



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

FOR

MINI PCI 802.11 B/G TRANSCEIVER

MODEL NUMBER: AR5BMB5

FCC ID: PPD-AR5BMB5

REPORT NUMBER: 04U3122-1

ISSUE DATE: DECEMBER 15, 2004

Prepared for
**ATHEROS COMMUNICATIONS INC.
529 ALMANOR AVE.
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NVLAP[®]
LAB CODE:200065-0

Revision History

<u>Rev.</u>	<u>Revisions</u>	<u>Revised By</u>
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ATHEROS COMMUNICATIONS INC.
529 ALMANOR AVE.
SUNNYVALE, CA 94085 U.S.A.

EUT DESCRIPTION: MINI PCI 802.11 b/g TRANSCEIVER

MODEL: AR5BMB5

DATE TESTED: DECEMBER 10 – DECEMBER 15, 2004

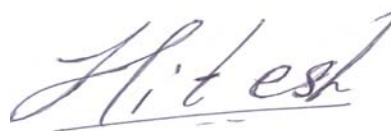
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

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

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

Approved & Released For CCS By:

Tested By:



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EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

HITESH H. SOLANKI
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 Mini PCI transceiver module, operating in the 2400-2483.5 MHz band.

The purpose of the Class II Permissive Change is to add to the list of antennas that are applicable with the module.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Maximum conducted peak power

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	22.78	189.67
2412 - 2462	802.11g	22.96	197.70
2437	802.11g Turbo	23.43	220.29

Maximum conducted average power

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	22.20	165.96
2412 - 2462	802.11g	19.28	84.72
2412 - 2462	802.11g Turbo	19.18	82.79

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two integrated omni directional antennas for diversity. The following is the list of the antennas to be added to AR5BMB5 Certifications. All the tests have been performed with the highest gain antenna, which is 81.ED415.002, manufactured by WISTRON.

Antennas to be Added to AR5BMB5 Certifications				
			Highest Gain in Green	
Manufacturer	Antenna Part Number	Antenna Type	Peak Assembly Gain (with Cable Loss) (dBi)	
			Cable Lengths Main/Aux (mm)	Peak Gain in 2.4GHz (dBi)
Wistron	81.ED415.002	Integrated Omnidirectional	455/625	3.2
Wistron	81.EBQ15.006	Integrated Omnidirectional	647/582	2.3
Wistron	81.EBJ15.004	Integrated Omnidirectional	720/550	3.1
Wistron	81.ED415.003	Integrated Omnidirectional	535/791	2.1
Wistron	81.ED615.001	Integrated Omnidirectional	596/771	2.0
Wistron	81.ED615.003	Integrated Omnidirectional	300/300	2.5
Wistron	81.ED615.002	Integrated Omnidirectional	300/300	2.5
Wistron	X01-15	Integrated Omnidirectional	535/791	2.3
Wistron	X01-14	Integrated Omnidirectional	535/791	1.7
Wistron	X00-15	Integrated Omnidirectional	535/791	0.0
Wistron	X00-14	Integrated Omnidirectional	535/791	0.1
Wistron	81.EBQ15.004	Integrated Omnidirectional	729/517	3.0
Wistron	81.EBQ15.004	Integrated Omnidirectional	300/300	2.9
Wistron	81.EBQ15.005	Integrated Omnidirectional	300/300	2.4
Foxconn	EW3-X04	Integrated Omnidirectional	610/705	1.7

5.4. SOFTWARE AND FIRMWARE

The test firmware was installed in the EUT during testing.

The test utility software used during testing was “art program” rev. V5_2_b14.

5.5. WORST-CASE CONFIGURATION AND MODE

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

The worst-case data rate for this channel is determined to be 11 Mb/s, based on previous experience with 802.11b/g WLAN product design architectures.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	PP01L	CN-04P240-48643-2BK-4131	DOC
AC/DC Adapter	Dell	AA2031	CN-09364U-12761-0BP-0QXN	N/A

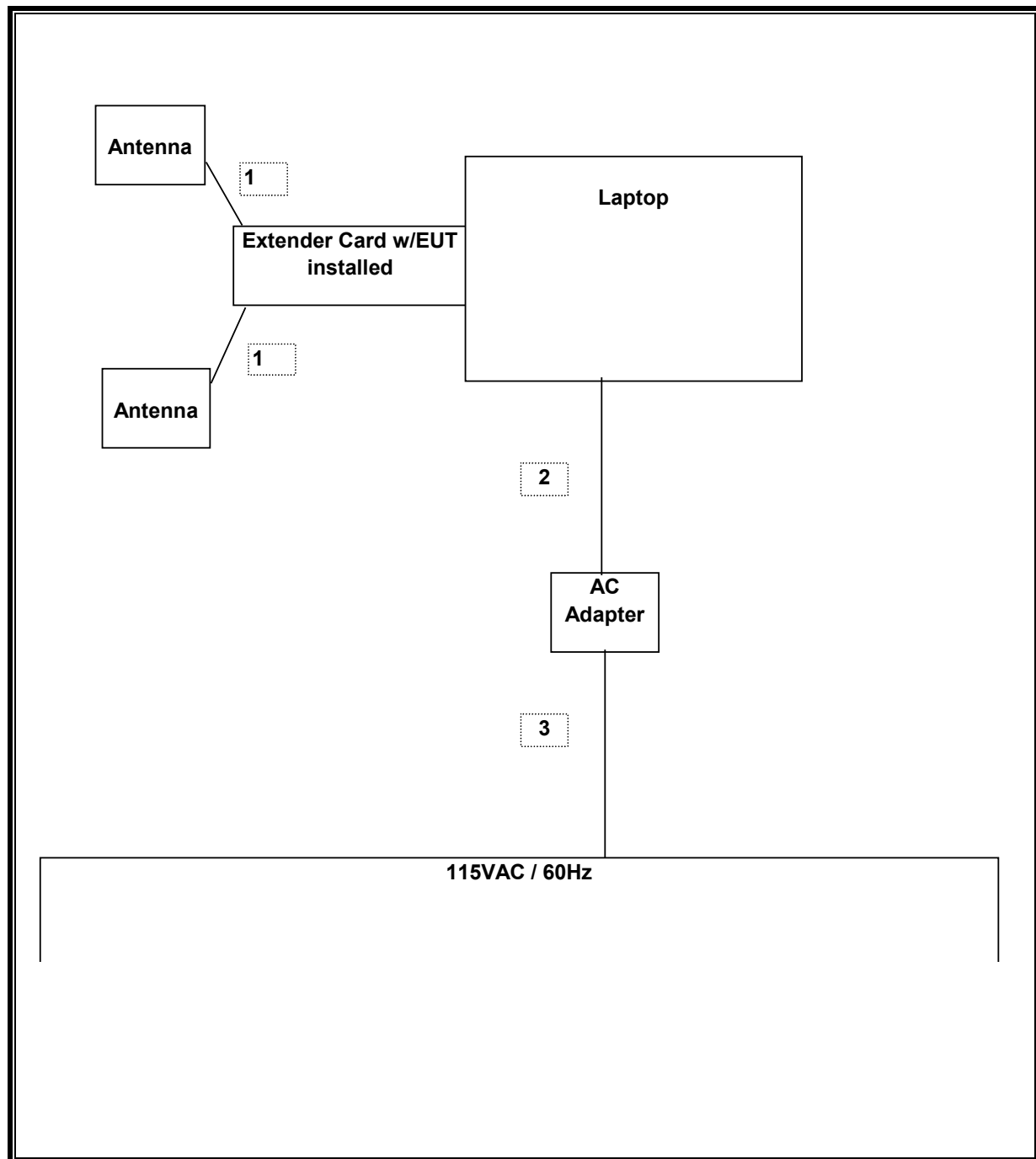
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Antenna	2		Shielded	.48m	Yes
2	DC	1	DC	Unshielded	1.8m	No
3	AC	1	AC	Unshielded	1.8m	No

