FCC CFR47 PART 15 SUBPART C CERTIFICATION

TEST REPORT

FOR

802.11b/g CARDBUS

MODEL NUMBER: AR5BCB-00043

FCC ID: PPD-AR5BCB-00043

REPORT NUMBER: 03U2247-1

ISSUE DATE: SEPTEMBER 17, 2003

Prepared for
ATHEROS COMMUNICATIONS
529 ALMANOR AVE.
SUNNYVALE
CA 94085, USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION

COMPANY NAME: ATHEROS COMMUNICATIONS
529 ALMANOR AVE.
SUNNYVALE, CA 94085

EUT DESCRIPTION: 802.11B/G CARDBUS

MODEL: AR5BCB-00043

DATE TESTED: SEPTEMBER 10 – SEPTEMBER 16, 2003

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: This document reports conditions under which testing was conducted and results of tests performed. 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.

Approved & Released For CCS By:

MIKE HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

NEELESH RAJ
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The EUT is an 802.11b/g transceiver module in a Cardbus form factor.

It utilizes two identical internal antennas, each with a maximum gain of 0 dBi.

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

Frequency Band (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2400 - 2483.5	802.11b	23.32	214.78
2400 - 2483.5	802.11g Normal	22.53	179.06
2400 - 2483.5	802.11g Turbo	23.53	225.42

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/1992, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

4. FACILITIES AND ACCREDITATION

The open area test sites and conducted 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.

NVLAP®

LAB CODE:200065-0

No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

5. CALIBRATION AND UNCERTAINTY

5.1. 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.

5.2. MEASUREMENT UNCERTAINTY

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

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%.

5.3. TEST AND MEASUREMENT EQUIPMENT

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

TEST AND MEASUREMENT EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due Date
Quasi-Peak Adapter	HP	85650A	2521A01038	7/16/2004
SA Display Section	HP	85662A	2314A04793	7/16/2004
SA RF Section	HP	85680A	2314A02604	7/16/2004
Preamplifier	HP	8447D	2944A06589	8/15/2004
Antenna, Biconical	Eaton	94455-1	1214	3/6/04
Antenna, Log Periodic	EMCO	3146	9107-3163	3/06/04
EMI Test Receiver	R & S	ESHS 20	827129/006	7/17/2004
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	10/6/2003
Spectrum Analyzer	AGILENT	E4446A	US42070220	1/13/04
Pre-amplifier	MITEQ	NSP2600-SP	924341	4/25/04
Horn Antenna	EMCO	3115	6717	2/4/04
Power Meter	AGILENT	E4416A	0841291160	11/7/04
Power Sensor	Agilent	E9327A	US40440755	11/7/04
High Pass Filter (4.57GHz)	FSY Microwave	FM-4570-9SS	003	N.C.R.

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Device Type	Manufacturer	Model	Serial Number	FCC ID
Laptop	Toshiba	TC8517ZCA000	J291200E8019	Doc
Power Adapter	Toshiba	PA3083U-1ACA	0536906G	Doc

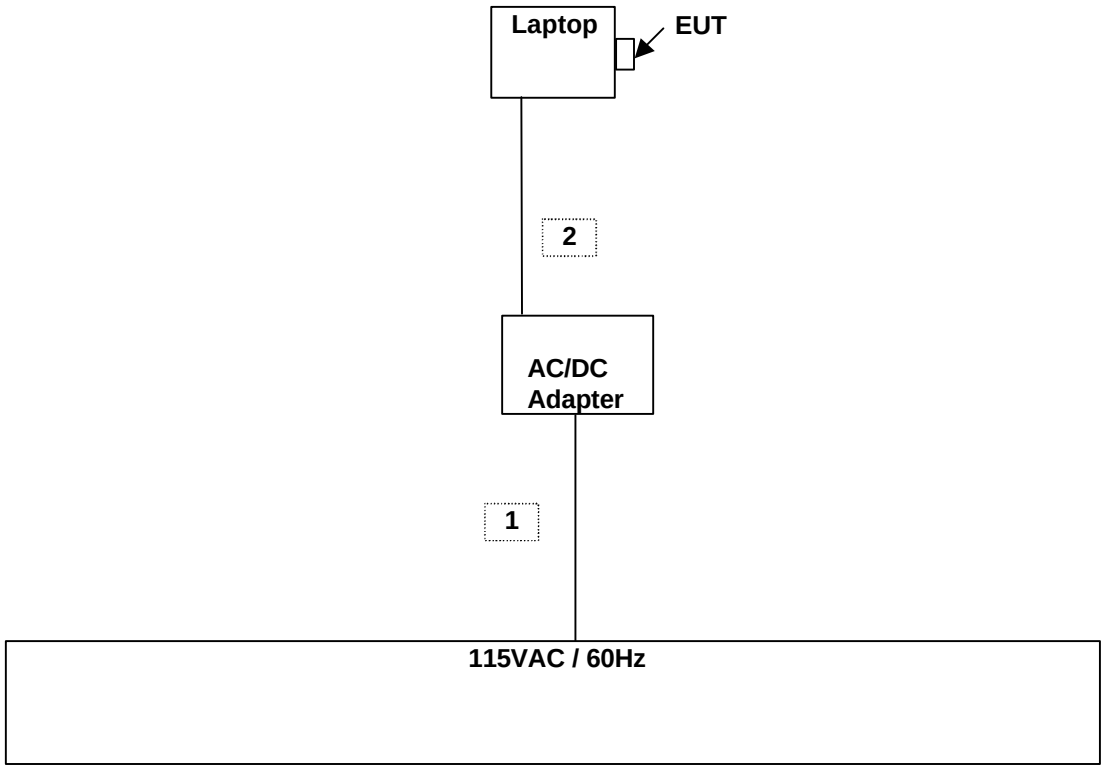
I/O CABLES

Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	US115V	Un-Shielded	2m	NA

TEST SETUP

The EUT was installed in the host computer and operated via a test program.

SETUP DIAGRAM FOR TESTS



7. APPLICABLE LIMITS AND TEST RESULTS

7.1. 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 100 kHz. The sweep time is coupled.

RESULTS

No non-compliance noted:

802.11b Mode

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	11900	500	11400
Middle	2437	12200	500	11700
High	2462	12250	500	11750
High	2467	11750	500	11250
High	2472	11950	500	11450

802.11g Normal Mode

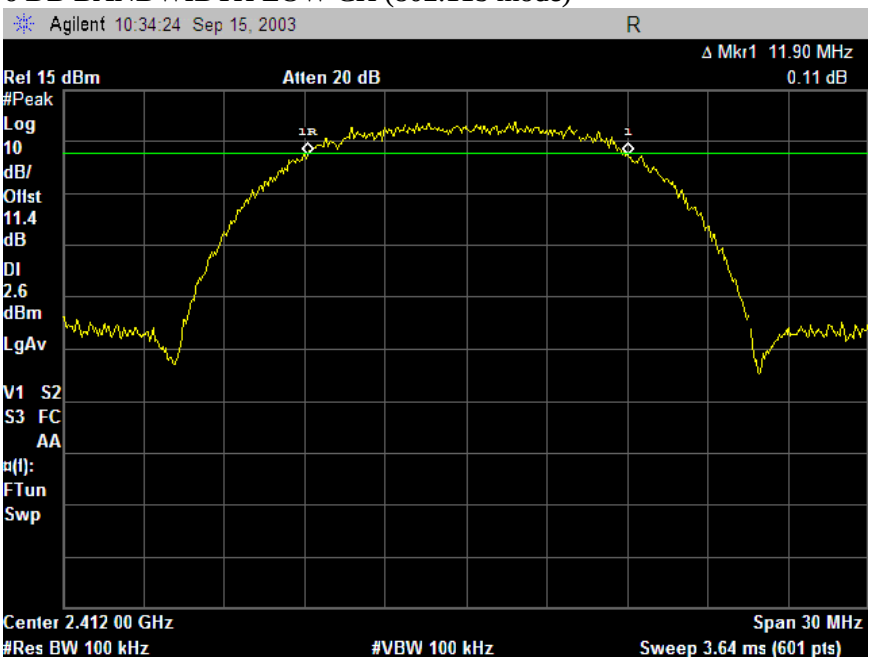
Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	16550	500	16050
Middle	2437	16550	500	16050
High	2462	16550	500	16050
High	2467	16550	500	16050
High	2472	16500	500	16000

802.11g Turbo Mode

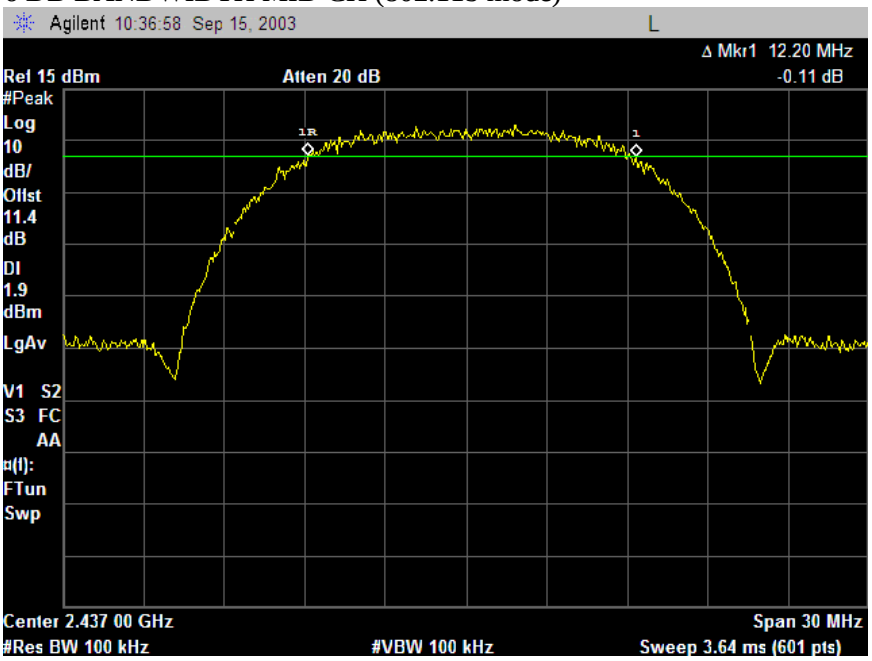
Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Middle	2437	32750	500	32250

6 DB BANDWIDTH (802.11b MODE)

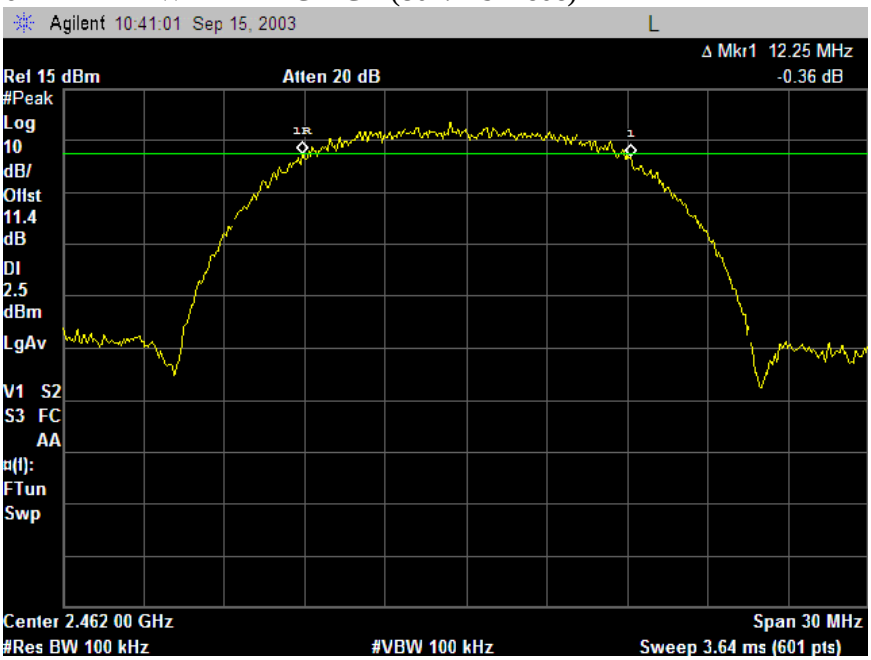
6 DB BANDWIDTH LOW CH (802.11b mode)



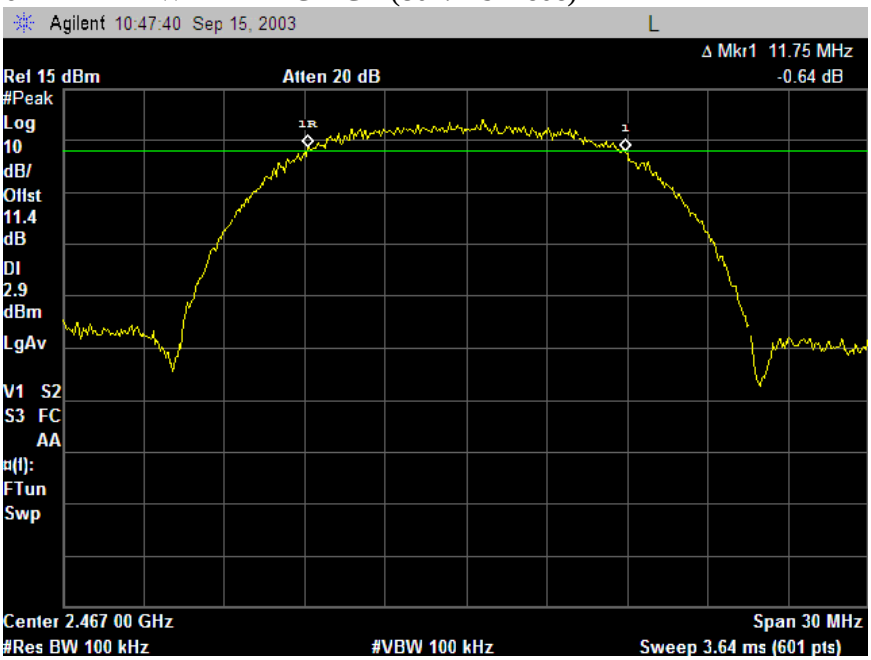
6 DB BANDWIDTH MID CH (802.11b mode)



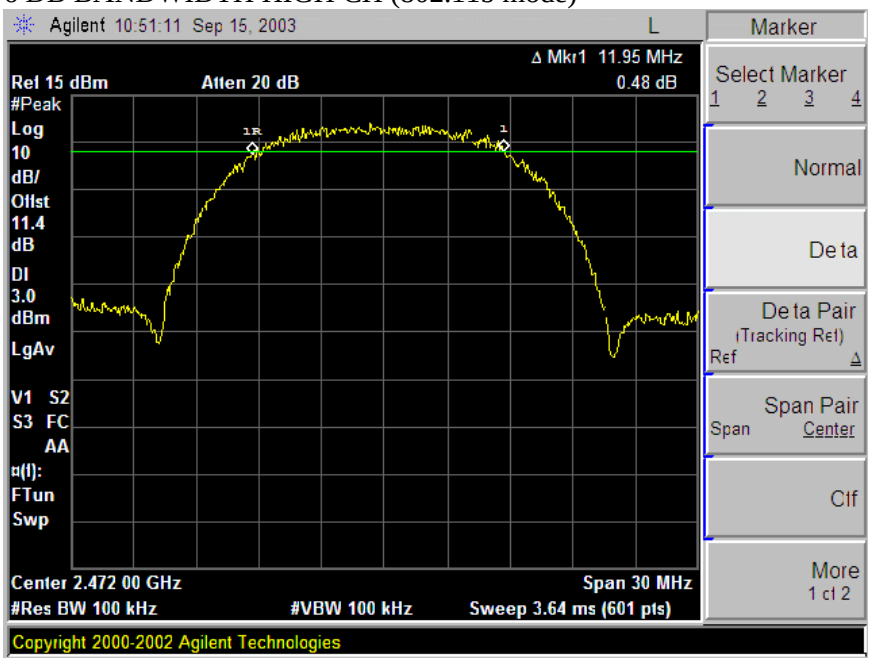
6 DB BANDWIDTH HIGH CH (802.11b mode)



6 DB BANDWIDTH HIGH CH (802.11b mode)

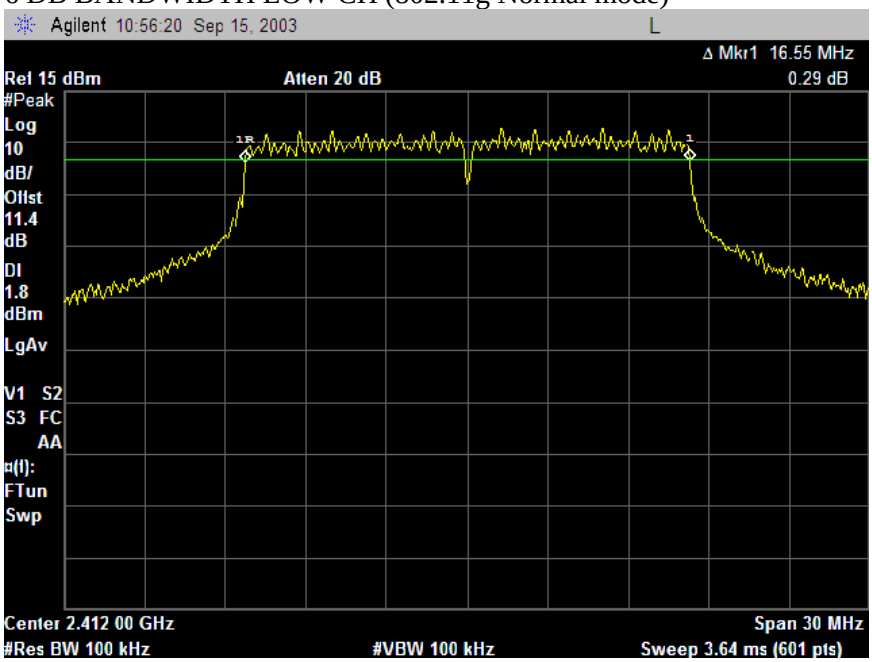


6 DB BANDWIDTH HIGH CH (802.11b mode)

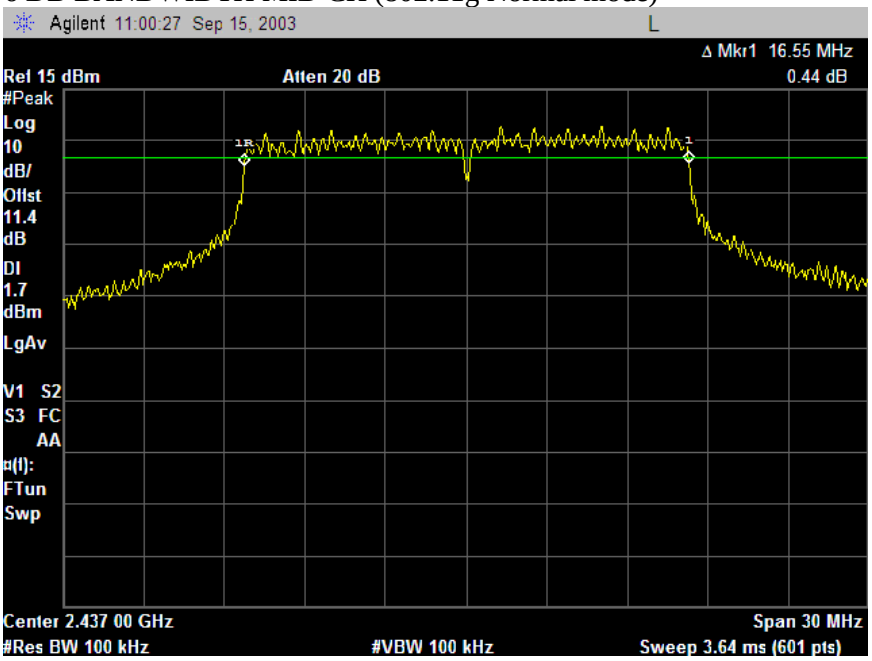


6 DB BANDWIDTH (802.11g NORMAL MODE)

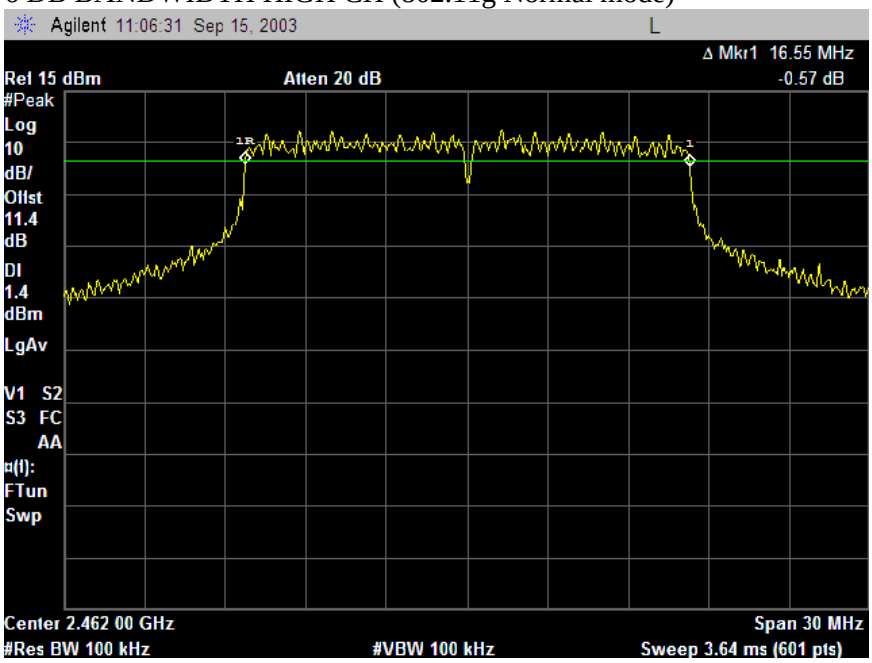
6 DB BANDWIDTH LOW CH (802.11g Normal mode)



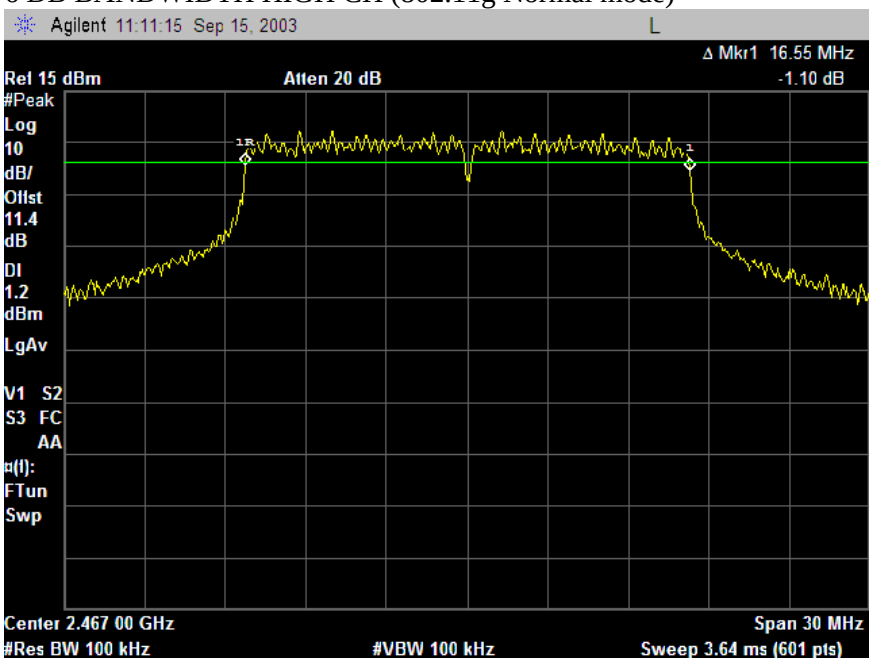
6 DB BANDWIDTH MID CH (802.11g Normal mode)



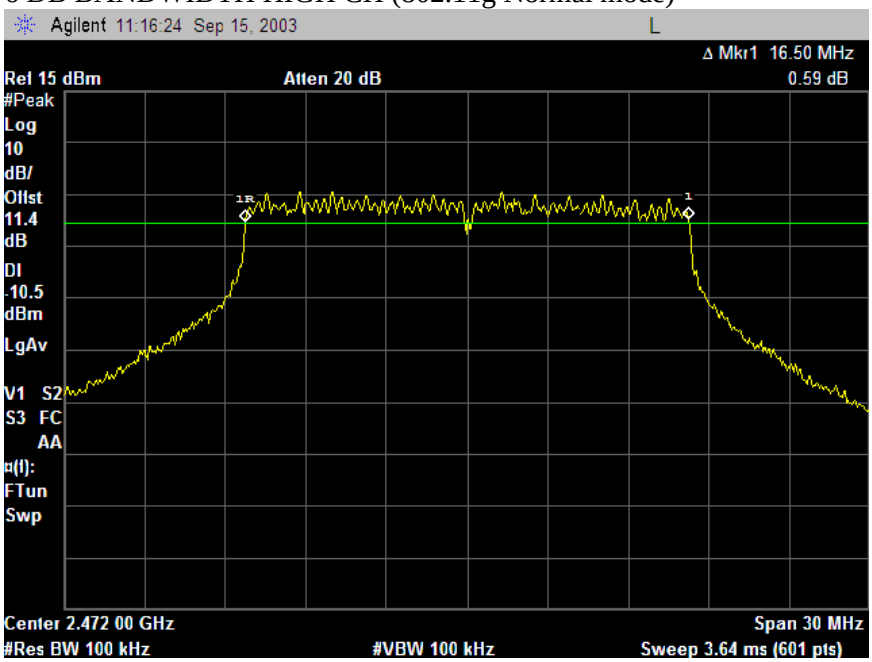
6 DB BANDWIDTH HIGH CH (802.11g Normal mode)



6 DB BANDWIDTH HIGH CH (802.11g Normal mode)

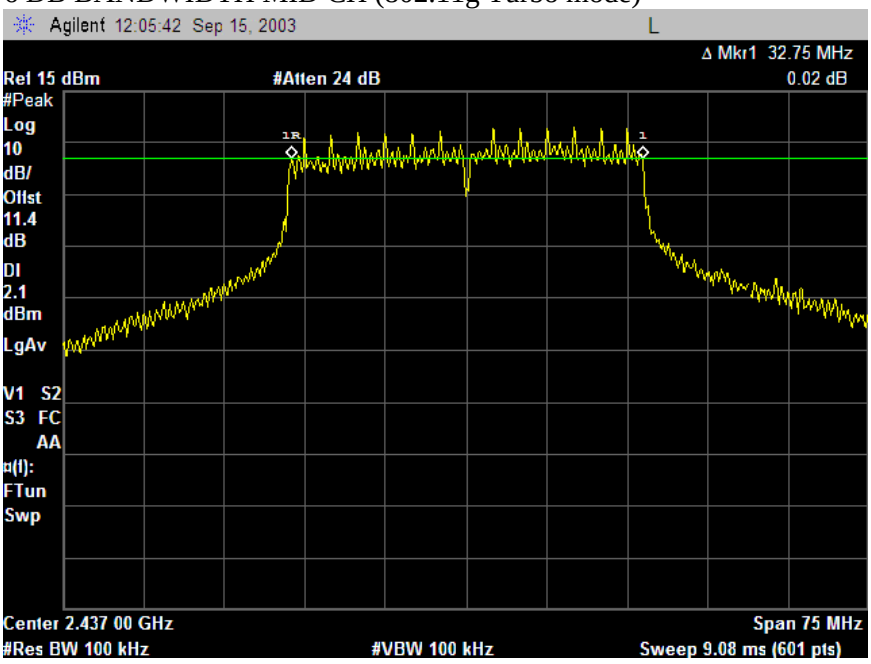


6 DB BANDWIDTH HIGH CH (802.11g Normal mode)



6 DB BANDWIDTH (802.11g TURBO MODE)

6 DB BANDWIDTH MID CH (802.11g Turbo mode)



7.2. 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 Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	15.2236
Middle	2437	15.6407
High	2462	15.3276
High	2467	15.6089
High	2472	15.3934

