Lab Code: 200167-0

FCC PART 15.247

TEST AND MEASUREMENT REPORT

For

Hanwang Technology Co., Ltd.

3 rd Floor, Building 5, No.8 Dongbeiwang West Road,

Haidian District, Beijing, China

FCC ID: XQI-HWTPB10A

Report Type:	**Product Type:**
Original Report	Tablet PC with 802.11b/g and Bluetooth Function

Test Engineers:	Jack Liu
Report Number:	R1004061-247
Report Date:	2010-05-21
Reviewed By:	Victor Zhang Test Engineer, RF Lead
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1004061-247	Original Report	2010-05-21

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *Hanwang Technology Co., Ltd.*, and their product *FCC ID: XQI-HWTPB10A*, model: *XC10C-X0347X series (X could be "A-Z")*, or the "EUT" as referred to in this report. The EUT is an all-touch-control tablet PC with wireless 802.11b/g and Bluetooth function.

1.2 Mechanical Description of EUT

The "EUT" measures approximately *25.2cm (L) x 16.8cm (W) x 1.6cm (H)*, and weighs approximately *978.5*g.

** The test data gathered are from typical production sample, serial number: HAN09530025, provided by the manufacturer.*

1.3 EUT Photo

Please refer to Exhibit C for more EUT photographs

1.4 Objective

This report is prepared on behalf of Hanwang Technology Co., Ltd. in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules, June 2007.

The objective is to determine compliance with FCC rules for Antenna Requirements, Conducted and Radiated Spurious Emissions.

1.5 Related Submittal(s)/Grant(s)

FCC ID: V83BLUEW-2310M

1.6 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.

1.7 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 values range from +2.0 for Conducted Emissions tests and +4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL.

Detailed instrumentation measurement uncertainties can be found in BACL report QAP-018.

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.

1.8 Test Facility

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

The test sites at BACL have 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 has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: R-2463 and C-2698. 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/Standards/scopes/2001670.htm

2 System Test Configuration

2.1 Justification

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

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT had been tested with the following data rate settings (worst case):

Radio Mode	Bandwidth (MHz)	Frequency/Data rate		
		Low CH (MHz/Mbps)	Mid CH (MHz/Mbps)	High CH (MHz)
Bluetooth	1	2402	2440	2480
802.11b	20	2412/1	2437/1	2462/1
802.11g	20	2412/6	2437/6	2462/6

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Special Accessories

N/A

2.5 Local Support Equipment

Manufacturer	Description	Model No.	Serial No.
Dell	Keyboard	L100	CNORH6597357167L048M
HP	Mouse	M-869	HCA52205870
COBY	Speaker	-	-

2.6 Power Supply and Line Filters

Manufacturers	Descriptions	Models	Serial Numbers
LITEON	AC Adapter	PA-1650-22	9Z00132901

2.7 EUT Internal Configuration Details

Manufacturers	Descriptions	Models	Serial Numbers
Shenzhen SeRhea Technology Co., Ltd.	Mouse Hanvon-10.1	SR320-HW-04	1970020001
Young Mountain Ele Co., Ltd.	Camera module Hanvon-10.1	EM4213C2-L4-3E0	1970030001
3DSP	WIFI&BT Module Hanvon-10.1	Bluew-2310u	1970040001
McNair New Power Co., Ltd	Battery-assy Hanvon-10.1	MLP8546105-2S1P	1970060001
KENMEC Technology(Suzhou) Co., Ltd.	PCBA_HDD,Hanvon-10.1"	A10SU-SA	1910010002
KENMEC Technology(Suzhou) Co., Ltd.	PCBA_Main,HanWang-10.1"	A10SU	1910010001
KENMEC Technology(Suzhou) Co., Ltd.	PCBA_I/O,Hanvon-10.1"	A10SU-UA	1910010003
KENMEC Technology(Suzhou) Co., Ltd.	PCBA_Button,Hanvon-10.1"	A10SU-WA	1910010004

3 Summary of Test Results

Results reported relate only to the product tested.

FCC Rules	Description of Test	Results
§15.247 (i)	RF Exposure	Compliant**
§15.203	Antenna Requirement	N/A*
§15.207(a)	Conducted Emissions	Compliant
§15.209,	Spurious Emissions at Antenna Port	N/A*
§15.205	Restricted Bands	Compliant
§15.209(a), §15.247(d)	Radiated Spurious Emissions	Compliant
§15.247(a)(2)	Channel Bandwidth	N/A*
§15.247(b)(3)	Maximum Peak Output Power	N/A*
§15.247(a) (1)	Hopping Channel Separation	N/A*
§15.247(a)(1)(iii)	Number of Hopping Frequencies Used	N/A*
§15.247(a)(1)(iii)	Dwell Time	N/A*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	N/A*
§15.247(e)	Power Spectral Density	N/A*

Note: * Refer to FCC ID: V83BLUEW-2310M
**Please refer to SAR report, report number: R1004061-FCC-SAR.

4 FCC §15.247(i) & §2.1093 - RF Exposure

4.1 Applicable Standard

According to FCC §15.247(i) and §2.1093, the EUT is portable device and needs SAR evaluation.

4.2 Measurement Result

Please refer to the SAR report, report number: R1004061-FCC-SAR

5 FCC §15.203 – Antenna Requirement

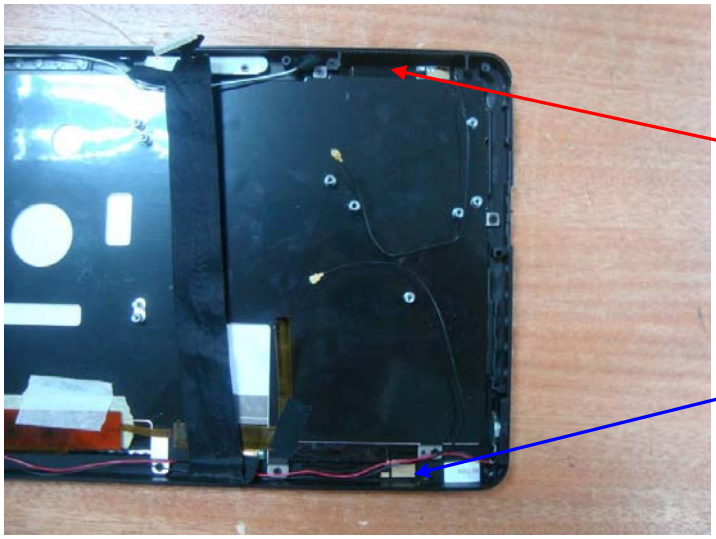
5.1 Applicable Standard

According to FCC §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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

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.

5.2 Result

Two internal antennas are available for the device, both of them has the unique connector, the end user can not access. The gain is 2 dBi, please refer to the antenna photos below.



Wi-Fi Antenna

Bluetooth Antenna

6 FCC §15.207 - Conducted Emissions

6.1 Applicable Standards

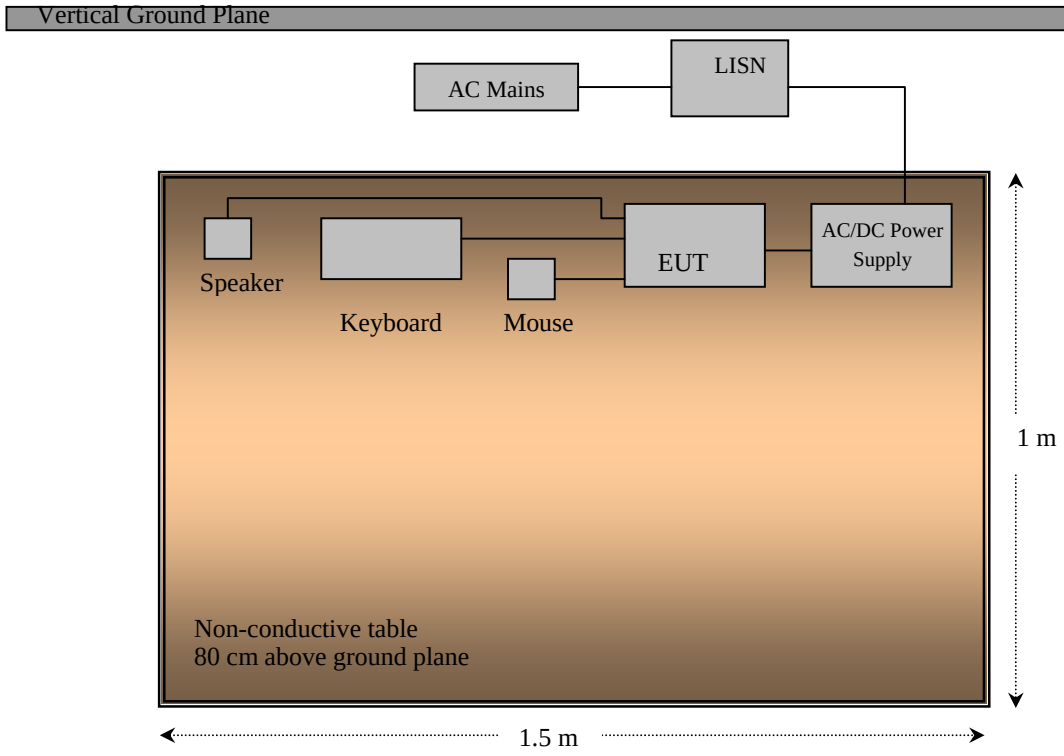
According to FCC §15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the 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 frequencies 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.*

6.2 Test Setup and Block Diagrams

The measurement was performed at shield room, using the setup per ANSI C63.4-2003 measurement procedure.
The specification used was FCC Part15.207 limits.
External I/O cables were draped along the edge of the test table and bundle when necessary.
The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V/60 Hz AC power.



6.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-2.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a "QP." Average readings are distinguished with an "Ave".

