



Product Service

RF - TEST REPORT

Report Number : **68/850.9.074.01** Date of Issue: 14 September 2009

Model : **PC-98902**

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 : 62

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1 Table of Contents

1	Table of Contents.....	2
2	Details about the Test Laboratory.....	3
3	Description of the Equipment Under Test.....	4
4	Summary of Test Standards.....	5
5	Summary of Test Results.....	6
6	General Remarks.....	7
7	Technical Requirements.....	8
7.1	Conducted Emission AC Power Port.....	8
7.2	Conducted Peak Power.....	12
7.3	Band edge compliance of RF emission.....	14
7.4	Spurious RF Conducted emission.....	28
7.5	Spurious radiated emissions.....	36
7.6	6dB bandwidth.....	42
7.7	Power spectral density.....	52
8	System Measurement Uncertainty.....	62



2 Details about the Test Laboratory

Details about the Test Laboratory

Company name: Jiangsu TÜV Product Service Ltd. – Shenzhen Branch
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Telephone: 86 755 8828 6998
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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-98902
Serial number:	NIL
Options and accessories:	NIL
Rating:	DC 12V 3A, 36W AC Adaptor: Model: MPA-12030 Input: 100-240V ~ 50/60Hz 1 Max Output: +12V DC 3A
Antenna:	Integral antenna inside enclosure of EUT, NOT accessible by end user Antenna Gain: 1dBi
RF Transmission Frequency:	2412-2462MHz(802.11b/g/n HT20) 2422-2452MHz(802.11n HT40)
Description of the EUT:	A Wi-Fi module was installed in this Notebook PC-98902

Auxiliary Equipment and Cable 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
Headphone	Ouyun	OH601	----
USB flash drive	Kingston	Data Traveller	----
SD card	Kingston	SD4/4GBFE	----
VGA cable	Lenovo	Shield	140cm
AC Power cable	Lenovo	Unshield	180cm



Product Service

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	☒	☐	☐
15.247 (b) (1) Conducted peak output power	12	☒	☐	☐
15.247(d) Band edge compliance of RF emissions	14	☒	☐	☐
15.247(d) Spurious RF conducted emissions	28	☒	☐	☐
15.247(d) 15.209 Spurious radiated emissions	36	☒	☐	☐
15.247(a)(2) 6dB bandwidth	42	☒	☐	☐
15.247(e) Power spectral density	52	☒	☐	☐

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: SMFPC98902 filing to 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: Sep 08 2009

Testing Start Date: Sep 09 2009

Testing End Date: Sep 11 2009

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by:

Prepared by:



Paul Yu
EMC Project Manager



Ken Li
EMC Test 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

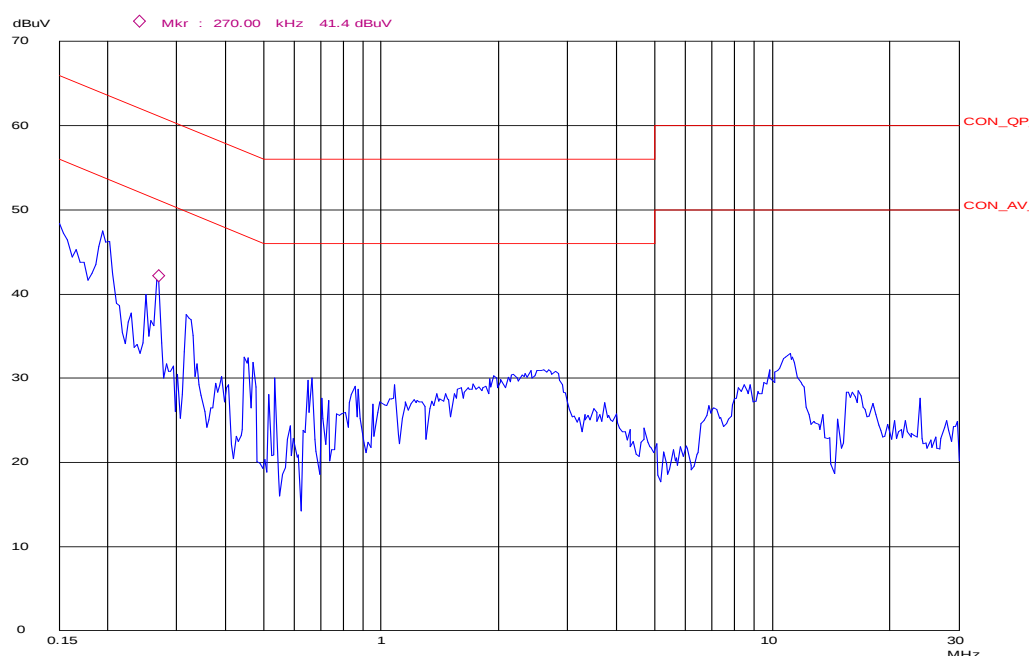
Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Conducted Emission

Conducted Disturbance

EUT: M/N:PC-98902
Op Cond: WIFI
Test Spec: L
Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBμV	QP Test result dBμV	QP Limit dBμV	Margin dB
0.150	9.8	30.8	40.6	66	25.4
0.194	9.8	35.0	44.8	63.9	19.1
0.270	9.8	28.8	38.6	61.1	22.5

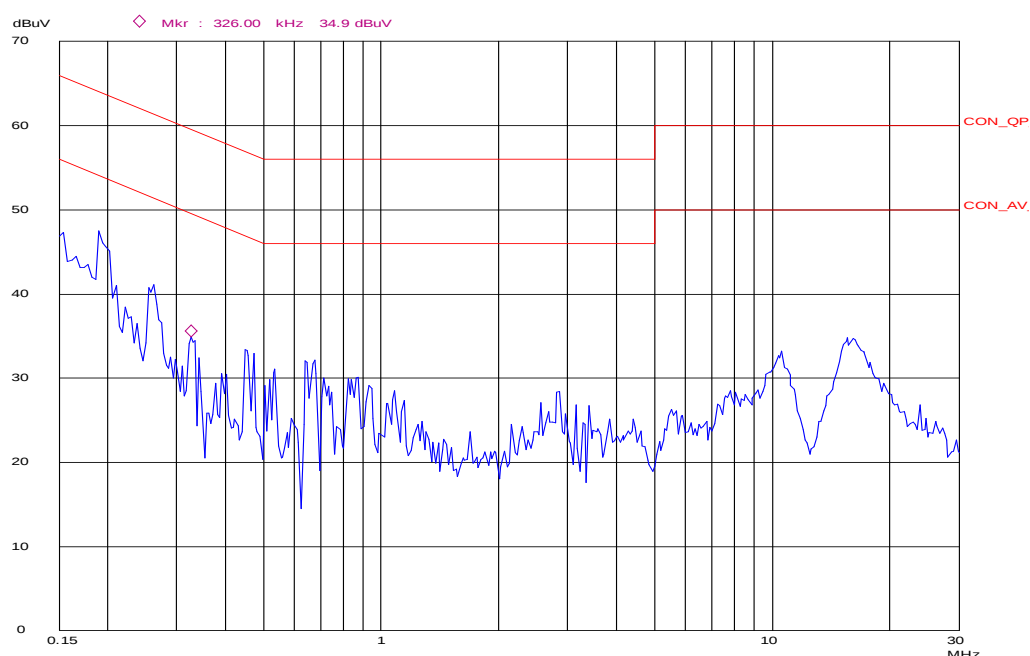
Frequency MHz	Cable Loss dB	Reading dBμV	AV Test result dBμV	AV Limit dBμV	Margin dB
0.150	9.8	4.3	14.1	56	41.9
0.194	9.8	21.2	31.0	53.9	22.9
0.270	9.8	11.0	20.8	51.1	30.3

Remark: Test Result= Reading + Cable Loss

Conducted Emission

Conducted Disturbance

EUT: M/N:PC-98902
Op Cond: WIFI
Test Spec: N
Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBμV	QP Test result dBμV	QP Limit dBμV	Margin dB
0.190	9.8	34.2	44.0	64.0	20
0.262	9.8	28.1	37.9	61.4	23.5
0.326	9.8	22.9	32.7	59.6	26.9

Frequency MHz	Cable Loss dB	Reading dBμV	AV Test result dBμV	AV Limit dBμV	Margin dB
0.190	9.8	18.1	27.9	54.0	26.1
0.262	9.8	15.2	25.0	51.4	26.4
0.326	9.8	10.7	20.5	49.6	29.1

Remark: Test Result= Reading + Cable Loss

Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	Dec 23 2009
AMN	Rohde & Schwarz	ESH3-Z5	100229	Dec 23 2009
AMN	Rohde & Schwarz	ENV216	100042	Dec 23 2009

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 802.11g modulation (6Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	21.52	Pass
CH6 2437MHz	19.70	Pass
CH11 2462MHz	19.50	Pass

IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	22.89	Pass
CH6 2437MHz	22.46	Pass
CH11 2462MHz	20.30	Pass

IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	20.87	Pass
CH6 2437MHz	19.32	Pass
CH11 2462MHz	19.60	Pass

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH3 2422MHz	21.13	Pass
CH6 2437MHz	20.62	Pass
CH9 2452MHz	19.80	Pass



Product Service

Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

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

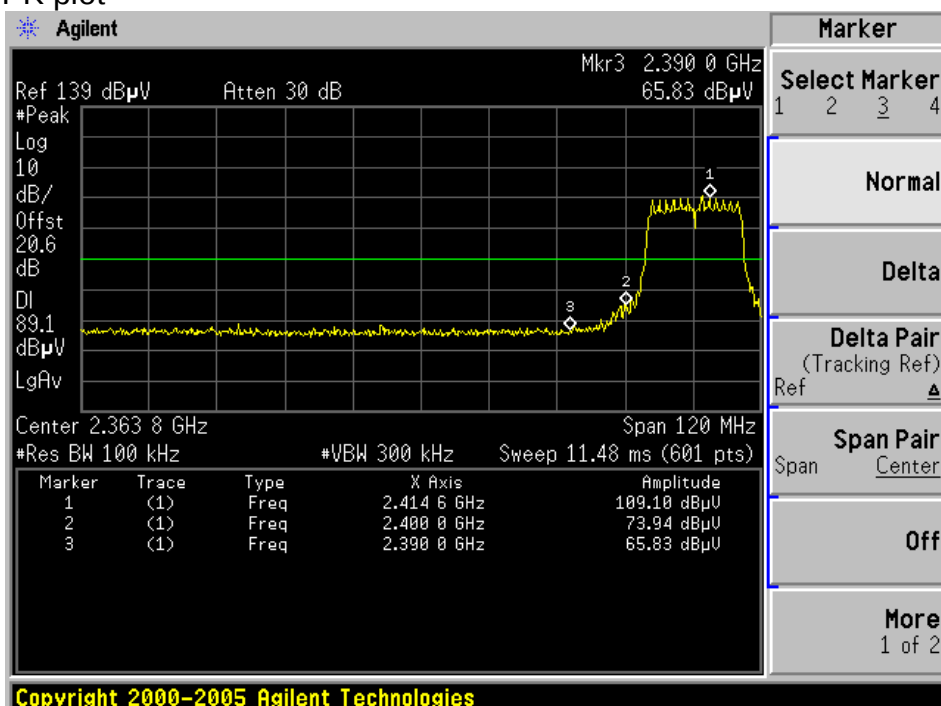
Band edge compliance of RF emissions

IEEE 802.11g modulation (6 Mbps) Test Result

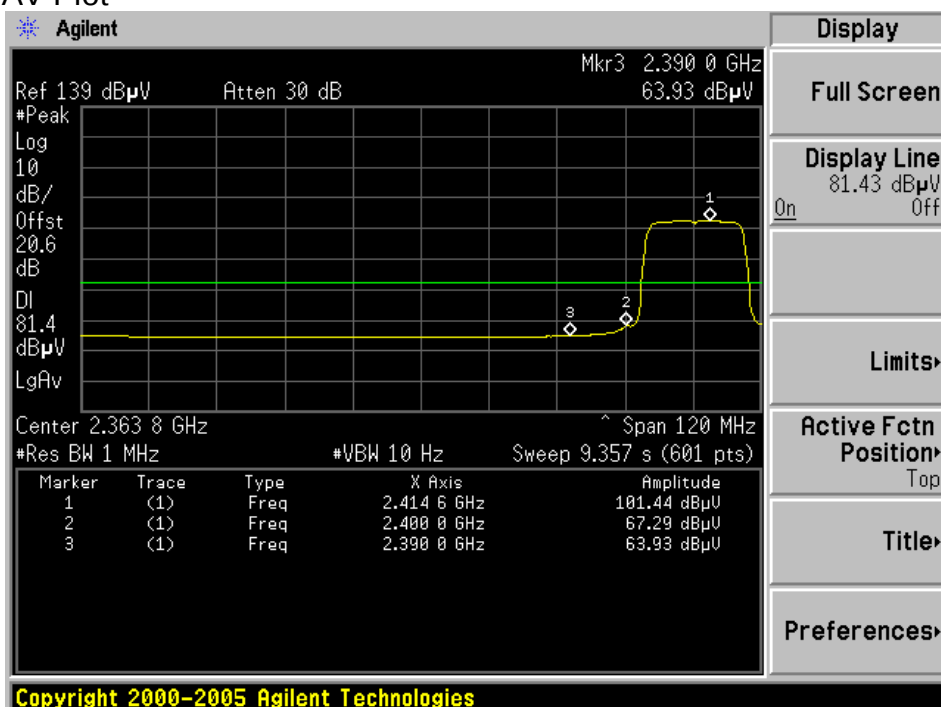
Maximum Carrier Field strength

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
2412.000	5.6	28.5	68.7	102.8	Horizontal	---	PK	---
2412.000	5.6	28.5	58.4	90.5	Horizontal	---	AV	---
2462.000	5.6	28.5	68.7	102.8	Horizontal	---	PK	---
2462.000	5.6	28.5	57.7	90.0	Horizontal	---	AV	---

