

FCC Part 15C

Measurement and Test Report

For

AsiaRF Ltd.

1F., No.2, Lane45, Shuiyuan Street., Yonghe City, Taipei County 234, Taiwan

FCC ID: TKZAWUHN2405

Report Concerns: Original Report	Equipment Type: WiFi USB Dongle
Model:	<u>AWUHN2405</u>
Report No.:	<u>STR10128231I</u>
Test Date:	<u>2010-12-29 to 2011-01-11</u>
Issue Date:	<u>2011-01-12</u>
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Reviewed By:	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
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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: 1F., No.2, Lane45, Shuiyuan Street., Yonghe City, Taipei County 234, Taiwan

Manufacturer: AsiaRF Ltd.
Address of manufacturer: 1F., No.2, Lane45, Shuiyuan Street., Yonghe City, Taipei County 234, Taiwan

General Description of E.U.T

Items	Description
EUT Description:	WiFi USB Dongle
Trade Name:	/
Model No.:	AWUHN2405
Rated Voltage:	DC 5V
RF Output Power	Max. 20.42dBm
Antenna Gain:	4 dBi
Frequency range:	2412MHz~2462MHz (802.11b, 802.11g, 802.11n-HT20) 2422MHz~2452MHz (802.11n-HT40)
Number of channels:	11 (802.11b, 802.11g, 802.11n-HT20) 9 (802.11n-HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Size:	25.2X3.5X0.9cm

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 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 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.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

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
Notebook	ASUS	X50R	74NOAS297138
/	/	/	/

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	4.0	Shielded	With 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

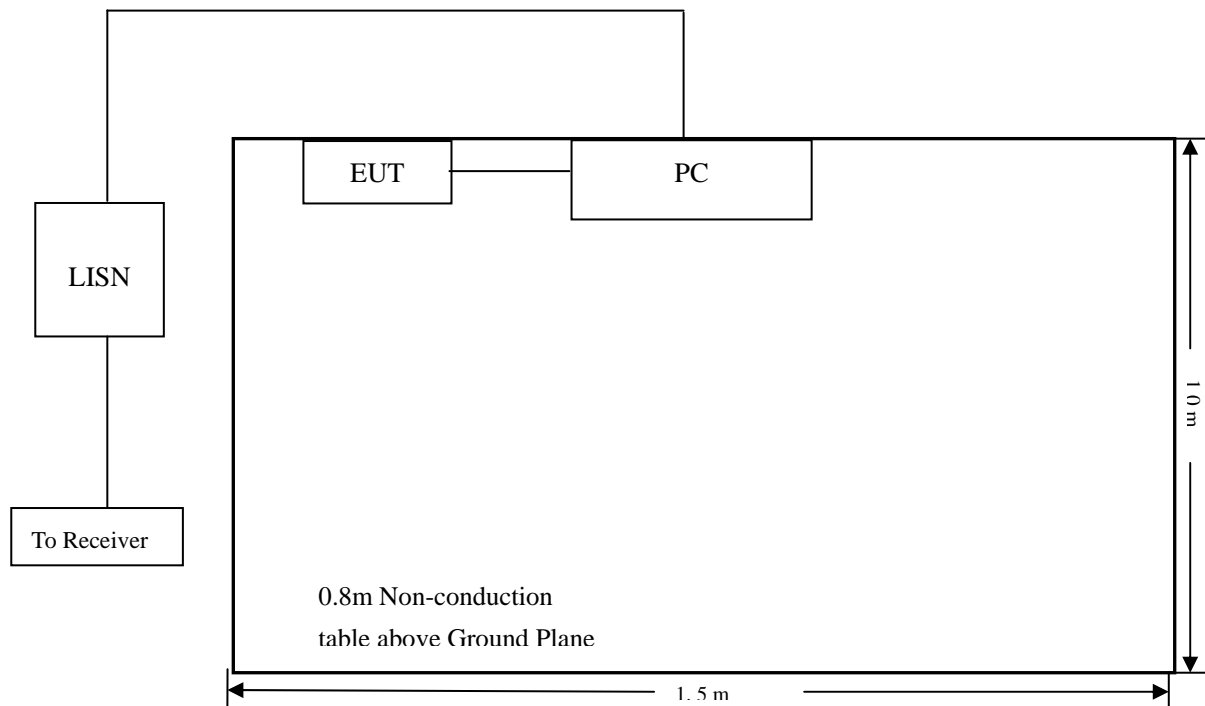
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-08-12	2011-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-08-12	2011-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-08-12	2011-08-11

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:

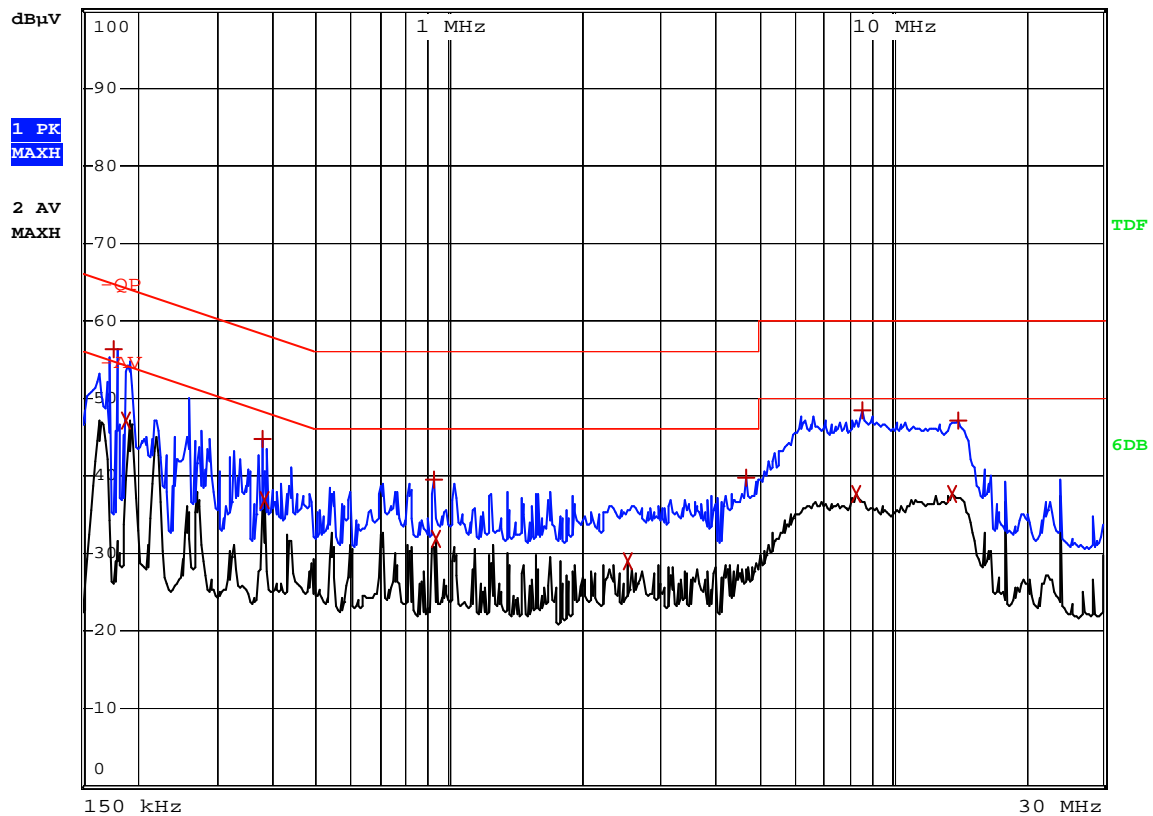
-2.4 dB μ V at 0.190 MHz in the Line Pk Detector, 0.15-30MHz

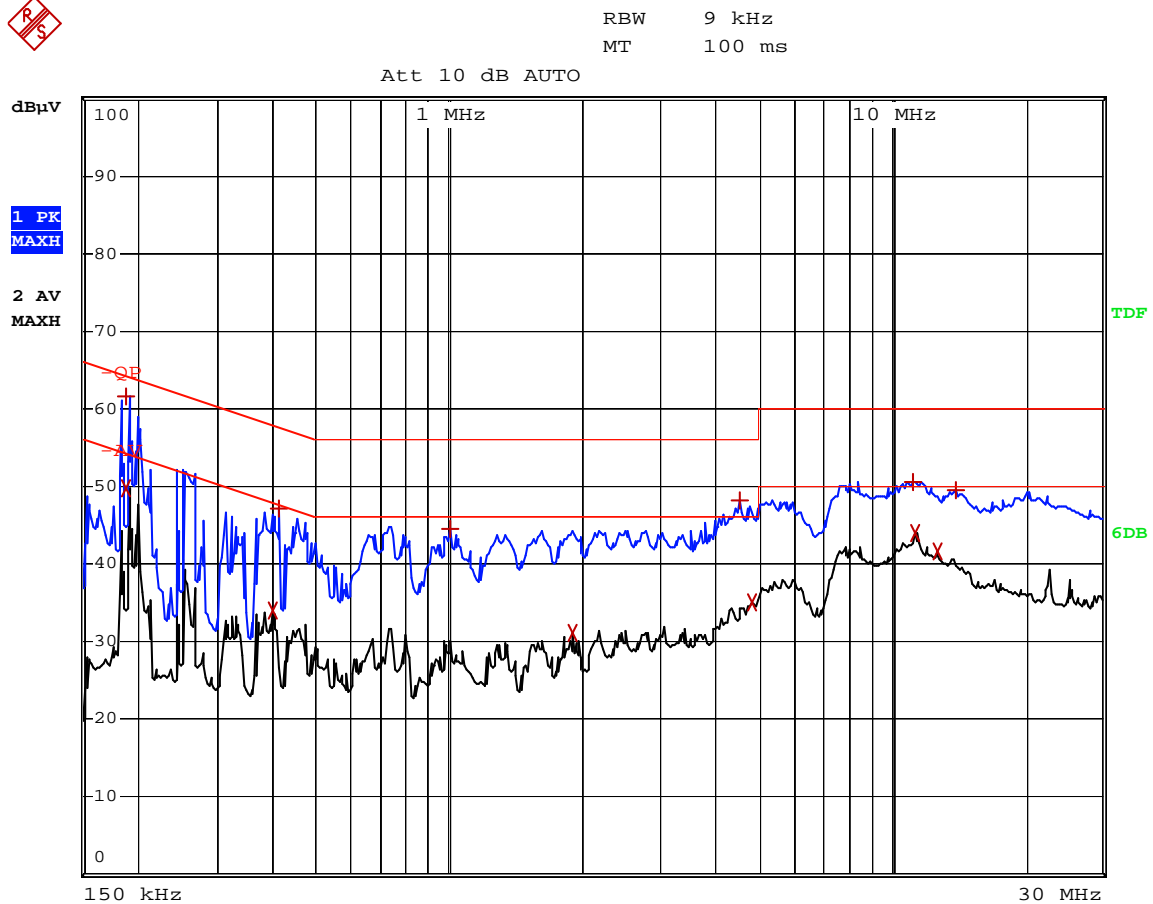
3.7 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15.207	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Pk	Line/Neutral	dB μ V	dB
0.190	61.67	Pk	Line	64.04	-2.4
0.190	49.66	Ave	Line	54.04	-4.4
11.330	44.03	Ave	Line	50.00	-6.0
0.190	47.15	Ave	Neutral	54.04	-6.9
4.526	48.24	Pk	Line	56.00	-7.8
0.178	56.30	Pk	Neutral	64.58	-8.3
12.734	41.59	Ave	Line	50.00	-8.4
11.146	50.49	Pk	Line	60.00	-9.5
0.410	47.17	Pk	Line	57.65	-10.5
14.006	49.42	Pk	Line	60.00	-10.6
4.862	35.10	Ave	Line	46.00	-10.9
0.382	36.86	Ave	Neutral	48.24	-11.4
8.602	48.37	Pk	Neutral	60.00	-11.6
1.006	44.41	Pk	Line	56.00	-11.6
8.360	37.65	Ave	Neutral	50.00	-12.4
13.706	37.64	Ave	Neutral	50.00	-12.4
14.066	47.15	Pk	Neutral	60.00	-12.9
0.378	44.66	Pk	Neutral	58.32	-13.7
0.930	31.88	Ave	Neutral	46.00	-14.1
4.714	39.69	Pk	Neutral	56.00	-16.3
0.926	39.51	Pk	Neutral	56.00	-16.5
2.526	28.95	Ave	Neutral	46.00	-17.1
0.398	24.11	Ave	Line	47.90	-23.8
1.898	21.21	Ave	Line	46.00	-24.8

Plot of Conducted Emissions Test Data*Conducted Disturbance**EUT: WiFi USB Dongle**M/N: AWUHN2405**Operating Condition: Transmitting**Test Specification: N**Comment: AC 120V/60Hz Notebook, USB 5V*RBW 9 kHz
MT 100 ms

Att 10 dB AUTO



Plot of Conducted Emissions Test Data*Conducted Disturbance**EUT: WiFi USB Dongle**M/N: AWUHN2405**Operating Condition: Transmitting**Test Specification: L**Comment: AC 120V/60Hz Notebook, USB 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 an 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	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 = 20MHz.
4. Repeat above procedures until all frequency measured was complete.

5.4 Environmental Conditions

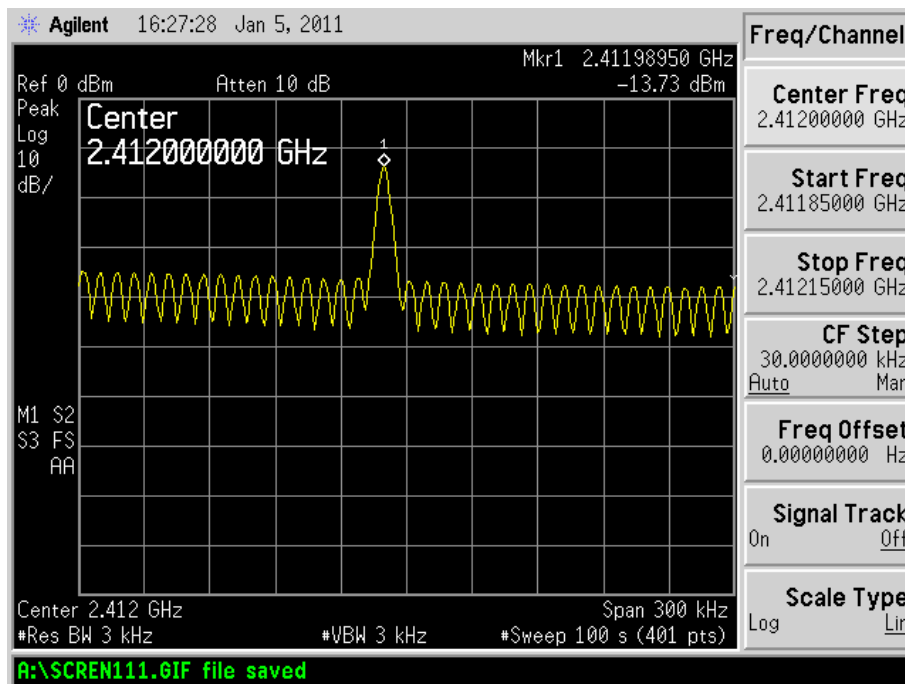
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.5 Summary of Test Results/Plots

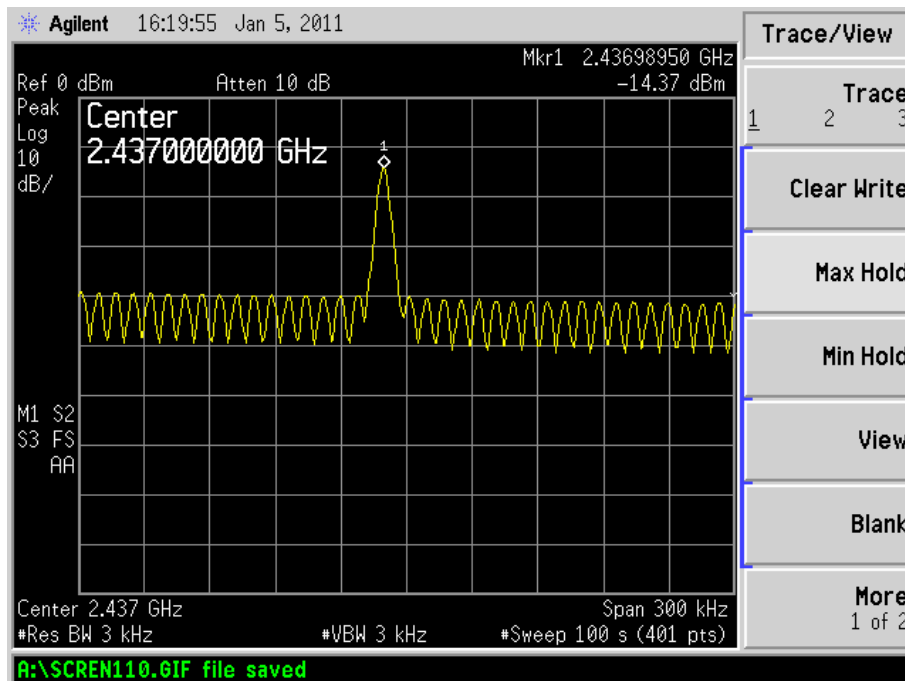
Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-13.73	8
	Middle channel (2437MHz)	-14.37	8
	High channel (2462MHz)	-14.40	8
802.11g	Low channel (2412MHz)	-14.67	8
	Middle channel (2437MHz)	-15.28	8
	High channel (2462MHz)	-15.83	8
802.11n-HT20	Low channel (2412MHz)	-14.34	8
	Middle channel (2437MHz)	-14.96	8
	High channel (2462MHz)	-15.54	8
802.11n-HT40	Low channel (2422MHz)	-14.45	8
	Middle channel (2437MHz)	-15.23	8
	High channel (2452MHz)	-15.29	8

For 802.11b

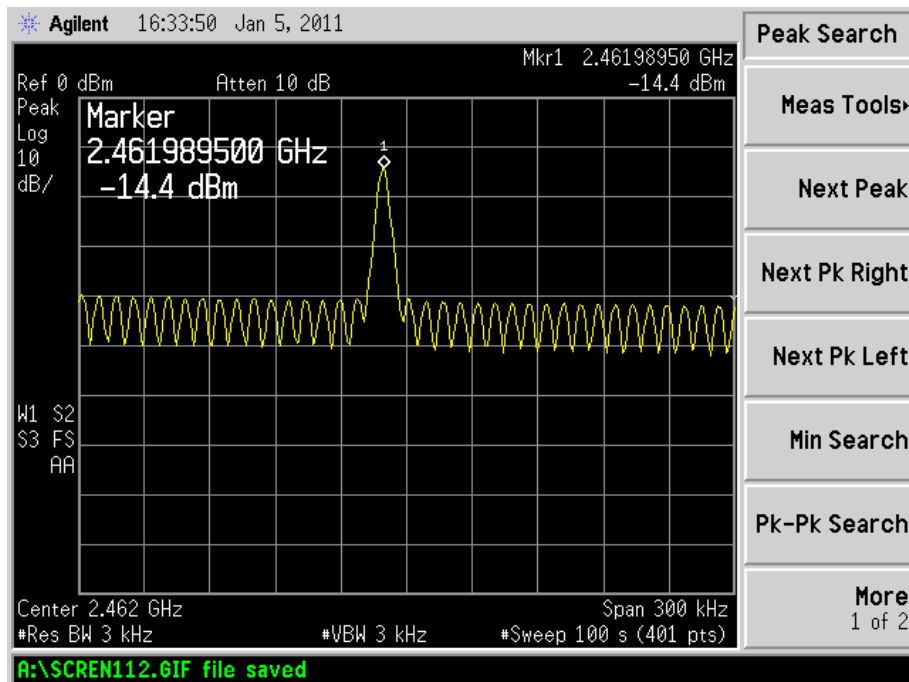
Low Channel:



Middle Channel:

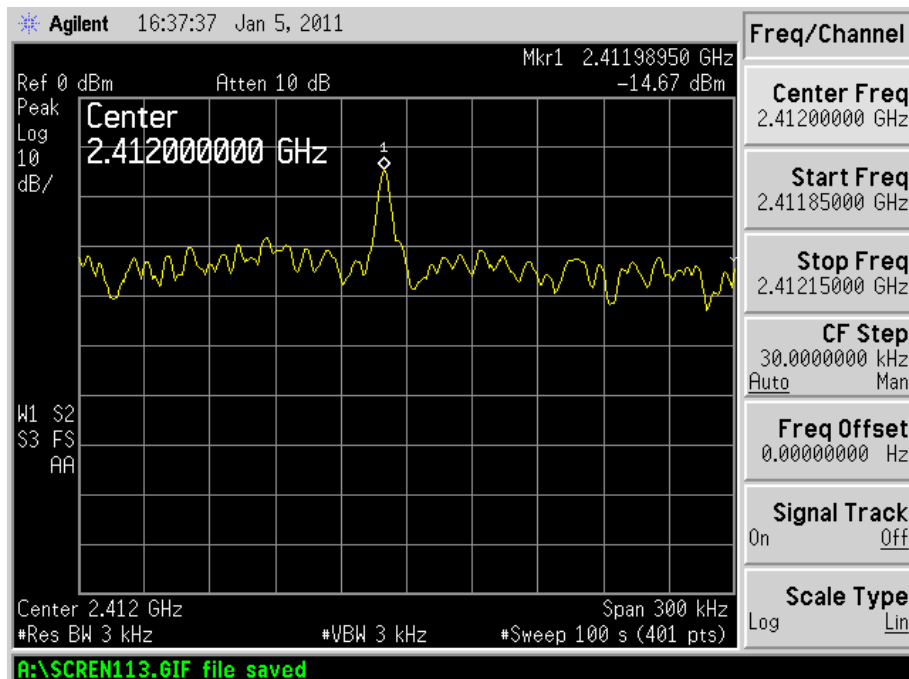


High Channel:

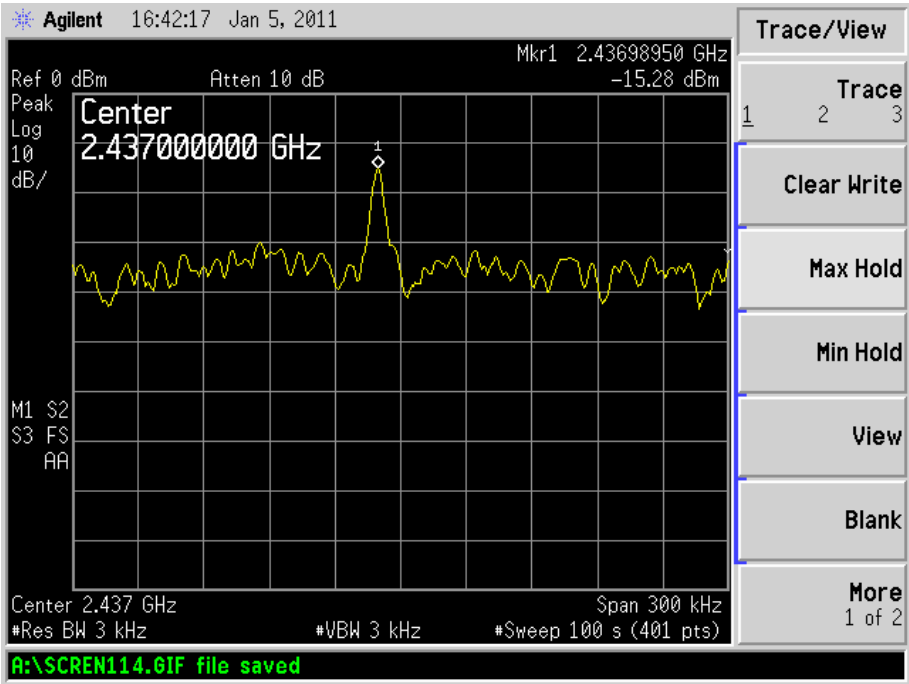


For 802.11g

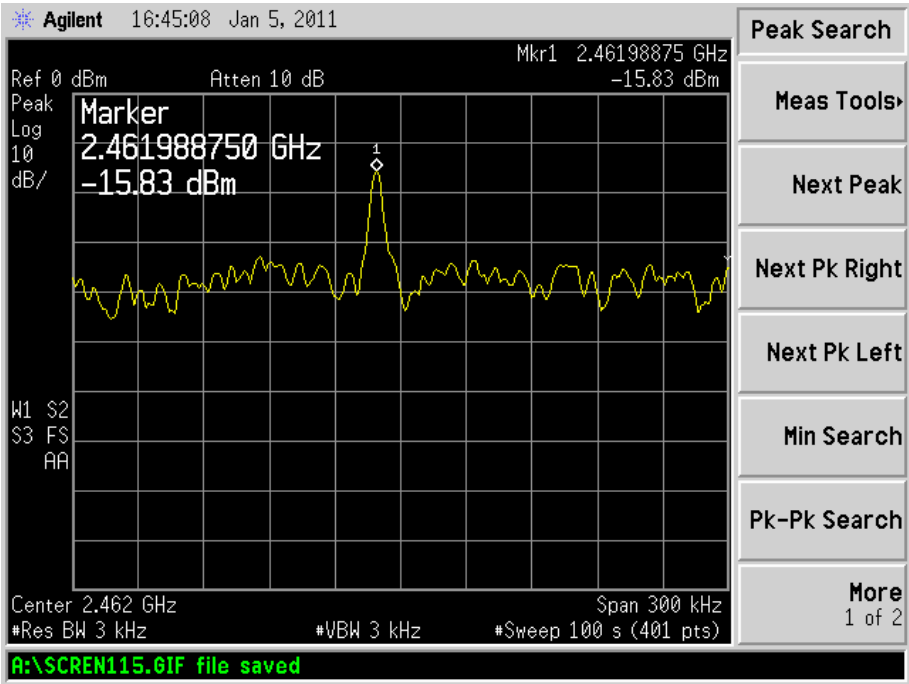
Low Channel:



Middle Channel:

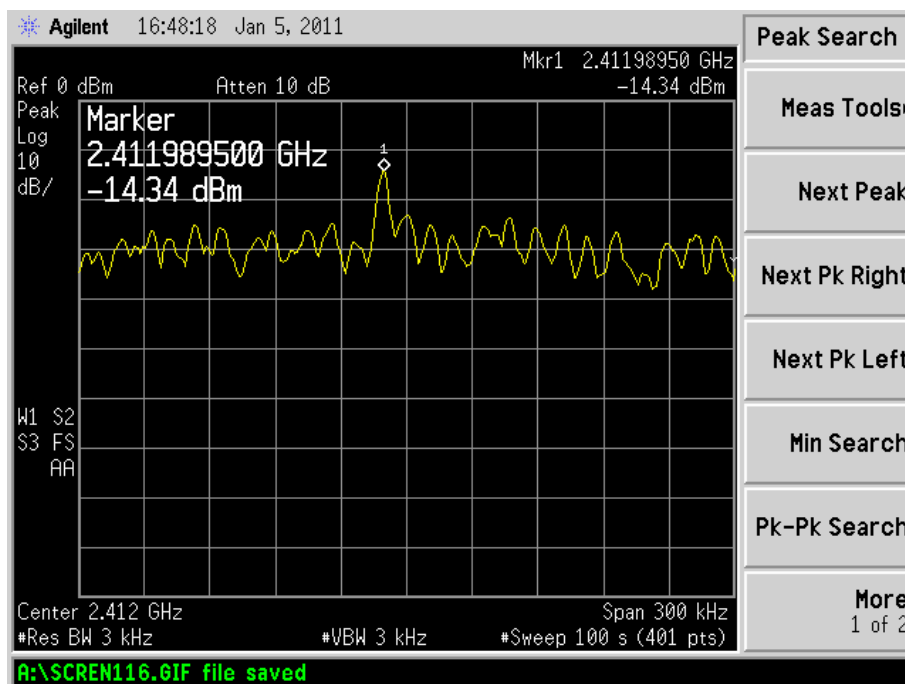


High Channel:

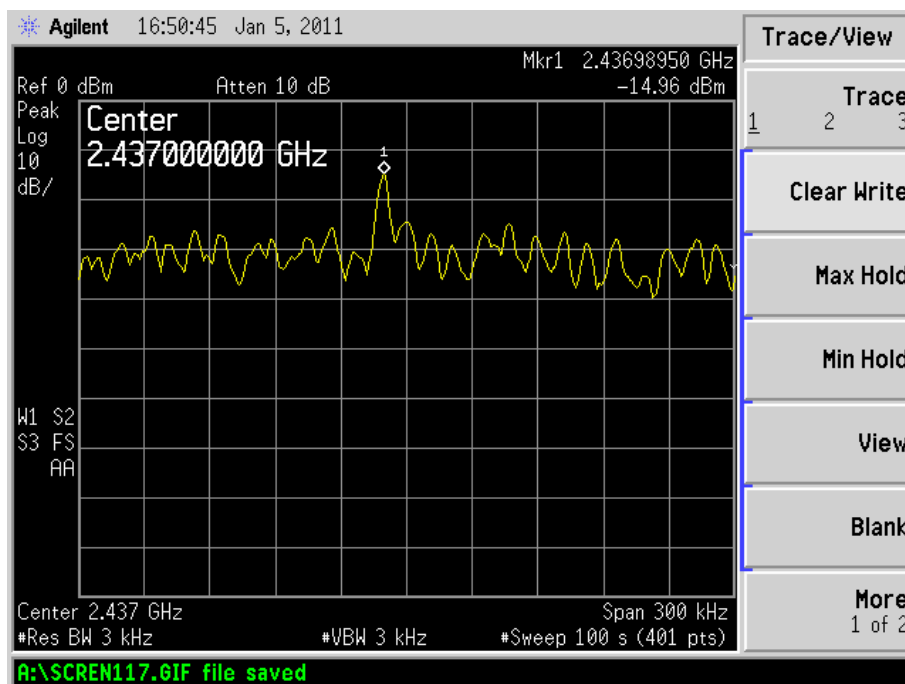


For 802.11n-HT20

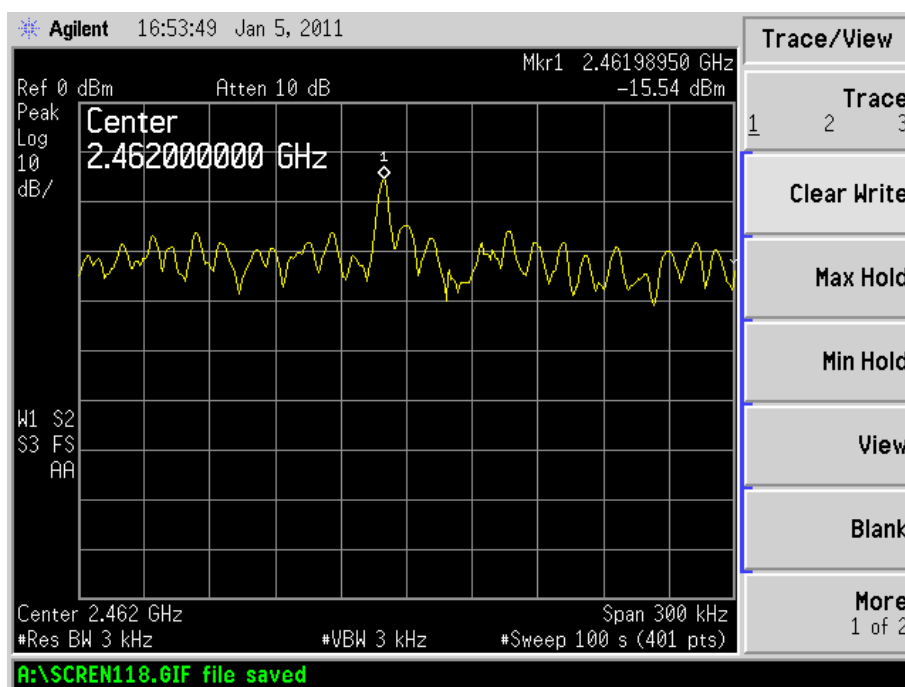
Low Channel:



Middle Channel:

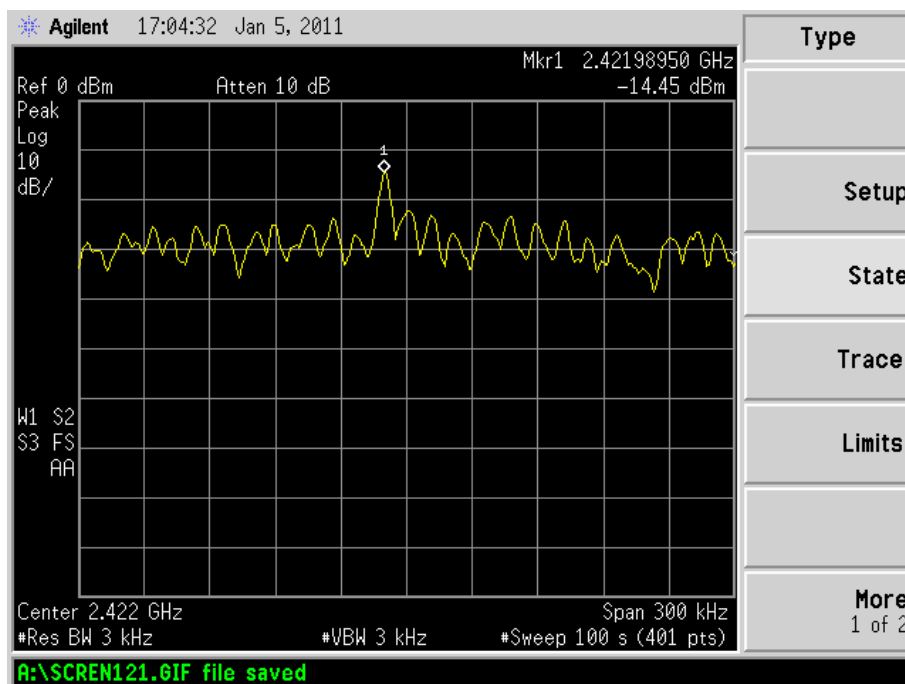


High Channel:

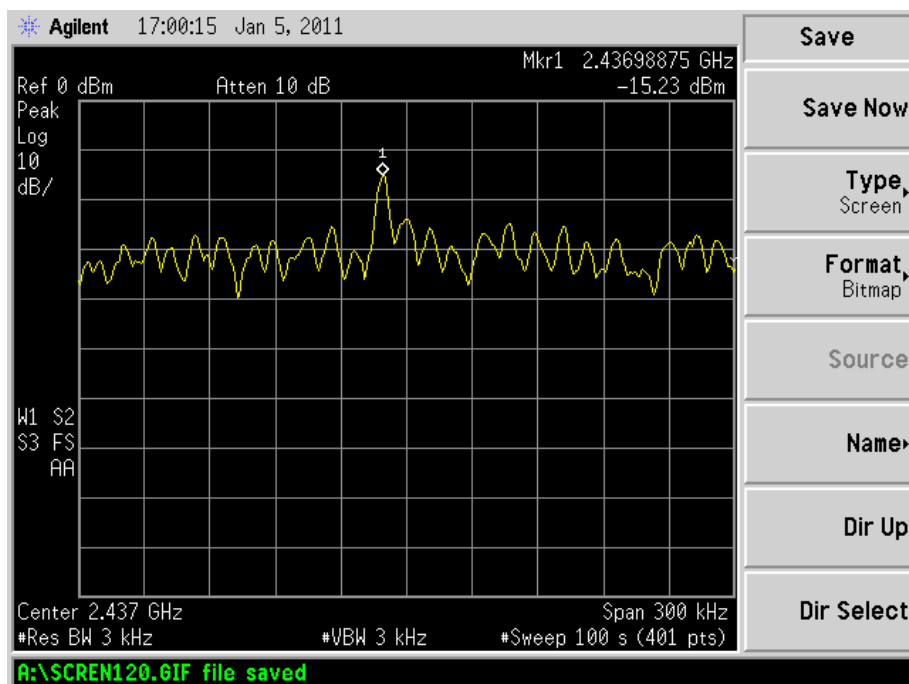


For 802.11n-HT40

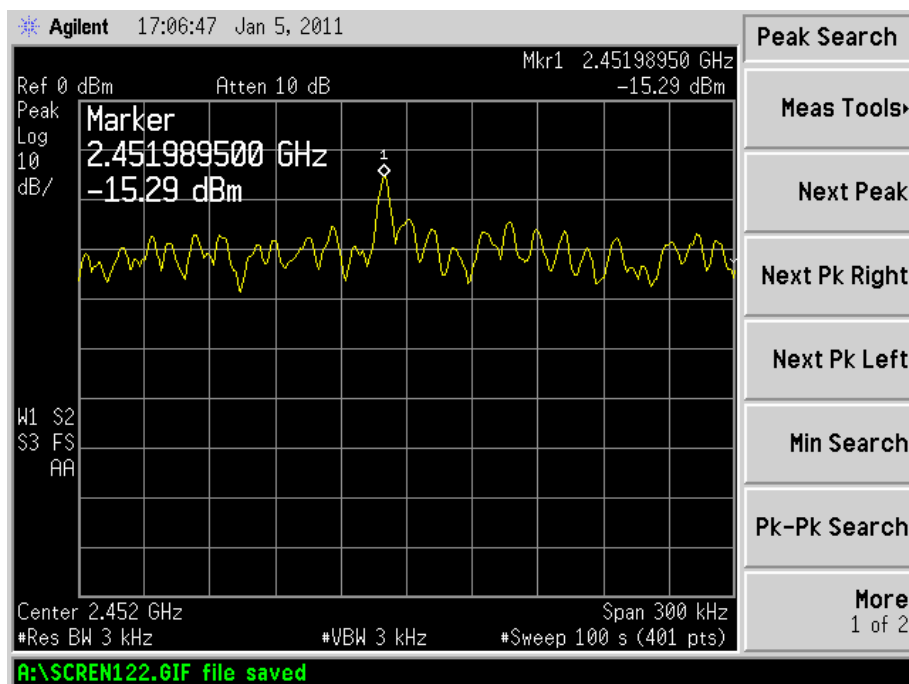
Low Channel:



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	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=100KHz (1 % of Bandwidth.), Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.

6.4 Environmental Conditions

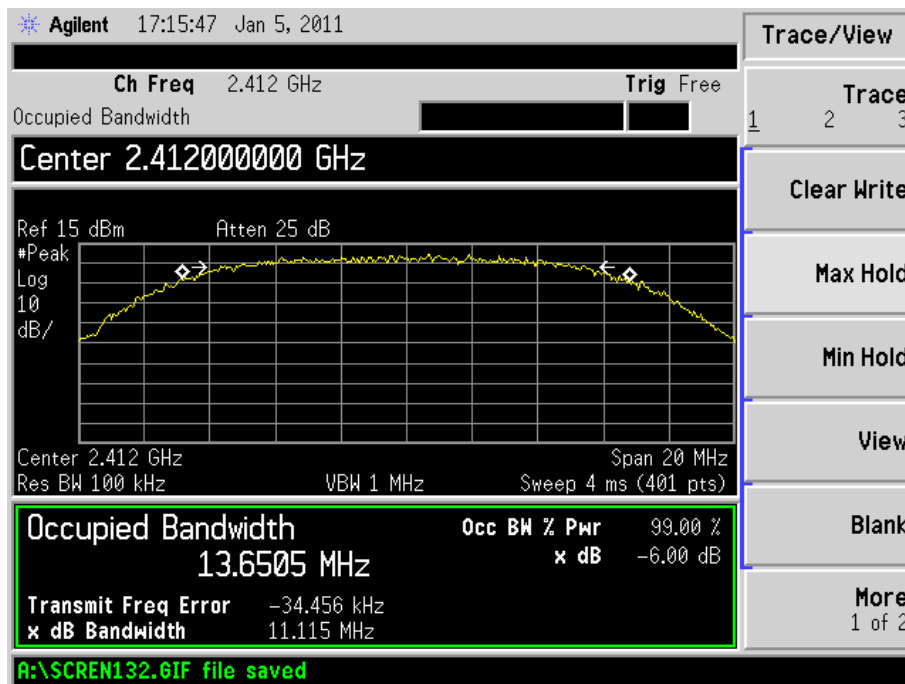
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.5 Summary of Test Results/Plots

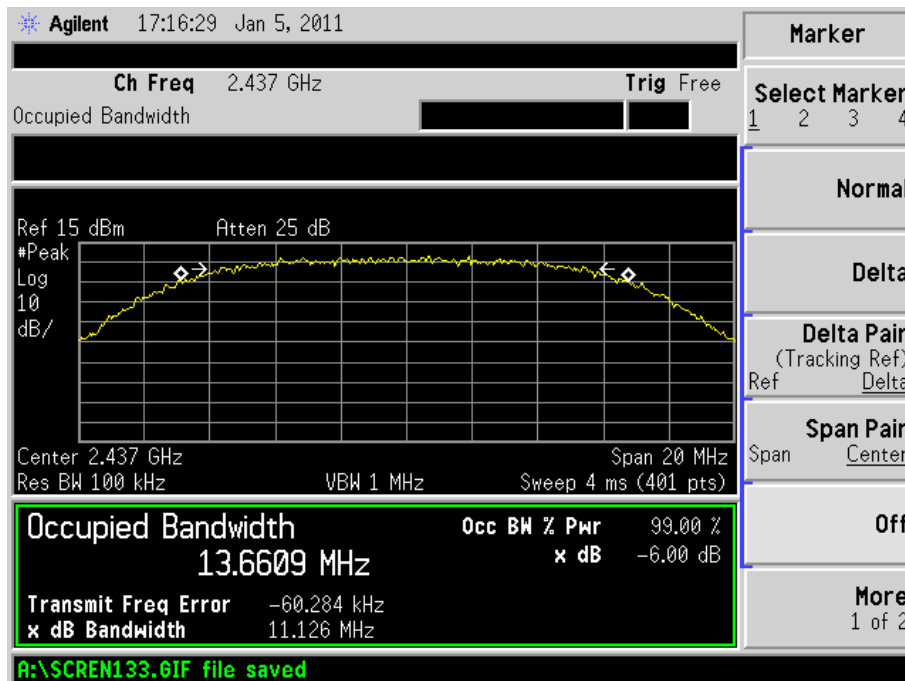
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	11115	500
	2437	11126	500
	2462	11126	500
802.11g	2412	16489	500
	2437	16486	500
	2462	16436	500
802.11n-HT20	2412	17615	500
	2437	17594	500
	2462	17617	500
802.11n-HT40	2422	35681	500
	2437	35508	500
	2452	35685	500

For 802.11b

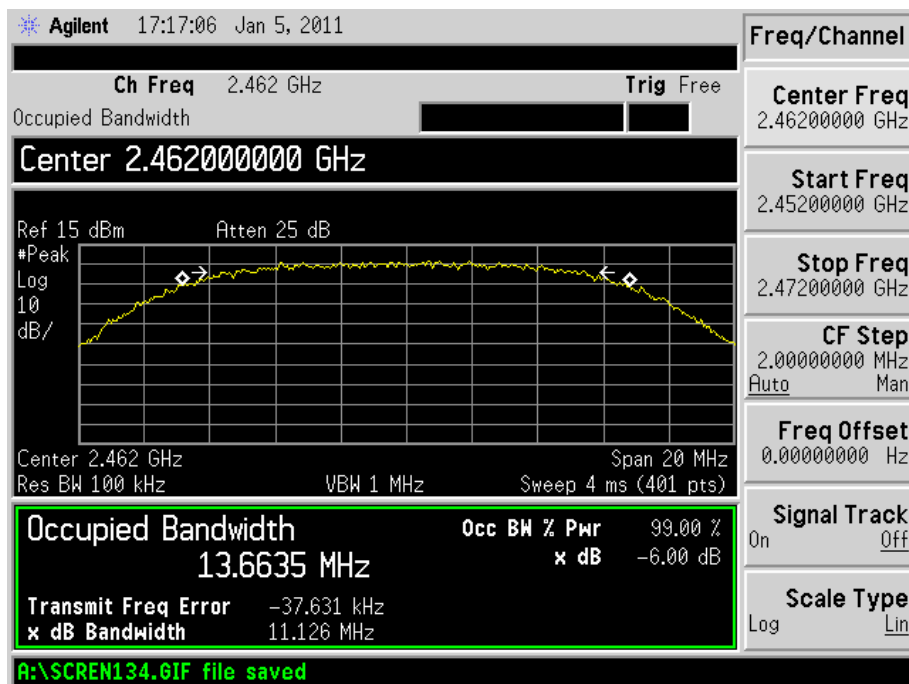
Low Channel:



Mid Channel:

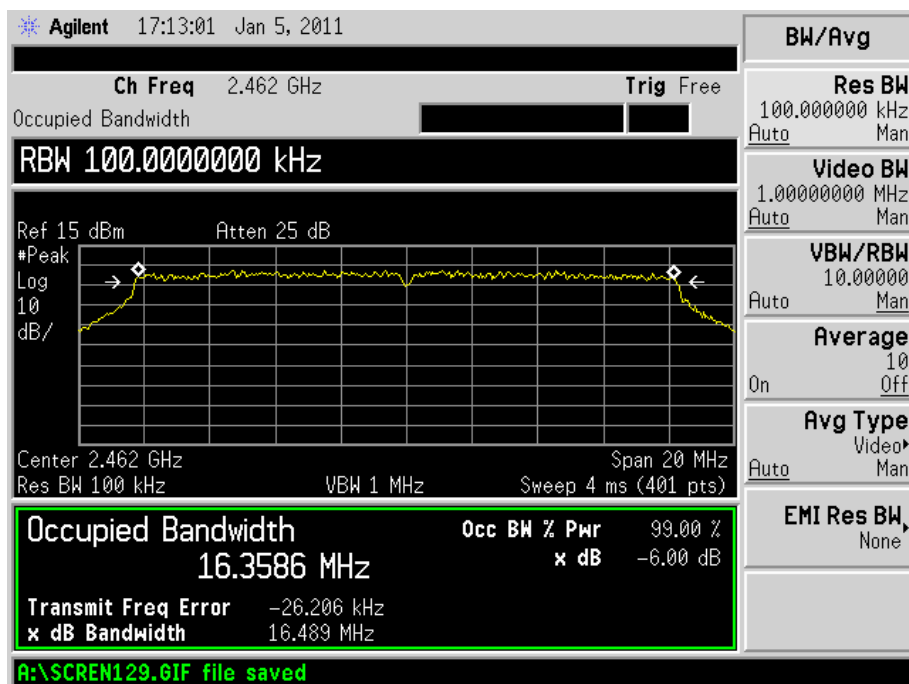


High Channel:

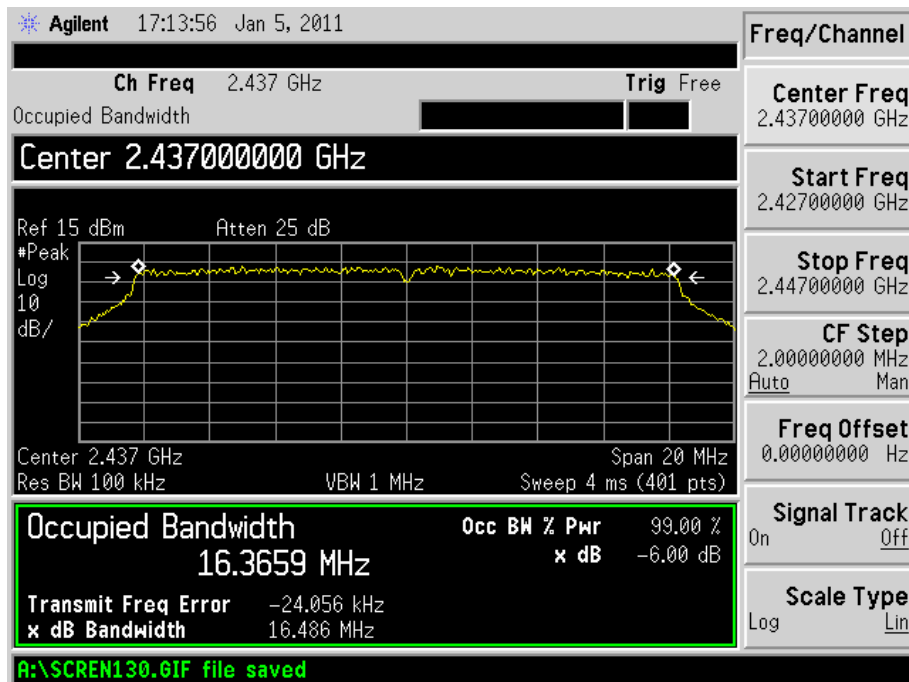


For 802.11g

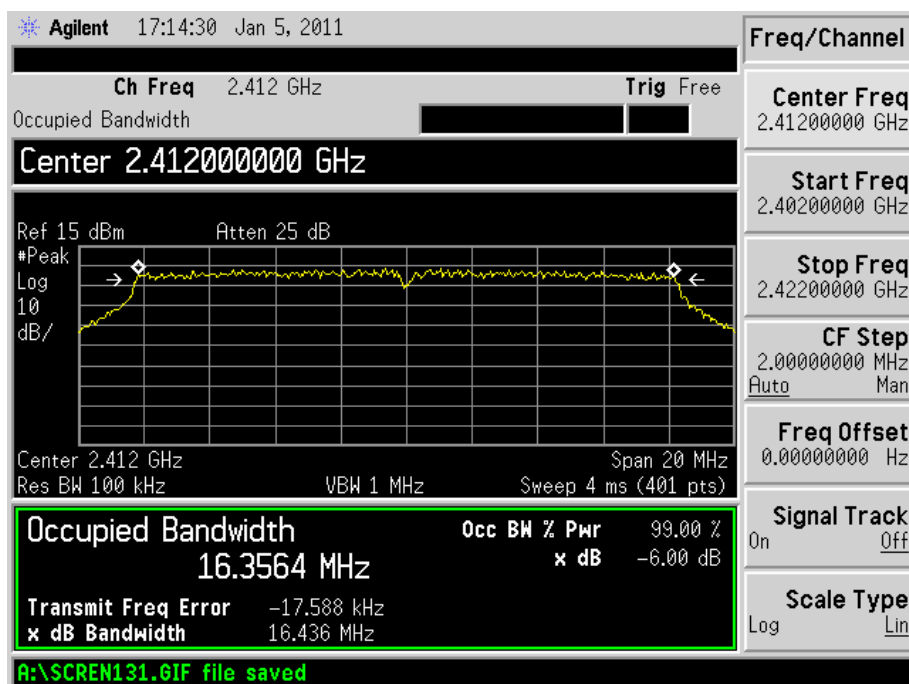
Low Channel:



Mid Channel:

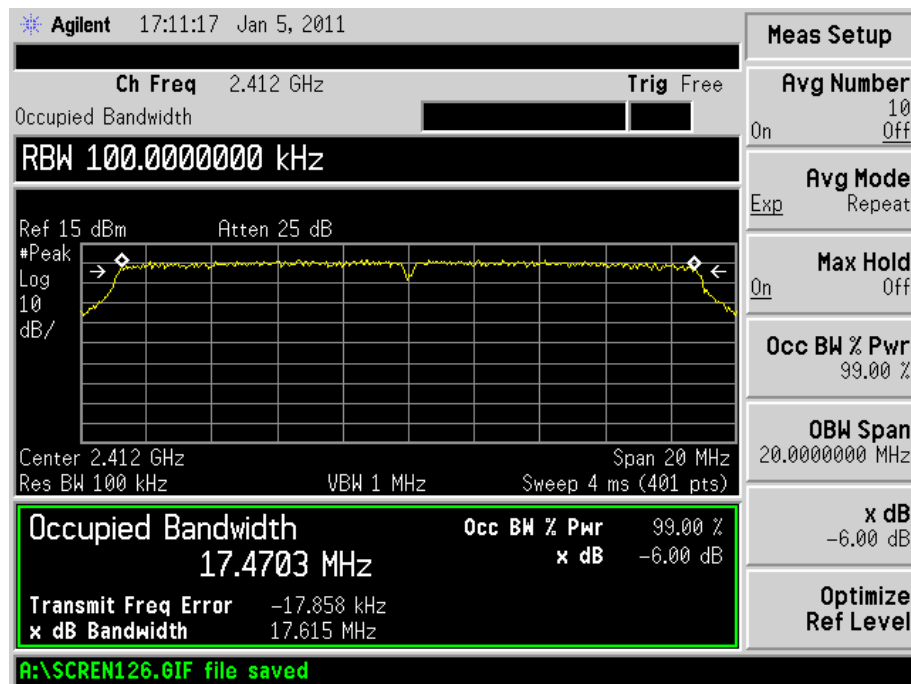


High Channel:

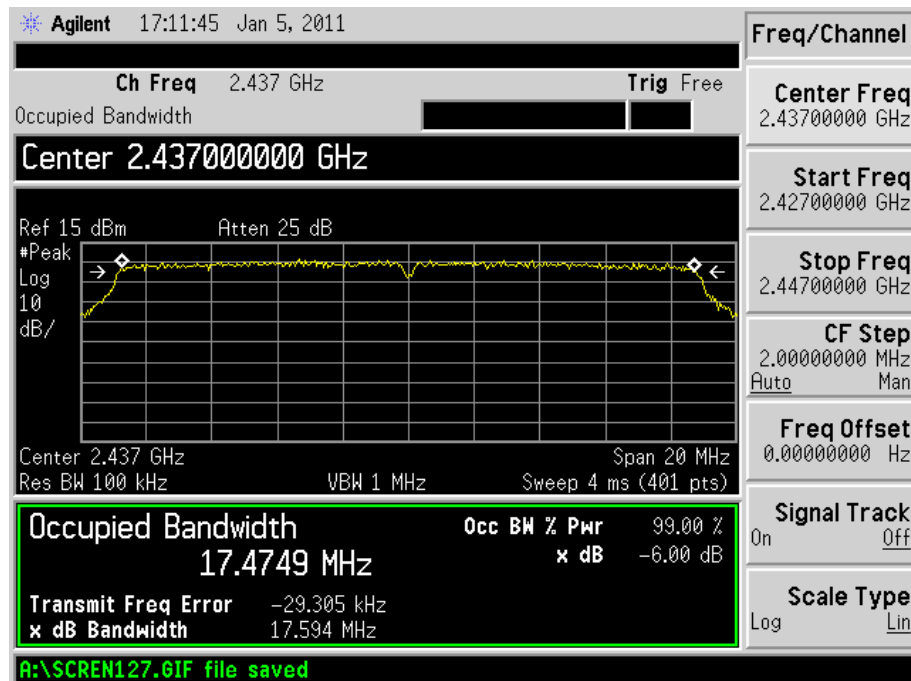


For 802.11n-HT20

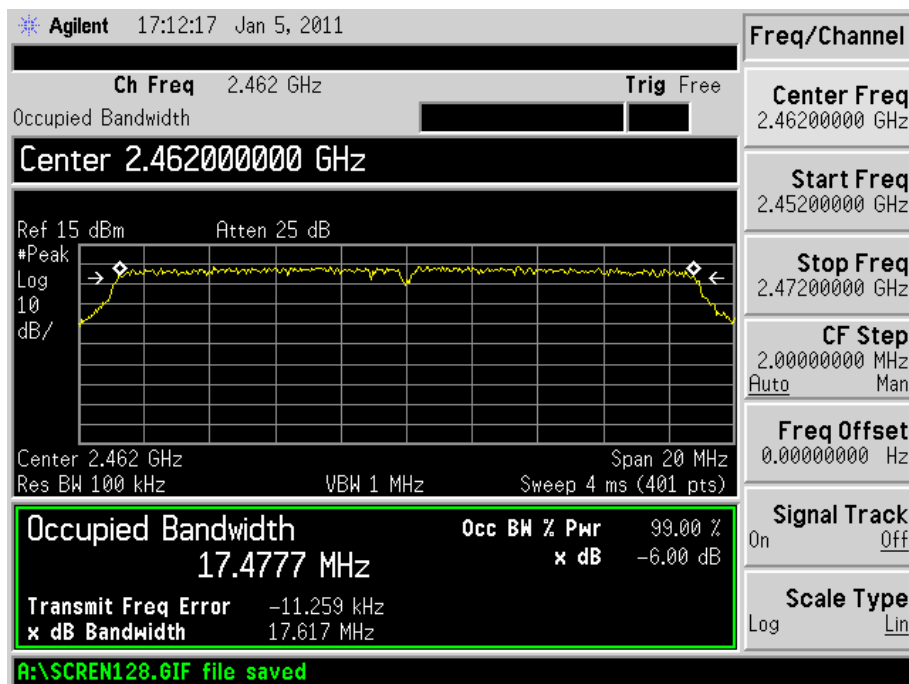
Low Channel:



Mid Channel:

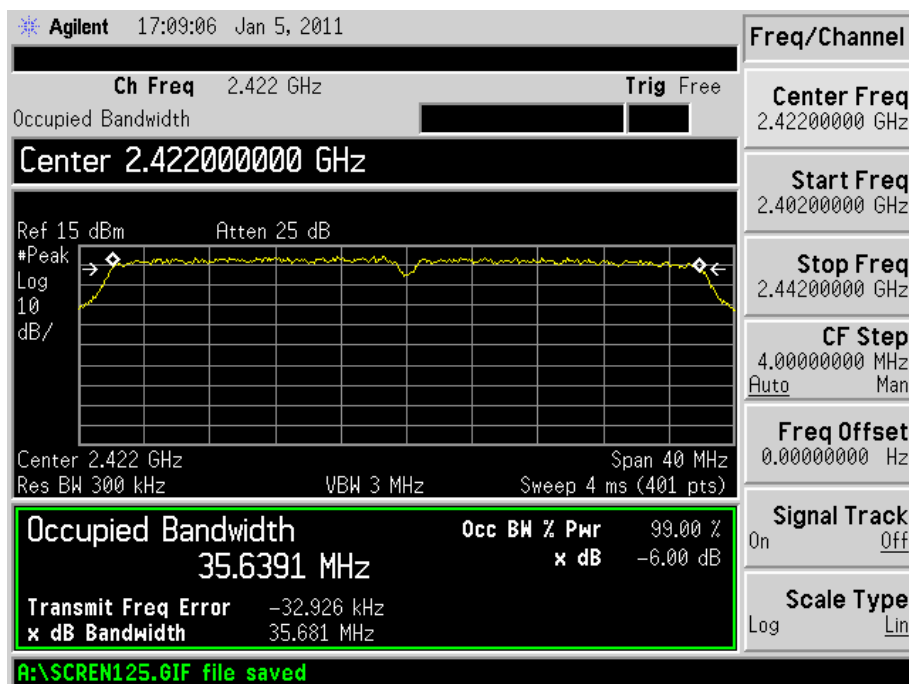


High Channel:

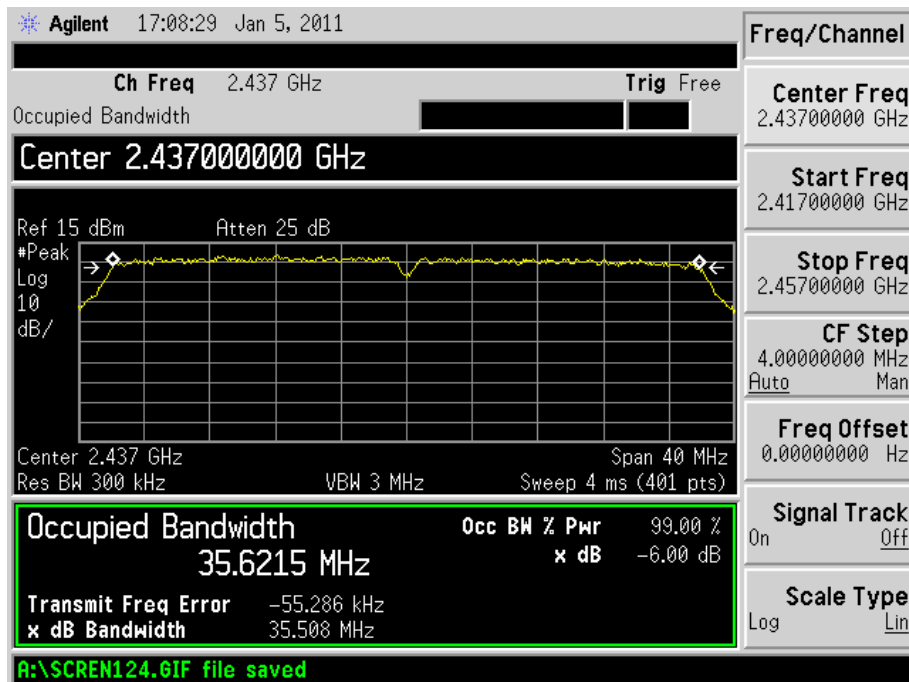


For 802.11n-HT40

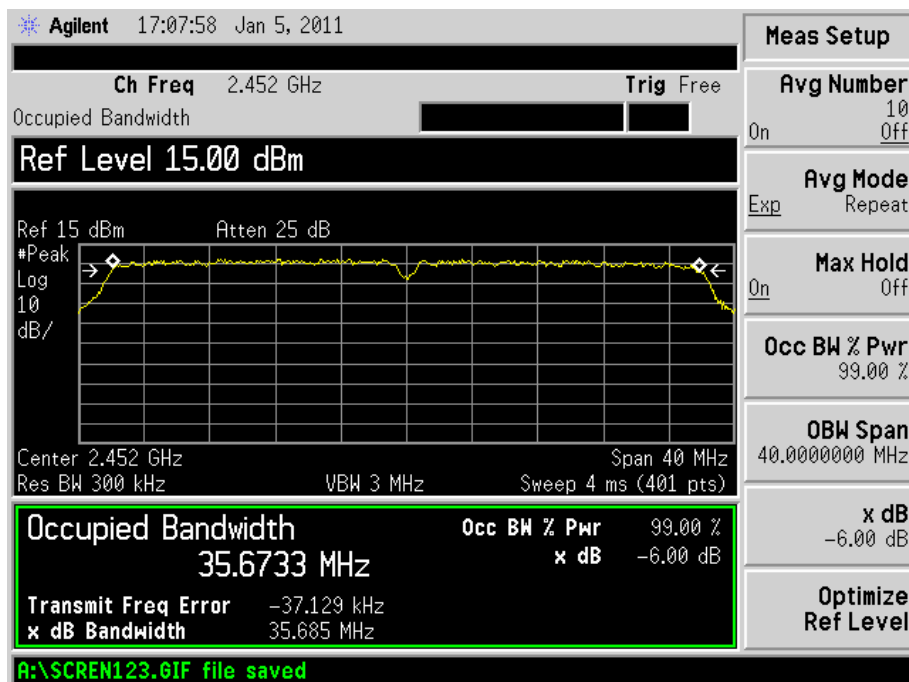
Low Channel:



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	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 \geq 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

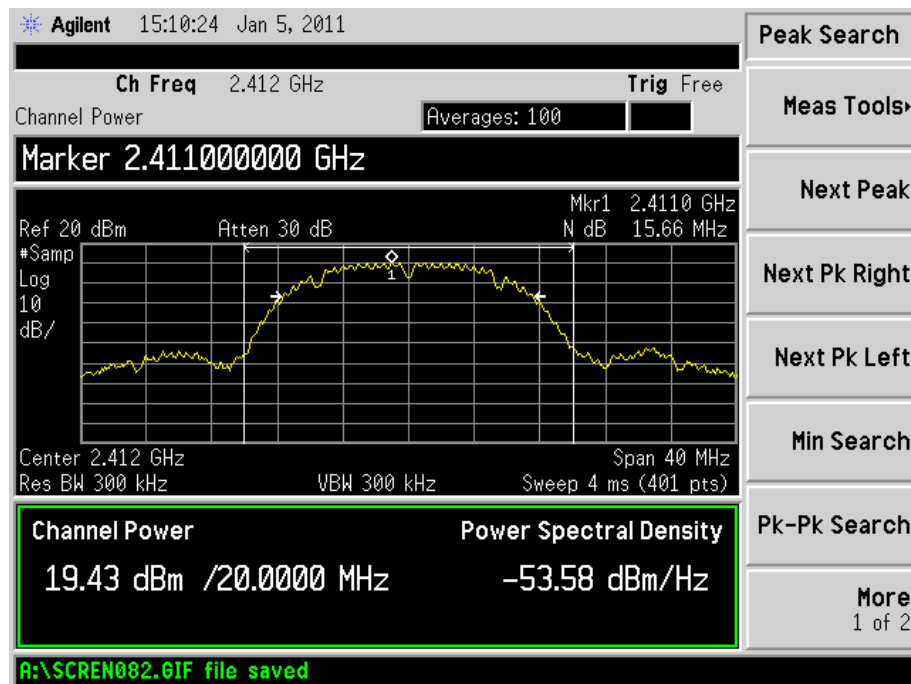
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

7.5 Summary of Test Results/Plots

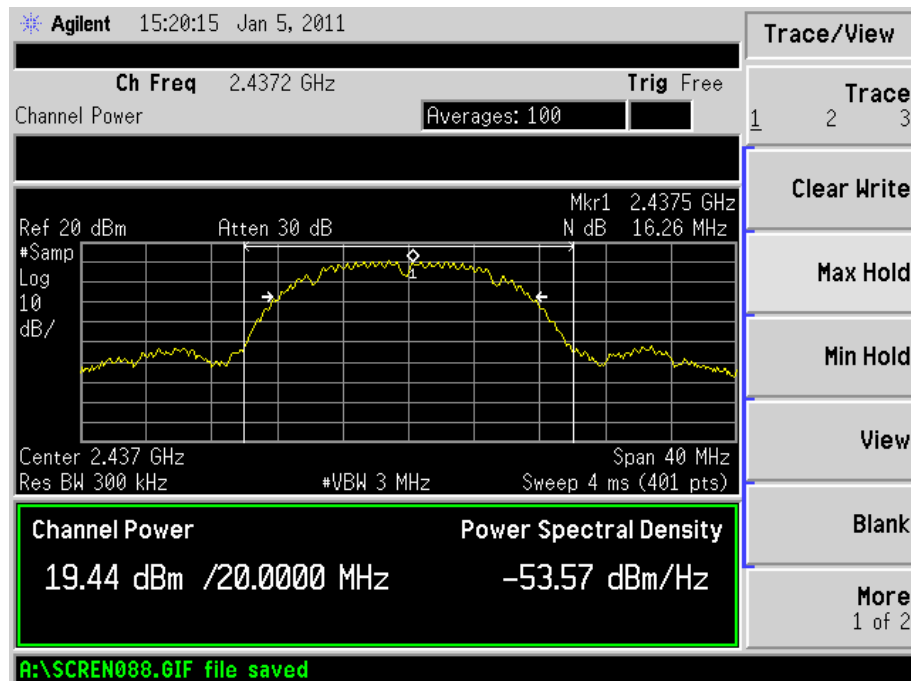
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11b (1M Short)	2412	19.43	0.0877	1
	2437	19.44	0.087902	1
	2462	18.49	0.070632	1
802.11b (1M Long)	2412	19.23	0.083753	1
	2437	19.58	0.090782	1
	2462	18.16	0.065464	1
802.11b (11M Short)	2412	19.36	0.086298	1
	2437	19.29	0.084918	1
	2462	18.53	0.071285	1
802.11b (11M Long)	2412	19.37	0.086497	1
	2437	19.53	0.089743	1
	2462	18.35	0.068391	1
802.11g (6M)	2412	20.42	0.110154	1
	2437	19.55	0.090157	1
	2462	19.31	0.08531	1
802.11g (54M)	2412	17.43	0.055335	1
	2437	16.53	0.044978	1
	2462	18.96	0.078705	1
802.11n-HT20	2412	20.33	0.107895	1
	2437	19.83	0.096161	1
	2462	19.31	0.08531	1
802.11n-HT40	2422	19.27	0.084528	1
	2437	19.55	0.090157	1
	2452	18.21	0.066222	1

For 802.11b_1M Short rate

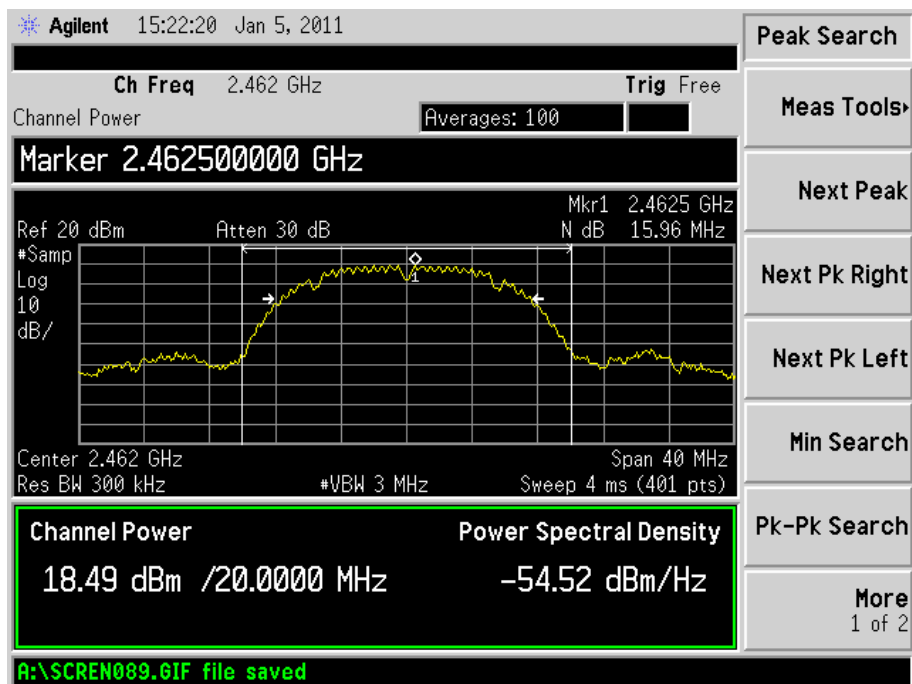
Low Channel:



Middle Channel:

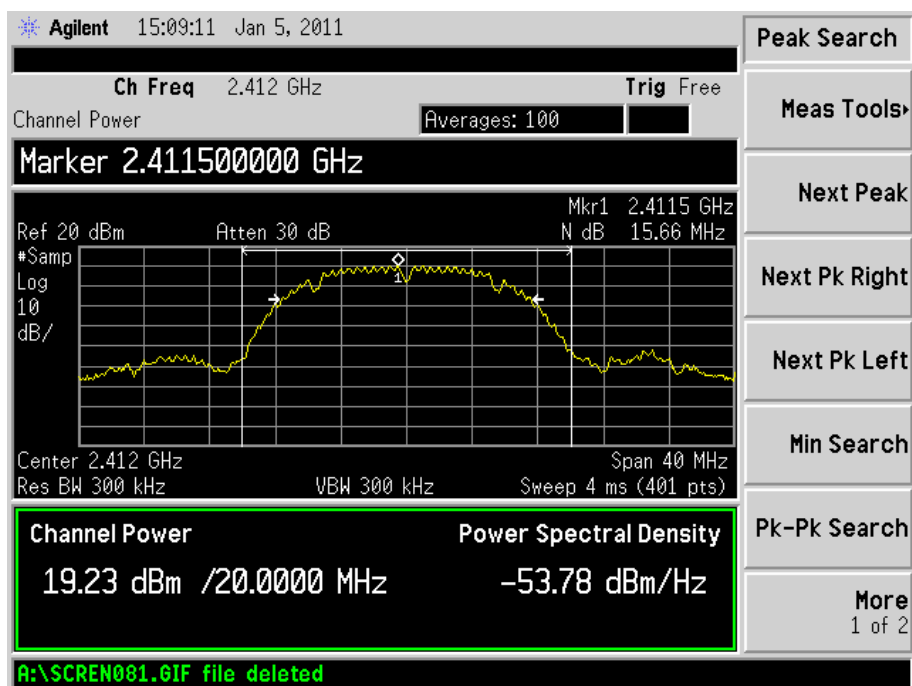


High Channel:

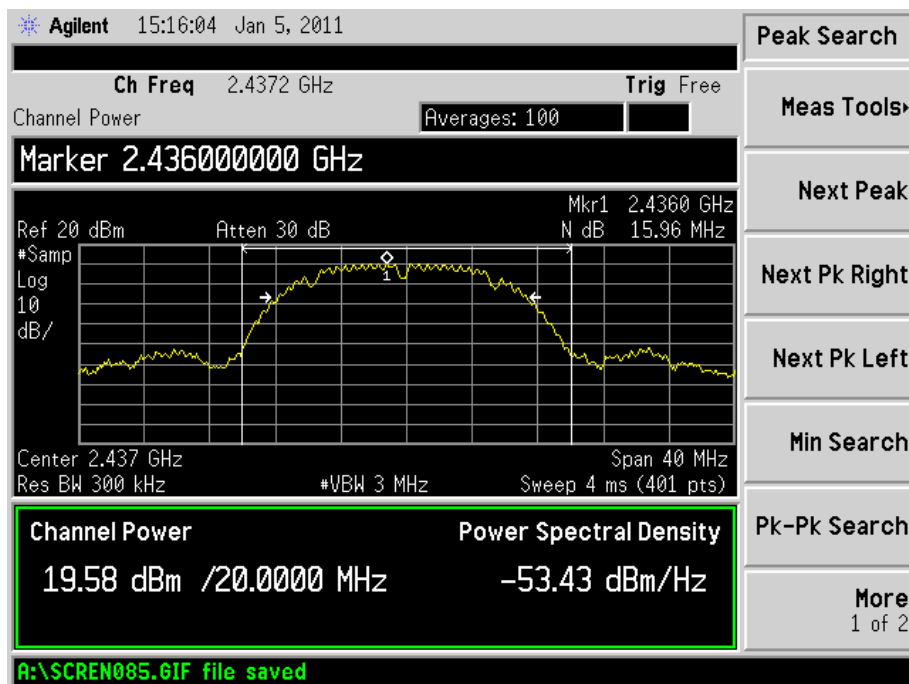


For 802.11b_1M Long rate

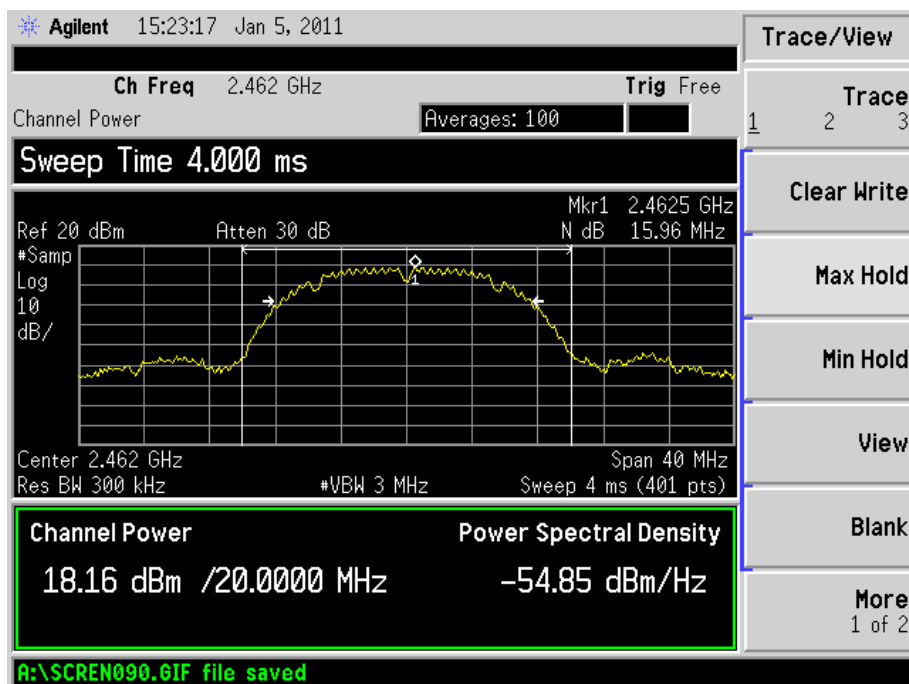
Low Channel:



Middle Channel:

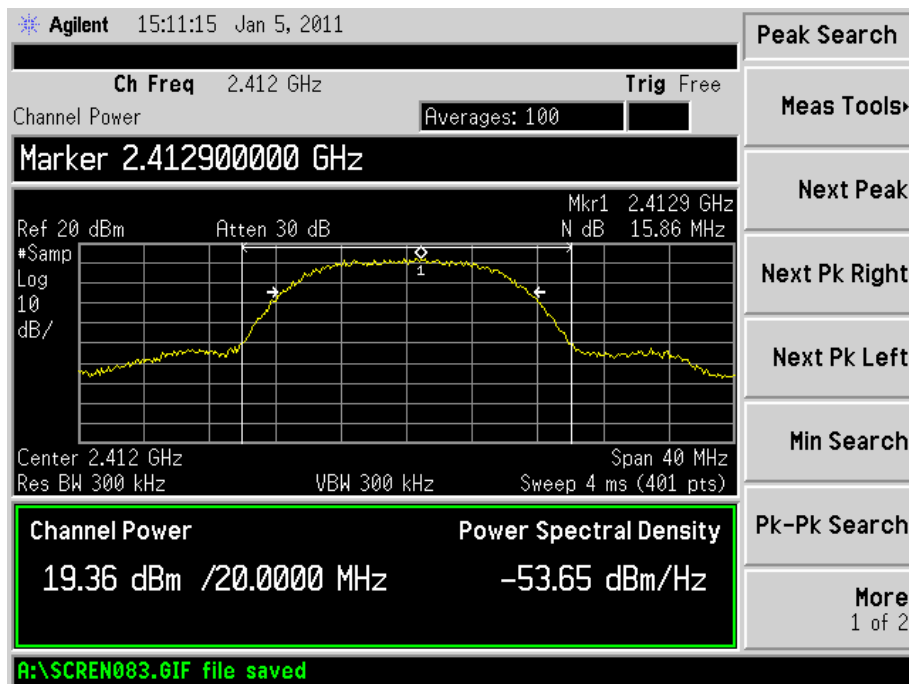


High Channel:

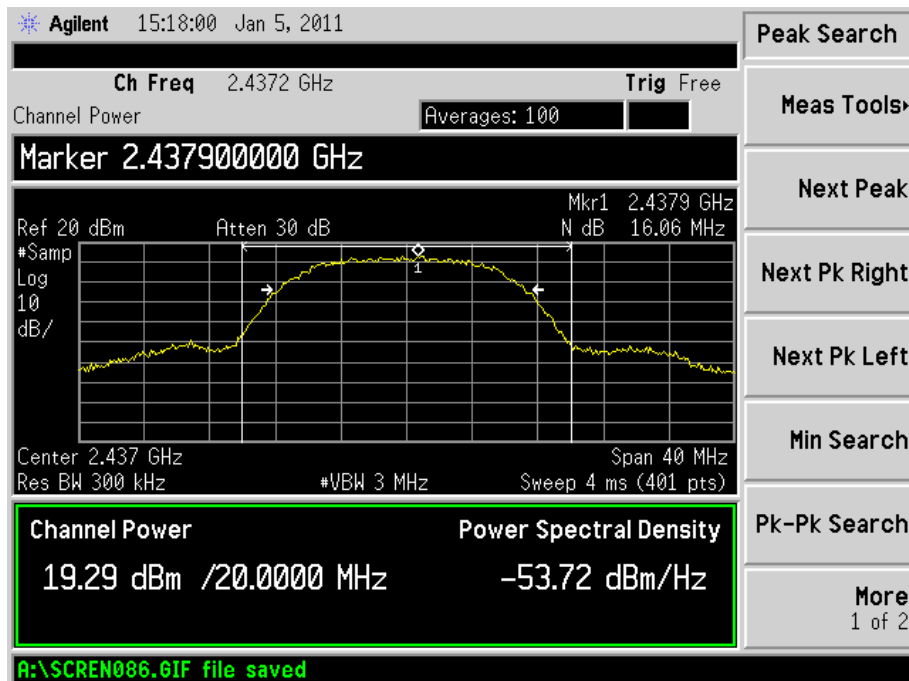


For 802.11b_11M Short rate

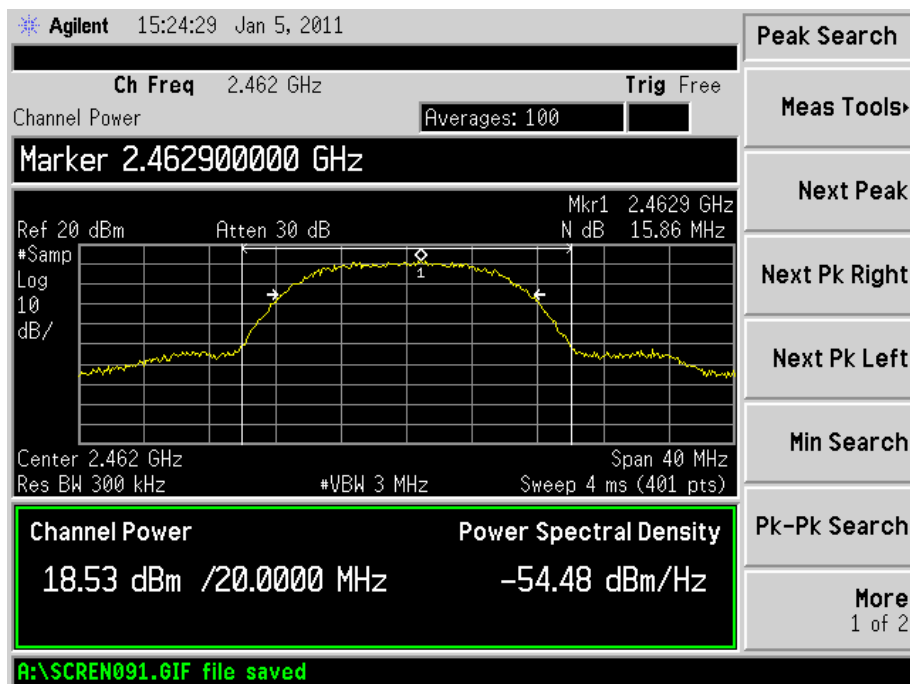
Low Channel:



Middle Channel:

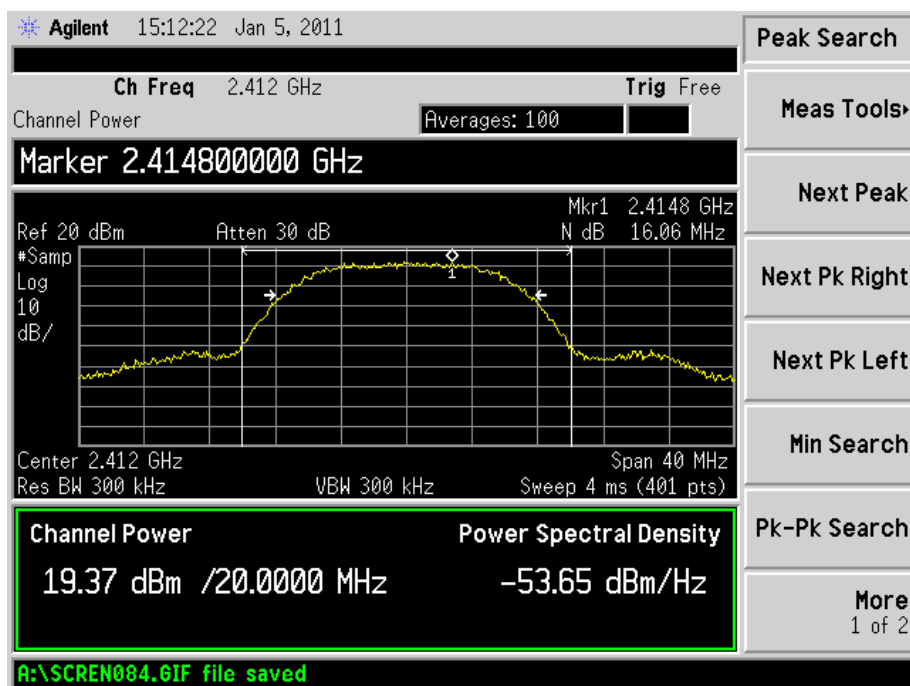


High Channel:

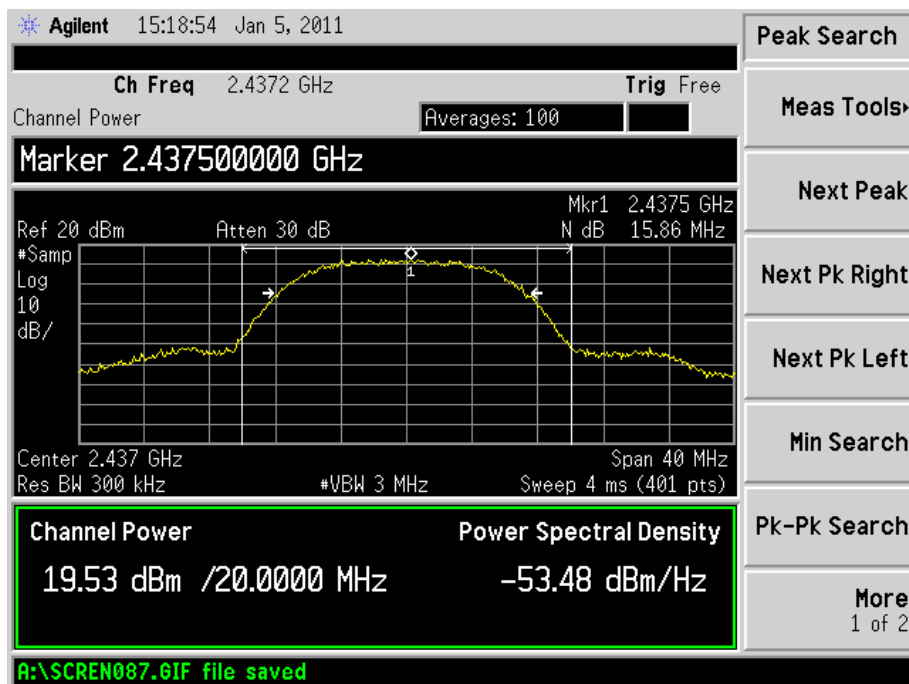


For 802.11b_11M Long rate

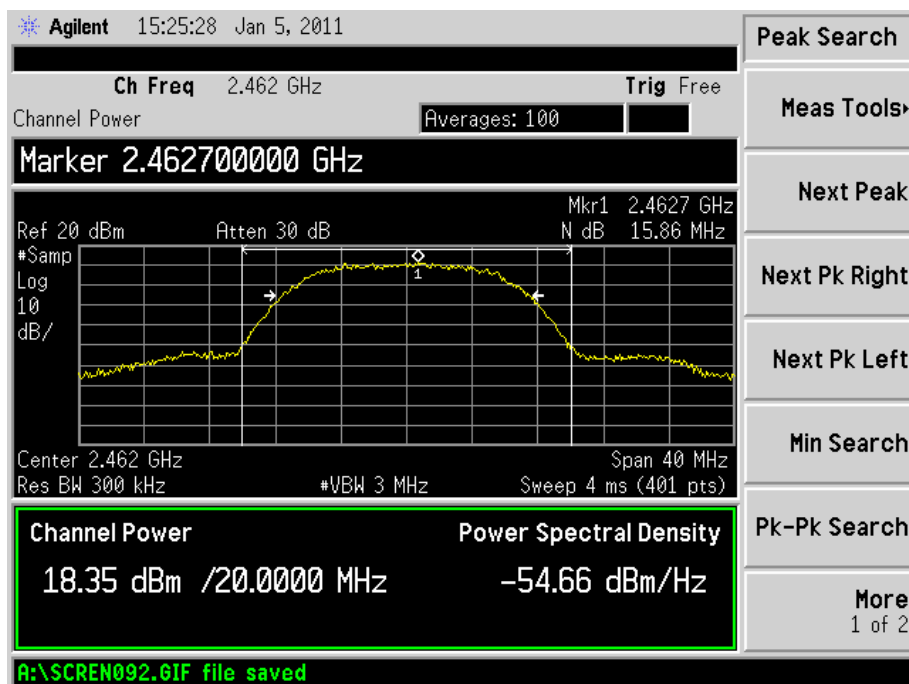
Low Channel:



Middle Channel:

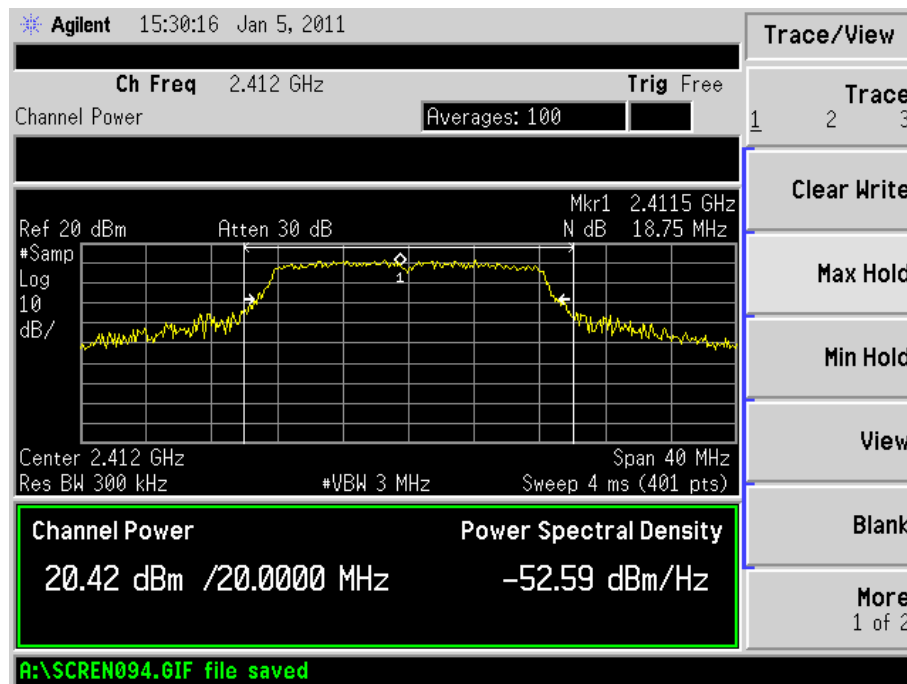


High Channel:

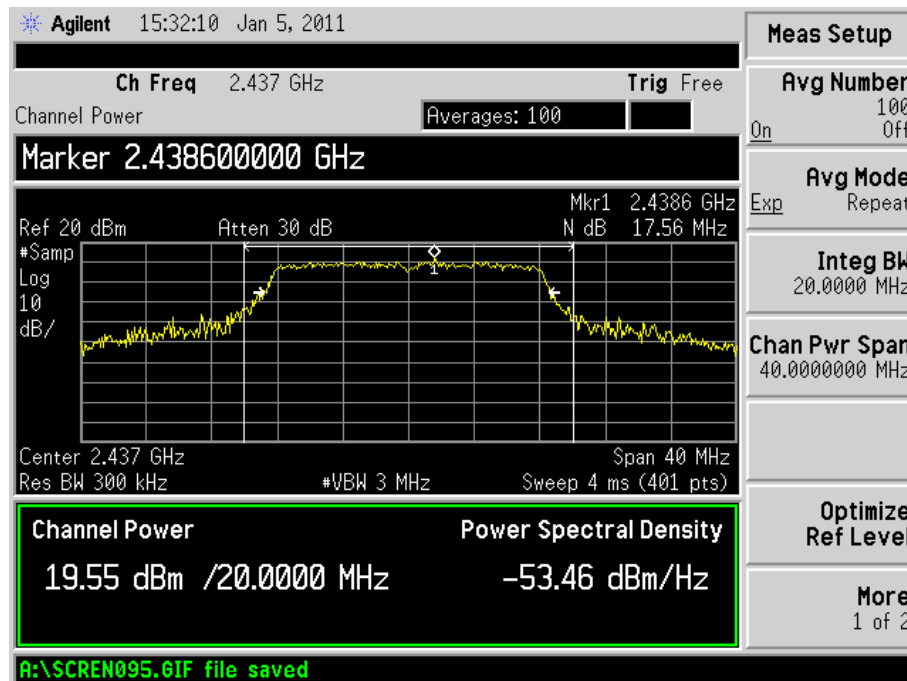


For 802.11g_6M rate

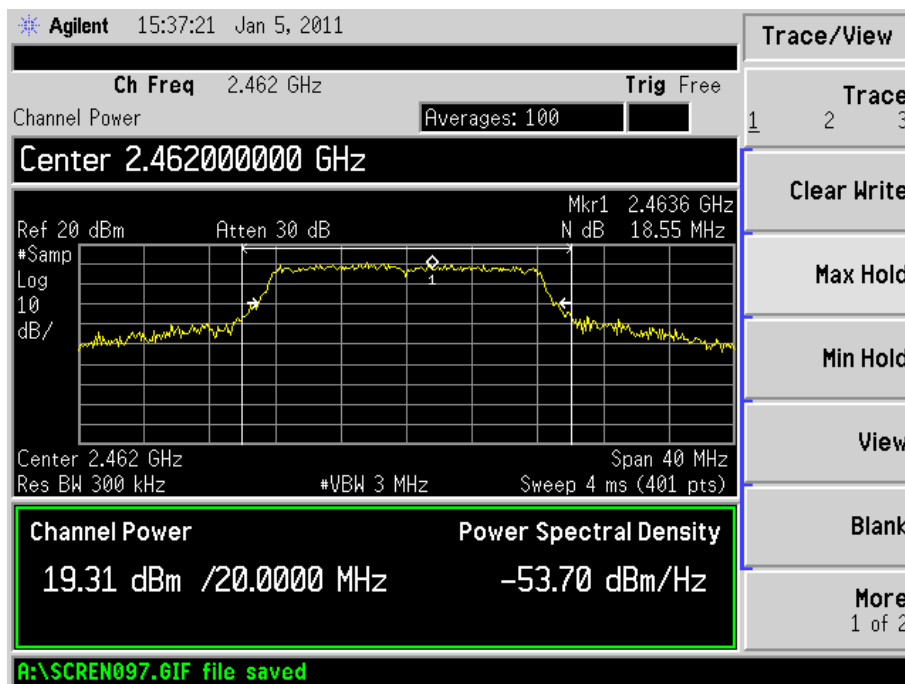
Low Channel:



Middle Channel:

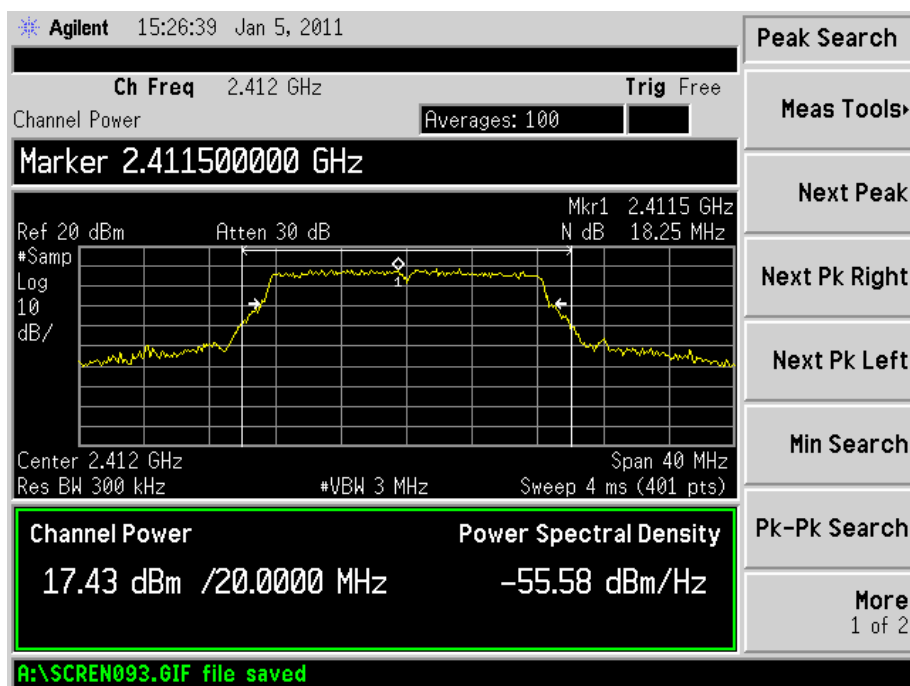


High Channel:

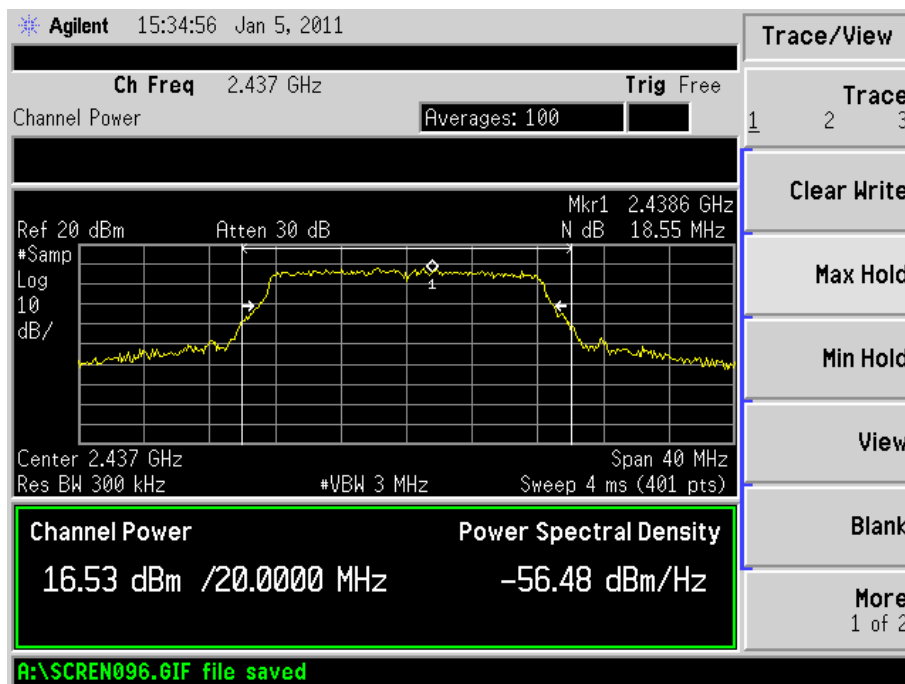


For 802.11g_54M rate

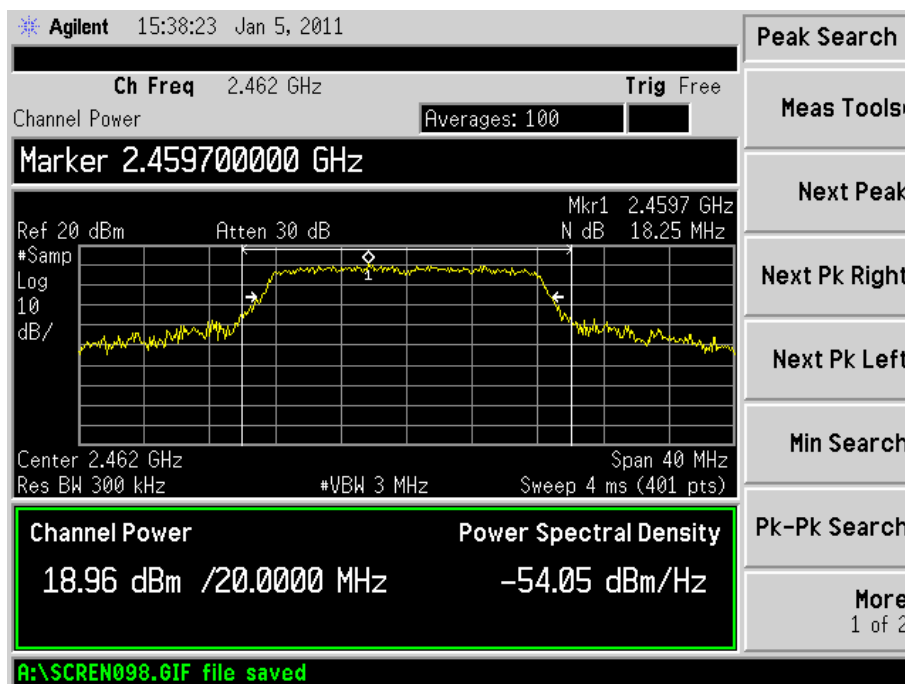
Low Channel:



Middle Channel:

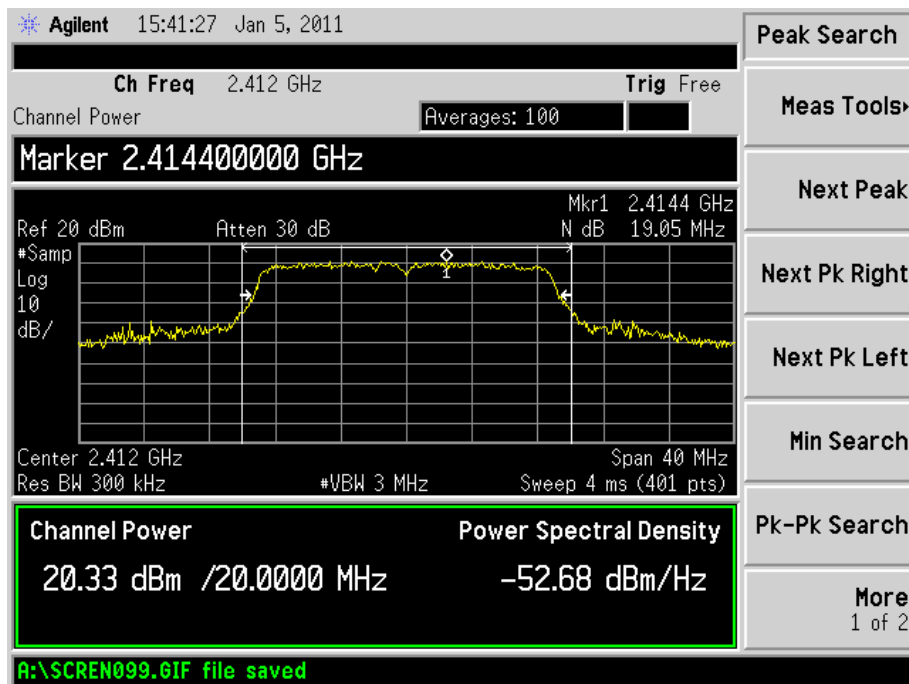


High Channel:

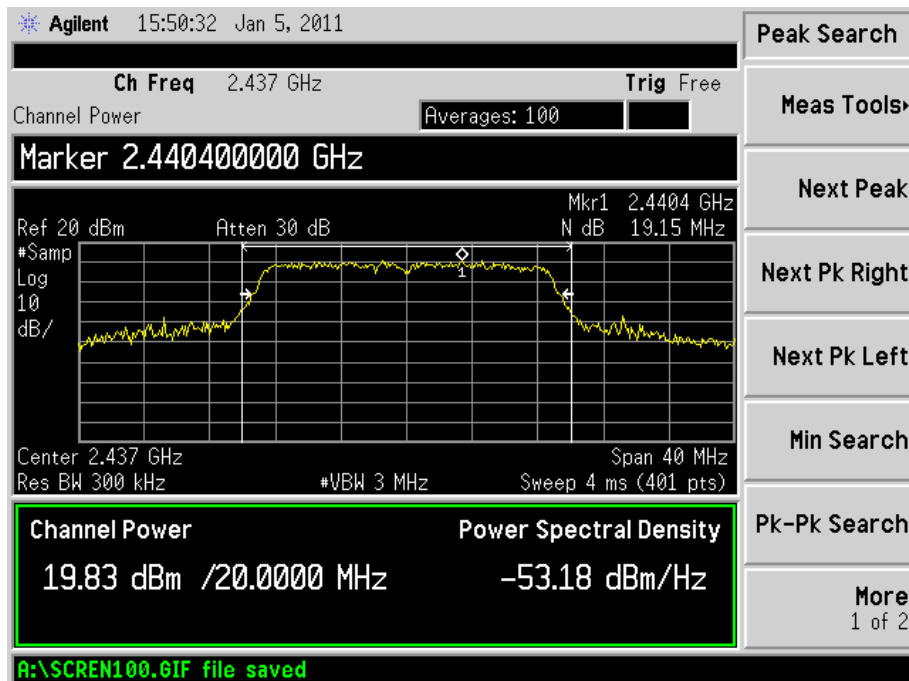


For 802.11n-HT20

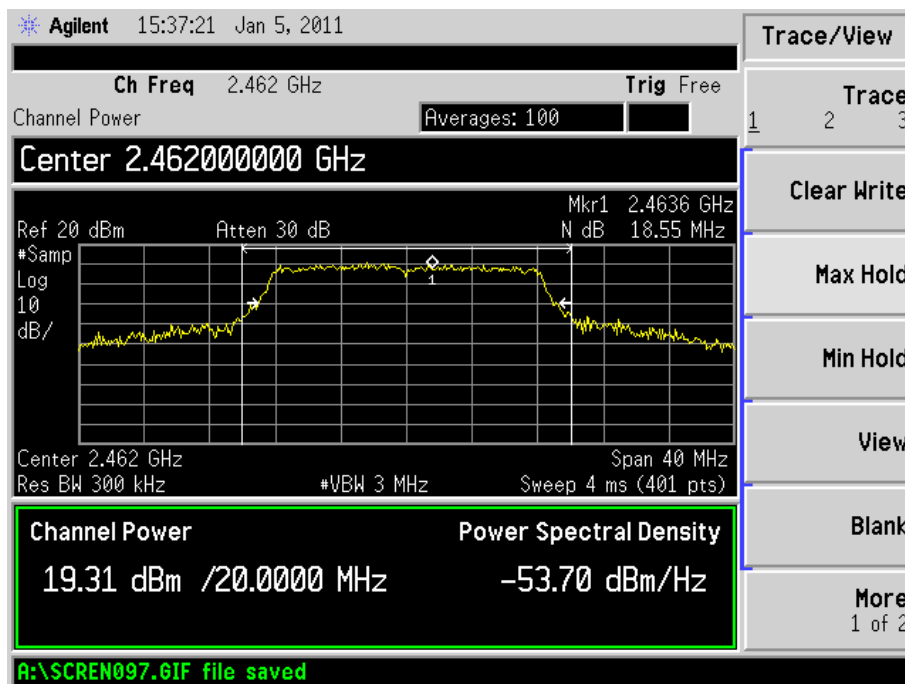
Low Channel:



Mid Channel:

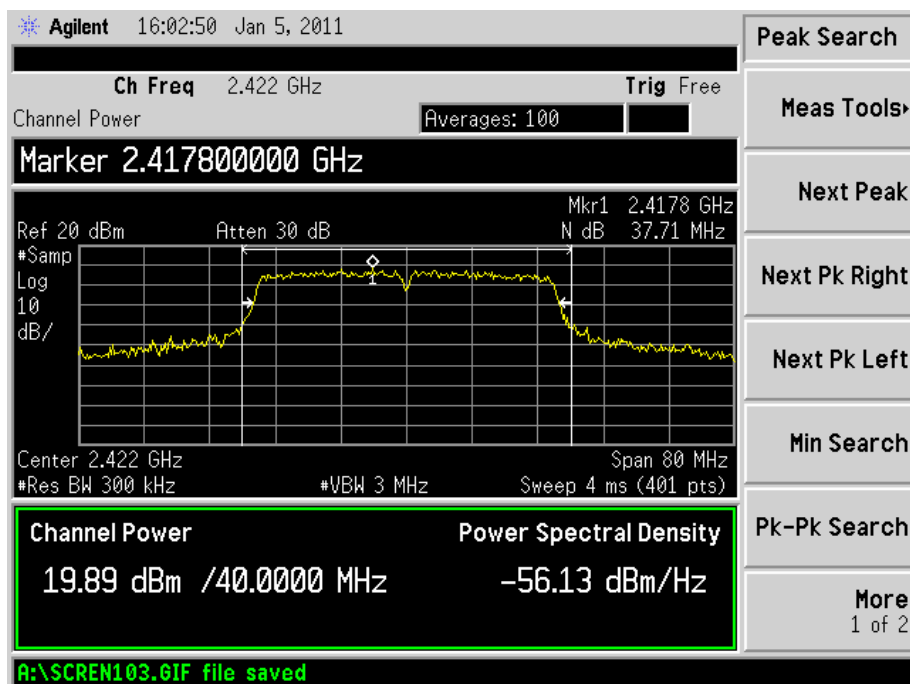


High Channel:

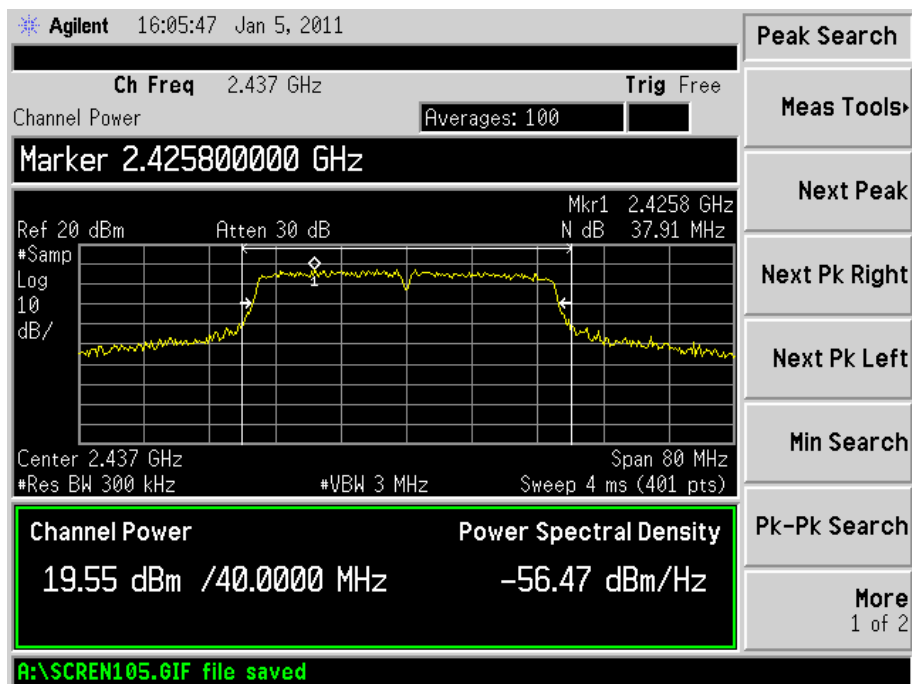


For 802.11n-HT40

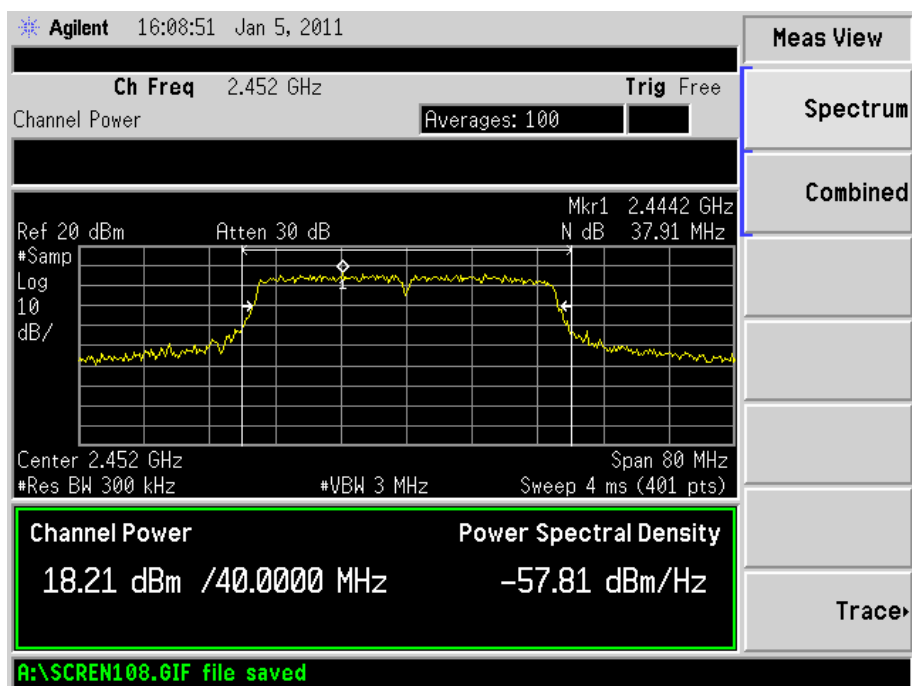
Low Channel:



Mid Channel:



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

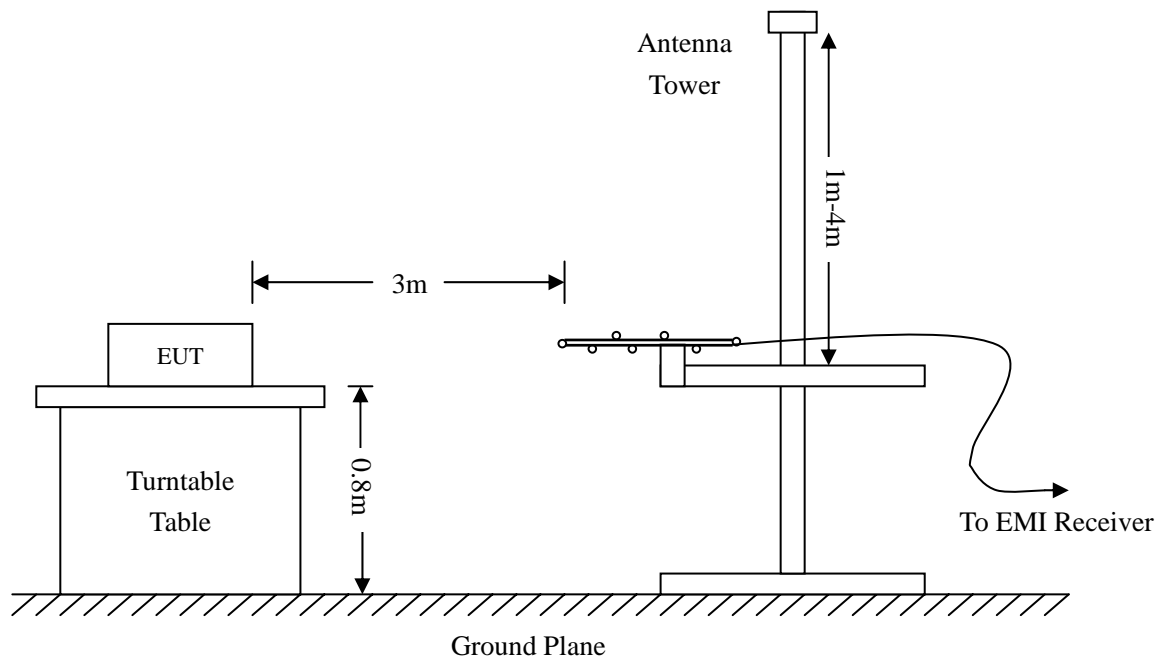
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-04-16	2011-04-15
EMI Test Receiver	R&S	ESVB	825471/005	2010-08-12	2011-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2010-08-12	2011-08-11
RF Switch	EM	EMSW18	SW060023	2010-08-12	2011-08-11
Pre-amplifier	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 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

