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TEST REPORT

FCC Standards : FCC 47CFR part 15 subpart C Industry Canada Standards :RSS-210 Issue 8 & RSS-GEN Issue 3

Test Report No. : CTK-2013-00175

Date of Issue : February 06, 2013

FCC ID : ZKJ-WCATA001

IC ID : 10229A-WCATA001

Model/Type No. : EBX1523P001

Kind of Product : Wi-Fi module

Applicant : GE Appliance & Lighting

Applicant Address : AP35-1403-02 Appliance Park, Louisville, KY 40225

Manufacturer : GE Appliance & Lighting

Manufacturer Address : 3F, Building B, Global R&D Center, 22, Daewangpangyo-ro 712 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 463-400, Korea

Contact Person : Kim, Younghoon / Lead Hardware RF Engineer

Telephone : 502-452-4755

Received Date : January 17, 2013

Test period : Start : January 18, 2013 End : February 21, 2013

Test Results : In Compliance Not in Compliance

The test results presented in this report relate only to the object tested.

Tested by

Y. T. Lee

Young-taek, Lee
Test Engineer
Date: February 21, 2013

Reviewed by

Y. J. Park

Young-Joon, Park
Technical Manager
Date: February 21, 2013



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REPORT REVISION HISTORY

Date	Revision	Page No
February 06, 2013	Issued (CTK-2013-00175)	All
February 21, 2013	Additional AC Conducted Emissions Test	

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1.0 General Product Description

Equipment model name	EBX1523P001
Serial number	Prototype
EUT condition	Pre-production, not damaged
Frequency Range	802.11b/g/n: 2412 MHz - 2462 MHz
RF output power	802.11b : 19.38 dBm (86.70 mW) 802.11g : 17.88 dBm (61.38 mW) 802.11n : 18.57 dBm (71.94 mW)
Number of channels	802.11b/g/n: 11
Channel Spacing	5 MHz
Transfer Rate	802.11b : 11 / 5.5 / 2 / 1 Mbps 802.11g : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps 802.11n(HT20): 65(MCS7) / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5(MCS0) Mbps
Type of Modulation	802.11b : DSSS 802.11g/n : OFDM
Duty cycle TX power	1.0
Power Source	DC 5 V
Antenna Type	Chip antenna
Antenna Gain	3.59 dBi

1.1 Tested Frequency

802.11b, 802.11g, 802.11n

	LOW	MID	HIGH
Frequency (MHz)	2412	2437	2462



1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Notebook Computer	TOSHIBA CORPORATION	PSL48K-00L00K	Z7037782R
AC/DC ADAPTER	TOSHIBA CORPORATION	ADP-75SB	708W15Y01MK

1.4 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.5 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.







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1.6 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements	 805871
JAPAN	VCCI	3 m & 10 m SAC and Conducted Test Site	 R-948, C-986, T-1843
KOREA	KCC	EMI (3 m & 10 m SAC and Conducted Test Site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	



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2 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)	Maximum Output Power	< 1 Watt		C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.247(e)	Transmitter Power Spectral Density	< 8 dBm @ 3 kHz		C
				C
15.209	Field Strength of Harmonics	15.209(a)	Radiated	C
15.207	AC Conducted Emissions	15.207(a)	Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

- FCC Part 15.247, ANSI C63.4-2003
- RSS-210, Issue No.:8 Date: 2010

The tests were performed according to the method of measurements prescribed in 558074 D01 DTS Meas Guidance.



2.1 Technical Characteristic Test

2.1.1 Bandwidth

Procedure:

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 40 MHz

VBW = 100 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data:

Test mode : 802.11b

Mode	Frequency (MHz)	Channel No.	Test Results		
			6 Bandwidth (MHz)	99% Bandwidth (MHz)	Result
802.11b	2412	1	7.855	12.631	Complies
	2437	6	7.765	12.464	Complies
	2462	11	7.955	12.405	Complies

Test mode : 802.11g

Mode	Frequency (MHz)	Channel No.	Test Results		
			6 Bandwidth (MHz)	99% Bandwidth (MHz)	Result
802.11g	2412	1	16.66	16.328	Complies
	2437	6	16.06	16.321	Complies
	2462	11	16.37	16.334	Complies



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Test mode : 802.11n

Mode	Frequency (MHz)	Channel No.	Test Results		
			6 Bandwidth (MHz)	99% Bandwidth (MHz)	Result
802.11n (20 MHz)	2412	1	16.39	17.524	Complies
	2437	6	16.34	17.517	Complies
	2462	11	17.25	17.510	Complies

Minimum Standard:

6 dB Bandwidth > 500kHz

See next pages for actual measured spectrum plots.



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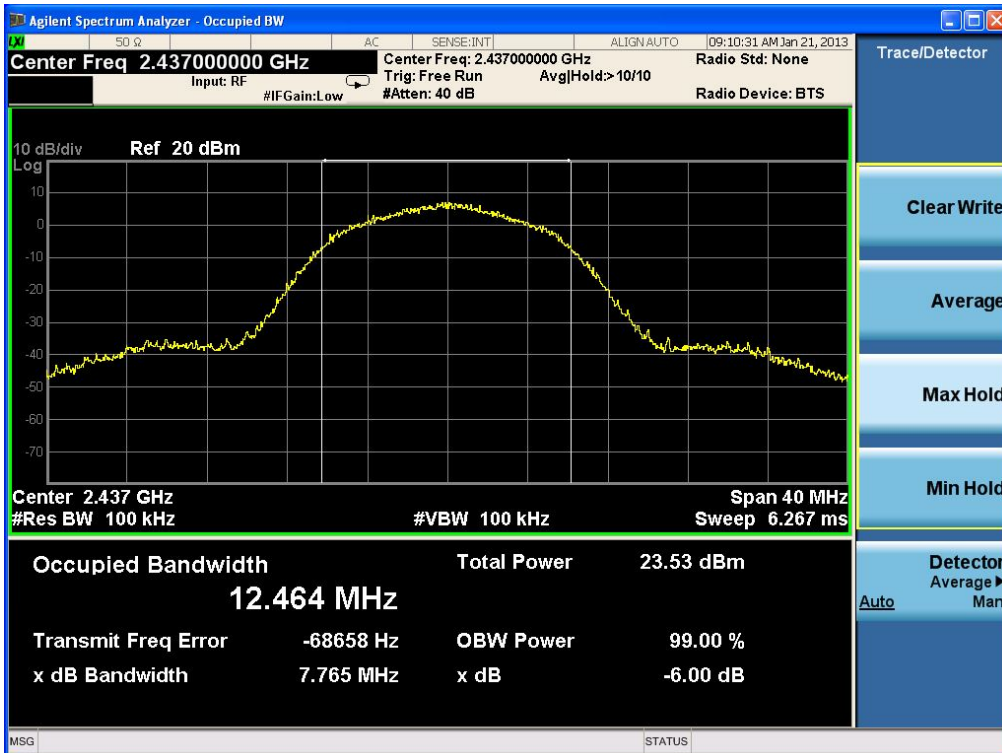
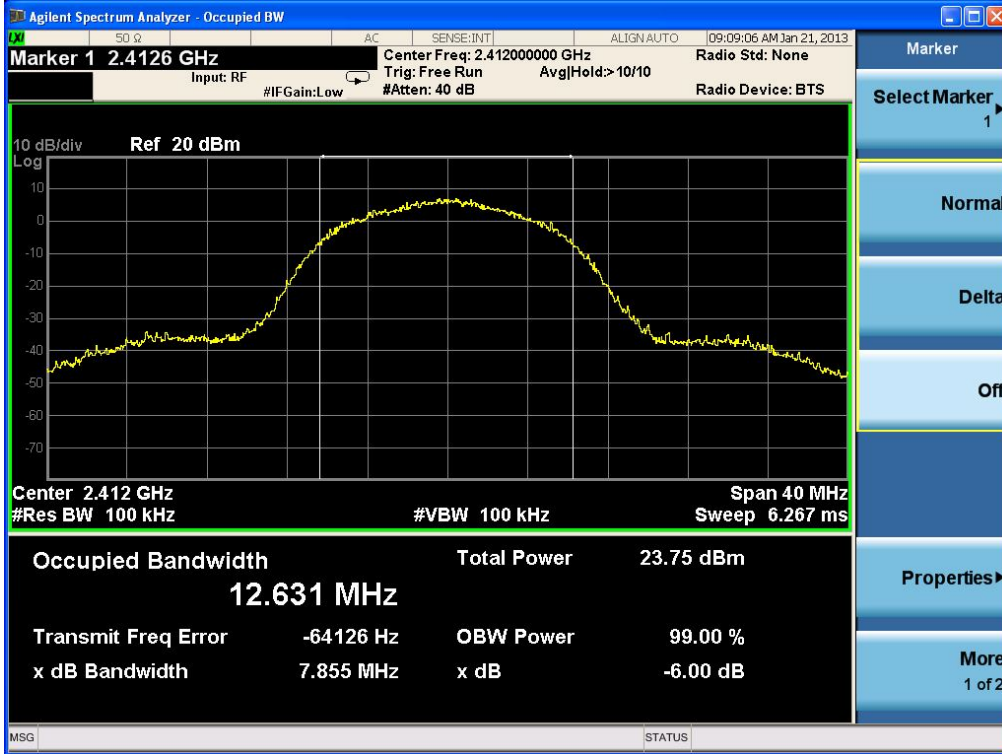
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802.11b



