



Product Service

FCC - TEST REPORT

Report Number : **68.850.10.017.01** Date of Issue: 15 March 2010

Model : **PC-91013**

Product Type : Notebook

Applicant : Wanlida Group Co., Ltd.

Address : No.618, Jiahe Road, Wanlida Industry Zone,
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

Company name: Jiangsu TÜV Product Service Ltd. – Shenzhen Branch
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No. 4001, Fuqiang Road,
Futian District 518048,
Shenzhen, P.R.C.

Telephone: 86 755 8828 6998
Fax: 86 755 8828 5299

Company name: China Shenzhen Academy of Metrology and Quality Inspection,
Metrology and Quality Inspection building,
Central Section of LongZhu Road,
Nan Shan,
Shenzhen,

Telephone: 86 755 2694 1599
Fax: 86 755 2694 1545

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: Notebook

Model no.: PC-91013

Brand Name: MALATA

Options and accessories: NIL

Rating: DC 19V, 40W
Test with adaptor:
Input: AC 100-240V, 50-60Hz, 1A
Output: DC 19V, 2.1A

RF Transmission
Frequency: 2412-2462MHz

Description of the EUT: NIL

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
LCD monitor	Lenovo	9227-AE1	V1TDB38
Keyboard	Lenovo	SK-8825 (L)	02553778
Mouse	Lenovo	MO28UOL	4418011108
PC host	Lenovo	9439	L3BDF2K
Headphone	Ouyun	OH601	----
SD card	Kingston	SD4/4GBFE	----
VGA cable	Lenovo	Shield	140cm
AC Power cable	Lenovo	Unshield	180cm

4 Summary of Test Standards

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

6 General Remarks

Remarks

This submittal(s) (test report) is intended for class 2 permissive change from FCC ID: VQF-RT3090-1T1R 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: 24 February 2010

Testing Start Date: 2 March 2010

Testing End Date: 11 March 2010

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by:

Prepared by:



Paul Yu
Assistant EMC Manager



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Senior EMC Project Engineer

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 (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line

Limit

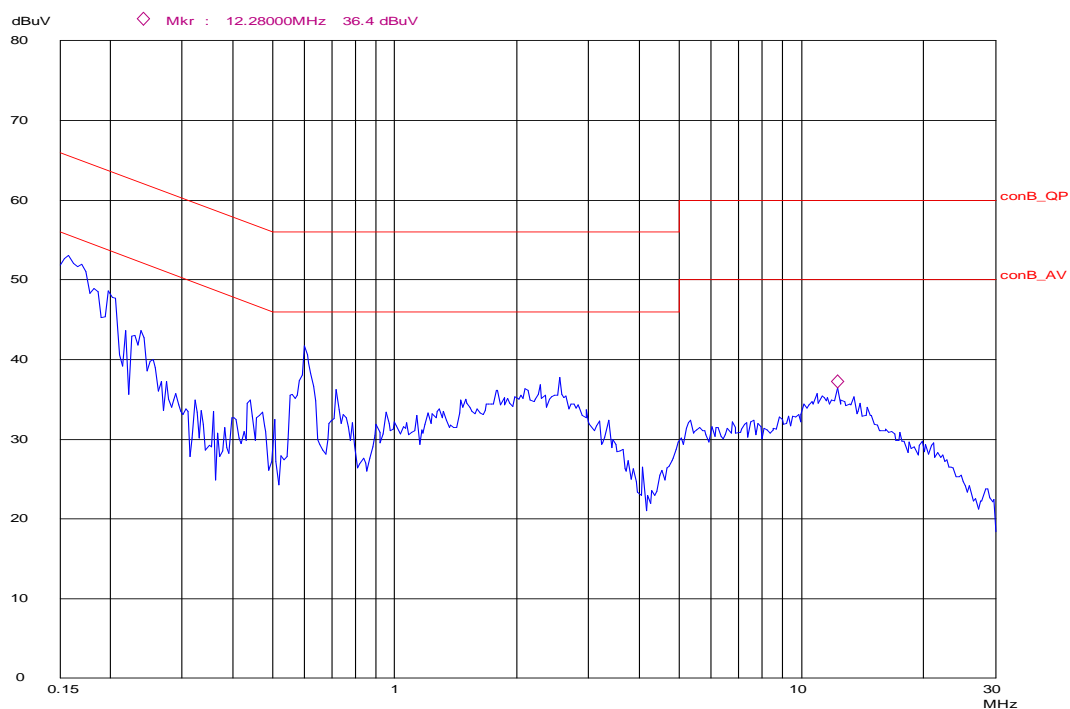
Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Conducted Emission

Conducted Disturbance

EUT: M/N:PC-91013
Op Cond: Run Test Program
Test Spec: L
Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBμV	QP Test result dBμV	QP Limit dBμV	Margin dB
0.158	9.8	41.7	51.5	65.6	14.1
0.598	9.9	29.2	39.1	56	16.9
12.280	10.2	20.9	31.1	60	28.9

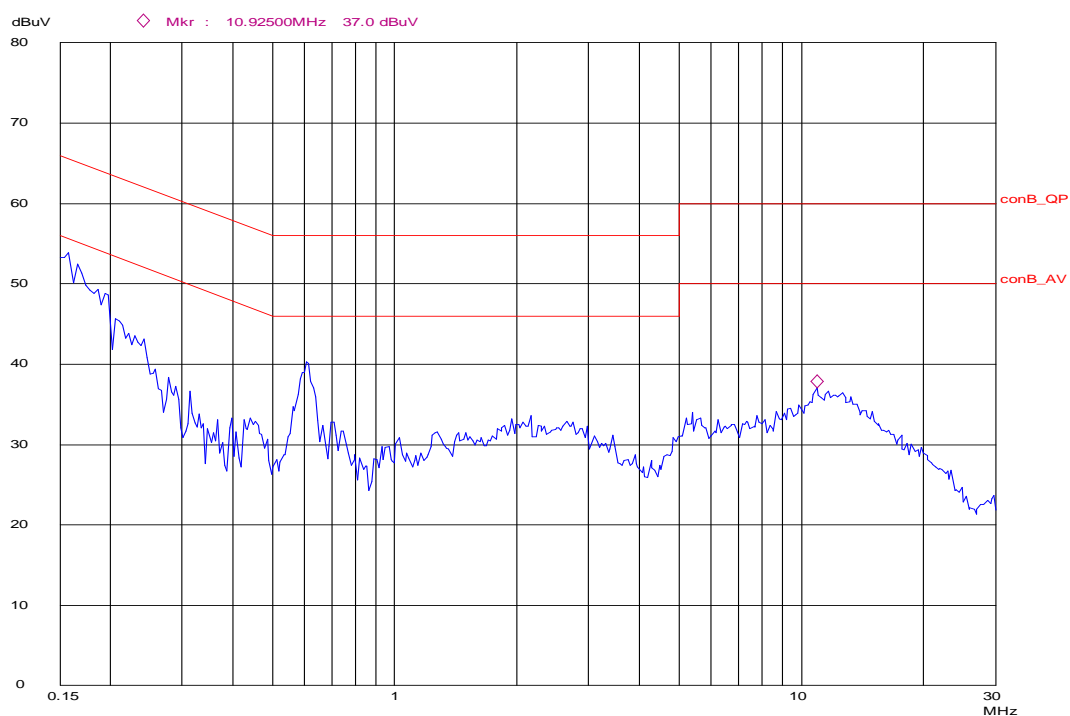
Frequency MHz	Cable Loss dB	Reading dBμV	AV Test result dBμV	AV Limit dBμV	Margin dB
0.158	9.8	24.1	33.9	55.6	21.7
0.598	9.9	21.3	31.2	46	14.8
12.280	10.2	14.9	25.1	50	24.9

Remark: Test Result= Reading + Cable Loss

Conducted Emission

Conducted Disturbance

EUT: M/N:PC-91013
Op Cond: Run Test Program
Test Spec: N
Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBμV	QP Test result dBμV	QP Limit dBμV	Margin dB
0.158	9.8	42.3	52.1	65.6	13.5
0.606	9.9	28.1	38.0	56	18
10.925	10.2	21.5	31.7	60	28.3

Frequency MHz	Cable Loss dB	Reading dBμV	AV Test result dBμV	AV Limit dBμV	Margin dB
0.158	9.8	25.2	35.0	55.6	20.6
0.606	9.9	20.1	30.0	46	16
10.925	10.2	15.4	25.6	50	24.4

Remark: Test Result= Reading + Cable Loss

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Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	Sep 21 2010
AMN	Rohde & Schwarz	ESH3-Z5	100229	Sep 21 2010
AMN	Rohde & Schwarz	ENV216	100042	Sep 21 2010

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

IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	19.33	Pass
CH6 2437MHz	18.87	Pass
CH11 2462MHz	18.56	Pass

IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	18.27	Pass
CH6 2437MHz	18.35	Pass
CH11 2462MHz	17.81	Pass

IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	18.50	Pass
CH6 2437MHz	18.28	Pass
CH11 2462MHz	17.86	Pass

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH3 2422MHz	18.80	Pass
CH6 2437MHz	17.62	Pass
CH9 2452MHz	18.34	Pass



Product Service

Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum Analyzer	Agilent	E4407B	MY41440292	May 10 2010

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

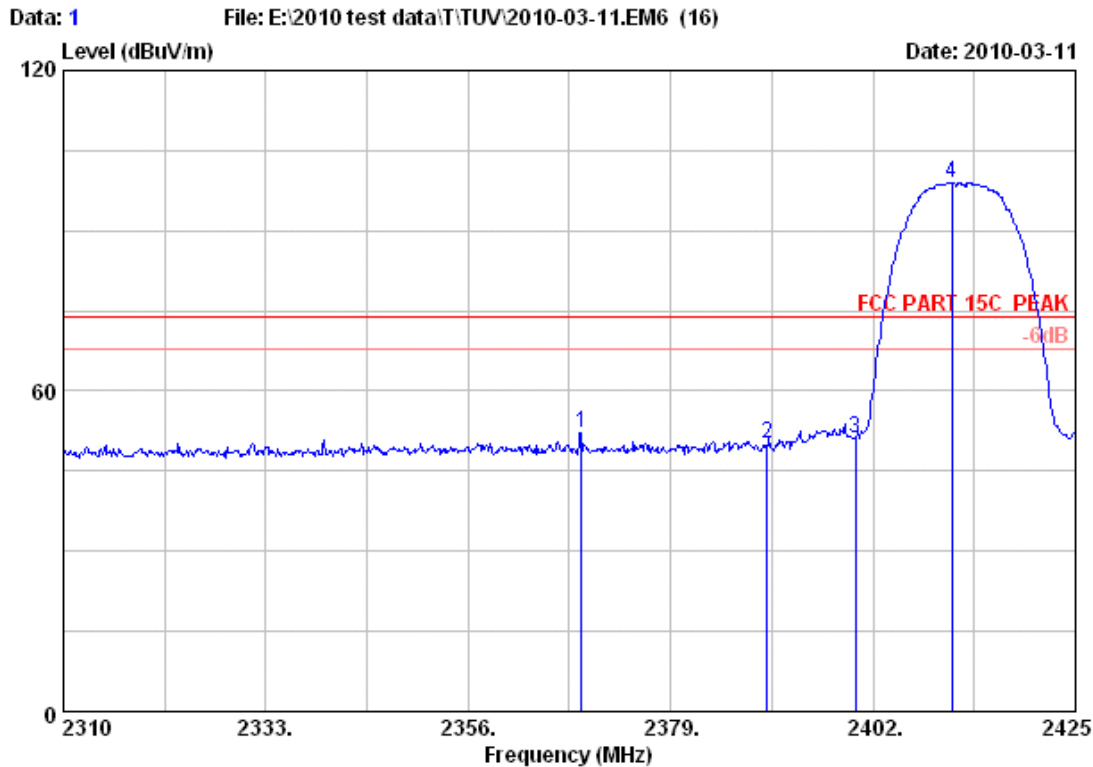
According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains 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

IEEE 802.11b modulation (1 Mbps) Test Result

Lower Edge PK plot:



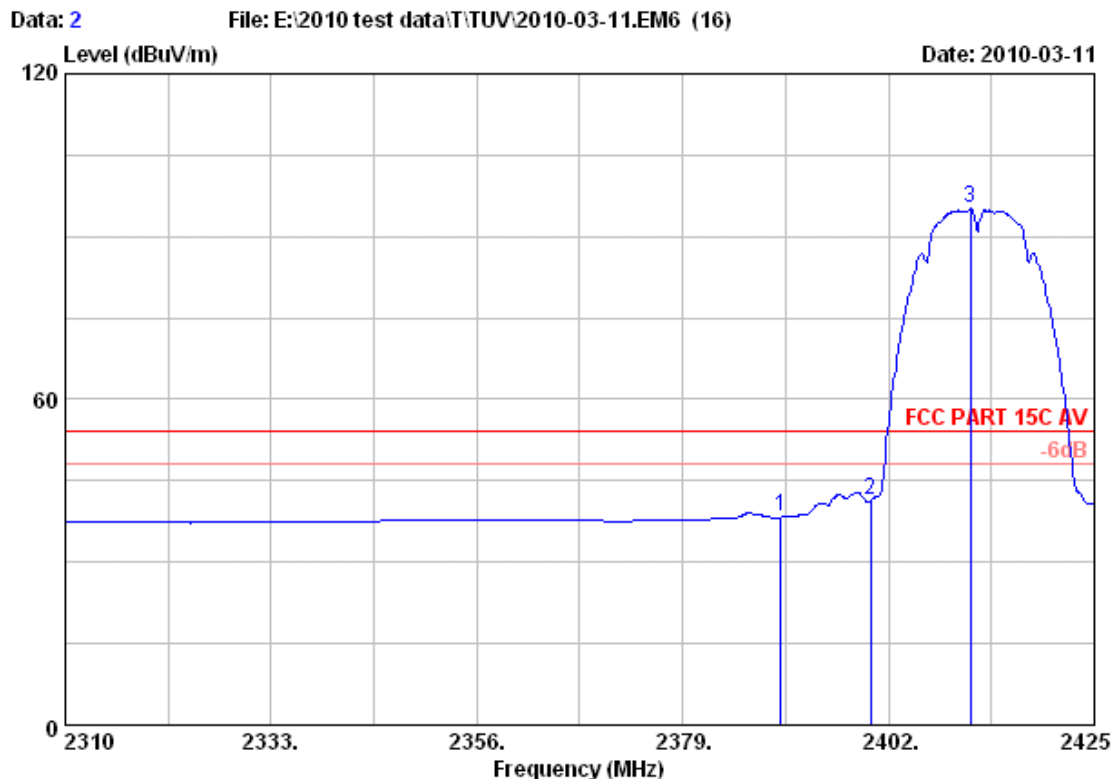
Site no.	: 3m Chamber	Data no.	: 1
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11b CH1 Tx		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1	2368.880	29.43	7.61	36.00	51.16	52.20	74.00	21.80	Peak
2	2390.000	29.44	7.66	36.09	49.20	50.21	74.00	23.79	Peak
3	2400.000	29.44	7.66	36.09	50.21	51.22	74.00	22.78	Peak
4	2410.970	29.45	7.66	35.95	97.86	99.02	74.00	-25.02	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:



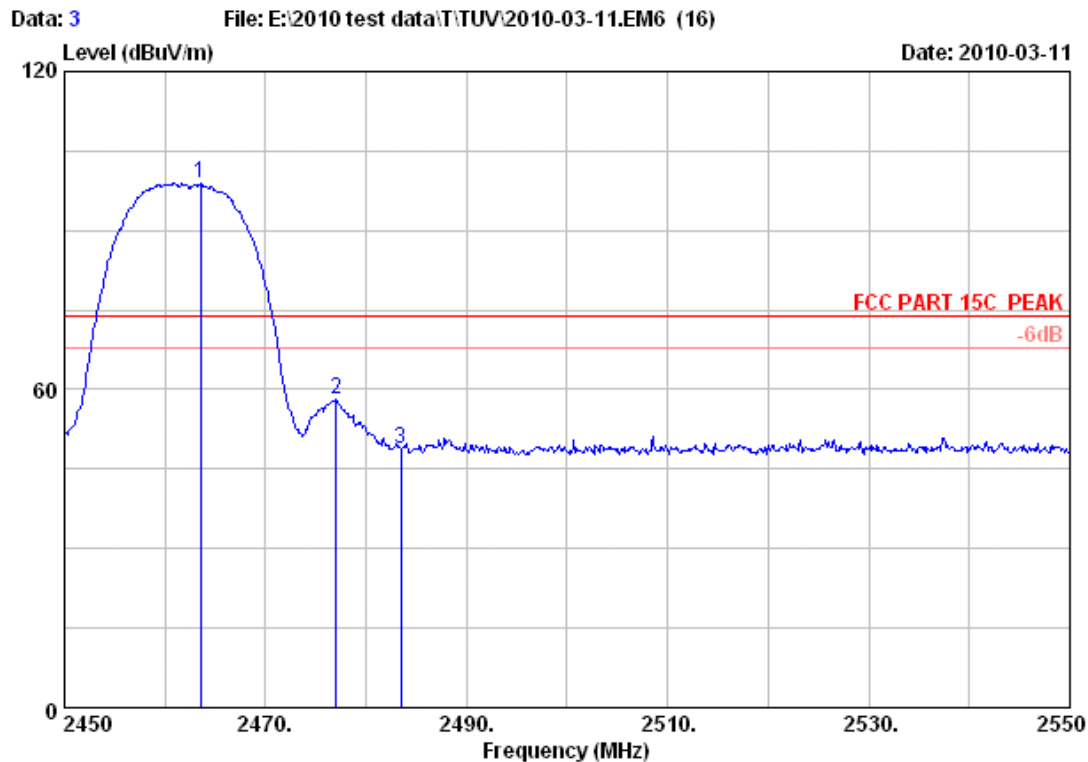
Site no. : 3m Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C AV
 Env. / Ins. : 24°C/70% Engineer : Jamy_Yu
 EUT : PC-91013
 Power : AC120V
 Test mode : 11b CH1 Tx
 M/N :

