FCC PART 15.247 & 15.407

EMI MEASUREMENT AND TEST REPORT

For

SOHOware Inc

3050 Coronado Drive
Santa Clara, CA 95054

FCC ID: RZ9AEROGUARD

This Report Concerns:	**Equipment Type:**
☒ Original Report	Advanced Wireless Appliance

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Report No.:	R0403041
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Note: This test report is specially limited to the above client company and product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *SOHOware Inc's*, FCC ID: *RZ9AEROGUARD,* or the "EUT" as referred to in this report is an 802.11a/b/g Advanced Wireless Appliance. The EUT is a composite device of DTS and NII. For the DTS part (802.11b/g), the frequency range is 2412.00 – 2462.00 MHz, maximum output power is 51.16mW. For the NII part (802.11a), the frequency range is 5180.00 – 5320.00 MHz, maximum output power is 66.37mW (18.22dBm).

** The test data gathered are from production sample, serial number: BBR1000 100000008, provided by the manufacturer.*

Objective

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

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth and 26 dB Bandwidth, power spectral density, 100 kHz Bandwidth of Band Edges Measurement, Out of Band Emission, Spurious Emission, Conducted and Spurious Radiated Emission, Discontinue Transmitting with Absence of Data or Operational Failure, Peak Excursion to Average Ratio and Frequency Stability.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2001, 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 Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, 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 C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234.

The test site has been approved by the FCC 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 scope of the accreditation covers the FCC Method – 47 CFR Part – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Sony	Laptop computer	PCG-9532	28318830 3700235	DOC
HP	Printer	Thinkjet 2225C	2512S43681	BS46XU2225C

External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Unshielded Serial Cable	2	Serial / Host	EUT
Unshielded Printer Cable	1.5	Parallel / Host	HP Printer
LAN Cable	1.5	LAN Port / Host	EUT

SYSTEM TEST CONFIGURATION

Justification

The host system was configured for testing according to ANSI C63.4-2001.

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 used during radiated and conducted testing was designed to exercise the system components in a manner similar to a typical use. The test software, provided by the customer, is started the Windows terminal program under the Windows 98/2000/ME/XP operating system.

Once loaded, set the Tx channel to low, mid and high for testing.

Special Accessories

As shown in following test setup block diagram, all interface cables used for compliance testing are shielded. The host PC and the peripherals featured shielded metal connectors.

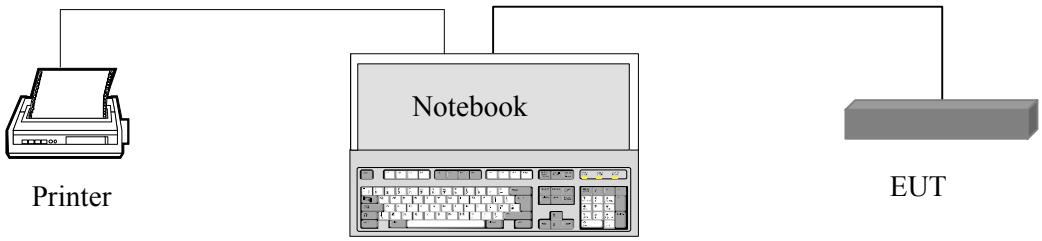
Schematics / Block Diagram

Please refer to Appendix A.

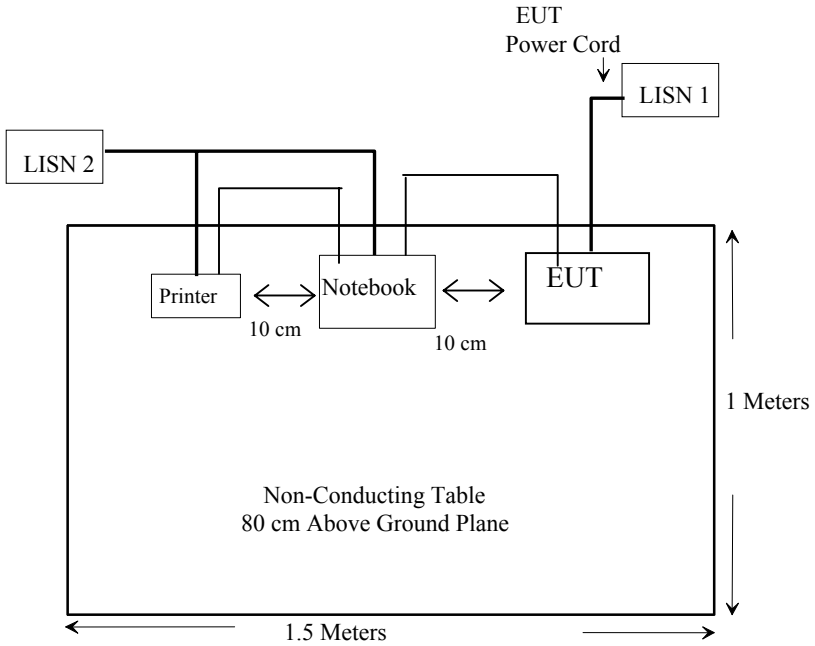
Equipment Modifications

No modifications were made to the EUT.

Configuration of Test System



Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: BBR1000 100000008.

FCC RULES	DESCRIPTION OF TEST	RESULT
§2.1093	RF Exposure Requirement	Compliant
§15.203	Antenna Requirement	Compliant
§ 15.205, §15.209(a), §15.407(b)(5), §15.407(b)(6)	Restricted Bands, Radiated Emission	Compliant
§ 15.207(a)	AC Line Conduction	Compliant
§15.247(a)(2), §15.407	6 dB Bandwidth & 26 dB Bandwidth	Compliant
§15.247(b)(3), §15.407(a)(2)	Maximum Peak Output Power	Compliant
§15.247(b)(4), §15.407 (f)	RF Exposure Requirement	Compliant
§ 15.247(c)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(d), §15.407(a)(2)	Peak Power Spectral Density	Compliant
§15.407(a)(6)	Peak Excursion	Compliant
§15.407(b)	Out of Band Emission	Compliant
§15.407(c)	Discontinue Transmitting with Absence of Data or Operational Failure	Compliant
§ 15.407(g)	Frequency Stability	Compliant

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

For intentional device, 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 (1), 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.

Refer to statement below for compliance.

"The antenna for this device is an integral antenna that the end user cannot access. Furthermore the device is for indoor use as detailed in the Users Manual and Operational Description".

§15.205, §15.209(a), §15.407(b)(5), §15.407(b)(6) - SPURIOUS RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties. 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.

According to §15.205, 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 – 12.57725	240 – 285	3345.8 – 3358	36.43 – 36.5
13.36 – 13.41	322 – 335.4	3600 – 4400	([2])

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510MHz
[2] Above 38.6

Except as provided in paragraph (d) and (e), the filed 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 1000MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, 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.

According to §15.209, the device shall meet radiated emission general requirements.

Except for Class A device, the filed strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (Microvolts/meter)	dB (dBμV/meter)
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2001. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle as required.

The host PC system was connected with 120Vac/60Hz power source.

Spectrum Analyzer Setup

According to FCC CFR 47, Section 15.31, the EUT was tested to 40GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Range	*RBW*	*Video B/W*
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Adapter, Quasi-Peak	85650A	3019A05393	6/13/2003
HP	Analyzer, Spectrum , RF	8568B	2601A02165,	7/7/2003
HP	Analyzer, Spectrum, Display	85662A	2542A12015	7/7/2003
HP	Analyzer, Spectrum	8565EC	3946A00131	6/30/2003
Agilent	Amplifier, Pre	8447D	2944A10187	9/23/2003
HP	Amplifier, Pre, microwave	8449B	3147A00400	3/14/2003
EMCO	Antenna, Biconical	3110B	9309-1165	10/11/2003
EMCO	Antenna, Logperiodic	3146	2101	11/8/2003
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	2455-261	8/1/2003

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

Test Procedure

For the radiated emissions test, the notebook PC system power cord was connected to the AC floor outlet since the power supply used in the EUT did not provide an accessory power outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV 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:

Corr. Ampl. = 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 -7dBμV means the emission is 7dBμV below the maximum limit for Subpart C. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Subpart C Limit

Summary of Test Results

According to the data in following tables, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.207 and 15.247, and had the worst margin of:

802.11b, 15.247

-13.4 dB at **7236.00 MHz** in the **Horizontal** polarization, Low Channel

-13.5 dB at **7311.00 MHz** in the **Vertical** polarization, Middle Channel

-13.4 dB at **7386.00 MHz** in the **Horizontal** polarization, High Channel

802.11g, 15.247

-13.4 dB at **7236.00 MHz** in the **Vertical** polarization, Low Channel

-11.5 dB at **7311.00 MHz** in the **Vertical** polarization, Middle Channel

-8.6 dB at **7386.00 MHz** in the **Vertical** polarization, High Channel

802.11a, 15.407

Band I & II:

-11.9 dB at **15540.00 MHz** in the **Horizontal/Vertical** polarization, Low Channel

-12.5 dB at **15720.00 MHz** in the **Vertical** polarization, Mid Channel

-14.2 dB at **15960.00 MHz** in the **Horizontal/Vertical** polarization, High Channel

Band III:

-9.8 dB at **17235.00 MHz** in the **Vertical** polarization, Low Channel

-9.1 dB at **17295.00 MHz** in the **Horizonta** polarization, Mid Channel

-10.1 dB at **17415.00 MHz** in the **Horizontal** polarization, High Channel

Unintentional Emission

-0.1 dB at **375.00 MHz** in the **Horizontal** polarization, High Channel, FCC 15 A

Final test data, for 802.11b (15.247)

Environmental Conditions

Temperature:	15° C
Relative Humidity:	42%
ATM Pressure:	1018 mbar

The testing was performed by Hang Tan on 2004-03-23.

