FCC Part 15C

Measurement and Test Report

For

Sinotech Digital Technology Company Ltd.

Room1105-07, Hongfa Center Mansion, Bao'an Central Area, Shenzhen P.R

China

FCC ID: YSFHSG-X5

Report Concerns: Original Report	**Equipment Type:** MID
Model:	HSG-X5
Report No.:	STR10098069I-1
Test Date:	2010-09-09 to 2010-09-17
Issue Date:	2010-09-21
Tested By:	Jason Chen / Engineer
Reviewed By:	Lahm Peng / EMC Manager
Approved & Authorized By:	Jandy so / PSQ Manager
Prepared By:	**Shenzhen SEM.Test Electronic Service Co., Ltd** 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C.（518101） Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

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:	Sinotch Digital Technology Company Ltd.
Address of applicant:	Room1105-07, Hongfa Center Mansion, Bao'an Central Area, Shenzhen P.R China
Manufacturer:	Sinotch Digital Technology Company Ltd.
Address of manufacturer:	Room1105-07, Hongfa Center Mansion, Bao'an Central Area, Shenzhen P.R China

General Description of E.U.T

Items	Description
EUT Description:	MID
Trade Name:	DIOO
Model No.:	HSG-X5
RF Output Power	Max. 9.5dBm
Frequency range:	2412-2462MHz
Number of channels:	11
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Rated Voltage:	7.4VDC Battery with 9VDC Adaptor
Size:	19.5x11.6x1.5 cm
For more information refer to the circuit diagram form and the user's manual.	

Note: The test data is gathered from a production sample, provided by the manufacture.

1.2 Test Standards

The following report is prepared on behalf of the Sinotech Digital Technology Company 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 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.

1.4 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.

1.5 EUT Exercise Software

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

1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/
/	/	/	/

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC Power Cable	1.5	Unshielded	Without Core
Earphone Cable	1.1	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203; § 15.247(c)(1)(i)	Antenna Requirement	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 ± 2.88 dB.

3.2 Test Equipment List and Details

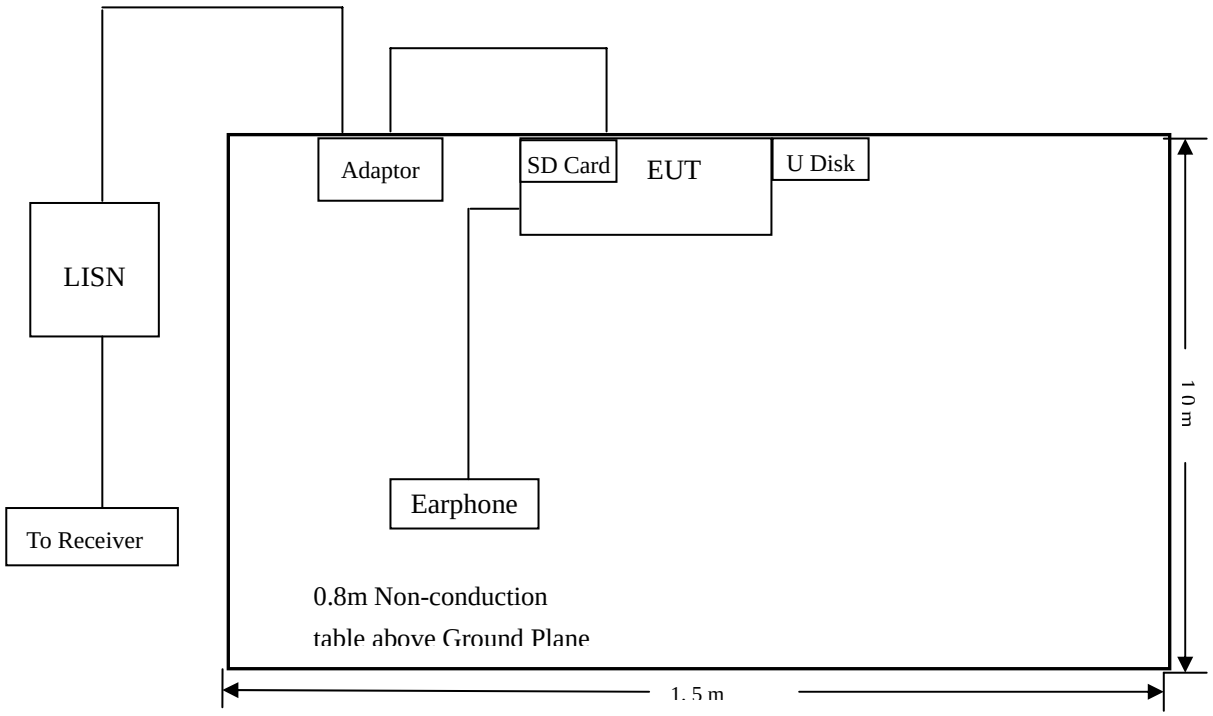
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-08-12	2011-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-08-12	2011-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-08-12	2011-08-11

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:

-4.29 dBμV at **0.222 MHz** in the **Line Ave** 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
0.222	48.45	AV	Line	52.74	-4.29
0.386	40.95	AV	Line	48.24	-7.19
0.982	36.93	AV	Neutral	46.00	-9.06
0.382	38.63	AV	Neutral	48.22	-9.59
0.218	43.15	AV	Neutral	52.89	-9.74
0.222	51.57	QP	Line	62.73	-11.16
17.47	48.52	QP	Neutral	60.00	-11.47
2.186	34.48	AV	Neutral	46.00	-11.51
0.218	50.48	QP	Neutral	62.89	-12.41
0.886	33.22	AV	Line	46.00	-12.77
0.49	42.86	QP	Line	56.00	-13.24
4.598	42.56	QP	Neutral	56.00	-13.43
0.818	40.39	QP	Neutral	56.00	-15.60
2.758	30.29	AV	Line	46.00	-15.70
4.722	40.27	QP	Line	56.00	-15.72
0.934	40.19	QP	Neutral	56.00	-15.80
0.99	38.13	QP	Line	56.00	-17.86

Plot of Conducted Emissions Test Data

Conducted Disturbance

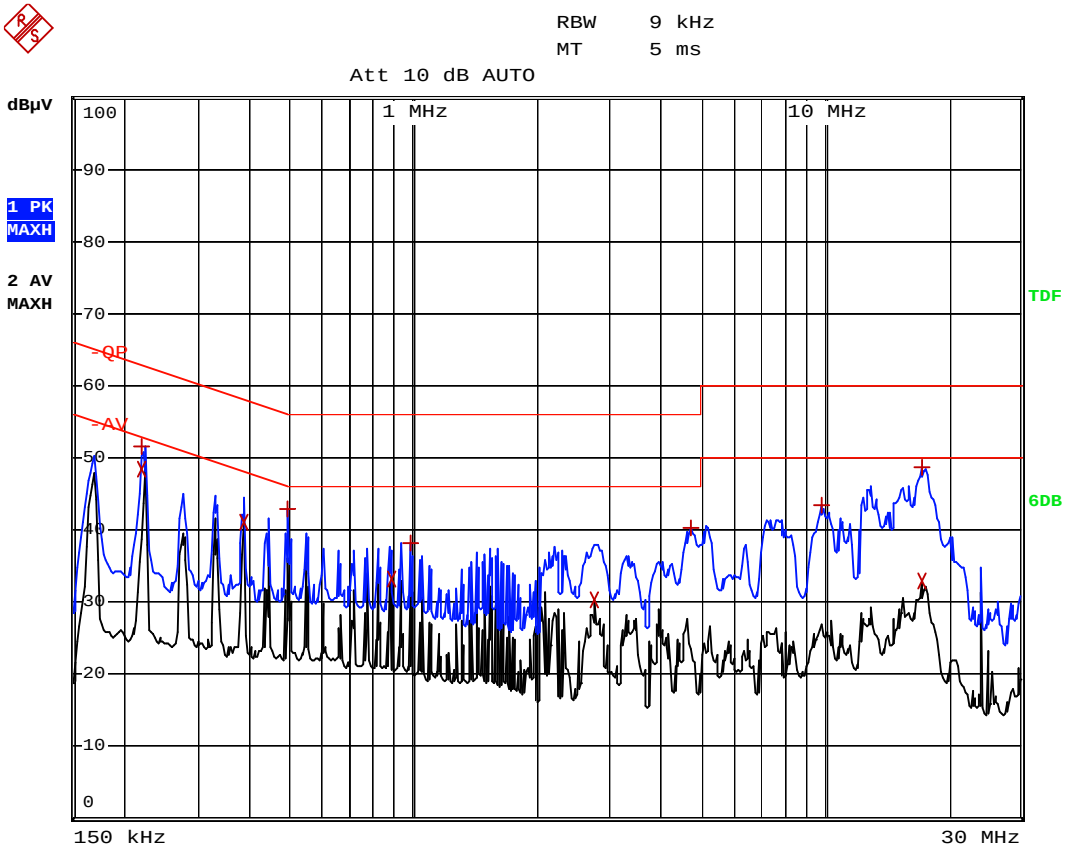
EUT: MID

M/N: HSG-X5

Operating Condition: Transmitting

Test Specification: L

Comment: AC 120V/60Hz/Adapter 9V



Plot of Conducted Emissions Test Data

Conducted Disturbance

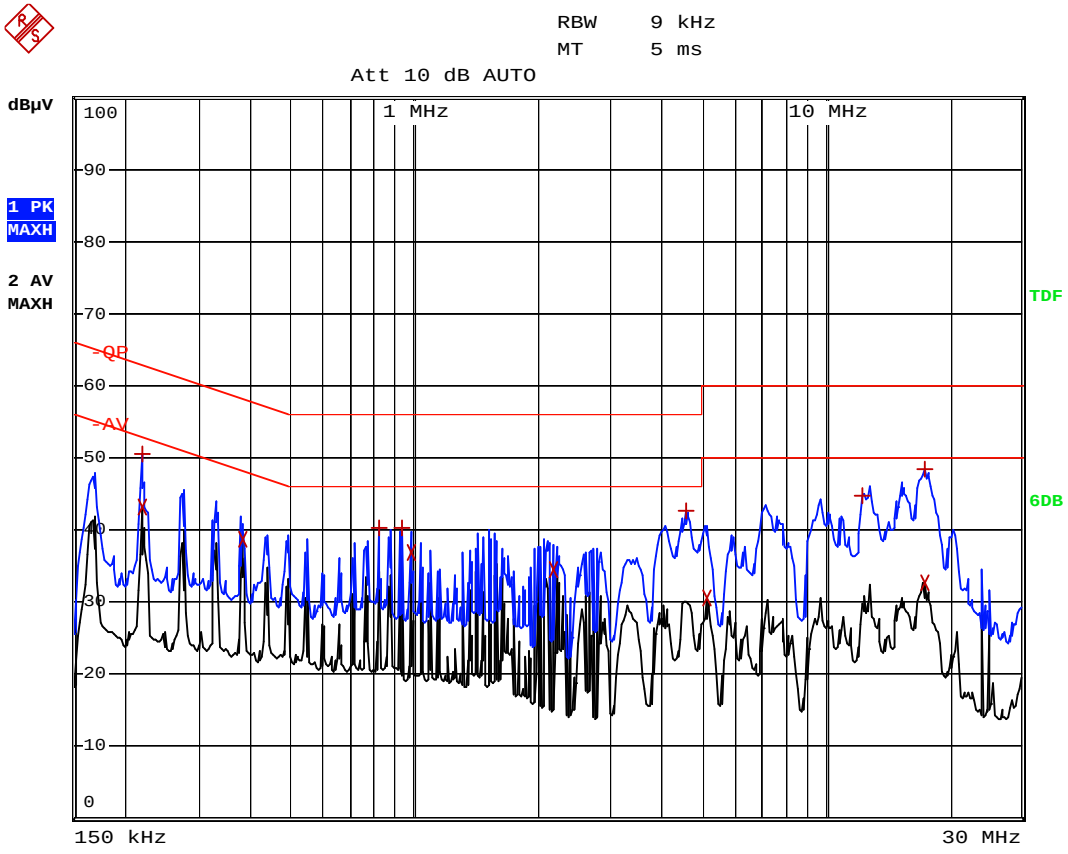
EUT: MID

M/N: HSG-X5

Operating Condition: Transmitting

Test Specification: N

Comment: AC 120V/60Hz/Adapter 9V



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 integral antenna, fulfill the requirement of this section.

5. POWER SPECTRAL DENSITY

5.1 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.

5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2010-08-12	2011-08-11
Attenuator	ATTEN	DC-4GHz	ATS100-4-20	2010-08-12	2011-08-11

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

5.3 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 = 300KHz.
4. Repeat above procedures until all frequency measured was complete.

5.4 Environmental Conditions

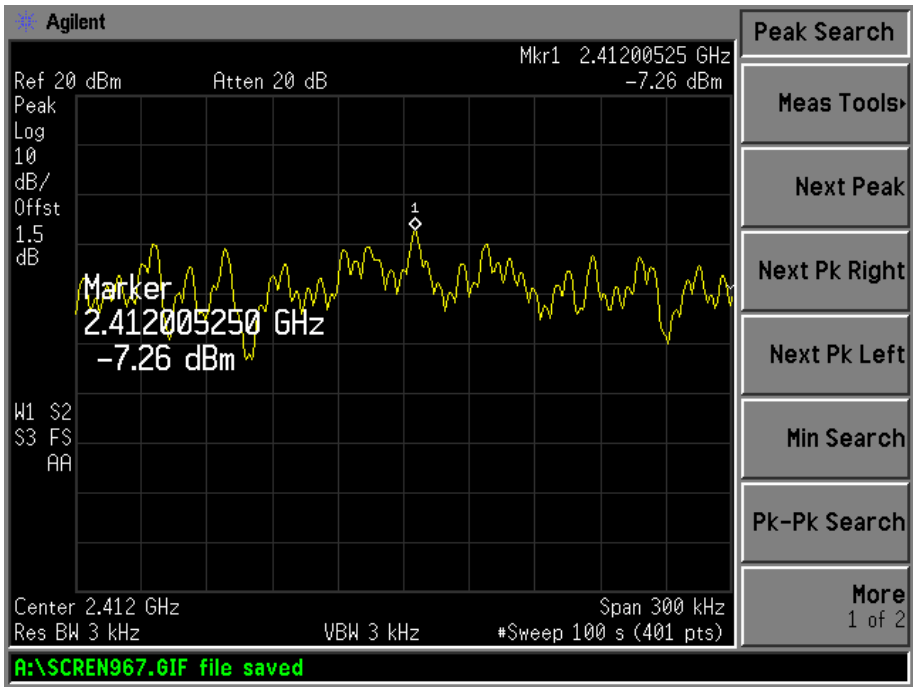
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.5 Summary of Test Results/Plots

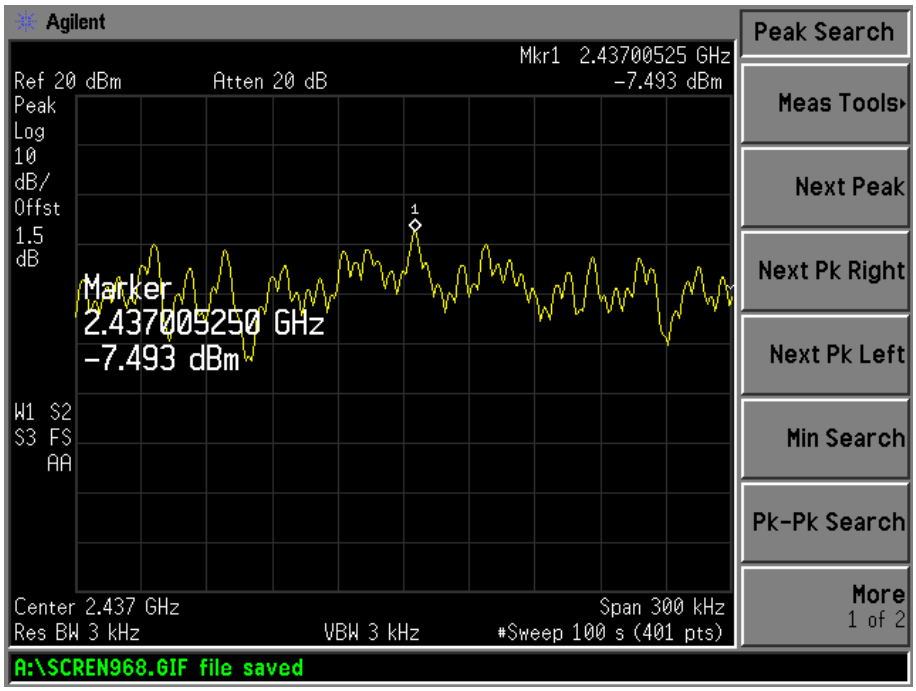
Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-7.26	8
	Middle channel (2437MHz)	-7.49	8
	High channel (2462MHz)	-7.75	8
802.11g	Low channel (2412MHz)	-13.68	8
	Middle channel (2437MHz)	-15.15	8
	High channel (2462MHz)	-11.29	8