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBUV)	(dBUV/m)	(dBUV/m)	(dB)		
1 2390.000	29.44	7.66	36.09	37.29	38.30	54.00	15.70	Average	
2 2400.000	29.44	7.66	36.09	40.47	41.48	54.00	12.52	Average	
3 2411.200	29.45	7.66	35.95	93.95	95.11	54.00	-41.11	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:



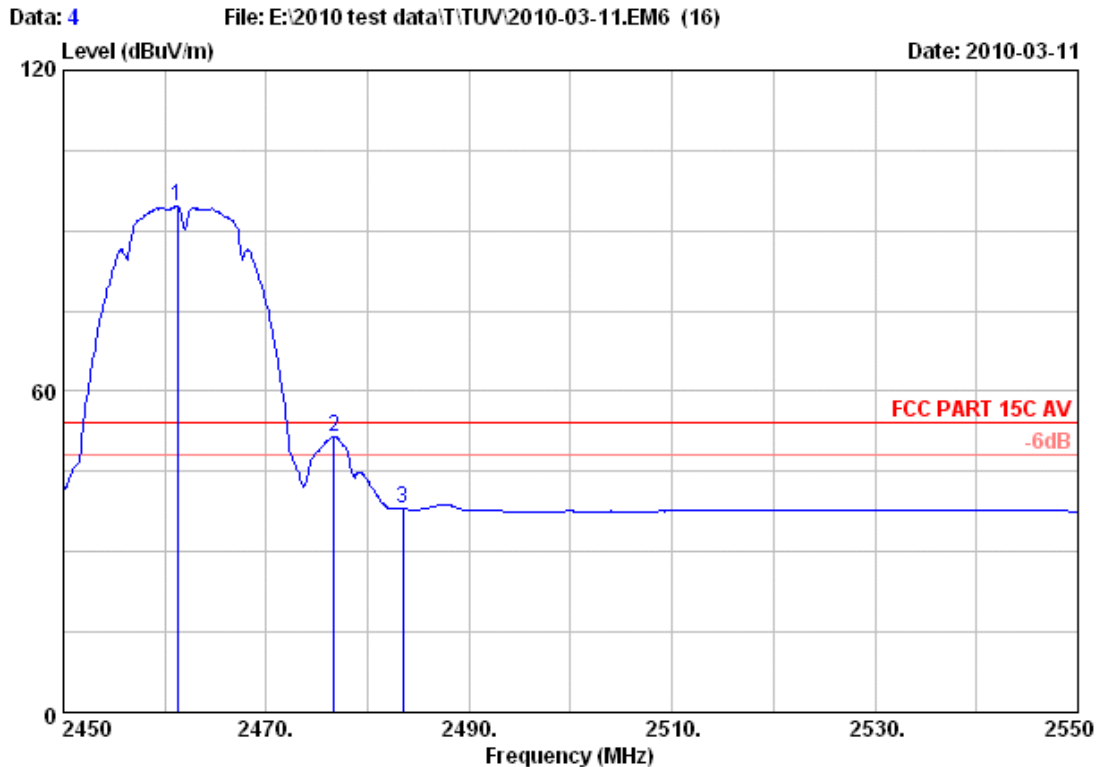
Site no.	: 3m Chamber	Data no.	: 3
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK	Engineer	: Jamy_Yu
Env. / Ins.	: 24°C/70%		
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11b CH11 Tx		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBUV)	(dBUV/m)	(dBUV/m)	(dB)		
1 2463.500	29.48	7.72	36.02	97.66	98.84	74.00	-24.84	Peak	
2 2477.000	29.49	7.77	35.97	56.78	58.07	74.00	15.93	Peak	
3 2483.500	29.49	7.77	35.97	47.63	48.92	74.00	25.08	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.	: 4
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11b CH11 Tx		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 2461.200	29.48	7.72	36.02	93.41	94.59	54.00	-40.59	Average	
2 2476.700	29.49	7.77	35.97	50.29	51.58	54.00	2.42	Average	
3 2483.500	29.49	7.77	35.97	36.82	38.11	54.00	15.89	Average	

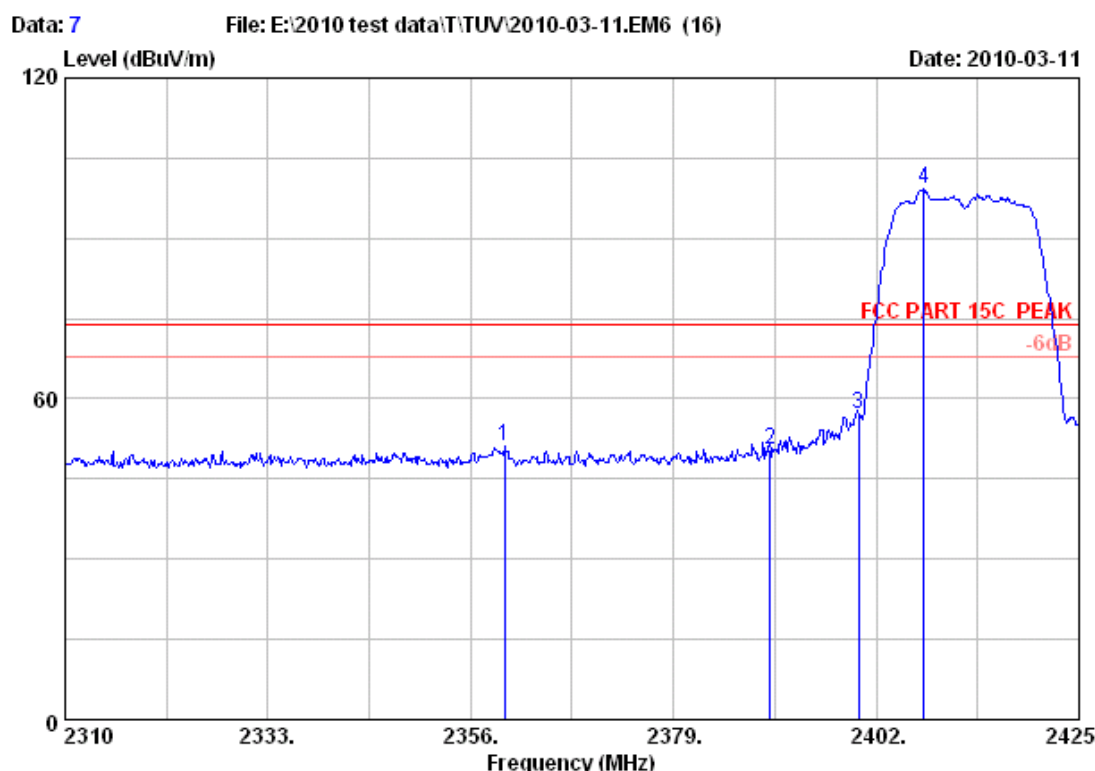
Remarks:

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

IEEE 802.11g modulation (6 Mbps) Test Result

Lower Edge PK Plot:



Site no. : 3m Chamber Data no. : 7
Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24°C/70% Engineer : Jamy_Yu
EUT : PC-91013
Power : AC120V
Test mode : 11g CH1 Tx
M/N :

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBUV)	(dBUV/m)	(dBUV/m)	(dB)		
1	2359.795	29.42	7.61	35.91	49.91	51.03	74.00	22.97	Peak
2	2390.000	29.44	7.66	36.09	49.42	50.43	74.00	23.57	Peak
3	2400.000	29.44	7.66	36.09	56.00	57.01	74.00	16.99	Peak
4	2407.405	29.45	7.66	35.95	98.03	99.19	74.00	-25.19	Peak

Remarks:

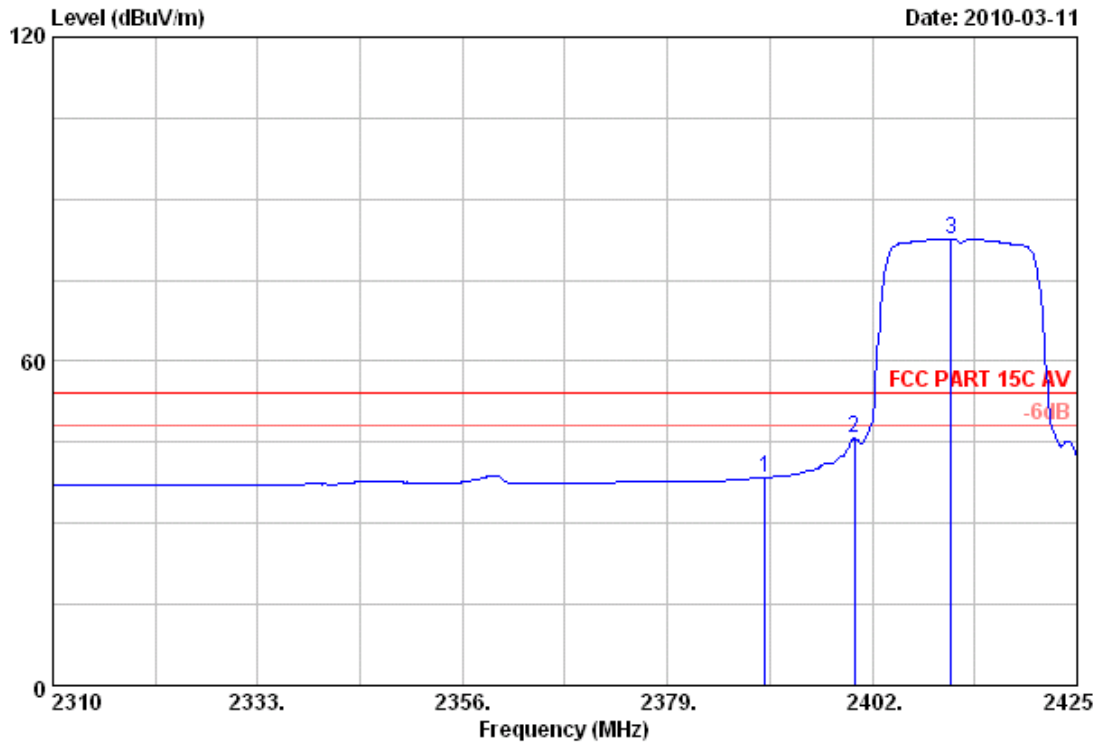
- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

Lower Edge AV Plot:

Data: 8

File: E:\2010 test data\TUV\2010-03-11.EM6 (16)

Date: 2010-03-11



Site no. : 3m Chamber
Dis. / Ant. : 3m 3115(0911)
Limit : FCC PART 15C AV
Env. / Ins. : 24°C/70%
EUT : PC-91013
Power : AC120V
Test mode : 11g CH1 Tx
M/N :

Data no. : 8
Ant. pol. : HORIZONTAL
Engineer : Jamy_Yu

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 2390.000	29.44	7.66	36.09	37.50	38.51	54.00	15.49	Average	
2 2400.000	29.44	7.66	36.09	44.64	45.65	54.00	8.35	Average	
3 2410.855	29.45	7.66	35.95	81.48	82.64	54.00	-28.64	Average	

Remarks:

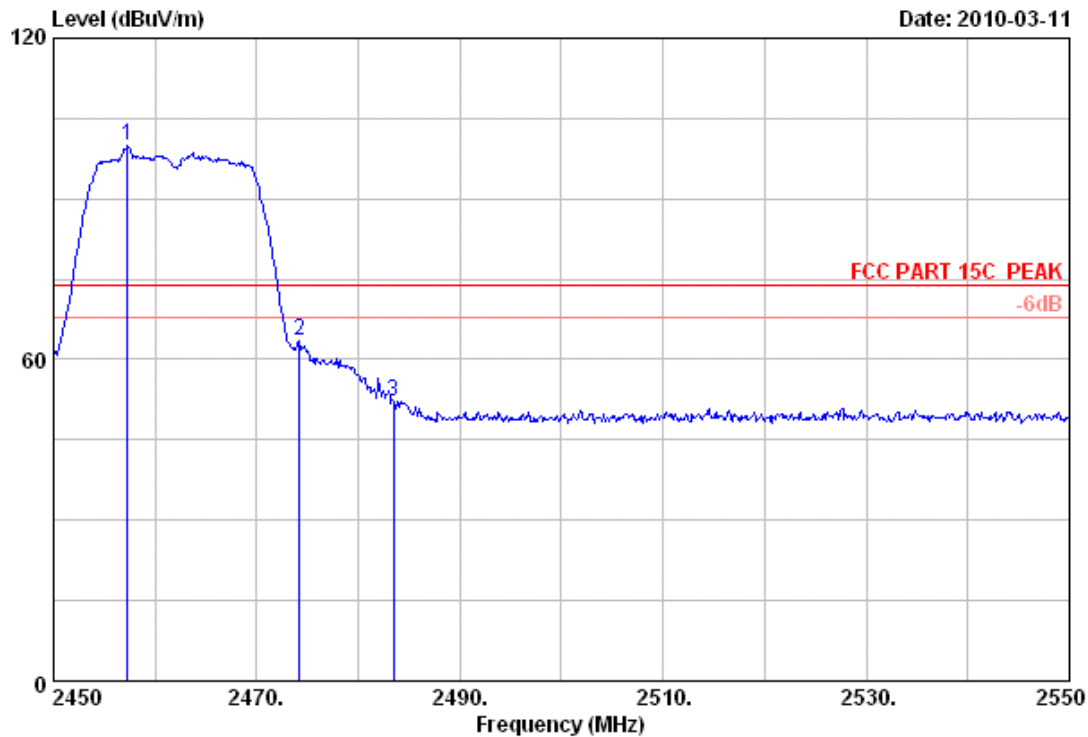
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Upper Edge PK Plot:

Data: 5

File: E:\2010 test data\TUV\2010-03-11.EM6 (16)

Date: 2010-03-11



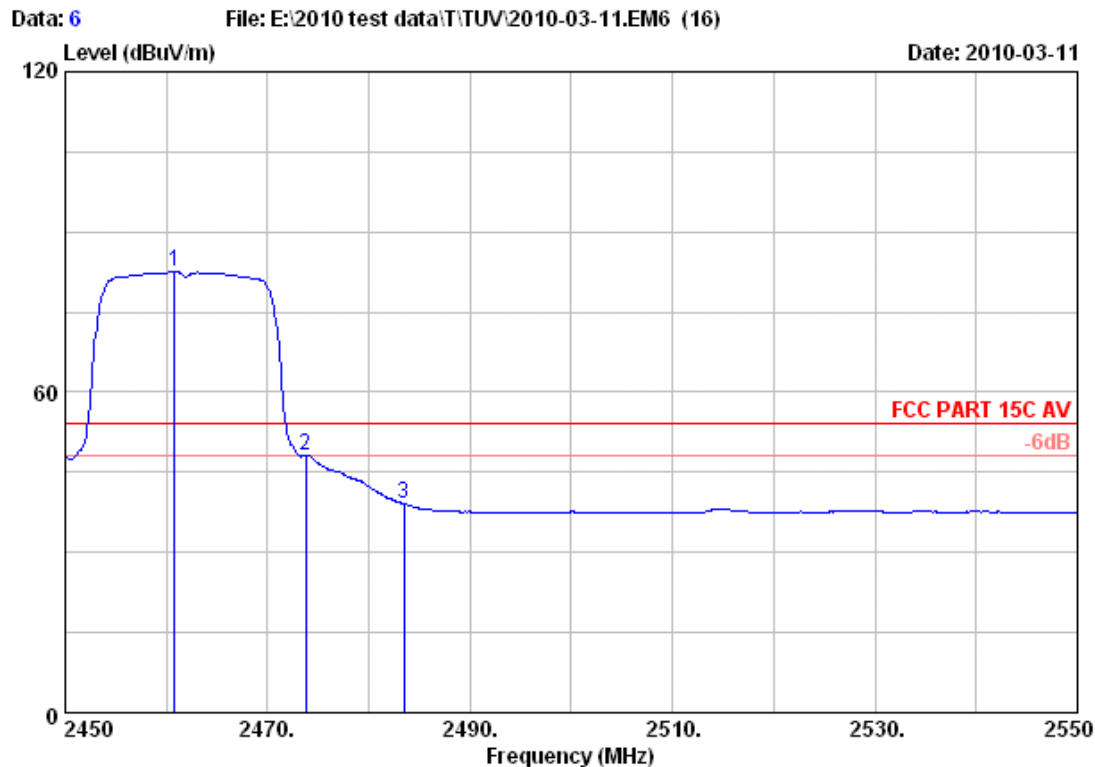
Site no.	: 3m Chamber	Data no.	: 5
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11g CH11 Tx		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 2457.300	29.48	7.72	36.02	98.67	99.85	74.00	-25.85	Peak	
2 2474.200	29.49	7.72	35.97	62.18	63.42	74.00	10.58	Peak	
3 2483.500	29.49	7.77	35.97	50.87	52.16	74.00	21.84	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.	: 6
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11g CH11 Tx		
M/N	:		

	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	2460.800	29.48	7.72	36.02	81.32	82.50	54.00	-28.50	Average
2	2473.800	29.49	7.72	35.97	46.79	48.03	54.00	5.97	Average
3	2483.500	29.49	7.77	35.97	37.80	39.09	54.00	14.91	Average

