



Product Service

## FCC - TEST REPORT

Report Number : **68.850.11.009.01** Date of Issue: 14 April 2011

Model : **310900**

Product Type : MP7 Module

Applicant : ICON Health & Fitness Inc.

Address : 1500 S 1000 W, LOGAN, Utah 84321

Xiamen Fujian, China 361006

Production Facility : Wanlida Group Co., Ltd.

Address : Wanlida Industry Zone, Nanjing, Fujian, China 363601

Test Result :  Positive  Negative

Total pages including Appendices : 66

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## 2 Details about the Test Laboratory

### Details about the Test Laboratory

#### Test site1:

Company name: Jiangsu TÜV Product Service Ltd. – Shenzhen Branch  
6th Floor, H Hall,  
Century Craftwork Culture Square,  
No. 4001, Fuqiang Road,  
Futian District 518048,  
Shenzhen,P.R.C.

Telephone: 86 755 8828 6998

Fax: 86 755 8828 5299

#### Test site2:

Company name: Audix Technology (shenzhen) Co.,Ltd  
Block Shenzhen, Science & Industry Park,  
Nantou, Shenzhen,  
Guangdong,  
China

Telephone: 86 755 2663 9496

Fax: 86 755 2663 2877



### 3 Description of the Equipment Under Test

#### Description of the Equipment Under Test

Product: MP7 Module

Model no.: 310900

Options and accessories: NIL

Rating: DC 12V, 2A  
Test with adaptor:  
Input: AC 100-240V, 50/60Hz, 1A  
Output: DC 12V, 2A

Antenna: Integral antenna inside enclosure of EUT, NOT accessible by end user  
Antenna Gain=1dBi

RF Transmission  
Frequency: 2400-2483.5MHz

Description of the EUT: NIL

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Laptop	Lenovo	X61	L3-L3729 08/03



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## 4 Summary of Test Standards

<b>Test Standards</b>	
Part 15 Subpart C, Oct. 1, 2009	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

**5 Summary of Test Results**

Technical Requirements					
FCC Part 15 Subpart C					
Test Condition	Pages	Test Result			Test Location
		Pass	Fail	N/A	
15.207 Conducted Emission AC Power Port	8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247 (b) (1) Conducted peak output power	12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247(d) Band edge compliance of RF emissions	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247(d) Spurious RF conducted emissions	32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247(d) 15.209 Spurious radiated emissions	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247(a)(2) 6dB bandwidth	46	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247(e) Power spectral density	56	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2



## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: OMC310900 comply with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

### SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed

- **Not** Performed

The Equipment Under Test

- **Fulfills** the general approval requirements.


- **Does not** fulfill the general approval requirements.


Sample Received Date: 16 February 2011

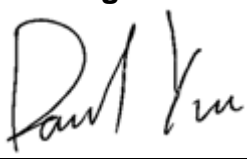
Testing Start Date: 22 February 2011

Testing End Date: 13 April 2011

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

<b>Tested By</b>	<u>2011-04-14</u>	<u>Sunny Lu</u>	
<b>Test Lab Engineer</b>	<b>Date</b>	<b>Name</b>	<b>Signature</b>

<b>Prepared By</b>	<u>2011-04-14</u>	<u>Ken Li</u>	
<b>Project Engineer</b>	<b>Date</b>	<b>Name</b>	<b>Signature</b>

<b>Reviewed By</b>	<u>2011-04-14</u>	<u>Paul Yu</u>	
<b>Assistant EMC Manager</b>	<b>Date</b>	<b>Name</b>	<b>Signature</b>

## 7 Technical Requirement

### 7.1 Conducted Emission

#### Test Method

- 1 The EUT was placed on a table, which is 0.8m above ground plane
- 2 The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
- 3 Maximum procedure was performed to ensure EUT compliance
- 4 A EMI test receiver is used to test the emissions from both sides of AC line

#### Limit

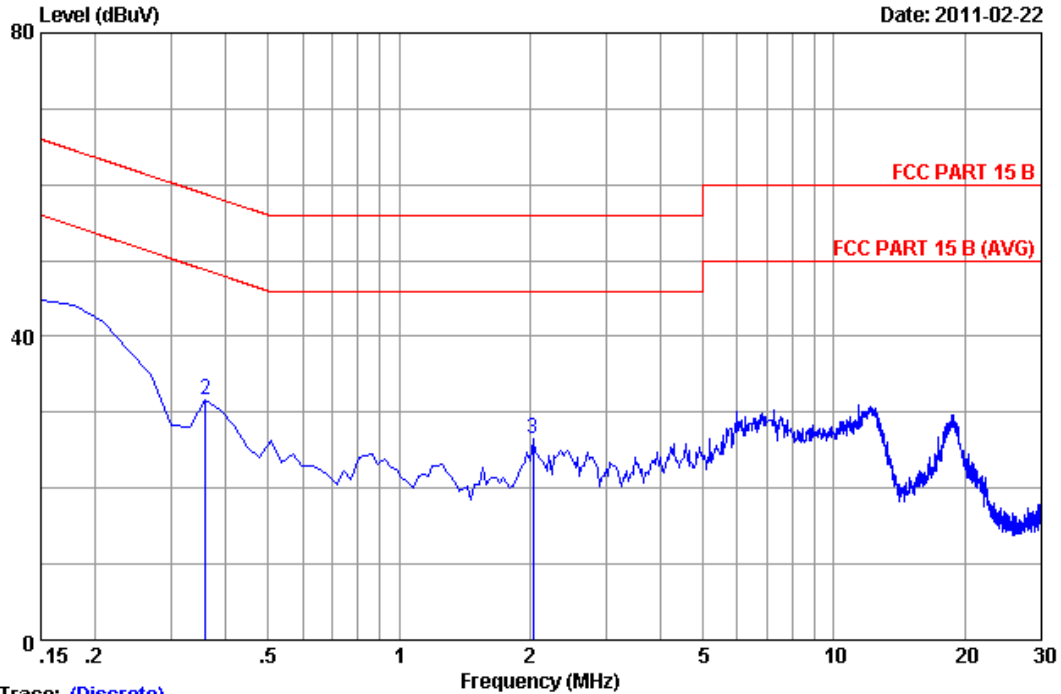
Frequency MHz	QP Limit dB $\mu$ V	AV Limit dB $\mu$ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Note: "\*" Decreasing linearly with logarithm of the frequency



## Conducted Emission

Data: 1 File: D:\DATA\2011 TEST data\TUV\20110222.EM6 (14) Date: 2011-02-22



Trace: (Discrete)

```

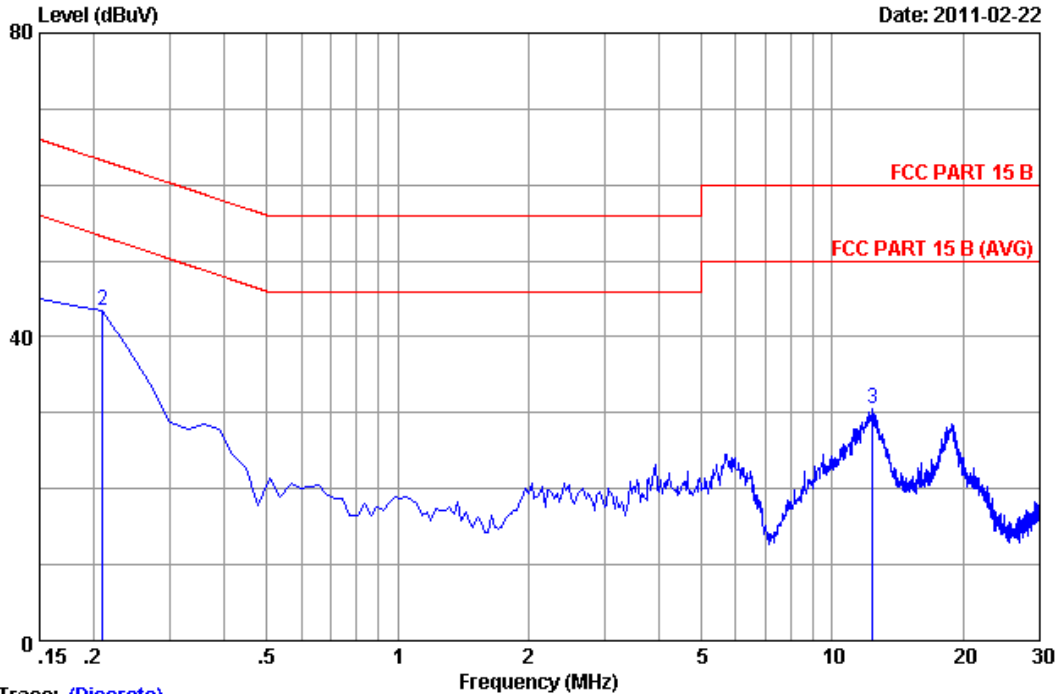
Site no      :1#conduction           Data No   :1
Dis./Ant.   :** 2011 ESH2-25 LINE
Limit       :FCC PART 15 C
Env./Ins.   :29.5*C/55%           Engineer  :Restar
EUT         :M/N:310900
Power Rating :120V/60Hz
Test Mode   :WIFI
    
```

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.17	9.88	34.81	44.86	66.00	21.14	Peak
2	0.35895	0.18	9.88	21.56	31.62	58.75	27.13	Peak
3	2.031	0.31	9.91	16.21	26.43	56.00	29.57	Peak

Remarks: 1. Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.  
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

## Conducted Emission

Data: 2 File: D:\DATA\2011 TEST data\TUV\20110222.EM6 (14) Date: 2011-02-22



Trace: (Discrete)

Site no :1#conduction Data No :2  
 Dis./Ant. \*\*: 2011 ESH2-Z5 NEUTRAL  
 Limit :FCC PART 15 C  
 Env./Ins. :29.5°C/55% Engineer :Restar  
 EUT :M/N:310900  
 Power Rating :120V/60Hz  
 Test Mode :WIFI

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.21	9.88	34.89	44.98	66.00	21.02	Peak
2	0.20970	0.21	9.88	33.37	43.46	63.22	19.76	Peak
3	12.359	0.52	10.01	19.90	30.43	60.00	29.57	Peak

Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit)+Reading.  
 2.If the average limit is met when using a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

**Test Equipment List**

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Dec.18, 11
L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	Mar.30, 11
L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	May.08, 11
Terminator	Hubersuhner	50Ω	No. 1	May.08, 11
Terminator	Hubersuhner	50Ω	No. 2	May.08, 11
RF Cable	Fujikura	3D-2W	LISN Cable 1#	May.08, 11
Coaxial Switch	Anritsu	MP59B	M55367	May.08, 11
Passive Probe	Rohde & Schwarz	ESH2-Z3	299.7810.52	May.08, 11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100341	May.08, 11

## 7.2 Conducted peak output power

### Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

### Limits for conducted peak output power measurements

Frequency Range MHz	Limit W	Limit dBm
2400-2483	≤1	≤30

## Conducted peak output power

### WIFI Mode IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	18.28	Pass
CH6 2437MHz	18.46	Pass
CH11 2462MHz	19.15	Pass

### WIFI Mode IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	21.65	Pass
CH6 2437MHz	21.97	Pass
CH11 2462MHz	22.44	Pass

### WIFI Mode IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	20.64	Pass
CH6 2437MHz	20.93	Pass
CH11 2462MHz	21.22	Pass

### WIFI Mode IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2422MHz	21.50	Pass
CH6 2437MHz	20.60	Pass
CH11 2452MHz	20.78	Pass



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## Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2011

## 7.3 Band edge compliance of RF emissions

### Test Method

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW and VBW to 1MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100kHz, to measure the conducted peak band edge.

### Limits

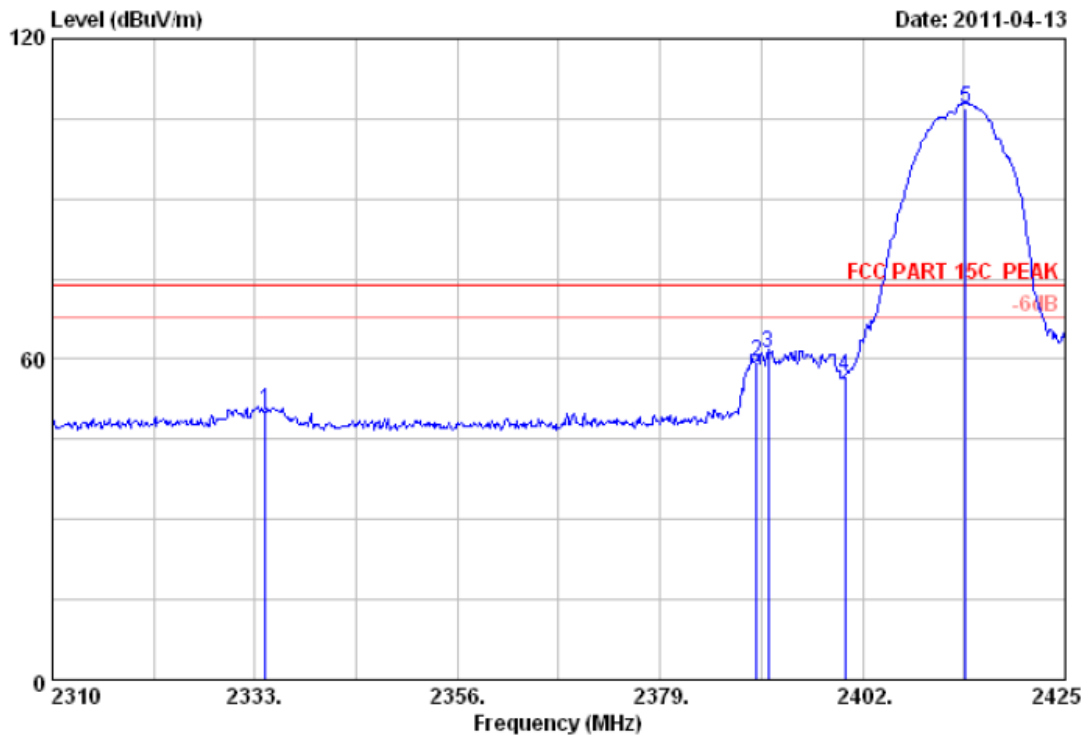
According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Frequency MHz	Limit Average dBuV/m	Limit Peak dBuV/m
Below 2390 Above 2483.5	54	74

## Band edge compliance of RF emissions

WIFI Mode IEEE 802.11b modulation (1 Mbps) Test Result

Lower Edge PK plot:



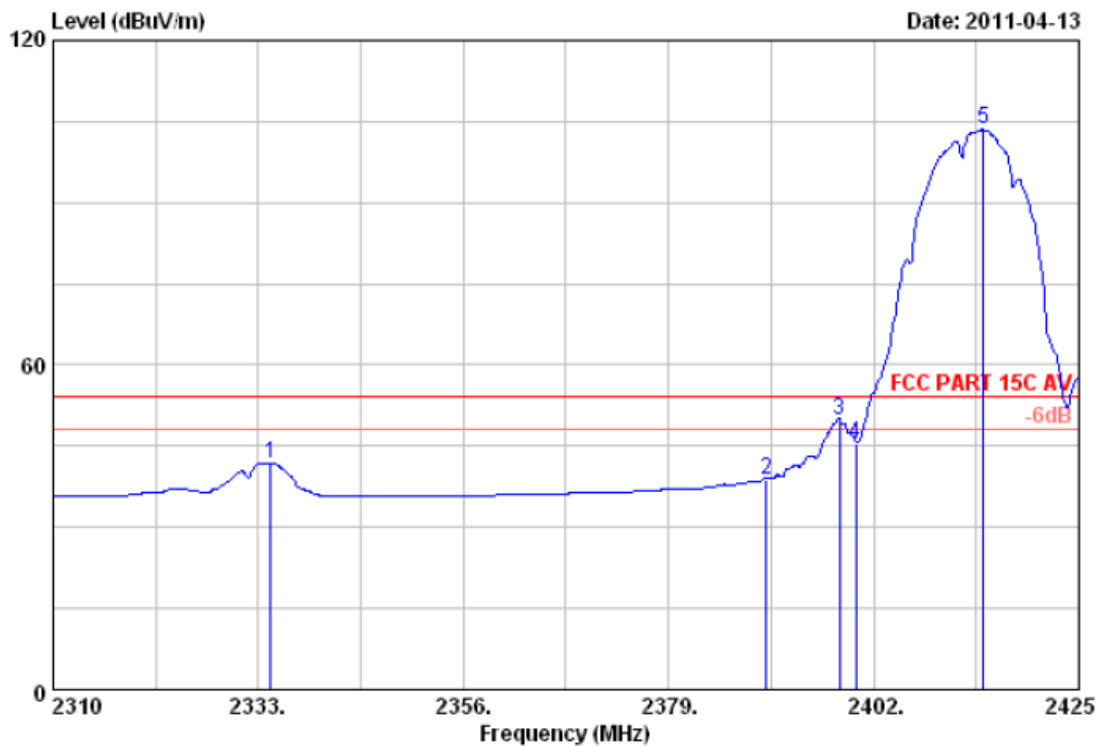
Site no.	: 3m Chamber	Data no.	: 10
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: 310900		
Power	: 120V/50Hz		
Test mode	: 11b CH1 2412MHz Tx		
M/N	:		

