FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT

FOR

802.11B/G 2x2 MIMO CARDBUS CARD

MODEL NUMBER: AGN1022PC-01

FCC ID: SA3-AGN1022PC0100

REPORT NUMBER: 05U3491-1

ISSUE DATE: JULY 5, 2005

Prepared for
AIRGO NETWORKS, INC.
900 ARASTRADERO ROAD
PALO ALTO, CA 94304, USA

Prepared by
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LAB CODE:200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
A		Initial Issue	YZ

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: AIRGO NETWORKS, INC.
900 ARASTRADERO ROAD
PALO ALTO, CA 94304, USA

EUT DESCRIPTION: 802.11b/g 2x2 MIMO Cardbus Card

MODEL: AGN1022PC-01

SERIAL NUMBER: 8676

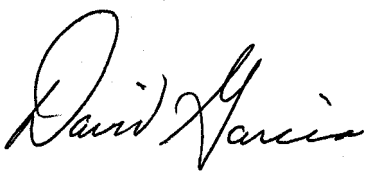
DATE TESTED: June 24, 2005 ~ June 30, 2005

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By: Tested By:



YAN ZHENG
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

DAVID GARCIA
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11b/g transceiver MIMO Cardbus Card.

The radio module is manufactured by Airgo Networks, Inc.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

2400 to 2483.5 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b, Dual Mode	26.04	401.79
2412 - 2462	802.11g, Dual Mode	26.87	486.41

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two printed circuit board antennas for diversity, each with a maximum gain of 2.2 dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was MfgDemoTest v18.00.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2412 MHz, g mode.

The worst-case data rate for this channel is determined to be 6 Mb/s, based on previous experience with 2.4 GHz WLAN product design architectures.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC/DC Adapter	Sony	PCGA-AC19V1	9/27/2263	N/A
Laptop PC	Sony	Vaio, PCG-5312	3303321	DoC

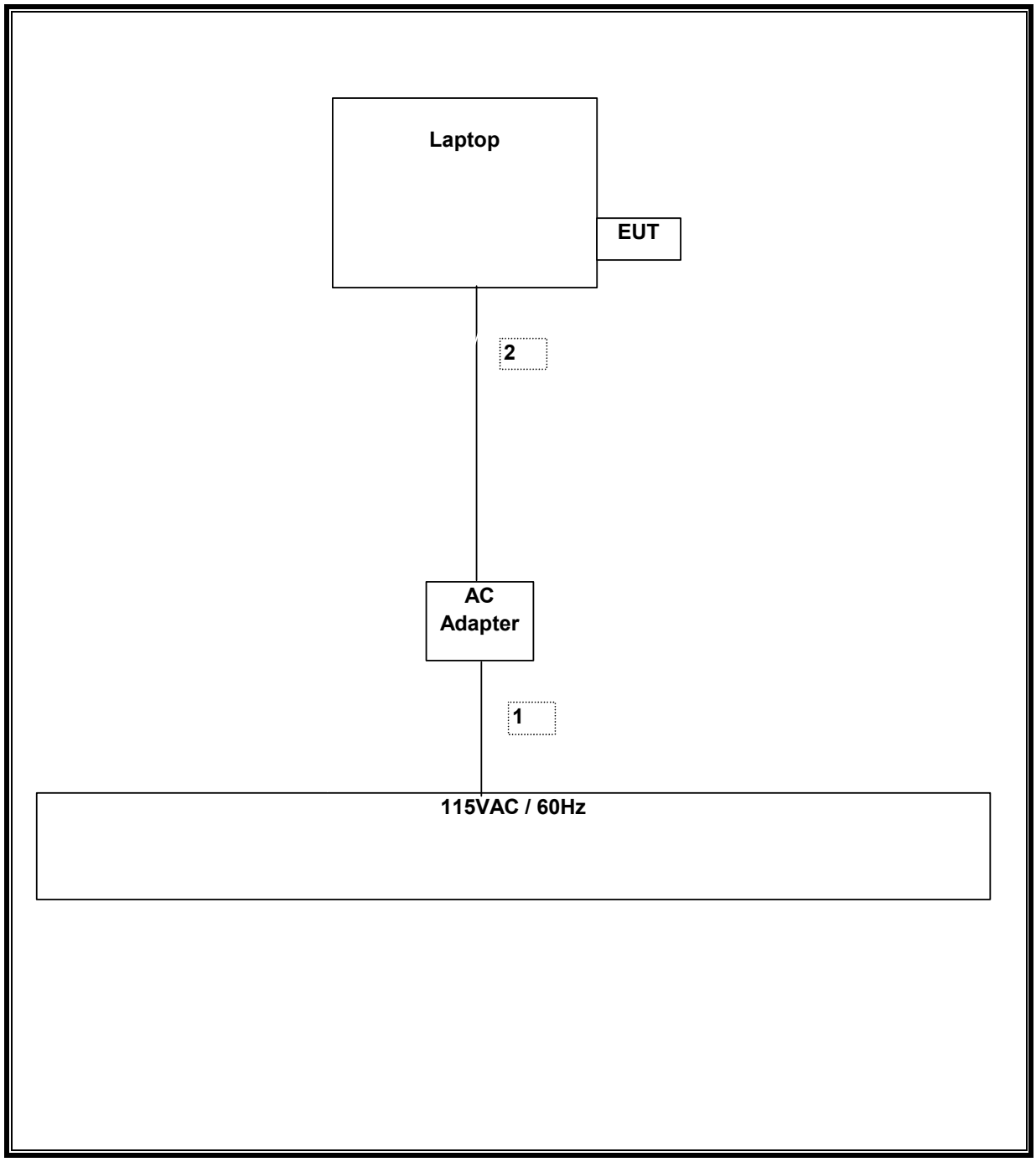
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	AC	Unshielded	0.5 m	
2	DC	1	DC	Unshielded	1.5 m	

TEST SETUP

The EUT is installed in a host laptop computer directly during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42510266	8/25/2005
EMI Test Receiver	R & S	ESIB40	100192	5/9/2006
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/2006
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/2006
RF Filter Section	HP	85420E	3705A00256	3/29/2006
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/2006
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	4/22/2006
Preamplifier, 1 ~ 26.5 GHz	HP	8449B	3008A00369	8/17/2005
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2005
Site A Line Stabilizer/Conditioner	Tripplite	LC-1800a	A005181	CNR
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/2006
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/2006
1.5 GHz High Pass Filter	Micro-Tronics	HPM13193	2	CNR
2.4-2.5 GHz Reject Filter	Micro-Tronics	BRM56702	2	CNR

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND

7.1.1. 6 dB BANDWIDTH

LIMIT

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

No non-compliance noted:

802.11b Dual Mode, Chain 1

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	10,080	500	9580
Middle	2437	11,250	500	10750
High	2462	10,670	500	10170

802.11b Dual Mode, Chain 2

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	10,670	500	10170
Middle	2437	10,000	500	9500
High	2462	10,250	500	9750

802.11g Dual Mode, Chain 1

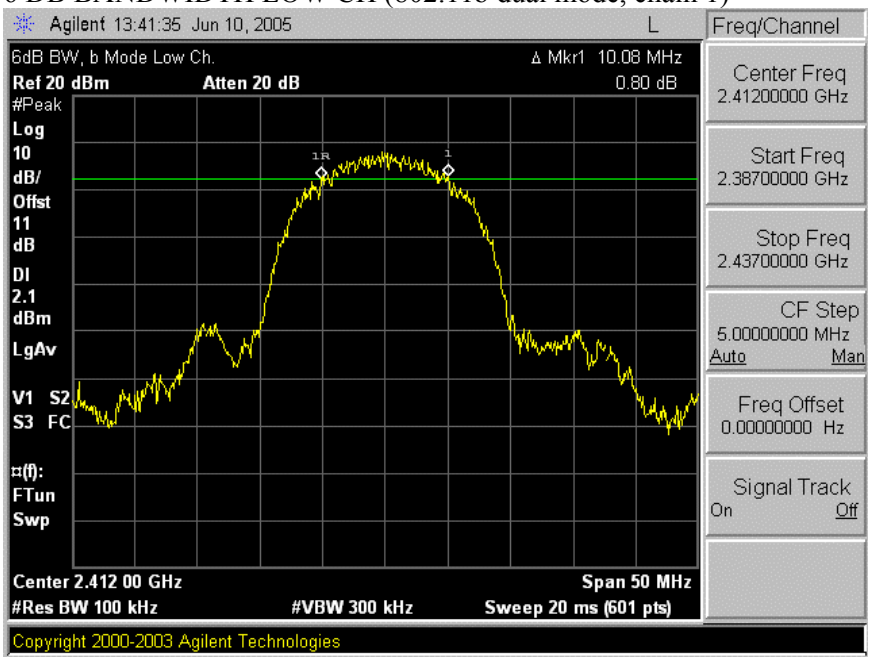
Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	15,170	500	14670
Middle	2437	15,170	500	14670
High	2462	15,170	500	14670

802.11g Dual Mode, Chain 2

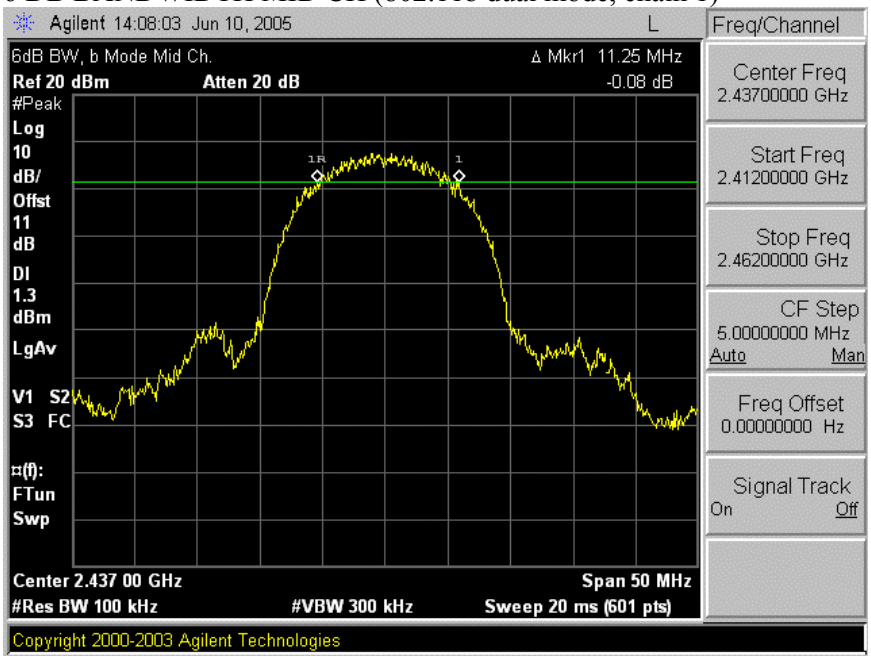
Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	15,170	500	14670
Middle	2437	15,250	500	14750
High	2462	15,170	500	14670

6 DB BANDWIDTH (802.11b DUAL MODE, CHAIN 1)

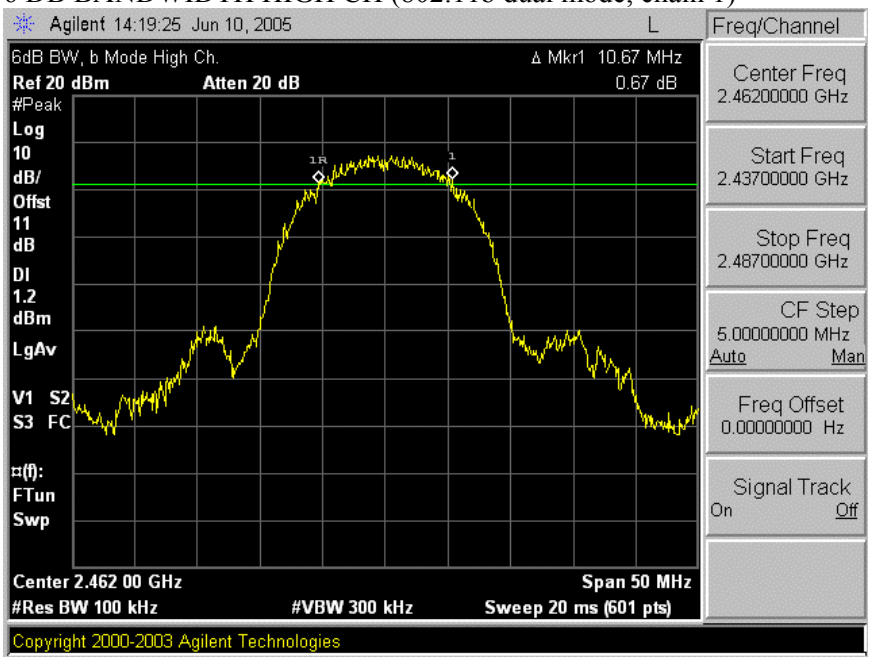
6 DB BANDWIDTH LOW CH (802.11b dual mode, chain 1)



6 DB BANDWIDTH MID CH (802.11b dual mode, chain 1)

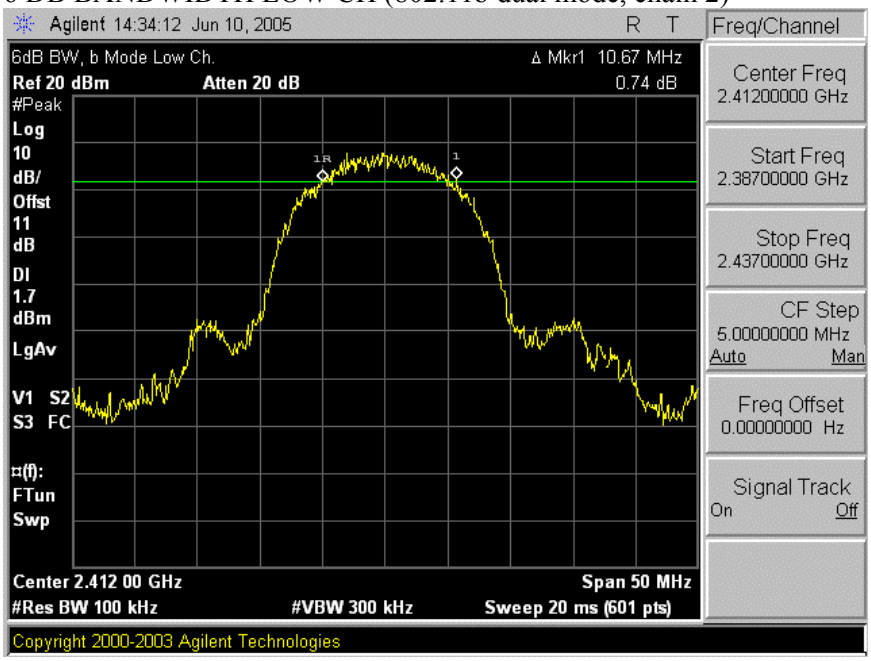


6 DB BANDWIDTH HIGH CH (802.11b dual mode, chain 1)

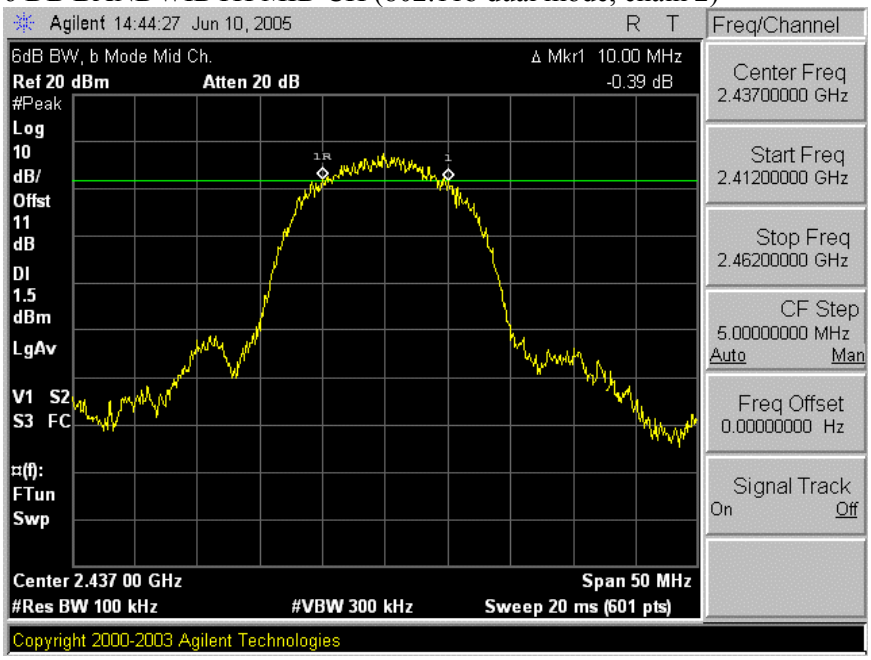


6 DB BANDWIDTH (802.11b DUAL MODE, CHAIN 2)

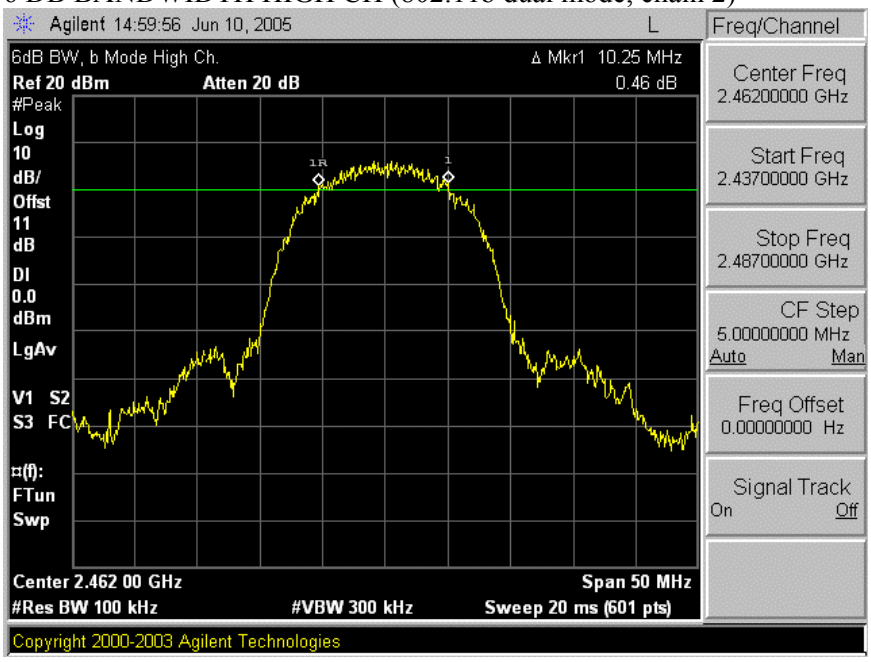
6 DB BANDWIDTH LOW CH (802.11b dual mode, chain 2)



6 DB BANDWIDTH MID CH (802.11b dual mode, chain 2)

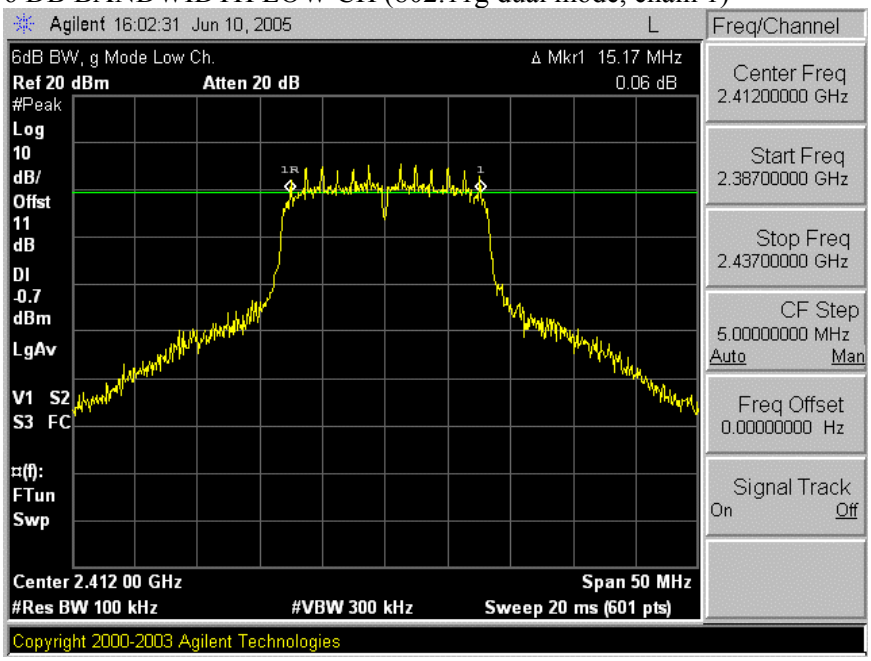


6 DB BANDWIDTH HIGH CH (802.11b dual mode, chain 2)

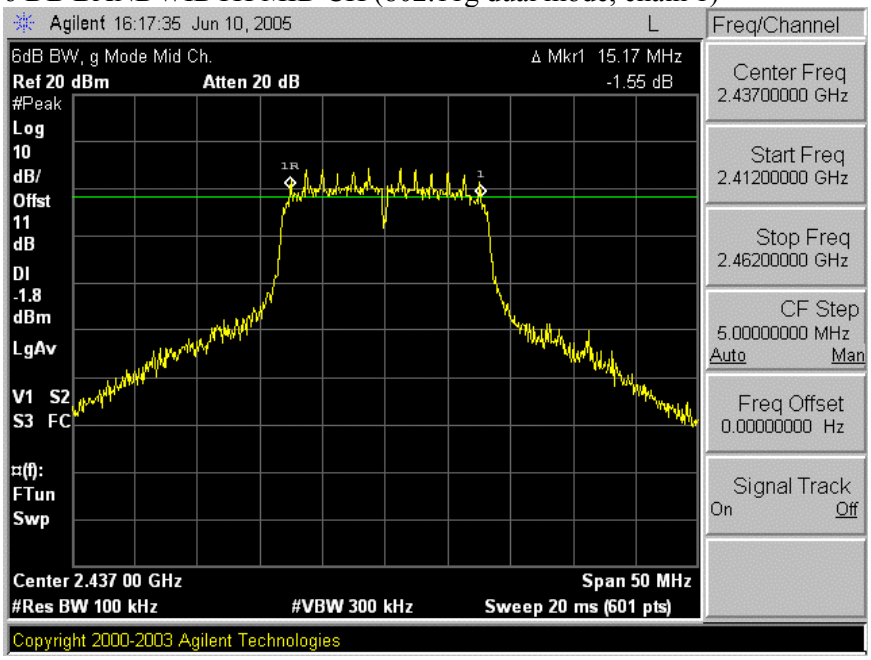


6 DB BANDWIDTH (802.11g DUAL MODE, CHAIN 1)

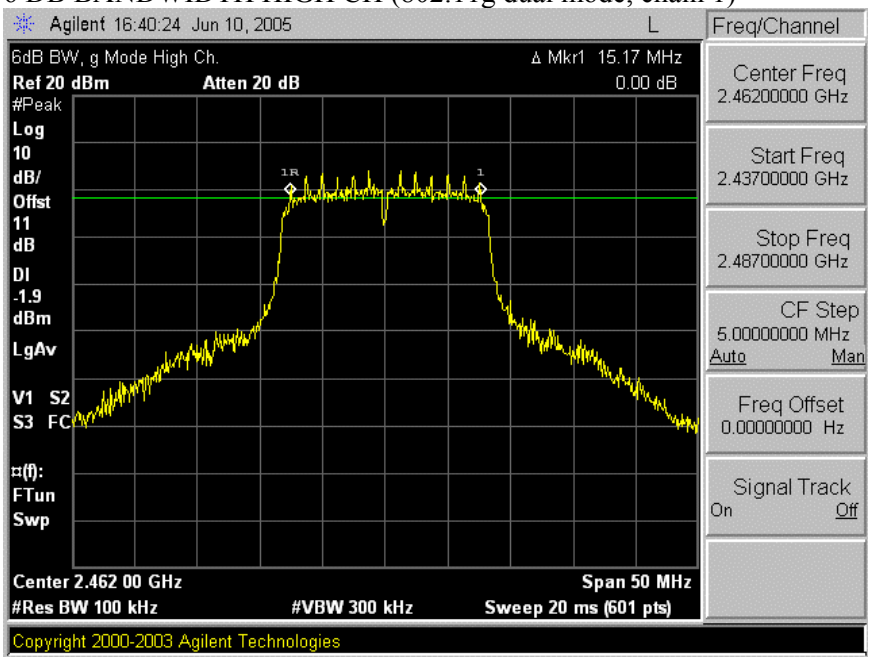
6 DB BANDWIDTH LOW CH (802.11g dual mode, chain 1)