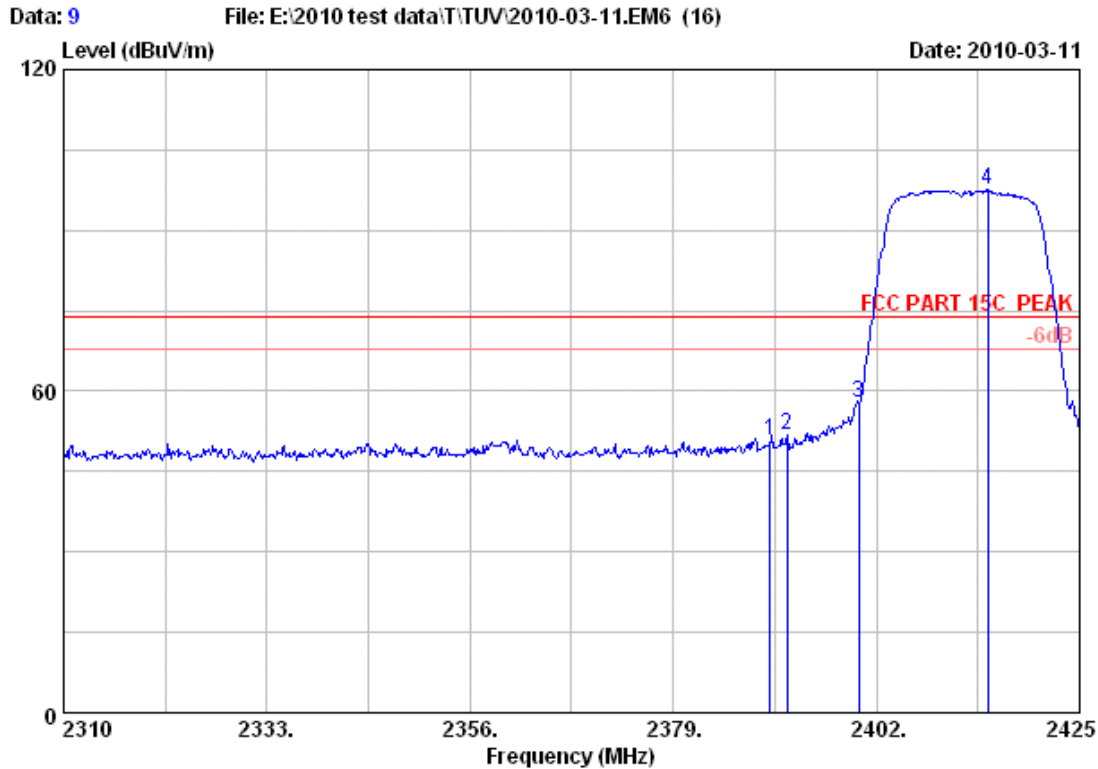
Remarks:

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

Band edge compliance of RF emissions

IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Lower Edge PK Plot:



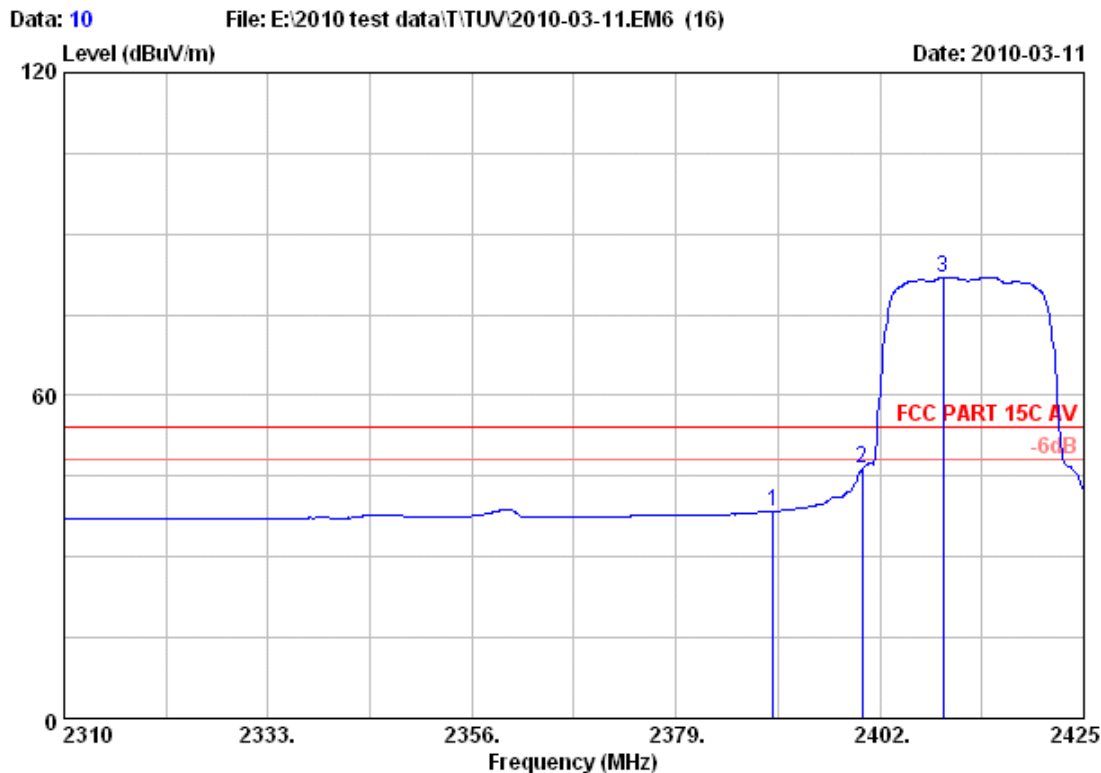
Site no.	: 3m Chamber	Data no.	: 9
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11nHT20 CH1 Tx		
M/N	:		

	Freq.	Ant.	Cable	Amp.		Emission			
	(MHz)	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	29.44	7.66	36.09	49.76	50.77	74.00	23.23	Peak
2	2391.880	29.44	7.66	36.09	50.86	51.87	74.00	22.13	Peak
3	2400.000	29.44	7.66	36.09	56.91	57.92	74.00	16.08	Peak
4	2414.650	29.45	7.66	35.95	96.60	97.76	74.00	-23.76	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.	: 10
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11nHT20 CH1 Tx		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 2390.000	29.44	7.66	36.09	37.49	38.50	54.00	15.50	Average	
2 2400.000	29.44	7.66	36.09	45.51	46.52	54.00	7.48	Average	
3 2409.130	29.45	7.66	35.95	80.69	81.85	54.00	-27.85	Average	

Remarks:

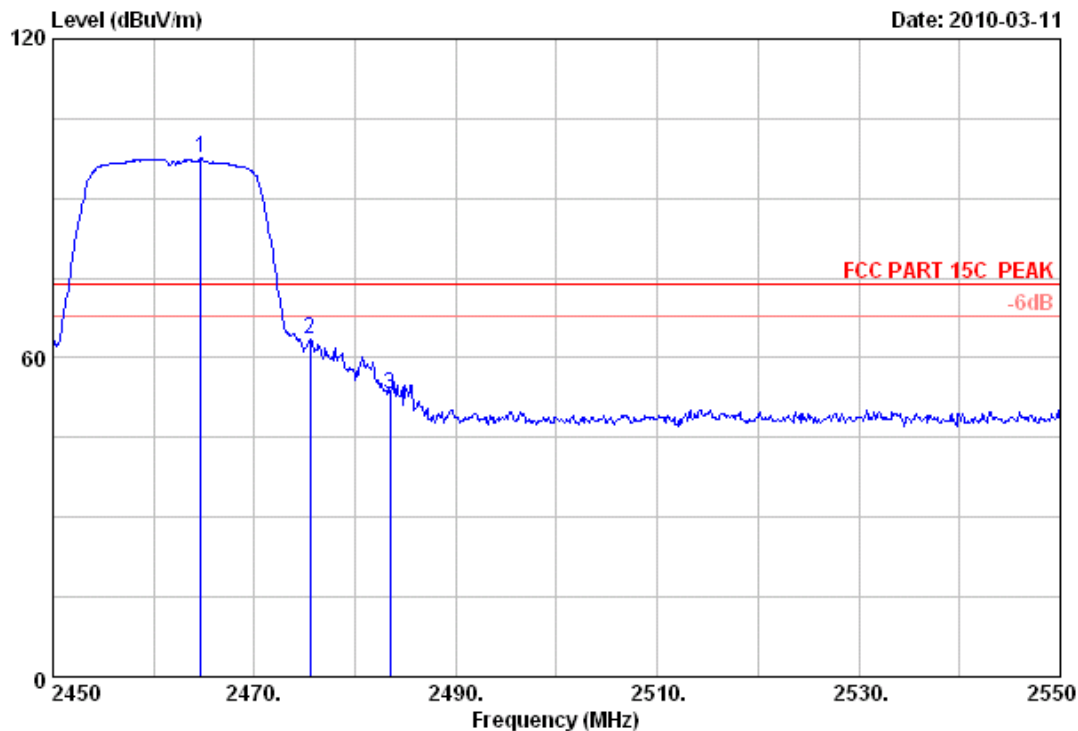
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Upper Edge PK Plot:

Data: 11

File: E:\2010 test data\T\TUV\2010-03-11.EM6 (16)

Date: 2010-03-11



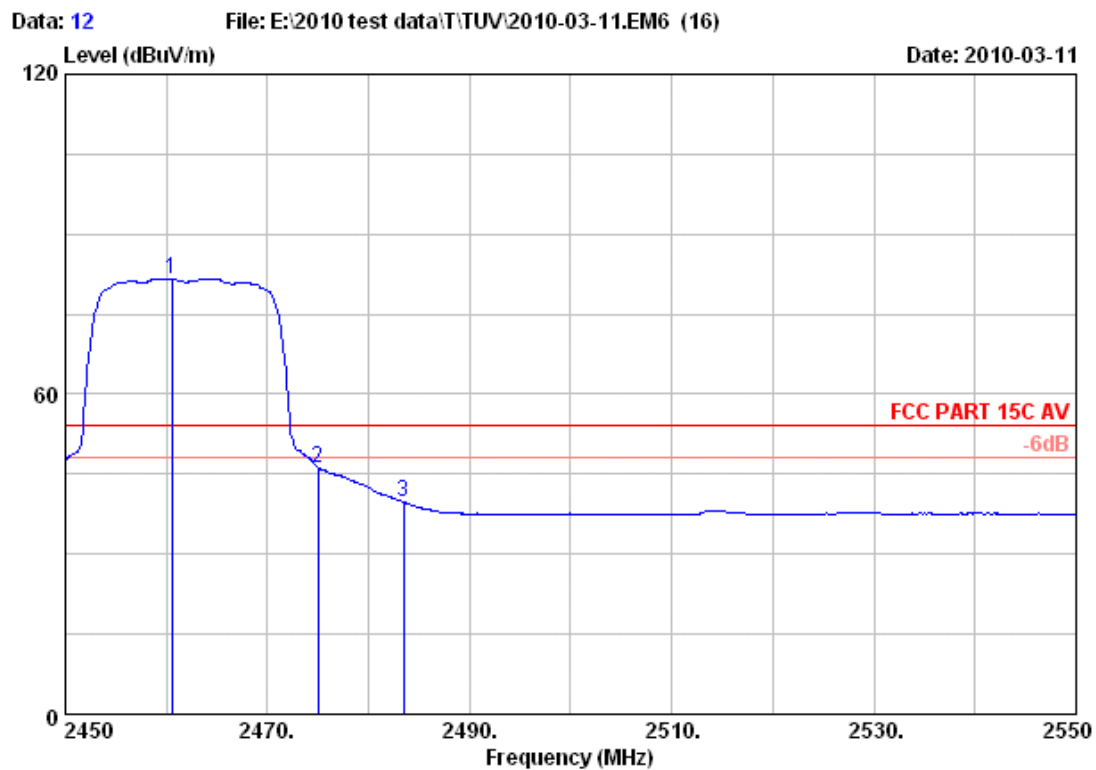
Site no.	: 3m Chamber	Data no.	: 11
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11nHT20 CH11 Tx		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 2464.700	29.48	7.72	36.02	96.35	97.53	74.00	-23.53	Peak	
2 2475.500	29.49	7.77	35.97	62.10	63.39	74.00	10.61	Peak	
3 2483.500	29.49	7.77	35.97	51.91	53.20	74.00	20.80	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.	: 12
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 24°C/70%	Engineer	: Jamy_Yu
EUT	: PC-91013		
Power	: AC120V		
Test mode	: 11nHT20 CH11 Tx		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 2460.500	29.48	7.72	36.02	80.53	81.71	54.00	-27.71	Average	
2 2475.000	29.49	7.72	35.97	45.02	46.26	54.00	7.74	Average	
3 2483.500	29.49	7.77	35.97	38.41	39.70	54.00	14.30	Average	

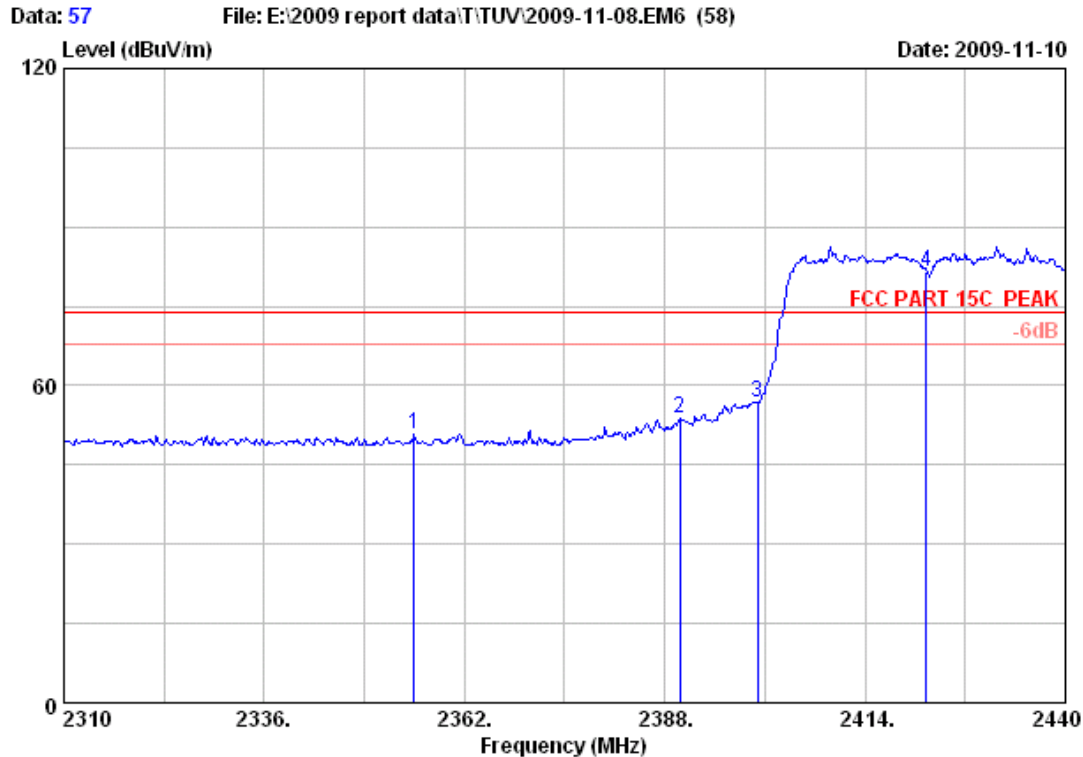
Remarks:

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

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Lower Edge PK Plot:



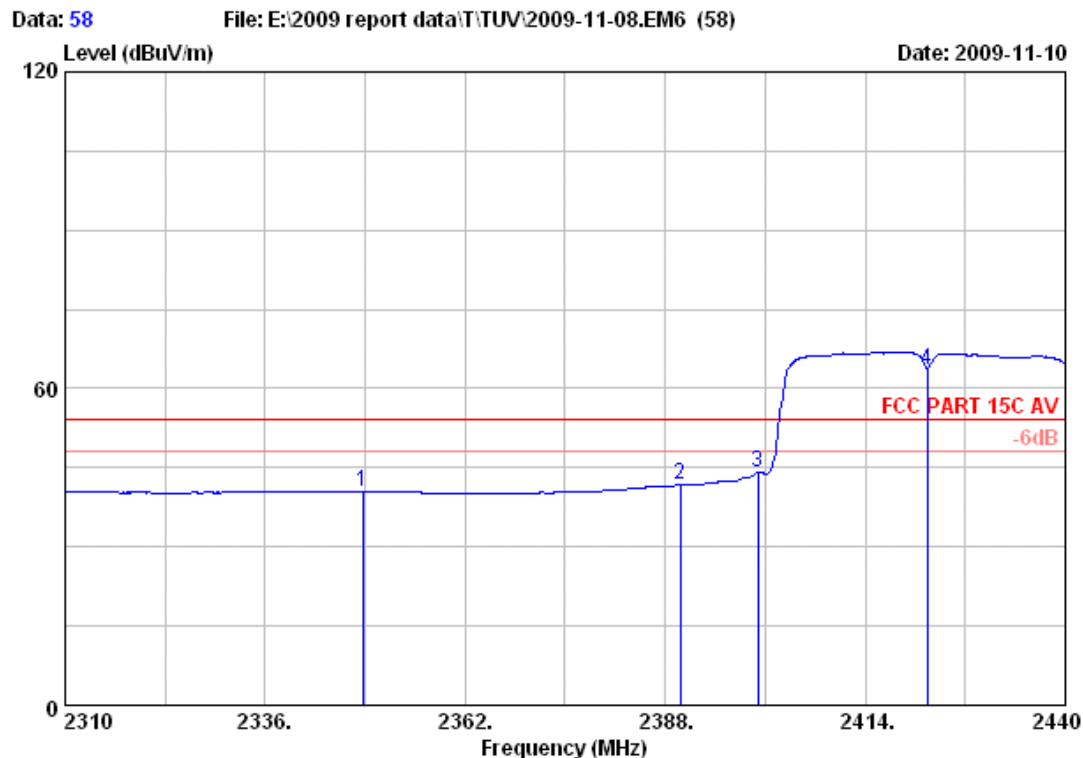
Site no. : 3m Chamber Data no. : 57
 Dis. / Ant. : 3m 3115(0905) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23°C/54% Engineer : Leo-LI
 EUT : Wi-Fi
 Power : DC 5V From PC Input AC 230V/50Hz
 Test mode : Tx Mode HT40 CH 3
 M/N :