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2334.150	29.40	7.27	36.63	50.41	50.45	74.00	23.55	Peak
2	2390.000	29.44	7.39	36.62	59.41	59.62	74.00	14.38	Peak
3	2391.305	29.44	7.39	36.62	60.96	61.17	74.00	12.83	Peak
4	2400.000	29.44	7.43	36.62	56.53	56.78	74.00	17.22	Peak
5	2413.730	29.45	7.43	36.62	106.70	106.96	74.00	-32.96	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Lower Edge AV plot:



Site no.	: 3m Chamber	Data no.	: 11
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: 310900		
Power	: 120V/50Hz		
Test mode	: 11b CH1 2412MHz Tx		
M/N	:		

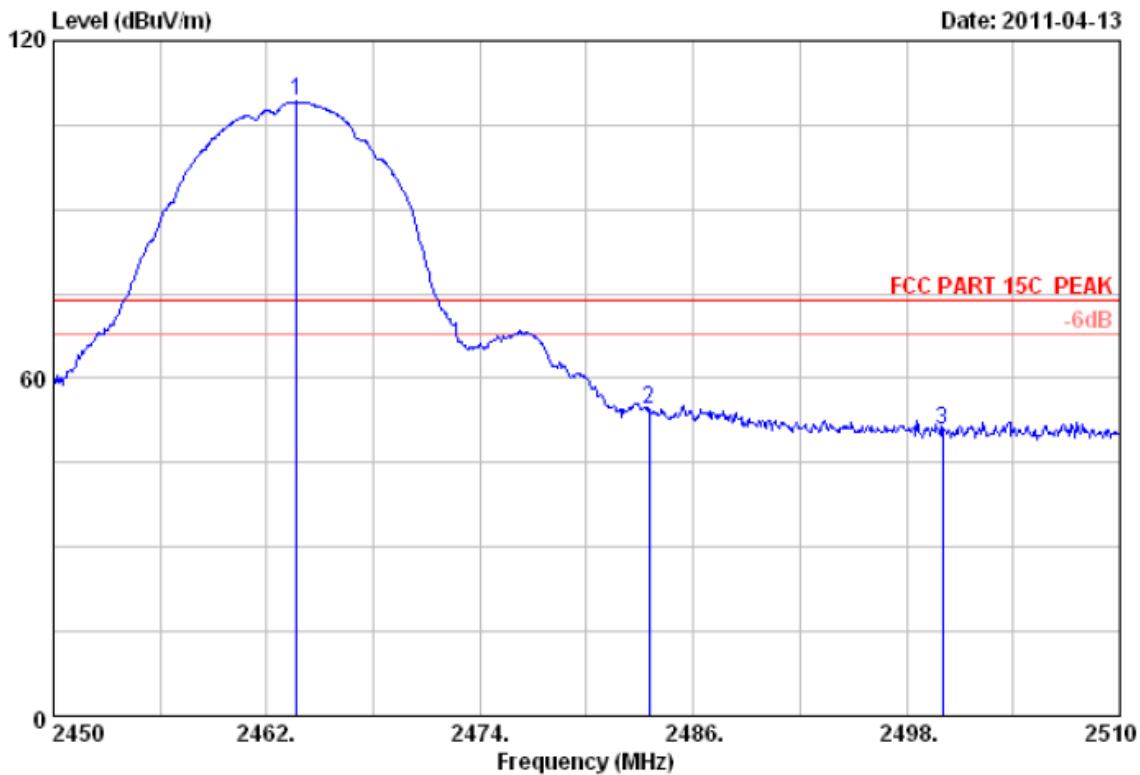
	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2334.380	29.40	7.27	36.63	41.90	41.94	54.00	12.06	Average
2	2390.000	29.44	7.39	36.62	38.49	38.70	54.00	15.30	Average
3	2398.205	29.44	7.39	36.62	49.50	49.71	54.00	4.29	Average
4	2400.000	29.44	7.43	36.62	45.09	45.34	54.00	8.66	Average
5	2414.305	29.45	7.43	36.62	103.24	103.50	54.00	-49.50	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Upper Edge PK plot:



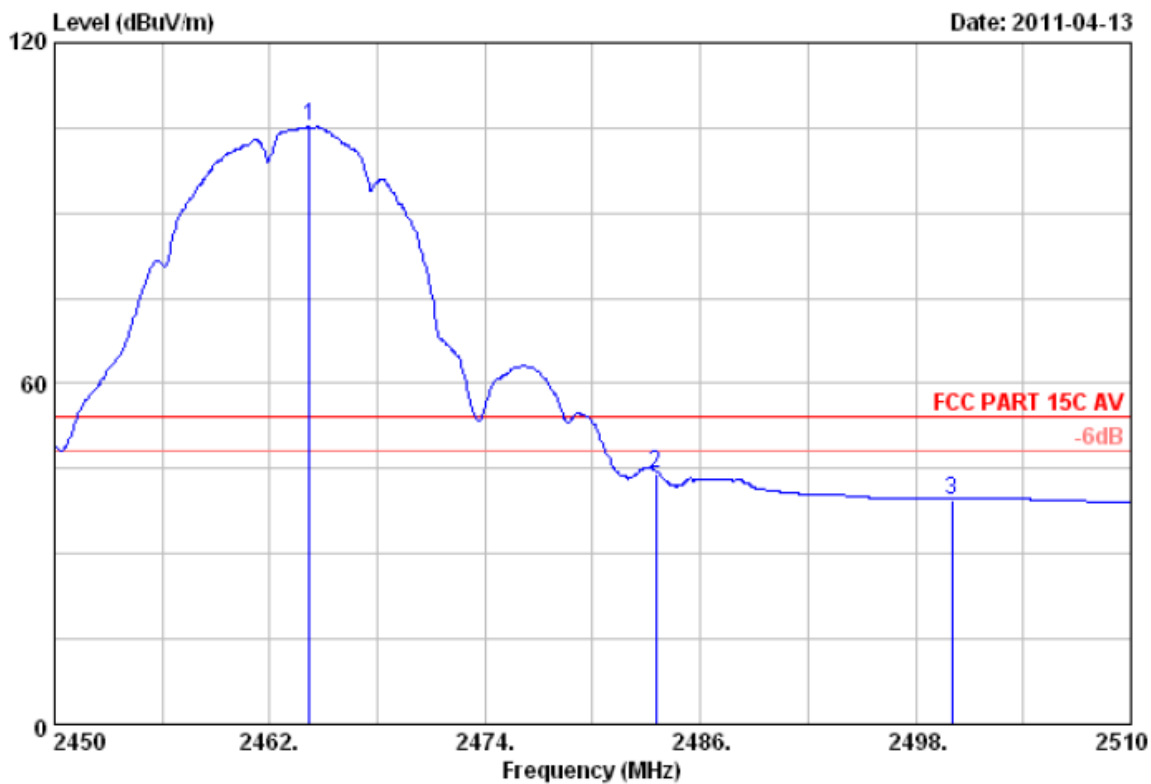
Site no. : 3m Chamber Data no. : 12  
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 310900  
 Power : 120V/50Hz  
 Test mode : 11b CH11 2462MHz Tx  
 M/N :

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2463.680	29.48	7.54	36.61	108.74	109.15	74.00	-35.15	Peak
2	2483.500	29.49	7.58	36.60	53.99	54.46	74.00	19.54	Peak
3	2500.000	29.50	7.62	36.60	50.45	50.97	74.00	23.03	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Upper Edge AV plot:



Site no.	: 3m Chamber	Data no.	: 13
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: 310900		
Power	: 120V/50Hz		
Test mode	: 11b CH11 2462MHz Tx		
M/N	:		

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2464.220	29.48	7.54	36.61	104.80	105.21	54.00	-51.21	Average
2	2483.500	29.49	7.58	36.60	43.67	44.14	54.00	9.86	Average
3	2500.000	29.50	7.62	36.60	38.89	39.41	54.00	14.59	Average

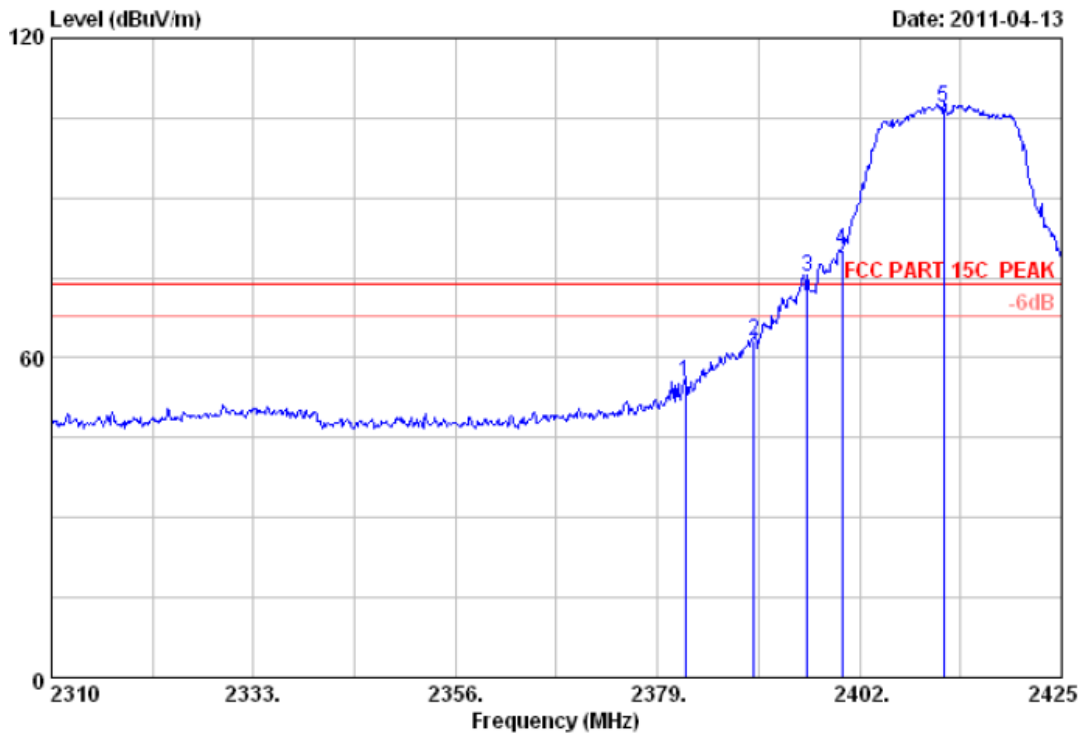
Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

## Band edge compliance of RF emissions

WIFI Mode IEEE 802.11g modulation (6 Mbps) Test Result

Lower Edge PK Plot:



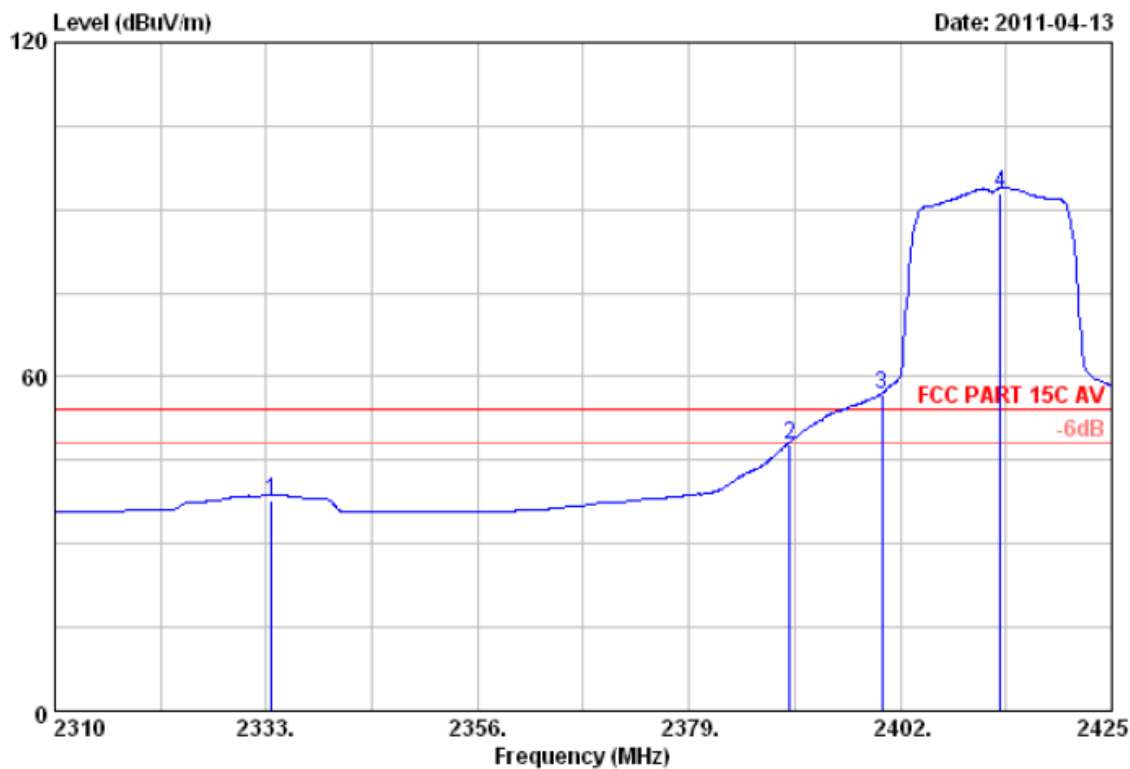
Site no.	: 3m Chamber	Data no.	: 8
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: 310900		
Power	: 120V/50Hz		
Test mode	: 11g CH1 2412MHz Tx		
M/N	:		

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2382.105	29.43	7.39	36.62	55.30	55.50	74.00	18.50	Peak
2	2390.000	29.44	7.39	36.62	63.12	63.33	74.00	10.67	Peak
3	2396.020	29.44	7.39	36.62	74.95	75.16	74.00	-1.16	Peak
4	2400.000	29.44	7.43	36.62	79.85	80.10	74.00	-6.10	Peak
5	2411.545	29.45	7.43	36.62	106.86	107.12	74.00	-33.12	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Lower Edge AV Plot:



Site no. : 3m Chamber  
 Dis. / Ant. : 3m 3115(0911)  
 Limit : FCC PART 15C AV  
 Env. / Ins. : 23°C/54%  
 EUT : 310900  
 Power : 120V/50Hz  
 Test mode : 11g CH1 2412MHz Tx  
 M/N :  
 Data no. : 9  
 Ant. pol. : HORIZONTAL  
 Engineer : Leo-Li

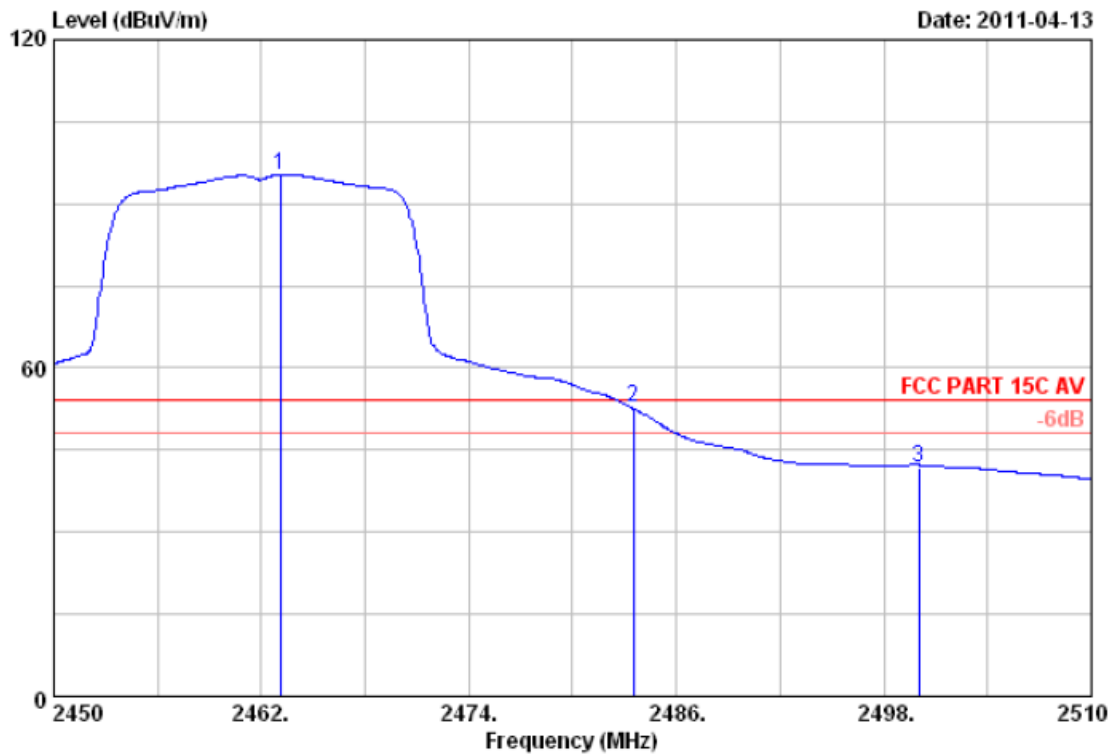
	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2333.575	29.40	7.27	36.63	37.89	37.93	54.00	16.07	Average
2	2390.000	29.44	7.39	36.62	47.60	47.81	54.00	6.19	Average
3	2400.000	29.44	7.43	36.62	56.42	56.67	54.00	-2.67	Average
4	2412.925	29.45	7.43	36.62	92.65	92.91	54.00	-38.91	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Upper Edge AV Plot:



