

## TEST REPORT For FCC

Test Report No. : CTK-2012-00206  
Date of Issue : April 05, 2012  
FCC ID : QJCH432Q  
Model/Type No. : H432Q  
Kind of Product : Braille Sense U2 QWERTY  
Applicant : HIMS International Corporation  
Applicant Address : KT Daejeon Satellite Center, 139-9, Gajung-dong, Yuseong-gu, Daejeon, KOREA, 305-350  
Manufacturer : HIMS International Corporation  
Manufacturer Address : KT Daejeon Satellite Center, 139-9, Gajung-dong, Yuseong-gu, Daejeon, KOREA, 305-350  
Contact Person : Young Sik Lim / Senior Researcher  
Telephone : +82-42-864-4460  
Received Date : March 14, 2012  
Test period : Start : March 14, 2012 End : April 3, 2012  
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: April 5, 2012

Reviewed by

*Y. J. Park*

Young-Joon, Park  
Technical Manager  
Date: April 5, 2012



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## REPORT REVISION HISTORY

Date	Revision	Page No
April 5, 2012	Issued (CTK-2012-00206)	All

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## TABLE OF CONTENTS

REPORT REVISION HISTORY .....	2
1.0 General Product Description .....	4
1.1 Tested Frequency .....	4
1.2 Device Modifications .....	5
1.3 Peripheral Devices .....	6
1.4 Calibration Details of Equipment Used for Measurement .....	6
1.5 Test Facility.....	6
1.6 Laboratory Accreditations and Listings .....	7
2 Summary of tests.....	8
2.1 Technical Characteristic Test .....	9
2.1.1 6dB Bandwidth .....	9
2.1.2 Maximum peak Conducted Output Power.....	23
2.1.3 Power Spectral Density .....	25
2.1.4 Band - edge .....	39
2.1.5 Field Strength of Emissions .....	58
Test Data.....	59
2.1.6 AC Conducted Emissions.....	65
APPENDIX A – Test Equipment Used For Tests .....	68



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## 1.0 General Product Description

Equipment model name	H432Q
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 : 8.37 dBm 802.11g : 3.92 dBm 802.11n(20 MHz) : 3.94 dBm 802.11n(40 MHz) : 3.24 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	DC 3.7 V (Lithium Ion Rechargeable Battery)
Antenna Type	Chip antenna
Antenna Gain	Ant0 - ALA931C5 : -1 dBi Ant1 - ALA931C5 : -1 dBi

## 1.1 Tested Frequency

802.11b, 802.11g, 802.11n (20MHz, Ant0 and Ant1)

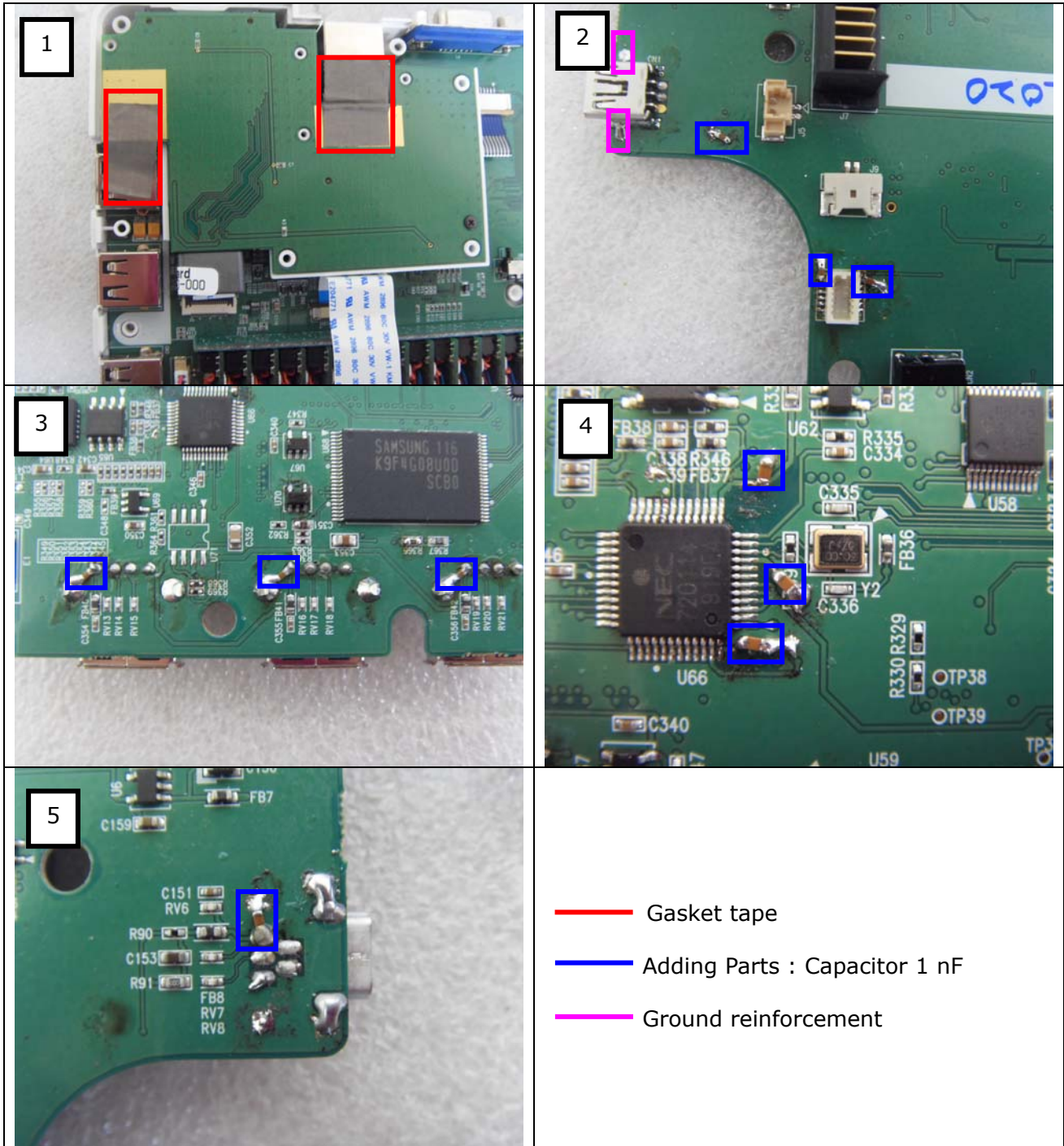
	LOW	MID	HIGH
Frequency (MHz)	2412	2437	2462

802.11n (40MHz, Ant0 and Ant1)

	LOW	MID	HIGH
Frequency (MHz)	2422	2437	2452

## 1.2 Device Modifications

The following modifications were necessary for compliance and was applied by applicant.





### 1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Switching Adapter1 (for EUT)	Dee Van Electronics(Longchuan)Co., Ltd.	DSA-12CA-05 050200	-
LCD Monitor	Lite-On Technology Corp.	VS17	CNN5130QMC
Keyboard (USB type)	-	PKB 1500U	018050030642
Mouse (USB type)	DONGGUAN PRIMAX ELECTRONIC & TELECOMMUNICATION PRODUCTS LTD.	SC-1000	1048007214
SD Card	-	-	-
USB Drive	BMK	MemoRive	-
Headset	-	-	-
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.







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## 1.6 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 m & 10 m OATS, 3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements	 805871
JAPAN	VCCI	10 m OATS, 3 m & 10 m SAC and Conducted Test Site	 R-948, C-986, T-1843
KOREA	KCC	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	KOLAS	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	9.575	Complies
	2437	6	10.04	Complies
	2462	11	10.08	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	16.52	Complies
	2462	11	16.49	Complies



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### Test mode : 802.11n (20 MHz, Ant0)

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (20 MHz, Ant0)	2412	1	17.71	Complies
	2437	6	17.71	Complies
	2462	11	17.75	Complies

### Test mode : 802.11n (40 MHz, Ant0)

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (40 MHz, Ant0)	2422	3	36.47	Complies
	2437	6	36.47	Complies
	2452	9	36.48	Complies

### Test mode : 802.11n (20 MHz, Ant1)

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (20 MHz, Ant1)	2412	1	17.69	Complies
	2437	6	17.71	Complies
	2462	11	17.75	Complies

### Test mode : 802.11n (40 MHz, Ant1)

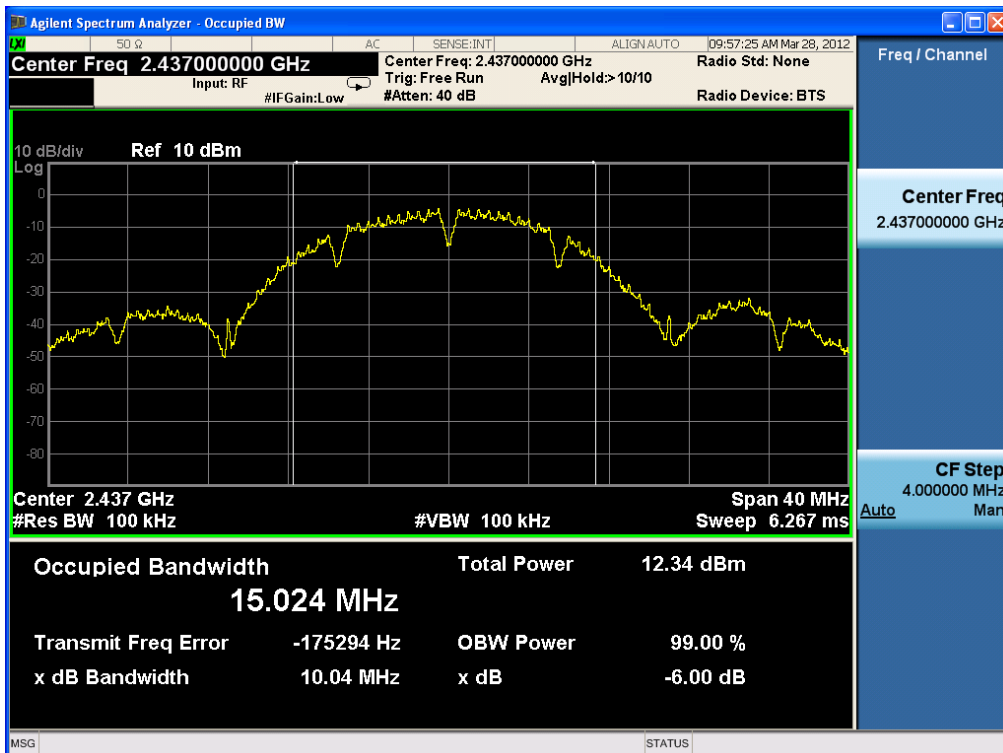
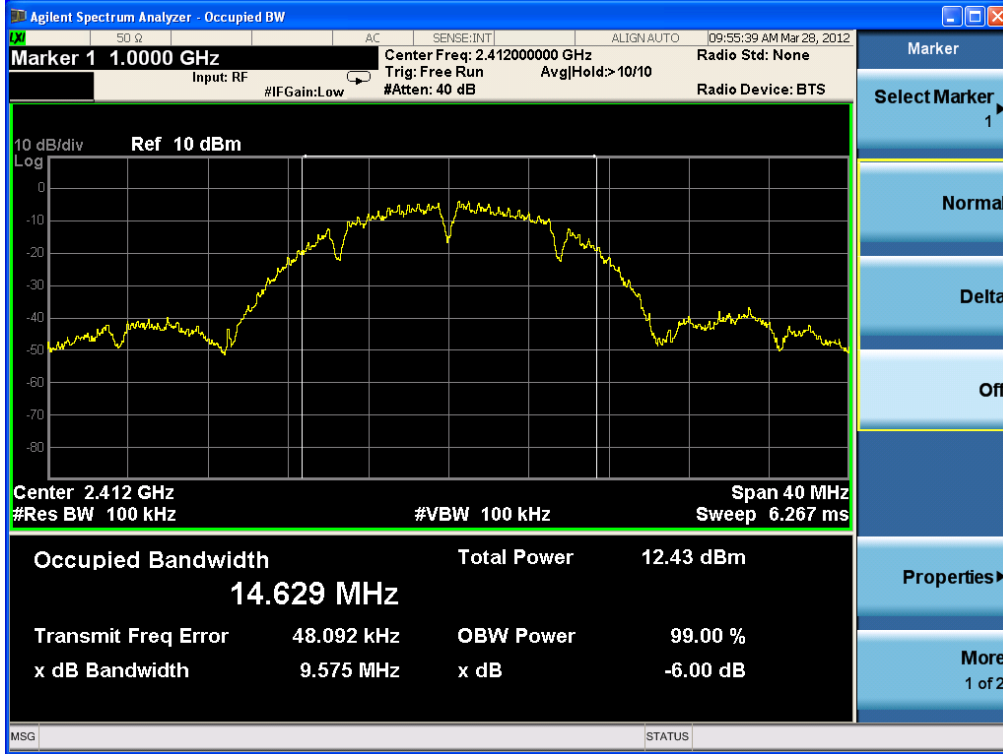
Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (40 MHz, Ant1)	2422	3	36.44	Complies
	2437	6	36.47	Complies
	2452	9	36.45	Complies

### Minimum Standard:

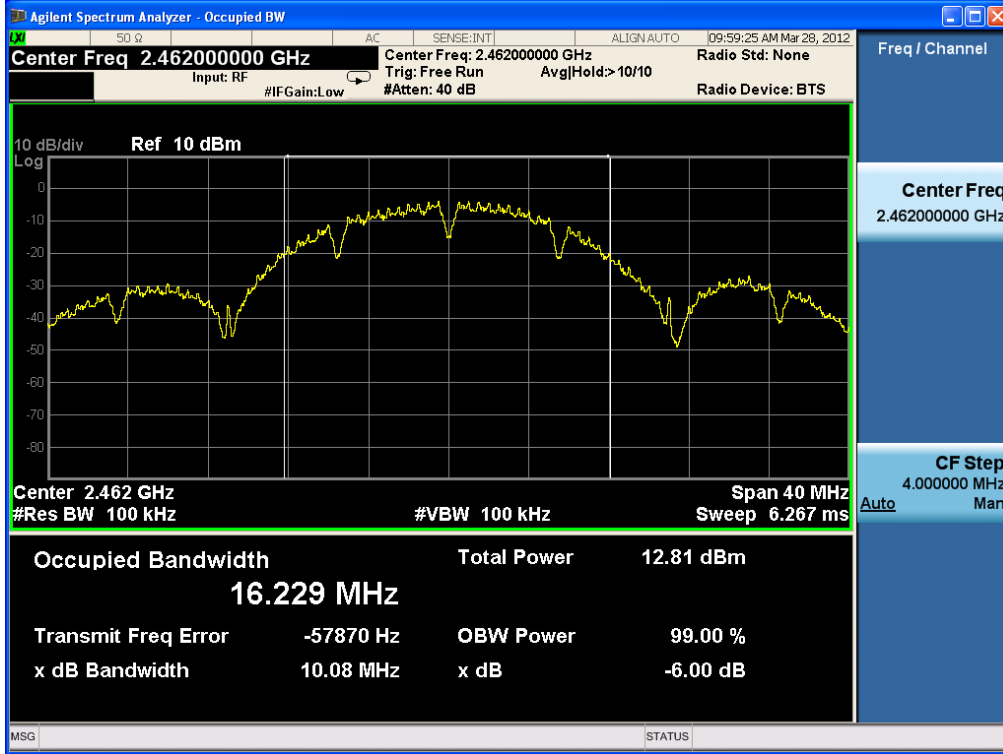
6 dB Bandwidth > 500kHz

See next pages for actual measured spectrum plots.

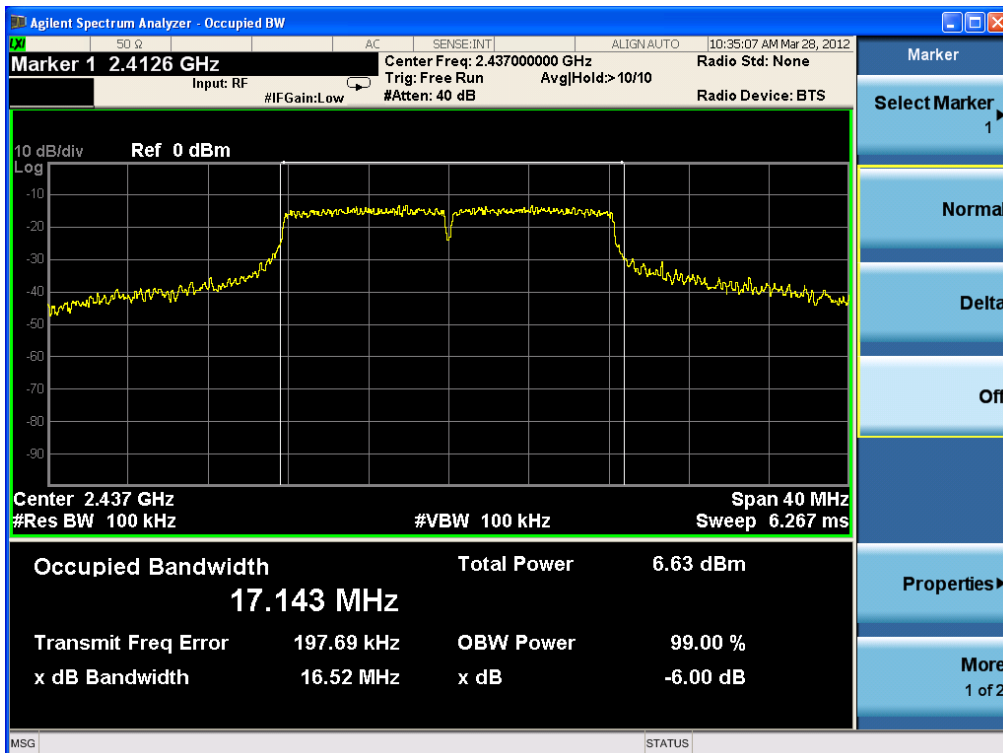
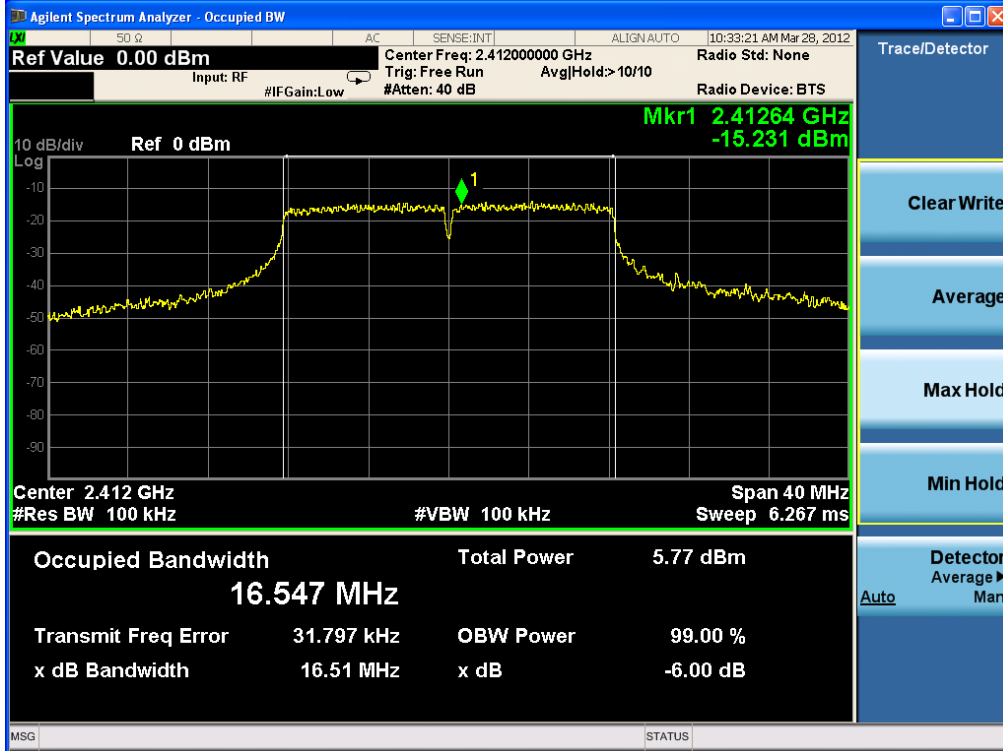
## 802.11b