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)		
1 2355.500	28.41	8.57	35.91	49.79	50.86	74.00	23.14	Peak	
2 2390.000	28.46	8.41	36.09	53.18	53.96	74.00	20.04	Peak	
3 2400.000	28.46	8.60	36.09	55.77	56.74	74.00	17.26	Peak	
4 2422.000	28.50	8.60	36.01	80.30	81.39	74.00	-7.39	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. : 58
Dis. / Ant. : 3m 3115(0905) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C AV
Env. / Ins. : 23°C/54% Engineer : Leo-LI
EUT : Wi-Fi
Power : DC 5V From PC Input AC 230V/50Hz
Test mode : Tx Mode HT40 CH 3
M/N :

	Ant.	Cable	Amp.			Emission			
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)		
1 2348.740	28.38	8.57	35.99	39.41	40.37	54.00	13.63	Peak	
2 2390.000	28.46	8.41	36.09	40.99	41.77	54.00	12.23	Peak	
3 2400.000	28.46	8.60	36.09	43.23	44.20	54.00	9.80	Peak	
4 2422.060	28.50	8.60	36.01	62.32	63.41	54.00	-9.41	Peak	

Remarks:

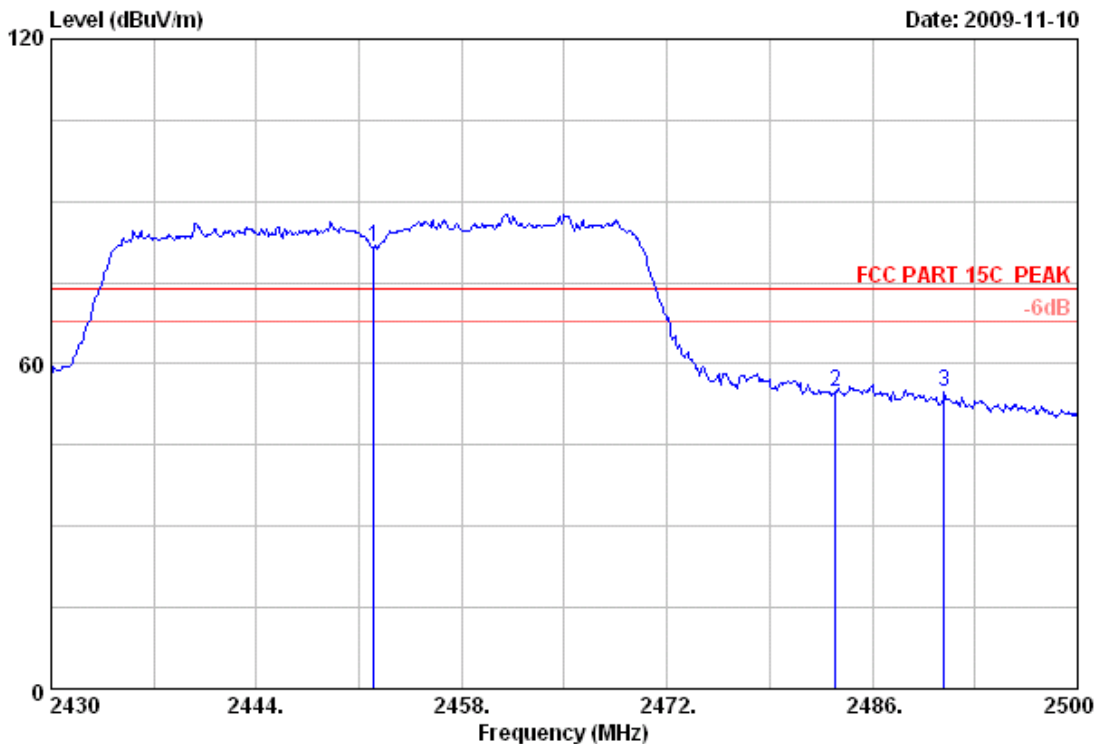
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Upper Edge PK Plot:

Data: 55

File: E:\2009 report data\T\TUV\2009-11-08.EM6 (58)

Date: 2009-11-10



Site no.	: 3m Chamber	Data no.	: 55
Dis. / Ant.	: 3m 3115(0905)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-LI
EUT	: Wi-Fi		
Power	: DC 5V From PC Input AC 230V/50Hz		
Test mode	: Tx Mode HT40 CH 9		
M/N	:		

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)		
1 2452.000	28.53	8.48	36.06	80.76	81.71	74.00	-7.71	Peak	
2 2483.500	28.58	8.94	35.97	53.11	54.66	74.00	19.34	Peak	
3 2490.900	28.60	8.94	36.00	53.43	54.97	74.00	19.03	Peak	

Remarks:

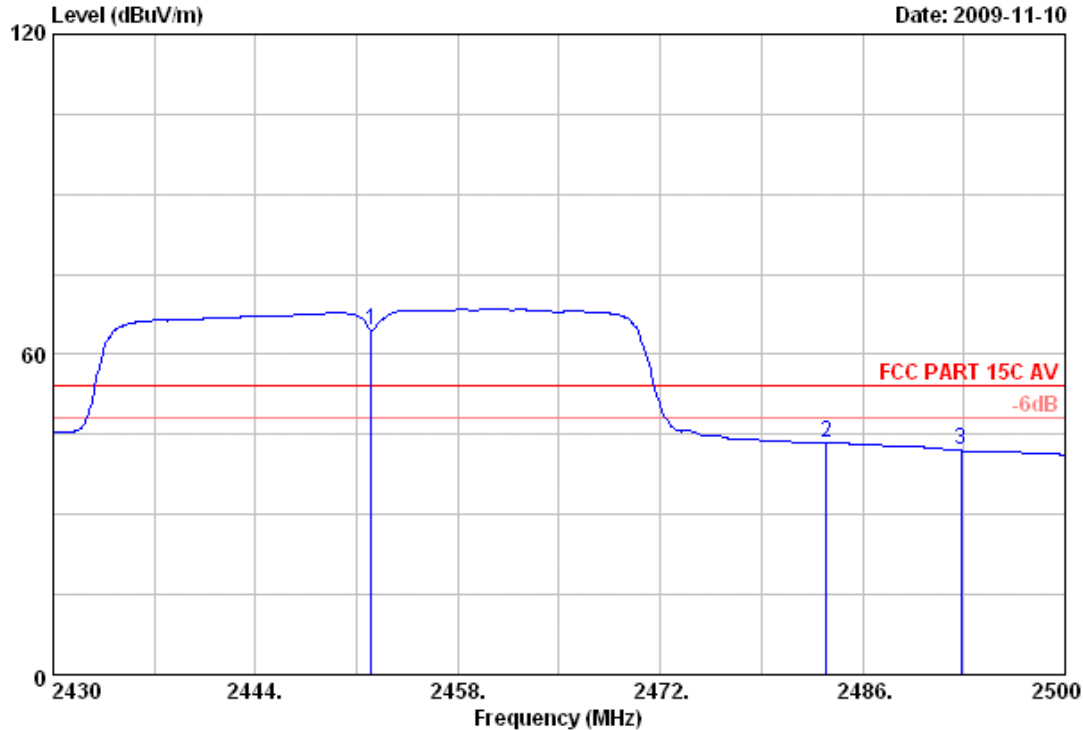
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Lower Edge PK Plot:

Data: 56

File: E:\2009 report data\TUV\2009-11-08.EM6 (58)

Date: 2009-11-10



Site no. : 3m Chamber
Dis. / Ant. : 3m 3115(0905)
Limit : FCC PART 15C AV
Env. / Ins. : 23°C/54%
EUT : Wi-Fi
Power : DC 5V From PC Input AC 230V/50Hz
Test mode : Tx Mode HT40 CH 9
M/N :
Data no. : 56
Ant. pol. : HORIZONTAL
Engineer : Leo-LI

	Ant.	Cable	Amp.		Emission				
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)		
1 2452.000	28.53	8.48	36.06	63.63	64.58	54.00	-10.58	Peak	
2 2483.500	28.58	8.94	35.97	41.88	43.43	54.00	10.57	Peak	
3 2492.790	28.60	8.94	36.00	40.41	41.95	54.00	12.05	Peak	

Remarks:

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



Product Service

Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum	Agilent	E4446A	US44300459	May 10 2010
Amp	HP	8449B	3008A02495	May 10 2010
Antenna	EMCO	3115	9607-4877	May 10 2010
HF Cable	Hubersuhne	Sucoflex104	---	May 10 2010

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.

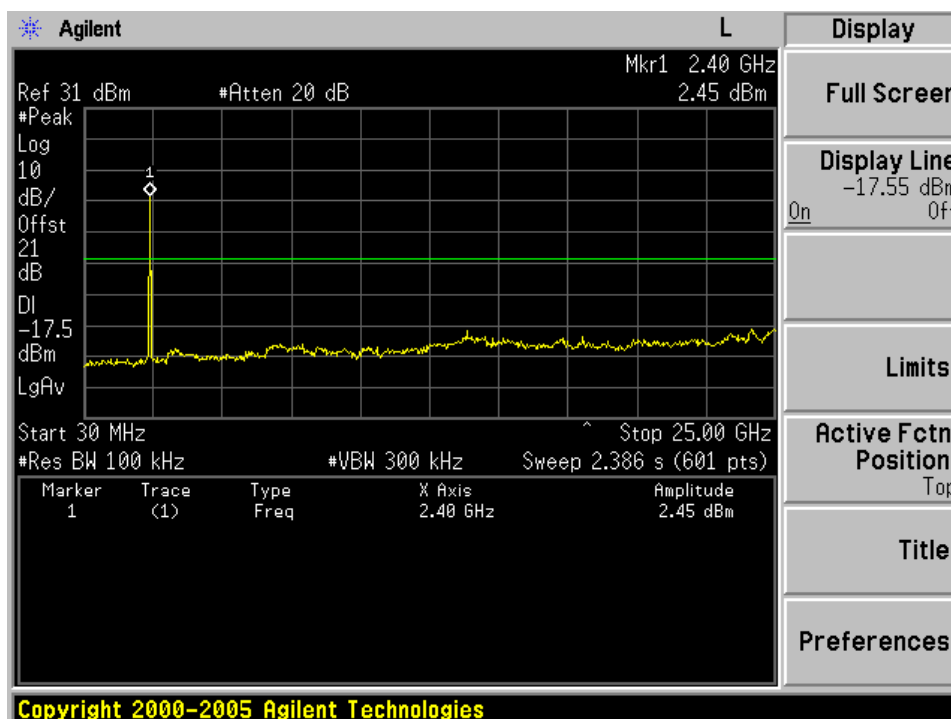
Limit

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

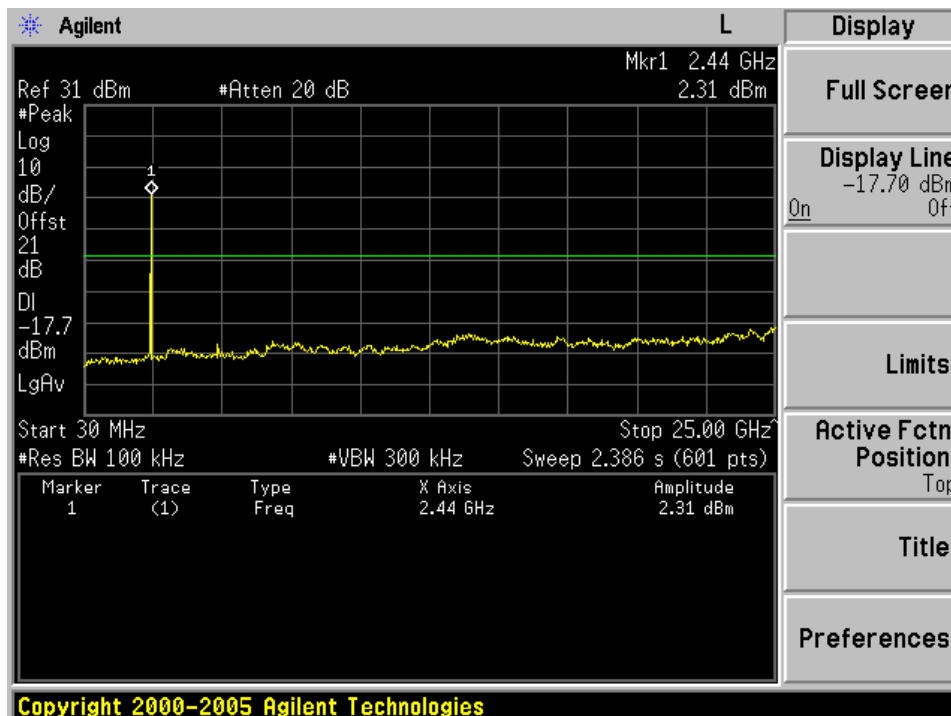
Spurious RF conducted emissions

IEEE 802.11b modulation (1 Mbps) Test Result

2412MHz

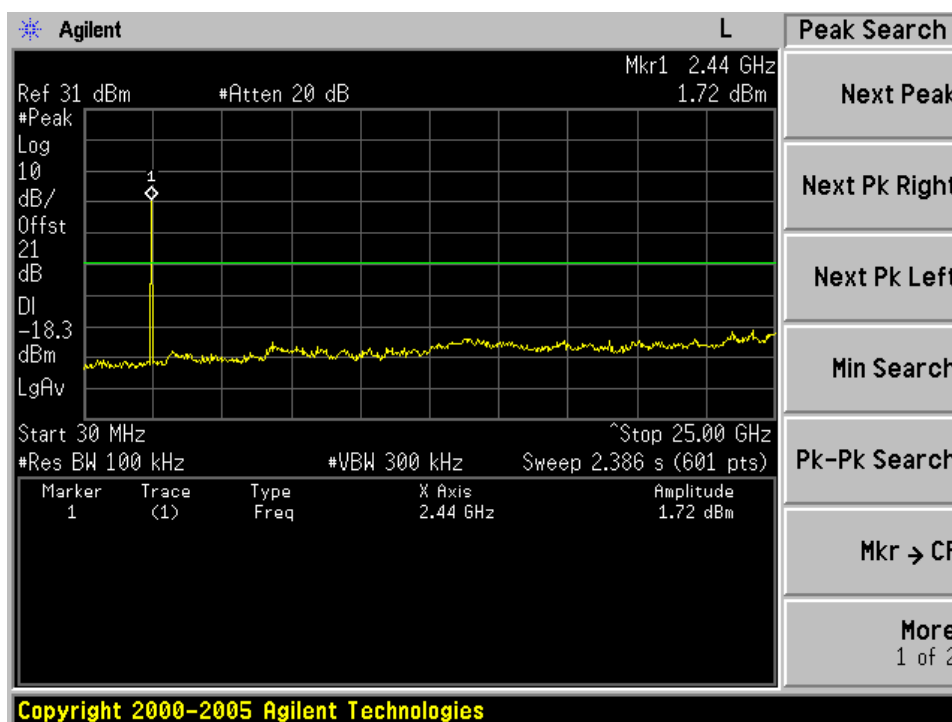


2437MHz



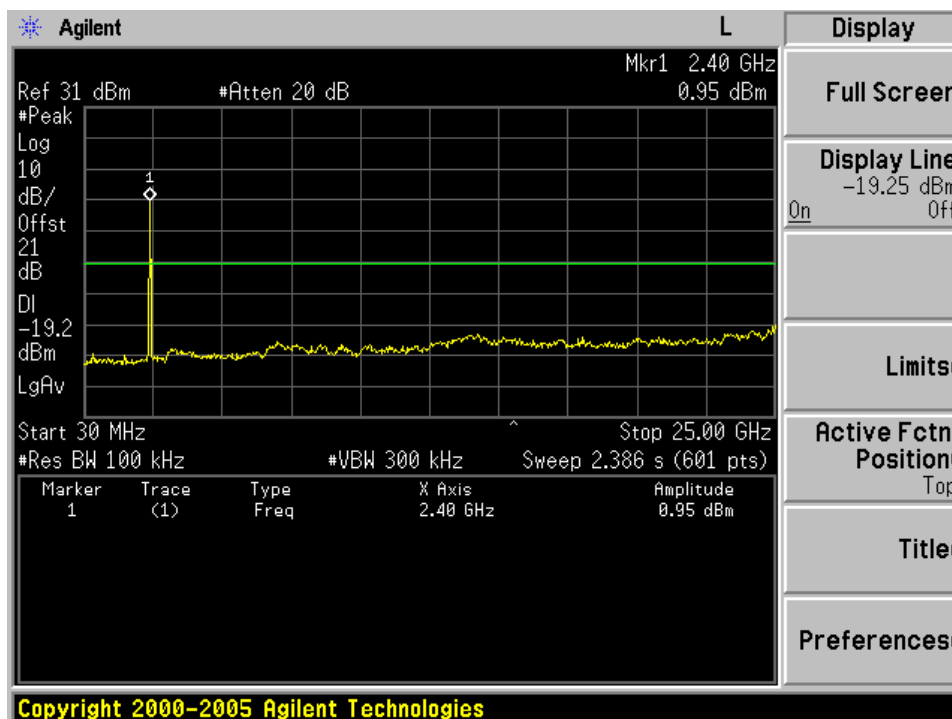
Spurious RF conducted emissions

2462MHz



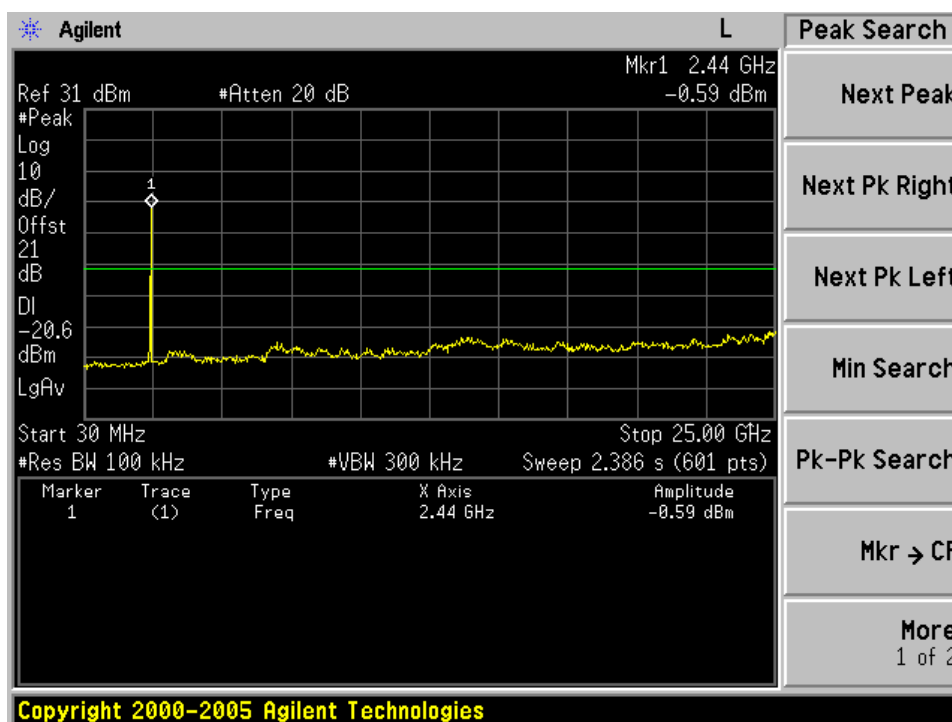
IEEE 802.11g modulation (6 Mbps) Test Result

