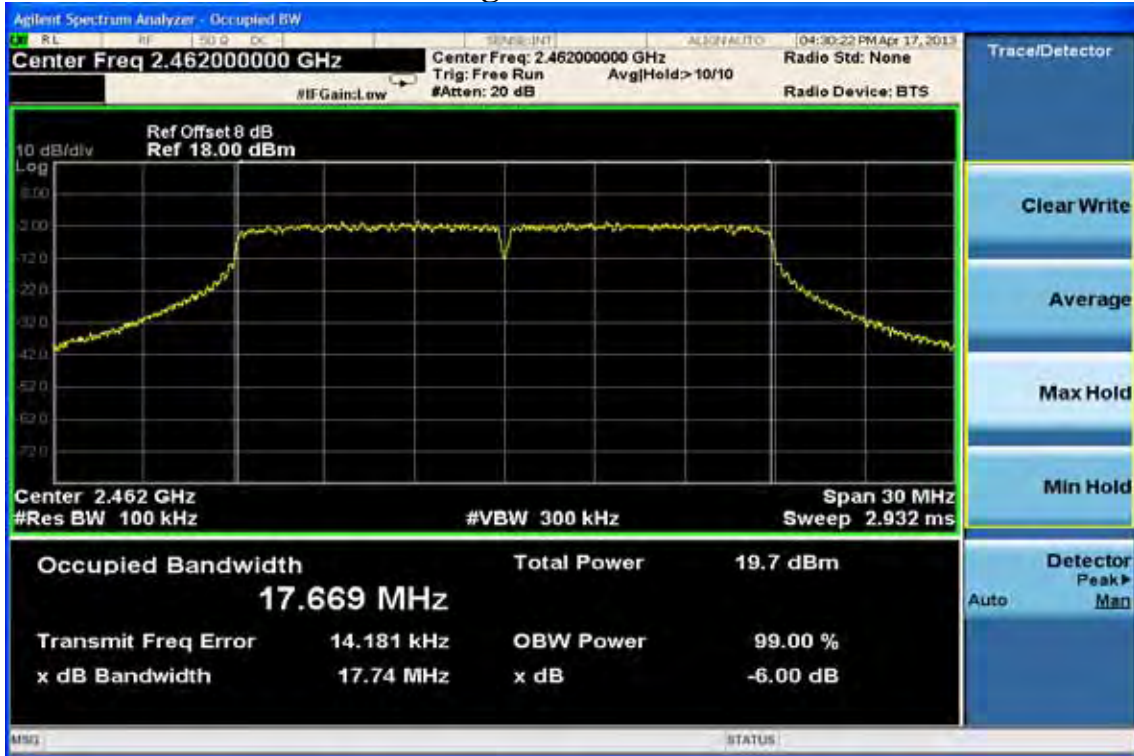
802.11n\_20M for 2.4GHz Combine  
6dB Band Width Test Data CH-Low



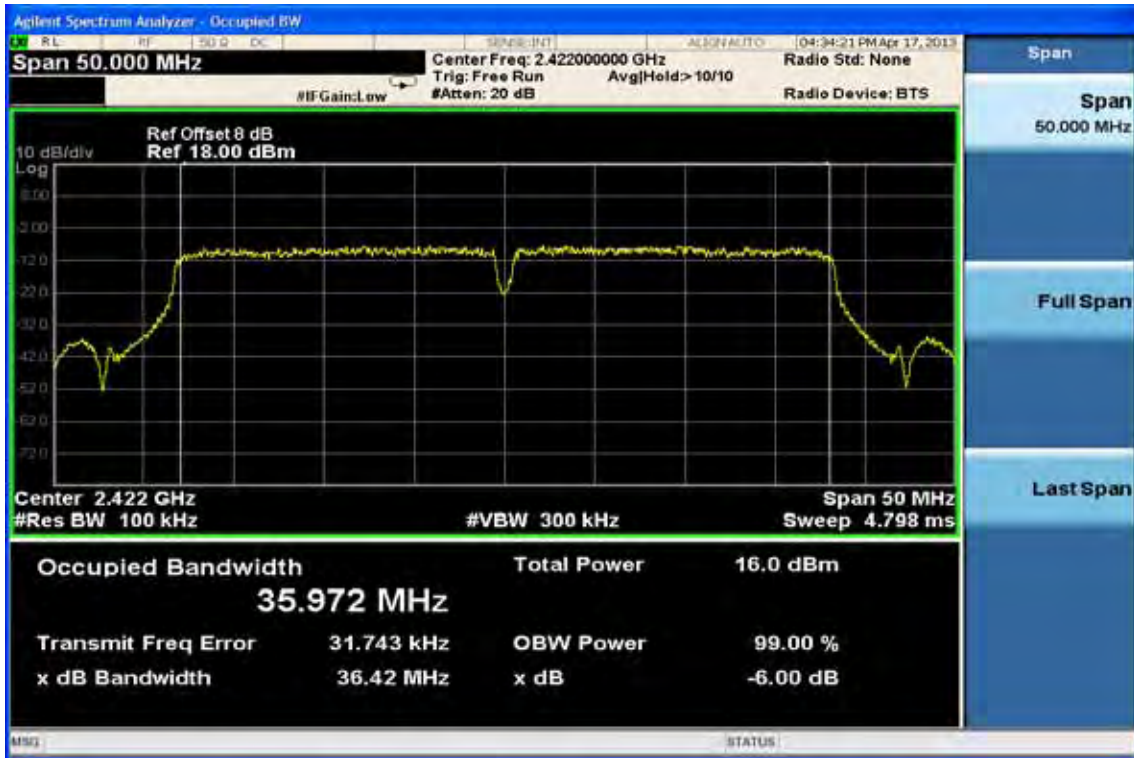
6dB Band Width Test Data CH-Mid



### 6dB Band Width Test Data CH-High



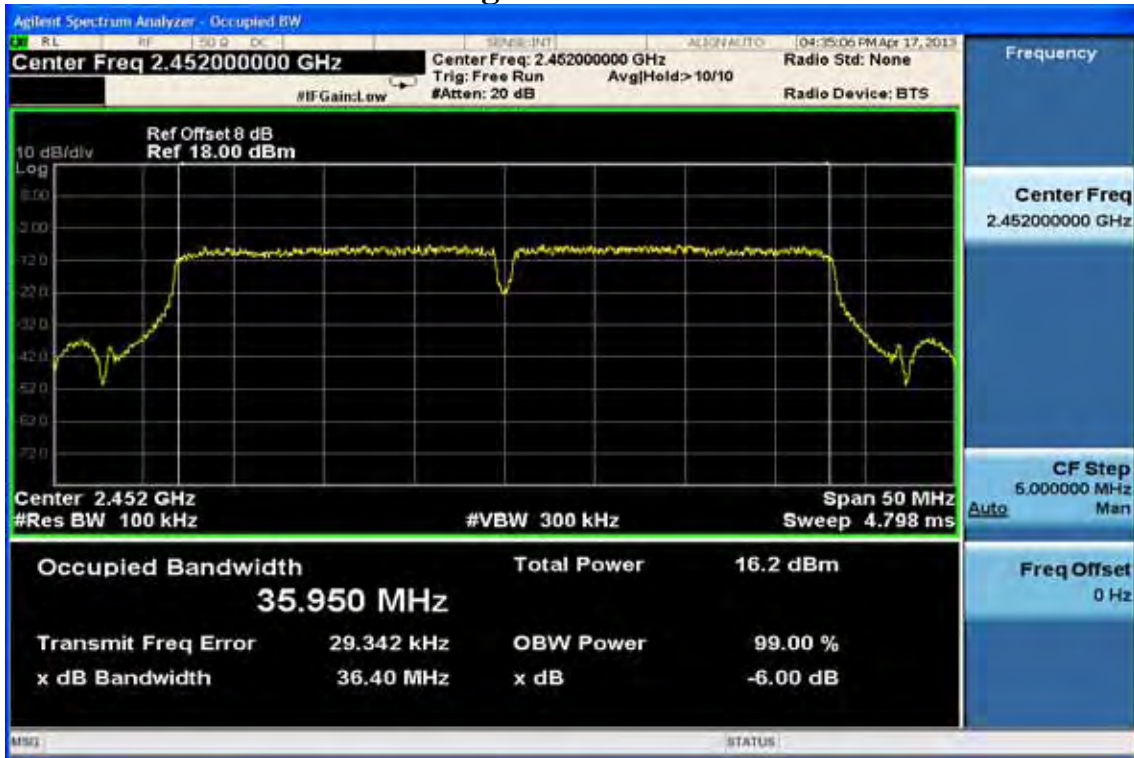
802.11n\_40M for 2.4GHz chain a  
6dB Band Width Test Data CH-Low



