

# FCC Part 15C

## Measurement and Test Report

For

**KEEN HIGH MEDIATECH (SHENZHEN) LTD.**

Room 1118,11th floor, In-long Development Center, Number 6025, Shennan Ave,  
FutianDist., Shenzhen, China

**FCC ID: YKWKMP51100**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> Internet TV/Radio
<b>Model:</b>	<u>KMP511</u>
<b>Report No.:</b>	<u>STR10078131I-1</u>
<b>Test Date:</b>	<u>2010-07-22 to 2010-07-31</u>
<b>Issue Date:</b>	<u>2010-08-09</u>
<b>Test Engineer:</b>	<u>John Zhi</u> 
<b>Reviewed By:</b>	<u>Lahm Peng</u> 
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: KEEN HIGH MEDIATECH (HSNEHZNE) LTD.  
Address of applicant: Room 1118, 11th floor, In-long Development center,  
Number 6025, Shennan Ave, FutianDist., Shenzhen, China

Manufacturer: KEEN HIGH MEDIATECH(HSNEHZNE) LTD.  
Address of manufacturer: Room 1118, 11th floor, In-long Development center,  
Number 6025, Shennan Ave, FutianDist., Shenzhen, China

#### General Description of E.U.T

Items	Description
EUT Description:	Internet TV/Radio
Trade Name:	/
Model No.:	KMP511, KMP510
Rated Voltage:	DC 5V
Max. Output Power	12 dBm
Frequency range:	2412-2462MHz
Number of channels:	11
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Packaging Size:	20.0X8.1X8.5cm
For more information refer to the circuit diagram form and the user's manual.	

*Note: The test data is gathered from a production sample, provided by the manufacture. The others models listed in the report have different appearance only of KMP511 without circuit and electronic construction changed, declared by the manufacturer.*

### 1.2 Test Standards

The following report is prepared on behalf of the KEEN HIGH MEDIATECH (HSNEHZNE) 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
Wireless AP	Tenda	WAP320	/
ASUS	Notebook	XR52	15G10N365600
/	/	/	/

### 1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Power Cable	1.3	Unshielded	With Core
/	/	/	/

## 2. SUMMARY OF TEST RESULTS

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

### **3. §15.203 - ANTENNA REQUIREMENT**

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#### **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  $\pm 2.88$  dB.

### 4.2 Test Equipment List and Details

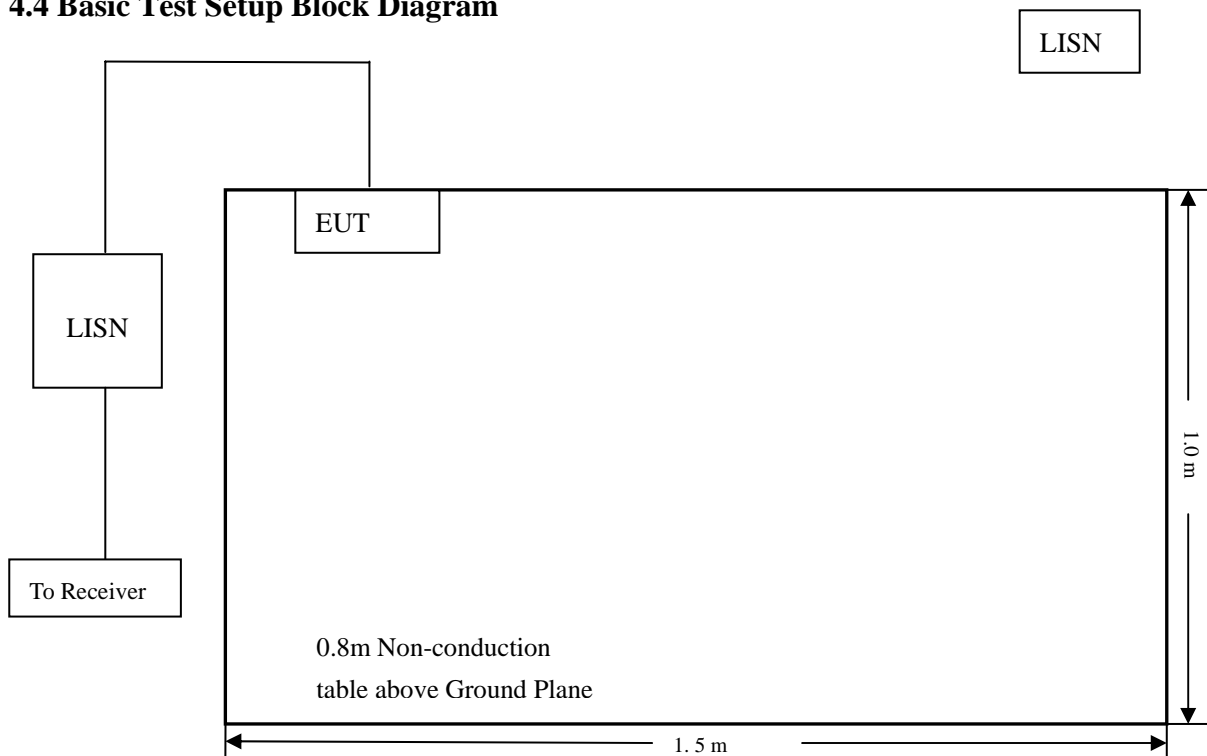
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
Puls Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-08-12	2010-08-11
L.I.S.N.	SCHWARZBECK	NSLK8126	8126-224	2009-08-12	2010-08-11
L.I.S.N.	EMCO	3825/2	11967C	2009-08-12	2010-08-11

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

### 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:

**-14.8 dB $\mu$ V at 0.35MHz in the Line, QP detector, 0.15-30MHz**

#### 4.7 Conducted Emissions Test Data

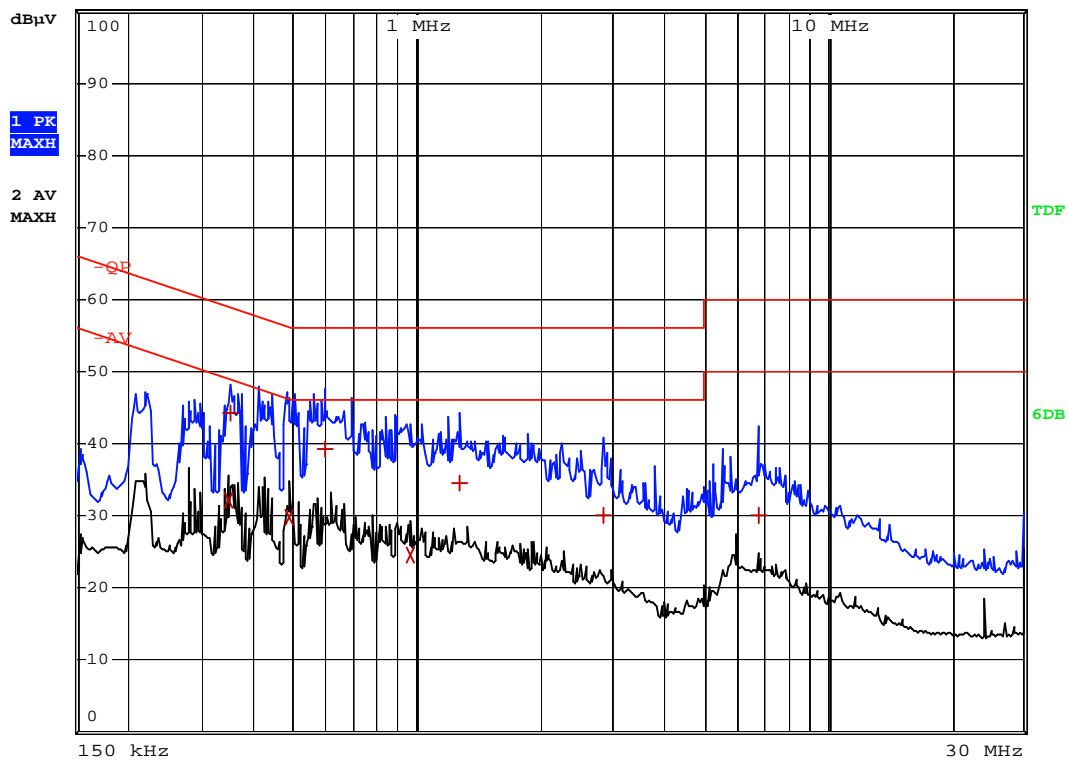
LINE CONDUCTED EMISSIONS				FCC 15.207	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB $\mu$ V	QP/Ave/Pk	Line/Neutral	dB $\mu$ V	dB
0.35	44.2	QP	Line	58.96	-14.8
0.35	43.3	QP	Neutral	58.96	-15.7
0.56	39.9	QP	Neutral	56	-16.1
0.48	29.7	AV	Line	46.34	-16.6
0.59	39.3	QP	Line	56	-16.7
0.34	32.2	AV	Line	49.2	-17.0
0.55	28.4	AV	Neutral	46	-17.6
0.95	35.0	QP	Neutral	56	-21.0
1.26	34.5	QP	Line	56	-21.5
0.34	27.2	AV	Neutral	49.2	-22.0
0.87	23.9	AV	Neutral	46	-22.1
0.96	21.4	AV	Line	46	-24.6

*Note: Emissions attenuation more than 25dB frequencies are not report.*



**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Internet TV/Radio**M/N: KMP511**Operating Condition: Wireless Playing**Test Specification: L**Comment: AC120V/60Hz; USB 5V*RBW 9 kHz  
MT 5 s

Att 10 dB AUTO



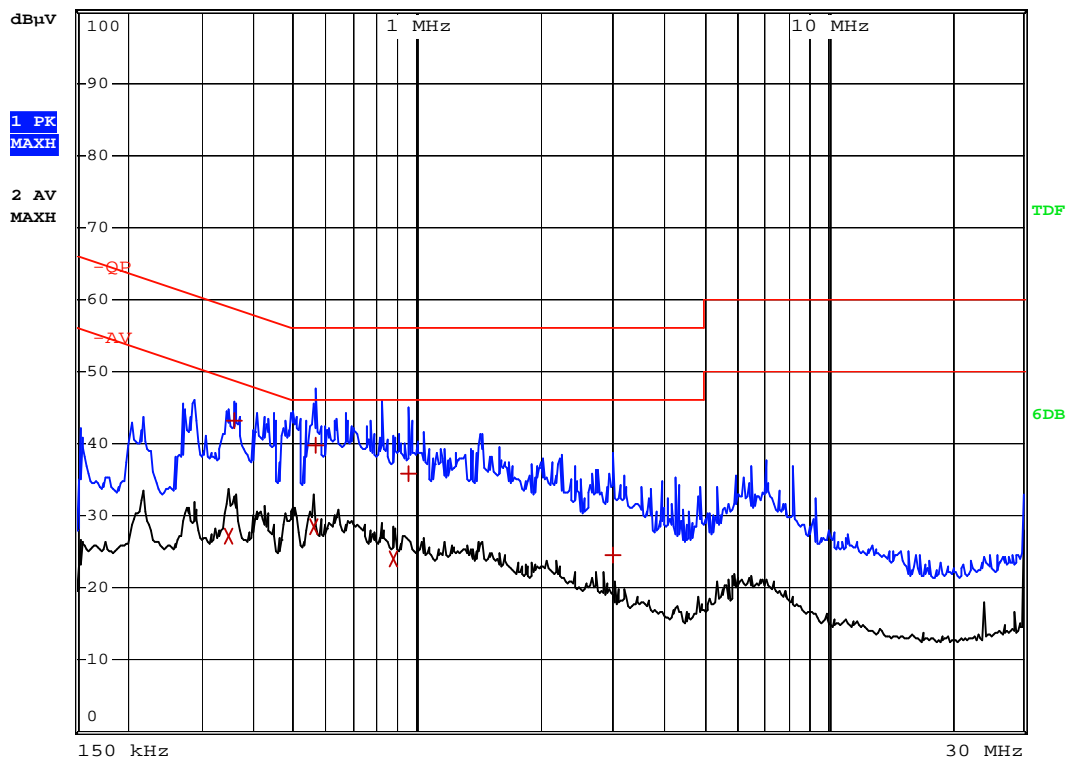
Date: 30.JUL.2010 09:08:32

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	346 kHz	32.19	-16.86
1 Quasi Peak	350 kHz	44.16	-14.80
2 Average	486 kHz	29.70	-16.53
1 Quasi Peak	594 kHz	39.33	-16.66
2 Average	966 kHz	24.55	-21.44
1 Quasi Peak	1.266 MHz	34.50	-21.49
1 Quasi Peak	2.858 MHz	29.96	-26.03
1 Quasi Peak	6.822 MHz	30.15	-29.84

Date: 30.JUL.2010 09:08:26

**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Internet TV/Radio**M/N: KMP511**Operating Condition: Wireless Playing**Test Specification: N**Comment: AC 120V/60Hz; USB 5V*RBW 9 kHz  
MT 5 s

Att 10 dB AUTO



Date: 30.JUL.2010 09:10:49

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
2 Average	346 kHz	27.18	-21.87
1 Quasi Peak	358 kHz	43.26	-15.50
2 Average	558 kHz	28.37	-17.62
1 Quasi Peak	566 kHz	39.86	-16.13
2 Average	878 kHz	23.93	-22.06
1 Quasi Peak	954 kHz	35.81	-20.19
1 Quasi Peak	2.998 MHz	24.44	-31.55

Date: 30.JUL.2010 09:10:39

## 5. POWER SPECTRAL DENSITY

### 5.1 Standard Applicable

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

### 5.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-08-12	2010-08-11
ETS	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	2009-08-12	2010-08-11

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

### 5.3 Test Procedure

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

### 5.4 Environmental Conditions

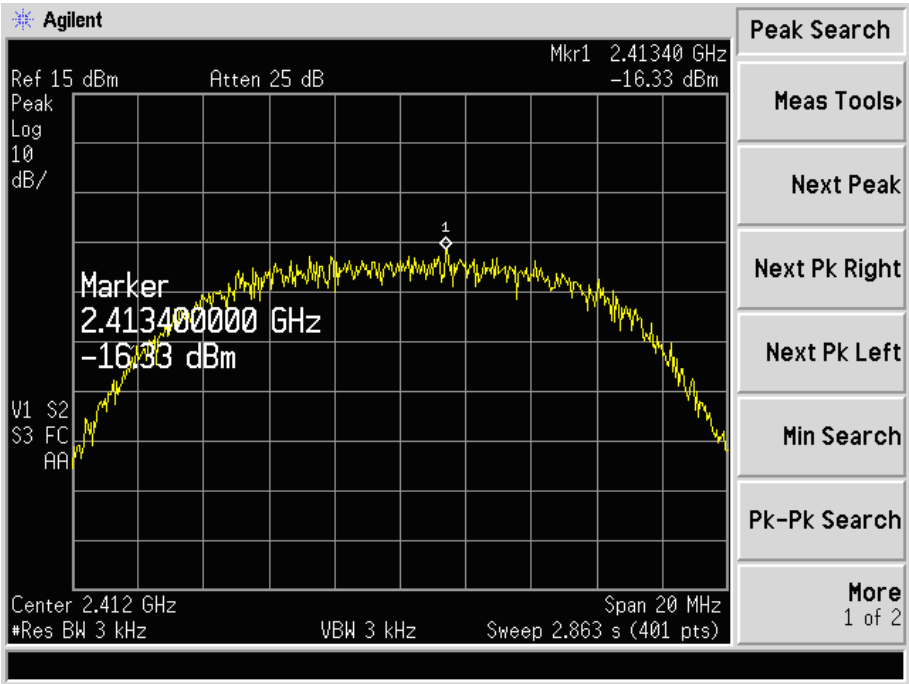
Temperature:	26 °C
Relative Humidity:	50 %
ATM Pressure:	1011 mbar