Lower Edge PK plot

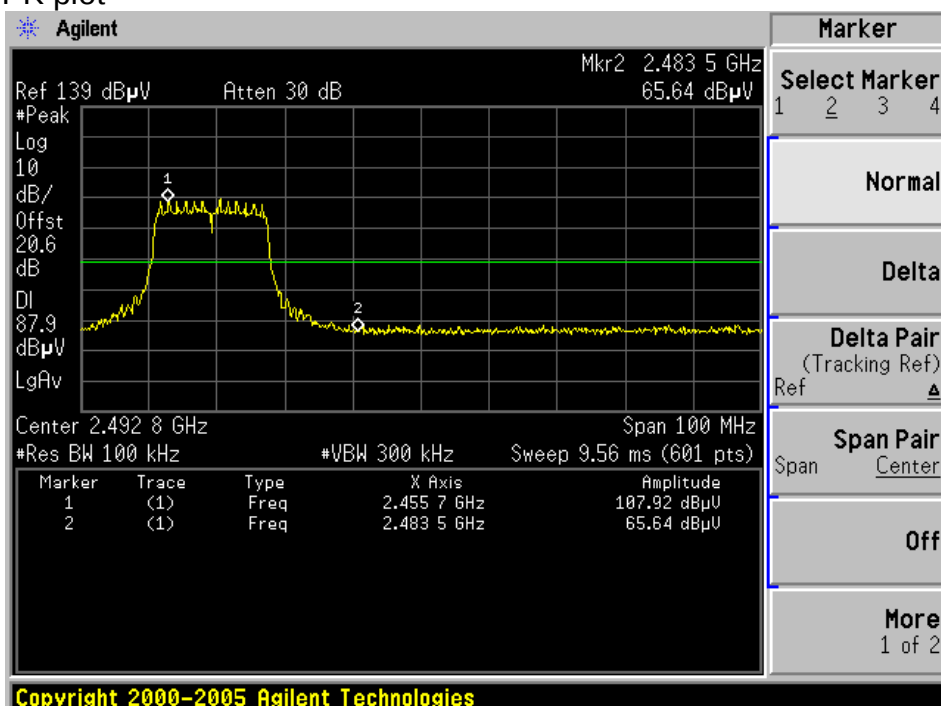


AV Plot

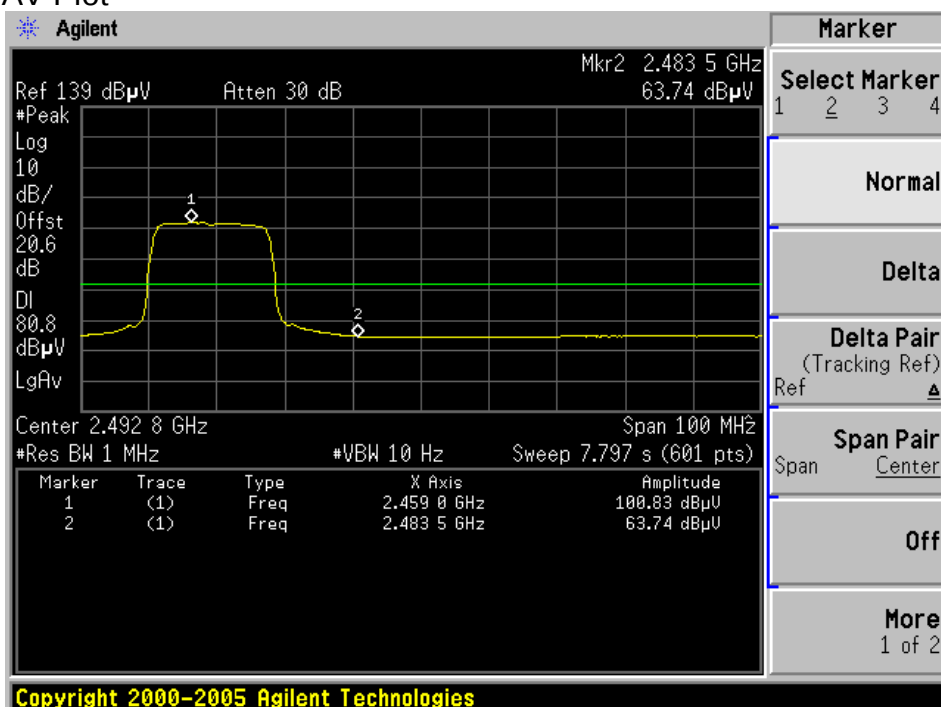


Max carrier field strength PK 102.8dB μ V/m, AV 90.5dB μ V/m
 At 2.390GHz, the deviation of PK plot is 43.3dB, AV plot is 37.5dB
 The field strength at 2.390GHz PK 59.5dB μ V/m, AV 53.0dB μ V/m
 Which fulfill the requirement of PK 74dB μ V/m and AV 54dB μ V/m

Upper Edge PK plot



AV Plot



Max carrier field strength PK 102.8dBuV/m, AV 90.0dBuV/m
 At 2.390GHz, the deviation of PK plot is 42.3dB, AV plot is 37.1dB
 The field strength at 2.390GHz PK 60.5dBuV/m, AV 52.9dBuV/m
 Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m

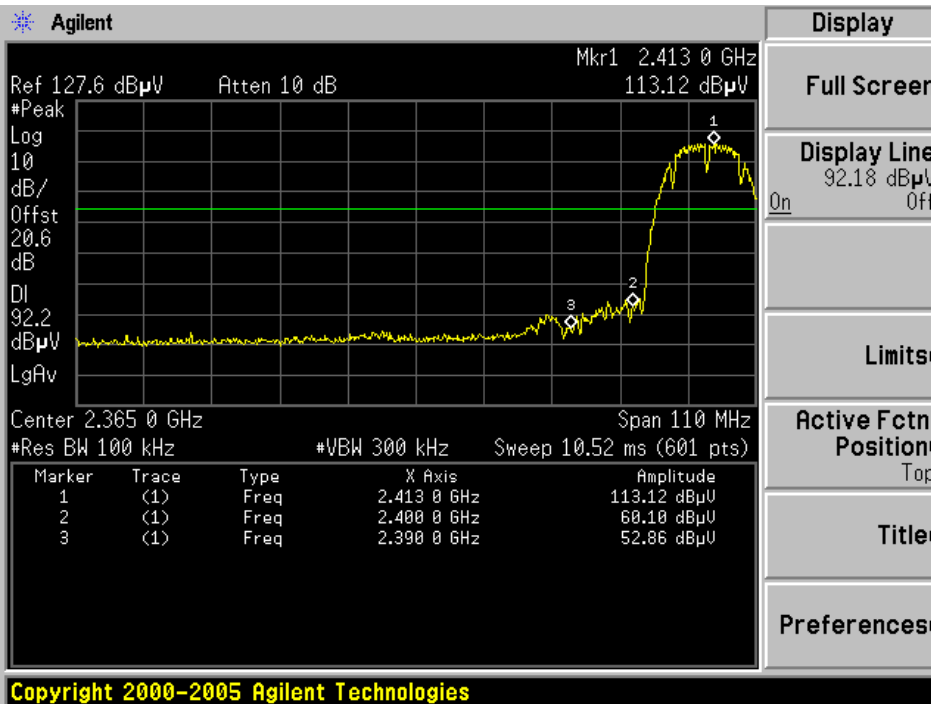
Band edge compliance of RF emissions

IEEE 802.11b modulation (6 Mbps) Test Result

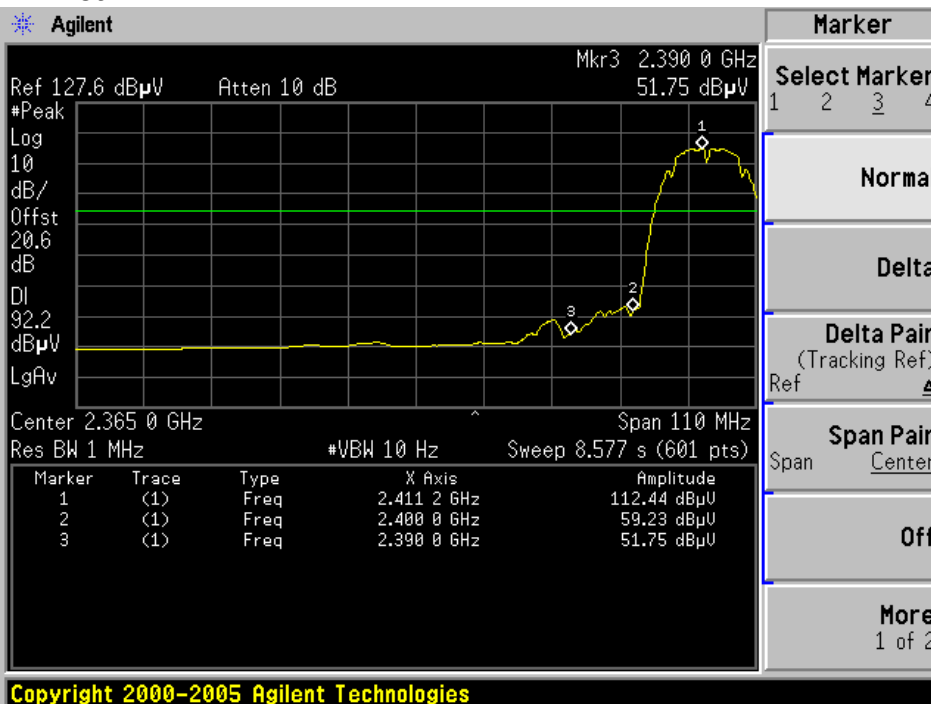
Maximum Carrier Field strength Carrier Field strength

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
2412.000	5.6	28.5	67.3	101.4	Horizontal	---	PK	---
2412.000	5.6	28.5	64.5	98.6	Horizontal	---	AV	---
2462.000	5.6	28.5	67.5	101.6	Horizontal	---	PK	---
2462.000	5.6	28.5	63.3	97.4	Horizontal	---	AV	---

Lower Edge PK Plot



AV Plot



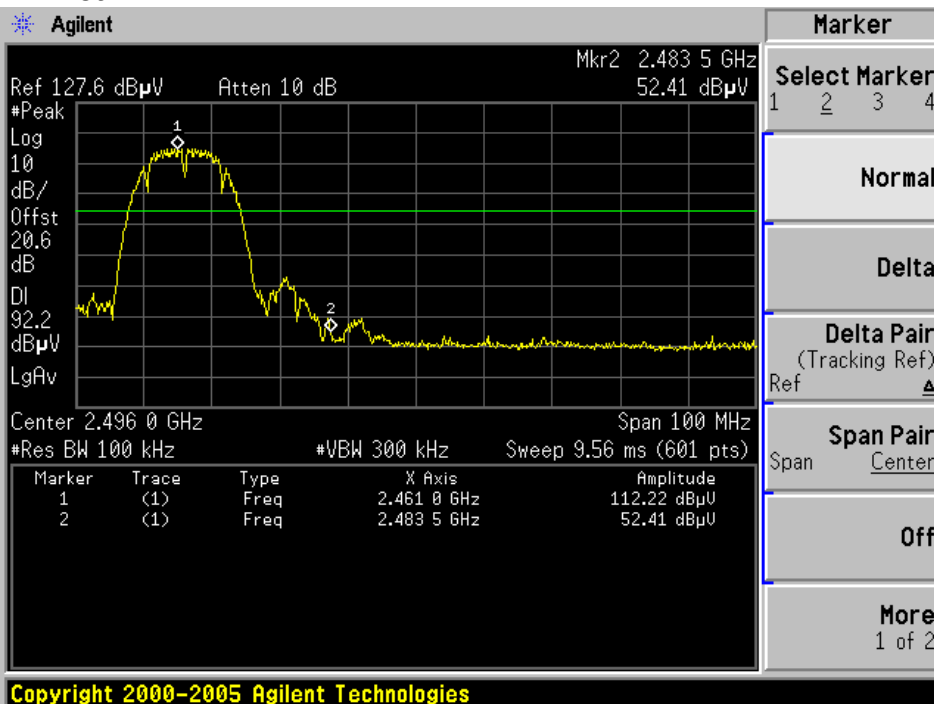
Max carrier field strength PK 101.4dBuV/m, AV 98.6dBuV/m

At 2.390GHz, the deviation of PK plot is 60.3dB, AV plot is 60.7dB

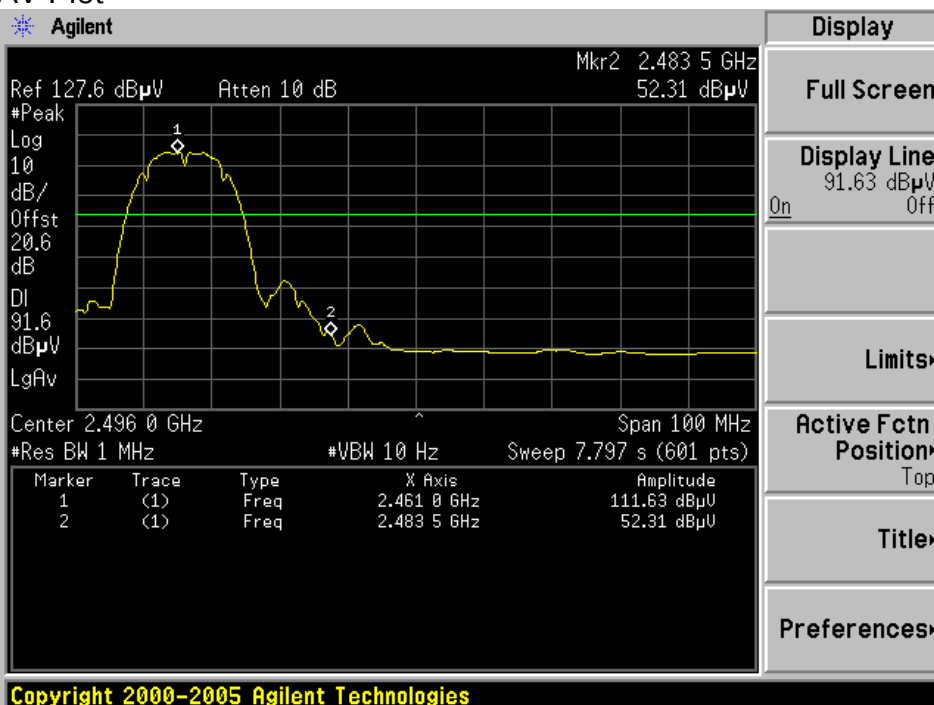
The field strength at 2.390GHz PK 41.1dBuV/m, AV 37.9dBuV/m

Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m

Upper Edge PK Plot



AV Plot



Max carrier field strength PK 101.6dBuV/m, AV 97.4dBuV/m
 At 2.4835GHz, the deviation of PK plot is 59.8dB, AV plot is 59.3dB
 The field strength at 2.4835GHz PK 41.8dBuV/m, AV 38.1dBuV/m
 Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m

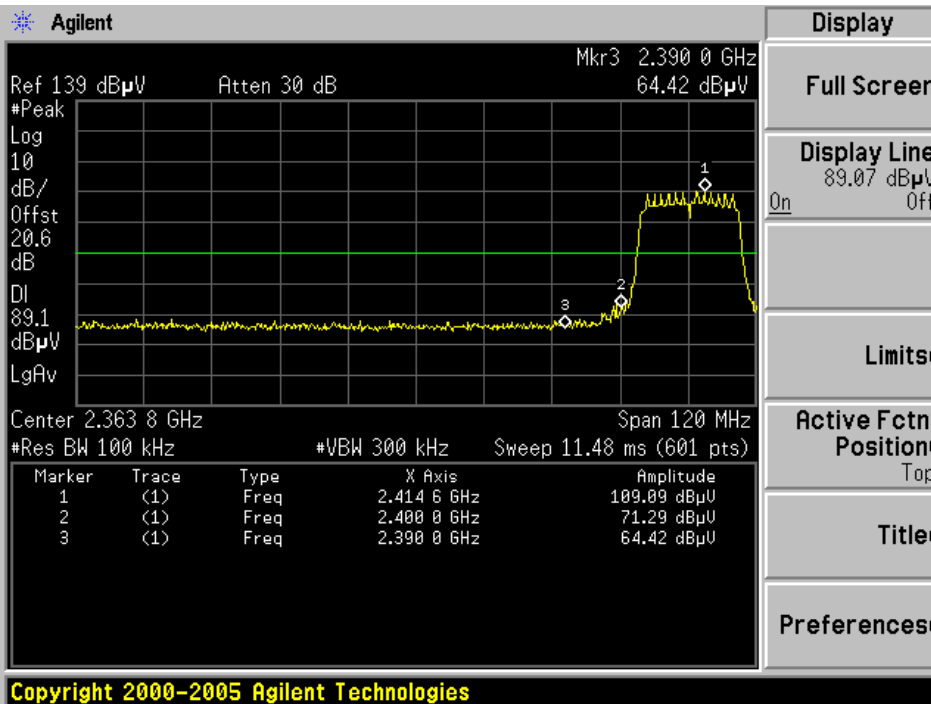
Band edge compliance of RF emissions

IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

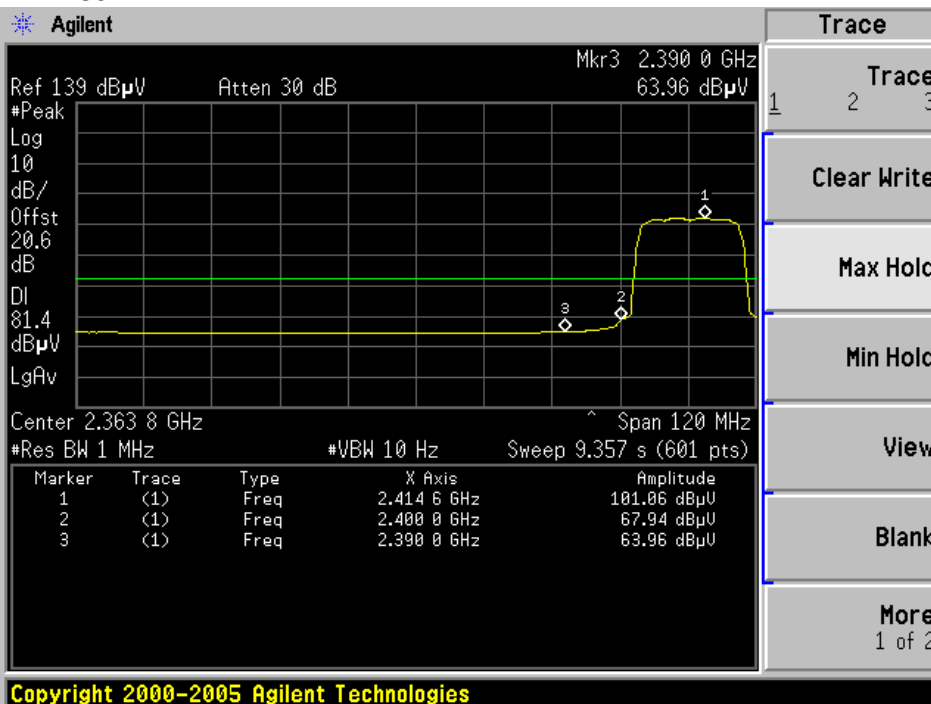
Maximum Carrier Field strength Carrier Field strength

