



## Test Report

Product Name	802.11b/g/n 1T1R Wireless Lan USB Module
Model No	WN4617R (M)
FCC ID.	MDZ-WN4517R-M

Applicant	Amtran Technology Co., Ltd
Address	17F., No.268, Liancheng Rd., Jhonghe, New Taipei City, Taiwan, R.O.C.

Date of Receipt	Oct. 01, 2012
Issue Date	Oct, 17, 2012
Report No.	12A055R-RFUSP42V01
Report Version	V1.0



The test results relate only to the samples tested.

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# Test Report Certification

Issue Date: Oct, 17, 2012

Report No.: 12A055R-RFUSP42V01



**Accredited by NIST (NVLAP)**  
NVLAP Lab Code: 200533-0

Product Name	802.11b/g/n 1T1R Wireless Lan USB Module
Applicant	Amtran Technology Co., Ltd
Address	17F., No.268, Liancheng Rd., Jhonghe, New Taipei City, Taiwan, R.O.C.
Manufacturer	DONG GUAN G-COM COMPUTER CO., LTD.
Model No.	WN4617R (M)
FCC ID.	MDZ-WN4517R-M
EUT Rated Voltage	DC 3.3V
EUT Test Voltage	AC 120V/60Hz
Trade Name	Amtran
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010 ANSI C63.4: 2003
Test Result	Complied

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( Engineer / Vincent Chu )

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( Manager / Vincent Lin )

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	802.11b/g/n 1T1R Wireless Lan USB Module
Trade Name	Amtran
Model No.	WN4617R (M)
FCC ID.	MDZ-WN4517R-M
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW, 2422-2452MHz for 802.11n-40BW
Number of Channels	802.11b/g/n-20MHz: 11, n-40MHz: 7
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 150Mbps
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto

#### Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	MAG.LAYERS	MSA-1606-2G4C1-A1	PIFA	4.72 dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203.

**802.11b/g/n-20MHz Center Frequency of Each Channel:**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

**802.11n-40MHz Center Frequency of Each Channel:**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 03:	2422 MHz	Channel 04:	2427 MHz	Channel 05:	2432 MHz	Channel 06:	2437 MHz
Channel 07:	2442 MHz	Channel 08:	2447 MHz	Channel 09:	2452 MHz		

**Note:**

1. The EUT is an 802.11b/g/n 1T1R Wireless Lan USB Module with a built-in 2.4GHz WLAN transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps 、 802.11g is 6Mbps 、 802.11n(20M-BW) is 7.2Mbps and 、 802.11n(40M-BW) is 15Mbps)
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
	Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

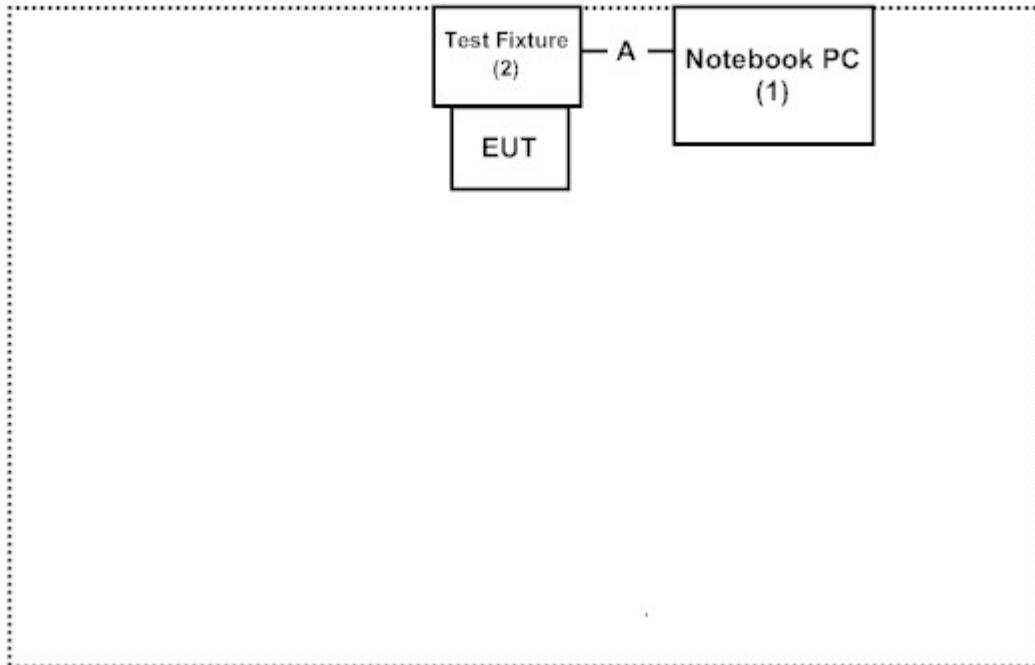
### 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
2 Test Fixture	Lite-on	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A USB Cable	Shielded, 1.0m, with one ferrite core bonded

### 1.4. Configuration of Tested System



### 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute software “QART5x7x (v1.0.8.0)” on the Notebook.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (5) Verify that the EUT works properly.

## 1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site: <http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site: <http://www.quietek.com/>

Site Description: File on  
Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046  
Registration Number: 92195

Accreditation on NVLAP  
NVLAP Lab Code: 200533-0

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FCC Accreditation Number: TW1014

## 2. Conducted Emission

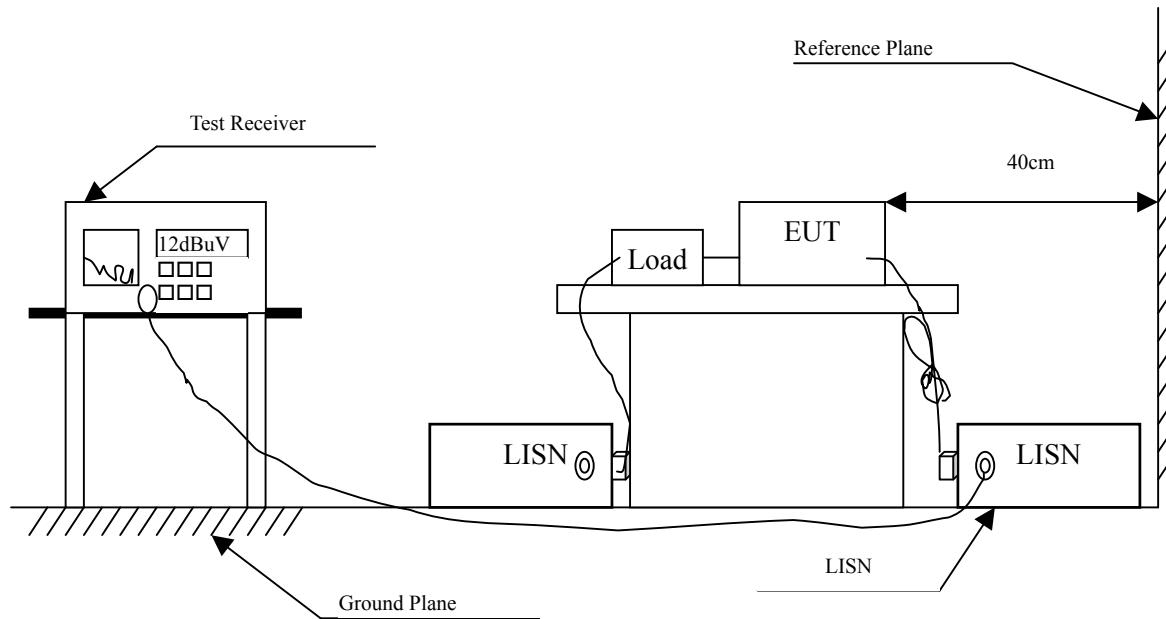
### 2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2012	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2012	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2012	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2012	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2012	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

### 2.2. Test Setup



### 2.3. Limits

<b>FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit</b>		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

### 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.162	9.830	23.290	33.120	-32.537	65.657
0.326	9.830	17.590	27.420	-33.551	60.971
0.408	9.830	17.130	26.960	-31.669	58.629
0.650	9.830	16.410	26.240	-29.760	56.000
2.048	9.840	14.770	24.610	-31.390	56.000
22.306	10.110	23.400	33.510	-26.490	60.000
<b>Average</b>					
0.162	9.830	21.610	31.440	-24.217	55.657
0.326	9.830	16.800	26.630	-24.341	50.971
0.408	9.830	16.180	26.010	-22.619	48.629
0.650	9.830	8.810	18.640	-27.360	46.000
2.048	9.840	12.620	22.460	-23.540	46.000
22.306	10.110	17.990	28.100	-21.900	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.170	9.837	13.930	23.767	-41.662	65.429
0.638	9.840	23.480	33.320	-22.680	56.000
2.052	9.860	11.550	21.410	-34.590	56.000
9.607	10.035	12.900	22.935	-37.065	60.000
13.966	10.184	20.640	30.824	-29.176	60.000
22.263	10.310	24.900	35.210	-24.790	60.000
<b>Average</b>					
0.170	9.837	4.860	14.697	-40.732	55.429
0.638	9.840	13.510	23.350	-22.650	46.000
2.052	9.860	9.530	19.390	-26.610	46.000
9.607	10.035	7.110	17.145	-32.855	50.000
13.966	10.184	16.170	26.354	-23.646	50.000
22.263	10.310	19.810	30.120	-19.880	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

### 3. Peak Power Output

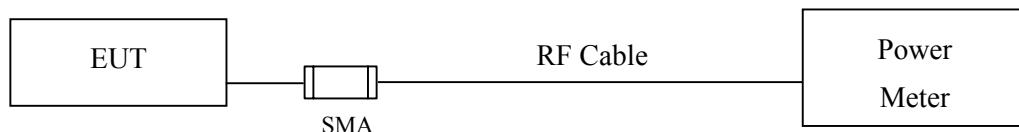
#### 3.1. Test Equipment

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Power Meter	Anritsu	ML2495A/6K00003357	May, 2012
X Power Sensor	Anritsu	MA2411B/0738448	Jun, 2012

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

#### 3.2. Test Setup



#### 3.3. Limits

The maximum peak power shall be less 1 Watt.

#### 3.4. Test Procedure

The EUT was tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

#### 3.5. Uncertainty

± 1.27 dB

### 3.6. Test Result of Peak Power Output

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11			
		Measurement Level (dBm)						
01	2412	17.70	--	--	--	20.02	<30dBm	Pass
06	2437	17.51	17.42	17.35	17.28	19.52	<30dBm	Pass
11	2462	17.51	--	--	--	19.45	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54			
		Measurement Level (dBm)										
01	2412	15.18	--	--	--	--	--	--	--	23.80	<30dBm	Pass
06	2437	15.21	15.19	15.05	14.96	14.82	14.76	14.64	14.52	24.08	<30dBm	Pass
11	2462	15.00	--	--	--	--	--	--	--	23.75	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2			
		Measurement Level (dBm)										
01	2412	15.18	--	--	--	--	--	--	--	23.19	<30dBm	Pass
06	2437	15.33	15.25	15.18	15.09	15	14.92	14.86	14.73	23.35	<30dBm	Pass
11	2462	15.00	--	--	--	--	--	--	--	22.91	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		15	30	45	60	90	120	135	150			
		Measurement Level (dBm)										
03	2422	13								20.84	<30dBm	Pass
06	2437	13.53	13.43	13.25	13.16	13.02	12.94	12.88	12.75	21.96	<30dBm	Pass
09	2452	13.31								21.76	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

## 4. Radiated Emission

### 4.1. Test Equipment

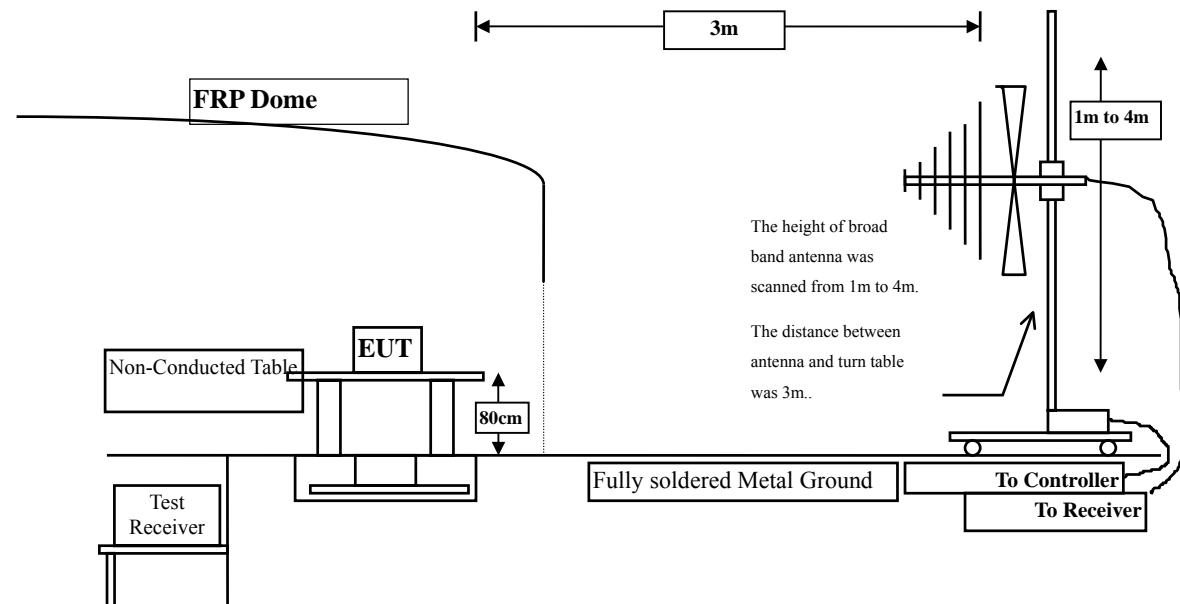
The following test equipment are used during the radiated emission test:

Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2012
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2012
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2012
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2012
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2012
	X	Coaxial Cable	QuiTek	QTK-CABLE/ CAB5	Feb., 2012
	X	Controller	QuiTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

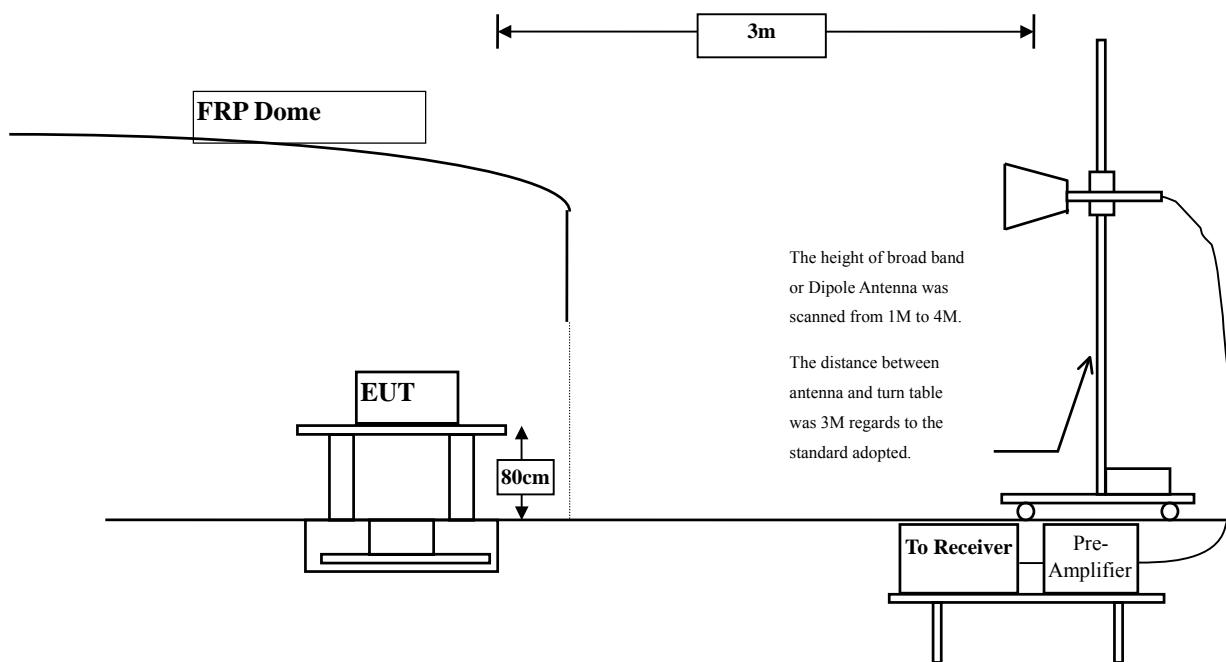
Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.  
2. The test instruments marked with "X" are used to measure the final test results.

## 4.2. Test Setup

### Radiated Emission Below 1GHz



### Radiated Emission Above 1GHz



#### 4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

<b>FCC Part 15 Subpart C Paragraph 15.209(a) Limits</b>		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

#### **4.4. Test Procedure**

The EUT was setup according to ANSI C63.4: 2003 and tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The frequency range from 30MHz to 10th harmonics is checked.

#### **4.5. Uncertainty**

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

#### 4.6. Test Result of Radiated Emission

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

##### Horizontal

###### Peak Detector:

4824.000	0.428	50.900	51.329	-22.671	74.000
7236.000	7.177	39.680	46.857	-27.143	74.000
9648.000	8.019	39.570	47.590	-26.410	74.000

###### Average Detector:

--

##### Vertical

###### Peak Detector:

4824.000	0.836	48.710	49.547	-24.453	74.000
7236.000	7.676	38.690	46.366	-27.634	74.000
9648.000	8.556	39.360	47.917	-26.083	74.000

###### Average Detector:

--

##### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

**Horizontal**  
**Peak Detector:**

4874.000	0.076	52.080	52.157	-21.843	74.000
7311.000	7.512	39.180	46.692	-27.308	74.000
9748.000	7.630	38.790	46.420	-27.580	74.000

**Average Detector:**

--

**Vertical**

**Peak Detector:**

4874.000	0.532	53.000	53.532	-20.468	74.000
7311.000	8.089	39.320	47.409	-26.591	74.000
9748.000	8.266	40.990	49.257	-24.743	74.000

**Average Detector:**

--

**Note:**

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

### Horizontal

#### Peak Detector:

4924.000	0.191	51.120	51.311	-22.689	74.000
7386.000	8.373	38.560	46.934	-27.066	74.000
9848.000	7.964	41.960	49.924	-24.076	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4924.000	0.805	51.370	52.175	-21.825	74.000
7386.000	9.180	38.000	47.180	-26.820	74.000
9848.000	8.801	42.470	51.271	-22.729	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
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### Horizontal

#### Peak Detector:

4824.000	0.428	45.760	46.189	-27.811	74.000
7236.000	7.177	38.880	46.057	-27.943	74.000
9648.000	8.019	38.500	46.520	-27.480	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4824.000	0.836	41.580	42.417	-31.583	74.000
7236.000	7.676	39.050	46.726	-27.274	74.000
9648.000	8.556	39.070	47.627	-26.373	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

**Horizontal**
**Peak Detector:**

4874.000	0.076	41.160	41.237	-32.763	74.000
7311.000	7.512	37.760	45.272	-28.728	74.000
9748.000	7.630	38.180	45.810	-28.190	74.000

**Average Detector:**

--

**Peak Detector:**

4874.000	0.532	41.390	41.922	-32.078	74.000
7311.000	8.089	38.300	46.389	-27.611	74.000
9748.000	8.266	39.330	47.597	-26.403	74.000

**Average Detector:**

--

**Note:**

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

### Horizontal

#### Peak Detector:

4924.000	0.191	47.180	47.371	-26.629	74.000
7386.000	8.373	38.190	46.564	-27.436	74.000
9848.000	7.964	39.610	47.574	-26.426	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4924.000	0.805	50.120	50.925	-23.075	74.000
7386.000	9.180	38.510	47.690	-26.310	74.000
9848.000	8.801	41.550	50.351	-23.649	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m

### Horizontal

#### Peak Detector:

4824.000	0.428	44.460	44.889	-29.111	74.000
7236.000	7.177	38.950	46.127	-27.873	74.000
9648.000	8.019	39.300	47.320	-26.680	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4824.000	0.836	41.990	42.827	-31.173	74.000
7236.000	7.676	39.900	47.576	-26.424	74.000
9648.000	8.556	39.020	47.577	-26.423	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

### Horizontal

#### Peak Detector:

4874.000	0.076	46.460	46.537	-27.463	74.000
7311.000	7.512	39.010	46.522	-27.478	74.000
9748.000	7.630	39.370	47.000	-27.000	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4874.000	0.532	43.710	44.242	-29.758	74.000
7311.000	8.089	38.580	46.669	-27.331	74.000
9748.000	8.266	38.330	46.597	-27.403	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

### Horizontal

#### Peak Detector:

4924.000	0.191	47.320	47.511	-26.489	74.000
7386.000	8.373	38.610	46.984	-27.016	74.000
9848.000	7.964	39.980	47.944	-26.056	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4924.000	0.805	45.600	46.405	-27.595	74.000
7386.000	9.180	38.770	47.950	-26.050	74.000
9848.000	8.801	41.090	49.891	-24.109	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2422MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

### Horizontal

#### Peak Detector:

4844.000	0.280	42.320	42.601	-31.399	74.000
7266.000	7.106	39.710	46.816	-27.184	74.000
9688.000	7.663	39.560	47.223	-26.777	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4844.000	0.707	42.390	43.098	-30.902	74.000
7266.000	7.626	39.220	46.846	-27.154	74.000
9688.000	8.284	39.890	48.174	-25.826	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m

### Horizontal

#### Peak Detector:

4874.000	0.076	43.350	43.427	-30.573	74.000
7311.000	7.512	39.440	46.952	-27.048	74.000
9748.000	7.630	39.300	46.930	-27.070	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4874.000	0.532	42.350	42.882	-31.118	74.000
7311.000	8.089	38.810	46.899	-27.101	74.000
9748.000	8.266	39.140	47.407	-26.593	74.000

#### Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2452 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m

### Horizontal

#### Peak Detector:

4904.000	0.000	42.840	42.841	-31.159	74.000
7356.000	8.308	38.630	46.938	-27.062	74.000
9808.000	7.850	39.640	47.490	-26.510	74.000

#### Average Detector:

--

### Vertical

#### Peak Detector:

4904.000	0.513	42.430	42.944	-31.056	74.000
7356.000	9.022	38.380	47.402	-26.598	74.000
9808.000	8.512	39.620	48.132	-25.868	74.000

#### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)

Frequency MHz	Correct Factor	Reading dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
109.540	-7.537	40.912	33.374	-10.126	43.500
398.600	0.879	36.437	37.316	-8.684	46.000
540.220	3.499	32.039	35.538	-10.462	46.000
600.360	3.472	30.725	34.197	-11.803	46.000
780.780	5.259	30.910	36.169	-9.831	46.000
901.060	5.878	31.776	37.654	-8.346	46.000
<b>Vertical</b>					
111.480	-3.439	40.279	36.841	-6.659	43.500
249.220	-5.096	39.860	34.764	-11.236	46.000
359.800	-1.316	39.598	38.282	-7.718	46.000
540.220	2.169	27.611	29.780	-16.220	46.000
800.180	2.637	32.114	34.751	-11.249	46.000
922.400	3.200	35.399	38.599	-7.401	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
111.480	-7.489	39.400	31.912	-11.588	43.500
396.660	0.771	36.959	37.730	-8.270	46.000
569.320	2.004	34.674	36.678	-9.322	46.000
780.780	5.259	29.889	35.148	-10.852	46.000
840.920	6.064	28.758	34.822	-11.178	46.000
901.060	5.878	30.510	36.388	-9.612	46.000
<b>Vertical</b>					
109.540	-3.507	39.736	36.228	-7.272	43.500
249.220	-5.096	40.207	35.111	-10.889	46.000
396.660	-2.039	38.454	36.415	-9.585	46.000
530.520	1.192	28.999	30.191	-15.809	46.000
840.920	2.284	33.787	36.071	-9.929	46.000
932.100	3.430	34.615	38.045	-7.955	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
111.480	-7.489	39.993	32.505	-10.995	43.500
398.600	0.879	36.505	37.384	-8.616	46.000
540.220	3.499	32.361	35.860	-10.140	46.000
625.580	1.419	32.857	34.277	-11.723	46.000
780.780	5.259	30.322	35.581	-10.419	46.000
926.280	6.832	29.953	36.785	-9.215	46.000
<b>Vertical</b>					
109.540	-3.507	38.785	35.277	-8.223	43.500
179.380	-0.824	34.019	33.195	-10.305	43.500
249.220	-5.096	39.048	33.952	-12.048	46.000
398.600	-2.371	39.225	36.854	-9.146	46.000
800.180	2.637	29.146	31.783	-14.217	46.000
924.340	3.149	32.929	36.078	-9.922	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
109.540	-7.537	40.470	32.932	-10.568	43.500
398.600	0.879	36.498	37.377	-8.623	46.000
540.220	3.499	32.279	35.778	-10.222	46.000
625.580	1.419	32.146	33.566	-12.434	46.000
780.780	5.259	30.963	36.222	-9.778	46.000
901.060	5.878	29.341	35.219	-10.781	46.000
<b>Vertical</b>					
111.480	-3.439	39.693	36.255	-7.245	43.500
249.220	-5.096	39.901	34.805	-11.195	46.000
398.600	-2.371	39.144	36.773	-9.227	46.000
499.480	-0.199	32.337	32.137	-13.863	46.000
827.340	2.711	32.885	35.596	-10.404	46.000
934.040	2.986	34.534	37.520	-8.480	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

## 5. RF antenna conducted test

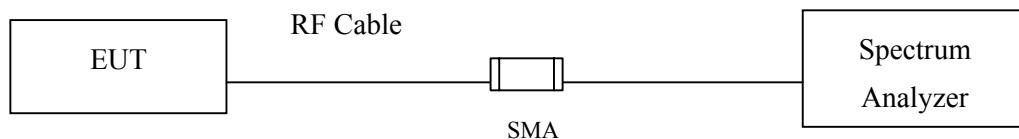
### 5.1. Test Equipment

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2012
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2012
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2012

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.  
2. The test instruments marked with "X" are used to measure the final test results.