6 DB BANDWIDTH MID CH (802.11g dual mode, chain 1)

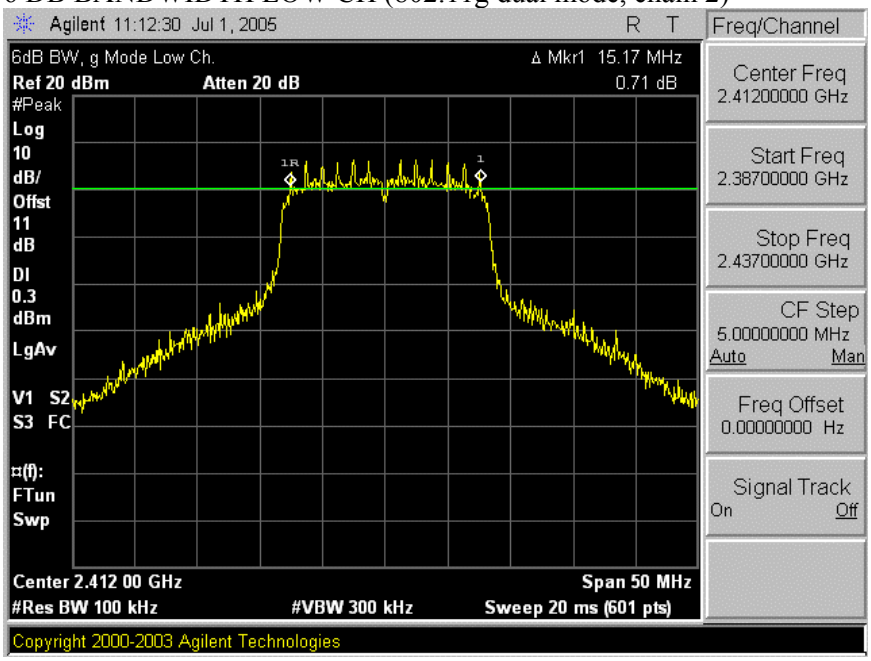


6 DB BANDWIDTH HIGH CH (802.11g dual mode, chain 1)

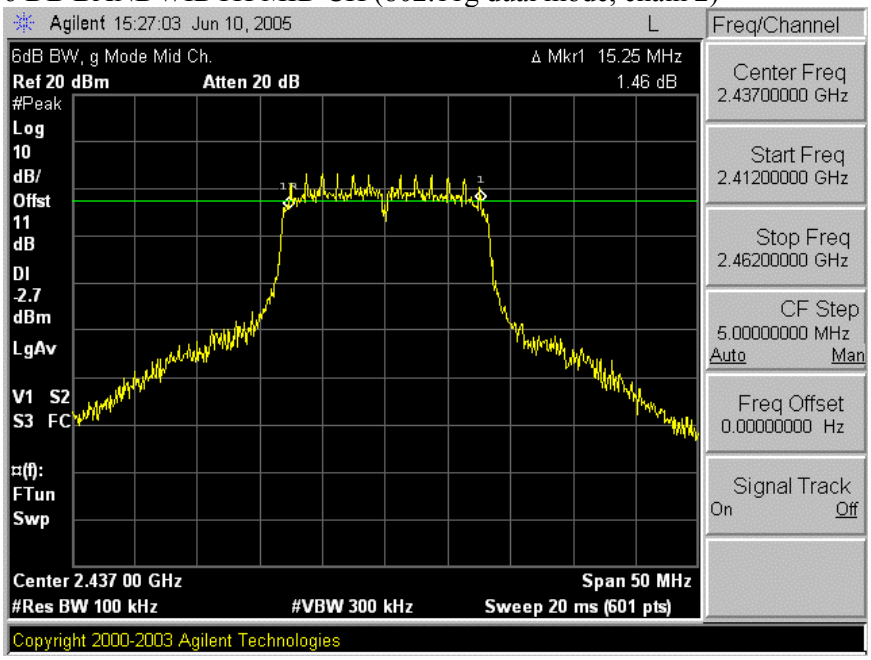


6 DB BANDWIDTH (802.11g DUAL MODE, CHAIN 2)

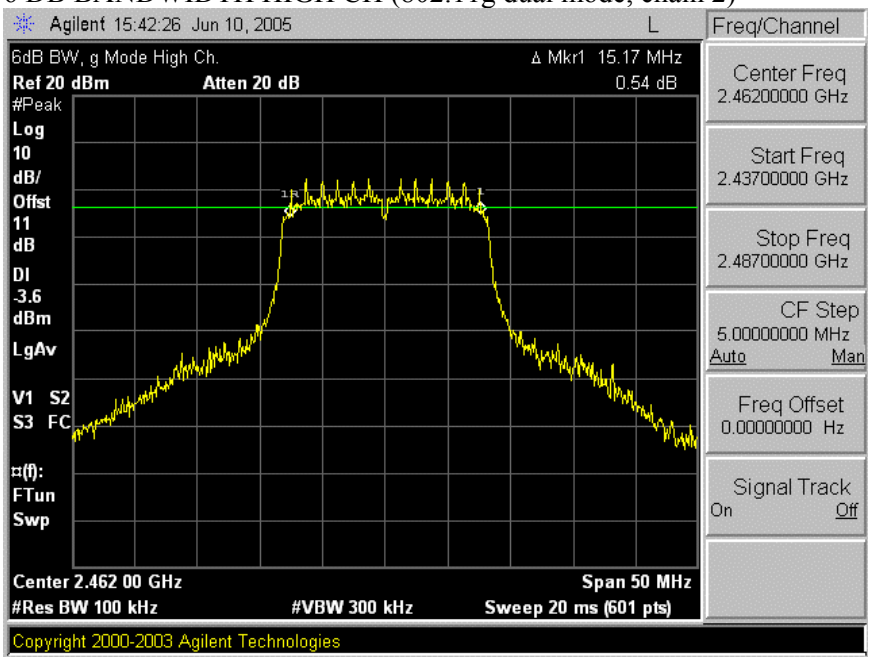
6 DB BANDWIDTH LOW CH (802.11g dual mode, chain 2)



6 DB BANDWIDTH MID CH (802.11g dual mode, chain 2)



6 DB BANDWIDTH HIGH CH (802.11g dual mode, chain 2)



7.1.2. 99% BANDWIDTH

LIMIT

None, for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

No non-compliance noted:

802.11b Dual Mode, Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	14.754
Middle	2437	14.7767
High	2462	14.7854

802.11b Dual Mode, Chain 2

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	14.8231
Middle	2437	14.7605
High	2462	14.7418

802.11g Dual Mode, Chain 1

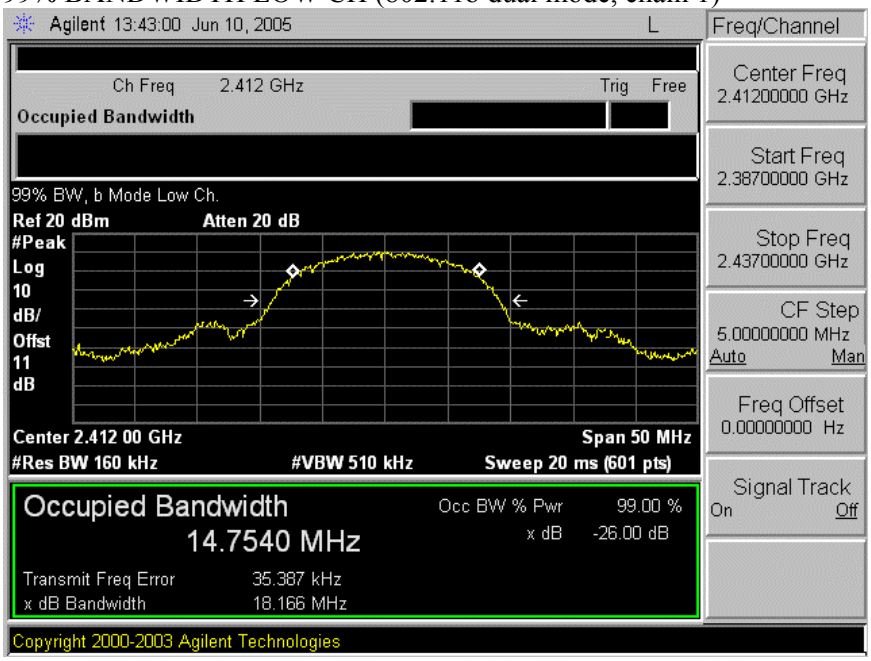
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.1763
Middle	2437	16.1779
High	2462	16.1793

802.11g Dual Mode, Chain 2

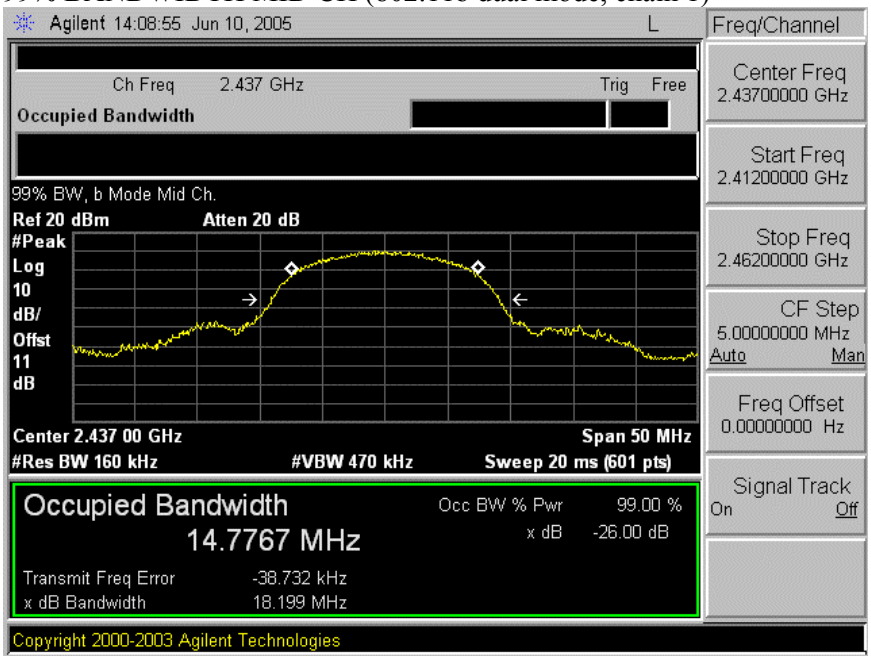
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.1847
Middle	2437	16.1791
High	2462	16.1823

99% BANDWIDTH (802.11b DUAL MODE, CHAIN 1)

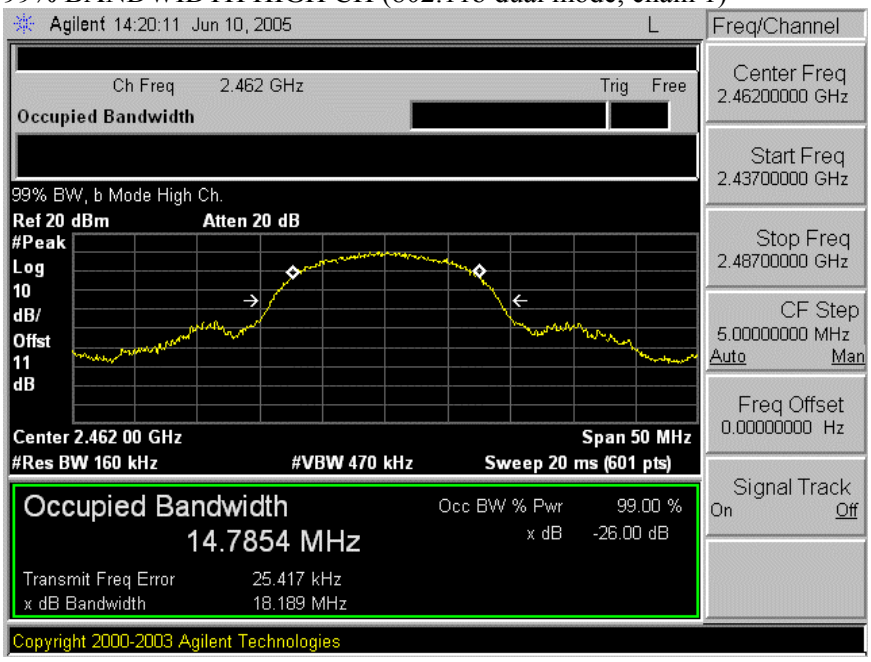
99% BANDWIDTH LOW CH (802.11b dual mode, chain 1)



99% BANDWIDTH MID CH (802.11b dual mode, chain 1)

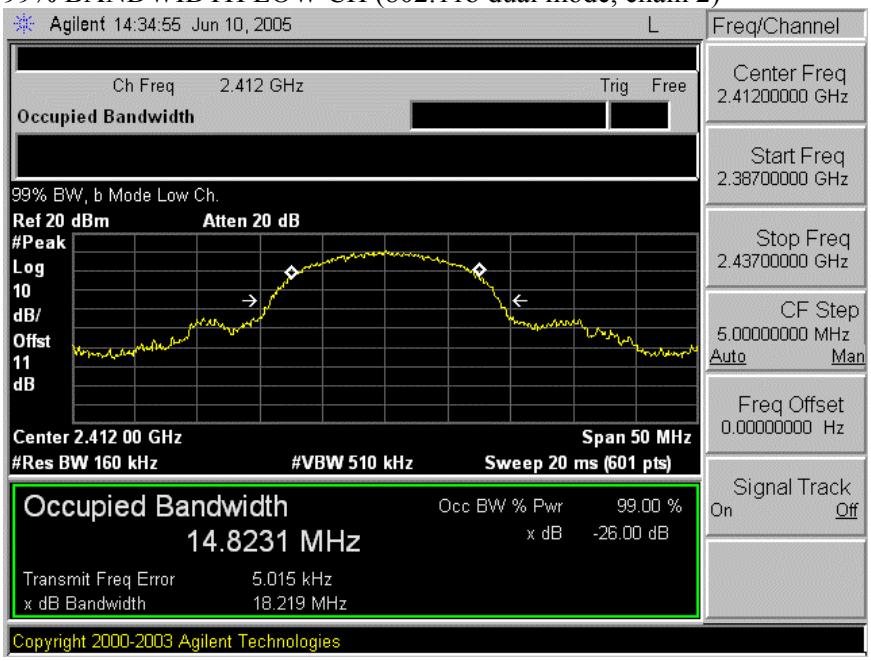


99% BANDWIDTH HIGH CH (802.11b dual mode, chain 1)

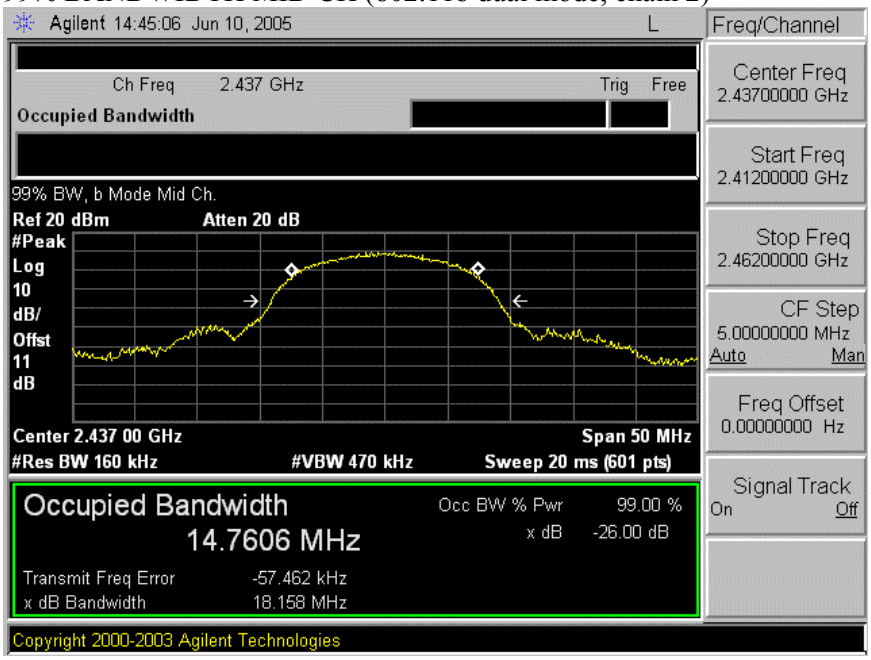


99% BANDWIDTH (802.11b DUAL MODE, CHAIN 2)

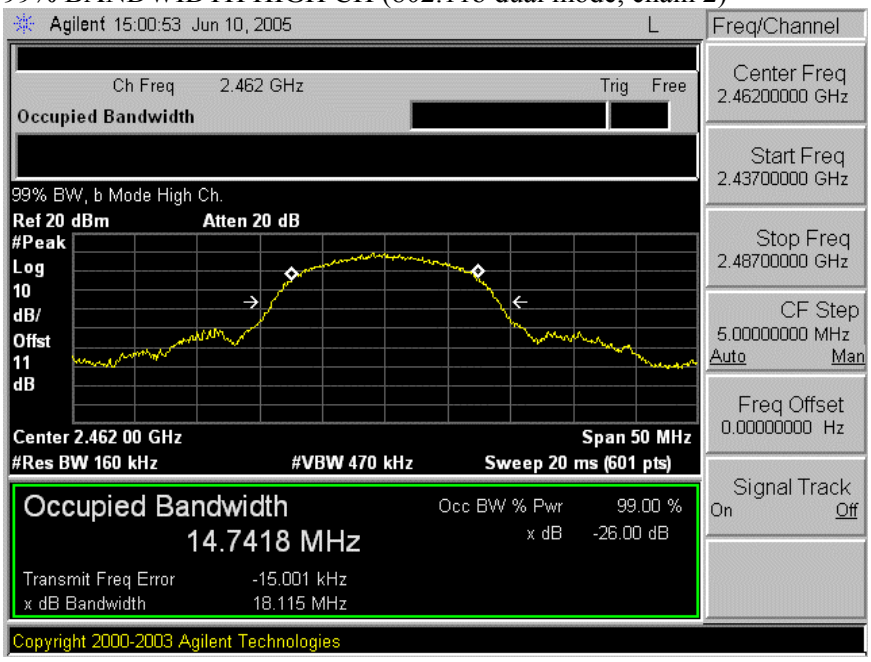
99% BANDWIDTH LOW CH (802.11b dual mode, chain 2)



99% BANDWIDTH MID CH (802.11b dual mode, chain 2)

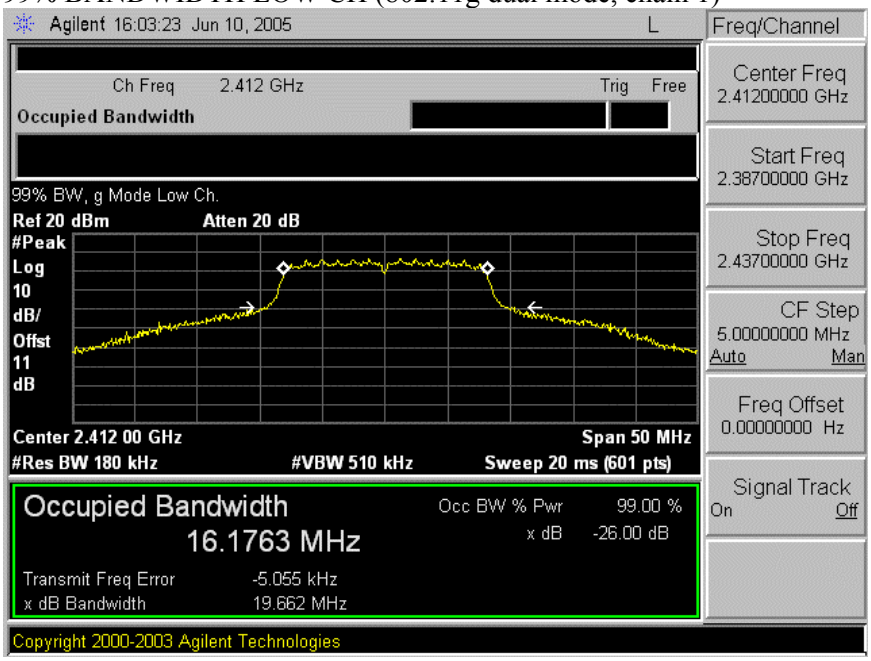


99% BANDWIDTH HIGH CH (802.11b dual mode, chain 2)

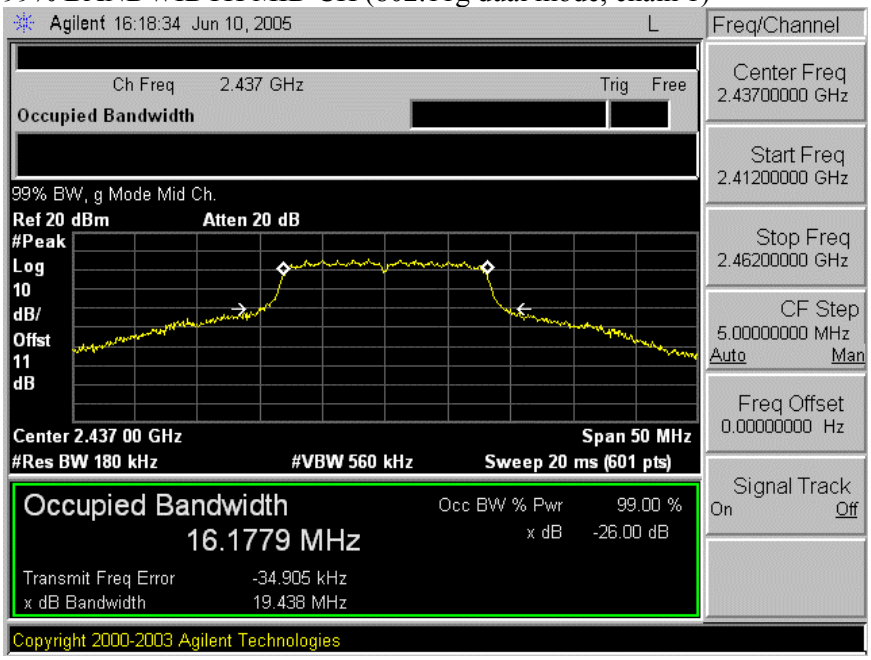


99% BANDWIDTH (802.11g DUAL MODE, CHAIN 1)

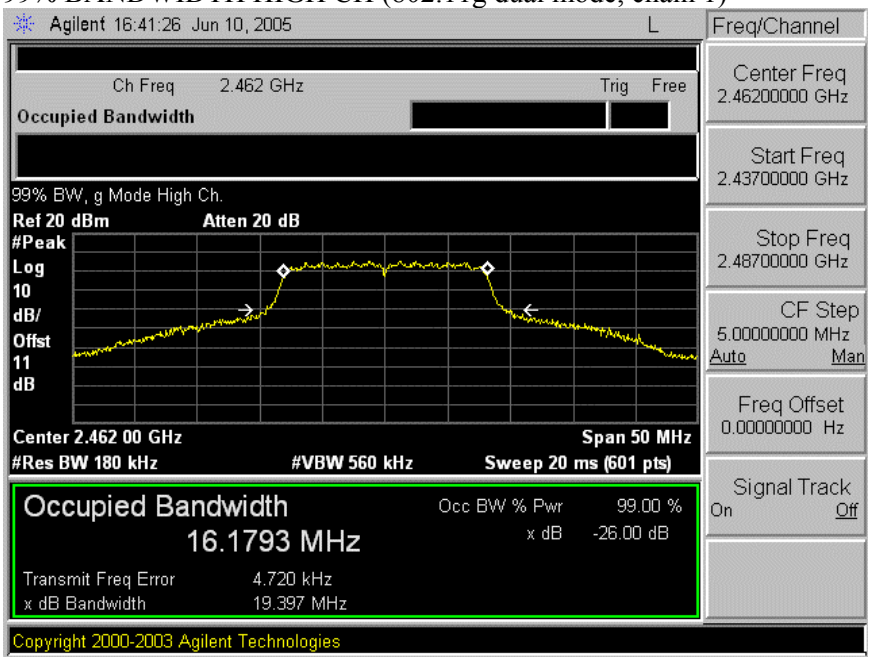
99% BANDWIDTH LOW CH (802.11g dual mode, chain 1)



99% BANDWIDTH MID CH (802.11g dual mode, chain 1)

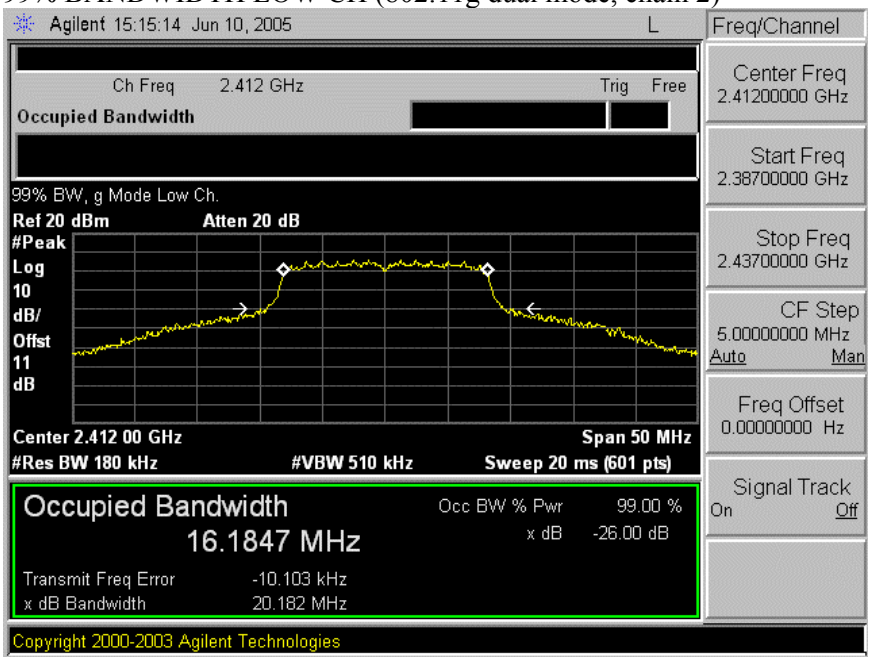


99% BANDWIDTH HIGH CH (802.11g dual mode, chain 1)

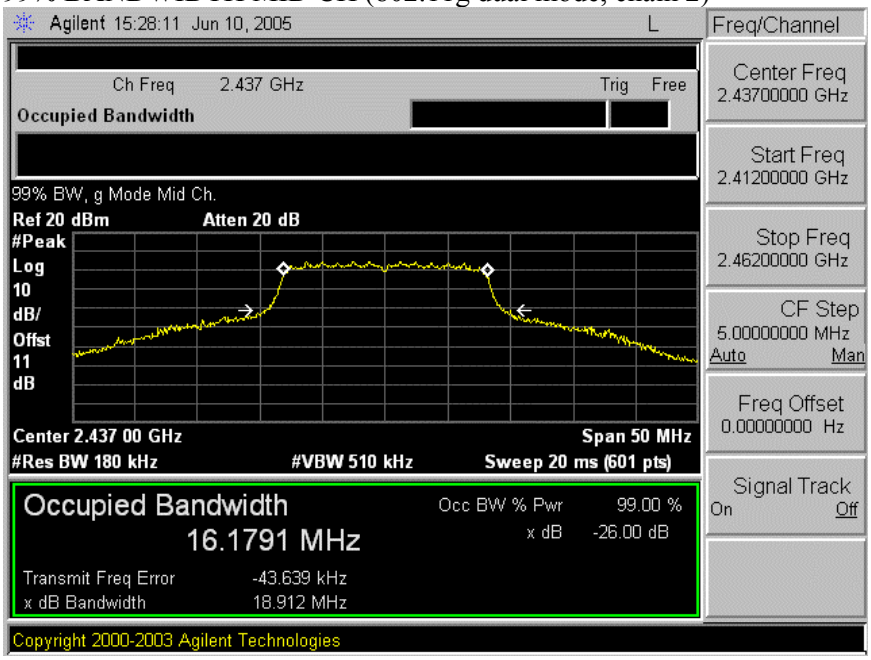


99% BANDWIDTH (802.11g DUAL MODE, CHAIN 2)

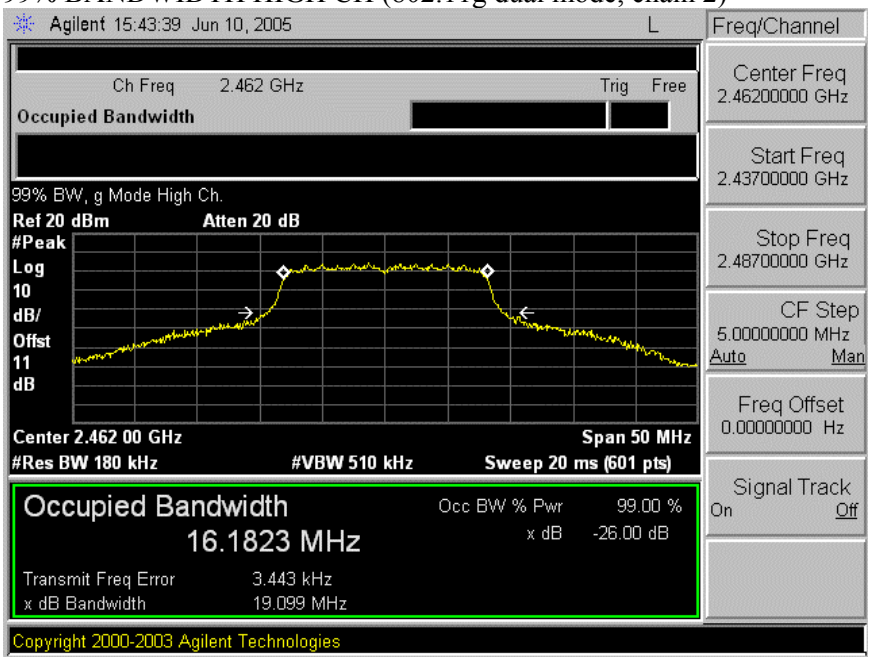
99% BANDWIDTH LOW CH (802.11g dual mode, chain 2)



99% BANDWIDTH MID CH (802.11g dual mode, chain 2)



99% BANDWIDTH HIGH CH (802.11g dual mode, chain 2)



7.1.3. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

§15.247 (b) (4) Except as shown in paragraphs (b)(4) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.247 (b) (4) (i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

The maximum antenna gain is 3 dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm.

