

FCC Part 15C

Measurement and Test Report

For

SHENZHEN TENDA TECHNOLOGY CO., LTD.

3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN,
NANSHAN DISTRICT, SHENZHEN, China.

FCC ID: V7TW322U

Report Concerns: Original Report	Equipment Type: Wireless-N USB Adapter
Model:	<u>W322U</u>
Report No.:	<u>STR09088029I</u>
Test/Witness Engineer:	<u>Susan Su</u>
Test Date:	<u>2009-08-07 to 2009-08-14</u>
Issued Date:	<u>2009-08-19</u>
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Approved & Authorized By:	<p><u>Jandy So</u> PSQ Manager / Jandy So</p>

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

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: SHENZHEN TENDA TECHNOLOGY CO., LTD.
 Address of applicant: 3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN, NANSHAN DISTRICT, SHENZHEN, China.

Manufacturer: SHENZHEN TENDA TECHNOLOGY CO., LTD.
 Address of manufacturer: 3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN, NANSHAN DISTRICT, SHENZHEN, China.

General Description of E.U.T

Items	Description
EUT Description:	Wireless-N USB Adapter
Trade Name:	Tenda
Model No.:	W322U
Rated Voltage:	DC 5V USB
Max. Output Power	12 dBm
Frequency range:	2412-2462MHz / 2422-2452MHz
Number of channels:	11 / 7
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Size:	6.4x1.9x0.1 cm

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

1.2 Test Standards

The following report is prepared on behalf of the SHENZHEN TENDA TECHNOLOGY CO., LTD. in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

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

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

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

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

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

1.5 Test Facility

- **FCC – Registration No.: 994117**

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

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

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

1.6 EUT Exercise Software

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

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
IBM	Notebook	T22	LV14893
TP-LINK	Modem	TM-EC5658V	KT99CTQC-508
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
§ 15.207	Conducted Emission	Compliant
§ 1.1307(b)	Maximum Permissible Exposure	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. §15.203 - ANTENNA REQUIREMENT

3.1 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.

3.2 Test Result

This product has an integral antenna, fulfill the requirement of this section.

4. CONDUCTED EMISSIONS

4.1 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.

4.2 Test Equipment List and Details

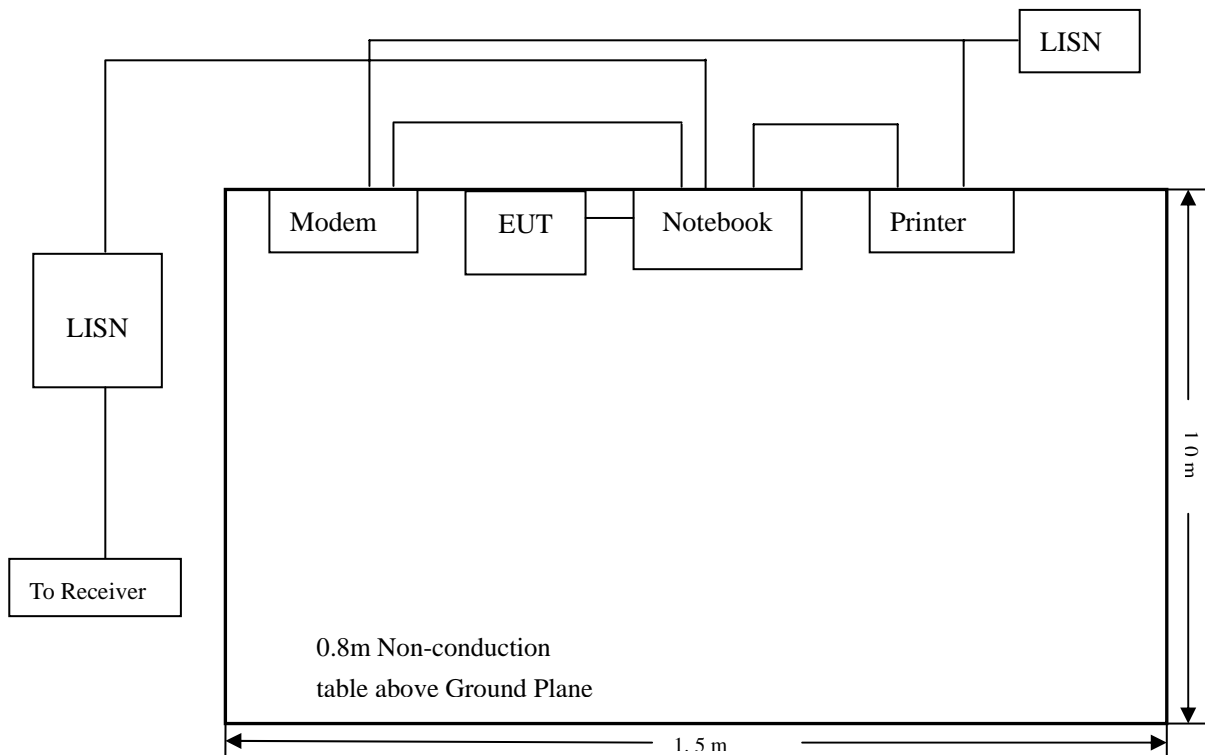
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESCS30	830245/009	2009-07-08	2010-07-07
AMN	Rohde & Schwarz	ESH2-Z5	100002	2009-07-08	2010-07-07
Limitter	Rohde & Schwarz	ESH3-Z2	357.8810.52	2009-07-08	2010-07-07
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2009-07-08	2010-07-07

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

4.3 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.

4.4 Basic Test Setup Block Diagram



4.5 Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.6 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:

-8.58 dB μ V at **0.154 MHz** in the **Neutral, Peak** detector, 0.15-30MHz

4.7 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
0.154	57.19	Pk	Neutral	65.77	-8.58
0.210	44.18	Ave	Line	53.20	-9.02
0.158	56.05	Pk	Line	65.55	-9.50
0.214	40.60	Ave	Neutral	53.04	-12.44
0.490	30.46	Ave	Neutral	46.16	-15.70
4.062	28.65	Ave	Neutral	45.99	-17.34
0.702	28.21	Ave	Line	45.99	-17.78
4.130	27.10	Ave	Line	45.99	-18.89
0.418	38.48	Pk	Line	57.48	-19.00
0.490	36.37	Pk	Neutral	56.15	-19.78
4.130	36.05	Pk	Line	55.99	-19.94
7.786	30.05	Ave	Line	49.99	-19.95

Note: Emissions attenuation more than 20dB are not report.

Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: Wireless-N USB Adapter

M/N: W322U

Operating Condition: Running

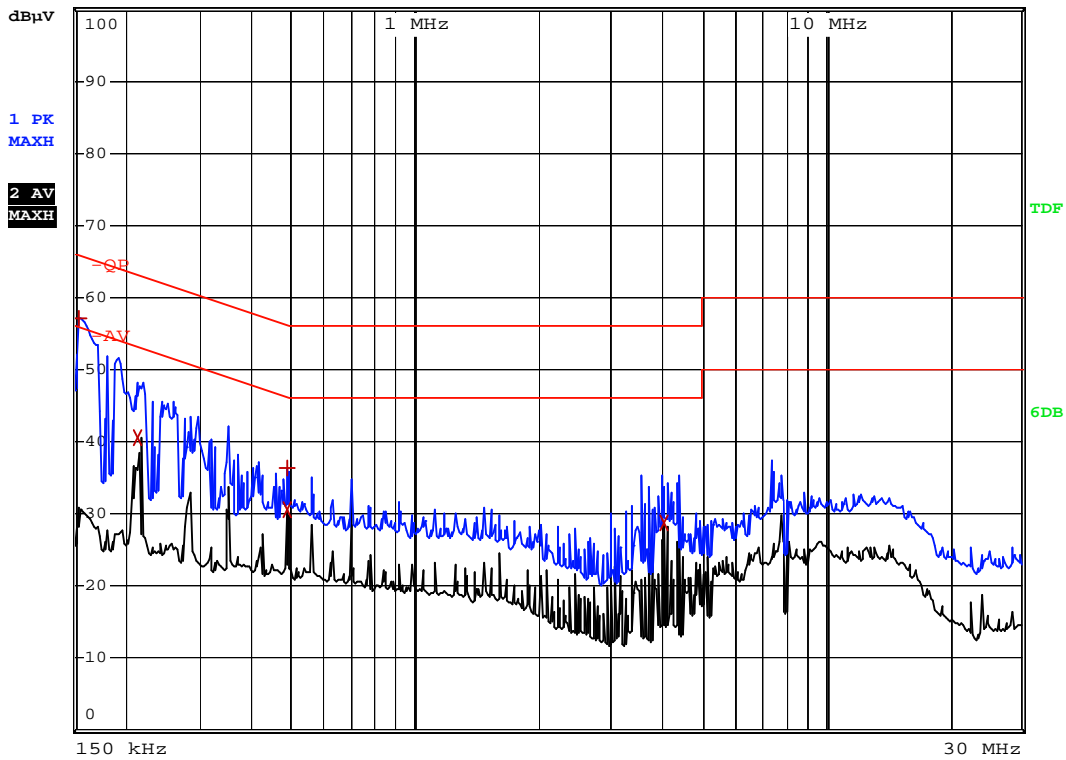
Test Specification: N

Comment: AC120V/60Hz; USB 5V



RBW 9 kHz
MT 5 ms

Att 10 dB AUTO



Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: Wireless-N USB Adapter

M/N: W322U

Operating Condition: Running

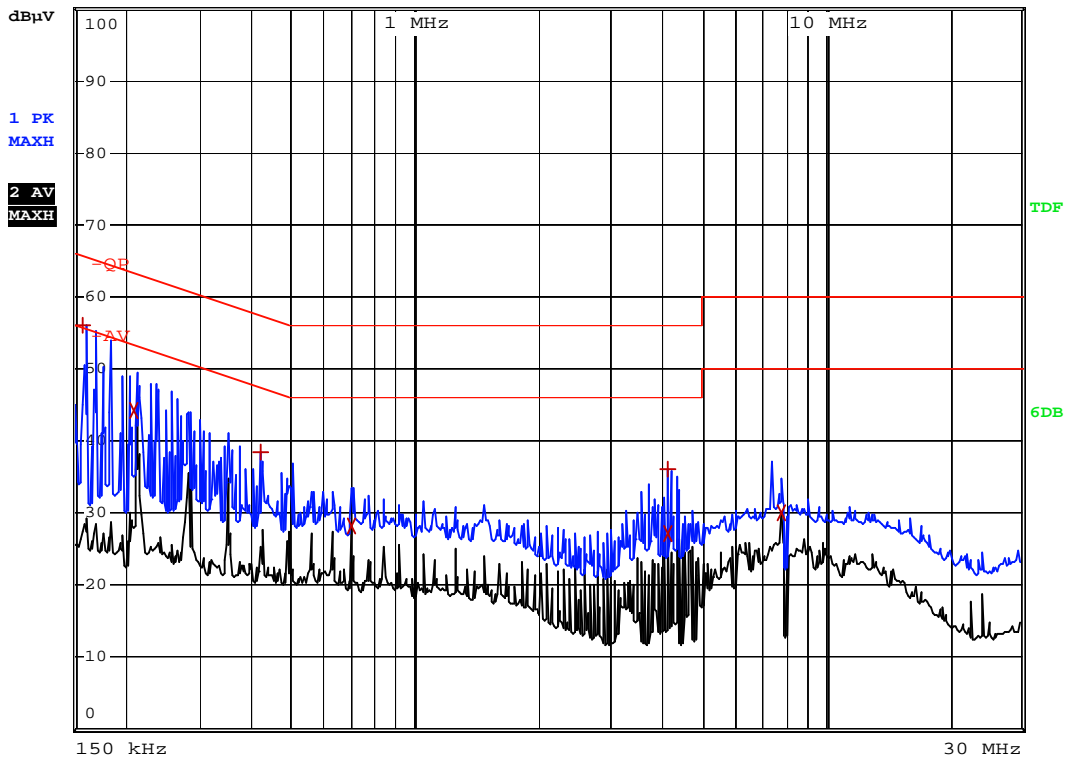
Test Specification: L

Comment: AC 120V/60Hz; USB 5V



RBW 9 kHz
MT 5 ms

Att 10 dB AUTO



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: 11.03(dBm)

Maximum peak output power at antenna input terminal: 12.6765187(mW)

Prediction distance: 2.5 (cm)

Prediction frequency: 2462 (MHz)

Antenna gain (typical): 0 (dBi)

Antenna gain (numeric): 1 (numeric)

The worst case is power density at prediction frequency at 2.5cm: 0.1614025 (mw/cm²)

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

$0.1614025 \text{ (mw/cm}^2\text{)} < 1 \text{ (mw/cm}^2\text{)}$

Result: Pass

6. POWER SPECTRAL DENSITY

6.1 Standard Applicable

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

6.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-07-08	2010-07-07
ETS	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	2009-07-08	2010-07-07

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:	26 °C
Relative Humidity:	50 %
ATM Pressure:	1011 mbar

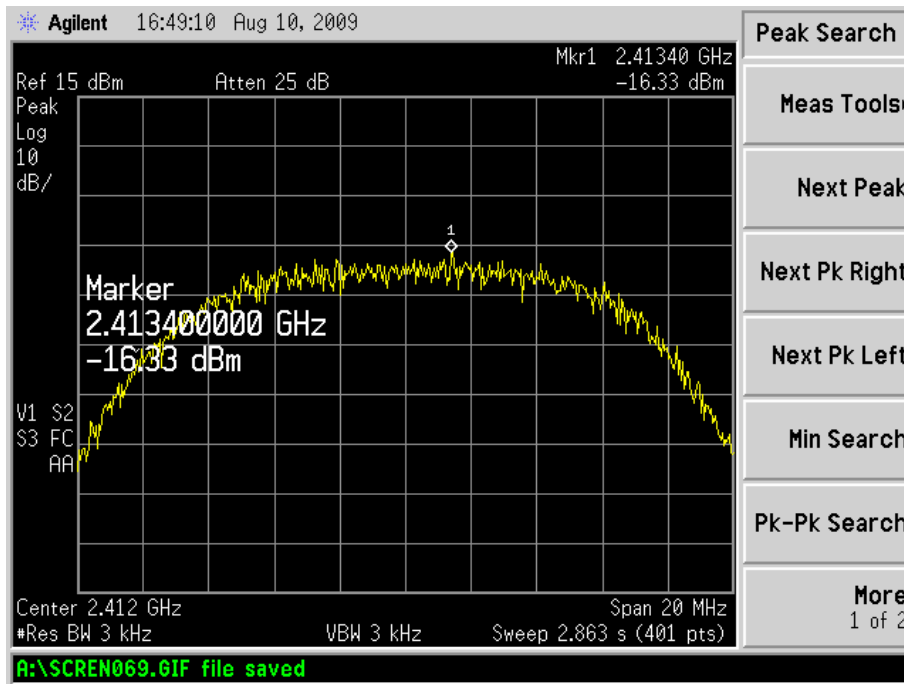
6.5 Summary of Test Results/Plots

Test mode	Test channel	Reading dBm/3kHz (Chain0)	Reading dBm/3kHz (Chain1)	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	---	-16.33	8
	Middle channel (2437MHz)	---	-14.18	8
	High channel (2462MHz)	---	-13.70	8
802.11g	Low channel (2412MHz)	-20.69	-21.06	8
	Middle channel (2437MHz)	-20.21	-19.35	8
	High channel (2462MHz)	-20.91	-19.30	8
802.11n HT-20	Low channel (2412MHz)	-20.16	-22.74	8
	Middle channel (2437MHz)	-19.67	-20.79	8
	High channel (2462MHz)	-20.18	-21.07	8
802.11n HT-40	Low channel (2412MHz)	-20.10	-24.33	8
	Middle channel (2437MHz)	-20.32	-22.74	8
	High channel (2462MHz)	-20.28	-22.96	8

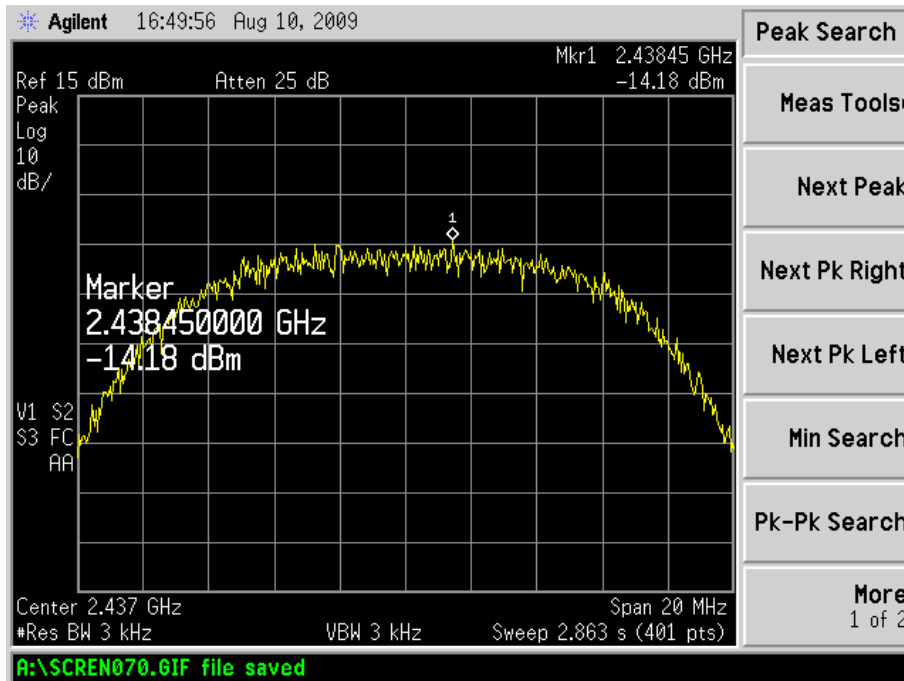
“----“ means that this test mode is no test data in the corresponding operating conditions.

For 802.11b (Chain1)

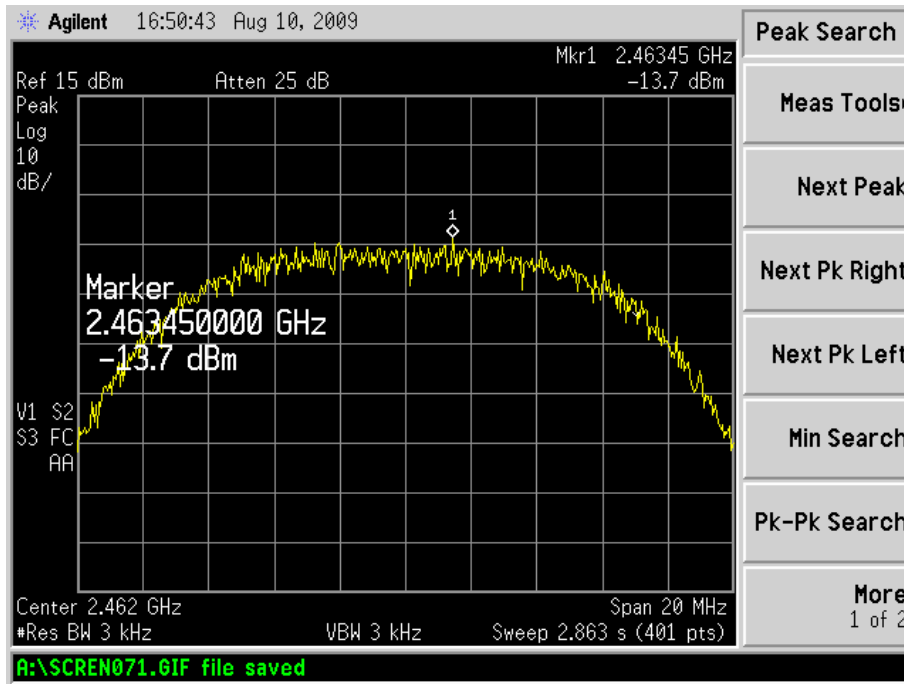
Low Channel:



Middle Channel:

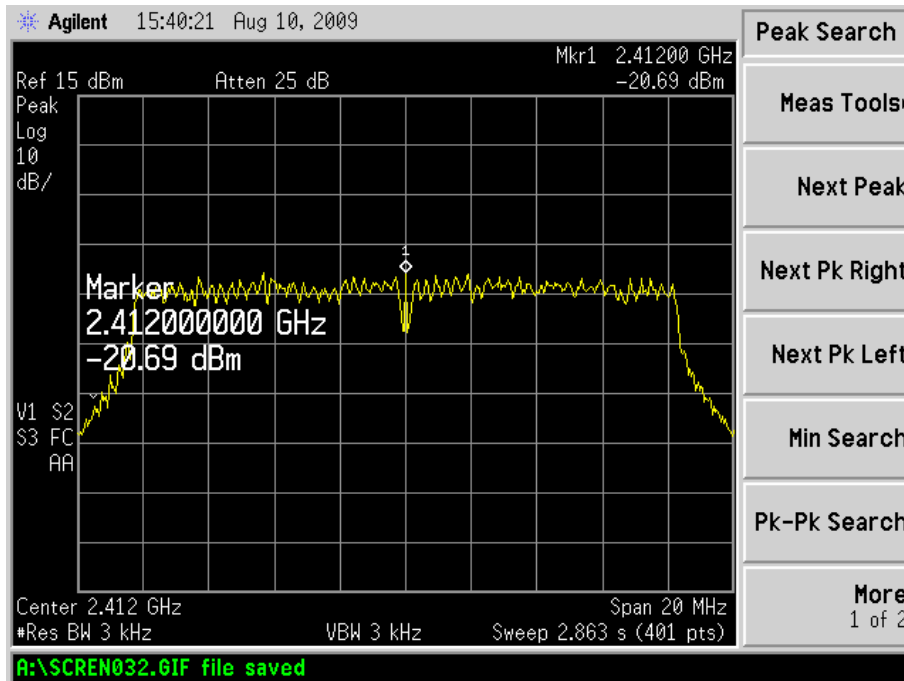


High Channel:

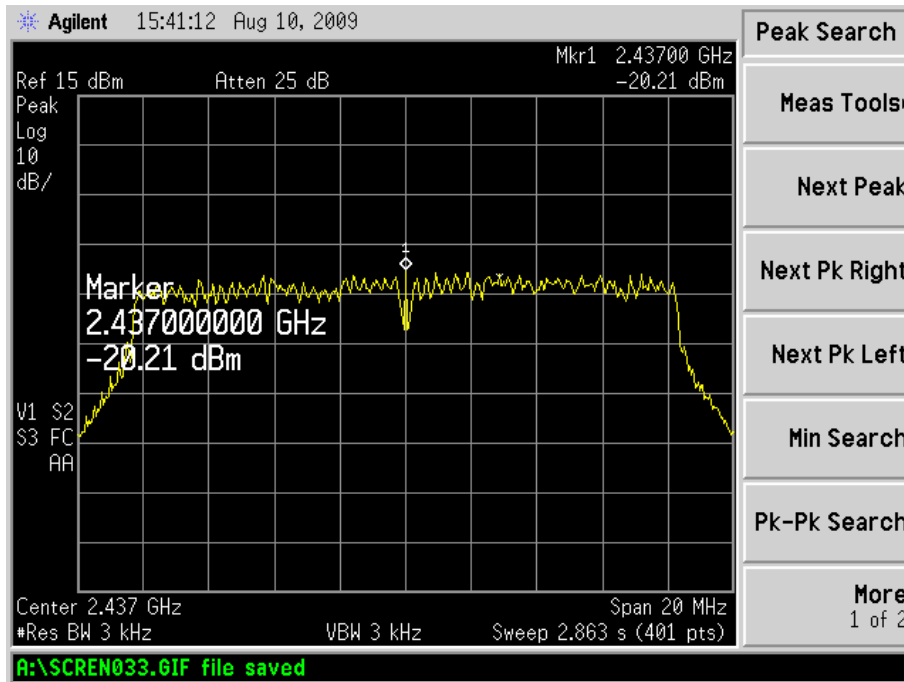


For 802.11g (Chain0)

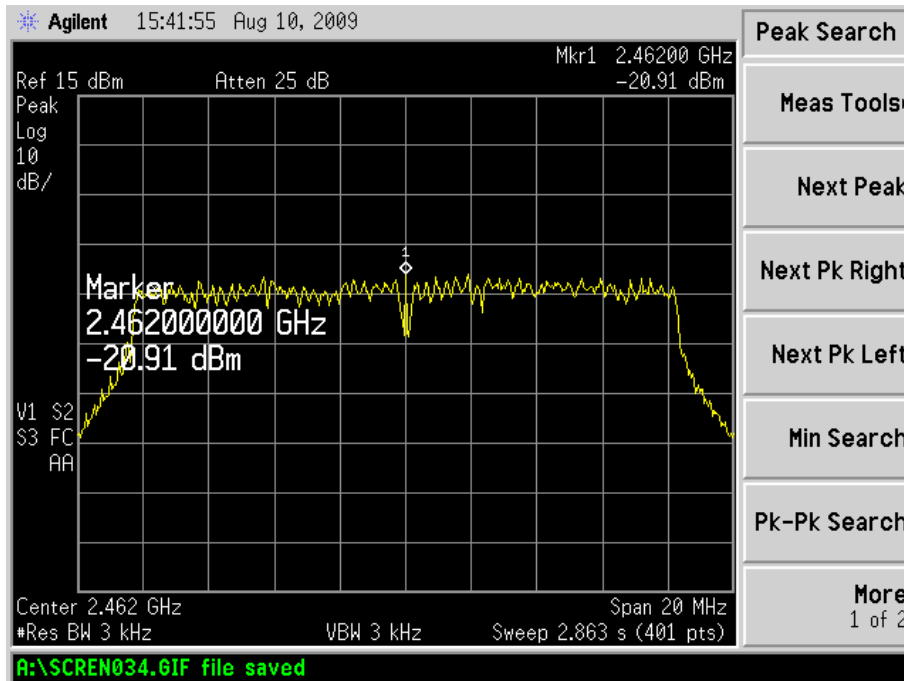
Low Channel:



Middle Channel:

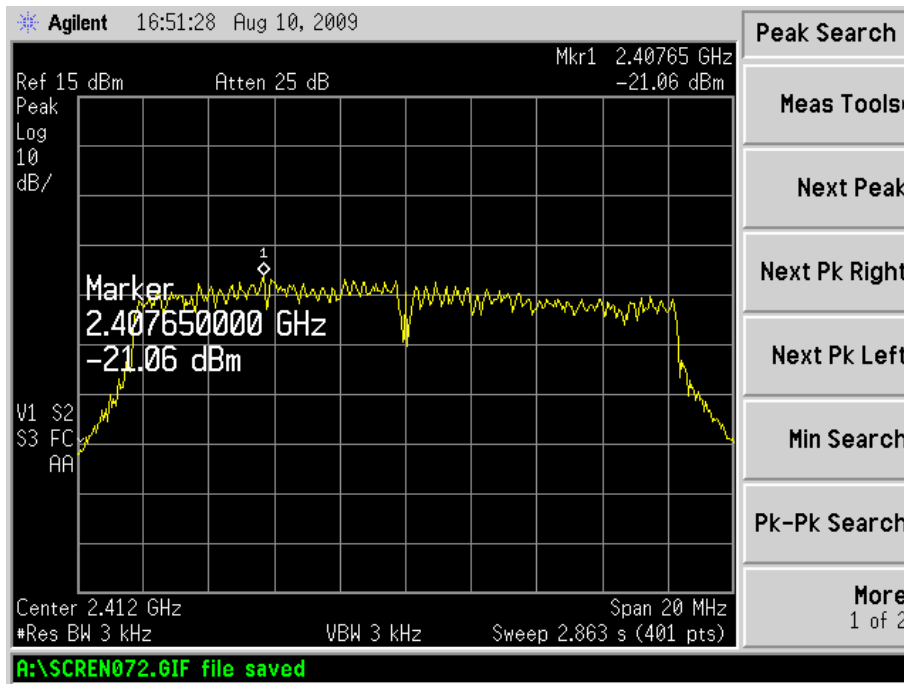


High Channel:

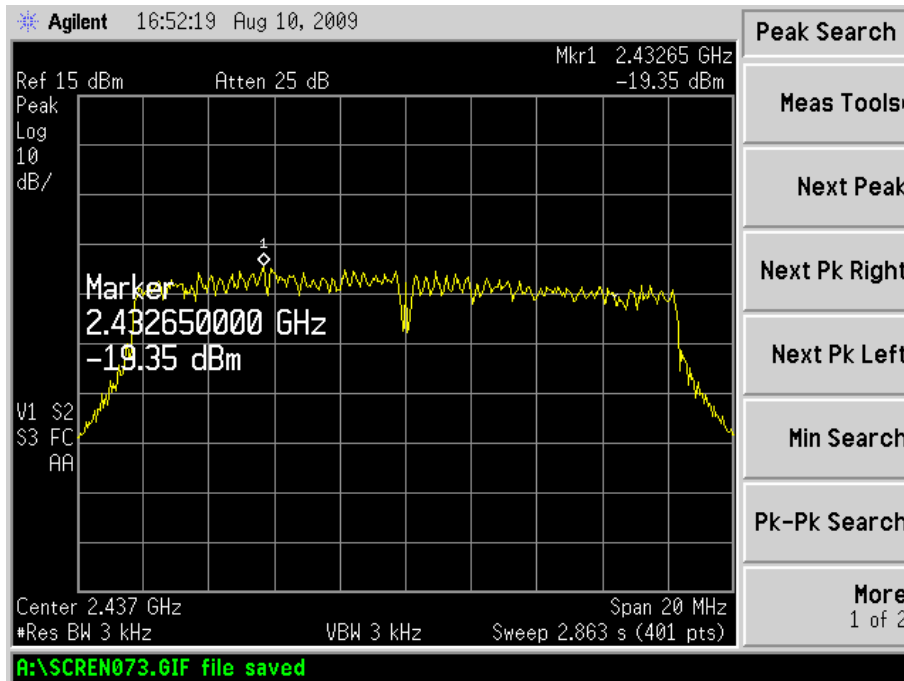


For 802.11g (Chain1)

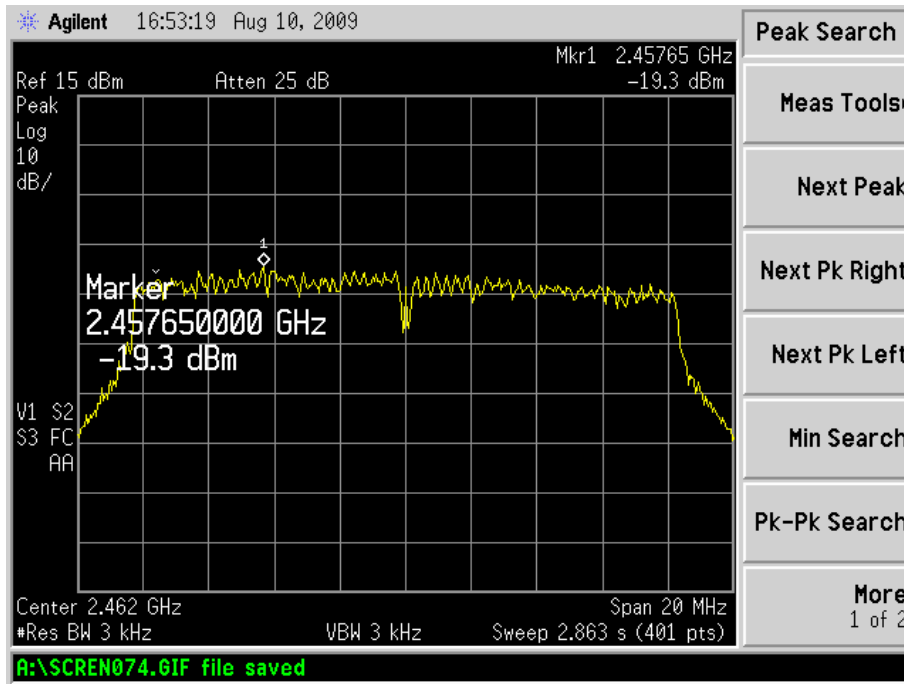
Low Channel:



Middle Channel:

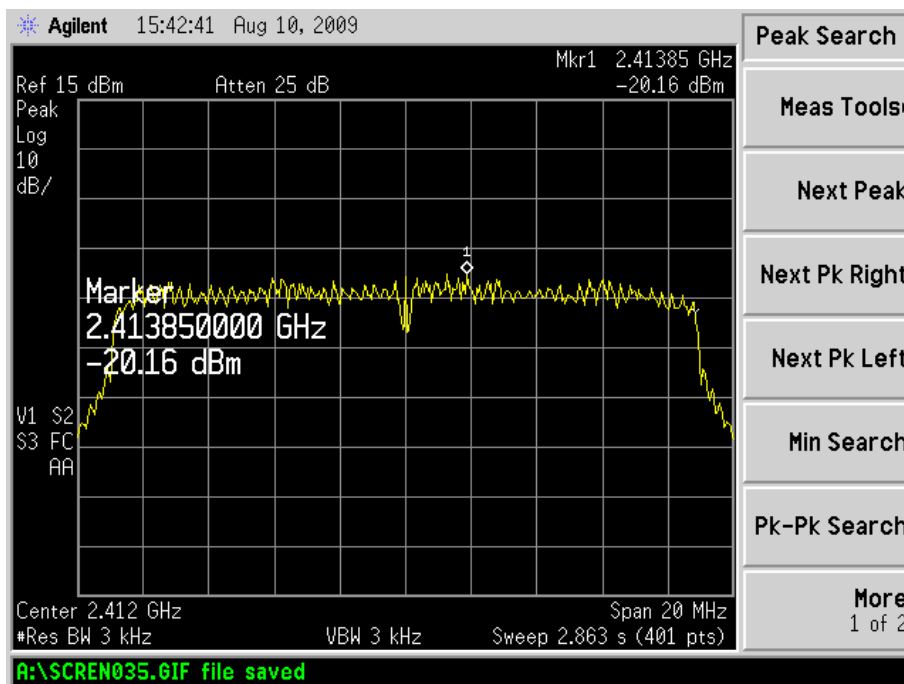


High Channel:

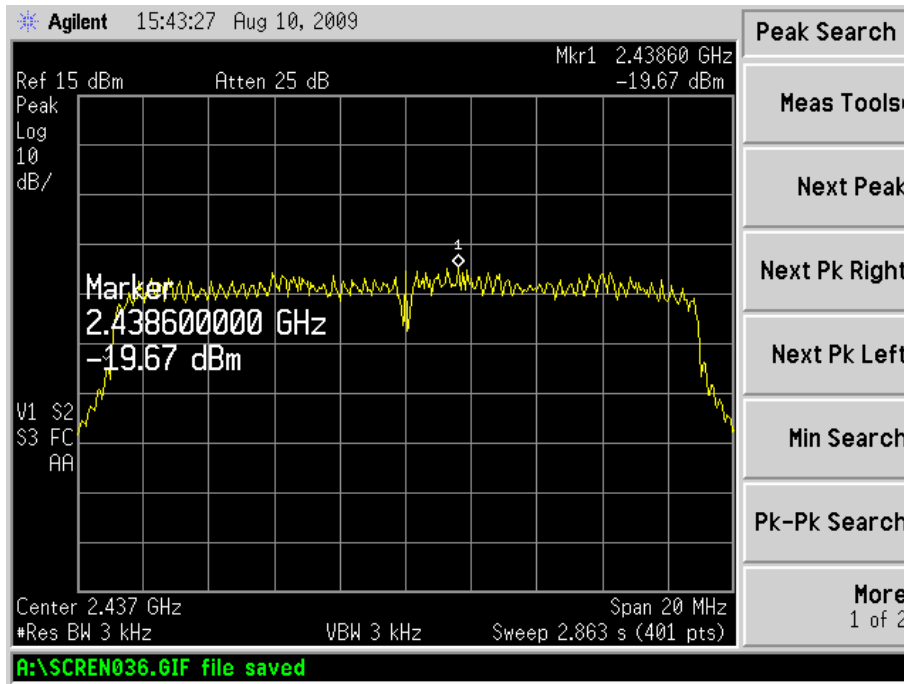


For 802.11n HT-20 (Chain0)

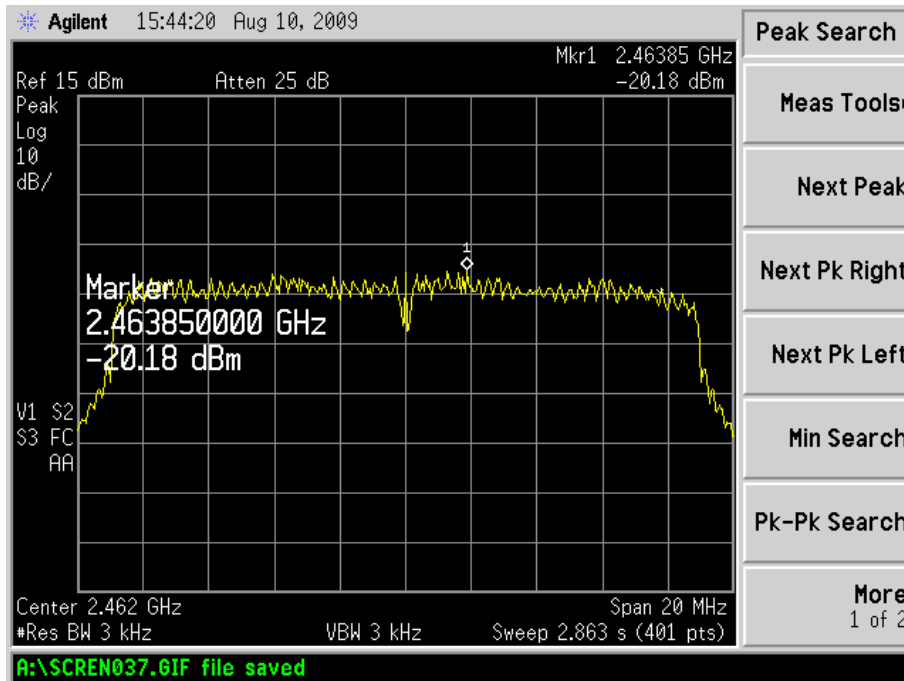
Low Channel:



Middle Channel:

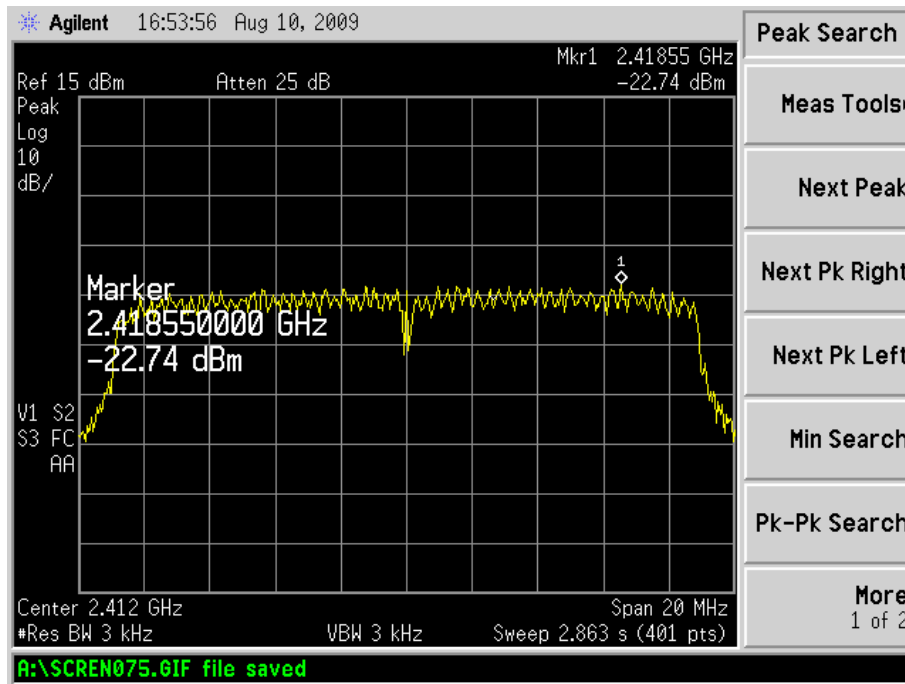


High Channel:

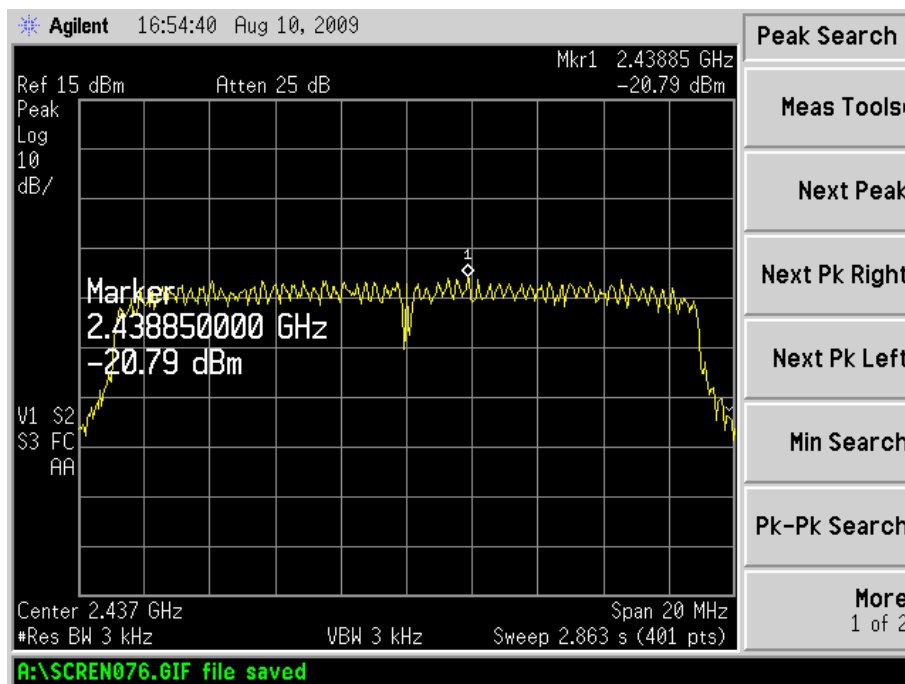


For 802.11n HT-20 (Chain1)

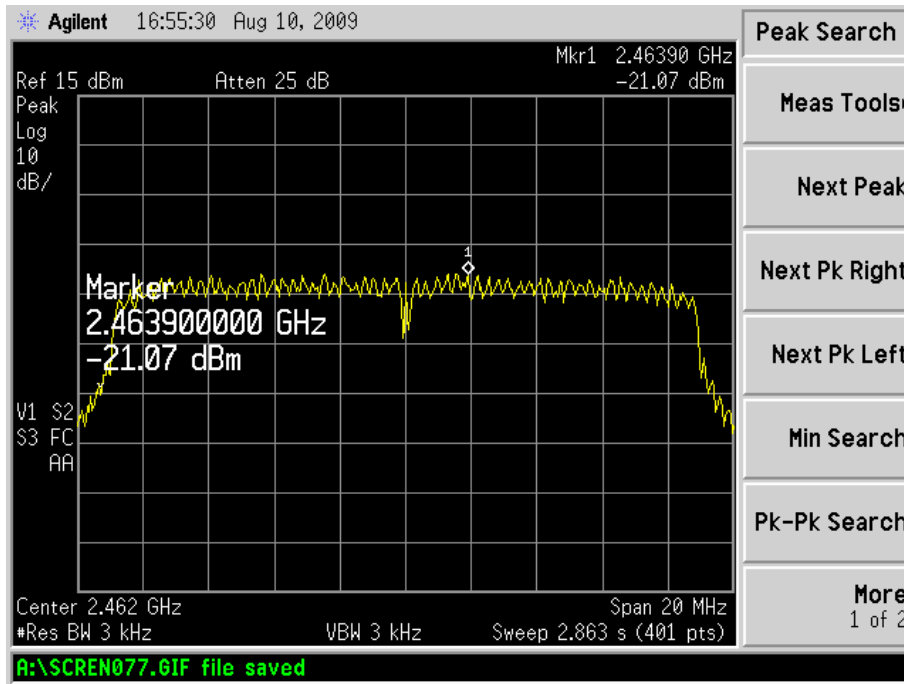
Low Channel:



Middle Channel:

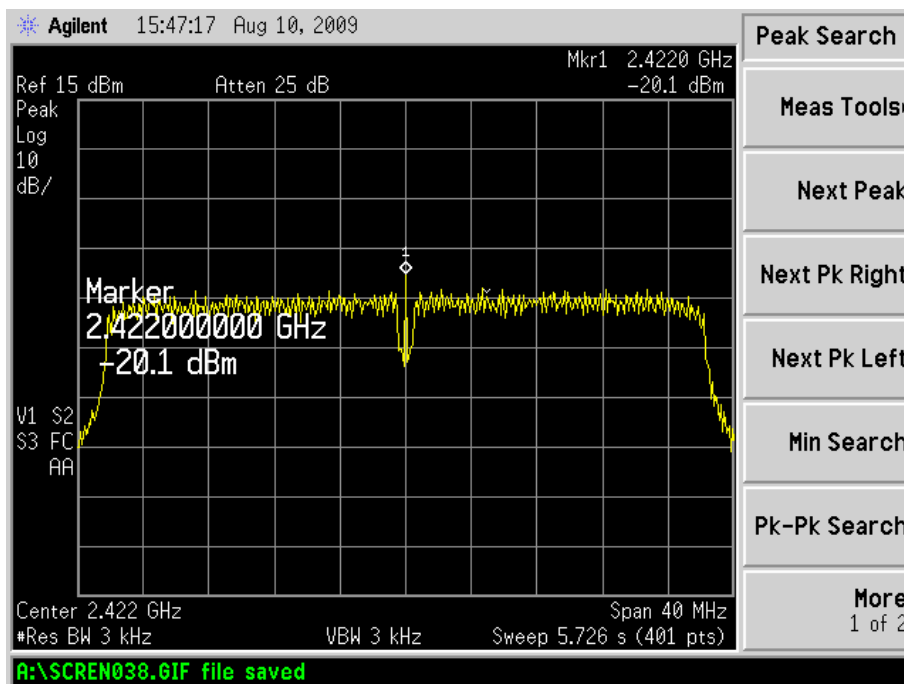


High Channel:

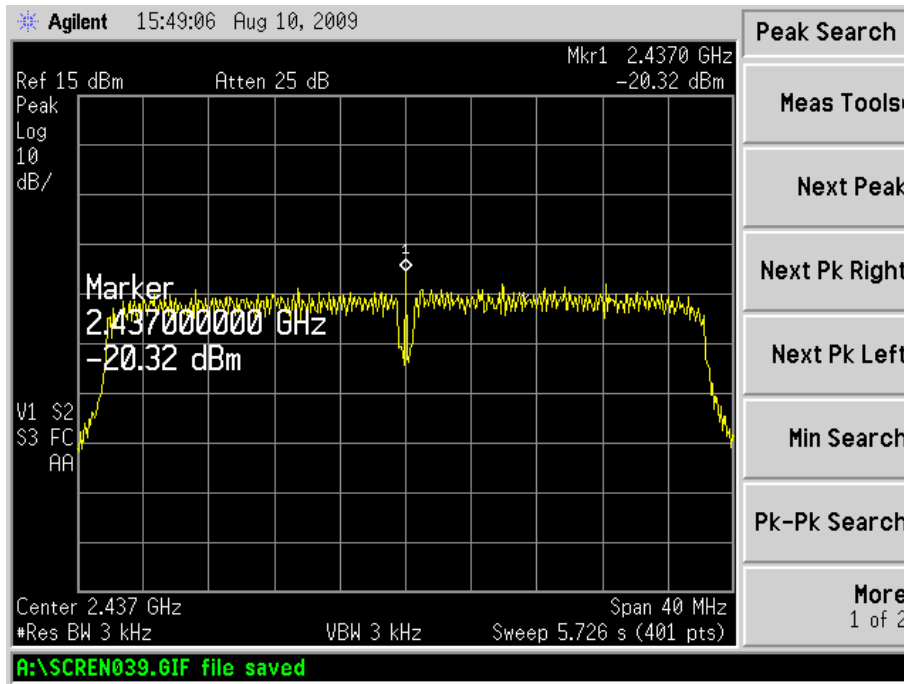


For 802.11n HT-40 (Chain0)

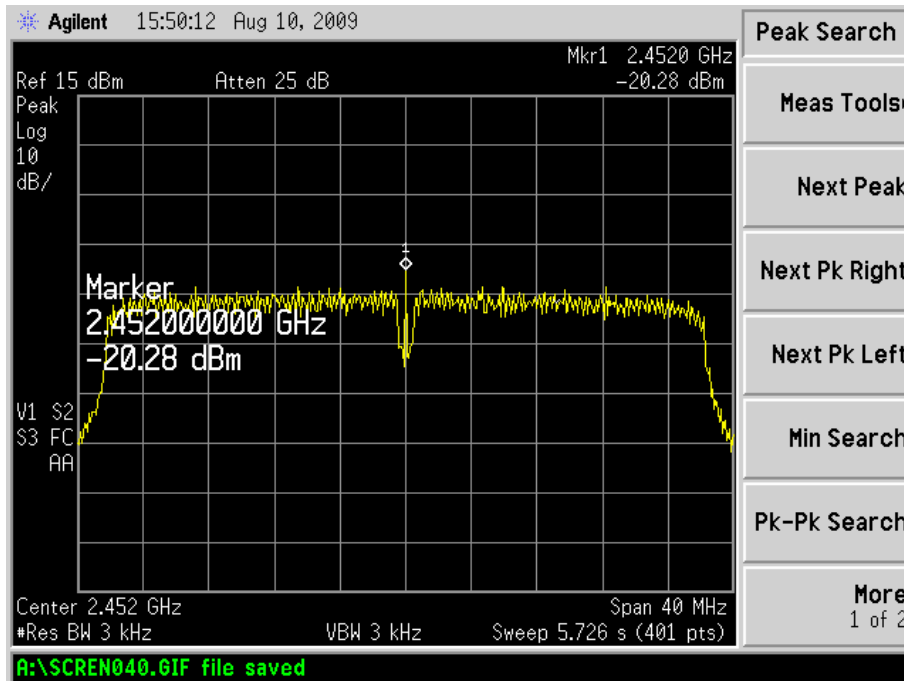
Low Channel:



Middle Channel:

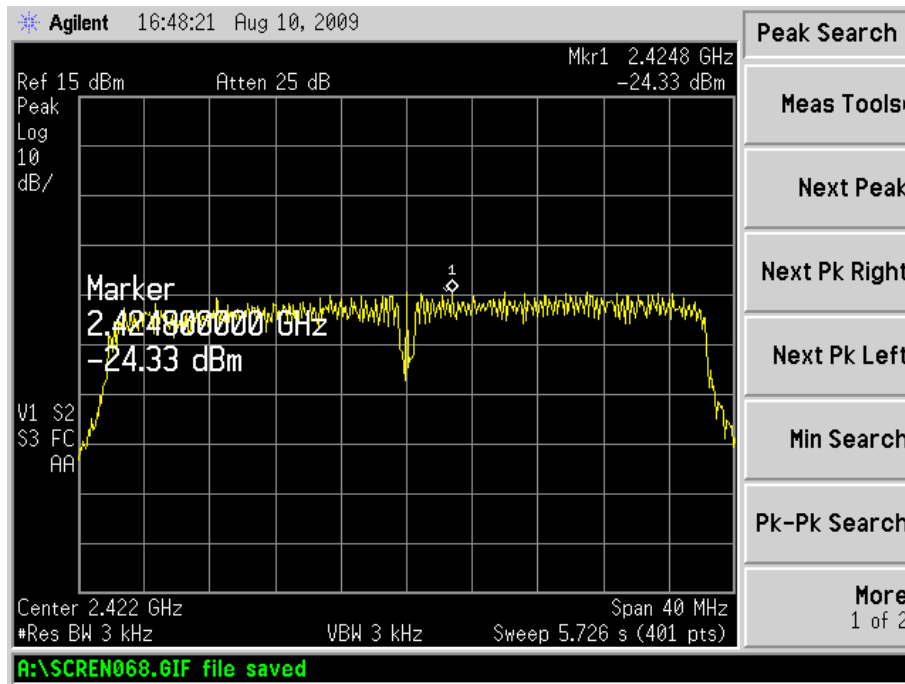


High Channel:

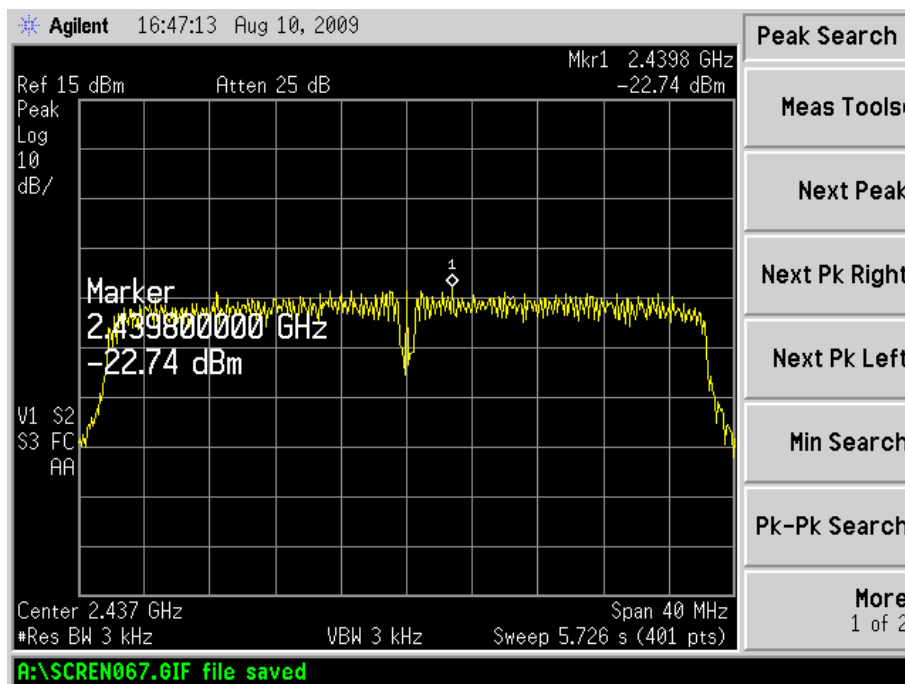


For 802.11n HT-40 (Chain1)

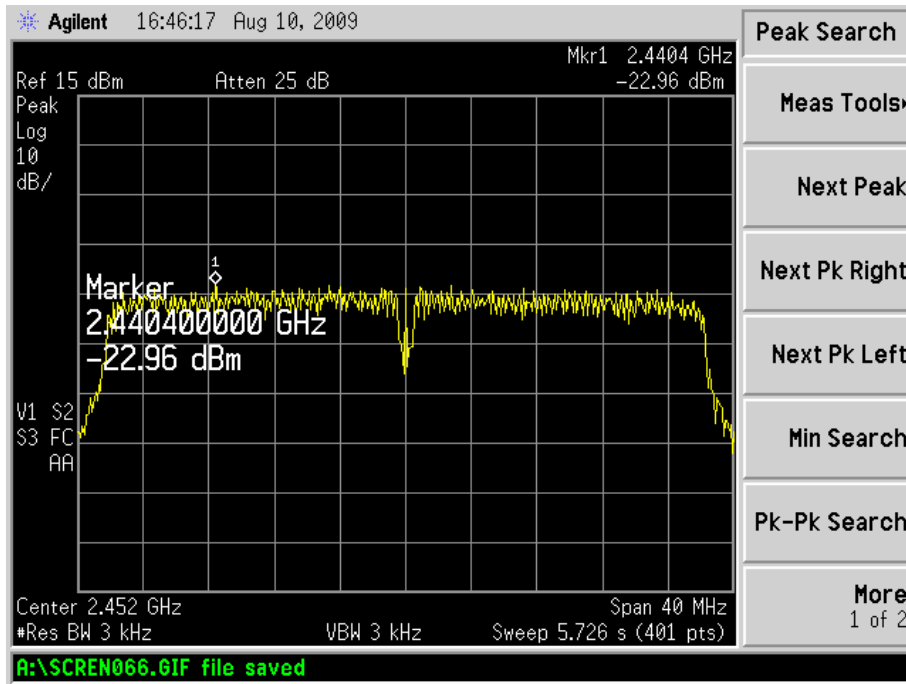
Low Channel:



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

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-01-25	2010-01-24
ETS	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	2009-01-25	2010-01-24

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:	26 °C
Relative Humidity:	52 %
ATM Pressure:	1014 mbar

7.5 Summary of Test Results/Plots

Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11b (Chain0)	2412	---	500
	2437	---	500
	2462	---	500
802.11 b (Chain1)	2412	10609	500
	2437	10628	500
	2462	10545	500

“----“ means that this test mode is no test data in the corresponding operating conditions.

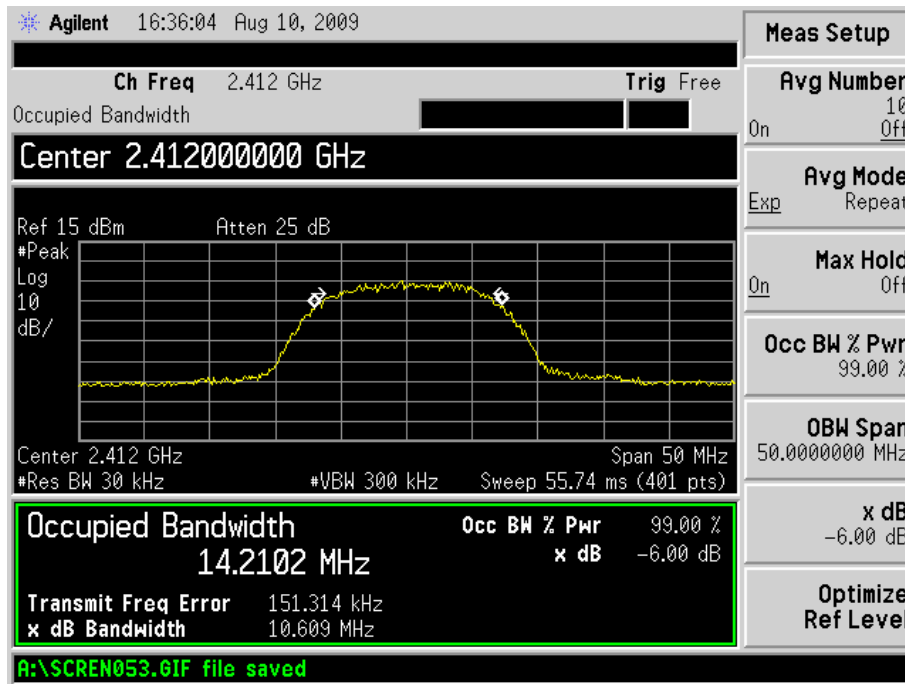
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11g (Chain0)	2412	16561	500
	2437	16487	500
	2462	16533	500
802.11 g (Chain1)	2412	16512	500
	2437	16520	500
	2462	16584	500

Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11n HT-20 (Chain0)	2412	16540	500
	2437	16534	500
	2462	16466	500
802.11 n HT-20 (Chain1)	2412	17687	500
	2437	17447	500
	2462	17648	500

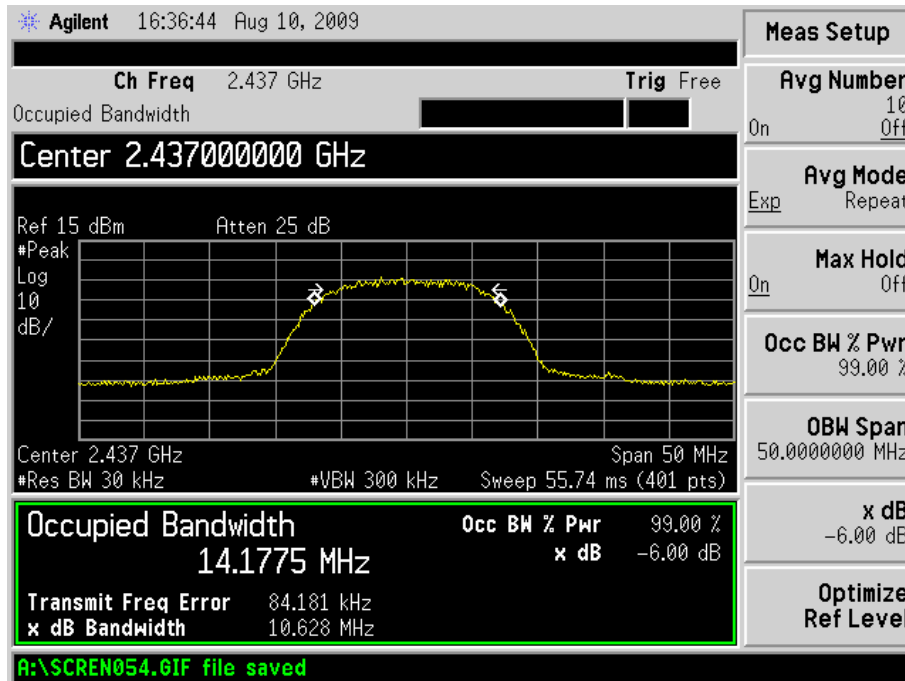
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11n HT-40 (Chain0)	2422	36354	500
	2437	36208	500
	2452	35730	500
802.11 n HT-40 (Chain1)	2422	35903	500
	2437	34974	500
	2452	36187	500

For 802.11b (Chain1)

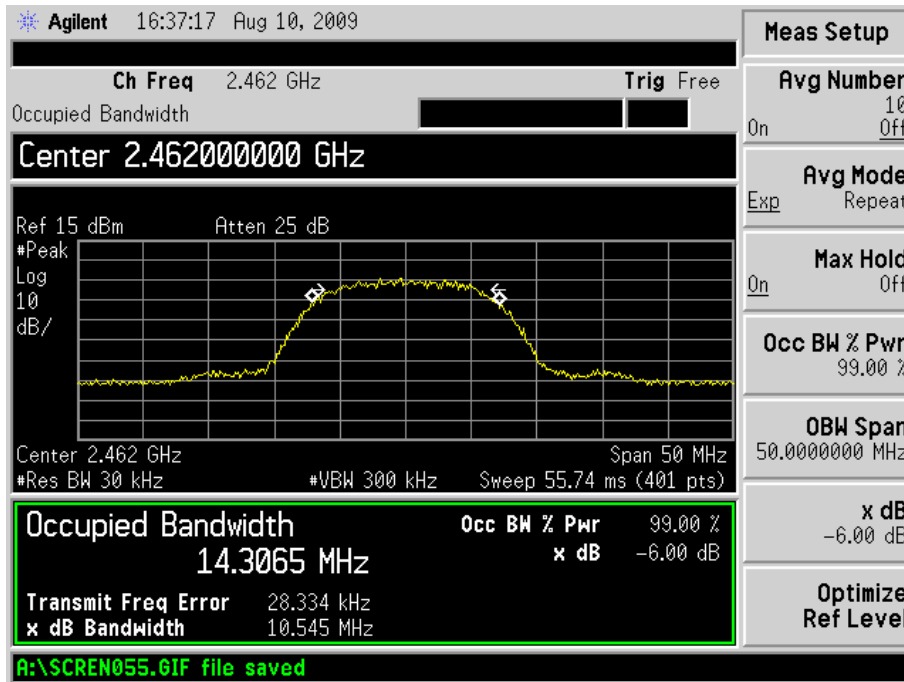
Low Channel:



Middle Channel:

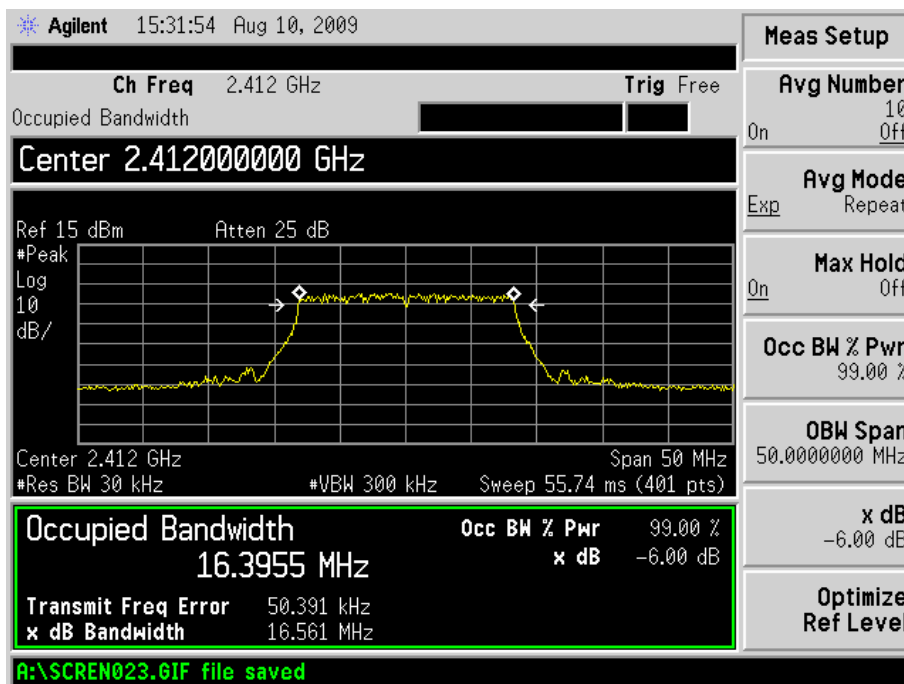


High Channel:

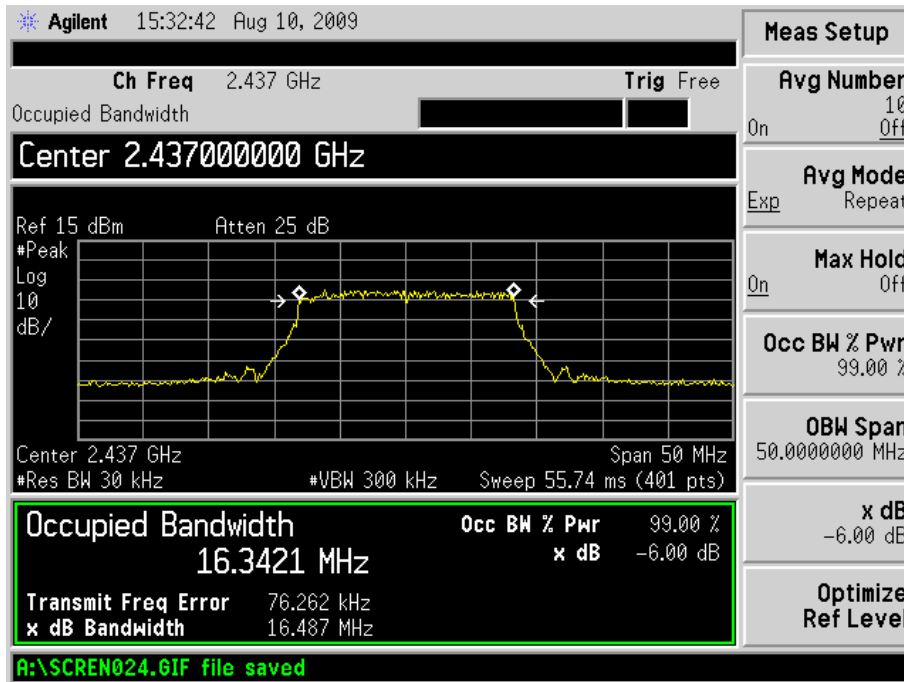


For 802.11g (Chain0)

