

RF TEST REPORT



Report No.: 18070473-FCC-R

Supersede Report No.: N/A

Applicant	YICHEN (Shenzhen) Technology Co.,LTD	
Product Name	N300 WiFi	
Model No.	JWA-N2315M,MRE120	
Serial No.	N/A	
Test Standard	FCC Part 15.247, ANSI C63.10: 2013	
Test Date	May 02 to 14, 2018	
Issue Date	May 15, 2018	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification		<input checked="" type="checkbox"/>
Equipment did not comply with the specification		<input type="checkbox"/>
Aaron Liang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety



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1. Report Revision History

Report No.	Report Version	Description	Issue Date
18070473-FCC-R	NONE	Original	May 15, 2018

2. Customer information

Applicant Name	YICHEN (Shenzhen) Technology Co.,LTD
Applicant Add	23/F, Block C1, Nanshan I Park, No. 1001, Xueyuan Road, Taoyuan Street, Nanshan Shenzhen, China
Manufacturer	YICHEN (Shenzhen) Technology Co.,LTD
Manufacturer Add	23/F, Block C1, Nanshan I Park, No. 1001, Xueyuan Road, Taoyuan Street, Nanshan Shenzhen, China

3. Test site information

Test Lab A:

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

Test Lab B:

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMC(ver.lcp-03A1)

Note: We just perform Radiated Spurious Emission above 18GHz in the test Lab. B.

4. Equipment under Test (EUT) Information

Description of EUT: N300 WiFi

Main Model: JWA-N2315M,MRE120

Serial Model: N/A

Date EUT received: May 01, 2018

Test Date(s): May 02 to 14, 2018

Equipment Category : DTS

Antenna Gain:
TX 0: 2dBi
TX 1: 2dBi

Antenna Type: C7521 PIFA

Type of Modulation: 802.11b/g/n: DSSS, OFDM

RF Operating Frequency (ies):
WIFI: 802.11b/g/n(20M): 2412-2462 MHz
WIFI: 802.11n(40M): 2422-2452 MHz

Max. Output Power:
802.11b: 3.99 dBm
802.11g: 4.13 dBm
802.11n(20M): 6.58 dBm
802.11n(40M): 6.35 dBm

Number of Channels:
WIFI :802.11b/g/n(20M): 11CH
WIFI :802.11n(40M): 7CH

Port: Please refer to the user' s manual



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Input Power: AC 100-240V,50/60Hz, 0.3A

Trade Name : **JCG**

FCC ID: 2AJSTJWA-N2315M

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.247 (a)(2)	DTS (6 dB&20 dB) CHANNEL BANDWIDTH	Compliance
§15.247(b)(3)	Conducted Maximum Output Power	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247(d)	Band-Edge & Unwanted Emissions into Restricted Frequency Bands	Compliance
§15.207 (a),	AC Power Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	Compliance

Measurement Uncertainty

Emissions		
Test Item	Description	Uncertainty
Band-Edge & Unwanted Emissions into Restricted Frequency Bands and Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. Measurements, Examination And Derived Results

6.1 Antenna Requirement

Applicable Standard

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has 2 antennas:

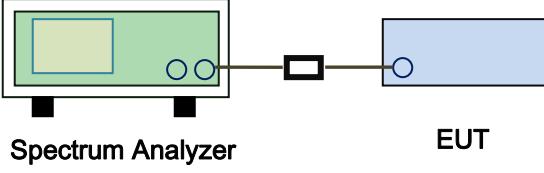
A permanently attached PCB antenna for WIF, the gain is 2dBi for WIFI TX 0, the gain is 2dBi for WIFI TX 1.

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

6.2 DTS (6 dB&20 dB) Channel Bandwidth

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1014mbar
Test date :	May 07, 2018
Tested By :	Aaron Liang

Spec	Item	Requirement	Applicable
§ 15.247(a)(2)	a)	6dB BW \geq 500kHz;	<input checked="" type="checkbox"/>
RSS Gen(4.6.1)	b)	99% BW: For FCC reference only; required by IC.	<input checked="" type="checkbox"/>
Test Setup		 Spectrum Analyzer EUT	
Test Procedure		<p>558074 D01 DTS MEAS Guidance v03r03, 8.1 DTS bandwidth</p> <p><u>6dB bandwidth</u></p> <ol style="list-style-type: none"> Set RBW = 100 kHz. Set the video bandwidth (VBW) \geq 3 \times RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. <p><u>20dB bandwidth</u></p> <p>C63.10 Occupied Bandwidth (OBW=20dB bandwidth)</p> <ol style="list-style-type: none"> Set RBW = 1%-5% OBW. Set the video bandwidth (VBW) \geq 3 x RBW. Set the span range between 2 times and 5 times of the OBW. Sweep time=Auto, Detector=PK, Trace=Max hold. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst- 	

	case (i.e., the widest) bandwidth. Unless otherwise specified for an unlicensed wireless device, measure the bandwidth at the 20 dB levels with respect to the reference level.
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

TX 0:

Measurement result

Test mode	CH	Freq (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	10.07	≥ 0.5
	Mid	2437	10.08	≥ 0.5
	High	2462	10.07	≥ 0.5
802.11g	Low	2412	15.12	≥ 0.5
	Mid	2437	15.12	≥ 0.5
	High	2462	15.11	≥ 0.5
802.11n (20M)	Low	2412	15.11	≥ 0.5
	Mid	2437	15.12	≥ 0.5
	High	2462	15.12	≥ 0.5
802.11n (40M)	Low	2422	33.83	≥ 0.5
	Mid	2437	32.58	≥ 0.5
	High	2452	33.78	≥ 0.5

Test mode	CH	Freq (MHz)	20dB Bandwidth (MHz)
802.11b	Low	2412	17.17
	Mid	2437	17.15
	High	2462	17.12
802.11g	Low	2412	18.84
	Mid	2437	18.83
	High	2462	18.81
802.11n (20M)	Low	2412	17.30
	Mid	2437	17.27
	High	2462	17.26
802.11n (40M)	Low	2422	37.28
	Mid	2437	37.31
	High	2452	37.29