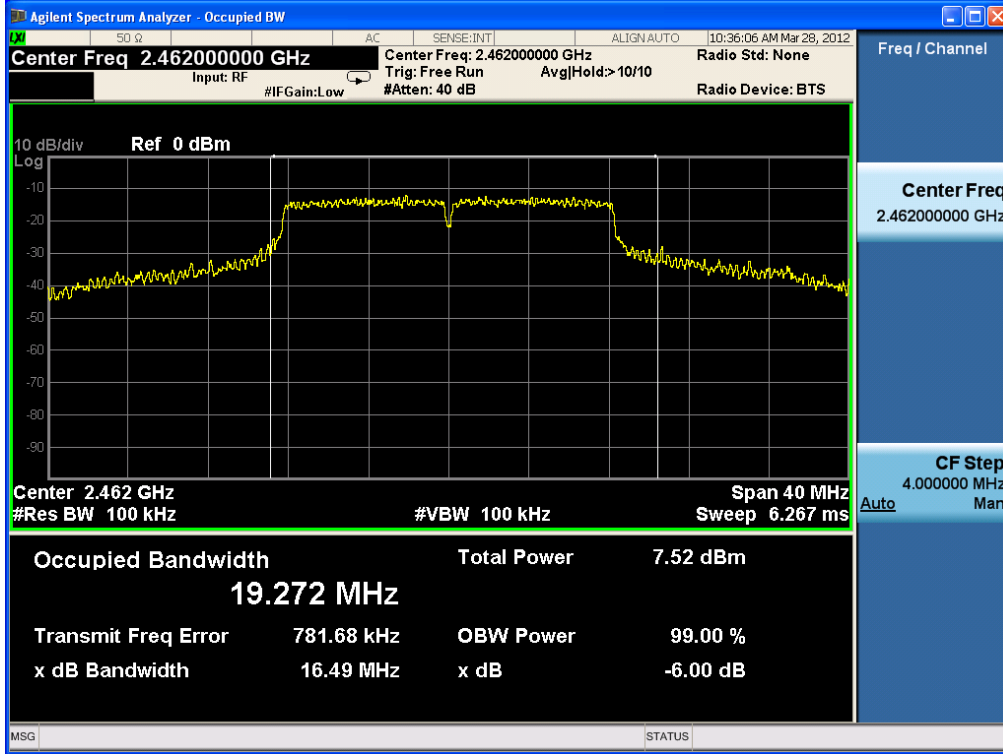
## 802.11b



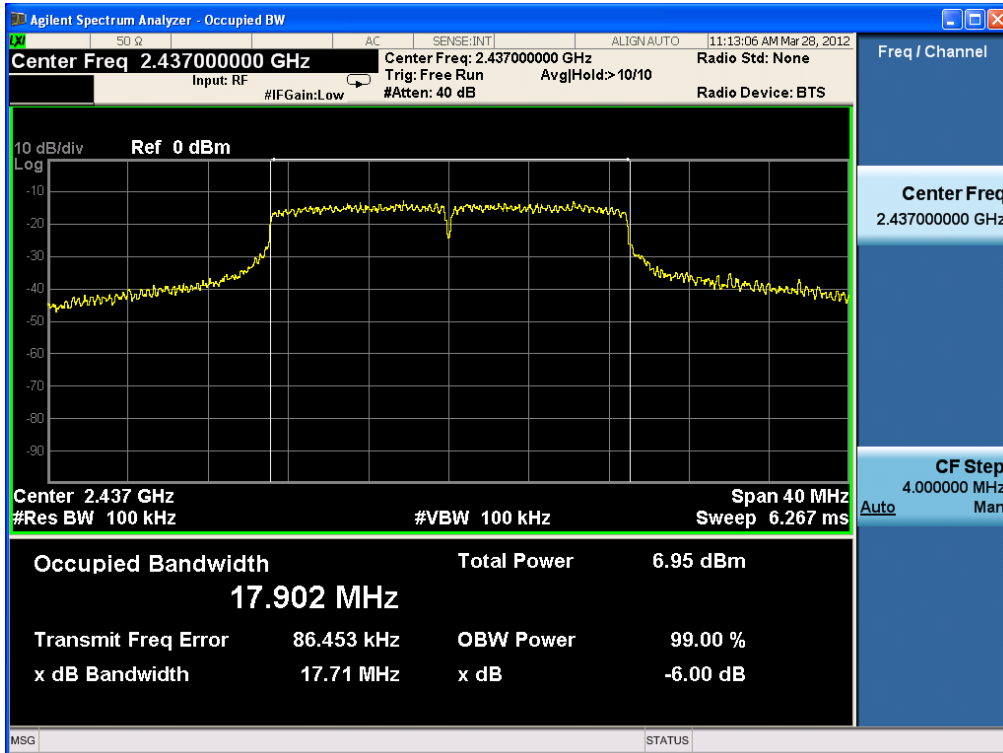
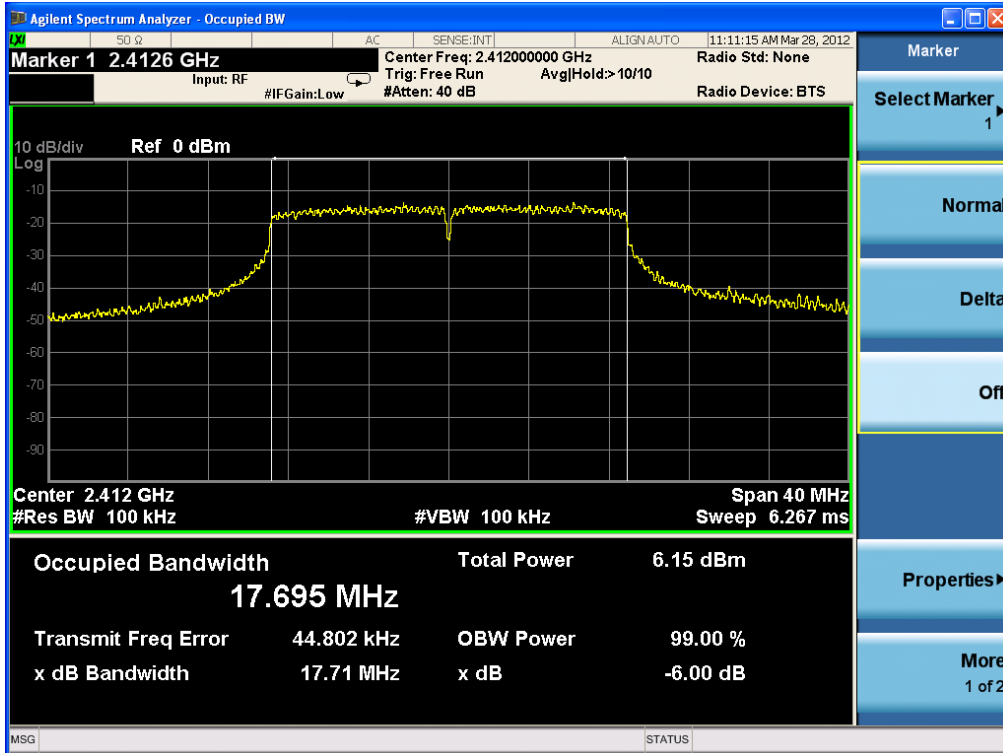
## 802.11g



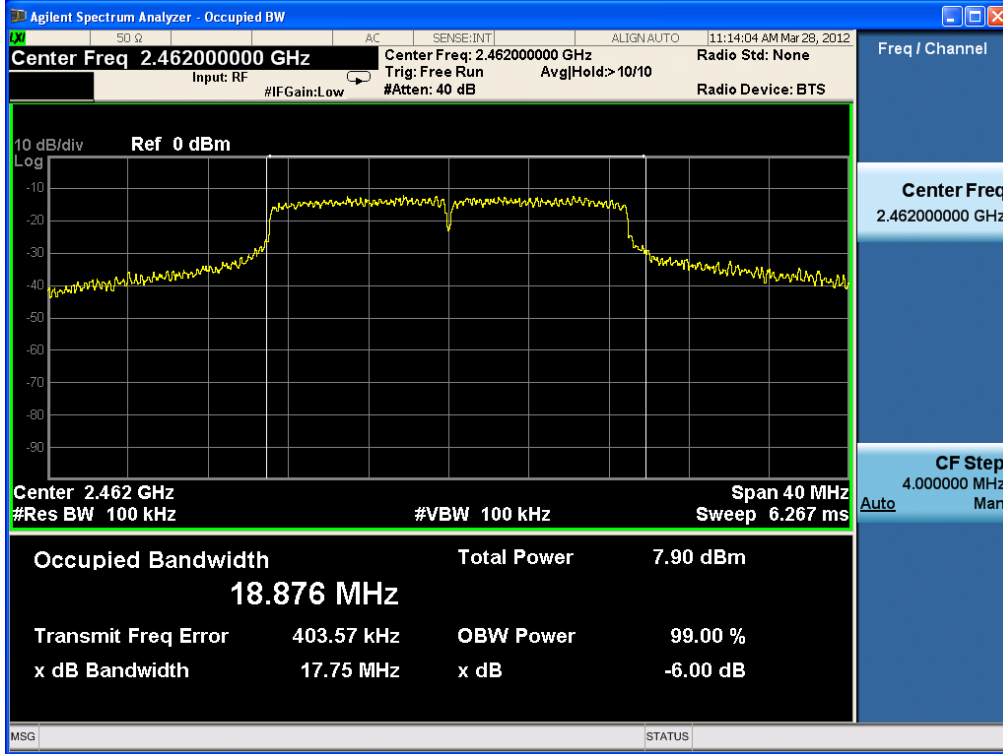
## 802.11g



## 802.11n (20 MHz, Ant0)

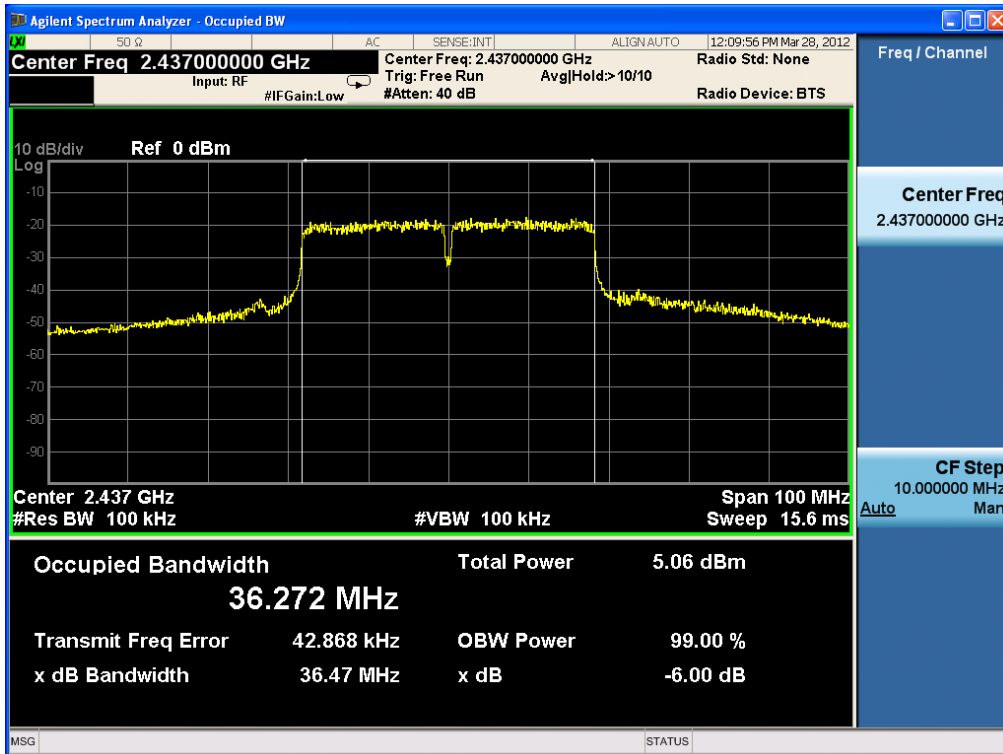
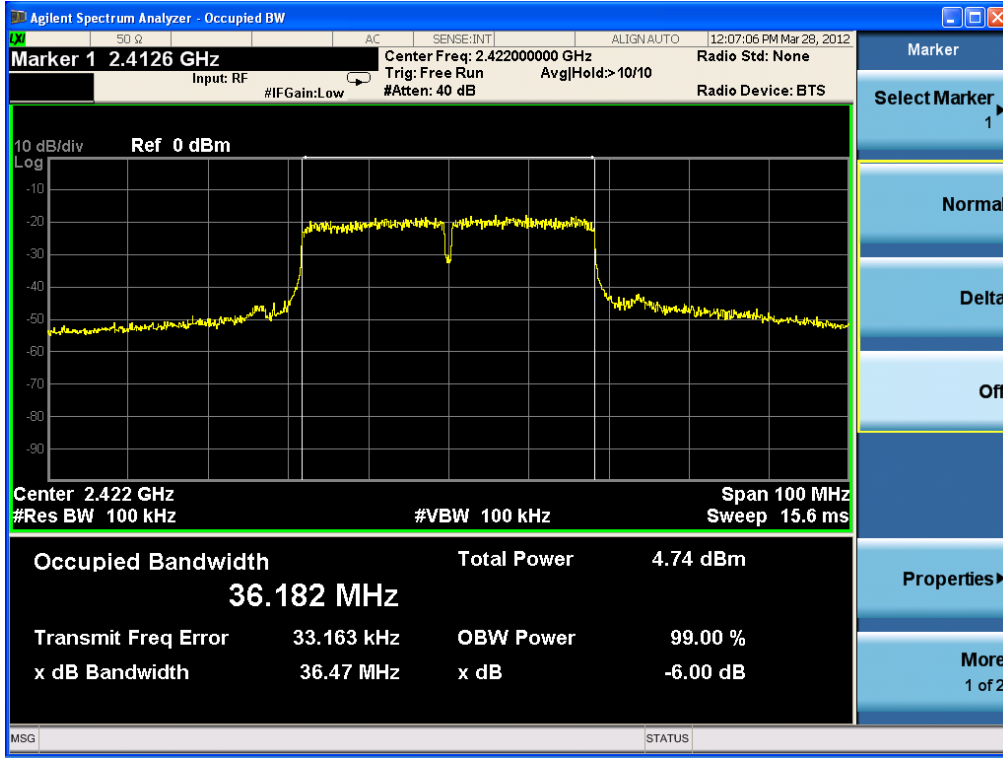


## 802.11n (20 MHz, Ant0)

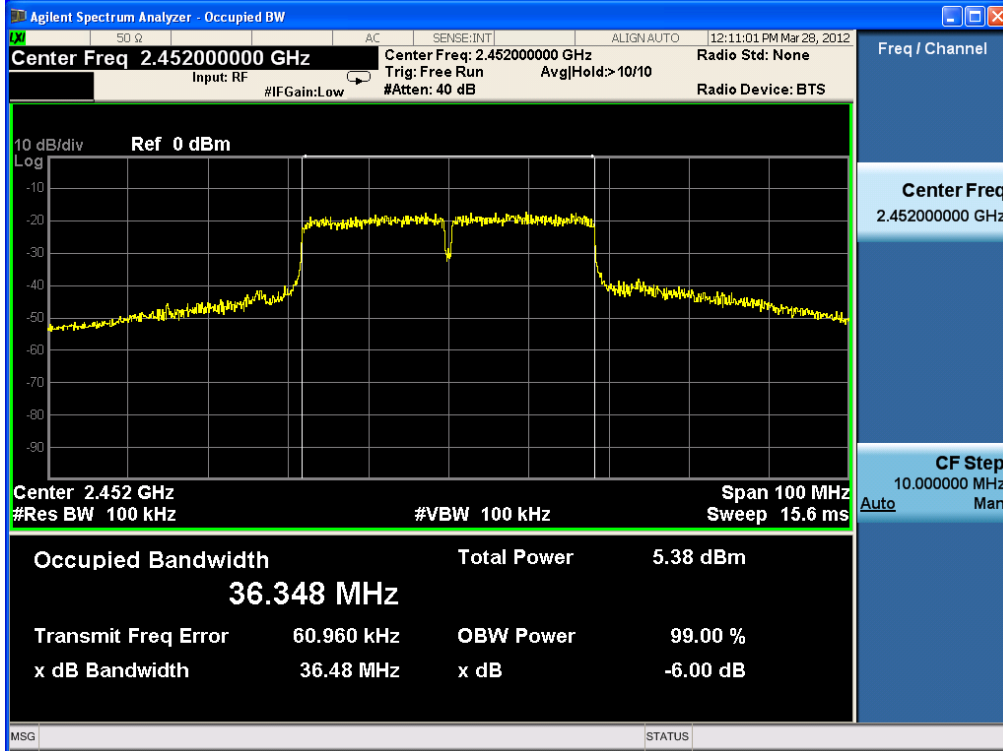




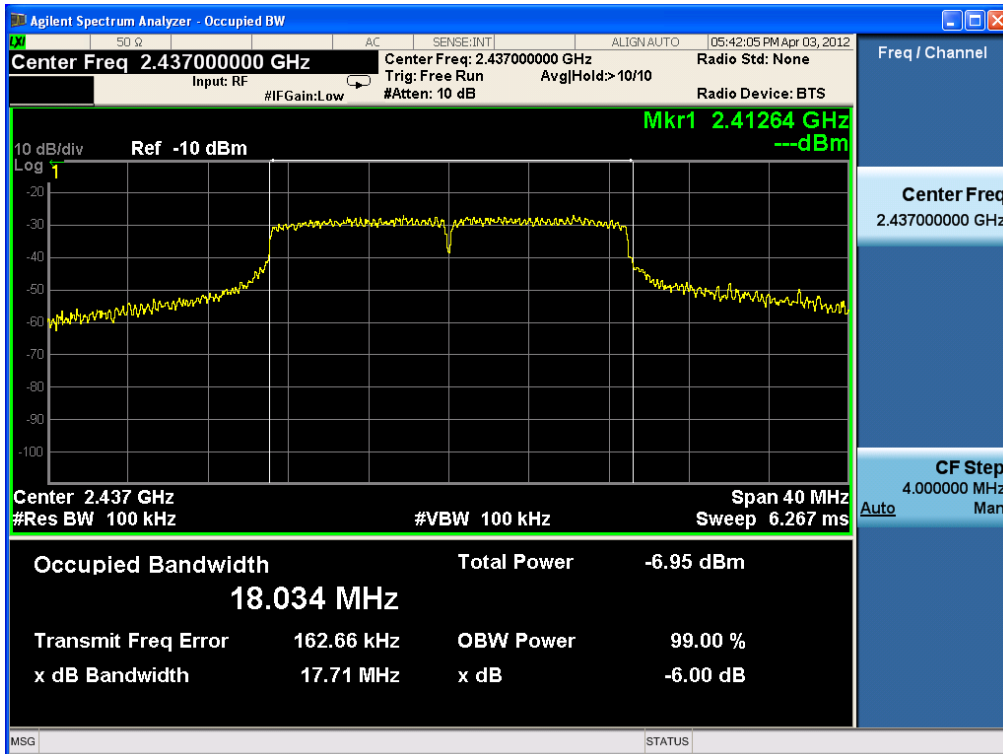
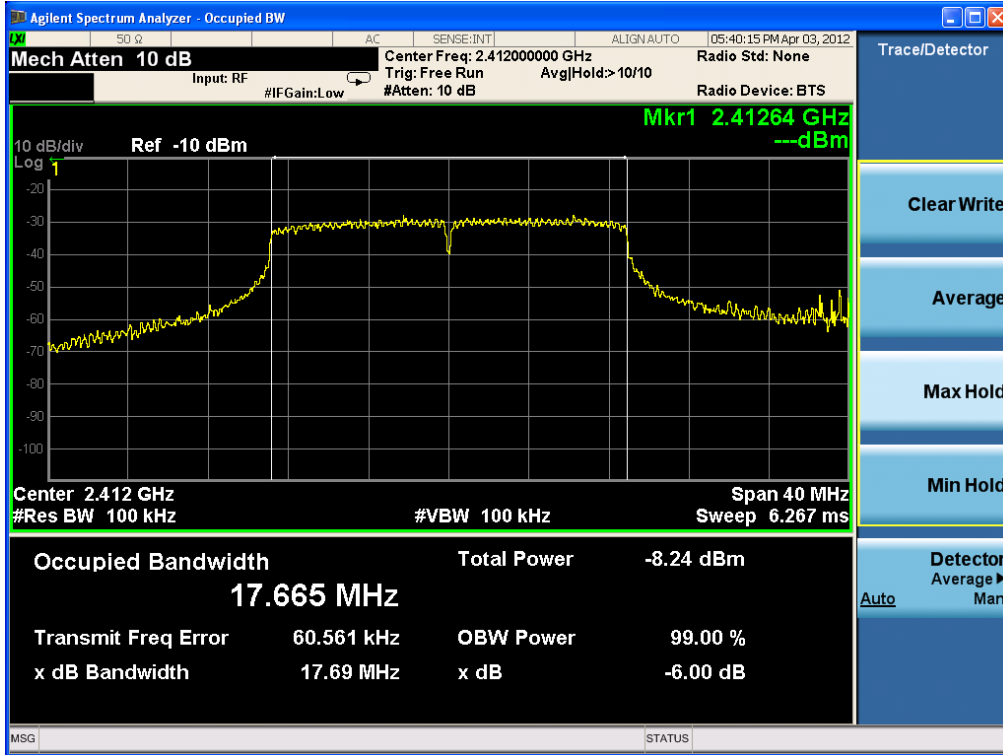
## 802.11n (40 MHz, Ant0)