2412MHz

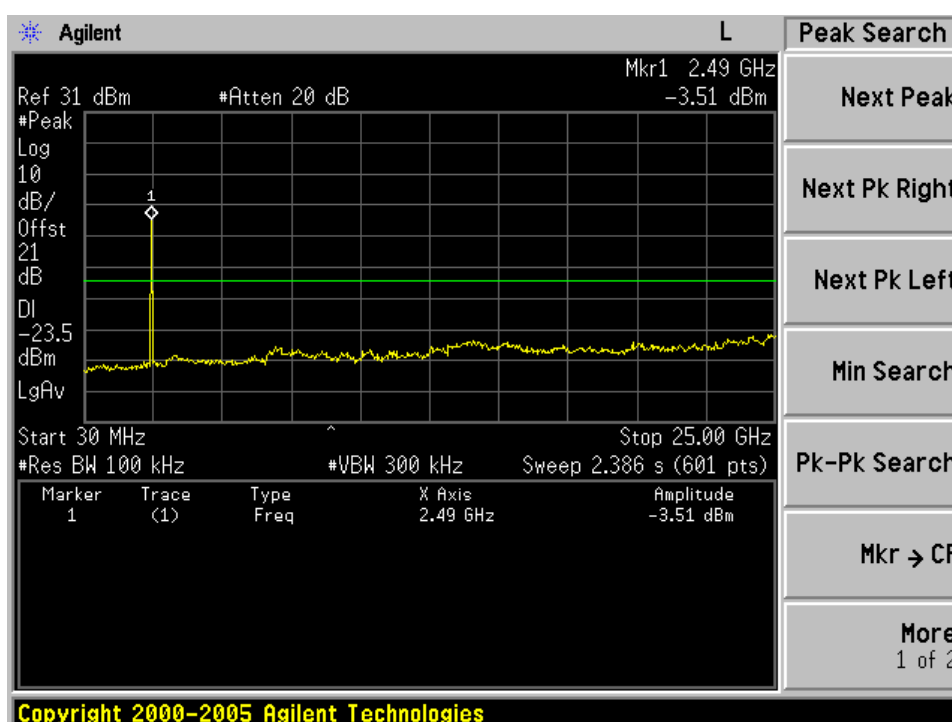


Spurious RF conducted emissions

2437MHz



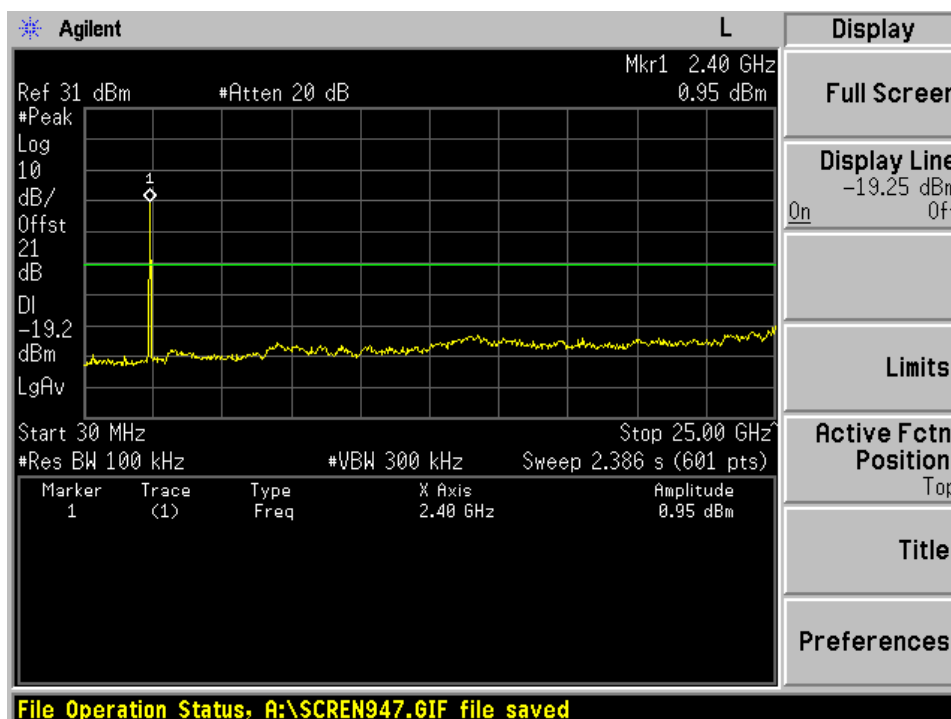
2462MHz



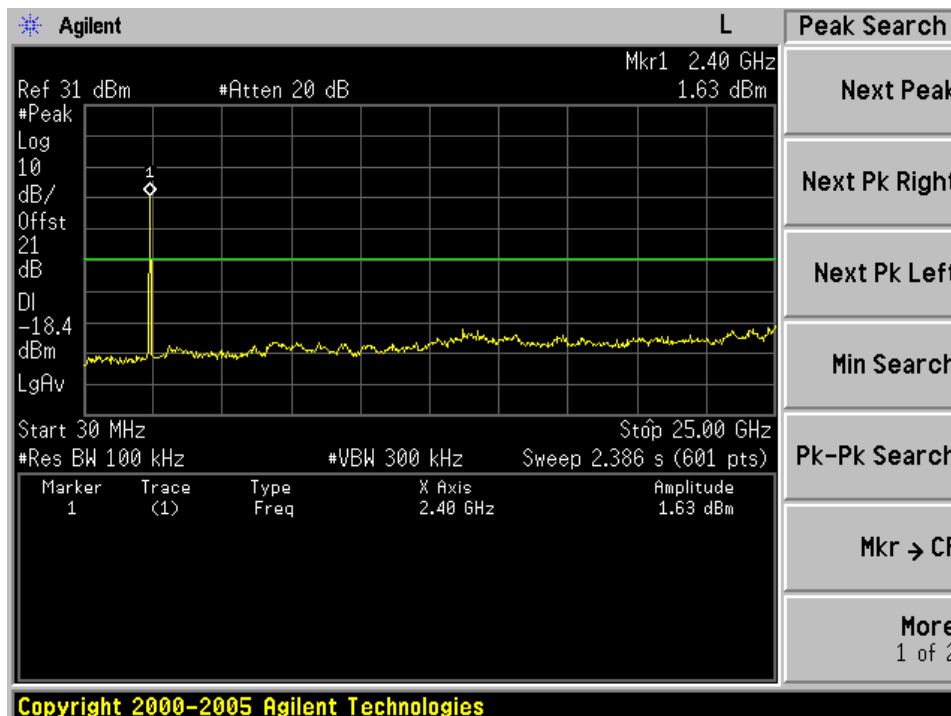
Spurious RF conducted emissions

IEEE 802.11n HT20 modulation (6.5 Mbps) Test Result

2412MHz

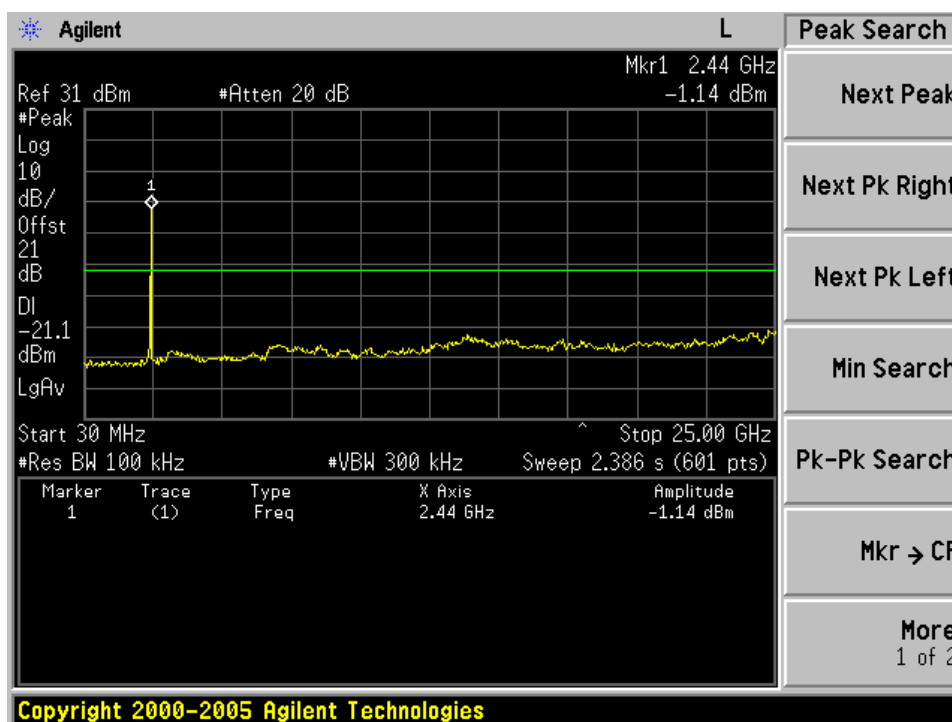


2437MHz



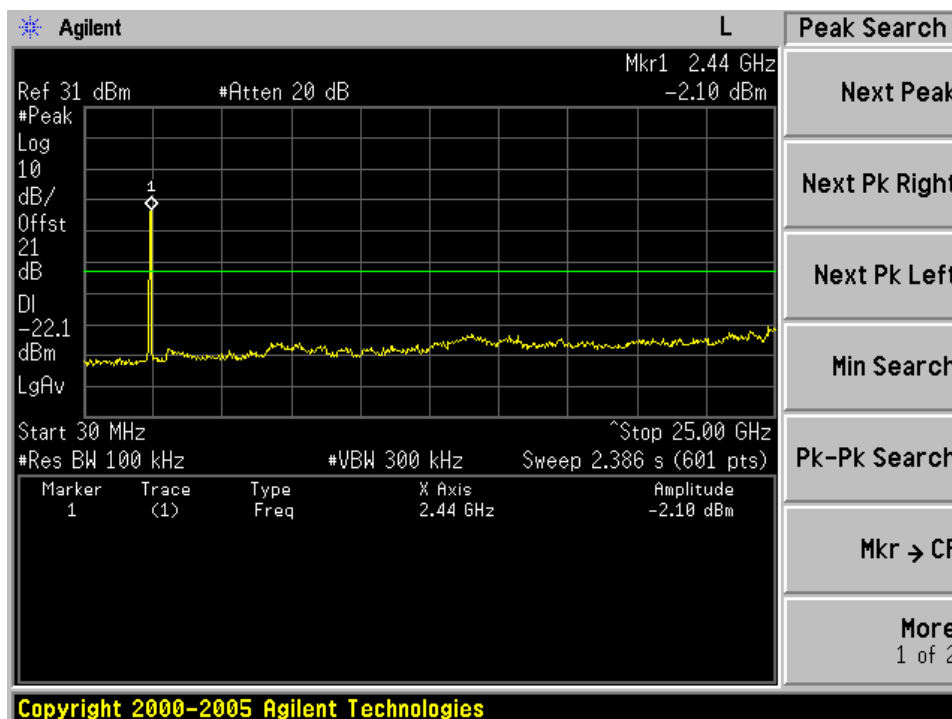
Spurious RF conducted emissions

2462MHz



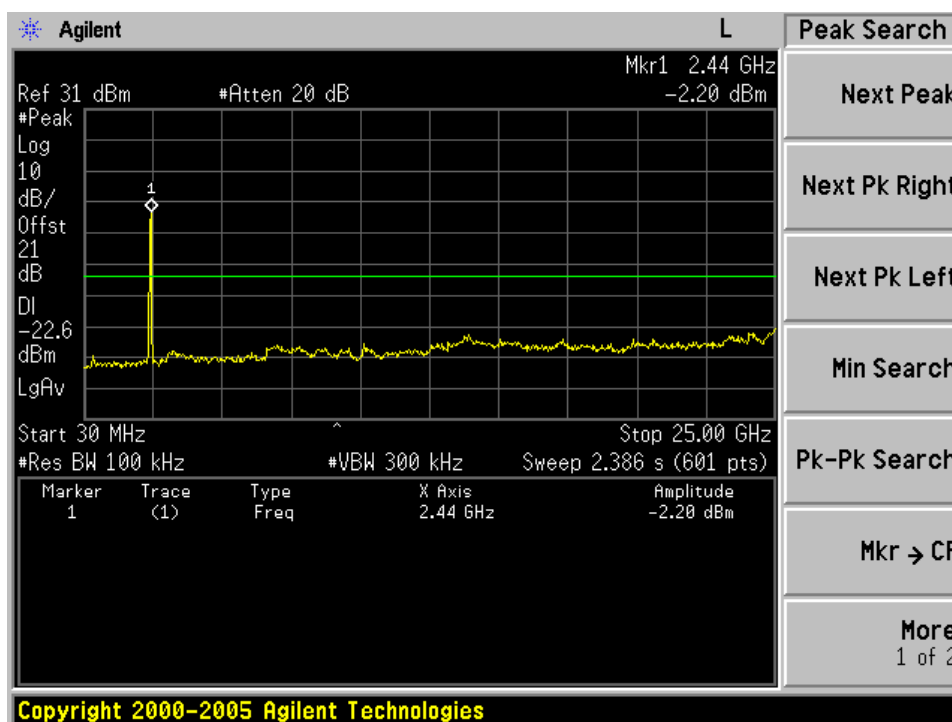
IEEE 802.11n HT40 modulation (13.5 Mbps) Test Result

2422MHz

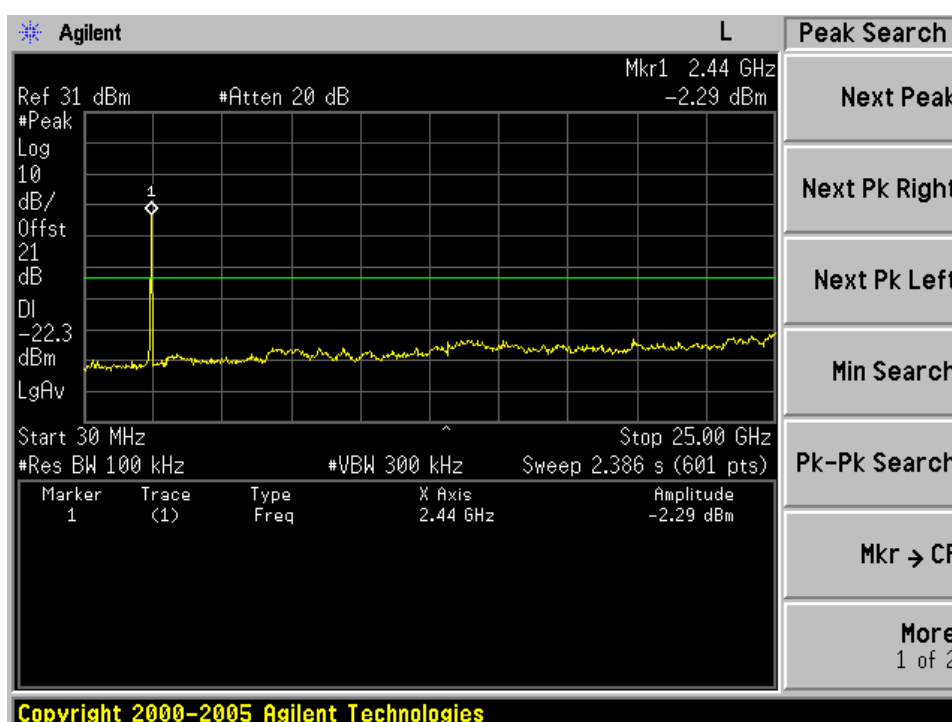


Spurious RF conducted emissions

2437MHz



2452MHz





Product Service

Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4407B	MY41440292	May 10 2010

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 dBμV/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