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
2412.000	5.6	28.5	66.1	100.2	Horizontal	---	PK	---
2412.000	5.6	28.5	54.6	88.7	Horizontal	---	AV	---
2462.000	5.6	28.5	66.4	100.5	Horizontal	---	PK	---
2462.000	5.6	28.5	54.1	88.2	Horizontal	---	AV	---

Lower Edge PK Plot



AV Plot



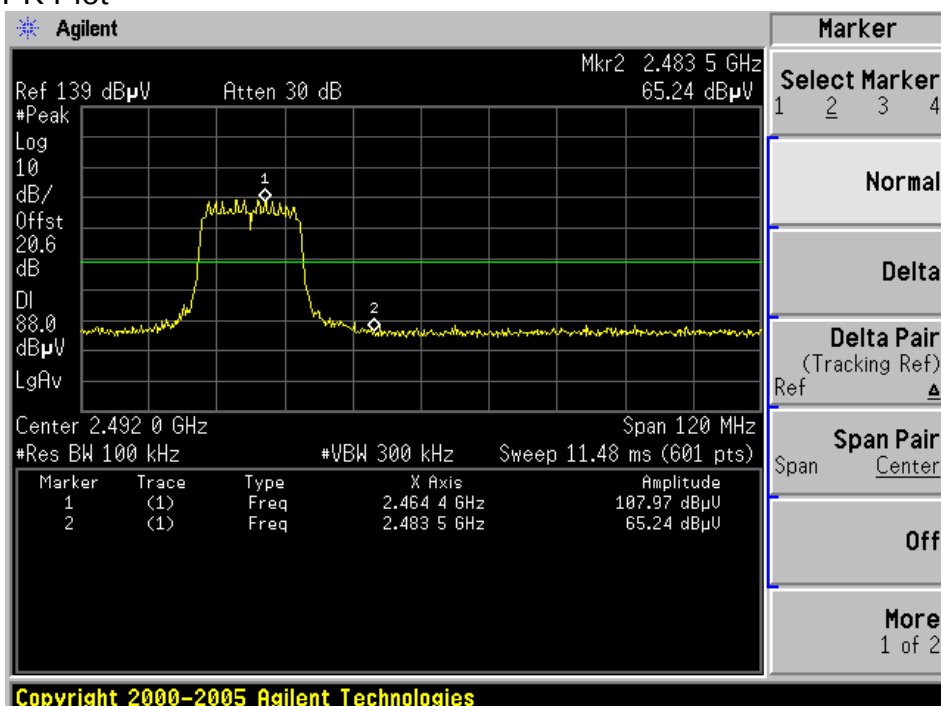
Max carrier field strength PK 100.2dBuV/m, AV 88.7dBuV/m

At 2.390GHz, the deviation of PK plot is 44.7dB, AV plot is 37.1dB

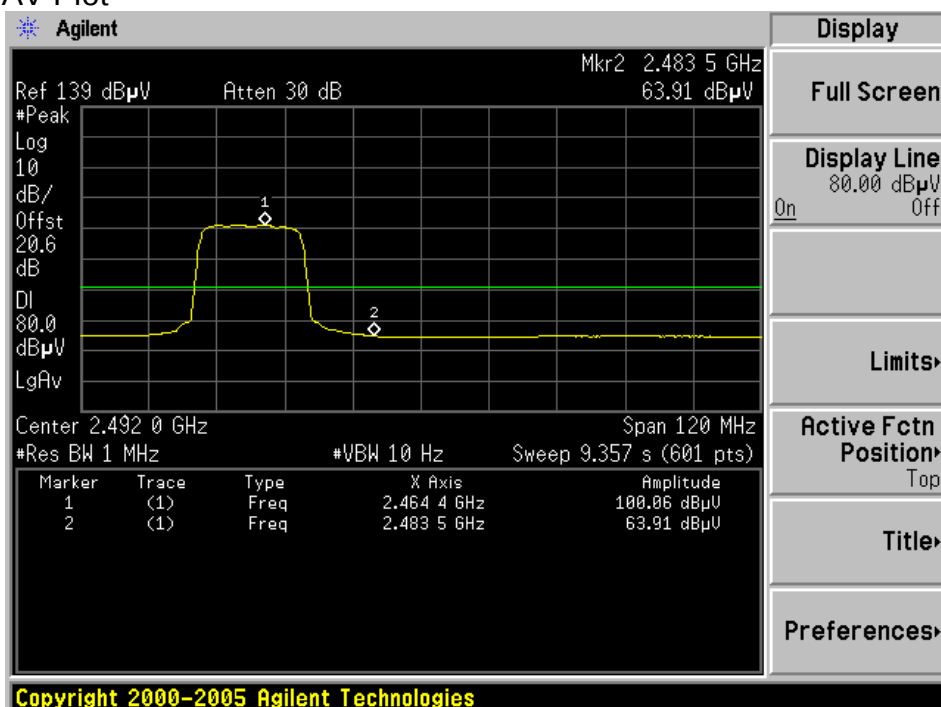
The field strength at 2.390GHz PK 55.5dBuV/m, AV 51.6dBuV/m

Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m

Upper Edge PK Plot



AV Plot



Max carrier field strength PK 100.5dBuV/m, AV 88.2dBuV/m
 At 2.4835GHz, the deviation of PK plot is 42.7dB, AV plot is 36.2dB
 The field strength at 2.4835GHz PK 57.8dBuV/m, AV 52.0dBuV/m
 Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m

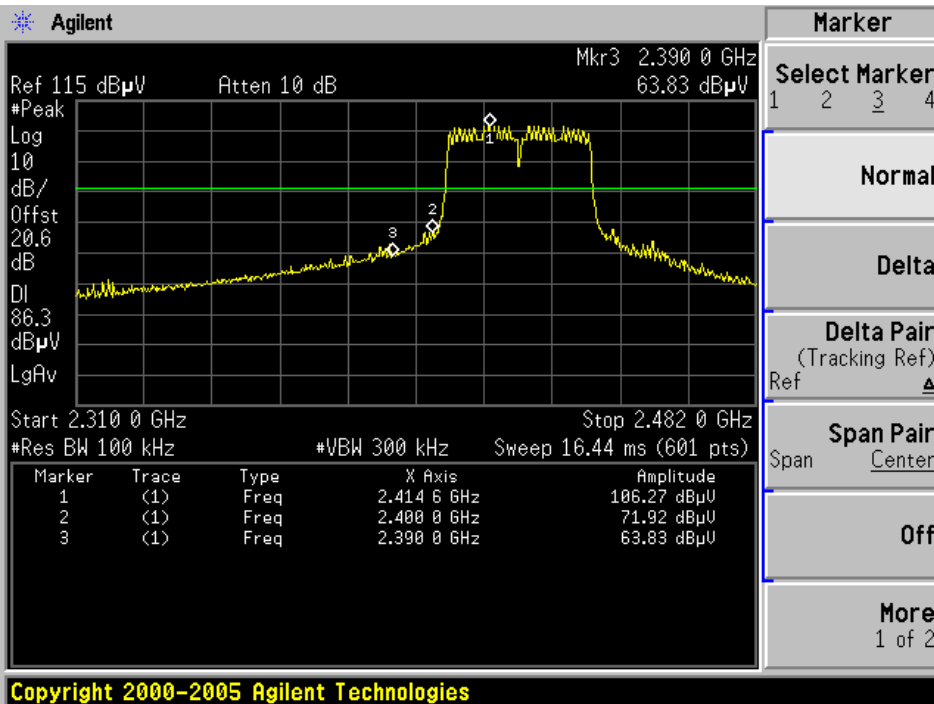
Band edge compliance of RF emissions

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

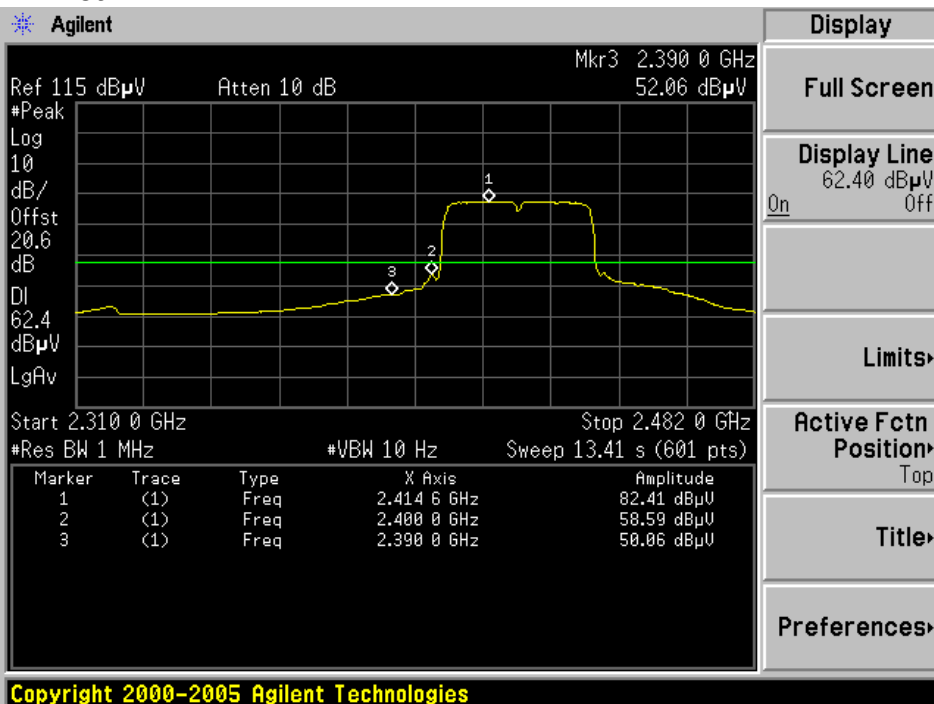
Maximum Carrier Field strength Carrier Field strength

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
2422.000	5.6	28.5	64.7	98.8	Horizontal	---	PK	---
2422.000	5.6	28.5	50.3	84.4	Horizontal	---	AV	---
2452.000	5.6	28.5	63.1	97.2	Horizontal	---	PK	---
2452.000	5.6	28.5	49.1	83.2	Horizontal	---	AV	---

Lower Edge PK Plot



AV Plot



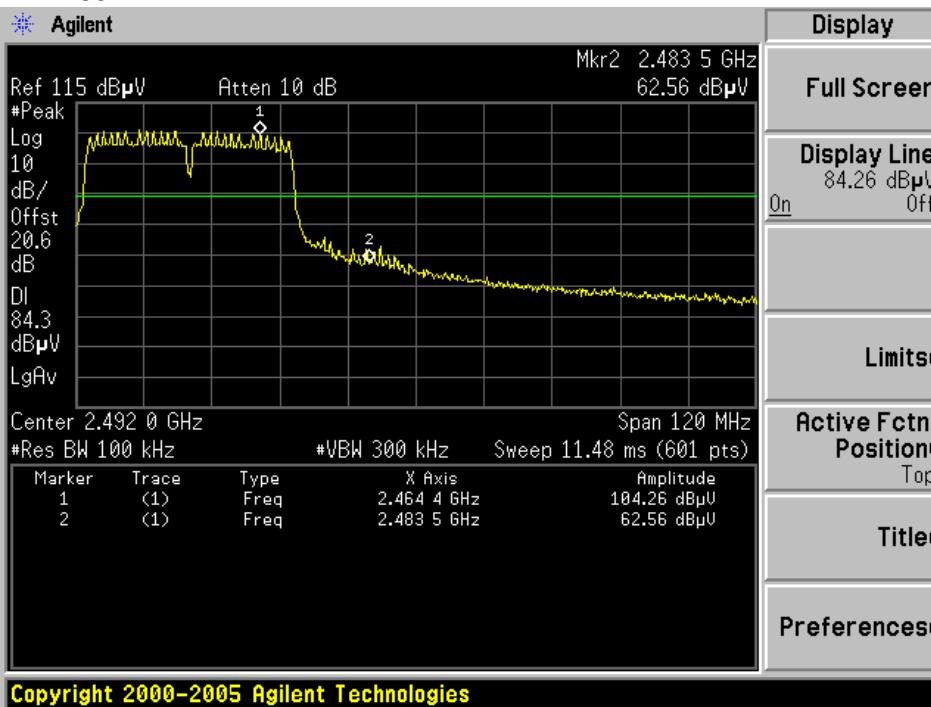
Max carrier field strength PK 98.8dBuV/m, AV 84.4dBuV/m

At 2.390GHz, the deviation of PK plot is 42.4dB, AV plot is 32.4dB

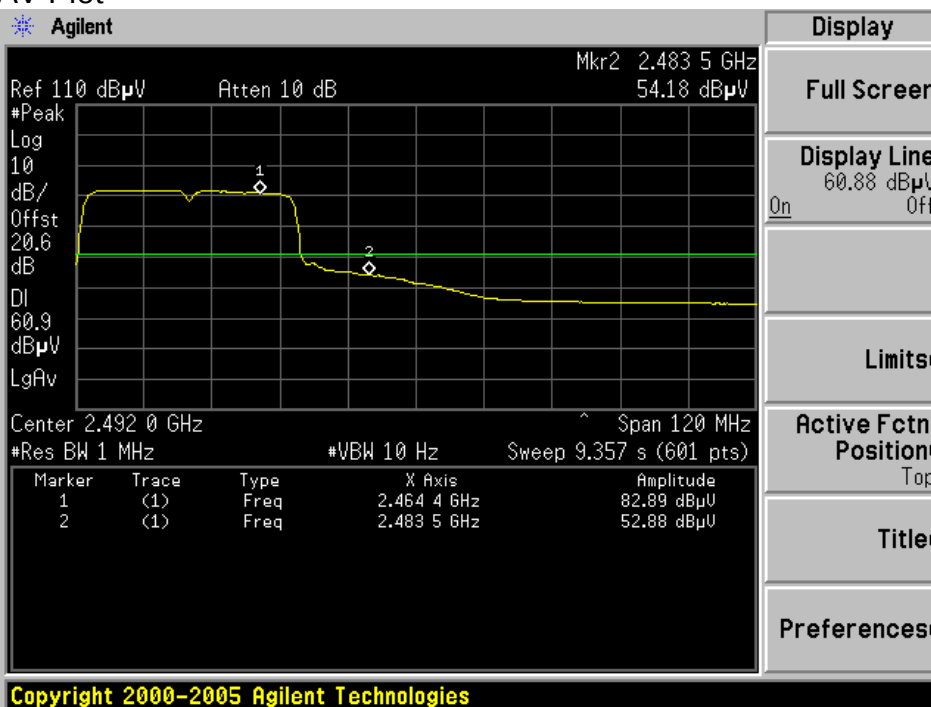
The field strength at 2.390GHz PK 56.4dBuV/m, AV 52.0dBuV/m

Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m

Upper Edge PK Plot



AV Plot



Max carrier field strength PK 97.2dBuV/m, AV 83.2dBuV/m
 At 2.4835GHz, the deviation of PK plot is 41.7dB, AV plot is 30.1dB
 The field strength at 2.4835GHz PK 55.5dBuV/m, AV 53.1dBuV/m
 Which fulfill the requirement of PK 74dBuV/m and AV 54dBuV/m



Product Service

Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
EMI Test Receiver	Rohde & Schwarz	ES126	838786/013	Dec 23 2009
Bilog Antenna	Chase	CBL6112B	2591	Dec 23 2009
Signal Generator	Rohde & Schwarz	SMR20	100047	Dec 23 2009
Antenna	Schwarzbeck	VUBA9117	115	Dec 23 2009
Horn Antenna	Rohde & Schwarz	HF906	100013	Dec 23 2009
Spectrum Analyzer	Agilent	E4446A	US44300459	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.