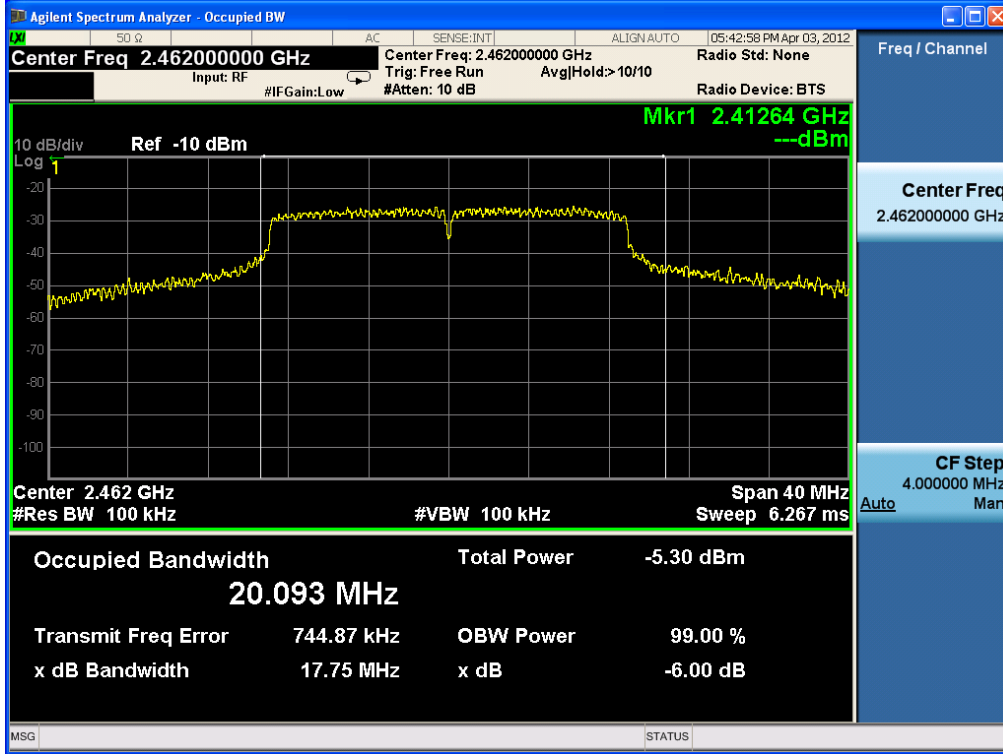
## 802.11n (40 MHz, Ant0)



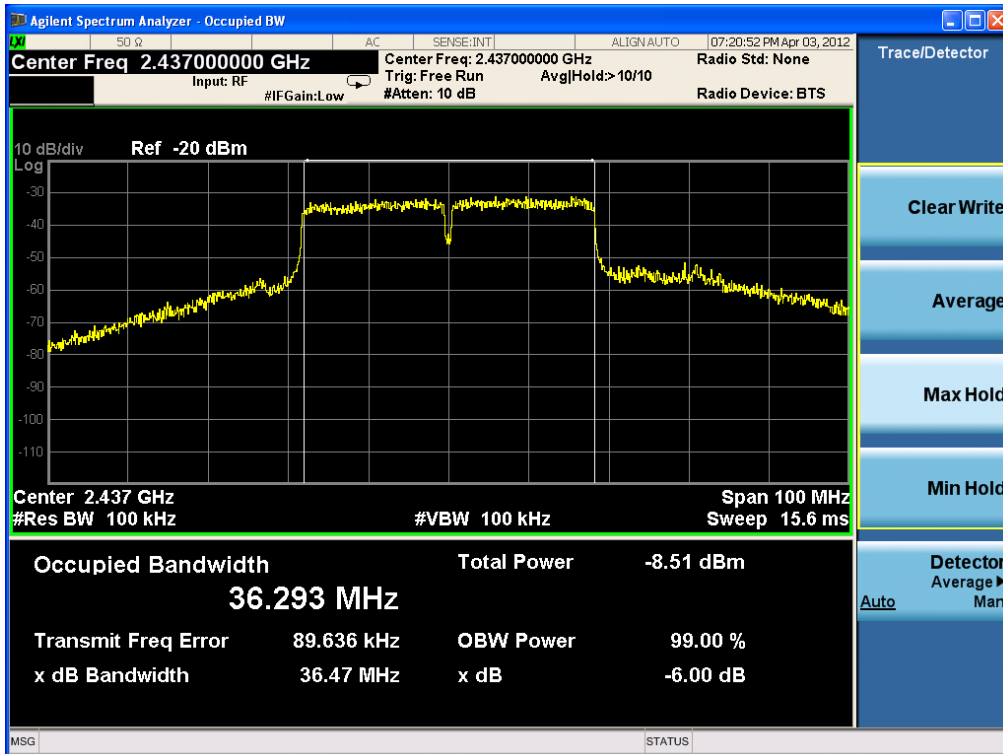
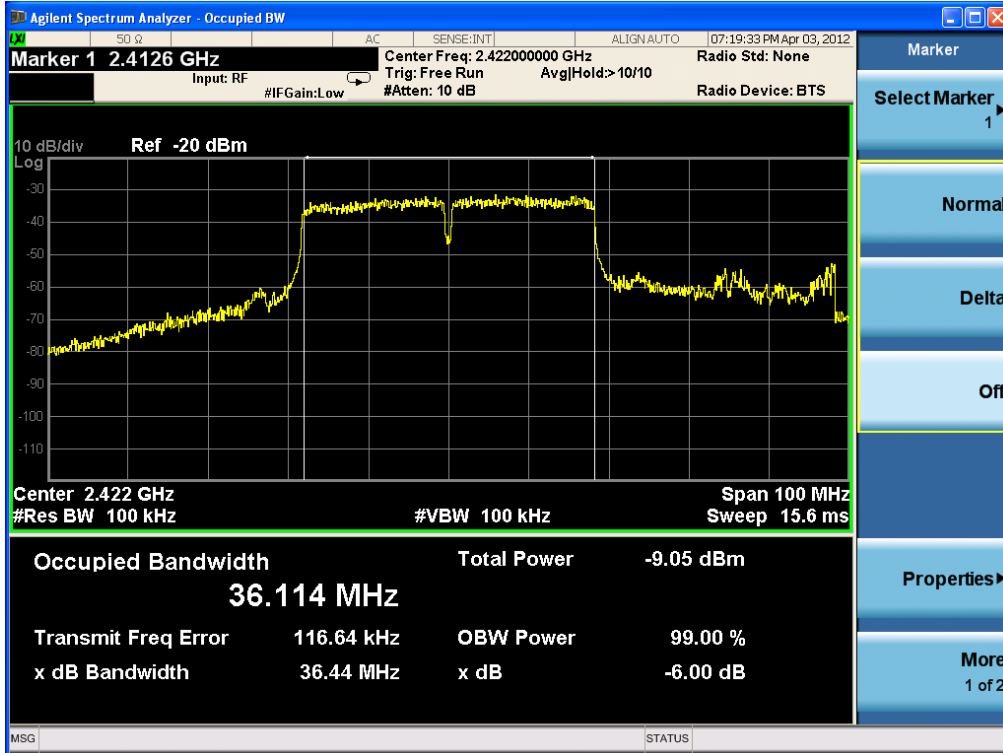
## 802.11n (20 MHz, Ant1)



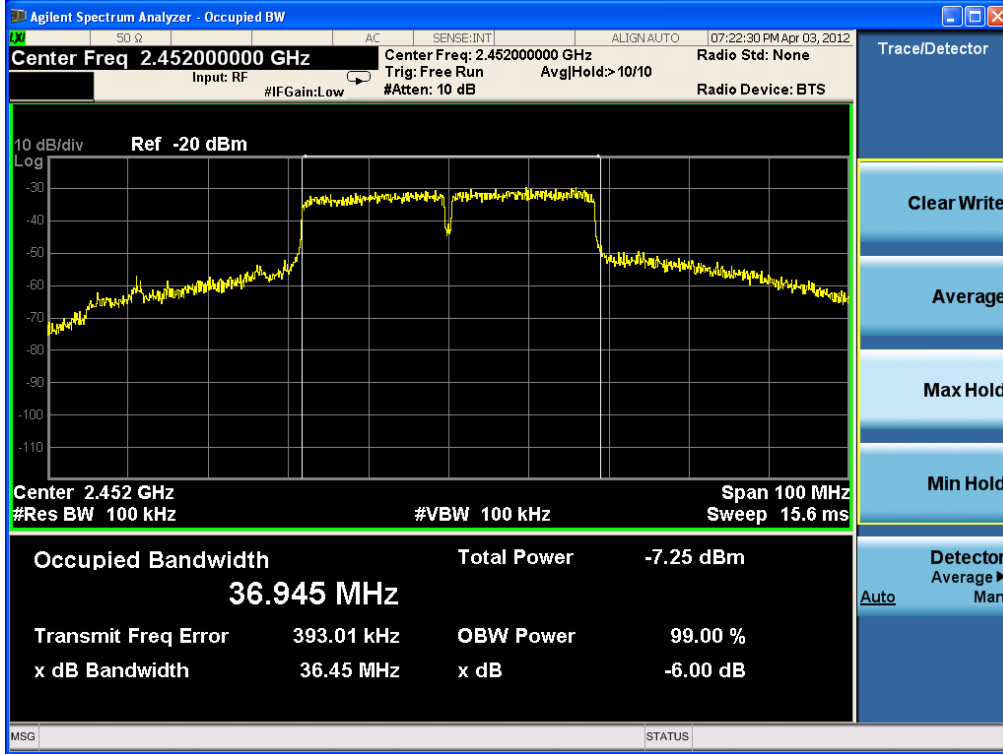
## 802.11n (20 MHz, Ant1)



## 802.11n (40 MHz, Ant1)



## 802.11n (40 MHz, Ant1)



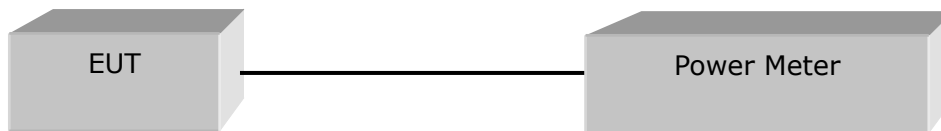
## 2.1.2 Maximum peak Conducted Output Power

### 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	7.24	30dBm	Complies
2437	Middle	8.37	30dBm	Complies
2462	High	8.27	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	2.54	30dBm	Complies
2437	Middle	3.55	30dBm	Complies
2462	High	3.92	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, Ant0) – MCS2**

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	2.56	30dBm	Complies
2437	Middle	3.44	30dBm	Complies
2462	High	3.94	30dBm	Complies

**Remark.**

The 802.11n(20 MHz, Ant0) data rate were set in MCS2, due to the highest RF output power.

**Test mode : 802.11n (40 MHz, Ant0) – MCS1**

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2422	Low	2.42	30dBm	Complies
2437	Middle	3.15	30dBm	Complies
2452	High	3.24	30dBm	Complies

**Remark.**

The 802.11n(40 MHz, Ant0) data rate were set in MCS1, due to the highest RF output power.

**Test mode : 802.11n (20 MHz, Ant1) – MCS2**

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	-12.11	30dBm	Complies
2437	Middle	-10.39	30dBm	Complies
2462	High	-9.24	30dBm	Complies

**Remark.**

The 802.11n(40 MHz, Ant1) data rate were set in MCS2, due to the highest RF output power.

**Test mode : 802.11n (40 MHz, Ant1) – MCS1**

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2422	Low	-11.94	30dBm	Complies
2437	Middle	-11.38	30dBm	Complies
2452	High	-10.56	30dBm	Complies

**Remark.**

The 802.11n(40 MHz, Ant1) data rate were set in MCS1, 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	-22.725	Complies
	2437	6	-21.563	Complies
	2462	11	-20.591	Complies

**Test mode : 802.11g**

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-26.239	Complies
	2437	6	-25.522	Complies
	2462	11	-24.001	Complies



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### Test mode : 802.11n(20 MHz, Ant0)

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (20 MHz, Ant0)	2412	1	-24.365	Complies
	2437	6	-23.743	Complies
	2462	11	-22.567	Complies

### Test mode : 802.11n(40 MHz, Ant0)

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (40 MHz, Ant0)	2422	3	-28.441	Complies
	2437	6	-26.514	Complies
	2452	9	-25.454	Complies

### Test mode : 802.11n(20 MHz, Ant1)

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (20 MHz, Ant1)	2412	1	-38.794	Complies
	2437	6	-37.665	Complies
	2462	11	-35.635	Complies

### Test mode : 802.11n(40 MHz, Ant1)

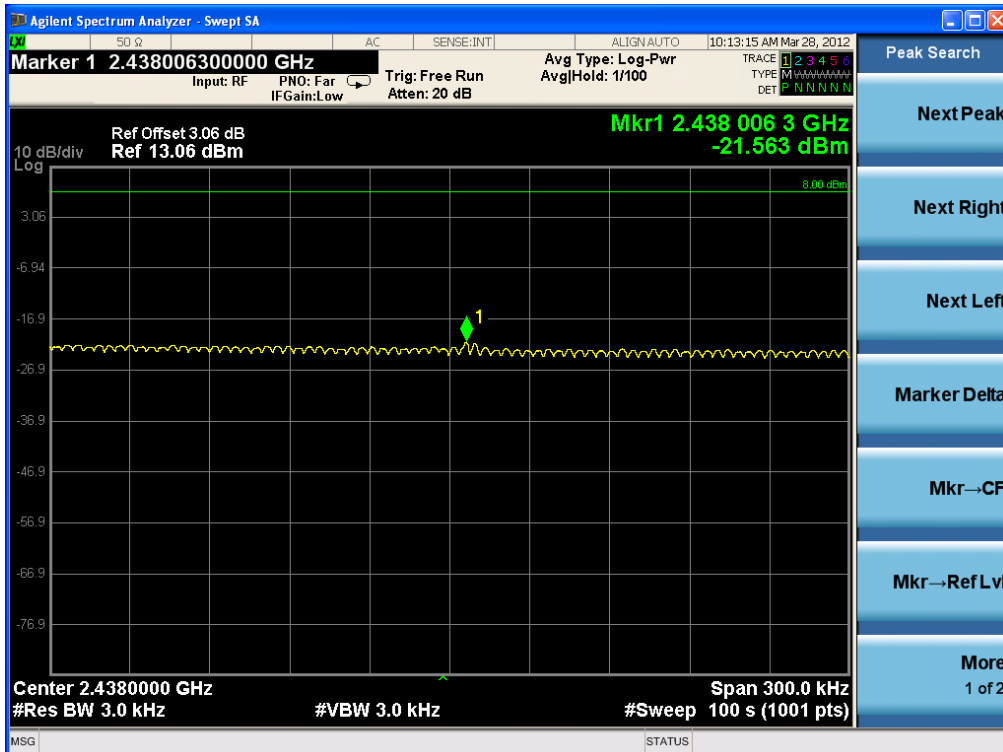
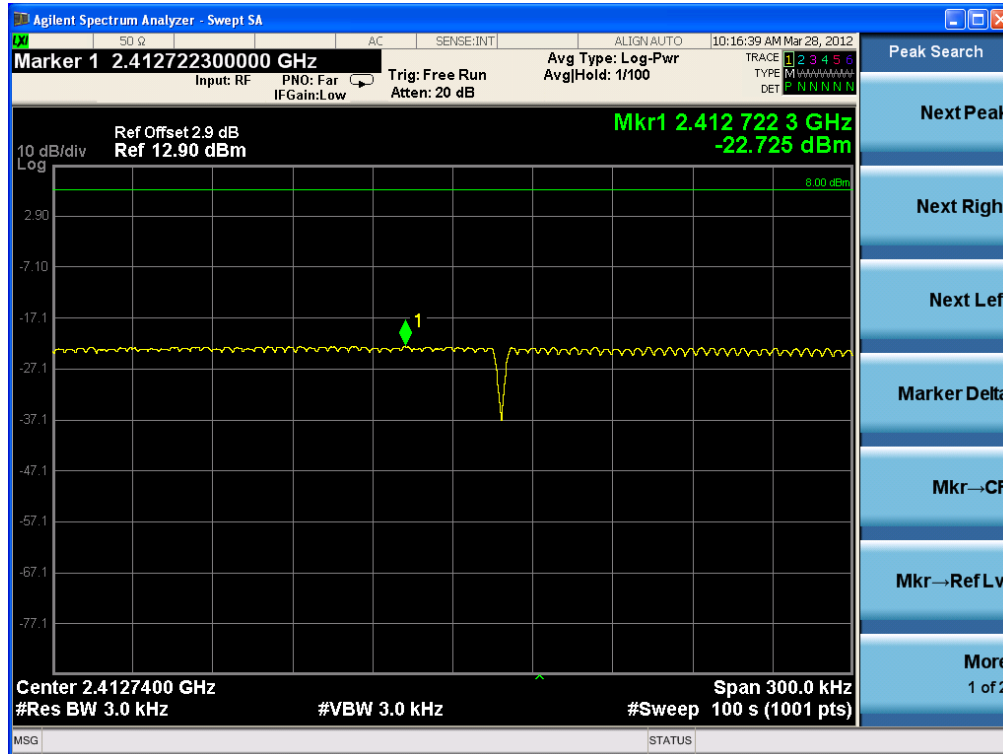
Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (40 MHz, Ant1)	2422	3	-40.327	Complies
	2437	6	-39.339	Complies
	2452	9	-38.870	Complies

#### Minimum Standard:

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

See next pages for actual measured spectrum plots.

