FCC Part 15C

Measurement and Test Report

For

ENCORE ELECTRONICS INC.

16483 Old Valley Blvd., La Puente, CA 91744, USA

FCC ID: YZ500000006

Report Concerns: Original Report	**Equipment Type:** Wireless N150 Router
Model:	ENHWI-1AN42
Report No.:	STR11058055I
Test Date:	2011-05-10 to 2011-06-22
Issue Date:	2011-06-22
Tested By:	Jason Chen / Engineer
Reviewed By:	Lahm Peng / EMC Manager
Approved & Authorized By:	Jandy so/PSQ Manager

Prepared By:

SEM.Test Compliance Service Co., Ltd
3/F, Jinbao Commerce Building, Xin'an Fanshen Road,
Bao'an District, Shenzhen, P.R.C.（518101）
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	ENCORE ELECTRONICS INC.
Address of applicant:	16483 Old Valley Blvd., La Puente, CA 91744, USA
Manufacturer:	Sun Rise Electronic Factory
Address of manufacturer:	LanYuan Road, ZengTian Industrial District, XinAn Community, ChangAn Town, DongGuan City, GuangDong Province, China

General Description of E.U.T

Items	Description
EUT Description:	Wireless N150 Router
Trade Name:	ENCORE
Test Model:	ENHWI-1AN42
Adding Model:	ENHWI-1AN45, WR8196C2, WR8196C5
Rated Voltage:	12V DC
Adaptor Model:	GS2T-006-120-B1
RF Output Power	Max. 5.45dBm (Conducted)
Frequency range:	2412-2472MHz for 11b/g/n(HT20) 2422-2462MHz for 11n(HT40)
Number of channels:	13 for 11b/g/n(HT20), 9 for 11n(HT40)
Channel Separation:	5MHz
Antenna Gain:	5dBi / 2dBi
Type of Antenna:	External and detachable antenna with reversed SMA connector
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. Test is carried out with ENHWI-1AN42 since the other models listed in this report are different appearance without circuit and electronic construction changed, declared by the manufacture.

1.2 Test Standards

The following report is prepared on behalf of the ENCORE ELECTRONICS INC. 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
ASUS	Notebook	X50R	74N0AS297138
/	/	/	/

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Power Cable	1.2	Unshielded	Without Core
RJ45	1.5	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203; § 15.247(c)(1)(i)	Antenna Requirement	Compliant
§ 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

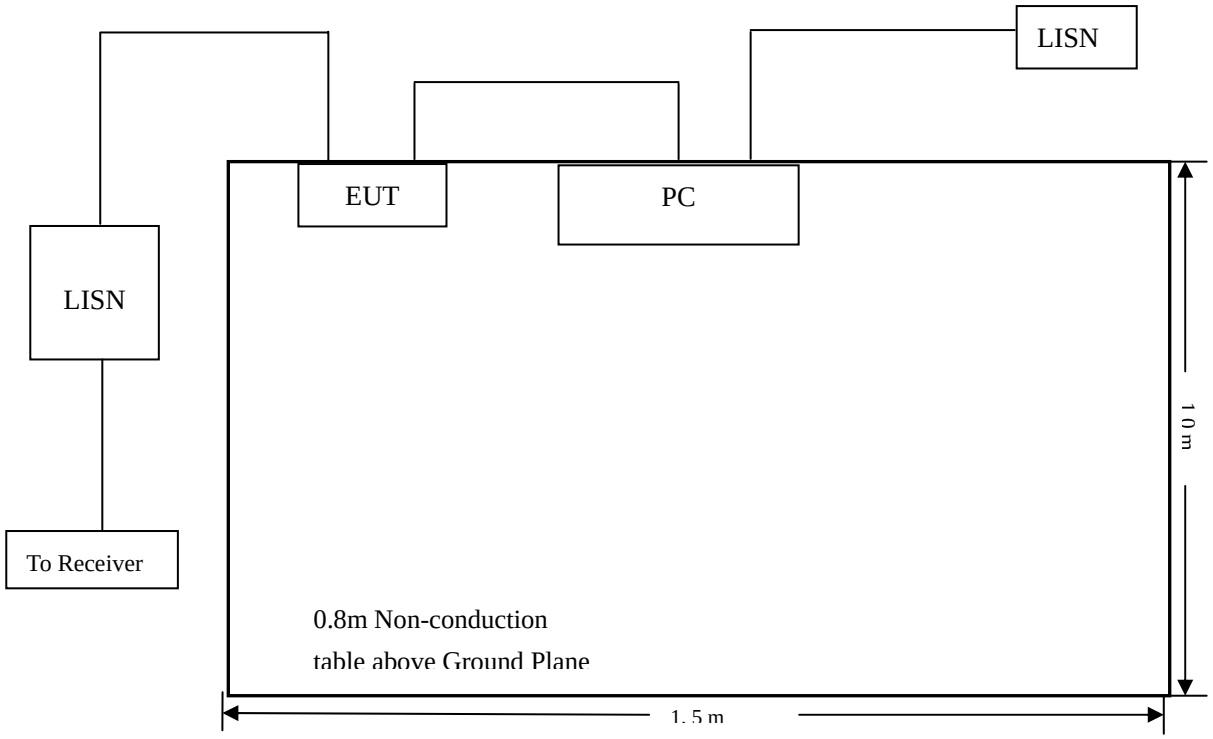
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-12-20	2011-12-19
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-12-20	2011-12-19
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-12-20	2011-12-19

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:

-5.98 dBμV at **0.502MHz** in the **Line AV** 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
0.502	40.01	AV	Line	46.00	-5.98
3.49	39.08	AV	Line	46.00	-6.91
4.642	46.78	Pk	Line	56.00	-9.21
0.506	46.19	Pk	Line	56.00	-9.80
0.502	43.68	Pk	Neutral	56.00	-12.31
2.102	43.66	Pk	Neutral	56.00	-12.33
0.498	33.45	AV	Neutral	46.02	-12.57
2.79	30.08	AV	Neutral	46.00	-15.91
23.982	33.18	AV	Line	50.00	-16.82
11.99	31.37	AV	Neutral	50.00	-18.62
7.066	40.03	Pk	Neutral	60.00	-19.96

Plot of Conducted Emissions Test Data

Conducted Disturbance

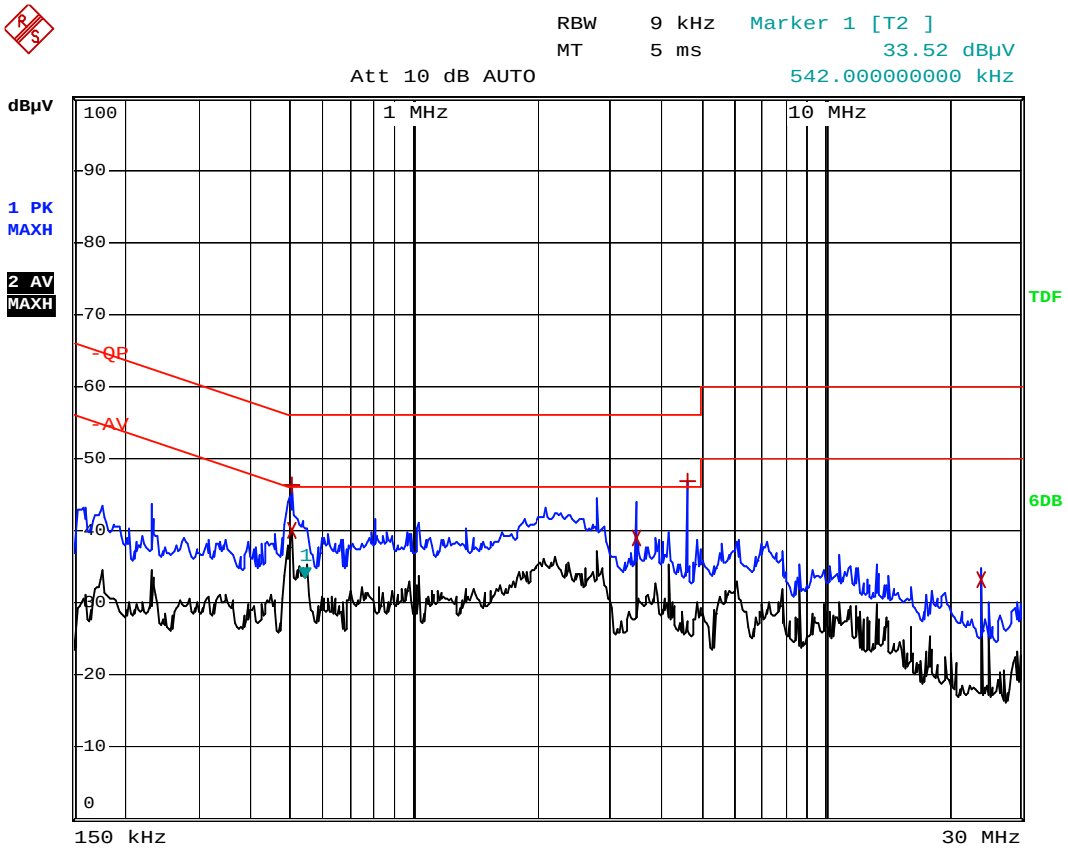
EUT: Wireless N150 Router

M/N: ENHWI-1AN42

Operating Condition: Transmitting

Test Specification: L

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



Date: 7.JUN.2011 14:23:13

Plot of Conducted Emissions Test Data

Conducted Disturbance

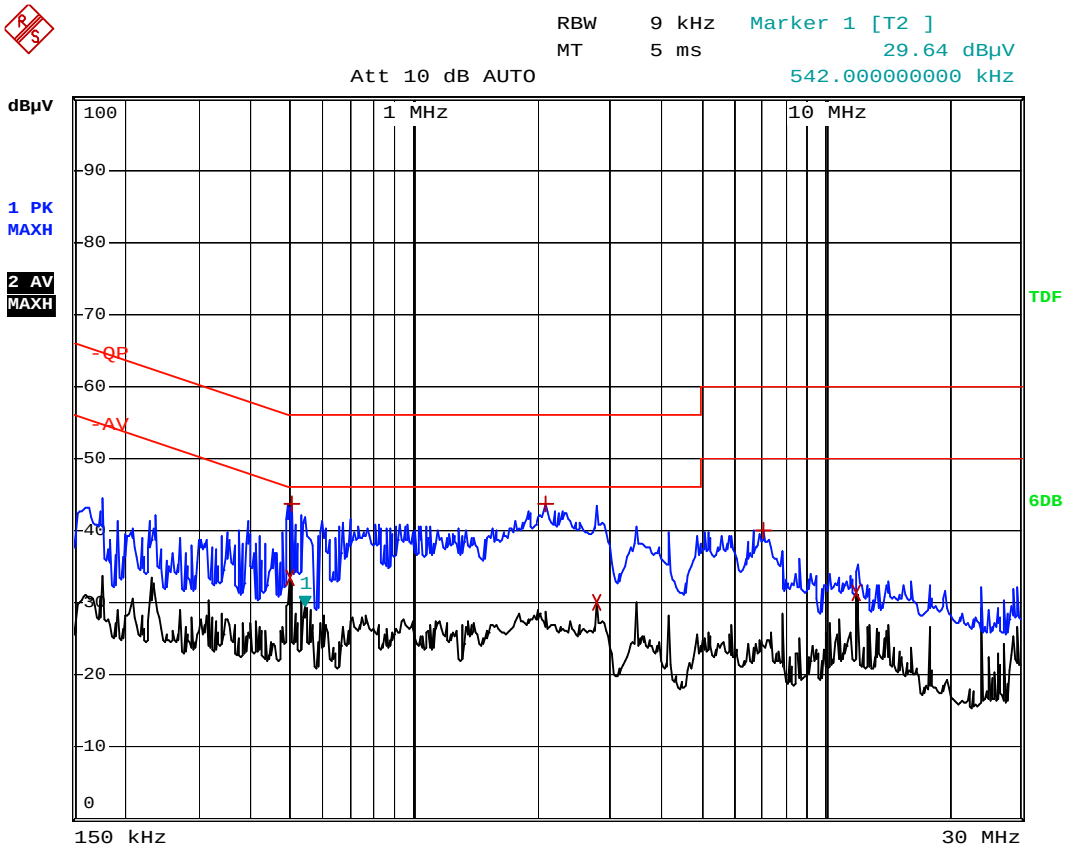
EUT: Wireless N150 Router

M/N: ENHWI-1AN42

Operating Condition: Transmitting

Test Specification: N

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



Date: 7.JUN.2011 14:24:22

4. §15.203 - ANTENNA REQUIREMENT

4.1 Standard Applicable

According to FCC Part 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 detachable and unique 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	2010-12-20	2011-12-19
Attenuator	ATTEN	ATS100-4-20	/	2010-12-20	2011-12-19

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

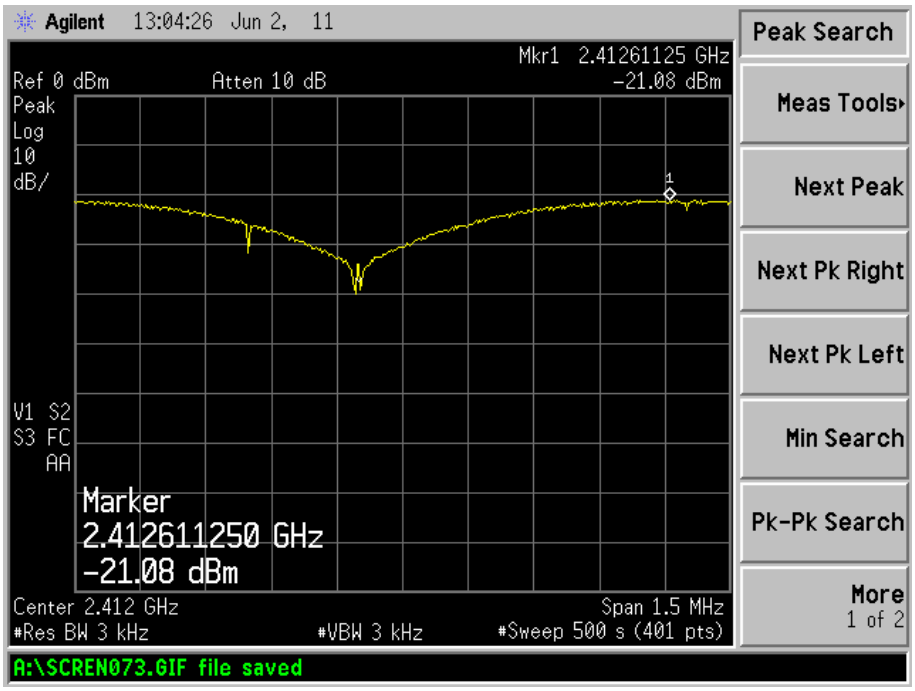
5.5 Summary of Test Results/Plots

Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-21.08	8
	Middle channel (2437MHz)	-20.65	8
	High channel (2462MHz)	-21.64	8
802.11g	Low channel (2412MHz)	-25.06	8
	Middle channel (2437MHz)	-25.37	8
	High channel (2462MHz)	-25.95	8

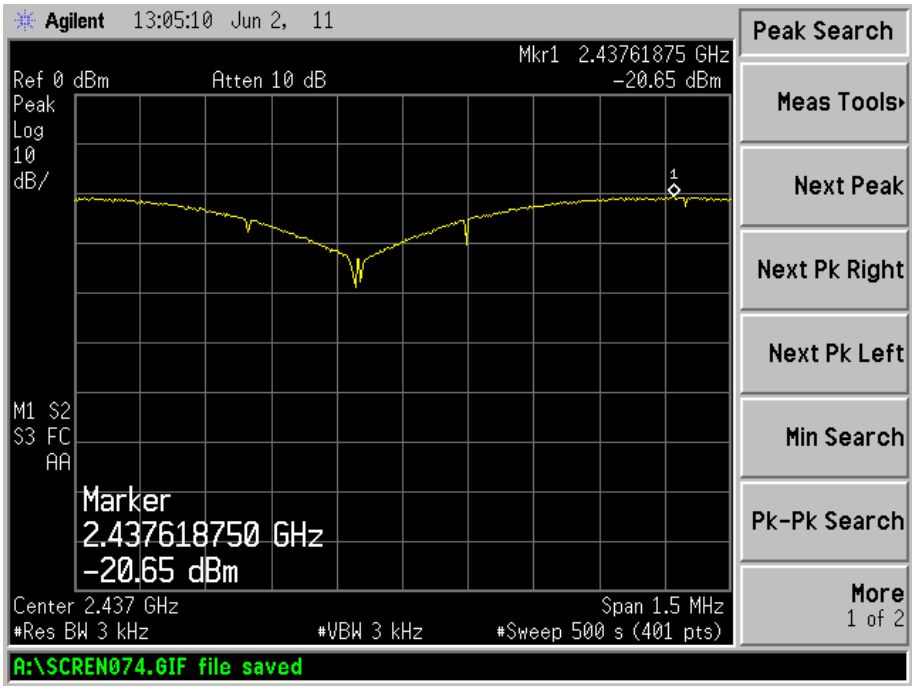
Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11n(HT20)	Low channel (2412MHz)	-25.02	8
	Middle channel (2437MHz)	-24.87	8
	High channel (2462MHz)	-25.79	8
802.11n(HT40)	Low channel (2422MHz)	-28.51	8
	Middle channel (2437MHz)	-28.78	8
	High channel (2452MHz)	-30.16	8

For 802.11b

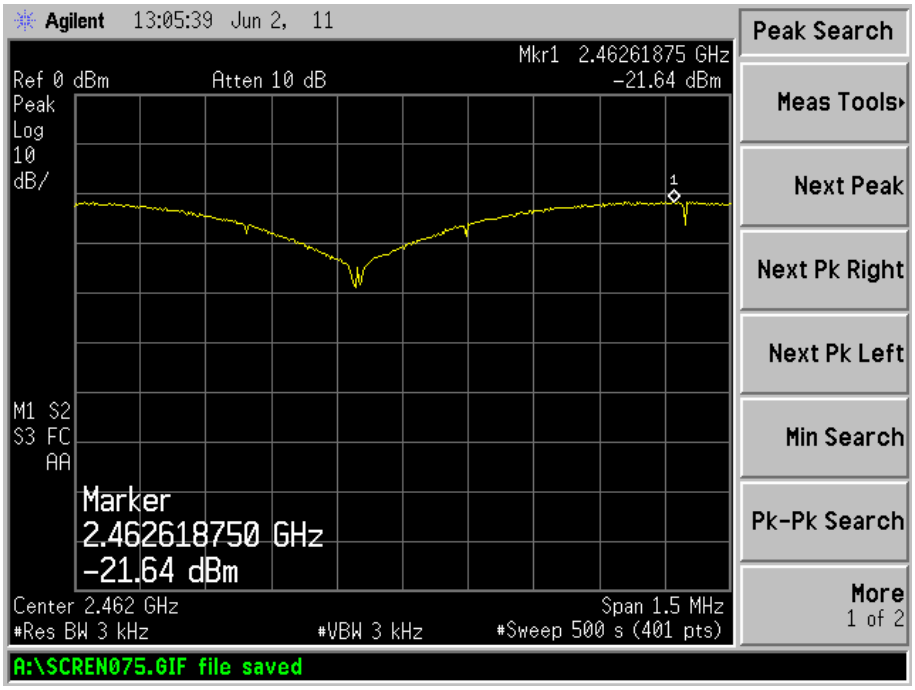
Low Channel:



Middle Channel:

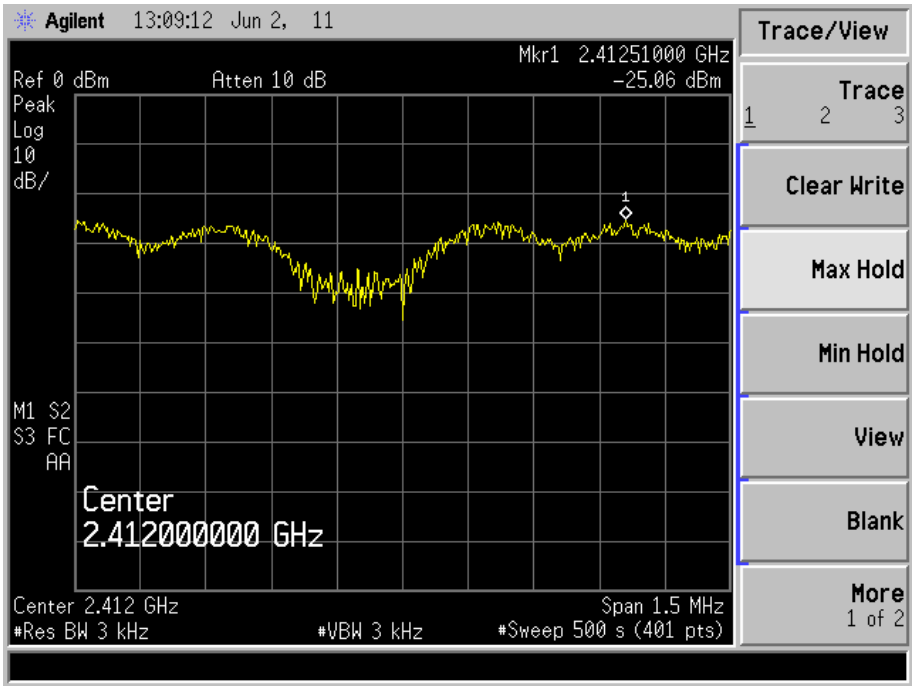


High Channel:

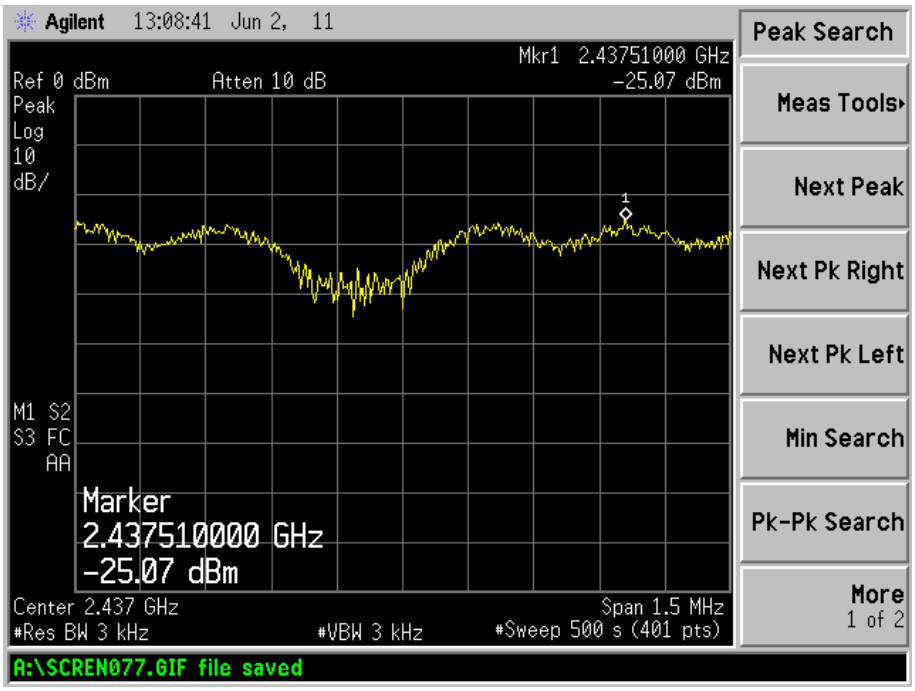


For 802.11g

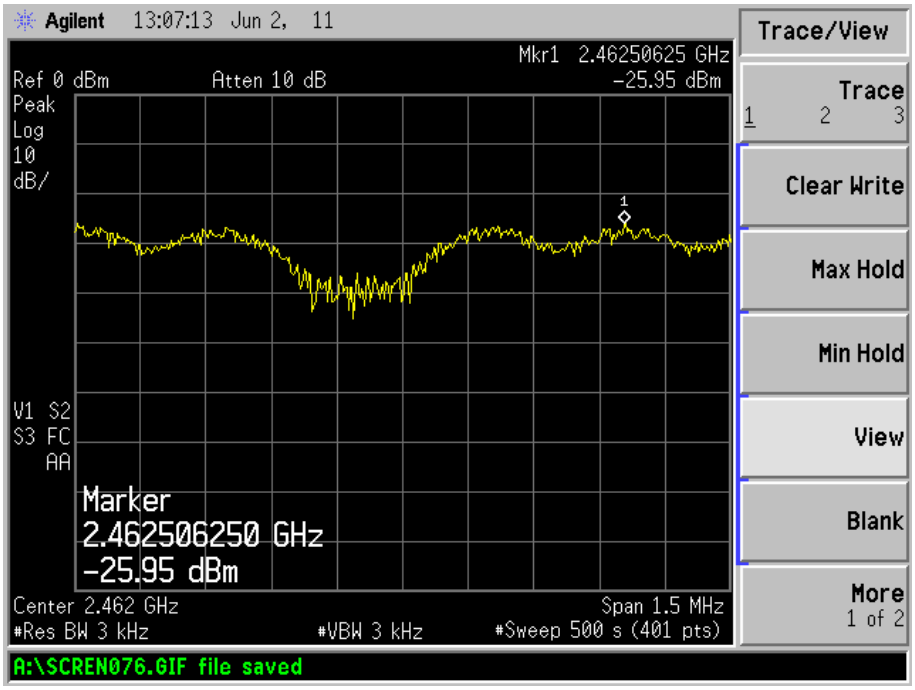
Low Channel:



Middle Channel:

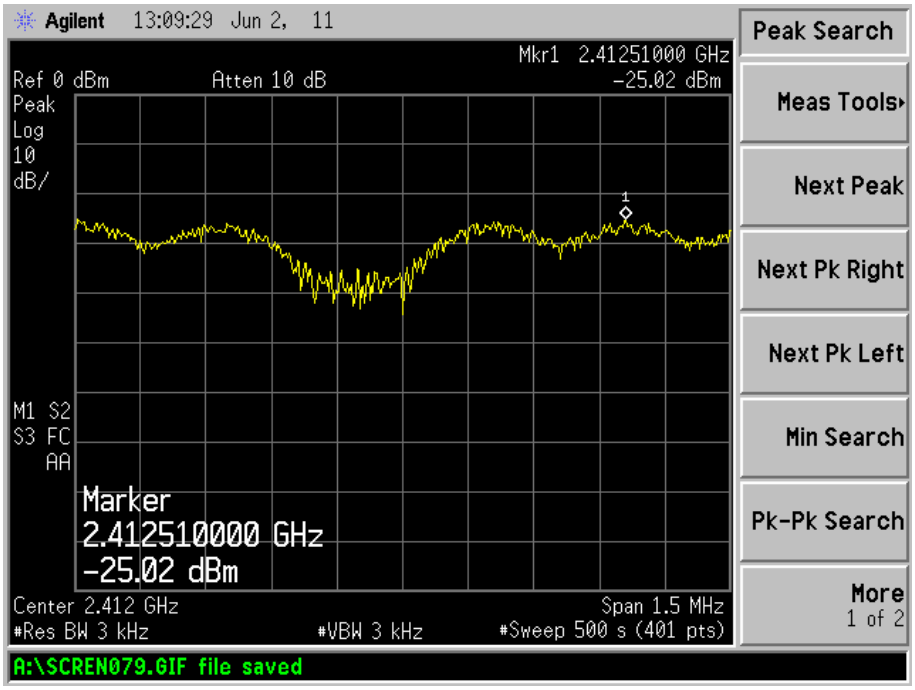


High Channel:

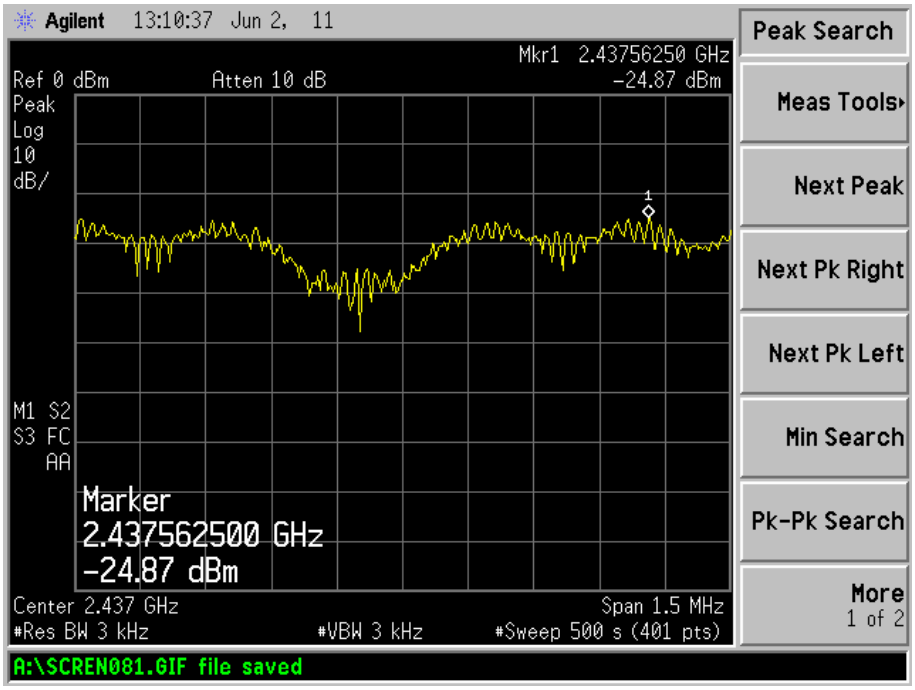


For 802.11n HT20

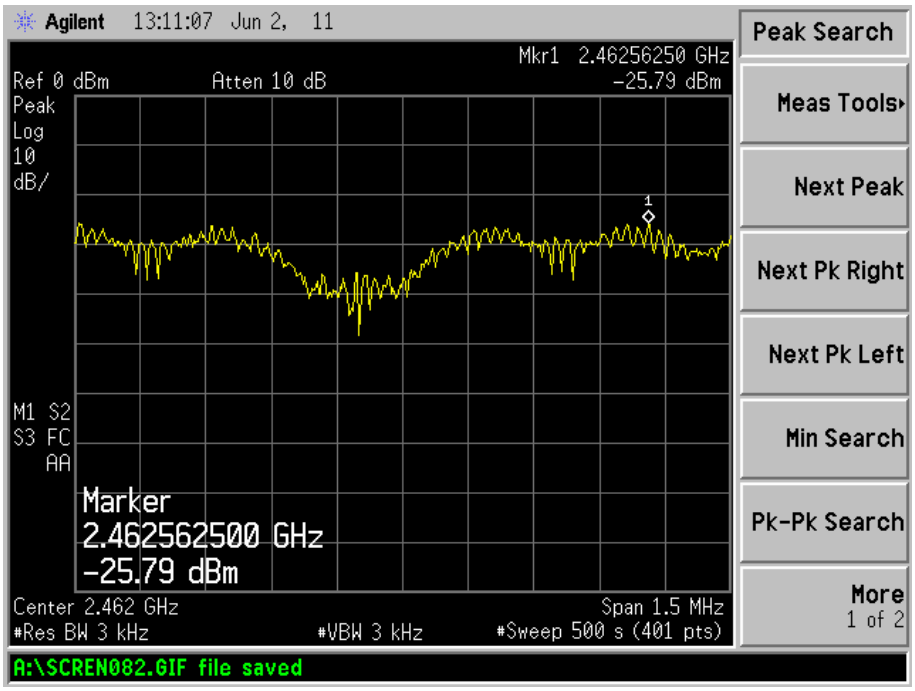
Low Channel:



Middle Channel:

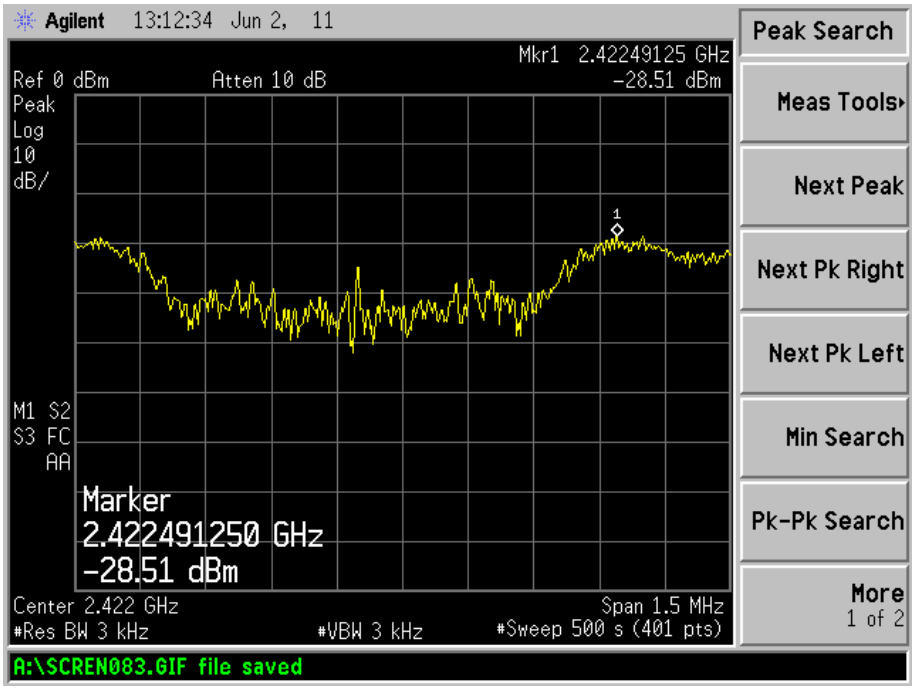


High Channel:

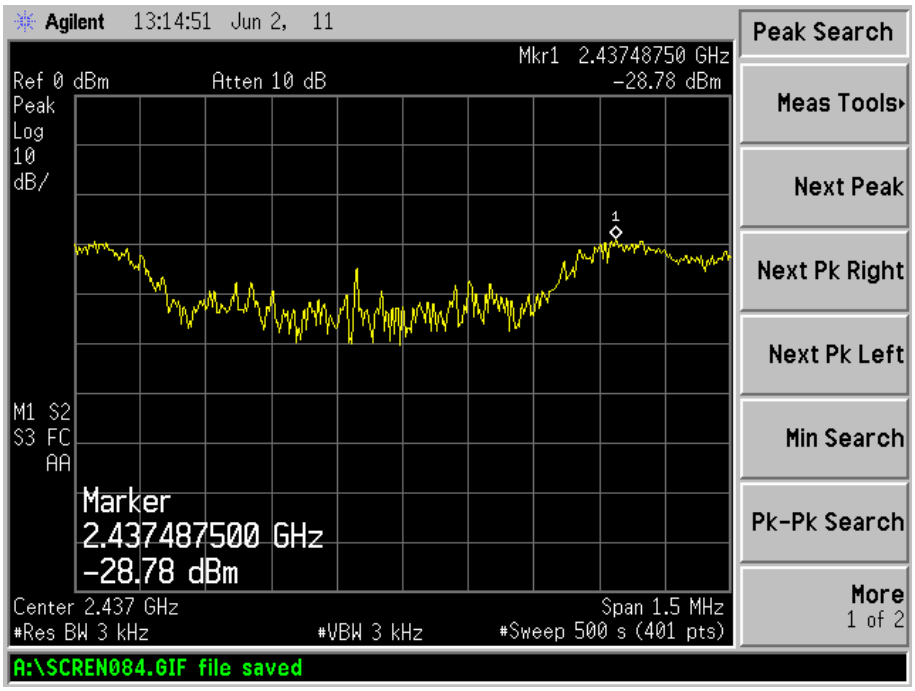


For 802.11n HT40

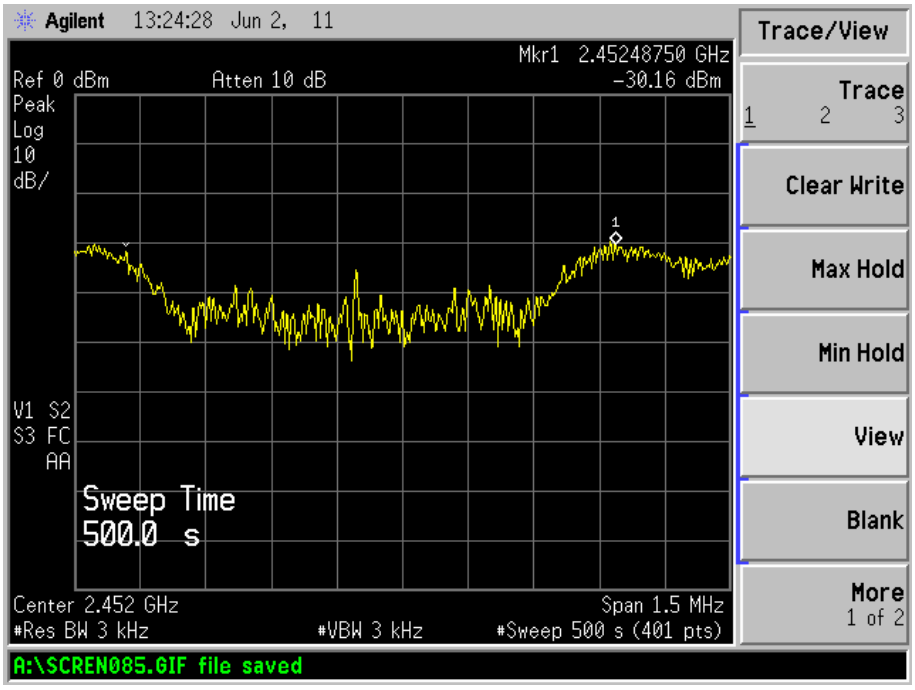
Low Channel:



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	2010-12-20	2011-12-19
Attenuator	ATTEN	ATS100-4-20	/	2010-12-20	2011-12-19

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

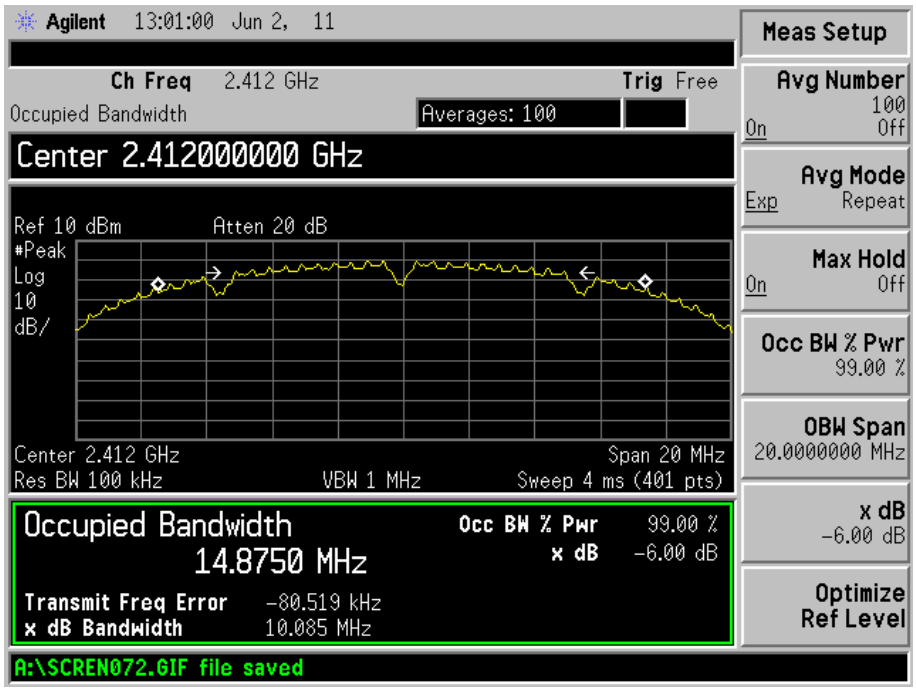
Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.5 Summary of Test Results/Plots

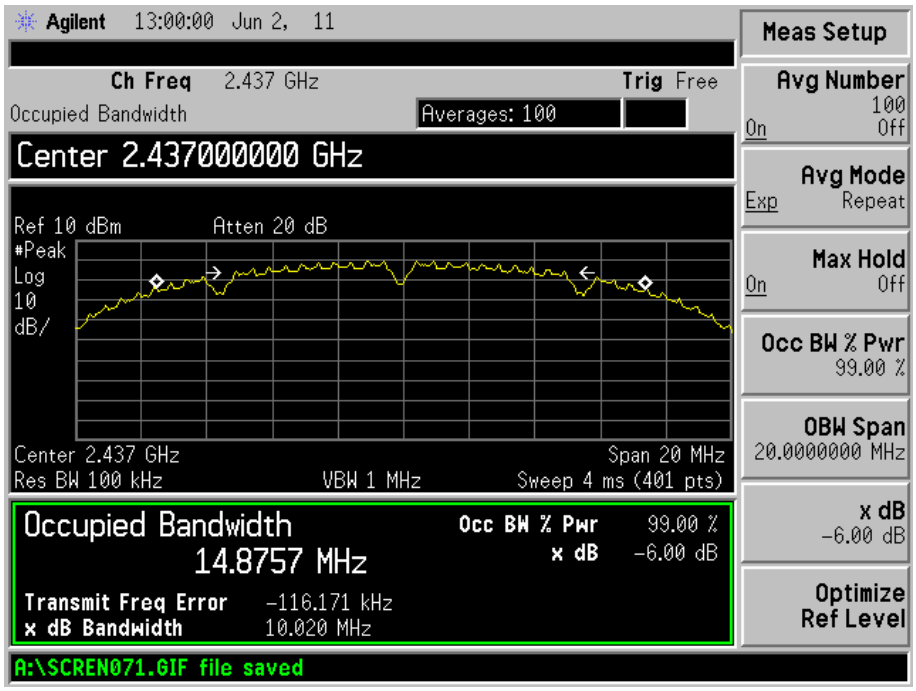
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11b	2412	10085	500
	2437	10020	500
	2462	10099	500
802.11g	2412	16523	500
	2437	16488	500
	2462	16498	500
802.11n HT20	2412	17799	500
	2437	17754	500
	2462	17762	500
802.11n HT40	2422	36326	500
	2437	36260	500
	2452	36276	500

For 802.11b

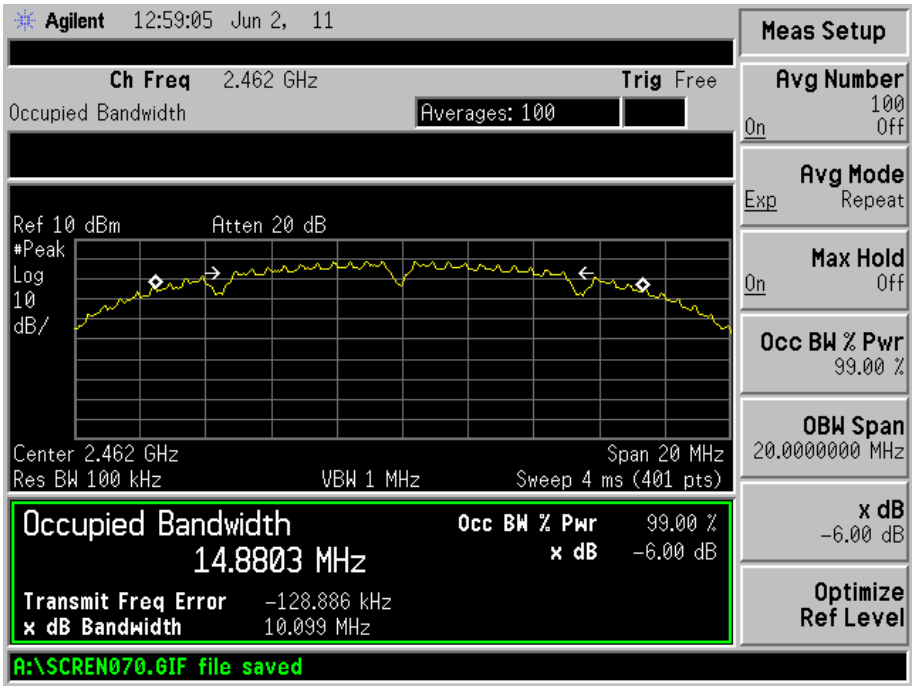
Low Channel:



Mid Channel:

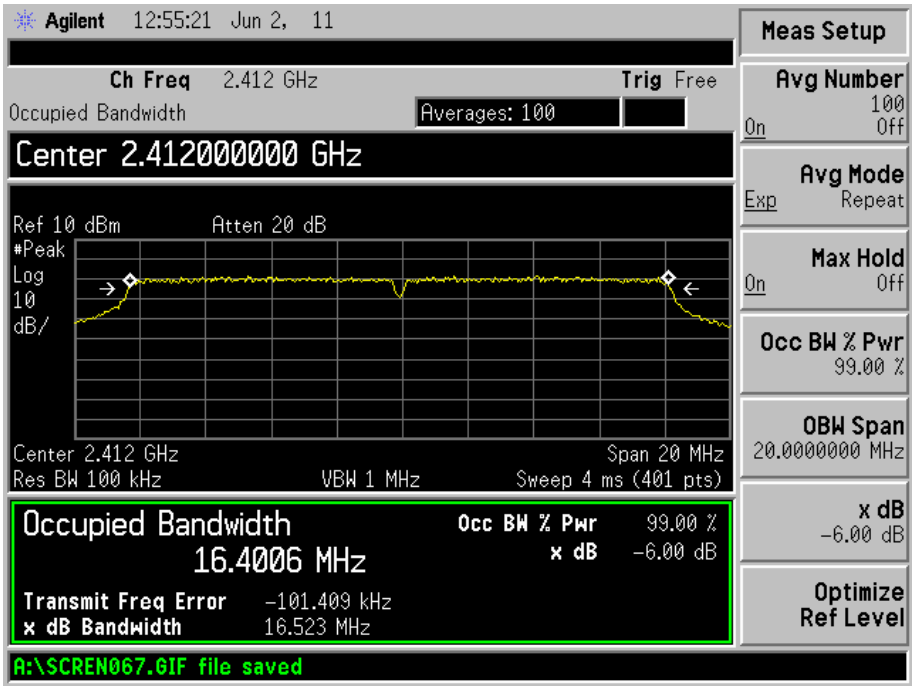


High Channel:

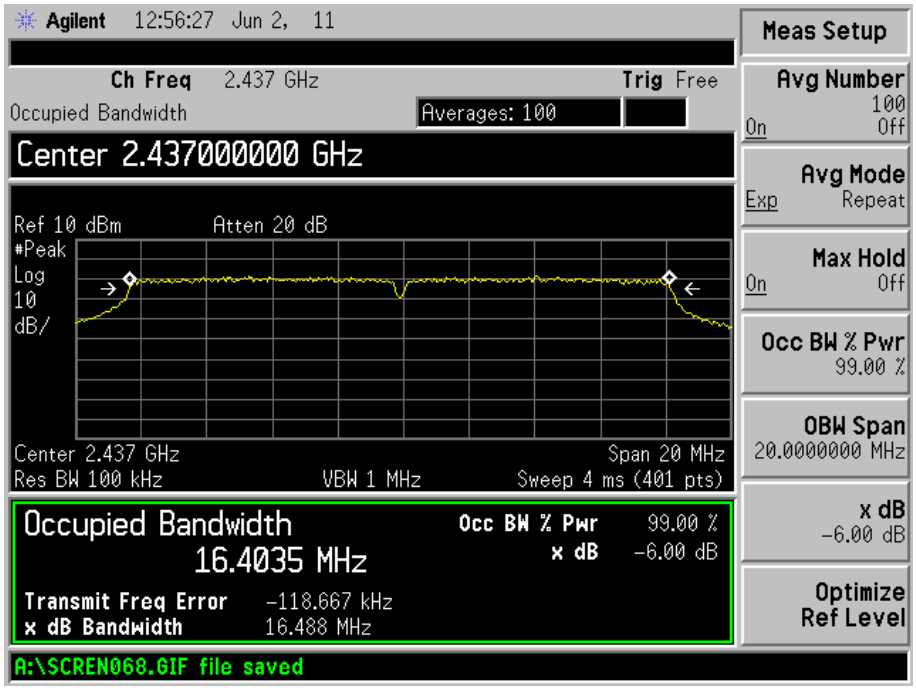


For 802.11g

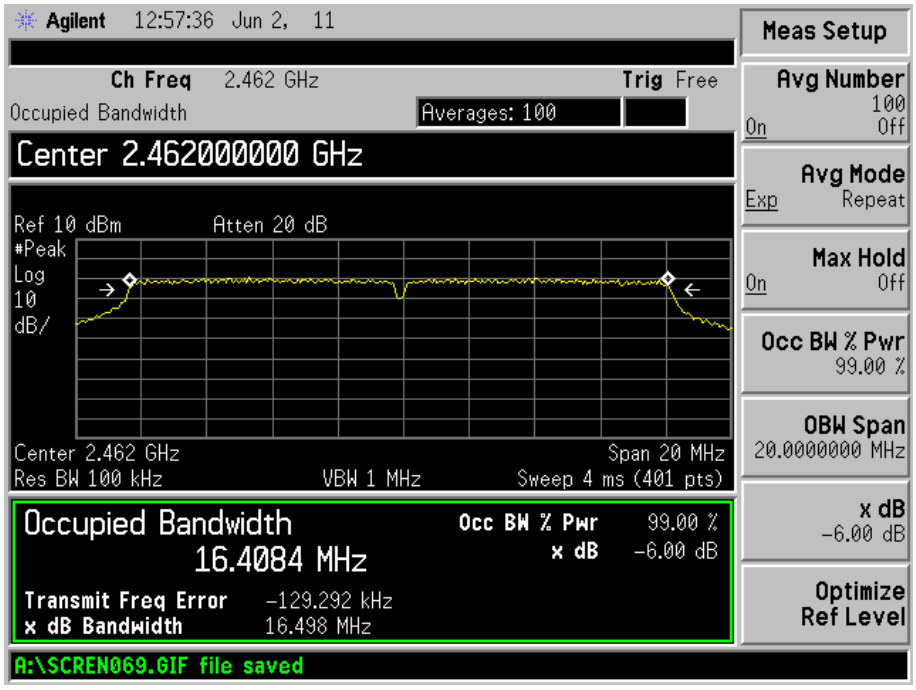
Low Channel:



Mid Channel:

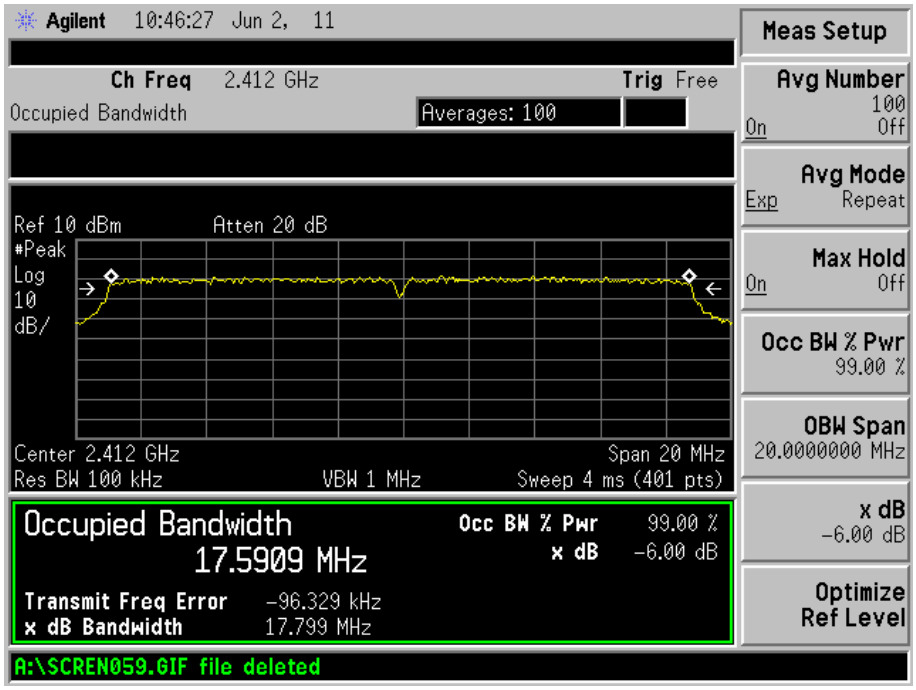


High Channel:

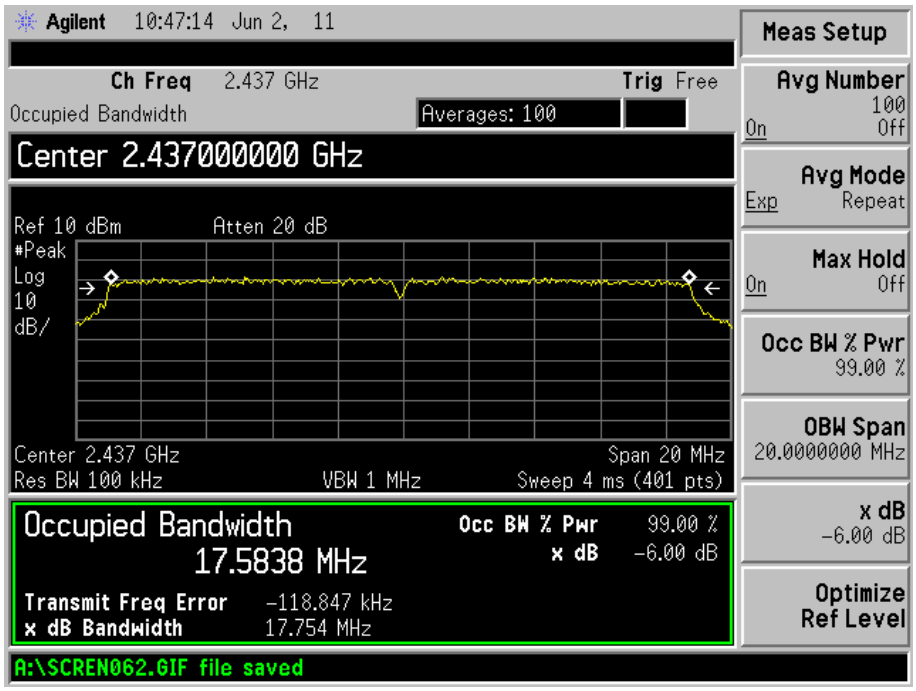


For 802.11n HT20

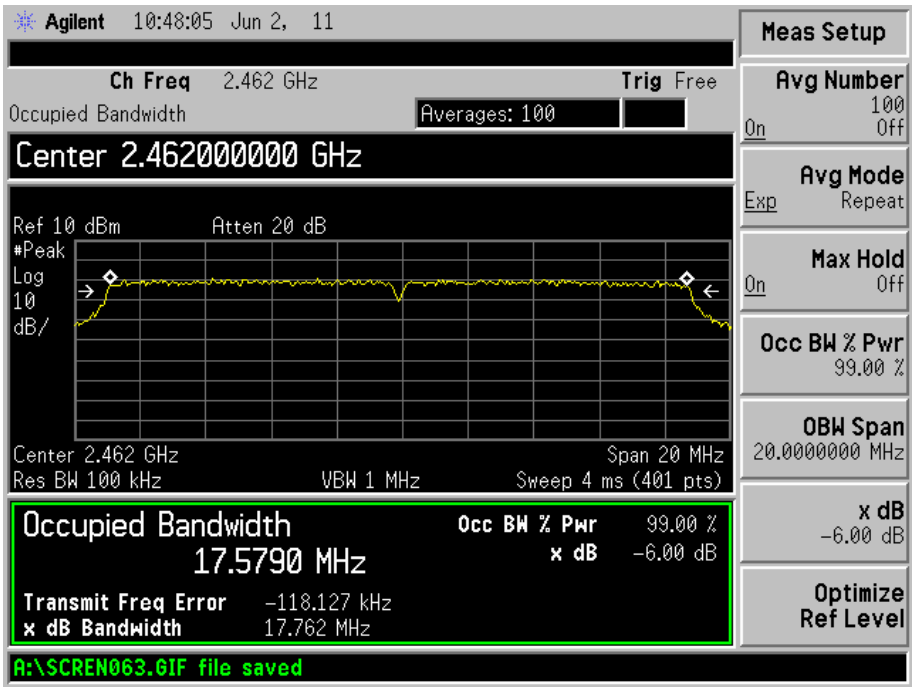
Low Channel:



Middle Channel:

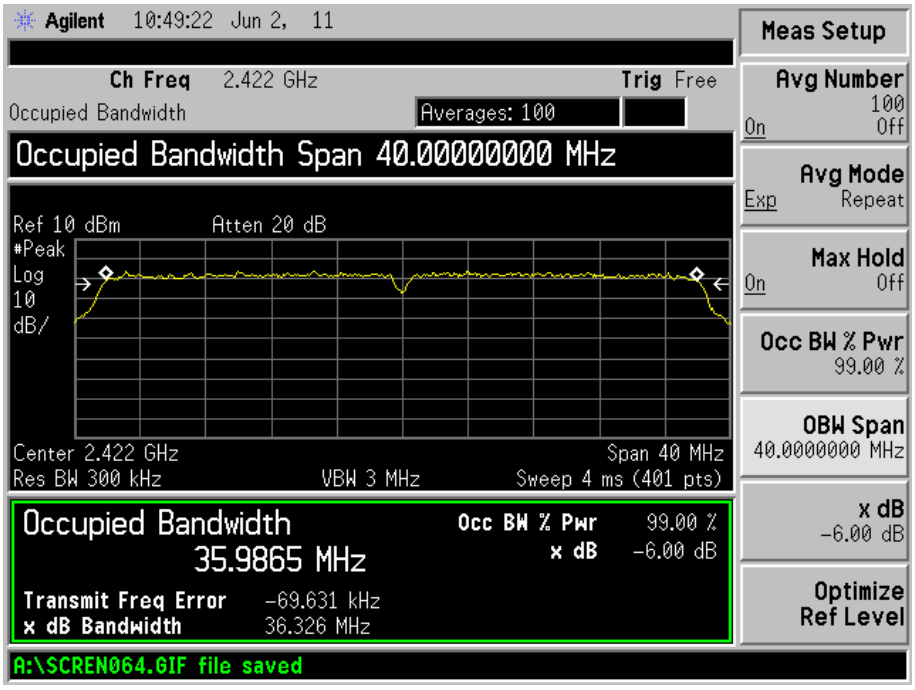


High Channel:

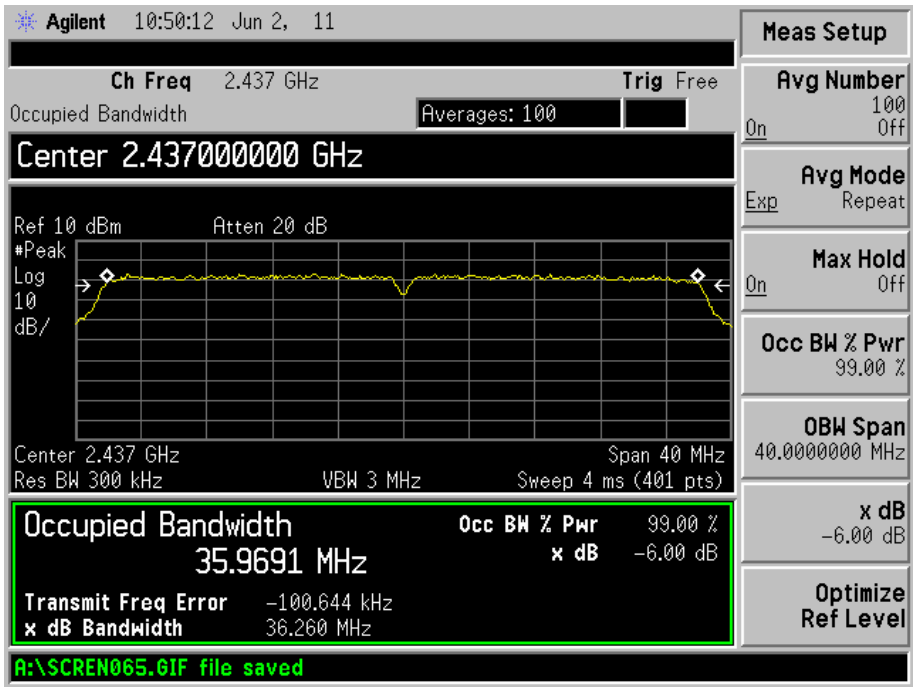


For 802.11n HT40

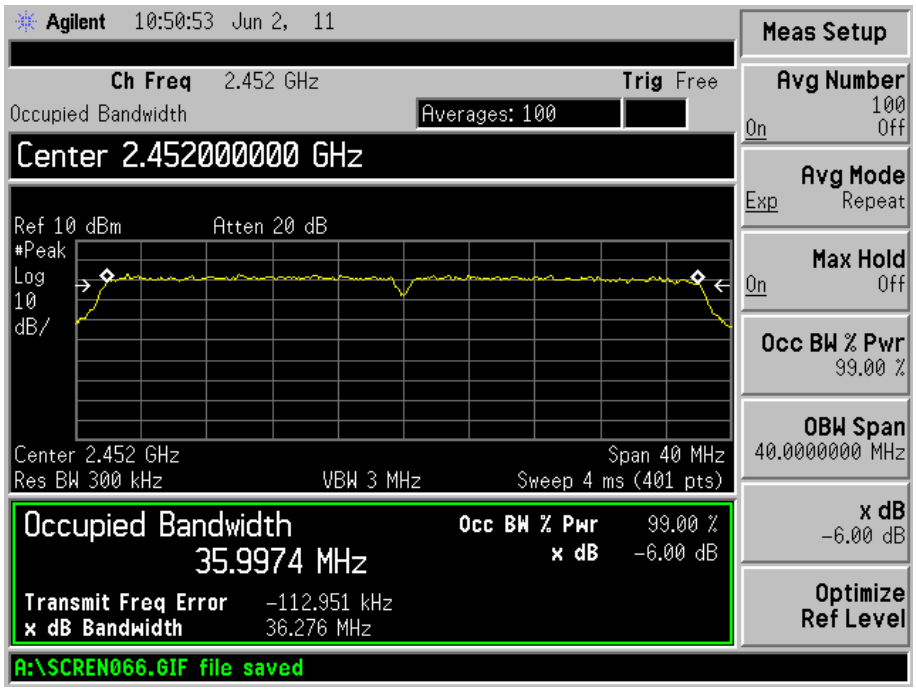
Low Channel:



Middle 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	2010-12-20	2011-12-19
Attenuator	ATTEN	ATS100-4-20	/	2010-12-20	2011-12-19

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 $\geqslant$ 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