Site no.	: 3m Chamber	Data no.	: 7
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: 310900		
Power	: 120V/50Hz		
Test mode	: 11g CH11 2462MHz Tx		
M/N	:		

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2463.080	29.48	7.54	36.61	94.93	95.34	54.00	-41.34	Average
2	2483.500	29.49	7.58	36.60	52.33	52.80	54.00	1.20	Average
3	2500.000	29.50	7.62	36.60	41.28	41.80	54.00	12.20	Average

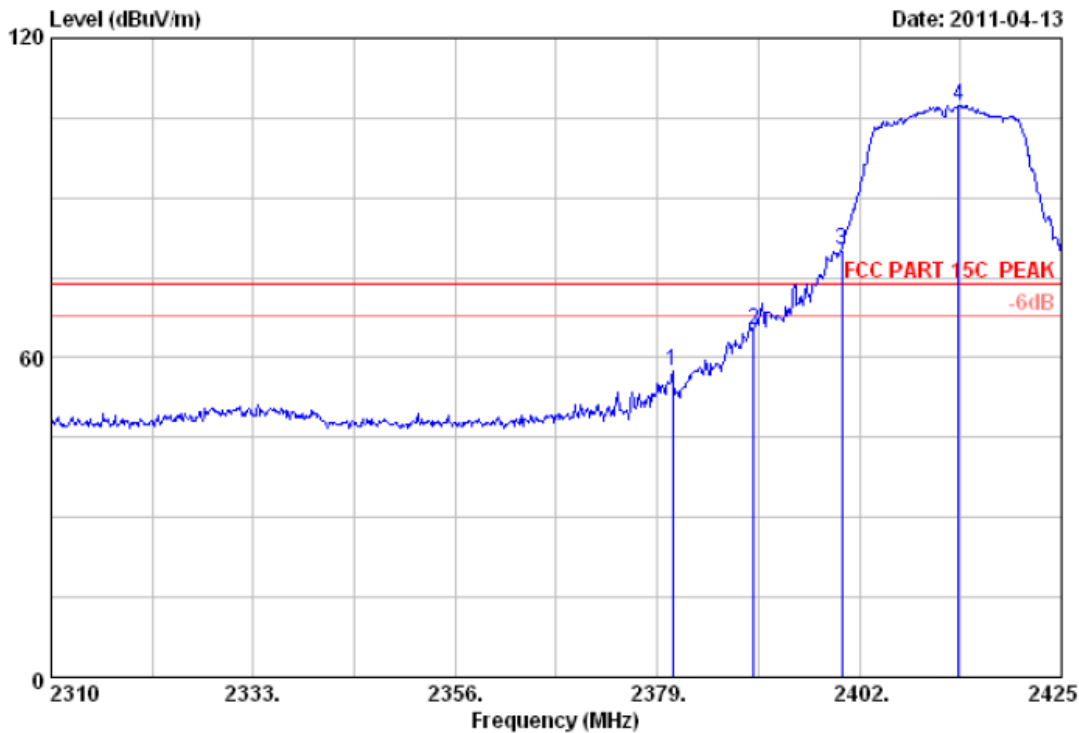
Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

## Band edge compliance of RF emissions

WIFI Mode IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Lower Edge PK Plot:



```

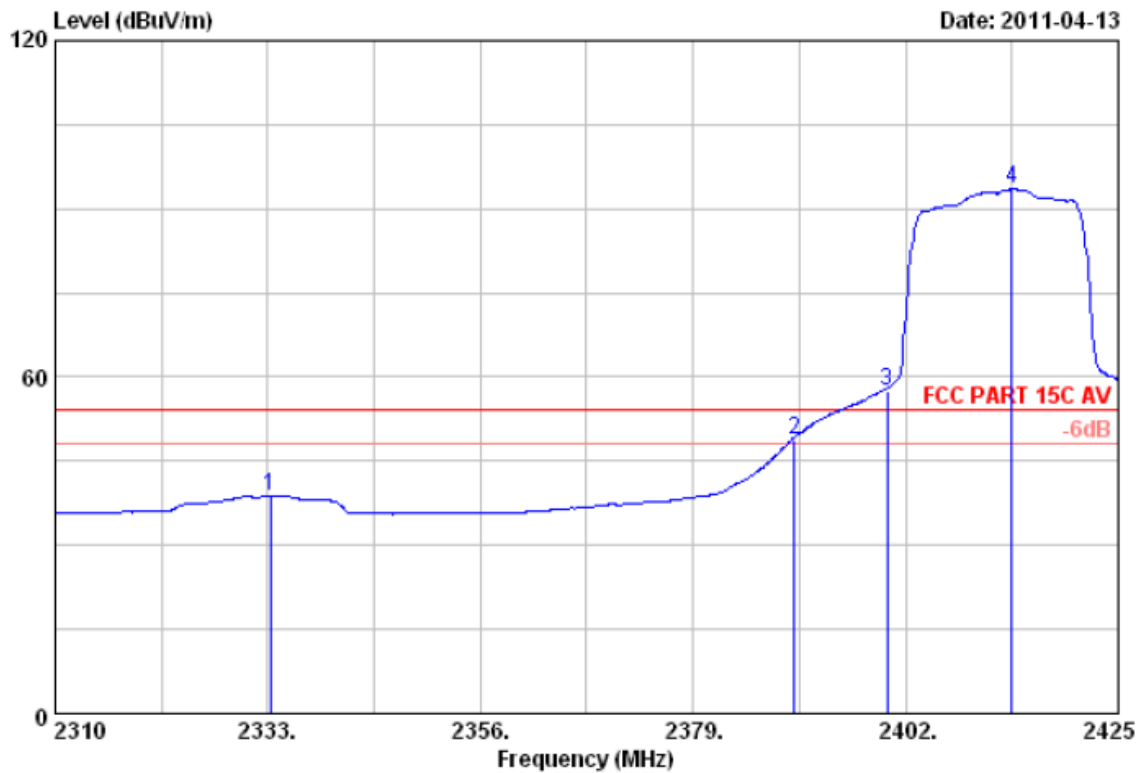
Site no.       : 3m Chamber           Data no. : 14
Dis. / Ant.   : 3m 3115(0911)       Ant. pol. : HORIZONTAL
Limit        : FCC PART 15C PEAK
Env. / Ins.   : 23*C/54%           Engineer  : Leo-Li
EUT          : 310900
Power        : 120V/50Hz
Test mode    : 11nHT20 CH1 2412MHz Tx
M/N         :
    
```

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2380.725	29.43	7.39	36.62	57.45	57.65	74.00	16.35	Peak
2	2390.000	29.44	7.39	36.62	65.09	65.30	74.00	8.70	Peak
3	2400.000	29.44	7.43	36.62	79.99	80.24	74.00	-6.24	Peak
4	2413.270	29.45	7.43	36.62	107.07	107.33	74.00	-33.33	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Lower Edge AV Plot:



Site no.	: 3m Chamber	Data no.	: 15
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV	Engineer	: Leo-Li
Env. / Ins.	: 23°C/54%		
EUT	: 310900		
Power	: 120V/50Hz		
Test mode	: 11nHT20 CH1 2412MHz Tx		
M/N	:		

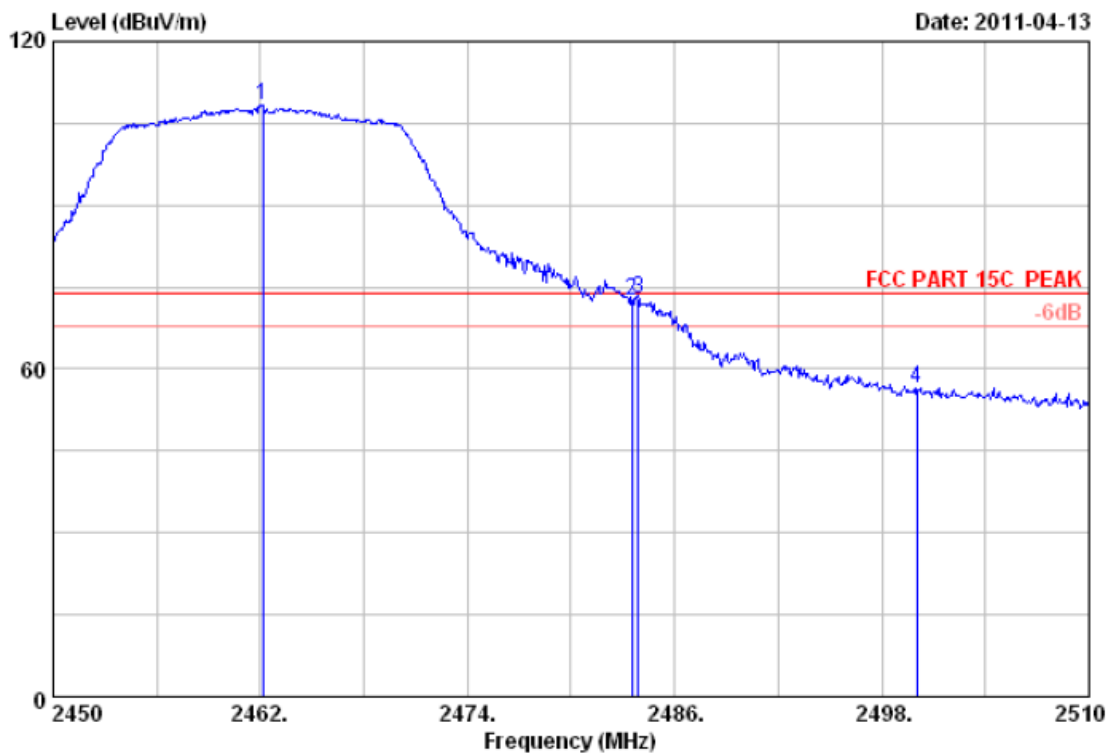
	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2333.230	29.40	7.27	36.63	38.88	38.92	54.00	15.08	Average
2	2390.000	29.44	7.39	36.62	48.62	48.83	54.00	5.17	Average
3	2400.000	29.44	7.43	36.62	57.38	57.63	54.00	-3.63	Average
4	2413.500	29.45	7.43	36.62	93.30	93.56	54.00	-39.56	Average

Remarks:

1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Upper Edge PK Plot:



Site no. : 3m Chamber  
 Dis. / Ant. : 3m 3115(0911)  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54%  
 EUT : 310900  
 Power : 120V/50Hz  
 Test mode : 11nHT20 CH11 2462MHz Tx  
 M/N :  
 Data no. : 18  
 Ant. pol. : HORIZONTAL  
 Engineer : Leo-Li  
 14dBm

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.120	29.48	7.54	36.61	108.02	108.43	74.00	-34.43	Peak
2	2483.500	29.49	7.58	36.60	72.15	72.62	74.00	1.38	Peak
3	2483.900	29.49	7.58	36.60	72.40	72.87	74.00	1.13	Peak
4	2500.000	29.50	7.62	36.60	55.94	56.46	74.00	17.54	Peak

Remarks:

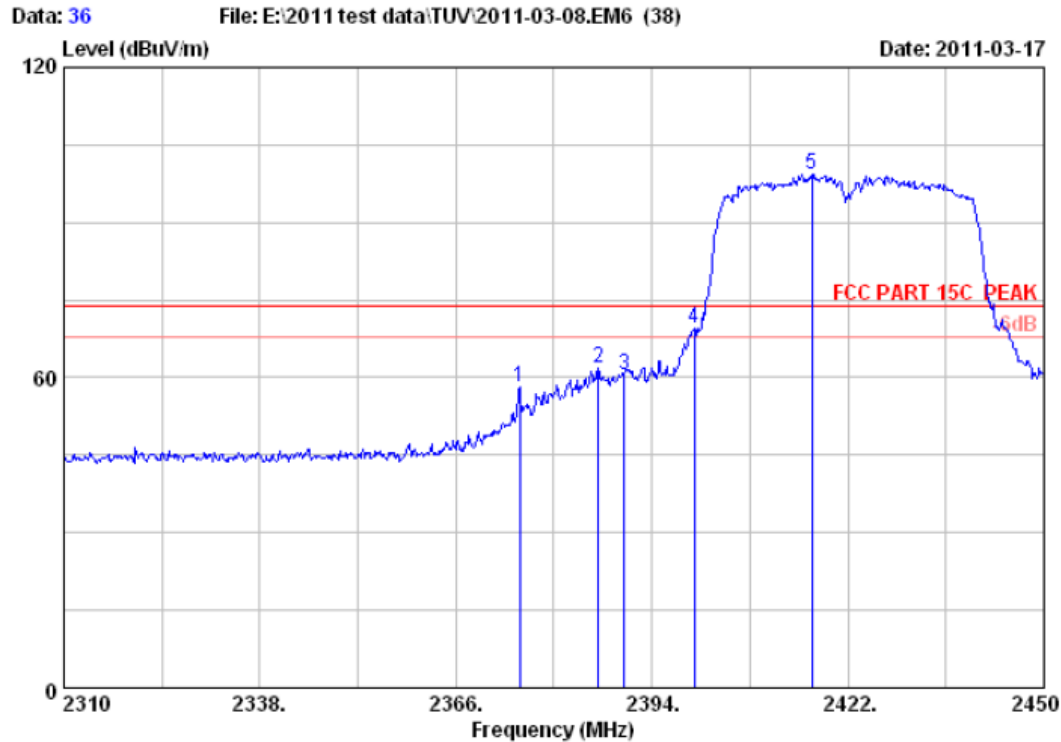
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



## Band edge compliance of RF emissions

WIFI Mode IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Lower Edge PK Plot:



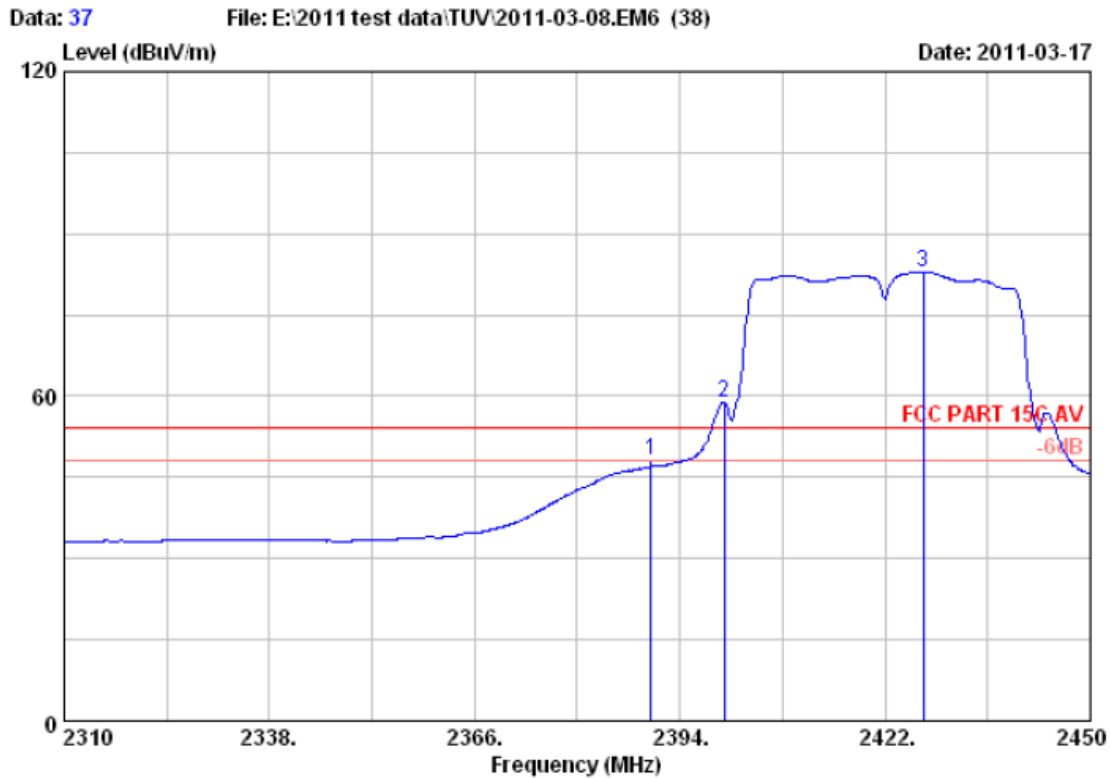
Site no. : 3# Chamber Data no. : 36  
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : 23°C/54% Engineer : Leo-Li  
 EUT : 310900  
 Power : DC 12V From AC Adapter  
 Test mode : 11nHT40 CH1 2422MHz Tx  
 M/N :

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.100	29.43	7.35	36.62	57.88	58.04	74.00	15.96	Peak
2	2386.300	29.44	7.39	36.62	61.74	61.95	74.00	12.05	Peak
3	2390.000	29.44	7.39	36.62	60.38	60.59	74.00	13.41	Peak
4	2400.000	29.44	7.43	36.62	69.30	69.55	74.00	4.45	Peak
5	2416.820	29.45	7.43	36.61	99.05	99.32	74.00	-25.32	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

### Lower Edge AV Plot:



Site no.	: 3# Chamber	Data no. :	37
Dis. / Ant.	: 3m 3115(0911)	Ant. pol. :	HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 23°C/54%	Engineer :	Leo-Li
EUT	: 310900		
Power	: DC 12V From AC Adapter		
Test mode	: 11nHT40 CH1 2422MHz Tx		
M/N	:		

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2390.000	29.44	7.39	36.62	47.85	48.06	54.00	5.94	Average
2	2400.000	29.44	7.43	36.62	58.62	58.87	54.00	-4.87	Average
3	2427.180	29.46	7.46	36.61	82.70	83.01	54.00	-29.01	Average