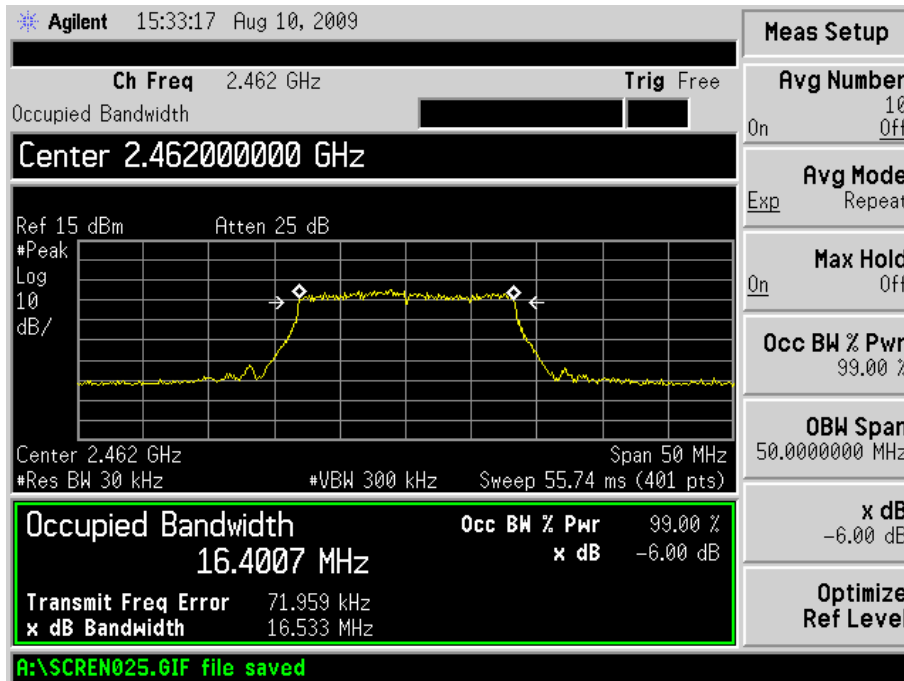
Low Channel:



Middle Channel:

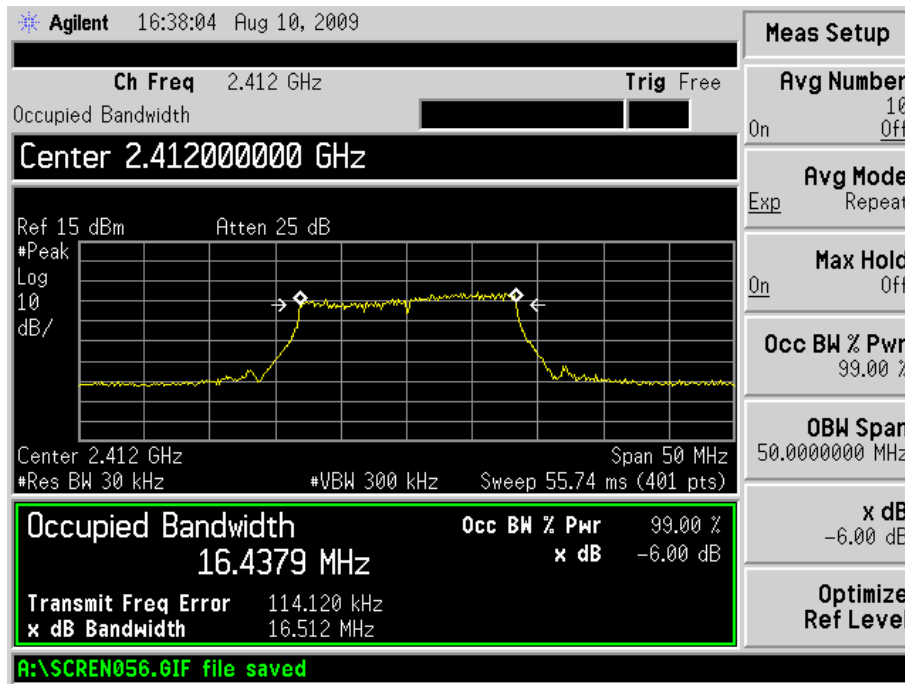


High Channel:

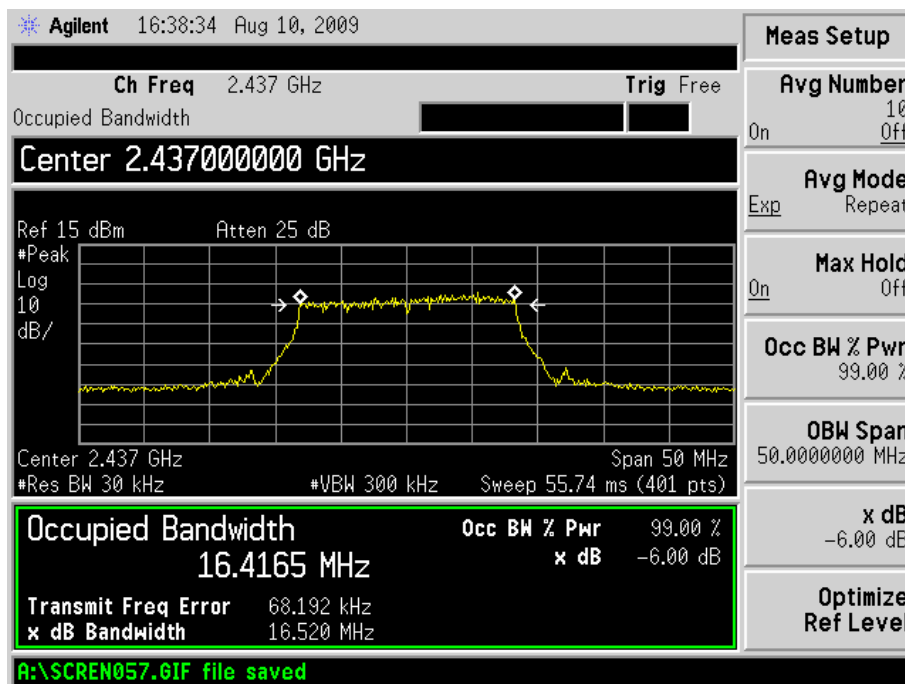


For 802.11g (Chain1)

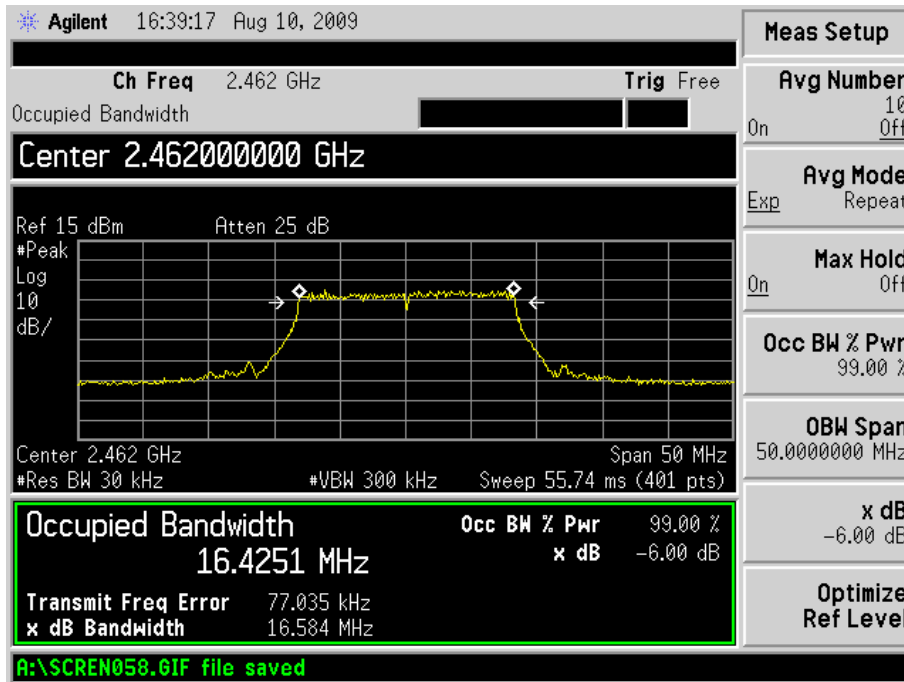
Low Channel:



Middle Channel:

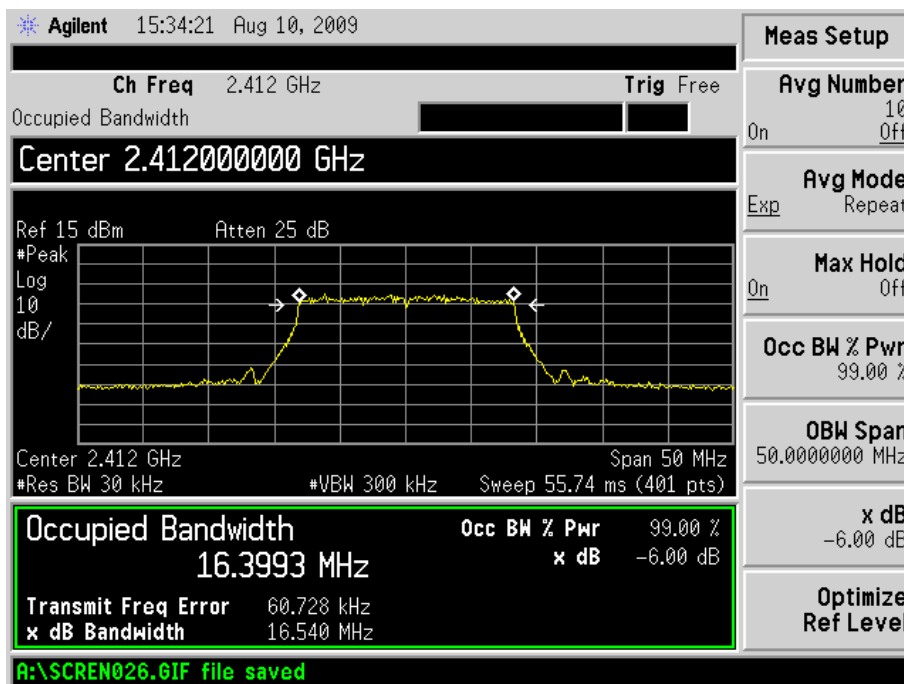


High Channel:

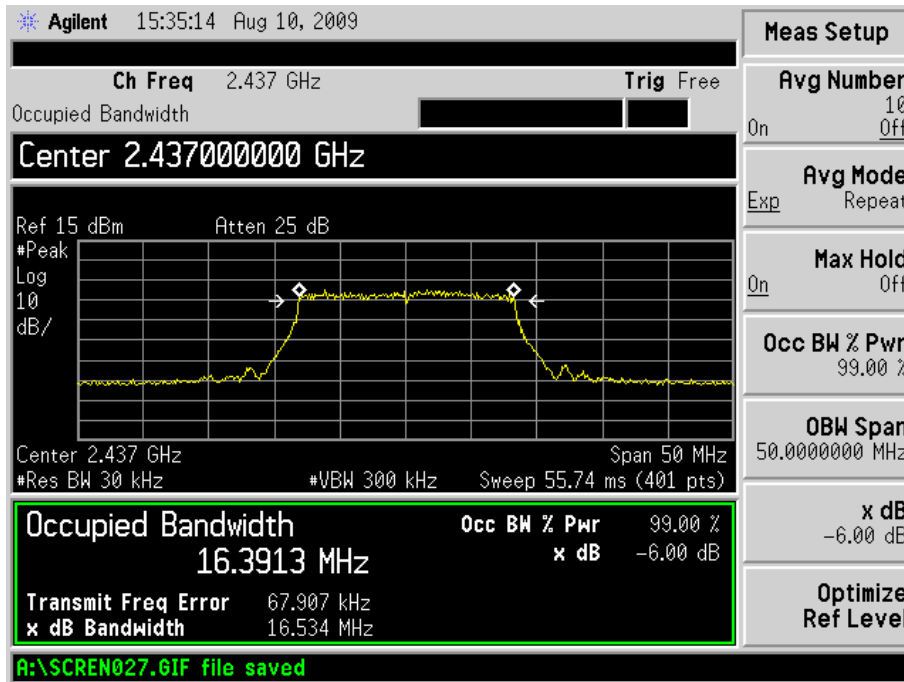


For 802.11n HT-20 (Chain0)

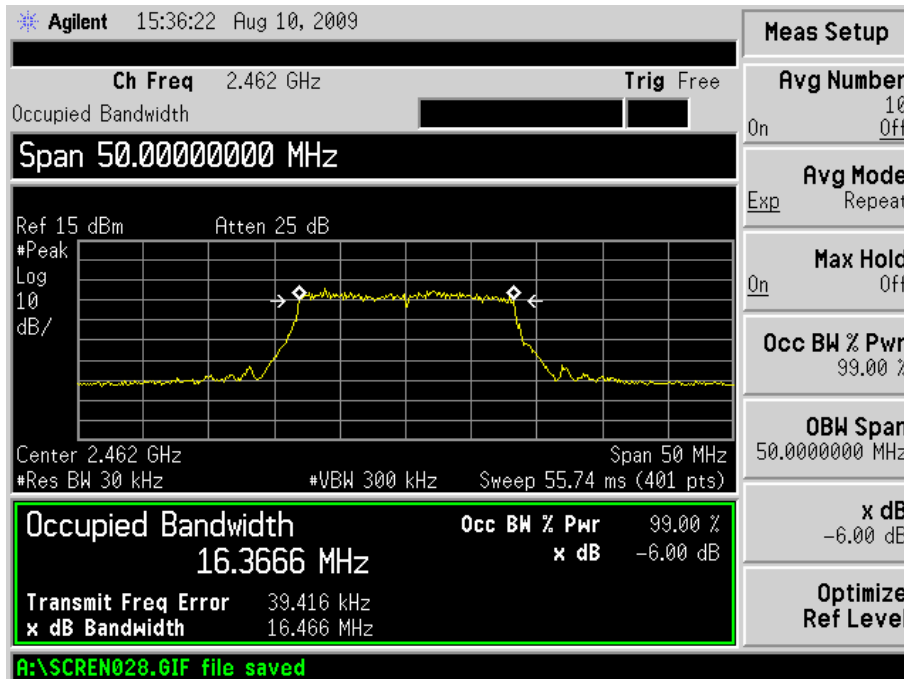
Low Channel:



Middle Channel:

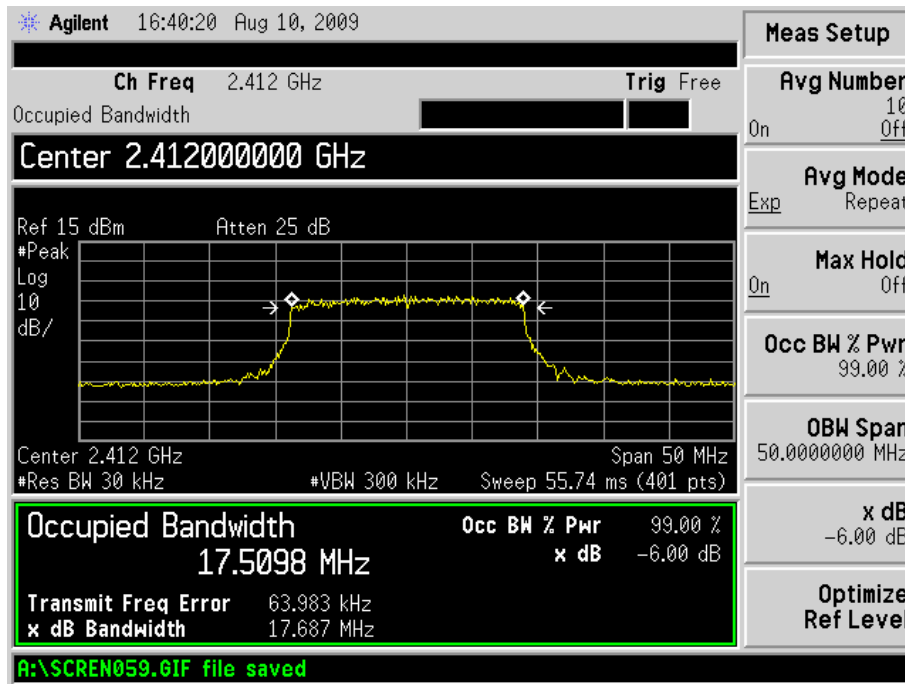


High Channel:

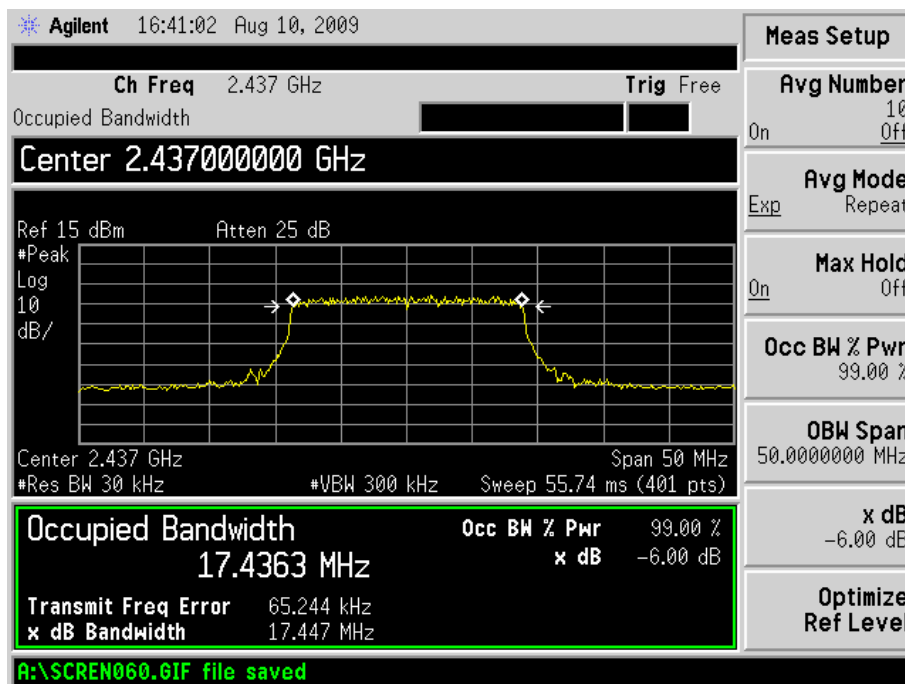


For 802.11n HT-20 (Chain1)

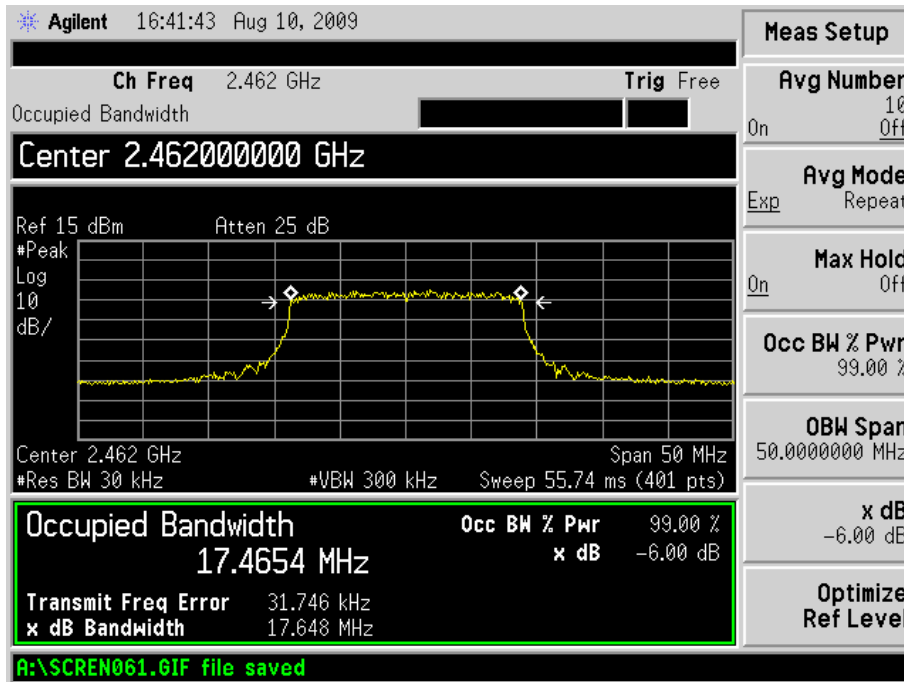
Low Channel:



Middle Channel:

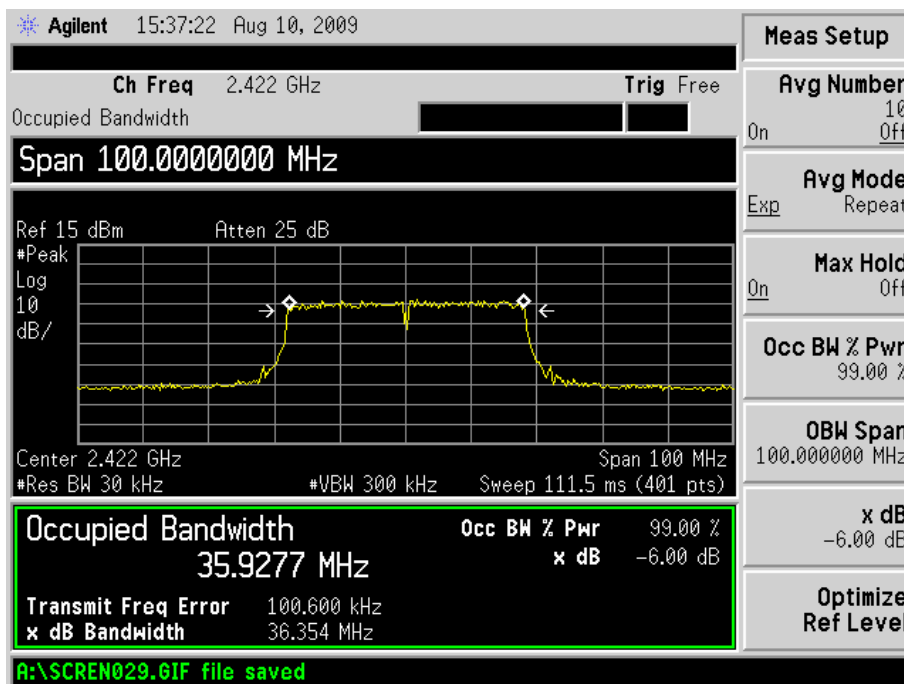


High Channel:

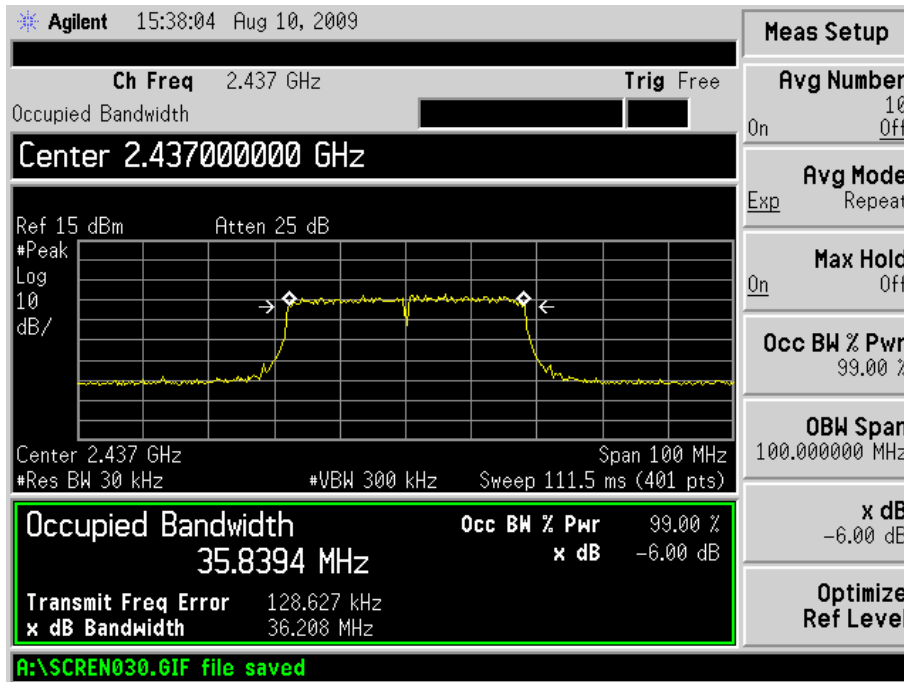


For 802.11n HT-40 (Chain0)

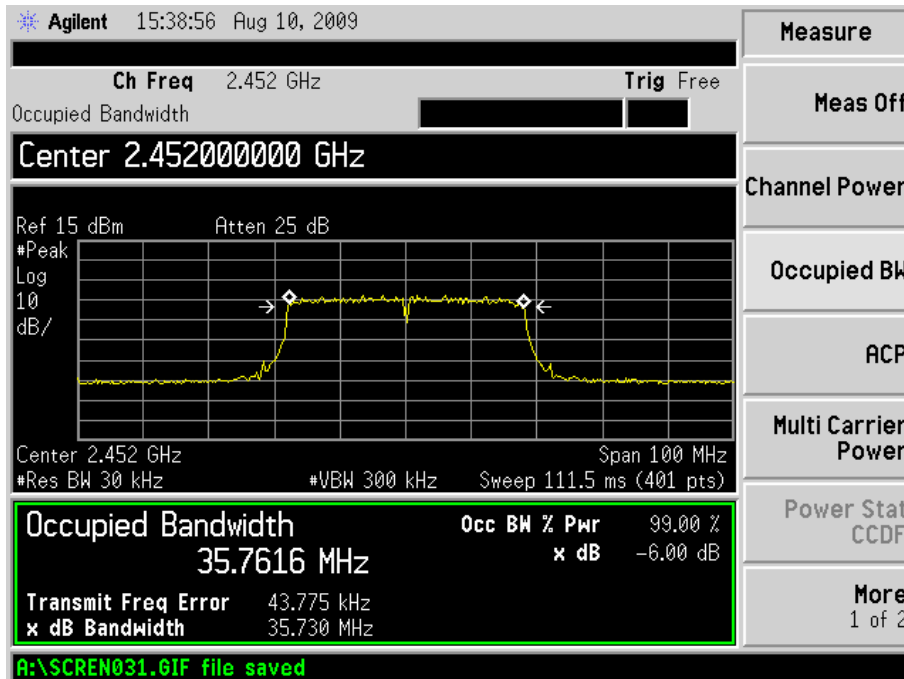
Low Channel:



Middle Channel:

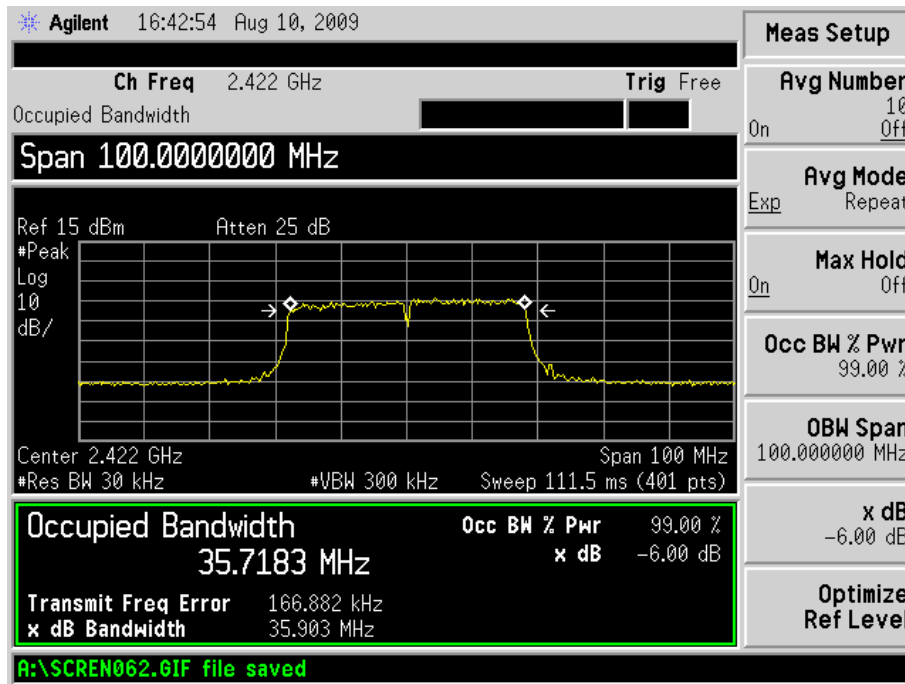


High Channel:

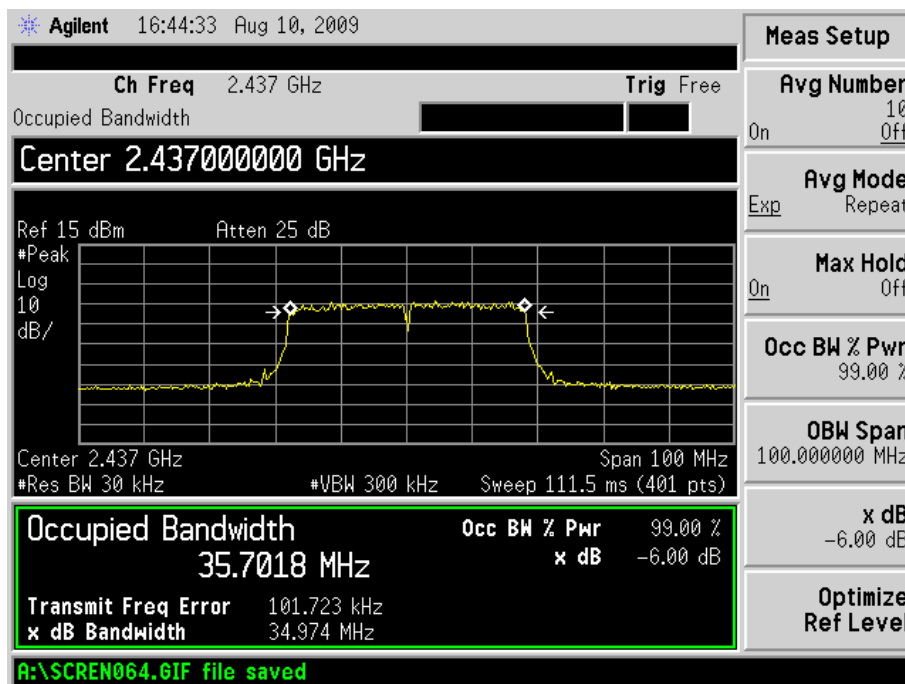


For 802.11n HT-40 (Chain1)

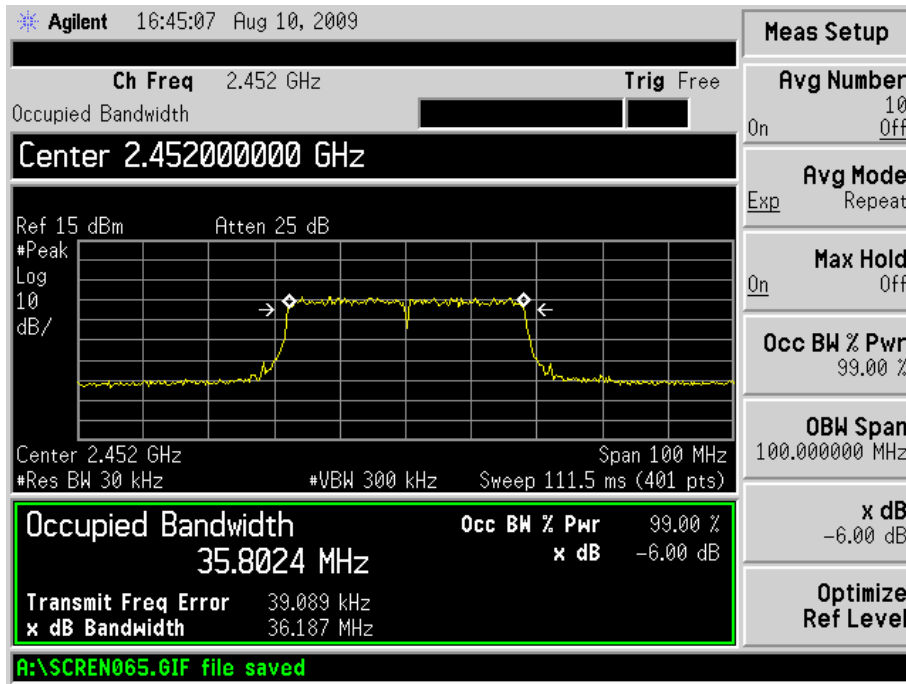
Low Channel:



Middle 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
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-07-08	2010-07-07
ETS	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	2009-07-08	2010-07-07

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:	26° C
Relative Humidity:	53%
ATM Pressure:	1012 mbar

8.5 Summary of Test Results/Plots

Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11b (Chain0)	2412	---	---	1
	2437	---	---	1
	2462	---	---	1
802.11b (Chain1)	2412	9.43	0.008770	1
	2437	10.93	0.012387	1
	2462	11.03	0.012677	1

“---“ means that this test mode is no test data in the corresponding operating conditions.