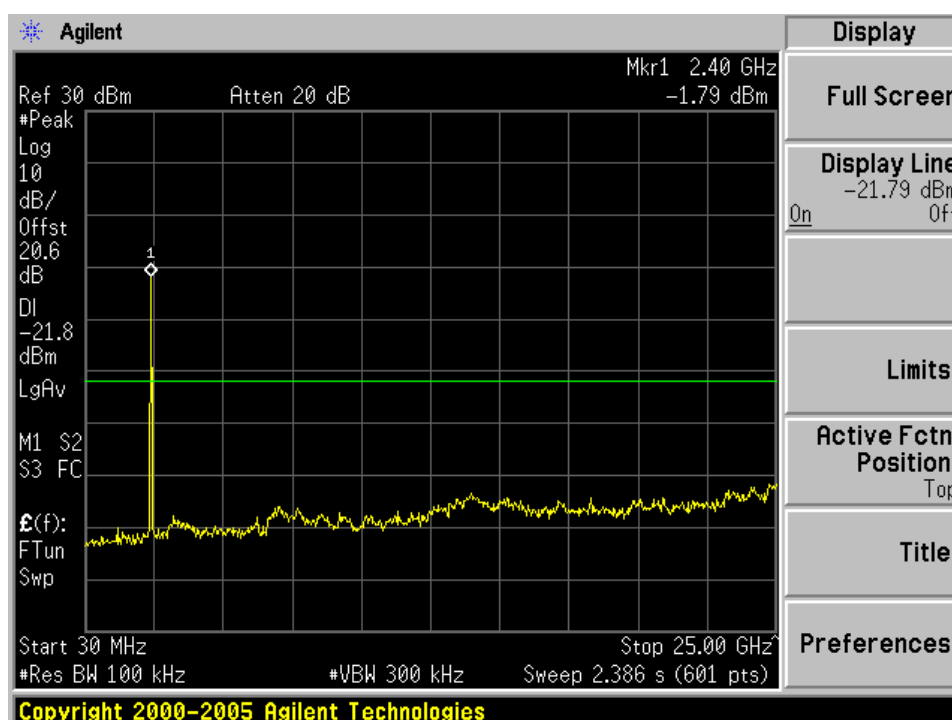
Limit

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

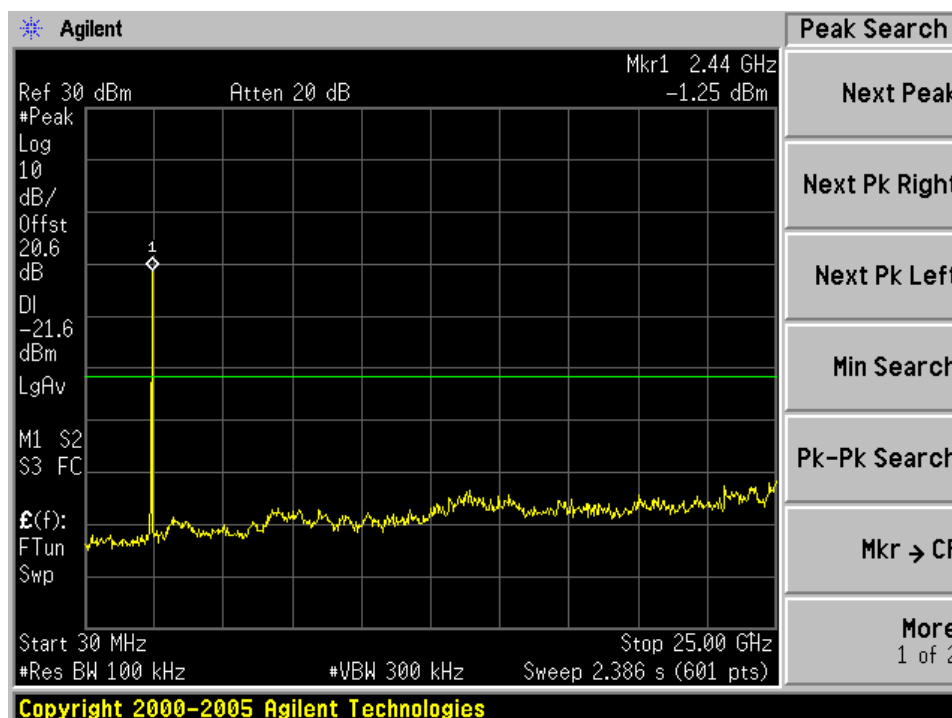
Spurious RF conducted emissions

IEEE 802.11g modulation (6 Mbps) Test Result

2412MHz

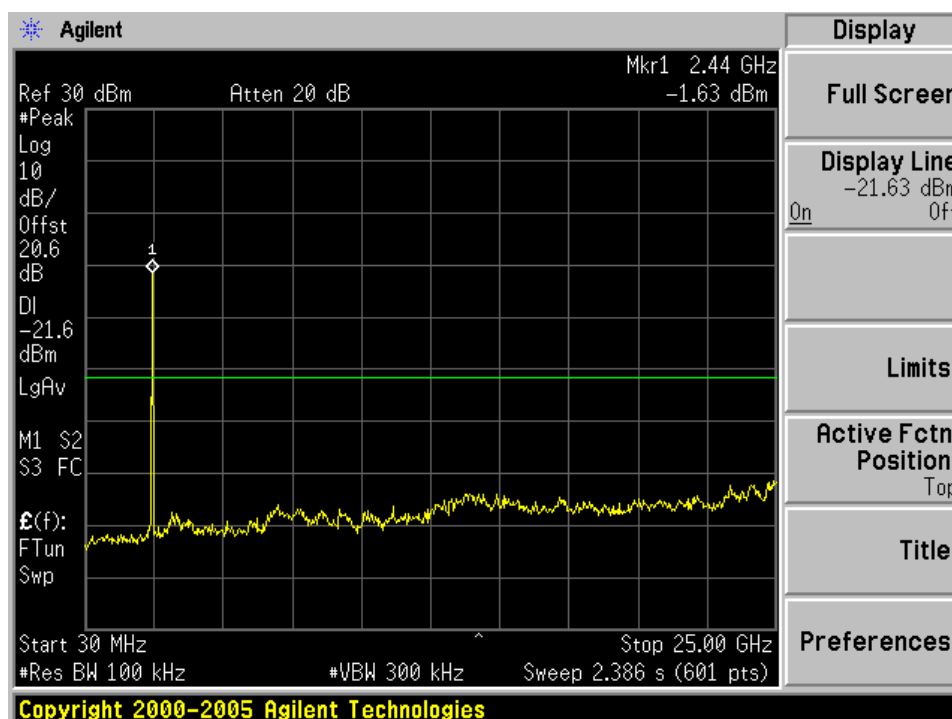


2437MHz



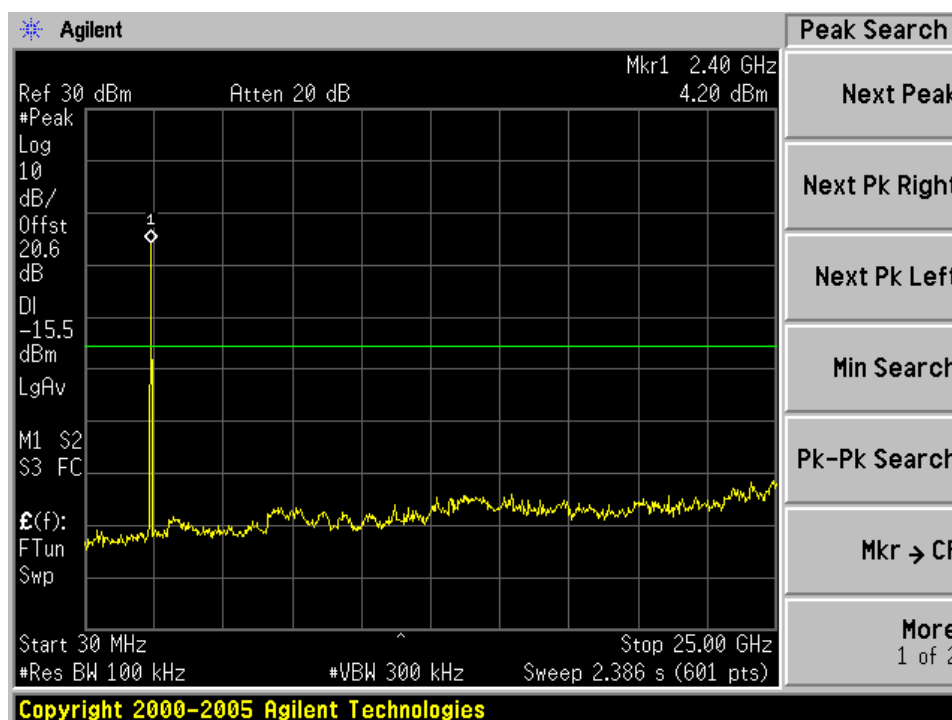
Spurious RF conducted emissions

2462MHz



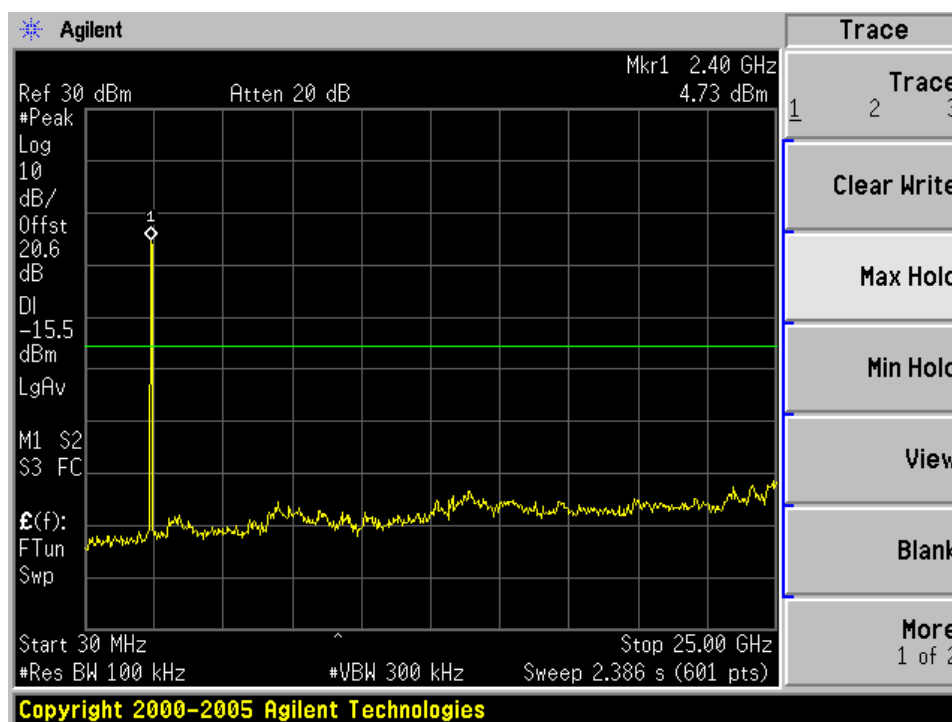
IEEE 802.11b modulation (1 Mbps) Test Result

