Lab Code: 200167-0

FCC PART 15.247

EMI MEASUREMENT AND TEST REPORT

For

Aztech Systems Ltd.

31 Ubi Road 1, Aztech Building
Singapore, 408694

FCC ID: I38-HL105EW
Model: HL105EW(US)

This Report Concerns:	Product name:
☒ Original Report	85Mbps HomePlug Wireless G Ethernet Adapter

Test Engineer:	Tom Chen
Report No.:	R0605042
Report Date:	2006-06-12
Reviewed By:	Test Engineer Daniel Deng
Prepared By:	Bay Area Compliance Laboratory Corporation (BACL) 1274 Anvilwood Ave. Sunnyvale, CA 94089 Tel: (408) 732-9162 Fax: (408) 732 9164

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Aztech Systems Ltd.'s* product, Model: *HL105EW(US)* or the "EUT" as referred to in this report is a Homeplug 85Mbps Turbo with 802.11G Wireless LAN that transforms in-house power circuit into networking infrastructure with a Wireless LAN interface. Transforms any plug socket into a WLAN connection. Ideal for anyone to extend their Wireless Internet access or make an internal network.

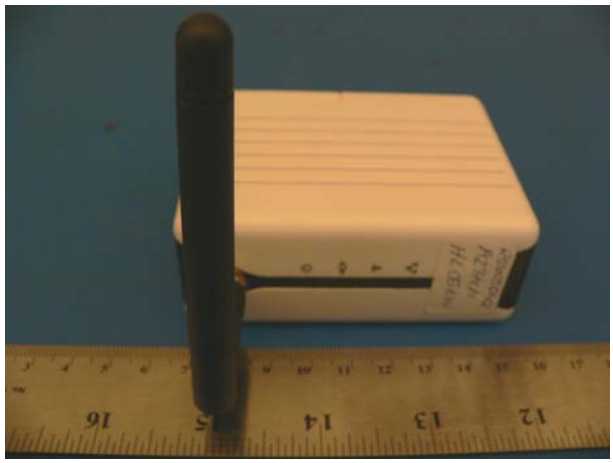
Built-in Quality of Service (QOS) features also provides the necessary bandwidth for multimedia payloads including TV over IP (IPTV), higher data rate broadband sharing, Online-Gaming, VoIP Calls, extending Wireless LANs coverage, Audio-Video transmission across the network as well as Network camera connectivity.

Mechanical Description

The *Aztech Systems Ltd.* product, *FCC ID: I38-HL105EW,* or the "EUT" as referred to this report is a *85Mbps HomePlug wireless Adapter* which measures approximately *8.5cmL x 3.58cmW x 6.7cmH.* The antenna for this device is an external antenna with gain of 3.0 dBi

** The test data gathered are from production sample, serial number: 04061700004, provided by the manufacturer.*

EUT Photo



Additional photos in Exhibit C

Objective

This type approval report is prepared on behalf of *Aztech Systems Ltd.*in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth, and power spectral density, 100 kHz Bandwidth of Band Edges Measurement, Spurious Emissions, Conducted and Spurious Radiated Emissions.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at it's facility in Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference have the reports on file and are listed under FCC file 31040/SIT 1300F2, IC registration number: 3062A, and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at
http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm

SYSTEM TEST CONFIGURATION

Justification

The host system was configured for testing according to ANSI C63.4-2003.

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

EUT Exercise Software

The EUT exercise program using for testing, and the following Channel setting was used during the testing:

802.11b	2412 MHZ	2437 MHz	2462 MHz
802.11g	2412 MHZ	2437 MHz	2462 MHz

Special Accessories

N/A

Equipment Modifications

No modifications were made to the EUT.

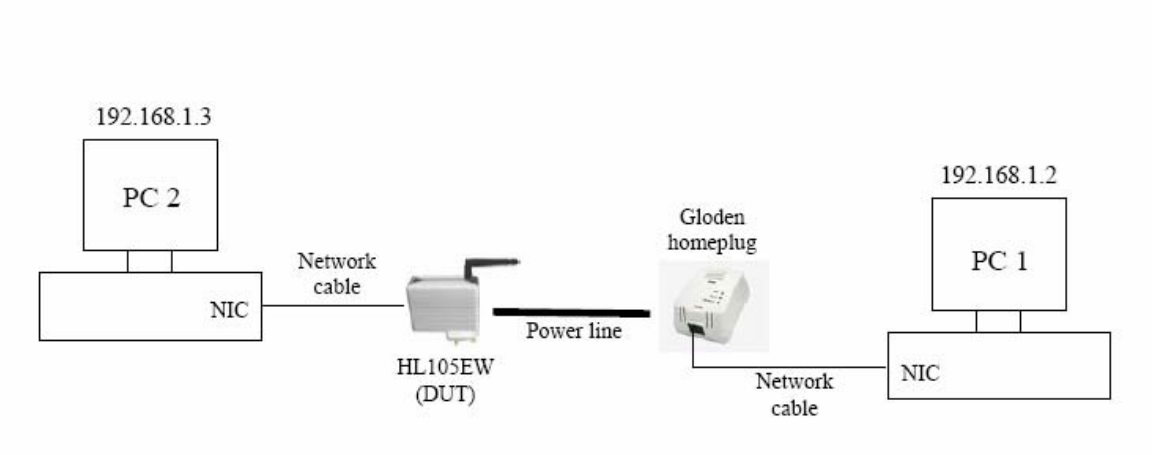
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Aztech	HomePlug wireless Adapter	HL105EW(US)	N/A

Interface Ports and Cabling

Cable Description	Length (M)	From	To
Power cable	1.0	Power supply	EUT
USB cable	1.5	Laptop	EUT

Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247(e)(i) §2.1091	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§2.1051 & §15.247(d)	Spurious Emissions at Antenna Port	Compliant
§15.205	Restricted Band	Compliant
§15.209 (a) & §15.247(c)	Radiated Emissions	Compliant *
§15.247 (a)(2)	6 dB Bandwidth	Compliant
§15.247 (b)(3)	Maximum Peak Output Power	Compliant
§ 15.247 (c)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247 (d)	Power Spectral Density	Compliant

**The test data error was within the measurement uncertaint tolerance.*

§15.247(e)(i),§2.1091 - RF EXPOSURE

According to §15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
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
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

MPE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal: 19.0(dBm)
Maximum peak output power at antenna input terminal: 79.43 (mW)
Prediction distance: 20 (cm)
Prediction frequency: 2400 (MHz)
Antenna Gain (typical): 3 (dBi)
antenna gain: 2 (numeric)
Power density at prediction frequency at 20 cm: 0.0316(mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm^2)

Test Result

The EUT is a Home Plug wireless Adapter. The power density level at 20 cm is $0.0316mW/cm^2$, which is below the uncontrolled exposure limit of $1.0mW/cm^2$ at 2400 MHz.

§15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna for this device is an external antenna with gain of 3.0 dBi. The connector type is a reverse polarity: **SMA MALE RVSE Y111E024-002 WIESON**

§2.1051 & §15.247(d) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Requirements: CFR 47, § 2.1051.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

Measurement Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.

Equipment Lists

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2006-01-11

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

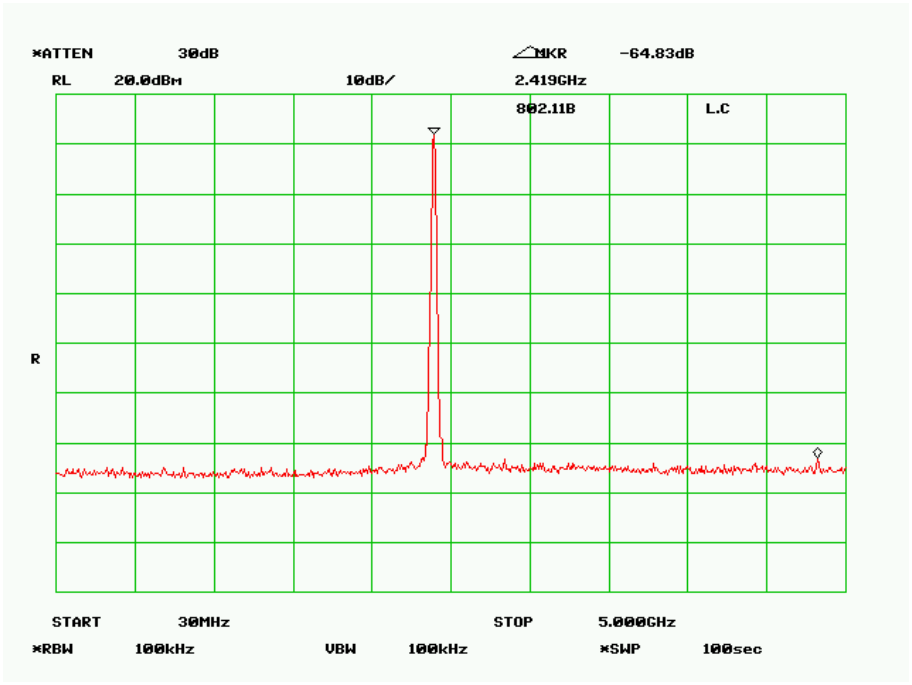
**The testing was performed by Tom Chen on 2006-05-18.*

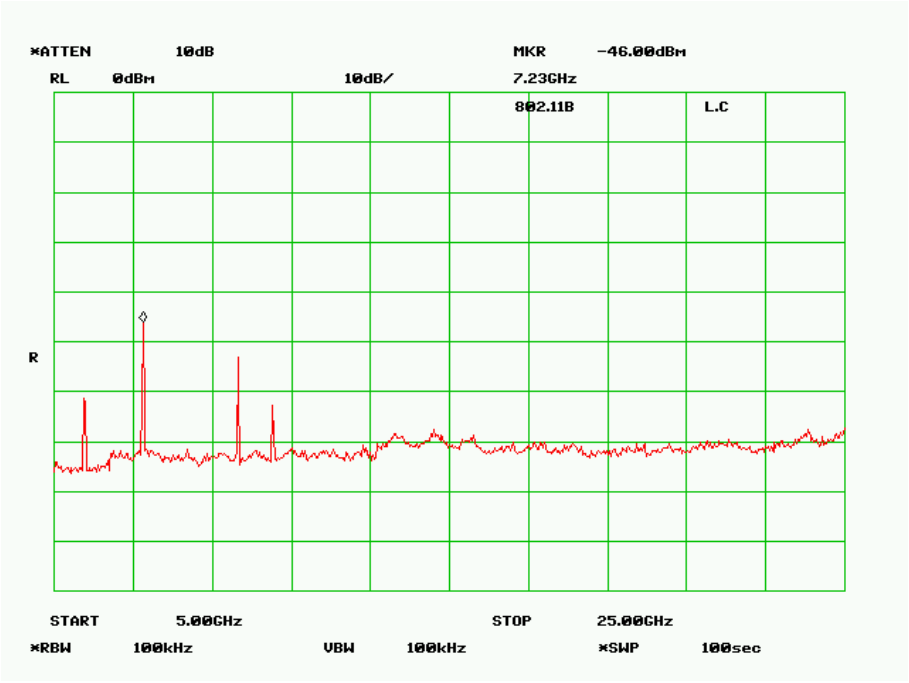
Measurement Result

Please refer to following pages for plots of spurious emissions.

