FCC Part 15C

Measurement and Test Report

For

Shenzhen DONICA Electronic Technology Co., Ltd.

3rd Floor, Bldg.6, Coolpad Cyber Park, 2# Mengxi Road, Hi-tech Industrial Park(Northern District), Nanshan Dist., Shenzhen, China.

FCC ID: XXGDWR2009

Report Concerns: Original Report	**Equipment Type:** 3G Wireless Router

Model:	DWR-02
Report No.:	STR09118052I
Test/Witness Engineer:	
Test Date:	2009-11-13 to 2009-11-30
Issue Date:	2009-12-03

Prepared By:

SEM.Test Compliance Service Co., Ltd
3/F, Jinbao Commerce Building, Xin'an Fanshen Road,
Bao'an District, Shenzhen, P.R.C.（518101）

Approved & Authorized By: 

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:	Shenzhen DONICA Electronic Technology Co., Ltd.
Address of applicant:	3rd Floor, Bldg.6, Coolpad Cyber Park, 2# Mengxi Road, Hi-tech Industrial Park(Northern District), Nanshan Dist., Shenzhen, China
Manufacturer:	Shenzhen DONICA Electronic Technology Co., Ltd.
Address of manufacturer:	3rd Floor, Bldg.6, Coolpad Cyber Park, 2# Mengxi Road, Hi-tech Industrial Park(Northern District), Nanshan Dist., Shenzhen, China

General Description of E.U.T

Items	Description
EUT Description:	3G Wireless Router
Trade Name:	DONICA
Model No.:	DWR-02, DWR-01
Rated Voltage:	DC 12V
Max. Output Power	22dBm (Conducted)
Antenna Gain:	<1.5dBi
Frequency range:	2412MHz~2462MHz
Number of channels:	11
Channel Separation:	5MHz
Type of Antenna:	Integral 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 Shenzhen DONICA Electronic Technology Co., 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
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

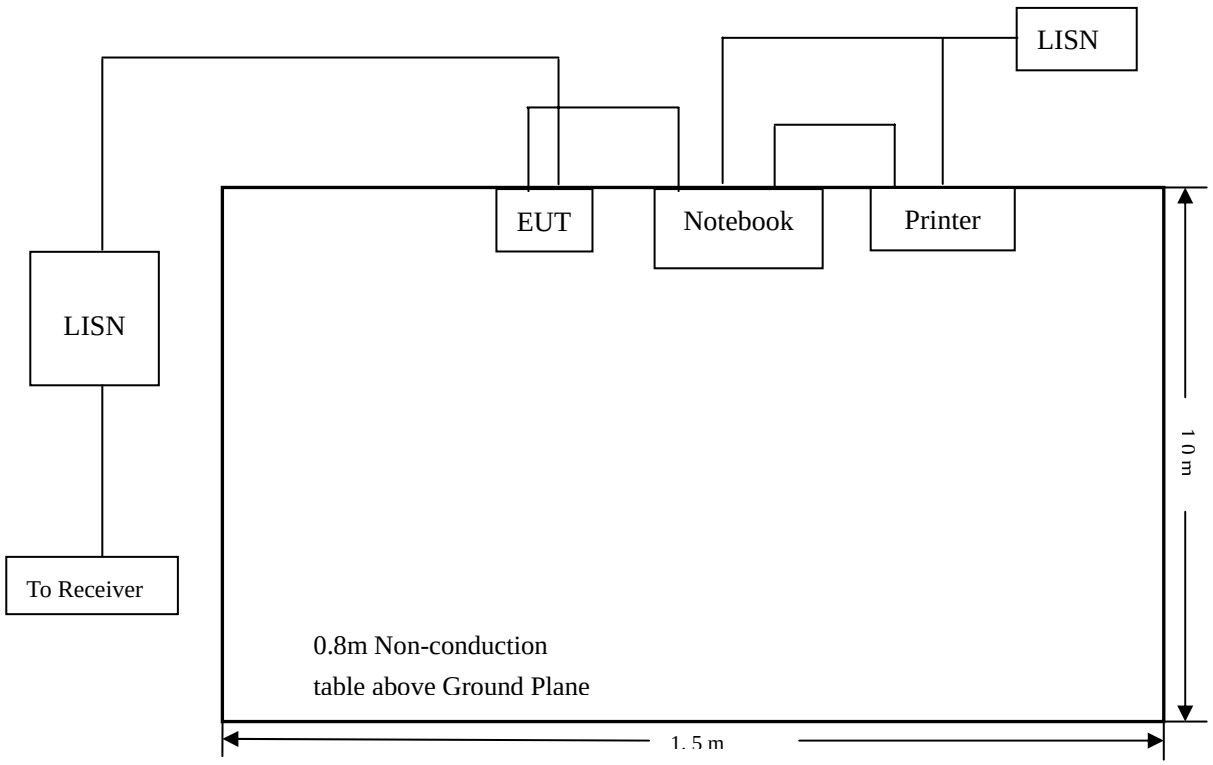
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
Puls Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-08-12	2010-08-11
L.I.S.N.	SCHWARZBECK	NSLK8126	8126-224	2009-08-12	2010-08-11
L.I.S.N.	EMCO	3825/2	11967C	2009-08-12	2010-08-11

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:

-14.01 dBμV at **0.22 MHz** in the **Line, QP** Detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15.207	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Ave/Pk	Line/Neutral	dBμV	dB
0.22	48.81	QP	Line	62.82	-14.01
0.56	38.91	QP	Line	56	-17.09
1.13	38.02	QP	Line	56	-17.98
0.60	36.24	QP	Neutral	56	-19.76
1.01	36.10	QP	Neutral	56	-19.90
2.21	34.33	QP	Neutral	56	-21.67
0.23	37.81	AV	Neutral	52.45	-14.64
0.48	29.28	AV	Neutral	46.34	-17.06
1.09	27.49	AV	Neutral	46	-18.51
0.15	38.87	AV	Line	56	-17.13
1.01	26.04	AV	Line	46	-19.96
2.02	25.83	AV	Line	46	-20.17

Plot of Conducted Emissions Test Data

Conducted Disturbance

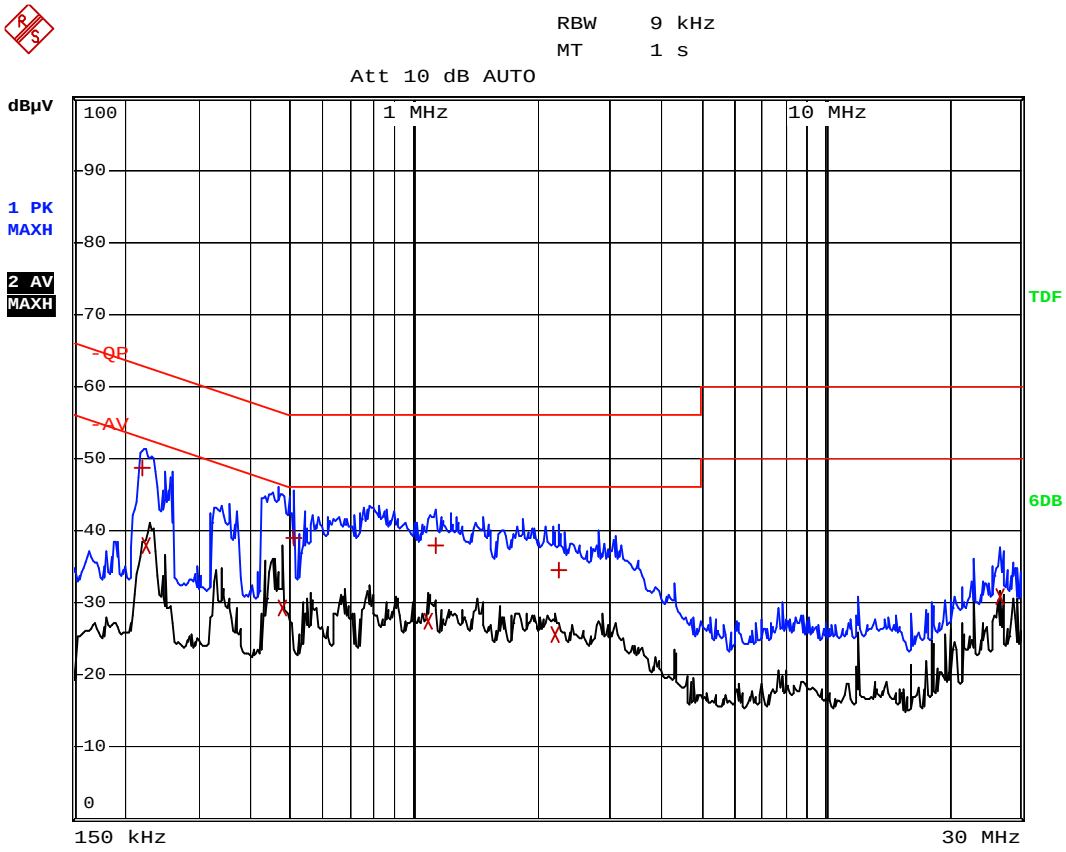
EUT: 3G Wireless Router

M/N: DWR-02

Operating Condition: Operating

Test Specification: N

Comment: AC 120V/60Hz Adapter DC 12V



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Plot of Conducted Emissions Test Data

Conducted Disturbance

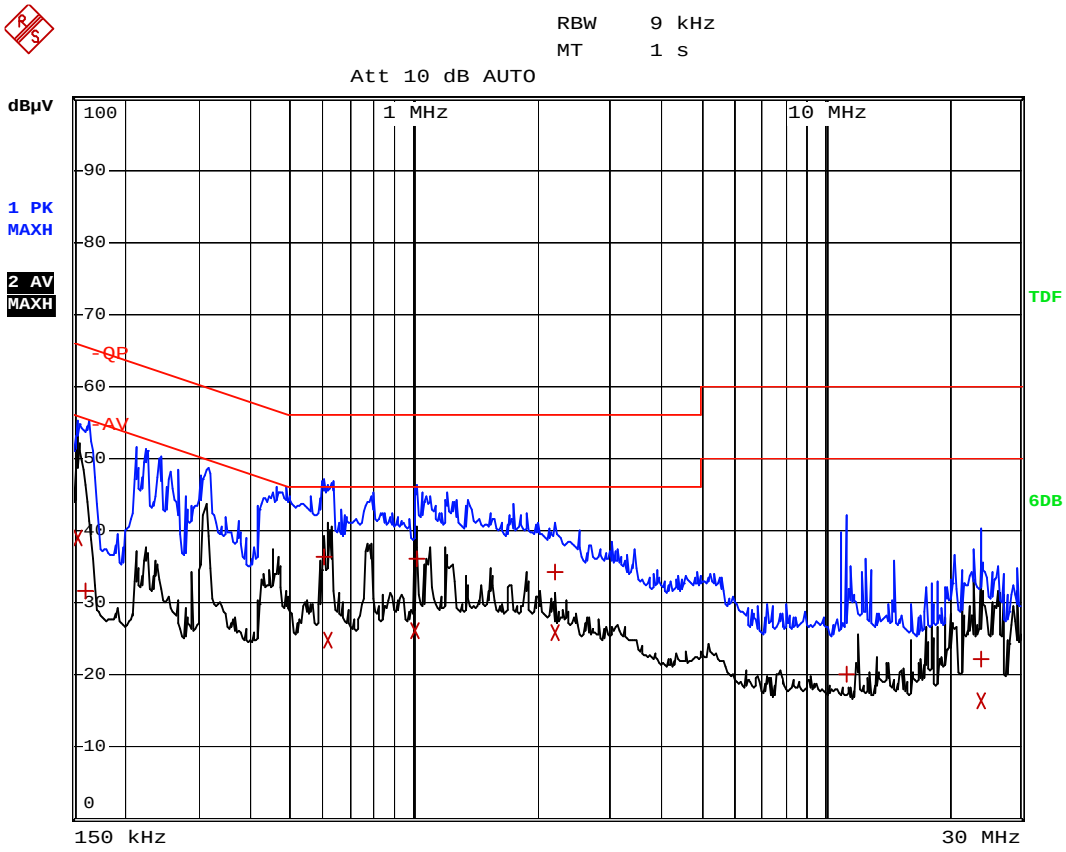
EUT: 3G Wireless Router

M/N: DWR-02

Operating Condition: Operating

Test Specification: L

Comment: AC 120V/60Hz Adapter DC 12V



Date: 24.NOV.2009 13:54:52

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

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

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: 21.54(dBm)
Maximum peak output power at antenna input terminal: 142.561 (mW)
Prediction distance: 20 (cm)
Prediction frequency: 2412 (MHz)
Antenna gain (typical): 1.5 (dBi)
Antenna gain (numeric): 1.4125375 (numeric)
The worst case is power density at prediction frequency at 20cm: 0.040062 (mw/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mw/cm^2)

0.040062(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	2009-08-12	2010-08-11
RF Limiter	Agilent	11867A	MY42241685	2009-08-12	2010-08-11
RMS/PEAK Voltmeter	Rohde & Schwarz	URE3	826135/008	2009-08-12	2010-08-11

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

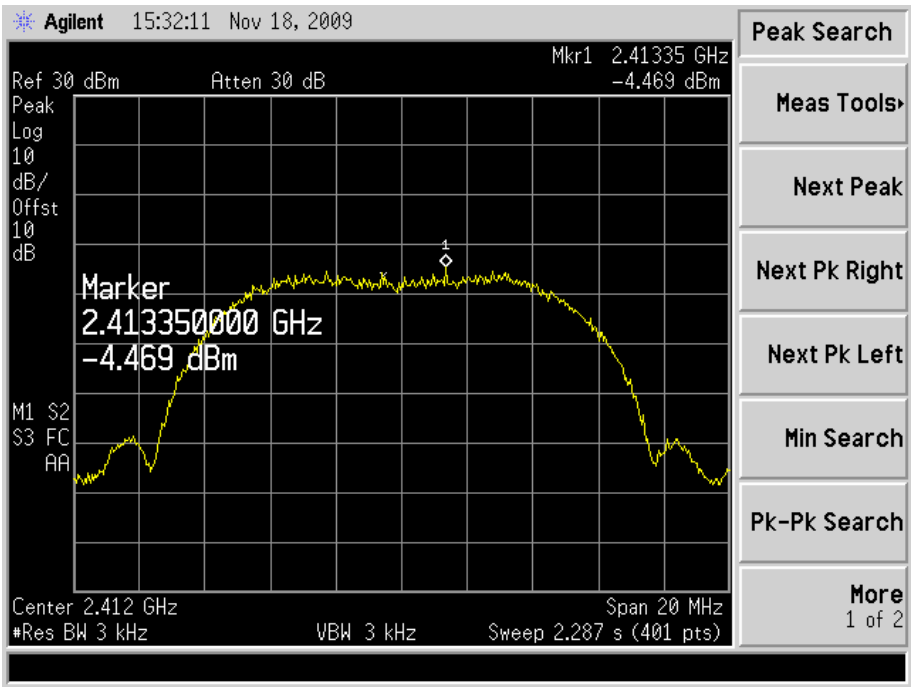
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

