FCC CFR47 PART 15 SUBPART C
CLASS II PERMISSIVE CHANGE
CERTIFICATION
TEST REPORT

PCI EXPRESS 802.11 B/G TRANSCEIVER

MODEL NUMBER: AR5BXB61

FCC ID: PPD-AR5BXB61

REPORT NUMBER: 06U10602-1, REVISION B

ISSUE DATE: OCTOBER 17, 2006

Prepared for
ATHEROS COMMUNICATIONS, INC.
5480 GREAT AMERICA PARKWAY
SANTA CLARA, CA 95054, USA

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

LAB CODE:200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/16/06	Initial Issue	Thu
B	10/17/06	C2PC updates incorporated.	S.R.
		MPE Collocate with BT	Thu

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ATHEROS COMMUNICATIONS, INC.
5480 GREAT AMERICA PARKWAY
SANTA CLARA, CA 95054, USA

EUT DESCRIPTION: PCI EXPRESS 802.11B/G TRANSCEIVER

MODEL: AR5BXB61

SERIAL NUMBER: 0016CF56EFA3

DATE TESTED: SEPTEMBER 21 – OCTOBER 02, 2006

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:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH NGUYEN
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.

The radio module is manufactured by Atheros Communications, Inc.

5.2. DESCRIPTION OF CLASS II CHANGE

The changes tested in this report are as follows:
-add antennas that are lower gain and same type,
-add one antenna with new type (dipole), and
-add collocation with Bluetooth module with FCCID: CWTUGPZ6

The 802.11g turbo mode is not supported by radio modules incorporating these additional antennas. This is accomplished by a firmware change with no change to hardware.

5.3. MAXIMUM OUTPUT POWER

Please refer to FCC ID: PPD-AR5BXB61 Report Number: 05U3748-1.

The transmitter has the same 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	23.93	247.17
2412 - 2462	802.11g	26.70	467.74

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antennas:

1. Dipole Antenna
   Model: 14G151039000SY
   Manufacturer: SmartAnt
   Highest Peak Gain w/ Cable Loss (dBi) at 2.4 GHz: 1.1 dBi

2. PIFA Antenna
   Model: WDAN-SCMS5001, 2-1F
   Manufacturer: Foxconn
   Highest Peak Gain w/ Cable Loss (dBi) at 2.4 GHz: 2.3 dBi

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was Atheros Radio Test, Revision 5.3 Build #11.

The test utility software, which was used during testing, was ART v5_3_b25.

5.6. 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.

The worst-case data rate for this channel is determined to be 1 Mb/s for 11b mode and 6 Mbps for 11g mode, based on previous experience with Atheros WLAN product design architectures.

Thus radiated emissions below 1 GHz were performed with the EUT set at mid channel, 1 Mb/s for 11b mode and 6 Mbps for 11g mode.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	IBM	1859-5RU	L3-GP950	DoC
AC Adapter	IBM	DCWP CM-2	11S92P1020Z1Z9	N/A
Extension Card	Atheros	NA	NA	NA

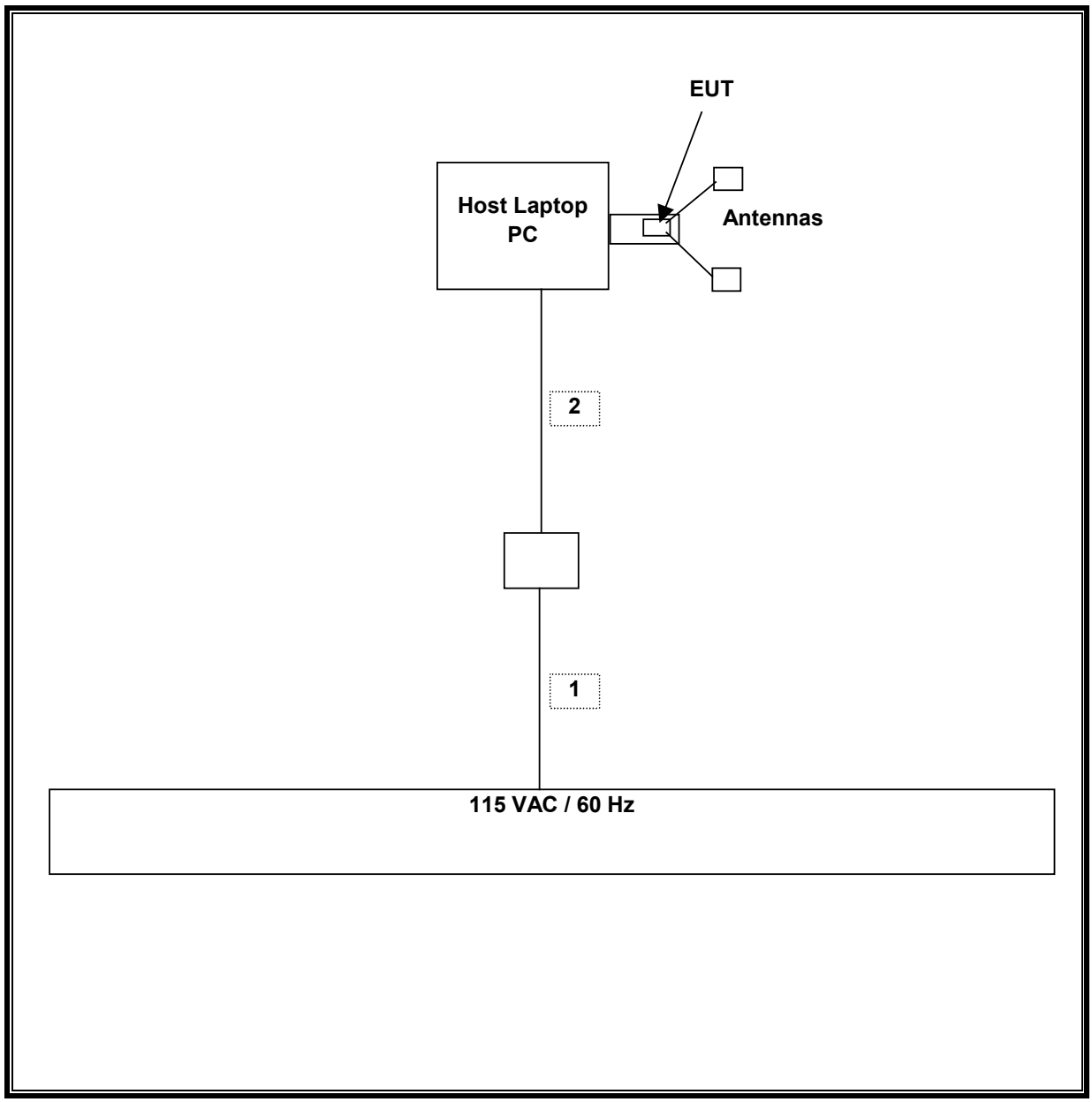
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	AC	Unshielded	1m	N/A
2	DC	1	DC	Unshielded	1.8m	Ferrite on cable

TEST SETUP

The EUT was tested with a host laptop computer connected via an express-card extension board. Test s/w 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

Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	5/3/2007
Power Meter	Agilent / HP	438A	3513U04320	1/12/2007
Power Sensor 10MHz - 18GHz	Agilent / HP	8481A	2237A31744	1/11/2007
4.0 GHz Highpass Filter	Micro-Tronics	HPM13351	2	CNR
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/2007
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/2007
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/2007

7. LIMITS AND RESULTS

7.1. RADIATED EMISSIONS

7.1.1. 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.

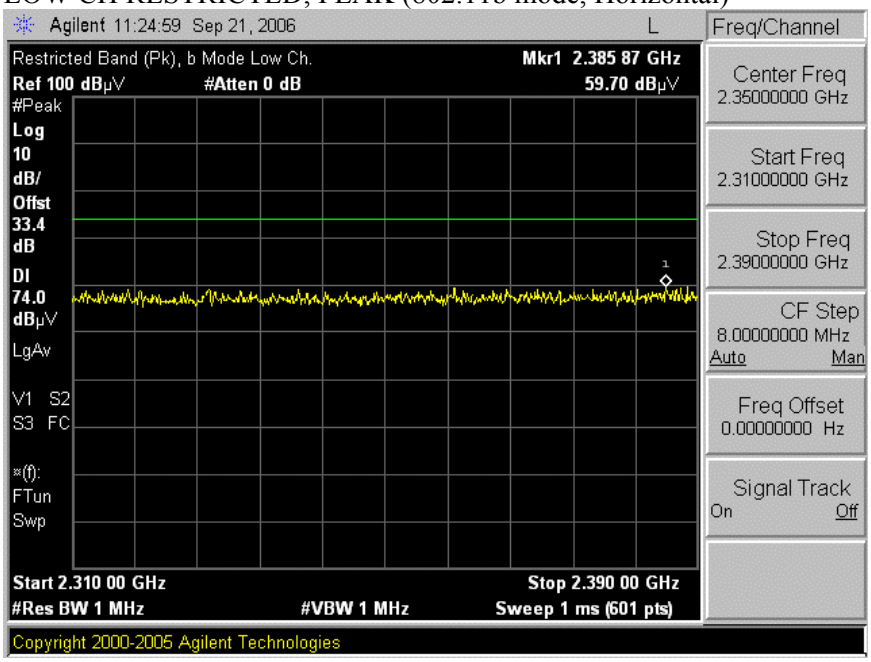
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

