



# Test Report

## (Class II Permissive Change)

Product Name	802.11b/g/n Wireless USB Mini card
Model No	AW-NU706, AW-NU706H
FCC ID.	TLZ-NU706

Applicant	AzureWave Technologies, Inc.
Address	8F, No. 94, Baozhong Rd., Xindian Taipei , 231 Taiwan

Date of Receipt	Dec. 24, 2009
Issue Date	Jan. 11, 2010
Report No.	09C425R-RFUSP05V01
Report Version	V1.0

The test results relate only to the samples tested.  
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# Test Report Certification

Issue Date: Jan. 11, 2010

Report No.: 09C425R-RFUSP05V01



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

Product Name	802.11b/g/n Wireless USB Mini card
Applicant	AzureWave Technologies, Inc.
Address	8F, No. 94, Baozhong Rd., Xindian Taipei , 231 Taiwan
Manufacturer	AzureWave Technologies, Inc.
Model No.	AW-NU706, AW-NU706H
EUT Rated Voltage	DC 3.3V
EUT Test Voltage	AC 120V/60Hz
Trade Name	AzureWave
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2008 ANSI C63.4: 2003
Test Result	Complied



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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	802.11b/g/n Wireless USB Mini card
Trade Name	AzureWave
Model No.	AW-NU706, AW-NU706H
FCC ID.	TLZ-NU706
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 300Mbps
Type of Modulation	802.11b:DSSS DBPSK, DQPSK, CCK 802.11g/n:OFDM BPSK, QPSK, 16QAM, 64QAM
Antenna Type	PIFA
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	YAGEO	CAN43139LWPE00402 (R), CAN43139LWPE00403 (L)	2.97dBi for 2.4 GHz
2	WNC	81.EK815.G01 (Main), 81.EK815.G02 (Aux)	2.18dBi for 2.4 GHz

Note:

- The antenna of EUT is conform to FCC 15.203.
- This is to request a Class II permissive change for **FCC ID: TLZ-NU706**, originally granted on **11/10/2008**.

The major change filed under this application is:

Change #1: Additional Chassis added

Model number: 20043, 8078

The variation of model number is for different size of DDR.

Model name: Smart book

(The device have co-located with HSPA module card, but non-simultaneously transmit.)

Change #2: Addition new antenna, antenna gain: 2.97dBi.

## 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 01:	2422 MHz	Channel 02:	2427 MHz	Channel 03:	2432 MHz	Channel 04:	2437 MHz
Channel 05:	2442 MHz	Channel 06:	2447 MHz	Channel 07:	2452 MHz		

## Note:

1. The EUT is an 802.11b/g/n Wireless USB Mini card with a built-in 2.4GHz WLAN transceiver.
2. Only the higher gain antenna Ant 1 was tested and recorded in this report.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. 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 14.4Mbps and 、 802.11n(40M-BW) is 30Mbps)
5. 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
6. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

## 1.2. Operational Description

The EUT is a 802.11b/g/n Wireless USB Mini card with 11 channels. This device provided four kinds of transmitting speed 1, 2, 5.5 and 11Mbps and the device of RF carrier is DBPSK, DQPSK and CCK (IEEE 802.11b). The device provided of eight kinds of transmitting speed 6, 9, 12, 18, 24, 36, 48 and 54Mbps the device of RF carrier is BPSK, QPSK, 16QAM and 64QAM (IEEE 802.11g).

The device provided of eight kinds of transmitting speed 14.4,28.8,43.4,57.8,86.6,115.6,130 and 144.4 Mbps in 802.11n(20BW) mode and 30,60,90,120,180,240,270 and 300Mbps(40M-BW) the device of RF carrier is BPSK, QPSK, 16QAM and 64QAM (IEEE 802.11n) , The IEEE 802.11n is Multiple In, Multiple Out” (MIMO) technology and two antennas to support 2(Transmit) \* 2(Receive) NIMO technology.

This 802.11b/g/n Wireless USB Mini card, compliant with IEEE 802.11b and IEEE 802.11g/n, is a high-efficiency Wireless LAN adapter. It allows your computer to connect to a wireless network and to share resources, such as files or printers without being bound to the network wires. Operation in 2.4GHz Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM) radio transmission, the 802.11b/g/n Wireless USB Mini card Wired Equivalent Protection (WEP) algorithm is used. In addition, its standard compliance ensures that it can communicate with any IEEE 802.11b and IEEE 802.11g/n network.

Test Mode:	Mode 1: Transmitter (802.11b 1Mbps)
	Mode 2: Transmitter (802.11g 6Mbps)
	Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW)
	Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW)

Note:

1. 802.11b 、 802.11g are tested by chain A.
2. 802.11n(20M-BW) 、 802.11n(40M-BW) are testd by chain A + chain B

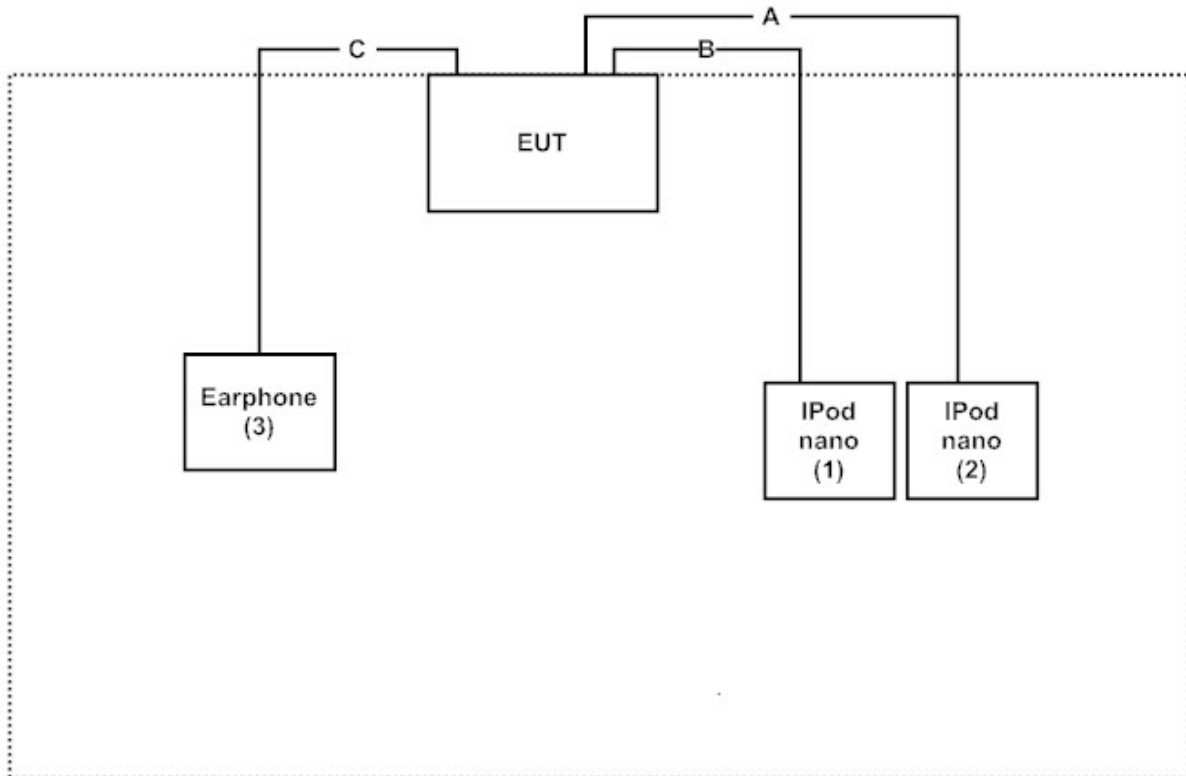
### 1.3. Tested System Details

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)	iPod nano	Apple	A1236	YM823SWSY0P	N/A
(2)	iPod nano	Apple	A1236	7L8221Y1Y0P	N/A
(3)	Earphone	AIWA	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A	USB Cable Shielded, 0.9m
B	USB Cable Shielded, 0.9m
C	Earphone Cable Non-Shielded, 1.2m

### 1.4. Configuration of Tested System



## 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute Command on the EUT.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous transmission.
- (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://tw.quietek.com/tw/emc/accreditations/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  
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Accreditation on NVLAP  
 NVLAP Lab Code: 200533-0



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FCC Accreditation Number: TW1014



## 2. Conducted Emission

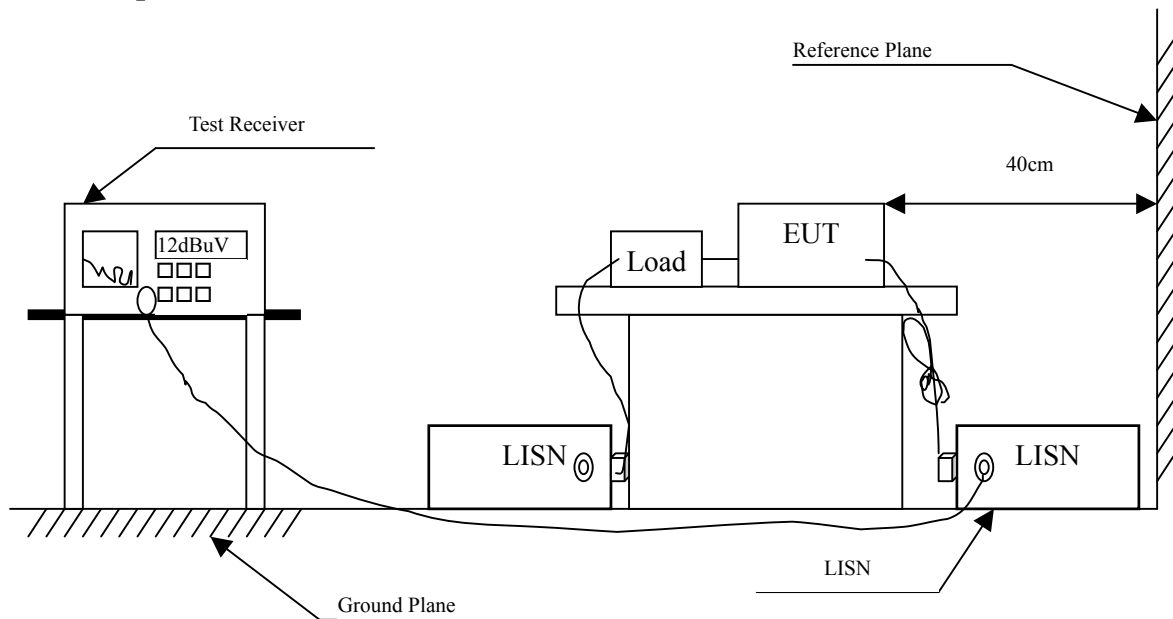
### 2.1. Test Equipment

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

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2009	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2009	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2009	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2009	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