TX 1:

Measurement result

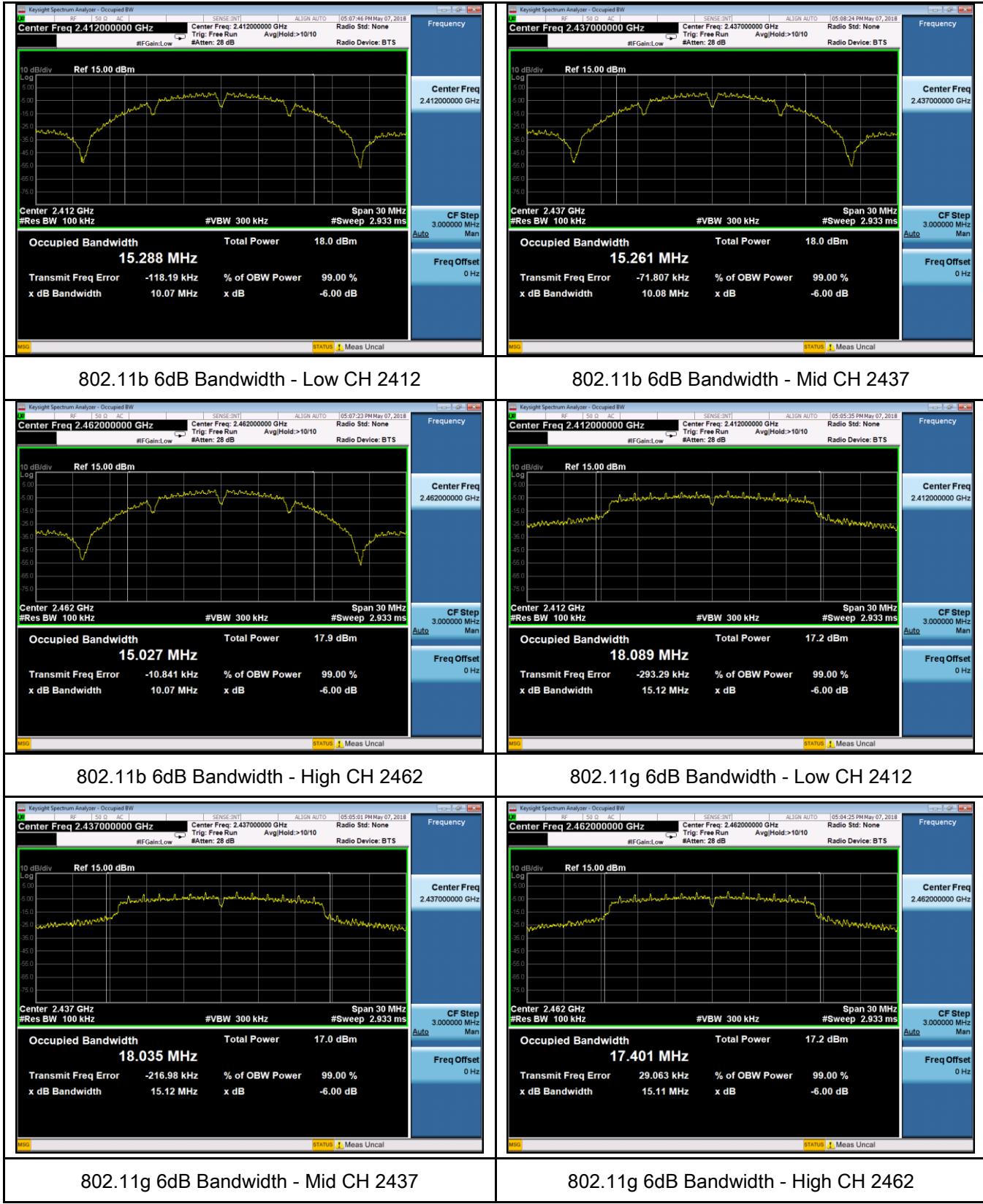
Test mode	CH	Freq (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	9.59	≥ 0.5
	Mid	2437	9.55	≥ 0.5
	High	2462	9.57	≥ 0.5
802.11g	Low	2412	15.10	≥ 0.5
	Mid	2437	15.09	≥ 0.5
	High	2462	15.11	≥ 0.5
802.11n (20M)	Low	2412	15.68	≥ 0.5
	Mid	2437	15.65	≥ 0.5
	High	2462	15.66	≥ 0.5
802.11n (40M)	Low	2422	35.05	≥ 0.5
	Mid	2437	32.58	≥ 0.5
	High	2452	33.82	≥ 0.5

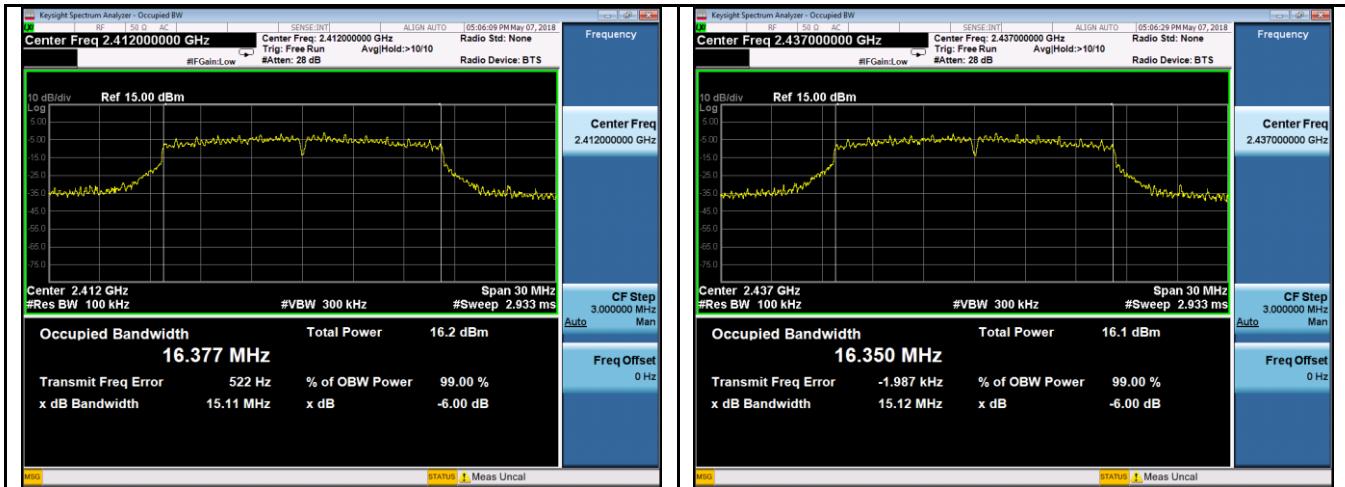
Test mode	CH	Freq (MHz)	20dB Bandwidth (MHz)
802.11b	Low	2412	16.58
	Mid	2437	16.30
	High	2462	16.29
802.11g	Low	2412	17.36
	Mid	2437	17.07
	High	2462	17.09
802.11n (20M)	Low	2412	17.14
	Mid	2437	17.11
	High	2462	17.14
802.11n (40M)	Low	2422	36.95
	Mid	2437	37.30
	High	2452	37.31