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

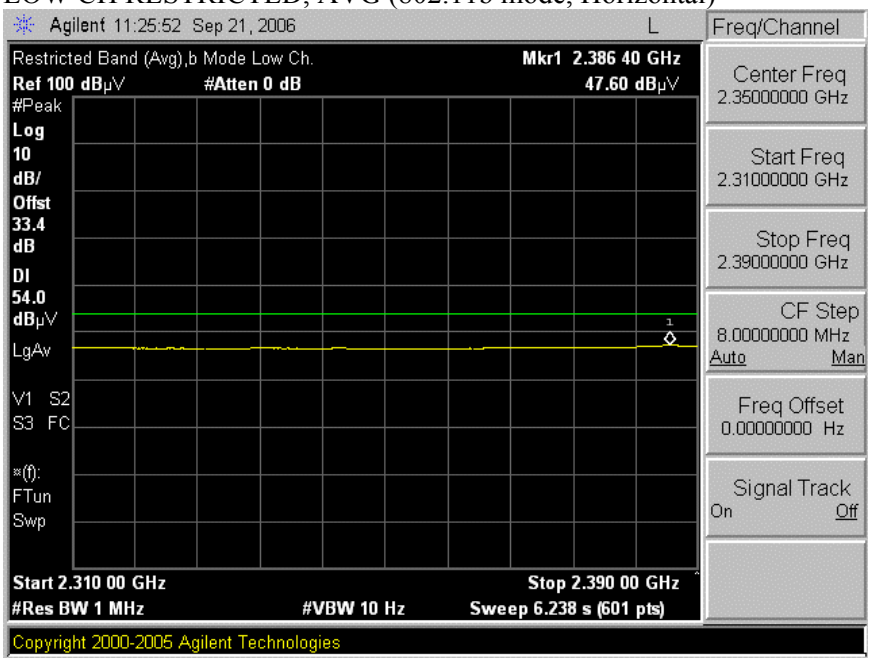
1) DIPOLE ANTENNA

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

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

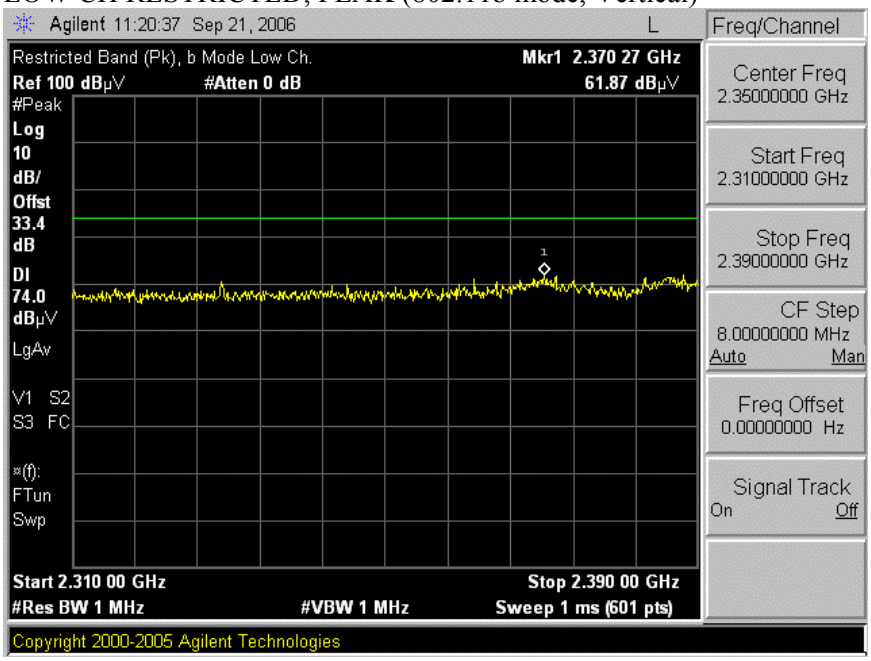


LOW CH RESTRICTED, AVG (802.11b mode, Horizontal)

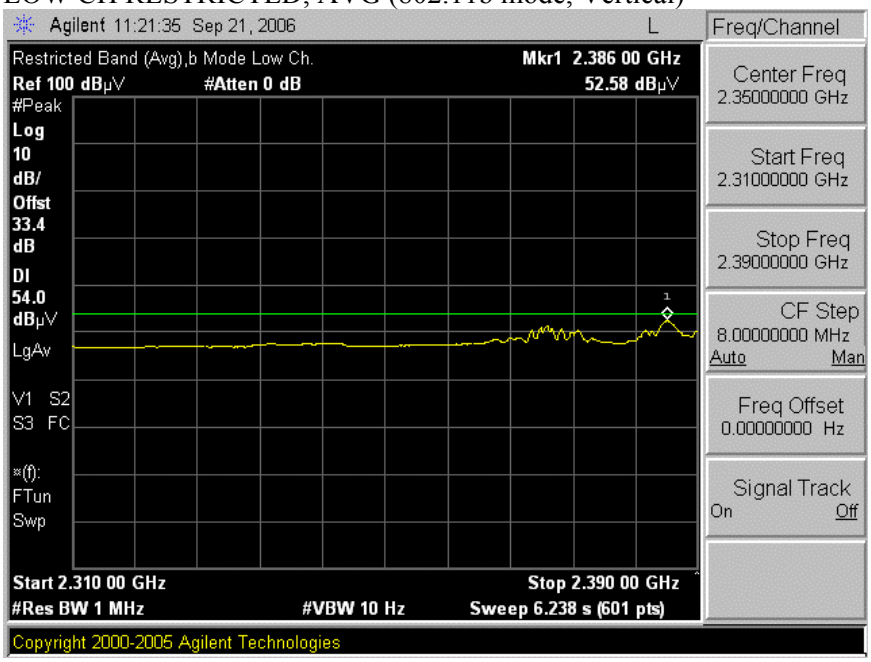


RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

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

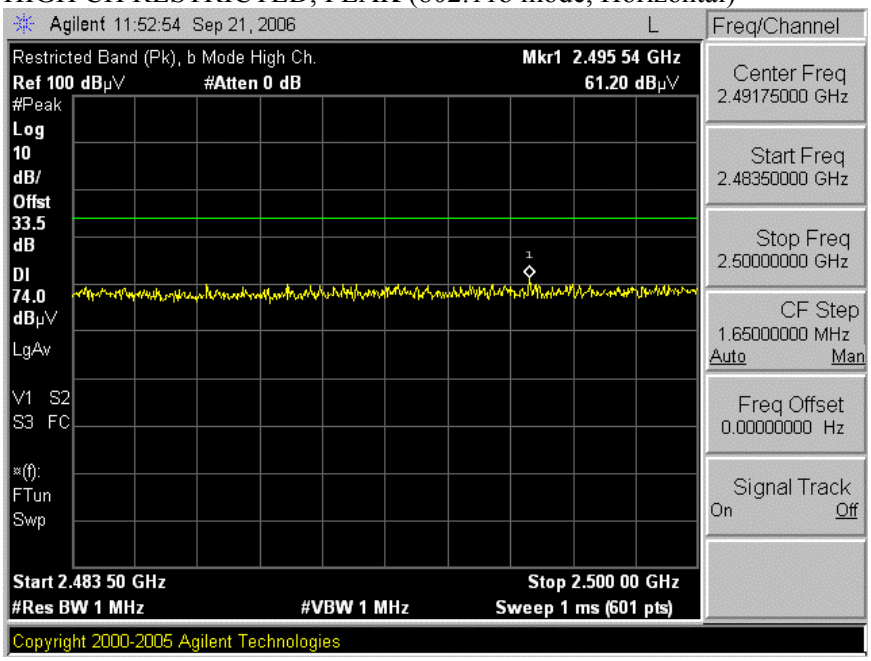


LOW CH RESTRICTED, AVG (802.11b mode, Vertical)

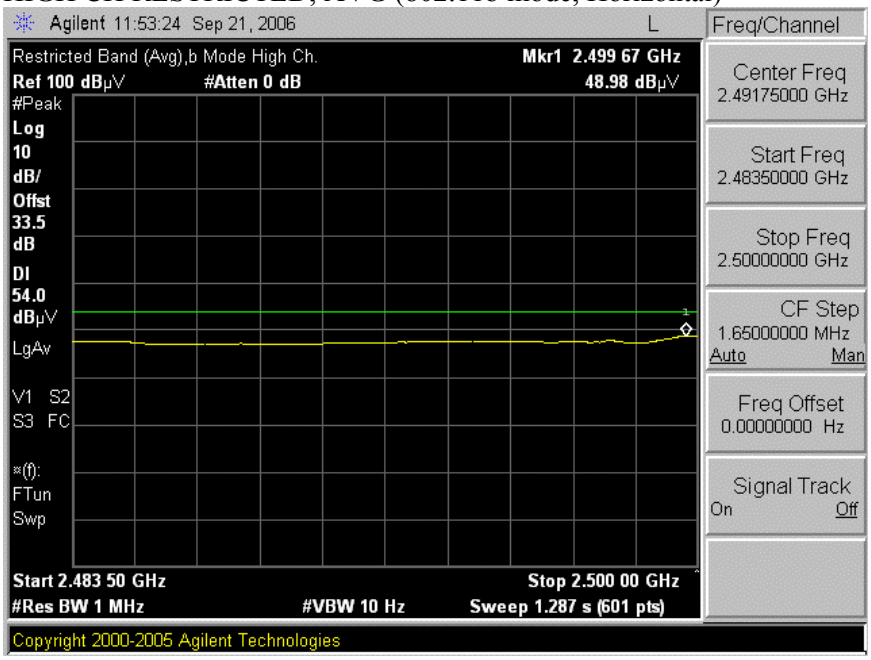


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

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

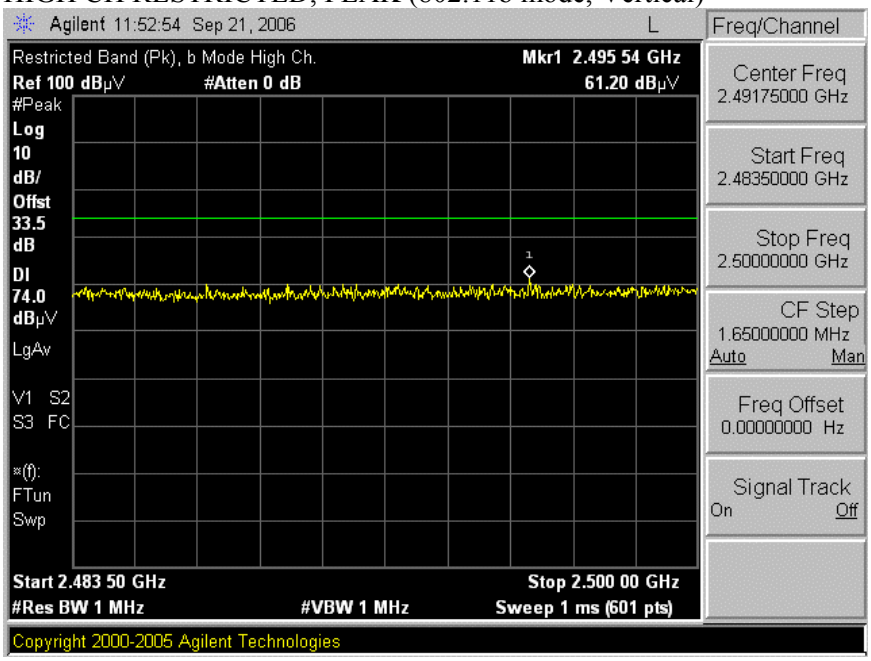


HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)

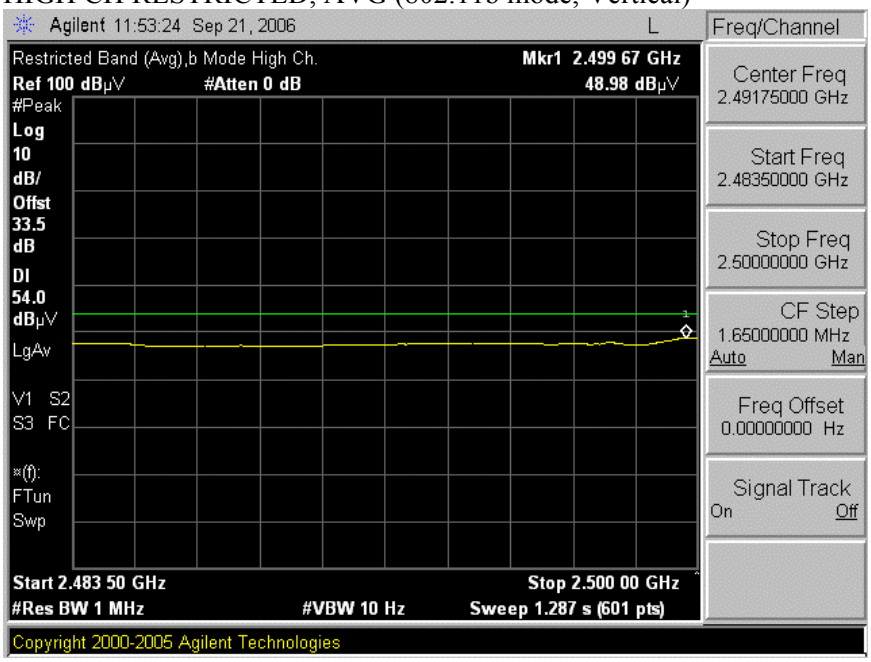


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)