**5.5 Summary of Test Results/Plots**

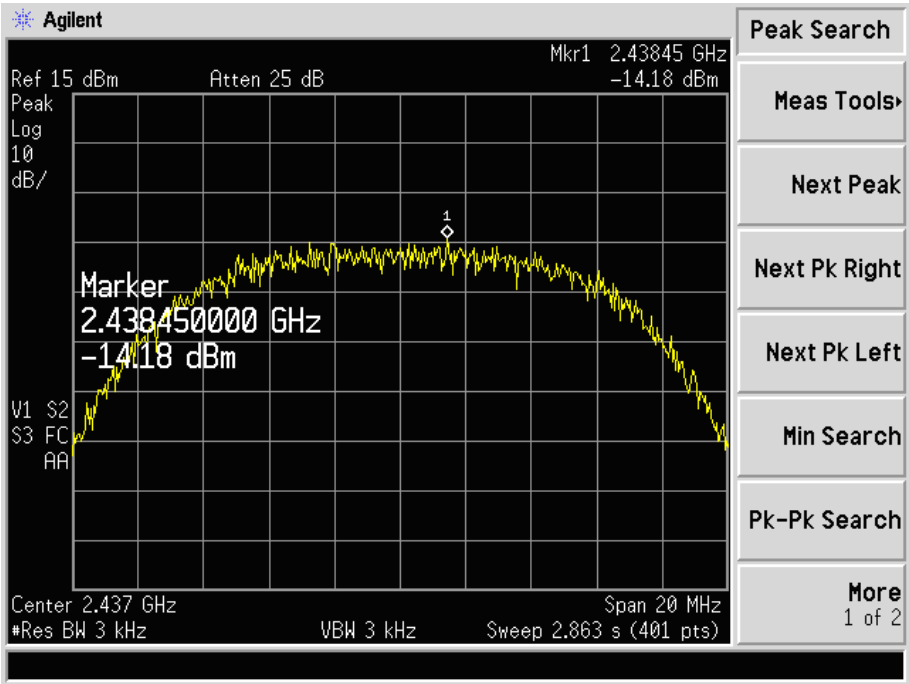
Test mode	Test channel	Reading dBm/3kHz	Limit dBm/3kHz
802.11b	Low channel (2412MHz)	-16.33	8
	Middle channel (2437MHz)	-14.18	8
	High channel (2462MHz)	-13.70	8
802.11g	Low channel (2412MHz)	-20.69	8
	Middle channel (2437MHz)	-20.21	8
	High channel (2462MHz)	-20.91	8

For 802.11b

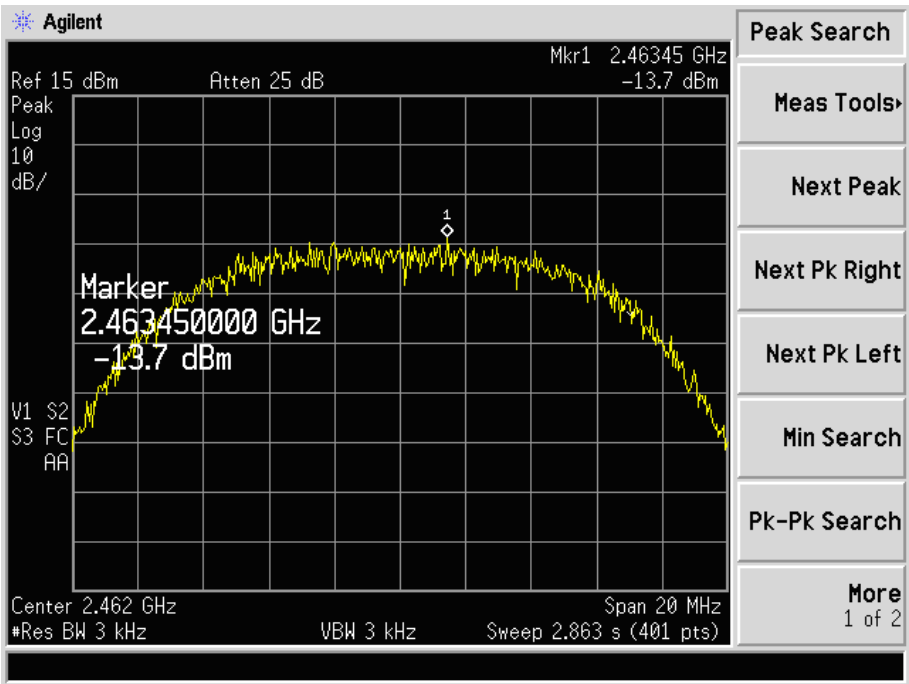
Low Channel:



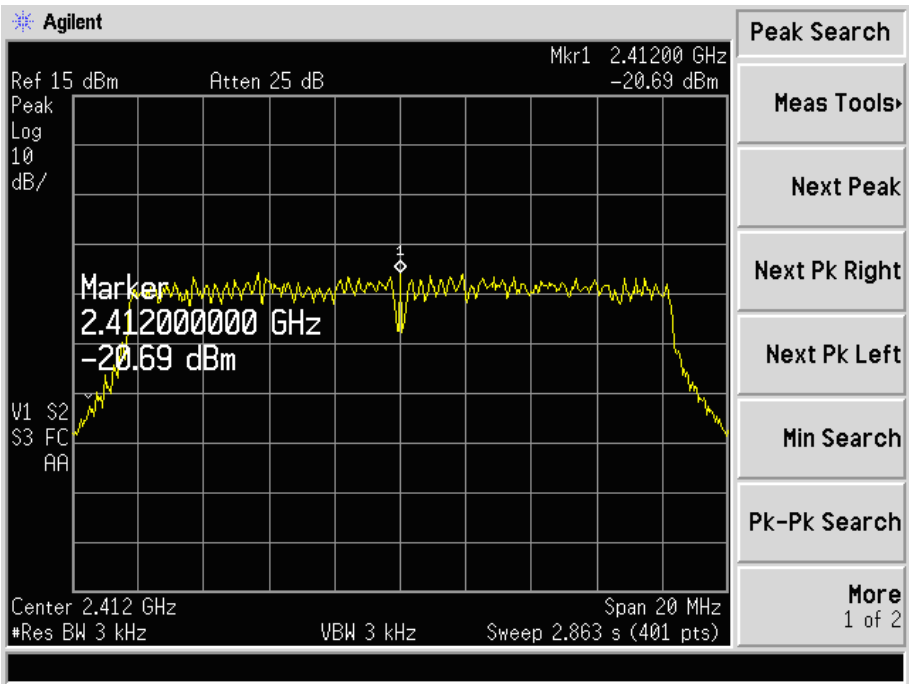
Middle Channel:



High Channel:

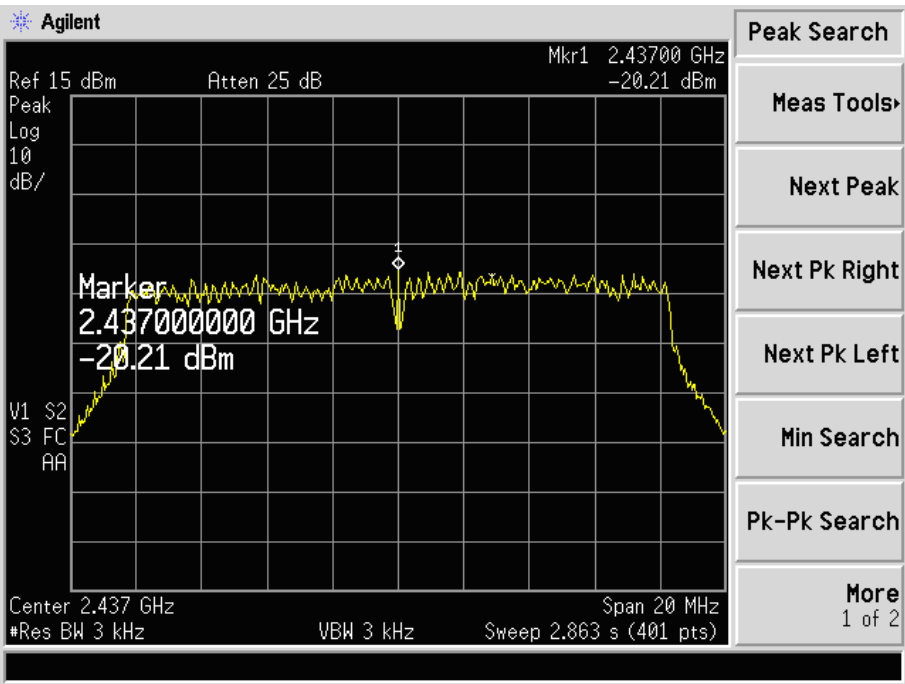


For 802.11g  
Low Channel:

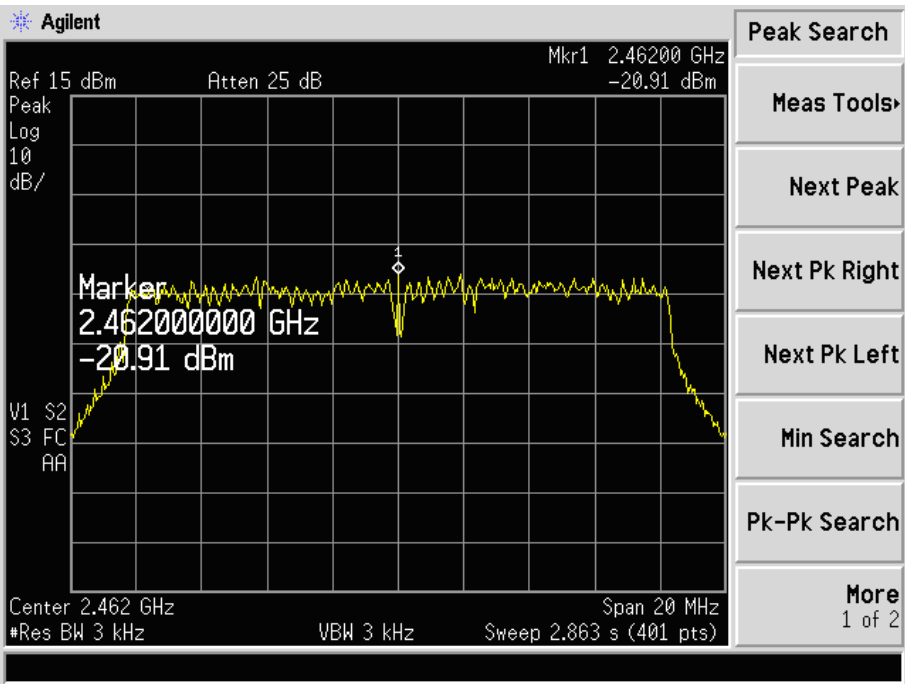




Middle Channel:

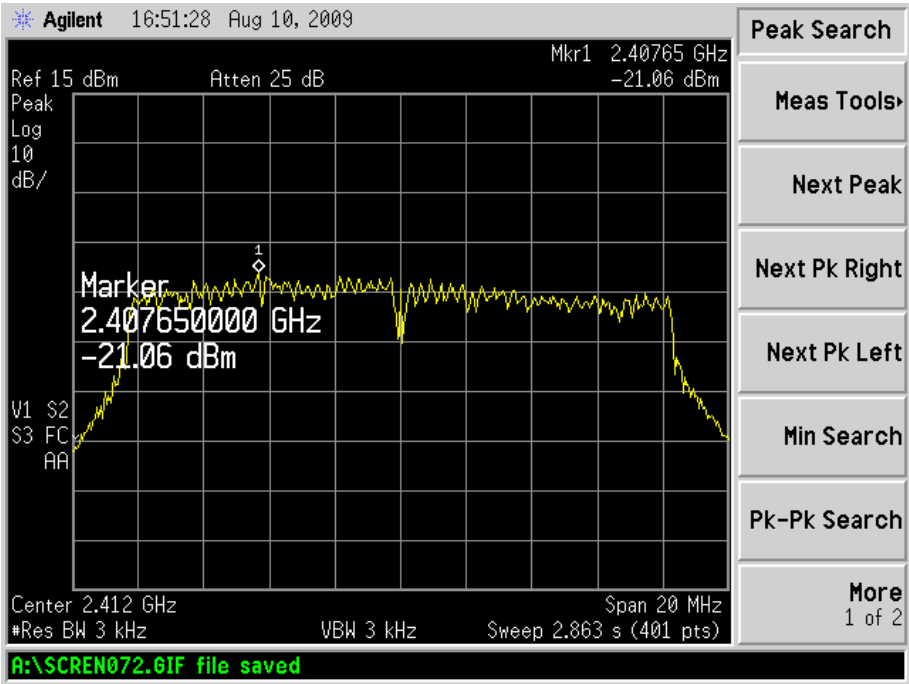


High Channel:

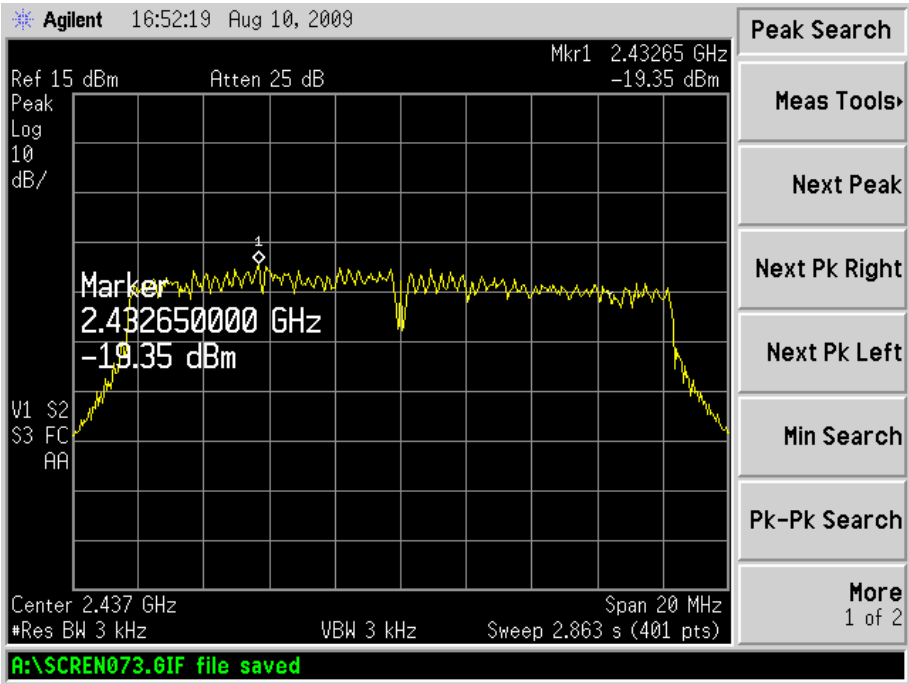


For 802.11g

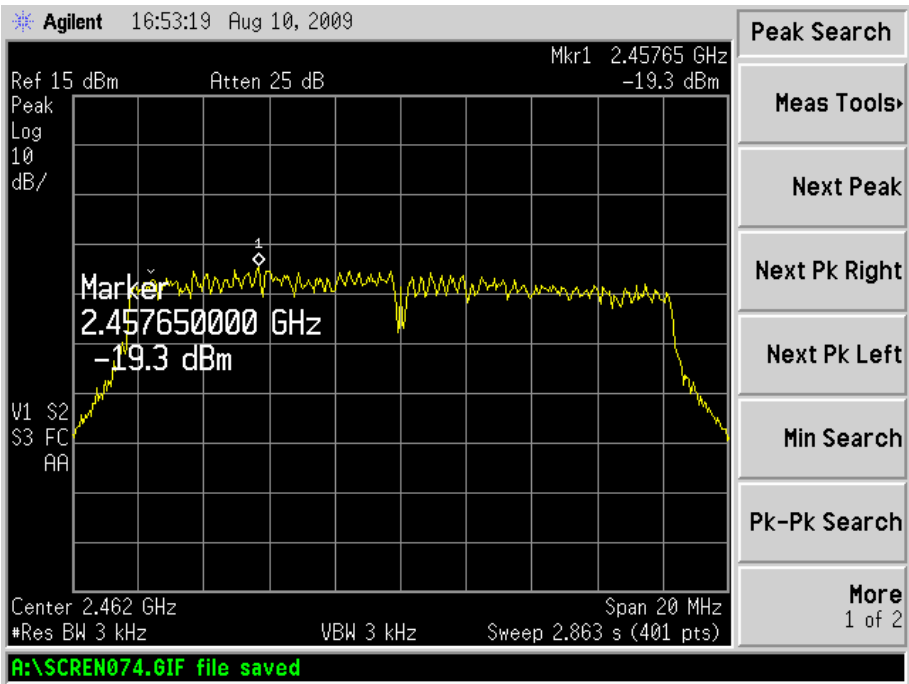
Low Channel:



Middle Channel:



High Channel:



## 6. 6-dB BANDWIDTH

### 6.1 Standard Applicable

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

### 6.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-08-12	2010-08-11
ETS	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	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. The spectrum analyzer as RBW=300KHz (1 % of Bandwidth.), Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.

### 6.4 Environmental Conditions

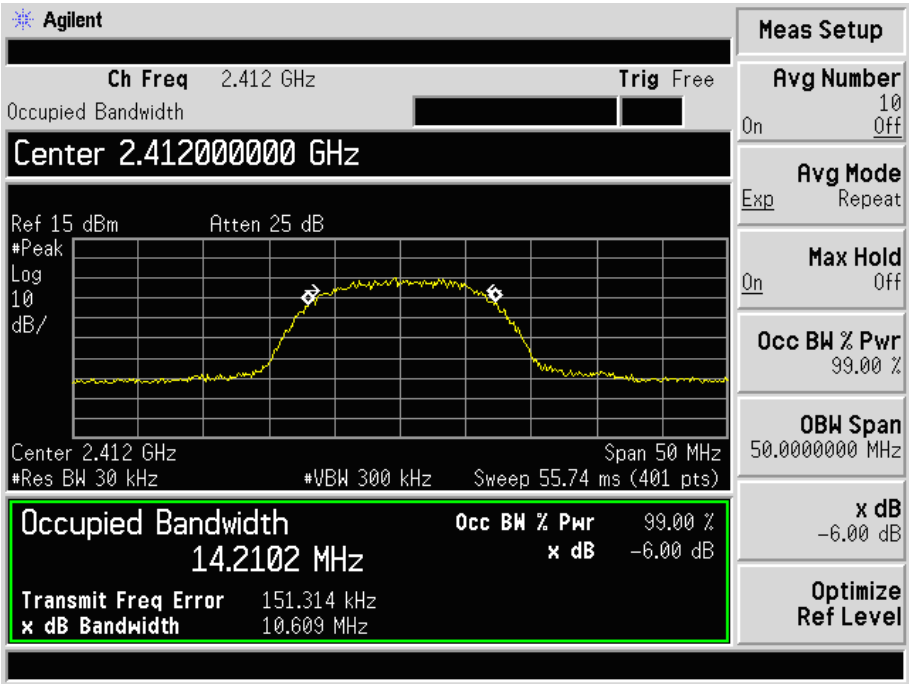
Temperature:	26 °C
Relative Humidity:	52 %
ATM Pressure:	1014 mbar

### 6.5 Summary of Test Results/Plots

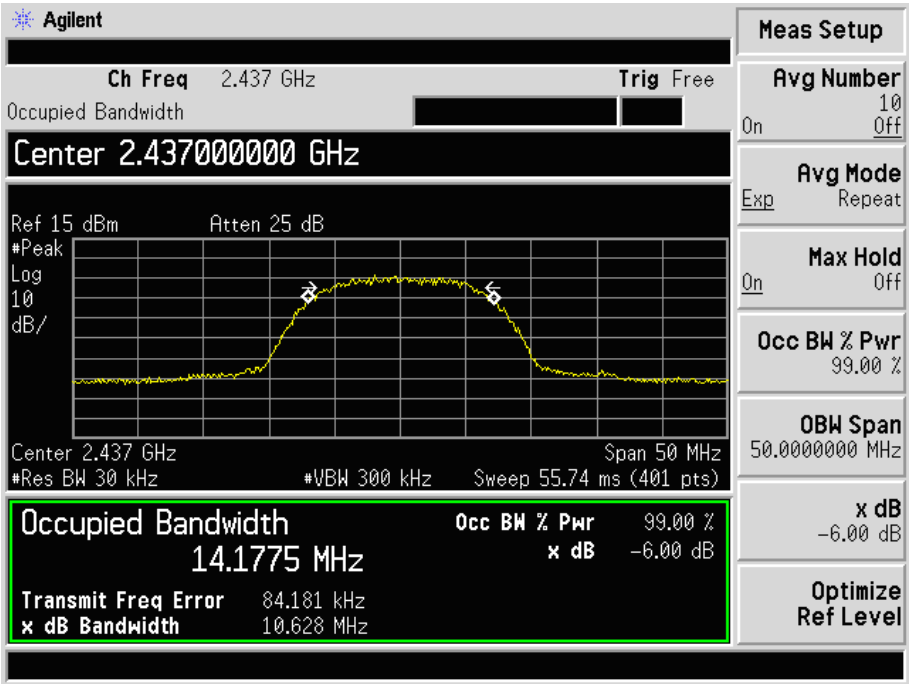
Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11 b	2412	10609	500
	2437	10628	500
	2462	10545	500

Test mode	Frequency MHz	6 dB Bandwidth kHz	Limit kHz
802.11g	2412	16561	500
	2437	16487	500
	2462	16533	500

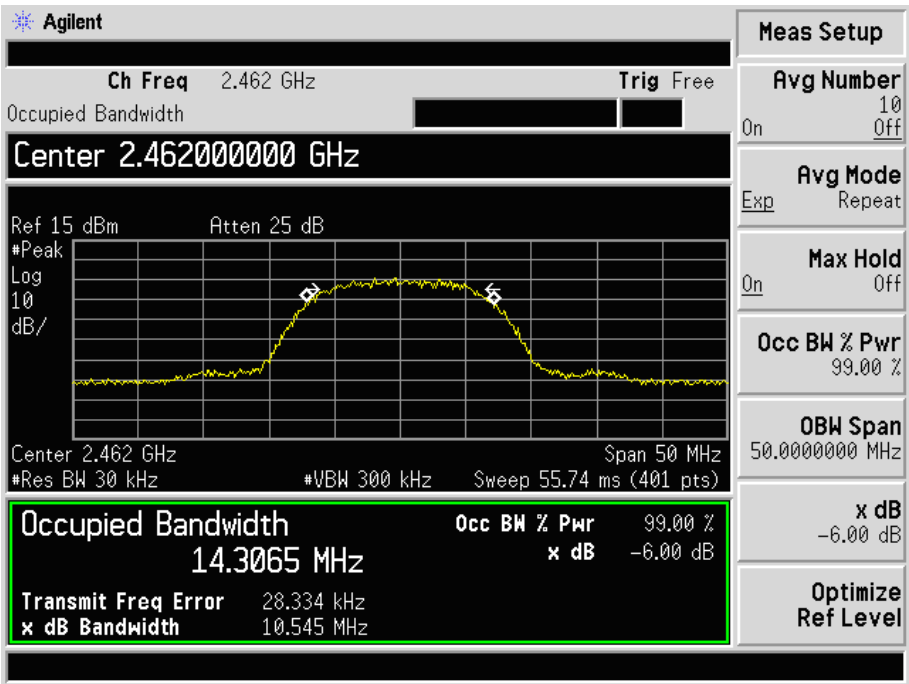
For 802.11b  
Low Channel:



Middle Channel:

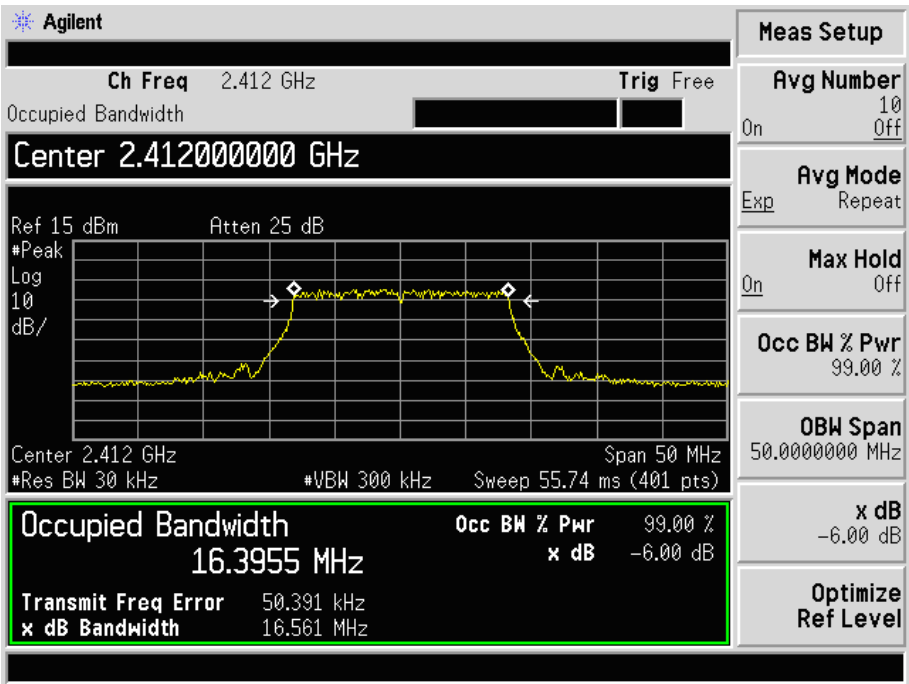


High Channel:

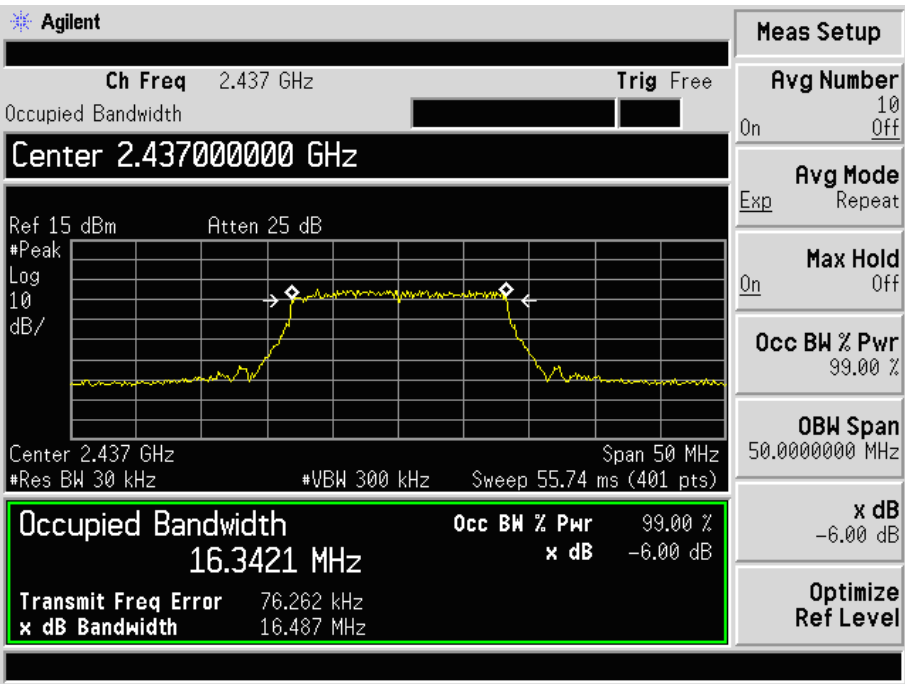


For 802.11g

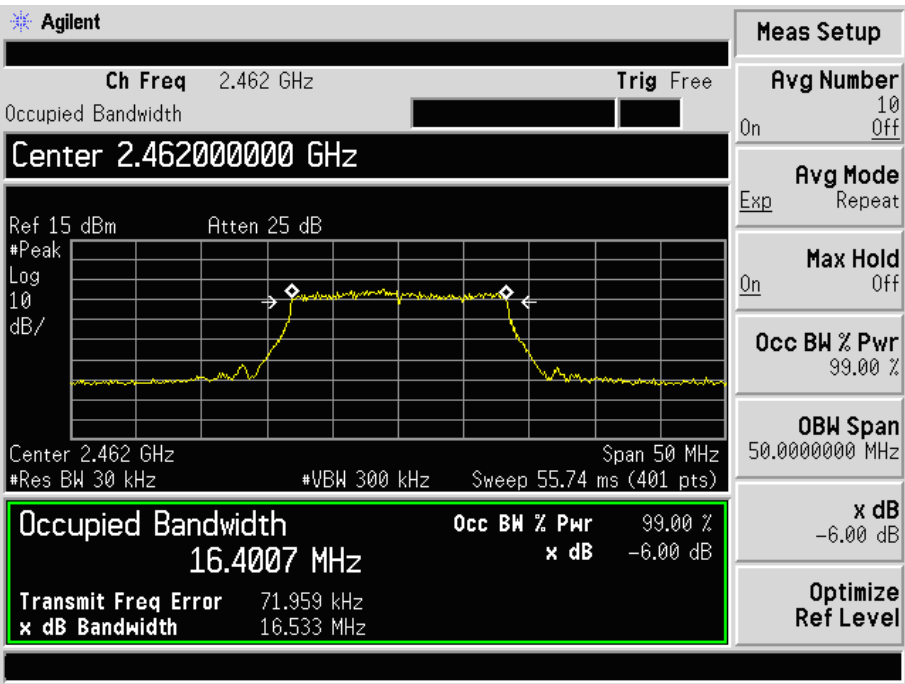
Low Channel:



Middle Channel:



High Channel:





## 7. POWER OUTPUT

### 7.1 Standard Applicable

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

### 7.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-08-12	2010-08-11
ETS	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	2009-08-12	2010-08-11

### 7.3 Test Procedure

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

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW  $\geq$  3 MHz.
4. Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode.
5. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”.
6. Trace average 100 traces in power averaging mode.
7. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges.