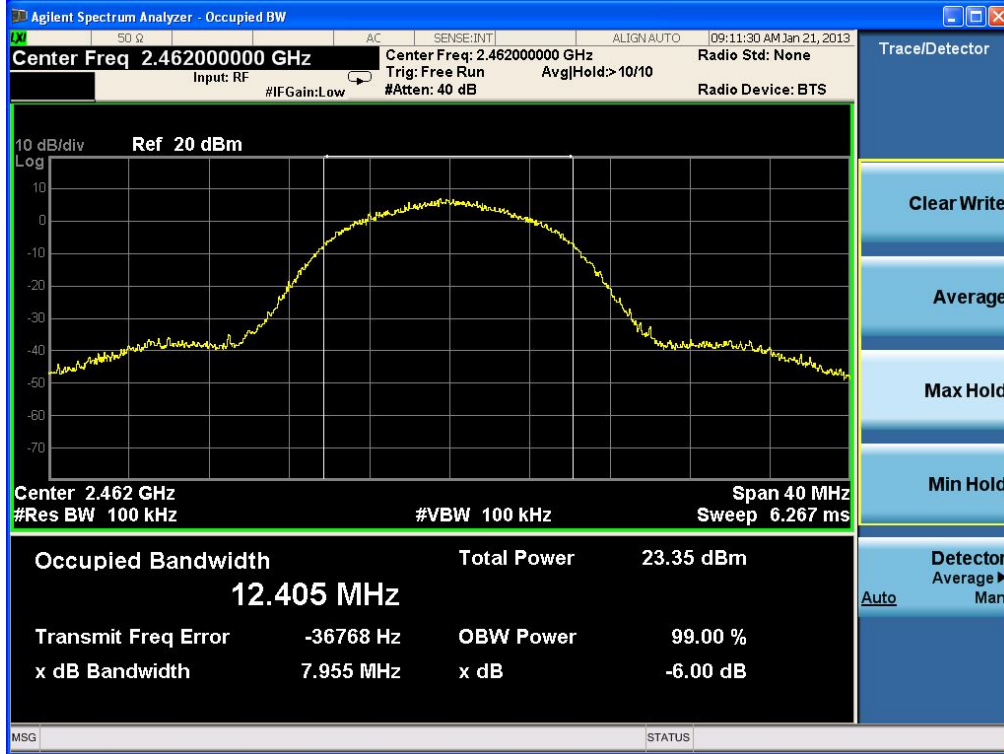


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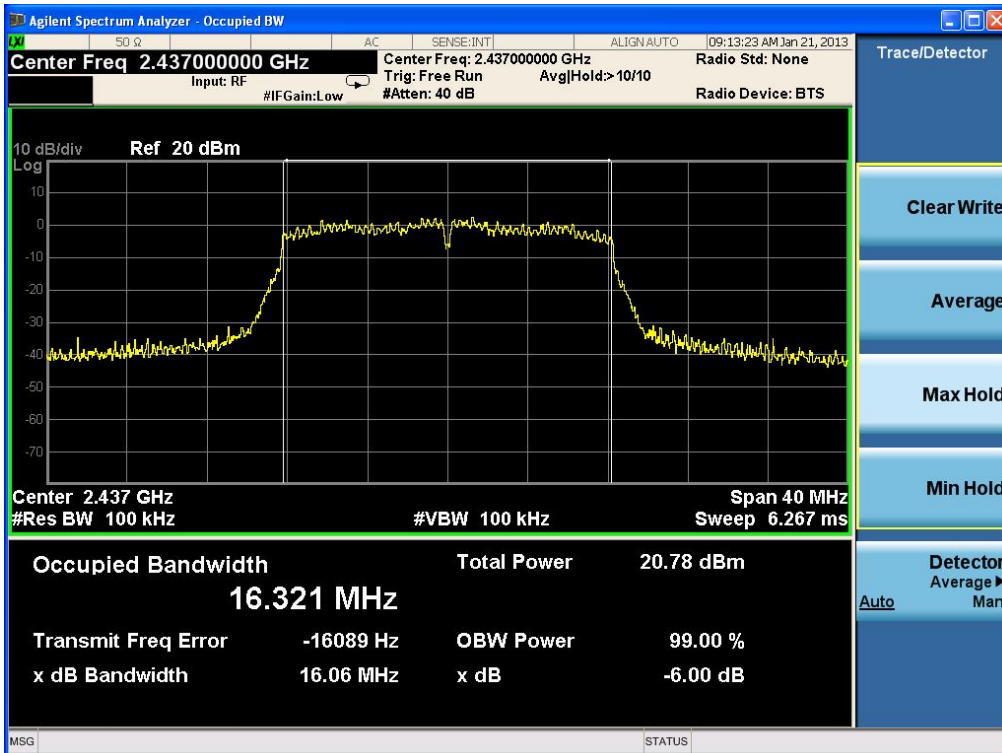
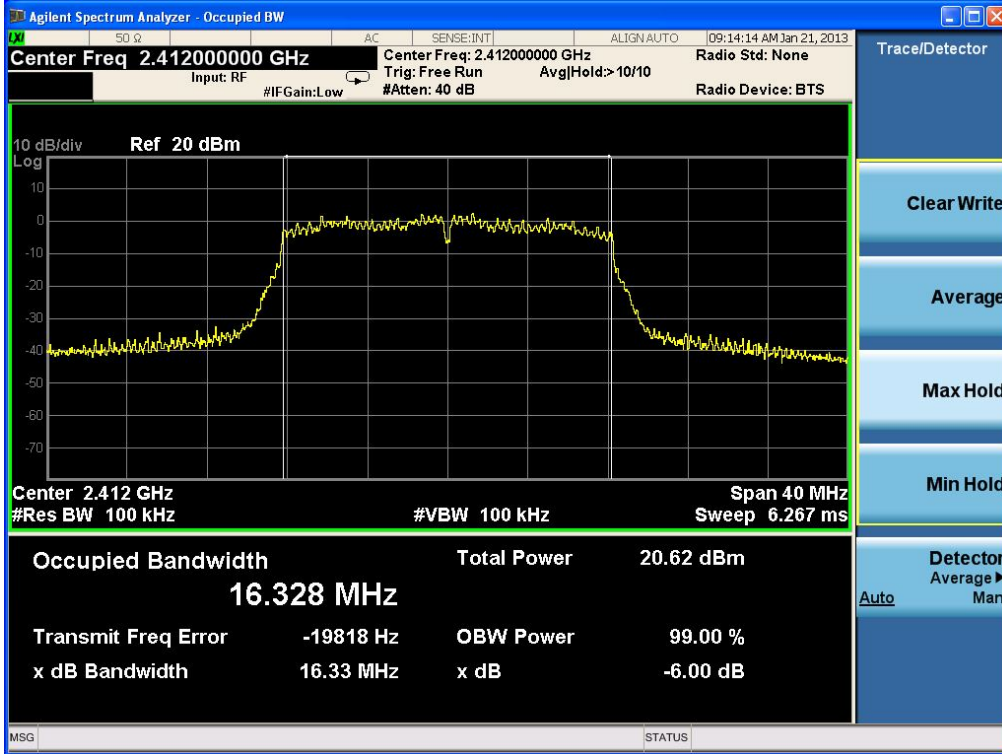
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802.11g