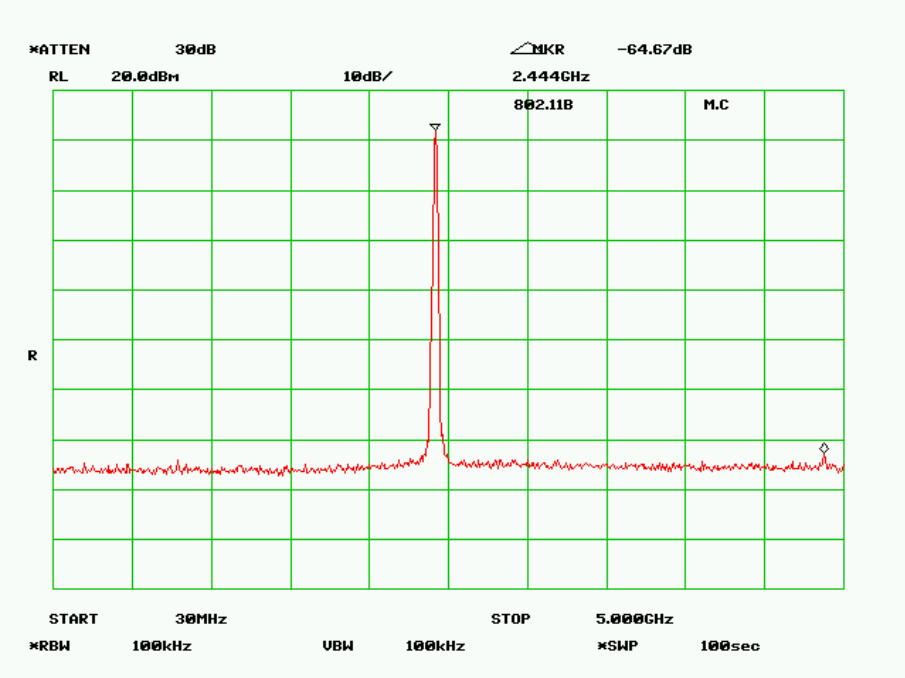
802.11b:

Low Channel



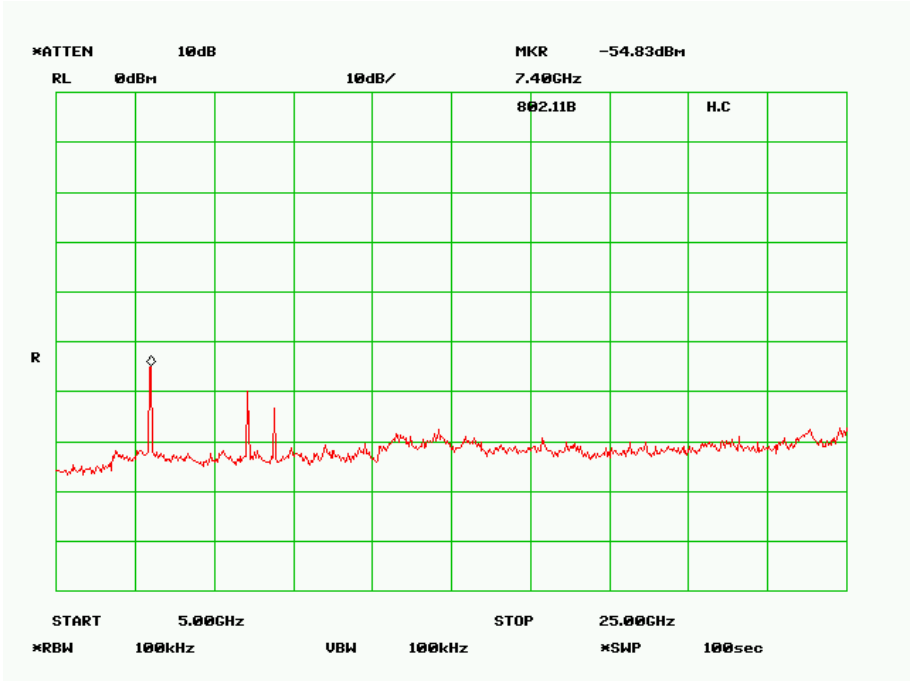


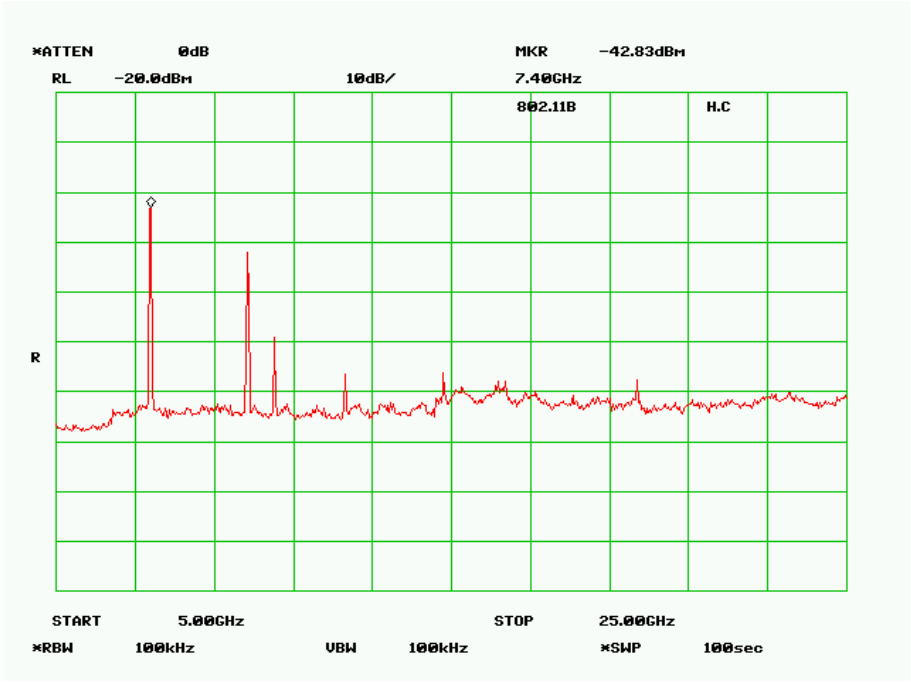
Mid Channel


*ATTEN 30dB
MKR -64.67dB
RL 20.0dBm
10dB/
2.444GHz
802.11B
M.C
R
START 30MHz
STOP 5.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec


*ATTEN 10dB
MKR -45.83dBm
RL 0dBm
10dB/
7.30GHz
802.11B
M.C
R
START 5.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec

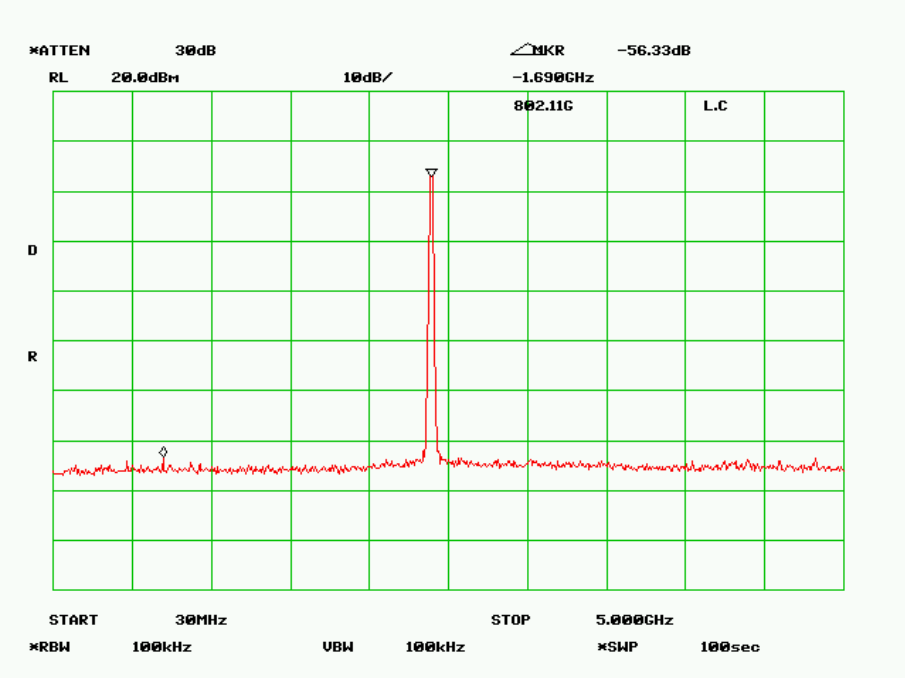
High Channel

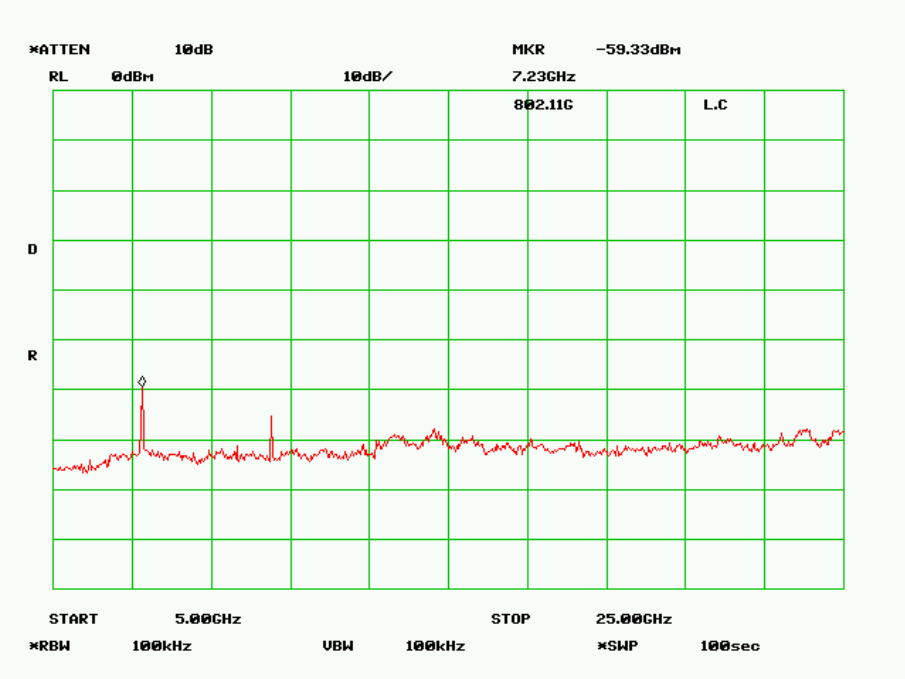




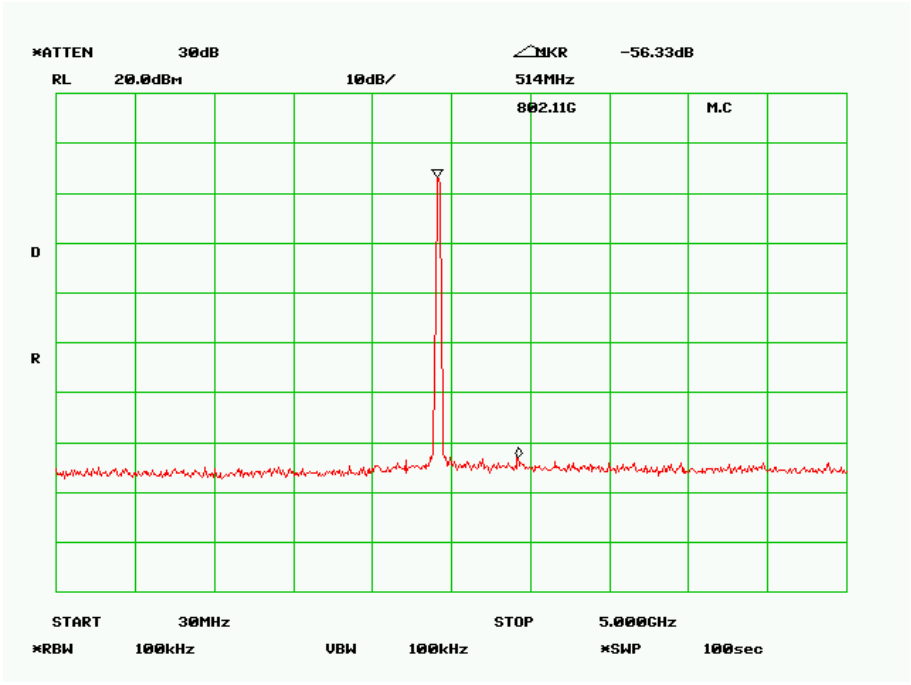
802.11g:

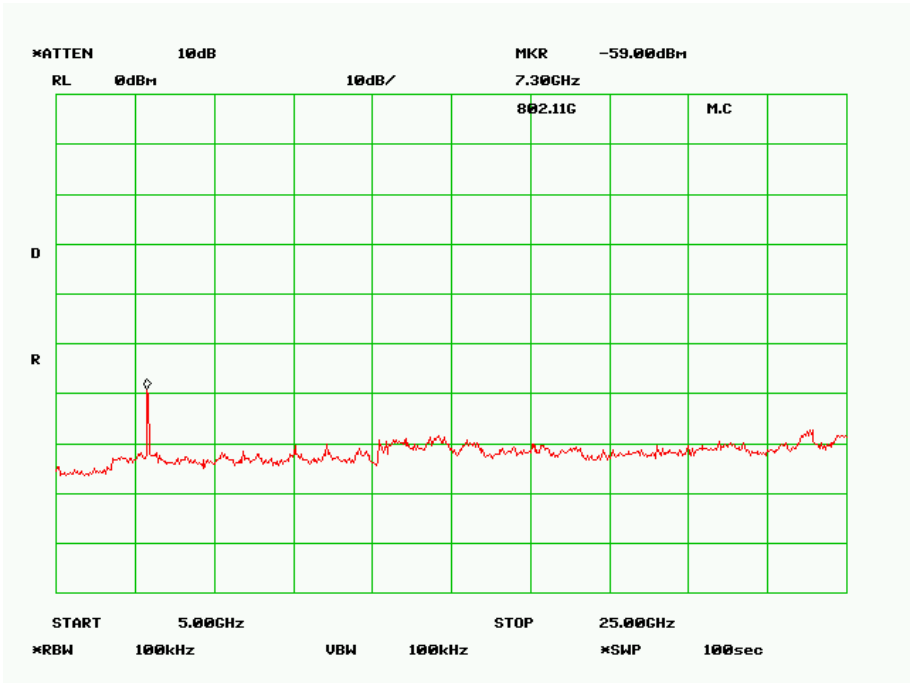
Low Channel



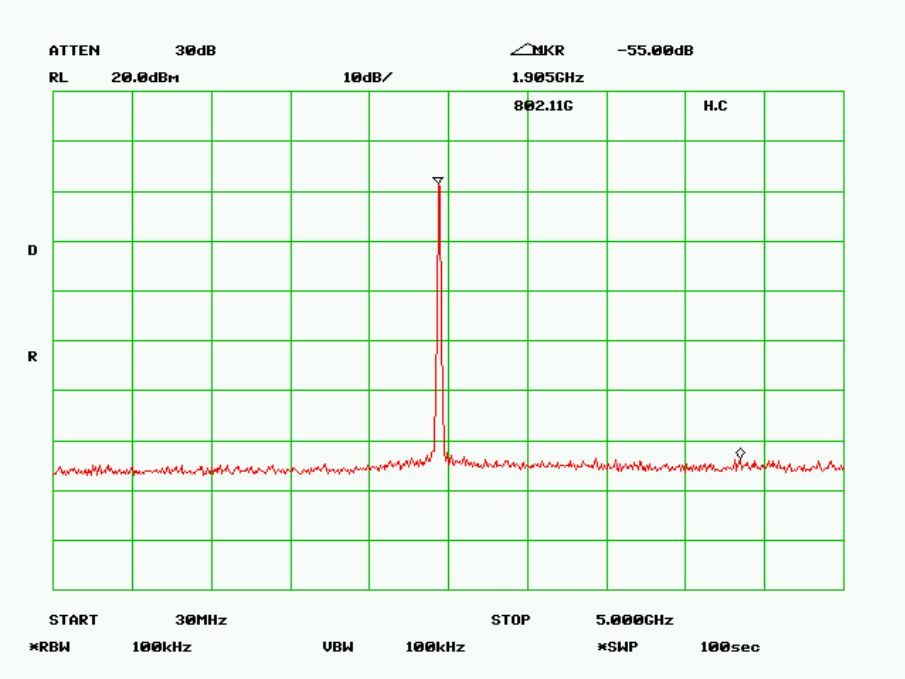


Mid Channel


*ATTEN 30dB
MKR -56.33dB
RL 20.0dBm
10dB/
514MHz
802.11G
M.C
D
R
START 30MHz
STOP 5.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec


*ATTEN 10dB
MKR -59.00dBm
RL 0dBm
10dB/
7.30GHz
802.11G
M.C
D
R
START 5.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec

High Channel



§15.205, §15.209 & §15.247(c) - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ±4.0 dB.

Test Setup

The radiated emissions tests were performed in the 3-meter open area test site, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Sonoma	Amplifier, Pre	317	260408	2006-02-03
Agilent	Analyzer, Spectrum	E4446A	US44300386	2006-03-06
HP	Pre, Amplifier (1 ~ 26.5 GHz)	8449B	3147A00400	2005-08-10
Sunol Sciences	Antenna	JB3	A020106-3/S006628	2006-03-14
A. R.A	Horn Antenna	DRG-118/A	1132	2005-08-17

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

**The testing was performed by Tom Chen on 2006-05-18.*

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

All data were recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limits), and are distinguished with a "**QP**" in the data table.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

> Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emissions is 7dB below the maximum limit. The equation for margin calculation is as follows:

> Margin = Corrected Amplitude – Part15.247 Limit

Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, and had the worst margin of:

-8.6 dB at **9648 MHz** in the **Vertical** polarization, 802.11b Low Channel, 3 meters

-3.1dB at **4874 MHz** in the **Vertical** polarization, 802.11b Middle Channel, 3 meters

-4.5 dB at **4924 MHz** in the **Vertical** polarization, 802.11b High Channel, 3 meters

-4.9 dB at **9648 MHz** in the **Vertical** polarization, 802.11g Low Channel, 3 meters

-7.1dB at **4874 MHz** in the **Vertical** polarization, 802.11g Middle Channel, 3 meters

-1.5 dB at **4924 MHz** in the **Vertical** polarization, 802.11g High Channel, 3 meters

Run#1 Radiated Harmonics and Spur Emissions

802.11b Low Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
9648.0000	37.8	285	1.0	V	38.1	3.7	34.2	45.4	54	-8.6	Ave
4824.0000	44.7	250	1.0	V	32.5	1.9	34.8	44.3	54	-9.7	Ave
4824.0000	44.5	225	1.0	H	32.5	1.9	34.8	44.1	54	-9.9	Ave
9648.0000	35.5	280	1.0	H	38.1	3.7	34.2	43.1	54	-10.9	Ave
7236.0000	29.2	180	1.0	V	36.7	4.2	34.7	35.4	54	-18.6	Ave
7236.0000	29.1	180	1.0	H	36.7	4.2	34.7	35.3	54	-18.7	Ave
9648.0000	43.8	285	1.0	V	38.1	3.7	34.2	51.5	74	-22.5	Peak
9648.0000	43.0	280	1.0	H	38.1	3.7	34.2	50.6	74	-23.4	Peak
4824.0000	50.8	250	1.0	V	32.5	1.9	34.8	50.4	74	-23.6	Peak
4824.0000	50.2	225	1.0	H	32.5	1.9	34.8	49.8	74	-24.2	Peak
7236.0000	40.8	180	1.0	V	36.7	4.2	34.7	47.1	74	-26.9	Peak
7236.0000	40.6	180	1.0	H	36.7	4.2	34.7	46.8	74	-27.2	Peak