6.5 Summary of Test Results/Plots

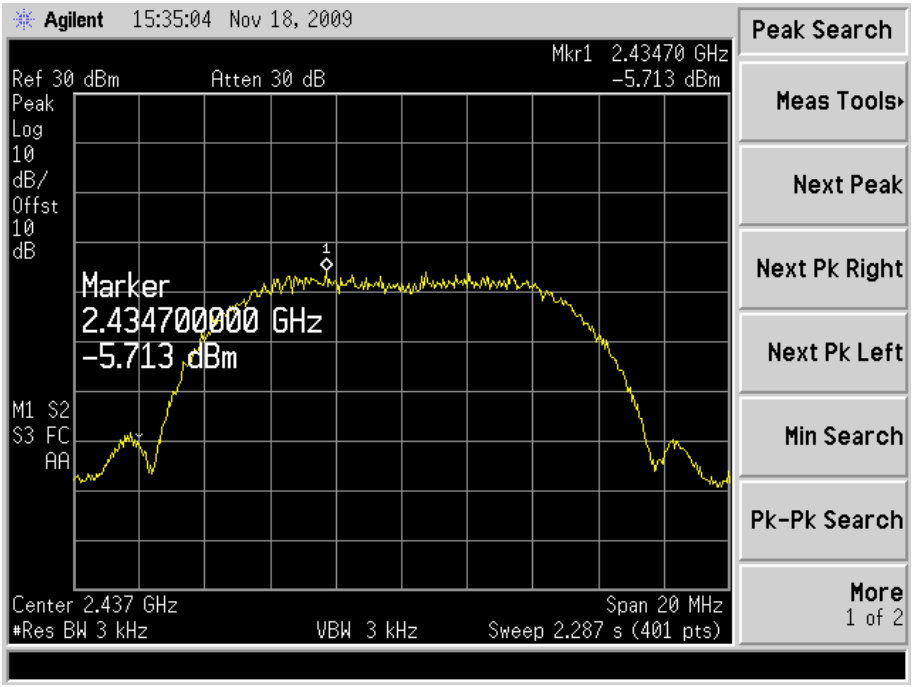
Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-4.469	8
	Middle channel (2437MHz)	-5.713	8
	High channel (2462MHz)	-5.354	8
802.11g	Low channel (2412MHz)	-7.109	8
	Middle channel (2437MHz)	-7.603	8
	High channel (2462MHz)	-5.973	8

For 802.11b

Low Channel:



Middle Channel:



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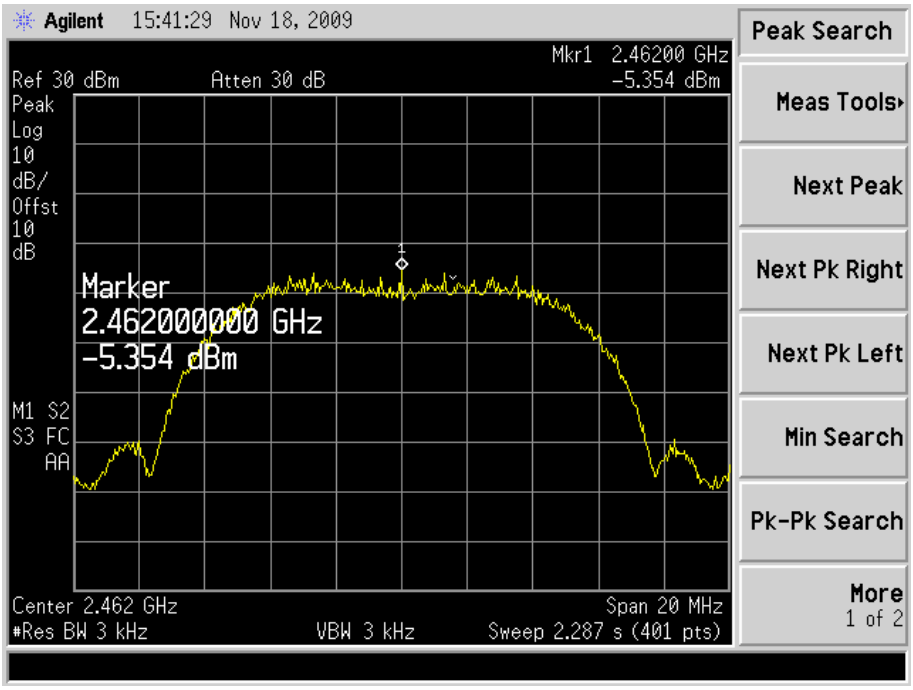
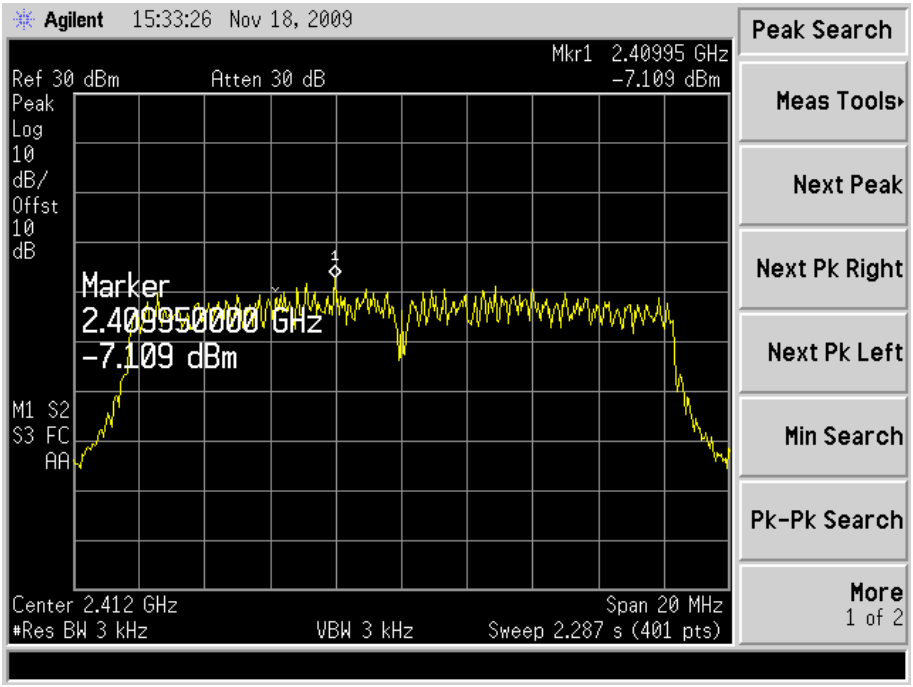
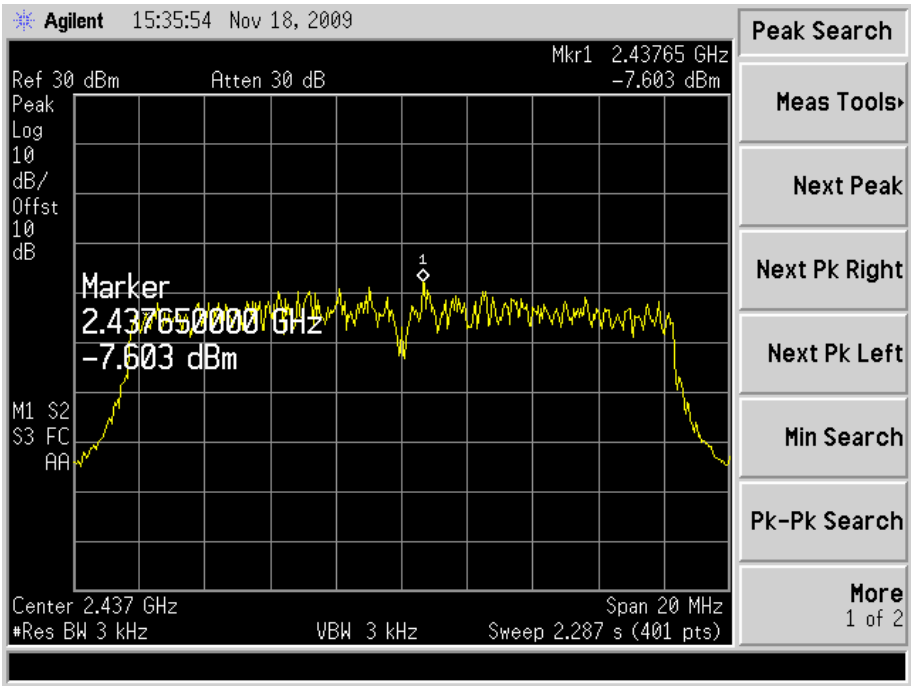


For 802.11g

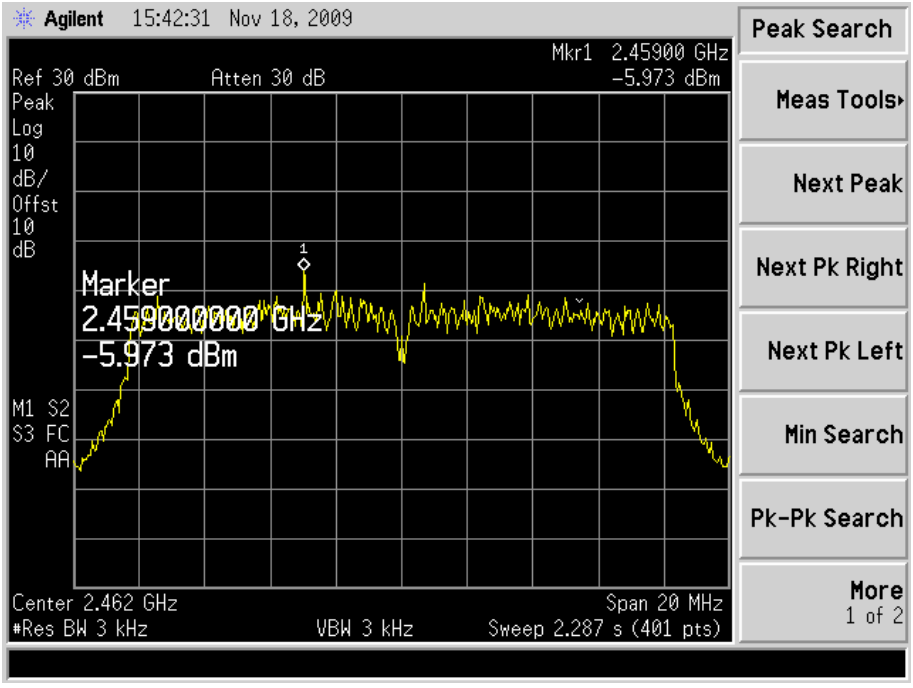
Low Channel:



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	2009-08-12	2010-08-11
RF Limiter	Agilent	11867A	MY42241685	2009-08-12	2010-08-11

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

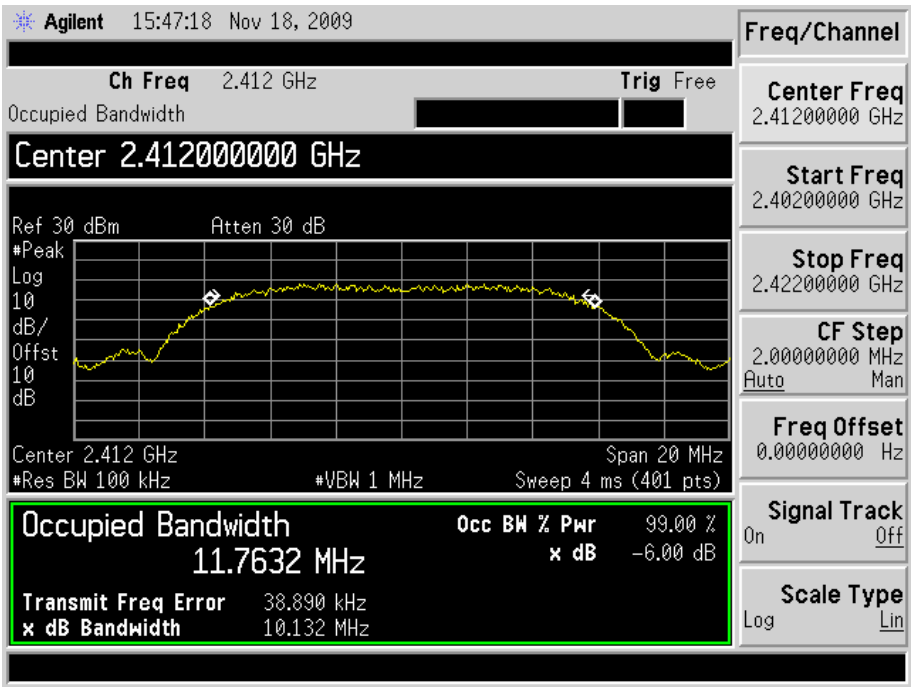
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

7.5 Summary of Test Results/Plots

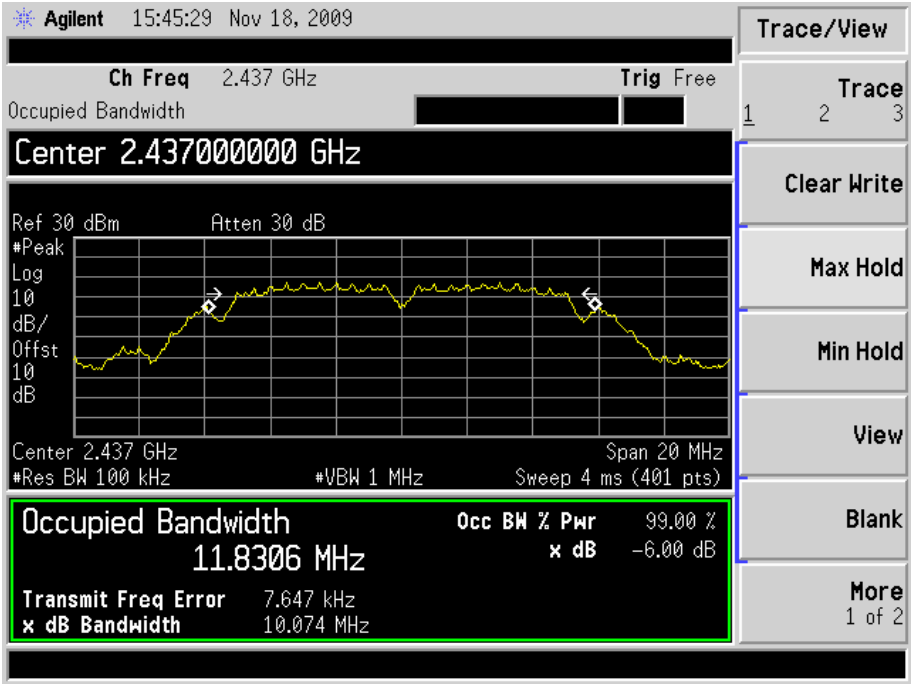
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	10132.0	>500
	2437	10074.0	>500
	2462	9995.0	>500
802.11g	2412	16046.0	>500
	2437	15062.0	>500
	2462	16469.0	>500