802.11g Normal Mode

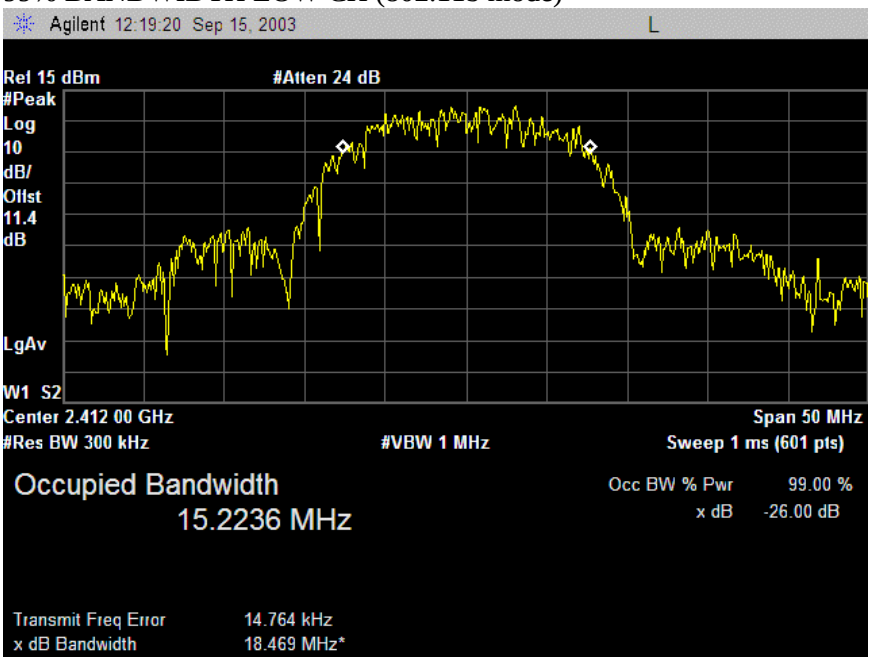
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.5617
Middle	2437	16.7016
High	2462	16.7594
High	2467	16.7892
High	2472	16.6243

802.11g Turbo Mode

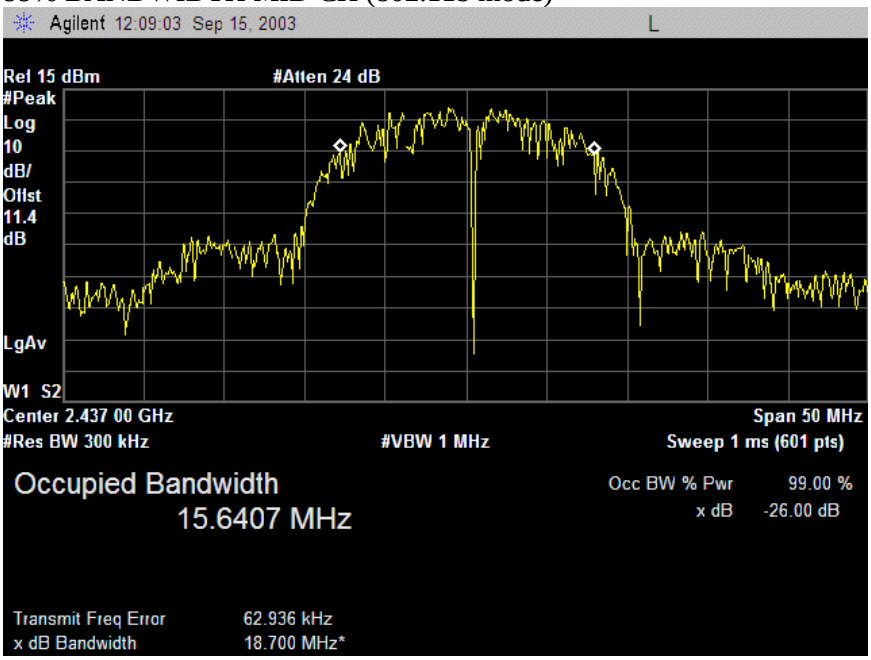
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Middle	2437	33.0825

99% BANDWIDTH (802.11b MODE)

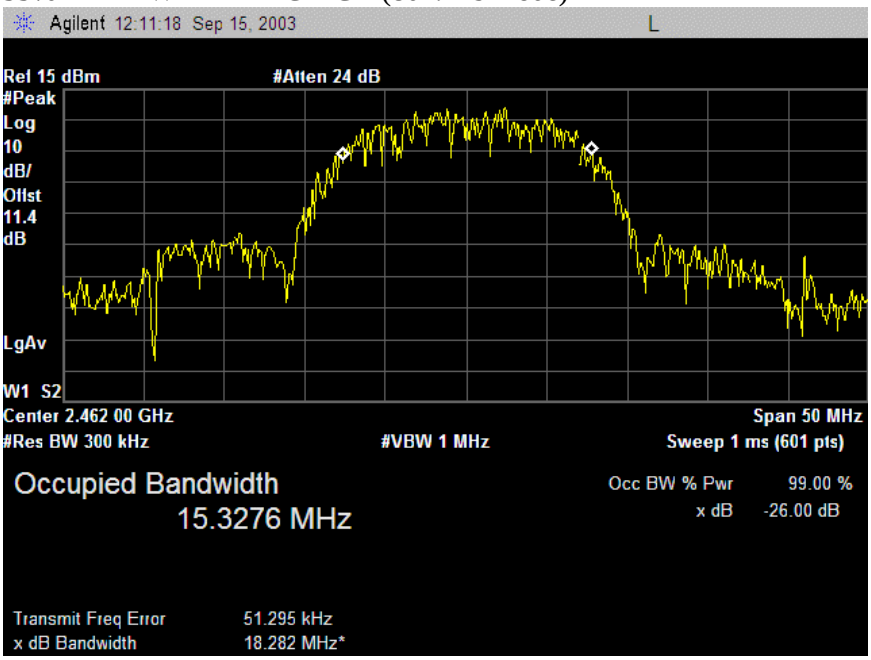
99% BANDWIDTH LOW CH (802.11b mode)



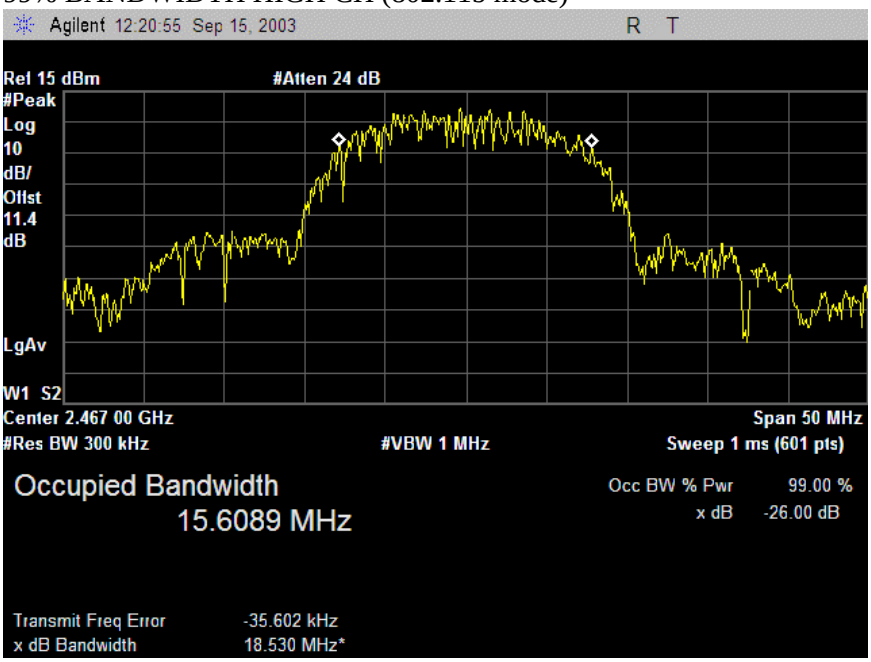
99% BANDWIDTH MID CH (802.11b mode)



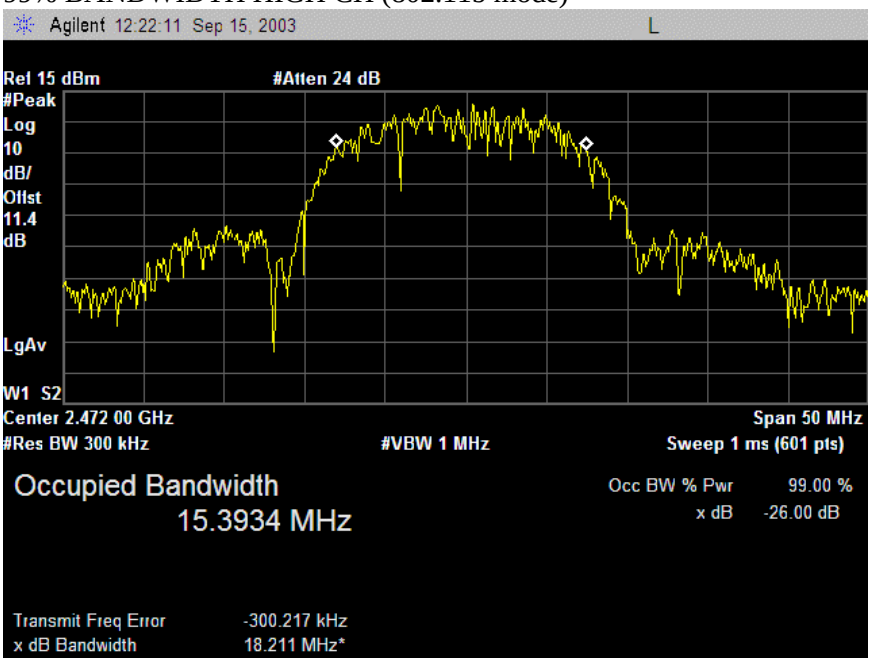
99% BANDWIDTH HIGH CH (802.11b mode)



99% BANDWIDTH HIGH CH (802.11b mode)

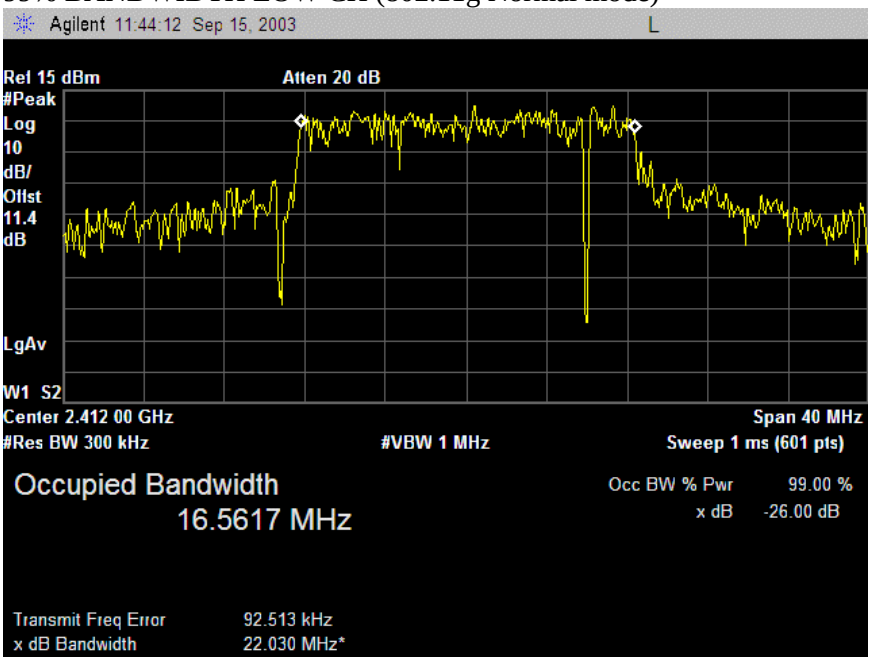


99% BANDWIDTH HIGH CH (802.11b mode)

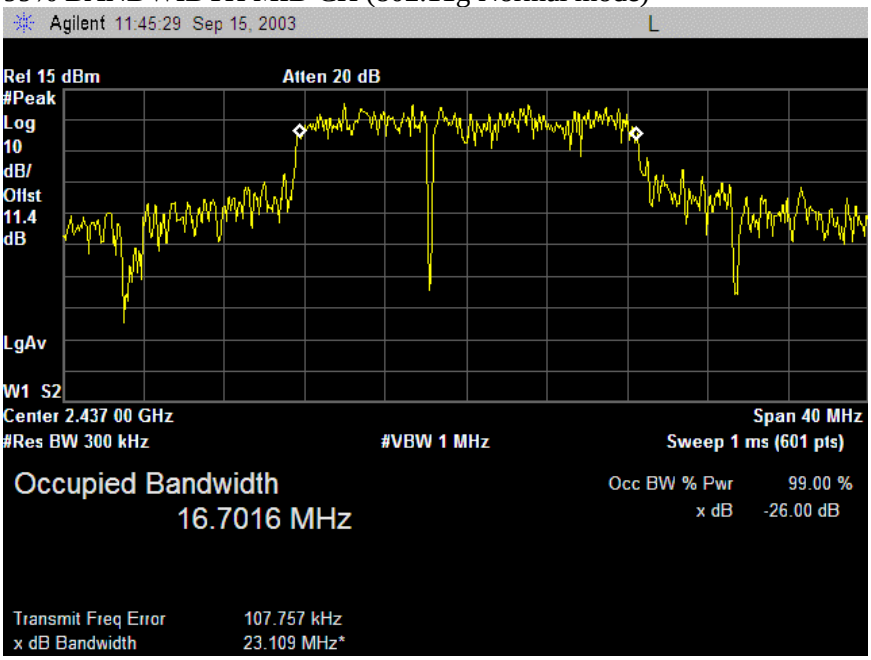


99% BANDWIDTH (802.11g NORMAL MODE)

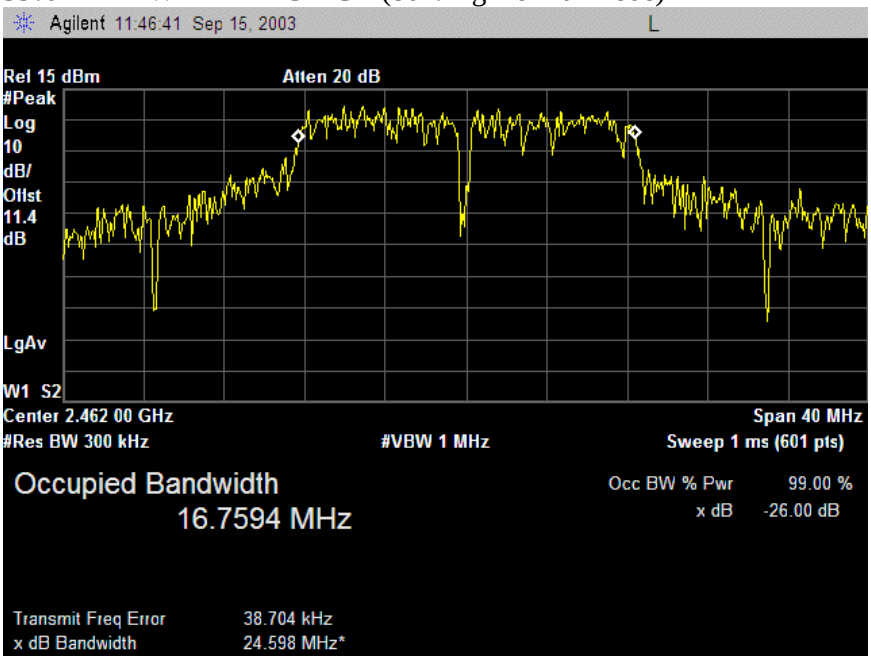
99% BANDWIDTH LOW CH (802.11g Normal mode)



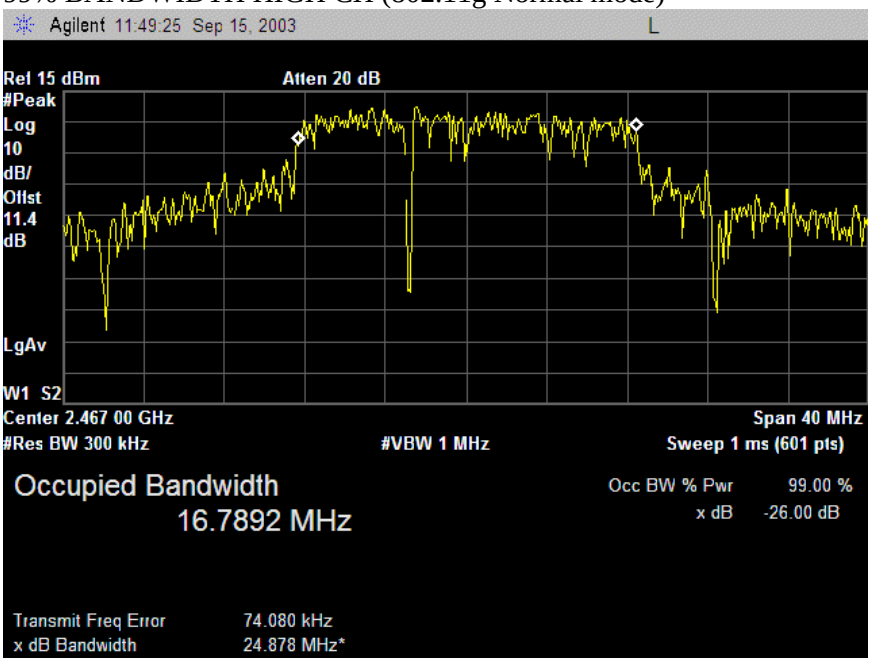
99% BANDWIDTH MID CH (802.11g Normal mode)



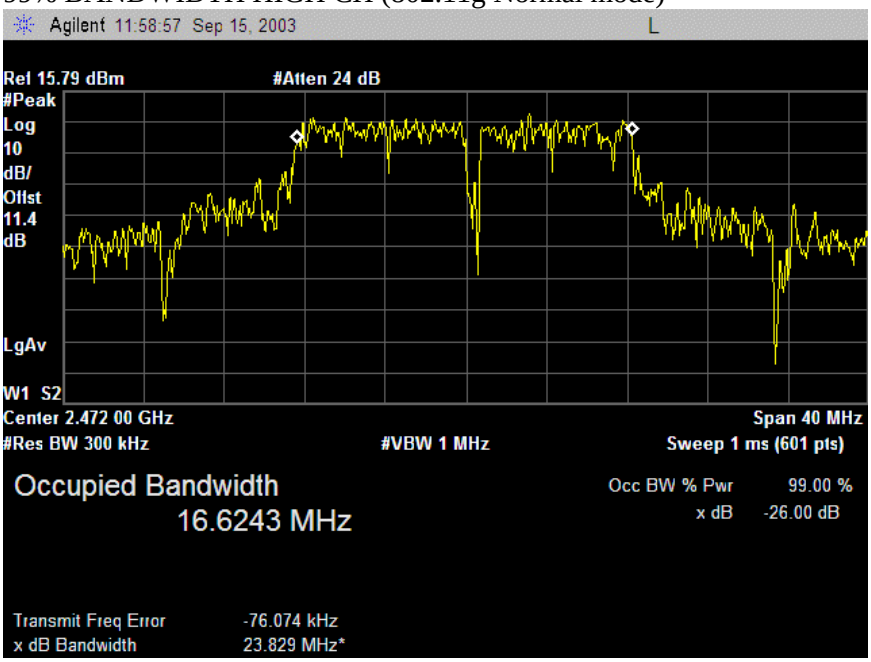
99% BANDWIDTH HIGH CH (802.11g Normal mode)



99% BANDWIDTH HIGH CH (802.11g Normal mode)

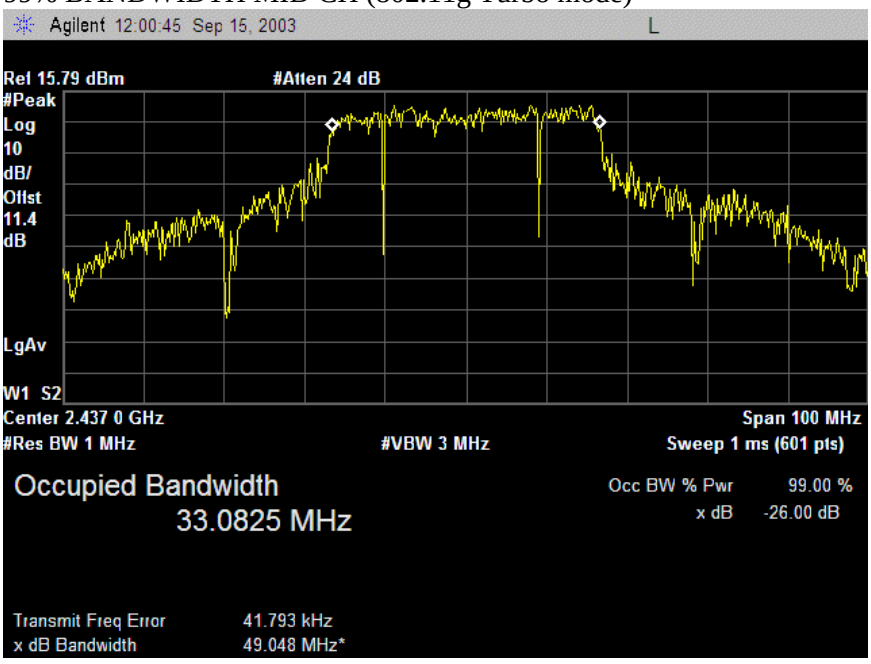


99% BANDWIDTH HIGH CH (802.11g Normal mode)



99% BANDWIDTH (802.11g TURBO MODE)

99% BANDWIDTH MID CH (802.11g Turbo mode)



7.3. 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)(3) (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.

The maximum antenna gain is 0 dBi, therefore the limit is 30 dBm.

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

No non-compliance noted:

802.11b Mode

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	21.83	30	-8.17
Middle	2437	23.32	30	-6.68
High	2462	22.07	30	-7.93
High	2467	19.22	30	-10.78
High	2472	17.09	30	-12.91

802.11g Normal Mode

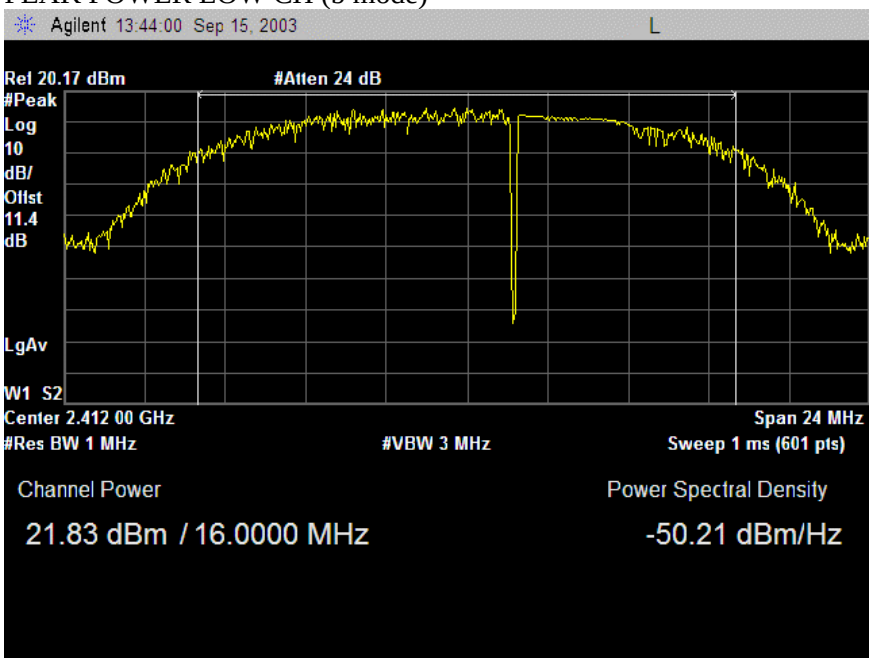
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	21.66	30	-8.34
Middle	2437	22.53	30	-7.47
High	2462	21.33	30	-8.67
High	2467	18.15	30	-11.85
High	2472	10.02	30	-19.98

802.11g Turbo Mode

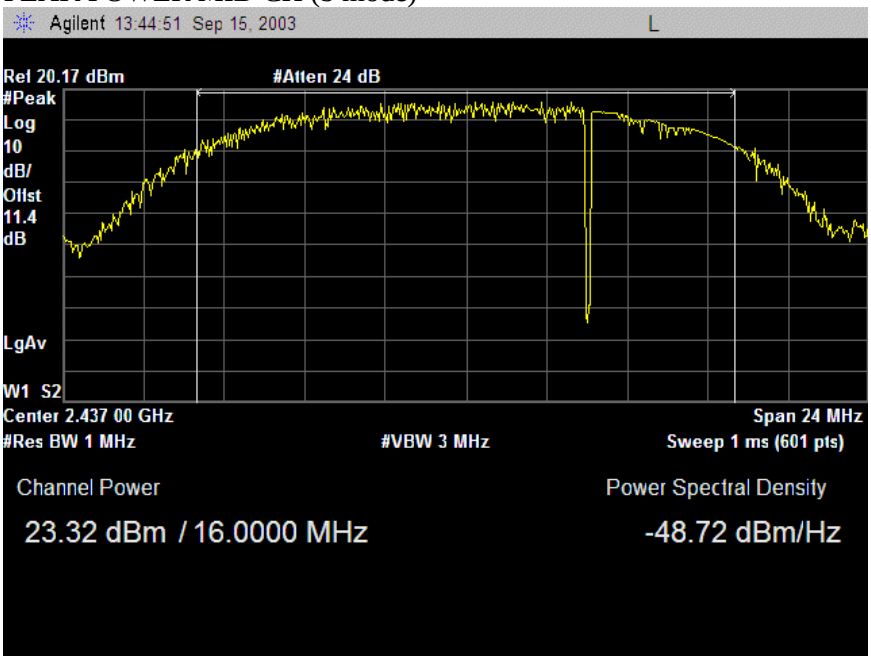
Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Middle	2437	23.53	30	-6.47

OUTPUT POWER (802.11b MODE)

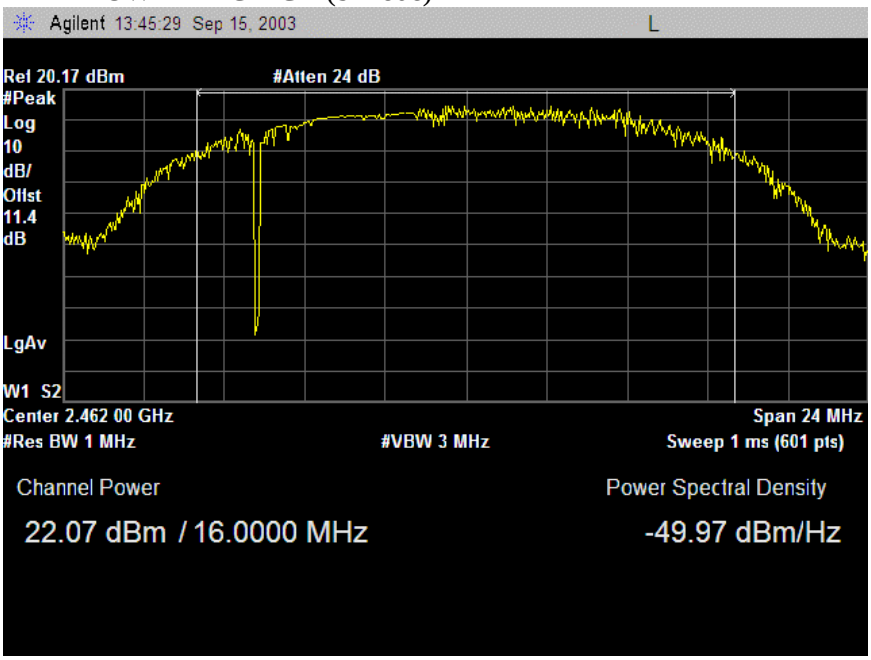
PEAK POWER LOW CH (b mode)