8.6 Environmental Conditions

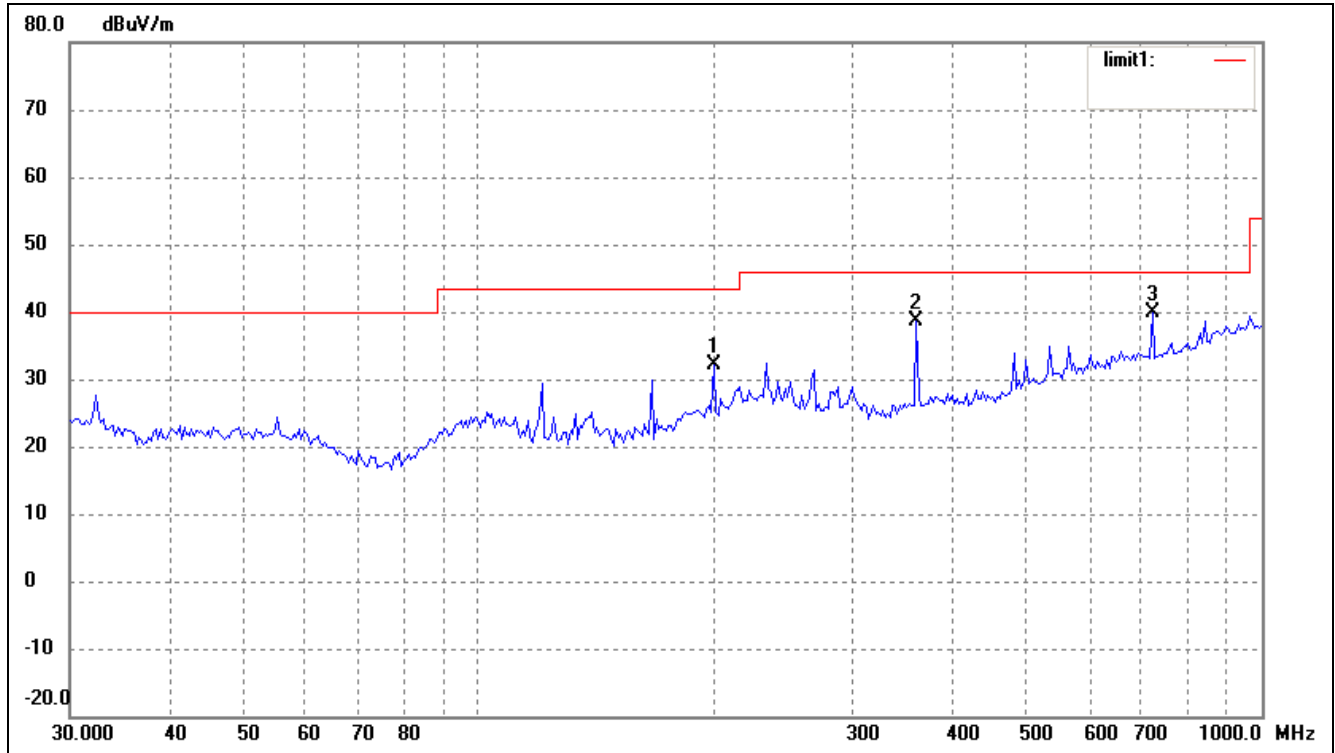
Temperature:	22° C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

8.7 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:

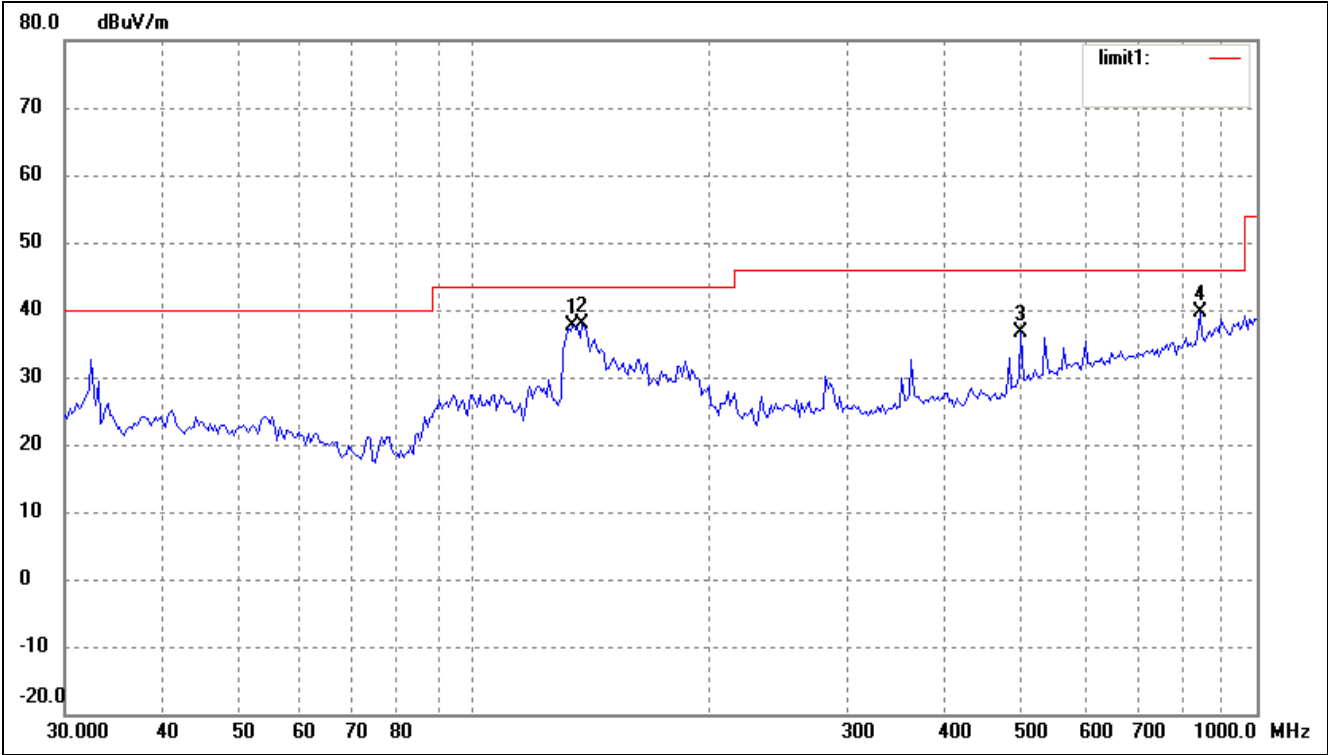
-2.0 dBμV at 4824MHz in the Horizontal polarization, Transmitting 802.11b Low Channel test mode with, 30 MHz to 25 GHz, 3Meters

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*

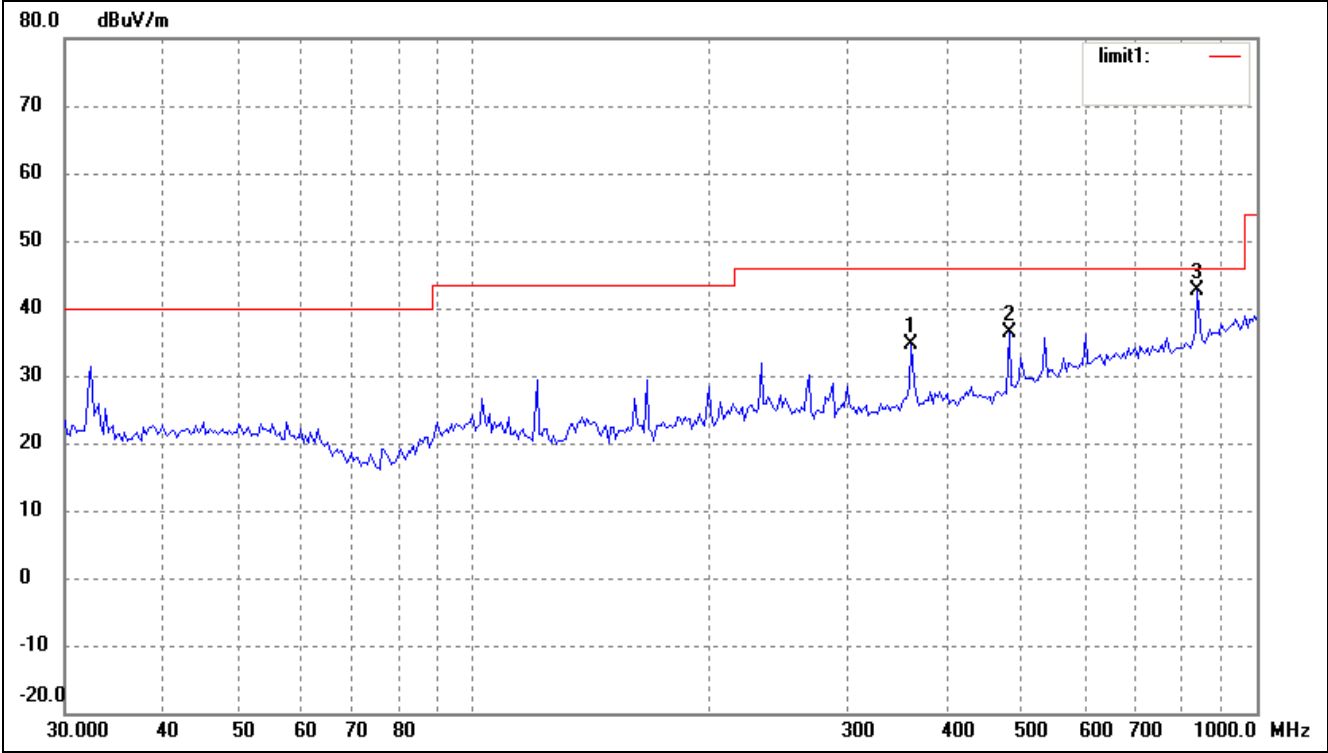
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	199.2855	25.45	6.58	32.03	43.50	-11.47	136	100	peak
2	361.7139	27.72	10.91	38.63	46.00	-7.37	228	100	peak
3	724.2611	22.04	17.86	39.90	46.00	-6.10	146	200	peak

Vertical



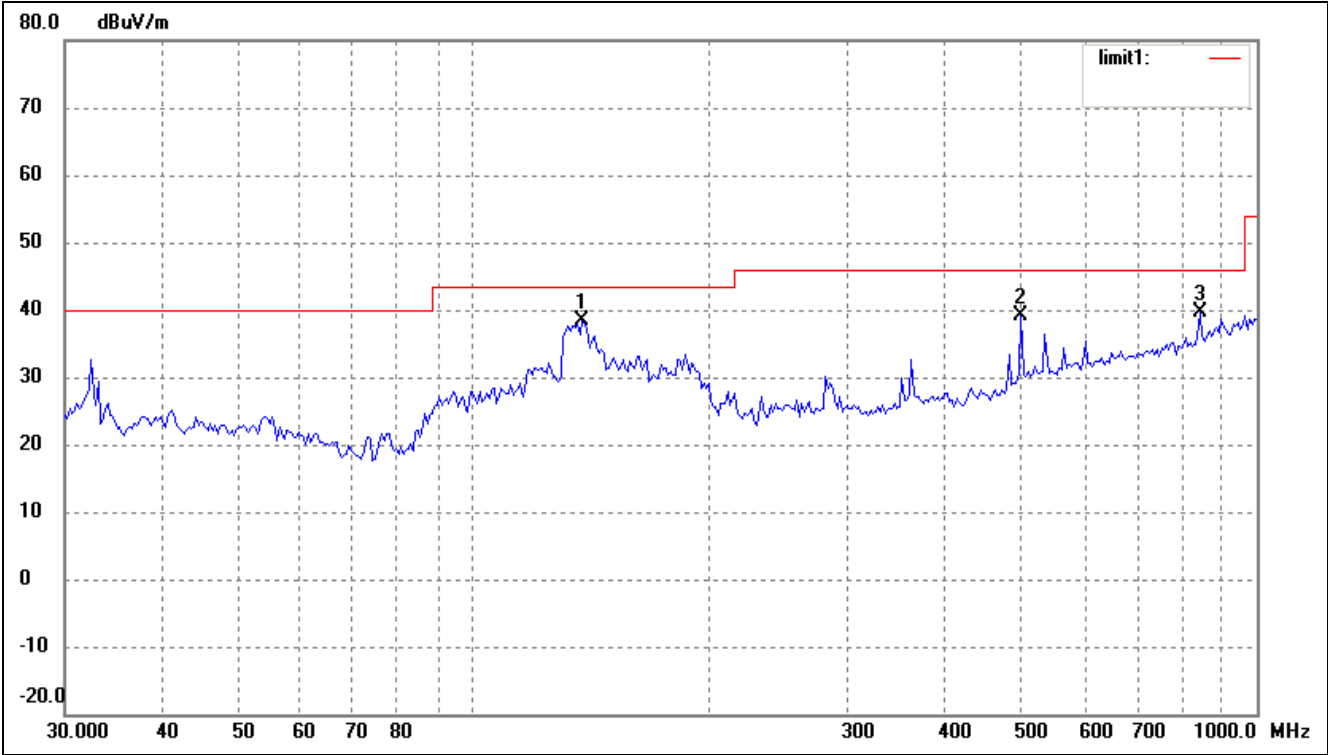
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	133.6188	33.34	4.35	37.69	43.50	-5.81	156	100	QP
2	137.4202	33.84	4.11	37.95	43.50	-5.55	270	100	QP
3	499.4247	22.36	14.36	36.72	46.00	-9.28	160	100	peak
4	845.0878	19.85	19.86	39.71	46.00	-6.29	130	100	peak

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



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	361.7139	23.60	10.91	34.51	46.00	-11.49	60	100	peak
2	482.2156	23.60	12.67	36.27	46.00	-9.73	360	100	peak
3	839.1818	22.77	19.75	42.52	46.00	-3.48	186	200	QP

Vertical



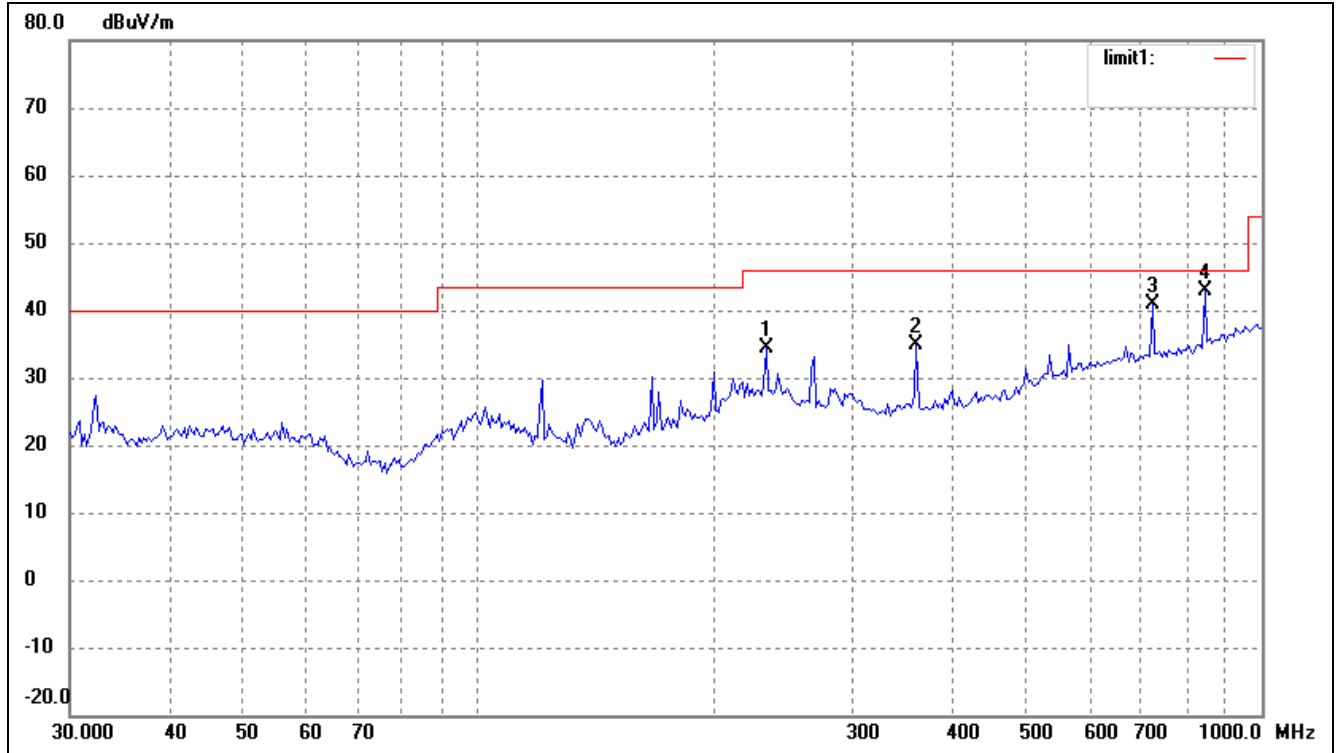
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	137.4202	34.34	4.11	38.45	43.50	-5.05	136	210	QP
2	499.4247	24.86	14.36	39.22	46.00	-6.78	250	132	peak
3	845.0878	19.85	19.86	39.71	46.00	-6.29	100	160	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b) High Channel

Comment:

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	232.5318	26.43	8.01	34.44	46.00	-11.56	260	100	peak
2	361.7139	23.94	10.91	34.85	46.00	-11.15	183	200	peak
3	724.2611	23.09	17.86	40.95	46.00	-5.05	210	100	QP
4	845.0878	22.94	19.86	42.80	46.00	-3.20	150	100	QP

Vertical



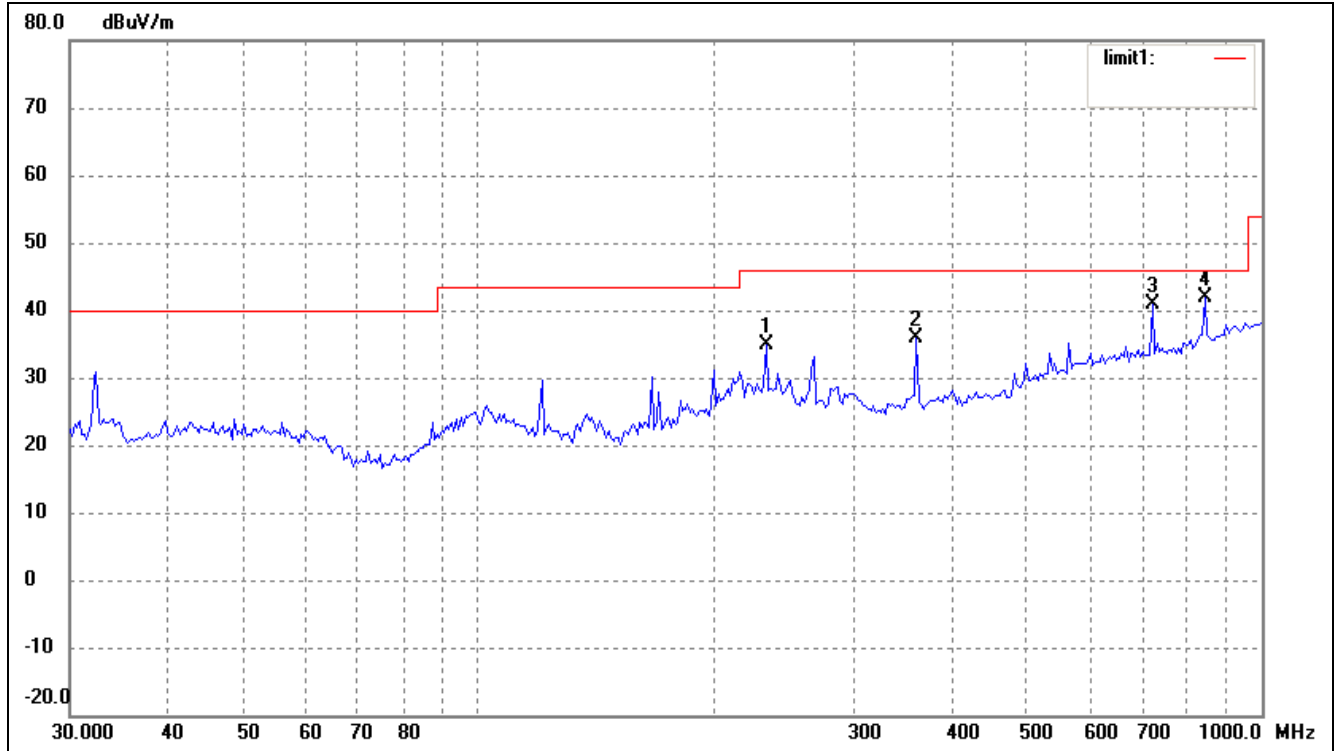
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	137.4202	31.88	4.11	35.99	43.50	-7.51	137	221	peak
2	144.3348	29.87	4.01	33.88	43.50	-9.62	264	167	peak
3	499.4247	18.31	14.36	32.67	46.00	-13.33	197	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g) Low Channel

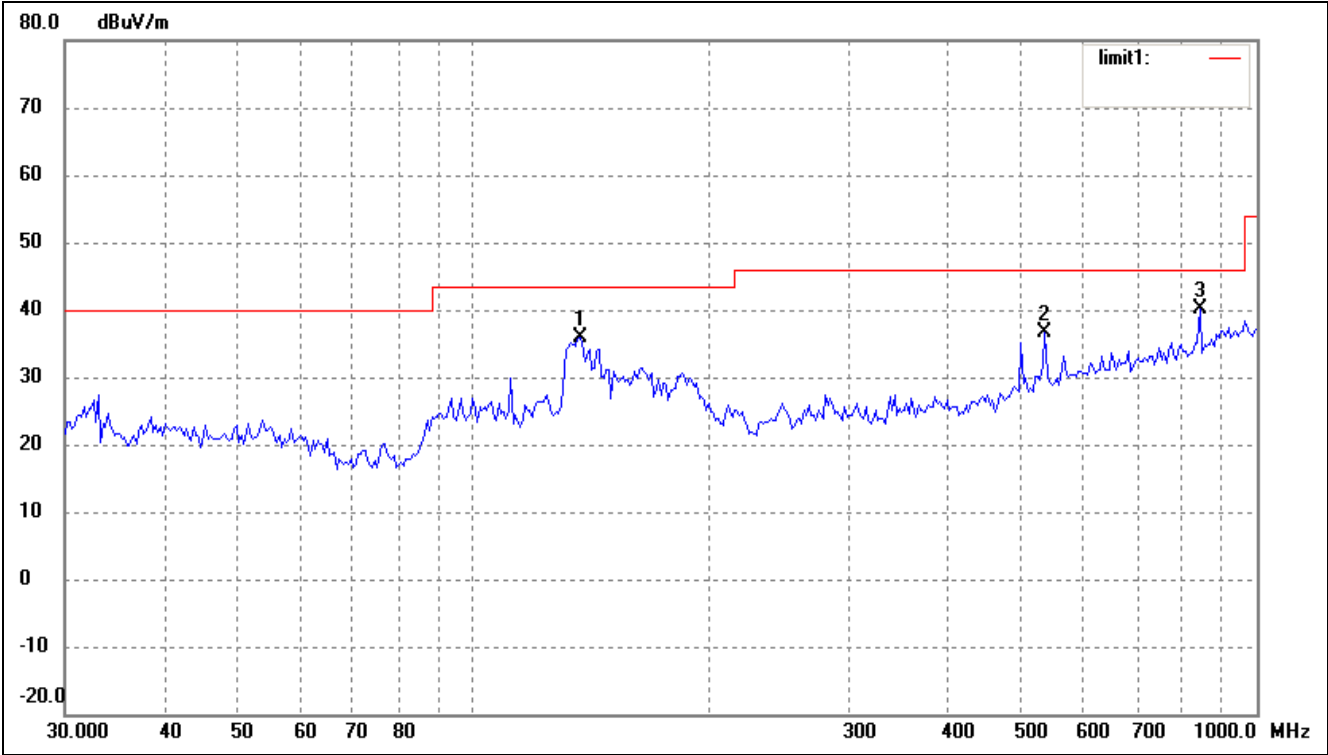
Comment:

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	232.5318	26.82	8.01	34.83	46.00	-11.17	360	100	peak
2	361.7139	24.89	10.91	35.80	46.00	-10.20	270	100	peak
3	724.2611	23.09	17.86	40.95	46.00	-5.05	120	100	QP
4	845.0878	22.05	19.86	41.91	46.00	-4.09	103	200	QP

Vertical



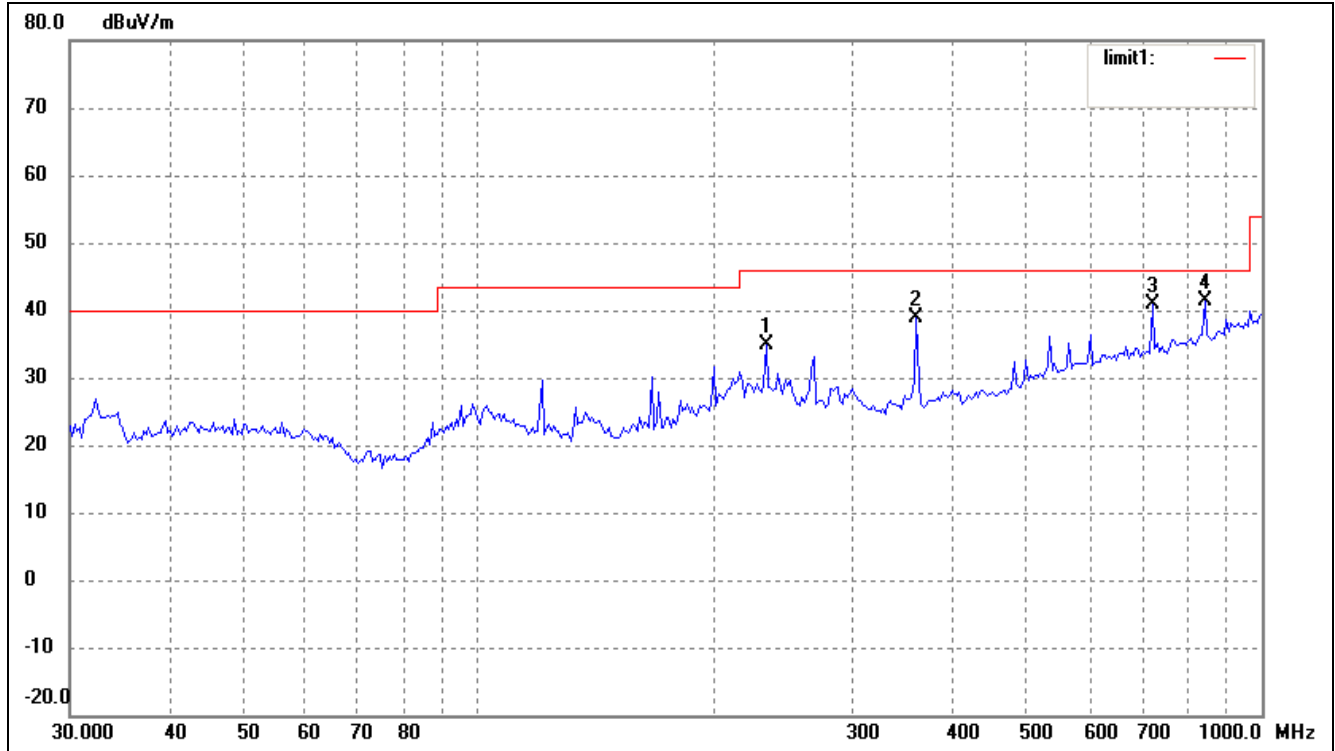
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	136.4598	31.64	4.17	35.81	43.50	-7.69	164	100	peak
2	535.7073	21.35	15.21	36.56	46.00	-9.44	271	100	peak
3	845.0878	20.35	19.86	40.21	46.00	-5.79	163	163	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g) Middle Channel

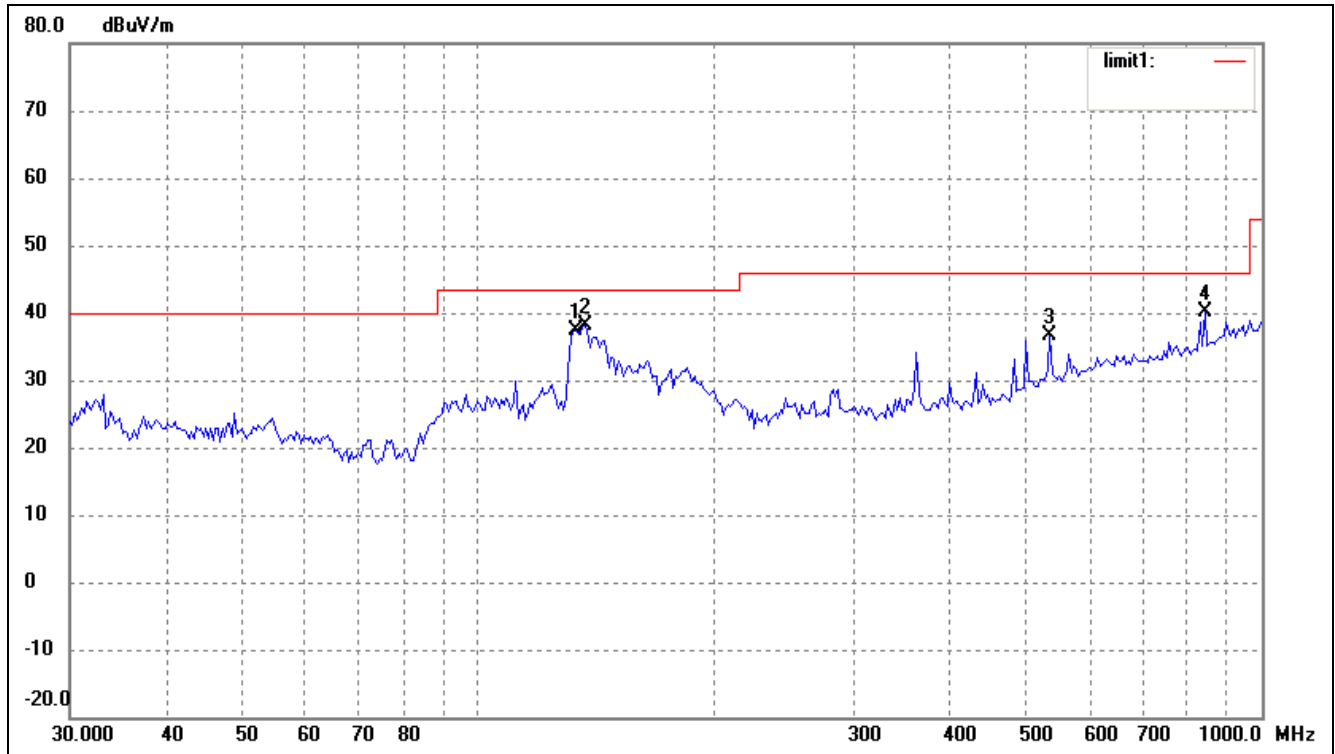
Comment:

Horizontal

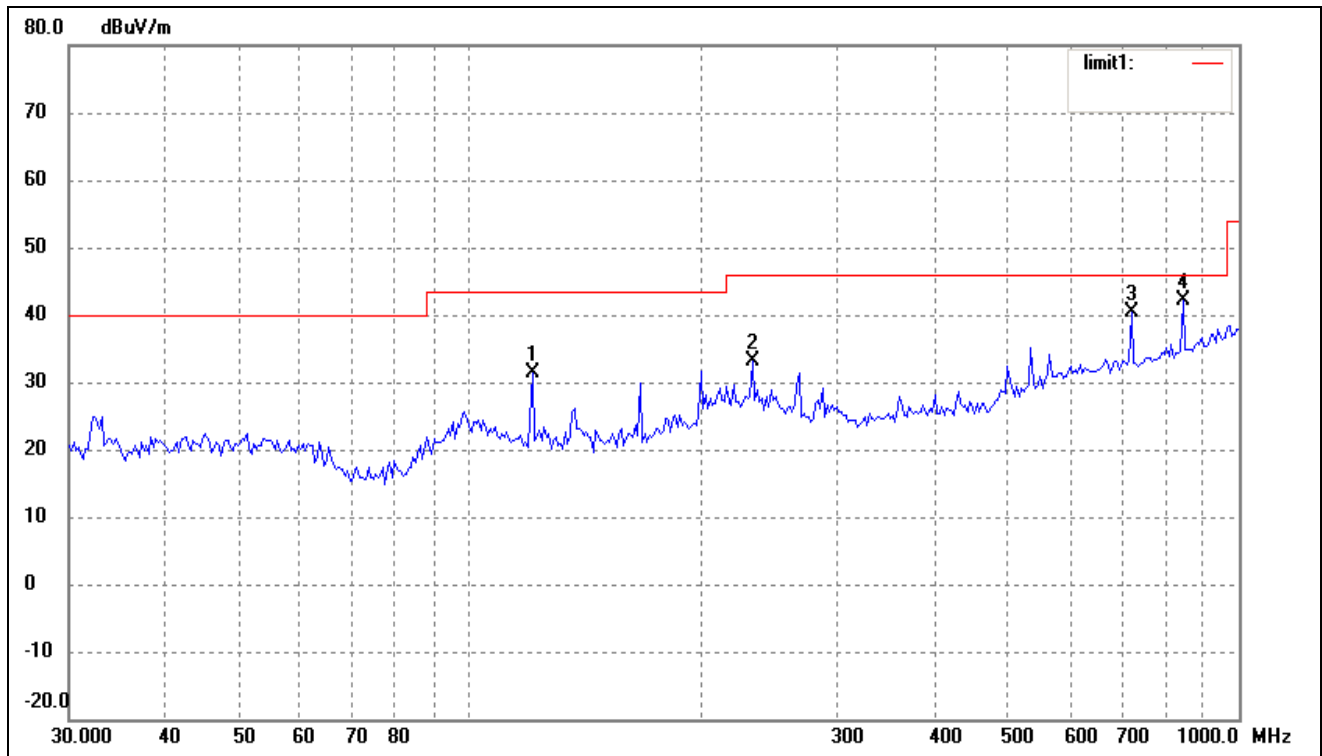


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	232.5318	26.82	8.01	34.83	46.00	-11.17	18037	100	peak
2	361.7139	27.86	10.91	38.77	46.00	-7.23	248	200	peak
3	724.2611	23.09	17.86	40.95	46.00	-5.05	160	110	QP
4	845.0878	21.44	19.86	41.30	46.00	-4.70	230	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	132.6850	33.09	4.40	37.49	43.50	-6.01	169	100	peak
2	136.4598	33.88	4.17	38.05	43.50	-5.45	286	100	QP
3	535.7073	21.35	15.21	36.56	46.00	-9.44	137	100	peak
4	845.0878	20.35	19.86	40.21	46.00	-5.79	202	100	QP

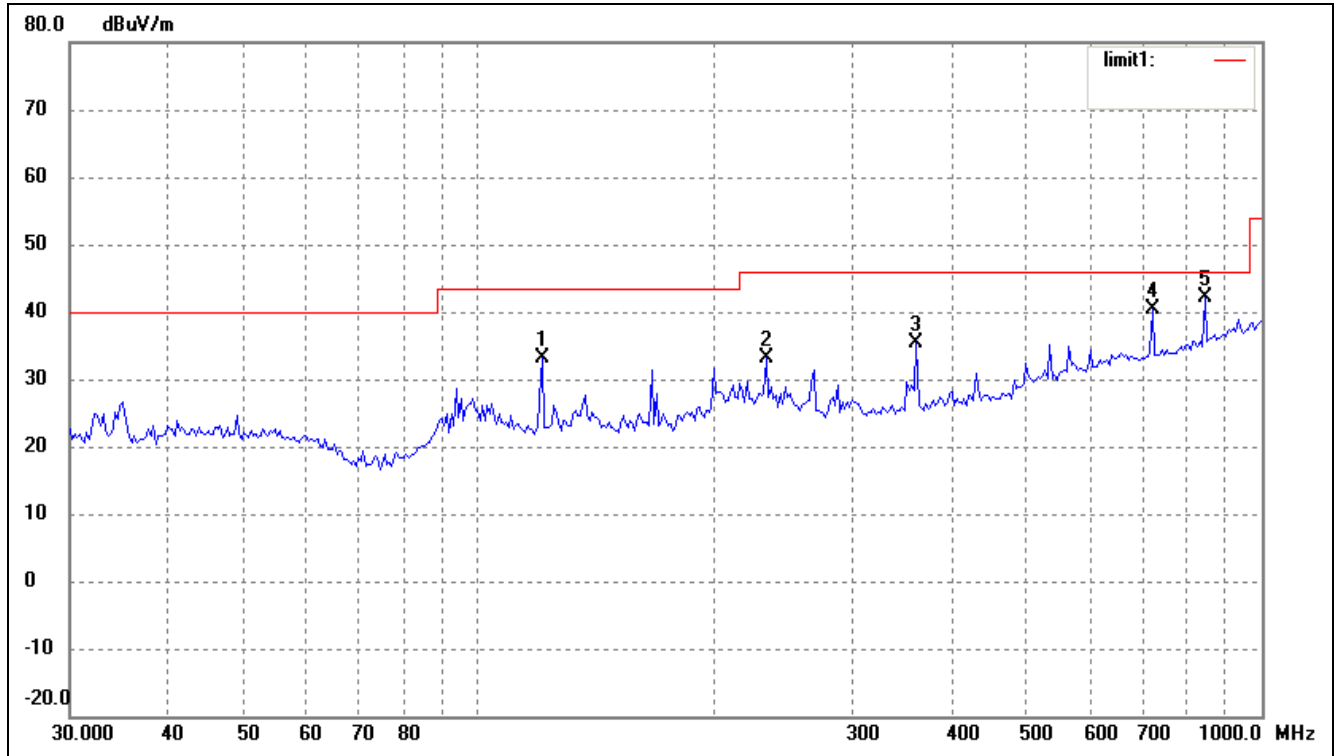
*Spurious Emission From 30 MHz to 1 GHz**Test mode: Transmitting (802.11g) High Channel**Comment:**Horizontal*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	120.2766	25.47	5.91	31.38	43.50	-12.12	136	100	peak
2	232.5318	25.08	8.01	33.09	46.00	-12.91	140	100	peak
3	724.2611	22.41	17.86	40.27	46.00	-5.73	251	100	QP
4	845.0878	22.36	19.86	42.22	46.00	-3.78	160	100	QP

Vertical

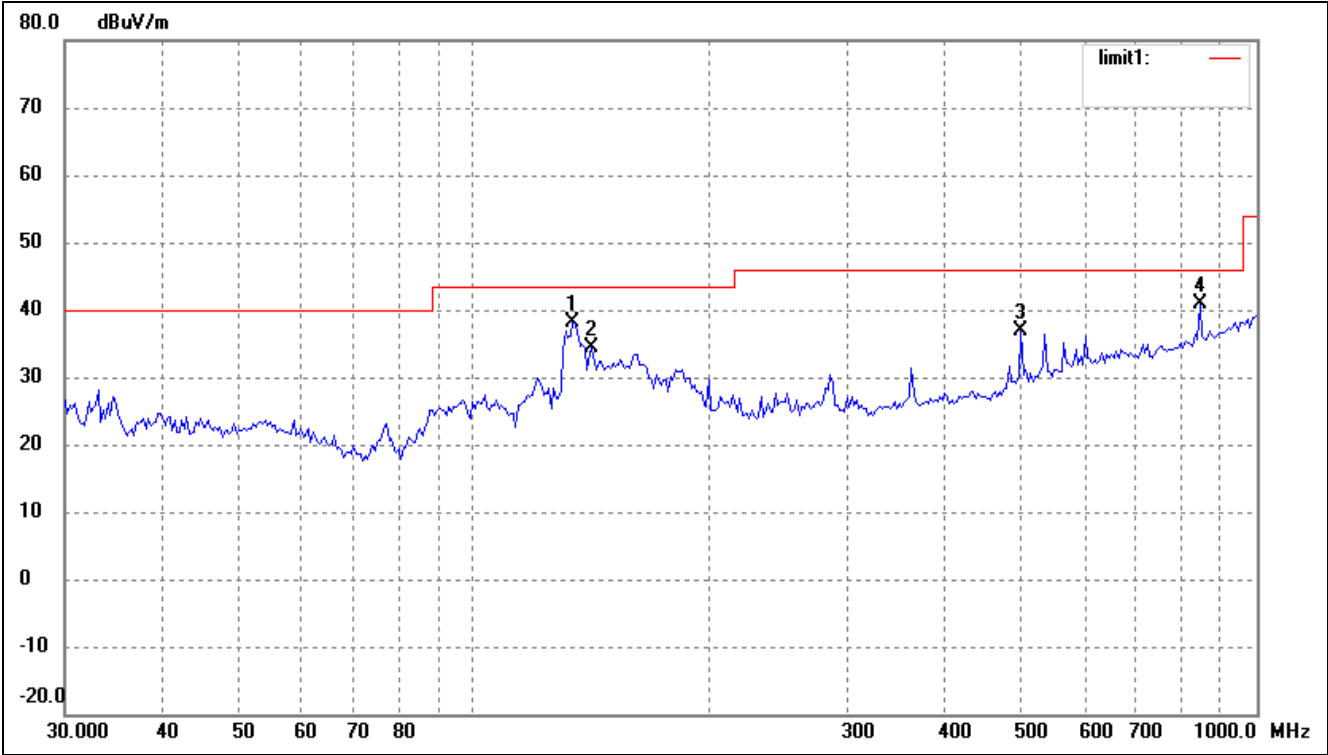


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	134.5592	34.30	4.29	38.59	43.50	-4.91	160	100	QP
2	499.4247	22.55	14.36	36.91	46.00	-9.09	225	100	peak
3	845.0878	21.02	19.86	40.88	46.00	-5.12	160	100	QP

*Test Result/Plots:**Spurious Emission From 30 MHz to 1 GHz**Test mode: Transmitting (802.11n-HT20) Low Channel**Comment:**Horizontal*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	120.2766	27.23	5.91	33.14	43.50	-10.36	164	200	peak
2	232.5318	25.08	8.01	33.09	46.00	-12.91	185	100	peak
3	361.7139	24.45	10.91	35.36	46.00	-10.64	226	100	peak
4	724.2611	22.41	17.86	40.27	46.00	-5.73	130	100	QP
5	845.0878	22.21	19.86	42.07	46.00	-3.93	229	100	QP

Vertical



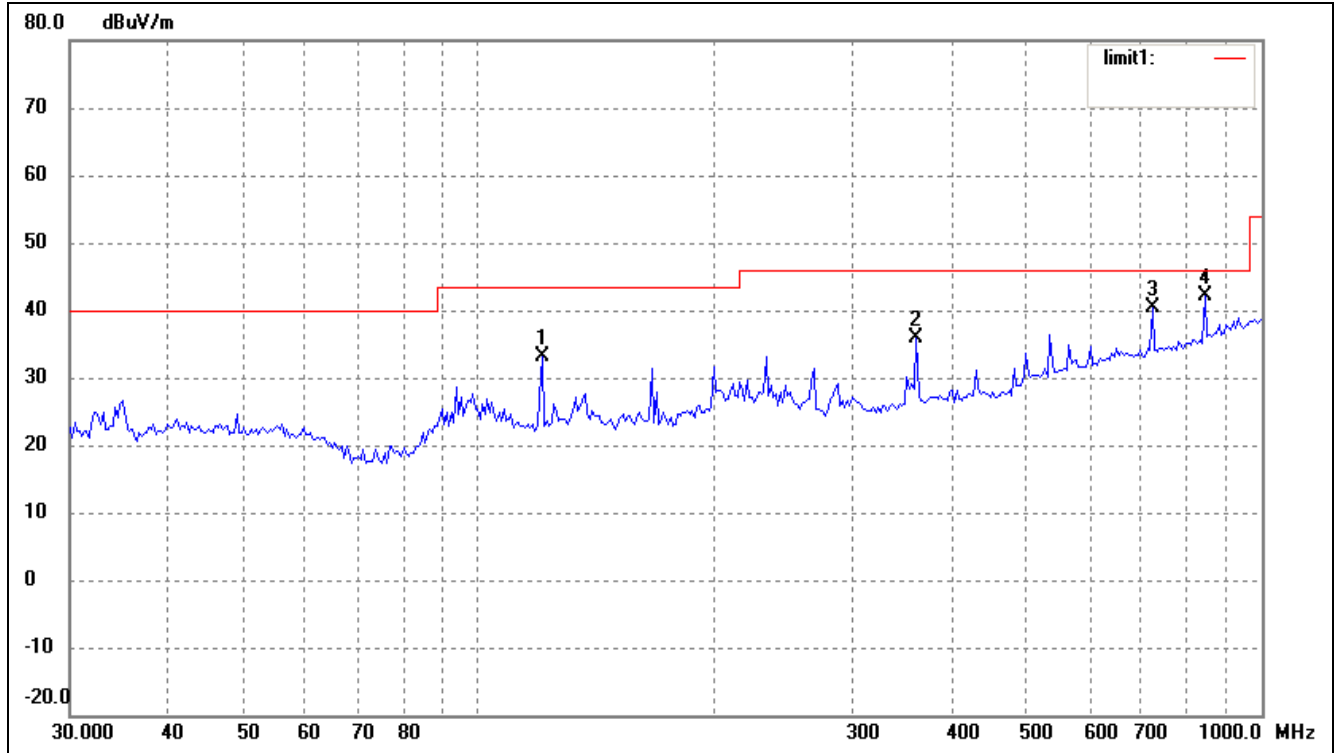
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	133.6188	33.81	4.35	38.16	43.50	-5.34	169	100	QP
2	141.3298	30.36	3.97	34.33	43.50	-9.17	257	200	peak
3	499.4247	22.55	14.36	36.91	46.00	-9.09	160	100	peak
4	845.0878	21.02	19.86	40.88	46.00	-5.12	163	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n-HT20) Middle Channel

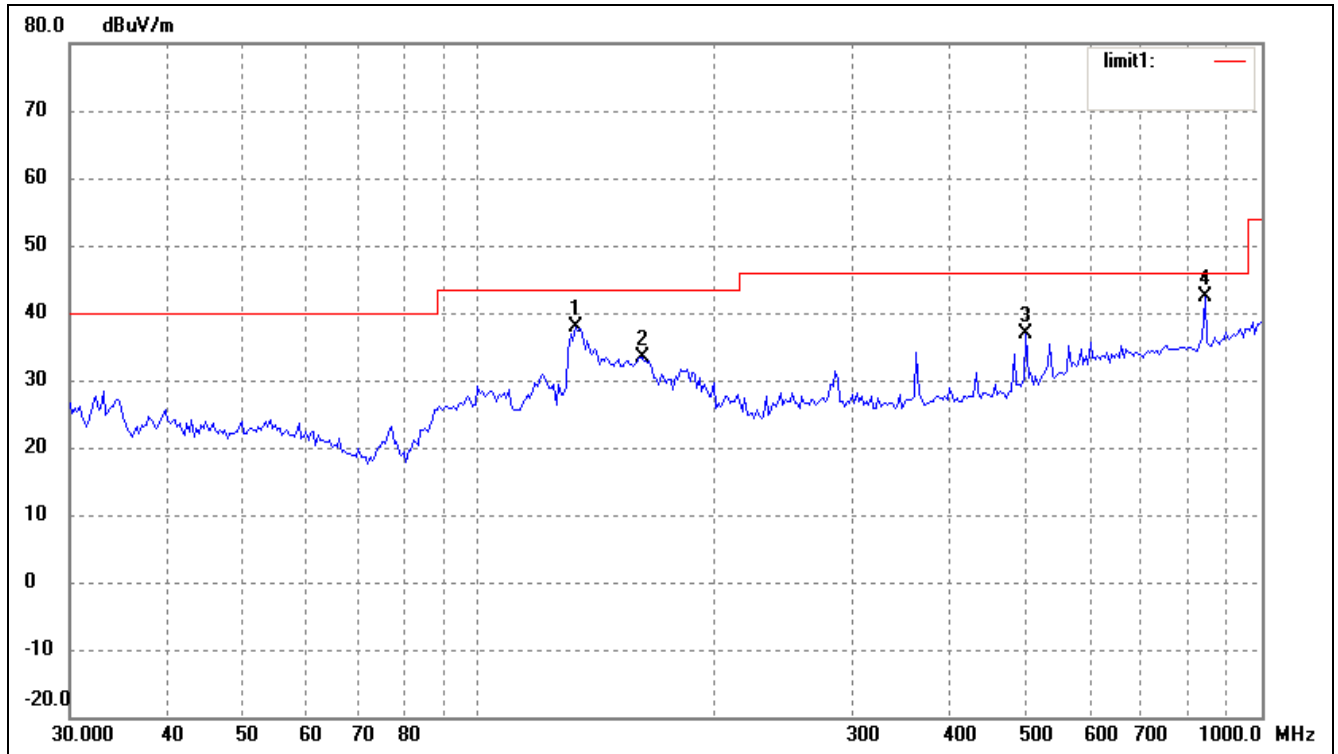
Comment:

Horizontal



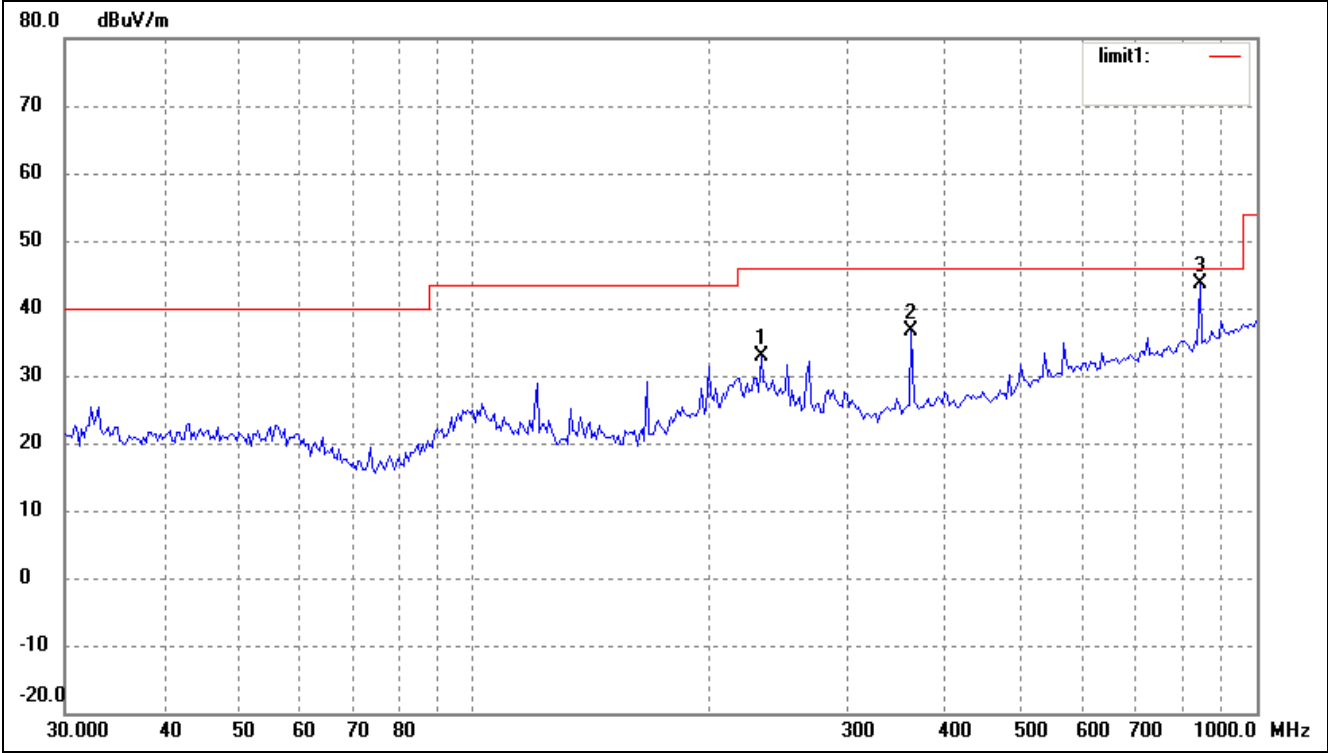
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	120.2766	27.23	5.91	33.14	43.50	-10.36	245	100	peak
2	361.7139	24.97	10.91	35.88	46.00	-10.12	360	100	peak
3	724.2611	22.41	17.86	40.27	46.00	-5.73	128	200	QP
4	845.0878	22.21	19.86	42.07	46.00	-3.93	224	100	QP

Vertical



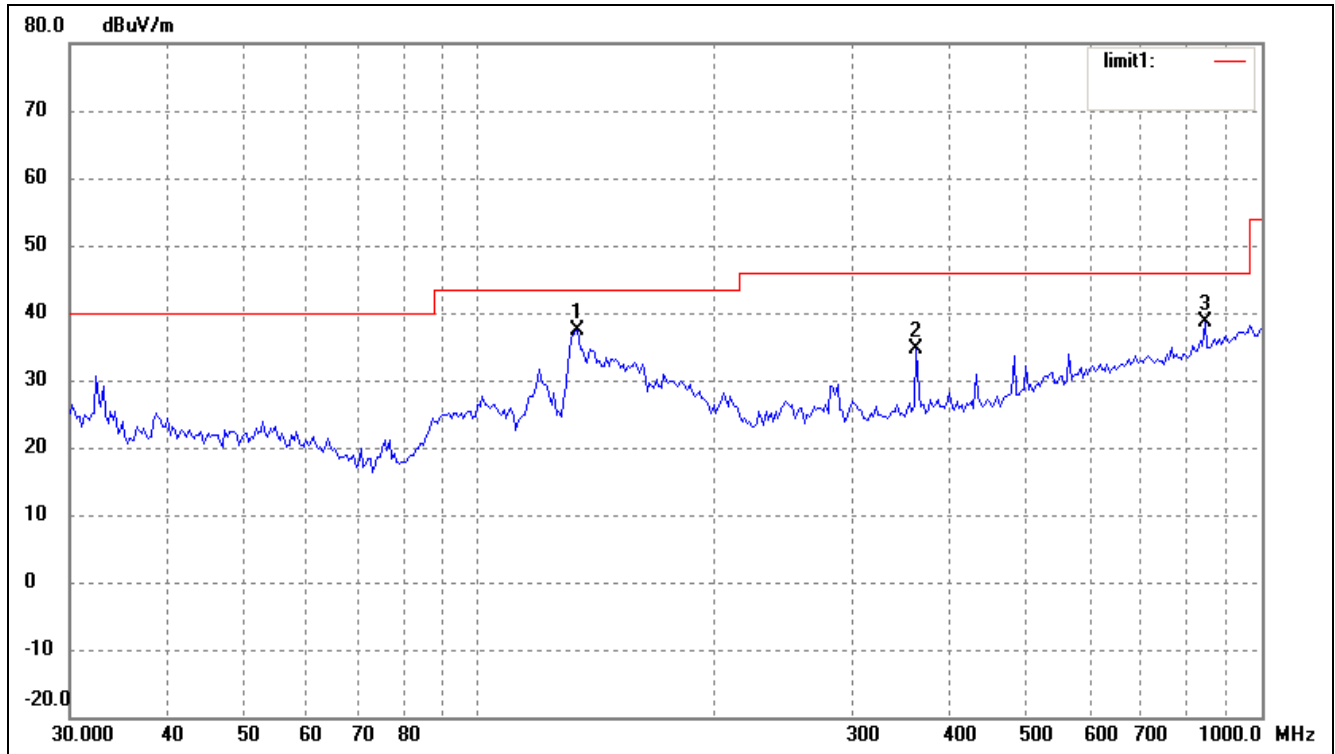
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	132.6850	33.40	4.40	37.80	43.50	-5.70	164	100	QP
2	161.4742	28.82	4.59	33.41	43.50	-10.09	175	200	peak
3	499.4247	22.55	14.36	36.91	46.00	-9.09	240	100	peak
4	845.0878	22.52	19.86	42.38	46.00	-3.62	194	100	QP

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11n-HT20) 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	232.5318	24.91	8.01	32.92	46.00	-13.08	138	100	peak
2	361.7139	25.63	10.91	36.54	46.00	-9.46	254	100	peak
3	845.0878	23.76	19.86	43.62	46.00	-2.38	199	100	QP

Vertical



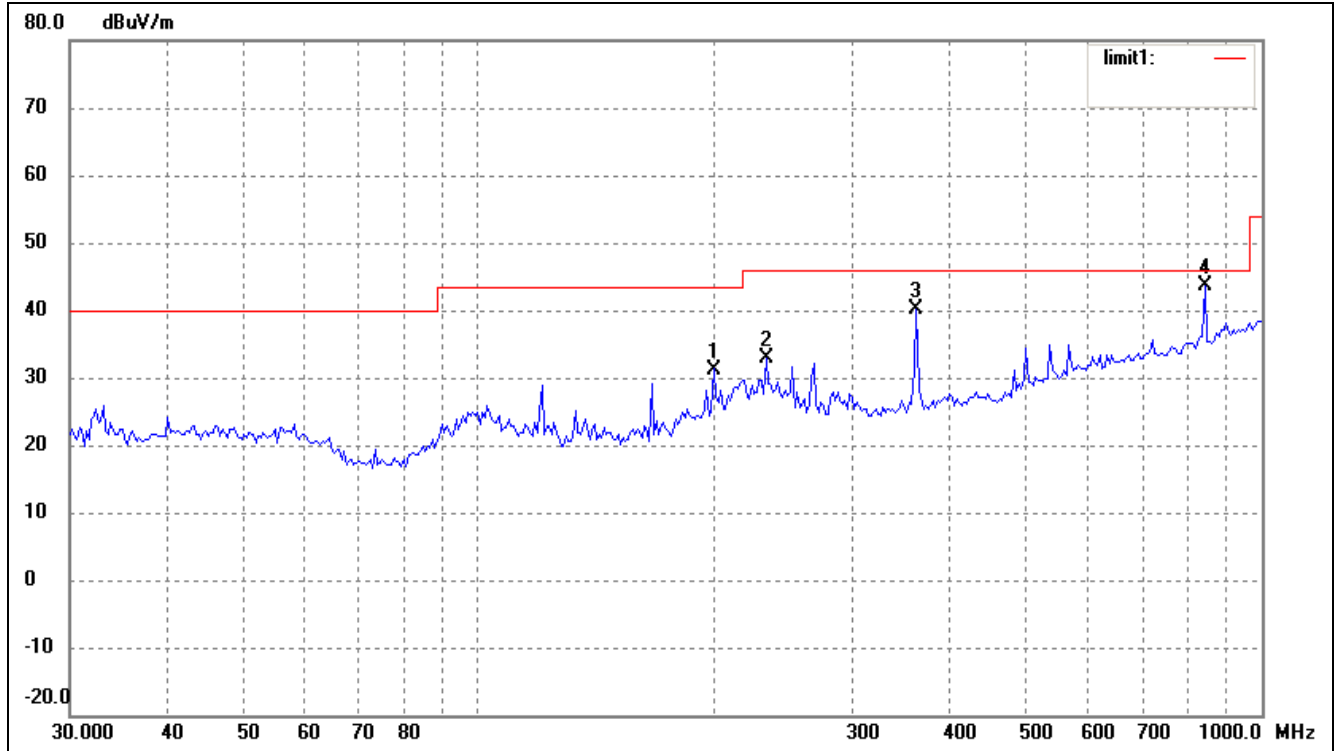
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	133.6188	33.04	4.35	37.39	43.50	-6.11	60	100	peak
2	361.7139	23.65	10.91	34.56	46.00	-11.44	197	100	peak
3	845.0878	18.72	19.86	38.58	46.00	-7.42	264	100	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n-HT40) Low Channel

