FCC Part 15C

Measurement and Test Report

For

AsiaRF Ltd.

4F., No.2, Lane560, Zhongzheng Rd., Xindian City, Taipei Country 231, Taiwan

FCC ID: TKZAIB1105G

Report Concerns: Original Report	**Equipment Type:** 802.11b/g 500mW WiFi Booster

Model:	AIB1105G
Report No.:	STR08088140I
Test/Witness Engineer:	Seven Song
Test Date:	2008-09-02 to 2008-09-24
Issue Date:	2008-09-25

Prepared By:

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Approved & Authorized By: Jandy So

Jandy So / PSQ Manager

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	AsiaRF Ltd.
Address of applicant:	4F., No.2, Lane560, Zhongzheng Rd., Xindian City, Taipei Country 231, Taiwan
Manufacturer:	AsiaRF Ltd.
Address of manufacturer:	4F., No.2, Lane560, Zhongzheng Rd., Xindian City, Taipei Country 231, Taiwan

General Description of E.U.T

Items	Description
EUT Description:	802.11b/g 500mW WiFi Booster
Trade Name:	AsiaRF
Model No.:	AIB1105G
Rated Voltage:	DC 5V
Max. Output Power	500mW
Antenna Gain:	<1.5dBi
Frequency range:	2412MHz~2462MHz
Number of channels:	11
Channel Separation:	5MHz
Type of Antenna:	Extra Antenna
Size:	4.2x2.0x1.0 cm

Note: The test data gathered are from a production sample provided by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the AsiaRF Ltd. in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted 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.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted with Low Channel, Middle Channel and High Channel, accordingly in reference to the Operating Instructions.

1.5 Test Facility

- **FCC – Registration No.: 994117**
  SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**
  The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

1.6 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components.

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
TW	Power Adaptor	SA01-6USG05-A	/
XSS	Power Adaptor	BI07-050120-AdU	/
IBM	Notebook	T22	LV14893
Gi-Link	Router	RG2415	/
Lenovo	Printer	3110	OD65133711480

1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC Power Cable	1.5	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203; § 15.247(c)(1)(i)	Antenna Requirement	Compliant
§ 1.1307(b)	Maximum Permissible Exposure	Compliant
§ 15.207	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	Power Output	Compliant
§ 15.209(a)(d)	Radiated Emission	Compliant
§ 15.247(d)	Band edge	Compliant

3. CONDUCTED EMISSIONS

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 0.5 dB.

3.2 Test Equipment List and Details

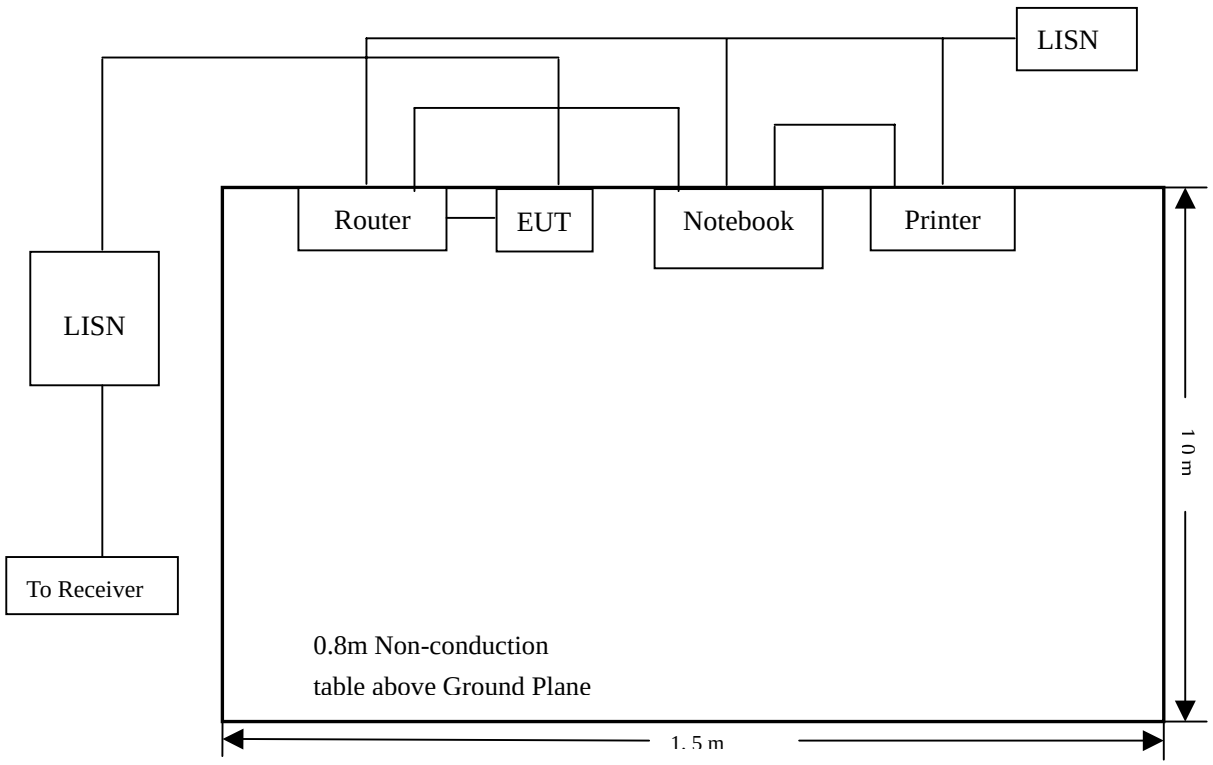
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2008-01-25	2009-01-24
Puls Limiter	Rohde & Schwarz	ESH3-Z2	100911	2008-01-25	2009-01-24
L.I.S.N.	SCHWARZBECK	NSLK8126	8126-224	2008-01-25	2009-01-24
L.I.S.N.	EMCO	3825/2	11967C	2008-01-25	2009-01-24

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

3.3 Test Procedure

Test is conducting under the description of 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.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	20° C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

-6.9 dBμV at **0.966 MHz** in the **Line QP** Detector, XSS Power Adaptor, 0.15-30MHz

3.7 Conducted Emissions Test Data

For TW Power Adaptor:

LINE CONDUCTED EMISSIONS				FCC 15.207	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Ave/Pk	Line/Neutral	dBμV	dB
4.218	48.15	QP	Neutral	56	-7.9
1.966	37.47	Ave	Line	46	-8.5
12.012	40.82	Ave	Neutral	50	-9.2
23.902	50.64	QP	Neutral	60	-9.4
0.510	36.47	Ave	Line	46	-9.5
19.318	39.33	Ave	Neutral	50	-10.7
12.002	49.30	QP	Line	60	-10.7
1.474	34.87	Ave	Neutral	46	-11.1
24.006	38.86	Ave	Line	50	-11.1
1.474	44.27	QP	Neutral	56	-11.7
4.422	43.76	QP	Line	56	-12.2
12.002	37.85	Ave	Line	50	-12.2
4.494	33.71	Ave	Line	46	-12.3
0.634	43.61	QP	Line	56	-12.4
12.102	47.47	QP	Neutral	60	-12.5
3.094	33.54	Ave	Neutral	46	-12.5
0.422	34.82	Ave	Neutral	47.41	-12.6
0.630	43.01	QP	Neutral	56	-13.0
2.034	42.52	QP	Line	56	-13.5
0.214	39.25	Ave	Line	53.05	-13.8
0.214	48.03	QP	Neutral	63.05	-15.0
0.214	36.70	Ave	Neutral	53.05	-16.3
0.214	46.68	QP	Line	63.05	-16.4

For XSS Power Adaptor:

LINE CONDUCTED EMISSIONS				FCC 15.207	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Ave/Pk	Line/Neutral	dBμV	dB
0.966	49.14	QP	Line	56	-6.9
2.146	38.88	Ave	Line	46	-7.1
1.986	38.52	Ave	Line	46	-7.5
0.790	48.08	QP	Line	56	-7.9
0.314	41.82	Ave	Line	49.86	-8.0
0.294	50.57	QP	Line	60.41	-9.8
0.730	36.23	Ave	Line	46	-9.8
2.218	45.71	QP	Line	56	-10.3
0.990	45.14	QP	Neutral	56	-10.9
0.834	44.32	QP	Neutral	56	-11.7
0.990	34.22	Ave	Neutral	46	-11.8
0.774	31.59	Ave	Neutral	46	-14.4
2.146	40.90	QP	Neutral	56	-15.1
0.302	44.80	QP	Neutral	60.19	-15.4
2.37	30.64	Ave	Neutral	46	-15.4
0.302	34.00	Ave	Neutral	50.19	-16.2