6.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Cable Loss, and Attenuator Factor adding to the Indicated Reading. The basic equation is as follows:

Corrected Amplitude = Indicated Reading + Cable Loss + Attenuator Factor

For example, a Corrected Amplitude of 34.08 dBuV/m = Indicated Reading (23.85 dBuV) + Cable Factor (0.22 dB) + Attenuator Factor (10dB)

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

Margin = Corrected Amplitude - Limit

6.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Solar Electronics	LISN	9252-R-24-BNC	511205	2009-06-09
TTE	Filter, High Pass	H962-150k-50-21378	K7132	2009-06-01
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2010-03-24

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

6.6 Test Environmental Conditions

Temperature:	18~21 °C
Relative Humidity:	30~35 %
ATM Pressure:	101.2-102.2kPa

**The testing was performed by Jack Liu from 2010-05-05 ~2010-05-14 in 5 meter chamber #3.*

6.7 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC standard's conducted emissions limits, with the margin reading of:

Worst Case: 802.11b – Middle Channel Transmitting Mode

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-10.09	24.001	Line	0.15 to 30

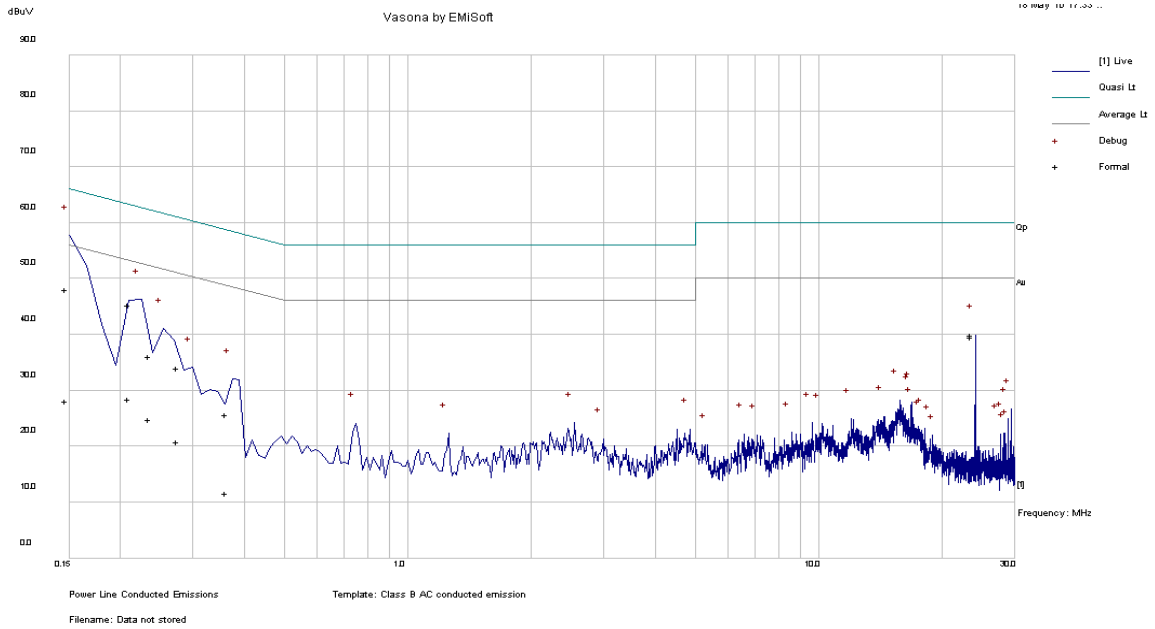
Worst Case: Bluetooth – Middle Channel Transmitting Mode

Connection: AC/DC adapter connected to 120 V/60 Hz, AC			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Line/Neutral)**	**Range (MHz)**
-11.65	24.00098	Line	0.15 to 30

6.8 Conducted Emissions Test Plots and Data

120 V, 60 Hz – Line

802.11 b mode Middle channel (2437 MHz)



Quasi-Peak Measurements

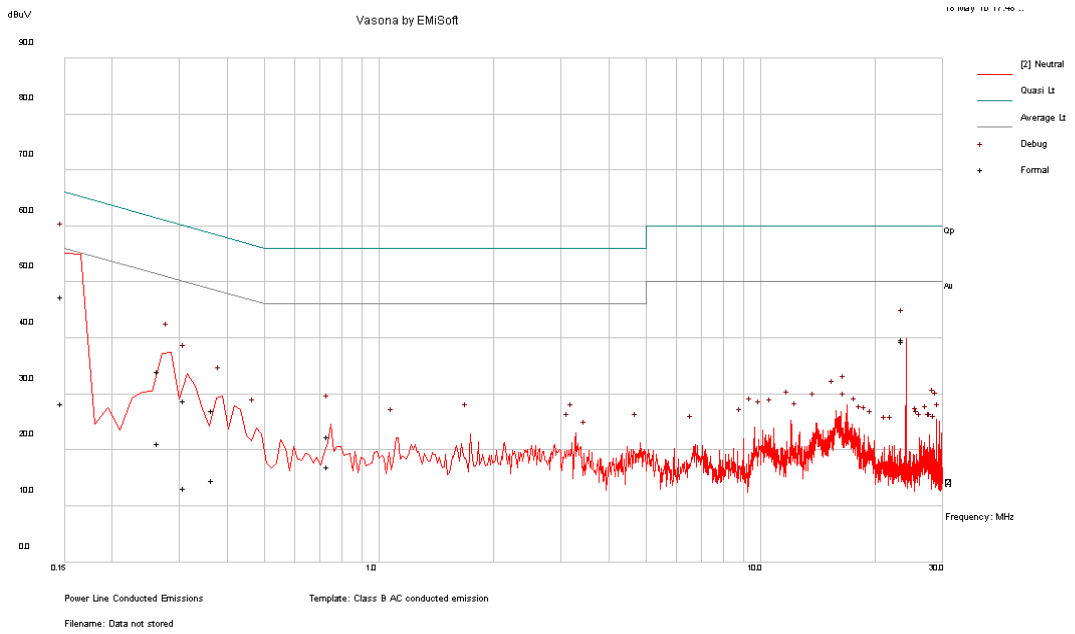
Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.213879	45.25	Line	63.05	-17.81
0.150232	47.99	Line	65.99	-18.00
24.00100	39.62	Line	60.00	-20.38
0.239553	36.08	Line	62.11	-26.03
0.281304	34.02	Line	60.78	-26.76
0.368799	25.67	Line	58.53	-32.85

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
24.001	39.91	Line	50.00	-10.09
0.213879	28.44	Line	53.05	-24.62
0.239553	24.83	Line	52.11	-27.28
0.150232	28.13	Line	55.99	-27.86
0.281304	20.82	Line	50.78	-29.96
0.368799	11.72	Line	48.53	-36.81

120 V, 60 Hz – Neutral

802.11 b mode Middle channel (2437 MHz)



Quasi-Peak Measurements

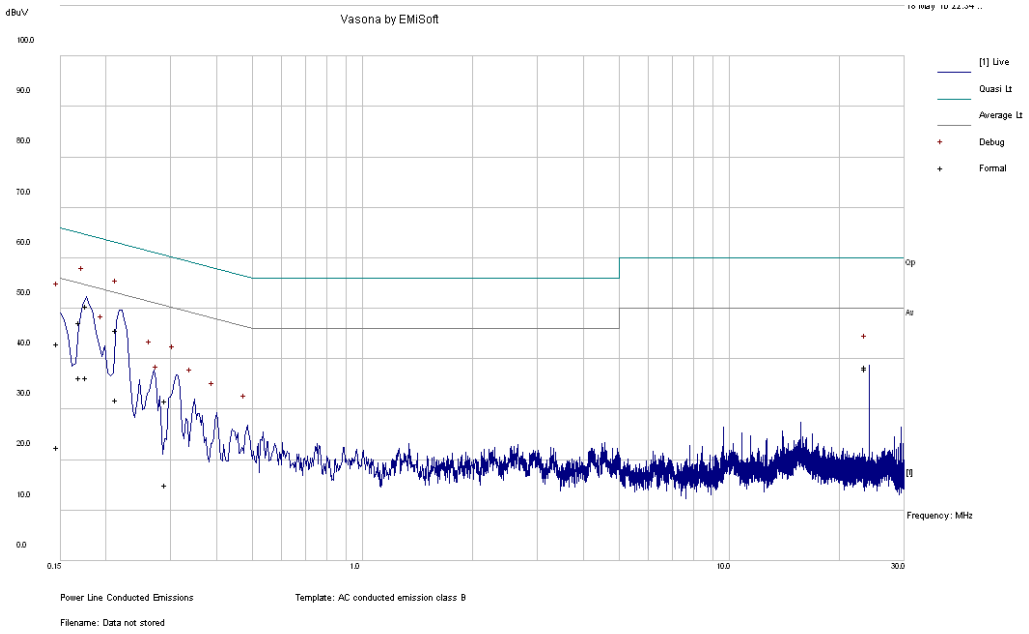
Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150134	47.43	Neutral	65.99	-18.56
24.00096	39.43	Neutral	60.00	-20.57
0.268359	34.01	Neutral	61.17	-27.16
0.314157	28.74	Neutral	59.86	-31.12
0.372672	27.14	Neutral	58.44	-31.30
0.746874	22.30	Neutral	56.00	-33.70

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
24.00096	39.76	Neutral	50.00	-10.24
0.150134	28.33	Neutral	55.99	-27.66
0.746874	17.08	Neutral	46.00	-28.92
0.268359	21.16	Neutral	51.17	-30.01
0.372672	14.65	Neutral	48.44	-33.79
0.314157	13.13	Neutral	49.86	-36.73

120 V, 60 Hz – Line

Bluetooth Middle channel (2442 MHz)



Quasi-Peak Measurements

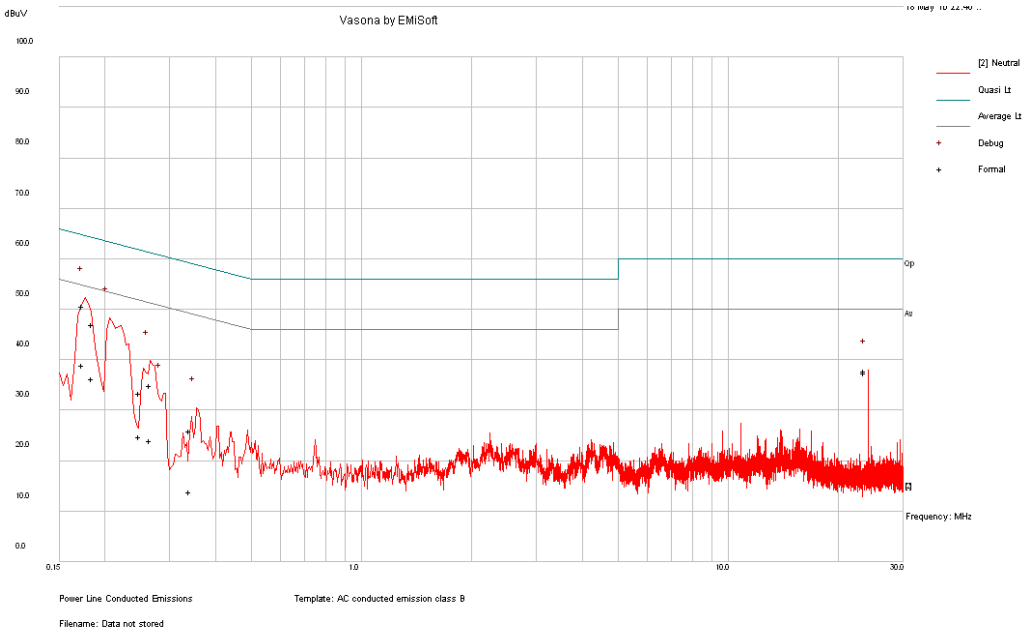
Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.180654	50.56	Line	64.46	-13.89
0.217653	45.68	Line	62.91	-17.22
0.172467	47.15	Line	64.84	-17.69
24.00098	38.08	Line	60.00	-21.92
0.150117	43.03	Line	65.99	-22.96
0.295677	31.65	Line	60.36	-28.71

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
24.00098	38.35	Line	50.00	-11.65
0.180654	36.39	Line	54.46	-18.06
0.172467	36.31	Line	54.84	-18.53
0.217653	31.99	Line	52.91	-20.92
0.150117	22.54	Line	55.99	-33.45
0.295677	14.97	Line	50.36	-35.39

120 V, 60 Hz – Neutral

Bluetooth Middle channel (2442 MHz)



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.177291	50.75	Neutral	64.61	-13.86
0.188153	47.12	Neutral	64.12	-17.00
24.00089	37.51	Neutral	60.00	-22.49
0.271488	34.95	Neutral	61.07	-26.12
0.253095	33.38	Neutral	61.65	-28.27
0.346341	25.98	Neutral	59.05	-33.07

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
24.00089	37.79	Neutral	50.00	-12.21
0.177291	39.02	Neutral	54.61	-15.59
0.188153	36.22	Neutral	54.12	-17.90
0.253095	24.87	Neutral	51.65	-26.78
0.271488	24.00	Neutral	51.07	-27.07
0.346341	13.85	Neutral	49.05	-35.20

7 FCC §15.247(d) - Spurious Emissions at Antenna Terminals

7.1 Applicable Standard

For FCC §15.247(d) in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits.