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-25GHz											
2412.00	94.7	FUND/PEAK	120	2.0	v	28.1	3.4	35.2	91.0		
2412.00	86.3	FUND/PEAK	90	1.8	h	28.1	3.4	35.2	82.6		
2412.00	92.5	FUND/AVE	120	2.0	v	28.1	3.4	35.2	88.8		
2412.00	83.8	FUND/AVE	90	1.8	h	28.1	3.4	35.2	80.1		
7236.00	33.3	AVE	0	1.0	h	35.1	5.6	33.5	40.6	54	-13.4
7236.00	33.2	AVE	270	1.4	v	35.1	5.6	33.5	40.4	54	-13.6
4824.00	31.3	AVE	150	1.6	v	32.5	4.9	33.0	35.7	54	-18.3
4824.00	31.3	AVE	30	1.5	h	32.5	4.9	33.0	35.7	54	-18.3
7236.00	46.7	PEAK	0	1.0	h	35.1	5.6	33.5	53.9	74	-20.1
7236.00	46.5	PEAK	270	1.4	v	35.1	5.6	33.5	53.7	74	-20.3
4824.00	46.0	PEAK	150	1.6	v	32.5	4.9	33.0	50.4	74	-23.6
4824.00	44.7	PEAK	30	1.5	h	32.5	4.9	33.0	49.1	74	-24.9
Middle Channel, 1-25GHz											
2437.00	94.9	FUND/PEAK	135	1.8	v	28.1	3.4	35.2	91.2		
2437.00	86.6	FUND/PEAK	90	1.6	h	28.1	3.4	35.2	82.9		
2437.00	92.9	FUND/AVE	135	1.8	v	28.1	3.4	35.2	89.2		
2437.00	84.1	FUND/AVE	90	1.6	h	28.1	3.4	35.2	80.4		
7311.00	33.3	AVE	210	1.2	v	35.1	5.6	33.5	40.5	54	-13.5
7311.00	33.2	AVE	0	1.0	h	35.1	5.6	33.5	40.4	54	-13.6
4874.00	31.5	AVE	150	1.5	v	32.5	4.9	33.0	35.9	54	-18.1
4874.00	31.4	AVE	45	1.5	h	32.5	4.9	33.0	35.8	54	-18.2
7311.00	46.7	PEAK	210	1.2	v	35.1	5.6	33.5	53.9	74	-20.1
7311.00	46.5	PEAK	0	1.0	h	35.1	5.6	33.5	53.7	74	-20.3
4874.00	45.9	PEAK	150	1.5	v	32.5	4.9	33.0	50.3	74	-23.7
4874.00	45.5	PEAK	45	1.5	h	32.5	4.9	33.0	49.9	74	-24.1

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
High Channel, 1-25GHz											
2462.00	95.2	FUND/PEAK	100	1.6	v	28.1	3.4	35.2	91.4		
2462.00	87.8	FUND/PEAK	90	1.8	h	28.1	3.4	35.2	84.1		
2462.00	93.2	FUND/AVE	100	1.6	v	28.1	3.4	35.2	89.4		
2462.00	85.2	FUND/AVE	90	1.8	h	28.1	3.4	35.2	81.5		
7386.00	33.3	AVE	90	1.0	h	35.1	5.6	33.5	40.6	54	-13.4
7386.00	33.2	AVE	120	1.5	v	35.1	5.6	33.5	40.4	54	-13.6
4924.00	31.5	AVE	90	1.4	v	32.5	4.9	33.0	35.9	54	-18.1
4924.00	31.5	AVE	150	1.2	h	32.5	4.9	33.0	35.9	54	-18.1
7386.00	46.8	PEAK	120	1.5	v	35.1	5.6	33.5	54.1	74	-19.9
7386.00	46.2	PEAK	90	1.0	h	35.1	5.6	33.5	53.4	74	-20.6
4924.00	46.0	PEAK	150	1.2	h	32.5	4.9	33.0	50.4	74	-23.6
4924.00	44.8	PEAK	90	1.4	v	32.5	4.9	33.0	49.2	74	-24.8

Note:

FUND = Fundamental
AVG = average

Final test data for 802.11g (15.247)

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-25GHz											
2412.00	93.8	FUND/PEAK	180	1.5	v	28.1	3.4	35.2	90.1		
2412.00	87.0	FUND/PEAK	90	1.8	h	28.1	3.4	35.2	83.3		
2412.00	88.5	FUND/AVE	180	1.5	v	28.1	3.4	35.2	84.8		
2412.00	80.7	FUND/AVE	90	1.8	h	28.1	3.4	35.2	76.9		
7236.00	33.3	AVE	120	1.4	v	35.1	5.6	33.5	40.6	54	-13.4
7236.00	33.2	AVE	180	1.5	h	35.1	5.6	33.5	40.4	54	-13.6
4824.00	31.3	AVE	270	1.4	h	32.5	4.9	33.0	35.7	54	-18.3
4824.00	31.1	AVE	90	1.6	v	32.5	4.9	33.0	35.5	54	-18.5
7236.00	47.3	PEAK	180	1.5	h	35.1	5.6	33.5	54.6	74	-19.4
7236.00	46.8	PEAK	120	1.4	v	35.1	5.6	33.5	54.0	74	-20.0
4824.00	45.0	PEAK	270	1.4	h	32.5	4.9	33.0	49.4	74	-24.6
4824.00	44.3	PEAK	90	1.6	v	32.5	4.9	33.0	48.7	74	-25.3
Middle Channel, 1-25GHz											
2437.00	94.1	FUND/PEAK	180	1.3	v	28.1	3.4	35.2	90.4		
2437.00	86.2	FUND/PEAK	120	1.5	h	28.1	3.4	35.2	82.5		
2437.00	89.1	FUND/AVE	180	1.3	v	28.1	3.4	35.2	85.4		
2437.00	80.5	FUND/AVE	120	1.5	h	28.1	3.4	35.2	76.8		
7311.00	35.3	AVE	90	1.5	v	35.1	5.6	33.5	42.5	54	-11.5
7311.00	33.6	AVE	210	1.3	h	35.1	5.6	33.5	40.8	54	-13.2
4874.00	31.5	AVE	225	1.4	h	32.5	4.9	33.0	35.9	54	-18.1
4874.00	31.4	AVE	90	1.5	v	32.5	4.9	33.0	35.8	54	-18.2
7311.00	47.1	PEAK	90	1.5	v	35.1	5.6	33.5	54.3	74	-19.7
7311.00	46.9	PEAK	210	1.3	h	35.1	5.6	33.5	54.1	74	-19.9
4874.00	45.0	PEAK	225	1.4	h	32.5	4.9	33.0	49.4	74	-24.6
4874.00	44.8	PEAK	90	1.5	v	32.5	4.9	33.0	49.2	74	-24.8