802.11b Middle Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
4874.0000	51.3	240	1.1	V	32.5	1.9	34.8	50.9	54	-3.1	Ave
4874.0000	51.1	232	1.1	H	32.5	1.9	34.8	50.7	54	-3.3	Ave
9748.0000	41.6	240	1.3	H	38.1	3.7	34.2	49.2	54	-4.8	Ave
9748.0000	41.4	250	1.4	V	38.1	3.7	34.2	49.1	54	-4.9	Ave
7311.0000	32.0	207	1.1	V	36.7	4.2	34.7	38.2	54	-15.8	Ave
7311.0000	31.5	210	1.1	H	36.7	4.2	34.7	37.7	54	-16.3	Ave
4874.0000	57.8	240	1.1	V	32.5	1.9	34.8	57.4	74	-16.6	Peak
4874.0000	57.0	232	1.1	H	32.5	1.9	34.8	56.6	74	-17.4	Peak
9748.0000	46.5	240	1.3	H	38.1	3.7	34.2	54.1	74	-19.9	Peak
9748.0000	46.3	250	1.4	V	38.1	3.7	34.2	54.0	74	-20.0	Peak
7311.0000	44.1	207	1.1	V	36.7	4.2	34.7	50.3	74	-23.7	Peak
7311.0000	43.1	210	1.1	H	36.7	4.2	34.7	49.3	74	-24.7	Peak

802.11b High Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
4924.0000	49.9	240	1.0	V	32.5	1.9	34.8	49.5	54	-4.5	Ave
4924.0000	46.6	230	1.1	H	32.5	1.9	34.8	46.2	54	-7.8	Ave
9848.0000	36.9	250	1.2	V	38.1	3.7	34.2	44.6	54	-9.4	Ave
9848.0000	32.7	240	1.4	H	38.1	3.7	34.2	40.3	54	-13.7	Ave
7386.0000	32.3	230	1.1	V	36.7	4.2	34.7	38.5	54	-15.5	Ave
7386.0000	31.6	210	1.1	H	36.7	4.2	34.7	37.8	54	-16.2	Ave
4924.0000	52.8	240	1.0	V	32.5	1.9	34.8	52.4	74	-21.6	Peak
9848.0000	44.3	250	1.2	V	38.1	3.7	34.2	51.9	74	-22.1	Peak
7386.0000	44.5	230	1.1	V	36.7	4.2	34.7	50.7	74	-23.3	Peak
4924.0000	50.7	230	1.1	H	32.5	1.9	34.8	50.3	74	-23.7	Peak
9848.0000	42.5	240	1.4	H	38.1	3.7	34.2	50.1	74	-23.9	Peak
7386.0000	43.3	210	1.1	H	36.7	4.2	34.7	49.5	74	-24.5	Peak

802.11g Low Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
9648.0000	41.4	267	1.1	V	38.1	3.7	34.2	49.1	54	-4.9	Ave
4824.0000	48.5	250	1.3	V	32.5	1.9	34.8	48.1	54	-5.9	Ave
9648.0000	39.3	305	1.3	H	38.1	3.7	34.2	47.0	54	-7.0	Ave
4824.0000	46.8	210	1.0	H	32.5	1.9	34.8	46.4	54	-7.6	Ave
7236.0000	31.8	250	1.2	V	36.7	4.2	34.7	38.1	54	-15.9	Ave
7236.0000	30.2	250	1.1	H	36.7	4.2	34.7	36.4	54	-17.6	Ave
9648.0000	48.3	267	1.1	V	38.1	3.7	34.2	55.9	74	-18.1	Peak
9648.0000	46.6	305	1.3	H	38.1	3.7	34.2	54.2	74	-19.8	Peak
4824.0000	53.5	250	1.3	V	32.5	1.9	34.8	53.1	74	-20.9	Peak
7236.0000	46.8	250	1.2	V	36.7	4.2	34.7	53.1	74	-20.9	Peak
4824.0000	51.6	210	1.0	H	32.5	1.9	34.8	51.2	74	-22.8	Peak
7236.0000	42.5	250	1.1	H	36.7	4.2	34.7	48.7	74	-25.3	Peak

802.11g Middle Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Readingr dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
4874.0000	47.3	246	1.2	V	32.5	1.9	34.8	46.9	54	-7.1	Ave
4874.0000	46.3	213	1.1	H	32.5	1.9	34.8	45.9	54	-8.1	Ave
9748.0000	34.5	275	1.5	V	38.1	3.7	34.2	42.1	54	-11.9	Ave
9748.0000	34.5	249	1.0	H	38.1	3.7	34.2	42.1	54	-11.9	Ave
7311.0000	29.6	324	1.4	V	36.7	4.2	34.7	35.8	54	-18.2	Ave
7311.0000	28.3	360	1.7	H	36.7	4.2	34.7	34.5	54	-19.5	Ave
4874.0000	53.4	246	1.2	V	32.5	1.9	34.8	53.0	74	-21.0	Peak
4874.0000	53.4	213	1.1	H	32.5	1.9	34.8	53.0	74	-21.0	Peak
7311.0000	46.2	324	1.4	V	36.7	4.2	34.7	52.4	74	-21.6	Peak
9748.0000	43.3	275	1.5	V	38.1	3.7	34.2	50.9	74	-23.1	Peak
9748.0000	43.3	249	1.0	H	38.1	3.7	34.2	50.9	74	-23.1	Peak
7311.0000	42.4	360	1.7	H	36.7	4.2	34.7	48.7	74	-25.3	Peak

802.11g High Channel:

Frequency MHz	Reading dBuV	Azimuth Degrees	Height m	Polar H / V	Antenna Factor dB	Cable loss dB	Amplifier dB	Corrected Reading dBuV/m	15.247 Limit (dBuV/m)	15.247 Margin	Comments
4924.0000	52.9	268	1.0	V	32.5	1.9	34.8	52.5	54	-1.5	Ave
4924.0000	45.3	274	1.0	H	32.5	1.9	34.8	44.9	54	-9.1	Ave
9848.0000	33.3	308	1.0	V	38.1	3.7	34.2	40.9	54	-13.1	Ave
9848.0000	33.1	279	1.0	H	38.1	3.7	34.2	40.7	54	-13.3	Ave
4924.0000	60.2	268	1.0	V	32.5	1.9	34.8	59.8	74	-14.2	Peak
4924.0000	56.8	274	1.0	H	32.5	1.9	34.8	56.4	74	-17.6	Peak
7386.0000	29.3	260	1.0	V	36.7	4.2	34.7	35.5	54	-18.5	Ave
7386.0000	28.9	206	1.4	H	36.7	4.2	34.7	35.2	54	-18.8	Ave
9848.0000	44.8	308	1.0	V	38.1	3.7	34.2	52.4	74	-21.6	Peak
7386.0000	45.2	260	1.0	V	36.7	4.2	34.7	51.4	74	-22.6	Peak
9848.0000	43.6	279	1.0	H	38.1	3.7	34.2	51.2	74	-22.8	Peak
7386.0000	43.3	206	1.4	H	36.7	4.2	34.7	49.6	74	-24.4	Peak

§15.247(a)(2) – 6 dB BANDWIDTH

Applicable Standard

According to §15.247(a)(2), for digital modulation techniques, the minimum 6dB bandwidth shall be at least 500 kHz.

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emissions bandwidth. (6 dB bandwidth for DTS)
4. Repeat above procedures until all frequencies measured were complete.

Equipment Lists

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2006-01-11

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

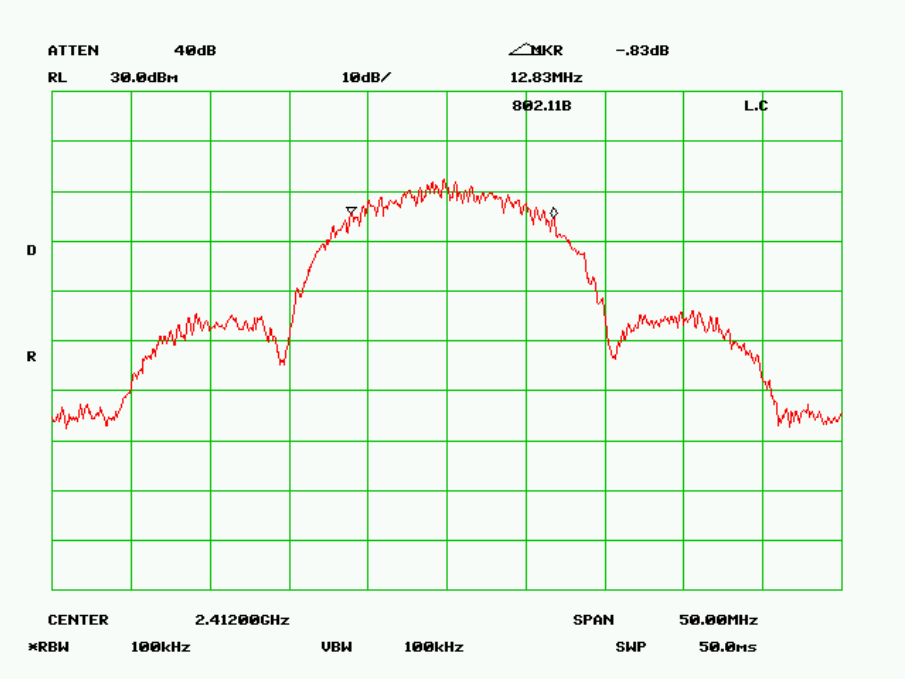
**The testing was performed by Tom Chen on 2006-05-18*

Measurement Result

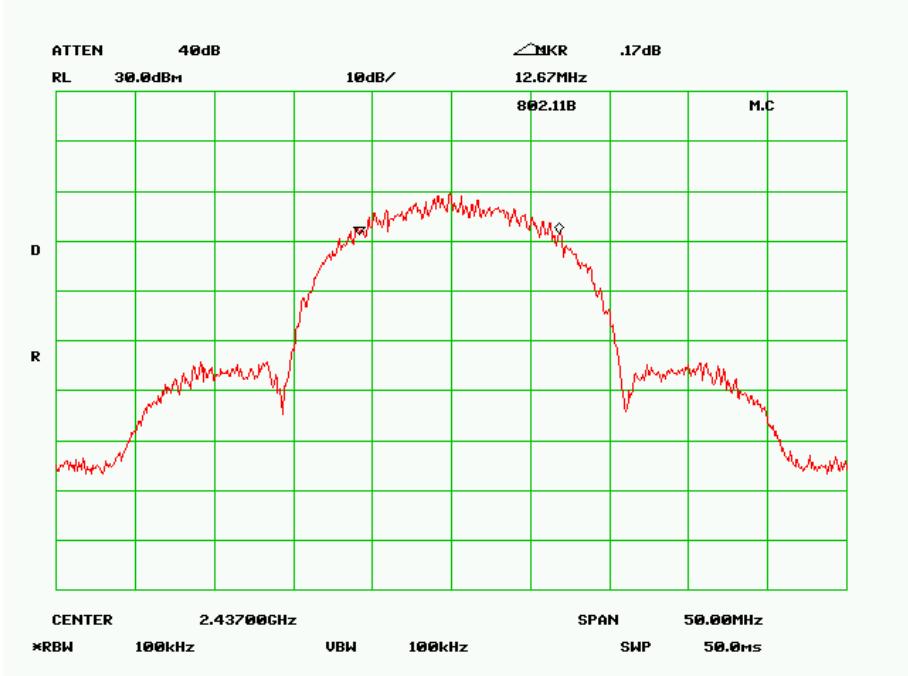
Frequency (MHz)	6dB Bandwidth (MHz)	
	802.11b	802.11g
2412	12.83	16.67
2437	12.67	16.67
2462	12.83	16.67