TEST SETUP

The EUT is installed in a host laptop computer via a cardbus-to-miniPCI adapter / extension board during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
EMI Test Receiver	R & S	ESHS 20	827129/006	10/22/2005
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	CNR
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2005
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/21/2005
Spectrum Analyzer	HP	E4446A	US42510266	8/25/2005
Antenna, Horn 1 ~ 18 GHz	EMCO	3117	29310	9/12/2005
Preamplifier, 1 ~ 26.5 GHz	HP	8449B	3008A00369	8/17/2005
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	5/13/2005
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/2006
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/9/2006
Spectrum Analyzer, 26.5 GHz	HP	8593EM	3710A00205	1/6/2006
Preamplifier, 1300MHz	HP	8447D	2944A06550	8/26/2005
30MHz---- 2Ghz	Sunol Sciences	JB1 Antenna	A121003	12/22/2004
4.0 High Pass Filter	Micro Tronics	HPM13351	3	N/A

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND

7.1.1. 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 11.08 dB (including 10 dB pad and 1.18 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	20.20
Middle	2437	19.20
High	2462	19.00

802.11g Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	16.08
Middle	2437	19.28
High	2462	16.36

802.11g Turbo Mode

Channel	Frequency (MHz)	Power (dBm)
Middle	2437	19.18

7.2. RADIATED EMISSIONS

7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

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

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

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

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

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

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

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

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

TEST PROCEDURE

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

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

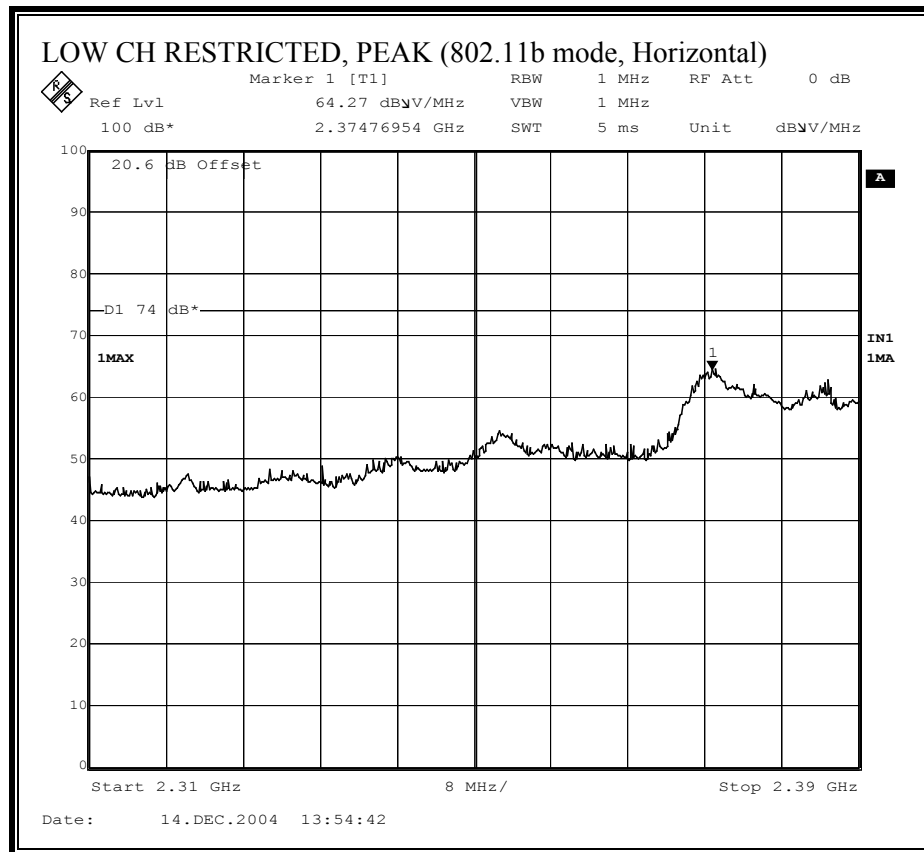
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

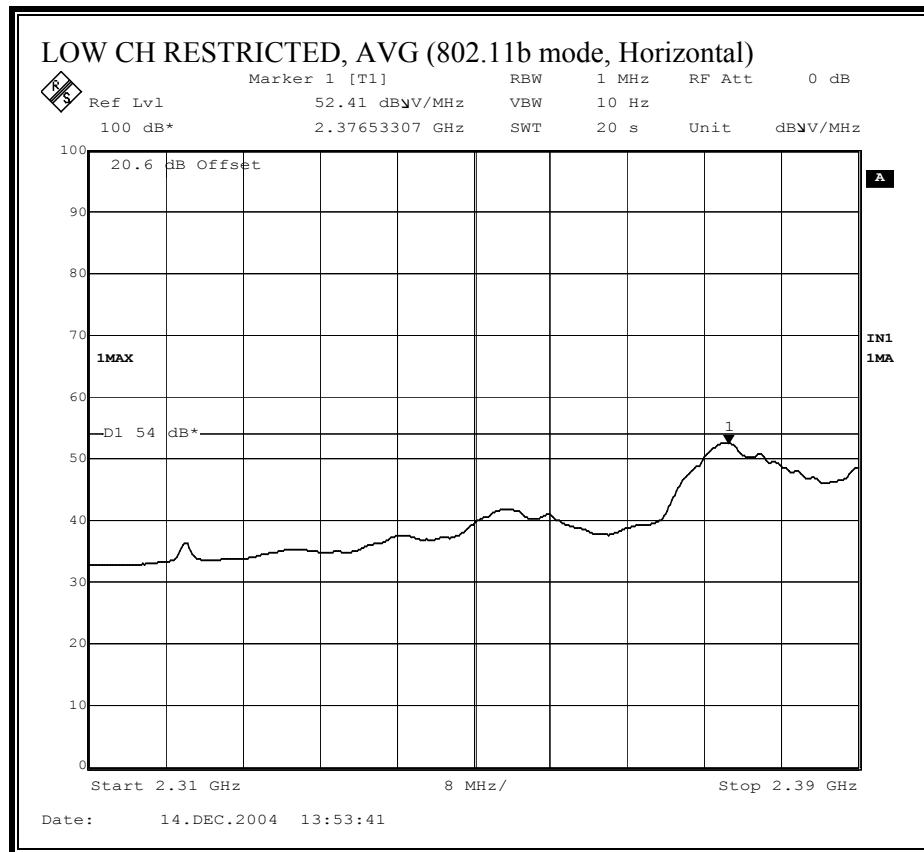
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

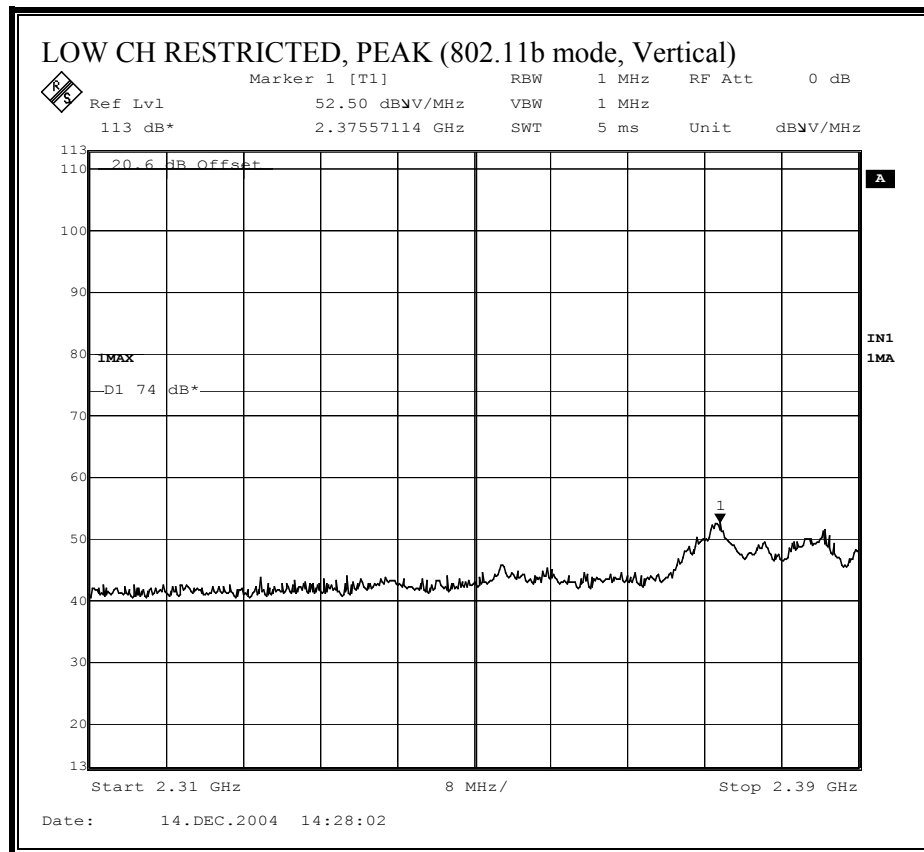
7.2.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