2412MHz

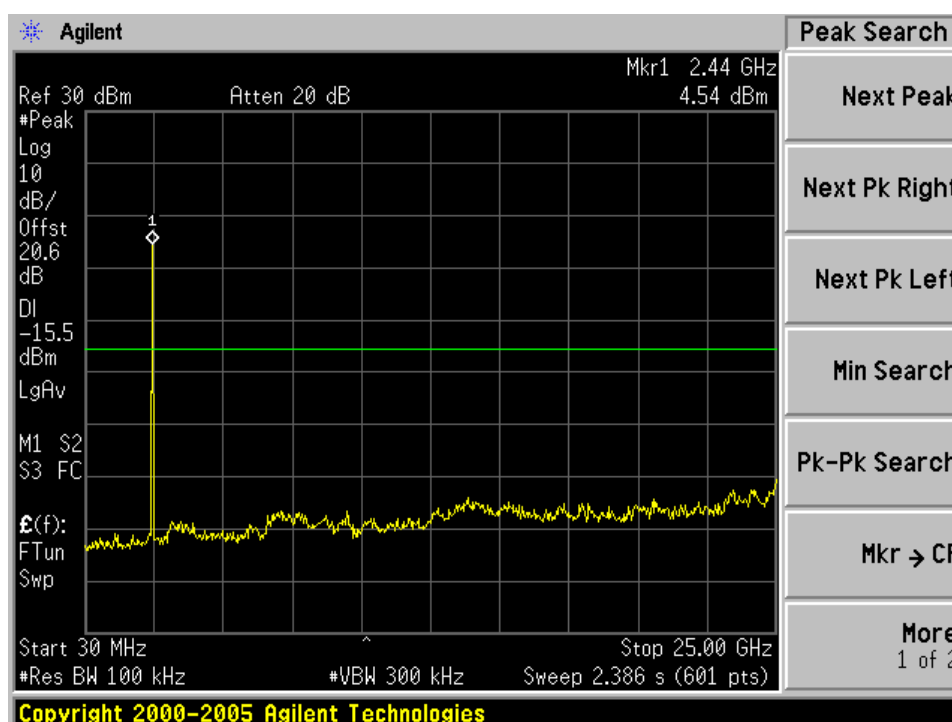


Spurious RF conducted emissions

2437MHz



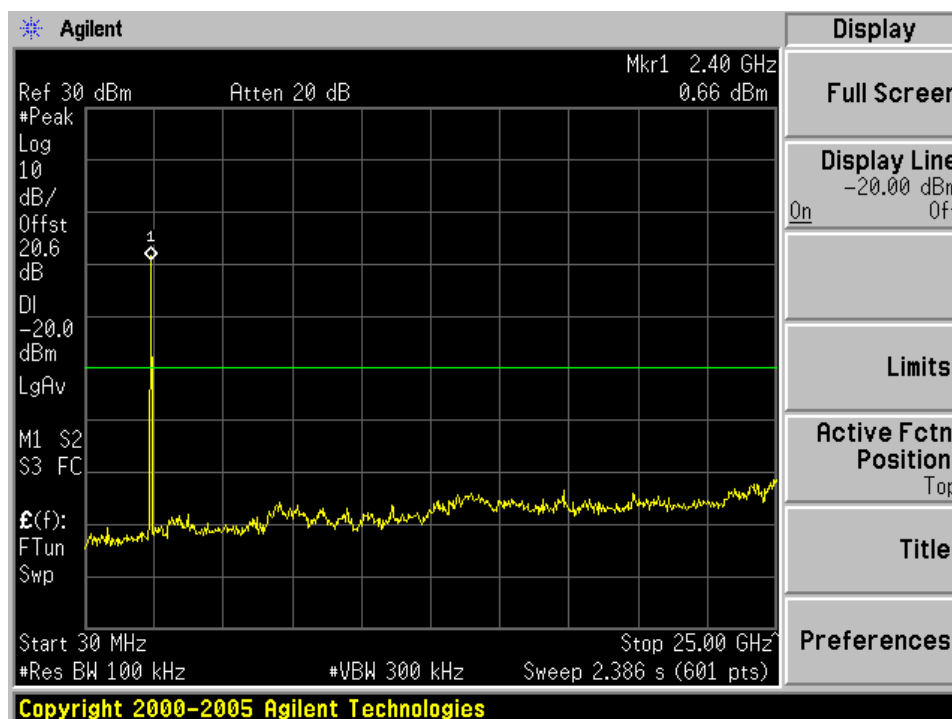
2462MHz



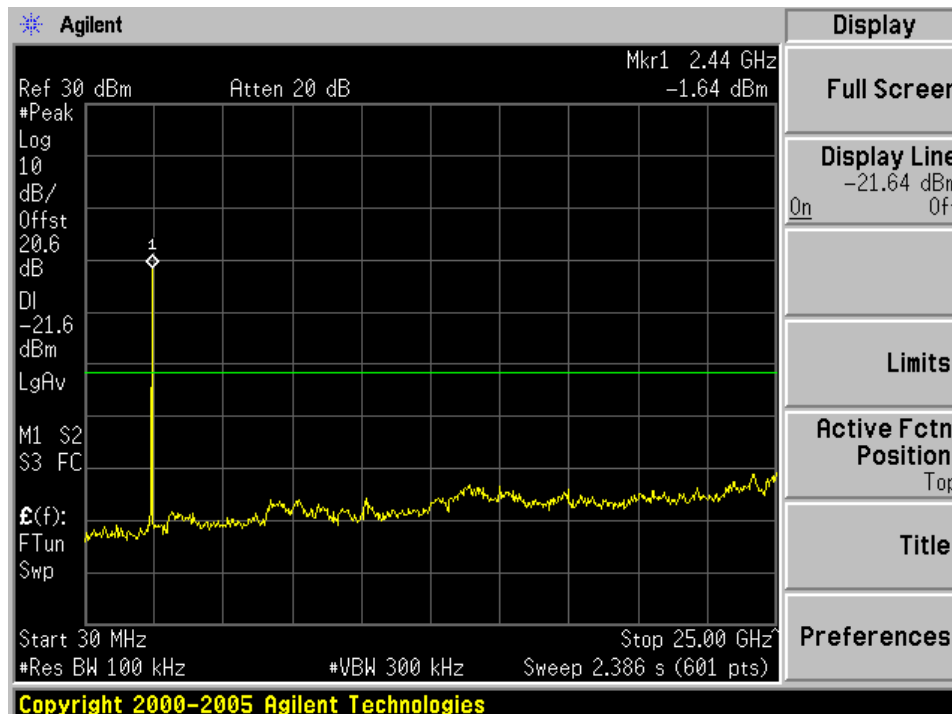
Spurious RF conducted emissions

IEEE 802.11n HT20 modulation (6.5 Mbps) Test Result

2412MHz

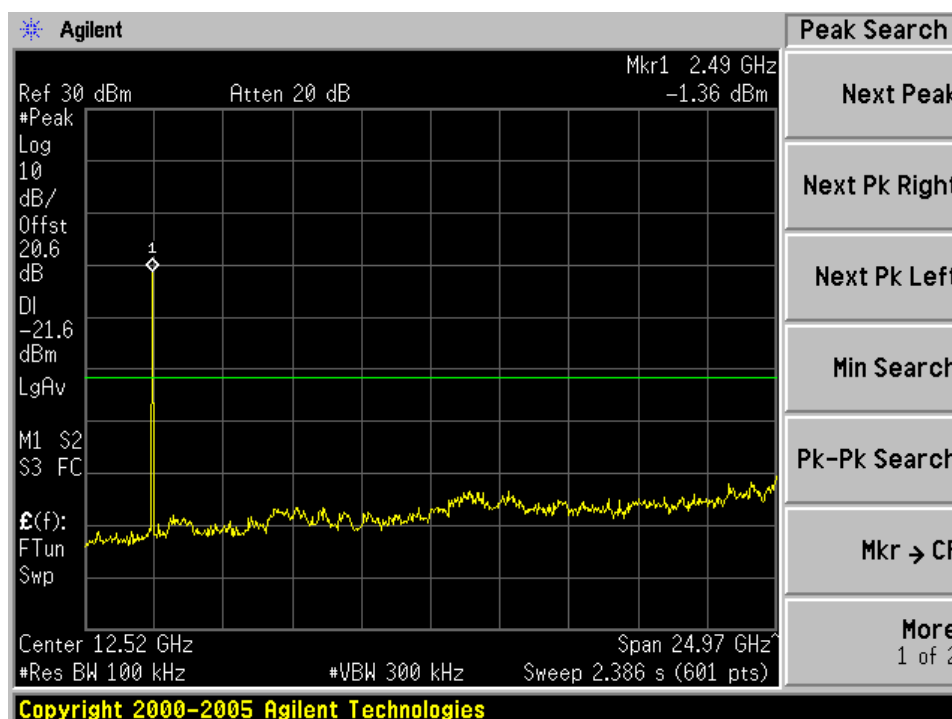


2437MHz



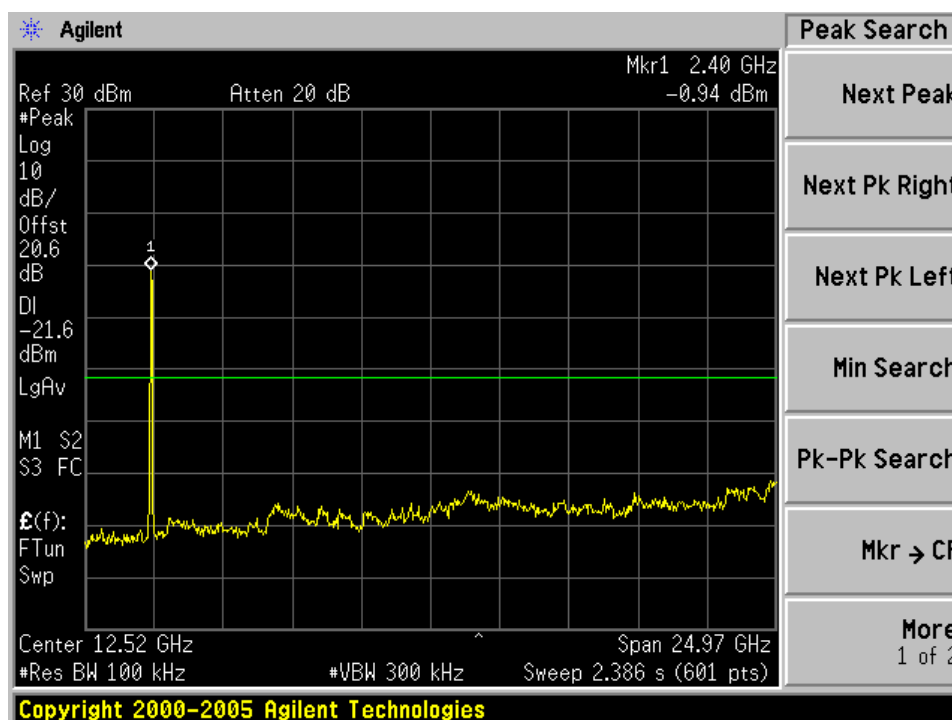
Spurious RF conducted emissions

2462MHz



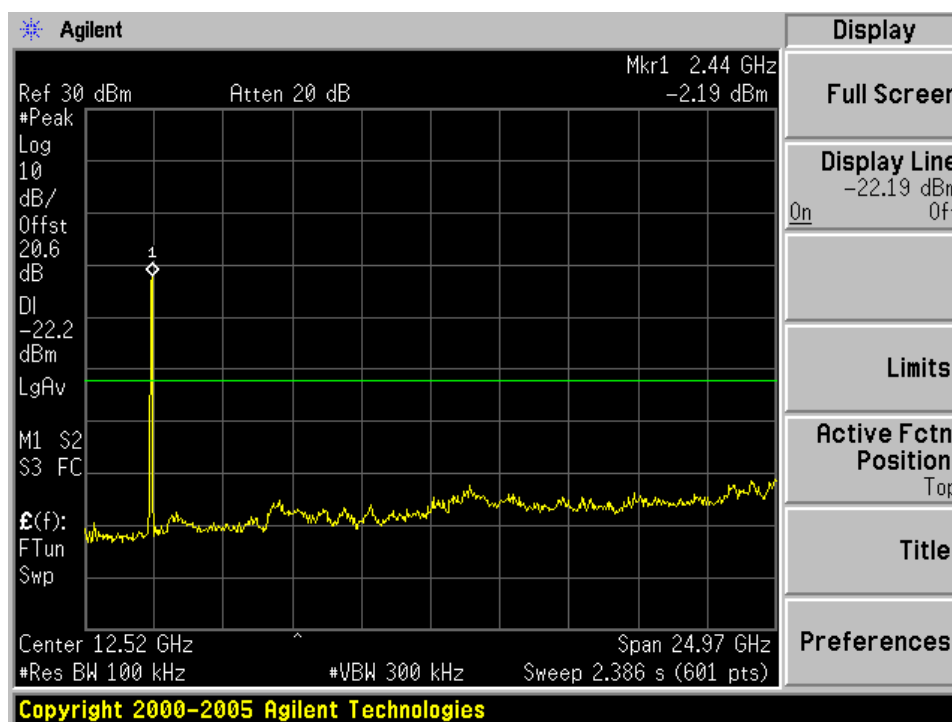
IEEE 802.11n HT40 modulation (13.5 Mbps) Test Result

2422MHz

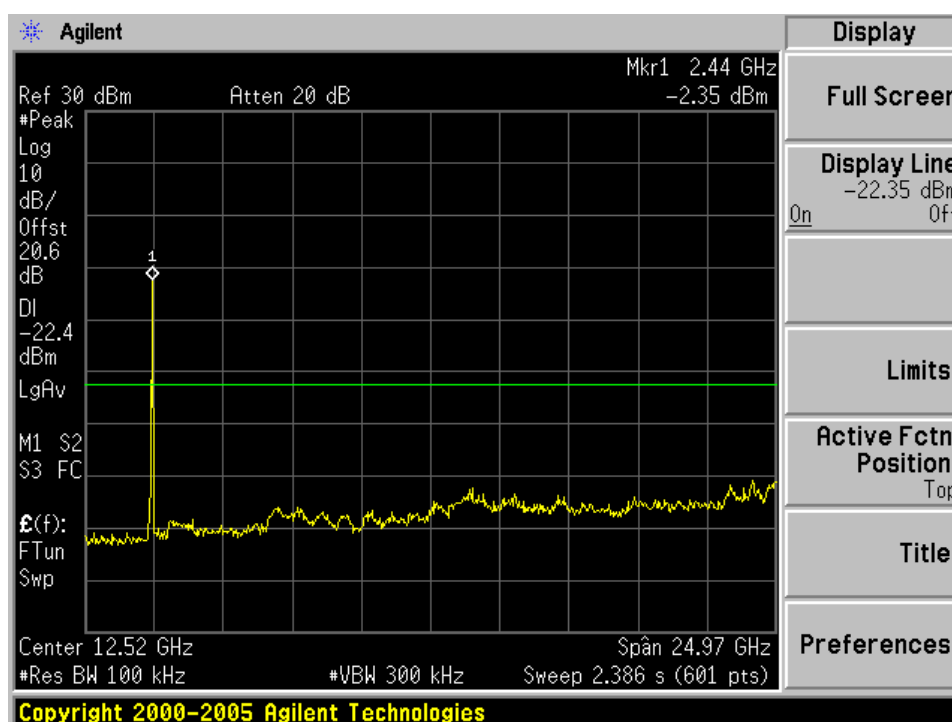


Spurious RF conducted emissions

2437MHz



2452MHz





Product Service

Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

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 802.11g 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
61.102	1.4	5.9	25.6	32.9	Horizontal	40.0	QP	Pass
500.420	3.7	17.6	15.0	36.3	Horizontal	46.0	QP	Pass
35.831	1.2	16.5	14.4	32.1	Vertical	40.0	QP	Pass
4824.000	4.2	33.3	5.8	43.3	Horizontal	74	PK	Pass
4824.000	4.2	33.3	3.2	40.7	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	6.9	44.5	Horizontal	74	PK	Pass
4874.000	4.3	33.3	2.7	40.3	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	7.0	44.6	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 802.11b 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
801.723	4.8	20.2	13.4	38.4	Horizontal	46.0	QP	Pass
59.158	1.2	5.3	26.4	32.9	Vertical	40.0	QP	Pass
799.993	4.8	20.1	15.9	40.8	Vertical	46.0	QP	Pass
4824.000	4.2	33.3	4.6	42.1	Horizontal	74	PK	Pass
4824.000	4.2	33.3	3.0	40.5	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	4.9	42.5	Horizontal	74	PK	Pass
4874.000	4.3	33.3	2.9	40.5	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	4.2	41.8	Horizontal	74	PK	Pass
4924.000	4.3	33.3	2.6	40.2	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
61.102	1.4	5.9	27.8	35.1	Horizontal	40.0	QP	Pass
35.831	1.2	16.5	14.1	31.8	Vertical	40.0	QP	Pass
59.158	1.2	5.3	26.1	32.6	Vertical	40.0	QP	Pass
4824.000	4.2	33.3	6.0	43.5	Horizontal	74	PK	Pass
4824.000	4.2	33.3	4.2	41.7	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	5.6	43.2	Horizontal	74	PK	Pass
4874.000	4.3	33.3	2.7	40.3	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	6.4	44.0	Horizontal	74	PK	Pass
4924.000	4.3	33.3	3.7	41.3	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
556.793	3.9	18.7	14.1	36.7	Horizontal	46.0	QP	Pass
772.565	4.7	20.2	14.9	39.8	Horizontal	46.0	QP	Pass
801.723	4.8	20.2	13.5	38.5	Vertical	46.0	QP	Pass
4844.000	4.2	33.3	6.7	44.2	Horizontal	74	PK	Pass
4844.000	4.2	33.3	5.0	42.5	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	7.1	44.7	Horizontal	74	PK	Pass
4874.000	4.3	33.3	4.4	42.0	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	6.3	43.9	Horizontal	74	PK	Pass
4904.000	4.3	33.3	4.1	41.7	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.