802.11b:

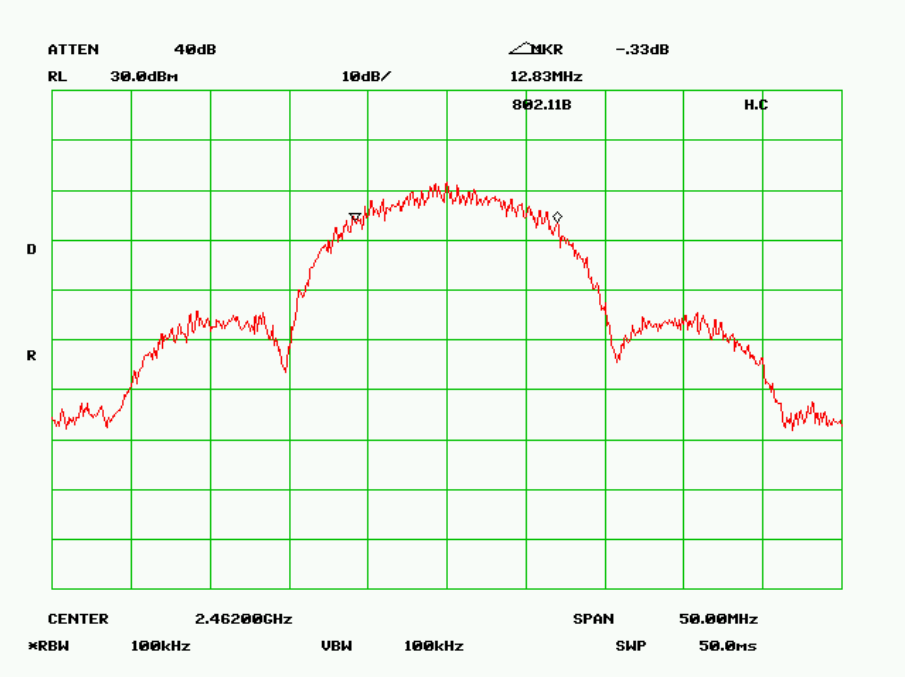
Low Channel



Middle Channel

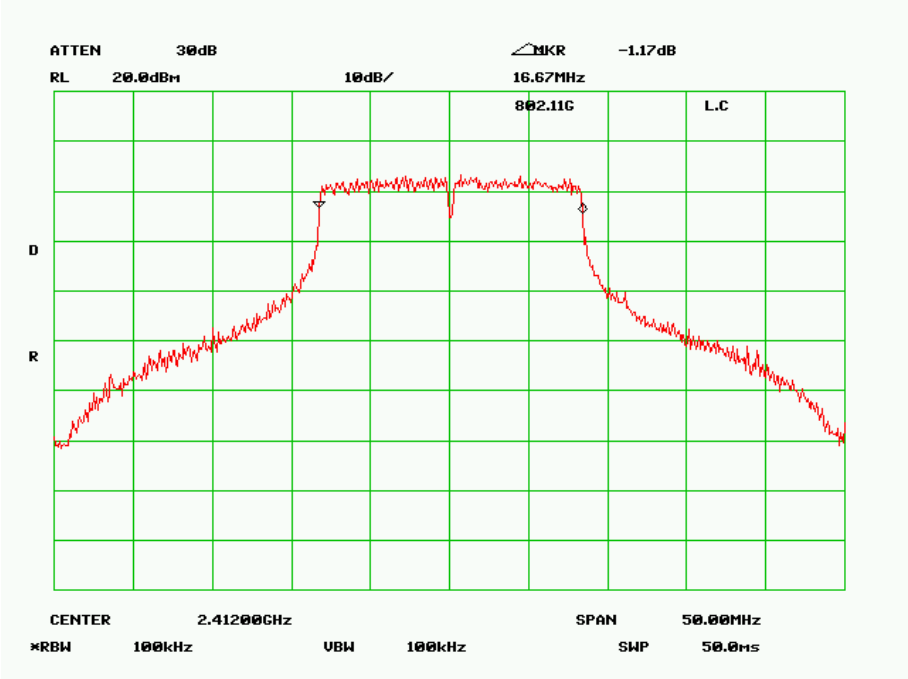


High Channel

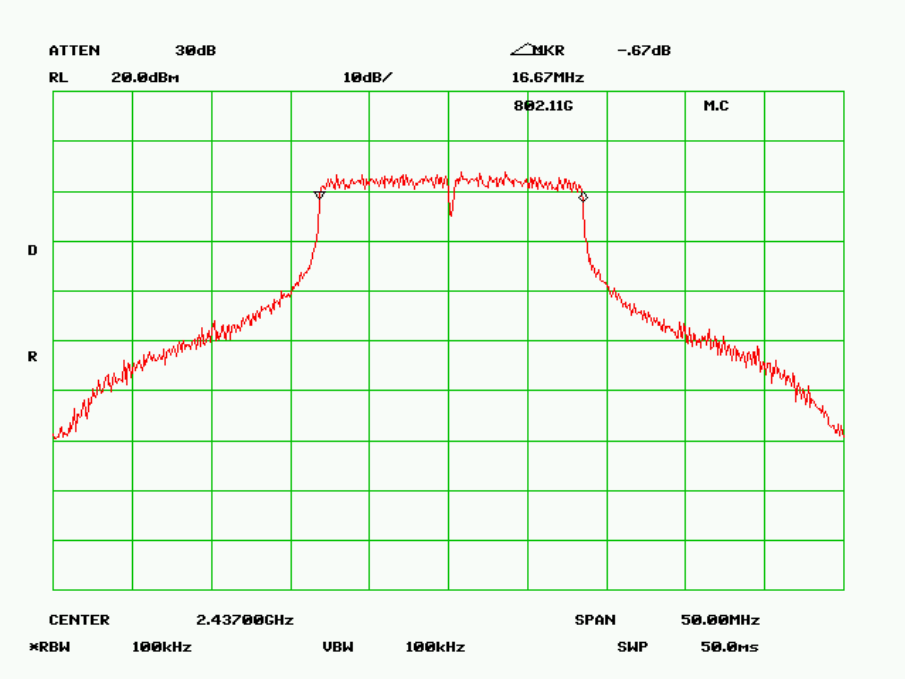


802.11g:

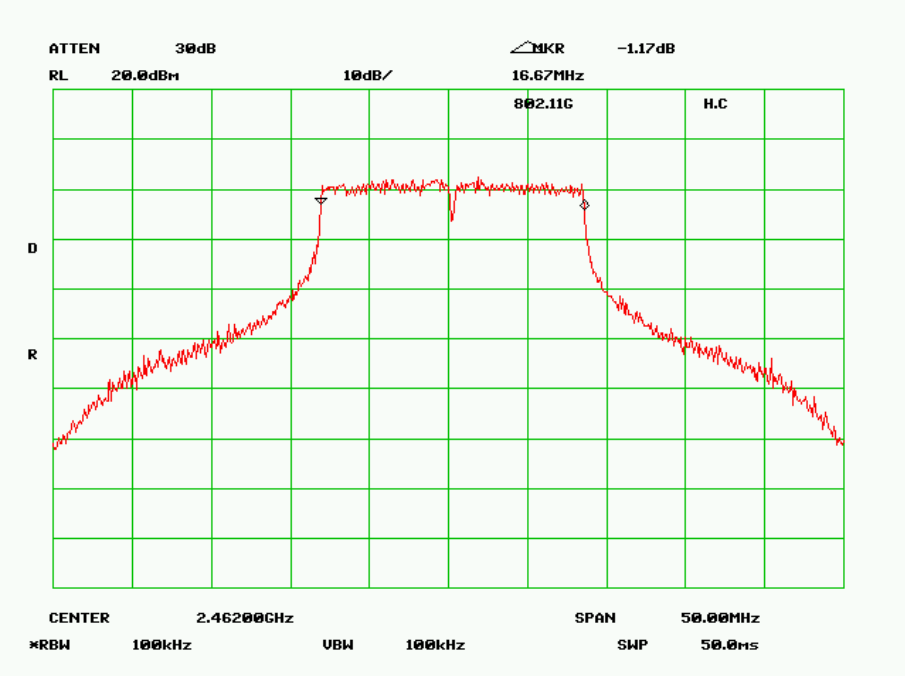
Low Channel



Mid. Channel



High Channel



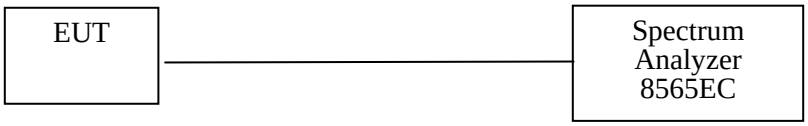
§15.247(b)(3) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (3), for systems using digital modulation in 2400-2483.5 MHz: 1 Watt

Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
3. Add a correction factor to the display.



