

## TEST REPORT For FCC

Test Report No. : CTK-2012-00478  
Date of Issue : June 4, 2012  
FCC ID : N7SC140T  
Model/Type No. : C140T  
Kind of Product : NetweeN  
Applicant : Center Network Solution  
Applicant Address : Suwon industrial, District2, 990-1, Gosaek-dong, Gwonsun-gu,  
Suwon-si, Gyeonggi-do, Korea  
Manufacturer : Center Network Solution  
Manufacturer Address : Suwon industrial, District2, 990-1, Gosaek-dong, Gwonsun-gu,  
Suwon-si, Gyeonggi-do, Korea  
Contact Person : Song, Jin Seok / Team Manager  
Telephone : +82-31-423-1001  
Received Date : April 2, 2012  
Test period : Start : April 4, 2012 End : May 25, 2012  
Test Results :  In Compliance  Not in Compliance

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

Tested by



Won-Jae, Hwang  
Test Engineer  
Date: June 4, 2012

Reviewed by



Young-Joon, Park  
Technical Manager  
Date: June 4, 2012



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## REPORT REVISION HISTORY

Date	Revision	Page No
June 4, 2012	Issued (CTK-2012-00478)	All

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## 1.0 General Product Description

Equipment model name	C140T
Serial number	Prototype
EUT condition	Pre-production, not damaged
Frequency Range	802.11b/g/n(20 MHz) : 2412 MHz - 2462 MHz 802.11n(40 MHz) : 2422 MHz - 2452 MHz
RF output power	802.11b : 15.02 dBm 802.11g : 14.79 dBm 802.11n(20 MHz) : 14.75 dBm 802.11n(40 MHz) : 14.63 dBm
Number of channels	802.11b/g/n(20 MHz) : 11 802.11n(40 MHz) : 7
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 : up to 300 Mbps
Type of Modulation	802.11b : DSSS 802.11g/n : OFDM
Duty cycle TX power	1.0
Power Source	5 Vdc
Antenna Type	Dipole antenna Gain : 3 dBi

## 1.1 Tested Frequency

802.11b, 802.11g, 802.11n (20MHz)

	LOW	MID	HIGH
<b>Frequency (MHz)</b>	2412	2437	2462

802.11n (40MHz)

	LOW	MID	HIGH
<b>Frequency (MHz)</b>	2422	2437	2452

## 1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

## 1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Switching Adapter (for EUT)	Shenzhen Yonghao Technology Co., Ltd.	YHS AFC0502000W1US	-
Note Computer	DELL INC.	Inspiron 6400	-
Switching Adapter2	DDongguang Lite Power 2nd Plant	LA65NS0-00	-





## 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.

## 1.6 Laboratory Accreditations and Listings

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

## 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

## 2.1 Technical Characteristic Test

### 2.1.1 6dB 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	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	11.28	Complies
	2437	6	11.55	Complies
	2462	11	11.54	Complies

**Test mode : 802.11g**

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11g	2412	1	16.51	Complies
	2437	6	16.47	Complies
	2462	11	16.54	Complies





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## Test mode : 802.11n (20 MHz)

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (20 MHz)	2412	1	17.64	Complies
	2437	6	17.64	Complies
	2462	11	17.64	Complies