## 802.11b Power Density Measurement





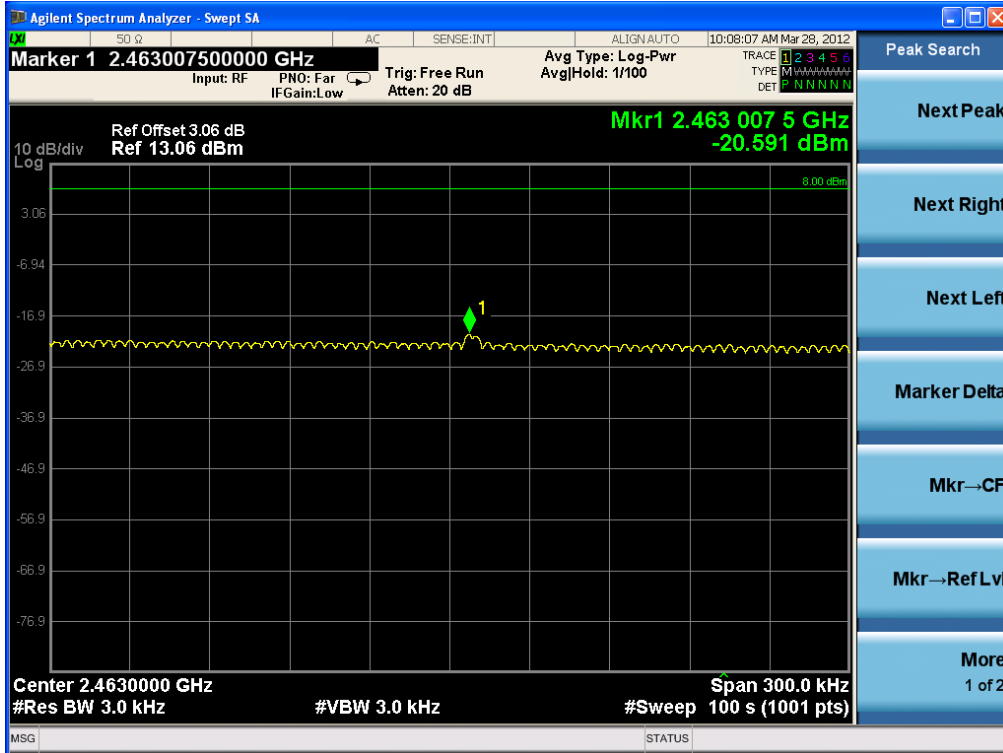
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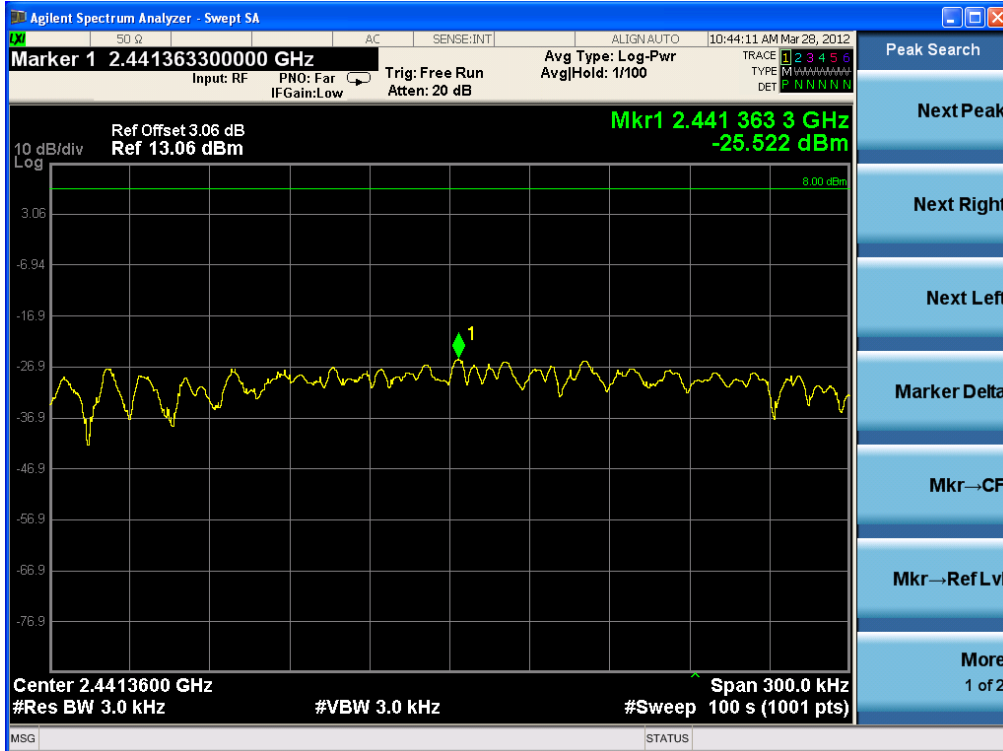
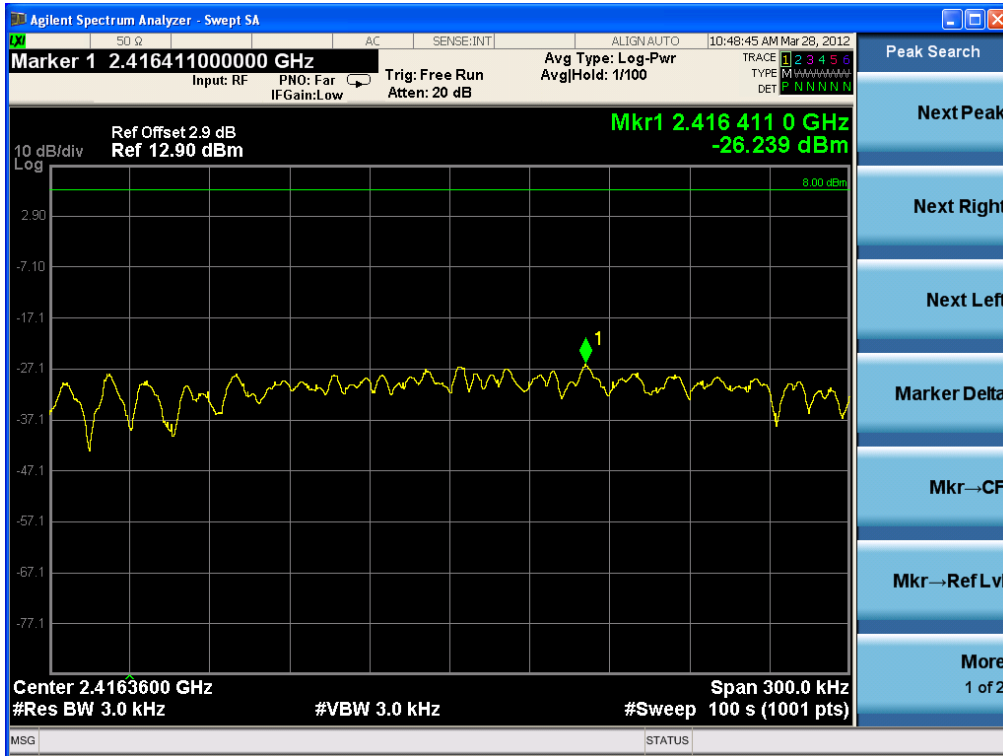
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## 802.11g Power Density Measurement





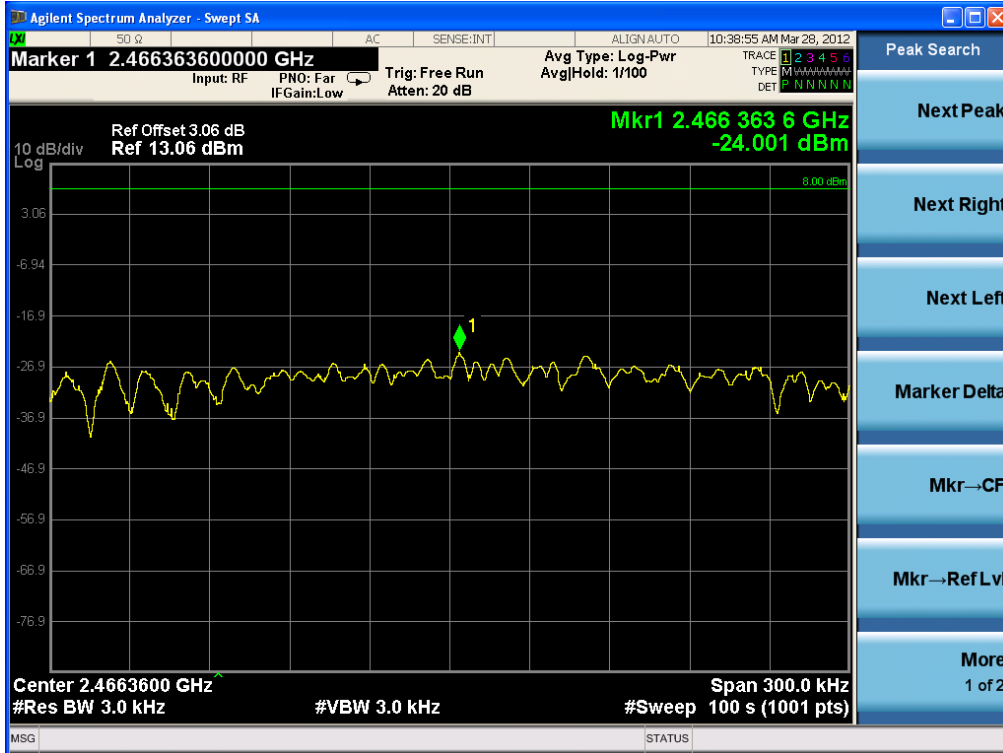
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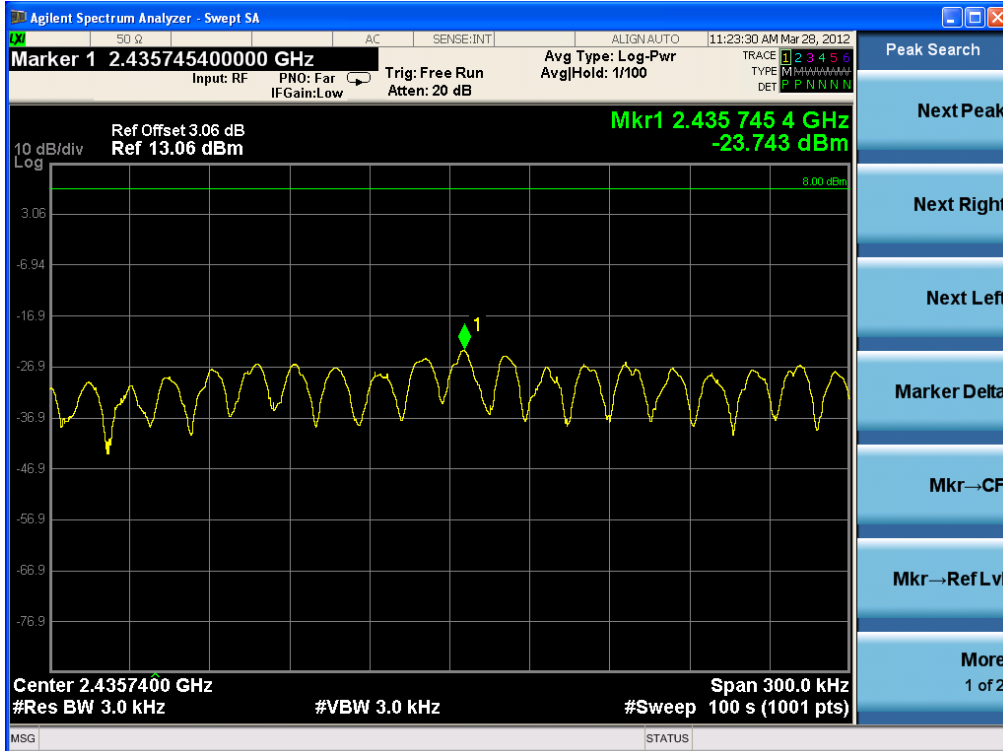
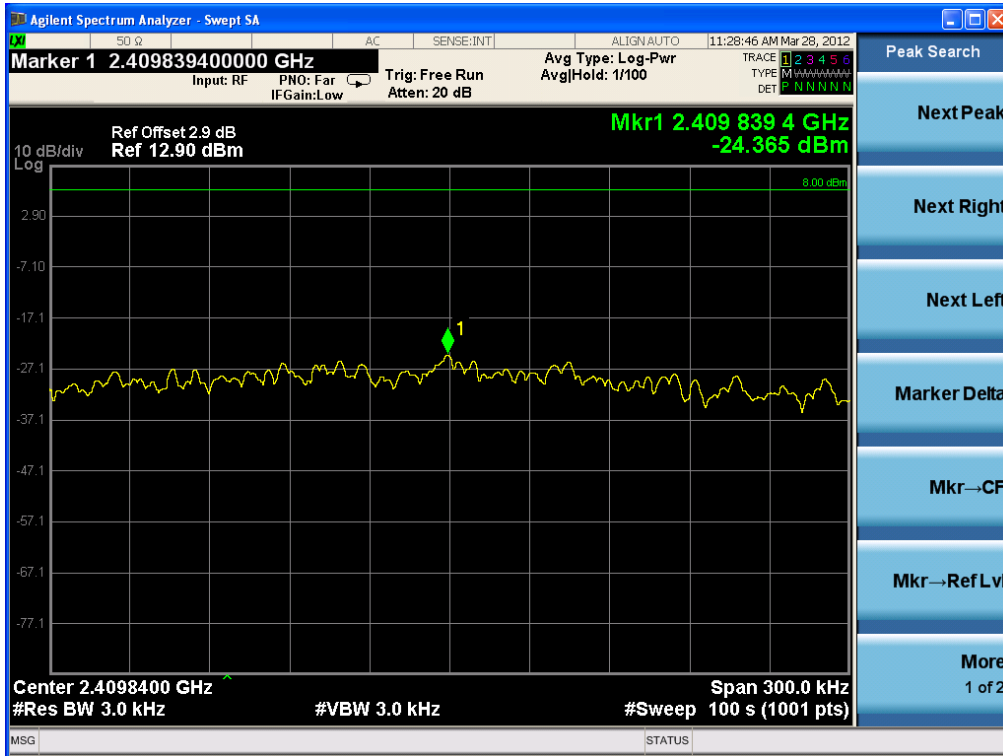
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## 802.11n(20 MHz, Ant0) Power Density Measurement





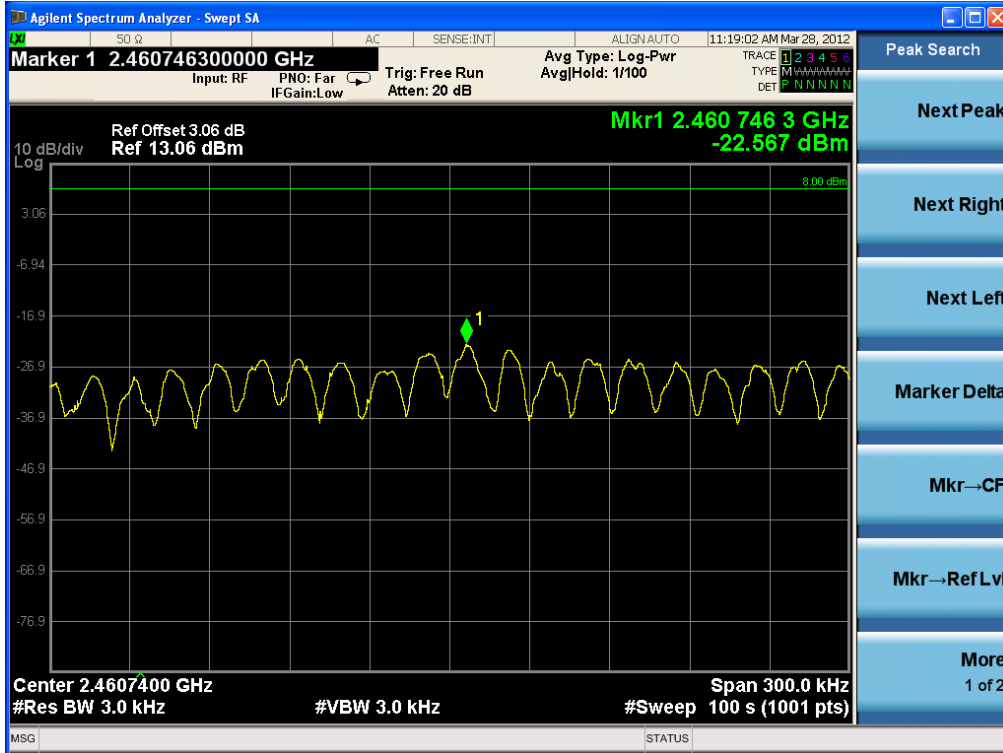
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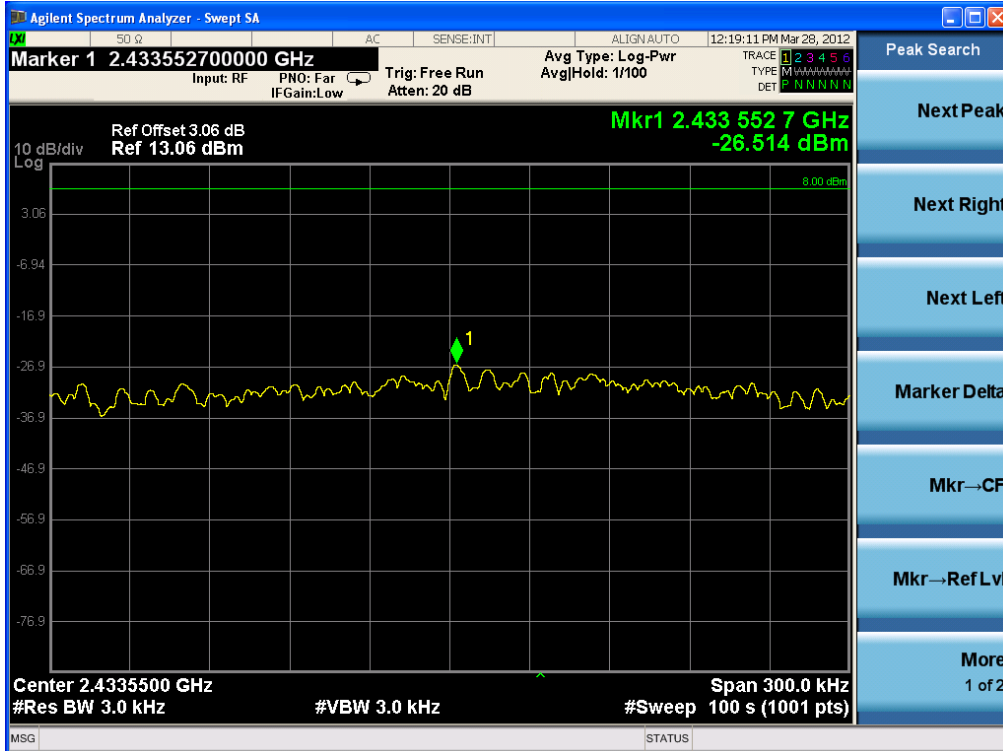
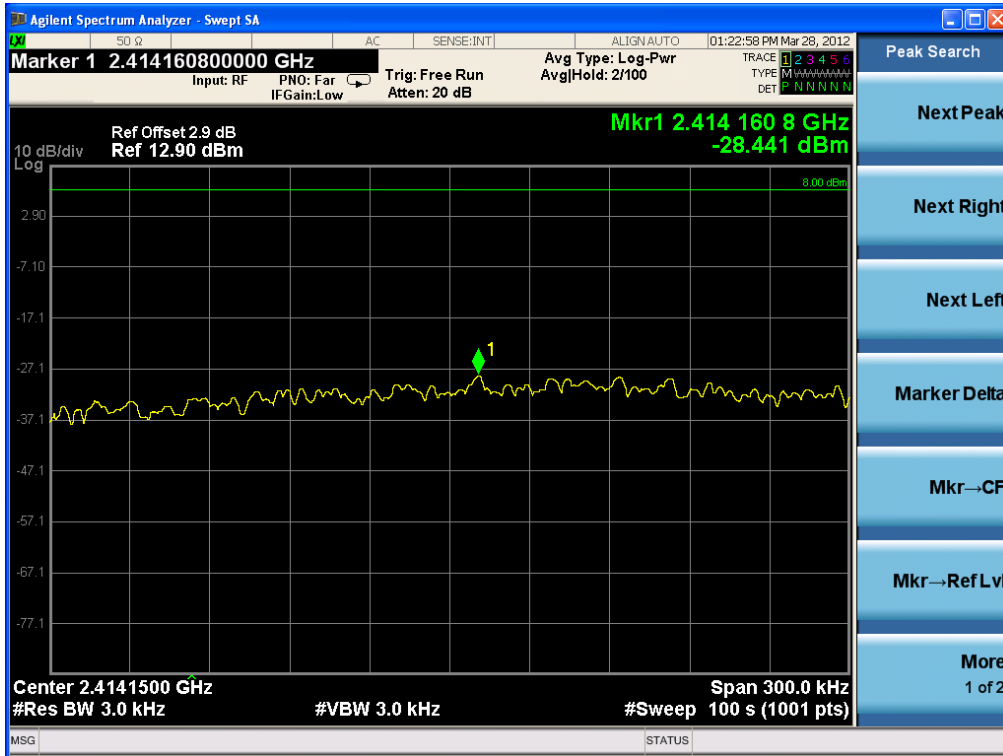
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## 802.11n(40MHz, Ant0) Power Density Measurement