For 802.11b

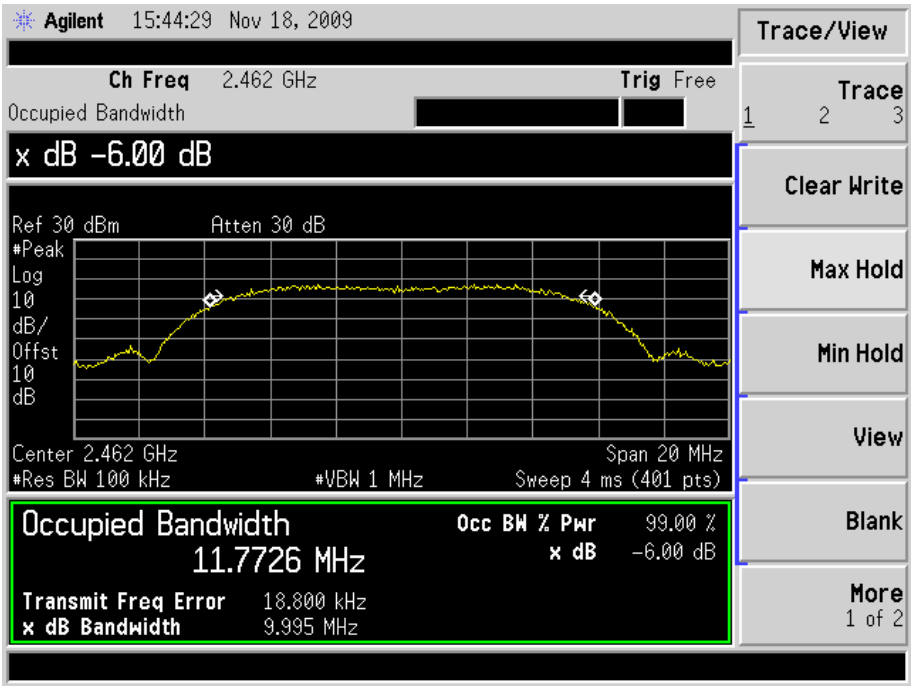
Low Channel:



Mid Channel:

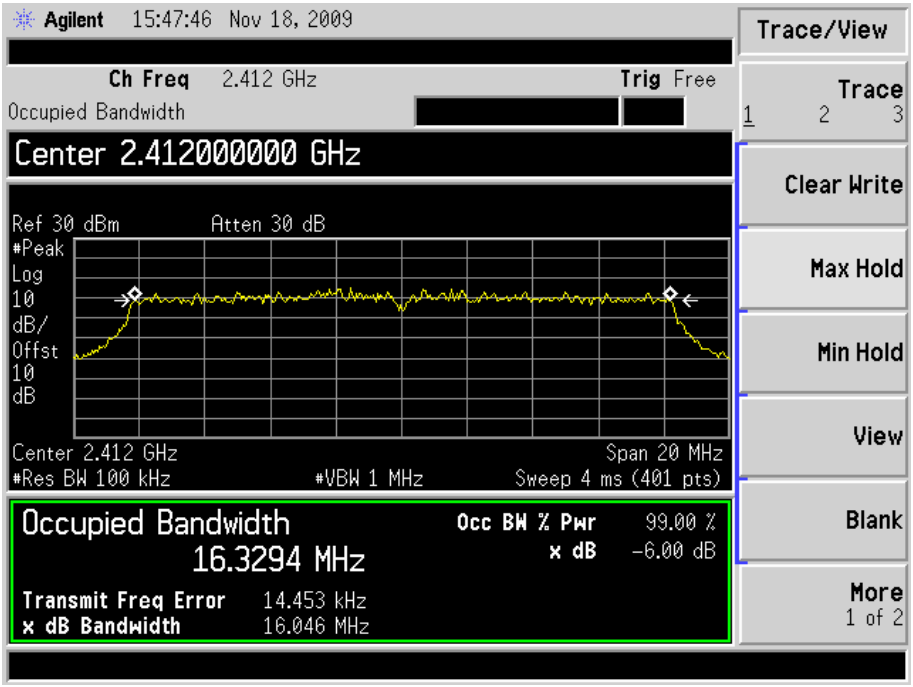


High Channel:

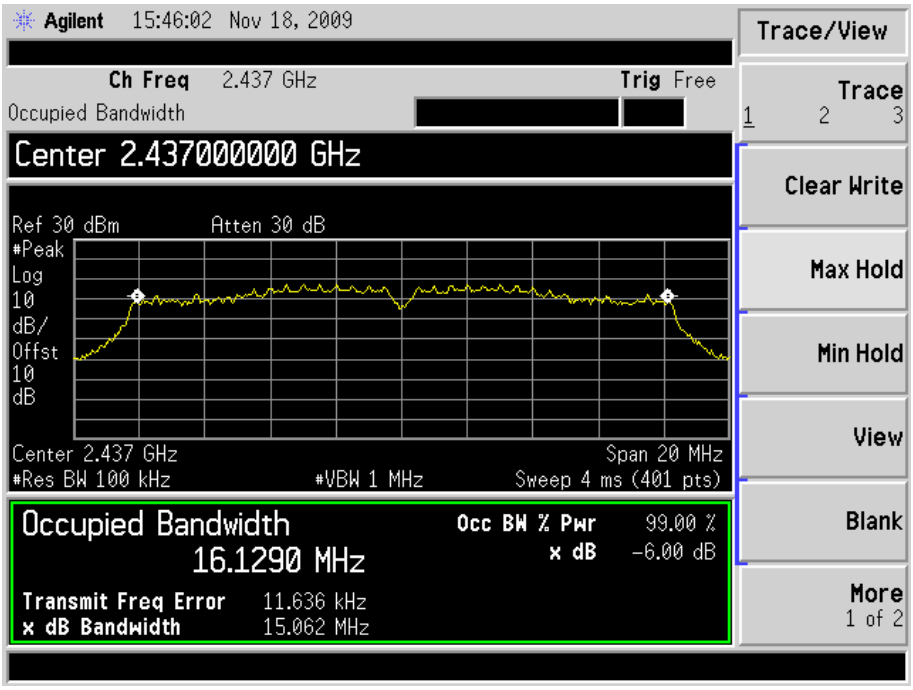


For 802.11g

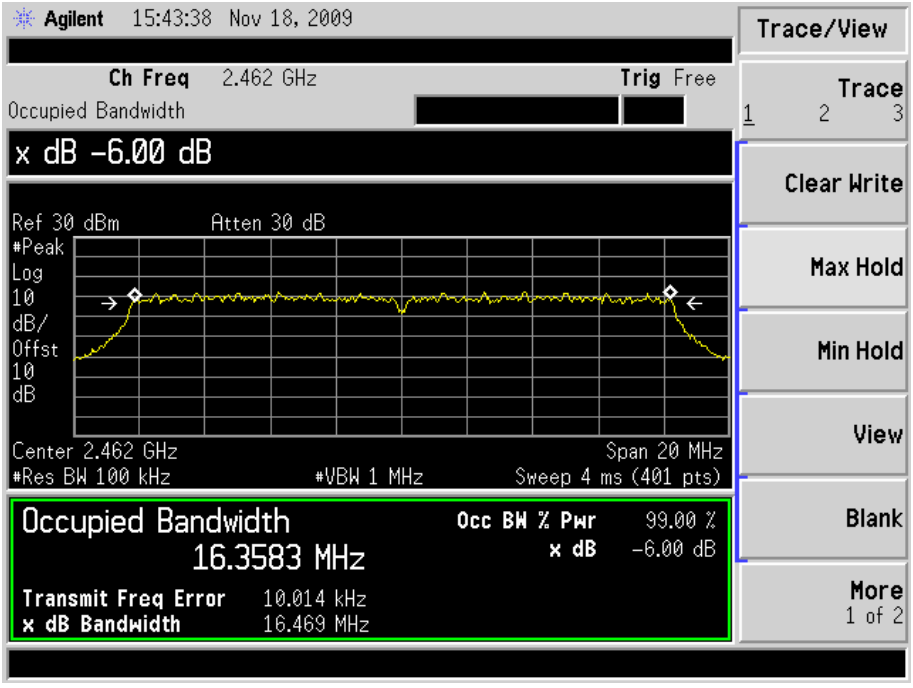
Low Channel:



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	2009-08-12	2010-08-11
RF Limiter	Agilent	11867A	MY42241685	2009-08-12	2010-08-11

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

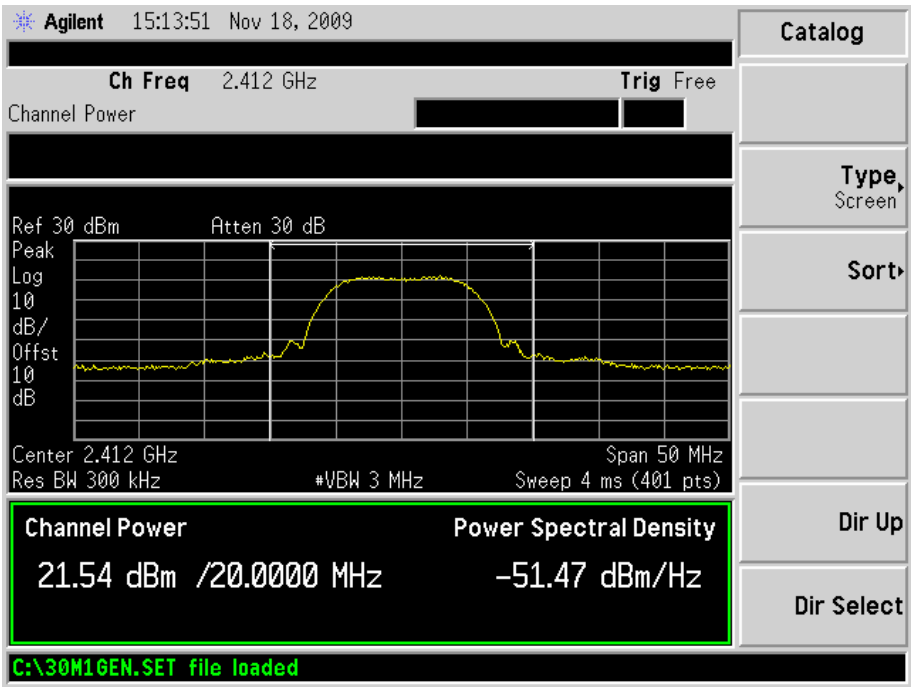
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

8.5 Summary of Test Results/Plots

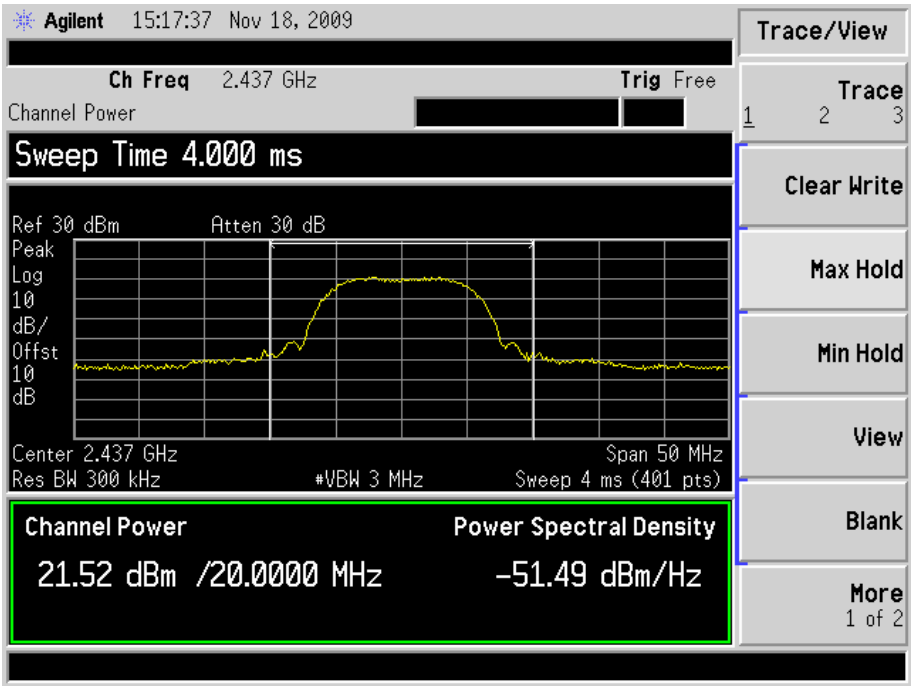
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11b	2412	21.54	0.142561	1
	2437	21.52	0.141906	1
	2462	21.15	0.130317	1
802.11g	2412	17.90	0.06166	1
	2437	17.55	0.056885	1
	2462	17.31	0.053827	1