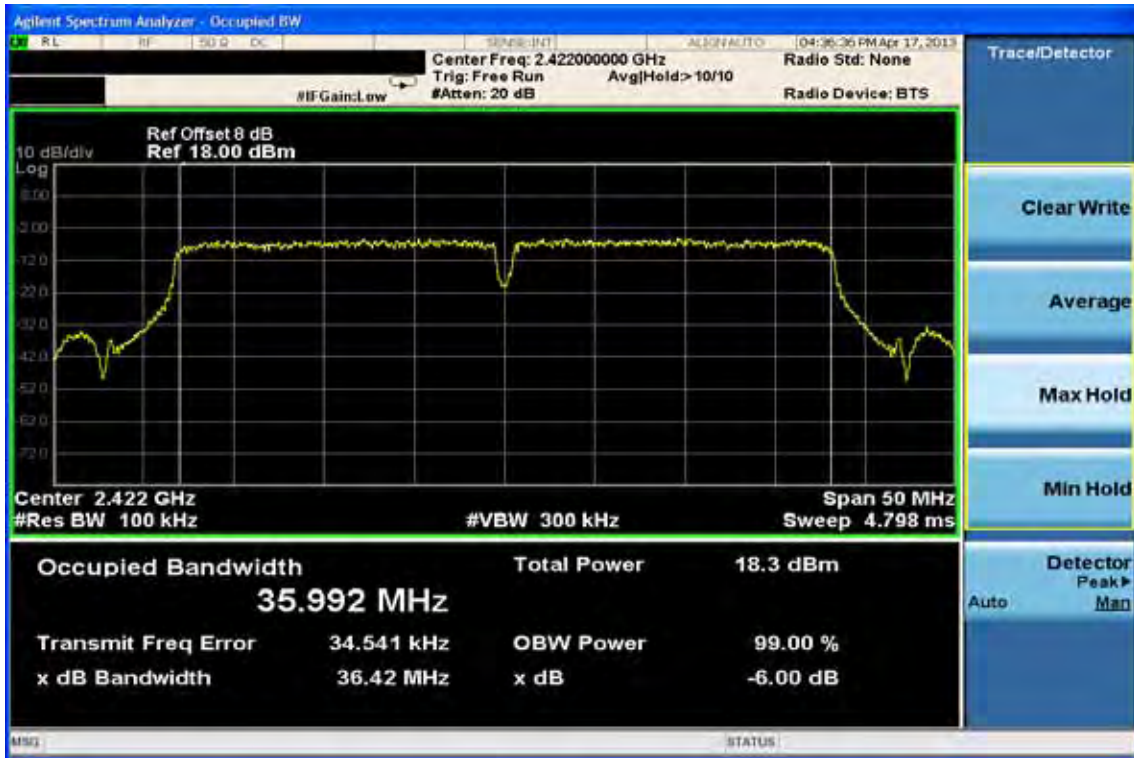
6dB Band Width Test Data CH-Mid



### 6dB Band Width Test Data CH-High



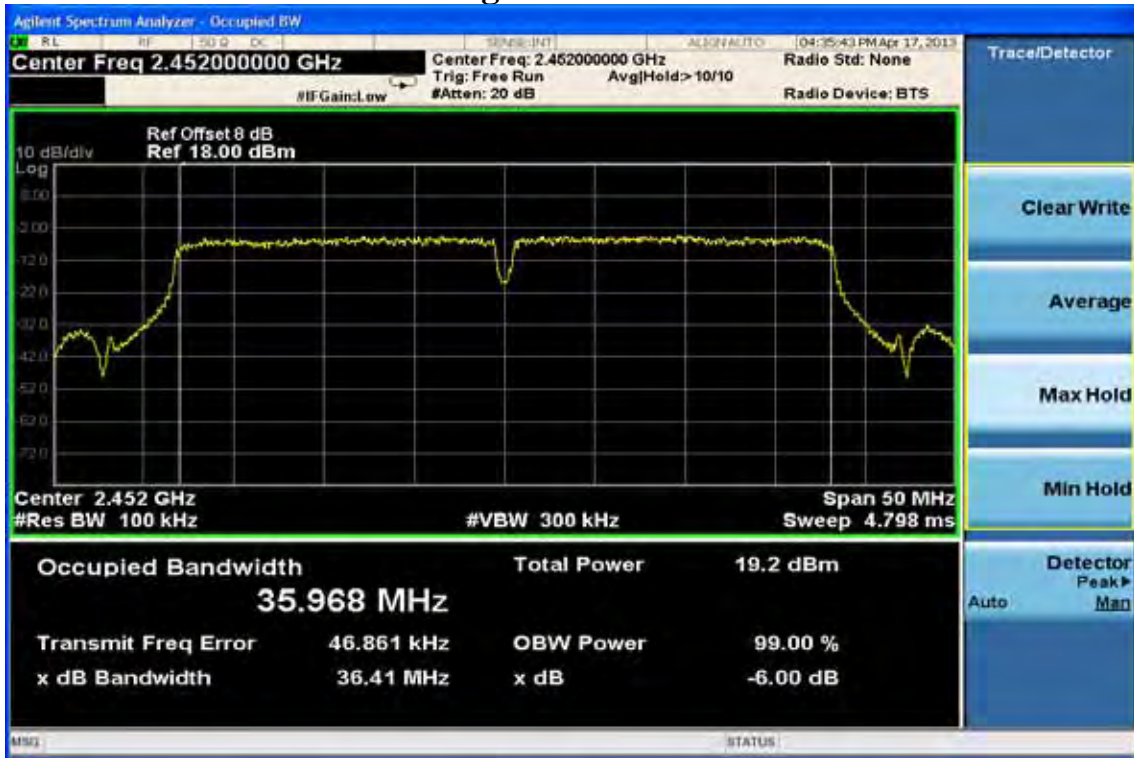
802.11n\_40M for 2.4GHz chain b  
6dB Band Width Test Data CH-Low