### 7.4 Environmental Conditions

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

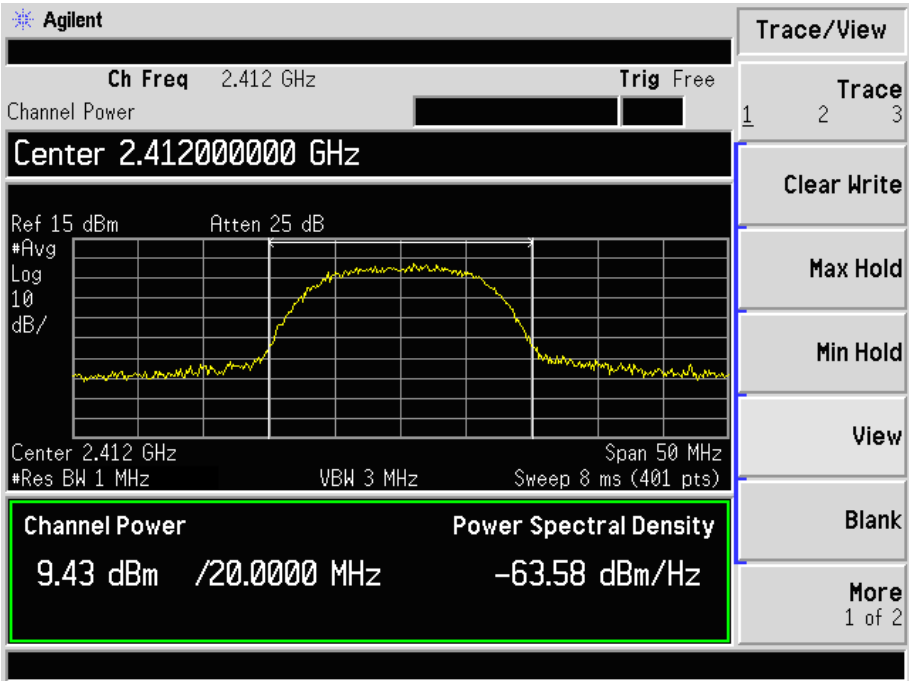
**7.5 Summary of Test Results/Plots**

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

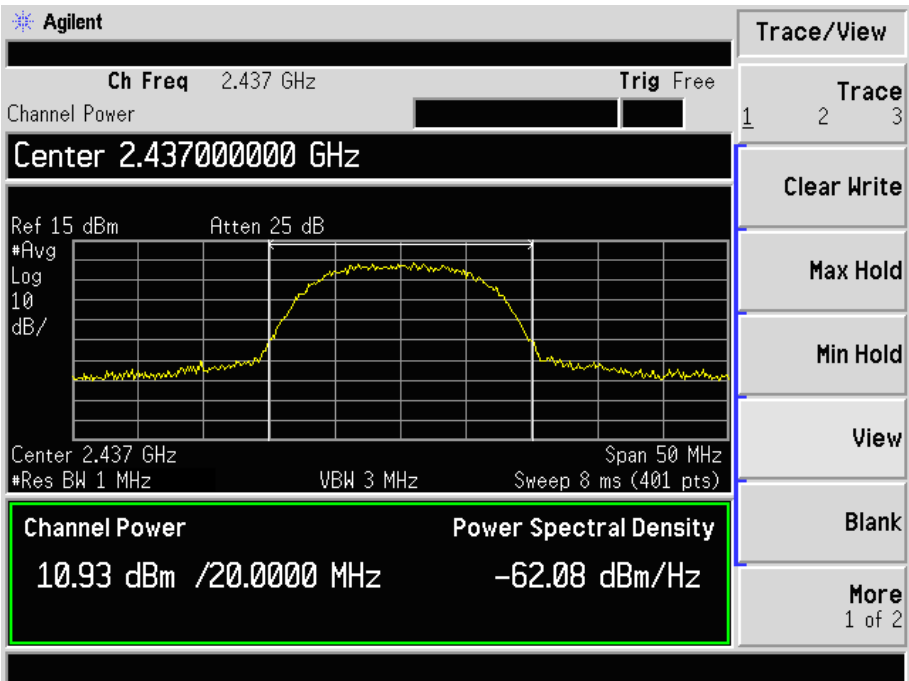
Test mode	Frequency MHz	Reading dBm	Output power W	Limit W
802.11g	2412	9.12	0.008616	1
	2437	7.28	0.005346	1
	2462	6.15	0.004121	1

For 802.11b

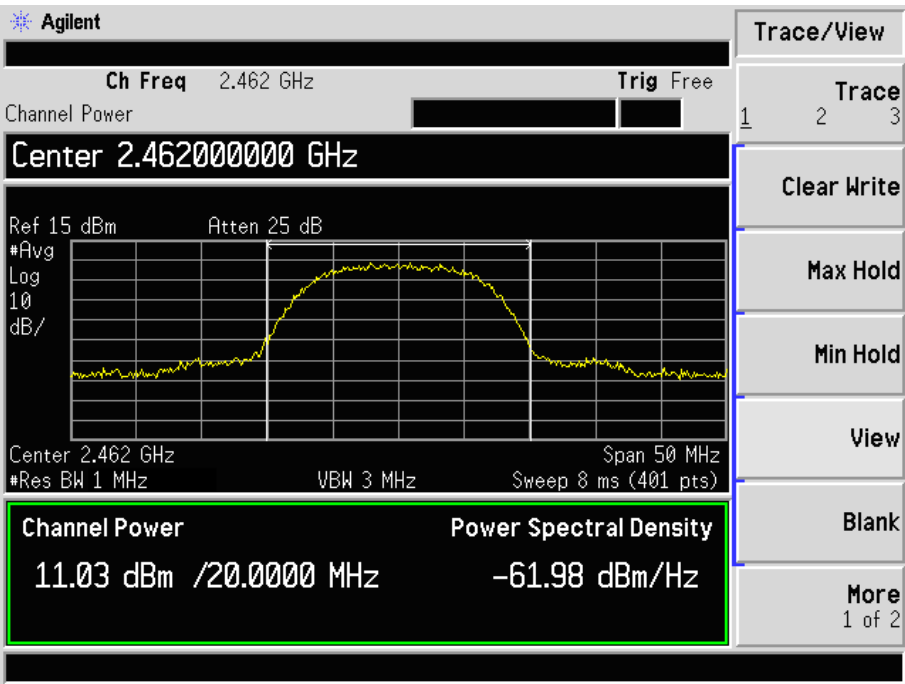
Low Channel:



Middle Channel:

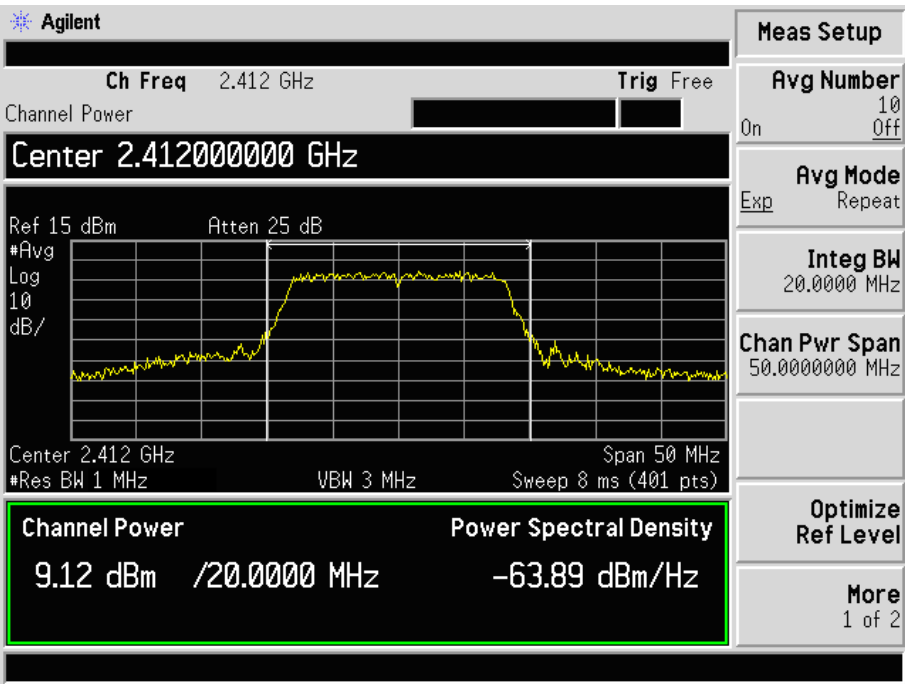


High Channel:

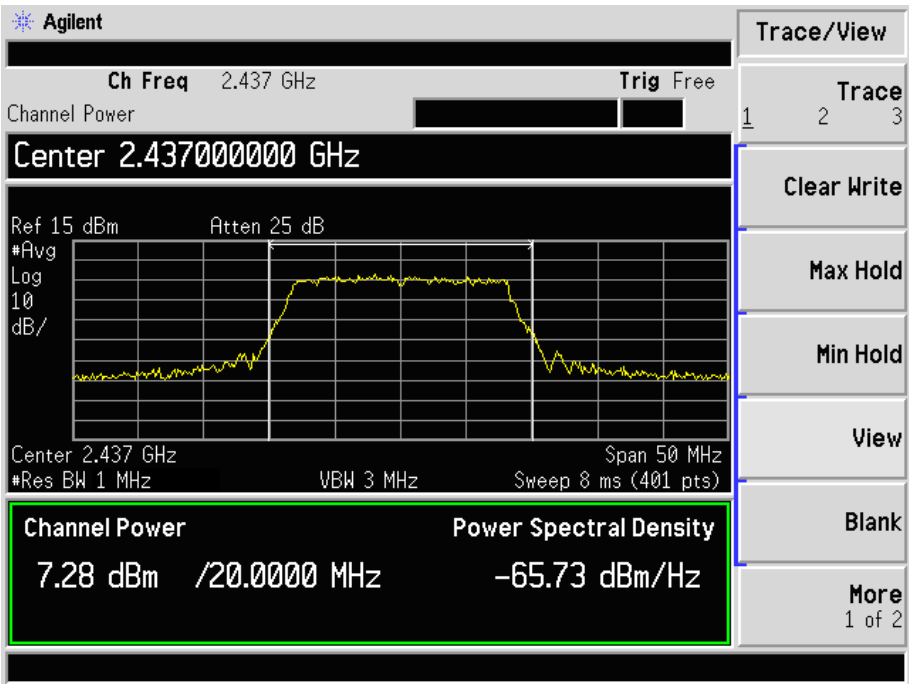


For 802.11g

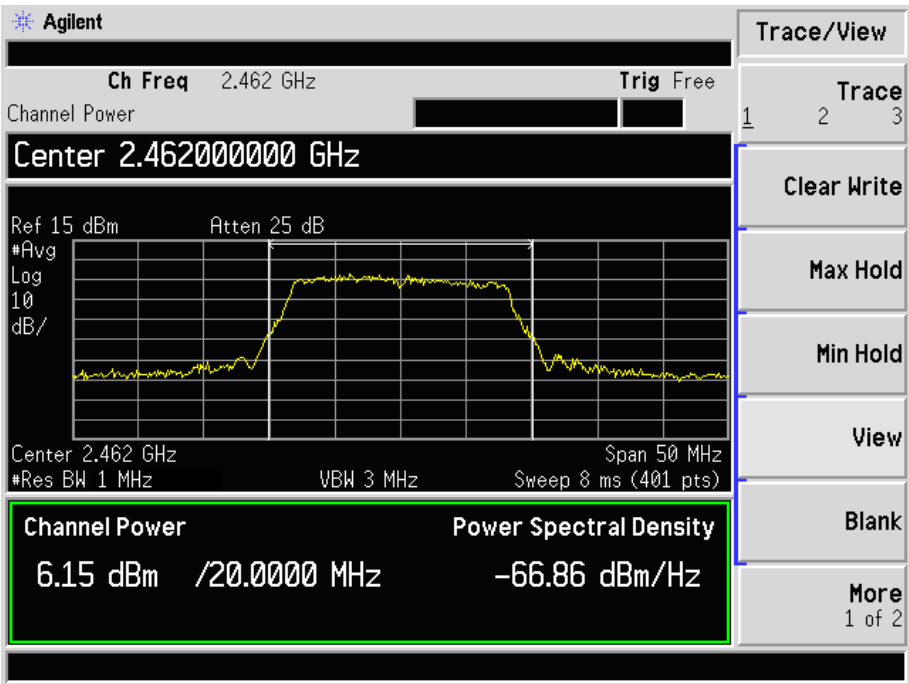
Low Channel:



Middle Channel:



High Channel:



## 8. FIELD STRENGTH OF SPURIOUS EMISSIONS

### 8.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is  $\pm 5.10$  dB.

### 8.2 Standard Applicable

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

Section 15.209:

30 - 88 MHz 40 dBuV/m @3M

88 -216 MHz 43.5 dBuV/m @3M

216 -960 MHz 46 dBuV/m @3M

Above 960 MHz 54dBuV/m @3M

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

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

### 8.3 Test Equipment List and Details

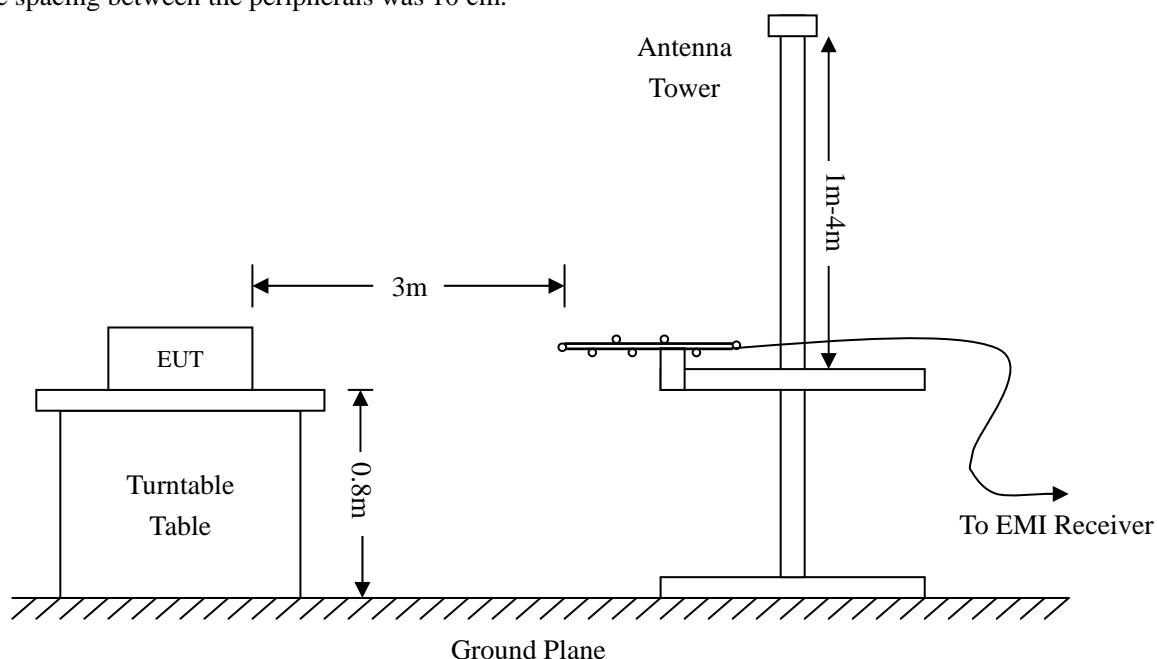
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2010-07-21	2011-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2010-07-21	2011-07-20
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
Spectrum Analyzer	ROHDE&SCHWARZ	FSP	836079/035	2010-04-16	2011-04-15