No non-compliance noted:

802.11b Dual Mode

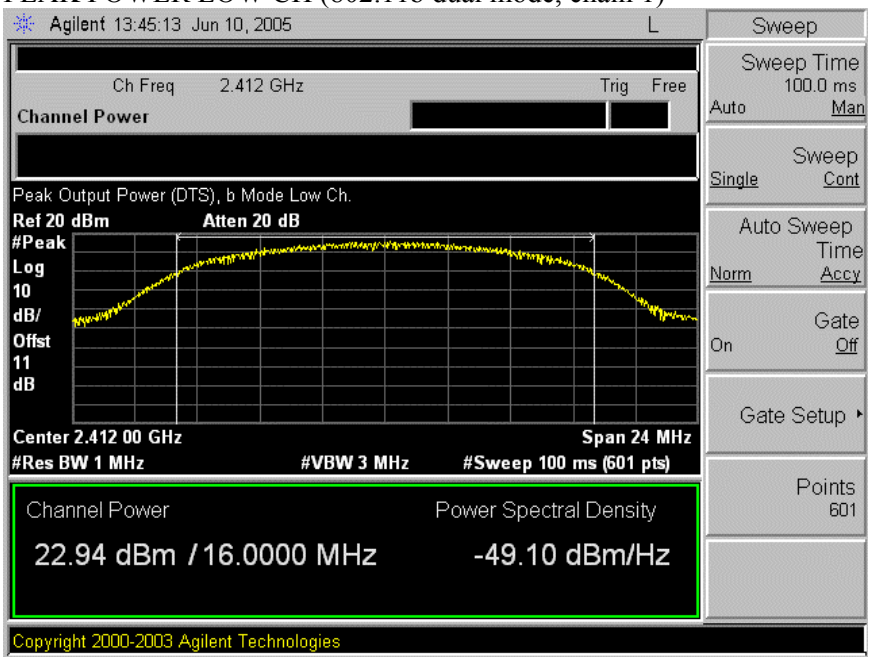
Frequency (MHz)	Peak Power Chain 1 (dBm)	Peak Power Chain 2 (dBm)	Peak Power Total (dBm)	Limit (dBm)	Margin (dB)
2412	22.9	23.1	26.04	30	-3.96
2437	23.1	22.4	25.76	30	-4.24
2462	22.8	21.8	25.32	30	-4.68

802.11g Dual Mode

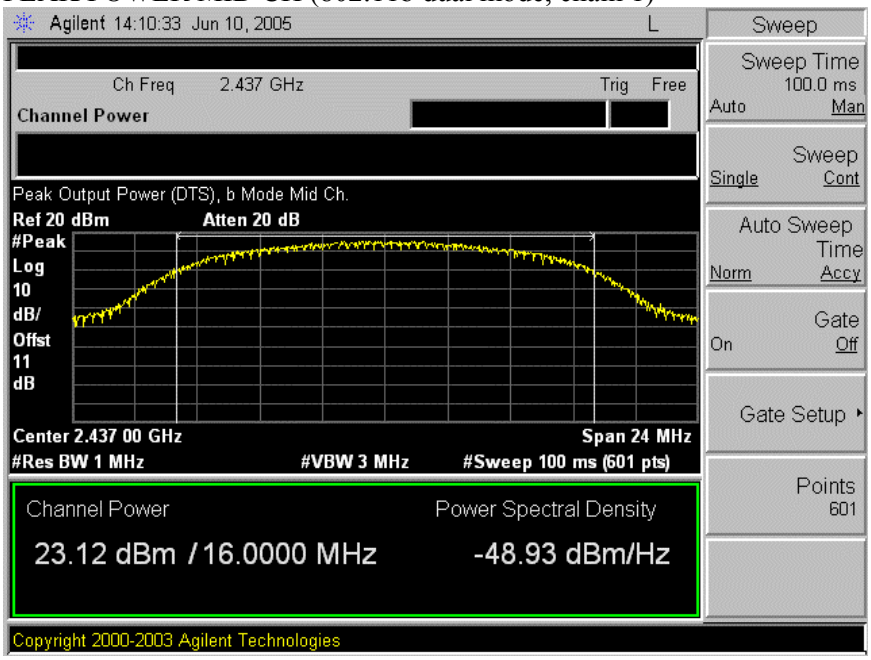
Frequency (MHz)	Peak Power Chain 1 (dBm)	Peak Power Chain 2 (dBm)	Peak Power Total (dBm)	Limit (dBm)	Margin (dB)
2412	24.2	23.5	26.87	30	-3.13
2437	23.5	22.6	26.06	30	-3.94
2462	23.3	21.9	25.67	30	-4.33

OUTPUT POWER (802.11b DUAL MODE, CHAIN 1)

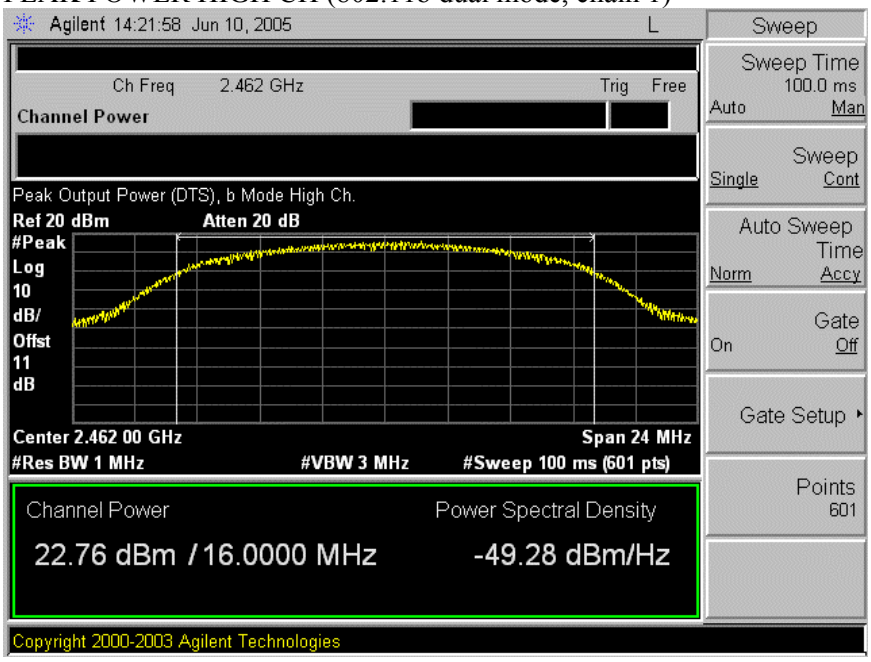
PEAK POWER LOW CH (802.11b dual mode, chain 1)



PEAK POWER MID CH (802.11b dual mode, chain 1)

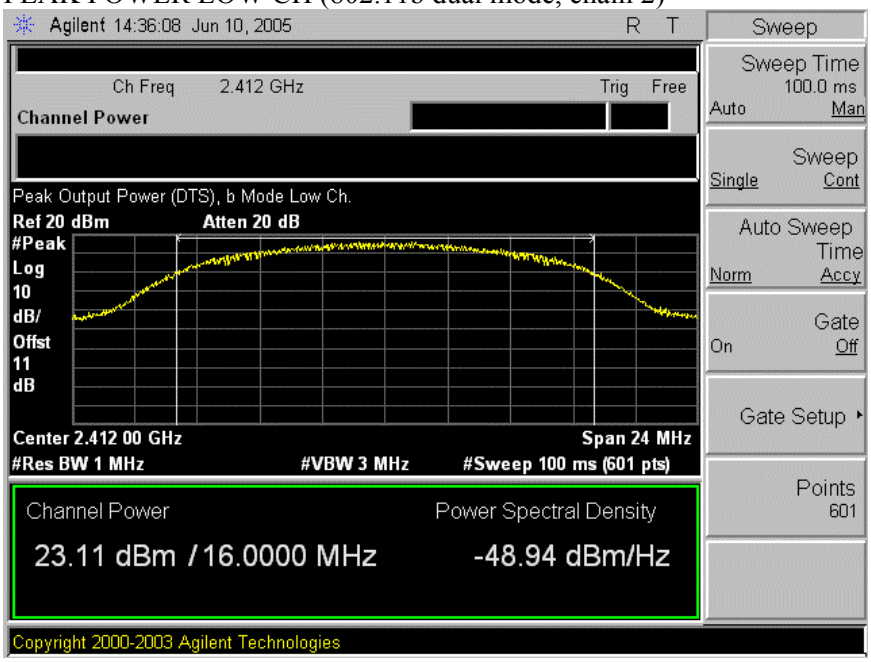


PEAK POWER HIGH CH (802.11b dual mode, chain 1)

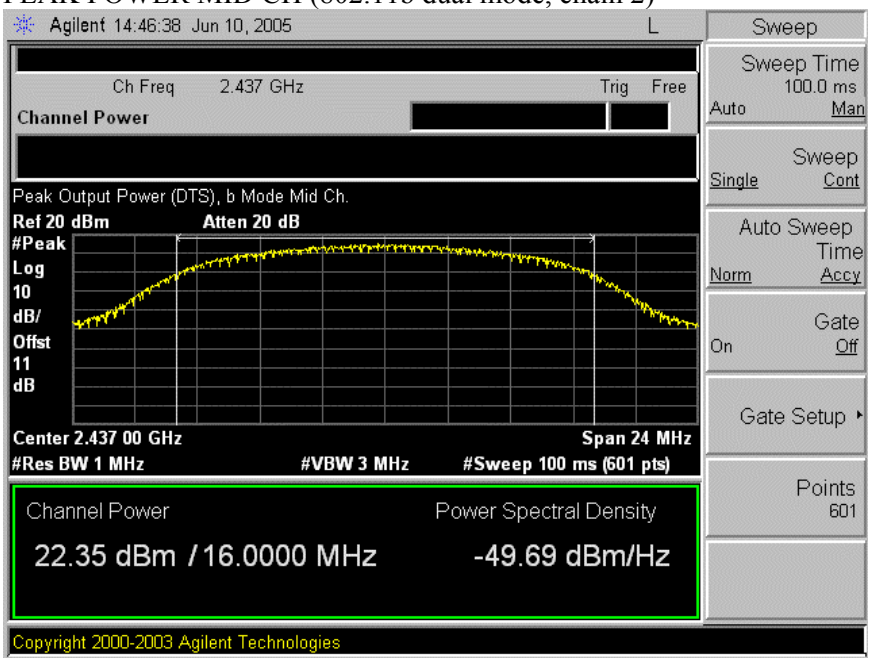


OUTPUT POWER (802.11b DUAL MODE, CHAIN 2)

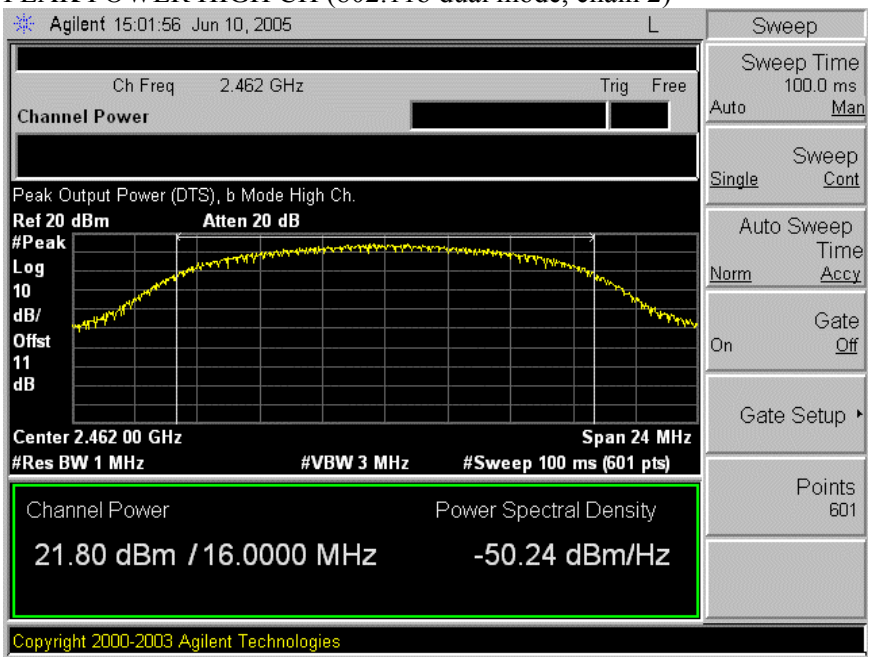
PEAK POWER LOW CH (802.11b dual mode, chain 2)



PEAK POWER MID CH (802.11b dual mode, chain 2)

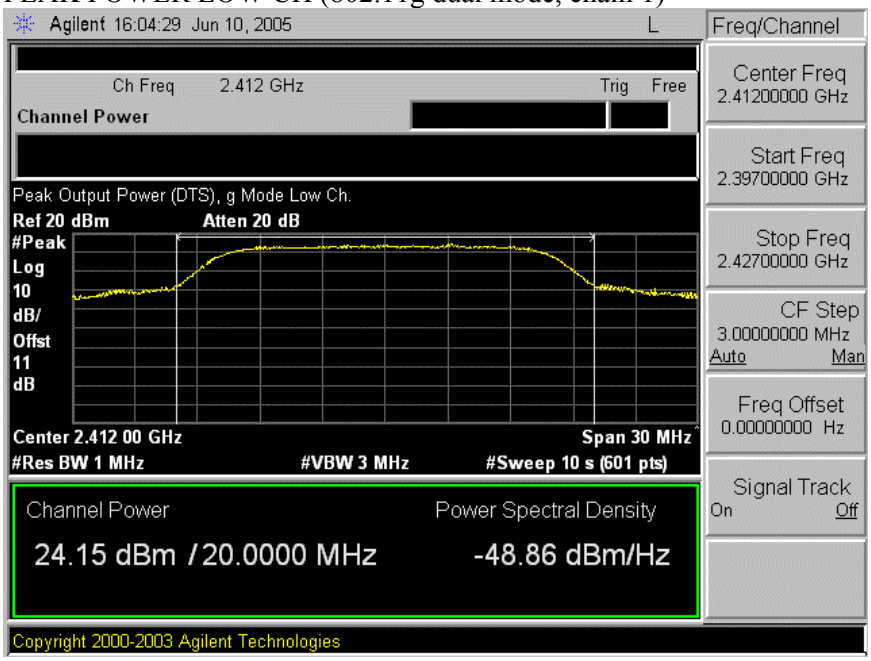


PEAK POWER HIGH CH (802.11b dual mode, chain 2)

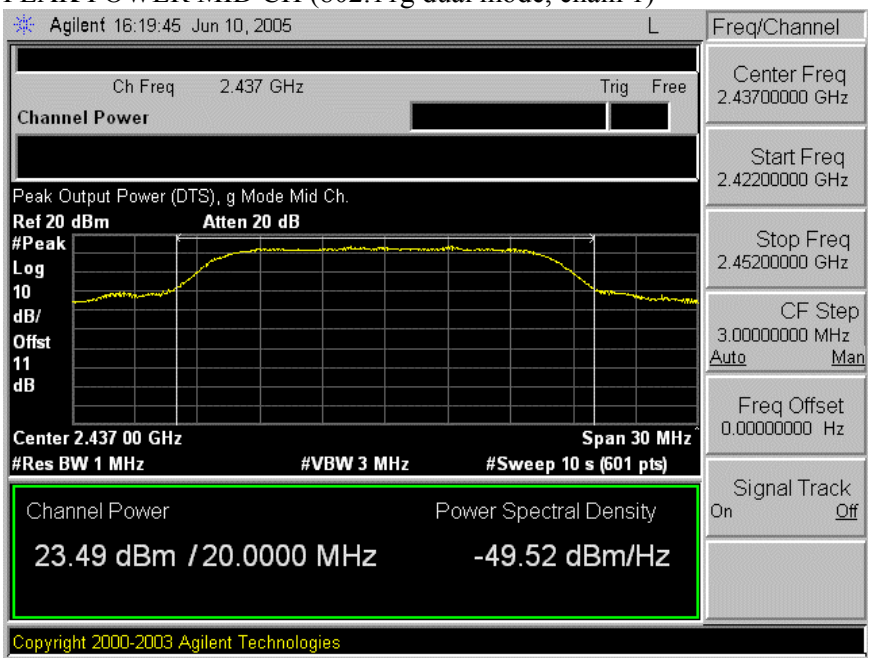


OUTPUT POWER (802.11g DUAL MODE, CHAIN 1)

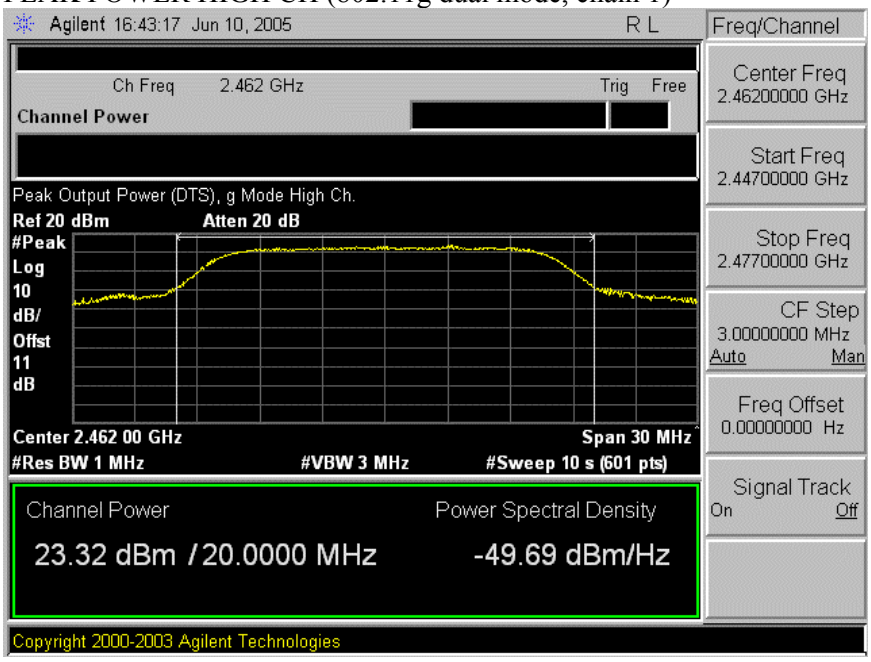
PEAK POWER LOW CH (802.11g dual mode, chain 1)



PEAK POWER MID CH (802.11g dual mode, chain 1)

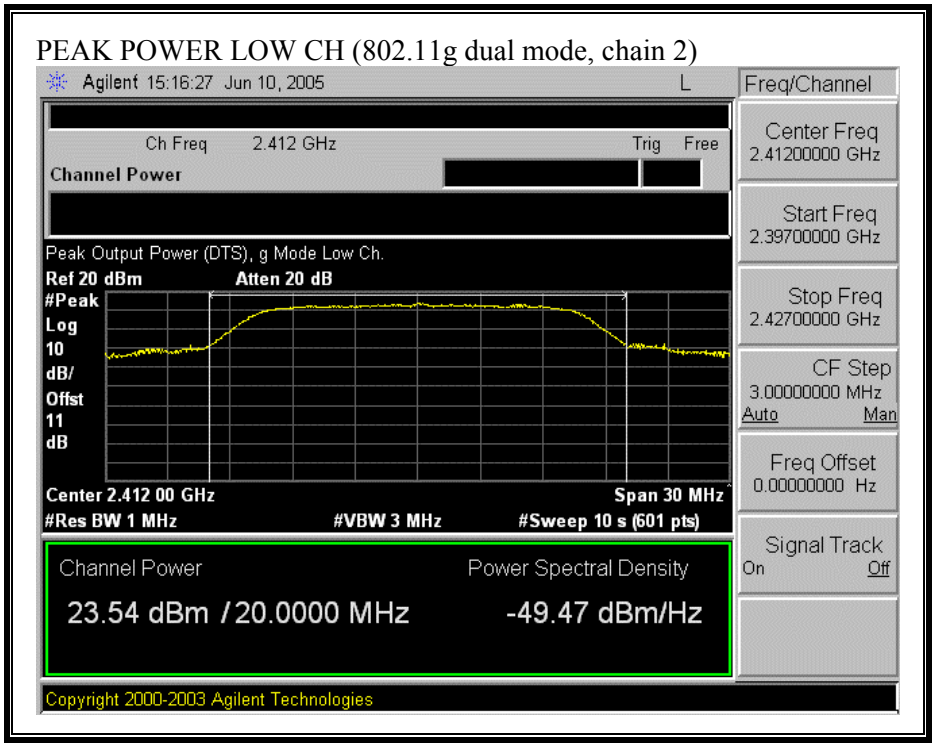


PEAK POWER HIGH CH (802.11g dual mode, chain 1)

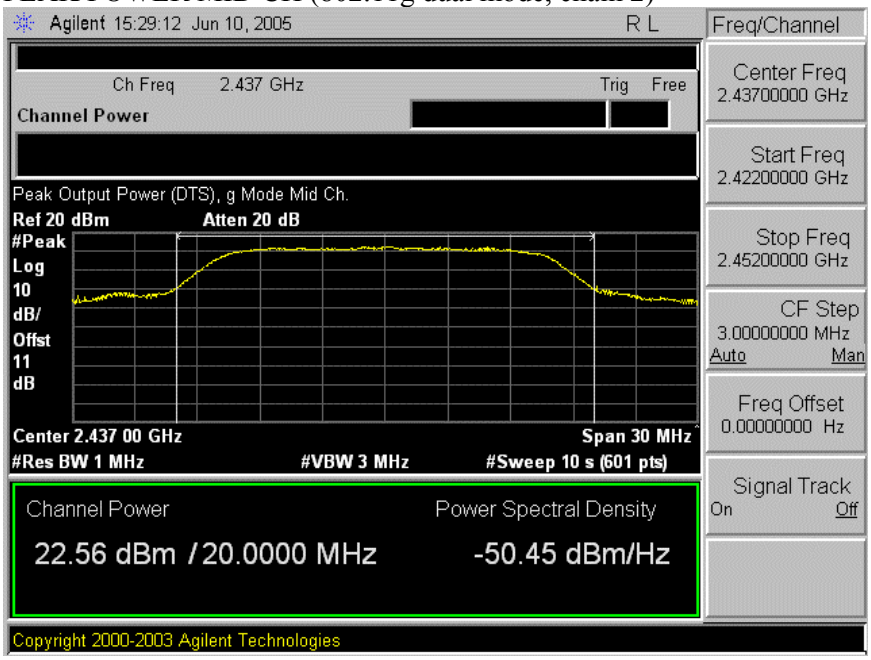


OUTPUT POWER (802.11g DUAL MODE, CHAIN 2)

