FCC CFR47 PART 15 SUBPART E
CLASS II PERMISSIVE CHANGE
TEST REPORT
FOR

802.11a/b/g/n PCIExpress Minicard

MODEL NUMBER: AR5BXB72-L

FCC ID: PPD-AR5BXB72-L

REPORT NUMBER: 07U11190-1

ISSUE DATE: JULY 20, 2007

Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: 802.11a/b/g/n PCIExpress Minicard

MODEL: AR5BXB72-L

SERIAL NUMBER: XB72-060-L0416

DATE TESTED: JULY 13 – JULY 14, 2007

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART E	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:

TOM CHEN
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, FCC CFR 47 Part 15 and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, 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 AR5BXB72-L is designed for 802.11a/b/g/n applications using the AR541X/51XX chipset with a PCIExpress Minicard interface. It has three receive chains and two transmit chains (2x3 configuration).

The 2x3 configuration is implemented with two outside chains (Chain 0 and 2) as Tx/Rx and the middle chain (chain 1) as Rx only.

A 2x2 configuration is implemented by depopulating the middle receive chain; in this configuration the transmit chains are identical to the 2x3 configuration. The 2x2 version, when marketed, will have a unique model ID to differentiate it from the fully configured version.

5.2. DESCRIPTION OF MODEL DIFFERENCES

Appendix A contains the applicant's attestation that the hardware and firmware of the EUT is identical to the sample tested.

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

Added portable condition in 5470-5725MHz band for Lenovo ThinkPad X60/X61 Tablet Series.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The 2x3 configuration utilizes a set of three PIFA antennas from Wistron NeWeb Corp.

- Main Antenna-1: 25.90354.001 (max gain of 5.09dBi @ 5470-5725MHz)
- Aux Antenna: 25.90355.001 (max gain of 6.45dBi @ 5470-5725MHz)
- MIMO 3rd Antenna: 25.90356.001 (max gain of 4.60dBi @ 5470-5725MHz)

The MIMO 3rd antenna is used for receiving only.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was AR5002, ANWI Diagnostic Kernel Drive.

The test utility software used during testing was Art Software Revision 0.3 Build #4 Art 11n.

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case configuration has been evaluated @ X-position by comparing the fundamental ERP / EIRP output power.

Thus all emissions tests were made with following data rates:

- 802.11a mode, 20 MHz Channel Bandwidth, 9 Mb/s, OFDM Modulation, Spatial Stream 1.
- 802.11n HT20 mode, 20 MHz Channel Bandwidth, MCS0, 6.5 Mb/s, OFDM Modulation, Spatial Stream 1.
- 802.11n HT40 mode, 40 MHz Channel Bandwidth, MCS0, 13.5 Mb/s, OFDM Modulation, Spatial Stream 1.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop PC	Lenovo	X60T	LV-00161	DOC
AC Adapter	Lenovo	Adapter	92P1156	DOC

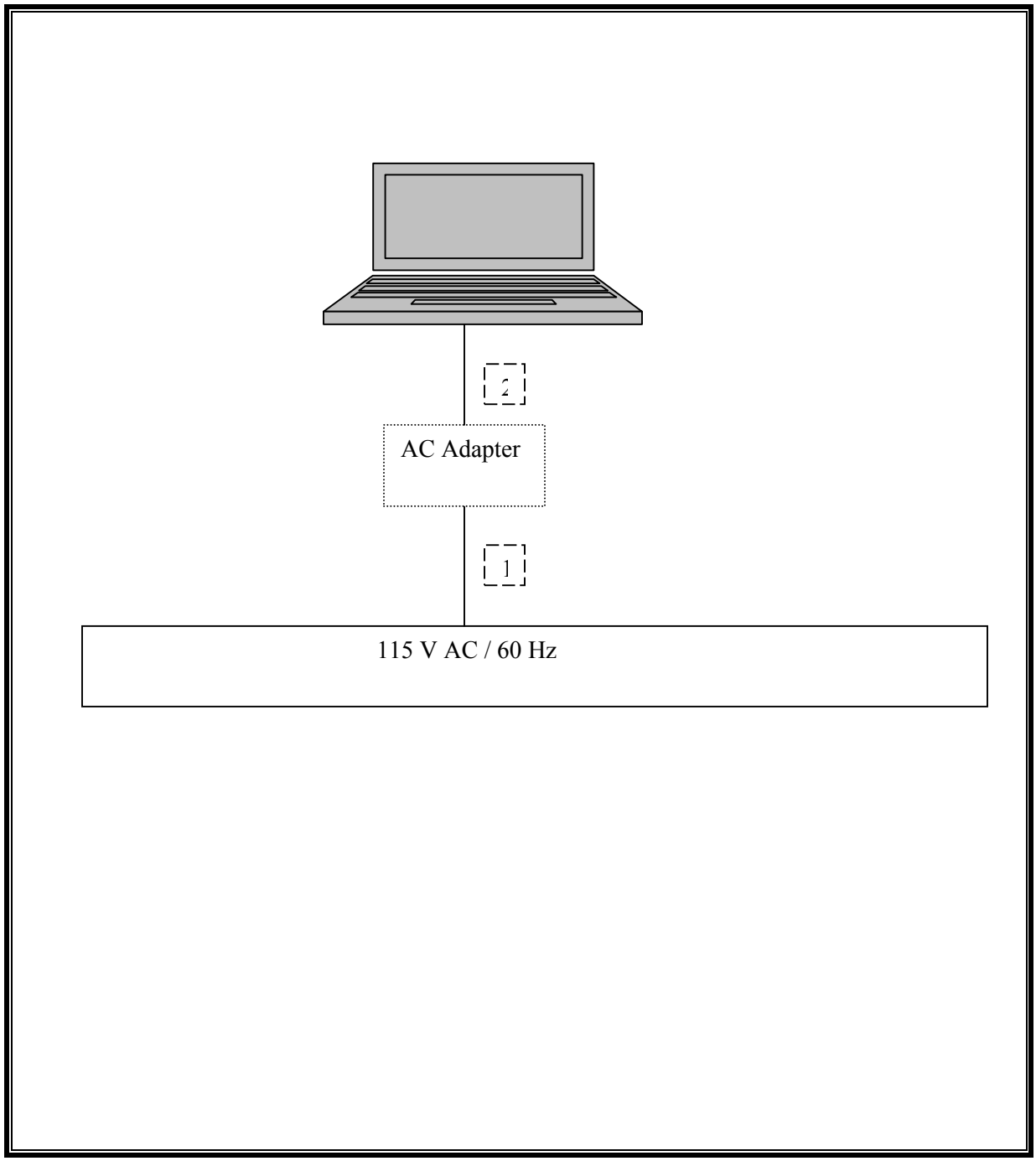
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	AC	Unshielded	1.2 m	N/A
2	DC	1	DC	Unshielded	1.2 m	N/A

TEST SETUP

The EUT is installed in a host laptop computer. 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**	**S/N**	**Cal Due**
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42510266	11/26/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	08/06/07
Antenna, Horn 26 ~ 40 GHz	ARA	MWH-2640/B	1029	08/06/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	10/03/07
Preamplifier, 26 ~ 40 GHz	Miteq	NSP4000-SP2	924343	08/24/07
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	09/15/07
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	09/15/07
EMI Test Receiver	R & S	ESHS 20	827129/006	01/27/08
AC Power Source, 10 kVA	ACS	AFC-10K-AFC-2	J1568	CNR
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	06/12/08
RF Filter Section	Agilent / HP	85420E	3705A00256	06/12/08
Antenna, Bilog 30 MHz ~ 2 GHz	Sunol Sciences	JB1	A121003	08/13/08
4.6 - 5.8 GHz Combiner	Mini-Circuits	ZB4PD1-5.8	SN649900514	N/A
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/02/07
Antenna, Horn 18 ~ 26 GHz	ARA	SWH-28	1007	04/15/08
7.6 GHz High Pass Filter	Micro Tronics	HPM13350	1	N/A
5.47-5.725GHz Reject Filter	Micro Tronics	BRC13191	1	N/A

7. LIMITS AND RESULTS

7.1. 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 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Mode Channel	Frequency (MHz)	Average Power Chain 0 (dBm)	Average Power Chain 2 (dBm)	Average Power Total (dBm)
802.11a Mode				
Low	5500	15.6	15.5	18.6
Middle	5600	15.7	15.1	18.4
High	5700	15.6	15.2	18.4
802.11n HT20 Mode				
Low	5500	17.7	17.6	20.7
Middle	5600	17.6	17.3	20.5
High	5700	17.1	17.0	20.1
802.11n HT40 Mode				
Low	5510	16.1	16.0	19.1
Middle	5590	17.8	17.0	20.4
High	5670	17.0	17.1	20.1

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

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

REPORTING NOTES

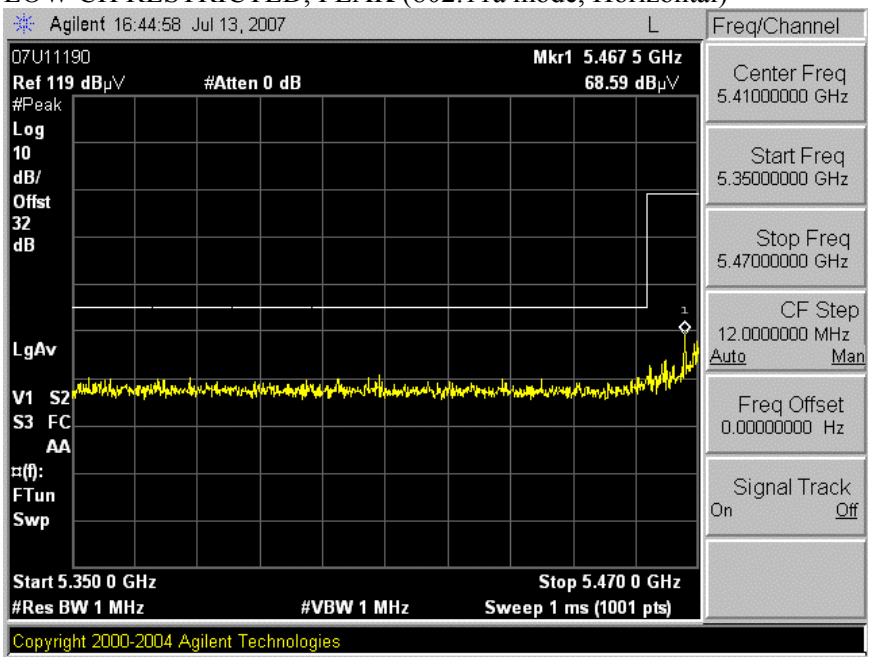
The nearby restricted band stops 10 MHz below the authorized band. A single plot is taken to show both restricted band emission levels and out-of-band radiated spurious emission levels at and near the lower authorized bandedge. The out-of-band spurious limits of -7 dBm Peak EIRP and -27 dBm Average EIRP are converted to the equivalent 3 meter field strengths of 88.2 dBuV/m Peak and 68.2 dBuV/m Average, respectively, for reporting purposes.