### 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 Wireless USB Mini card  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW) (2437MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.193	9.711	37.600	47.311	-17.460	64.771
0.259	9.670	31.340	41.010	-21.876	62.886
1.209	9.670	22.140	31.810	-24.190	56.000
3.244	9.690	18.920	28.610	-27.390	56.000
8.037	9.780	22.140	31.920	-28.080	60.000
13.697	9.940	31.590	41.530	-18.470	60.000
<b>Average</b>					
0.193	9.711	26.250	35.961	-18.810	54.771
0.259	9.670	22.560	32.230	-20.656	52.886
1.209	9.670	10.620	20.290	-25.710	46.000
3.244	9.690	10.730	20.420	-25.580	46.000
8.037	9.780	16.190	25.970	-24.030	50.000
13.697	9.940	26.580	36.520	-13.480	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 Wireless USB Mini card  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW) (2437MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.189	9.724	37.180	46.904	-17.982	64.886
0.318	9.660	25.910	35.570	-25.630	61.200
0.509	9.640	20.030	29.670	-26.330	56.000
2.318	9.680	22.300	31.980	-24.020	56.000
4.599	9.700	22.370	32.070	-23.930	56.000
13.904	9.950	31.170	41.120	-18.880	60.000
<b>Average</b>					
0.189	9.724	24.070	33.794	-21.092	54.886
0.318	9.660	15.610	25.270	-25.930	51.200
0.509	9.640	7.560	17.200	-28.800	46.000
2.318	9.680	13.590	23.270	-22.730	46.000
4.599	9.700	14.680	24.380	-21.620	46.000
13.904	9.950	26.010	35.960	-14.040	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

The following test equipments are used during the radiated emission tests:

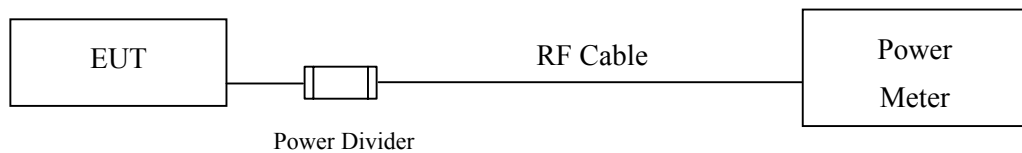
Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Power Meter	Anritsu	ML2495A/6K00003357	May, 2009
X Power Sensor	Anritsu	MA2411B/0846193	Jun, 2009
X 8-WAY Power Divider	JFW	50PD-647/526770 0916	Apr., 2009

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. The power combiner is used for measure 11n mode.

#### 3.2. Test Setup

Conducted Measurement



#### 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 Mar. 2005 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 Wireless USB Mini card  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps)

Cable Loss=0.5dB		Peak Power Output					
Channel No.	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit
		1	2	5.5	11		
1	2412.00	13.20	--	--	--	16.12	1Watt= 30 dBm
6	2437.00	13.68	13.65	13.6	13.55	16.20	1Watt= 30 dBm
11	2462.00	13.00	--	--	--	15.63	1Watt= 30 dBm

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

Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps)

Cable Loss=0.5dB		Peak Power Output									
Channel No.	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit
		6	9	12	18	24	36	48	54	6	
1	2412.00	7.6	--	--	--	--	--	--	--	17.22	1Watt= 30 dBm
6	2437.00	7.95	7.03	7.01	6.9	6.97	6.89	6.92	7.25	17.35	1Watt= 30 dBm
11	2462.00	6.7	--	--	--	--	--	--	--	16.62	1Watt= 30 dBm

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



Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW)

Cable Loss=0.5dB		Peak Power Output									
Channel No.	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit
		14.4	28.8	43.4	57.8	86.8	115.6	130	144.4		
1	2412.00	6.95	--	--	--	--	--	--	--	16.3	1Watt= 30 dBm
6	2437.00	7.57	7.53	7.51	7.47	7.43	7.41	7.38	7.37	16.32	1Watt= 30 dBm
11	2462.00	6.4	--	--	--	--	--	--	--	15.8	1Watt= 30 dBm

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

Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW)

Cable Loss=0.5dB		Peak Power Output									
Channel No.	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit
		30	60	90	120	180	240	270	300	30	
1	2422.00	5	--	--	--	--	--	--	--	14.2	1Watt= 30 dBm
4	2437.00	5.37	5.11	5.05	5.02	4.97	4.93	4.9	4.85	14.36	1Watt= 30 dBm
7	2452.00	4.3	--	--	--	--	--	--	--	13.64	1Watt= 30 dBm

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

## 4. Radiated Emission

### 4.1. Test Equipment

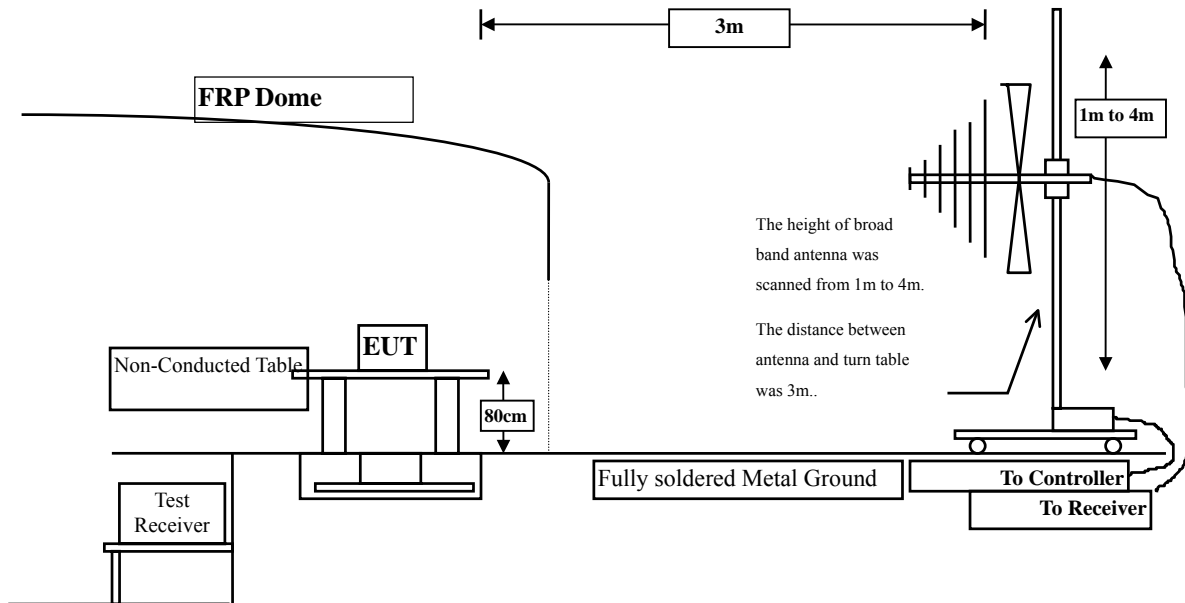
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2009
	X	Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2009
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2009
	X	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2009
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2009
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

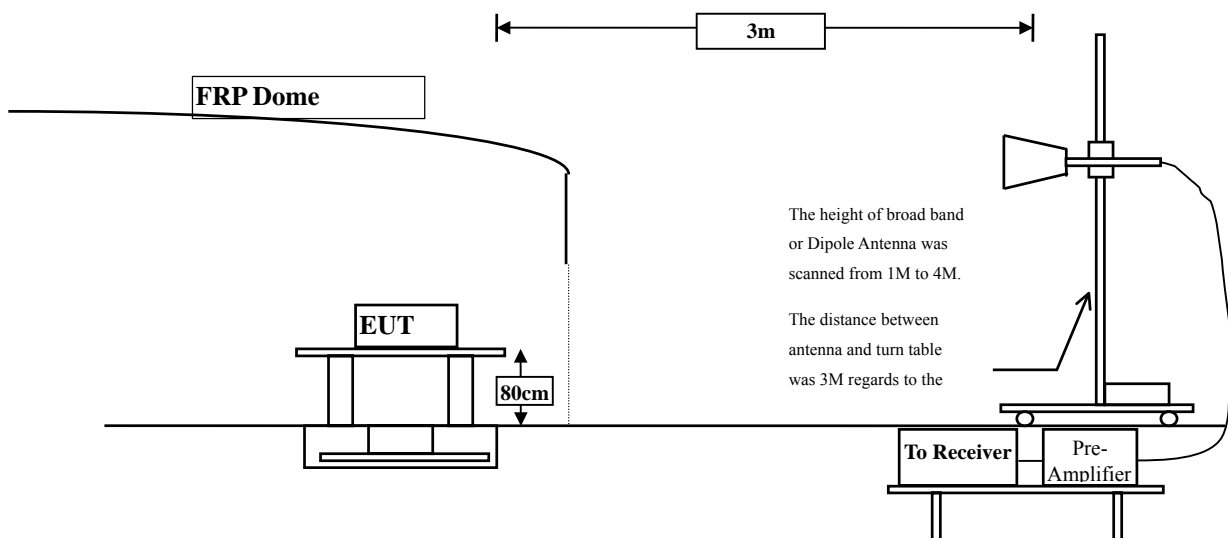
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

## 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 Mar. 2005 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 measurement frequency range from 30MHz - 10th Harmonic of fundamental was investigated.