TX 0:

Test Plots

6dB Bandwidth measurement result





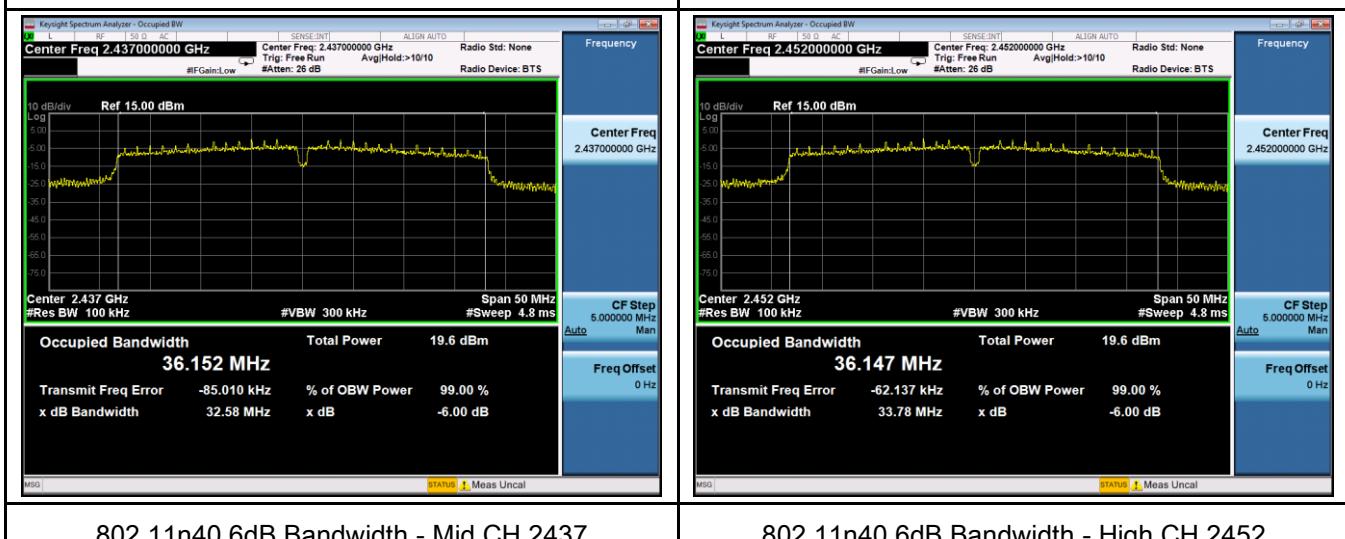
802.11n20 6dB Bandwidth - Low CH 2412

802.11n20 6dB Bandwidth - Mid CH 2437



802.11n20 6dB Bandwidth - High CH 2462

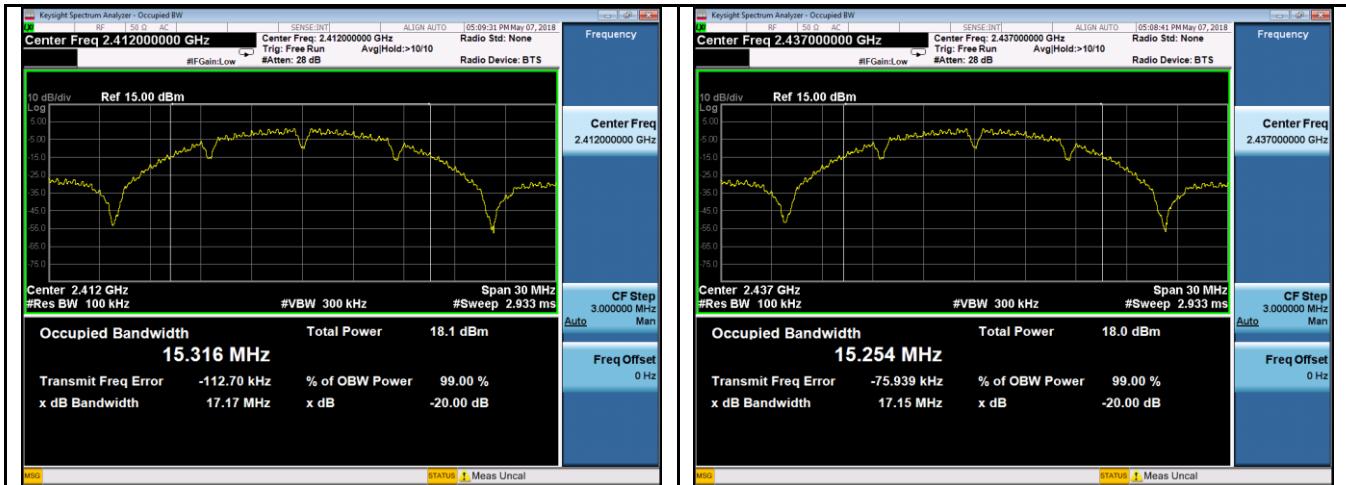
802.11n40 6dB Bandwidth - Low CH 2422



802.11n40 6dB Bandwidth - Mid CH 2437

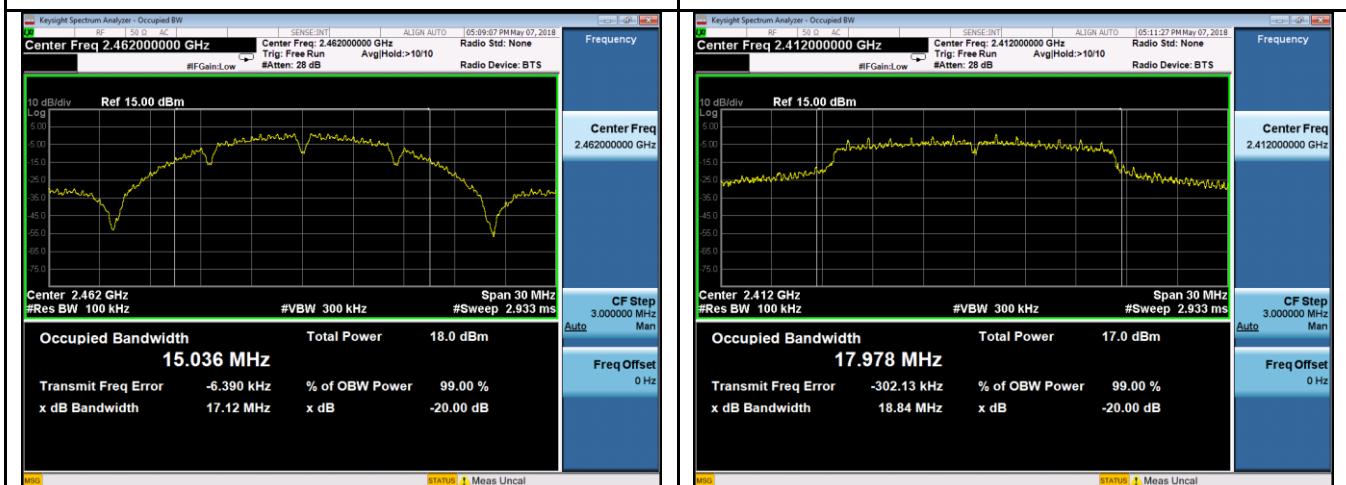