7.2 Measurement Result

Refer to FCC ID: V83BLUEW-2310M

8 FCC §15.205, §15.209 & §15.247(d) - Spurious Radiated Emissions

8.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §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 (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
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.

As Per FCC §15.205(a) except as show 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	960 – 1240	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5. 35 – 5. 46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 –167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3 3458 – 3 358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the

transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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).

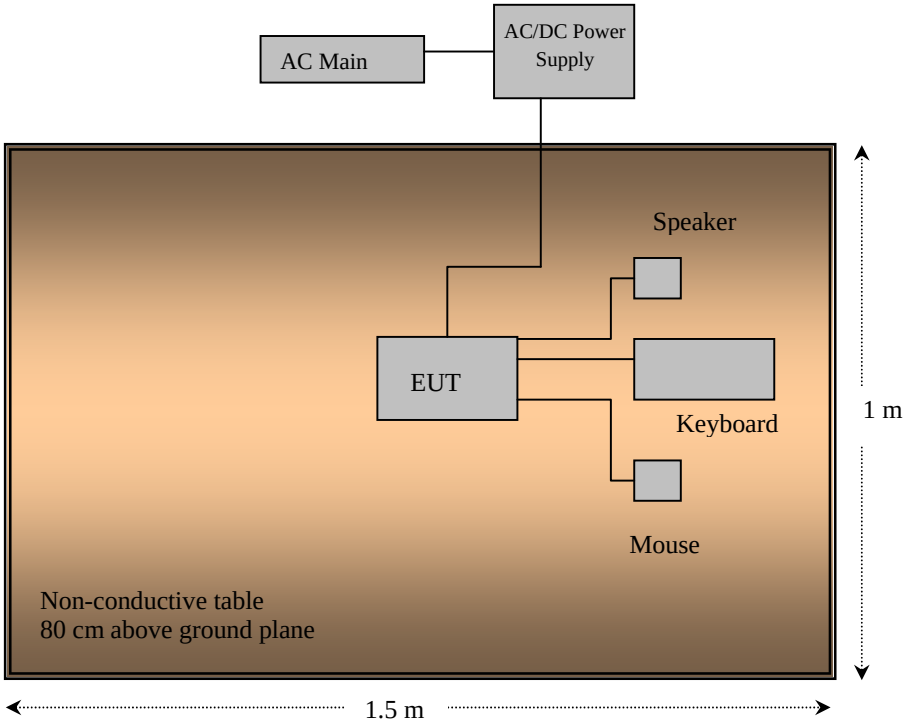
8.2 EUT Setup

The radiated emissions tests were performed using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15C 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.

8.3 Test Setup Diagram



8.4 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Cable Loss, and Attenuator Factor adding to the Indicated Reading. The basic equation is as follows:

Corrected Amplitude = Indicated Reading + Cable Loss + Attenuator Factor

For example, a Corrected Amplitude of 34.08 dBuV/m = Indicated Reading (23.85 dBuV) + Cable Factor (0.22 dB) + Attenuator Factor (10dB)

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

Margin = Corrected Amplitude - Limit

8.6 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Hewlett Packard	Pre amplifier	8447D	2944A06639	2009-06-05
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2009-05-05
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2009-04-29
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
A.R.A Inc	Horn antenna	DRG-1181A	1132	2009-10-27
Agilent	PSA Series Spectrum Analyzer	E4440A	US45303156	2009-07-23
HP	Pre Amplifier	8449B	3147A00400	2010-02-01

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

8.7 Test Environmental Conditions

Temperature:	18~21 °C
Relative Humidity:	30~35 %
ATM Pressure:	101.2-102.2kPa

**The testing was performed by Jack Liu from 2010-05-05 ~2010-05-14 in 5 meter chamber #3.*

8.8 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15, Subpart C, section 15.205, 15.209 and 15.247 standard's radiated emissions limits, and had the worst margin of:

802.11 b/g mode:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
30-1000 MHz			
-5.11	30.61652	Vertical	802.11g mode, Mid CH 30 MHz – 1GHz
Above 1 GHz			
-	-	-	1– 25 GHz

*Note: *All Frequencies are 20 dB below the limit or are on the noise floor level*

Bluetooth mode:

Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Channel, Range**
30-1000 MHz			
-5.45	119.9643	Horizontal	Mid CH 30 MHz – 1 GHz
Above 1 GHz			
-	-	-	1– 25 GHz

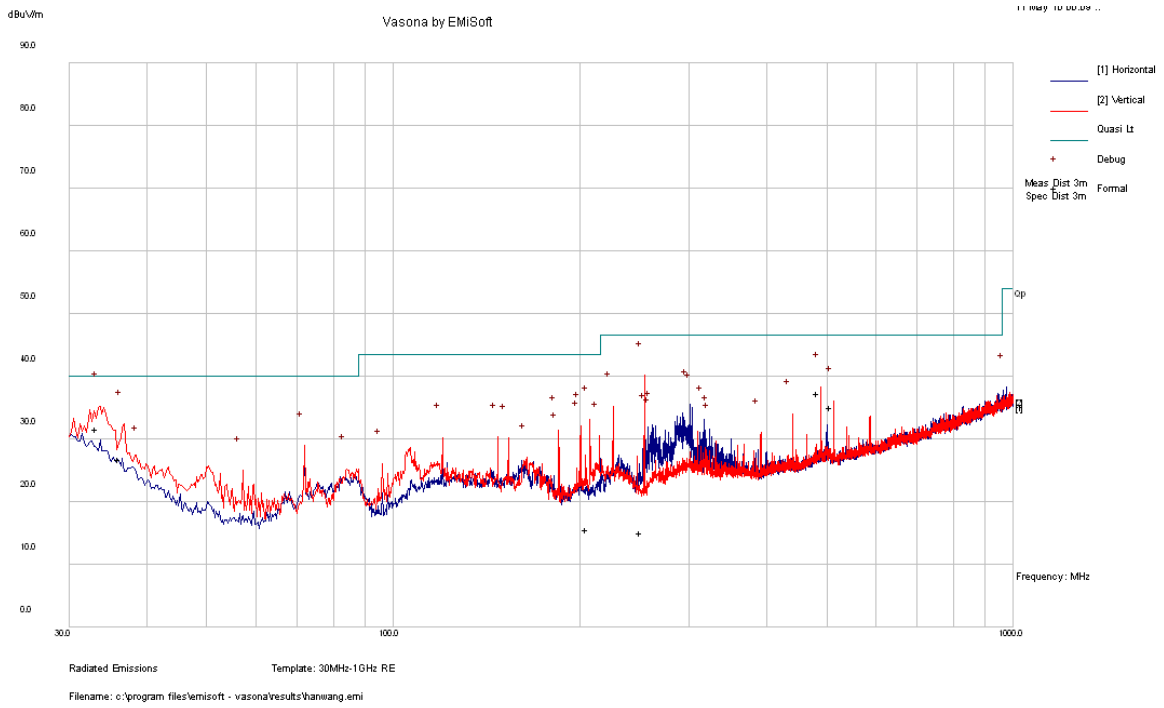
**All Frequencies are 20 dB below the limit or are on the noise floor level*

Please refer to the following table and plots for specific test result details

8.9 Radiated Emissions Test Result Data:

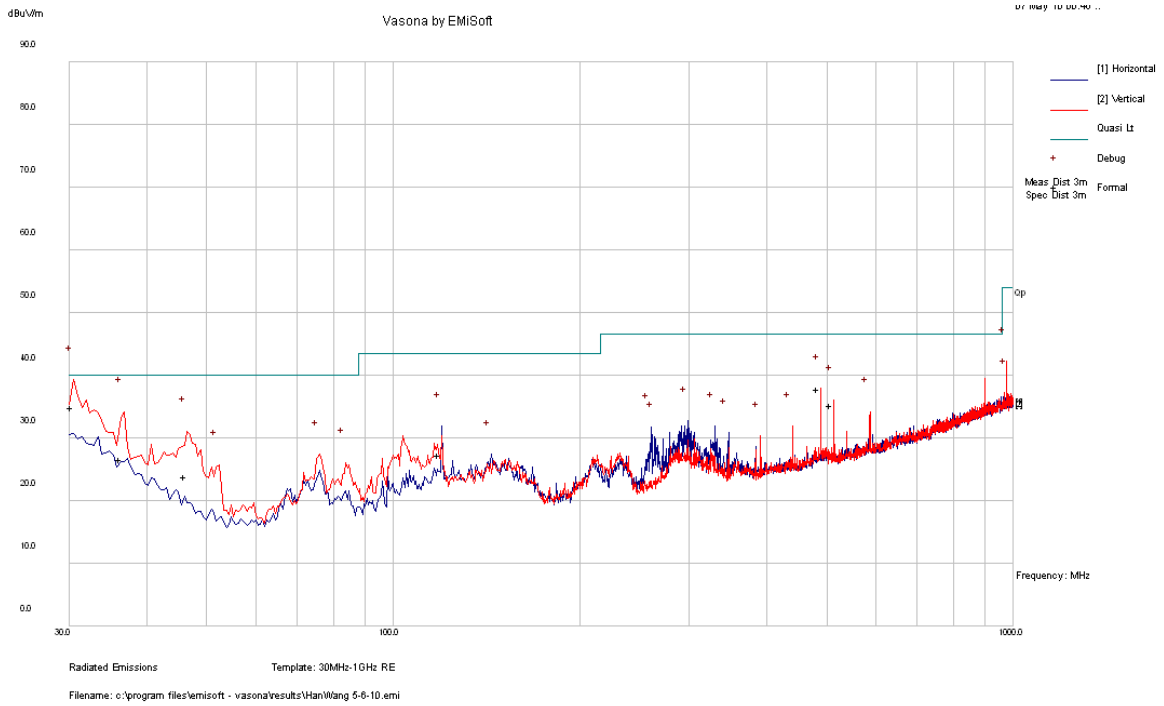
Radiated Emission at 3 meters, 30 MHz – 1 GHz

