



## Test Report

Product Name	Notebook
Model No	MS-1242, U200
FCC ID.	I4L-12-EM7306891

Applicant	MICRO-STAR INT'L Co., LTD.
Address	No. 69, Li-De St., Jung-He City, Taipei Hsien, Taiwan, R.O.C.

Date of Receipt	May 26, 2009
Issue Date	July 17, 2009
Report No.	096001R-RFUSP05V01-A
Report Version	V1.0

The test results relate only to the samples tested.

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# Test Report Certification

Issue Date: July 17, 2009

Report No.: 096001R-RFUSP05V01-A



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

Product Name	Notebook
Applicant	MICRO-STAR INT'L Co., LTD.
Address	No. 69, Li-De St., Jung-He City, Taipei Hsien, Taiwan, R.O.C.
Manufacturer	MICRO-STAR INT'L Co., LTD.
Model No.	MS-1242, U200
EUT Rated Voltage	AC 120V/60Hz
EUT Test Voltage	DC 3.3V
Trade Name	MSI
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2008 ANSI C63.4: 2003
Test Result	Complied



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( Manager / Vincent Lin )



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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Notebook
Trade Name	MSI
Model No.	MS-1242, U200
FCC ID.	I4L-12-EM7306891
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: 7.2-150Mbps
Type of Modulation	802.11b:DSSS, DBPSK, DQPSK, CCK 802.11g/n:OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna Type	Printed on PCB
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto
Power Adapter	MFR: DELTA, M/N: ADP-40MH BD Input: AC 100-240V, 50-60Hz, 1.2A Output: DC 20V, 2A Cable Out: Shielded, 1.7m with one ferrite core bonded.

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	INPAQ	S79-1800N80-I05	2.6 dBi in 2.4GHz

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 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 a Notebook with a built-in 2.4GHz WLAN transceiver.
2. The EUT is including two models, The MS-1242 for MSI and the U200 for different marketing requirement.
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 7.2Mbps and 、 802.11n(40M-BW) is 15Mbps)
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 Notebook 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 7.2、14.4、21.7、28.9、43.3、57.8、65 and 72.2Mbps in 802.11n(20M-BW) mode and 15、30、45、60、90、120、135 and 150 Mbps(40M-BW) the device of RF carrier is BPSK, QPSK, 16QAM and 64QAM (IEEE 802.11n).

The device adapts direct sequence spread spectrum modulation. The antenna provides diversity function to improve the receiving function and the antennas to support 1(Transmit) × 2 (Receive) technology.

This Notebook, 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 Direst Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM) radio transmission, the Notebook 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 7.2Mbps 20M-BW)
	Mode 4: Transmitter (802.11n MCS8 15Mbps 40M-BW)

Note: 802.11b/g/n are tested by Chain A.