### 5.2. Test Setup

#### RF antenna Conducted Measurement:



### 5.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 5.4. Test Procedure

The EUT was tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

## 5.5. Uncertainty

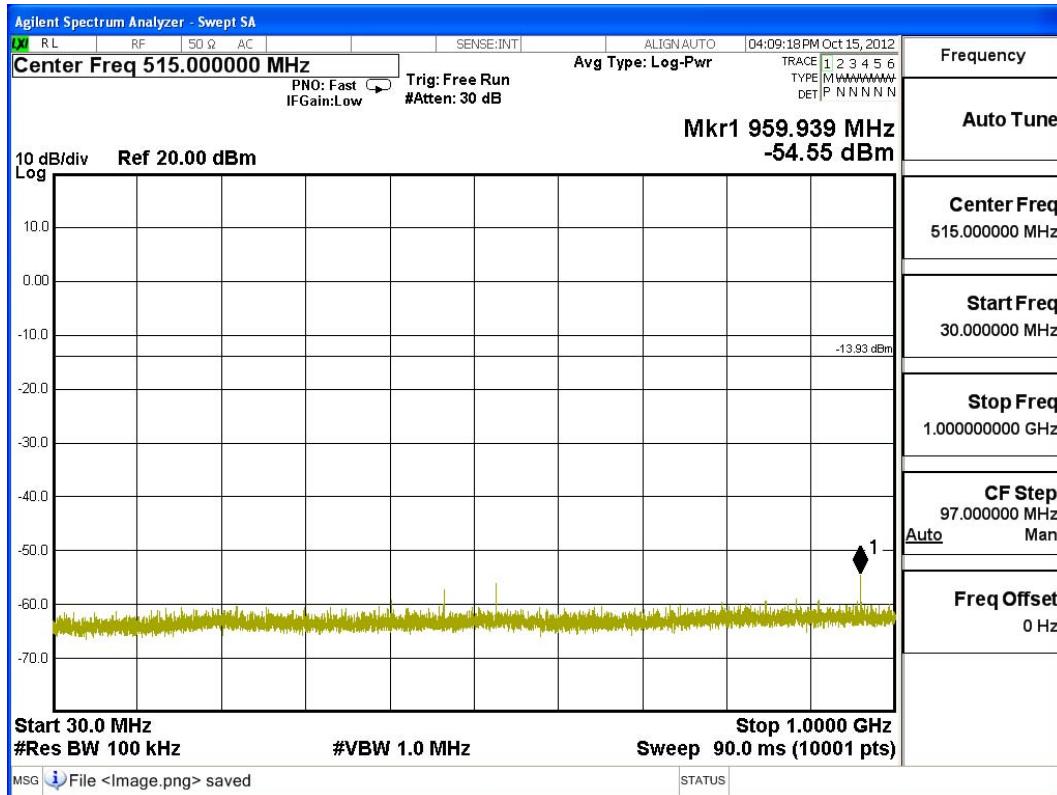
The measurement uncertainty

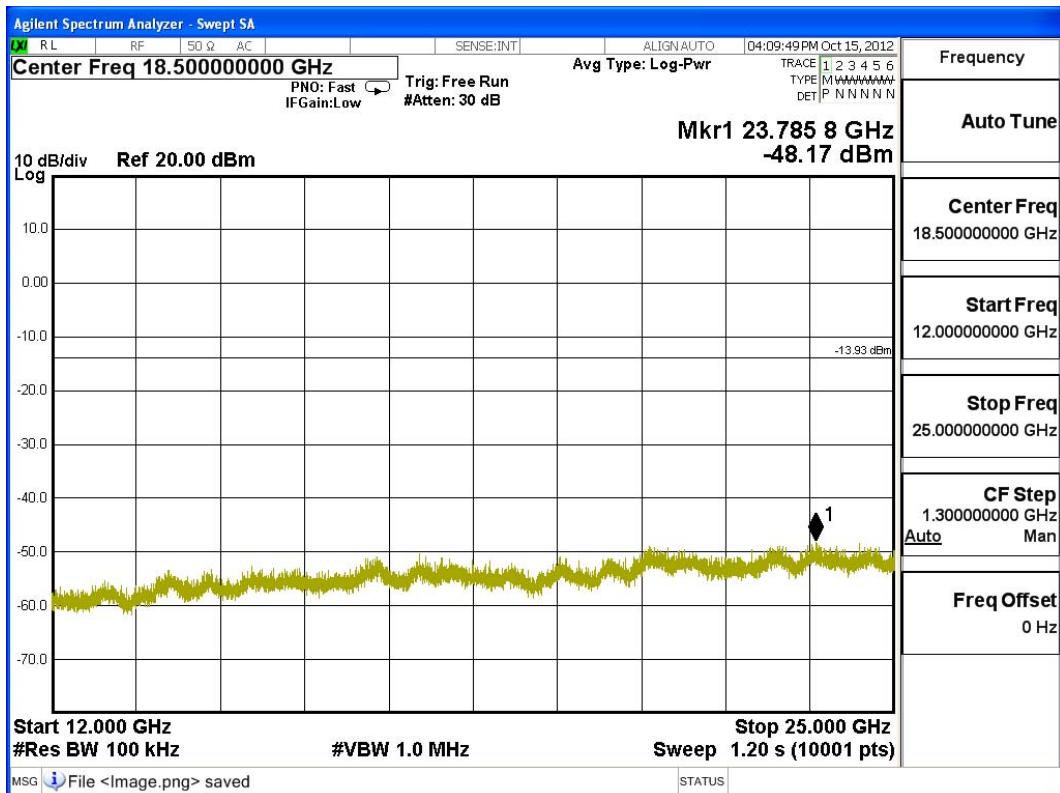
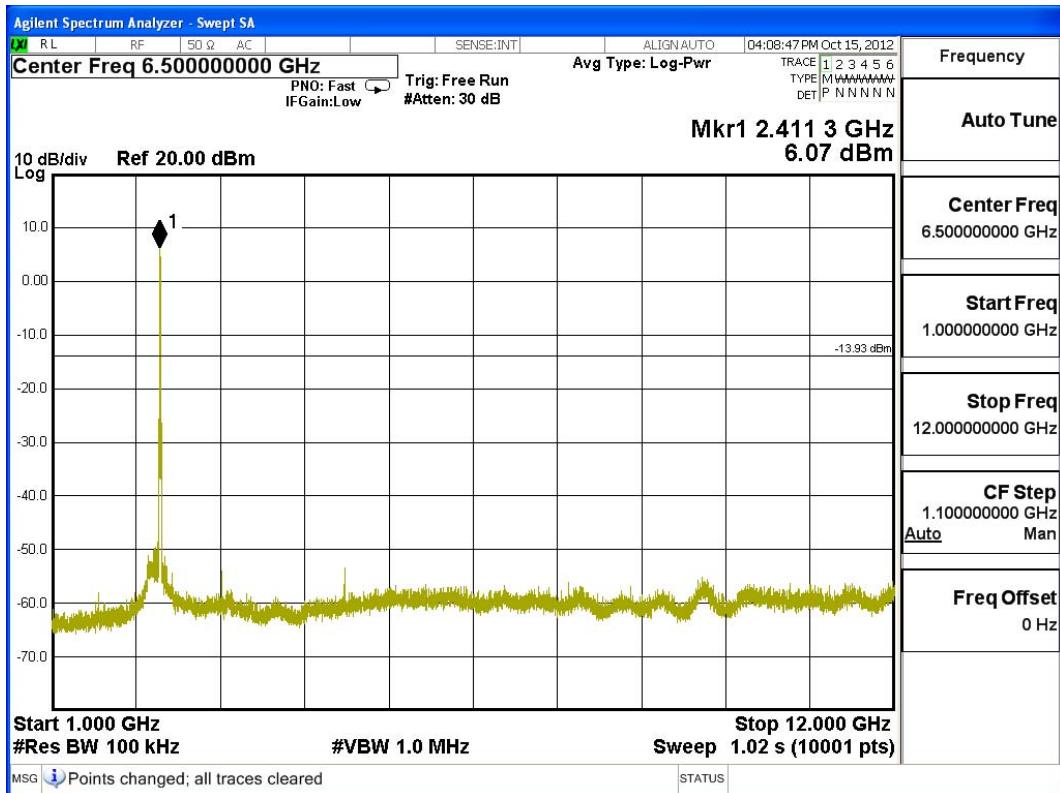
Conducted is defined as  $\pm 1.27\text{dB}$

## 5.6. Test Result of RF antenna conducted test

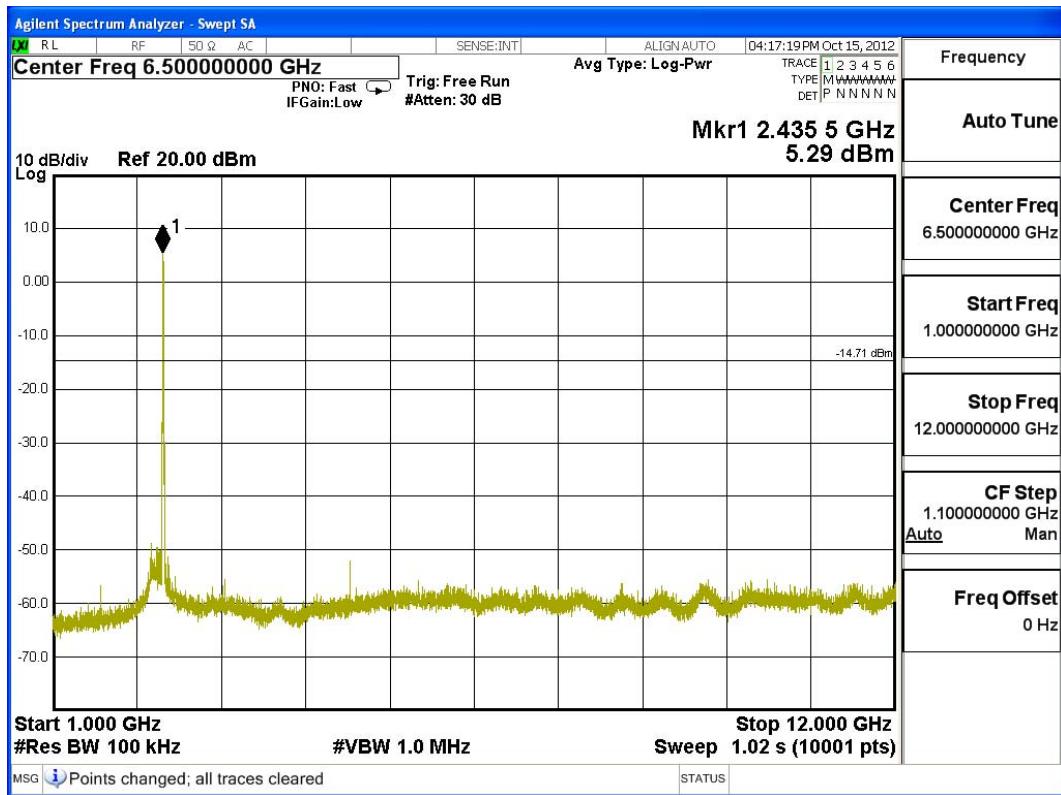
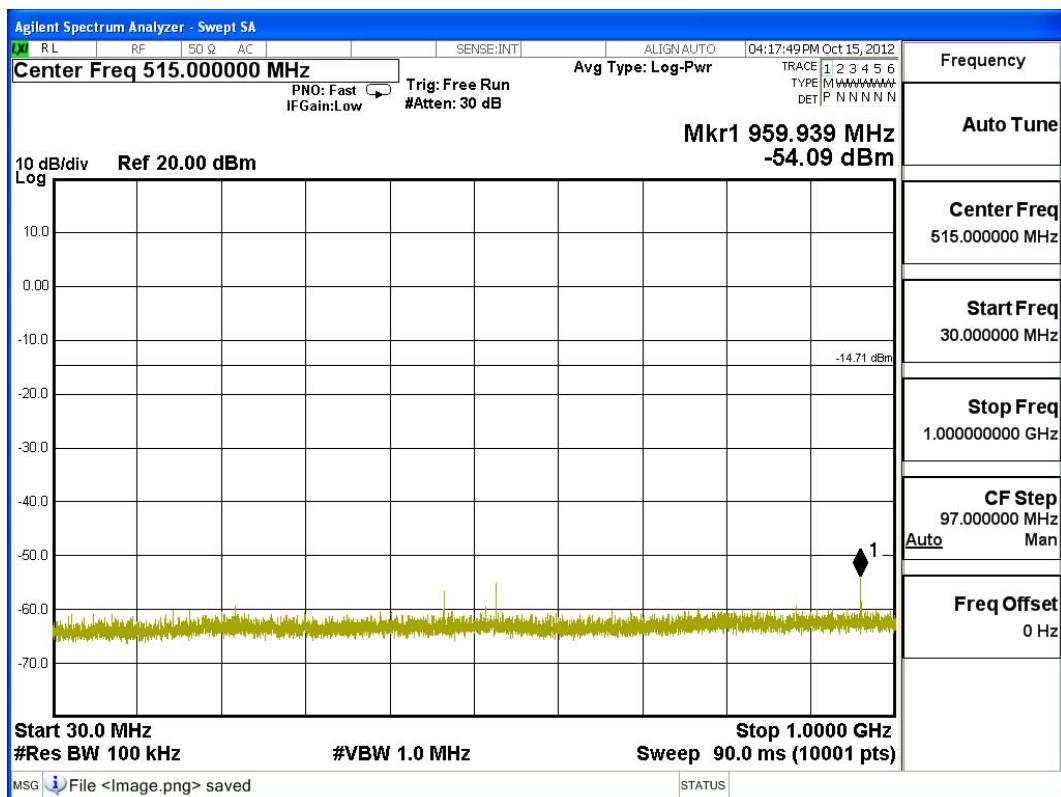
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : RF antenna conducted test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

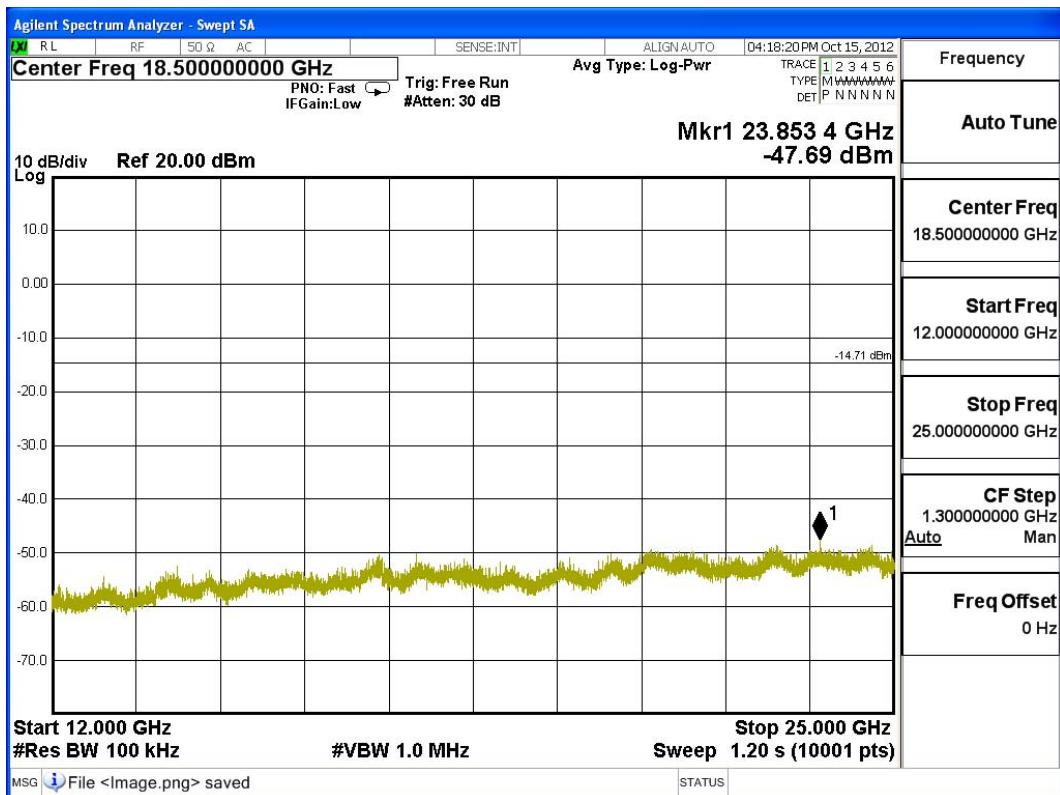
### Channel 01 (2412MHz)

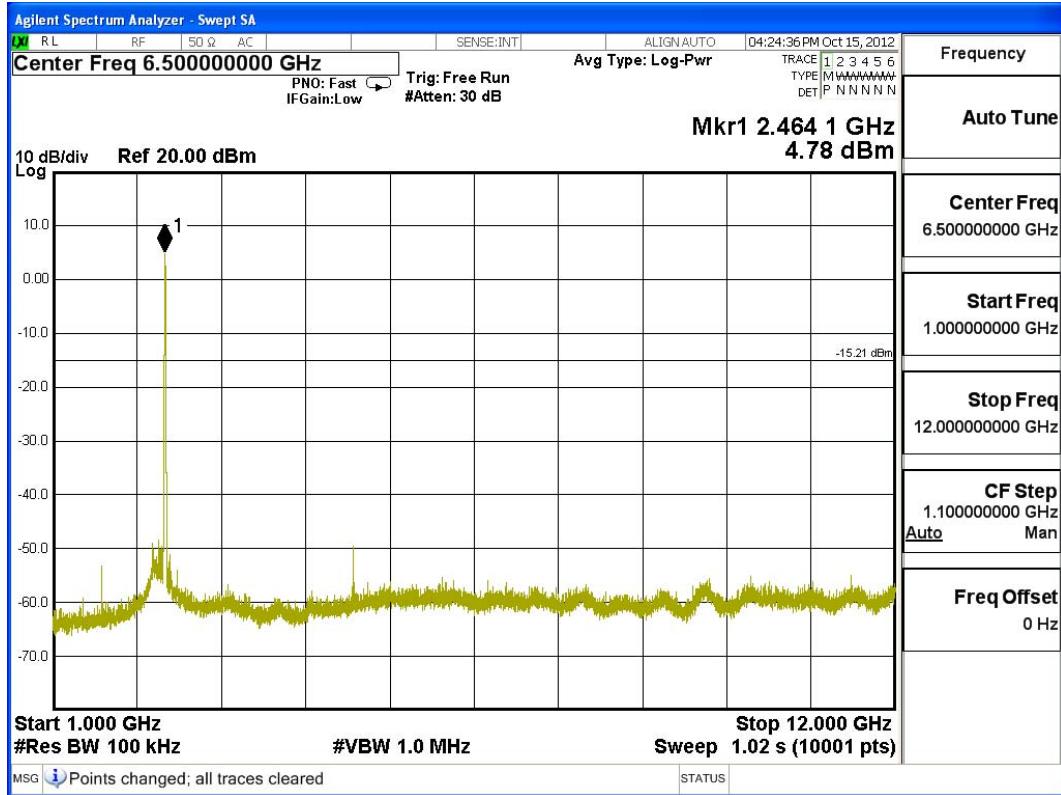
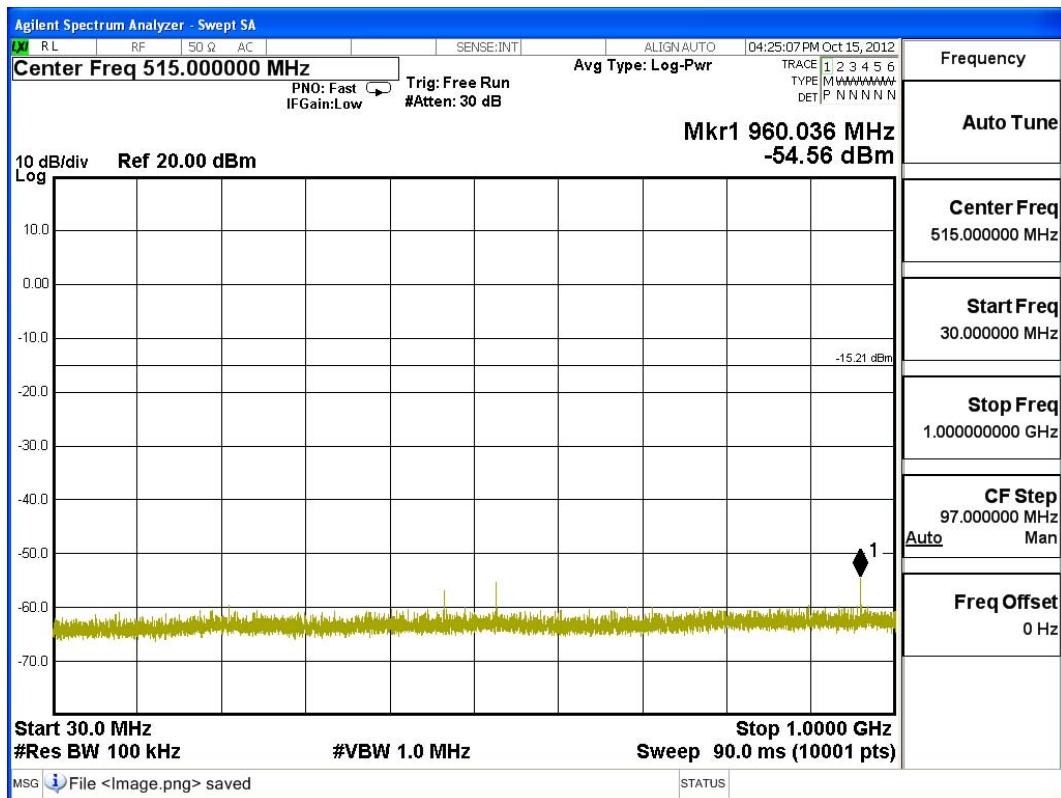