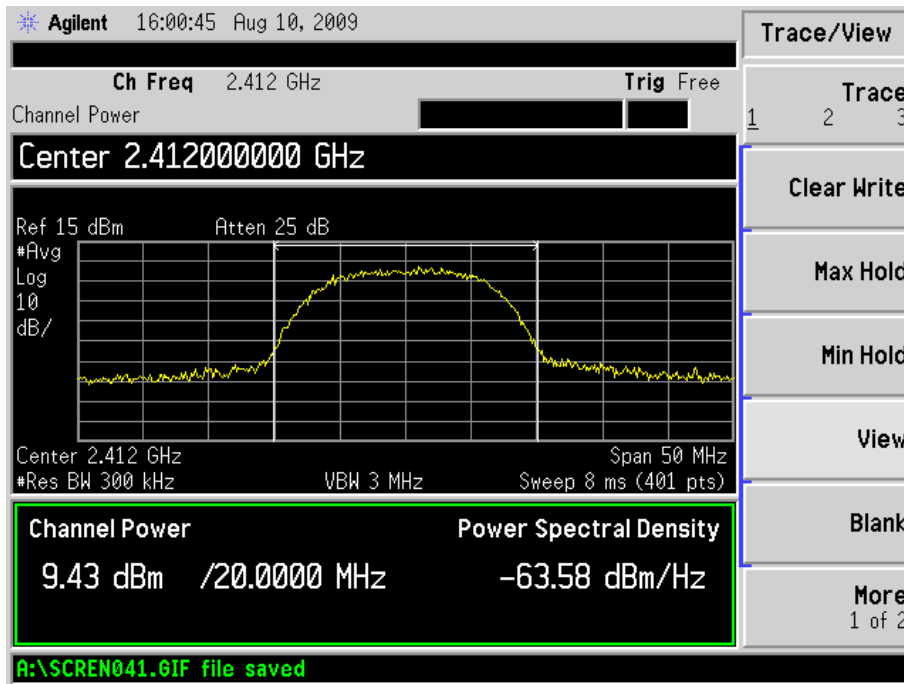
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11g (Chain0)	2412	9.12	0.008616	1
	2437	7.28	0.005346	1
	2462	6.15	0.004121	1
802.11g (Chain1)	2412	4.84	0.003048	1
	2437	7.33	0.005408	1
	2462	6.55	0.004519	1

Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11n HT-20 (Chain0)	2412	6.42	0.004385	1
	2437	6.17	0.004140	1
	2462	5.67	0.003690	1
802.11n HT-20 (Chain1)	2412	4.41	0.002761	1
	2437	6.17	0.004140	1
	2462	6.28	0.004246	1

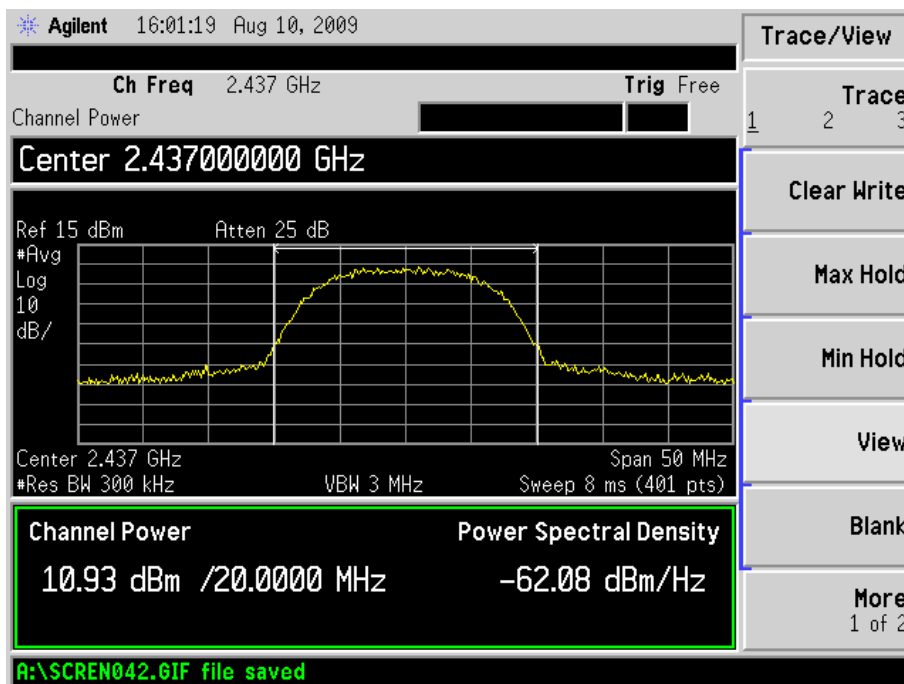
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11n HT-40 (Chain0)	2422	7.47	0.005585	1
	2437	6.62	0.004592	1
	2452	6.16	0.004130	1
802.11n HT-40 (Chain1)	2422	4.58	0.002871	1
	2437	5.93	0.003917	1
	2452	6.38	0.004345	1

For 802.11b (Chain1)

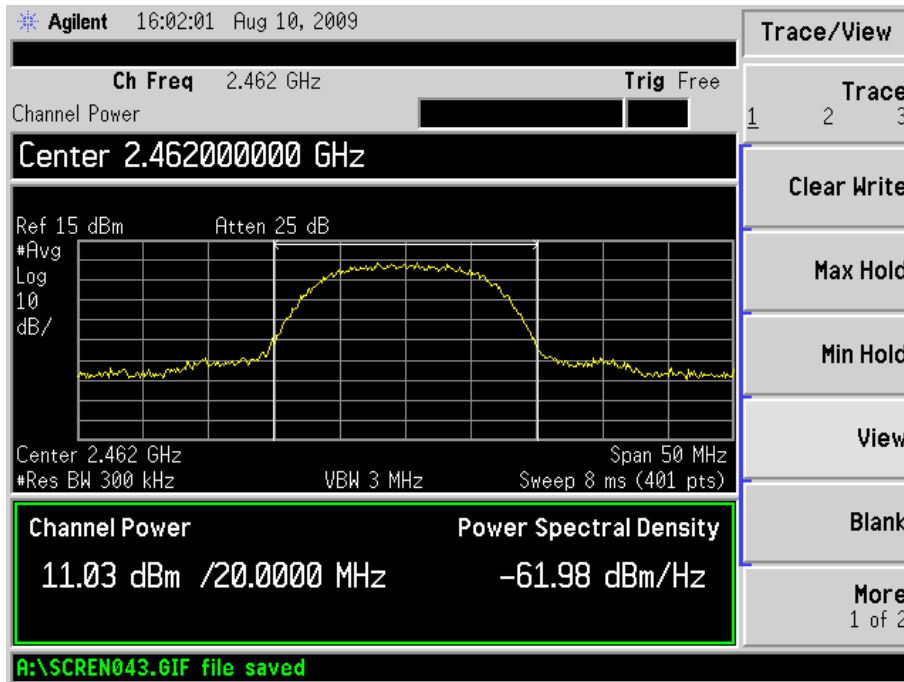
Low Channel:



Middle Channel:

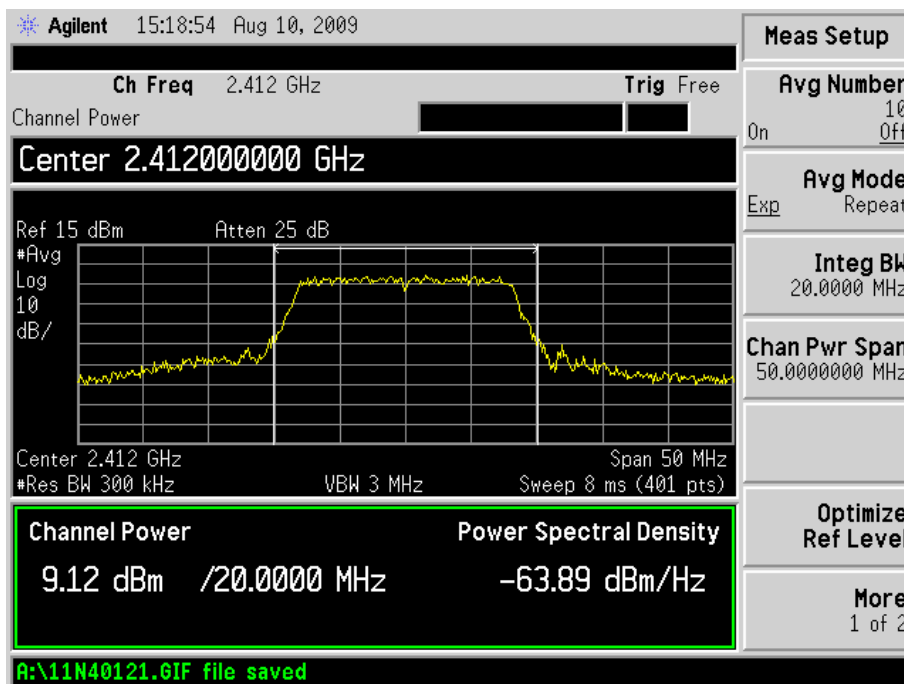


High Channel:

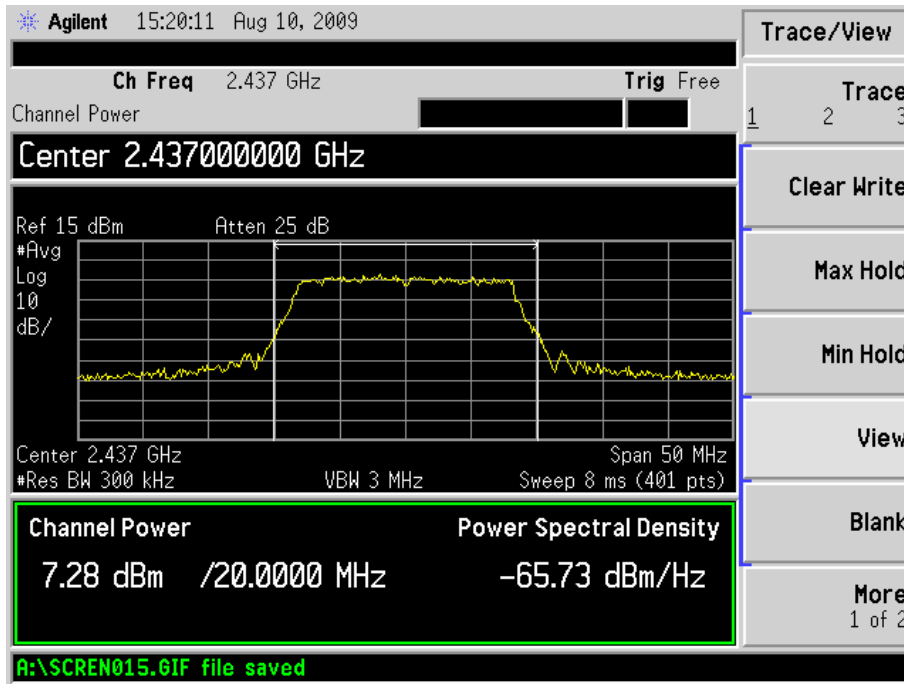


For 802.11g (Chain0)

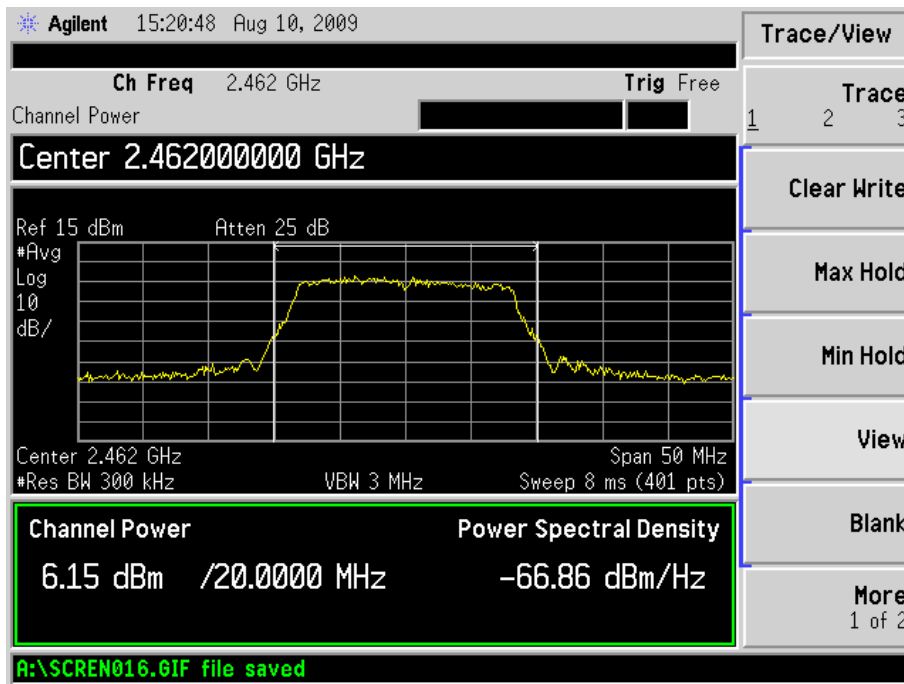
Low Channel:



Middle Channel:

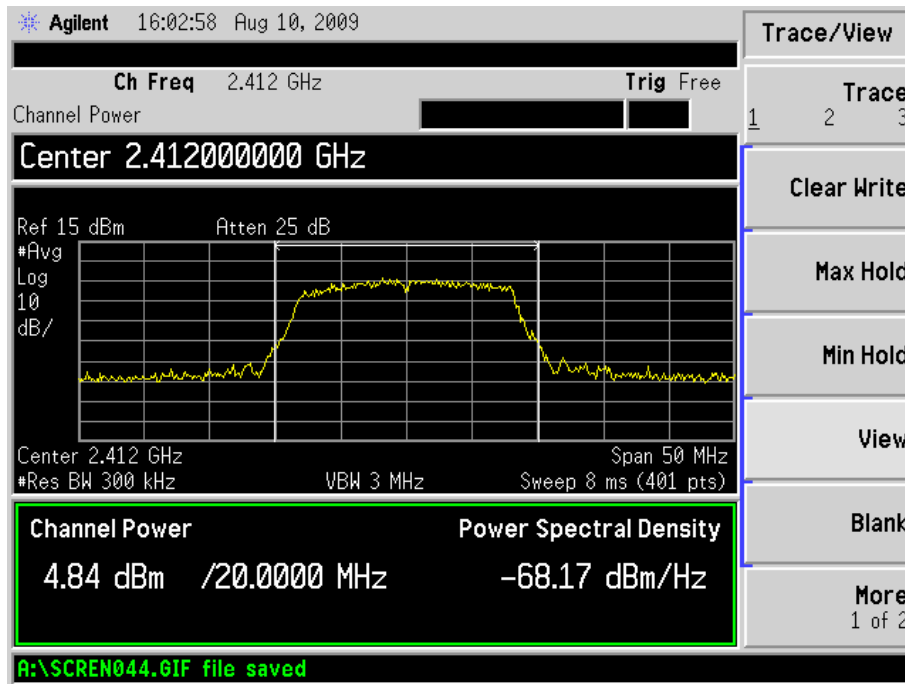


High Channel:

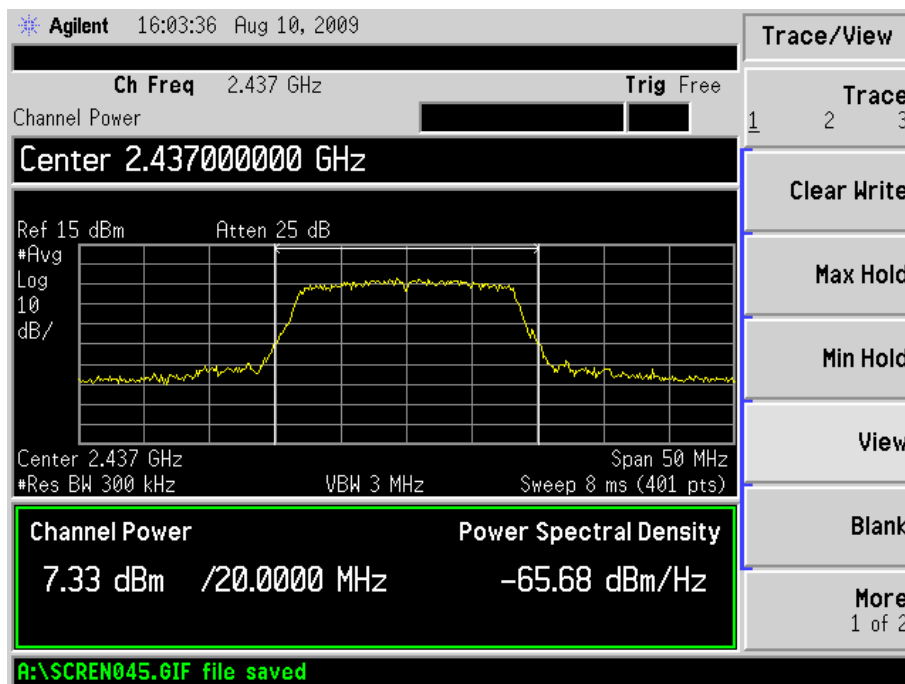


For 802.11g (Chain1)

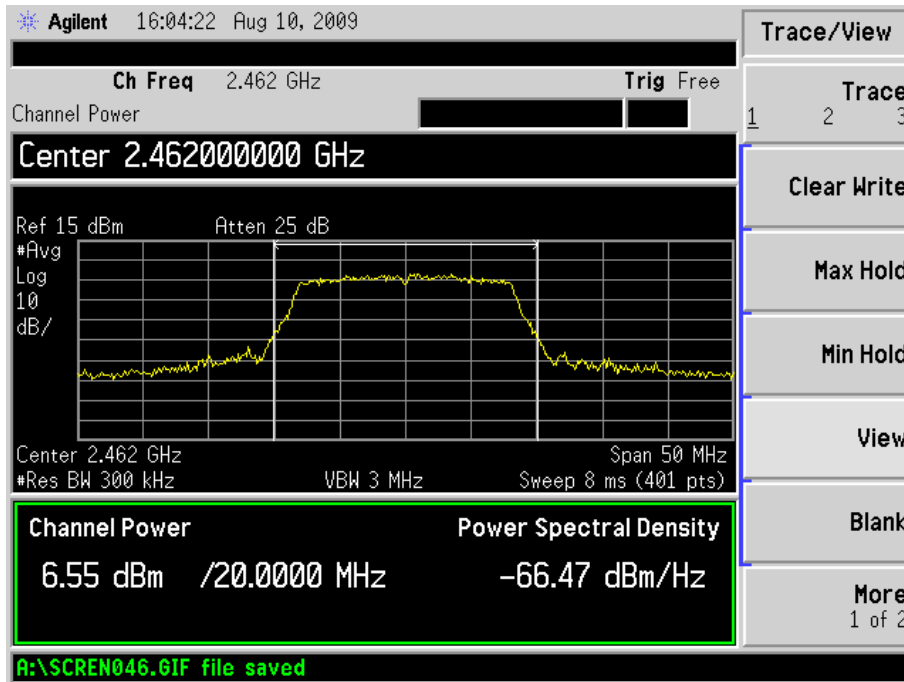
Low Channel:



Middle Channel:

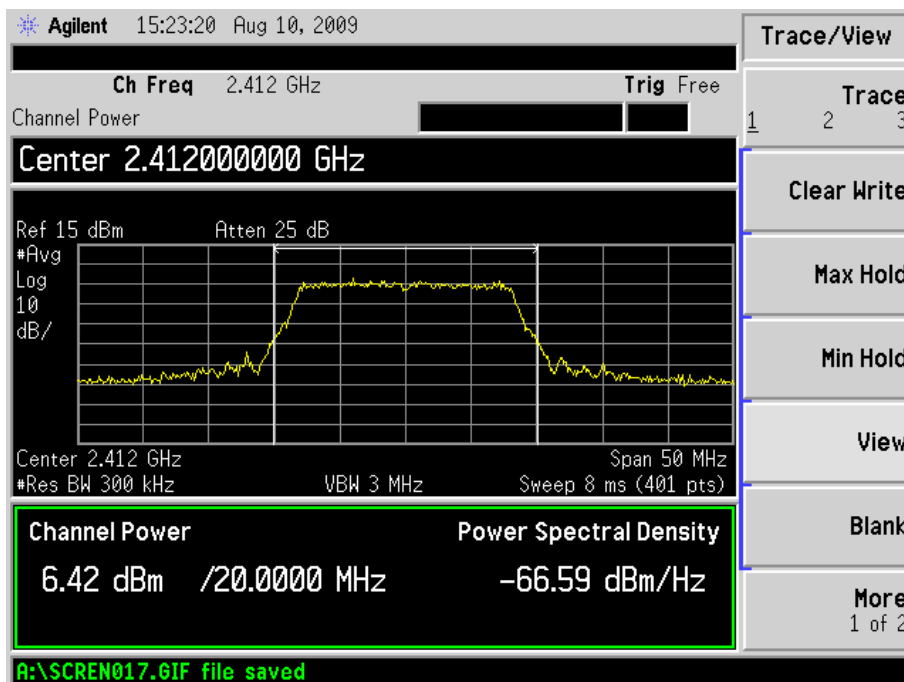


High Channel:

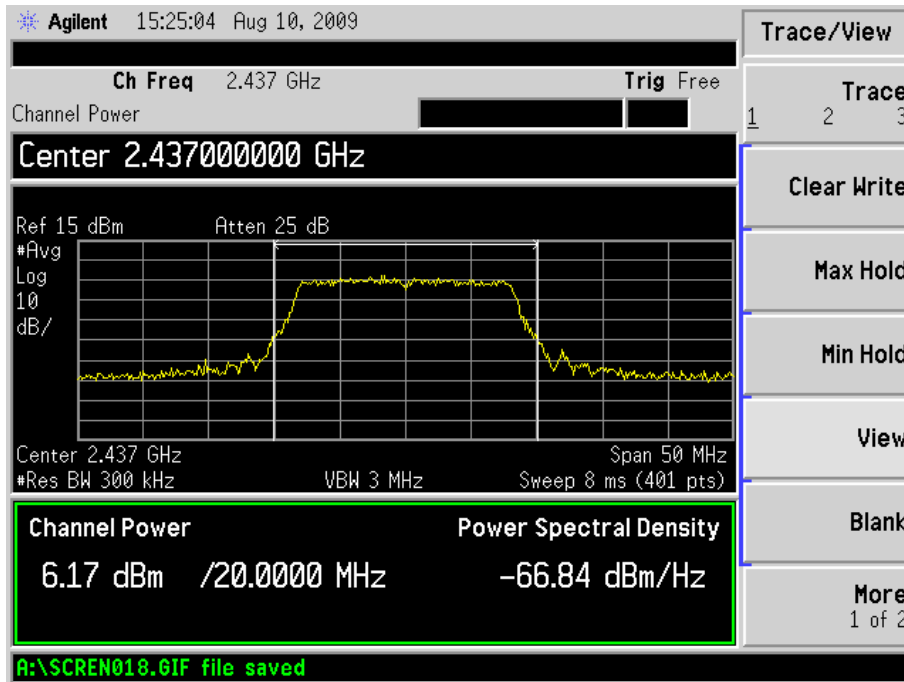


For 802.11n HT-20 (Chain0)

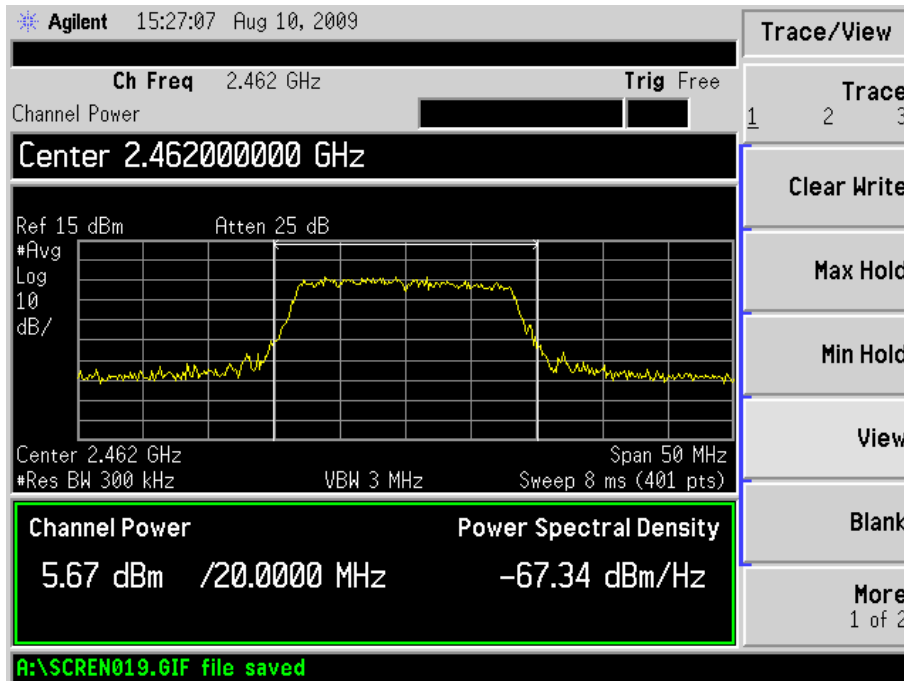
Low Channel:



Middle Channel:

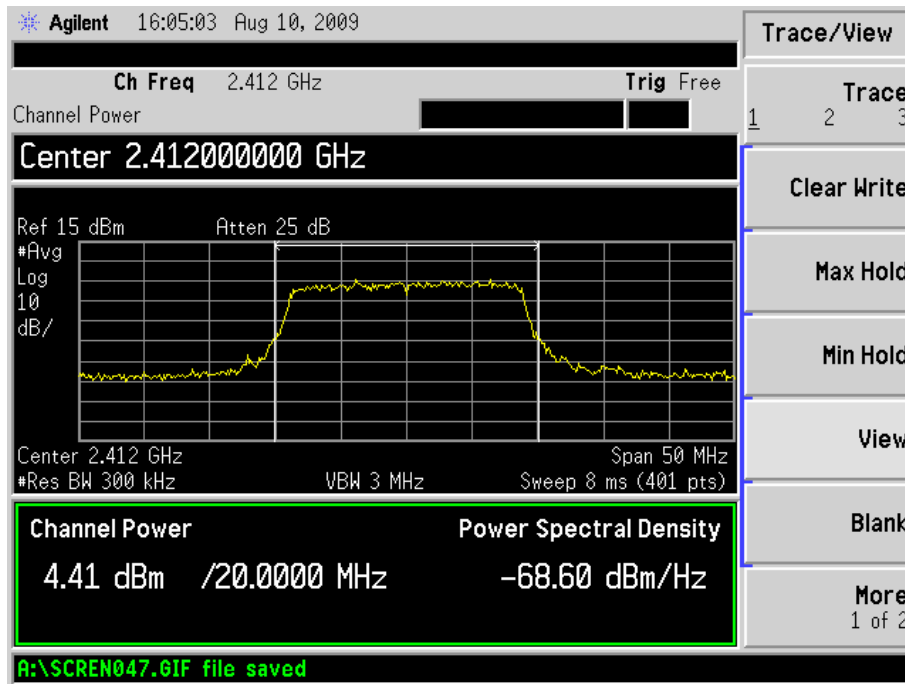


High Channel:

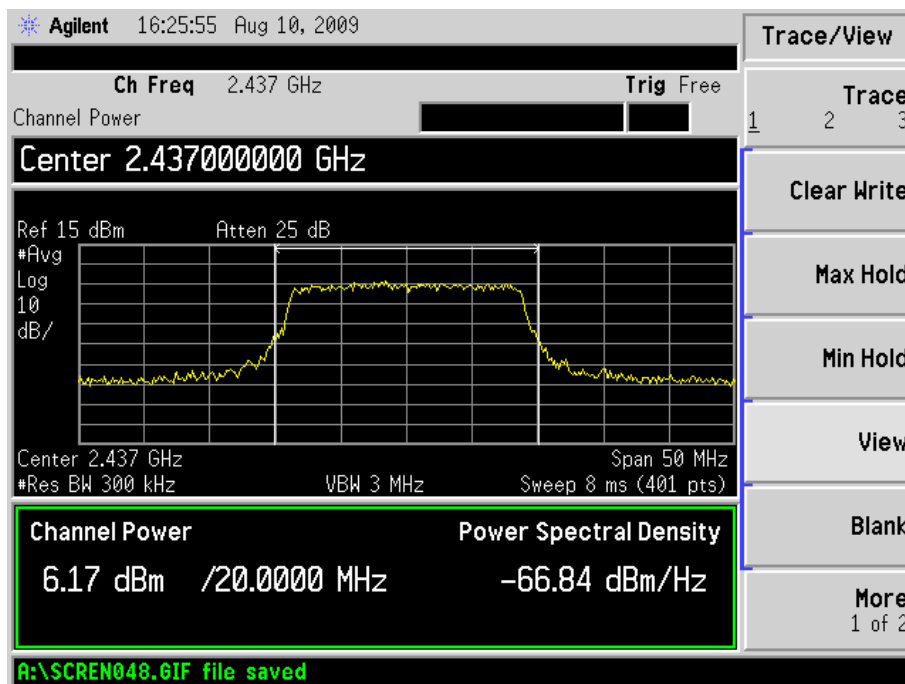


For 802.11n HT-20 (Chain1)

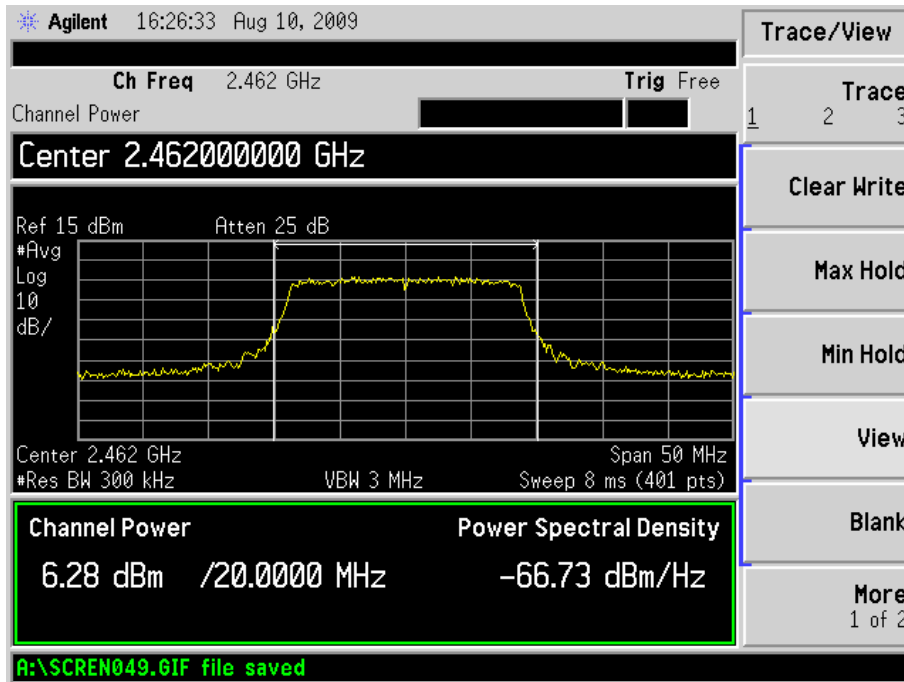
Low Channel:



Middle Channel:

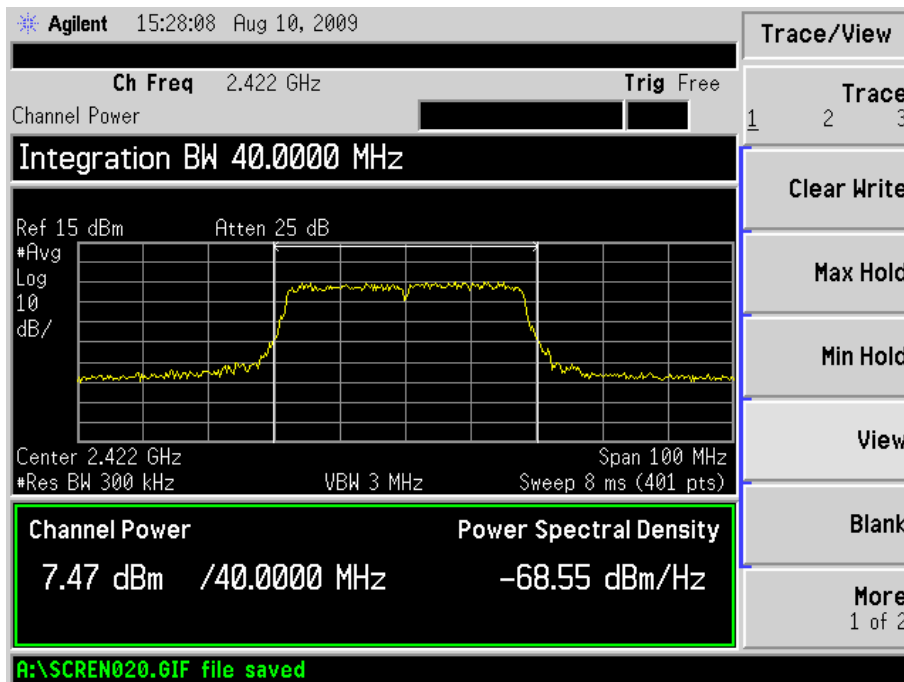


High Channel:

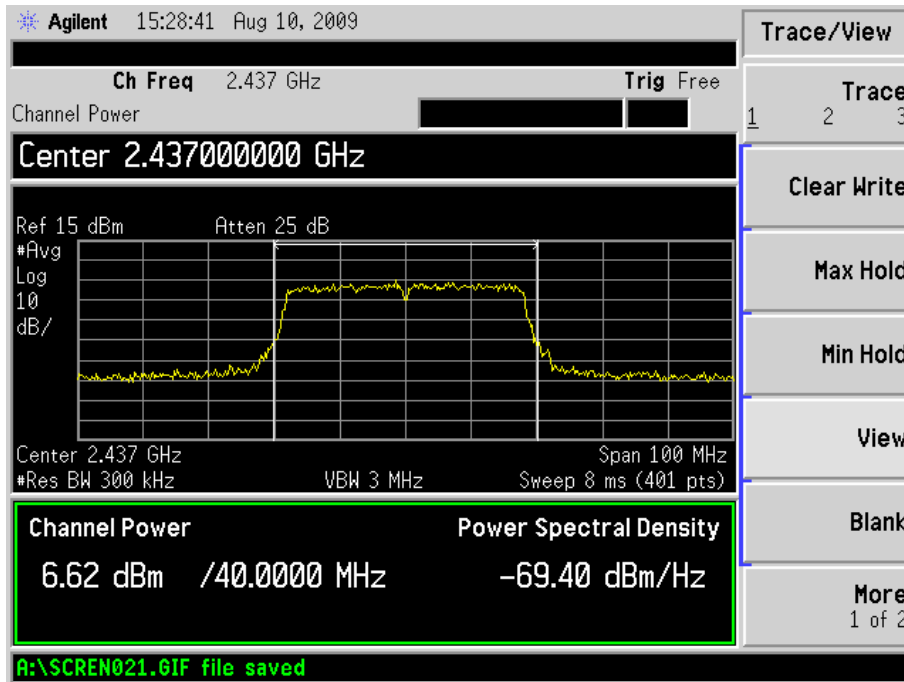


For 802.11n HT-40 (Chain0)

