

FCC Part 15C

Measurement and Test Report


For

FreeWings Technologies Co., Ltd.

Rm505, Huana Business Center, No.1733, Lianhua Road, Shanghai, 201103,

P.R.China

FCC ID: XU5FW5301

Report Concerns: Original Report	Equipment Type: Wireless Card
Model:	<u>FW5301</u>
Report No.:	<u>STR09108061I</u>
Test/Witness Engineer:	<u>Jason</u>
Test Date:	<u>2009-10-21 to 2009-11-05</u>
Issue Date:	<u>2009-11-10</u>
Prepared By:	SEM.Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)
Approved & Authorized By:	 Jandy So / PSQ Manager

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

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: FreeWings Technologies Co., Ltd.
Address of applicant: Rm505, Huana Business Center, No.1733, Lianhua Road, Shanghai, 201103, P.R.China

Manufacturer: FreeWings Technologies Co., Ltd.
Address of manufacturer: Rm505, Huana Business Center, No.1733, Lianhua Road, Shanghai, 201103, P.R.China

General Description of E.U.T

Items	Description
EUT Description:	Wireless Card
Trade Name:	/
Model No.:	FW5301
Rated Voltage:	DC 3.3V
RF Output Power	Max. 13.74dBm
Antenna Gain:	0.54dBi
Frequency range:	2412MHz~2462MHz
Number of channels:	11
Channel Separation:	5MHz
Type of Antenna:	Extra Antenna
Antenna Length:	56.5cm
Size:	5.1x3.0x0.2cm

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

1.2 Test Standards

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

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

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

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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

1.5 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**

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

1.6 EUT Exercise Software

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

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
ASUS	Notebook PC	X85E66Se-SL	/
Gi-Link	Router	RG2415	/
Lenovo	Printer	3110	OD65133711480

1.8 EUT Cable List and Details

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

2. SUMMARY OF TEST RESULTS

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

3. CONDUCTED EMISSIONS

3.1 Measurement Uncertainty

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

3.2 Test Equipment List and Details

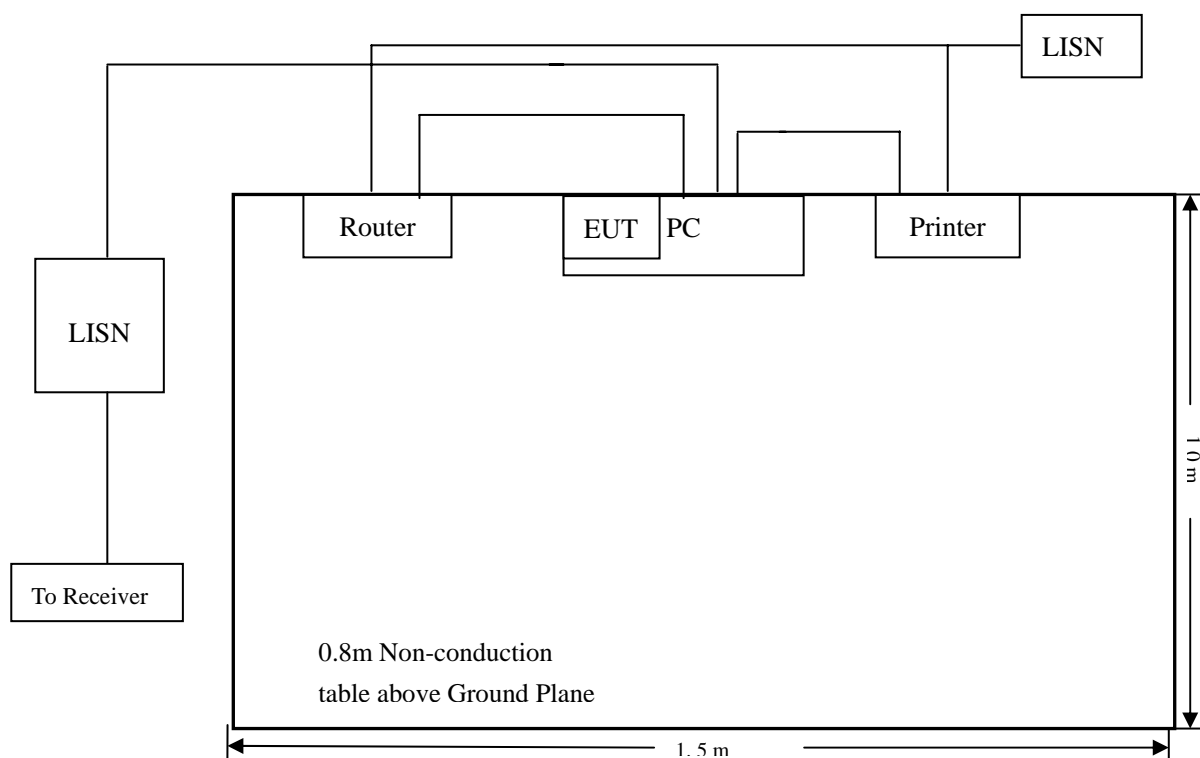
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
Puls Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-08-12	2010-08-11
L.I.S.N.	SCHWARZBECK	NSLK8126	8126-224	2009-08-12	2010-08-11
L.I.S.N.	EMCO	3825/2	11967C	2009-08-12	2010-08-11

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

3.3 Test Procedure

Test is conducting under the description of ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

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

3.6 Summary of Test Results/Plots

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

-8.57 dB μ V at 0.214 MHz in the Line Ave Detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15.207	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Pk	Line/Neutral	dB μ V	dB
0.214	44.47	Ave	Line	53.04	-8.57
0.170	54.95	QP	Neutral	64.95	-10.00
0.214	42.97	Ave	Neutral	53.04	-10.07
0.214	52.51	QP	Line	63.04	-10.53
4.442	34.20	Ave	Line	46.00	-11.79
4.730	31.83	Ave	Neutral	46.00	-14.16
0.638	30.70	Ave	Neutral	46.00	-15.29
0.634	29.98	Ave	Line	46.00	-16.01
0.990	28.69	Ave	Neutral	46.00	-17.31
4.302	38.16	QP	Line	56.00	-17.83
0.414	39.62	QP	Line	57.56	-17.94
0.986	27.98	Ave	Line	46.00	-18.01
4.730	37.22	QP	Neutral	56.00	-18.77

Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: Wireless Card

M/N: FW5301

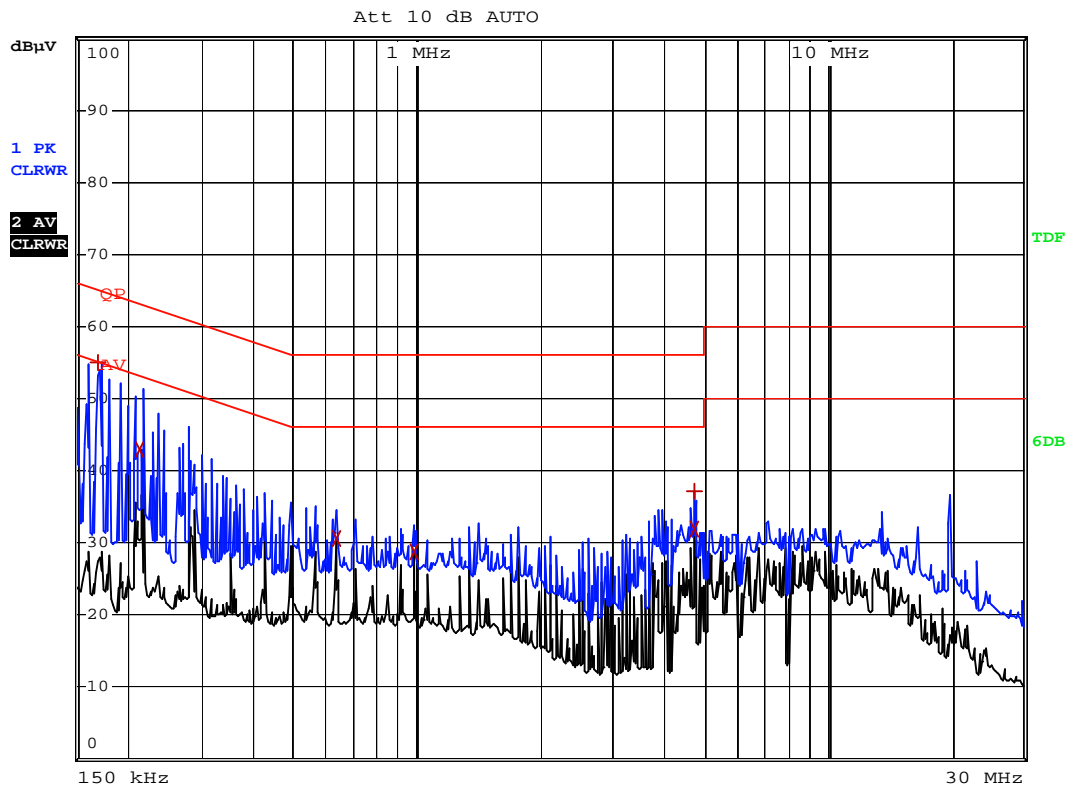
Operating Condition: Transmitting

Test Specification: N

Comment: AC 120V/60Hz



RBW 9 kHz
MT 4 ms



Date: 23.JUL.2008 11:28:25

Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: Wireless Card

M/N: FW5301

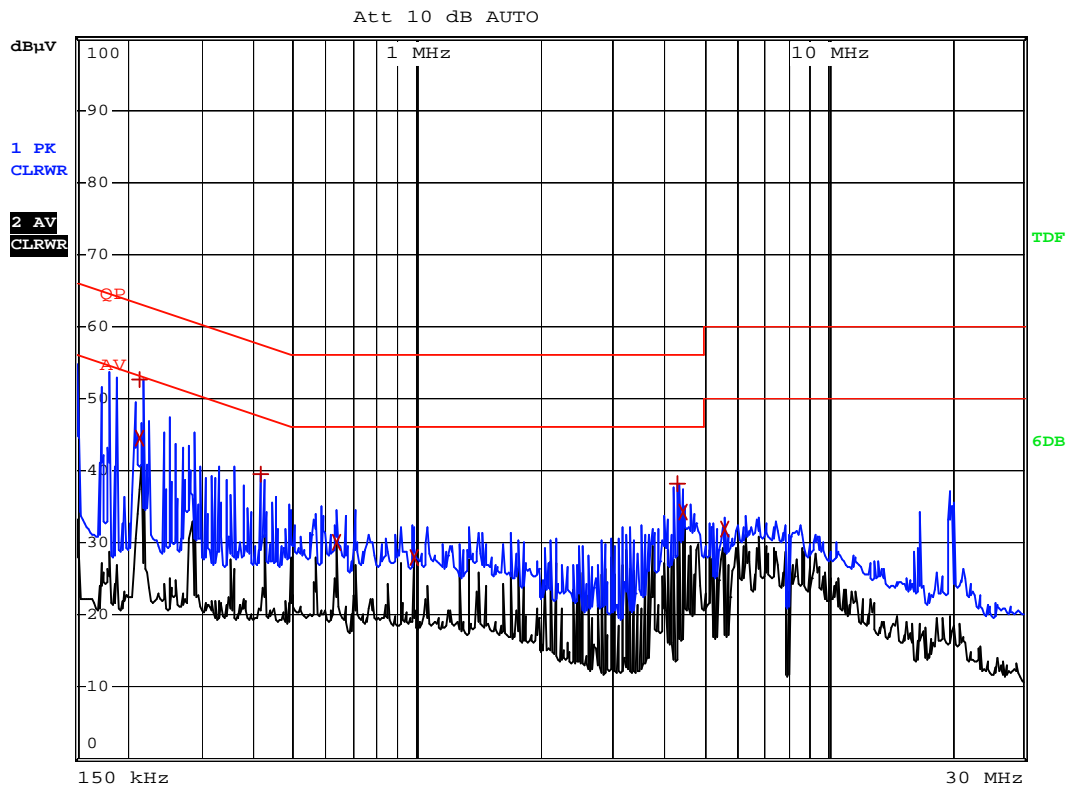
Operating Condition: Transmitting

Test Specification: L

Comment: AC 120V/60Hz



RBW 9 kHz
MT 4 ms



Date: 23.JUL.2008 11:29:41

4. §15.203 - ANTENNA REQUIREMENT

4.1 Standard Applicable

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Test Result

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

5. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

5.1 Standard Applicable

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

(a) Limits for Occupational / Controlled Exposure

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

(b) Limits for General Population / Uncontrolled Exposure

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

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

5.2 MPE Calculation Method

$$S = (P \cdot G) / (4 \cdot \pi \cdot R^2)$$

S = power density (in appropriate units, e.g., mW/cm²)

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

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

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

5.3 MPE Calculation Result

Maximum peak output power at antenna input terminal: 13.74(dBm)

Maximum peak output power at antenna input terminal: 23.659196(mW)

Prediction distance: 2.5 (cm)

Prediction frequency: 2437(MHz)

Antenna gain (typical): 0.54 (dBi)

Antenna gain (numeric): 1.132400 (numeric)

The worst case is power density at prediction frequency at 2.5cm: 0.3411222(mw/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

$$0.3411222 \text{ (mw/cm}^2\text{)} < 1 \text{ (mw/cm}^2\text{)}$$

Result: Compliance

6. POWER SPECTRAL DENSITY

6.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2009-08-12	2010-08-11
RF Limiter	Agilent	11867A	MY42241685	2009-08-12	2010-08-11
RMS/PEAK Voltmeter	Rohde & Schwarz	URE3	826135/008	2009-08-12	2010-08-11

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

6.3 Test Procedure

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

6.4 Environmental Conditions

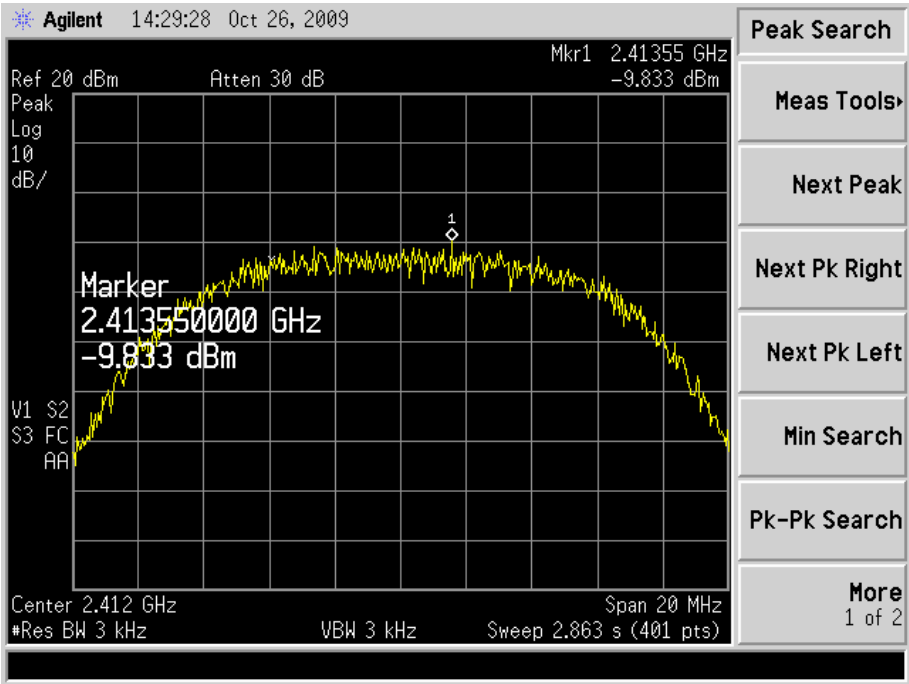
Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

6.5 Summary of Test Results/Plots

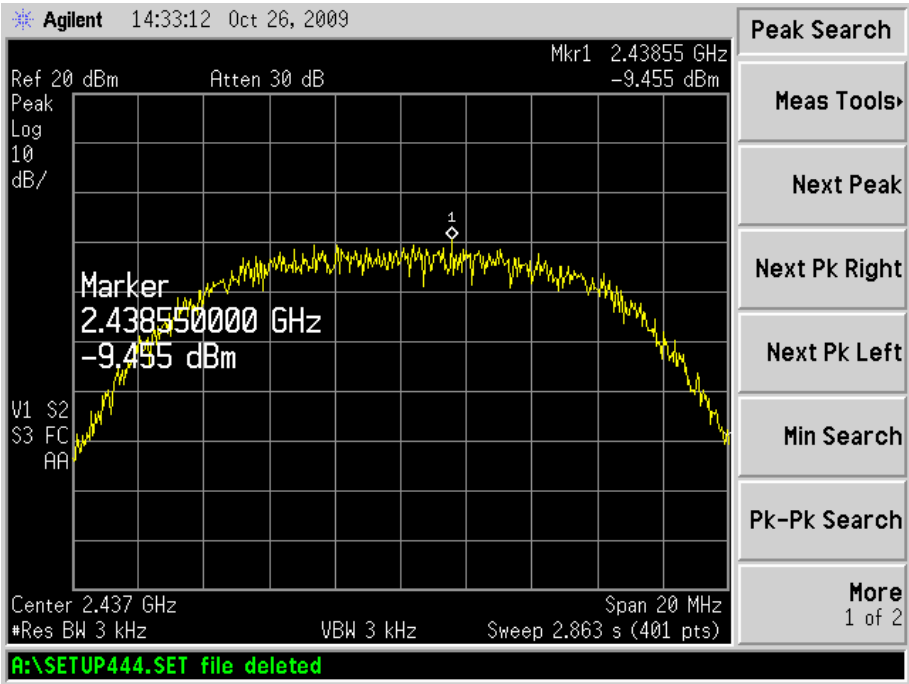
Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-9.833	8
	Middle channel (2437MHz)	-9.455	8
	High channel (2462MHz)	-9.563	8
802.11g	Low channel (2412MHz)	-15.62	8
	Middle channel (2437MHz)	-15.68	8
	High channel (2462MHz)	-15.97	8
802.11n HT20	Low channel (2412MHz)	-16.39	8
	Middle channel (2437MHz)	-16.03	8
	High channel (2462MHz)	-16.16	8
802.11n HT40	Low channel (2422MHz)	-17.59	8
	Middle channel (2437MHz)	-17.32	8
	High channel (2452MHz)	-17.22	8

For 802.11b

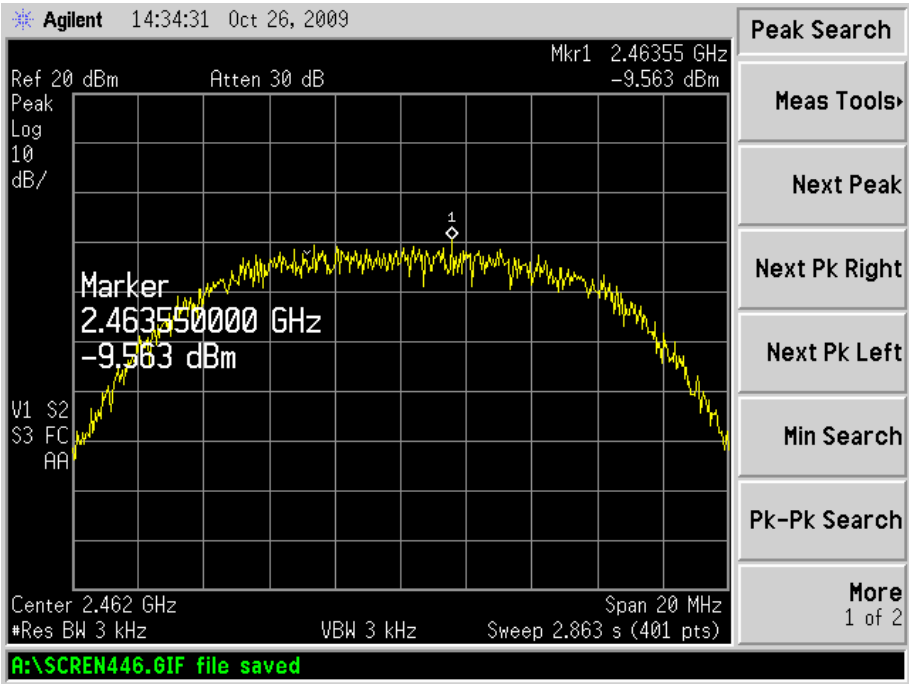
Low Channel:



Middle Channel:

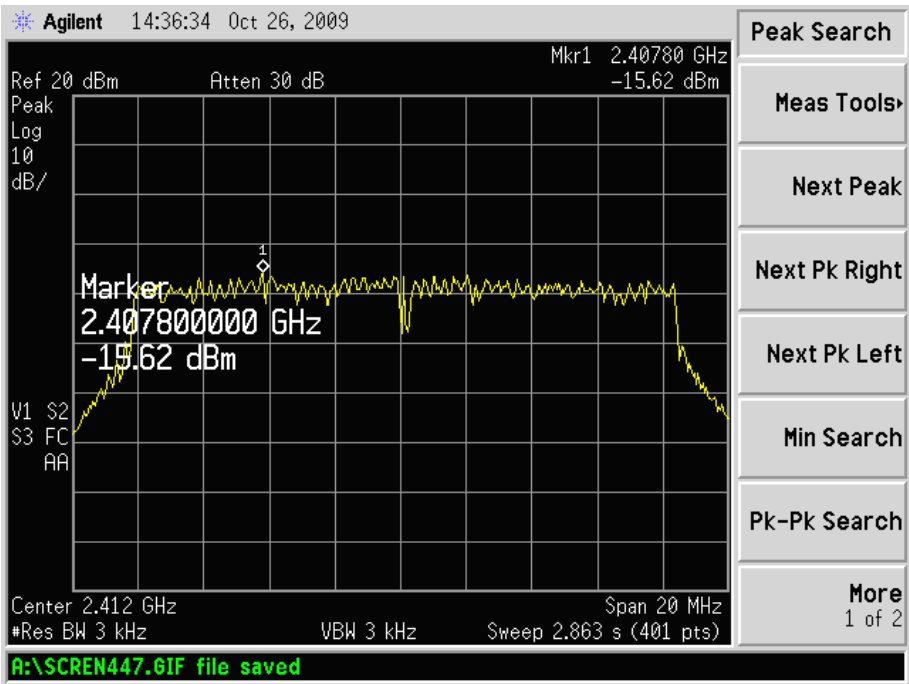


High Channel:

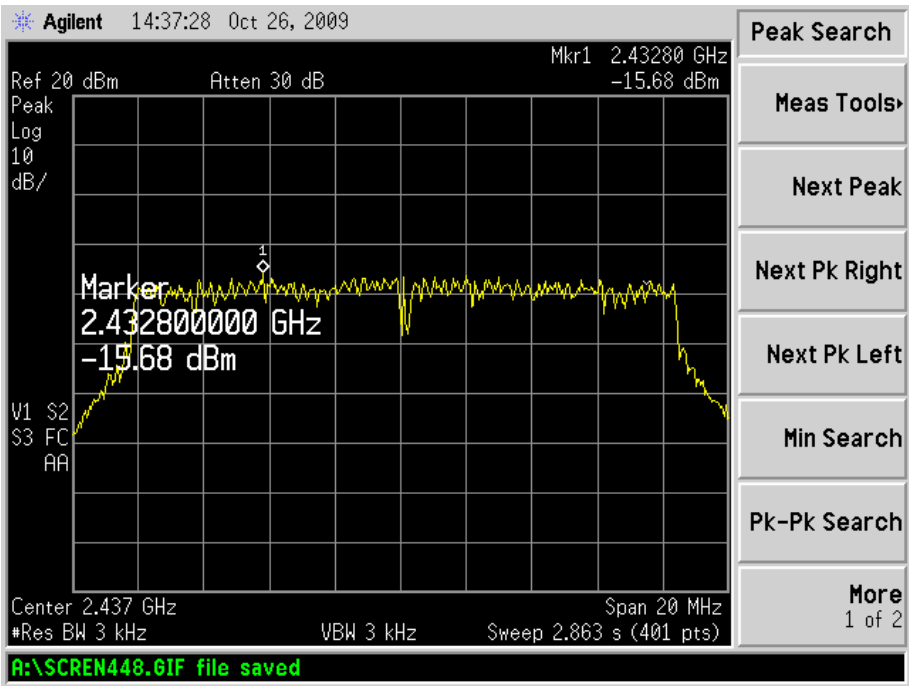


For 802.11g

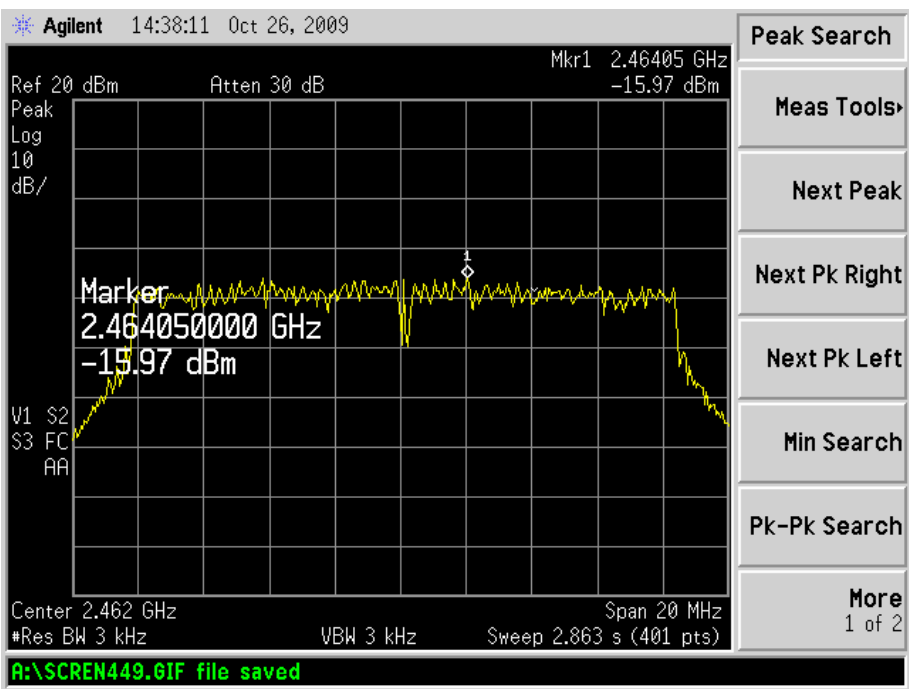
Low Channel:



Middle Channel:

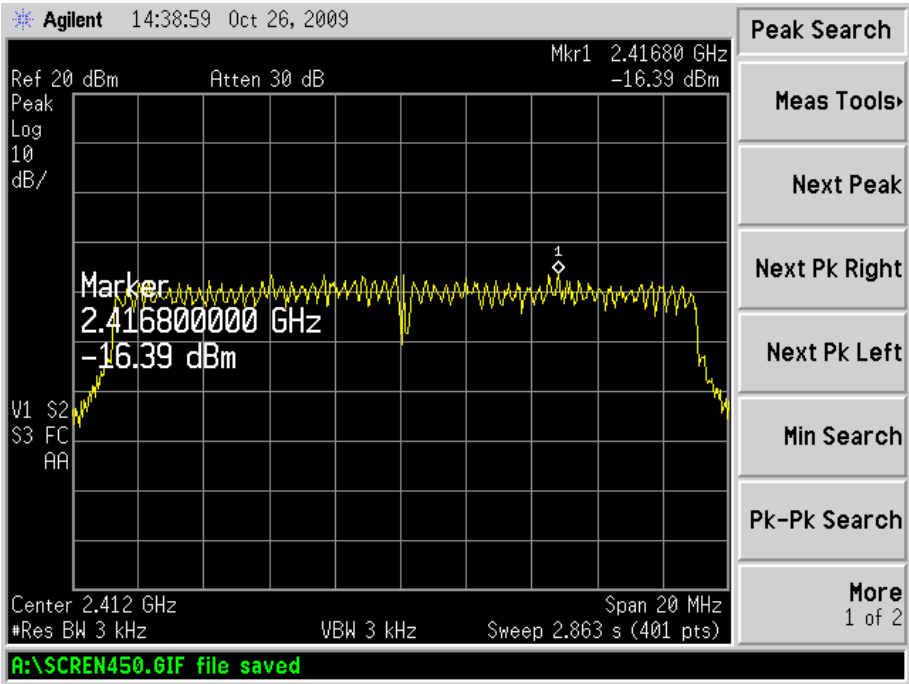


High Channel:

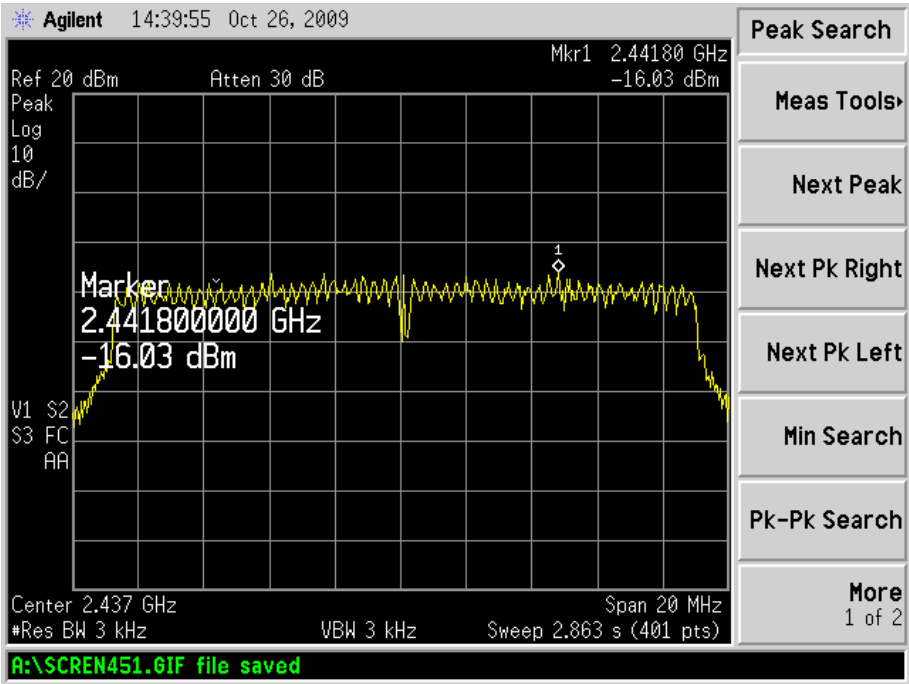


For 802.11n HT20

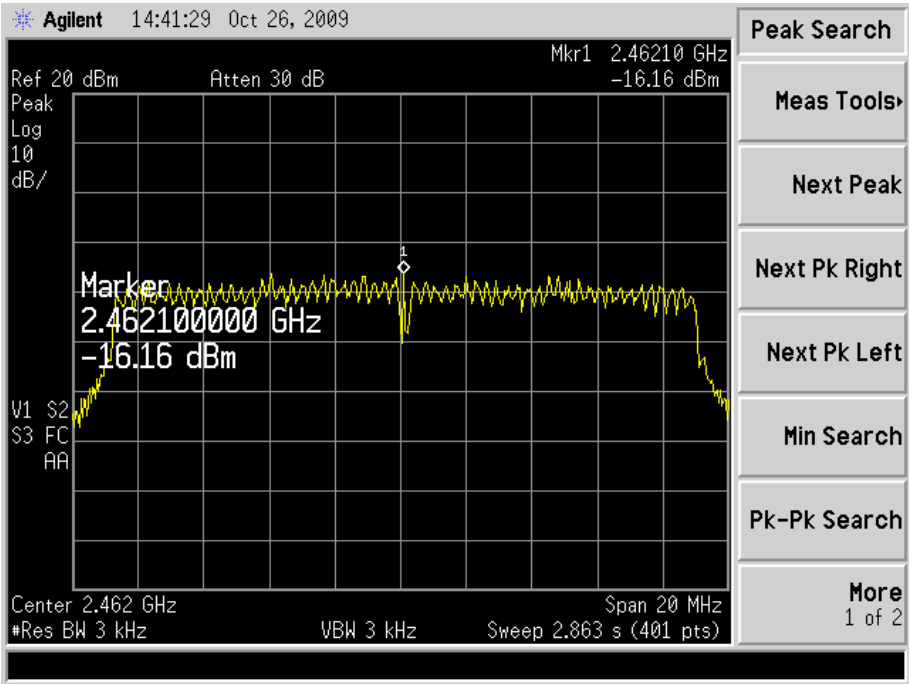
Low Channel:



Middle Channel:

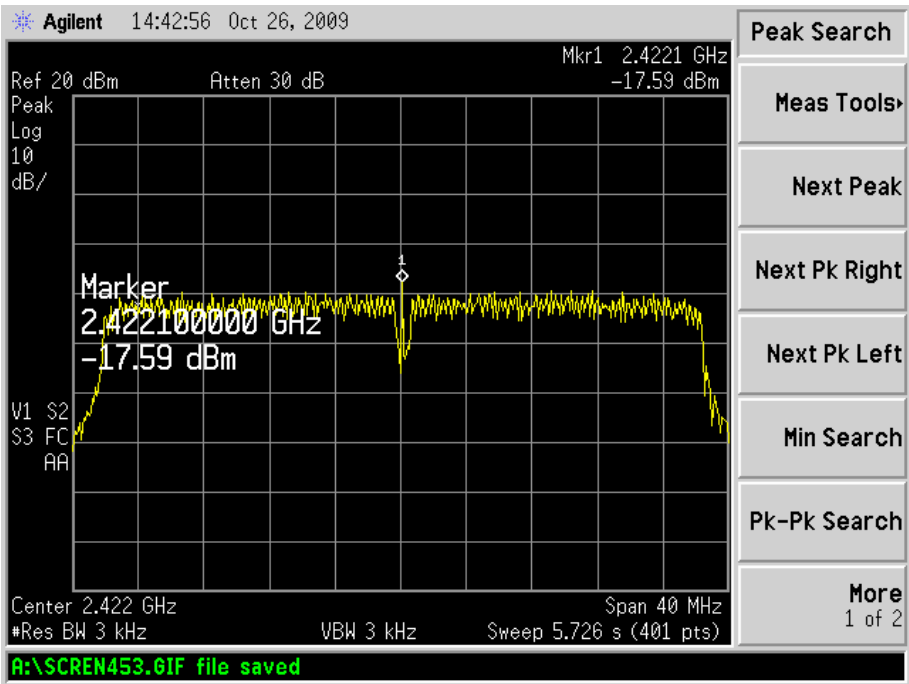


High Channel:

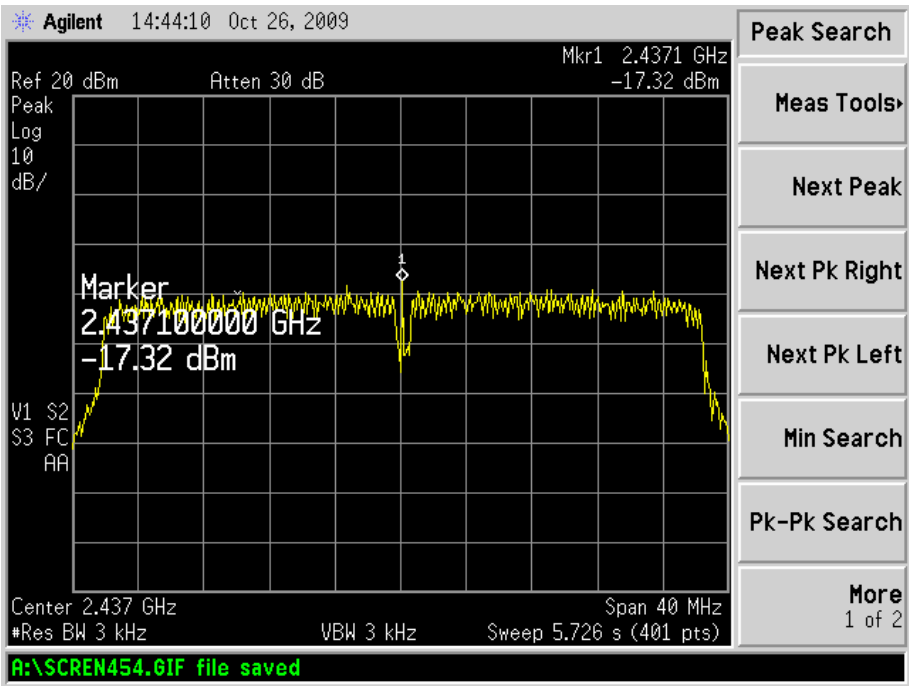


For 802.11n HT40

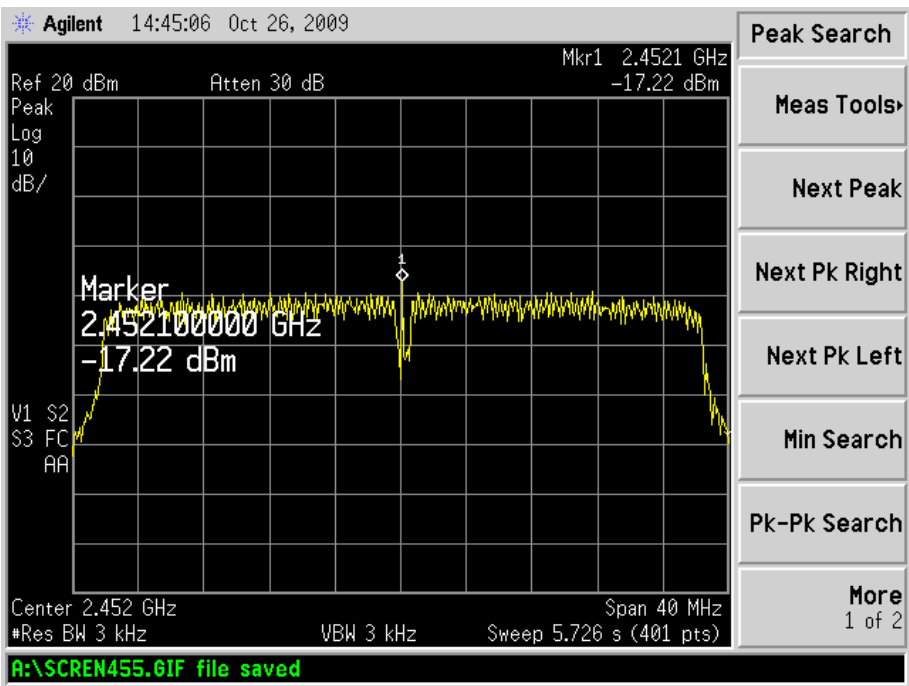
Low Channel:



Middle Channel:



High Channel:



7. 6-dB BANDWIDTH

7.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2009-08-12	2010-08-11
RF Limiter	Agilent	11867A	MY42241685	2009-08-12	2010-08-11

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

7.3 Test Procedure

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

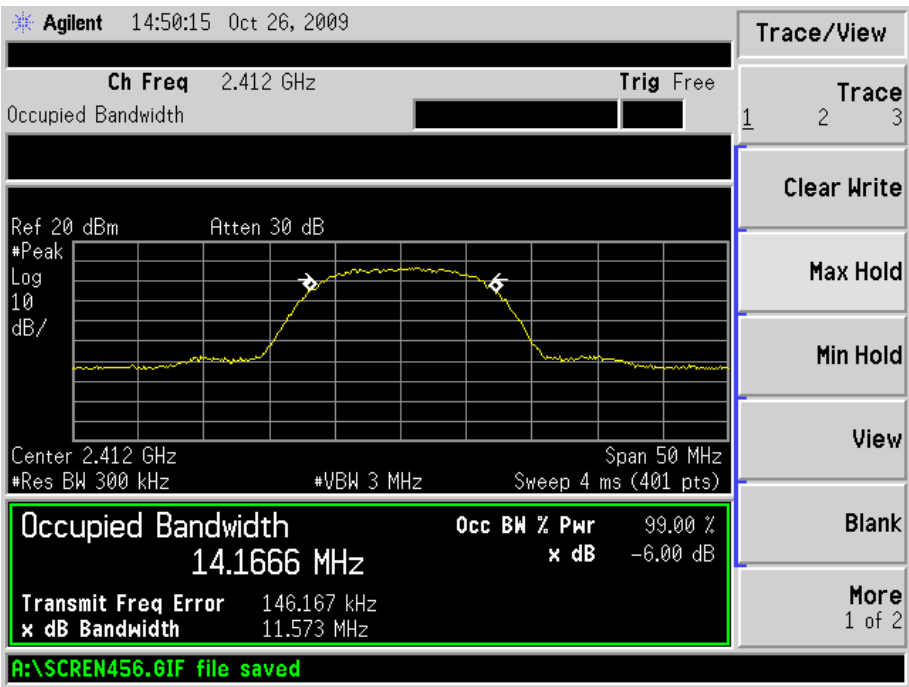
7.4 Environmental Conditions

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

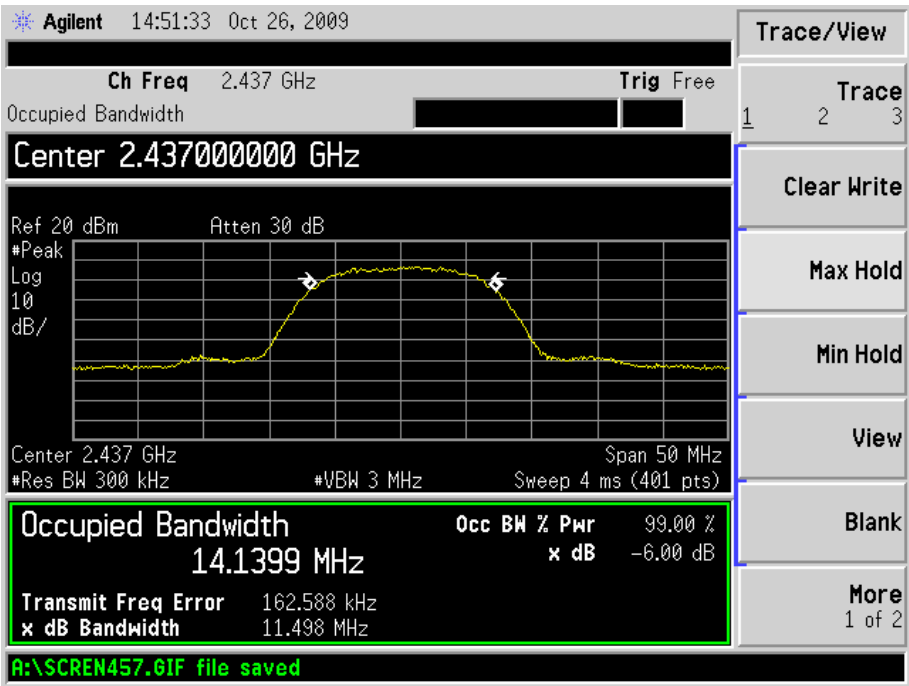
7.5 Summary of Test Results/Plots

Test mode	Frequency MHz	6 dB Bandwidth (Antenna) kHz	Limit kHz
802.11b	2412	11573	500
	2437	11498	500
	2462	11529	500
802.11g	2412	16660	500
	2437	16566	500
	2462	16579	500
802.11n HT20	2412	17606	500
	2437	17648	500
	2462	17513	500
802.11n HT40	2422	36396	500
	2437	36073	500
	2452	36248	500

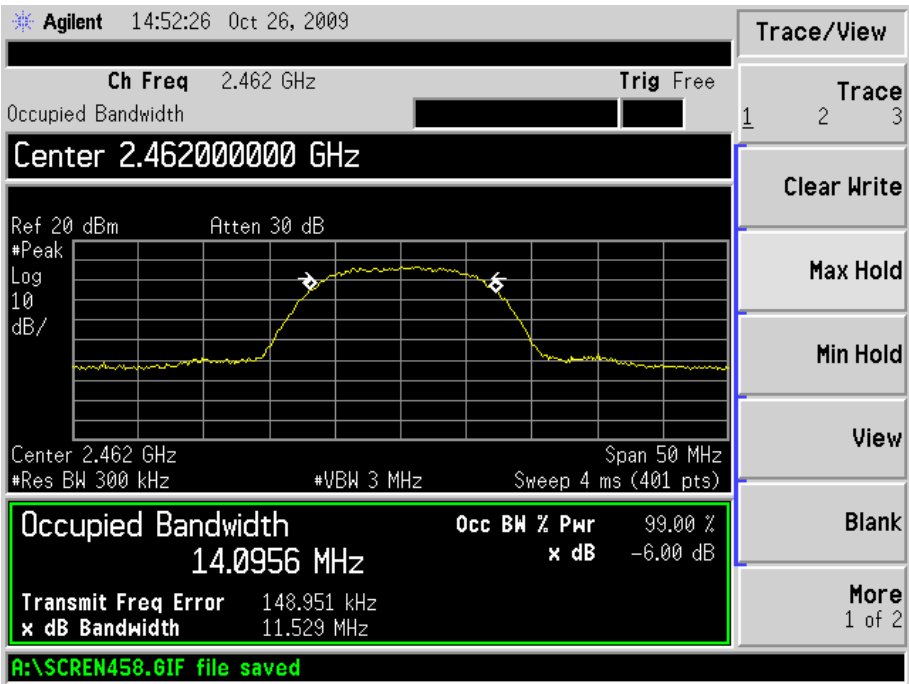
For 802.11b
Low Channel:



Mid Channel:

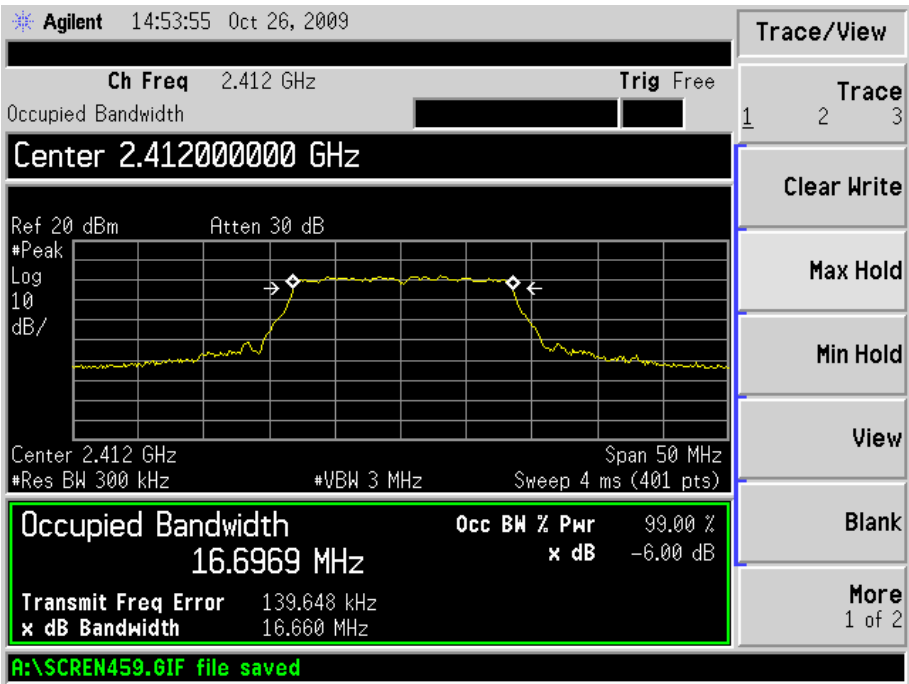


High Channel:

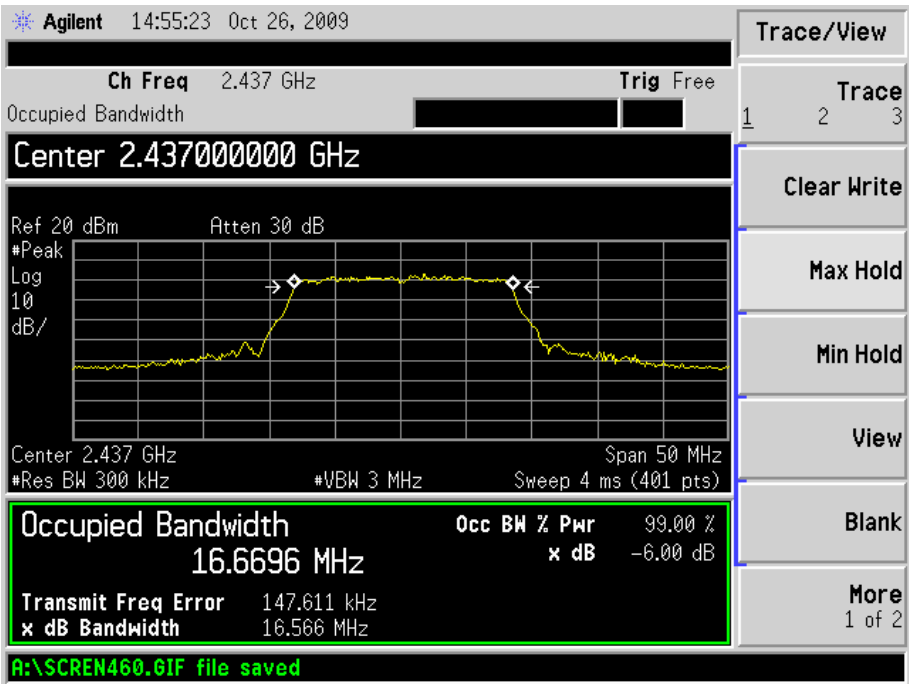


For 802.11g

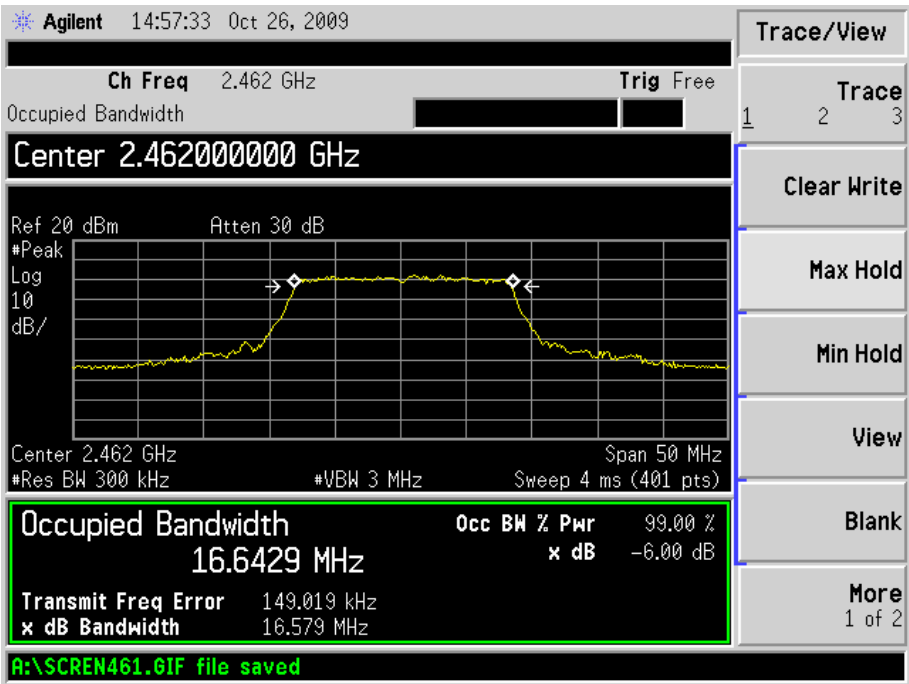
Low Channel:



Mid Channel:

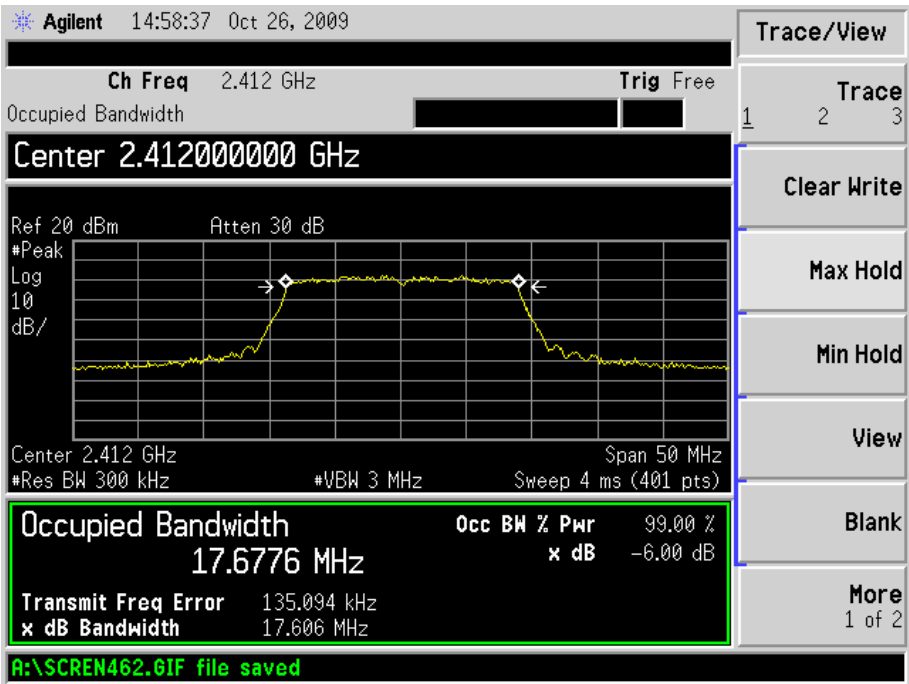


High Channel:

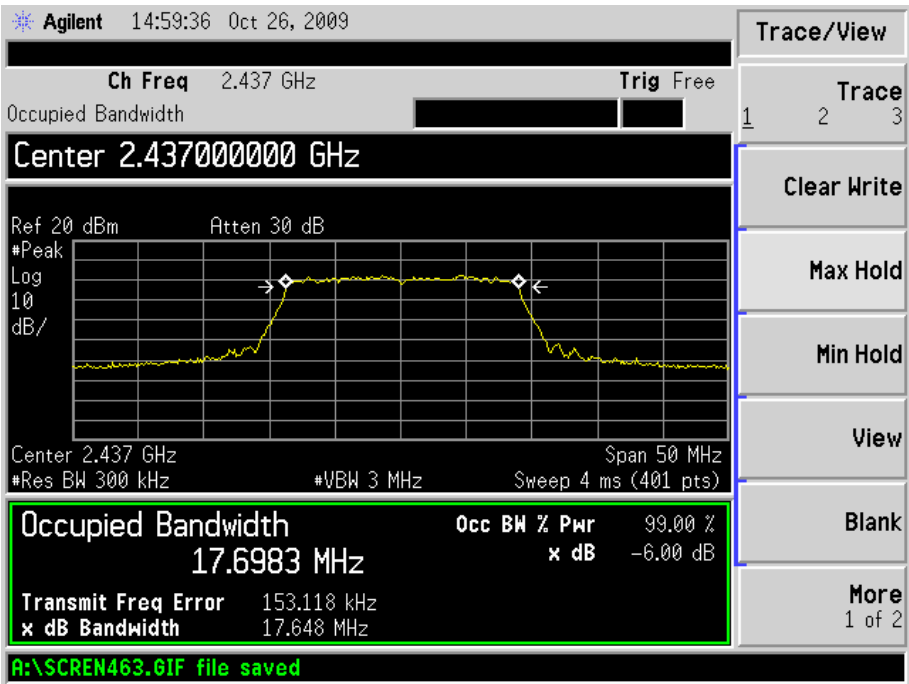


For 802.11n HT20

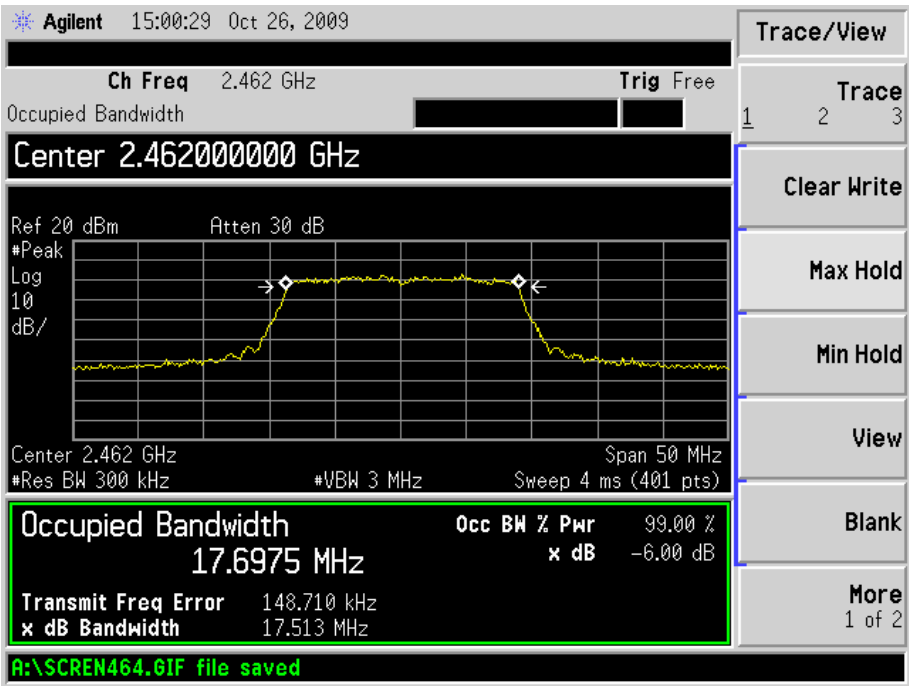
Low Channel:



Mid Channel:

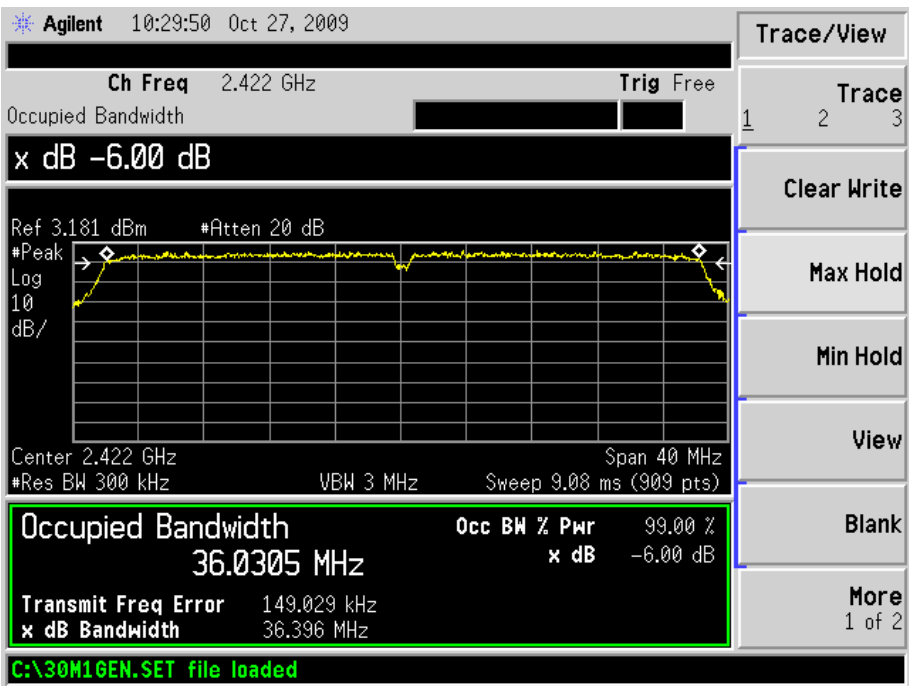


High Channel:

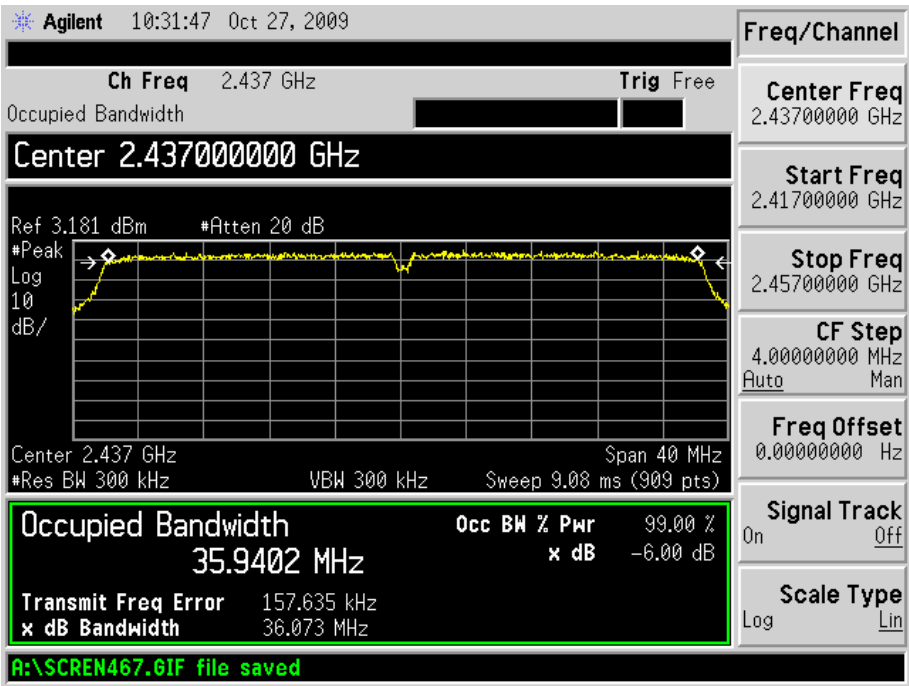


For 802.11n HT40

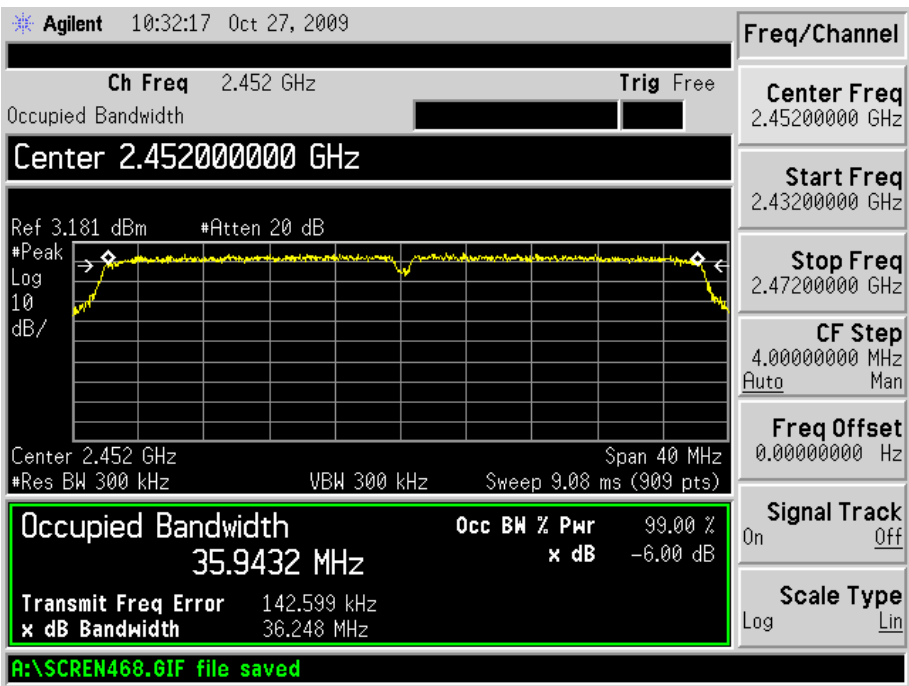
Low Channel:



Mid Channel:



High Channel:



8. POWER OUTPUT

8.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

8.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2009-08-12	2010-08-11
RF Limiter	Agilent	11867A	MY42241685	2009-08-12	2010-08-11

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

8.3 Test Procedure

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

8.4 Environmental Conditions

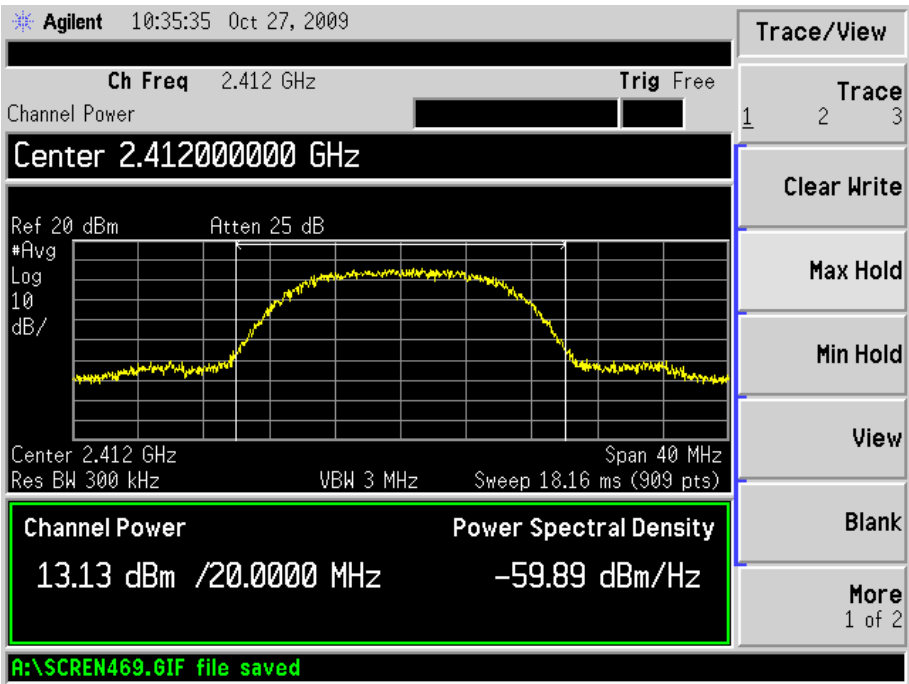
Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

8.5 Summary of Test Results/Plots

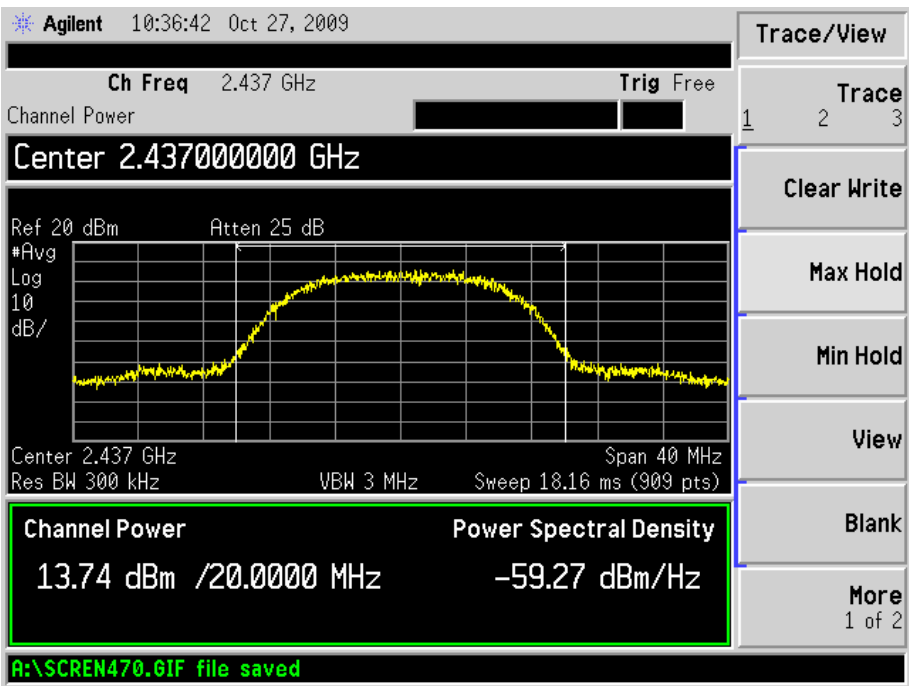
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11b	2412	13.13	0.02055	1
	2437	13.74	0.02365	1
	2462	12.68	0.01853	1
802.11g	2412	9.93	0.00984	1
	2437	9.58	0.00907	1
	2462	9.89	0.00974	1
802.11n	2412	9.76	0.00946	1
	2437	9.98	0.00995	1
	2462	9.72	0.00937	1
802.11n HT40	2422	9.76	0.00946	1
	2437	10.06	0.01013	1
	2452	10.26	0.01061	1

For 802.11b

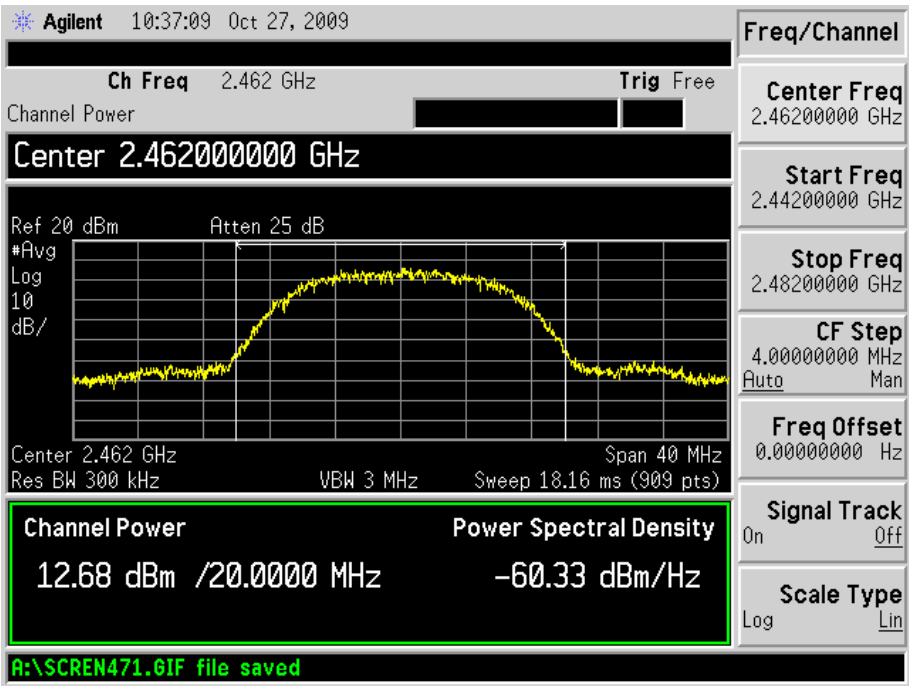
Low Channel:



Middle Channel:

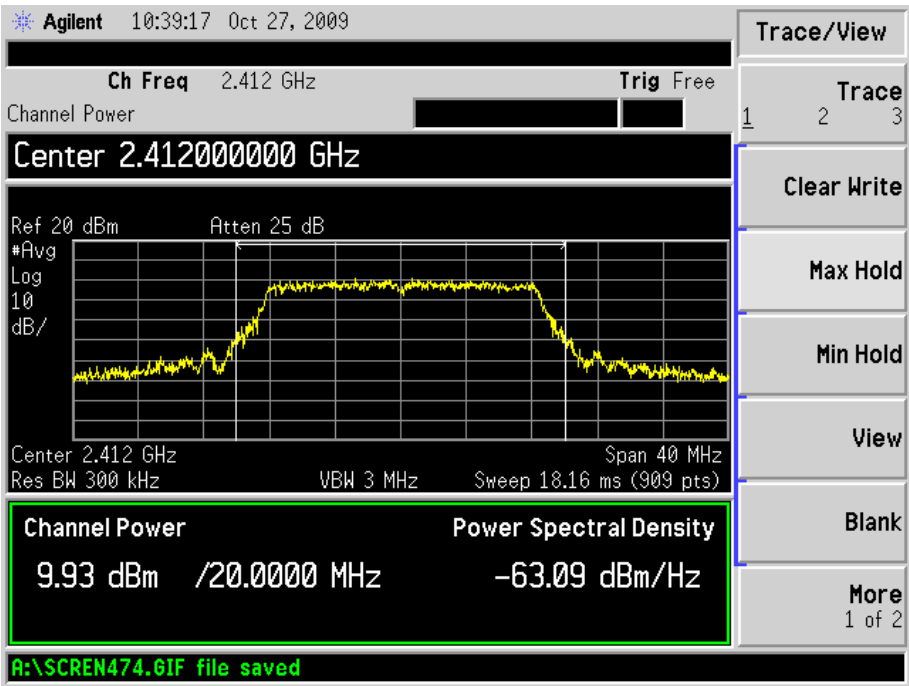


High Channel:

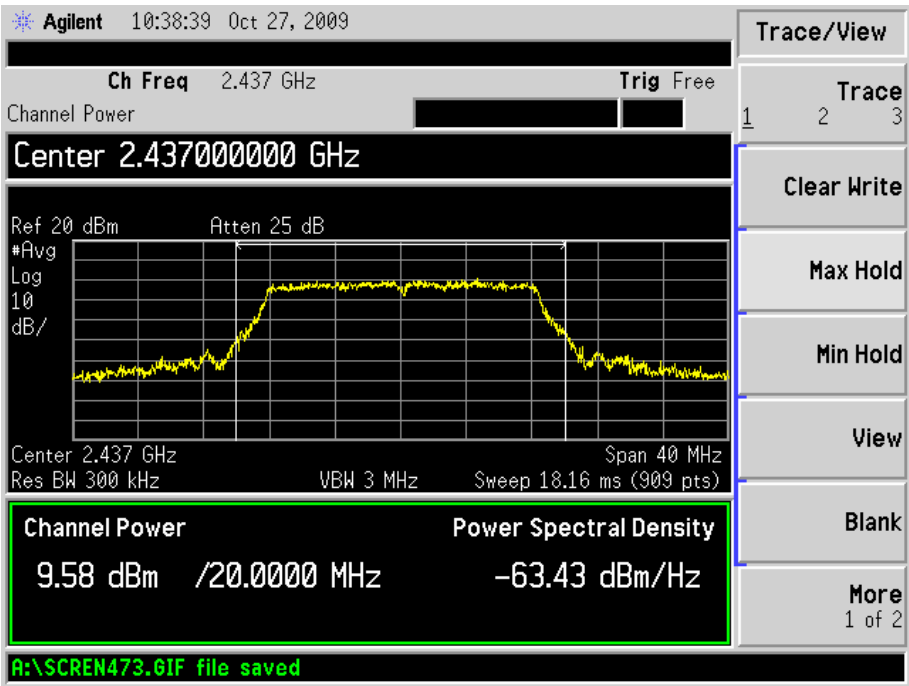


For 802.11g

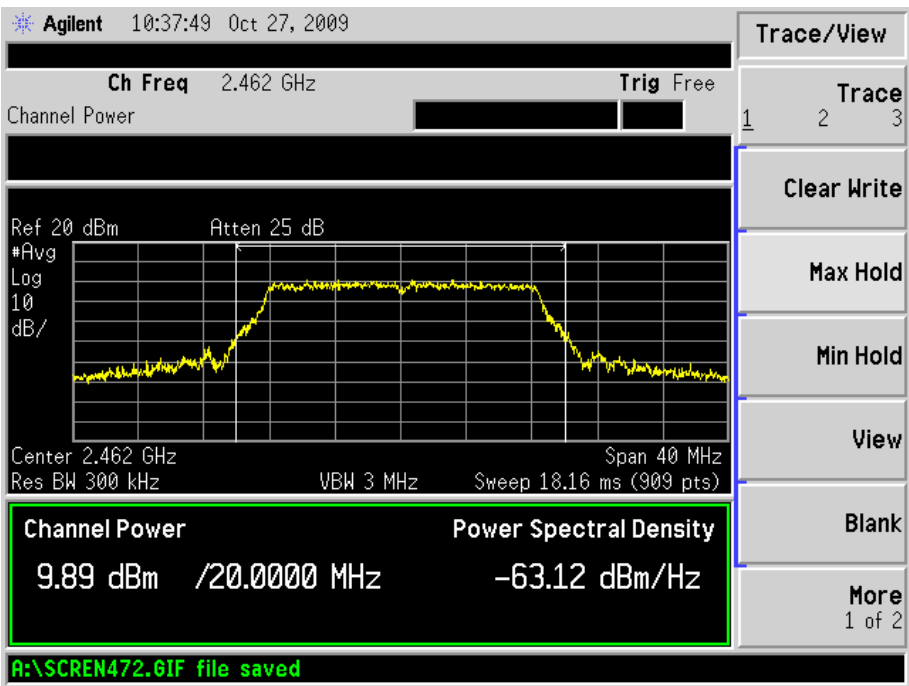
Low Channel:



Middle Channel:

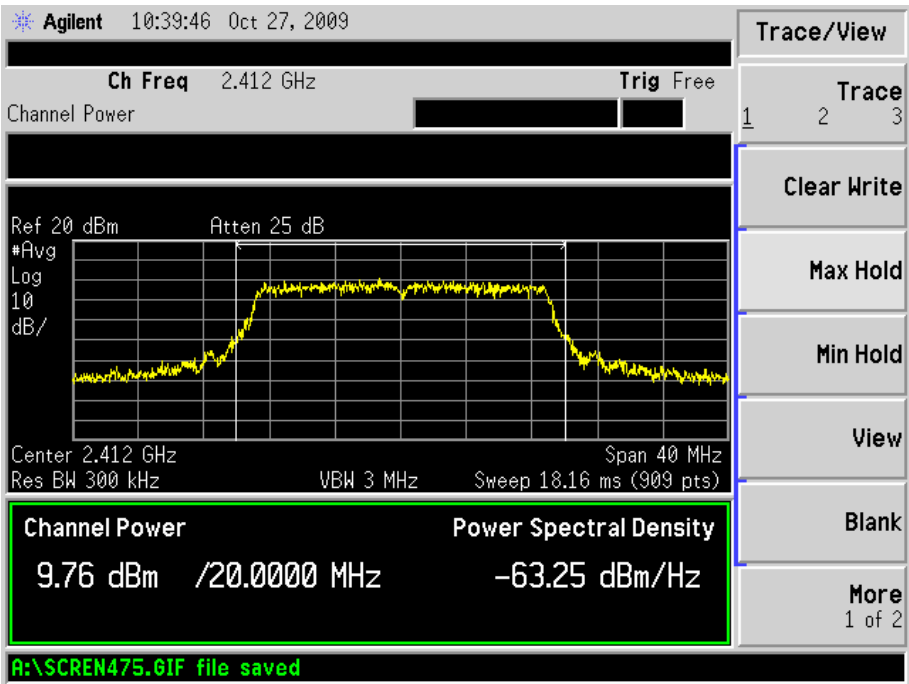


High Channel:

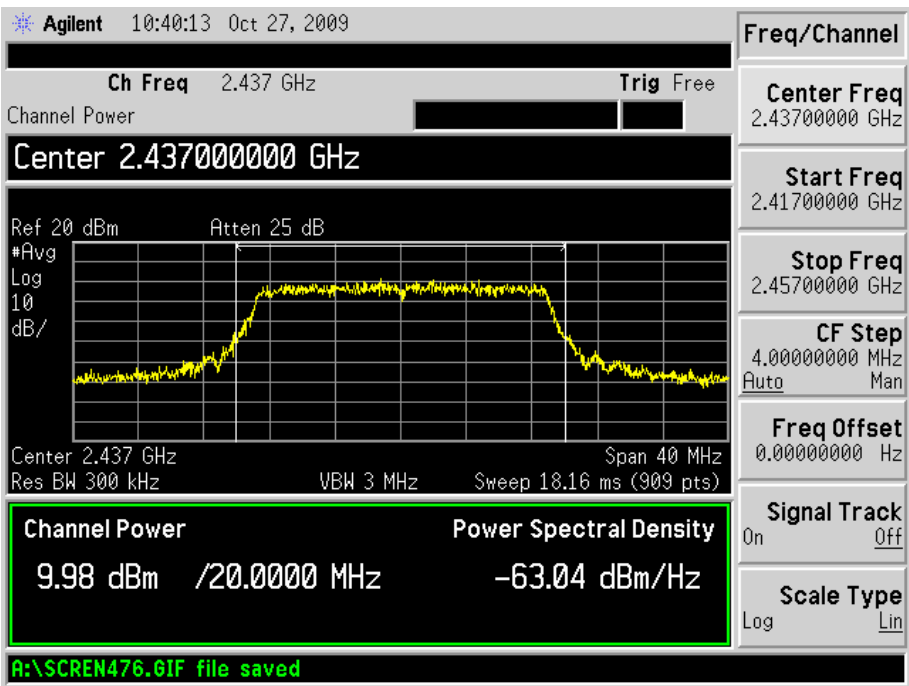


For 802.11n HT20

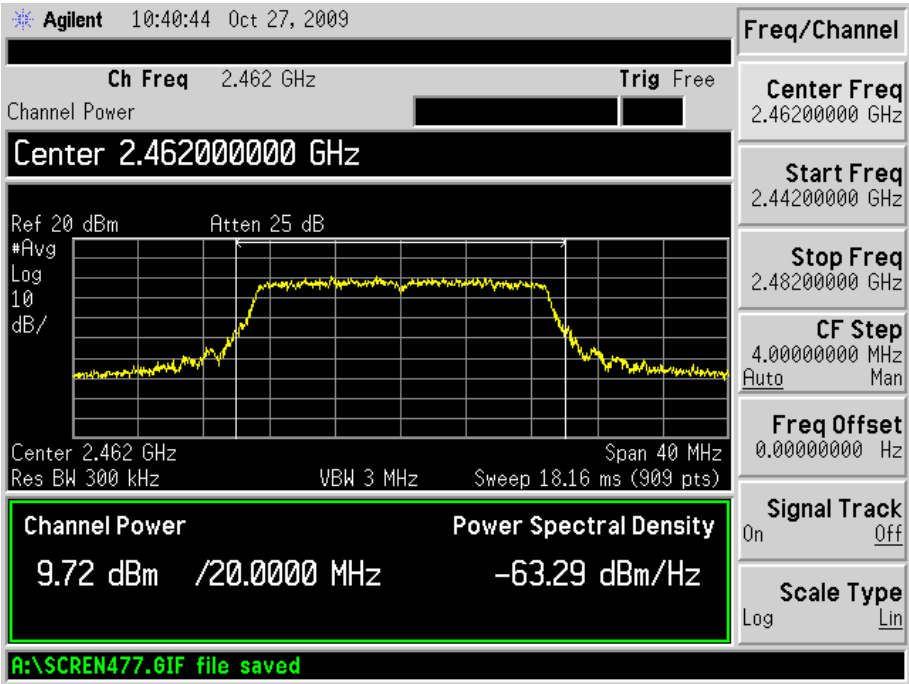
Low Channel:



Middle Channel:

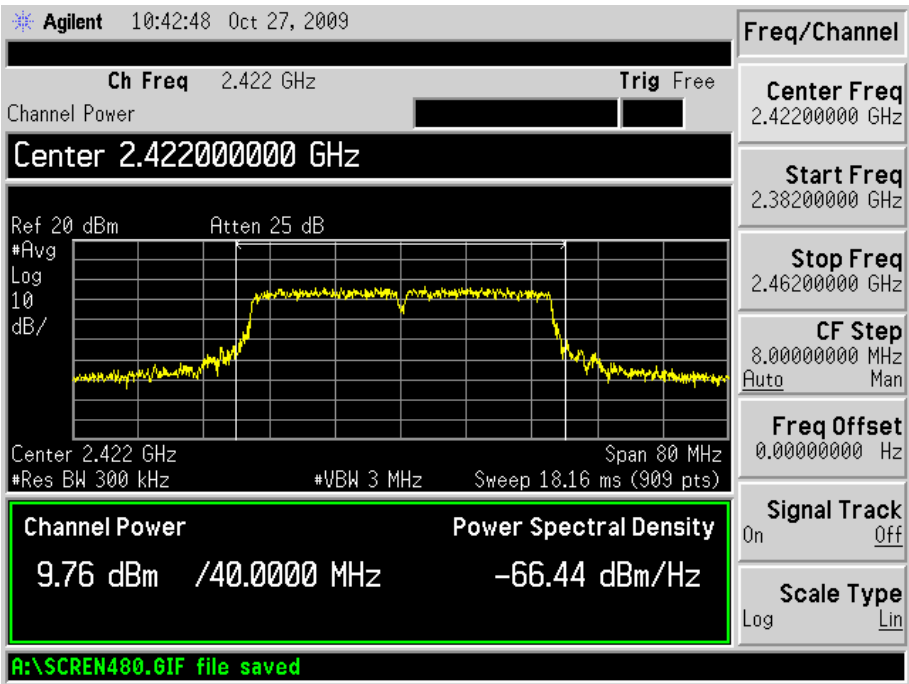


High Channel:

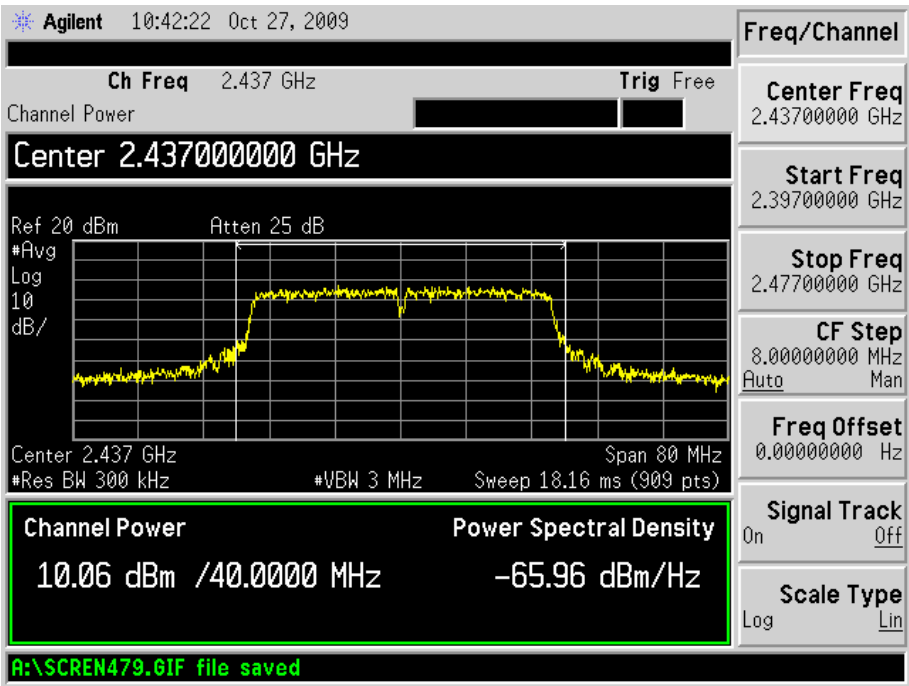


For 802.11n HT40

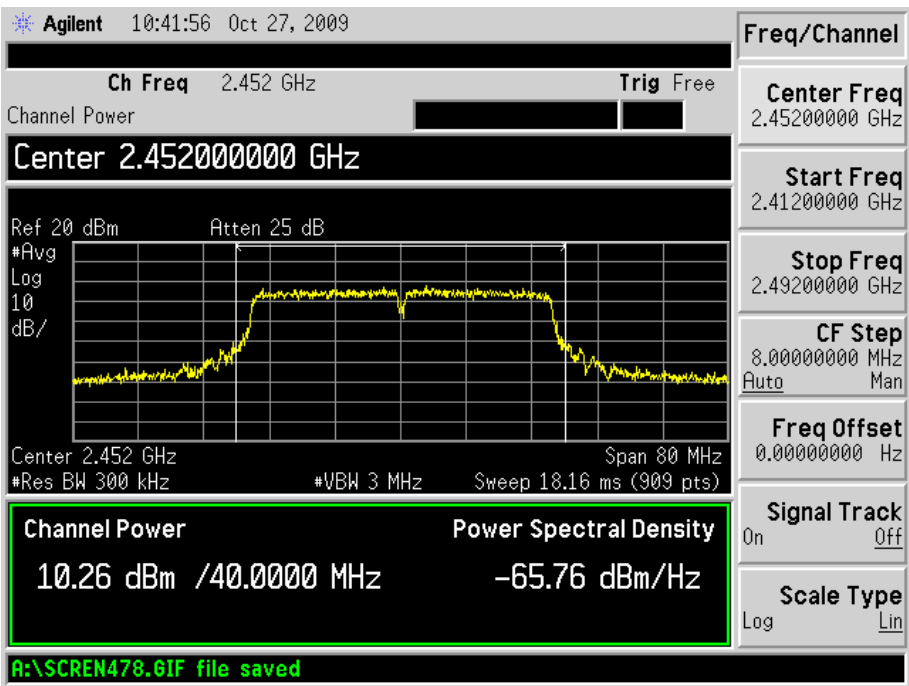
Low Channel:



Middle Channel:



High Channel:



9. FIELD STRENGTH OF SPURIOUS EMISSIONS

9.1 Measurement Uncertainty

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

9.2 Standard Applicable

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

Section 15.209:

30 - 88 MHz 40 dBuV/m @3M

88 -216 MHz 43.5 dBuV/m @3M

216 -960 MHz 46 dBuV/m @3M

Above 960 MHz 54dBuV/m @3M

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

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

9.3 Test Equipment List and Details

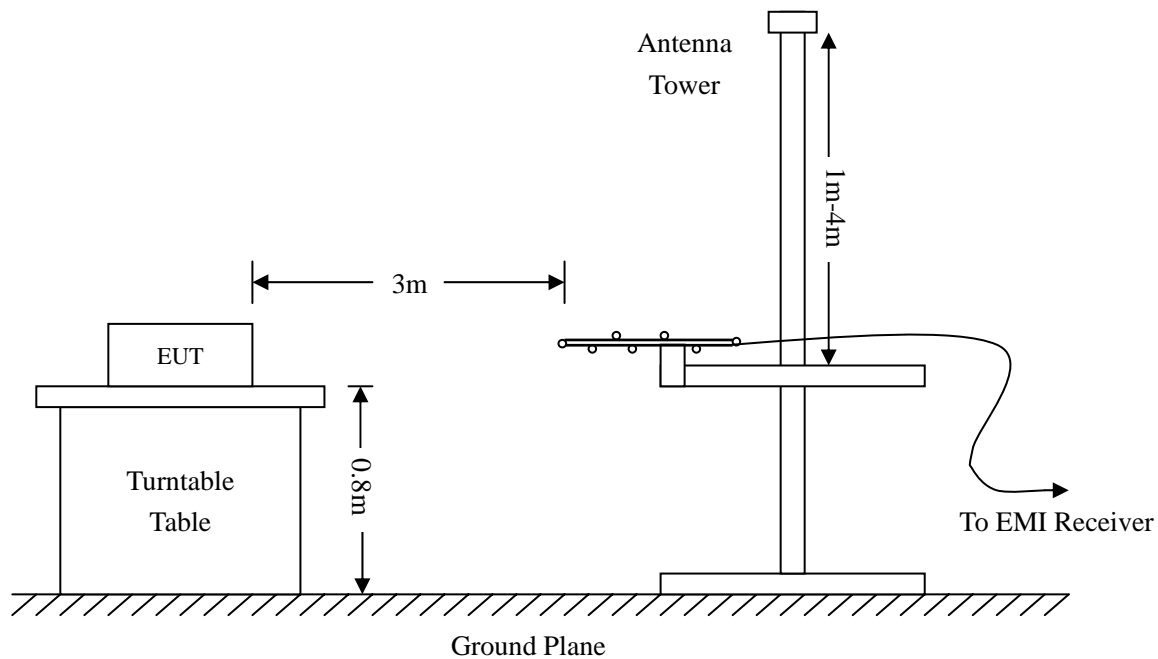
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX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

9.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



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:

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

9.6 Environmental Conditions

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

9.7 Summary of Test Results/Plots

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

-1.4 dBμV at 7311MHz in the Vertical polarization, Transmitting 802.11b Middle Channel test mode with, 30 MHz to 25 GHz, 3Meters

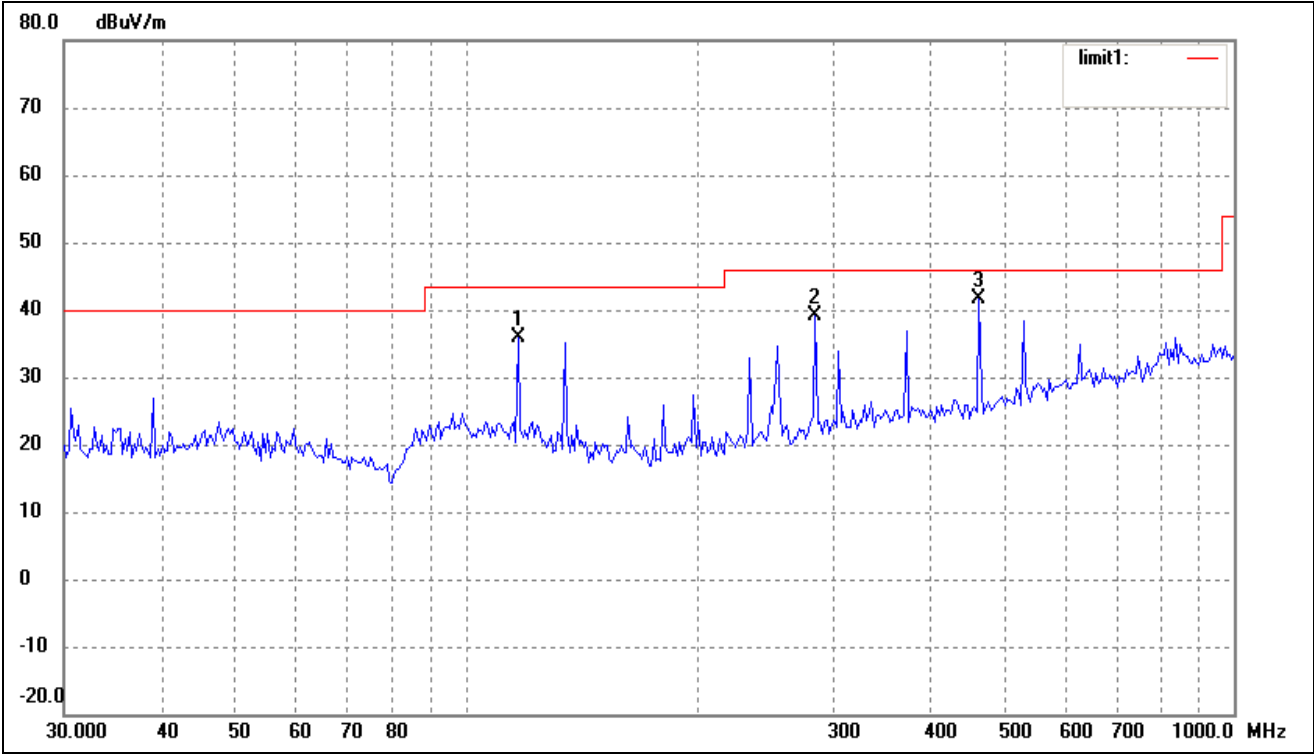
Test Result/Plots:

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b) Low Channel

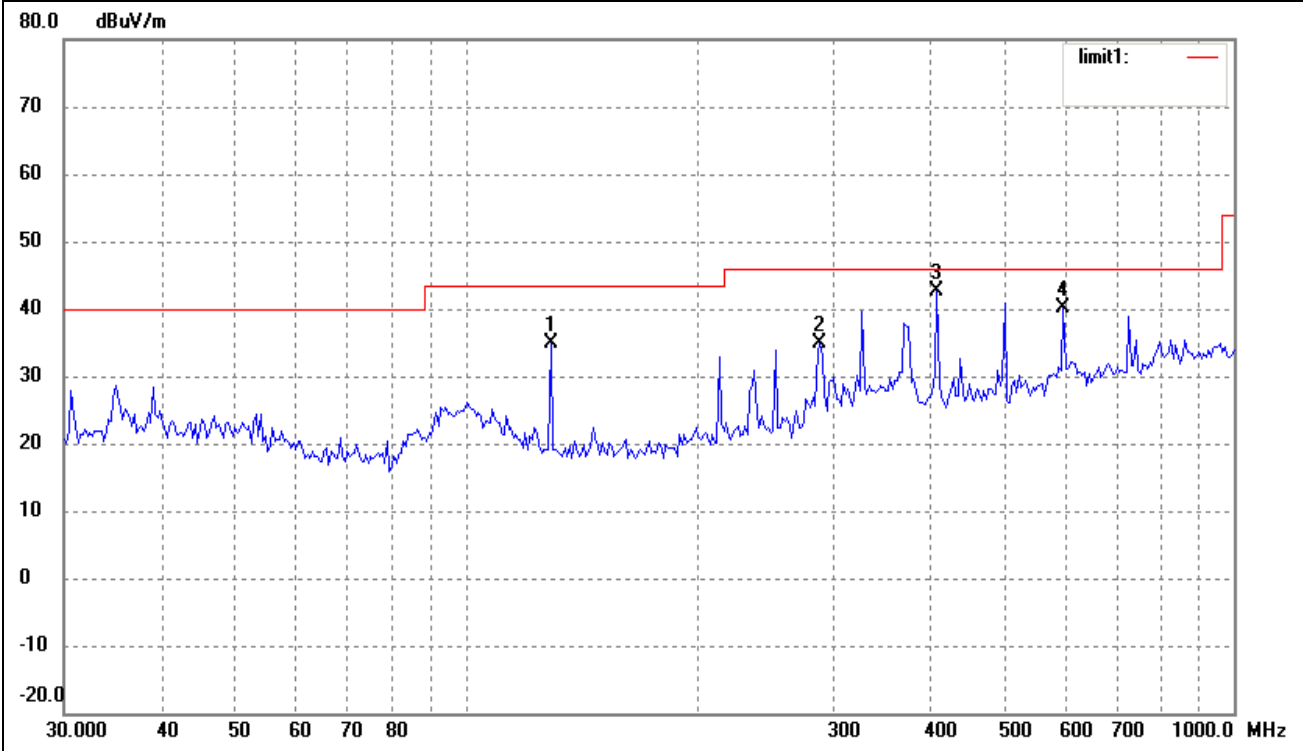
Comment: Connect to PC

Horizontal



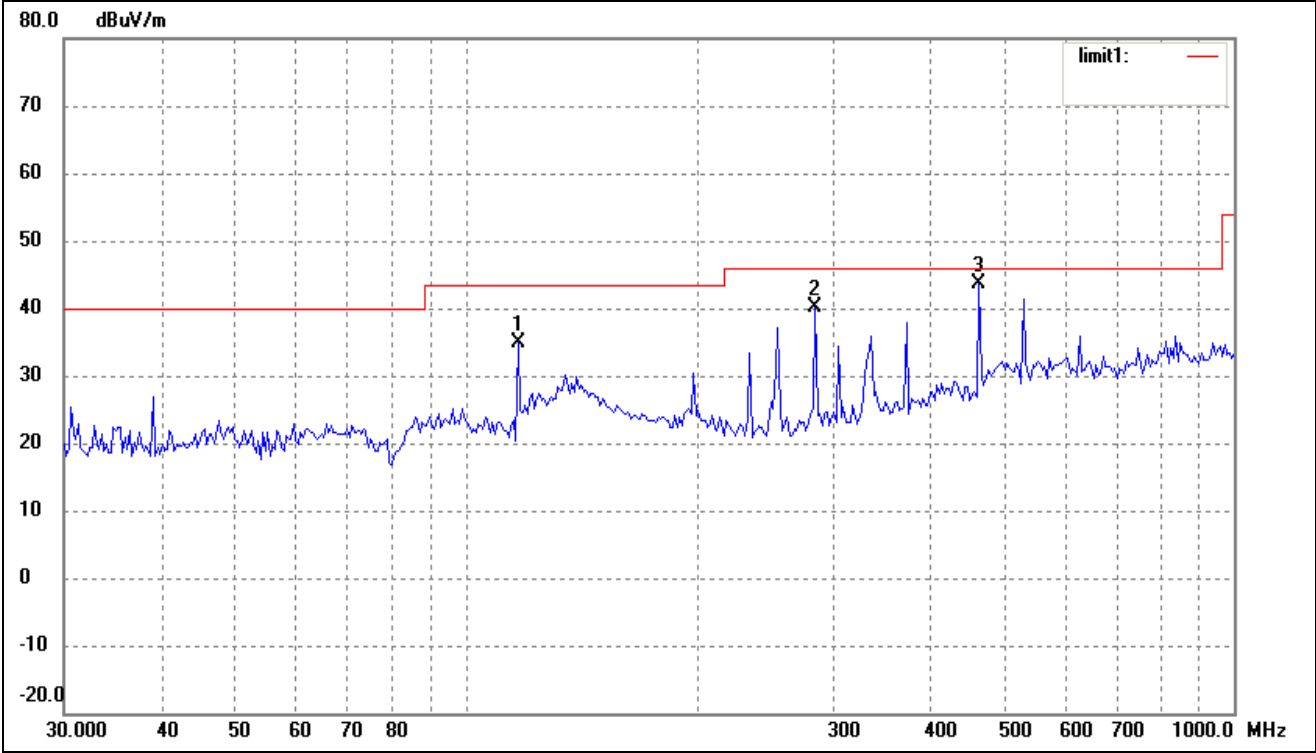
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	116.9495	29.46	6.45	35.91	43.50	-7.59	360	100	peak
2	284.9767	28.90	10.19	39.09	46.00	-6.91	0	100	peak
3	465.5994	28.52	13.03	41.55	46.00	-4.45	0	200	QP

Vertical



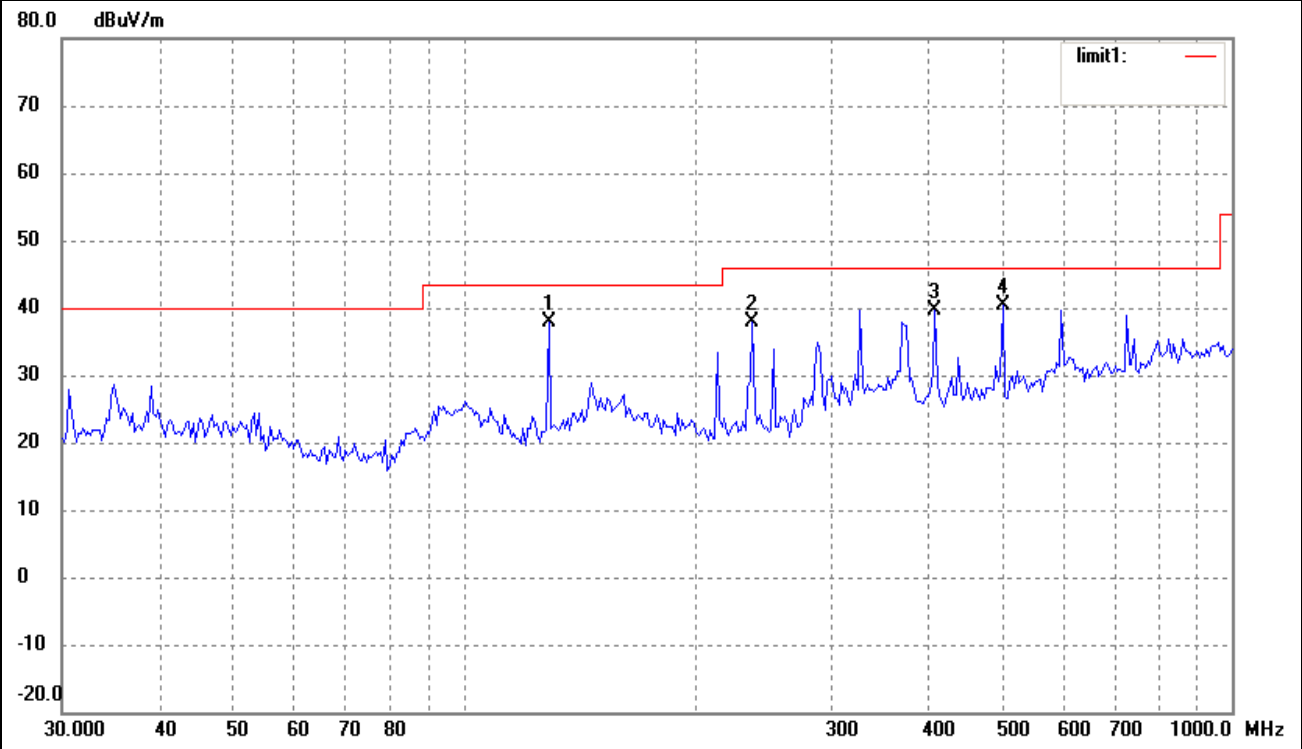
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	30.19	4.70	34.89	43.50	-8.61	360	200	peak
2	289.0021	24.60	10.31	34.91	46.00	-11.09	0	100	peak
3	410.3825	30.31	12.30	42.61	46.00	-3.39	203	100	QP
4	599.3213	24.09	15.96	40.05	46.00	-5.95	121	100	QP