For 802.11b

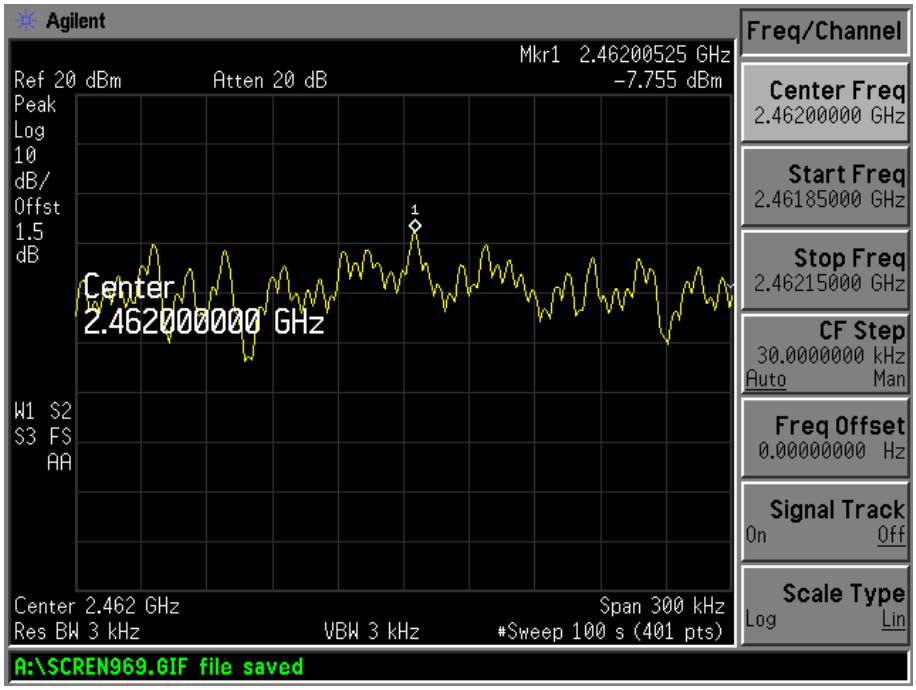
Low Channel:



Middle Channel:

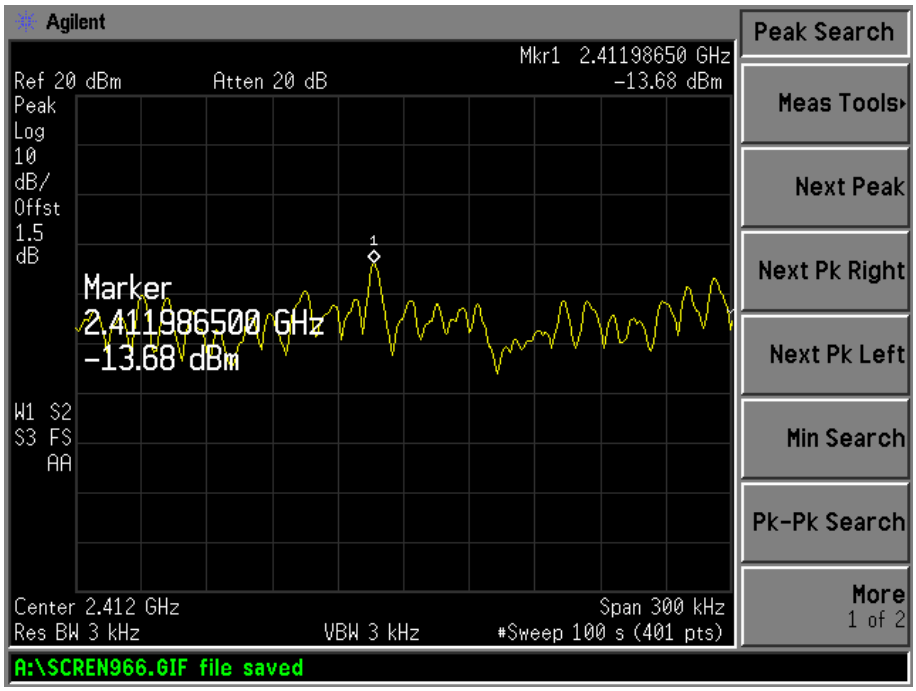


High Channel:

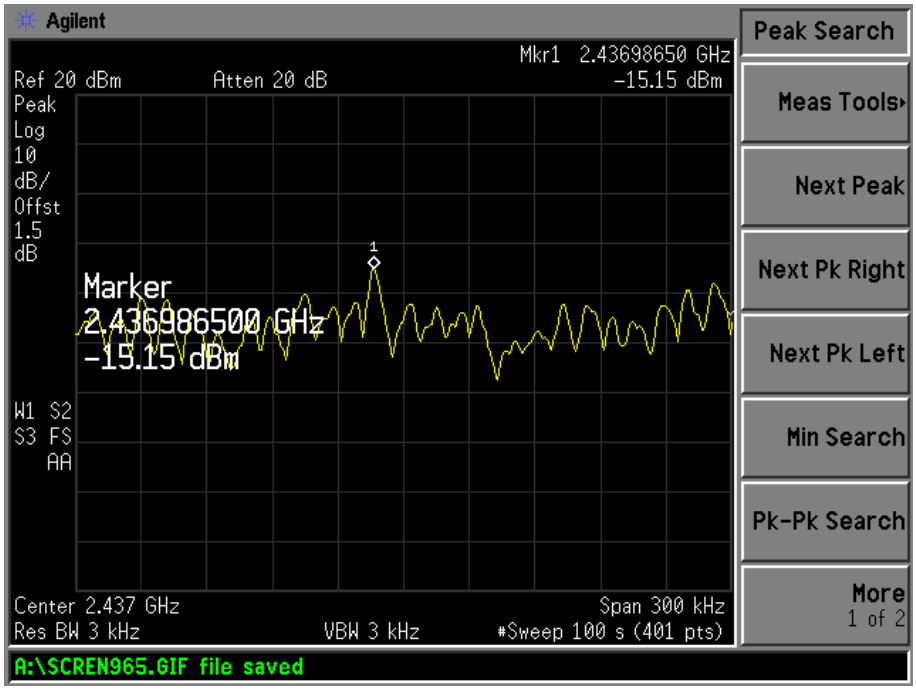


For 802.11g

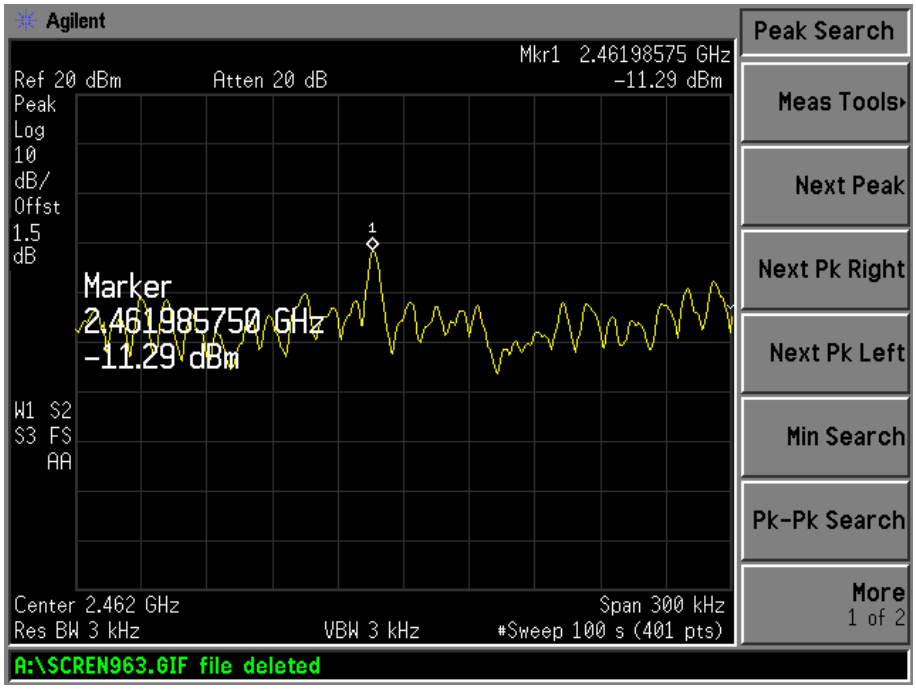
Low Channel:



Middle Channel:



High Channel:



6. 6-dB BANDWIDTH

6.1 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.

6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2010-08-12	2011-08-11
Attenuator	ATTEN	DC-4GHz	ATS100-4-20	2010-08-12	2011-08-11

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. The spectrum analyzer as RBW=300KHz (1 % of Bandwidth.), Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.

6.4 Environmental Conditions

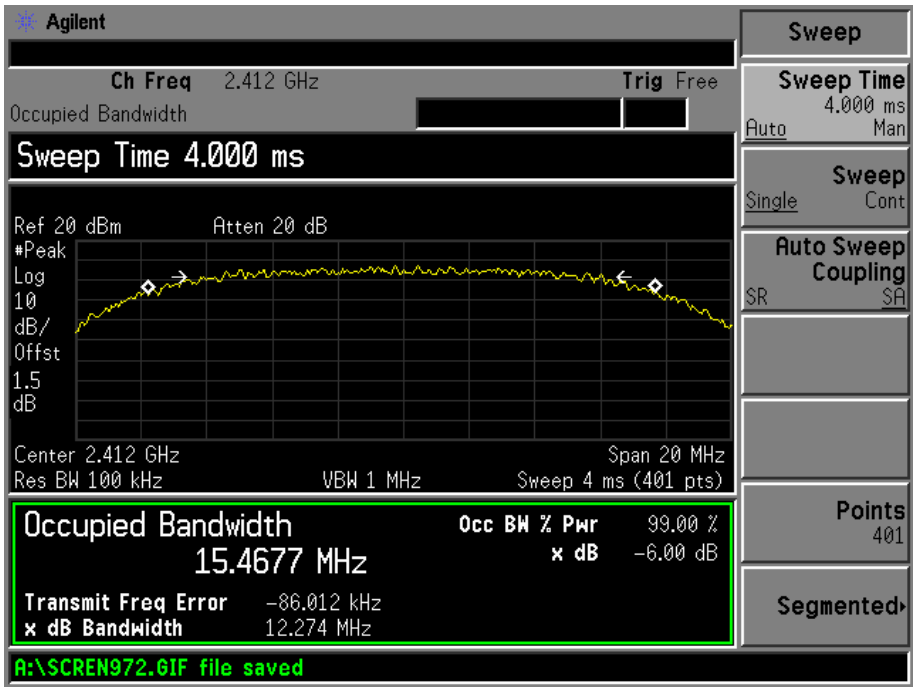
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.5 Summary of Test Results/Plots

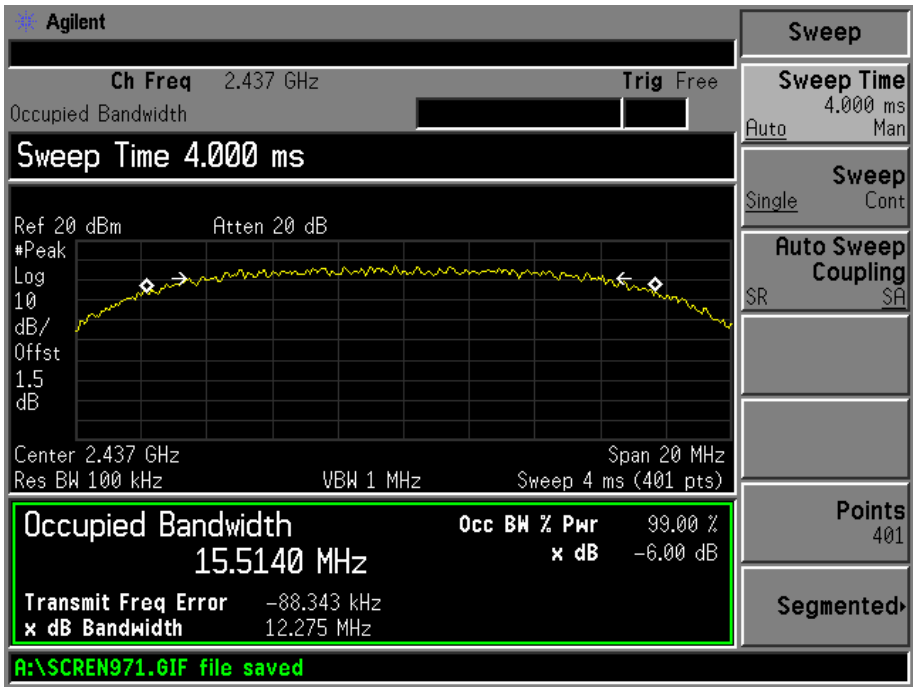
Test mode	Frequency MHz	6 dB Bandwidth KHz	Limit kHz
802.11b	2412	12274	500
	2437	12275	500
	2462	12281	500
802.11g	2412	16542	500
	2437	16528	500
	2462	16506	500

For 802.11b

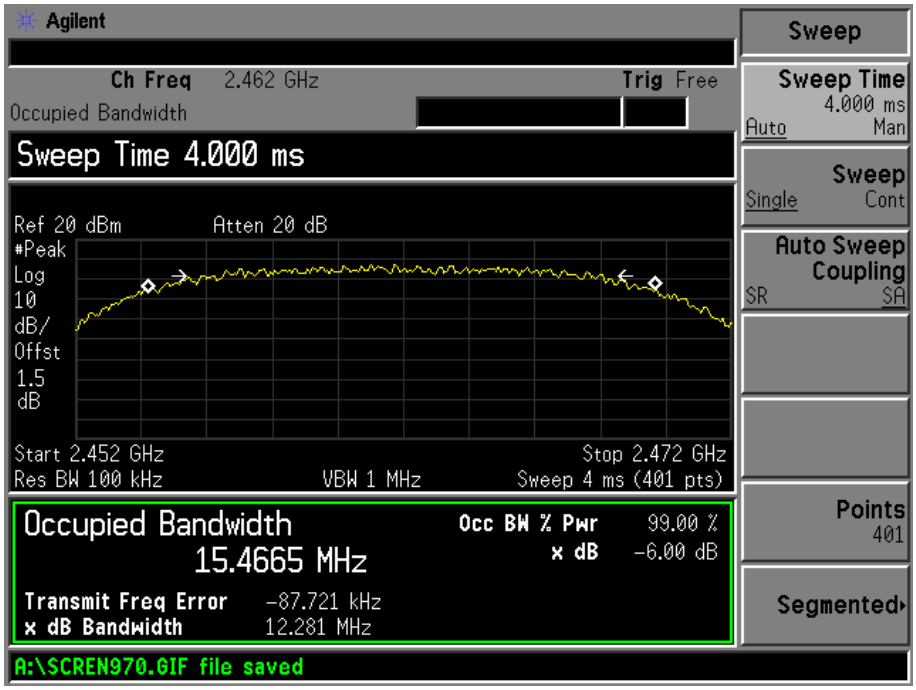
Low Channel:



Mid Channel:

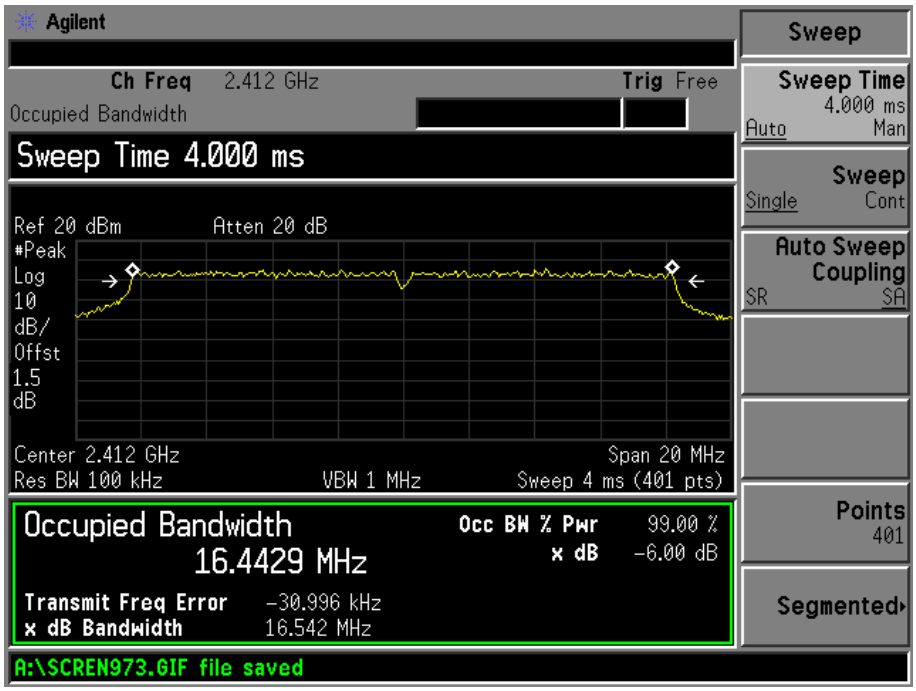


High Channel:

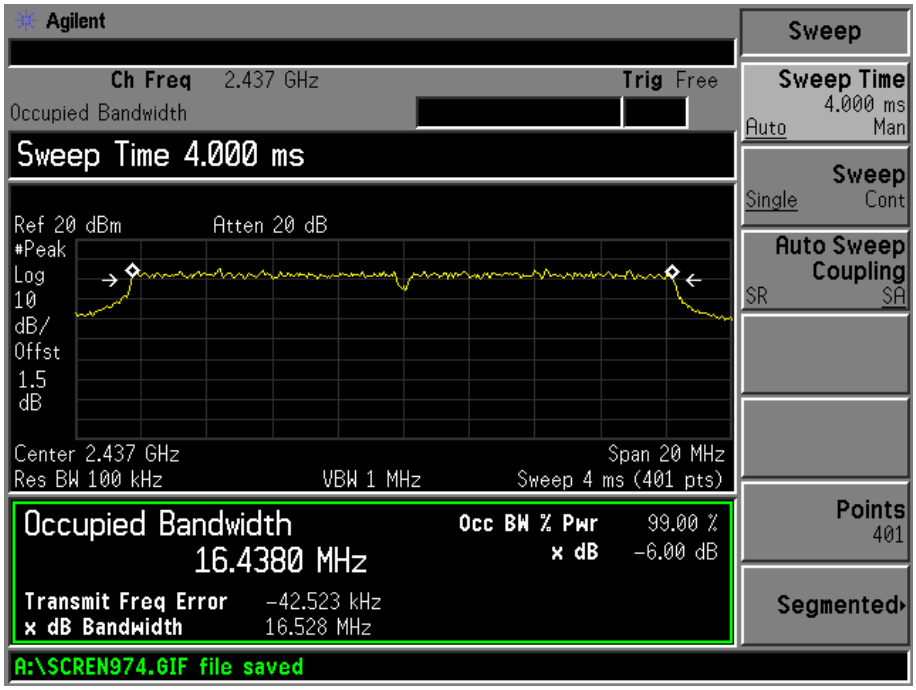


For 802.11g

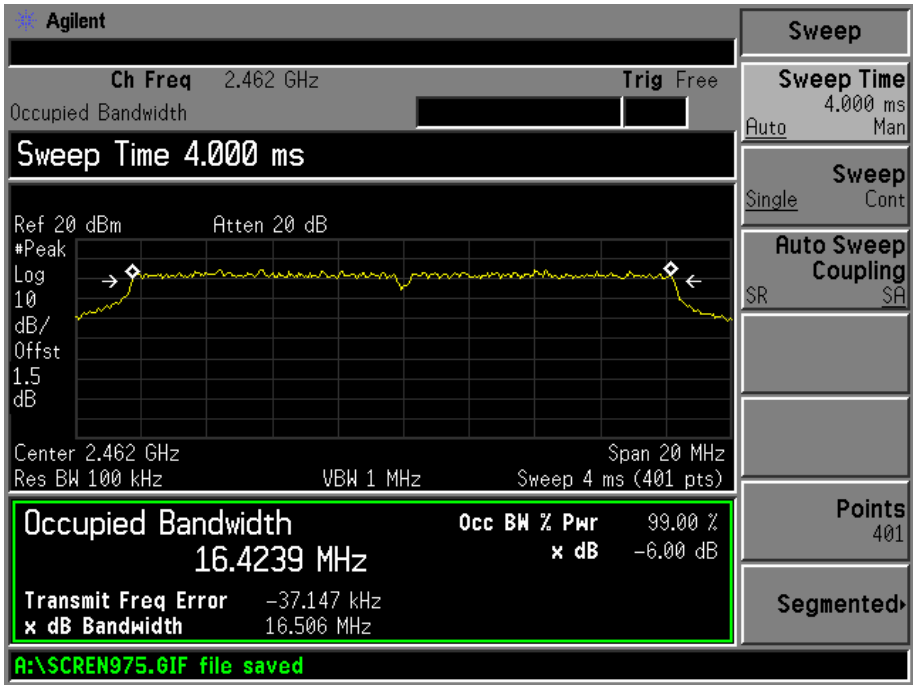
Low Channel:



Mid Channel:



High Channel:



7. POWER OUTPUT

7.1 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.

7.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2010-08-12	2011-08-11
Attenuator	ATTEN	DC-4GHz	ATS100-4-20	2010-08-12	2011-08-11

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

7.3 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 (2005), the method #1 of the power output option2 was used, the following is the measurement procedure.

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.

2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz.

4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode.

5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”.

6. Trace average 100 traces in power averaging mode.

7. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges.

7.4 Environmental Conditions

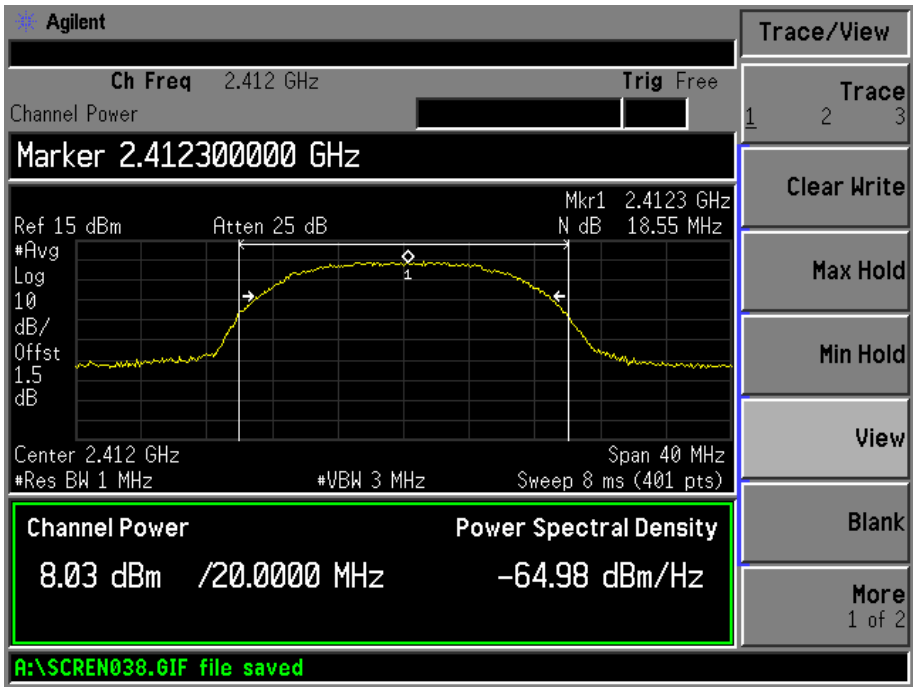
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

7.5 Summary of Test Results/Plots

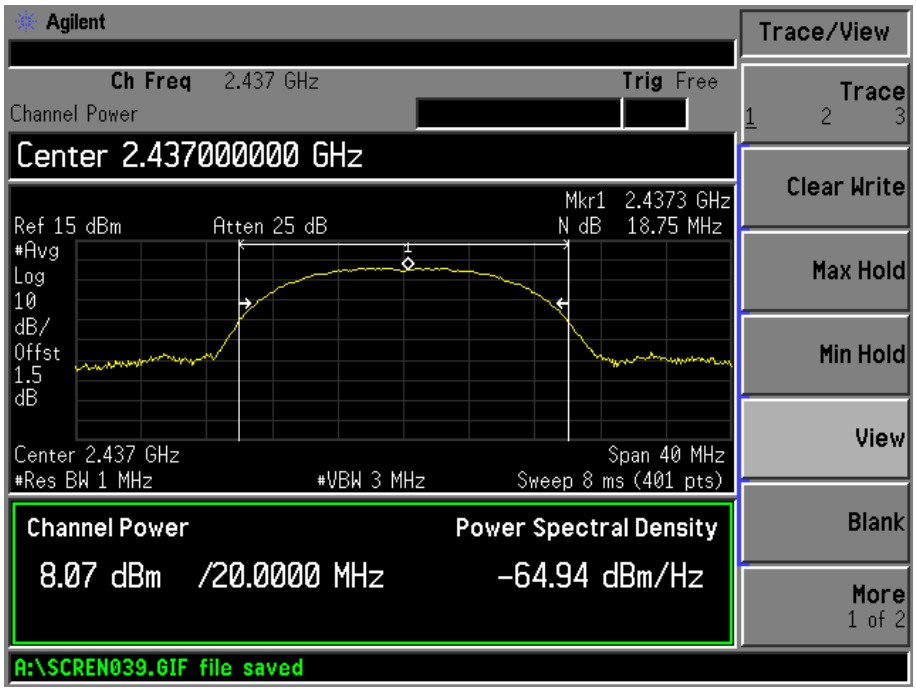
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11b (1M)	2412	8.03	0.006353	1
	2437	8.07	0.006412	1
	2462	7.74	0.005942	1
802.11b (11M)	2412	9.50	0.008912	1
	2437	8.22	0.006637	1
	2462	9.00	0.007943	1
802.11g (6M)	2412	8.98	0.007906	1
	2437	8.70	0.007413	1
	2462	8.53	0.007128	1
802.11g (54M)	2412	9.05	0.008035	1
	2437	7.81	0.006039	1
	2462	7.40	0.005495	1

For 802.11b_1M rate

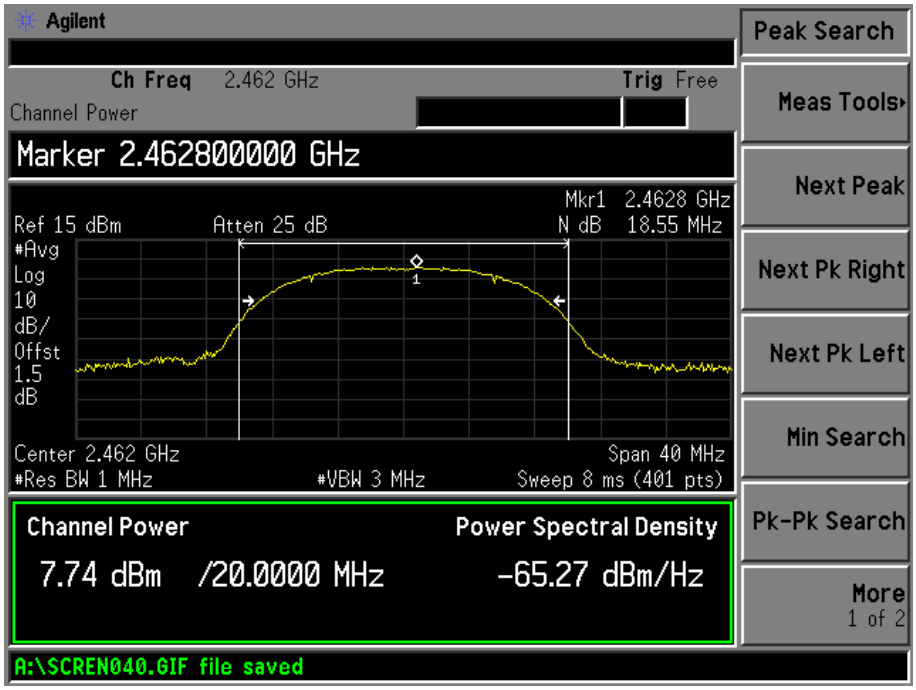
Low Channel:



Middle Channel:

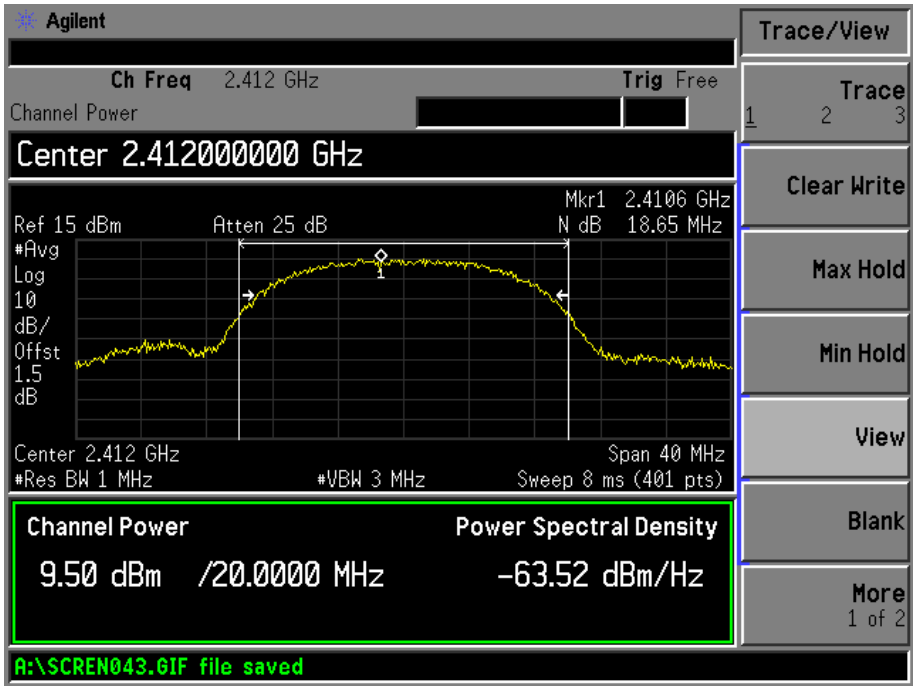


High Channel:

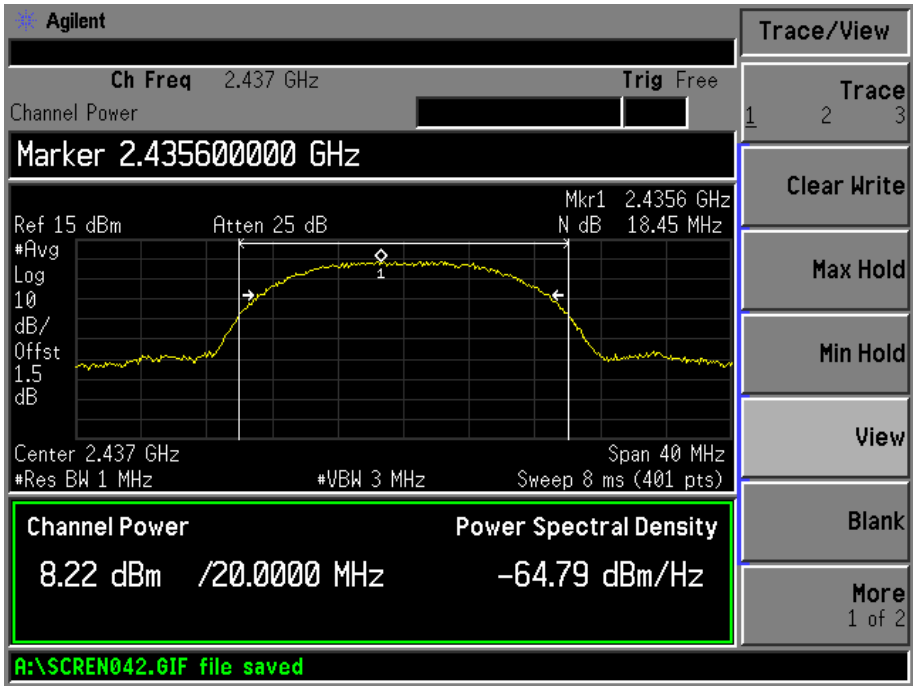


For 802.11b_11M rate

Low Channel:



Middle Channel:



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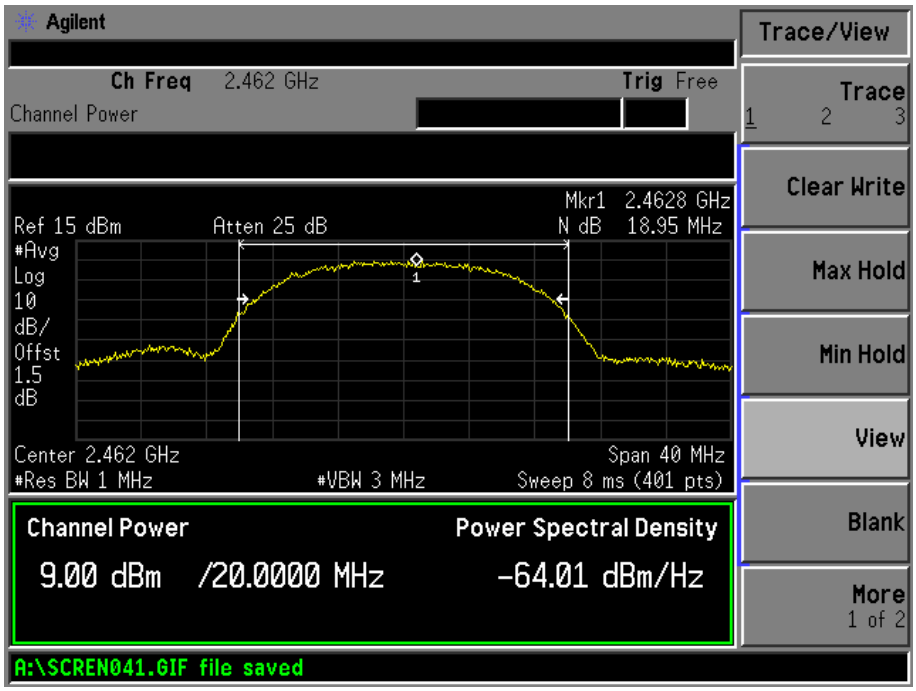
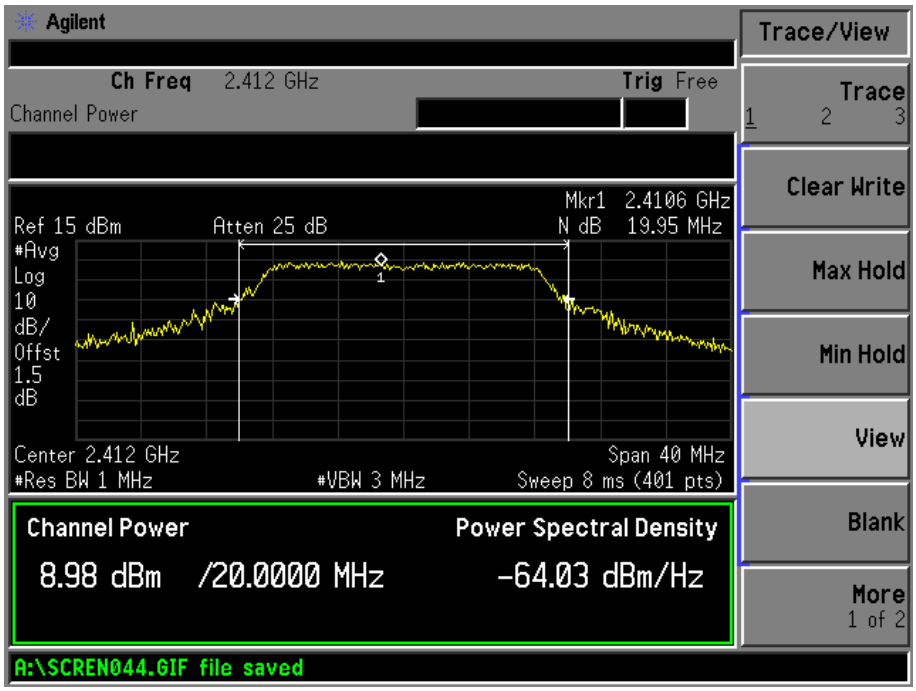


For 802.11g_6M rate

Low Channel:



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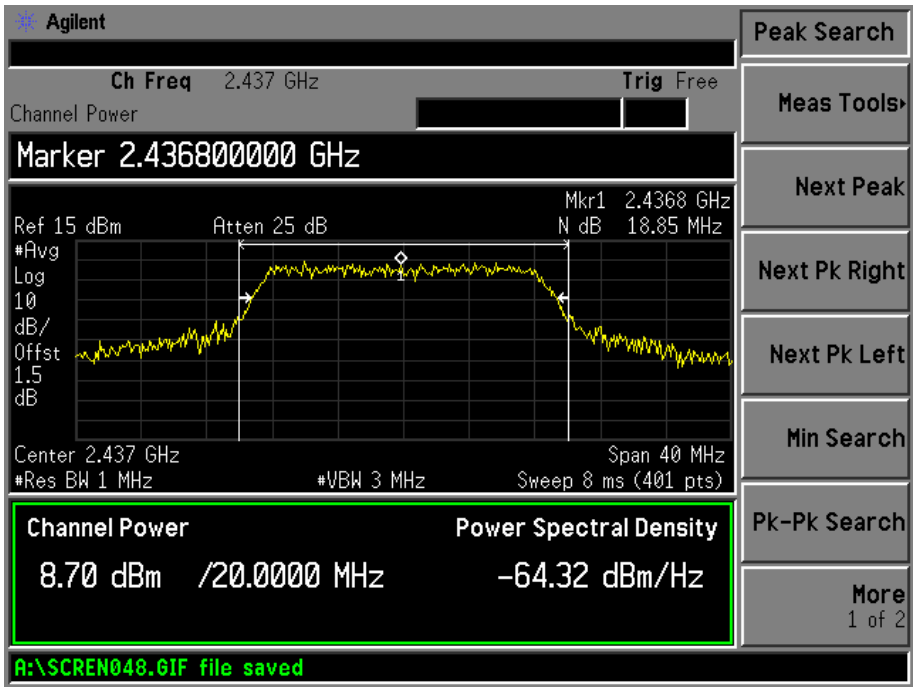

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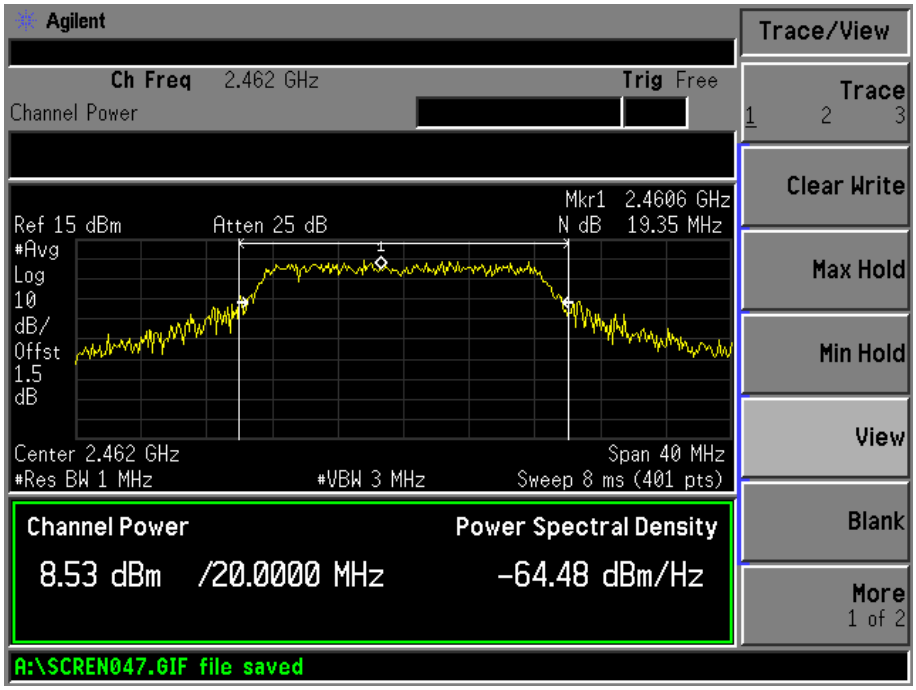
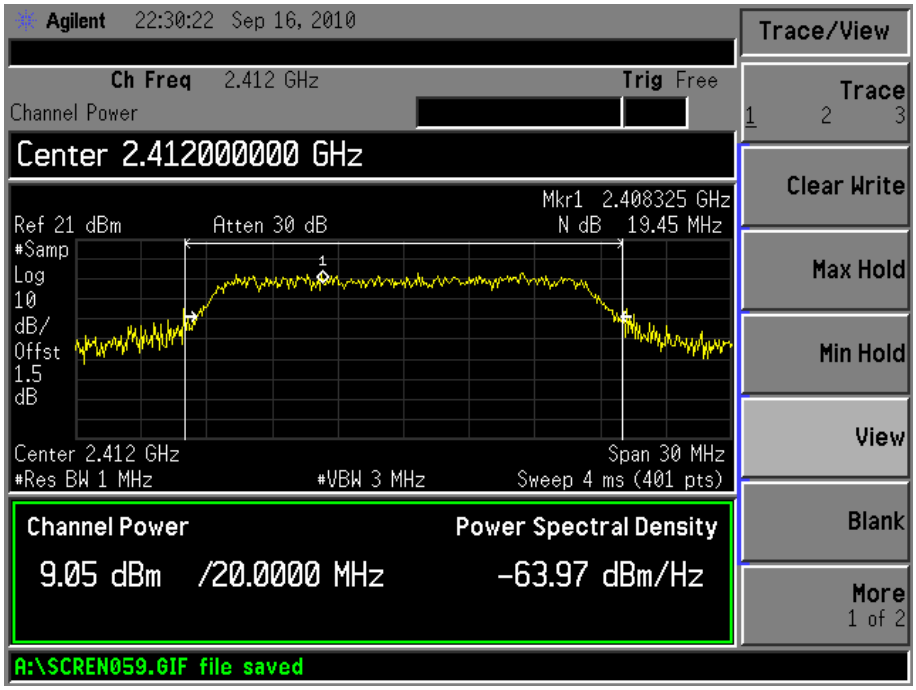


For 802.11g_54M rate

Low Channel:



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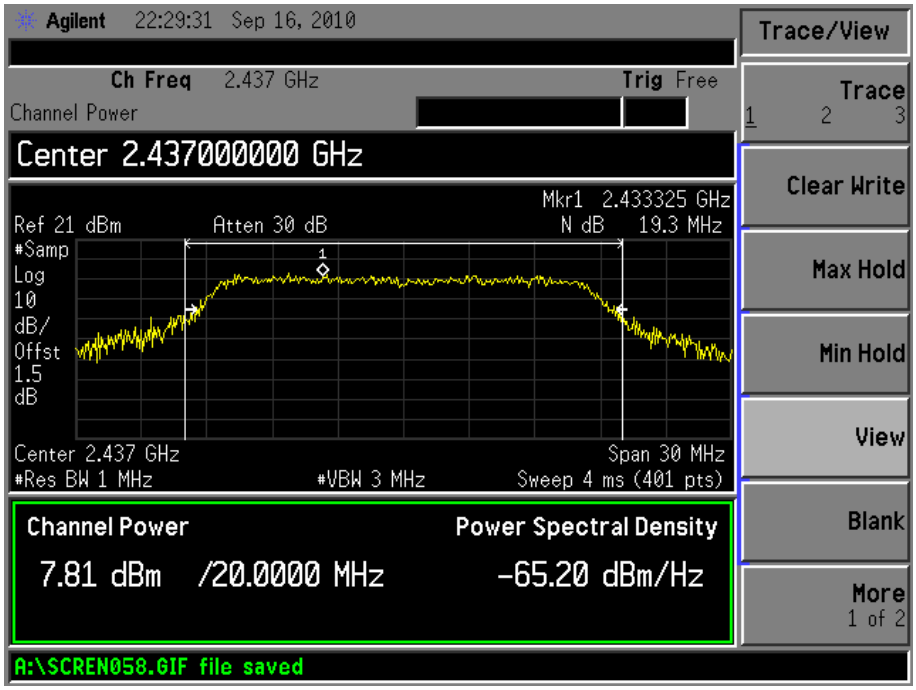
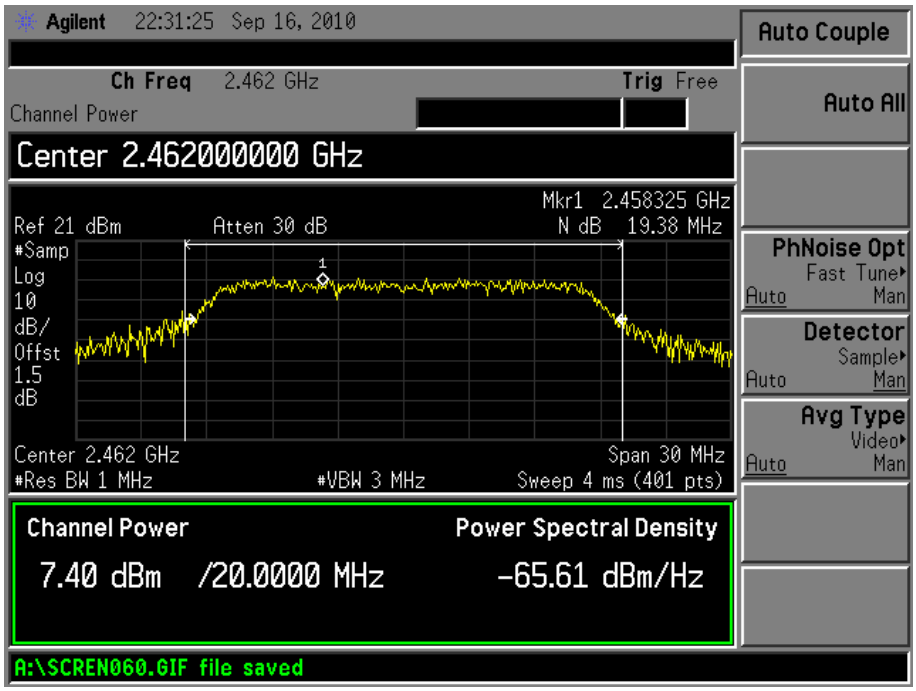


High Channel:



8. FIELD STRENGTH OF SPURIOUS EMISSIONS

8.1 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 ±5.10 dB.

8.2 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.