#### 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4824.000	9.582	41.330	50.912	-23.088	74.000
7236.000	14.401	34.970	49.371	-24.629	74.000
9648.000	19.795	36.440	56.235	-17.765	74.000
<b>Average Detector:</b>					
9648.000	19.795	22.440	42.235	-11.765	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4824.000	8.462	41.690	50.152	-23.848	74.000
7236.000	15.412	37.900	53.312	-20.688	74.000
9648.000	19.005	35.990	54.995	-19.005	74.000
<b>Average Detector:</b>					
9648.000	19.005	23.690	42.695	-11.305	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4874.000	9.473	42.010	51.483	-22.517	74.000
7311.000	14.540	34.210	48.749	-25.251	74.000
9748.000	20.024	35.050	55.075	-18.925	74.000
<b>Average Detector:</b>					
9748.000	20.024	24.250	44.275	-9.725	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	8.882	43.590	52.471	-21.529	74.000
7311.000	15.283	34.250	49.533	-24.467	74.000
9748.000	19.228	37.080	56.309	-17.691	74.000
<b>Average Detector:</b>					
9748.000	19.228	28.350	47.579	-6.421	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4924.000	9.487	38.330	47.816	-26.184	74.000
7386.000	14.798	33.820	48.618	-25.382	74.000
9848.000	20.005	35.730	55.736	-18.264	74.000
<b>Average Detector:</b>					
9848.000	20.005	22.440	42.446	-11.554	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4924.000	9.415	43.220	52.634	-21.366	74.000
7386.000	15.269	34.460	49.729	-24.271	74.000
9848.000	19.191	36.790	55.981	-18.019	74.000
<b>Average Detector:</b>					
9848.000	19.191	26.990	46.181	-7.819	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4824.000	9.582	38.100	47.682	-26.318	74.000
7236.000	14.401	35.390	49.791	-24.209	74.000
9648.000	19.795	35.890	55.685	-18.315	74.000
<b>Average Detector:</b>					
9648.000	19.795	23.220	43.015	-10.985	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4824.000	8.462	39.740	48.202	-25.798	74.000
7236.000	15.412	35.580	50.992	-23.008	74.000
9648.000	19.005	35.320	54.325	-19.675	74.000
<b>Average Detector:</b>					
9648.000	19.005	22.440	41.445	-12.555	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4874.000	9.473	37.600	47.073	-26.927	74.000
7311.000	14.540	34.020	48.559	-25.441	74.000
9748.000	20.024	34.950	54.975	-19.025	74.000
<b>Average Detector:</b>					
9748.000	20.024	23.600	43.625	-10.375	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	8.882	36.320	45.201	-28.799	74.000
7311.000	15.283	34.410	49.693	-24.307	74.000
9748.000	19.228	35.750	54.979	-19.021	74.000
<b>Average Detector:</b>					
9748.000	19.228	24.090	43.319	-10.681	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4924.000	9.487	36.560	46.046	-27.954	74.000
7386.000	14.798	34.990	49.788	-24.212	74.000
9848.000	20.005	35.090	55.096	-18.904	74.000
<b>Average Detector:</b>					
9848.000	20.005	23.600	43.606	-10.394	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4924.000	9.415	36.210	45.624	-28.376	74.000
7386.000	15.269	35.810	51.079	-22.921	74.000
9848.000	19.191	35.910	55.101	-18.899	74.000
<b>Average Detector:</b>					
9848.000	19.191	23.690	42.881	-11.119	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4824.000	9.582	34.190	43.772	-30.228	74.000
7236.000	14.401	34.590	48.991	-25.009	74.000
9648.000	19.795	35.660	55.455	-18.545	74.000
<b>Average Detector:</b>					
9648.000	19.795	24.050	43.845	-10.155	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4824.000	8.462	36.650	45.112	-28.888	74.000
7236.000	15.412	34.850	50.262	-23.738	74.000
9648.000	19.005	37.660	56.665	-17.335	74.000
<b>Average Detector:</b>					
9648.000	19.005	24.020	43.025	-10.975	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4874.000	9.473	35.990	45.463	-28.537	74.000
7311.000	14.540	33.530	48.069	-25.931	74.000
9748.000	20.024	35.550	55.575	-18.425	74.000
<b>Average Detector:</b>					
9748.000	20.024	24.020	44.045	-9.955	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	8.882	36.390	45.271	-28.729	74.000
7311.000	15.283	34.320	49.603	-24.397	74.000
9748.000	19.228	36.040	55.269	-18.731	74.000
<b>Average Detector:</b>					
9748.000	19.228	23.660	42.889	-11.111	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4924.000	9.487	36.330	45.816	-28.184	74.000
7386.000	14.798	34.690	49.488	-24.512	74.000
9848.000	20.005	35.220	55.226	-18.774	74.000
<b>Average Detector:</b>					
9848.000	20.005	24.600	44.606	-9.394	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4924.000	9.415	36.660	46.074	-27.926	74.000
7386.000	15.269	35.050	50.319	-23.681	74.000
9848.000	19.191	34.660	53.851	-20.149	74.000
<b>Average Detector:</b>					
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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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW) (2422MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4844.000	9.536	36.590	46.126	-27.874	74.000
7266.000	14.459	35.490	49.949	-24.051	74.000
9688.000	19.847	35.090	54.937	-19.063	74.000
<b>Average Detector:</b>					
9688.000	19.847	23.990	43.837	-10.163	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4844.000	8.627	36.880	45.507	-28.493	74.000
7266.000	15.363	34.650	50.014	-23.986	74.000
9688.000	19.057	35.930	54.987	-19.013	74.000
<b>Average Detector:</b>					
9688.000	19.057	23.660	42.717	-11.283	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4874.000	9.473	36.910	46.383	-27.617	74.000
7311.000	14.540	33.970	48.509	-25.491	74.000
9748.000	20.024	34.800	54.825	-19.175	74.000
<b>Average Detector:</b>					
9748.000	20.024	23.660	43.685	-10.315	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	8.882	37.050	45.931	-28.069	74.000
7311.000	15.283	33.610	48.893	-25.107	74.000
9748.000	19.228	35.760	54.989	-19.011	74.000
<b>Average Detector:</b>					
9748.000	19.228	24.050	43.279	-10.721	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW) (2452 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4904.000	9.518	36.550	46.068	-27.932	74.000
7356.000	14.741	34.490	49.230	-24.770	74.000
9808.000	20.066	35.550	55.616	-18.384	74.000
<b>Average Detector:</b>					
9808.000	20.066	24.110	44.176	-9.824	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4904.000	9.235	36.290	45.524	-28.476	74.000
7356.000	15.318	33.690	49.008	-24.992	74.000
9808.000	19.266	35.000	54.266	-19.734	74.000
<b>Average Detector:</b>					
9808.000	19.266	24.360	43.626	-10.374	54.000

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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps)(2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
43.580	-4.897	35.183	30.285	-9.715	40.000
264.740	-5.420	41.828	36.408	-9.592	46.000
299.660	-4.061	42.580	38.519	-7.481	46.000
332.640	-4.429	39.436	35.007	-10.993	46.000
464.560	0.067	39.150	39.217	-6.783	46.000
480.080	-0.784	37.432	36.648	-9.352	46.000
<b>Vertical</b>					
45.520	-4.715	37.637	32.922	-7.078	40.000
90.140	-3.376	41.228	37.852	-5.648	43.500
210.420	-8.281	45.944	37.663	-5.837	43.500
266.680	-8.654	47.657	39.003	-6.997	46.000
332.640	-5.159	44.943	39.784	-6.216	46.000
532.460	-1.092	38.182	37.090	-8.910	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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps)(2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
31.940	-0.786	33.411	32.625	-7.375	40.000
231.760	-8.701	40.859	32.158	-13.842	46.000
270.560	-5.471	41.966	36.495	-9.505	46.000
321.000	-4.667	38.369	33.702	-12.298	46.000
480.080	-0.784	37.227	36.443	-9.557	46.000
534.400	1.540	39.057	40.597	-5.403	46.000
<b>Vertical</b>					
90.140	-3.376	41.507	38.131	-5.369	43.500
266.680	-8.654	46.843	38.189	-7.811	46.000
332.640	-5.159	44.501	39.342	-6.658	46.000
462.620	-4.298	36.689	32.391	-13.609	46.000
499.480	-1.342	39.165	37.822	-8.178	46.000
532.460	-1.092	36.282	35.190	-10.810	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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW)(2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
41.640	-4.347	37.157	32.810	-7.190	40.000
90.140	-9.676	41.770	32.094	-11.406	43.500
268.620	-5.394	40.593	35.199	-10.801	46.000
338.460	-4.190	40.476	36.286	-9.714	46.000
480.080	-0.784	37.097	36.313	-9.687	46.000
532.460	1.428	32.419	33.847	-12.153	46.000
<b>Vertical</b>					
43.580	-3.387	36.290	32.902	-7.098	40.000
90.140	-3.376	40.394	37.018	-6.482	43.500
198.780	-8.679	42.061	33.382	-10.118	43.500
249.220	-8.023	41.310	33.287	-12.713	46.000
338.460	-4.530	35.703	31.173	-14.827	46.000
400.540	-5.660	36.293	30.633	-15.367	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. “ \* ”, 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 Wireless USB Mini card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW)(2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
45.520	-7.685	36.795	29.110	-10.890	40.000
262.800	-5.432	43.634	38.202	-7.798	46.000
299.660	-4.061	43.238	39.177	-6.823	46.000
365.620	-1.817	35.392	33.575	-12.425	46.000
462.620	0.712	35.975	36.687	-9.313	46.000
600.360	3.455	29.243	32.698	-13.302	46.000
<b>Vertical</b>					
41.640	-2.207	37.267	35.060	-4.940	40.000
78.500	-6.008	37.683	31.675	-8.325	40.000
177.440	-8.870	42.846	33.976	-9.524	43.500
264.740	-8.110	47.676	39.566	-6.434	46.000
299.660	-7.331	46.837	39.506	-6.494	46.000
536.340	-0.833	36.145	35.312	-10.688	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. “ \* ”, 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.