## Test mode : 802.11n (40 MHz)

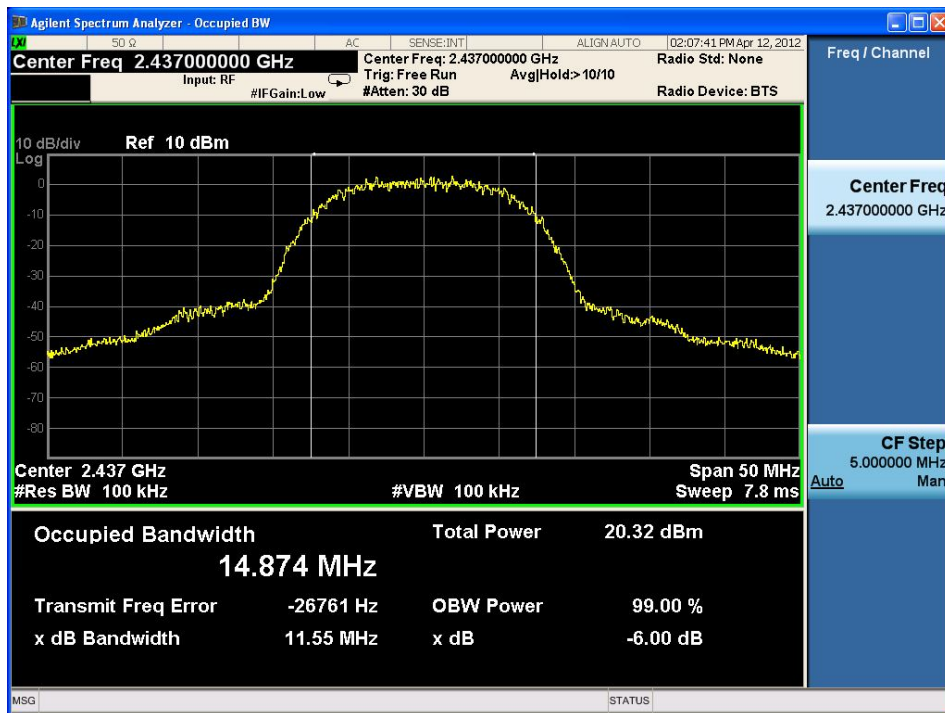
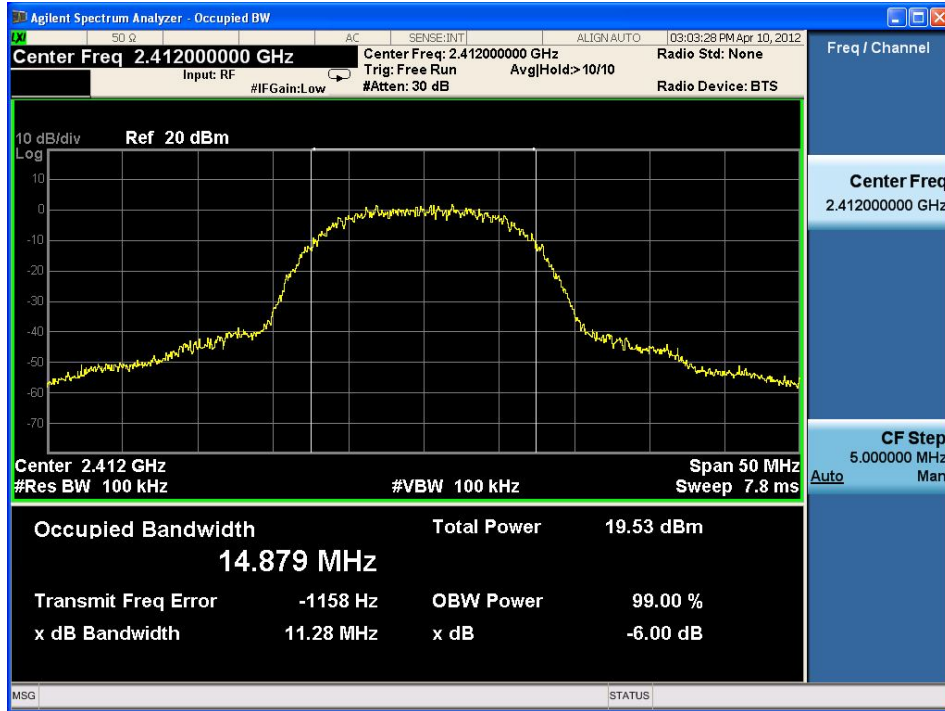
Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (40 MHz)	2422	3	36.35	Complies
	2437	6	36.33	Complies
	2452	9	36.32	Complies