Plot of Conducted Emissions Test Data

Conducted Disturbance

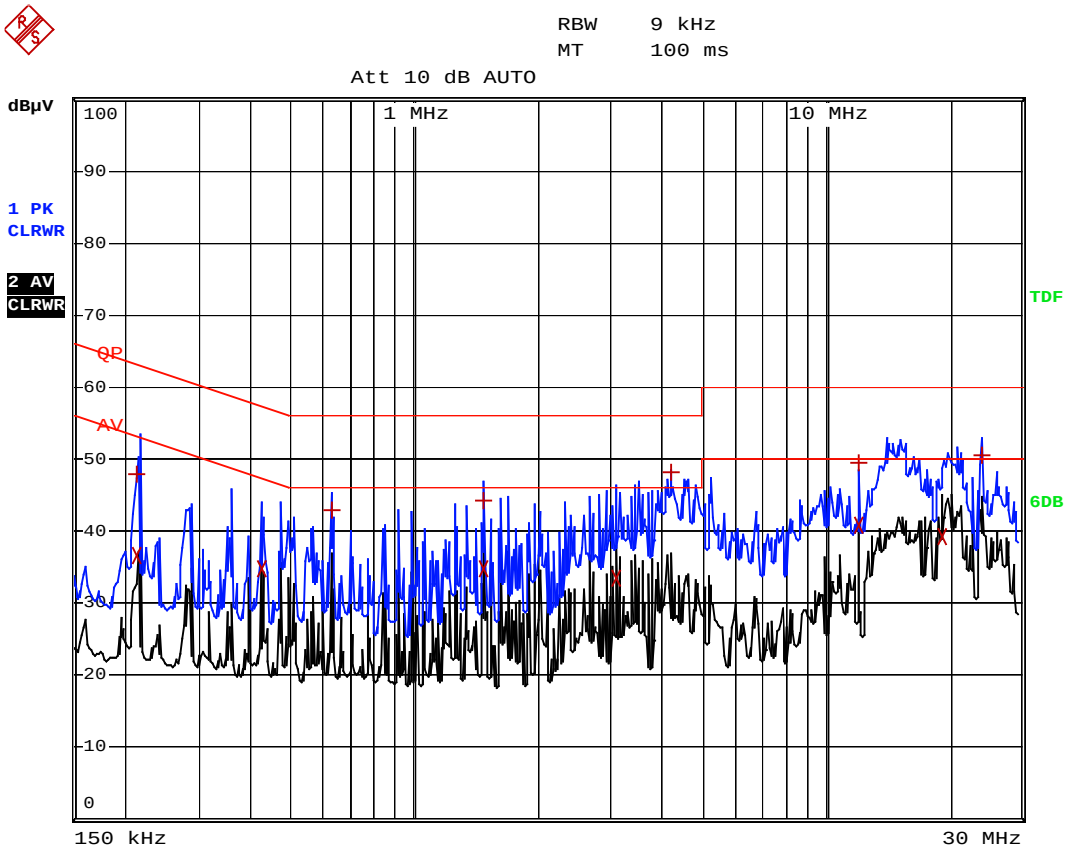
EUT: 802.11b/g 500mW WiFi Booster

M/N: AIB1105G

Operating Condition: Operating

Test Specification: N

Comment: AC 120V/60Hz TW Adapter DC 5V



Plot of Conducted Emissions Test Data

Conducted Disturbance

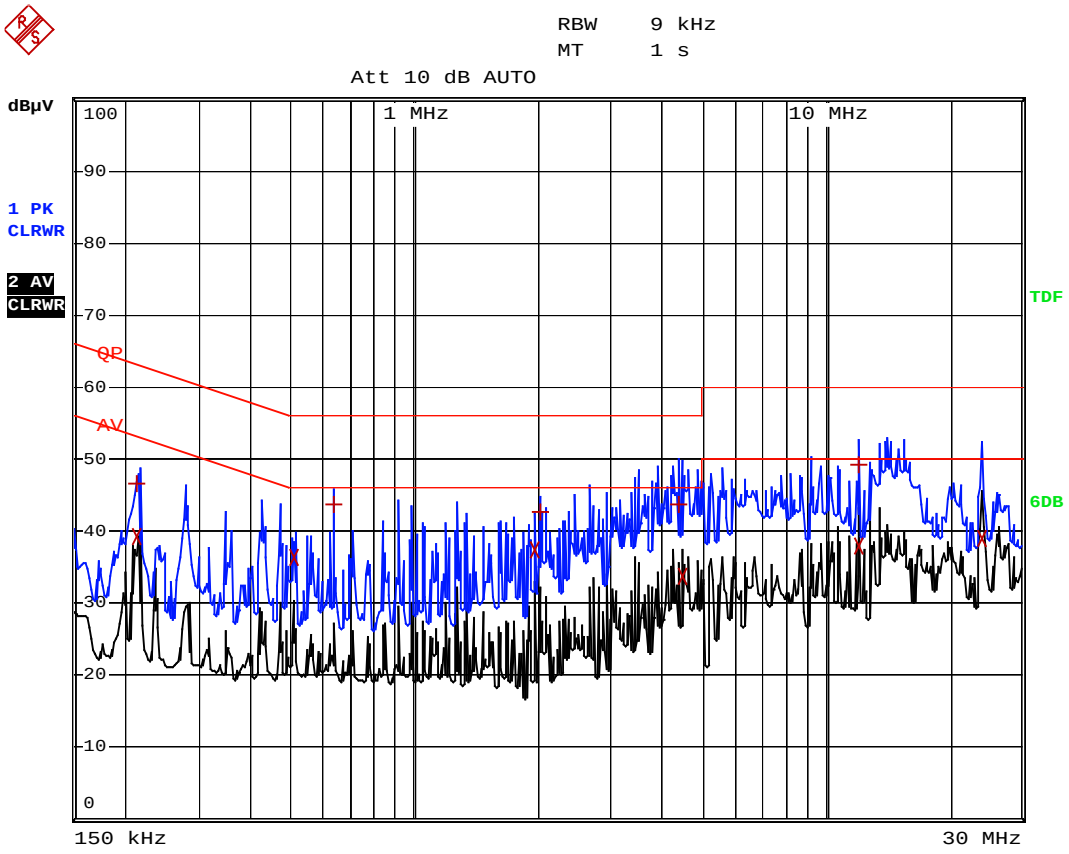
EUT: 802.11b/g 500mW WiFi Booster

M/N: AIB1105G

Operating Condition: Operating

Test Specification: L

Comment: AC 120V/60Hz TW Adapter DC 5V



Plot of Conducted Emissions Test Data

Conducted Disturbance

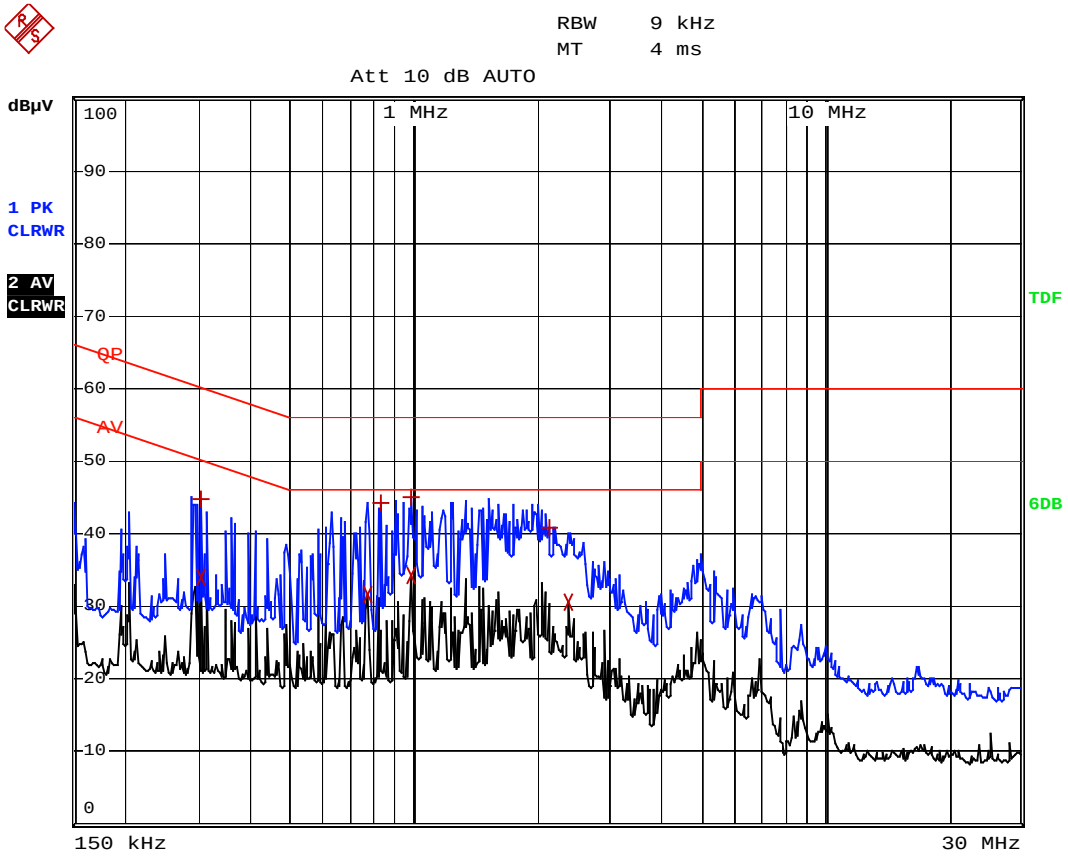
EUT: 802.11b/g 500mW WiFi Booster

M/N: AIB1105G

Operating Condition: Operating

Test Specification: N

Comment: AC 120V/60Hz XSS Adapter DC 5V



Plot of Conducted Emissions Test Data

Conducted Disturbance

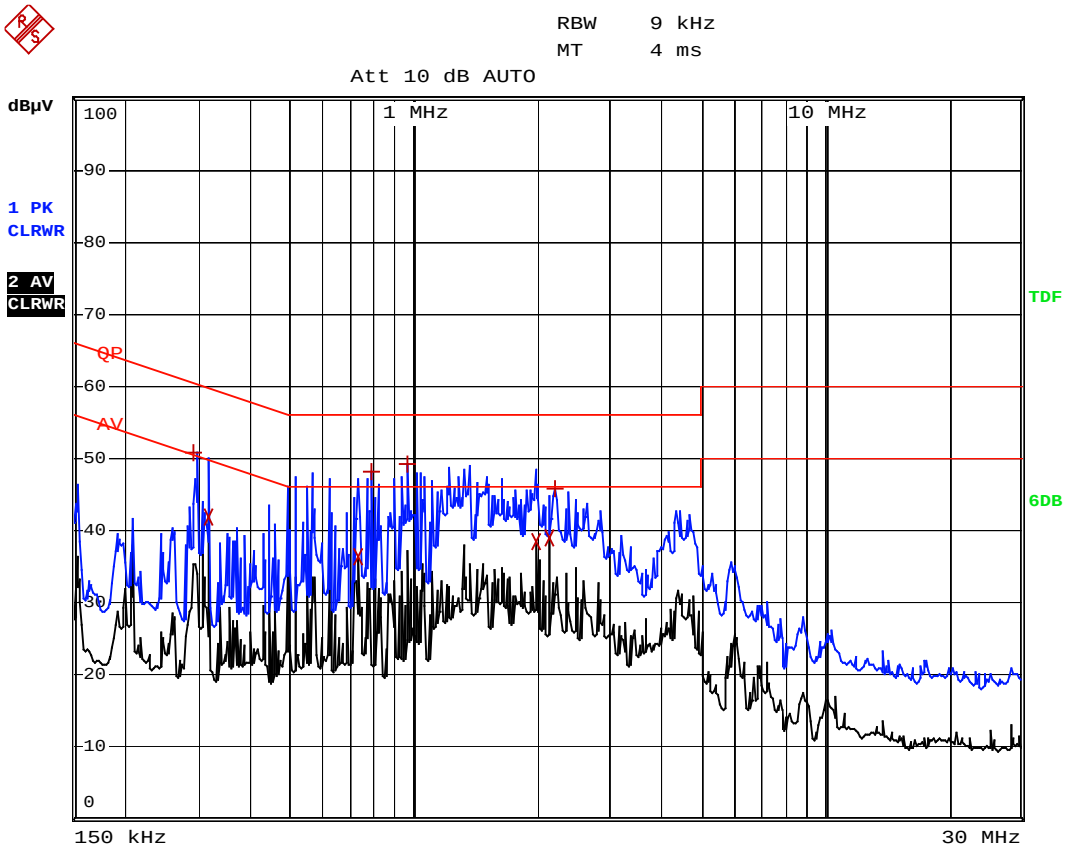
EUT: 802.11b/g 500mW WiFi Booster

M/N: AIB1105G

Operating Condition: Operating

Test Specification: L

Comment: AC 120V/60Hz XSS Adapter DC 5V



4. §15.203 - ANTENNA REQUIREMENT

4.1 Standard Applicable

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.

4.2 Test Result

This product has a Unique antenna, fulfill the requirement of this section.

5. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

5.1 Standard Applicable

According to § 1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100000			1	30

Note: f = frequency in MHz: * = Plane-wave equivalents power density

5.2 MPE Calculation Method

$S = (P*G) / (4*\prod*R^2)$

S = power density (in appropriate units, e.g., mw/cm^2)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

5.3 MPE Calculation Result

Maximum peak output power at antenna input terminal: 27.17(dBm)
Maximum peak output power at antenna input terminal: 521.19471(mW)
Prediction distance: 20 (cm)
Prediction frequency: 2437 (MHz)
Antenna gain (typical): 1.5 (dBi)
Antenna gain (numeric): 1.4125375 (numeric)
The worst case is power density at prediction frequency at 20cm: 0.146468 (mw/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mw/cm^2)

0.146468 (mw/cm^2) < 1 (mw/cm^2)

Result: Pass

6. POWER SPECTRAL DENSITY

6.1 Standard Applicable

According to 15.247(a)(1)(iii), 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.

6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2008-01-25	2009-01-24
RF Limiter	Agilent	11867A	MY42241685	2008-01-25	2009-01-24
RMS/PEAK Voltmeter	Rohde & Schwarz	URE3	826135/008	2008-01-25	2009-01-24

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

6.3 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW, VBW=3KHz, Span = 20MHz.
4. Repeat above procedures until all frequency measured was complete.

6.4 Environmental Conditions

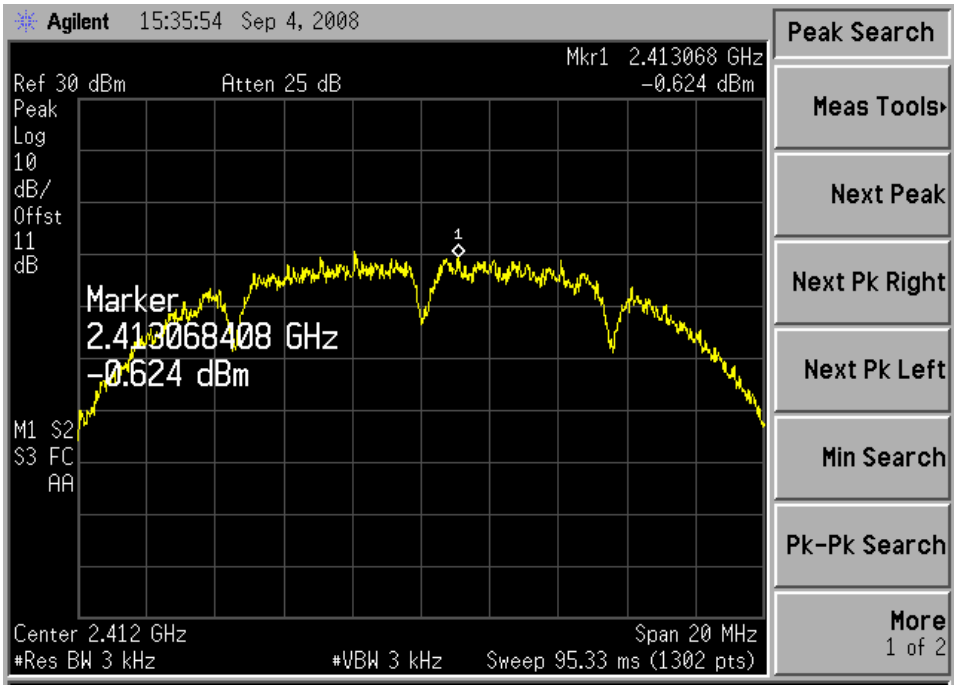
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

6.5 Summary of Test Results/Plots

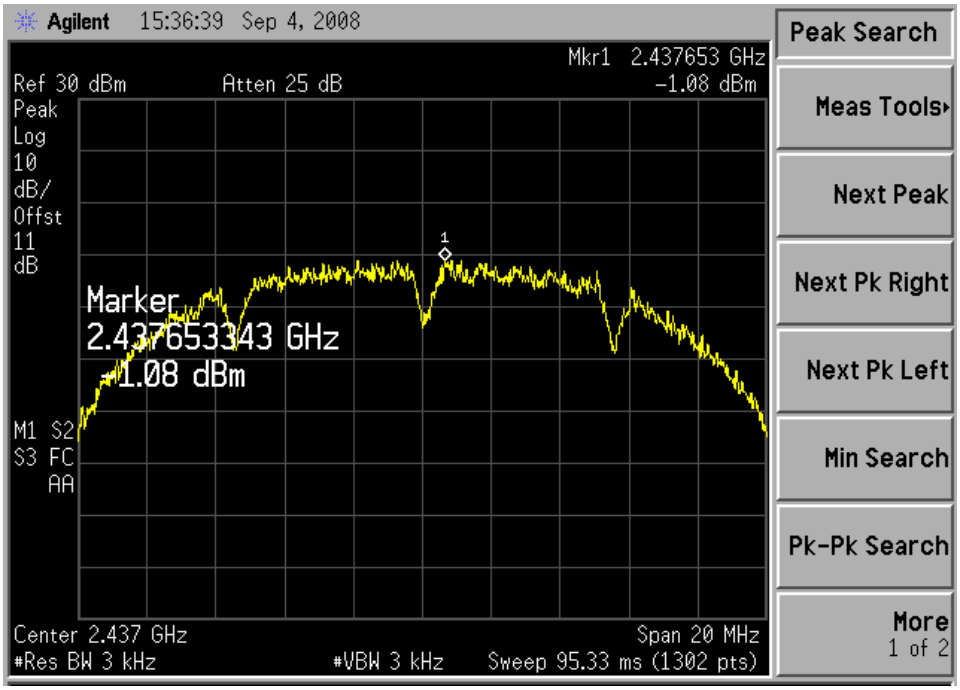
Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-0.624	8
	Middle channel (2437MHz)	-1.08	8
	High channel (2462MHz)	-1.631	8
802.11g	Low channel (2412MHz)	0.477	8
	Middle channel (2437MHz)	-0.377	8
	High channel (2462MHz)	-1.069	8

For 802.11b

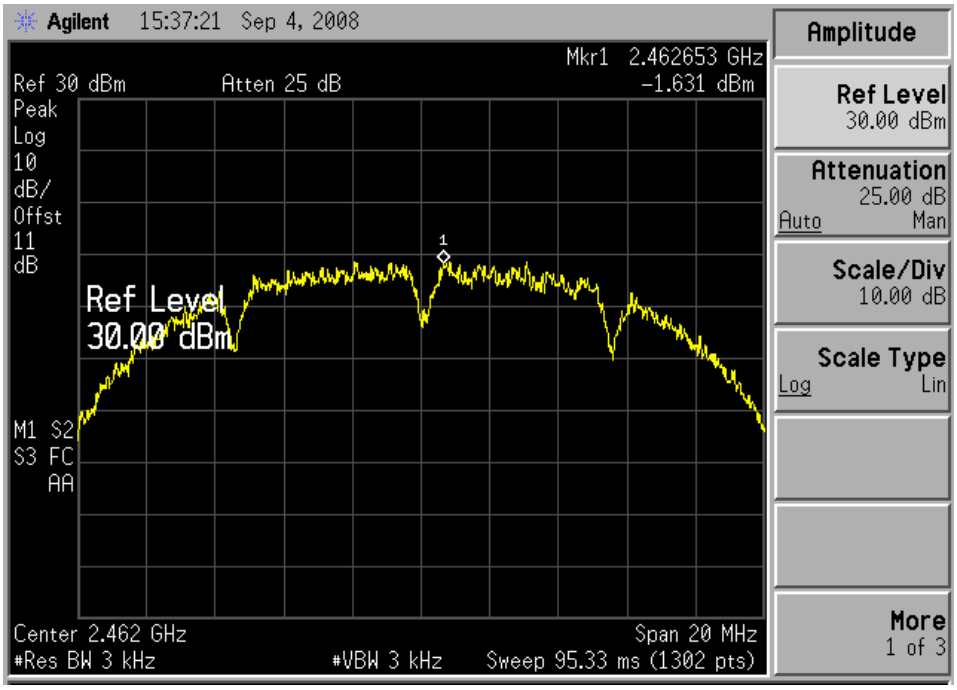
Low Channel:



Middle Channel:

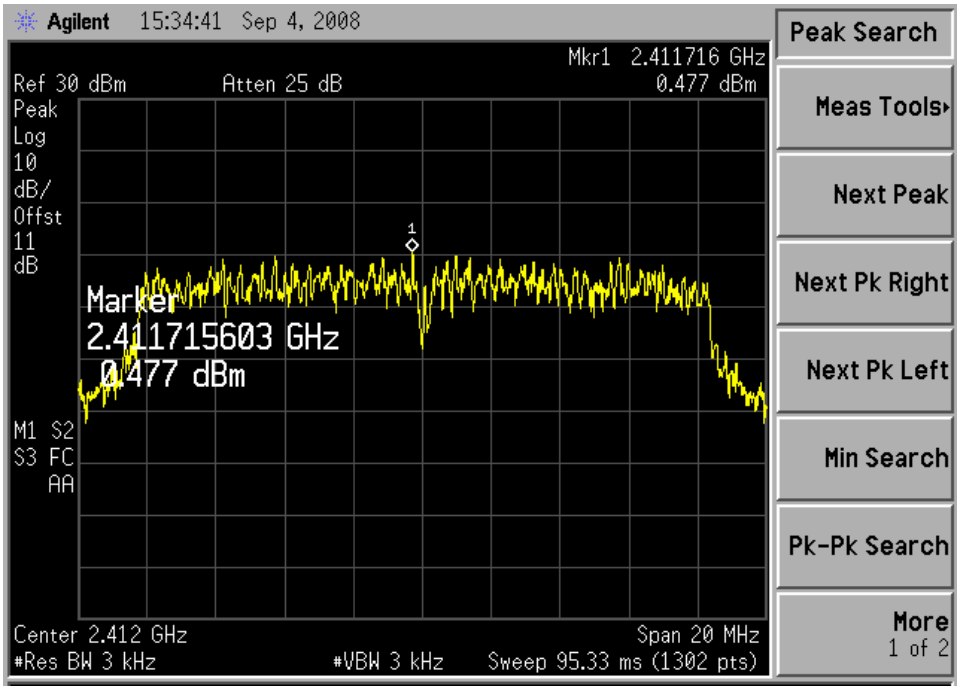


High Channel:

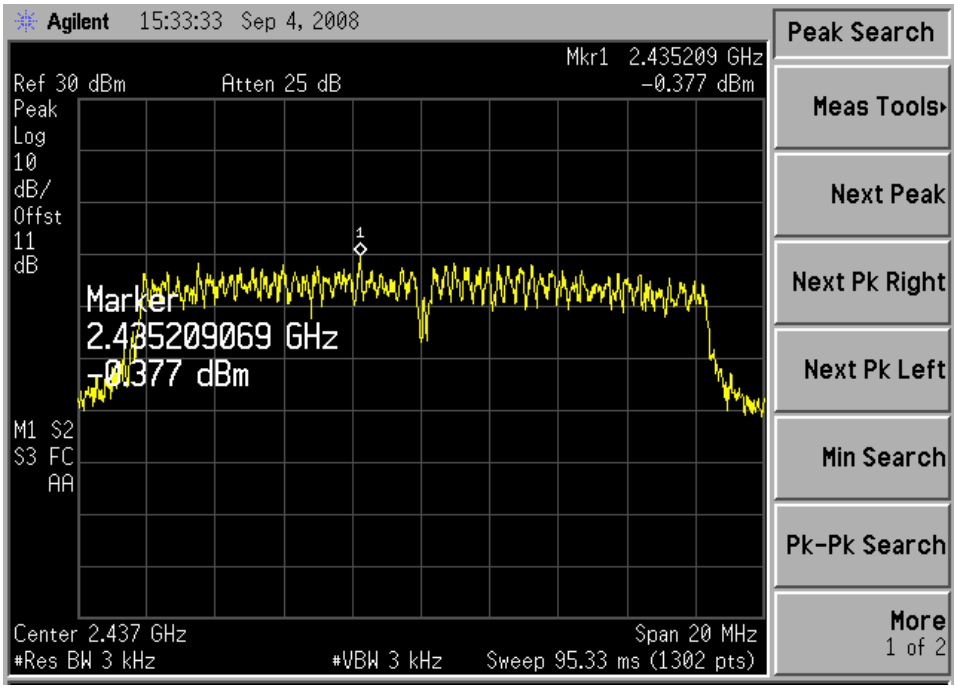


For 802.11g

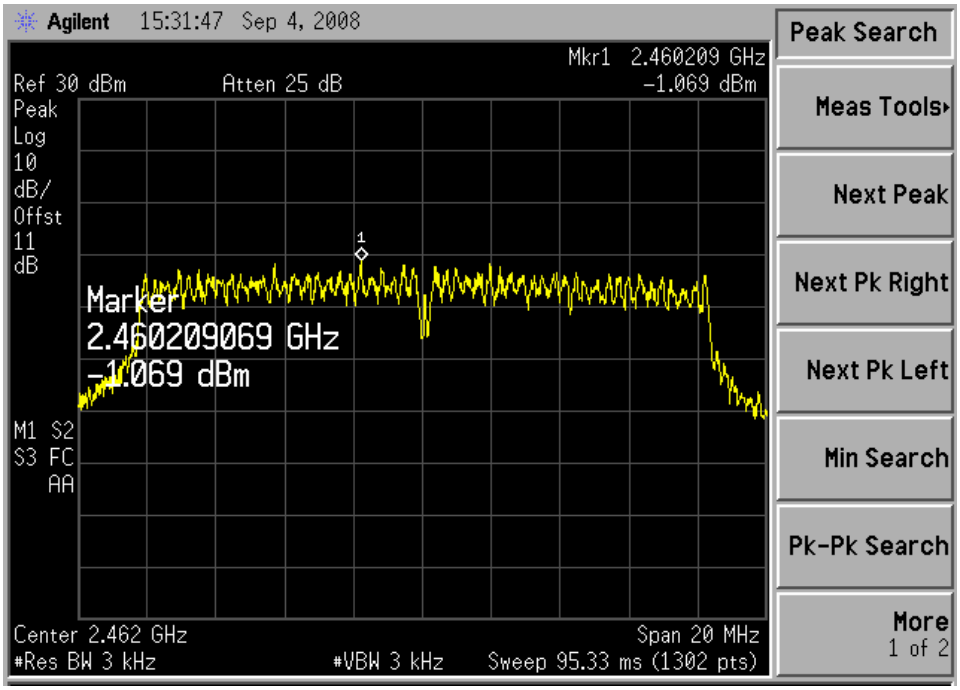
Low Channel:



Middle Channel:



High Channel:



7. 6-dB BANDWIDTH

7.1 Standard Applicable

According to 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.

7.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2008-01-25	2009-01-24
RF Limiter	Agilent	11867A	MY42241685	2008-01-25	2009-01-24

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

7.3 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set center frequency of spectrum analyzer = operating frequency.
3. The spectrum analyzer as RBW=300KHz (1 % of Bandwidth.), Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.

7.4 Environmental Conditions

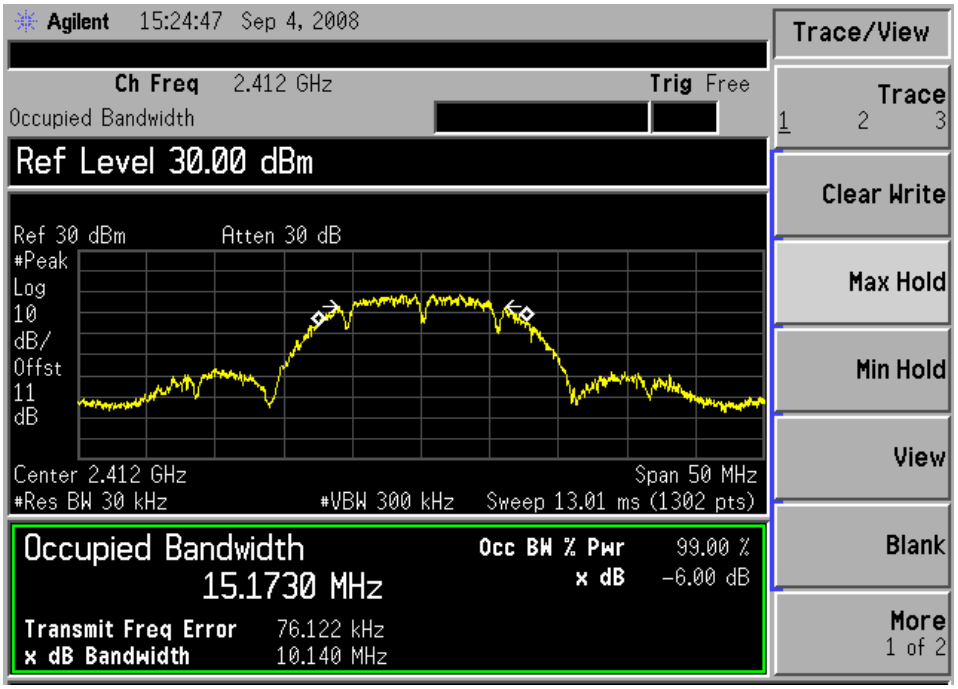
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

7.5 Summary of Test Results/Plots

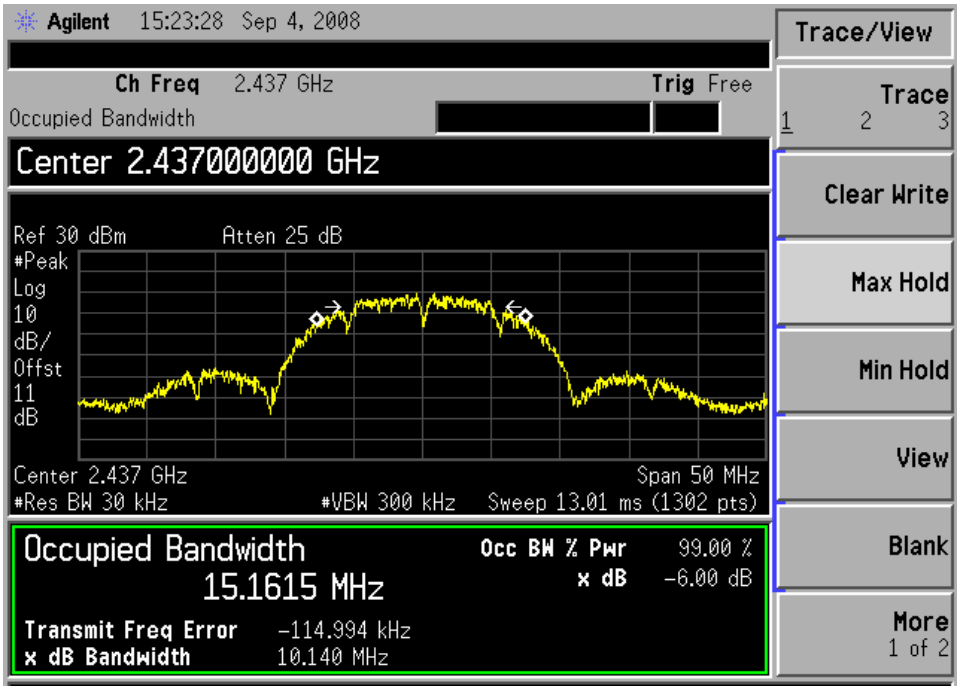
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	15173.0	500
	2437	15161.5	500
	2462	15166.5	500
802.11g	2412	16413.4	500
	2437	16426.5	500
	2462	16359.7	500

For 802.11b

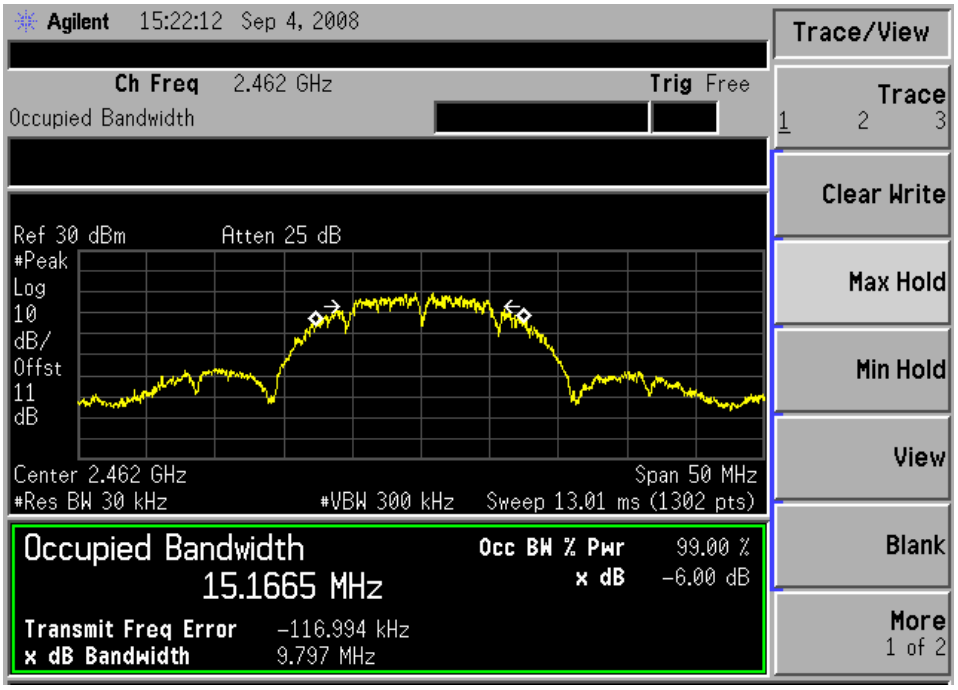
Low Channel:



Mid Channel:

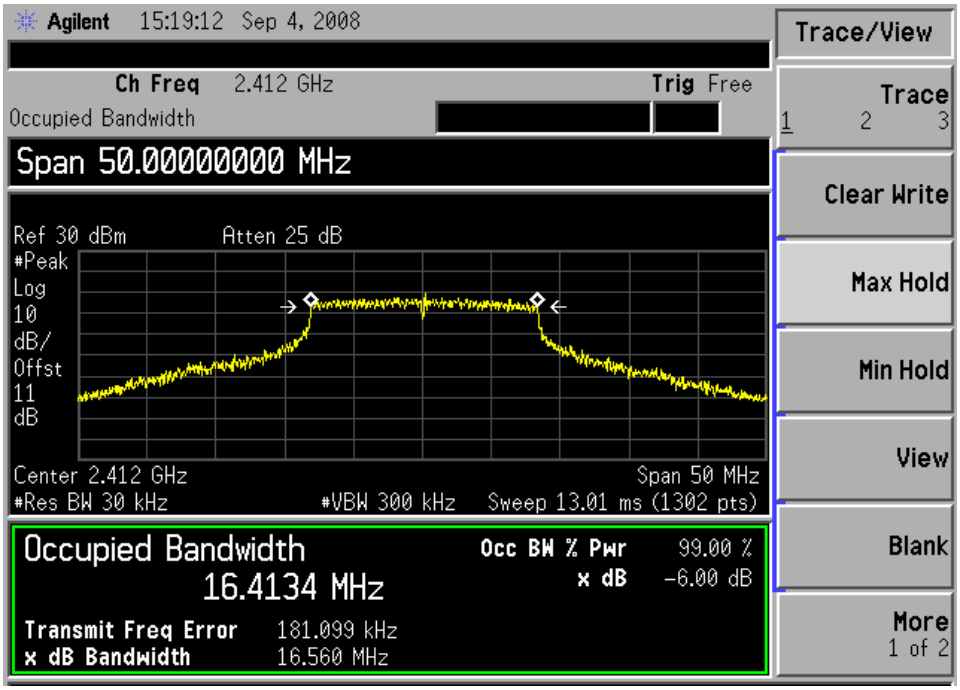


High Channel:

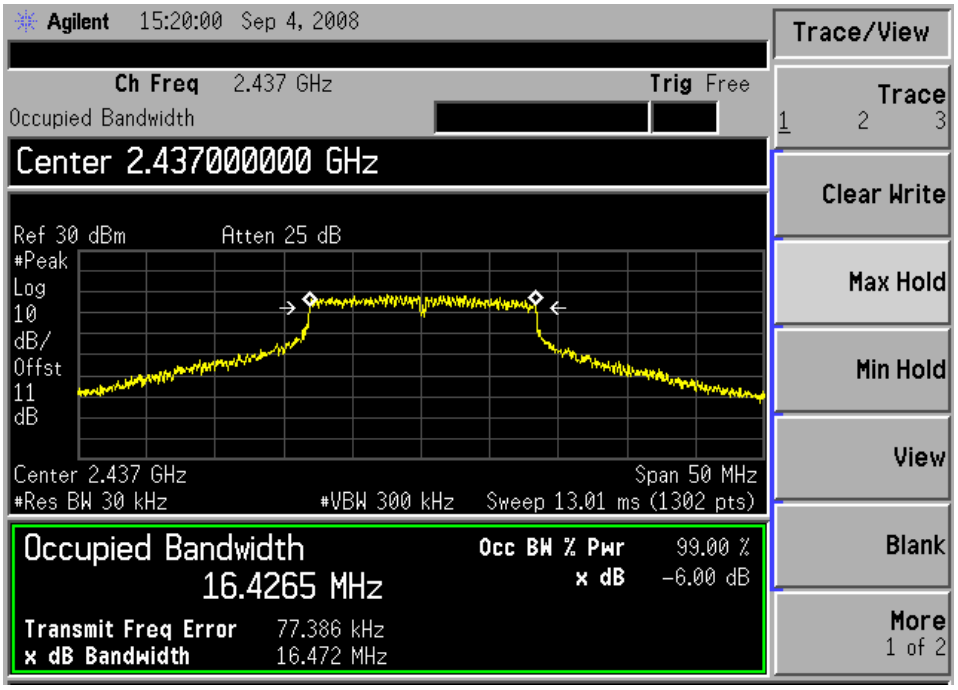


For 802.11g

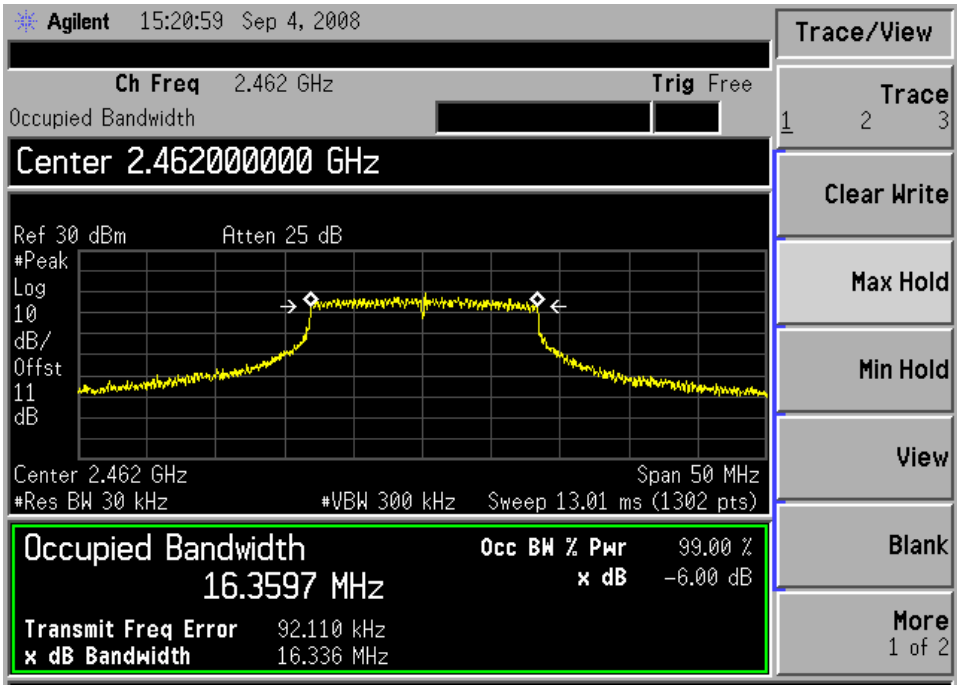
Low Channel:



Mid Channel:



High Channel:



8. POWER OUTPUT

8.1 Standard Applicable

According to 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.

8.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2008-01-25	2009-01-24
RF Limiter	Agilent	11867A	MY42241685	2008-01-25	2009-01-24

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

8.3 Test Procedure

The device under test has an integral antenna and the power was measured on a radiated basis.

8.4 Environmental Conditions

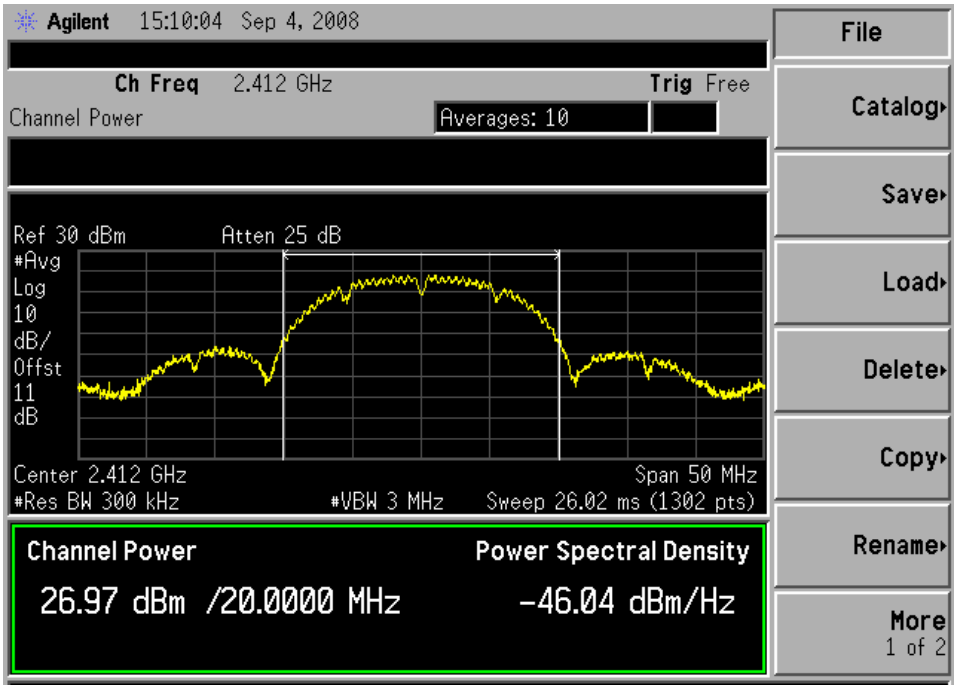
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

8.5 Summary of Test Results/Plots

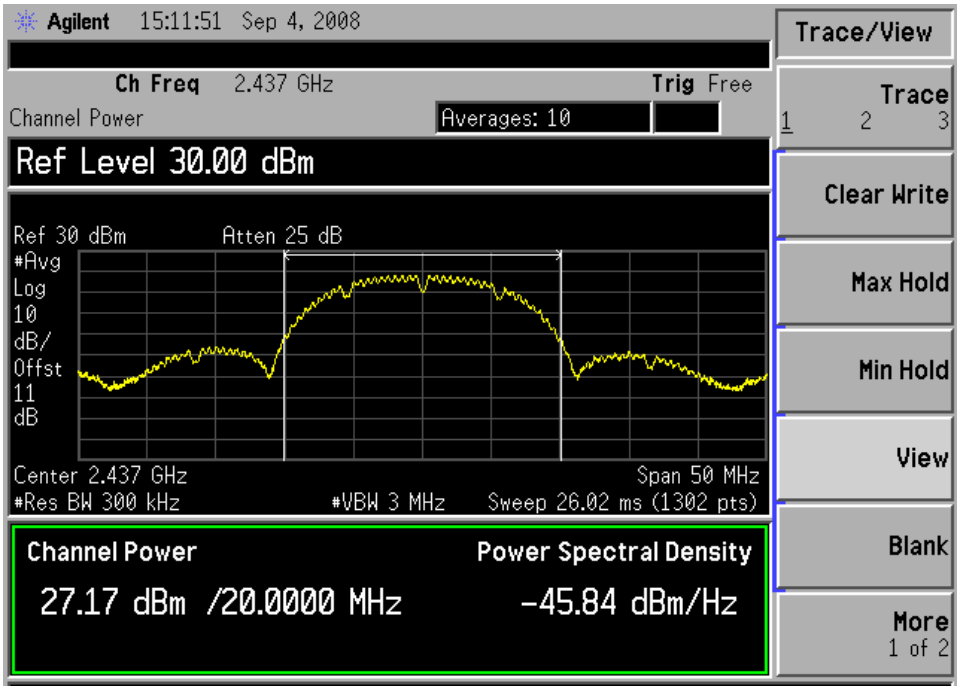
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11b	2412	26.97	0.4977	1
	2437	27.17	0.5212	1
	2462	27.17	0.5212	1
802.11g	2412	24.18	0.2618	1
	2437	23.93	0.2472	1
	2462	23.96	0.2489	1

For 802.11b

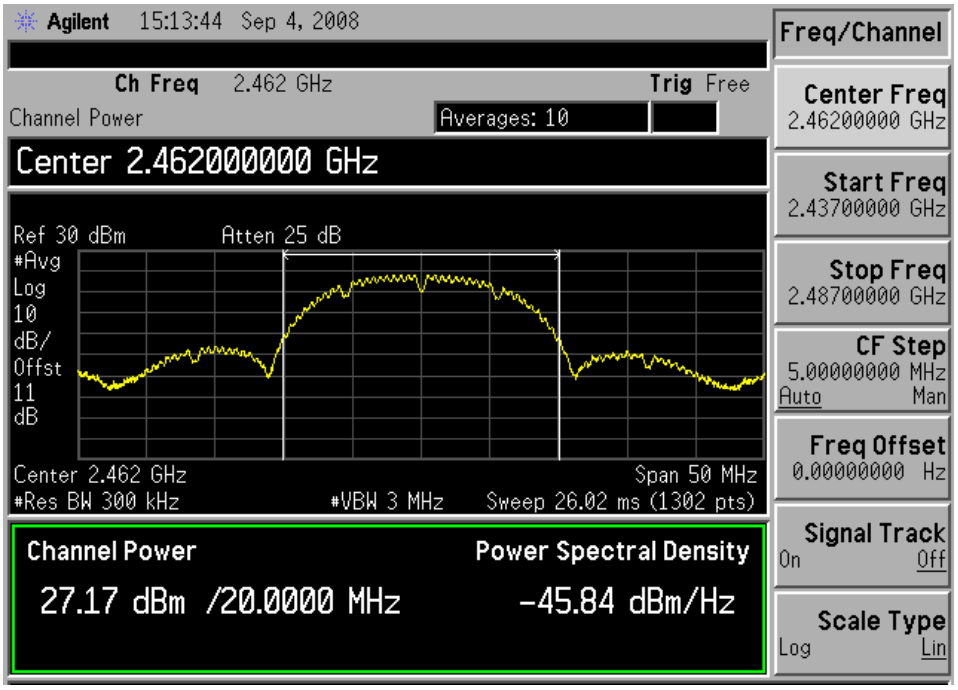
Low Channel:



Middle Channel:

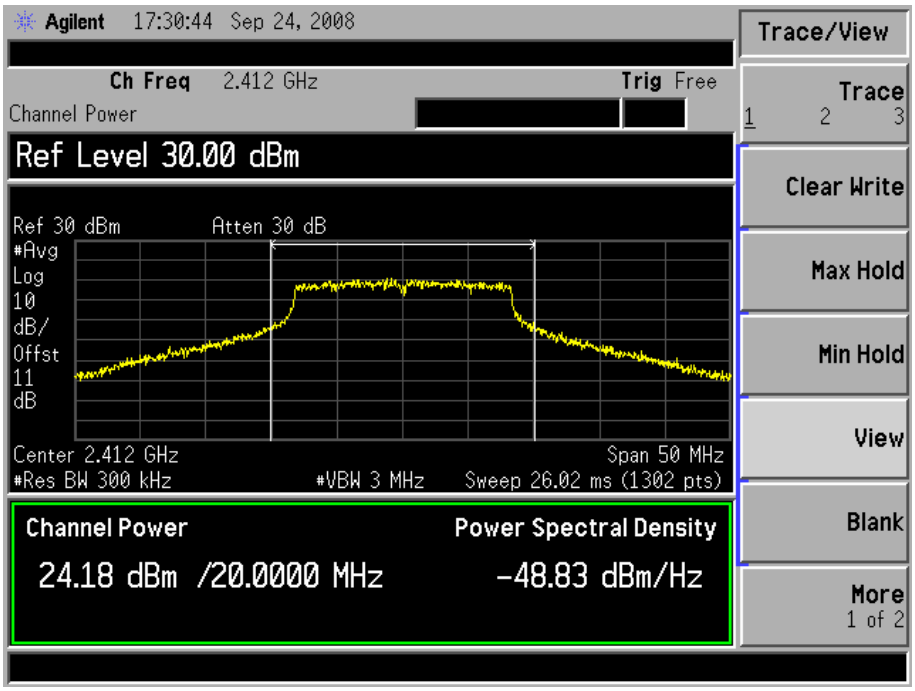


High Channel:

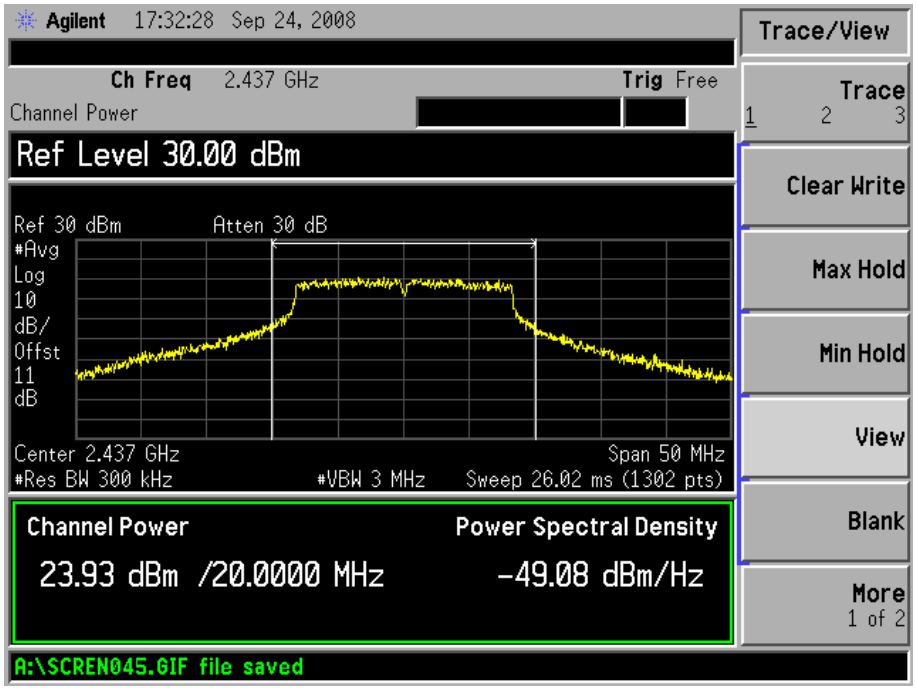


For 802.11g

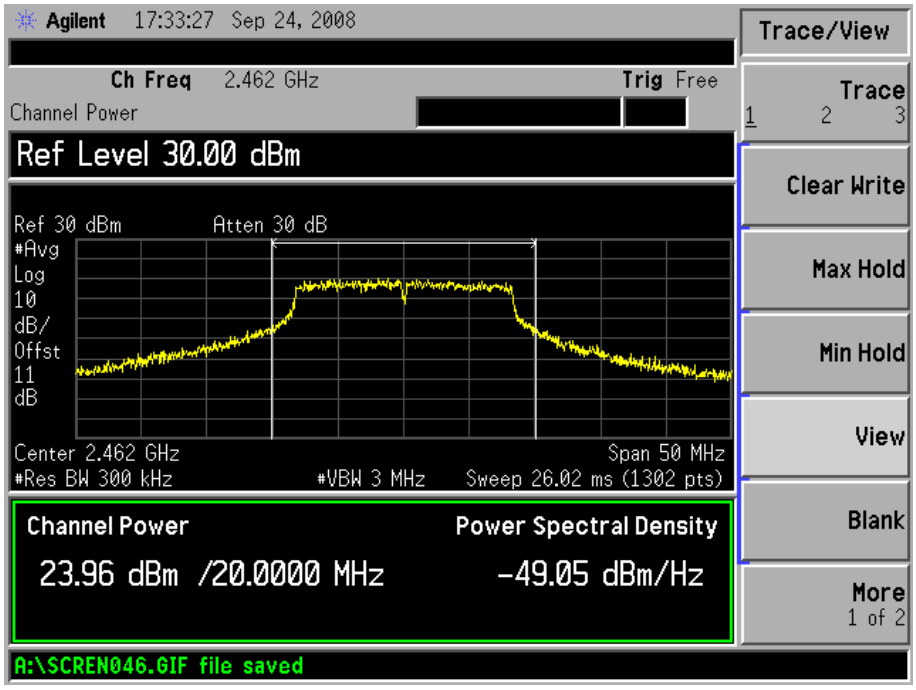
Low Channel:



Middle Channel:



High Channel:



9. FIELD STRENGTH OF SPURIOUS EMISSIONS

9.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ±3.0 dB.

9.2 Standard Applicable

According to §15.247(c), 15.205 15.209(b) &15.35 (b), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Section 15.209:
30 - 88 MHz 40 dBuV/m @3M
88 -216 MHz 43.5 dBuV/m @3M
216 -960 MHz 46 dBuV/m @3M
Above 960 MHz 54dBuV/m @3M

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

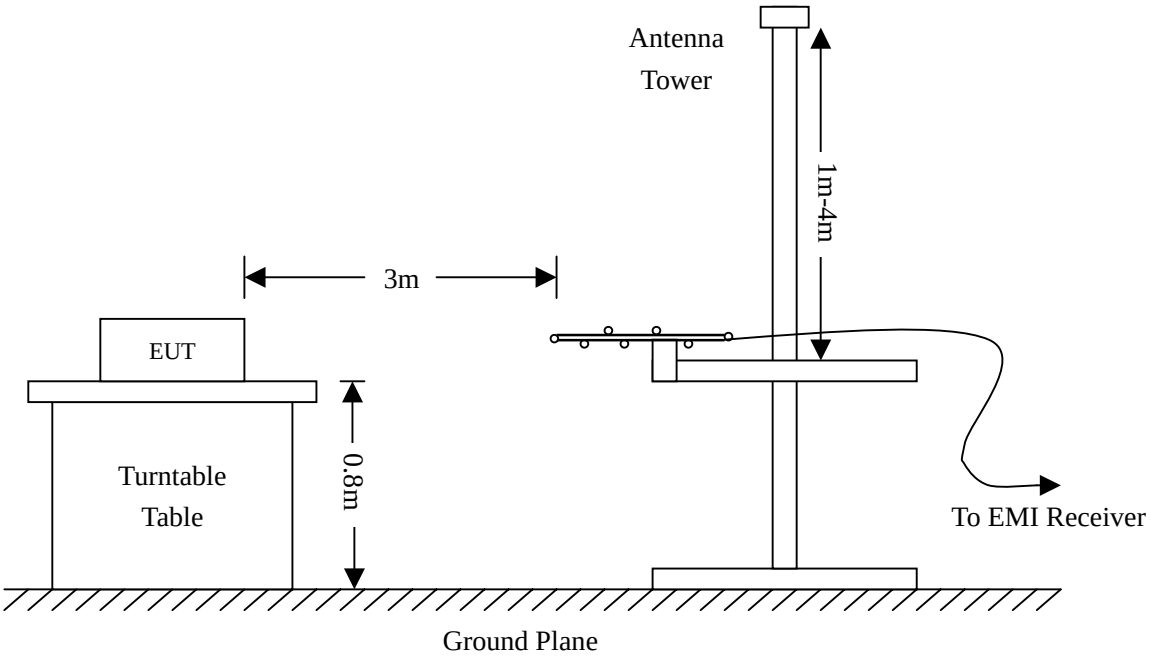
Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-01-25	2009-01-24
Positioning Controller	C&C	CC-C-1F	N/A	2008-01-25	2009-01-24
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2008-01-25	2009-01-24
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2008-01-25	2009-01-24
RF Switch	EM	EMSW18	SW060023	2008-01-25	2009-01-24
Amplifier	Agilent	8447F	3113A06717	2008-01-25	2009-01-24
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2008-01-25	2009-01-24
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2008-01-25	2009-01-24

9.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.



8.5 Corrected Amplitude & Margin Calculation

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

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

9.6 Environmental Conditions

Temperature:	22° C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

9.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst margin of:

-0.54 dBμV at **33.5700 MHz** in the **Vertical** polarization, **Transmitting 802.11g** test mode with **TX** power adaptor, **30 MHz to 25 GHz, 3Meters**

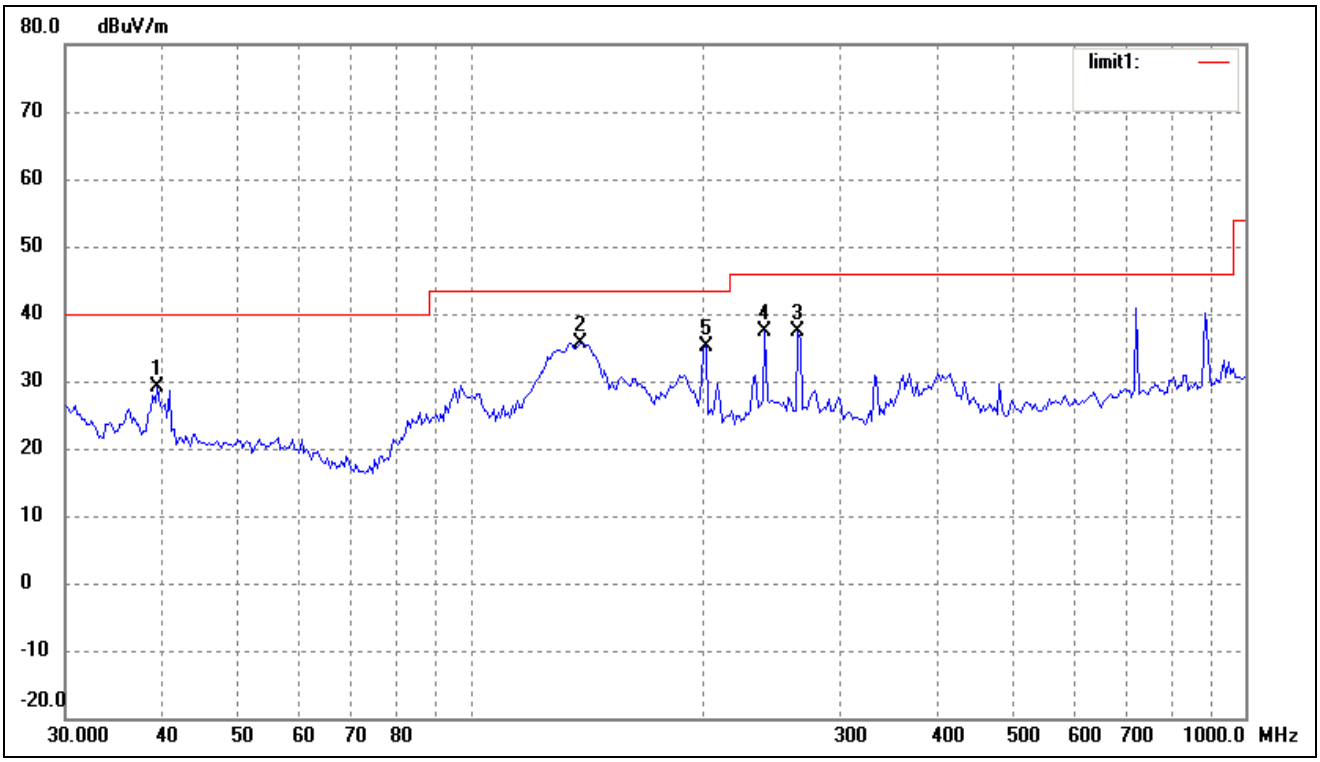
Test Result/Plots:

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b)