Equipment Lists

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Sensor, Power	E4412A	US38488542	2006-09-08
Agilent	Meter, Power	E4419B	MY4121511	2006-08-31
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2006-01-11

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

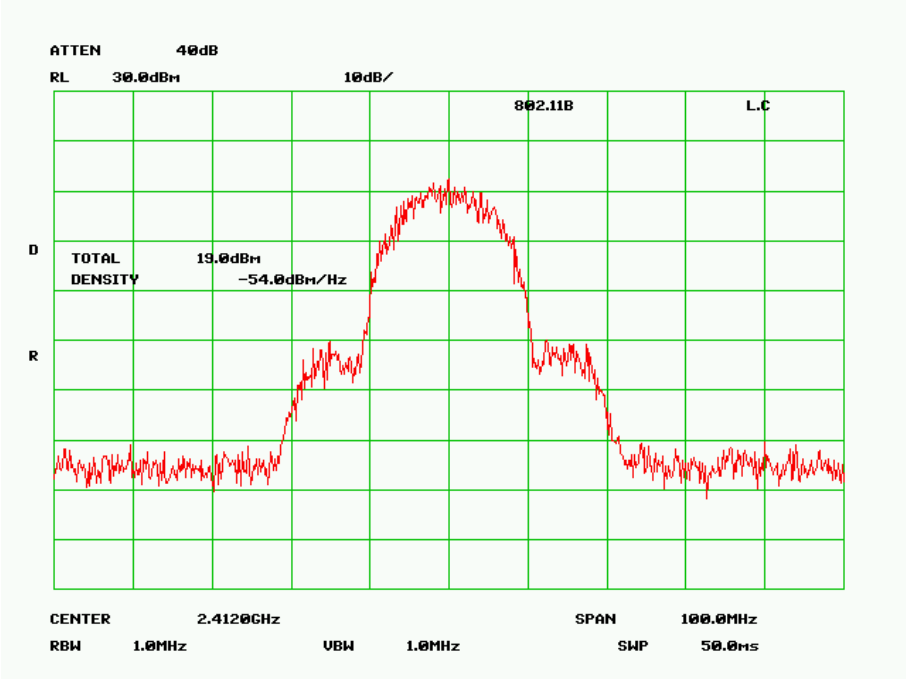
Temperature:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

**The testing was performed by Tom Chen on 2006-05-18.*

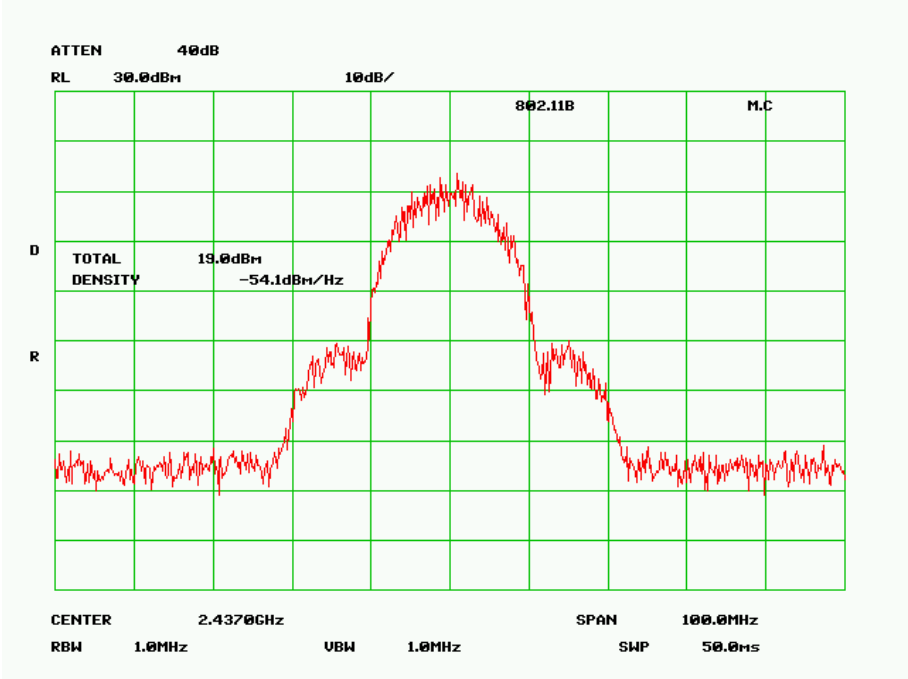
Measurement Result

Frequency (MHz)	RF Power (dBm)		Limit (dBm)
	802.11b	802.11g	
2412	19.0	14.9	30
2437	19.0	14.8	30
2462	18.5	13.6	30