802.11 b Mode, Middle channel (2437 MHz)



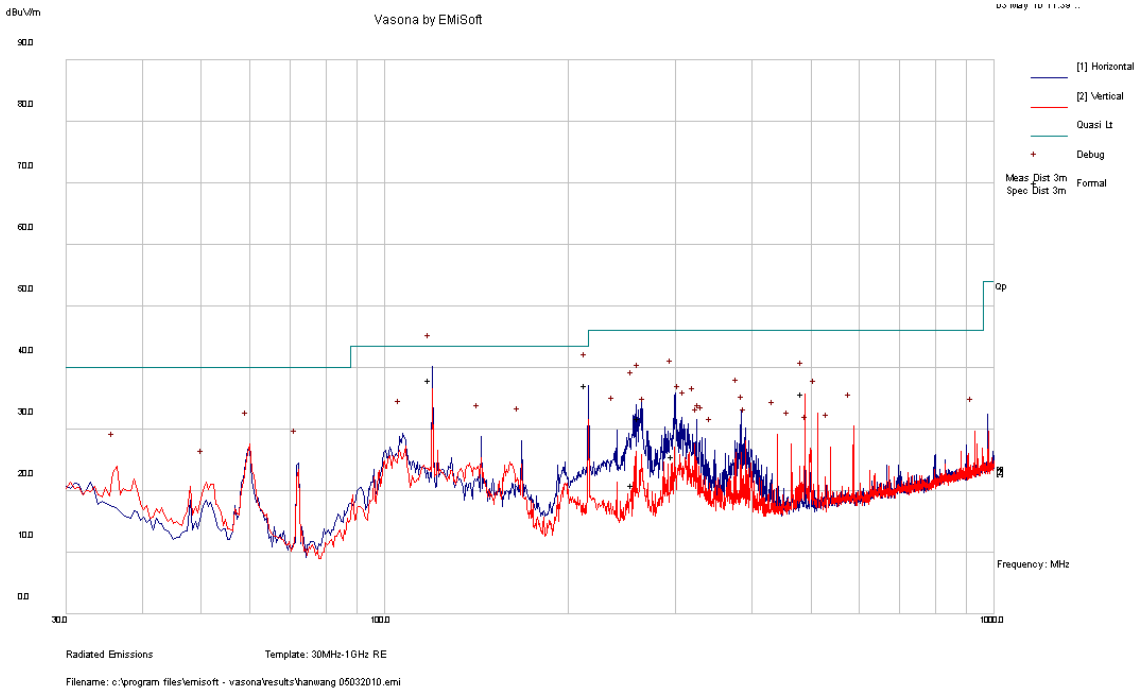
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
33.64662	31.68	125	V	307	40.0	-8.32
489.1536	37.37	105	V	360	46.0	-8.63
513.6101	35.15	98	V	5	46.0	-10.85
36.63760	26.87	100	V	291	40.0	-13.13
207.6845	15.66	148	V	111	43.5	-27.84
253.8990	15.16	206	V	212	46.0	-30.84

802.11 g Mode, Middle channel (2437 MHz)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
30.61652	34.89	99	V	40	40.0	-5.11
489.1779	37.84	100	V	359	46.0	-8.16
513.6122	35.25	103	V	1	46.0	-10.75
36.67096	26.65	212	V	195	40.0	-13.35
46.70480	23.91	95	V	275	40.0	-16.09
119.9597	27.27	291	H	112	43.5	-16.23

Bluetooth, Middle Channel (2442 MHz)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
119.9643	38.05	270	H	41	43.5	-5.45
215.9904	37.10	139	H	135	43.5	-6.40
489.1700	35.76	101	V	8	46.0	-10.24
263.9591	31.80	124	H	136	46.0	-14.20
299.8830	25.53	126	H	47	46.0	-20.47
258.0650	21.01	102	H	281	46.0	-24.99

Radiated Emission at 3 meters, 1 – 25 GHz

1) 802.11 b Mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre Amp. (dB)	Cord. Reading (dBµV/m)	Part 15C		Comments
			Height (m)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-
Middle channel 2437MHz measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-
High channel 2462 MHz measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-

*Note: *All Frequencies are 20 dB below the limit or are on the noise floor level.*

2) 802.11 g Mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre Amp. (dB)	Cord. Reading (dBµV/m)	Part 15C		Comments
			Height (m)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-
Middle channel 2437MHz measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-
High channel 2462 MHz measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-

*Note: *All Frequencies are 20 dB below the limit or are on the noise floor level.*

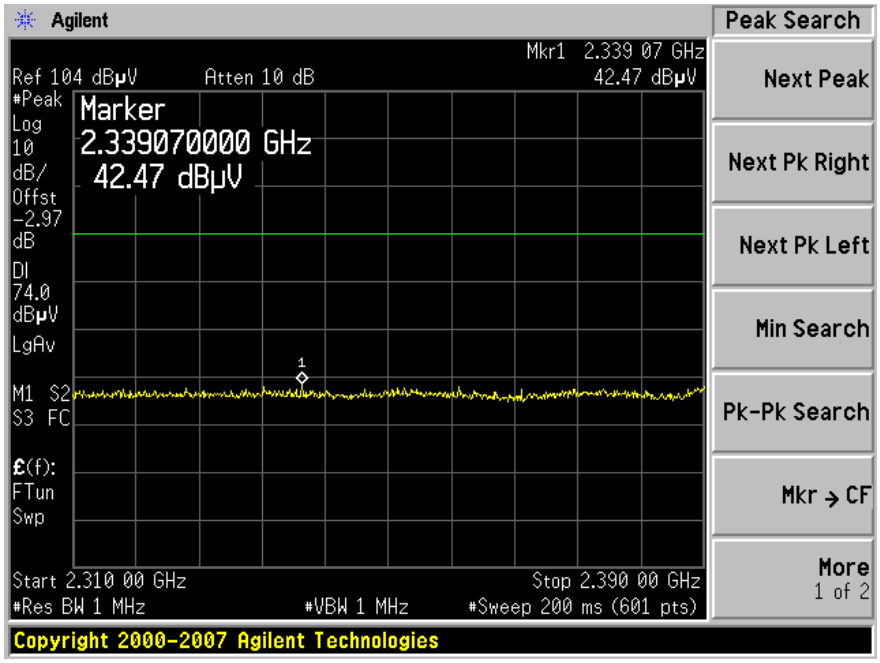
3) Bluetooth Mode:

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre Amp. (dB)	Cord. Reading (dBµV/m)	Part 15C		Comments
			Height (m)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz, measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-
Middle channel 2437MHz measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-
High channel 2462 MHz measured at 3 meters											
-	-	-	-	-	-	-	-	-	-	-	-

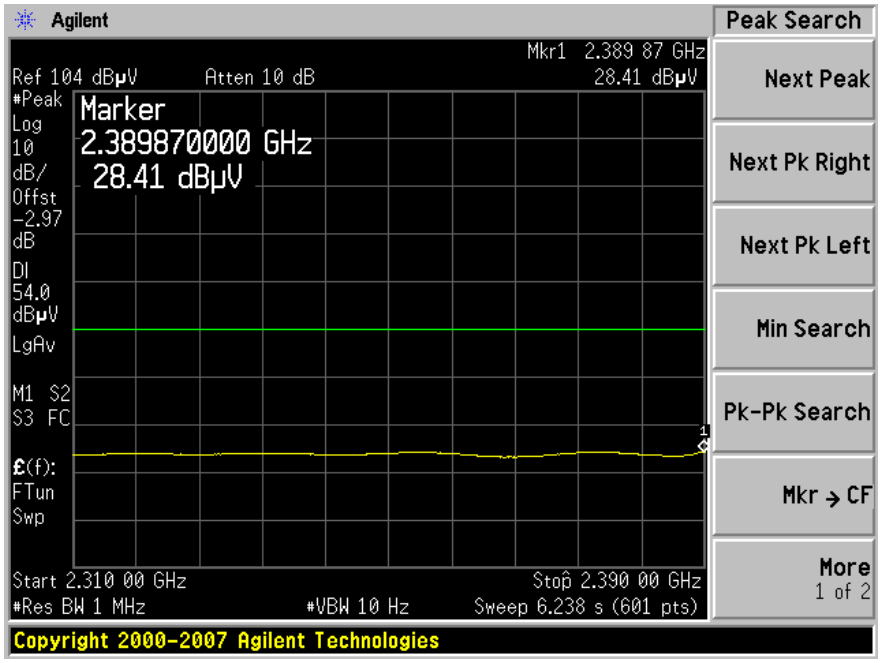
*Note: *All Frequencies are 20 dB below the limit or are on the noise floor level.*

Restricted Band Emissions

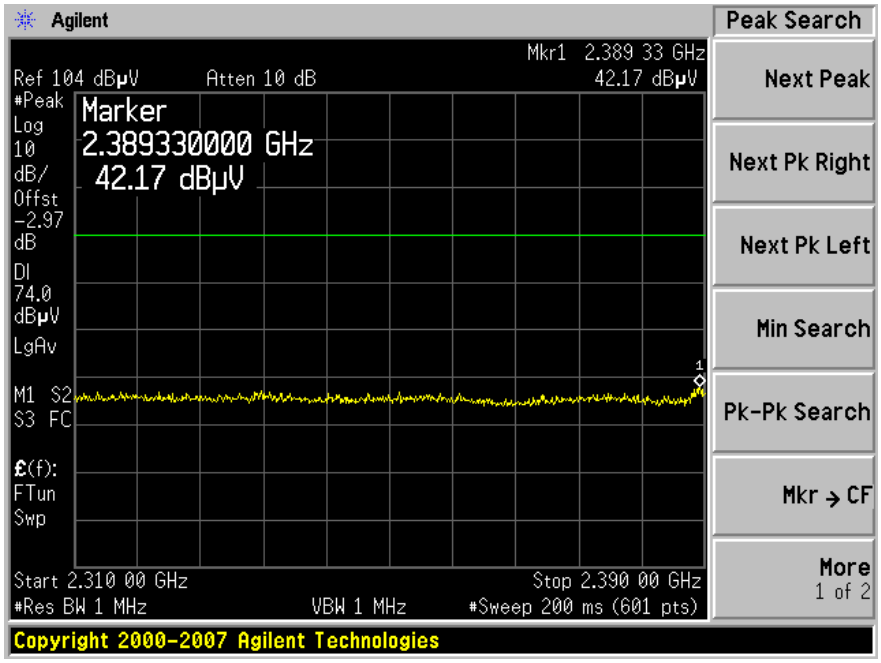
802.11 b, Lowest Channel at Horizontal, Peak