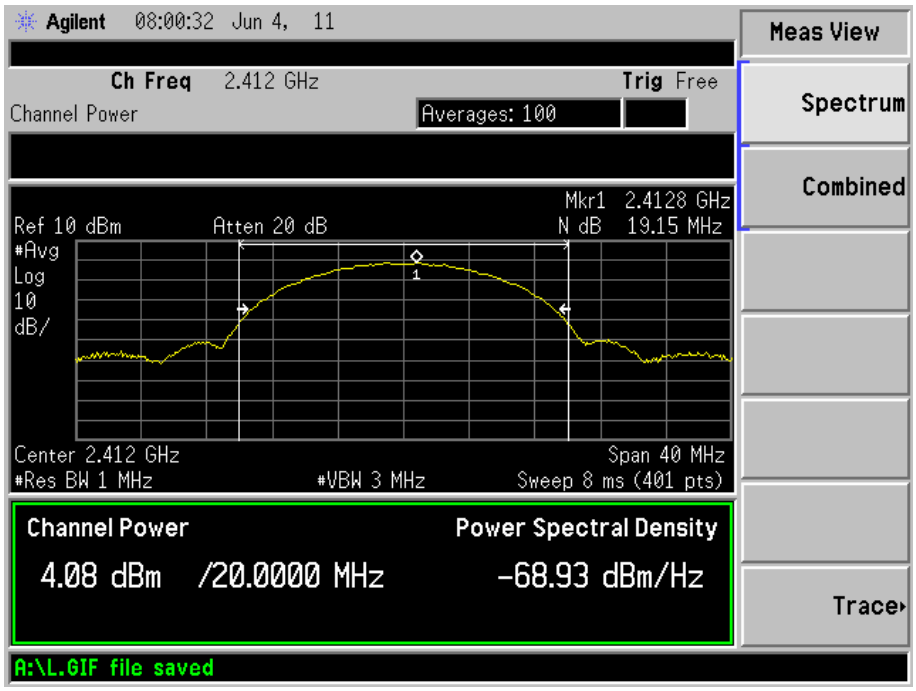
7.5 Summary of Test Results/Plots

Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11b (1M)	2412	4.08	0.002559	1
	2437	4.76	0.002992	1
	2462	4.73	0.002972	1
802.11b (11M)	2412	4.39	0.002748	1
	2437	4.86	0.003062	1
	2462	4.51	0.002825	1
802.11g (6M)	2412	4.73	0.002972	1
	2437	5.38	0.003451	1
	2462	4.64	0.002911	1
802.11g (54M)	2412	4.18	0.002618	1
	2437	4.77	0.002999	1
	2462	4.24	0.002655	1

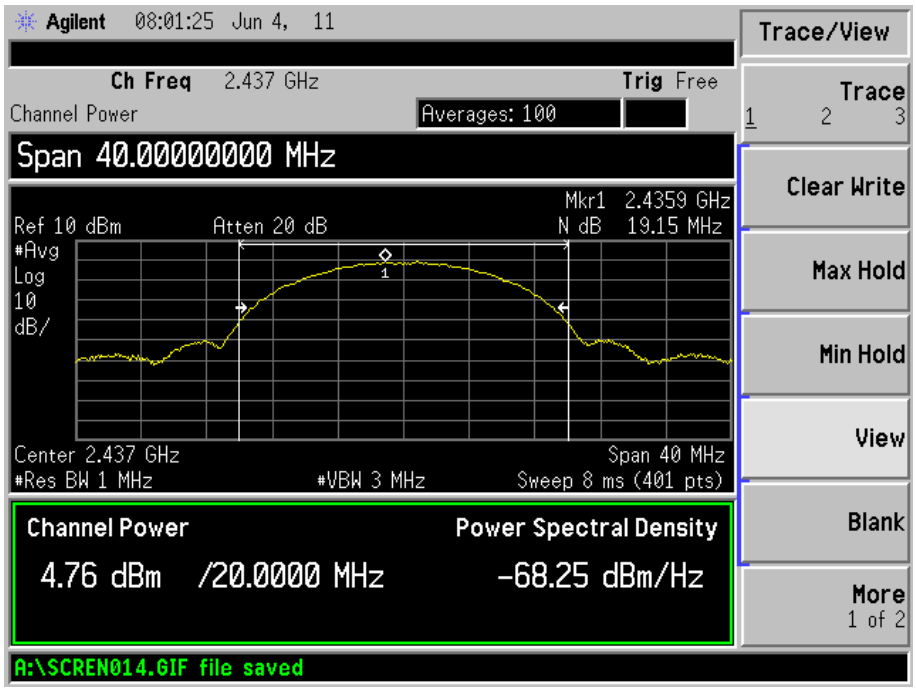
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11n HT20 (MCS 01)	2412	4.29	0.002685	1
	2437	4.99	0.003155	1
	2462	4.60	0.002884	1
802.11n HT20 (MCS 07)	2412	3.54	0.002259	1
	2437	4.14	0.002594	1
	2462	3.65	0.002317	1
802.11n HT40 (MCS 01)	2422	4.64	0.002911	1
	2437	4.70	0.002951	1
	2452	4.78	0.003006	1
802.11n HT40 (MCS 07)	2422	4.29	0.002685	1
	2437	4.69	0.002944	1
	2452	4.43	0.002773	1

For 802.11b_1M rate

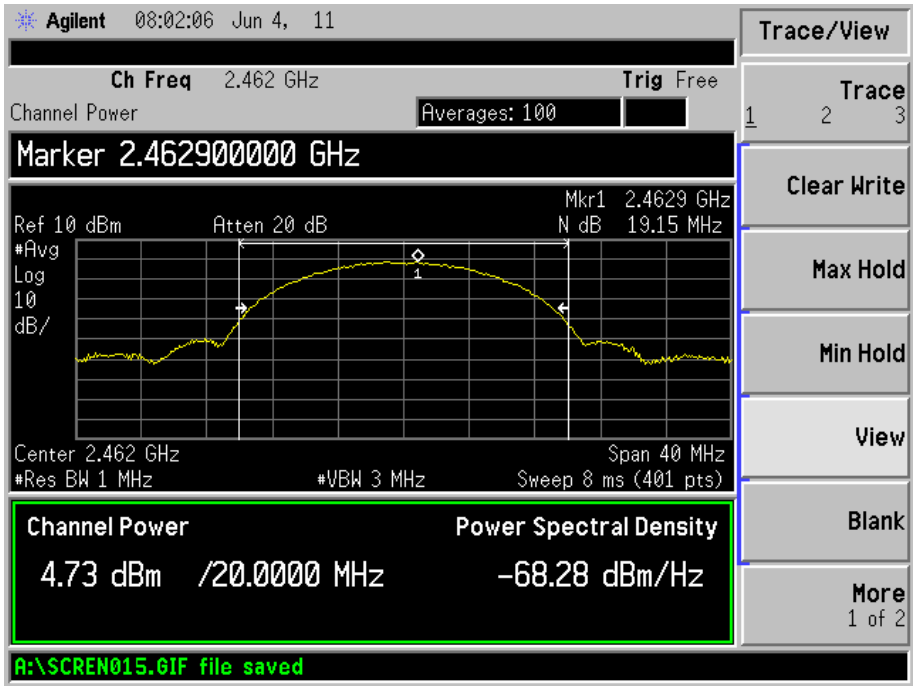
Low Channel:



Middle Channel:

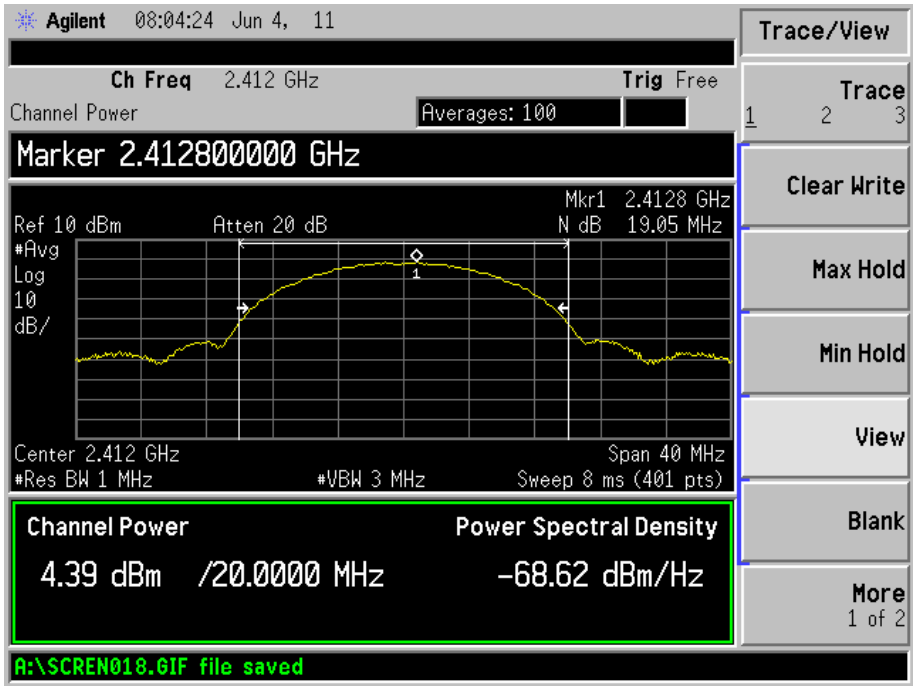


High Channel:

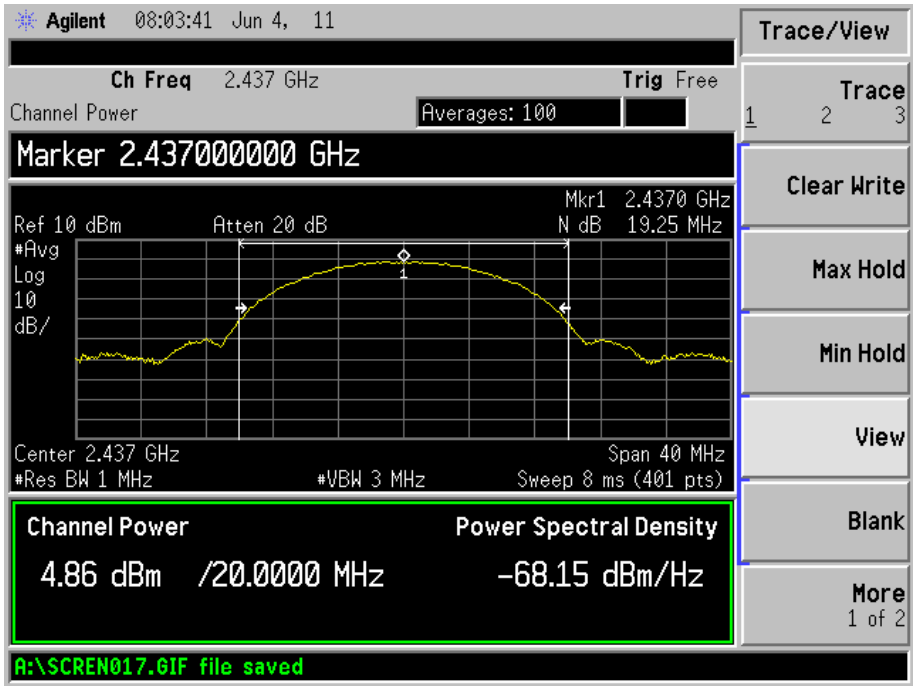


For 802.11b_11M rate

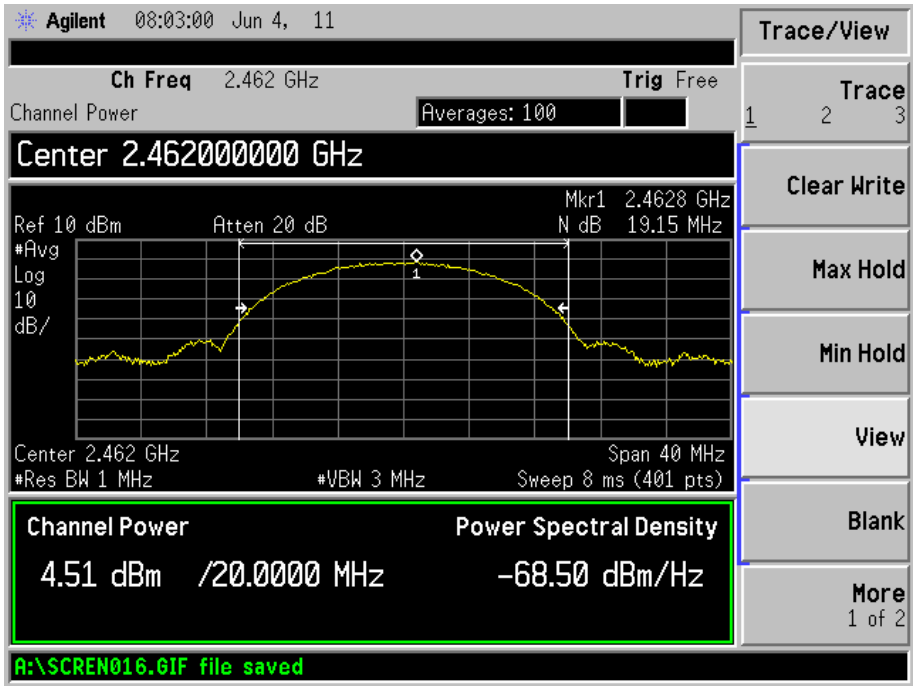
Low Channel:



Middle Channel:

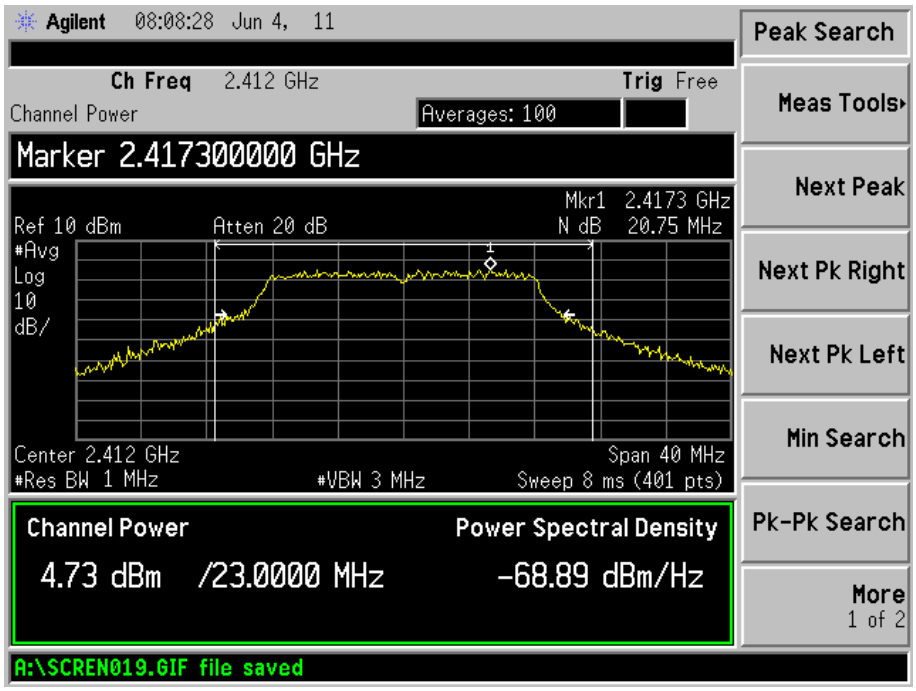


High Channel:

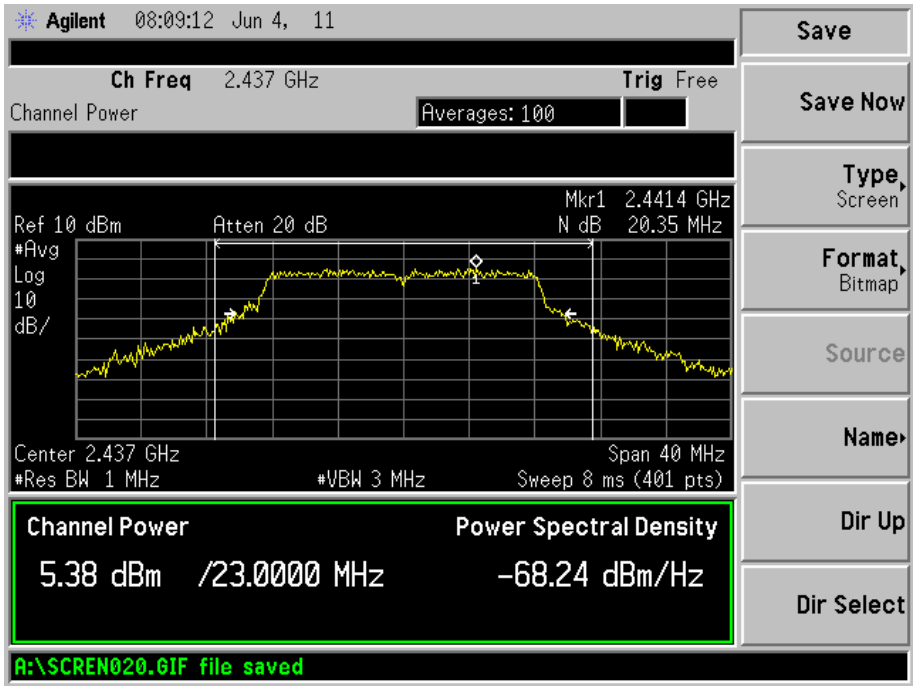


For 802.11g_6M rate

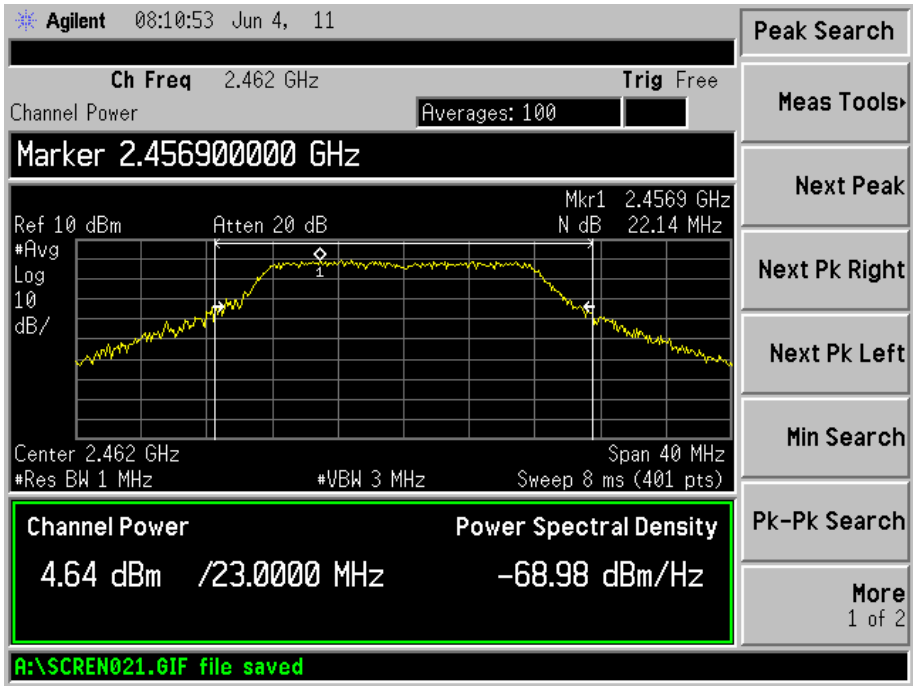
Low Channel:



Middle Channel:

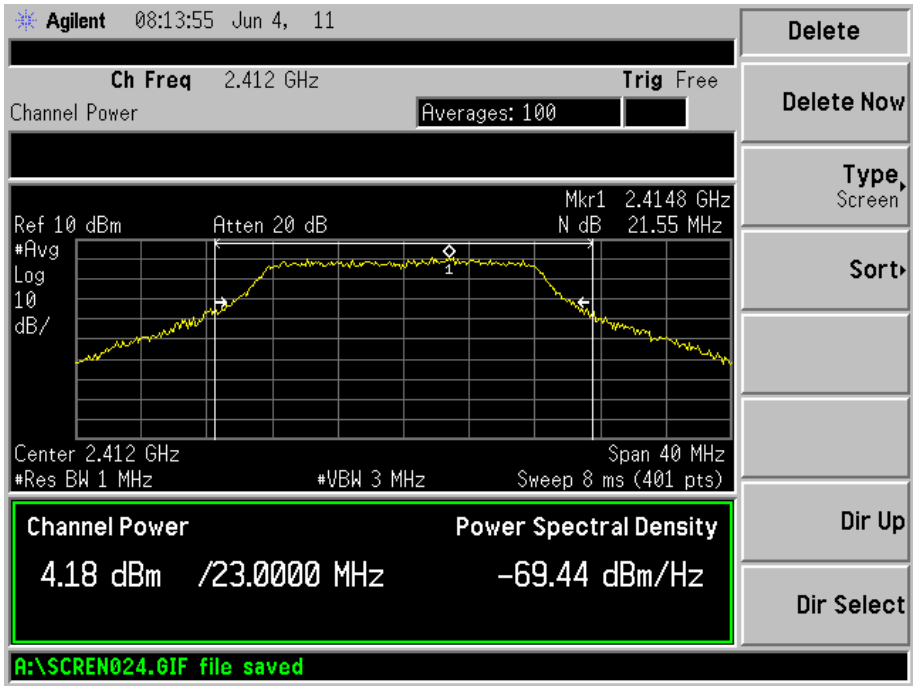


High Channel:

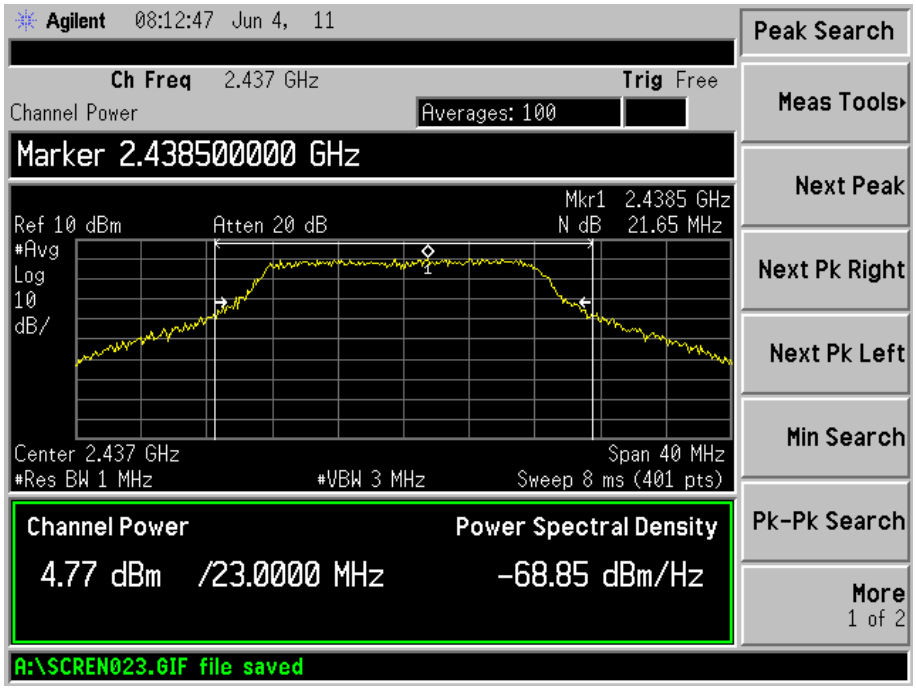


For 802.11g_54M rate

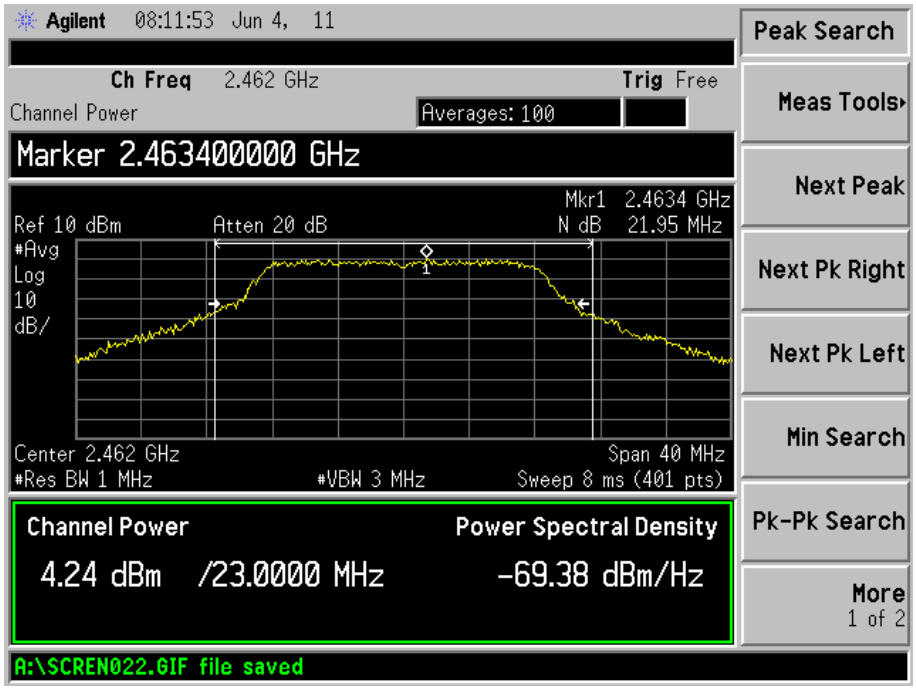
Low Channel:



Middle Channel:

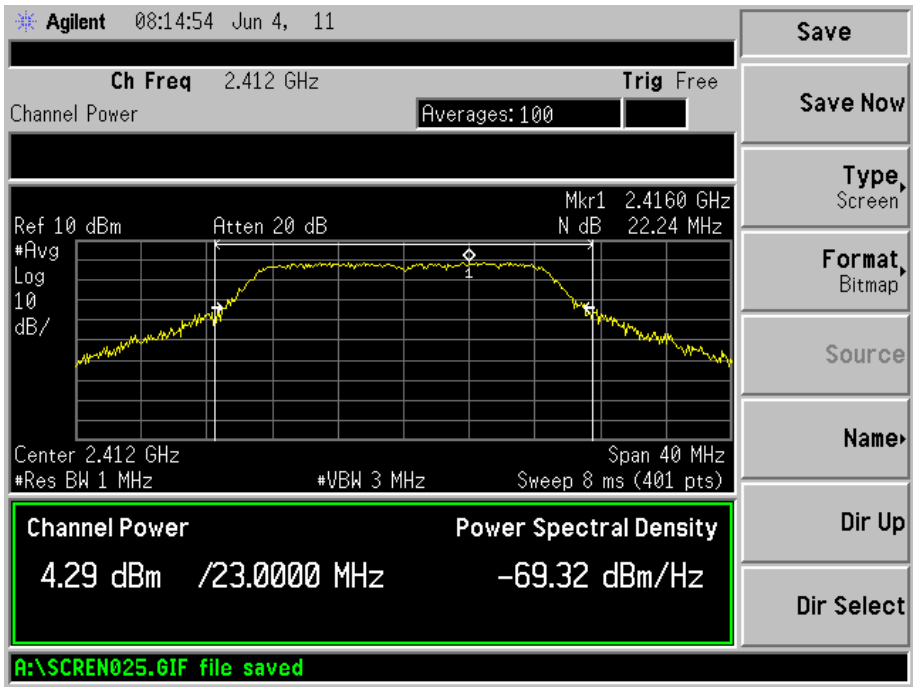


High Channel:

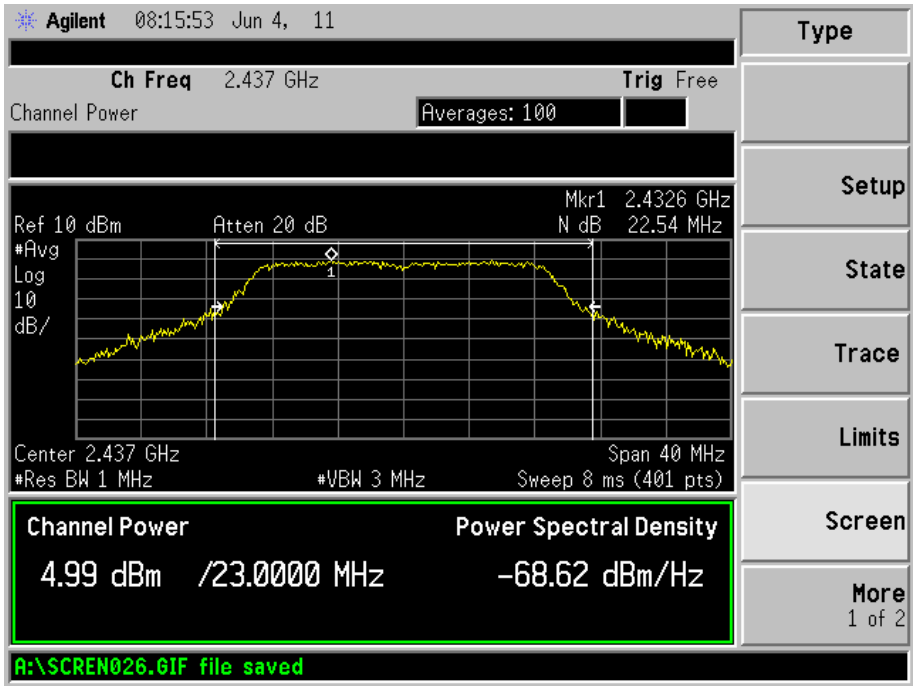


For 802.11n HT20_MCS 01 rate

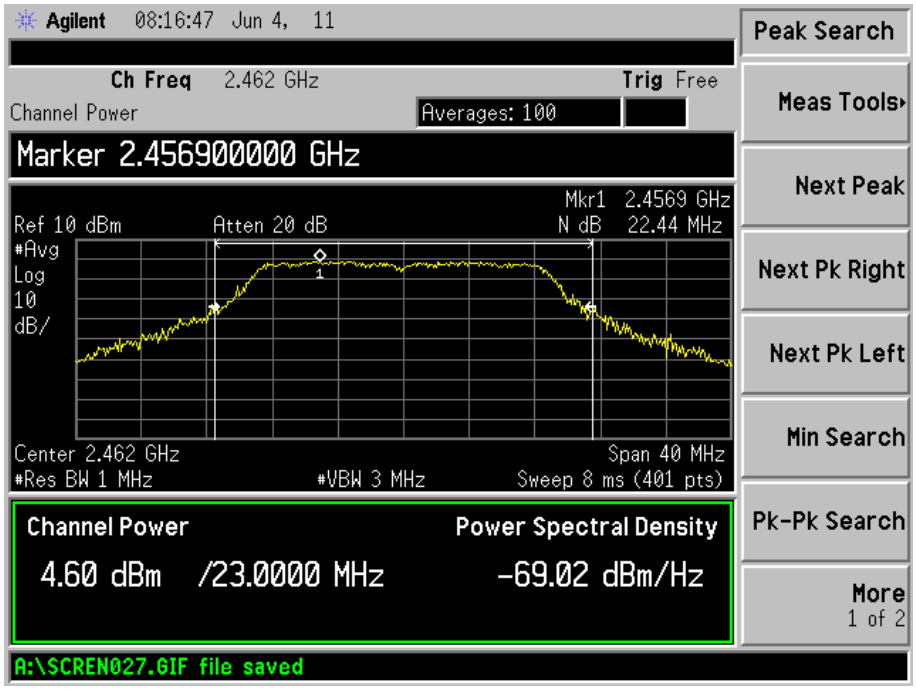
Low Channel:



Middle Channel:

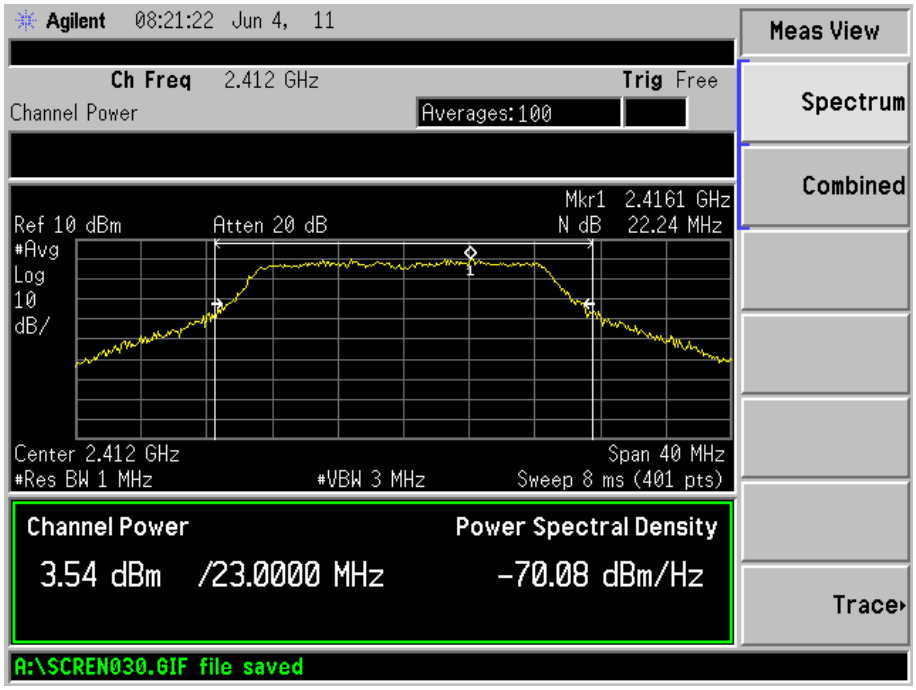


High Channel:

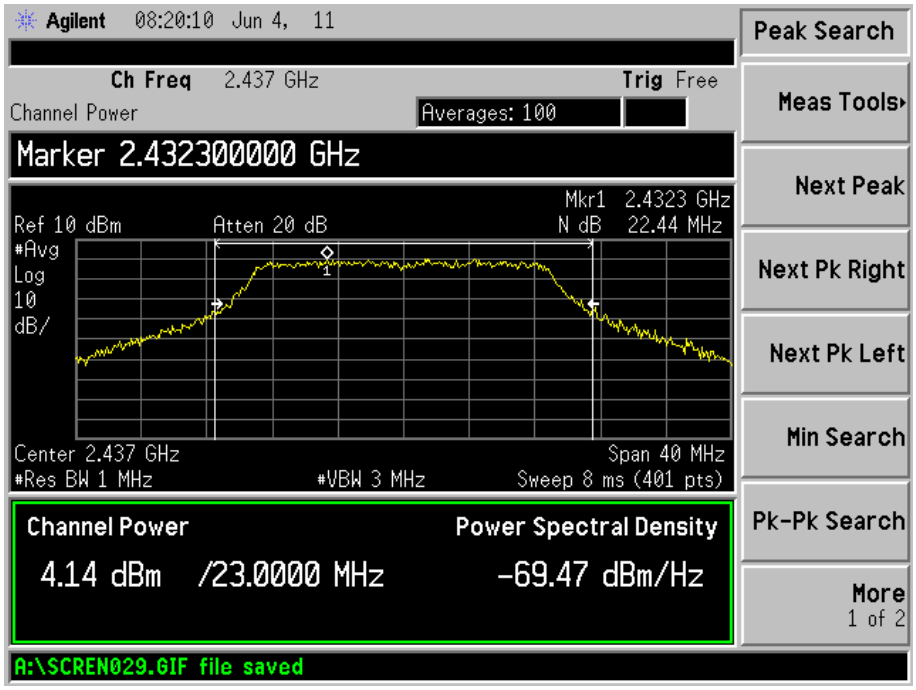


For 802.11n HT20_MCS 07 rate

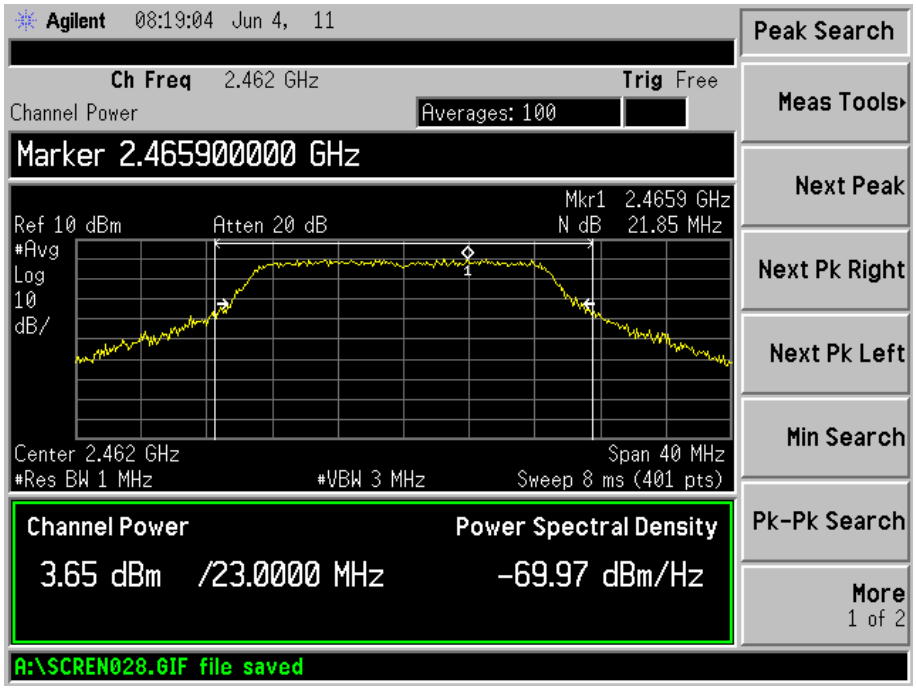
Low Channel:



Middle Channel:

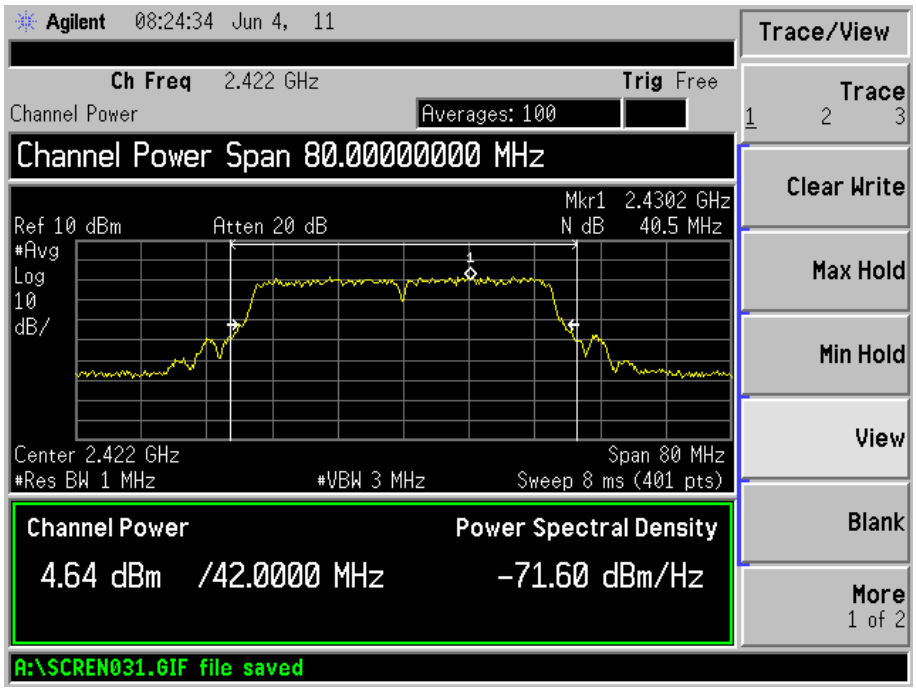


High Channel:

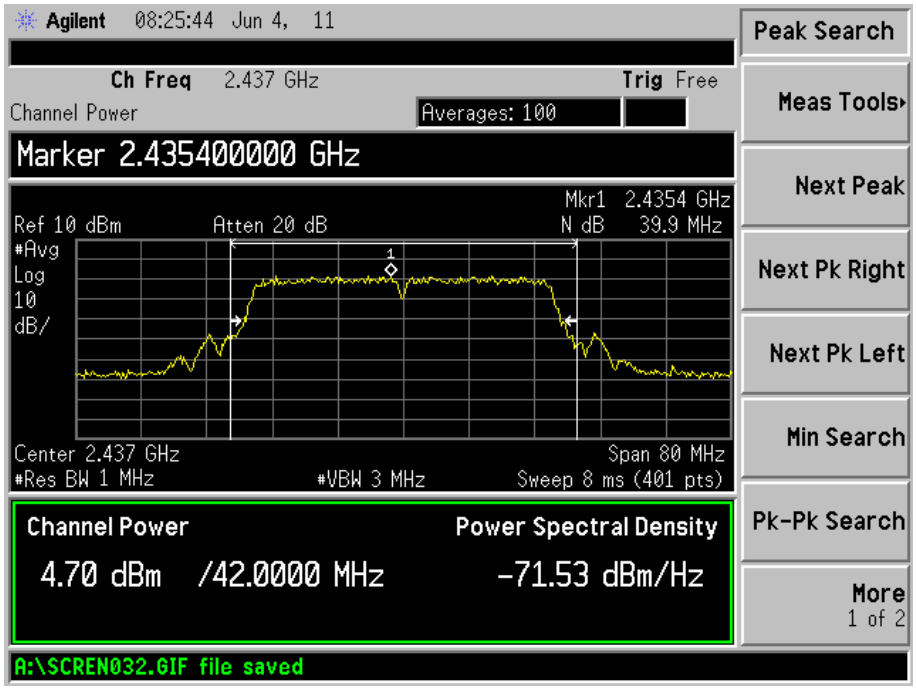


For 802.11n HT40_MCS 01 rate

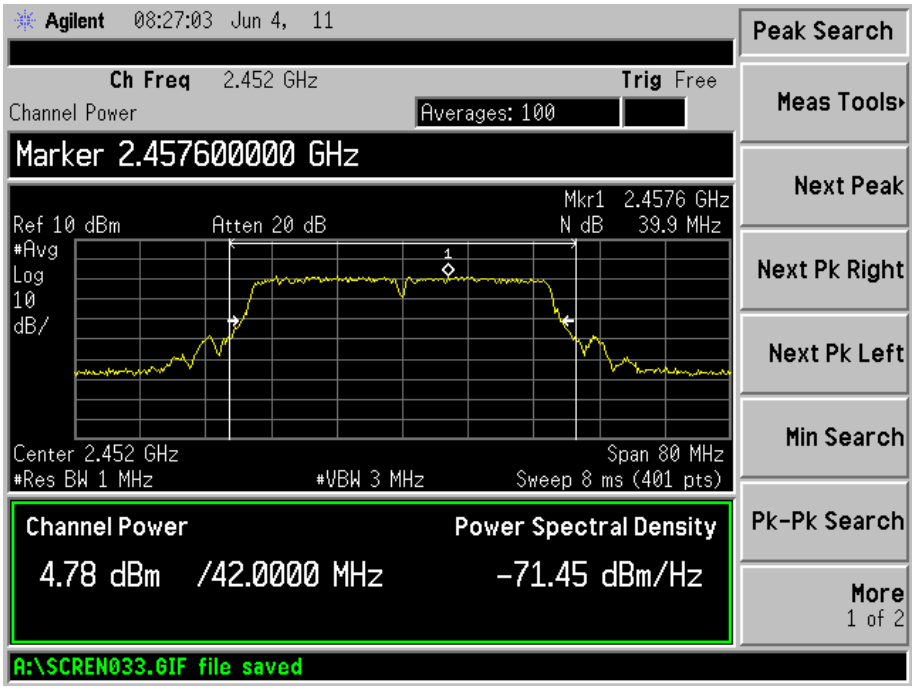
Low Channel:



Middle Channel:

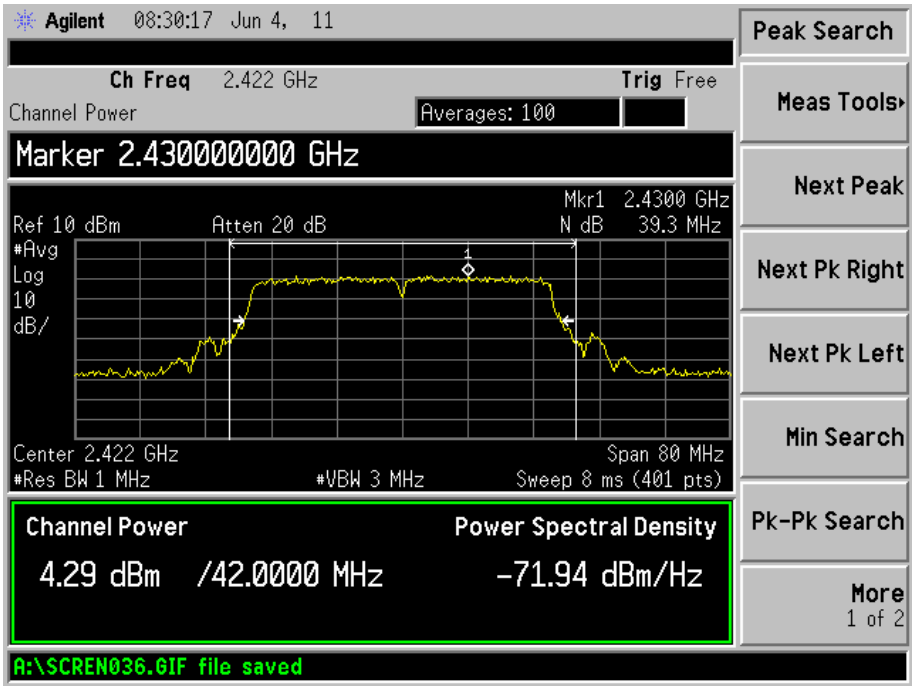


High Channel:

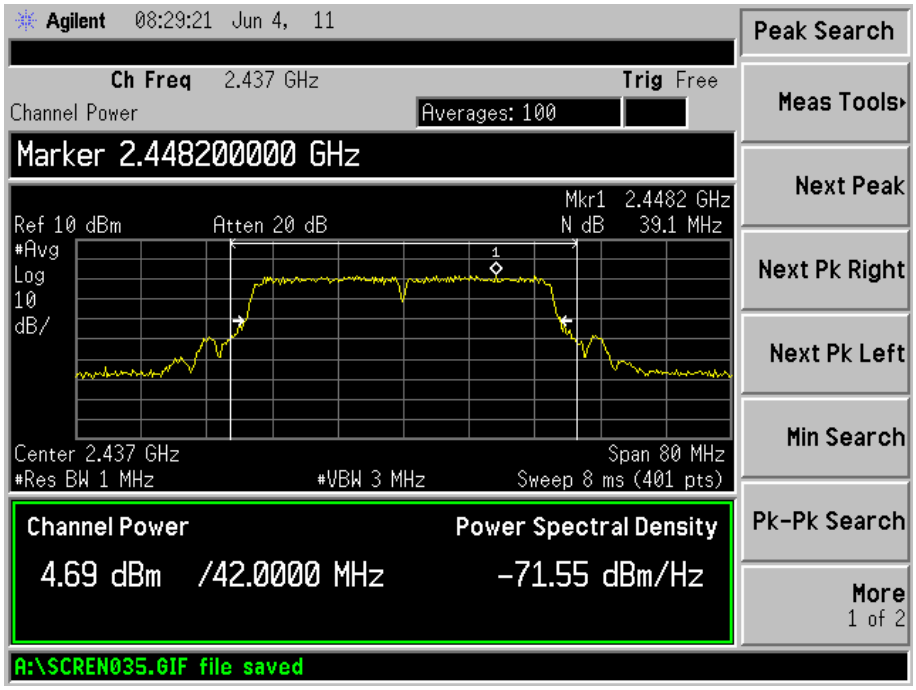


For 802.11n HT40_MCS 07 rate

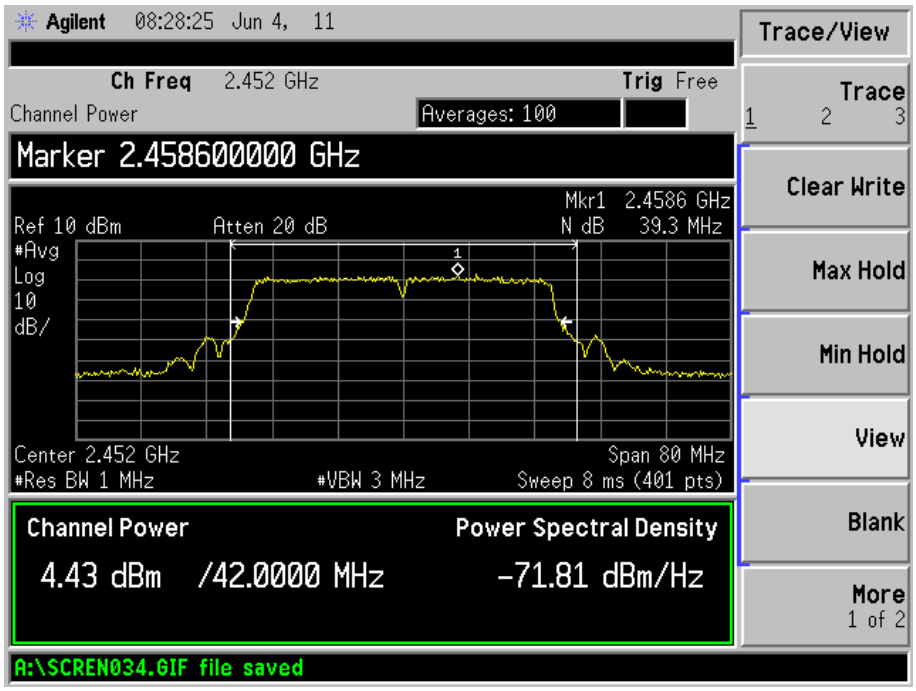
Low Channel:



Middle 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.

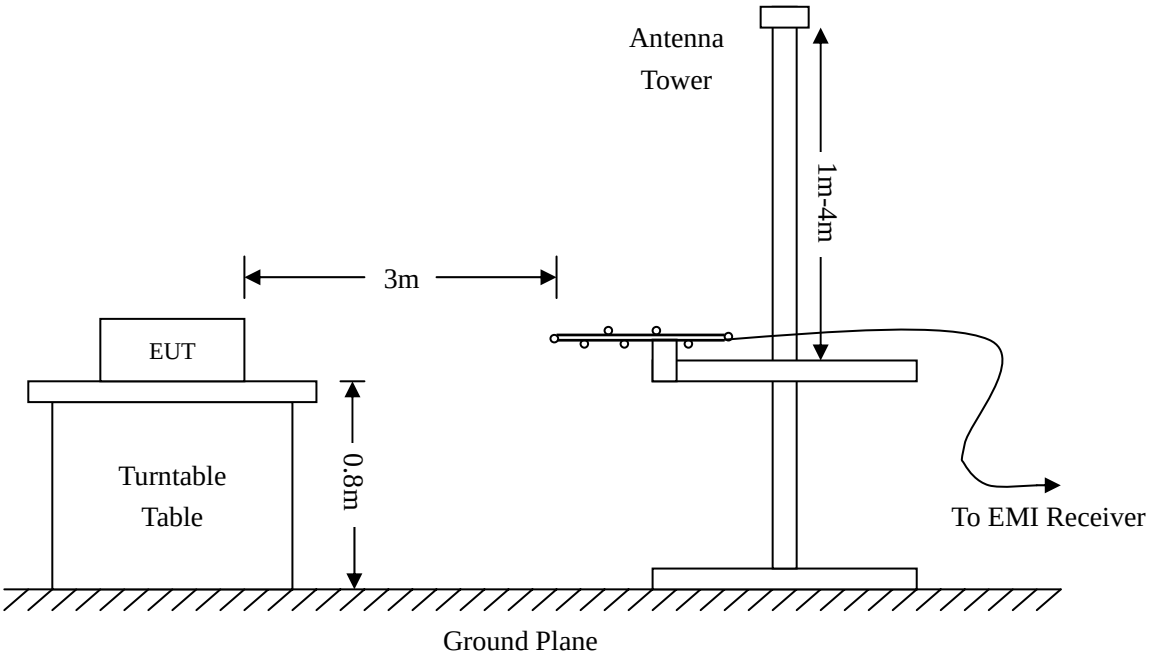
Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

8.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08

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:

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

8.6 Environmental Conditions

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

8.7 Summary of Test Results/Plots

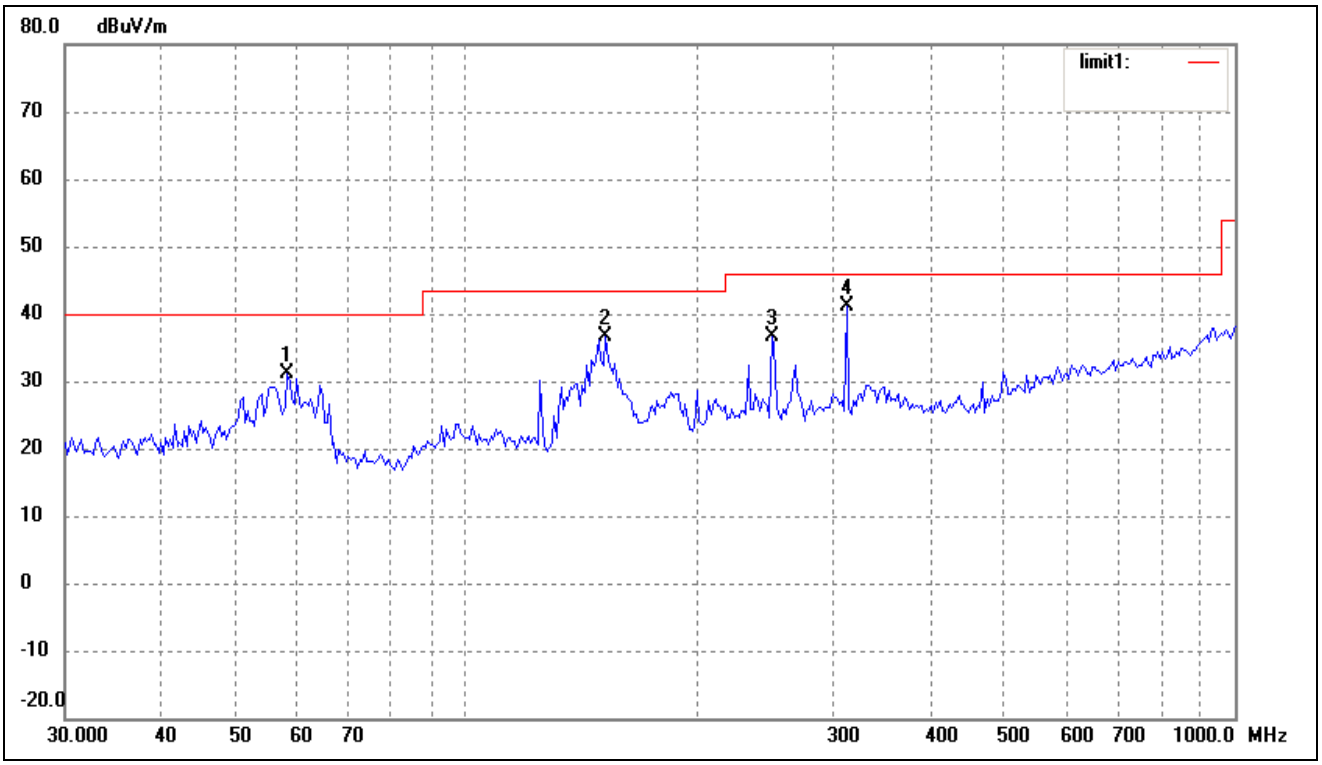
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst margin of:

-2.87dBμV at **468.8761MHz** in the **Vertical** polarization, **Transmitting 802.11b** test mode with, **30 MHz to 25 GHz, 3Meters**

-2.41dBμV at **4874MHz** in the **Vertical** polarization, **Transmitting 802.11b** test mode with, **30 MHz to 25 GHz, 3Meters**

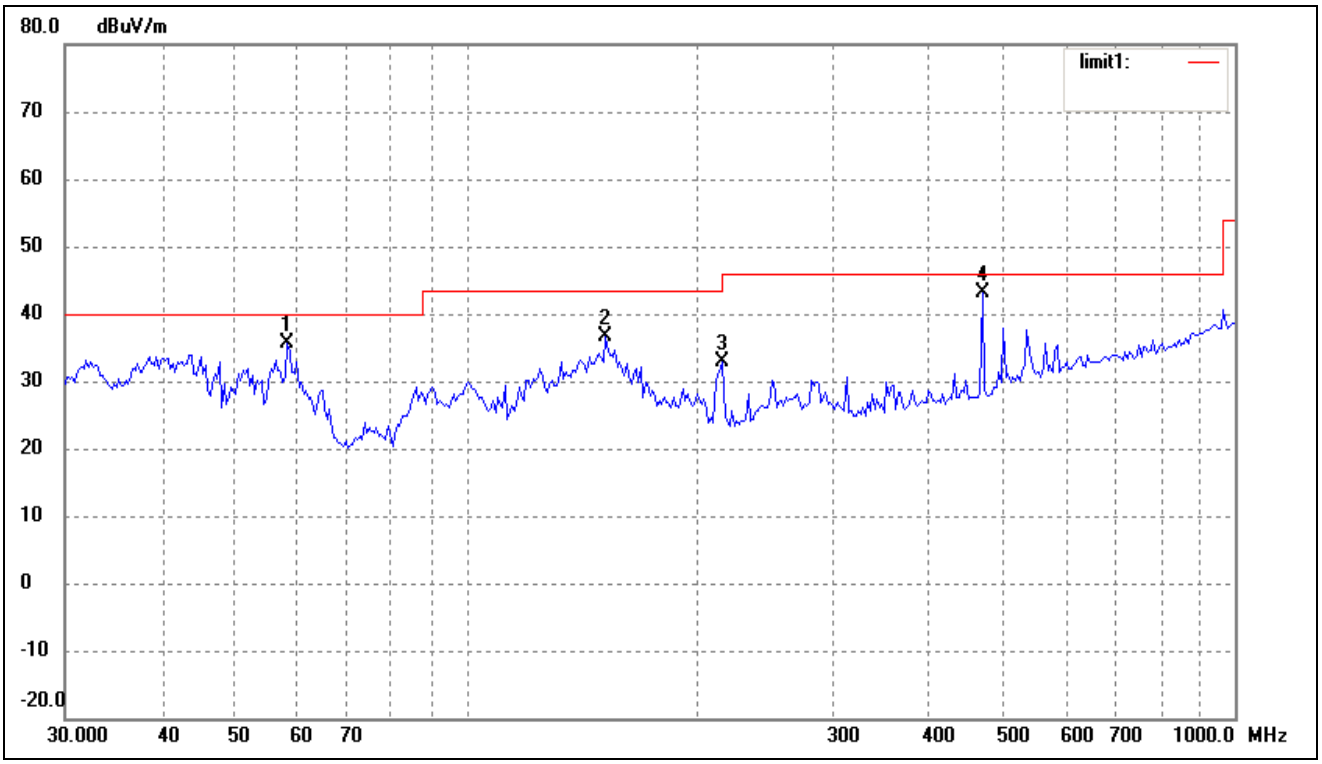
Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

Test Result/Plots:
For Short Antenna (Gain 2dBi)
Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b)
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	23.42	7.60	31.02	40.00	-8.98	360	100	peak
2	151.5971	32.48	4.15	36.63	43.50	-6.87	0	200	peak
3	249.4250	27.90	8.68	36.58	46.00	-9.42	0	200	peak
4	312.1793	31.12	9.90	41.02	46.00	-4.98	206	339	QP

Vertical

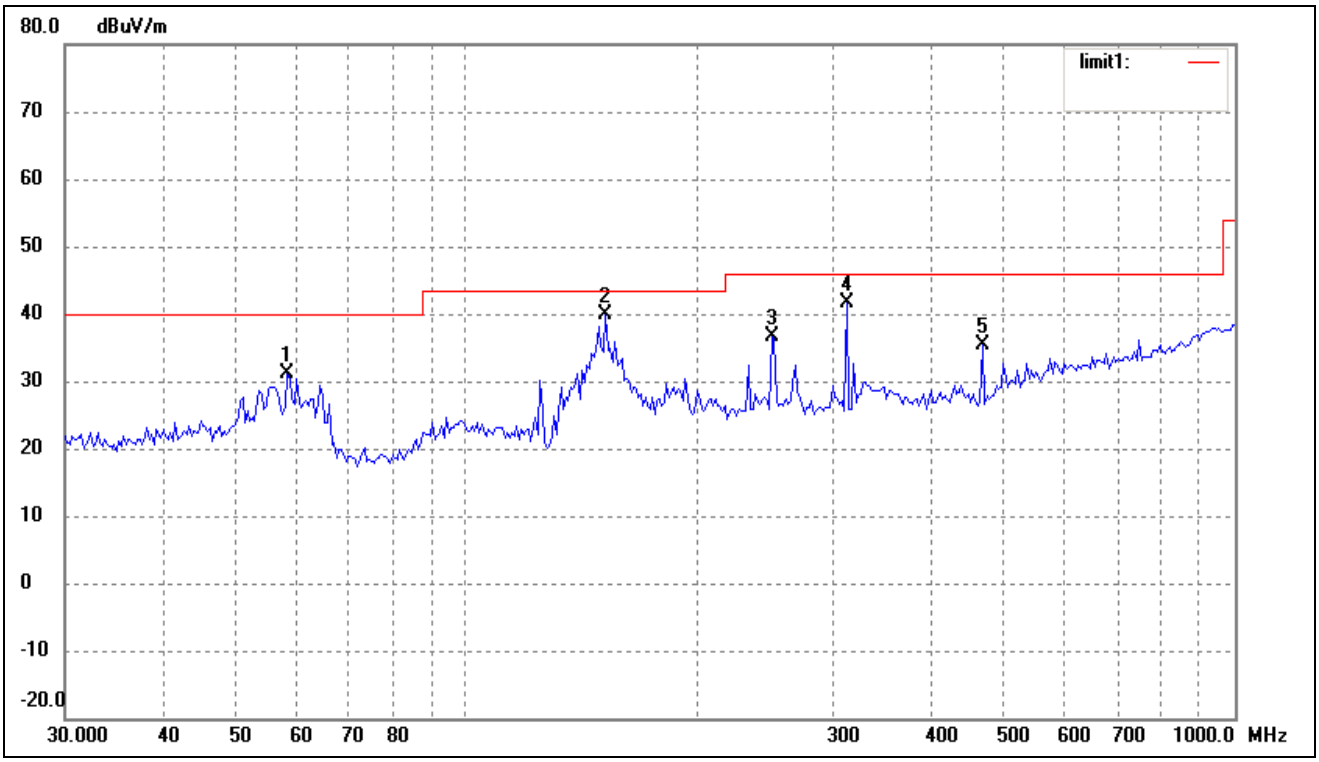


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	28.13	7.60	35.73	40.00	-4.27	109	143	QP
2	151.5971	32.59	4.15	36.74	43.50	-6.76	360	200	peak
3	215.2677	25.71	7.12	32.83	43.50	-10.67	360	200	peak
4	468.8761	31.07	12.06	43.13	46.00	-2.87	119	219	QP

