

FCC TEST REPORT

For

CILICON LIMITED

4G SMART PHONE

Test Model: X6L

Prepared for : CILICON LIMITED
Address : Room A 7/F CHINA OVERSEAS BLDG 139 HENNESSY
ROAD, WANCHAI , HONG KONG, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : October 12, 2015
Number of tested samples : 1
Serial number : Prototype
Date of Test : October 12, 2015 - November 23, 2015
Date of Report : November 23, 2015

FCC TEST REPORT**FCC CFR 47 PART 15 C(15.247): 2014****Report Reference No. : LCS1511181565E**

Date of Issue : November 23, 2015

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, ChinaTesting Location/ Procedure..... : Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing method ☐**Applicant's Name..... : CILICON LIMITED**Address : Room A 7/F CHINA OVERSEAS BLDG 139 HENNESSY
ROAD, WANCHAI , HONG KONG, China**Test Specification**

Standard : FCC CFR 47 PART 15 C(15.247): 2014 / ANSI C63.10: 2013

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. : 4G SMART PHONE

Trade Mark : CILICON, NOVEA, MAGIC

Test Model : X6L

Ratings : DC 3.8V by Lithium ion polymer battery(4000mAh)
Recharged by DC 5V/2.1A Travel ChargerResult : **Positive****Compiled by:**

Dick Su/ File administrators

Supervised by:

Glin Lu/ Technique principal

Approved by:

Gavin Liang/ Manager

FCC -- TEST REPORT**Test Report No. : LCS151181565E**November 23, 2015

Date of issue

Test Model..... : X6L

EUT..... : 4G SMART PHONE

Applicant..... : CILICON LIMITEDAddress..... : Room A 7/F CHINA OVERSEAS BLDG 139 HENNESSY ROAD,
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Test Result**Positive**

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.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: 4G SMART PHONE
Test Model	: X6L
Hardware Version	: I3-MB-P1
Software Version	: *#41*#
Power Supply	: DC 3.8V by Lithium ion polymer battery(4000mAh) Recharged by DC 5V/2.1A Travel Charger
EUT Support	: GSM/GPRS/EGPRS(Only Downlink)/
Radios Application	WCDMA/HSUPA/HSDPA/LTE/WIFI/Bluetooth/GPS(Only RX)
Bluetooth	:
Frequency Range	: 2402.00-2480.00MHz
Channel Spacing	: 2MHz
Channel Number	: 40
Modulation Technology	: GFSK
Bluetooth Version	: This report is only for Bluetooth V4.0 BLE part. For Bluetooth V3.0 part, please see another separate report.
Antenna Description	: PIFA Antenna, 0 dBi(Max.)
WIFI Technology	:
Operating Frequency	: 2412.00-2462.00MHz
Channel Spacing	: 5MHz
Channel Number	: 11 Channels for 20MHz Bandwidth 7 Channels for 40MHz Bandwidth
Modulation Technology	: 802.11b: DSSS(CCK,DQPSK,DBPSK) 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK)
Data Rates	: 802.11b: 1-11Mbps 802.11g: 6-54Mbps 802.11n: MCS0-MCS7
Antenna Description	: PIFA Antenna, 0 dBi(Max.)

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
CILICON LIMITED	Adapter	ZDA050060US	--	VOC

1.3. External I/O

I/O Port Description	Quantity	Cable
Earphone Port	1	N/A
USB Port	1	N/A
SIM Card Slot	2	N/A

1.4. Description of Test Facility

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

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 X position.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, that was determined to be 802.11b mode(Low Channel).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be 802.11b mode(Low Channel).

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

BLE 4.0: 1Mbps, GFSK

802.11b Mode : 1 Mbps, DSSS.

802.11g Mode : 6 Mbps, OFDM.

802.11n Mode HT20:MCS0, OFDM.

802.11n Mode HT40: MCS0, OFDM.

Channel List & Frequency
BLE 4.0

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
2402~2480MHz	1	2402	21	2442
	2	2404	--	--
	3	2406	--	--
	--	--	38	2476
	--	--	39	2478
	20	2440	40	2480

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

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

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 v03r02 is 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 15.203, 15.205, 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be 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 and 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

The system was configured for testing in a continuous transmit condition.

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)(3)	Maximum Conducted Output Power	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant
§15.205	Emissions at Restricted Band	Compliant
§15.207(a)	Line Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant

5. TEST RESULT

5.1. Maximum Conducted Output Power Measurement

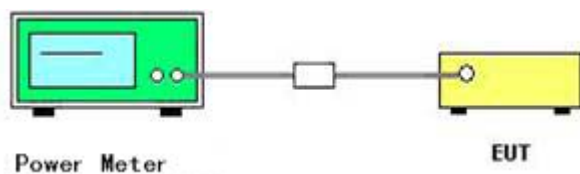
5.1.1. Standard Applicable

According to §15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz bands: 1 Watt.

5.1.2. Test Procedures

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

5.1.3. Test Setup Layout



5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.5. Test Result of Maximum Conducted Output Power

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

BLE 4.0

Channel	Frequency (MHz)	Conducted Power (dBm, Peak)	Max. Limit (dBm)	Result
0	2402	-4.23	30	Complies
19	2440	-4.49	30	Complies
39	2480	-4.14	30	Complies

802.11b

Channel	Frequency (MHz)	Conducted Power (dBm, Peak)	Max. Limit (dBm)	Result
1	2412	16.36	30	Complies
6	2437	16.88	30	Complies
11	2462	16.49	30	Complies

802.11g

Channel	Frequency (MHz)	Conducted Power (dBm, Peak)	Max. Limit (dBm)	Result
1	2412	19.97	30	Complies
6	2437	20.72	30	Complies
11	2462	20.44	30	Complies

802.11n HT20

Channel	Frequency (MHz)	Conducted Power (dBm, Peak)	Max. Limit (dBm)	Result
1	2412	19.73	30	Complies
6	2437	20.66	30	Complies
11	2462	20.41	30	Complies

802.11n(HT40)

Channel	Frequency (MHz)	Conducted Power (dBm, Peak)	Max. Limit (dBm)	Result
3	2422	21.19	30	Complies
6	2437	21.87	30	Complies
9	2452	21.55	30	Complies

5.2. Power Spectral Density Measurement

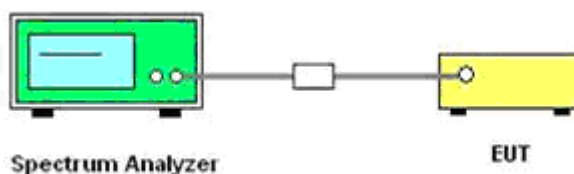
5.2.1. Standard Applicable

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.

5.2.2. 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 $\geq 3 \times$ 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.