Remarks:

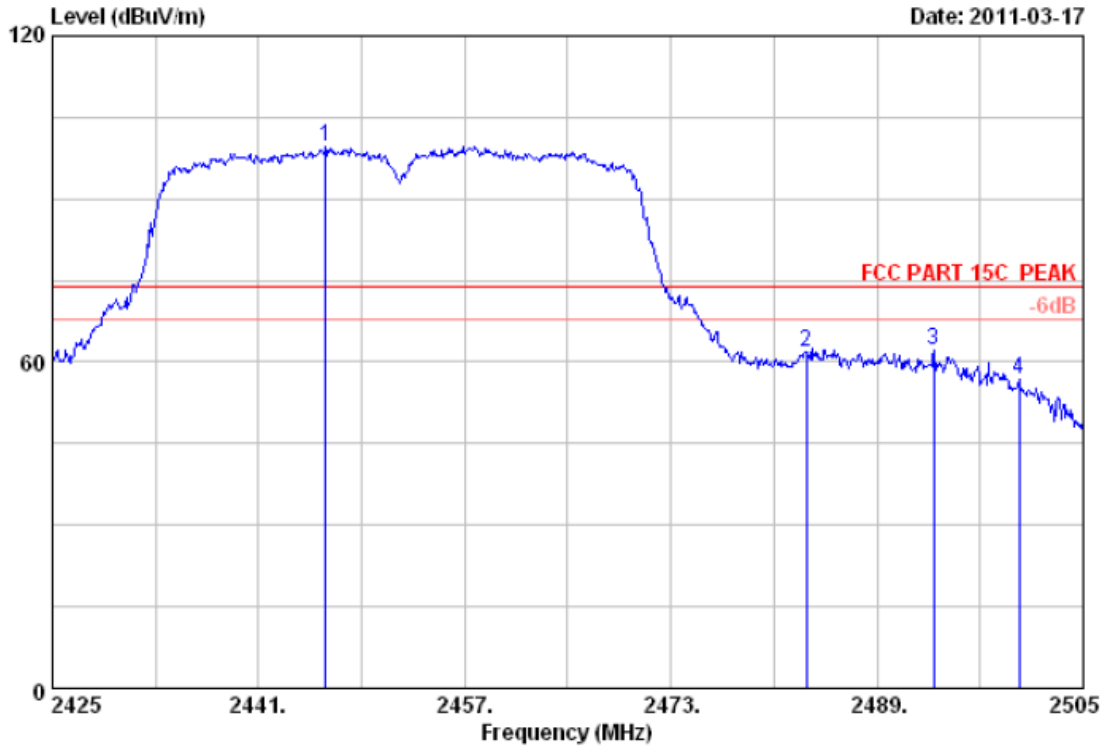
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

### Upper Edge PK Plot:

Data: 34

File: E:\2011 test data\TUV\2011-03-08.EM6 (38)

Date: 2011-03-17



```

Site no.      : 3# Chamber           Data no. : 34
Dis. / Ant.  : 3m 3115(0911)       Ant. pol.: HORIZONTAL
Limit        : FCC PART 15C PEAK
Env. / Ins.  : 23*C/54%           Engineer : Leo-Li
EUT          : 310900
Power        : DC 12V From AC Adapter
Test mode    : 11nHT40 CH7 2452MHz Tx
M/N         :
  
```

	Ant. Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2446.200	29.47	7.50	36.61	99.31	99.67	74.00	-25.67	Peak
2	2483.500	29.49	7.58	36.60	61.40	61.87	74.00	12.13	Peak
3	2493.400	29.50	7.58	36.60	61.83	62.31	74.00	11.69	Peak
4	2500.000	29.50	7.62	36.60	56.36	56.88	74.00	17.12	Peak

Remarks:

1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



**Test Equipment List**

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum	Agilent	E4446A	US44300459	May 08, 2011
Amp	HP	8449B	3008A02495	May 08, 2011
Antenna	EMCO	3115	9607-4877	May 17, 2011
Bilog Antenna	Schaffner	CBL6111C	2598	Dec.14, 2011
HF Cable	Hubersuhne	Sucoflex104	---	May 08, 2011

## 7.4 Spurious RF conducted emissions

### Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The resolution bandwidth(RBW) and the video bandwidth (VBW) of the spectrum analyzer were respectively set to 100kHz and 100kHz.

### Limit

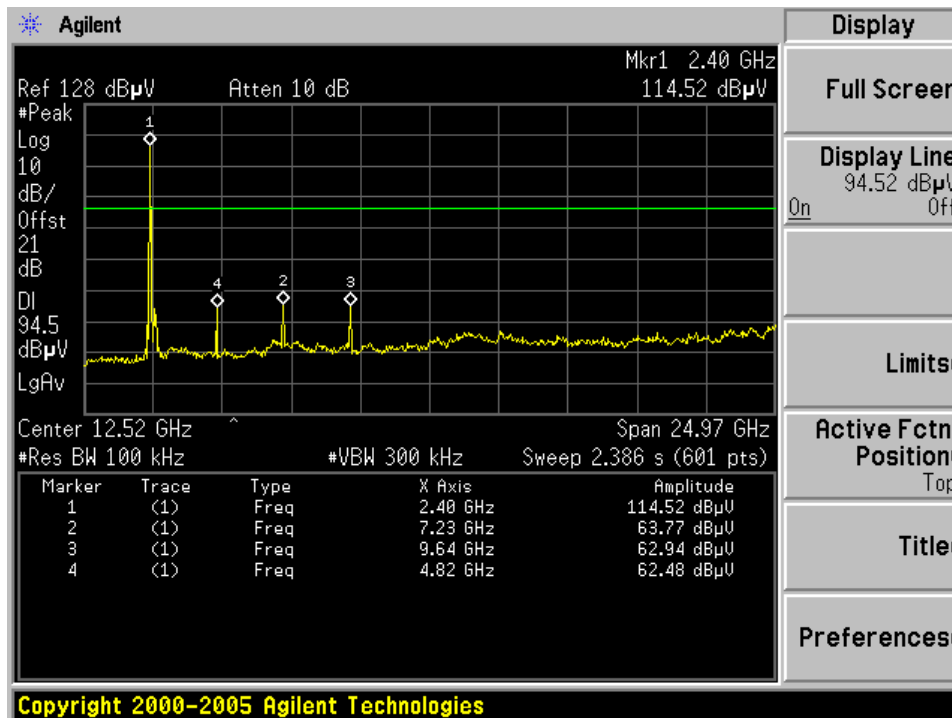
Frequency Range MHz	Limit (dBc)
1000-25000	-20



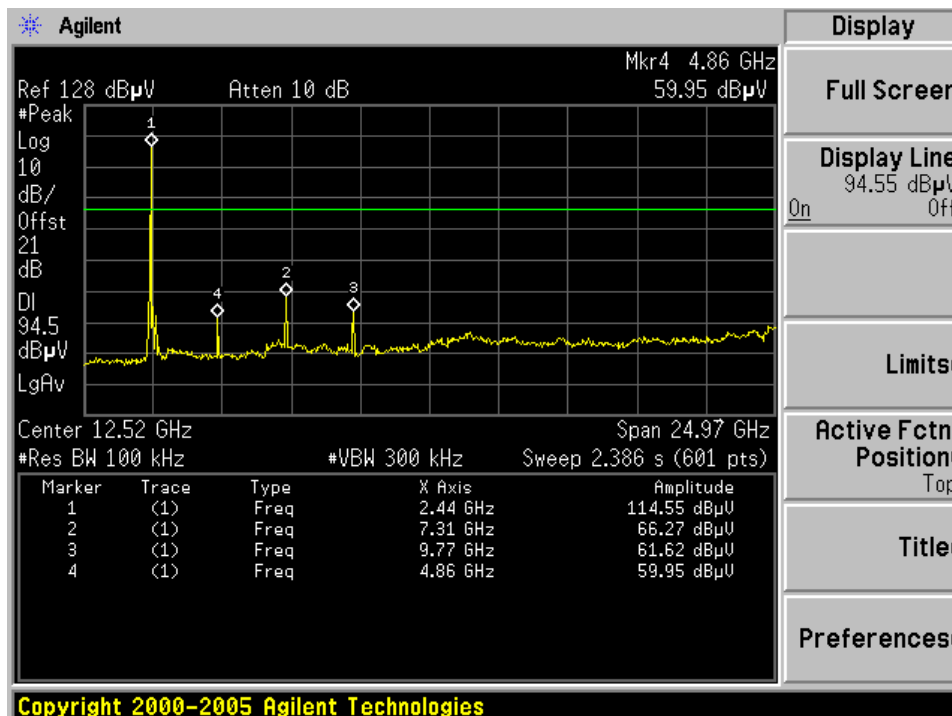
### Spurious RF conducted emissions

WIFI Mode IEEE 802.11b modulation (1 Mbps) Test Result

2412MHz

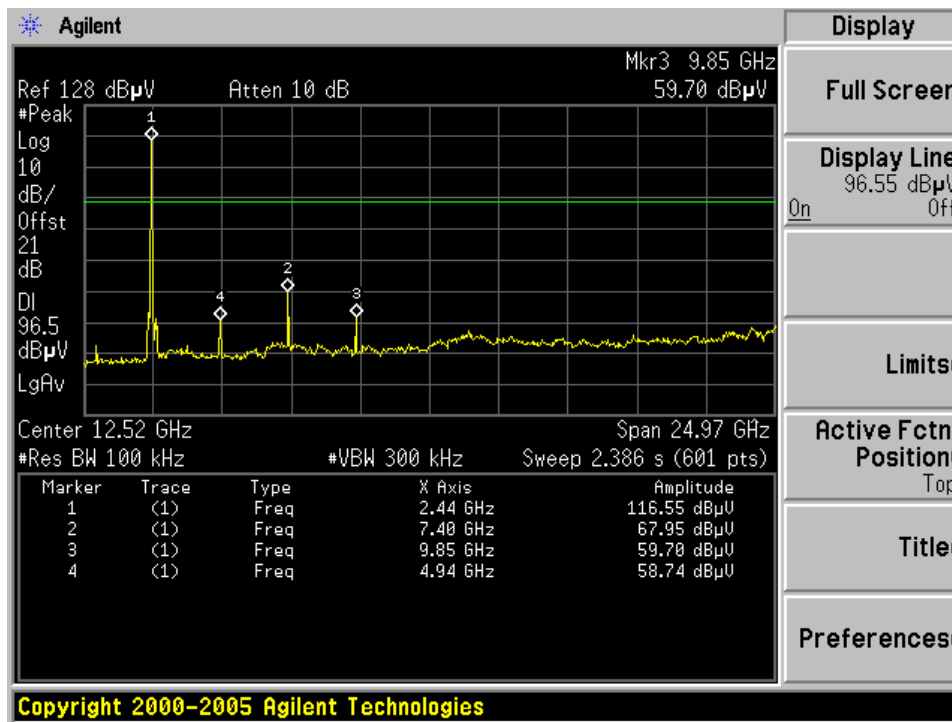


2437MHz



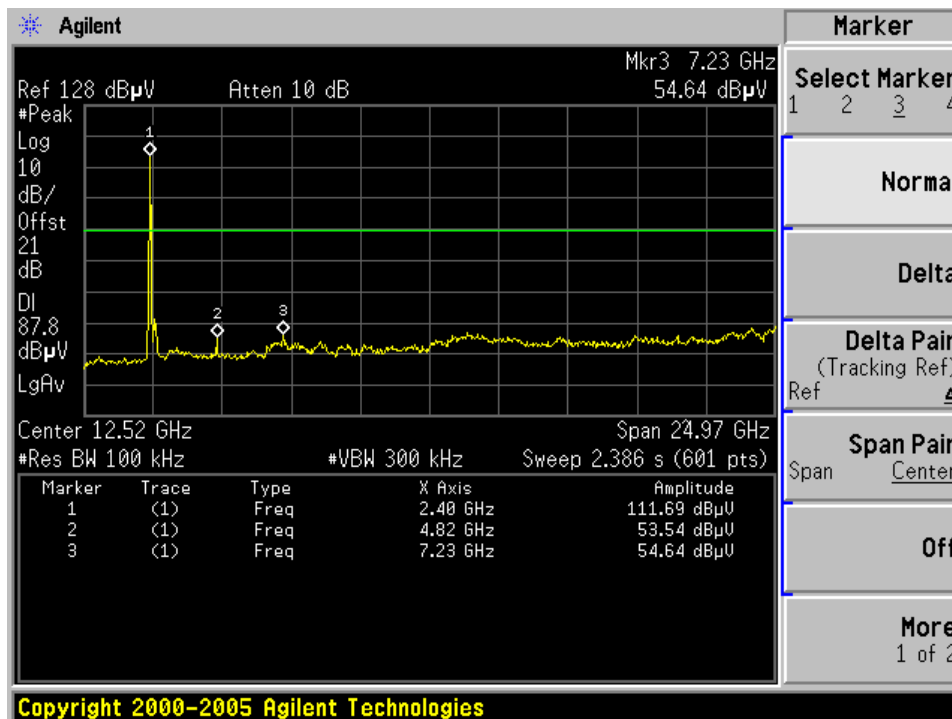
## Spurious RF conducted emissions

2462MHz



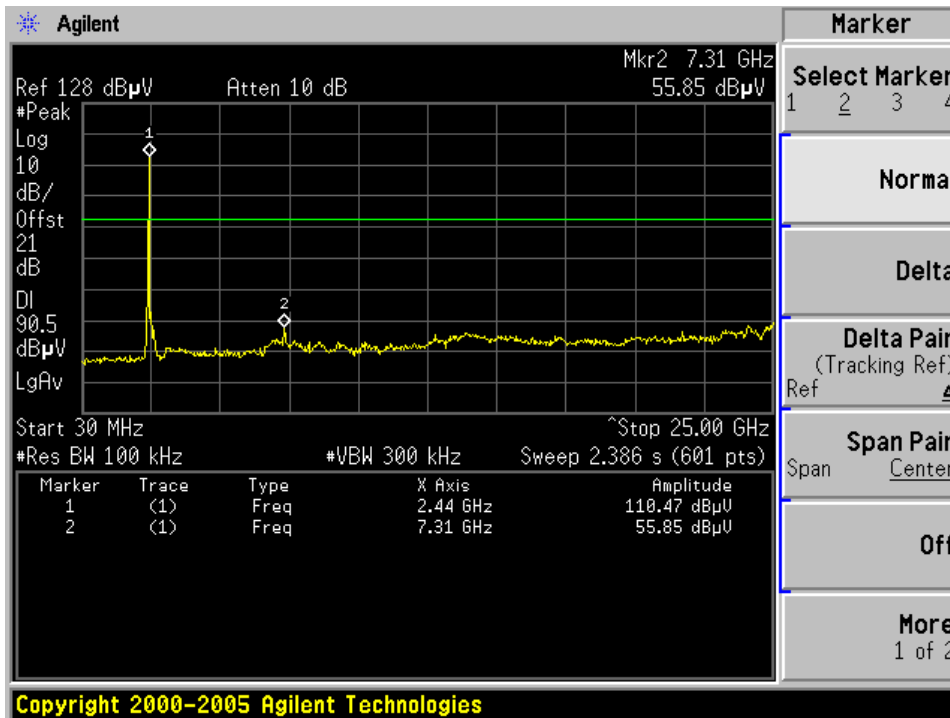
## WIFI Mode IEEE 802.11g modulation (6 Mbps) Test Result