### Minimum Standard:

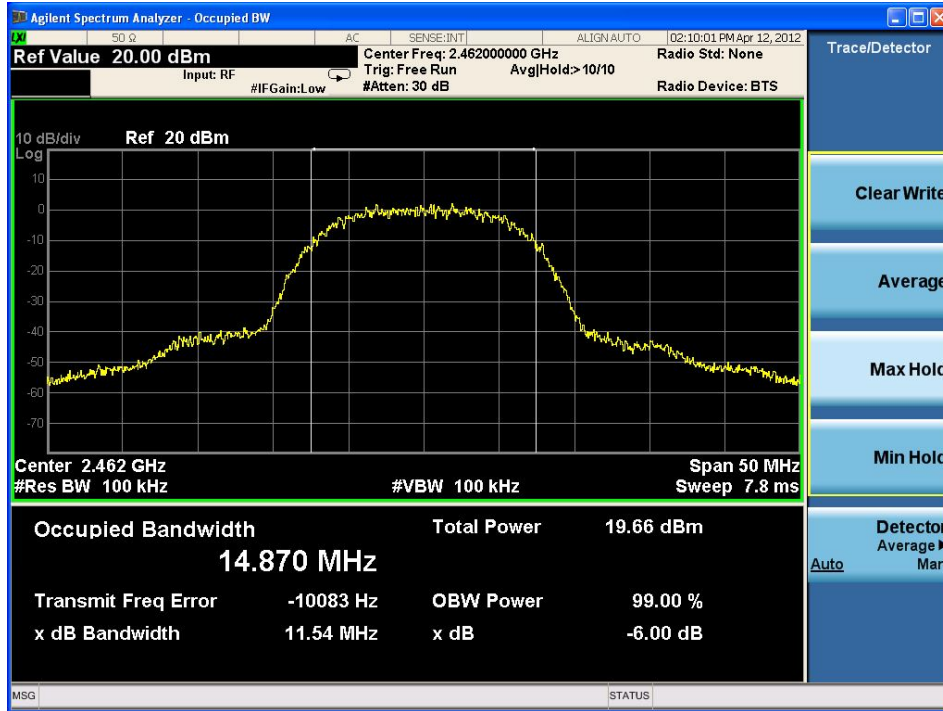
6 dB Bandwidth > 500kHz

See next pages for actual