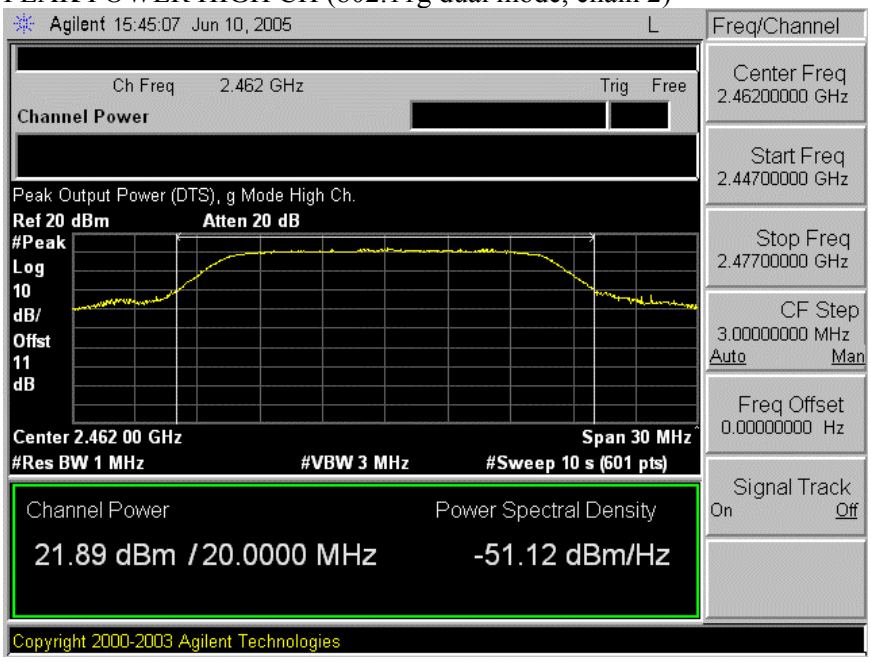
PEAK POWER LOW CH (802.11g dual mode, chain 2)



PEAK POWER MID CH (802.11g dual mode, chain 2)



PEAK POWER HIGH CH (802.11g dual mode, chain 2)



7.1.4. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1.0 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11b Dual Mode

Frequency (MHz)	Average Power Chain 1 (dBm)	Average Power Chain 2 (dBm)	Average Power Total (dBm)
2412	20.6	19.9	23.26
2437	20.0	18.8	22.45
2462	19.7	17.2	21.64

802.11g Dual Mode

Frequency (MHz)	Average Power Chain 1 (dBm)	Average Power Chain 2 (dBm)	Average Power Total (dBm)
2412	17.1	16.6	19.86
2437	15.1	14.3	17.73
2462	14.8	13.5	17.21

7.1.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

RESULTS

No non-compliance noted:

802.11b Dual Mode

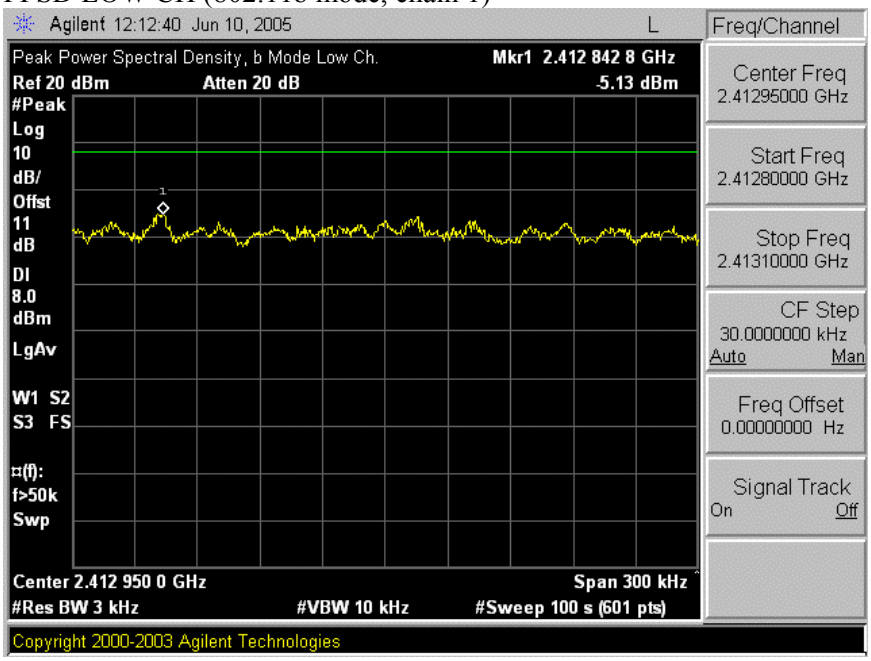
Channel	Frequency (MHz)	PPSD Chain 1 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-5.13	-5.67	-2.38	8	-10.38
Middle	2437	-4.99	-5.83	-2.38	8	-10.38
High	2462	-7.00	-8.85	-4.82	8	-12.82

802.11g Dual Mode

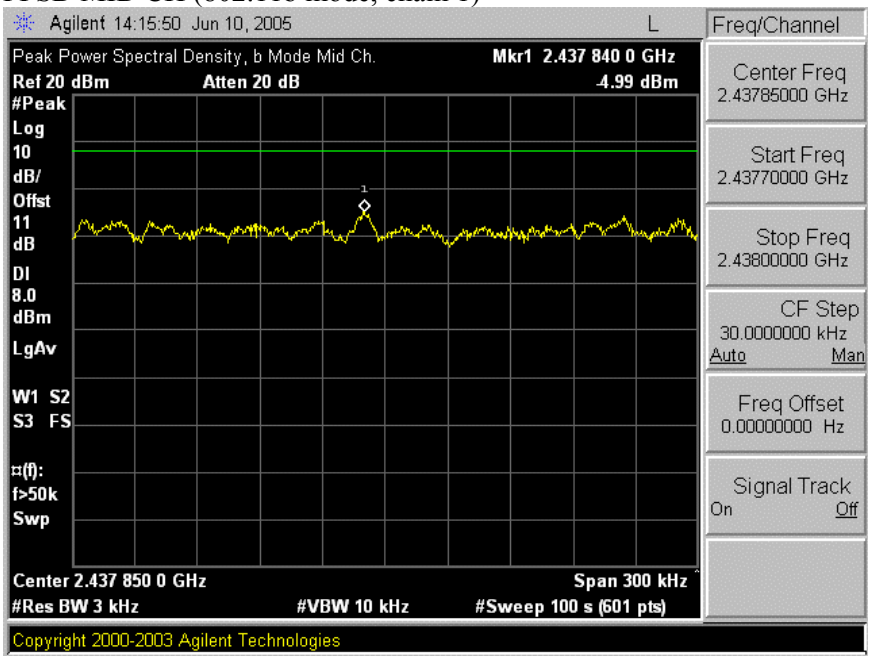
Channel	Frequency (MHz)	PPSD Chain 1 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-10.11	-9.48	-6.77	8	-14.77
Middle	2437	-9.46	-9.09	-6.26	8	-14.26
High	2462	-11.50	-11.10	-8.29	8	-16.29

PEAK POWER SPECTRAL DENSITY (802.11b MODE, CHAIN 1)

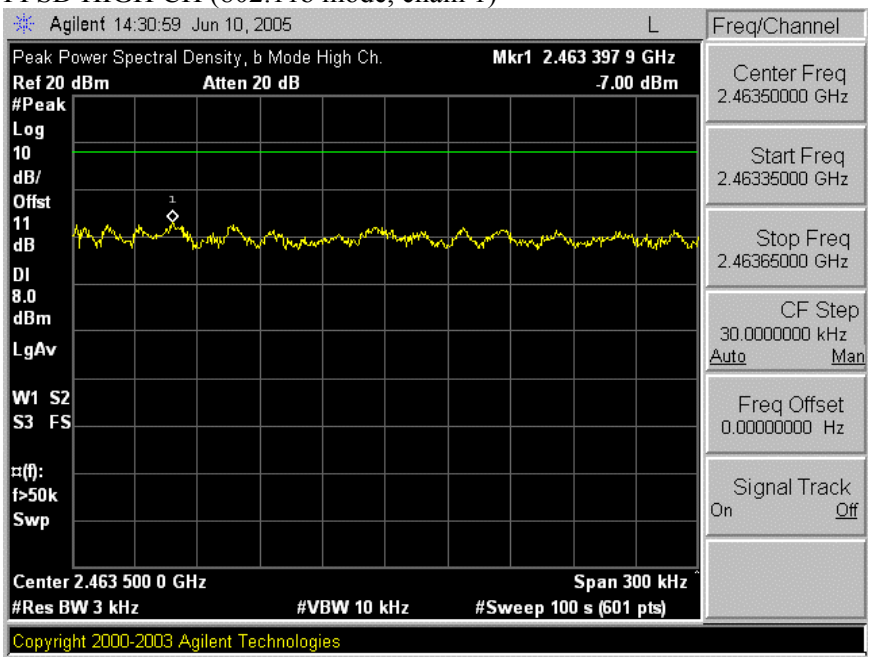
PPSD LOW CH (802.11b mode, chain 1)



PPSD MID CH (802.11b mode, chain 1)

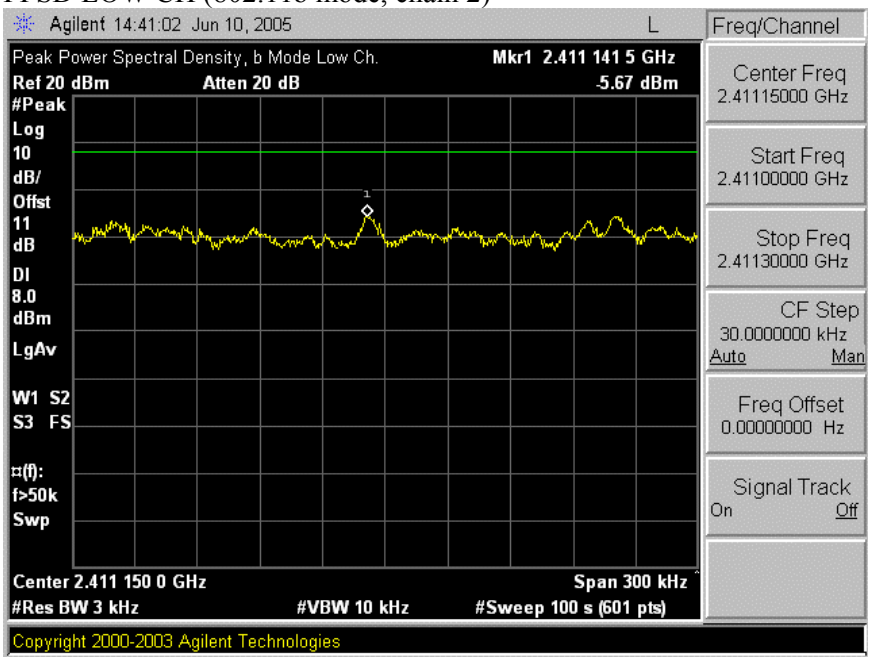


PPSD HIGH CH (802.11b mode, chain 1)

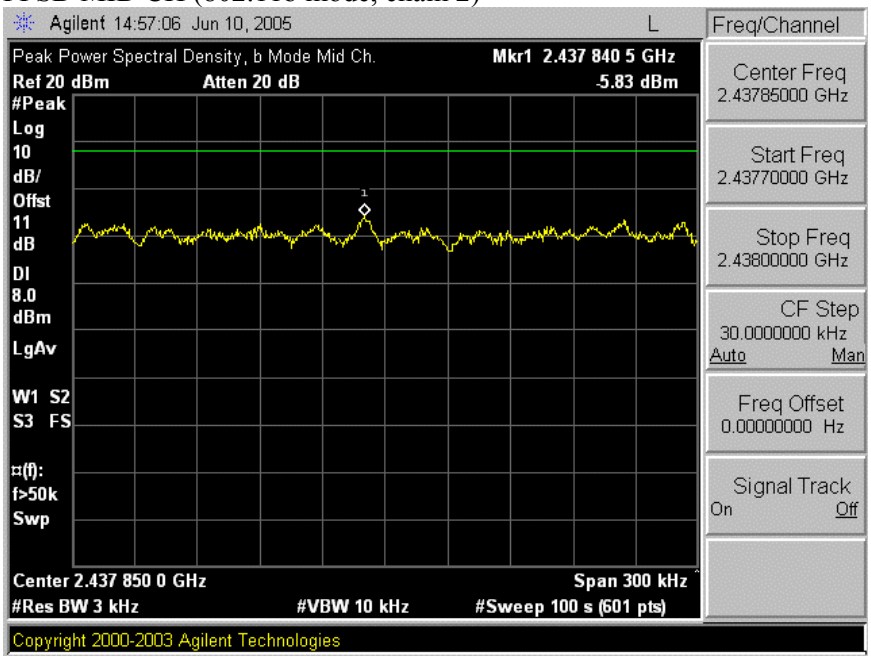


PEAK POWER SPECTRAL DENSITY (802.11b MODE, CHAIN 2)

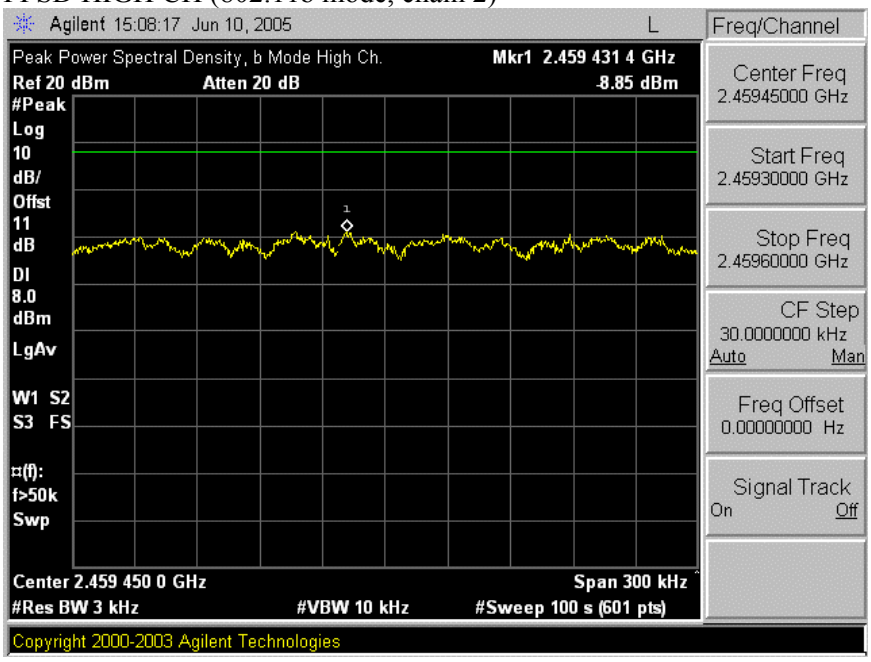
PPSD LOW CH (802.11b mode, chain 2)



PPSD MID CH (802.11b mode, chain 2)

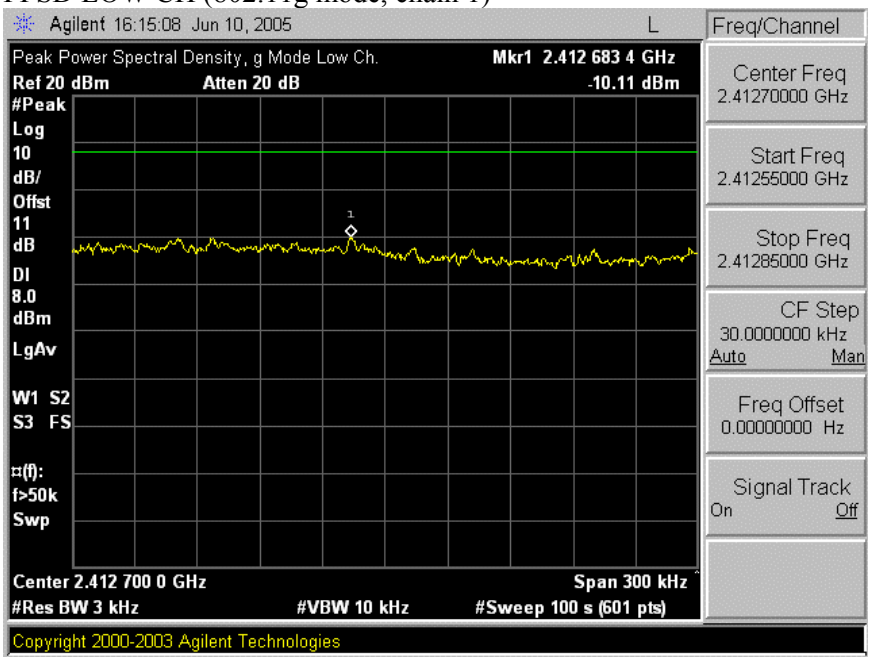


PPSD HIGH CH (802.11b mode, chain 2)

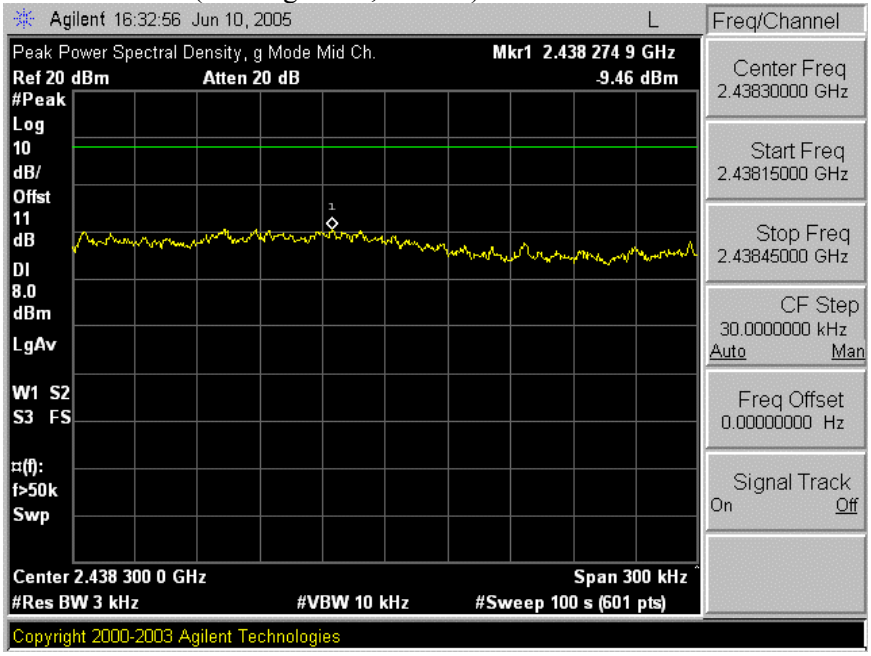


PEAK POWER SPECTRAL DENSITY (802.11g MODE, CHAIN 1)

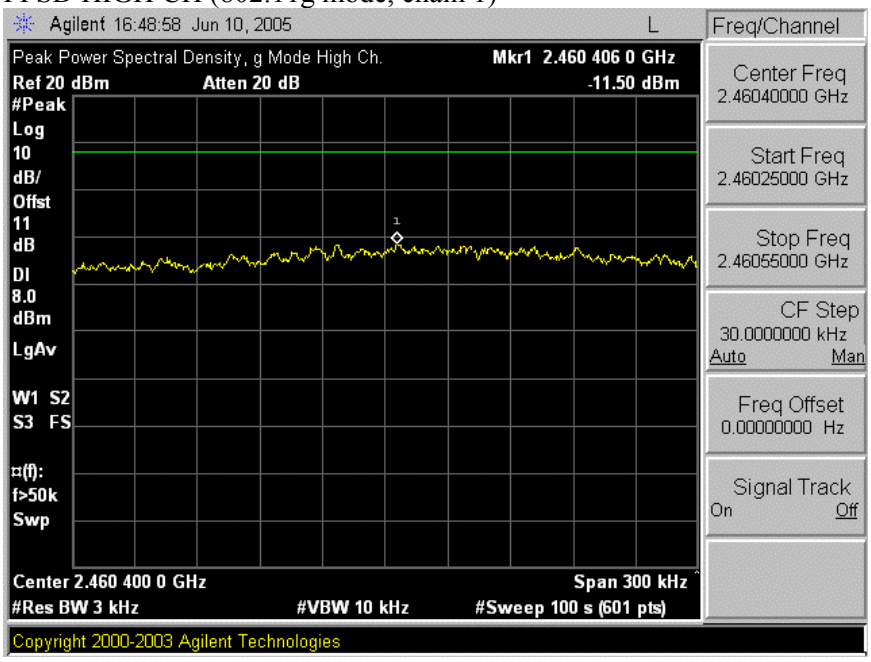
PPSD LOW CH (802.11g mode, chain 1)



PPSD MID CH (802.11g mode, chain 1)

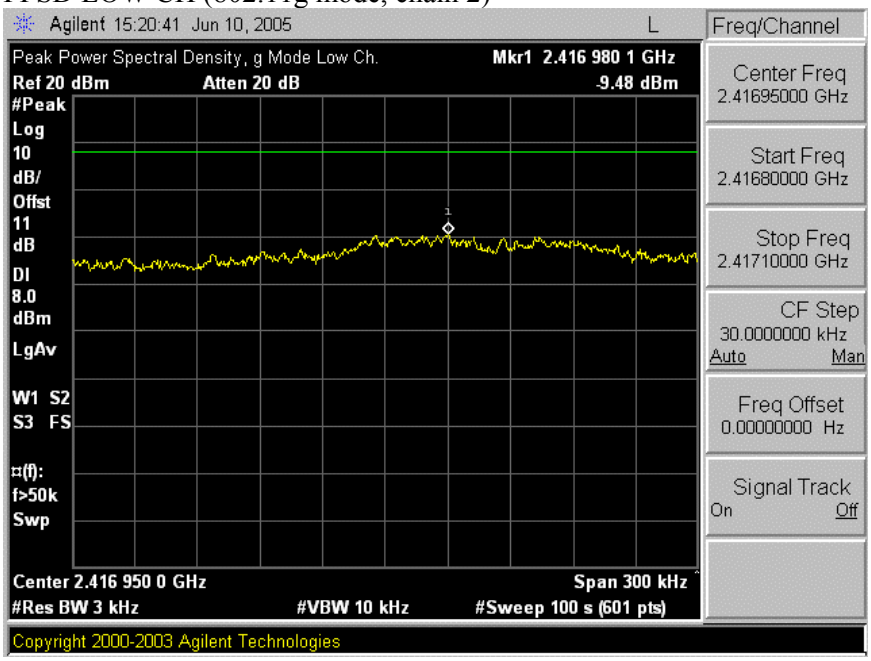


PPSD HIGH CH (802.11g mode, chain 1)

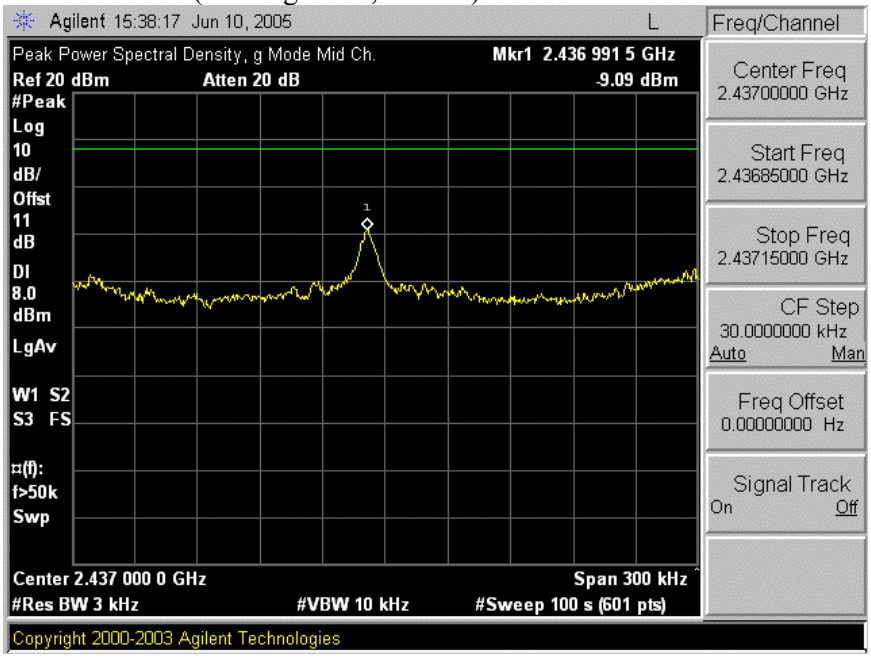


PEAK POWER SPECTRAL DENSITY (802.11g MODE, CHAIN 2)

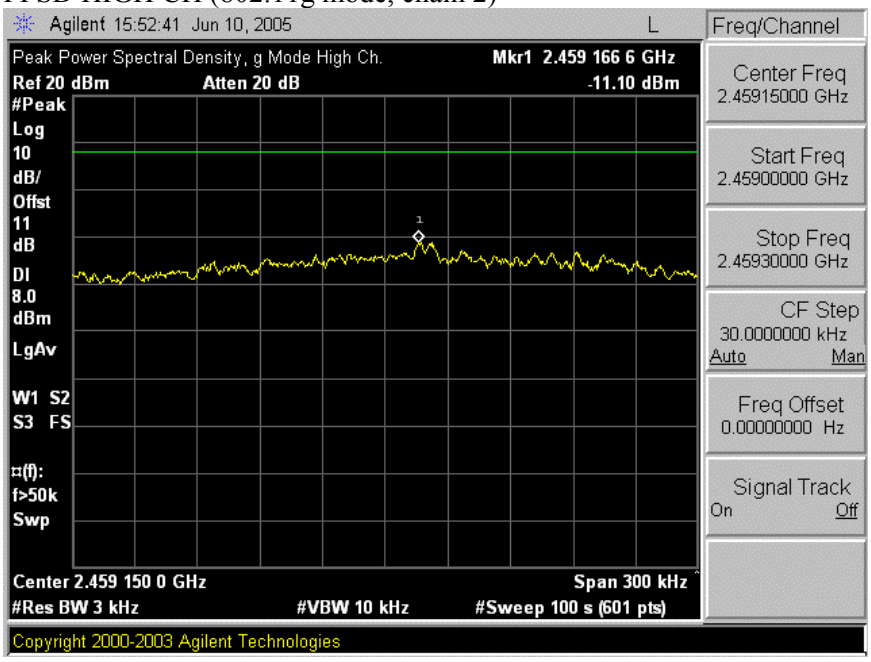
PPSD LOW CH (802.11g mode, chain 2)



PPSD MID CH (802.11g mode, chain 2)



PPSD HIGH CH (802.11g mode, chain 2)



7.1.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band 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. Attenuation below the general limits specified in §15.209(a) is not required. 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 §15.205(c)).