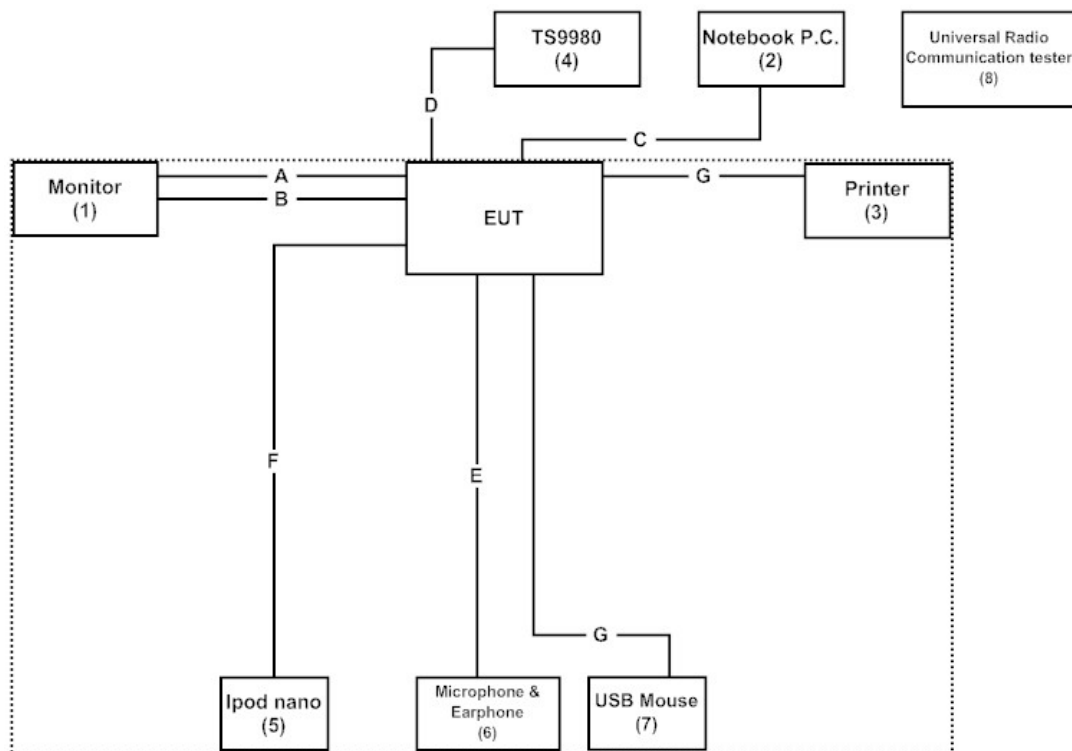
### 1.3. Tested System Details

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)	Monitor	Dell	2408WFPb	CN-0NN792-74261-82S-0YCS	Non-Shielded, 1.8m
(2)	Notebook PC	DELL	PP04X	C8YYM1S	Non-Shielded, 1.8m
(3)	Printer	EPSON	StyLus C63	FAPY012396	Non-Shielded, 1.8m
(4)	TS9980	R&S	N/A	N/A	Non-Shielded, 1.8m
(5)	iPod nano	Apple	A1236	7K823DY0Y0P	N/A
(6)	Microphone & Earphone	PCHOME	N/A	N/A	N/A
(7)	USB Mouse	Logitech	M-BE58	HCA24311471	N/A
(8)	Universal Radio Communication tester	Rohde & Schwarz	CMU200	104846	Non-Shielded, 1.8m

Signal Cable Type	Signal cable Description
A	D-SUB Cable
B	HDMI Cable
C	LAN Cable
D	Coaxial Cable
E	Earphone & Microphone Cable
F	USB Cable
G	USB Cable

### 1.4. Configuration of Tested System





## 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute “QA\_RT” Program Ver.1.2.0.1 on the EUT.
- (3) Configure the test mode, the test channel, and the data rate to start the continuous transmit
- (4) 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/modules/myalbum/>  
 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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 7435 Oakland Mills Road  
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 Registration Number: 92195



Accreditation on NVLAP  
 NVLAP Lab Code: 200533-0



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FCC Accreditation Number: TW1014