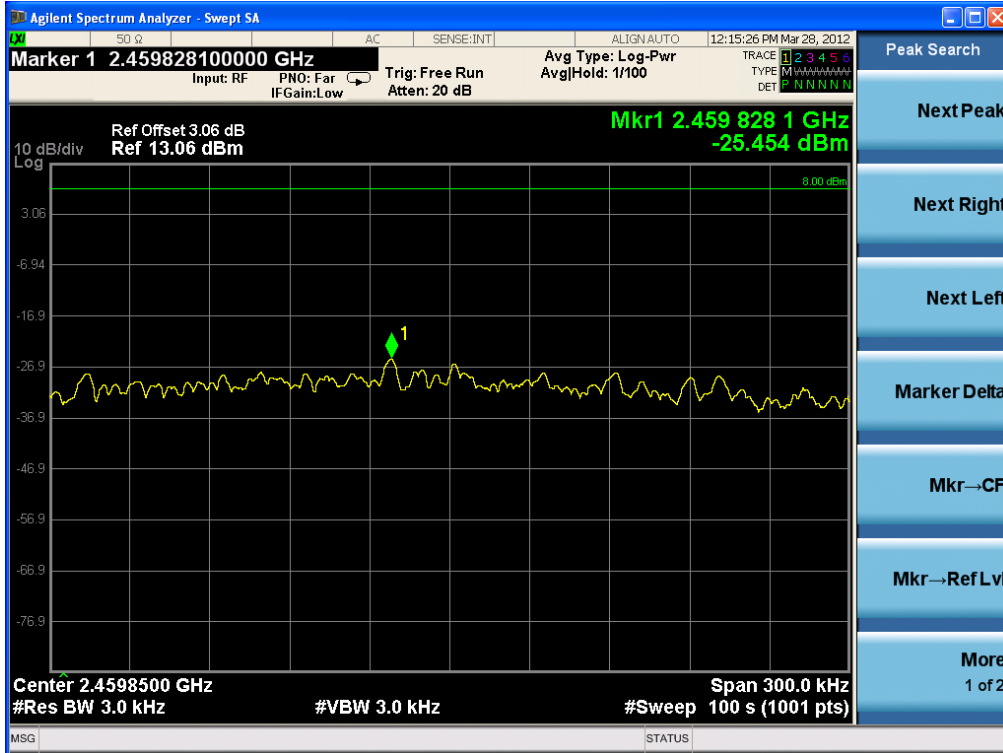
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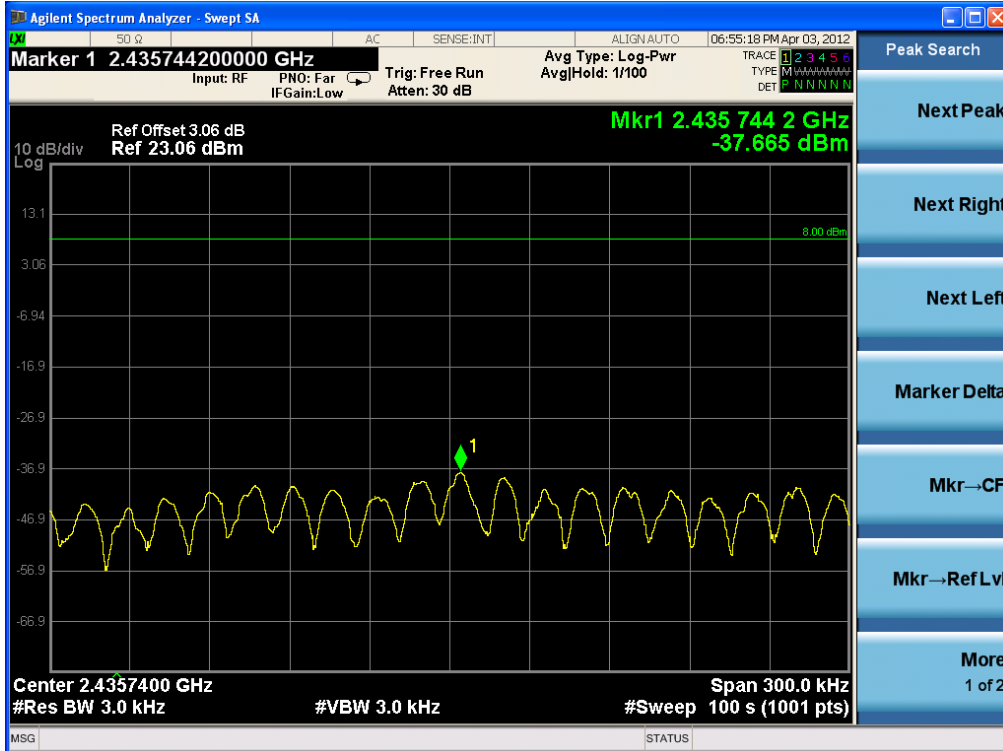
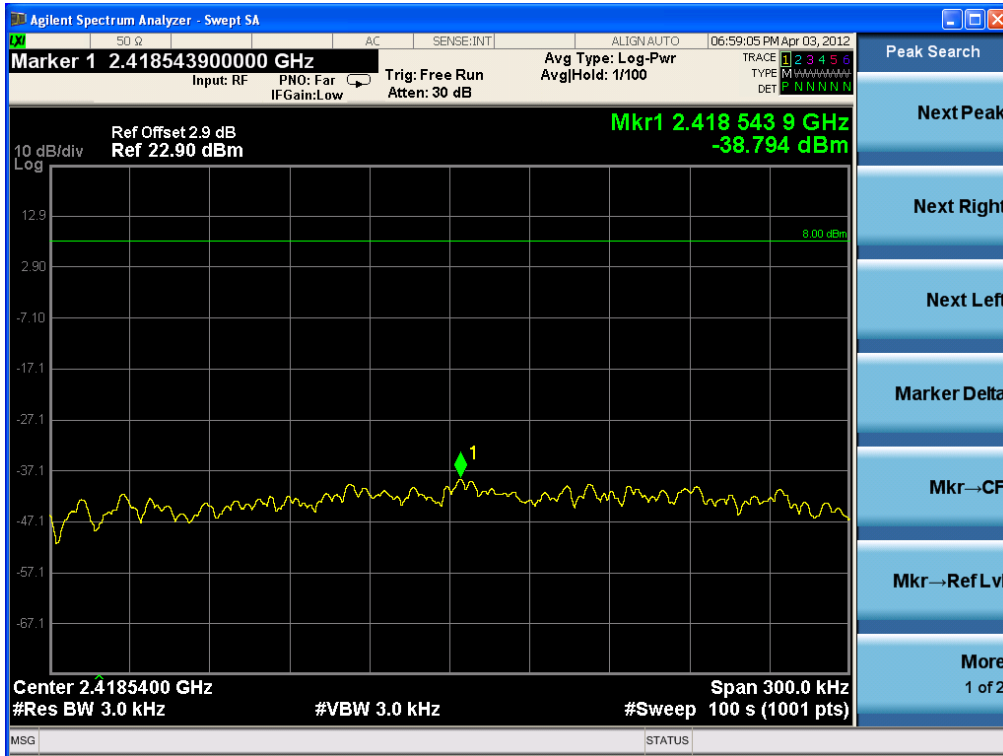
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## 802.11n(20 MHz, Ant1) Power Density Measurement





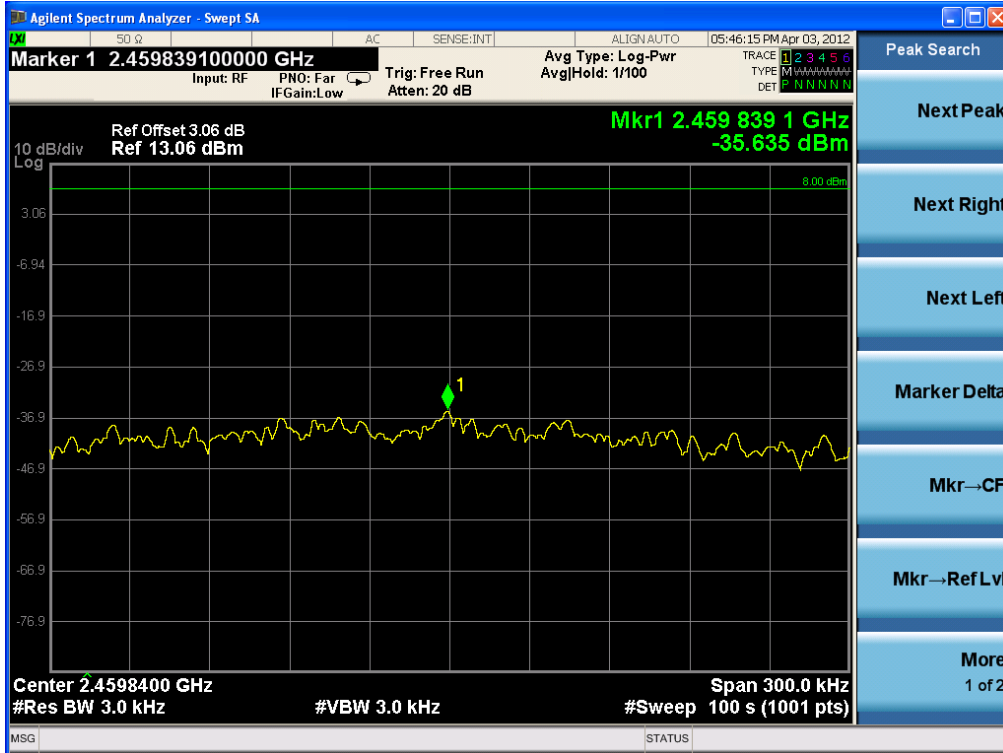
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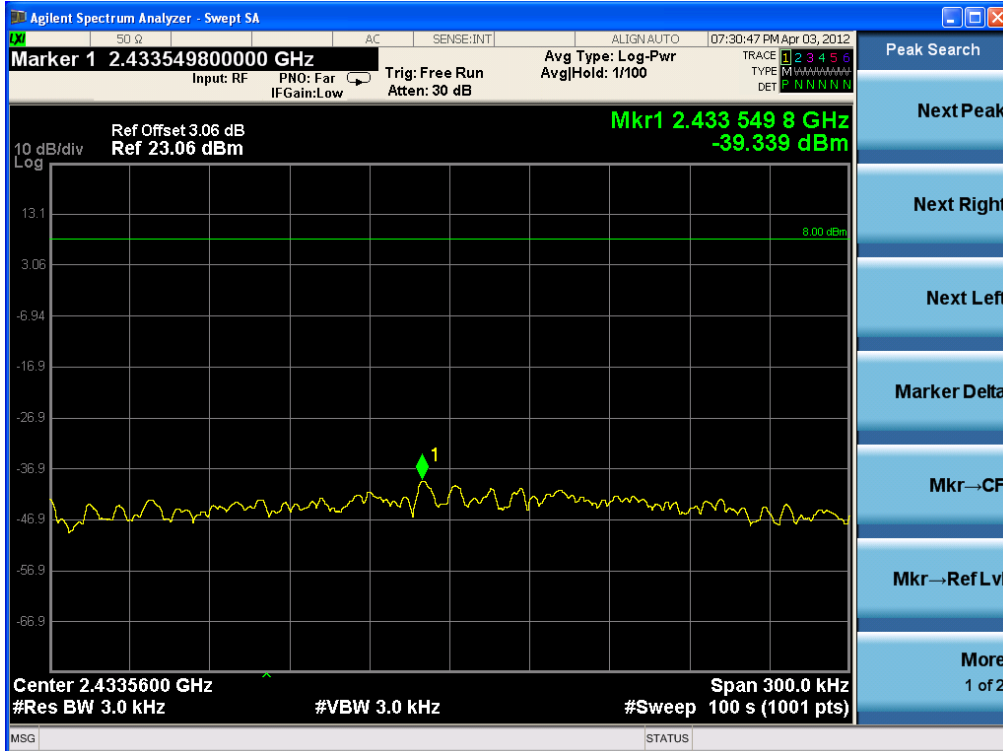
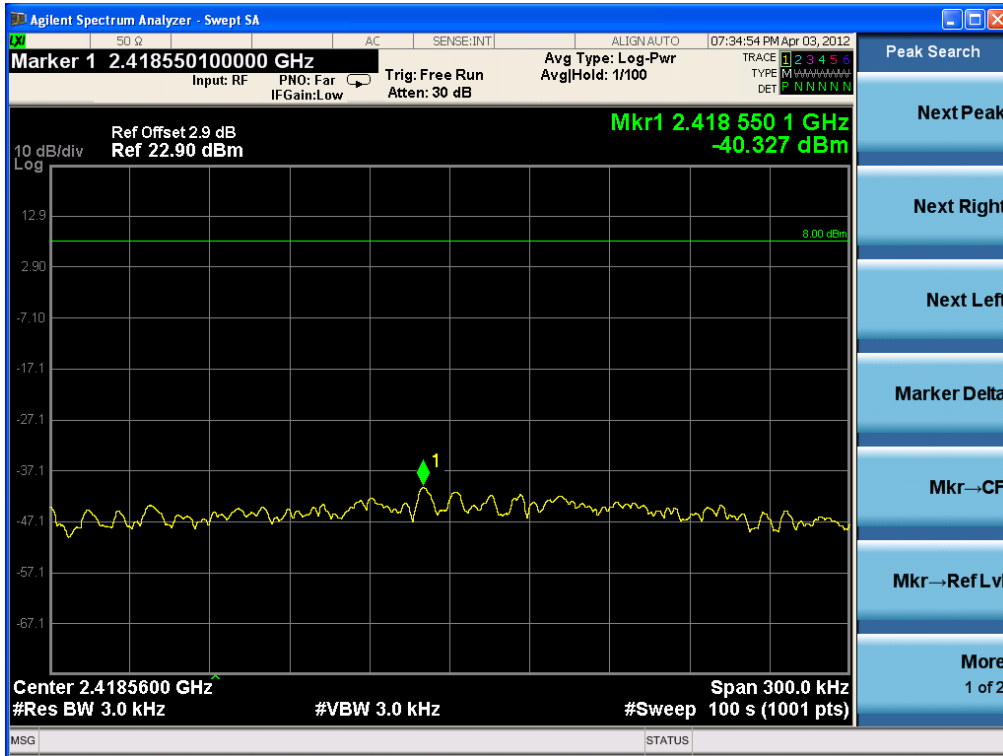
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## 802.11n(40MHz, Ant1) Power Density Measurement





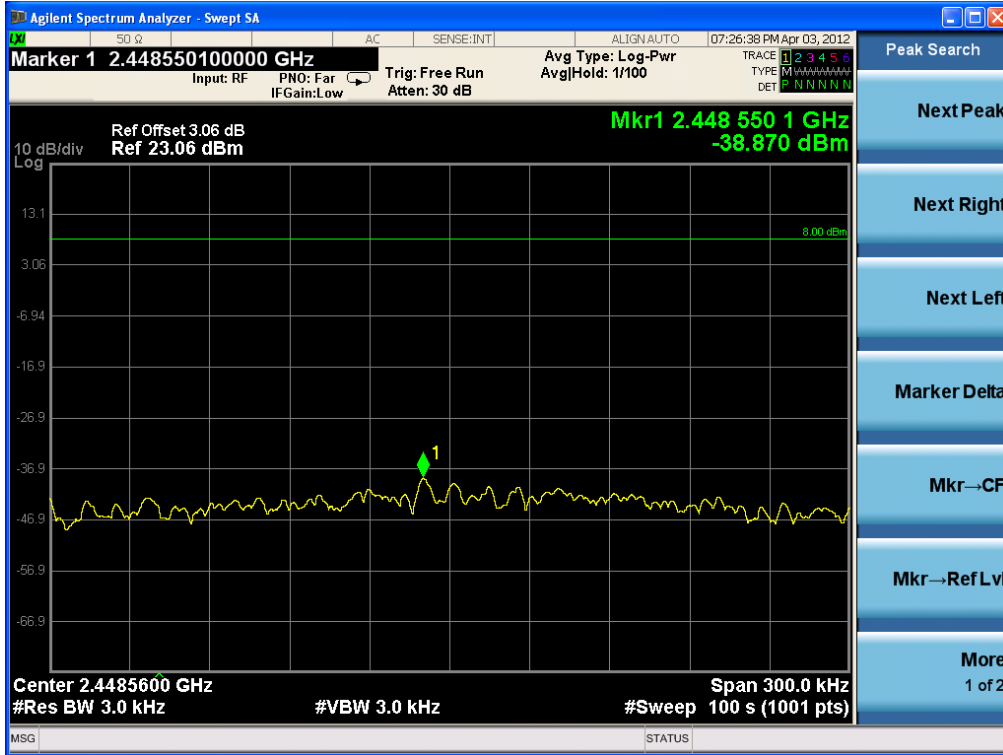
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## 2.1.4 Band - edge

### Procedure:

The bandwidth at 20dB down from the highest inband spectral density is 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 measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 100 kHz

Span = 50 MHz

Detector function = peak

Trace = max hold

Sweep = auto

### Measurement Data: Complies

- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

<b>Minimum Standard:</b>	> 20 dBc
--------------------------	----------

See next pages for actual measured spectrum plots.

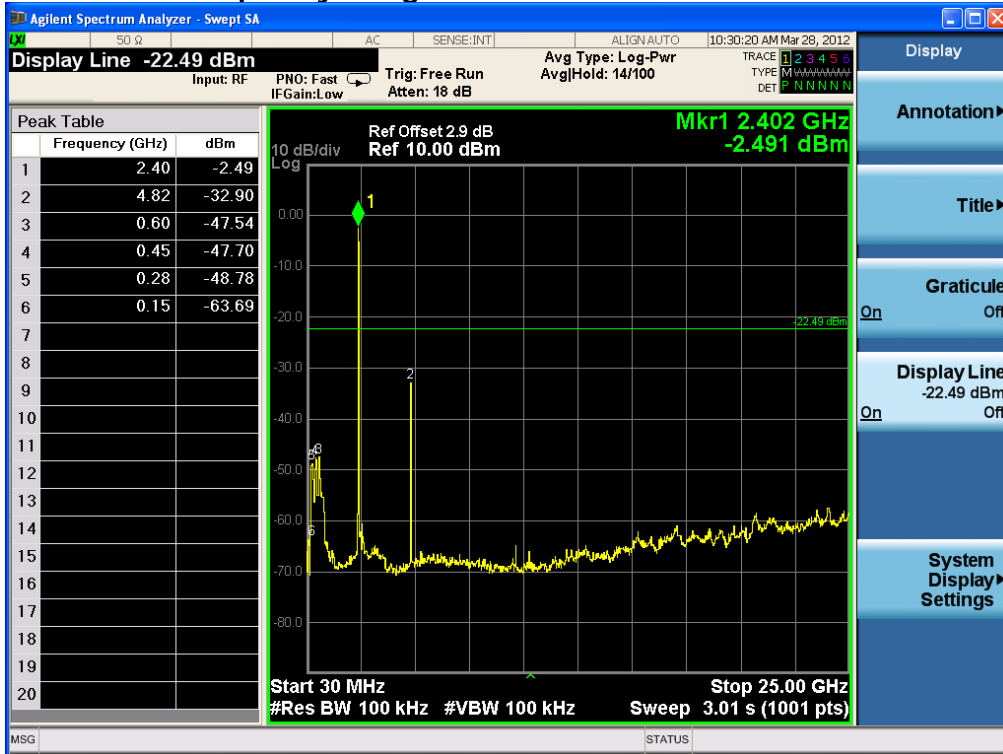
## 802.11b Band-edge Measurements







**Band – edge (at 20 dB blow) – Low channel(802.11b)**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



**Band – edge (at 20 dB blow) – Mid channel(802.11b)**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**





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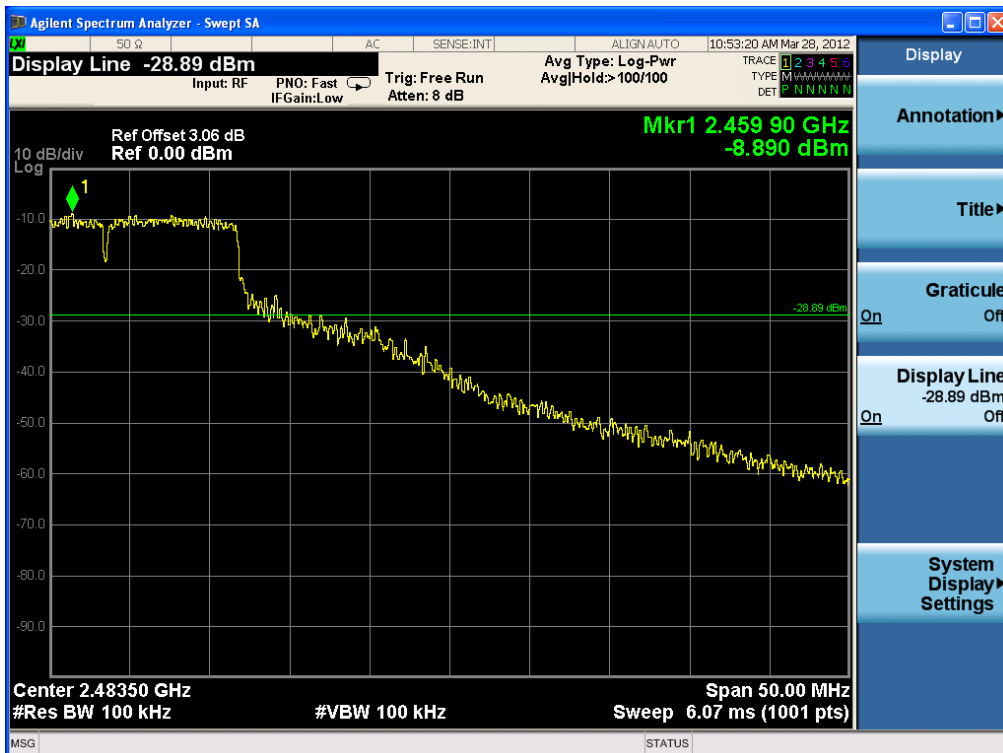
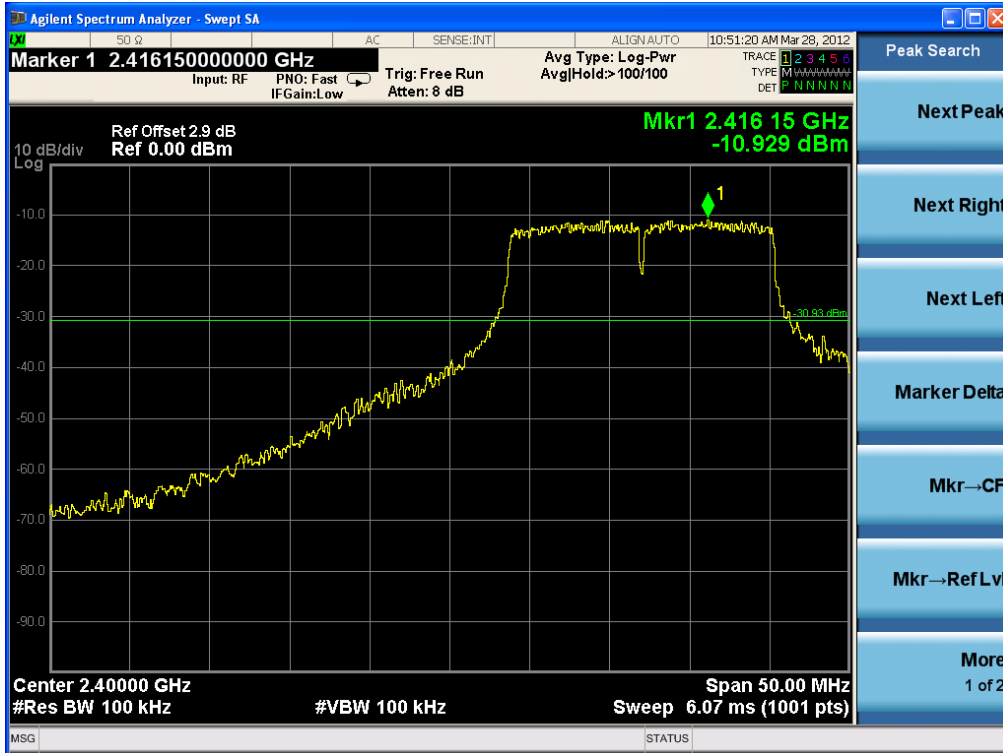
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## Band – edge (at 20 dB blow) – High channel(802.11b) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