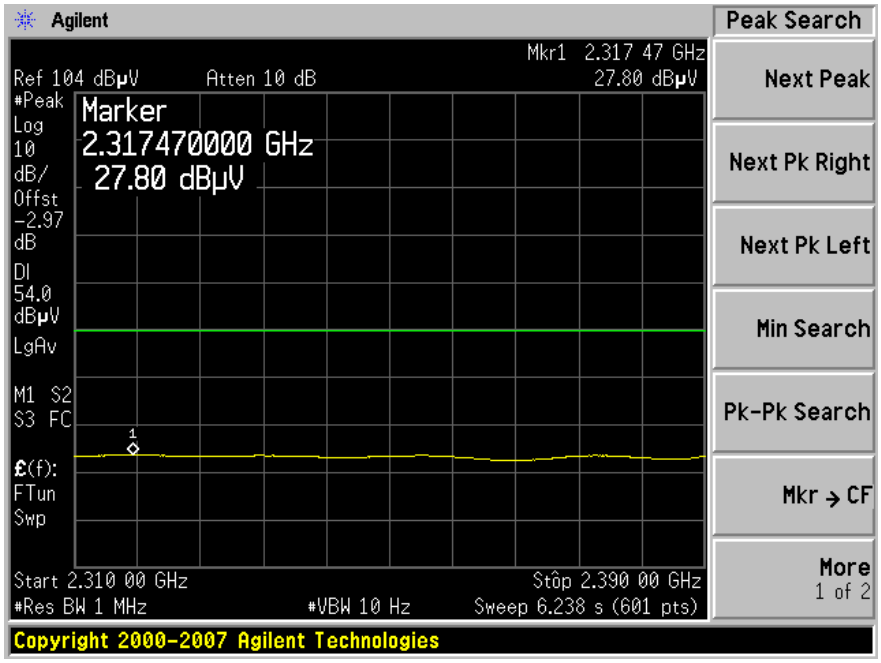
802.11b, Lowest Channel at Horizontal, Average



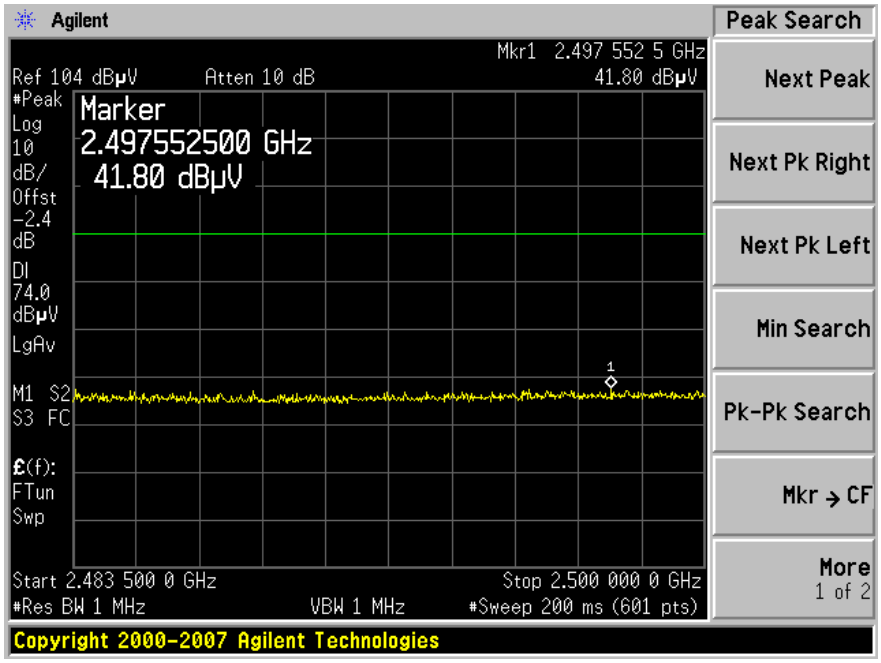
802.11b, Lowest Channel at Vertical, Peak



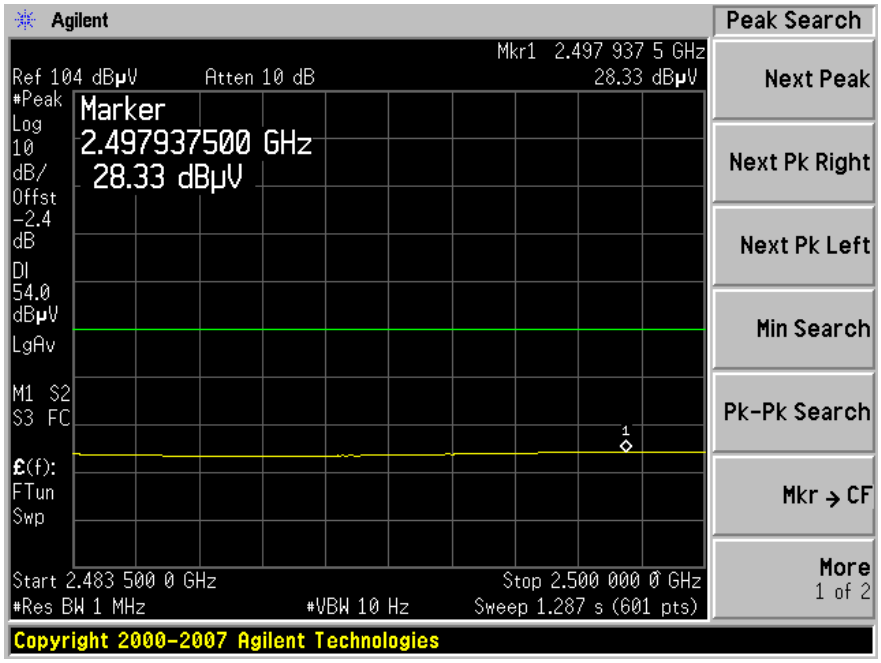
802.11b, Lowest Channel at Vertical, Average



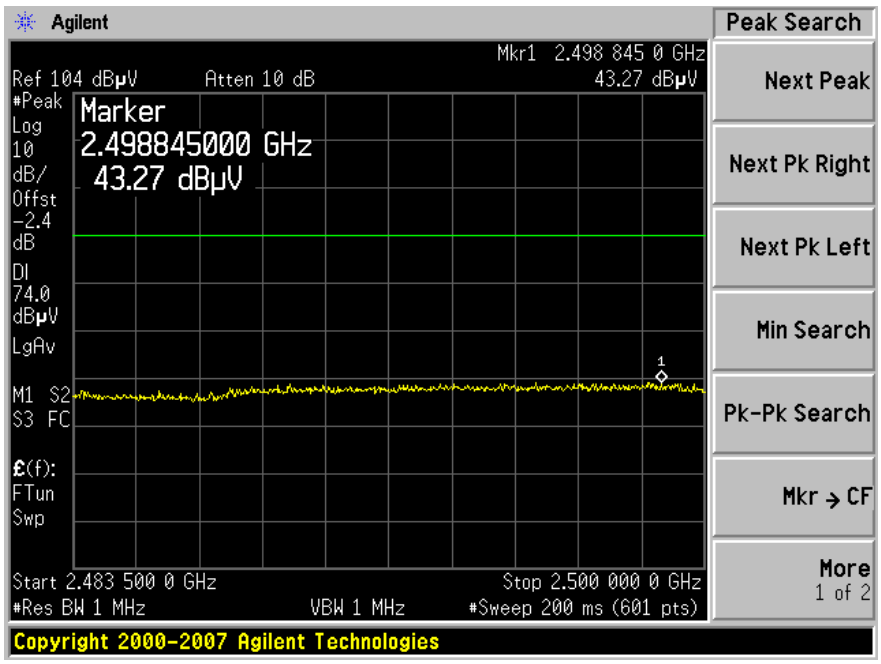
802.11b, Highest Channel at Horizontal, Peak



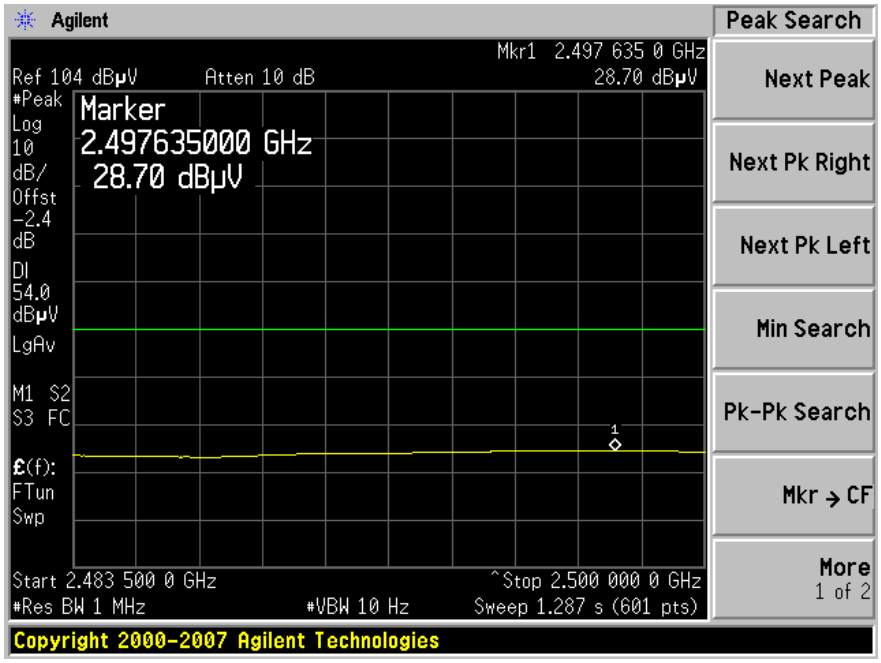
802.11b, Highest Channel at Horizontal, Average