## 2. Conducted Emission

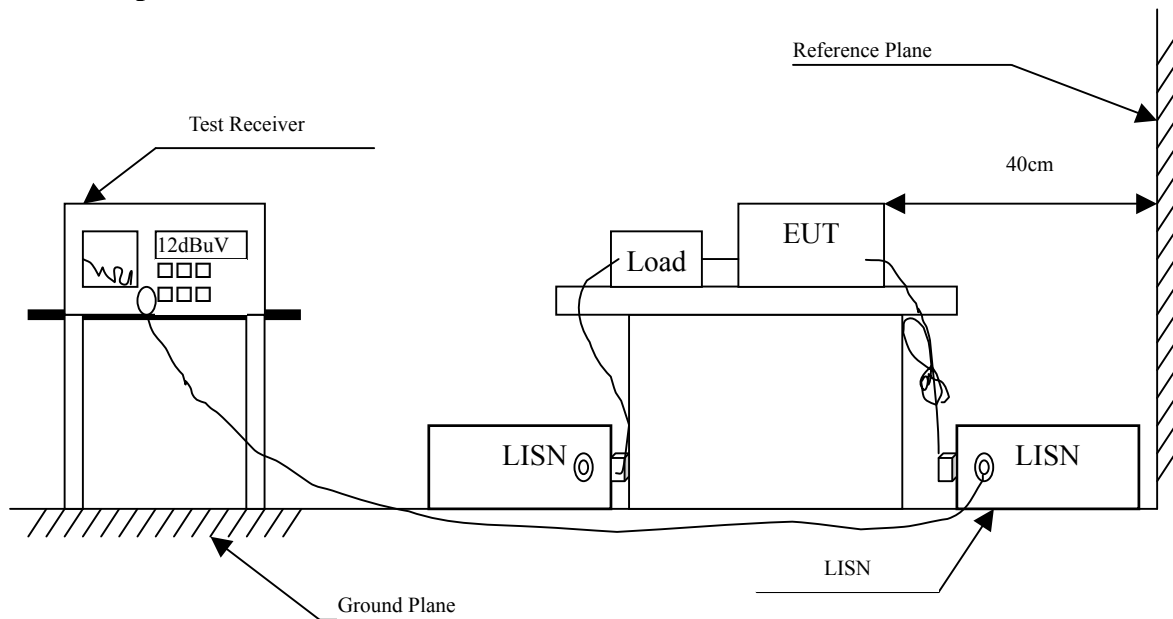
### 2.1. Test Equipment

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 : Notebook  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 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>					
0.197	9.709	32.380	42.089	-22.568	64.657
0.259	9.670	31.400	41.070	-21.816	62.886
0.388	9.650	30.150	39.800	-19.400	59.200
0.709	9.630	26.340	35.970	-20.030	56.000
5.154	9.700	17.500	27.200	-32.800	60.000
15.408	9.990	23.740	33.730	-26.270	60.000
<b>Average</b>					
0.197	9.709	26.460	36.169	-18.488	54.657
0.259	9.670	28.640	38.310	-14.576	52.886
0.388	9.650	29.280	38.930	-10.270	49.200
0.709	9.630	25.010	34.640	-11.360	46.000
5.154	9.700	11.600	21.300	-28.700	50.000
15.408	9.990	17.940	27.930	-22.070	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 : Notebook  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 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	31.550	41.274	-23.612	64.886
0.259	9.680	35.410	45.090	-17.796	62.886
0.388	9.650	31.990	41.640	-17.560	59.200
4.904	9.700	25.060	34.760	-21.240	56.000
15.673	10.000	23.480	33.480	-26.520	60.000
27.154	10.170	22.130	32.300	-27.700	60.000
<b>Average</b>					
0.189	9.724	24.160	33.884	-21.002	54.886
0.259	9.680	31.450	41.130	-11.756	52.886
0.388	9.650	30.120	39.770	-9.430	49.200
4.904	9.700	17.920	27.620	-18.380	46.000
15.673	10.000	19.340	29.340	-20.660	50.000
27.154	10.170	14.220	24.390	-25.610	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

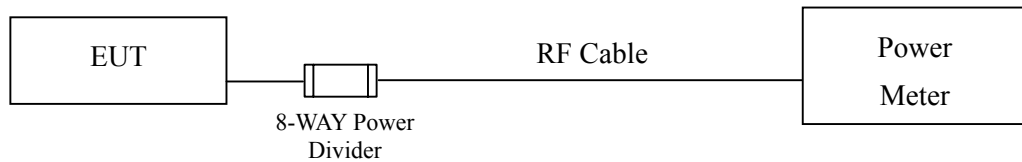
The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2009
X	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2009
X	8-WAY Power Divider	JFW	50PD-647 / 526770 0916	Apr., 2009

- Note:
1. All instruments are calibrated every one year.
  2. The test instruments marked by “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 : Notebook  
 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				Required Limit
Channel No.	Frequency (MHz)	Data Rate				
		1	2	5.5	11	
1	2412.00	20.62	--	--	--	1Watt= 30 dBm
6	2437.00	20.64	20.6	20.56	20.53	1Watt= 30 dBm
11	2462.00	20.65	--	--	--	1Watt= 30 dBm

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



Product : Notebook  
 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)	Data Rate								Required Limit
		6	9	12	18	24	36	48	54	
1	2412.00	20.55	--	--	--	--	--	--	--	1Watt= 30 dBm
6	2437.00	20.48	20.44	20.41	20.38	20.35	20.32	20.29	20.26	1Watt= 30 dBm
11	2462.00	20.61	--	--	--	--	--	--	--	1Watt= 30 dBm

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

Product : Notebook  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 20M-BW)

Cable Loss=0.5dB		Peak Power Output								Required Limit
Channel No.	Frequency (MHz)	Data Rate								
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	
1	2412.00	20.65	--	--	--	--	--	--	--	1Watt= 30 dBm
6	2437.00	20.63	20.58	20.52	20.48	20.45	20.43	20.41	20.38	1Watt= 30 dBm
11	2462.00	20.73	--	--	--	--	--	--	--	1Watt= 30 dBm

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

Product : Notebook  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 40M-BW)

Cable Loss=0.5dB		Peak Power Output								Required Limit
Channel No.	Frequency (MHz)	Data Rate								
		15	30	45	60	90	120	135	150	
1	2422.00	20.58	--	--	--	--	--	--	--	1Watt= 30 dBm
4	2437.00	20.63	20.59	20.56	20.55	20.53	20.5	20.47	20.45	1Watt= 30 dBm
7	2452.00	20.59	--	--	--	--	--	--	--	1Watt= 30 dBm