## 5. Band Edge

### 5.1. Test Equipment

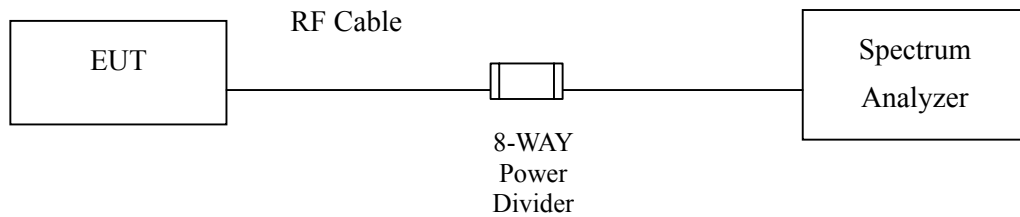
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2009
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2009
	X Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2009
	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2009
	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2009
	X Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2009
	X Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X Coaxial Switch	Anritsu	MP59B/6200265729	N/A

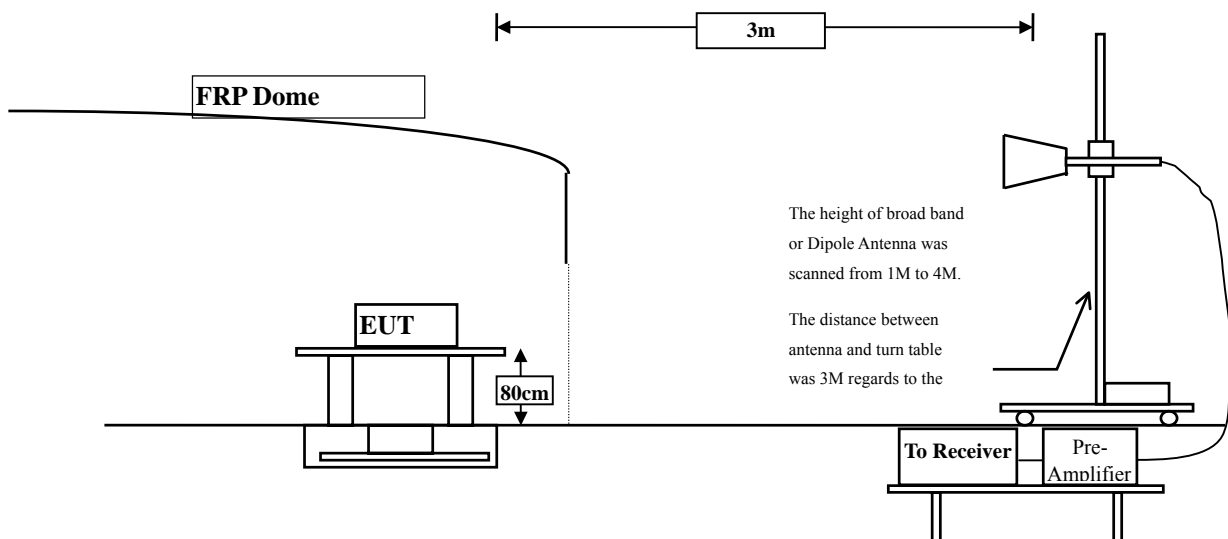
- Note:
1. All instruments are calibrated every one year.
  2. The test instruments marked by "X" are used to measure the final test results.

### 5.2. Test Setup

#### RF Conducted Measurement:



#### RF Radiated Measurement:



### 5.3. 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.

### 5.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Mar. 2005 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.

### 5.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz



## 5.6. Test Result of Band Edge

Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps)-Channel 1

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2412	36.613	65.790	102.403	Peak
Horizontal	2412	36.613	58.160	94.773	Average
Vertical	2412	35.629	69.810	105.439	Peak
Vertical	2412	35.629	62.340	97.969	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2390.0	102.403	41.1	62.303	Peak
Horizontal	2390.0	94.773	43.02	51.753	Average
Vertical	2390.0	105.439	41.1	64.339	Peak
Vertical	2390.0	97.969	43.02	52.949	Average

Note:

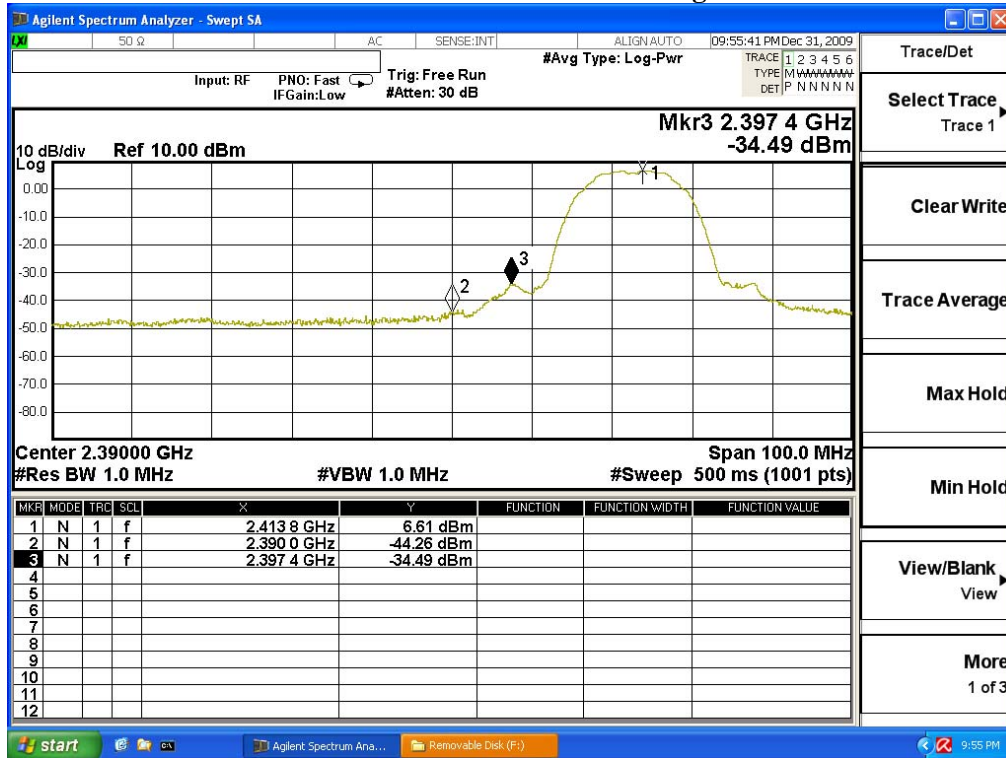
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

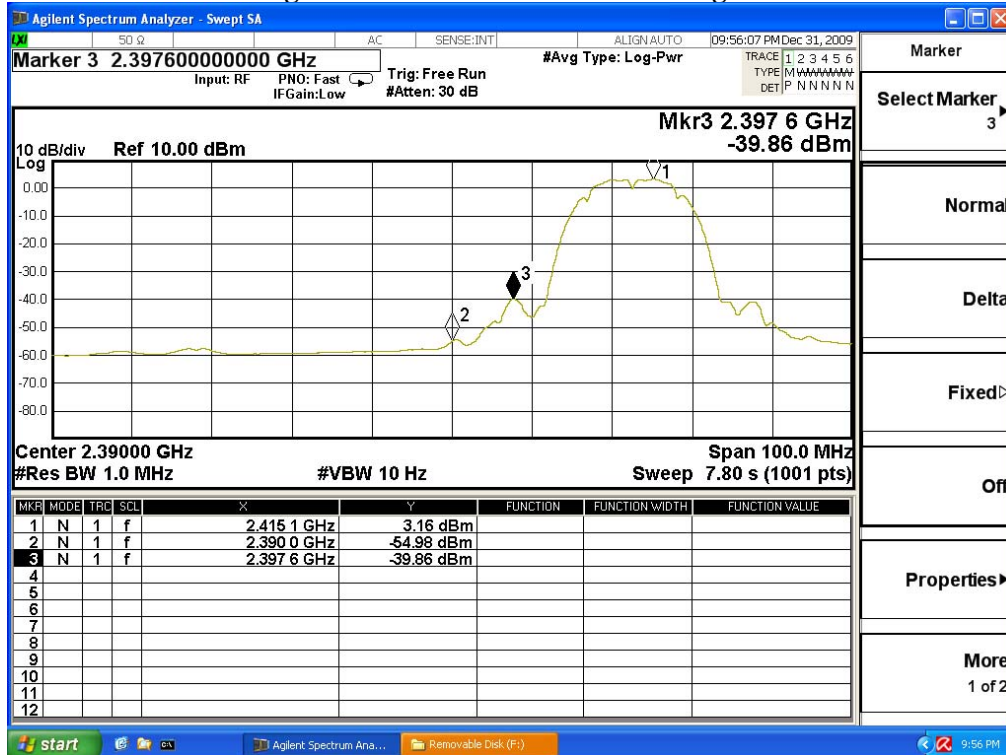
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) -Channel 11