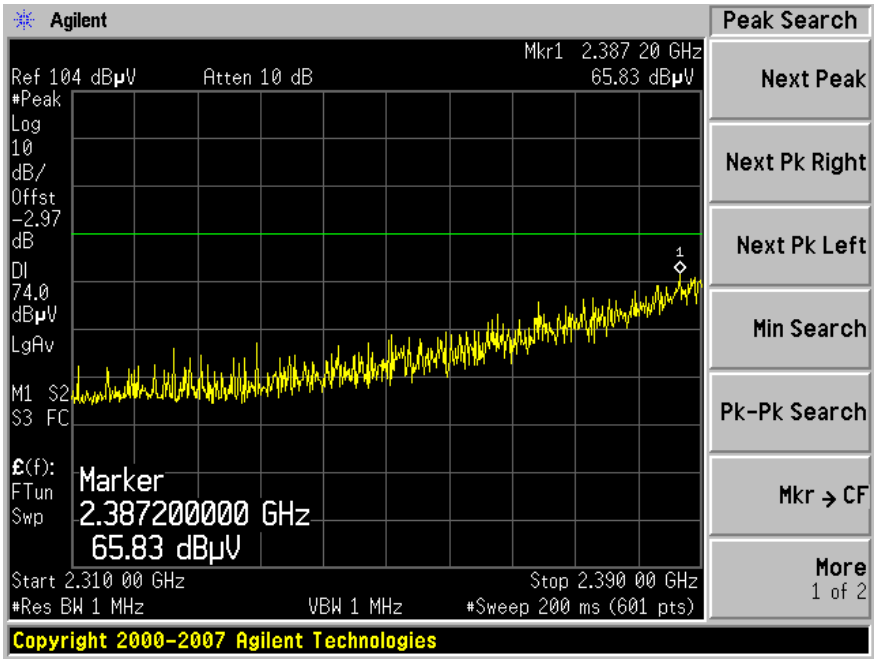
802.11b, Highest Channel at Vertical, Peak



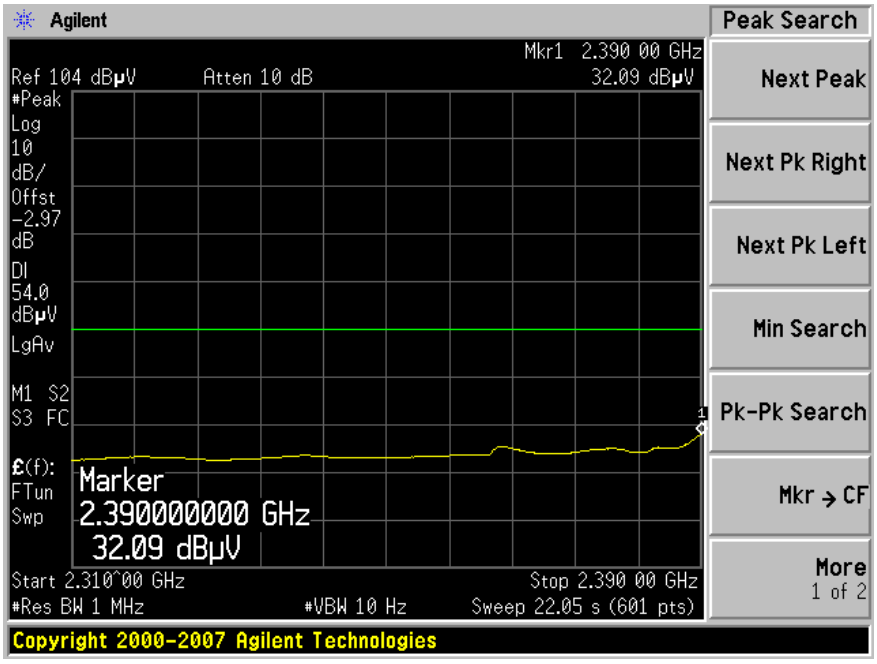
802.11b, Highest Channel at Vertical, Average



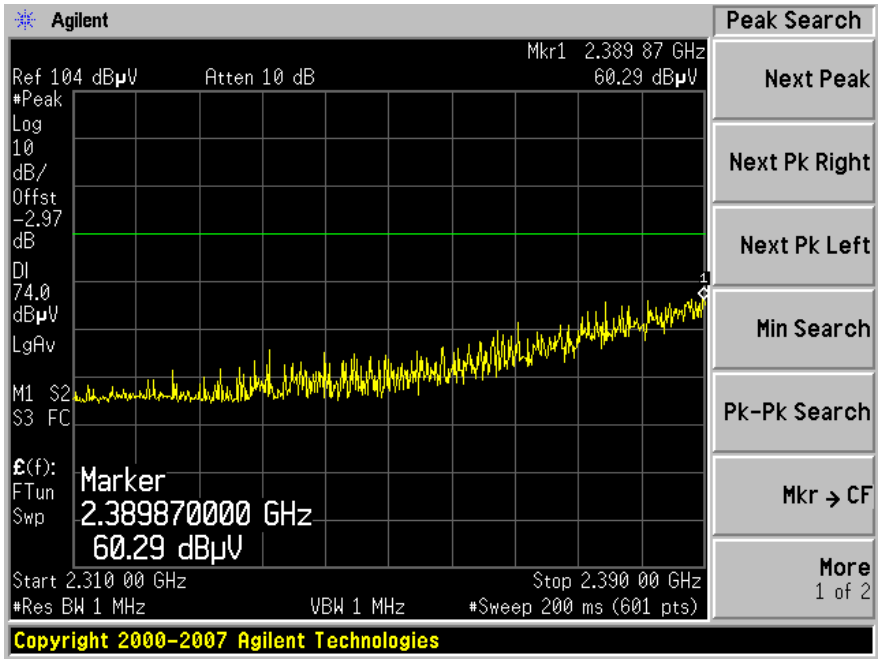
802.11 g, Lowest Channel at Horizontal, Peak



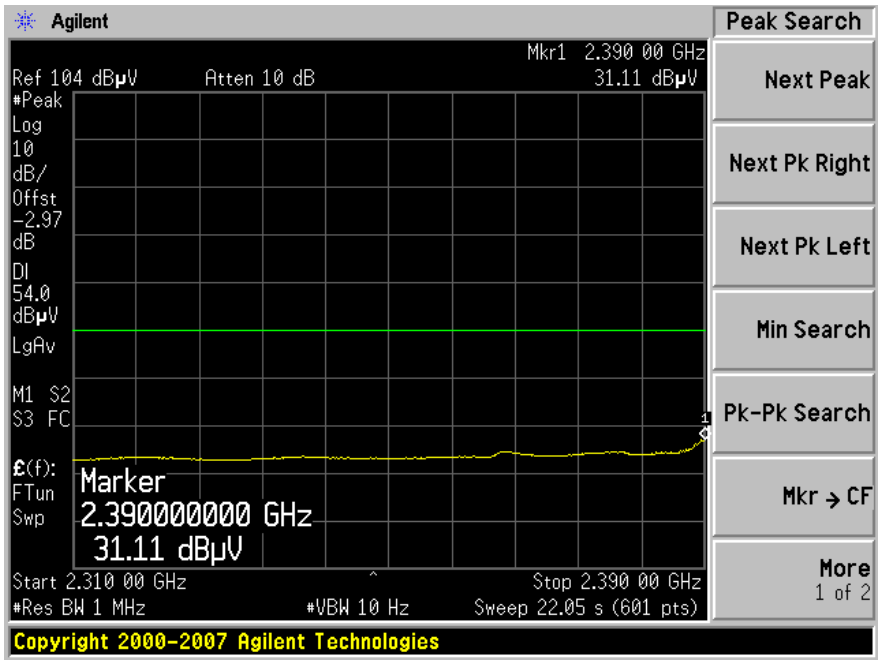
802.11g, Lowest Channel at Horizontal, Average



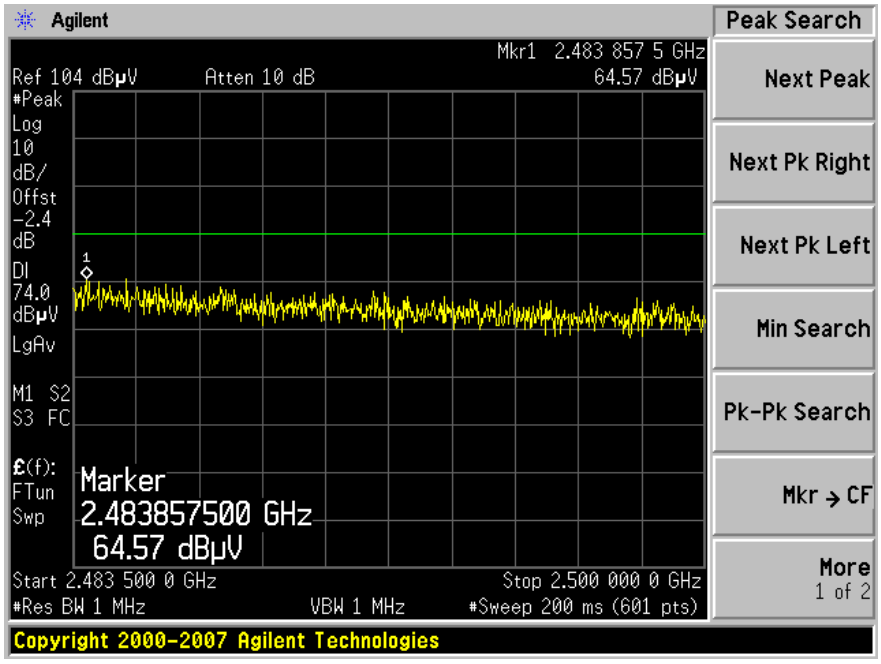
802.11g, Lowest Channel at Vertical, Peak



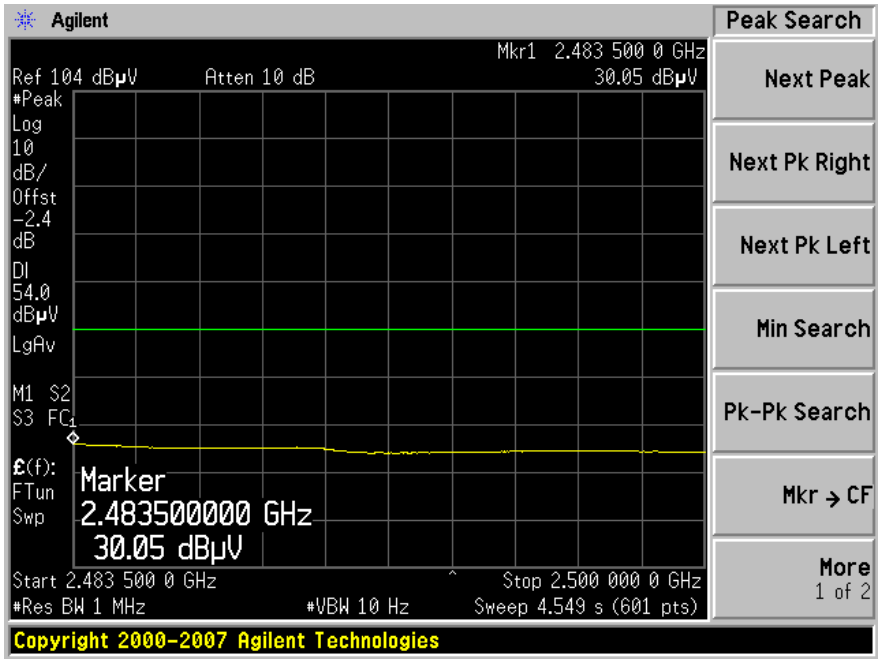
802.11g, Lowest Channel at Vertical, Average