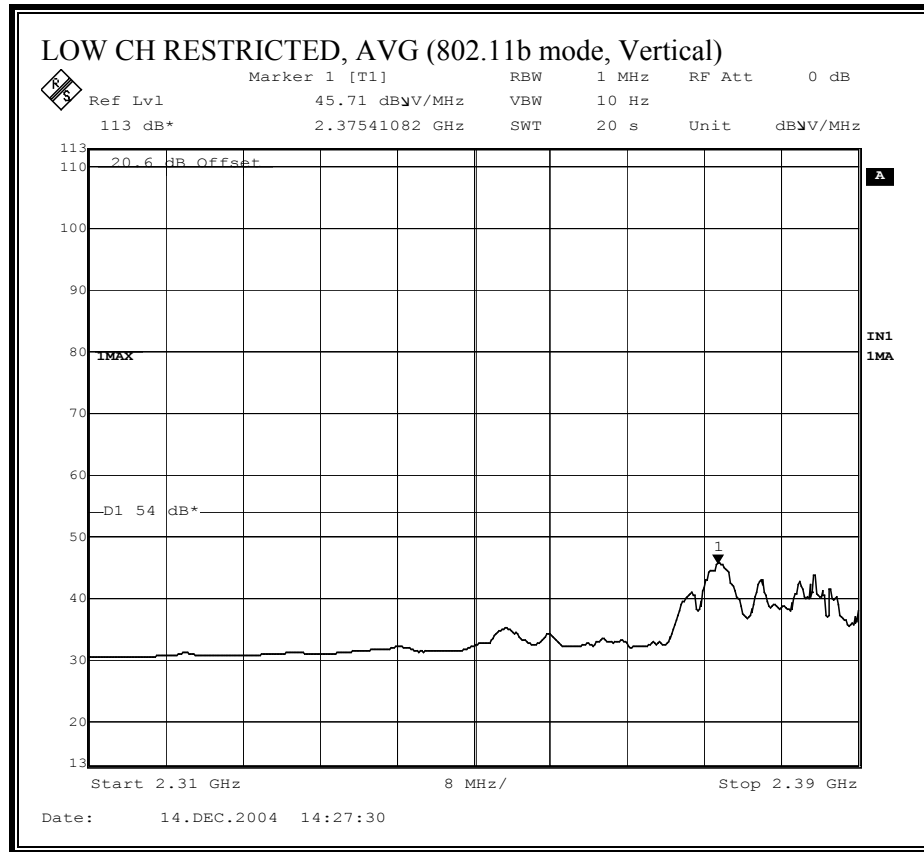
RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)



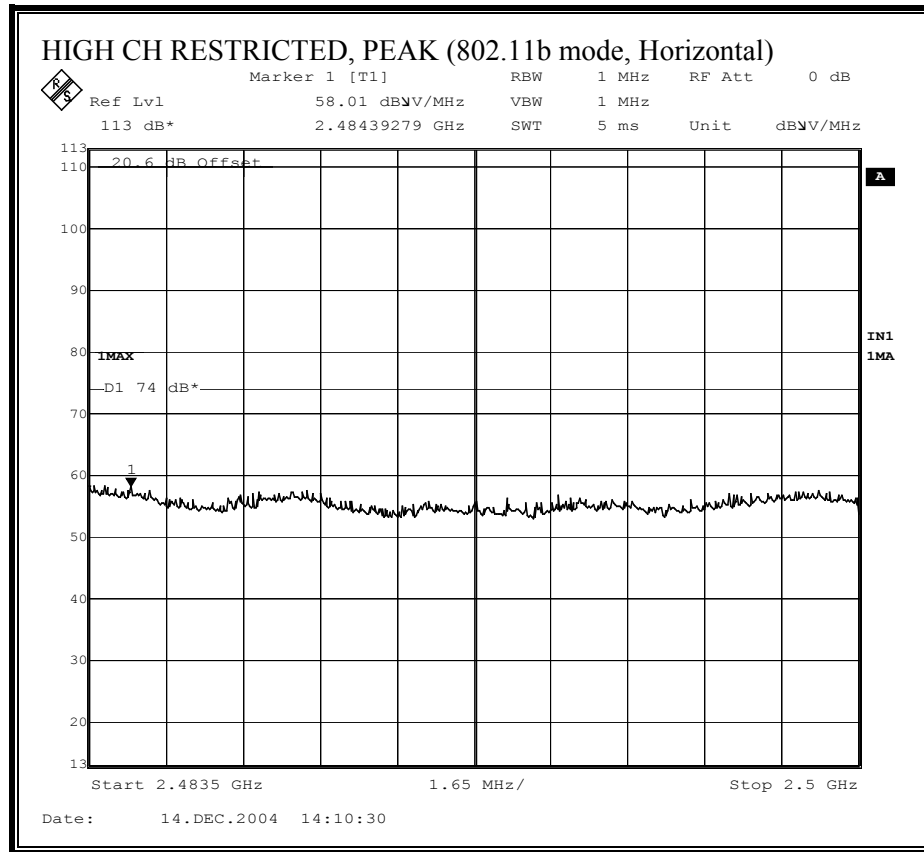


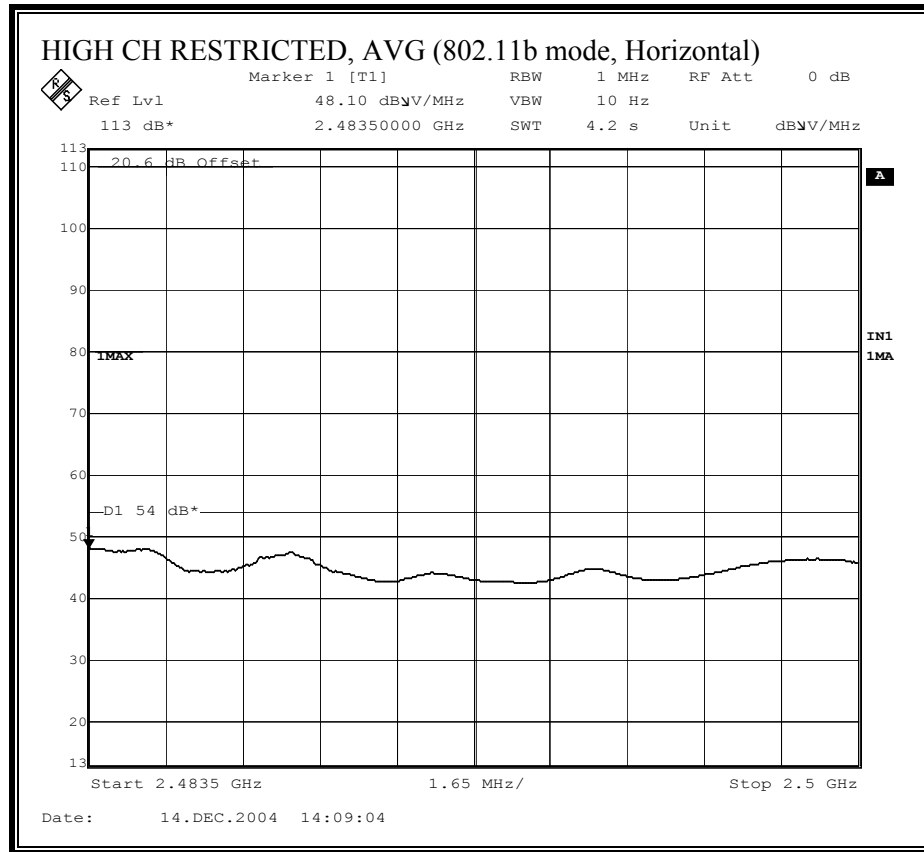
RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)