For 802.11b

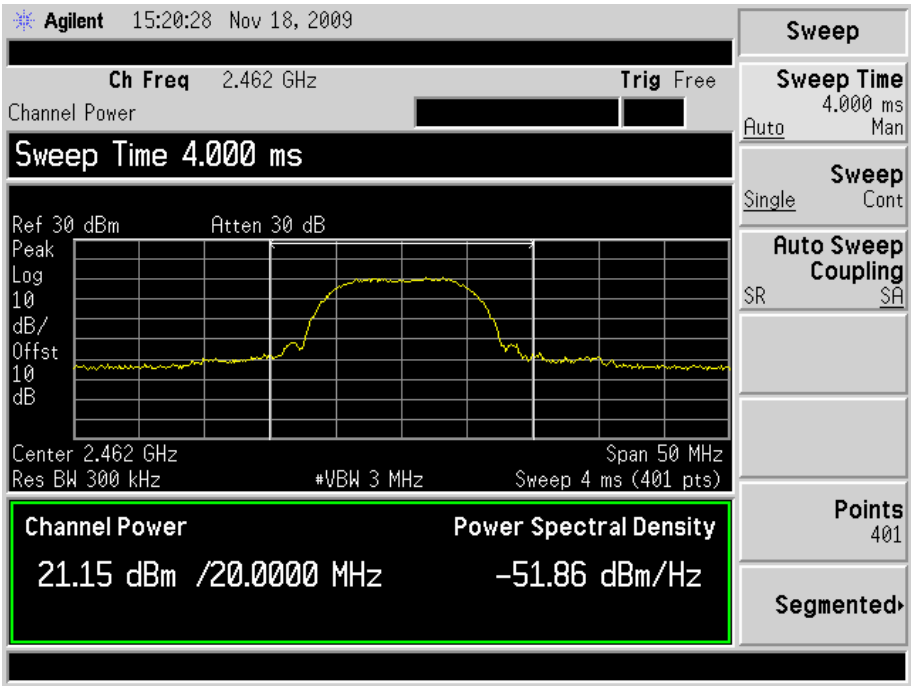
Low Channel:



Middle Channel:

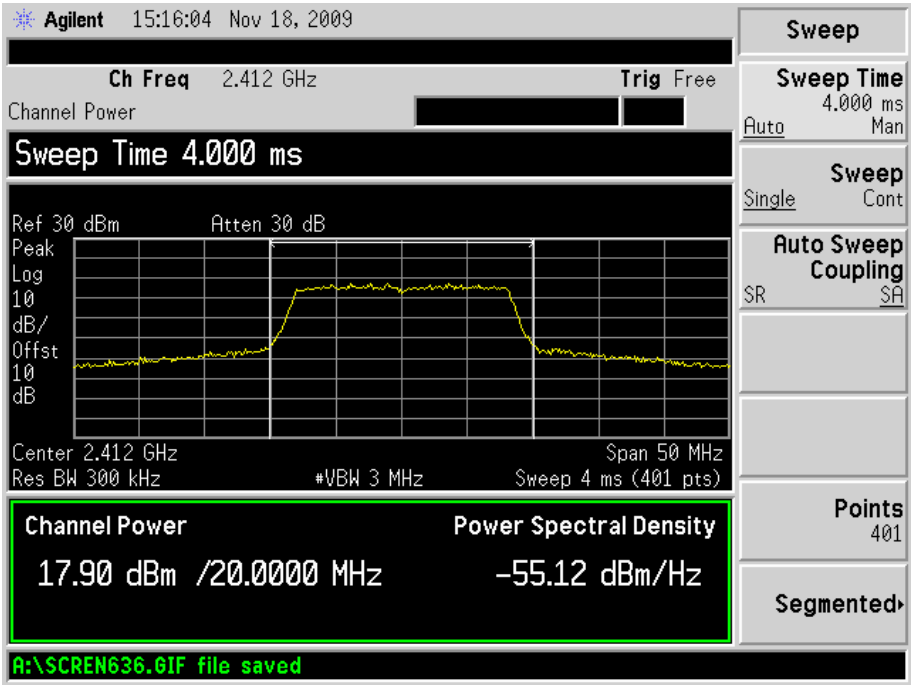


High Channel:

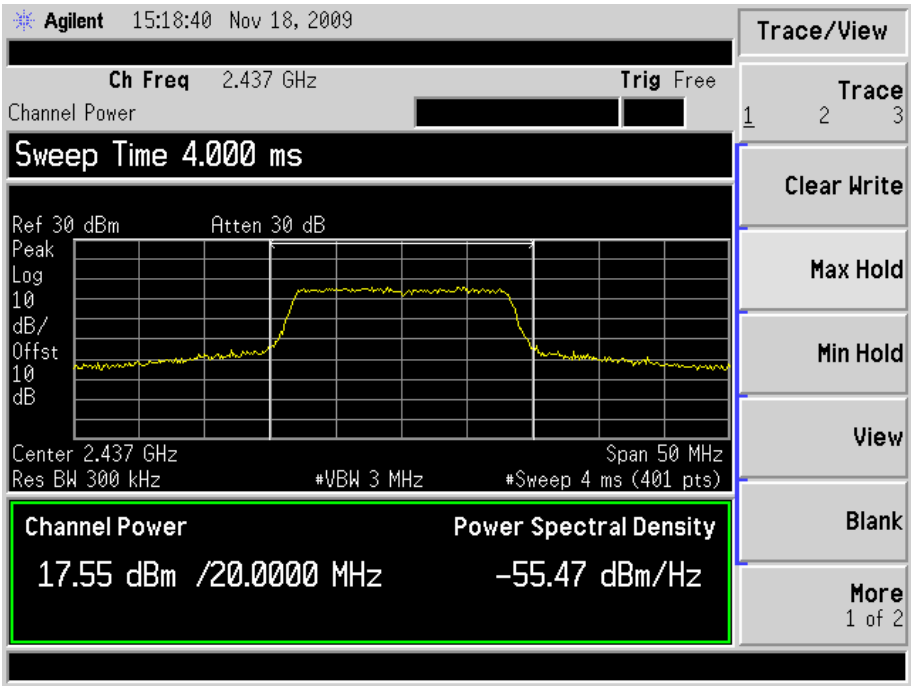


For 802.11g

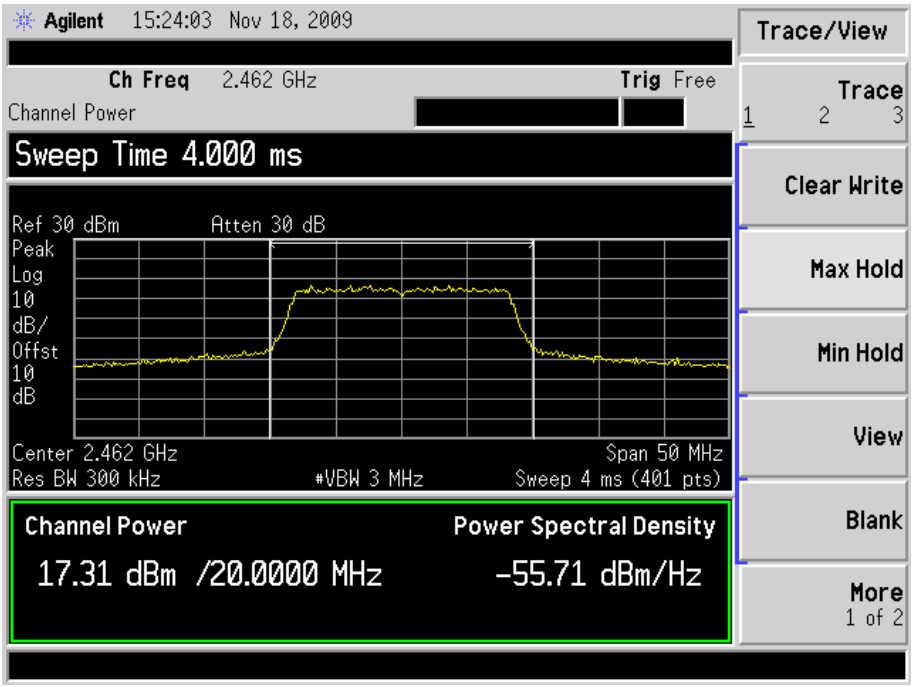
Low Channel:



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.

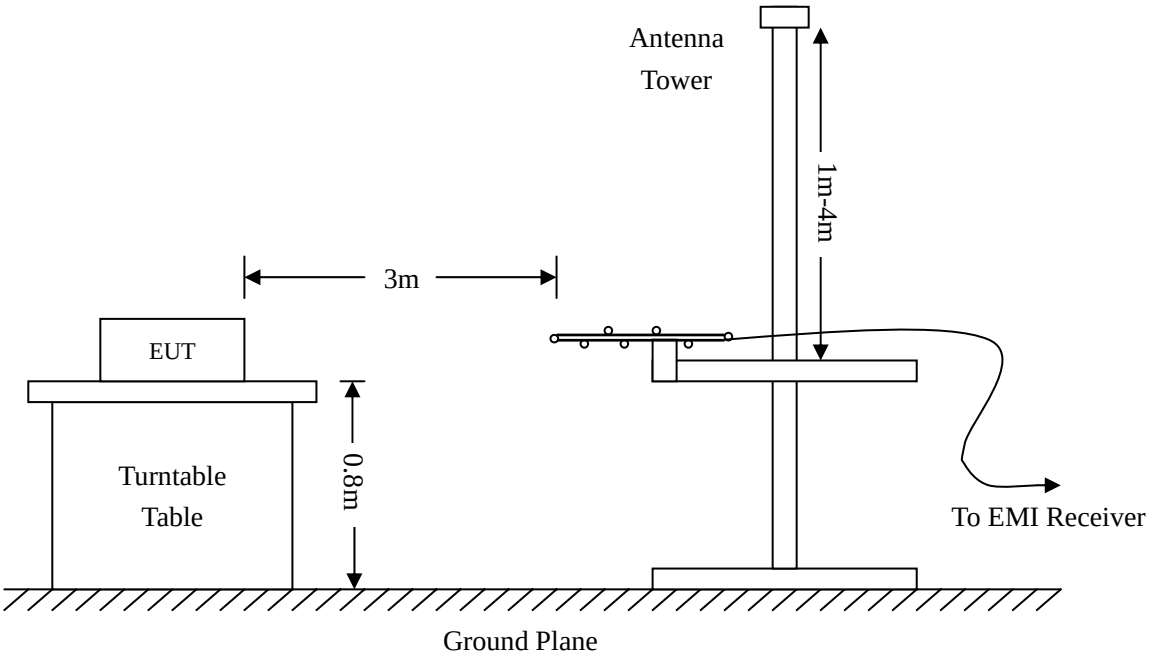
Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-08-12	2010-08-11

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.



9.5 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:

-1.60 dBμV at **240.8304MHz** in the **Horizontal** polarization, **Transmitting 802.11g Low Channel** test mode, **30 MHz to 25 GHz, 3Meters**

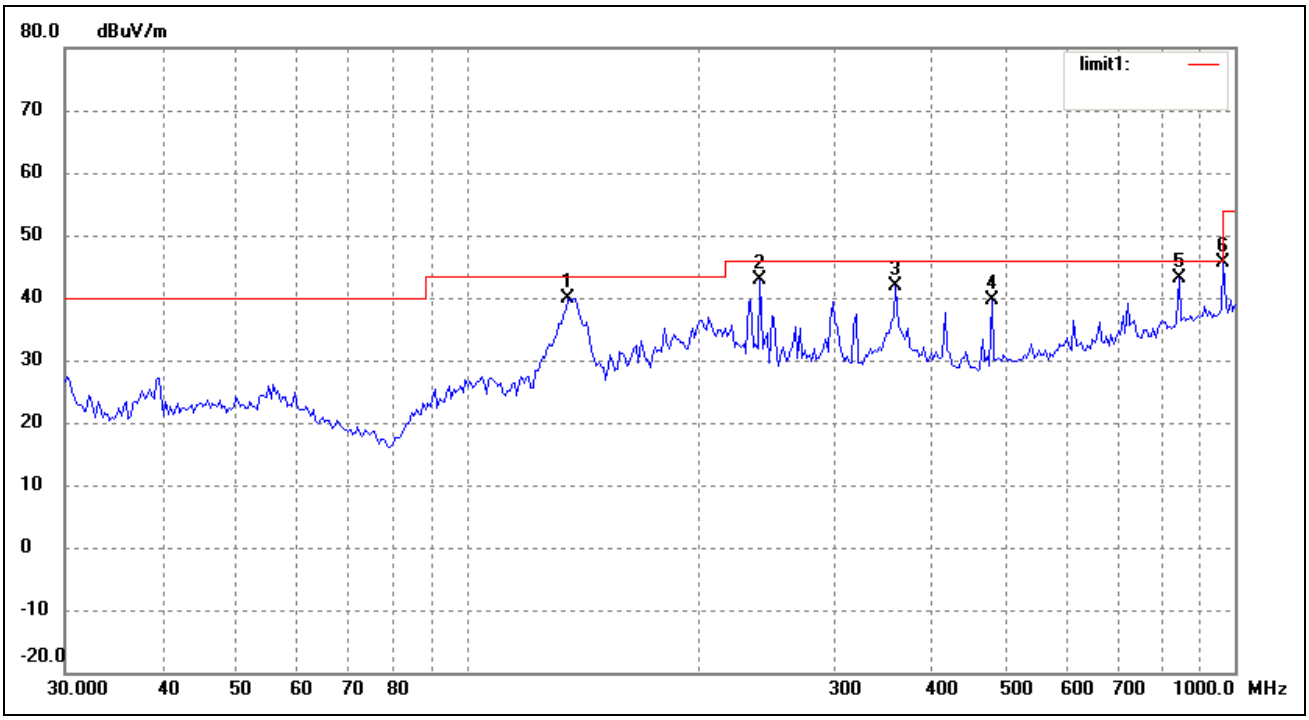
Test Result/Plots:

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b Low Channel)