## 802.11g Band-edge Measurements





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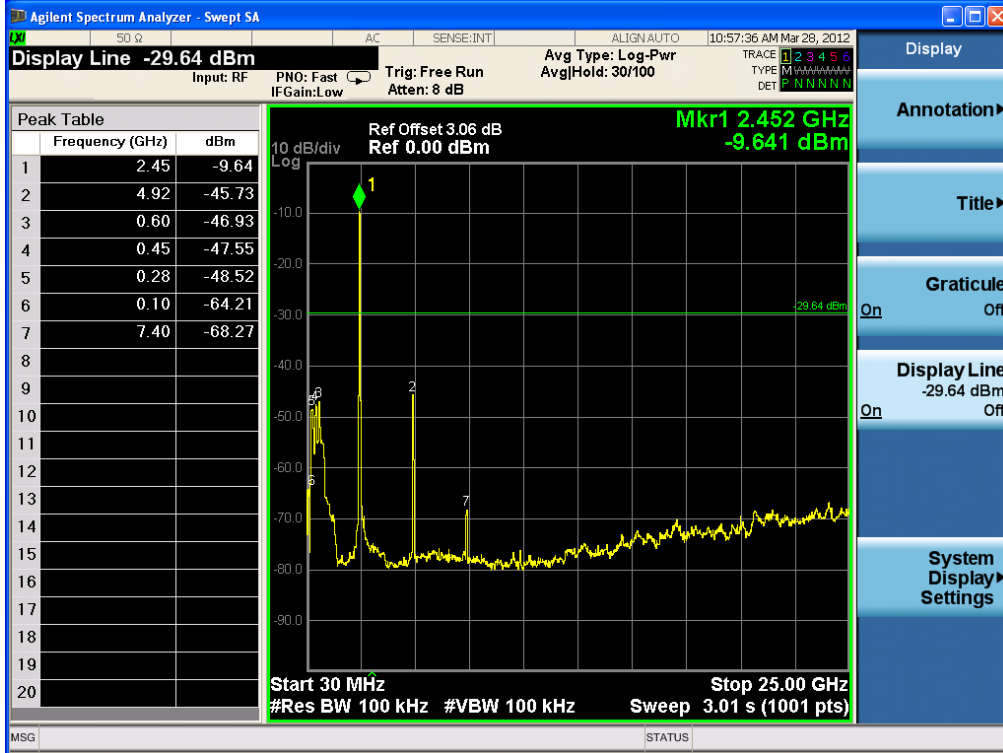
## Band – edge (at 20 dB blow) – Low channel(802.11g) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



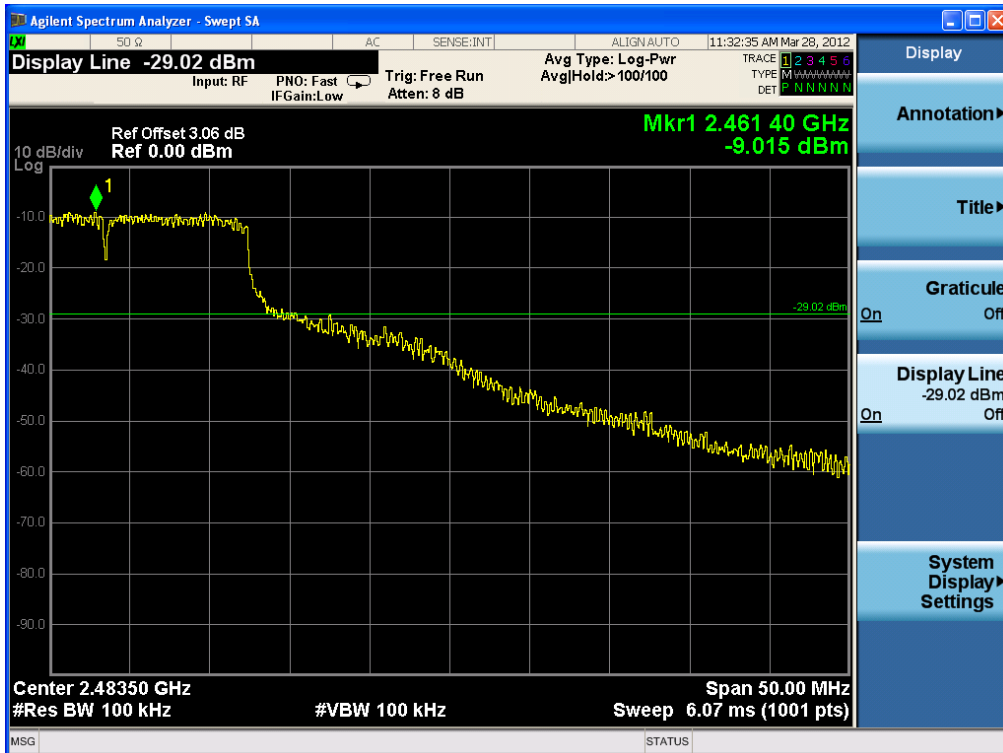
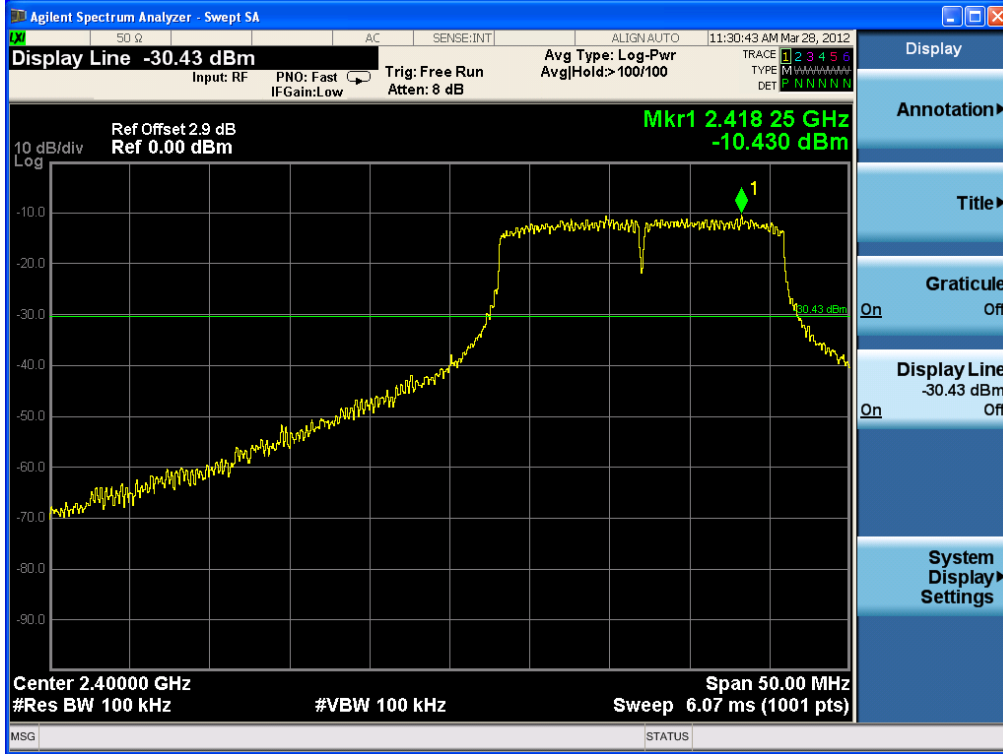
## Band – edge (at 20 dB blow) – Mid channel(802.11g) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



**Band – edge (at 20 dB blow) – High channel(802.11g)  
Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



## 802.11n(20MHz, Ant0) Band-edge Measurements



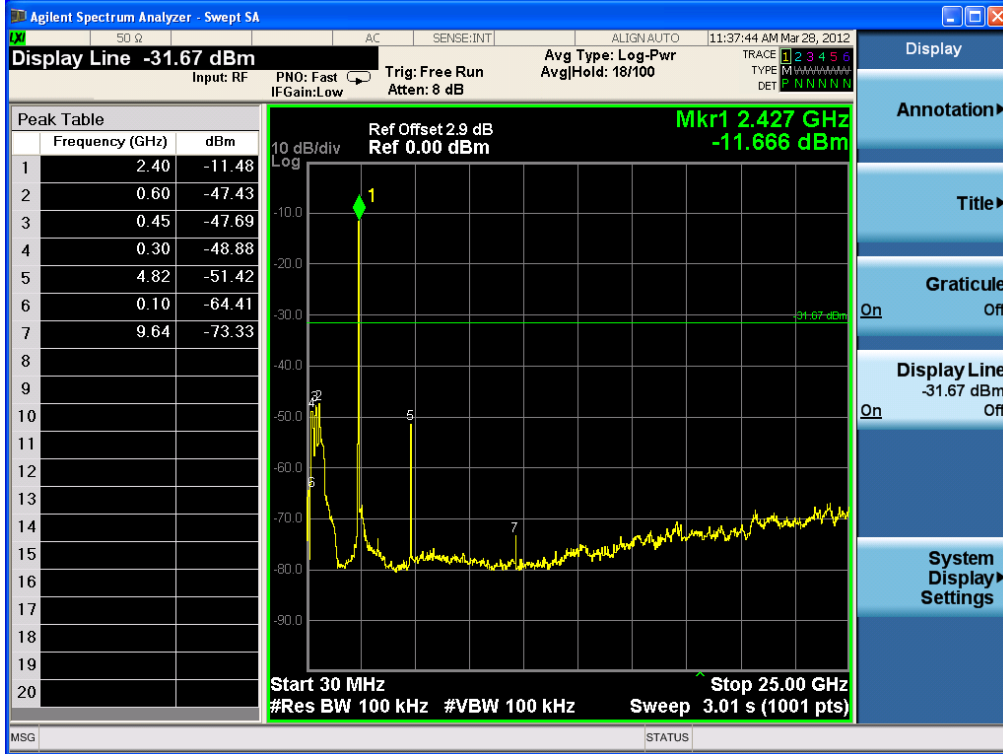


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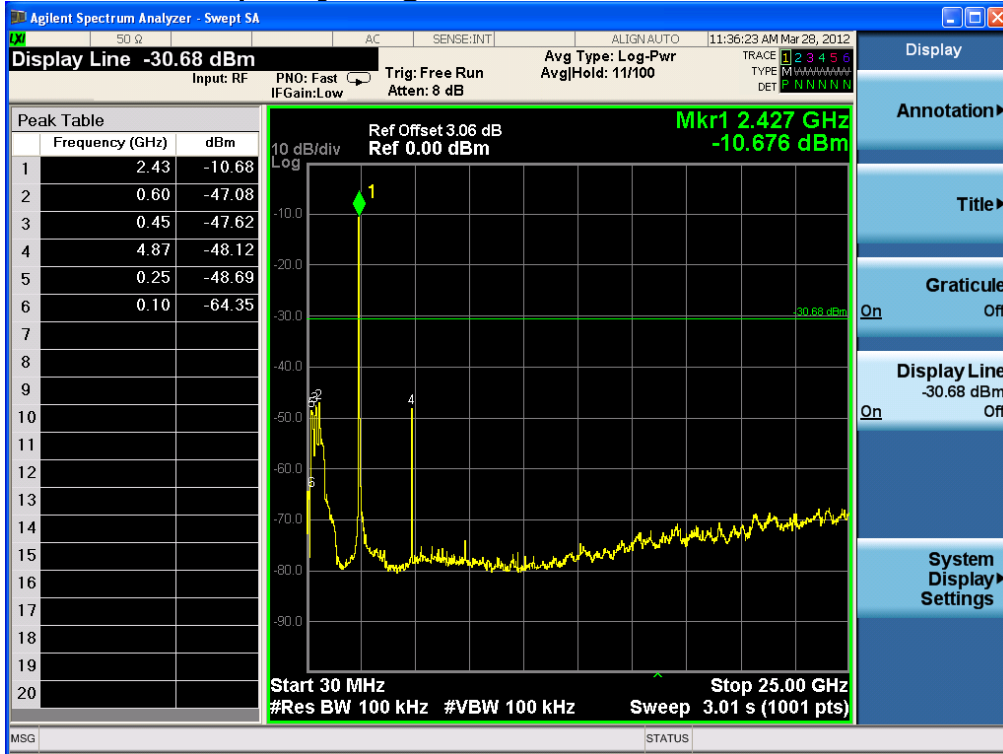
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## Band – edge (at 20 dB blow) – Low channel(802.11n(20MHz, Ant0)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



## Band – edge (at 20 dB blow) – Mid channel(802.11n(20MHz, Ant0)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic





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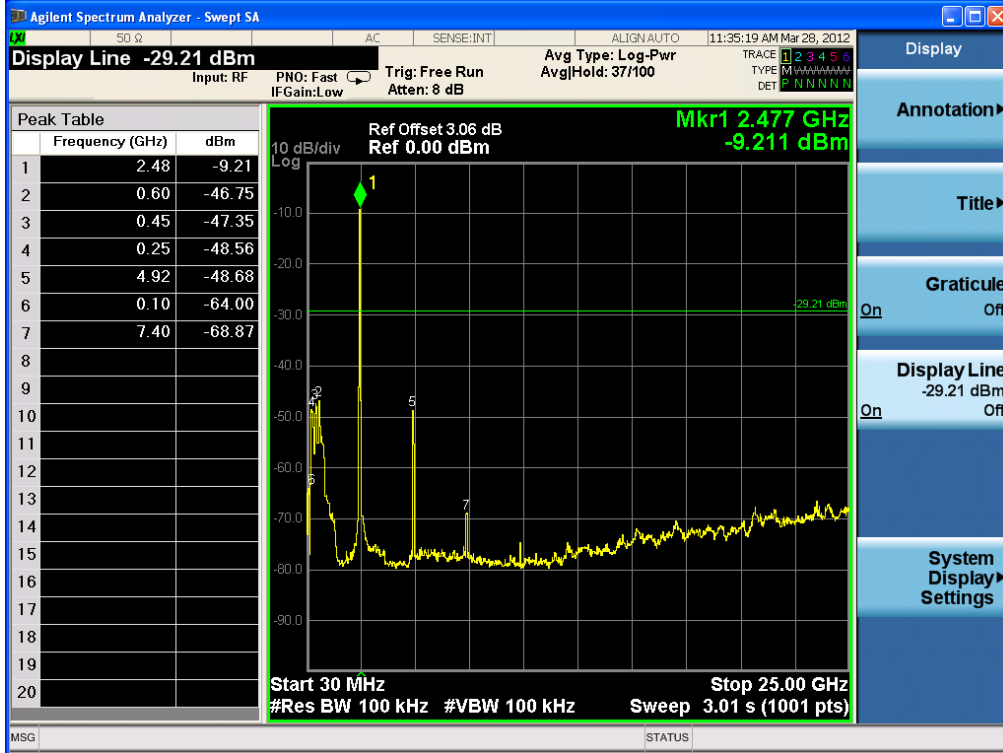
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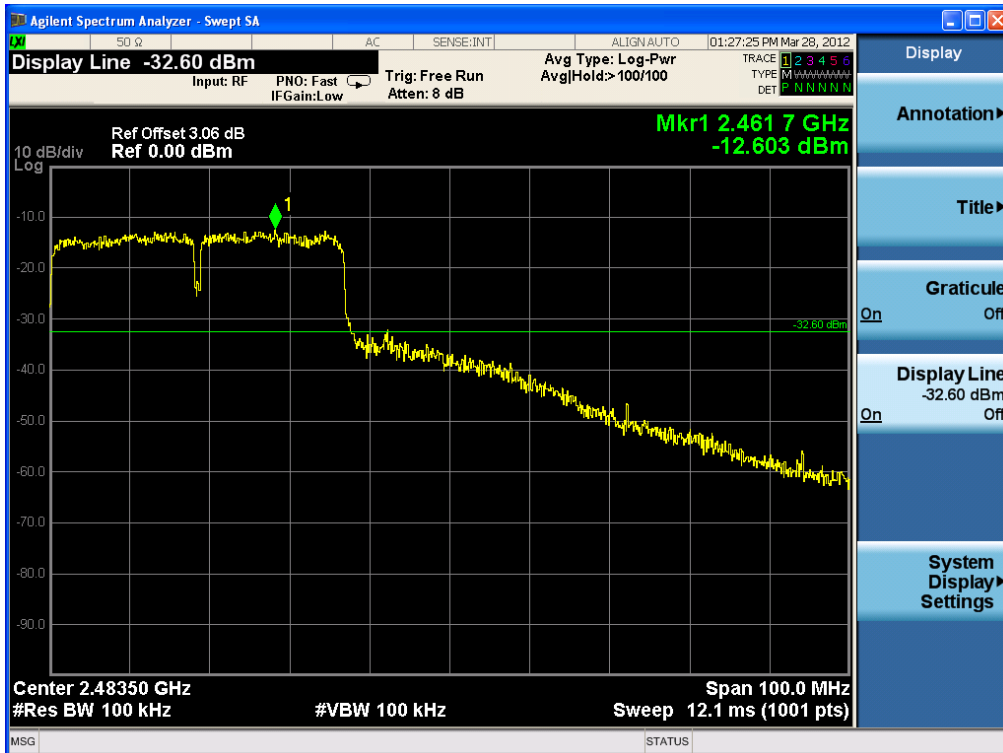
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## Band – edge (at 20 dB blow) – High channel(802.11n(20MHz, Ant0)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic





## 802.11n(40MHz, Ant0) Band-edge Measurements





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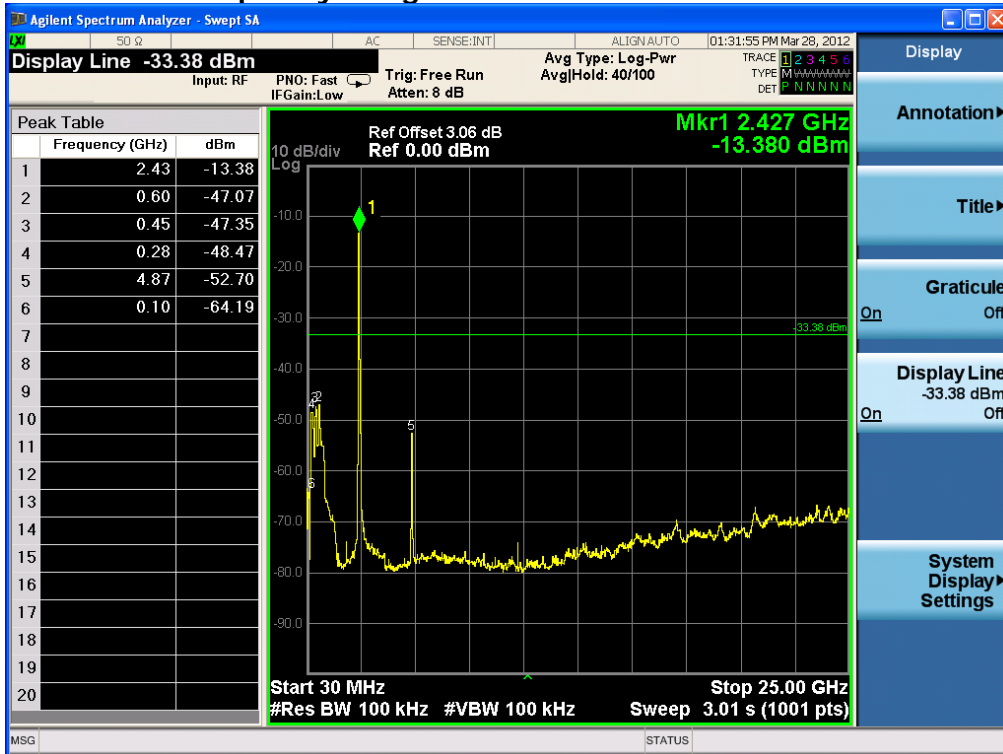
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## Band – edge (at 20 dB blow) – Low channel(802.11n(40MHz, Ant0)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