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



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



HARMONICS AND SPURIOUS EMISSIONS (b MODE)

9/22/2006 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thanh Nguyen
Project #: 06U10602-1
Company: Atheros
EUT Descrip.: PCI express 802.11 b/g tranceiver
EUT M/N: AR5BXB61
Test Target: FCC 15.247
Mode Oper: b mode, TX With Dipole Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T119; S/N: 29301 @3m	T87 Miteq 924342			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	Thanh 208946003	HPF_4.0GHz	

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)
Low Ch, 2412MHz															
4.824	3.0	55.55	50.08	34.0	2.6	-45.3	0.0	0.6	47.5	42.0	74	54	-26.5	-12.0	V
7.236	3.0	53.04	42.29	35.6	3.7	-43.3	0.0	0.6	49.6	38.8	74	54	-24.4	-15.2	V
9.648	3.0	48.82	35.28	37.1	4.0	-39.9	0.0	0.8	50.9	37.4	74	54	-23.1	-16.6	Noise Floor
4.824	3.0	51.93	38.23	34.0	2.6	-45.3	0.0	0.6	43.8	30.1	74	54	-30.2	-23.9	H
9.648	3.0	51.57	38.24	37.1	4.0	-39.9	0.0	0.8	53.7	40.3	74	54	-20.3	-13.7	H
12.060	3.0	47.19	35.17	38.4	4.3	-40.0	0.0	0.9	50.8	38.8	74	54	-23.2	-15.2	Noise Floor
Mid Ch, 2437MHz															
4.874	3.0	53.84	38.70	34.1	2.6	-45.3	0.0	0.6	45.8	30.7	74	54	-28.2	-23.3	V
7.311	3.0	52.56	42.33	35.6	3.7	-43.2	0.0	0.6	49.3	39.0	74	54	-24.7	-15.0	V
9.748	3.0	48.36	35.54	37.3	4.0	-39.6	0.0	0.8	50.9	38.0	74	54	-23.1	-16.0	Noise Floor
4.874	3.0	51.70	38.36	34.1	2.6	-45.3	0.0	0.6	43.7	30.3	74	54	-30.3	-23.7	H
7.311	3.0	51.96	38.46	35.6	3.7	-43.2	0.0	0.6	48.7	35.2	74	54	-25.3	-18.8	H
9.748	3.0	47.57	35.63	37.3	4.0	-39.6	0.0	0.8	50.1	38.1	74	54	-23.9	-15.9	Noise Floor
High Ch, 2462MHz															
4.924	3.0	58.22	53.78	34.1	2.7	-45.4	0.0	0.6	50.3	45.8	74	54	-23.7	-8.2	V
7.386	3.0	53.94	40.45	35.7	3.7	-43.1	0.0	0.6	50.8	37.3	74	54	-23.2	-16.7	V
9.848	3.0	49.31	36.38	37.5	4.0	-39.4	0.0	0.8	52.2	39.3	74	54	-21.8	-14.7	Noise Floor
4.924	3.0	53.1	39.2	34.1	2.7	-45.4	0.0	0.6	45.1	31.2	74	54	-28.9	-22.8	H
7.386	3.0	52.0	39.5	35.7	3.7	-43.1	0.0	0.6	48.9	36.3	74	54	-25.1	-17.7	H
9.848	3.0	49.2	37.7	37.5	4.0	-39.4	0.0	0.8	52.1	40.6	74	54	-21.9	-13.4	Noise Floor

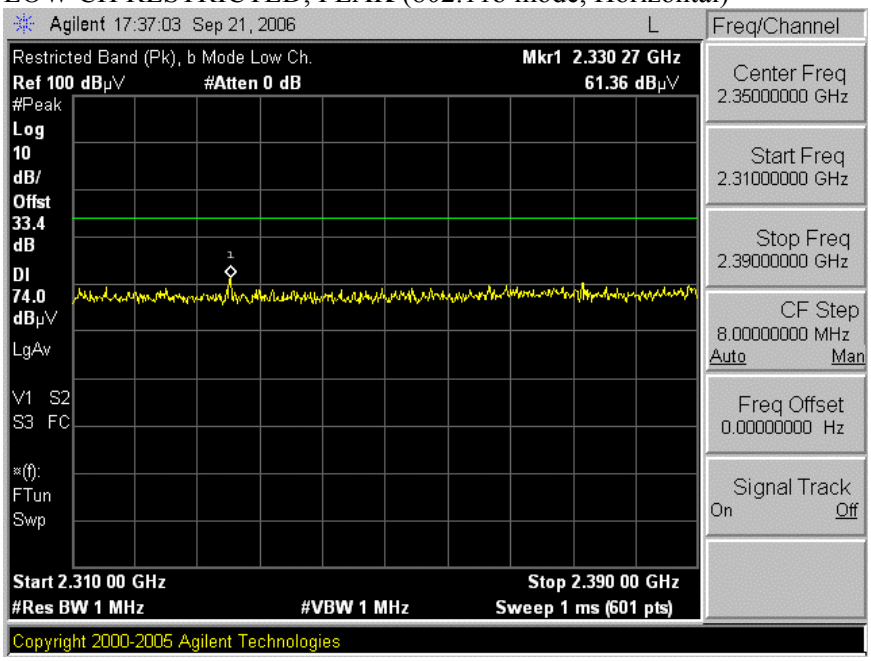
No other emissions were detected above 4th Harmonic.

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		

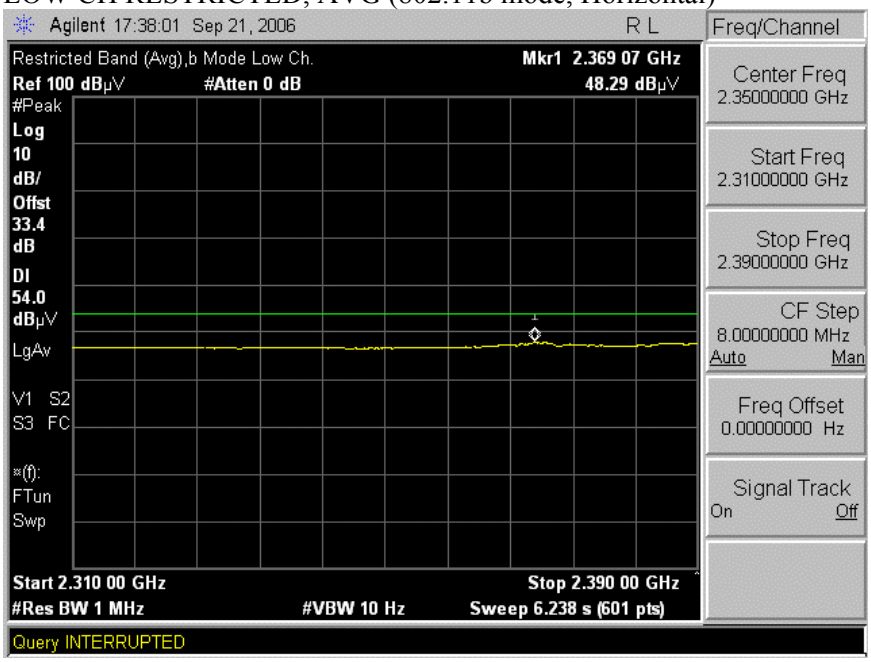
2) PIFA ANTENNA IRX-3860

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

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

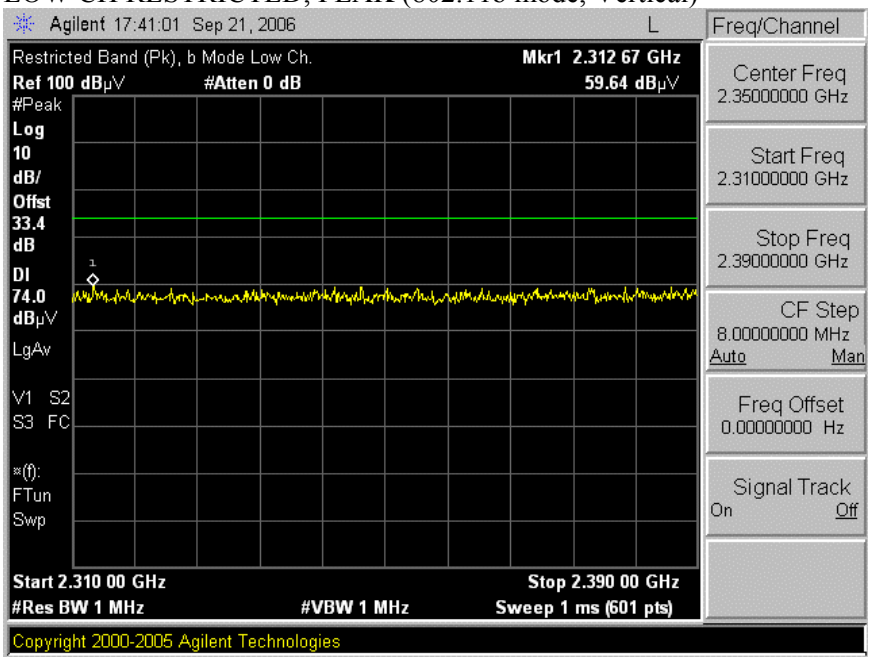


LOW CH RESTRICTED, AVG (802.11b mode, Horizontal)