802.11n40 6dB Bandwidth - High CH 2452

20 dB Bandwidth measurement result



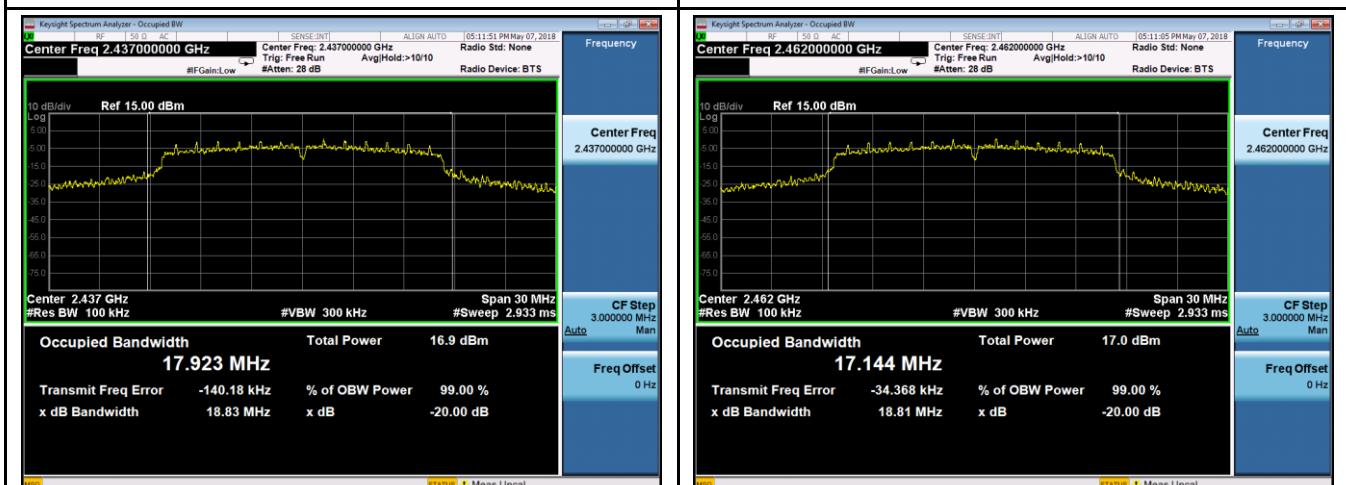
802.11b 20dB Bandwidth - Low CH 2412

802.11b 20dB Bandwidth - Mid CH 2437



802.11b 20dB Bandwidth - High CH 2462

802.11g 20dB Bandwidth - Low CH 2412



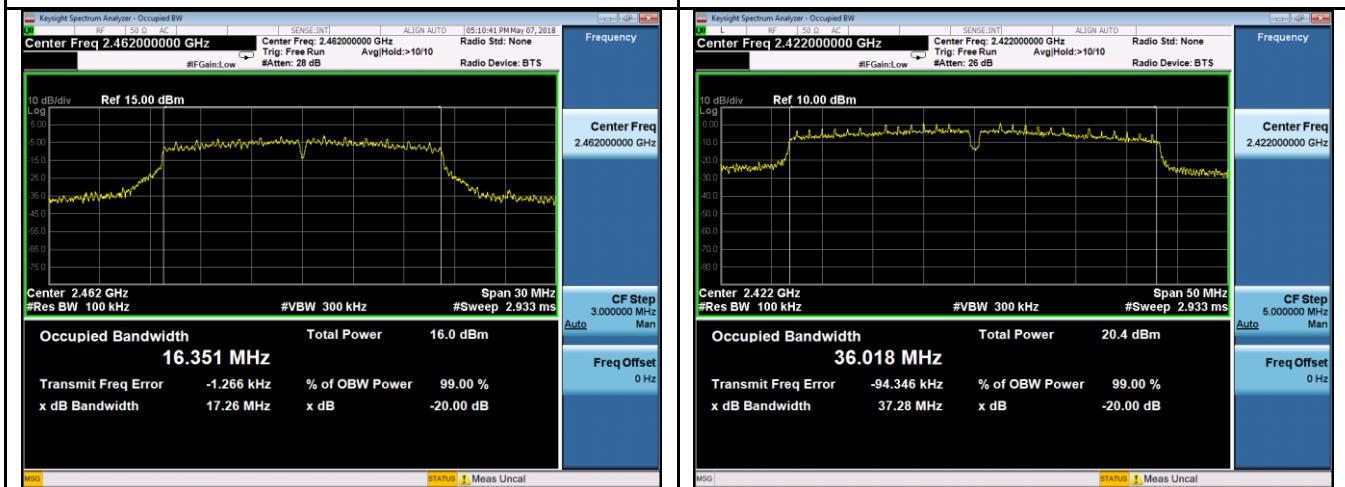
802.11g 20dB Bandwidth - Mid CH 2437