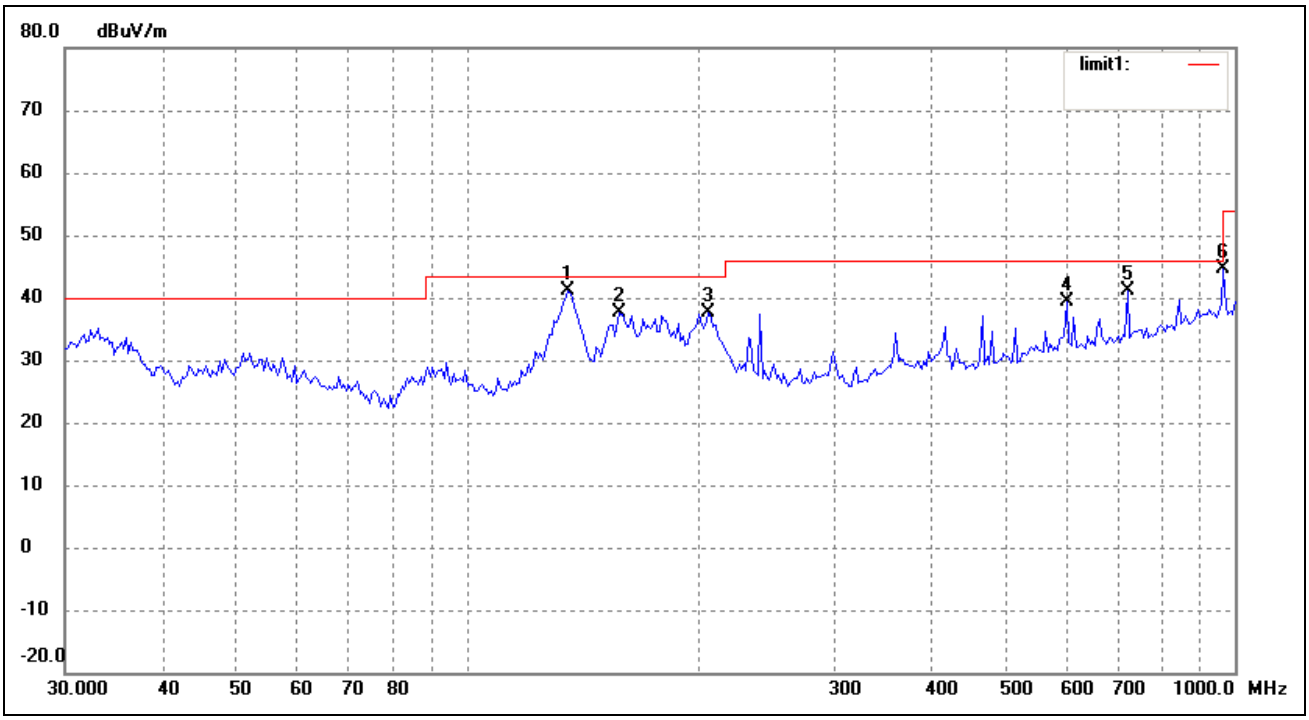
Comment: 120V/60Hz Adapter 12V

Horizontal



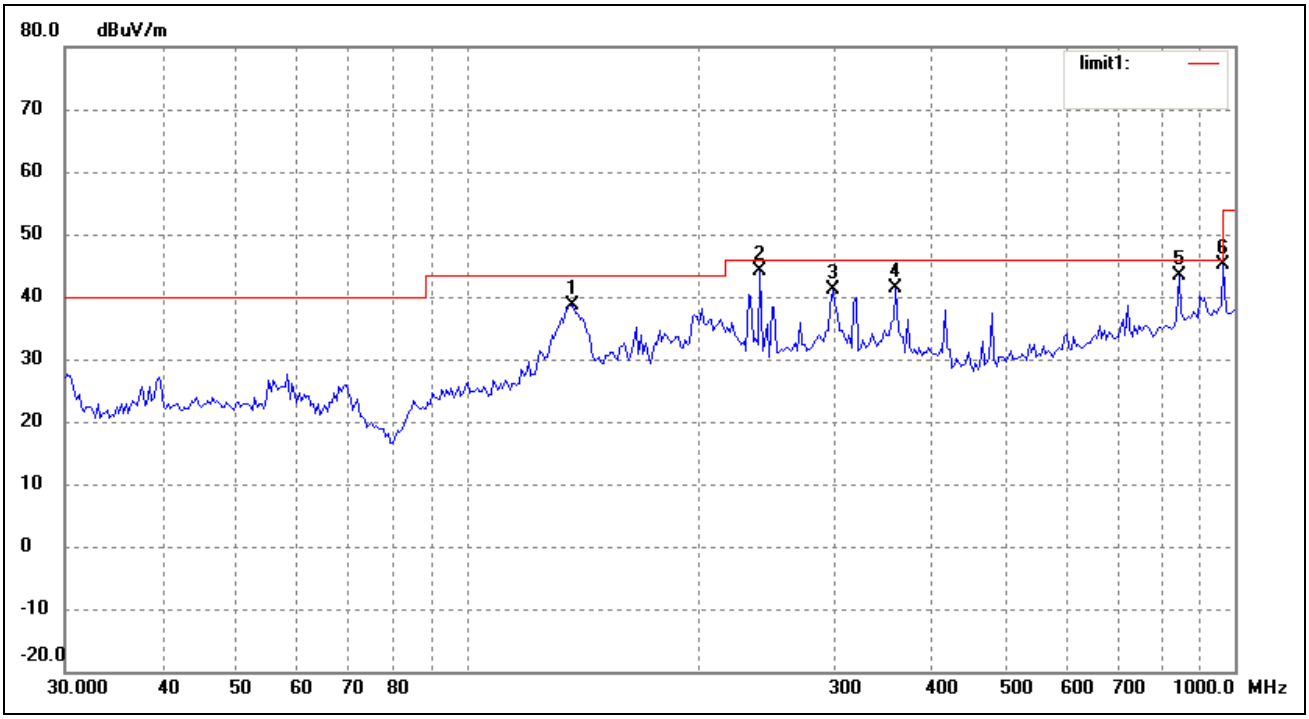
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	135.5062	35.67	4.24	39.91	43.50	-3.59	265	100	QP
2	240.8304	33.99	8.84	42.83	46.00	-3.17	210	100	QP
3	361.7139	29.71	12.10	41.81	46.00	-4.19	15	100	QP
4	482.2156	26.19	13.36	39.55	46.00	-6.45	206	100	QP
5	845.0878	23.61	19.54	43.15	46.00	-2.85	12	100	QP
6	965.5421	24.33	21.29	45.62	54.00	-8.38	215	100	Peak

Vertical



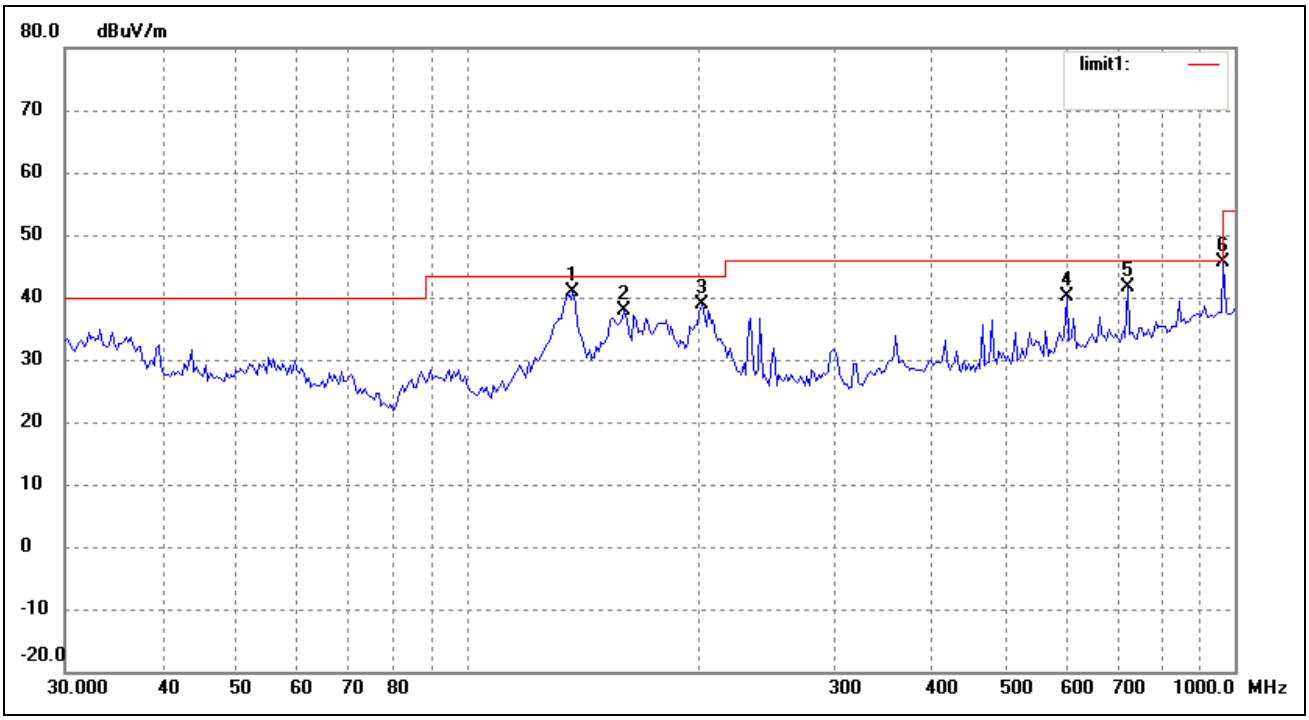
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	135.5062	36.87	4.24	41.11	43.50	-2.39	120	100	QP
2	158.1123	33.12	4.45	37.57	43.50	-5.93	356	100	QP
3	206.3976	30.42	7.14	37.56	43.50	-5.94	5	100	QP
4	603.5392	23.33	16.01	39.34	46.00	-6.66	359	100	QP
5	724.2611	23.63	17.62	41.25	46.00	-4.75	250	200	QP
6	965.5421	23.33	21.29	44.62	54.00	-9.38	360	100	Peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b Middle Channel)
Comment: 120V/60Hz Adapter 12V
Horizontal



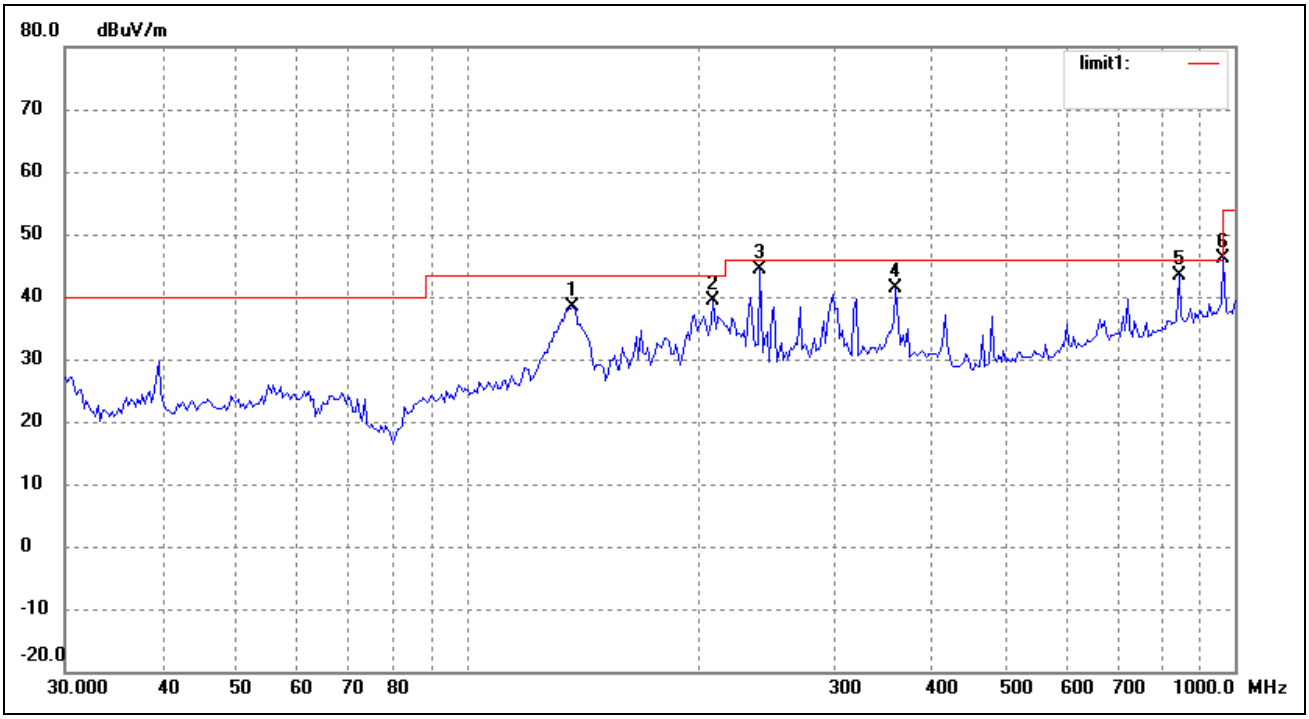
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	137.4202	34.60	4.11	38.71	43.50	-4.79	10	100	QP
2	240.8304	35.37	8.84	44.21	46.00	-1.79	28	100	QP
3	299.3158	30.57	10.65	41.22	46.00	-4.78	45	100	QP
4	361.7139	29.18	12.10	41.28	46.00	-4.72	200	100	QP
5	845.0878	23.87	19.54	43.41	46.00	-2.59	355	100	QP
6	965.5421	23.84	21.29	45.13	54.00	-8.87	360	100	Peak

Vertical



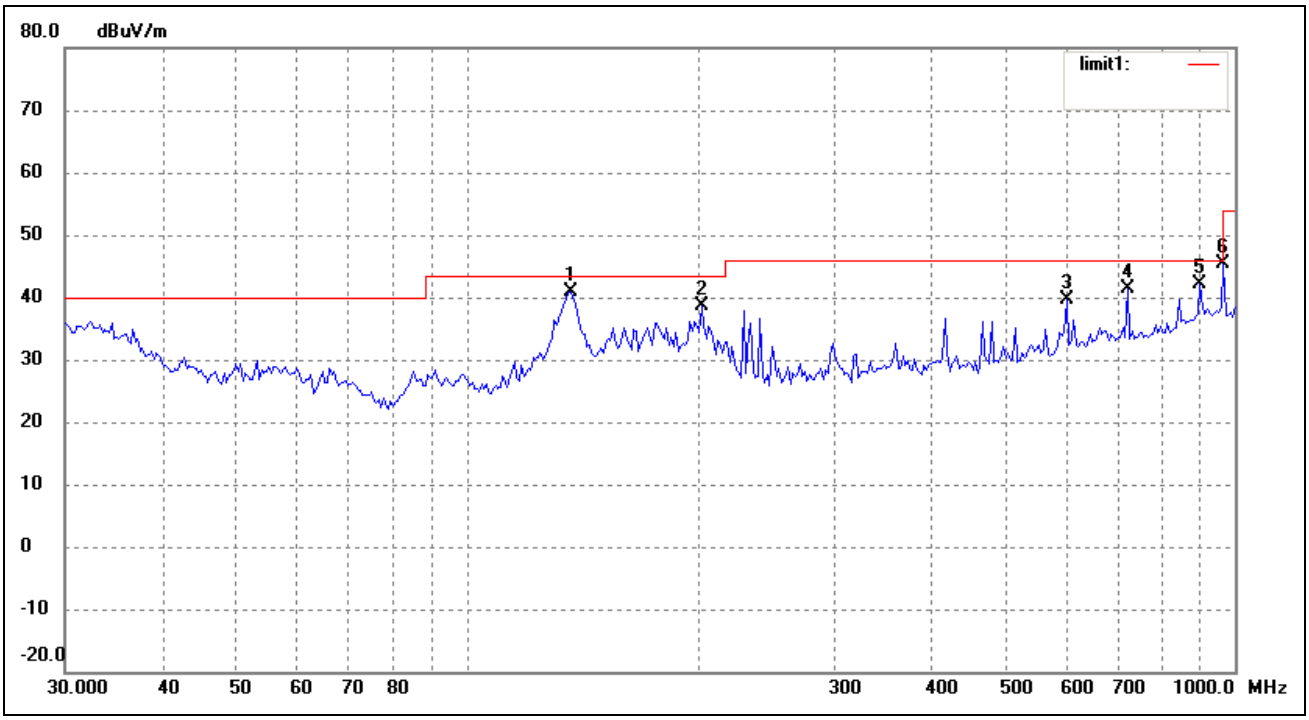
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	137.4202	36.65	4.11	40.76	43.50	-2.74	273	100	QP
2	160.3457	33.36	4.55	37.91	43.50	-5.59	32	100	QP
3	202.1005	31.79	6.97	38.76	43.50	-4.74	342	100	QP
4	603.5392	24.07	16.01	40.08	46.00	-5.92	179	100	QP
5	724.2611	24.00	17.62	41.62	46.00	-4.38	250	100	QP
6	965.5421	24.42	21.29	45.71	54.00	-8.29	125	200	Peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b high Channel)
Comment: 120V/60Hz Adapter 12V
Horizontal