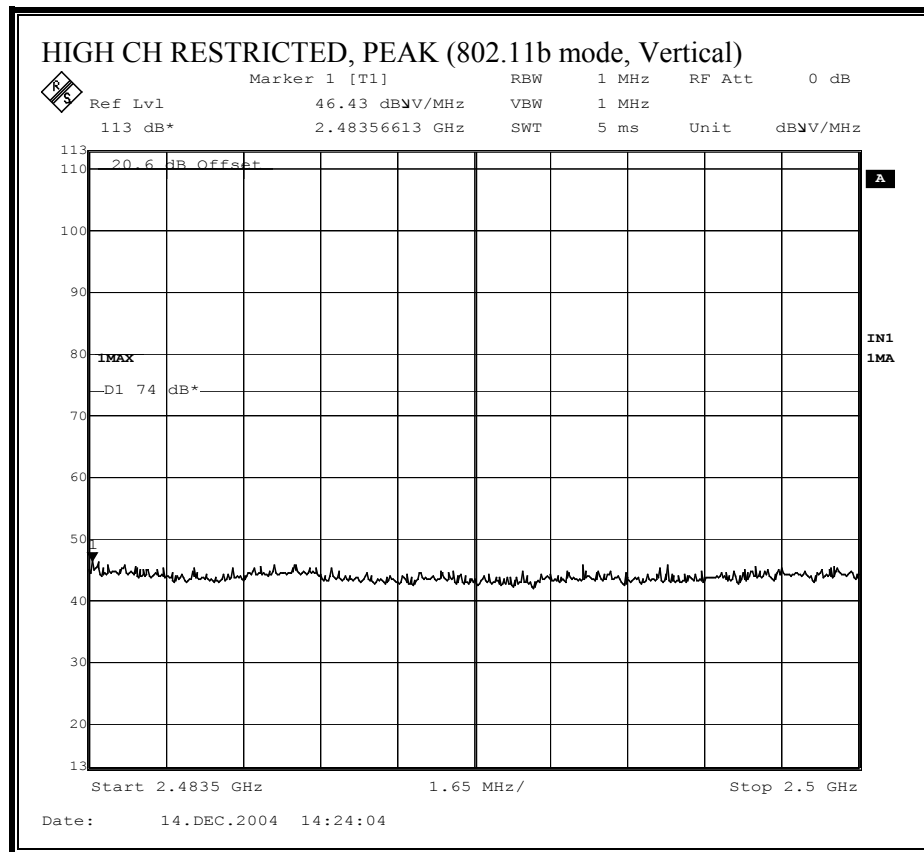


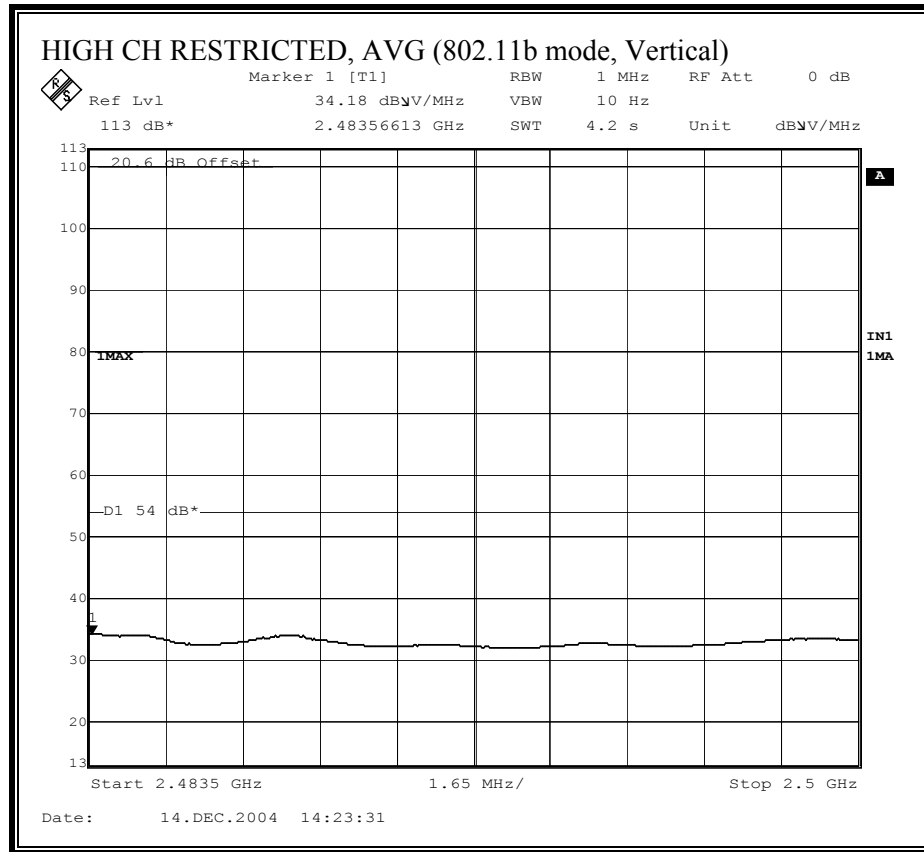
RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS (b MODE)

12/13/04 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Hitesh H. Solanki
Project #: 04u3122
Company: Atheros Communication Inc.
EUT Descrip.: MiniPCI 802.11 b/g Transceiver (with TURBO mode)
EUT M/N: AR5BMB5
Test Target: INTENTIONAL RADIATOR 15.247 CLASS II PERMISSIVE CHANGE
Mode Oper: Transmitt only, b mode

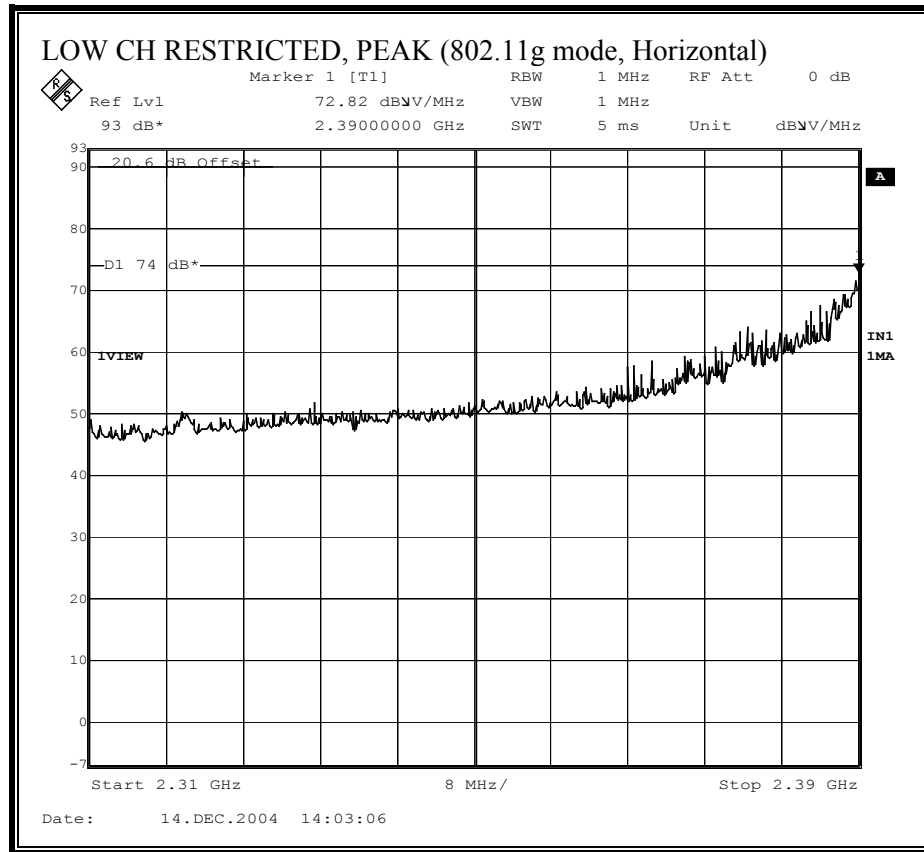
Test Equipment:

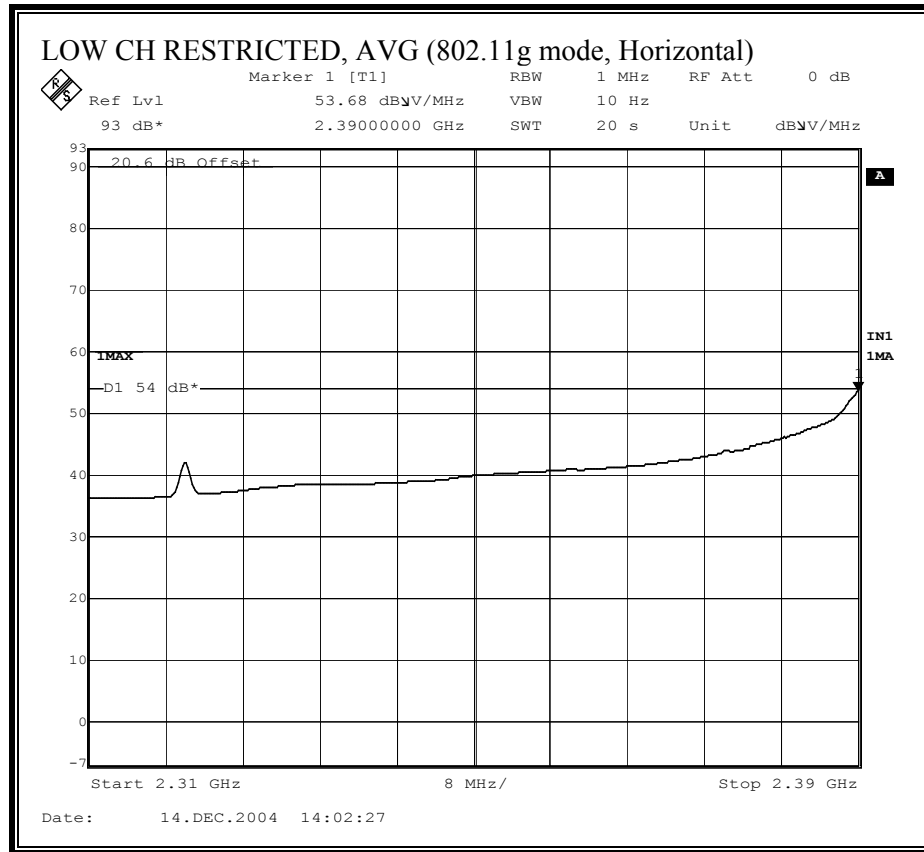
EMCO Horn 1-18GHz T60; S/N: 2238 @3m	Pre-amplifier 1-26GHz T63 Miteq 646456	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit FCC 15.209
Hi Frequency Cables				
2 foot cable	3 foot cable	4 foot cable 4_Hitesh	12 foot cable 12_Hitesh	HPF HPF_40GHz
				Reject Filter R_001
				Peak Measurements RBW=VBW=1MHz
				Average Measurements RBW=1MHz, VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt 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 channel 2412 MHz															
4.824	3.0	48.7	36.9	33.0	4.5	-35.5	0.0	0.6	51.2	39.4	74	54	-22.8	-14.6	V
7.236	3.0	46.3	34.7	35.8	6.2	-34.9	0.0	0.6	54.0	42.4	74	54	-20.0	-11.6	V
9.648	3.0	46.4	39.4	38.2	7.7	-33.0	0.0	0.8	60.0	53.0	74	54	-14.0	-1.0	V
middle channel 2437 MHz															
4.874	3.0	46.5	40.0	33.0	4.5	-35.5	0.0	0.6	49.1	42.6	74	54	-24.9	-11.4	V
7.311	3.0	44.5	36.5	35.9	6.2	-34.8	0.0	0.6	52.4	44.4	74	54	-21.6	-9.6	V
9.748	3.0	43.5	38.7	38.2	7.7	-33.0	0.0	0.8	57.2	52.4	74	54	-16.8	-1.6	V
high channel 2462 MHz															
4.924	3.0	45.5	33.7	33.0	4.5	-35.5	0.0	0.6	48.2	36.4	74	54	-25.8	-17.6	V
7.386	3.0	44.4	31.5	36.0	6.3	-34.8	0.0	0.6	52.6	39.7	74	54	-21.4	-14.3	V
9.848	3.0	44.0	33.7	38.3	7.7	-33.0	0.0	0.8	57.9	47.6	74	54	-16.1	-6.4	V
low channel 2412 MHz															
4.824	3.0	45.9	33.9	33.0	4.5	-35.5	0.0	0.6	48.4	36.4	74	54	-25.6	-17.6	H
7.236	3.0	46.0	33.4	35.8	6.2	-34.9	0.0	0.6	53.7	41.1	74	54	-20.3	-12.9	H
9.648	3.0	44.6	36.5	38.2	7.7	-33.0	0.0	0.8	58.2	50.1	74	54	-15.8	-3.9	H
middle channel 2437 MHz															
4.874	3.0	47.0	35.1	33.0	4.5	-35.5	0.0	0.6	49.6	37.7	74	54	-24.4	-16.3	H
7.311	3.0	45.8	33.2	35.9	6.2	-34.8	0.0	0.6	53.7	41.1	74	54	-20.3	-12.9	H
9.748	3.0	43.9	38.4	38.2	7.7	-33.0	0.0	0.8	57.6	52.1	74	54	-16.4	-1.9	H
high channel 2462 MHz															
4.924	3.0	46.2	34.5	33.0	4.5	-35.5	0.0	0.6	48.9	37.2	74	54	-25.1	-16.8	H
7.386	3.0	44.4	31.8	36.0	6.3	-34.8	0.0	0.6	52.6	40.0	74	54	-21.4	-14.0	H
9.848	3.0	43.9	31.5	38.3	7.7	-33.0	0.0	0.8	57.8	45.4	74	54	-16.2	-8.6	H

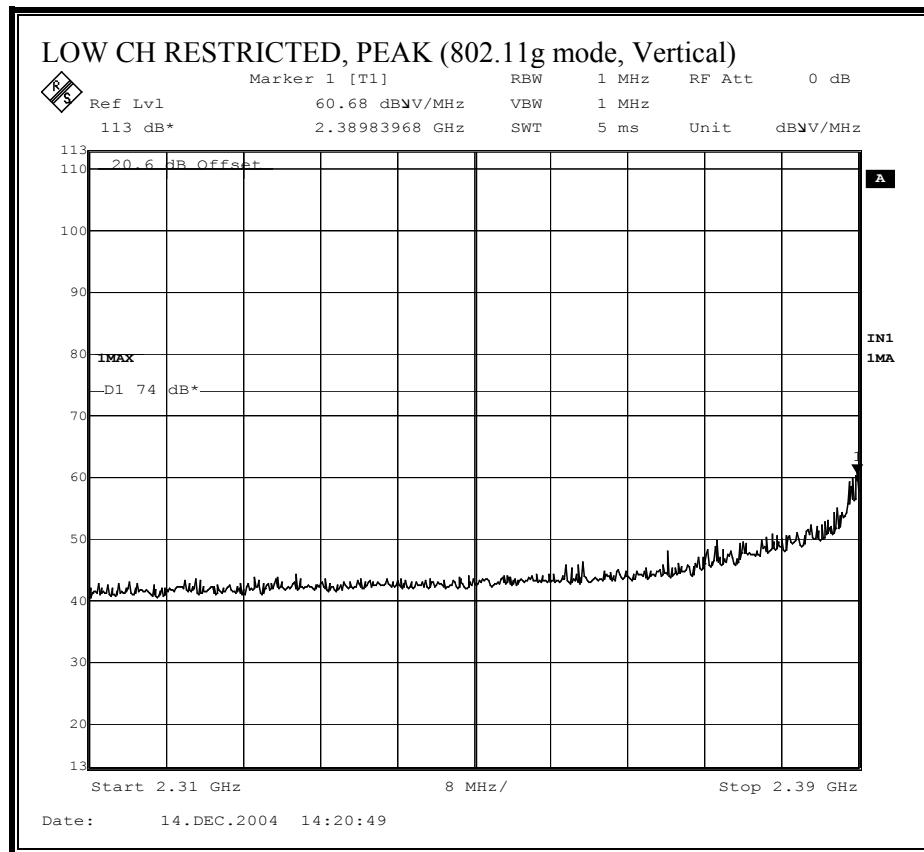
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