The out-of- band radiated spurious emission levels at and near the upper authorized bandedge are reported as EIRP values.

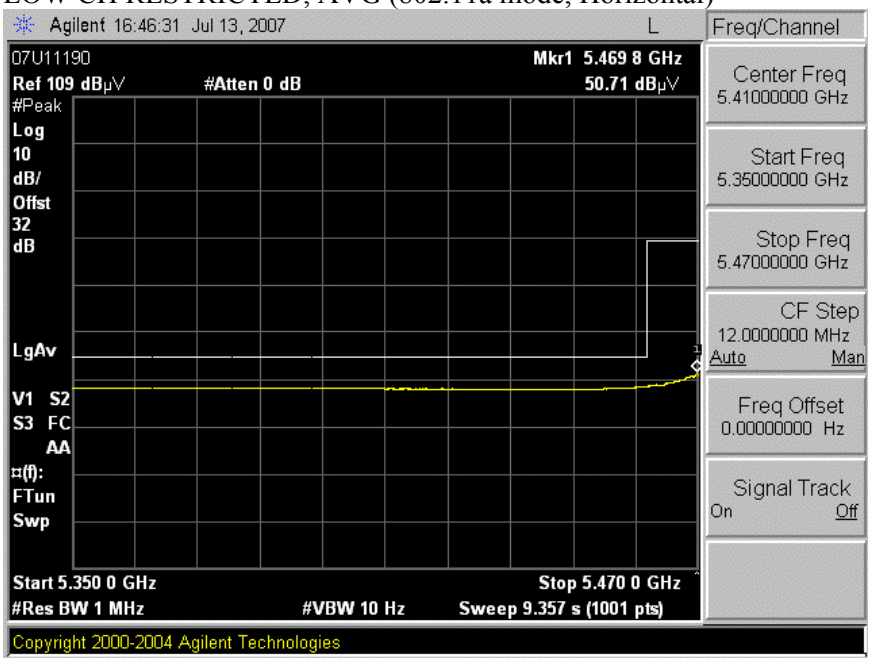
7.2.2. TRANSMITTER ABOVE 1 GHZ FOR 5470 TO 5725 MHz BAND

RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, 5500MHz, HORIZONTAL)

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

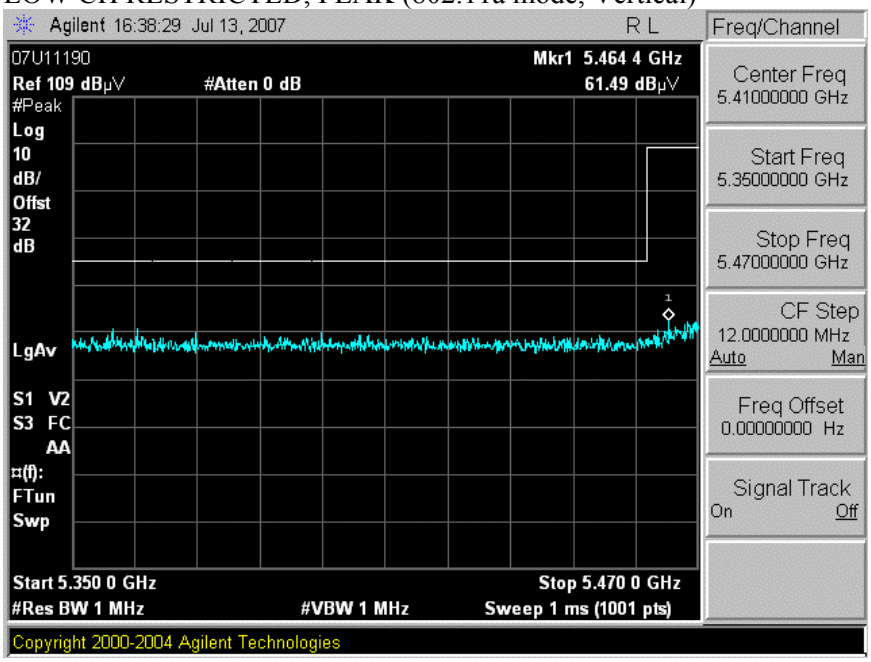


LOW CH RESTRICTED, AVG (802.11a mode, Horizontal)

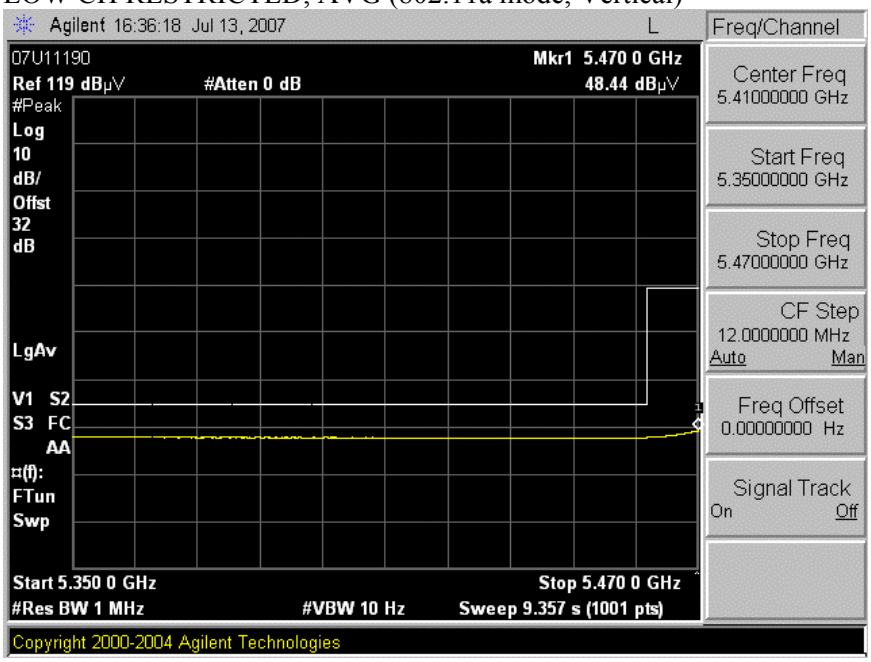


RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, 5500 MHz, VERTICAL)

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

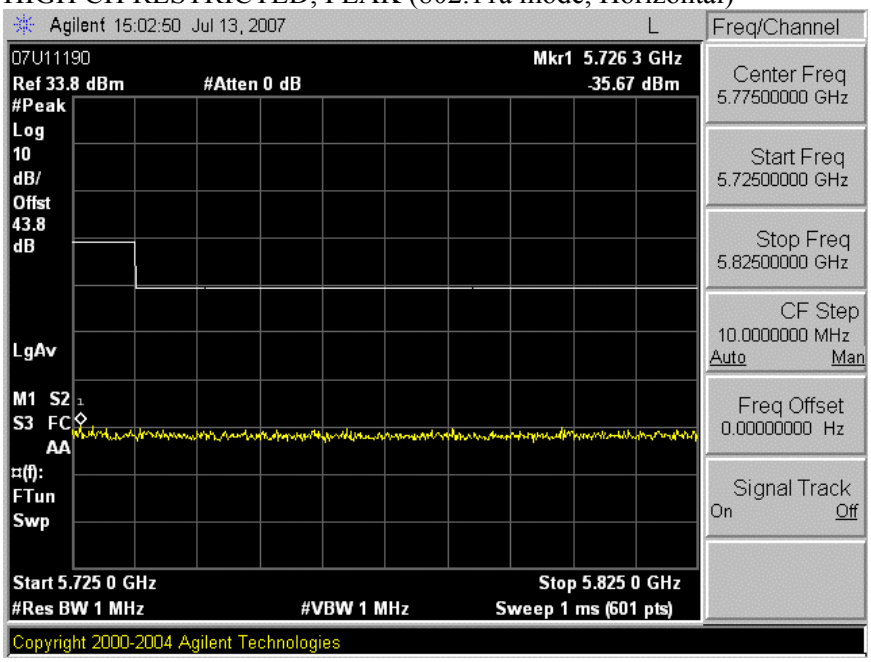


LOW CH RESTRICTED, AVG (802.11a mode, Vertical)

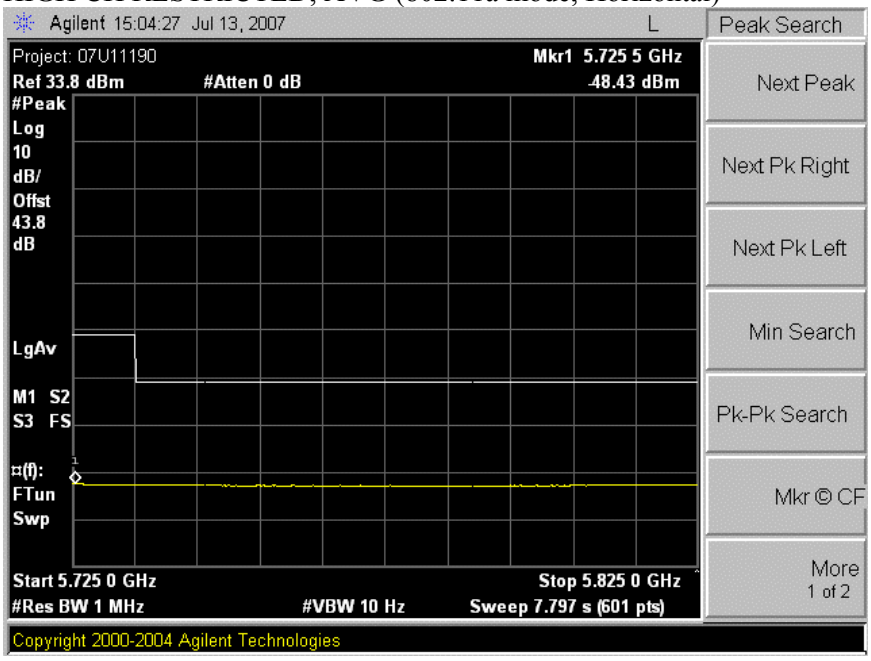


RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, 5700MHz, HORIZONTAL)