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
505.729	3.7	17.6	19.5	40.8	Vertical	46.0	QP	Pass
758.591	4.6	20.2	15.6	40.4	Vertical	46.0	QP	Pass
303.469	2.9	13.8	24.0	40.7	Horizontal	46.0	QP	Pass
4824.000	4.2	33.3	5.8	43.3	Horizontal	74	PK	Pass
4824.000	4.2	33.3	2.5	40.0	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	6.3	43.9	Horizontal	74	PK	Pass
4874.000	4.3	33.3	3.7	41.3	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4924.000	4.3	33.3	6.9	44.5	Horizontal	74	PK	Pass
4924.000	4.3	33.3	2.5	40.1	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna 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

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
505.729	3.7	17.6	20.9	42.2	Horizontal	46.0	QP	Pass
325.470	3.4	16.9	18.3	38.6	Vertical	46.0	QP	Pass
4824.000	4.2	33.3	6.4	43.9	Horizontal	74	PK	Pass
4824.000	4.2	33.3	3.7	41.2	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	5.3	48.9	Horizontal	74	PK	Pass
4874.000	4.3	33.3	2.1	39.7	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4924.000	4.3	33.3	5.8	43.4	Horizontal	74	PK	Pass
4924.000	4.3	33.3	3.4	41.0	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna 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

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
505.729	3.7	17.6	21.5	42.8	Horizontal	46.0	QP	Pass
810.028	4.9	20.3	15.7	40.9	Horizontal	46.0	QP	Pass
4824.000	4.2	33.3	6.1	43.6	Horizontal	74	PK	Pass
4824.000	4.2	33.3	4.3	41.8	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	6.5	44.1	Horizontal	74	PK	Pass
4874.000	4.3	33.3	3.7	41.3	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4924.000	4.3	33.3	5.8	43.4	Horizontal	74	PK	Pass
4924.000	4.3	33.3	3.5	41.1	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna 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

IEEE 802.11n HT40 modulation (13.5 Mbps) CH3 2422MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
505.729	3.7	17.6	21.5	42.8	Horizontal	46.0	QP	Pass
810.042	4.9	20.3	15.0	40.2	Horizontal	46.0	QP	Pass
4844.000	4.2	33.3	5.8	43.3	Horizontal	74	PK	Pass
4844.000	4.2	33.3	4.2	41.7	Horizontal	54	AV	Pass
7266.000	-	-	-	-	-	-	-	-
7266.000	-	-	-	-	-	-	-	-

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

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	6.1	43.7	Horizontal	74	PK	Pass
4874.000	4.3	33.3	3.7	41.3	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

IEEE 802.11n HT40 modulation (13.5 Mbps) CH9 2452MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4904.000	4.3	33.3	5.6	43.2	Horizontal	74	PK	Pass
4904.000	4.3	33.3	3.5	41.1	Horizontal	54	AV	Pass
7356.000	-	-	-	-	-	-	-	-
7356.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna 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
EMI Test Receiver	Rohde & Schwarz	ESi26	838786/013	Sep 21 2010
Bilog Antenna	Chase	CBL6112B	2591	Sep 21 2010
Signal Generator	Rohde & Schwarz	SMR20	100047	Sep 21 2010
Antenna	Schwarzbeck	VUBA9117	115	Sep 21 2010
Horn Antenna	Rohde & Schwarz	HF906	100013	Sep 21 2010

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 –6dB (upper and lower) frequency.

Limit

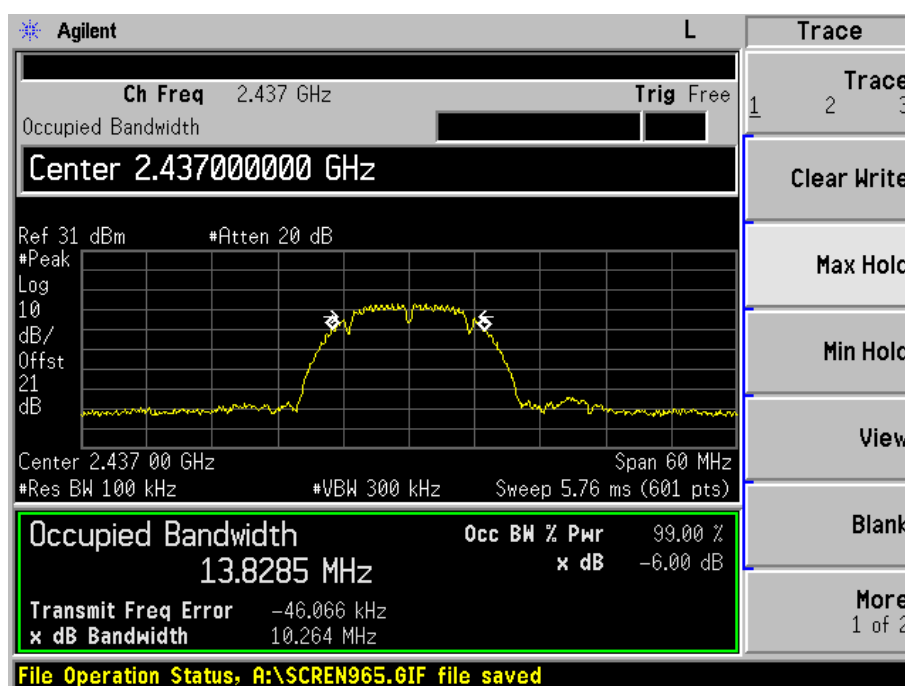
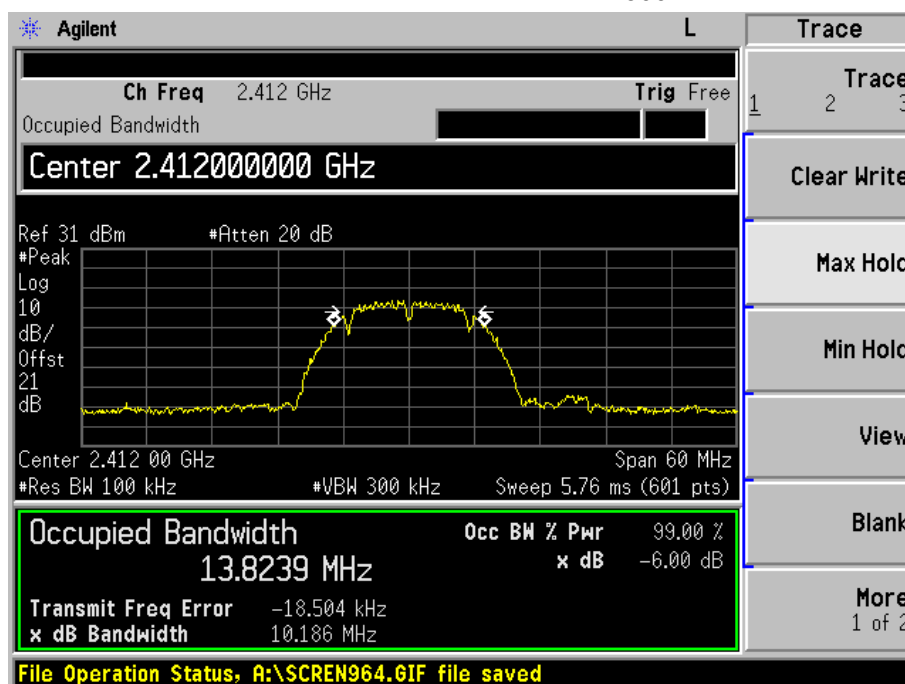
Limit [kHz]

≥ 500

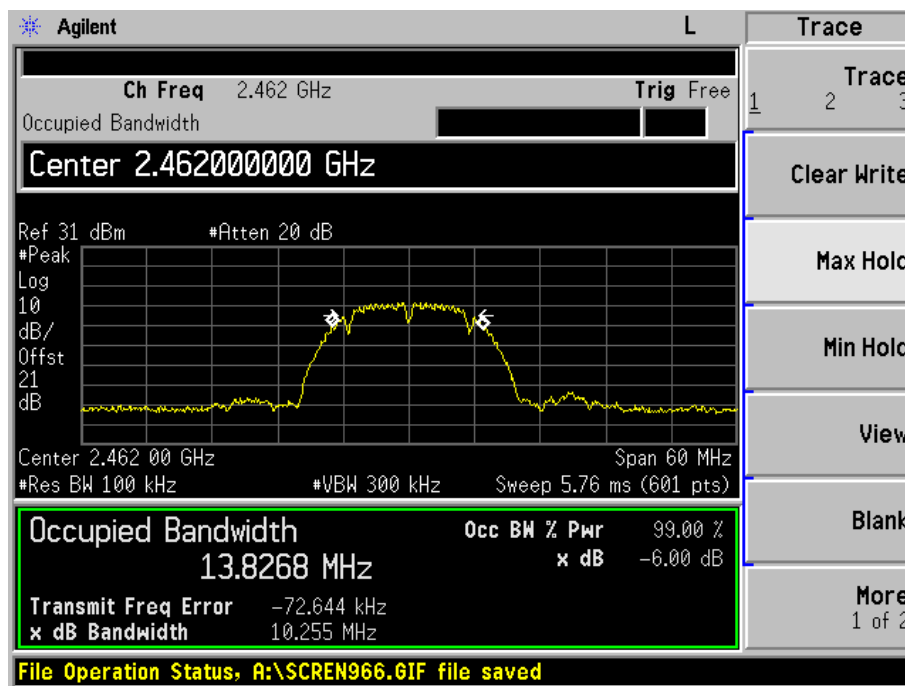
6 dB bandwidth

IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	10186	≥ 500	Pass
2437	10264	≥ 500	Pass
2462	10255	≥ 500	Pass



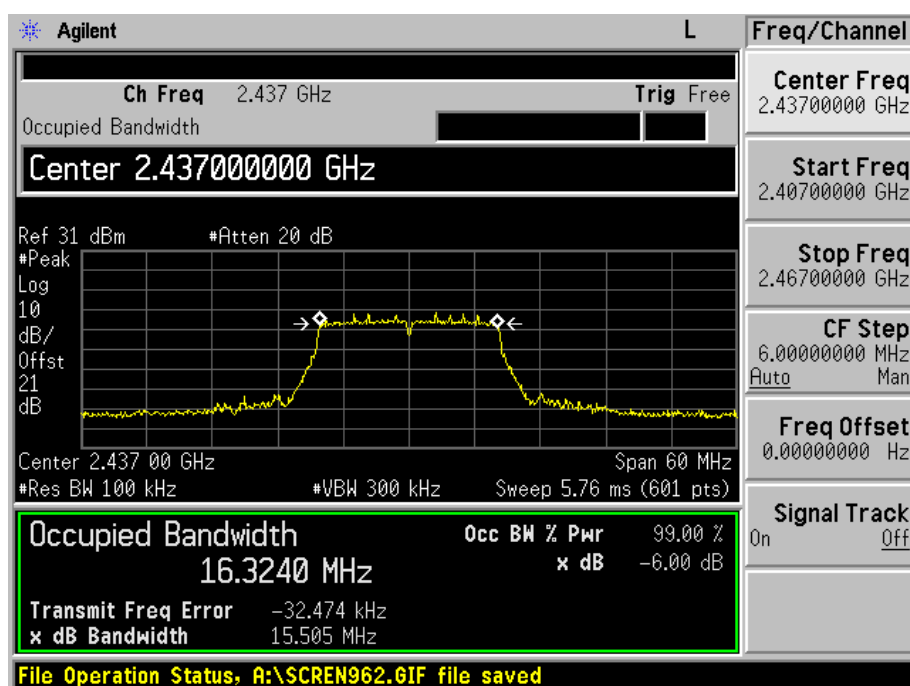
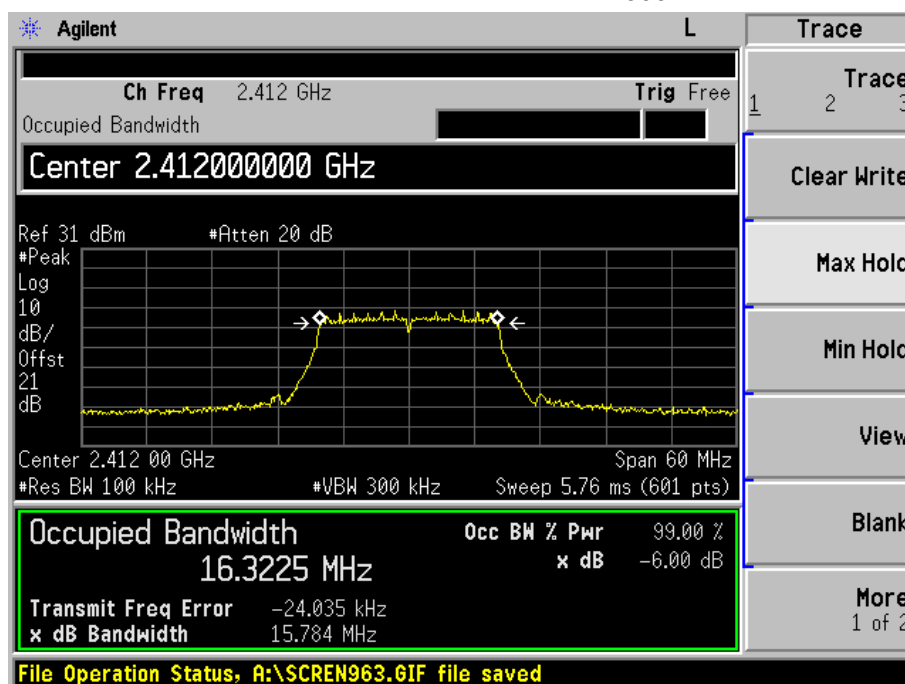
6 dB bandwidth



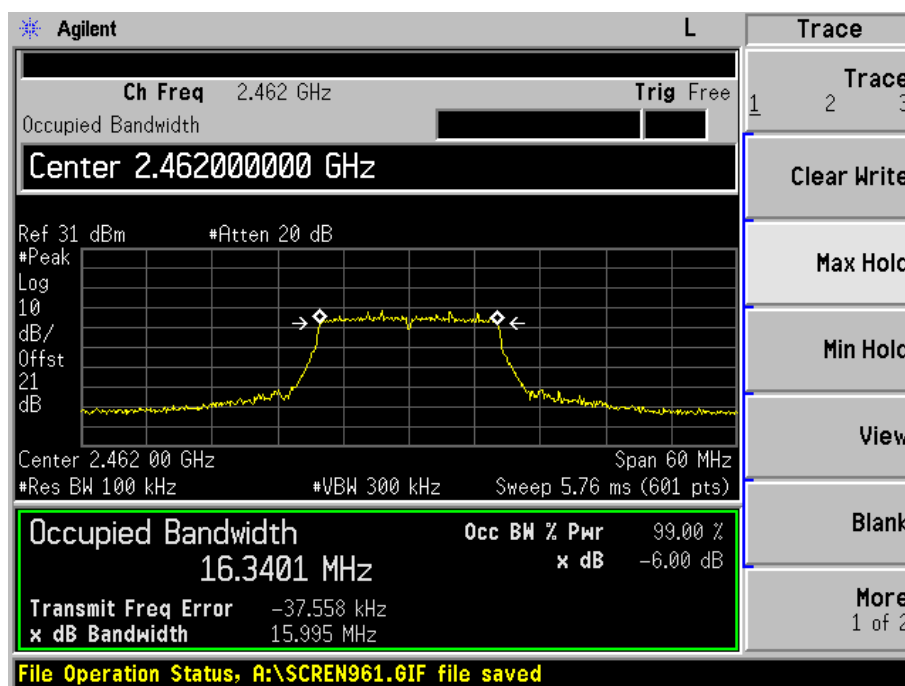
6 dB bandwidth

IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	15784	≥ 500	Pass
2437	15505	≥ 500	Pass
2462	15995	≥ 500	Pass