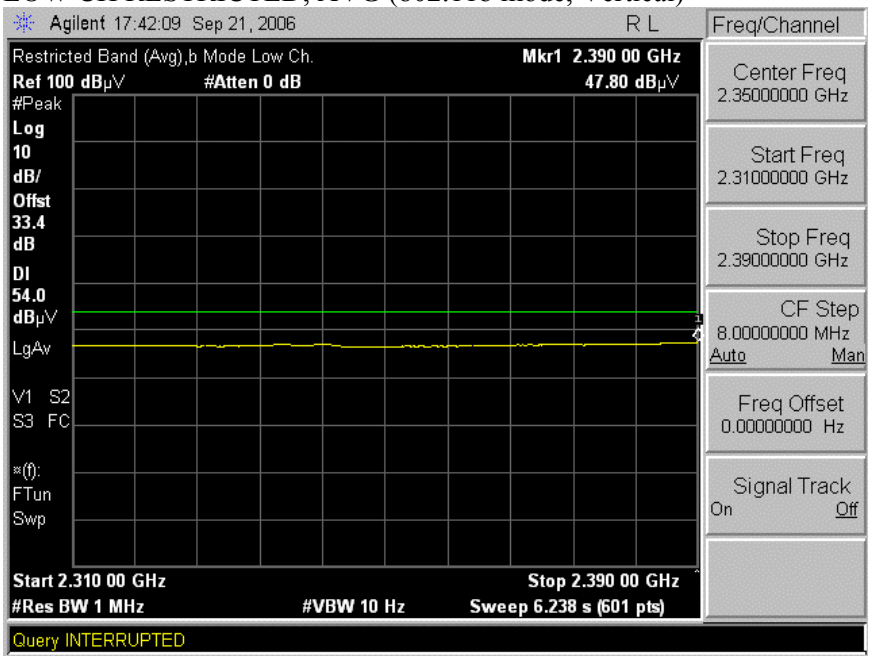


RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

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

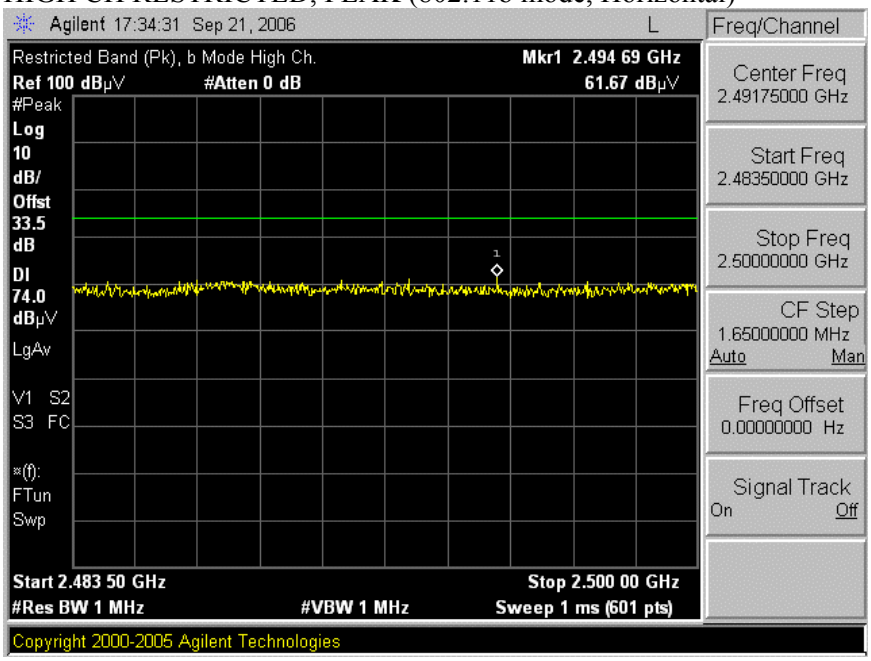


LOW CH RESTRICTED, AVG (802.11b mode, Vertical)

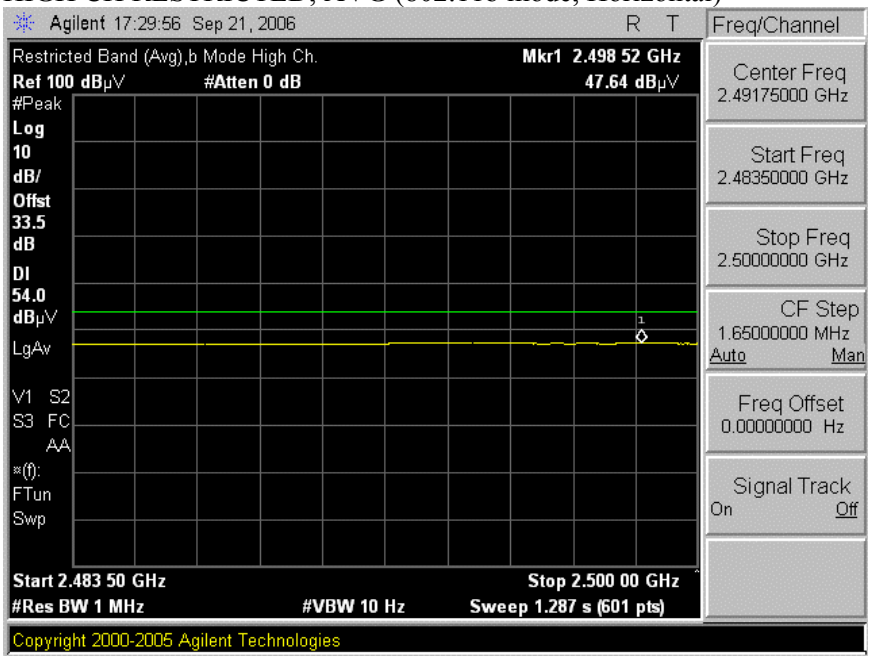


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

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

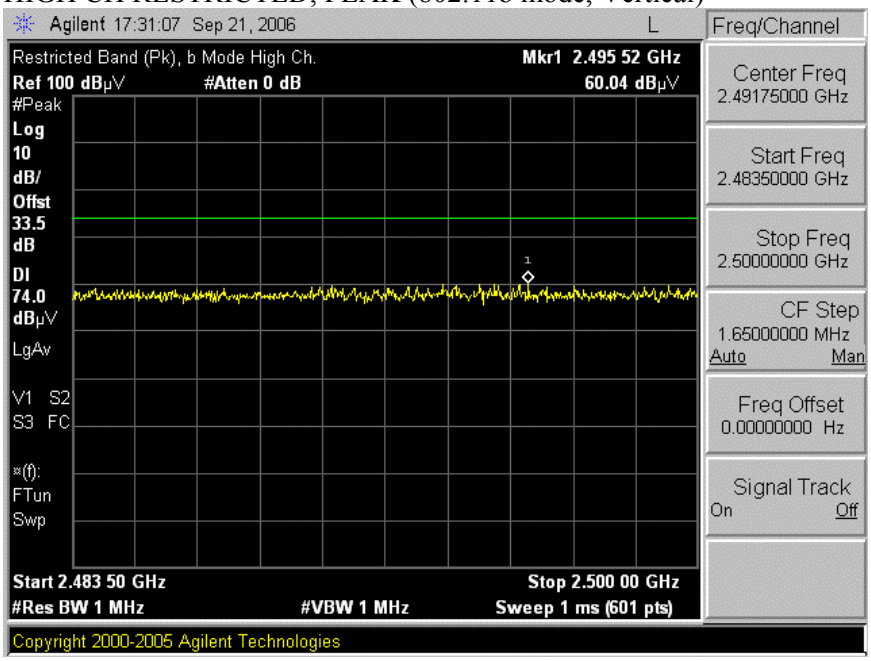


HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)

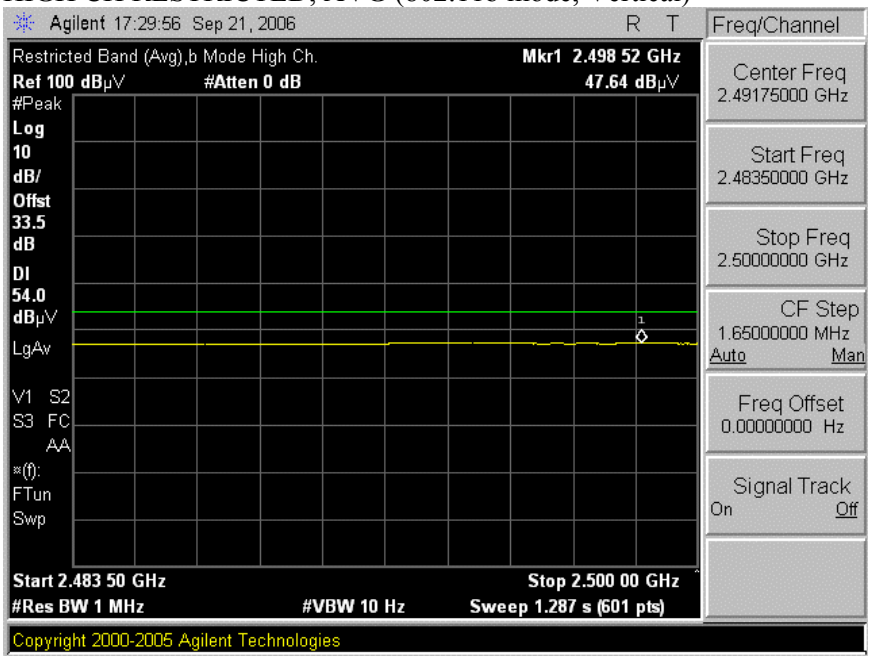


RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)

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



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



HARMONICS AND SPURIOUS EMISSIONS (b MODE)

9/22/2006 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thanh Nguyen
Project #: 06U10602-1
Company: Atheros
EUT Descrip.: PCI express 802.11 b/g tranceiver
EUT M/N: AR5BXB61
Test Target: FCC 15.247
Mode Oper: b mode, TX With PiFa IRX-3860 Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T119; S/N: 29301 @3m	T87 Miteq 924342			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	Thanh 208946003	HPF_4.0GHz	

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)
Low Ch, 2412MHz															
4.824	3.0	52.72	40.20	34.0	2.6	-45.3	0.0	0.6	44.6	32.1	74	54	-29.4	-21.9	V
7.236	3.0	54.29	42.67	35.6	3.7	-43.3	0.0	0.6	50.8	39.2	74	54	-23.2	-14.8	V
9.648	3.0	48.64	38.07	37.1	4.0	-39.9	0.0	0.8	50.7	40.2	74	54	-23.3	-13.8	V
4.824	3.0	52.92	45.85	34.0	2.6	-45.3	0.0	0.6	44.8	37.8	74	54	-29.2	-16.2	H
9.648	3.0	53.30	41.55	37.1	4.0	-39.9	0.0	0.8	55.4	43.6	74	54	-18.6	-10.4	H
12.060	3.0	47.49	35.65	38.4	4.3	-40.0	0.0	0.9	51.1	39.3	74	54	-22.9	-14.7	Noise Floor
Mid Ch, 2437MHz															
4.874	3.0	53.34	38.52	34.1	2.6	-45.3	0.0	0.6	45.3	30.5	74	54	-28.7	-23.5	V
7.311	3.0	52.88	40.83	35.6	3.7	-43.2	0.0	0.6	49.6	37.5	74	54	-24.4	-16.5	V
9.748	3.0	50.43	41.13	37.3	4.0	-39.6	0.0	0.8	52.9	43.6	74	54	-21.1	-10.4	V
4.874	3.0	52.40	40.78	34.1	2.6	-45.3	0.0	0.6	44.4	32.8	74	54	-29.6	-21.2	H
7.311	3.0	51.94	37.97	35.6	3.7	-43.2	0.0	0.6	48.6	34.7	74	54	-25.4	-19.3	H
9.748	3.0	48.79	35.65	37.3	4.0	-39.6	0.0	0.8	51.3	38.1	74	54	-22.7	-15.9	Noise Floor
High Ch, 2462MHz															
4.924	3.0	53.58	44.15	34.1	2.7	-45.4	0.0	0.6	45.6	36.2	74	54	-28.4	-17.8	V
7.386	3.0	54.29	43.83	35.7	3.7	-43.1	0.0	0.6	51.2	40.7	74	54	-22.8	-13.3	V
9.848	3.0	48.77	37.18	37.5	4.0	-39.4	0.0	0.8	51.7	40.1	74	54	-22.3	-13.9	Noise Floor
4.924	3.0	55.24	44.08	34.1	2.7	-45.4	0.0	0.6	47.3	36.1	74	54	-26.7	-17.9	H
7.386	3.0	51.57	38.43	35.7	3.7	-43.1	0.0	0.6	48.4	35.3	74	54	-25.6	-18.7	H
9.848	3.0	51.89	38.49	37.5	4.0	-39.4	0.0	0.8	54.8	41.4	74	54	-19.2	-12.6	Noise Floor

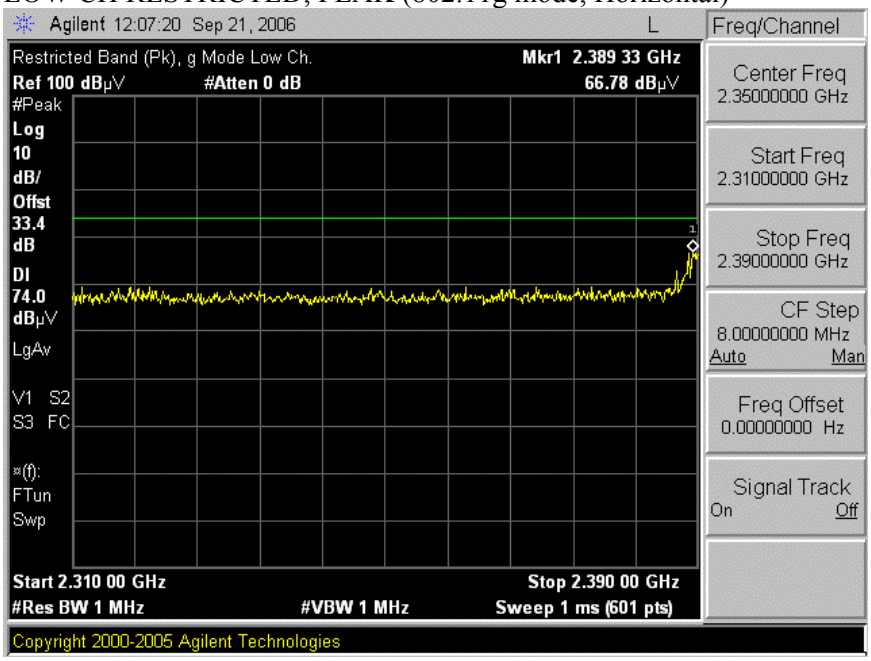
No other emissions were detected above 4th Harmonic.