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

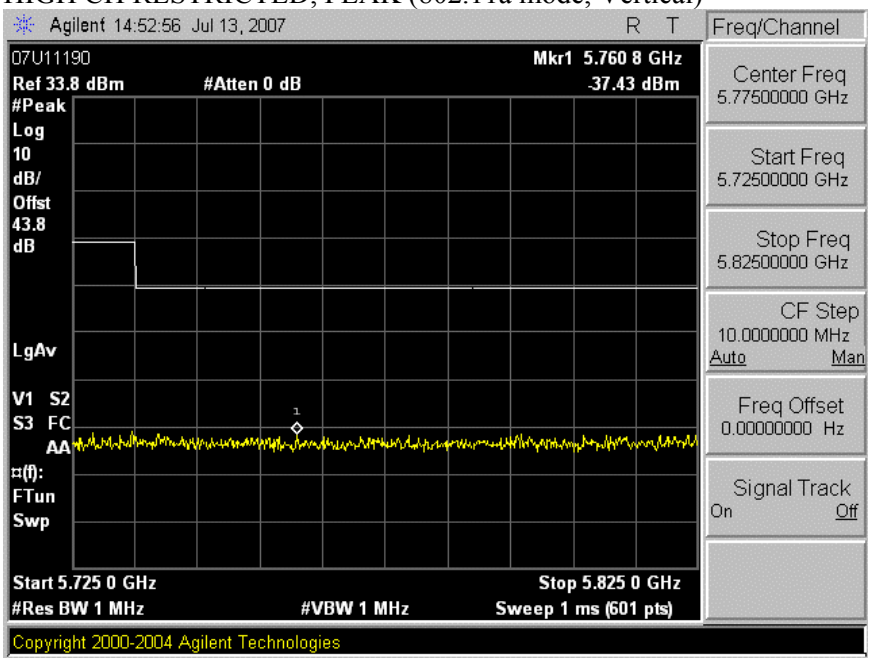


HIGH CH RESTRICTED, AVG (802.11a mode, Horizontal)

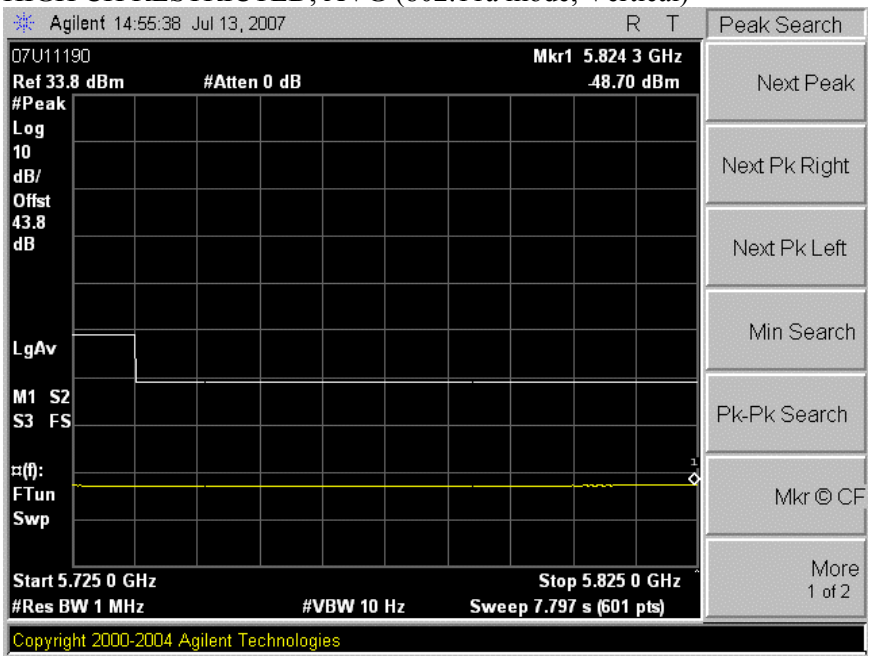


RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, 5700MHz, VERTICAL)

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



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



HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Atheros
Project #: 07U11190
Date: 07/13/07
Test Engineer: Can Ming Chung
Configuration: Worst Configuration_X position
Mode: TX, 5.5Ghz Legacy

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A0056			FCC 15.109

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		R_001

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

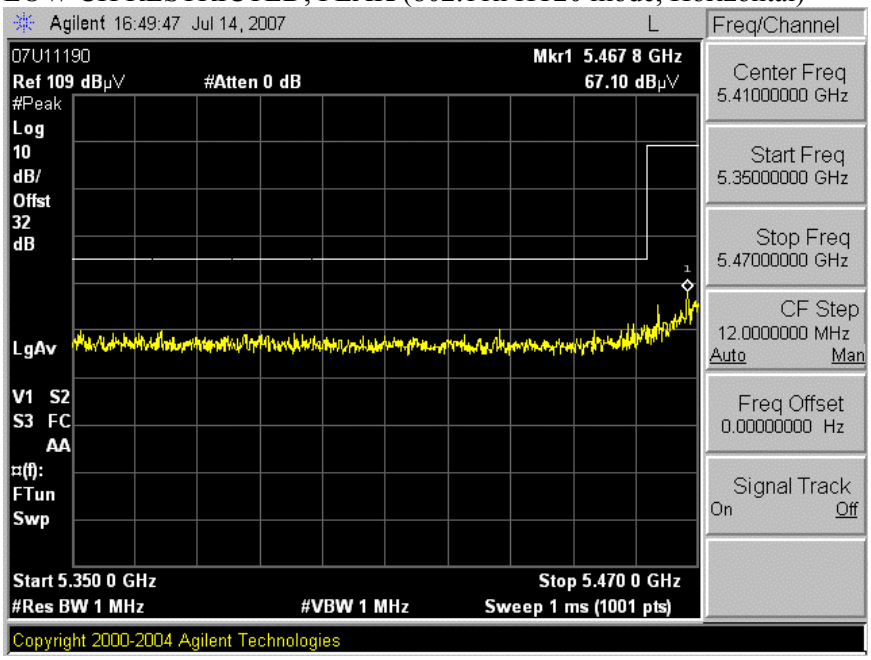
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
LOW CH(5500)															
10.990	3.0	41.3	28.7	37.5	11.3	-33.8	0.0	0.0	56.4	43.8	74	54	-17.6	-10.2	H
10.993	3.0	40.9	28.1	37.5	11.3	-33.8	0.0	0.0	55.9	43.2	74	54	-18.1	-10.8	V
MID CH(5600)															
11.583	3.0	41.4	27.9	37.6	11.9	-33.0	0.0	0.0	58.0	44.5	74	54	-16.0	-9.5	H
11.850	3.0	40.9	27.5	37.7	12.2	-32.6	0.0	0.0	58.2	44.8	74	54	-15.8	-9.2	V
HIGH CH(5700)															
11.406	3.0	41.7	28.1	37.6	11.8	-33.2	0.0	0.0	57.8	44.3	74	54	-16.2	-9.7	H
11.397	3.0	40.6	27.8	37.6	11.7	-33.2	0.0	0.0	56.7	43.9	74	54	-17.3	-10.1	V

Rev. 4.12.7

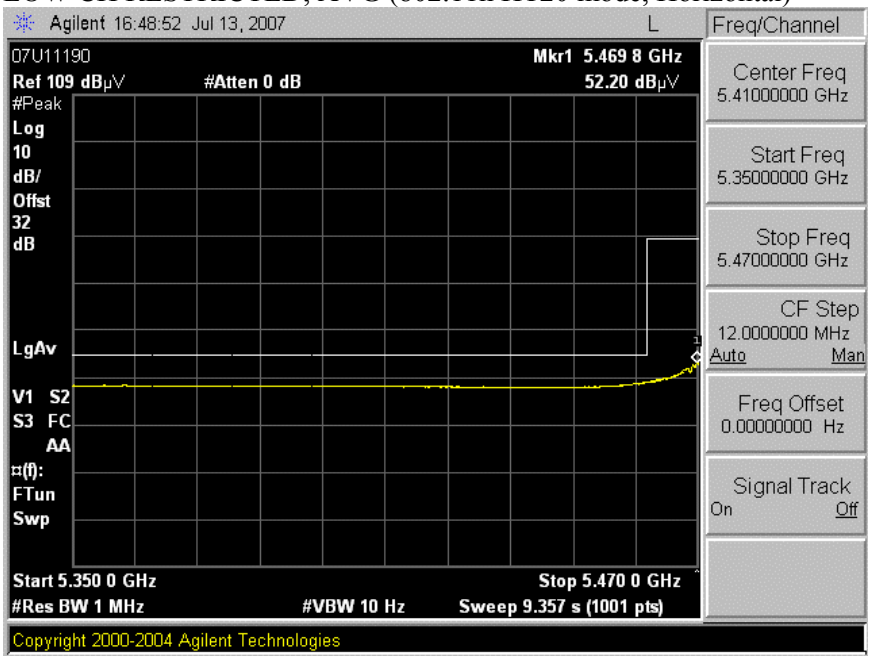
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11n HT20 MODE, LOW CHANNEL, 5500MHz, HORIZONTAL)

LOW CH RESTRICTED, PEAK (802.11n HT20 mode, Horizontal)

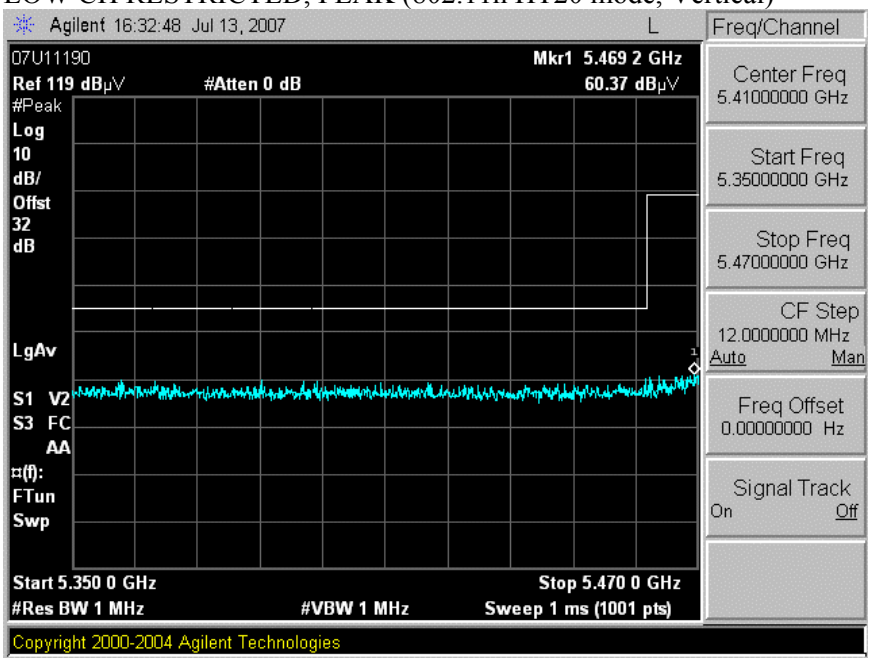


LOW CH RESTRICTED, AVG (802.11n HT20 mode, Horizontal)