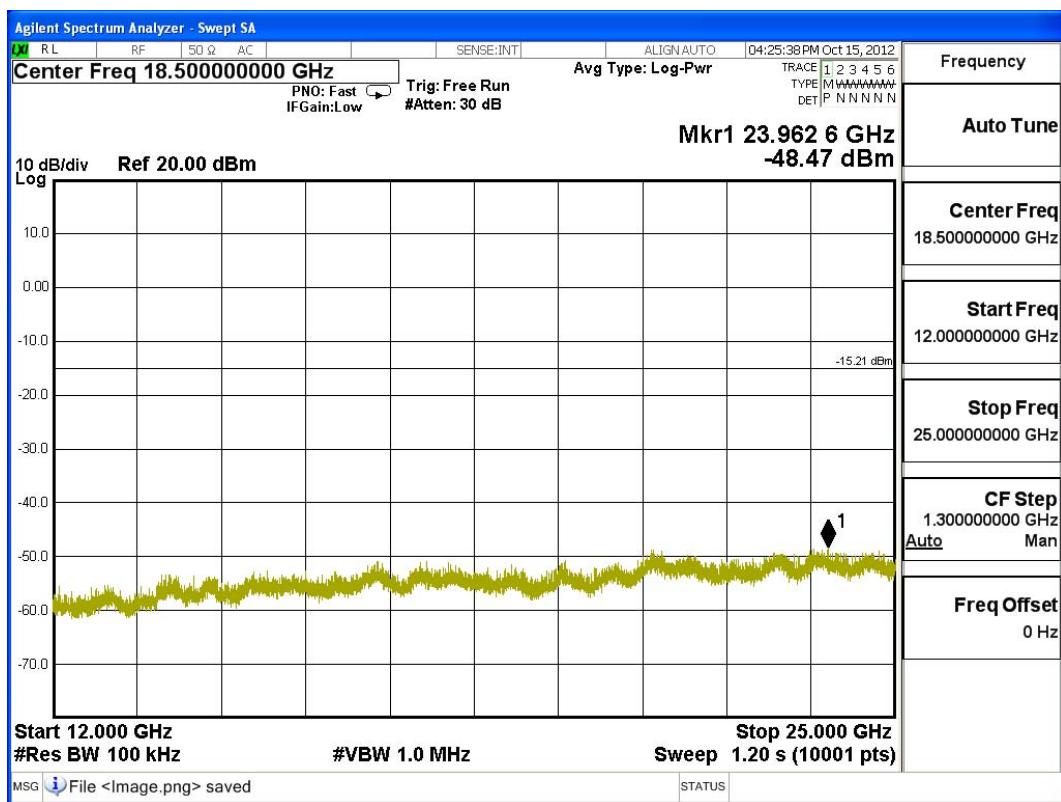


### Channel 06 (2437MHz)



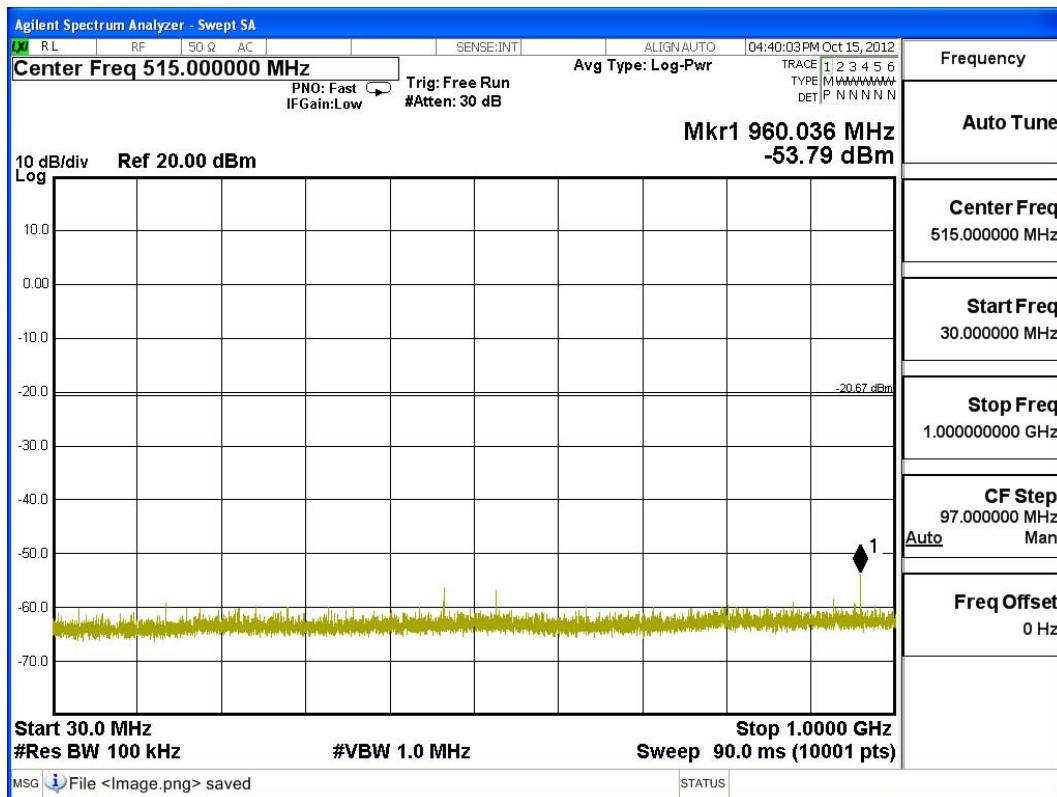


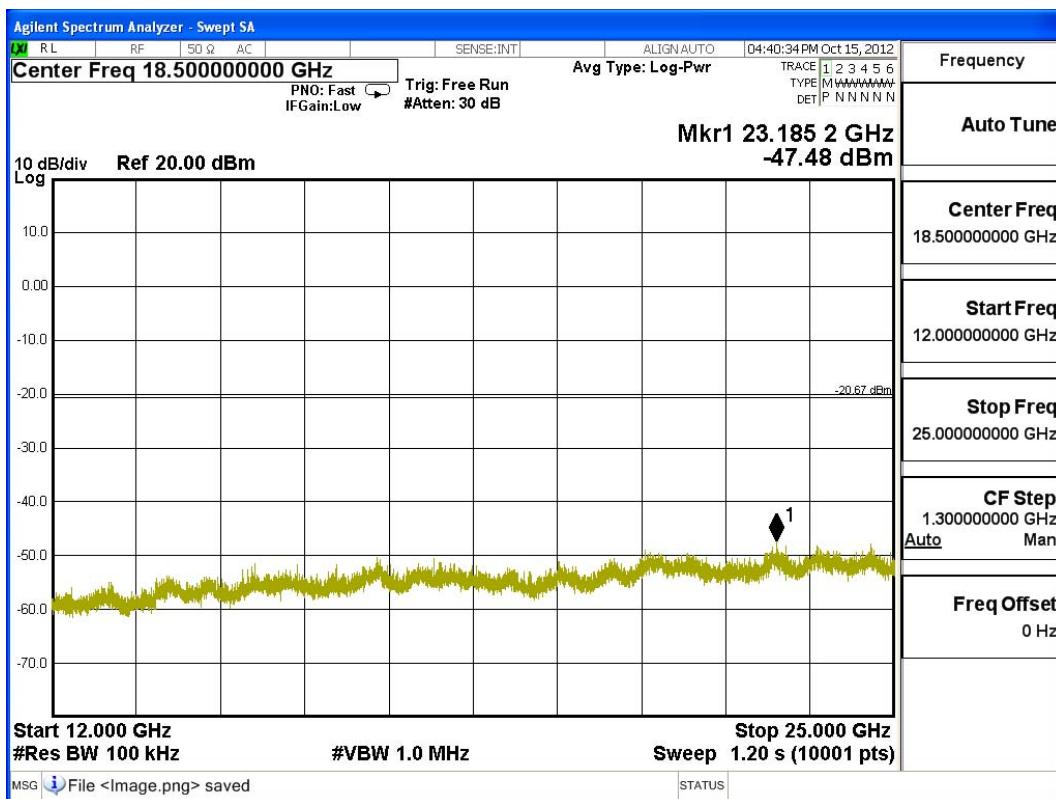
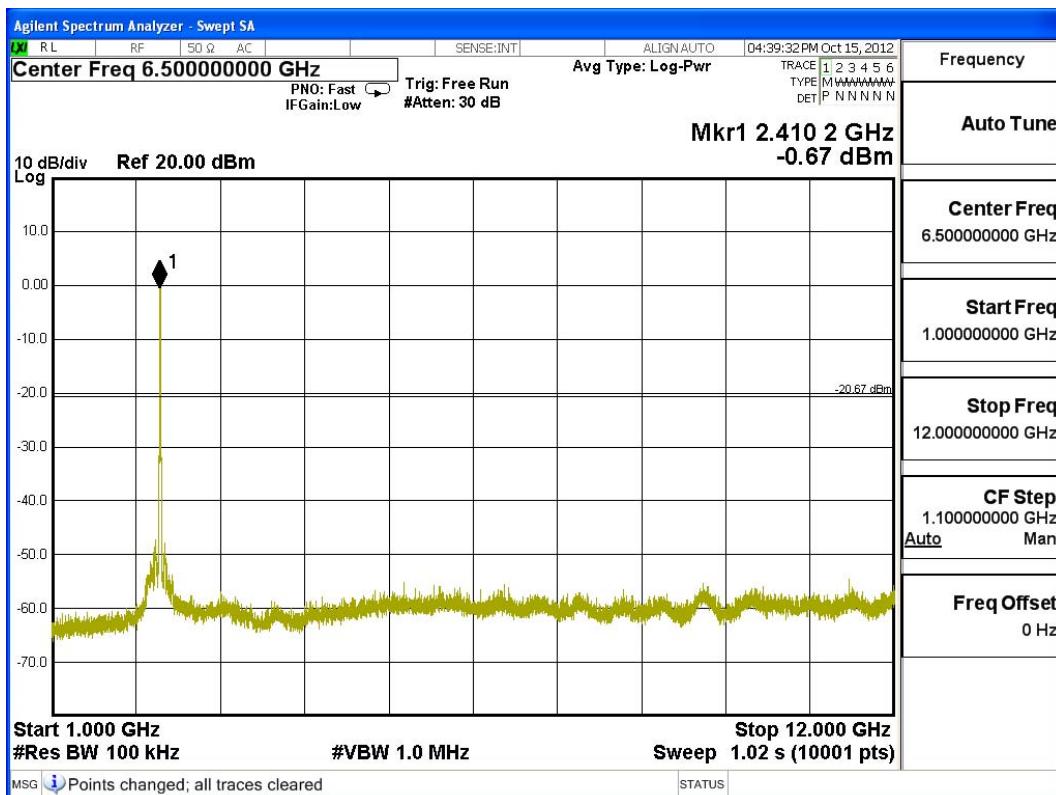
**Channel 11 (2462MHz)**




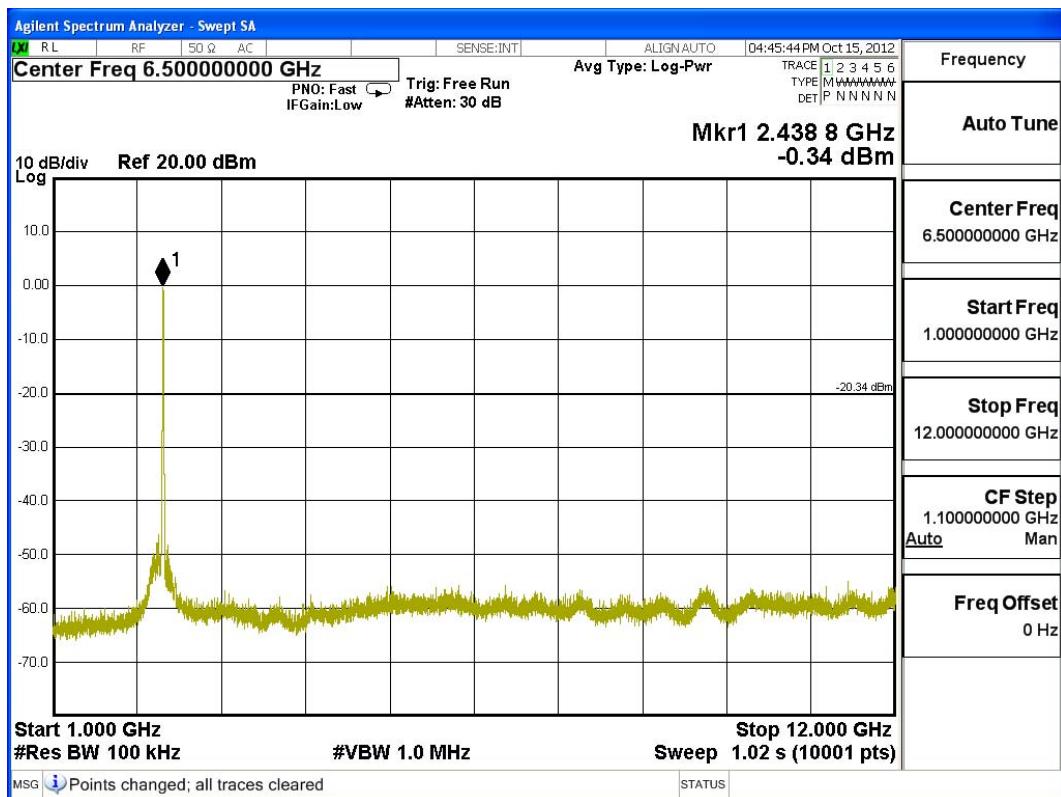
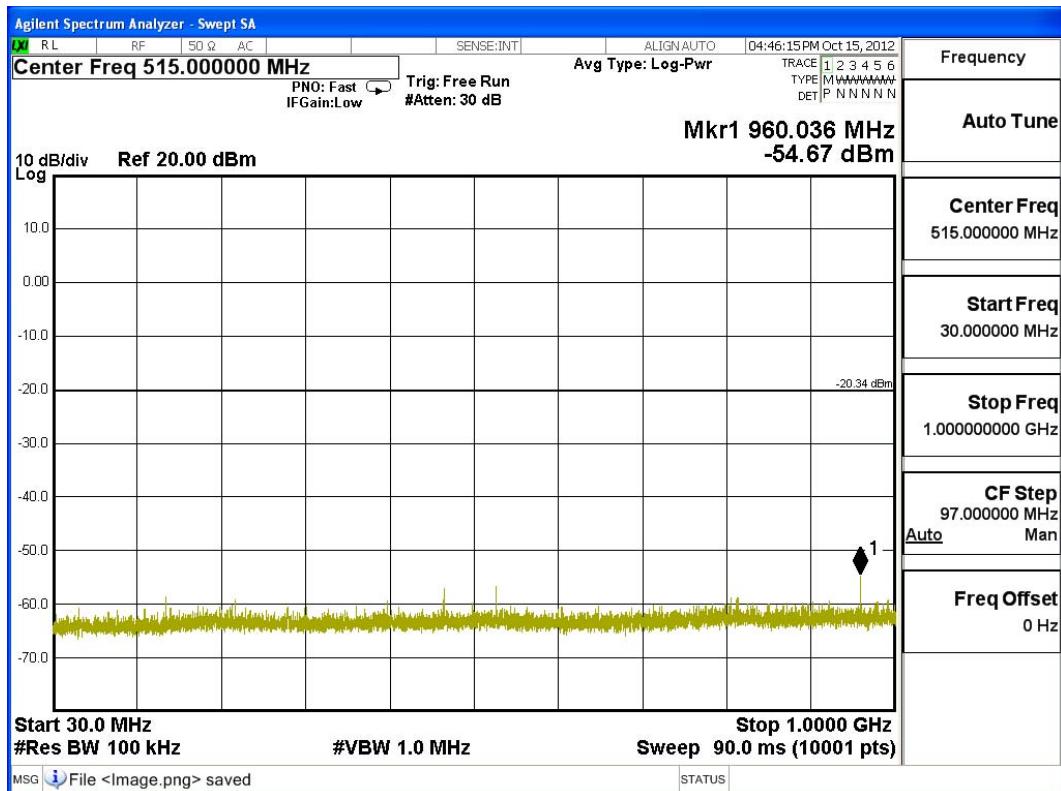
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : RF Antenna Conducted Spurious  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

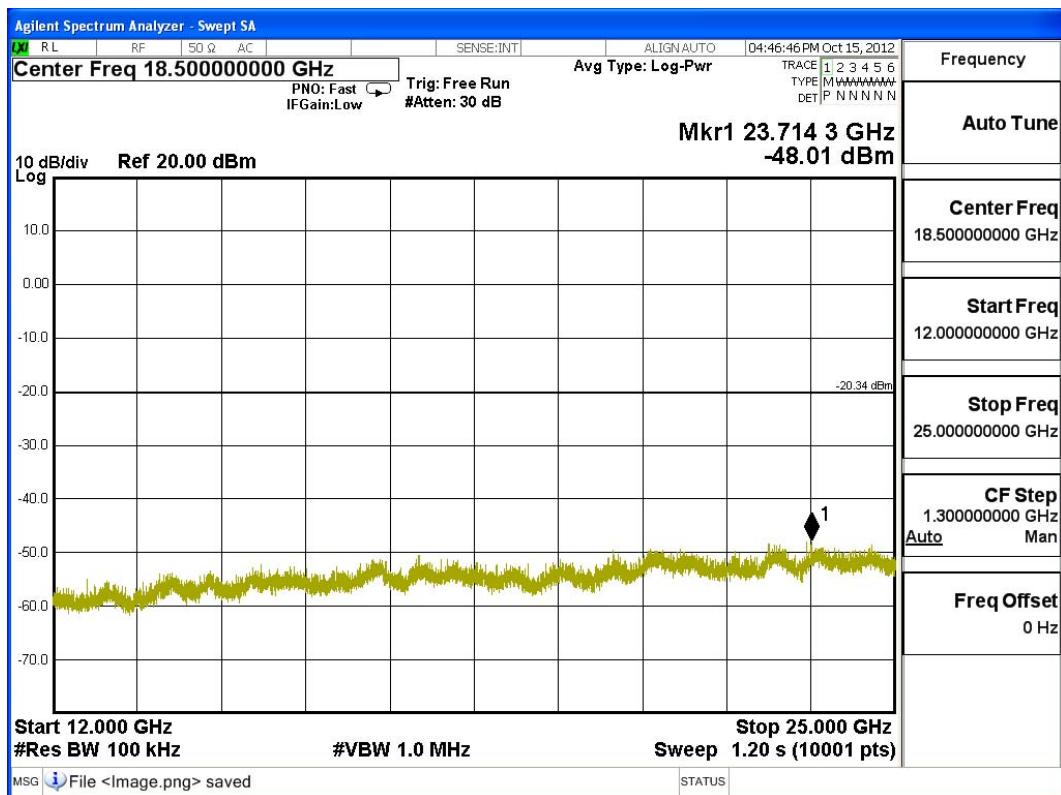
### Channel 01 (2412MHz)



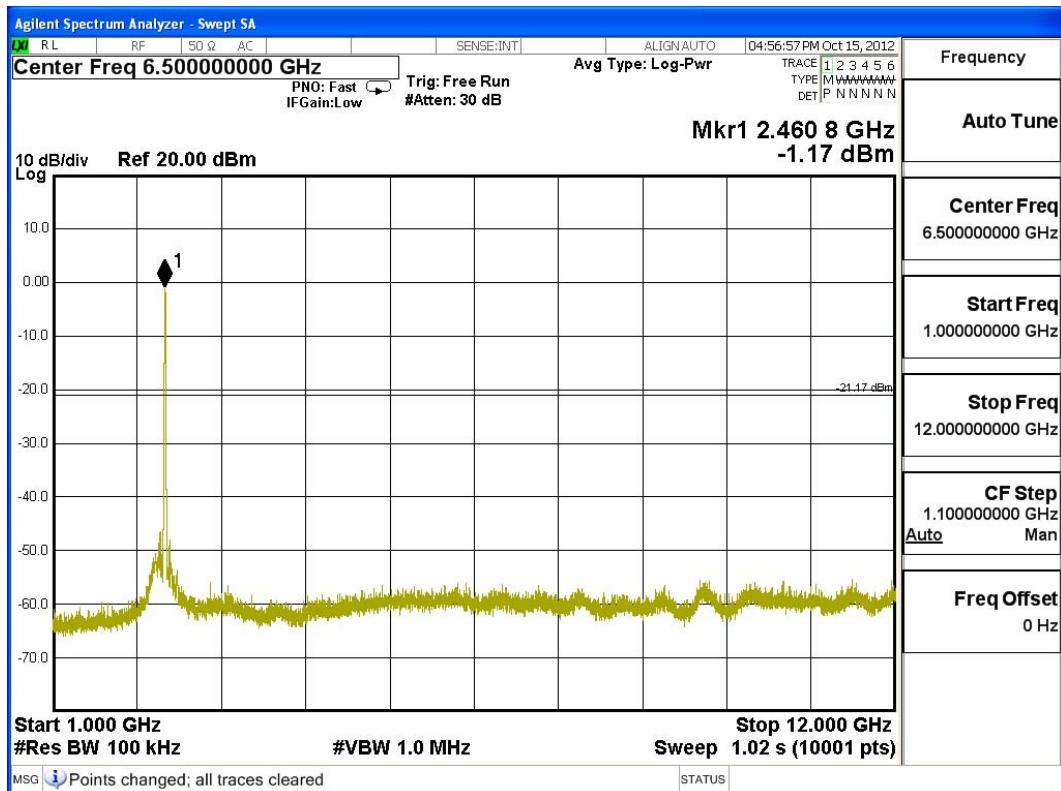
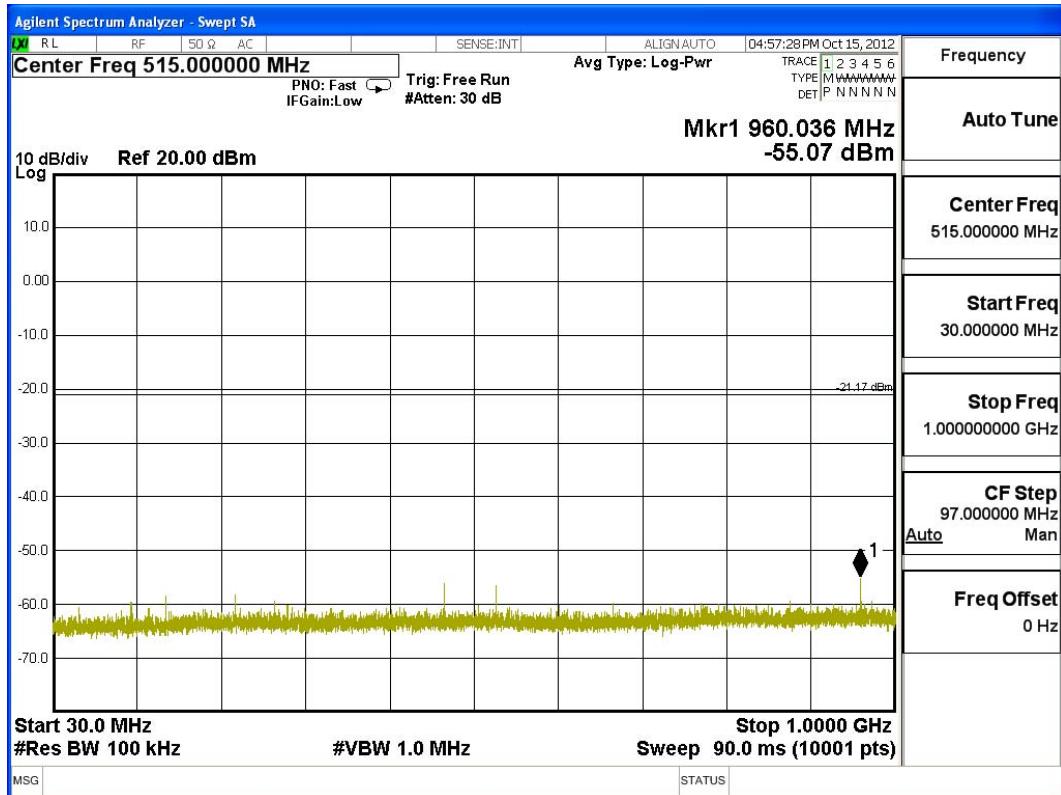