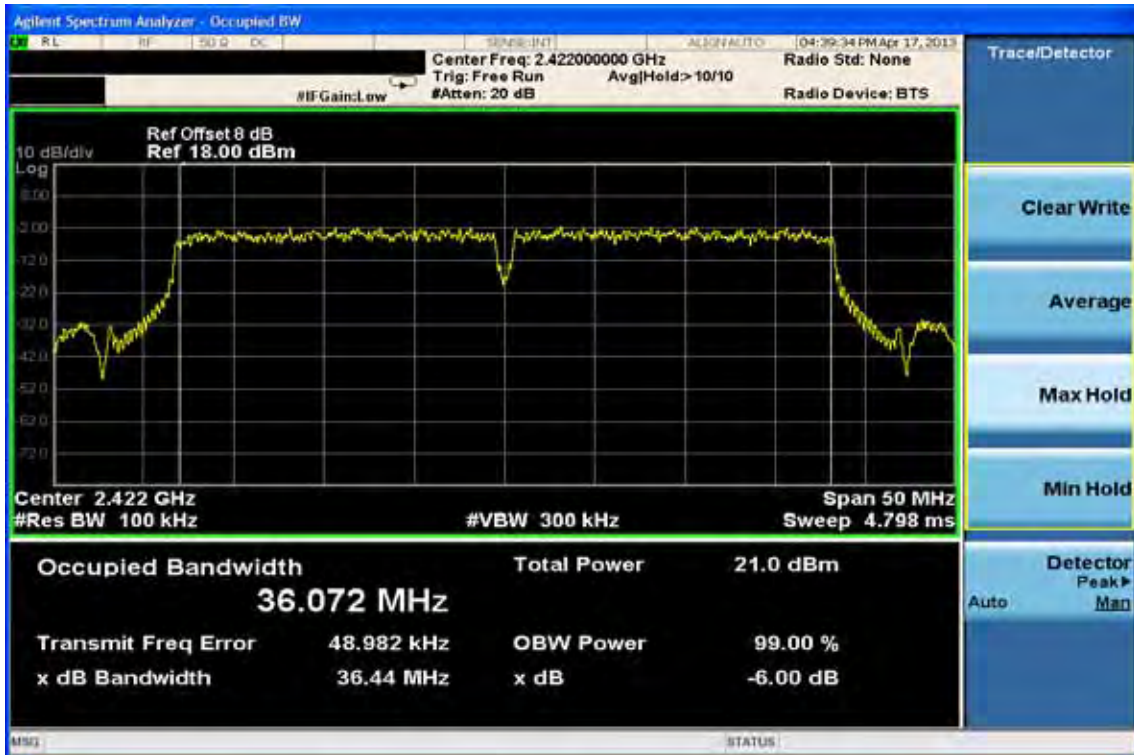
6dB Band Width Test Data CH-Mid



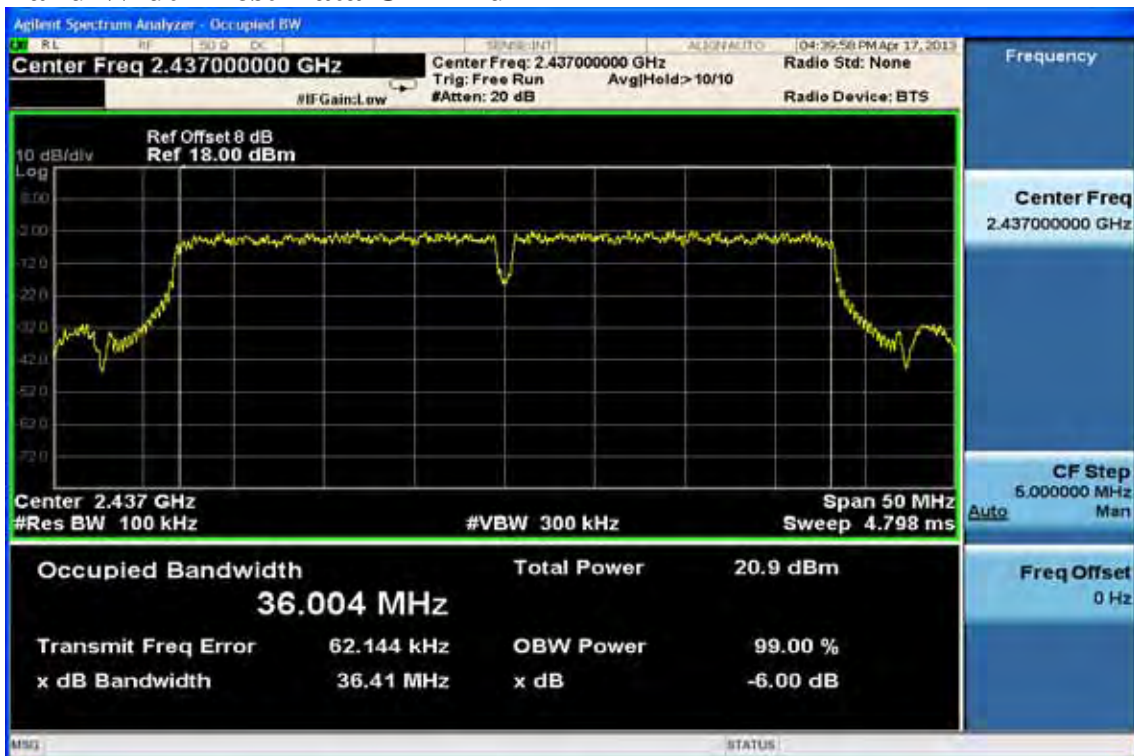
### 6dB Band Width Test Data CH-High



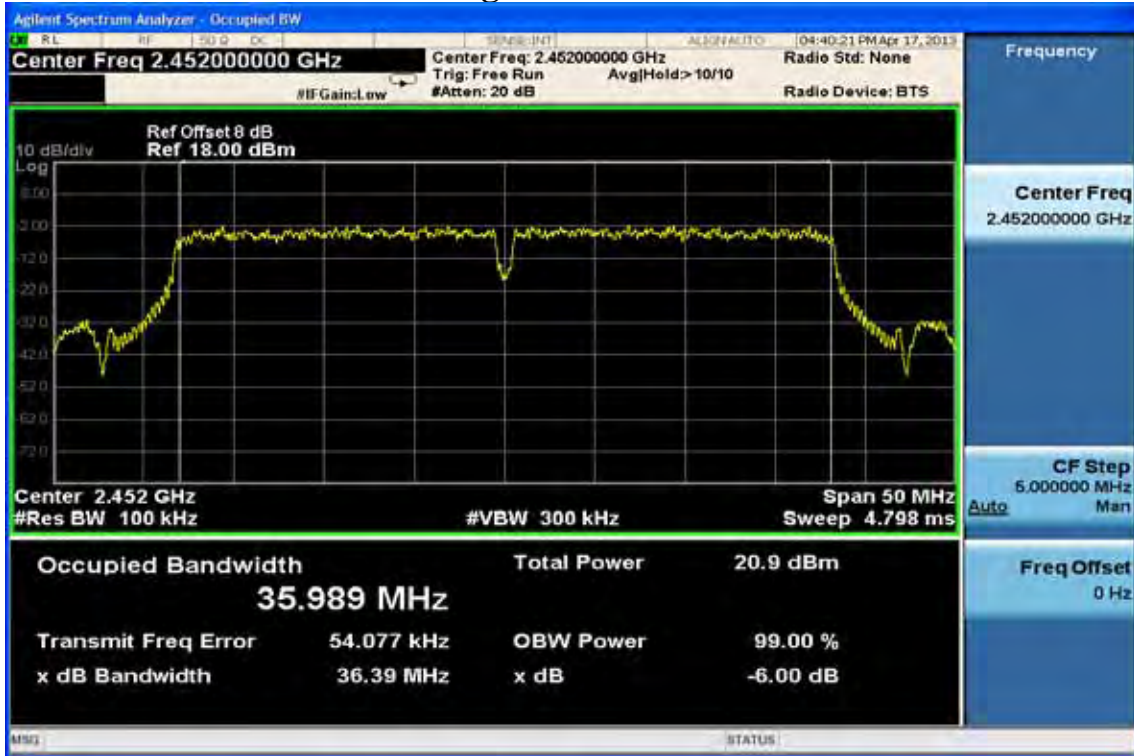
802.11n\_40M for 2.4GHz Combine  
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