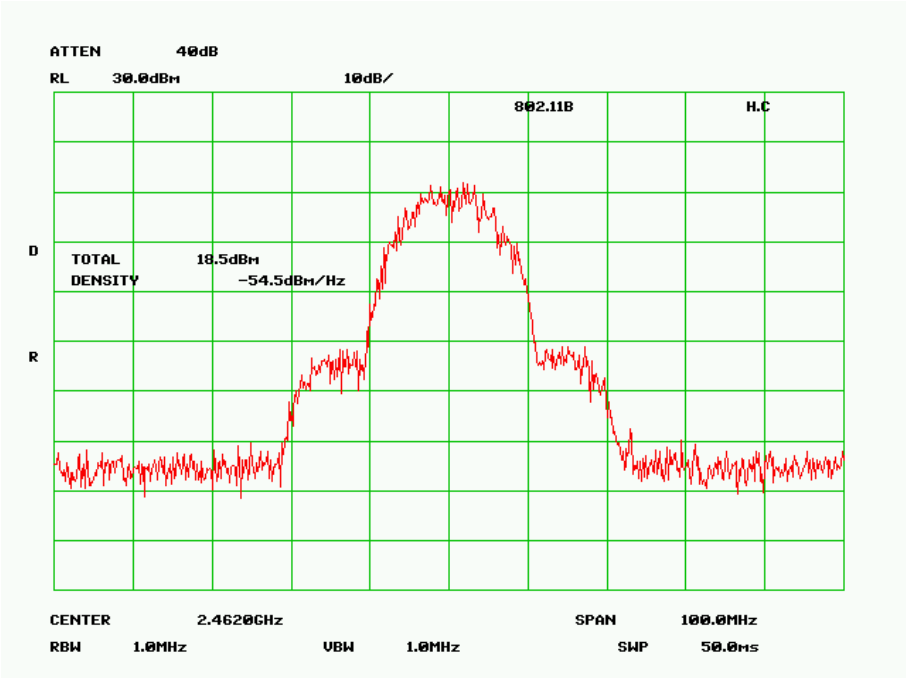
802.11b, Low Channel



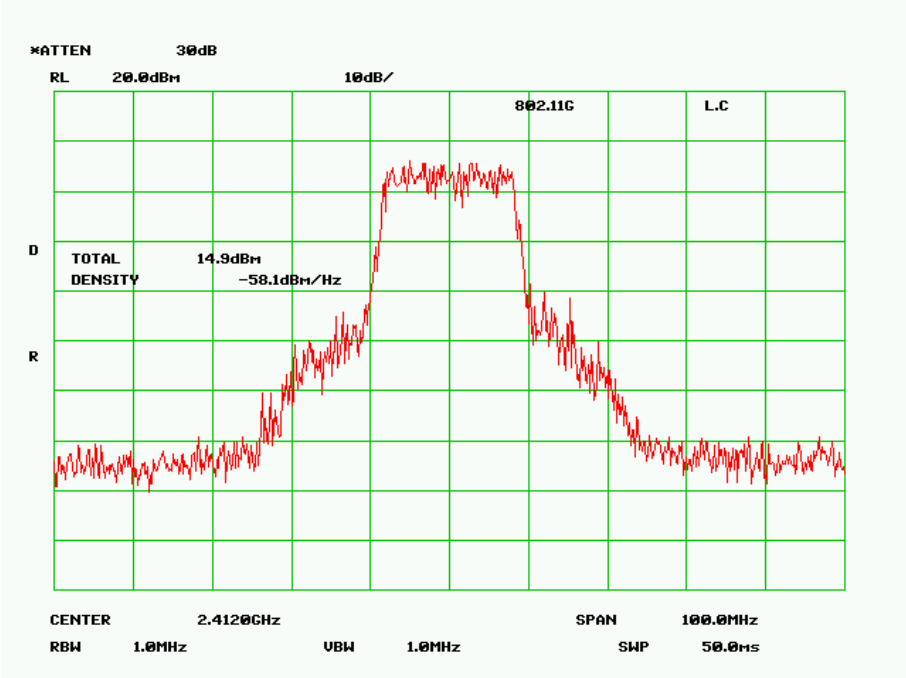
802.11b, Middle Channel



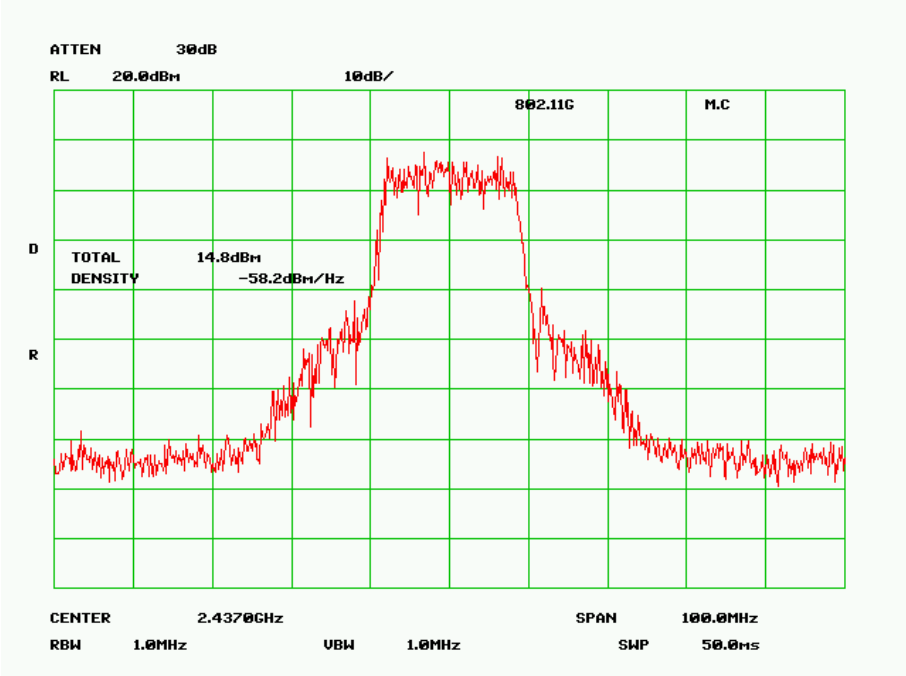
802.11b, High Channel



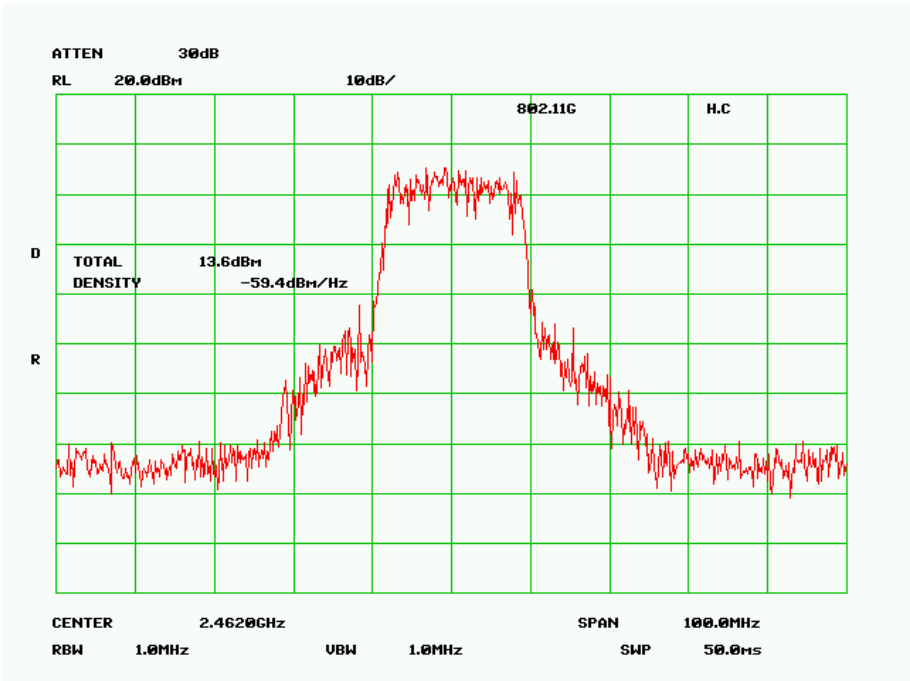
802.11g, Low Channel



802.11g, Middle Channel



802.11g, High Channel



§15.247(c) - 100 KHZ BANDWIDTH FROM BAND EDGES

Applicable Standard

According to §15.247(d), in *any* 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emissions limits specified in §15.209(a) see §15.205(c)).

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Equipment Lists

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2006-01-11

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

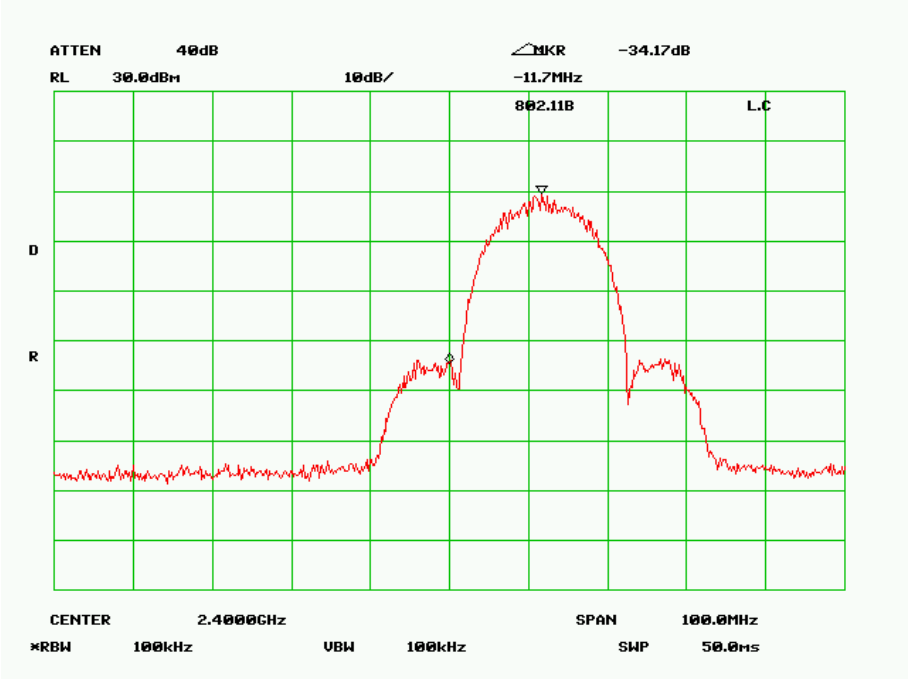
**The testing was performed by Tom Chen on 2006-05-18.*

Measurement Result

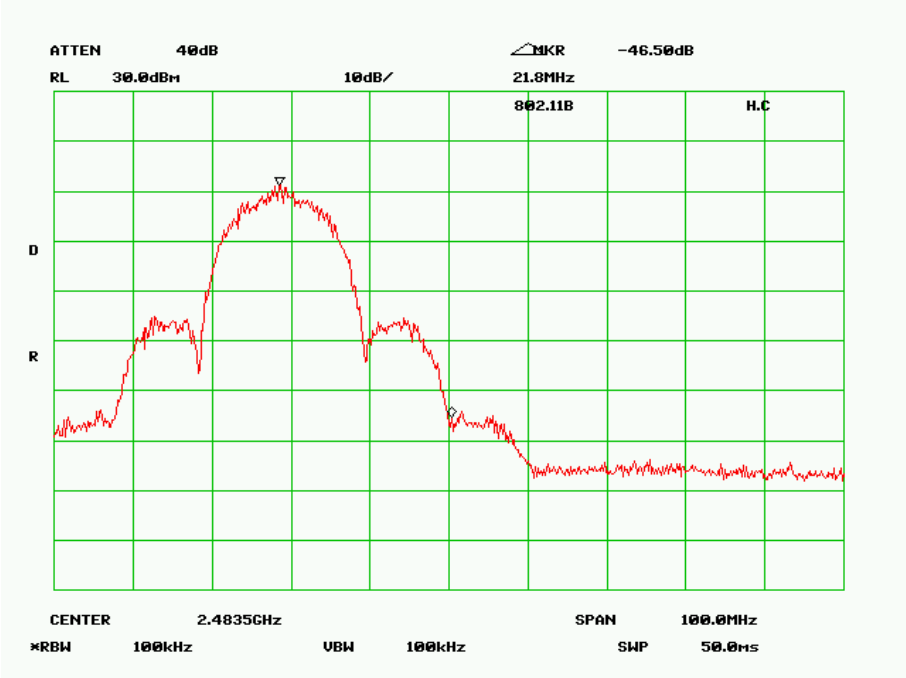
Please refer to following pages for plots of band edge.

802.11b:

Low Channel

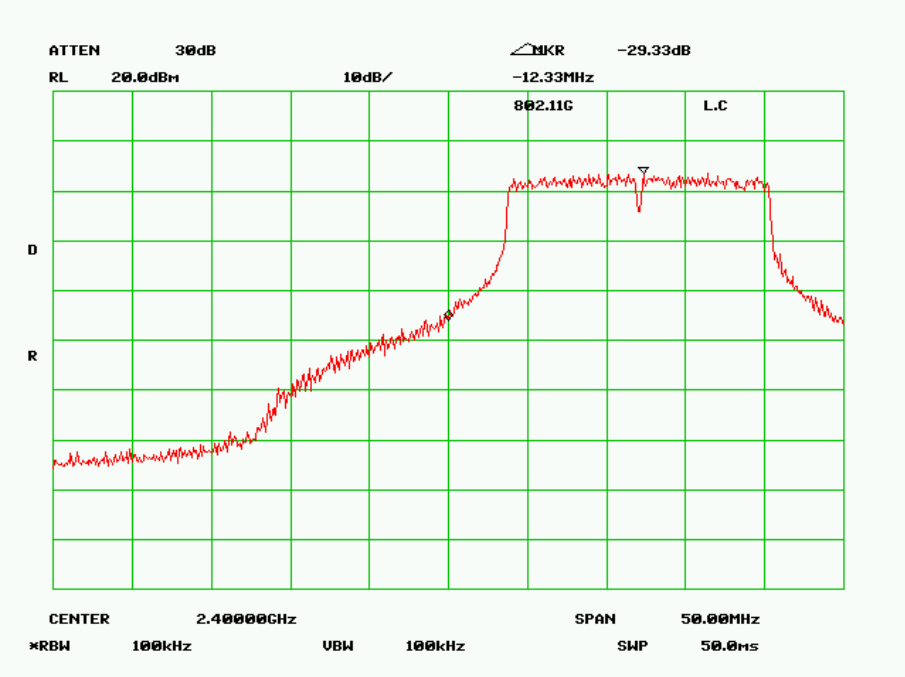


High Channel

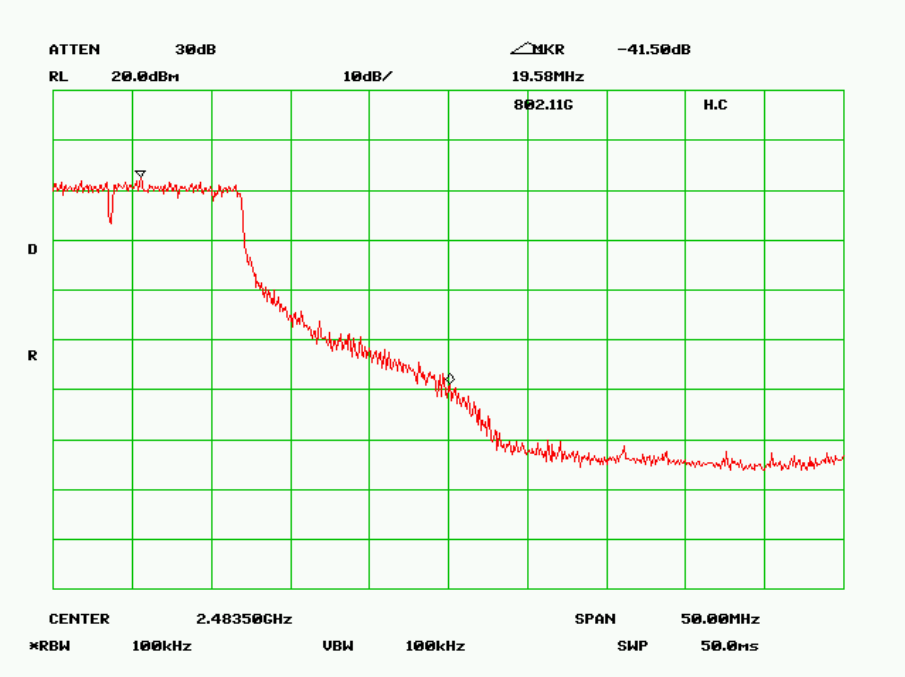


802.11g:

Low Channel



High Channel



§15.247(d) - POWER SPECTRAL DENSITY

Applicable Standard

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

Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value. (DTS)
4. Repeat above procedures until all frequencies measured were complete.