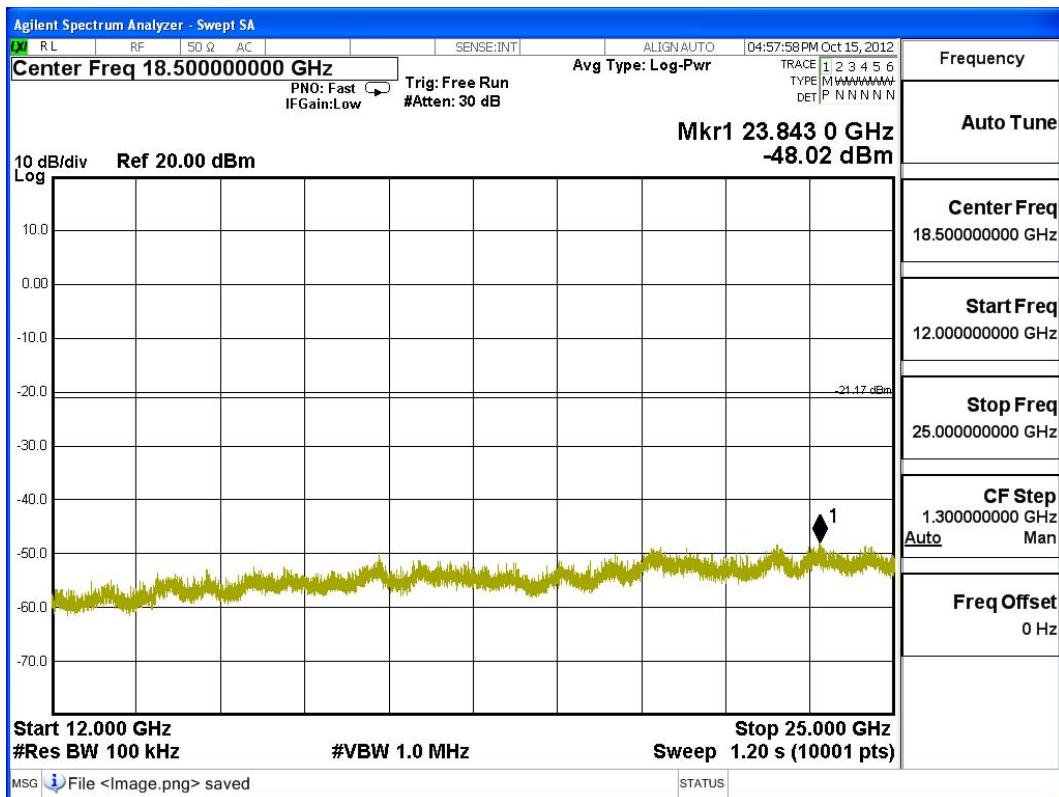
### Channel 06 (2437MHz)





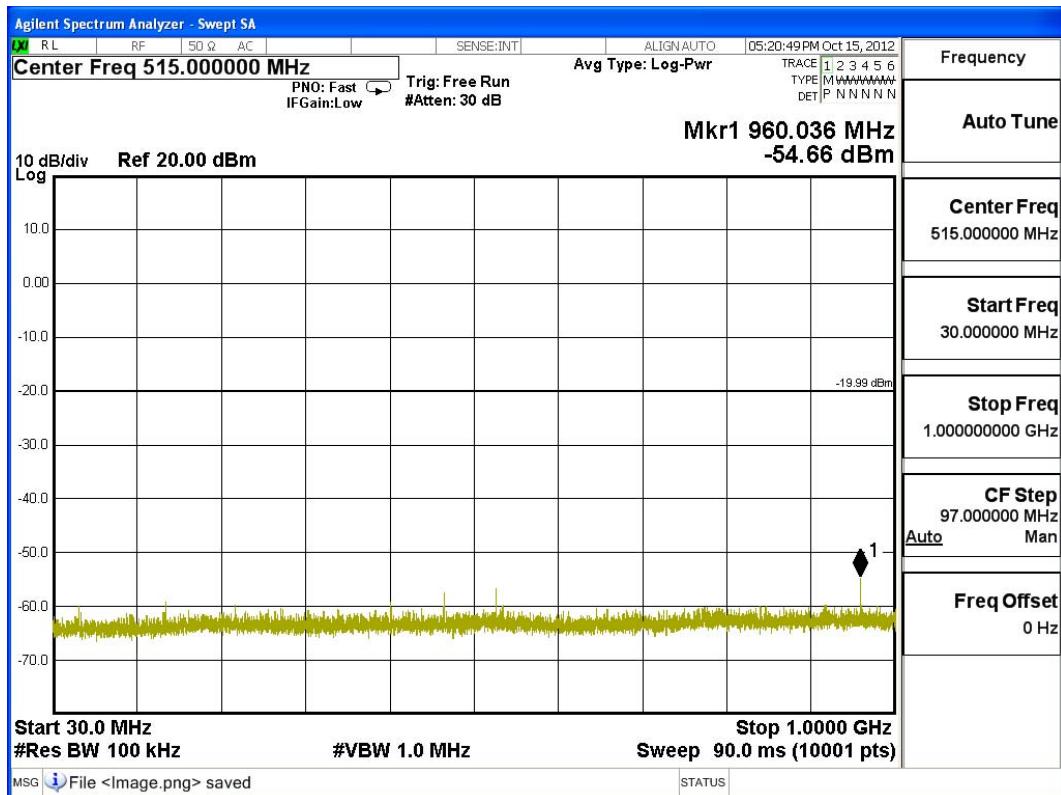
### Channel 11 (2462MHz)

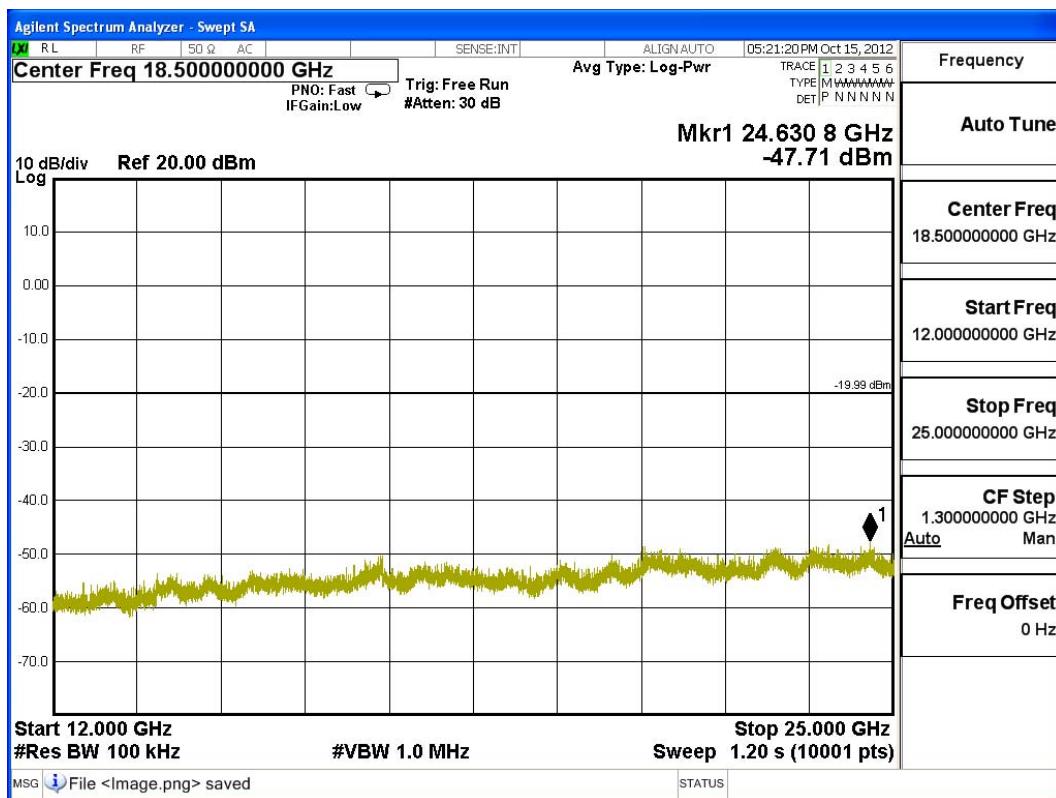
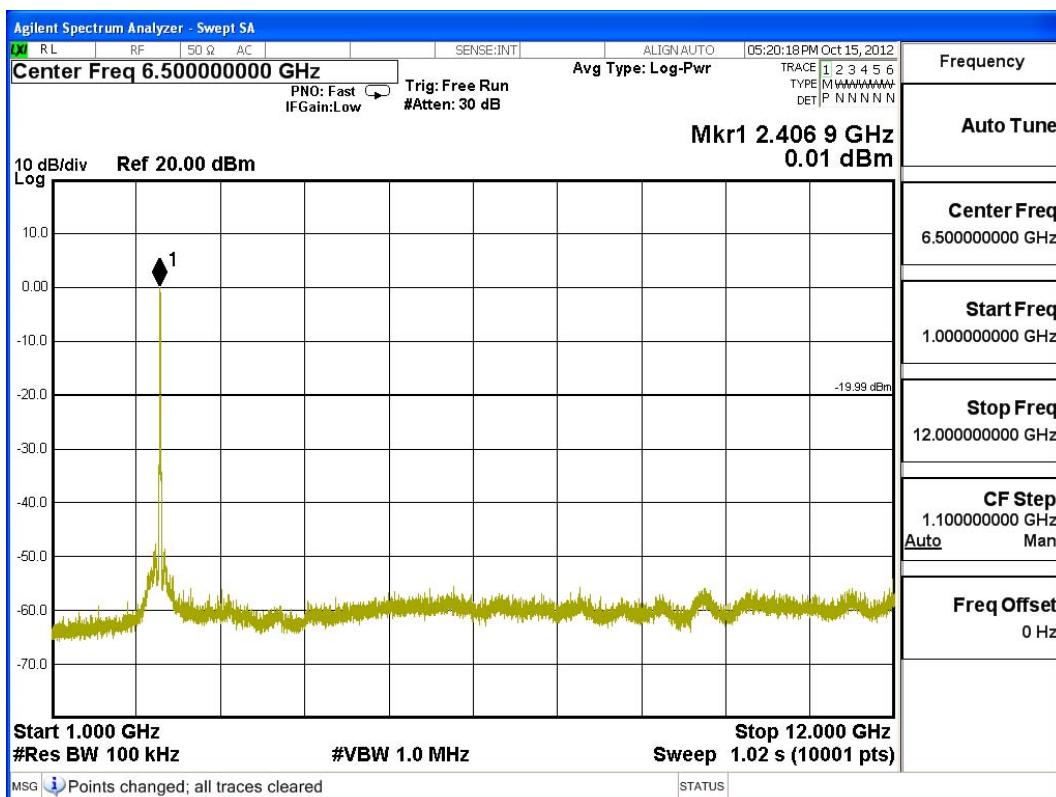




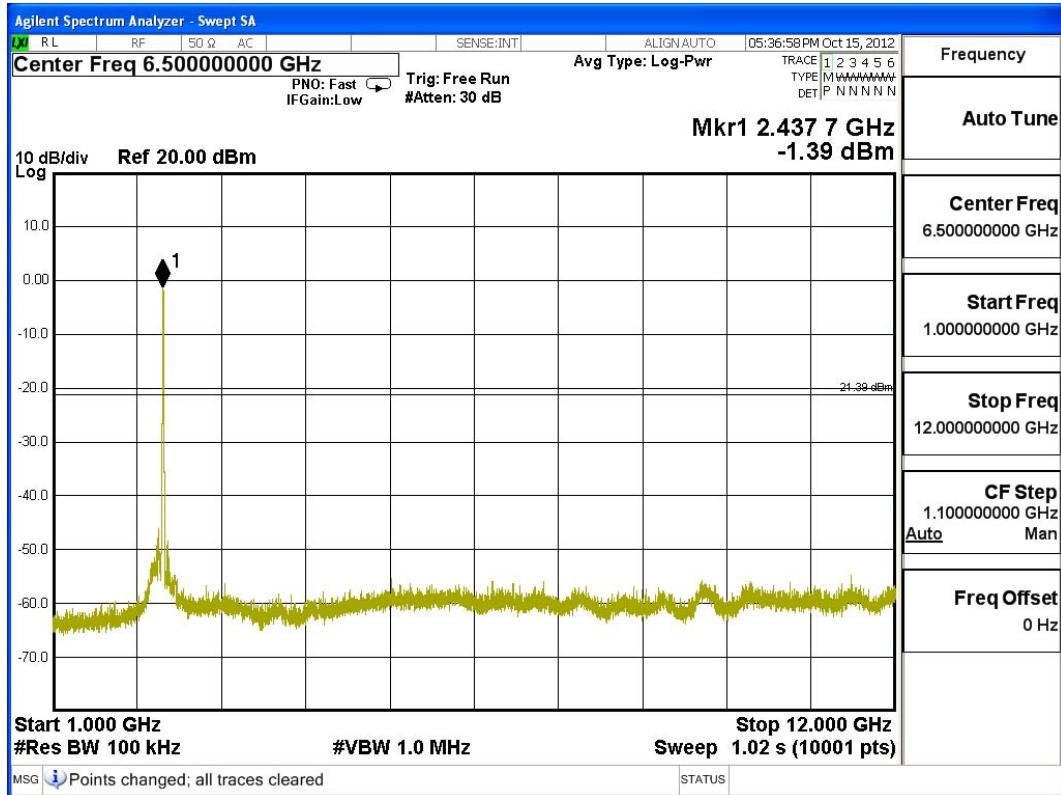
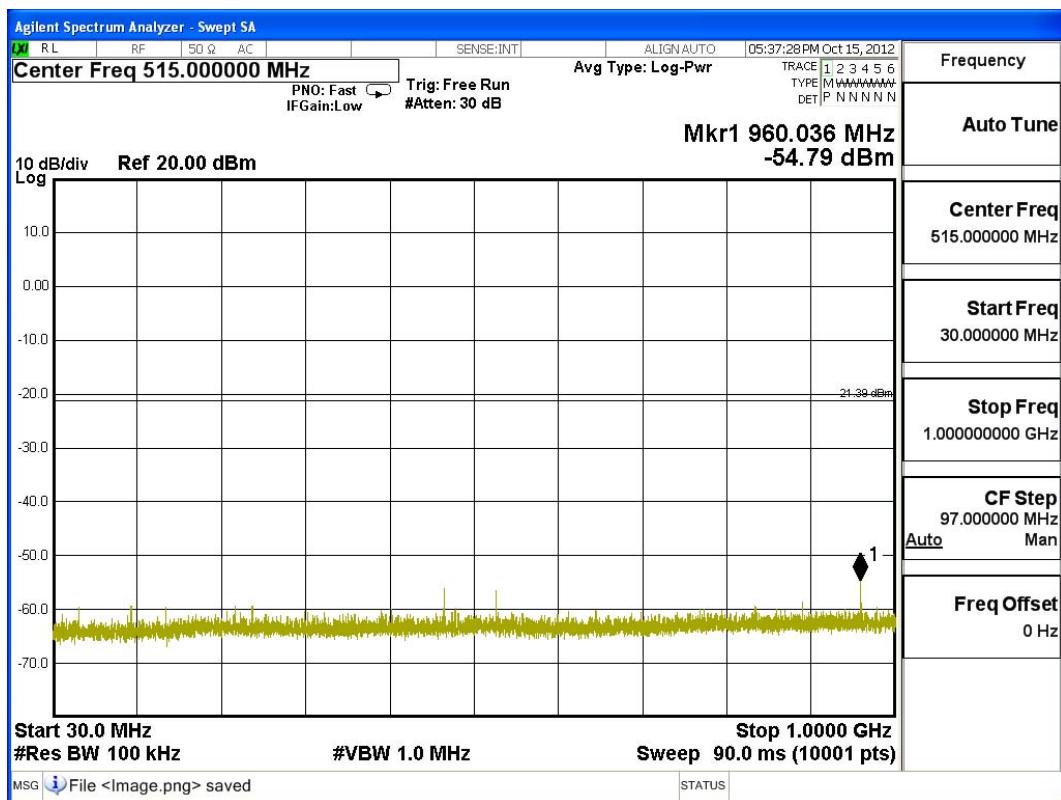
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : RF Antenna Conducted Spurious  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

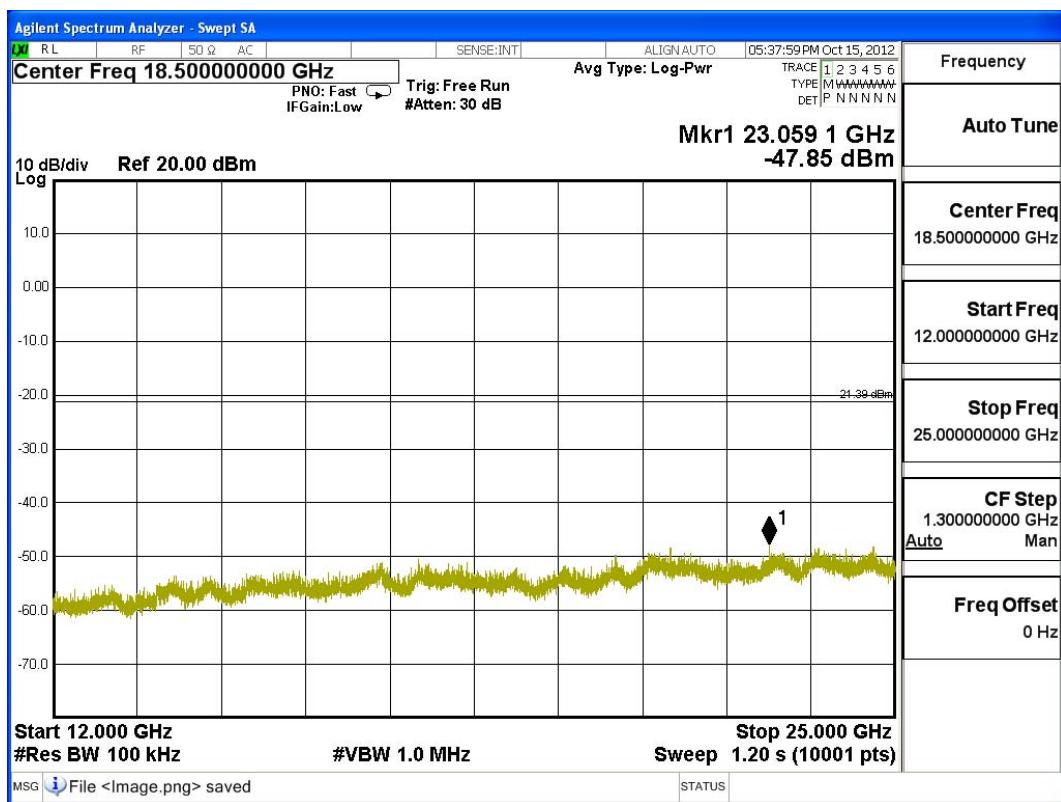
### Channel 01 (2412MHz)



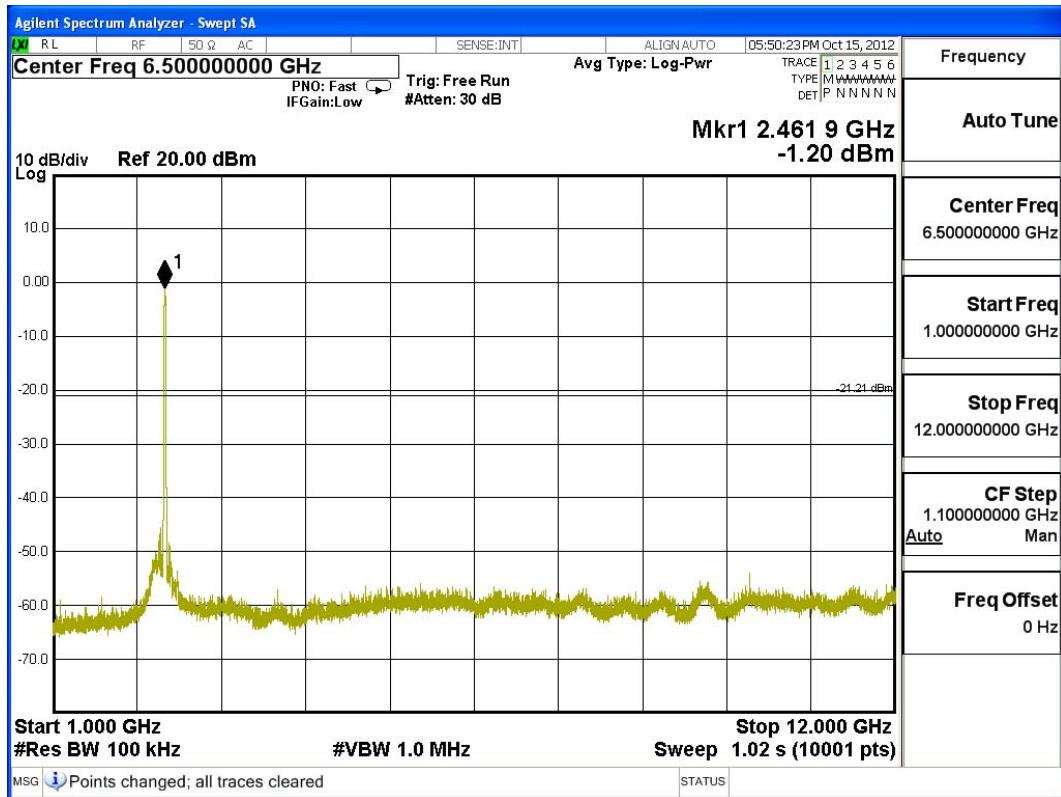
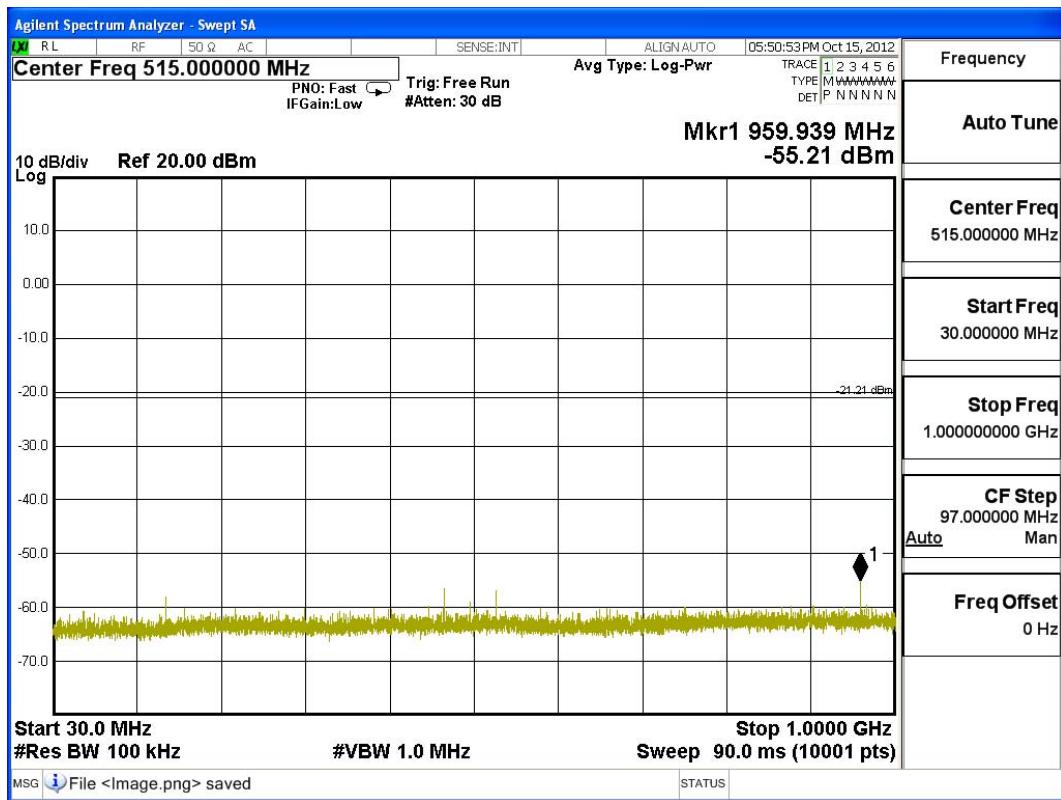