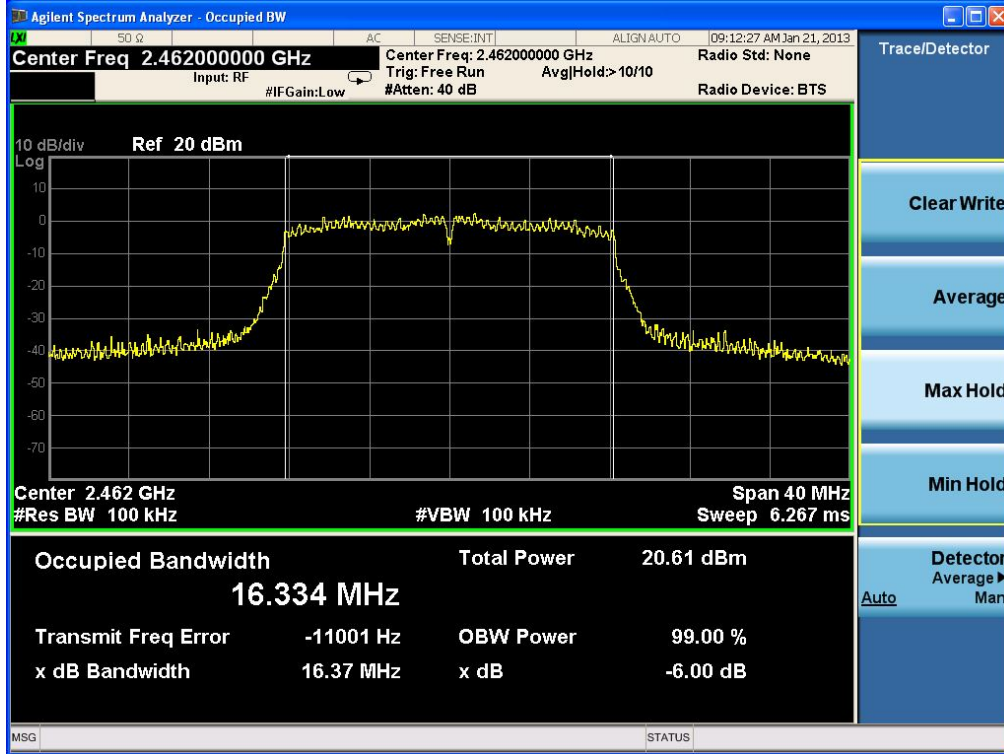


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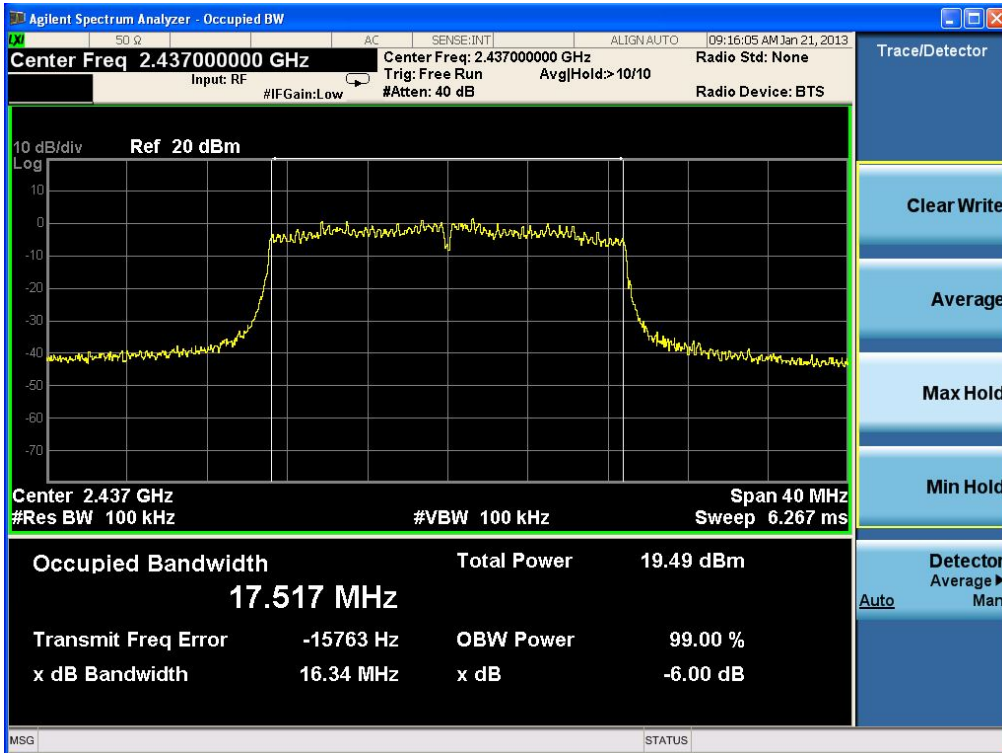
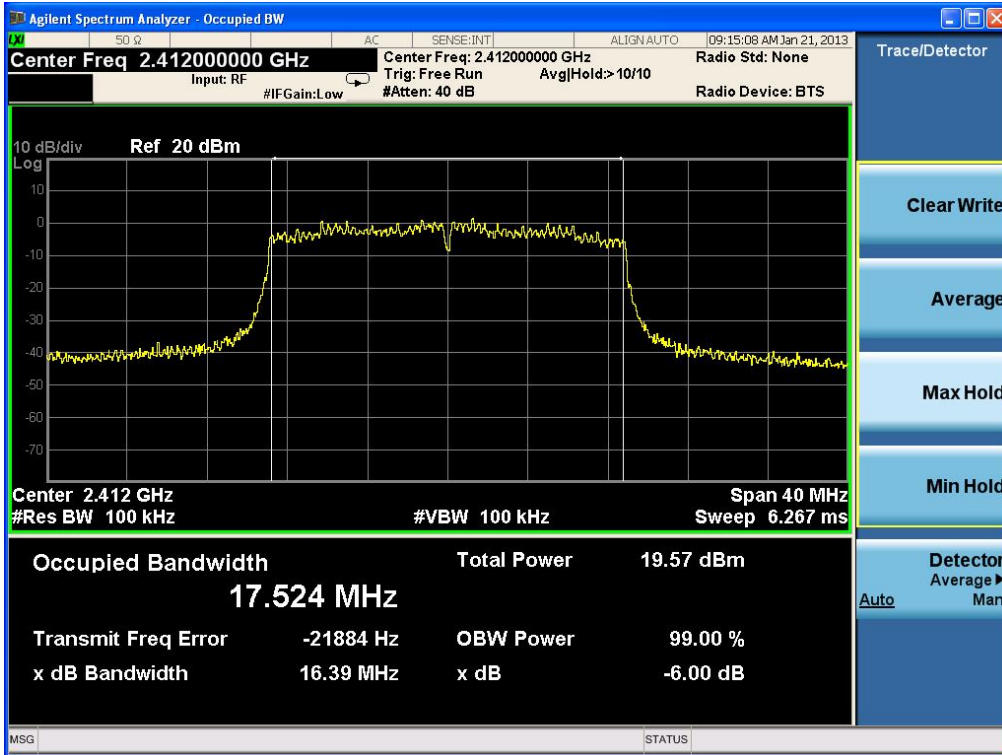
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802.11n