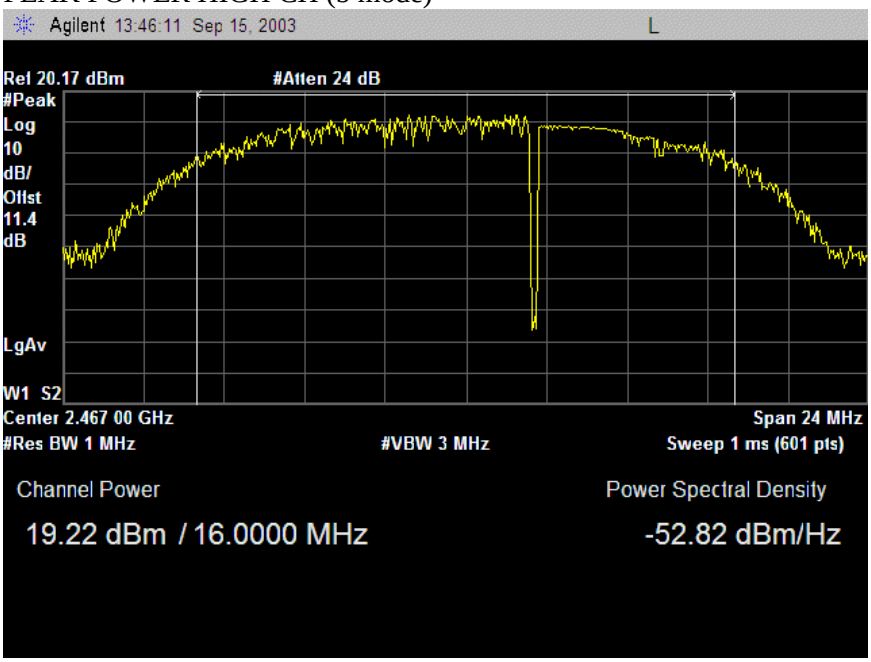
PEAK POWER MID CH (b mode)



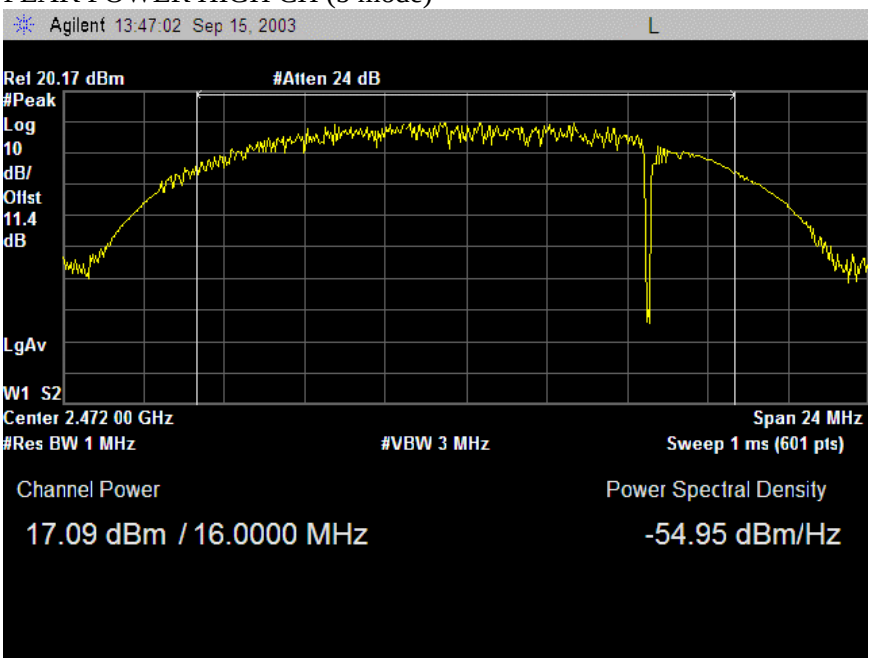
PEAK POWER HIGH CH (b mode)



PEAK POWER HIGH CH (b mode)

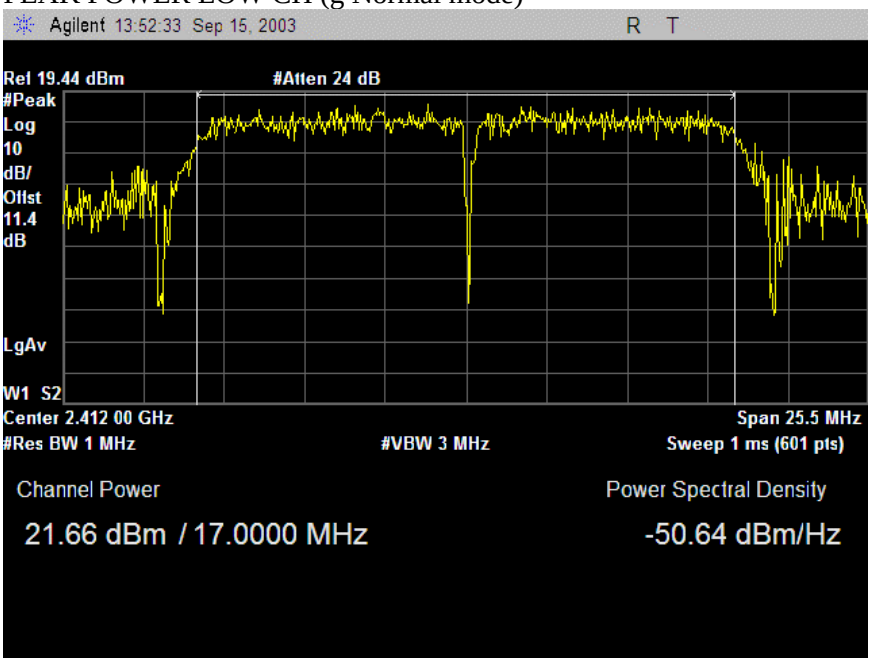


PEAK POWER HIGH CH (b mode)

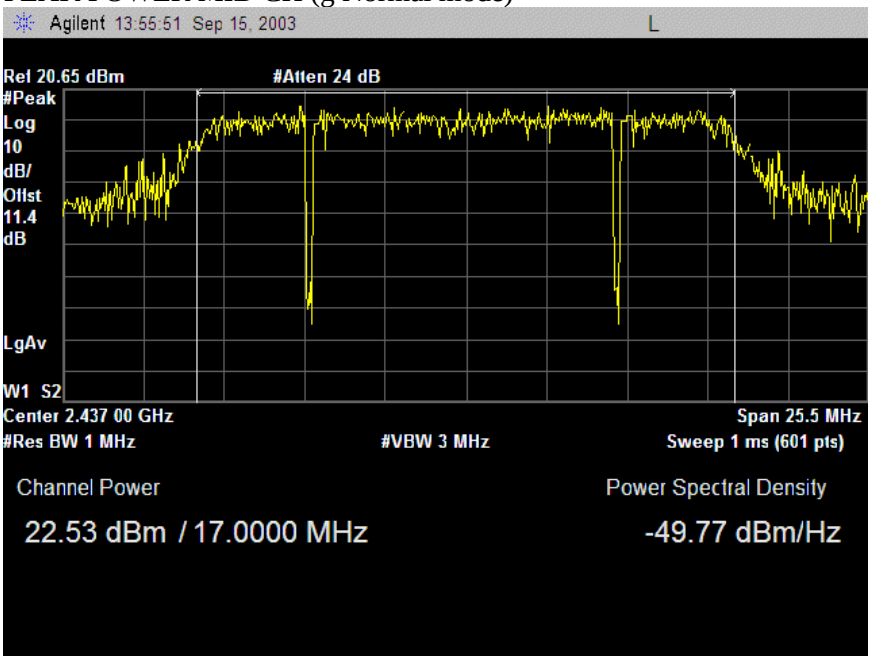


OUTPUT POWER (802.11g NORMAL MODE)

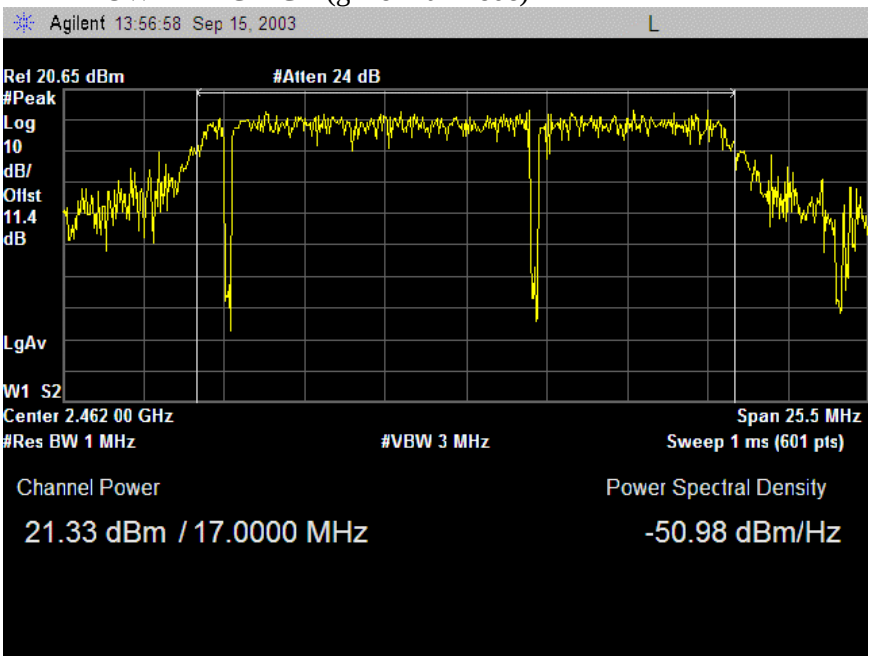
PEAK POWER LOW CH (g Normal mode)



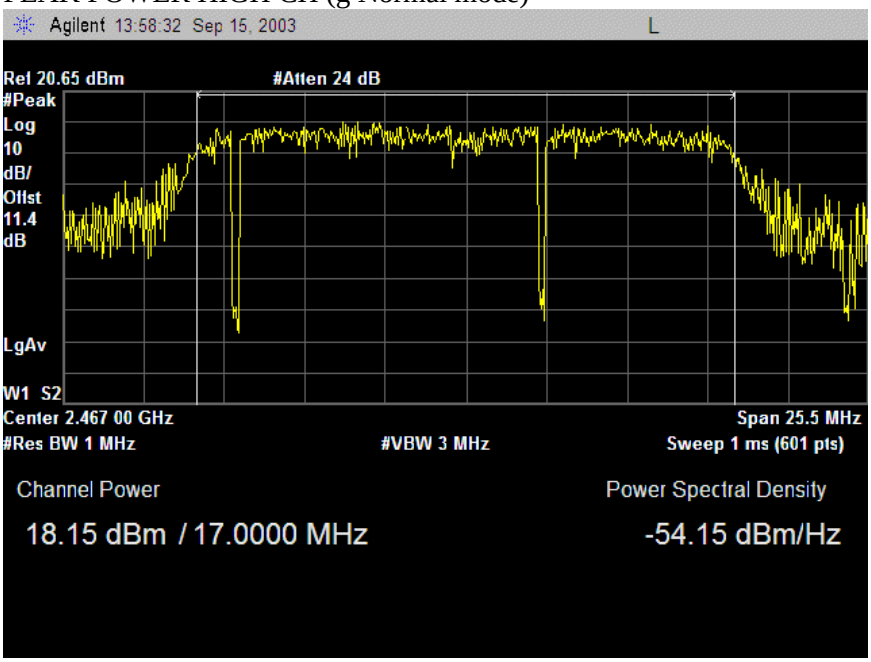
PEAK POWER MID CH (g Normal mode)



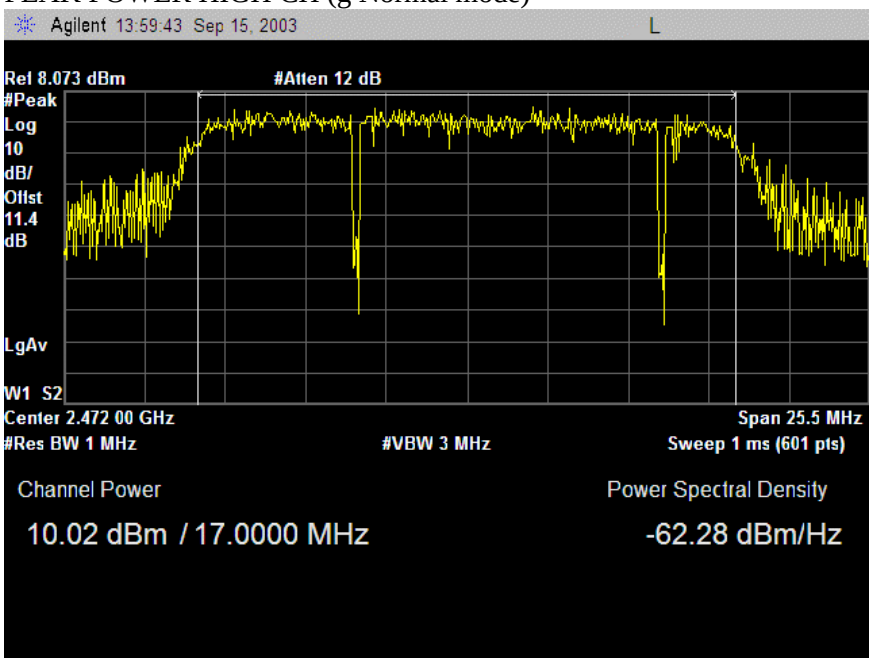
PEAK POWER HIGH CH (g Normal mode)



PEAK POWER HIGH CH (g Normal mode)

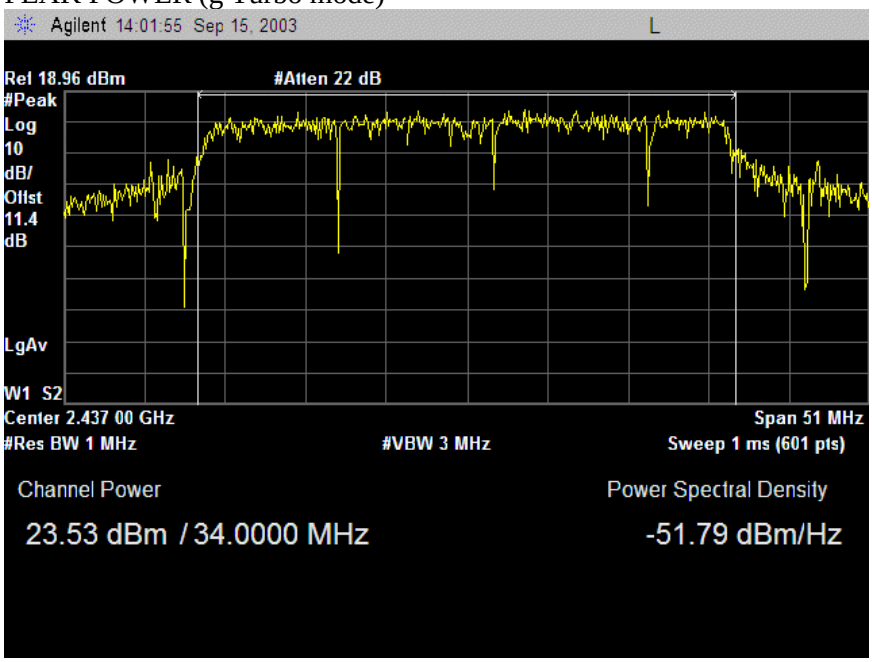


PEAK POWER HIGH CH (g Normal mode)



OUTPUT POWER (802.11g TURBO MODE)

PEAK POWER (g Turbo mode)



7.4. 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 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11b Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	2412	18.80
Middle	2437	19.70
High	2462	19.00
High	2467	16.80
High	2472	13.90

802.11g Normal Mode

Channel	Frequency (MHz)	Average Power (dBm)
Low	2412	17.90
Middle	2437	18.50
High	2462	17.50
High	2467	14.50
High	2472	6.70

802.11g Turbo Mode

Channel	Frequency (MHz)	Average Power (dBm)
Middle	2437	20.00

7.5. 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 Mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-4.77	8	-12.77
Middle	2437	-3.05	8	-11.05
High	2462	-2.99	8	-10.99
High	2467	-6.49	8	-14.49
High	2472	-9.91	8	-17.91

802.11g Normal Mode

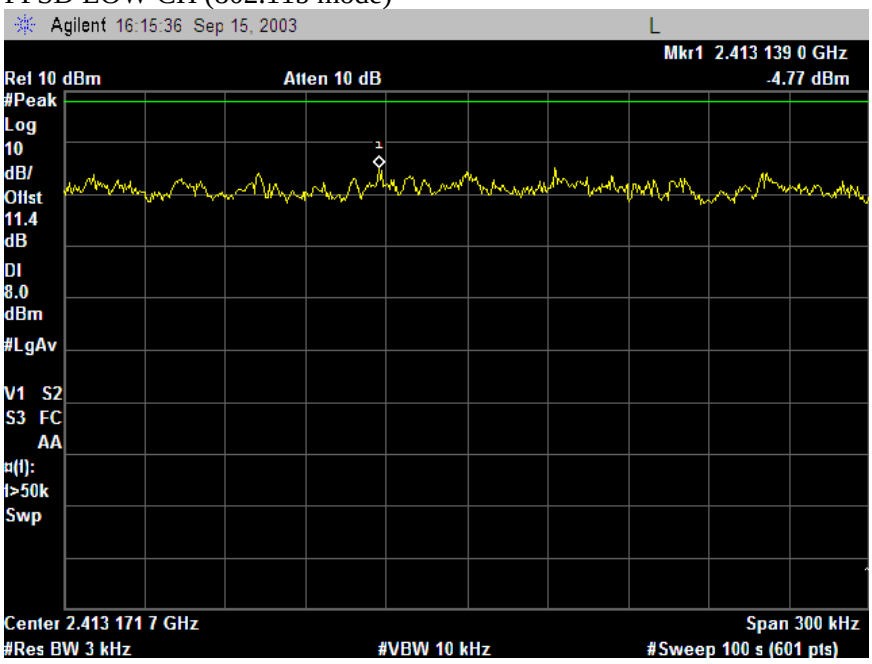
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.60	8	-14.60
Middle	2437	-5.68	8	-13.68
High	2462	-5.82	8	-13.82
High	2467	-8.81	8	-16.81
High	2472	-14.49	8	-22.49

802.11g Turbo Mode

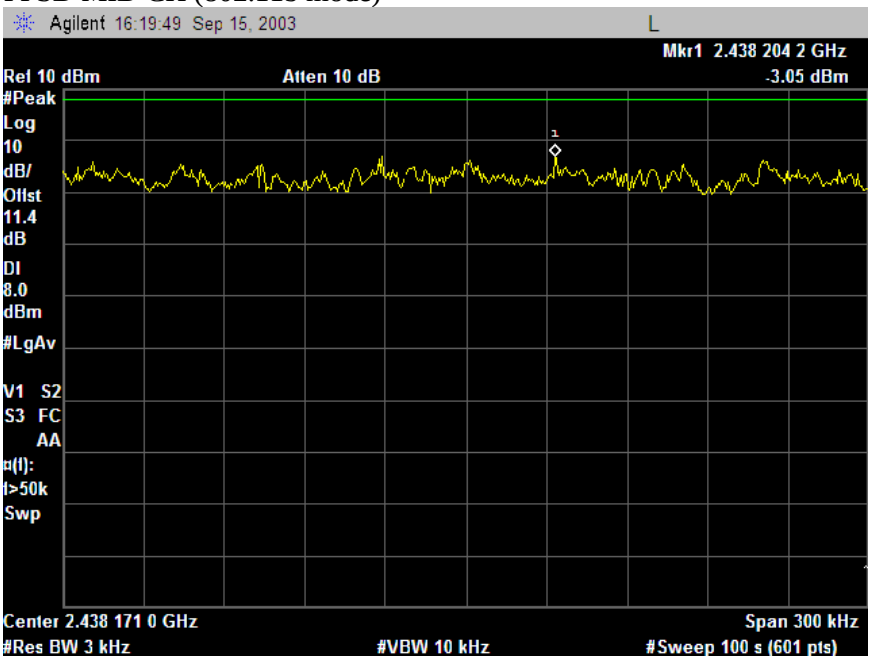
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Middle	2437	-6.09	8	-14.09

PEAK POWER SPECTRAL DENSITY (802.11b MODE)

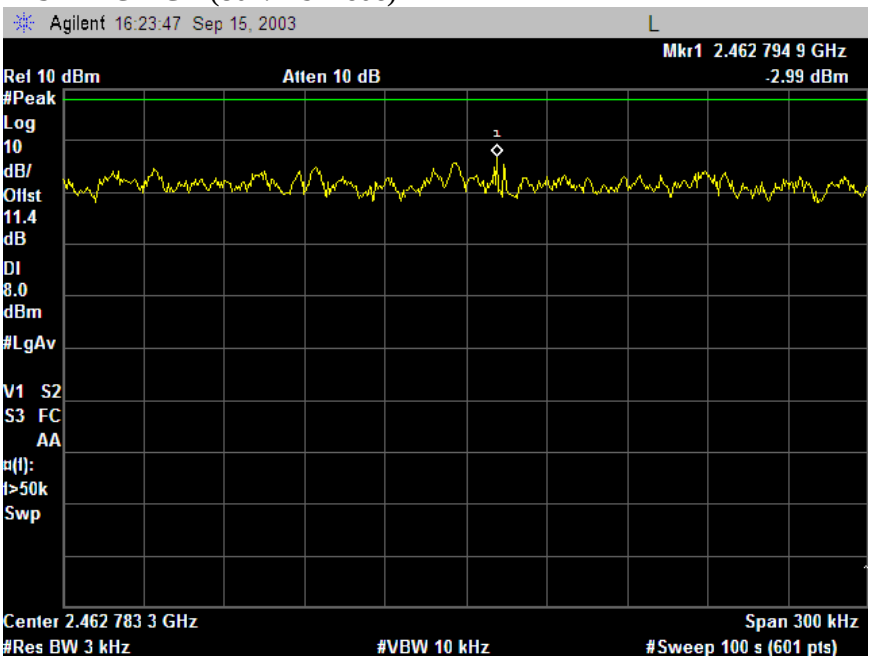
PPSD LOW CH (802.11b mode)



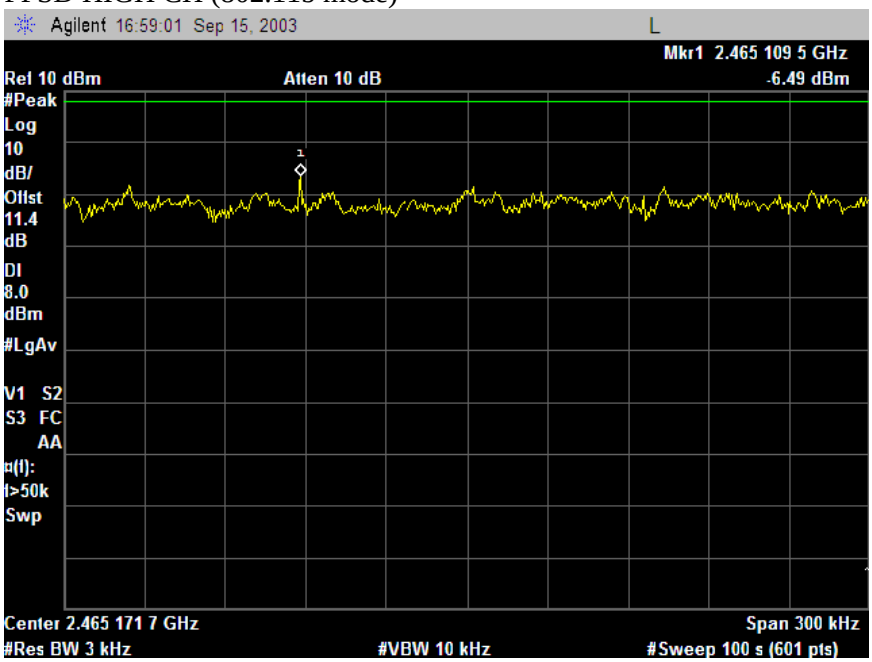
PPSD MID CH (802.11b mode)



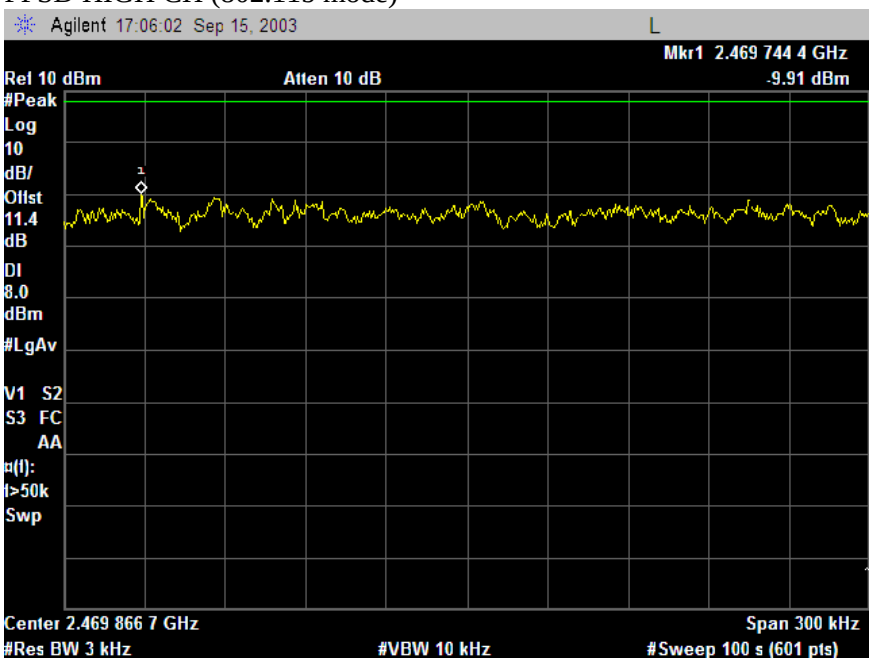
PPSD HIGH CH (802.11b mode)



PPSD HIGH CH (802.11b mode)

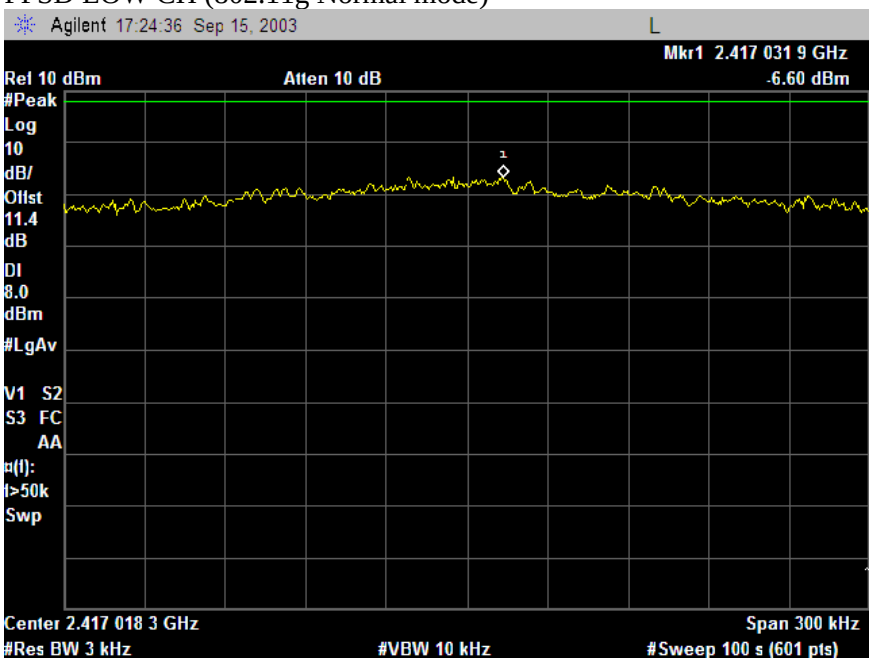


PPSD HIGH CH (802.11b mode)

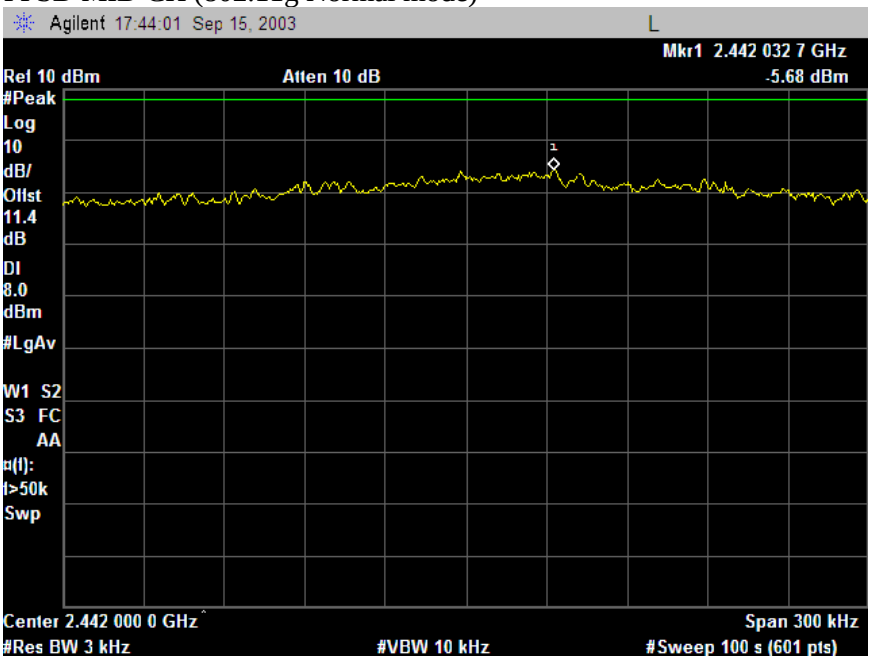


PEAK POWER SPECTRAL DENSITY (802.11g NORMAL MODE)