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



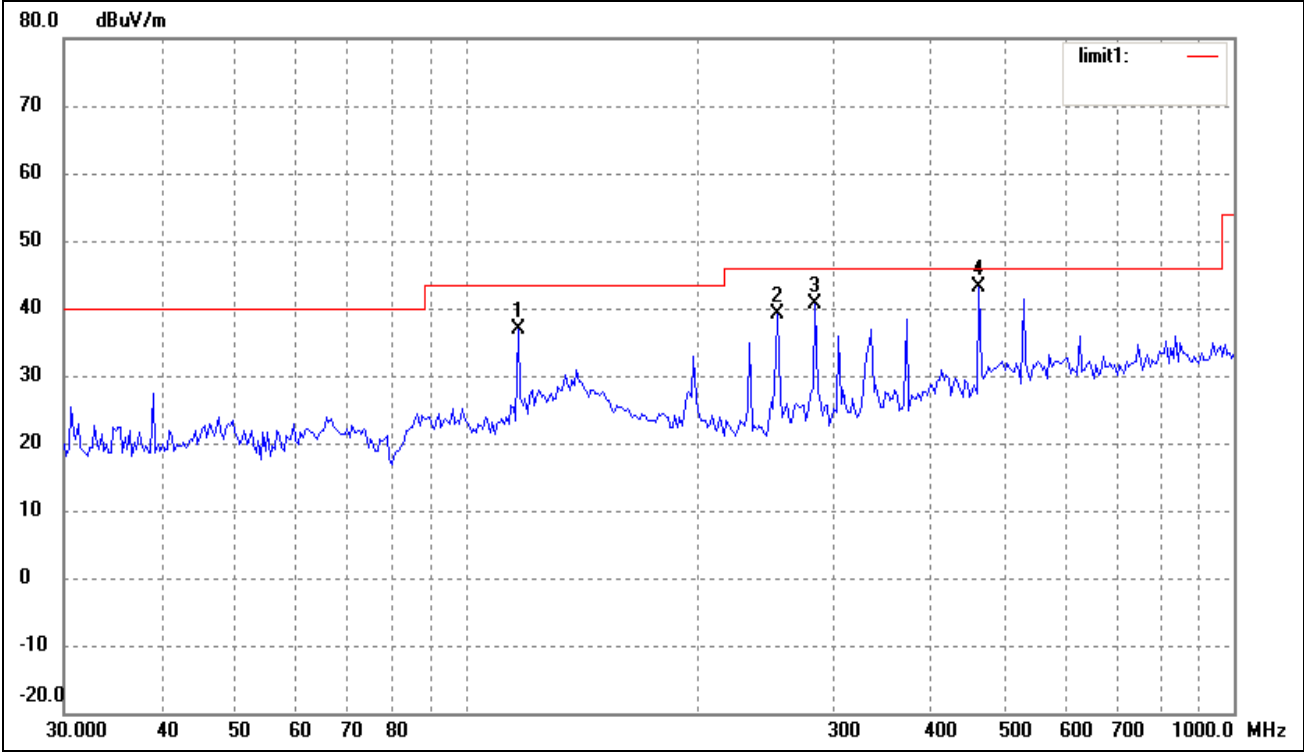
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	116.9495	28.46	6.45	34.91	43.50	-8.59	360	100	peak
2	284.9766	29.90	10.19	40.09	46.00	-5.91	0	100	peak
3	465.5994	30.52	13.03	43.55	46.00	-2.45	204	115	QP

Vertical



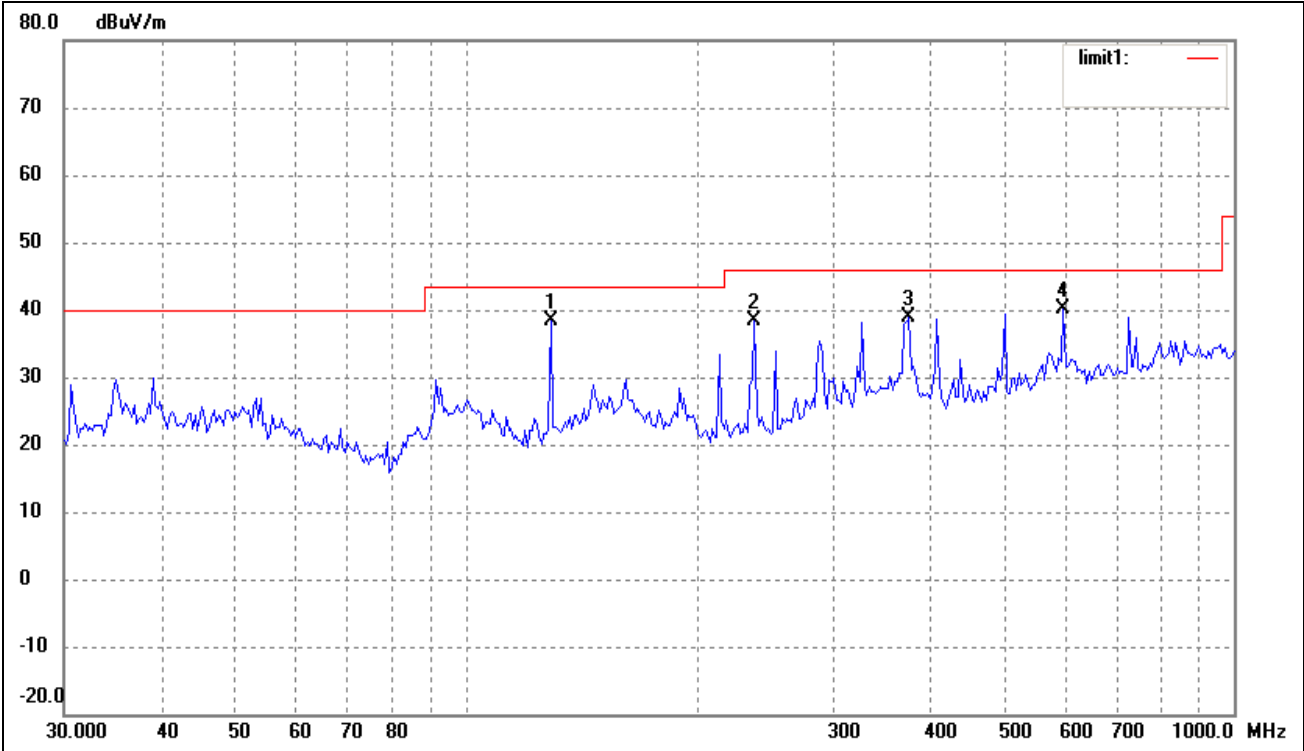
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	33.19	4.70	37.89	43.50	-5.61	360	200	peak
2	237.4760	29.30	8.68	37.98	46.00	-8.02	360	100	peak
3	410.3825	27.31	12.30	39.61	46.00	-6.39	0	100	peak
4	502.9395	26.26	14.16	40.42	46.00	-5.58	0	100	peak

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



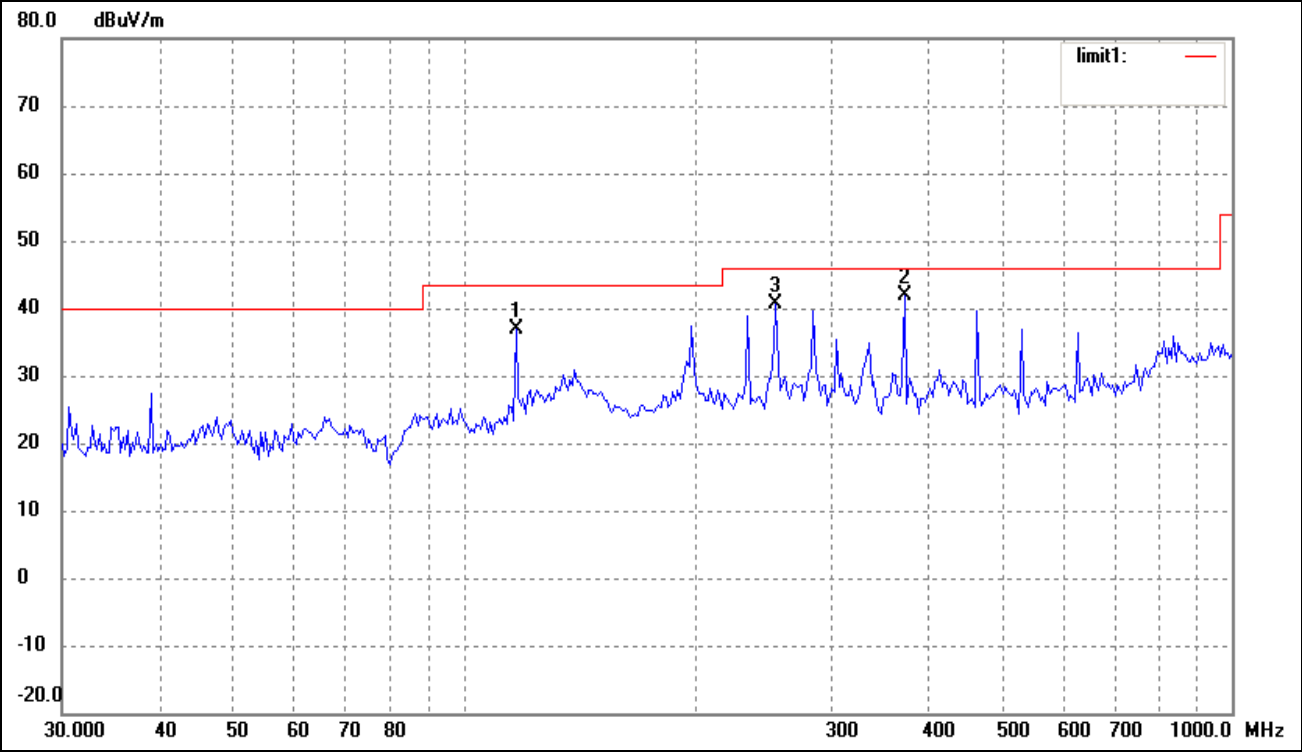
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	116.9495	30.46	6.45	36.91	43.50	-6.59	360	100	peak
2	254.7283	30.18	8.92	39.10	46.00	-6.90	0	100	peak
3	284.9766	30.40	10.19	40.59	46.00	-5.41	0	100	peak
4	465.5994	30.02	13.03	43.05	46.00	-2.95	204	115	QP

Vertical



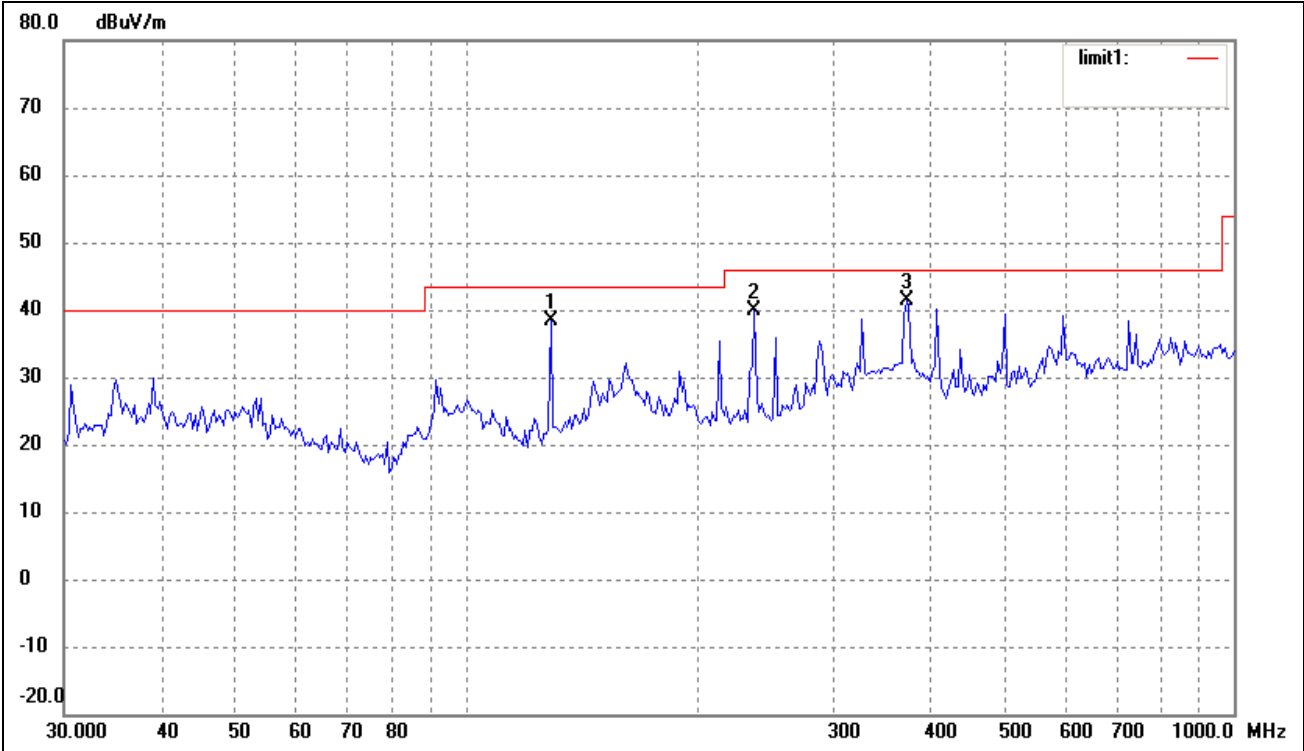
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	33.69	4.70	38.39	43.50	-5.11	201	114	QP
2	237.4759	29.80	8.68	38.48	46.00	-7.52	360	100	peak
3	377.2590	26.56	12.28	38.84	46.00	-7.16	0	100	peak
4	599.3212	24.09	15.96	40.05	46.00	-5.95	0	200	peak

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



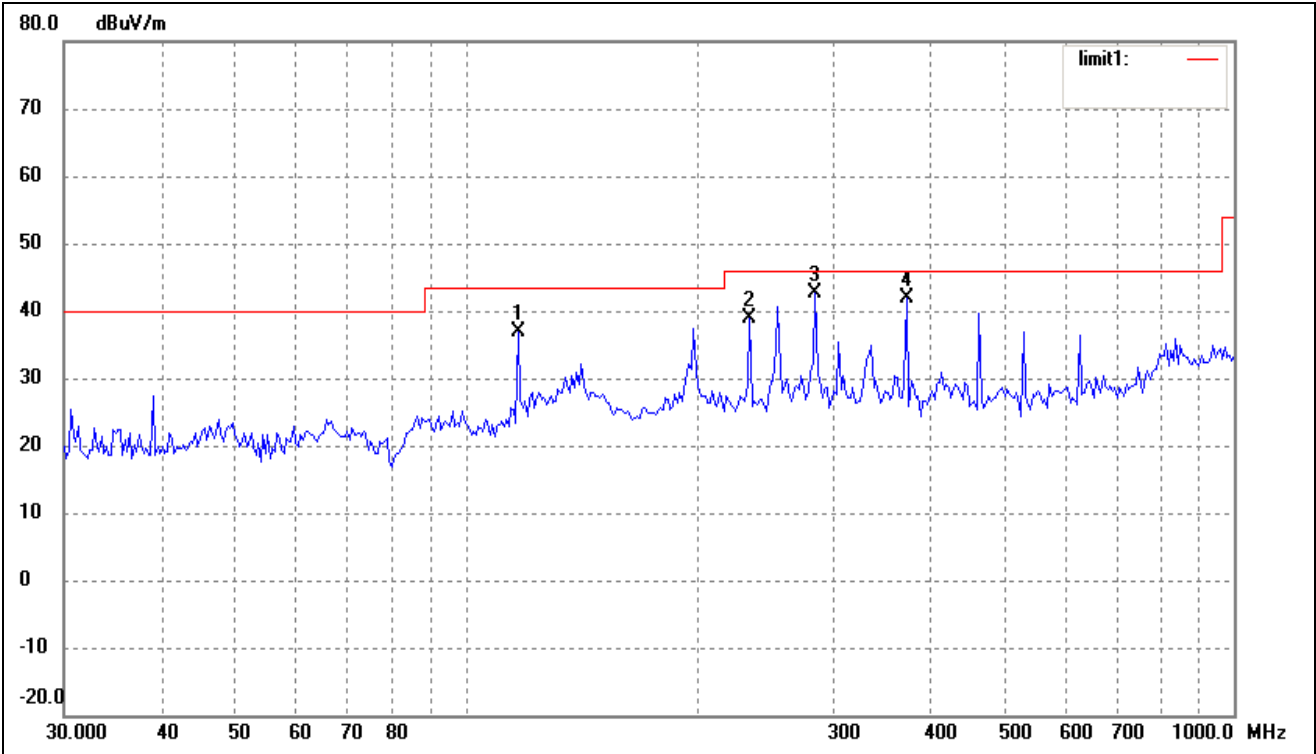
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	116.9495	30.46	6.45	36.91	43.50	-6.59	360	100	peak
2	374.6225	29.58	12.24	41.82	46.00	-4.18	110	124	QP
3	254.7282	31.68	8.92	40.60	46.00	-5.40	208	104	QP

Vertical



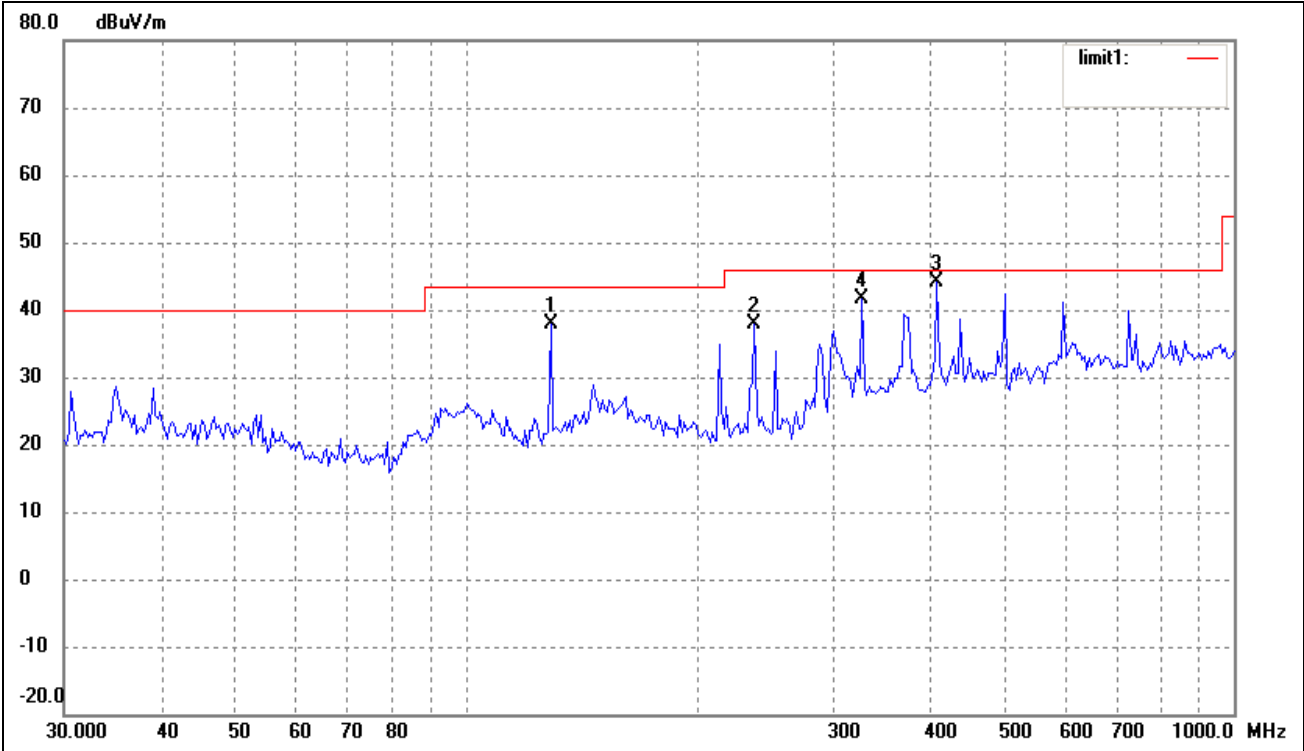
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	33.69	4.70	38.39	43.50	-5.11	201	204	QP
2	237.4760	31.30	8.68	39.98	46.00	-6.02	360	100	peak
3	374.6226	29.21	12.24	41.45	46.00	-4.55	118	100	QP

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	116.9495	30.46	6.45	36.91	43.50	-6.59	360	100	peak
2	234.1682	30.41	8.50	38.91	46.00	-7.09	0	100	peak
3	284.9766	32.40	10.19	42.59	46.00	-3.41	203	105	QP
4	374.6225	29.58	12.24	41.82	46.00	-4.18	221	114	QP

Vertical



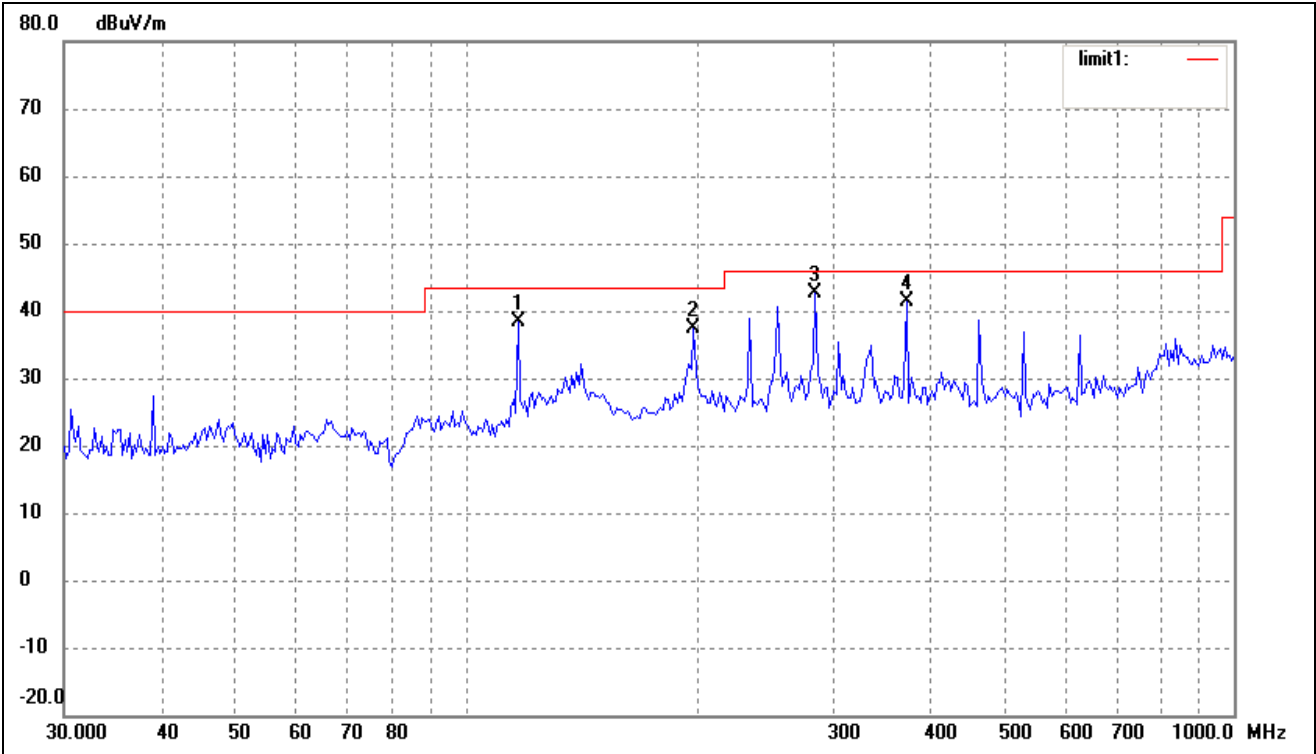
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	33.19	4.70	37.89	43.50	-5.61	204	164	QP
2	237.4759	29.30	8.68	37.98	46.00	-8.02	360	200	peak
3	410.3824	31.81	12.30	44.11	46.00	-1.89	221	107	QP
4	327.8872	30.75	10.88	41.63	46.00	-4.37	181	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g) High Channel

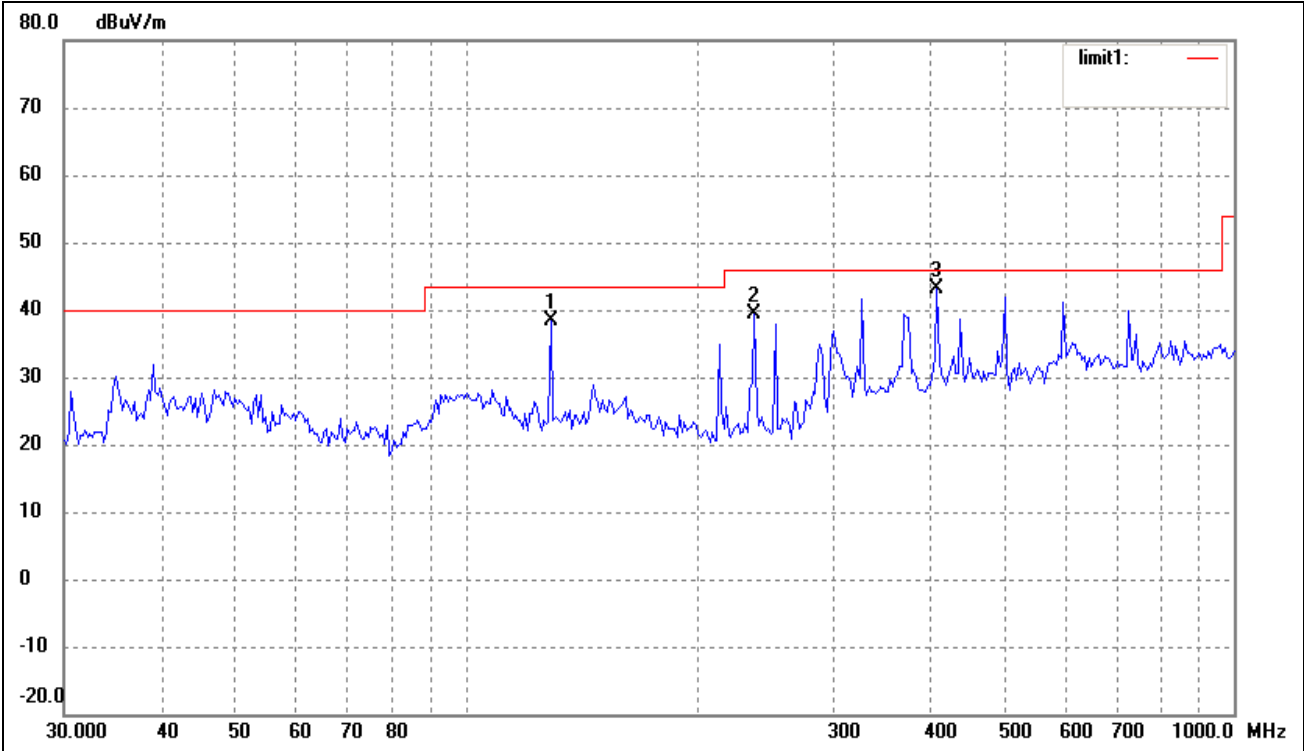
Comment: Connect to PC

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	116.9495	31.96	6.45	38.41	43.50	-5.09	216	206	QP
2	197.8926	30.48	6.88	37.36	43.50	-6.14	360	100	peak
3	284.9766	32.40	10.19	42.59	46.00	-3.41	208	106	QP
4	374.6225	29.08	12.24	41.32	46.00	-4.68	127	119	QP