Conducted power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

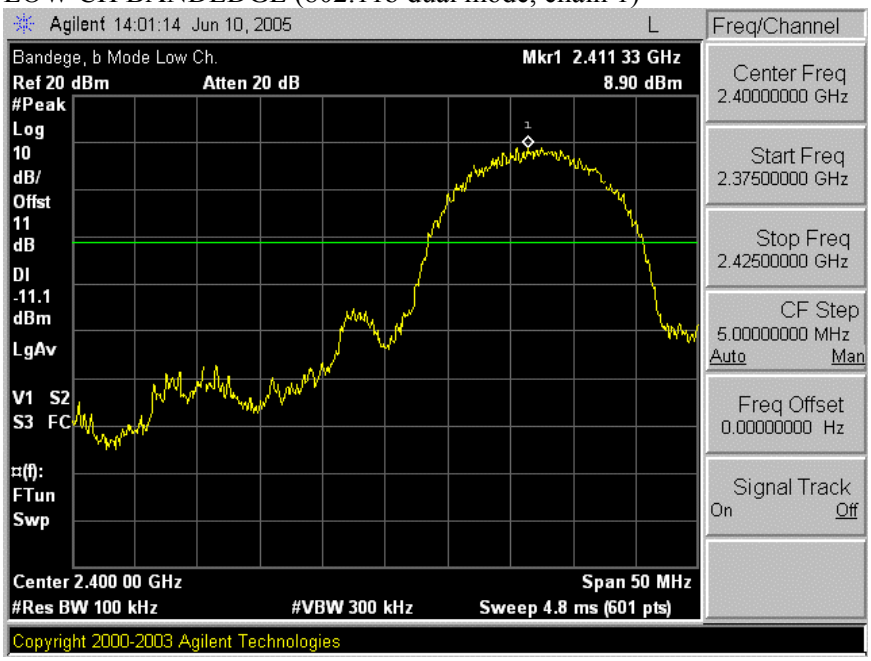
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

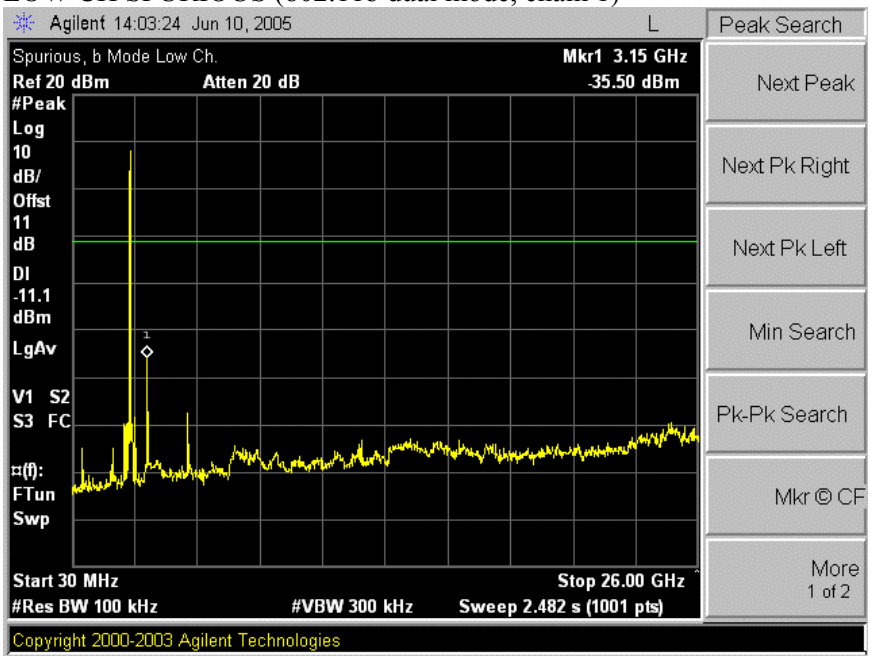
No non-compliance noted:

SPURIOUS EMISSIONS, LOW CHANNEL (802.11b DUAL MODE, CHAIN 1)

LOW CH BANDEDGE (802.11b dual mode, chain 1)

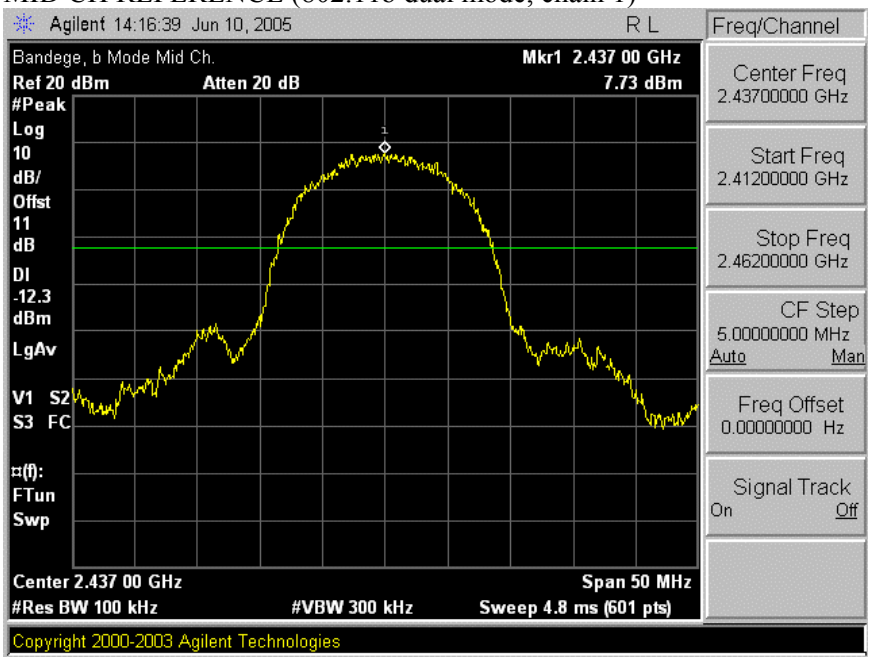


LOW CH SPURIOUS (802.11b dual mode, chain 1)

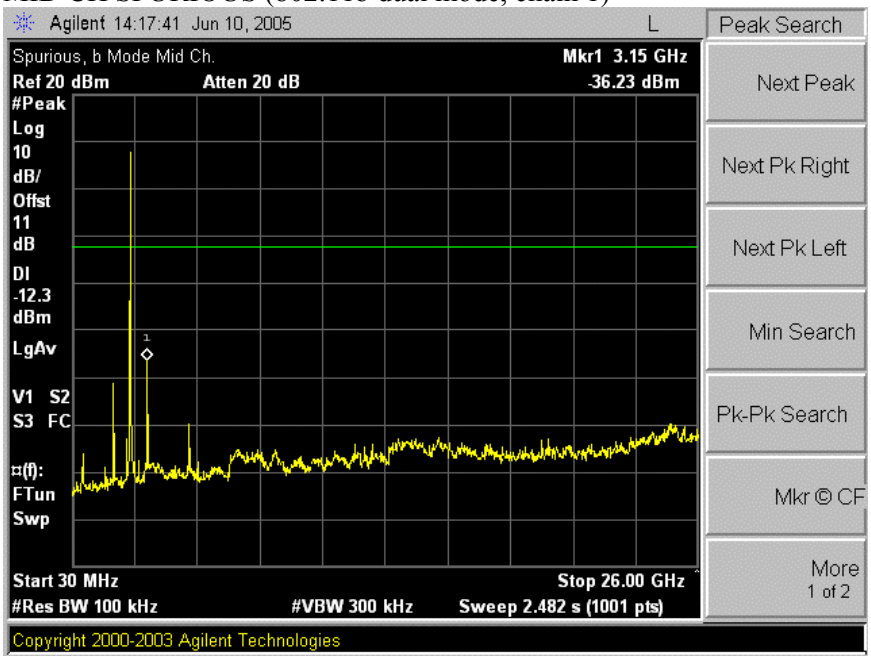


SPURIOUS EMISSIONS, MID CHANNEL (802.11b DUAL MODE, CHAIN 1)

MID CH REFERENCE (802.11b dual mode, chain 1)

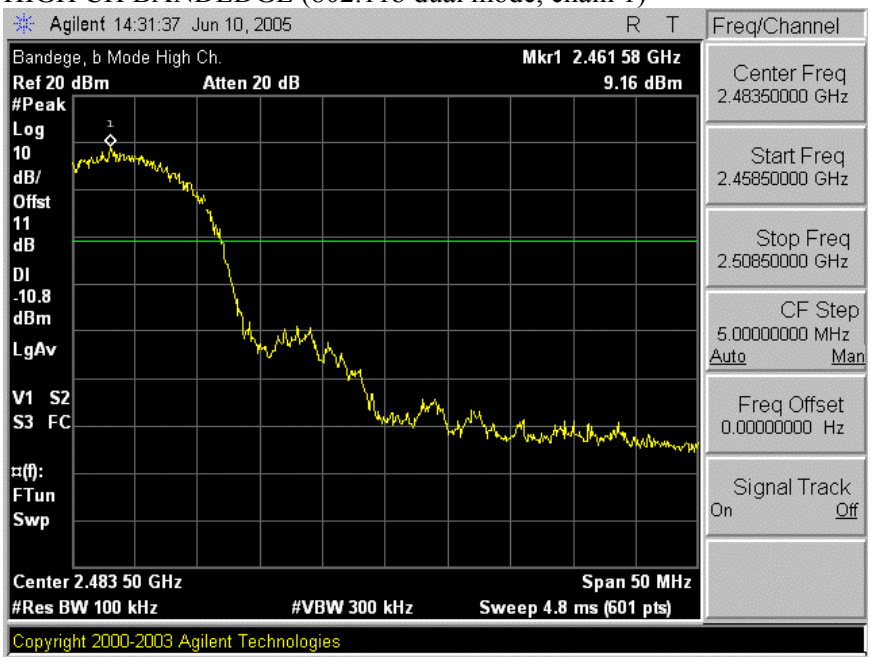


MID CH SPURIOUS (802.11b dual mode, chain 1)

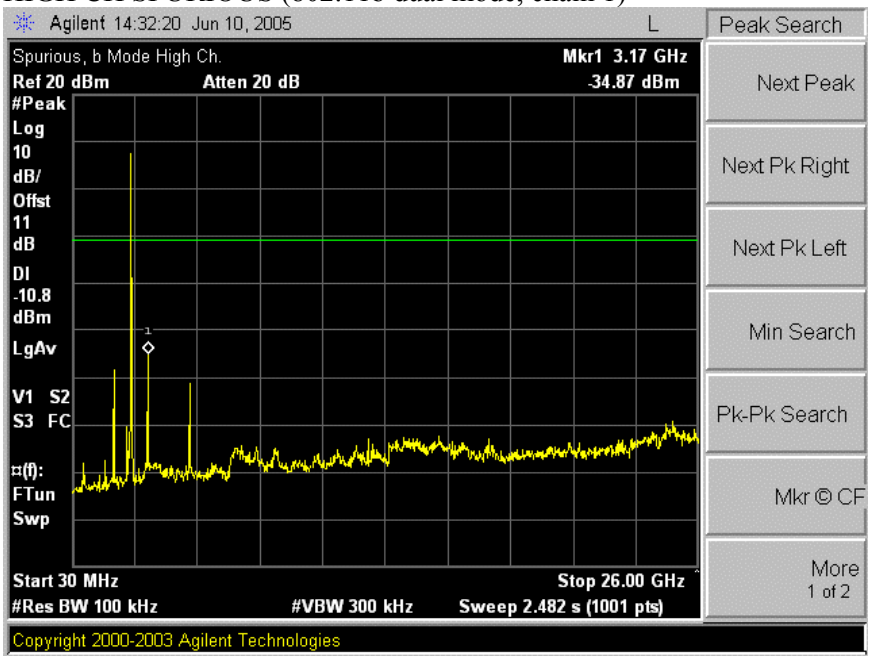


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b DUAL MODE, CHAIN 1)

HIGH CH BANDEDGE (802.11b dual mode, chain 1)

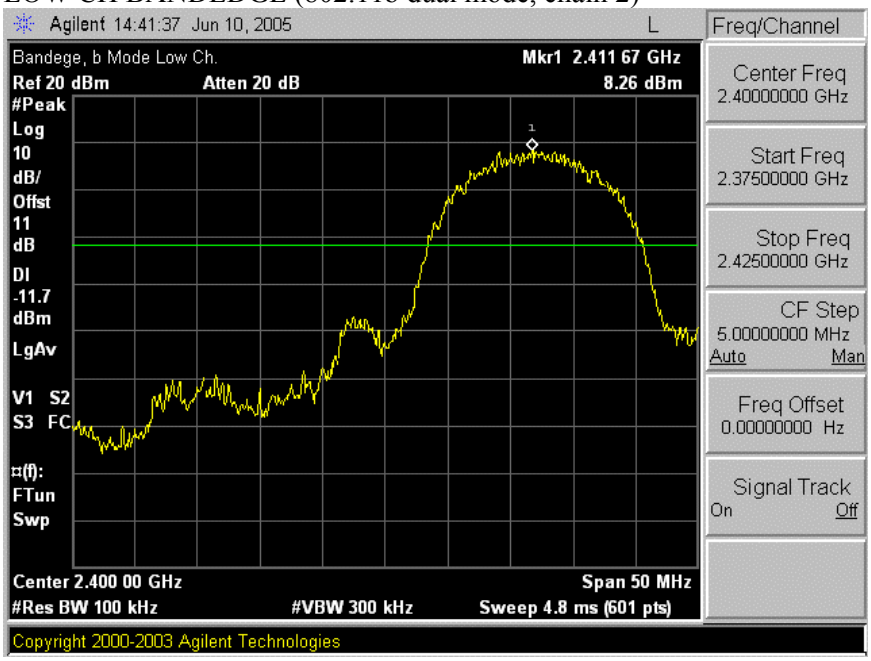


HIGH CH SPURIOUS (802.11b dual mode, chain 1)

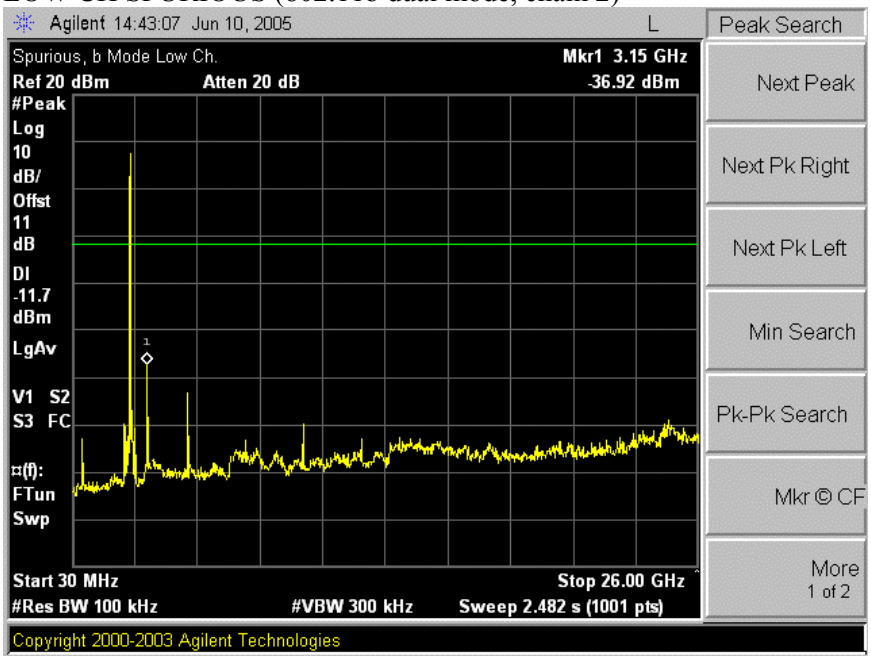


SPURIOUS EMISSIONS, LOW CHANNEL (802.11b DUAL MODE, CHAIN 2)

LOW CH BANDEDGE (802.11b dual mode, chain 2)

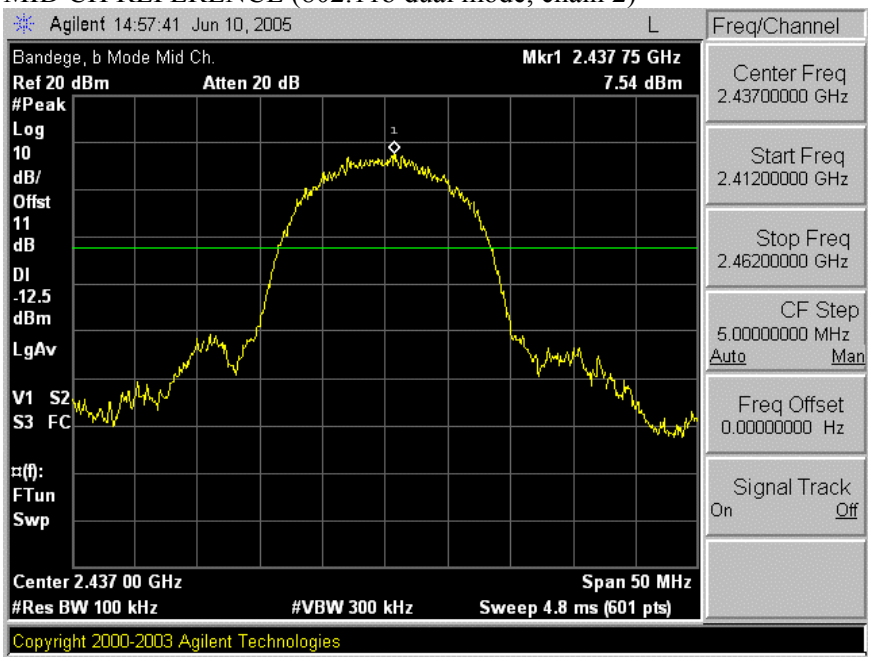


LOW CH SPURIOUS (802.11b dual mode, chain 2)

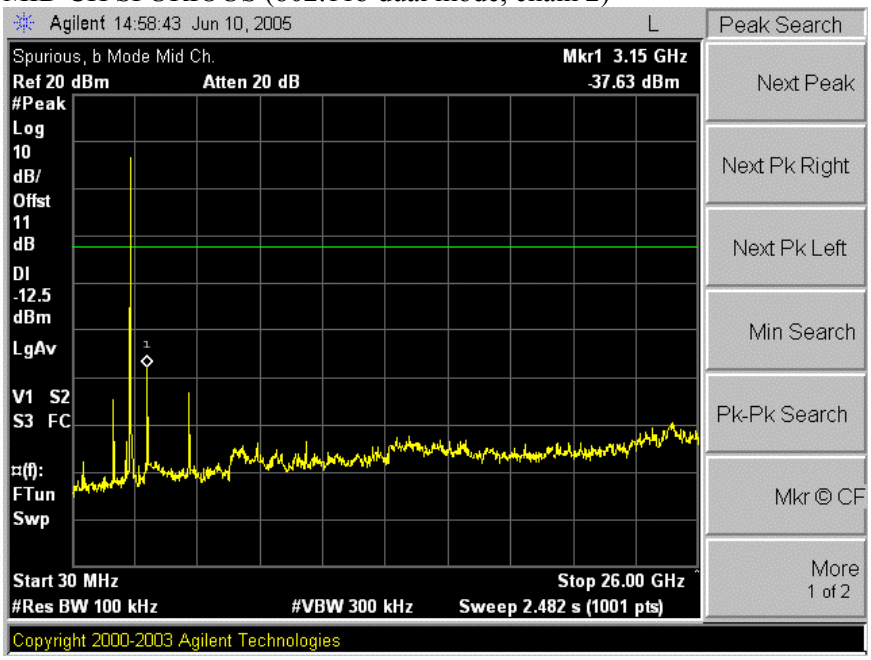


SPURIOUS EMISSIONS, MID CHANNEL (802.11b DUAL MODE, CHAIN 2)

MID CH REFERENCE (802.11b dual mode, chain 2)

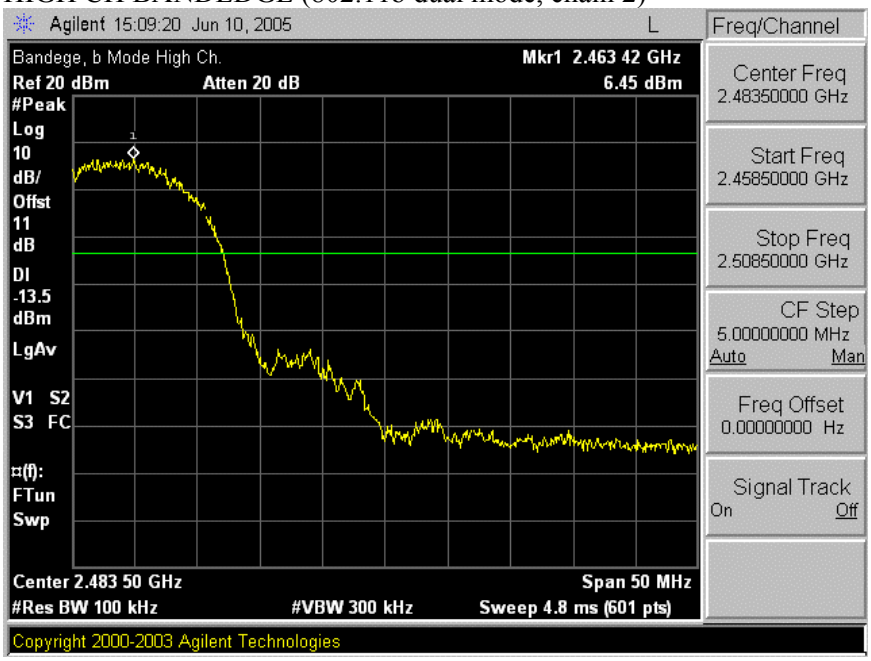


MID CH SPURIOUS (802.11b dual mode, chain 2)

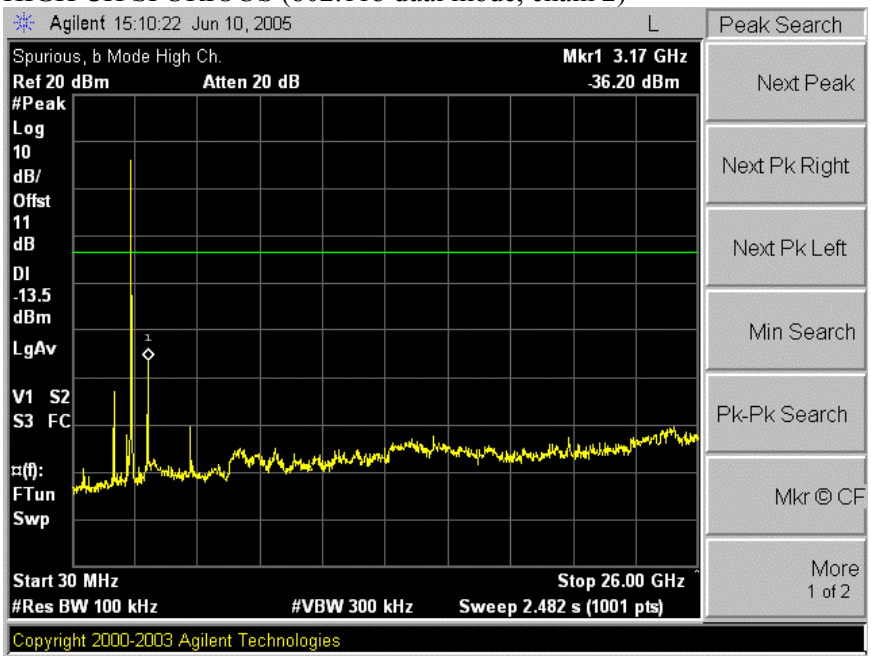


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b DUAL MODE, CHAIN 2)

HIGH CH BANDEDGE (802.11b dual mode, chain 2)

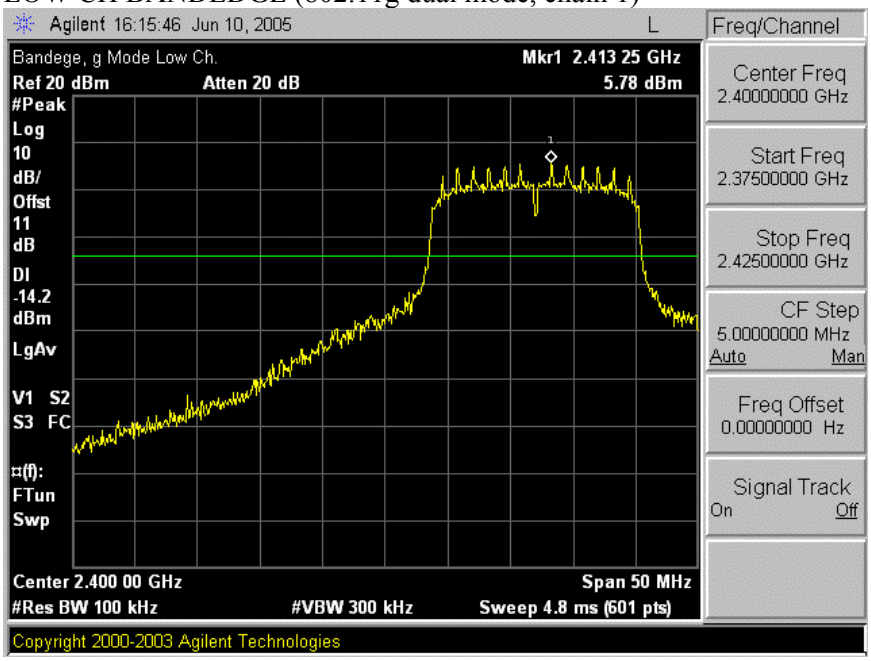


HIGH CH SPURIOUS (802.11b dual mode, chain 2)