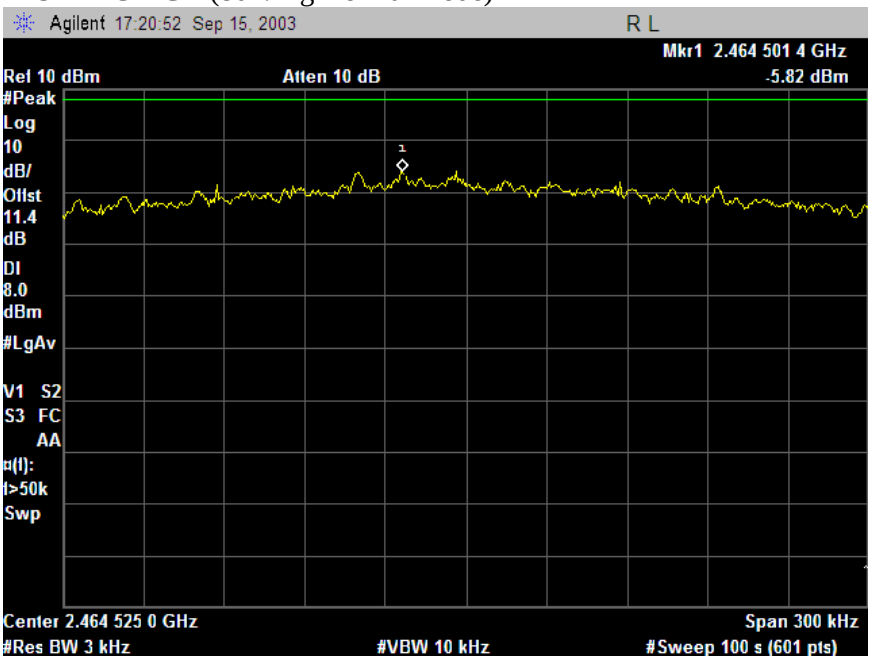
PPSD LOW CH (802.11g Normal mode)



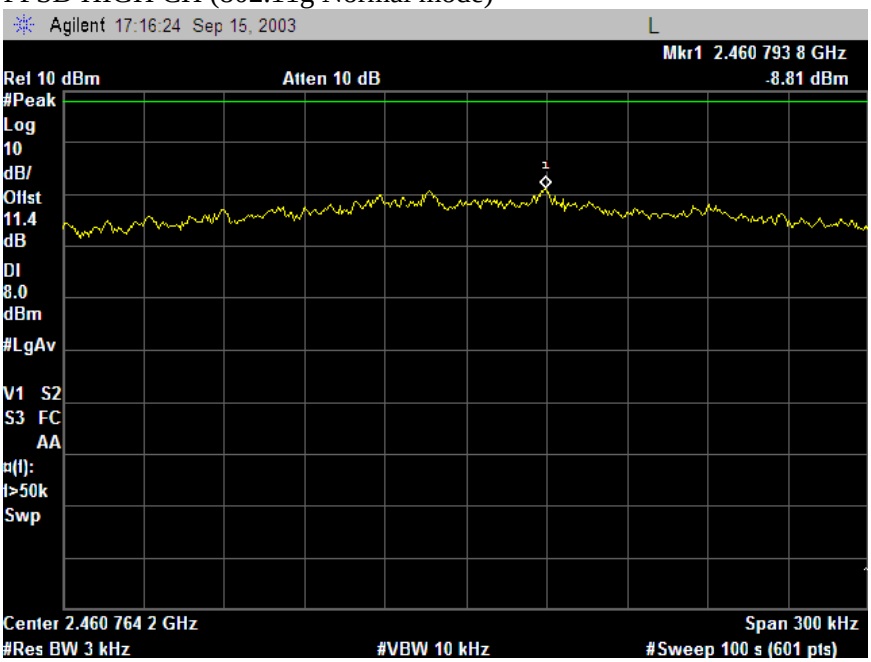
PPSD MID CH (802.11g Normal mode)



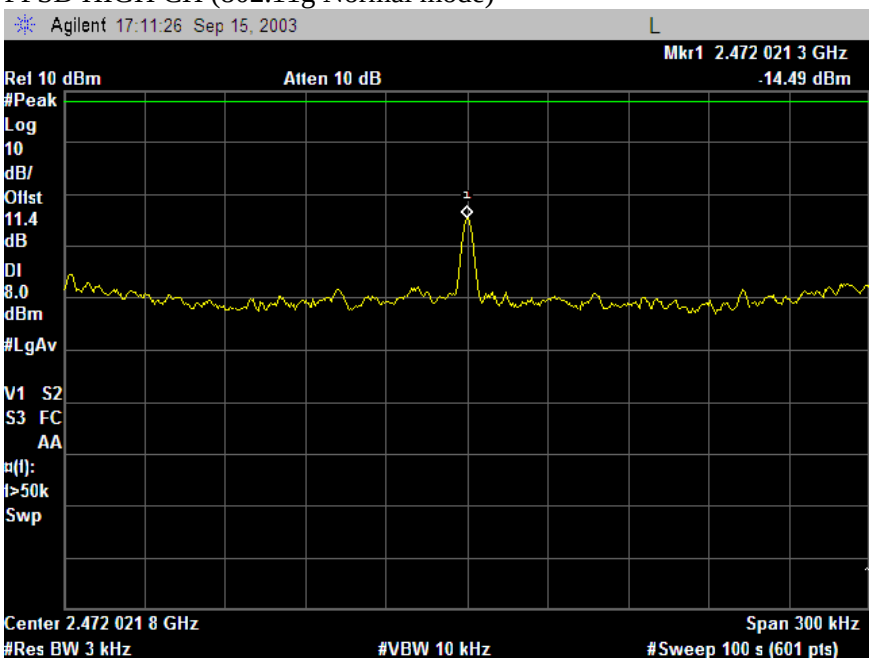
PPSD HIGH CH (802.11g Normal mode)



PPSD HIGH CH (802.11g Normal mode)

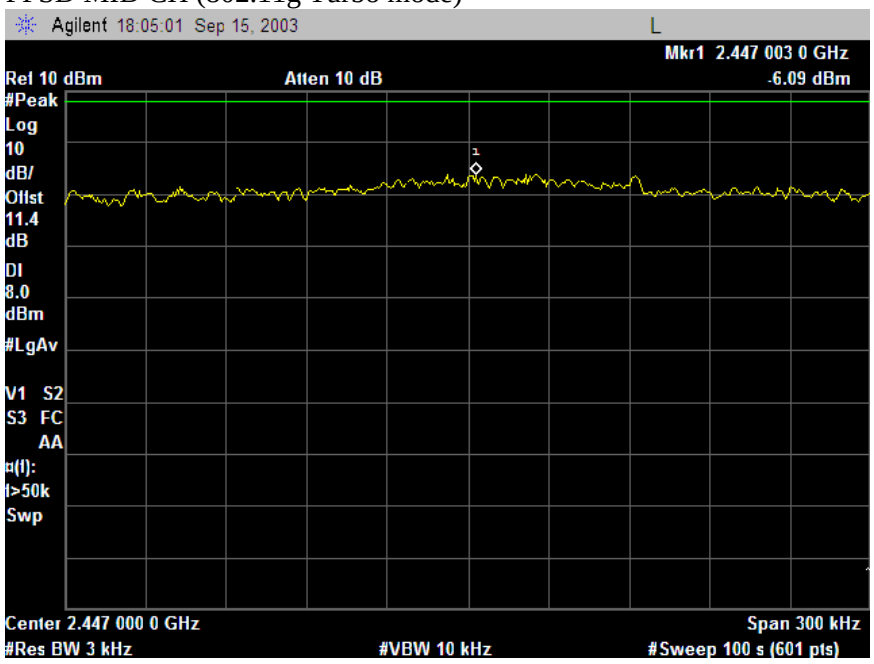


PPSD HIGH CH (802.11g Normal mode)



PEAK POWER SPECTRAL DENSITY (802.11g TURBO MODE)

PPSD MID CH (802.11g Turbo mode)



7.6. 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)).

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 100 kHz.

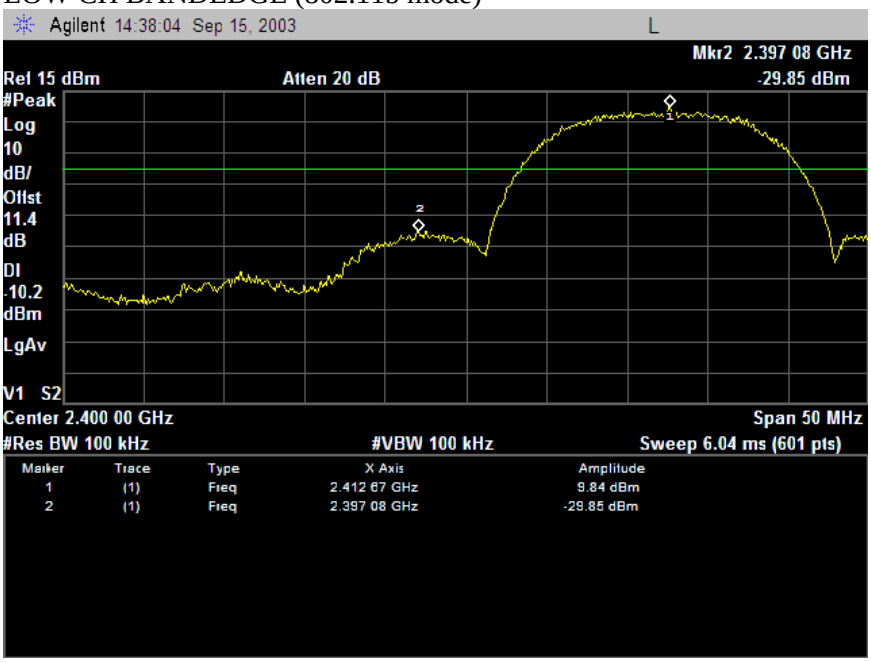
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

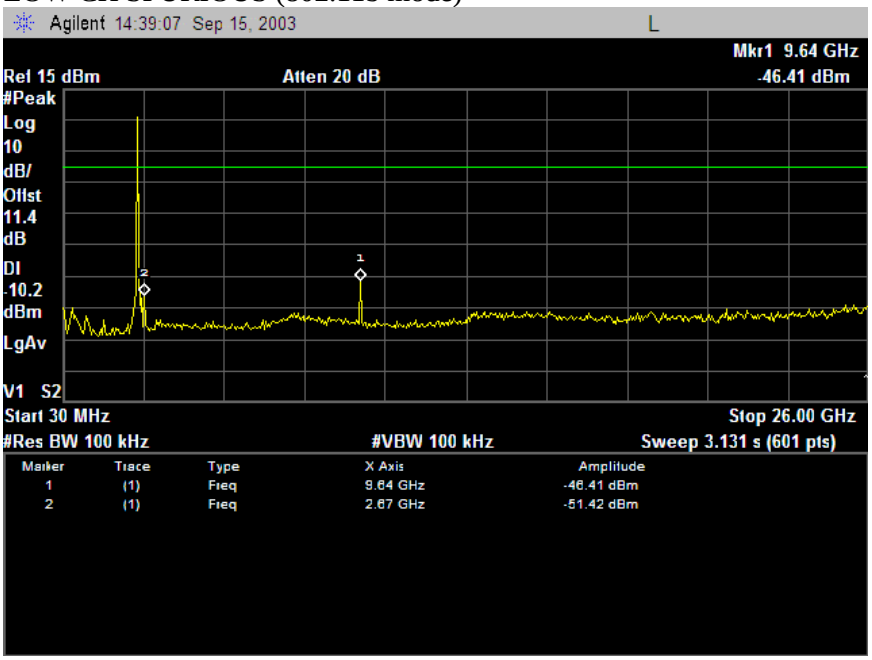
No non-compliance noted:

SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE) (2412MHz)

LOW CH BANDEDGE (802.11b mode)

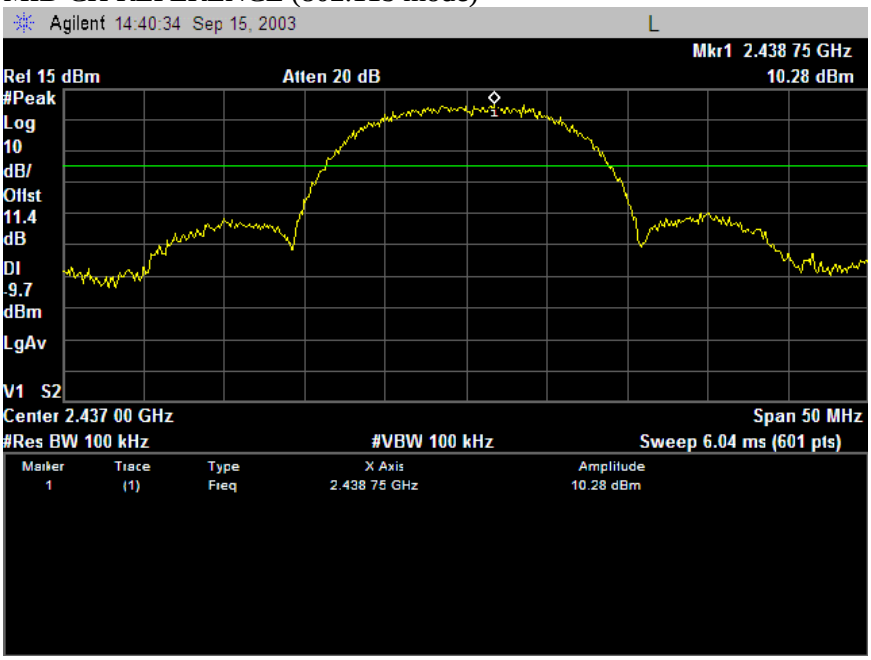


LOW CH SPURIOUS (802.11b mode)

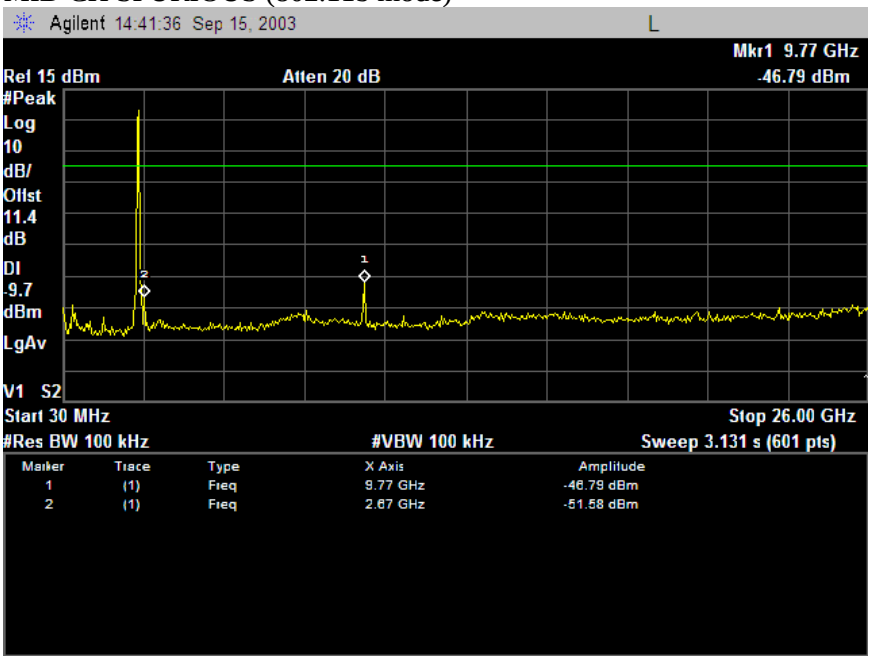


SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE) (2437MHz)

MID CH REFERENCE (802.11b mode)

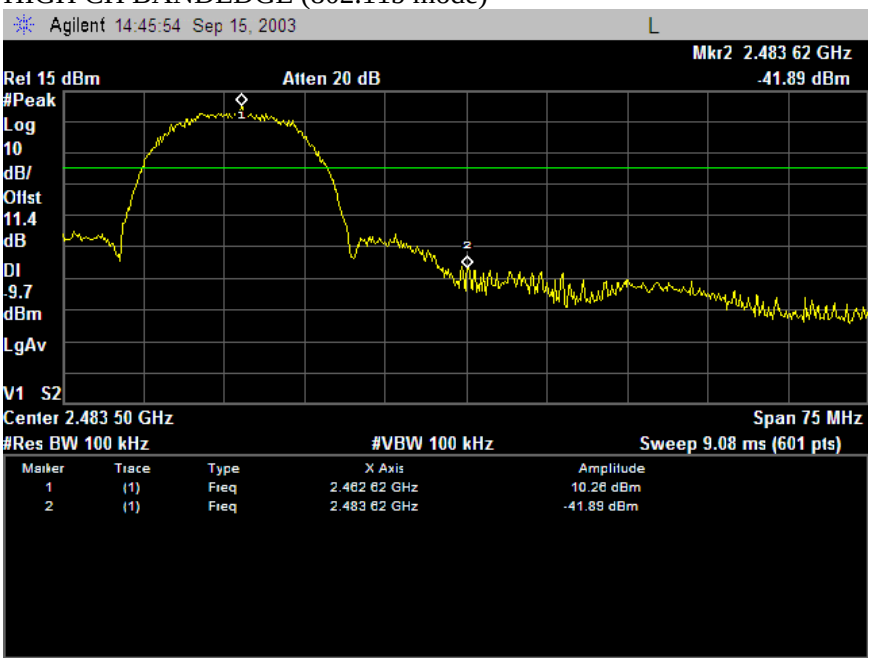


MID CH SPURIOUS (802.11b mode)

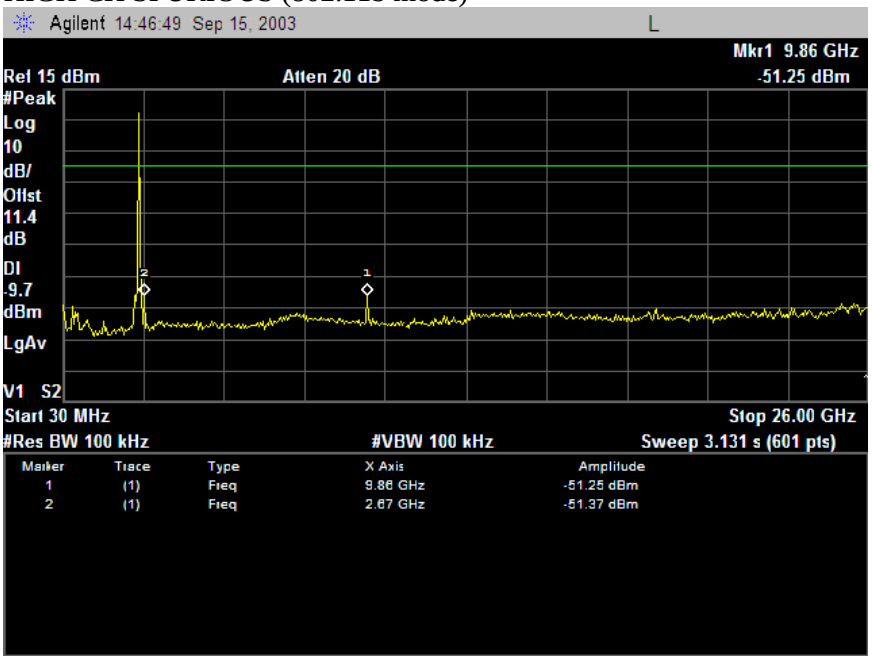


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE) (2462MHz)

HIGH CH BANDEDGE (802.11b mode)

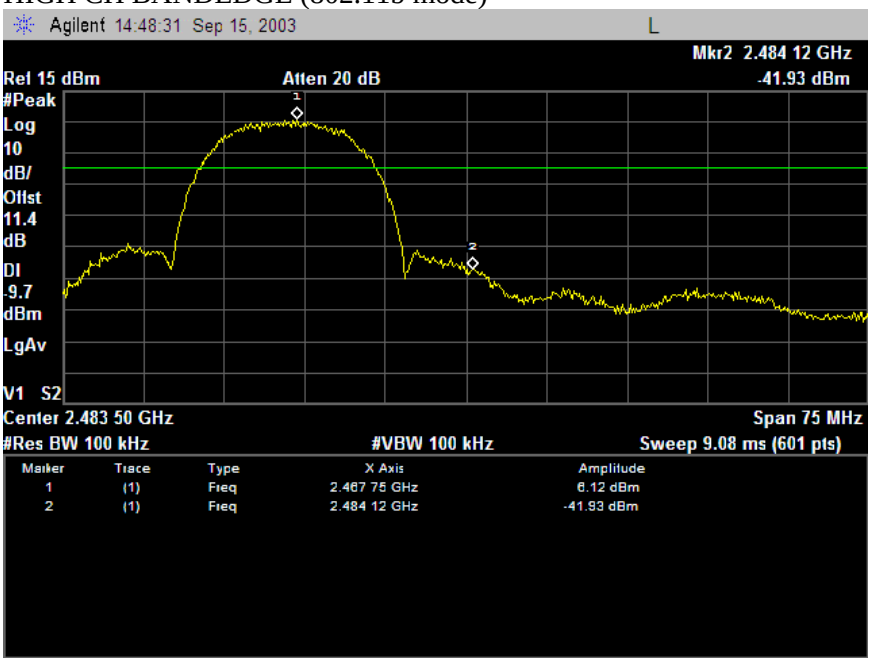


HIGH CH SPURIOUS (802.11b mode)

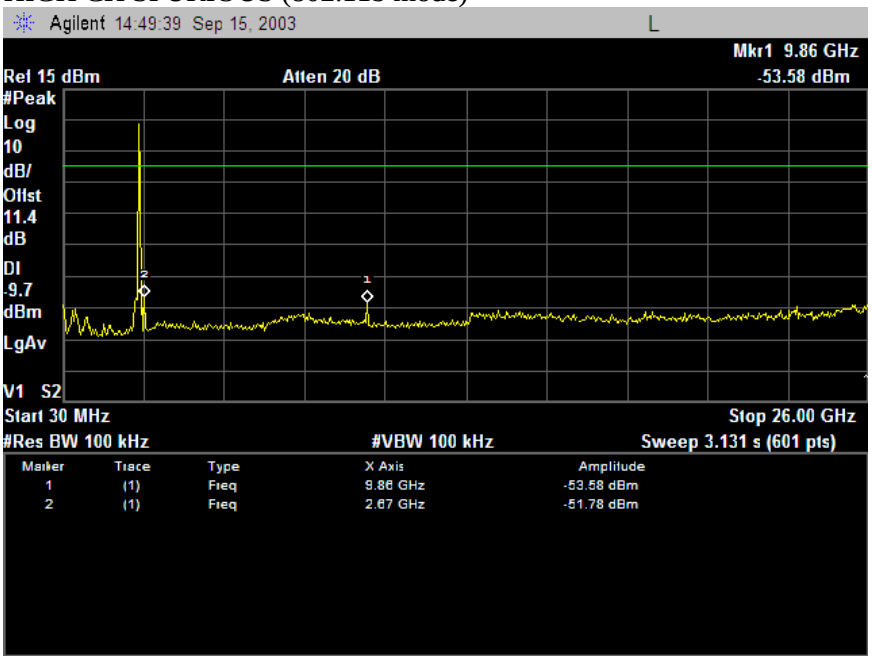


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE) (2467MHz)

HIGH CH BANDEDGE (802.11b mode)

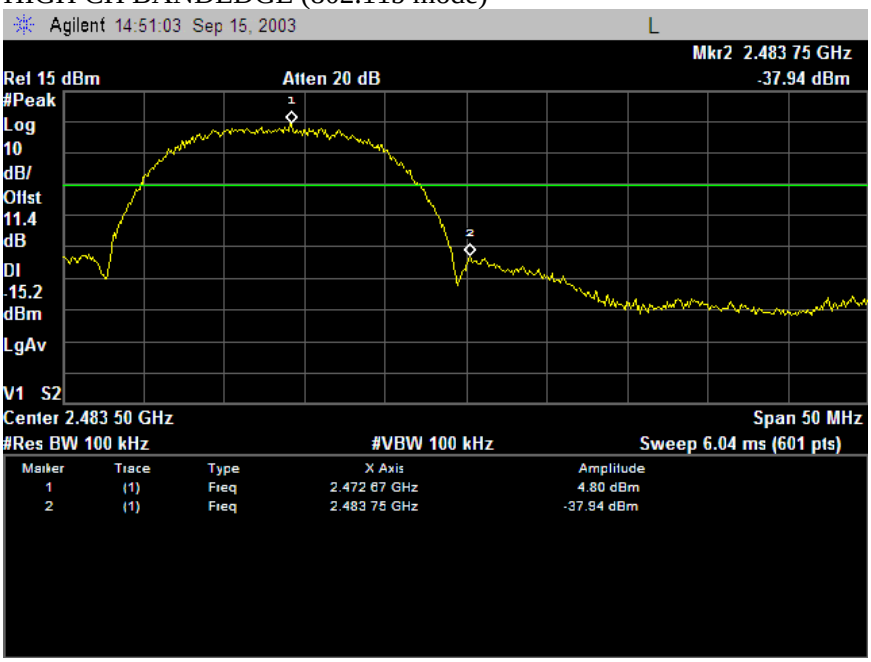


HIGH CH SPURIOUS (802.11b mode)

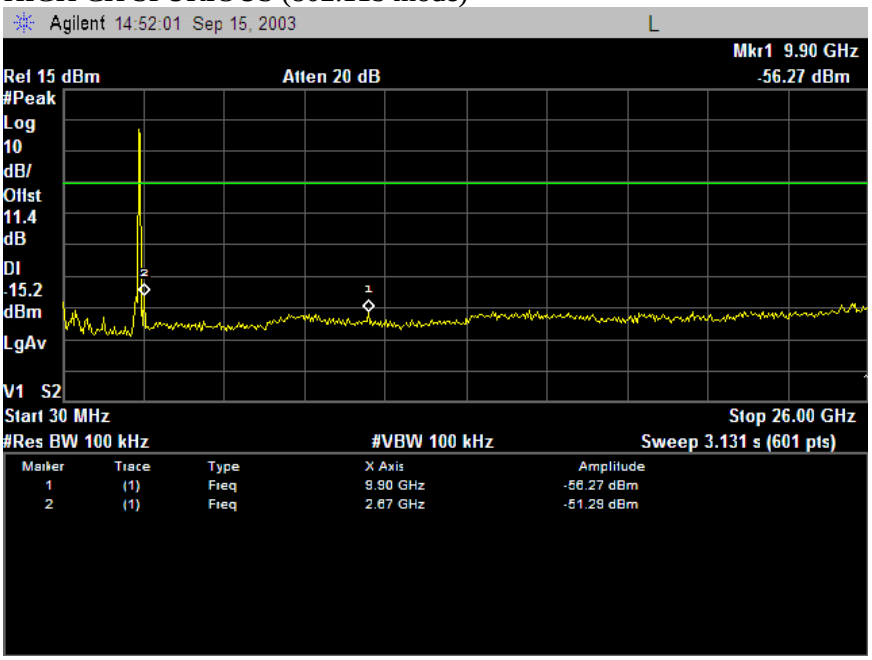


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE) (2472MHz)

HIGH CH BANDEDGE (802.11b mode)