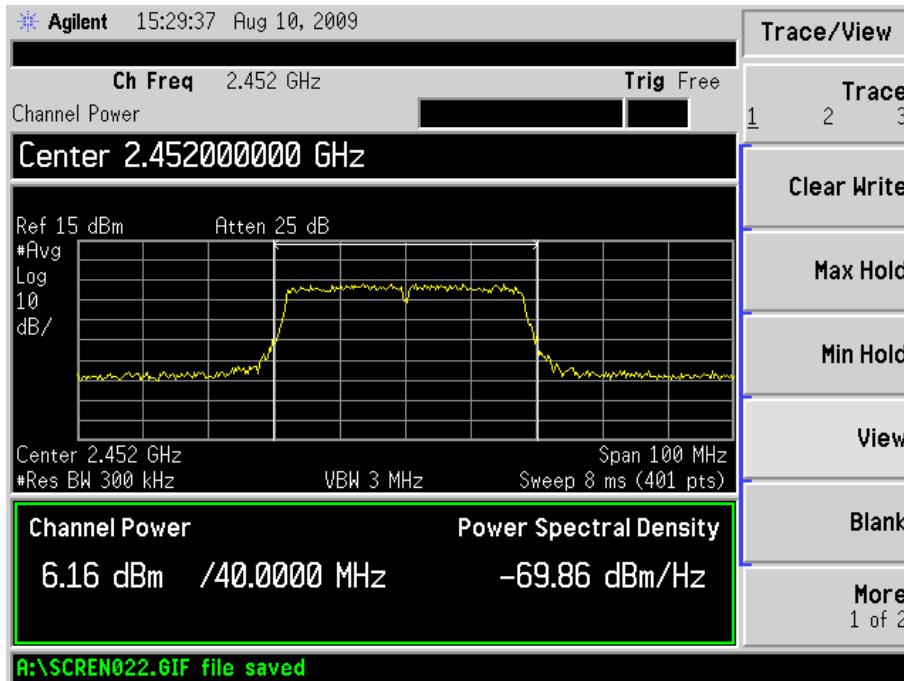
Low Channel:



Middle Channel:

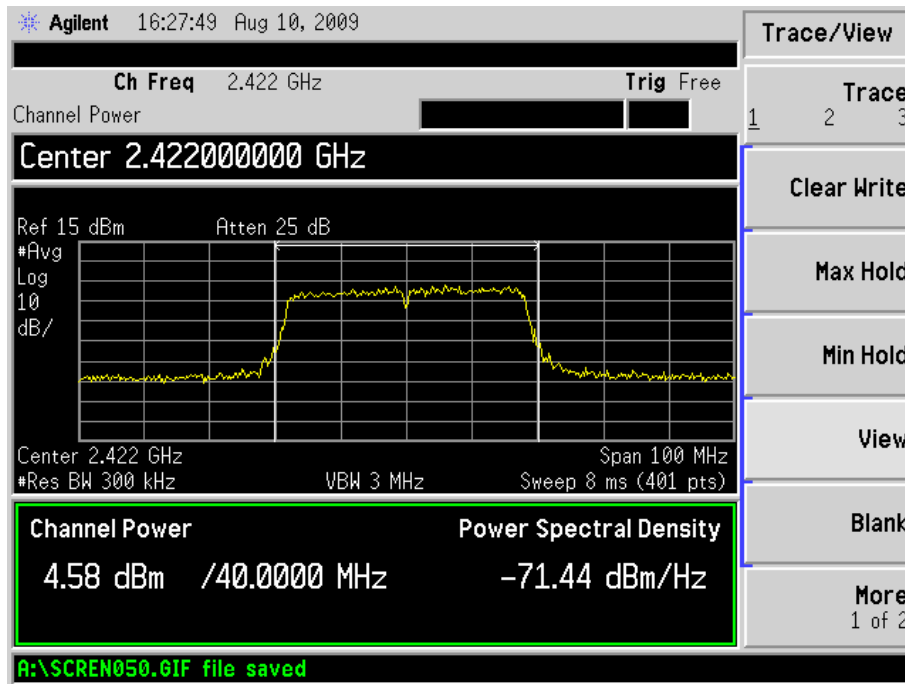


High Channel:

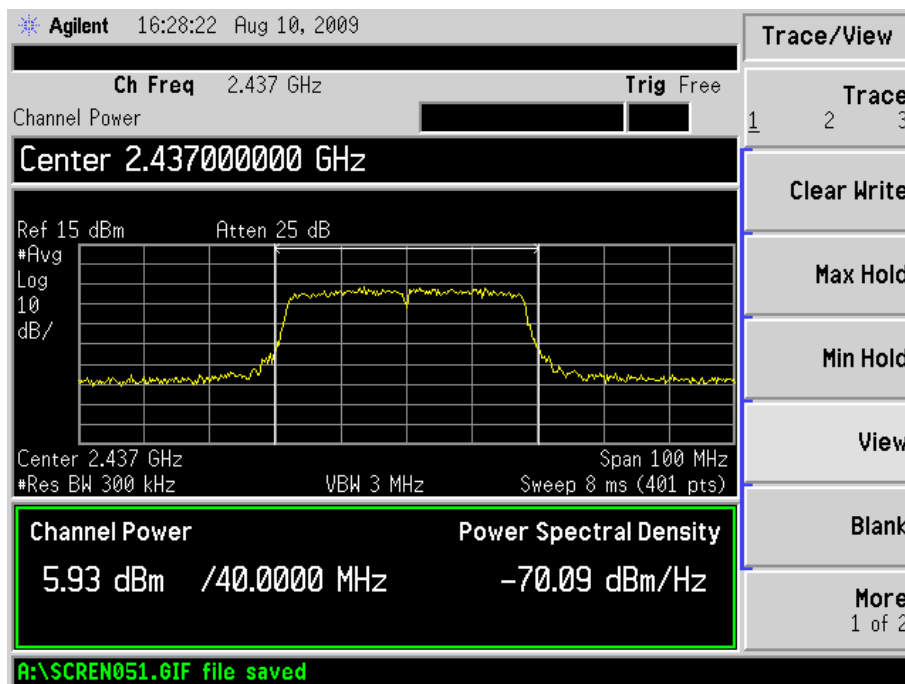


For 802.11n HT-40 (Chain1)

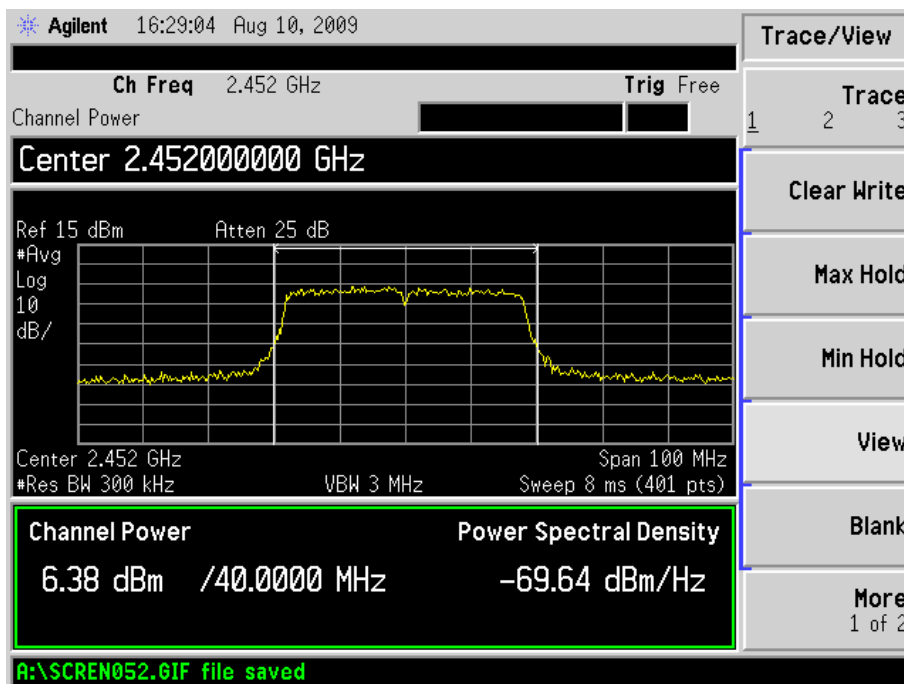
Low Channel:



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

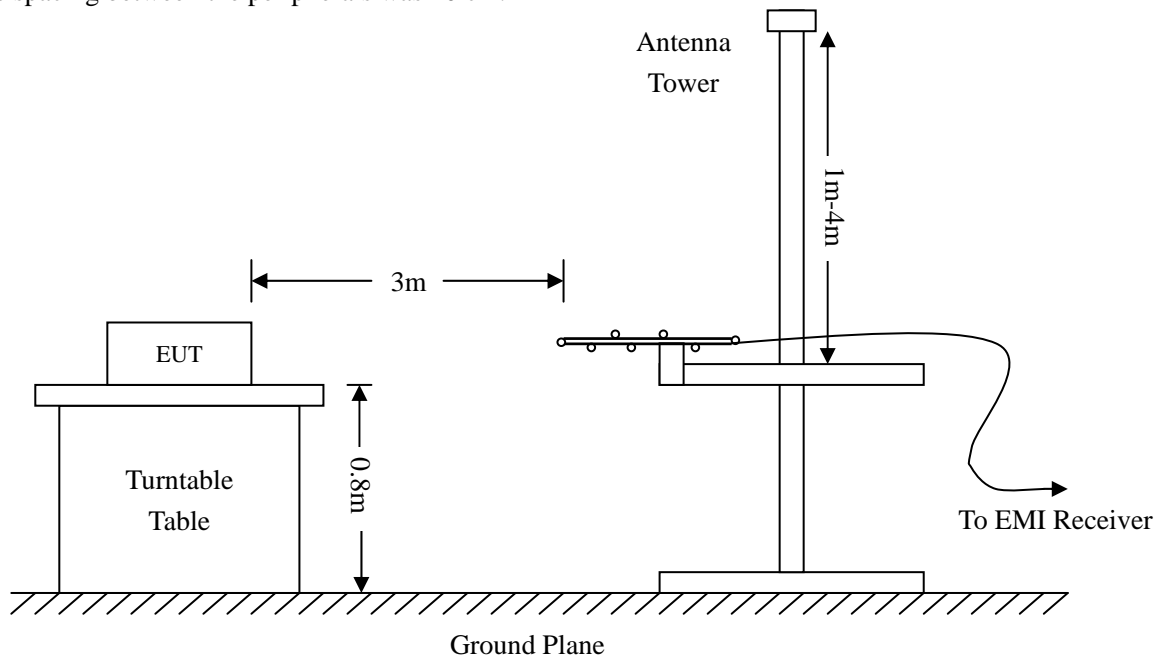
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-07-08	2010-07-07
Positioning Controller	C&C	CC-C-1F	N/A	2009-07-08	2010-07-07
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-08	2010-07-07
Horn Antenna	SCHWARZBECK	BBHX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

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

9.4 Test Procedure

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

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.



9.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

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

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:	26 °C
Relative Humidity:	52 %
ATM Pressure:	1015 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:

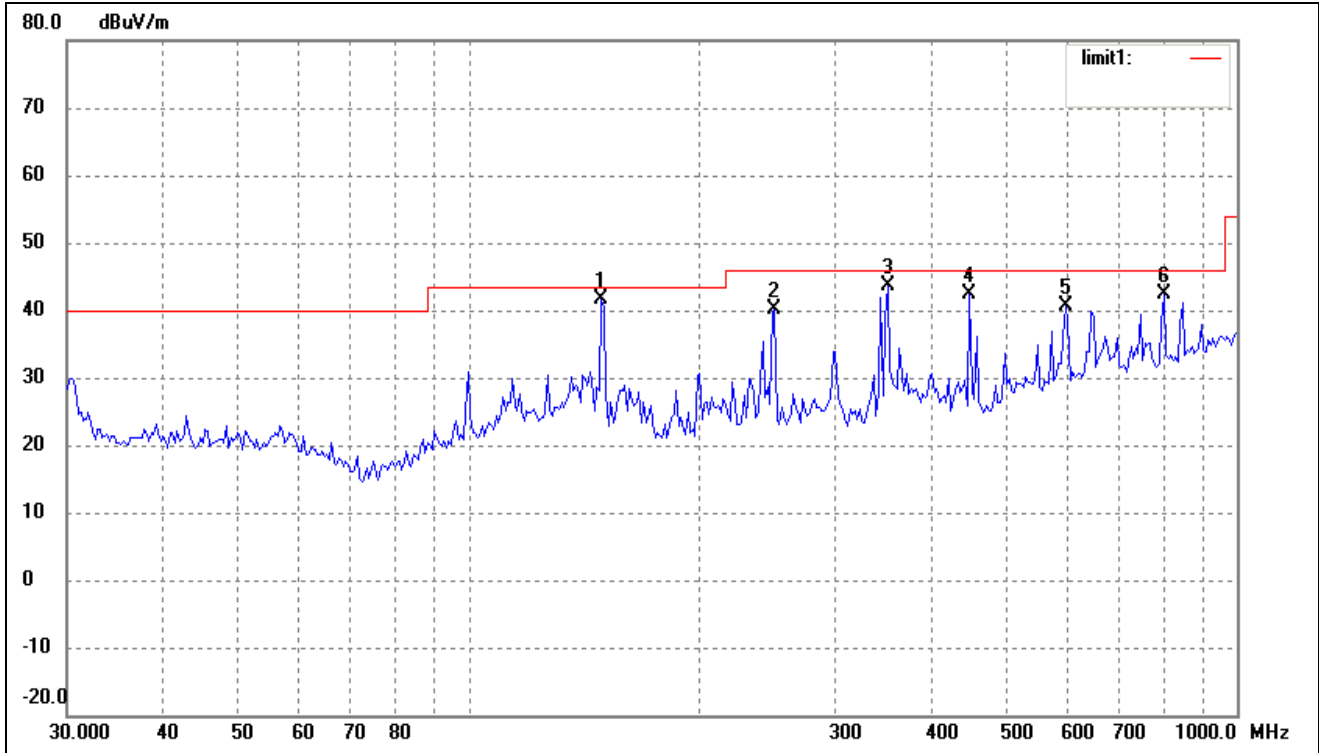
-1.58 dBμV at 250.4859 MHz in the Horizontal polarization, 802.11b Middle Channel Test Mode, 30 MHz to 25 GHz, 3Meters

Test Result/Plots:

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b Low Channel)

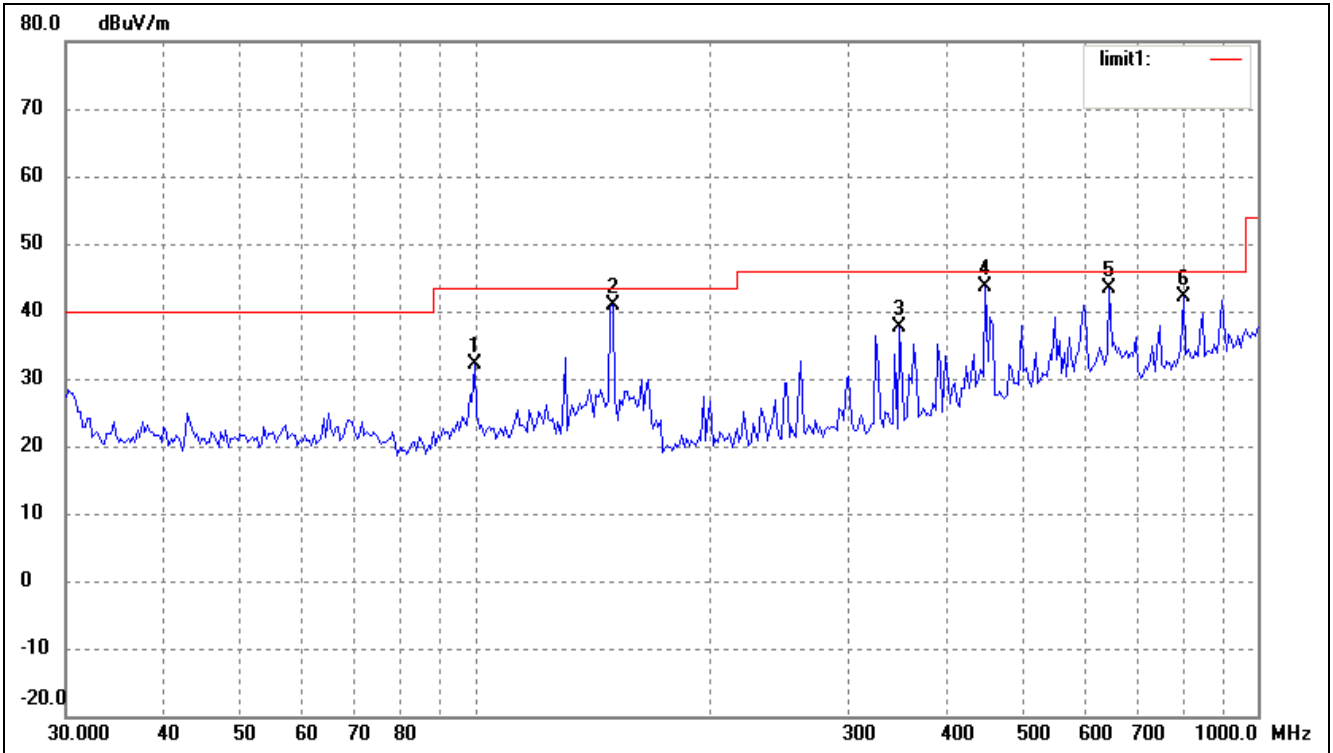
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	148.9175	38.43	3.30	41.73	43.50	-1.77	215	100	QP
2	250.4859	32.54	7.69	40.23	46.00	-5.77	331	150	QP
3	350.9722	34.18	9.46	43.64	46.00	-2.36	105	110	QP
4	448.8361	31.71	10.59	42.30	46.00	-3.70	66	100	QP
5	598.7067	25.64	14.99	40.63	46.00	-5.37	291	100	QP
6	804.2523	25.15	17.13	42.28	46.00	-3.72	105	100	QP

Test mode: Transmitting (802.11b Low Channel)

Vertical

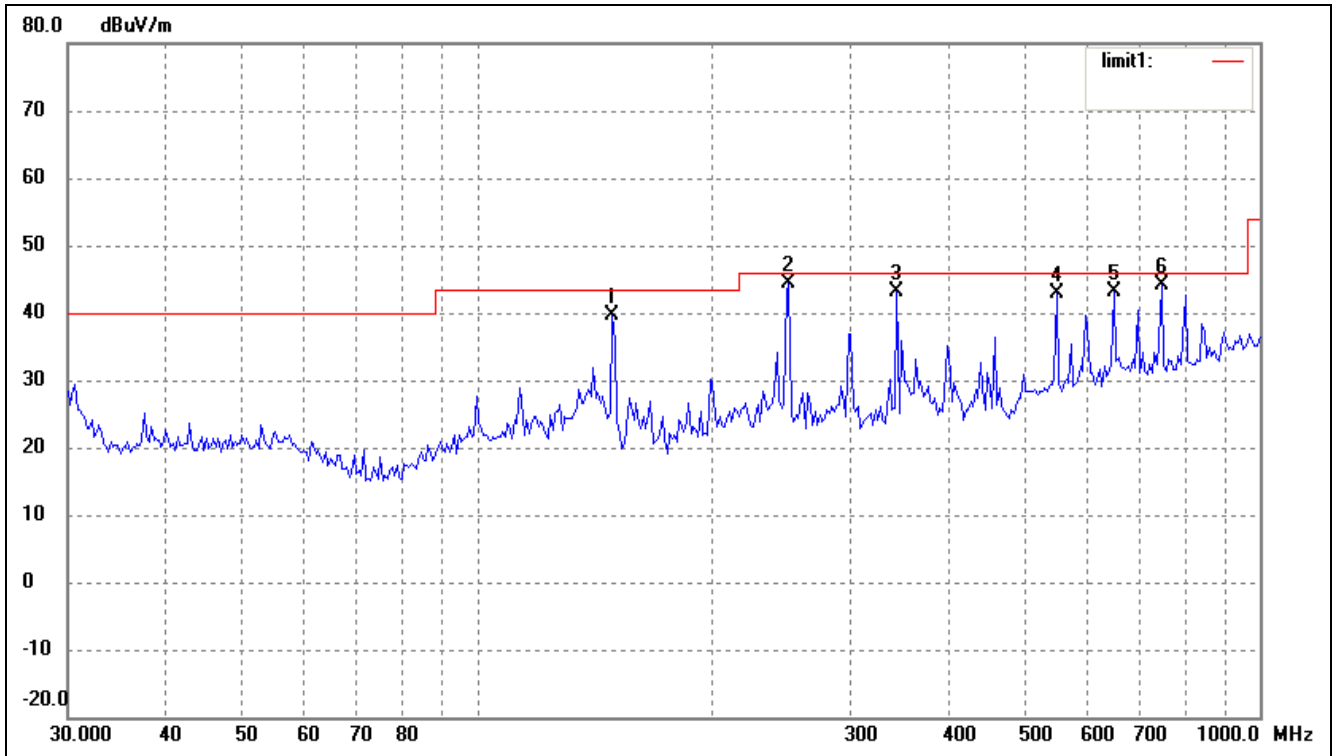


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	99.7676	24.25	7.79	32.04	43.50	-11.46	74	100	peak
2	149.9676	37.52	3.31	40.83	43.50	-2.67	152	100	QP
3	348.5145	28.13	9.41	37.54	46.00	-8.46	135	100	peak
4	448.8361	33.14	10.59	43.73	46.00	-2.27	49	120	QP
5	646.8217	28.08	15.34	43.42	46.00	-2.58	316	100	QP
6	804.2523	24.90	17.13	42.03	46.00	-3.97	55	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b Middle Channel)

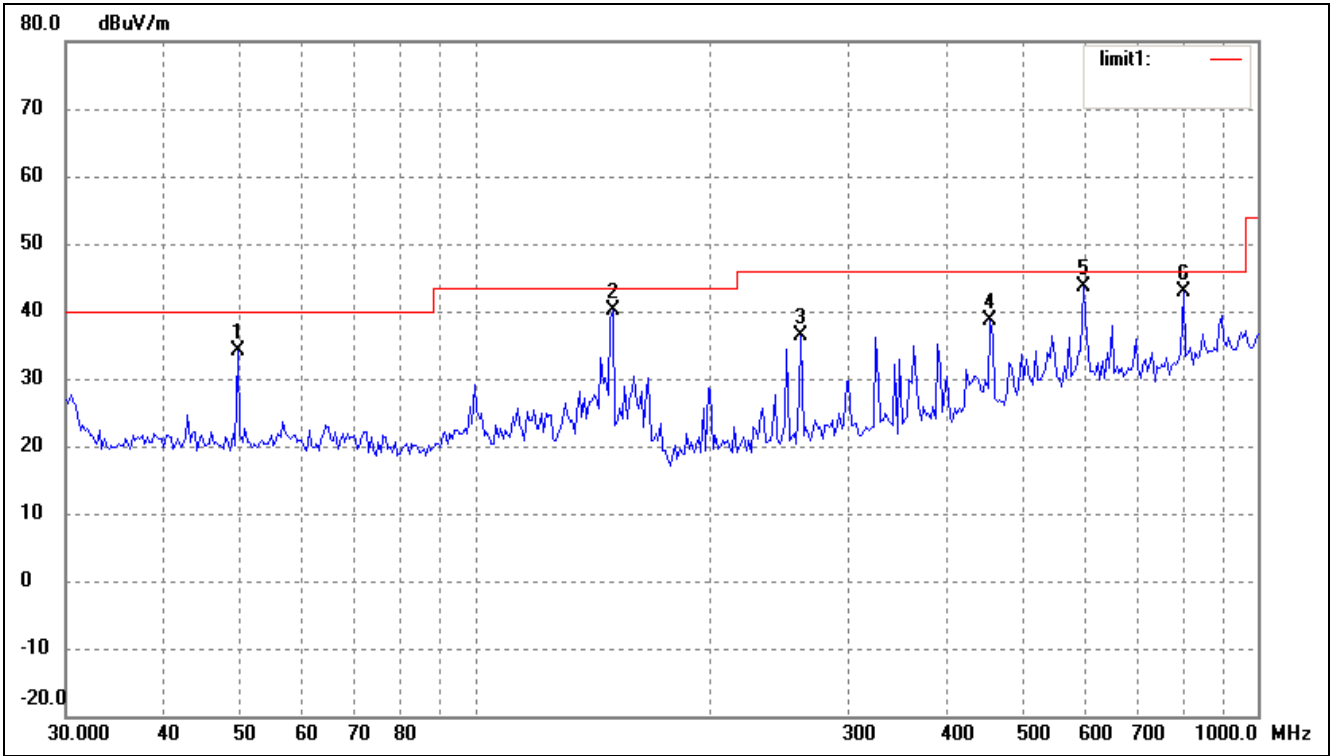
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	148.9175	36.29	3.30	39.59	43.50	-3.91	46	100	QP
2	250.4859	36.73	7.69	44.42	46.00	-1.58	162	100	QP
3	343.6506	33.89	9.31	43.20	46.00	-2.80	309	100	QP
4	550.2902	28.83	13.98	42.81	46.00	-3.19	258	100	QP
5	651.3831	27.71	15.37	43.08	46.00	-2.92	146	100	QP
6	749.6761	27.67	16.37	44.04	46.00	-1.96	207	100	QP

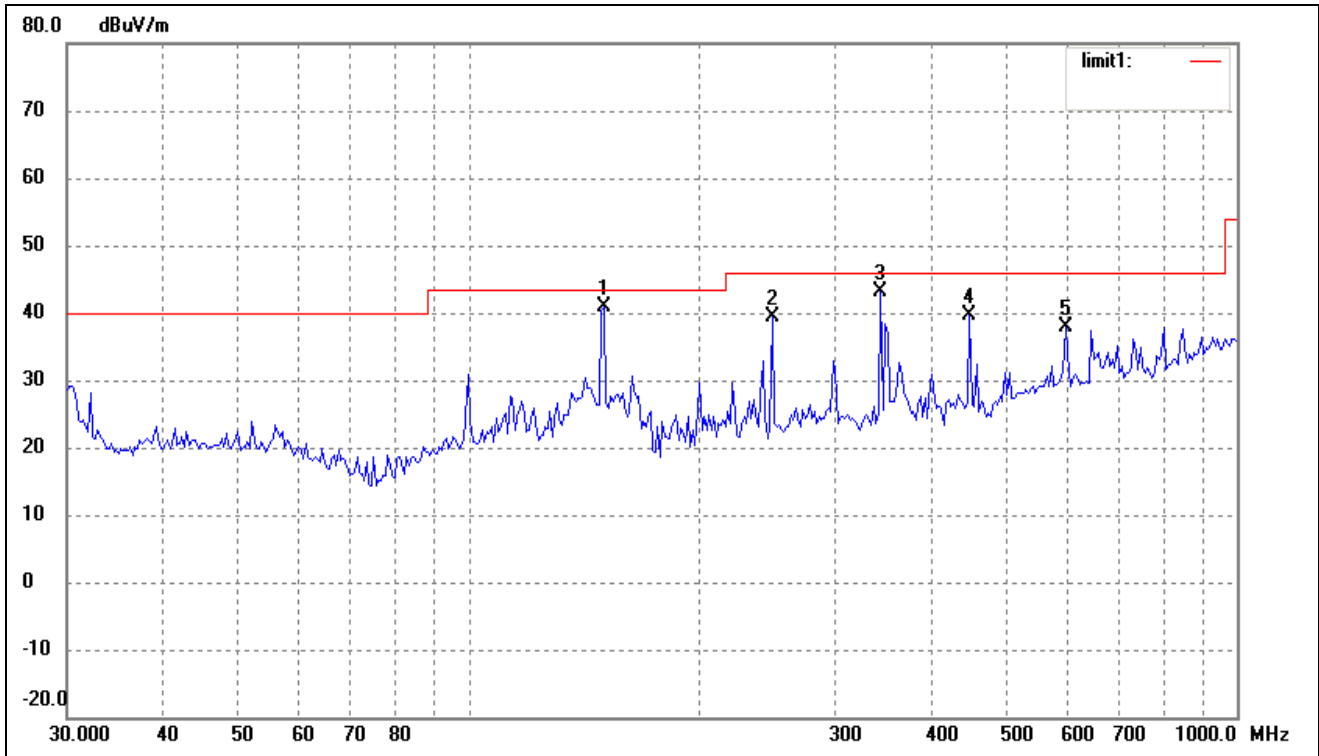
Test mode: Transmitting (802.11b Middle Channel)

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	26.40	7.70	34.10	40.00	-5.90	142	110	QP
2	149.9676	36.81	3.31	40.12	43.50	-3.38	66	100	QP
3	261.2730	28.54	7.95	36.49	46.00	-9.51	213	200	peak
4	455.1888	28.23	10.45	38.68	46.00	-7.32	56	100	peak
5	598.7067	28.58	14.99	43.57	46.00	-2.43	51	200	QP
6	804.2523	25.64	17.13	42.77	46.00	-3.23	51	100	QP

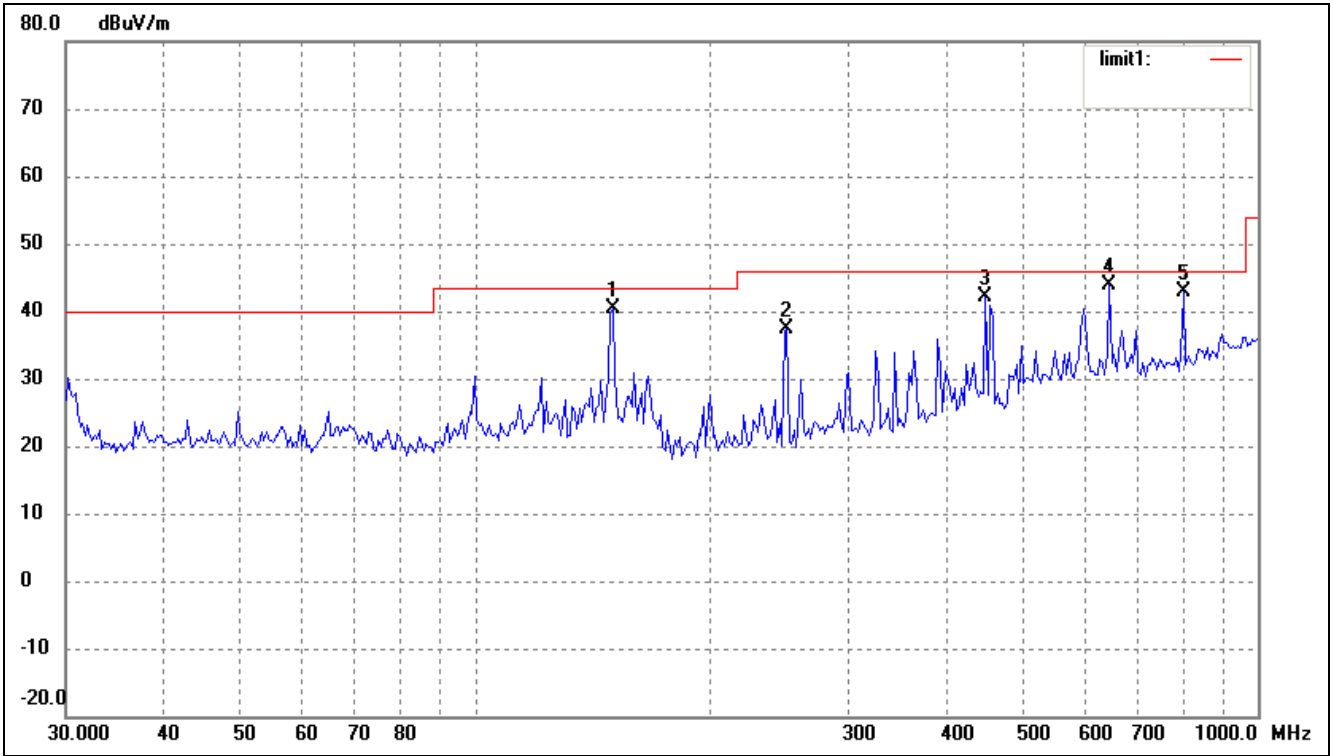
Spurious Emission From 30 MHz to 1 GHz
 Test mode: Transmitting (802.11b High Channel)
 Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	149.9676	37.49	3.31	40.80	43.50	-2.70	150	100	QP
2	248.7319	31.68	7.65	39.33	46.00	-6.67	225	100	peak
3	343.6506	33.93	9.31	43.24	46.00	-2.76	170	100	QP
4	448.8361	29.00	10.59	39.59	46.00	-6.41	31	200	peak
5	598.7067	22.99	14.99	37.98	46.00	-8.02	156	100	peak

Test mode: Transmitting (802.11b High Channel)