measured spectrum plots.

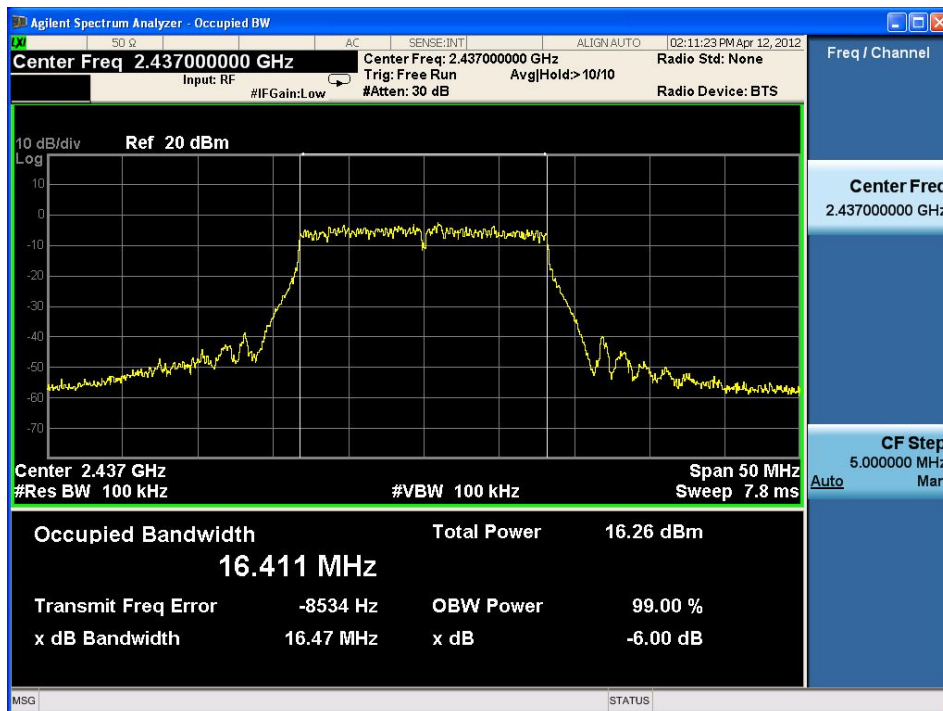
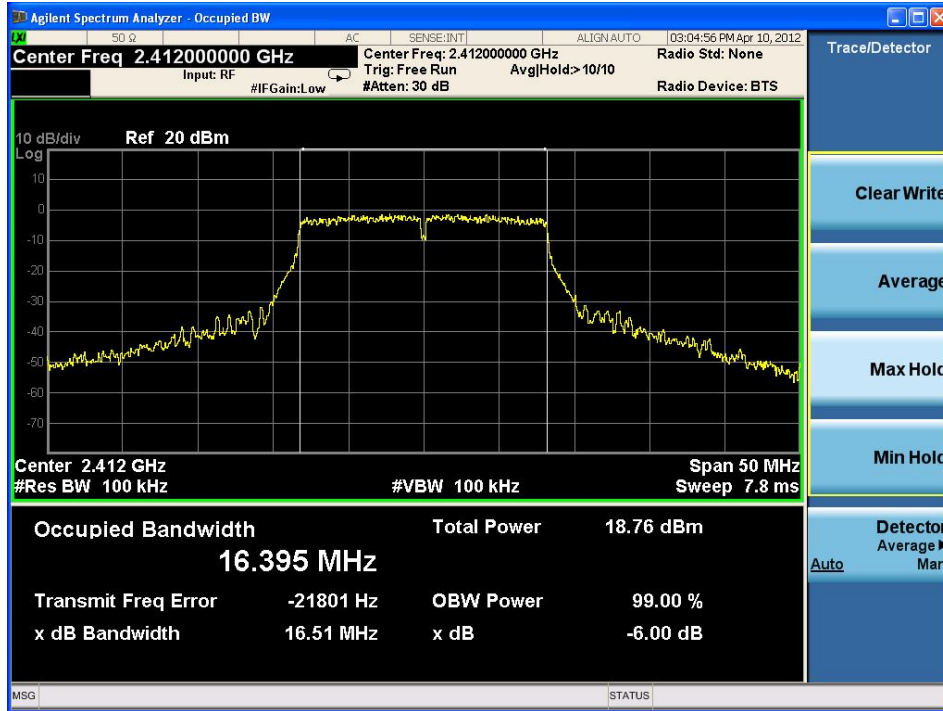
## 802.11b