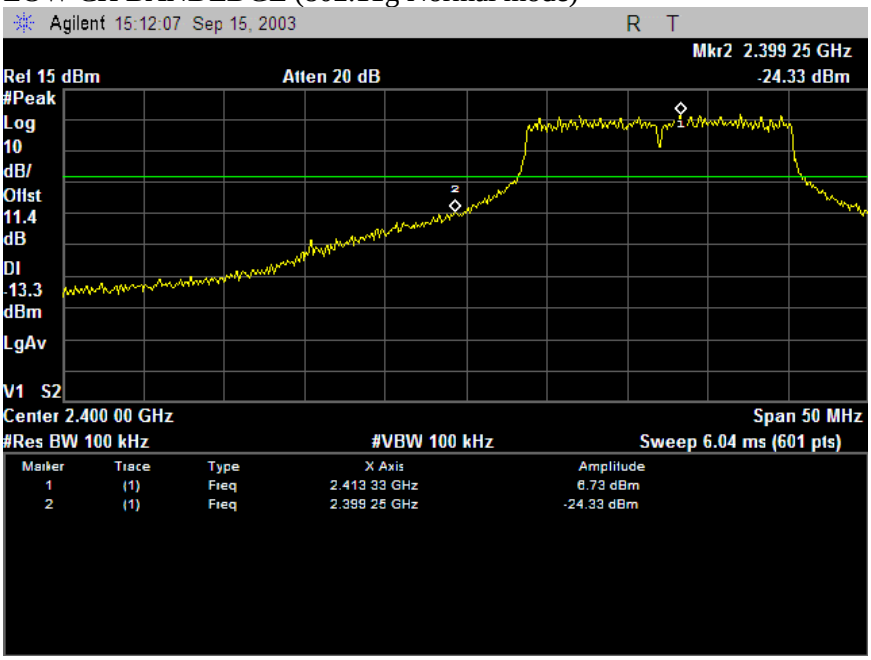


HIGH CH SPURIOUS (802.11b mode)

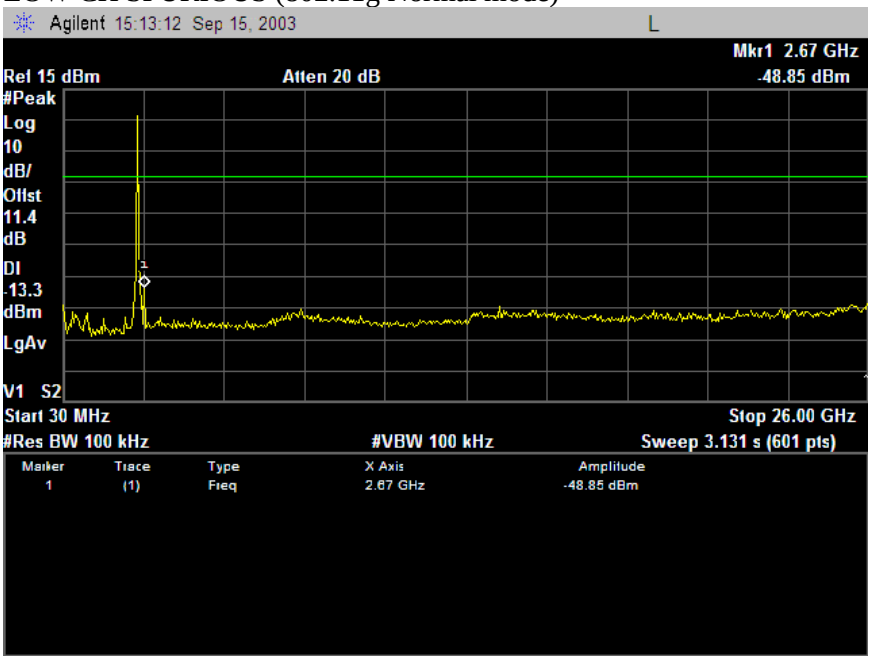


SPURIOUS EMISSIONS, LOW CHANNEL (802.11g NORMAL MODE) (2412MHz)

LOW CH BANDEDGE (802.11g Normal mode)

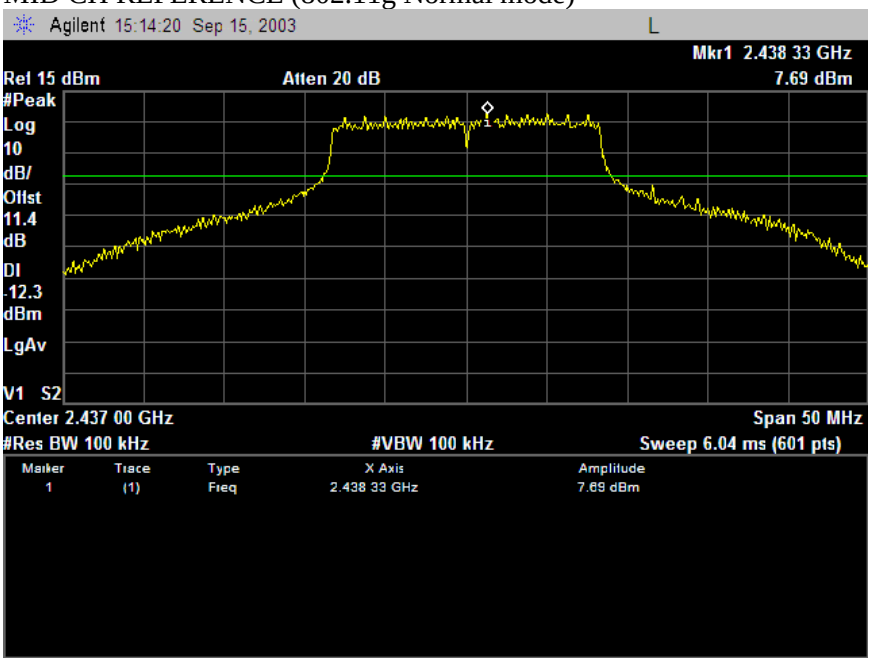


LOW CH SPURIOUS (802.11g Normal mode)

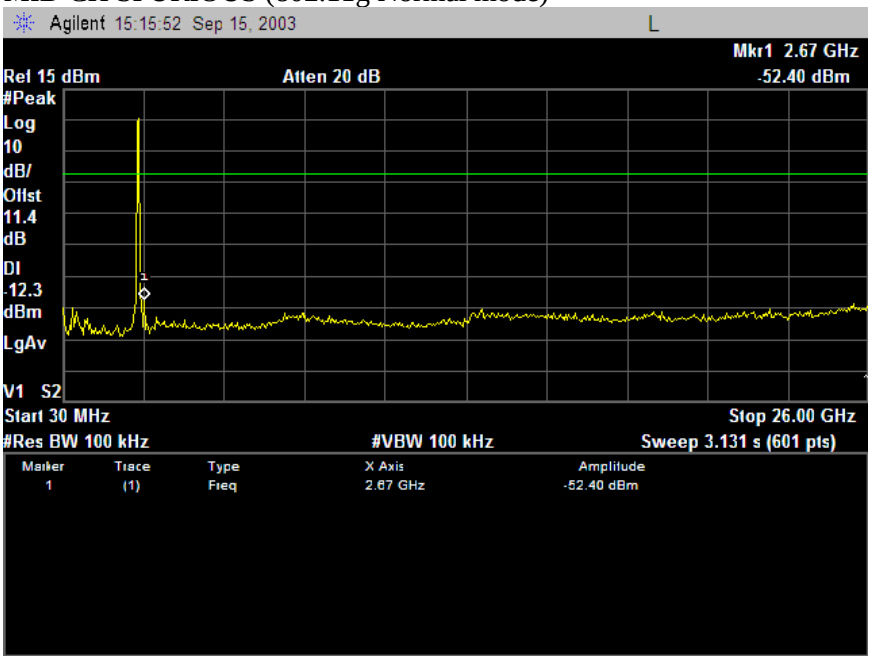


SPURIOUS EMISSIONS, MID CHANNEL (802.11g NORMAL MODE) (2437MHz)

MID CH REFERENCE (802.11g Normal mode)

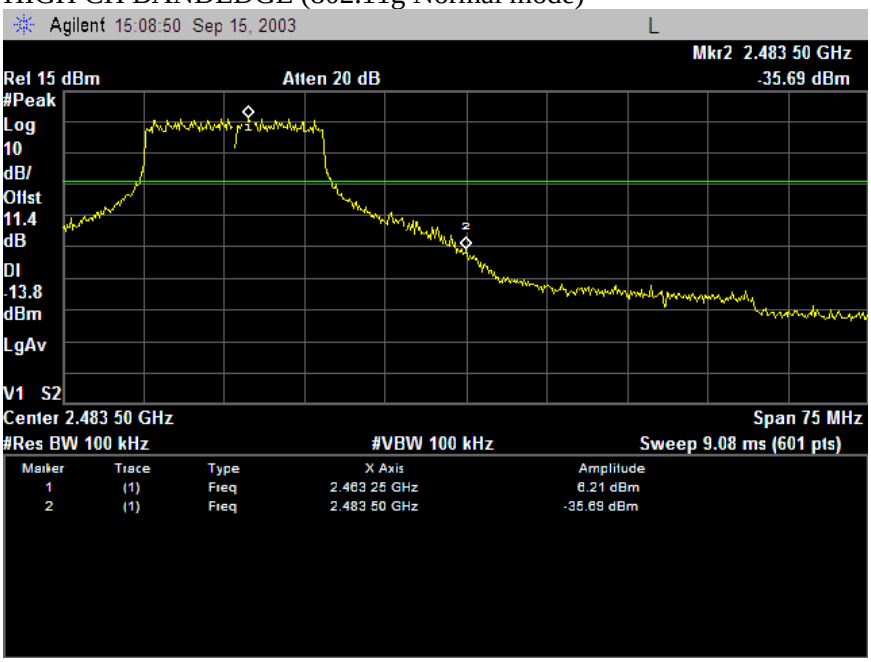


MID CH SPURIOUS (802.11g Normal mode)

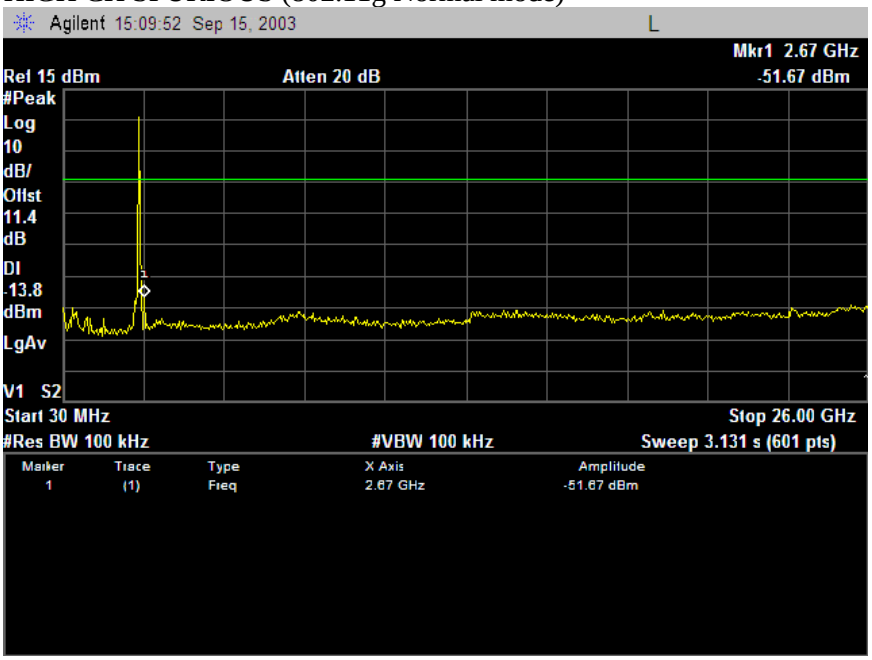


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g NORMAL MODE) (2462MHz)

HIGH CH BANDEDGE (802.11g Normal mode)

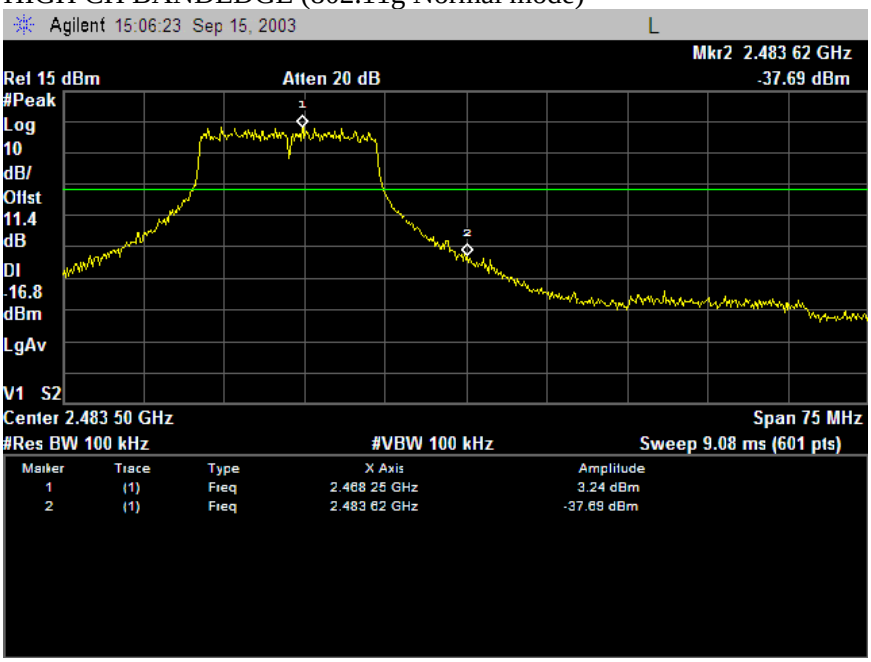


HIGH CH SPURIOUS (802.11g Normal mode)

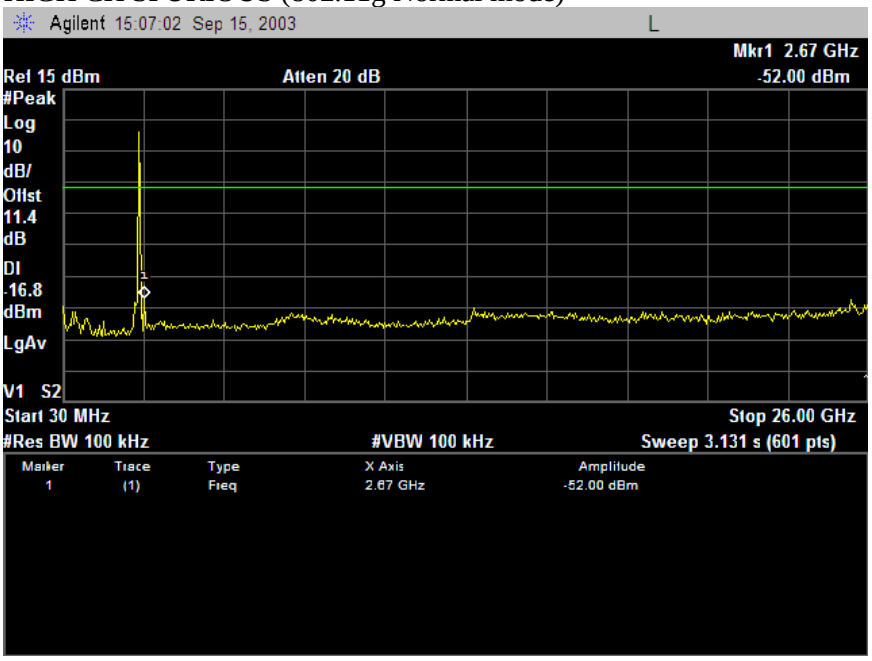


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g NORMAL MODE) (2467MHz)

HIGH CH BANDEDGE (802.11g Normal mode)

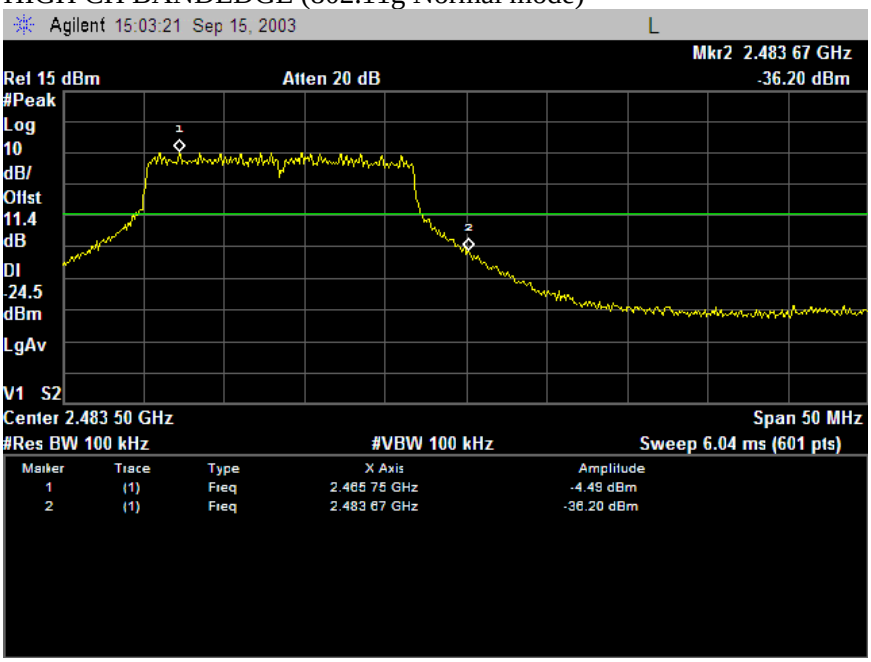


HIGH CH SPURIOUS (802.11g Normal mode)

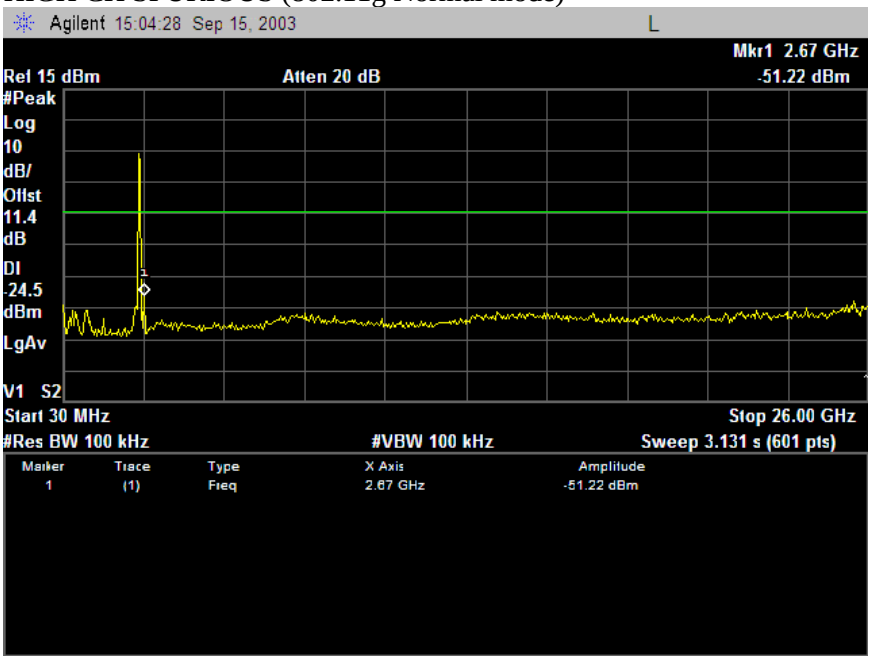


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g NORMAL MODE) (2472MHz)

HIGH CH BANDEDGE (802.11g Normal mode)

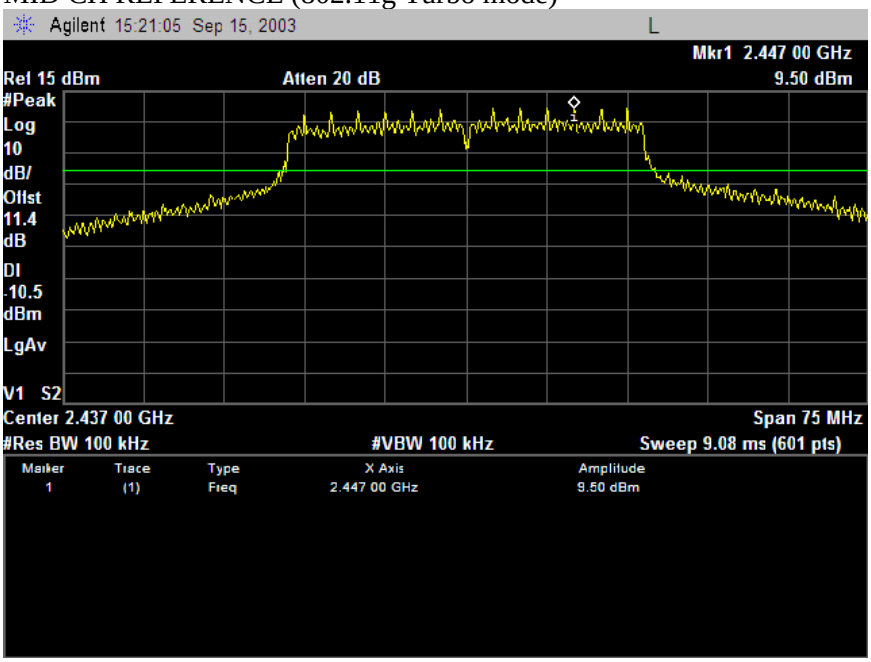


HIGH CH SPURIOUS (802.11g Normal mode)

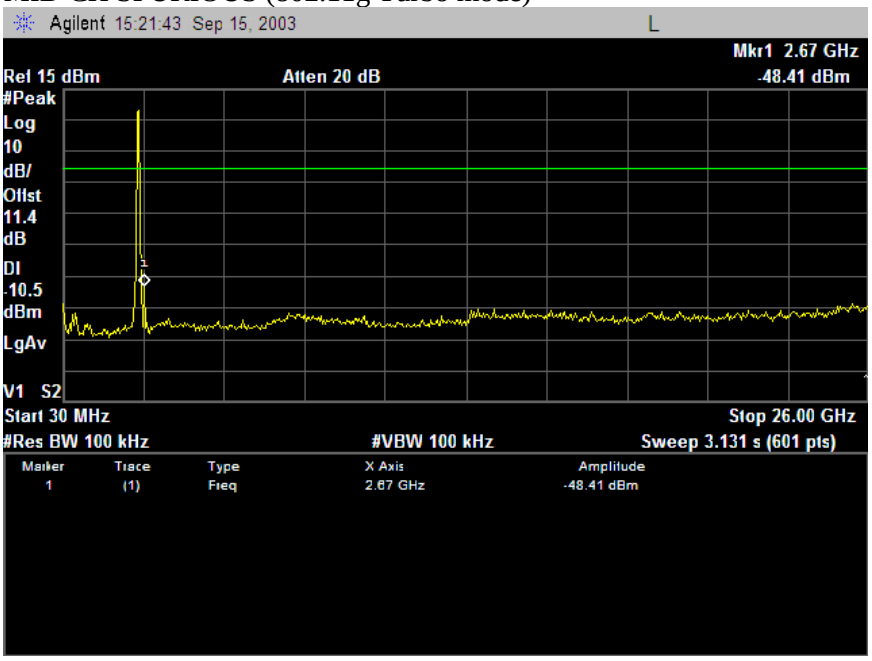


SPURIOUS EMISSIONS, MID CHANNEL (802.11g TURBO MODE) (2437MHz)

MID CH REFERENCE (802.11g Turbo mode)



MID CH SPURIOUS (802.11g Turbo mode)



7.7. RADIATED 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.

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.

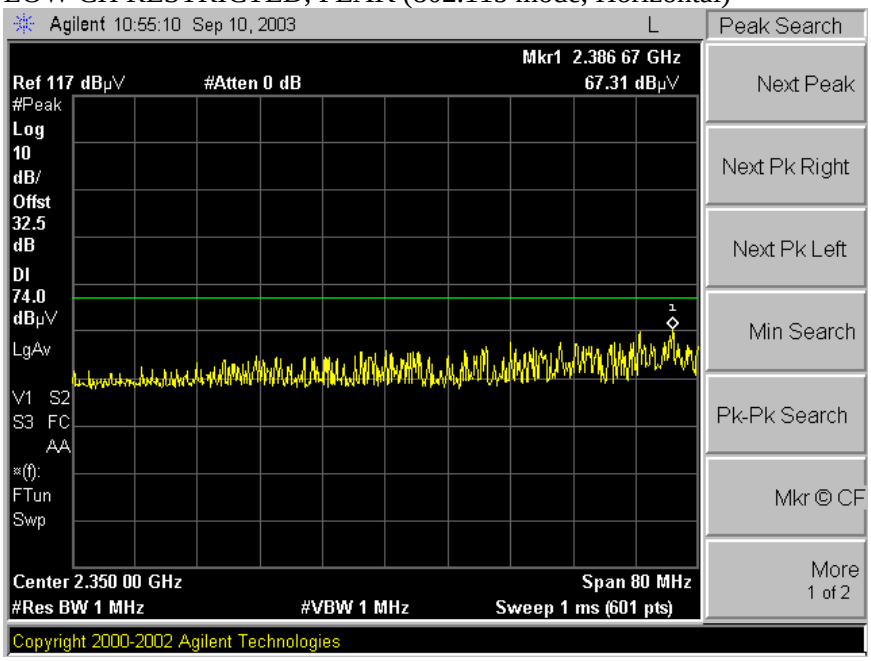
RESULTS

No non-compliance noted:

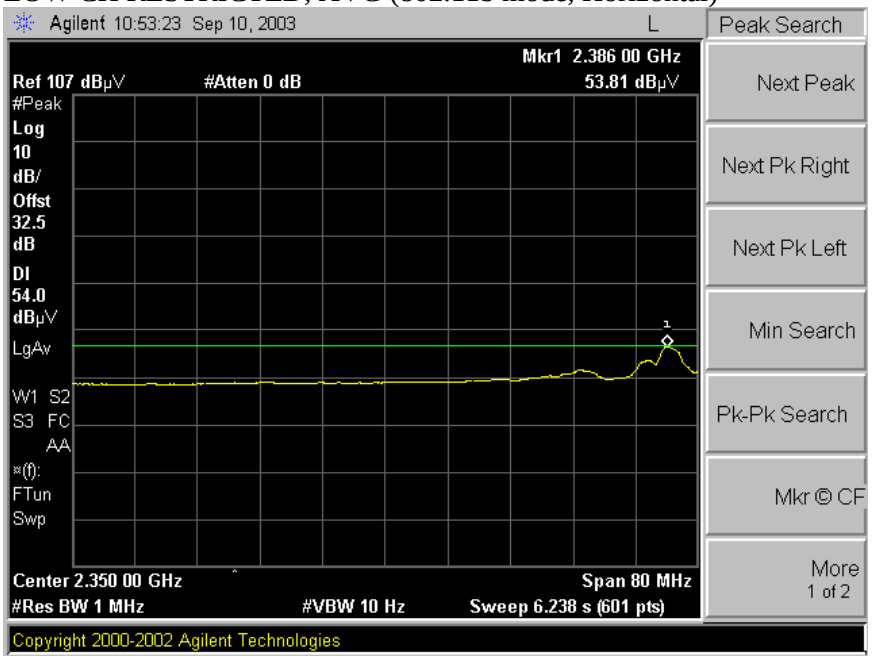
7.7.1. TRANSMITTER SPURIOUS EMISSIONS ABOVE 1 GHZ

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

LOW CH RESTRICTED, PEAK (802.11b mode, Horizontal)

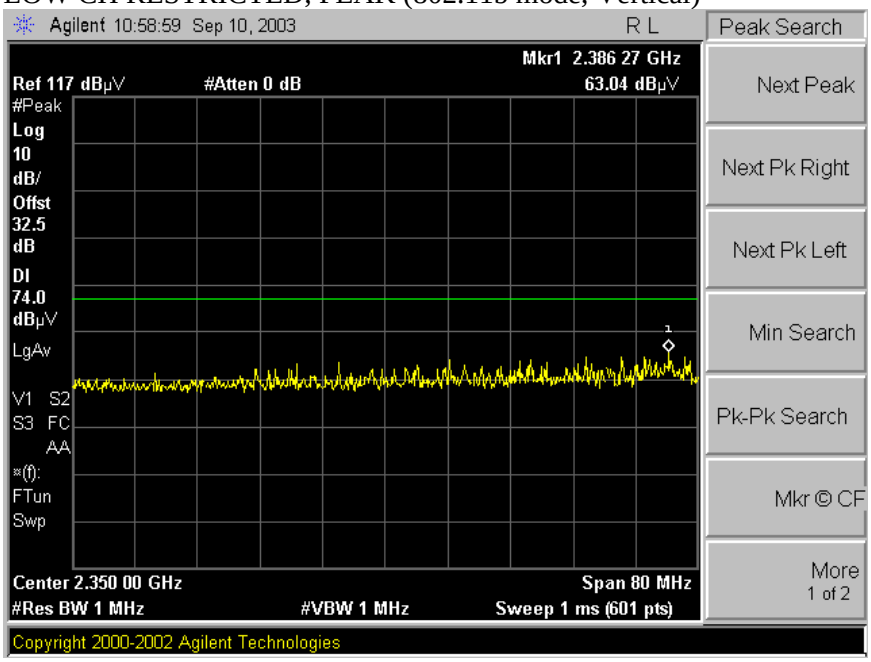


LOW CH RESTRICTED, AVG (802.11b mode, Horizontal)