## Band – edge (at 20 dB blow) – Mid channel(802.11n(40MHz, Ant0)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic





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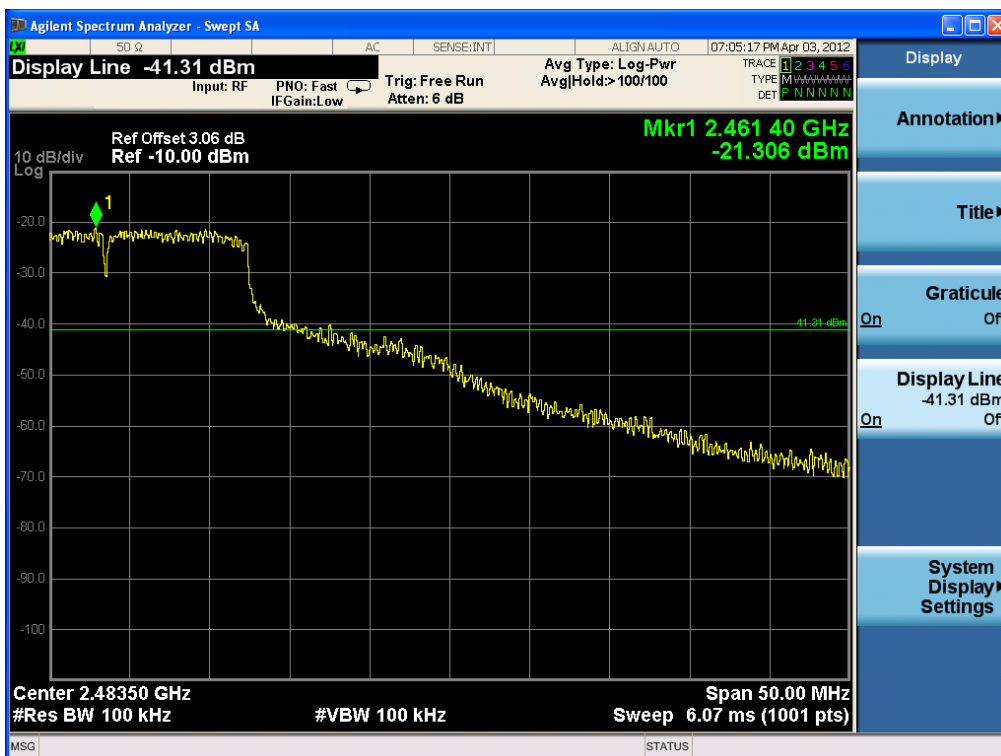
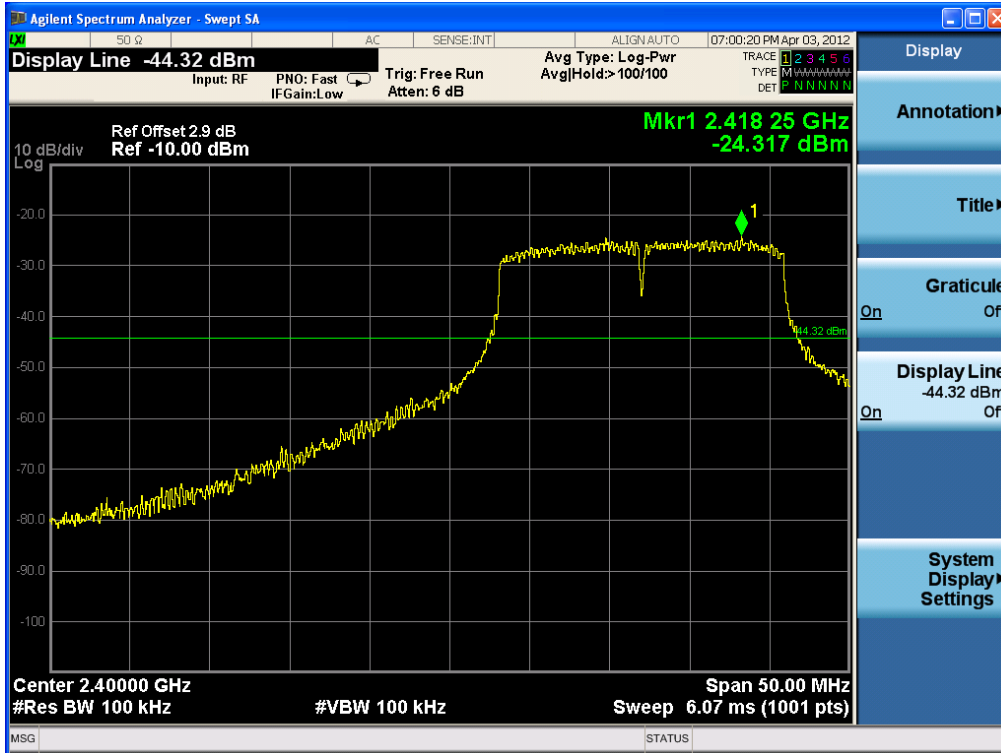
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## Band – edge (at 20 dB blow) – High channel(802.11n(40MHz, Ant0)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



## 802.11n(20MHz, Ant1) Band-edge Measurements



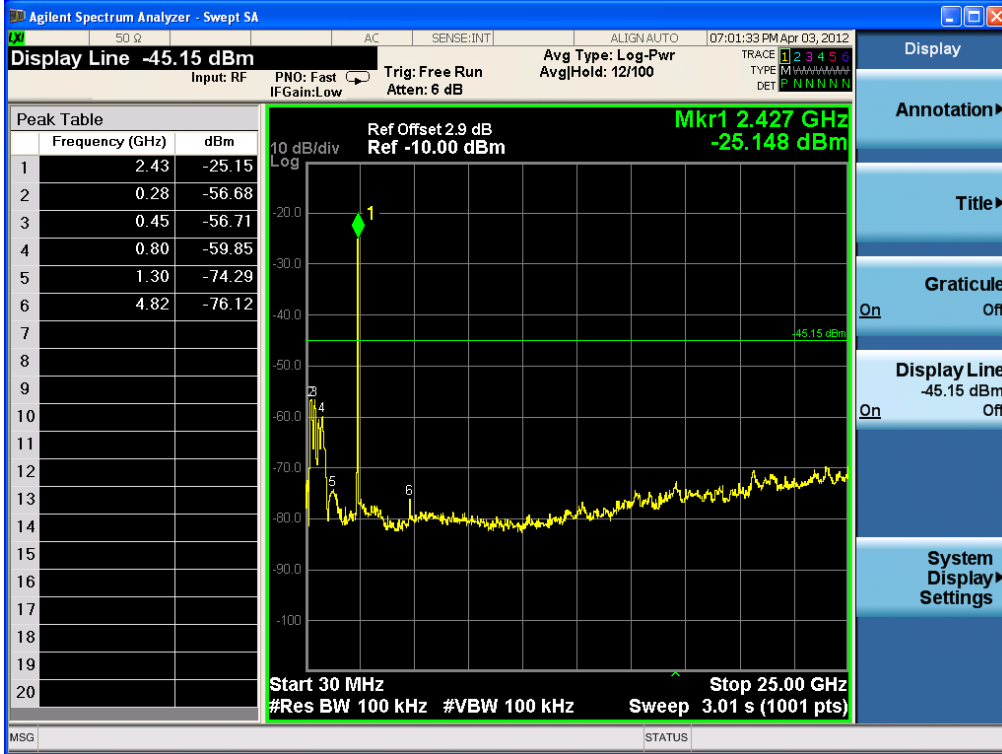


# CTK Co., Ltd.

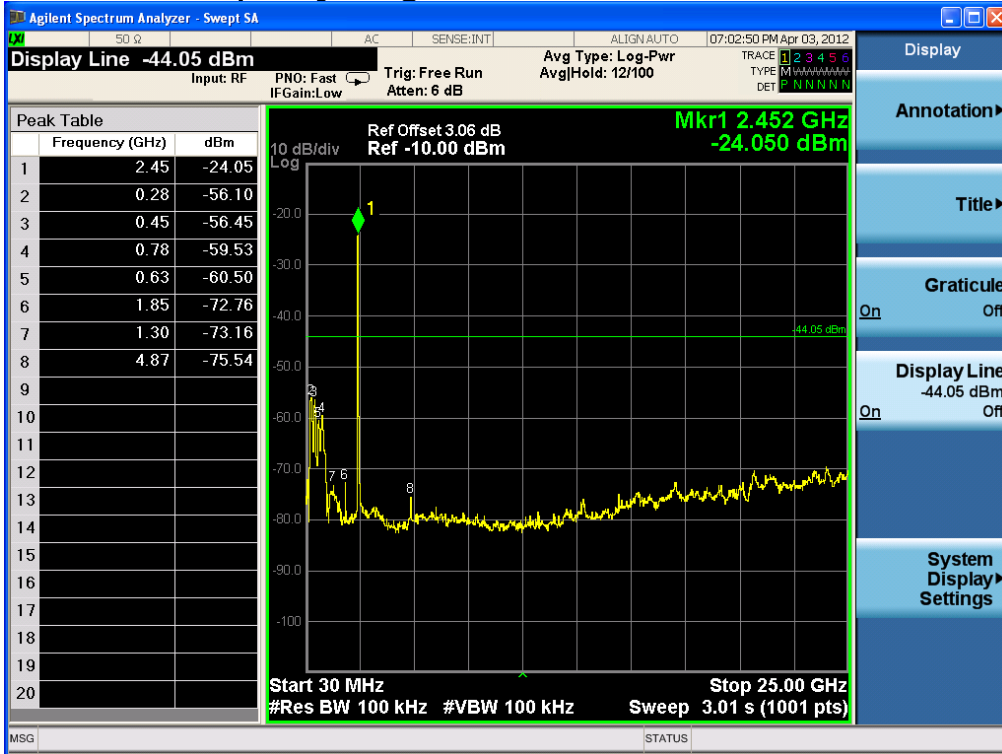
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## Band – edge (at 20 dB blow) – Low channel(802.11n(20MHz, Ant1)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



## Band – edge (at 20 dB blow) – Mid channel(802.11n(20MHz, Ant1)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



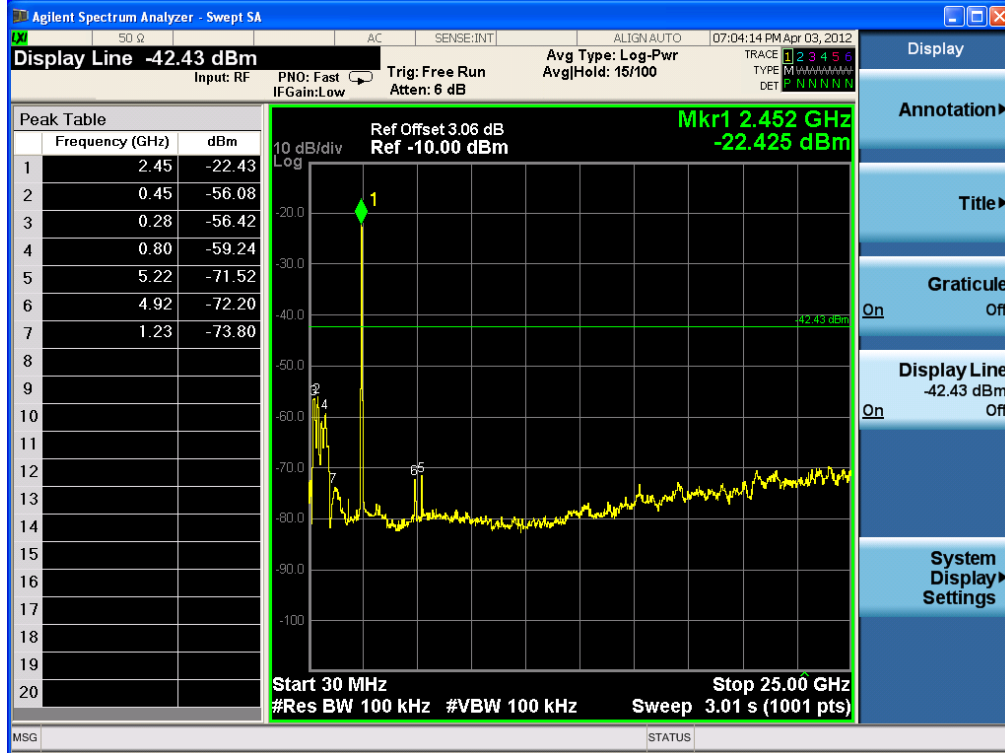


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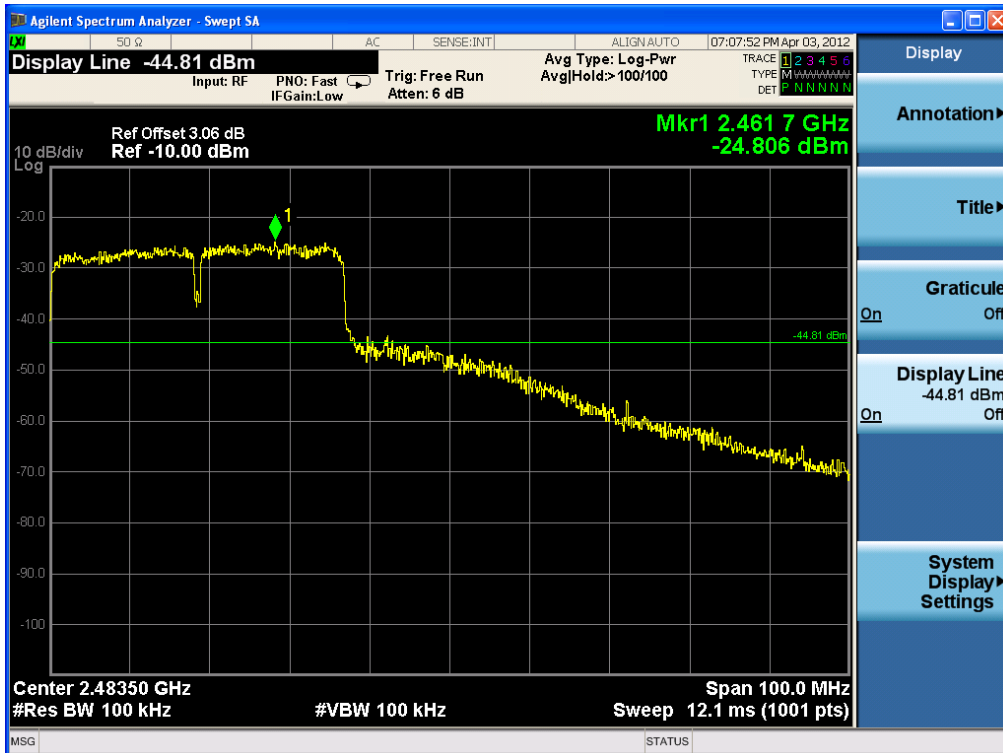
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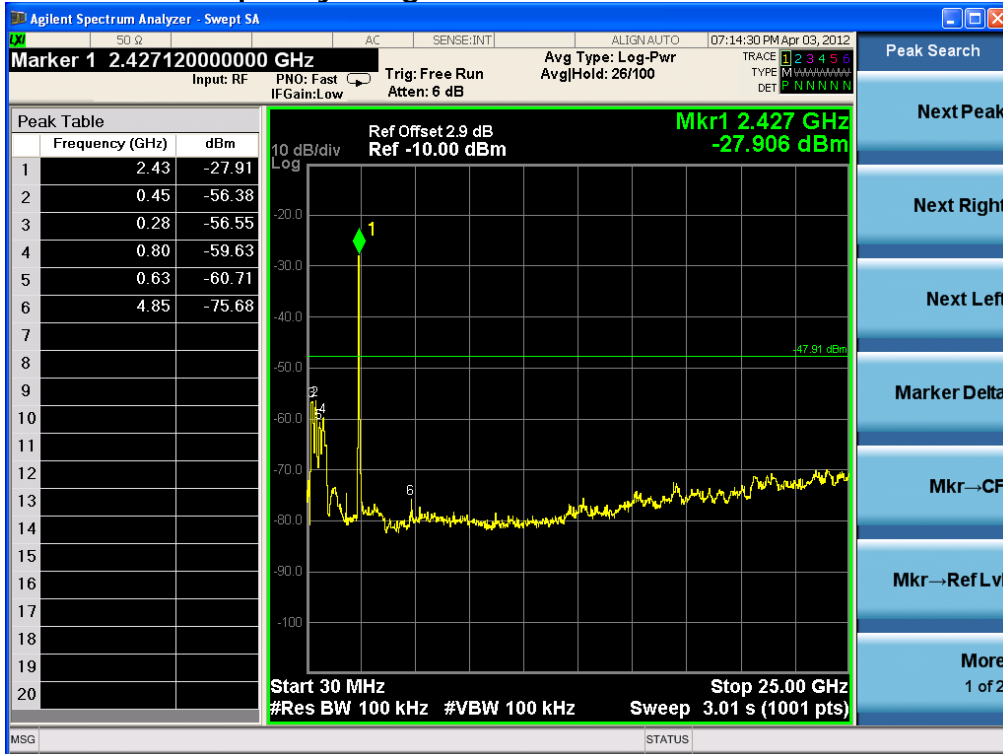
## Band – edge (at 20 dB blow) – High channel(802.11n(20MHz, Ant1)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



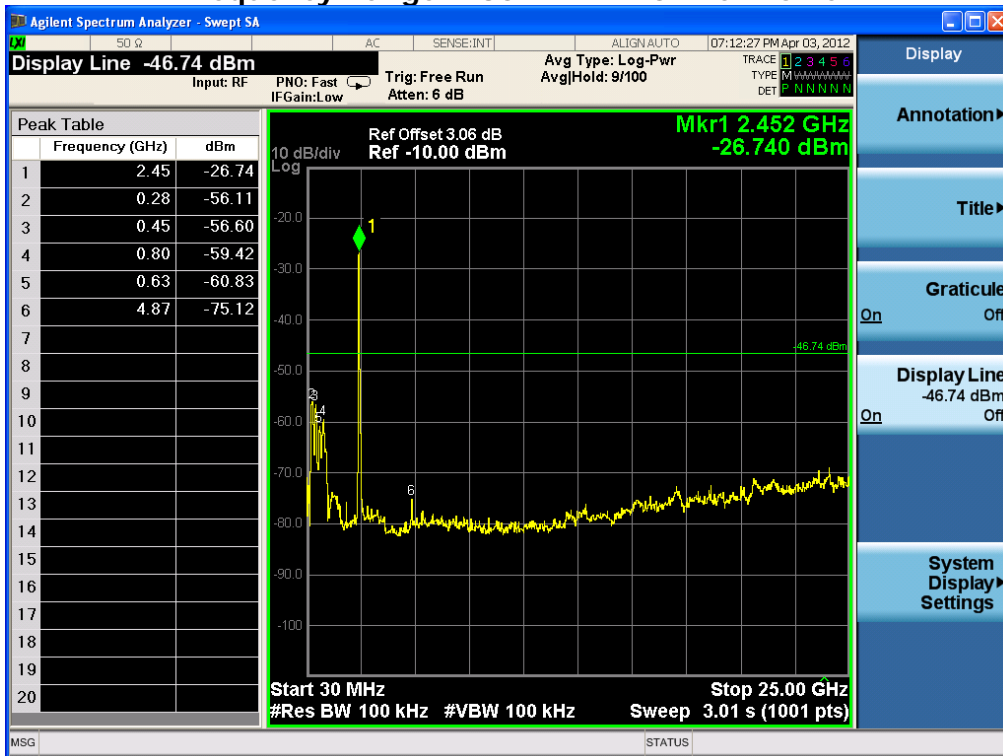
## 802.11n(40MHz, Ant1) Band-edge Measurements



**Band – edge (at 20 dB blow) – Low channel(802.11n(40MHz, Ant1))**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



**Band – edge (at 20 dB blow) – Mid channel(802.11n(40MHz, Ant1))**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**







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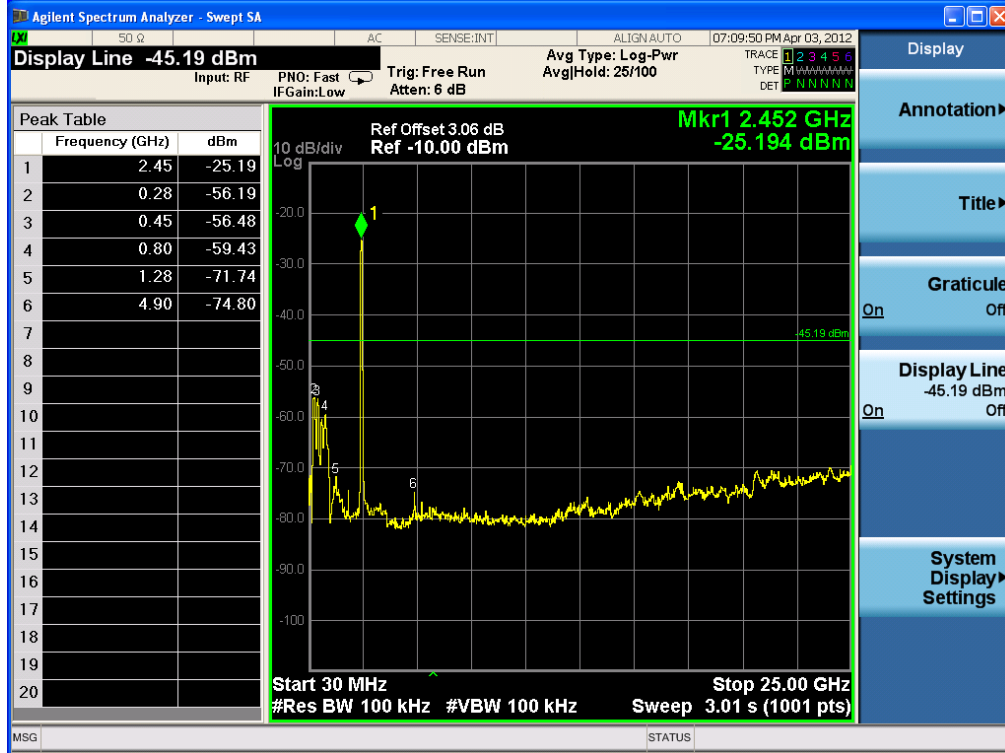
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## Band – edge (at 20 dB blow) – High channel(802.11n(40MHz, Ant1)) Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic



## 2.1.5 Field Strength of Emissions

### Test Location

Testing was performed at a test distance of 3 meter SAC

### Test Procedures

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity. The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic

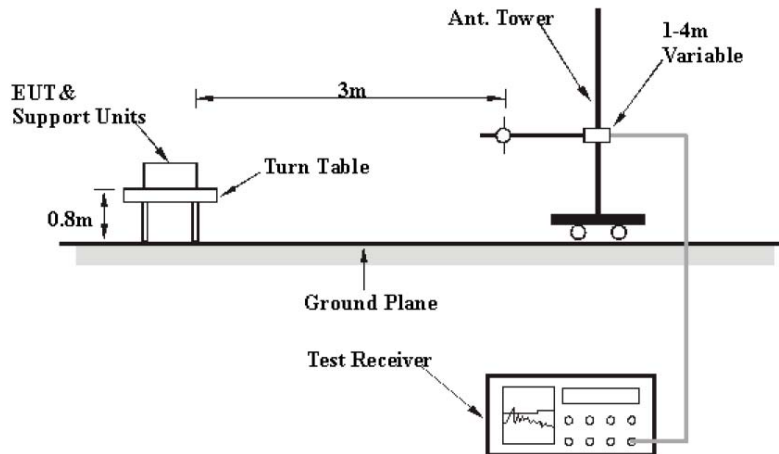
RBW = 120 kHz (30 MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10<sup>th</sup> harmonic)

Span = 100 MHz

Detector function = Quasi-peak

Trace = max hold



### Limit

#### - 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m
30-88	100**	40
88-216	150**	43.5
216-960	200**	46
Above 960	500	54

\*\* Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.