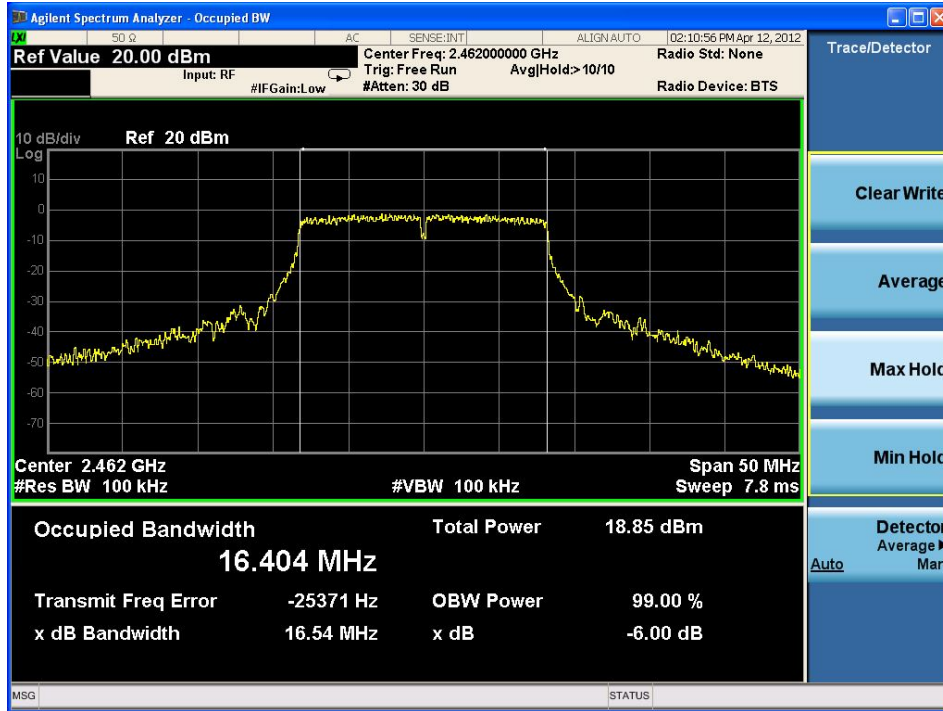
## 802.11b



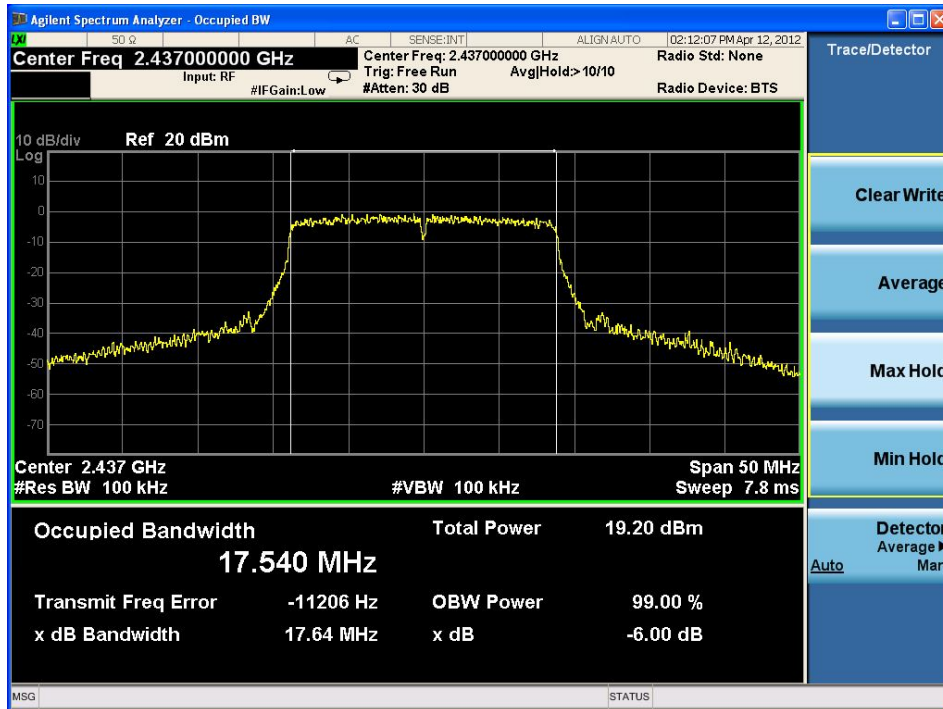
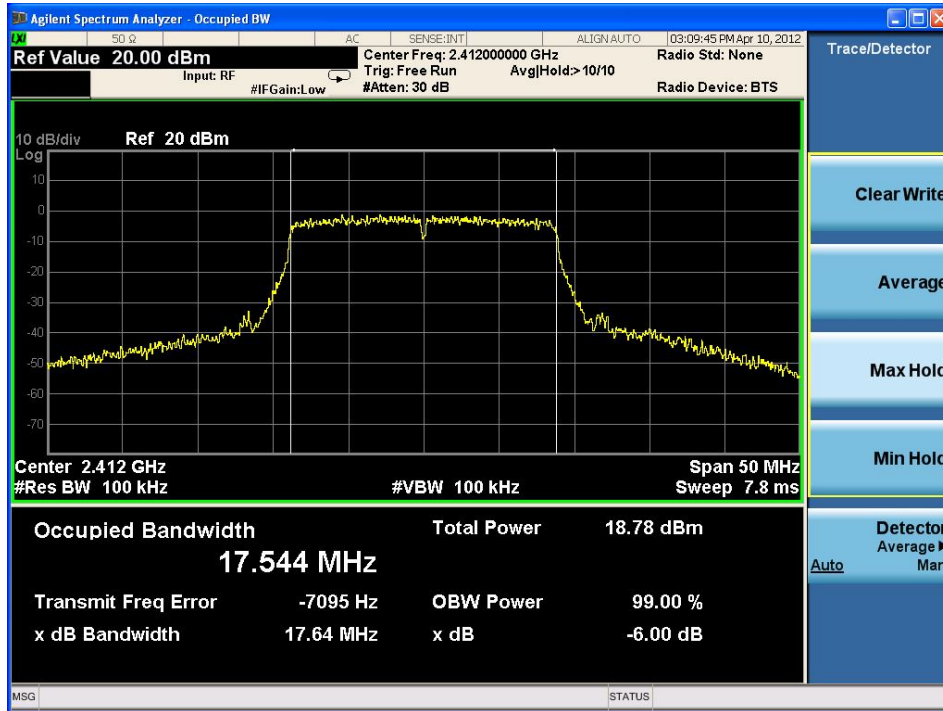
## 802.11g