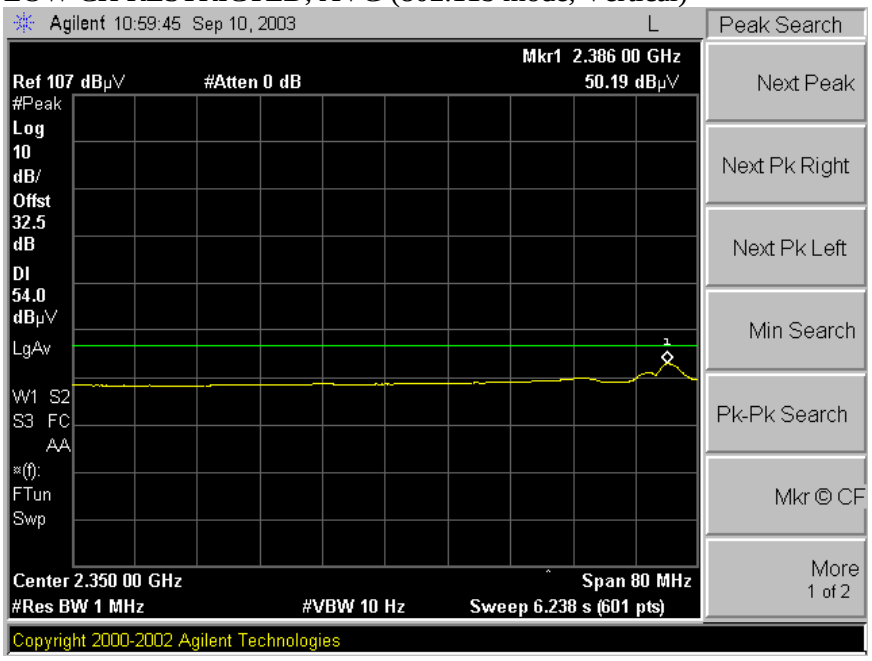


RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

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

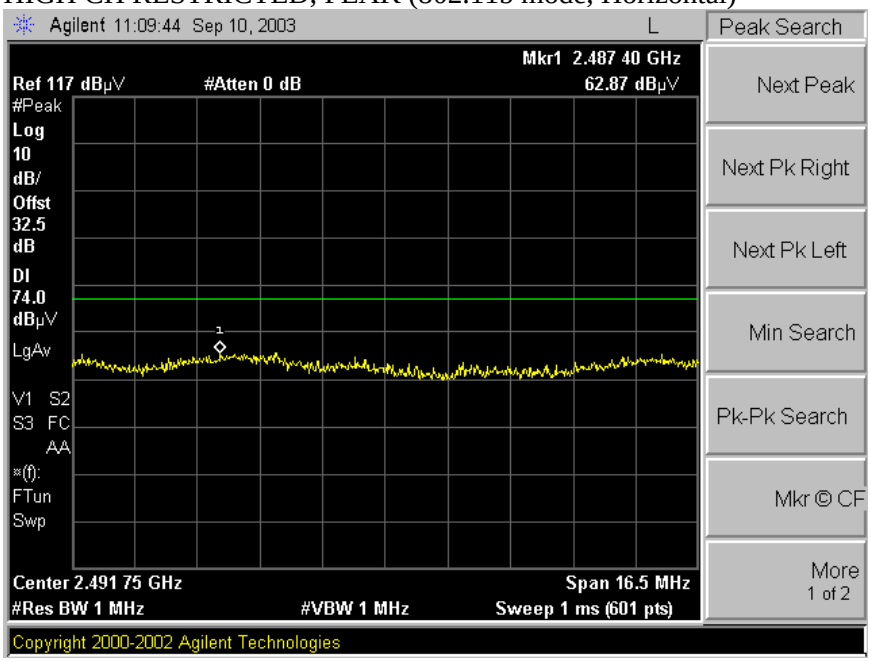


LOW CH RESTRICTED, AVG (802.11b mode, Vertical)

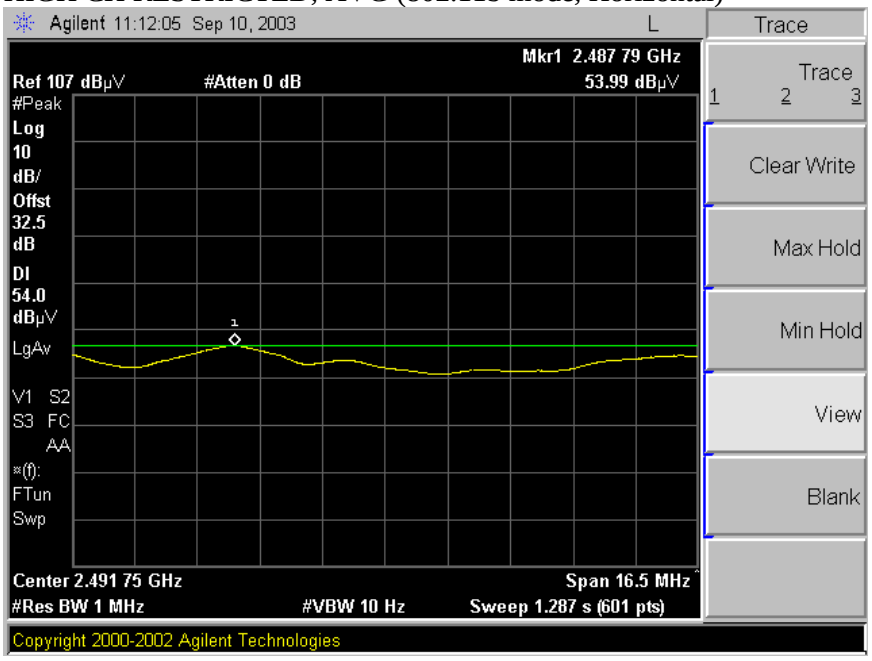


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, 2462 MHz, HORIZONTAL)

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

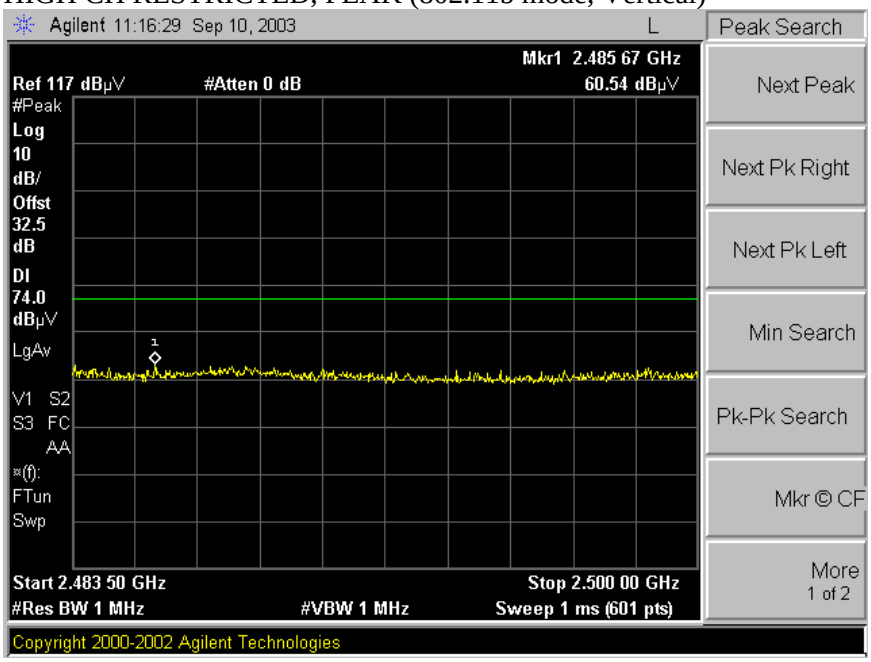


HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)

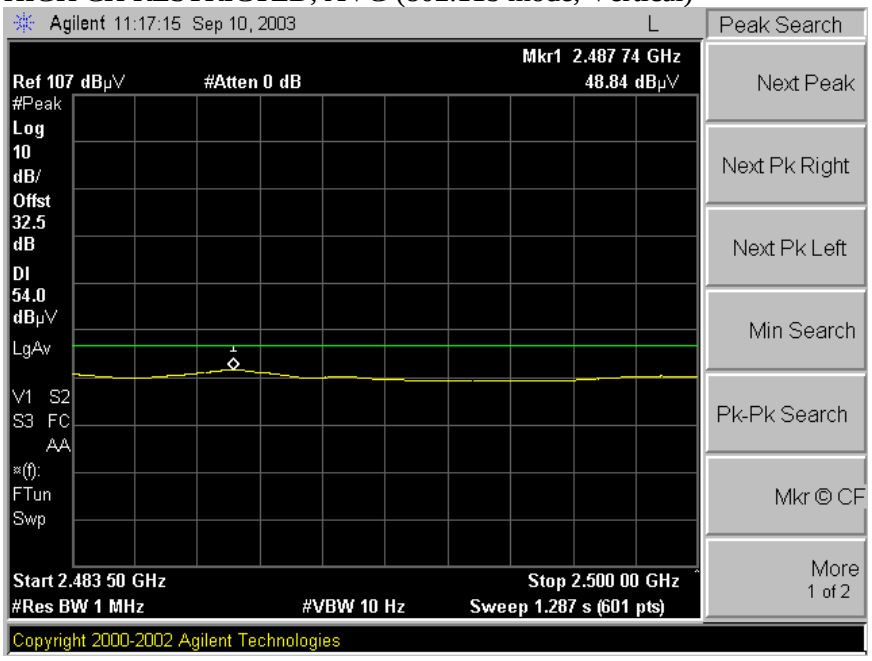


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, 2462 MHz, VERTICAL)

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

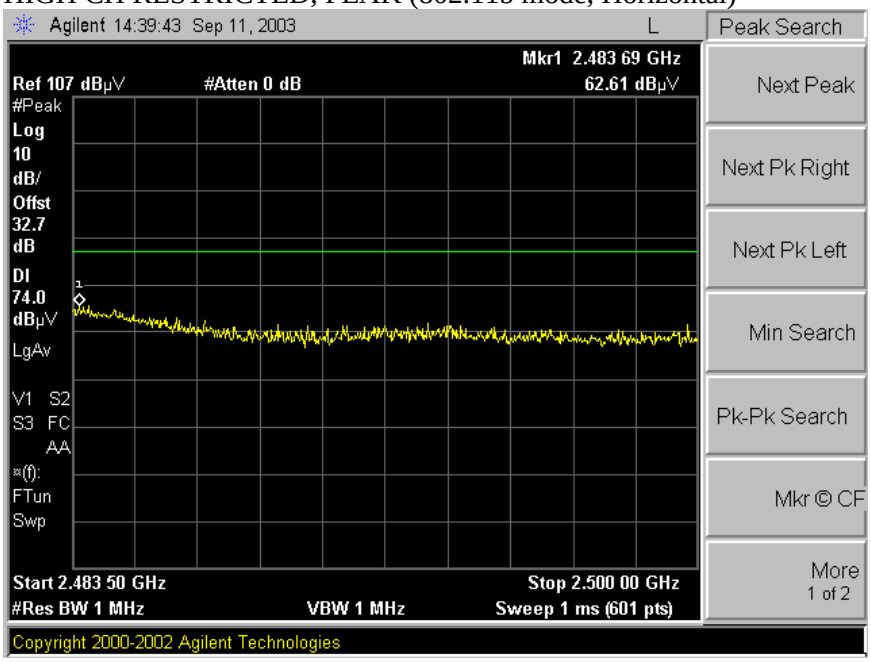


HIGH CH RESTRICTED, AVG (802.11b mode, Vertical)

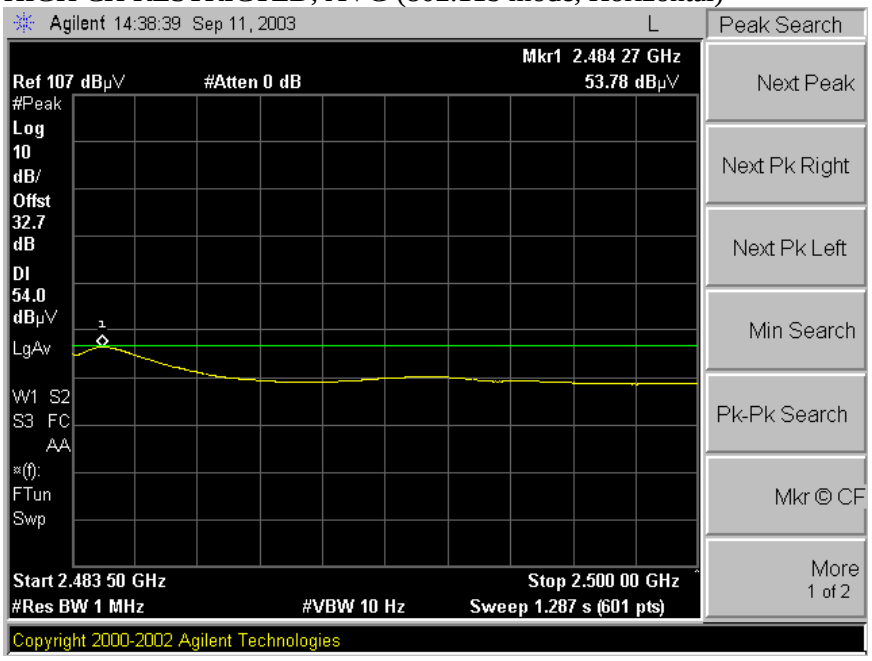


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, 2467 MHz, HORIZONTAL)

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

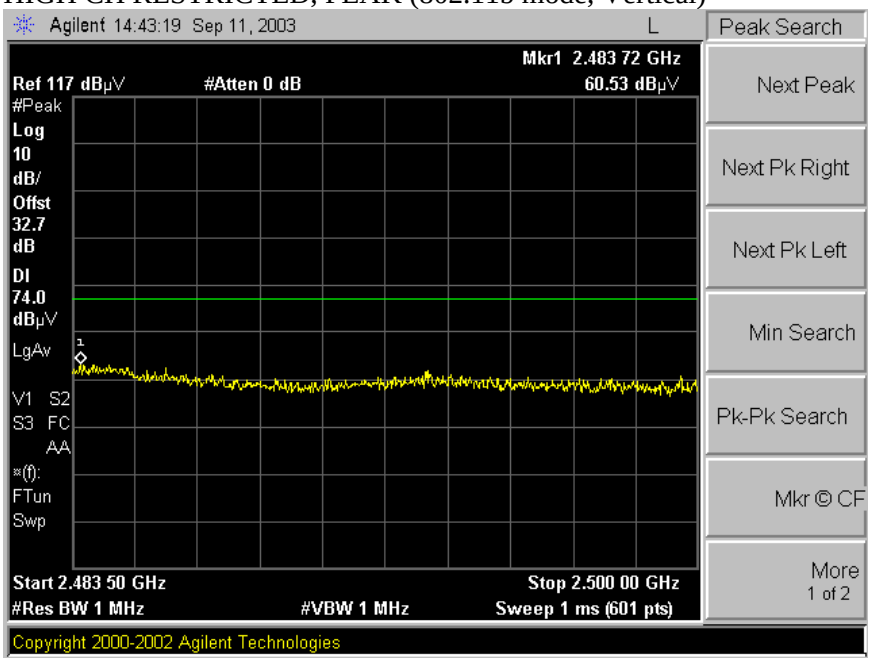


HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)

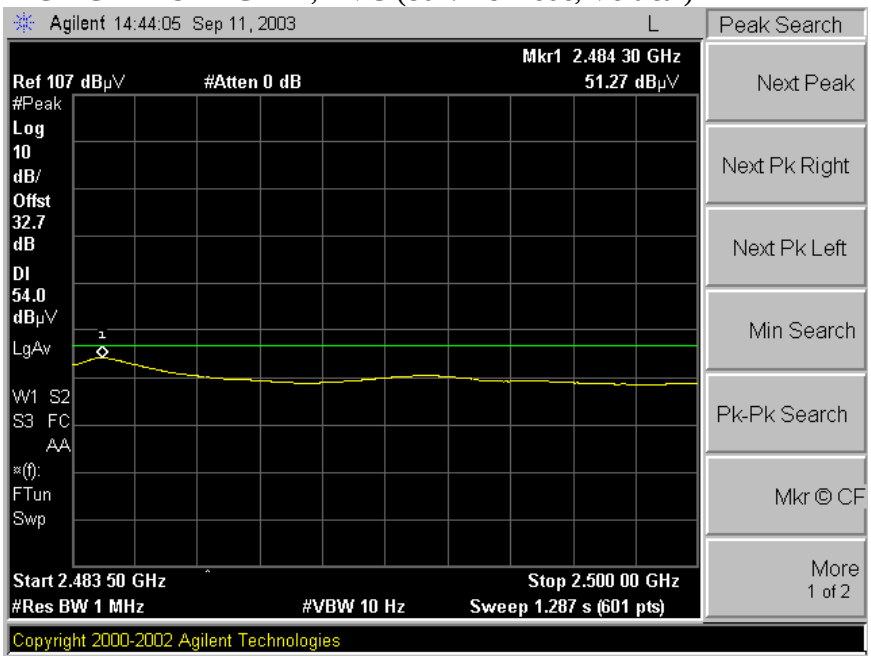


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, 2467 MHz, VERTICAL)

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

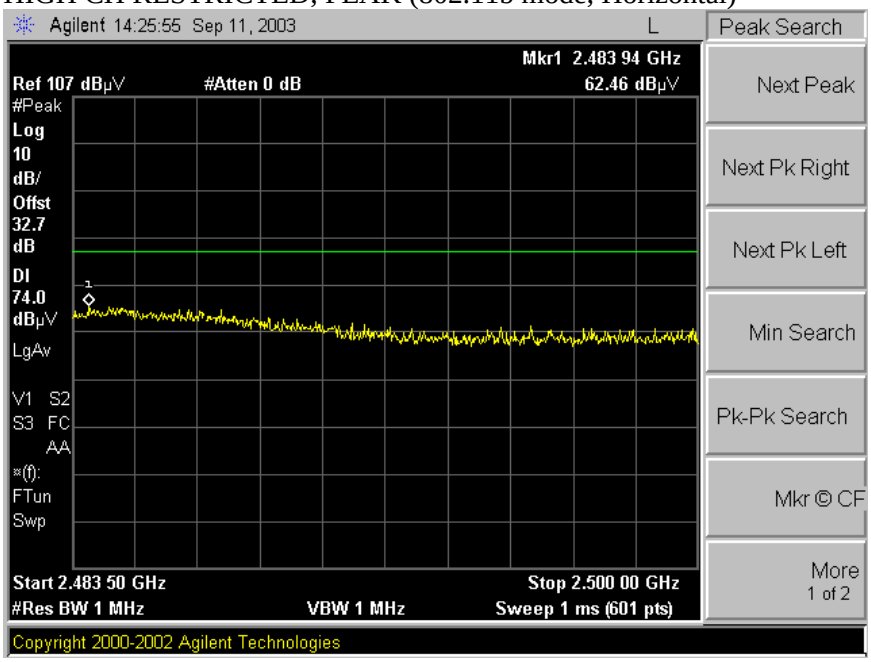


HIGH CH RESTRICTED, AVG (802.11b mode, Vertical)

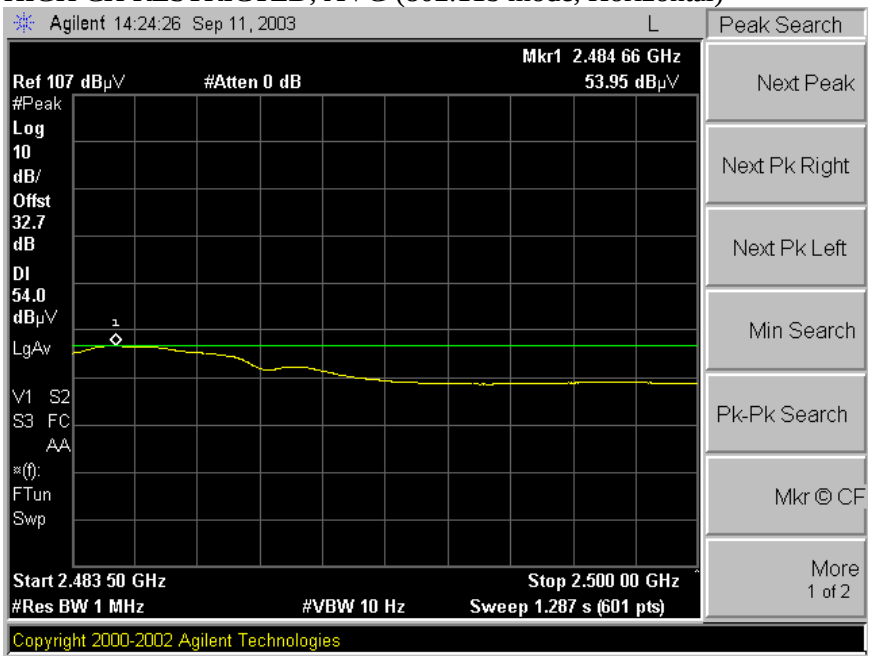


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, 2472 MHz, HORIZONTAL)

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

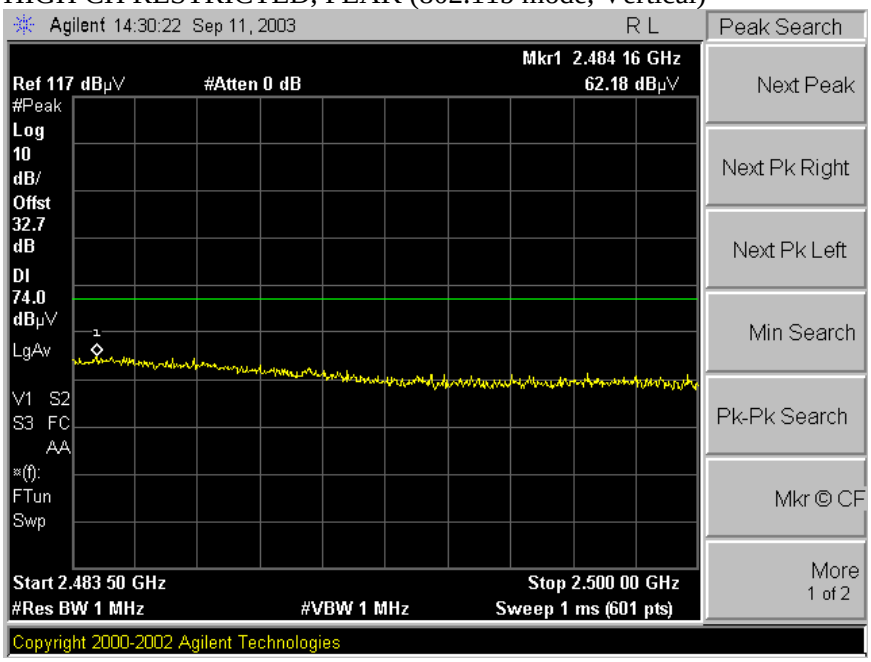


HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)

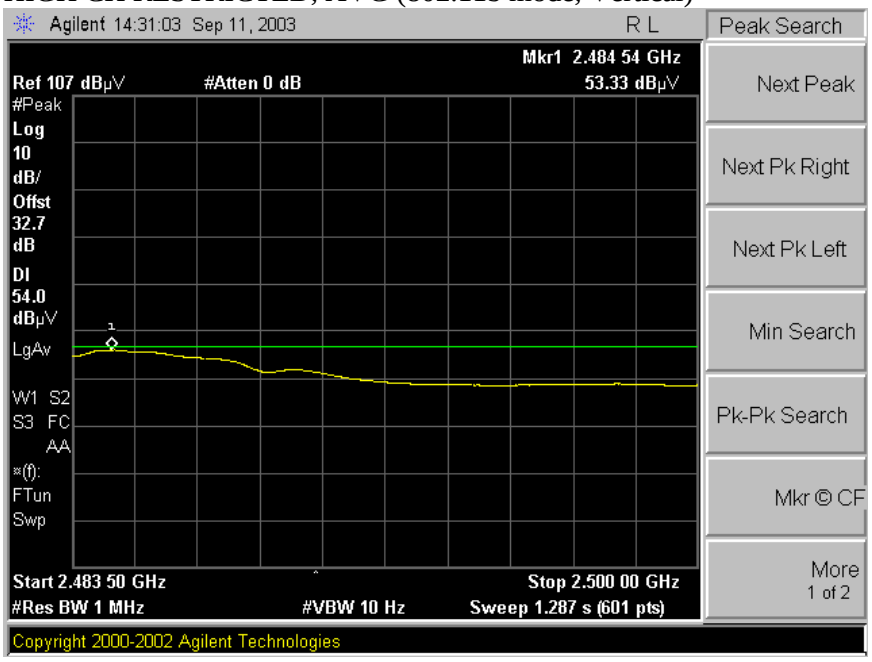


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, 2472 MHz, VERTICAL)

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



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



HARMONICS AND SPURIOUS EMISSIONS (b MODE, LOW CHANNEL)

09/12/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2252
Company Name:Atheros Communications
EUT Descrip.:802.11 b/g Cardbus
EUT M/N:CB43
Test Target:FCC 15.247
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T60; S/N: 2238 @1m	T86 Miteq 924341			FCC 15.209

Hi Frequency Cables: ☑ (3 ft) ☐ (3 ~ 5 ft) ☐ (5 ~ 6 ft) ☑ (12 ft)

Peak Measurements: 1 MHz Resolution Bandwidth; 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth; 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
4.824	9.8	53.3	45.6	33.7	3.9	-45.6	0.0	1.0	46.3	38.5	74.0	54.0	-27.7	-15.5	b mode-Low Ch-ant19,V
4.824	9.8	52.8	39.2	33.7	3.9	-45.6	0.0	1.0	45.7	32.2	74.0	54.0	-28.3	-21.8	b mode-Low Ch-ant19,H
7.236	9.8	61.9	56.0	37.2	4.9	-46.6	0.0	1.0	58.4	52.5	74.0	54.0	-15.6	-1.5	b mode-Low Ch-ant19,V
7.236	9.8	57.4	50.5	37.2	4.9	-46.6	0.0	1.0	53.9	47.0	74.0	54.0	-20.1	-7.0	b mode-Low Ch-ant19,H
9.648	9.8	55.6	47.9	39.2	5.8	-45.2	0.0	1.0	56.3	48.7	74.0	54.0	-17.7	-5.3	b mode-Low Ch-ant19,V
9.648	9.8	57.7	52.4	39.2	5.8	-45.2	0.0	1.0	58.5	53.1	74.0	54.0	-15.5	-0.9	b mode-Low Ch-ant19,H

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		

HARMONICS AND SPURIOUS EMISSIONS (b MODE, MID CHANNEL)

09/12/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2252
Company Name:Atheros Communications
EUT Descrip.:802.11 b/g Cardbus
EUT M/N:CB43
Test Target:FCC 15.247
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18Ghz	Pre-amplifier 1-26Ghz	Spectrum Analyzer	Horn > 18GHz	Limit
T60; S/N: 2238 @1m	T86 Miteq 924341			FCC 15.209

Hi Frequency Cables: ☑ (3 ft) ☐ (3 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements: 1 MHz Resolution Bandwidth; 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth; 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
4.874	9.8	51.9	39.8	33.8	3.9	-45.6	0.0	1.0	44.9	32.8	74.0	54.0	-29.1	-21.2	b mode-Mid Ch-ant20,V
4.874	9.8	52.7	42.3	33.8	3.9	-45.6	0.0	1.0	45.7	35.3	74.0	54.0	-28.3	-18.7	b mode-Mid Ch-ant20,H
7.311	9.8	59.2	52.7	37.3	4.9	-46.6	0.0	1.0	55.8	49.3	74.0	54.0	-18.2	-4.7	b mode-Mid Ch-ant20,V
7.311	9.8	58.5	51.5	37.3	4.9	-46.6	0.0	1.0	55.1	48.1	74.0	54.0	-18.9	-5.9	b mode-Mid Ch-ant20,H
9.748	9.8	50.7	40.7	39.2	5.8	-45.1	0.0	1.0	51.6	41.5	74.0	54.0	-22.4	-12.5	b mode-Mid Ch-ant20,V
9.748	9.8	55.1	47.3	39.2	5.8	-45.1	0.0	1.0	56.0	48.2	74.0	54.0	-18.0	-5.8	b mode-Mid Ch-ant20,H