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART C	
Frequency MHz	Ampl. dBμV /m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
High Channel, 1-25GHz											
2462.00	94.5	FUND/PEAK	180	1.5	v	28.1	3.4	35.2	90.8		
2462.00	85.2	FUND/PEAK	90	1.4	h	28.1	3.4	35.2	81.4		
2462.00	89.8	FUND/AVE	180	1.5	v	28.1	3.4	35.2	86.1		
2462.00	80.3	FUND/AVE	90	1.4	h	28.1	3.4	35.2	76.6		
7386.00	38.2	AVE	330	1.8	v	35.1	5.6	33.5	45.4	54	-8.6
7386.00	35.0	AVE	0	1.2	h	35.1	5.6	33.5	42.2	54	-11.8
4924.00	31.7	AVE	180	1.4	v	32.5	4.9	33.0	36.1	54	-17.9
4924.00	31.7	AVE	30	1.8	h	32.5	4.9	33.0	36.1	54	-17.9
7386.00	47.5	PEAK	330	1.8	v	35.1	5.6	33.5	54.7	74	-19.3
7386.00	46.8	PEAK	0	1.2	h	35.1	5.6	33.5	54.1	74	-19.9
4924.00	45.2	PEAK	30	1.8	h	32.5	4.9	33.0	49.6	74	-24.4
4924.00	45.0	PEAK	180	1.4	v	32.5	4.9	33.0	49.4	74	-24.6

Note:

FUND = Fundamental
AVG = average

Final test data, for 802.11a (15.407)

Band I & II:

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-50GHz											
5180.00	89.5	FUND/PEAK	180	1.0	v	33.9	5.2	33.0	95.6		
5180.00	79.7	FUND/PEAK	270	1.5	h	33.9	5.2	33.0	85.7		
5180.00	83.2	FUND/AVE	180	1.0	v	33.9	5.2	33.0	89.3		
5180.00	74.5	FUND/AVE	270	1.5	h	33.9	5.2	33.0	80.6		
15540.00	34.7	AVE	270	1.4	v	35.1	5.6	33.3	42.1	54	-11.9
15540.00	34.7	AVE	150	1.6	h	35.1	5.6	33.3	42.1	54	-11.9
10360.00	32.3	AVE	270	1.2	v	35.1	5.6	34.5	38.6	54	-15.4
10360.00	32.2	AVE	180	1.3	h	35.1	5.6	34.5	38.4	54	-15.6
15540.00	48.8	PEAK	150	1.6	h	35.1	5.6	33.3	56.3	74	-17.7
15540.00	48.3	PEAK	270	1.4	v	35.1	5.6	33.3	55.8	74	-18.2
10360.00	47.8	PEAK	270	1.2	v	35.1	5.6	34.5	54.1	74	-19.9
10360.00	45.5	PEAK	180	1.3	h	35.1	5.6	34.5	51.7	74	-22.3
Middle Channel, 1-50GHz											
5240.00	89.3	FUND/PEAK	180	1.0	v	33.9	5.2	33.0	95.4		
5240.00	79.5	FUND/PEAK	210	1.2	h	33.9	5.2	33.0	85.6		
5240.00	82.9	FUND/AVE	180	1.0	v	33.9	5.2	33.0	89.0		
5240.00	74.0	FUND/AVE	210	1.2	h	33.9	5.2	33.0	80.1		
15720.00	34.1	AVE	270	1.5	v	35.1	5.6	33.3	41.5	54	-12.5
15720.00	34.0	AVE	120	1.3	h	35.1	5.6	33.3	41.4	54	-12.6
10480.00	32.2	AVE	270	1.4	v	35.1	5.6	34.5	38.4	54	-15.6
10480.00	32.1	AVE	0	1.3	h	35.1	5.6	34.5	38.3	54	-15.7
15720.00	48.2	PEAK	120	1.3	h	35.1	5.6	33.3	55.6	74	-18.4
15720.00	47.8	PEAK	270	1.5	v	35.1	5.6	33.3	55.2	74	-18.8
10480.00	46.9	PEAK	270	1.4	v	35.1	5.6	34.5	53.1	74	-20.9
10480.00	45.3	PEAK	0	1.3	h	35.1	5.6	34.5	51.5	74	-22.5

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
High Channel, 1-50GHz											
5320.00	88.0	Fund/Peak	0	1.2	v	33.9	5.2	33.0	94.1		
5320.00	77.0	Fund/Peak	300	1.2	h	33.9	5.2	33.0	83.1		
5320.00	81.7	Fund/Ave	0	1.2	v	33.9	5.2	33.0	87.7		
5320.00	72.5	Fund/Ave	300	1.2	h	33.9	5.2	33.0	78.6		
15960.00	32.3	Ave	300	1.4	v	35.1	5.6	33.3	39.8	54	-14.2
15960.00	32.3	Ave	60	1.2	h	35.1	5.6	33.3	39.8	54	-14.2
10640.00	32.0	Ave	0	1.6	v	35.1	5.6	34.5	38.2	54	-15.8
10640.00	32.0	Ave	270	1.2	h	35.1	5.6	34.5	38.2	54	-15.8
15960.00	46.2	Peak	300	1.4	v	35.1	5.6	33.3	53.6	74	-20.4
15960.00	46.2	Peak	60	1.2	h	35.1	5.6	33.3	53.6	74	-20.4
10640.00	45.7	Peak	0	1.6	v	35.1	5.6	34.5	51.9	74	-22.1
10640.00	45.2	Peak	270	1.2	h	35.1	5.6	34.5	51.4	74	-22.6

Band III:

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-50GHz											
5745.00	89.3	Fund/Peak	90	1.2	v	34.1	5.4	33.0	95.8		
5745.00	77.8	Fund/Peak	150	1.1	h	34.1	5.4	33.0	84.3		
5745.00	82.5	Fund/Ave	90	1.2	v	34.1	5.4	33.0	89.0		
5745.00	71.7	Fund/Ave	150	1.1	h	34.1	5.4	33.0	78.2		
17235.00	36.8	Ave	180	1.2	v	35.1	5.6	33.3	44.2	54	-9.8
17235.00	36.5	Ave	120	1.4	h	35.1	5.6	33.3	43.9	54	-10.1
11490.00	36.5	Ave	0	1.0	v	35.1	5.6	34.5	42.7	54	-11.3
11490.00	36.5	Ave	180	1.3	h	35.1	5.6	34.5	42.7	54	-11.3
17235.00	48.2	Peak	180	1.2	v	35.1	5.6	33.3	55.6	74	-18.4
17235.00	48.0	Peak	120	1.4	h	35.1	5.6	33.3	55.4	74	-18.6
11490.00	47.2	Peak	0	1.0	v	35.1	5.6	34.5	53.4	74	-20.6
11490.00	47.0	Peak	180	1.3	h	35.1	5.6	34.5	53.2	74	-20.8

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Middle Channel, 1-50GHz											
5765.00	90.8	Fund/Peak	180	1.0	v	34.1	5.4	33.0	97.3		
5765.00	78.2	Fund/Peak	0	1.2	h	34.1	5.4	33.0	84.7		
5765.00	85.2	Fund/Ave	180	1.0	v	34.1	5.4	33.0	91.7		
5765.00	69.2	Fund/Ave	0	1.2	h	34.1	5.4	33.0	75.7		
17295.00	37.5	Ave	150	1.1	h	35.1	5.6	33.3	44.9	54	-9.1
17295.00	36.2	Ave	90	1.2	v	35.1	5.6	33.3	43.6	54	-10.4
11530.00	36.8	Ave	90	1.2	h	35.1	5.6	34.5	43.1	54	-10.9
11530.00	36.5	Ave	210	1.3	v	35.1	5.6	34.5	42.7	54	-11.3
17295.00	48.3	Peak	90	1.2	v	35.1	5.6	33.3	55.8	74	-18.2
17295.00	48.2	Peak	150	1.1	h	35.1	5.6	33.3	55.6	74	-18.4
11530.00	46.6	Peak	90	1.2	h	35.1	5.6	34.5	52.8	74	-21.2
11530.00	46.5	Peak	210	1.3	v	35.1	5.6	34.5	52.7	74	-21.3
High Channel, 1-50GHz											
5805.00	90.3	Fund/Peak	0	1.0	v	34.1	5.4	33.0	96.8		
5805.00	79.7	Fund/Peak	90	1.2	h	34.1	5.4	33.0	86.2		
5805.00	83.8	Fund/Ave	0	1.0	v	34.1	5.4	33.0	90.3		
5805.00	72.7	Fund/Ave	90	1.2	h	34.1	5.4	33.0	79.2		
17415.00	36.5	Ave	180	1.3	v	35.1	5.6	33.3	43.9	54	-10.1
17415.00	36.0	Ave	60	1.2	h	35.1	5.6	33.3	43.4	54	-10.6
11610.00	36.5	Ave	30	1.2	v	35.1	5.6	34.5	42.7	54	-11.3
11610.00	35.7	Ave	120	1.1	h	35.1	5.6	34.5	41.9	54	-12.1
17415.00	48.5	Peak	180	1.3	v	35.1	5.6	33.3	55.9	74	-18.1
11610.00	47.7	Peak	30	1.2	v	35.1	5.6	34.5	53.9	74	-20.1
17415.00	46.2	Peak	60	1.2	h	35.1	5.6	33.3	53.6	74	-20.4
11610.00	47.0	Peak	120	1.1	h	35.1	5.6	34.5	53.2	74	-20.8