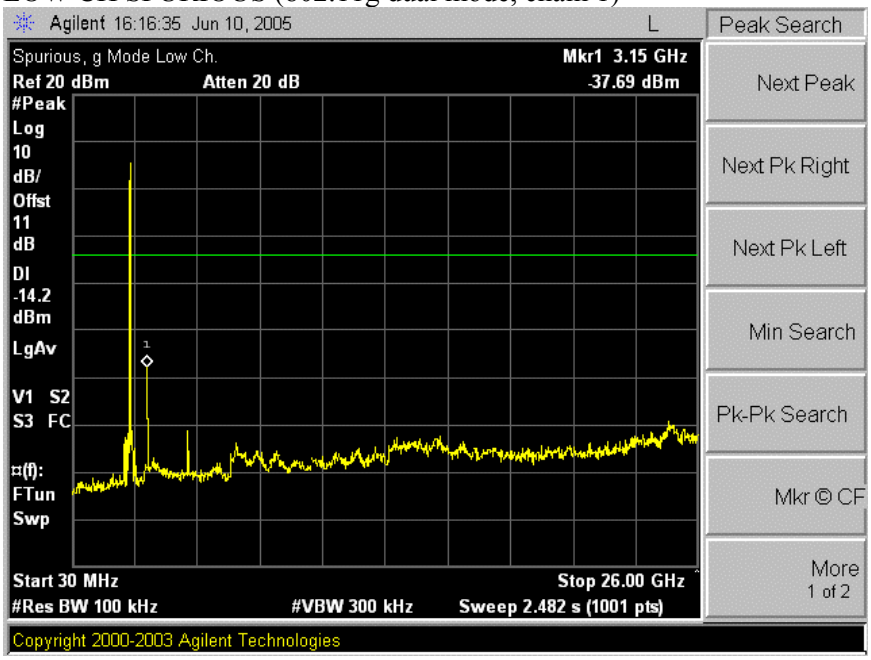


SPURIOUS EMISSIONS, LOW CHANNEL (802.11g DUAL MODE, CHAIN 1)

LOW CH BANDEDGE (802.11g dual mode, chain 1)

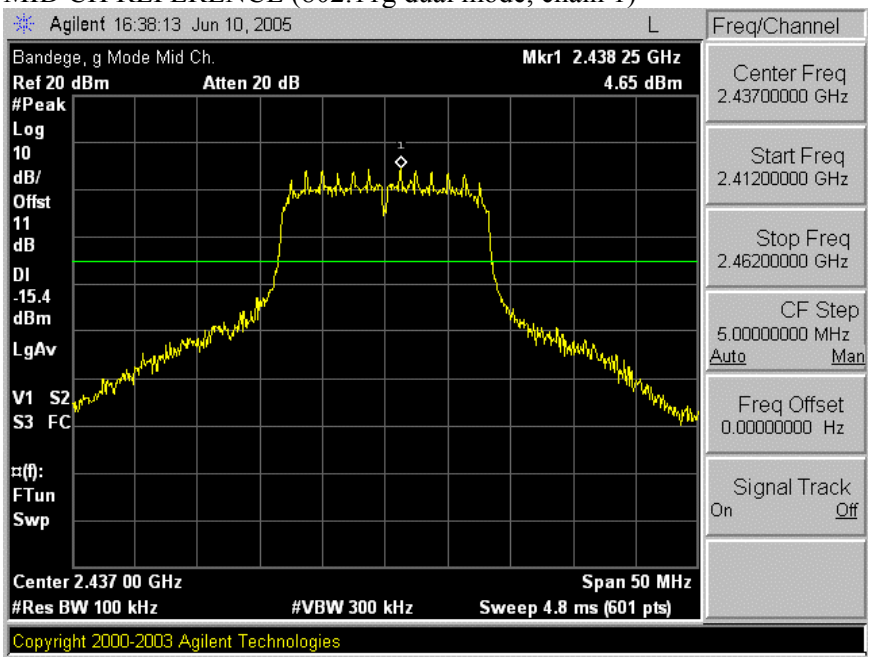


LOW CH SPURIOUS (802.11g dual mode, chain 1)

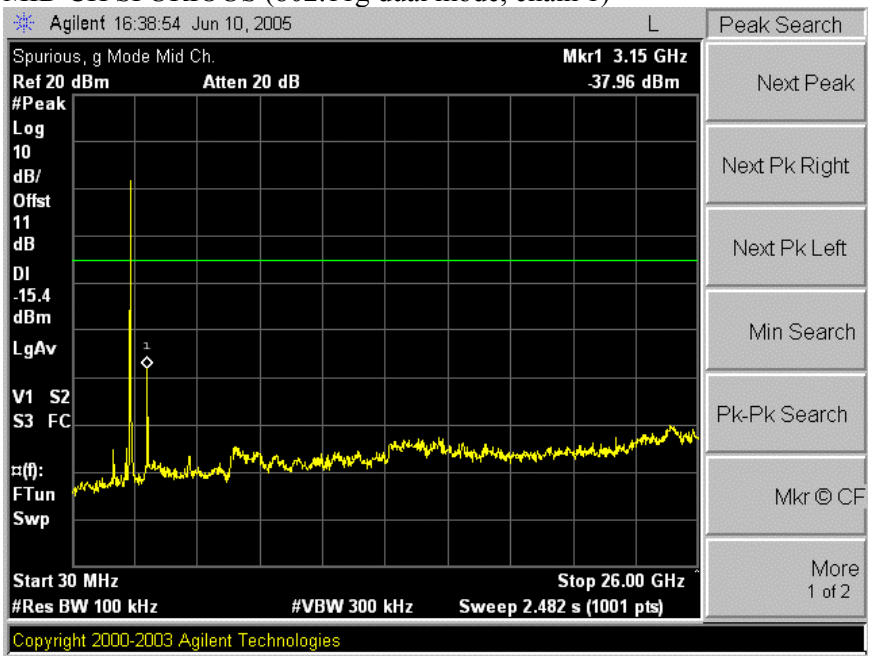


SPURIOUS EMISSIONS, MID CHANNEL (802.11g DUAL MODE, CHAIN 1)

MID CH REFERENCE (802.11g dual mode, chain 1)

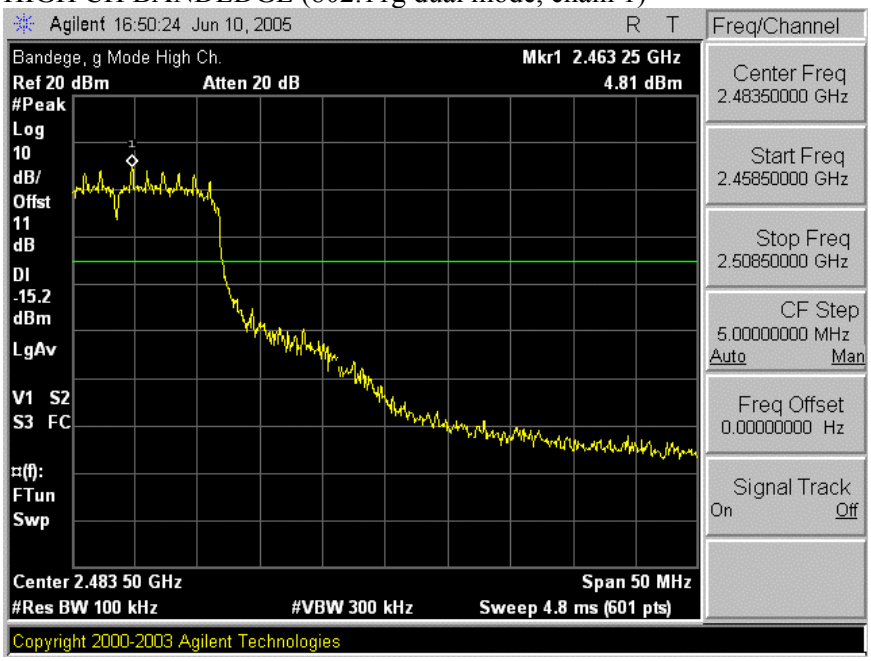


MID CH SPURIOUS (802.11g dual mode, chain 1)

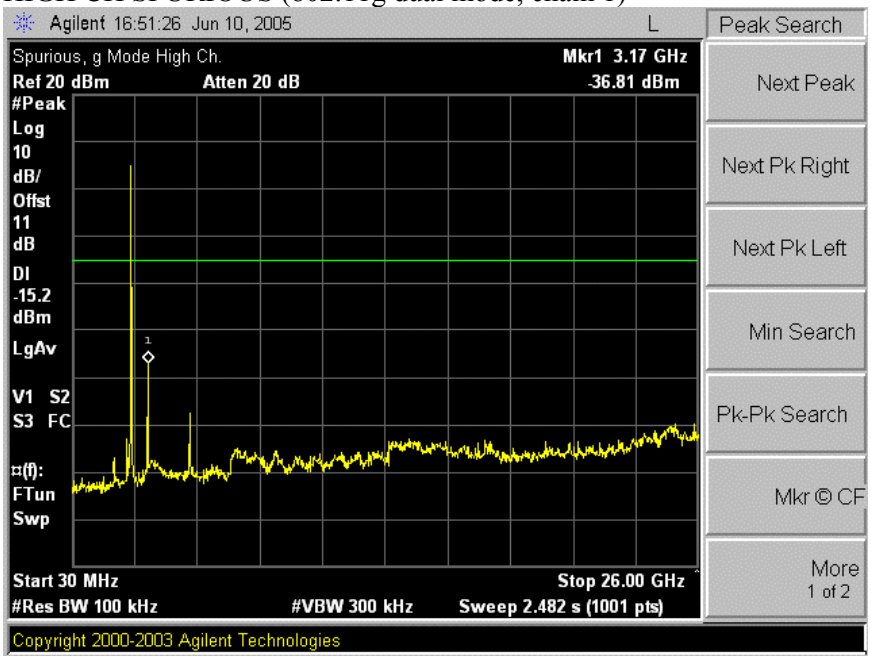


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g DUAL MODE, CHAIN 1)

HIGH CH BANDEDGE (802.11g dual mode, chain 1)

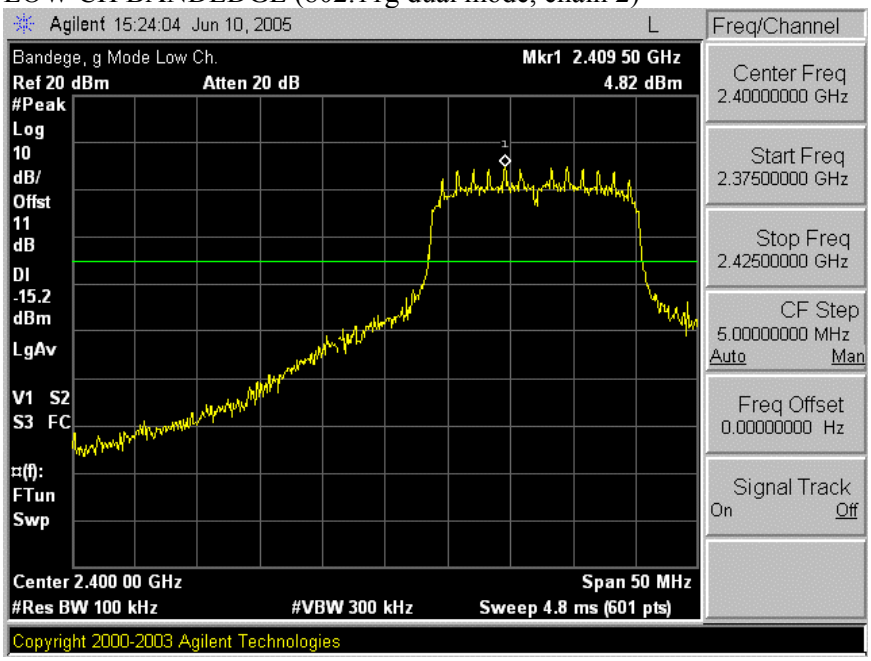


HIGH CH SPURIOUS (802.11g dual mode, chain 1)

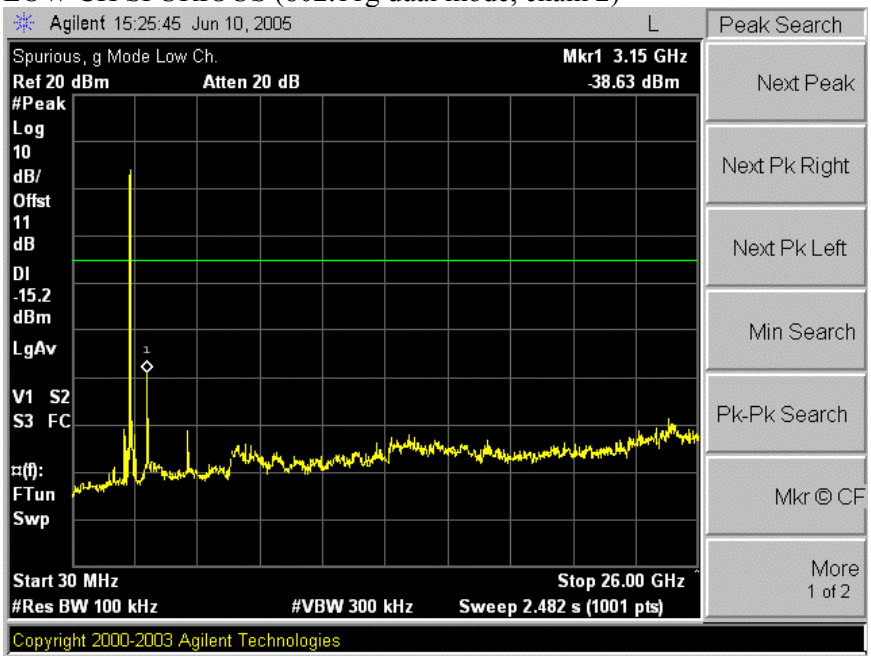


SPURIOUS EMISSIONS, LOW CHANNEL (802.11g DUAL MODE, CHAIN 2)

LOW CH BANDEDGE (802.11g dual mode, chain 2)

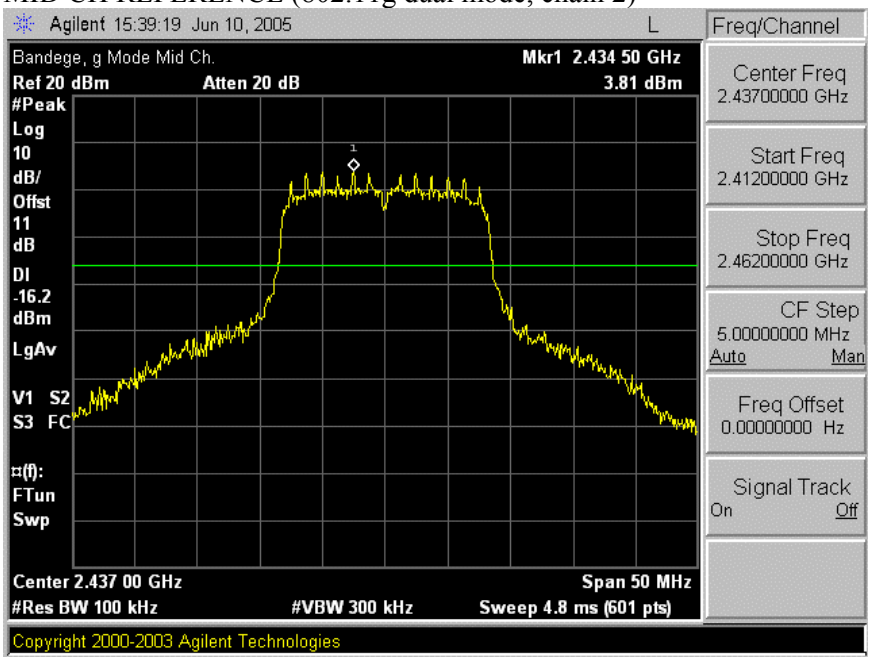


LOW CH SPURIOUS (802.11g dual mode, chain 2)

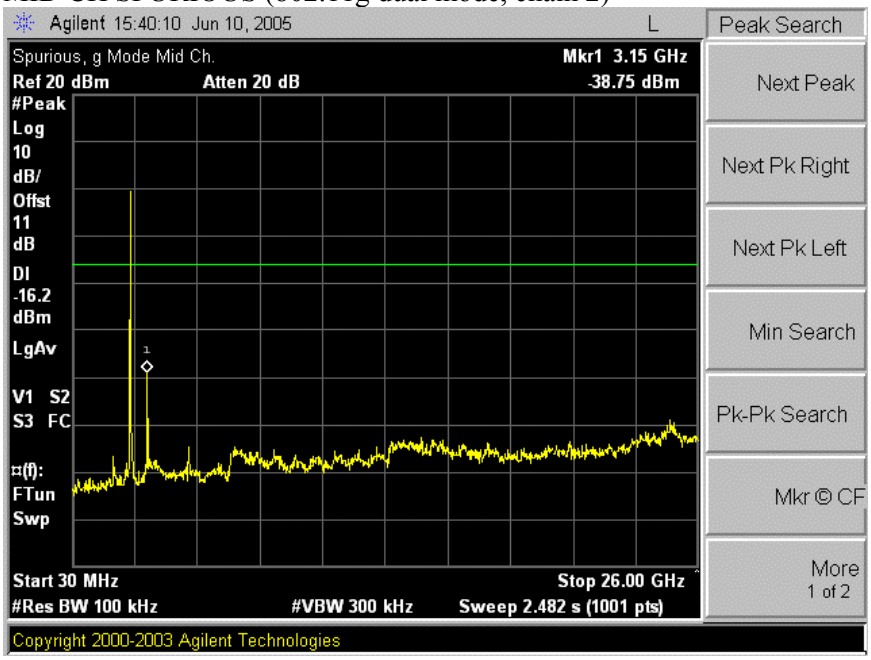


SPURIOUS EMISSIONS, MID CHANNEL (802.11g DUAL MODE, CHAIN 2)

MID CH REFERENCE (802.11g dual mode, chain 2)

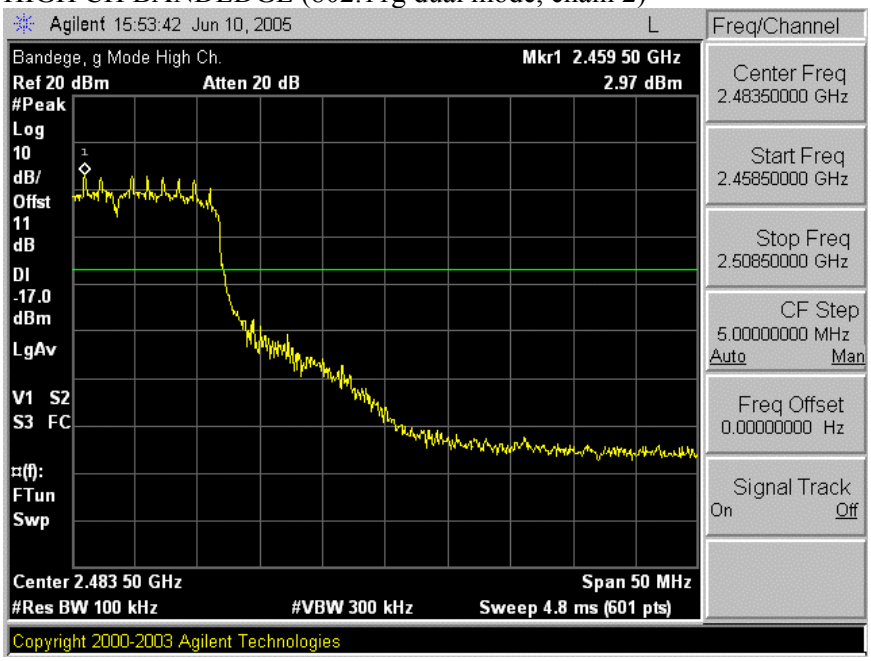


MID CH SPURIOUS (802.11g dual mode, chain 2)

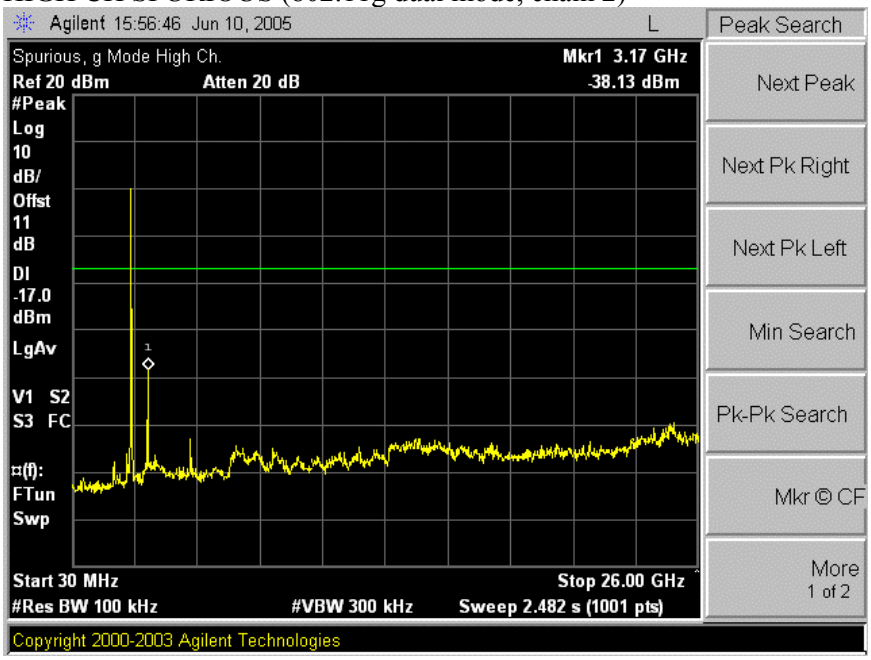


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g DUAL MODE, CHAIN 2)

HIGH CH BANDEDGE (802.11g dual mode, chain 2)



HIGH CH SPURIOUS (802.11g dual mode, chain 2)



7.2. RADIATED EMISSIONS

7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

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

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

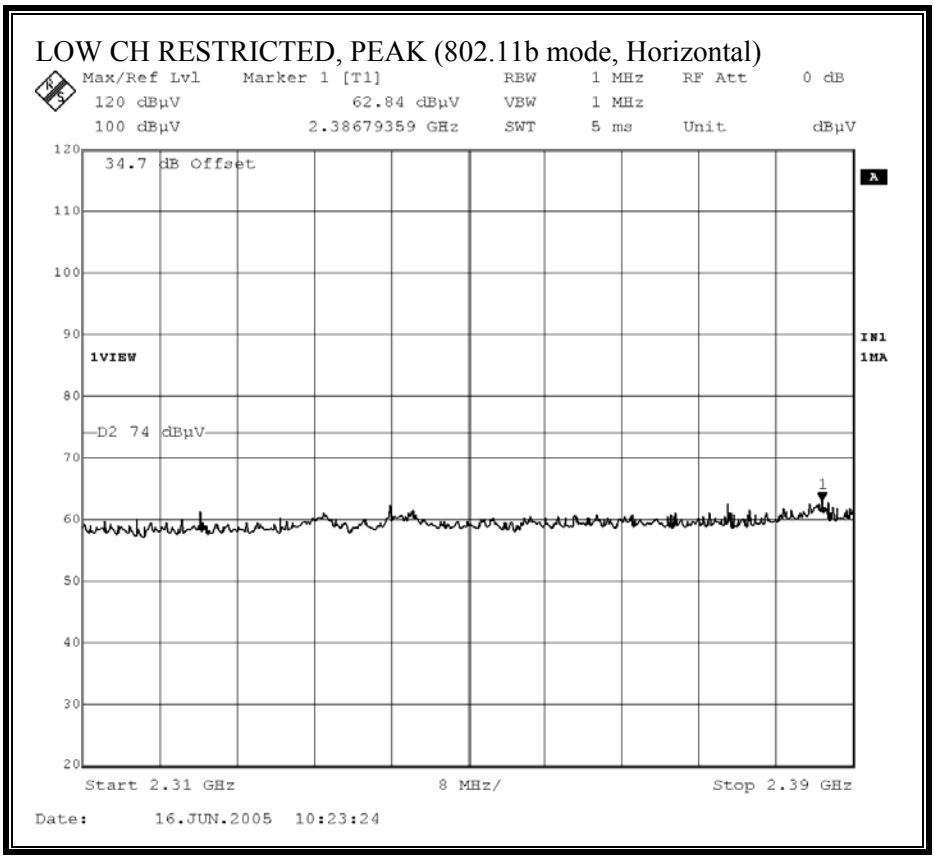
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

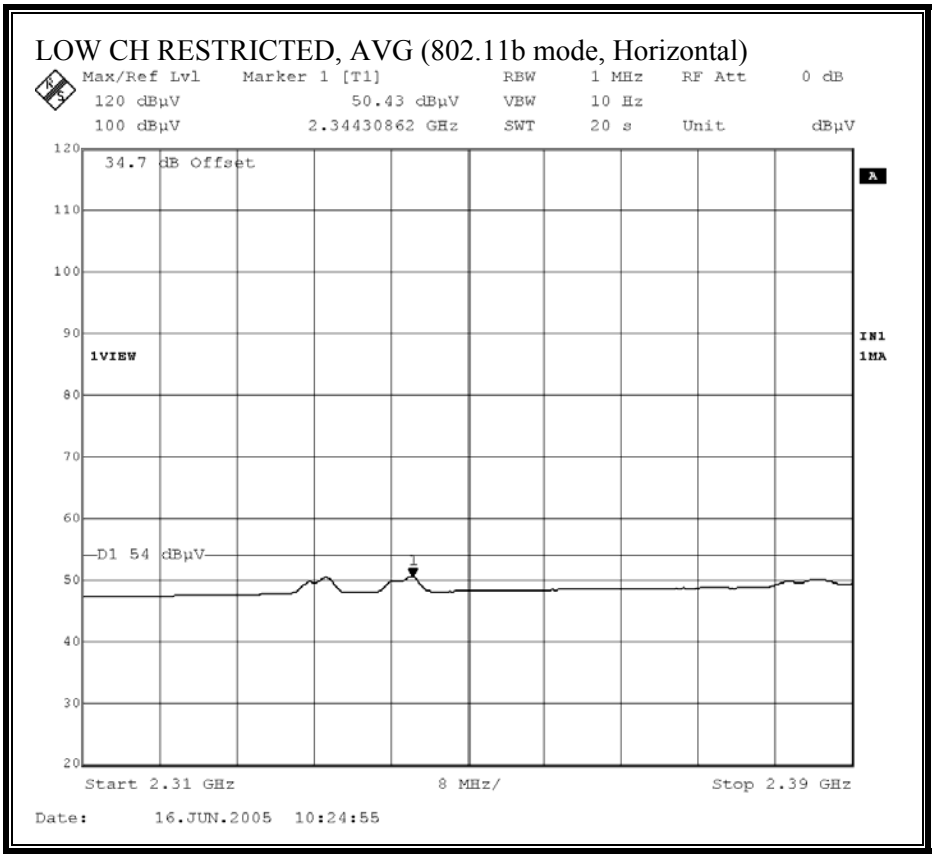
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