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		

HARMONICS AND SPURIOUS EMISSIONS (b MODE, HIGH CHANNELS)

09/12/03 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2252
Company Name:Atheros Communications
EUT Descrip.:802.11 b/g Cardbus
EUT M/N:CB43
Test Target:FCC 15.247
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T60; S/N: 2238 @1m	T86 Miteq 924341			FCC 15.209

Hi Frequency Cables: (2 ft) (2 ~ 3 ft) (4 ~ 6 ft) (12 ft)

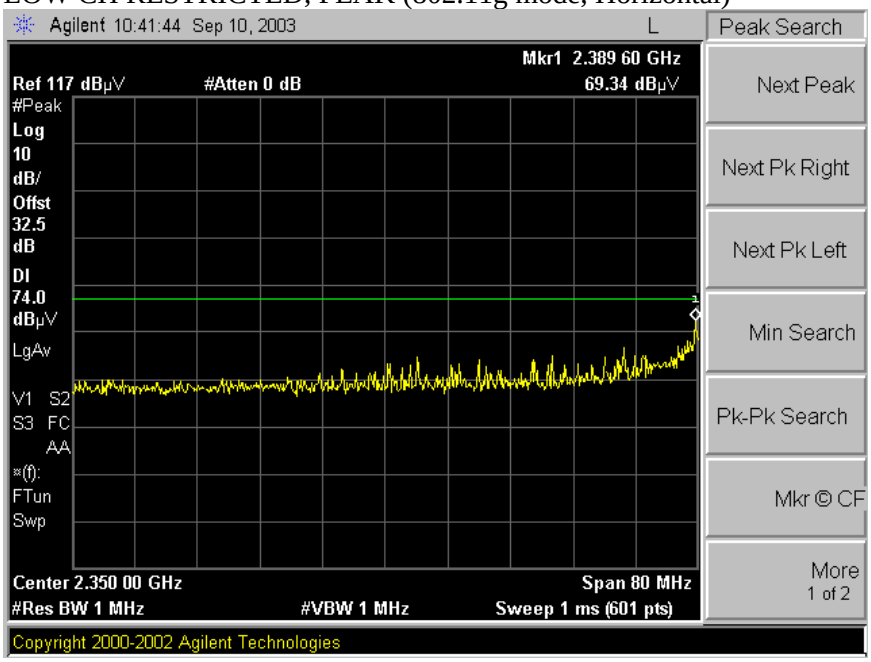
Peak Measurements: 1 MHz Resolution Bandwidth, 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth, 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
4.924	9.8	52.0	41.3	33.8	3.9	-45.7	0.0	1.0	45.0	34.3	74.0	54.0	-29.0	-19.7	b mode-Ch2462-ant19,V
4.924	9.8	53.6	43.8	33.8	3.9	-45.7	0.0	1.0	46.6	36.8	74.0	54.0	-27.4	-17.2	b mode-Ch2462-ant19,H
7.386	9.8	56.8	48.5	37.4	5.0	-46.5	0.0	1.0	53.5	45.2	74.0	54.0	-20.5	-8.8	b mode-Ch2462-ant19,V
7.386	9.8	55.5	44.0	37.4	5.0	-46.5	0.0	1.0	52.2	40.8	74.0	54.0	-21.8	-13.2	b mode-Ch2462-ant19,H
4.934	9.8	51.9	39.8	33.8	3.9	-45.7	0.0	1.0	44.9	32.5	74.0	54.0	-29.1	-21.5	b mode-Ch2467-ant16.5,V
4.934	9.8	51.6	41.2	33.8	3.9	-45.7	0.0	1.0	44.6	34.2	74.0	54.0	-29.4	-19.8	b mode-Ch2467-ant16.5,H
7.401	9.8	55.1	45.2	37.4	5.0	-46.5	0.0	1.0	51.9	41.9	74.0	54.0	-22.1	-12.1	b mode-Ch2467-ant16.5,V
7.401	9.8	54.8	43.4	37.4	5.0	-46.5	0.0	1.0	51.3	40.2	74.0	54.0	-22.7	-13.8	b mode-Ch2467-ant16.5,H
4.944	9.8	49.8	38.3	33.8	3.9	-45.7	0.0	1.0	42.8	31.3	74.0	54.0	-31.2	-22.7	b mode-Ch2472-ant14.5,V
4.944	9.8	50.6	38.2	33.8	3.9	-45.7	0.0	1.0	43.6	31.2	74.0	54.0	-30.4	-22.8	b mode-Ch2472-ant14.5,H
7.416	9.8	53.4	42.4	37.4	5.0	-46.5	0.0	1.0	50.2	39.2	74.0	54.0	-23.8	-14.8	b mode-Ch2472-ant14.5,V
7.416	9.8	52.8	41.4	37.4	5.0	-46.5	0.0	1.0	49.5	38.2	74.0	54.0	-24.5	-15.8	b mode-Ch2472-ant14.5,H

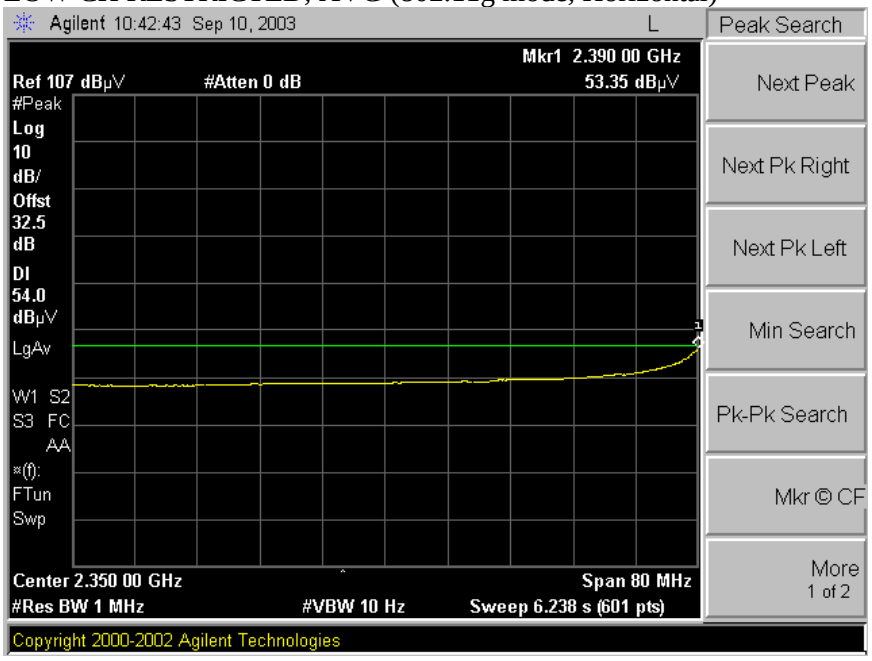
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

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

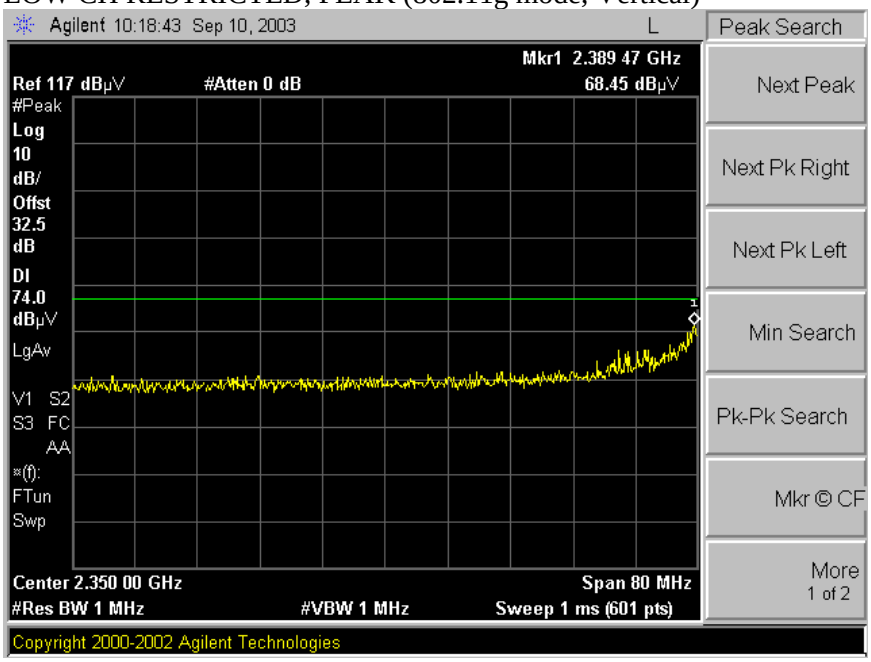


LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)

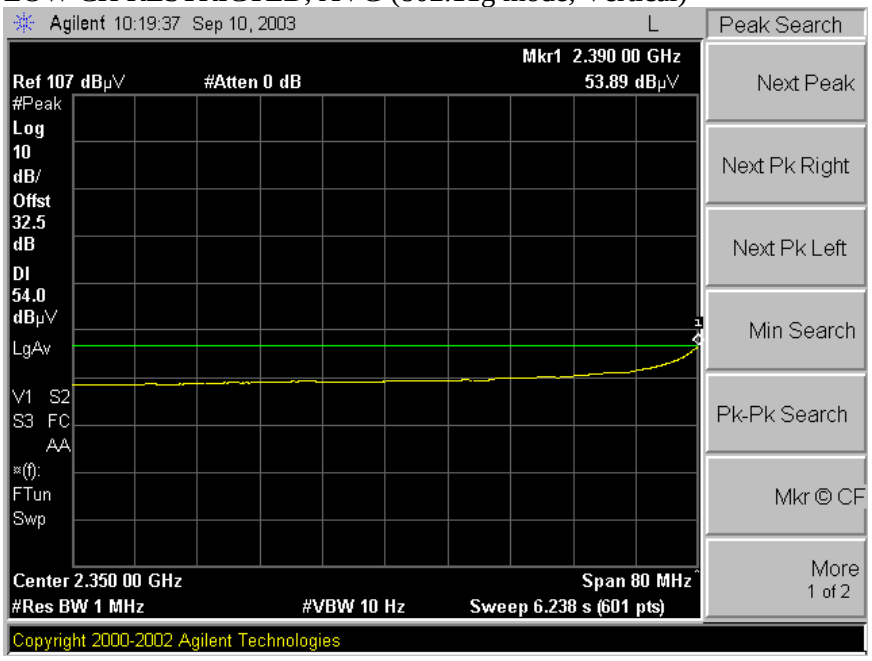


RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

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

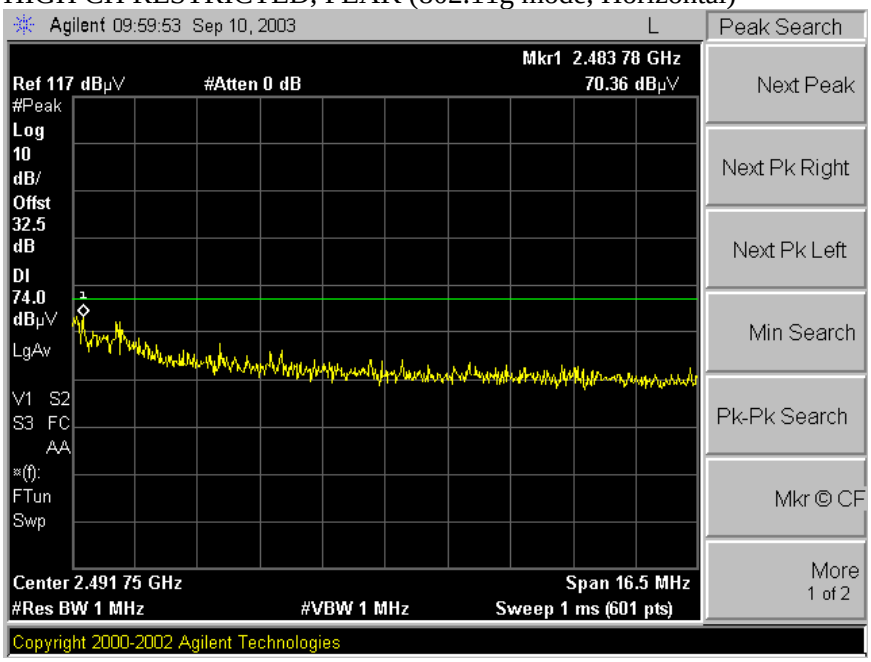


LOW CH RESTRICTED, AVG (802.11g mode, Vertical)

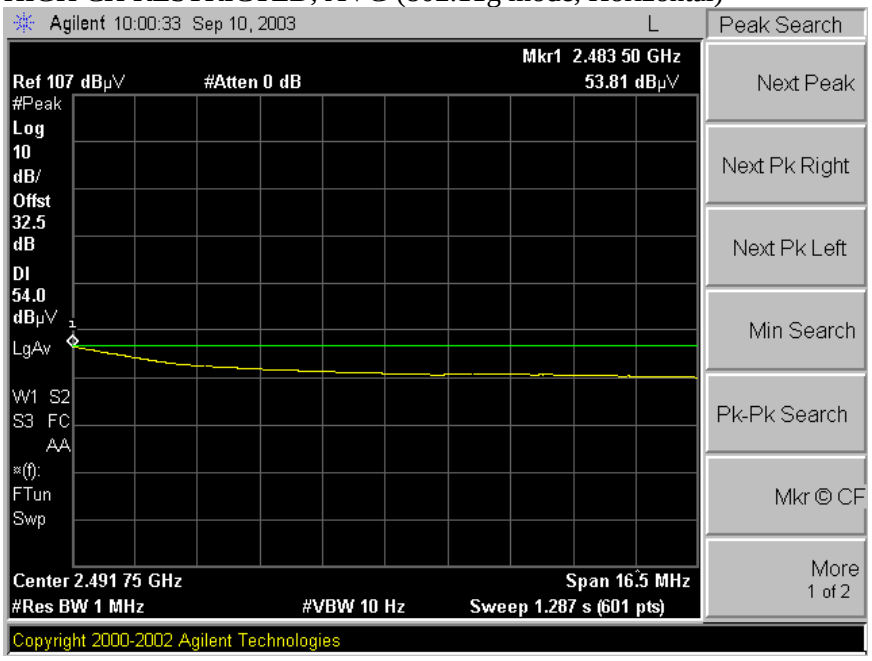


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, 2462 MHz, HORIZONTAL)

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

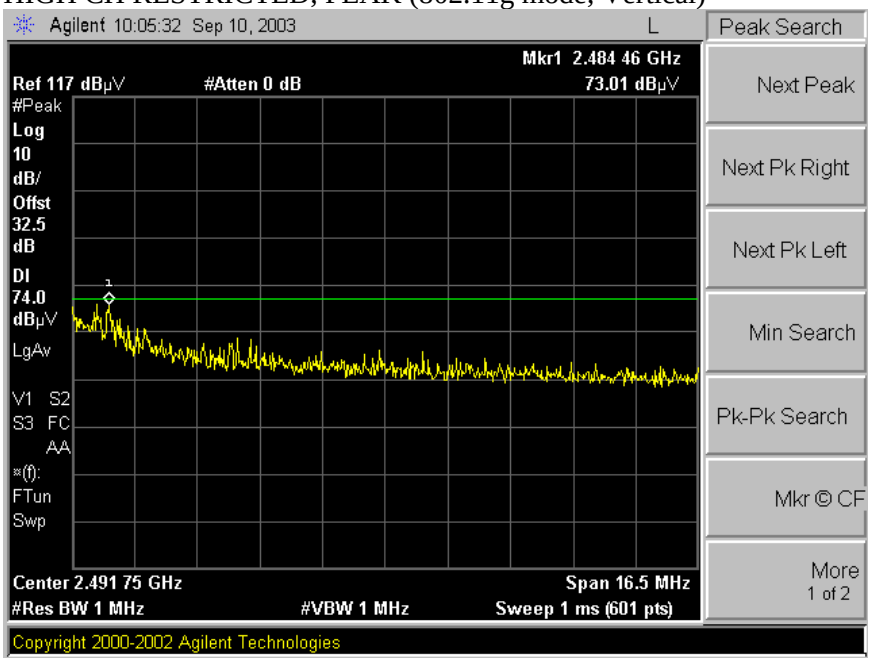


HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)

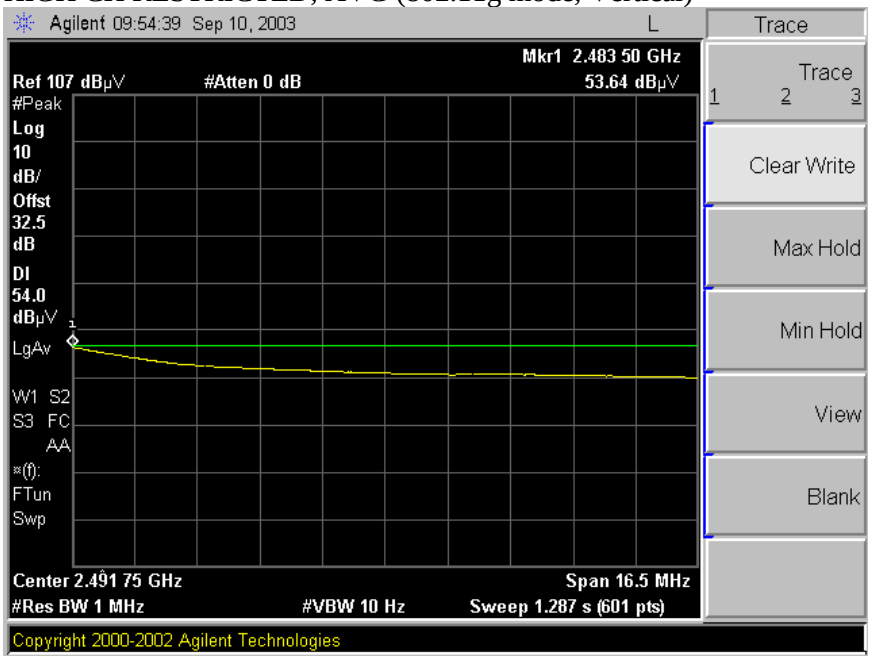


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, 2462 MHz, VERTICAL)

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

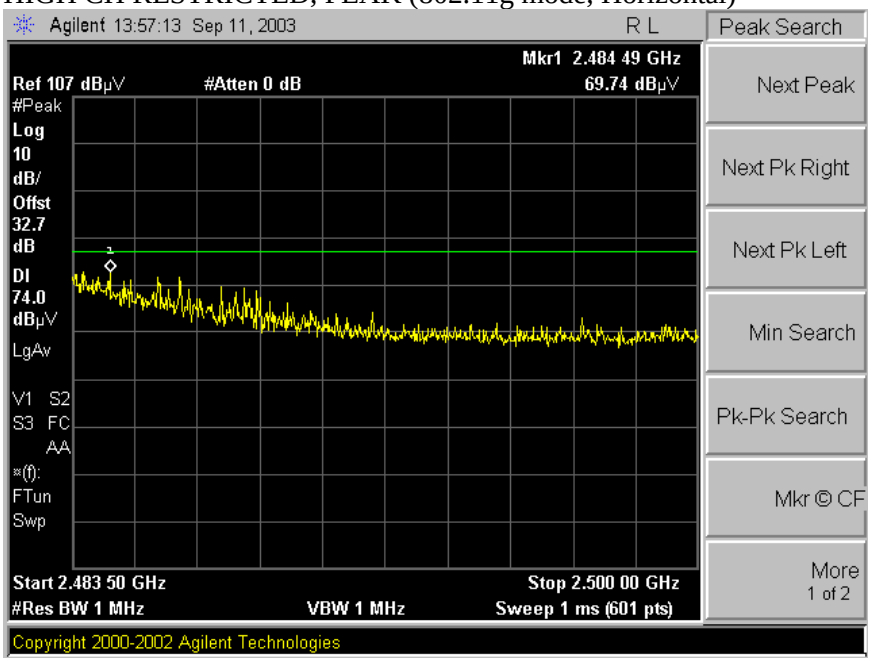


HIGH CH RESTRICTED, AVG (802.11g mode, Vertical)

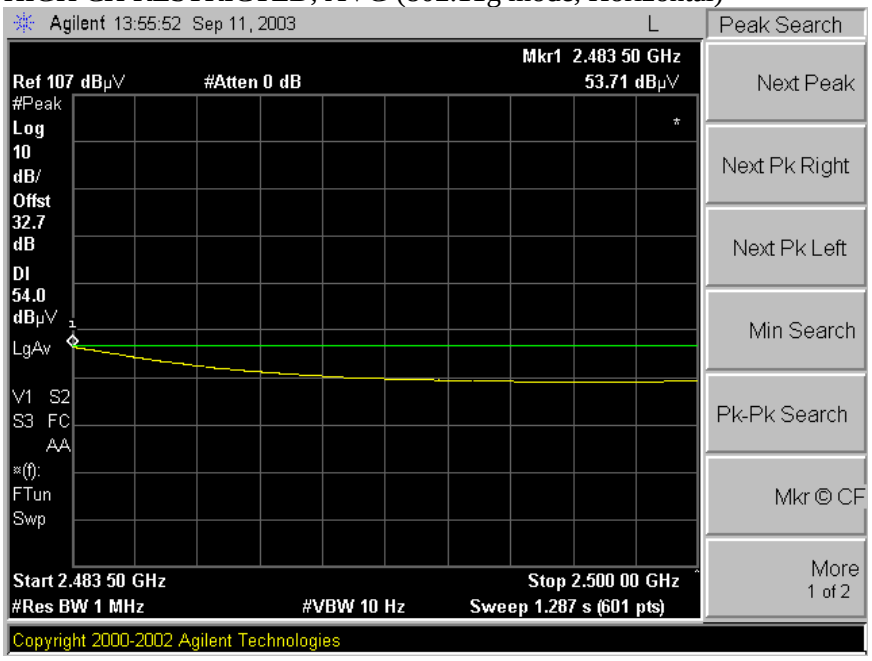


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, 2467 MHz, HORIZONTAL)

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

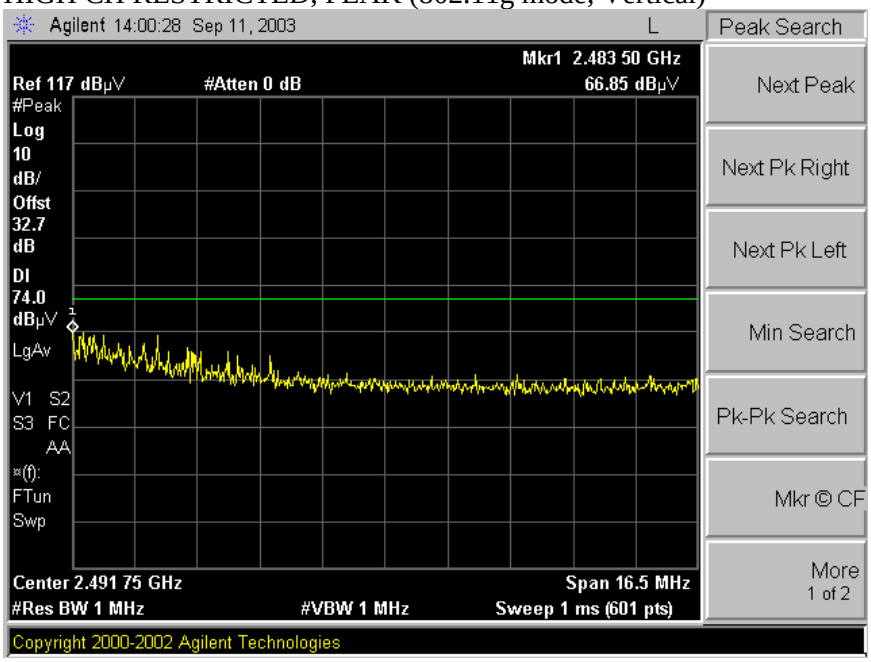


HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)

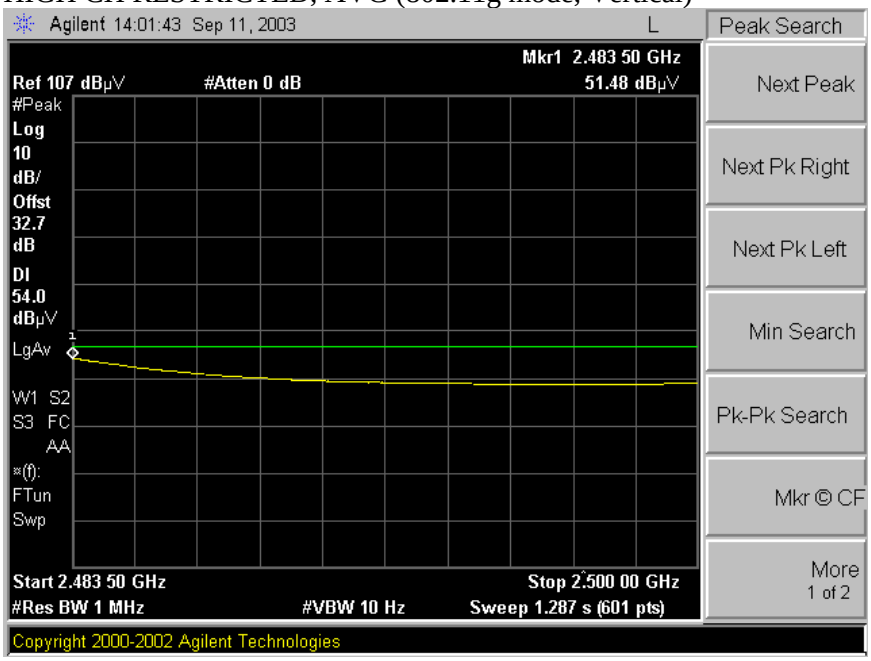


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, 2467 MHz, VERTICAL)

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

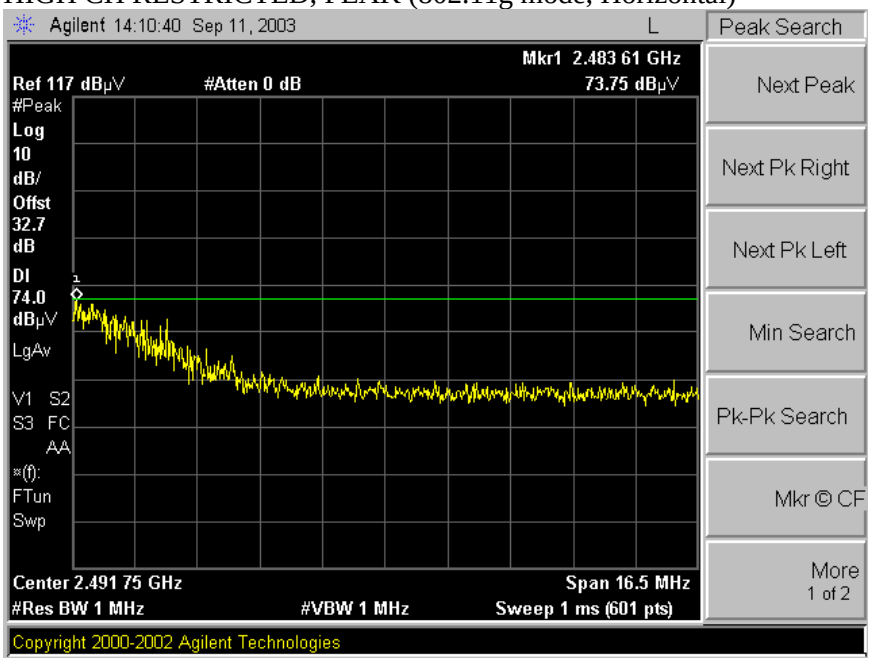


HIGH CH RESTRICTED, AVG (802.11g mode, Vertical)