2412MHz

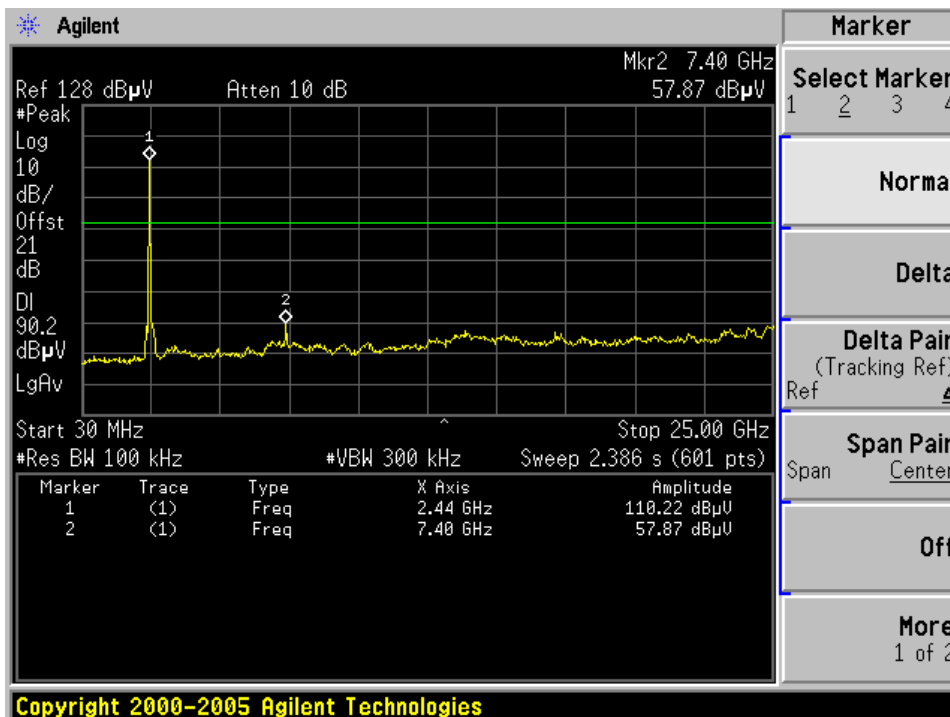


## Spurious RF conducted emissions

2437MHz

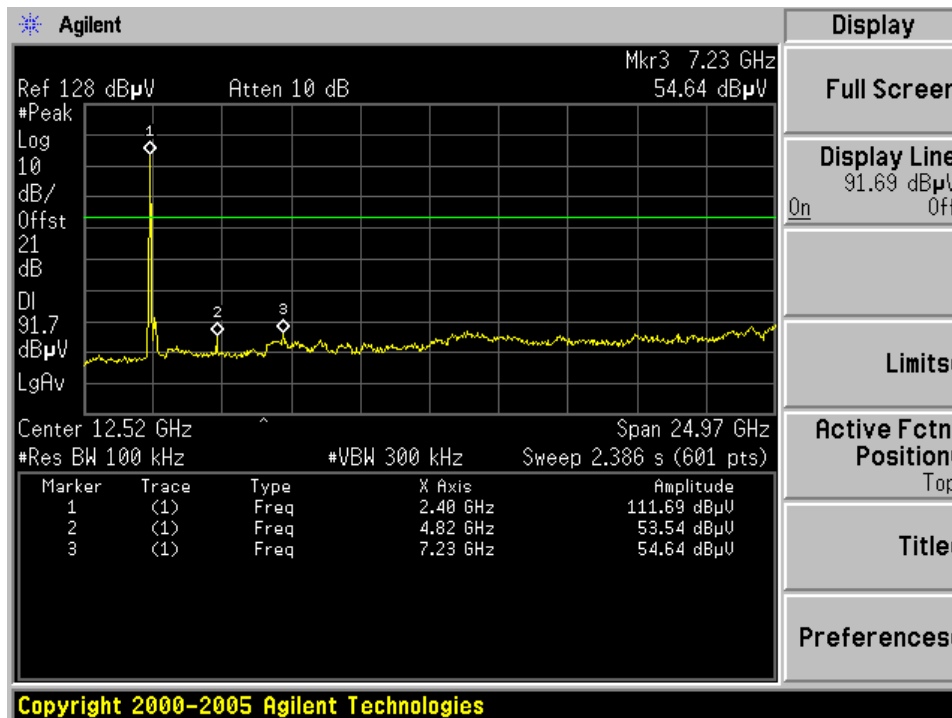


2462MHz

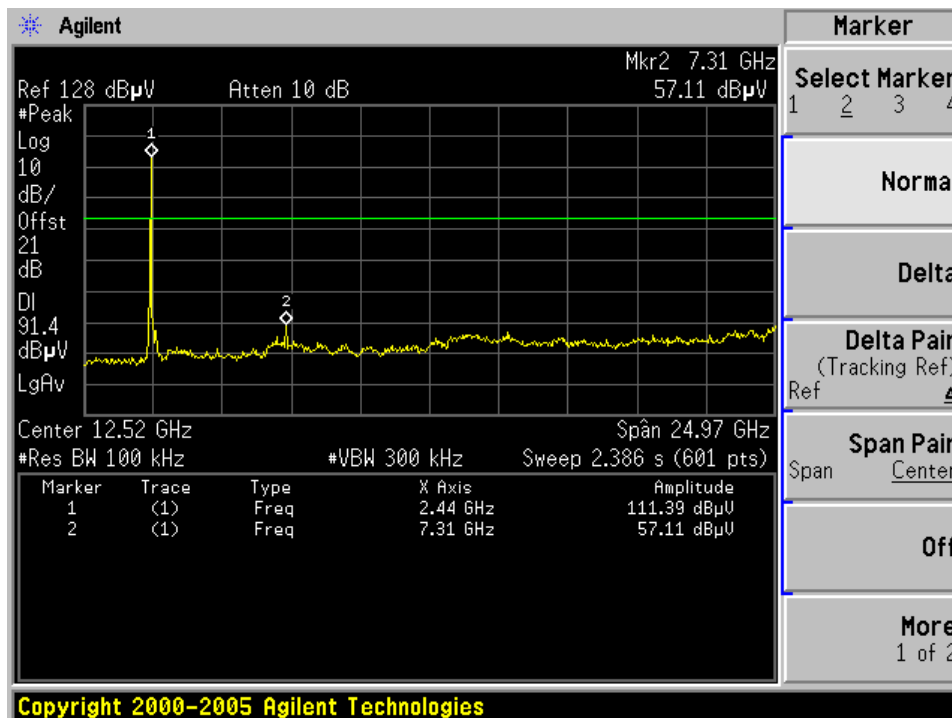


### Spurious RF conducted emissions

WIFI Mode IEEE 802.11n HT20 modulation (6.5 Mbps) Test Result  
2412MHz

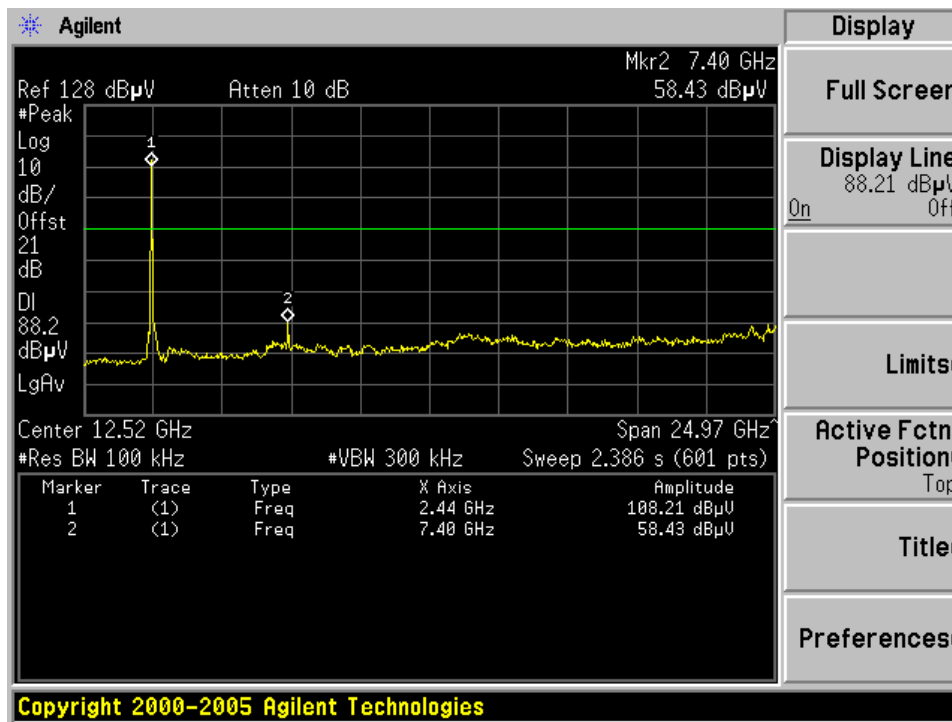


2437MHz



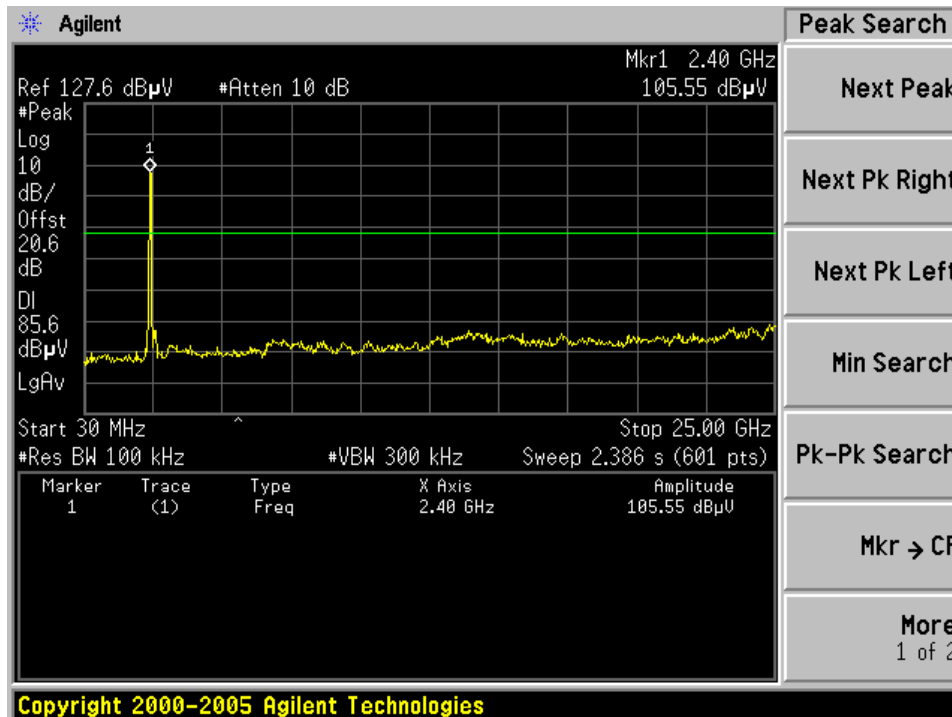
### Spurious RF conducted emissions

2462MHz



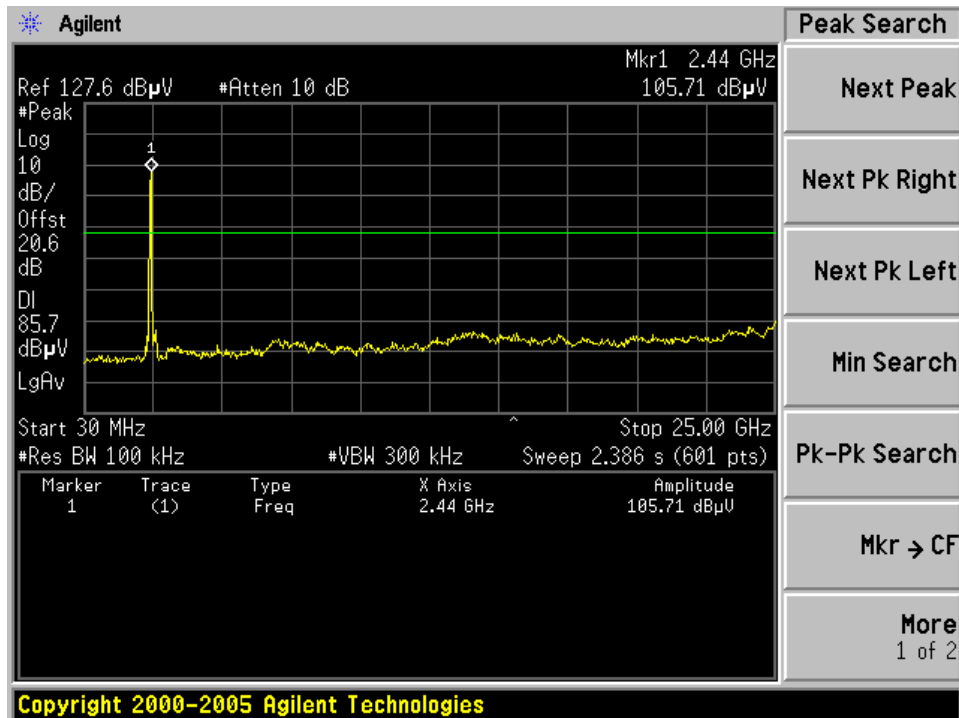
### WIFI Mode IEEE 802.11n HT40 modulation (13.5 Mbps) Test Result

2422MHz

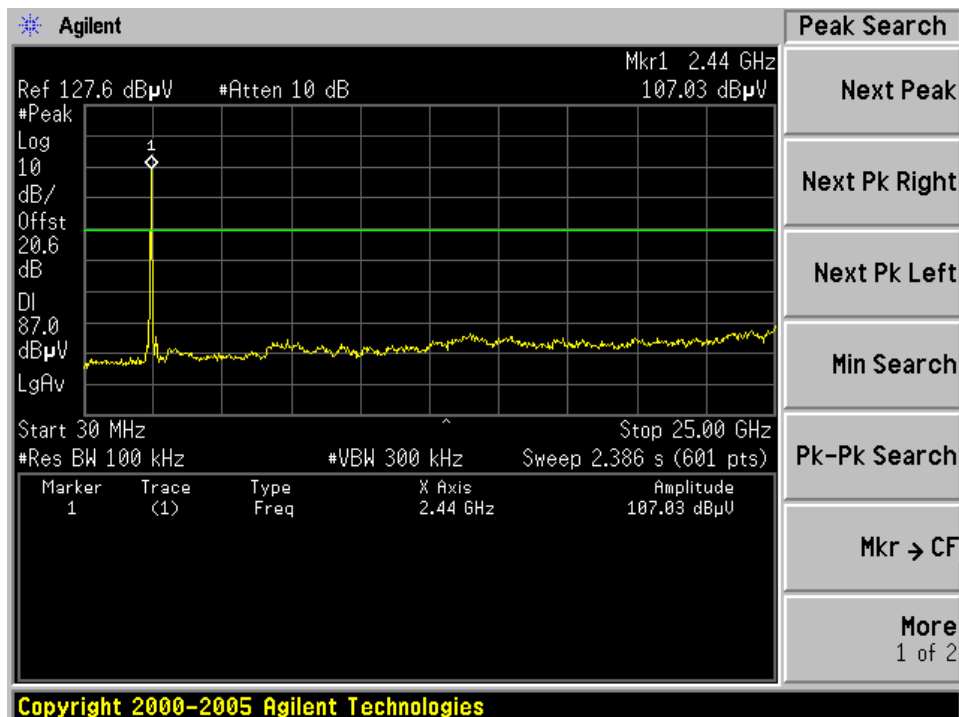


## Spurious RF conducted emissions

2437MHz



2452MHz





Product Service

## Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	May 08, 2011

## 7.5 Spurious radiated emissions

### Test Method

- 1 The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
- 3 EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5 Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

### Limit

Frequency MHz	Field Strength uV/m	Field Strength dB $\mu$ V/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK



## Radiated Emission

### WIFI Mode IEEE 802.11b modulation (1 Mbps) CH1 2412MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
199.750	10.00	1.72	0	52.83	36.42	Horizontal	43.50	QP	Pass
600.030	19.90	4.12	0	16.90	40.92	Horizontal	46.00	QP	Pass
4824.000	34.32	10.64	35.08	47.93	57.81	Horizontal	74	PK	Pass
4824.000	34.32	10.64	35.08	42.57	52.45	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-	-

### WIFI Mode IEEE 802.11b modulation (1 Mbps) CH6 2437MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4874.000	34.41	10.69	35.03	45.59	55.55	Horizontal	74	PK	Pass
4874.000	34.41	10.69	35.03	40.81	50.88	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

### WIFI Mode IEEE 802.11b modulation (1 Mbps) CH11 2462MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4924.000	34.49	10.76	34.98	46.68	56.95	Horizontal	74	PK	Pass
4924.000	34.49	10.76	34.98	38.33	48.60	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-	-

#### Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

**Radiated Emission**

## WIFI Mode IEEE 802.11g modulation (6 Mbps) CH1 2412MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
199.750	10.00	1.72	0	52.50	36.09	Horizontal	43.50	QP	Pass
600.030	19.90	4.12	0	17.20	41.22	Horizontal	46.00	QP	Pass
4824.000	34.32	10.64	35.08	45.37	55.25	Horizontal	74	PK	Pass
4824.000	34.32	10.64	35.08	33.90	43.78	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-	-

## WIFI Mode IEEE 802.11g modulation (6 Mbps) CH6 2437MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4874.000	34.41	10.69	35.03	45.65	55.63	Horizontal	74	PK	Pass
4874.000	34.41	10.69	35.03	33.48	43.55	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

## WIFI Mode IEEE 802.11g modulation (6 Mbps) CH11 2462MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4924.000	34.49	10.76	34.98	45.57	55.84	Horizontal	74	PK	Pass
4924.000	34.49	10.76	34.98	33.62	43.89	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-	-

## Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

## Radiated Emission

### WIFI Mode IEEE 802.11n HT20 modulation (6.5 Mbps) CH1 2412MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
199.750	10.00	1.72	0	53.00	36.59	Horizontal	43.50	QP	Pass
600.030	19.90	4.12	0	18.20	42.22	Horizontal	46.00	QP	Pass
4824.000	34.32	10.64	35.08	46.47	56.35	Horizontal	74	PK	Pass
4824.000	34.32	10.64	35.08	34.16	44.04	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-	-

### WIFI Mode IEEE 802.11n HT20 modulation (6.5 Mbps) CH6 2437MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4874.000	34.41	10.69	35.03	46.70	56.77	Horizontal	74	PK	Pass
4874.000	34.41	10.69	35.03	34.20	44.27	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

### WIFI Mode IEEE 802.11n HT20 modulation (6.5 Mbps) CH11 2462MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4924.000	34.49	10.76	34.98	45.78	56.05	Horizontal	74	PK	Pass
4924.000	34.49	10.76	34.98	34.07	44.34	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-	-

#### Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

**Radiated Emission**

## WIFI Mode IEEE 802.11n HT40 modulation (13.5 Mbps) CH1 2422MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
199.750	10.00	1.72	0	52.60	36.19	Horizontal	43.50	QP	Pass
600.030	19.90	4.12	0	17.15	41.17	Horizontal	46.00	QP	Pass
4844.000	34.35	10.67	35.05	44.61	54.58	Horizontal	74	PK	Pass
4844.000	34.35	10.67	35.05	31.58	41.55	Horizontal	54	AV	Pass
7266.000	-	-	-	-	-	-	-	-	-
7266.000	-	-	-	-	-	-	-	-	-

## WIFI Mode IEEE 802.11n HT40 modulation (13.5 Mbps) CH6 2437MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4874.000	34.41	10.69	35.03	43.89	53.96	Horizontal	74	PK	Pass
4874.000	34.41	10.69	35.03	31.22	41.29	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

## WIFI Mode IEEE 802.11n HT40 modulation (13.5 Mbps) CH11 2452MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Result
4904.000	34.46	10.74	35.00	44.97	55.17	Horizontal	74	PK	Pass
4904.000	34.46	10.74	35.00	31.34	41.54	Horizontal	54	AV	Pass
7356.000	-	-	-	-	-	-	-	-	-
7356.000	-	-	-	-	-	-	-	-	-

## Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.



## Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum	Agilent	E4446A	US44300459	May 08, 2011
Amp	HP	8449B	3008A02495	May 08, 2011
Antenna	EMCO	3115	9607-4877	May 17, 2011
Bilog Antenna	Schaffner	CBL6111C	2598	Dec.14, 2011
HF Cable	Hubersuhne	Sucoflex104	---	May 08, 2011

## 7.6 6 dB bandwidth

### Test Method

- 1 Place the EUT on the table and set it in the transmitting mode.
- 2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3 Mark the peak frequency and  $-6\text{dB}$  (upper and lower) frequency.

### Limit

Limit [kHz]

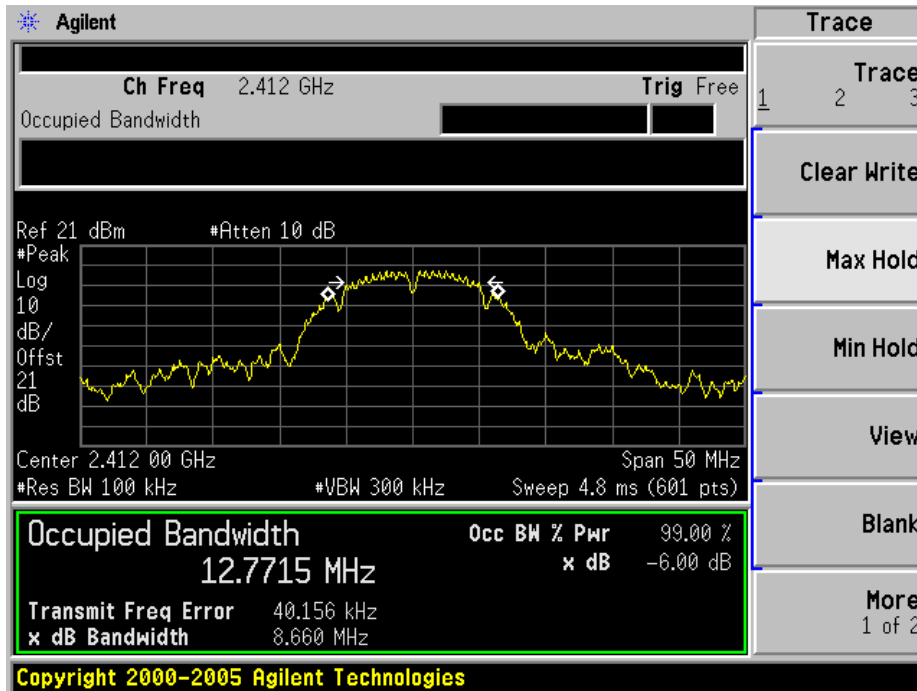
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$\geq 500$

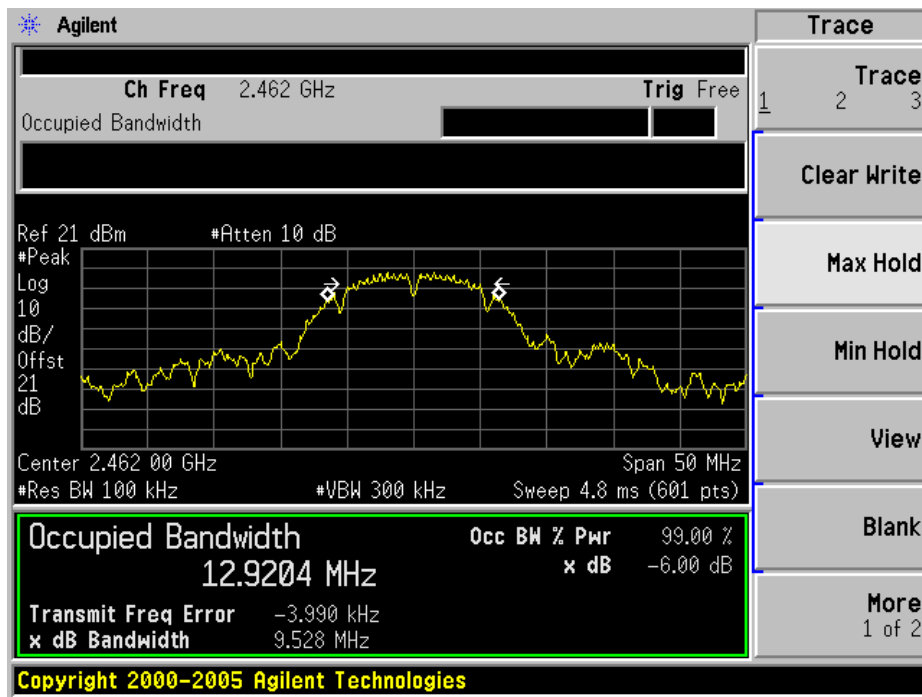
## 6 dB bandwidth

### WIFI Mode IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	8660	≥ 500	Pass
2437	9118	≥ 500	Pass
2462	9528	≥ 500	Pass



## 6 dB bandwidth

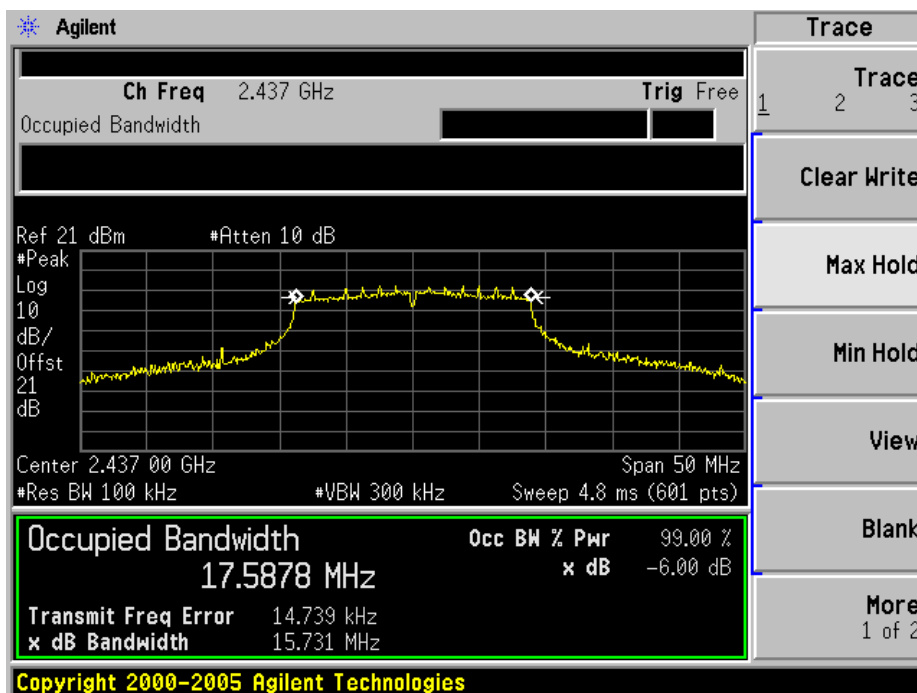
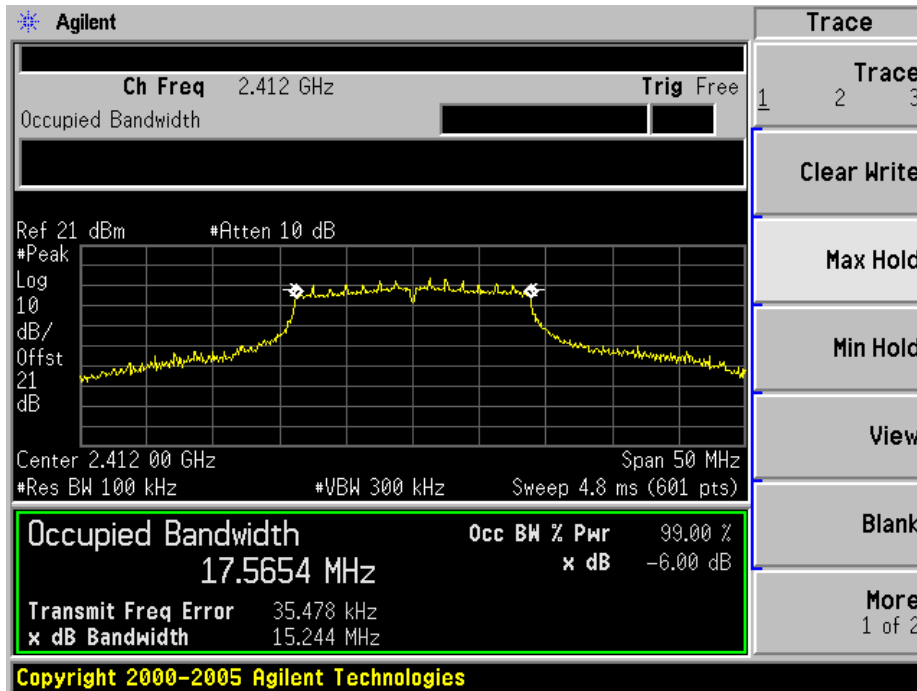




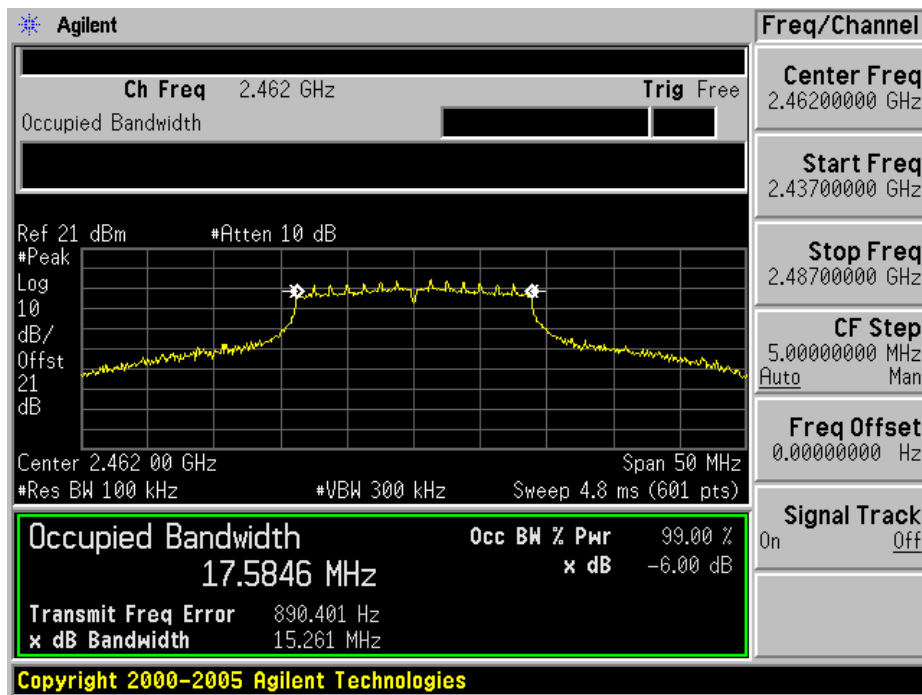
## 6 dB bandwidth

### WIFI Mode IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	15244	≥ 500	Pass
2437	15731	≥ 500	Pass
2462	15261	≥ 500	Pass



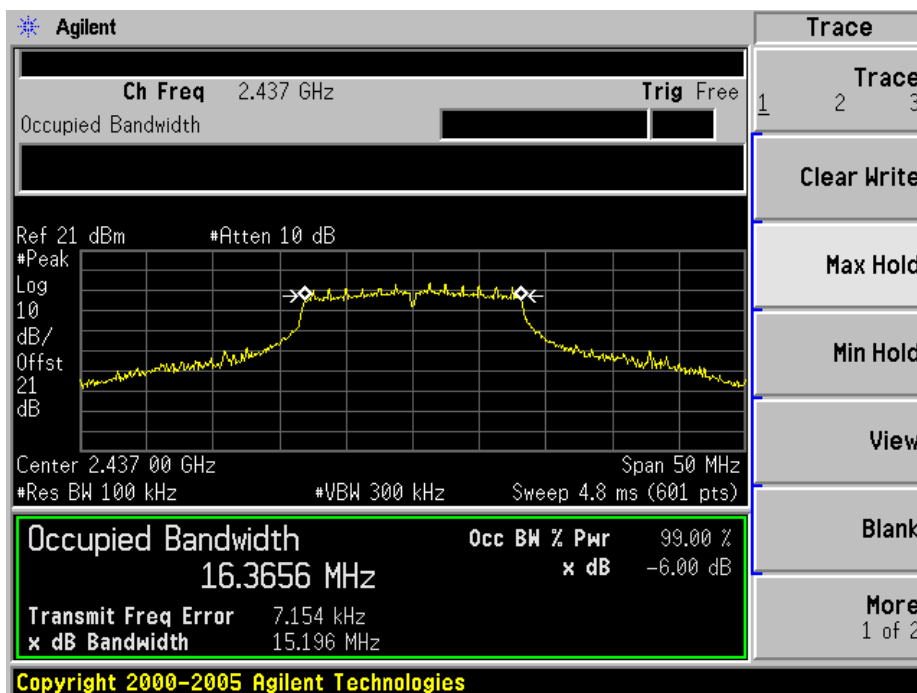
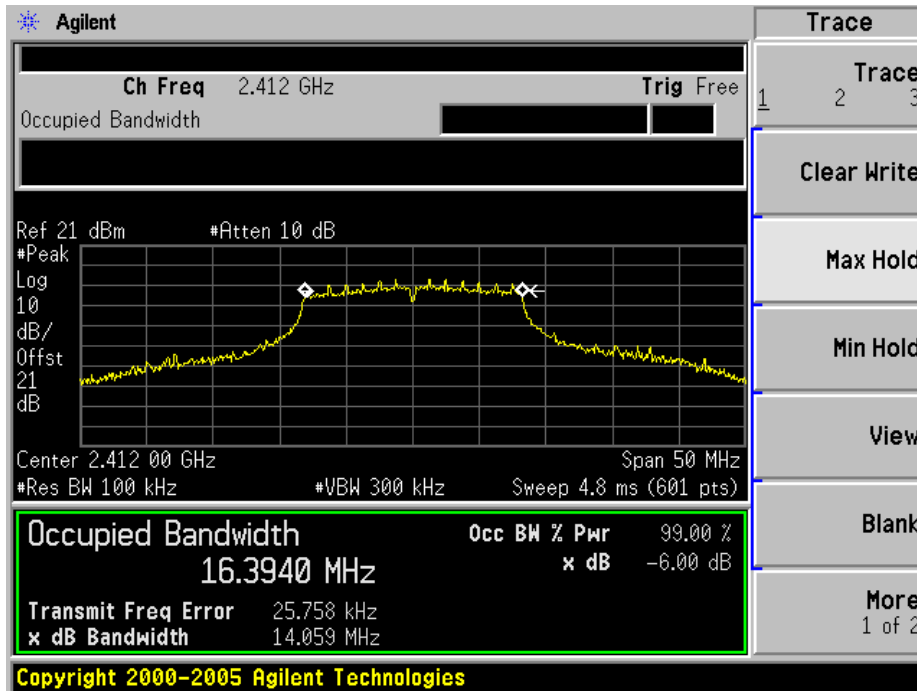
## 6 dB bandwidth



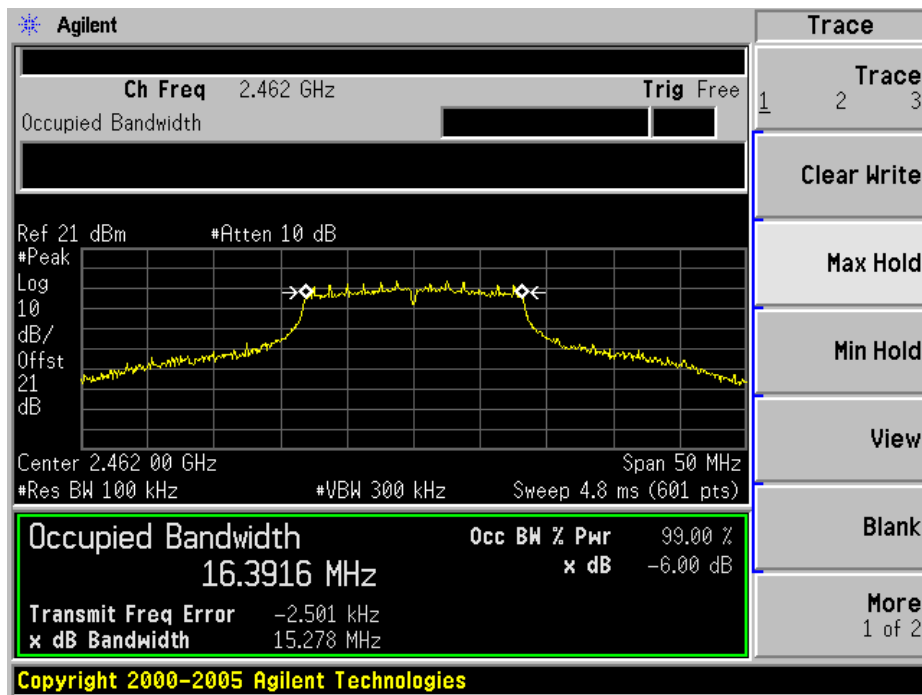
**6 dB bandwidth**

WIFI Mode IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	14059	≥ 500	Pass
2437	15196	≥ 500	Pass
2462	15278	≥ 500	Pass