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		

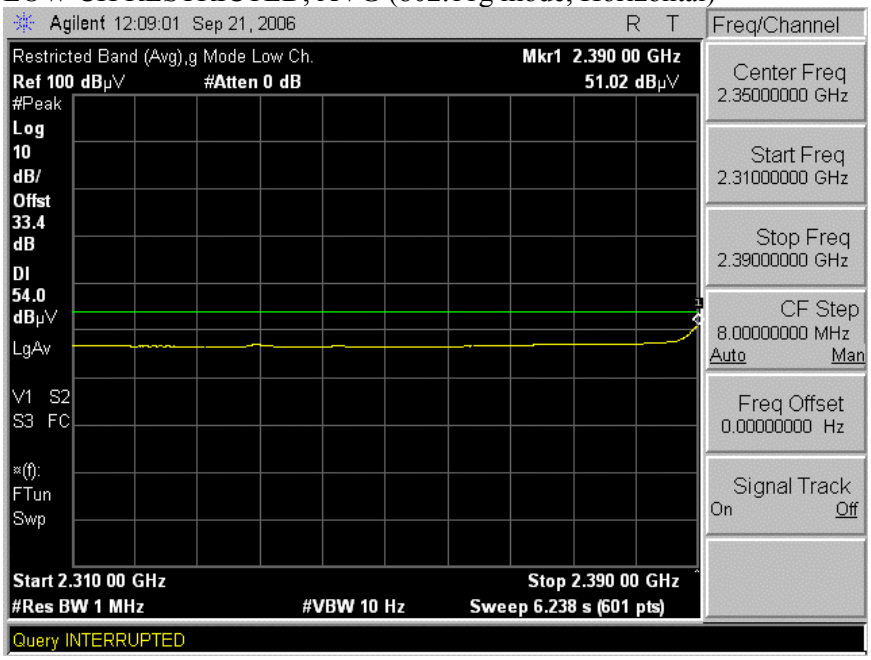
1) DIPOLE ANTENNA

RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

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

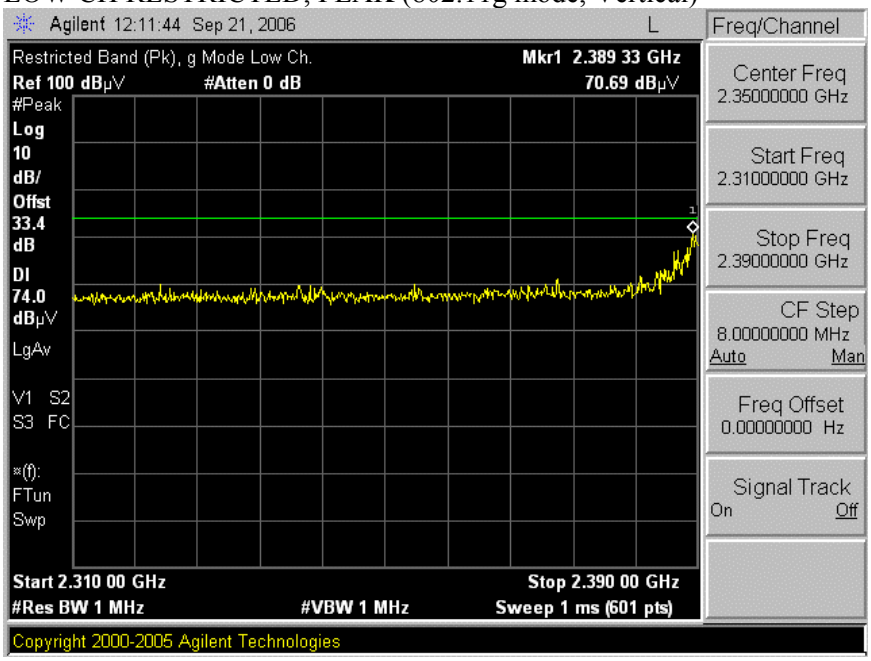


LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)

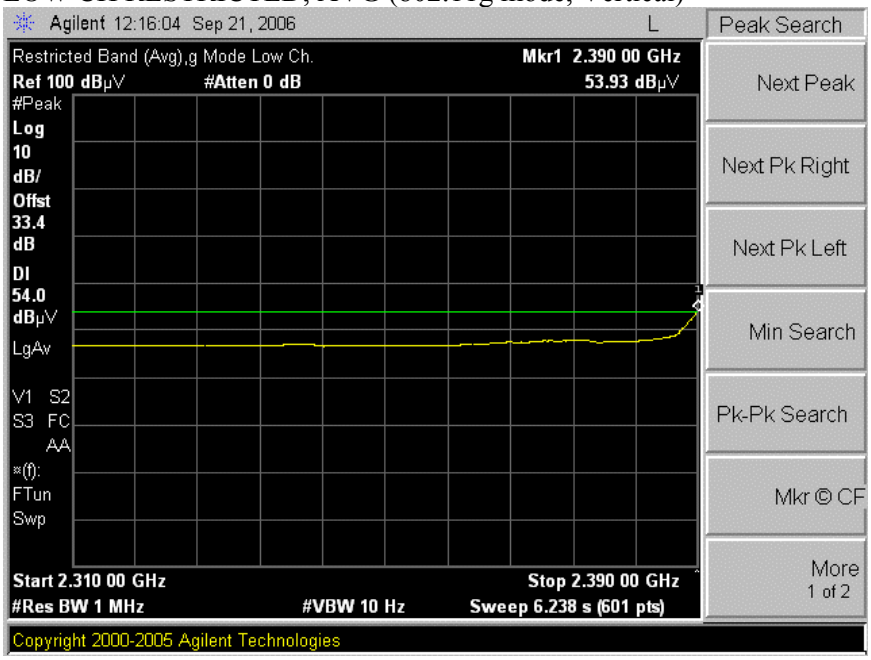


RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

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

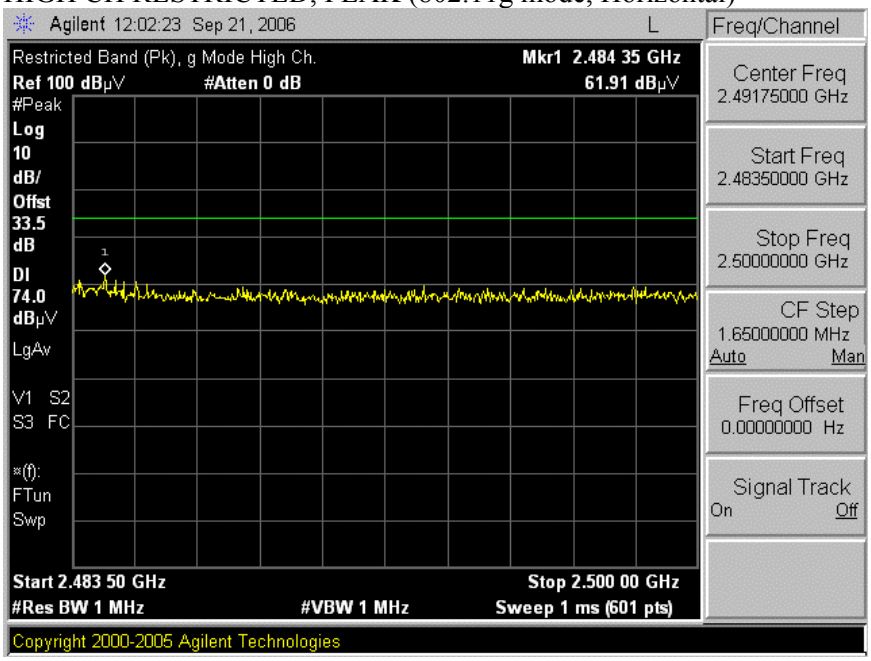


LOW CH RESTRICTED, AVG (802.11g mode, Vertical)

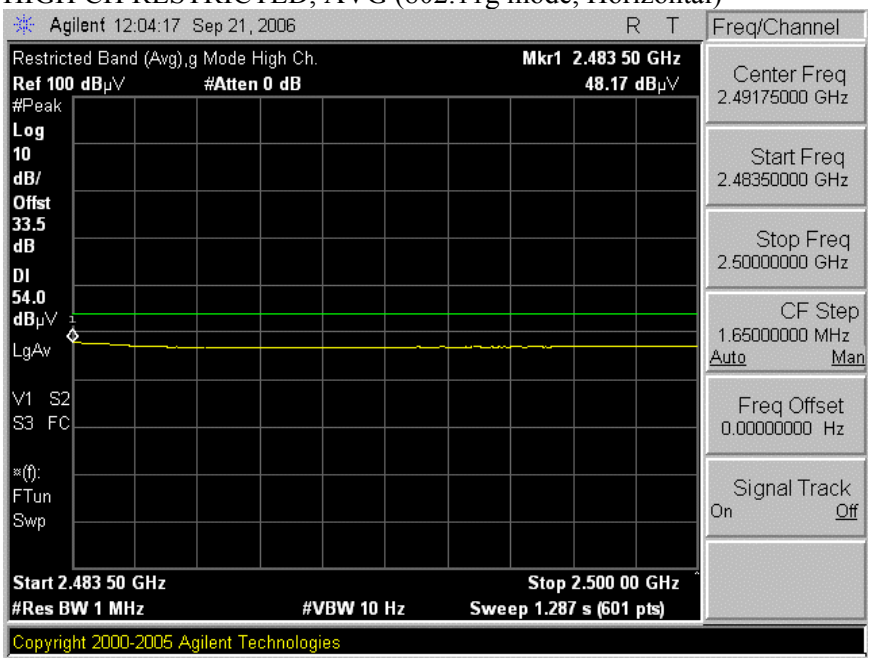


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

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

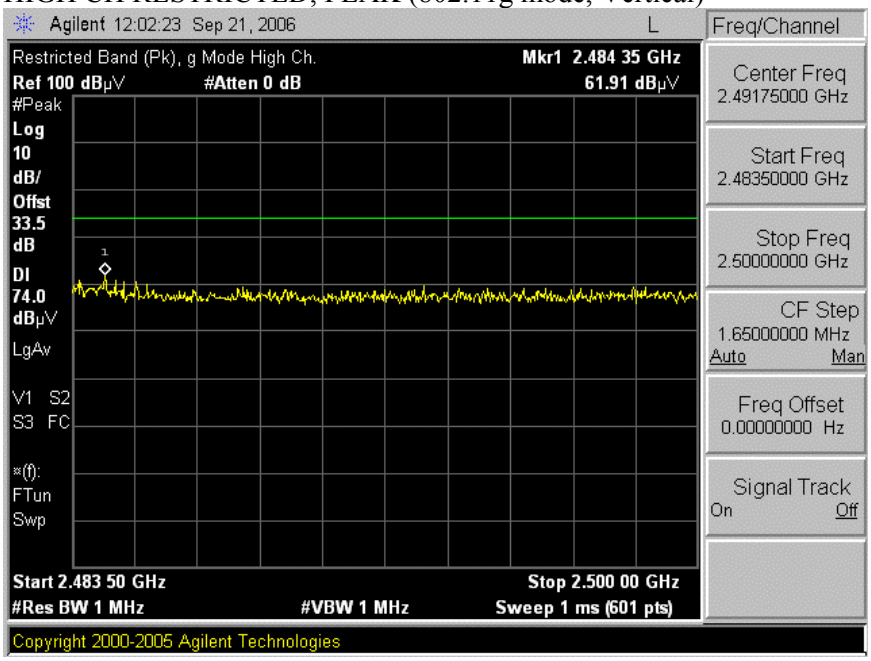


HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)