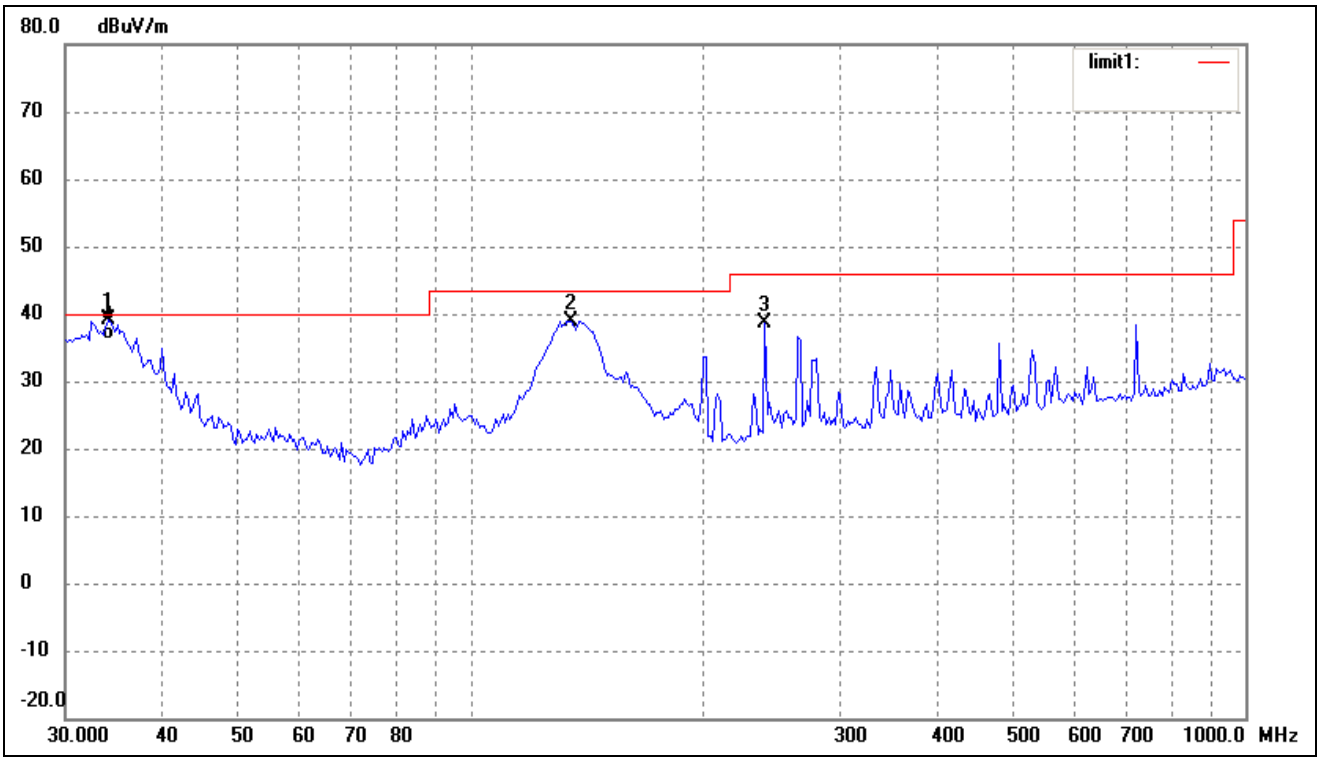
Comment: With TW power adaptor

Horizontal



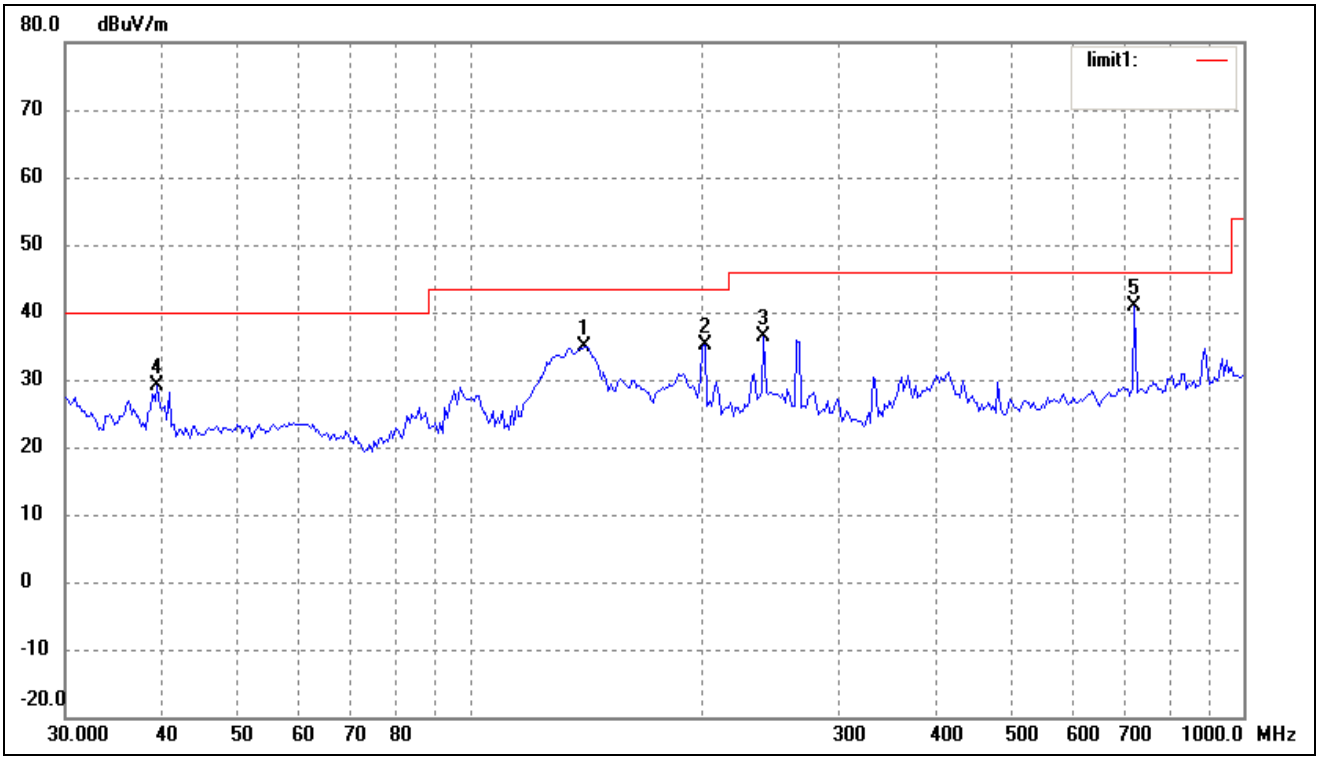
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	39.4587	21.41	7.78	29.19	40.00	-10.81	265	100	peak
2	138.8120	32.42	3.30	35.72	43.50	-7.78	210	100	peak
3	264.9707	29.30	8.06	37.36	46.00	-8.64	15	100	peak
4	240.1442	30.00	7.44	37.44	46.00	-8.56	206	100	peak
5	201.4539	29.35	5.73	35.08	43.50	-8.42	12	100	peak

Vertical



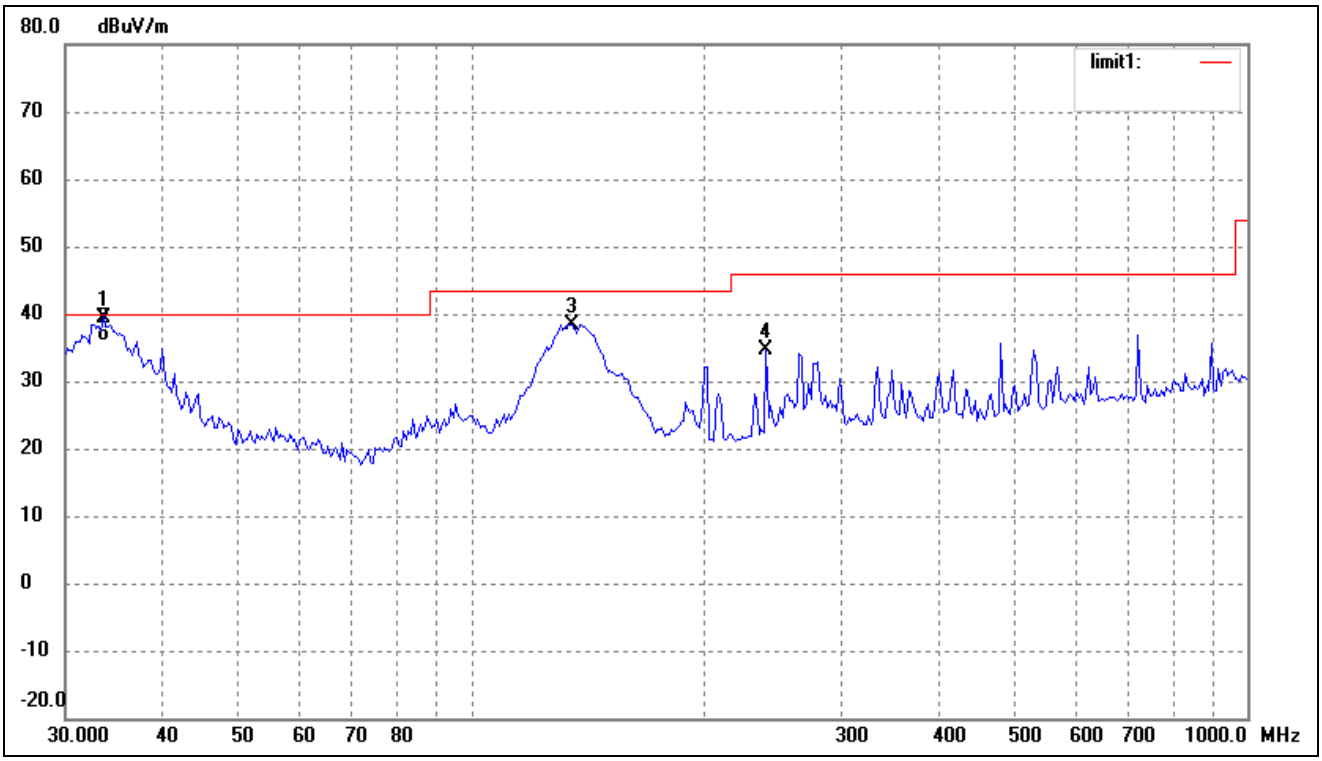
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	34.0449	32.44	6.61	39.05	40.00	-0.95	120	100	peak
2	134.9643	35.39	3.54	38.93	43.50	-4.57	356	100	peak
3	240.1442	31.19	7.44	38.63	46.00	-7.37	5	100	peak
4	34.0450	29.44	6.61	36.05	40.00	-3.95	359	100	QP

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11g)
Comment: With TW power adaptor
Horizontal



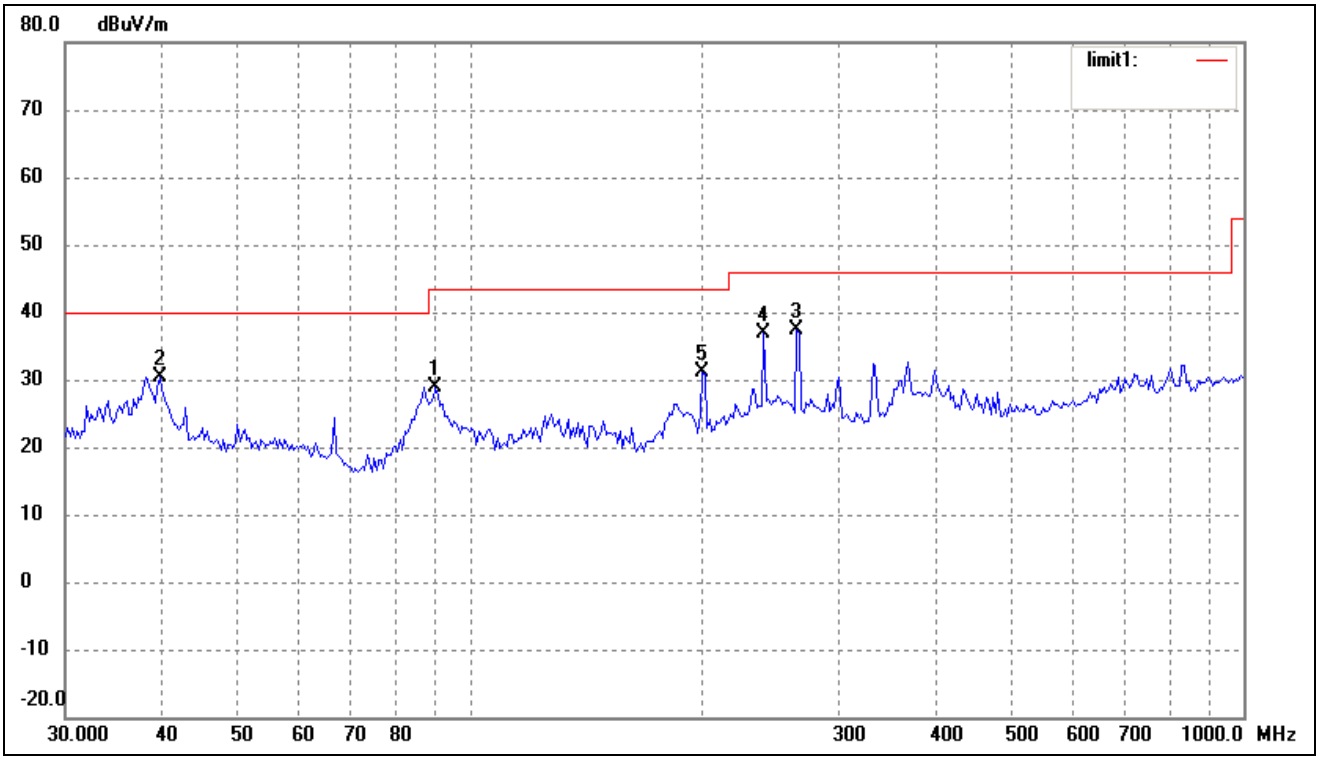
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	140.7767	31.76	3.23	34.99	43.50	-8.51	10	100	peak
2	201.4539	29.35	5.73	35.08	43.50	-8.42	28	100	peak
3	240.1442	29.00	7.44	36.44	46.00	-9.56	45	100	peak
4	39.4587	21.41	7.78	29.19	40.00	-10.81	200	100	peak
5	723.7930	27.98	12.90	40.88	46.00	-5.12	355	100	peak

Vertical



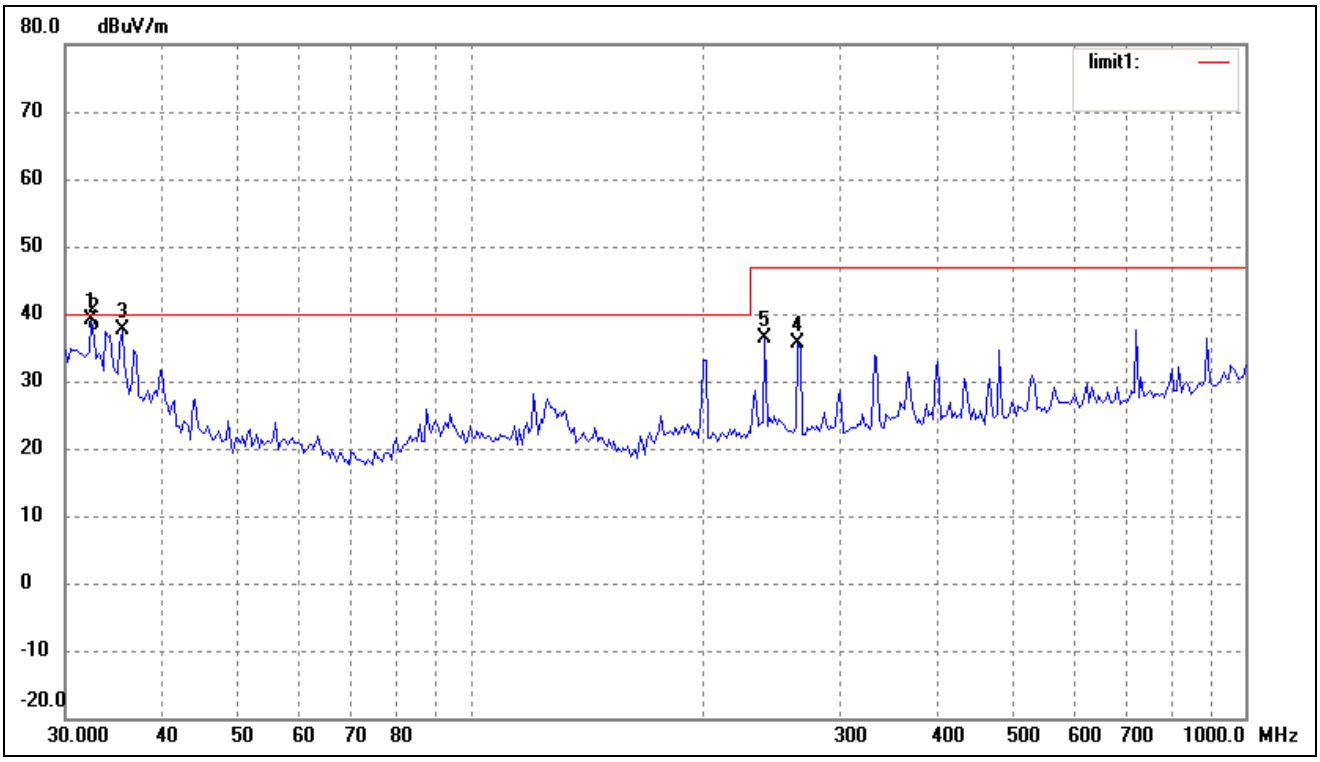
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	33.5700	32.85	6.61	39.46	40.00	-0.54	273	100	peak
2	33.5700	29.35	6.61	35.96	40.00	-4.04	32	100	QP
3	134.9644	34.89	3.54	38.43	43.50	-5.07	342	100	peak
4	240.1442	27.19	7.44	34.63	46.00	-11.37	179	100	peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b)
Comment: With XSS power adaptor
Horizontal