Note:

FUND = Fundamental
AVG = average

Final test data, for Unintentional Emission, FCC 15A

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart A	
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dBμV/m	dBμV/m	dB	dBμV/m	dBμV/m	dB
375.00	54.8	240	2.0	h	14.9	4.1	27.9	45.9	46	-0.1
500.00	50.5	90	1.6	h	18.5	4.9	28.4	45.5	46	-0.5
40.45	54.3	0	1.0	v	12.1	1.4	28.7	39.1	40	-0.9
133.34	55.5	270	2.5	h	12.6	2.4	28.2	42.3	43.5	-1.2
64.06	55.3	210	1.0	v	9.7	1.7	28.6	38.1	40	-1.9
666.67	45.3	180	1.0	v	20.8	5.6	28.2	43.5	46	-2.5
400.00	51.2	180	2.2	v	15.8	4.6	28.2	43.4	46	-2.6
500.00	48.5	60	1.8	h	18.5	4.9	28.4	43.5	46.4	-2.9
666.67	45.1	270	4.0	h	20.8	5.6	28.2	43.3	46.4	-3.1
125.00	54.0	270	2.5	h	12.3	2.3	28.3	40.3	43.5	-3.2
300.00	52.5	30	1.0	h	13.9	3.6	27.3	42.7	46	-3.3
666.67	44.7	100	2.7	v	20.8	5.6	28.2	42.9	46.4	-3.5
70.75	53.50	0	1.0	v	9.6	1.8	28.6	36.3	40	-3.7
166.67	51.3	270	1.8	h	13.3	2.7	28.0	39.3	43.5	-4.2
233.35	54.6	270	1.3	h	11.3	3.3	27.5	41.7	46	-4.3
800.00	40.6	60	1.0	h	22.6	6.2	28.1	41.3	46	-4.7
54.40	51.6	210	1.0	v	10.5	1.6	28.6	35.1	40	-4.9
250.00	53.3	180	1.4	v	11.7	3.4	27.6	40.8	46	-5.2
250.00	53.7	120	3.0	h	11.7	3.4	27.6	41.2	46.4	-5.2
750.00	40.6	300	1.2	h	22.2	6.2	28.7	40.3	46	-5.7
925.00	37.4	280	1.0	v	23.5	6.9	27.6	40.2	46	-5.8
400.00	48.3	210	2.2	h	15.8	4.6	28.2	40.5	46.4	-5.9
800.00	39.3	0	1.8	v	22.6	6.2	28.1	40.0	46	-6.0
866.68	38.8	90	1.0	h	22.8	6.3	28.0	39.9	46	-6.1
925.00	37.1	30	1.5	h	23.5	6.9	27.6	39.9	46	-6.1
69.82	50.9	90	2.7	h	9.7	1.7	28.6	33.7	40	-6.3
600.00	43.7	140	1.3	h	19.5	5.4	28.9	39.7	46	-6.3
499.24	44.4	0	1.0	h	17.9	4.9	28.3	38.9	46	-7.1
47.25	48.4	180	1.0	v	11.3	1.5	28.7	32.5	40	-7.5
924.04	35.7	30	1.5	h	23.5	6.9	27.6	38.5	46	-7.5
333.33	46.7	240	1.0	h	15.4	3.9	27.8	38.2	46	-7.8
125.00	49.3	0	2.5	v	12.3	2.3	28.3	35.6	43.5	-7.9
225.00	51.0	120	1.2	h	11.3	3.1	27.7	37.7	46	-8.3
933.34	35.1	210	1.0	h	23.5	7.0	27.6	38.0	46.4	-8.4
500.00	42.7	270	4.0	v	18.5	4.9	28.4	37.7	46.4	-8.7
183.80	46.2	90	1.5	h	13.6	2.8	27.9	34.7	43.5	-8.8
366.68	45.8	240	1.0	h	14.9	4.1	27.8	37.0	46	-9.0
275.00	48.3	300	1.2	h	12.6	3.5	27.5	36.9	46	-9.1
300.00	46.7	200	1.2	v	13.9	3.6	27.3	36.9	46	-9.1
133.34	47.4	0	1.5	v	12.6	2.4	28.2	34.2	43.5	-9.3
143.24	46.7	270	2.0	h	13.2	2.4	28.2	34.1	43.5	-9.4
866.68	35.4	300	1.0	v	22.8	6.3	28.0	36.5	46	-9.5

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart A	
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dBμV/m	dBμV/m	dB	dBμV/m	dBμV/m	dB
366.68	44.9	180	1.8	v	14.9	4.1	27.8	36.1	46	-9.9
400.00	44.3	0	1.0	v	15.8	4.6	28.2	36.5	46.4	-9.9
750.00	36.4	120	1.0	v	22.2	6.2	28.7	36.1	46	-9.9
833.35	35.3	270	1.0	h	22.5	6.4	28.3	35.9	46	-10.1
933.34	33.3	0	3.0	v	23.5	7.0	27.6	36.2	46.4	-10.2
275.00	46.4	150	1.0	v	12.6	3.5	27.5	35.0	46	-11.0
525.00	40.3	270	1.5	h	18.5	5.0	29.0	34.8	46	-11.2
375.00	43.6	240	2.6	v	14.9	4.1	27.9	34.7	46	-11.3
110.34	46.7	270	2.4	h	11.7	2.2	28.5	32.1	43.5	-11.4
40.86	43.7	60	1.3	h	12.1	1.4	28.7	28.5	40	-11.5
833.35	33.7	180	1.0	v	22.5	6.4	28.3	34.3	46	-11.7
143.29	44.1	200	1.5	v	13.2	2.4	28.2	31.5	43.5	-12.0
266.68	46.0	270	1.0	h	11.7	3.5	27.6	33.6	46	-12.4
433.34	41.0	90	1.7	h	16.2	4.4	28.3	33.3	46	-12.7
250.00	46.1	0	1.0	v	11.7	3.4	27.6	33.6	46.4	-12.8
266.68	45.5	210	1.0	v	11.7	3.5	27.6	33.1	46	-12.9
333.33	41.2	120	1.2	v	15.4	3.9	27.8	32.7	46	-13.3
233.35	45.2	270	1.2	v	11.3	3.3	27.5	32.3	46	-13.7
1000.00	35.1	90	1.3	h	24.2	7.1	27.4	39.0	54	-15.0
111.10	42.6	0	1.2	v	11.7	2.2	28.5	28.0	43.5	-15.5
525.00	36.0	0	1.8	v	18.5	5.0	29.0	30.5	46	-15.5
166.67	39.9	0	1.8	v	13.3	2.7	28.0	27.9	43.5	-15.6
466.67	37.0	30	1.8	h	17.1	4.7	28.9	29.9	46	-16.1
1000.00	33.5	50	1.2	v	24.2	7.1	27.4	37.4	54	-16.6
433.34	36.7	270	1.3	v	16.2	4.4	28.3	29.0	46	-17.0
225.00	41.4	0	2.0	v	11.3	3.1	27.7	28.1	46	-17.9
57.48	38.2	90	2.5	h	10.3	1.6	28.6	21.5	40	-18.5
183.80	35.1	0	2.7	v	13.6	2.8	27.9	23.6	43.5	-19.9

Note: For 30MHz - 1GHz spurious emission is complied with FCC Class A limit.

§15.207(a) - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is ±2.4 dB.

EUT Setup

The measurement was performed in the shield room, using the same setup per ANSI C63.4-2001 measurement procedure. The specification used was FCC 15 Subpart B limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The notebook PC was connected with 120Vac/60Hz power source.

Spectrum Analyzer Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30Mhz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Rohde & Schwarz	Artificial LISN	ESH2-Z5	871884/039	2003-03-28
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2003-05-06

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

Test Procedure

During the conducted emission test, the power cord of the host system was connected to the auxiliary outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of each modes tested to ensure EUT is compliant with all installation combination.

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

Summary of Test Results

According to the data in following table, the EUT complies with the FCC Conducted margin for a Class B device, with the *worst* margin reading of:

-11.8 dBμV at 3.820 MHz in the Line mode

Conducted Emissions Test Data

Environmental Conditions

Temperature:	12° C
Relative Humidity:	48%
ATM Pressure:	1100 mbar

The testing was performed by Hang Tan on 2004-03-23.