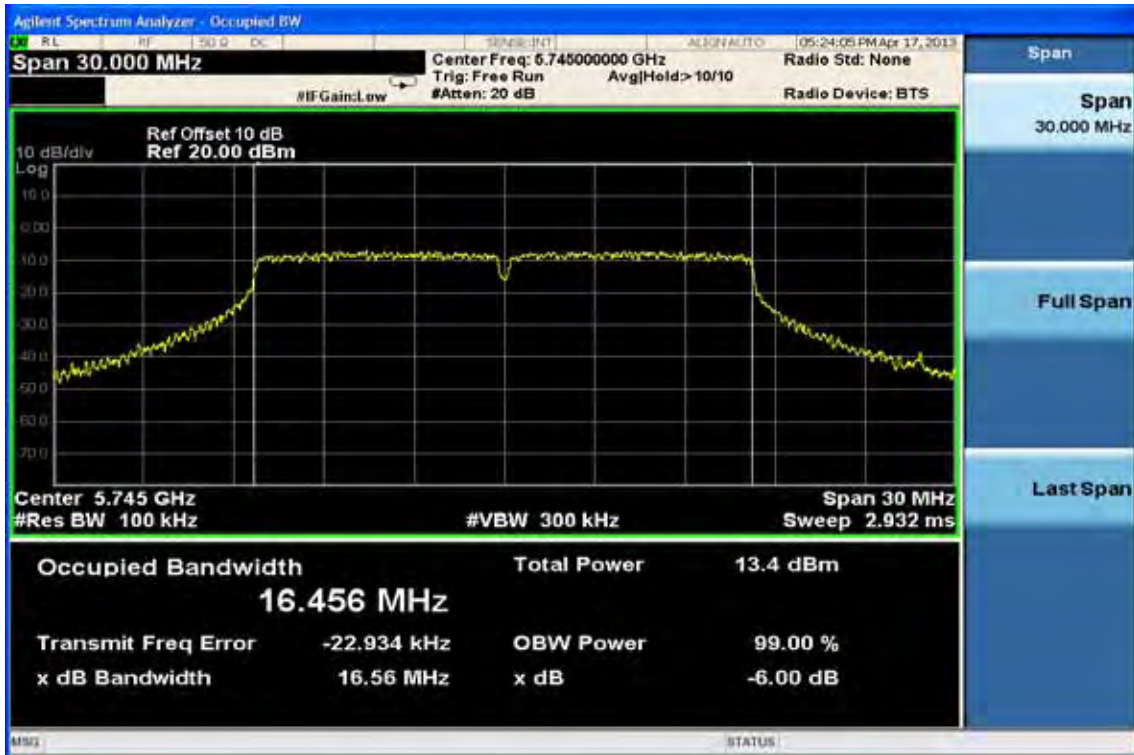
### 6dB Band Width Test Data CH-High



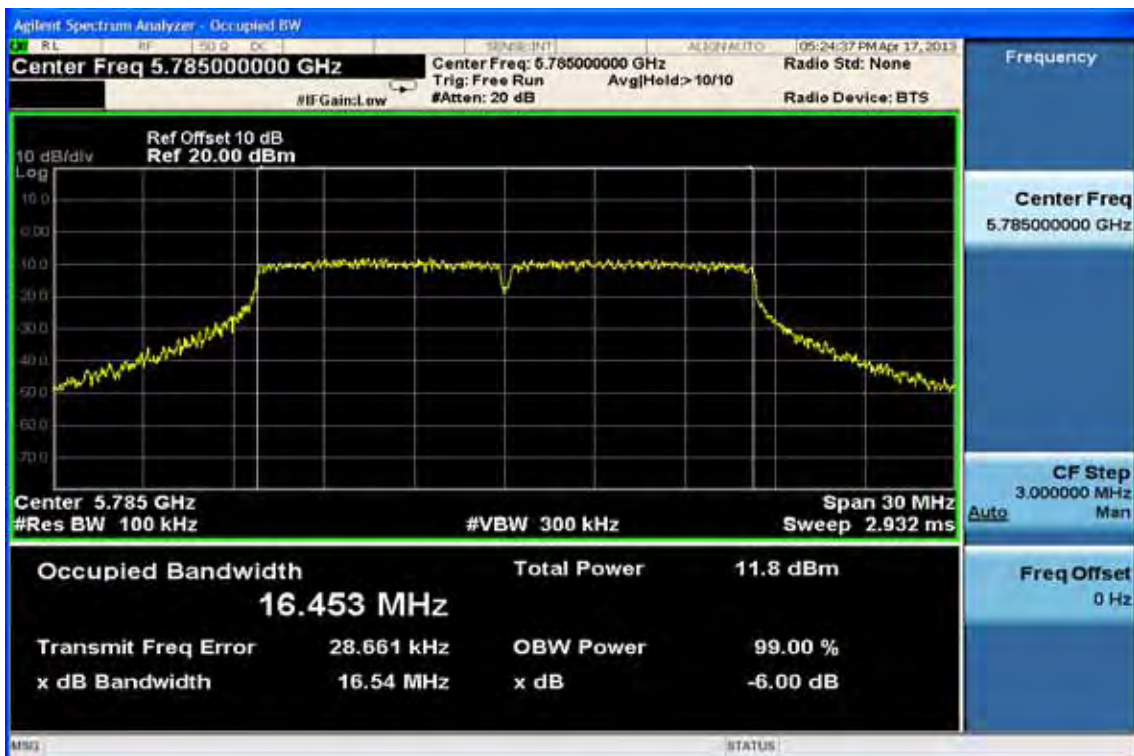


802.11a

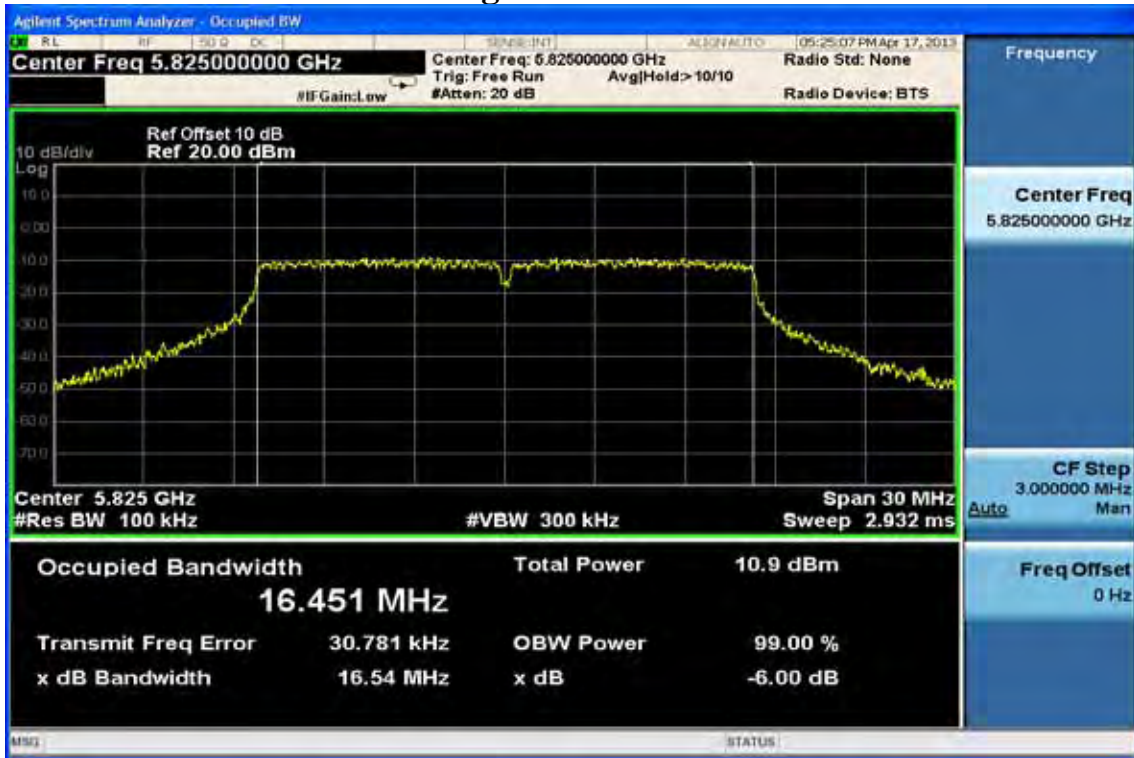
6dB Band Width Test Data CH-Low



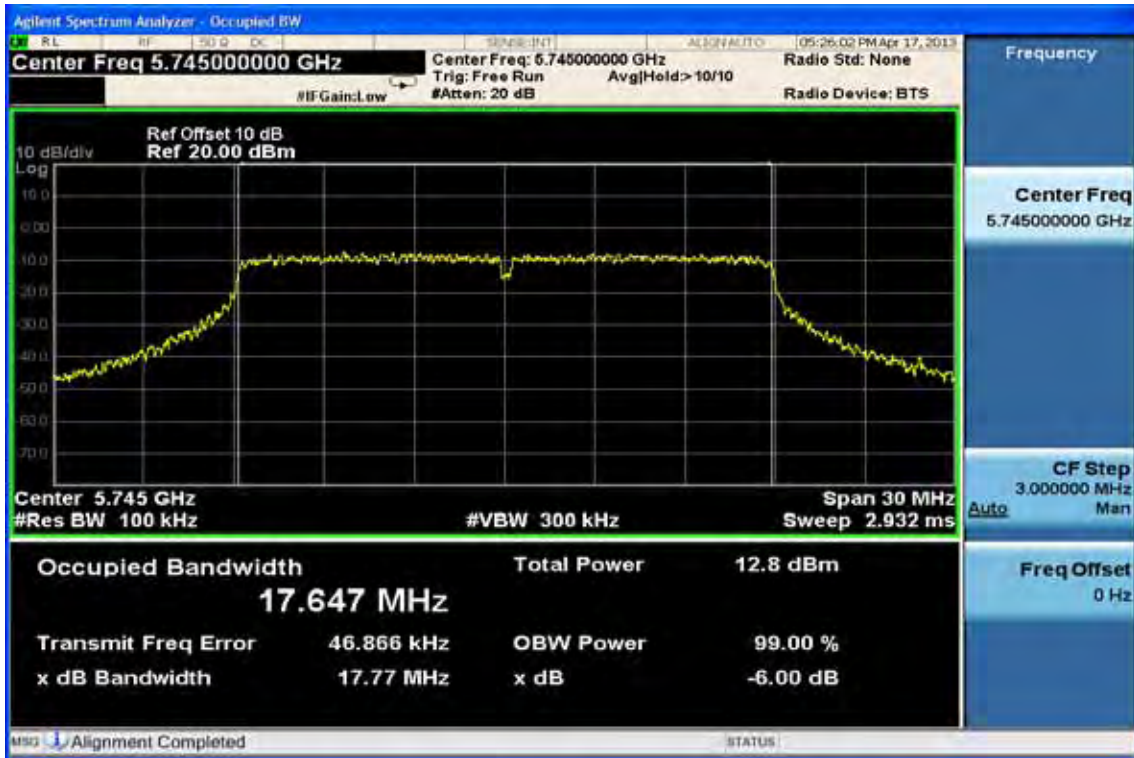
6dB Band Width Test Data CH-Mid



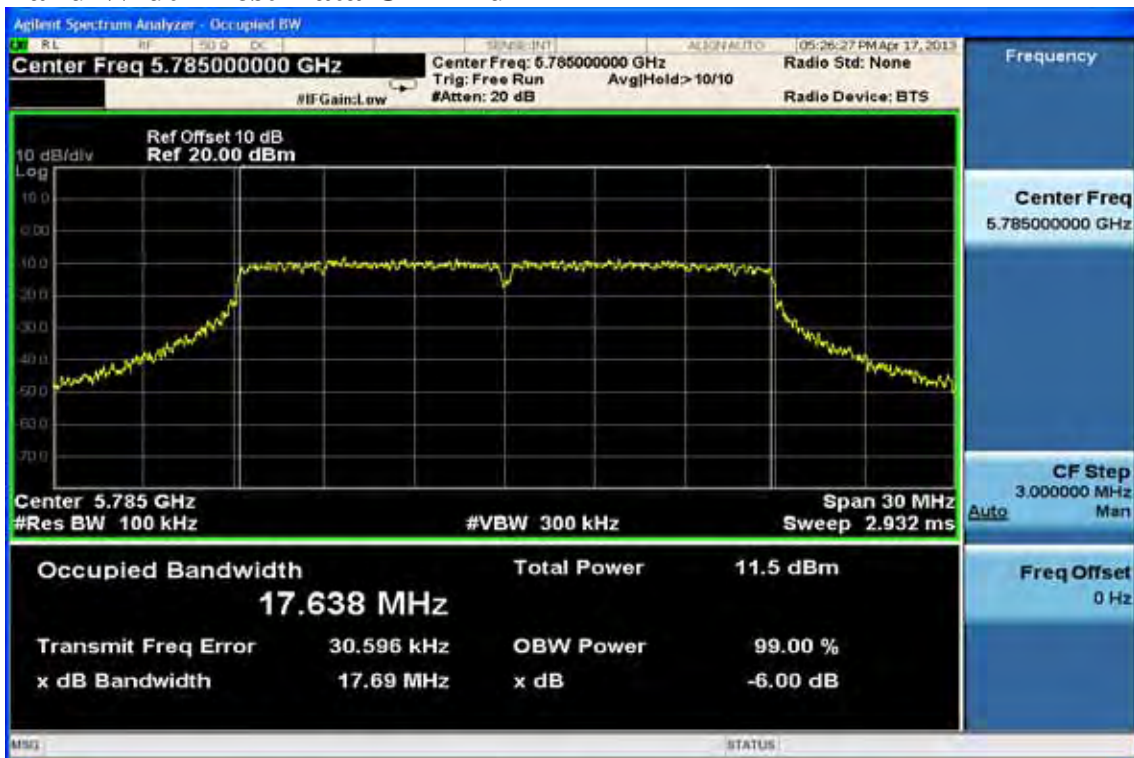