Vertical



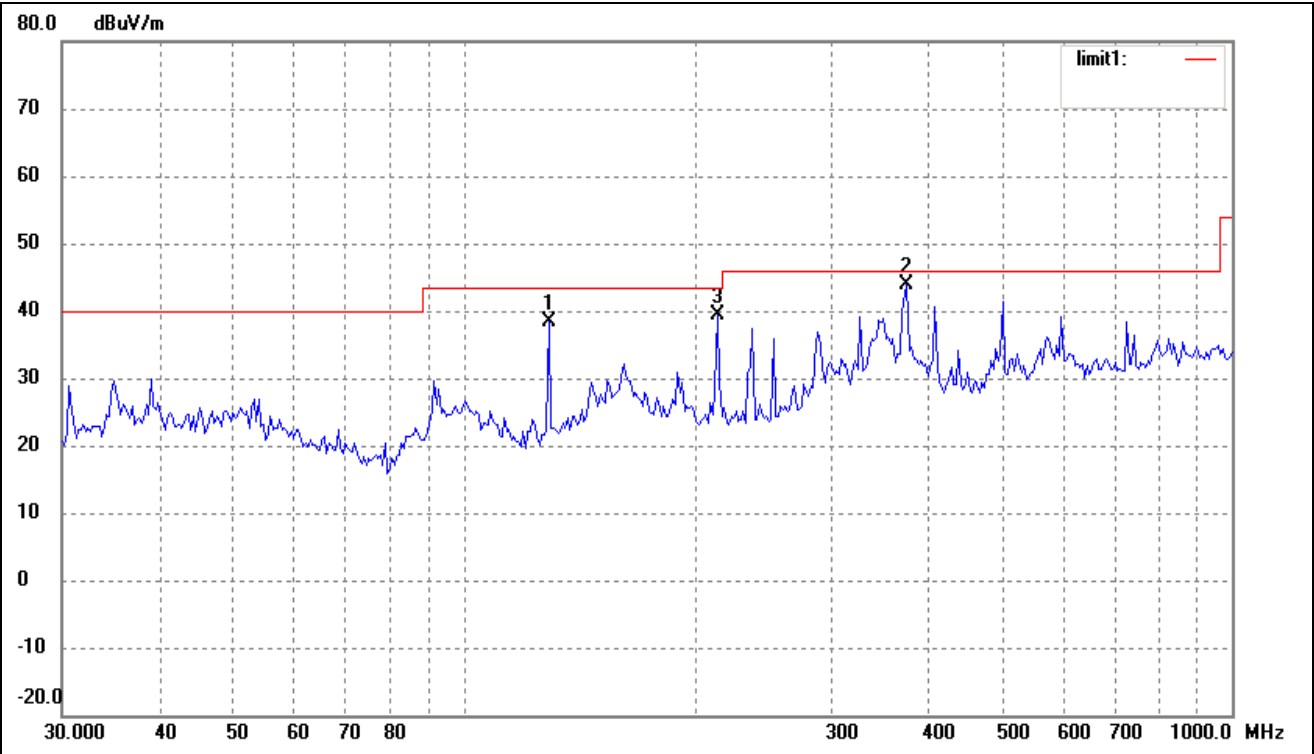
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	33.69	4.70	38.39	43.50	-5.11	204	124	QP
2	237.4759	30.80	8.68	39.48	46.00	-6.52	360	100	peak
3	410.3824	30.81	12.30	43.11	46.00	-2.89	225	106	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n HT20) Low Channel

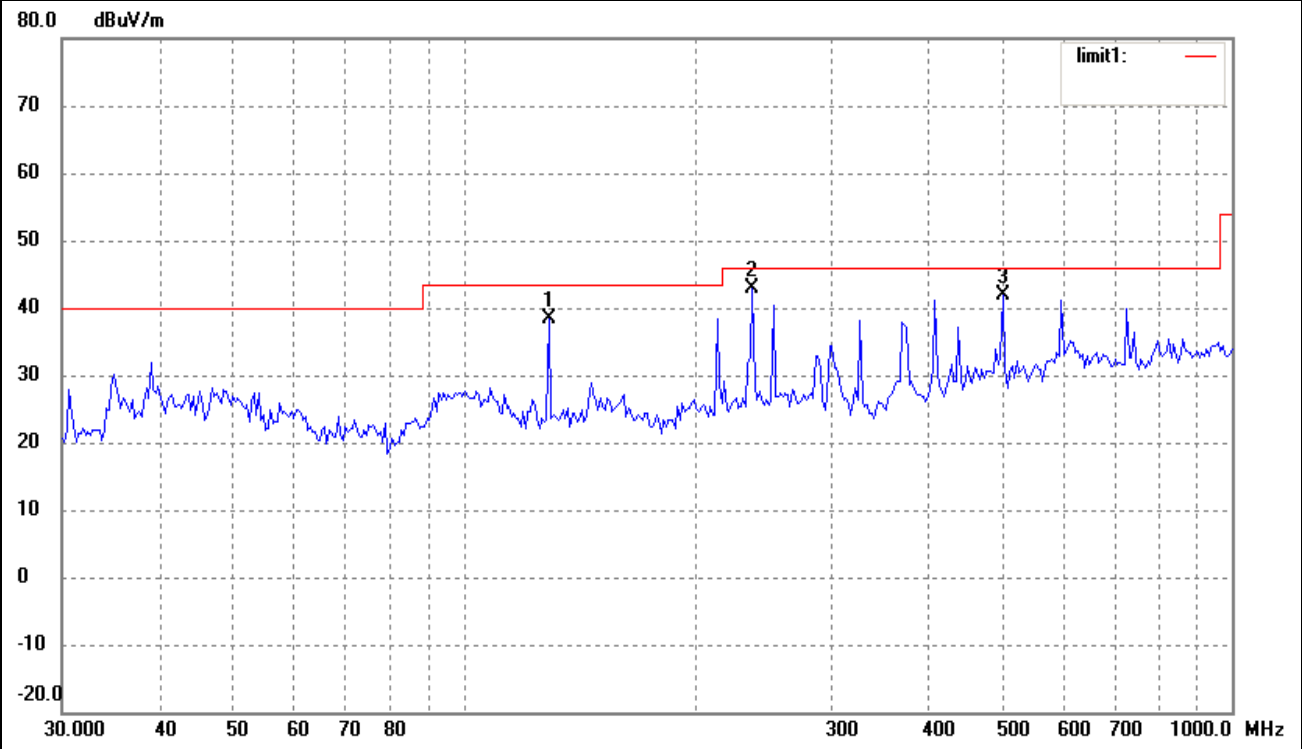
Comment: Connect to PC

Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	33.69	4.70	38.39	43.50	-5.11	251	114	QP
2	377.2590	31.56	12.28	43.84	46.00	-2.16	221	120	QP
3	213.7633	32.02	7.43	39.45	43.50	-4.05	305	100	QP

Vertical



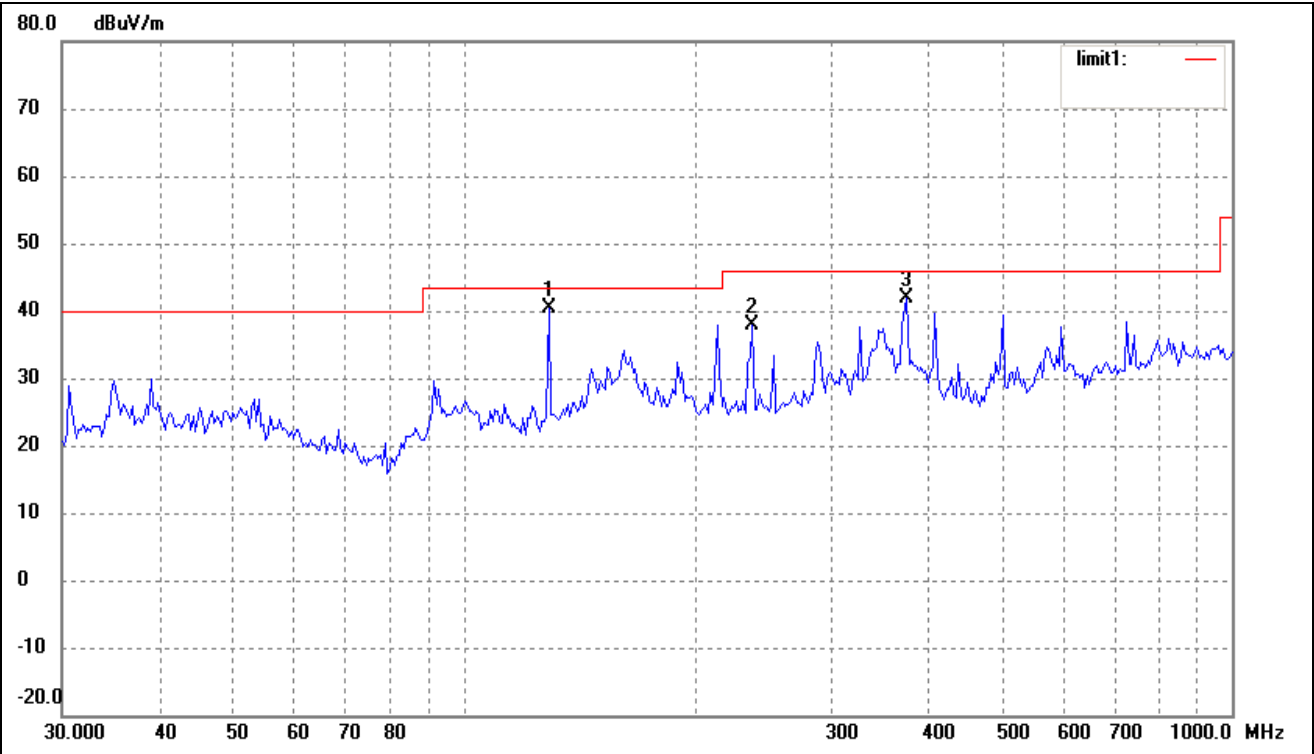
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	33.69	4.70	38.39	43.50	-5.12	302	108	QP
2	237.4759	34.30	8.68	42.98	46.00	-3.02	214	154	QP
3	502.9395	27.76	14.16	41.92	46.00	-4.08	205	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n HT20) Middle Channel

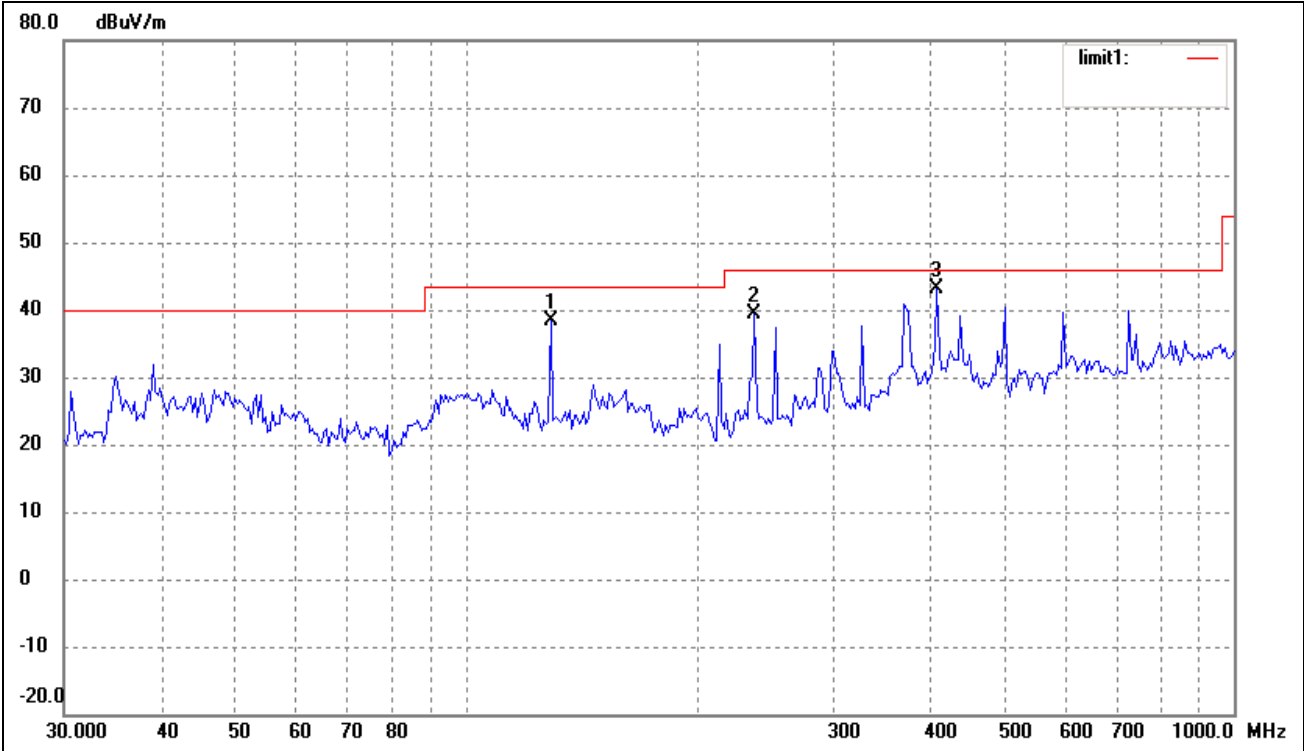
Comment: Connect to PC

Horizontal



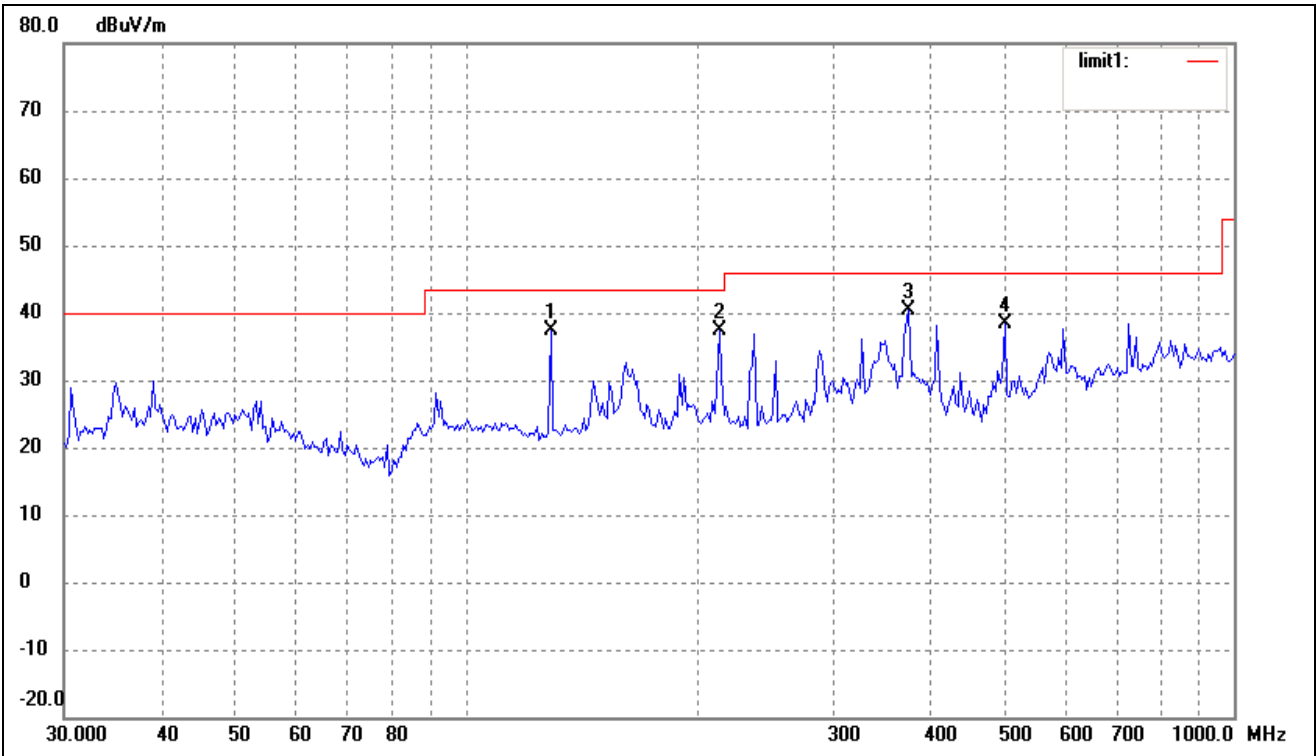
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	35.69	4.70	40.39	43.50	-3.11	305	104	QP
2	237.4759	29.30	8.68	37.98	46.00	-8.02	360	200	peak
3	377.2590	29.56	12.28	41.84	46.00	-4.16	206	100	QP

Vertical



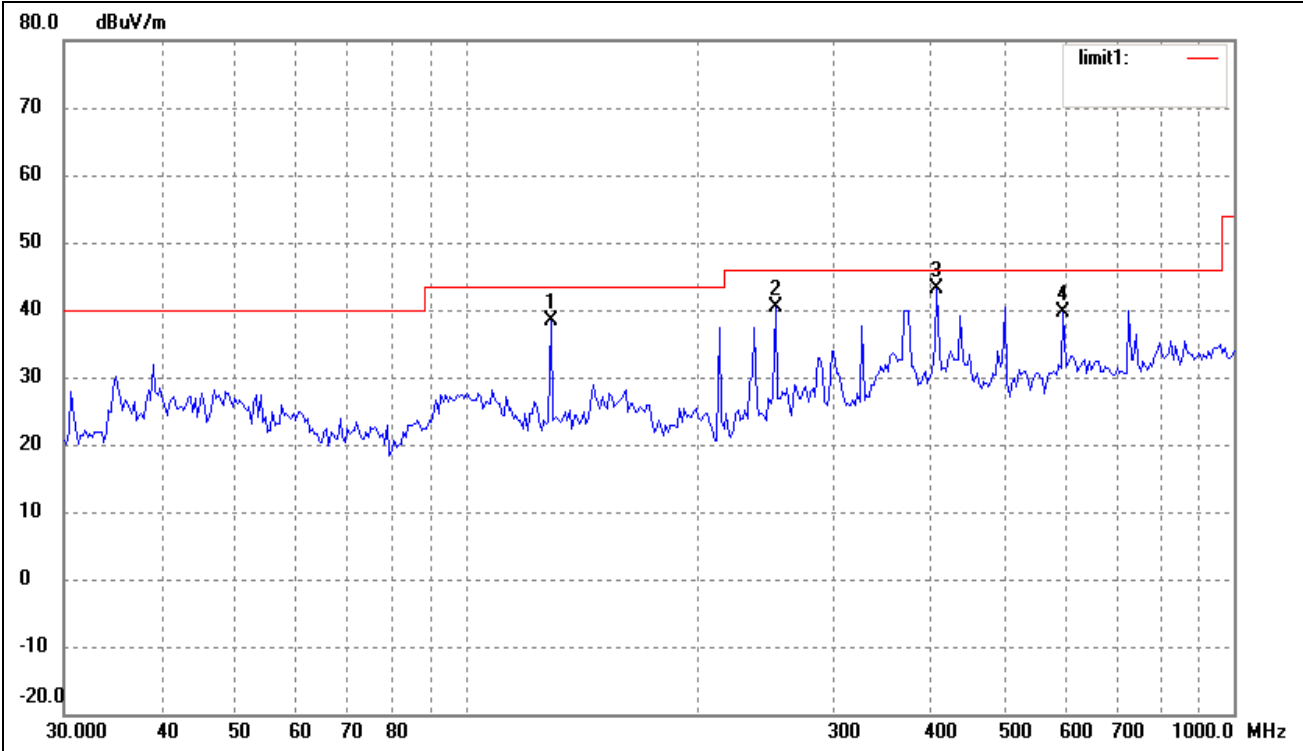
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	33.69	4.70	38.39	43.50	-5.11	302	154	QP
2	237.4760	30.80	8.68	39.48	46.00	-6.52	360	100	peak
3	410.3825	30.81	12.30	43.11	46.00	-2.89	205	100	QP

Spurious Emission From 30 MHz to 1 GHz
Test mode: Transmitting (802.11n HT20) High Channel
Comment: Connect to PC
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	32.69	4.70	37.39	43.50	-6.11	360	100	peak
2	213.7633	30.02	7.43	37.45	43.50	-6.05	0	200	peak
3	377.2590	28.06	12.28	40.34	46.00	-5.66	204	117	QP
4	502.9395	24.26	14.16	38.42	46.00	-7.58	360	100	peak

Vertical



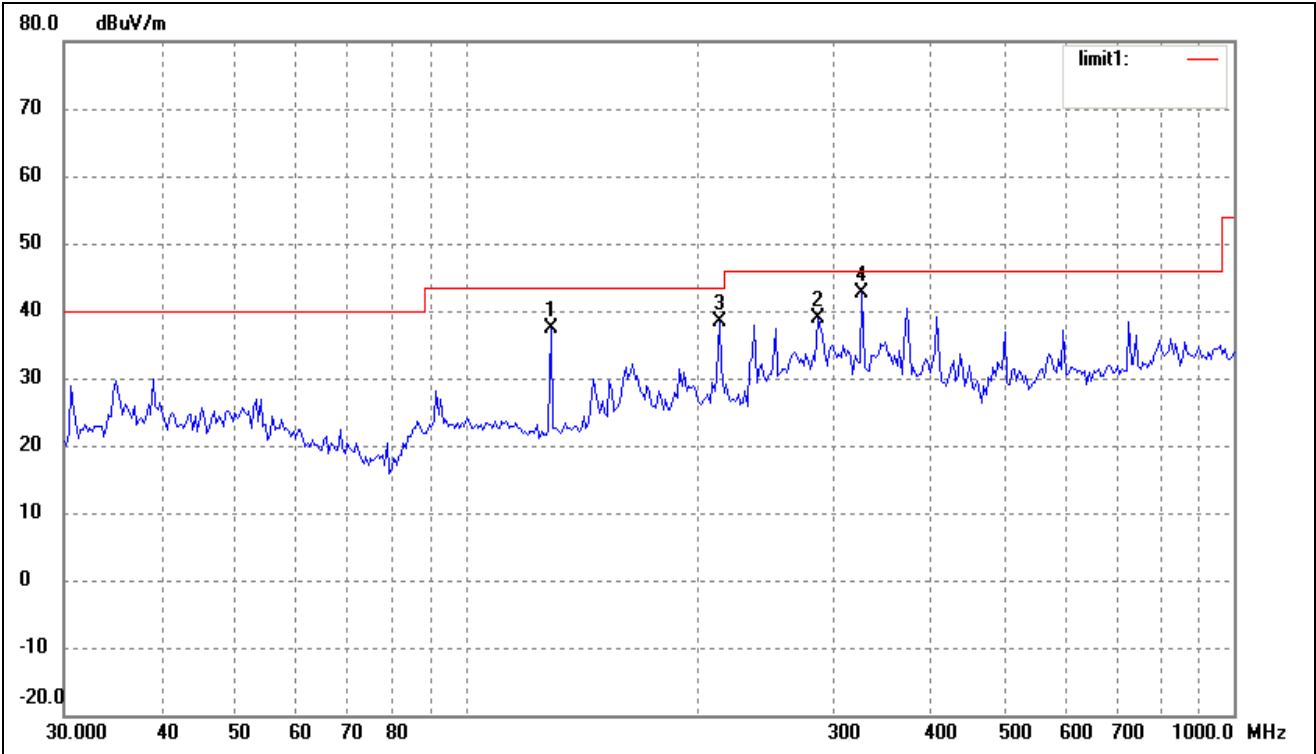
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	33.69	4.70	38.39	43.50	-5.11	221	210	QP
2	252.9482	31.40	8.91	40.31	46.00	-5.69	360	100	peak
3	410.3825	30.81	12.30	43.11	46.00	-2.89	110	141	QP
4	599.3213	23.59	15.96	39.55	46.00	-6.45	0	200	peak

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n HT40) Low Channel

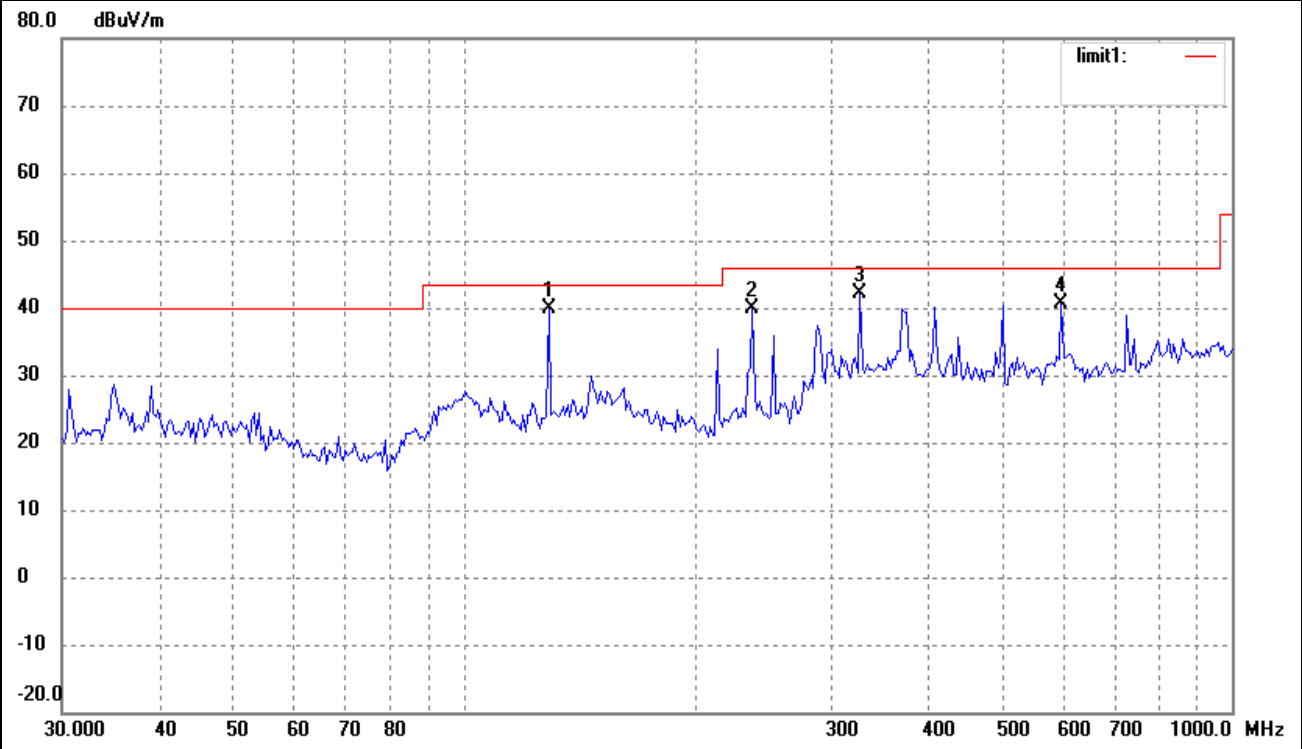
Comment: Connect to PC

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	32.69	4.70	37.39	43.50	-6.11	360	200	peak
2	286.9823	28.72	10.25	38.97	46.00	-7.03	0	100	peak
3	213.7633	31.02	7.43	38.45	43.50	-5.05	204	145	QP
4	327.8872	31.75	10.88	42.63	46.00	-3.37	115	105	QP