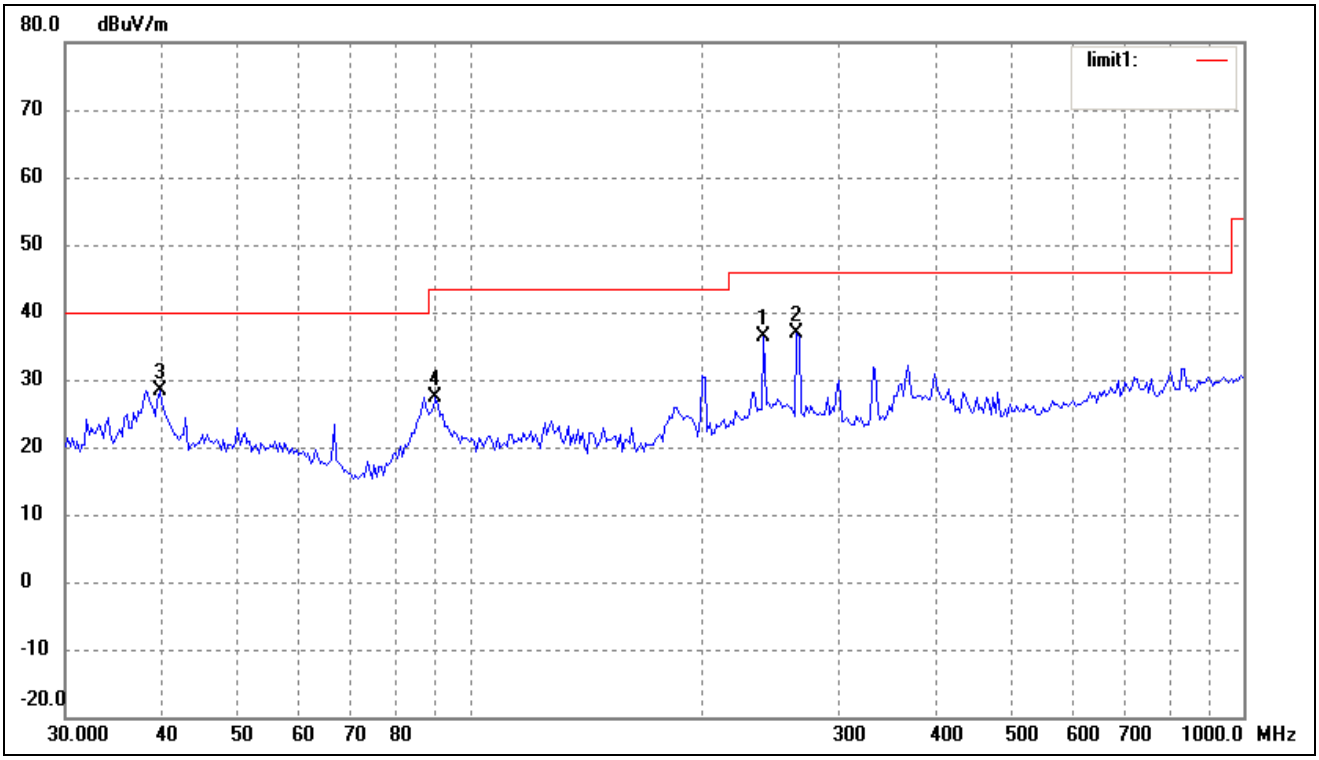
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	90.4197	22.35	6.61	28.96	43.50	-14.54	180	100	peak
2	39.7370	22.49	7.86	30.35	40.00	-9.65	360	100	peak
3	264.9708	29.21	8.06	37.27	46.00	-8.73	5	100	peak
4	240.1442	29.40	7.44	36.84	46.00	-9.16	356	100	peak
5	200.0432	25.42	5.68	31.10	43.50	-12.40	350	100	peak

Vertical



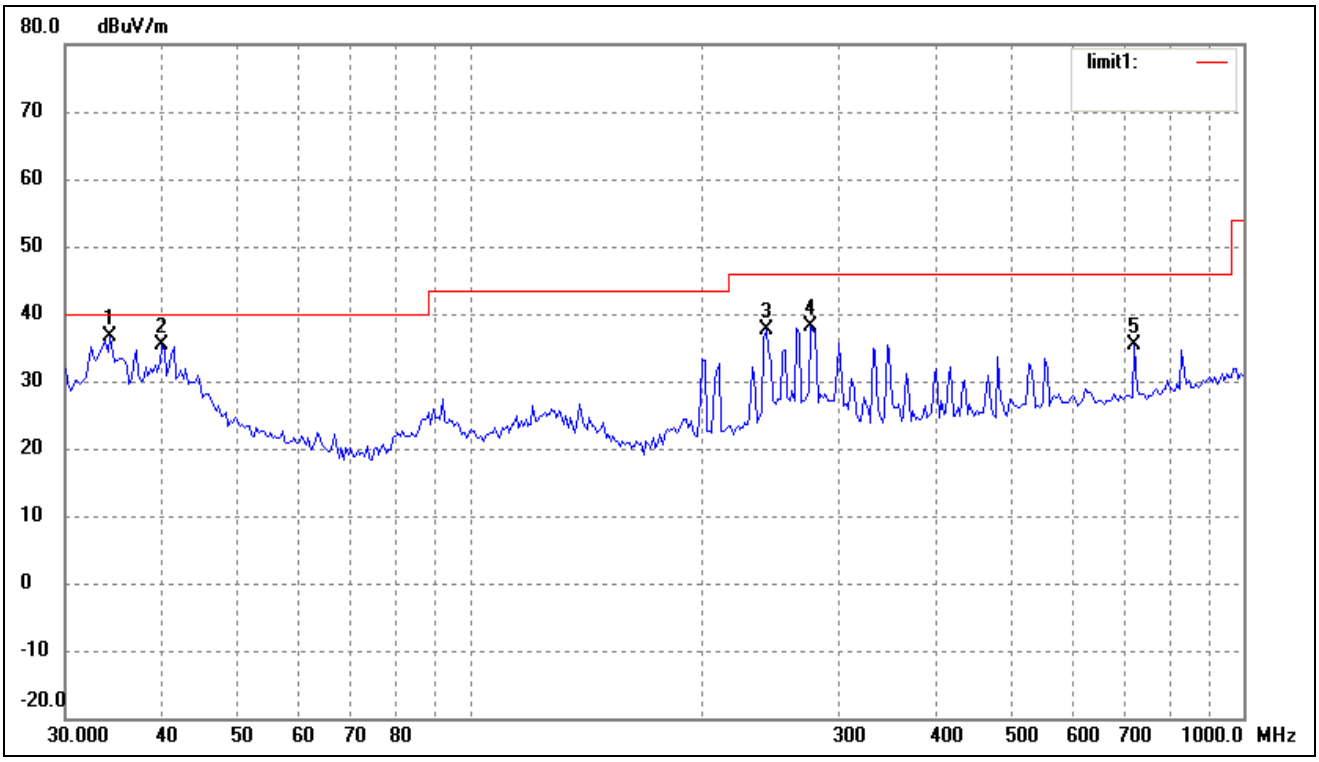
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	32.4109	32.43	6.62	39.05	40.00	-0.95	270	100	peak
2	32.5562	30.69	6.61	37.30	40.00	-2.70	100	100	QP
3	35.5112	30.78	6.74	37.52	40.00	-2.48	15	100	peak
4	264.9708	27.50	8.06	35.56	47.00	-11.44	222	100	peak
5	240.1442	28.90	7.44	36.34	47.00	-10.66	358	100	peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11g)
Comment: With XSS power adaptor
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	240.1442	28.90	7.44	36.34	46.00	-9.66	210	100	peak
2	264.9708	28.71	8.06	36.77	46.00	-9.23	125	100	peak
3	39.7370	20.49	7.86	28.35	40.00	-11.65	0	100	peak
4	90.4197	20.85	6.61	27.46	43.50	-16.04	45	100	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	34.2852	29.98	6.60	36.58	40.00	-3.42	358	100	peak
2	40.0173	27.35	7.93	35.28	40.00	-4.72	180	100	peak
3	241.8377	30.11	7.49	37.60	46.00	-8.40	245	100	peak
4	276.3817	29.68	8.36	38.04	46.00	-7.96	87	100	peak
5	723.7930	22.39	12.90	35.29	46.00	-10.71	334	100	peak

Spurious Emission Above 1GHz

Test Mode: Transmitting (802.11b)

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (1G to 25GHz)										
4824.0	PK	55.1	90	V	34.1	5.2	33.0	61.4	74	-12.6
7236.0	PK	51.2	270	V	37.4	6.1	33.5	61.2	74	-12.8
7236.0	PK	50	180	H	37.4	6.1	33.5	60.0	74	-14.0
4824.0	PK	54.4	45	H	34.1	5.2	33.0	60.7	74	-13.3
4824.0	AV	45.7	270	V	34.1	5.2	33.0	52.0	54	-2.0
7236.0	AV	41.4	90	V	37.4	6.1	33.5	51.4	54	-2.6
7236.0	AV	40.2	45	H	37.4	6.1	33.5	50.2	54	-3.8
4824.0	AV	44.4	60	H	34.1	5.2	33.0	50.7	54	-3.3
Middle Channel (1G to 25GHz)										
7311.0	PK	51.8	45	V	37.4	6.1	33.5	61.8	74	-12.2
4874.0	PK	54.0	270	V	34.1	5.2	33.0	60.3	74	-13.7
7311.0	PK	49.5	45	H	37.4	6.1	33.5	59.5	74	-14.5
4874.0	PK	53.9	180	H	34.1	5.2	33.0	60.2	74	-13.8
7311.0	AV	42.6	270	V	37.4	6.1	33.5	52.6	54	-1.4
4874.0	AV	45.5	90	V	34.1	5.2	33.0	51.8	54	-2.2
7311.0	AV	40.2	60	H	37.4	6.1	33.5	50.2	54	-3.8
4874.0	AV	42.4	45	H	34.1	5.2	33.0	48.7	54	-5.3
4924.0	PK	55.4	270	V	34.1	5.2	33.0	61.7	74	-12.3
7386.0	PK	51.5	45	V	37.4	6.1	33.5	61.5	74	-12.5
4924.0	PK	53.8	180	H	34.1	5.2	33.0	60.1	74	-13.9
7386.0	PK	49.7	45	H	37.4	6.1	33.5	59.7	74	-14.3
4924.0	AV	46.4	90	V	34.1	5.2	33.0	52.7	54	-1.3
7386.0	AV	41.8	270	V	37.4	6.1	33.5	51.8	54	-2.2
4924.0	AV	45.0	60	H	34.1	5.2	33.0	51.3	54	-2.7
7386.0	AV	40.6	60	H	37.4	6.1	33.5	50.6	54	-3.4

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 5th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

Spurious Emission Above 1GHz

Test Mode: Transmitting (802.11g)

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (1G to 25GHz)										
4824.0	PK	56.0	90	V	34.1	5.2	33.0	62.3	74	-11.7
7236.0	PK	51.8	270	V	37.4	6.1	33.5	61.8	74	-12.2
7236.0	PK	50.5	180	H	37.4	6.1	33.5	60.5	74	-13.5
4824.0	PK	56.2	45	H	34.1	5.2	33.0	62.5	74	-11.5
4824.0	AV	46.3	270	V	34.1	5.2	33.0	52.6	54	-1.4
7236.0	AV	41.8	90	V	37.4	6.1	33.5	51.8	54	-2.2
7236.0	AV	40.9	45	H	37.4	6.1	33.5	50.9	54	-3.1
4824.0	AV	45.1	60	H	34.1	5.2	33.0	51.4	54	-2.6
Middle Channel (1G to 25GHz)										
7311.0	PK	52.6	45	V	37.4	6.1	33.5	62.6	74	-11.4
4874.0	PK	55.2	270	V	34.1	5.2	33.0	61.5	74	-12.5
7311.0	PK	50.5	45	H	37.4	6.1	33.5	60.5	74	-13.5
4874.0	PK	54.8	180	H	34.1	5.2	33.0	61.1	74	-12.9
7311.0	AV	42.4	270	V	37.4	6.1	33.5	52.4	54	-1.6
4874.0	AV	45.2	90	V	34.1	5.2	33.0	51.5	54	-2.5
7311.0	AV	40.7	60	H	37.4	6.1	33.5	50.7	54	-3.3
4874.0	AV	43.3	45	H	34.1	5.2	33.0	49.6	54	-4.4
4924.0	PK	55.6	270	V	34.1	5.2	33.0	61.9	74	-12.1
7386.0	PK	51.7	45	V	37.4	6.1	33.5	61.7	74	-12.3
4924.0	PK	54.5	180	H	34.1	5.2	33.0	60.8	74	-13.2
7386.0	PK	50.5	45	H	37.4	6.1	33.5	60.5	74	-13.5
4924.0	AV	46.0	90	V	34.1	5.2	33.0	52.3	54	-1.7
7386.0	AV	41.4	270	V	37.4	6.1	33.5	51.4	54	-2.6
4924.0	AV	44.9	60	H	34.1	5.2	33.0	51.2	54	-2.8
7386.0	AV	40.3	60	H	37.4	6.1	33.5	50.3	54	-3.7

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 5th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

10. OUT OF BAND EMISSIONS

10.1 Standard Applicable

According to §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.

10.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2008-01-25	2009-01-24
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-01-25	2009-01-24
Positioning Controller	C&C	CC-C-1F	N/A	2008-01-25	2009-01-24
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2008-01-25	2009-01-24
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2008-01-25	2009-01-24
RF Switch	EM	EMSW18	SW060023	2008-01-25	2009-01-24
Amplifier	Agilent	8447F	3113A06717	2008-01-25	2009-01-24
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2008-01-25	2009-01-24
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2008-01-25	2009-01-24

10.3 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW, VBW=100KHz, Span=50MHz, Sweep = auto
3. Set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2438.5MHz, then mark the higher-level emission for comparing with the FCC rules.