802.11g 20dB Bandwidth - High CH 2462



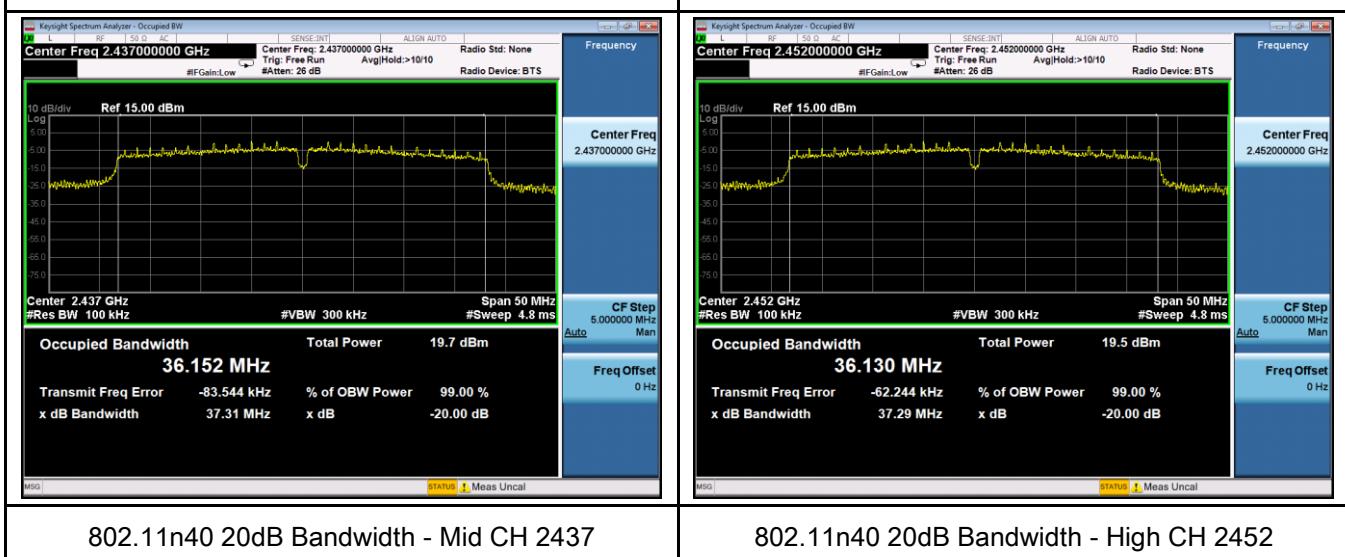
802.11n20 20dB Bandwidth - Low CH 2412

802.11n20 20dB Bandwidth - Mid CH 2437



802.11n20 20dB Bandwidth - High CH 2462

802.11n40 20dB Bandwidth - Low CH 2422



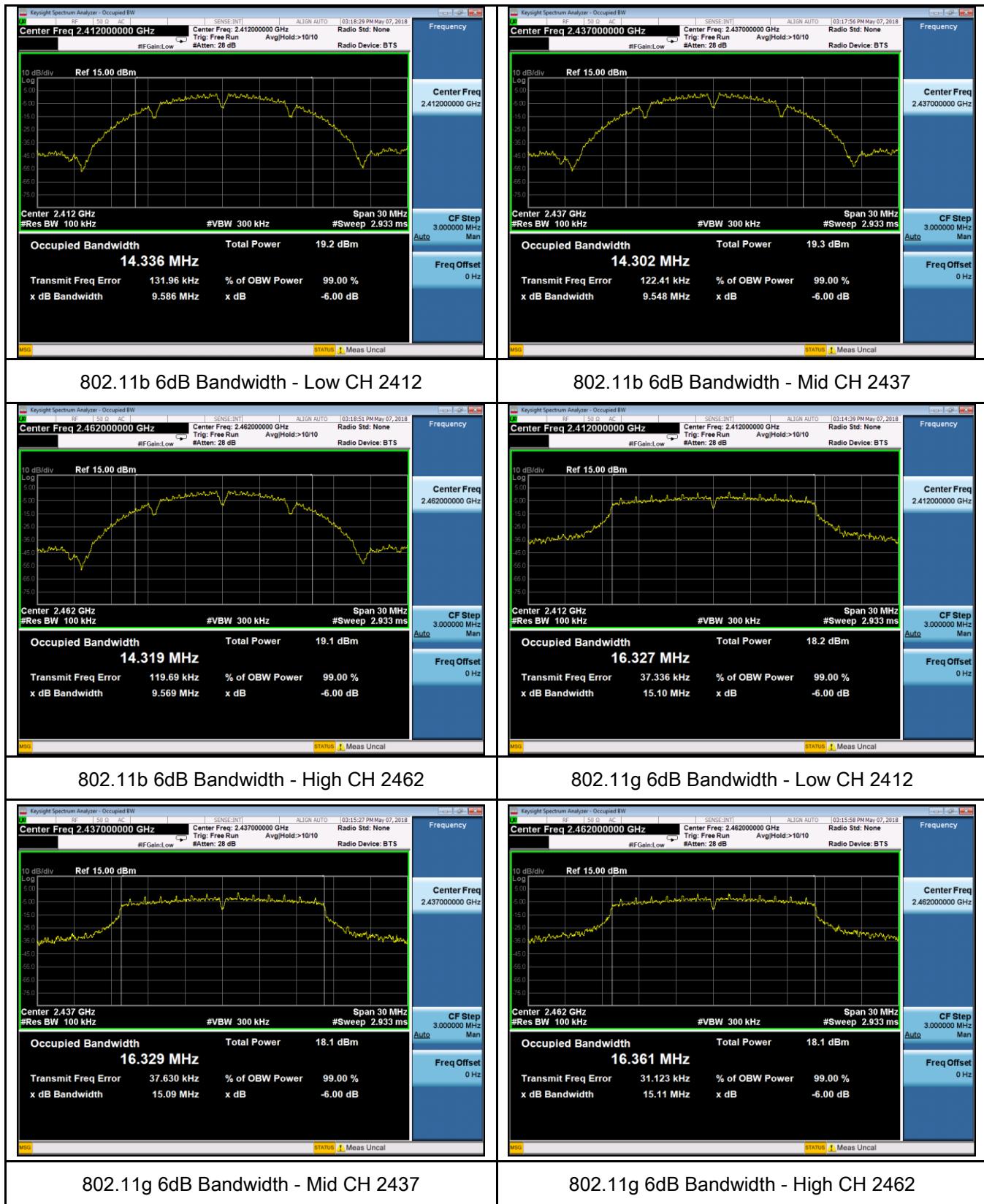
802.11n40 20dB Bandwidth - Mid CH 2437

802.11n40 20dB Bandwidth - High CH 2452

TX 1:

Test Plots

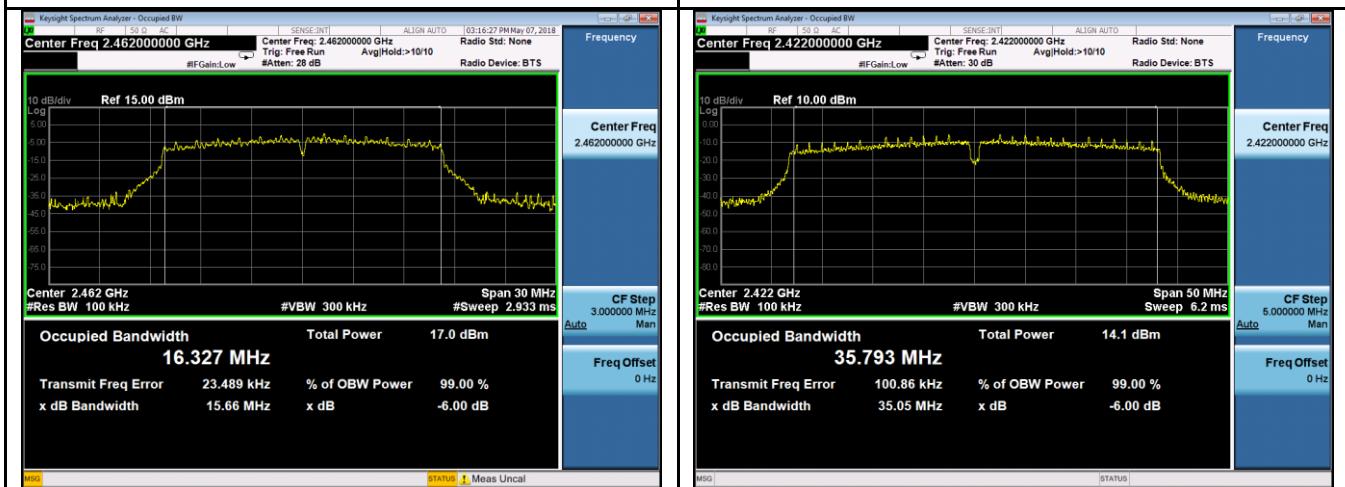
6dB Bandwidth measurement result





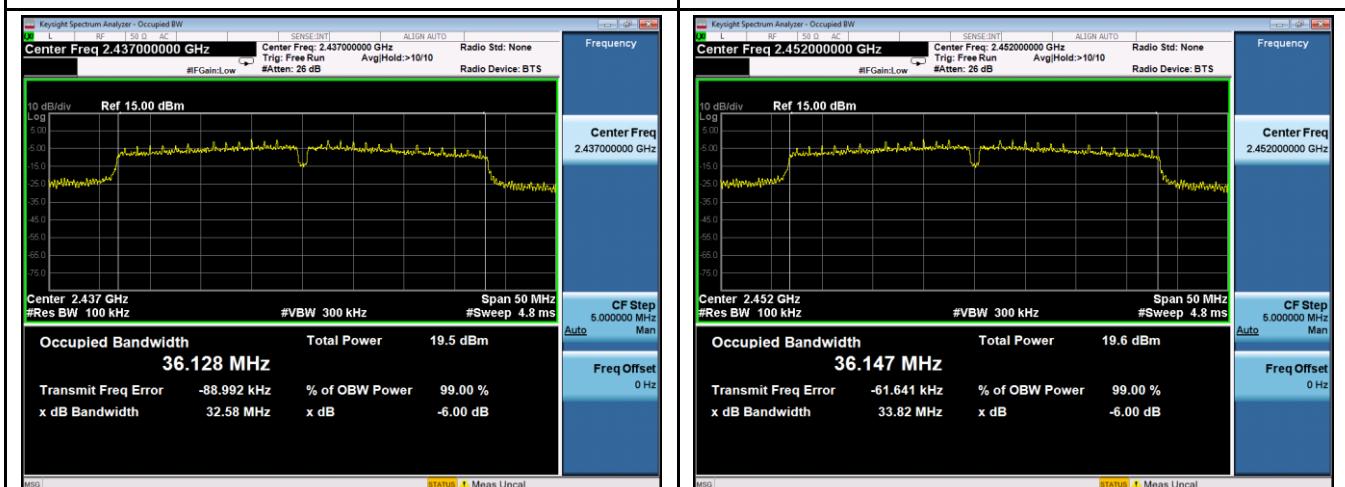
802.11n20 6dB Bandwidth - Low CH 2412

802.11n20 6dB Bandwidth - Mid CH 2437



802.11n20 6dB Bandwidth - High CH 2462

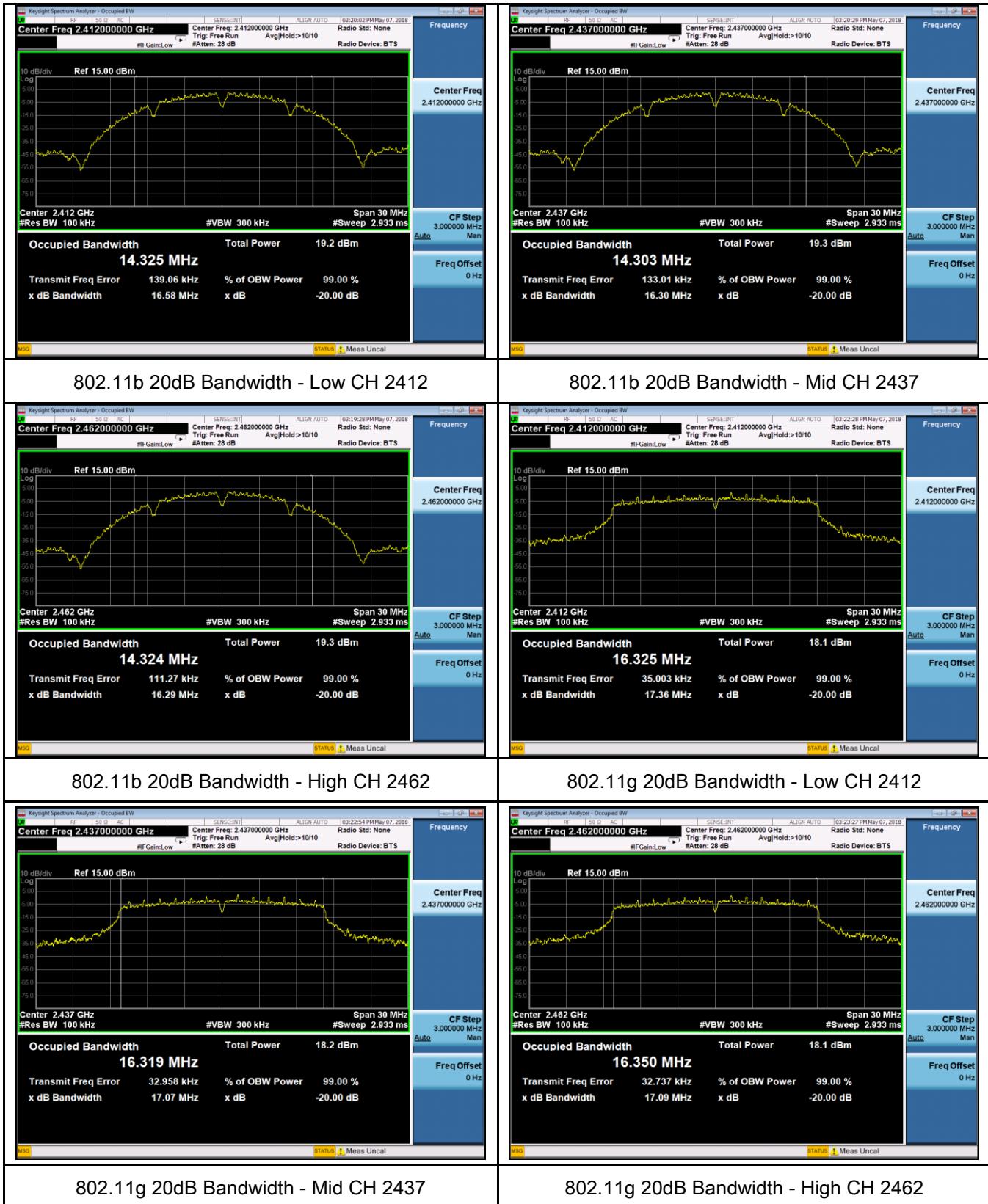
802.11n20 6dB Bandwidth - Low CH 2422



802.11n40 6dB Bandwidth - Mid CH 2437

802.11n40 6dB Bandwidth - High CH 2452

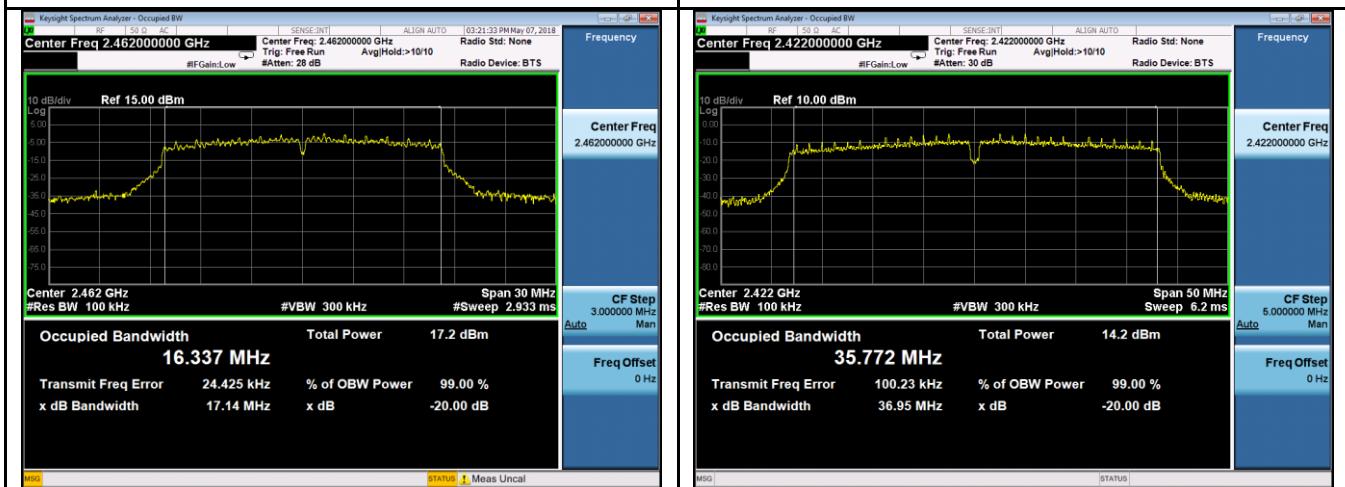
20 dB Bandwidth measurement result





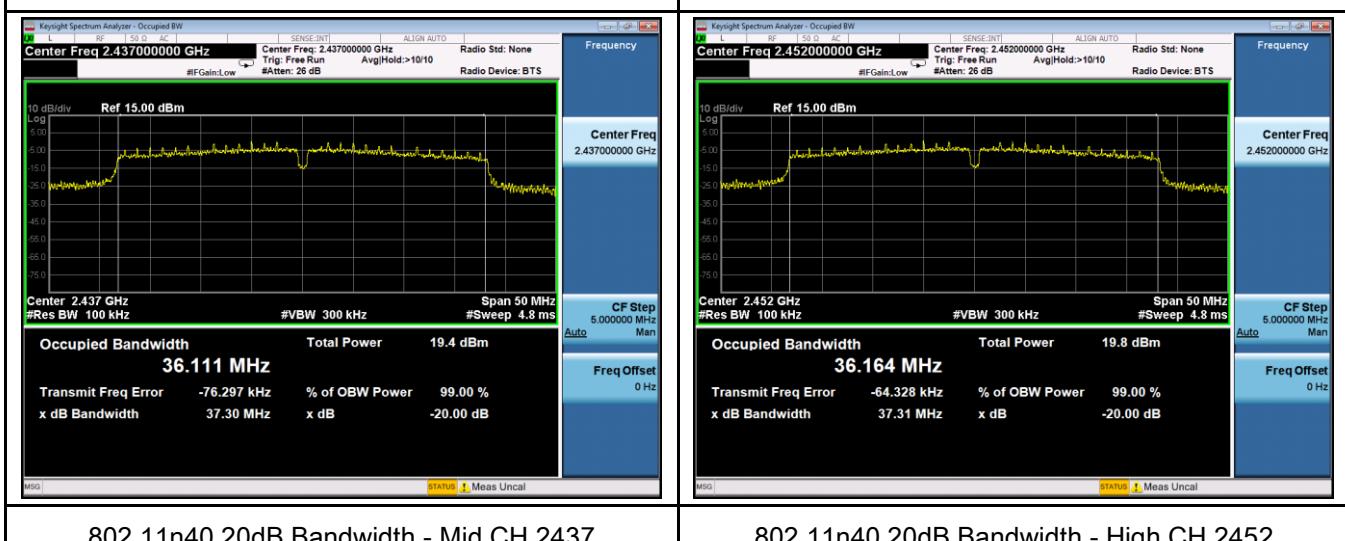
802.11n20 20dB Bandwidth - Low CH 2412

802.11n20 20dB Bandwidth - Mid CH 2437



802.11n20 20dB Bandwidth - High CH 2462

802.11n40 20dB Bandwidth - Low CH 2422



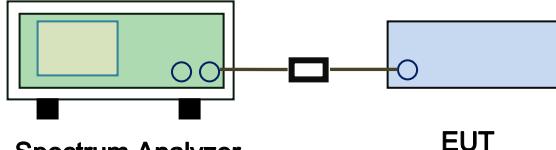
802.11n40 20dB Bandwidth - Mid CH 2437

802.11n40 20dB Bandwidth - High CH 2452

6.3 Maximum Output Power