LINE CONDUCTED EMISSIONS				FCC PART 15 CLASS B	
Frequency MHz	Amplitude dBμV	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dBμV	Margin dB
3.820	34.2	Ave	Line	46.0	-11.8
4.890	32.8	Ave	Line	46.0	-13.2
3.820	31.3	Ave	Neutral	46.0	-14.7
0.270	34.1	Ave	Neutral	51.1	-17.0
0.200	34.8	Ave	Neutral	53.6	-18.8
4.890	36.3	QP	Line	56.0	-19.7
3.820	35.8	QP	Neutral	56.0	-20.2
0.200	43.2	QP	Neutral	63.6	-20.4
0.270	40.5	QP	Neutral	61.1	-20.6
0.200	42.1	QP	Line	63.6	-21.5
0.200	32.0	Ave	Line	53.6	-21.6
0.270	38.1	QP	Line	61.1	-23.0

Plot of Conducted Emissions Test Data

Plot(s) of Conducted Emissions Test Data is presented hereinafter as reference.

Bay Area Compliance Lab Corp 23. Mar 04 11:39

Class B

2004-3-23

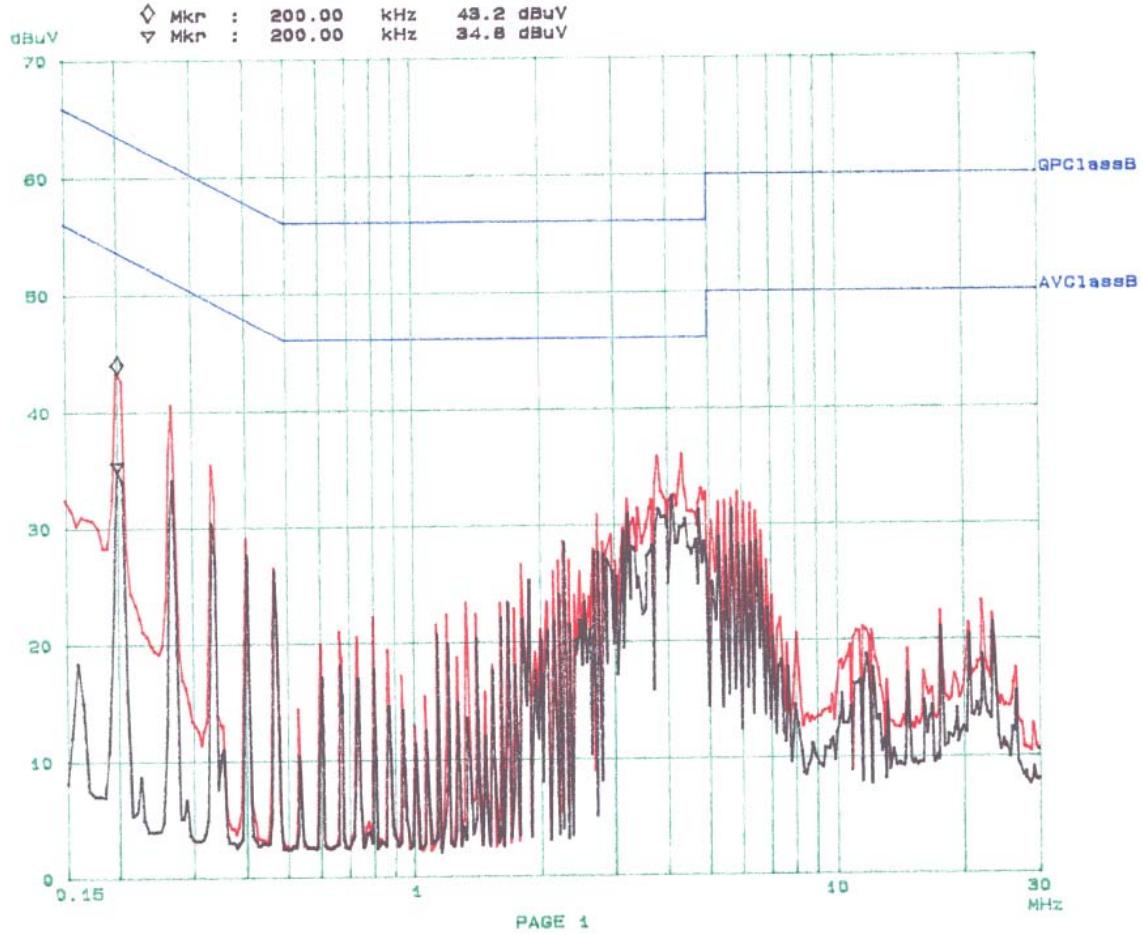
EUT: AS65000
Manuf: Sohoware
Op Cond: Normal
Operator: Hang
Comment: N

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	1M	5k	9k	QP+AV	20ms	15dBLN	OFF
1M	5M	10k	9k	QP+AV	1ms	15dBLN	OFF
5M	30M	100k	9k	QP+AV	1ms	15dBLN	OFF

Final Measurement: X QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB

◇ Mkr : 200.00 kHz 43.2 dBuV
▽ Mkr : 200.00 kHz 34.8 dBuV



Bay Area Compliance Lab Corp 23. Mar 04 11:15

Class B

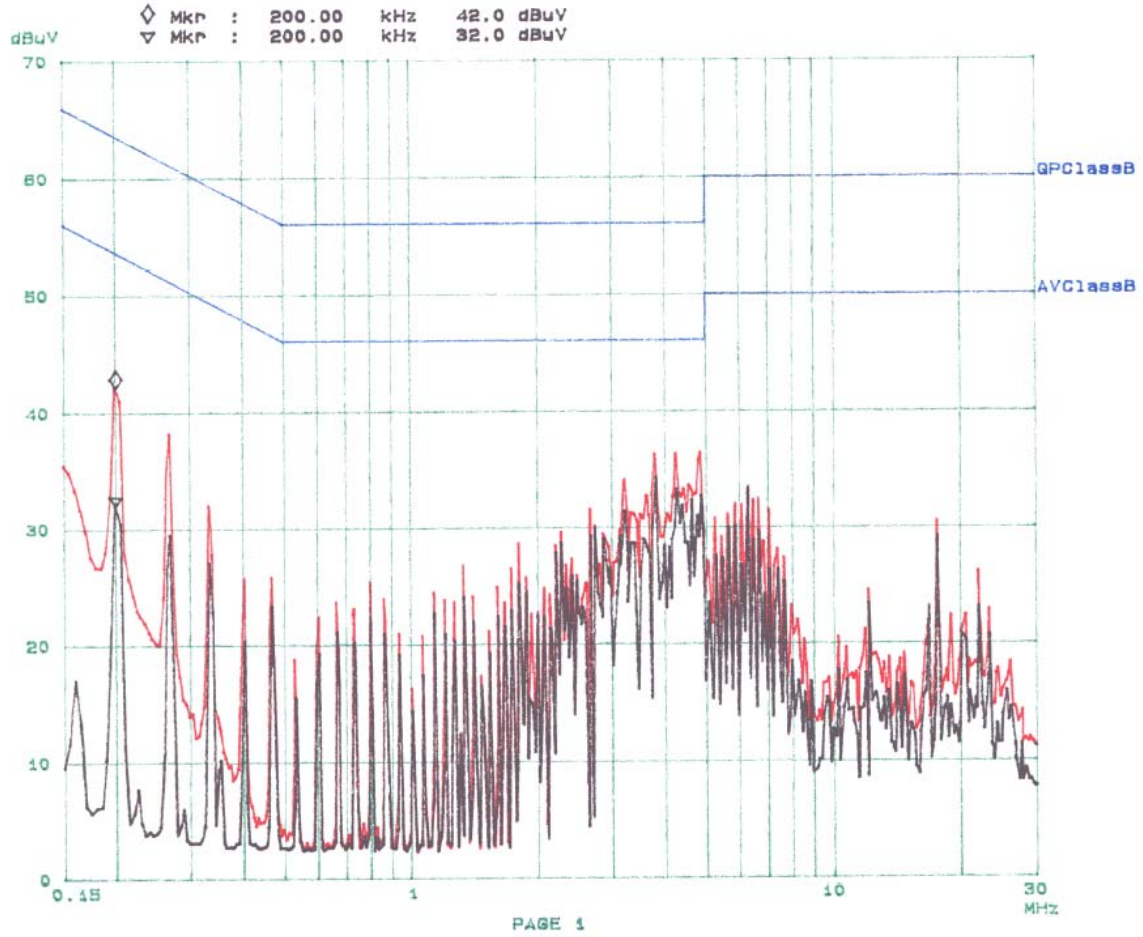
2004-3-23

EUT: ASG5000
Manuf: Sohoware
Op Cond: Normal
Operator: Hang
Comment: L

Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	1M	5k	9k	QP+AV	20ms	15dBLN	OFF
1M	5M	10k	9k	QP+AV	1ms	15dBLN	OFF
5M	30M	100k	9k	QP+AV	1ms	15dBLN	OFF

Final Measurement: X QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



PAGE 1

§15.247(a)(2) & §15.407 – 6 DB BANDWIDTH and 26 DB BANDWIDTH

Standard Applicable

According to §15.247(a)(2), for direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz. According to §15.407, 26dB Bandwidth should be shown.