10.4 Environmental Conditions

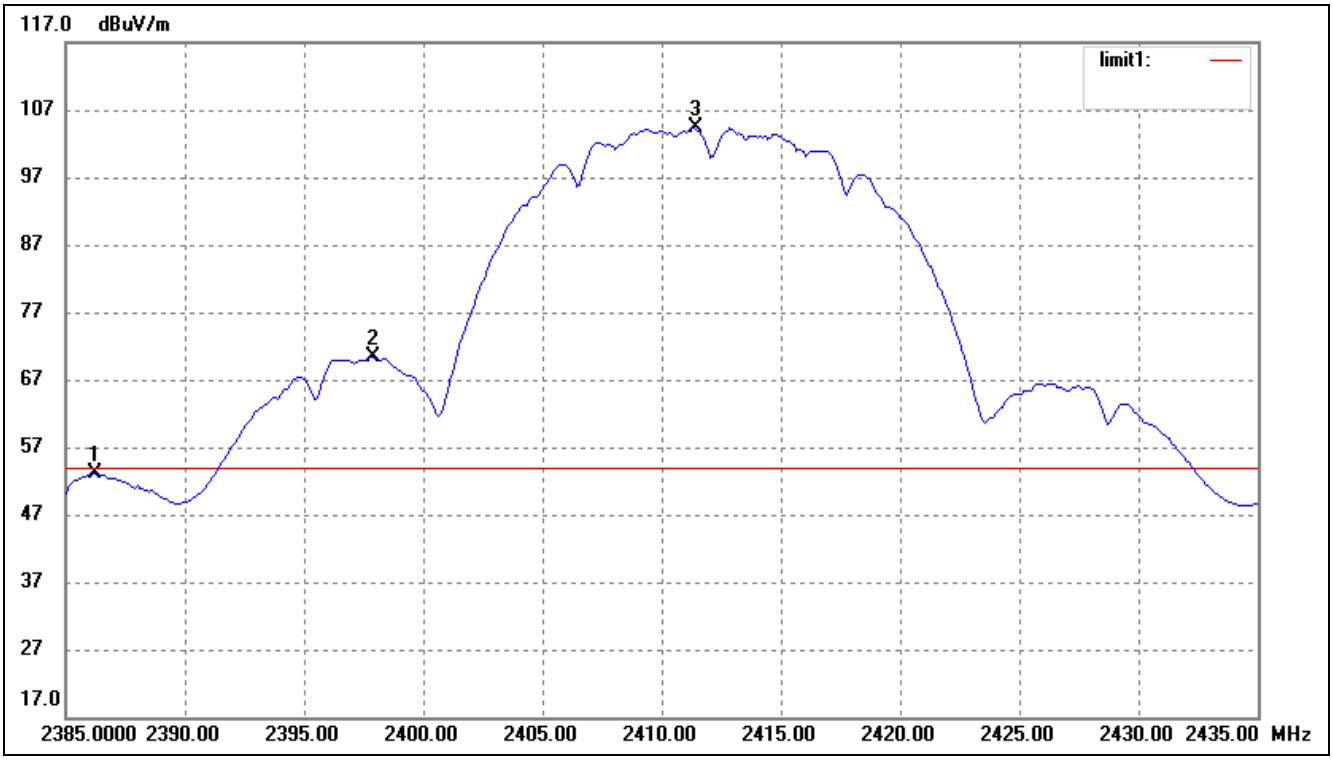
Temperature:	21° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

10.5 Summary of Test Results/Plots

Test mode	Frequency MHz	Limit dBuV /dB	Result
802.11b	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass
802.11g	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass

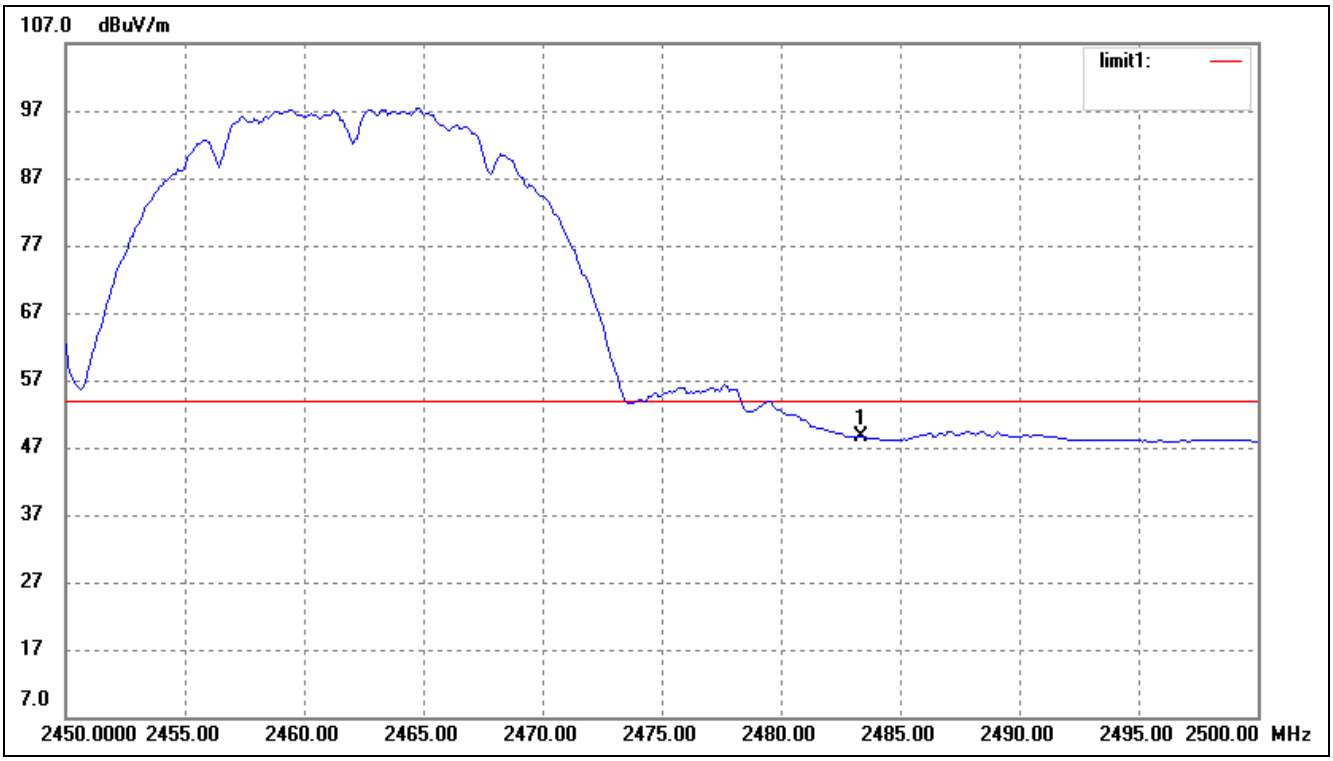
For 802.11b

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2386.202	17.28	35.76	53.04	54.00	-0.96	224	149	Ave
	2386.202	27.15	35.76	62.91	74.00	-11.09	159	126	peak
2	2397.826	34.46	35.83	70.29	54.00	16.29	98	120	Ave
3	2411.353	68.49	35.99	104.48	54.00	50.48	321	150	Ave

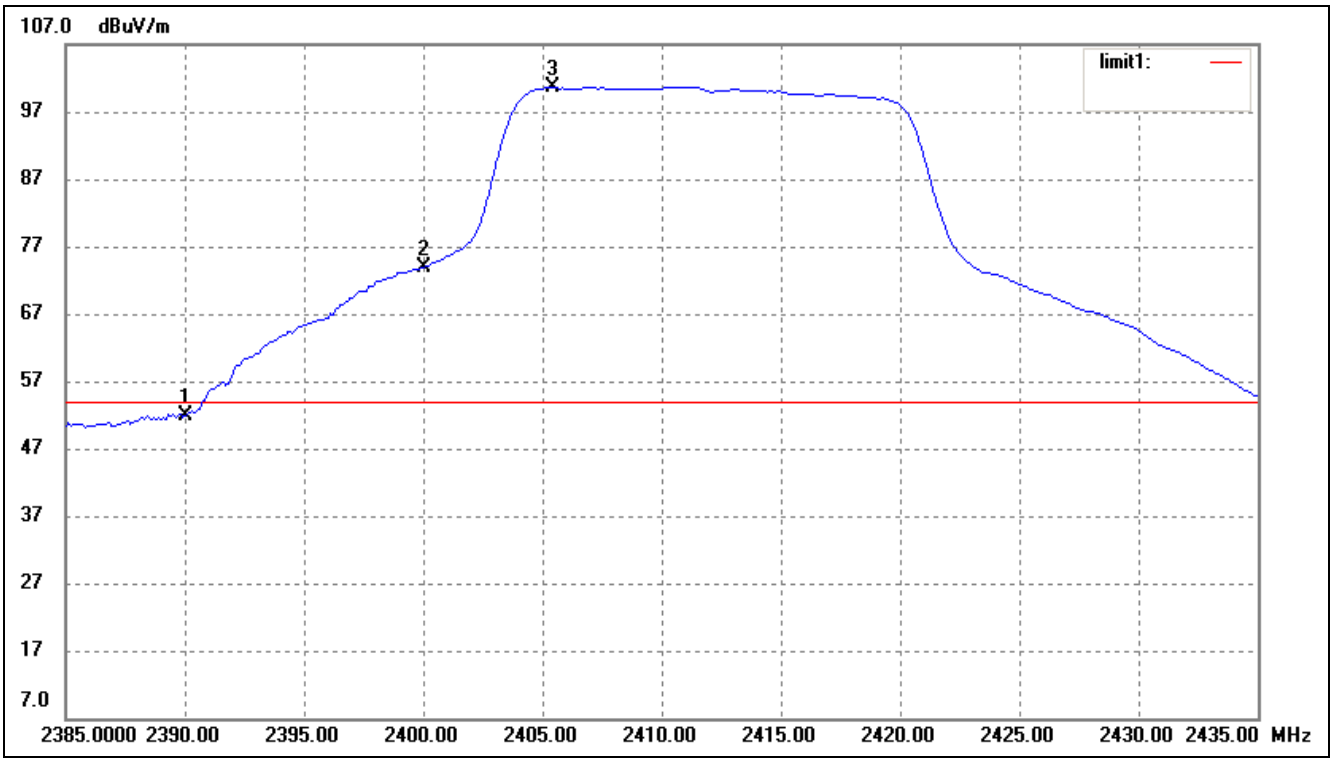
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.267	12.02	36.69	48.71	54.00	-5.29	100	144	Ave
	2483.267	23.11	36.69	59.80	74.00	-14.20	207	132	peak

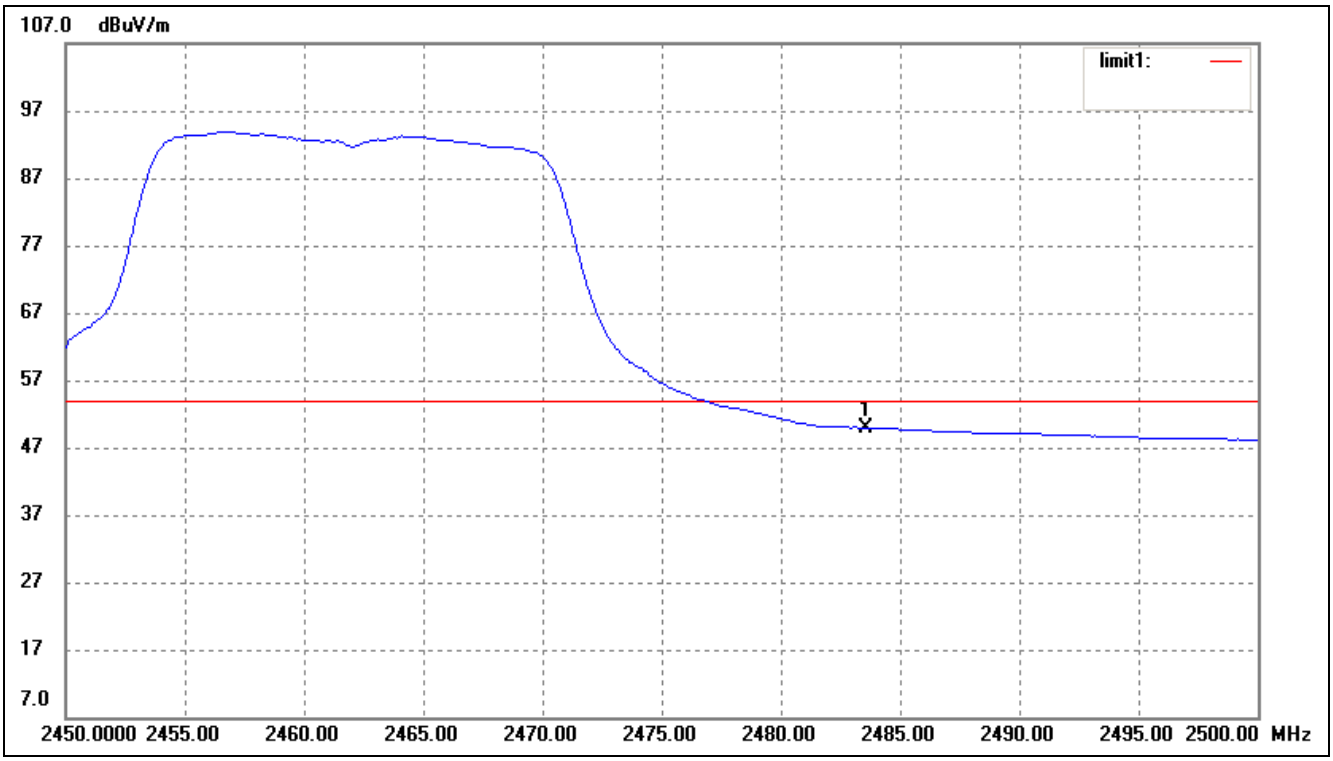
For 802.11g

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2390.010	16.18	35.78	51.96	54.00	-2.04	134	110	Ave
	2390.010	25.43	35.78	61.21	74.00	-12.79	159	120	peak
2	2400.030	38.03	35.84	73.87	54.00	19.87	222	146	Ave
3	2405.341	64.68	35.91	100.59	54.00	46.59	300	152	Ave

Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.467	13.31	36.69	50.00	54.00	-4.00	147	150	Ave
	2483.467	24.65	36.69	61.34	74.00	-12.66	65	137	peak