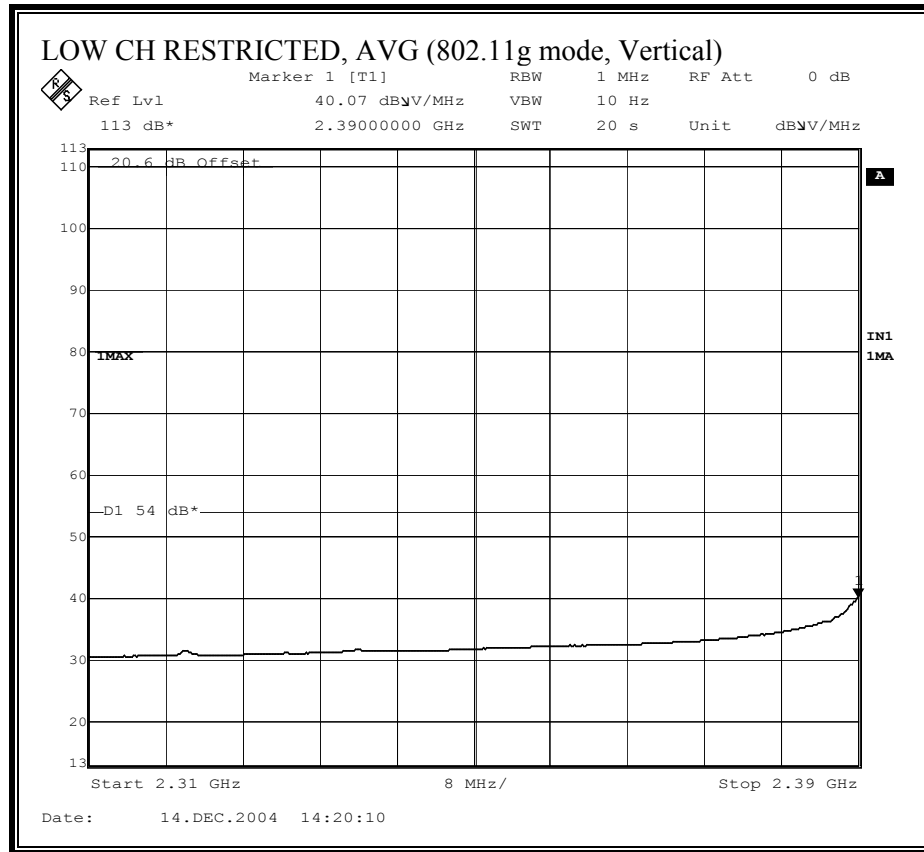
RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)



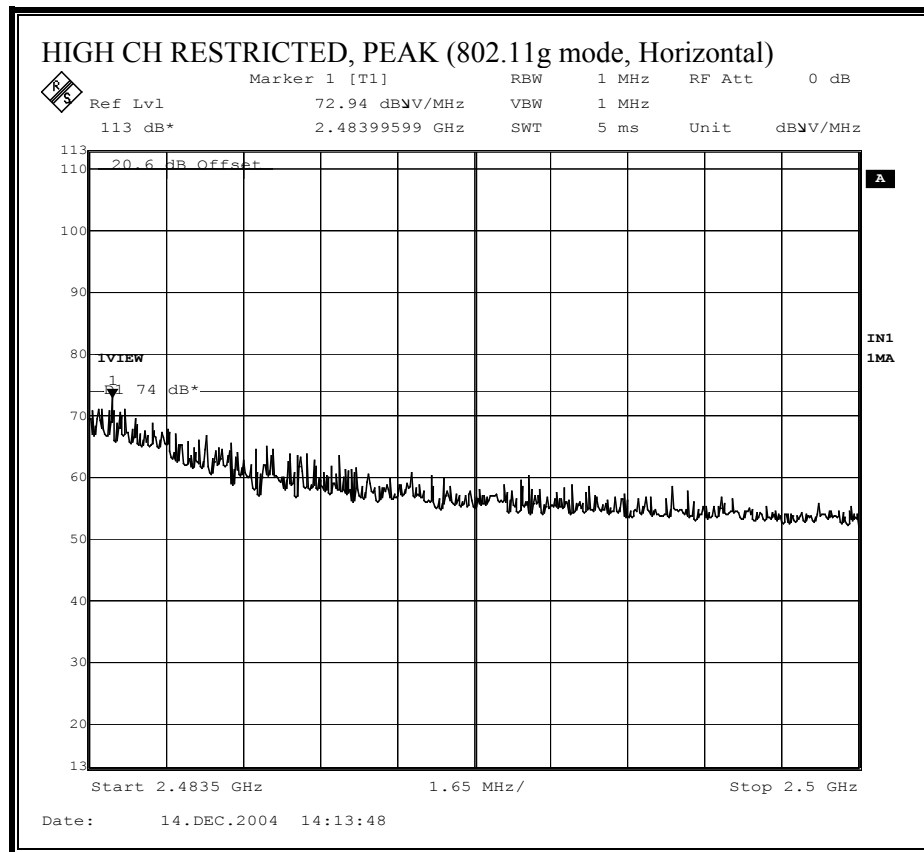


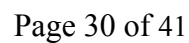
RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)