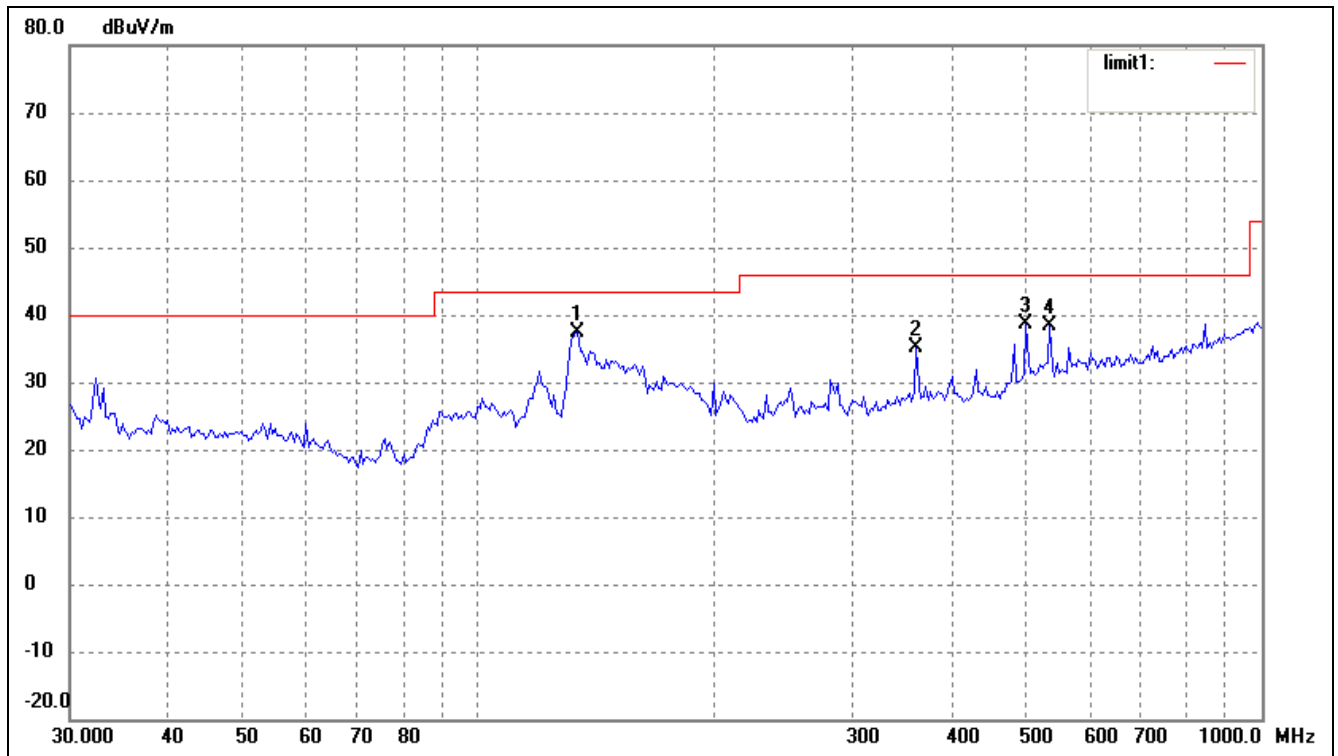
Comment:

Horizontal



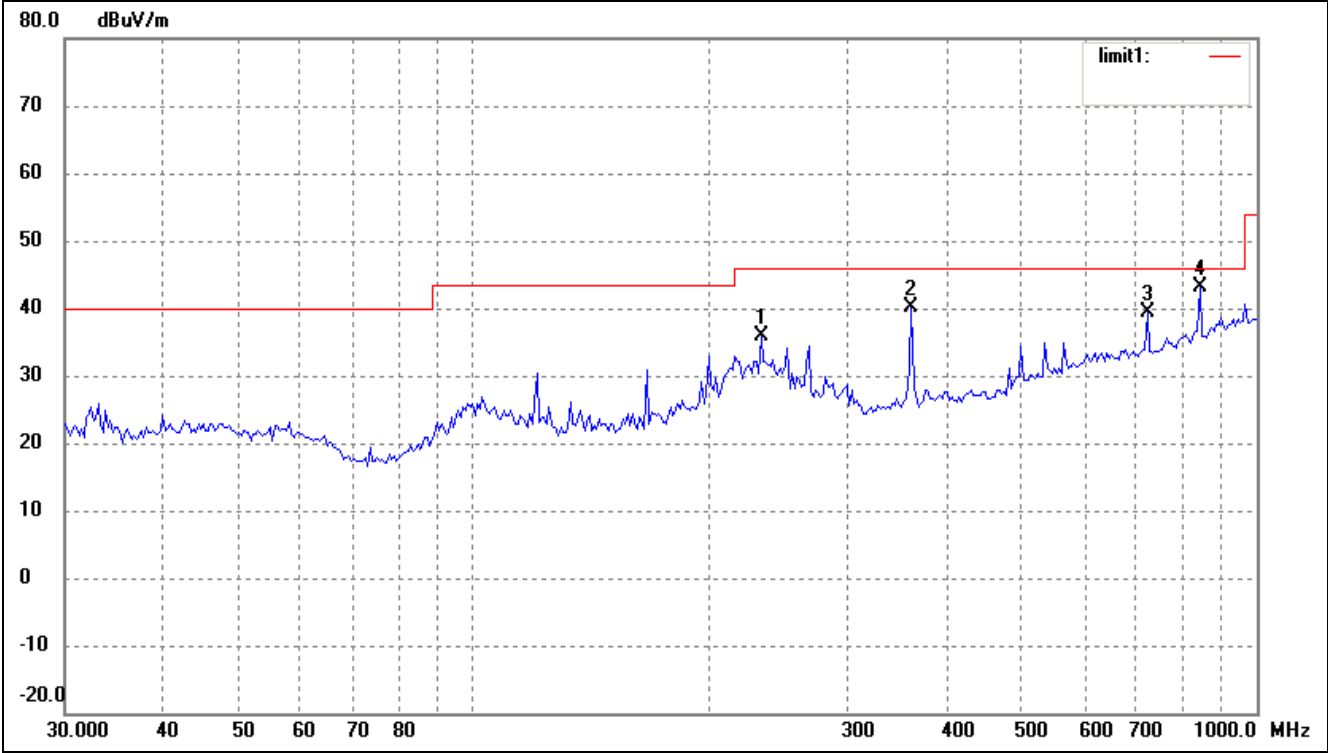
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	199.2855	24.67	6.58	31.25	43.50	-12.25	164	100	peak
2	232.5318	24.91	8.01	32.92	46.00	-13.08	284	100	peak
3	361.7139	29.20	10.91	40.11	46.00	-5.89	167	100	QP
4	845.0878	23.76	19.86	43.62	46.00	-2.38	220	100	QP

Vertical



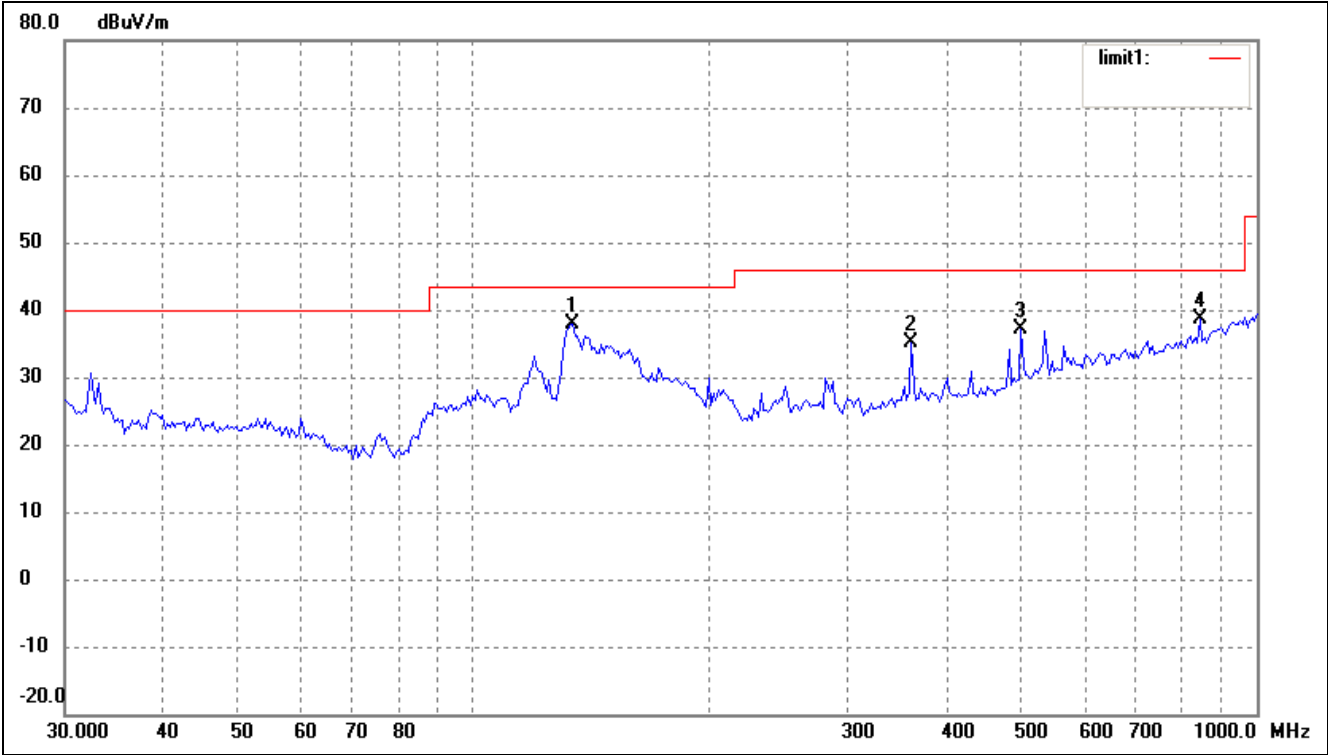
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	133.6188	33.04	4.35	37.39	43.50	-6.11	134	100	peak
2	361.7139	24.15	10.91	35.06	46.00	-10.94	256	100	peak
3	499.4247	24.17	14.36	38.53	46.00	-7.47	113	100	peak
4	535.7073	23.23	15.21	38.44	46.00	-7.56	270	100	peak

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



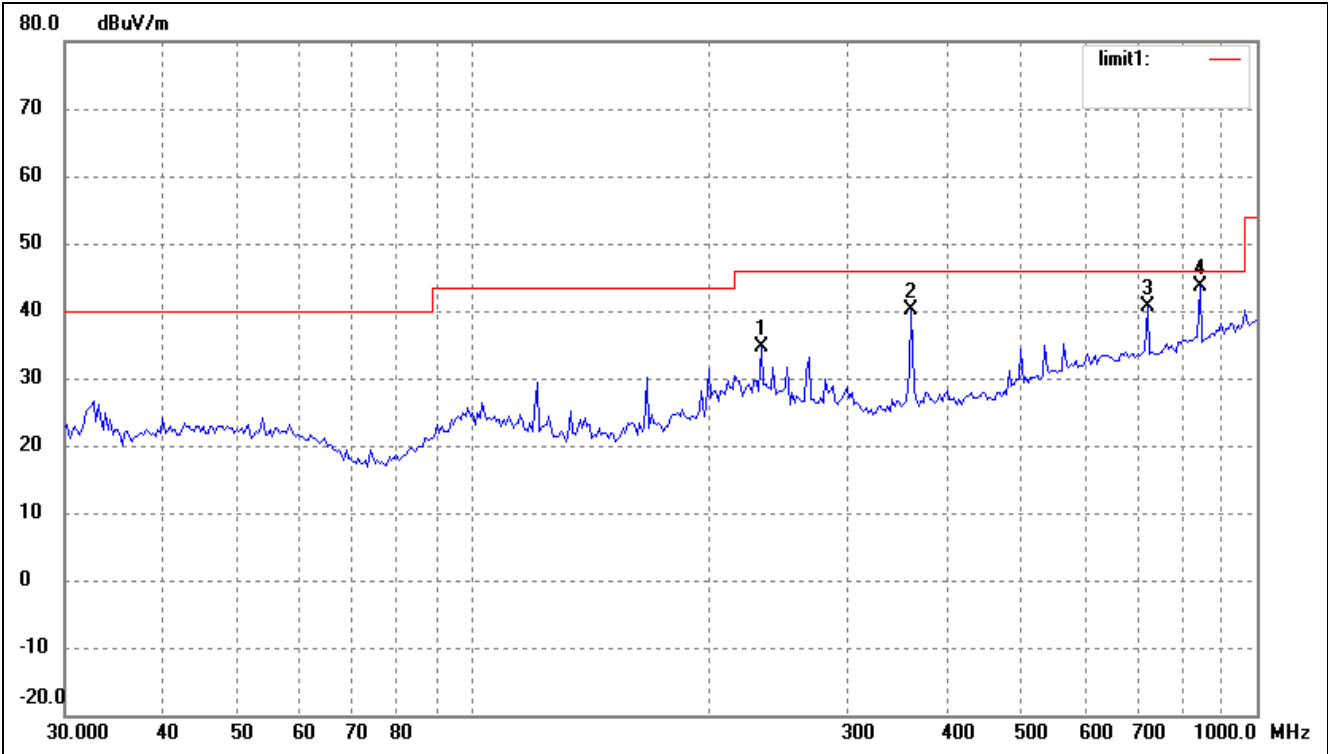
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	232.5318	27.96	8.01	35.97	46.00	-10.03	174	100	peak
2	361.7139	29.20	10.91	40.11	46.00	-5.89	245	100	QP
3	724.2611	21.57	17.86	39.43	46.00	-6.57	106	100	peak
4	845.0878	23.26	19.86	43.12	46.00	-2.88	287	100	QP

Vertical



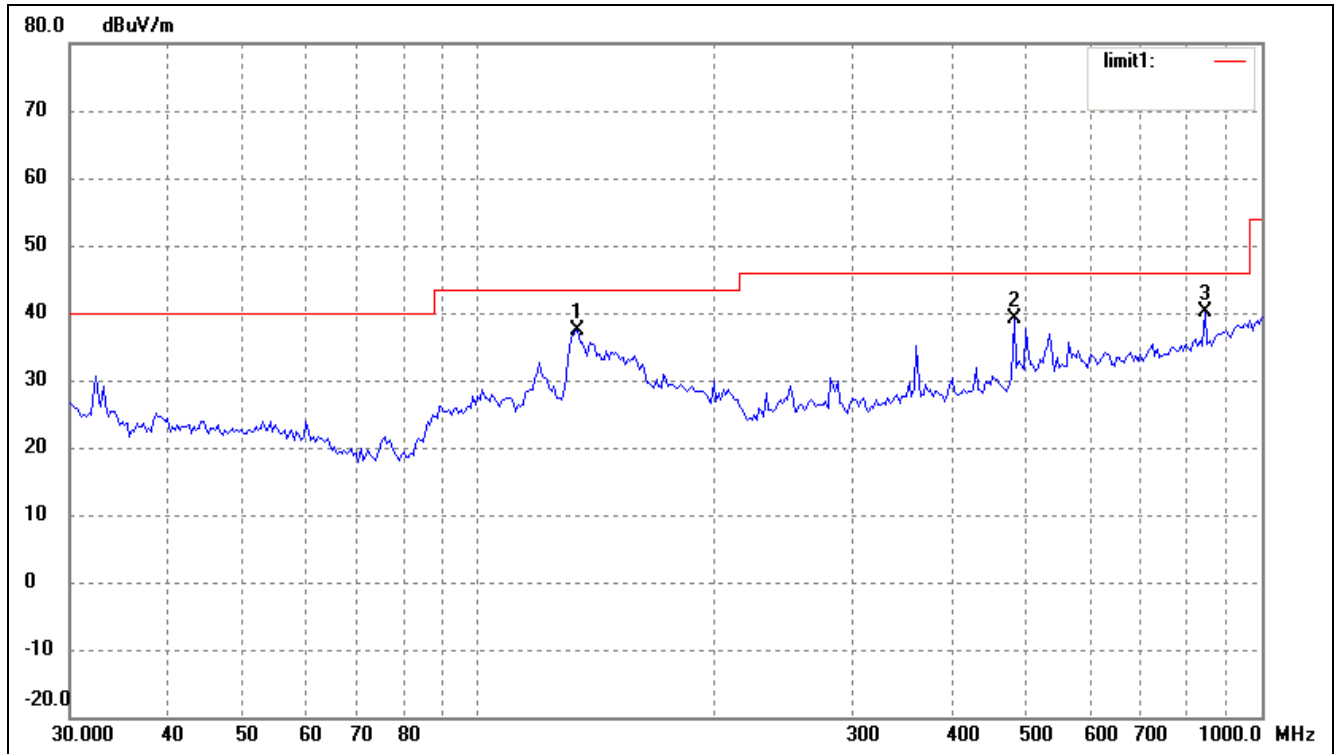
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	133.6188	33.54	4.35	37.89	43.50	-5.61	237	100	QP
2	361.7139	24.15	10.91	35.06	46.00	-10.94	146	100	peak
3	499.4247	22.67	14.36	37.03	46.00	-8.97	258	100	peak
4	845.0878	18.85	19.86	38.71	46.00	-7.29	100	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	232.5318	26.55	8.01	34.56	46.00	-11.44	354	100	peak
2	361.7139	29.20	10.91	40.11	46.00	-5.89	187	100	QP
3	724.2611	22.87	17.86	40.73	46.00	-5.27	94	200	QP
4	845.0878	23.76	19.86	43.62	46.00	-2.38	106	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	133.6188	33.04	4.35	37.39	43.50	-6.11	246	100	peak
2	482.2156	26.50	12.67	39.17	46.00	-6.83	190	100	peak
3	845.0878	20.35	19.86	40.21	46.00	-5.79	221	100	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	53.0	360	V	34.1	5.2	33.0	59.3	74	-14.7
4824.0	PK	55.2	270	H	34.1	5.2	33.0	61.5	74	-12.5
7236.0	PK	48.9	180	V	37.4	6.1	33.5	58.9	74	-15.1
7236.0	PK	50.3	45	H	37.4	6.1	33.5	60.3	74	-13.7
4824.0	AV	45.1	270	V	34.1	5.2	33.0	51.4	54	-2.6
4824.0	AV	45.7	90	H	34.1	5.2	33.0	52.0	54	-2.0
7236.0	AV	40.6	45	V	37.4	6.1	33.5	50.6	54	-3.4
7236.0	AV	41.7	60	H	37.4	6.1	33.5	51.7	54	-2.3
Middle Channel (1G to 25GHz)										
4874.0	PK	52.3	45	V	34.1	5.2	33.0	58.6	74	-15.4
4874.0	PK	54.0	270	H	34.1	5.2	33.0	60.3	74	-13.7
7311.0	PK	49.4	45	V	37.4	6.1	33.5	59.4	74	-14.6
7311.0	PK	52.0	180	H	37.4	6.1	33.5	62.0	74	-12.0
4874.0	AV	44.8	270	V	34.1	5.2	33.0	51.1	54	-2.9
4874.0	AV	45.7	90	H	34.1	5.2	33.0	52.0	54	-2.0
7311.0	AV	40.3	60	V	37.4	6.1	33.5	50.3	54	-3.7
7311.0	AV	41.6	45	H	37.4	6.1	33.5	51.6	54	-2.4
High Channel (1G to 25GHz)										
4924.0	PK	51.6	270	V	34.1	5.2	33.0	57.9	74	-16.1
4924.0	PK	55.0	45	H	34.1	5.2	33.0	61.3	74	-12.7
7386.0	PK	47.5	180	V	37.4	6.1	33.5	57.5	74	-16.5
7386.0	PK	50.5	360	H	37.4	6.1	33.5	60.5	74	-13.5
4924.0	AV	43.9	90	V	34.1	5.2	33.0	50.2	54	-3.8
4924.0	AV	45.0	270	H	34.1	5.2	33.0	51.3	54	-2.7
7386.0	AV	39.6	180	V	37.4	6.1	33.5	49.6	54	-4.4
7386.0	AV	41.0	60	H	37.4	6.1	33.5	51.0	54	-3.0

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	51.9	90	V	34.1	5.2	33.0	58.2	74	-15.8
4824.0	PK	54.7	270	H	34.1	5.2	33.0	61.0	74	-13.0
7236.0	PK	47.2	180	V	37.4	6.1	33.5	57.2	74	-16.8
7236.0	PK	50.9	45	H	37.4	6.1	33.5	60.9	74	-13.1
4824.0	AV	45.0	270	V	34.1	5.2	33.0	51.3	54	-2.7
4824.0	AV	45.0	90	H	34.1	5.2	33.0	51.3	54	-2.7
7236.0	AV	39.6	45	V	37.4	6.1	33.5	49.6	54	-4.4
7236.0	AV	41.0	60	H	37.4	6.1	33.5	51.0	54	-3.0
Middle Channel (1G to 25GHz)										
4874.0	PK	52.7	45	V	34.1	5.2	33.0	59.0	74	-15.0
4874.0	PK	56.0	270	H	34.1	5.2	33.0	62.3	74	-11.7
7311.0	PK	48.5	45	V	37.4	6.1	33.5	58.5	74	-15.5
7311.0	PK	50.6	180	H	37.4	6.1	33.5	60.6	74	-13.4
4874.0	AV	43.9	270	V	34.1	5.2	33.0	50.2	54	-3.8
4874.0	AV	44.7	90	H	34.1	5.2	33.0	51.0	54	-3.0
7311.0	AV	39.6	60	V	37.4	6.1	33.5	49.6	54	-4.4
7311.0	AV	40.7	45	H	37.4	6.1	33.5	50.7	54	-3.3
High Channel (1G to 25GHz)										
4924.0	PK	53.8	270	V	34.1	5.2	33.0	60.1	74	-13.9
4924.0	PK	55.3	45	H	34.1	5.2	33.0	61.6	74	-12.4
7386.0	PK	49.0	180	V	37.4	6.1	33.5	59.0	74	-15.0
7386.0	PK	50.5	45	H	37.4	6.1	33.5	60.5	74	-13.5
4924.0	AV	44.3	90	V	34.1	5.2	33.0	50.6	54	-3.4
4924.0	AV	45.0	270	H	34.1	5.2	33.0	51.3	54	-2.7
7386.0	AV	40.1	60	V	37.4	6.1	33.5	50.1	54	-3.9
7386.0	AV	41.3	60	H	37.4	6.1	33.5	51.3	54	-2.7

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.

*Spurious Emission above 1GHz**Test Mode: Transmitting (802.11n-HT20)*

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	52.6	360	V	34.1	5.2	33.0	58.9	74	-15.1
4824.0	PK	54.0	270	H	34.1	5.2	33.0	60.3	74	-13.7
7236.0	PK	49.7	180	V	37.4	6.1	33.5	59.7	74	-14.3
7236.0	PK	52.0	45	H	37.4	6.1	33.5	62.0	74	-12.0
4824.0	AV	44.8	270	V	34.1	5.2	33.0	51.1	54	-2.9
4824.0	AV	45.7	90	H	34.1	5.2	33.0	52.0	54	-2.0
7236.0	AV	40.8	45	V	37.4	6.1	33.5	50.8	54	-3.2
7236.0	AV	41.4	60	H	37.4	6.1	33.5	51.4	54	-2.6
Middle Channel (1G to 25GHz)										
4874.0	PK	52.3	45	V	34.1	5.2	33.0	58.6	74	-15.4
4874.0	PK	54.0	270	H	34.1	5.2	33.0	60.3	74	-13.7
7311.0	PK	49.4	45	V	37.4	6.1	33.5	59.4	74	-14.6
7311.0	PK	52.5	180	H	37.4	6.1	33.5	62.5	74	-11.5
4874.0	AV	45.3	270	V	34.1	5.2	33.0	51.6	54	-2.4
4874.0	AV	45.7	90	H	34.1	5.2	33.0	52.0	54	-2.0
7311.0	AV	40.3	60	V	37.4	6.1	33.5	50.3	54	-3.7
7311.0	AV	41.6	45	H	37.4	6.1	33.5	51.6	54	-2.4
High Channel (1G to 25GHz)										
4924.0	PK	52.0	270	V	34.1	5.2	33.0	58.3	74	-15.7
4924.0	PK	54.3	45	H	34.1	5.2	33.0	60.6	74	-13.4
7386.0	PK	49.8	180	V	37.4	6.1	33.5	59.8	74	-14.2
7386.0	PK	51.5	360	H	37.4	6.1	33.5	61.5	74	-12.5
4924.0	AV	43.7	90	V	34.1	5.2	33.0	50.0	54	-4.0
4924.0	AV	45.4	270	H	34.1	5.2	33.0	51.7	54	-2.3
7386.0	AV	41.1	180	V	37.4	6.1	33.5	51.1	54	-2.9
7386.0	AV	41.5	60	H	37.4	6.1	33.5	51.5	54	-2.5

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 (802.11n-HT40)*

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)										
4844.0	PK	53.3	90	V	34.1	5.2	33.0	59.6	74	-14.4
4844.0	PK	56.1	270	H	34.1	5.2	33.0	62.4	74	-11.6
7266.0	PK	48.7	180	V	37.4	6.1	33.5	58.7	74	-15.3
7266.0	PK	51.4	45	H	37.4	6.1	33.5	61.4	74	-12.6
4844.0	AV	43.9	270	V	34.1	5.2	33.0	50.2	54	-3.8
4844.0	AV	45.7	90	H	34.1	5.2	33.0	52.0	54	-2.0
7266.0	AV	40.4	45	V	37.4	6.1	33.5	50.4	54	-3.6
7266.0	AV	41.5	60	H	37.4	6.1	33.5	51.5	54	-2.5
Middle Channel (1G to 25GHz)										
4874.0	PK	54.0	45	V	34.1	5.2	33.0	60.3	74	-13.7
4874.0	PK	56.2	270	H	34.1	5.2	33.0	62.5	74	-11.5
7311.0	PK	49.4	45	V	37.4	6.1	33.5	59.4	74	-14.6
7311.0	PK	50.5	180	H	37.4	6.1	33.5	60.5	74	-13.5
4874.0	AV	44.4	270	V	34.1	5.2	33.0	50.7	54	-3.3
4874.0	AV	44.9	90	H	34.1	5.2	33.0	51.2	54	-2.8
7311.0	AV	40.6	60	V	37.4	6.1	33.5	50.6	54	-3.4
7311.0	AV	41.7	45	H	37.4	6.1	33.5	51.7	54	-2.3
High Channel (1G to 25GHz)										
4904.0	PK	53.4	270	V	34.1	5.2	33.0	59.7	74	-14.3
4904.0	PK	56.1	45	H	34.1	5.2	33.0	62.4	74	-11.6
7356.0	PK	49.8	180	V	37.4	6.1	33.5	59.8	74	-14.2
7356.0	PK	50.4	45	H	37.4	6.1	33.5	60.4	74	-13.6
4904.0	AV	44.3	90	V	34.1	5.2	33.0	50.6	54	-3.4
4904.0	AV	45.2	270	H	34.1	5.2	33.0	51.5	54	-2.5
7356.0	AV	41.0	60	V	37.4	6.1	33.5	51.0	54	-3.0
7356.0	AV	41.9	60	H	37.4	6.1	33.5	51.9	54	-2.1

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.