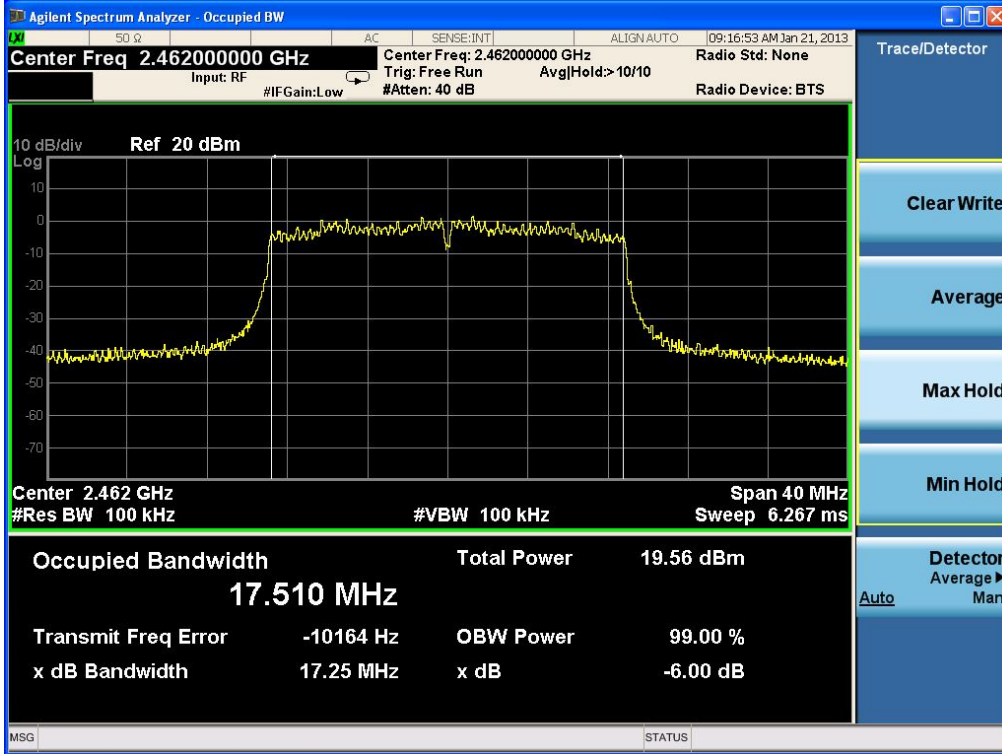


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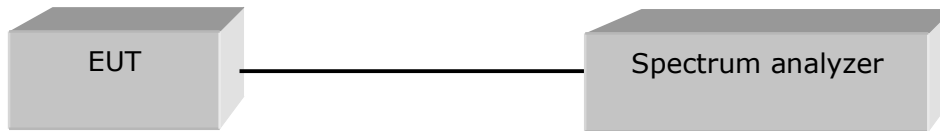
2.1.2 Maximum peak Conducted Output Power

Test Location

RF Test Room

Test Procedures

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1 MHz

Span = fully encompass the DTS bandwidth

VBW = 1 MHz (VBW ≥ RBW)

Sweep = auto

Trace = Max hold

Detector function = peak

Limit

< 1 W

Test Results

Test mode : 802.11b - 11 Mbps

Frequency (MHz)	Channel No.	Reading power(dBm)	Cable loss (dB)	Test results	
				Peak output power (dBm)	Result
2412	Low	18.62	0.63	19.25	Complies
2437	Middle	18.72	0.66	19.38	Complies
2462	High	18.55	0.68	19.23	Complies

Remark.

The 802.11b data rate were set in 11 Mbps, due to the highest RF output power.



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Test mode : 802.11g - 24 Mbps

Frequency (MHz)	Channel No.	Reading power(dBm)	Cable loss (dB)	Test results	
				Peak output power (dBm)	Result
2412	Low	16.94	0.63	17.57	Complies
2437	Middle	17.22	0.66	17.88	Complies
2462	High	16.91	0.68	17.59	Complies

Remark.

The 802.11g data rate were set in 24 Mbps, due to the highest RF output power.

Test mode : 802.11n (20 MHz) - MCS4

Frequency (MHz)	Channel No.	Reading power(dBm)	Cable loss (dB)	Test results	
				Peak output power (dBm)	Result
2412	Low	17.47	0.63	18.10	Complies
2437	Middle	17.91	0.66	18.57	Complies
2462	High	17.48	0.68	18.16	Complies

Remark.

The 802.11n data rate were set in MCS4, due to the highest RF output power.

See next pages for actual measured spectrum plots.



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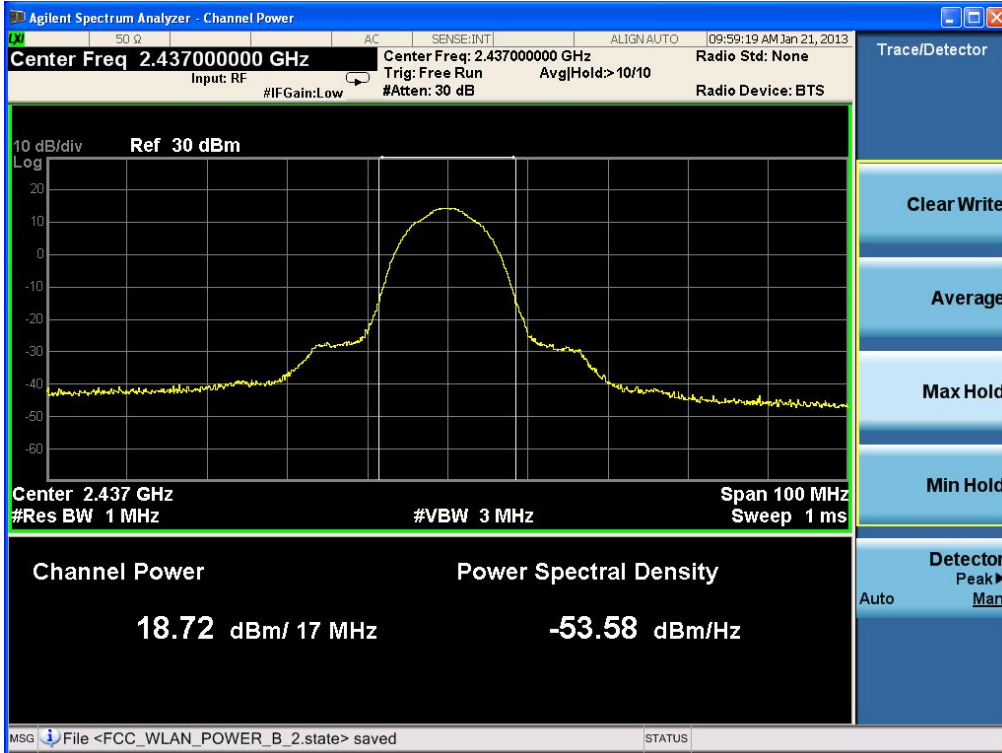
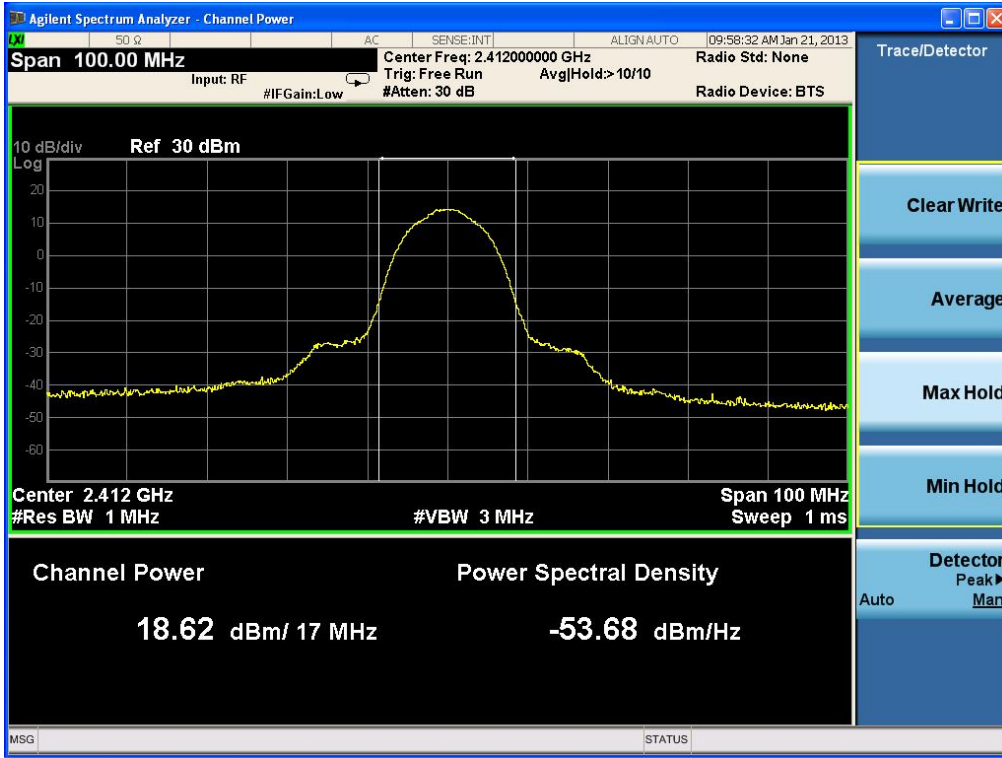
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802.11b