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

## 4. Radiated Emission

### 4.1. Test Equipment

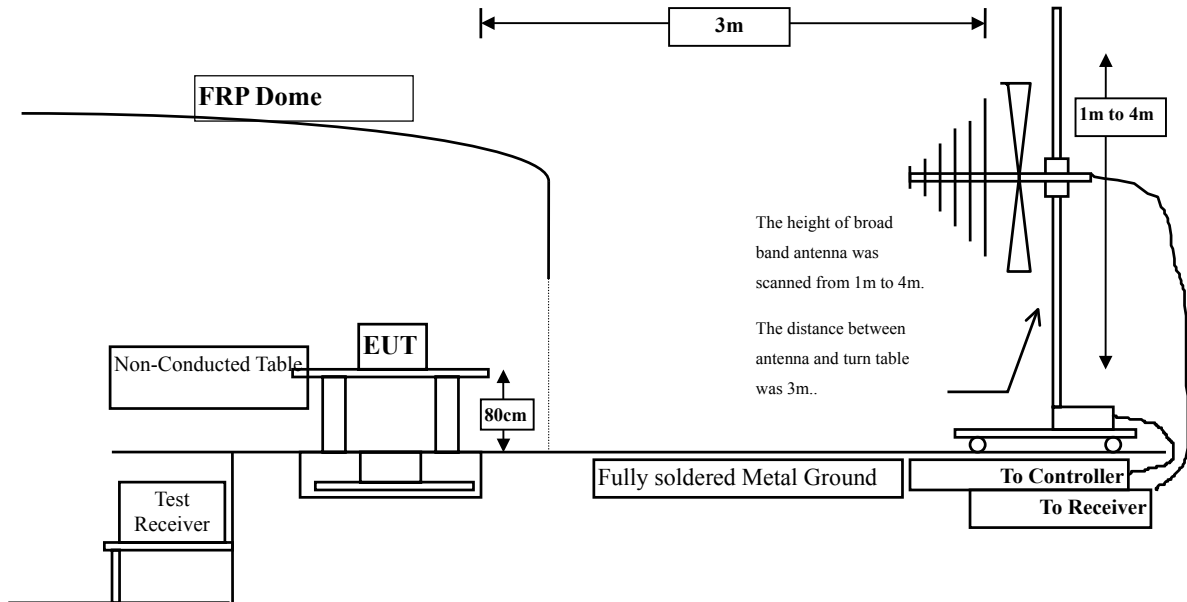
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2009
	X	Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2008
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2008
	X	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2008
	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

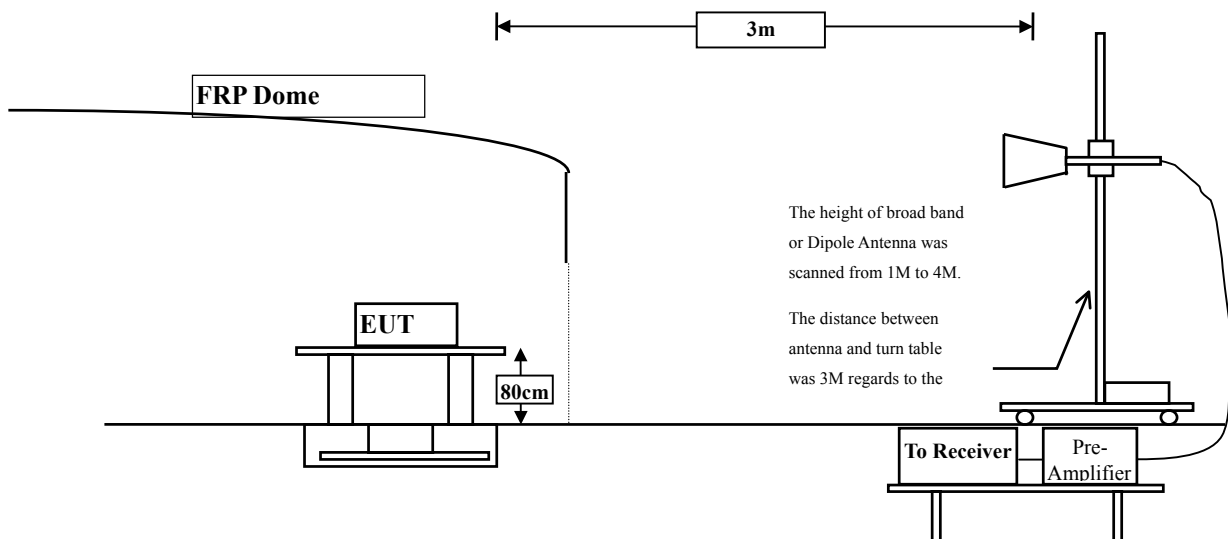
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