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

### 8.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

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



### 8.5 Corrected Amplitude & Margin Calculation

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

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

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

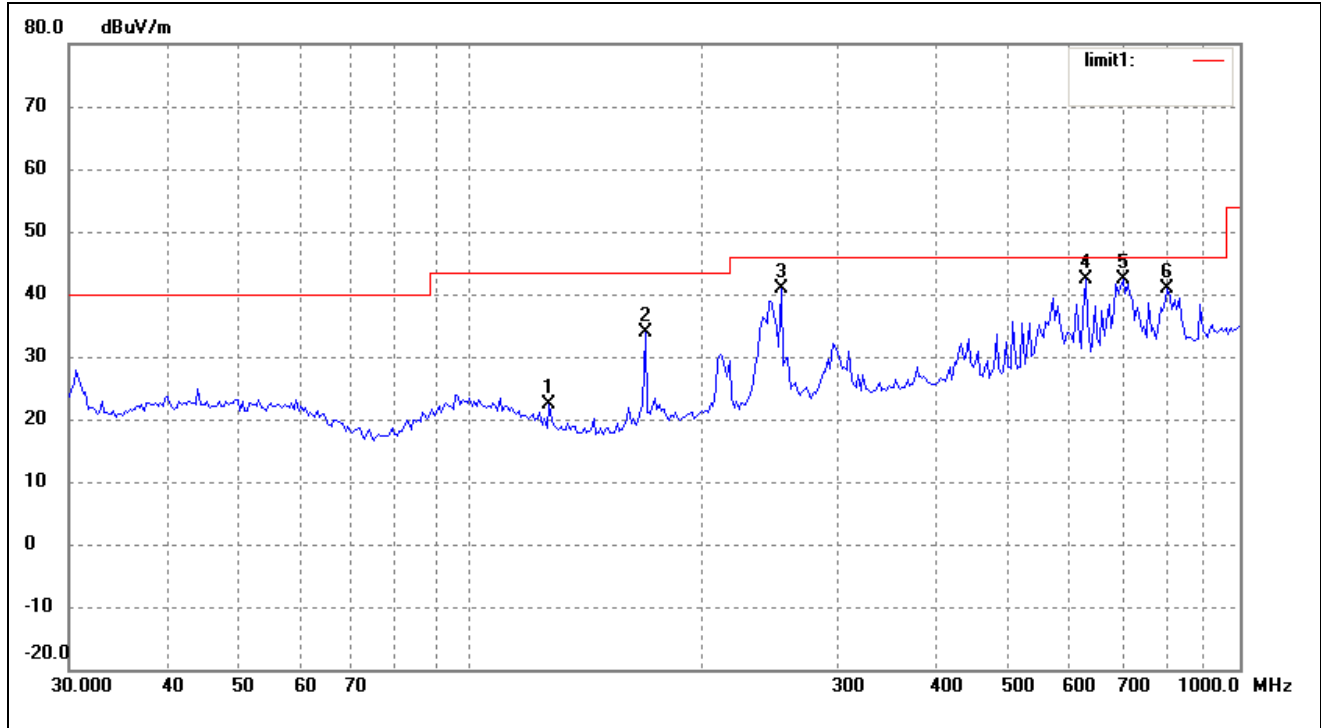
### 8.6 Environmental Conditions

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

### 8.7 Summary of Test Results/Plots

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

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

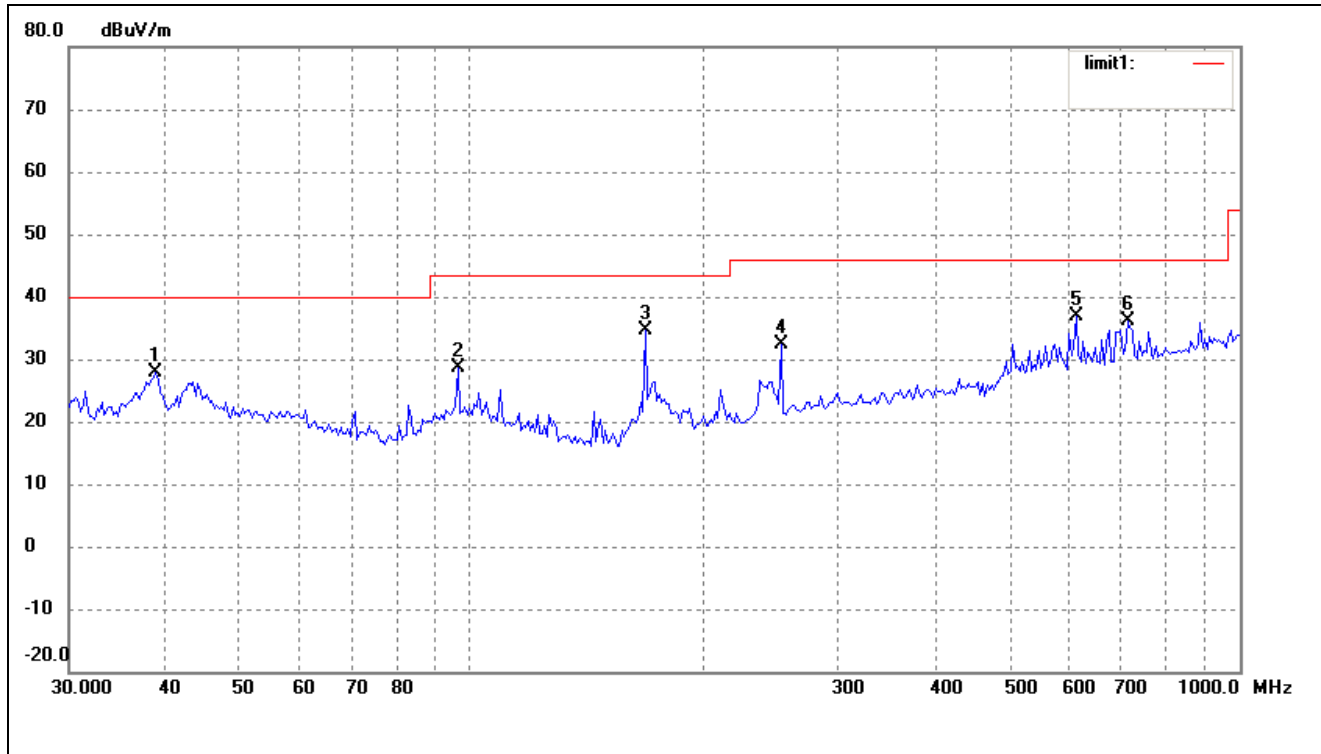
*Test Result/Plots:**Spurious Emission From 30 MHz to 1 GHz**Test mode: Transmitting (802.11b Low Channel)**Horizontal*

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( °)	(cm)	
1	126.3286	18.00	4.37	22.37	43.50	-21.13	215	100	QP
2	168.4138	29.93	4.01	33.94	43.50	-9.56	331	150	QP
3	252.9482	33.20	7.75	40.95	46.00	-5.05	105	110	QP
4	629.4772	28.02	14.27	42.29	46.00	-3.71	66	100	QP
5	704.2261	27.86	14.54	42.40	46.00	-3.60	291	100	QP
6	804.6028	25.21	15.57	40.78	46.00	-5.22	105	100	QP



Test mode: Transmitting (802.11b Low Channel)

Vertical

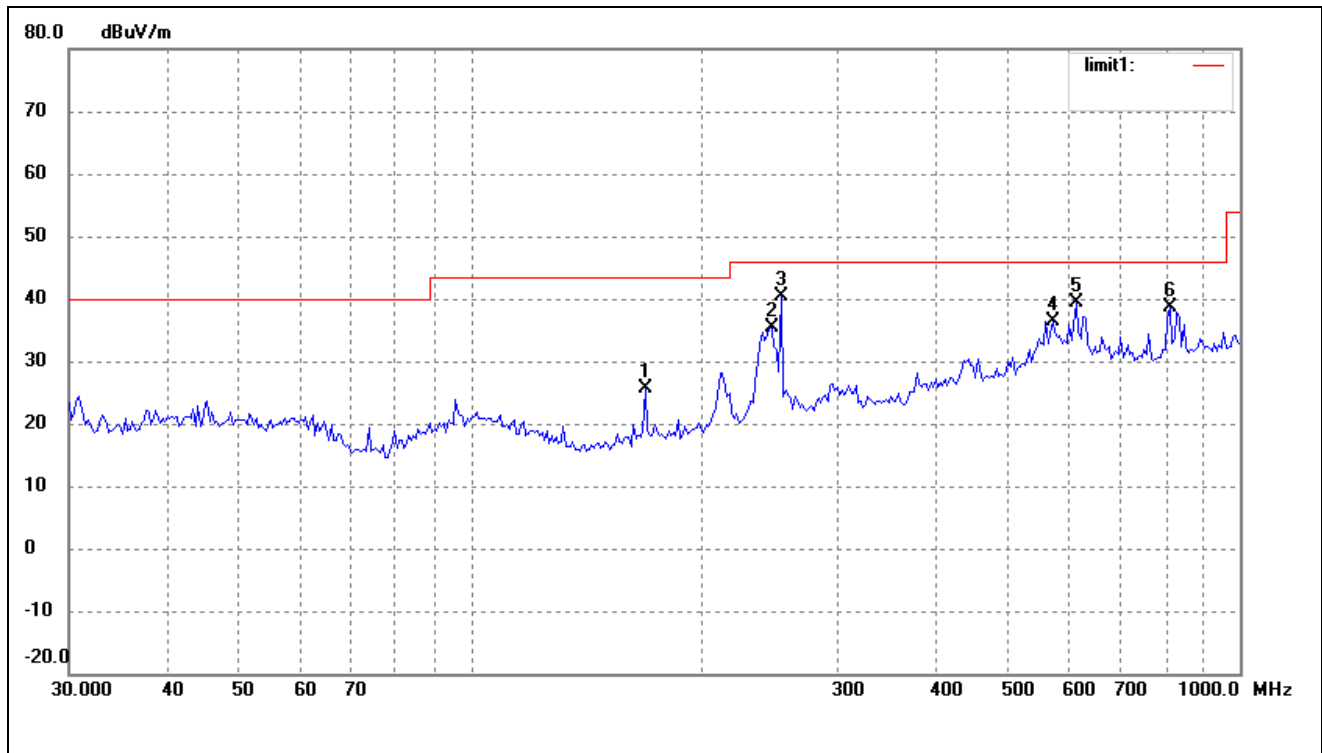


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	38.8879	20.31	7.64	27.95	40.00	-12.05	174	100	Peak
2	96.0986	21.02	7.54	28.56	43.50	-14.94	152	100	Peak
3	168.4138	30.65	4.01	34.66	43.50	-8.84	135	100	QP
4	252.9482	24.51	7.75	32.26	46.00	-13.74	49	120	QP
5	612.0642	22.63	14.21	36.84	46.00	-9.16	316	100	QP
6	714.1734	21.43	14.64	36.07	46.00	-9.93	55	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11b Middle Channel)

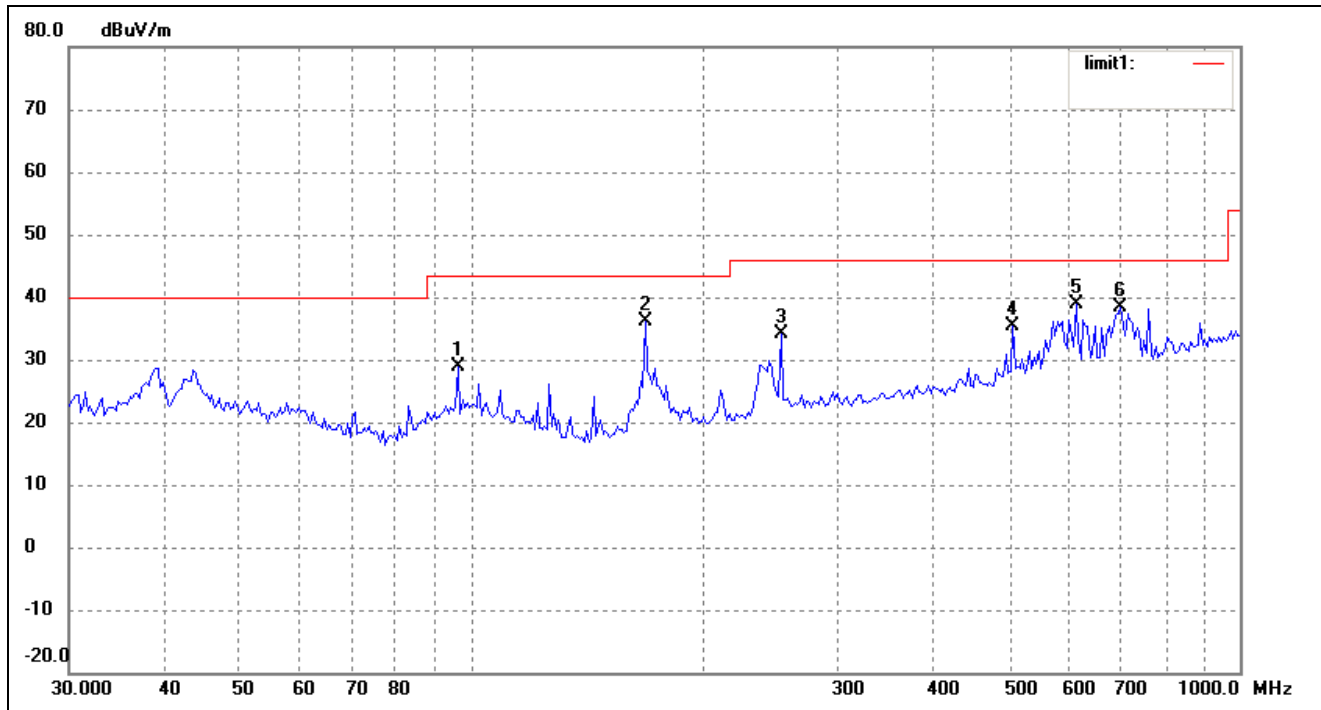
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	168.4138	21.64	4.01	25.65	43.50	-17.85	146	100	Peak
2	245.9509	27.87	7.58	35.45	46.00	-10.55	13	100	QP
3	252.9482	32.60	7.75	40.35	46.00	-5.65	339	100	QP
4	570.6100	22.74	13.65	36.39	46.00	-9.61	158	100	QP
5	612.0642	25.17	14.21	39.38	46.00	-6.62	146	100	QP
6	810.2654	23.03	15.65	38.68	46.00	-7.32	207	100	QP