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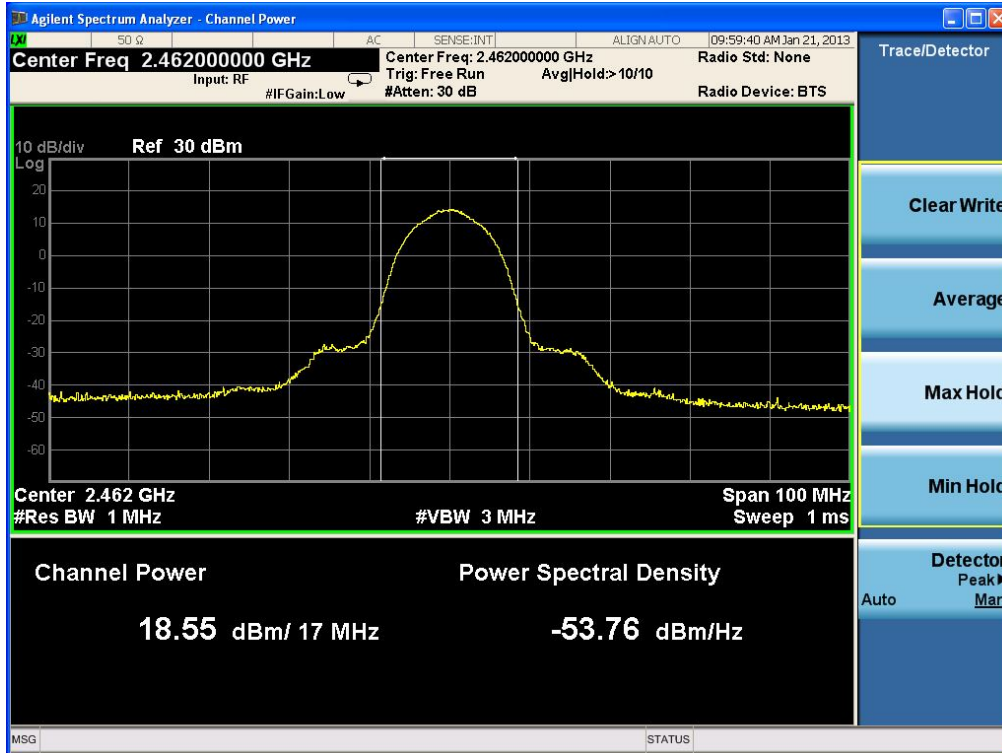
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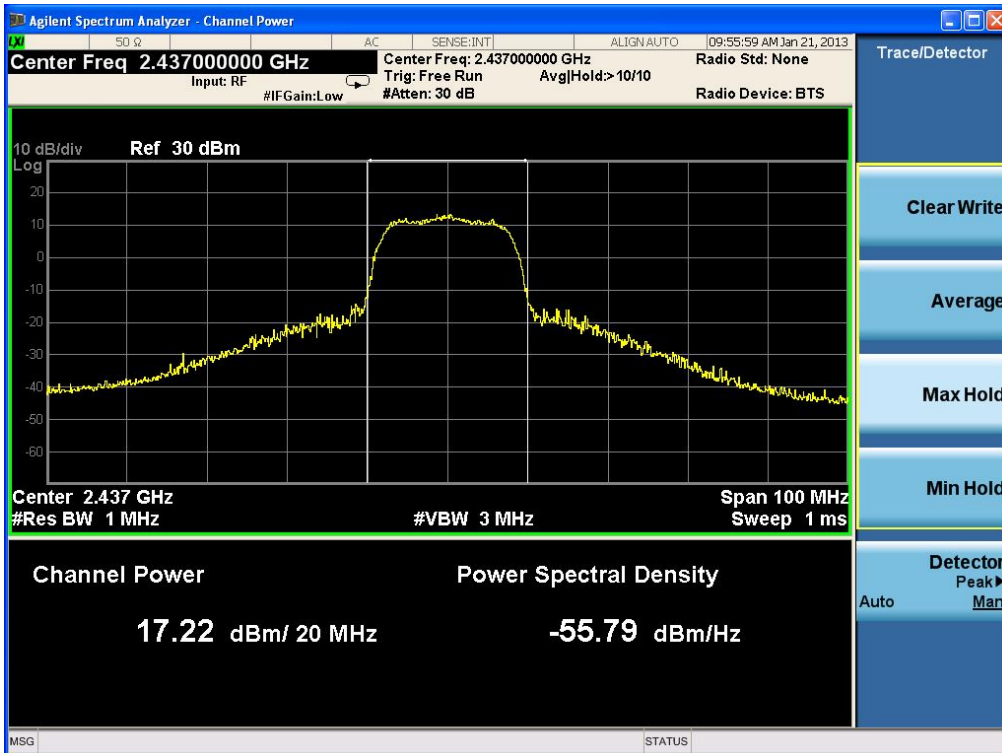
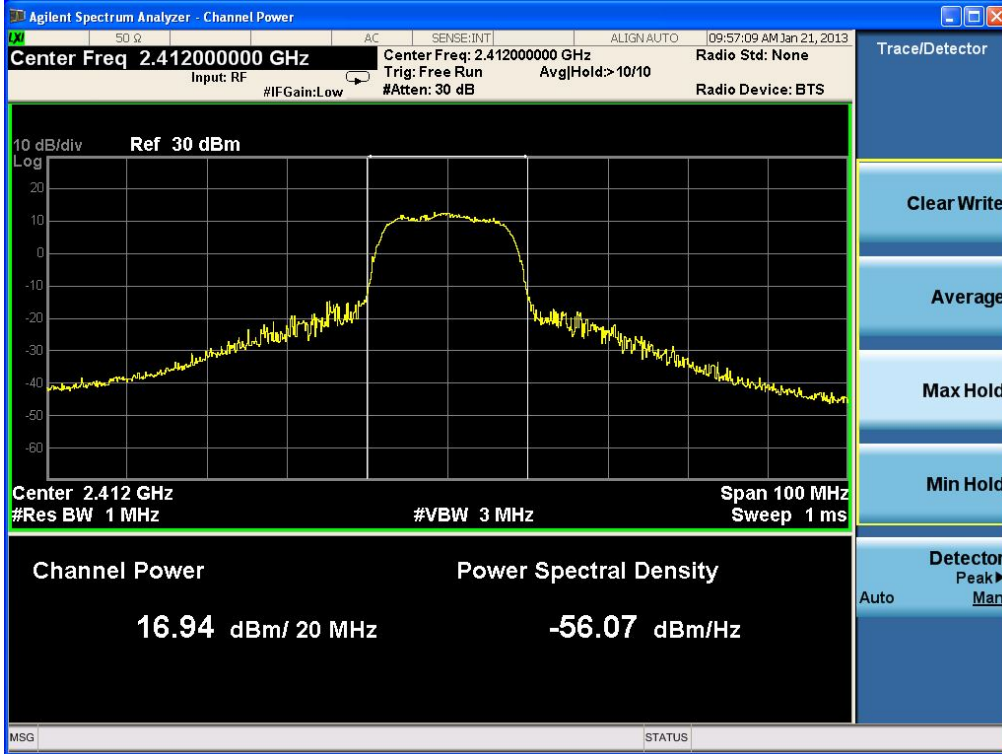
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802.11g