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dB(uV)]	Emission Level [dB(uV/m)]	Detector
Horizontal	2462	36.699	67.110	103.809	Peak
Horizontal	2462	36.704	63.020	99.725	Average
Vertical	2462	36.039	71.090	107.129	Peak
Vertical	2462	36.039	66.690	102.729	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2483.5	103.809	51.6	52.209	Peak
Horizontal	2484.4	99.725	58.01	41.715	Average
Vertical	2483.5	107.129	51.6	55.529	Peak
Vertical	2484.4	102.729	58.01	44.719	Average

Note:

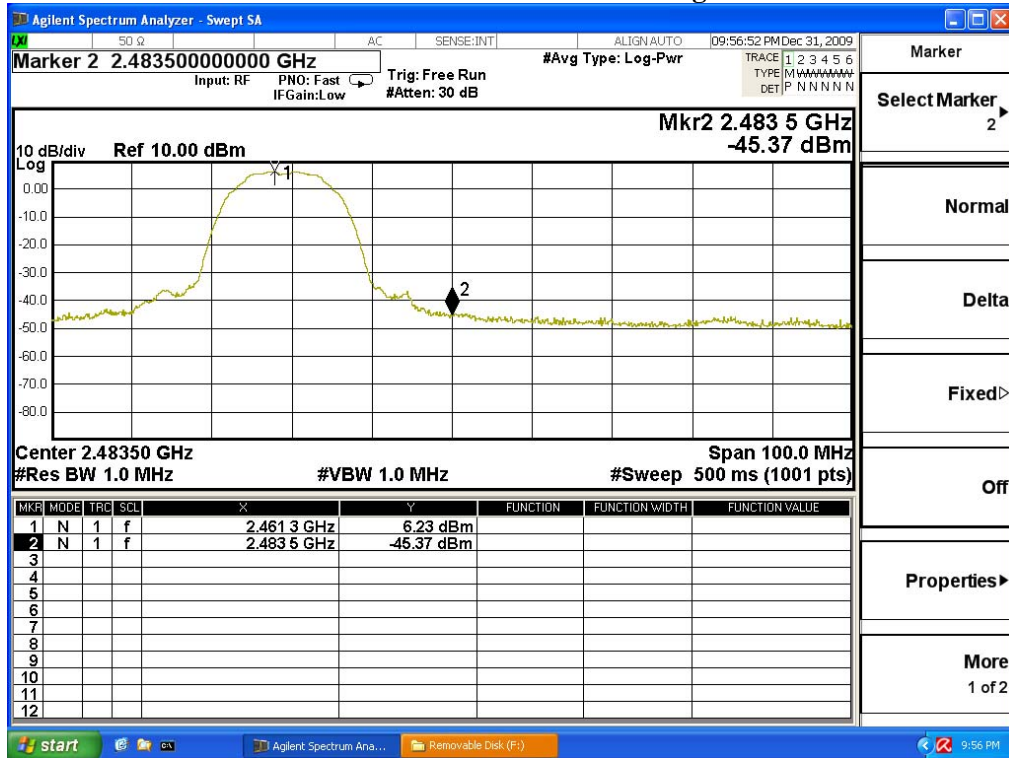
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

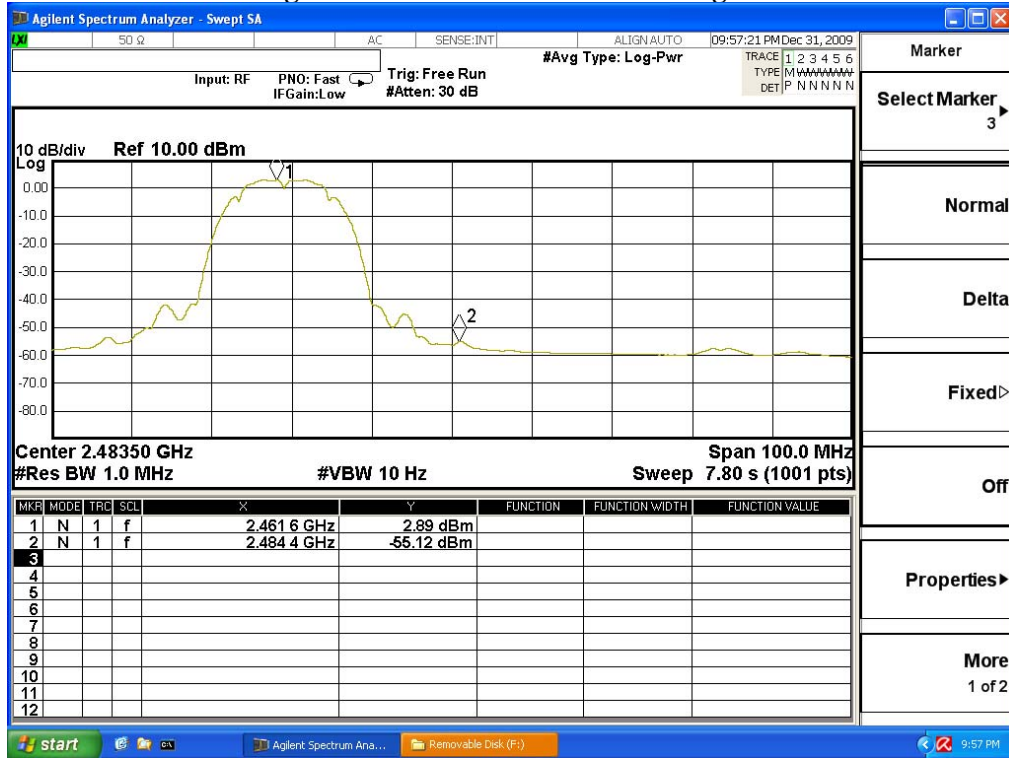
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) -Channel 1

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2412	36.613	61.720	98.333	Peak
Horizontal	2412	36.613	51.580	88.193	Average
Vertical	2412	35.629	65.100	100.729	Peak
Vertical	2412	35.629	54.170	89.799	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2390	98.333	49.63	48.703	Peak
Horizontal	2360.1	88.193	52.55	35.643	Average
Vertical	2390	100.729	49.63	51.099	Peak
Vertical	2360.1	89.799	52.55	37.249	Average

Note:

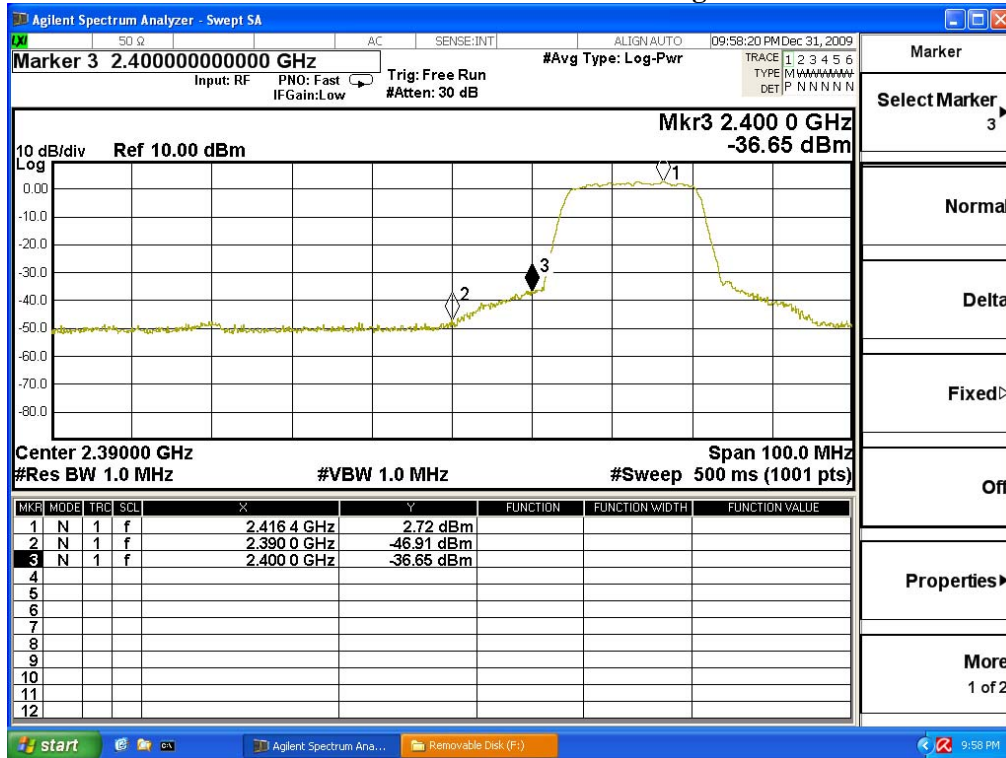
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