Vertical



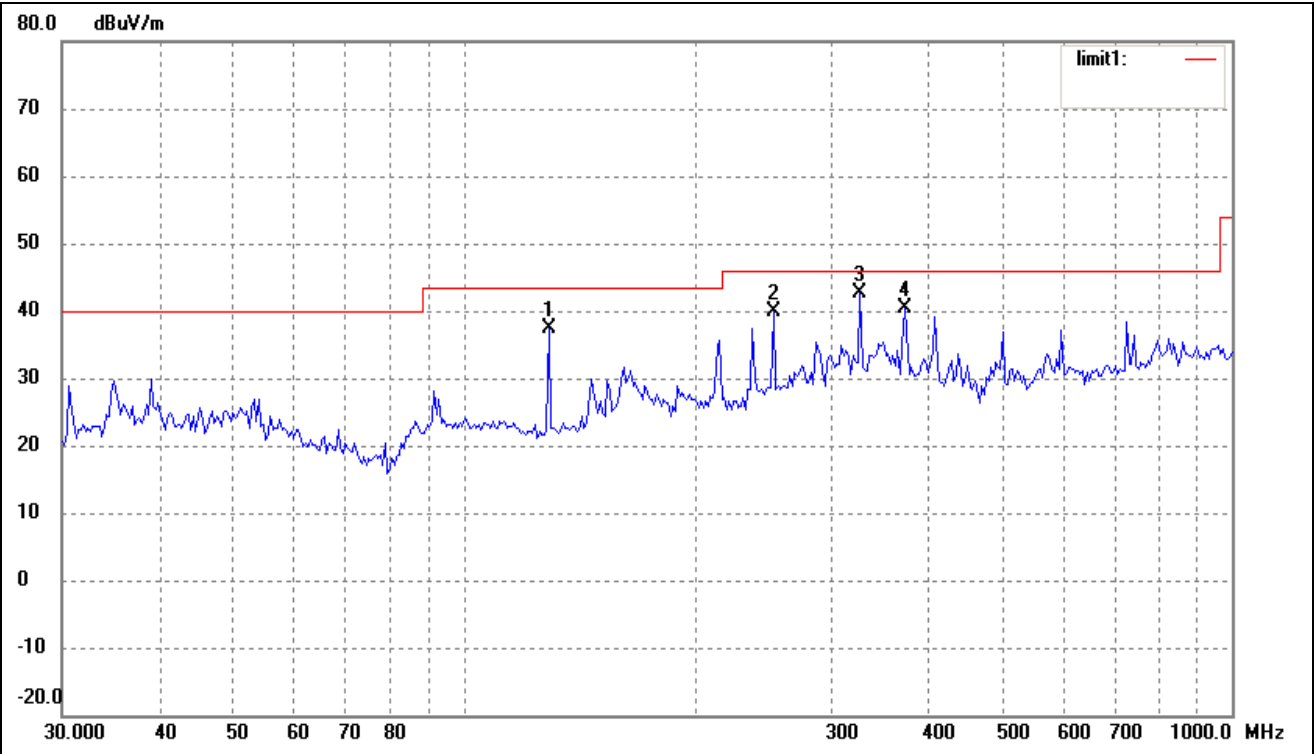
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	35.19	4.70	39.89	43.50	-3.61	221	124	QP
2	237.4759	31.30	8.68	39.98	46.00	-6.02	360	200	peak
3	327.8872	31.25	10.88	42.13	46.00	-3.87	150	114	QP
4	599.3212	24.59	15.96	40.55	46.00	-5.45	224	204	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n HT40) Middle Channel

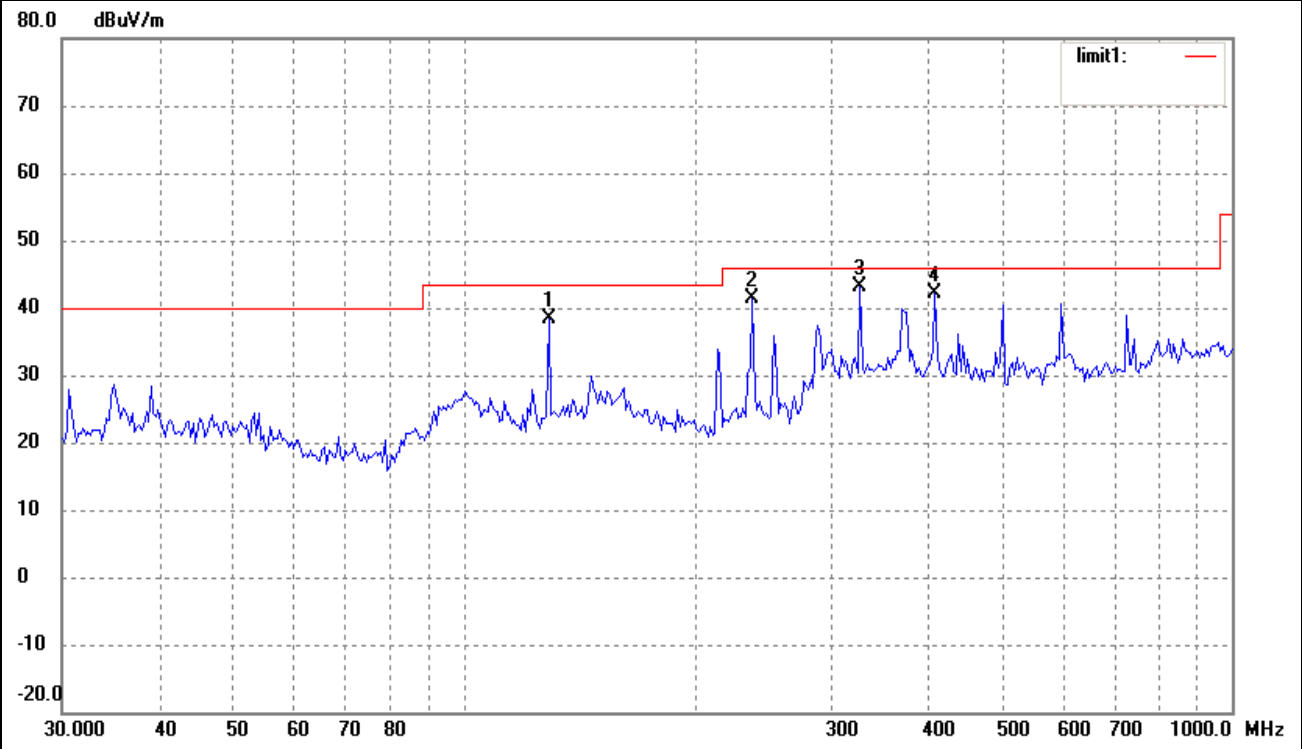
Comment: Connect to PC

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	32.69	4.70	37.39	43.50	-6.11	360	200	peak
2	252.9482	30.90	8.91	39.81	46.00	-6.19	0	200	peak
3	327.8872	31.75	10.88	42.63	46.00	-3.37	215	114	QP
4	374.6225	28.21	12.24	40.45	46.00	-5.55	224	201	QP

Vertical



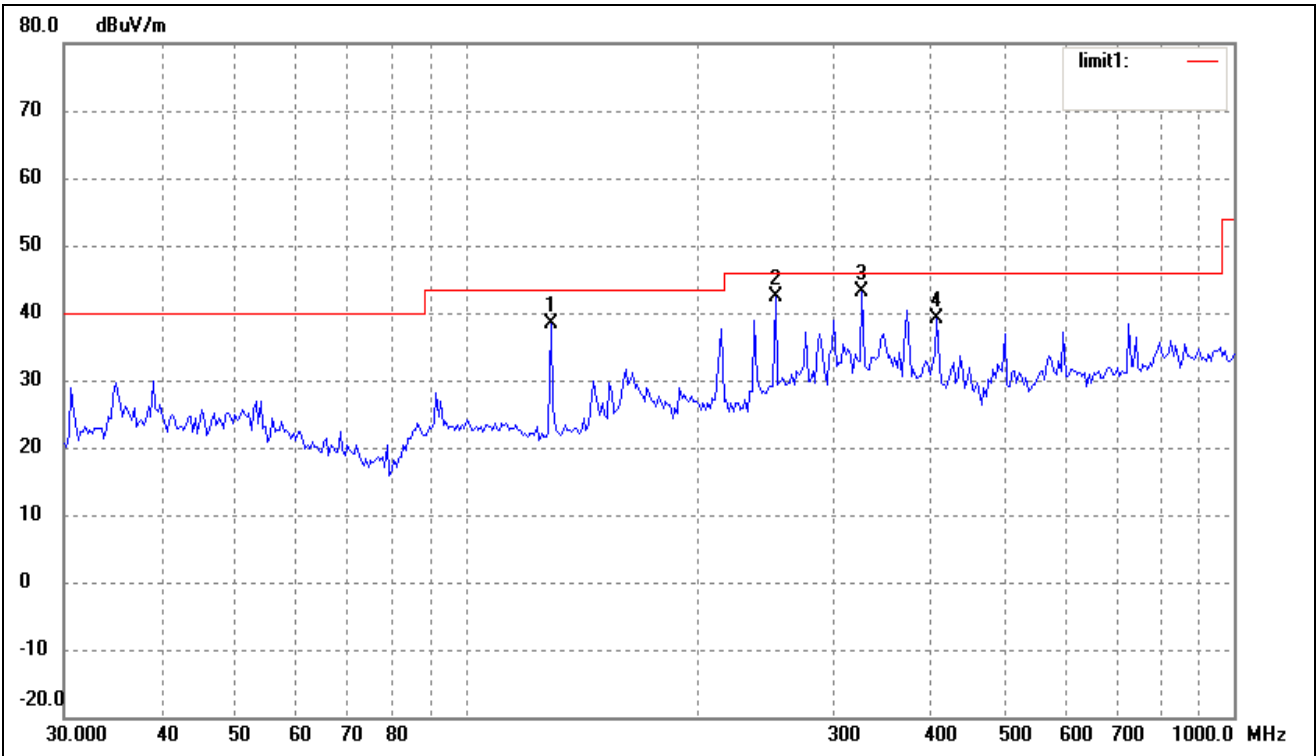
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	33.69	4.70	38.39	43.50	-5.11	204	231	QP
2	237.4759	32.80	8.68	41.48	46.00	-4.52	221	140	QP
3	327.8872	32.25	10.88	43.13	46.00	-2.87	251	142	QP
4	410.3824	29.81	12.30	42.11	46.00	-3.89	204	224	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11n HT40) High Channel

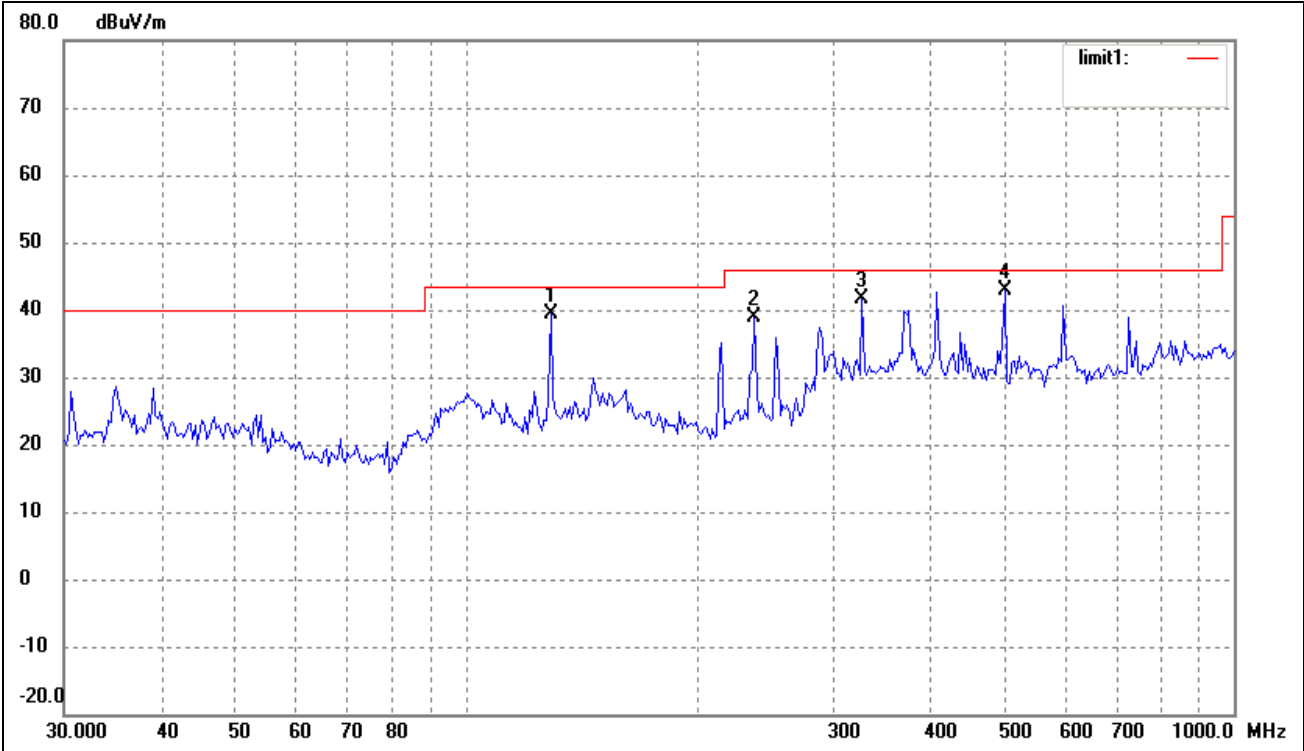
Comment: Connect to PC

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	129.0146	33.69	4.70	38.39	43.50	-5.11	210	127	QP
2	252.9482	33.40	8.91	42.31	46.00	-3.69	146	158	QP
3	327.8872	32.25	10.88	43.13	46.00	-2.87	108	144	QP
4	410.3824	26.81	12.30	39.11	46.00	-6.89	360	100	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	129.0146	34.69	4.70	39.39	43.50	-4.11	208	110	QP
2	237.4759	30.30	8.68	38.98	46.00	-7.02	360	100	peak
3	327.8872	30.75	10.88	41.63	46.00	-4.37	221	114	QP
4	502.9395	28.76	14.16	42.92	46.00	-3.08	217	104	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	53.7	90	V	34.1	5.2	33.0	60.0	74	-14.0
7236.0	PK	51.6	270	V	37.4	6.1	33.5	61.6	74	-12.4
7236.0	PK	50.4	180	H	37.4	6.1	33.5	60.4	74	-13.6
4824.0	PK	52.7	45	H	34.1	5.2	33.0	59.0	74	-15.0
4824.0	AV	42.5	270	V	34.1	5.2	33.0	48.8	54	-5.2
7236.0	AV	40.7	90	V	37.4	6.1	33.5	50.7	54	-3.3
7236.0	AV	41.2	45	H	37.4	6.1	33.5	51.2	54	-2.8
4824.0	AV	42.4	60	H	34.1	5.2	33.0	48.7	54	-5.3
Middle Channel (1G to 25GHz)										
7311.0	PK	52.4	45	V	37.4	6.1	33.5	62.4	74	-11.6
4874.0	PK	51.3	270	V	34.1	5.2	33.0	57.6	74	-16.4
7311.0	PK	50.4	45	H	37.4	6.1	33.5	60.4	74	-13.6
4874.0	PK	53.1	180	H	34.1	5.2	33.0	59.4	74	-14.6
7311.0	AV	42.6	270	V	37.4	6.1	33.5	52.6	54	-1.4
4874.0	AV	45.1	90	V	34.1	5.2	33.0	51.4	54	-2.6
7311.0	AV	40.3	60	H	37.4	6.1	33.5	50.3	54	-3.7
4874.0	AV	41.4	45	H	34.1	5.2	33.0	47.7	54	-6.3
High Channel (1G to 25GHz)										
4924.0	PK	56.1	270	V	34.1	5.2	33.0	62.4	74	-11.6
7386.0	PK	51.4	45	V	37.4	6.1	33.5	61.4	74	-12.6
4924.0	PK	54.7	180	H	34.1	5.2	33.0	61.0	74	-13
7386.0	PK	50.1	45	H	37.4	6.1	33.5	60.1	74	-13.9
4924.0	AV	43.2	90	V	34.1	5.2	33.0	49.5	54	-4.5
7386.0	AV	41.5	270	V	37.4	6.1	33.5	51.5	54	-2.5
4924.0	AV	44.6	60	H	34.1	5.2	33.0	50.9	54	-3.9
7386.0	AV	41.4	60	H	37.4	6.1	33.5	51.4	54	-2.6

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

*Spurious Emission Above 1GHz**Test Mode: Transmitting (802.11g)*

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (1G to 25GHz)										
4824.0	PK	56.4	90	V	34.1	5.2	33.0	62.7	74	-11.3
7236.0	PK	52.7	270	V	37.4	6.1	33.5	62.7	74	-11.3
7236.0	PK	51.2	180	H	37.4	6.1	33.5	61.2	74	-12.8
4824.0	PK	57.4	45	H	34.1	5.2	33.0	63.7	74	-10.3
4824.0	AV	45.1	270	V	34.1	5.2	33.0	51.4	54	-2.6
7236.0	AV	40.8	90	V	37.4	6.1	33.5	50.8	54	-3.2
7236.0	AV	41.4	45	H	37.4	6.1	33.5	51.4	54	-2.6
4824.0	AV	44.2	60	H	34.1	5.2	33.0	50.5	54	-3.5
Middle Channel (1G to 25GHz)										
7311.0	PK	51.5	45	V	37.4	6.1	33.5	61.5	74	-12.5
4874.0	PK	54.6	270	V	34.1	5.2	33.0	60.9	74	-13.1
7311.0	PK	51.7	45	H	37.4	6.1	33.5	61.7	74	-12.3
4874.0	PK	55.2	180	H	34.1	5.2	33.0	61.5	74	-12.5
7311.0	AV	41.5	270	V	37.4	6.1	33.5	51.5	54	-2.5
4874.0	AV	43.4	90	V	34.1	5.2	33.0	49.7	54	-4.3
7311.0	AV	40.6	60	H	37.4	6.1	33.5	50.6	54	-3.4
4874.0	AV	42.5	45	H	34.1	5.2	33.0	48.8	54	-5.2
High Channel (1G to 25GHz)										
4924.0	PK	54.2	270	V	34.1	5.2	33.0	60.5	74	-13.5
7386.0	PK	52.4	45	V	37.4	6.1	33.5	62.4	74	-11.6
4924.0	PK	54.5	180	H	34.1	5.2	33.0	60.8	74	-13.2
7386.0	PK	50.5	45	H	37.4	6.1	33.5	60.5	74	-13.5
4924.0	AV	45.1	90	V	34.1	5.2	33.0	51.4	54	-2.6
7386.0	AV	42.1	270	V	37.4	6.1	33.5	52.1	54	-1.9
4924.0	AV	43.5	60	H	34.1	5.2	33.0	49.8	54	-4.2
7386.0	AV	40.5	60	H	37.4	6.1	33.5	50.5	54	-3.5

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 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	54.2	90	V	34.1	5.2	33.0	60.5	74	-13.5
7236.0	PK	50.4	270	V	37.4	6.1	33.5	60.4	74	-13.6
7236.0	PK	51.2	180	H	37.4	6.1	33.5	61.2	74	-12.8
4824.0	PK	53.1	45	H	34.1	5.2	33.0	59.4	74	-14.6
4824.0	AV	44.8	270	V	34.1	5.2	33.0	51.1	54	-2.9
7236.0	AV	41.7	90	V	37.4	6.1	33.5	51.7	54	-2.3
7236.0	AV	40.3	45	H	37.4	6.1	33.5	50.3	54	-3.7
4824.0	AV	42.5	60	H	34.1	5.2	33.0	48.8	54	-5.2
Middle Channel (1G to 25GHz)										
7311.0	PK	52.4	45	V	37.4	6.1	33.5	62.4	74	-11.6
4874.0	PK	53.8	270	V	34.1	5.2	33.0	60.1	74	-13.9
7311.0	PK	50.7	45	H	37.4	6.1	33.5	60.7	74	-13.3
4874.0	PK	52.6	180	H	34.1	5.2	33.0	58.9	74	-15.1
7311.0	AV	41.2	270	V	37.4	6.1	33.5	51.2	54	-2.8
4874.0	AV	44.6	90	V	34.1	5.2	33.0	50.9	54	-3.1
7311.0	AV	41.4	60	H	37.4	6.1	33.5	51.4	54	-2.6
4874.0	AV	40.7	45	H	34.1	5.2	33.0	47	54	-7.0
4924.0	PK	54.6	270	V	34.1	5.2	33.0	60.9	74	-13.1
7386.0	PK	52.4	45	V	37.4	6.1	33.5	62.4	74	-11.6
4924.0	PK	51.7	180	H	34.1	5.2	33.0	58	74	-16
7386.0	PK	50.4	45	H	37.4	6.1	33.5	60.4	74	-13.6
4924.0	AV	45.2	90	V	34.1	5.2	33.0	51.5	54	-2.5
7386.0	AV	40.7	270	V	37.4	6.1	33.5	50.7	54	-3.3
4924.0	AV	43.6	60	H	34.1	5.2	33.0	49.9	54	-4.1
7386.0	AV	40.6	60	H	37.4	6.1	33.5	50.6	54	-3.4

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

*Spurious Emission Above 1GHz**Test Mode: Transmitting (802.11n 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	54.8	90	V	34.1	5.2	33.0	61.1	74	-12.9
7266.0	PK	54.6	270	V	37.4	6.1	33.5	64.6	74	-9.4
7266.0	PK	51.7	180	H	37.4	6.1	33.5	61.7	74	-12.3
4844.0	PK	53.8	45	H	34.1	5.2	33.0	60.1	74	-13.9
4844.0	AV	44.2	270	V	34.1	5.2	33.0	50.5	54	-3.5
7266.0	AV	40.4	90	V	37.4	6.1	33.5	50.4	54	-3.6
7266.0	AV	41.1	45	H	37.4	6.1	33.5	51.1	54	-2.9
4844.0	AV	42.8	60	H	34.1	5.2	33.0	49.1	54	-4.9
Middle Channel (1G to 25GHz)										
7311.0	PK	53.6	45	V	37.4	6.1	33.5	63.6	74	-10.4
4874.0	PK	55.7	270	V	34.1	5.2	33.0	62	74	-12
7311.0	PK	51.2	45	H	37.4	6.1	33.5	61.2	74	-12.8
4874.0	PK	53.9	180	H	34.1	5.2	33.0	60.2	74	-13.8
7311.0	AV	40.6	270	V	37.4	6.1	33.5	50.6	54	-3.4
4874.0	AV	41.7	90	V	34.1	5.2	33.0	48	54	-6.0
7311.0	AV	40.5	60	H	37.4	6.1	33.5	50.5	54	-3.5
4874.0	AV	43.8	45	H	34.1	5.2	33.0	50.1	54	-3.9
4904.0	PK	54.8	270	V	34.1	5.2	33.0	61.1	74	-12.9
7356.0	PK	52.1	45	V	37.4	6.1	33.5	62.1	74	-11.9
4904.0	PK	52.8	180	H	34.1	5.2	33.0	59.1	74	-14.9
7356.0	PK	46.8	45	H	37.4	6.1	33.5	56.8	74	-17.2
4904.0	AV	44.9	90	V	34.1	5.2	33.0	51.2	54	-2.8
7356.0	AV	40.5	270	V	37.4	6.1	33.5	50.5	54	-3.5
4904.0	AV	44.6	60	H	34.1	5.2	33.0	50.9	54	-3.1
7356.0	AV	41.7	60	H	37.4	6.1	33.5	51.7	54	-2.3

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

10. OUT OF BAND EMISSIONS

10.1 Standard Applicable

According to §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

10.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-08-12	2010-08-11
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-08-12	2010-08-11