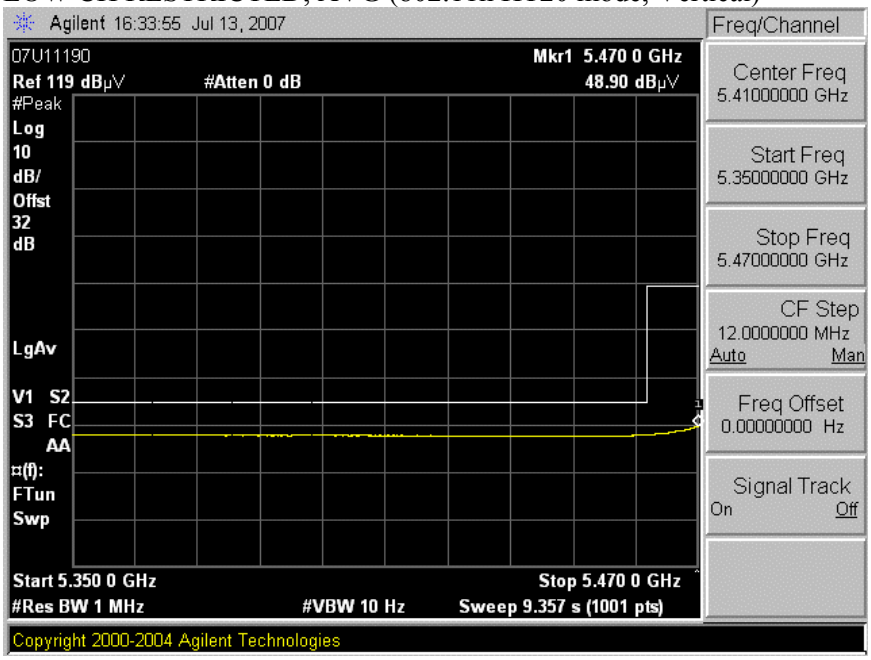


RESTRICTED BANDEDGE (802.11n HT20 MODE, LOW CHANNEL, 5500 MHz, VERTICAL)

LOW CH RESTRICTED, PEAK (802.11n HT20 mode, Vertical)

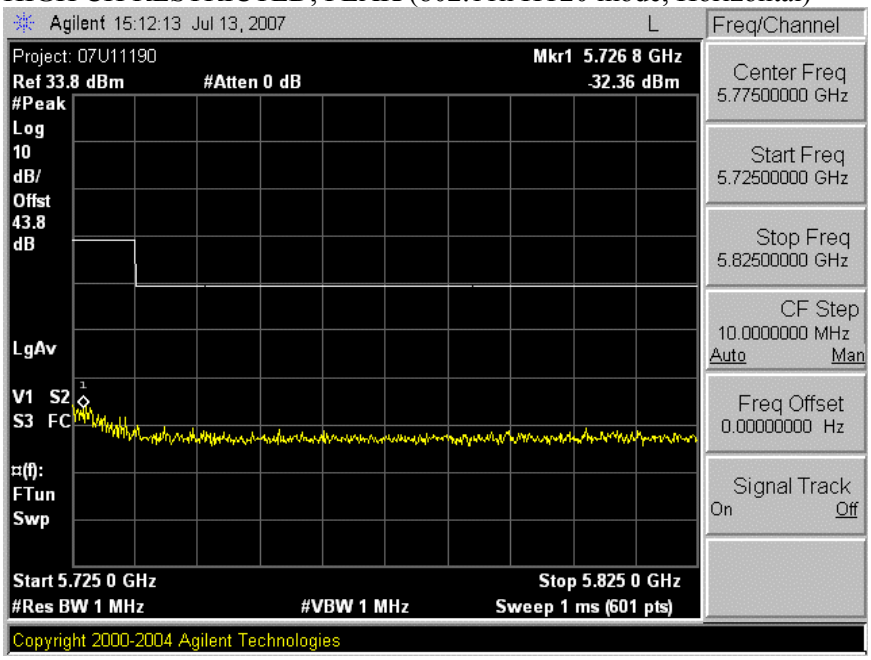


LOW CH RESTRICTED, AVG (802.11n HT20 mode, Vertical)

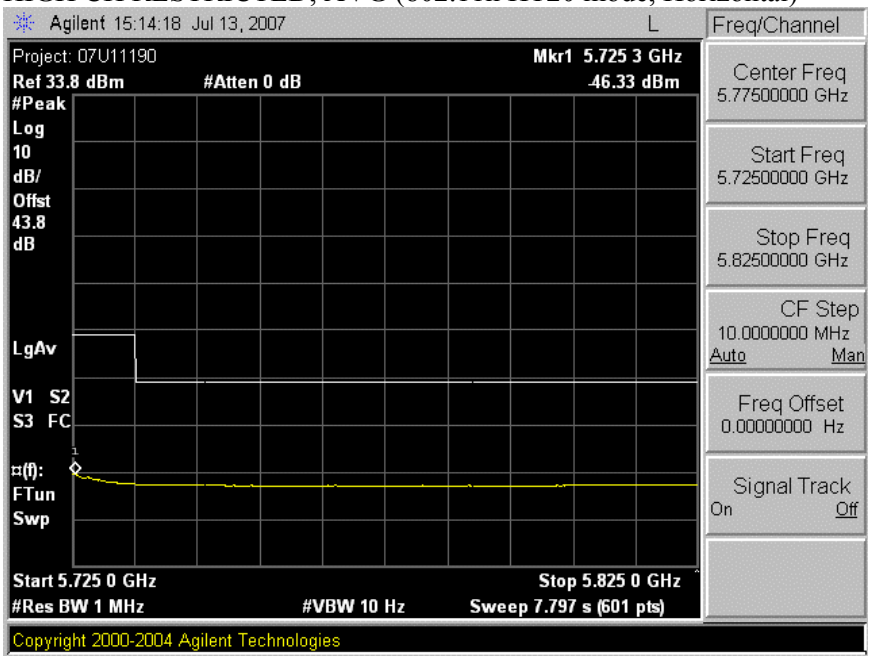


RESTRICTED BANDEDGE (802.11n HT20 MODE, HIGH CHANNEL, 5700MHz, HORIZONTAL)

HIGH CH RESTRICTED, PEAK (802.11n HT20 mode, Horizontal)

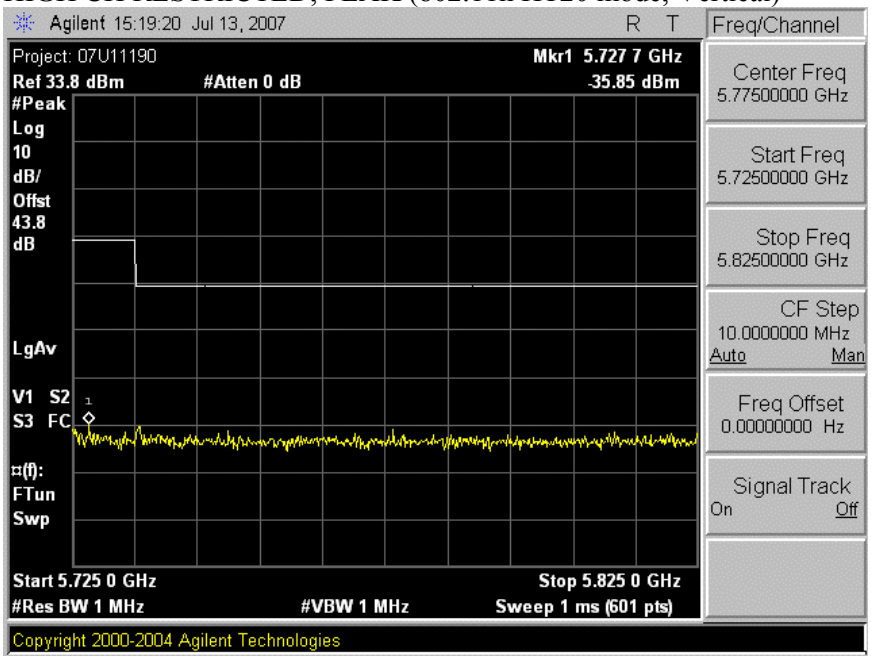


HIGH CH RESTRICTED, AVG (802.11n HT20 mode, Horizontal)

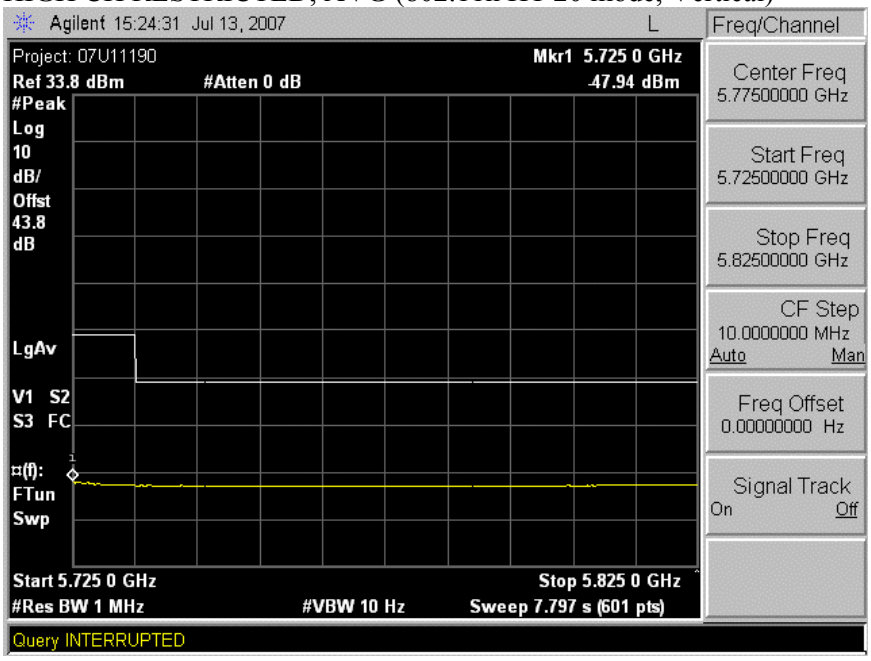


RESTRICTED BANDEDGE (802.11n HT20 MODE, HIGH CHANNEL, 5700MHz, VERTICAL)

HIGH CH RESTRICTED, PEAK (802.11n HT20 mode, Vertical)



HIGH CH RESTRICTED, AVG (802.11n HT 20 mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11n HT 20 MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Atheros
Project #: 07U11190
Date: 07/13/07
Test Engineer: Can Ming Chung
Configuration: Worst Configuration_X position
Mode: TX, 5.5Ghz 20 HT