Vertical

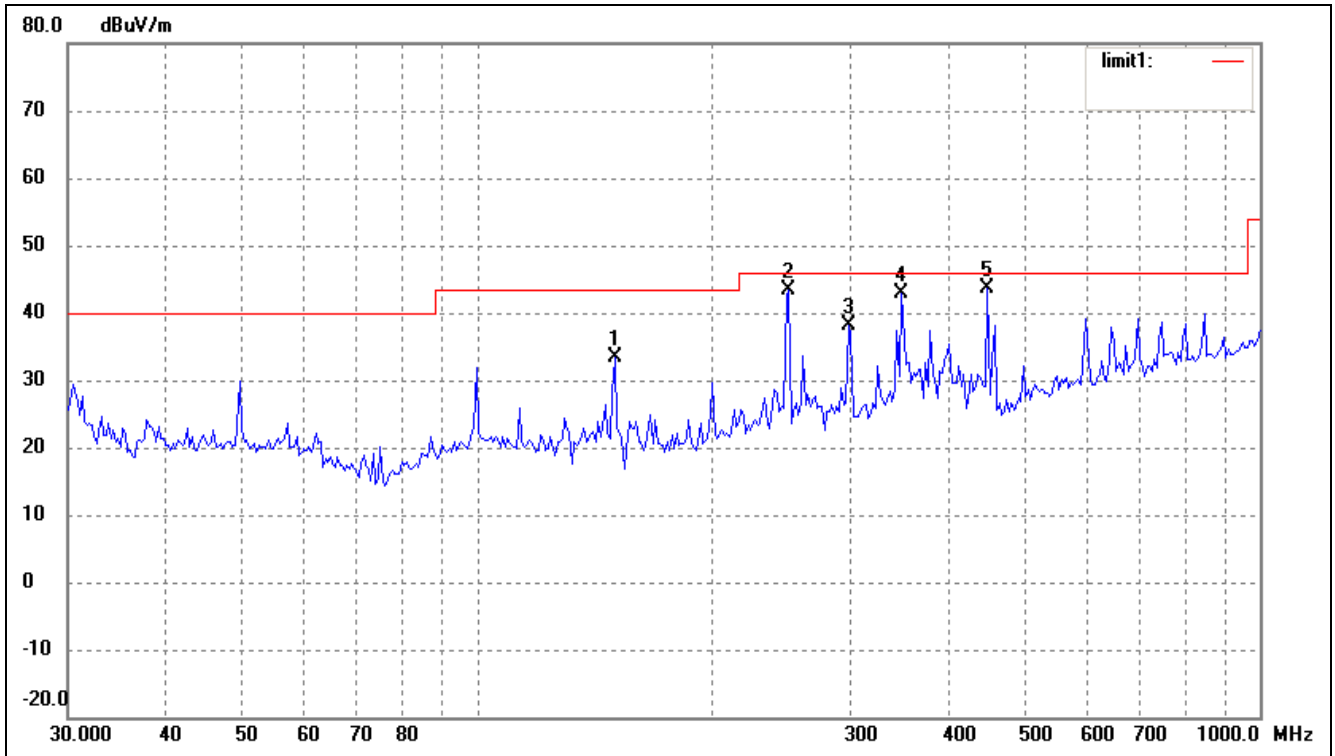


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	149.9676	37.06	3.31	40.37	43.50	-3.13	33	100	QP
2	250.4859	29.61	7.69	37.30	46.00	-8.70	125	100	peak
3	448.8361	31.52	10.59	42.11	46.00	-3.89	130	100	QP
4	646.8217	28.51	15.34	43.85	46.00	-2.15	100	120	QP
5	804.2523	25.69	17.13	42.82	46.00	-3.18	49	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g Low Channel)

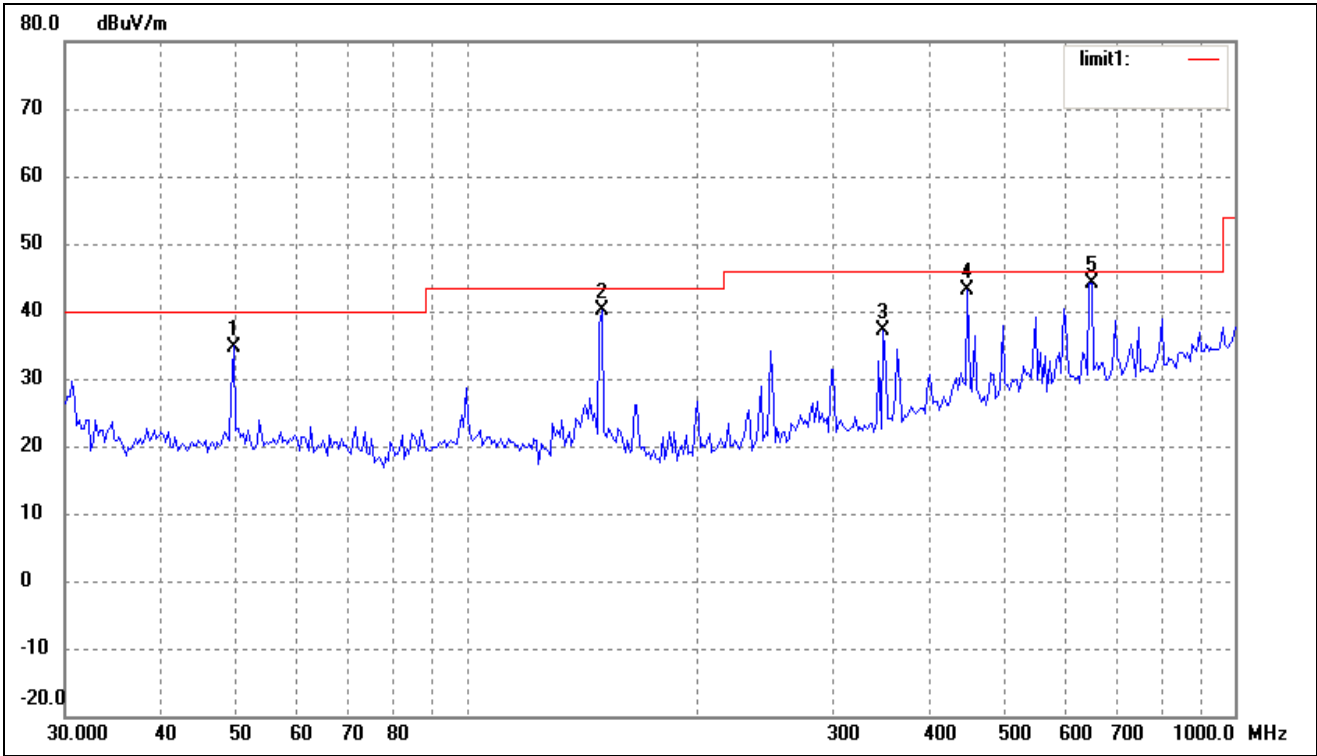
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	149.9676	29.98	3.31	33.29	43.50	-10.21	78	100	peak
2	250.4859	35.74	7.69	43.43	46.00	-2.57	66	100	QP
3	298.5932	29.54	8.63	38.17	46.00	-7.83	301	100	peak
4	348.5145	33.55	9.41	42.96	46.00	-3.04	24	100	QP
5	448.8361	32.96	10.59	43.55	46.00	-2.45	77	100	QP

Test mode: Transmitting (802.11g Low Channel)

Vertical:

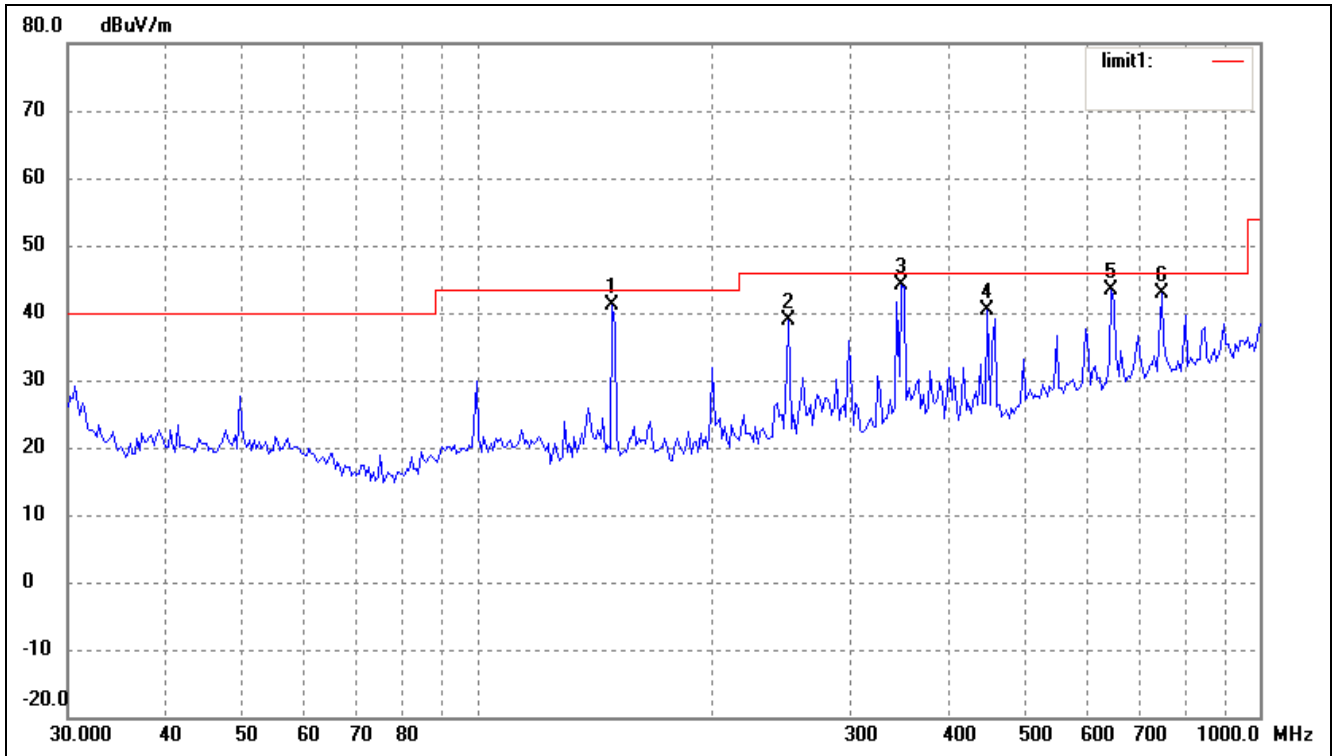


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	27.05	7.70	34.75	40.00	-5.25	12	100	QP
2	149.9676	36.91	3.31	40.22	43.50	-3.28	76	100	QP
3	348.5145	27.60	9.41	37.01	46.00	-8.99	62	100	peak
4	448.8361	32.49	10.59	43.08	46.00	-2.92	156	100	QP
5	651.3831	28.73	15.37	44.10	46.00	-1.90	99	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g Middle Channel)

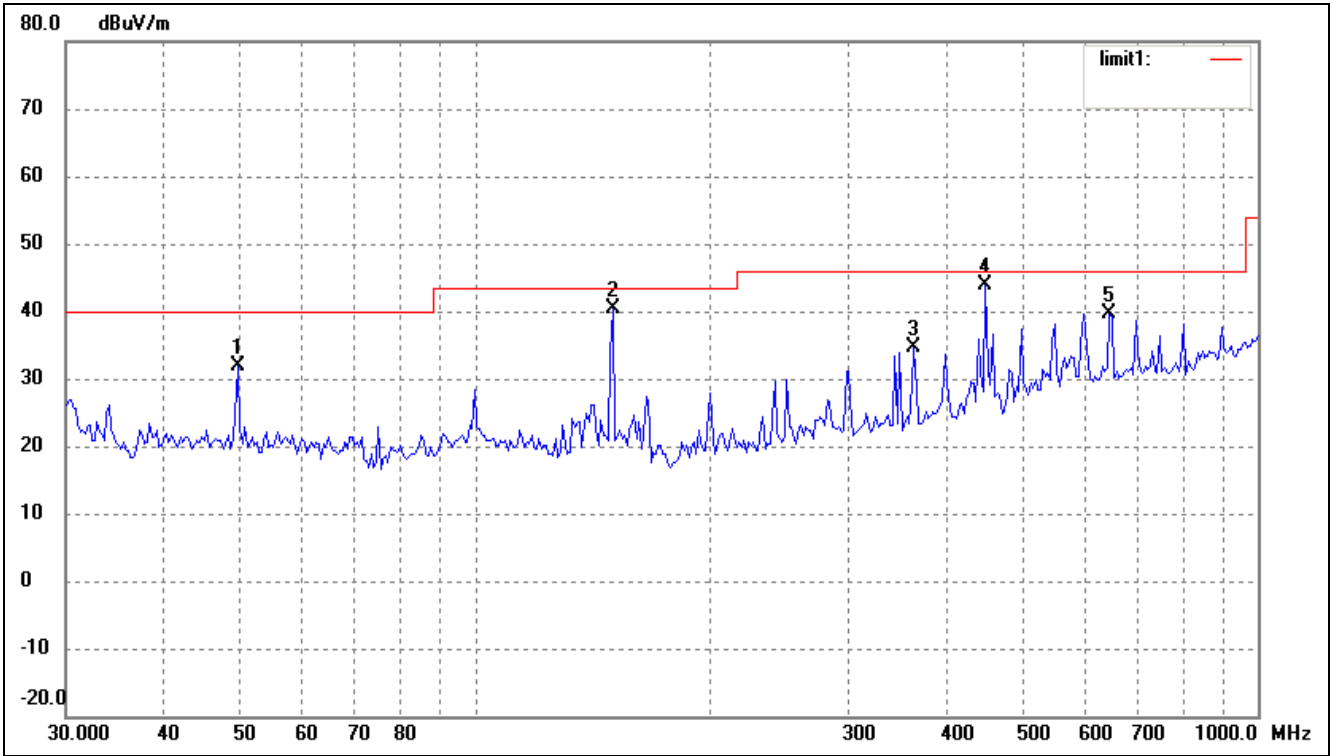
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	148.9175	37.83	3.30	41.13	43.50	-2.37	152	100	QP
2	250.4859	31.09	7.69	38.78	46.00	-7.22	31	100	peak
3	348.5145	34.66	9.41	44.07	46.00	-1.93	11	100	QP
4	448.8361	29.84	10.59	40.43	46.00	-5.57	267	100	QP
5	646.8217	27.93	15.34	43.27	46.00	-2.73	56	100	QP
6	749.6761	26.44	16.37	42.81	46.00	-3.19	150	100	QP

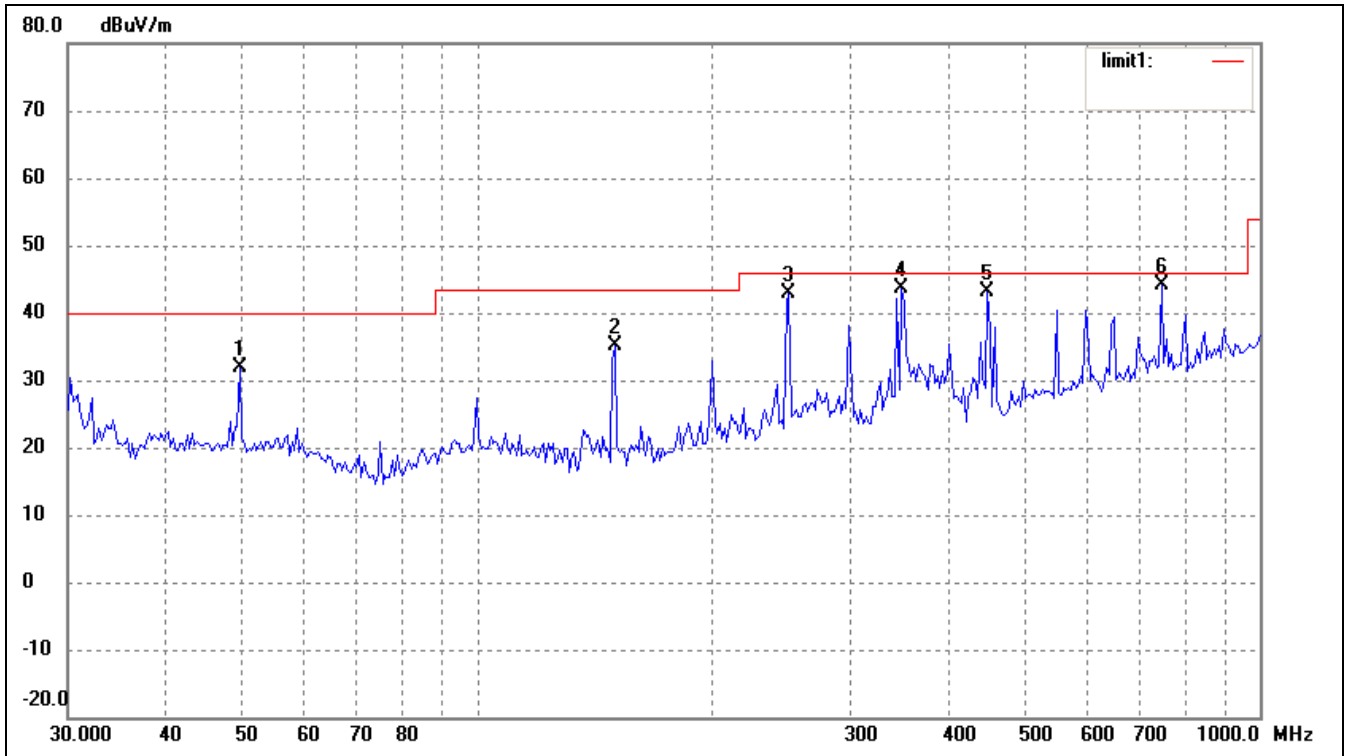
Test mode: Transmitting (802.11g Middle Channel)

Vertical:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	24.21	7.70	31.91	40.00	-8.09	101	100	peak
2	149.9676	37.11	3.31	40.42	43.50	-3.08	45	100	QP
3	363.5231	24.96	9.70	34.66	46.00	-11.34	326	100	peak
4	448.8361	33.38	10.59	43.97	46.00	-2.03	159	100	QP
5	646.8217	24.36	15.34	39.70	46.00	-6.30	78	100	peak

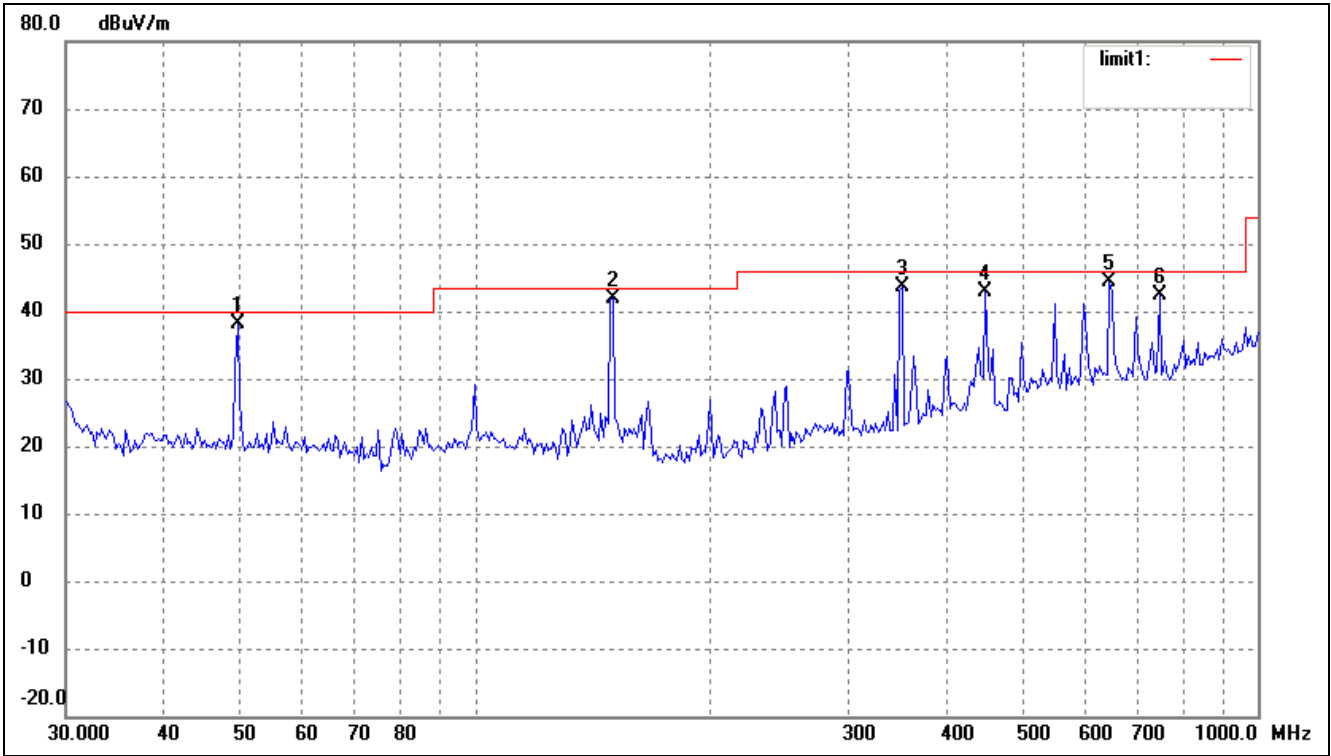
Spurious Emission From 30 MHz to 1 GHz
 Test mode: Transmitting (802.11g High Channel)
 Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	24.10	7.70	31.80	40.00	-8.20	120	200	peak
2	149.9676	31.89	3.31	35.20	43.50	-8.30	145	100	peak
3	250.4859	35.14	7.69	42.83	46.00	-3.17	87	100	QP
4	348.5145	34.14	9.41	43.55	46.00	-2.45	63	100	QP
5	448.8361	32.47	10.59	43.06	46.00	-2.94	20	100	QP
6	749.6761	27.81	16.37	44.18	46.00	-1.82	136	100	QP

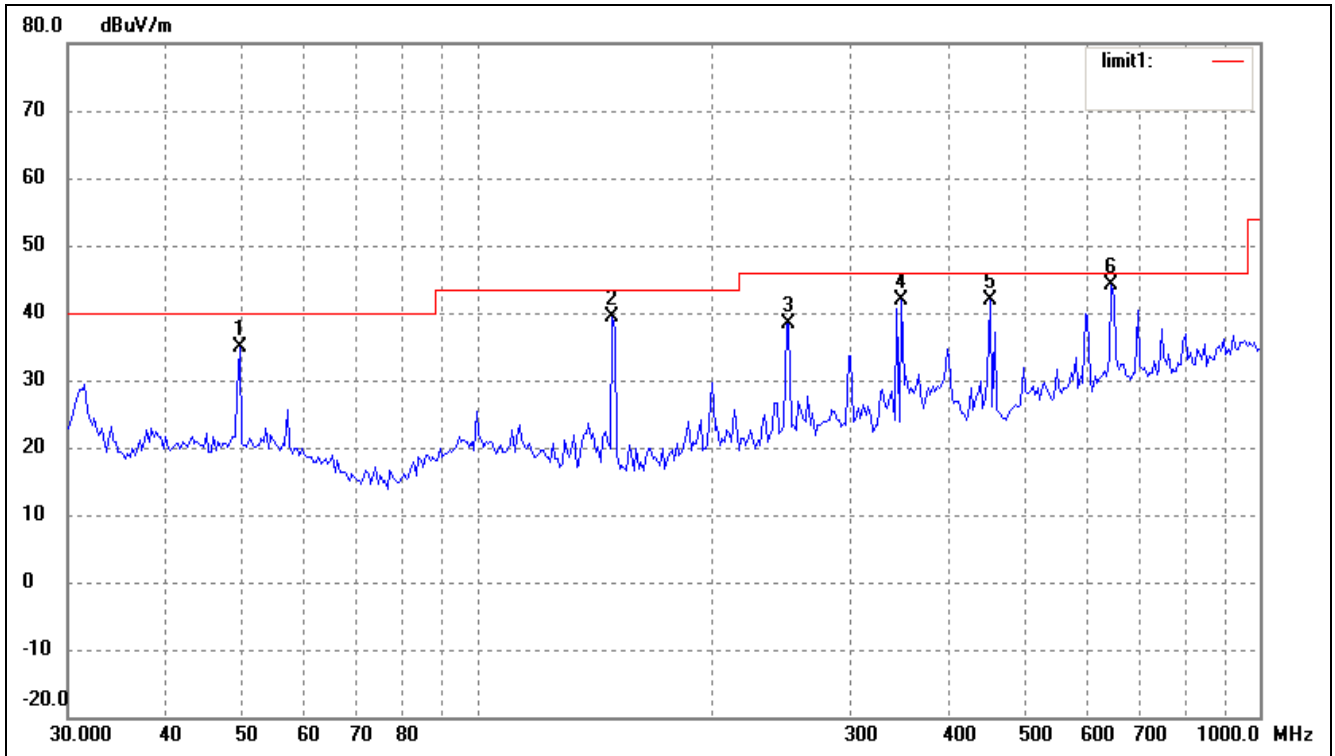
Test mode: Transmitting (802.11g High Channel)

Vertical:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	30.35	7.70	38.05	40.00	-1.95	36	110	QP
2	149.9676	38.55	3.31	41.86	43.50	-1.64	49	100	QP
3	350.9722	34.11	9.46	43.57	46.00	-2.43	51	100	QP
4	448.8361	32.32	10.59	42.91	46.00	-3.09	125	200	QP
5	646.8217	29.02	15.34	44.36	46.00	-1.64	359	100	QP
6	749.6761	26.12	16.37	42.49	46.00	-3.51	87	100	QP

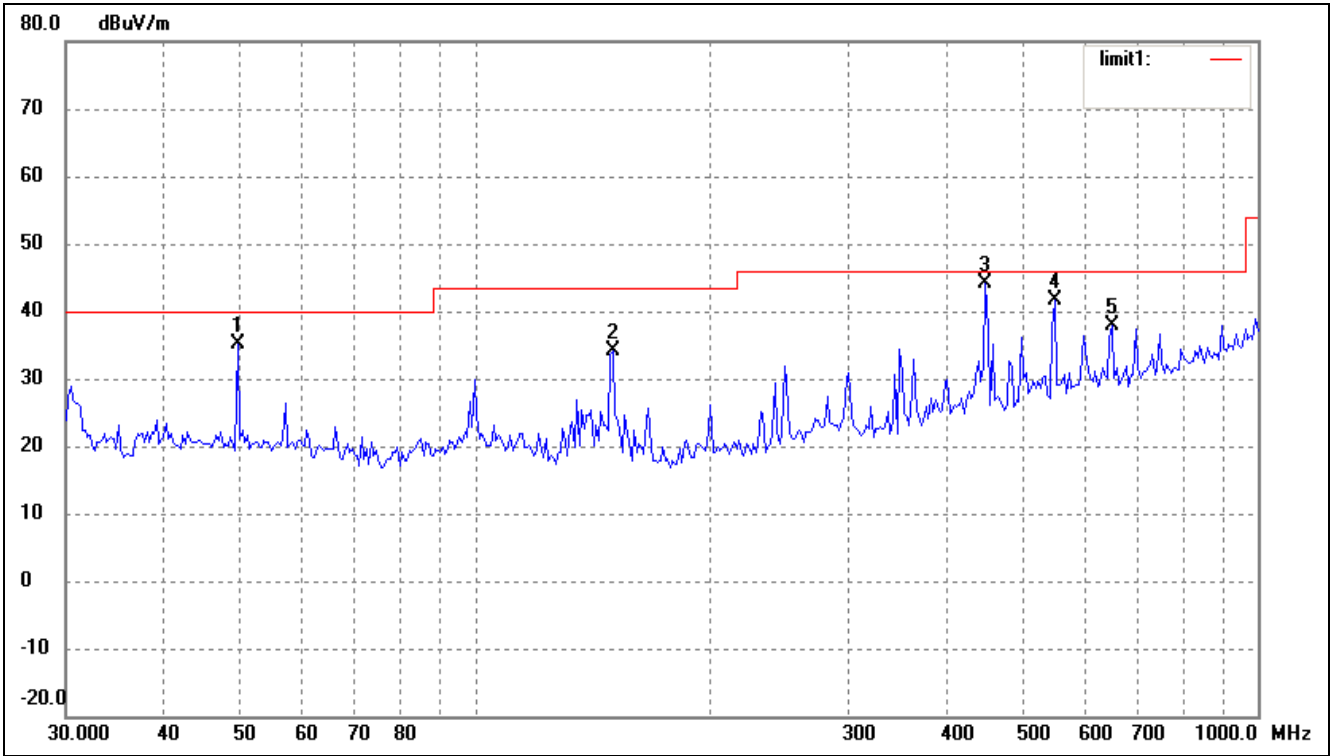
Spurious Emission From 30 MHz to 1 GHz
 Test mode: Transmitting (802.11n-HT20 Low Channel)
 Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	27.17	7.70	34.87	40.00	-5.13	67	200	QP
2	148.9175	36.06	3.30	39.36	43.50	-4.14	41	100	QP
3	250.4859	30.71	7.69	38.40	46.00	-7.60	104	100	peak
4	348.5145	32.45	9.41	41.86	46.00	-4.14	158	100	QP
5	452.0013	31.34	10.52	41.86	46.00	-4.14	68	100	QP
6	646.8217	28.82	15.34	44.16	46.00	-1.84	115	100	QP

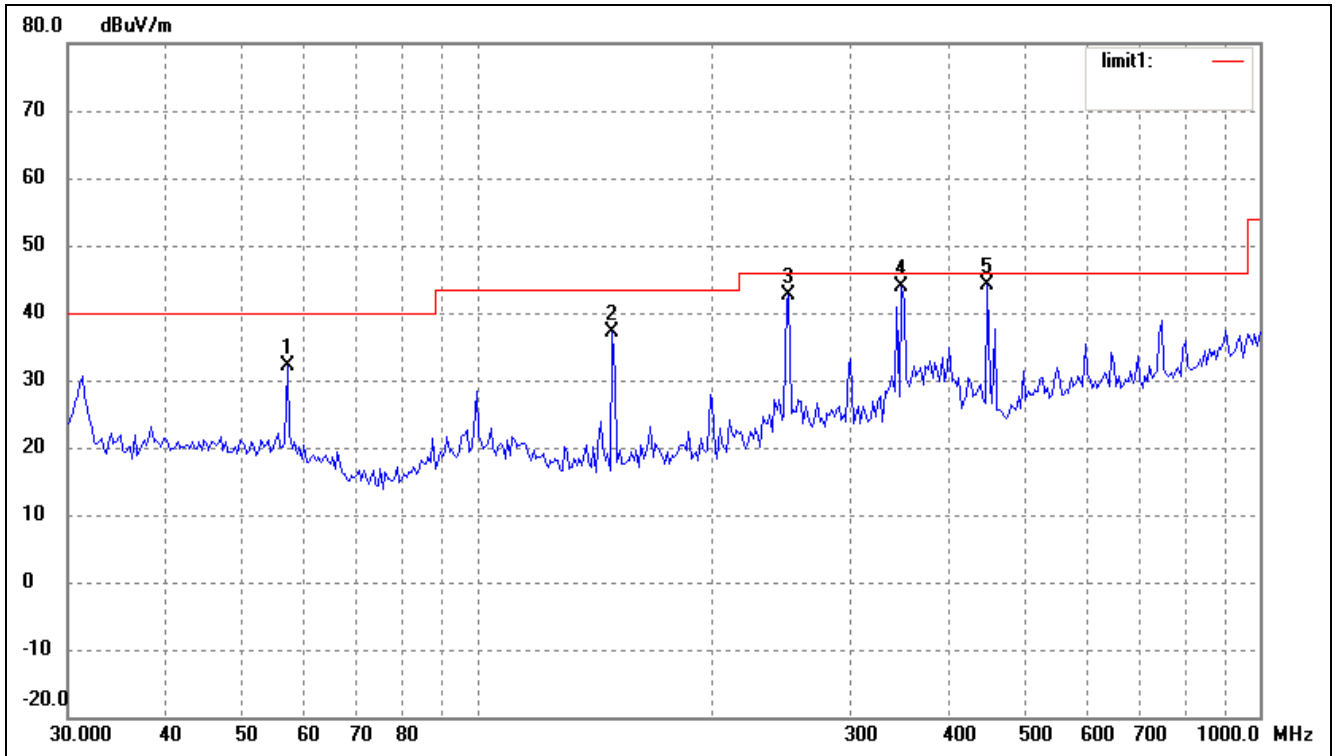
Test mode: Transmitting (802.11n-HT20 Low Channel)

Vertical:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	27.52	7.70	35.22	40.00	-4.78	64	200	QP
2	149.9676	30.87	3.31	34.18	43.50	-9.32	44	100	peak
3	448.8361	33.48	10.59	44.07	46.00	-1.93	147	100	QP
4	550.2902	27.75	13.98	41.73	46.00	-4.27	58	100	QP
5	651.3831	22.59	15.37	37.96	46.00	-8.04	51	100	peak

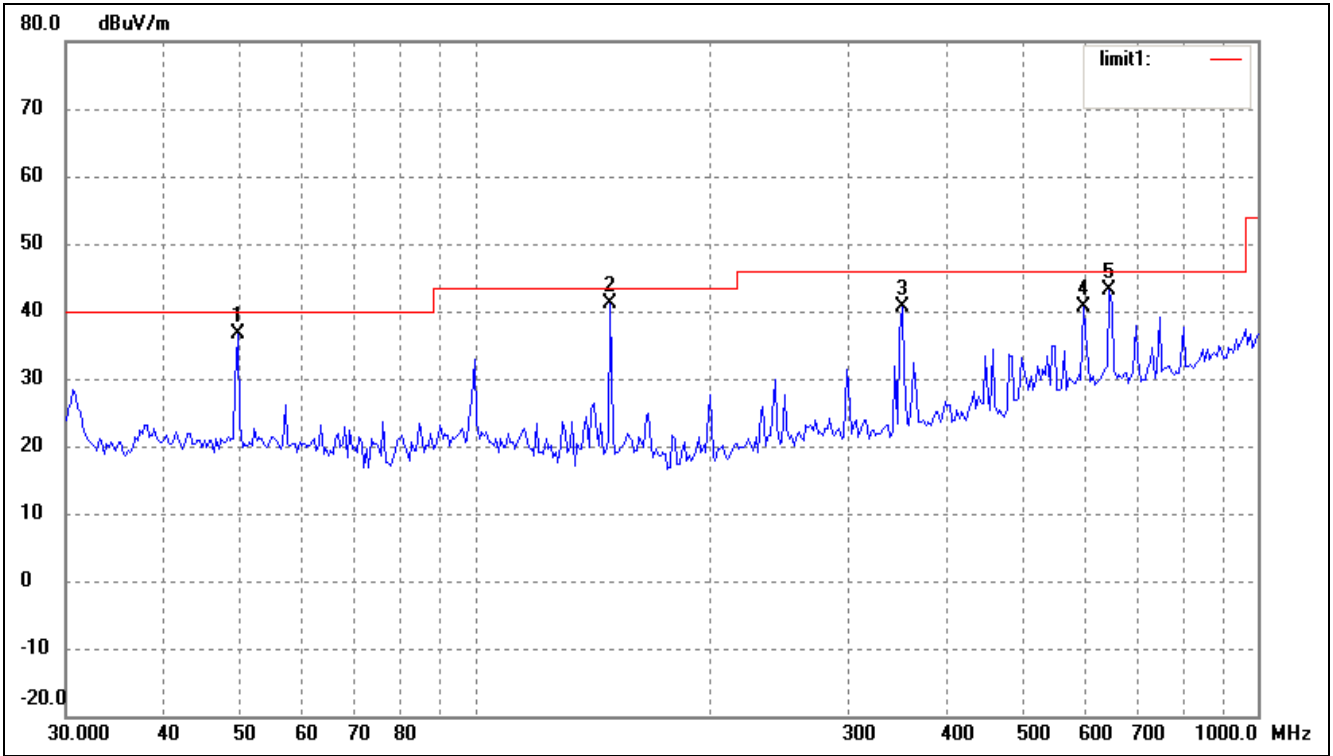
Spurious Emission From 30 MHz to 1 GHz
 Test mode: Transmitting (802.11n-HT20 Middle Channel)
 Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	57.2654	24.67	7.34	32.01	40.00	-7.99	36	100	peak
2	148.9175	33.78	3.30	37.08	43.50	-6.42	149	100	peak
3	250.4859	34.91	7.69	42.60	46.00	-3.40	55	100	QP
4	348.5145	34.40	9.41	43.81	46.00	-2.19	84	100	QP
5	448.8361	33.50	10.59	44.09	46.00	-1.91	112	100	QP