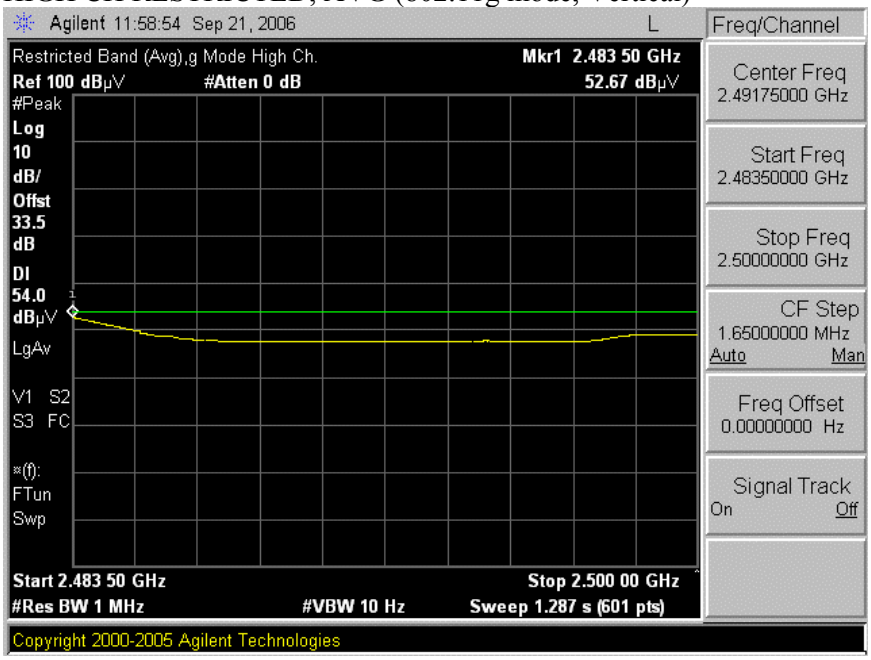


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)

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



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



HARMONICS AND SPURIOUS EMISSIONS (g MODE)

9/22/2006 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thanh Nguyen
Project #: 06U10602-1
Company: Atheros
EUT Descrip.: PCI express 802.11 b/g tranceiver
EUT M/N: AR5BXB61
Test Target: FCC 15.247
Mode Oper: g mode, TX With Dipole Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T119; S/N: 29301 @3m	T87 Miteq 924342			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	Thanh 208946003	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

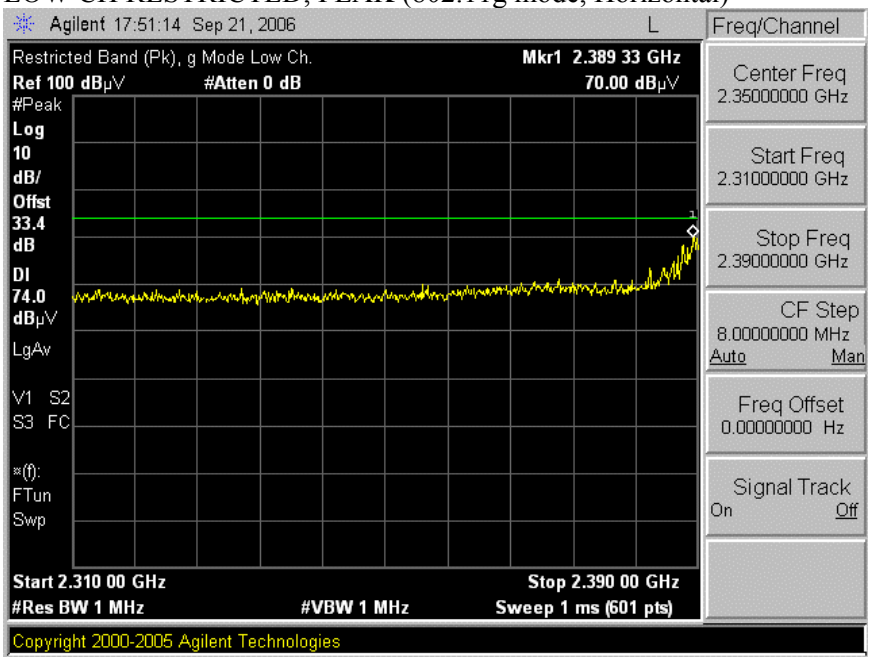
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
4.824	3.0	54.28	38.58	34.0	2.6	-45.3	0.0	0.6	46.2	30.5	74	54	-27.8	-23.5	V
7.236	3.0	53.68	40.74	35.6	3.7	-43.3	0.0	0.6	50.2	37.3	74	54	-23.8	-16.7	V
9.648	3.0	48.94	35.06	37.1	4.0	-39.9	0.0	0.8	51.0	37.2	74	54	-23.0	-16.8	Noise Floor
4.824	3.0	51.96	38.10	34.0	2.6	-45.3	0.0	0.6	43.9	30.0	74	54	-30.1	-24.0	H
9.648	3.0	51.81	38.37	37.1	4.0	-39.9	0.0	0.8	53.9	40.5	74	54	-20.1	-13.5	H
12.060	3.0	48.60	37.20	38.4	4.3	-40.0	0.0	0.9	52.2	40.8	74	54	-21.8	-13.2	Noise Floor
Mid Ch, 2437MHz															
4.874	3.0	52.08	38.70	34.1	2.6	-45.3	0.0	0.6	44.1	30.7	74	54	-29.9	-23.3	V
7.311	3.0	52.30	39.17	35.6	3.7	-43.2	0.0	0.6	49.0	35.9	74	54	-25.0	-18.1	V
9.748	3.0	48.50	35.66	37.3	4.0	-39.6	0.0	0.8	51.0	38.2	74	54	-23.0	-15.8	Noise Floor
4.874	3.0	51.89	38.43	34.1	2.6	-45.3	0.0	0.6	43.9	30.4	74	54	-30.1	-23.6	H
7.311	3.0	54.21	39.82	35.6	3.7	-43.2	0.0	0.6	50.9	36.5	74	54	-23.1	-17.5	H
9.748	3.0	48.24	35.74	37.3	4.0	-39.6	0.0	0.8	50.7	38.2	74	54	-23.3	-15.8	Noise Floor
High Ch, 2462MHz															
4.924	3.0	54.38	41.23	34.1	2.7	-45.4	0.0	0.6	46.4	33.3	74	54	-27.6	-20.7	V
7.386	3.0	53.25	39.42	35.7	3.7	-43.1	0.0	0.6	50.1	36.3	74	54	-23.9	-17.7	V
9.848	3.0	49.60	36.11	37.5	4.0	-39.4	0.0	0.8	52.5	39.0	74	54	-21.5	-15.0	Noise Floor
4.924	3.0	52.7	39.2	34.1	2.7	-45.4	0.0	0.6	44.8	31.2	74	54	-29.2	-22.8	H
7.386	3.0	51.9	38.7	35.7	3.7	-43.1	0.0	0.6	48.8	35.5	74	54	-25.2	-18.5	H
9.848	3.0	50.0	37.4	37.5	4.0	-39.4	0.0	0.8	52.9	40.3	74	54	-21.1	-13.7	Noise Floor
No other emissions were detected above 4th Harmonic.															

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		

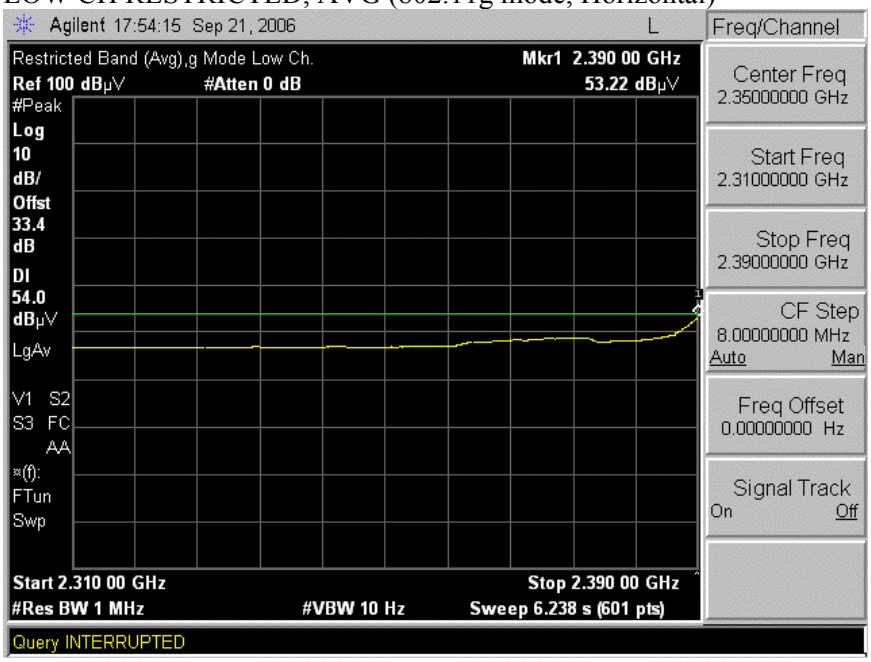
1) PIFA IRX-3860 ANTENNA

RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)