## 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 beamwidth 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 : Notebook  
 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	3.478	65.742	69.220	-4.780	74.000
7236.000	7.874	52.176	60.050	-13.950	74.000
9648.000	13.283	47.937	61.220	-12.780	74.000
<b>Average Detector:</b>					
4824.000	3.478	46.542	50.020	-3.980	54.000
7236.000	7.874	39.706	47.580	-6.420	54.000
9648.000	13.283	26.967	40.250	-13.750	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4824.000	3.570	64.650	68.220	-5.780	74.000
7236.000	8.819	51.511	60.330	-13.670	74.000
9648.000	13.761	48.540	62.300	-11.700	74.000
<b>Average Detector:</b>					
4824.000	3.570	44.680	48.250	-5.750	54.000
7236.000	8.819	37.871	46.690	-7.310	54.000
9648.000	13.761	19.900	33.660	-20.340	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : Notebook  
 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	3.100	62.890	65.990	-8.010	74.000
7311.000	7.417	55.913	63.330	-10.670	74.000
9748.000	13.322	46.698	60.020	-13.980	74.000
<b>Average Detector:</b>					
4874.000	3.100	44.120	47.220	-6.780	54.000
7311.000	7.417	37.833	45.250	-8.750	54.000
9748.000	13.322	21.788	35.110	-18.890	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	3.574	62.756	66.330	-7.670	74.000
7311.000	8.230	52.020	60.250	-13.750	74.000
9748.000	13.421	43.829	57.250	-16.750	74.000
<b>Average Detector:</b>					
4874.000	3.574	45.486	49.060	-4.940	54.000
7311.000	8.230	35.930	44.160	-9.840	54.000
9748.000	13.421	20.329	33.750	-20.250	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 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	3.364	64.106	67.470	-6.530	74.000
7386.000	6.624	56.626	63.250	-10.750	74.000
9848.000	13.631	41.420	55.050	-18.950	74.000
<b>Average</b>					
<b>Detector:</b>					
4924.000	3.364	43.886	47.250	-6.750	54.000
7386.000	6.624	36.766	43.390	-10.610	54.000
9848.000	13.631	19.620	33.250	-20.750	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4924.000	4.221	61.129	65.350	-8.650	74.000
7386.000	7.305	54.815	62.120	-11.880	74.000
9848.000	13.600	41.760	55.360	-18.640	74.000
<b>Average</b>					
<b>Detector:</b>					
4924.000	4.221	42.469	46.690	-7.310	54.000
7386.000	7.305	37.145	44.450	-9.550	54.000
9848.000	13.600	20.560	34.160	-19.840	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 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	3.478	47.120	50.598	-23.402	74.000
7236.000	7.874	42.910	50.784	-23.216	74.000
9648.000	13.283	40.460	53.743	-20.257	74.000
<b>Average Detector:</b>					
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<b>Vertical</b>					
<b>Peak Detector:</b>					
4824.000	3.570	43.400	46.970	-27.030	74.000
7236.000	8.819	42.690	51.509	-22.491	74.000
9648.000	13.761	40.230	53.990	-20.010	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 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	3.100	45.970	49.070	-24.930	74.000
7311.000	7.417	41.640	49.057	-24.943	74.000
9748.000	13.322	40.620	53.942	-20.058	74.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	3.574	44.010	47.584	-26.416	74.000
7311.000	8.230	42.350	50.580	-23.420	74.000
9748.000	13.421	40.110	53.531	-20.469	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 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	3.364	46.530	49.894	-24.106	74.000
7386.000	6.624	41.920	48.544	-25.456	74.000
9848.000	13.631	40.280	53.910	-20.090	74.000
<b>Average Detector:</b>					
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<b>Vertical</b>					
<b>Peak Detector:</b>					
4924.000	4.221	45.040	49.261	-24.739	74.000
7386.000	7.305	42.970	50.275	-23.725	74.000
9848.000	13.600	40.270	53.870	-20.130	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 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	3.478	45.080	48.558	-25.442	74.000
7236.000	7.874	42.710	50.584	-23.416	74.000
9648.000	13.283	40.170	53.453	-20.547	74.000
<b>Average Detector:</b>					
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<b>Vertical</b>					
<b>Peak Detector:</b>					
4824.000	3.570	43.540	47.110	-26.890	74.000
7236.000	8.819	44.650	53.469	-20.531	74.000
9648.000	13.761	40.220	53.980	-20.020	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 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	3.100	46.300	49.400	-24.600	74.000
7311.000	7.417	41.760	49.177	-24.823	74.000
9748.000	13.322	39.690	53.012	-20.988	74.000
<b>Average Detector:</b>					
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<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	3.574	44.460	48.034	-25.966	74.000
7311.000	8.230	42.390	50.620	-23.380	74.000
9748.000	13.421	39.880	53.301	-20.699	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 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	3.364	44.530	47.894	-26.106	74.000
7386.000	6.624	41.730	48.354	-25.646	74.000
9848.000	13.631	40.080	53.710	-20.290	74.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4924.000	4.221	43.490	47.711	-26.289	74.000
7386.000	7.305	42.530	49.835	-24.165	74.000
9848.000	13.600	39.970	53.570	-20.430	74.000