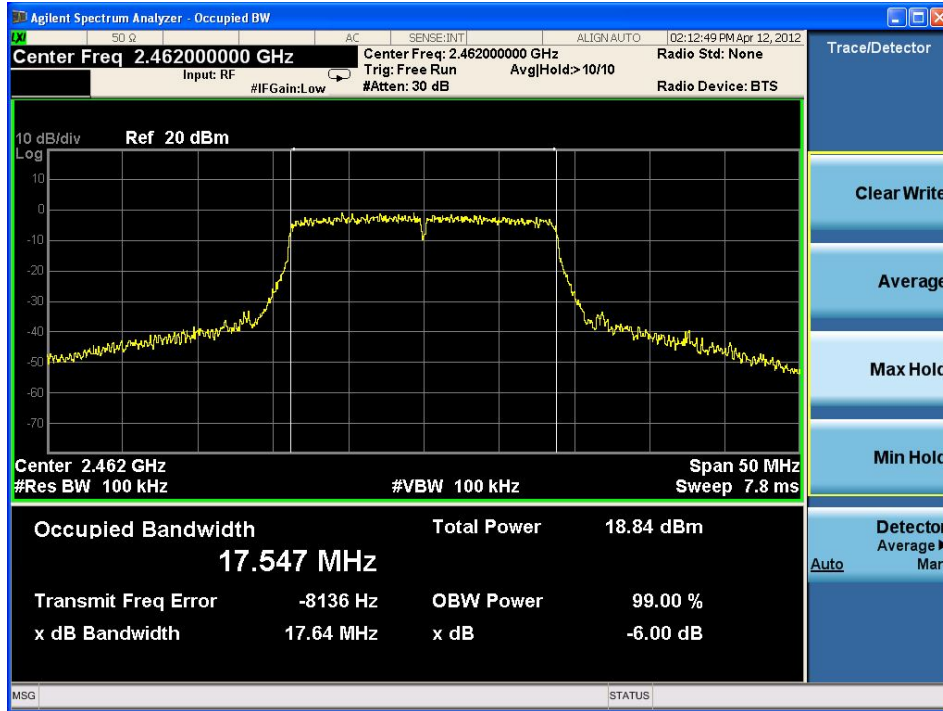
## 802.11g



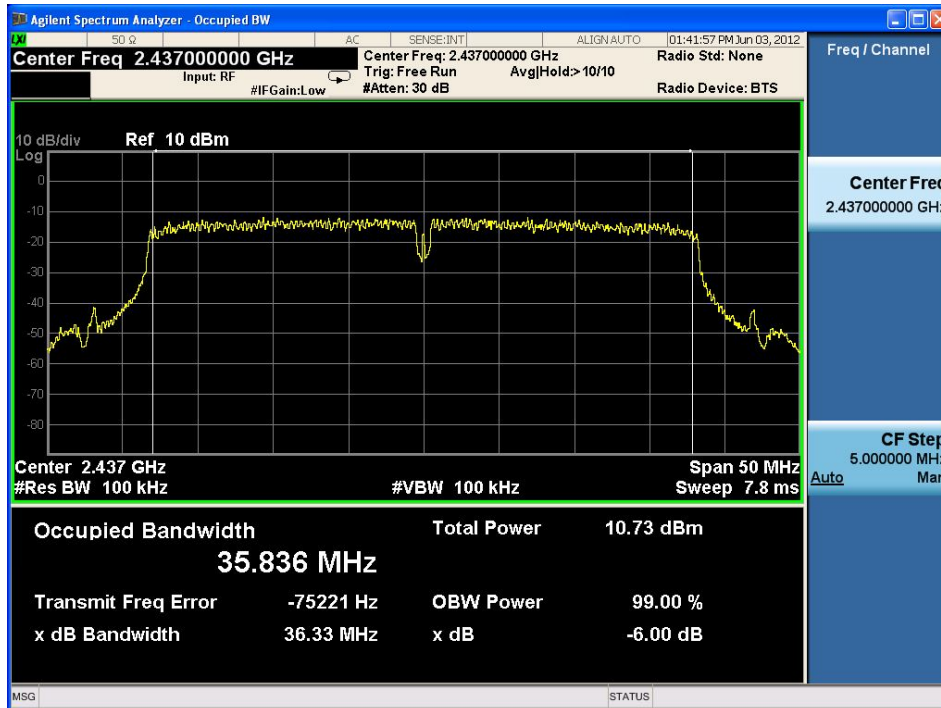
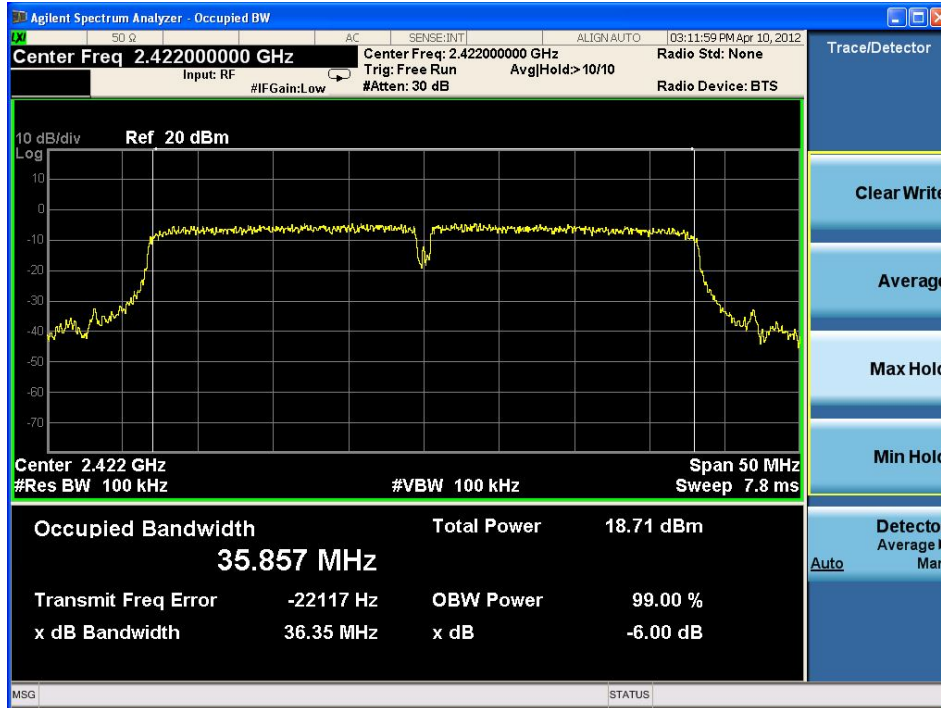
## 802.11n (20 MHz)