Spurious Emission From 30 MHz to 1 GHz

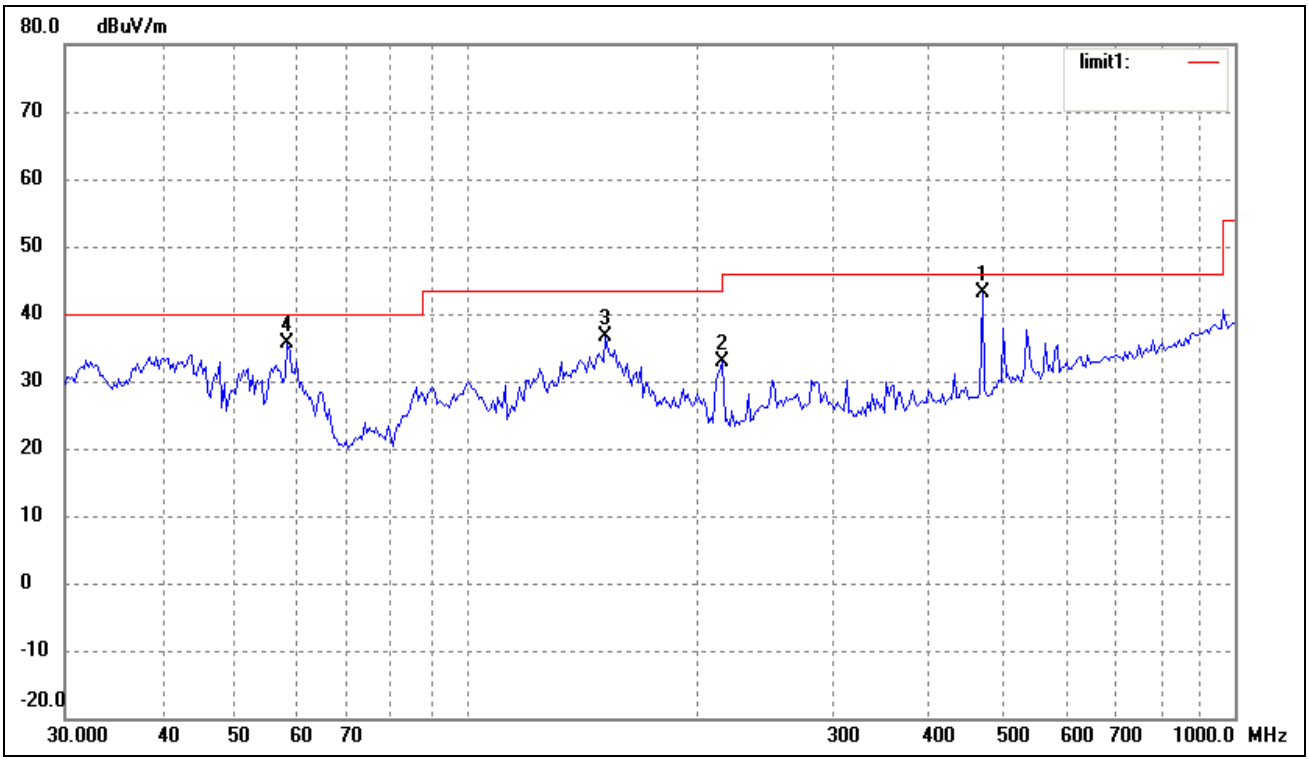
Test mode: Transmitting (802.11g)

Horizontal



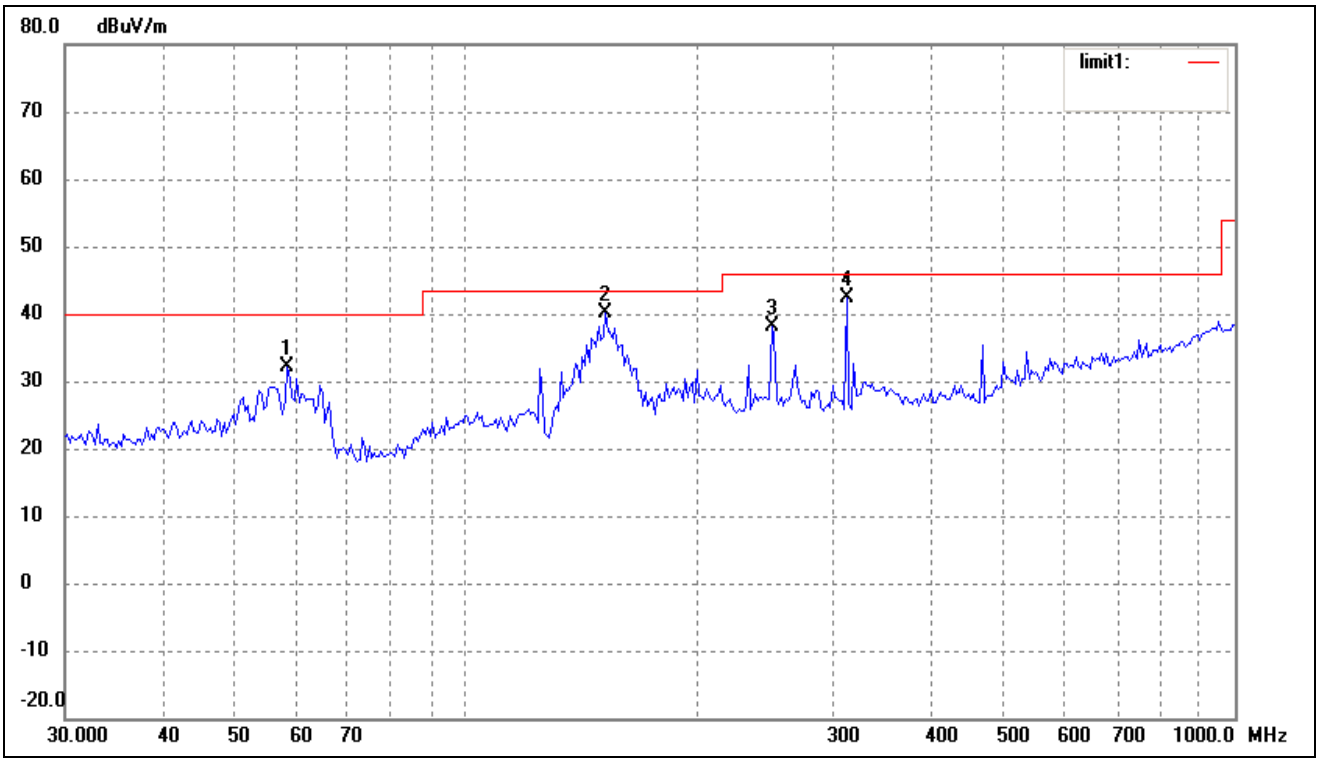
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	23.42	7.60	31.02	40.00	-8.98	360	200	peak
2	151.5971	35.69	4.15	39.84	43.50	-3.66	303	128	QP
3	249.4250	27.90	8.68	36.58	46.00	-9.42	0	200	peak
4	312.1793	31.69	9.90	41.59	46.00	-4.41	116	136	QP
5	468.8761	23.36	12.06	35.42	46.00	-10.58	0	200	peak

Vertical



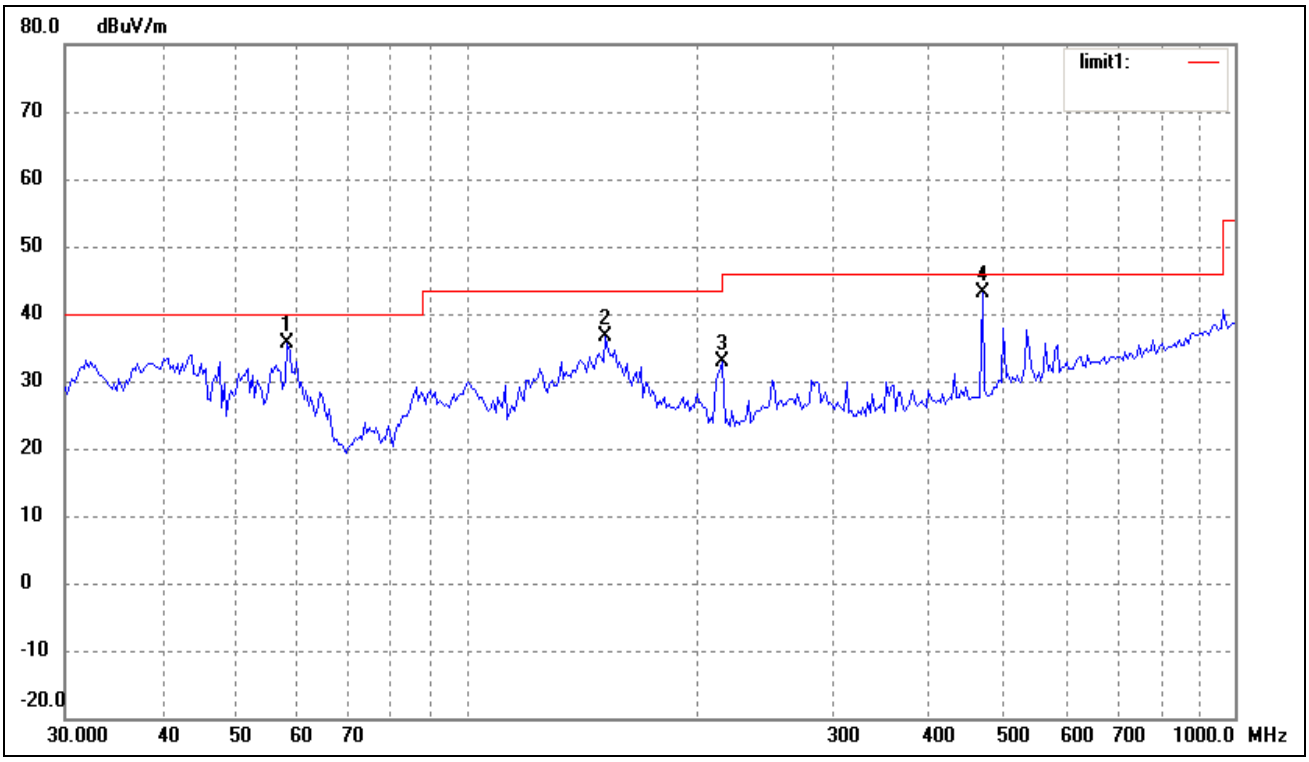
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	468.8761	31.07	12.06	43.13	46.00	-2.87	235	126	QP
2	215.2677	25.71	7.12	32.83	43.50	-10.67	360	100	peak
3	151.5971	32.59	4.15	36.74	43.50	-6.76	0	200	peak
4	58.4074	28.13	7.60	35.73	40.00	-4.27	119	208	QP

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11n HT20)
Horizontal



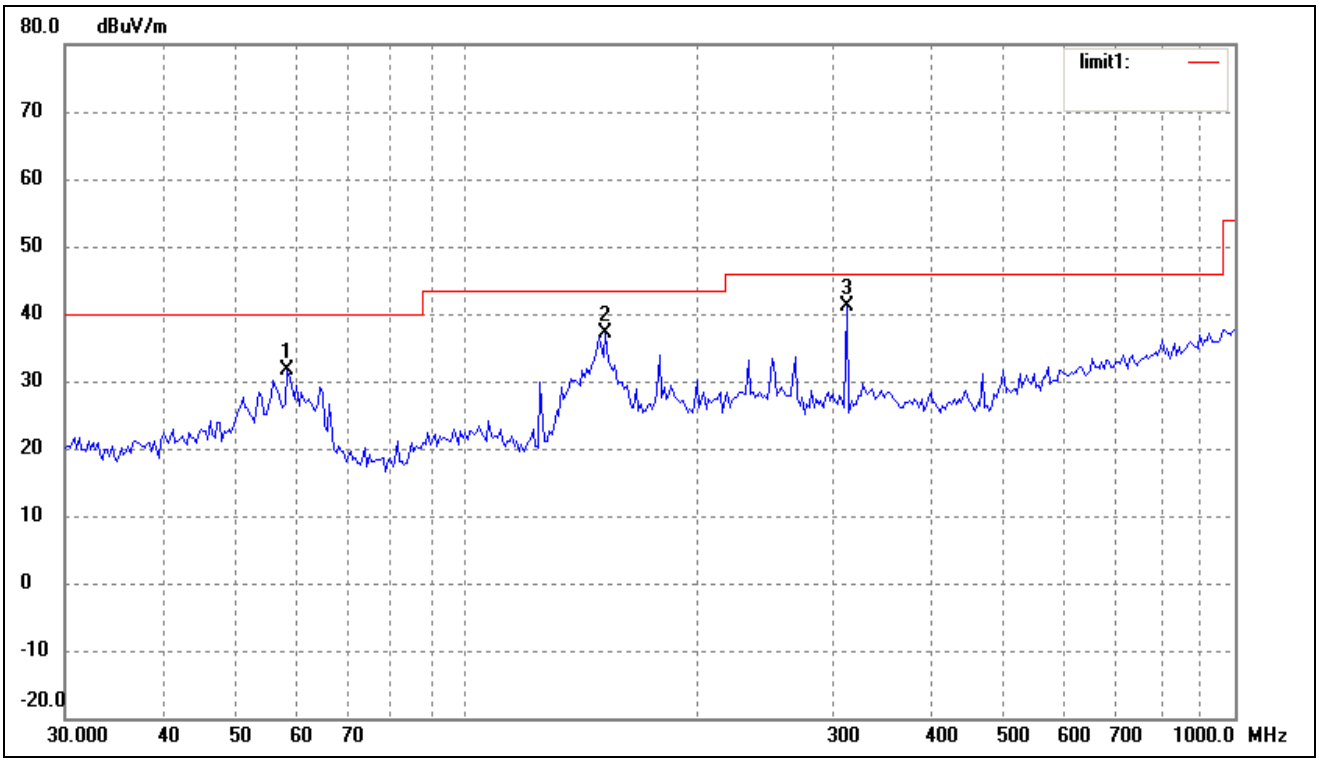
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	24.63	7.60	32.23	40.00	-7.77	360	100	peak
2	151.5971	35.87	4.15	40.02	43.50	-3.48	209	154	QP
3	249.4250	29.35	8.68	38.03	46.00	-7.97	0	200	peak
4	312.1793	32.45	9.90	42.35	46.00	-3.65	118	224	QP

Vertical



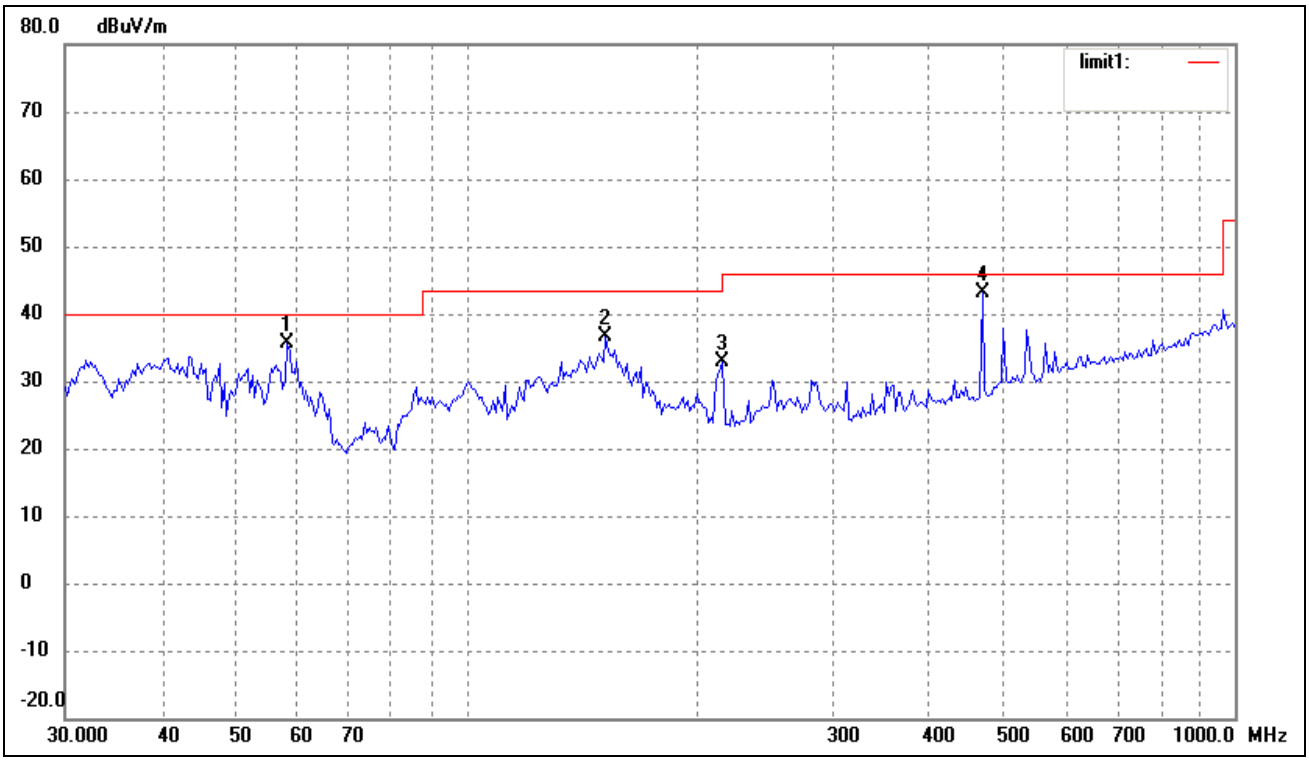
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	28.13	7.60	35.73	40.00	-4.27	338	130	QP
2	151.5971	32.59	4.15	36.74	43.50	-6.76	360	100	peak
3	215.2677	25.71	7.12	32.83	43.50	-10.67	0	200	peak
4	468.8761	31.07	12.06	43.13	46.00	-2.87	129	118	QP

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11n HT40)
Horizontal



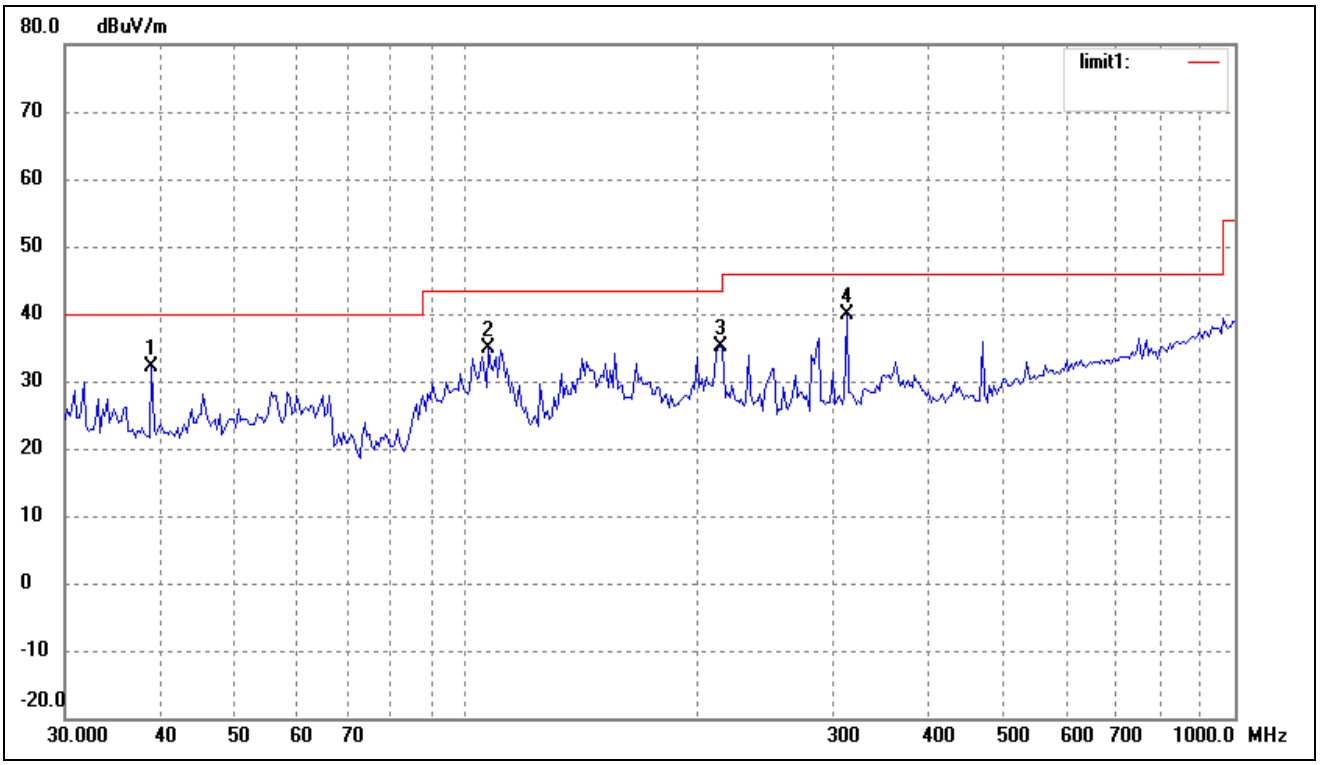
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	24.14	7.60	31.74	40.00	-8.26	360	200	peak
2	151.5972	33.08	4.15	37.23	43.50	-6.27	360	200	peak
3	312.1794	31.24	9.90	41.14	46.00	-4.86	228	109	QP

Vertical



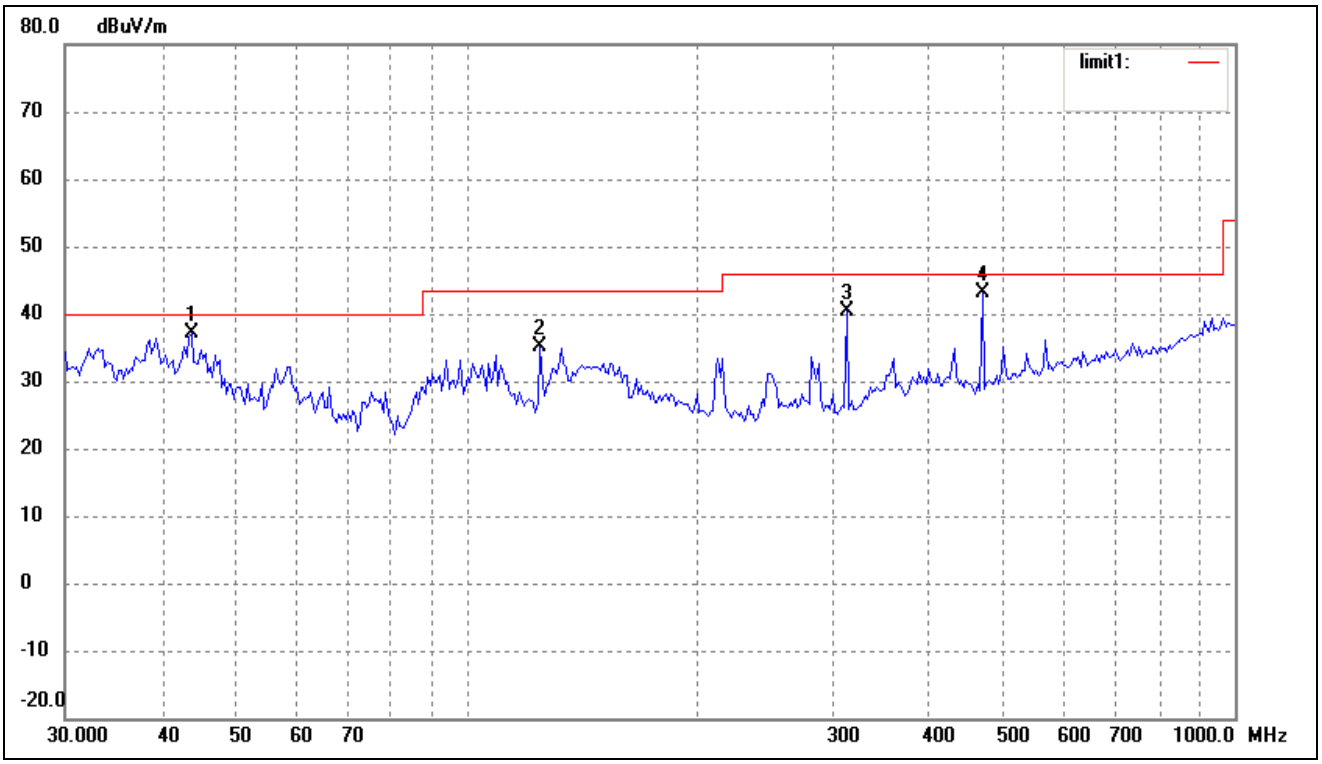
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	28.13	7.60	35.73	40.00	-4.27	335	118	QP
2	151.5971	32.59	4.15	36.74	43.50	-6.76	360	100	peak
3	215.2677	25.71	7.12	32.83	43.50	-10.67	0	200	peak
4	468.8761	31.07	12.06	43.13	46.00	-2.87	229	106	QP

Test Result/Plots:
For Long Antenna (Gain 5dBi)
Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11b)
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	38.8879	24.32	7.84	32.16	40.00	-7.84	360	100	peak
2	106.7587	26.91	7.86	34.77	43.50	-8.73	360	100	peak
3	213.7634	27.98	7.06	35.04	43.50	-8.46	0	200	peak
4	312.1794	30.03	9.90	39.93	46.00	-6.07	0	200	peak

Vertical

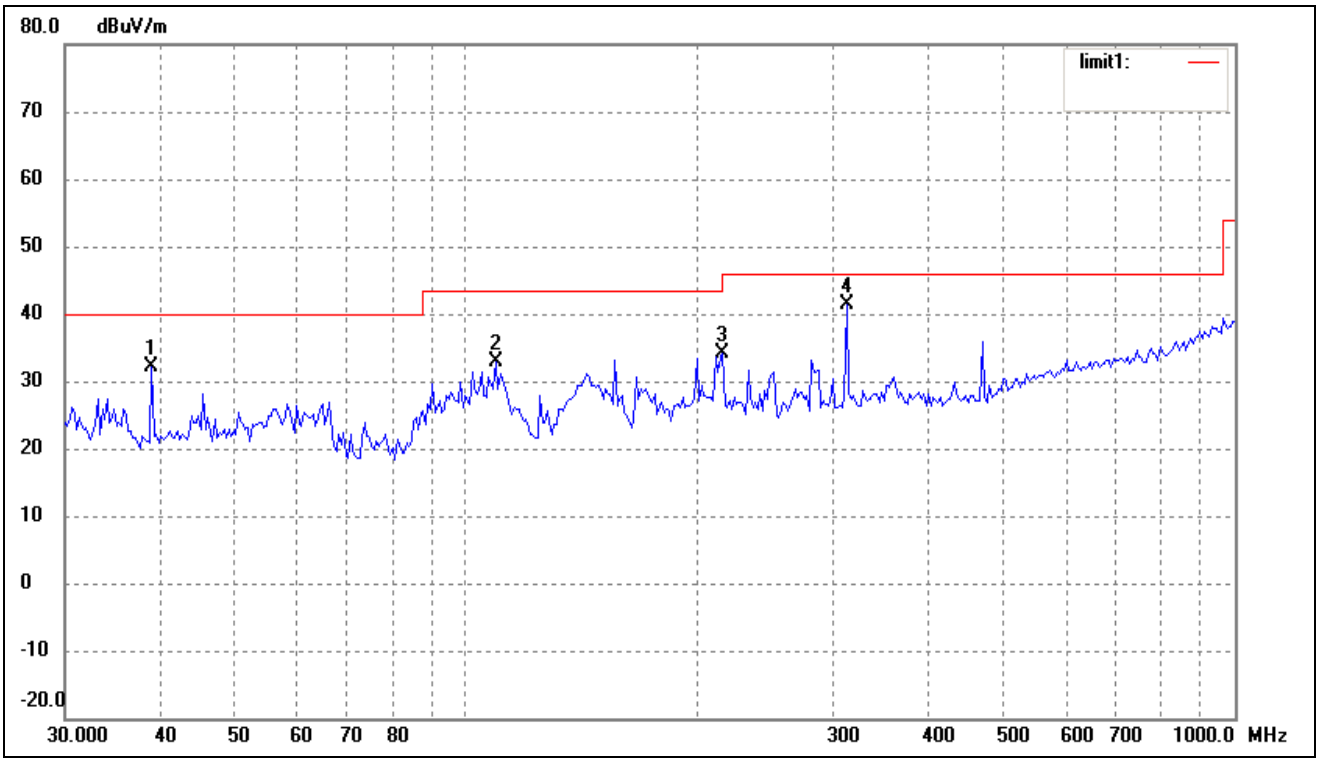


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	43.8119	28.92	8.21	37.13	40.00	-2.87	238	137	QP
2	124.5690	29.80	5.32	35.12	43.50	-8.38	360	200	peak
3	312.1794	30.36	9.90	40.26	46.00	-5.74	115	112	QP
4	468.8762	31.10	12.06	43.16	46.00	-2.84	226	105	QP

Spurious Emission From 30 MHz to 1 GHz

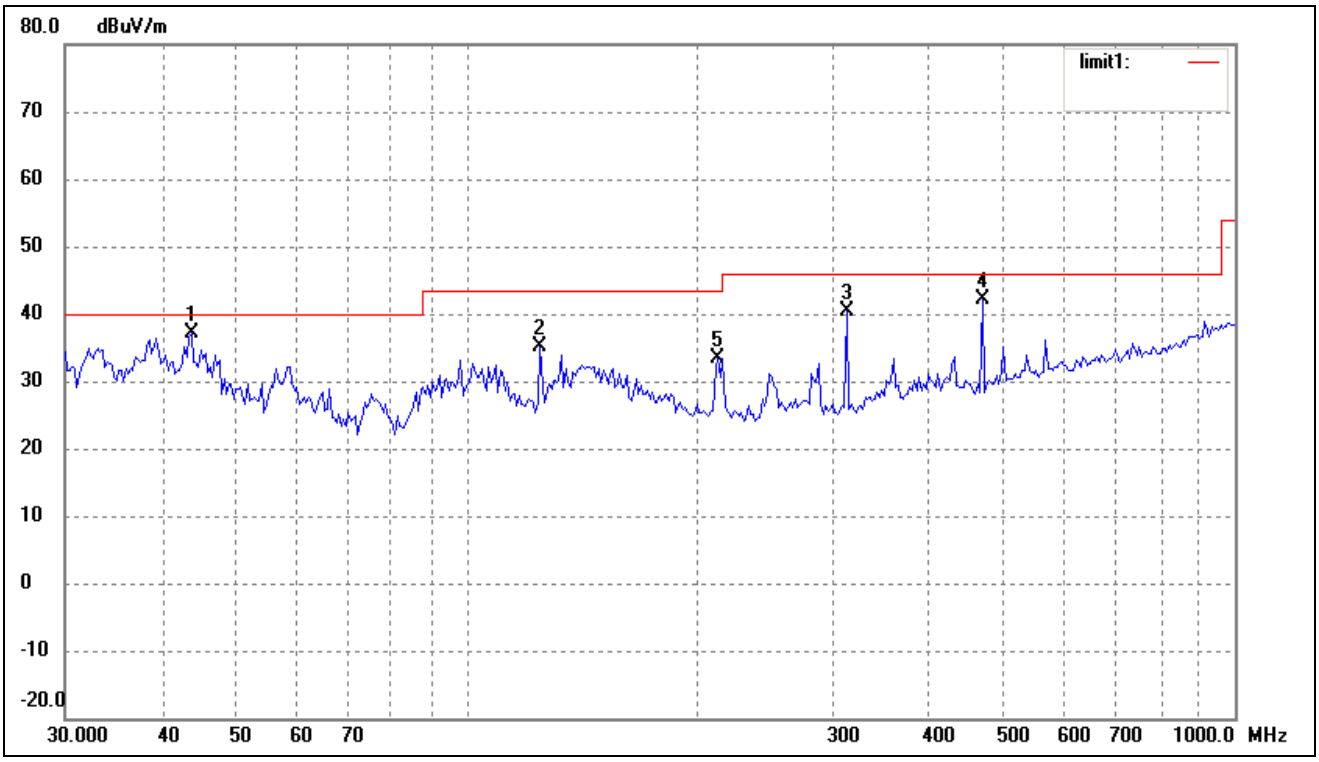
Test mode: Transmitting (802.11g)