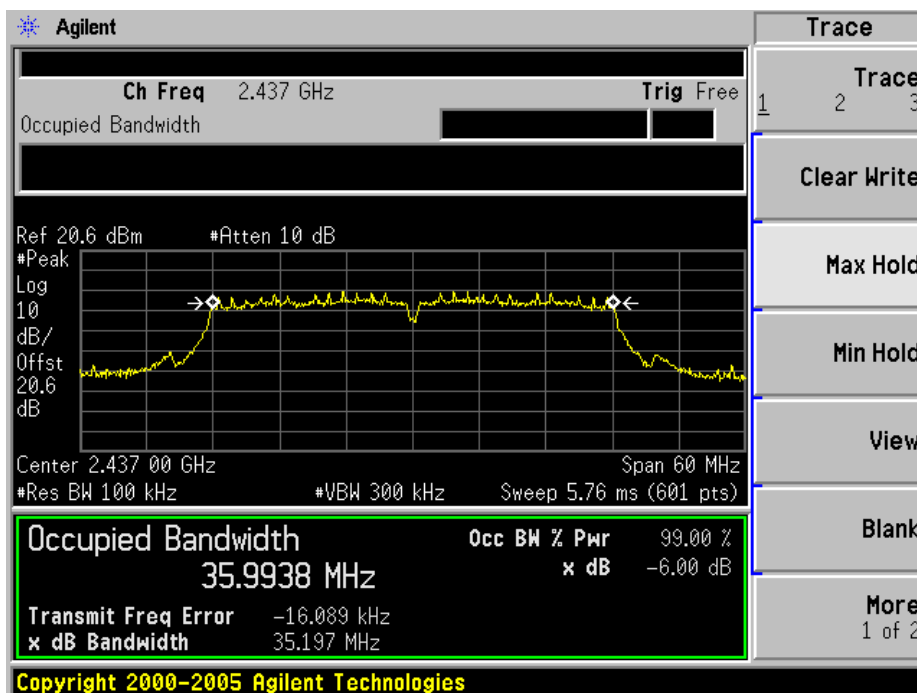
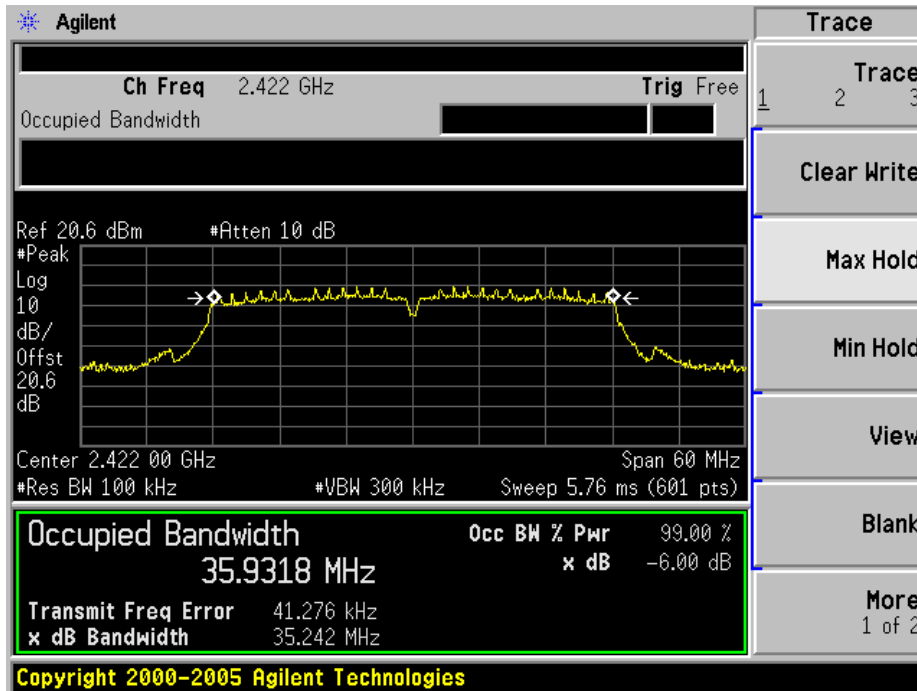
## 6 dB bandwidth



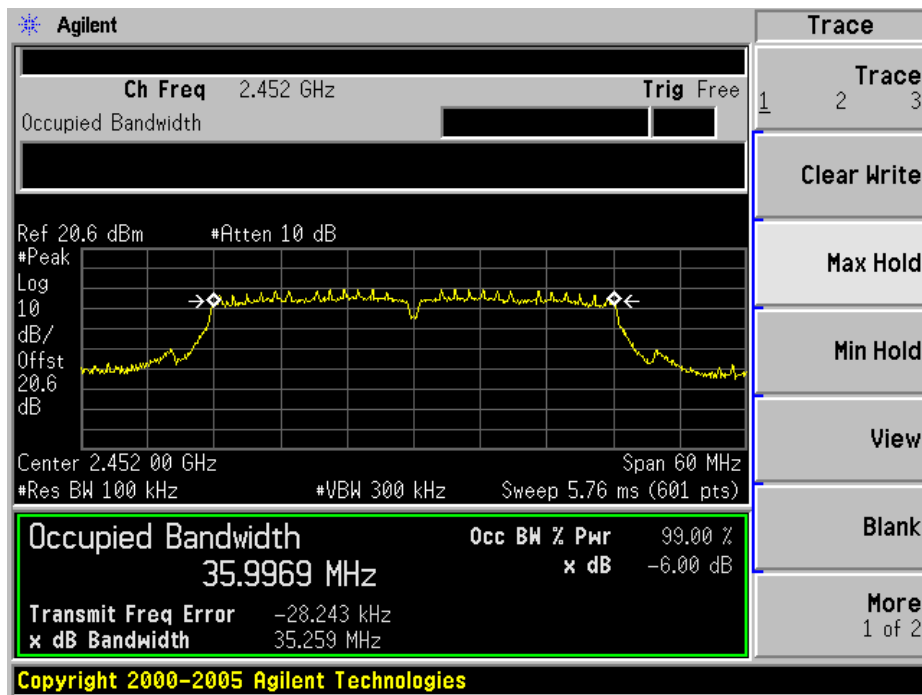
**6 dB bandwidth**

WIFI Mode IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	35242	≥ 500	Pass
2437	35197	≥ 500	Pass
2462	35259	≥ 500	Pass



## 6 dB bandwidth





Product Service

## Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	MY41440292	May 08, 2011

## 7.7 Power spectral density

### Test Method

- 1 Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 2 Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300kHz, Sweep = 100 s
- 3 Record the max reading.

### Limit

Limit  
dBm / 3 kHz

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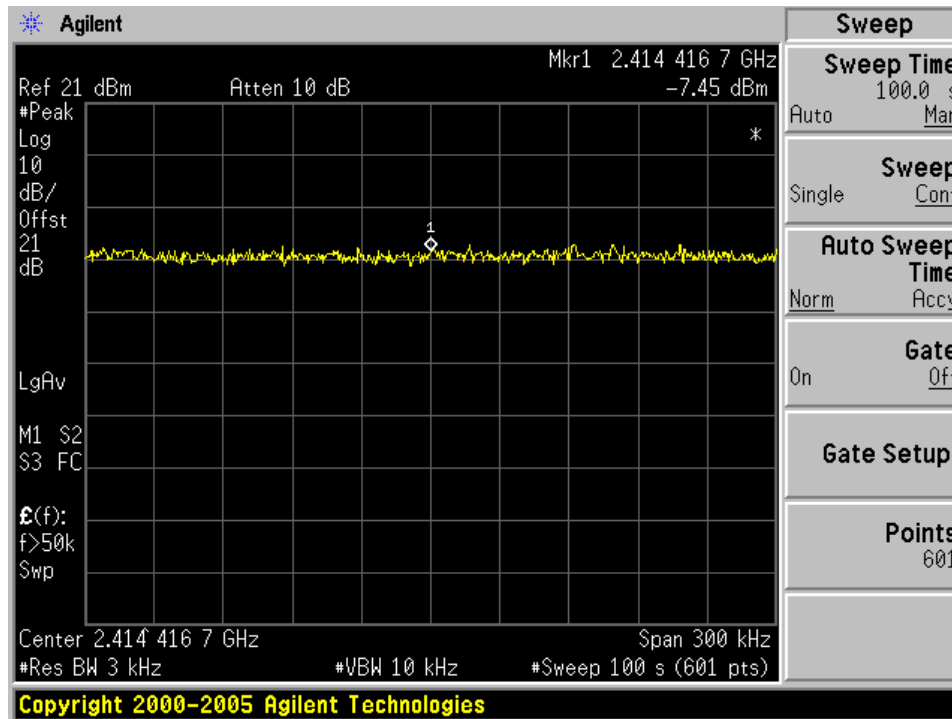
8



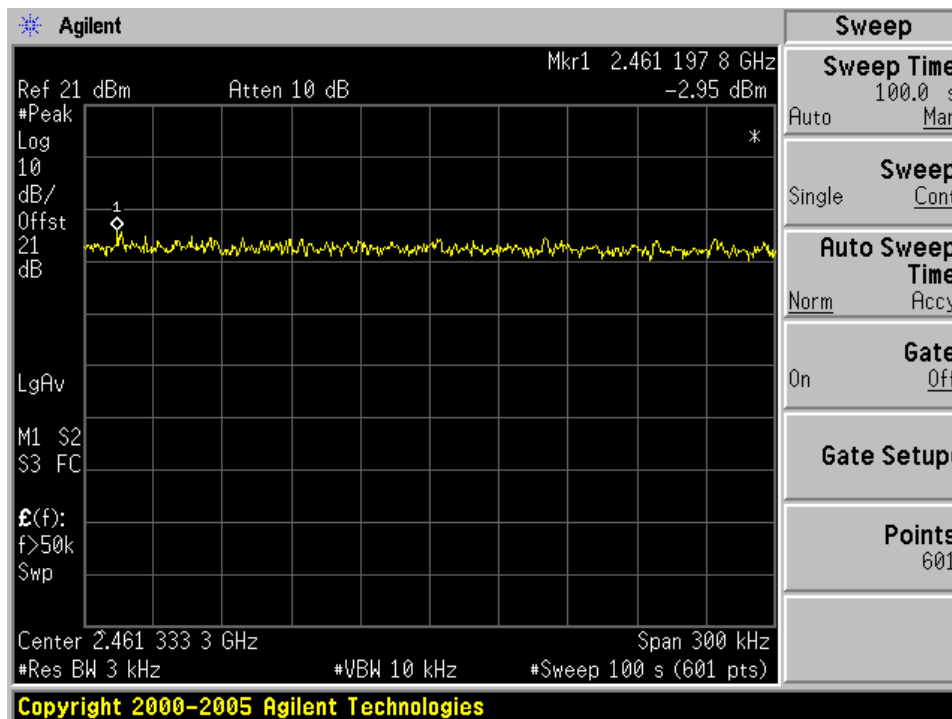
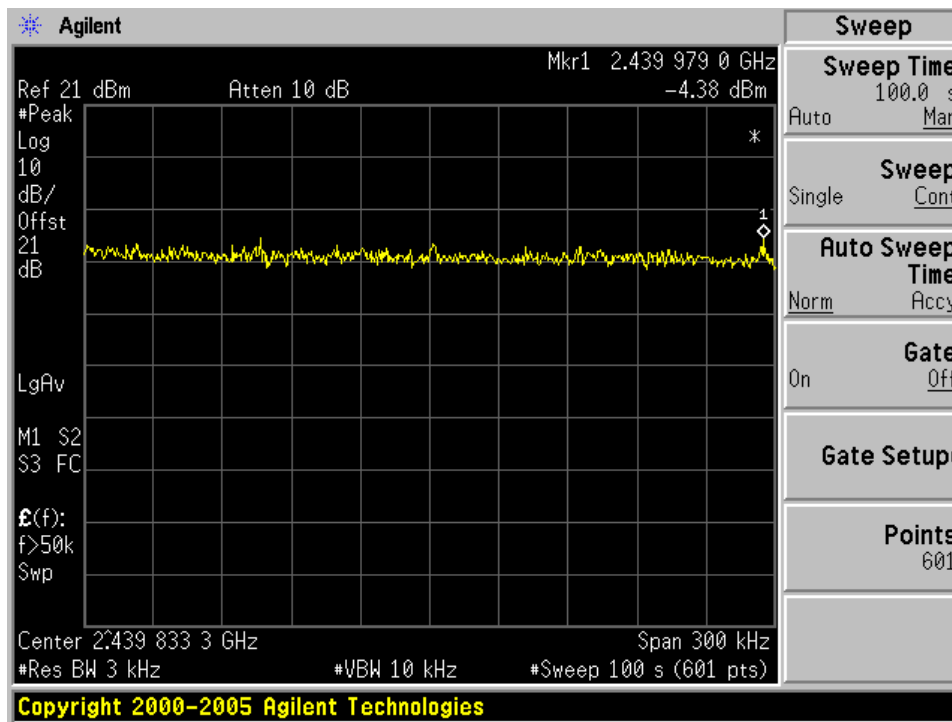
## Power spectral density