**Average Detector:**

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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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 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	3.329	48.350	51.679	-22.321	74.000
7266.000	7.681	44.180	51.861	-22.139	74.000
9688.000	13.217	40.260	53.477	-20.523	74.000
<b>Average Detector:</b>					
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<b>Vertical</b>					
<b>Peak Detector:</b>					
4844.000	3.575	45.320	48.895	-25.105	74.000
7266.000	8.564	44.900	53.464	-20.536	74.000
9688.000	13.553	40.020	53.573	-20.427	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 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	3.100	45.750	48.850	-25.150	74.000
7311.000	7.417	41.980	49.397	-24.603	74.000
9748.000	13.322	40.060	53.382	-20.618	74.000
<b>Average Detector:</b>					
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<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	3.574	44.190	47.764	-26.236	74.000
7311.000	8.230	42.280	50.510	-23.490	74.000
9748.000	13.421	40.300	53.721	-20.279	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 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	3.145	45.210	48.355	-25.645	74.000
7356.000	6.664	41.150	47.813	-26.187	74.000
9808.000	13.495	39.590	53.085	-20.915	74.000
<b>Average Detector:</b>					
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<b>Vertical</b>					
<b>Peak Detector:</b>					
4904.000	3.849	43.440	47.289	-26.711	74.000
7356.000	7.389	41.590	48.978	-25.022	74.000
9808.000	13.417	40.190	53.607	-20.393	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.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Notebook  
 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>					
299.660	-4.929	39.976	35.047	-10.953	46.000
449.040	0.231	36.847	37.078	-8.922	46.000
598.420	3.286	28.547	31.833	-14.167	46.000
695.420	3.349	31.143	34.492	-11.508	46.000
796.300	6.303	30.686	36.989	-9.011	46.000
899.120	5.488	25.511	30.999	-15.001	46.000
<b>Vertical</b>					
299.660	-4.239	39.483	35.244	-10.756	46.000
375.320	0.154	33.326	33.480	-12.520	46.000
449.040	-6.139	34.990	28.851	-17.149	46.000
522.760	0.899	32.647	33.546	-12.454	46.000
600.360	1.065	28.233	29.298	-16.702	46.000
821.520	2.939	31.908	34.847	-11.153	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 : Notebook  
 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>					
299.660	-4.929	39.583	34.654	-11.346	46.000
449.040	0.231	36.264	36.495	-9.505	46.000
522.760	2.959	29.656	32.615	-13.385	46.000
600.360	3.235	27.584	30.819	-15.181	46.000
699.300	2.822	31.113	33.935	-12.065	46.000
800.180	6.336	31.316	37.653	-8.347	46.000
<b>Vertical</b>					
299.660	-4.239	41.229	36.990	-9.010	46.000
375.320	0.154	31.700	31.854	-14.146	46.000
524.700	0.912	32.910	33.822	-12.178	46.000
674.080	-0.117	28.924	28.807	-17.193	46.000
800.180	2.556	37.156	39.713	-6.287	46.000
897.180	0.710	31.210	31.920	-14.080	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 : Notebook  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 20M-BW)(2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
299.660	-4.929	40.615	35.686	-10.314	46.000
373.380	0.653	32.981	33.634	-12.366	46.000
449.040	0.231	34.835	35.066	-10.934	46.000
600.360	3.235	28.416	31.651	-14.349	46.000
697.360	3.097	30.560	33.657	-12.343	46.000
796.300	6.303	31.571	37.874	-8.126	46.000
<b>Vertical</b>					
299.660	-4.239	40.379	36.140	-9.860	46.000
392.780	-1.444	34.972	33.528	-12.472	46.000
524.700	0.912	33.450	34.362	-11.638	46.000
598.420	0.876	29.061	29.937	-16.063	46.000
674.080	-0.117	29.219	29.102	-16.898	46.000
796.300	2.553	36.456	39.009	-6.991	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 : Notebook  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 40M-BW)(2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
299.660	-4.929	40.363	35.434	-10.566	46.000
375.320	0.684	29.176	29.860	-16.140	46.000
449.040	0.231	35.262	35.493	-10.507	46.000
598.420	3.286	29.283	32.569	-13.431	46.000
699.300	2.822	31.498	34.320	-11.680	46.000
800.180	6.336	32.209	38.546	-7.454	46.000
<b>Vertical</b>					
299.660	-4.239	39.427	35.188	-10.812	46.000
375.320	0.154	33.009	33.163	-12.837	46.000
524.700	0.912	33.477	34.389	-11.611	46.000
641.100	-2.057	34.767	32.710	-13.290	46.000
749.740	1.841	30.472	32.313	-13.687	46.000
796.300	2.553	37.051	39.604	-6.396	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. RF antenna conducted test**