5.2.3. Test Setup Layout



5.2.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.5. Test Result of Power Spectral Density

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

BLE 4.0

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
0	2402	-21.864	8	Complies
19	2440	-21.916	8	Complies
39	2480	-22.745	8	Complies

802.11b

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-18.268	8	Complies
6	2437	-16.238	8	Complies
11	2462	-13.663	8	Complies

802.11g

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-18.921	8	Complies
6	2437	-17.245	8	Complies
11	2462	-14.903	8	Complies

802.11n HT20

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
1	2412	-19.801	8	Complies
6	2437	-14.284	8	Complies
11	2462	-14.489	8	Complies

802.11n HT40

Channel	Frequency (MHz)	Power Density (dBm/3KHz)	Max. Limit (dBm/3KHz)	Result
3	2422	-20.908	8	Complies
6	2437	-18.276	8	Complies
9	2452	-17.071	8	Complies

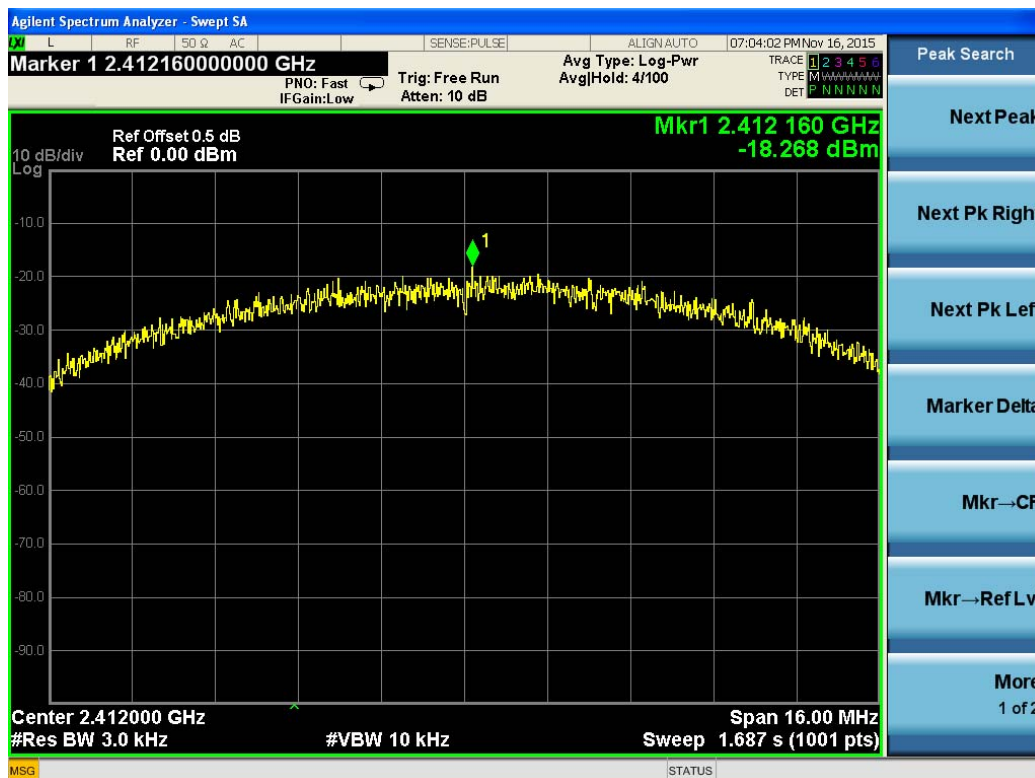
Note: The measured power density (dBm) has the offset with cable loss already.