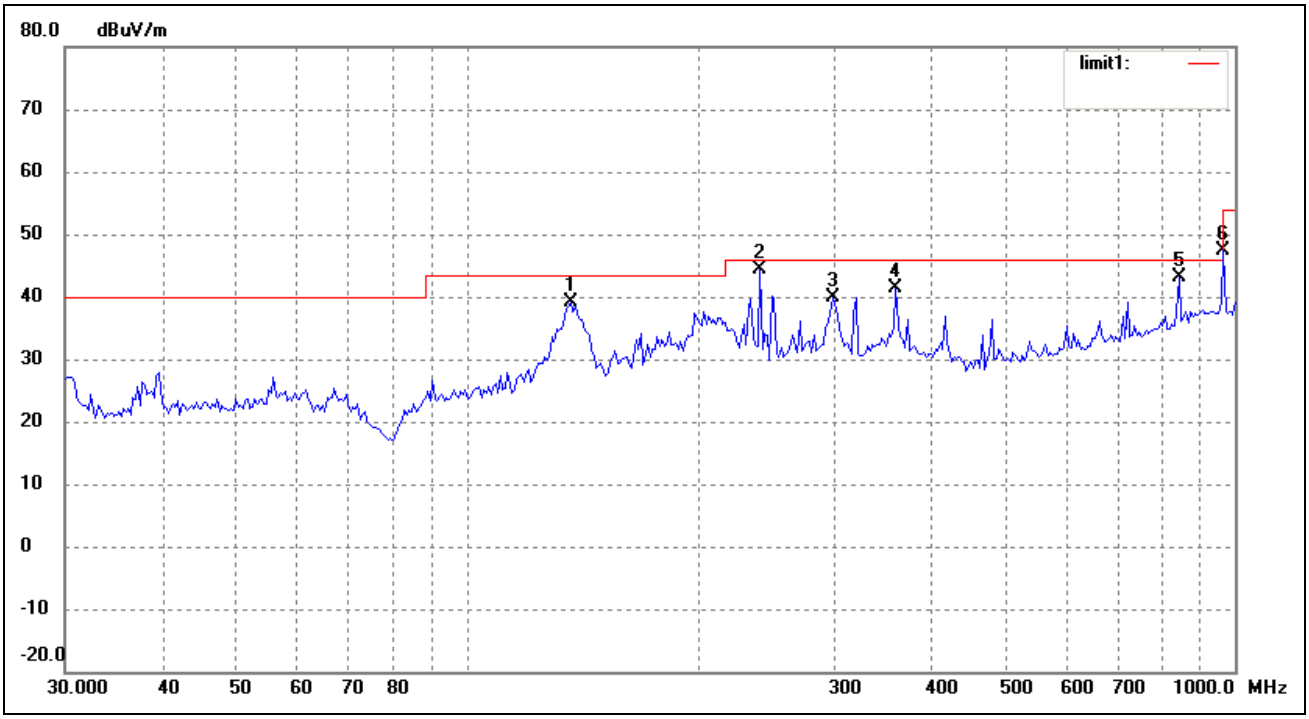
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	137.4202	34.37	4.11	38.48	43.50	-5.02	180	100	QP
2	209.3129	32.23	7.26	39.49	43.50	-4.01	360	100	QP
3	240.8304	35.47	8.84	44.31	46.00	-1.69	5	100	QP
4	361.7139	29.17	12.10	41.27	46.00	-4.73	356	100	QP
5	845.0878	23.76	19.54	43.30	46.00	-2.70	350	100	QP
6	965.5421	24.83	21.29	46.12	54.00	-7.88	360	100	Peak

Vertical



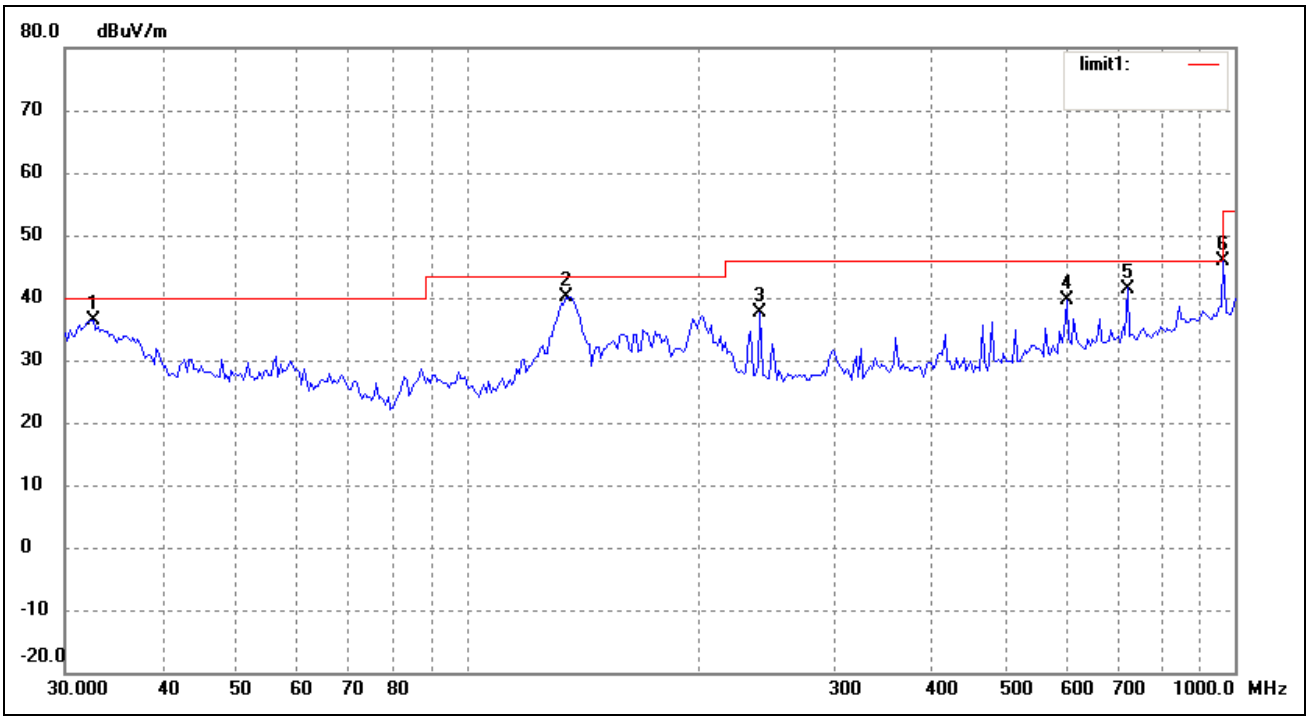
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	136.4598	36.71	4.17	40.88	43.50	-2.62	270	100	QP
2	202.1005	31.54	6.97	38.51	43.50	-4.99	100	100	QP
3	603.5392	23.66	16.01	39.67	46.00	-6.33	15	100	QP
4	724.2611	23.86	17.62	41.48	46.00	-4.52	222	100	QP
5	900.1474	21.32	20.70	42.02	46.00	-3.98	358	100	QP
6	965.5421	24.19	21.29	45.48	54.00	-8.52	250	100	Peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11g Low Channel)
Comment: 120V/60Hz Adapter 12V
Horizontal



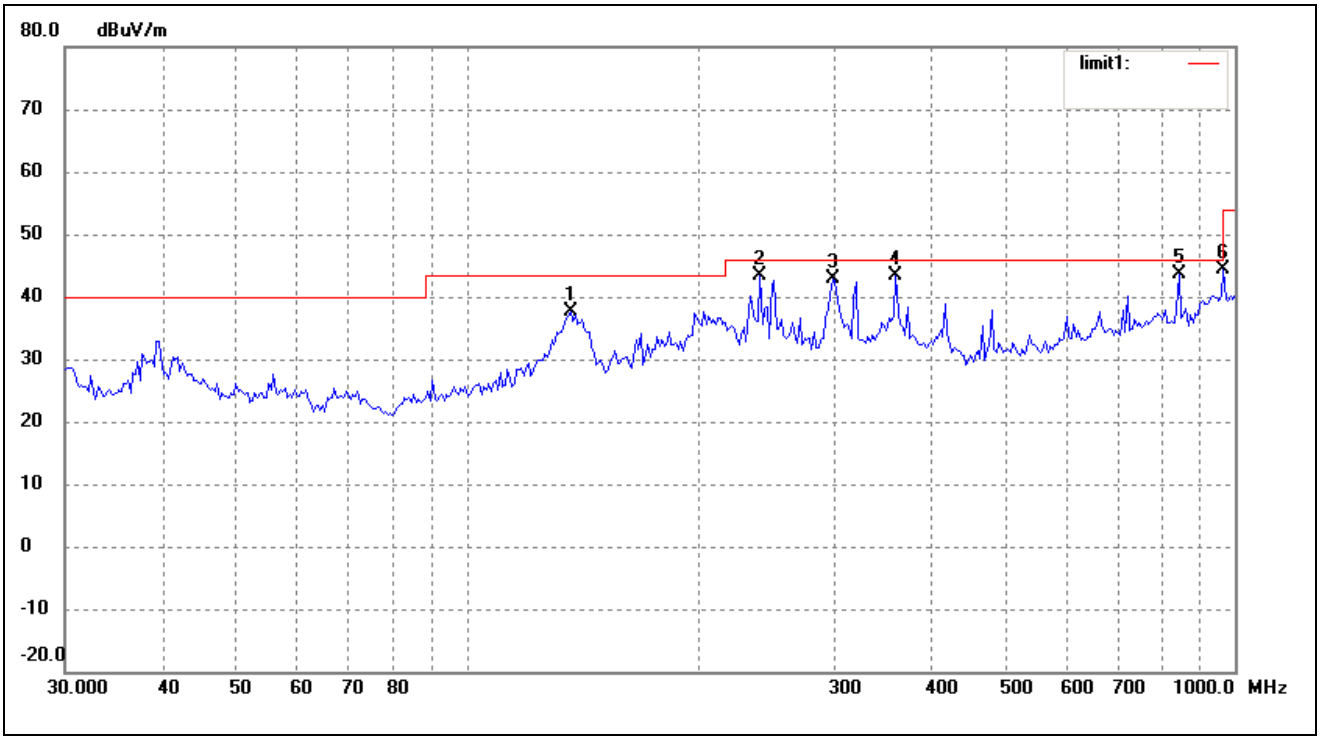
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	136.4598	35.03	4.17	39.20	43.50	-4.30	210	100	QP
2	240.8304	35.56	8.84	44.40	46.00	-1.60	125	100	QP
3	299.3158	29.34	10.65	39.99	46.00	-6.01	0	100	QP
4	361.7139	29.17	12.10	41.27	46.00	-4.73	45	100	QP
5	845.0878	23.60	19.54	43.14	46.00	-2.86	250	100	QP
6	965.5421	26.06	21.29	47.35	54.00	-6.65	102	100	QP

Vertical



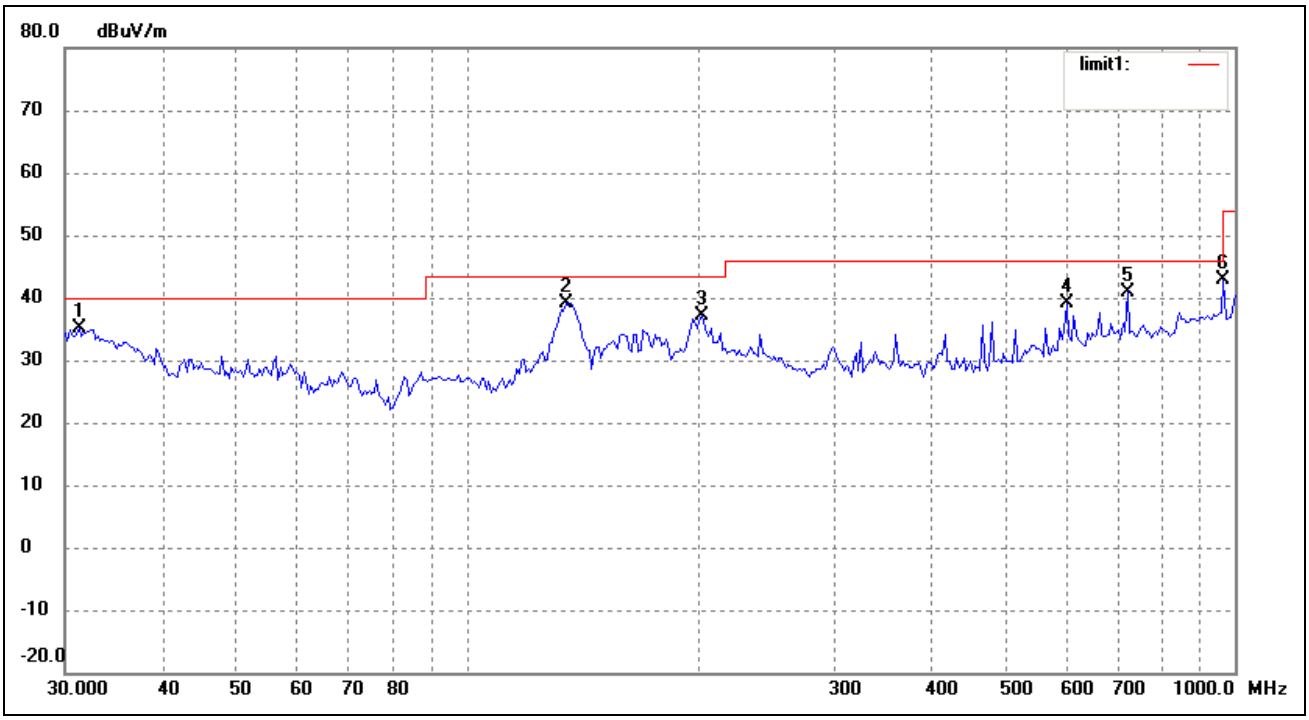
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	32.6340	29.47	6.89	36.36	40.00	-3.64	358	100	QP
2	134.5592	35.90	4.29	40.19	43.50	-3.31	180	100	QP
3	240.8304	28.68	8.84	37.52	46.00	-8.48	245	100	Peak
4	603.5392	23.66	16.01	39.67	46.00	-6.33	87	100	Peak
5	724.2611	23.88	17.62	41.50	46.00	-4.50	36	110	QP
6	965.5421	24.49	21.29	45.78	54.00	-8.22	334	100	Peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11G Middle Channel)
Comment: 120V/60Hz Adapter 12V
Horizontal