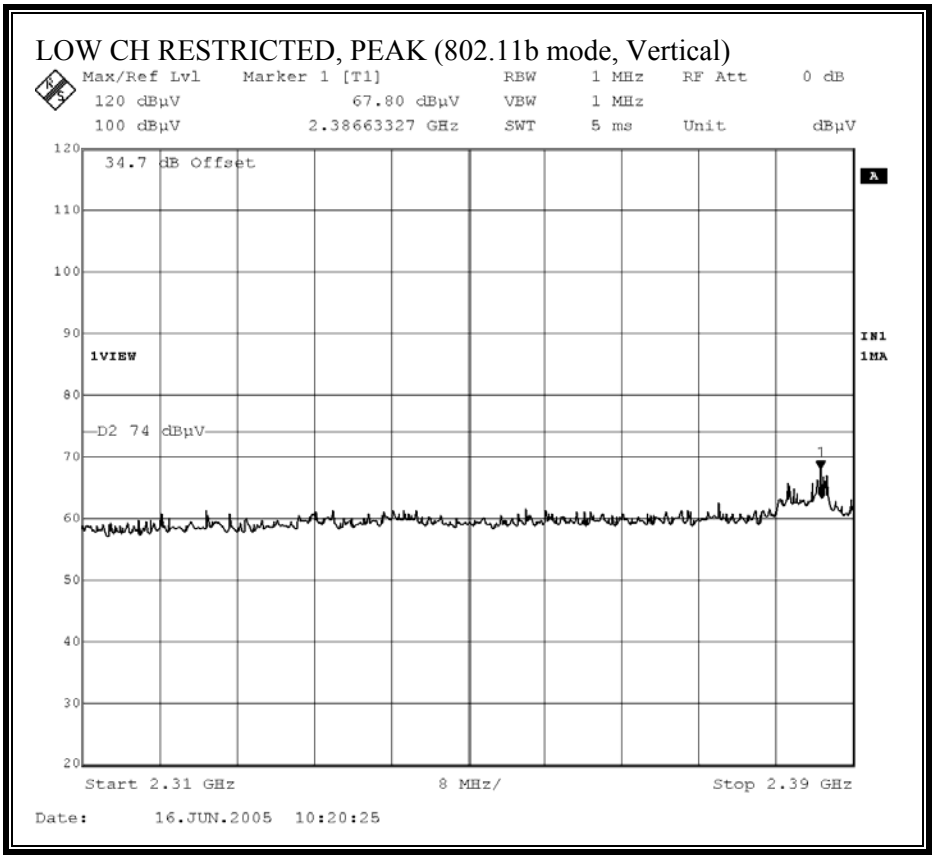
7.2.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

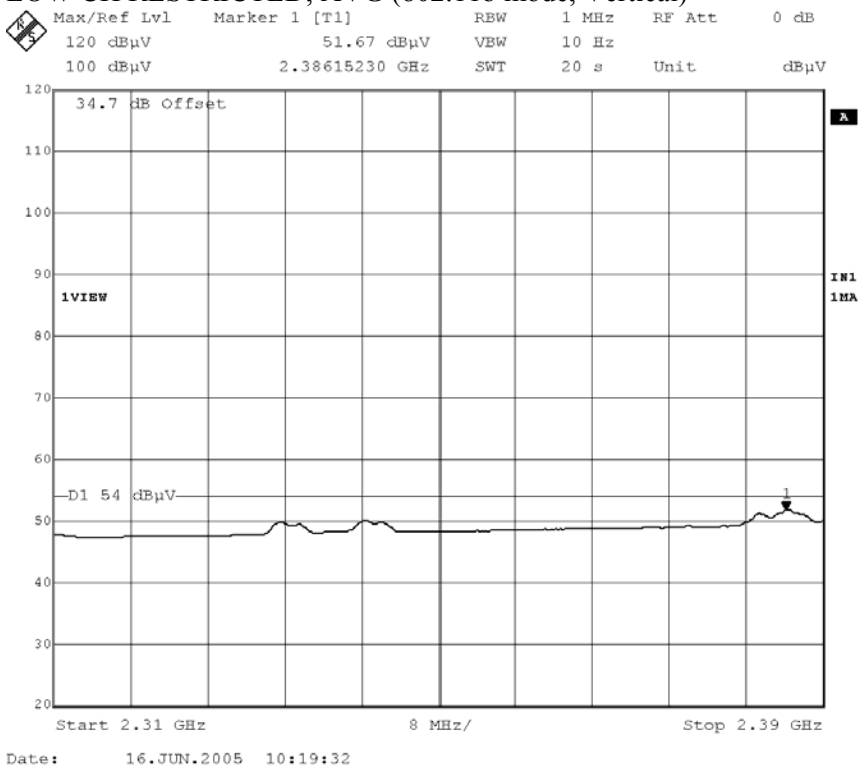




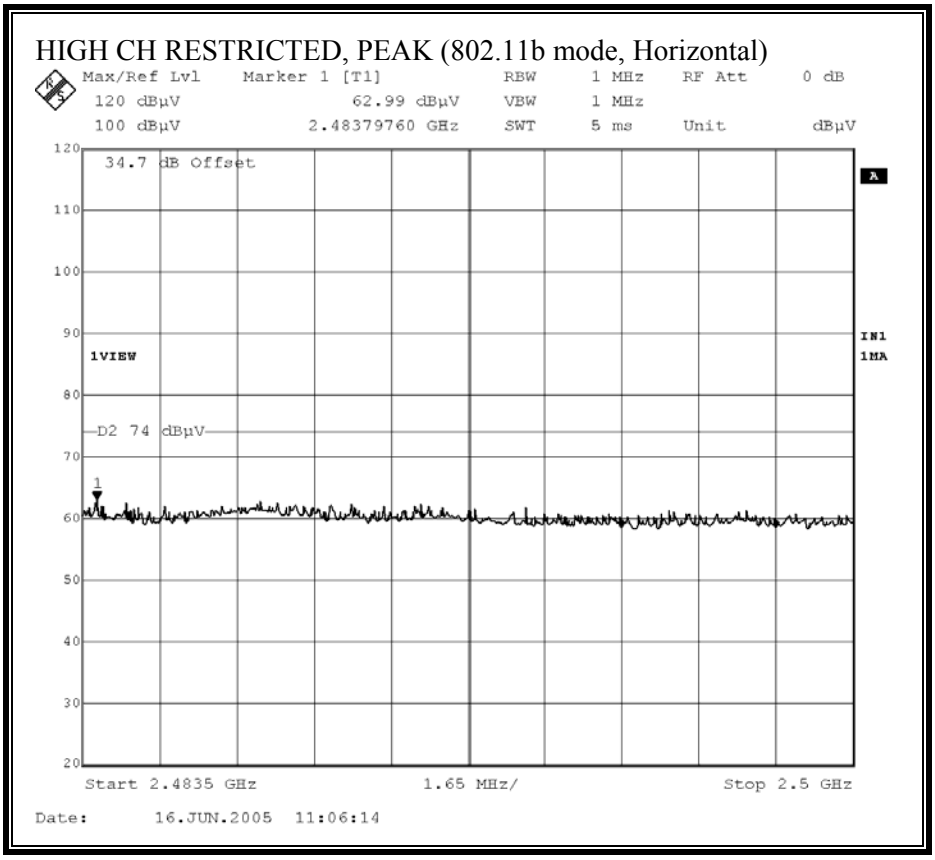
RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)



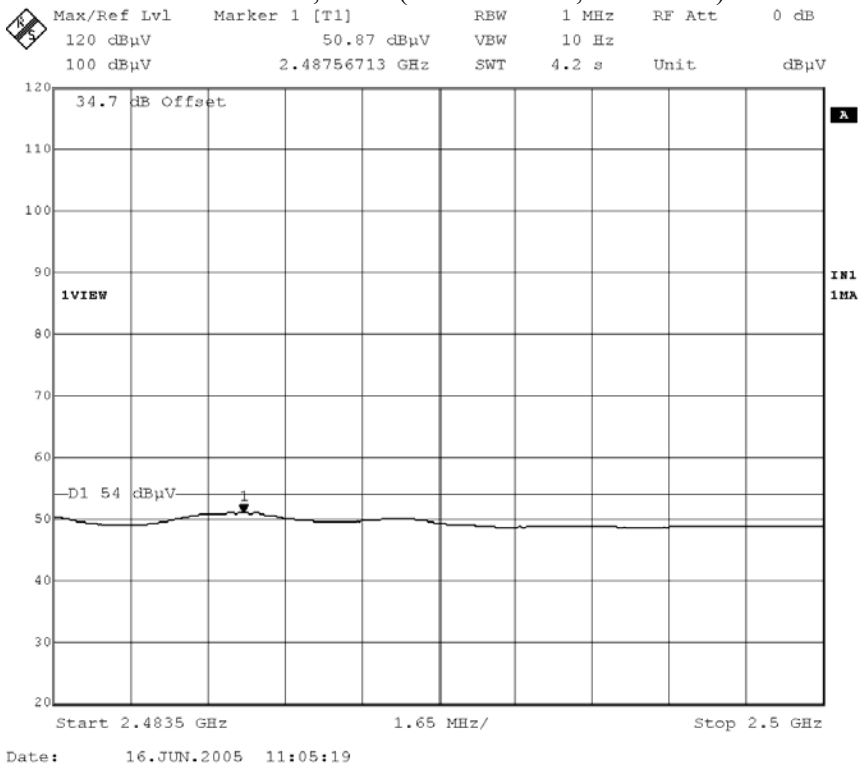
LOW CH RESTRICTED, AVG (802.11b mode, Vertical)



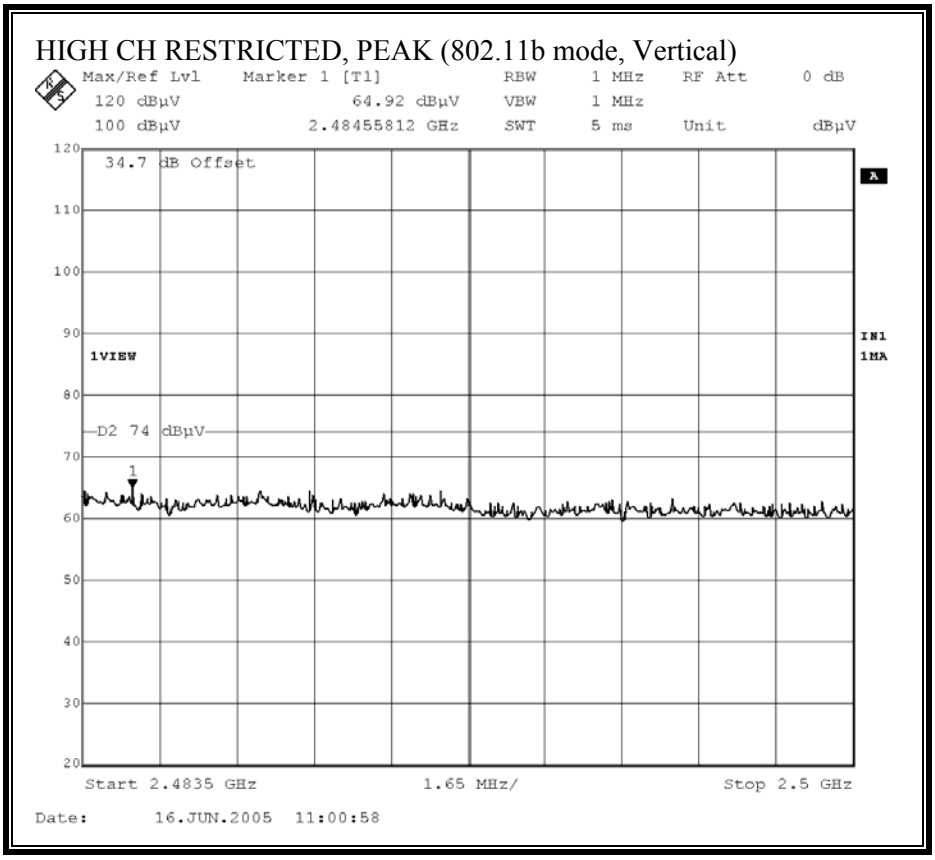
RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)



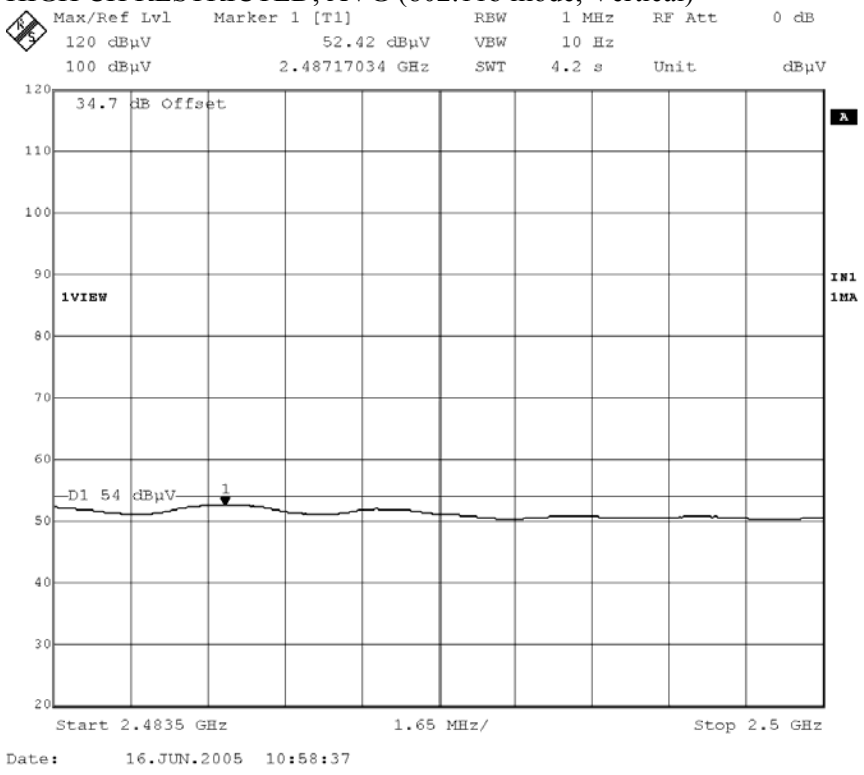
HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)



RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (802.11b mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (b MODE)

06/16/05 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 05U3491-1
Company: Airgo
EUT Descrip.: 2x2 802.11b/g WLAN PC Card
EUT M/N: AGN1022PC-01
Test Target: FCC 15.247, 15.205
Mode Oper: 11b Tx
Average Power Meter: Low = xx dBm, Mid = xx dBm, High = xx dBm

Test Equipment:

EMCO Horn 1-18GHz: T119; S/N: 29301 @3m
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:
Horn >18GHz:

Hi Frequency Cables: 2 foot cable: 2_David; 3 foot cable:; 4 foot cable: 4_David; 12 foot cable: 12_Yan

HPF: HPF_1.5GHz
Reject Filter: R_001

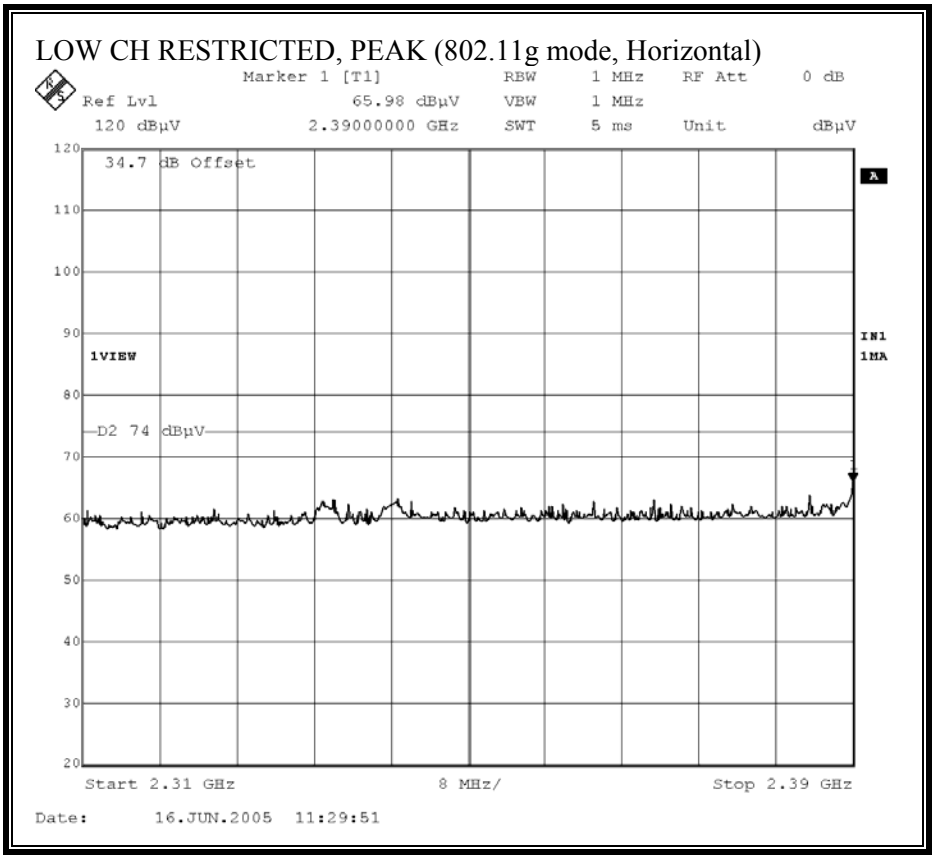
Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

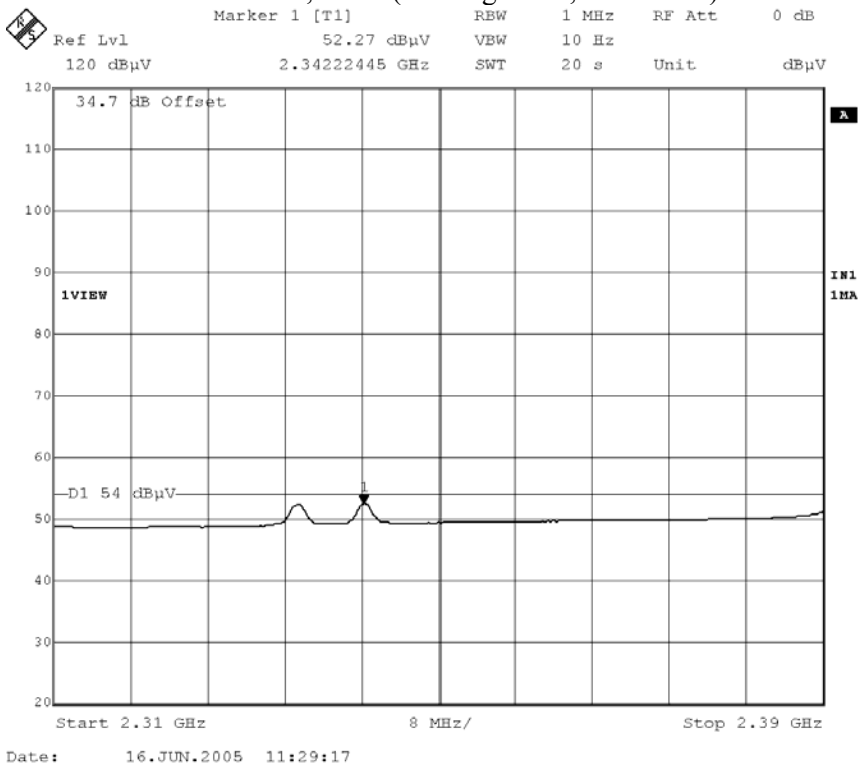
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
2412 Channel, 19 dB software power setting															
4.824	3.0	46.2	32.4	34.0	5.5	-33.6	0.0	0.6	52.8	39.0	74	54	-21.2	-15.0	V
12.060	3.0	44.3	31.2	38.4	9.5	-33.5	0.0	0.8	59.5	46.4	74	54	-14.5	-7.6	V
4.824	3.0	44.5	31.6	34.0	5.5	-33.6	0.0	0.6	51.1	38.2	74	54	-22.9	-15.8	H
12.060	3.0	43.3	30.8	38.4	9.5	-33.5	0.0	0.8	58.5	46.0	74	54	-15.5	-8.0	H
2437 Channel, 20 dB software power setting															
4.874	3.0	46.4	32.9	34.1	5.5	-33.5	0.0	0.6	53.0	39.5	74	54	-21.0	-14.5	V
7.311	3.0	44.4	31.7	35.6	6.8	-33.3	0.0	0.6	54.1	41.4	74	54	-19.9	-12.6	V
12.185	3.0	43.0	31.4	38.5	9.5	-33.4	0.0	0.8	58.3	46.7	74	54	-15.7	-7.3	V
4.874	3.0	45.1	31.5	34.1	5.5	-33.5	0.0	0.6	51.7	38.1	74	54	-22.3	-15.9	H
12.185	3.0	44.6	31.5	38.5	9.5	-33.4	0.0	0.8	59.9	46.8	74	54	-14.1	-7.2	H
2462 Channel, 19 dB software power setting															
4.924	3.0	48.0	32.5	34.1	5.6	-33.5	0.0	0.6	54.7	39.2	74	54	-19.3	-14.8	V
7.386	3.0	44.7	31.6	35.7	6.8	-33.3	0.0	0.6	54.5	41.4	74	54	-19.5	-12.6	V
12.310	3.0	44.1	31.5	38.5	9.6	-33.4	0.0	0.8	59.6	47.0	74	54	-14.4	-7.0	V
4.924	3.0	44.4	31.4	34.1	5.6	-33.5	0.0	0.6	51.1	38.1	74	54	-22.9	-15.9	H
12.310	3.0	44.2	31.9	38.5	9.6	-33.4	0.0	0.8	59.7	47.4	74	54	-14.3	-6.6	H
No further emissions were detected above the noise floor of the receiver.															

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

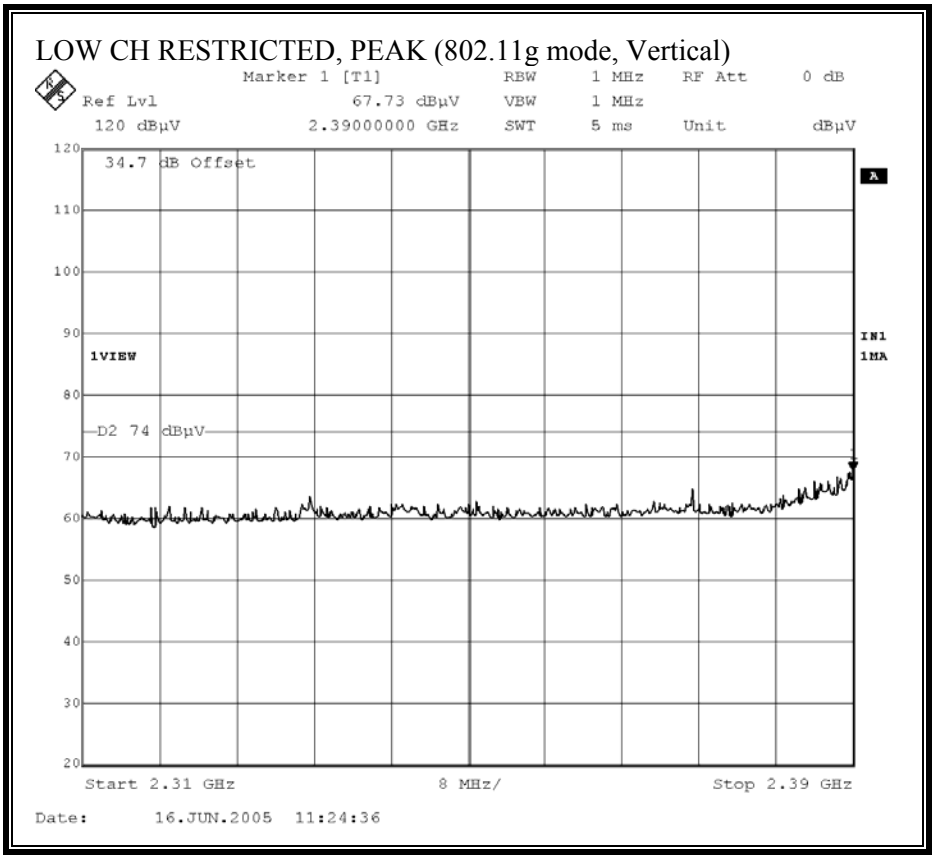
RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)



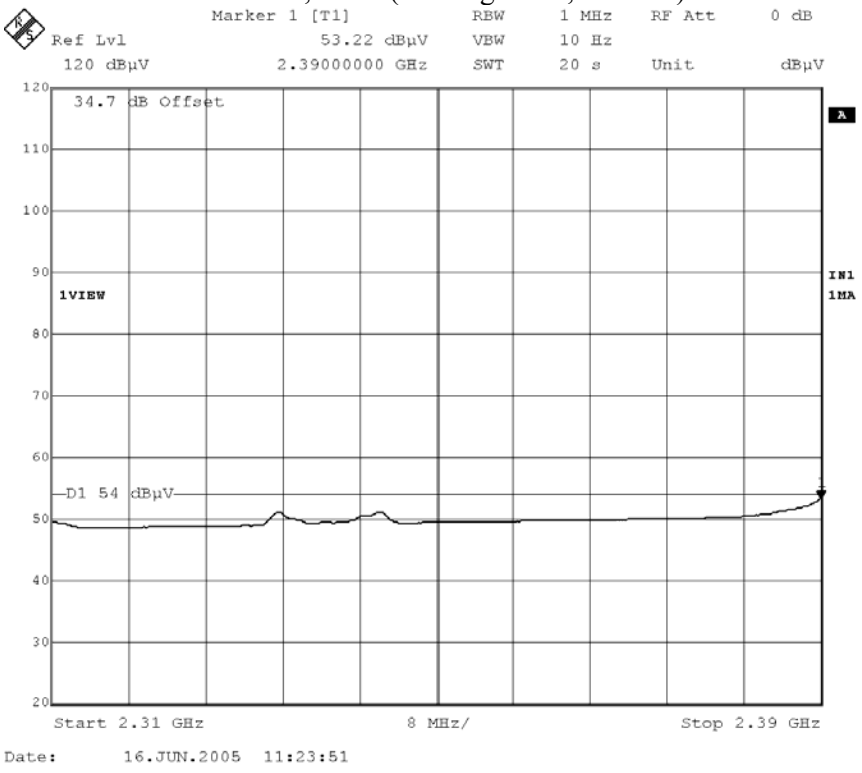
LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)