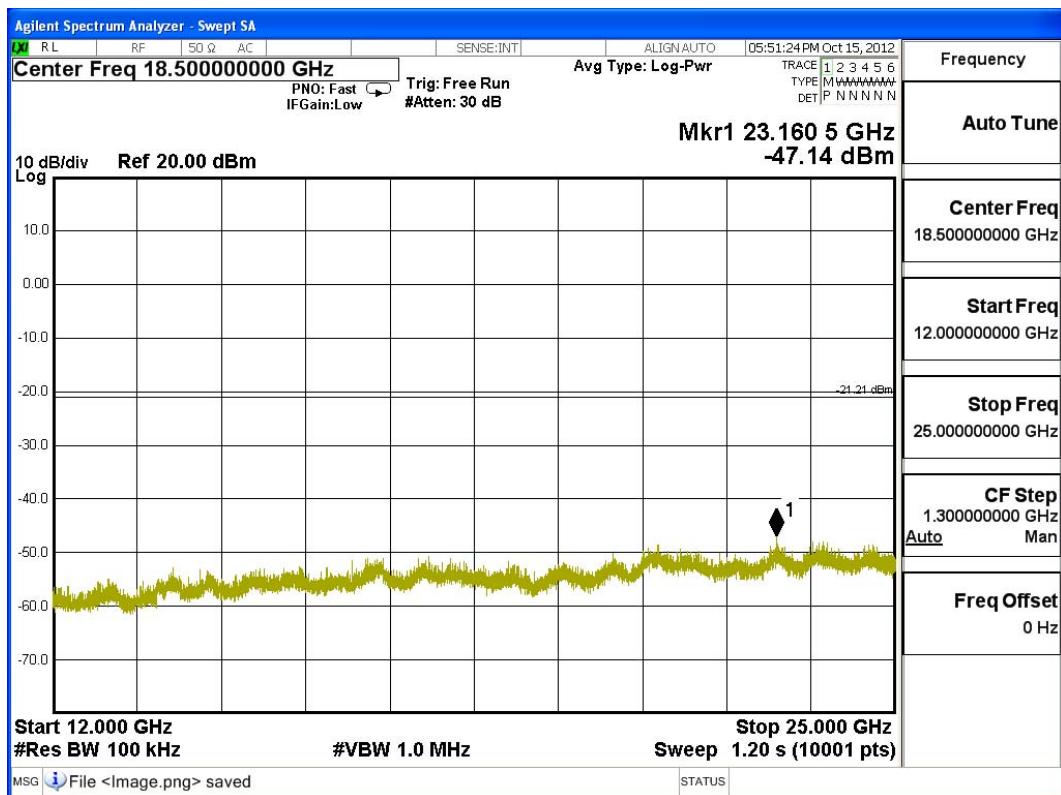
## Channel 06 (2437MHz)





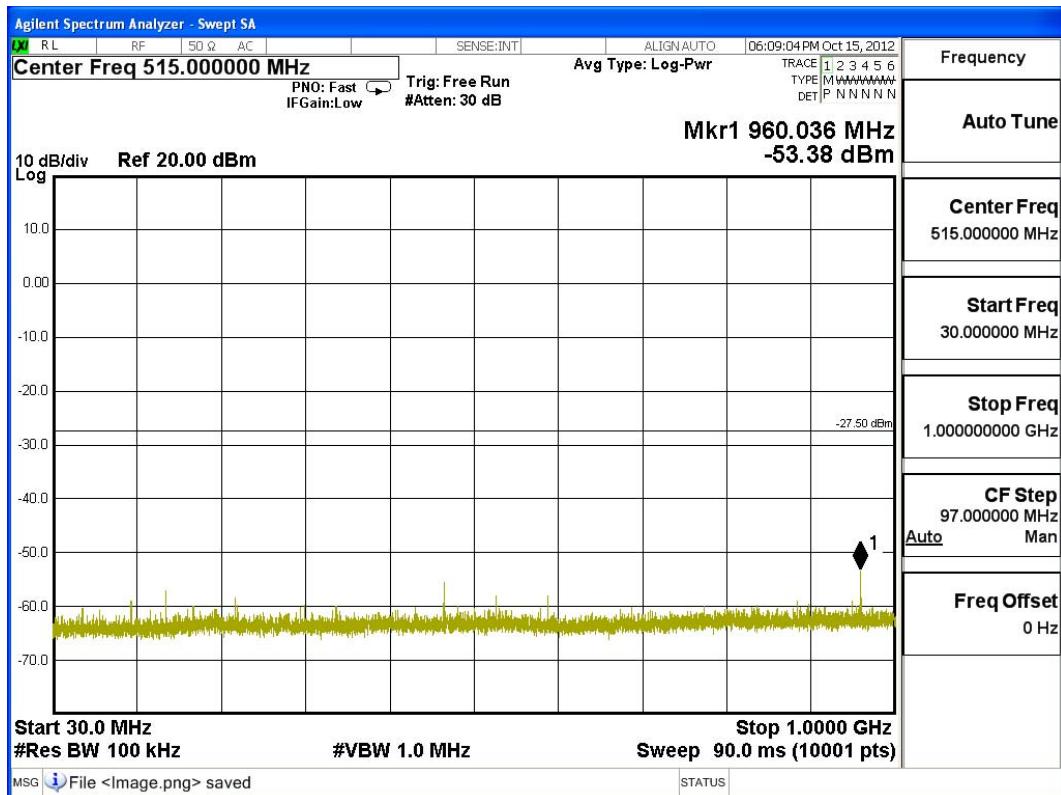
### Channel 11 (2462MHz)

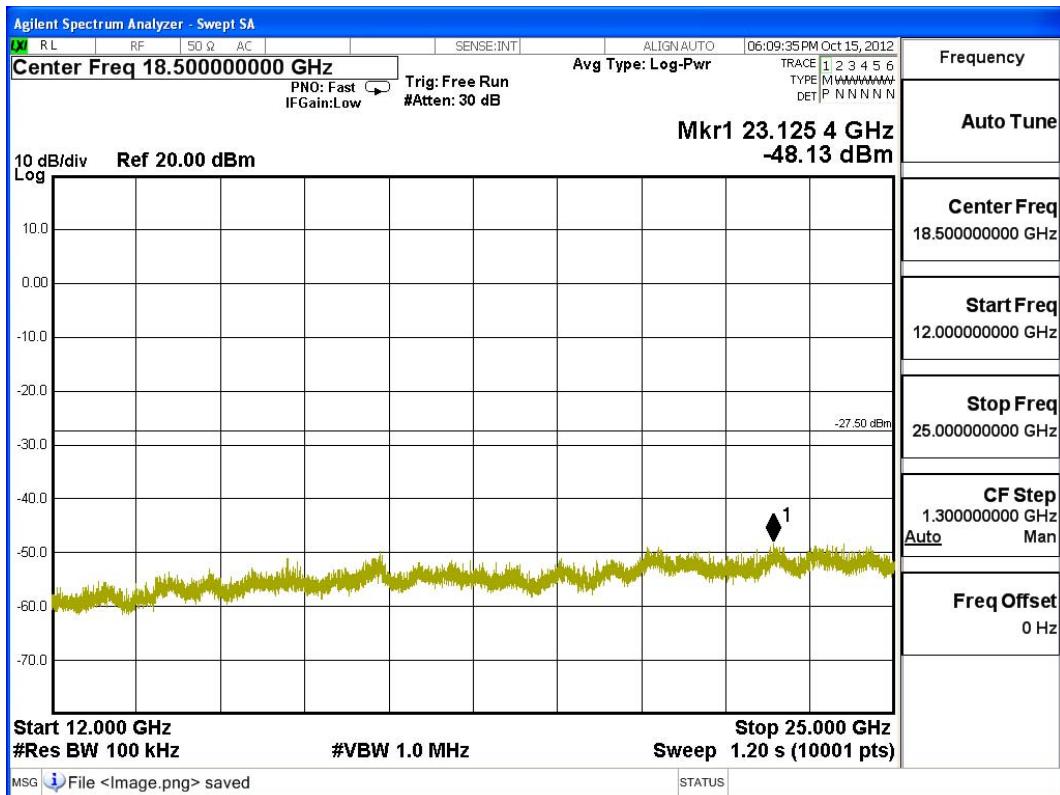
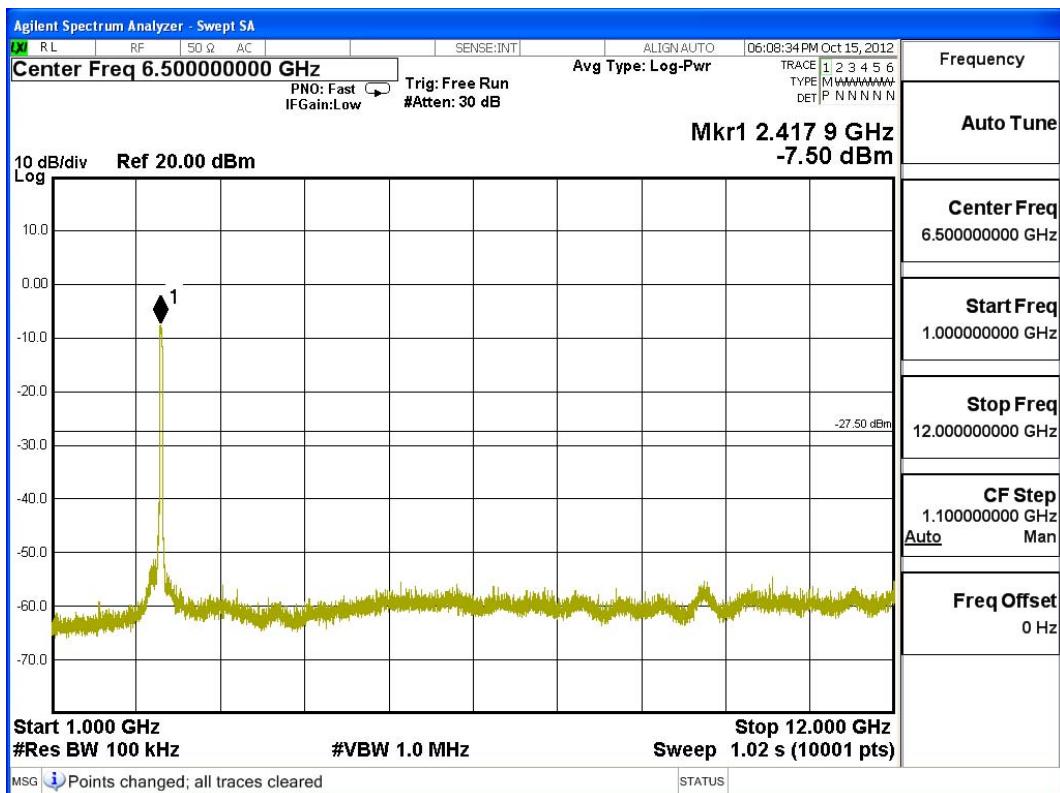




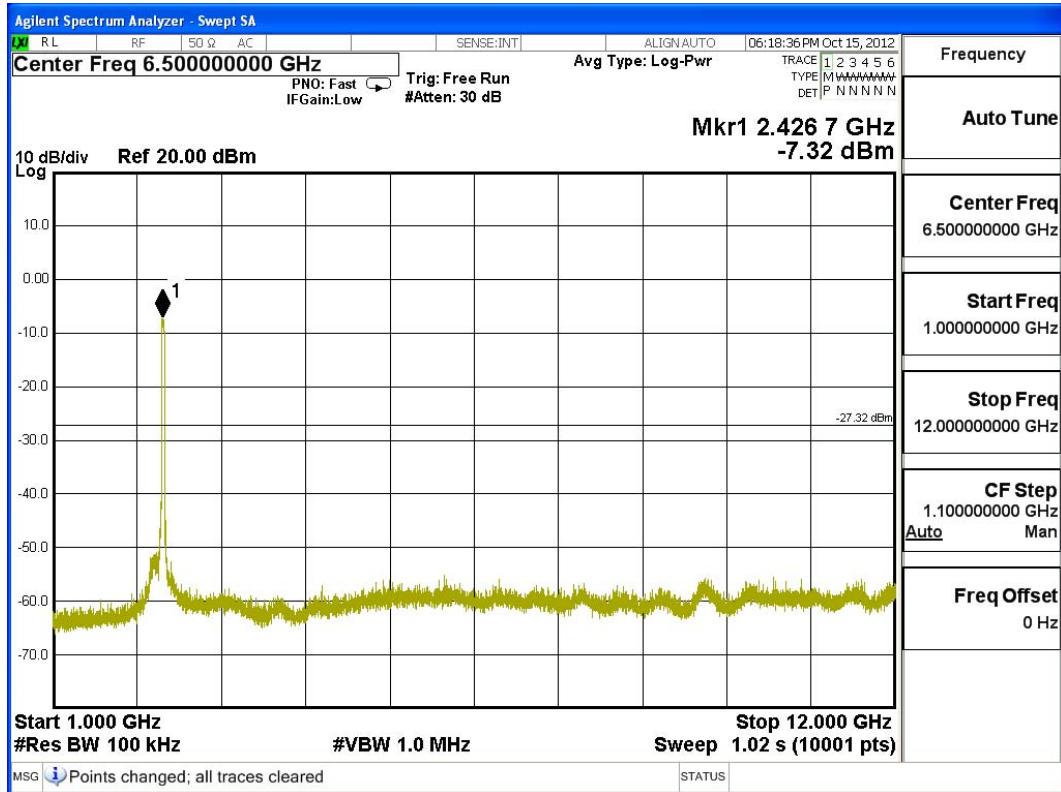
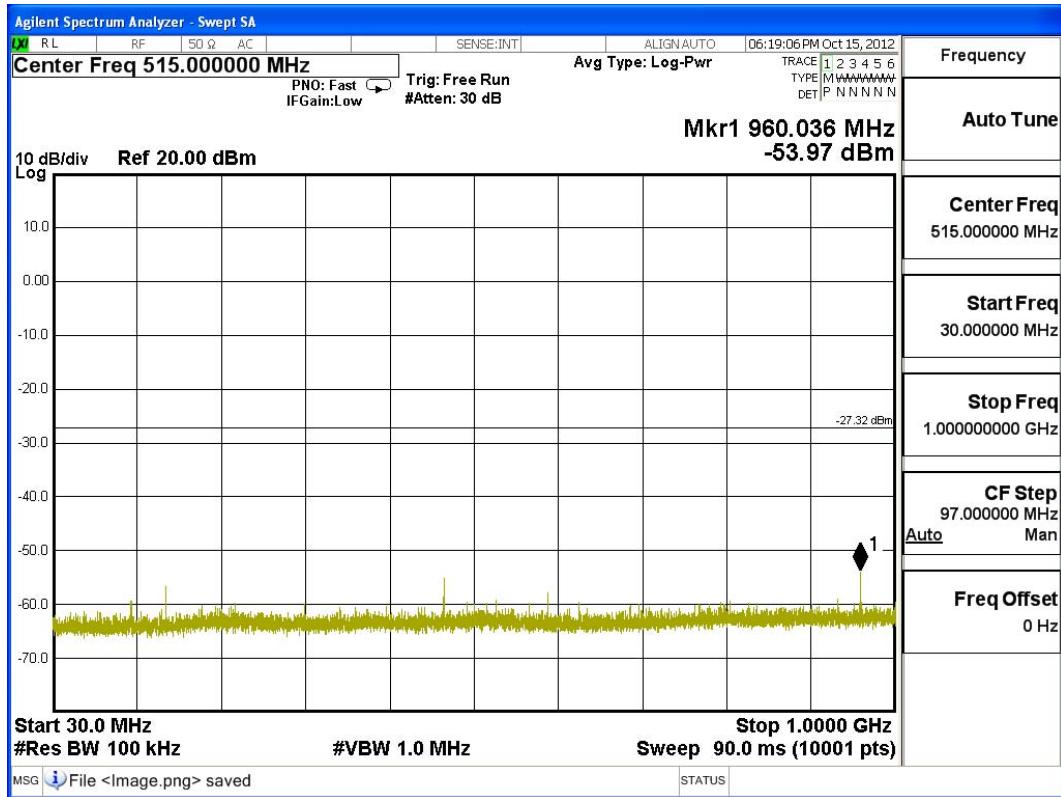
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : RF Antenna Conducted Spurious  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

### Channel 01 (2422MHz)



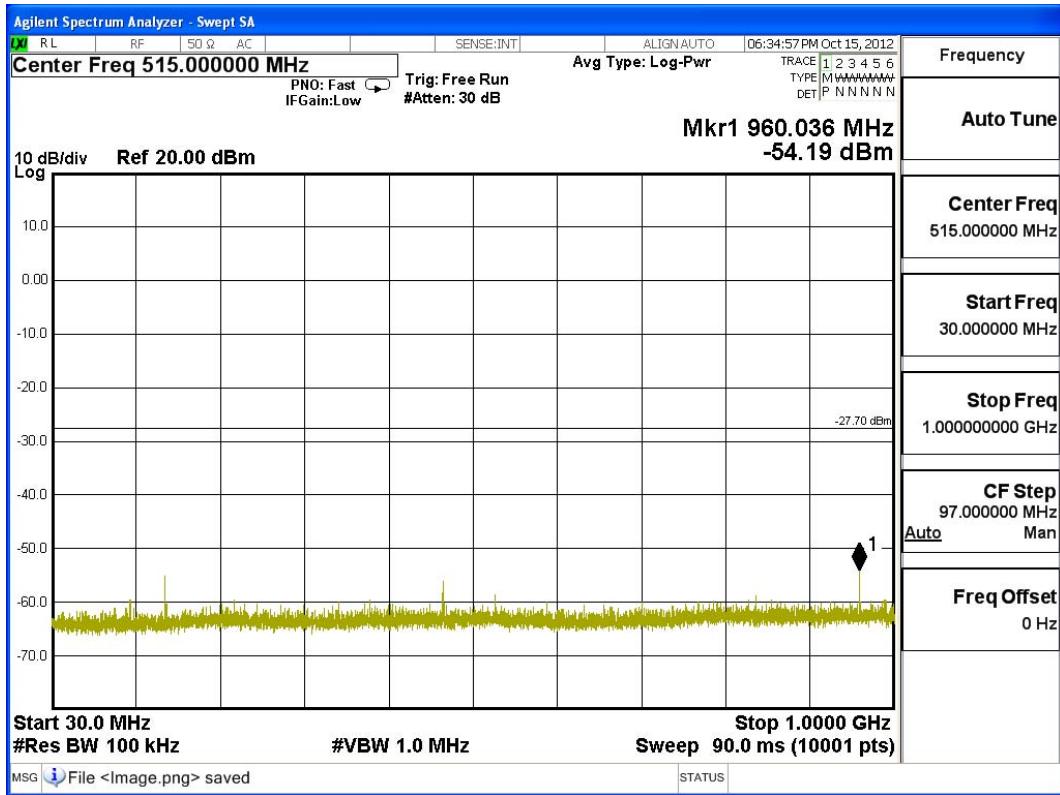


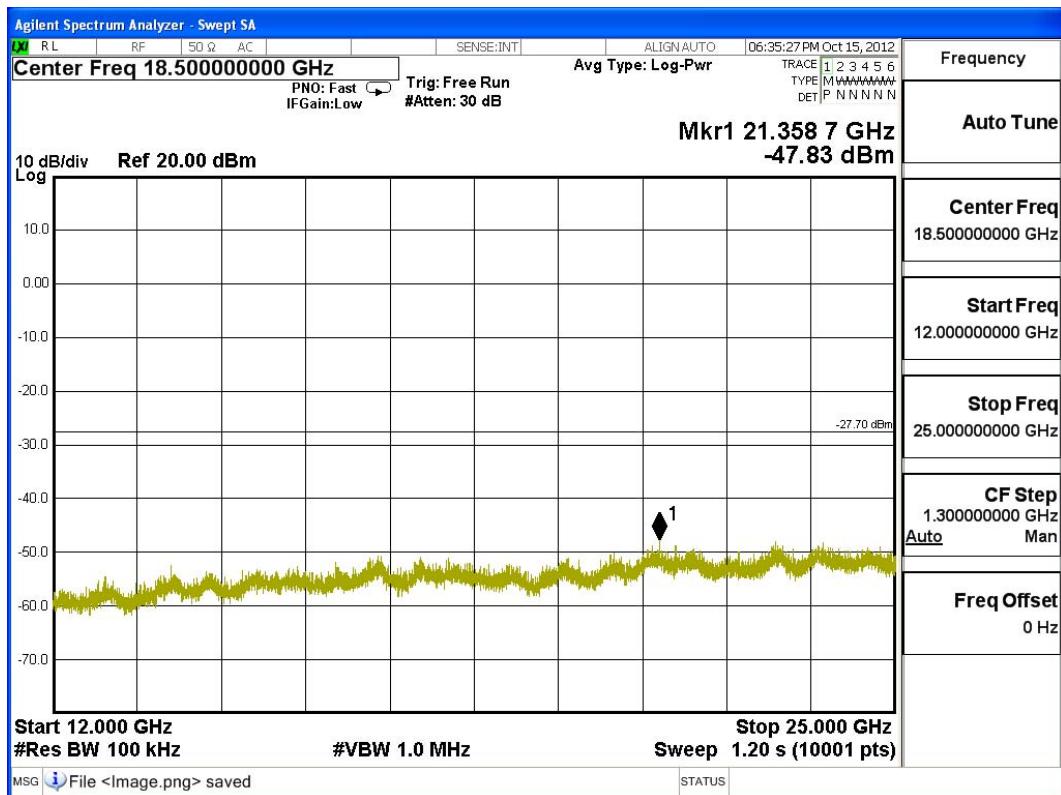
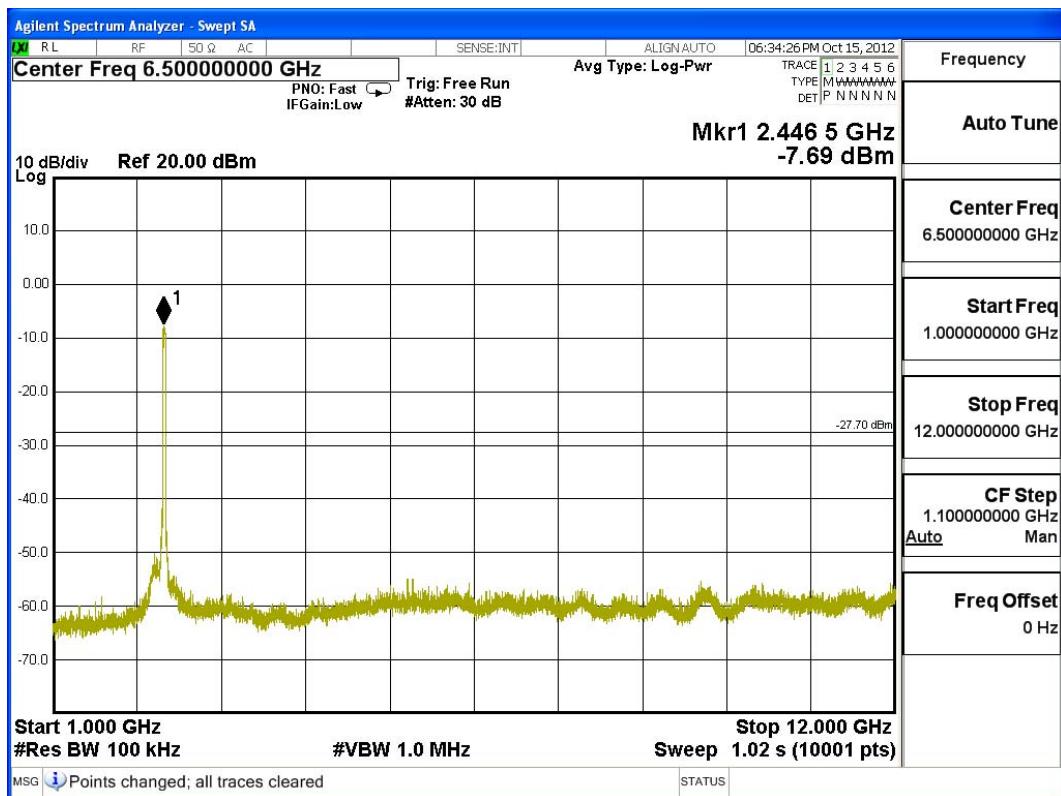
## Channel 04 (2437MHz)