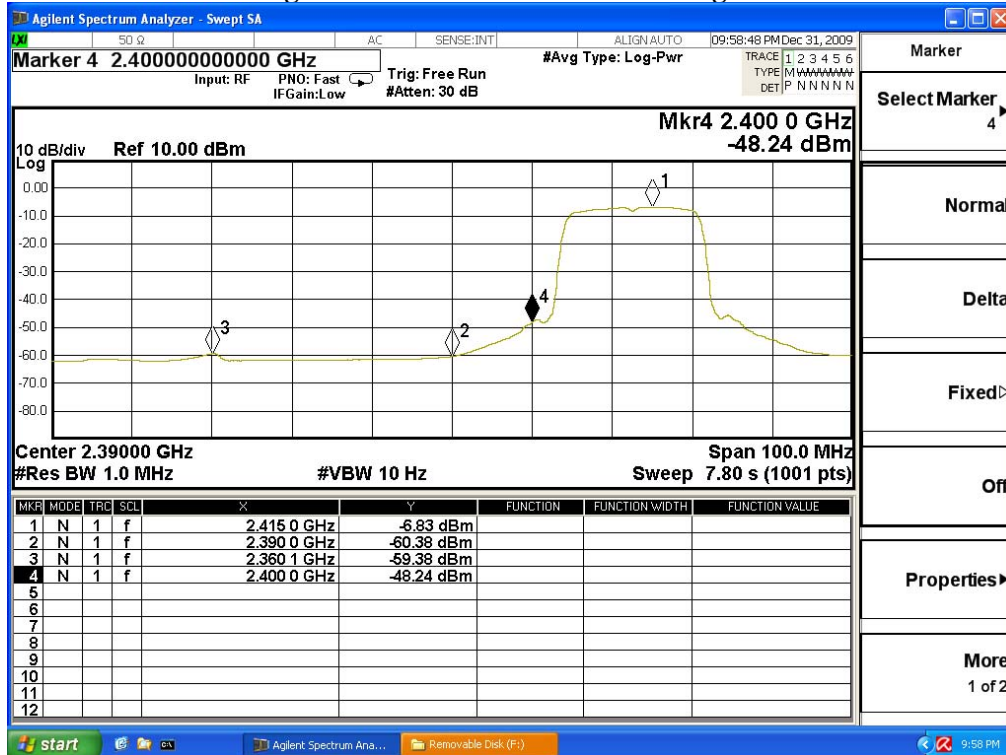
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) -Channel 11

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dB(uV)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]	Detector
Horizontal	2462	36.699	62.770	99.469	Peak
Horizontal	2462	36.699	52.830	89.529	Average
Vertical	2462	36.039	66.470	102.509	Peak
Vertical	2462	36.039	55.410	91.449	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2496.5	99.469	50.27	49.199	Peak
Horizontal	2483.5	89.529	52.5	37.029	Average
Vertical	2496.5	102.509	50.27	52.239	Peak
Vertical	2483.5	91.449	52.5	38.949	Average

Note:

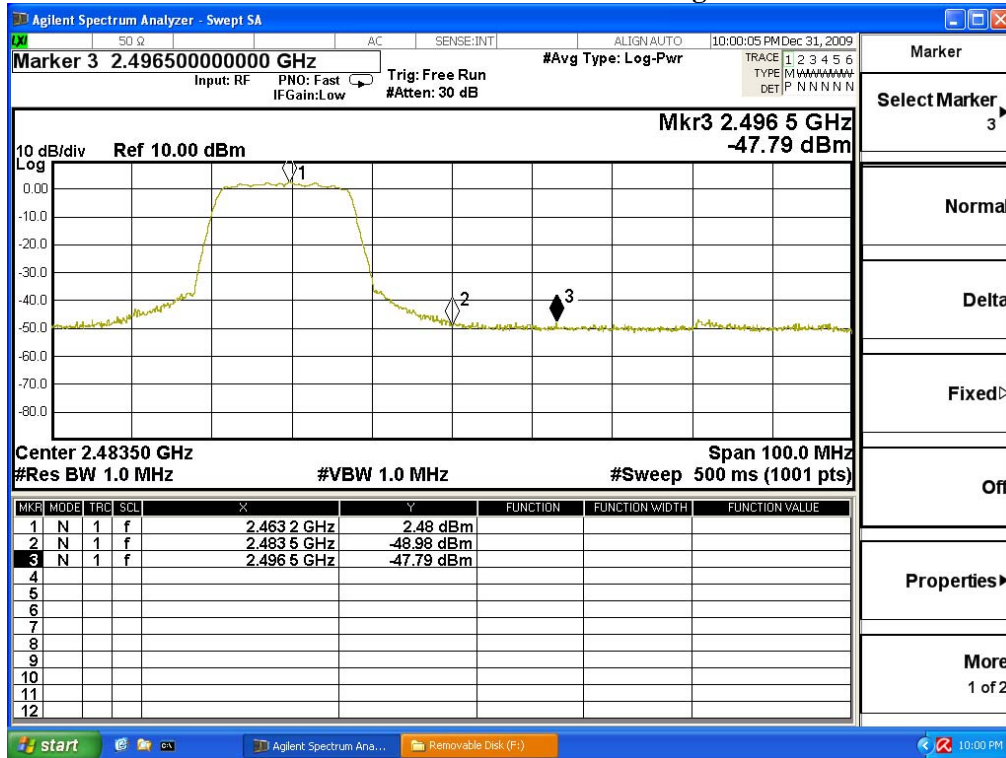
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

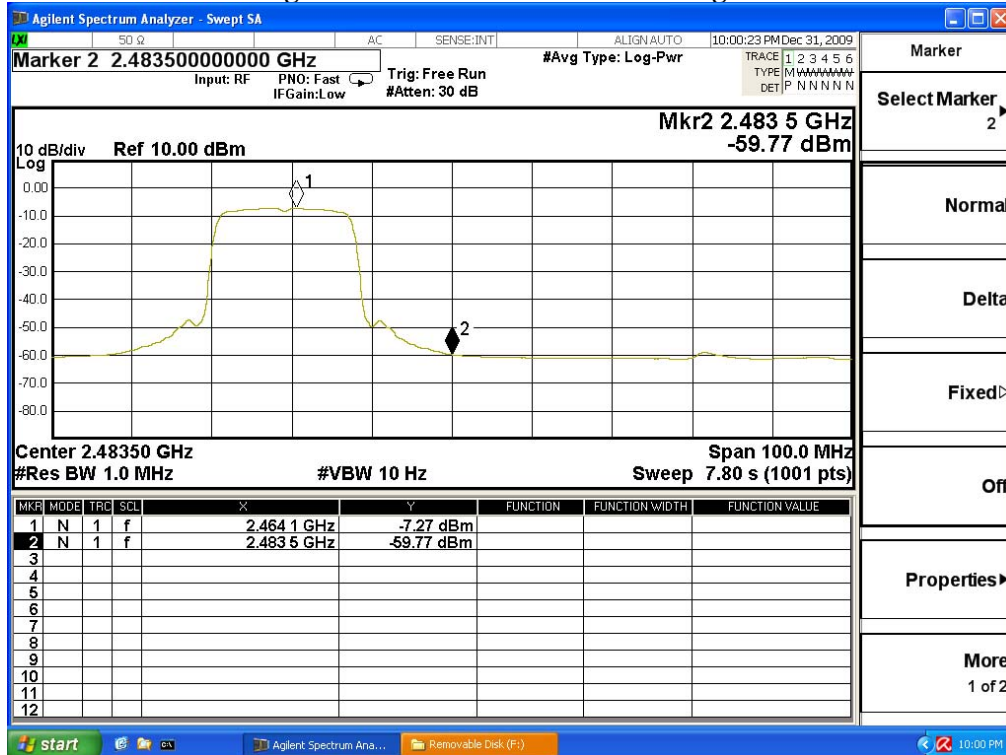
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta





Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW) -Channel 1

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2412	36.613	60.860	97.473	Peak
Horizontal	2412	36.613	49.930	86.543	Average
Vertical	2412	35.629	64.280	99.909	Peak
Vertical	2412	35.629	53.160	88.789	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2390	97.473	50.4	47.073	Peak
Horizontal	2360.8	86.543	51.89	34.653	Average
Vertical	2390	99.909	50.4	49.509	Peak
Vertical	2360.8	88.789	51.89	36.899	Average

Note:

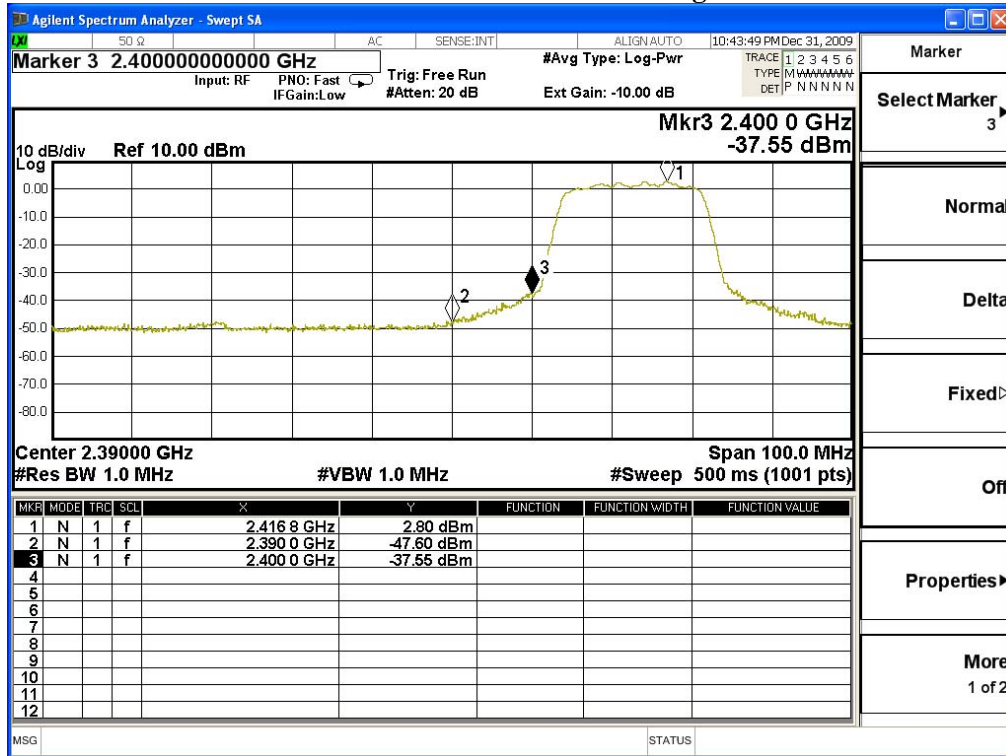
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