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

Vertical

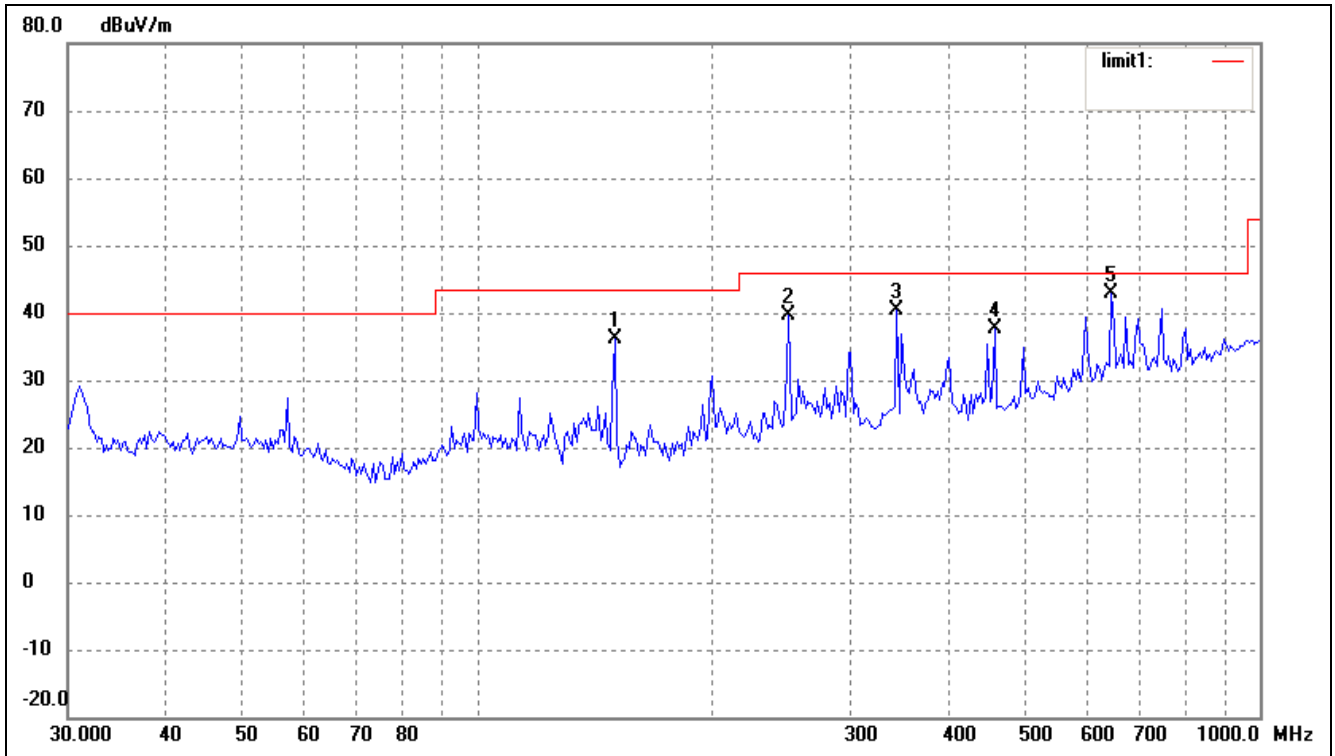


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	28.85	7.70	36.55	40.00	-3.45	5	100	QP
2	148.9175	37.88	3.30	41.18	43.50	-2.32	21	100	QP
3	350.9722	31.08	9.46	40.54	46.00	-5.46	54	100	QP
4	598.7067	25.64	14.99	40.63	46.00	-5.37	169	100	QP
5	646.8217	27.90	15.34	43.24	46.00	-2.76	47	200	QP

Spurious Emission From 30 MHz to 1 GHz

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

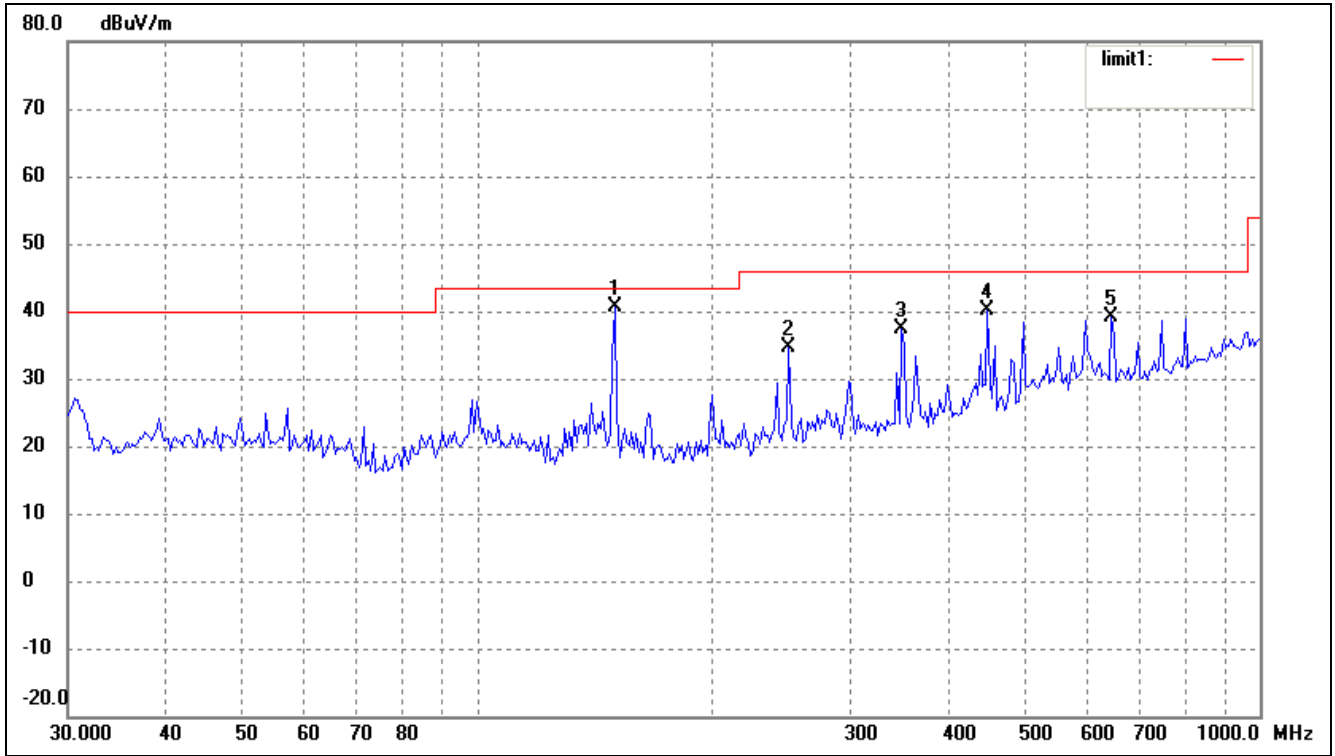
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	149.9676	32.87	3.31	36.18	43.50	-7.32	65	100	peak
2	250.4859	31.86	7.69	39.55	46.00	-6.45	15	100	peak
3	343.6506	31.08	9.31	40.39	46.00	-5.61	78	100	QP
4	458.3987	27.19	10.38	37.57	46.00	-8.43	50	100	peak
5	646.8217	27.51	15.34	42.85	46.00	-3.15	135	100	QP

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

Vertical

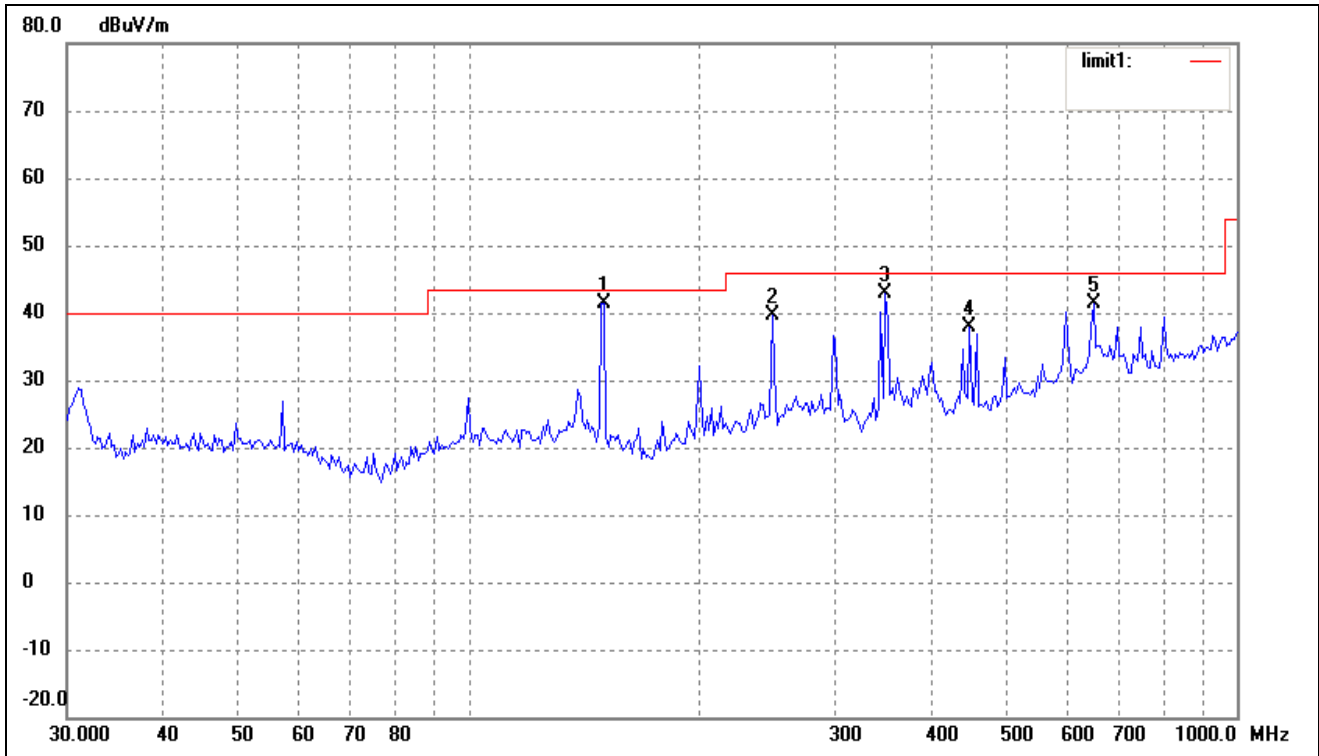


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	149.9676	37.28	3.31	40.59	43.50	-2.91	69	100	QP
2	250.4859	27.00	7.69	34.69	46.00	-11.31	63	100	peak
3	348.5145	27.99	9.41	37.40	46.00	-8.60	120	100	peak
4	448.8361	29.59	10.59	40.18	46.00	-5.82	48	100	QP
5	646.8217	23.86	15.34	39.20	46.00	-6.80	77	100	peak

Spurious Emission From 30 MHz to 1 GHz

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

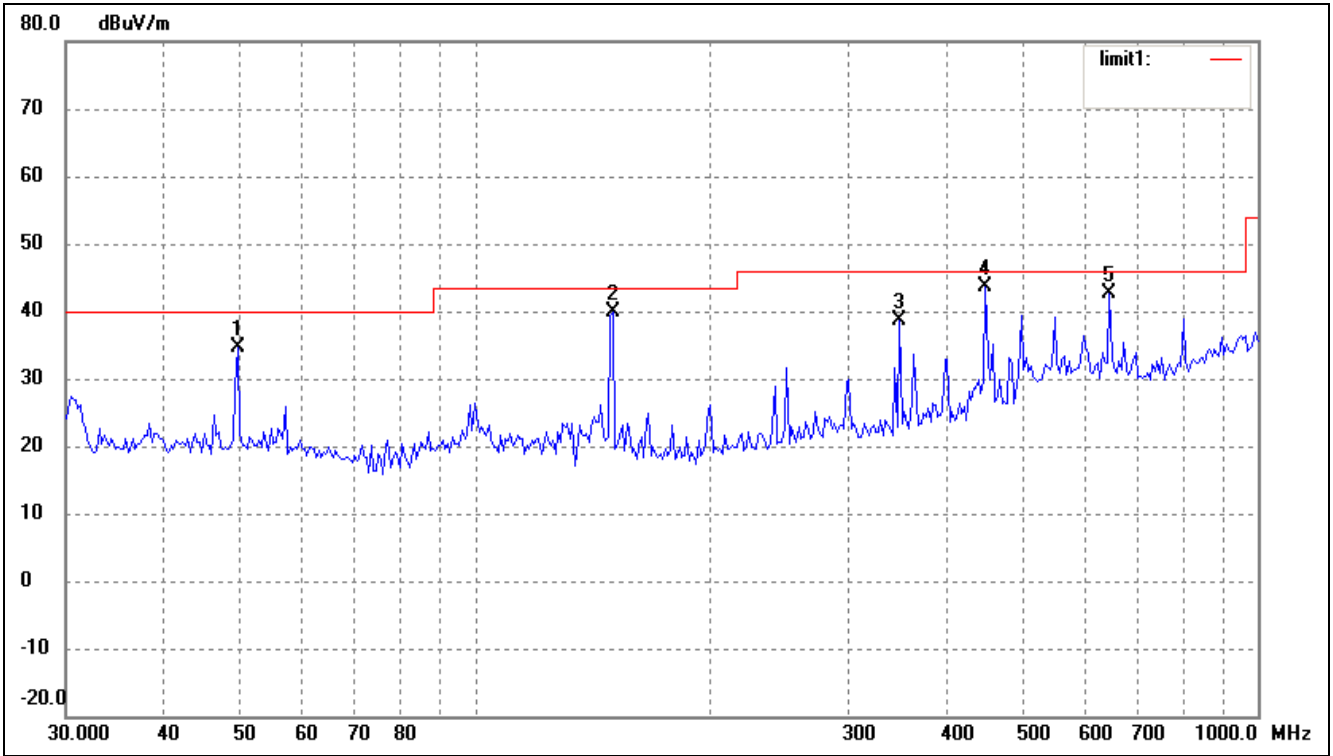
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	149.9676	38.16	3.31	41.47	43.50	-2.03	36	120	QP
2	248.7319	32.04	7.65	39.69	46.00	-6.31	161	100	peak
3	348.5145	33.46	9.41	42.87	46.00	-3.13	24	100	QP
4	448.8361	27.38	10.59	37.97	46.00	-8.03	268	100	peak
5	651.3831	25.92	15.37	41.29	46.00	-4.71	77	100	QP

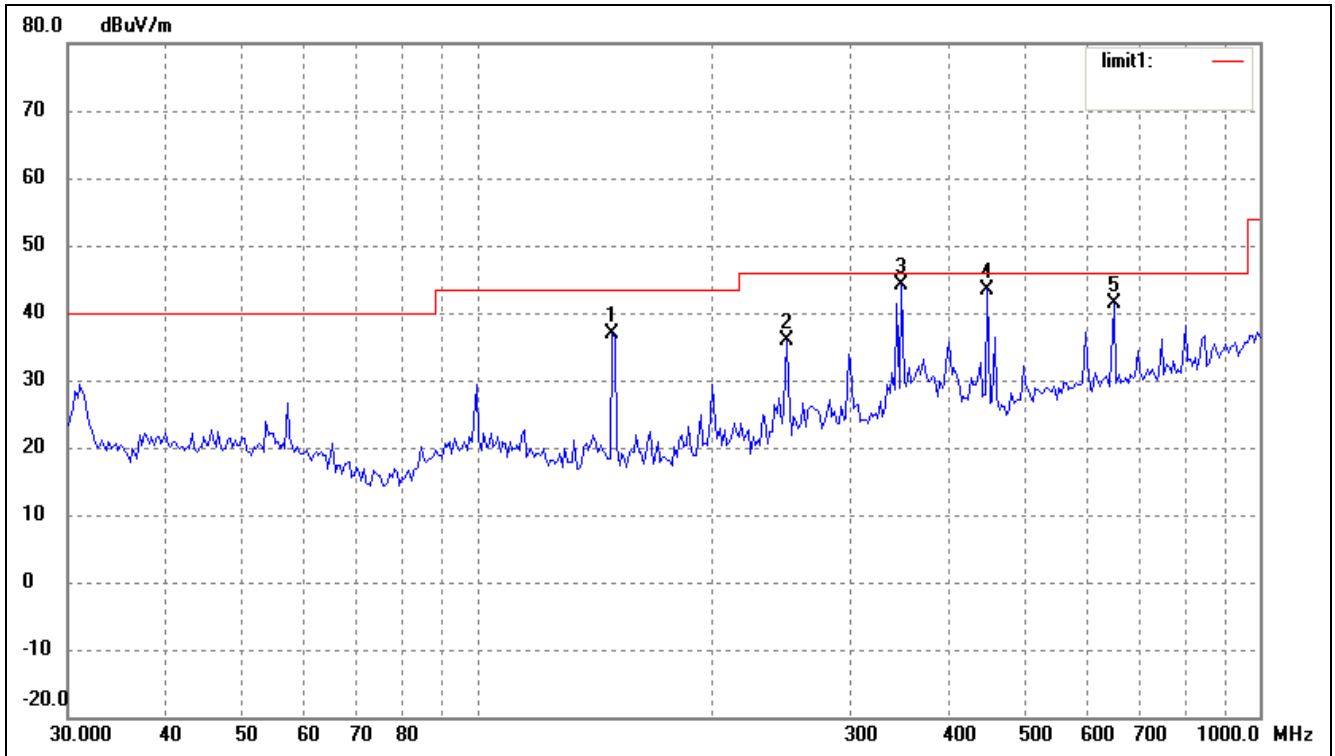
Test mode: Transmitting (802.11n-HT40 Low Channel)

Vertical:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	27.05	7.70	34.75	40.00	-5.25	125	100	QP
2	149.9676	36.46	3.31	39.77	43.50	-3.73	147	100	QP
3	348.5145	29.27	9.41	38.68	46.00	-7.32	64	100	peak
4	448.8361	33.11	10.59	43.70	46.00	-2.30	102	100	QP
5	646.8217	27.31	15.34	42.65	46.00	-3.35	320	100	QP

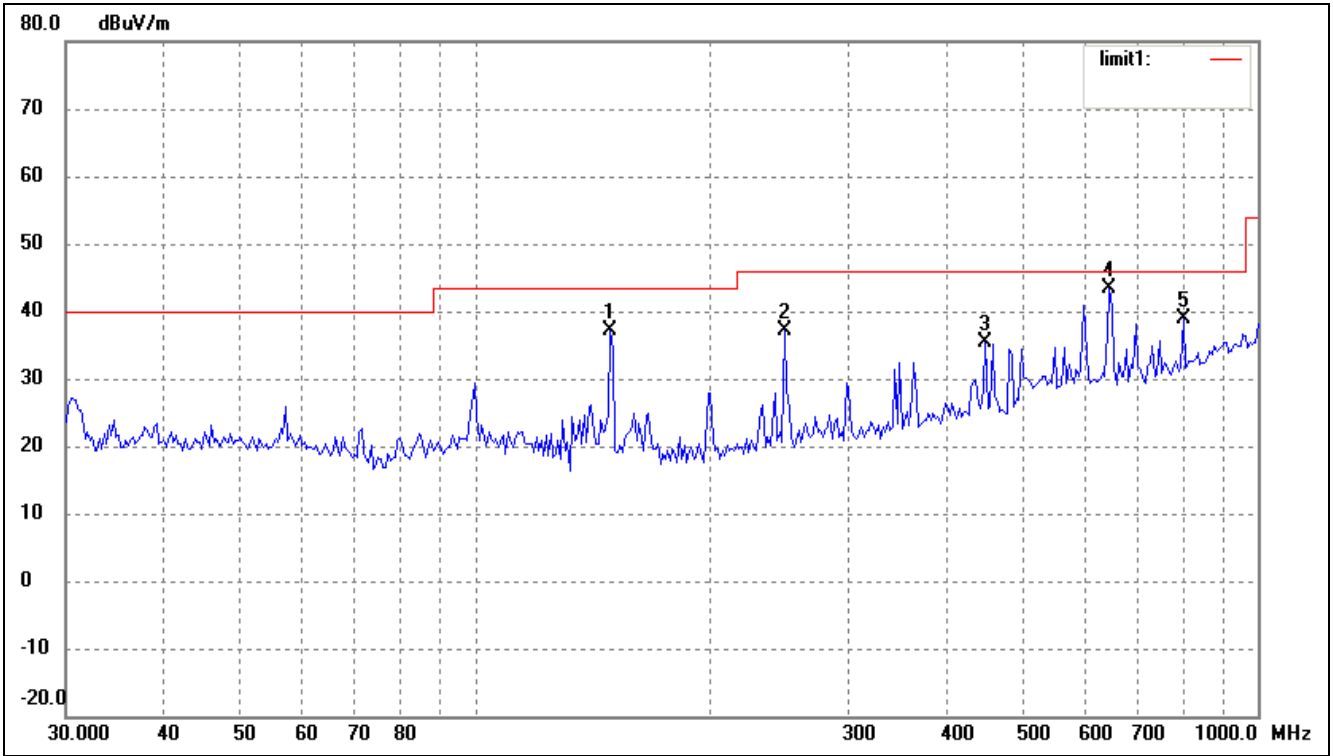
Spurious Emission From 30 MHz to 1 GHz
 Test mode: Transmitting (802.11n-HT40 Middle Channel)
 Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	148.9175	33.62	3.30	36.92	43.50	-6.58	120	100	peak
2	248.7319	28.34	7.65	35.99	46.00	-10.01	34	100	peak
3	348.5145	34.79	9.41	44.20	46.00	-1.80	49	100	QP
4	448.8361	32.91	10.59	43.50	46.00	-2.50	108	100	QP
5	651.3831	26.03	15.37	41.40	46.00	-4.60	77	100	QP

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

Vertical

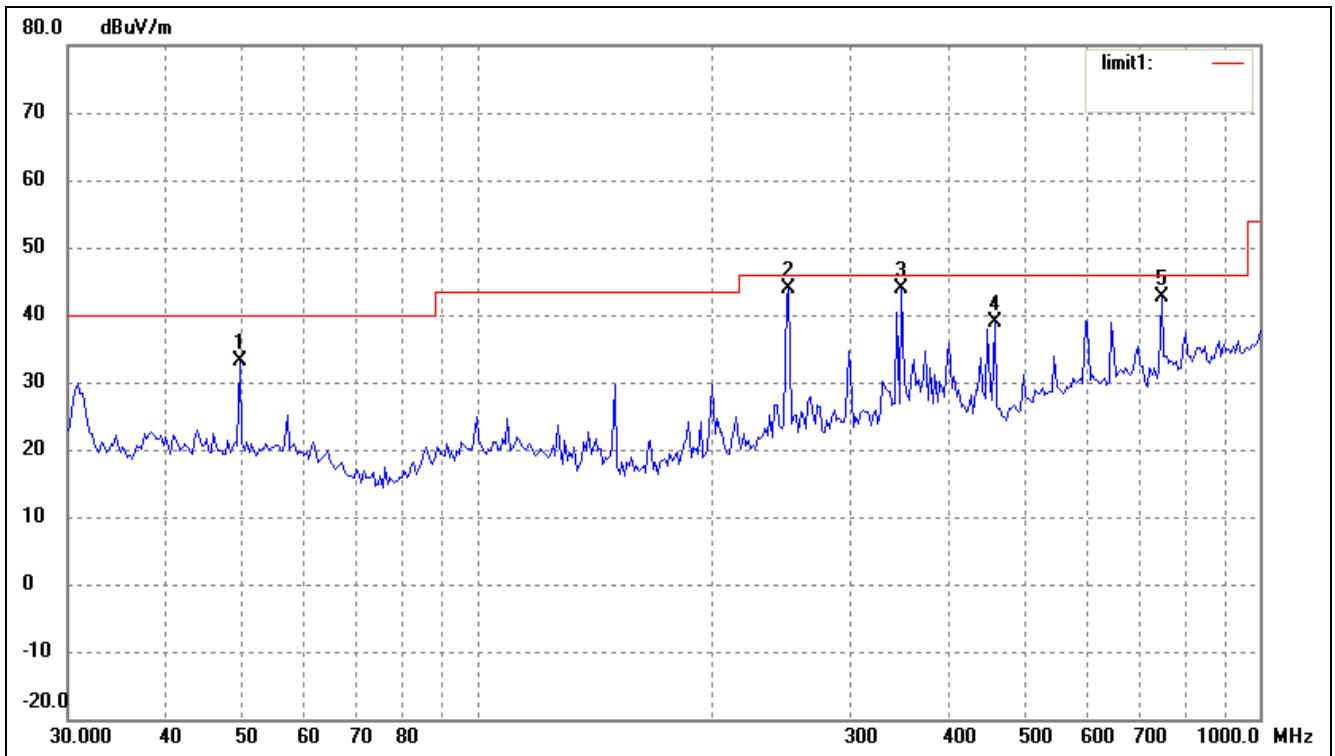


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	148.9175	33.72	3.30	37.02	43.50	-6.48	63	100	peak
2	248.7319	29.47	7.65	37.12	46.00	-8.88	32	100	peak
3	448.8361	24.72	10.59	35.31	46.00	-10.69	157	200	peak
4	646.8217	27.94	15.34	43.28	46.00	-2.72	44	100	QP
5	804.2523	21.75	17.13	38.88	46.00	-7.12	78	100	peak

Spurious Emission From 30 MHz to 1 GHz

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

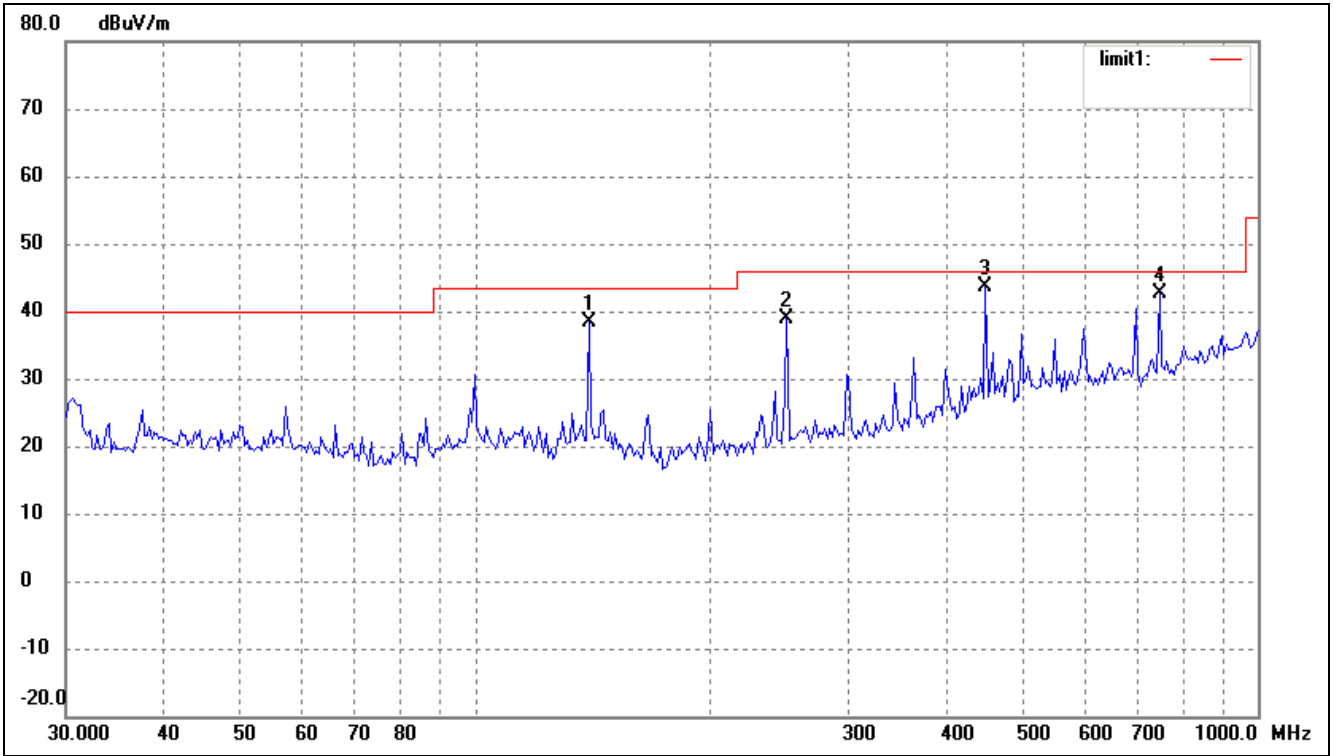
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	25.51	7.70	33.21	40.00	-6.79	11	100	peak
2	250.4859	36.10	7.69	43.79	46.00	-2.21	124	100	QP
3	348.5145	34.48	9.41	43.89	46.00	-2.11	56	100	QP
4	458.3987	28.38	10.38	38.76	46.00	-7.24	92	100	peak
5	749.6761	26.30	16.37	42.67	46.00	-3.33	207	100	QP

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

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	139.7909	35.08	3.24	38.32	43.50	-5.18	36	150	QP
2	250.4859	31.11	7.69	38.80	46.00	-7.20	98	100	peak
3	448.8361	33.01	10.59	43.60	46.00	-2.40	77	100	QP
4	749.6761	26.23	16.37	42.60	46.00	-3.40	51	100	QP

*Spurious Emission Above 1GHz**Test mode: Transmitting (802.11b)*

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low Channel (1G to 25GHz)										
4824.0	AV	45.3	270	V	34.1	5.2	33.0	51.6	54	-2.4
4824.0	AV	40.7	90	H	37.4	5.2	33.0	50.3	54	-3.7
7236.0	AV	39.2	60	H	34.1	6.1	33.5	45.9	54	-8.1
7236.0	AV	36.5	45	V	37.4	6.1	33.5	46.5	54	-7.5
4824.0	PK	54.9	90	V	34.1	5.2	33.0	61.2	74	-12.8
4824.0	PK	53.4	45	H	34.1	5.2	33.0	59.7	74	-14.3
7236.0	PK	46.5	270	V	37.4	6.1	33.5	56.5	74	-17.5
7236.0	PK	45.8	180	H	37.4	6.1	33.5	55.8	74	-18.2
Middle Channel (1G to 25GHz)										
4874.0	AV	45.5	90	V	34.1	5.2	33.0	51.8	54	-2.2
7311.0	AV	39.1	270	V	37.4	6.1	33.5	48.7	54	-5.3
4874.0	AV	44.2	45	H	34.1	5.2	33.0	50.9	54	-3.1
7311.0	AV	37.2	60	H	37.4	6.1	33.5	47.2	54	-6.8
4874.0	PK	56.6	270	V	34.1	5.2	33.0	62.9	74	-11.1
7311.0	PK	53.1	45	V	37.4	6.1	33.5	59.4	74	-14.6
4874.0	PK	51.6	180	H	34.1	5.2	33.0	61.6	74	-12.4
7311.0	PK	47.7	45	H	37.4	6.1	33.5	57.7	74	-16.3
High Channel (1G to 25GHz)										
4924.0	AV	44.8	90	V	34.1	5.2	33.0	51.1	54	-2.9
7386.0	AV	42.2	270	V	37.4	6.1	33.5	51.8	54	-2.2
4924.0	AV	42.9	60	H	34.1	5.2	33.0	49.6	54	-4.4
7386.0	AV	39.0	60	H	37.4	6.1	33.5	49.0	54	-5.0
4924.0	PK	58.0	270	V	34.1	5.2	33.0	64.3	74	-9.7
4924.0	PK	57.5	180	H	34.1	5.2	33.0	63.8	74	-10.2
7386.0	PK	51.5	45	V	37.4	6.1	33.5	61.5	74	-12.5
7386.0	PK	50.2	45	H	37.4	6.1	33.5	60.2	74	-13.8