**5.1. Test Equipment**

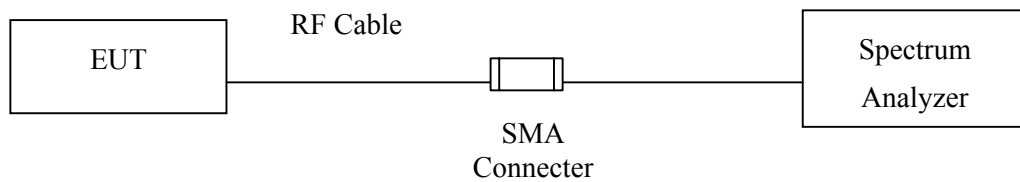
The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Nov, 2008
	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2009
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	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.

**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 Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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



## 5.5. Uncertainty

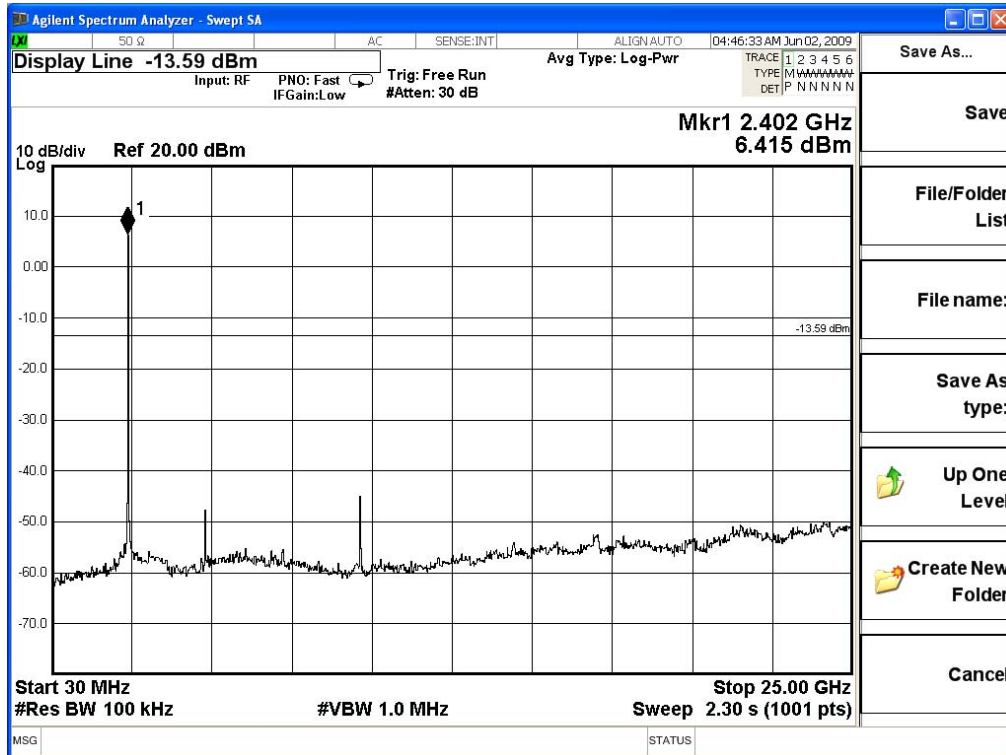
The measurement uncertainty

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

**5.6. Test Result of RF antenna conducted test**

Product : Notebook  
 Test Item : RF antenna conducted test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps)