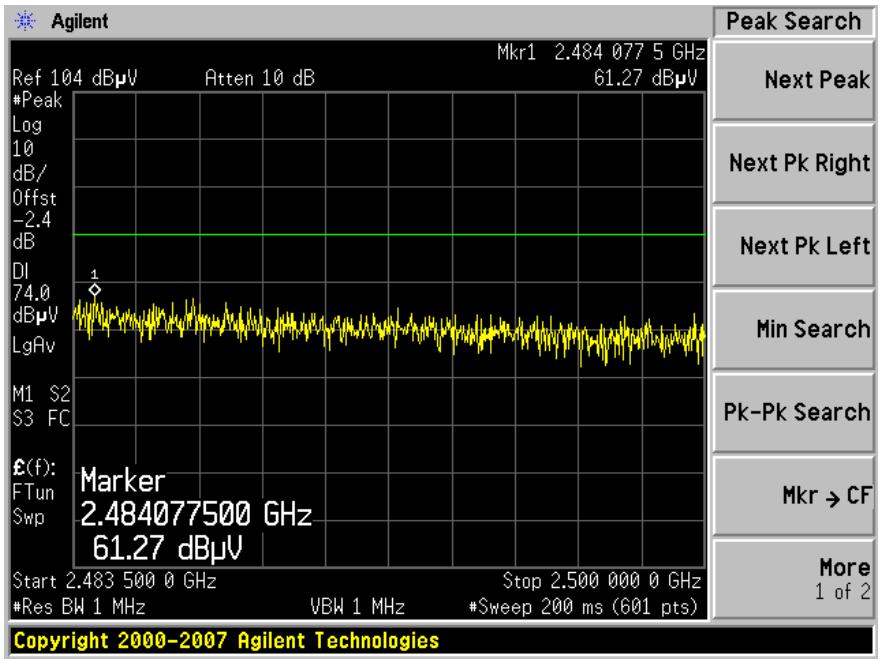
802.11g, Highest Channel at Horizontal, Peak



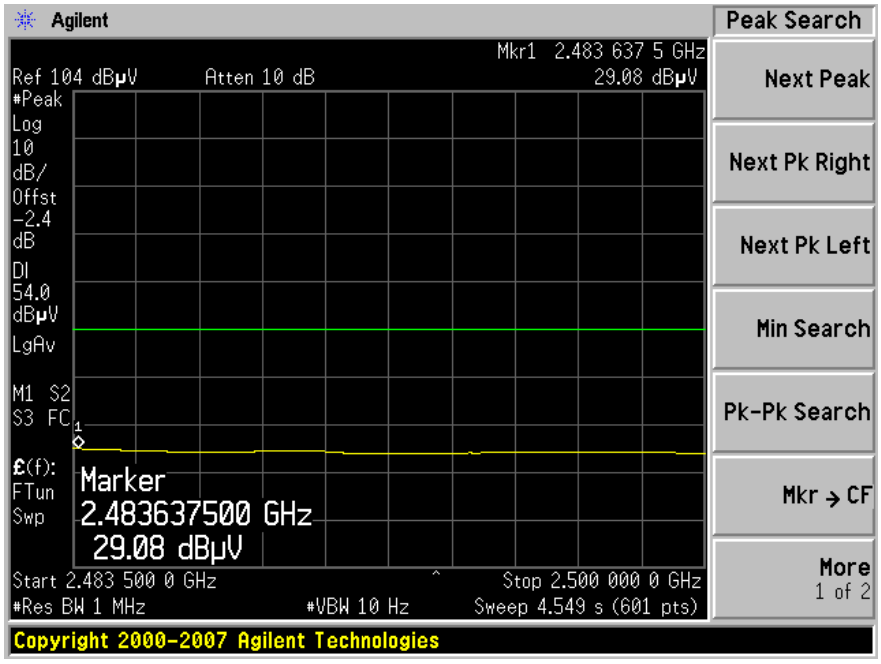
80.211g, Highest Channel at Horizontal, Average



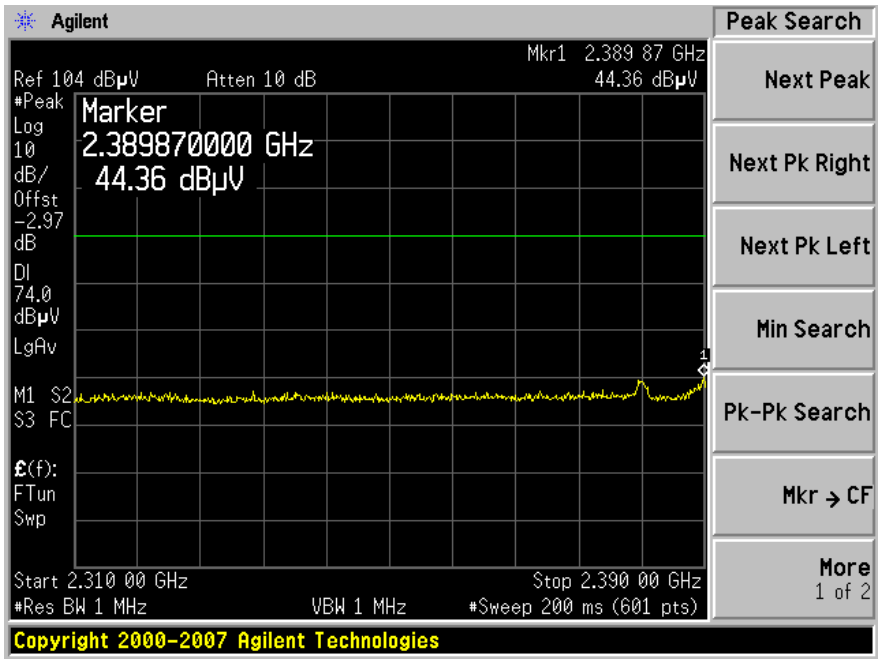
802.11g, Highest Channel at Vertical, Peak



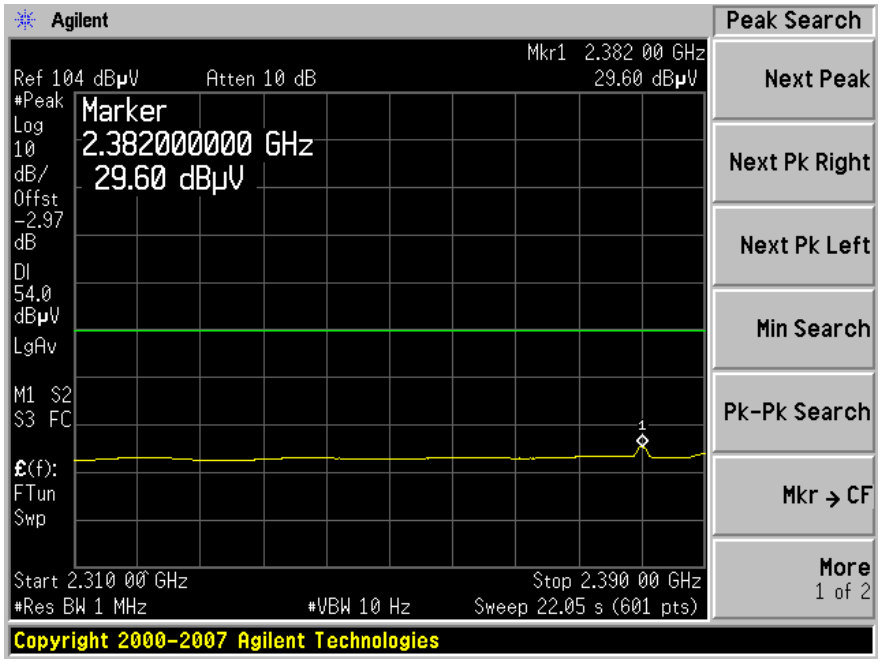
802.11g, Highest Channel at Vertical, Average



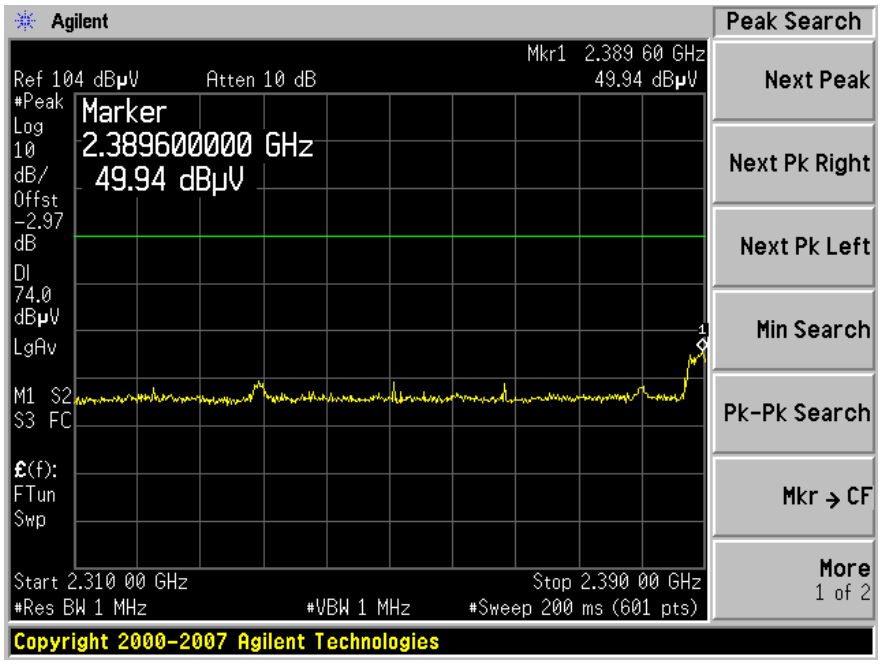
Bluetooth, Lowest Channel at Horizontal, Peak