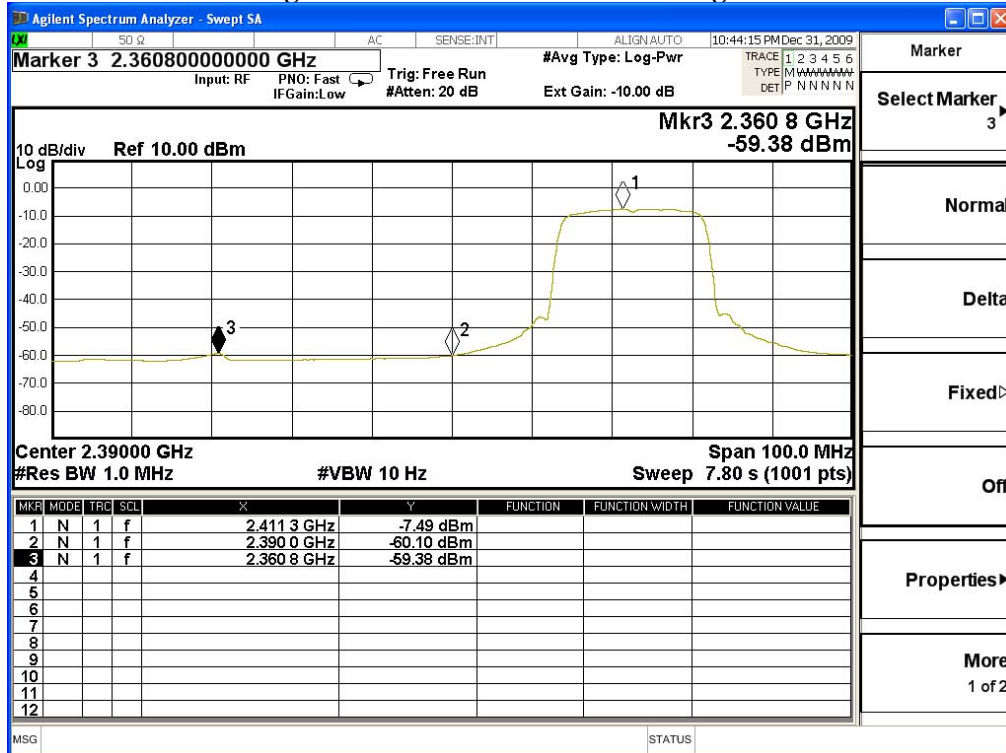
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 14.4Mbps 20M-BW) -Channel 11

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dB(uV)]	Emission Level [dB(uV/m)]	Detector
Horizontal	2462	36.699	62.980	99.679	Peak
Horizontal	2462	36.699	51.990	88.689	Average
Vertical	2462	36.039	66.000	102.039	Peak
Vertical	2462	36.039	54.560	90.599	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2483.7	99.679	49.29	50.389	Peak
Horizontal	2483.5	88.689	52.44	36.249	Average
Vertical	2483.7	102.039	49.29	52.749	Peak
Vertical	2483.5	90.599	52.44	38.159	Average

Note:

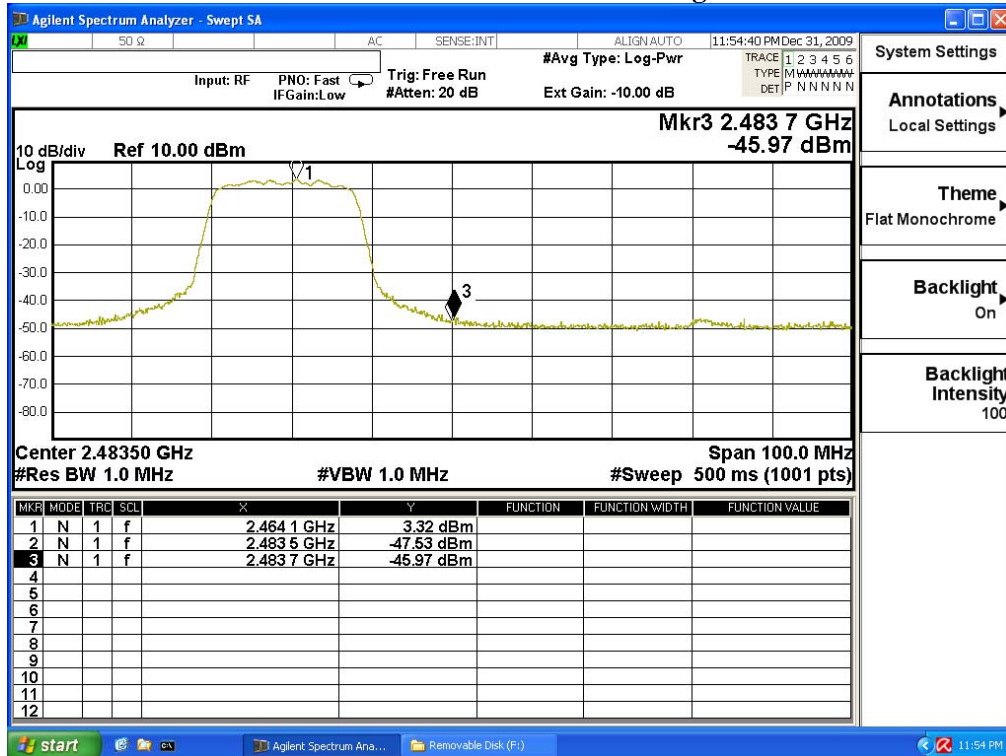
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

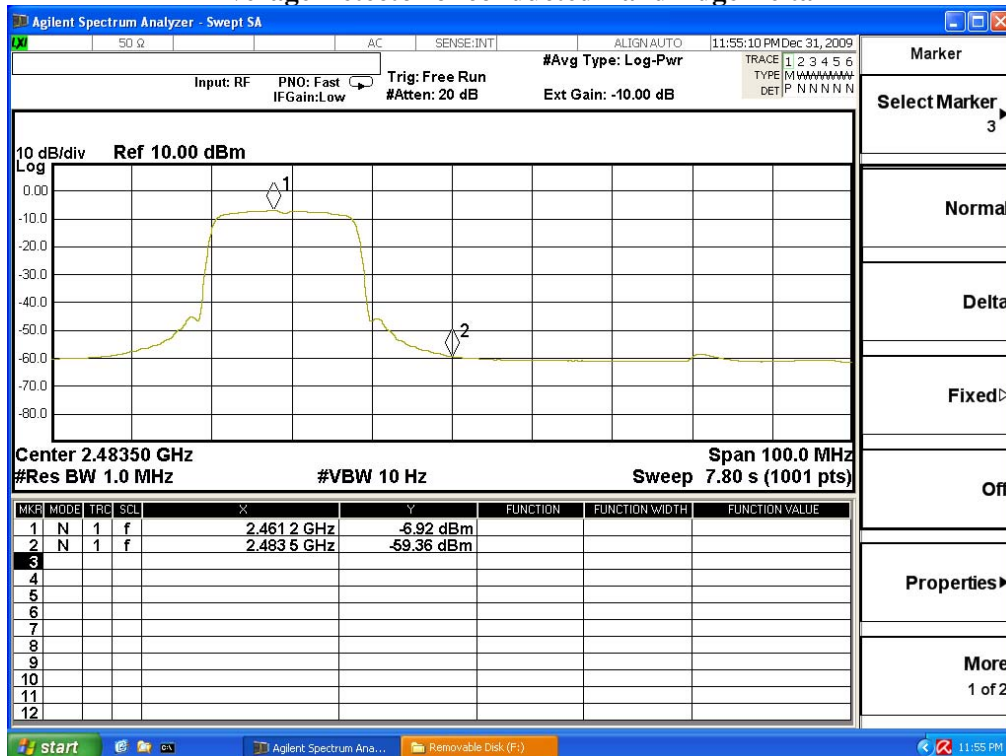
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW) -Channel 1

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2422	36.614	55.950	92.564	Peak
Horizontal	2422	36.614	44.420	81.034	Average
Vertical	2422	35.695	59.170	94.865	Peak
Vertical	2422	35.695	48.610	84.305	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2390	92.564	45.6	46.964	Peak
Horizontal	2390	81.034	46.95	34.084	Average
Vertical	2390	94.865	45.6	49.265	Peak
Vertical	2390	84.305	46.95	37.355	Average

Note:

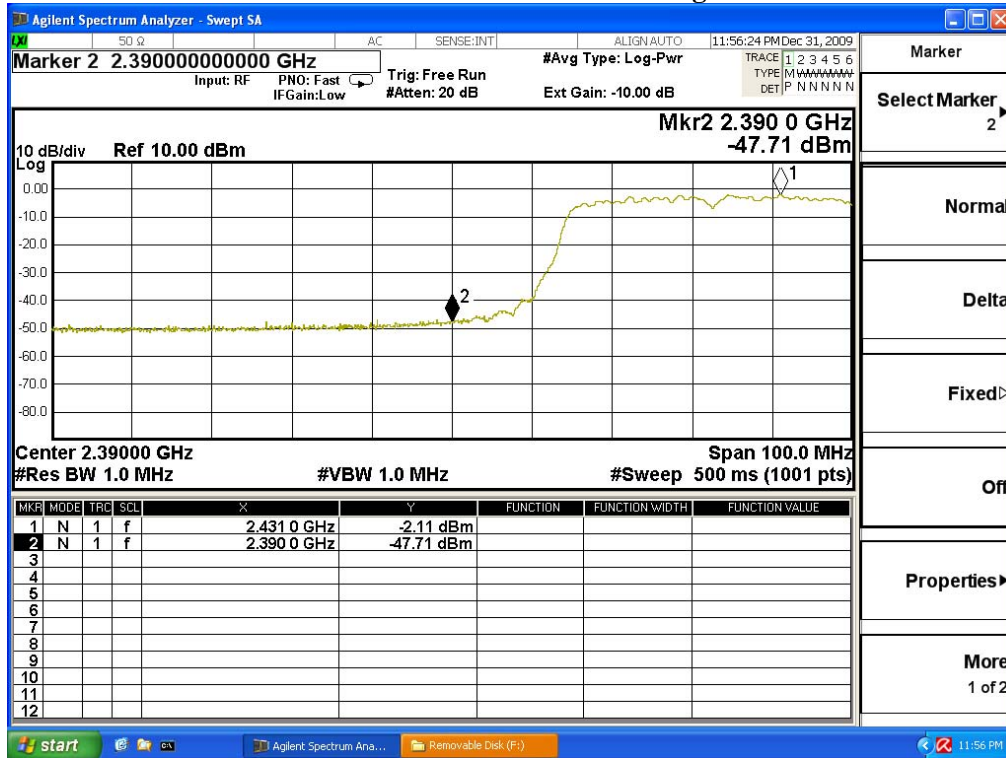
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

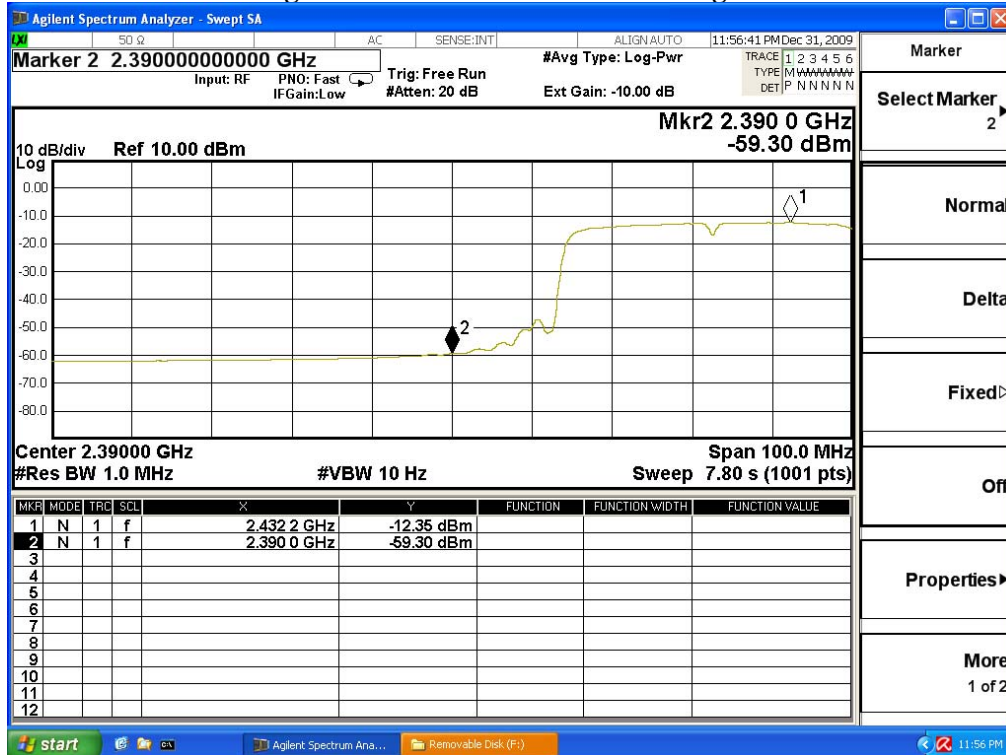
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : 802.11b/g/n Wireless USB Mini card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 30Mbps 40M-BW) -Channel 7

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dB(uV)]	Emission Level [dB(uV/m)]	Detector
Horizontal	2452	36.645	57.410	94.055	Peak
Horizontal	2452	36.645	46.430	83.075	Average
Vertical	2452	35.920	61.200	97.120	Peak
Vertical	2452	35.920	50.250	86.170	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2483.5	94.055	44.99	49.065	Peak
Horizontal	2483.5	83.075	46.84	36.235	Average
Vertical	2483.5	97.120	44.99	52.13	Peak
Vertical	2483.5	86.170	46.84	39.33	Average

Note:

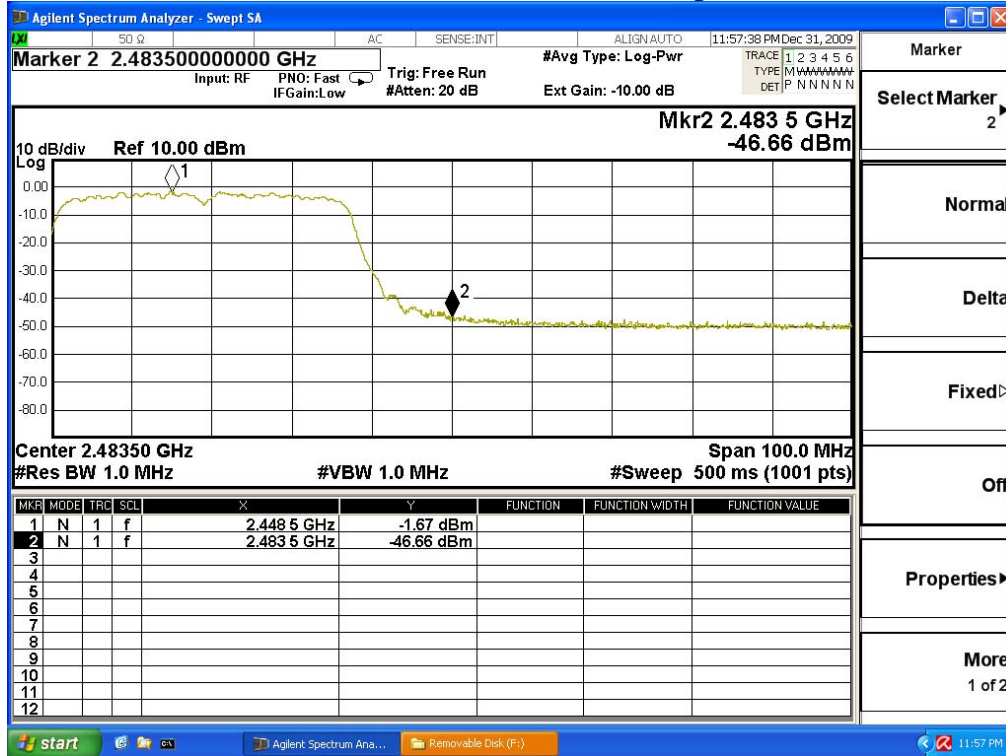
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

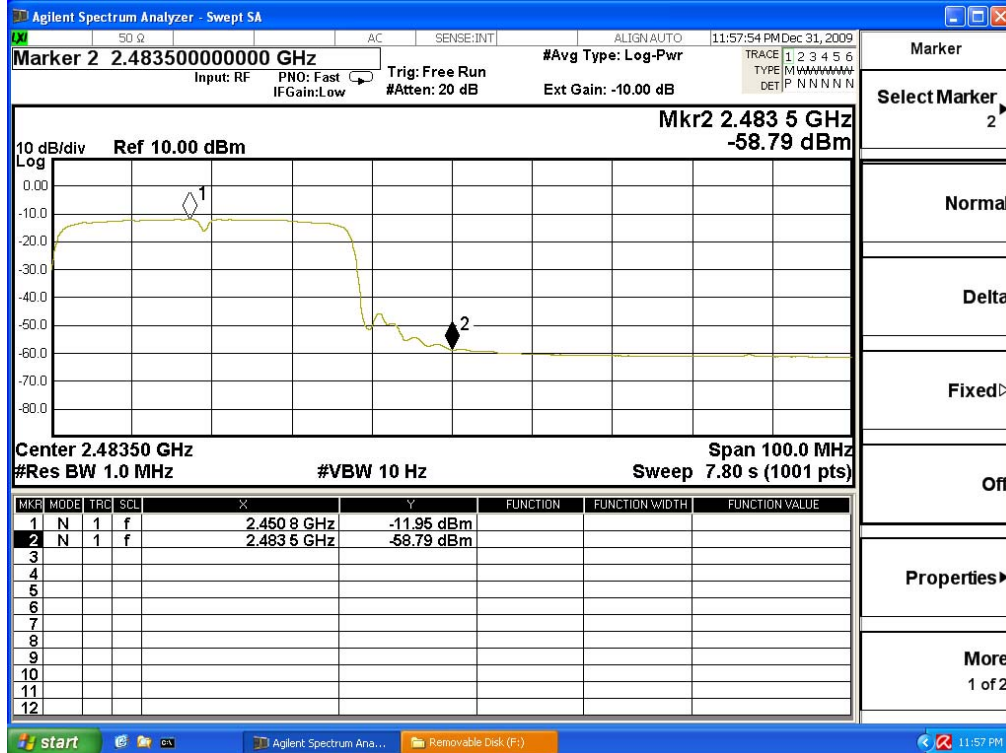
F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta





## 6. EMI Reduction Method During Compliance Testing

No modification was made during testing.

## Attachment 1: EUT Test Photographs

## Attachment 2: EUT Detailed Photographs