10.3 Test Procedure

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

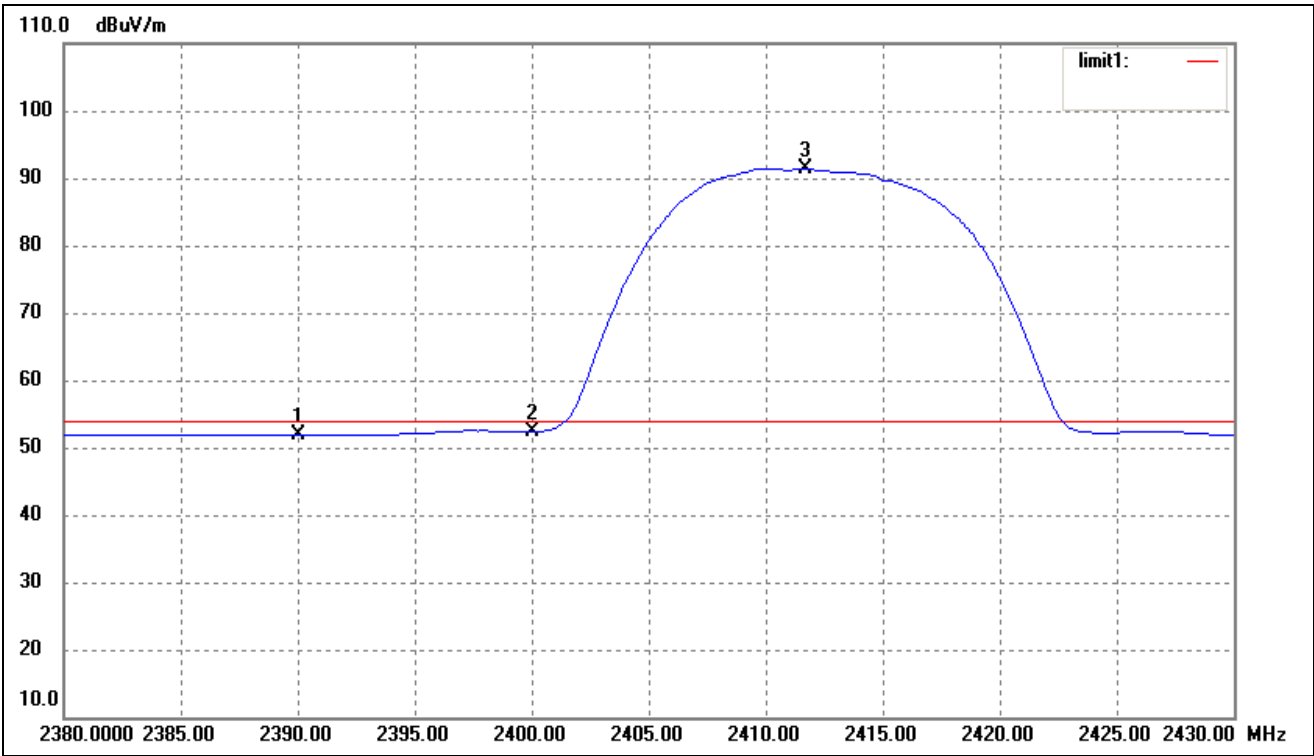
10.4 Environmental Conditions

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

10.5 Summary of Test Results/Plots

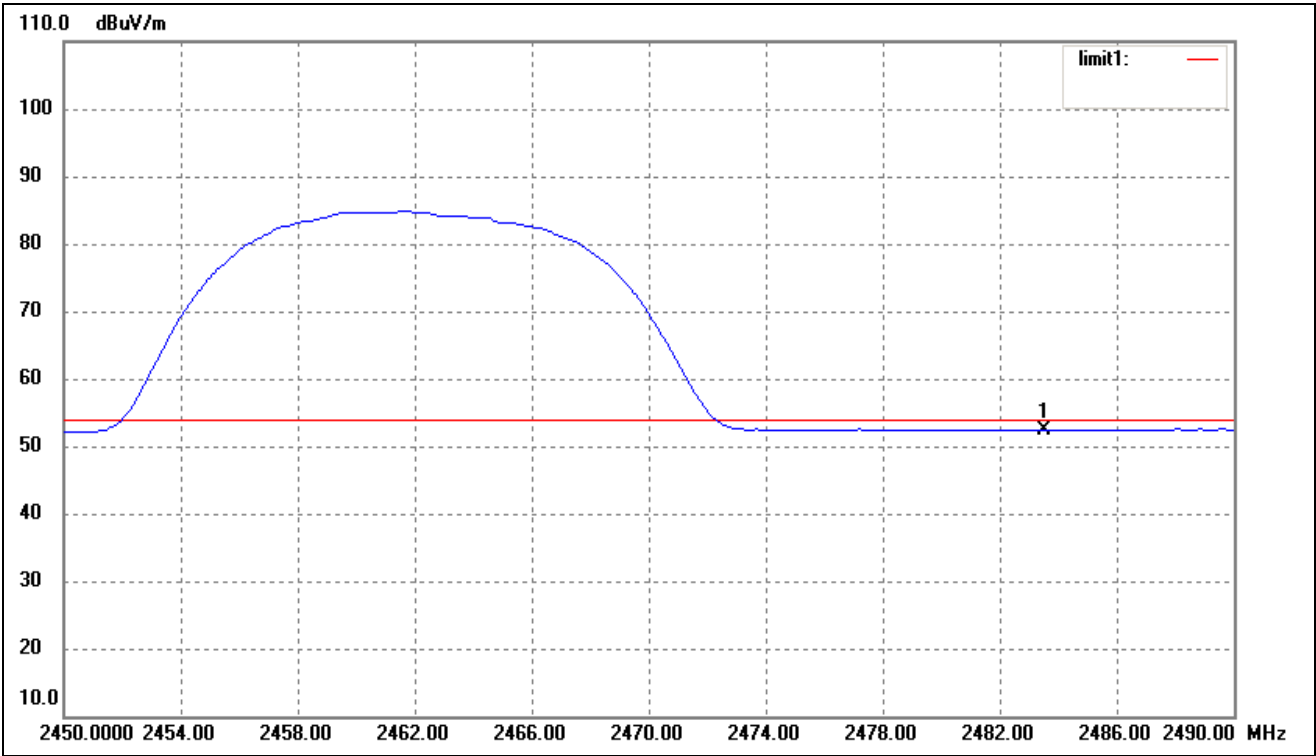
Test mode	Frequency MHz	Limit dBuV /dB	Result
802.11b	2390.00	<54dBuV	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuV	Pass
802.11g	2390.00	<54dBuV	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuV	Pass
802.11n HT20	2390.00	<54dBuV	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuV	Pass
802.11g HT40	2390.00	<54dBuV	Pass
	2400.00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

For 802.11b
Lowest Bandedge



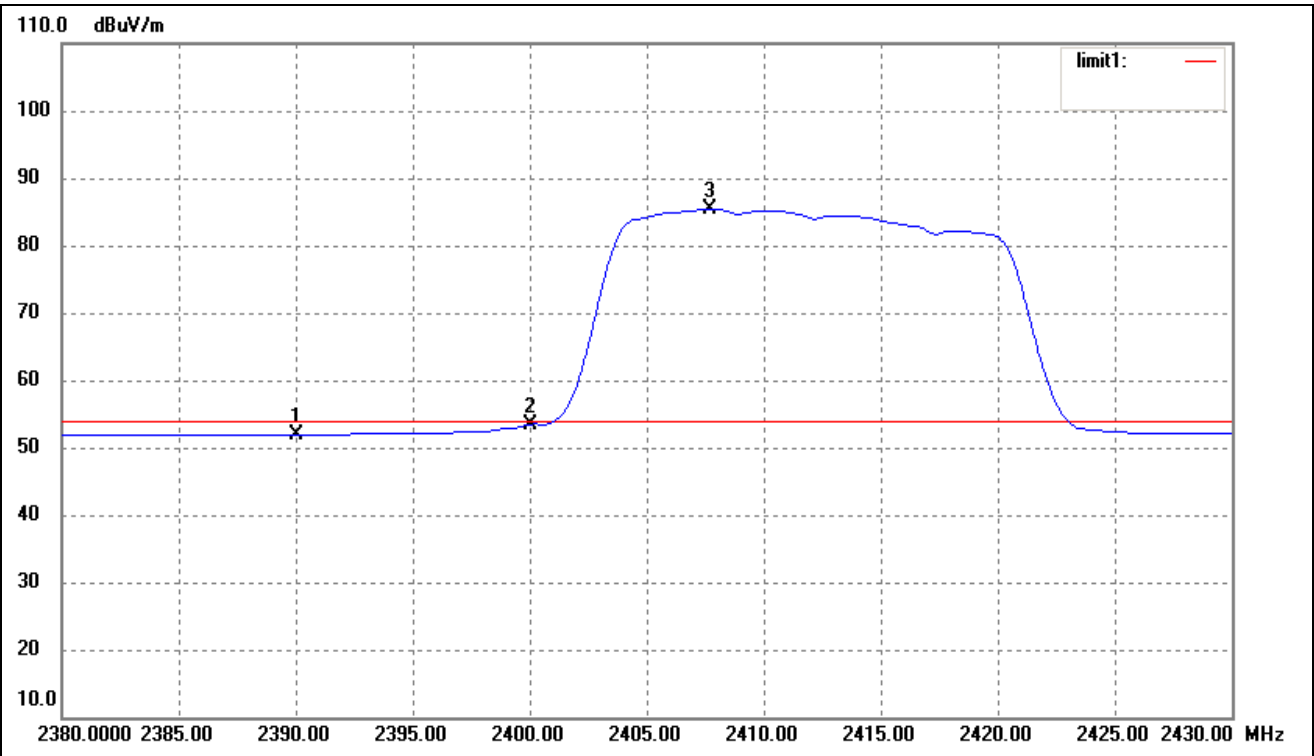
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2390.000	12.20	39.71	51.91	54.00	-2.09	360	100	Ave
	2390.000	21.37	40.24	61.61	74.00	-12.39	360	100	peak
2	2400.000	12.61	39.76	52.37	54.00	-1.63	360	100	Ave
3	2411.700	51.66	39.82	91.48	/	37.48	360	100	Ave

Highest Bandedge



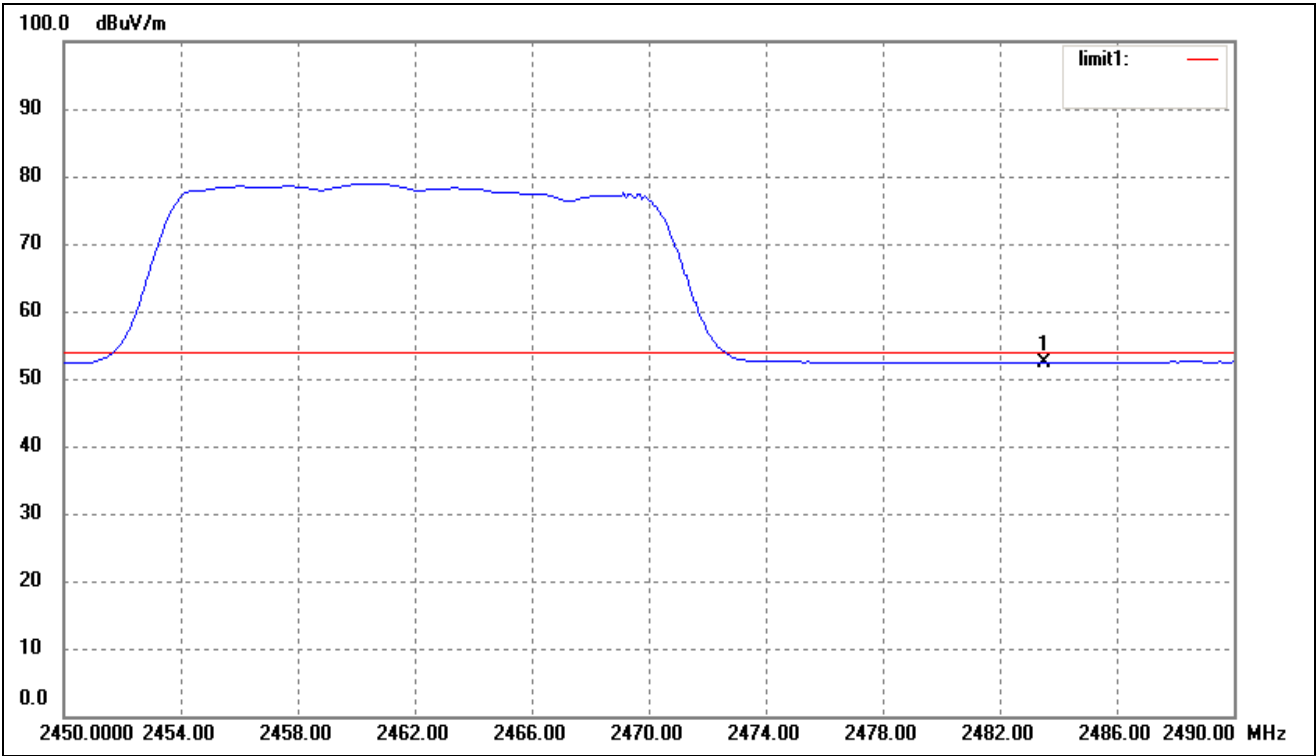
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	12.21	40.18	52.39	54.00	-1.61	0	200	Ave
	2483.500	20.35	41.24	61.59	74.00	-12.41	0	200	peak

For 802.11g
Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2390.000	12.20	39.71	51.91	54.00	-2.09	360	100	Ave
	2390.000	21.16	40.54	61.70	74.00	-12.30	360	100	peak
2	2400.000	13.67	39.76	53.43	54.00	-0.57	360	100	Ave
3	2407.700	45.60	39.80	85.40	/	31.40	360	100	Ave

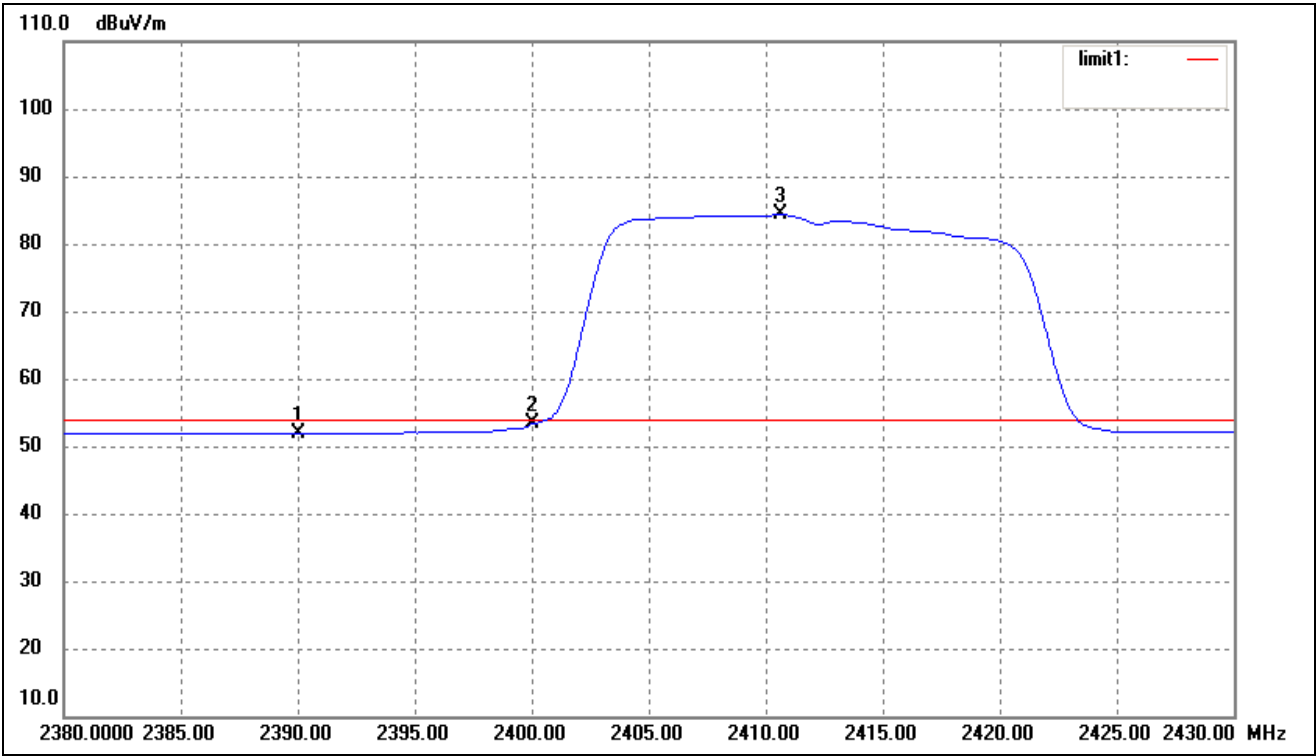
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	12.23	40.18	52.41	54.00	-1.59	0	200	Ave
	2483.500	23.52	41.20	64.72	74.00	-9.28	0	200	peak

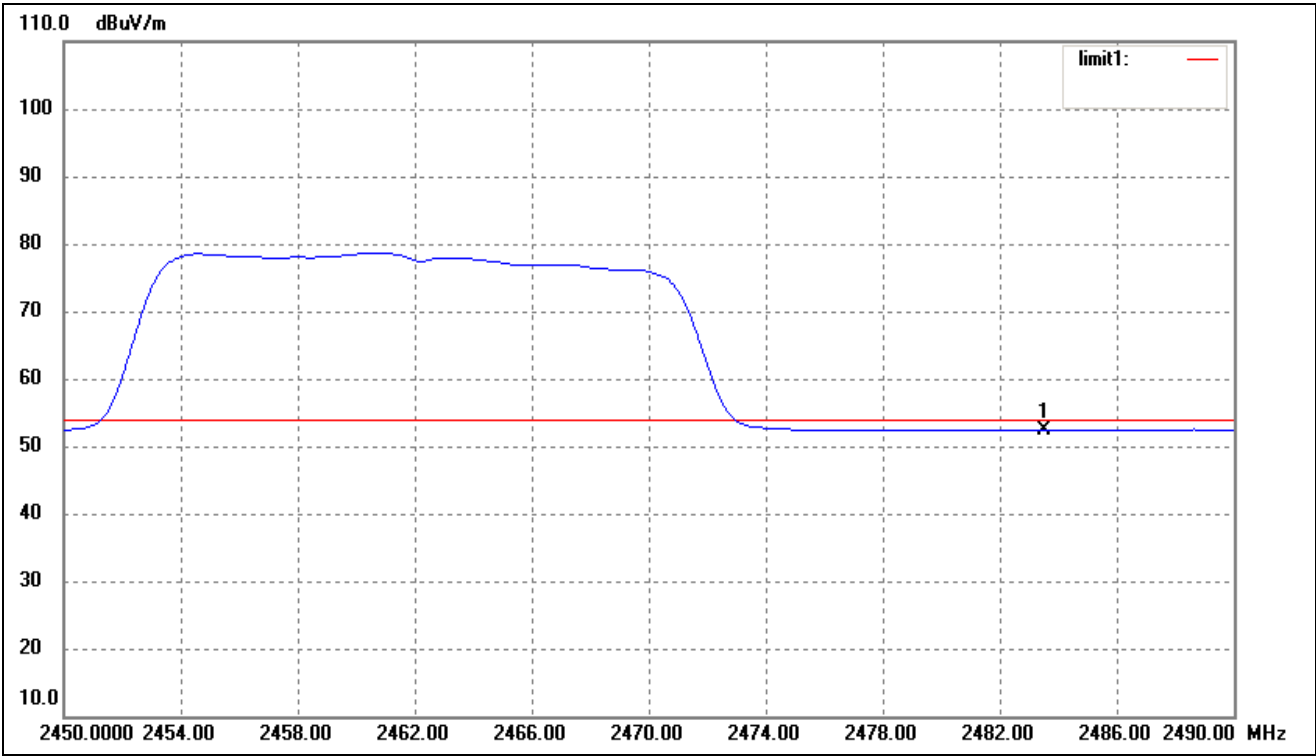
For 802.11n HT20

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2390.000	12.18	39.71	51.89	54.00	-2.11	360	100	Ave
	2390.000	22.31	41.24	63.55	74.00	-10.45	360	100	peak
2	2400.000	13.52	39.76	53.28	54.00	-0.72	360	100	Ave
3	2410.600	44.48	39.82	84.30	/	30.30	360	100	Ave

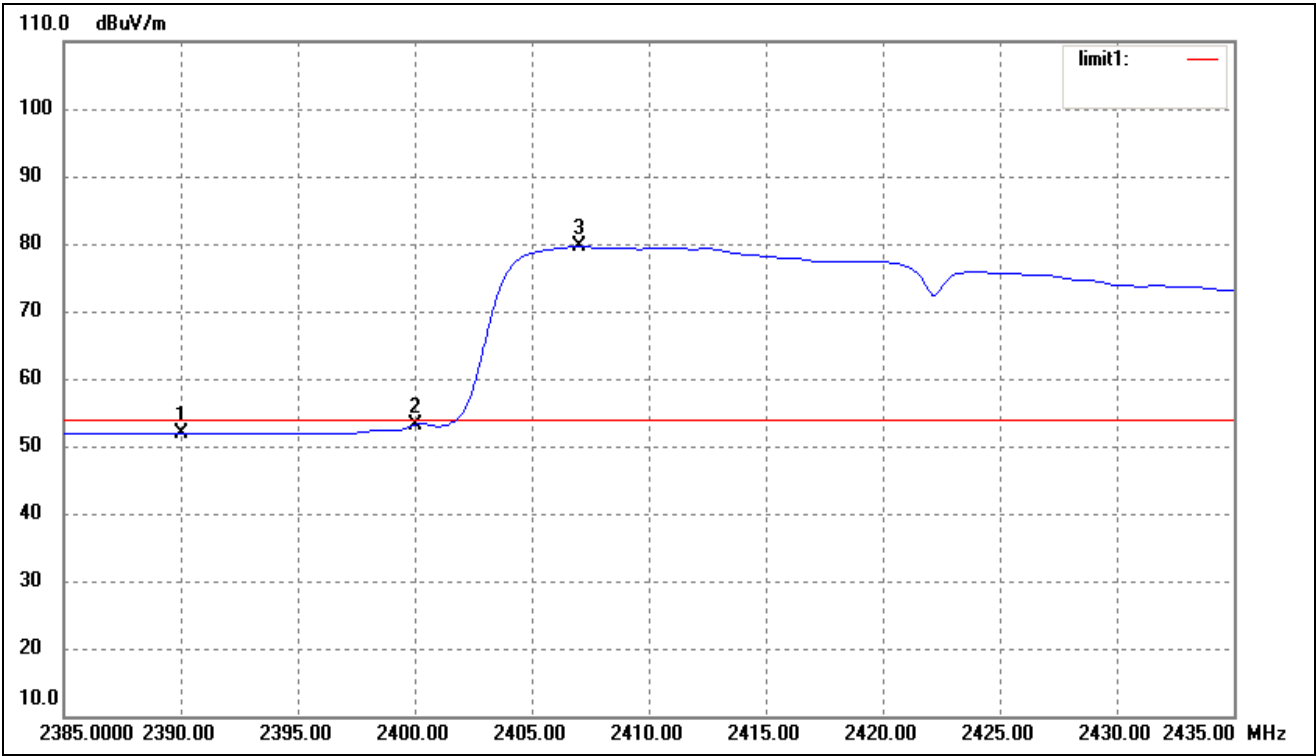
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	12.24	40.18	52.42	54.00	-1.58	0	200	Ave
	2483.500	22.31	41.02	63.33	74.00	-10.67	0	200	peak

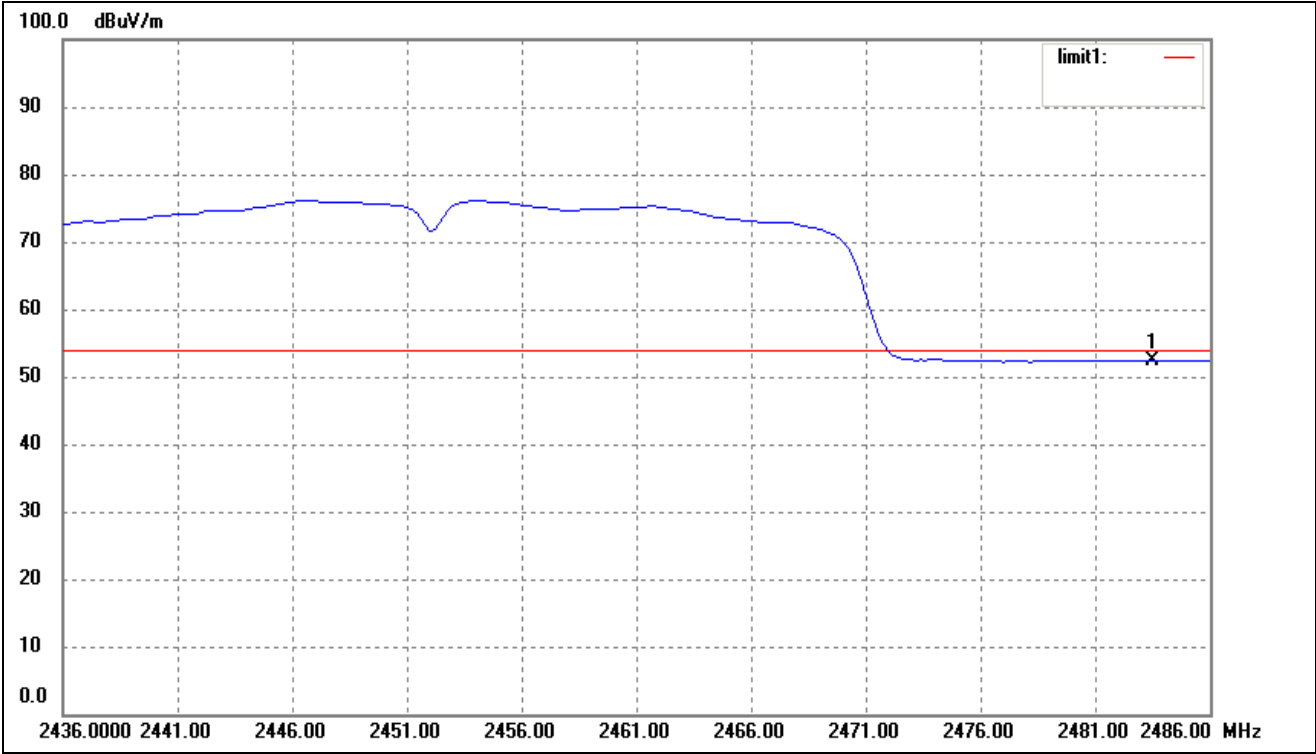
For 802.11n HT40

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2390.000	12.14	39.71	51.85	54.00	-2.15	360	100	Ave
	2390.000	22.12	40.24	62.36	74.00	-11.64	360	100	peak
2	2400.000	13.41	39.76	53.17	54.00	-0.83	0	100	Ave
3	2407.000	39.89	39.79	79.68	/	25.68	0	100	Ave

Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	12.18	40.18	52.36	54.00	-1.64	360	200	Ave
	2483.500	22.05	41.17	63.22	74.00	-10.78	360	200	peak