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A0056			FCC 15.109

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		R_001

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

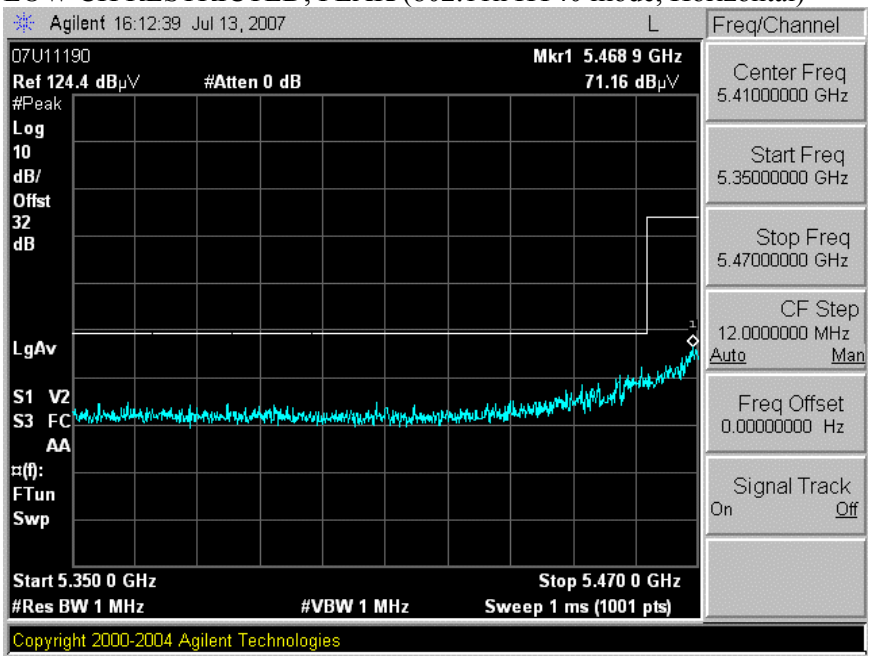
f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
LOW CH(5500)															
10.990	3.0	43.4	29.9	37.5	11.3	-33.8	0.0	0.0	58.5	45.0	74	54	-15.5	-9.0	H
10.993	3.0	41.6	28.9	37.5	11.3	-33.8	0.0	0.0	56.7	44.0	74	54	-17.3	-10.0	V
MID CH(5600)															
11.183	3.0	42.7	28.3	37.6	11.5	-33.5	0.0	0.0	58.2	43.9	74	54	-15.8	-10.1	H
11.210	3.0	41.9	29.3	37.6	11.6	-33.5	0.0	0.0	57.5	45.0	74	54	-16.5	-9.0	V
HIGH CH(5700)															
11.415	3.0	41.2	28.9	37.6	11.8	-33.2	0.0	0.0	57.4	45.0	74	54	-16.6	-9.0	H
11.395	3.0	41.0	28.4	37.6	11.7	-33.2	0.0	0.0	57.1	44.5	74	54	-16.9	-9.5	V

Rev. 4.12.7

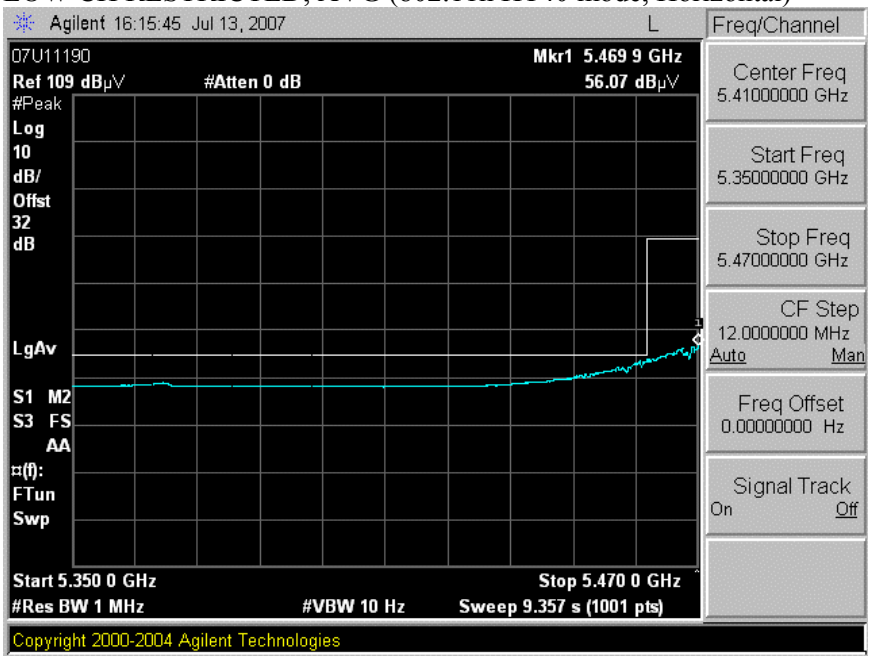
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

RESTRICTED BANDEDGE (802.11n HT40 MODE, LOW CHANNEL, 5500MHz, HORIZONTAL)

LOW CH RESTRICTED, PEAK (802.11n HT40 mode, Horizontal)

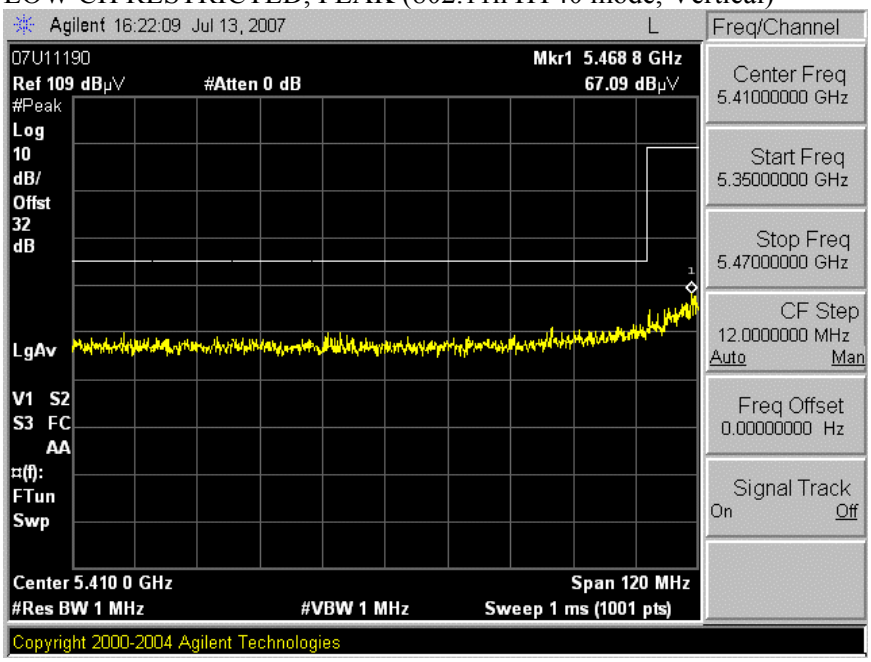


LOW CH RESTRICTED, AVG (802.11n HT40 mode, Horizontal)

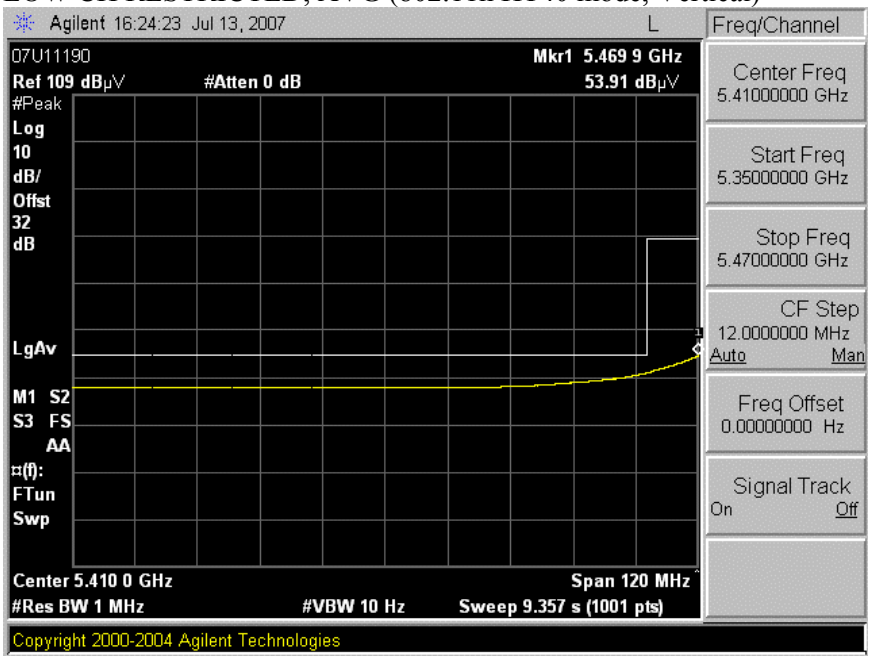


RESTRICTED BANDEDGE (802.11n HT40 MODE, LOW CHANNEL, 5500 MHz, VERTICAL)

LOW CH RESTRICTED, PEAK (802.11n HT40 mode, Vertical)

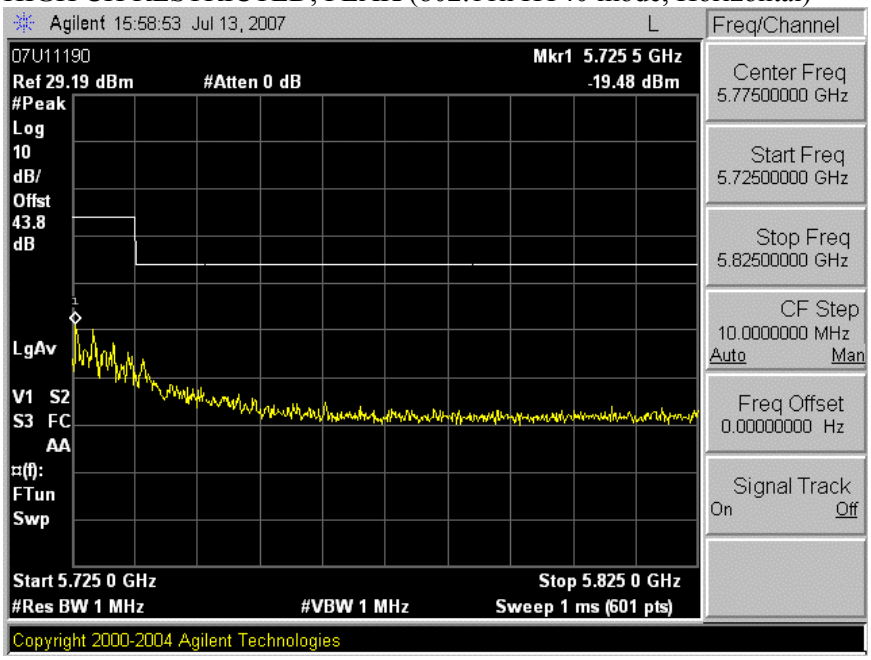


LOW CH RESTRICTED, AVG (802.11n HT40 mode, Vertical)