Horizontal



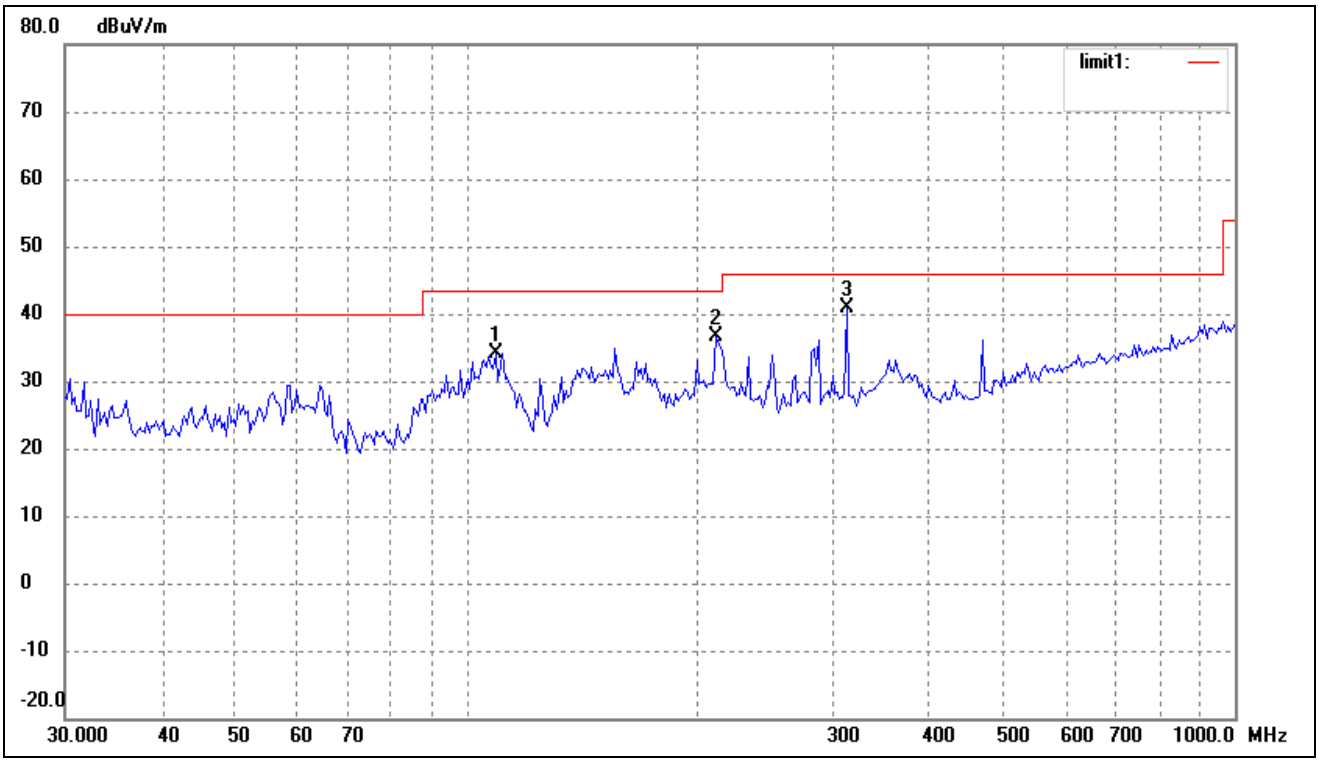
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	38.8879	24.32	7.84	32.16	40.00	-7.84	360	200	peak
2	109.0285	25.31	7.68	32.99	43.50	-10.51	0	200	peak
3	215.2677	27.00	7.12	34.12	43.50	-9.38	360	200	peak
4	312.1793	31.53	9.90	41.43	46.00	-4.57	223	215	QP

Vertical



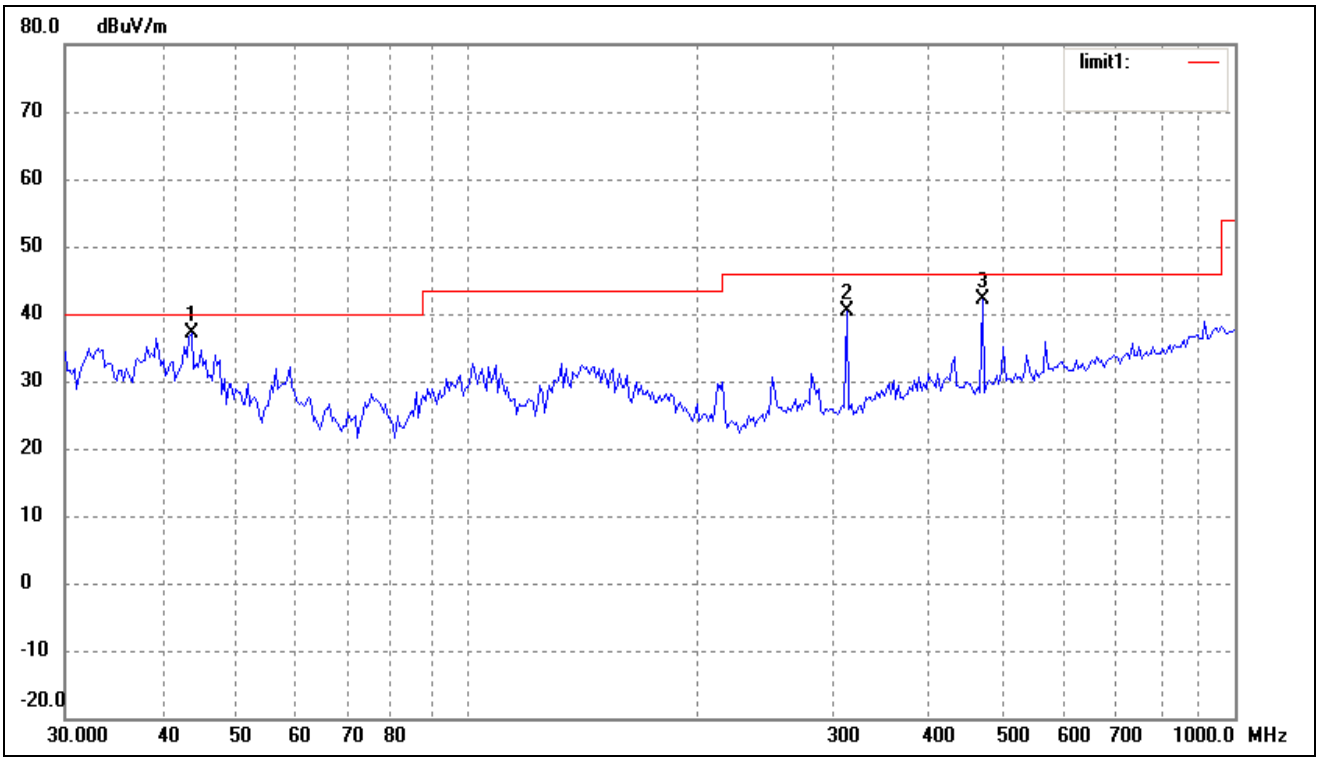
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	43.8119	28.92	8.21	37.13	40.00	-2.87	230	236	QP
2	124.5690	29.80	5.32	35.12	43.50	-8.38	0	100	peak
3	312.1793	30.36	9.90	40.26	46.00	-5.74	225	128	QP
4	468.8761	29.96	12.06	42.02	46.00	-3.98	108	240	QP
5	212.2694	26.39	7.01	33.40	43.50	-10.10	0	200	peak

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11n HT20)
Horizontal



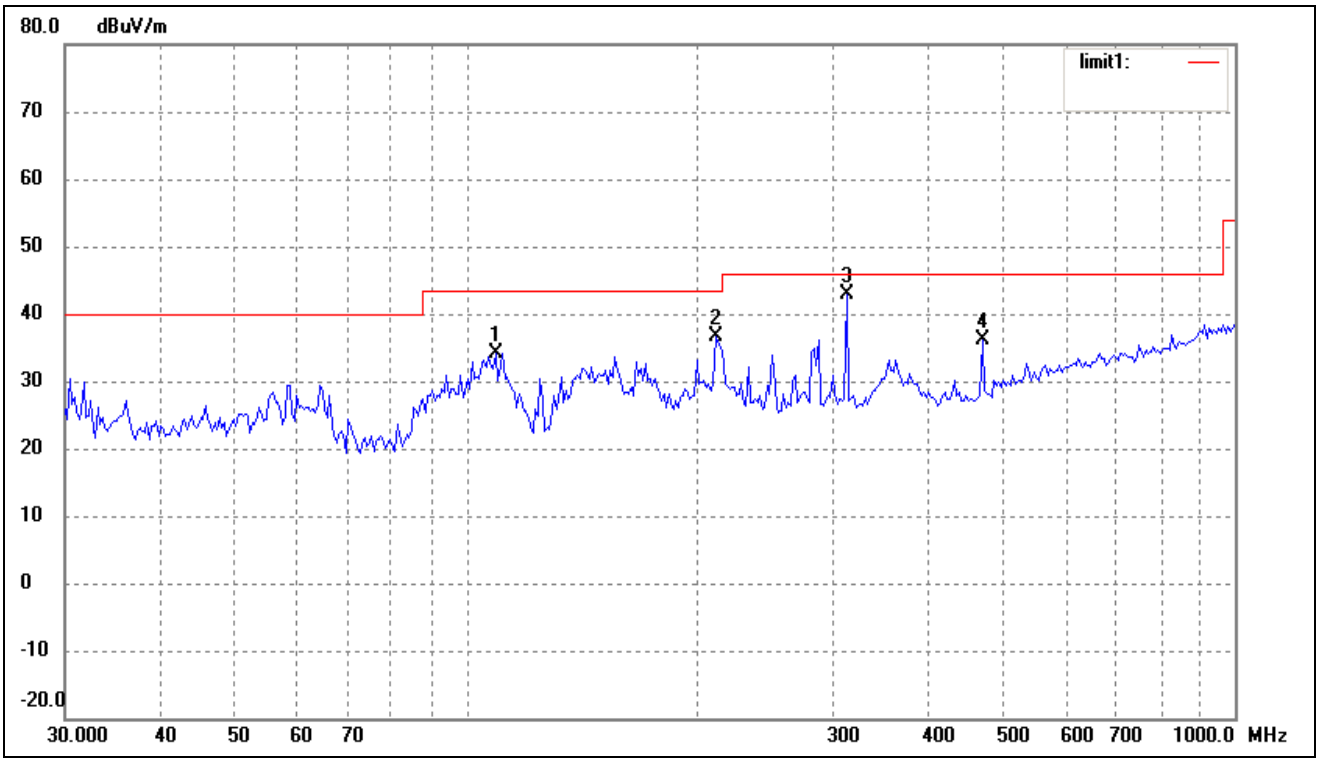
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	109.0285	26.56	7.68	34.24	43.50	-9.26	360	100	peak
2	210.7860	29.58	6.97	36.55	43.50	-6.95	360	100	peak
3	312.1793	31.01	9.90	40.91	46.00	-5.09	229	116	QP

Vertical



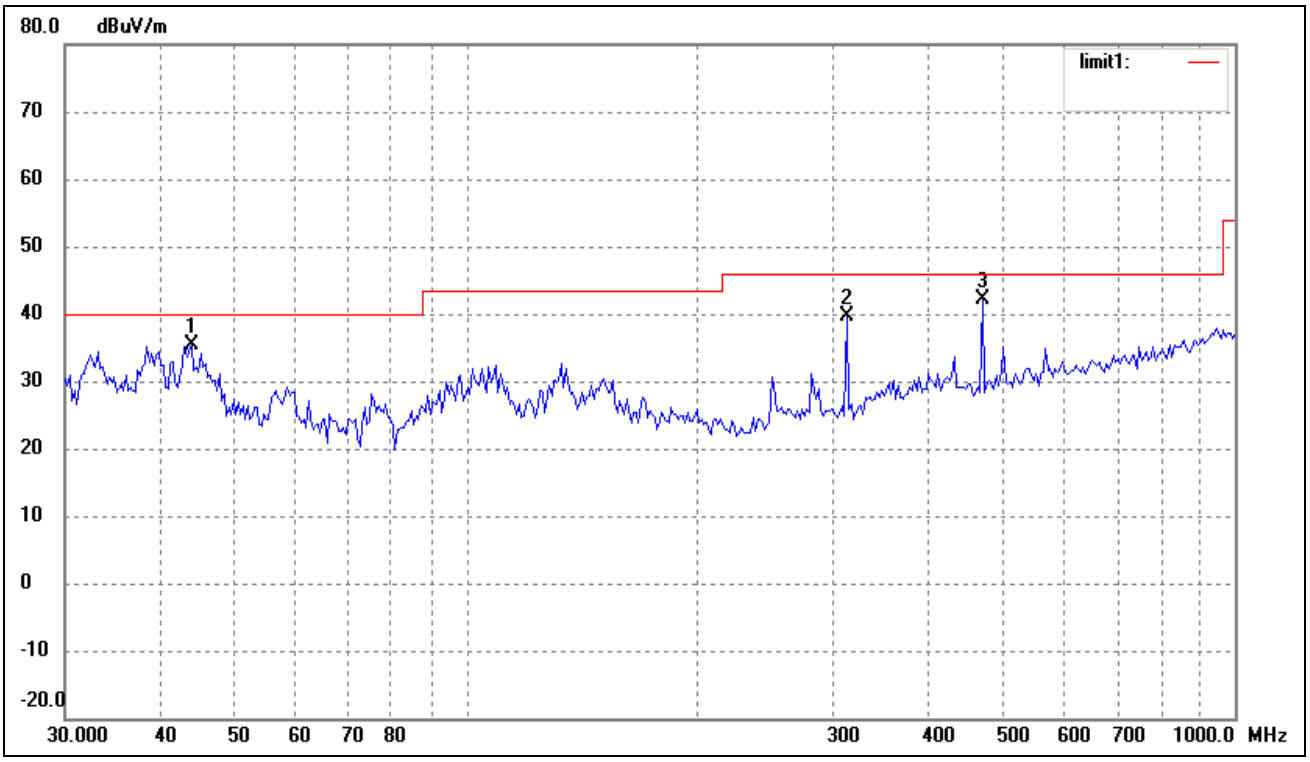
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	43.8119	28.92	8.21	37.13	40.00	-2.87	235	117	QP
2	312.1793	30.36	9.90	40.26	46.00	-5.74	116	150	QP
3	468.8761	29.96	12.06	42.02	46.00	-3.98	109	228	QP

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11n HT40)
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	109.0285	26.56	7.68	34.24	43.50	-9.26	360	100	peak
2	210.7860	29.58	6.97	36.55	43.50	-6.95	0	100	peak
3	312.1793	33.08	9.90	42.98	46.00	-3.02	229	125	QP
4	468.8761	24.00	12.06	36.06	46.00	-9.94	0	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	43.8119	27.16	8.21	35.37	40.00	-4.63	226	119	QP
2	312.1793	29.63	9.90	39.53	46.00	-6.47	360	100	peak
3	468.8761	29.96	12.06	42.02	46.00	-3.98	113	106	QP

Spurious Emission above 1GHz
Test Mode: Transmitting (802.11b)
For Short Antenna (Gain 2dBi)

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	58.68	90	V	34.1	5.2	33.0	64.98	74	-9.02
4824.0	PK	54.49	270	H	34.1	5.2	33.0	60.79	74	-13.21
7236.0	PK	57.12	180	V	37.4	6.1	33.5	67.12	74	-6.88
7236.0	PK	56.40	45	H	37.4	6.1	33.5	66.40	74	-7.60
4824.0	AV	43.63	270	V	34.1	5.2	33.0	49.93	54	-4.07
4824.0	AV	32.18	90	H	34.1	5.2	33.0	38.48	54	-15.52
7236.0	AV	39.97	45	V	37.4	6.1	33.5	49.97	54	-4.03
7236.0	AV	38.36	60	H	37.4	6.1	33.5	48.36	54	-5.64
Middle Channel (1G to 25GHz)										
4874.0	PK	57.19	45	V	34.1	5.2	33.0	63.49	74	-10.51
4874.0	PK	55.24	270	H	34.1	5.2	33.0	61.54	74	-12.46
7311.0	PK	56.69	45	V	37.4	6.1	33.5	66.69	74	-7.31
7311.0	PK	53.48	180	H	37.4	6.1	33.5	63.48	74	-10.52
4874.0	AV	44.18	270	V	34.1	5.2	33.0	50.48	54	-3.52
4874.0	AV	43.29	90	H	34.1	5.2	33.0	49.59	54	-4.41
7311.0	AV	39.26	60	V	37.4	6.1	33.5	46.29	54	-4.74
7311.0	AV	36.19	45	H	37.4	6.1	33.5	46.19	54	-7.81
High Channel (1G to 25GHz)										
4924.0	PK	58.23	270	V	34.1	5.2	33.0	64.53	74	-9.47
4924.0	PK	56.13	45	H	34.1	5.2	33.0	62.43	74	-11.57
7386.0	PK	57.29	180	V	37.4	6.1	33.5	67.29	74	-6.71
7386.0	PK	54.27	45	H	37.4	6.1	33.5	64.27	74	-9.73
4924.0	AV	43.29	90	V	34.1	5.2	33.0	49.59	54	-4.41
4924.0	AV	41.34	270	H	34.1	5.2	33.0	47.64	54	-6.36
7386.0	AV	38.26	60	V	37.4	6.1	33.5	48.26	54	-5.74
7386.0	AV	37.60	60	H	37.4	6.1	33.5	47.60	54	-6.40

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)
For Short Antenna (Gain 2dBi)

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	59.23	90	V	34.1	5.2	33.0	65.53	74	-8.47
4824.0	PK	57.13	270	H	34.1	5.2	33.0	63.43	74	-10.57
7236.0	PK	57.03	180	V	37.4	6.1	33.5	67.03	74	-6.97
7236.0	PK	56.08	45	H	37.4	6.1	33.5	66.08	74	-7.92
4824.0	AV	42.61	270	V	34.1	5.2	33.0	48.91	54	-5.09
4824.0	AV	41.06	90	H	34.1	5.2	33.0	47.36	54	-6.64
7236.0	AV	39.16	45	V	37.4	6.1	33.5	49.16	54	-4.84
7236.0	AV	38.25	60	H	37.4	6.1	33.5	48.25	54	-5.75
Middle Channel (1G to 25GHz)										
4874.0	PK	57.32	45	V	34.1	5.2	33.0	63.62	74	-10.38
4874.0	PK	56.49	270	H	34.1	5.2	33.0	62.79	74	-11.21
7311.0	PK	55.29	45	V	37.4	6.1	33.5	65.29	74	-8.71
7311.0	PK	53.09	180	H	37.4	6.1	33.5	63.09	74	-10.91
4874.0	AV	41.06	270	V	34.1	5.2	33.0	47.36	54	-6.64
4874.0	AV	42.18	90	H	34.1	5.2	33.0	48.48	54	-5.52
7311.0	AV	38.62	60	V	37.4	6.1	33.5	48.62	54	-5.38
7311.0	AV	37.25	45	H	37.4	6.1	33.5	47.25	54	-6.75
High Channel (1G to 25GHz)										
4924.0	PK	58.13	270	V	34.1	5.2	33.0	64.43	74	-9.57
4924.0	PK	56.29	45	H	34.1	5.2	33.0	62.59	74	-11.41
7386.0	PK	55.23	180	V	37.4	6.1	33.5	65.23	74	-8.77
7386.0	PK	54.28	45	H	37.4	6.1	33.5	64.28	74	-9.72
4924.0	AV	42.38	90	V	34.1	5.2	33.0	48.68	54	-5.32
4924.0	AV	41.08	270	H	34.1	5.2	33.0	47.38	54	-6.62
7386.0	AV	38.26	60	V	37.4	6.1	33.5	48.26	54	-5.74
7386.0	AV	36.23	60	H	37.4	6.1	33.5	46.23	54	-7.77

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)

For Short Antenna (Gain 2dBi)

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	58.36	90	V	34.1	5.2	33.0	64.66	74	-9.34
4824.0	PK	56.29	270	H	34.1	5.2	33.0	62.59	74	-11.41
7236.0	PK	56.12	180	V	37.4	6.1	33.5	66.12	74	-7.88
7236.0	PK	55.28	45	H	37.4	6.1	33.5	65.28	74	-8.72
4824.0	AV	44.36	270	V	34.1	5.2	33.0	50.66	54	-3.34
4824.0	AV	42.06	90	H	34.1	5.2	33.0	48.36	54	-5.64
7236.0	AV	38.57	45	V	37.4	6.1	33.5	48.57	54	-5.43
7236.0	AV	37.23	60	H	37.4	6.1	33.5	47.23	54	-6.77
Middle Channel (1G to 25GHz)										
4874.0	PK	58.29	45	V	34.1	5.2	33.0	64.59	74	-9.41
4874.0	PK	57.34	270	H	34.1	5.2	33.0	63.64	74	-10.36
7311.0	PK	54.09	45	V	37.4	6.1	33.5	64.09	74	-9.91
7311.0	PK	53.68	180	H	37.4	6.1	33.5	63.68	74	-10.32
4874.0	AV	42.10	270	V	34.1	5.2	33.0	48.40	54	-5.60
4874.0	AV	41.38	90	H	34.1	5.2	33.0	47.68	54	-6.32
7311.0	AV	37.63	60	V	37.4	6.1	33.5	47.63	54	-6.37
7311.0	AV	36.26	45	H	37.4	6.1	33.5	46.26	54	-7.74
High Channel (1G to 25GHz)										
4924.0	PK	59.26	270	V	34.1	5.2	33.0	65.56	74	-8.44
4924.0	PK	58.08	45	H	34.1	5.2	33.0	64.38	74	-9.62
7386.0	PK	57.26	180	V	37.4	6.1	33.5	67.26	74	-6.74
7386.0	PK	55.34	45	H	37.4	6.1	33.5	65.34	74	-8.66
4924.0	AV	41.03	90	V	34.1	5.2	33.0	47.33	54	-6.67
4924.0	AV	40.56	270	H	34.1	5.2	33.0	46.80	54	-7.20
7386.0	AV	37.34	60	V	37.4	6.1	33.5	47.34	54	-6.66
7386.0	AV	36.59	60	H	37.4	6.1	33.5	46.59	54	-7.41

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)
For Short Antenna (Gain 2dBi)

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	58.20	90	V	34.1	5.2	33.0	64.50	74	-9.50
4824.0	PK	57.43	270	H	34.1	5.2	33.0	63.73	74	-10.27
7236.0	PK	58.36	180	V	37.4	6.1	33.5	68.36	74	-5.64
7236.0	PK	55.28	45	H	37.4	6.1	33.5	65.28	74	-8.72
4824.0	AV	41.32	270	V	34.1	5.2	33.0	47.62	54	-6.38
4824.0	AV	40.38	90	H	34.1	5.2	33.0	46.68	54	-7.32
7236.0	AV	38.56	45	V	37.4	6.1	33.5	48.56	54	-5.44
7236.0	AV	37.61	60	H	37.4	6.1	33.5	47.61	54	-6.36
Middle Channel (1G to 25GHz)										
4874.0	PK	58.23	45	V	34.1	5.2	33.0	64.53	74	-9.47
4874.0	PK	57.20	270	H	34.1	5.2	33.0	63.50	74	-10.50
7311.0	PK	56.32	45	V	37.4	6.1	33.5	66.32	74	-7.68
7311.0	PK	54.05	180	H	37.4	6.1	33.5	64.05	74	-9.95
4874.0	AV	42.32	270	V	34.1	5.2	33.0	48.62	54	-5.38
4874.0	AV	41.06	90	H	34.1	5.2	33.0	47.36	54	-6.64
7311.0	AV	38.06	60	V	37.4	6.1	33.5	48.06	54	-5.94
7311.0	AV	36.38	45	H	37.4	6.1	33.5	48.38	54	-7.62
High Channel (1G to 25GHz)										
4924.0	PK	59.20	270	V	34.1	5.2	33.0	65.50	74	-8.50
4924.0	PK	57.36	45	H	34.1	5.2	33.0	63.66	74	-10.34
7386.0	PK	56.18	180	V	37.4	6.1	33.5	66.18	74	-7.82
7386.0	PK	55.20	45	H	37.4	6.1	33.5	65.20	74	-8.80
4924.0	AV	41.38	90	V	34.1	5.2	33.0	47.68	54	-6.32
4924.0	AV	40.56	270	H	34.1	5.2	33.0	46.86	54	-7.14
7386.0	AV	37.26	60	V	37.4	6.1	33.5	47.26	54	-6.74
7386.0	AV	36.30	60	H	37.4	6.1	33.5	46.30	54	-7.70

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 (802.11b)
For Long Antenna (Gain 5dBi)

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	59.23	100	V	34.1	5.2	33.0	65.53	74	-8.47
4824.0	PK	55.18	210	H	34.1	5.2	33.0	61.48	74	-12.52
7236.0	PK	58.34	180	V	37.4	6.1	33.5	68.34	74	-5.66
7236.0	PK	56.36	142	H	37.4	6.1	33.5	66.34	74	-7.66
4824.0	AV	44.28	270	V	34.1	5.2	33.0	50.58	54	-3.42
4824.0	AV	36.08	360	H	34.1	5.2	33.0	42.38	54	-11.62
7236.0	AV	40.19	92	V	37.4	6.1	33.5	50.19	54	-3.81
7236.0	AV	39.37	72	H	37.4	6.1	33.5	49.37	54	-4.63
Middle Channel (1G to 25GHz)										
4874.0	PK	58.26	60	V	34.1	5.2	33.0	64.56	74	-9.44
4874.0	PK	56.34	270	H	34.1	5.2	33.0	62.64	74	-11.36
7311.0	PK	57.29	38	V	37.4	6.1	33.5	67.29	74	-6.71
7311.0	PK	54.06	90	H	37.4	6.1	33.5	64.06	74	-9.94
4874.0	AV	45.29	360	V	34.1	5.2	33.0	51.59	54	-2.41
4874.0	AV	43.68	90	H	34.1	5.2	33.0	49.98	54	-4.02
7311.0	AV	40.18	49	V	37.4	6.1	33.5	50.18	54	-3.82
7311.0	AV	37.29	60	H	37.4	6.1	33.5	47.29	54	-6.71
High Channel (1G to 25GHz)										
4924.0	PK	59.35	270	V	34.1	5.2	33.0	65.65	74	-8.35
4924.0	PK	57.02	45	H	34.1	5.2	33.0	63.32	74	-10.68
7386.0	PK	58.13	180	V	37.4	6.1	33.5	68.13	74	-5.87
7386.0	PK	55.08	70	H	37.4	6.1	33.5	65.08	74	-8.92
4924.0	AV	42.19	180	V	34.1	5.2	33.0	48.49	54	-5.51
4924.0	AV	40.38	270	H	34.1	5.2	33.0	46.68	54	-7.32
7386.0	AV	39.35	60	V	37.4	6.1	33.5	49.35	54	-4.65
7386.0	AV	35.34	90	H	37.4	6.1	33.5	45.34	54	-8.66

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)
For Long Antenna (Gain 5dBi)

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	60.35	90	V	34.1	5.2	33.0	66.65	74	-7.35
4824.0	PK	58.16	270	H	34.1	5.2	33.0	64.46	74	-9.54
7236.0	PK	58.36	180	V	37.4	6.1	33.5	68.36	74	-5.64
7236.0	PK	57.19	45	H	37.4	6.1	33.5	67.19	74	-6.81
4824.0	AV	42.08	270	V	34.1	5.2	33.0	48.38	54	-5.62
4824.0	AV	41.38	90	H	34.1	5.2	33.0	47.68	54	-6.32
7236.0	AV	40.28	45	V	37.4	6.1	33.5	50.28	54	-3.72
7236.0	AV	39.34	60	H	37.4	6.1	33.5	49.34	54	-4.66
Middle Channel (1G to 25GHz)										
4874.0	PK	58.37	45	V	34.1	5.2	33.0	64.67	74	-9.33
4874.0	PK	57.29	270	H	34.1	5.2	33.0	63.59	74	-10.41
7311.0	PK	56.34	45	V	37.4	6.1	33.5	66.34	74	-7.66
7311.0	PK	54.18	180	H	37.4	6.1	33.5	64.18	74	-9.82
4874.0	AV	42.36	270	V	34.1	5.2	33.0	48.66	54	-5.34
4874.0	AV	41.58	90	H	34.1	5.2	33.0	47.88	54	-6.12
7311.0	AV	39.37	60	V	37.4	6.1	33.5	49.37	54	-4.63
7311.0	AV	36.28	45	H	37.4	6.1	33.5	46.28	54	-7.72
High Channel (1G to 25GHz)										
4924.0	PK	59.68	270	V	34.1	5.2	33.0	65.98	74	-8.02
4924.0	PK	57.28	45	H	34.1	5.2	33.0	63.58	74	-10.42
7386.0	PK	56.32	180	V	37.4	6.1	33.5	66.32	74	-7.68
7386.0	PK	54.65	45	H	37.4	6.1	33.5	64.65	74	-9.35
4924.0	AV	43.18	90	V	34.1	5.2	33.0	49.48	54	-4.52
4924.0	AV	41.36	270	H	34.1	5.2	33.0	47.66	54	-6.34
7386.0	AV	39.24	60	V	37.4	6.1	33.5	49.24	54	-4.76
7386.0	AV	35.26	60	H	37.4	6.1	33.5	45.26	54	-8.74

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)
For Long Antenna (Gain 5dBi)

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	59.25	90	V	34.1	5.2	33.0	65.55	74	-8.45
4824.0	PK	57.13	270	H	34.1	5.2	33.0	63.43	74	-10.57
7236.0	PK	57.29	180	V	37.4	6.1	33.5	67.29	74	-6.71
7236.0	PK	56.34	45	H	37.4	6.1	33.5	66.34	74	-7.66
4824.0	AV	43.29	270	V	34.1	5.2	33.0	49.59	54	-4.41
4824.0	AV	41.09	90	H	34.1	5.2	33.0	47.39	54	-6.61
7236.0	AV	39.34	45	V	37.4	6.1	33.5	49.34	54	-4.66
7236.0	AV	37.64	60	H	37.4	6.1	33.5	47.64	54	-6.36
Middle Channel (1G to 25GHz)										
4874.0	PK	59.23	45	V	34.1	5.2	33.0	65.53	74	-8.47
4874.0	PK	57.18	270	H	34.1	5.2	33.0	63.48	74	-10.52
7311.0	PK	55.24	45	V	37.4	6.1	33.5	65.24	74	-8.76
7311.0	PK	54.06	180	H	37.4	6.1	33.5	64.06	74	-9.94
4874.0	AV	43.28	270	V	34.1	5.2	33.0	49.58	54	-4.42
4874.0	AV	40.34	90	H	34.1	5.2	33.0	46.64	54	-7.36
7311.0	AV	38.62	60	V	37.4	6.1	33.5	48.62	54	-5.38
7311.0	AV	37.34	45	H	37.4	6.1	33.5	47.34	54	-6.66
High Channel (1G to 25GHz)										
4924.0	PK	59.34	270	V	34.1	5.2	33.0	65.64	74	-8.36
4924.0	PK	56.28	45	H	34.1	5.2	33.0	62.58	74	-11.42
7386.0	PK	58.31	180	V	37.4	6.1	33.5	68.31	74	-5.69
7386.0	PK	56.25	45	H	37.4	6.1	33.5	66.25	74	-7.75
4924.0	AV	42.07	90	V	34.1	5.2	33.0	48.37	54	-5.63
4924.0	AV	41.34	270	H	34.1	5.2	33.0	47.64	54	-6.36
7386.0	AV	38.35	60	V	37.4	6.1	33.5	48.35	54	-5.65
7386.0	AV	37.63	60	H	37.4	6.1	33.5	47.63	54	-6.37