### Channel 07 (2452MHz)





## 6. Band Edge

### 6.1. Test Equipment

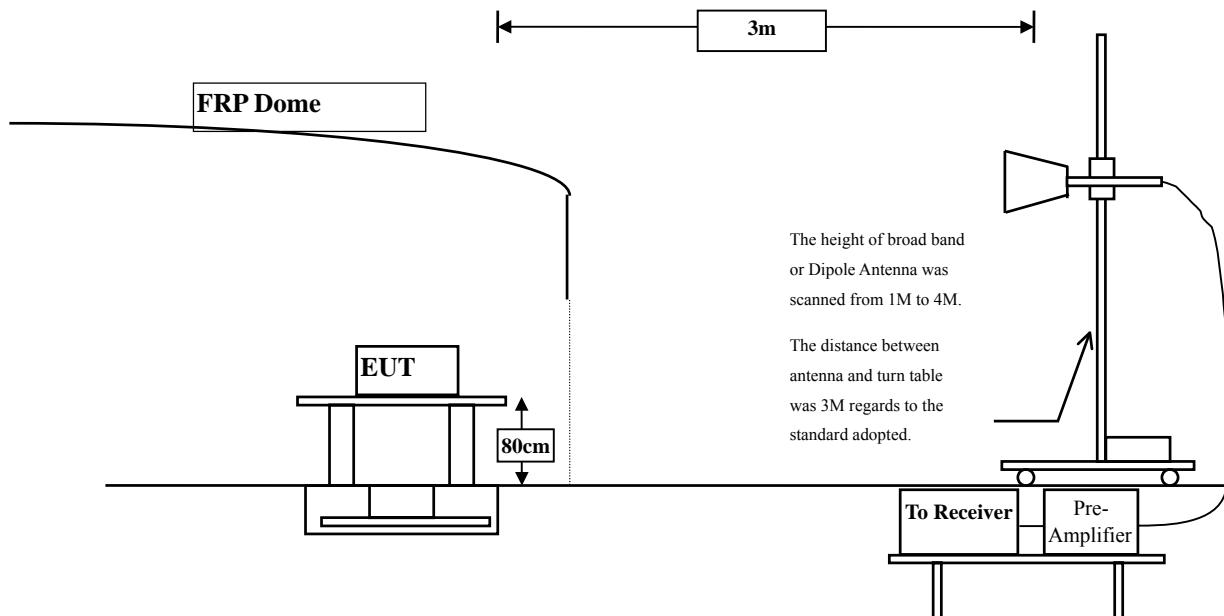
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2012
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2012
	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2012
	X Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2012
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2012
	X Coaxial Cable	QuiTek	QTK-CABLE/ CAB5	Feb., 2012
	X Controller	QuiTek	QTK-CONTROLLER/ CTRL3	N/A
	X Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note: 1. All instruments are calibrated every one year.  
2. The test instruments marked by "X" are used to measure the final test results.

### 6.2. Test Setup

#### RF Radiated Measurement:



### **6.3. Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

### **6.4. Test Procedure**

The EUT was setup according to ANSI C63.4: 2003 and tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2003 on radiated measurement.

### **6.5. Uncertainty**

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

## 6.6. Test Result of Band Edge

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2142MHz)

### RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2389.600	31.739	25.973	57.711	74.00	54.00	Pass
01 (Peak)	2390.000	31.739	24.786	56.525	74.00	54.00	Pass
01 (Peak)	2411.000	31.769	70.105	101.874	--	--	--
01 (Average)	2370.400	31.723	13.394	45.117	74.00	54.00	Pass
01 (Average)	2390.000	31.739	13.493	45.232	74.00	54.00	Pass
01 (Average)	2409.400	31.767	65.709	97.476	--	--	--

Figure Channel 01:

Horizontal (Peak)

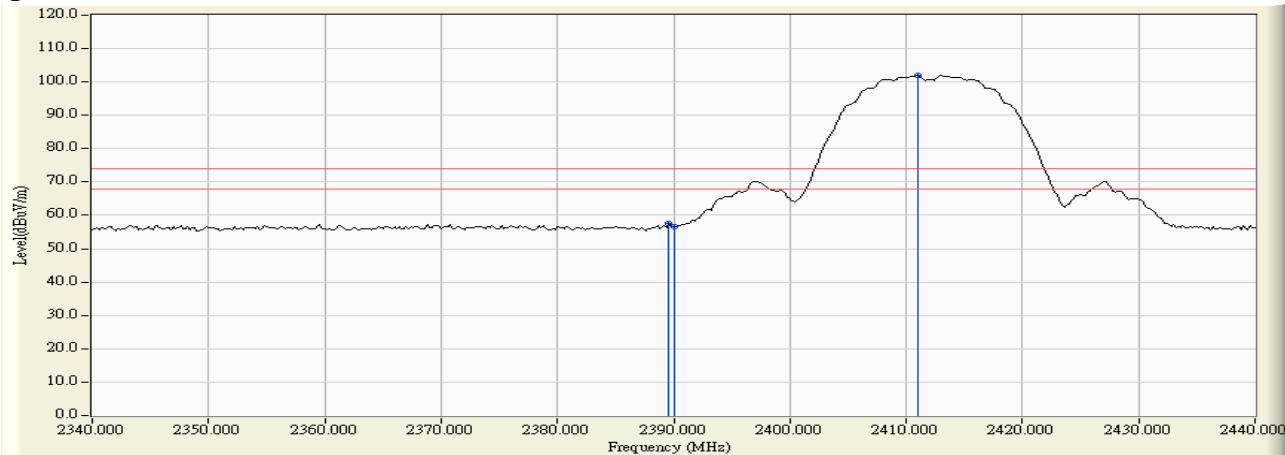
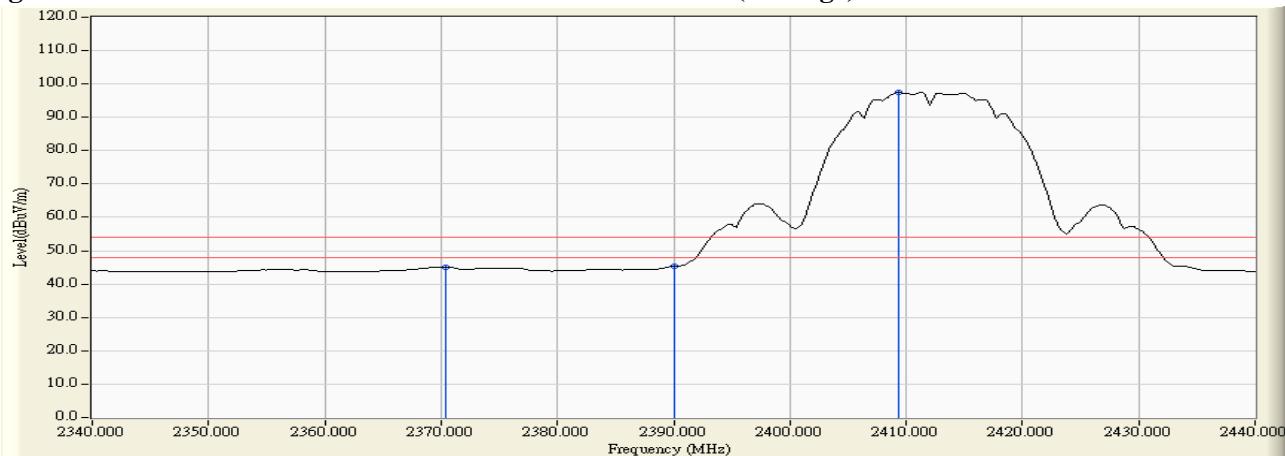


Figure Channel 01:

Horizontal (Average)



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

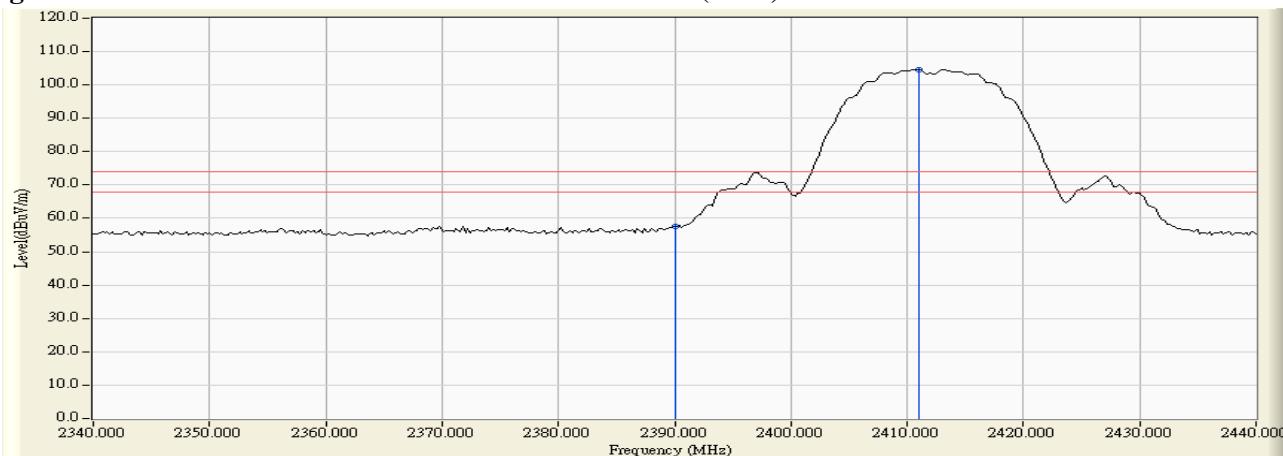
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2142MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	30.267	27.177	57.444	74.00	54.00	Pass
01 (Peak)	2411.000	30.244	74.313	104.557	--	--	--
01 (Average)	2375.400	30.369	14.920	45.289	74.00	54.00	Pass
01 (Average)	2390.000	30.267	15.966	46.233	74.00	54.00	Pass
01 (Average)	2409.400	30.245	70.182	100.426	--	--	--

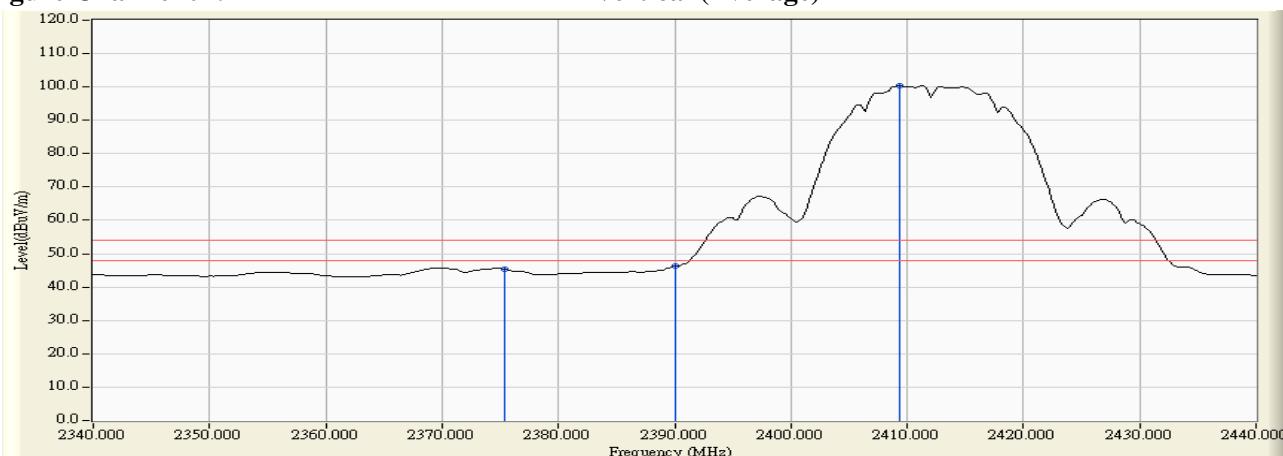
**Figure Channel 01:**

**Vertical (Peak)**



**Figure Channel 01:**

**Vertical (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

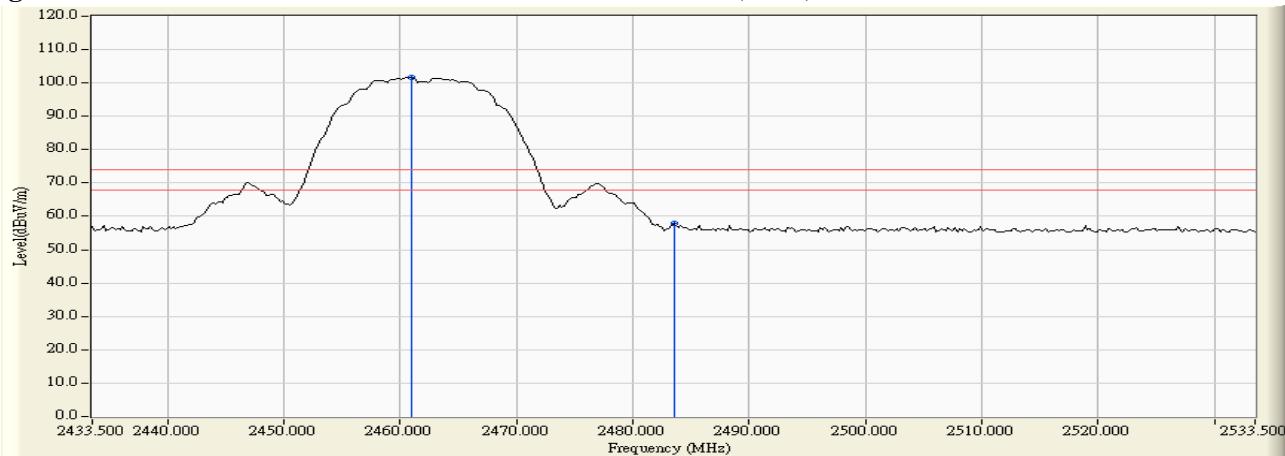
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2460.900	31.890	69.737	101.627	--	--	--
11 (Peak)	2483.500	31.951	25.938	57.888	74.00	54.00	Pass
11 (Average)	2459.300	31.886	65.798	97.684	--	--	--
11 (Average)	2483.500	31.951	13.208	45.158	74.00	54.00	Pass

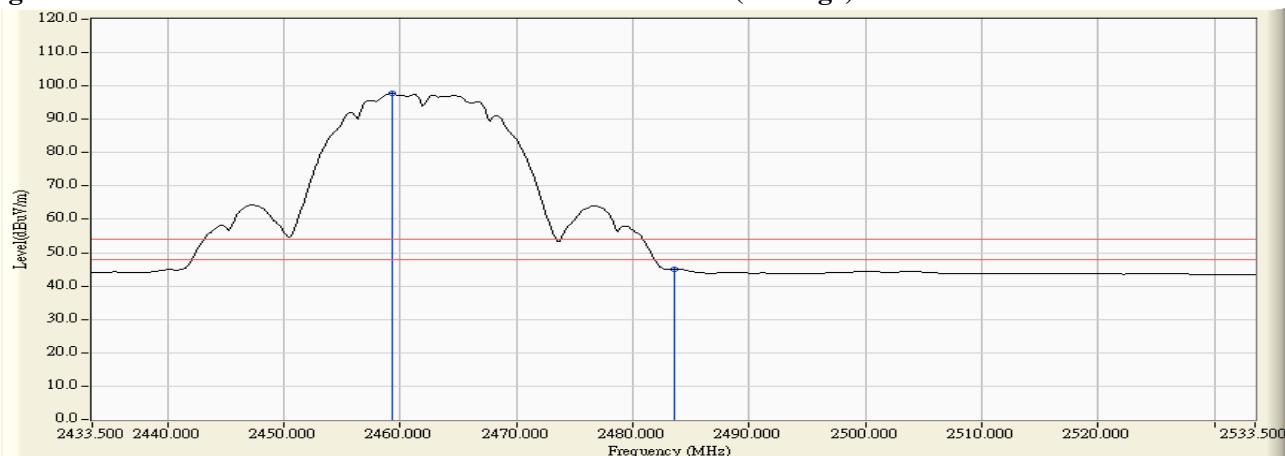
**Figure Channel 11:**

**Horizontal (Peak)**



**Figure Channel 11:**

**Horizontal (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

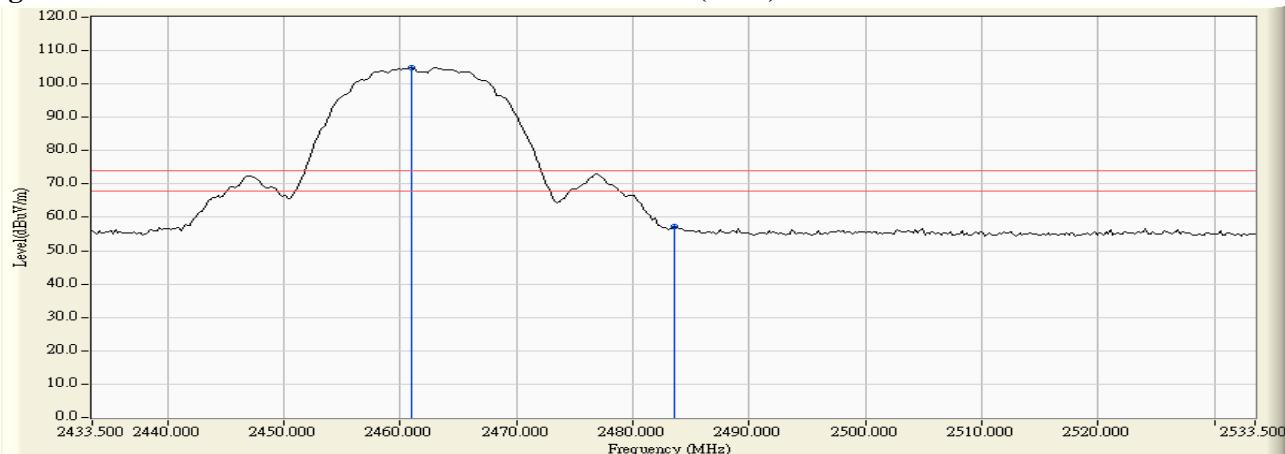
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2460.900	30.476	74.288	104.763	--	--	--
11 (Peak)	2483.500	30.586	26.658	57.243	74.00	54.00	Pass
11 (Average)	2459.300	30.468	70.758	101.225	--	--	--
11 (Average)	2483.500	30.586	15.400	45.985	74.00	54.00	Pass

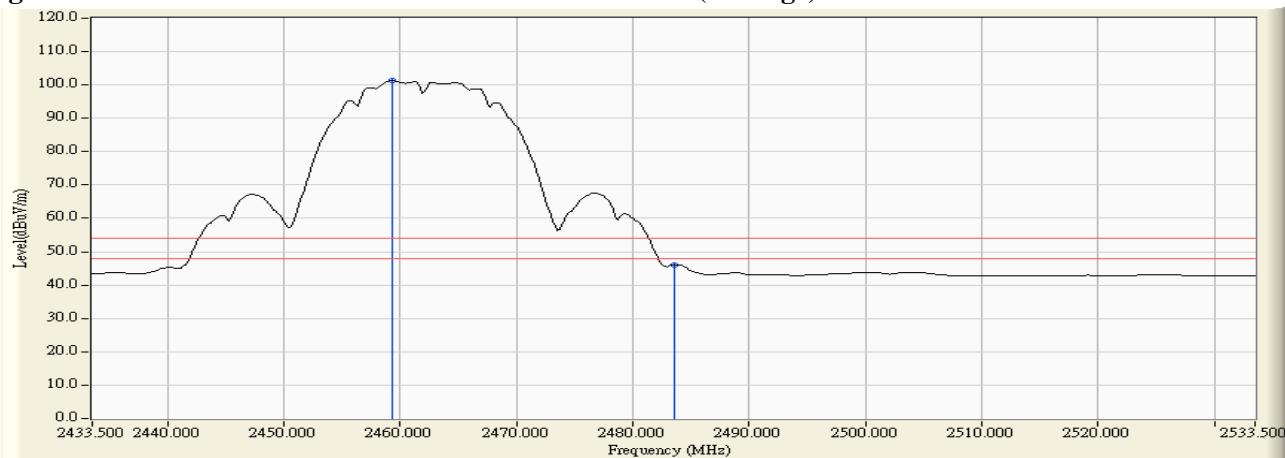
**Figure Channel 11:**

**Vertical (Peak)**



**Figure Channel 11:**

**Vertical (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

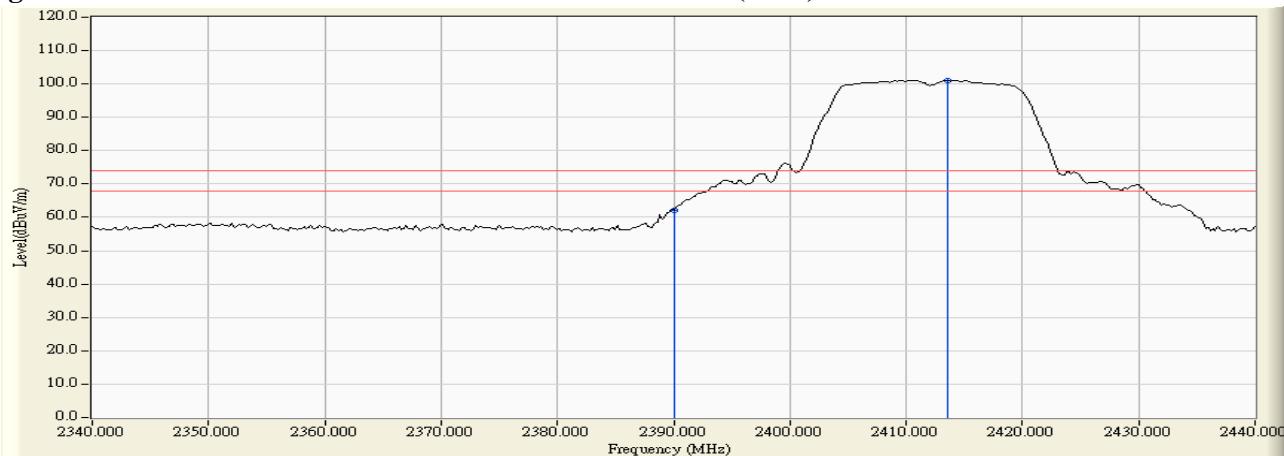
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	31.739	30.228	61.967	74.00	54.00	Pass
01 (Peak)	2413.600	31.776	69.297	101.073	--	--	--
01(Average)	2390.000	31.739	15.408	47.147	74.00	54.00	Pass
01(Average)	2410.800	31.769	60.163	91.932	--	--	--