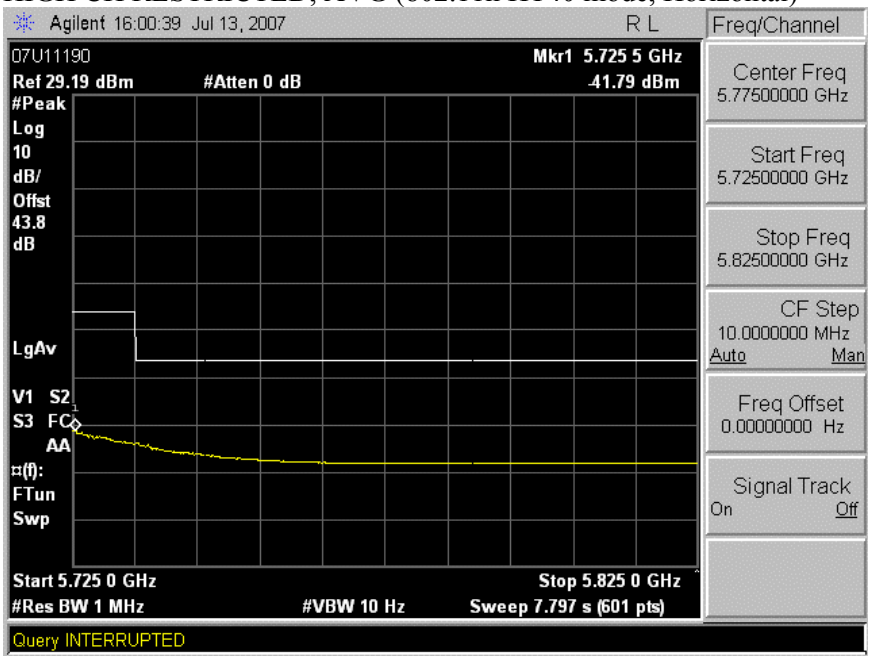


RESTRICTED BANDEDGE (802.11n HT40 MODE, HIGH CHANNEL, 5700MHz, HORIZONTAL)

HIGH CH RESTRICTED, PEAK (802.11n HT40 mode, Horizontal)

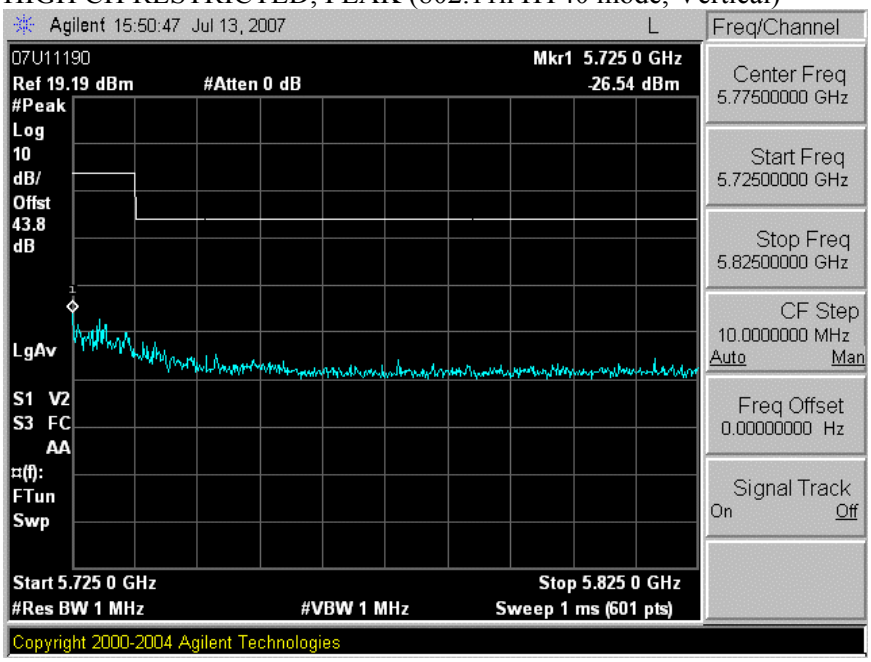


HIGH CH RESTRICTED, AVG (802.11n HT40 mode, Horizontal)

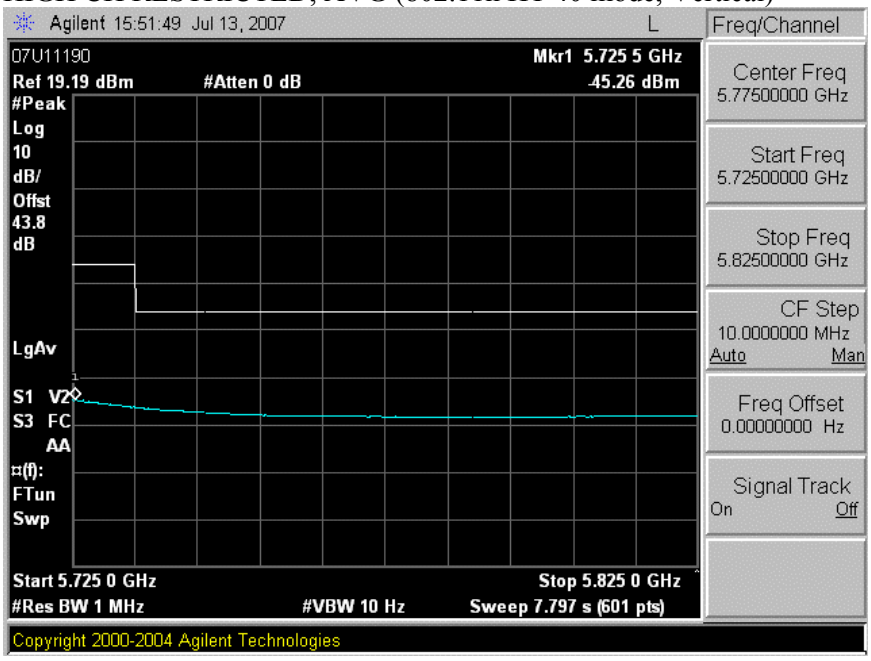


RESTRICTED BANDEDGE (802.11n HT40 MODE, HIGH CHANNEL, 5700MHz, VERTICAL)

HIGH CH RESTRICTED, PEAK (802.11n HT40 mode, Vertical)



HIGH CH RESTRICTED, AVG (802.11n HT 40 mode, Vertical)



HARMONICS AND SPURIOUS EMISSIONS (802.11n HT 40 MODE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Atheros
Project #: 07U11190
Date: 07/13/07
Test Engineer: Can Ming Chung
Configuration: Worst Configuration_X position
Mode: TX, 5.5Ghz 40 HT

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T120; S/N: 29310 @3m	T145 Agilent 3008A0056			10.99

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
		B-5m Chamber		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)
LOW CH(5510Mhz)															
11.040	3.0	42.8	28.1	37.5	11.4	-33.7	0.0	0.0	58.0	43.3	74	54	-16.0	-10.7	H
11.408	3.0	41.6	27.6	37.6	11.8	-33.2	0.0	0.0	57.8	43.7	74	54	-16.2	-10.3	V
MID CH(5600Mhz)															
11.386	3.0	41.0	28.7	37.6	11.7	-33.2	0.0	0.0	57.1	44.8	74	54	-16.9	-9.2	H
11.398	3.0	40.8	27.7	37.6	11.7	-33.2	0.0	0.0	56.9	43.8	74	54	-17.1	-10.2	V
HIGH CH(5690Mhz)															
11.340	3.0	42.1	28.8	37.6	11.7	-33.3	0.0	0.0	58.1	44.7	74	54	-15.9	-9.3	H
11.386	3.0	41.4	28.0	37.6	11.7	-33.2	0.0	0.0	57.5	44.1	74	54	-16.5	-9.9	V