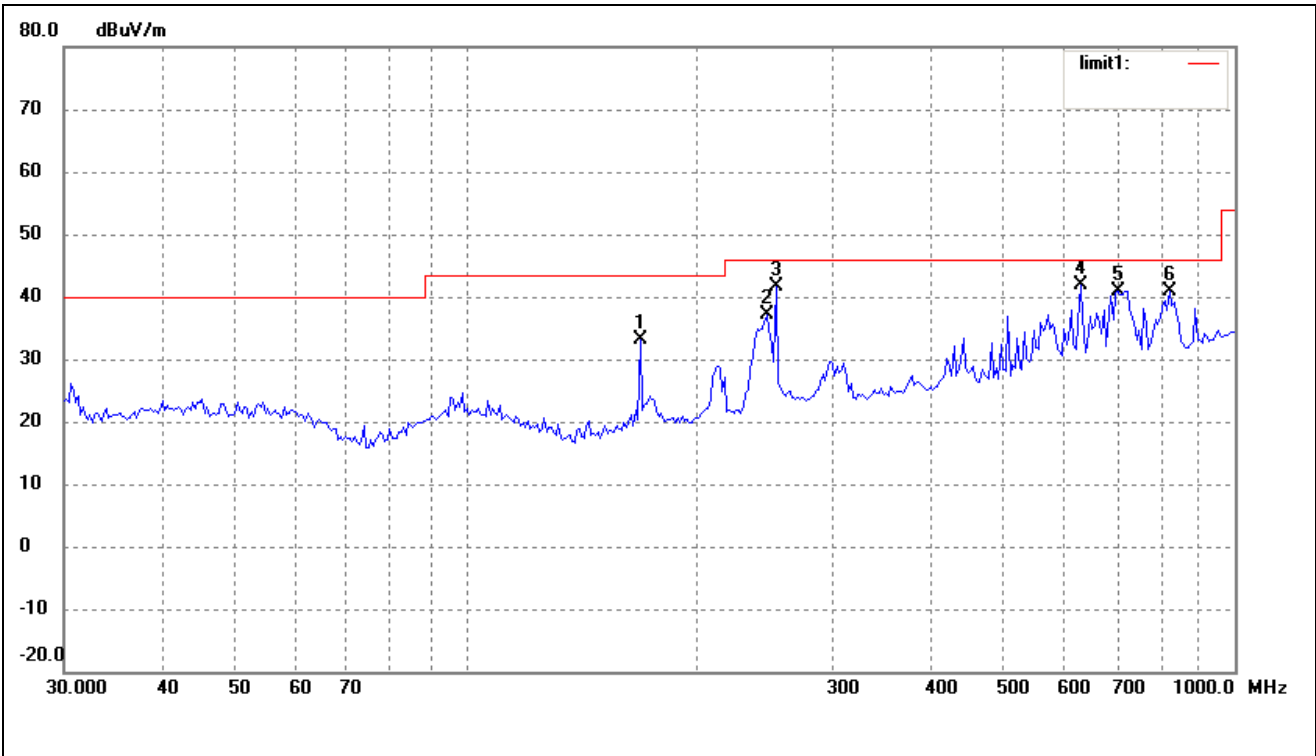
Test mode: Transmitting (802.11b Middle Channel)

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	96.0986	21.26	7.54	28.80	43.50	-14.70	142	110	Peak
2	168.4138	32.06	4.01	36.07	43.50	-7.43	66	100	Peak
3	252.9482	26.39	7.75	34.14	46.00	-11.86	213	200	Peak
4	506.4791	22.31	13.01	35.32	46.00	-10.68	56	100	peak
5	612.0642	24.68	14.21	38.89	46.00	-7.11	59	200	QP
6	699.3046	23.82	14.50	38.32	46.00	-7.68	31	100	QP

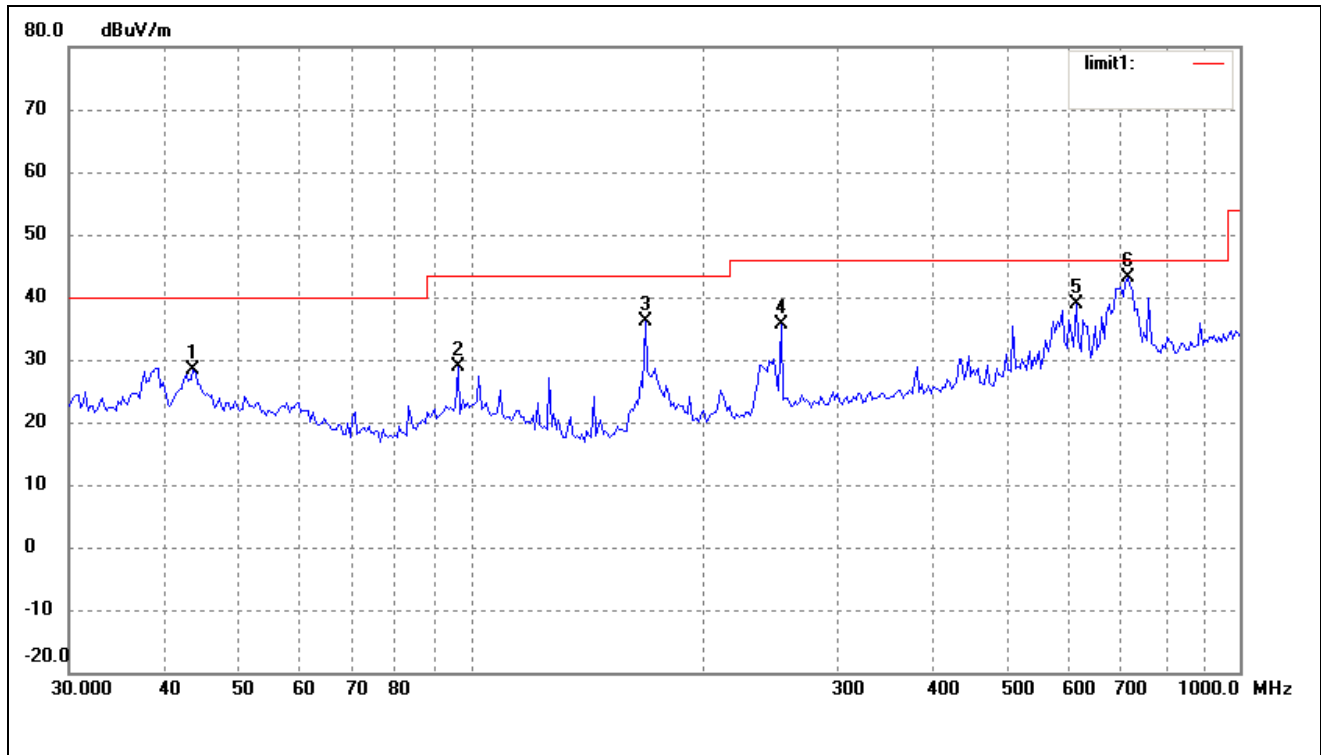
Spurious Emission From 30 MHz to 1 GHz  
Test mode: Transmitting (802.11b High Channel)  
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	168.4138	29.20	4.01	33.21	43.50	-10.29	150	100	Peak
2	245.9509	29.46	7.58	37.04	46.00	-8.96	225	100	Peak
3	252.9482	33.88	7.75	41.63	46.00	-4.37	170	100	QP
4	629.4772	27.66	14.27	41.93	46.00	-4.07	31	200	Peak
5	704.2261	26.43	14.54	40.97	46.00	-5.03	156	100	Peak
1	168.4138	29.20	4.01	33.21	43.50	-10.29	21	100	Peak

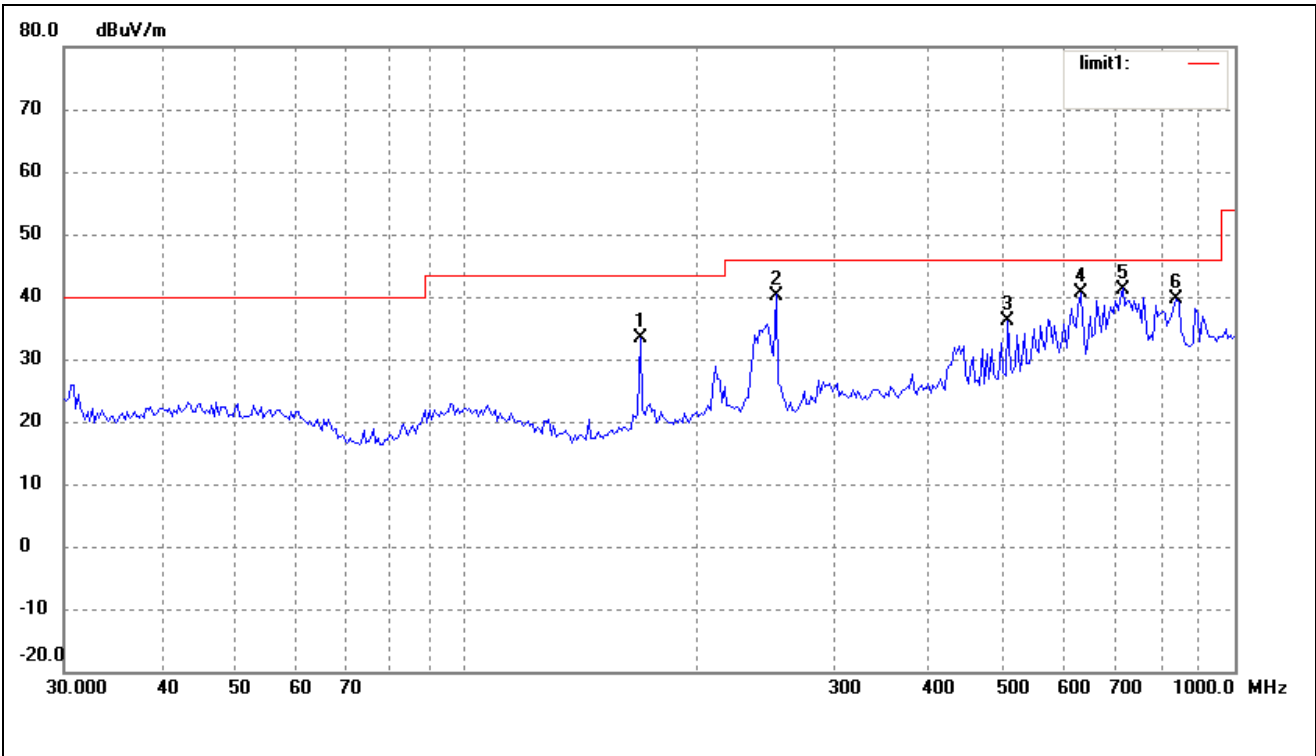
Test mode: Transmitting (802.11b High Channel)

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( °)	Height (cm)	Remark
1	43.5057	20.32	7.97	28.29	40.00	-11.71	33	100	QP
2	96.0986	21.26	7.54	28.80	43.50	-14.70	125	100	Peak
3	168.4138	32.06	4.01	36.07	43.50	-7.43	130	100	QP
4	252.9482	27.84	7.75	35.59	46.00	-10.41	100	120	Peak
5	612.0642	24.68	14.21	38.89	46.00	-7.11	49	100	QP
6	714.1734	28.41	14.64	43.05	46.00	-2.95	125	100	QP

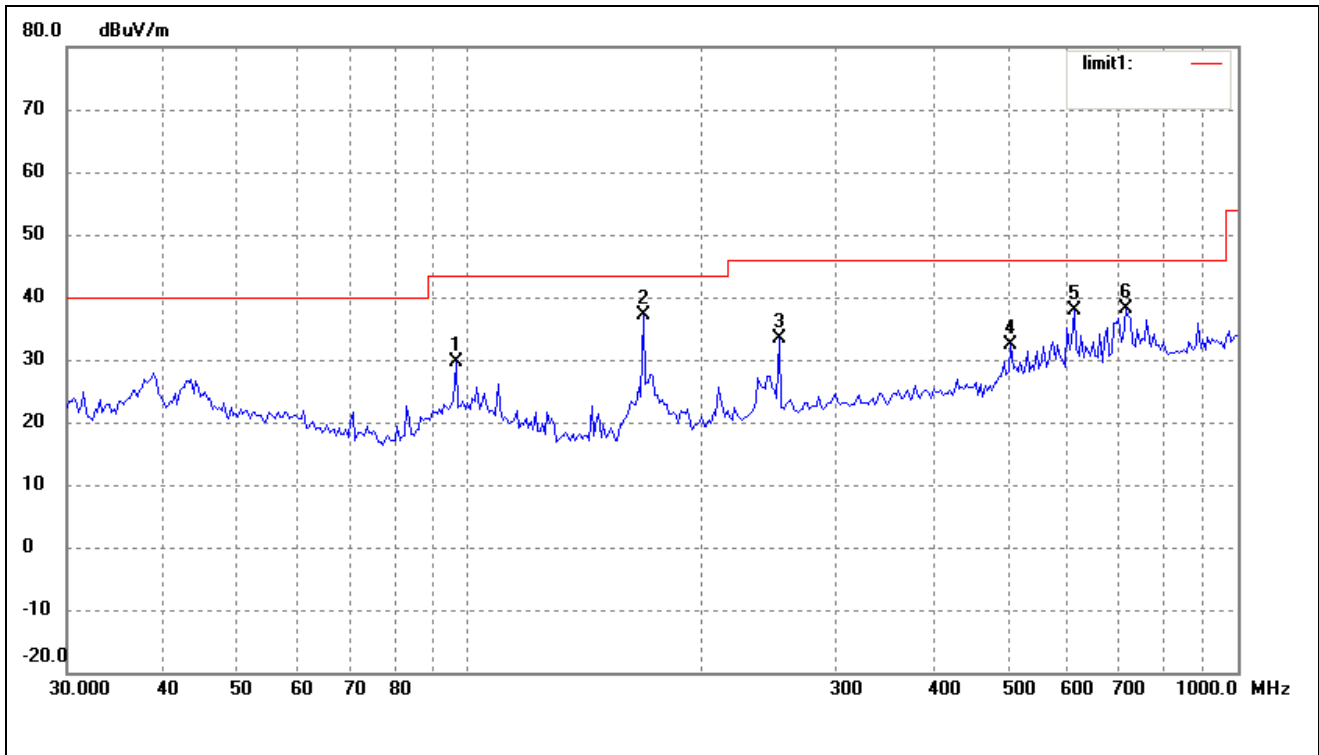
Spurious Emission From 30 MHz to 1 GHz  
Test mode: Transmitting (802.11g Low Channel)  
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	168.4138	29.48	4.01	33.49	43.50	-10.01	78	100	Peak
2	252.9482	32.50	7.75	40.25	46.00	-5.75	66	100	QP
3	506.4791	23.68	12.52	36.20	46.00	-9.80	301	100	Peak
4	629.4772	26.44	14.27	40.71	46.00	-5.29	24	100	QP
5	714.1734	26.61	14.64	41.25	46.00	-4.75	77	100	QP
6	839.1817	23.66	16.06	39.72	46.00	-6.28	250	100	QP