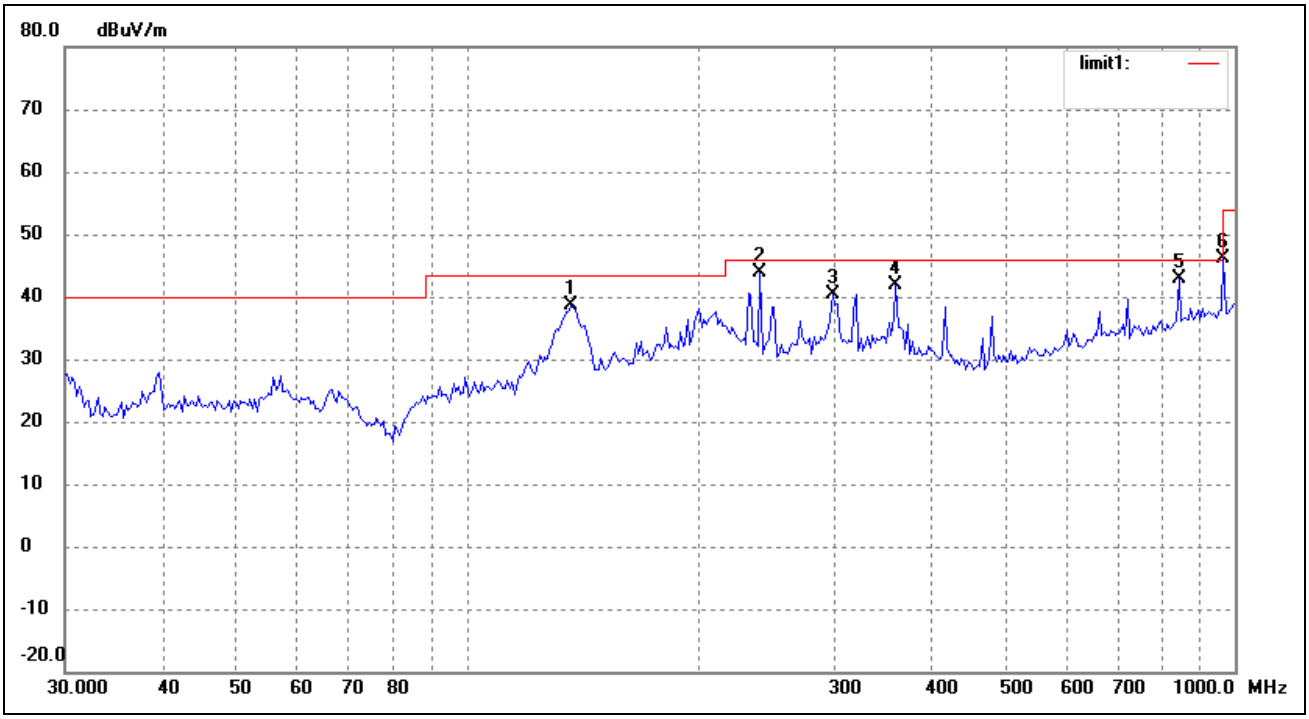
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	136.4598	33.53	4.17	37.70	43.50	-5.80	230	100	QP
2	240.8303	34.56	8.84	43.40	46.00	-2.60	152	100	QP
3	299.3158	32.34	10.65	42.99	46.00	-3.01	11	100	QP
4	361.7139	31.17	12.10	43.27	46.00	-2.73	36	100	QP
5	845.0878	24.10	19.54	43.64	46.00	-2.36	25	100	QP
6	965.5421	23.06	21.29	44.35	54.00	-9.65	360	100	Peak

Vertical



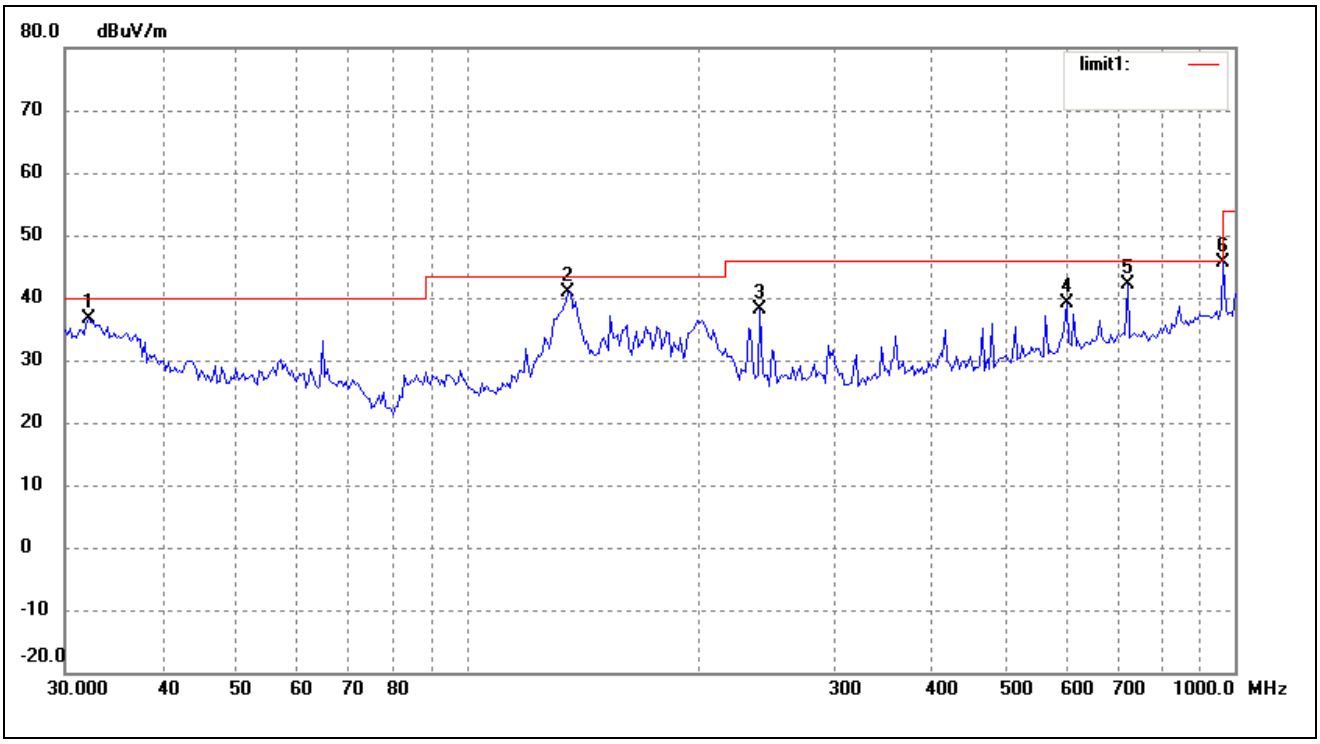
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	31.2893	28.28	6.92	35.20	40.00	-4.80	36	100	QP
2	134.5592	34.90	4.29	39.19	43.50	-4.31	12	100	QP
3	202.1005	30.08	6.97	37.05	43.50	-6.45	54	100	QP
4	603.5392	23.16	16.01	39.17	46.00	-6.83	63	100	QP
5	724.2611	23.38	17.62	41.00	46.00	-5.00	85	100	QP
6	965.5421	21.49	21.29	42.78	54.00	-11.22	11	100	Peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11g High Channel)
Comment: 120V/60Hz Adapter 12V
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	136.4598	34.38	4.17	38.55	43.50	-4.95	210	100	QP
2	240.8304	35.13	8.84	43.97	46.00	-2.03	125	100	QP
3	299.3158	29.65	10.65	40.30	46.00	-5.70	0	100	QP
4	361.7139	29.69	12.10	41.79	46.00	-4.21	45	100	QP
5	845.0878	23.35	19.54	42.89	46.00	-3.11	250	100	QP
6	965.5421	24.78	21.29	46.07	54.00	-7.93	102	100	QP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	32.1795	29.62	6.89	36.51	40.00	-3.49	358	100	QP
2	135.5062	36.69	4.24	40.93	43.50	-2.57	180	100	QP
3	240.8304	29.27	8.84	38.11	46.00	-7.89	245	100	Peak
4	603.5392	23.16	16.01	39.17	46.00	-6.83	87	100	Peak
5	724.2611	24.50	17.62	42.12	46.00	-3.88	36	110	QP
6	965.5421	24.26	21.29	45.55	54.00	-8.45	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	50.0	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	45.4	270	V	34.1	5.2	33.0	51.7	54	-2.3
7236.0	AV	41.3	90	V	37.4	6.1	33.5	51.3	54	-2.7
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
9648.0	PK	42.9	270	H	37.9	6.7	33.2	54.3	74	-19.7
9648.0	PK	44.5	45	V	37.9	6.7	33.2	55.9	74	-18.1
9648.0	AV	33.8	180	H	37.9	6.7	33.2	45.2	54	-8.8
9648.0	AV	34.4	45	V	37.9	6.7	33.2	45.8	54	-8.2
12060.0	PK	38.5	90	H	38.3	7.4	33.7	50.5	74	-23.5
12060.0	PK	39.6	270	V	38.3	7.4	33.7	51.6	74	-22.4
12060.0	AV	29.2	60	H	38.3	7.4	33.7	41.2	54	-12.8
12060.0	AV	30.4	60	V	38.3	7.4	33.7	42.4	54	-11.6
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	42.3	270	V	37.4	6.1	33.5	52.3	54	-1.7
4874.0	AV	45.2	90	V	34.1	5.2	33.0	51.5	54	-2.5
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
9748.0	PK	42.2	90	H	37.9	6.7	33.2	53.6	74	-20.4
9748.0	PK	43.4	270	V	37.9	6.7	33.2	54.8	74	-19.2
9748.0	AV	33.0	180	H	37.9	6.7	33.2	44.4	54	-9.6
9748.0	AV	34.1	45	V	37.9	6.7	33.2	45.5	54	-8.5
12185.0	PK	38.1	270	H	38.3	7.4	33.7	50.1	74	-23.9
12185.0	PK	39.2	90	V	38.3	7.4	33.7	51.2	74	-22.8
12185.0	AV	28.4	45	H	38.3	7.4	33.7	40.4	54	-13.6
12185.0	AV	29.2	60	V	38.3	7.4	33.7	41.2	54	-12.8

High Channel (1G to 25GHz)										
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	45.4	90	V	34.1	5.2	33.0	51.7	54	-2.3
7386.0	AV	41.6	270	V	37.4	6.1	33.5	51.6	54	-2.4
4924.0	AV	44.9	60	H	34.1	5.2	33.0	51.2	54	-2.8
7386.0	AV	40.6	60	H	37.4	6.1	33.5	50.6	54	-3.4
9848.0	PK	41.8	45	H	37.9	6.7	33.2	53.2	74	-20.8
9848.0	PK	43.1	270	V	37.9	6.7	33.2	54.5	74	-19.5
9848.0	AV	33.4	45	H	37.9	6.7	33.2	44.8	54	-9.2
9848.0	AV	34.5	180	V	37.9	6.7	33.2	45.9	54	-8.1
12310.0	PK	38.6	270	H	38.3	7.4	33.7	50.6	74	-23.4
12310.0	PK	39.1	90	V	38.3	7.4	33.7	51.1	74	-22.9
12310.0	AV	28.7	60	H	38.3	7.4	33.7	40.7	54	-13.3
12310.0	AV	28.8	45	V	38.3	7.4	33.7	40.8	54	-13.2

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	43.9	270	V	34.1	5.2	33.0	50.2	54	-3.8
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	44.1	60	H	34.1	5.2	33.0	50.4	54	-3.6
9648.0	PK	41.3	270	H	37.9	6.7	33.2	52.7	74	-21.3
9648.0	PK	42.0	45	V	37.9	6.7	33.2	53.4	74	-20.6
9648.0	AV	33.2	180	H	37.9	6.7	33.2	44.6	54	-9.4
9648.0	AV	34.3	45	V	37.9	6.7	33.2	45.7	54	-8.3
12060.0	PK	35.2	90	H	38.3	7.4	33.7	47.2	74	-26.8
12060.0	PK	37.1	270	V	38.3	7.4	33.7	49.1	74	-24.9
12060.0	AV	27.6	60	H	38.3	7.4	33.7	39.6	54	-14.4
12060.0	AV	29.2	60	V	38.3	7.4	33.7	41.2	54	-12.8
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	41.3	270	V	37.4	6.1	33.5	51.3	54	-2.7
4874.0	AV	44.2	90	V	34.1	5.2	33.0	50.5	54	-3.5
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
9748.0	PK	39.4	90	H	37.9	6.7	33.2	50.8	74	-23.2
9748.0	PK	39.9	270	V	37.9	6.7	33.2	51.3	74	-22.7
9748.0	AV	30.3	180	H	37.9	6.7	33.2	41.7	54	-12.3
9748.0	AV	30.5	45	V	37.9	6.7	33.2	41.9	54	-12.1
12185.0	PK	33.1	270	H	38.3	7.4	33.7	45.1	74	-28.9
12185.0	PK	36.2	90	V	38.3	7.4	33.7	48.2	74	-25.8
12185.0	AV	26.3	45	H	38.3	7.4	33.7	38.3	54	-15.7
12185.0	AV	26.7	60	V	38.3	7.4	33.7	38.7	54	-15.3