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 emission bandwidth. (6 dB bandwidth for DTS)
4. Same as (3) except 26 dB. (26dB bandwidth for UNII)
5. Repeat above procedures until all frequencies measured were complete.

Equipment Lists

Manufacturer	Model No.	Description	Calibration Date
HP	8565EC	Spectrum Analyzer	2003-01-22

Measurement Result

Environmental Conditions

Temperature:	15° C
Relative Humidity:	42%
ATM Pressure:	1018 mbar

The testing was performed by Hang Tan on 2004-03-23.

Test Result for 802.11b (15.247)

Channel	Frequency (MHz)	Measured (MHz)	Standard (kHz)	Result
Low	2412	11.72 MHz	≥ 500	Compliant
Mid	2437	11.72 MHz	≥ 500	Compliant
High	2462	11.40 MHz	≥ 500	Compliant

Test Result for 802.11g (15.247)

Channel	Frequency (MHz)	Measured (MHz)	Standard (kHz)	Result
Low	2412	16.48	≥ 500	Compliant
Mid	2437	16.48	≥ 500	Compliant
High	2462	16.48	≥ 500	Compliant

Test Result for 802.11a (15.407)

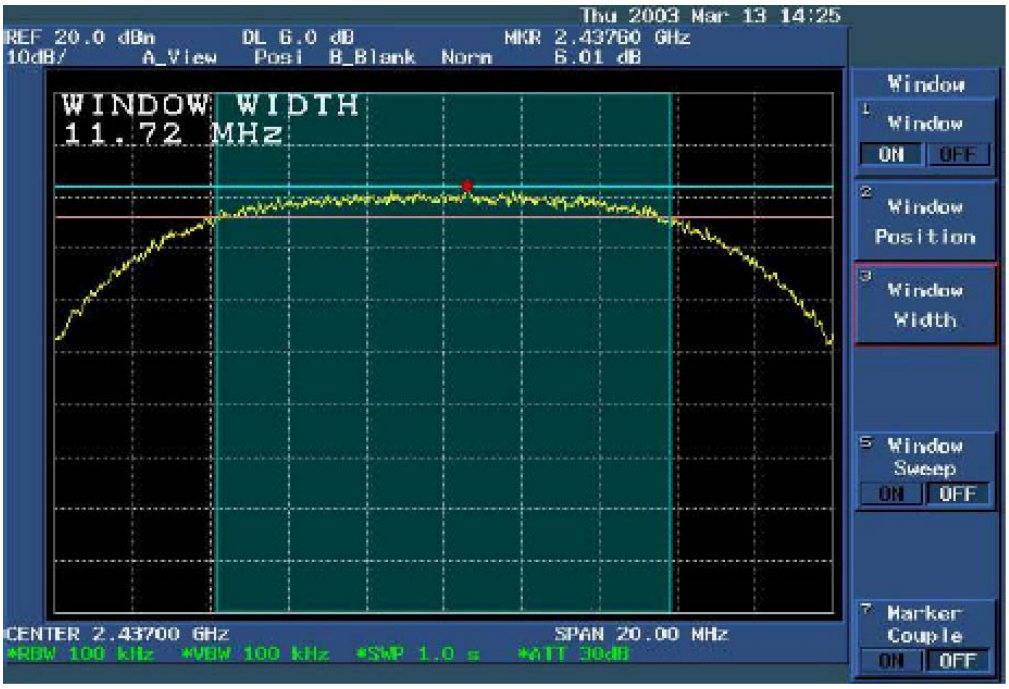
BAND I & II:

Channel	Frequency (MHz)	Measured (MHz)
Low	5180	28.35
Mid	5240	28.07
High	5320	28.35

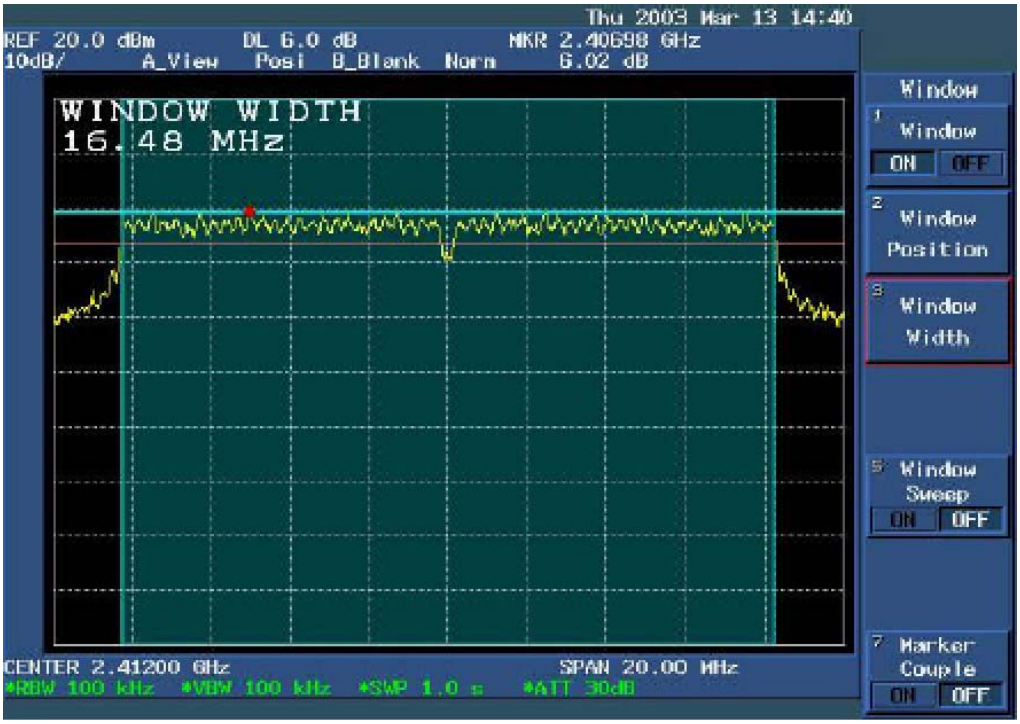
BAND III:

Channel	Frequency (MHz)	Measured (MHz)
Low	5745	22.17
Mid	5765	23.00
High	5805	24.75

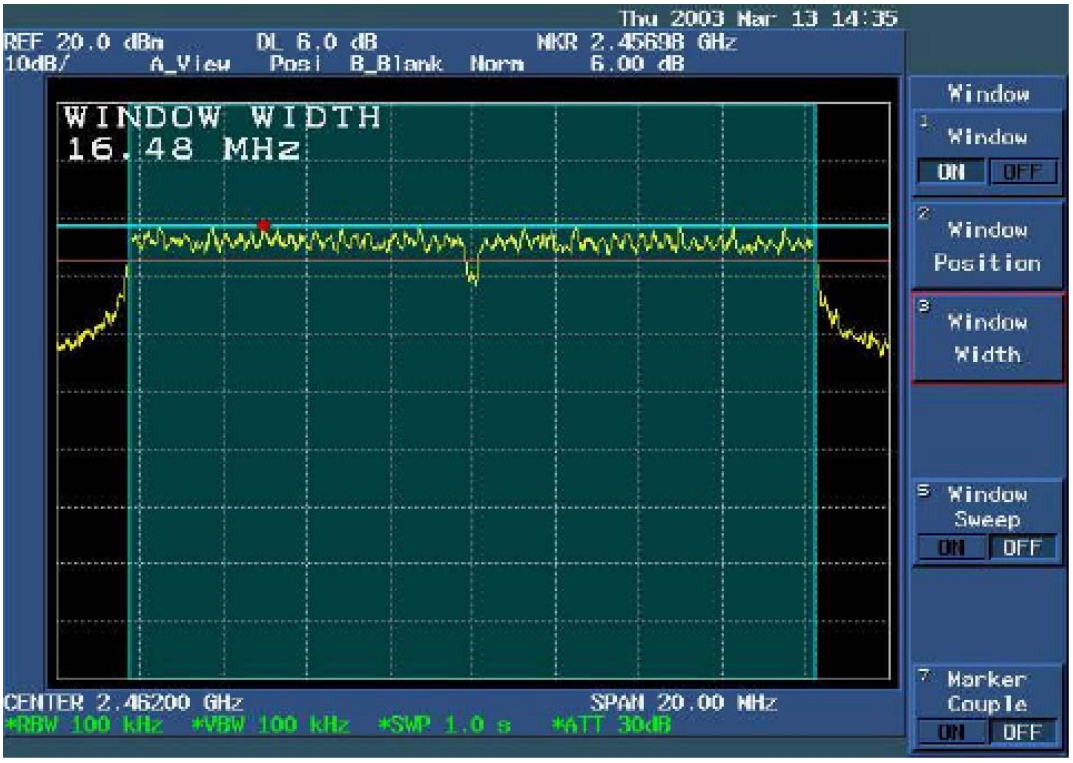
Plots of 6dB Bandwidth for 802.11b (15.247)