## 802.11n (20 MHz)

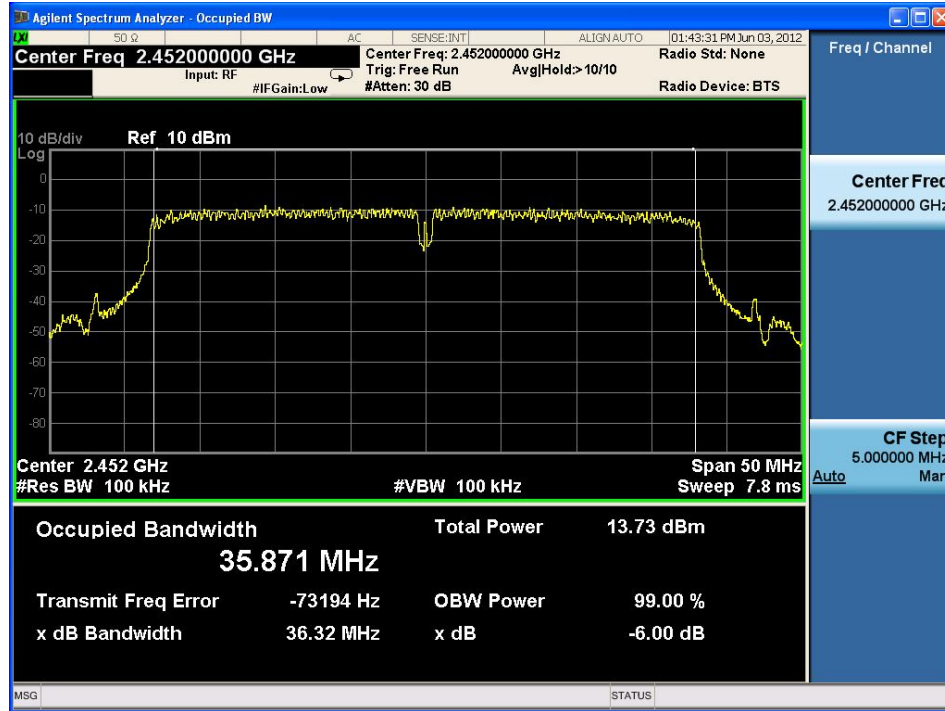


## 802.11n (40 MHz)





## 802.11n (40 MHz)



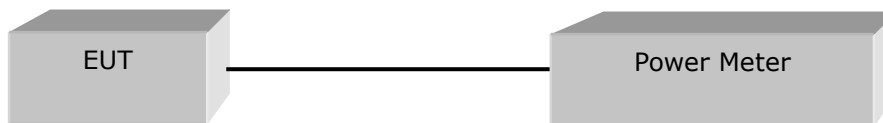
## 2.1.2 Maximum peak Conducted Output Power

### 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.



### Limit

< 1 W

### Test Results

#### Test mode : 802.11b - 11 Mbps

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	14.26	30dBm	Complies
2437	Middle	15.02	30dBm	Complies
2462	High	15.01	30dBm	Complies

#### Remark.

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

#### Test mode : 802.11g - 6 Mbps

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	14.26	30dBm	Complies
2437	Middle	14.75	30dBm	Complies
2462	High	14.79	30dBm	Complies

#### Remark.

The 802.11g data rate were set in 6 Mbps, due to the highest RF output power.

**Test mode : 802.11n (20 MHz) – MCS0**

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	14.16	30dBm	Complies
2437	Middle	14.69	30dBm	Complies
2462	High	14.75	30dBm	Complies

**Remark.**

The 802.11n(20 MHz) data rate were set in MCS0, due to the highest RF output power.

**Test mode : 802.11n (40 MHz) – MCS0**

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2422	Low	14.14	30dBm	Complies
2437	Middle	14.61	30dBm	Complies
2452	High	14.63	30dBm	Complies

**Remark.**

The 802.11n(40 MHz) data rate were set in MCS0, due to the highest RF output power.