High Channel (1G to 25GHz)										
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	44.8	90	V	34.1	5.2	33.0	51.1	54	-2.9
7386.0	AV	40.4	270	V	37.4	6.1	33.5	50.4	54	-3.6
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
9848.0	PK	39.1	45	H	37.9	6.7	33.2	50.5	74	-23.5
9848.0	PK	40.3	270	V	37.9	6.7	33.2	51.7	74	-22.3
9848.0	AV	30.1	45	H	37.9	6.7	33.2	41.5	54	-12.5
9848.0	AV	31.0	180	V	37.9	6.7	33.2	42.4	54	-11.6
12310.0	PK	32.6	270	H	38.3	7.4	33.7	44.6	74	-29.4
12310.0	PK	36.5	90	V	38.3	7.4	33.7	48.5	74	-25.5
12310.0	AV	25.6	60	H	38.3	7.4	33.7	37.6	54	-16.4
12310.0	AV	26.3	45	V	38.3	7.4	33.7	38.3	54	-15.7

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	2009-08-12	2010-08-11
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-08-12	2010-08-11

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

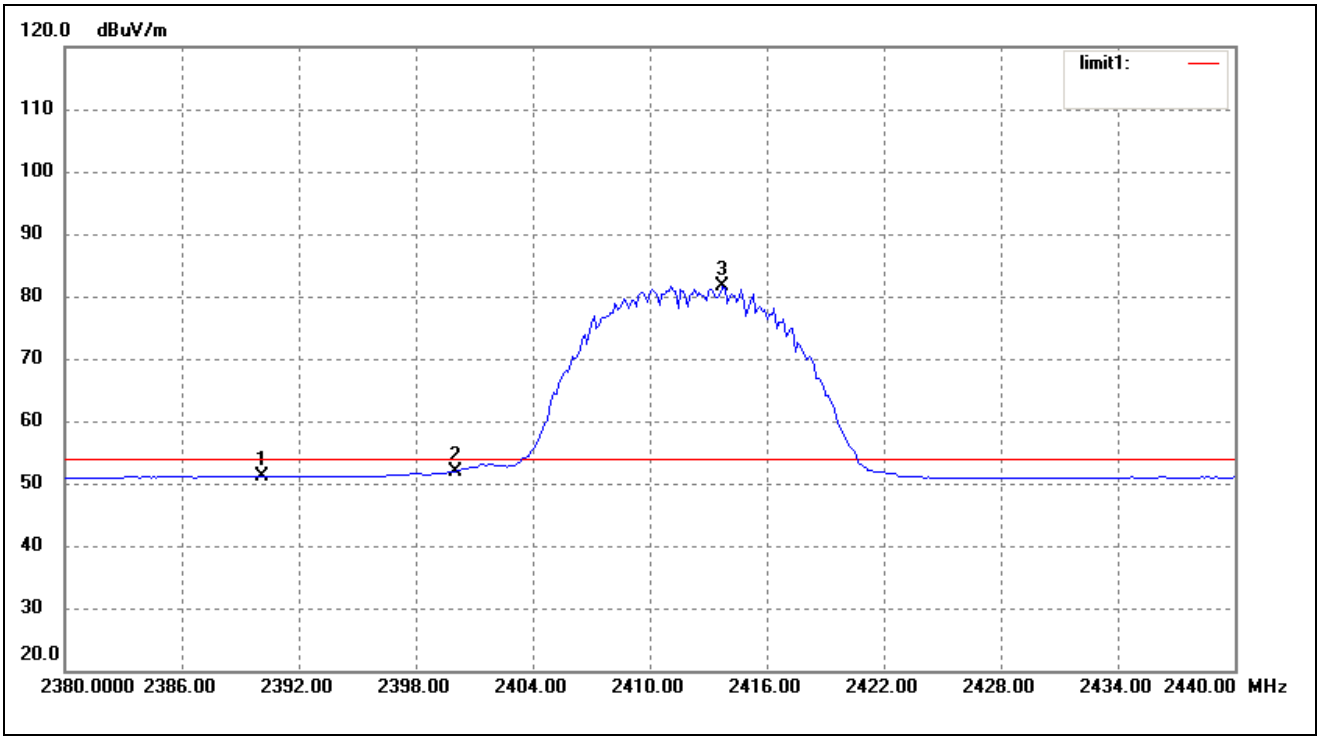
Temperature:	21° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

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

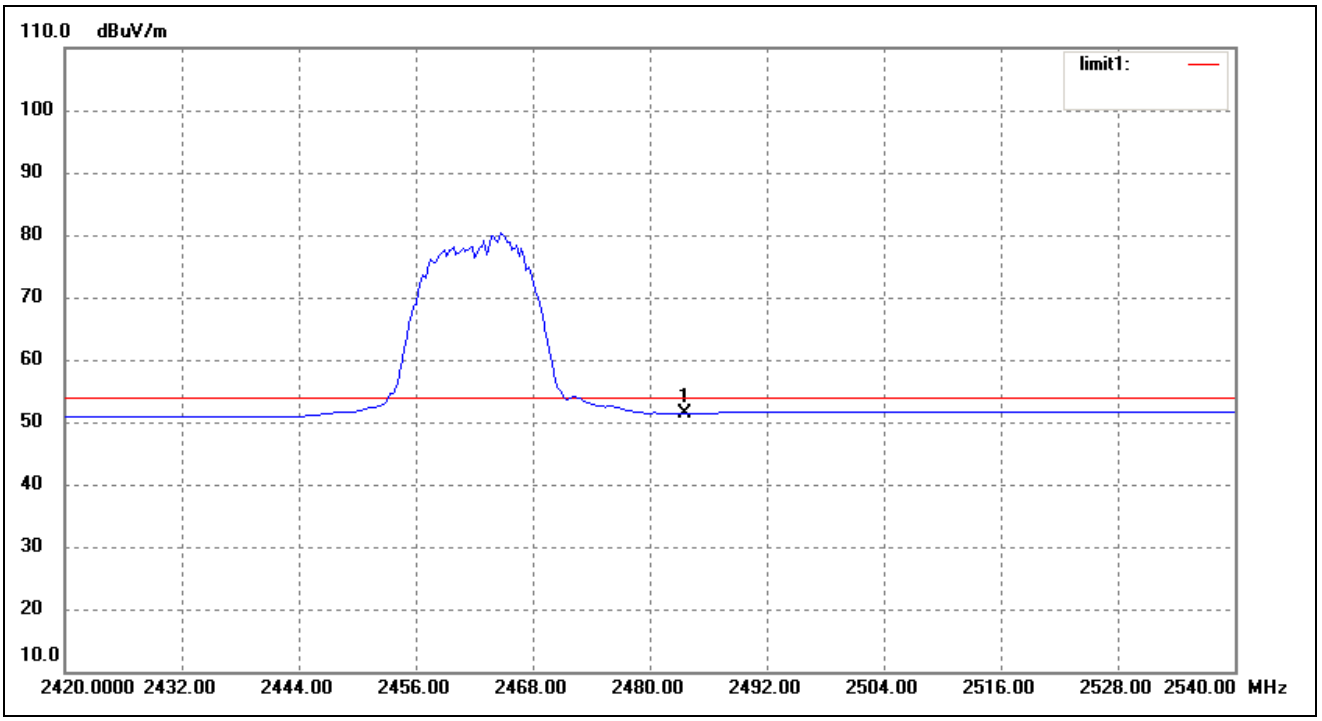
For 802.11b

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2390.000	12.29	38.86	51.15	54.00	-2.85	22	149	Ave
	2390.000	23.29	38.86	52.15	74.00	-11.85	15	126	peak
2	2400.000	13.04	38.95	51.99	/	/	48	120	Ave
3	2413.720	42.75	39.00	81.75	/	/	41	100	Ave

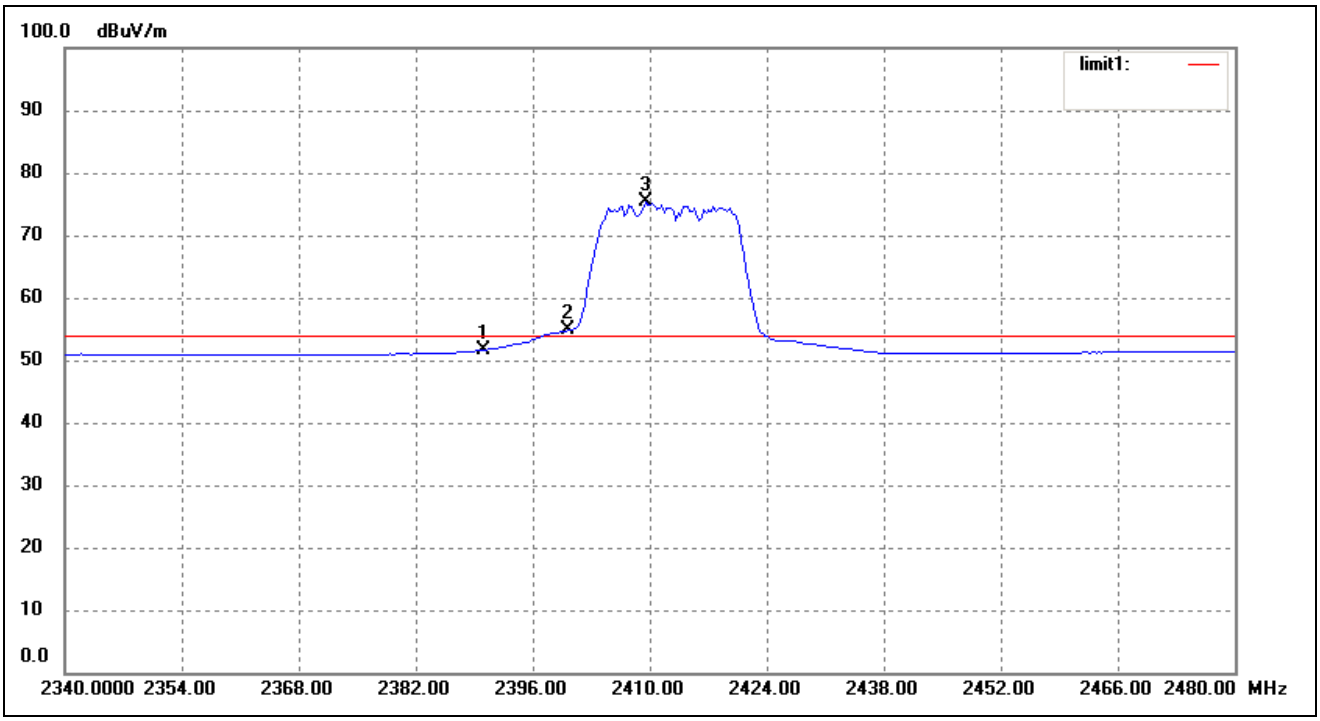
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	12.22	39.24	51.46	54.00	-2.54	140	100	Ave
	2483.500	23.12	39.24	62.36	74.00	-11.64	217	120	peak

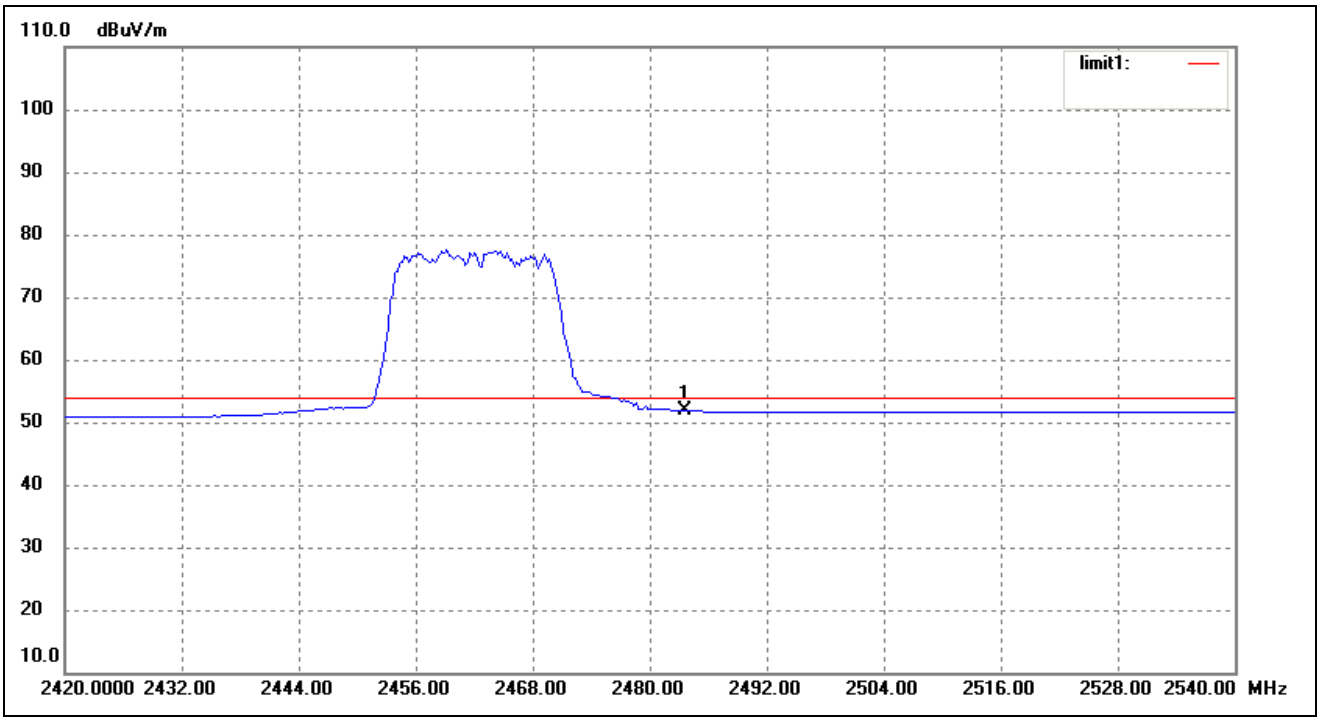
For 802.11g

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2390.000	12.81	38.86	51.67	54.00	-2.33	1	110	Ave
	2390.010	23.43	38.86	62.29	74.00	-11.71	36	120	peak
2	2400.000	15.96	38.95	54.91	/	/	12	100	Ave
3	2409.440	36.34	38.98	75.32	/	/	45	140	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	2483.500	12.61	39.24	51.85	54.00	-2.15	147	150	Ave
	2483.500	23.11	39.24	62.35	74.00	-11.65	65	137	peak

******* END OF REPORT *******