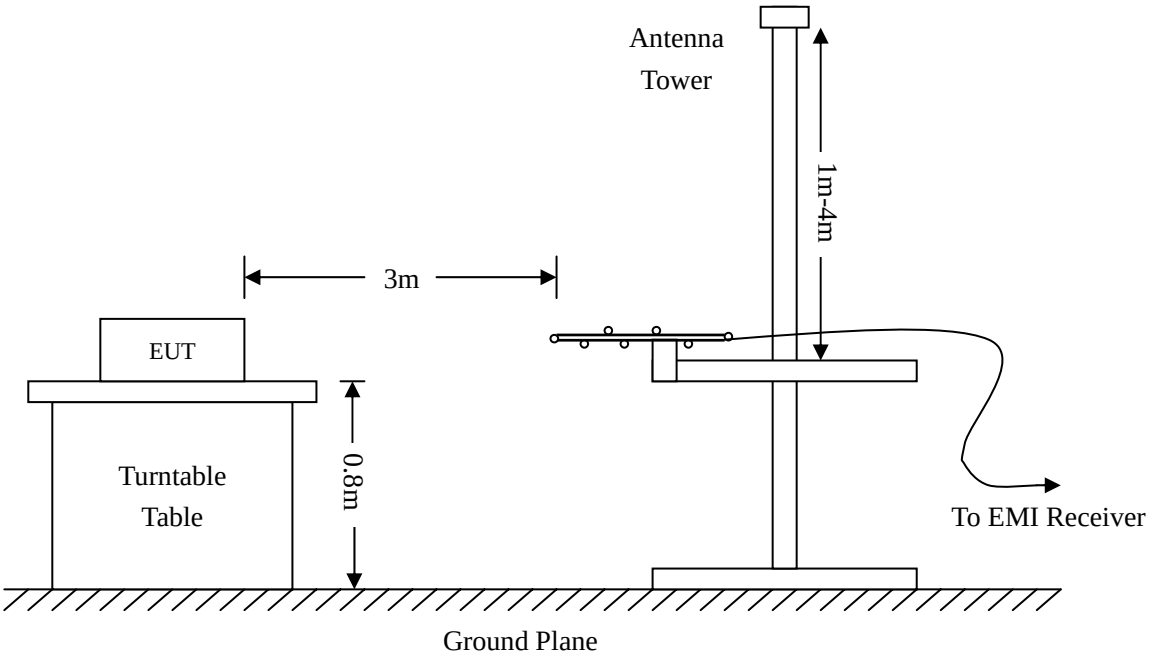
Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

8.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-04-16	2011-04-15
EMI Test Receiver	R&S	ESVB	825471/005	2010-08-12	2011-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2010-08-12	2011-08-11
RF Switch	EM	EMSW18	SW060023	2010-08-12	2011-08-11
Pre-amplifier	Agilent	8447F	3113A06717	2010-08-12	2011-08-11
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-08-12	2011-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2010-07-21	2011-07-20
Horn Antenna	ETS	3117	00086197	2010-07-21	2011-07-20

8.4 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 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

8.6 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

8.7 Environmental Conditions

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

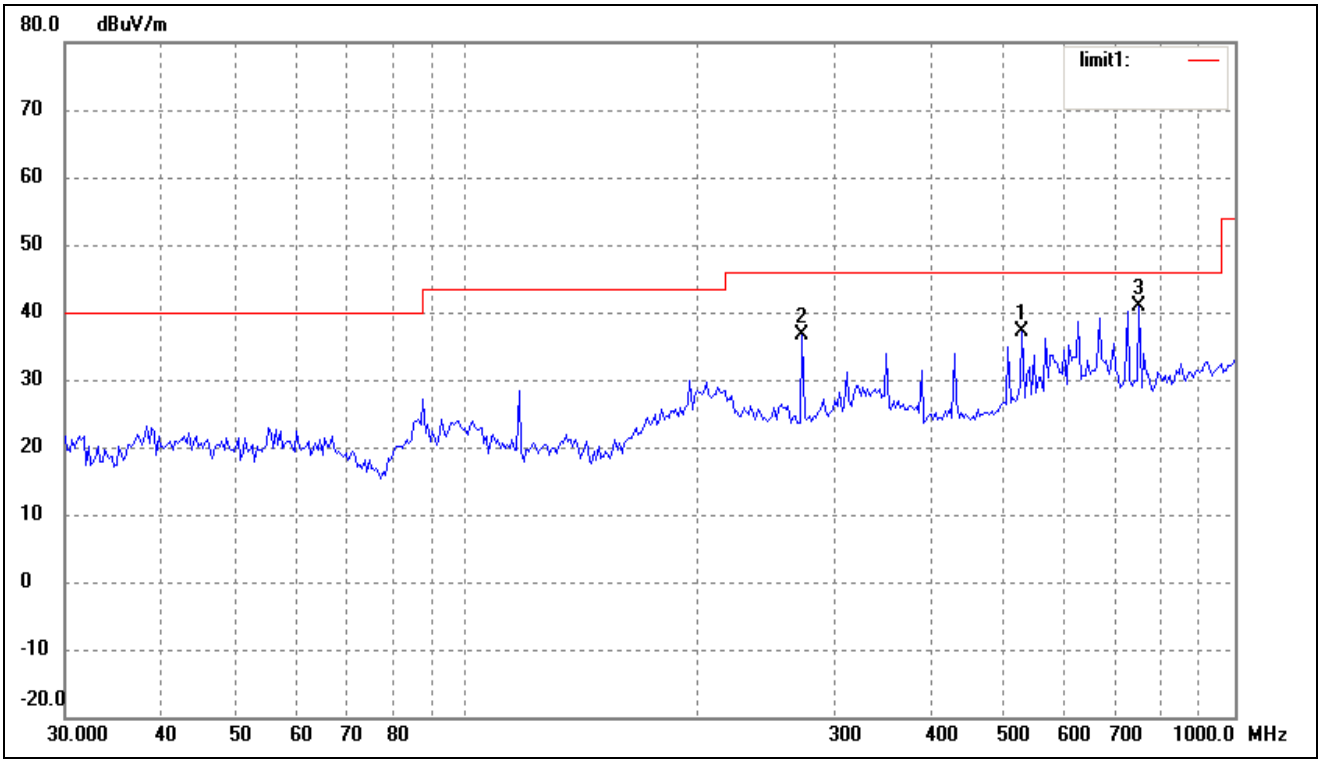
8.8 Summary of Test Results/Plots

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

-1.63dBμV at **582.7425MHz** in the **Vertical** polarization, **Transmitting 802.11b Middle Channel** test mode with, **30 MHz to 25 GHz, 3Meters**

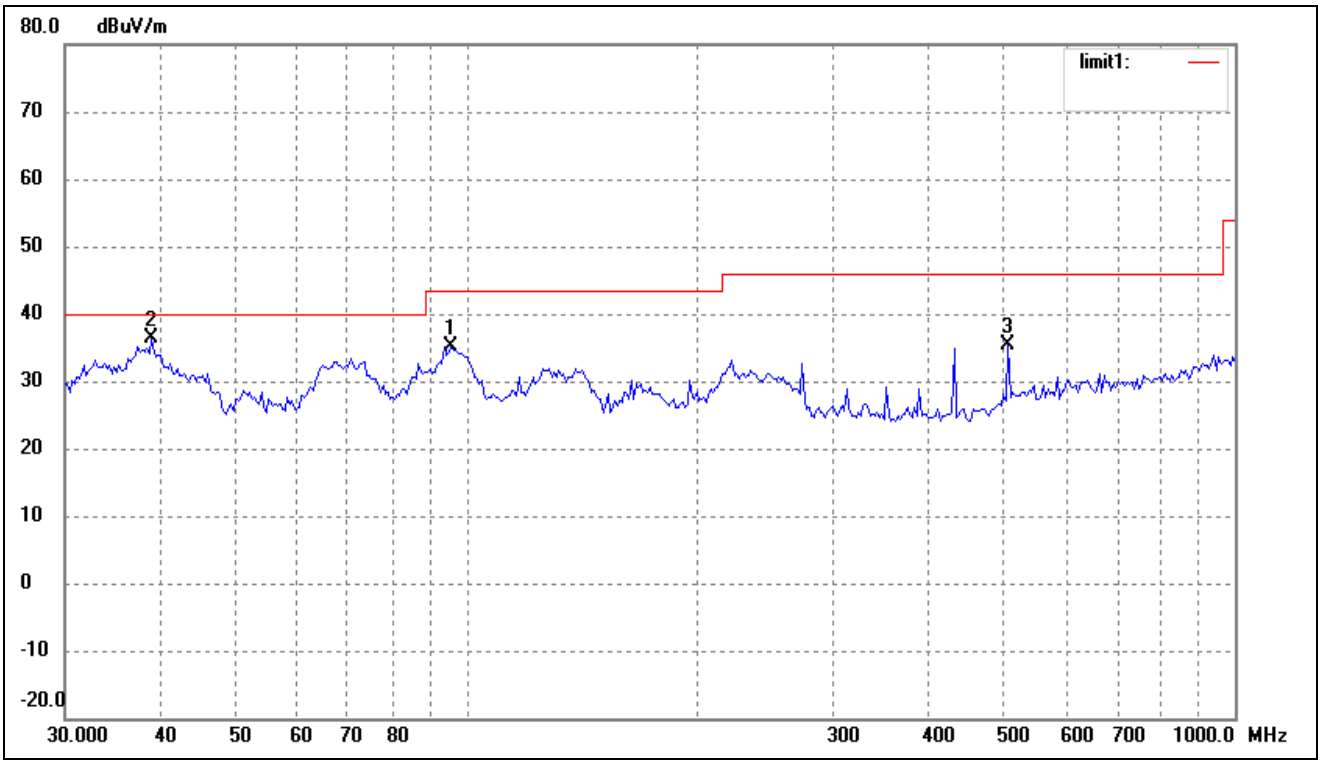
Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

Test Result/Plots:
Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b) Low Channel
Comment:
Horizontal



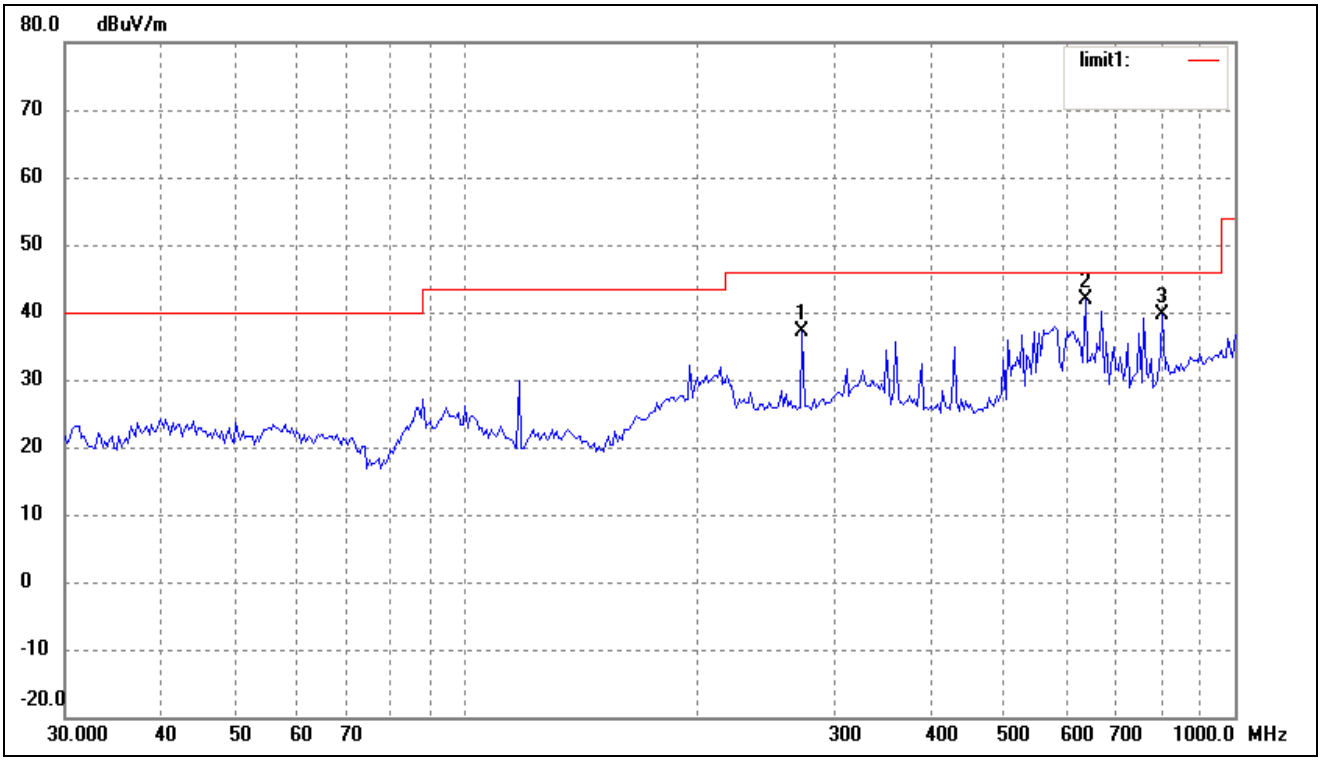
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	528.2458	24.23	12.91	37.14	46.00	-8.86	360	100	peak
2	273.2341	28.25	8.27	36.52	46.00	-9.48	360	100	peak
3	750.1083	25.75	15.01	40.76	46.00	-5.24	118	100	QP

Vertical



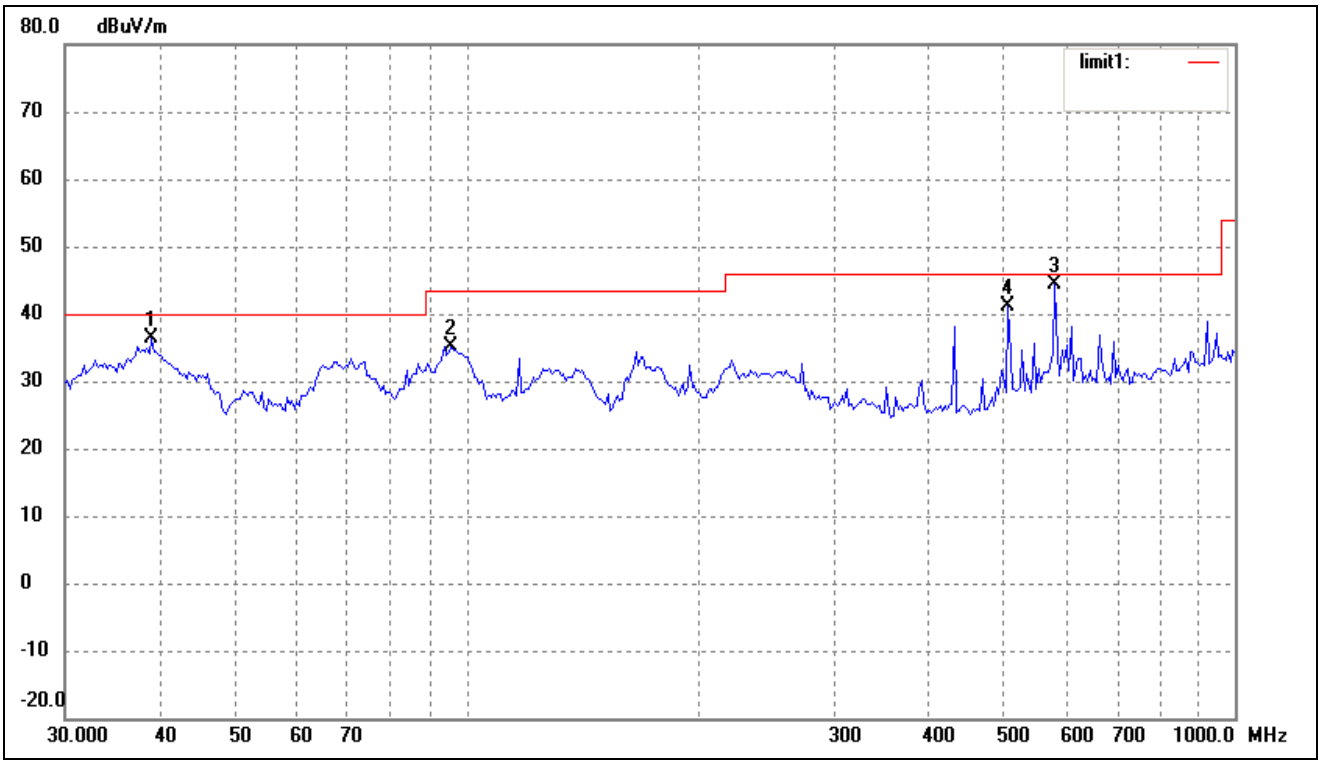
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	95.4270	27.69	7.50	35.19	43.50	-8.31	360	100	peak
2	38.8879	28.71	7.64	36.35	40.00	-3.65	206	150	QP
3	506.4791	22.45	13.01	35.46	46.00	-10.54	360	100	peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b) Middle Channel
Comment:
Horizontal