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

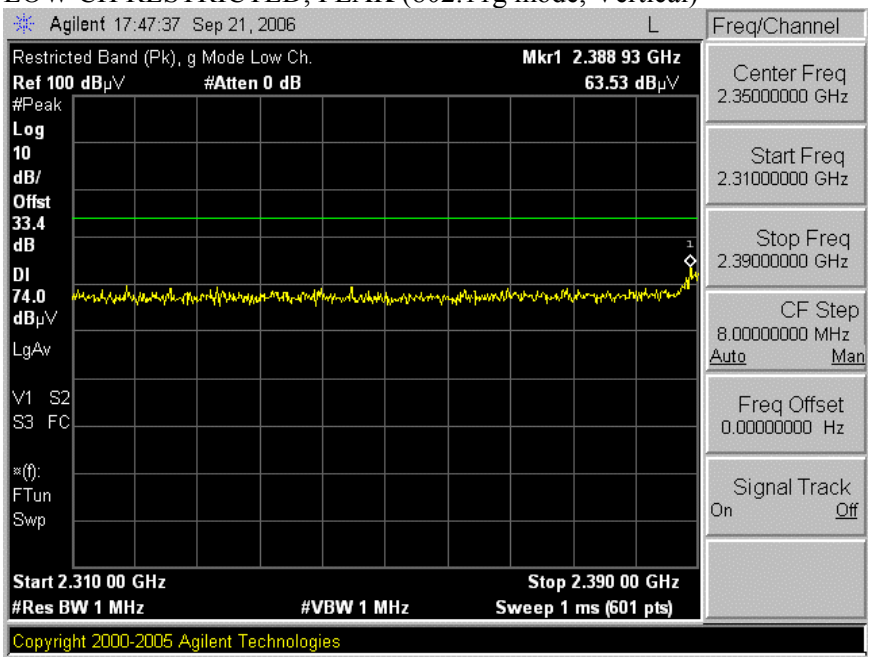


LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)

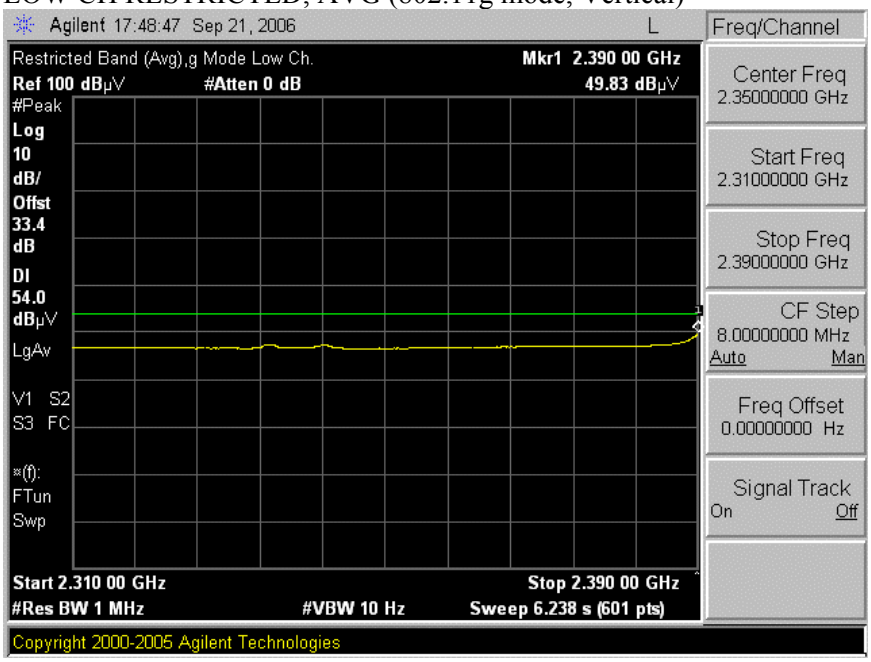


RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

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

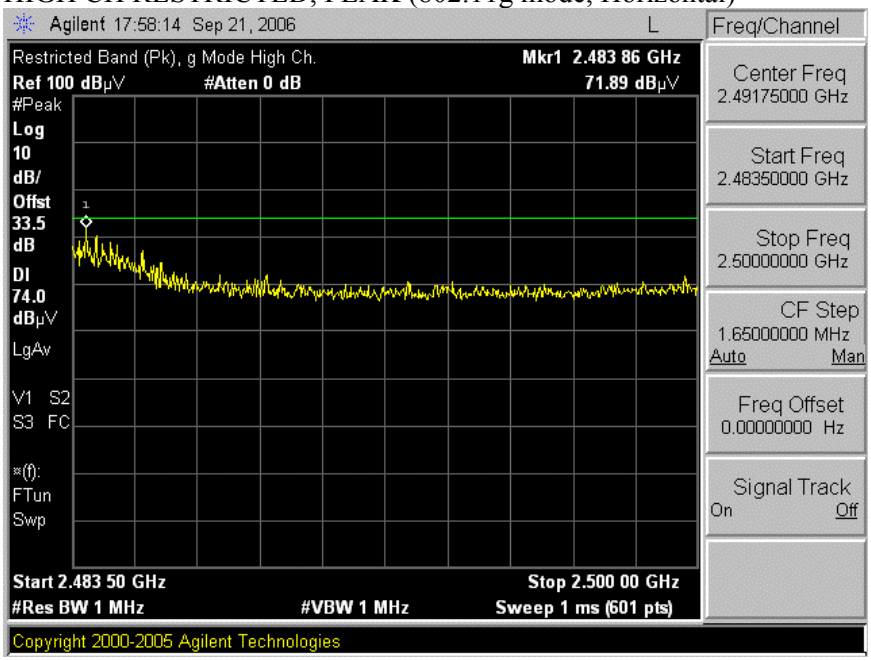


LOW CH RESTRICTED, AVG (802.11g mode, Vertical)

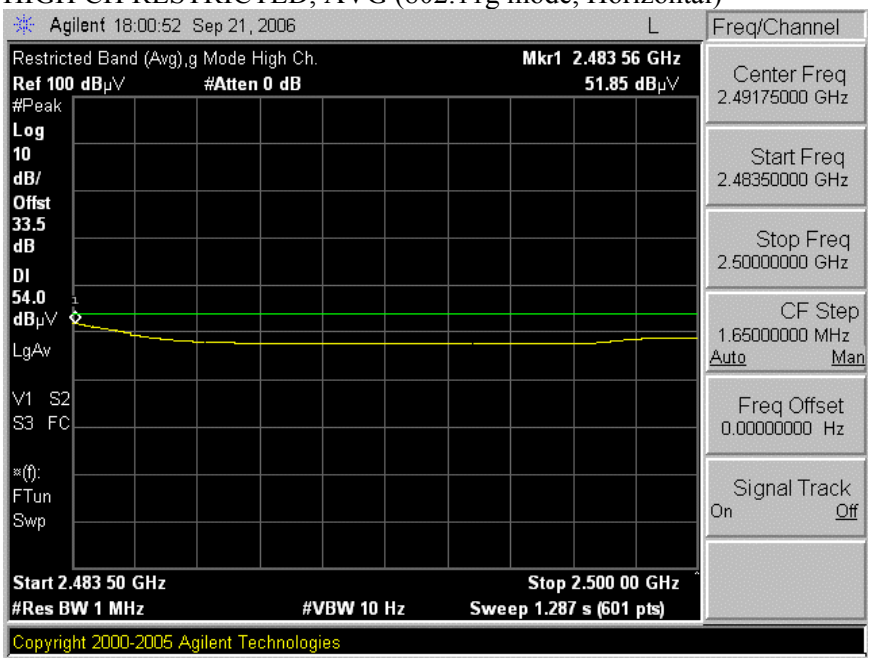


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

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

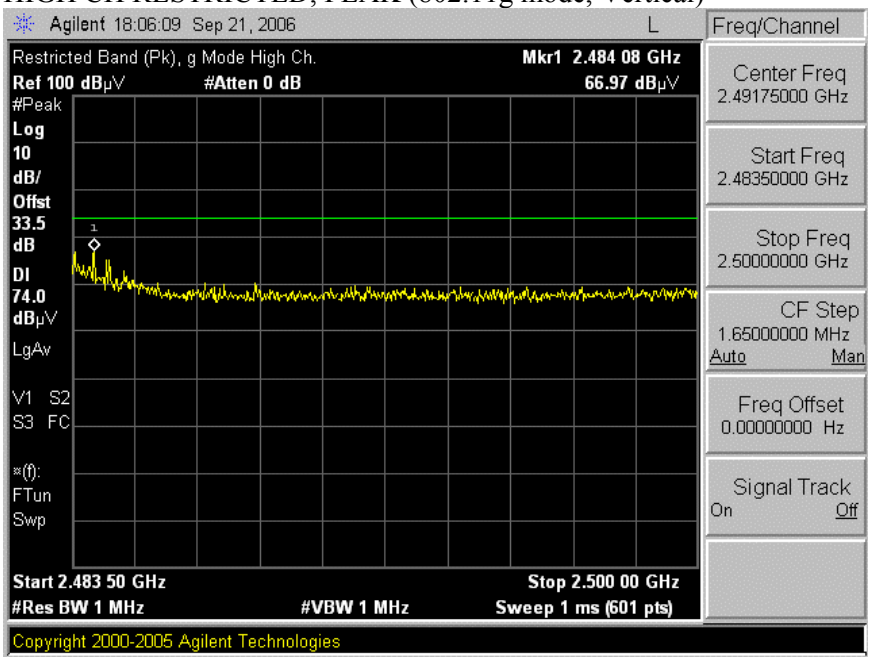


HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)

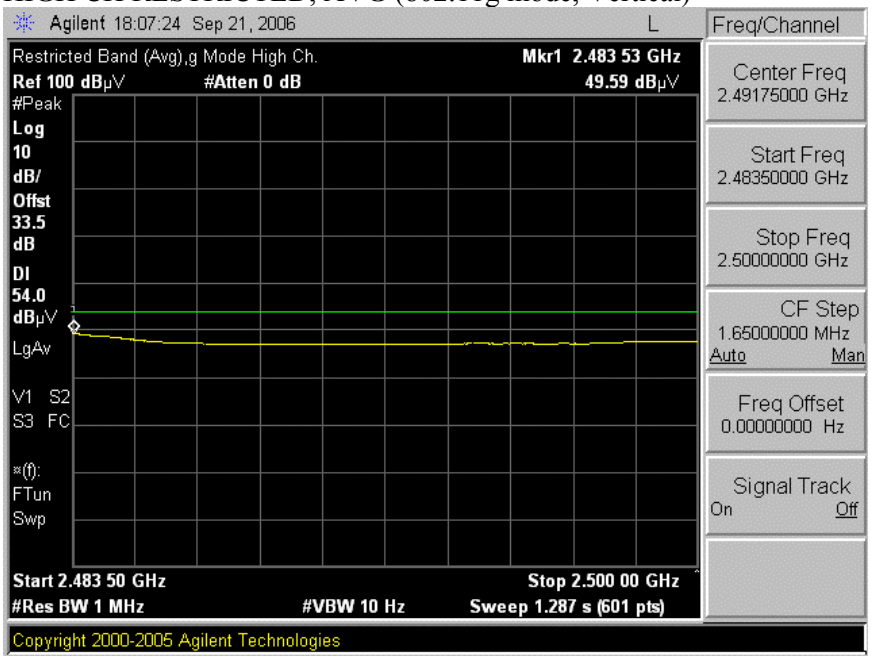


RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)

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



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



HARMONICS AND SPURIOUS EMISSIONS (g MODE)

9/22/2006 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thanh Nguyen
Project #: 06U10602-1
Company: Atheros
EUT Descrip.: PCI express 802.11 b/g tranceiver
EUT M/N: AR5BXB61
Test Target: FCC 15.247
Mode Oper: g mode, TX With PiFa IRX-3860 Antenna

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T119; S/N: 29301 @3m	T87 Miteq 924342			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Thanh 187215003	Thanh 208946003	HPF_4.0GHz	