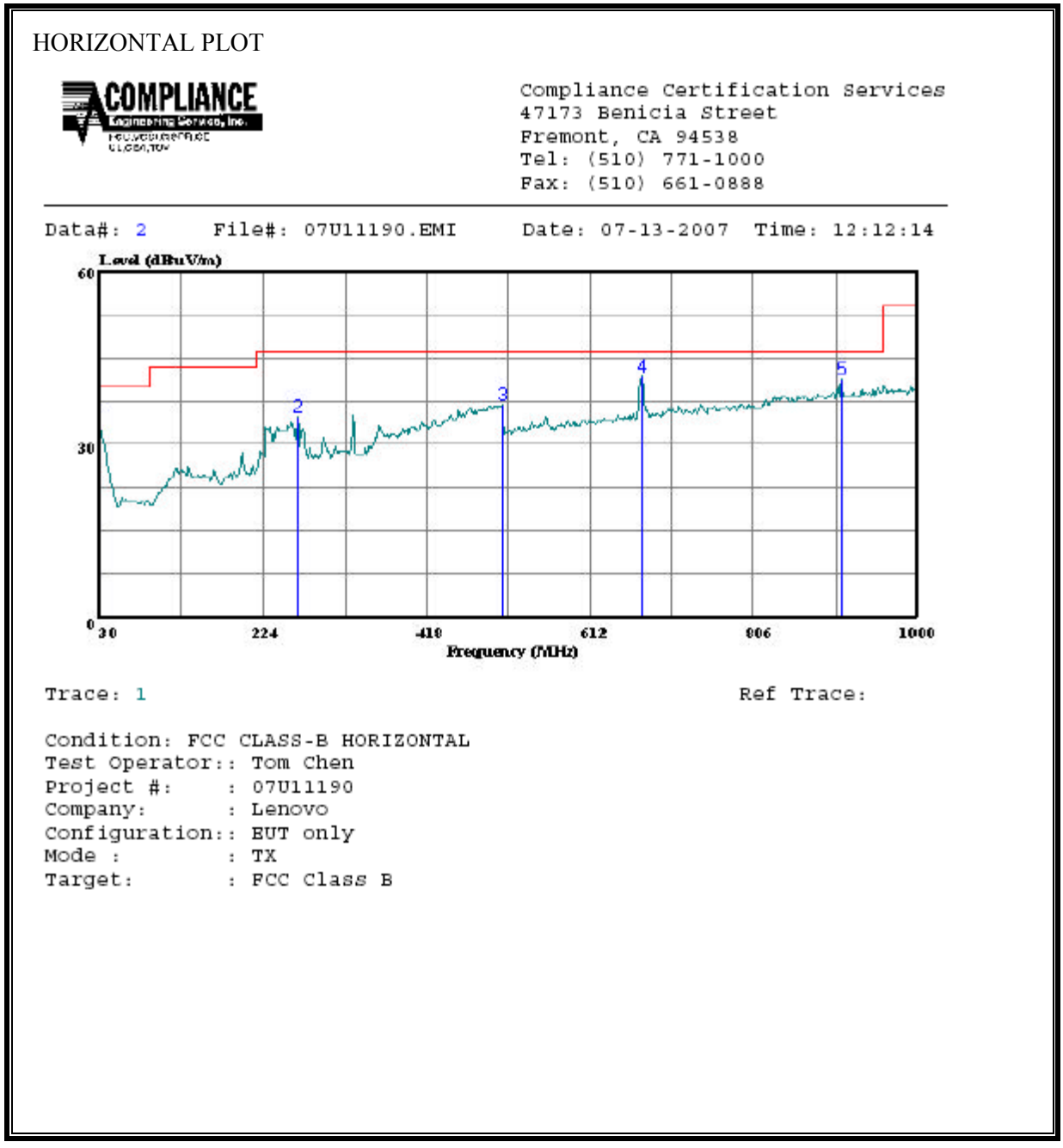
Rev. 4.12.7

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



HORIZONTAL DATA

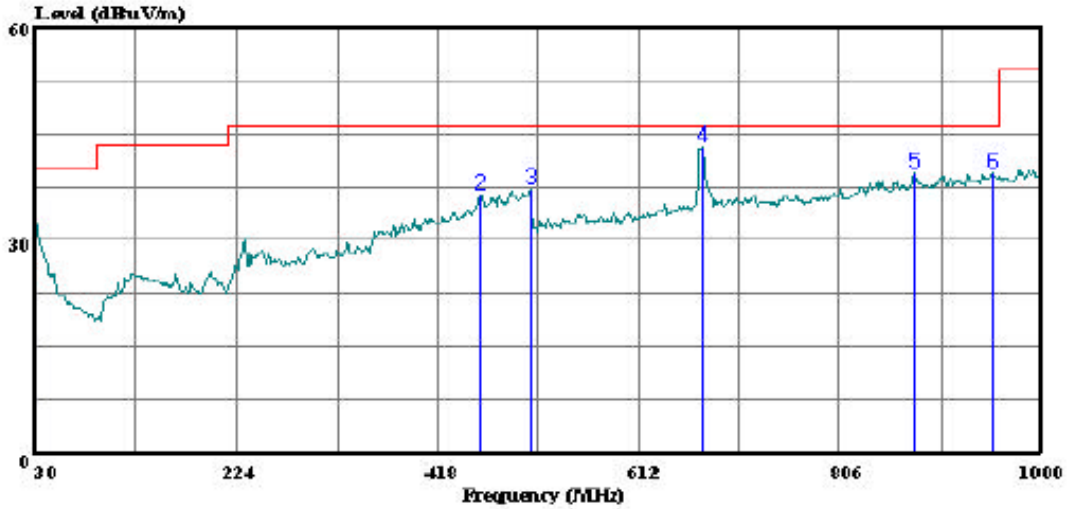
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.970	10.10	22.65	32.75	40.00	-7.25	Peak
2	264.740	20.30	14.42	34.72	46.00	-11.28	Peak
3	507.240	16.21	20.56	36.77	46.00	-9.23	Peak
4	672.140	18.65	23.11	41.76	46.00	-4.24	Peak
5	909.790	15.15	26.25	41.40	46.00	-4.60	Peak

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

VERTICAL PLOT

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 4 File#: 07U11190.EMI Date: 07-13-2007 Time: 12:20:48



Trace: 3 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator:: Tom Chen
Project #: : 07U11190
Company: : Lenovo
Configuration:: EUT only
Mode : : TX
Target: : FCC Class B

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.970	9.82	22.65	32.47	40.00	-7.53	Peak
2	458.740	16.74	19.54	36.28	46.00	-9.72	Peak
3	507.240	16.53	20.56	37.09	46.00	-8.91	Peak
4	672.140	19.97	23.11	43.08	46.00	-2.92	Peak
5	877.780	13.50	25.88	39.38	46.00	-6.62	Peak
6	953.440	12.68	26.76	39.44	46.00	-6.56	Peak

7.3. POWERLINE CONDUCTED EMISSIONS

LIMIT

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

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

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

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

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

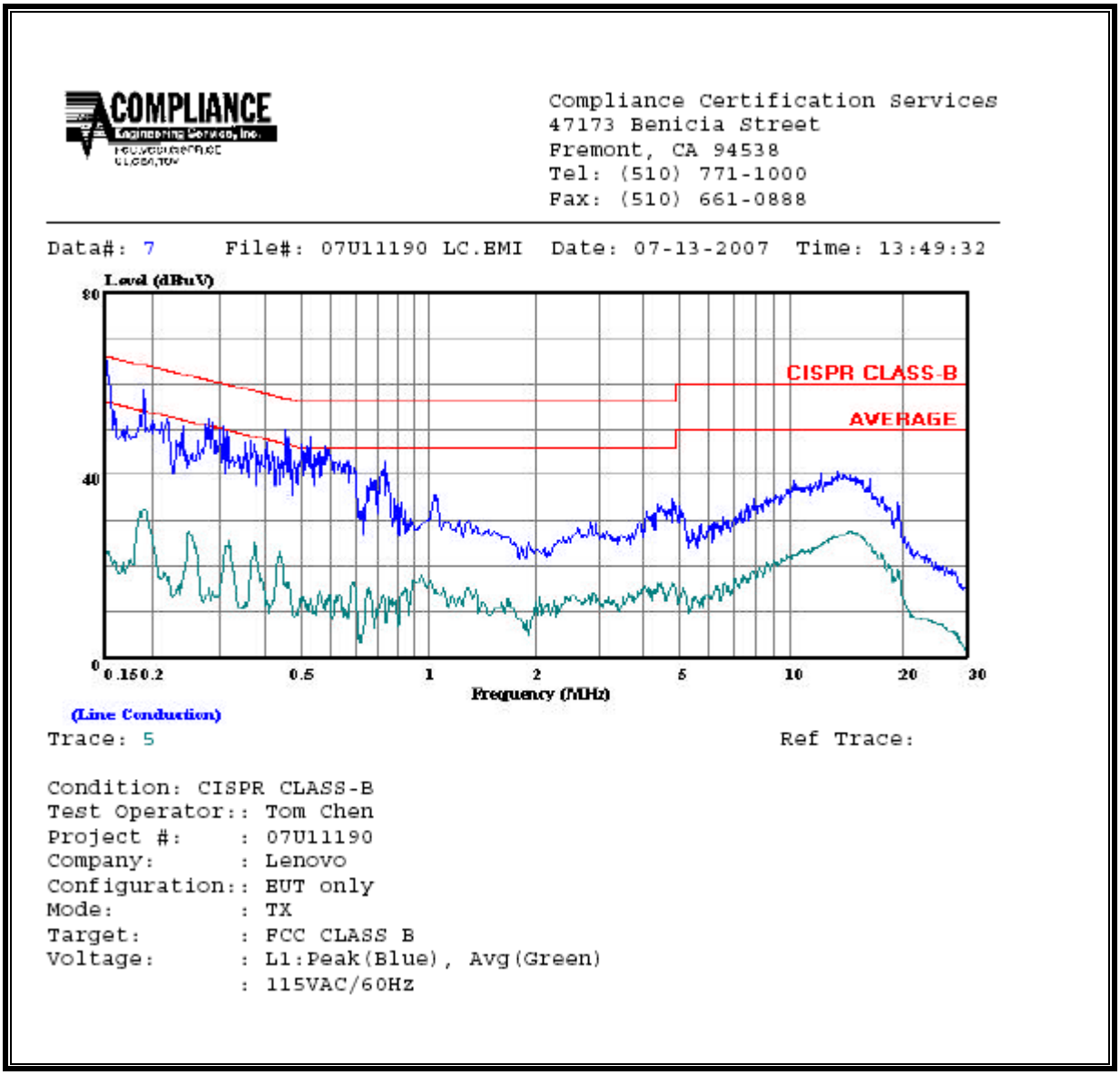
RESULTS

No non-compliance noted:

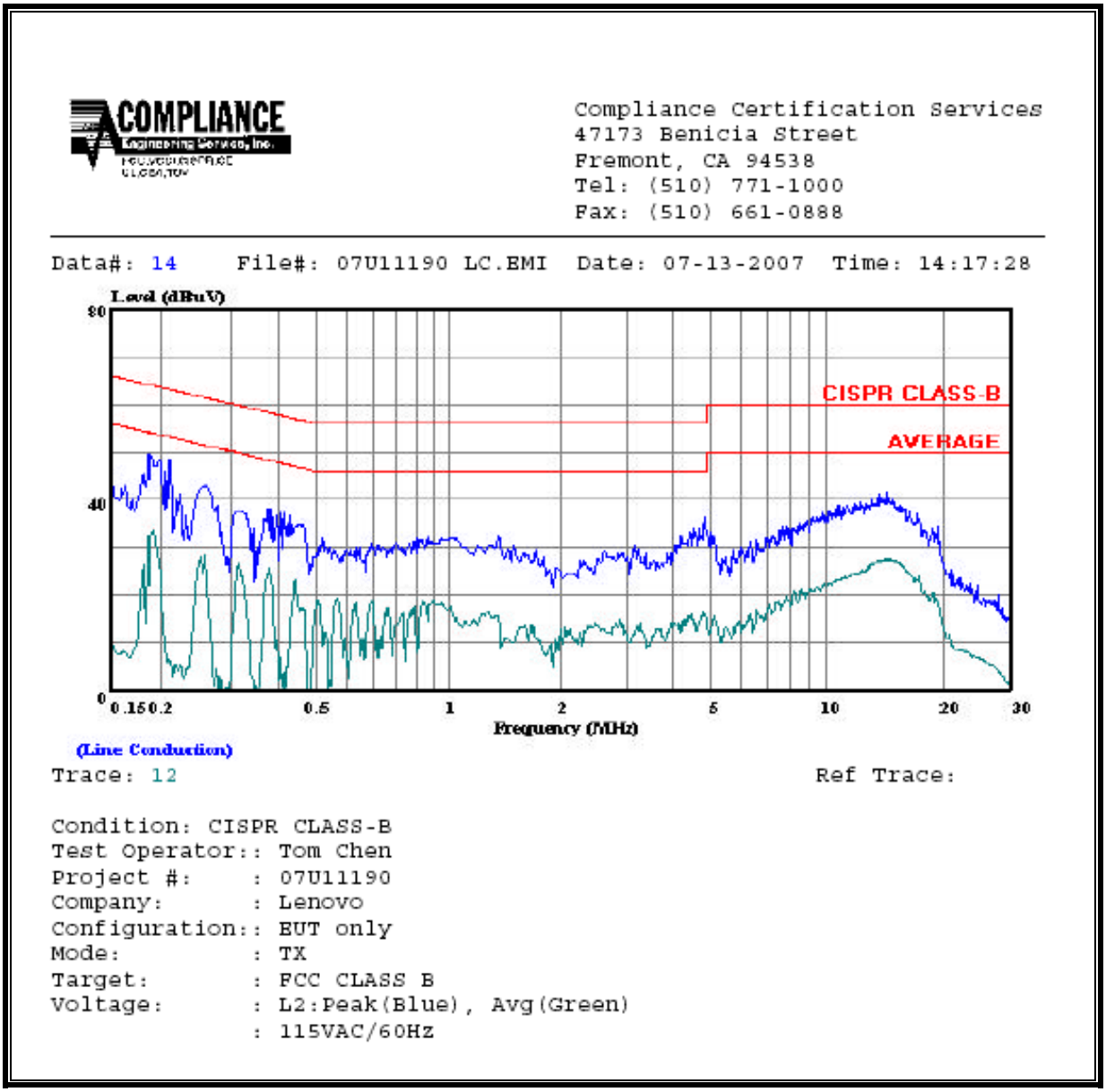
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	65.14	--	23.08	0.00	65.89	55.89	-0.75	-32.81	L1
0.19	58.70	--	32.47	0.00	64.08	54.08	-5.38	-21.61	L1
0.46	49.80	--	16.12	0.00	56.77	46.77	-6.97	-30.65	L1
0.19	49.44	--	32.57	0.00	64.17	54.17	-14.73	-21.60	L2
0.21	48.58	--	6.47	0.00	63.24	53.24	-14.66	-46.77	L2
4.90	36.44	--	16.09	0.00	56.00	46.00	-19.56	-29.91	L2
6 Worst Data									