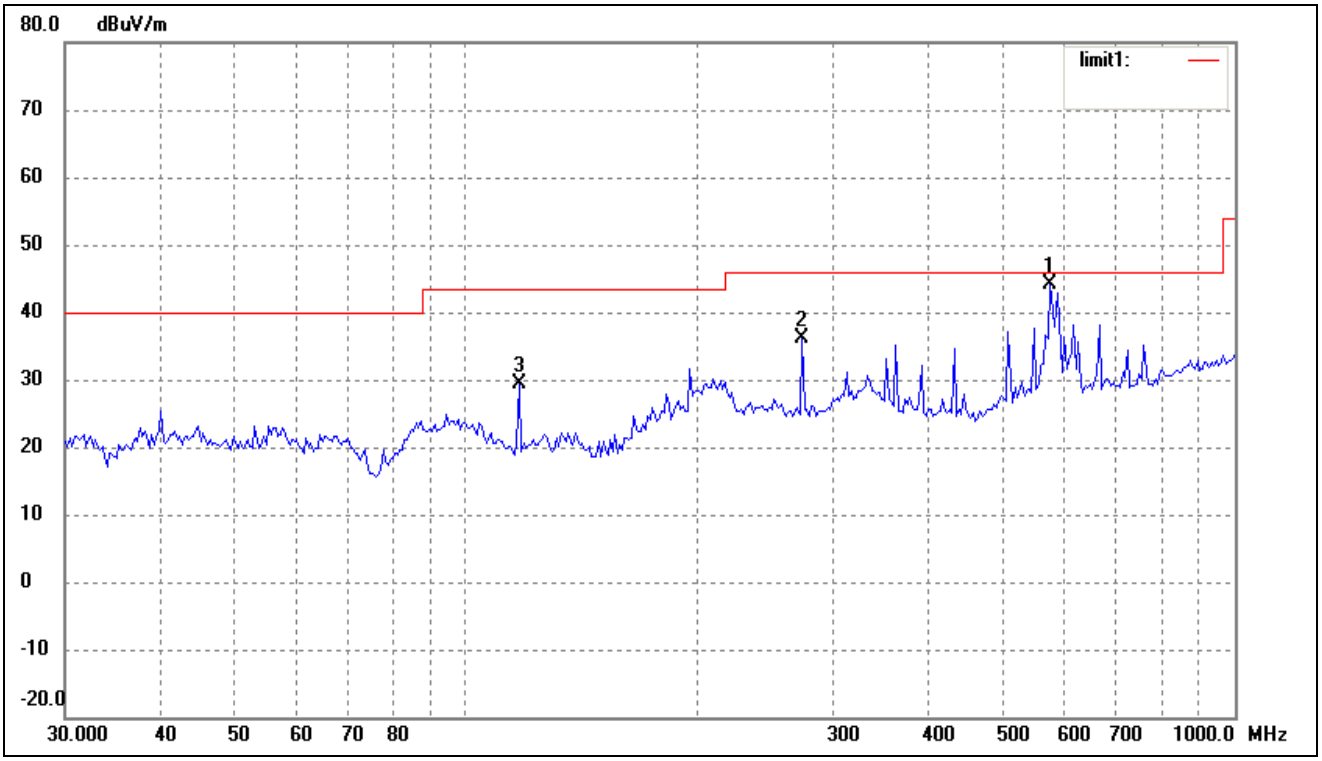
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	273.2341	28.91	8.27	37.18	46.00	-8.82	360	100	peak
2	638.3686	27.70	14.29	41.99	46.00	-4.01	221	112	QP
3	804.6028	24.09	15.57	39.66	46.00	-6.34	360	100	peak

Vertical



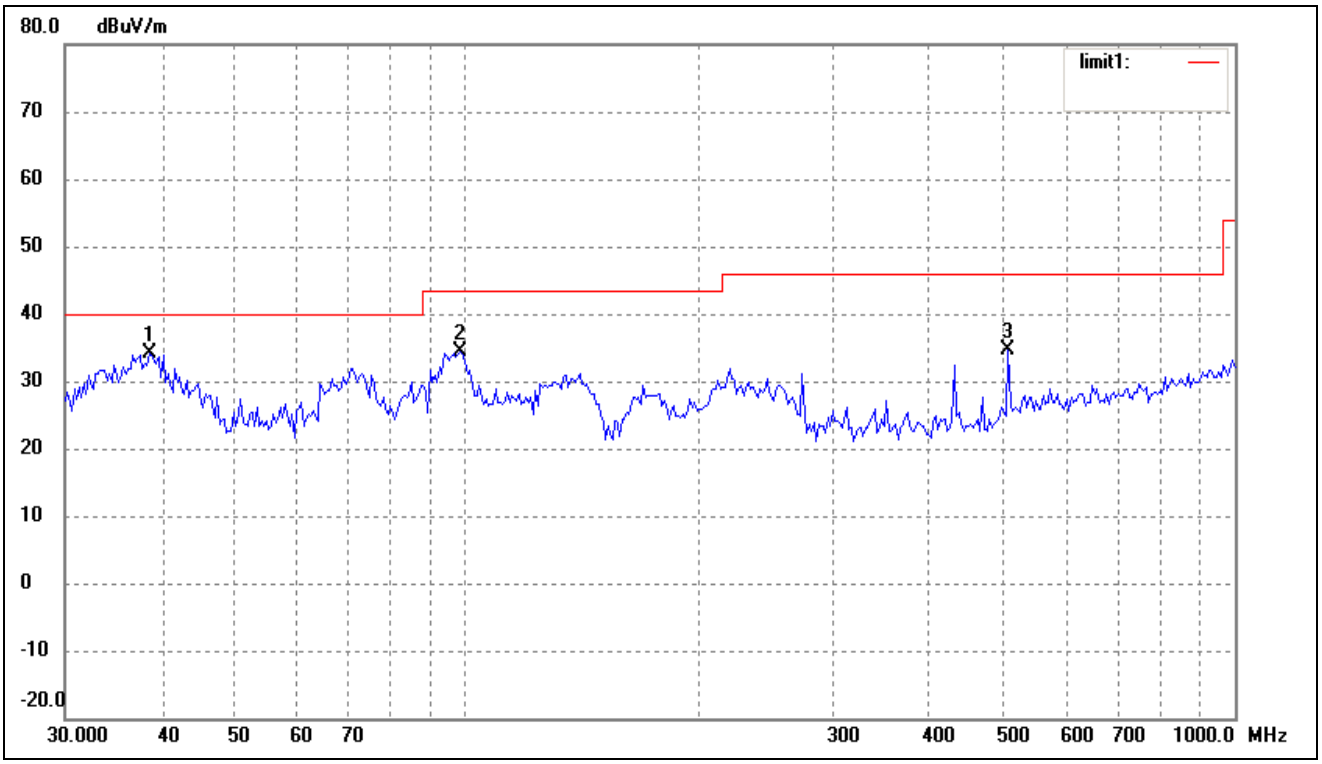
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	38.8879	28.71	7.64	36.35	40.00	-3.65	224	206	QP
2	95.4270	27.69	7.50	35.19	43.50	-8.31	360	100	peak
3	582.7425	30.42	13.95	44.37	46.00	-1.63	109	114	QP
4	506.4791	28.24	13.01	41.25	46.00	-4.75	241	142	QP

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b) High Channel
Comment:
Horizontal



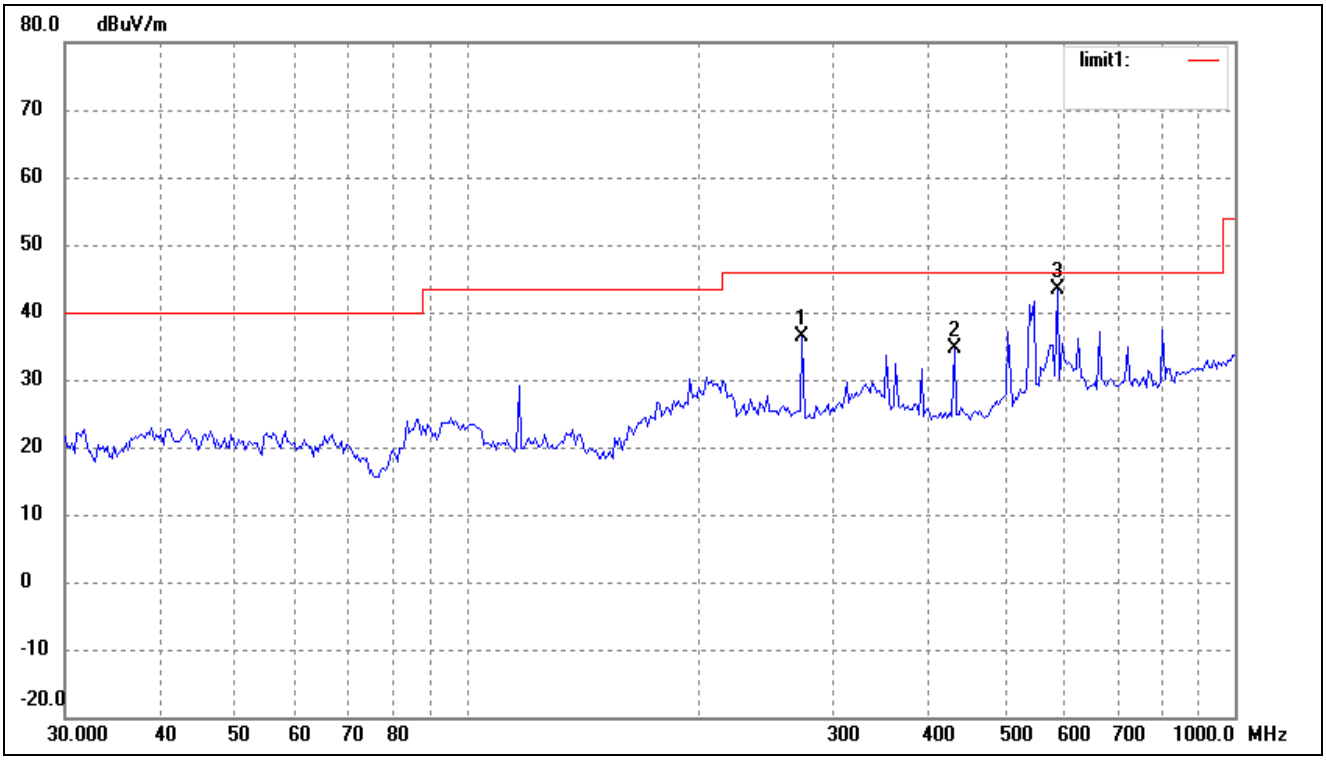
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	574.6258	30.33	13.73	44.06	46.00	-1.94	203	124	QP
2	273.2341	27.78	8.27	36.05	46.00	-9.95	360	100	peak
3	116.9495	23.53	5.78	29.31	43.50	-14.19	360	100	peak

Vertical



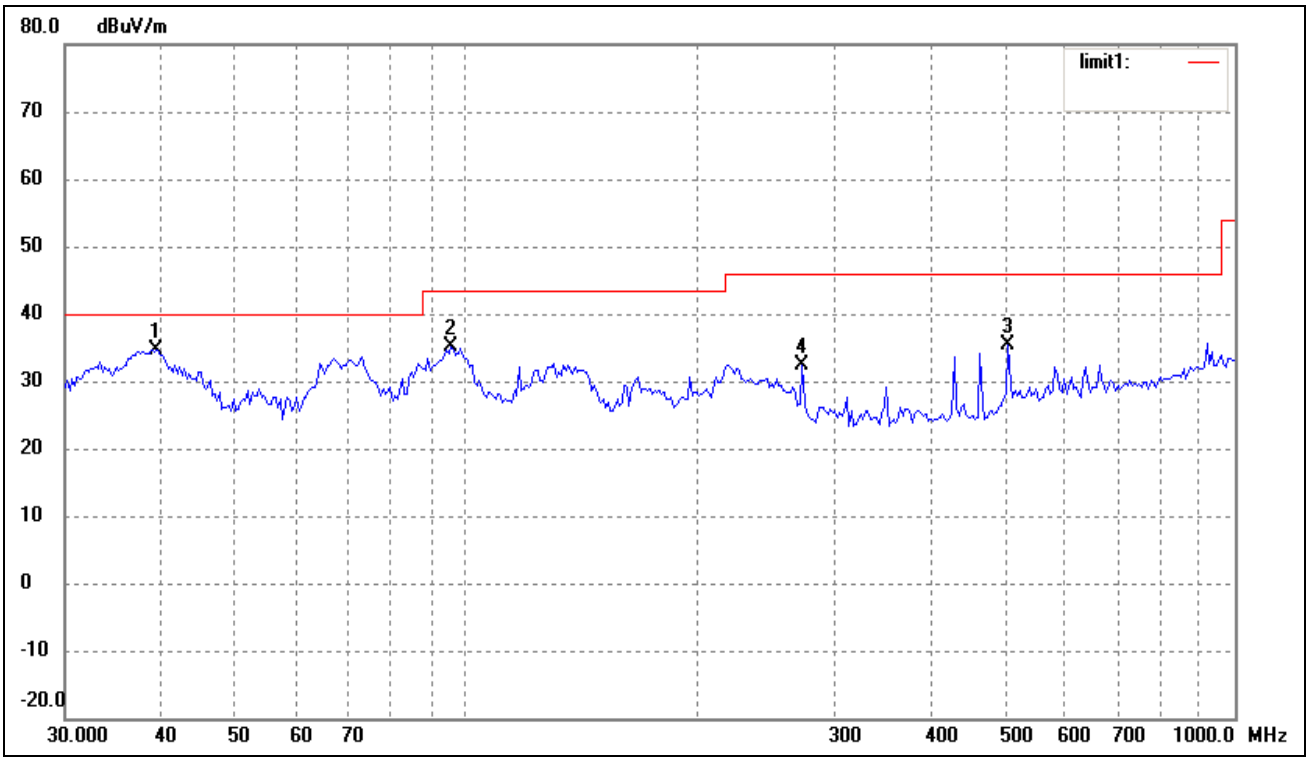
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	38.6161	26.56	7.57	34.13	40.00	-5.87	226	142	QP
2	98.1419	26.59	7.69	34.28	43.50	-9.22	360	100	peak
3	506.4791	21.53	13.01	34.54	46.00	-11.46	360	100	peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11g) Low Channel
Comment:
Horizontal



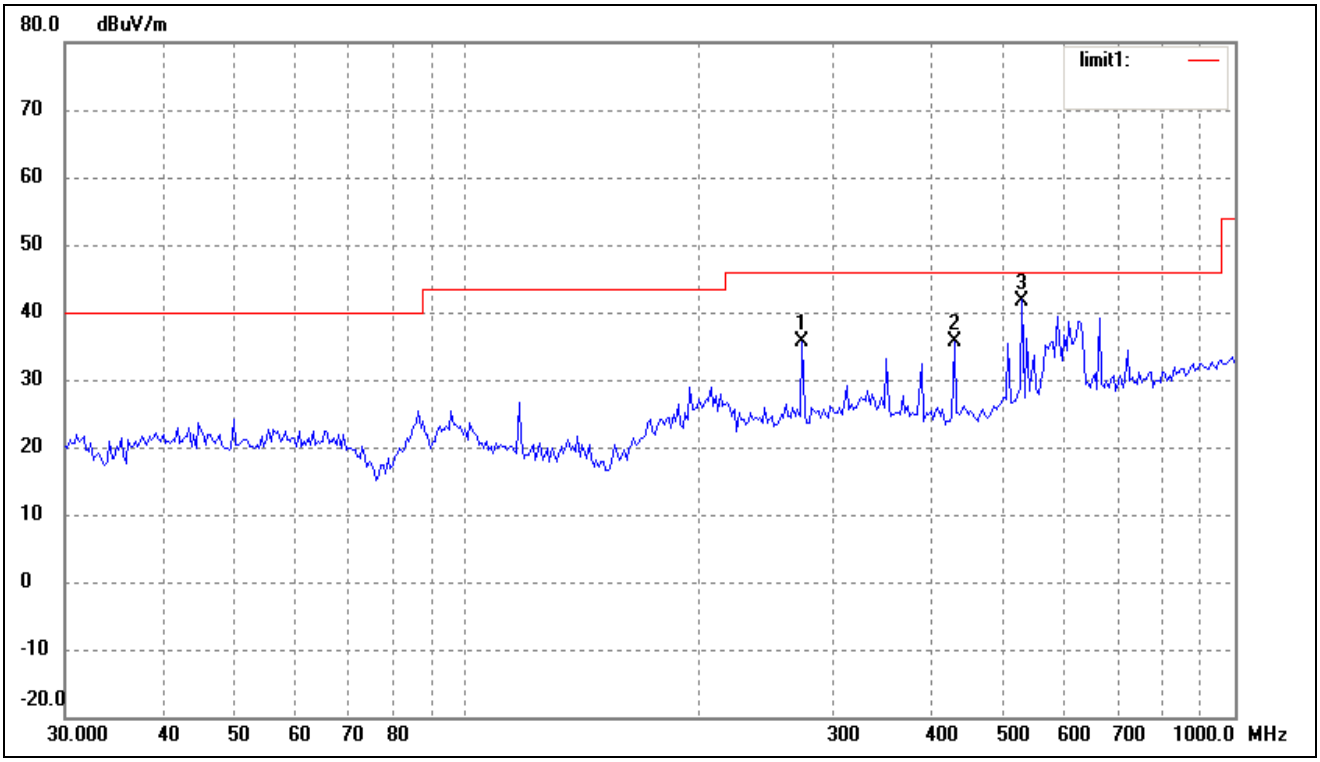
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	273.2341	28.20	8.27	36.47	46.00	-9.53	360	100	peak
2	431.0316	24.09	10.45	34.54	46.00	-11.46	360	100	peak
3	586.8437	29.32	13.94	43.26	46.00	-2.74	225	124	QP