### 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	-11.096	Complies
	2437	6	-10.578	Complies
	2462	11	-11.074	Complies

**Test mode : 802.11g**

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11g	2412	1	-14.858	Complies
	2437	6	-13.959	Complies
	2462	11	-14.328	Complies



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## Test mode : 802.11n(20 MHz)

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (20 MHz)	2412	1	-15.113	Complies
	2437	6	-14.062	Complies
	2462	11	-14.718	Complies

## Test mode : 802.11n(40 MHz)

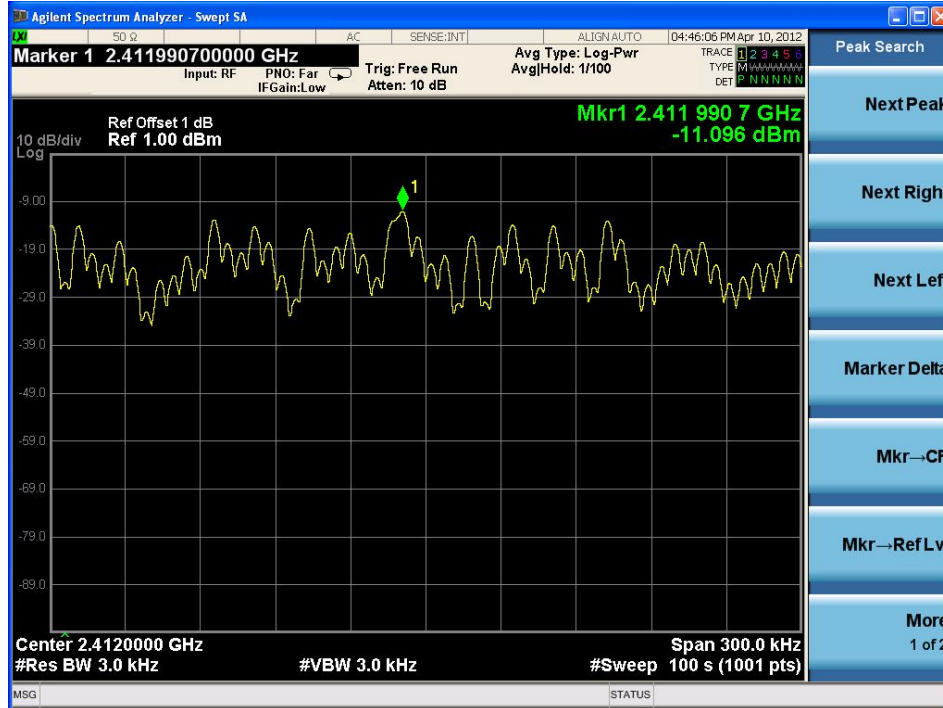
Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (40 MHz)	2422	3	-16.784	Complies
	2437	6	-15.092	Complies
	2452	9	-15.712	Complies

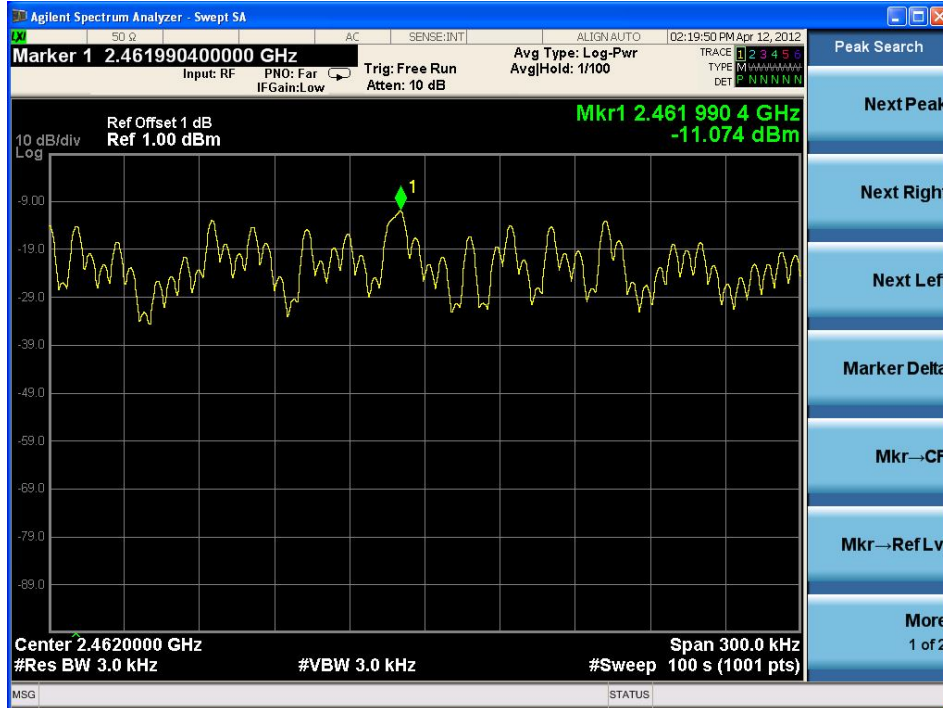
### Minimum Standard:

Power Spectral Density	< 8dBm @ 3 kHz BW
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See next pages for actual measured spectrum plots.

## 802.11b Power Density Measurement





## 802.11g Power Density Measurement