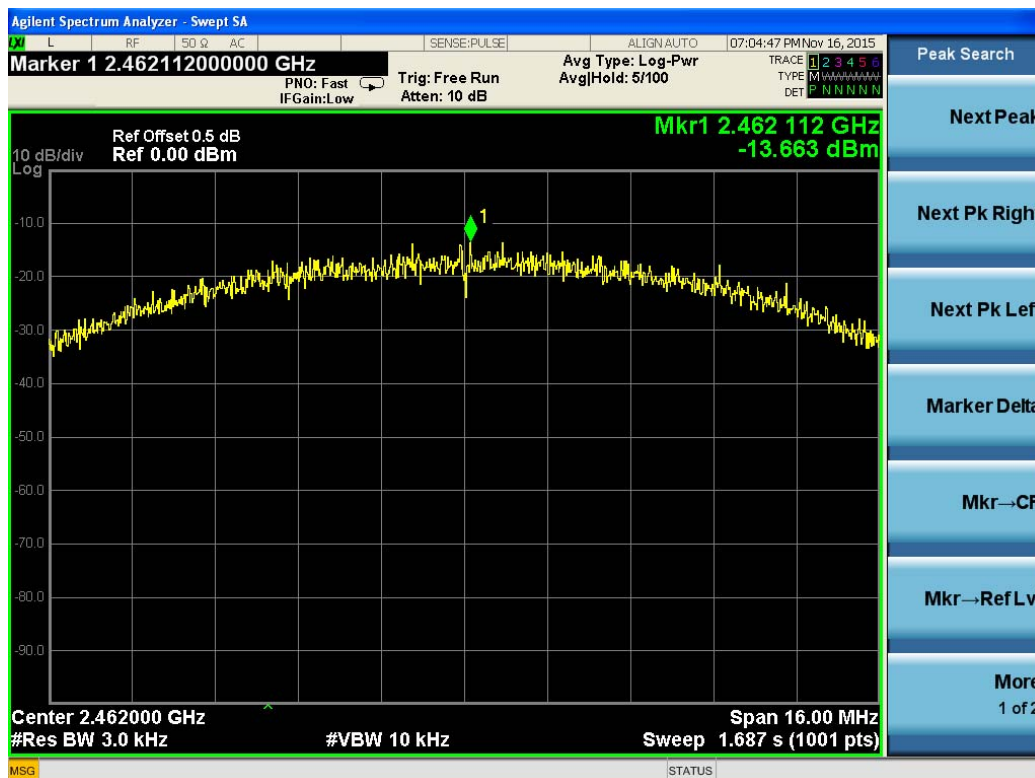
BLE 4.0 power density



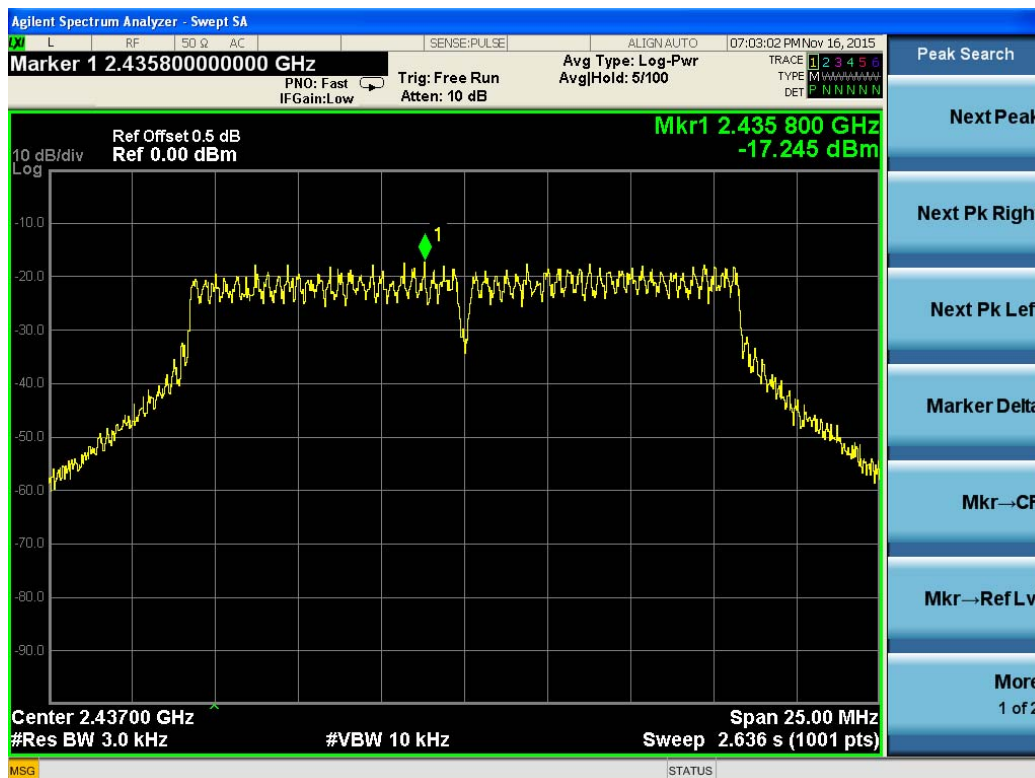


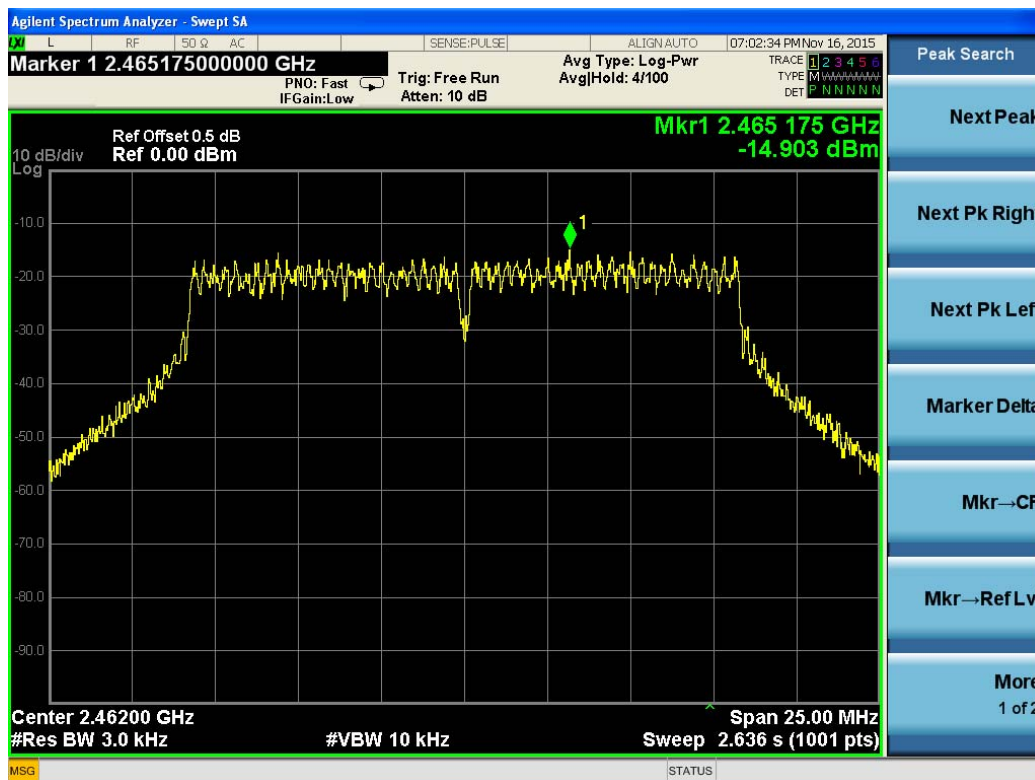
802.11b power density





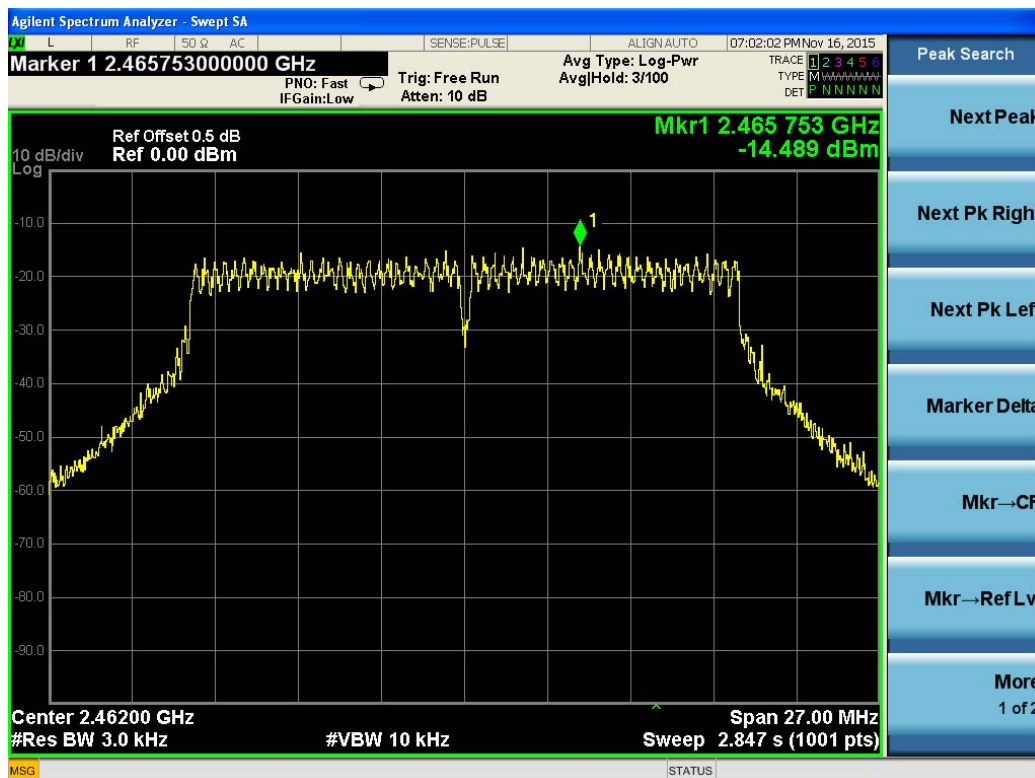
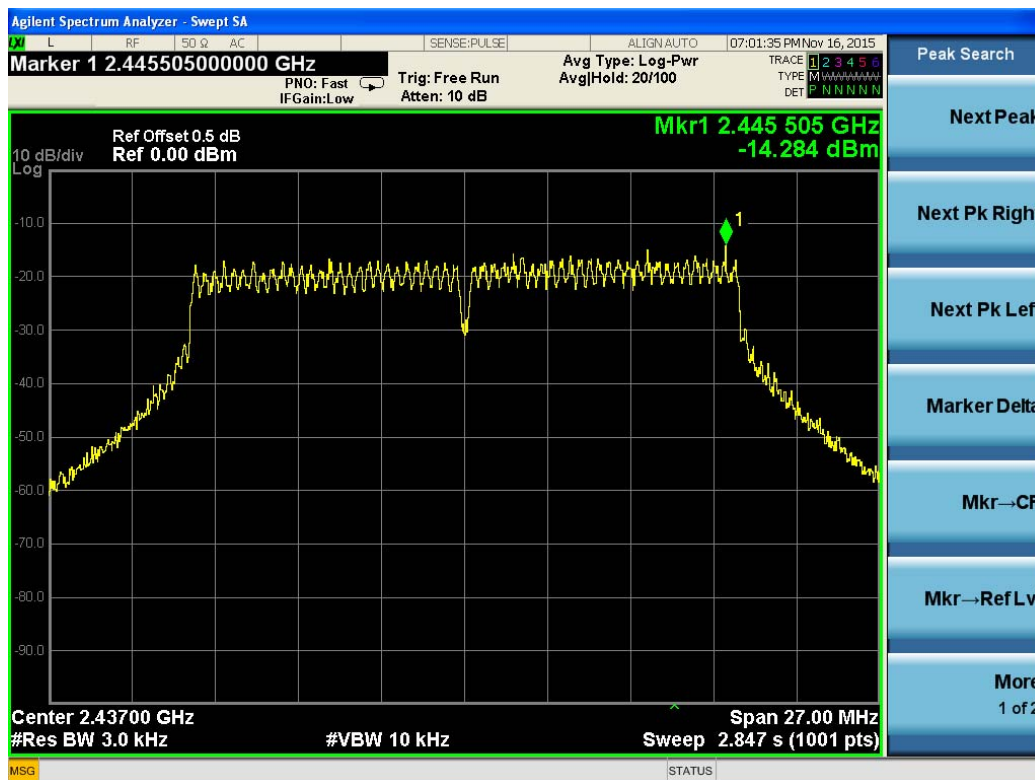
802.11g power density