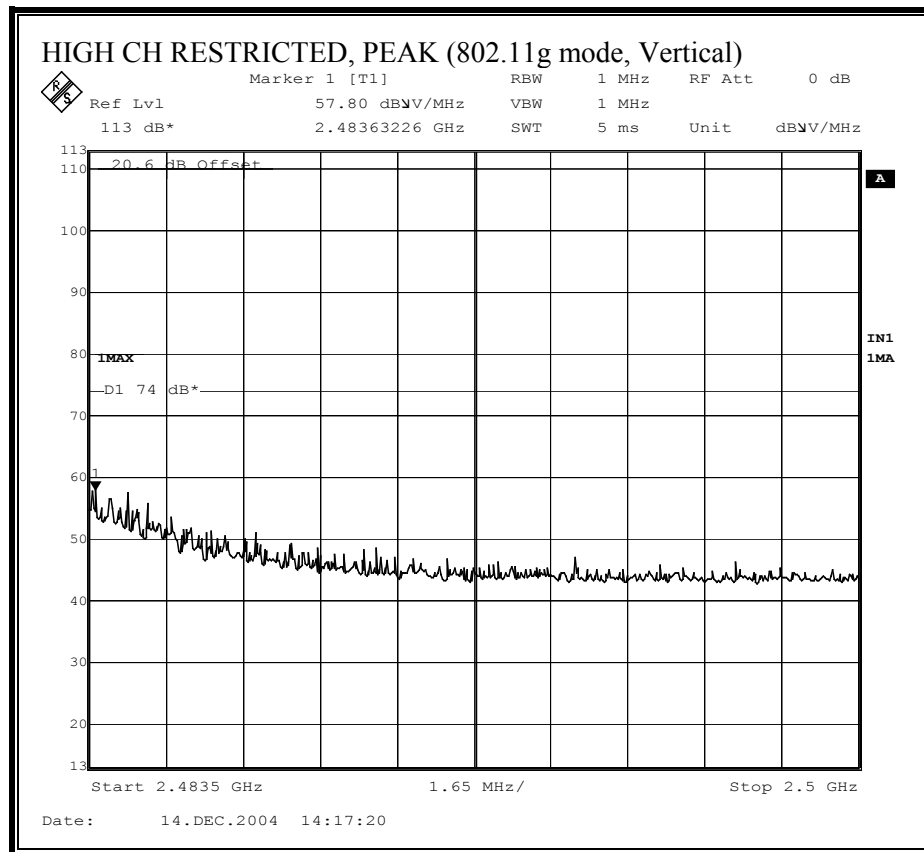


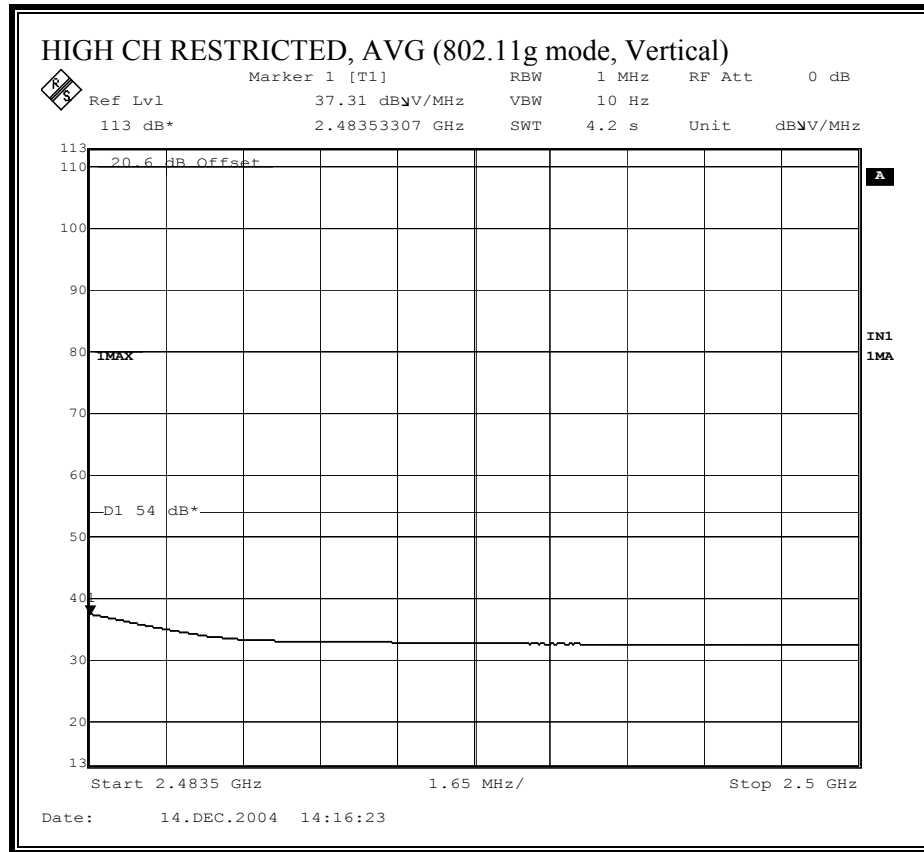
RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS (g MODE)

12/13/04 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: Hitesh H. Solanki Project #: 04u3122 Company: Atheros Communication Inc. EUT Descrip.: MiniPCI 802.11 b/g Transceiver (with TURBO mode) EUT M/N: AR5BMB Test Target: INTENTIONAL RADIATOR 15.247 CLASS II PERMISSIVE CHANGE Mode Oper: Transmitt only, g mode																
Test Equipment:																
EMCO Horn 1-18GHz T60; S/N: 2238 @3m			Pre-amplifier 1-26GHz T63 Miteq 646456			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit FCC 15.209				
Hi Frequency Cables 2 foot cable 3 foot cable 4 foot cable 12 foot cable 4_Hitesh 12_Hitesh								HPF HPF_4.0GHz		Reject Filter R_001		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz, VBW=10Hz				
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr 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 channel 2412 MHz																
4.824	3.0	45.7	33.7	33.0	4.5	-35.5	0.0	0.6	48.2	36.2	74	54	-25.8	-17.8	V	
7.236	3.0	45.6	32.4	35.8	6.2	-34.9	0.0	0.6	53.3	40.1	74	54	-20.7	-13.9	V	
9.648	3.0	44.7	32.0	38.2	7.7	-33.0	0.0	0.8	58.3	45.6	74	54	-15.7	-8.4	V	
middle channel 2437 MHz																
4.874	3.0	47.0	35.8	33.0	4.5	-35.5	0.0	0.6	49.6	38.4	74	54	-24.4	-15.6	V	
7.311	3.0	46.4	34.8	35.9	6.2	-34.8	0.0	0.6	54.3	42.7	74	54	-19.7	-11.3	V	
9.748	3.0	45.8	34.0	38.2	7.7	-33.0	0.0	0.8	59.5	47.7	74	54	-14.5	-6.3	V	
high channel 2462 MHz																
4.924	3.0	46.5	33.7	33.0	4.5	-35.5	0.0	0.6	49.2	36.4	74	54	-24.8	-17.6	V	
7.386	3.0	47.6	34.2	36.0	6.3	-34.8	0.0	0.6	55.8	42.4	74	54	-18.2	-11.6	V	
9.848	3.0	47.4	34.0	38.3	7.7	-33.0	0.0	0.8	61.3	47.9	74	54	-12.7	-6.1	V	
low channel 2412 MHz																
4.824	3.0	46.5	33.6	33.0	4.5	-35.5	0.0	0.6	49.0	36.1	74	54	-25.0	-17.9	H	
7.236	3.0	38.6	33.2	35.8	6.2	-34.9	0.0	0.6	46.3	40.9	74	54	-27.7	-13.1	H	
9.648	3.0	48.0	34.4	38.2	7.7	-33.0	0.0	0.8	61.6	48.0	74	54	-12.4	-6.0	H	
middle channel 2437 MHz																
4.874	3.0	46.2	35.1	33.0	4.5	-35.5	0.0	0.6	48.8	37.7	74	54	-25.2	-16.3	H	
7.311	3.0	44.4	33.4	35.9	6.2	-34.8	0.0	0.6	52.4	41.3	74	54	-21.6	-12.7	H	
9.748	3.0	51.0	39.4	38.2	7.7	-33.0	0.0	0.8	64.7	53.1	74	54	-9.3	-0.9	H	
high channel 2462 MHz																
4.924	3.0	45.4	33.8	33.0	4.5	-35.5	0.0	0.6	48.1	36.5	74	54	-25.9	-17.5	H	
7.386	3.0	44.2	32.0	36.0	6.3	-34.8	0.0	0.6	52.4	40.2	74	54	-21.6	-13.8	H	
9.848	3.0	49.3	35.6	38.3	7.7	-33.0	0.0	0.8	63.2	49.5	74	54	-10.8	-4.5	H	
f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Antenna Factor CL Cable Loss Amp Preamp Gain D Corr Distance Correct to 3 meters Avg Average Field Strength @ 3 m Peak Calculated Peak Field Strength HPF High Pass Filter Avg Lim Average Field Strength Limit Pk Lim Peak Field Strength Limit Avg Mar Margin vs. Average Limit Pk Mar Margin vs. Peak Limit																

HARMONICS AND SPURIOUS EMISSIONS (g TURBO MODE)

12/10/04 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: Hitesh H. Solanki Project #: 04u3122 Company: Atheros Communication Inc. EUT Descrip.: MiniPCI 802.11 b/g Transceiver (with TURBO mode) EUT M/N: AR5BMB Test Target: INTENTIONAL RADIATOR 15.247 CLASS II PERMISSIVE CHANGE Mode Oper: Transmitt only, g mode																
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Hi Frequency Cables		2 foot cable		3 foot cable		4 foot cable 4_Hitesh		12 foot cable 12_Hitesh		HPF HPF_4.0GHz		Reject Filter R_001		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz		
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
TURBO MODE 2437 MHz																
4.874	3.0	45.0	33.7	33.0	4.5	-35.5	0.0	0.6	47.6	36.3	74	54	-26.4	-17.7	V	
7.311	3.0	44.8	32.7	35.9	6.2	-34.8	0.0	0.6	52.7	40.6	74	54	-21.3	-13.4	V	
9.728	3.0	46.5	34.5	38.2	7.7	-33.0	0.0	0.8	60.2	48.2	74	54	-13.8	-5.8	V	
14.603	3.0	46.4	34.9	39.9	10.2	-36.7	0.0	0.9	60.7	49.2	74	54	-13.3	-4.8	V	
TURBO MODE 2437 MHz																
4.874	3.0	45.9	33.4	33.0	4.5	-35.5	0.0	0.6	48.5	36.0	74	54	-25.5	-18.0	H	
7.311	3.0	45.0	32.8	35.9	6.2	-34.8	0.0	0.6	52.9	40.7	74	54	-21.1	-13.3	H	
9.728	3.0	43.5	29.9	38.2	7.7	-33.0	0.0	0.8	57.2	43.6	74	54	-16.8	-10.4	H	
12.185	3.0	44.1	32.8	38.4	8.7	-35.0	0.0	0.9	57.1	45.8	74	54	-16.9	-8.2	H	
14.622	3.0	47.8	35.0	40.0	10.2	-36.7	0.0	0.9	62.2	49.4	74	54	-11.8	-4.6	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																