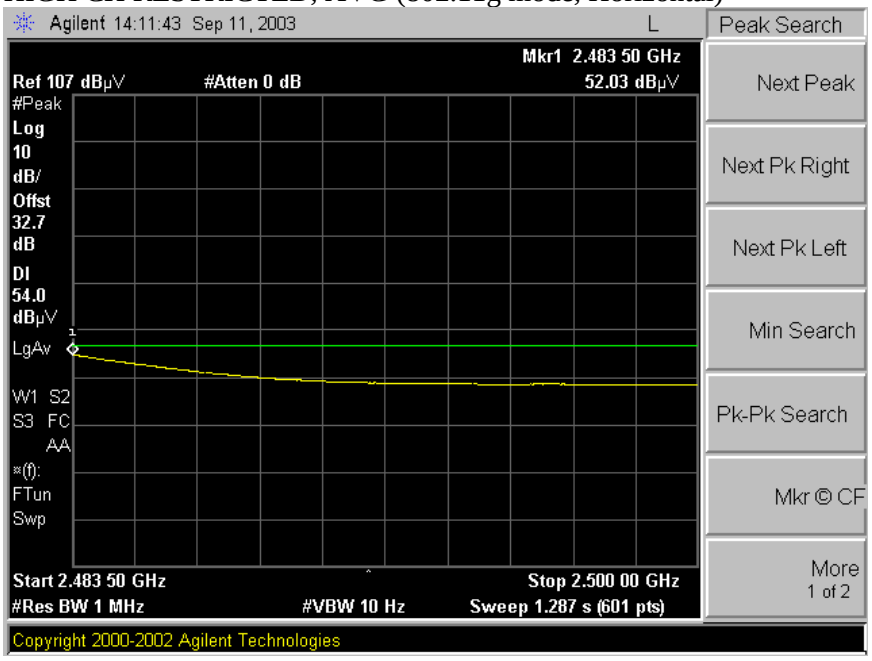


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, 2472 MHz, HORIZONTAL)

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

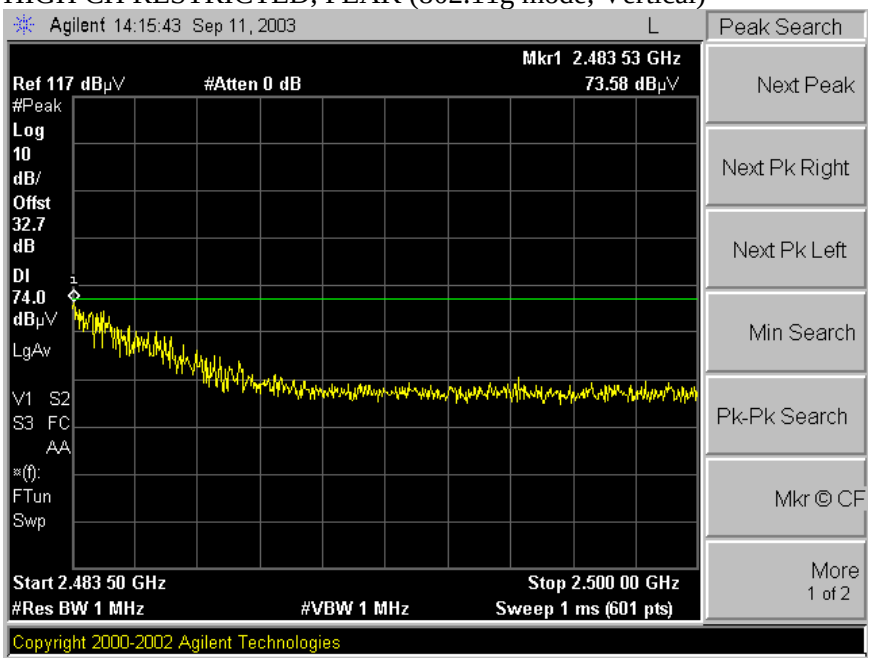


HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)

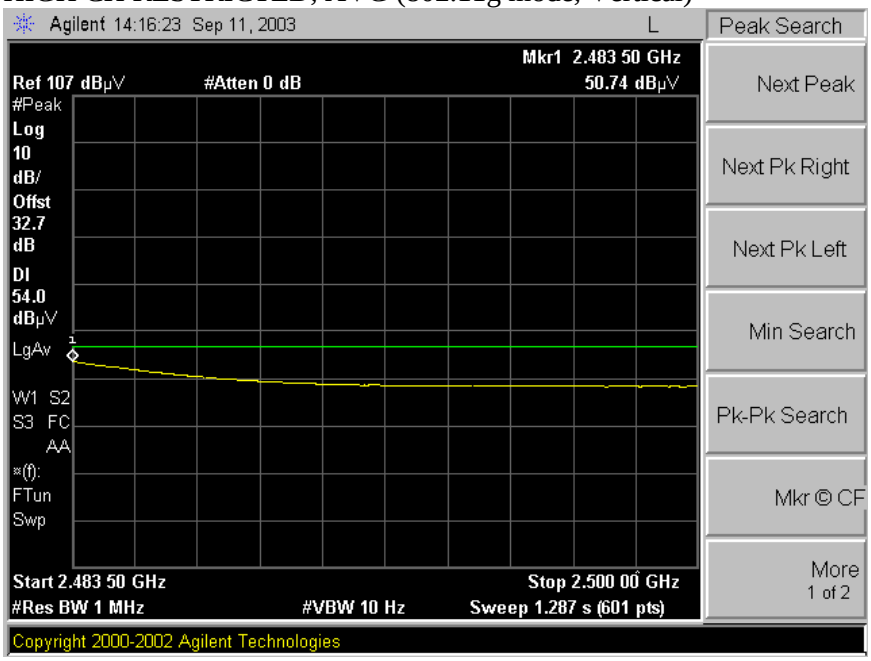


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, 2472 MHz, VERTICAL)

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



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



HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE, LOW CHANNEL)

09/12/03 **High Frequency Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: William Zhuang
Project #: 03U2252
Company Name: Atheros Communications
EUT Descrip.: 802.11 b/g Cardbus
EUT M/N: CB43
Test Target: FCC 15.247
Mode Oper: Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T60; S/N: 2238 @1m	T86 Miteq 924341			FCC 15.209

Hi Frequency Cables: ☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements: 1 MHz Resolution Bandwidth; 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth; 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
4.824	9.8	51.6	39.2	33.7	3.9	-45.6	0.0	1.0	44.6	32.2	74.0	54.0	-29.4	-21.8	g mode-Low Ch-ant1 7,V
4.824	9.8	52.1	39.1	33.7	3.9	-45.6	0.0	1.0	45.1	32.1	74.0	54.0	-28.9	-21.9	g mode-Low Ch-ant1 7,H
7.236	9.8	61.2	48.1	37.2	4.9	-46.6	0.0	1.0	57.7	44.5	74.0	54.0	-16.3	-9.5	g mode-Low Ch-ant1 7,V
7.236	9.8	58.3	45.5	37.2	4.9	-46.6	0.0	1.0	54.8	42.0	74.0	54.0	-19.2	-12.0	g mode-Low Ch-ant1 7,H

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		

HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE, MID CHANNEL)

09/12/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2252
Company Name:Atheros Communications
EUT Descrip.:802.11 b/g Cardbus
EUT M/N:CB43
Test Target:FCC 15.247
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T60; S/N: 2238 @1m	T86 Miteq 924341			FCC 15.209

Hi Frequency Cables: ☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements: 1 MHz Resolution Bandwidth, 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth, 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
4.874	9.8	52.1	39.0	33.8	3.9	-45.6	0.0	1.0	45.1	32.0	74.0	54.0	-28.9	-22.0	g mode-Mid Ch-ant18.5,V
4.874	9.8	51.8	39.3	33.8	3.9	-45.6	0.0	1.0	44.8	32.3	74.0	54.0	-29.2	-21.7	g mode-Mid Ch-ant18.5,H
7.311	9.8	70.4	51.0	37.3	4.9	-46.6	0.0	1.0	67.0	47.6	74.0	54.0	-7.0	-6.4	g mode-Mid Ch-ant18.5,V
7.311	9.8	69.6	50.5	37.3	4.9	-46.6	0.0	1.0	66.2	47.1	74.0	54.0	-7.8	-6.9	g mode-Mid Ch-ant18.5,H
4.874	9.8	51.9	39.3	33.8	3.9	-45.6	0.0	1.0	44.9	32.3	74.0	54.0	-29.1	-21.7	g turbo-Mid Ch-ant19.0,V
4.874	9.8	51.6	39.3	33.8	3.9	-45.6	0.0	1.0	44.6	32.3	74.0	54.0	-29.4	-21.7	g turbo-Mid Ch-ant19.0,H
7.311	9.8	66.1	49.3	37.3	4.9	-46.6	0.0	1.0	62.7	45.9	74.0	54.0	-11.3	-8.1	g turbo-Mid Ch-ant19.0,V
7.311	9.8	60.1	46.1	37.3	4.9	-46.6	0.0	1.0	56.7	42.7	74.0	54.0	-17.3	-11.3	g turbo-Mid Ch-ant19.0,H

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		

HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE, HIGH CHANNELS)

09/12/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2252
Company Name:Atheros Communications
EUT Descrip.:802.11 b/g Cardbus
EUT M/N:CB43
Test Target:FCC 15.247
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T60; S/N: 2238 @1m	T86 Miteq 924341			FCC 15.209

Hi Frequency Cables: ☑ (3 ft) ☐ (3 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements: 1 MHz Resolution Bandwidth; 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth; 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
4.924	9.8	51.4	39.3	33.8	3.9	-45.7	0.0	1.0	44.4	32.3	74.0	54.0	-29.6	-21.7	g mode-Ch2462-ant17.5,V
4.924	9.8	51.8	39.8	33.8	3.9	-45.7	0.0	1.0	44.8	32.4	74.0	54.0	-29.2	-21.6	g mode-Ch2462-ant17.5,H
7.386	9.8	71.7	50.4	37.4	5.0	-46.5	0.0	1.0	68.5	47.2	74.0	54.0	-5.5	-6.8	g mode-Ch2462-ant17.5,V
7.386	9.8	65.2	46.6	37.4	5.0	-46.5	0.0	1.0	61.9	43.4	74.0	54.0	-12.1	-10.6	g mode-Ch2462-ant17.5,H
4.934	9.8	50.9	38.1	33.8	3.9	-45.7	0.0	1.0	43.9	31.1	74.0	54.0	-30.1	-22.9	g mode-Ch2467-ant14.5,V
4.934	9.8	50.5	38.0	33.8	3.9	-45.7	0.0	1.0	43.5	31.0	74.0	54.0	-30.5	-23.0	g mode-Ch2467-ant14.5,H
7.401	9.8	53.5	41.6	37.4	5.0	-46.5	0.0	1.0	50.3	38.4	74.0	54.0	-23.7	-15.6	g mode-Ch2467-ant14.5,V
7.401	9.8	52.4	40.6	37.4	5.0	-46.5	0.0	1.0	49.1	37.3	74.0	54.0	-24.9	-16.7	g mode-Ch2467-ant14.5,H
4.944	9.8	50.3	38.0	33.8	3.9	-45.7	0.0	1.0	43.3	31.0	74.0	54.0	-30.7	-23.0	g mode-Ch2472-ant6.5,V
4.944	9.8	49.9	38.0	33.8	3.9	-45.7	0.0	1.0	42.9	31.0	74.0	54.0	-31.1	-23.0	g mode-Ch2472-ant6.5,H
7.416	9.8	52.4	40.3	37.4	5.0	-46.5	0.0	1.0	49.2	37.1	74.0	54.0	-24.8	-16.9	g mode-Ch2472-ant6.5,V
7.416	9.8	52.4	40.3	37.4	5.0	-46.5	0.0	1.0	49.2	37.1	74.0	54.0	-24.8	-16.9	g mode-Ch2472-ant6.5,H

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		

HARMONICS AND SPURIOUS EMISSIONS (g TURBO MODE)

09/12/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2252
Company Name:Atheros Communications
EUT Descrip.:802.11 b/g Cardbus
EUT M/N:CB43
Test Target:FCC 15.247
Mode Oper:Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T60| S/N: 2238 @1m	T86 Miteq 924341			FCC 15.209

Hi Frequency Cables: ☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements: 1 MHz Resolution Bandwidth; 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth; 10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
4.874	9.8	49.6	37.7	33.8	3.9	-45.6	0.0	1.0	42.6	30.7	74.0	54.0	-31.4	-23.3	g turbo Mid Ch-ant20,V
4.874	9.8	50.4	37.6	33.8	3.9	-45.6	0.0	1.0	43.4	30.6	74.0	54.0	-30.6	-23.4	g turbo Mid Ch-ant20,H
7.311	9.8	70.4	55.4	37.3	4.9	-46.6	0.0	1.0	67.0	52.0	74.0	54.0	-7.0	-2.0	g turbo Mid Ch-ant20,V
7.311	9.8	64.7	49.5	37.3	4.9	-46.6	0.0	1.0	61.3	46.1	74.0	54.0	-12.7	-7.9	g turbo Mid Ch-ant20,H

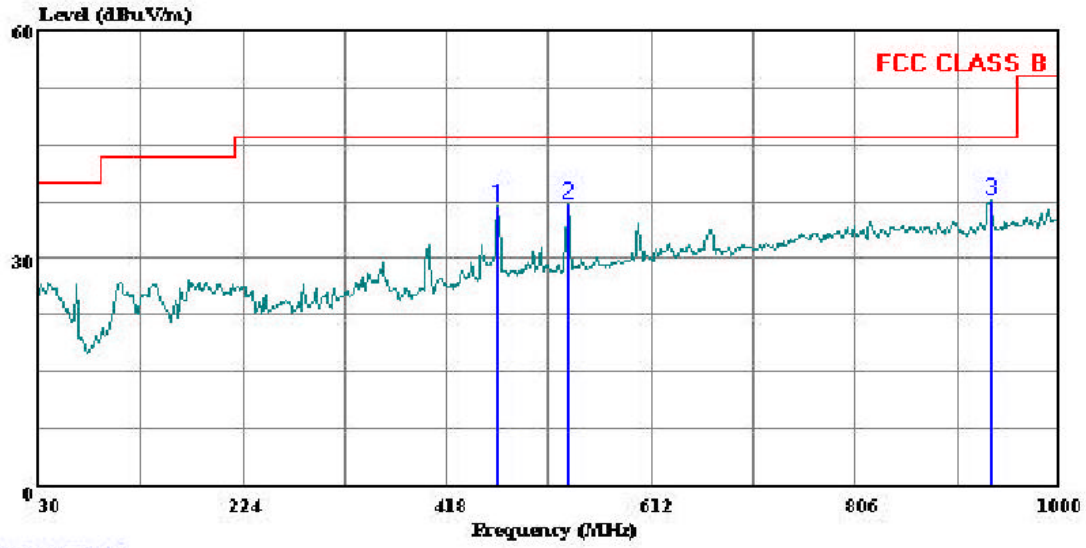
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

7.7.2. WORST-CASE SPURIOUS EMISSIONS BELOW 1 GHZ

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

561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 3 File#: Run1.emi Date: 09-17-2003 Time: 10:19:19



Trace: 2 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 HORIZONTAL
Project # : 03U2247
Engineer : NEELESH RAJ
Company : ATHEROS COMMUNICATIONS
EUT : 802.11 B/G CARDBUS
Model : CB43
Configuration : EUT/LAPTOP/AC ADAPTER
Target of Test : FCC
Mode of Operation: TX (WORST CASE)

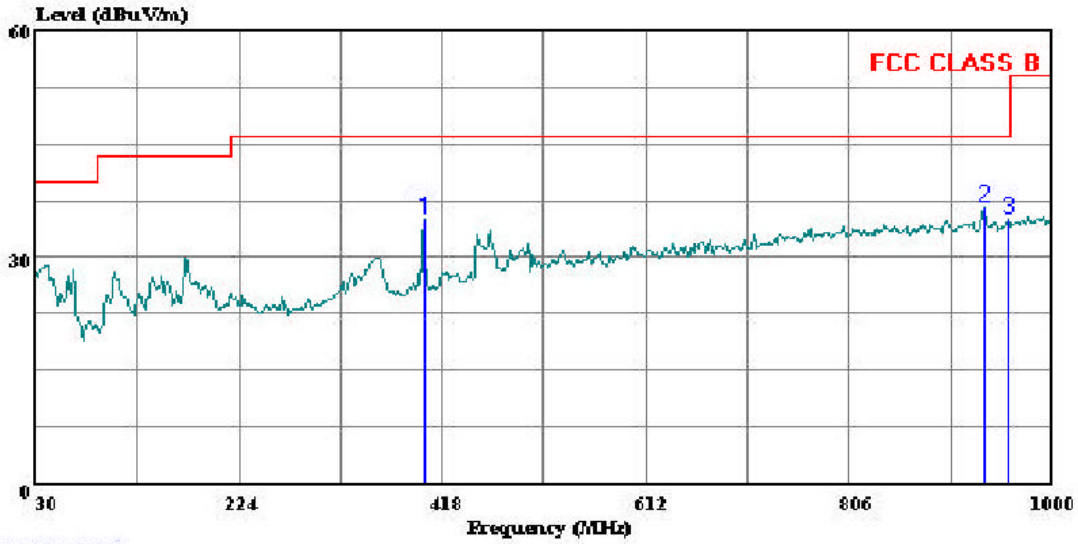
Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV/m	dBuV/m	dB	
1	465.530	18.83	15.87	2.25	36.95	46.00	-9.05	Peak
2	533.430	17.64	16.95	2.44	37.03	46.00	-8.97	Peak
3	934.040	13.60	20.81	3.31	37.72	46.00	-8.28	Peak

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

COMPLIANCE Engineering Service, Inc.
561F Monterey Road
San Jose, CA 95131
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 6 File#: Run1.emi Date: 09-17-2003 Time: 10:33:41



Trace: 4 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 VERTICAL
Project # : 03U2247
Engineer : NEELESH RAJ
Company : ATHEROS COMUNICATIONS
EUT : 802.11 B/G CARDBUS
Model : CB43
Configuration : EUT/LAPTOP/AC ADAPTER
Target of Test : FCC
Mode of Operation: TX (WORST CASE)

Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV/m	dBuV/m	dB	
1	400.540	18.70	14.45	2.01	35.16	46.00	-10.84	Peak
2	934.040	12.42	20.81	3.31	36.54	46.00	-9.46	Peak
3	958.290	10.81	20.96	3.35	35.12	46.00	-10.88	Peak

7.8. 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.

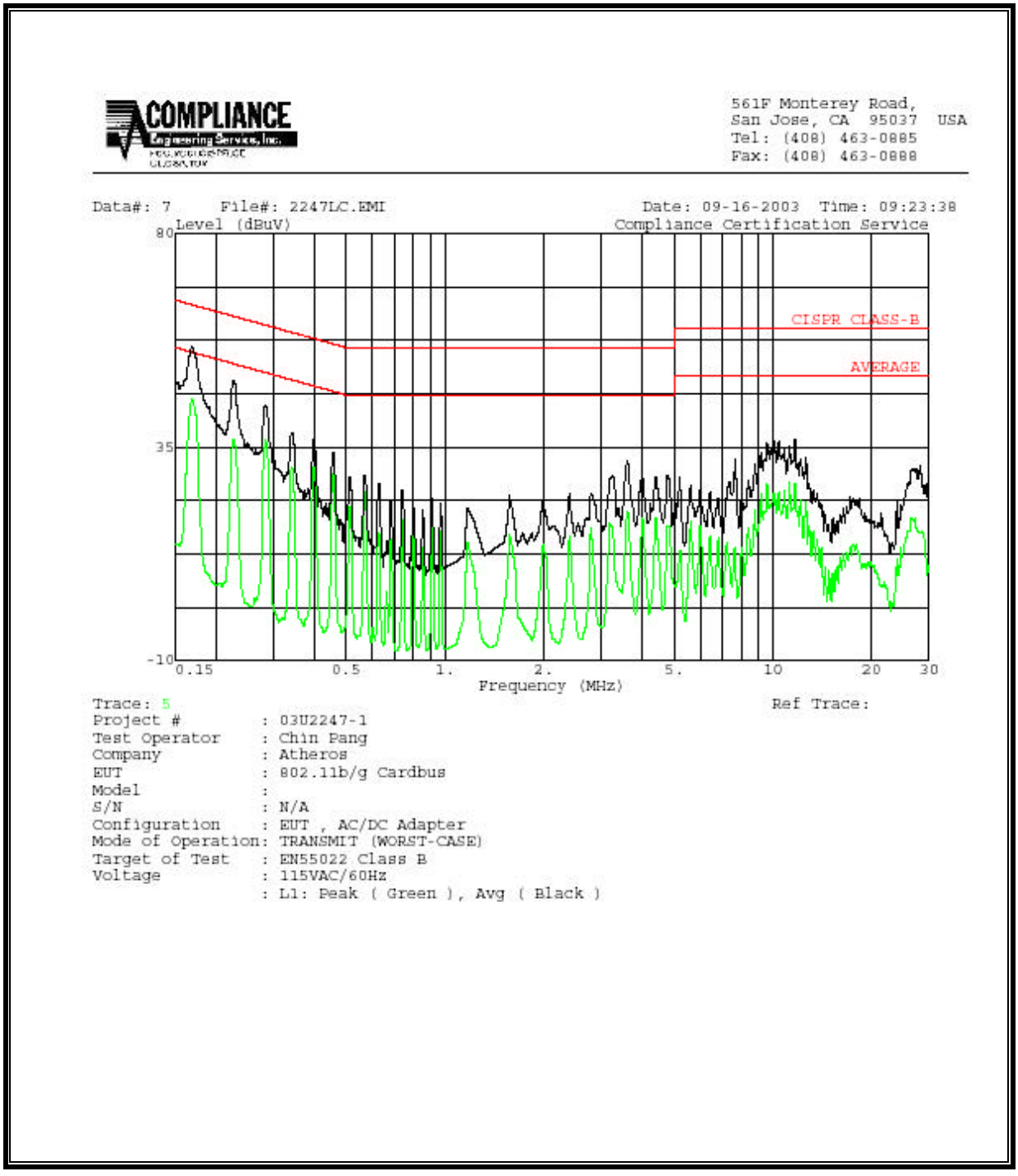
RESULTS

No non-compliance noted:

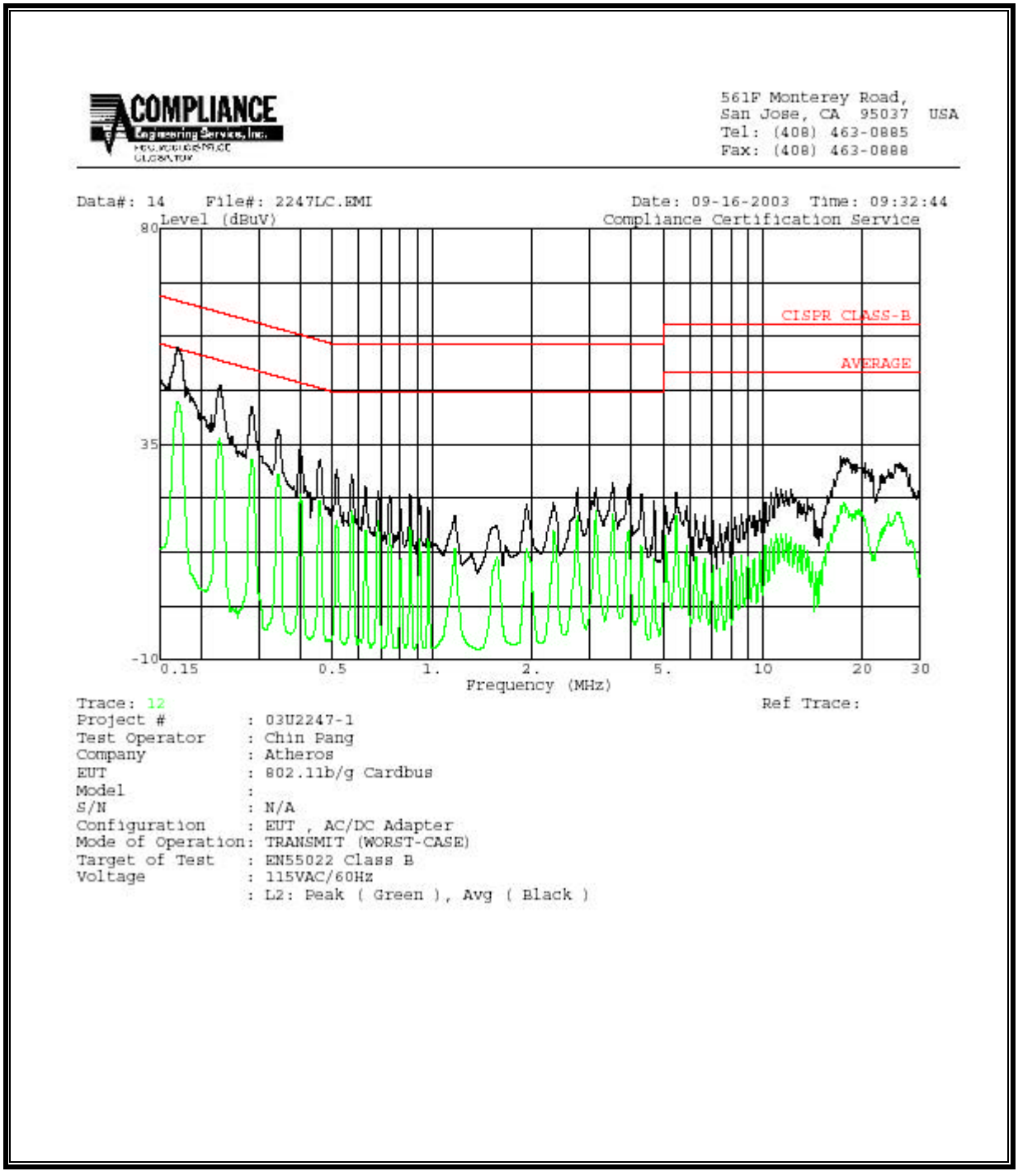
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.17	56.80	--	45.51	0.00	65.43	55.43	-8.63	-9.92	L1
0.23	50.42	--	37.80	0.00	63.74	53.74	-13.32	-15.94	L1
0.29	43.42	--	36.90	0.00	62.11	52.11	-18.69	-15.21	L1
0.17	56.00	--	43.96	0.00	65.43	55.43	-9.43	-11.47	L2
0.23	47.24	--	37.27	0.00	63.74	53.74	-16.50	-16.47	L2
0.28	43.98	--	33.68	0.00	62.20	52.20	-18.22	-18.52	L2
6 Worst Data									

LINE 1 RESULTS



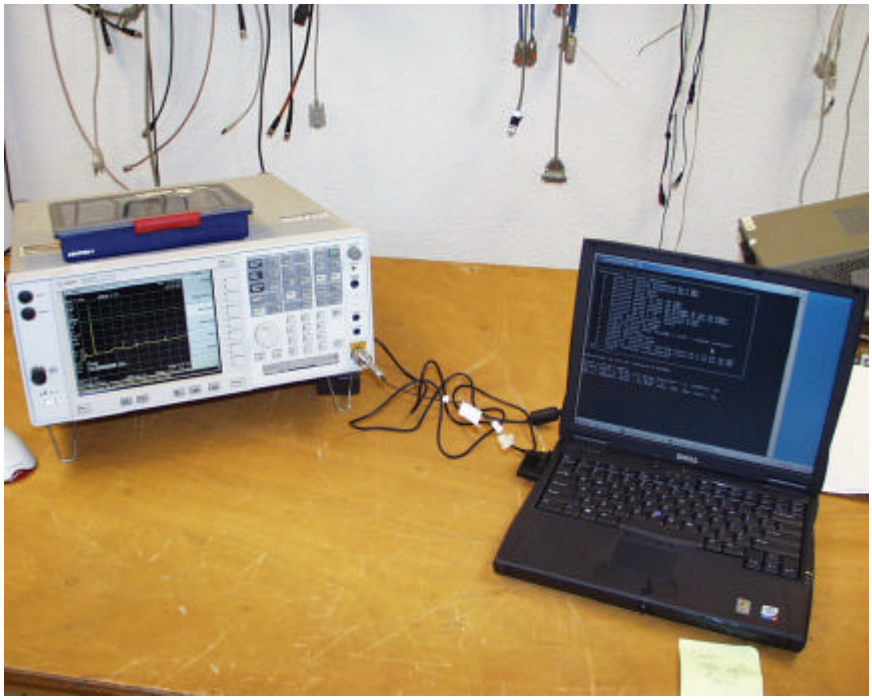
LINE 2 RESULTS



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