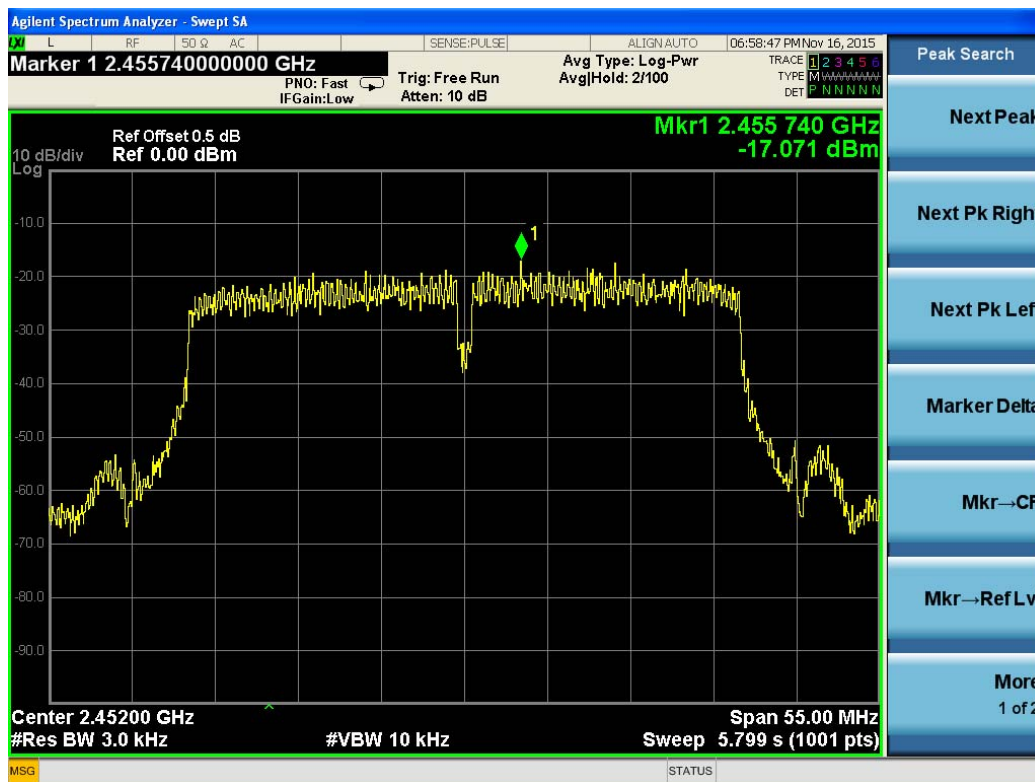
802.11n HT20 power density





802.11n HT40 power density





5.3. 6 dB Spectrum Bandwidth Measurement

5.3.1. Standard Applicable

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

5.3.2. Instruments Setting

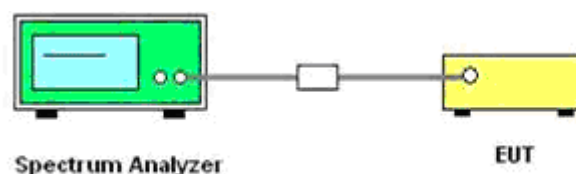
The following table is the setting of the Spectrum Analyzer.

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

5.3.3. 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 D01 DTS Meas. Guidance v03r02.
- 3) Measured 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 6dB relative to the maximum level measured in the fundamental emission.
- 4) For 20dB Bandwidth measurement, RBW is set in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW. Measured 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 20dB relative to the maximum level measured in the fundamental emission.

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of Spectrum Bandwidth

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

BLE 4.0

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
0	2402	0.70	500	Complies
19	2440	0.70	500	Complies
39	2480	0.70	500	Complies

802.11b

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	10.39	500	Complies
6	2437	9.70	500	Complies
11	2462	9.92	500	Complies

802.11g

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	16.11	500	Complies
6	2437	16.39	500	Complies
11	2462	16.37	500	Complies

802.11n HT20

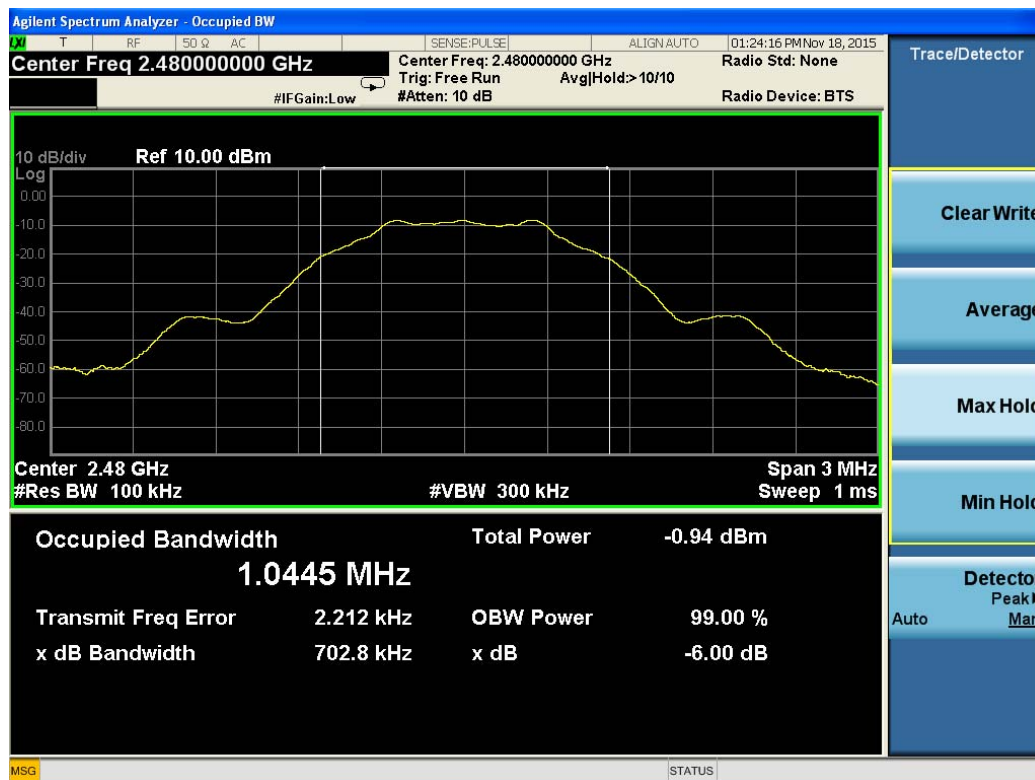
Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	17.35	500	Complies
6	2437	17.23	500	Complies
11	2462	17.61	500	Complies

802.11n HT40

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	34.15	500	Complies
6	2437	35.36	500	Complies
11	2462	35.13	500	Complies