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)
Low Ch, 2412MHz															
4.824	3.0	52.02	39.07	34.0	2.6	-45.3	0.0	0.6	43.9	31.0	74	54	-30.1	-23.0	V
7.236	3.0	52.71	40.03	35.6	3.7	-43.3	0.0	0.6	49.3	36.6	74	54	-24.7	-17.4	V
9.648	3.0	48.11	35.90	37.1	4.0	-39.9	0.0	0.8	50.2	38.0	74	54	-23.8	-16.0	Noise Floor
4.824	3.0	52.34	38.93	34.0	2.6	-45.3	0.0	0.6	44.2	30.8	74	54	-29.8	-23.2	H
7.236	3.0	51.70	38.95	35.6	3.7	-43.3	0.0	0.6	48.2	35.5	74	54	-25.8	-18.5	H
9.648	3.0	49.16	35.78	37.1	4.0	-39.9	0.0	0.8	51.3	37.9	74	54	-22.7	-16.1	Noise Floor
Mid Ch, 2437MHz															
4.874	3.0	52.66	39.44	34.1	2.6	-45.3	0.0	0.6	44.6	31.4	74	54	-29.4	-22.6	V
7.311	3.0	51.67	42.33	35.6	3.7	-43.2	0.0	0.6	48.4	39.0	74	54	-25.6	-15.0	V
9.748	3.0	50.10	36.25	37.3	4.0	-39.6	0.0	0.8	52.6	38.7	74	54	-21.4	-15.3	V
4.874	3.0	53.07	39.56	34.1	2.6	-45.3	0.0	0.6	45.0	31.5	74	54	-29.0	-22.5	H
7.311	3.0	51.80	38.45	35.6	3.7	-43.2	0.0	0.6	48.5	35.2	74	54	-25.5	-18.8	H
9.748	3.0	48.99	36.07	37.3	4.0	-39.6	0.0	0.8	51.5	38.6	74	54	-22.5	-15.4	Noise Floor
High Ch, 2462MHz															
4.924	3.0	53.52	41.21	34.1	2.7	-45.4	0.0	0.6	45.6	33.3	74	54	-28.4	-20.7	V
7.386	3.0	57.44	44.52	35.7	3.7	-43.1	0.0	0.6	54.3	41.4	74	54	-19.7	-12.6	V
9.848	3.0	51.32	37.23	37.5	4.0	-39.4	0.0	0.8	54.2	40.1	74	54	-19.8	-13.9	Noise Floor
4.924	3.0	54.07	40.13	34.1	2.7	-45.4	0.0	0.6	46.1	32.2	74	54	-27.9	-21.8	H
7.386	3.0	53.59	39.55	35.7	3.7	-43.1	0.0	0.6	50.5	36.4	74	54	-23.5	-17.6	H
9.848	3.0	49.55	36.97	37.5	4.0	-39.4	0.0	0.8	52.4	39.9	74	54	-21.6	-14.1	Noise Floor

No other emissions were detected above 4th Harmonic.

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		

7.1.3. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f^2)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

$E = \sqrt{(30 * P * G)} / d$

and

$S = E ^ 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.282 * 10 ^ ((P + G) / 20) / \sqrt{S}$

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW/cm^2

Rearranging terms to calculate the power density at a specific distance yields

$S = 0.0795 * 10 ^ ((P + G) / 10) / (d^2)$

LIMITS

From §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2

RESULTS

No non-compliance noted:

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)
802.11b	20.0	23.95	2.30	0.08
802.11g	20.0	26.70	2.30	0.16

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

7.1.4. CO-LOCATED MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f^2)	6
30–300	61.4	0.163	1.0	6
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

$E = \sqrt{(30 * P * G)} / d$

and

$S = E \wedge 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

For multiple colocated transmitters operating simultaneously the total power density can be calculated by summing the Power * Gain product of each transmitter.

yields

$d = 0.282 * \sqrt{((P1 * G1) + (P2 * G2) + ... + (Pn * Gn)) / S)}$

where

d = distance in cm
Pk = Power in mW of the kth transmitter
Gk = Numeric antenna gain of the kth transmitter
S = Power Density in mW/cm^2

Rearranging terms to calculate the power density at a specific distance yields

$S = 0.0795 * 10 \wedge (((P1 * G1) + (P2 * G2) + ... + (Pn * Gn)) / 10) / (d^2)$

In the table below, Power and Gain are entered in units of dBm and dBi respectively, then these are converted to their linear forms prior to the summation function.

LIMITS

From §1.1310 Table 1 (B), S = 1.0 mW/cm^2

RESULTS

No non-compliance noted: (MPE distance equals 20 cm)

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)
Bluetooth		0.93	1.73	
802.11b		23.95	2.30	
Combined	20.0			0.08

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)
Bluetooth		0.93	1.73	
802.11g		26.70	2.30	
Combined	20.0			0.16

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

7.1.5. 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 10.70 dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11b Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	20.55
Middle	2437	20.45
High	2462	20.46

802.11g Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	19.30
Middle	2437	19.17
High	2462	18.35

7.1.6. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (11b, Dipole Antenna, HORIZONTAL)

HORIZONTAL DATA

```
Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Frank Ibrahim
Company:       : Atheros
Project #:     : 06U10602
Configuration:: EUT with Dipole Antennas connected to
               : Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11b
Target:        : FCC Class B
EUT S/N:       : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	300.630	21.35	15.67	37.02	46.00	-8.98	Peak
2	324.880	20.42	16.28	36.70	46.00	-9.30	Peak
3	390.840	20.56	17.83	38.39	46.00	-7.61	Peak
4	400.540	24.07	18.04	42.11	46.00	-3.89	Peak
5	499.480	16.73	20.22	36.95	46.00	-9.05	Peak
6	798.240	17.00	24.53	41.53	46.00	-4.47	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (11b, Dipole Antenna, VERTICAL)

VERTICAL DATA

```
Condition: FCC CLASS-B VERTICAL
Test Operator:: Frank Ibrahim
Company:       : Atheros
Project #:     : 06U10602
Configuration:: EUT with Dipole Antennas connected to
               : Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11b
Target:        : FCC Class B
EUT S/N:       : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	51.340	26.69	9.05	35.74	40.00	-4.26	Peak
2	92.080	28.79	9.31	38.10	43.50	-5.40	Peak
3	208.480	27.92	13.30	41.22	43.50	-2.28	Peak
4	300.630	19.00	15.67	34.67	46.00	-11.33	Peak
5	499.480	14.87	20.22	35.09	46.00	-10.91	Peak
6	798.240	15.71	24.53	40.24	46.00	-5.76	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (11g, Dipole Antenna, HORIZONTAL)

HORIZONTAL DATA

```
Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Frank Ibrahim
Company:       : Atheros
Project #:     : 06U10602
Configuration:: EUT with Dipole Antennas connected to
               : Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11g
Target:        : FCC Class B
EUT S/N:       : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	300.630	21.77	15.67	37.44	46.00	-8.56	Peak
2	324.880	22.02	16.28	38.30	46.00	-7.70	Peak
3	390.840	18.81	17.83	36.64	46.00	-9.36	Peak
4	400.540	21.65	18.04	39.69	46.00	-6.31	Peak
5	499.480	16.41	20.22	36.63	46.00	-9.37	Peak
6	798.240	17.16	24.53	41.69	46.00	-4.31	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (11g, Dipole Antenna, VERTICAL)

VERTICAL DATA

```
Condition: FCC CLASS-B VERTICAL
Test Operator:: Frank Ibrahim
Company:       : Atheros
Project #:     : 06U10602
Configuration:: EUT with Dipole Antennas connected to
               : Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11g
Target:        : FCC Class B
EUT S/N:       : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	41.640	21.96	14.90	36.86	40.00	-3.14	Peak
2	51.340	30.75	9.05	39.80	40.00	-0.20	Peak
3	208.480	27.82	13.30	41.12	43.50	-2.38	Peak
4	400.540	17.18	18.04	35.22	46.00	-10.78	Peak
5	499.480	16.83	20.22	37.05	46.00	-8.95	Peak
6	798.240	14.63	24.53	39.16	46.00	-6.84	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (11b, PIFA Antenna, HORIZONTAL)

HORIZONTAL DATA

```
Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Frank Ibrahim
Company:      : Atheros
Project #:    : 06U10602
Configuration:: EUT with PIFA IRX-3860 Antennas
              : connected to Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11b
Target:       : FCC Class B
EUT S/N:      : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	130.880	23.21	15.09	38.30	43.50	-5.20	Peak
2	245.340	28.26	13.72	41.98	46.00	-4.02	Peak
3	366.590	23.89	17.31	41.20	46.00	-4.80	Peak
4	400.540	20.43	18.04	38.47	46.00	-7.53	Peak
5	499.480	17.89	20.22	38.11	46.00	-7.89	Peak
6	798.240	15.16	24.53	39.69	46.00	-6.31	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (11b, PIFA Antenna, VERTICAL)

VERTICAL DATA

```
Condition: FCC CLASS-B VERTICAL
Test Operator:: Frank Ibrahim
Company:       : Atheros
Project #:     : 06U10602
Configuration:: EUT with PIFA IRX-3860 Antennas
               : connected to Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11b
Target:        : FCC Class B
EUT S/N:       : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	101.780	30.33	11.77	42.10	43.50	-1.40	Peak
2	201.690	28.78	14.32	43.10	43.50	-0.40	Peak
3	300.630	24.93	15.67	40.60	46.00	-5.40	Peak
4	366.590	21.26	17.31	38.57	46.00	-7.43	Peak
5	499.480	16.80	20.22	37.02	46.00	-8.98	Peak
6	798.240	16.77	24.53	41.30	46.00	-4.70	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (11g, PIFA Antenna, HORIZONTAL)

HORIZONTAL DATA

```
Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Frank Ibrahim
Company:      : Atheros
Project #:    : 06U10602
Configuration:: EUT with PIFA IRX-3860 Antennas
              : connected to Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11g
Target:       : FCC Class B
EUT S/N:      : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	130.880	26.13	15.09	41.22	43.50	-2.28	Peak
2	245.340	27.60	13.72	41.32	46.00	-4.68	Peak
3	334.580	22.41	16.53	38.94	46.00	-7.06	Peak
4	366.590	24.74	17.31	42.05	46.00	-3.95	Peak
5	392.780	25.38	17.87	43.25	46.00	-2.75	Peak
6	798.240	16.04	24.53	40.57	46.00	-5.43	Peak

SPURIOUS EMISSIONS 30 TO 1000 MHz (11g, PIFA Antenna, VERTICAL)

VERTICAL DATA

```
Condition: FCC CLASS-B VERTICAL
Test Operator:: Frank Ibrahim
Company:       : Atheros
Project #:     : 06U10602
Configuration:: EUT with PIFA IRX-3860 Antennas
               : connected to Host Laptop PC
Mode of Oper.:: TX ON at Mid Channel (2437 MHz), 11g
Target:        : FCC Class B
EUT S/N:       : 0016CF56EFA3
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	101.780	30.35	11.77	42.12	43.50	-1.38	Peak
2	300.630	24.69	15.67	40.36	46.00	-5.64	Peak
3	366.590	21.85	17.31	39.16	46.00	-6.84	Peak
4	390.840	16.30	17.83	34.13	46.00	-11.87	Peak
5	499.480	16.39	20.22	36.61	46.00	-9.39	Peak
6	798.240	17.03	24.53	41.56	46.00	-4.44	Peak

8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP:

1) DIPOLE ANTENNA

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

1) PIFA RRX-3860 ANTENNA

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

END OF REPORT