### 6dB Band Width Test Data CH-High



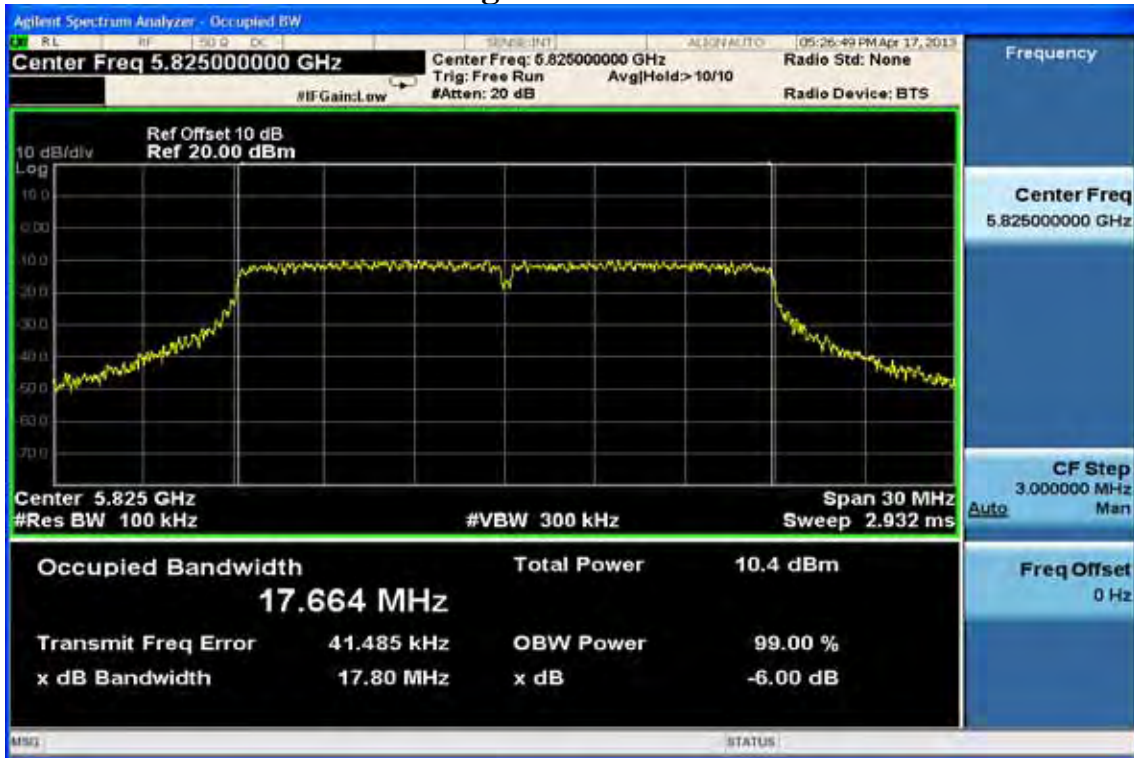
802.11n\_20M for 5GHz chain a  
6dB Band Width Test Data CH-Low



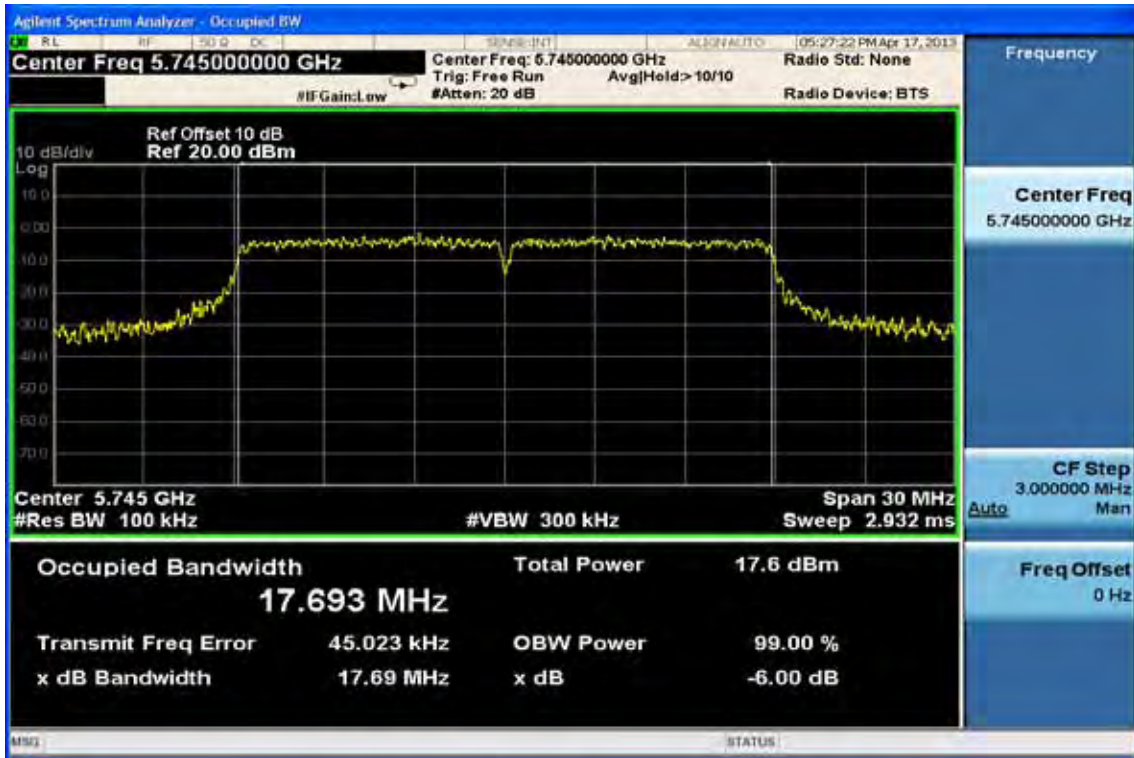
6dB Band Width Test Data CH-Mid



### 6dB Band Width Test Data CH-High



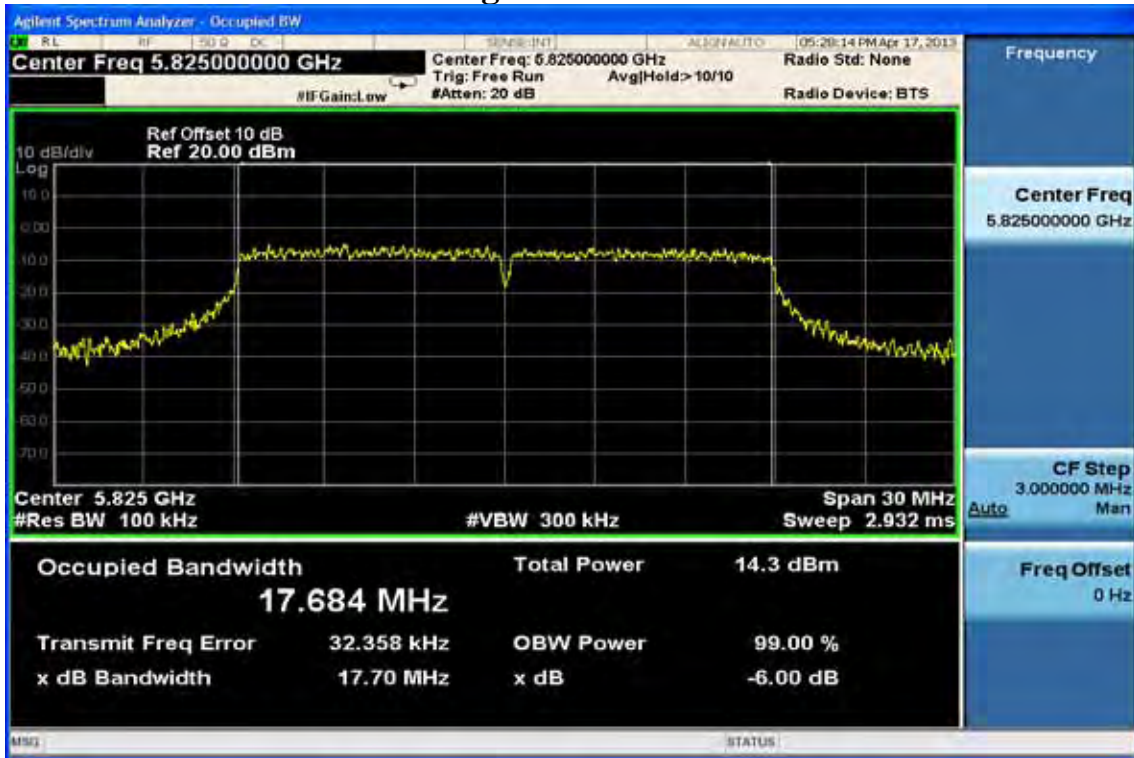
802.11n\_20M for 5GHz chain b  
6dB Band Width Test Data CH-Low