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)
For Long Antenna (Gain 5dBi)

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	59.34	90	V	34.1	5.2	33.0	65.64	74	-8.36
4824.0	PK	57.25	270	H	34.1	5.2	33.0	63.55	74	-10.45
7236.0	PK	58.36	180	V	37.4	6.1	33.5	68.36	74	-5.64
7236.0	PK	54.28	45	H	37.4	6.1	33.5	64.28	74	-9.72
4824.0	AV	42.06	270	V	34.1	5.2	33.0	48.36	54	-5.64
4824.0	AV	41.39	90	H	34.1	5.2	33.0	47.69	54	-6.31
7236.0	AV	39.46	45	V	37.4	6.1	33.5	49.46	54	-4.54
7236.0	AV	38.24	60	H	37.4	6.1	33.5	48.24	54	-5.76
Middle Channel (1G to 25GHz)										
4874.0	PK	59.53	45	V	34.1	5.2	33.0	65.83	74	-8.17
4874.0	PK	57.06	270	H	34.1	5.2	33.0	63.36	74	-10.64
7311.0	PK	58.31	45	V	37.4	6.1	33.5	68.31	74	-5.69
7311.0	PK	53.28	180	H	37.4	6.1	33.5	63.28	74	-10.72
4874.0	AV	41.39	270	V	34.1	5.2	33.0	47.69	54	-6.31
4874.0	AV	40.37	90	H	34.1	5.2	33.0	46.67	54	-7.33
7311.0	AV	39.36	60	V	37.4	6.1	33.5	49.36	54	-4.64
7311.0	AV	35.64	45	H	37.4	6.1	33.5	45.64	54	-8.36
High Channel (1G to 25GHz)										
4924.0	PK	58.61	270	V	34.1	5.2	33.0	64.91	74	-9.09
4924.0	PK	55.39	45	H	34.1	5.2	33.0	61.69	74	-12.31
7386.0	PK	57.15	180	V	37.4	6.1	33.5	67.15	74	-6.85
7386.0	PK	55.08	45	H	37.4	6.1	33.5	65.08	74	-8.92
4924.0	AV	42.37	90	V	34.1	5.2	33.0	48.67	54	-5.33
4924.0	AV	41.21	270	H	34.1	5.2	33.0	47.51	54	-6.49
7386.0	AV	38.34	60	V	37.4	6.1	33.5	48.34	54	-5.66
7386.0	AV	36.85	60	H	37.4	6.1	33.5	46.85	54	-7.15

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	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08

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

For Short Antenna (Gain 2dBi)

Test mode	Frequency MHz	Limit dBuV /dB	Result
802.11b	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass
802.11g	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass
802.11n HT20	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass
802.11n HT40	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass

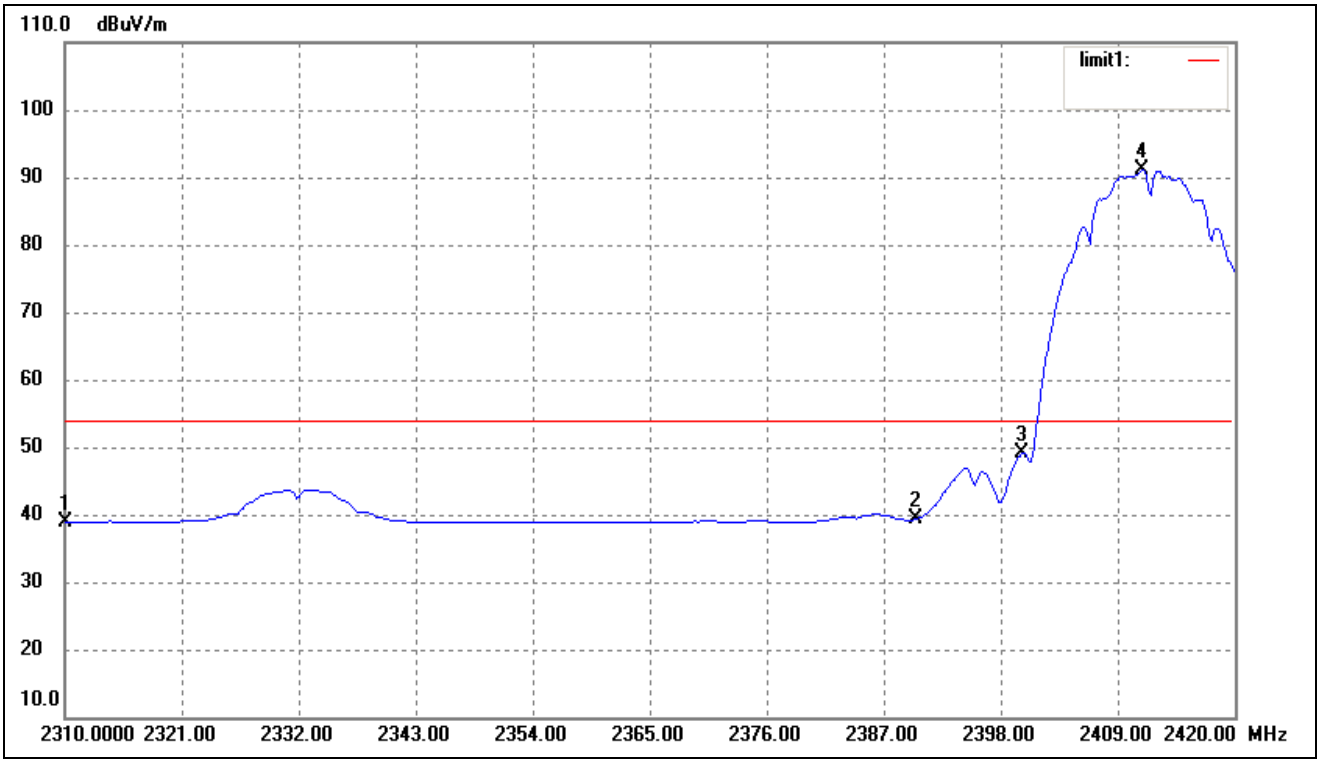
For Long Antenna (Gain 5dBi)

Test mode	Frequency MHz	Limit dBuV /dB	Result
802.11b	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass
802.11g	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass
802.11n HT20	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass
802.11n HT40	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass

For Short Antenna (Gain 2dBi)

For 802.11b

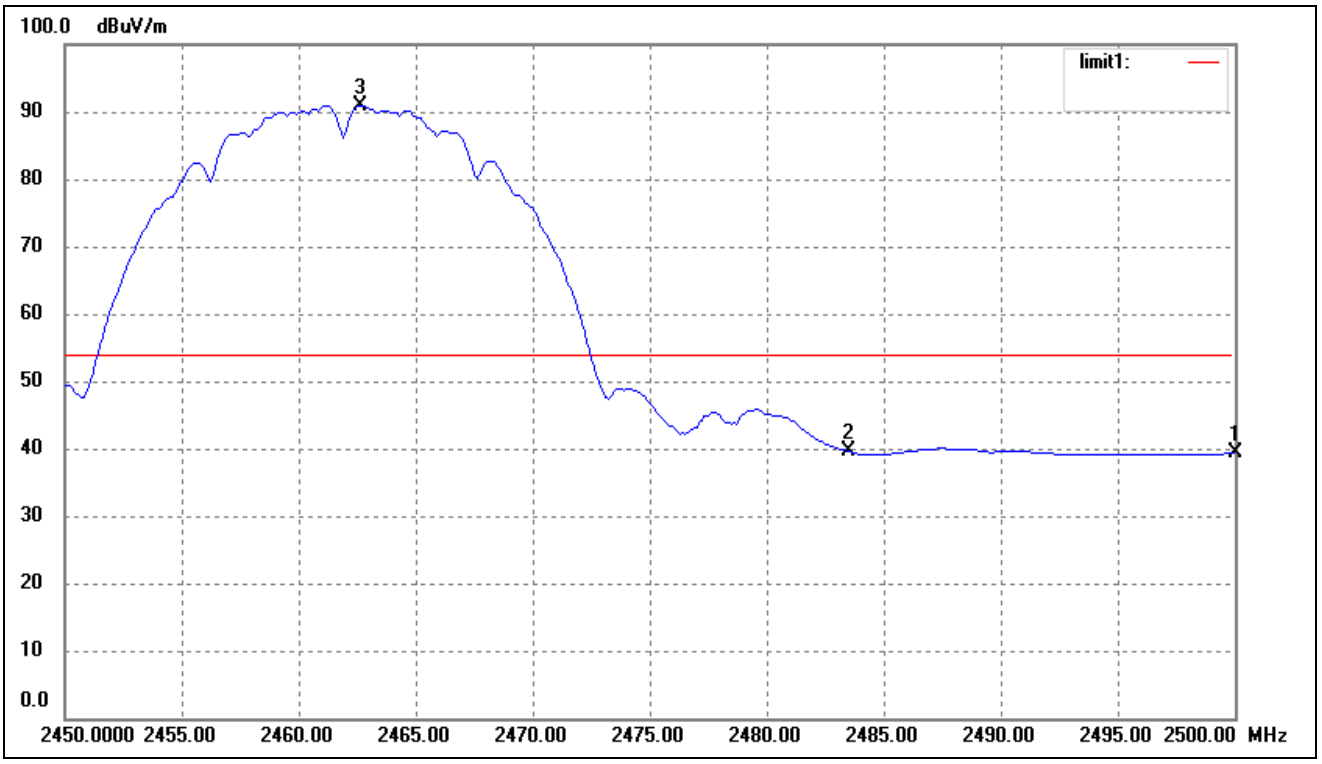
Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2310.000	36.43	2.49	38.92	54.00	-15.08	226	100	Ave
	2310.000	48.88	2.49	51.37	74.00	-22.63	226	100	peak
2	2390.000	36.74	2.66	39.40	54.00	-14.60	154	100	Ave
	2390.000	49.95	2.66	52.61	74.00	-21.84	223	100	peak
3	2400.000	46.36	2.69	49.05	/	/	/	/	Ave
4	2411.200	88.33	2.72	91.05	/	/	/	/	Ave

For 802.11b

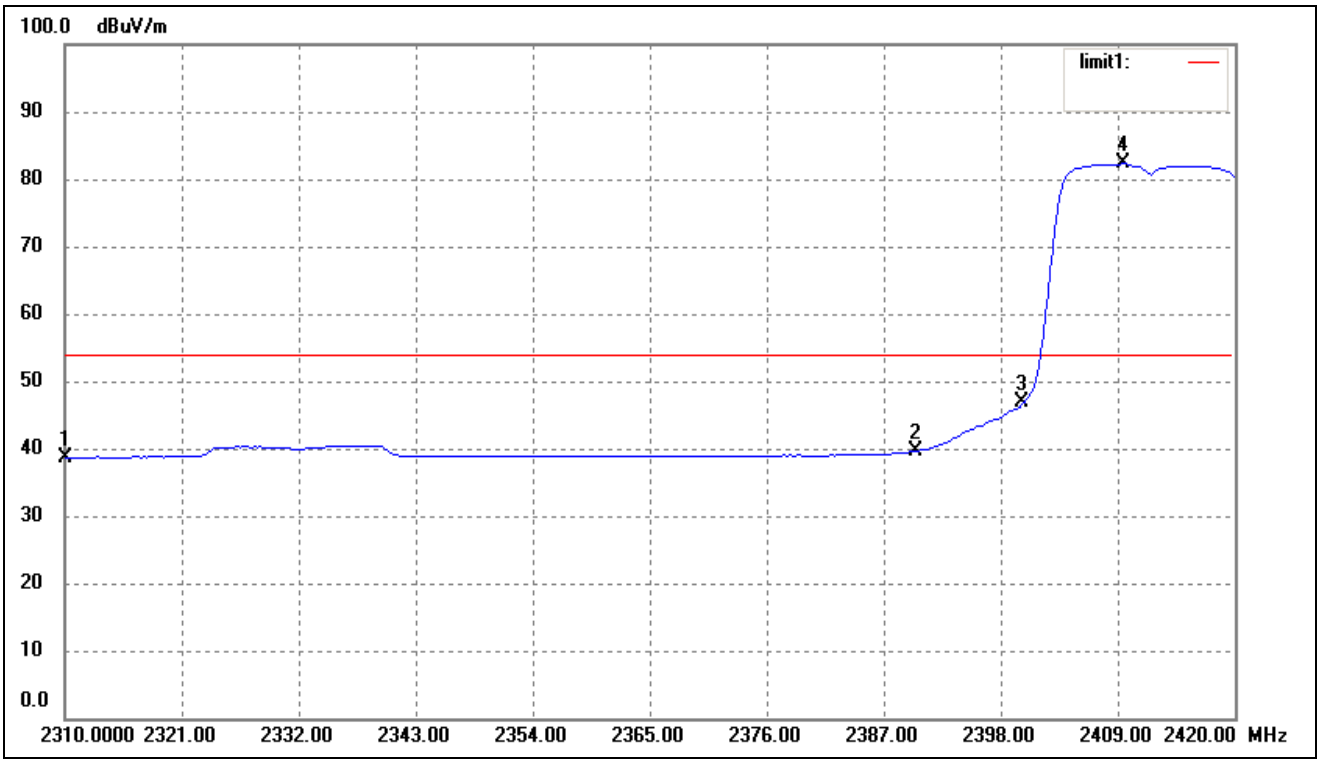
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2500.000	36.51	2.92	39.43	54.00	-14.57	360	100	Ave
	2500.000	47.46	2.92	50.38	74.00	-23.62	208	100	peak
2	2483.500	36.69	2.87	39.56	54.00	-14.44	124	100	Ave
	2483.500	49.32	2.87	52.19	74.00	-21.81	336	100	peak
3	2462.600	88.16	2.83	90.99	/	/			Ave

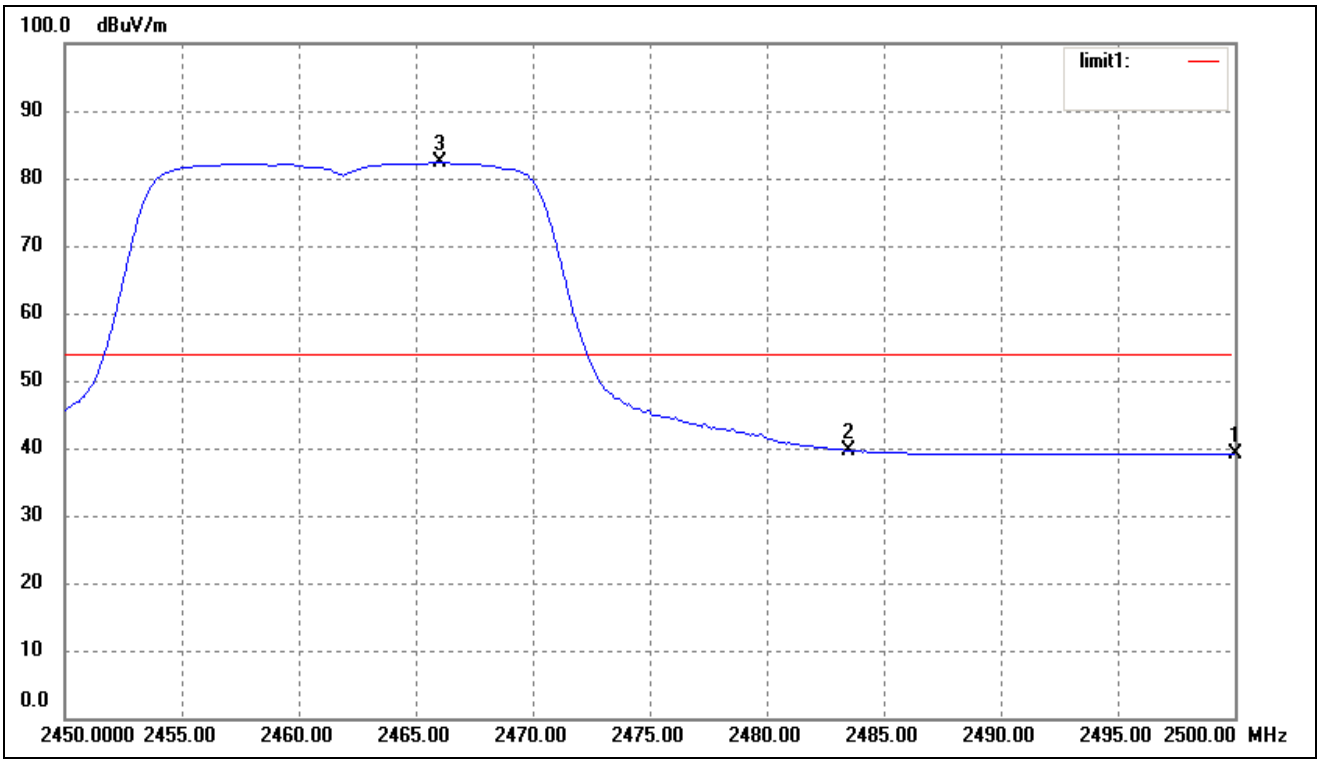
For 802.11g

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	36.22	2.49	38.71	54.00	-15.29	125	100	Ave
	2310.000	48.57	2.49	51.06	74.00	-22.94	360	100	peak
2	2390.000	37.02	2.66	39.68	54.00	-14.32	0	120	Ave
	2390.000	50.96	2.66	53.62	74.00	-20.38	336	100	peak
3	2400.000	44.24	2.69	46.93	/	/	/	/	Ave
4	2409.440	79.56	2.72	82.28	/	/	/	/	Ave

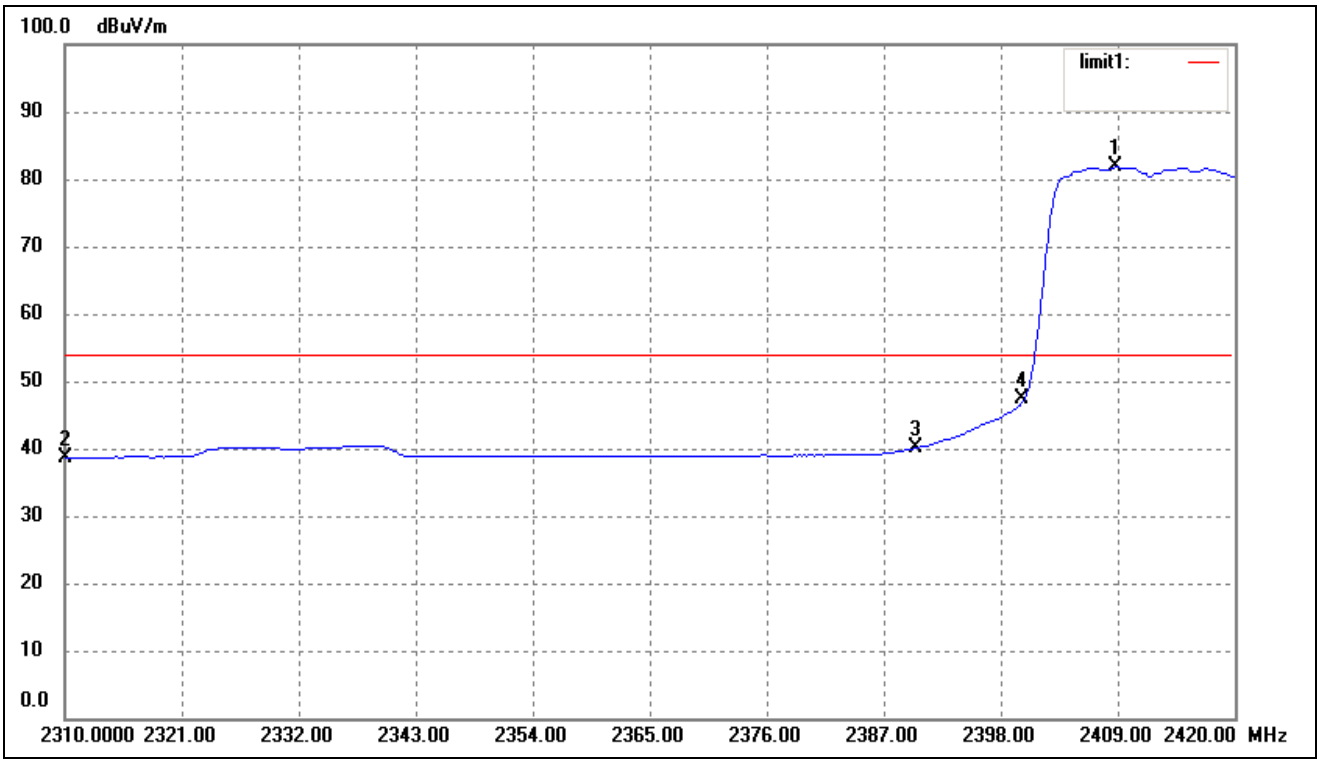
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2500.000	36.26	2.92	39.18	54.00	-14.82	360	100	Ave
	2500.000	47.42	2.92	50.34	74.00	-23.66	0	100	peak
2	2483.500	36.82	2.87	39.69	54.00	-14.31	0	120	Ave
	2483.500	49.52	2.87	52.39	74.00	-21.61	205	100	peak
3	2466.000	79.48	2.85	82.33	/	/	/	/	Ave

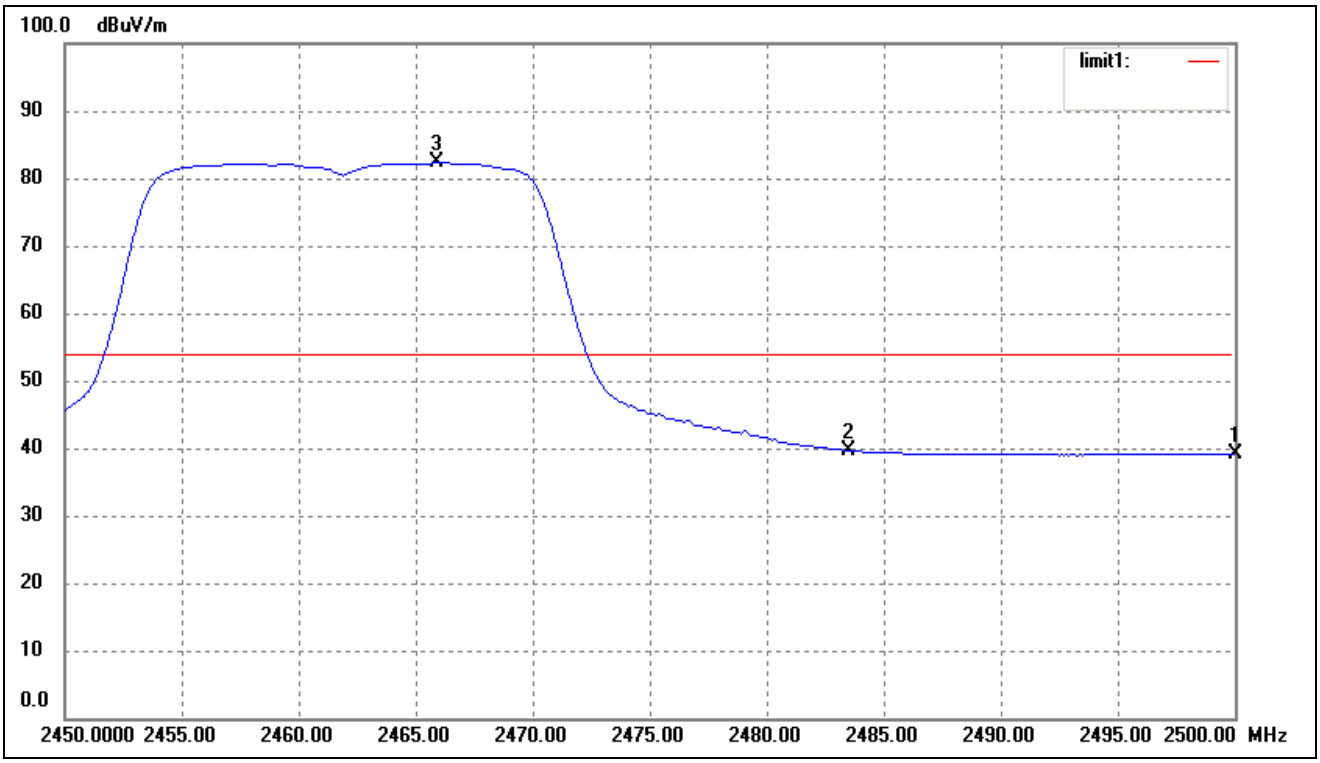
For 802.11n HT20

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
2	2310.000	36.20	2.49	38.69	54.00	-15.31	206	100	Ave
	2310.000	51.90	2.49	54.29	74.00	-19.71	228	125	peak
3	2390.000	37.52	2.66	40.18	54.00	-13.82	360	100	Ave
	2390.000	48.82	2.66	51.84	74.00	-22.52	0	200	peak
4	2400.000	44.77	2.69	47.46	/	/	/	/	Ave
1	2408.780	79.08	2.71	81.79	/	/	/	/	Ave

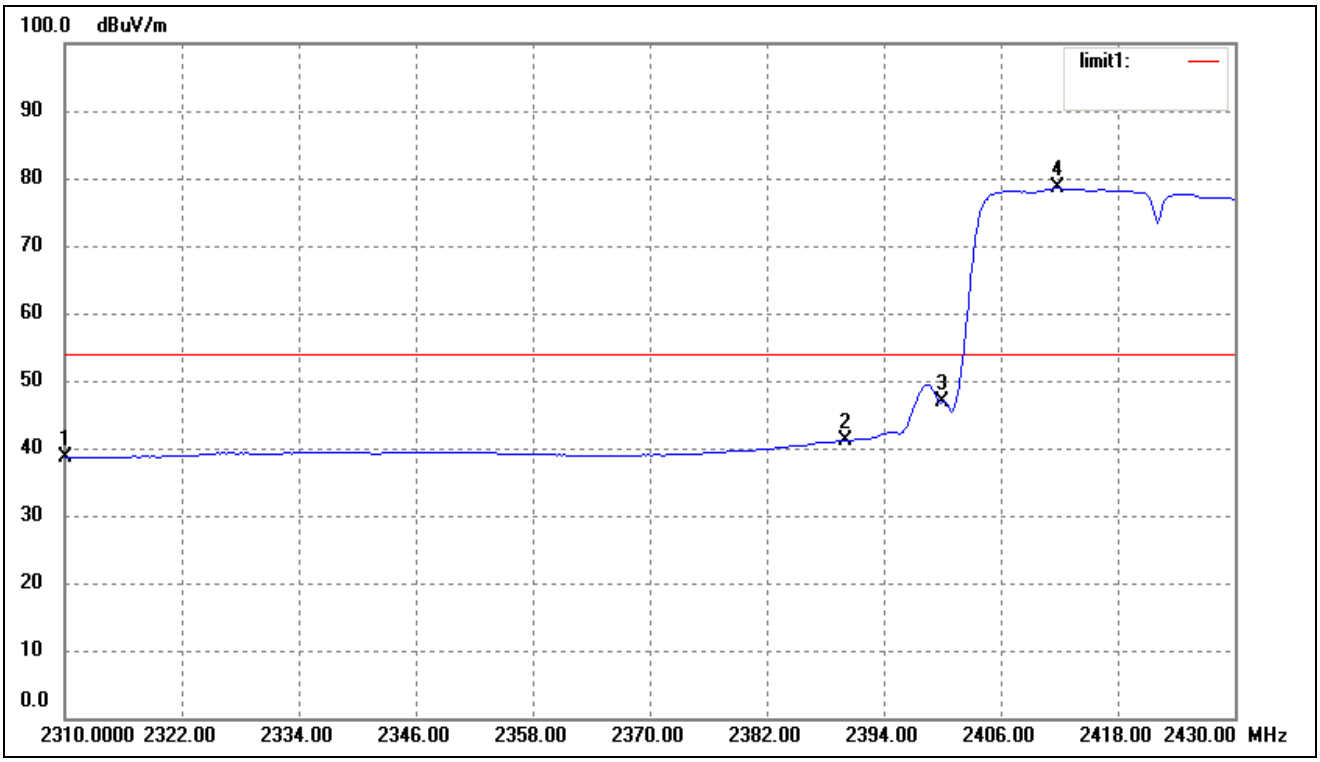
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2500.000	36.27	2.92	39.19	54.00	-14.81	226	134	Ave
	2500.000	48.62	2.92	51.54	74.00	-22.46	231	128	peak
2	2483.500	36.78	2.87	39.65	54.00	-14.35	106	100	Ave
	2483.500	49.89	2.87	52.76	74.00	-21.24	115	200	peak
3	2465.900	79.47	2.85	82.32	/	/	/	/	Ave

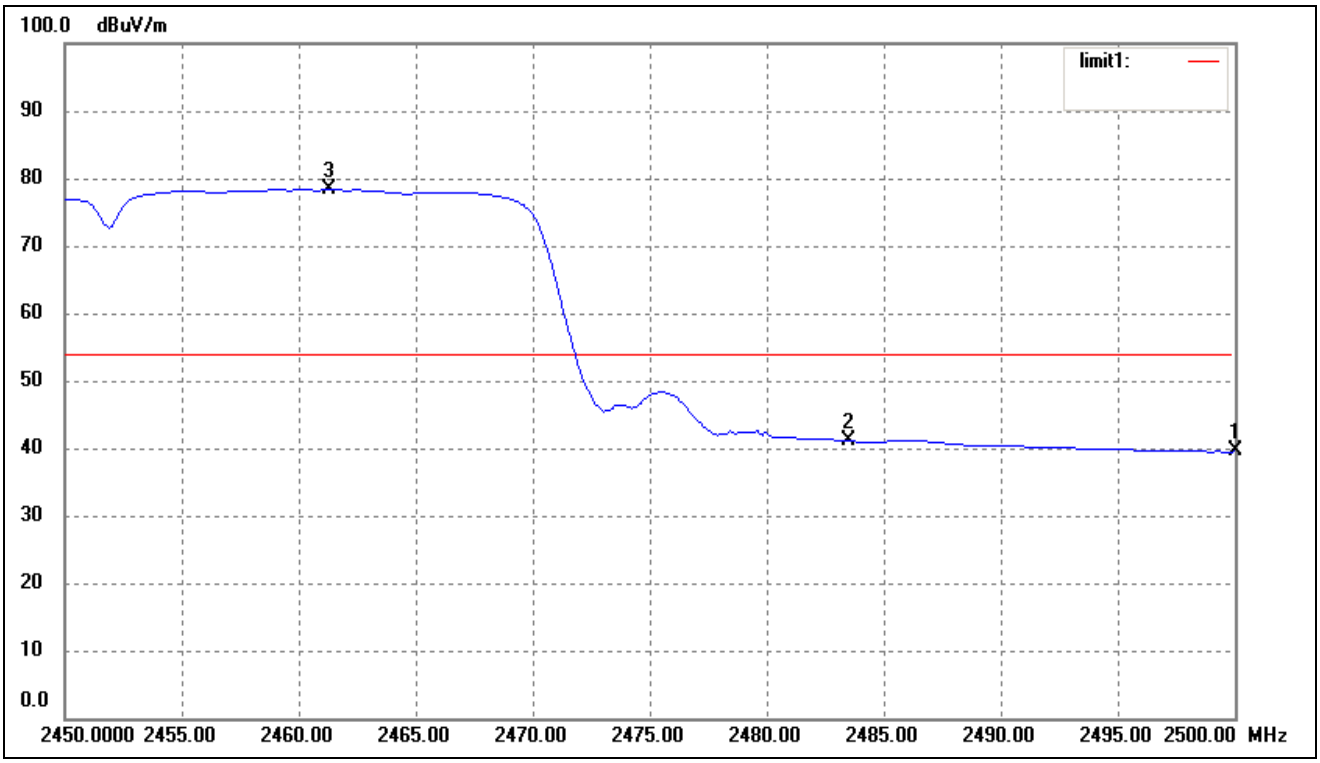
For 802.11n HT40

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	36.19	2.49	38.68	54.00	-15.32	223	120	Ave
	2310.000	48.89	2.49	51.38	74.00	-22.62	206	112	peak
2	2390.000	38.50	2.66	41.16	54.00	-12.84	115	105	Ave
	2390.000	49.93	2.66	52.59	74.00	-21.41	126	100	peak
3	2400.000	44.10	2.69	46.79	/	/	/	/	Ave
4	2411.760	75.82	2.72	78.54	/	/	/	/	Ave