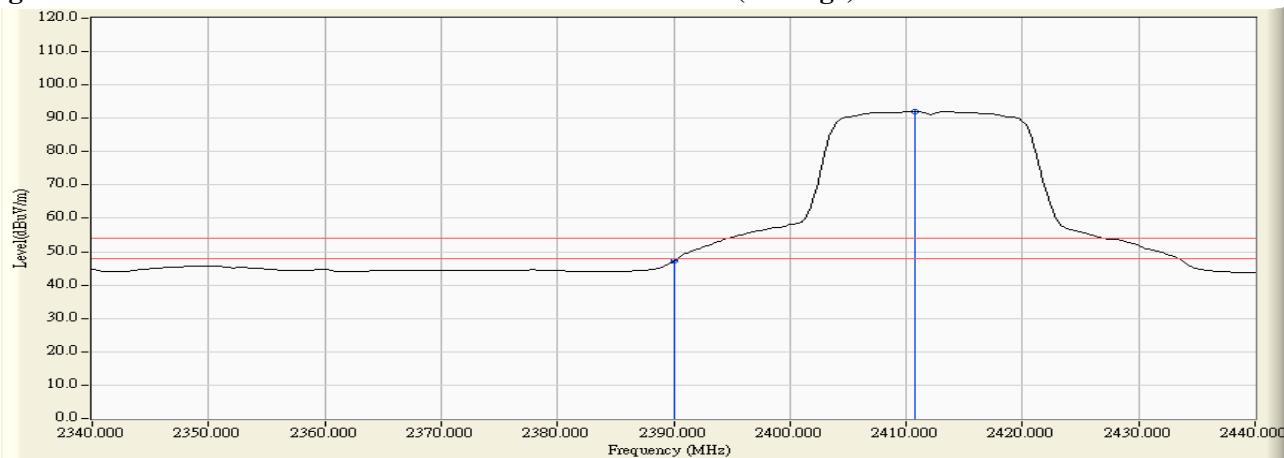
**Figure Channel 01:**

**Horizontal (Peak)**



**Figure Channel 01:**

**Horizontal (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

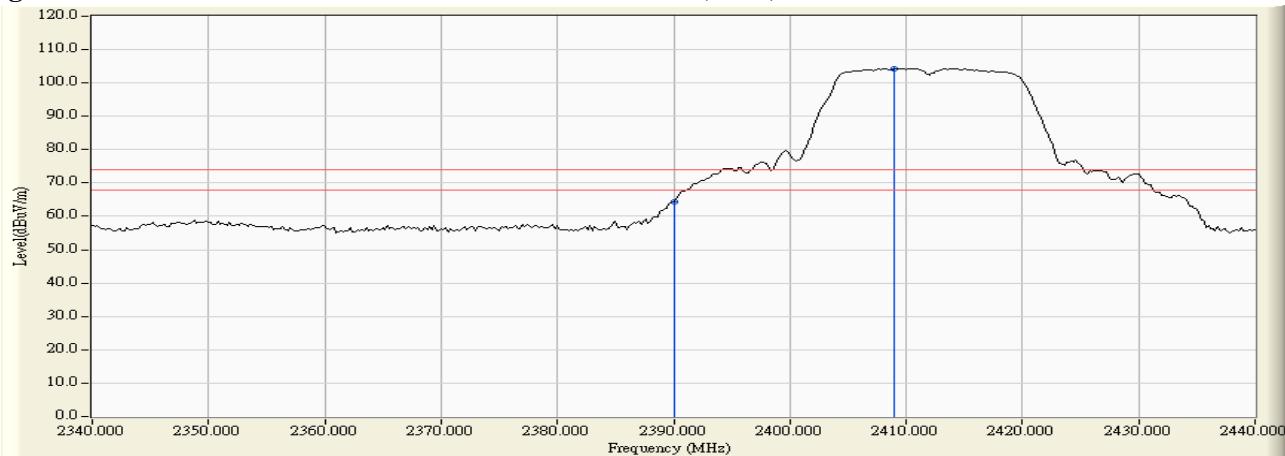
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	30.267	34.169	64.436	74.00	54.00	Pass
01 (Peak)	2409.000	30.244	74.126	104.370	--	--	--
01 (Average)	2390.000	30.267	18.704	48.971	74.00	54.00	Pass
01 (Average)	2410.800	30.244	64.350	94.594	--	--	--

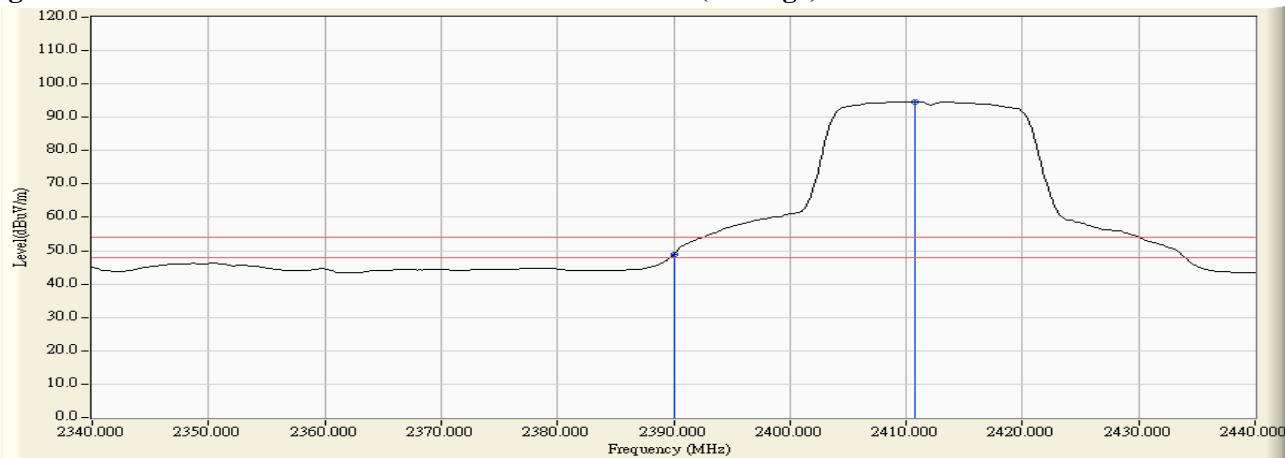
**Figure Channel 01:**

**Vertical (Peak)**



**Figure Channel 01:**

**Vertical (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

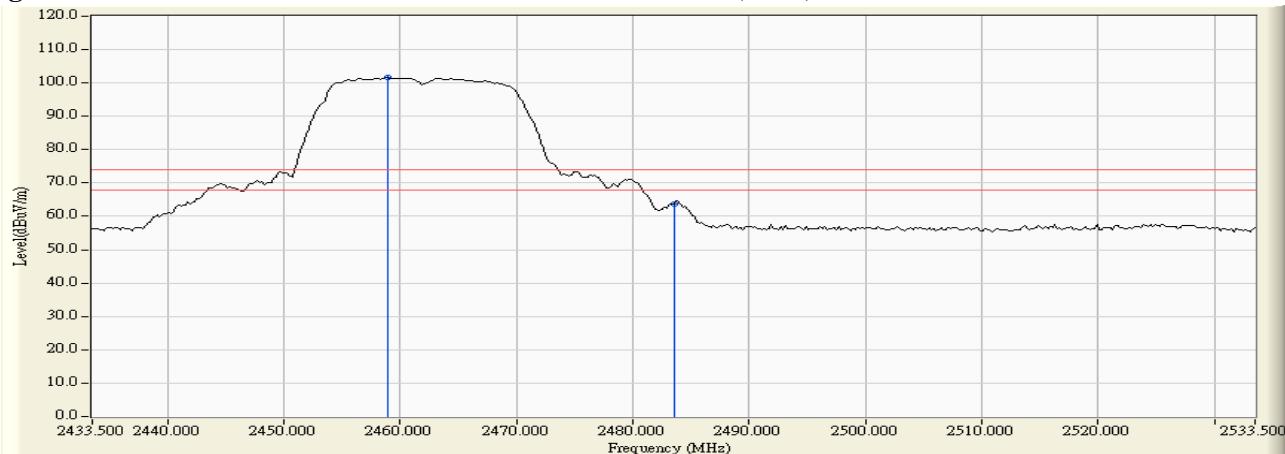
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2458.900	31.885	69.682	101.567	--	--	--
11 (Peak)	2483.500	31.951	31.806	63.756	74.00	54.00	Pass
11 (Average)	2458.500	31.883	59.954	91.838	--	--	--
11 (Average)	2483.500	31.951	14.342	46.292	74.00	54.00	Pass

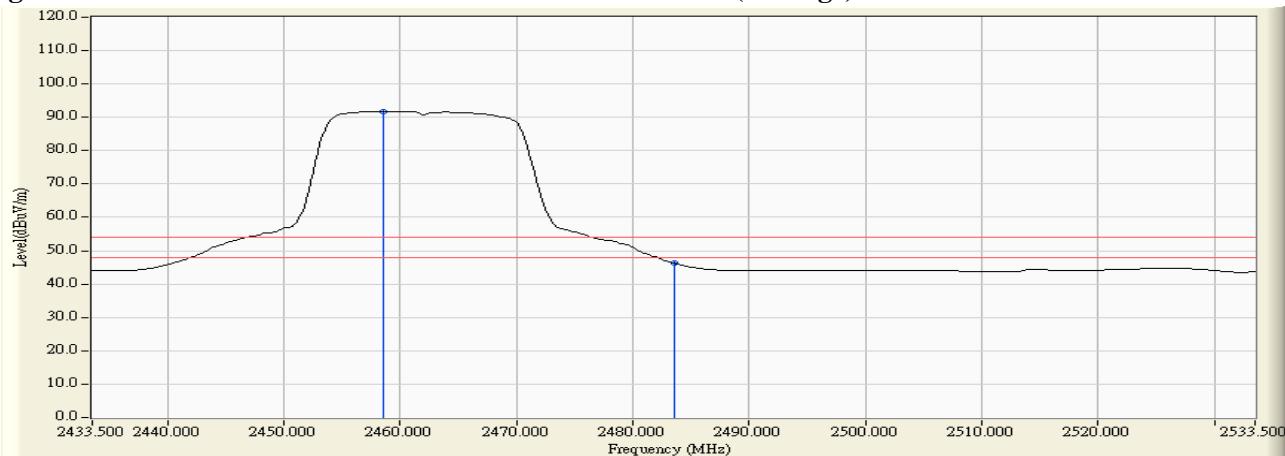
**Figure Channel 11:**

**Horizontal (Peak)**



**Figure Channel 11:**

**Horizontal (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2458.900	30.466	74.284	104.750	--	--	--
11 (Peak)	2483.500	30.586	36.107	66.692	74.00	54.00	Pass
11 (Average)	2460.700	30.475	64.461	94.935	--	--	--
11 (Average)	2483.500	30.586	16.995	47.580	74.00	54.00	Pass

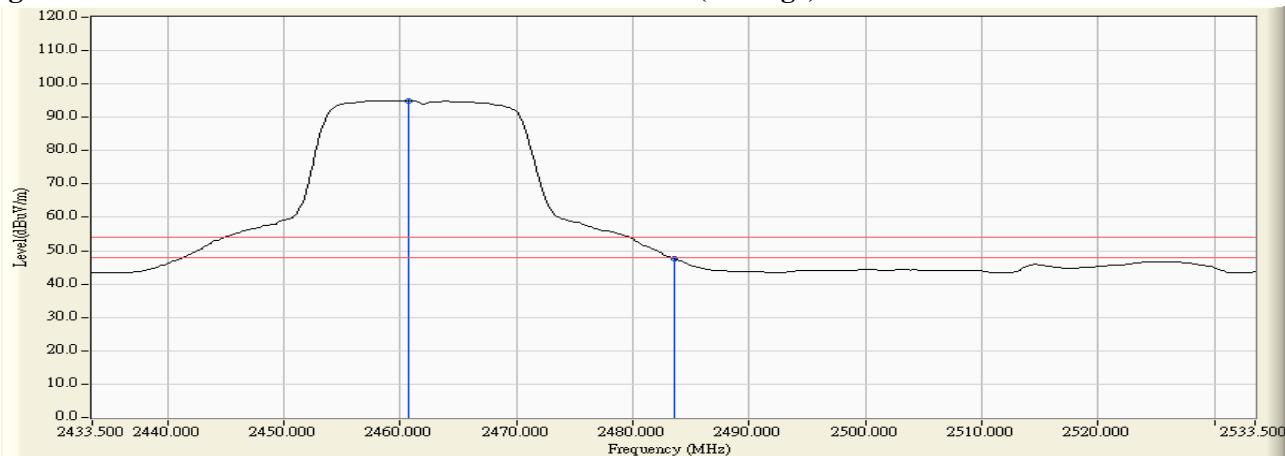
**Figure Channel 11:**

**Vertical (Peak)**



**Figure Channel 11:**

**Vertical (Average)**



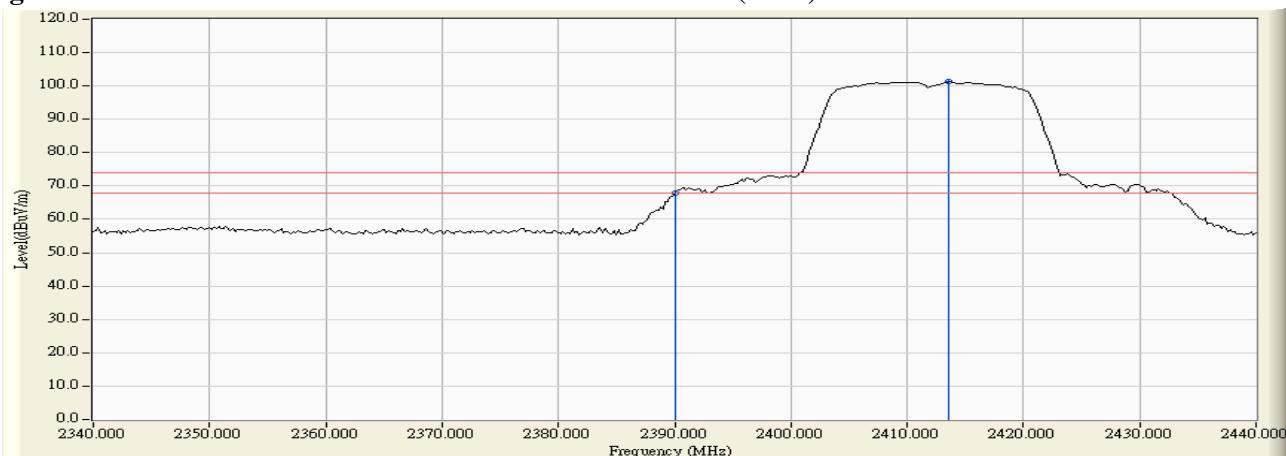
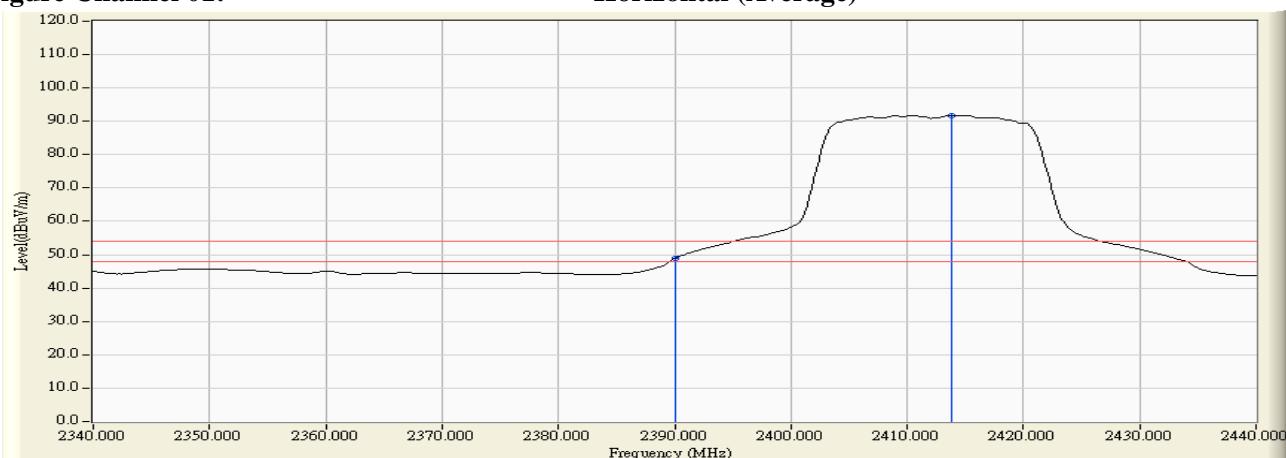
## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
Test Item : Band Edge  
Test Site : No.3 OATS  
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	31.739	36.258	67.997	74.00	54.00	Pass
01 (Peak)	2413.600	31.776	69.510	101.286	--	--	--
01 (Average)	2390.000	31.739	17.141	48.880	74.00	54.00	Pass
01 (Average)	2413.800	31.776	59.950	91.726	--	--	--

**Figure Channel 01:****Horizontal (Peak)****Figure Channel 01:****Horizontal (Average)**

## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

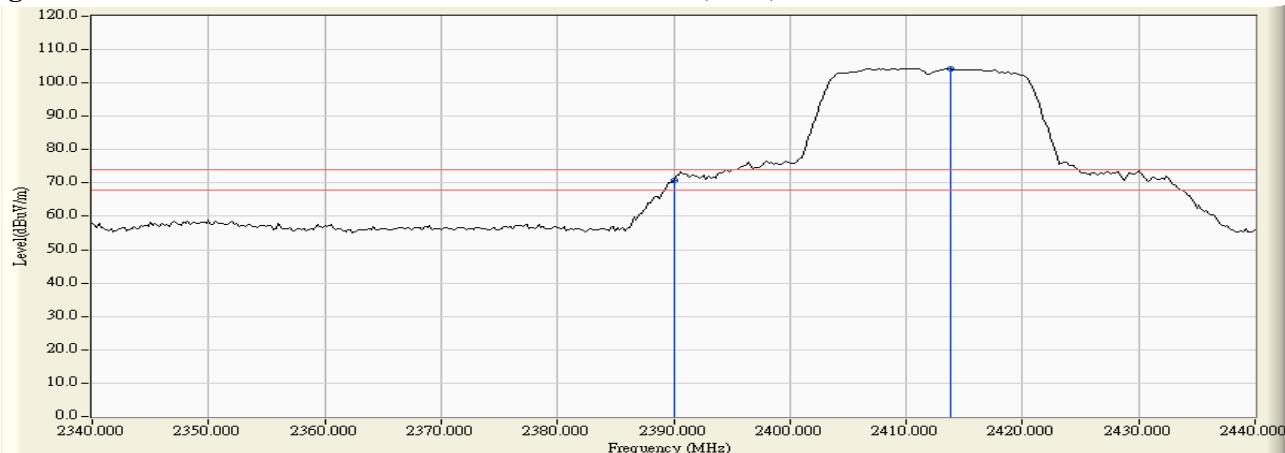
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
01 (Peak)	2390.000	30.267	40.523	70.790	74.00	54.00	Pass
01 (Peak)	2413.800	30.257	74.094	104.351	--	--	--
01 (Average)	2390.000	30.267	20.726	50.993	74.00	54.00	Pass
01 (Average)	2410.600	30.244	64.140	94.384	--	--	--

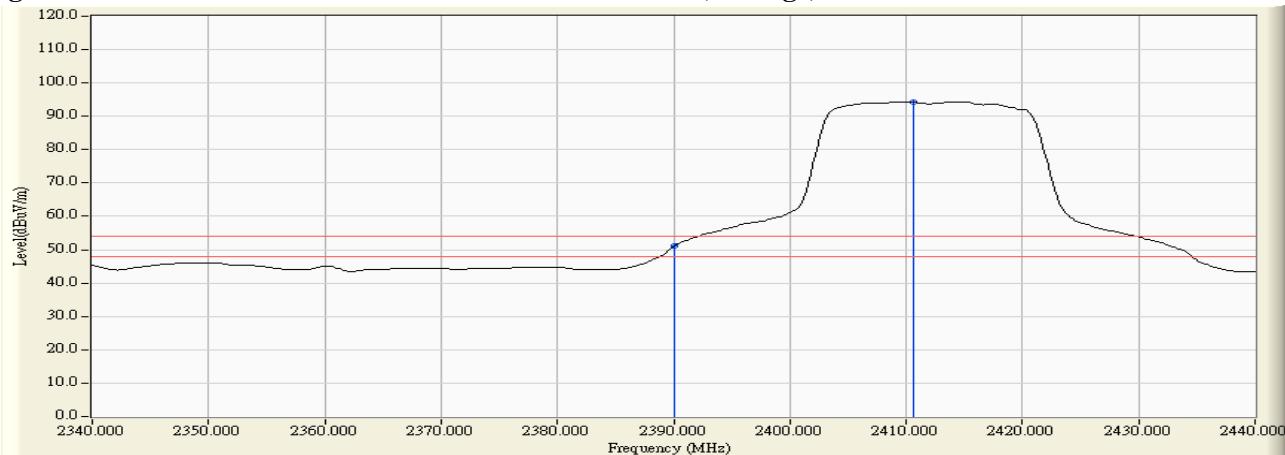
**Figure Channel 01:**

**Vertical (Peak)**



**Figure Channel 01:**

**Vertical (Average)**



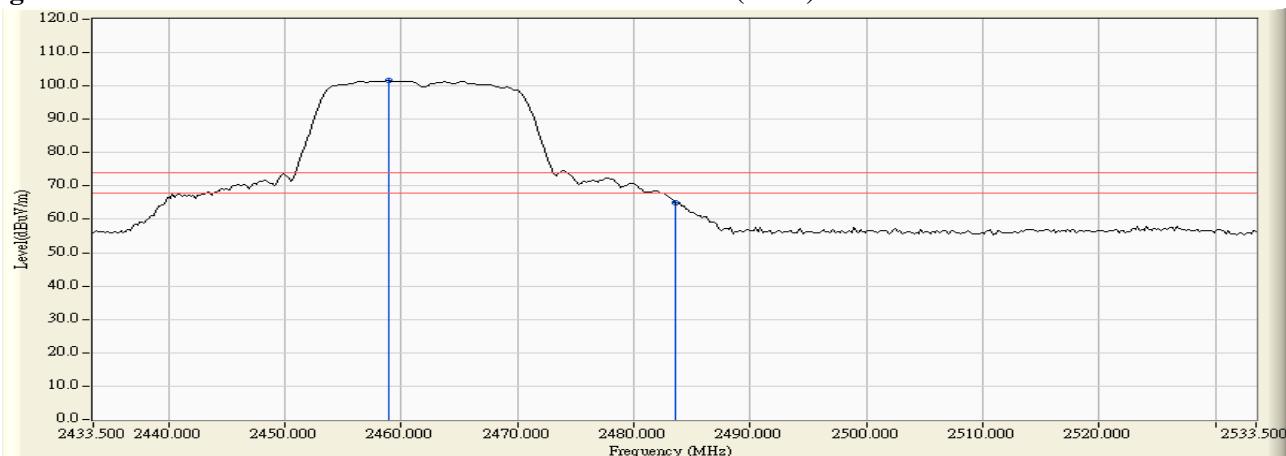
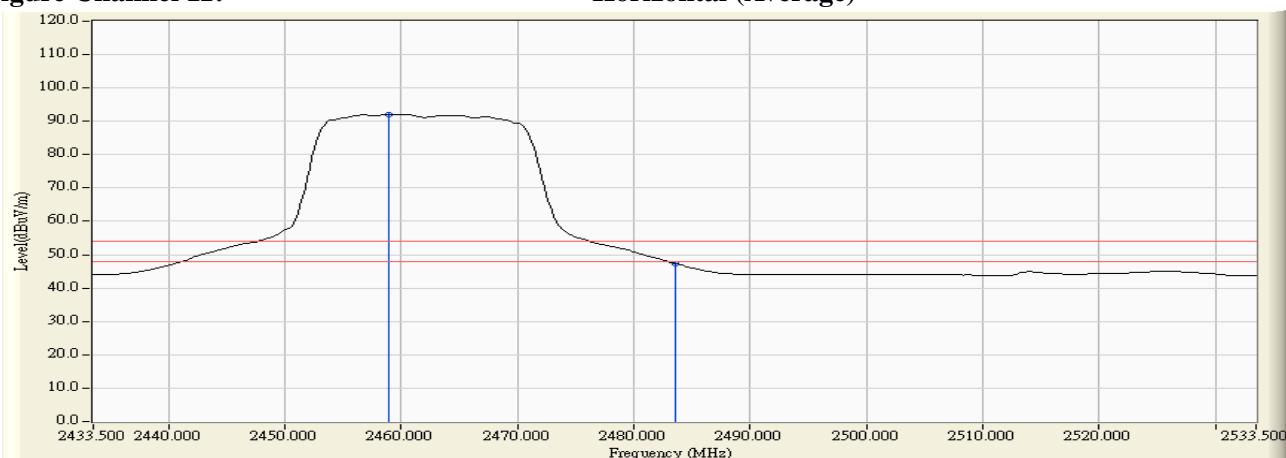
## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2458.900	31.885	69.690	101.575	--	--	--
11 (Peak)	2483.500	31.951	33.184	65.134	74.00	54.00	Pass
11 (Average)	2458.900	31.885	60.224	92.109	--	--	--
11 (Average)	2483.500	31.951	15.406	47.356	74.00	54.00	Pass