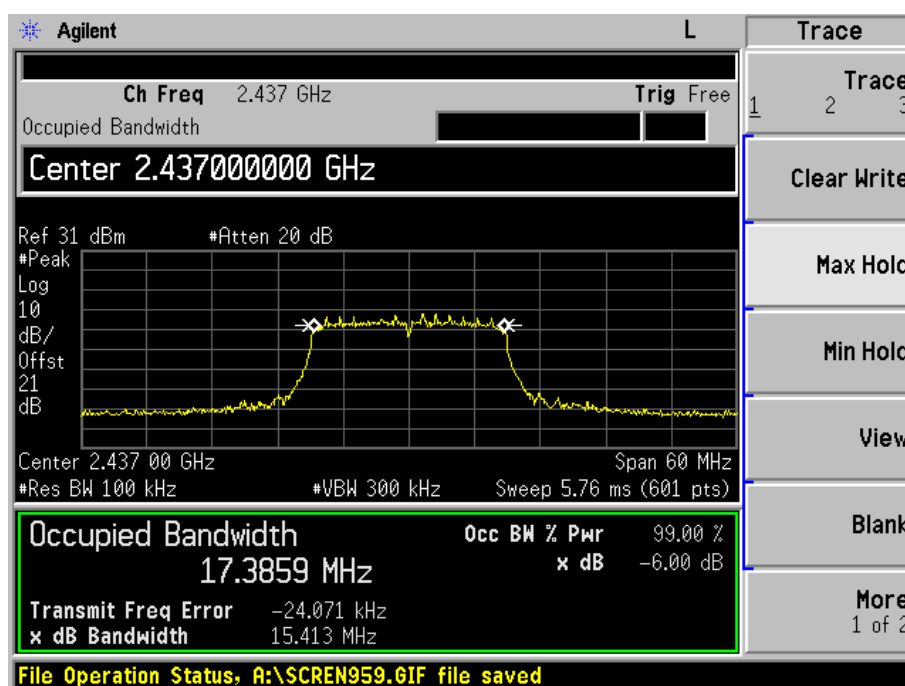
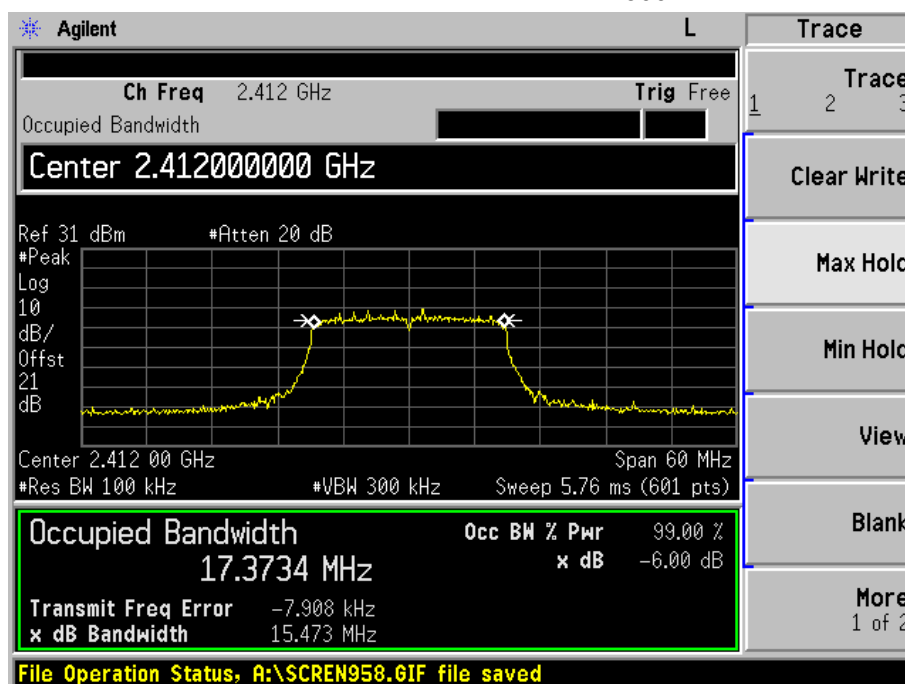
6 dB bandwidth



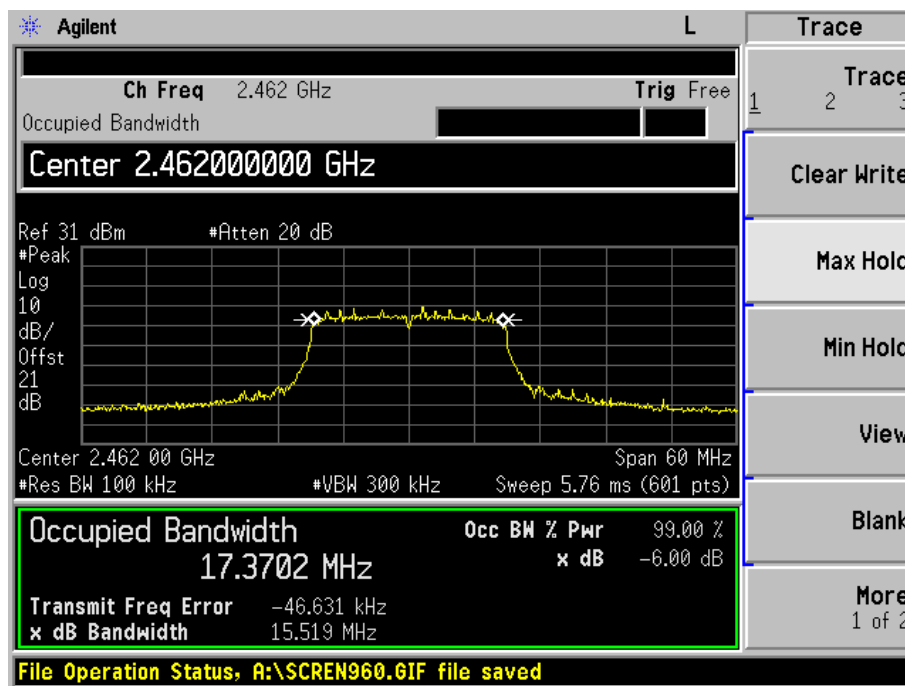
6 dB bandwidth

IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	15473	≥ 500	Pass
2437	15413	≥ 500	Pass
2462	15519	≥ 500	Pass



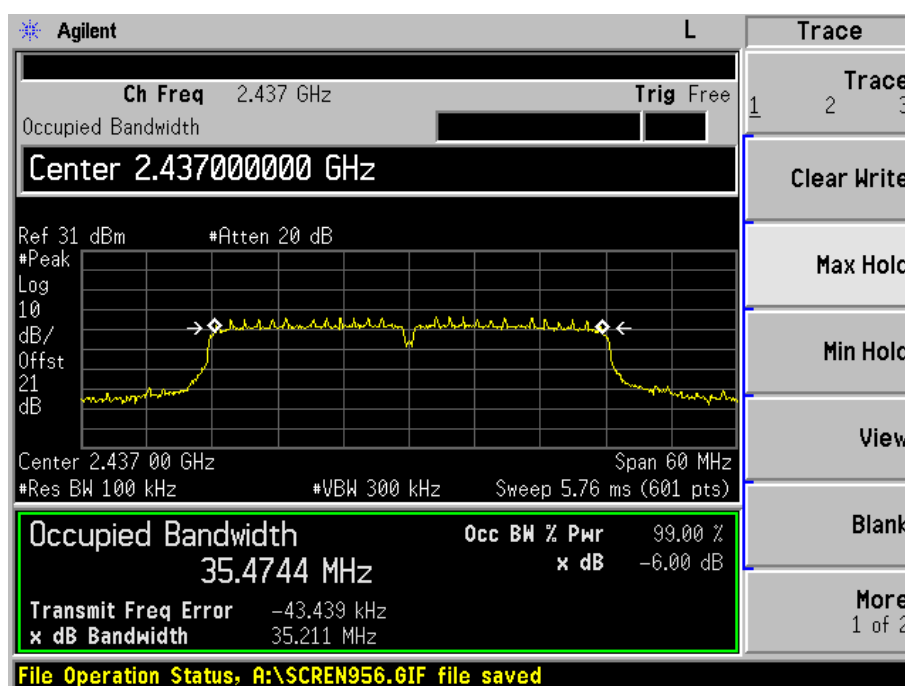
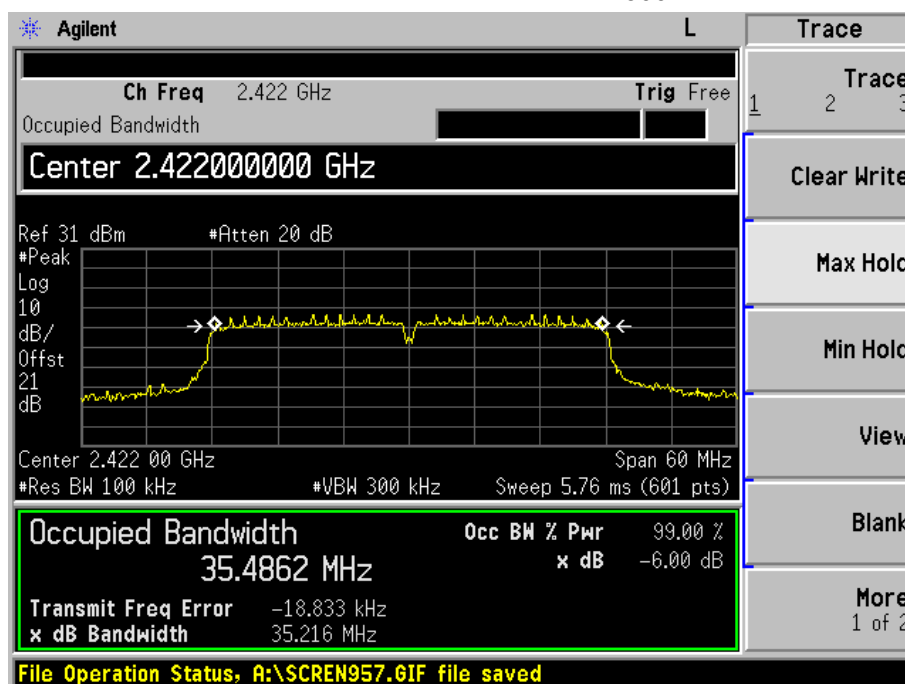
6 dB bandwidth



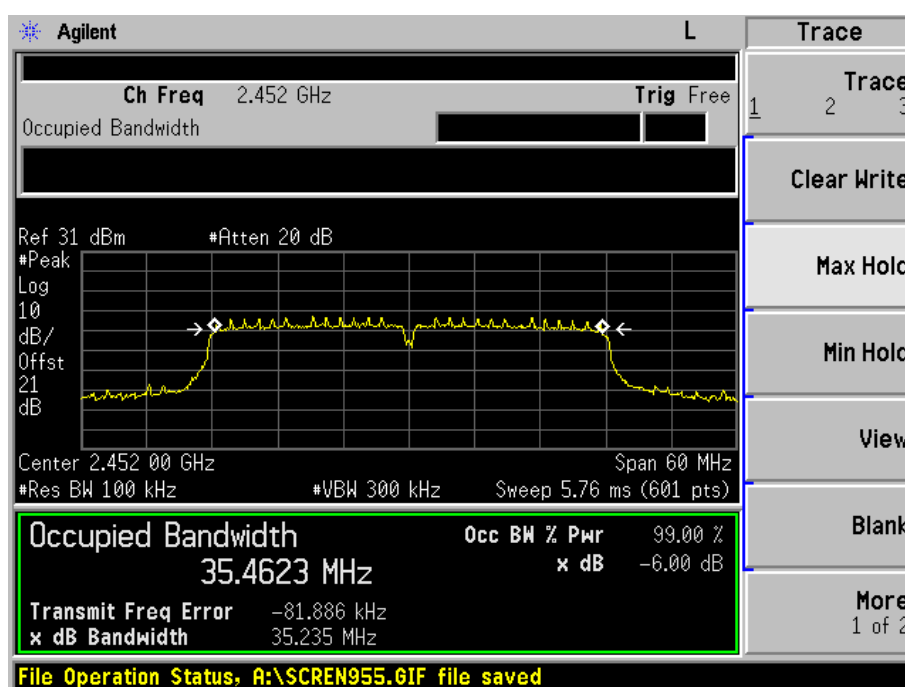
6 dB bandwidth

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2422	35216	≥ 500	Pass
2437	35211	≥ 500	Pass
2452	35235	≥ 500	Pass



6 dB bandwidth





Product Service

Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	MY41440292	May 10 2010

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

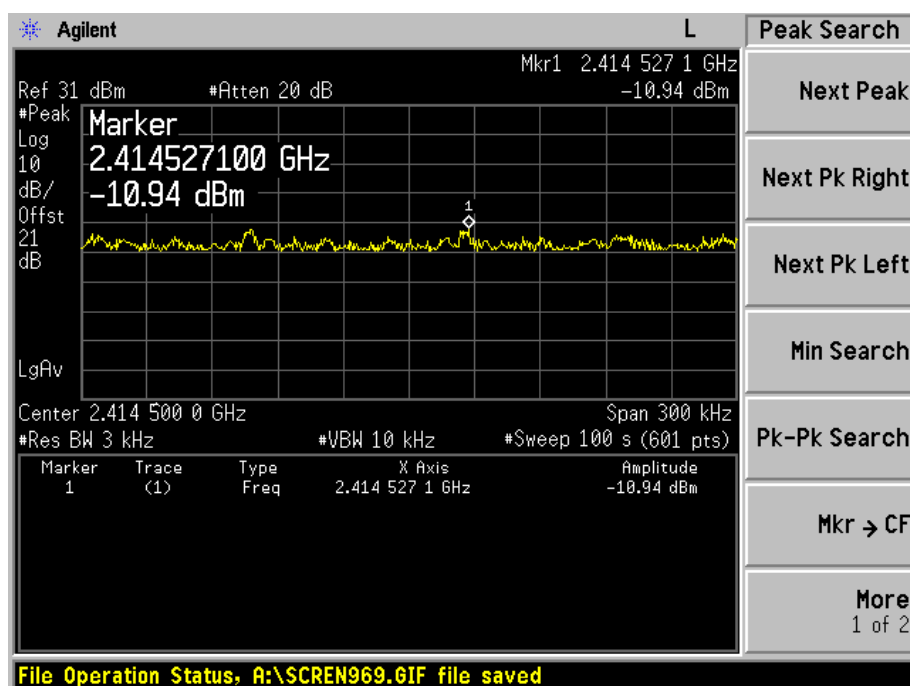
Limit
dBm / 3 kHz

8

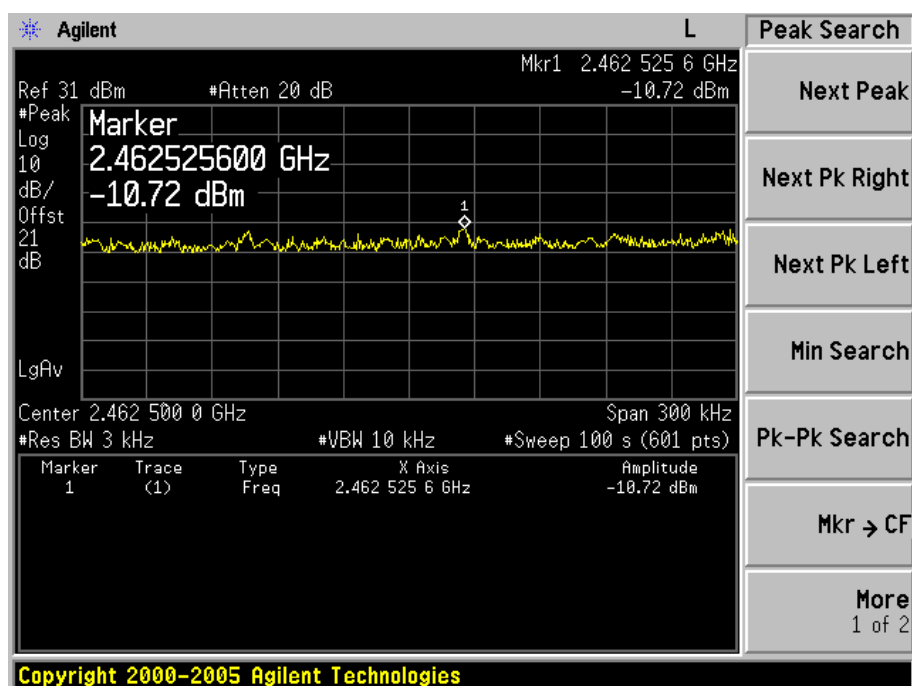
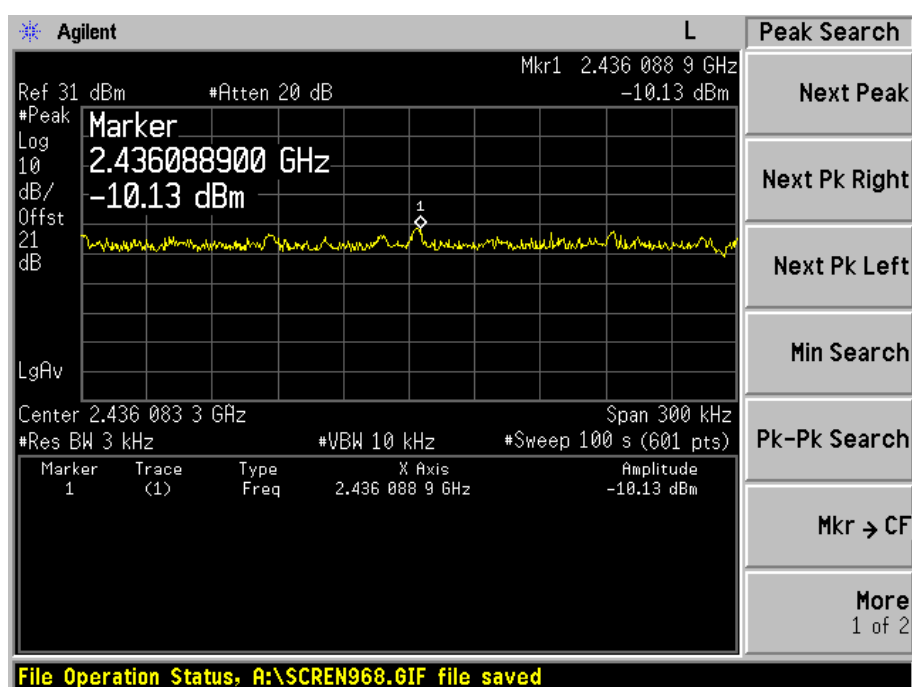
Power spectral density

IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-10.94	Pass
2437	-10.13	Pass
2462	-10.72	Pass