BLE 4.0 channel, 6dB bandwidth



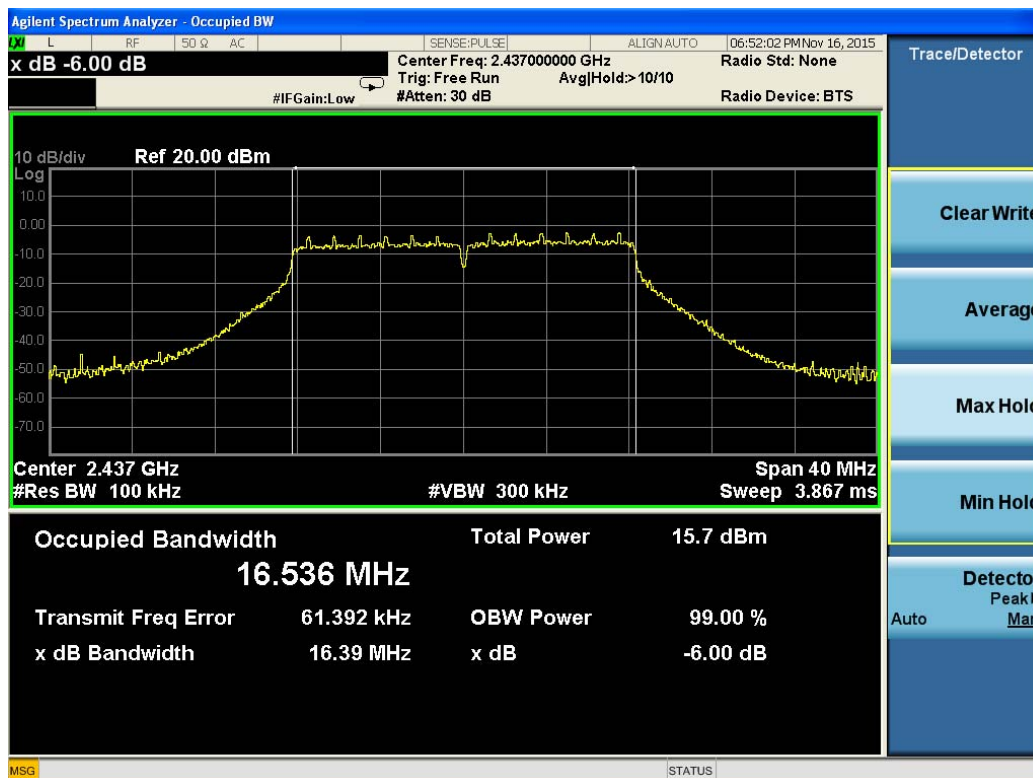
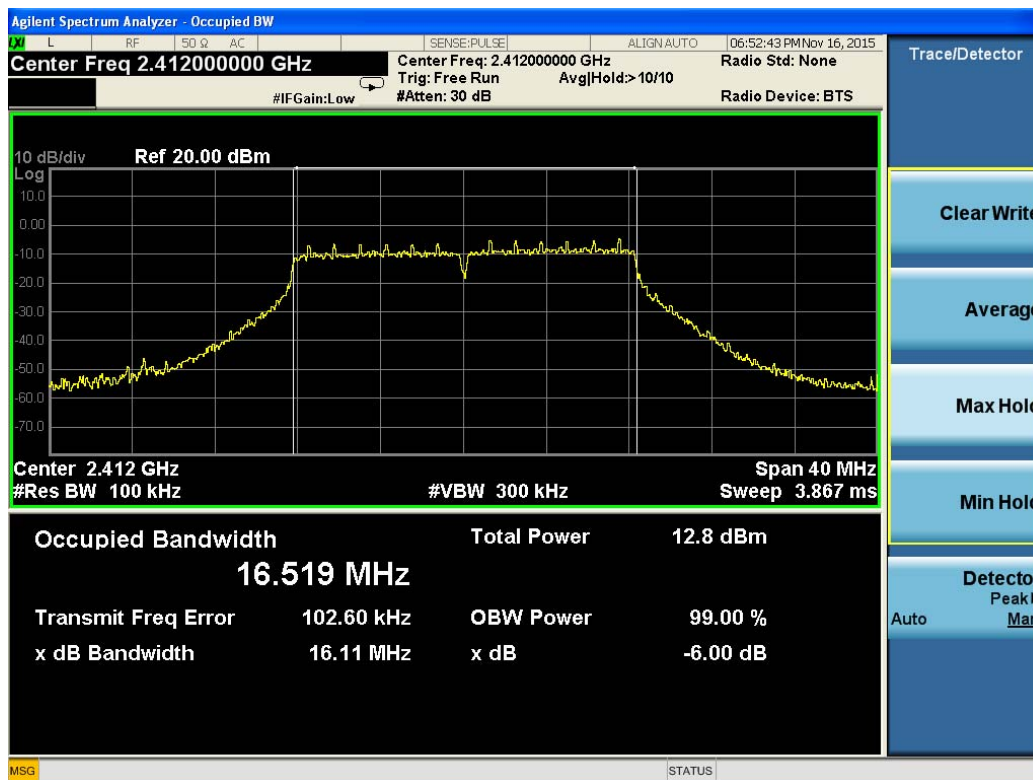