Equipment Lists

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Analyzer, Spectrum	8565EC	3946A00131	2006-01-11

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

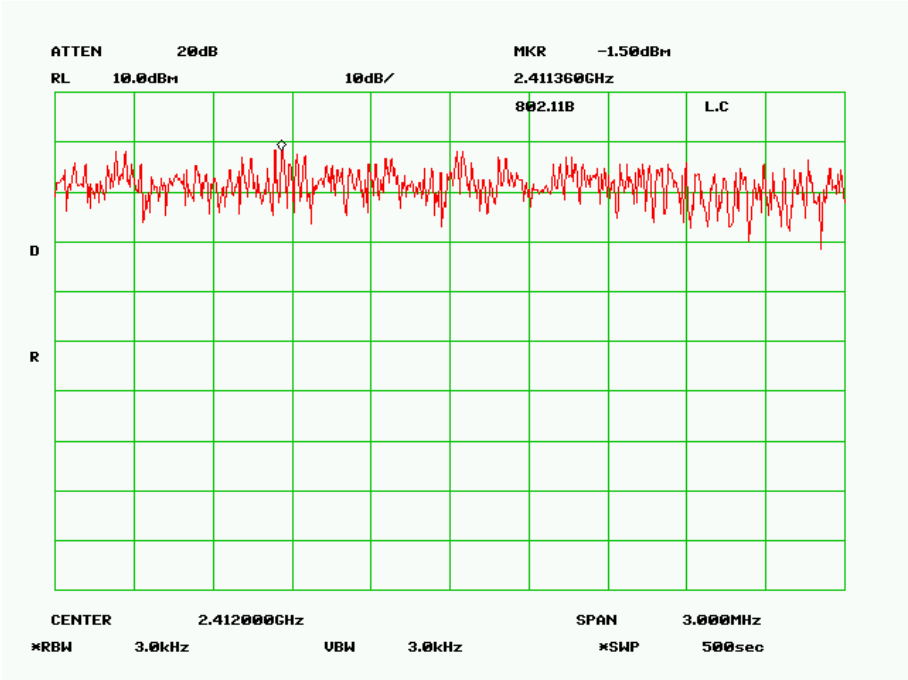
Temperature:	22° C
Relative Humidity:	75%
ATM Pressure:	1021 mbar

**The testing was performed by Tom Chen on 2006-05-18*

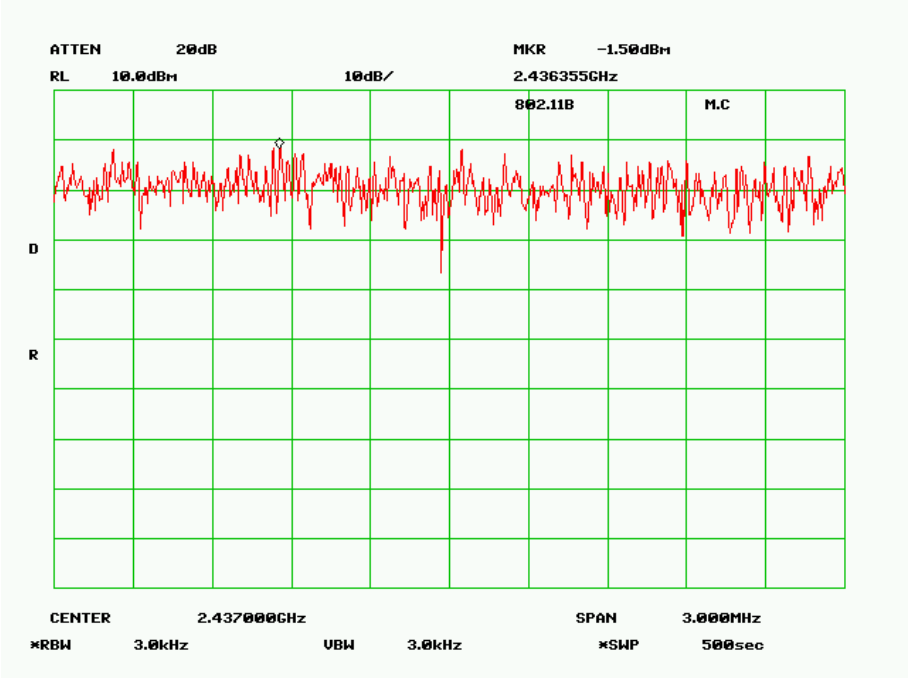
Measurement Result

Channel	Power Spectral Density (dBm/3KHz)		Limit (dBm/3KHz)
	802.11b	802.11g	
Low	-1.5	-8.5	8
Mid	-1.5	-7.83	8
High	-2.33	-9.17	8

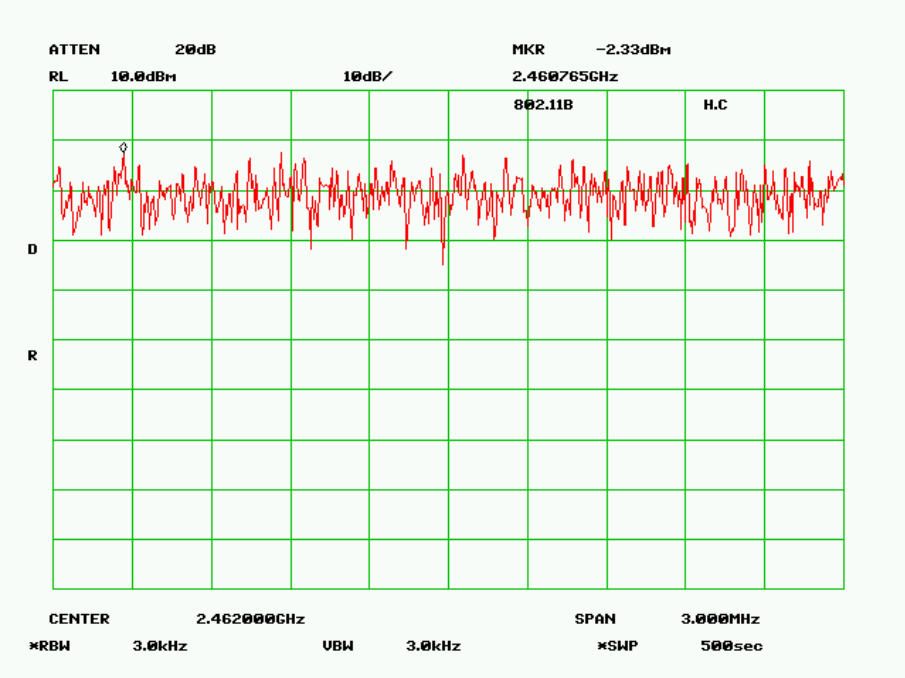
802.11b, Low Channel



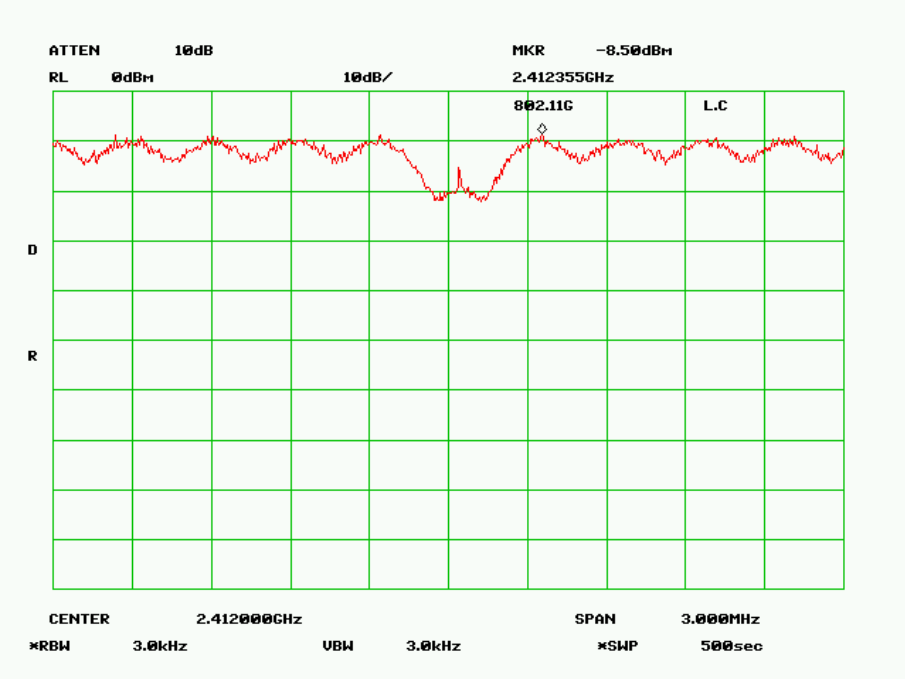
802.11b, Mid. Channel



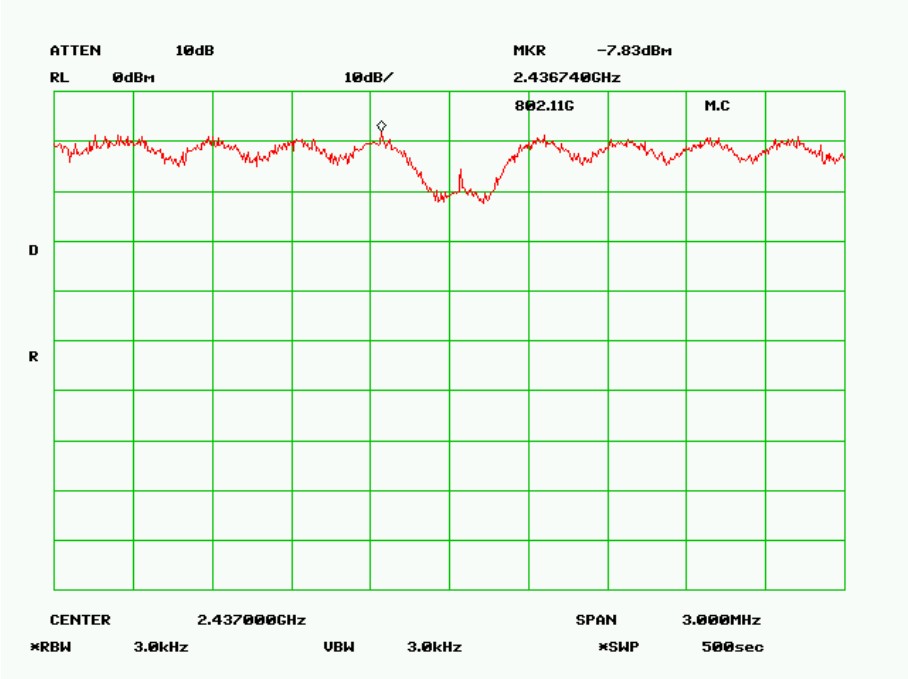
802.11b, High Channel



802.11g, Low Channel



802.11g, Mid Channel



802.11g, High Channel