Test mode: Transmitting (802.11g Low Channel)

Vertical:

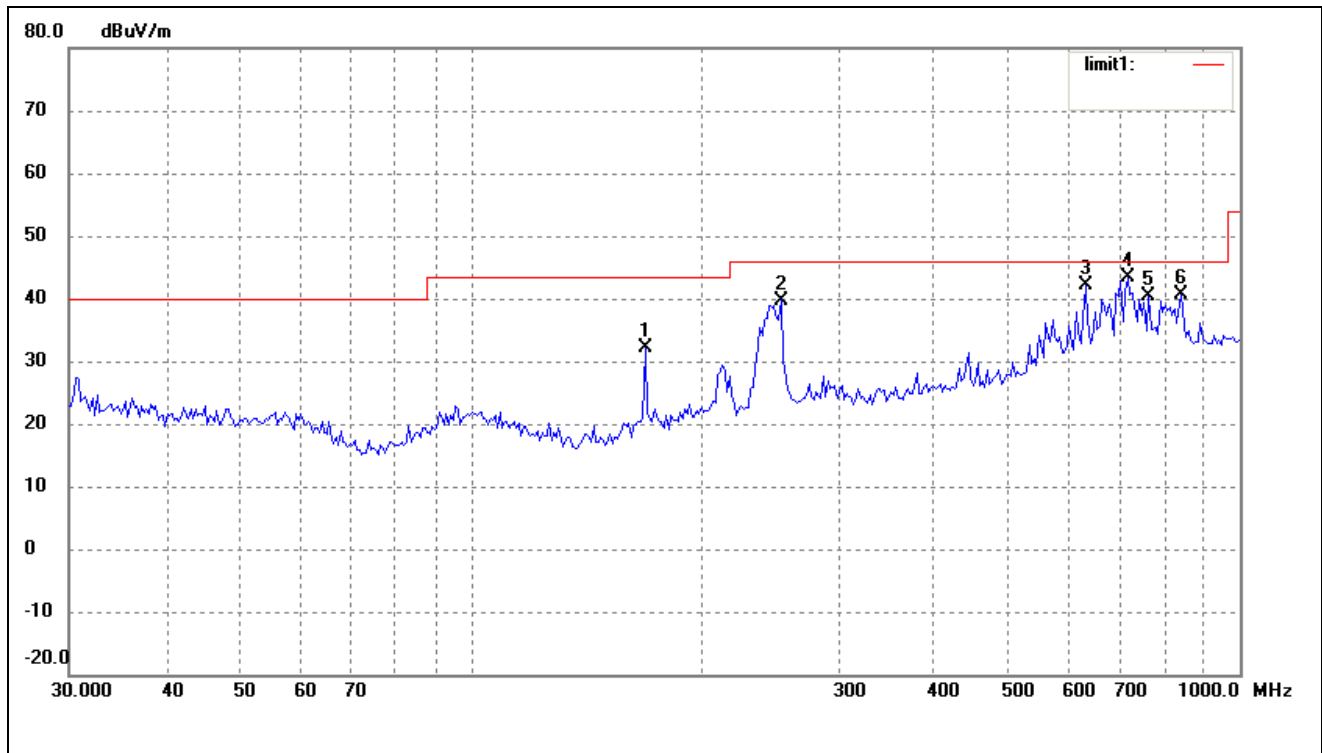


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( °)	Height (cm)	Remark
1	96.0986	22.02	7.54	29.56	43.50	-13.94	12	100	QP
2	168.4138	33.15	4.01	37.16	43.50	-6.34	76	100	QP
3	252.9482	25.51	7.75	33.26	46.00	-12.74	62	100	Peak
4	506.4791	19.45	13.01	32.46	46.00	-13.54	156	100	Peak
5	612.0642	23.63	14.21	37.84	46.00	-8.16	99	100	QP
6	714.1734	23.43	14.64	38.07	46.00	-7.93	63	100	QP

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting (802.11g Middle Channel)

Horizontal

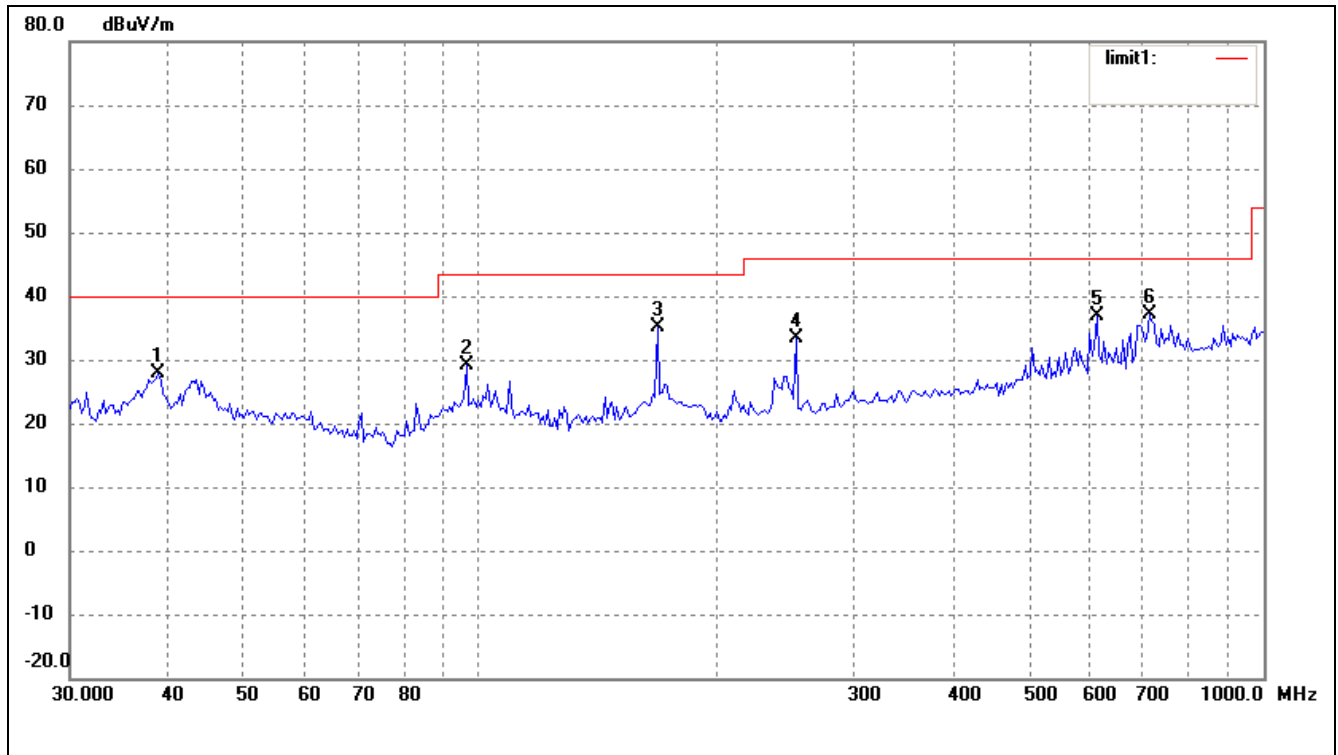


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	168.4138	28.06	4.01	32.07	43.50	-11.43	152	100	Peak
2	252.9482	32.00	7.75	39.75	46.00	-6.25	31	100	QP
3	629.4772	27.94	14.27	42.21	46.00	-3.79	11	100	QP
4	714.1734	28.73	14.64	43.37	46.00	-2.63	267	100	QP
5	760.7036	25.23	15.12	40.35	46.00	-5.65	56	100	QP
6	839.1817	24.66	16.06	40.72	46.00	-5.28	150	100	QP



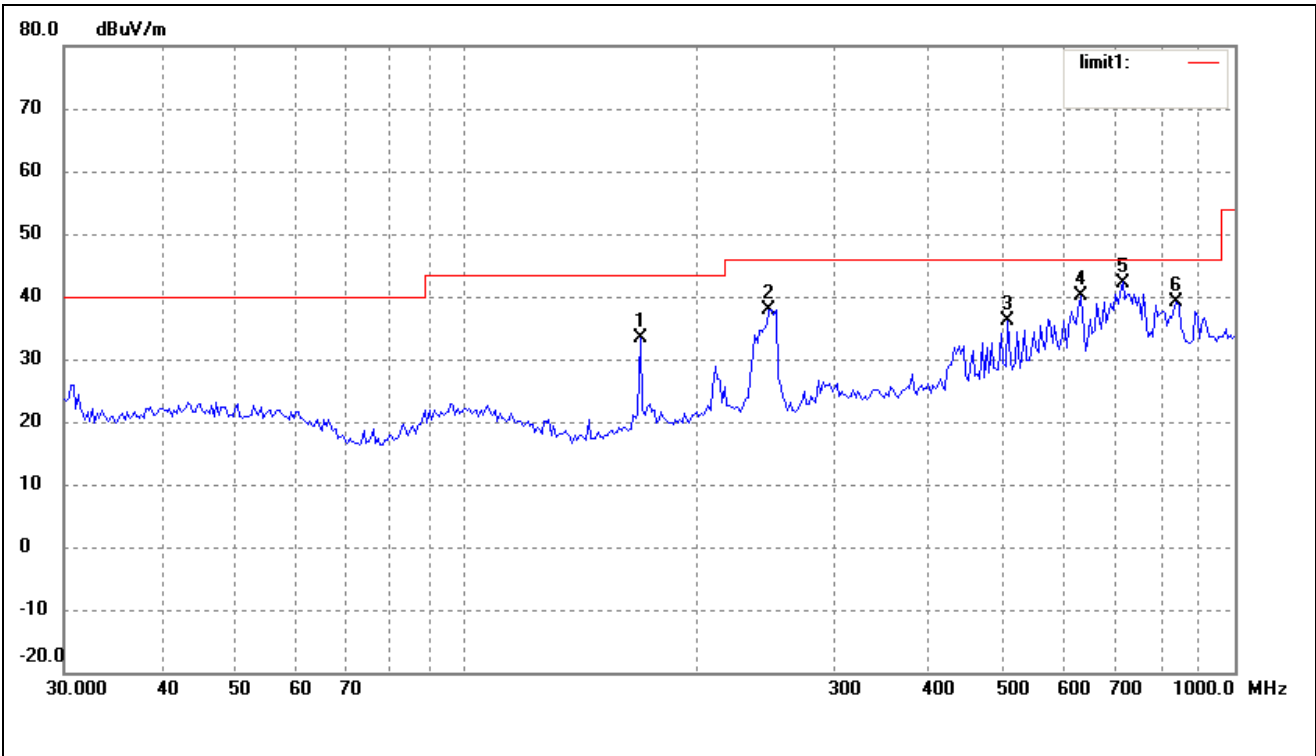
Test mode: Transmitting (802.11g Middle Channel)

Vertical:



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	38.8879	20.31	7.64	27.95	40.00	-12.05	101	100	Peak
2	96.0986	21.52	7.54	29.06	43.50	-14.44	45	100	Peak
3	168.4138	31.15	4.01	35.16	43.50	-8.34	326	100	Peak
4	252.9482	25.51	7.75	33.26	46.00	-12.74	159	100	Peak
5	612.0642	22.63	14.21	36.84	46.00	-9.16	78	100	Peak
6	714.1734	22.43	14.64	37.07	46.00	-8.93	250	100	Peak

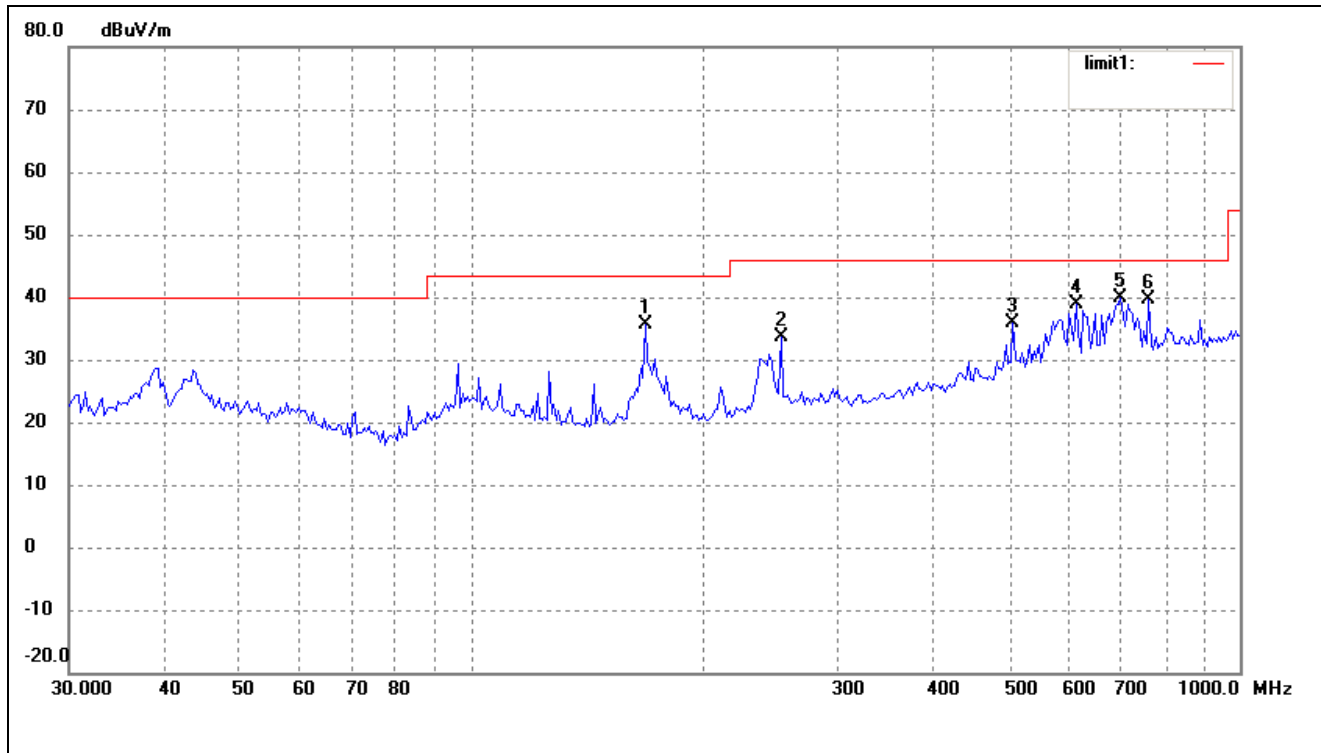
Spurious Emission From 30 MHz to 1 GHz  
Test mode: Transmitting (802.11g High Channel)  
Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	168.4138	29.48	4.01	33.49	43.50	-10.01	120	200	Peak
2	247.6819	30.23	7.62	37.85	46.00	-8.15	145	100	Peak
3	506.4791	23.68	12.52	36.20	46.00	-9.80	187	100	QP
4	629.4772	25.94	14.27	40.21	46.00	-5.79	263	100	QP
5	714.1734	27.61	14.64	42.25	46.00	-3.75	220	100	QP
6	839.1816	23.16	16.06	39.22	46.00	-6.78	36	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	168.4138	31.56	4.01	35.57	43.50	-7.93	316	110	QP
2	252.9482	25.89	7.75	33.64	46.00	-12.36	149	100	QP
3	506.4791	22.81	13.01	35.82	46.00	-10.18	21	100	QP
4	612.0642	24.68	14.21	38.89	46.00	-7.11	25	200	QP
5	699.3046	25.32	14.50	39.82	46.00	-6.18	359	100	QP
6	760.7036	24.56	15.12	39.68	46.00	-6.32	87	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	44.3	270	V	34.1	5.2	33.0	50.6	54	-3.4
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	46.5	90	V	34.1	5.2	33.0	50.8	54	-3.2
7311.0	AV	39.1	270	V	37.4	6.1	33.5	48.7	54	-5.3
4874.0	AV	43.2	45	H	34.1	5.2	33.0	49.9	54	-4.1
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	43.8	90	V	34.1	5.2	33.0	50.1	54	-3.9
7386.0	AV	41.2	270	V	37.4	6.1	33.5	50.8	54	-3.2
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