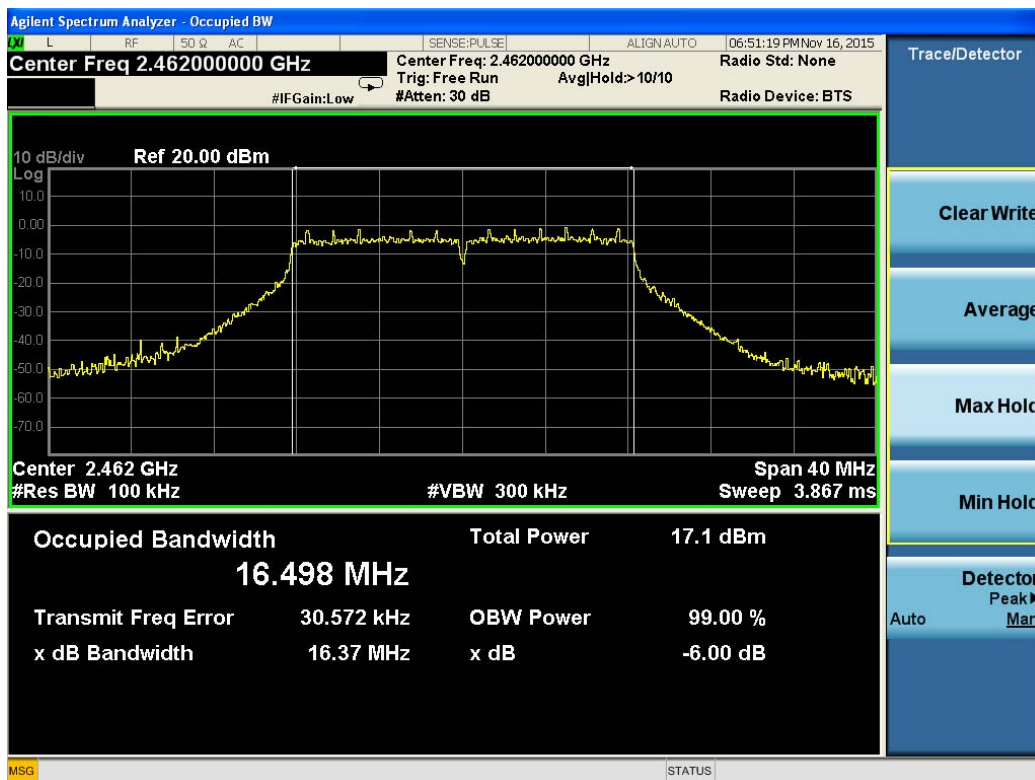
802.11b channel, 6dB bandwidth



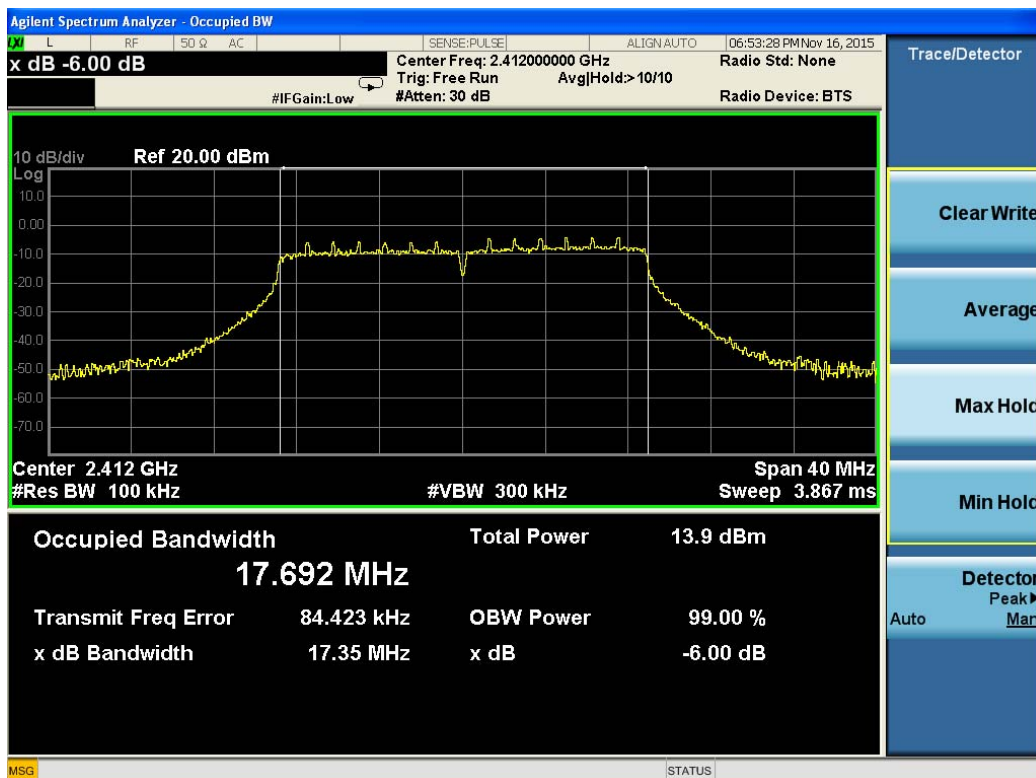


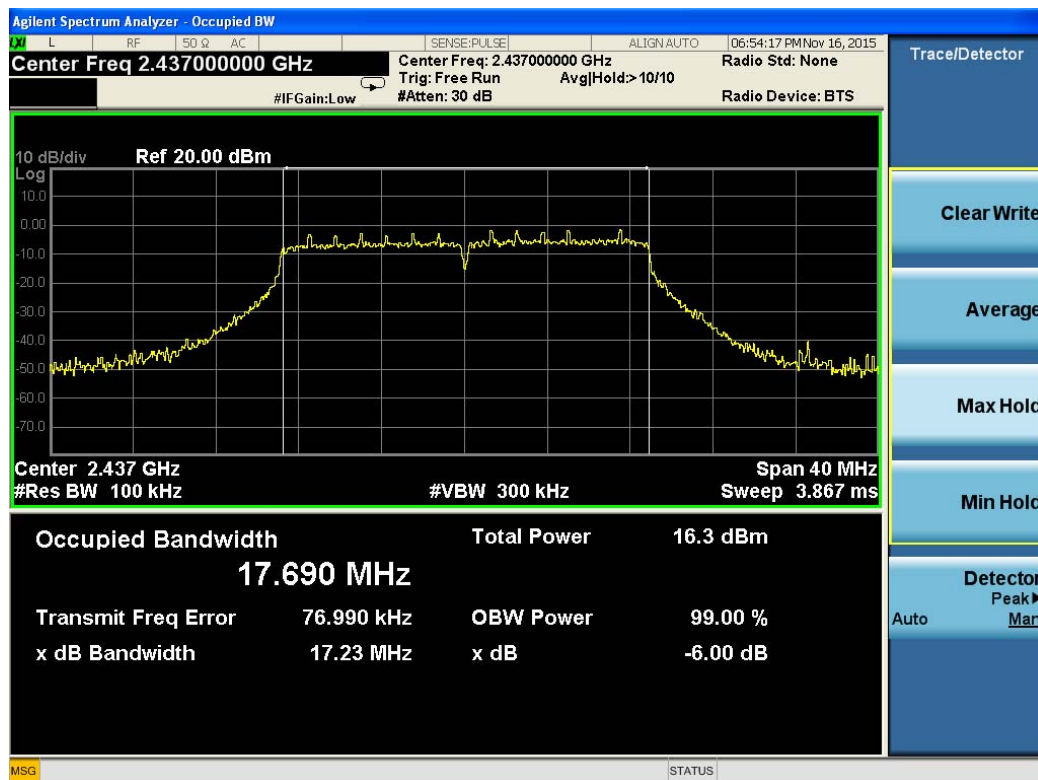
802.11g channel, 6dB bandwidth



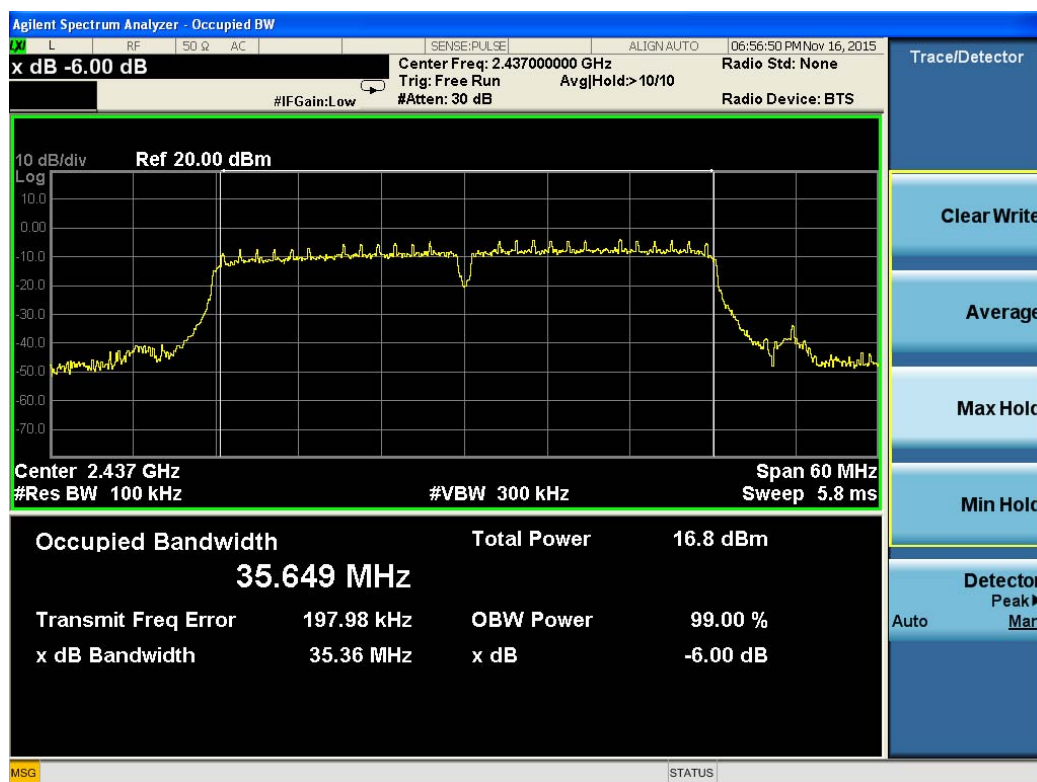
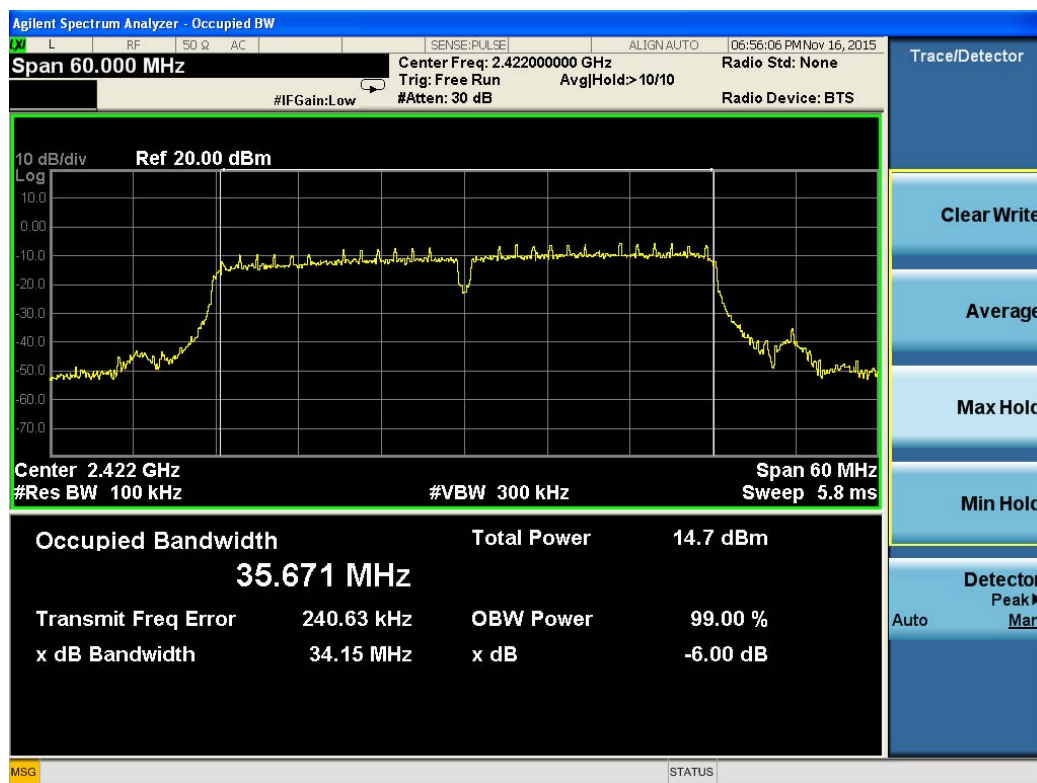


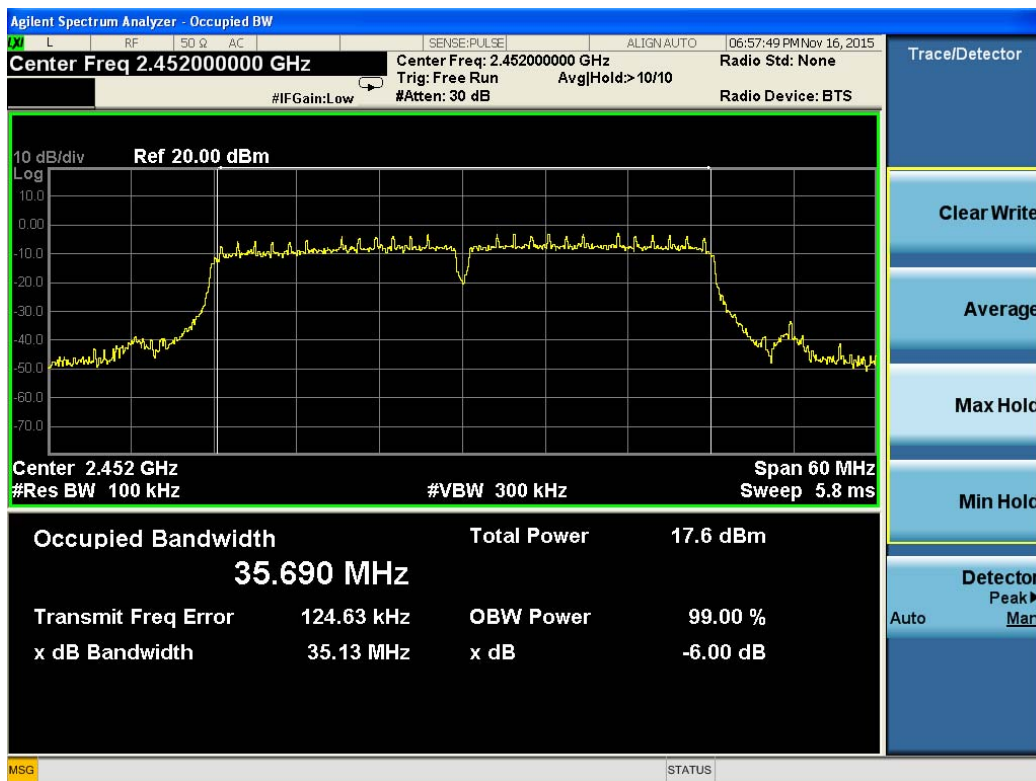
802.11n HT20 channel, 6dB bandwidth





802.11n HT40 channel, 6dB bandwidth





BLE 4.0

Channel	Frequency	20dB Bandwidth (MHz)	Limit
0	2402	1.23	Non-specified
19	2440	1.23	
29	2480	1.24	

802.11b

Channel	Frequency	20dB Bandwidth (MHz)	Limit
1	2412	15.91	Non-specified
6	2437	15.90	
11	2462	15.90	

802.11g

Channel	Frequency	20dB Bandwidth (MHz)	Limit
1	2412	18.55	Non-specified
6	2437	18.63	
11	2462	18.87	