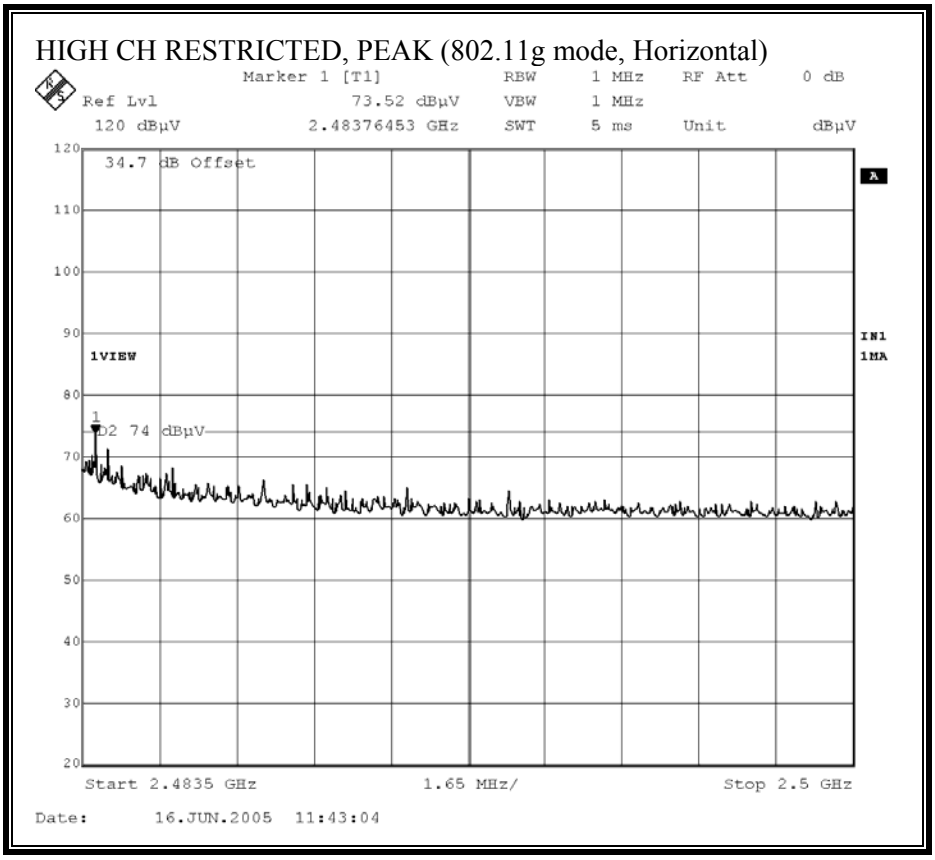
RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)



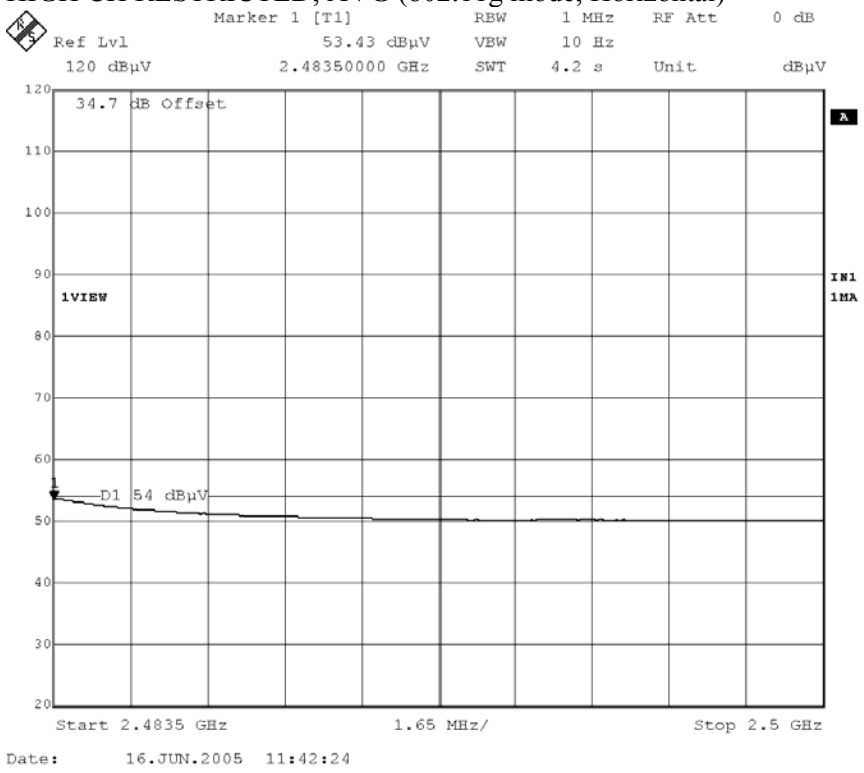
LOW CH RESTRICTED, AVG (802.11g mode, Vertical)



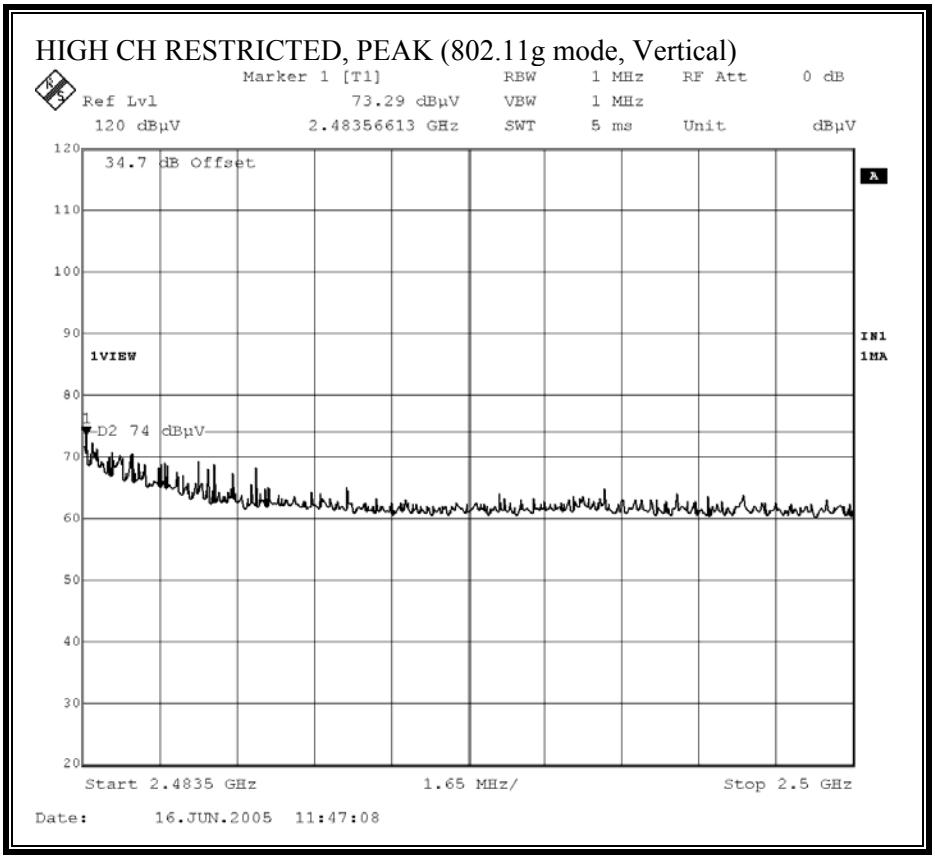
RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)



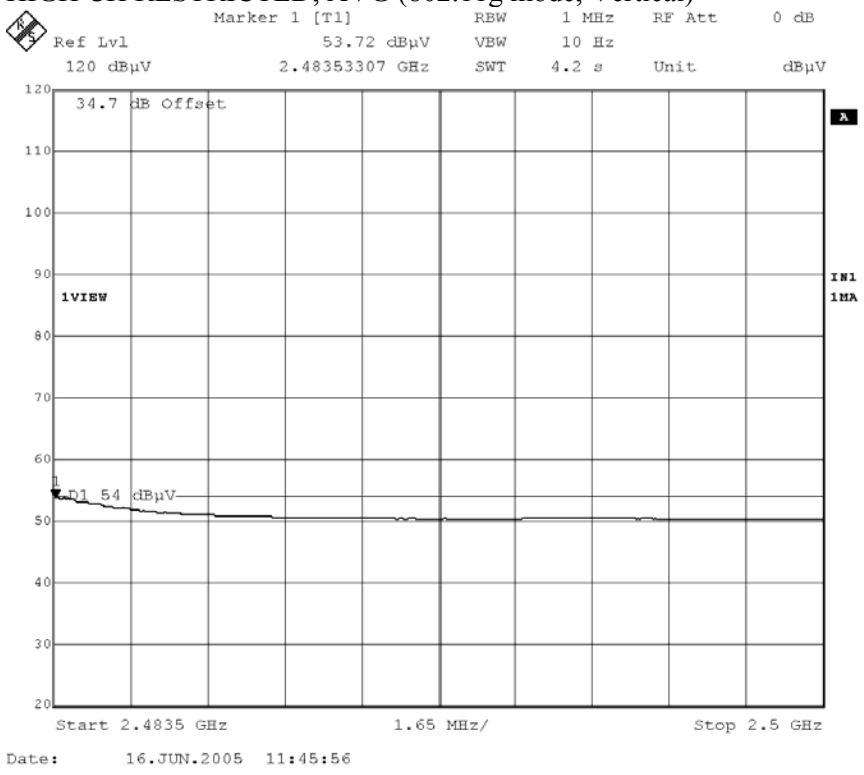
HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)



RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)



HIGH CH RESTRICTED, AVG (802.11g mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (g MODE)

06/16/05 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: David Garcia
Project #: 05U3491-1
Company: Airgo
EUT Descrip.: 2x2 802.11b/g WLAN PC Card
EUT M/N: AGN1022PC-01
Test Target: FCC 15.247, 15.205
Mode Oper: 11g Tx
Average Power Meter: Low = xx dBm, Mid = xx dBm, High = xx dBm

Test Equipment:

EMCO Horn 1-18GHz: T119; S/N: 29301 @3m
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:
Horn >18GHz:

Hi Frequency Cables
2 foot cable: 2_David
3 foot cable:
4 foot cable: 4_David
12 foot cable: 12_Yan

HPF: HPF_1.5GHz
Reject Filter: R_001

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
2412 Channel, 16 dB software power setting															
4.824	3.0	43.3	30.0	34.0	5.5	-33.6	0.0	0.6	49.9	36.6	74	54	-24.1	-17.4	V
4.824	3.0	43.0	29.8	34.0	5.5	-33.6	0.0	0.6	49.6	36.4	74	54	-24.4	-17.6	H
2437 Channel, 20 dB software power setting															
4.874	3.0	44.5	30.1	34.1	5.5	-33.5	0.0	0.6	51.1	36.7	74	54	-22.9	-17.3	V
7.311	3.0	43.8	30.7	35.6	6.8	-33.3	0.0	0.6	53.5	40.4	74	54	-20.5	-13.6	V
4.874	3.0	43.1	29.9	34.1	5.5	-33.5	0.0	0.6	49.7	36.5	74	54	-24.3	-17.5	H
2462 Channel, 15 dB software power setting															
4.924	3.0	43.4	29.9	34.1	5.6	-33.5	0.0	0.6	50.1	36.6	74	54	-23.9	-17.4	V
4.924	3.0	43.1	29.8	34.1	5.6	-33.5	0.0	0.6	49.8	36.5	74	54	-24.2	-17.5	H
No Further emissions were detected above the noise floor of test receiver.															

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

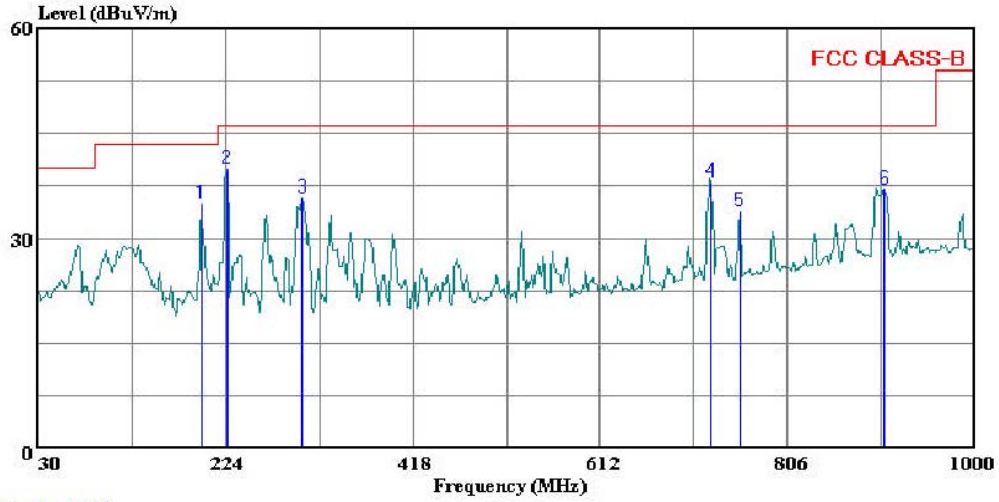
7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 2 File#: 05U3491.EMI Date: 06-24-2005 Time: 10:47:18



Trace: 1 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : David Garcia
Project #: : 05U3491
Company: : Airgo
EUT: : 802.11 b/g 2x 2 Cardbus
Model No. : AGN1022PC-01
Configuration : EUT installed in Sony laptop
Target of Test : FCC Class B
Mode of Operation: Tx low channel (highest power)

HORIZONTAL DATA

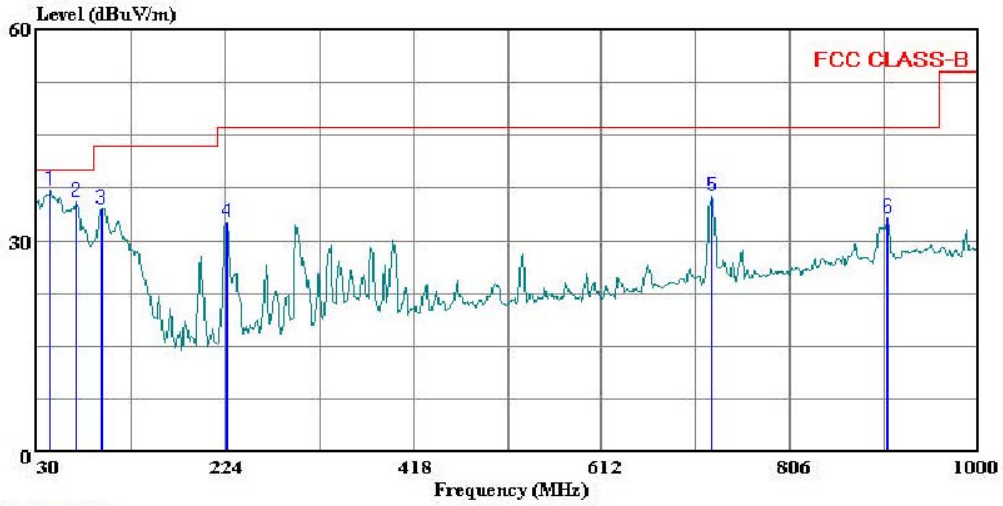
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	198.780	20.48	14.37	34.85	43.50	-8.65	Peak
2	225.940	26.90	12.91	39.81	46.00	-6.19	Peak
3	303.540	20.04	15.75	35.79	46.00	-10.21	Peak
4	726.460	14.54	23.53	38.06	46.00	-7.94	Peak
5	756.530	9.87	23.93	33.80	46.00	-12.20	Peak
6	906.880	10.91	26.01	36.92	46.00	-9.08	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 4 File#: 05U3491.EMI Date: 06-24-2005 Time: 10:53:18



(Audix ATC)

Trace: 3 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : David Garcia
Project #: : 05U3491
Company: : Airgo
EUT: : 802.11 b/g 2x 2 Cardbus
Model No. : AGN1022PC-01
Configuration : EUT installed in Sony laptop
Target of Test : FCC Class B
Mode of Operation: Tx low channel (highest power)

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	43.580	24.16	13.02	37.18	40.00	-2.82	Peak
2	70.740	26.21	9.34	35.55	40.00	-4.45	Peak
3	96.930	23.93	10.58	34.51	43.50	-8.99	Peak
4	225.940	19.65	12.91	32.56	46.00	-13.44	Peak
5	725.490	12.84	23.53	36.37	46.00	-9.63	Peak
6	906.880	7.30	26.01	33.31	46.00	-12.70	Peak

7.3. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

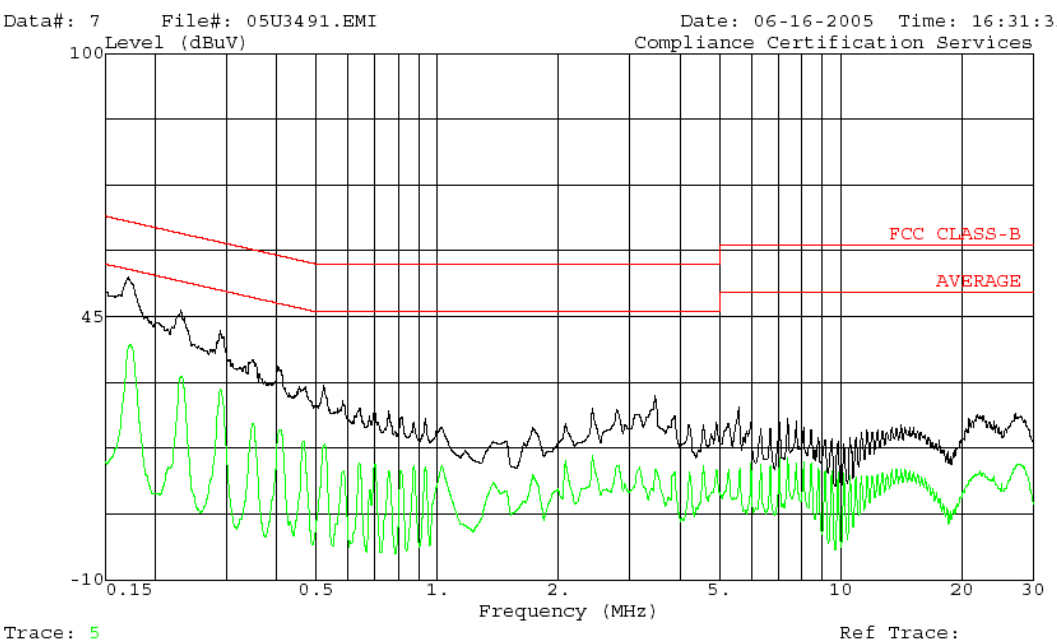
No non-compliance noted:

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.17	53.20	--	--	0.00	64.91	54.91	-11.71	-1.71	L1
3.47	28.52	--	--	0.00	56.00	46.00	-27.48	-17.48	L1
5.59	26.12	--	--	0.00	60.00	50.00	-33.88	-23.88	L1
0.17	51.86	--	--	0.00	64.91	54.91	-13.05	-3.05	L2
3.82	28.52	--	--	0.00	56.00	46.00	-27.48	-17.48	L2
4.90	26.98	--	--	0.00	56.00	46.00	-29.02	-19.02	L2
6 Worst Data									

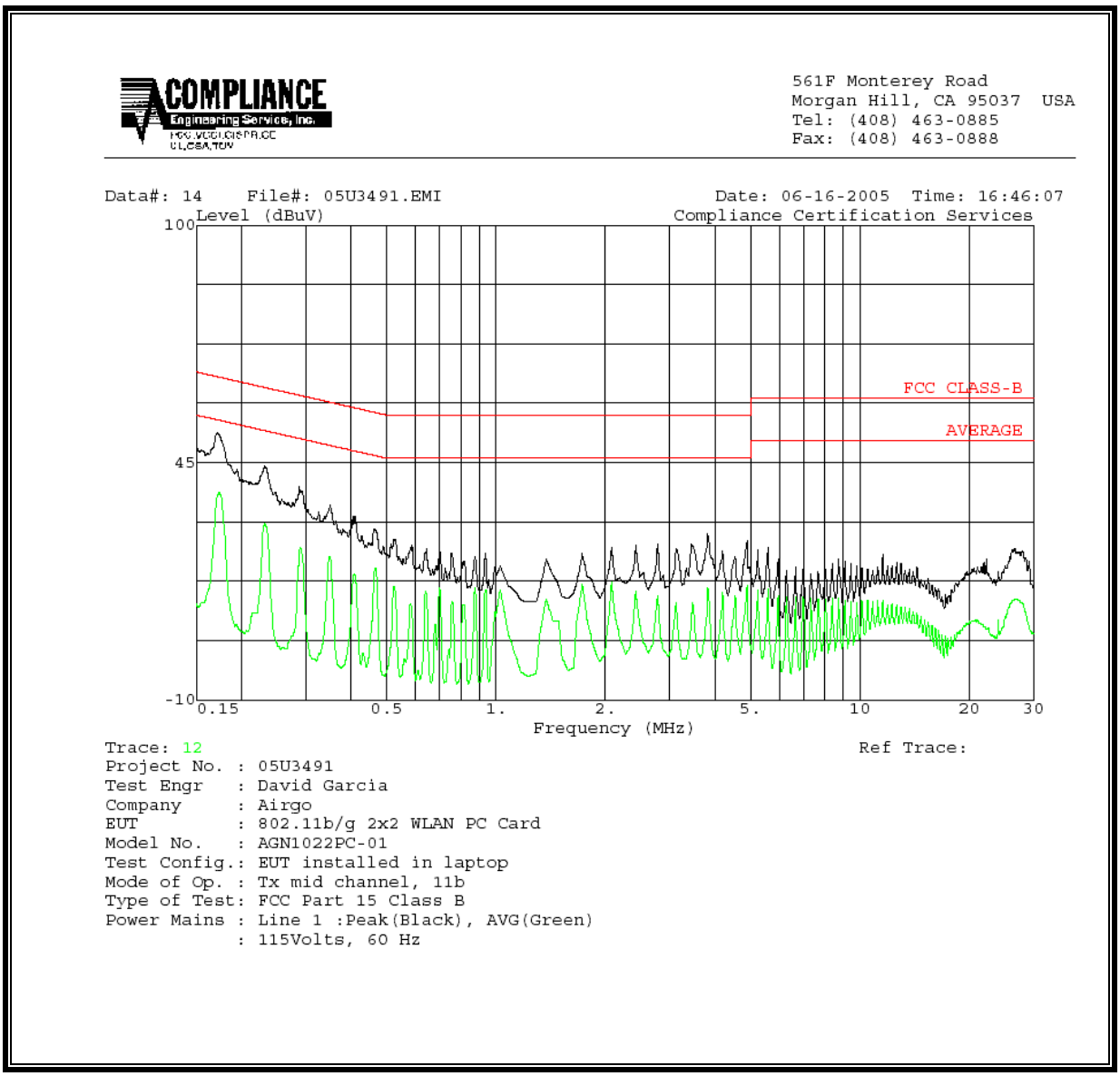
LINE 1 RESULTS

561F Monterey Road
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



Trace: 5 Ref Trace:
Project No. : 05U3491
Test Engr : David Garcia
Company : Airgo
EUT : 802.11b/g 2x2 WLAN PC Card
Model No. : AGN1022PC-01
Test Config.: EUT installed in laptop
Mode of Op. : Tx mid channel, 11b
Type of Test: FCC Part 15 Class B
Power Mains : Line 1 :Peak(Black), AVG(Green)
: 115Volts, 60 Hz

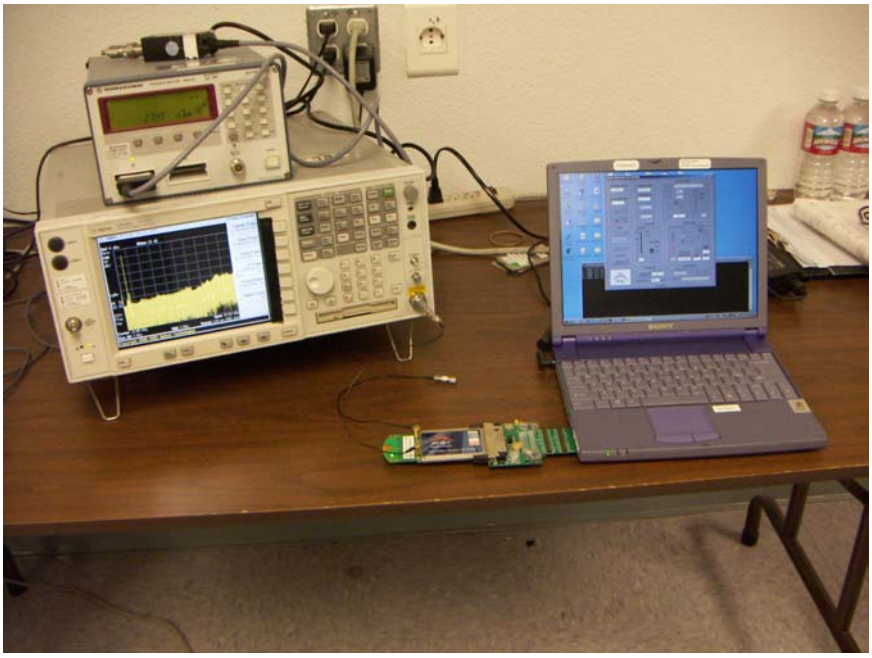
LINE 2 RESULTS



8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO



RADIATED RF MEASUREMENT SETUP

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO

END OF REPORT