**Figure Channel 11:**
**Horizontal (Peak)**

**Figure Channel 11:**
**Horizontal (Average)**


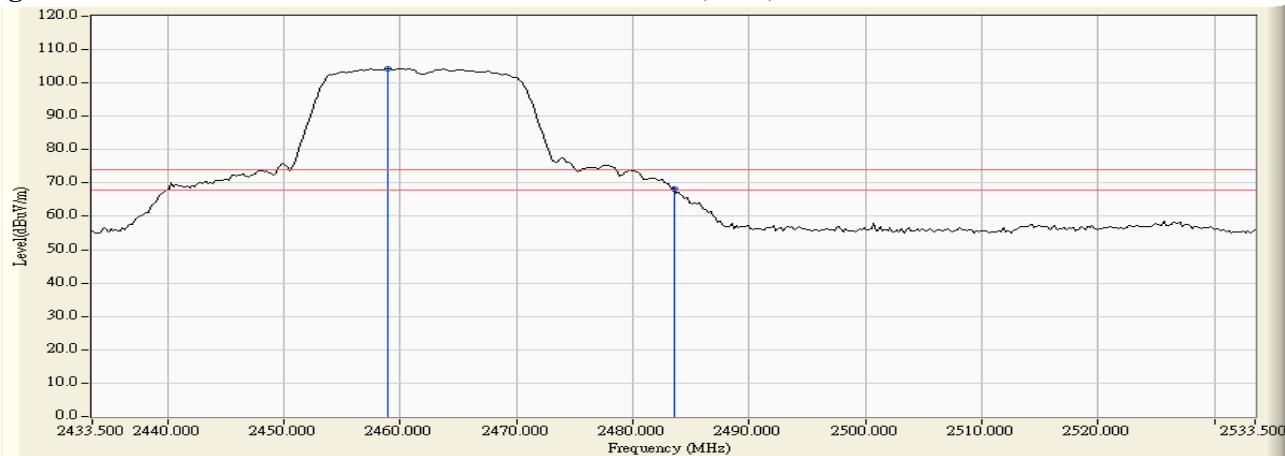
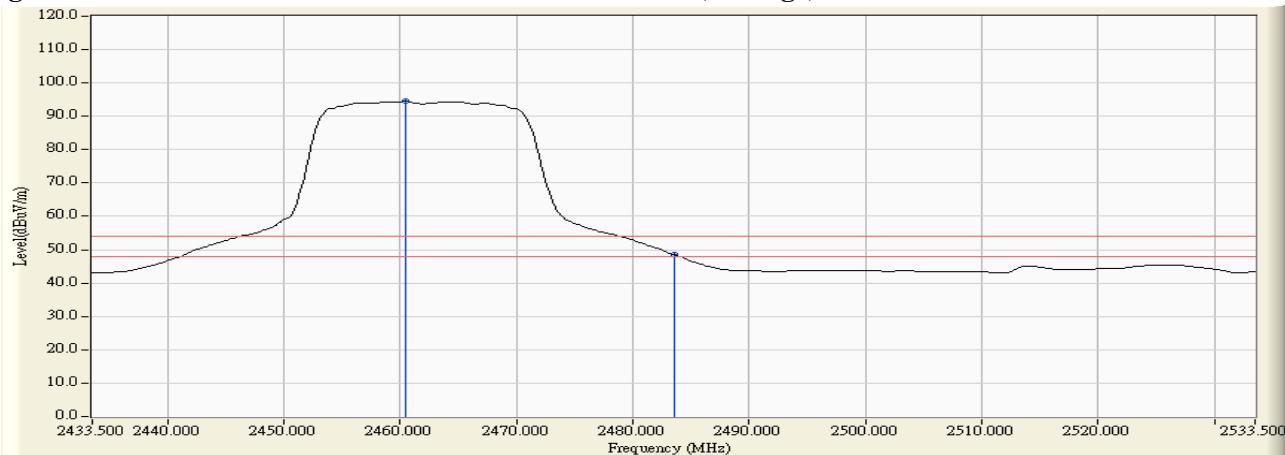
## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
11 (Peak)	2458.900	30.466	73.846	104.312	--	--	--
11 (Peak)	2483.500	30.586	37.590	68.175	74.00	54.00	Pass
11 (Average)	2460.500	30.473	63.972	94.445	--	--	--
11 (Average)	2483.500	30.586	17.892	48.477	74.00	54.00	Pass

**Figure Channel 11:**
**Vertical (Peak)**

**Figure Channel 11:**
**Vertical (Average)**


## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

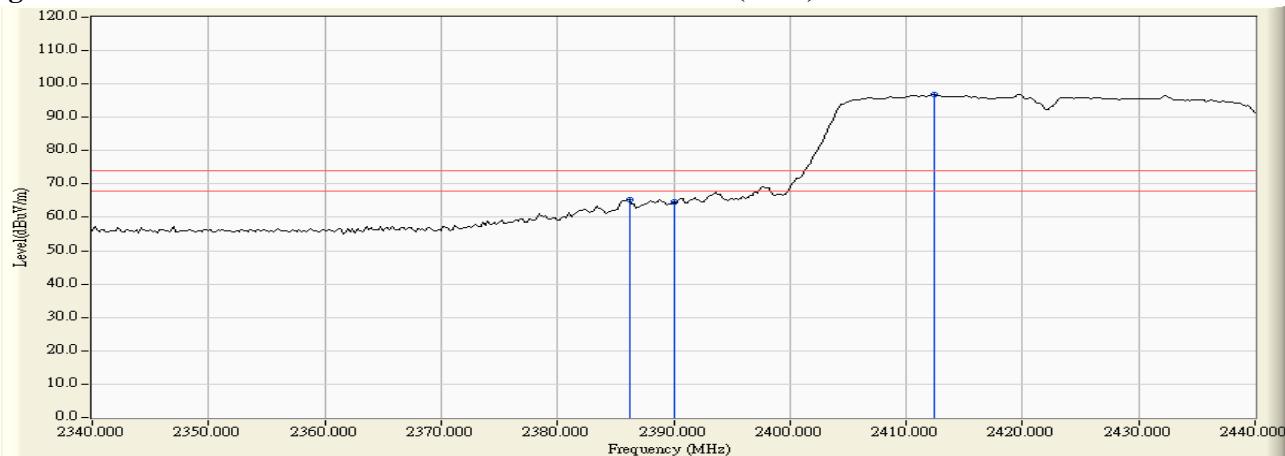
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2422MHz)

**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2386.200	31.735	33.685	65.421	74.00	54.00	Pass
01 (Peak)	2390.000	31.739	32.967	64.706	74.00	54.00	Pass
01 (Peak)	2412.400	31.772	65.065	96.838	--	--	--
01 (Average)	2390.000	31.739	18.508	50.247	74.00	54.00	Pass
01 (Average)	2412.400	31.772	55.296	87.069	--	--	--

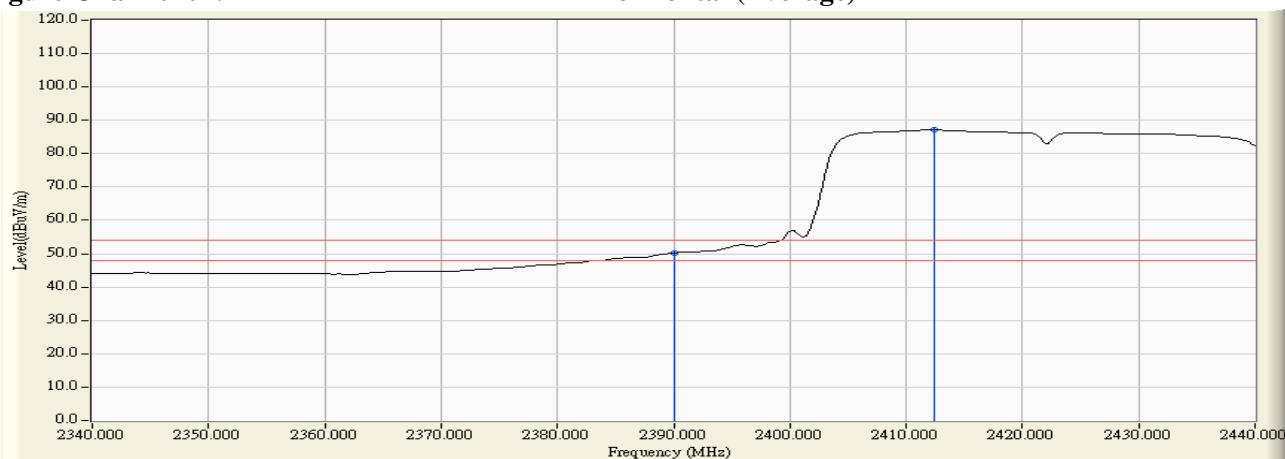
**Figure Channel 01:**

**Horizontal (Peak)**



**Figure Channel 01:**

**Horizontal (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

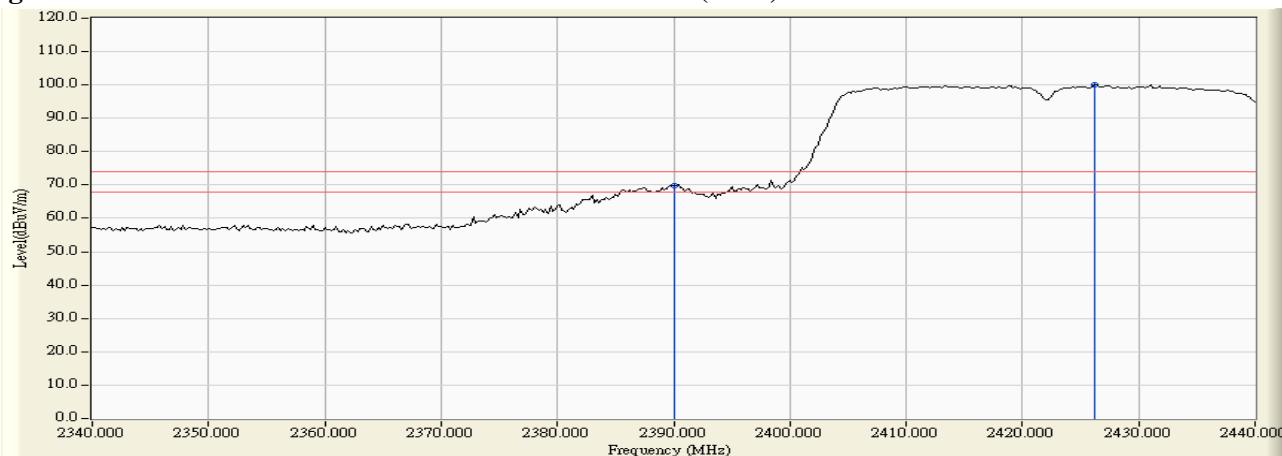
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2422MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	30.267	39.653	69.920	74.00	54.00	Pass
01 (Peak)	2426.200	30.313	69.870	100.183	--	--	--
01 (Average)	2390.000	30.267	20.598	50.865	74.00	54.00	Pass
01 (Average)	2413.400	30.255	49.399	79.654	--	--	--

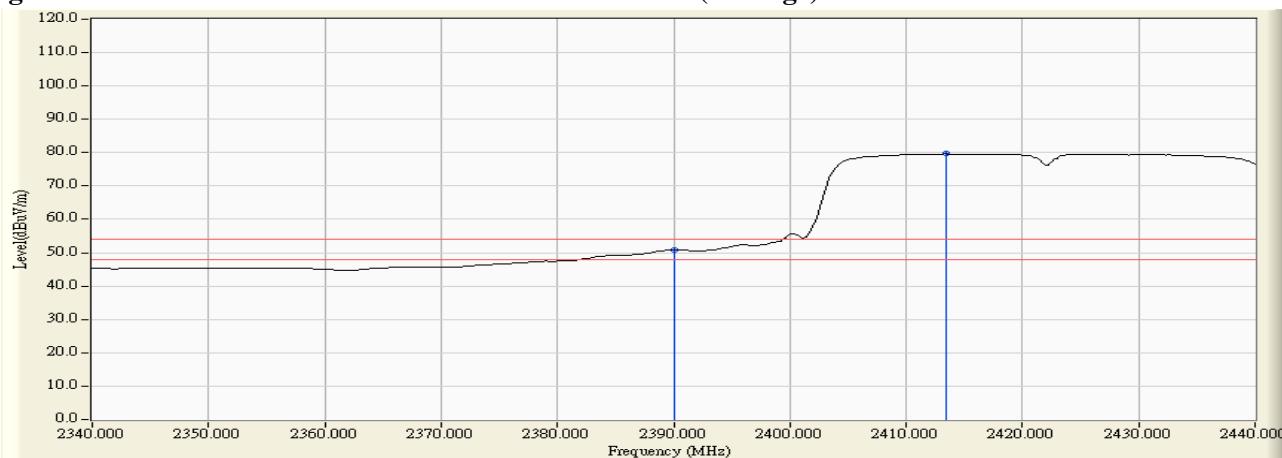
**Figure Channel 01:**

**Vertical (Peak)**



**Figure Channel 01:**

**Vertical (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

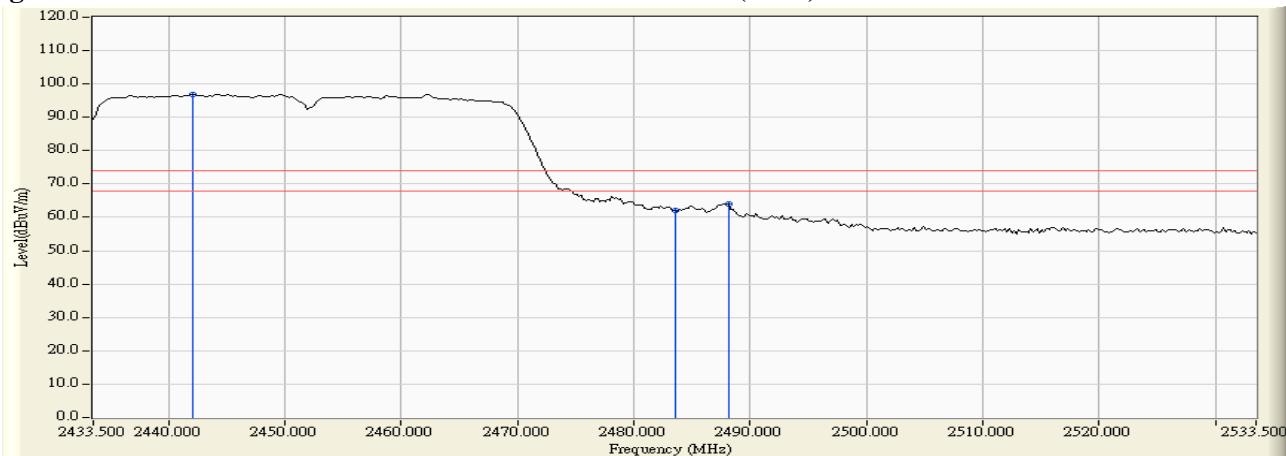
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2452MHz)

**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
07 (Peak)	2442.100	31.843	65.102	96.945	--	--	--
07 (Peak)	2483.500	31.951	30.223	62.173	74.00	54.00	Pass
07 (Peak)	2488.100	31.962	31.992	63.954	74.00	54.00	Pass
07 (Average)	2442.300	31.843	55.536	87.379	--	--	--
07 (Average)	2483.500	31.951	16.697	48.647	74.00	54.00	Pass

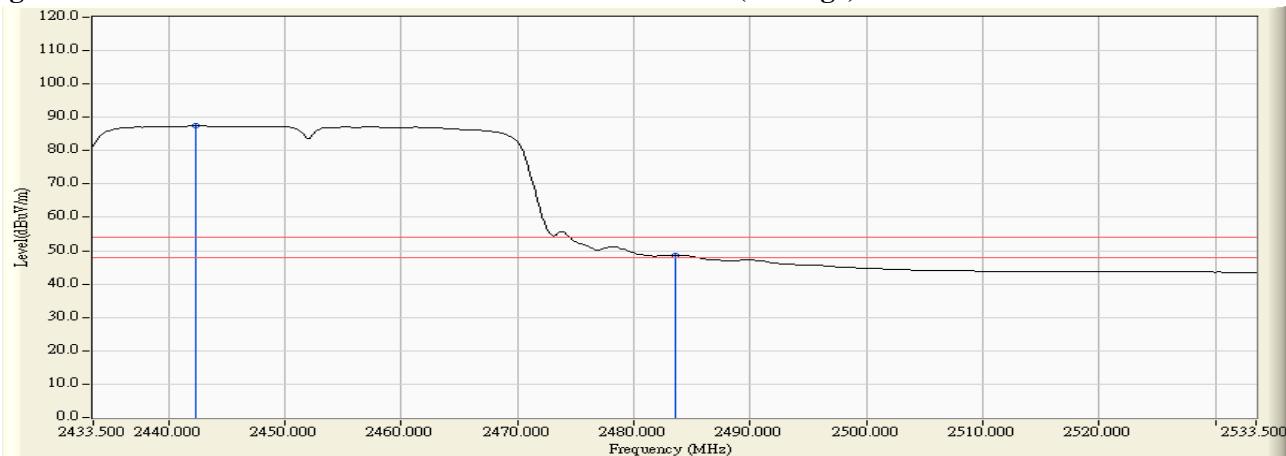
**Figure Channel 07:**

**Horizontal (Peak)**



**Figure Channel 07:**

**Horizontal (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

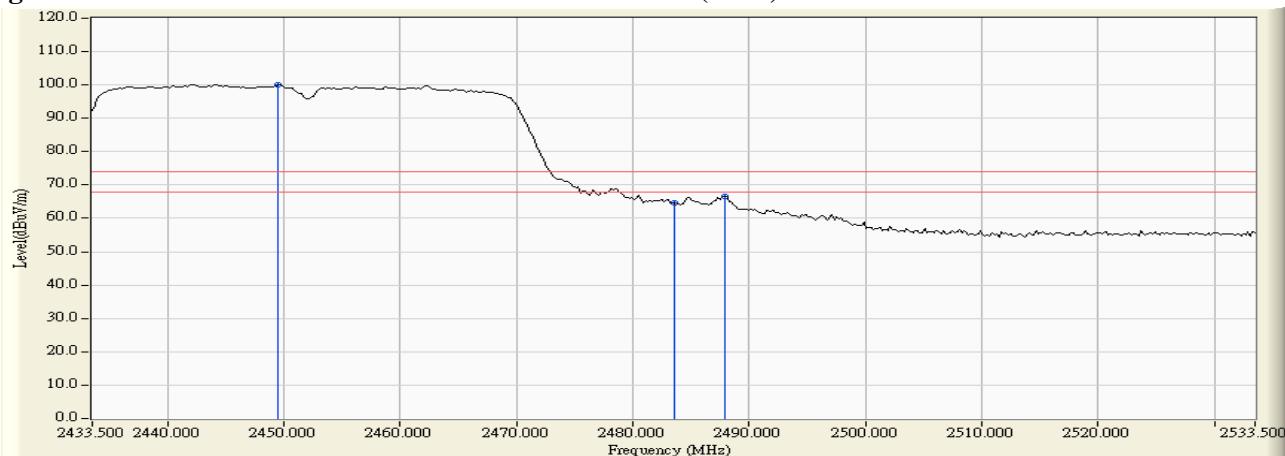
Product : 802.11b/g/n 1T1R Wireless Lan USB Module  
 Test Item : Band Edge  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2452MHz)

**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
07 (Peak)	2449.500	30.420	69.660	100.080	--	--	--
07 (Peak)	2483.500	30.586	34.189	64.774	74.00	54.00	Pass
07 (Peak)	2487.900	30.607	36.097	66.703	74.00	54.00	Pass
07 (Average)	2442.500	30.387	59.639	90.026	--	--	--
07 (Average)	2483.500	30.586	19.056	49.641	74.00	54.00	Pass

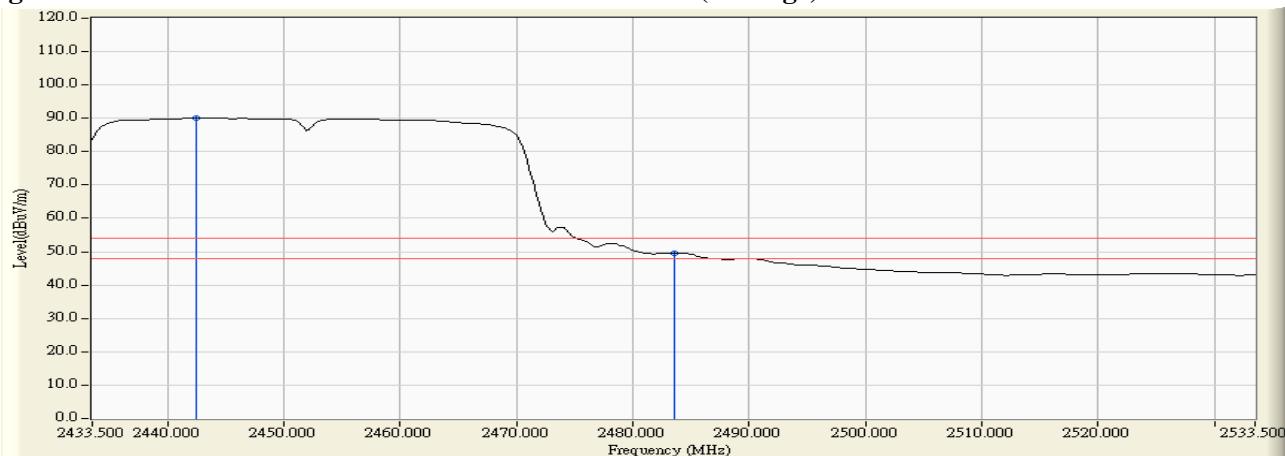
**Figure Channel 07:**

**Vertical (Peak)**



**Figure Channel 01:**

**Vertical (Average)**



## Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.