Product Service

Test Equipment List

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
EMI Test Receiver	Rohde & Schwarz	ES126	838786/013	Dec 23 2009
Bilog Antenna	Chase	CBL6112B	2591	Dec 23 2009
Signal Generator	Rohde & Schwarz	SMR20	100047	Dec 23 2009
Antenna	Schwarzbeck	VUBA9117	115	Dec 23 2009
Horn Antenna	Rohde & Schwarz	HF906	100013	Dec 23 2009

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

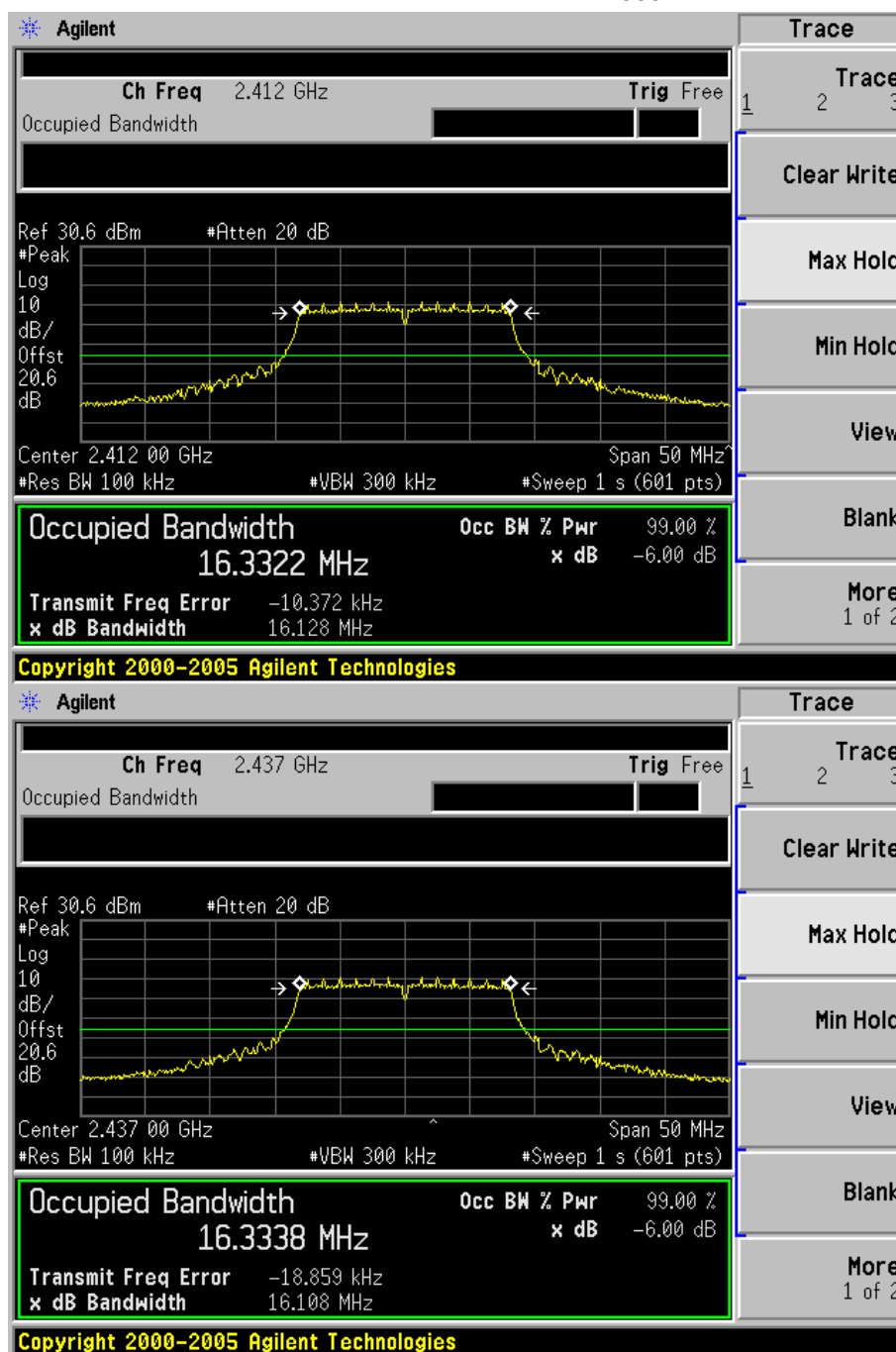
Limit [kHz]

≥ 500

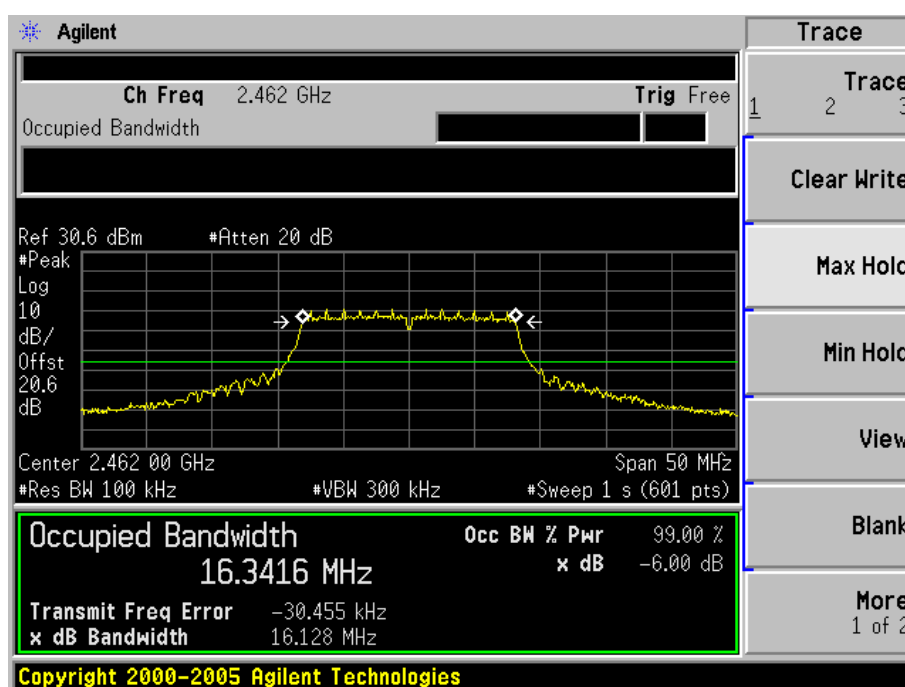
6 dB bandwidth

IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	16128	≥ 500	Pass
2437	16108	≥ 500	Pass
2462	16128	≥ 500	Pass



6 dB bandwidth



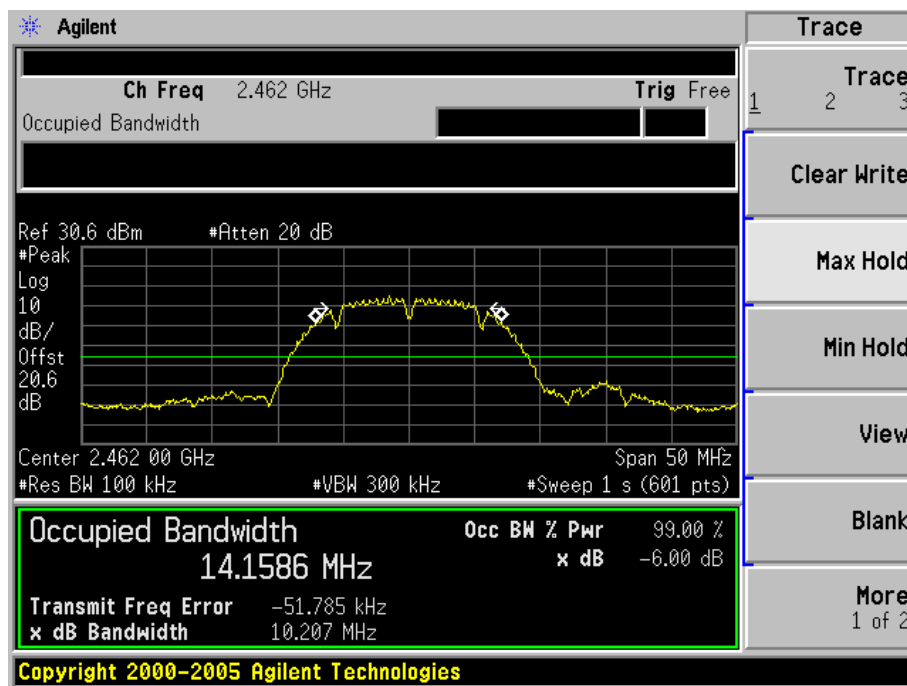
6 dB bandwidth

IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	10240	≥ 500	Pass
2437	10211	≥ 500	Pass
2462	10207	≥ 500	Pass



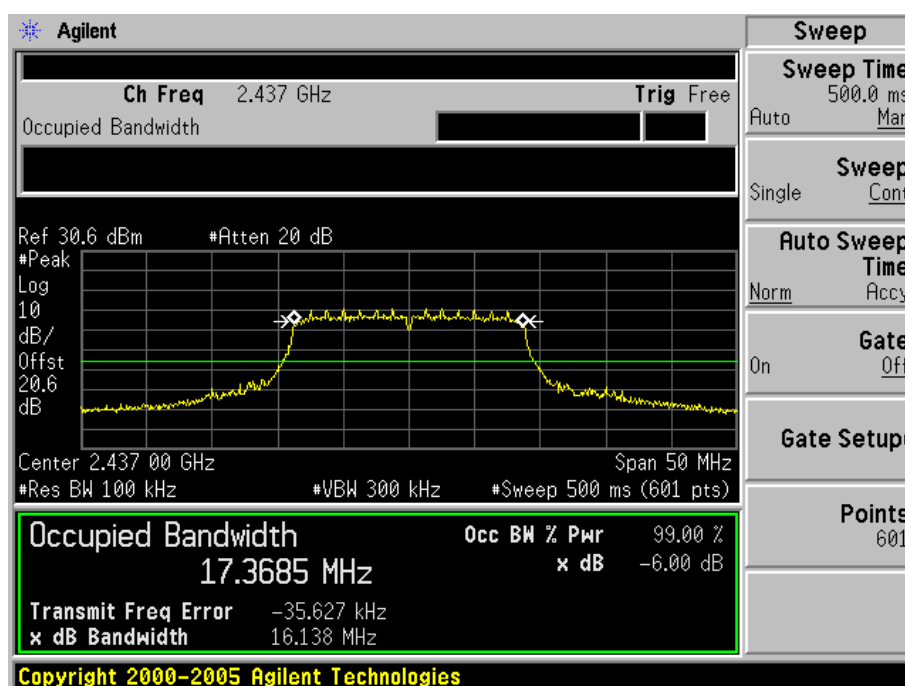
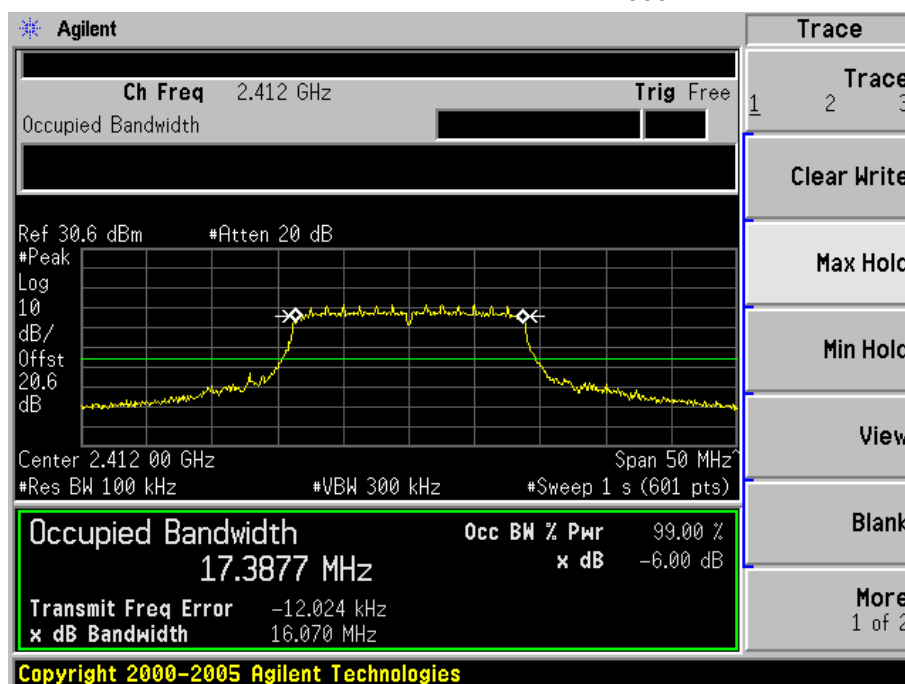
6 dB bandwidth



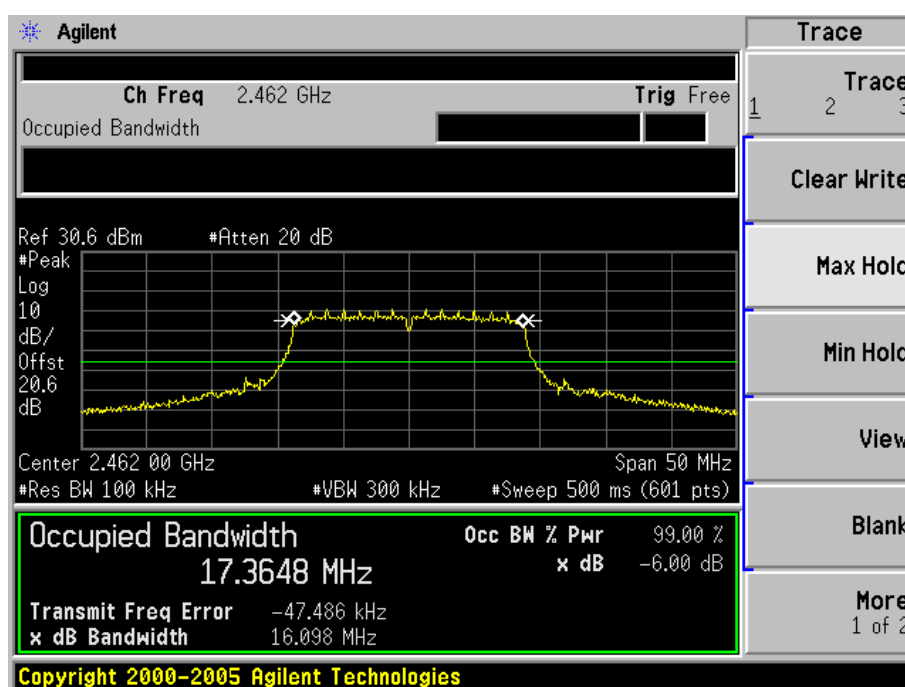
6 dB bandwidth

IEEE 802.11n HT40 modulation (6.5Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2412	16070	≥ 500	Pass
2437	16138	≥ 500	Pass
2462	16098	≥ 500	Pass



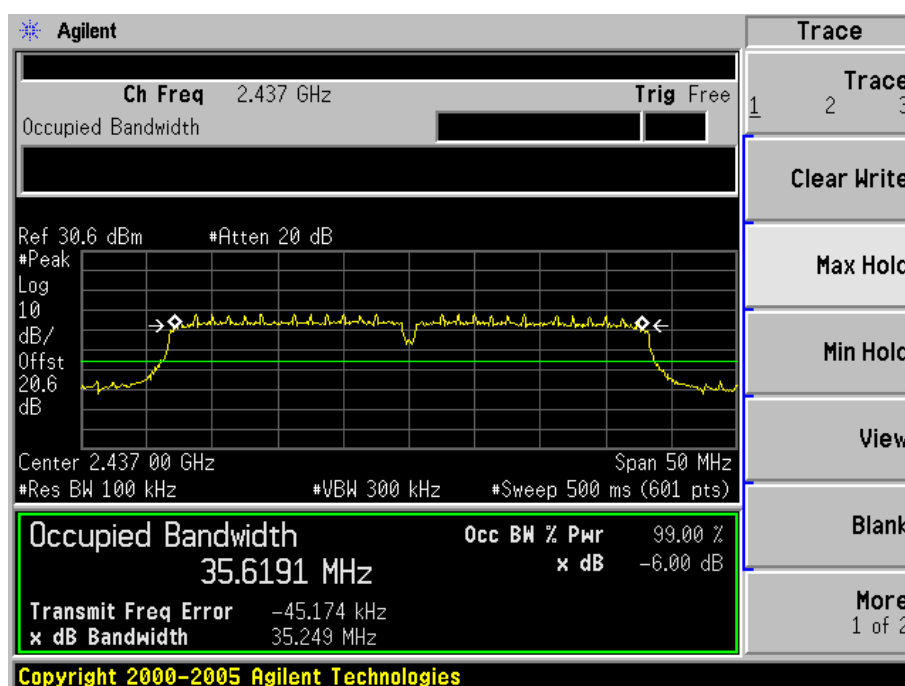
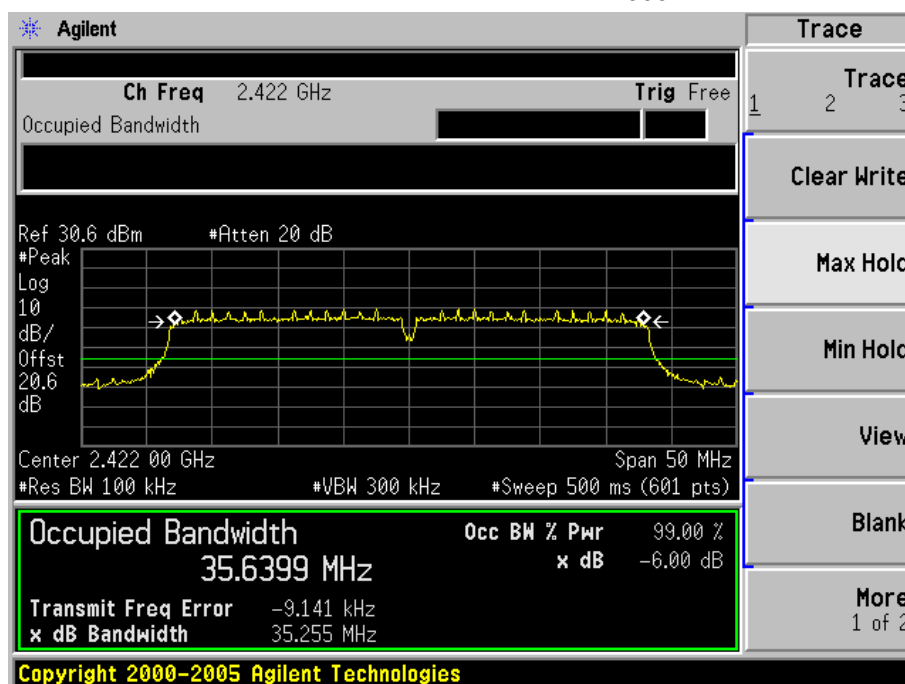
6 dB bandwidth