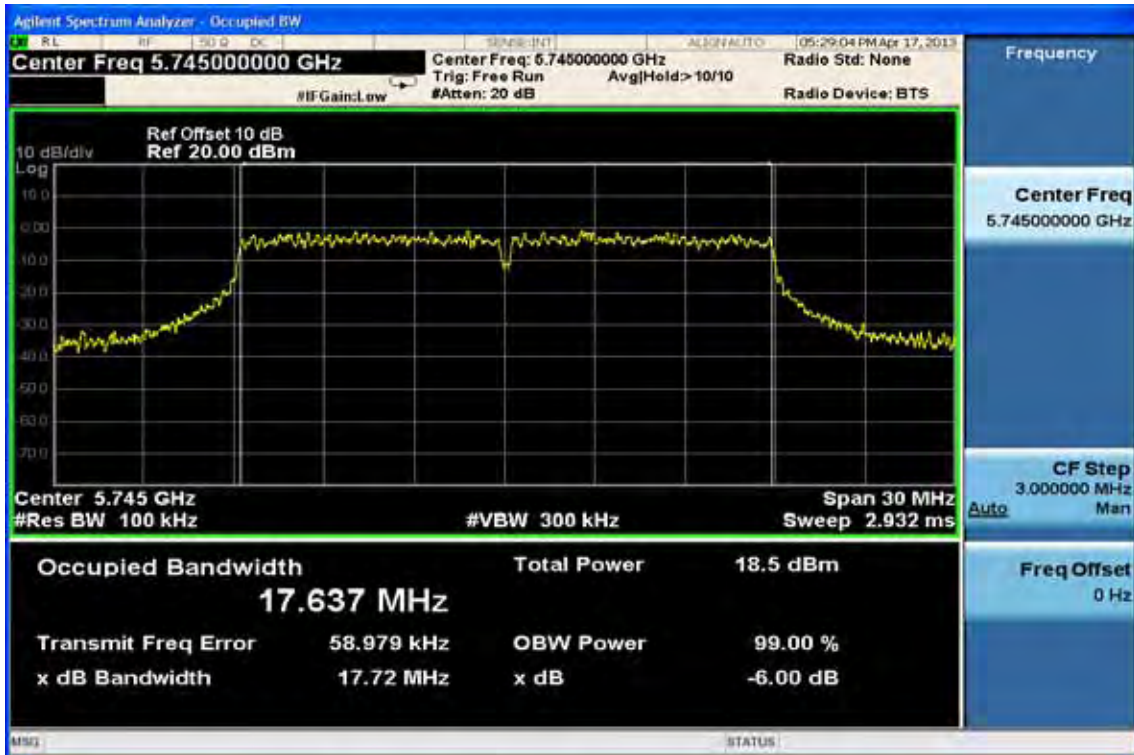
6dB Band Width Test Data CH-Mid



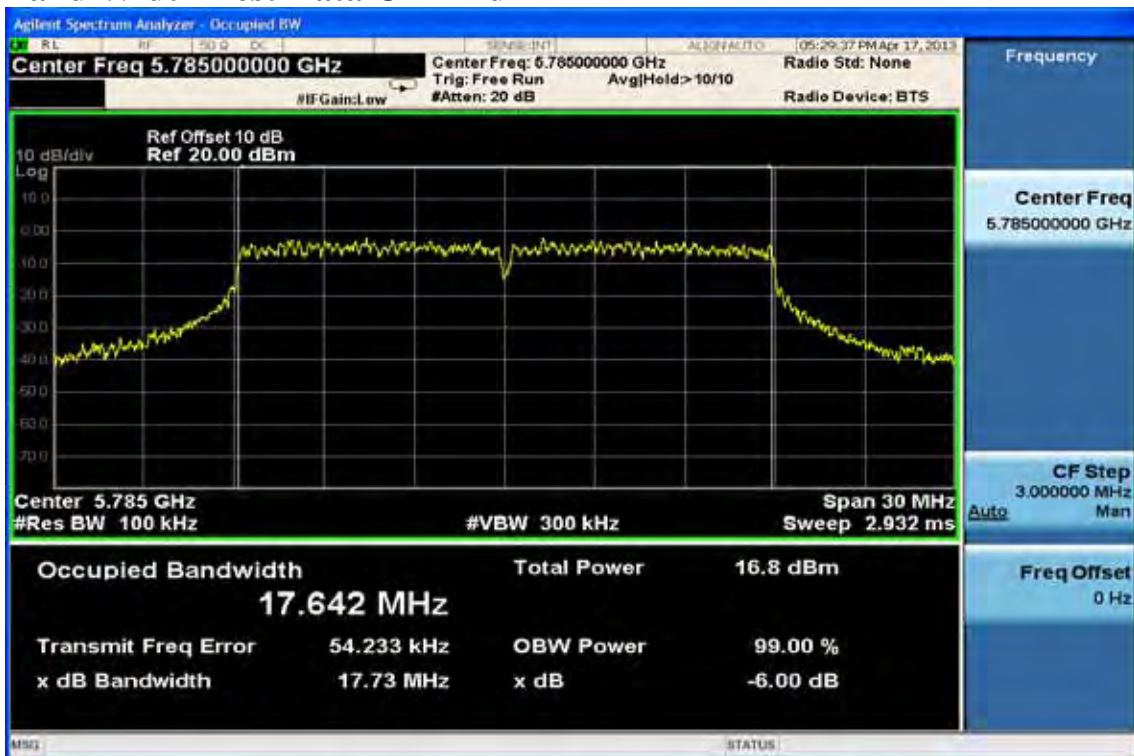
### 6dB Band Width Test Data CH-High



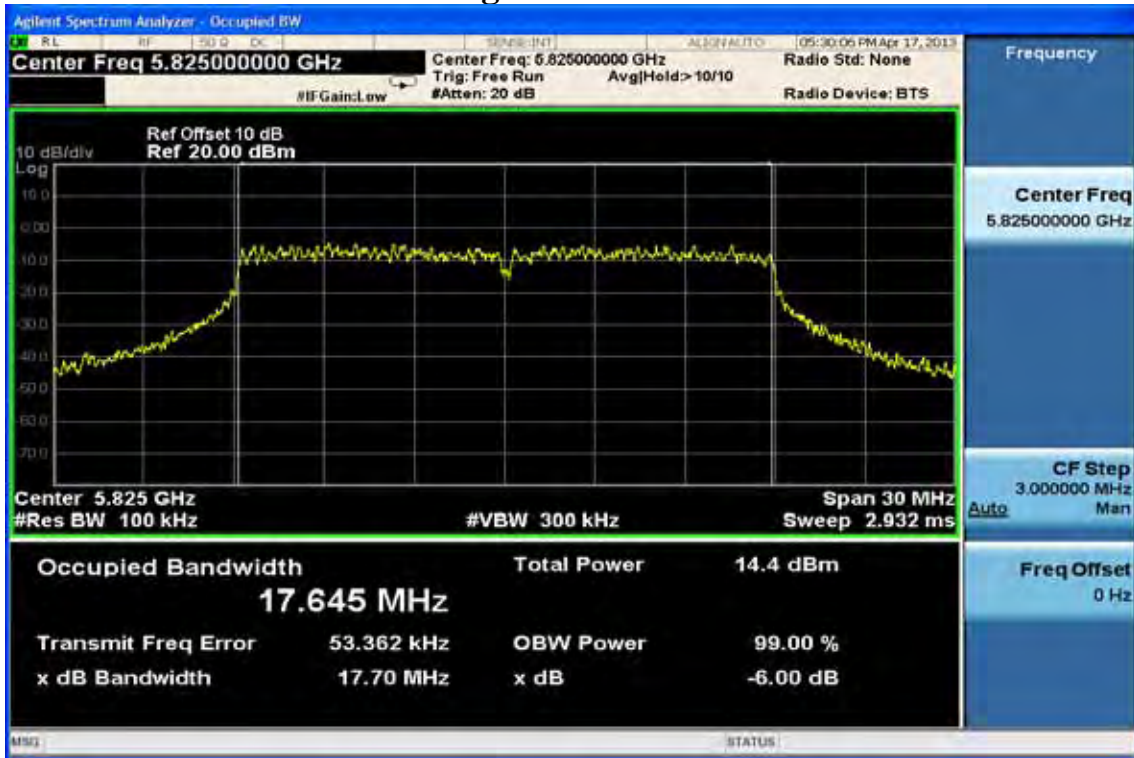
802.11n\_20M for 5GHz Combine  
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