LINE 1 RESULTS



LINE 2 RESULTS



8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP FOR DESKTOP CONFIGURATION

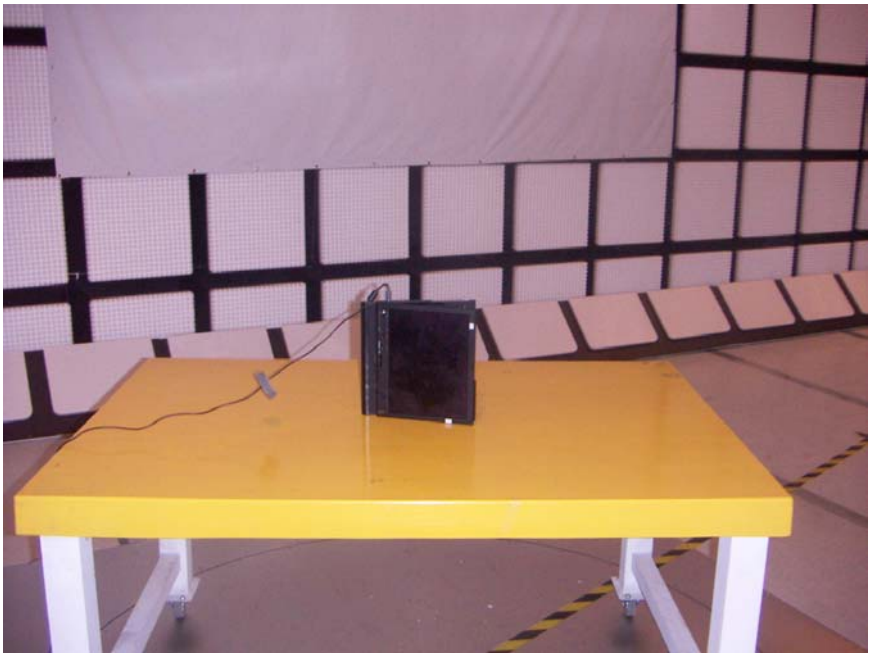
RADIATED FRONT PHOTO

RADIATED BACK PHOTO

RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

X-AXIS FRONT PHOTO

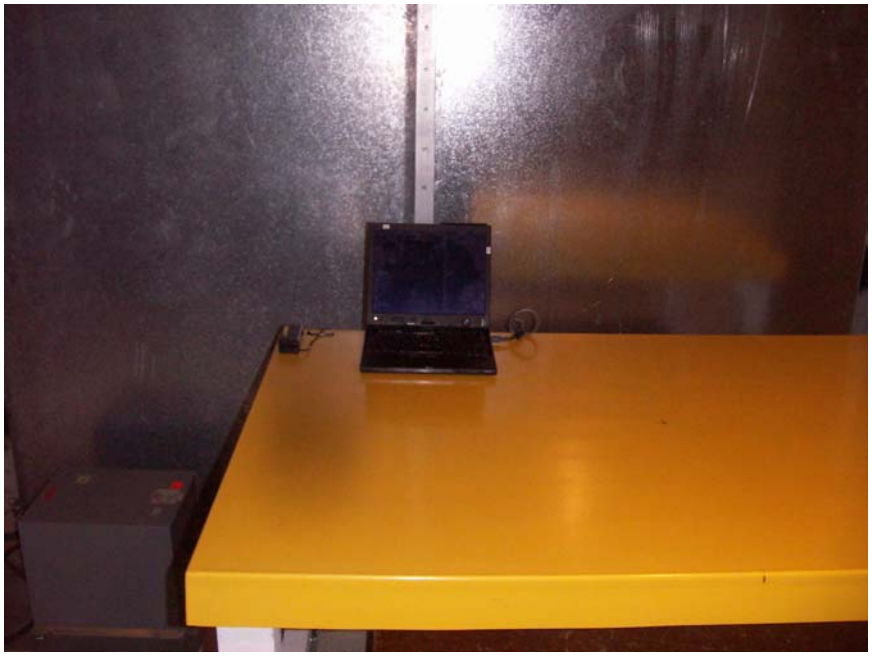
Y-AXIS FRONT PHOTO



Z-AXIS FRONT PHOTO

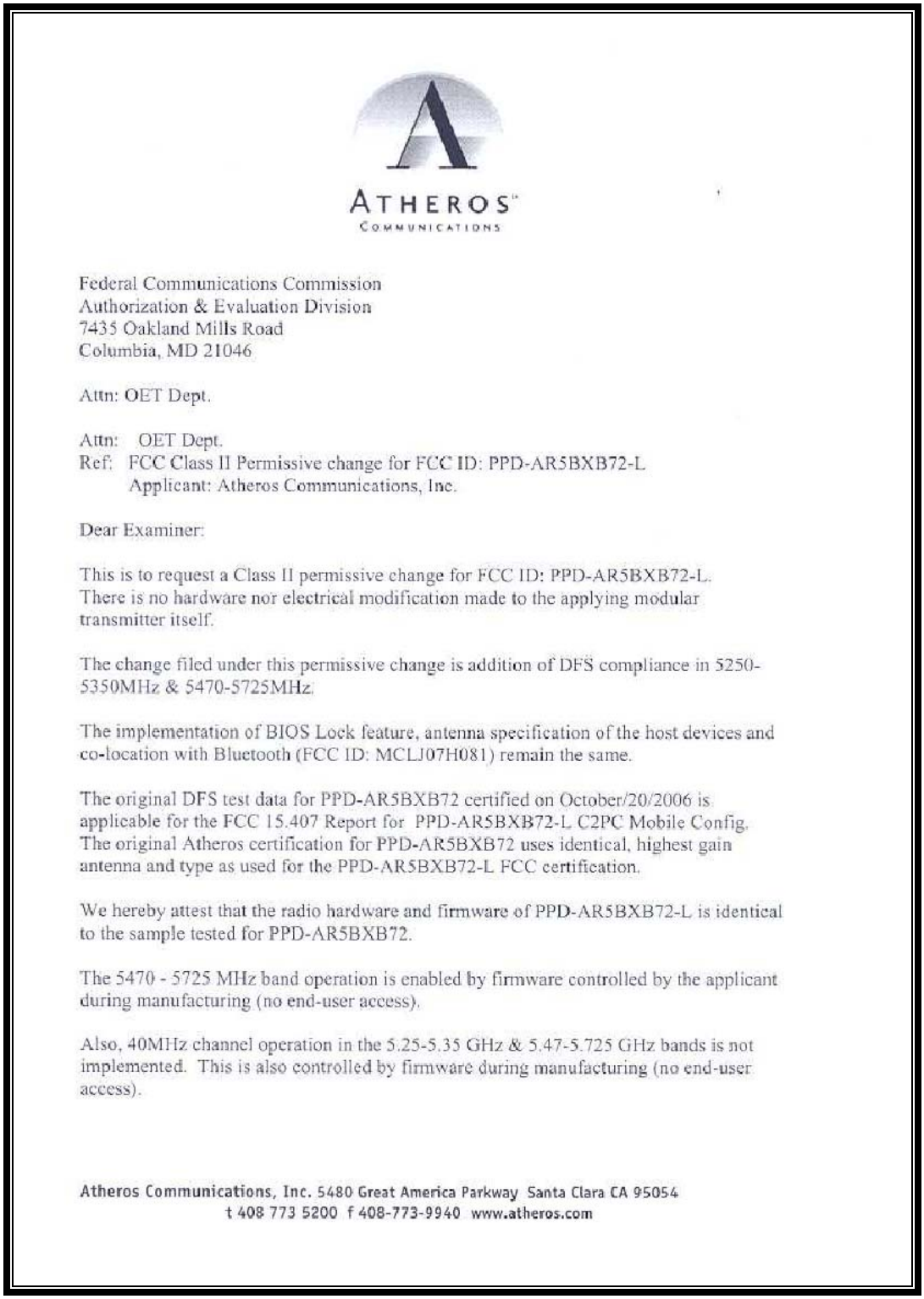
POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO



LINE CONDUCTED BACK PHOTO

9. APPENDIX A: MANUFACTURER'S DECLARATION OF MODEL DIFFERENCES



ATHEROS
COMMUNICATIONS

Federal Communications Commission
Authorization & Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

Attn: OET Dept.

Attn: OET Dept.
Ref: FCC Class II Permissive change for FCC ID: PPD-AR5BXB72-L
Applicant: Atheros Communications, Inc.

Dear Examiner:

This is to request a Class II permissive change for FCC ID: PPD-AR5BXB72-L. There is no hardware nor electrical modification made to the applying modular transmitter itself.

The change filed under this permissive change is addition of DFS compliance in 5250-5350MHz & 5470-5725MHz.

The implementation of BIOS Lock feature, antenna specification of the host devices and co-location with Bluetooth (FCC ID: MCLJ07H081) remain the same.

The original DFS test data for PPD-AR5BXB72 certified on October/20/2006 is applicable for the FCC 15.407 Report for PPD-AR5BXB72-L C2PC Mobile Config. The original Atheros certification for PPD-AR5BXB72 uses identical, highest gain antenna and type as used for the PPD-AR5BXB72-L FCC certification.

We hereby attest that the radio hardware and firmware of PPD-AR5BXB72-L is identical to the sample tested for PPD-AR5BXB72.

The 5470 - 5725 MHz band operation is enabled by firmware controlled by the applicant during manufacturing (no end-user access).

Also, 40MHz channel operation in the 5.25-5.35 GHz & 5.47-5.725 GHz bands is not implemented. This is also controlled by firmware during manufacturing (no end-user access).

Atheros Communications, Inc. 5480 Great America Parkway Santa Clara CA 95054
t 408 773 5200 f 408-773-9940 www.atheros.com

Statement Regarding AdHoc feature:
This device does not enable Ad Hoc operation (i.e. wireless operation without a master/controller device) using non-US frequencies or using DFS frequencies.

We hereby certify that no party to this application is subject to a denial of benefits, including FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C.853(a).

Sincerely,

Michael Green / Manager, Global Product Compliance
Atheros Communications Inc.

Atheros Communications, Inc. 5480 Great America Parkway Santa Clara CA 95054
T 408 773 5200 T 408-773-9940 www.atheros.com

END OF REPORT