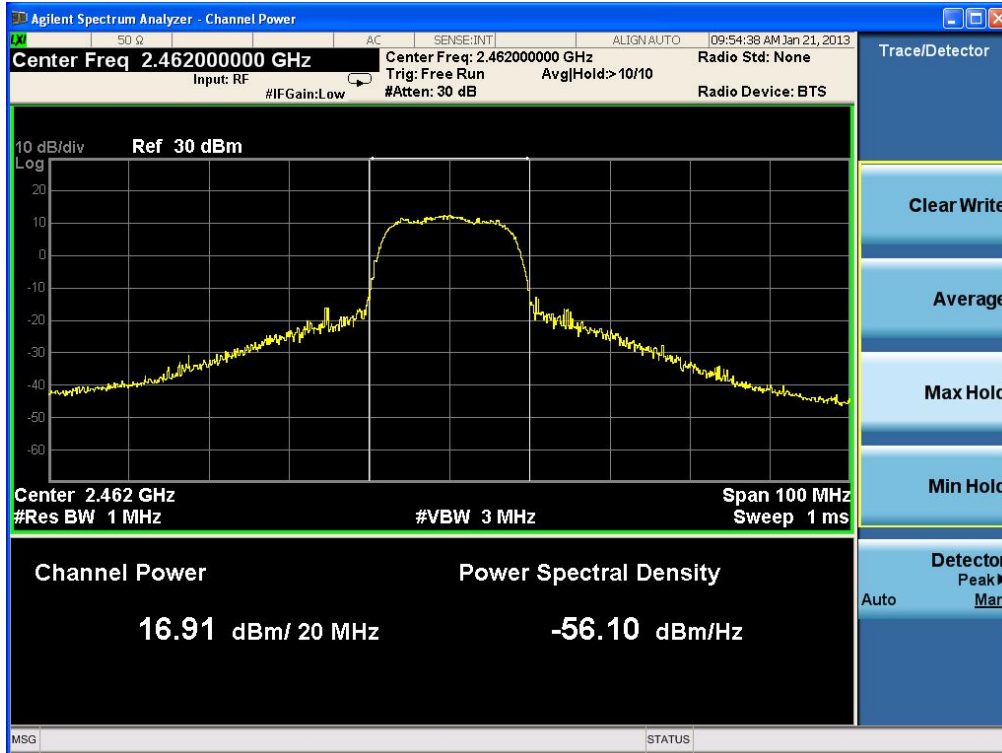


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802.11g





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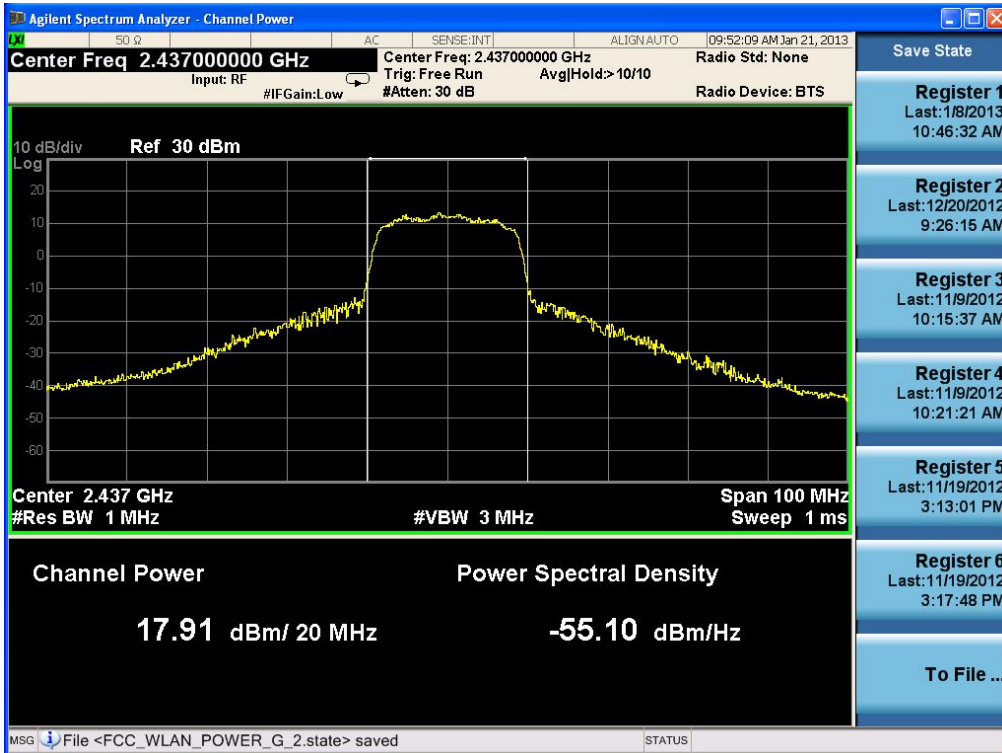
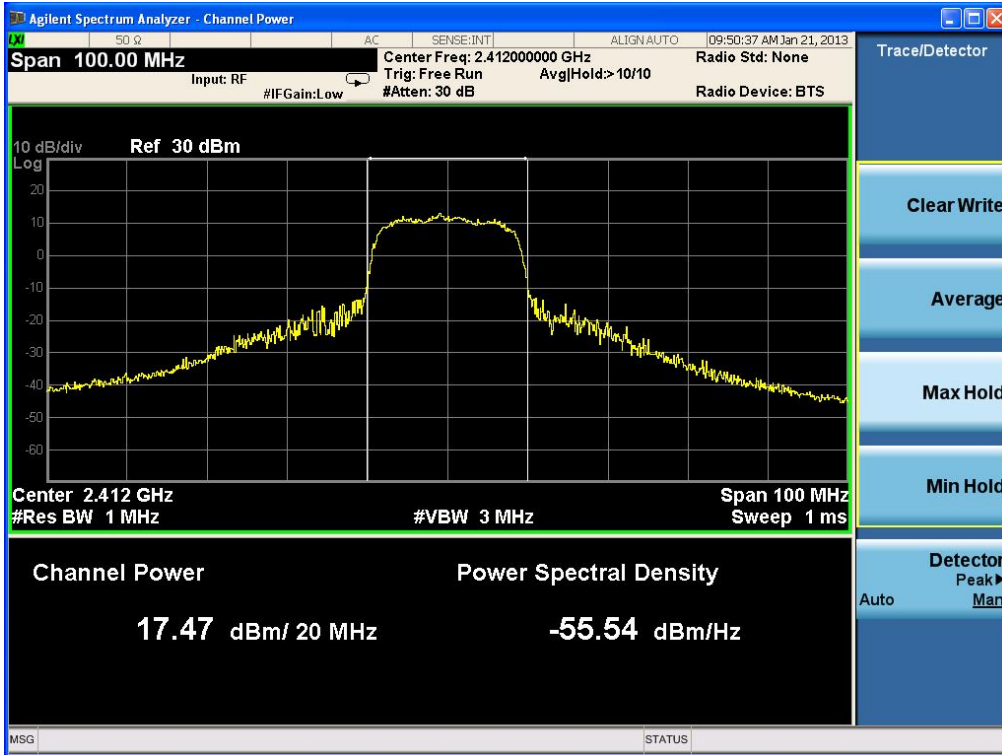
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2.1.3 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz

VBW = (VBW ≥ RBW)

Sweep = 100 s (Span/3 kHz)

Span = 300 kHz

Detector function = peak

Trace = max hold

Test Results

Test mode : 802.11b

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-6.826	Complies
	2437	6	-6.572	Complies
	2462	11	-6.587	Complies

Test mode : 802.11g

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-15.742	Complies
	2437	6	-15.386	Complies
	2462	11	-15.757	Complies



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Test mode : 802.11n

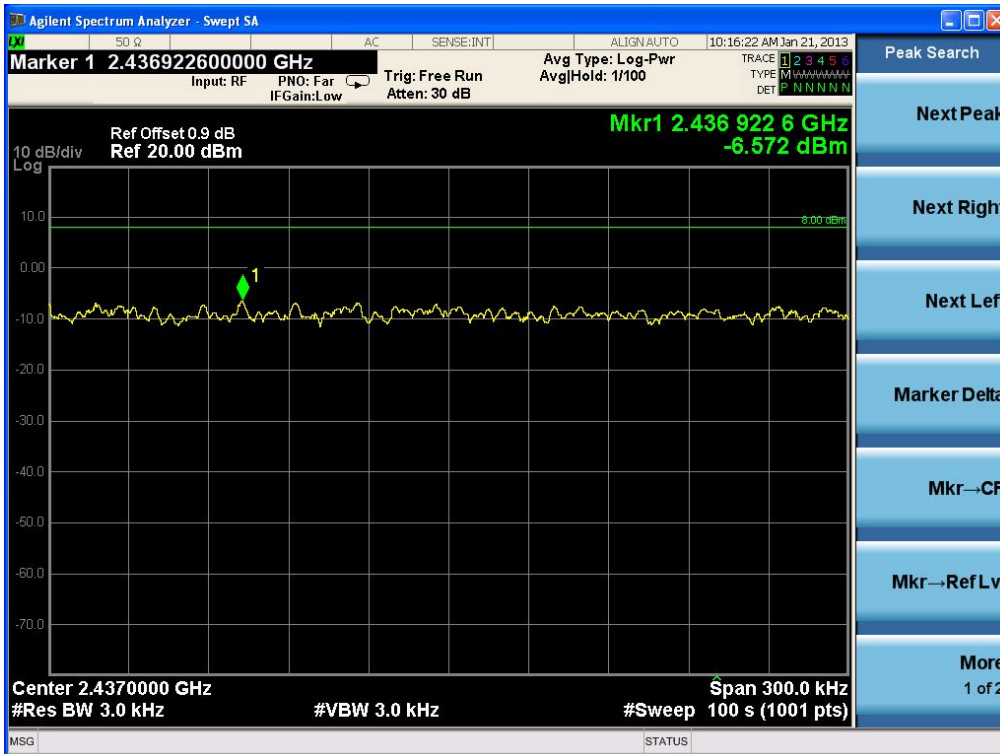
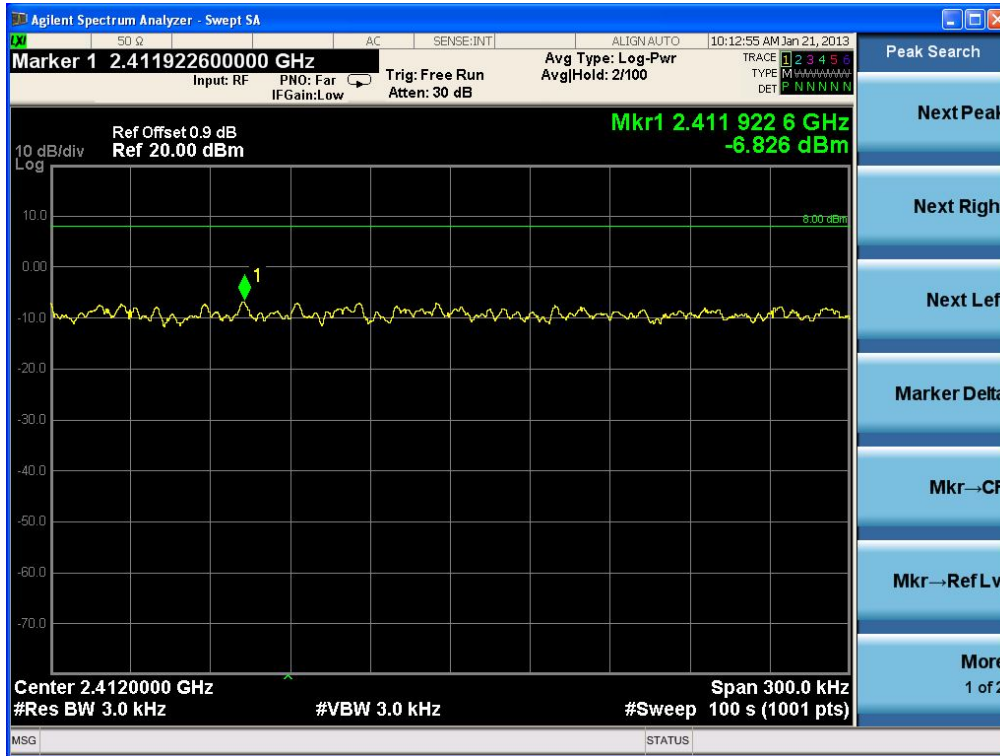
Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (20 MHz)	2412	1	-15.340	Complies
	2437	6	-15.326	Complies
	2462	11	-15.515	Complies

Minimum Standard:

Power Spectral Density	< 8dBm @ 3 kHz BW
------------------------	-------------------

See next pages for actual measured spectrum plots.