Vertical



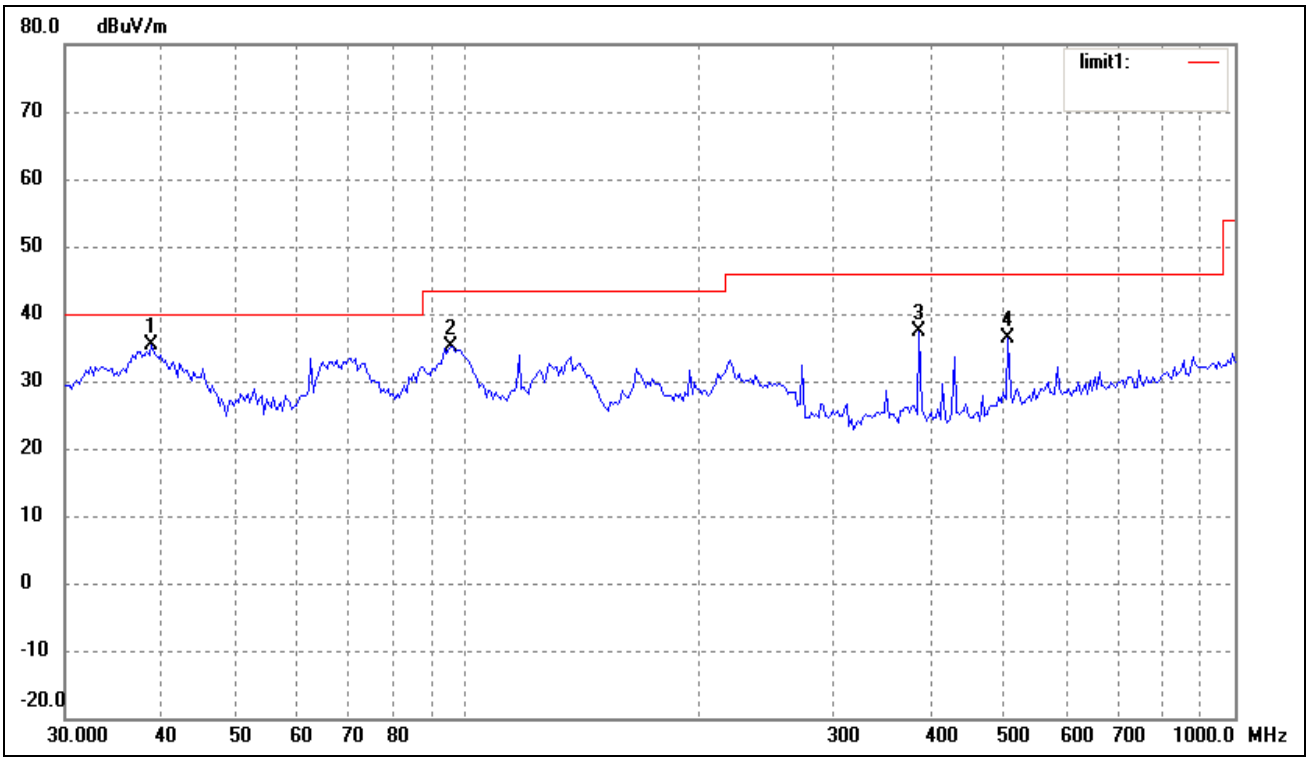
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	39.4372	26.77	7.78	34.55	40.00	-5.45	208	114	QP
2	95.4270	27.53	7.50	35.03	43.50	-8.47	360	100	peak
3	506.4791	22.29	13.01	35.30	46.00	-10.70	360	100	peak
4	273.2341	24.13	8.27	32.40	46.00	-13.60	360	100	peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11g) Middle Channel
Comment:
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	273.2341	27.46	8.27	35.73	46.00	-10.27	360	100	peak
2	431.0316	25.22	10.45	35.67	46.00	-10.33	360	100	peak
3	528.2458	28.84	12.91	41.75	46.00	-4.25	225	125	QP

Vertical



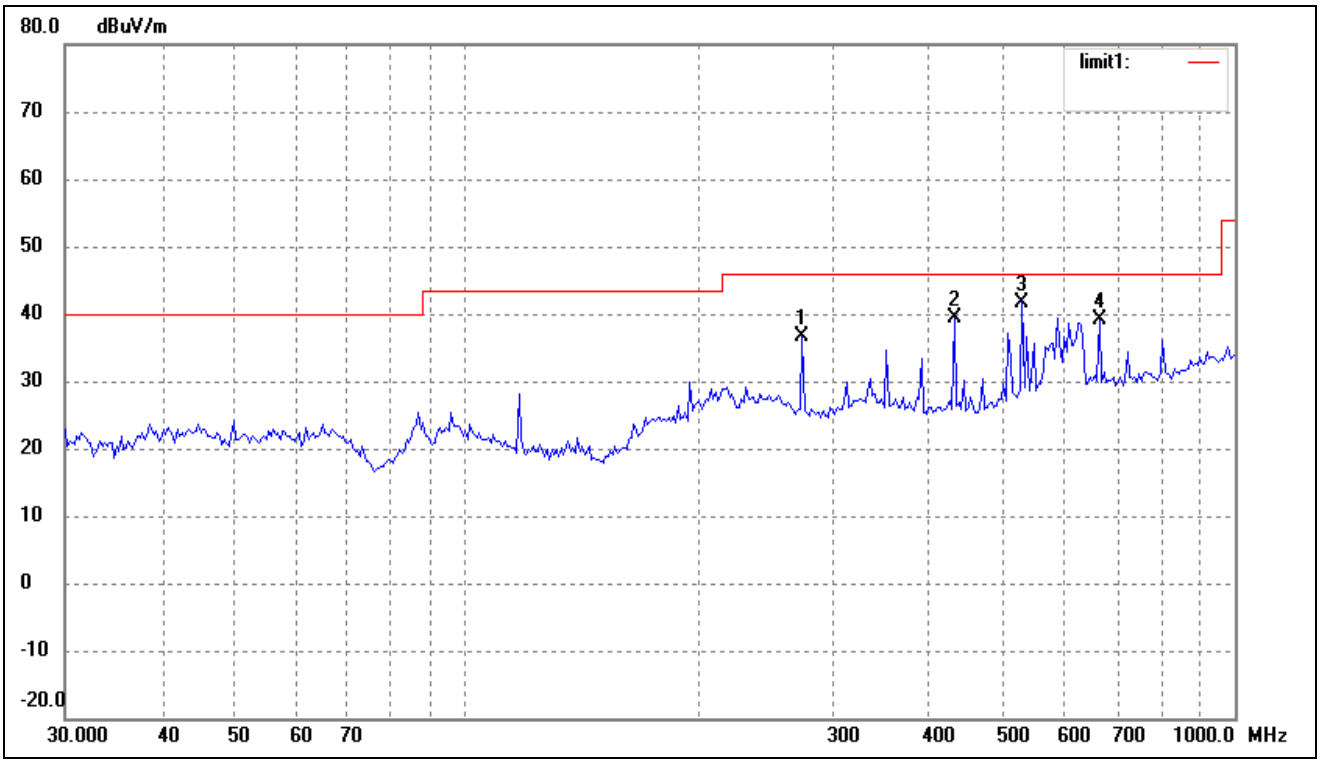
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	38.8879	27.77	7.64	35.41	40.00	-4.59	116	112	QP
2	95.4270	27.67	7.50	35.17	43.50	-8.33	360	100	peak
3	387.9920	27.36	9.99	37.35	46.00	-8.65	360	100	peak
4	506.4791	23.43	13.01	36.44	46.00	-9.56	360	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g) High Channel

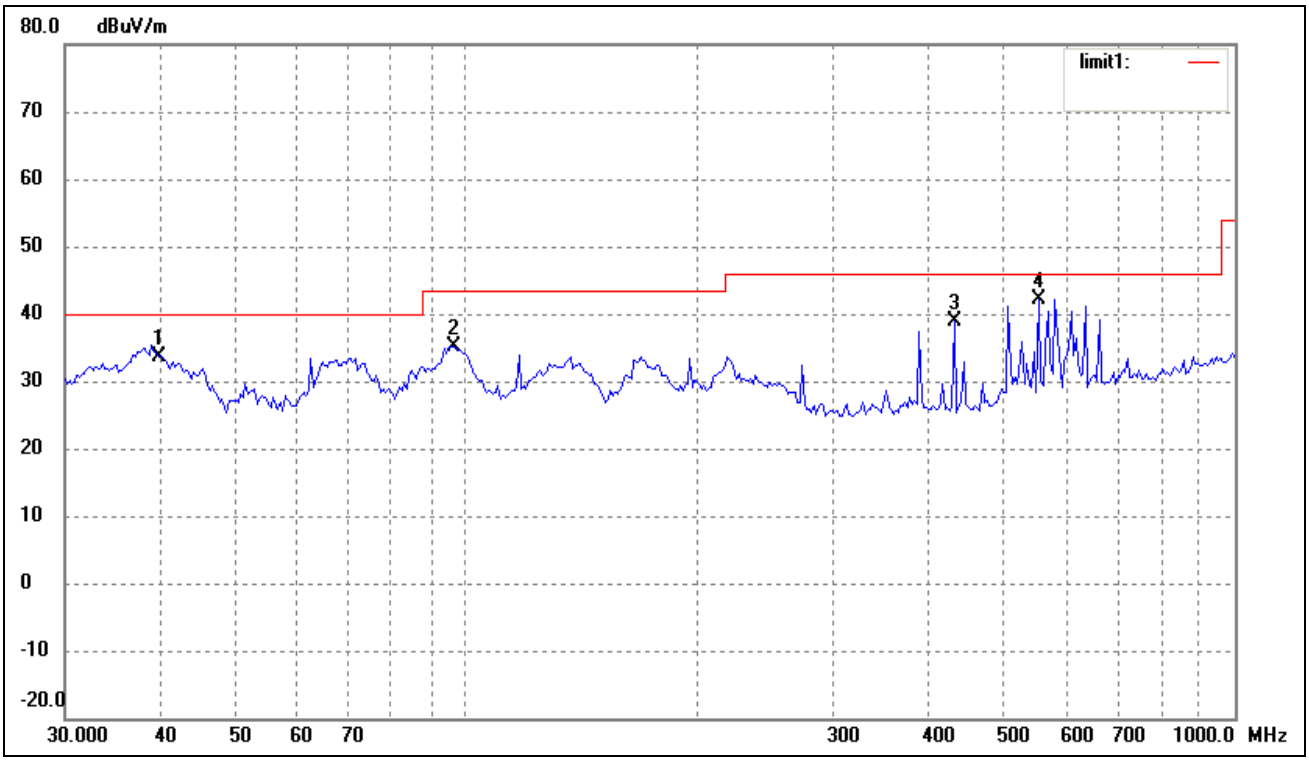
Comment:

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	273.2341	28.26	8.27	36.53	46.00	-9.47	360	100	peak
2	431.0316	28.96	10.45	39.41	46.00	-6.59	360	100	peak
3	528.2458	28.84	12.91	41.75	46.00	-4.25	221	102	QP
4	665.8035	24.74	14.39	39.13	46.00	-6.87	360	100	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	39.7147	25.89	7.86	33.75	40.00	-6.25	360	100	peak
2	96.0986	27.64	7.54	35.18	43.50	-8.32	360	100	peak
3	431.0316	28.41	10.45	38.86	46.00	-7.14	360	100	peak
4	554.8254	28.48	13.61	42.09	46.00	-3.91	224	125	QP

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	50.4	45	H	34.1	5.2	33.0	56.3	74	-17.7
4824.0	PK	52.4	90	V	34.1	5.2	33.0	58.7	74	-15.3
7236.0	PK	51.1	270	V	37.4	6.1	33.5	61.1	74	-12.9
7236.0	PK	51.4	180	H	37.4	6.1	33.5	61.4	74	-12.6
4824.0	AV	41.7	60	H	34.1	5.2	33.0	48.0	54	-6.0
4824.0	AV	43.4	270	V	34.1	5.2	33.0	49.7	54	-4.3
7236.0	AV	40.3	45	H	37.4	6.1	33.5	50.3	54	-3.7
7236.0	AV	41.8	90	V	37.4	6.1	33.5	51.8	54	-2.2
Middle Channel (1G to 25GHz)										
4874.0	PK	51.4	270	V	34.1	5.2	33.0	57.7	74	-16.3
4874.0	PK	52.7	180	H	34.1	5.2	33.0	59.0	74	-15.0
7311.0	PK	51.2	45	H	37.4	6.1	33.5	61.2	74	-12.8
7311.0	PK	53.7	45	V	37.4	6.1	33.5	63.7	74	-10.3
4874.0	AV	42.1	45	H	34.1	5.2	33.0	48.4	54	-5.6
4874.0	AV	43.8	90	V	34.1	5.2	33.0	50.1	54	-3.9
7311.0	AV	40.6	270	V	37.4	6.1	33.5	50.6	54	-3.4
7311.0	AV	41.2	60	H	37.4	6.1	33.5	51.2	54	-2.8
High Channel (1G to 25GHz)										
4924.0	PK	53.8	180	H	34.1	5.2	33.0	60.1	74	-13.9
7386.0	PK	50.6	45	H	37.4	6.1	33.5	60.6	74	-13.4
7386.0	PK	52.1	45	V	37.4	6.1	33.5	62.1	74	-11.9
4924.0	PK	57.6	270	V	34.1	5.2	33.0	63.9	74	-10.1
4924.0	AV	42.4	90	V	34.1	5.2	33.0	48.7	54	-5.3
7386.0	AV	41.2	270	V	37.4	6.1	33.5	51.2	54	-2.8
7386.0	AV	41.2	60	H	37.4	6.1	33.5	51.2	54	-2.8
4924.0	AV	45.1	60	H	34.1	5.2	33.0	51.4	54	-2.6

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	55.8	90	V	34.1	5.2	33.0	62.1	74	-11.9
7236.0	PK	51.7	270	V	37.4	6.1	33.5	61.7	74	-12.3
7236.0	PK	52.4	180	H	37.4	6.1	33.5	62.4	74	-11.6
4824.0	PK	56.7	45	H	34.1	5.2	33.0	63.0	74	-11.0
4824.0	AV	42.4	270	V	34.1	5.2	33.0	48.7	54	-5.3
7236.0	AV	39.5	90	V	37.4	6.1	33.5	49.5	54	-4.5
7236.0	AV	40.2	45	H	37.4	6.1	33.5	50.2	54	-3.8
4824.0	AV	41.8	60	H	34.1	5.2	33.0	48.1	54	-5.9
Middle Channel (1G to 25GHz)										
7311.0	PK	51.4	45	V	37.4	6.1	33.5	61.4	74	-12.6
4874.0	PK	53.5	270	V	34.1	5.2	33.0	59.8	74	-14.2
7311.0	PK	52.3	45	H	37.4	6.1	33.5	62.3	74	-11.7
4874.0	PK	54.1	180	H	34.1	5.2	33.0	60.4	74	-13.6
7311.0	AV	39.4	270	V	37.4	6.1	33.5	49.4	54	-4.6
4874.0	AV	41.4	90	V	34.1	5.2	33.0	47.7	54	-6.3
7311.0	AV	40.1	60	H	37.4	6.1	33.5	50.1	54	-3.9
4874.0	AV	40.5	45	H	34.1	5.2	33.0	46.8	54	-7.2
High Channel (1G to 25GHz)										
4924.0	PK	53.4	270	V	34.1	5.2	33.0	59.7	74	-14.3
4924.0	PK	54.2	180	H	34.1	5.2	33.0	60.5	74	-13.5
7386.0	PK	51.4	45	H	37.4	6.1	33.5	61.4	74	-12.6
7386.0	PK	51.7	45	V	37.4	6.1	33.5	61.7	74	-12.3
4924.0	AV	42.4	60	H	34.1	5.2	33.0	48.7	54	-5.3
4924.0	AV	42.7	90	V	34.1	5.2	33.0	49.0	54	-5.0
7386.0	AV	39.5	270	V	37.4	6.1	33.5	49.5	54	-4.5
7386.0	AV	40.7	60	H	37.4	6.1	33.5	50.7	54	-3.3

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.