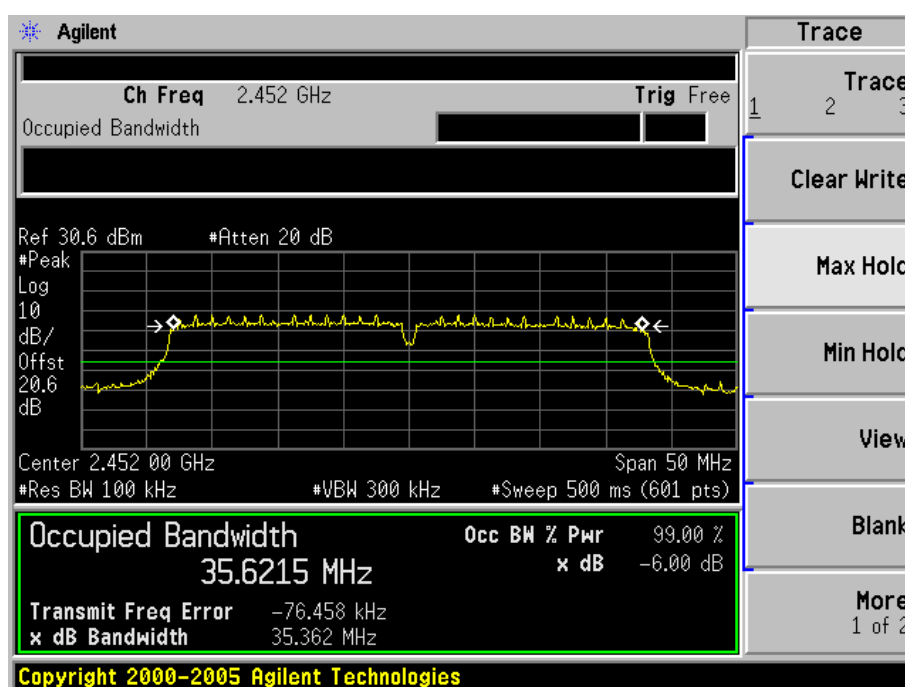
6 dB bandwidth

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency MHz	Bandwidth kHz	Limit kHz	Result
2422	35255	≥ 500	Pass
2437	35249	≥ 500	Pass
2452	35362	≥ 500	Pass



6 dB bandwidth





Product Service

Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

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

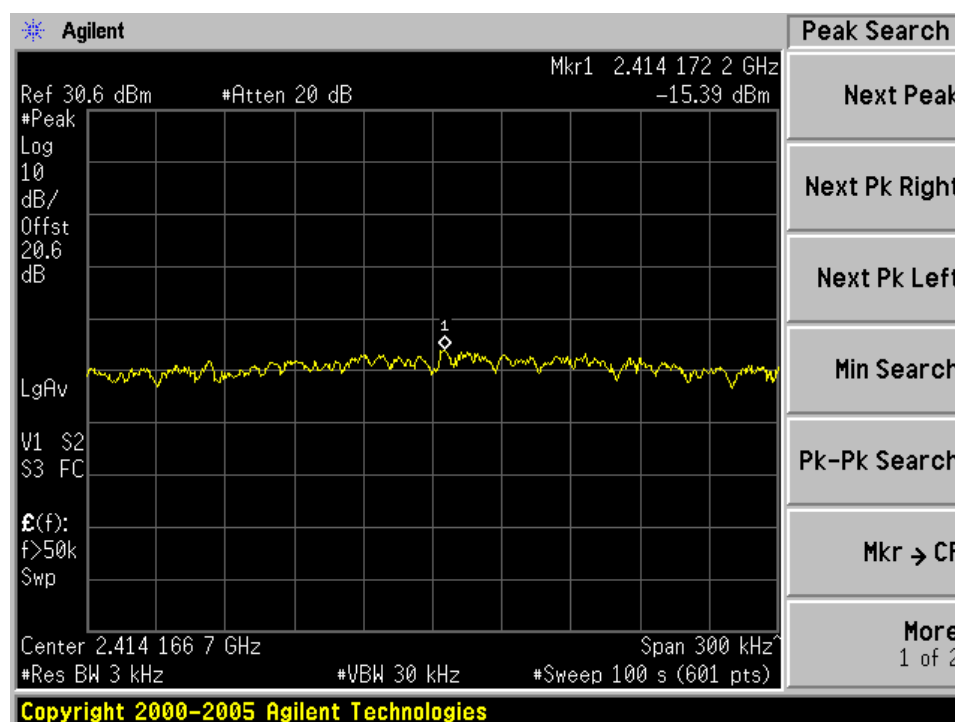
Limit
dBm / 3 kHz

8

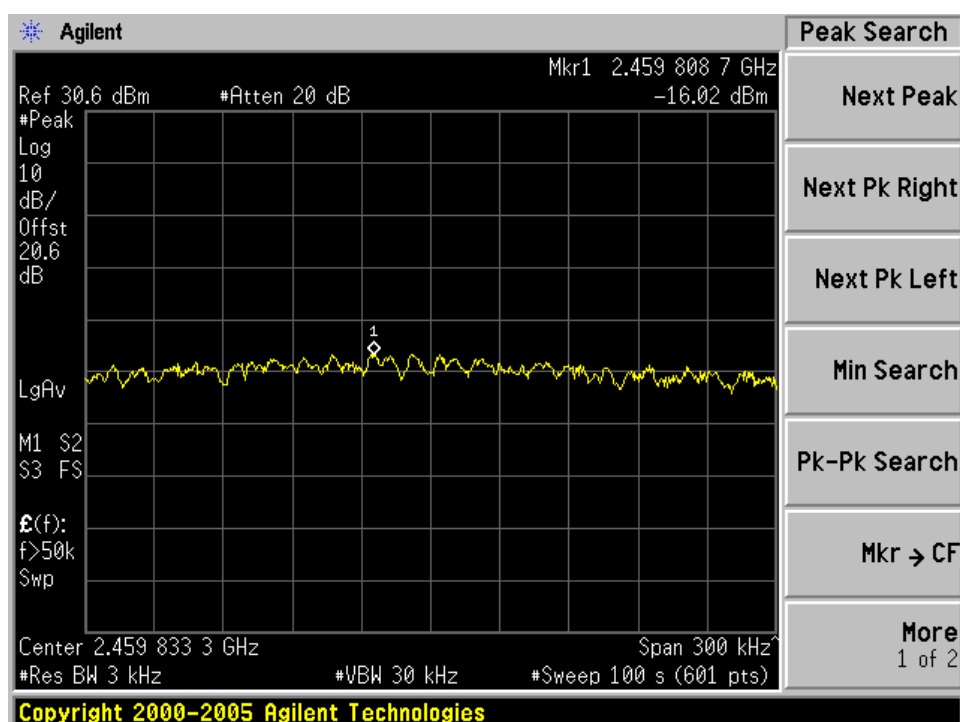
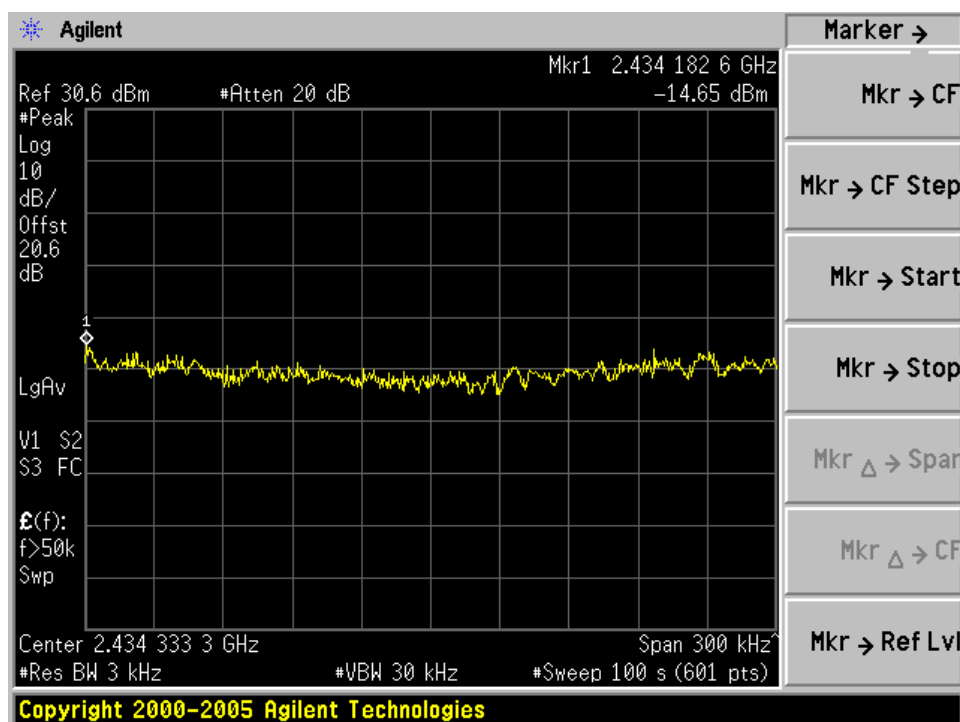
Power spectral density

IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-15.39	Pass
2437	-14.65	Pass
2462	-16.02	Pass



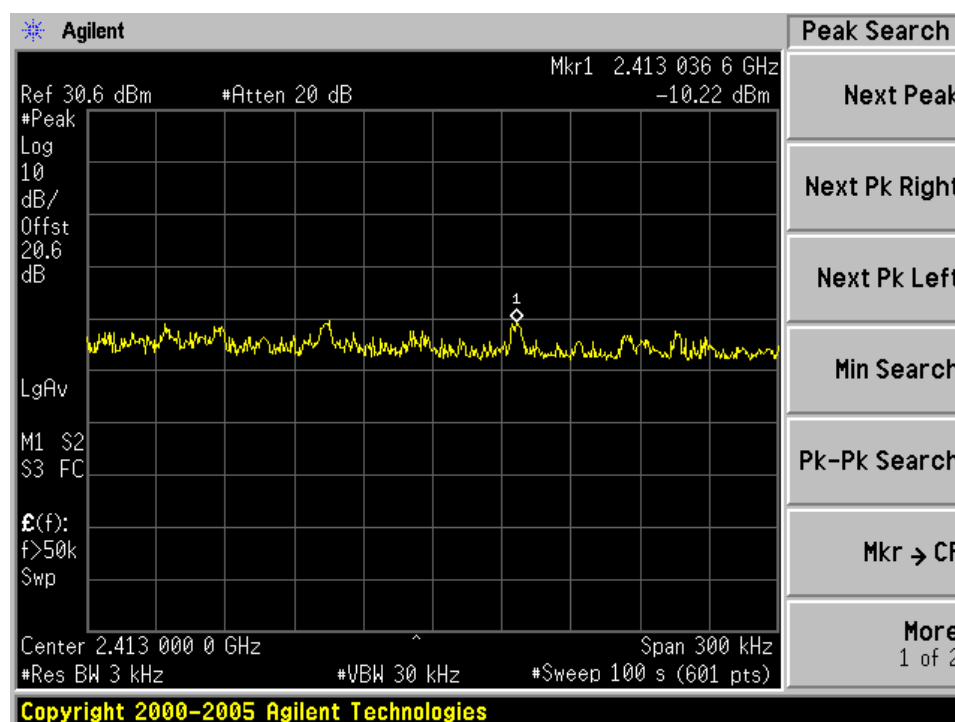
Power spectral density



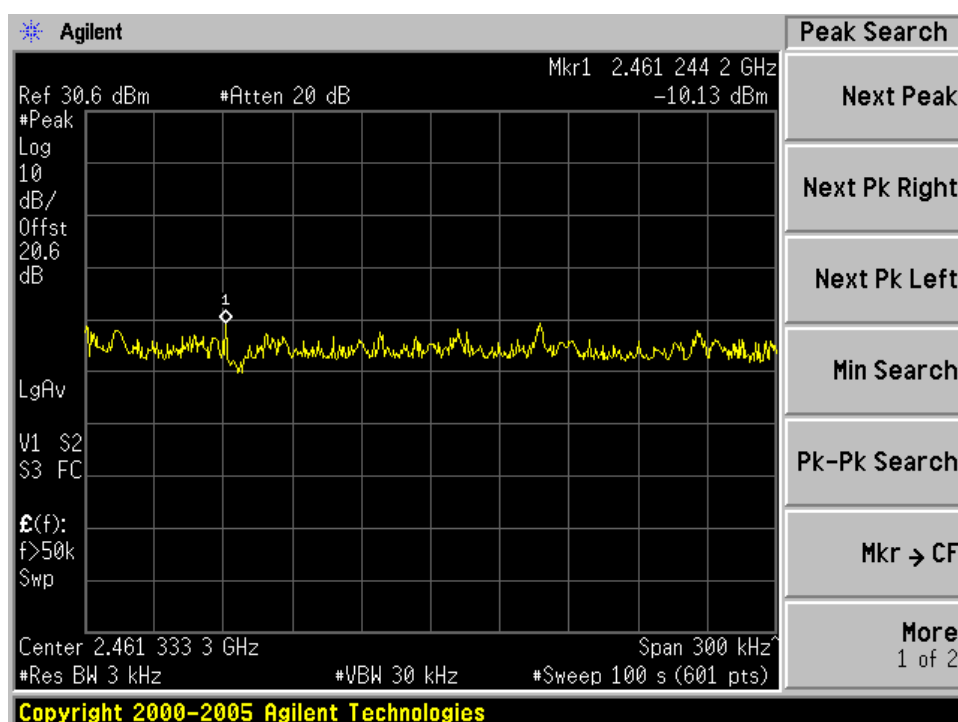
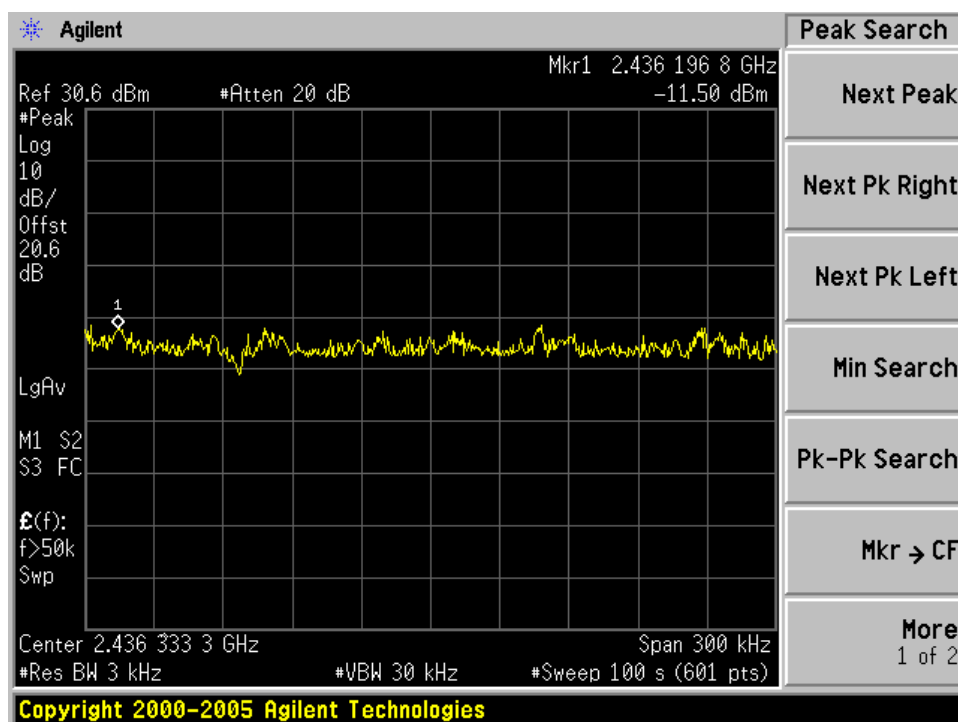
Power spectral density

IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	P dBm	Result
2412	-10.22	Pass
2437	-11.50	Pass
2462	-10.13	Pass



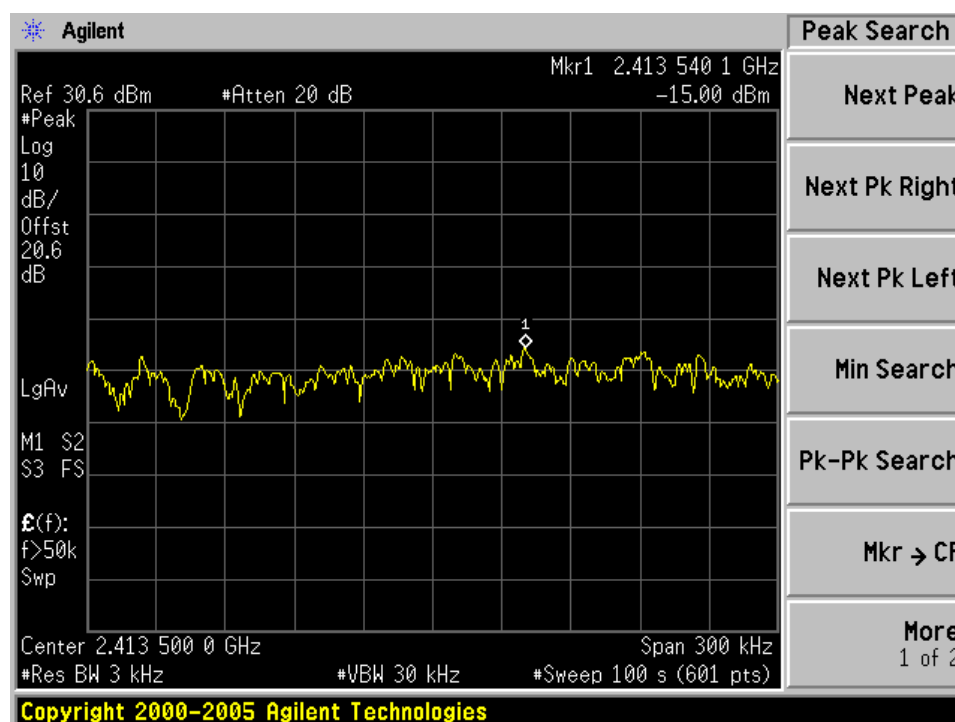
Power spectral density



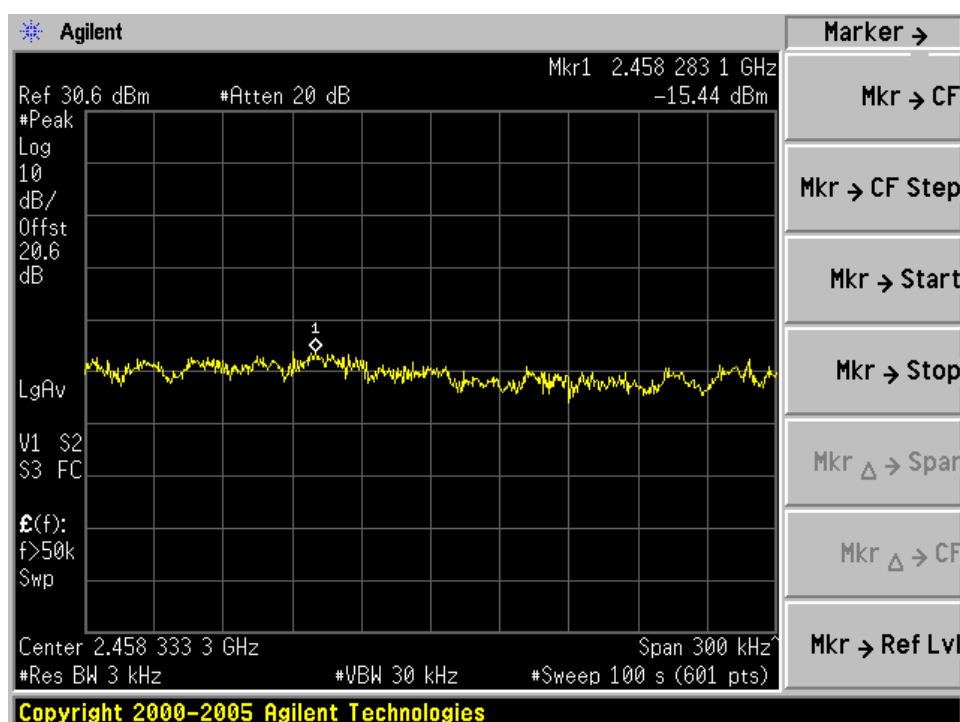
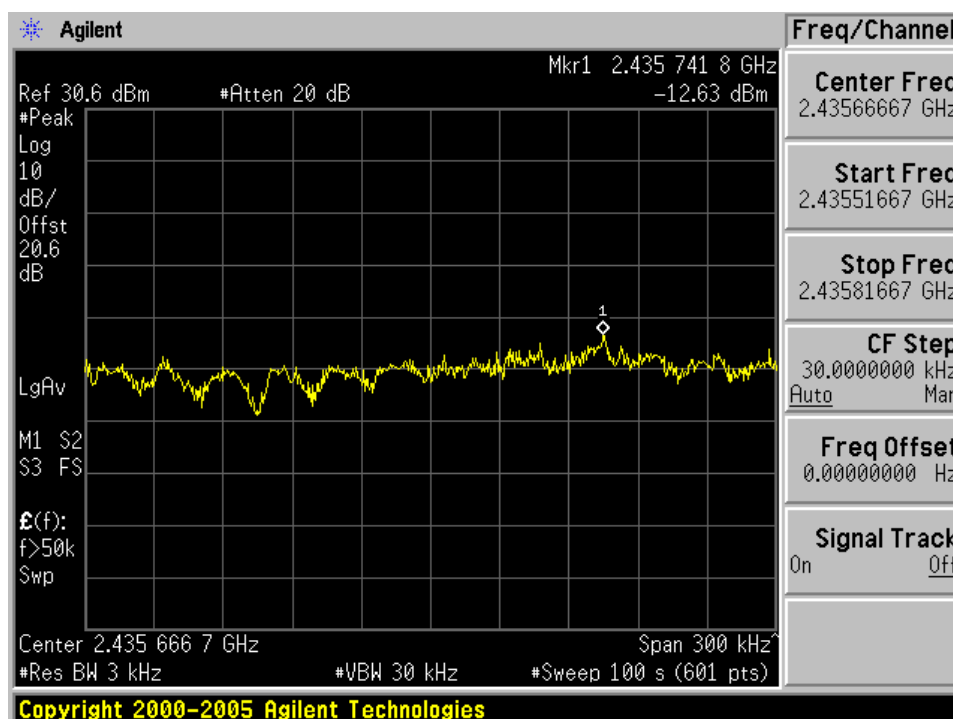
Power spectral density

IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency	P	Result
MHz	dBm	
2412	-15.00	Pass
2437	-12.63	Pass
2462	-15.44	Pass



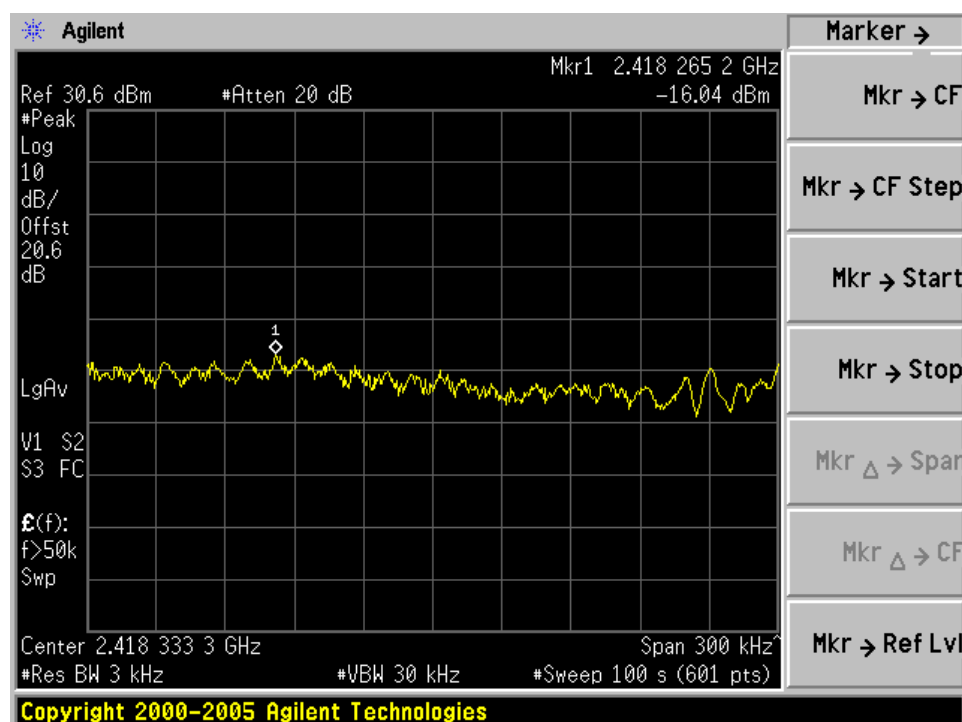
Power spectral density



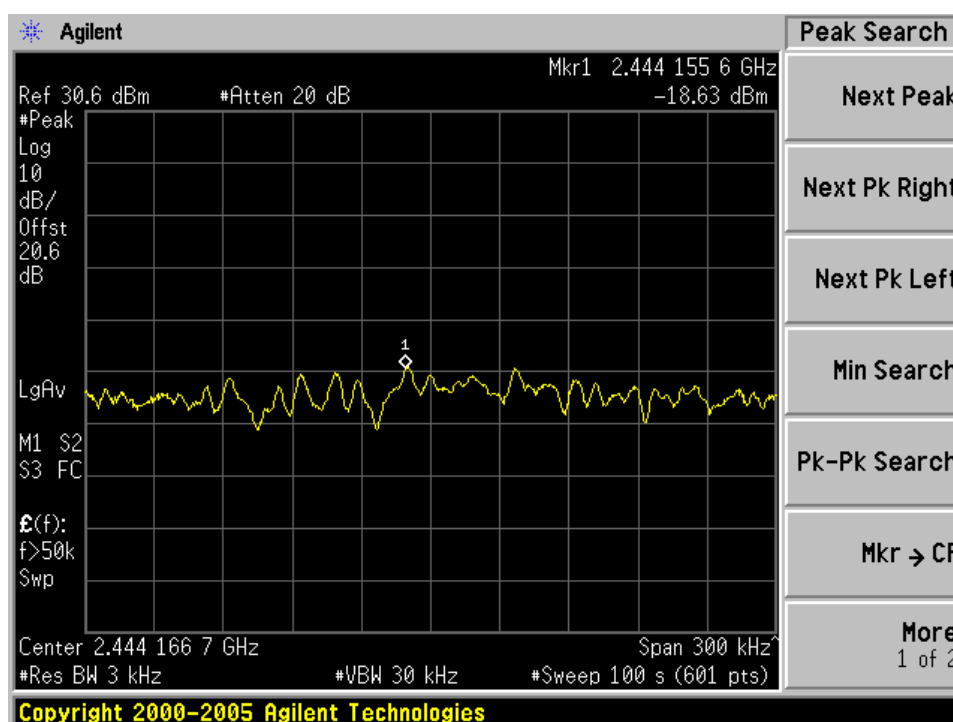
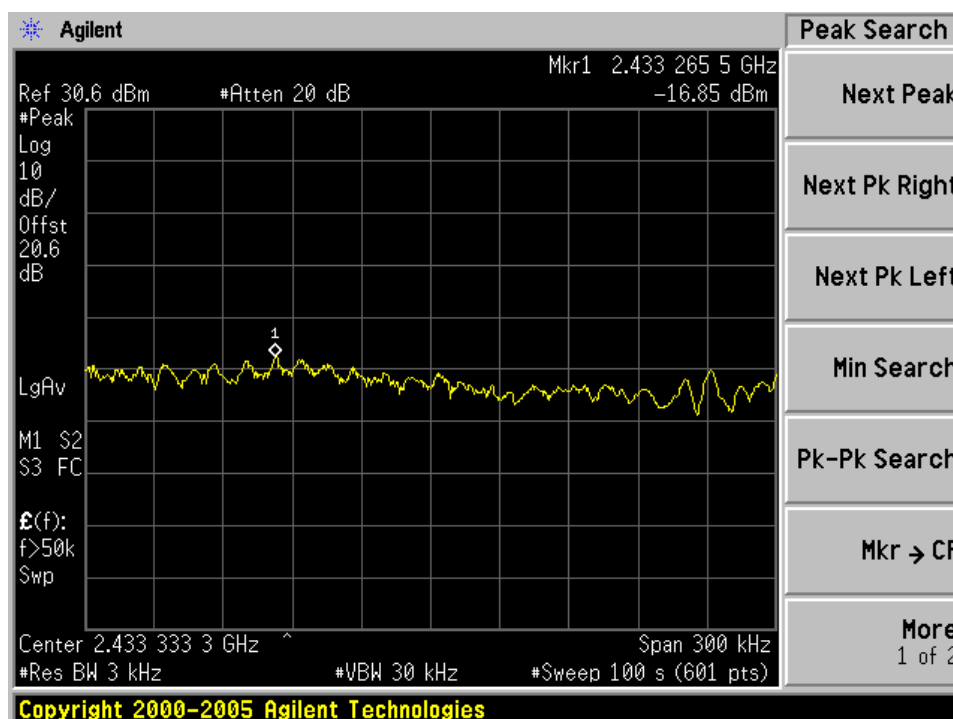
Power spectral density

IEEE 802.11n HT40 modulation (13.5Mbps) Test Result

Frequency	P	Result
MHz	dBm	
2422	-16.04	Pass
2437	-16.85	Pass
2452	-18.63	Pass



Power spectral density





Product Service

Test Equipment

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

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