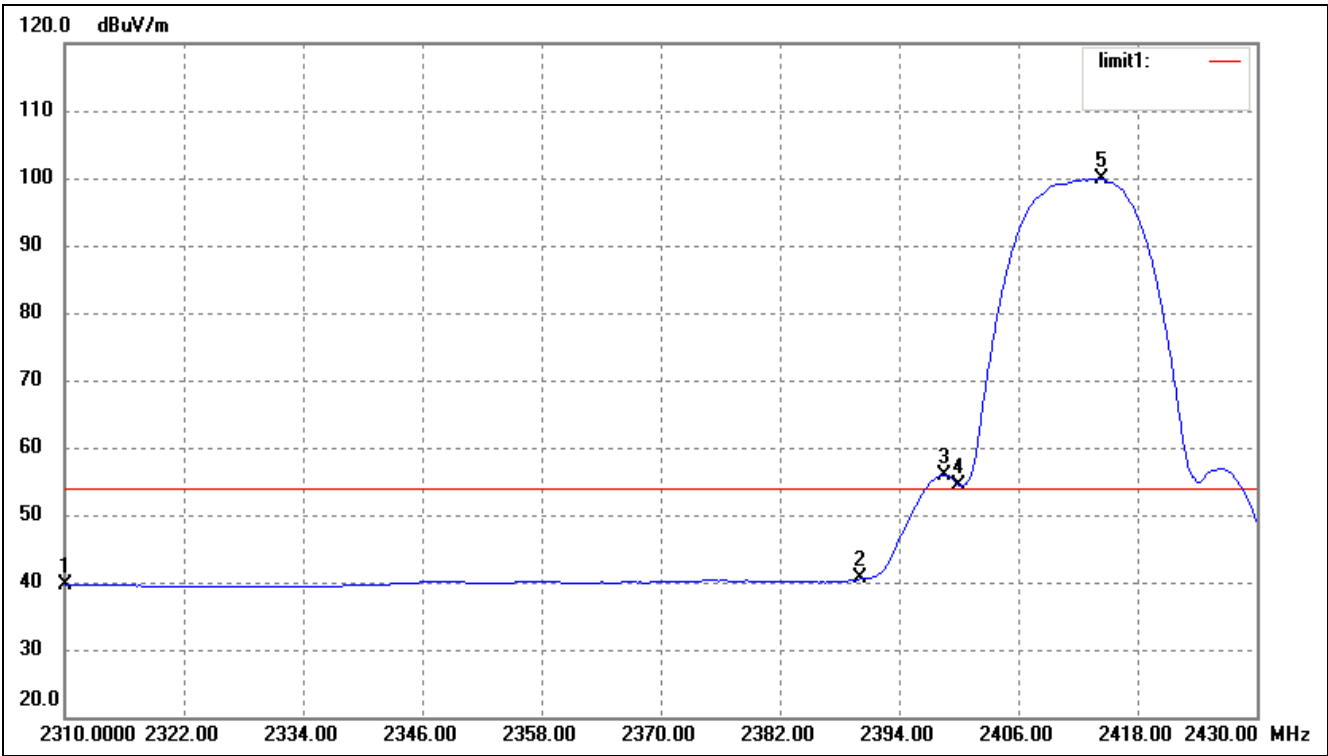
9.4 Environmental Conditions

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

9.5 Summary of Test Results/Plots

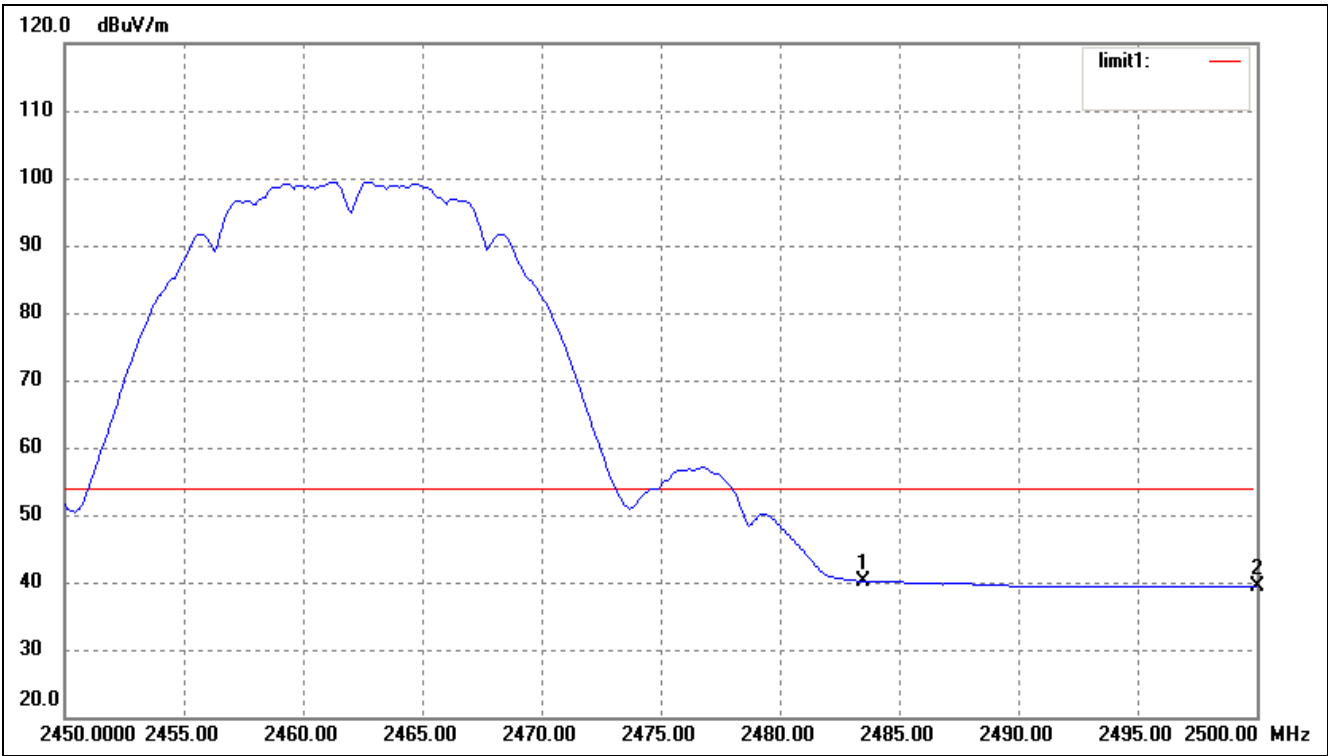
Test mode	Frequency MHz	Limit dBuV /dB	Result
802.11b	2310.00	<54dBuV	Pass
	2390.00	<54dBuV	Pass
	2400.00	>20dB ATT	Pass
	2398.56	>20dB ATT	Pass
	2483.50	<54dBuV	Pass
	2500.00	<54dBuV	Pass
802.11g	2310.00	<54dBuV	Pass
	2390.00	<54dBuV	Pass
	2400.00	>20dB ATT	Pass
	2483.50	<54dBuV	Pass
	2500.00	<54dBuV	Pass
802.11n-HT20	2310.00	<54dBuV	Pass
	2390.00	<54dBuV	Pass
	2400.00	>20dB ATT	Pass
	2483.50	<54dBuV	Pass
	2500.00	<54dBuV	Pass
802.11n-HT40	2310.00	<54dBuV	Pass
	2390.00	<54dBuV	Pass
	2400.00	>20dB ATT	Pass
	2483.50	<54dBuV	Pass
	2500.00	<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	44.19	-4.65	39.54	54.00	-14.46	360	200	Ave
	2310.000	54.78	-4.65	50.13	74.00	-23.87	360	200	Peak
2	2390.000	45.01	-4.46	40.55	54.00	-13.45	274	200	Ave
	2390.000	56.86	-4.46	52.4	74.00	-21.6	274	200	Peak
3	2398.560	60.41	-4.43	55.98	/	/	360	100	Ave
4	2400.000	58.80	-4.43	54.37	/	/	360	100	Ave
5	2414.400	104.35	-4.40	99.95	/	/	360	100	Ave

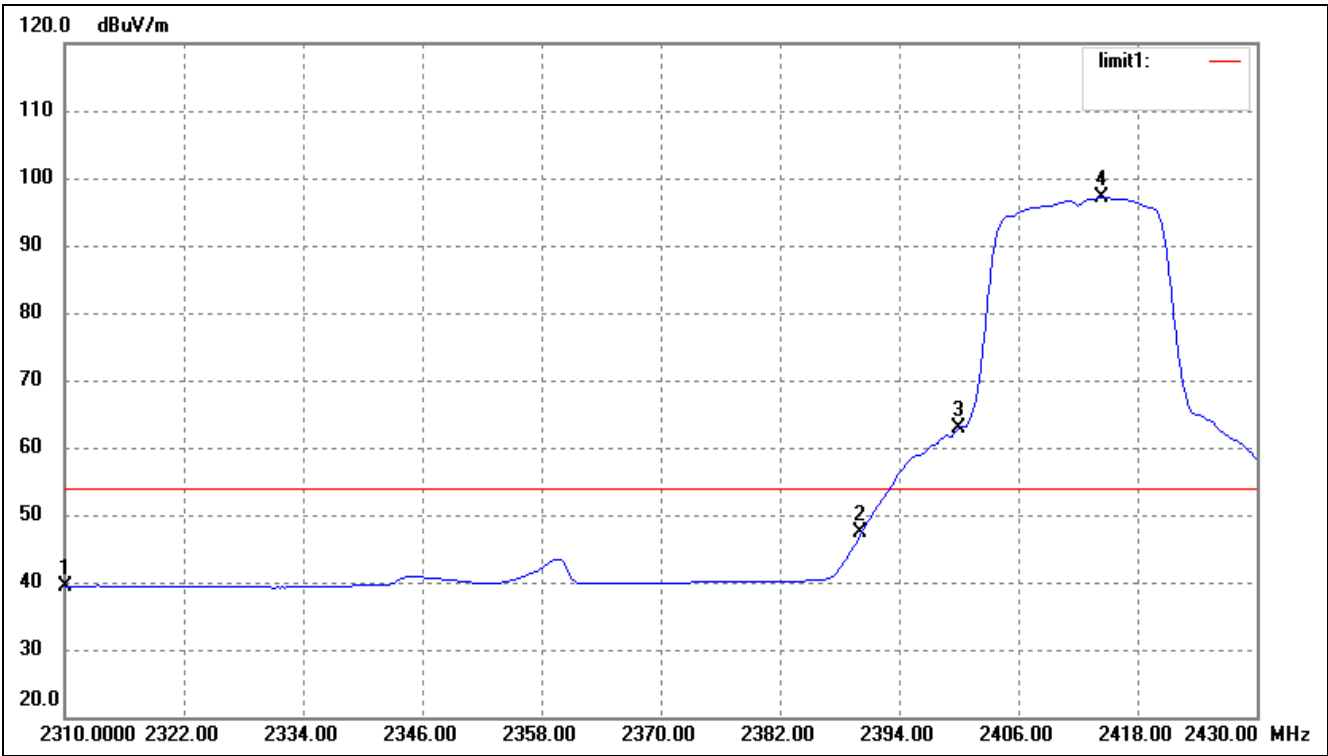
For 802.11b
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	44.39	-4.23	40.16	54.00	-13.84	360	200	Ave
	2483.500	56.87	-4.23	52.64	74.00	-21.36	360	200	Peak
2	2500.000	43.51	-4.18	39.33	54.00	-14.67	182	200	Ave
	2500.000	55.21	-4.18	51.03	74.00	-22.97	182	200	Peak

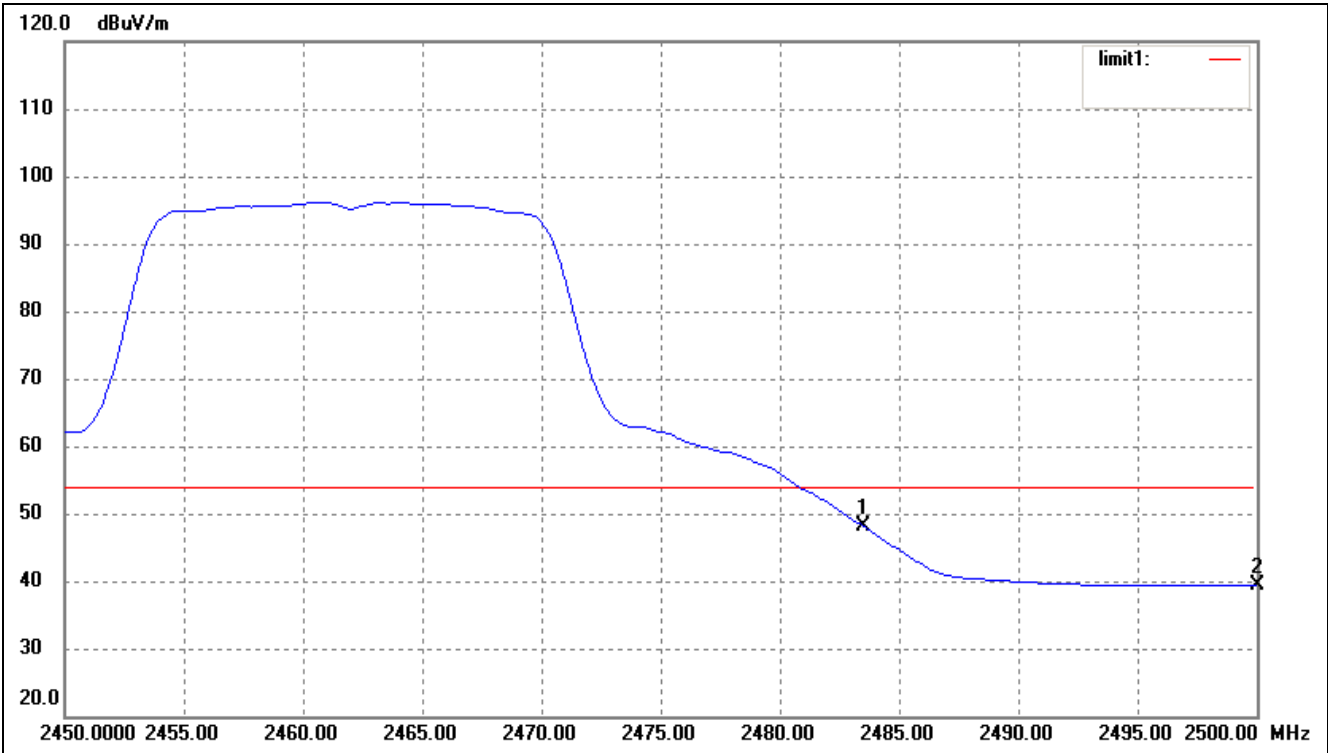
For 802.11g

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	44.10	-4.65	39.45	54.00	-14.55	360	200	Ave
	2310.000	55.99	-4.65	51.34	74.00	-22.66	360	200	Peak
2	2390.000	51.74	-4.46	47.28	54.00	-6.72	176	100	Ave
	2390.000	54.13	-4.46	49.67	74.00	-24.33	176	100	Peak
3	2400.000	67.34	-4.43	62.91	/	/	360	100	Ave
4	2414.400	101.49	-4.40	97.09	/	/	360	100	Ave

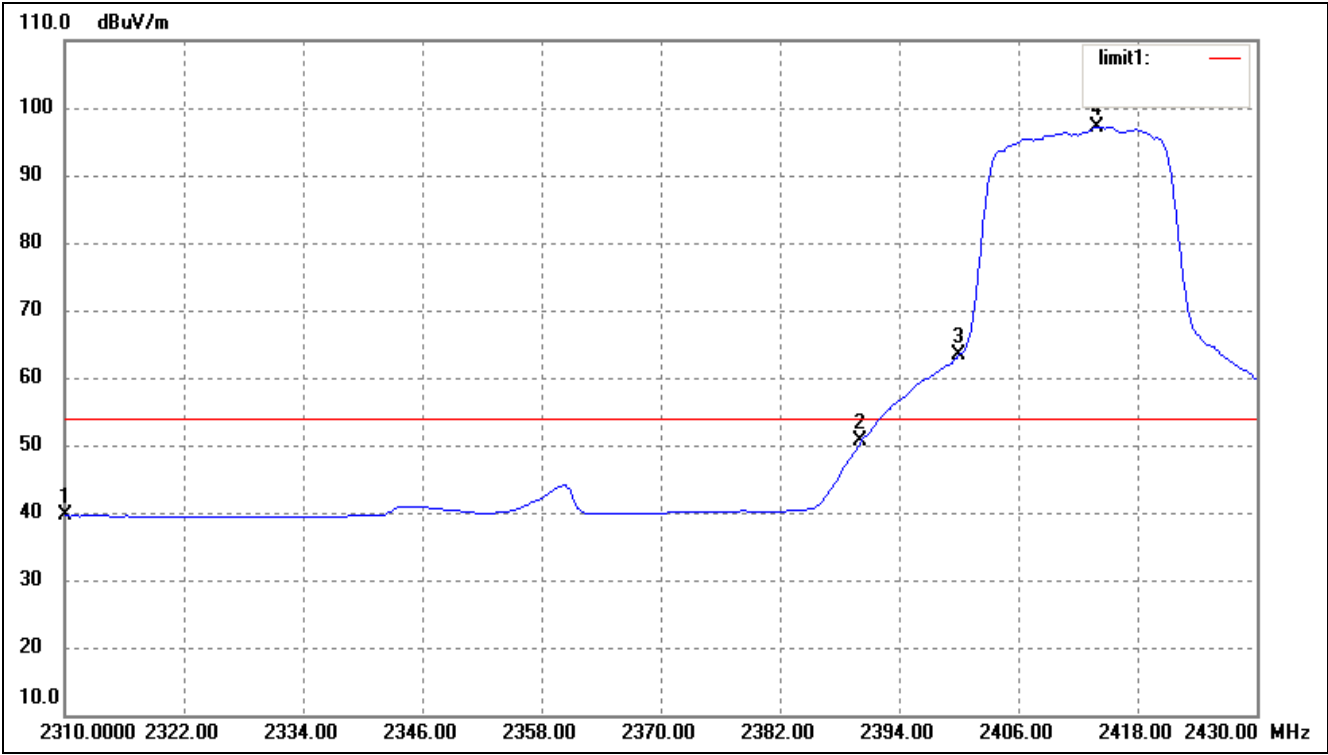
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	52.30	-4.23	48.07	54.00	-5.93	162	100	Ave
	2483.500	63.87	-4.23	59.64	74.00	-14.36	162	100	Peak
2	2500.000	43.54	-4.18	39.36	54.00	-14.64	360	200	Ave
	2500.000	54.31	-4.18	50.13	74.00	-23.87	360	200	Peak

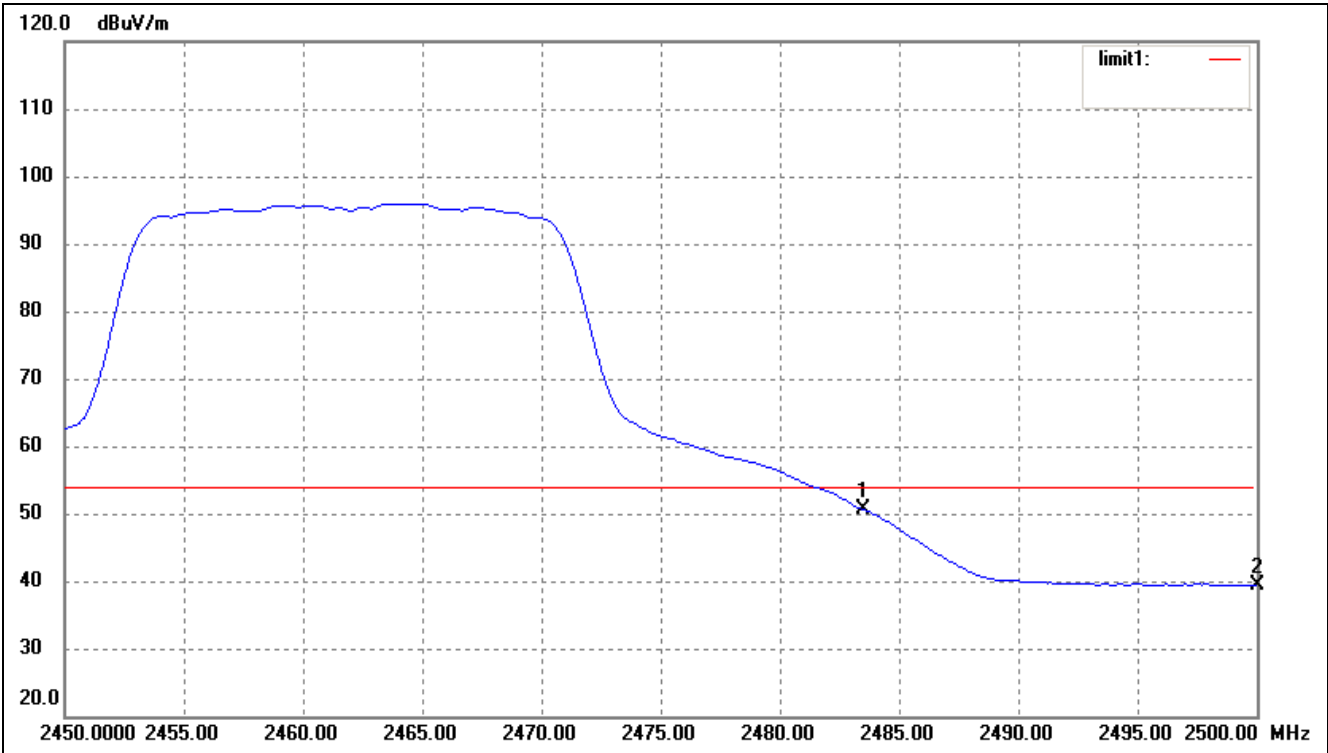
For 802.11n-HT20

Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2310.000	44.16	-4.65	39.51	54.00	-14.49	270	100	Ave
	2310.000	55.29	-4.65	50.64	74.00	-23.36	270	100	Peak
2	2390.000	55.02	-4.46	50.56	54.00	-3.44	360	200	Ave
	2390.000	65.08	-4.46	60.62	74.00	-13.38	360	200	Peak
3	2400.000	67.78	-4.43	63.35	/	/	360	200	Ave
4	2413.920	101.48	-4.40	97.08	/	/	360	200	Ave

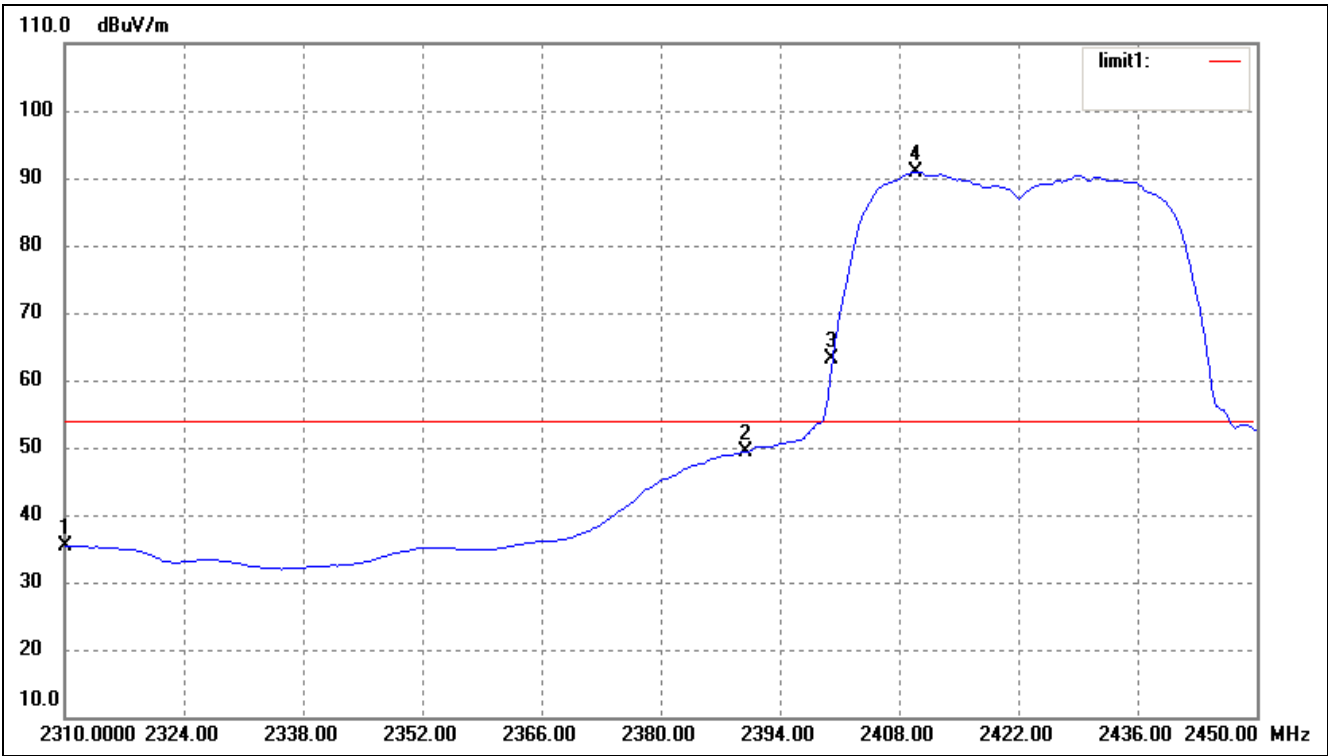
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	54.77	-4.23	50.54	54.00	-3.46	160	100	Ave
	2483.500	65.57	-4.23	61.34	74.00	-12.66	160	100	Peak
2	2500.000	43.56	-4.18	39.38	54.00	-14.62	291	200	Ave
	2500.000	53.75	-4.18	49.57	74.00	-24.43	290	200	Peak

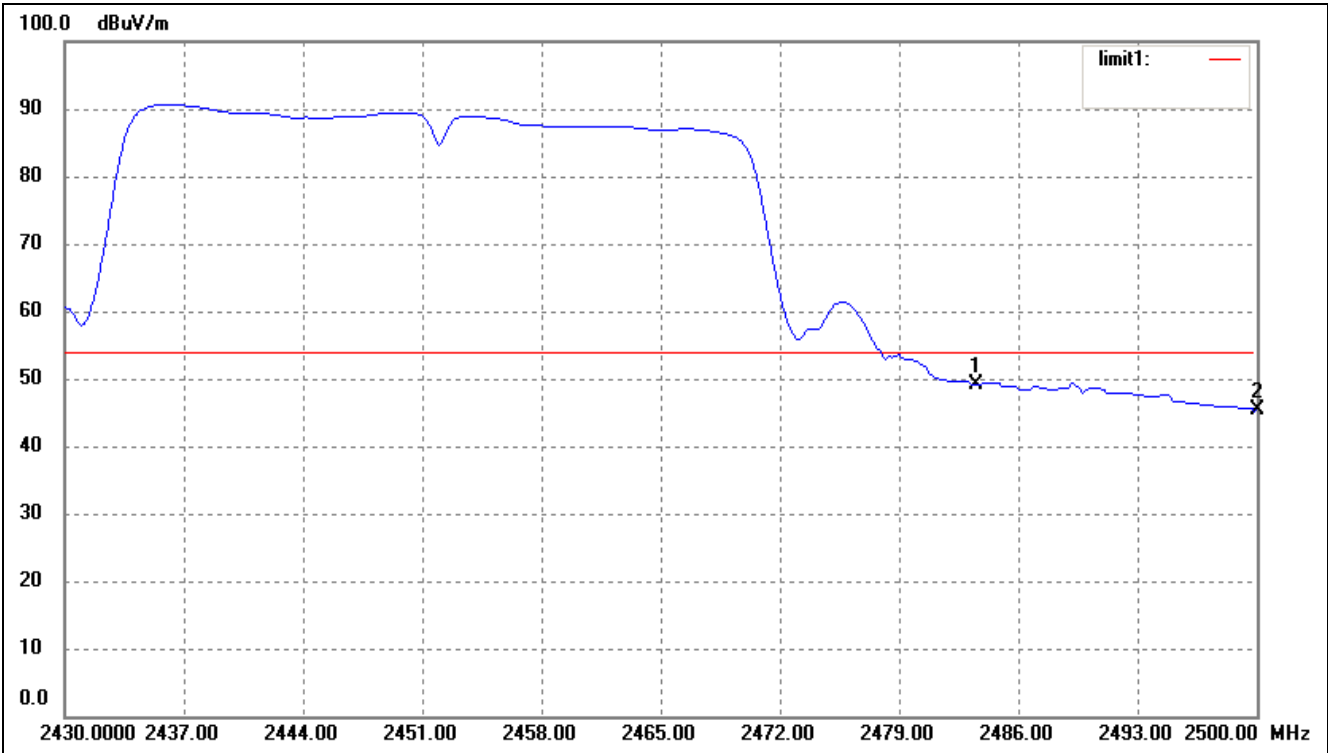
For 802.11n-HT40

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	40.23	-4.76	35.47	54.00	-18.53	360	100	Ave
	2310.000	51.52	-4.76	46.76	74.00	-27.24	360	100	Peak
2	2390.000	53.88	-4.51	49.37	54.00	-4.63	179	100	Ave
	2390.000	64.73	-4.51	60.22	74.00	-13.78	179	100	Peak
3	2400.000	67.68	-4.48	63.20	54.00	9.20	276	200	peak
4	2409.960	95.44	-4.44	91.00	54.00	37.00	276	200	peak

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	53.34	-4.23	49.11	54.00	-4.89	360	100	Ave
	2483.500	62.99	-4.23	58.76	74.00	-15.24	360	100	Peak
2	2500.000	49.68	-4.18	45.50	54.00	-8.50	182	100	Ave
	2500.000	59.81	-4.18	55.63	74.00	-18.37	182	100	Peak

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