9. OUT OF BAND EMISSIONS

9.1 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.

9.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-04-16	2011-04-15
EMI Test Receiver	R&S	ESVB	825471/005	2010-08-12	2011-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2010-08-12	2011-08-11
RF Switch	EM	EMSW18	SW060023	2010-08-12	2011-08-11
Pre-amplifier	Agilent	8447F	3113A06717	2010-08-12	2011-08-11
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-08-12	2011-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2010-07-21	2011-07-20
Horn Antenna	ETS	3117	00086197	2010-07-21	2011-07-20

9.3 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.

9.4 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

9.5 Environmental Conditions

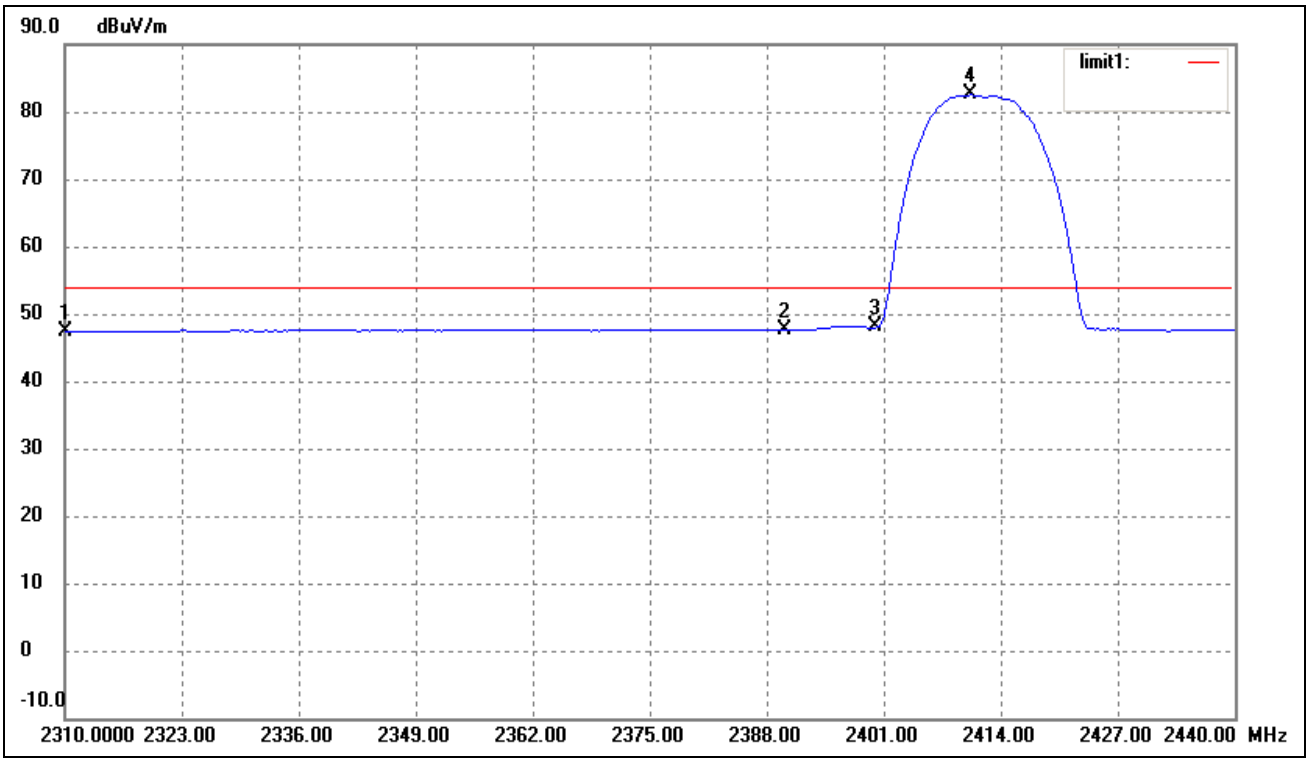
Temperature:	21° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.6 Summary of Test Results/Plots

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

For 802.11b

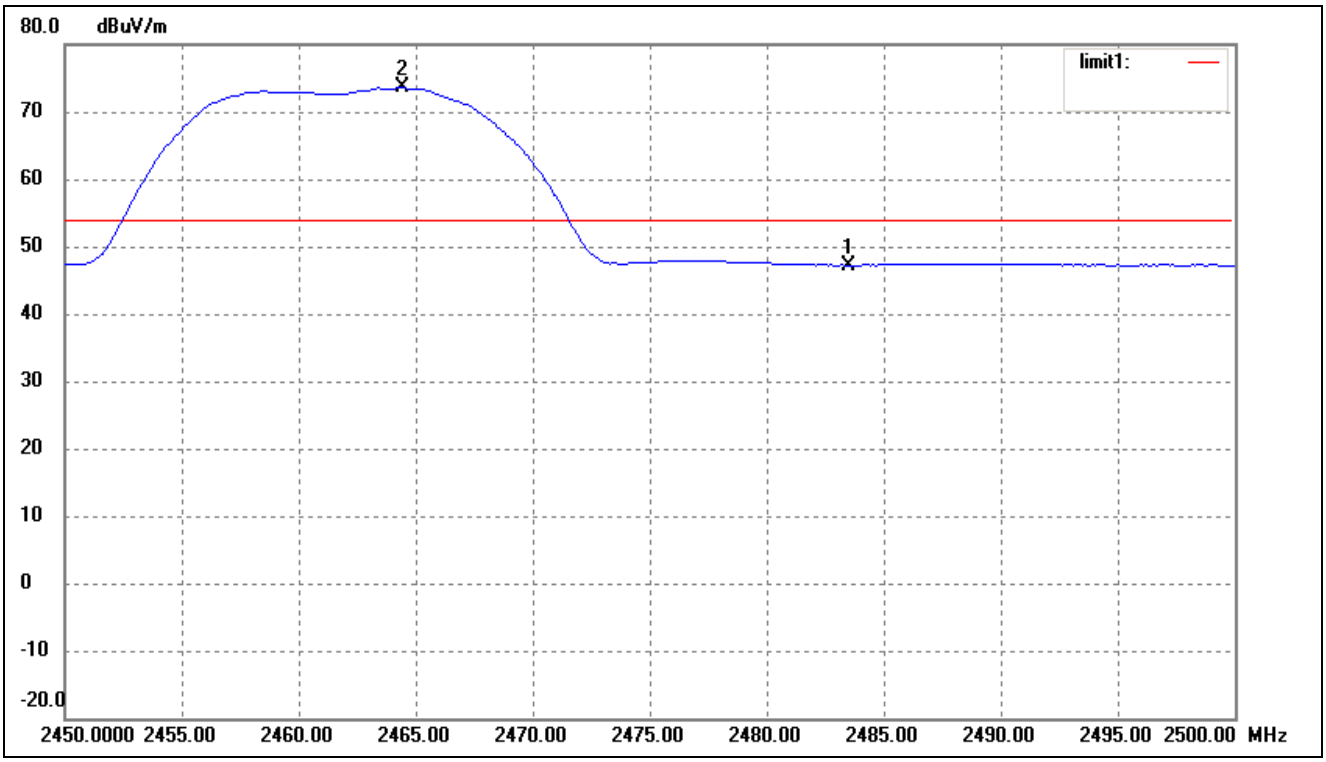
Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2310.000	12.48	34.91	47.39	54.00	-6.61	360	100	Ave
	2310.000	23.81	34.91	58.72	74.00	-15.28	360	100	peak
2	2390.000	12.03	35.59	47.62	54.00	-6.38	360	100	Ave
	2390.000	22.84	35.59	58.43	74.00	-15.57	360	100	peak
3	2400.000	12.34	35.68	48.02	54.00	-5.98	360	100	Ave
4	2410.620	46.79	35.72	82.51			360	100	Ave

For 802.11b

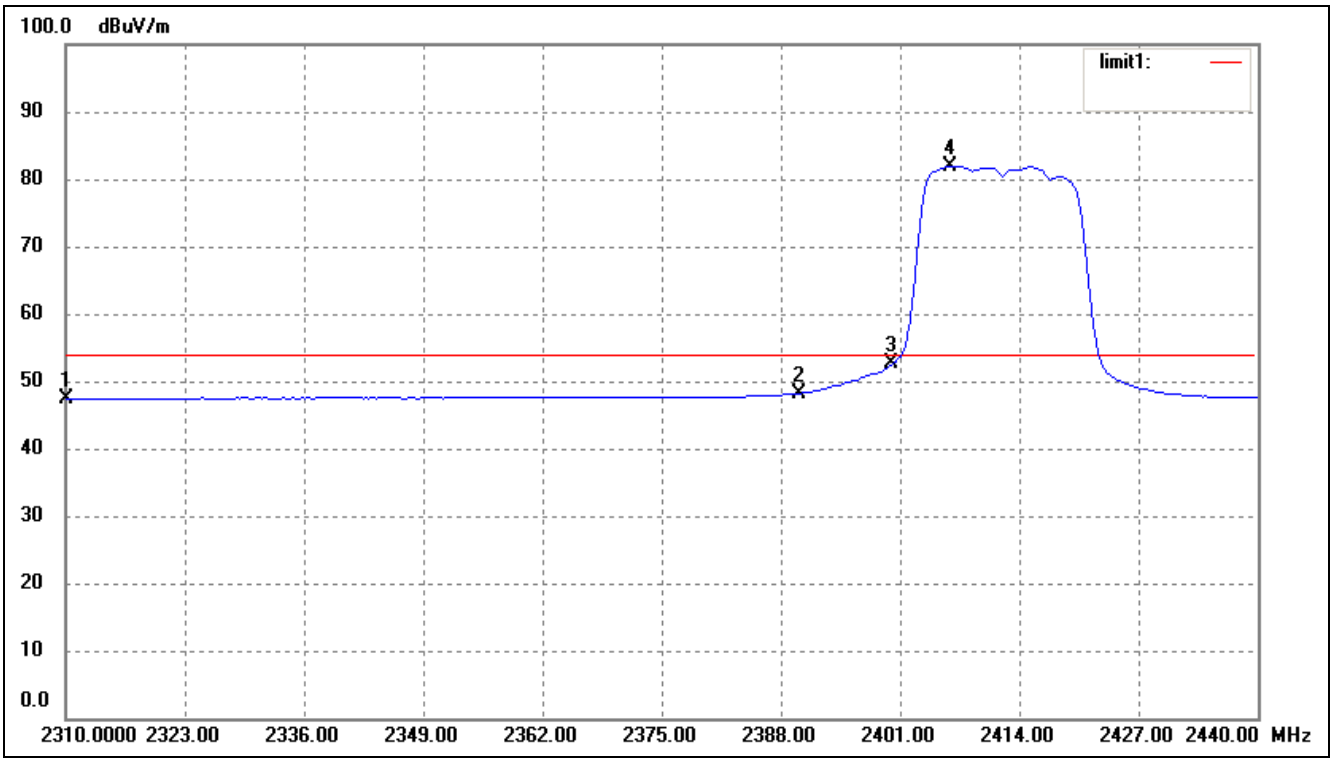
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	12.25	34.97	47.22	54.00	-6.78	360	100	Ave
	2483.500	24.26	34.97	59.23	74.00	-14.77	360	100	peak
2	2464.400	38.65	34.91	73.56	/	/	360	100	Ave

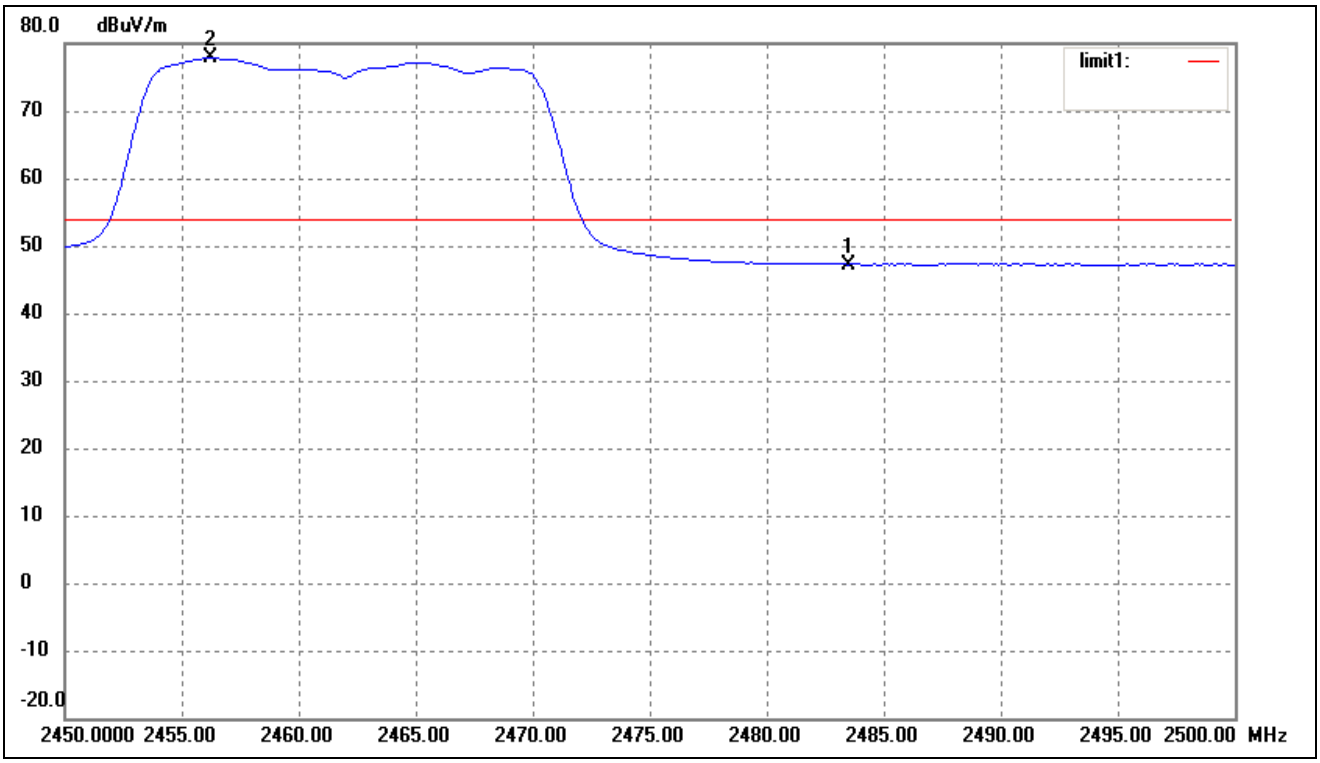
For 802.11g

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2310.000	12.42	34.91	47.33	54.00	-6.67	360	100	Ave
	2310.000	23.54	34.91	58.45	74.00	-15.55	360	100	peak
2	2390.000	12.65	35.59	48.24	54.00	-5.76	360	100	Ave
	2390.000	22.74	35.59	58.33	54.00	-15.67	360	100	peak
3	2400.000	17.03	35.68	52.71	54.00	-1.29	360	100	Ave
4	2406.460	46.19	35.70	81.89	/	/	360	100	Ave

Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	12.27	34.97	47.24	54.00	-6.76	360	100	Ave
	2483.500	23.58	34.97	58.55	74.00	-15.45	360	100	peak
2	2456.200	42.97	34.88	77.85	/	/	360	100	Ave

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