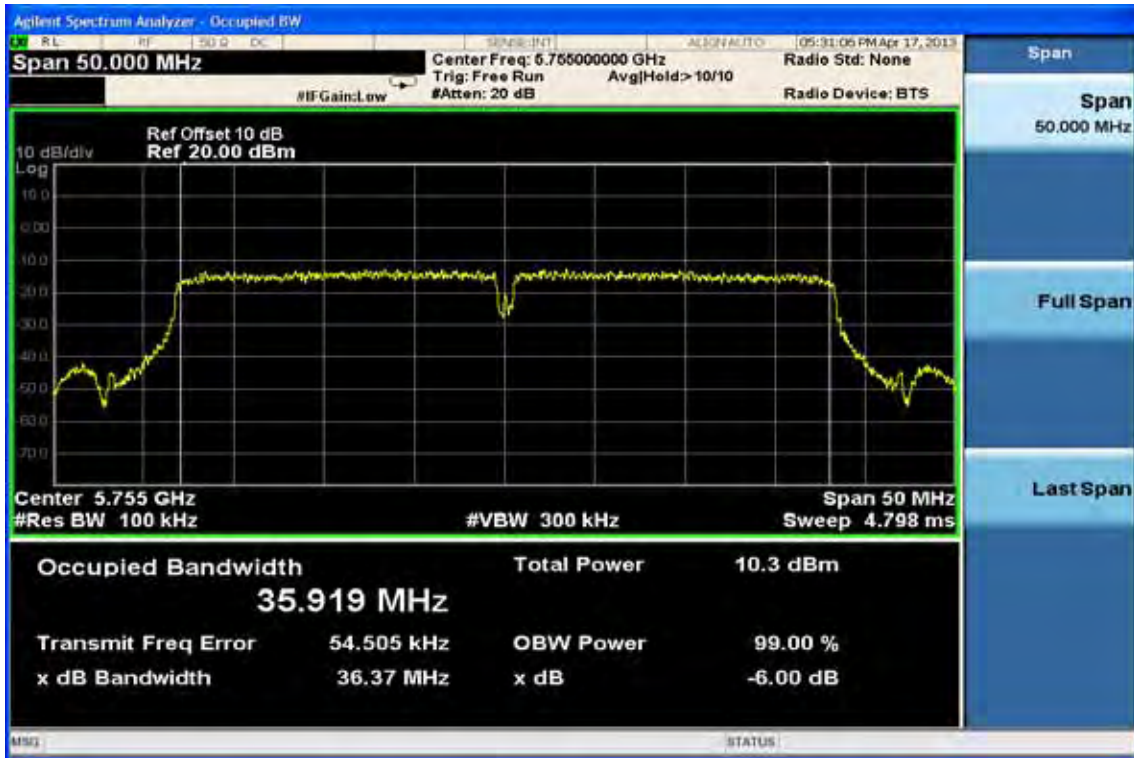


### 6dB Band Width Test Data CH-High

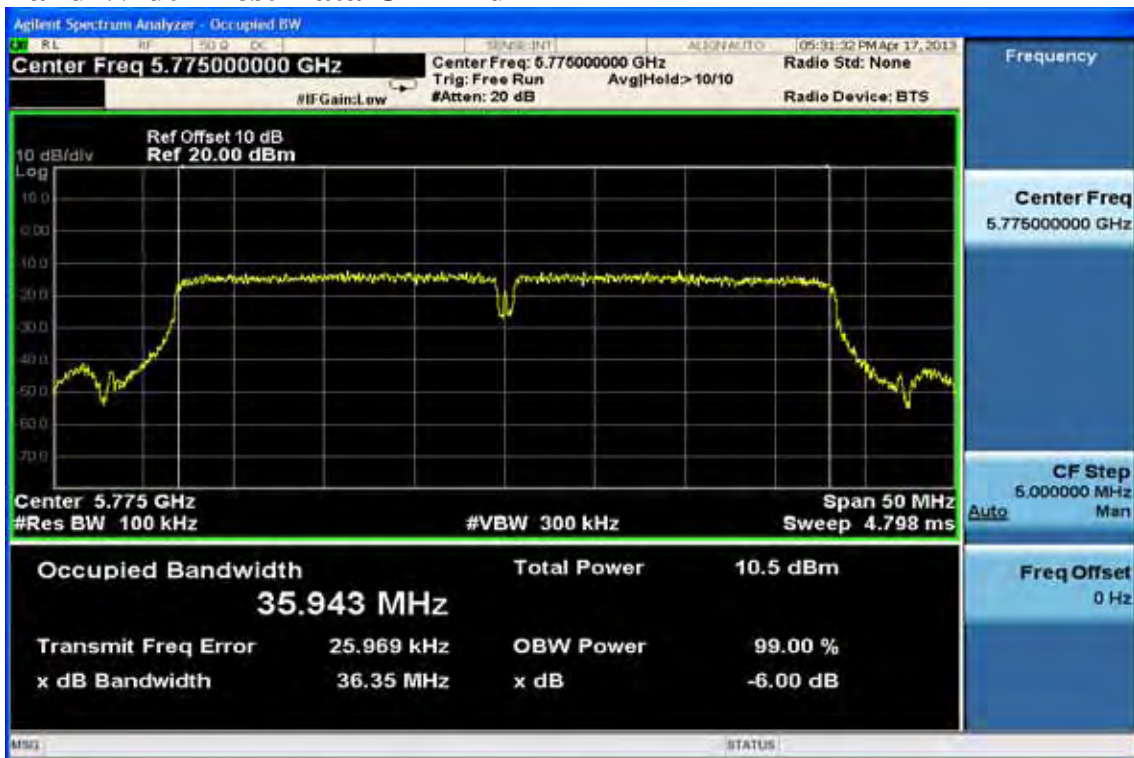




802.11n\_40M for 5GHz chain a  
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