## Test Results

### Test mode : 802.11b

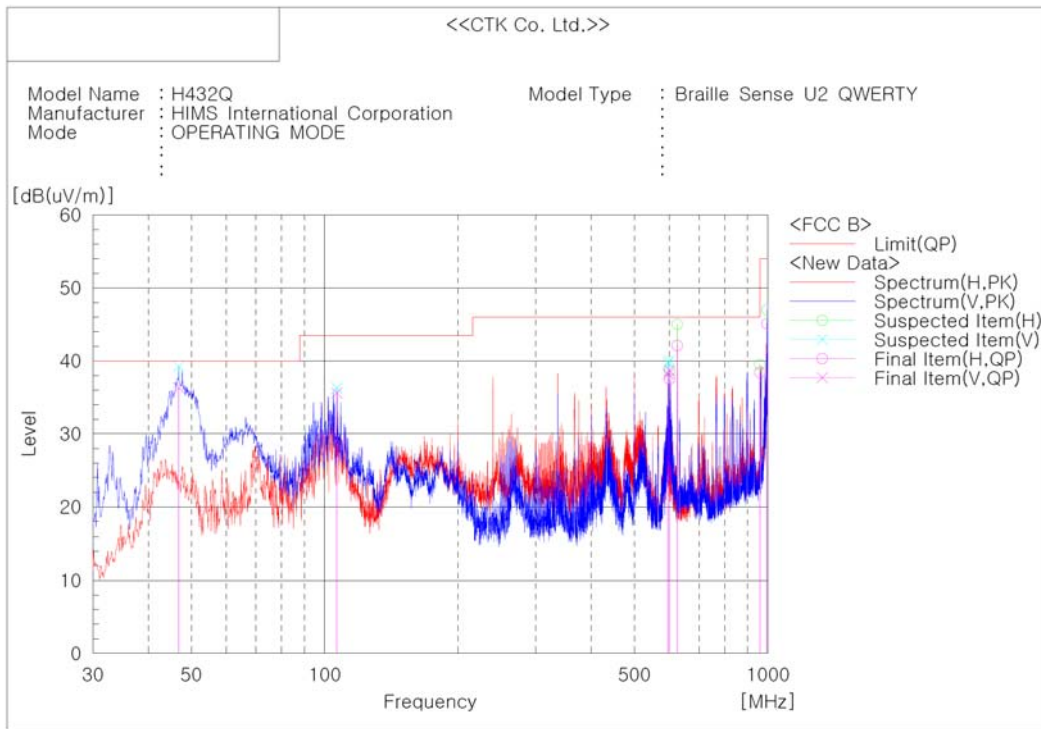
EUT	Braille Sense U2 QWERTY	Measurement Detail	
Model	H432Q	Frequency Range	Below 1000MHz
Mode	802.11b(Worst Case)	Detector function	Quasi-Peak

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
46.854	36.3	3.7	Quasi-peak

### Test Data



#### Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	46.854	V	55.7	-19.4	36.3	40.0	3.7	100.0	253.0
2	106.630	V	53.9	-18.3	35.6	43.5	7.9	100.0	66.0
3	596.238	V	45.4	-7.2	38.2	46.0	7.8	100.0	178.0
4	599.996	V	45.9	-7.2	38.7	46.0	7.3	100.0	66.0
5	600.118	H	44.7	-7.2	37.5	46.0	8.5	207.0	290.0
6	624.974	H	48.3	-6.2	42.1	46.0	3.9	207.0	290.0
7	959.987	H	37.9	0.5	38.4	46.0	7.6	100.0	278.0
8	996.241	H	43.2	1.9	45.1	54.0	8.9	207.0	104.0

#### Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.



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## Test Results

EUT	Braille Sense U2 QWERTY	Measurement Detail	
Model	H432Q	Frequency Range	1-25GHz
Channel	Low Channel	Detector function	Peak

### Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2390	47.8	6.2	Average

### Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	25.5	34.4	V	1.1	29.9	35.5	9.1	54.0	74.0	29.0	37.9	25.0	36.1

### Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	25.3	34.6	V	1.1	29.9	35.5	9.1	54.0	74.0	28.8	38.1	25.2	35.9

### Test Data – 802.11n(20 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	25.6	34.2	V	1.1	29.9	35.5	9.1	54.0	74.0	29.1	37.7	24.9	36.3

### Test Data – 802.11n(40 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	24.8	34.3	V	1.1	29.9	35.5	9.1	54.0	74.0	28.3	37.8	25.7	36.2



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## Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

### Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
2387.00	46.9	56.3	V	1.1	28.2	35.3	7.4	54.0	74.0	47.2	56.6	6.8	17.4

### Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
2390.00	46.0	61.2	V	1.1	28.2	35.3	7.4	54.0	74.0	46.3	61.5	7.7	12.5

### Test Data - 802.11n(20 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
2390.00	47.5	62.8	V	1.1	28.2	35.3	7.4	54.0	74.0	47.8	63.1	6.2	10.9

### Test Data - 802.11n(40 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
2390.00	45.3	59.7	V	1.1	28.2	35.3	7.4	54.0	74.0	45.6	60.0	8.4	14.0



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## Test Results

EUT	Braille Sense U2 QWERTY	Measurement Detail	
Model	H432Q	Frequency Range	1-25GHz
Channel	Mid Channel	Detector function	Peak

### Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
3180	29.1	24.9	Average

### Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
3180.00	25.7   35.0	V	1.1	29.9	35.5	9.1	54.0   74.0	29.2   38.5	24.8   35.5

### Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
3180.00	25.6   34.1	V	1.1	29.9	35.5	9.1	54.0   74.0	29.1   37.6	24.9   36.4

### Test Data – 802.11n(20 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
3180.00	25.2   34.7	V	1.1	29.9	35.5	9.1	54.0   74.0	28.7   38.2	25.3   35.8

### Test Data – 802.11n(40 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
3180.00	24.8   34.5	V	1.1	29.9	35.5	9.1	54.0   74.0	28.3   38.0	25.7   36.0



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## Test Results

EUT	Braille Sense U2 QWERTY	Measurement Detail	
Model	H432Q	Frequency Range	1-25GHz
Channel	High Channel	Detector function	Peak

### Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2483.5	46.4	7.6	Average

### Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	25.1	33.7	V	1.1	29.9	35.5	9.1	54.0	74.0	28.6	37.2	25.4	36.8

### Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	25.7	34.4	V	1.1	29.9	35.5	9.1	54.0	74.0	29.2	37.9	24.8	36.1

### Test Data – 802.11n(20 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	25.4	34.8	V	1.1	29.9	35.5	9.1	54.0	74.0	28.9	38.3	25.1	35.7

### Test Data – 802.11n(40 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m]		Pol.	Height [m]	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV	Peak			Antenna	Amp. Gain	Cable	AV	Peak	AV	Peak	AV	Peak
3180.00	25.0	34.7	V	1.1	29.9	35.5	9.1	54.0	74.0	28.5	38.2	25.5	35.8



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## Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

### Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
2483.50	43.9 ..... 54.6	V	1.1	28.2	35.3	7.4	54.0 ..... 74.0	44.2 ..... 54.9	9.8 ..... 19.1

### Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
2483.50	44.3 ..... 59.1	V	1.1	28.2	35.3	7.4	54.0 ..... 74.0	44.6 ..... 59.4	9.4 ..... 14.6

### Test Data - 802.11n(20 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
2483.50	45.4 ..... 59.3	V	1.1	28.2	35.3	7.4	54.0 ..... 74.0	45.7 ..... 59.6	8.3 ..... 14.4

### Test Data - 802.11n(40 MHz, Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
2483.50	46.1 ..... 59.5	V	1.1	28.2	35.3	7.4	54.0 ..... 74.0	46.4 ..... 59.8	7.6 ..... 14.2



## 2.1.6 AC Conducted Emissions

### Test Location

Shielded Room

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

### Limit

#### - 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

\* Decreases with the logarithm of the frequency.

### Test Results

The requirements are:

Complies

**Test mode : 802.11b**

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
3.525 000	35.1	10.9	Average



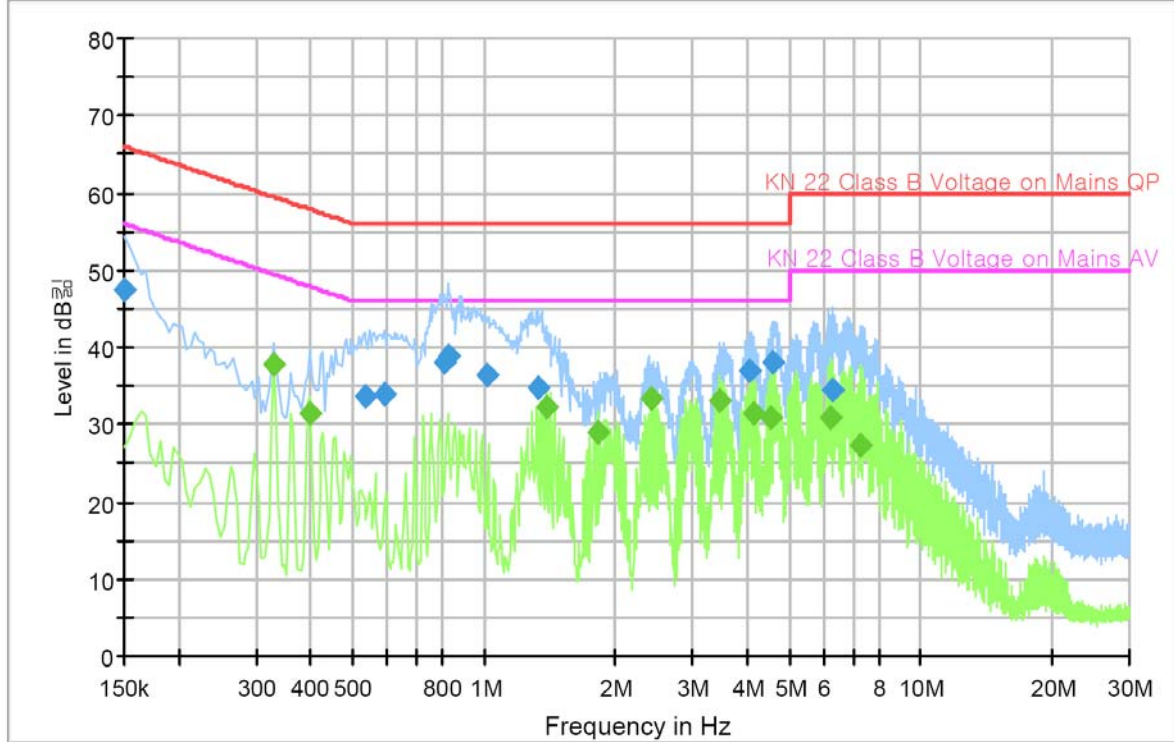
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## Test Data

[HOT]



### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.150000	47.5	1000.0	9.000	On	L1	10.2	18.5	66.0
0.532500	33.6	1000.0	9.000	On	L1	10.0	22.4	56.0
0.591000	33.9	1000.0	9.000	On	L1	10.0	22.1	56.0
0.807000	38.1	1000.0	9.000	On	L1	10.1	17.9	56.0
0.825000	38.9	1000.0	9.000	On	L1	10.1	17.1	56.0
1.014000	36.4	1000.0	9.000	On	L1	10.0	19.6	56.0
1.329000	34.8	1000.0	9.000	On	L1	10.0	21.2	56.0
4.051500	37.1	1000.0	9.000	On	L1	9.8	18.9	56.0
4.560000	38.2	1000.0	9.000	On	L1	9.8	17.8	56.0
6.279000	34.6	1000.0	9.000	On	L1	9.7	25.4	60.0

### Final Result 2

Frequency (MHz)	Average (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.330000	37.7	1000.0	9.000	On	L1	10.0	11.7	49.5
0.397500	31.3	1000.0	9.000	On	L1	10.0	16.6	47.9
1.387500	32.1	1000.0	9.000	On	L1	10.0	13.9	46.0
1.815000	29.0	1000.0	9.000	On	L1	9.9	17.0	46.0
2.409000	33.3	1000.0	9.000	On	L1	9.9	12.7	46.0
3.466500	33.2	1000.0	9.000	On	L1	9.8	12.8	46.0
4.128000	31.3	1000.0	9.000	On	L1	9.8	14.7	46.0
4.524000	30.9	1000.0	9.000	On	L1	9.8	15.1	46.0
6.207000	30.8	1000.0	9.000	On	L1	9.7	19.2	50.0
7.296000	27.2	1000.0	9.000	On	L1	9.7	22.8	50.0



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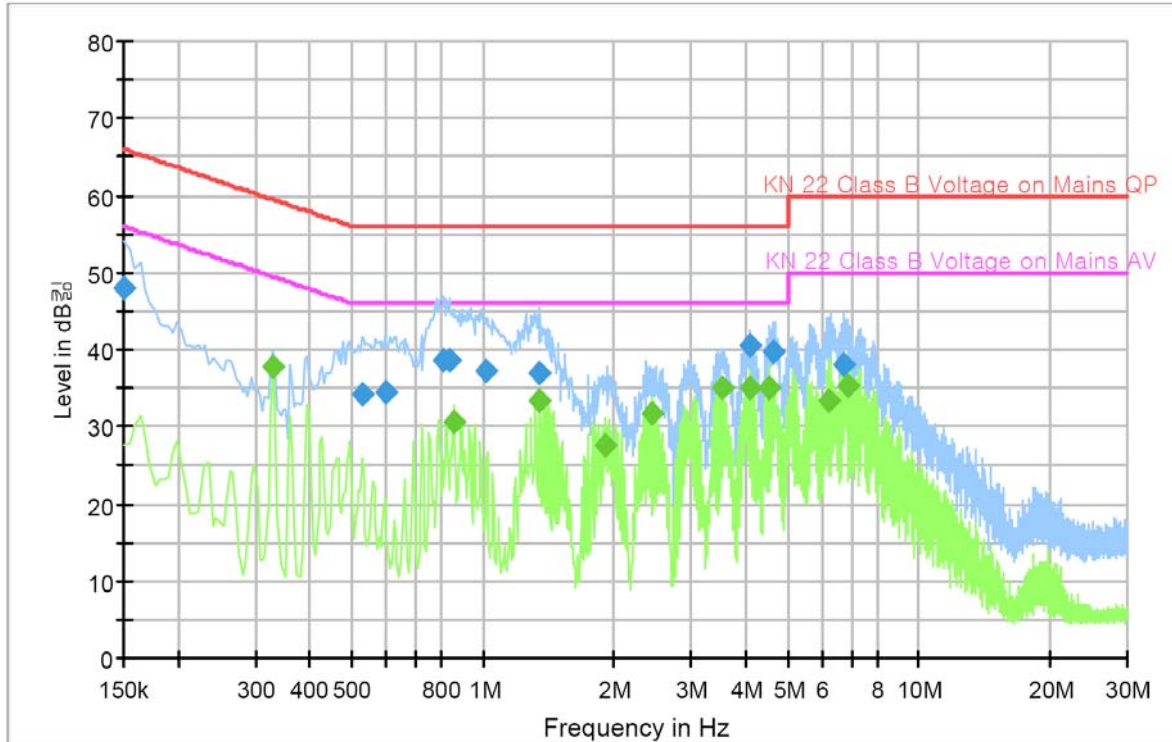
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## [NEUTRAL]



### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	47.9	1000.0	9.000	On	N	10.2	18.1	66.0
0.528000	34.3	1000.0	9.000	On	N	9.9	21.7	56.0
0.595500	34.4	1000.0	9.000	On	N	10.0	21.6	56.0
0.807000	38.5	1000.0	9.000	On	N	10.1	17.5	56.0
0.838500	38.5	1000.0	9.000	On	N	10.1	17.5	56.0
1.018500	37.2	1000.0	9.000	On	N	10.0	18.8	56.0
1.351500	36.9	1000.0	9.000	On	N	10.0	19.1	56.0
4.114500	40.4	1000.0	9.000	On	N	9.8	15.6	56.0
4.614000	39.9	1000.0	9.000	On	N	9.8	16.1	56.0
6.742500	37.9	1000.0	9.000	On	N	9.7	22.1	60.0

### Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.330000	37.9	1000.0	9.000	On	N	10.0	11.5	49.5
0.856500	30.5	1000.0	9.000	On	N	10.0	15.5	46.0
1.351500	33.3	1000.0	9.000	On	N	10.0	12.7	46.0
1.914000	27.6	1000.0	9.000	On	N	9.9	18.4	46.0
2.440500	31.7	1000.0	9.000	On	N	9.9	14.3	46.0
3.525000	35.1	1000.0	9.000	On	N	9.8	10.9	46.0
4.087500	35.1	1000.0	9.000	On	N	9.8	10.9	46.0
4.515000	35.0	1000.0	9.000	On	N	9.8	11.0	46.0
6.229500	33.5	1000.0	9.000	On	N	9.7	16.5	50.0
6.886500	35.3	1000.0	9.000	On	N	9.7	14.7	50.0



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## APPENDIX A – Test Equipment Used For Tests

Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Signal Analyzer	Agilent	N9020A	MY48011598	2012-11-10
Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2012-11-10
EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2012-07-07
ULTRA Broadband Antenna	Rohde & Schwarz	HL562	100203	2013-07-05
LOOP ANTENNA	EMCO	6502	9107-2652	2012-10-29
Attenuator	HP	8494A	3308A33351	2012-11-14
EPM Series Power Meter	HP	E4418A	GB38272734	2012-11-10
Power Sensor	HP	8487A	3318A03524	2012-07-07
Audio Analyzer	HP	8903B	2747A03432	2012-11-10
ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2012-11-21
SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2012-11-10
Modulation Analyzer	HP	8901B	3438A05228	2012-11-18
Attenuator	BIRD	1000-WA-MFN-30	236	2012-11-14
Temp&Humi Chamber	Kunpoong	JT-TH-556-1	9QE5-002	2013-01-12
DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
EMC Analyzer	Agilent	E7405A	MY45110859	2013-02-13
Horn Antenna	ETS-Lindgren	3115	00078894	2013-03-22
Horn Antenna	ETS-Lindgren	3115	00078895	2013-03-22
Antenna(Biconical)	EMCO	3110	9202-1510	2012-06-10
Antenna(Log Periodic)	EMCO	3146	9607-4567	2012-06-10
OPT H64 AMPLIFIER	HP	8447F	3113A06814	2013-03-27
PREAMPLIFIER	Agilent	8449B	3008A02307	2012-11-17
EMI Test Receiver	Rohde & Schwarz	ESHS30	828144/022	2013-02-09
LISN	Rohde & Schwarz	ENV216	101150	2013-02-09
EMI Test Receiver	Rohde & Schwarz	ESCI3	100032	2013-02-09
AC Power Source	California Instruments	2001RP	08770	2013-02-09