7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

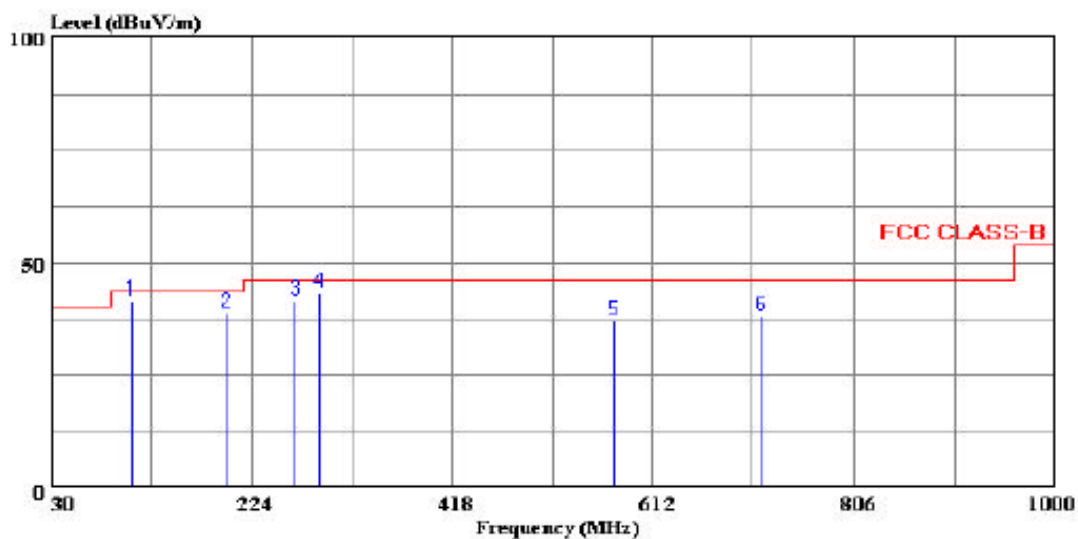
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

Data#: 14 File#: 04u3122.emi Date: 12-13-2004 Time: 13:34:47



(Auxiliary)

Trace:

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : David Garcia
Project #: : 04U3122-1
Company: : Atheros
EUT: : PCMCIA 802.11b/g Card
Model No: : AR5MB5
Configuration: : EUT / Laptop/extender board
Target of Test: : FCC Class B
Mode of Operation: TX, b mode, 2412 Channel

HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	108.570	55.32	-13.87	41.45	43.50	-2.05	Peak
2	200.720	51.40	-12.73	38.67	43.50	-4.83	Peak
3	266.680	52.83	-11.34	41.49	46.00	-4.51	Peak
4	288.990	53.67	-10.54	43.13	46.00	-2.87	Peak
5	575.140	42.70	-5.79	36.91	46.00	-9.09	Peak
6	717.730	41.53	-3.38	38.15	46.00	-7.85	Peak

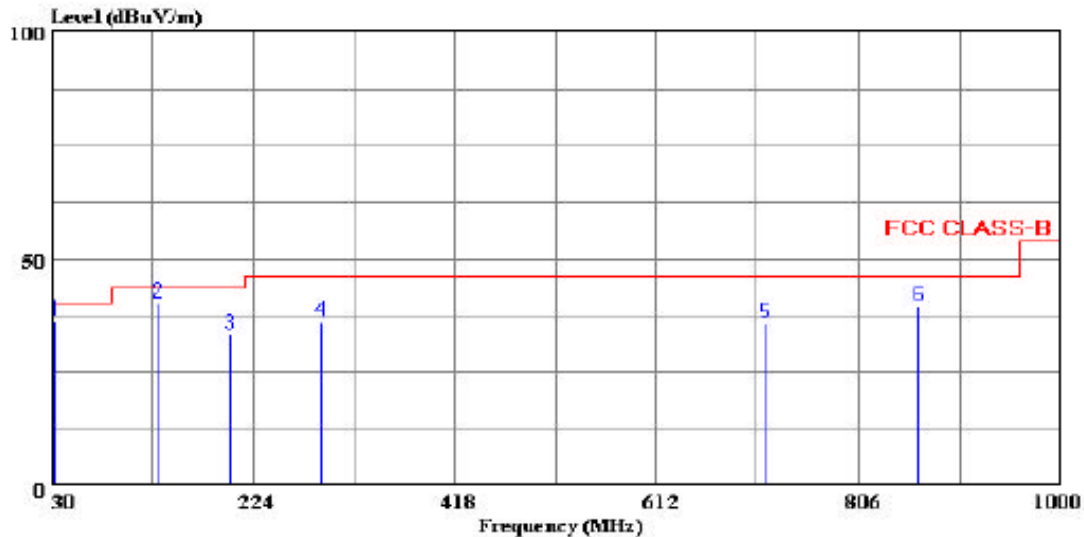
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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

Data#: 15 File#: 04u3122.emi Date: 12-13-2004 Time: 13:37:19



(Auxiliary ATC)

Trace:

Ref Trace:

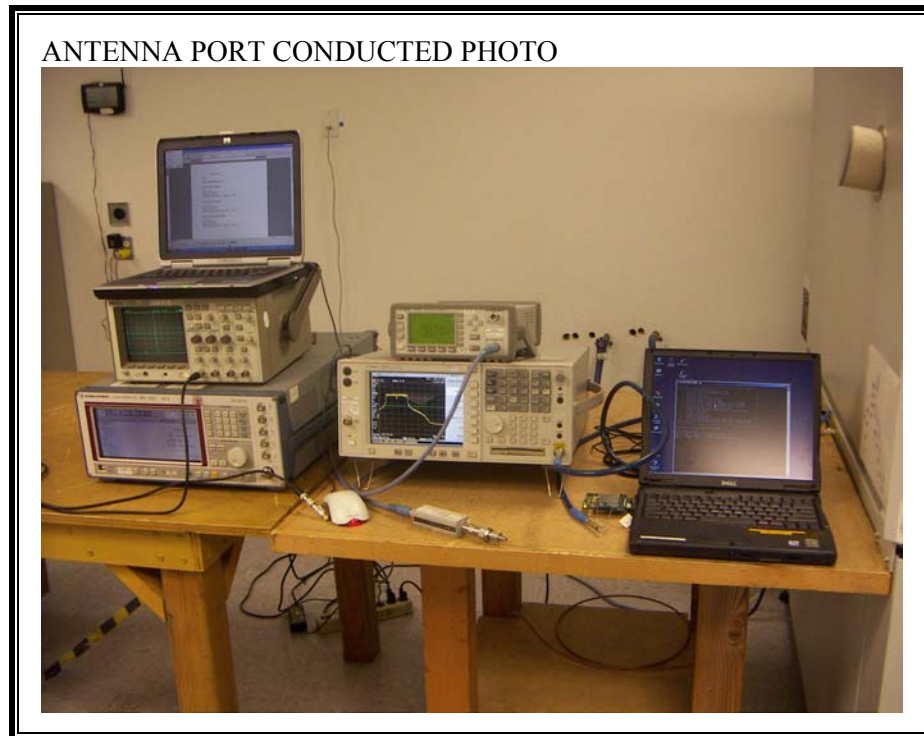
Condition: FCC CLASS-B VERTICAL
Test Operator: : David Garcia
Project #: : 04U3122-1
Company: : Atheros
EUT: : PCMCIA 802.11b/g Card
Model No: : AR5MB5
Configuration: : EUT / Laptop/extender board
Target of Test: : FCC Class B
Mode of Operation: TX, b mode, 2412 Channel

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	42.79	-6.46	36.33	40.00	-3.67	Peak
2	133.790	51.26	-11.27	39.99	43.50	-3.51	Peak
3	201.690	45.82	-12.73	33.10	43.50	-10.41	Peak
4	288.990	46.56	-10.54	36.02	46.00	-9.98	Peak
5	717.730	39.07	-3.38	35.69	46.00	-10.31	Peak
6	863.230	40.95	-1.46	39.49	46.00	-6.51	Peak

8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



RADIATED RF MEASUREMENT SETUP



RADIATED BACK PHOTO



END OF REPORT