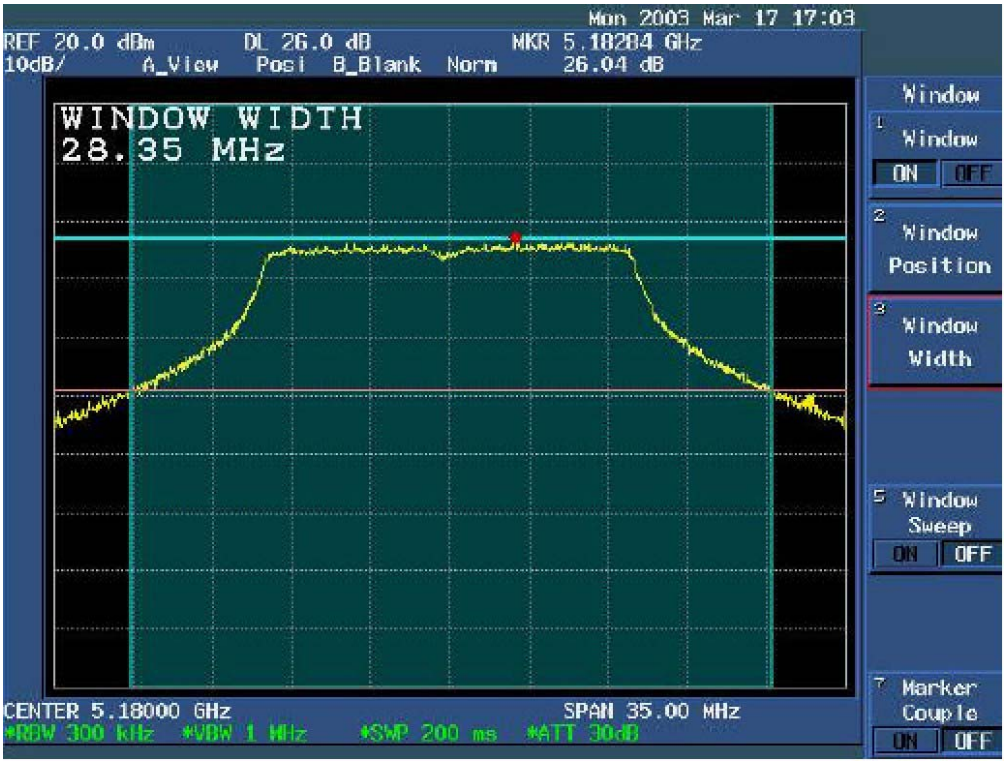
Plots of 6dB Bandwidth for 802.11g (15.247)

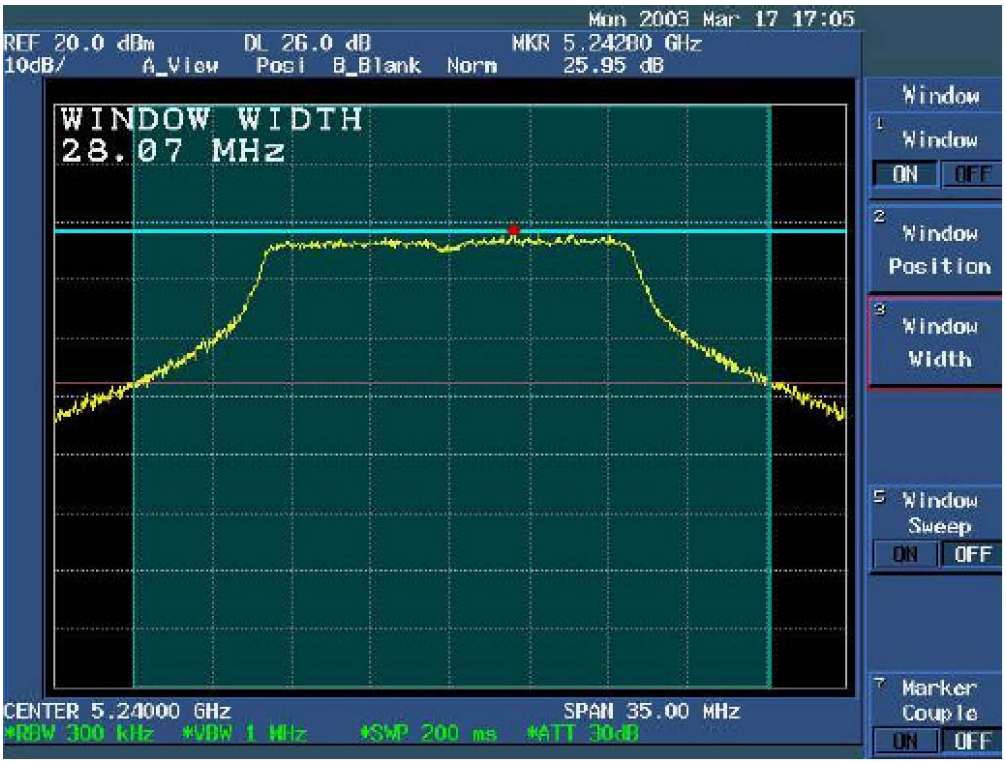


Thu 2003 Mar 13 14:38
REF 20.0 dBm
DL 6.0 dB
MKR 2.43198 GHz
10dB/
A_View
Posi
B_Blank
Norm
5.95 dB
WINDOW WIDTH
16.48 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
CENTER 2.43700 GHz
SPAN 20.00 MHz

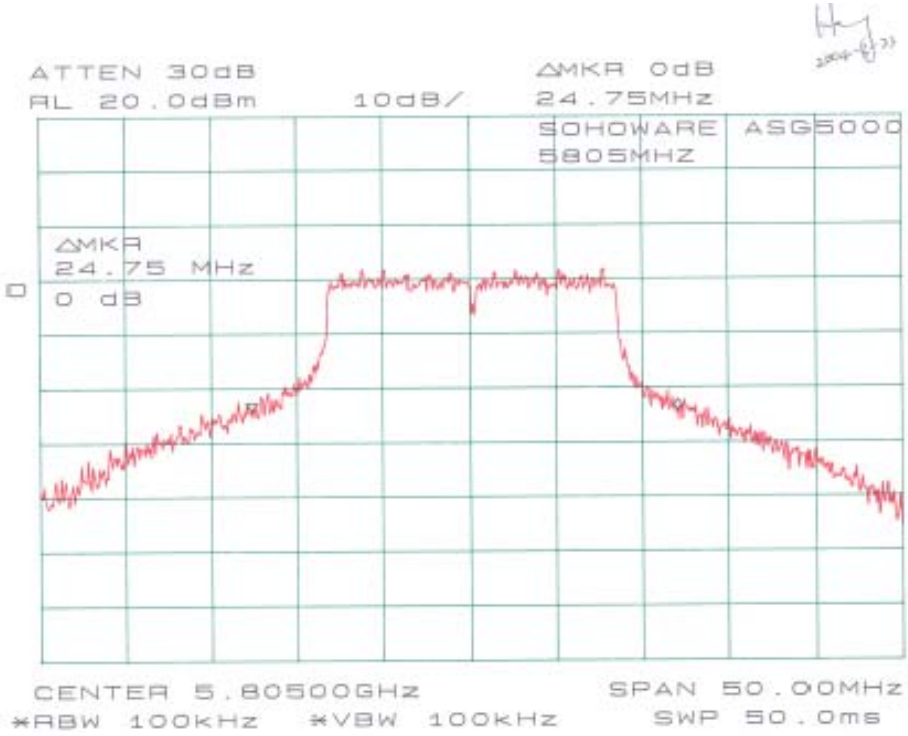

Thu 2003 Mar 13 14:35
REF 20.0 dBm
DL 6.0 dB
MKR 2.45698 GHz
10dB/
A_View
Posi
B_Blank
Norm
6.00 dB
WINDOW WIDTH
16.48 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 2.46200 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB

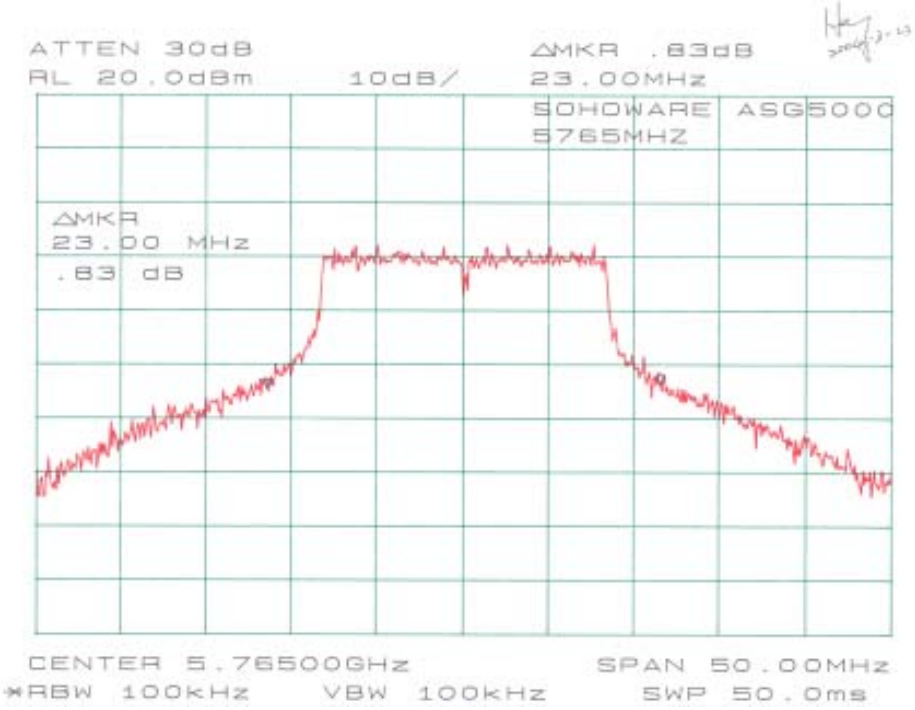
Plots of 26dB Bandwidth for 802.11a (15.407), Band I & II

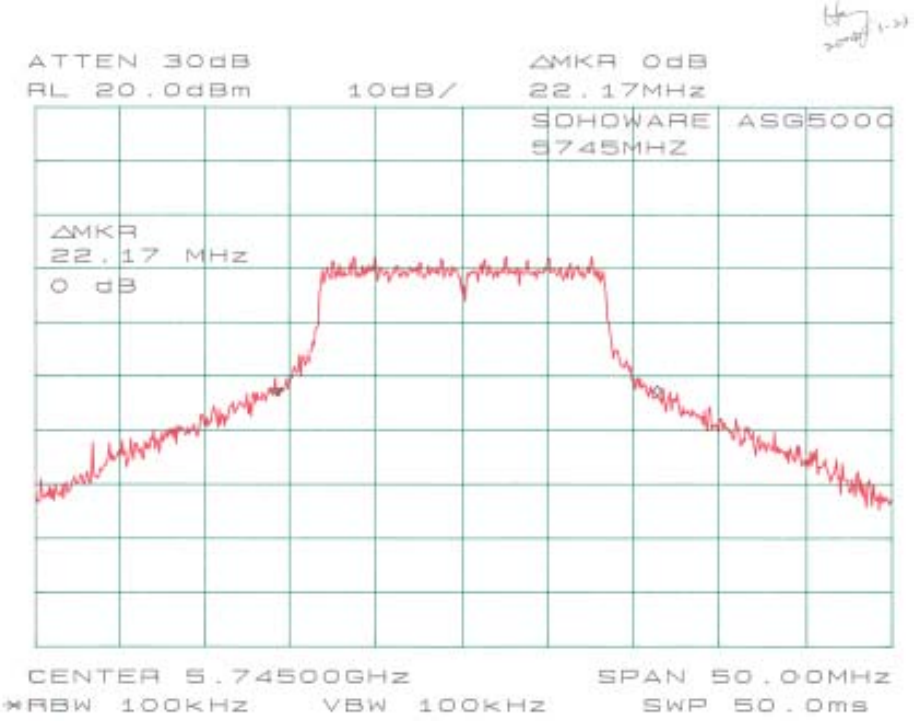




Plots of 26dB Bandwidth for 802.11a (15.407), Band III




ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR .83dB
23.00MHz
SOHOWARE ASG5000
5765MHZ
ΔMKR
23.00 MHz
.83 dB
CENTER 5.76500GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR 0dB
22.17MHz
SOHOWARE ASG5000
5745MHZ
ΔMKR
22.17 MHz
0 dB
CENTER 5.74500GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

§15.247(b)(3), §15.407(a)(2) - PEAK OUTPUT POWER MEASUREMENT

Standard Applicable

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

According to §15.407(a)(1), for the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10logB, where B is the 26-dB emission bandwidth in MHz.

According to §15.407(a)(2), for the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10logB, where B is the 26-dB emission bandwidth in MHz.

According to §15.407(a)(3), for the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10logB, where B is the 26-dB emission bandwidth in MHz.

Measurement Procedure

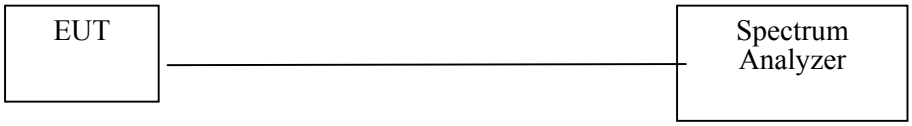
Test was performed according to FCC Public Notice DA 02-2138:

Procedure for DTS:

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.

Procedure for UNII:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz.
3. Set VBW ≥ 3 MHz.
4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode.
5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”.
6. Trace average 100 traces in power averaging mode.
7. Computer power by integrating can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging in linear power terms, power levels in each frequency bin across the 1MHz.



Equipment Lists

Manufacturer	Model No.	Description	Calibration Date
HP	8565EC	Spectrum Analyzer	2003-01-22

Measurement Result

Environmental Conditions

Temperature:	15° C
Relative Humidity:	42%
ATM Pressure:	1018 mbar

The testing was performed by Hang Tan on 2004-03-23.

Output Power (15.247) for 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Standard	Result
1	2412	17.08	0.05105	≤ 1W (30dBm)	Compliant
6	2442	17.01	0.05023	≤ 1W (30dBm)	Compliant
11	2462	17.06	0.05082	≤ 1W (30dBm)	Compliant

Output Power (15.247) for 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Standard	Result
1	2412	17.05	0.05069	≤ 1W (30dBm)	Compliant
6	2442	17.09	0.05116	≤ 1W (30dBm)	Compliant
11	2462	17.02	0.05035	≤ 1W (30dBm)	Compliant

RF Output Power (15.407) for 802.11a

Band I & II:

Channel (MHz)	Frequency (MHz)	Output Power (dBm)	26 dBc Bandwidth (MHz)	Standard (dB)	Result
1	5180	16.41	28.35	<17	Compliant
4	5240	16.35	28.07	<17	Compliant
8	5320	18.22	28.35	<24	Compliant

Band III:

Channel (MHz)	Frequency (MHz)	Output Power (dBm)	26 dBc Bandwidth (MHz)	Standard (dB)	Result
1	5745	15.7	22.17	<30	Compliant
2	5765	16.03	23.00	<30	Compliant
4	5805	15.7	24.75	<30	Compliant

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

Standard Applicable

According to §15.247(c), 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 emission 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 100kHz 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	Model No.	Description	Calibration Date
Agilent	8564E	Spectrum Analyzer	2003-08-26

Measure Results

Environmental Conditions

Temperature:	15° C
Relative Humidity:	42%
ATM Pressure:	1018 mbar

The testing was performed by Hang Tan on 2004-03-23.

Plots of Band Edge for 802.11b (15.247), Conducted

Plots of Band Edge for 802.11b (15.247), Radiated – Average Mode