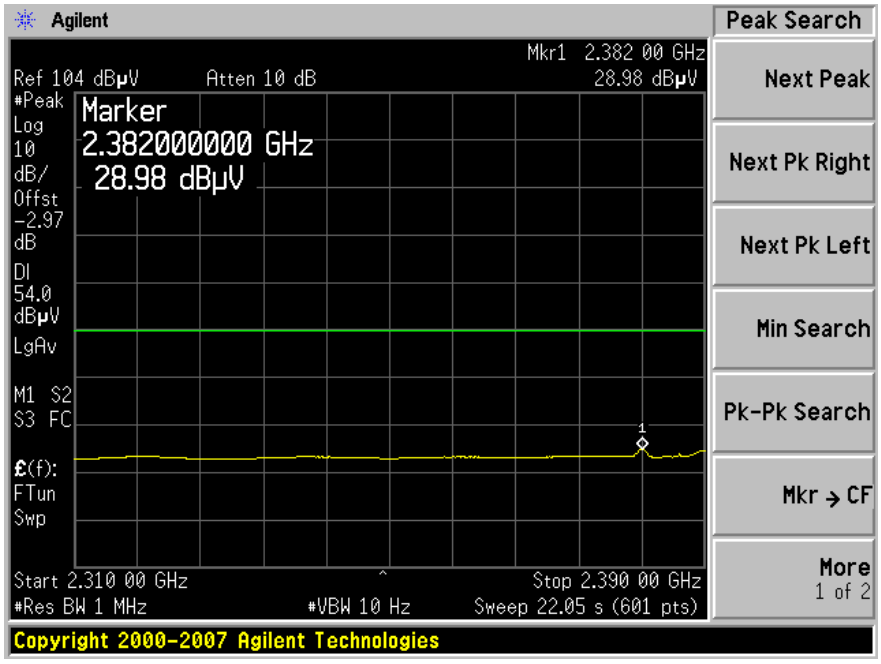
Bluetooth, Lowest Channel at Horizontal, Average



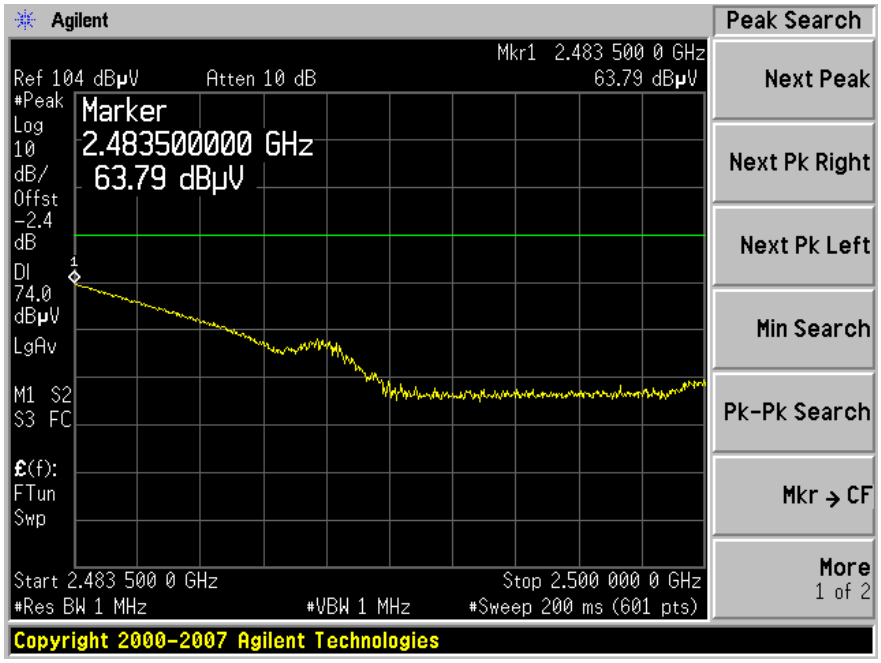
Bluetooth, Lowest Channel at Vertical, Peak



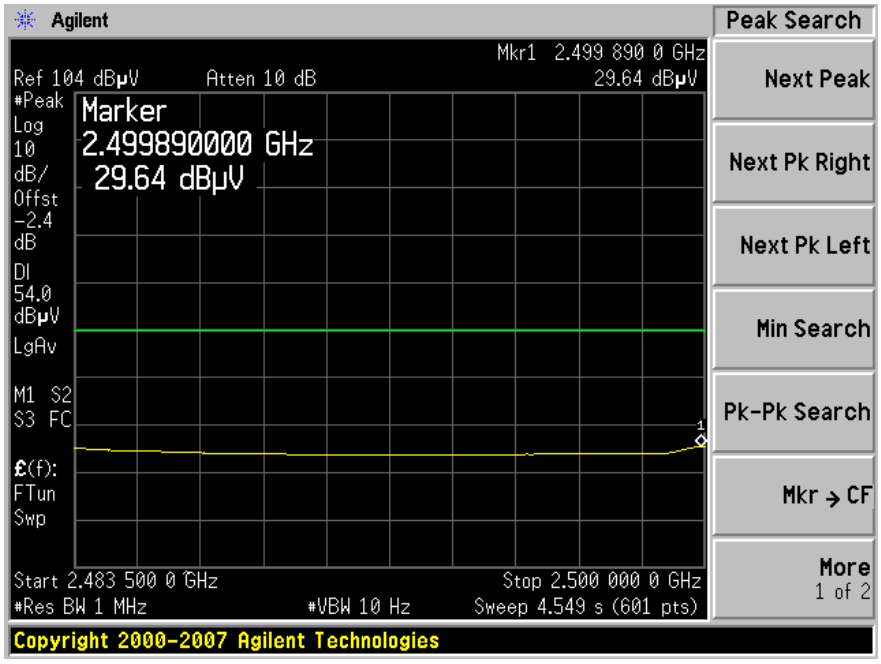
Bluetooth, Lowest Channel at Vertical, Average



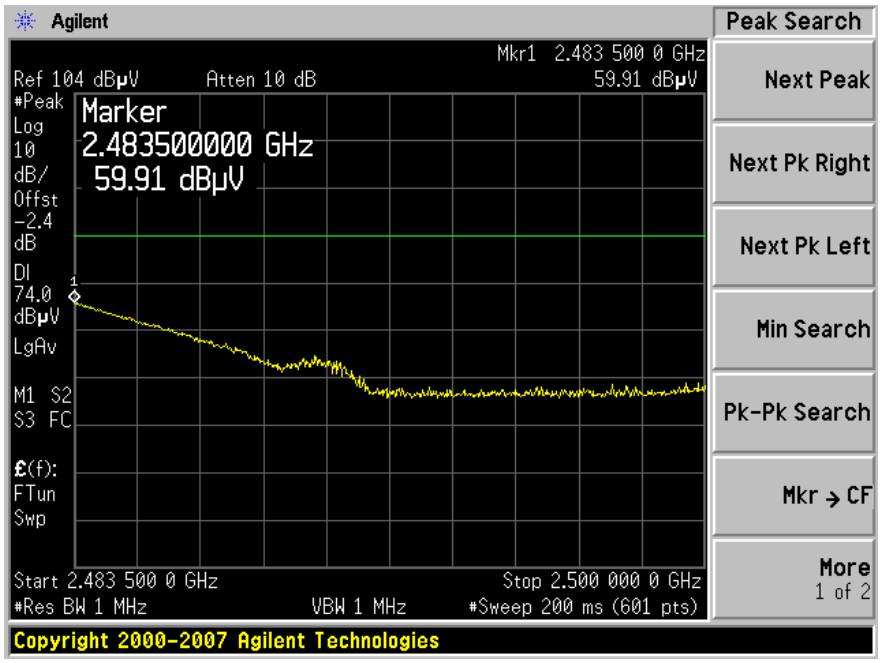
Bluetooth, Highest Channel at Horizontal, Peak



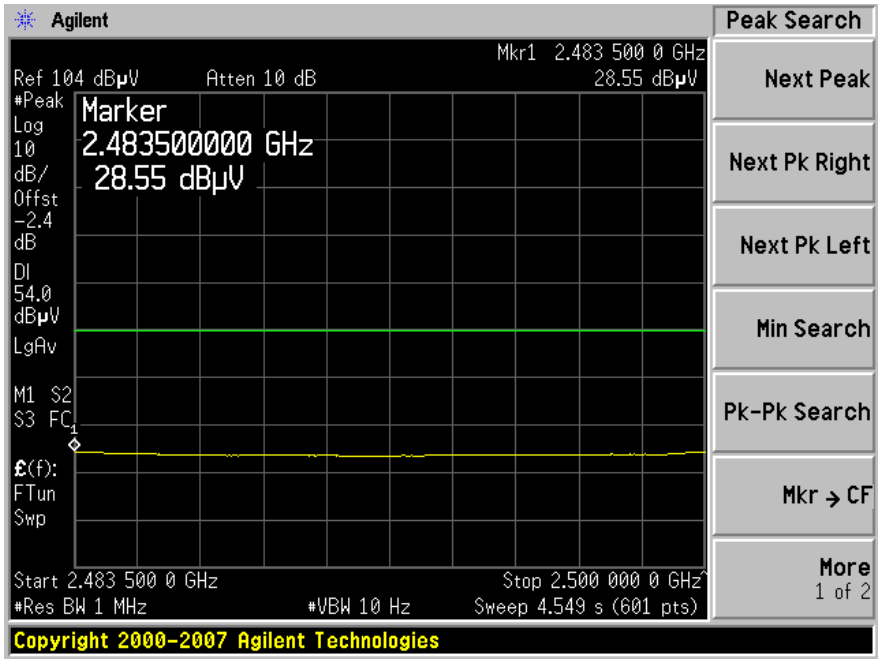
Bluetooth, Highest Channel at Horizontal, Average



Bluetooth, Highest Channel at Vertical, Peak



Bluetooth, Highest Channel at Vertical, Average



9 FCC§15.247(a) (2) – Occupied Bandwidth

9.1 Applicable Standard

According to FCC §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Measurement Results

Refer to FCC ID: V83BLUEW-2310M

10 FCC §15.247(b) - Peak Output Power Measurement

10.1 Applicable Standard

According to FCC §15.247(b) (3) for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

10.2 Measurement Results

Refer to FCC ID: V83BLUEW-2310M

11 FCC §15.247(d) - 100 kHz Bandwidth of Band Edges

11.1 Applicable Standard

According to FCC §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).

11.2 Measurement Results

Refer to FCC ID: V83BLUEW-2310M

12 FCC §15.247(e) - Power Spectral Density

12.1 Applicable Standard

According to FCC §15.247 (e) and RSS-210 § A8.2 (b) , for digitally modulated systems, the 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.

12.2 Measurement Results

Refer to FCC ID: V83BLUEW-2310M

13 FCC §15.247(a) (1) - Hopping Channel Separation

13.1 Applicable Standard

According to FCC §15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

13.2 Measurement Results

Refer to FCC ID: V83BLUEW-2310M

14 FCC §15.247(a) (1) (iii) – Number of Hopping Frequencies Used

14.1 Applicable Standard

According to FCC §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

14.2 Measurement Results

Refer to FCC ID: V83BLUEW-2310M

15 FCC §15.247(a)(1)(iii) – Dwell Time

15.1 Applicable Standard

According to FCC §15.247 (a)(1)(iii), the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

15.2 Measurement Results

Refer to FCC ID: V83BLUEW-2310M