### WIFI Mode IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-7.45	Pass
2437	-4.38	Pass
2462	-2.95	Pass



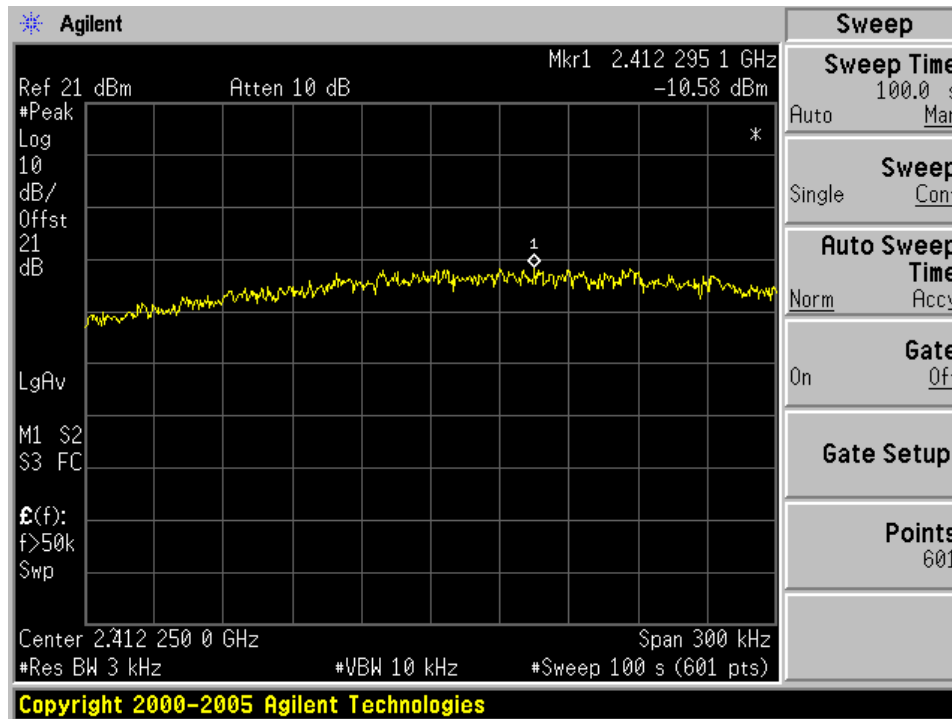
## Power spectral density



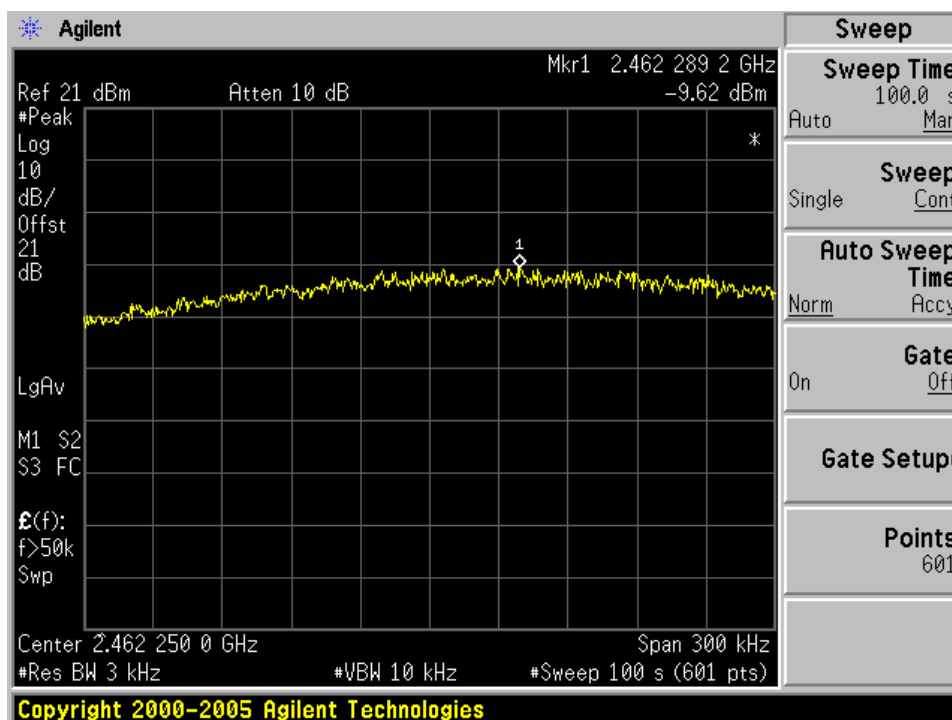
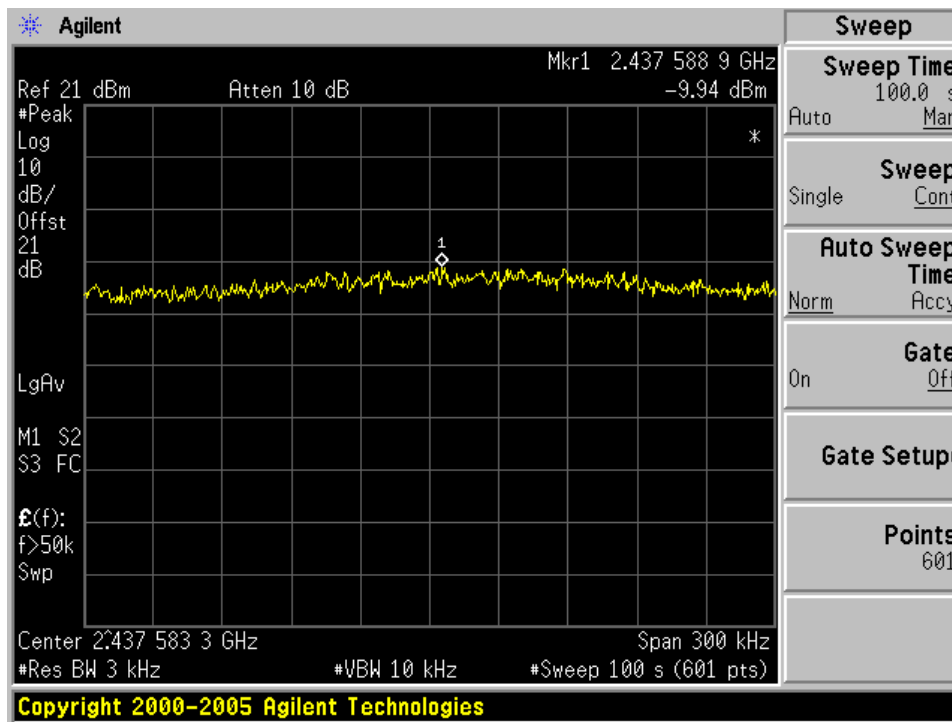
## Power spectral density

### WIFI Mode IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-10.58	Pass
2437	-9.94	Pass
2462	-9.62	Pass



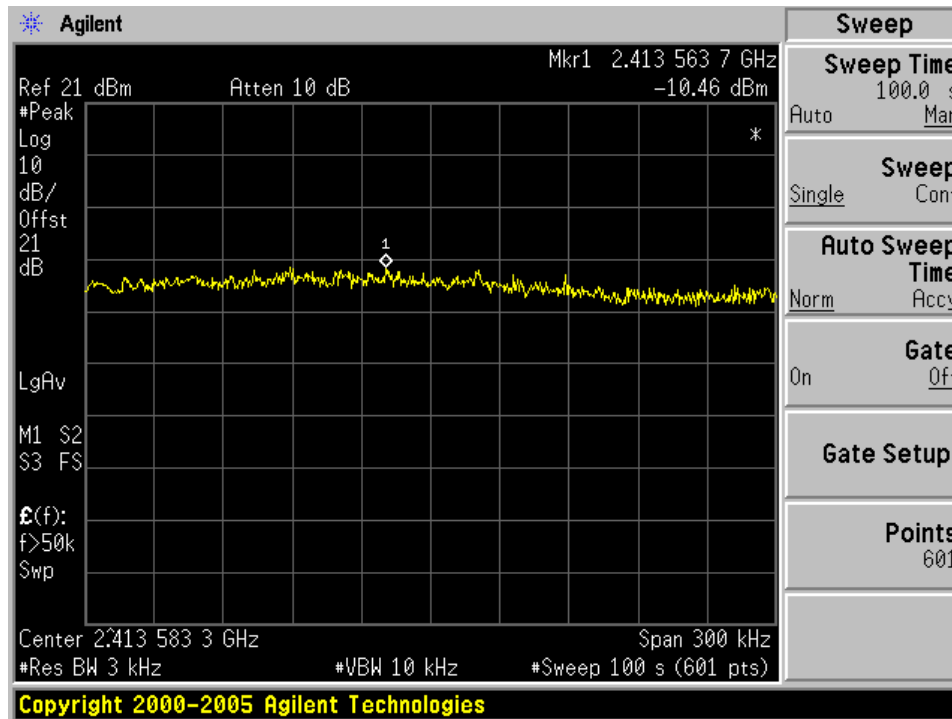
## Power spectral density



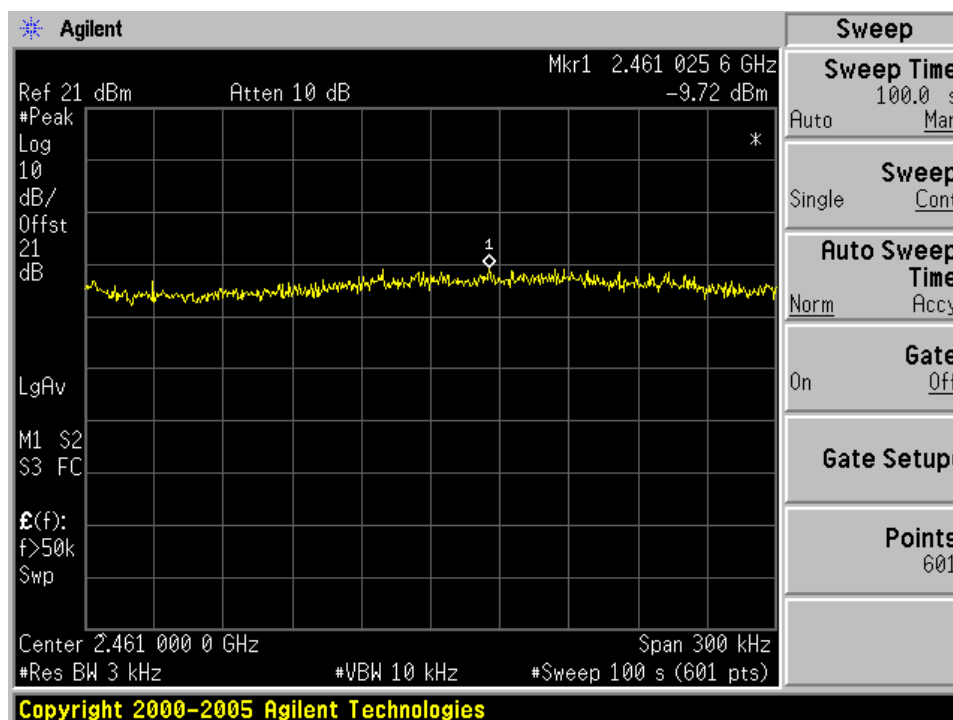
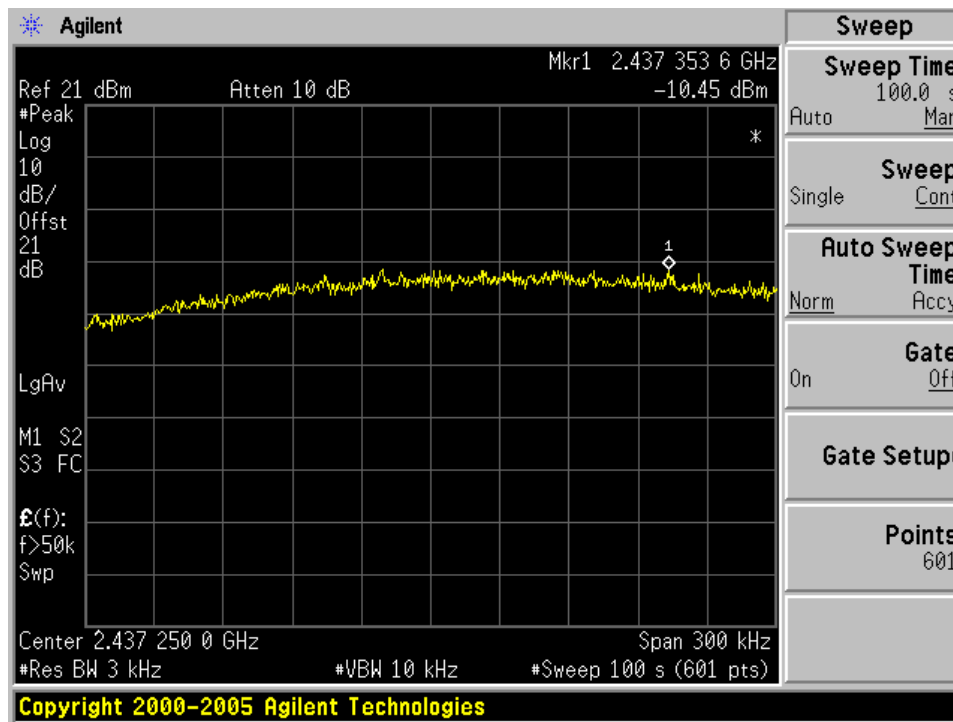
## Power spectral density

### WIFI Mode IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-10.46	Pass
2437	-10.45	Pass
2462	-9.72	Pass



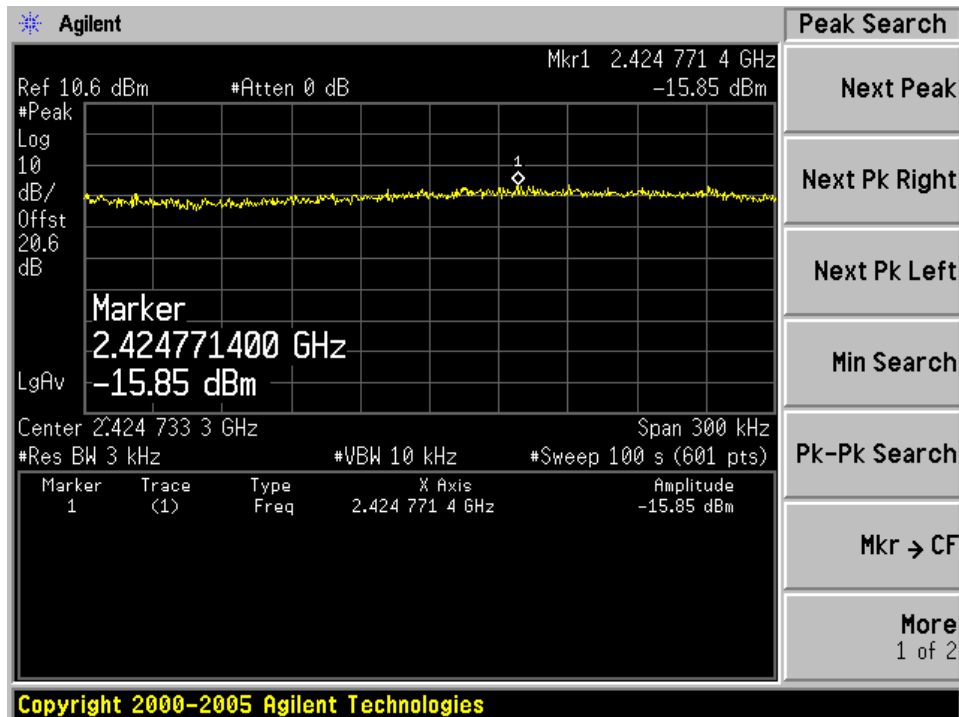
## Power spectral density



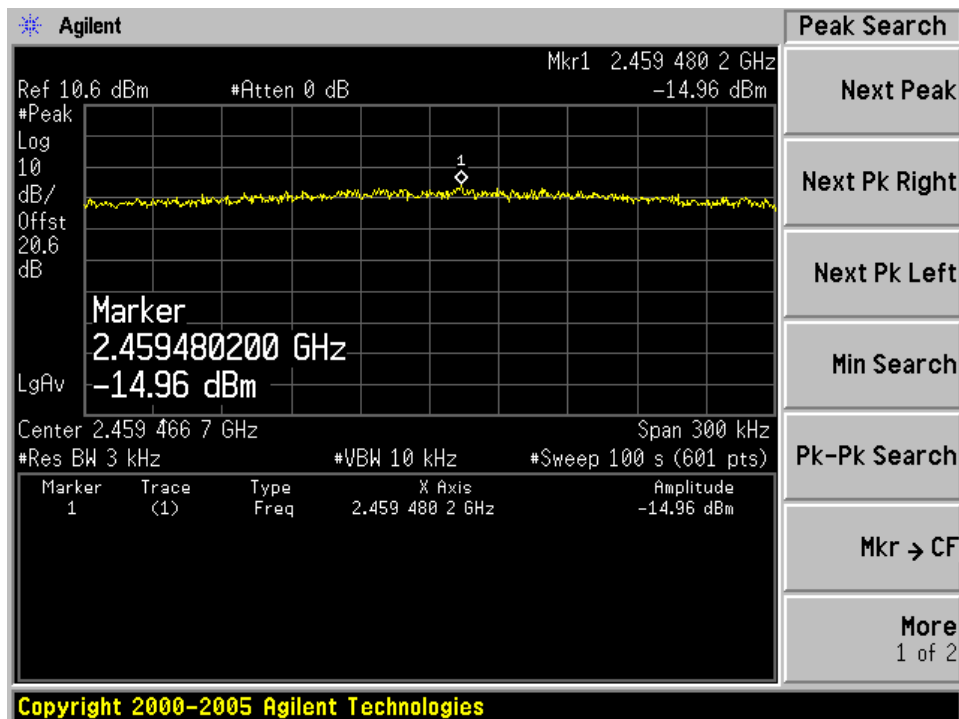
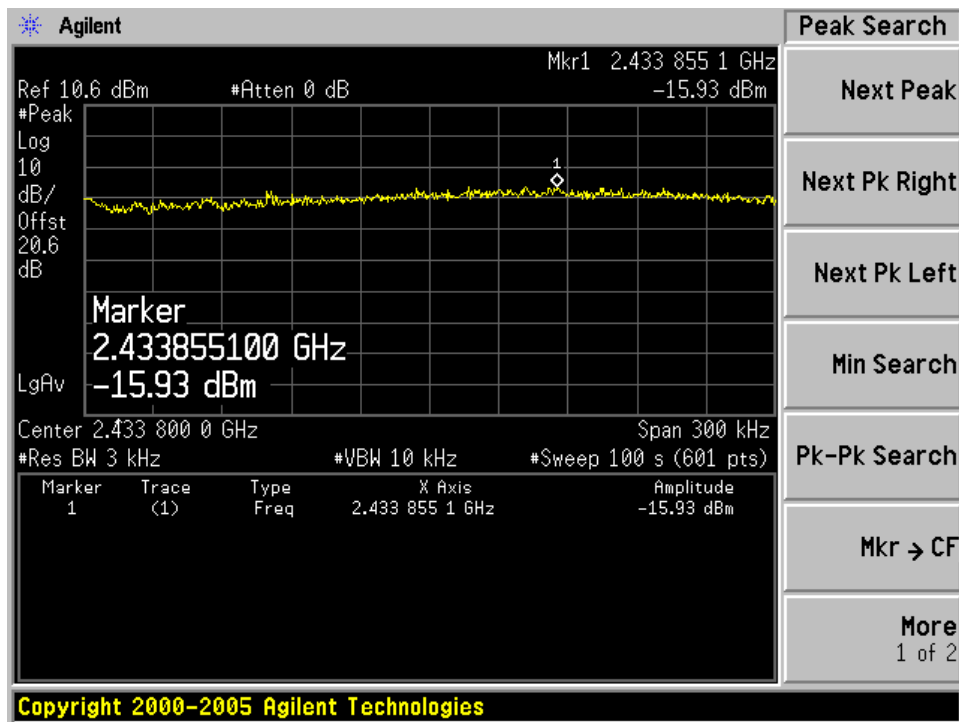
## Power spectral density

### WIFI Mode IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	P dBm	Result
2422	-15.85	Pass
2437	-15.93	Pass
2452	-14.96	Pass



## Power spectral density







Product Service

## Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	MY41440292	May 08, 2011



## 8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

**System Measurement Uncertainty**

Items		Extended Uncertainty
RE	Field strength (dB $\mu$ V/m)	U=4.32dB (30MHz-25GHz)
CE	Disturbance Voltage (dB $\mu$ V)	U=2.40dB(150KHz-30MHz)