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

## 9. OUT OF BAND EMISSIONS

### 9.1 Standard Applicable

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

### 9.2 Test Equipment List and Details

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	2010-07-21	2011-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2010-07-21	2011-07-20
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
Spectrum Analyzer	ROHDE&SCHWARZ	FSP	836079/035	2010-04-16	2011-04-15

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

### 9.3 Test Procedure

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

### 9.4 Environmental Conditions

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

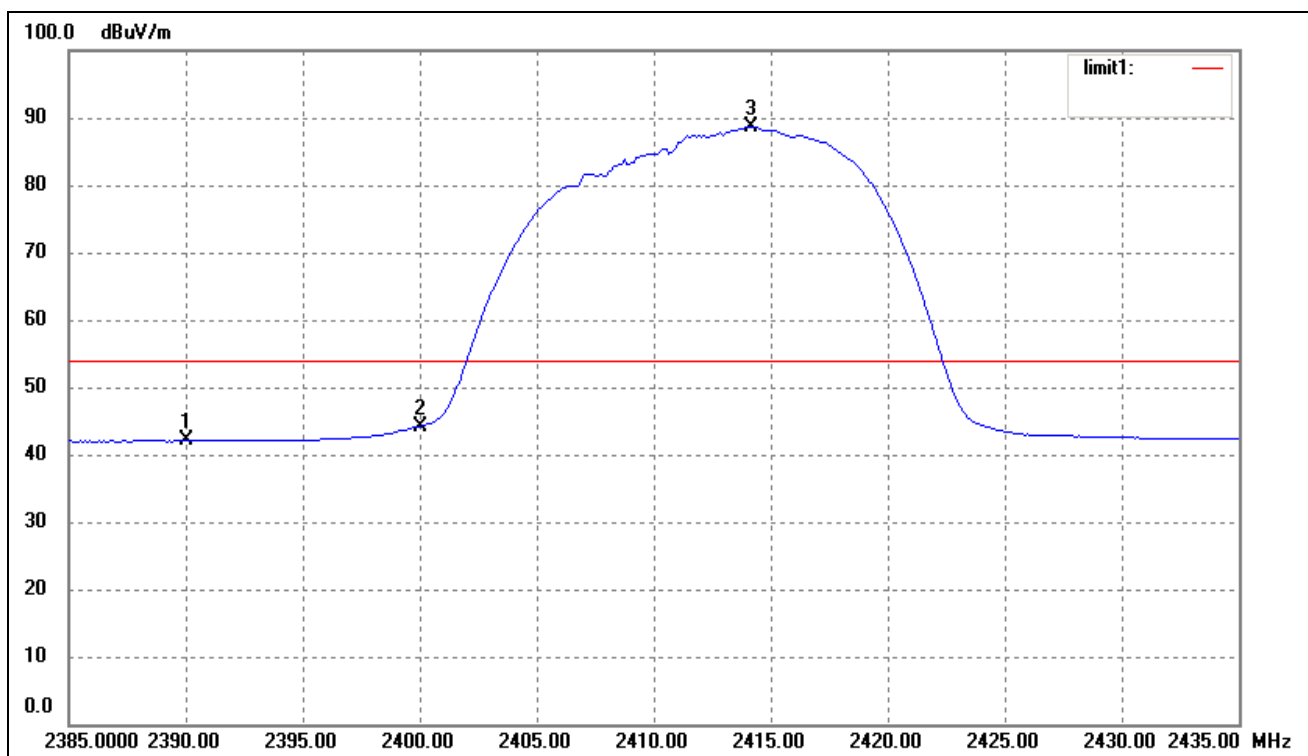
## 9.5 Summary of Test Results/Plots

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

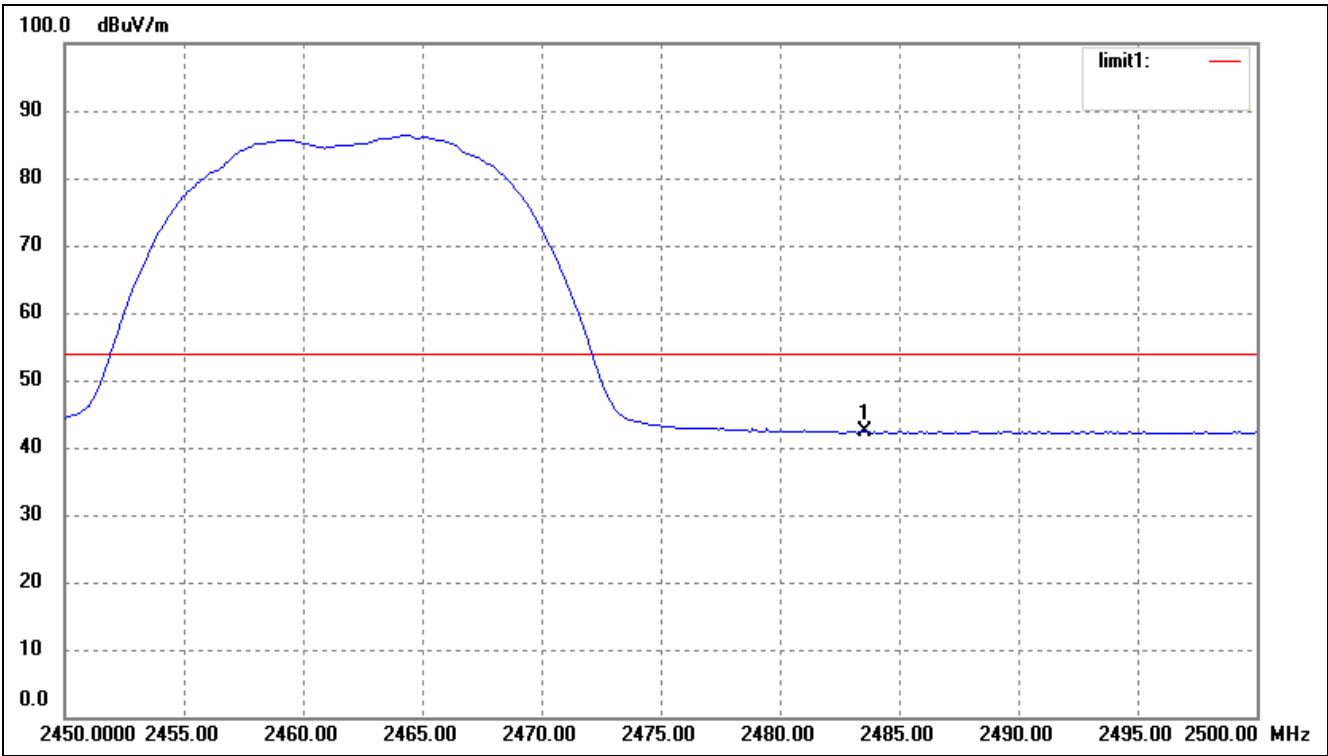
### For 802.11b

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	6.51	35.59	42.10	54.00	-11.90	206	100	Ave
	2390.000	15.65	35.59	51.44	74.00	-22.56	26	100	peak
2	2400.000	8.53	35.68	44.21	54.00	-9.79	54	100	Ave
3	2414.158	52.91	35.73	88.64	/	/	/	/	Ave

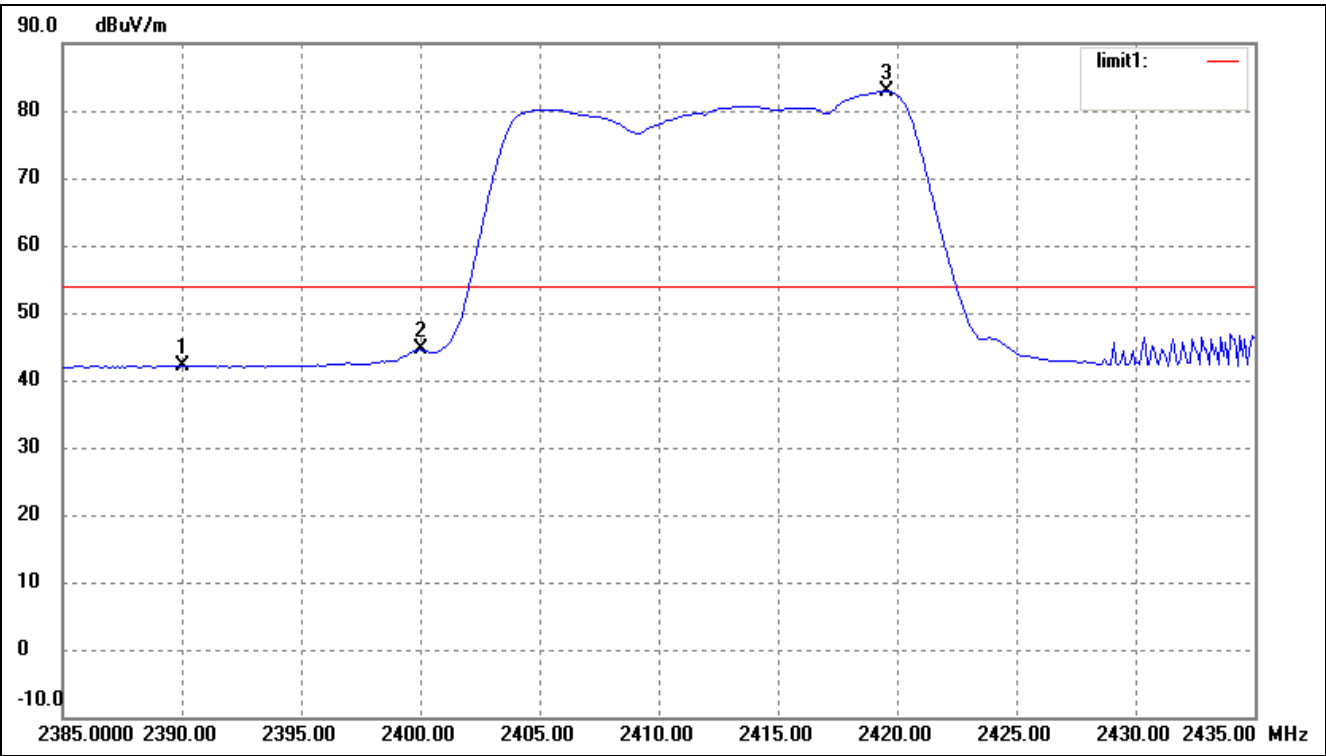
For 802.11b  
Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	2483.500	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

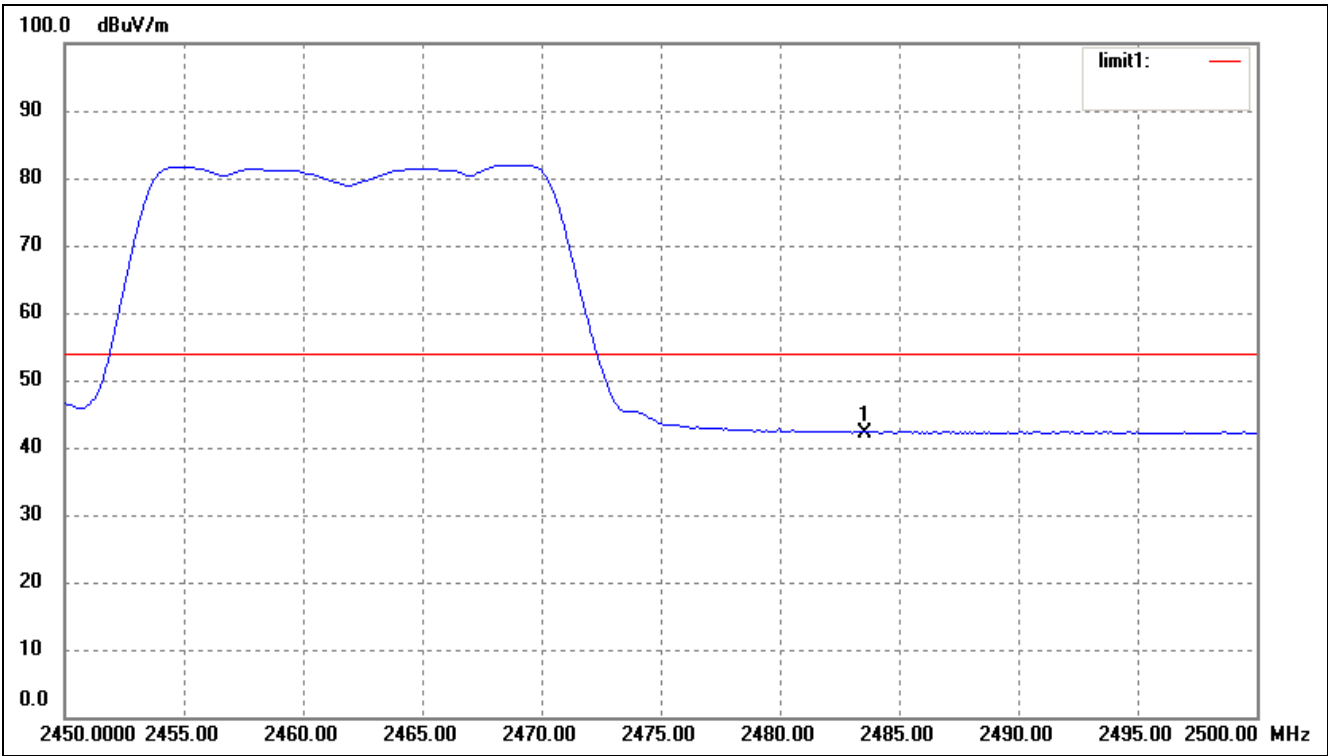


For 802.11g  
Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	2390.000	6.53	35.59	42.12	54.00	-11.88	0	100	Ave
	2390.000	14.97	35.59	50.59	74.00	-23.41	0	100	peak
2	2400.000	7.86	35.68	43.54	54.00	-10.46	154	100	Ave
3	2419.569	47.14	35.75	82.89	/	/	/	/	Ave

For 802.11g  
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	6.08	35.97	42.05	54.00	-11.95	66	100	Ave
	2483.500	16.08	35.97	52.05	74.00	-21.97	66	100	peak

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