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	AV	43.4	270	V	34.1	5.2	33.0	49.7	54	-4.3
4824.0	AV	37.9	90	H	37.4	5.2	33.0	47.5	54	-6.5
7236.0	AV	37.8	60	H	34.1	6.1	33.5	44.5	54	-9.5
7236.0	AV	35.4	45	V	37.4	6.1	33.5	45.4	54	-8.6
4824.0	PK	53.1	90	V	34.1	5.2	33.0	59.4	74	-14.6
4824.0	PK	51.5	45	H	34.1	5.2	33.0	57.8	74	-16.2
7236.0	PK	47.2	270	V	37.4	6.1	33.5	57.2	74	-16.8
7236.0	PK	45.4	180	H	37.4	6.1	33.5	55.4	74	-18.6
Middle Channel (1G to 25GHz)										
4874.0	AV	43.2	90	V	34.1	5.2	33.0	49.5	54	-4.5
7311.0	AV	36.9	270	V	37.4	6.1	33.5	46.5	54	-7.5
4874.0	AV	41.2	45	H	34.1	5.2	33.0	47.9	54	-6.1
7311.0	AV	35.6	60	H	37.4	6.1	33.5	45.6	54	-8.4
4874.0	PK	54.4	270	V	34.1	5.2	33.0	60.7	74	-13.3
7311.0	PK	51.3	45	V	37.4	6.1	33.5	57.6	74	-16.4
4874.0	PK	49.1	180	H	34.1	5.2	33.0	59.1	74	-14.9
7311.0	PK	46.5	45	H	37.4	6.1	33.5	56.5	74	-17.5
High Channel (1G to 25GHz)										
4924.0	AV	43.1	90	V	34.1	5.2	33.0	49.4	54	-4.6
7386.0	AV	40.7	270	V	37.4	6.1	33.5	50.3	54	-3.7
4924.0	AV	41.0	60	H	34.1	5.2	33.0	47.7	54	-6.3
7386.0	AV	38.3	60	H	37.4	6.1	33.5	48.3	54	-5.7
4924.0	PK	56.1	270	V	34.1	5.2	33.0	62.4	74	-11.6
4924.0	PK	54.8	180	H	34.1	5.2	33.0	61.1	74	-12.9
7386.0	PK	48.3	45	V	37.4	6.1	33.5	58.3	74	-15.7
7386.0	PK	47.2	45	H	37.4	6.1	33.5	57.2	74	-16.8

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	AV	42.2	270	V	34.1	5.2	33.0	48.5	54	-5.5
4824.0	AV	37.6	90	H	37.4	5.2	33.0	47.2	54	-6.8
7236.0	AV	36.7	60	H	34.1	6.1	33.5	43.4	54	-10.6
7236.0	AV	35.5	45	V	37.4	6.1	33.5	45.5	54	-8.5
4824.0	PK	51.9	90	V	34.1	5.2	33.0	58.2	74	-15.8
4824.0	PK	50.5	45	H	34.1	5.2	33.0	56.8	74	-17.2
7236.0	PK	43.1	270	V	37.4	6.1	33.5	53.1	74	-20.9
7236.0	PK	42.3	180	H	37.4	6.1	33.5	52.3	74	-21.7
Middle Channel (1G to 25GHz)										
4874.0	AV	42.6	90	V	34.1	5.2	33.0	48.9	54	-5.1
7311.0	AV	38.2	270	V	37.4	6.1	33.5	47.8	54	-6.2
4874.0	AV	39.5	45	H	34.1	5.2	33.0	46.2	54	-7.8
7311.0	AV	35.1	60	H	37.4	6.1	33.5	45.1	54	-8.9
4874.0	PK	53.0	270	V	34.1	5.2	33.0	59.3	74	-14.7
7311.0	PK	52.1	45	V	37.4	6.1	33.5	58.4	74	-15.6
4874.0	PK	45.8	180	H	34.1	5.2	33.0	55.8	74	-18.2
7311.0	PK	45.7	45	H	37.4	6.1	33.5	55.7	74	-18.3
High Channel (1G to 25GHz)										
4924.0	AV	41.0	90	V	34.1	5.2	33.0	47.3	54	-6.7
7386.0	AV	38.3	270	V	37.4	6.1	33.5	47.9	54	-6.1
4924.0	AV	40.0	60	H	34.1	5.2	33.0	46.7	54	-7.3
7386.0	AV	36.9	60	H	37.4	6.1	33.5	46.9	54	-7.1
4924.0	PK	52.5	270	V	34.1	5.2	33.0	58.8	74	-15.2
4924.0	PK	51.1	180	H	34.1	5.2	33.0	57.4	74	-16.6
7386.0	PK	47.9	45	V	37.4	6.1	33.5	57.9	74	-16.1
7386.0	PK	47.5	45	H	37.4	6.1	33.5	57.5	74	-16.5

*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	AV	41.0	270	V	34.1	5.2	33.0	47.3	54	-6.7
4844.0	AV	35.9	90	H	37.4	5.2	33.0	45.5	54	-8.5
7266.0	AV	35.9	60	H	34.1	6.1	33.5	42.6	54	-11.4
7266.0	AV	33.4	45	V	37.4	6.1	33.5	43.4	54	-10.6
4844.0	PK	50.2	90	V	34.1	5.2	33.0	56.5	74	-17.5
4844.0	PK	49.5	45	H	34.1	5.2	33.0	55.8	74	-18.2
7266.0	PK	43.5	270	V	37.4	6.1	33.5	53.5	74	-20.5
7266.0	PK	42.1	180	H	37.4	6.1	33.5	52.1	74	-21.9
Middle Channel (1G to 25GHz)										
4874.0	AV	41.2	90	V	34.1	5.2	33.0	47.5	54	-6.5
7311.0	AV	35.7	270	V	37.4	6.1	33.5	45.3	54	-8.7
4874.0	AV	40.1	45	H	34.1	5.2	33.0	46.8	54	-7.2
7311.0	AV	34.2	60	H	37.4	6.1	33.5	44.2	54	-9.8
4874.0	PK	52.4	270	V	34.1	5.2	33.0	58.7	74	-15.3
7311.0	PK	50.6	45	V	37.4	6.1	33.5	56.9	74	-17.1
4874.0	PK	47.9	180	H	34.1	5.2	33.0	57.9	74	-16.1
7311.0	PK	44.5	45	H	37.4	6.1	33.5	54.5	74	-19.5
High Channel (1G to 25GHz)										
4904.0	AV	41.1	90	V	34.1	5.2	33.0	47.4	54	-6.6
7356.0	AV	37.7	270	V	37.4	6.1	33.5	47.3	54	-6.7
4904.0	AV	39.4	60	H	34.1	5.2	33.0	46.1	54	-7.9
7356.0	AV	35.8	60	H	37.4	6.1	33.5	45.8	54	-8.2
4904.0	PK	55.1	270	V	34.1	5.2	33.0	61.4	74	-12.6
4904.0	PK	54.0	180	H	34.1	5.2	33.0	60.3	74	-13.7
7356.0	PK	47.3	45	V	37.4	6.1	33.5	57.3	74	-16.7
7356.0	PK	45.6	45	H	37.4	6.1	33.5	55.6	74	-18.4

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

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

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:	26° C
Relative Humidity:	53 %
ATM Pressure:	1012 mbar

10.5 Summary of Test Results/Plots

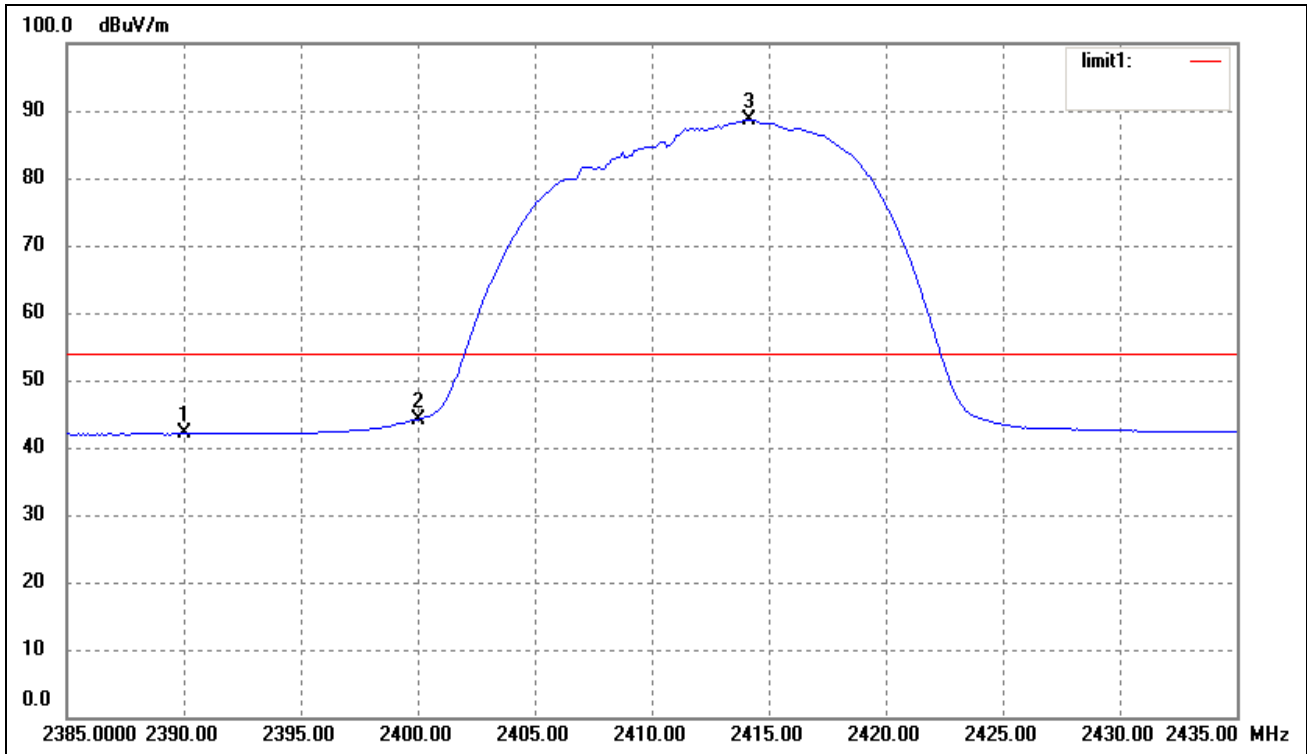
Test mode	Frequency MHz	Limit dBuV /dB	Result
802. 11b	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass

Test mode	Frequency MHz	Limit dBuV /dB	Result
802. 11g	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass

Test mode	Frequency MHz	Limit dBuV /dB	Result
802. 11n HT-20	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass

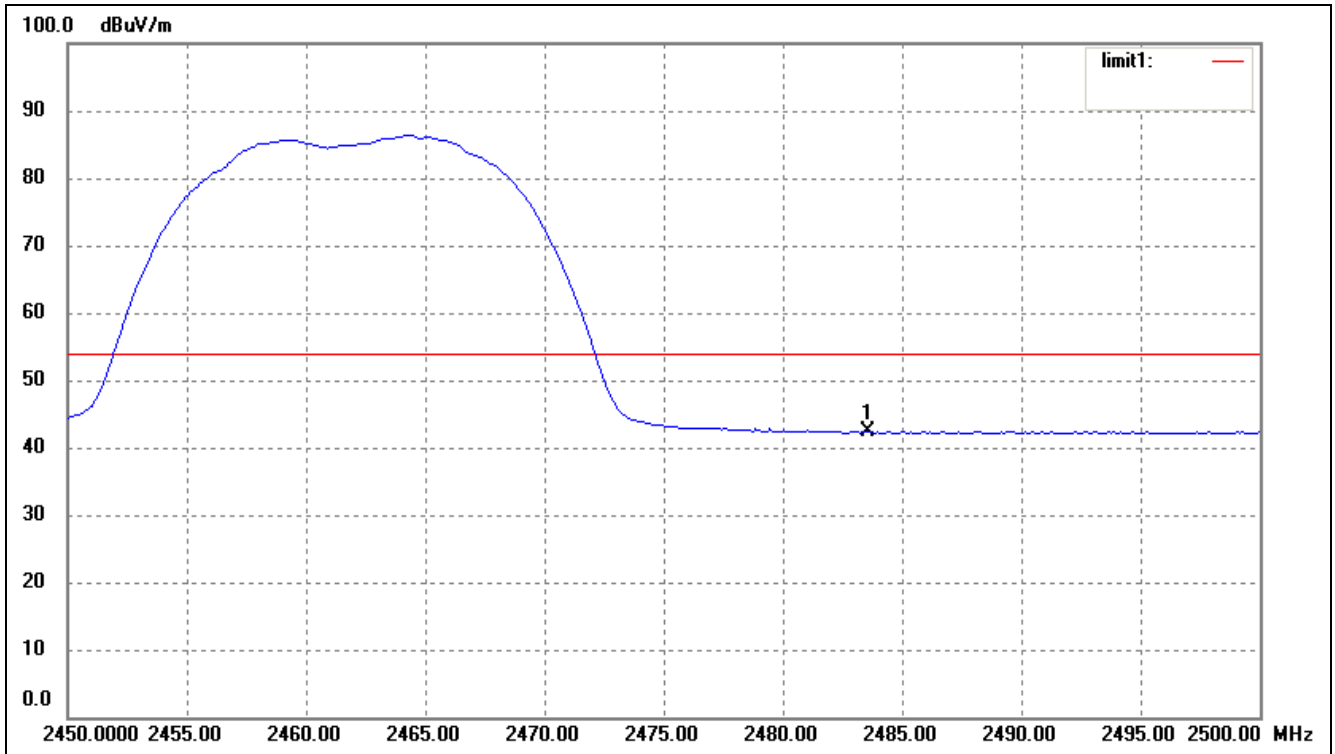
Test mode	Frequency MHz	Limit dBuV /dB	Result
802. 11n HT-40	2390.00	<54dBuv	Pass
	2400.00	>20dB	Pass
	2483.50	<54dBuv	Pass

For 802.11b
Lowest Bandedge



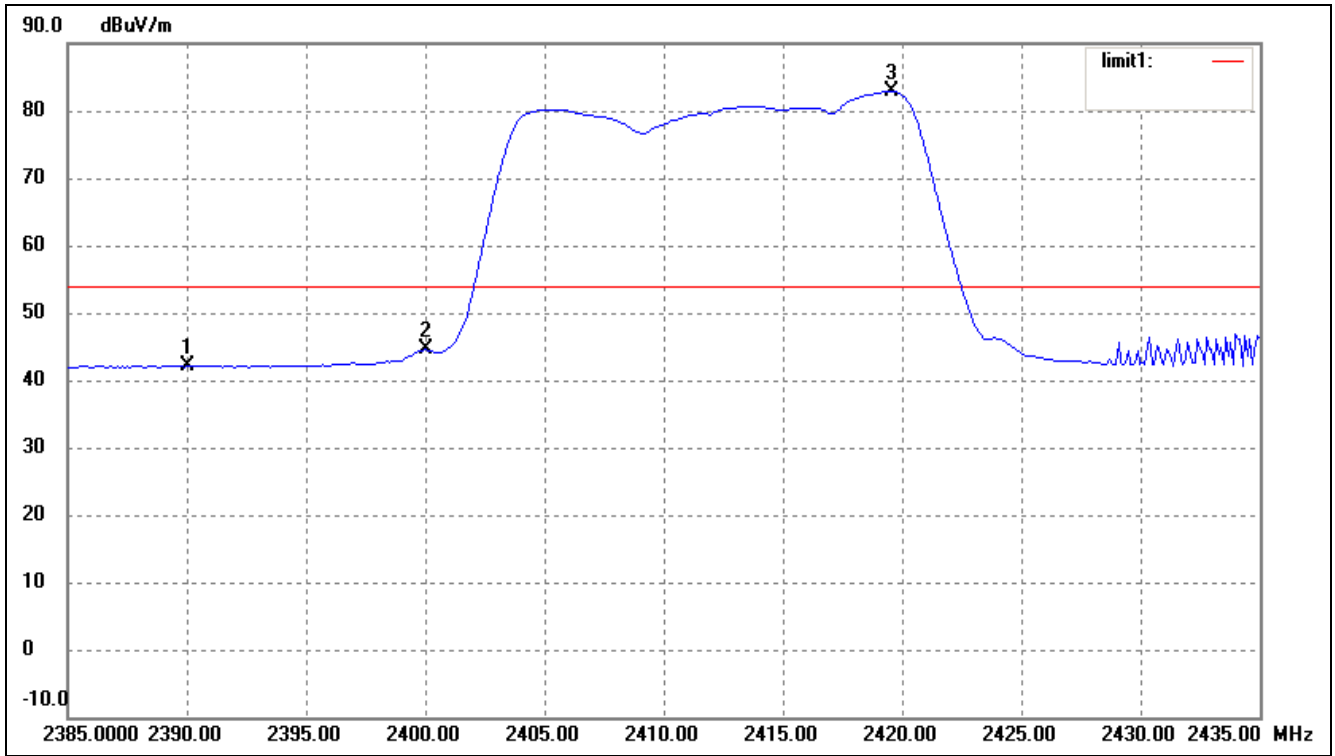
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2390.000	6.49	35.59	42.08	54.00	-11.92	226	100	Ave
	2390.000	15.65	35.59	51.24	74.00	-22.76	226	100	peak
2	2400.000	8.54	35.68	44.22	54.00	-9.78	154	100	Ave
3	2414.158	52.91	35.73	88.64	/	/	/	/	Ave

For 802.11b
Highest Bandedge



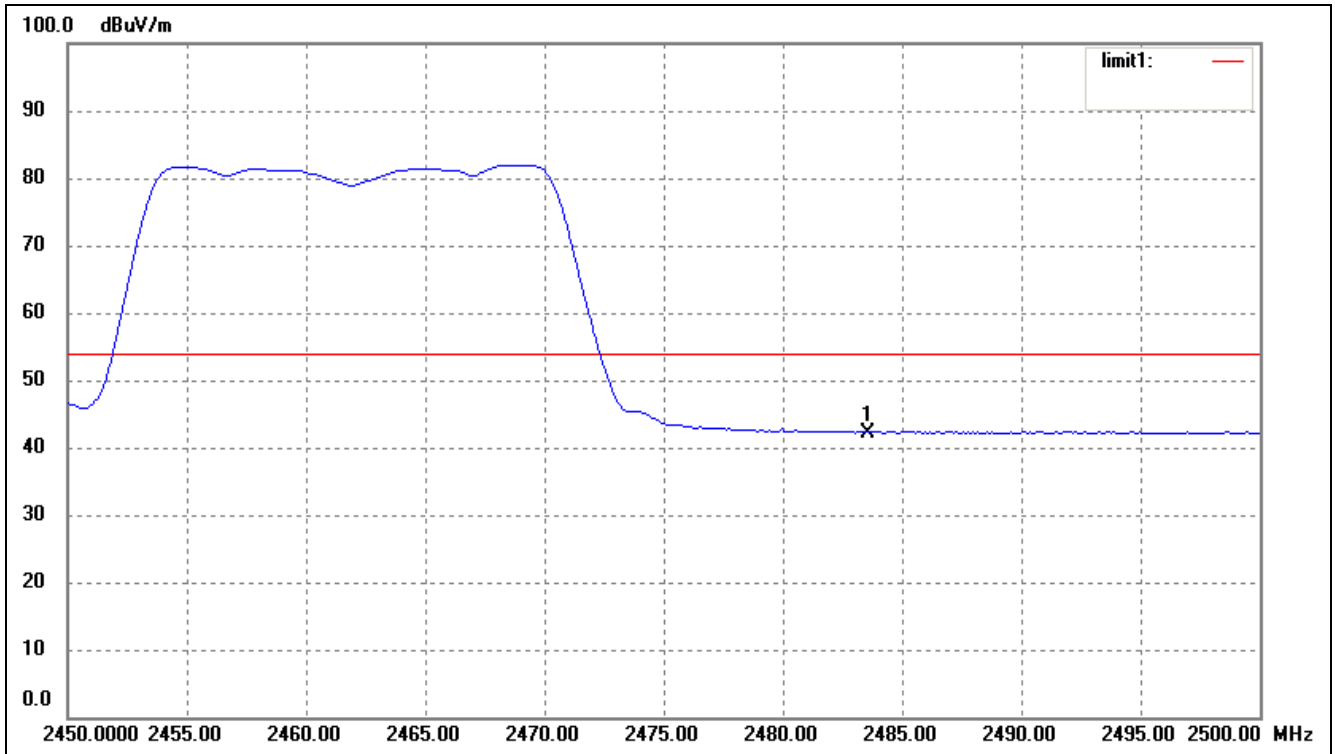
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2483.500	6.29	35.97	42.26	54.00	-11.74	55	100	Ave
	2483.500	15.70	35.97	51.67	74.00	-22.33	55	100	peak

For 802.11g
Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2390.000	6.43	35.59	42.02	54.00	-11.98	359	100	Ave
	2390.000	14.96	35.59	50.58	74.00	-23.42	359	100	peak
2	2400.000	8.86	35.68	44.54	54.00	-9.46	154	100	Ave
3	2419.569	47.14	35.75	82.89	/	/	/	/	Ave

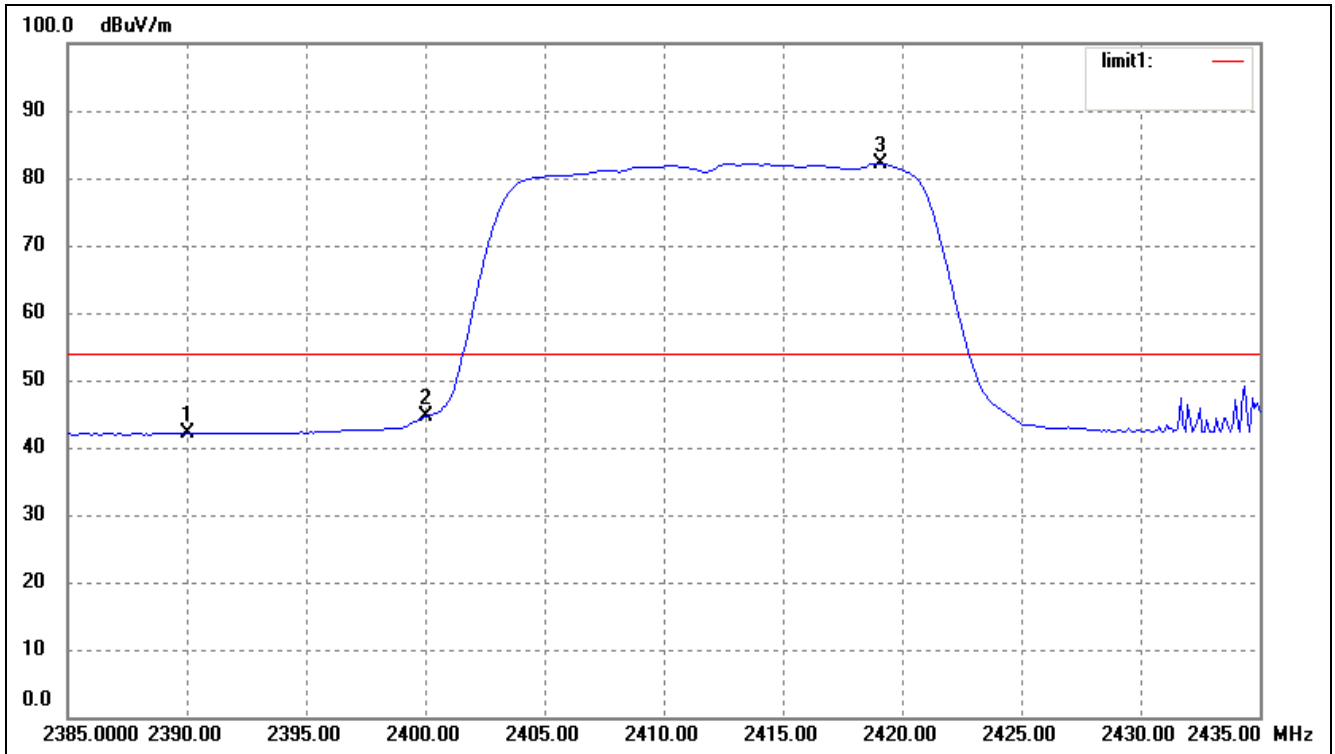
For 802.11g
Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2483.500	6.28	35.97	42.25	54.00	-11.75	66	100	Ave
	2483.500	16.07	35.97	52.04	74.00	-21.96	66	100	peak

For 802.11n HT-20

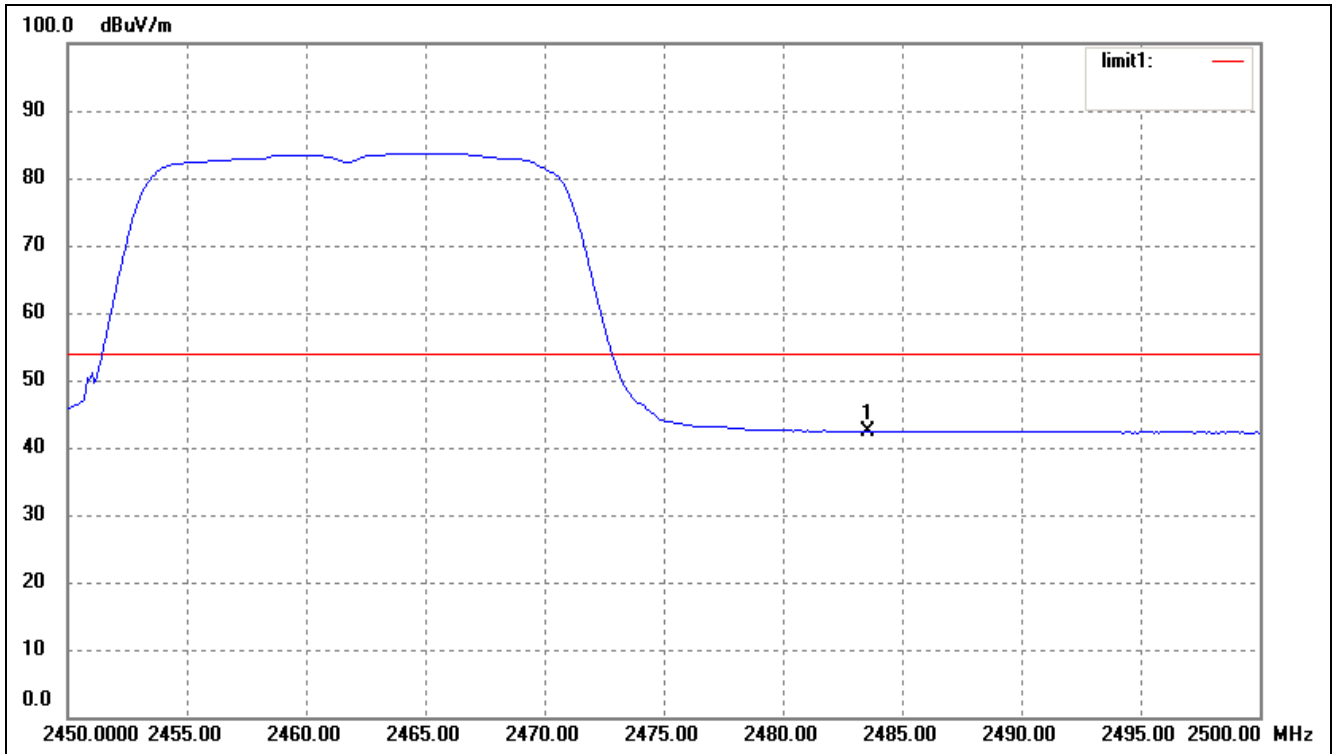
Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2390.000	6.52	35.59	42.11	54.00	-11.89	54	100	Ave
	2390.000	16.32	35.59	51.91	74.00	-22.09	54	100	peak
2	2400.000	8.88	35.68	44.56	54.00	-9.44	120	100	Ave
3	2419.068	46.42	35.75	82.17	/	/	/	/	Ave

For 802.11n HT-20

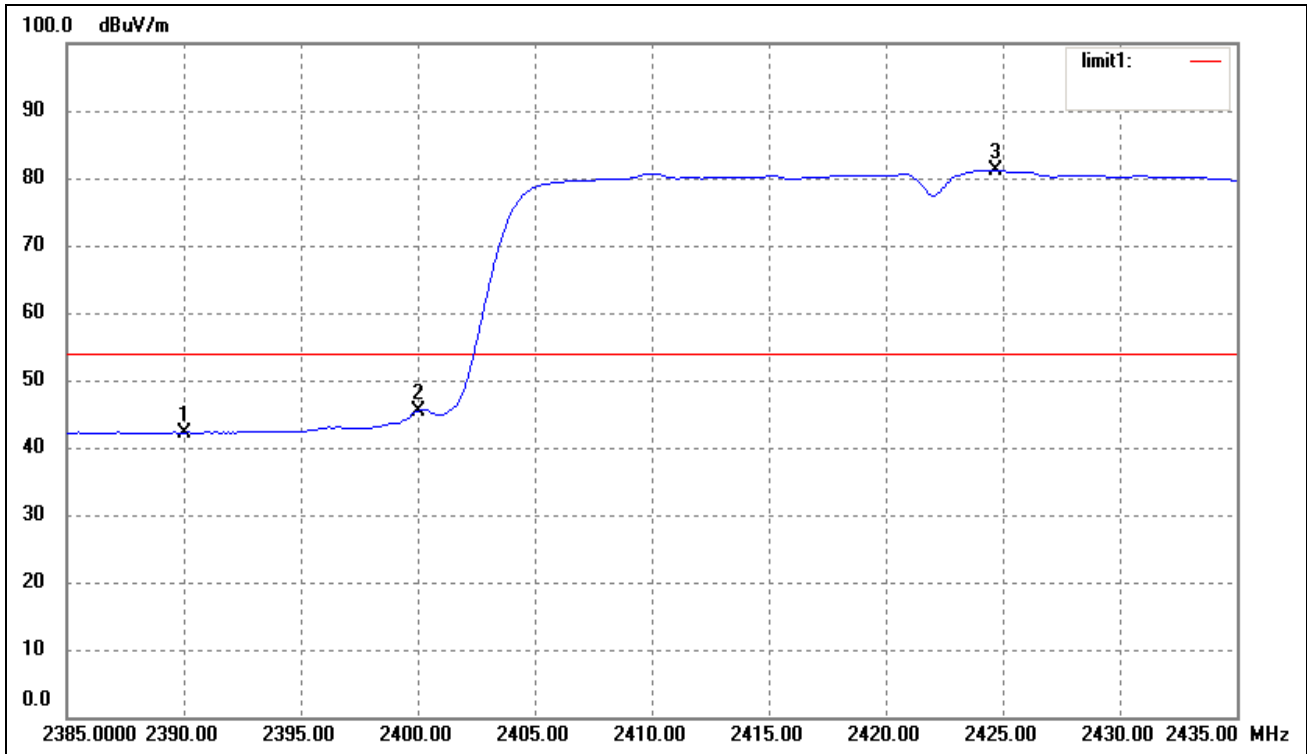
Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2483.500	6.39	35.97	42.36	54.00	-11.64	26	100	Ave
	2483.500	15.88	35.97	51.85	74.00	-22.15	26	100	peak

For 802.11n HT-40

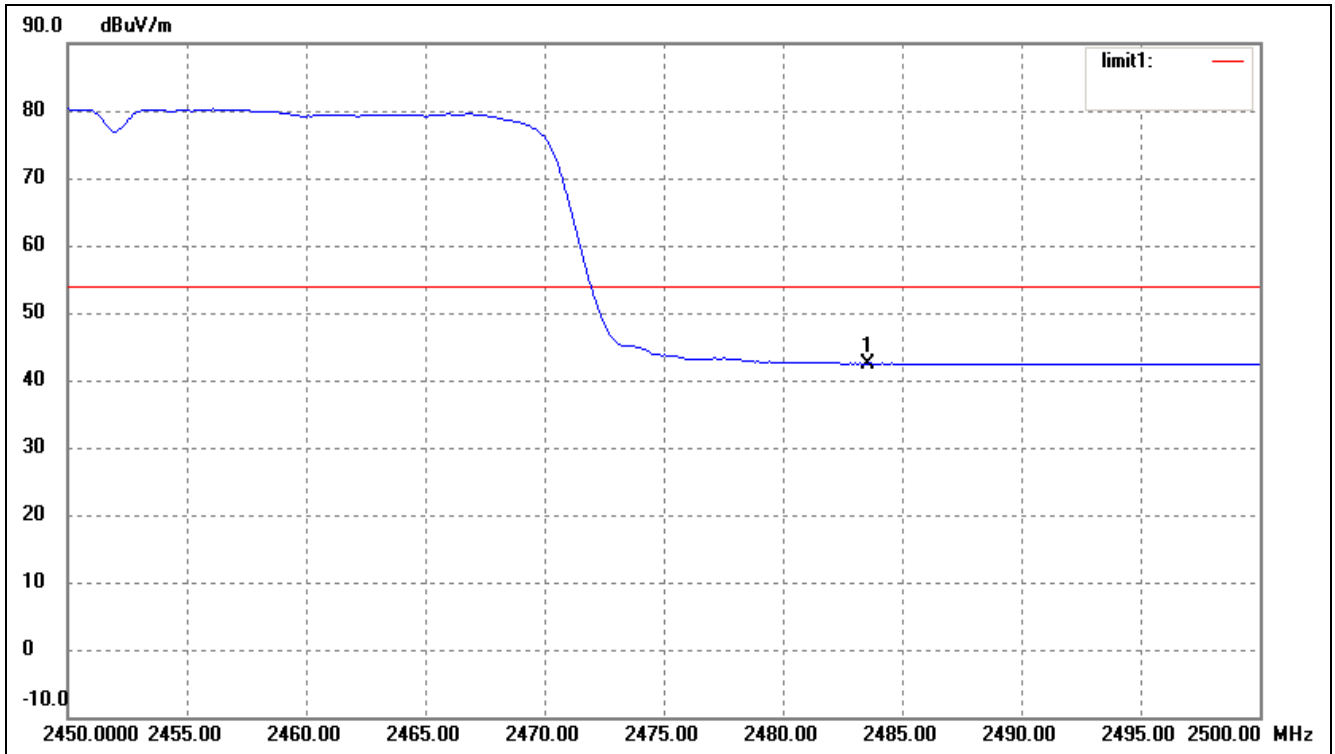
Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2390.000	6.62	35.59	42.21	54.00	-11.79	321	100	Ave
	2390.000	14.42	35.59	50.01	74.00	-23.99	321	100	peak
2	2400.000	9.80	35.68	45.48	54.00	-8.52	15	100	Ave
3	2424.679	45.40	35.77	81.17	/	/	/	/	Ave

For 802.11n HT-40

Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	2483.500	6.52	35.97	42.49	54.00	-11.51	17	100	Ave
	2483.500	16.66	35.97	52.63	74.00	-21.37	17	100	peak

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