802.11b Power Density Measurement





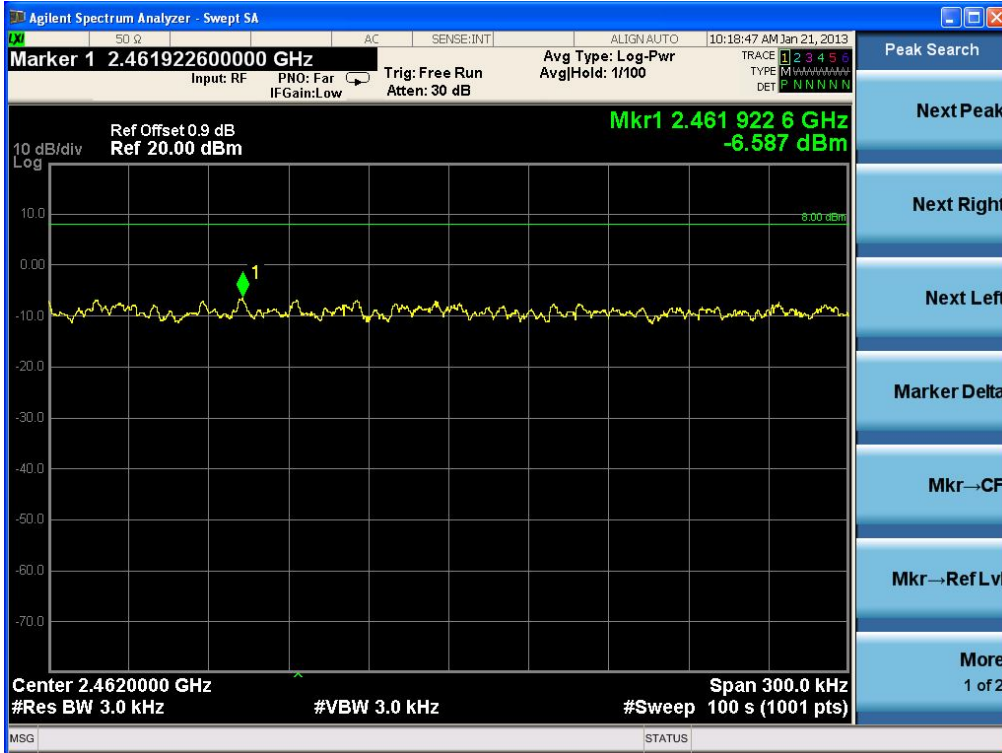
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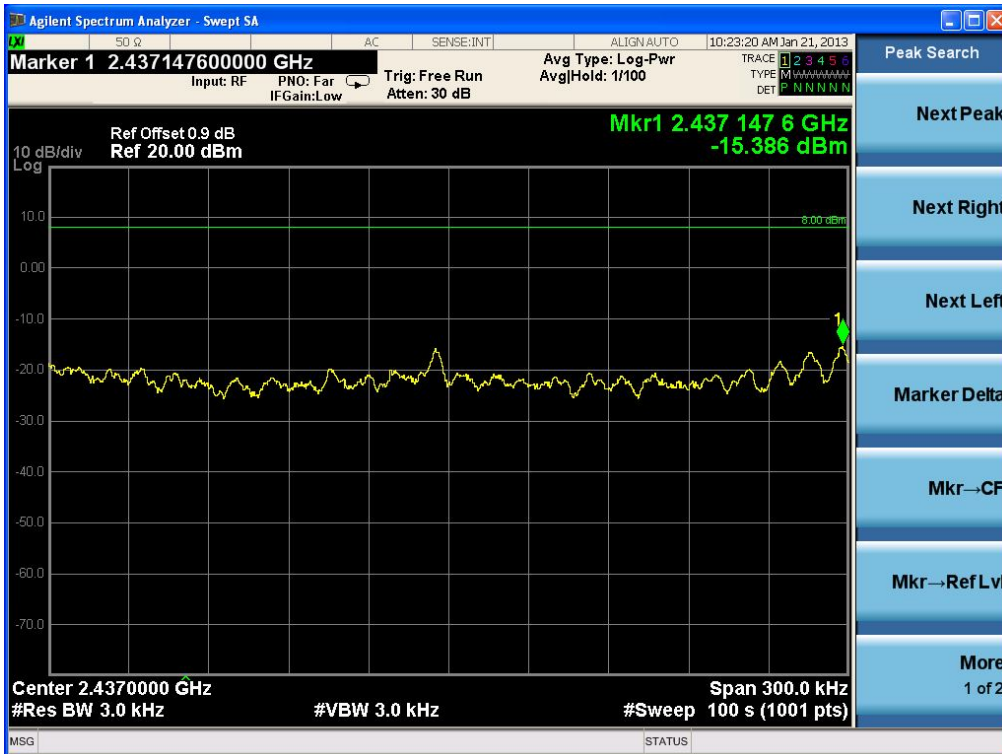
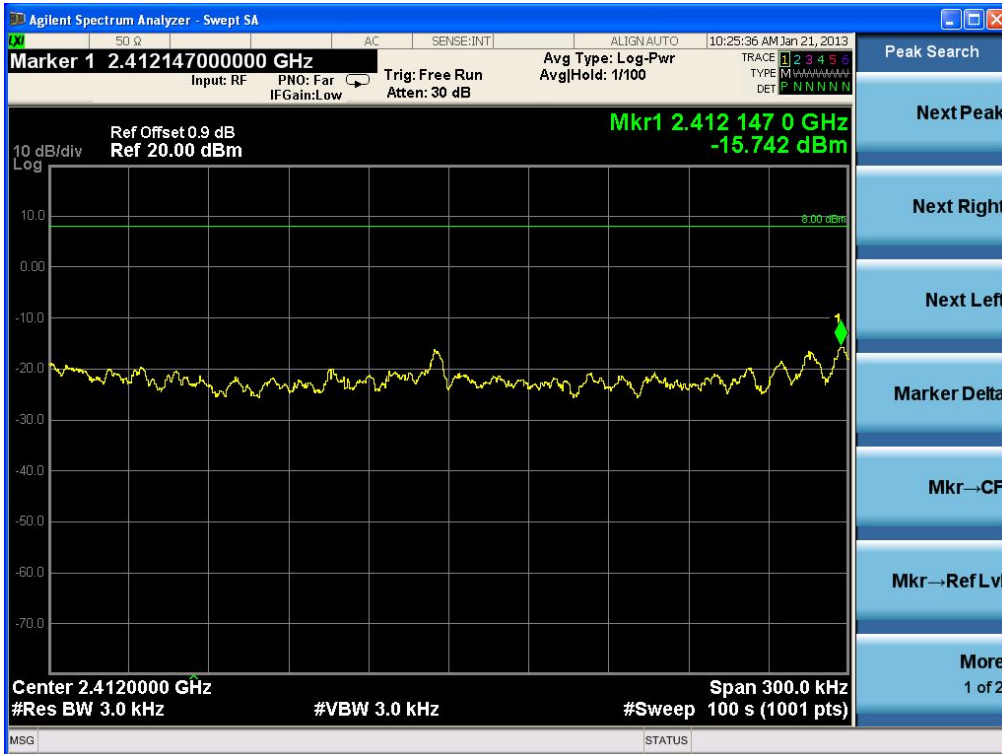
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802.11g Power Density Measurement





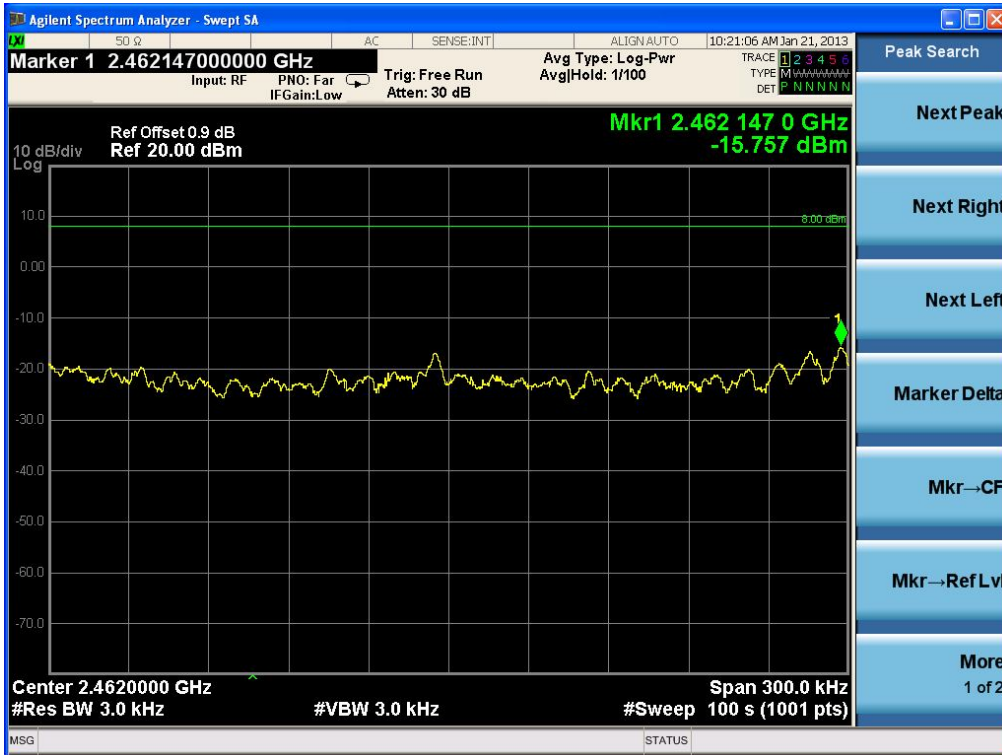
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802.11n Power Density Measurement