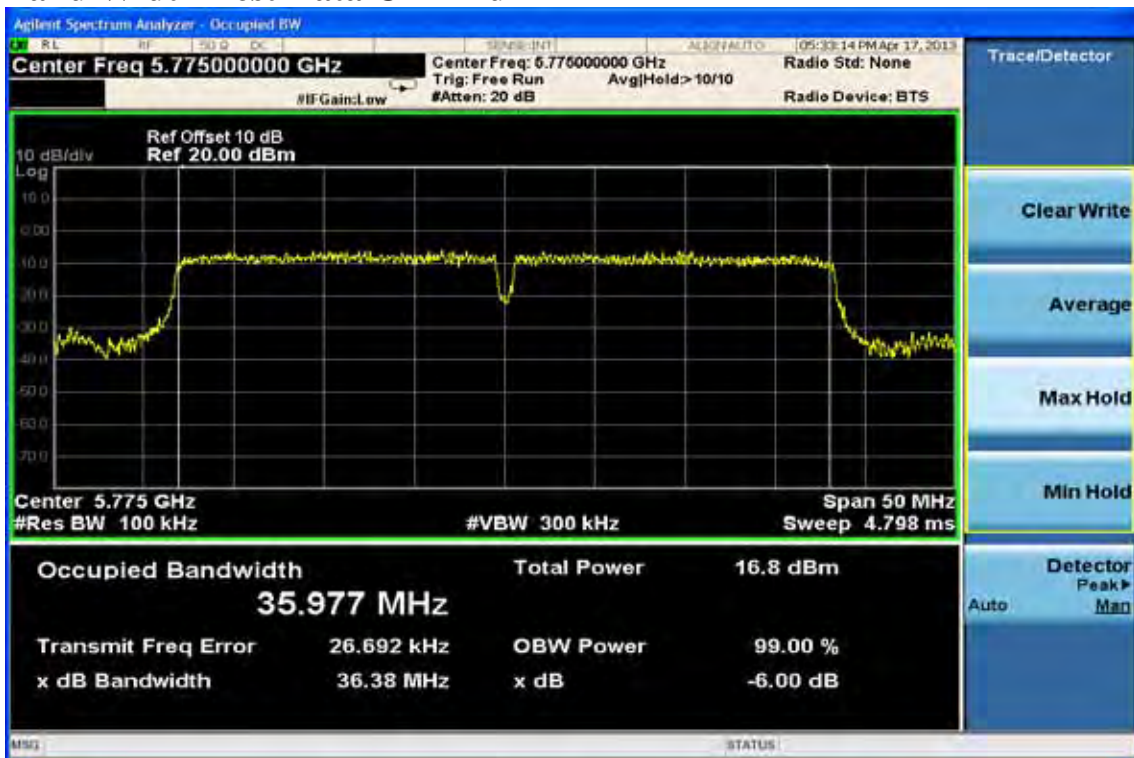
### 6dB Band Width Test Data CH-High



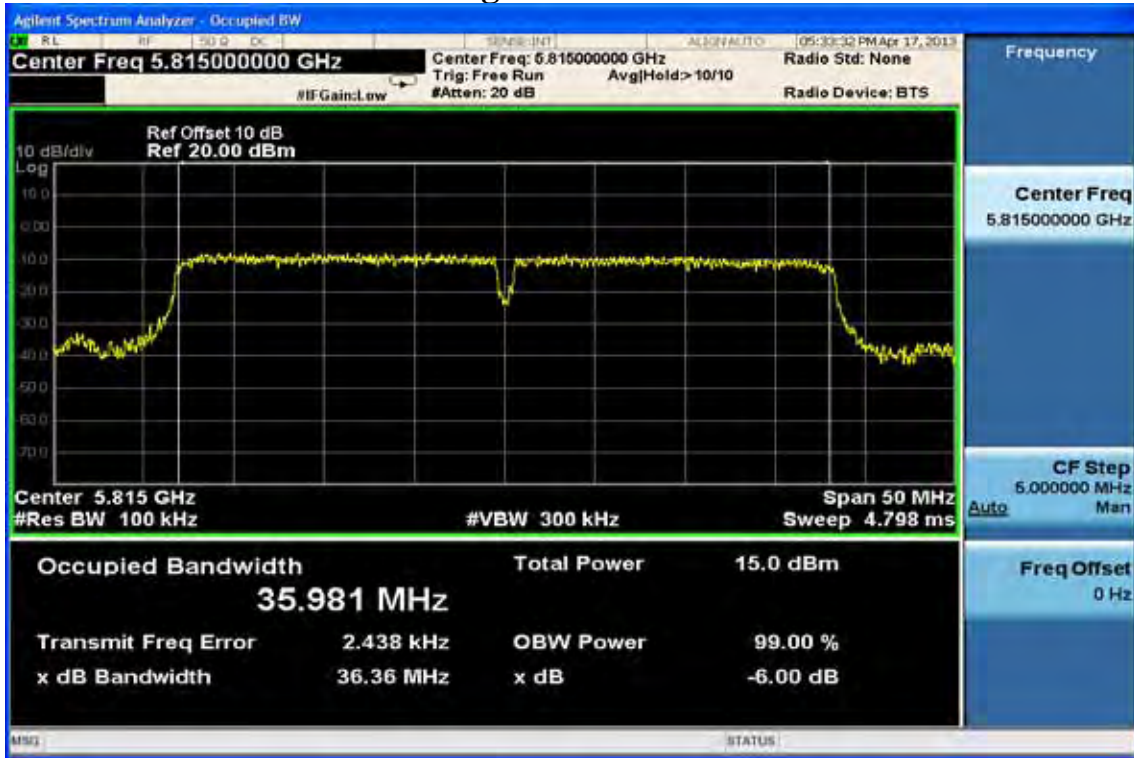
802.11n\_40M for 5GHz chain b  
6dB Band Width Test Data CH-Low



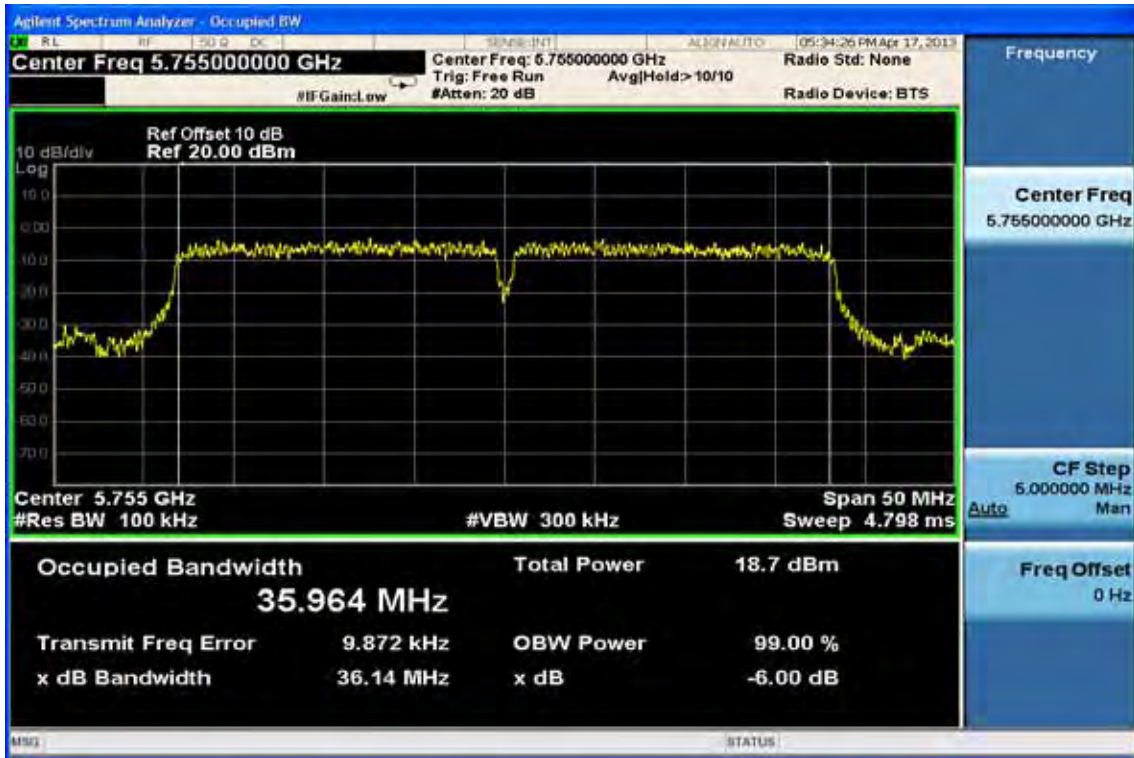
6dB Band Width Test Data CH-Mid



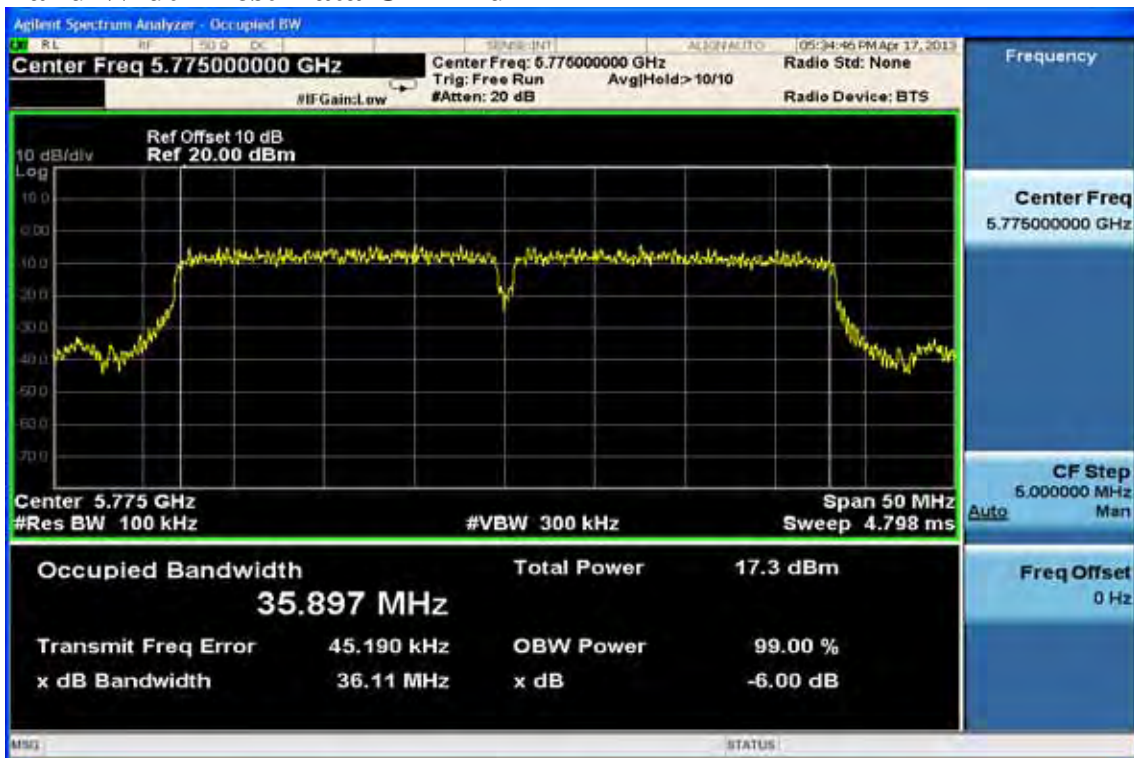
### 6dB Band Width Test Data CH-High



### 802.11n\_40M for 5GHz Combine 6dB Band Width Test Data CH-Low



### 6dB Band Width Test Data CH-Mid



### 6dB Band Width Test Data CH-High