802.11n HT20

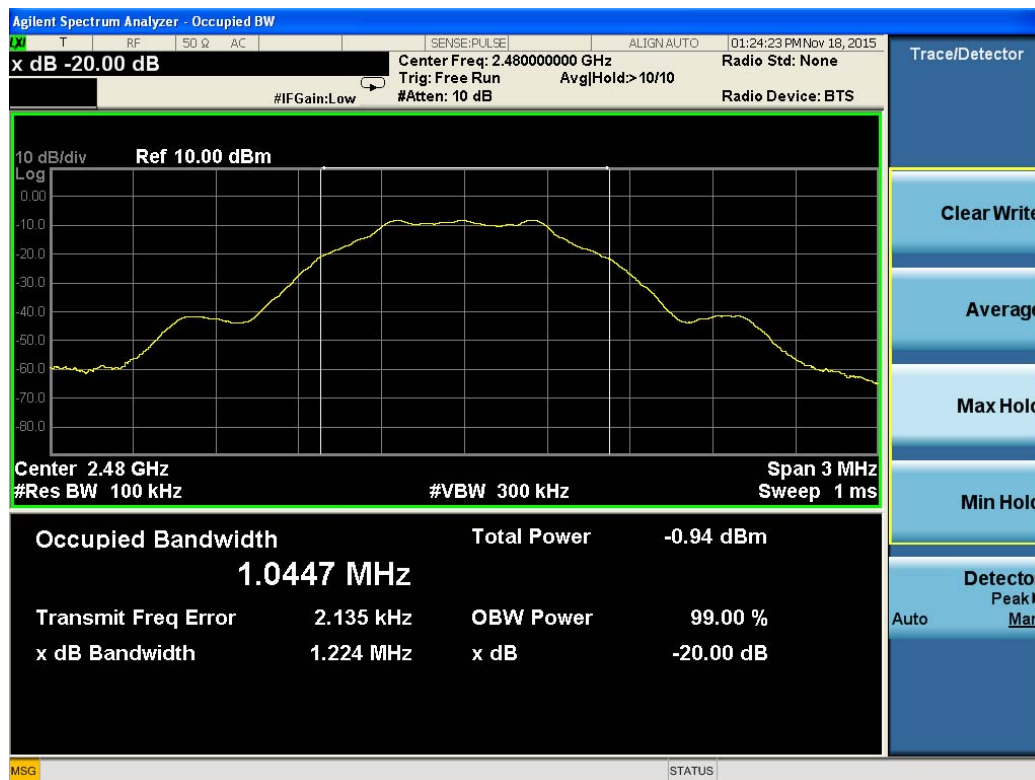
Channel	Frequency	20dB Bandwidth (MHz)	Limit
1	2412	19.10	Non-specified
6	2437	19.12	
11	2462	19.10	

802.11n HT40

Channel	Frequency	20dB Bandwidth (MHz)	Limit
1	2412	19.10	Non-specified
6	2437	19.12	
11	2462	19.10	

BLE 4.0 channel, 20dB bandwidth



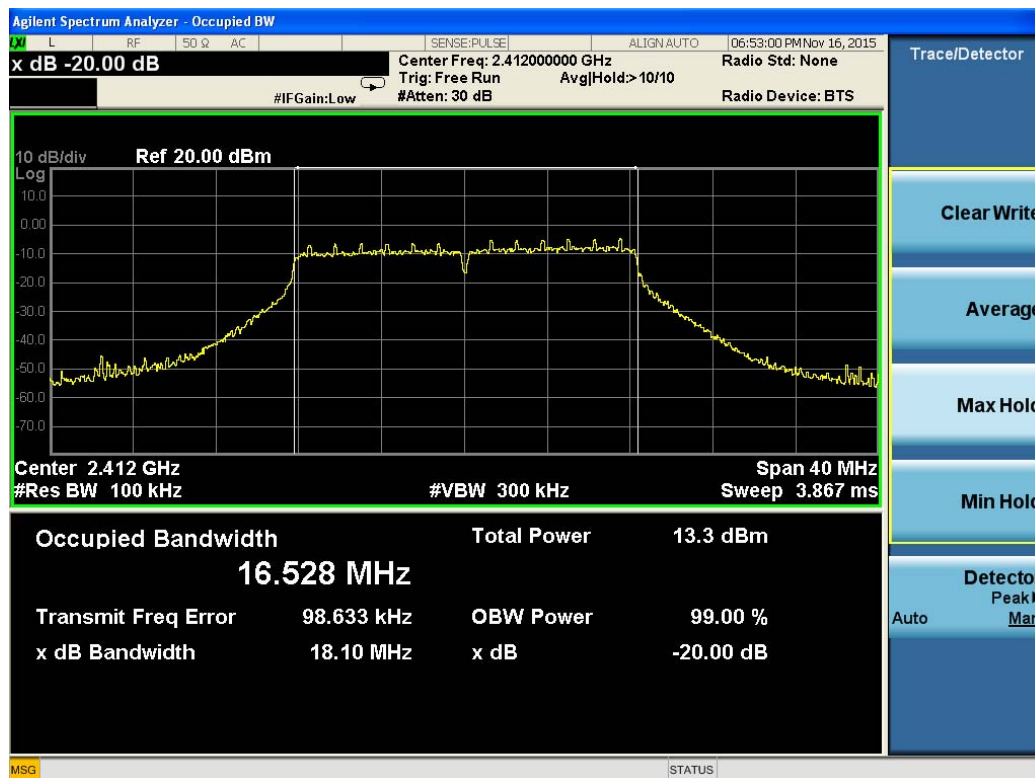


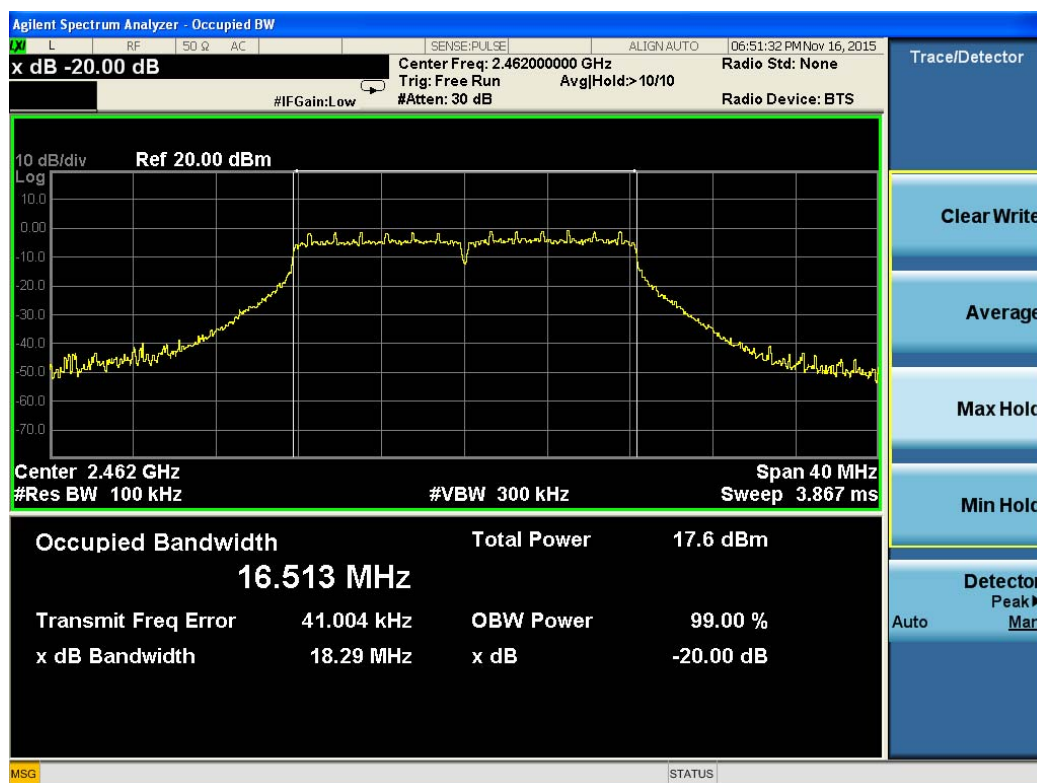
802.11b channel, 20dB bandwidth





802.11g channel, 20dB bandwidth





802.11n HT20 channel, 20dB bandwidth