Highest Bandedge

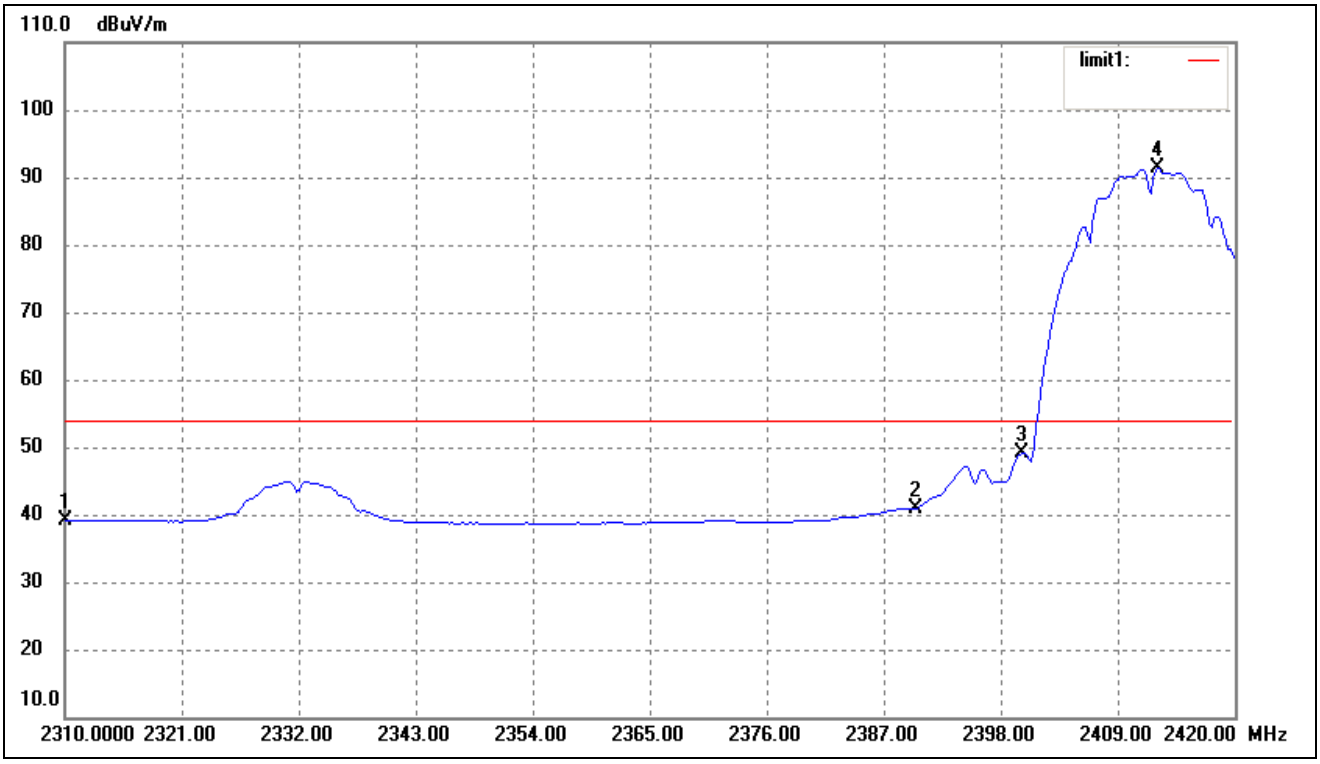


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2500.000	36.59	2.92	39.51	54.00	-14.49	106	336	Ave
	2500.000	47.36	2.92	50.28	74.00	-23.72	110	145	peak
2	2483.500	38.17	2.87	41.04	54.00	-12.96	100	360	Ave
	2483.500	48.52	2.87	51.39	74.00	-22.61	200	253	peak
3	2461.300	75.57	2.83	78.40	/	/	/	/	Ave

For Long Antenna (Gain 5dBi)

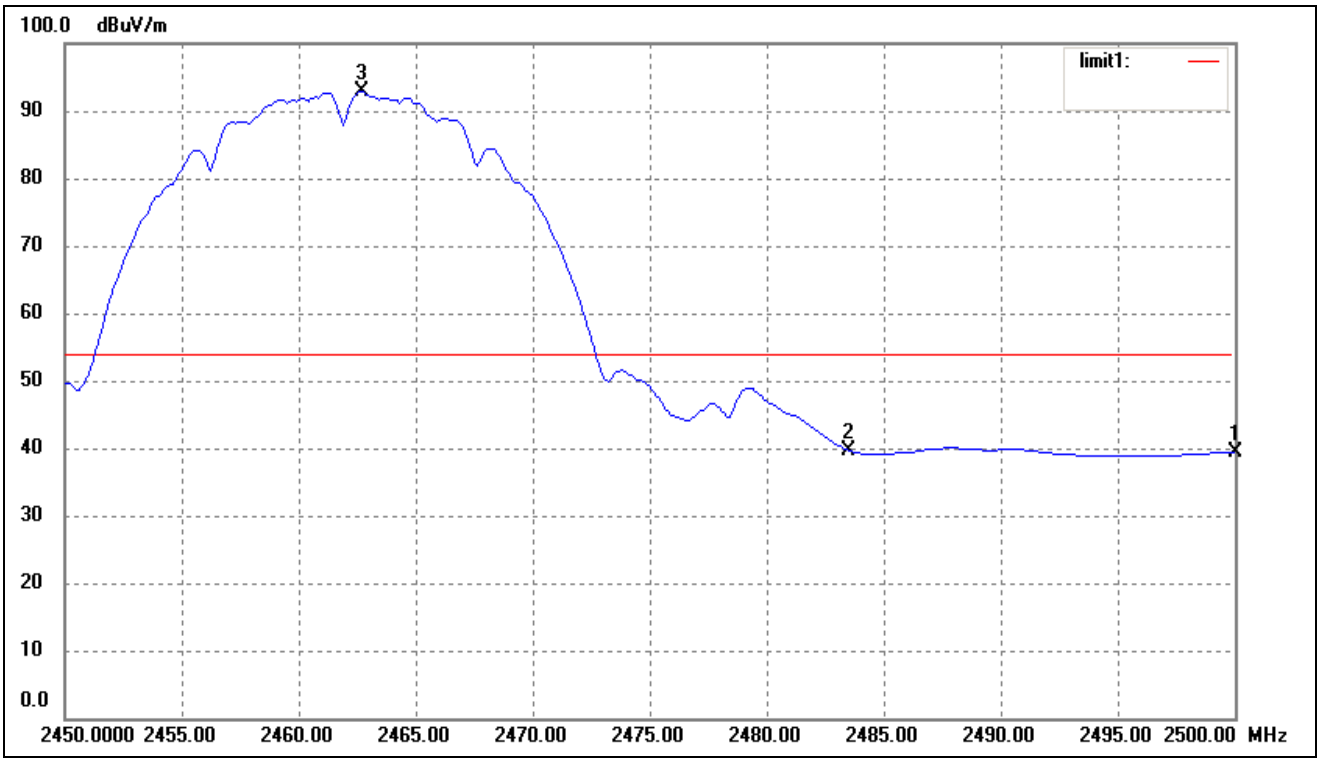
For 802.11b

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	36.68	2.49	39.17	54.00	-14.83	236	114	Ave
	2310.000	47.79	2.49	50.28	74.00	-23.72	220	100	peak
2	2390.000	38.33	2.66	40.99	54.00	-13.01	108	125	Ave
	2390.000	50.05	2.66	52.73	74.00	-21.27	110	200	peak
3	2400.000	46.53	2.69	49.22	/	/	/	/	Ave
4	2412.740	88.64	2.72	91.36	/	/	/	/	Ave

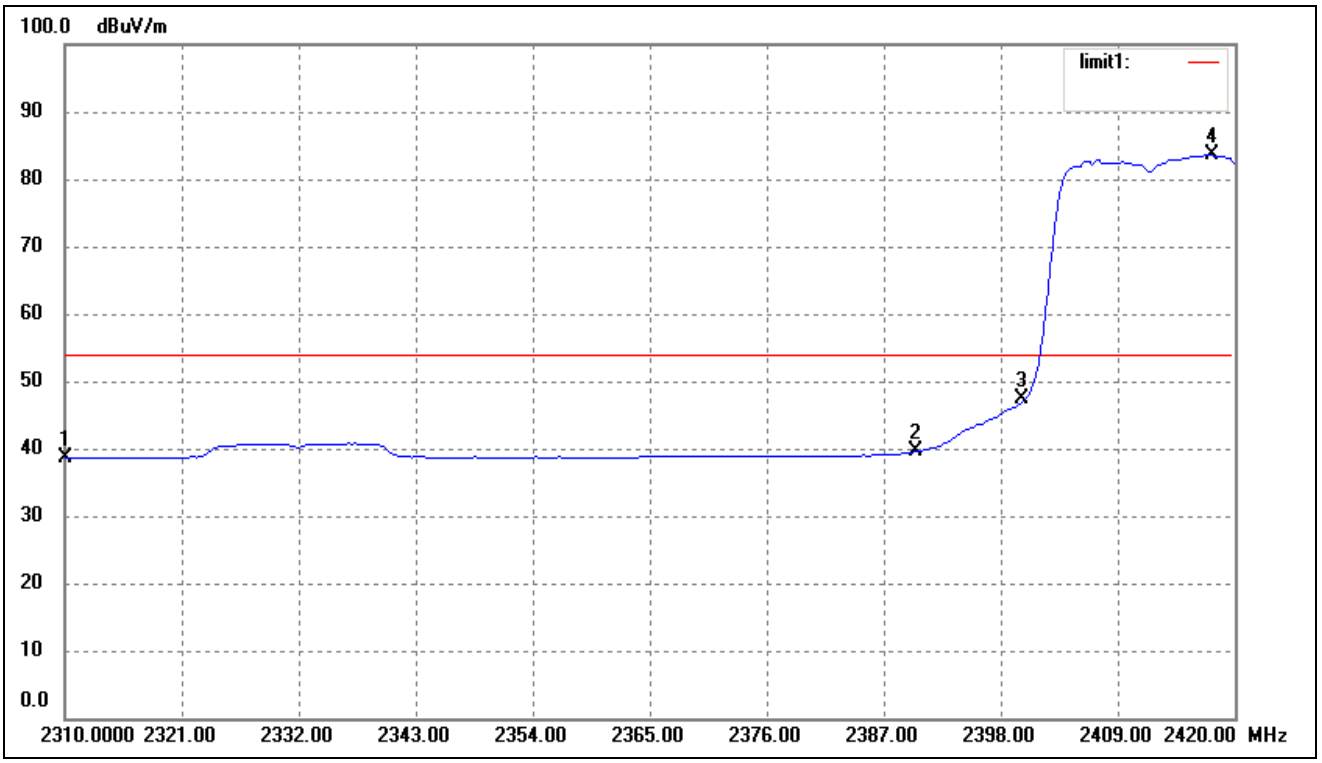
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2500.000	36.44	2.92	39.36	54.00	-14.64	223	152	Ave
	2500.000	48.14	2.92	51.06	74.00	-22.94	256	110	peak
2	2483.500	36.85	2.87	39.72	54.00	-14.28	124	120	Ave
	2483.500	50.42	2.87	53.29	74.00	-20.71	106	200	peak
3	2462.700	89.93	2.83	92.76	/	/	/	/	Ave

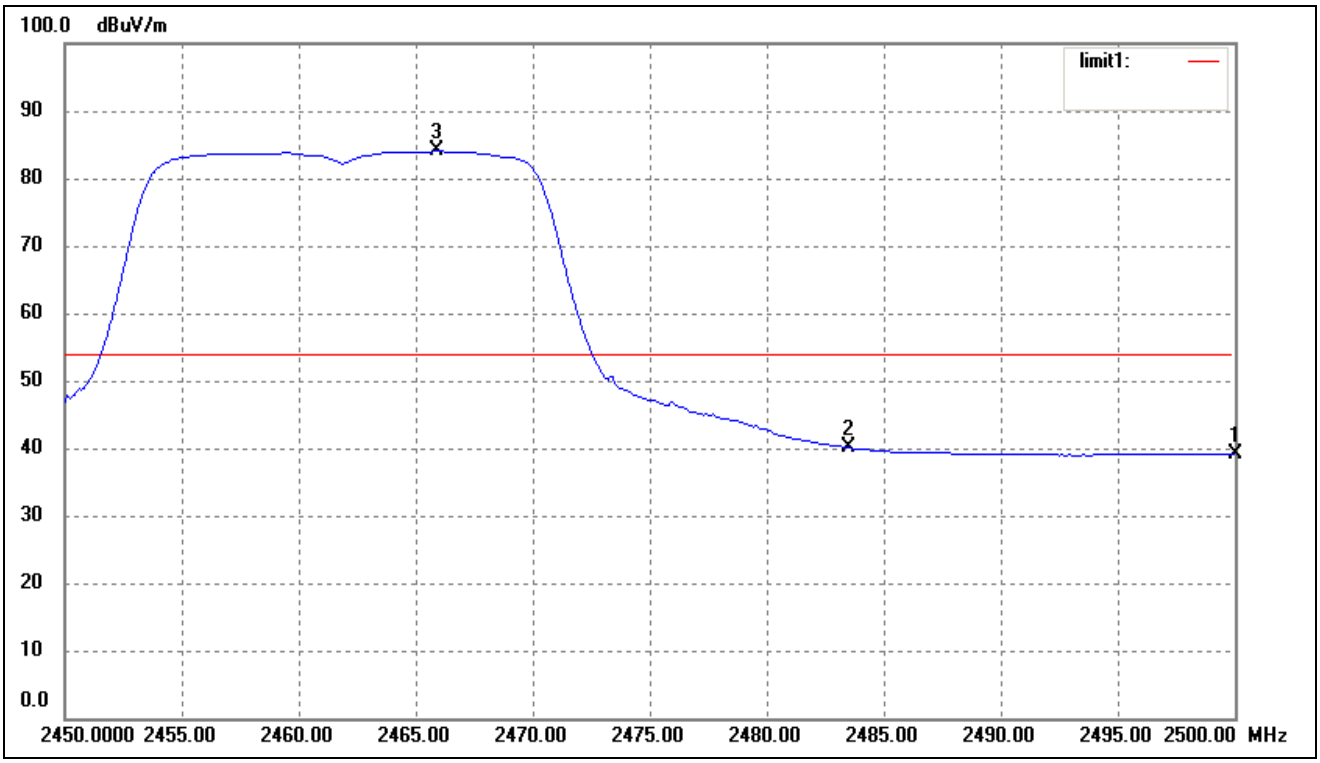
For 802.11g

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	36.20	2.49	38.69	54.00	-15.31	230	100	Ave
	2310.000	48.86	2.49	51.35	74.00	-22.65	220	124	peak
2	2390.000	36.95	2.66	39.61	54.00	-14.39	106	200	Ave
	2390.000	51.01	2.66	53.67	74.00	-20.33	112	200	peak
3	2400.000	44.62	2.69	47.31	/	/	/	/	Ave
4	2417.800	80.78	2.74	83.52	/	/	/	/	Ave

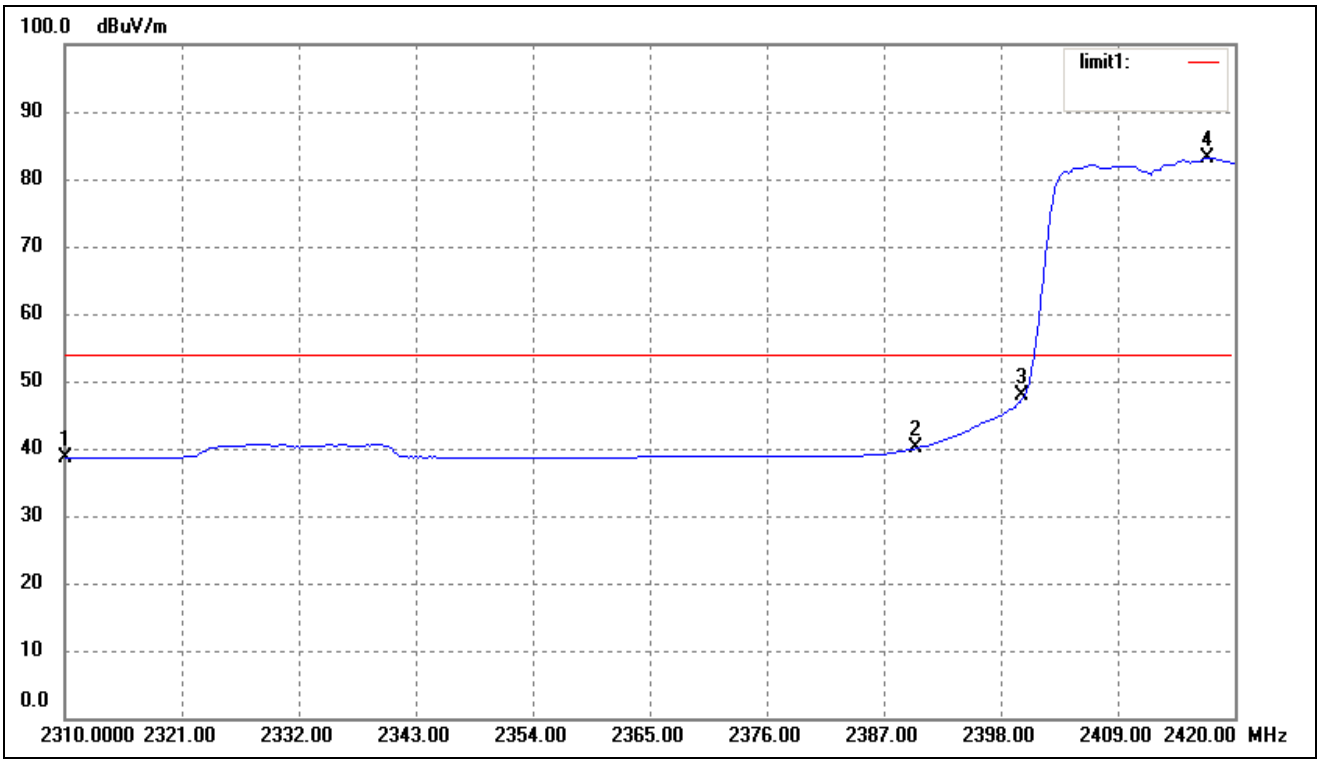
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2500.000	36.25	2.92	39.17	54.00	-14.83	233	120	Ave
	2500.000	49.43	2.92	52.35	74.00	-21.65	163	100	peak
2	2483.500	37.17	2.87	40.04	54.00	-13.96	108	215	Ave
	2483.500	50.82	2.87	53.69	74.00	-20.31	116	200	peak
3	2465.900	81.17	2.85	84.02	/	/	/	/	Ave

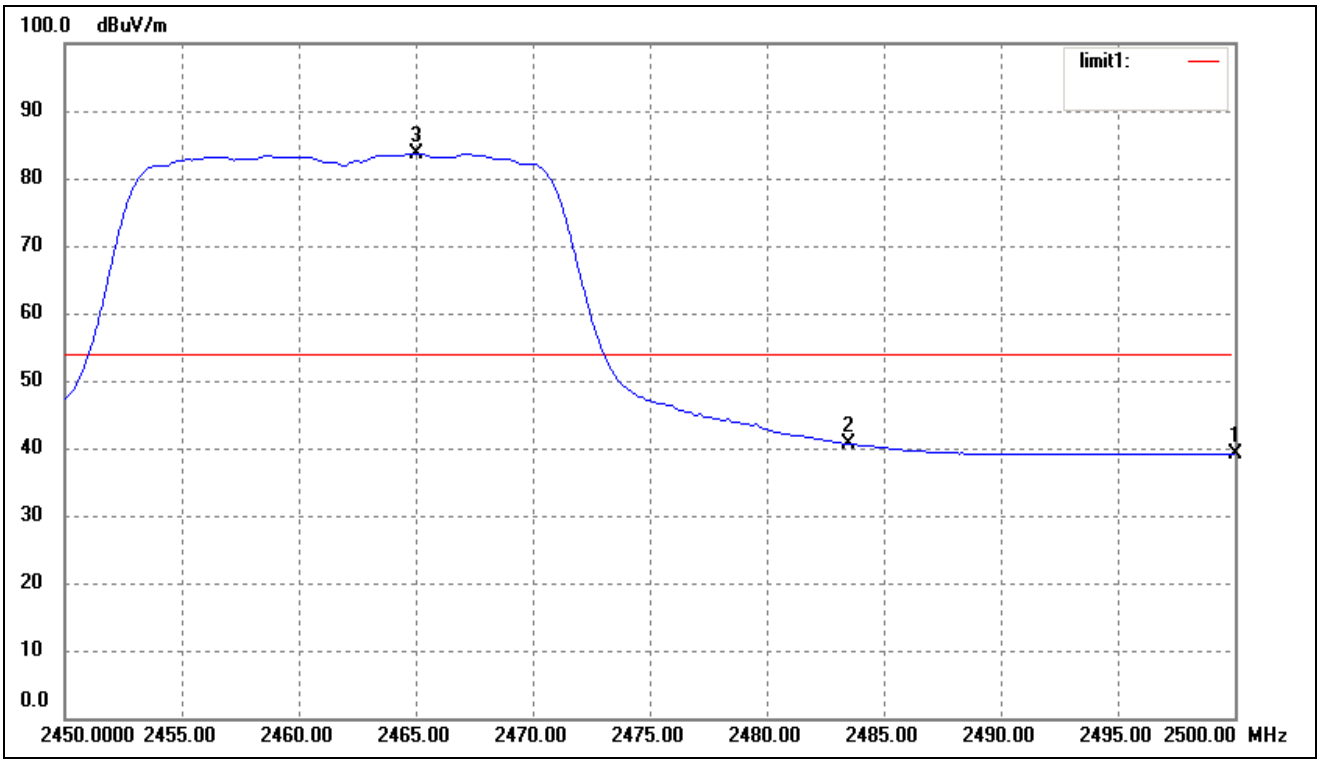
For 802.11n HT20

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	36.18	2.49	38.67	54.00	-15.33	251	100	Ave
	2310.000	47.90	2.49	50.39	74.00	-23.64	226	102	peak
2	2390.000	37.42	2.66	40.08	54.00	-13.92	109	215	Ave
	2390.000	49.93	2.66	52.59	74.00	-21.41	117	200	peak
3	2400.000	45.19	2.69	47.88	/	/	/	/	Ave
4	2417.360	80.39	2.73	83.12	/	/	/	/	Ave

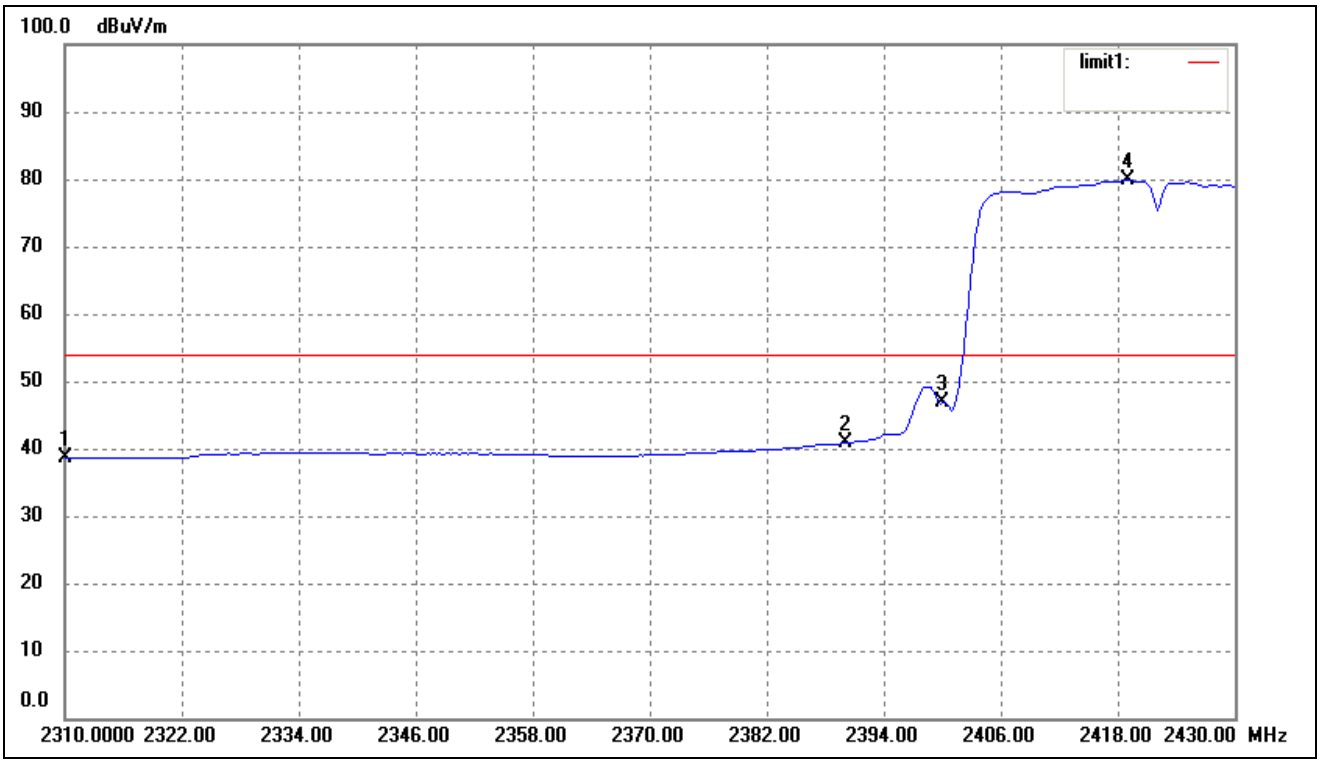
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2500.000	36.25	2.92	39.17	54.00	-14.83	236	117	Ave
	2500.000	48.47	2.92	51.39	74.00	-22.61	261	124	peak
2	2483.500	37.75	2.87	40.62	54.00	-13.38	104	218	Ave
	2483.500	50.95	2.87	53.82	74.00	-21.18	118	200	peak
3	2465.000	80.87	2.84	83.71	/	/	/	/	Ave

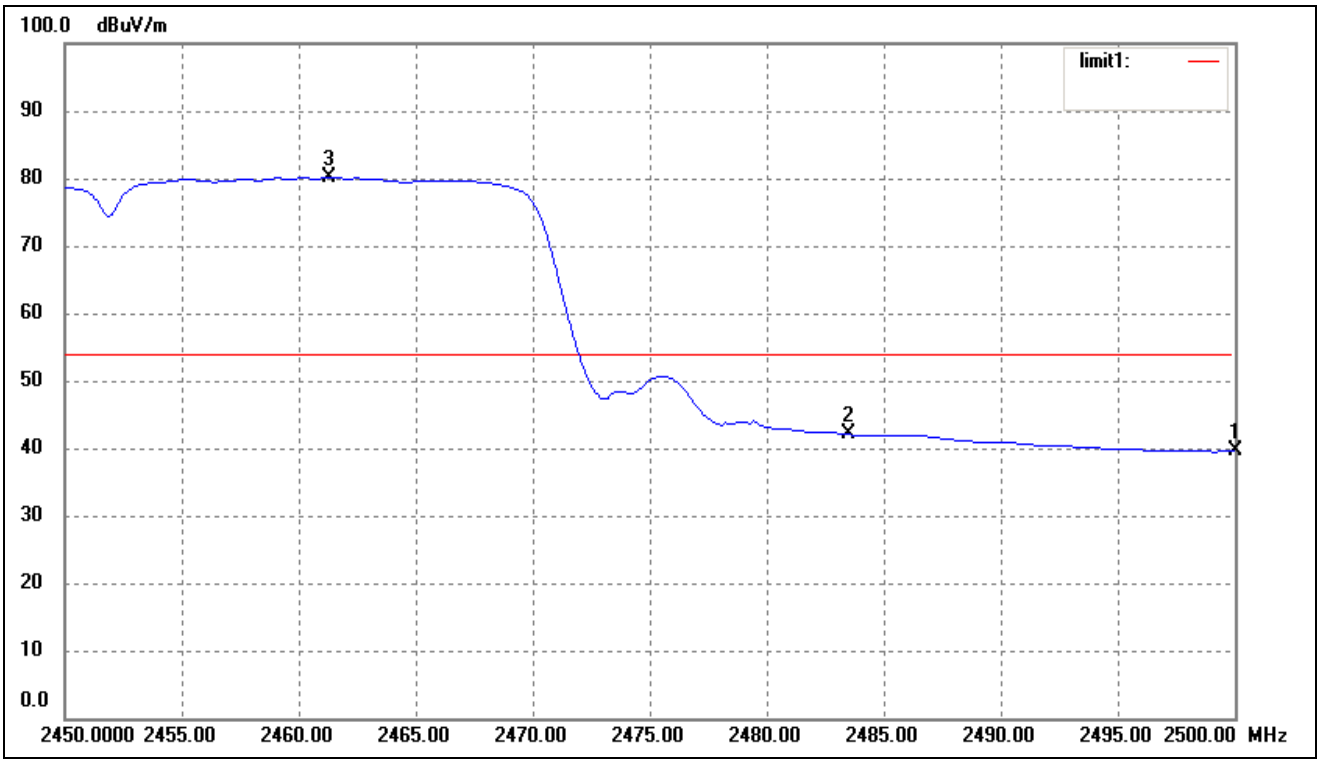
For 802.11n HT40

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	36.09	2.49	38.58	54.00	-15.42	125	110	Ave
	2310.000	47.82	2.49	50.31	74.00	-23.69	119	107	peak
2	2390.000	38.21	2.66	40.87	54.00	-13.13	235	115	Ave
	2390.000	50.60	2.66	53.26	74.00	-20.74	156	208	peak
3	2400.000	44.18	2.69	46.87	/	/	/	/	Ave
4	2418.960	77.06	2.74	79.80	/	/	/	/	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	2500.000	36.62	2.92	39.54	54.00	-14.46	228	287	Ave
	2500.000	46.46	2.92	49.38	74.00	-24.62	135	446	peak
2	2483.500	39.15	2.87	42.02	54.00	-11.98	115	109	Ave
	2483.500	47.50	2.87	50.57	74.00	-23.53	209	227	peak
3	2461.300	77.29	2.83	80.12	/	/	/	/	Ave

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