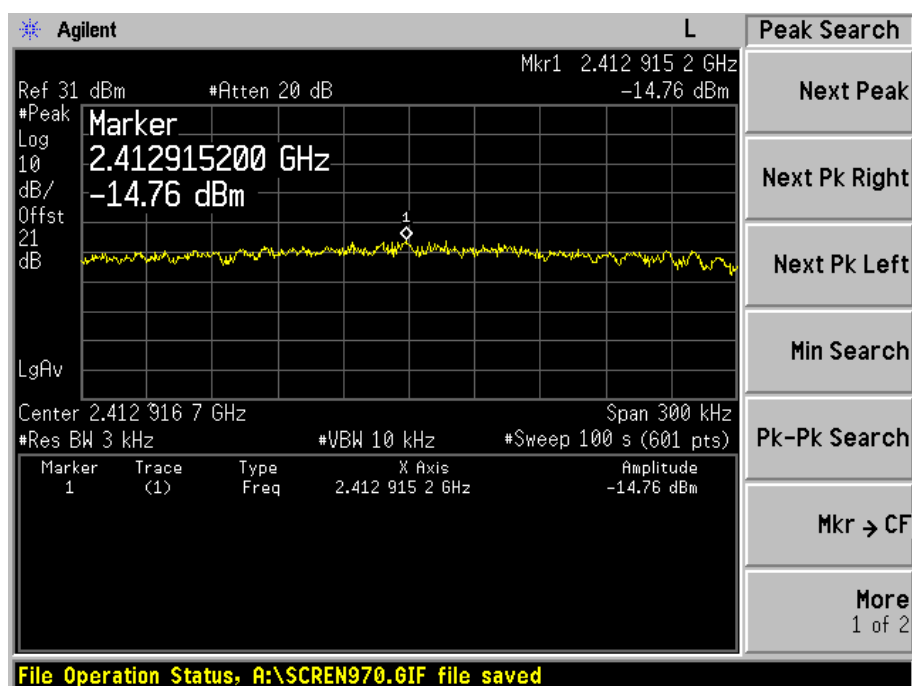
Power spectral density



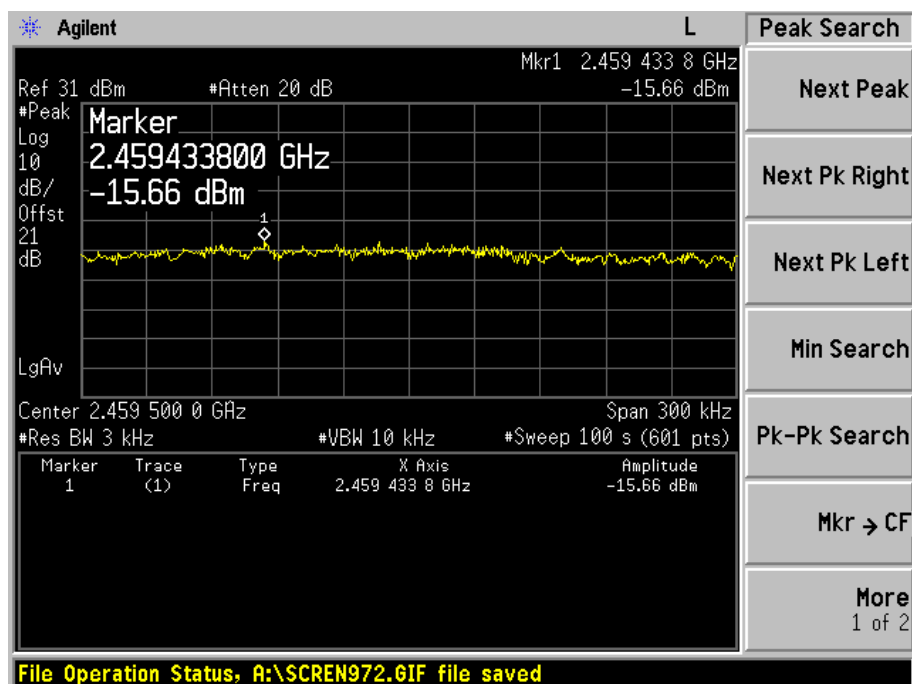
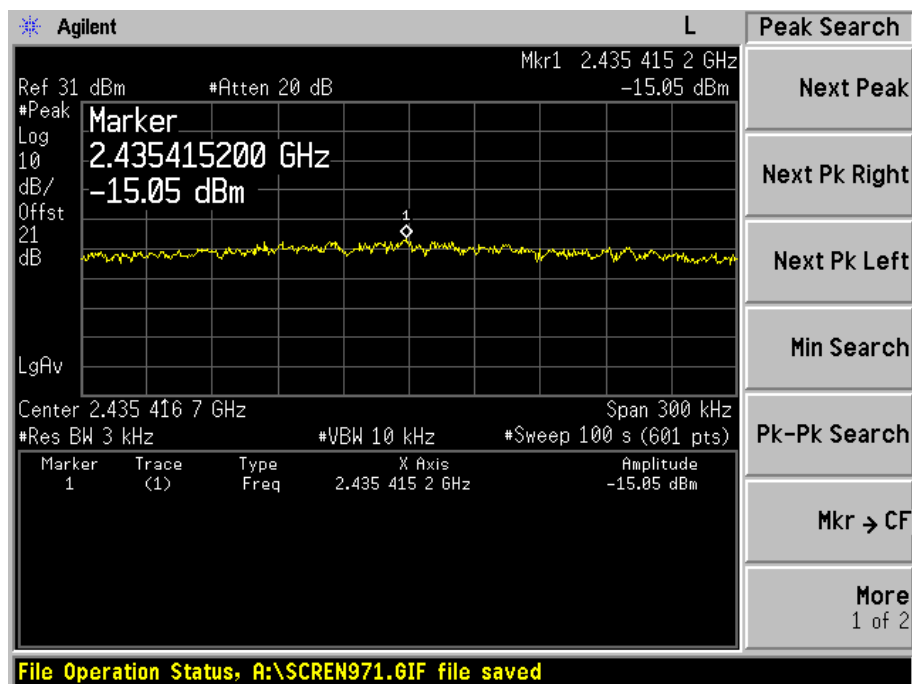
Power spectral density

IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-14.76	Pass
2437	-15.05	Pass
2462	-15.66	Pass



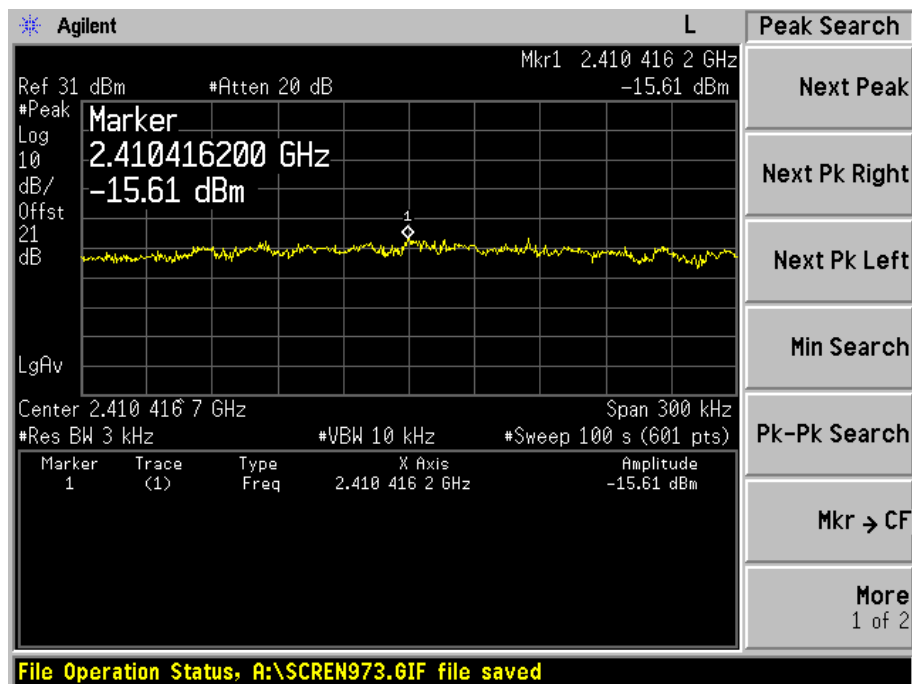
Power spectral density



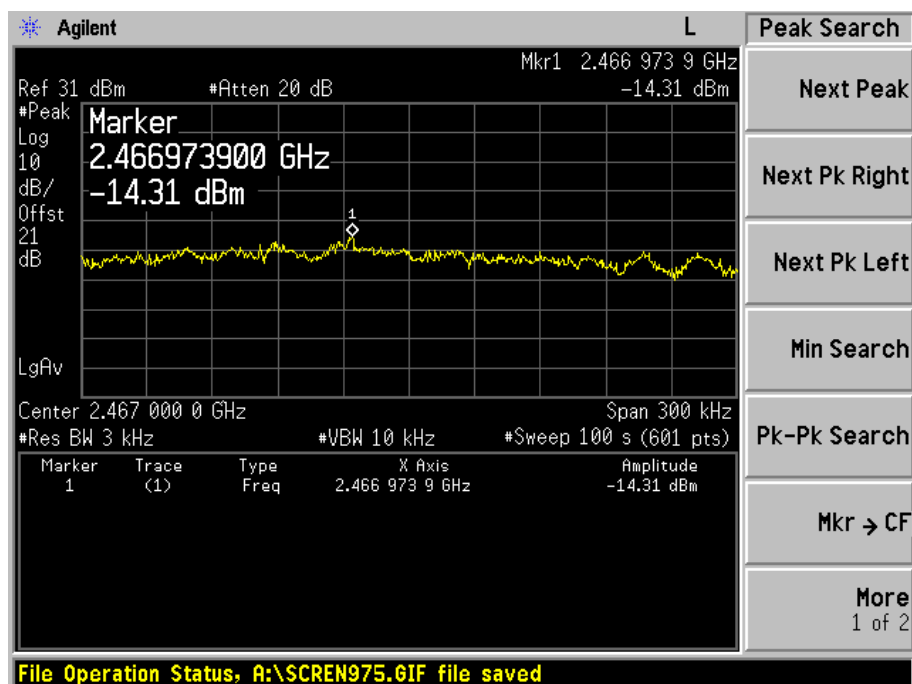
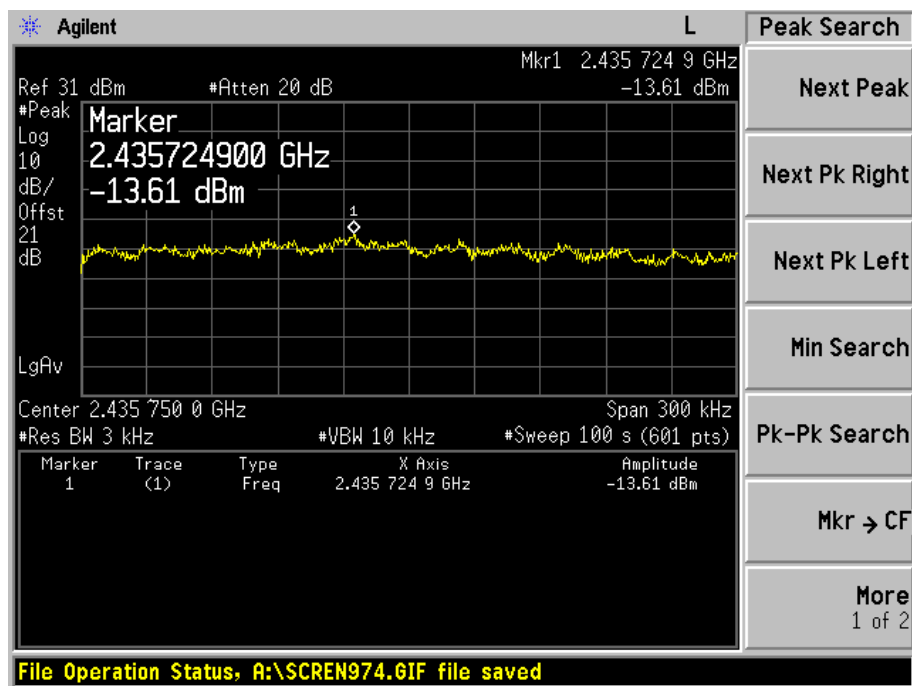
Power spectral density

IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-15.61	Pass
2437	-13.61	Pass
2462	-14.31	Pass



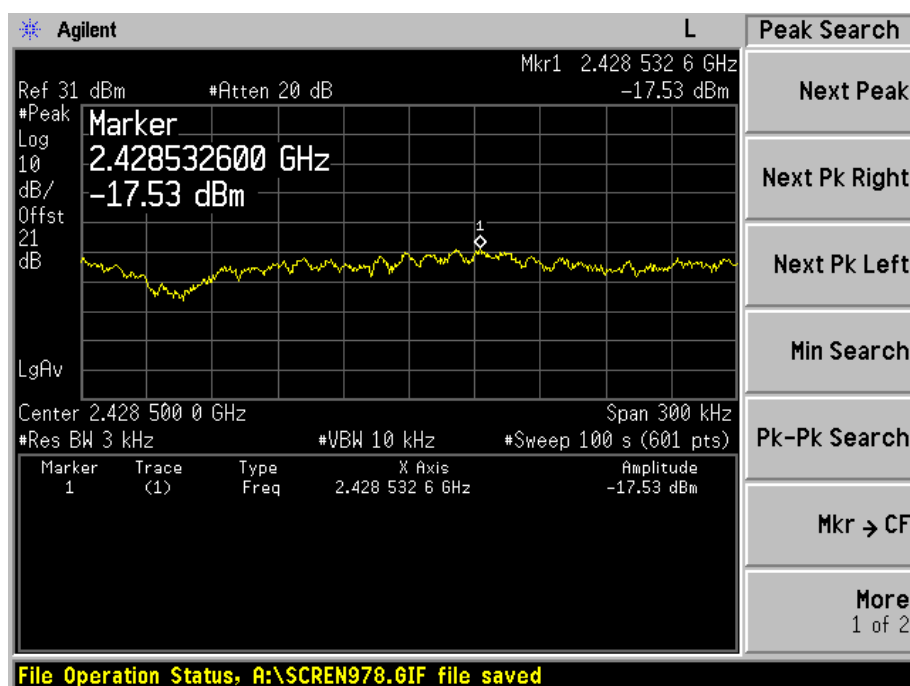
Power spectral density



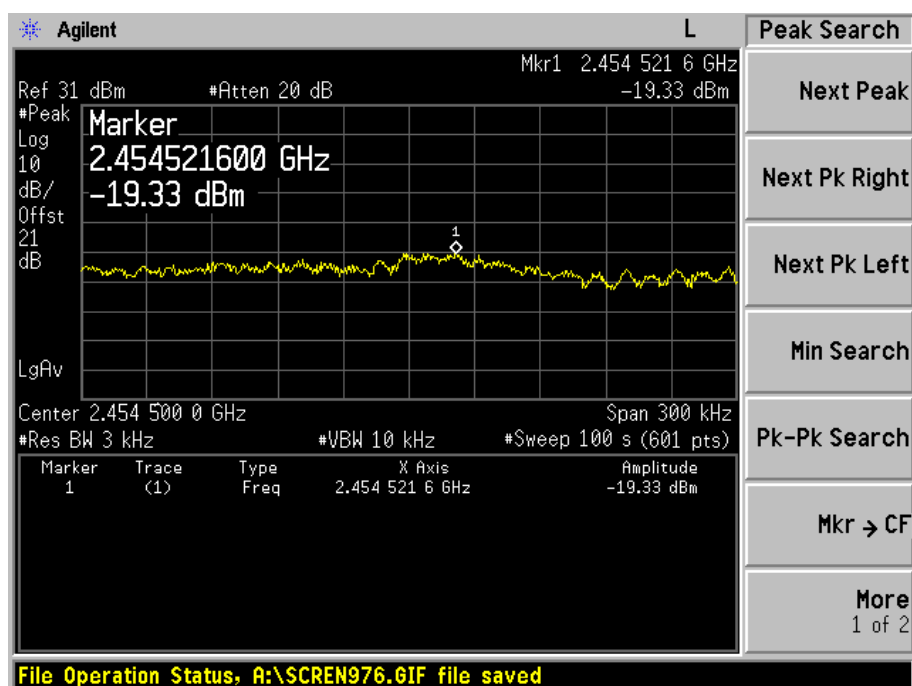
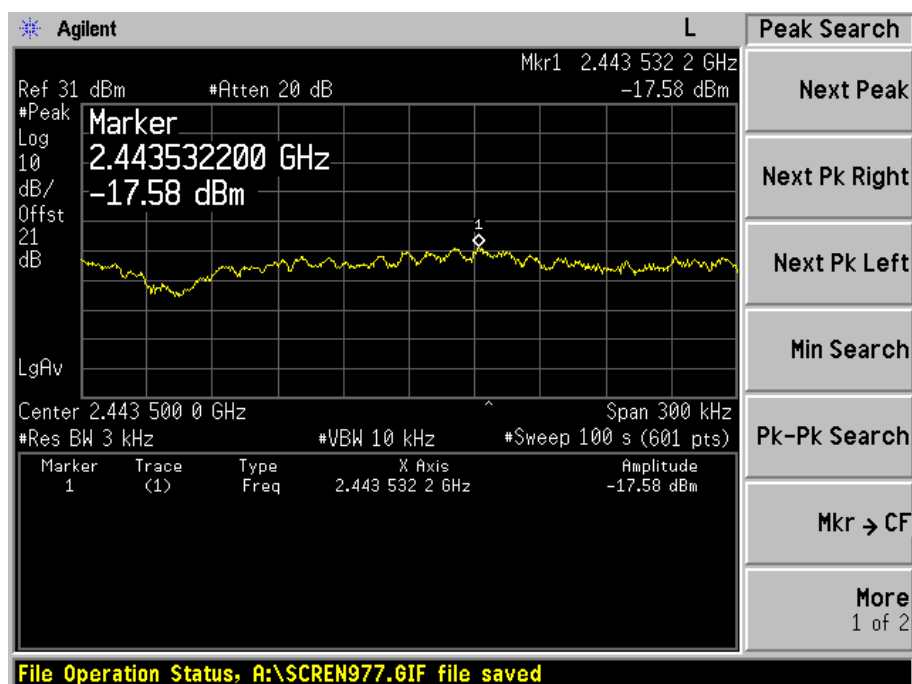
Power spectral density

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	P dBm	Result
2422	-17.53	Pass
2437	-17.58	Pass
2452	-19.33	Pass



Power spectral density





Product Service

Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4407B	MY41440292	May 10 2010

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 μ V/m)	U=4.6dB; k=2(30MHz-1GHz)
CE	Disturbance Voltage (dB μ V)	U=3.3dB; k=2