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1014mbar
Test date :	May 07, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(b) (3), RSS210 (A8.4)	a)	FHSS in 2400-2483.5MHz with \geq 75 channels: \leq 1 Watt	<input type="checkbox"/>
	b)	FHSS in 5725-5850MHz: \leq 1 Watt	<input type="checkbox"/>
	c)	For all other FHSS in the 2400-2483.5MHz band: \leq 0.125 Watt.	<input type="checkbox"/>
	d)	FHSS in 902-928MHz with \geq 50 channels: \leq 1 Watt	<input type="checkbox"/>
	e)	FHSS in 902-928MHz with \geq 25 & $<$ 50 channels: \leq 0.25 Watt	<input type="checkbox"/>
	f)	DTS in 902-928MHz, 2400-2483.5MHz: \leq 1 Watt	<input checked="" type="checkbox"/>
Test Setup		 Spectrum Analyzer EUT	
Test Procedure		<p>558074 D01 DTS MEAS Guidance v03r03, 9.1.2 Integrated band power method</p> <p>Maximum output power measurement procedure</p> <ul style="list-style-type: none"> - a) Set span to at least 1.5 times the OBW. - b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz. - c) Set VBW \geq 3 x RBW. - d) Number of points in sweep \geq 2 \times span / RBW. (This gives bin-to-bin spacing \leq RBW/2, so that narrowband signals are not lost between frequency bins.) - e) Sweep time = auto. - f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode. - g) If transmit duty cycle $<$ 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum 	

	<p>power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “ free run” .</p> <ul style="list-style-type: none"> - h) Trace average at least 100 traces in power averaging (i.e., RMS) mode. - i) Compute power by integrating the spectrum across the OBW of the signal using the instrument’ s band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A