**Channel 01 (2412MHz) 30 MHz -25GHz**



**Channel 06 (2437MHz) 30 MHz -25GHz**

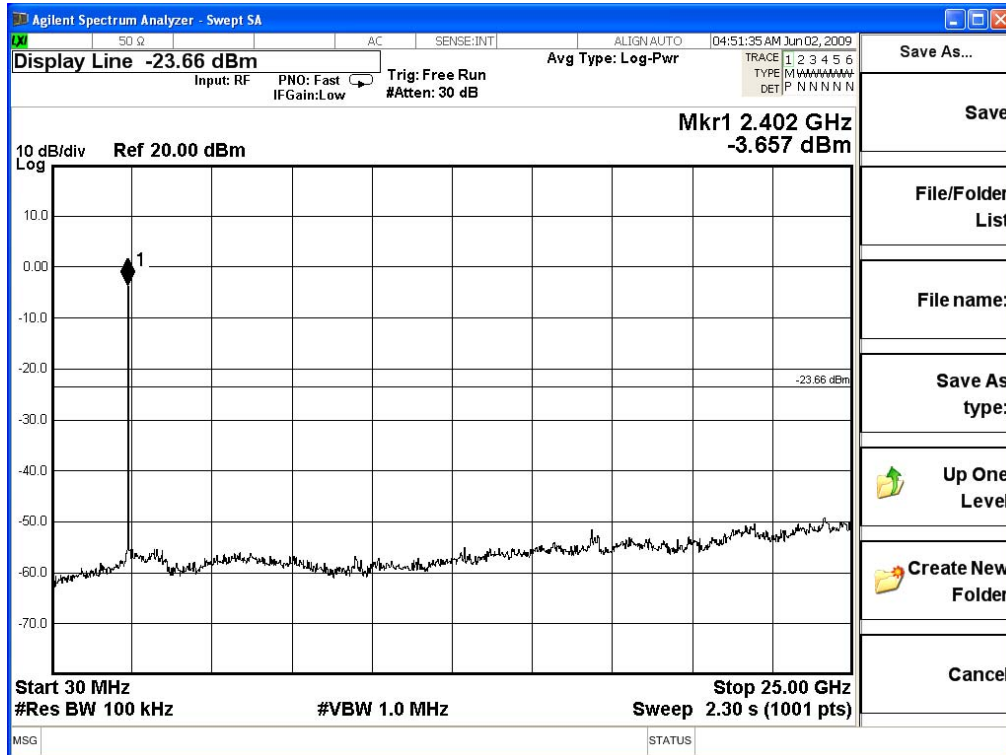


**Channel 11 (2462MHz) 30 MHz -25GHz**

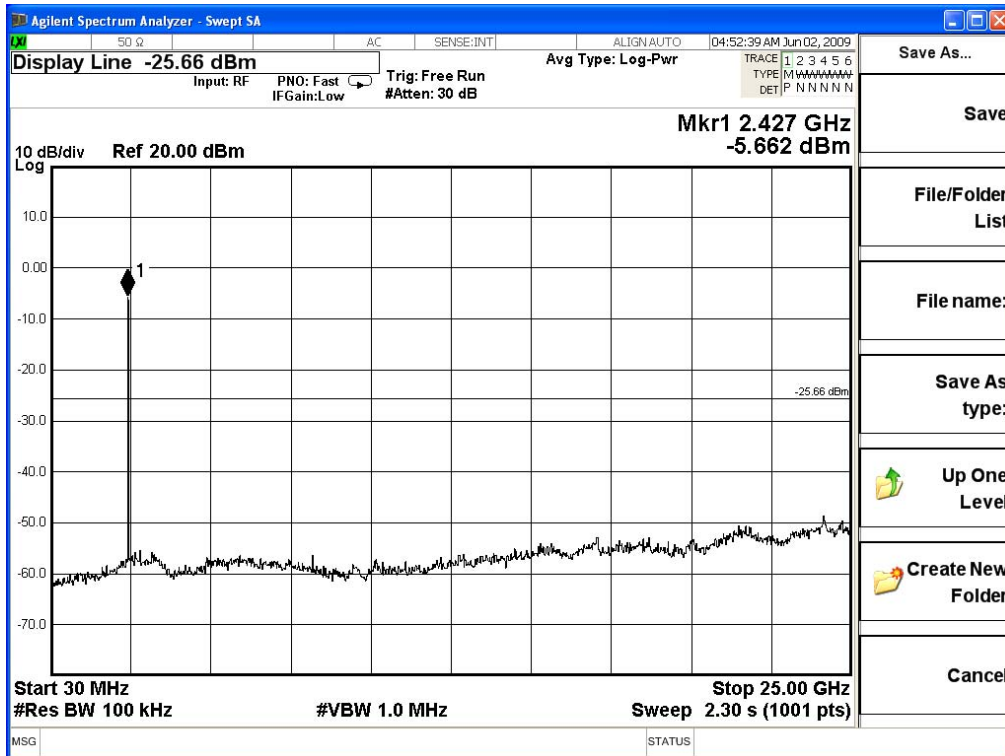


Product : Notebook  
 Test Item : RF Antenna Conducted Spurious  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps)

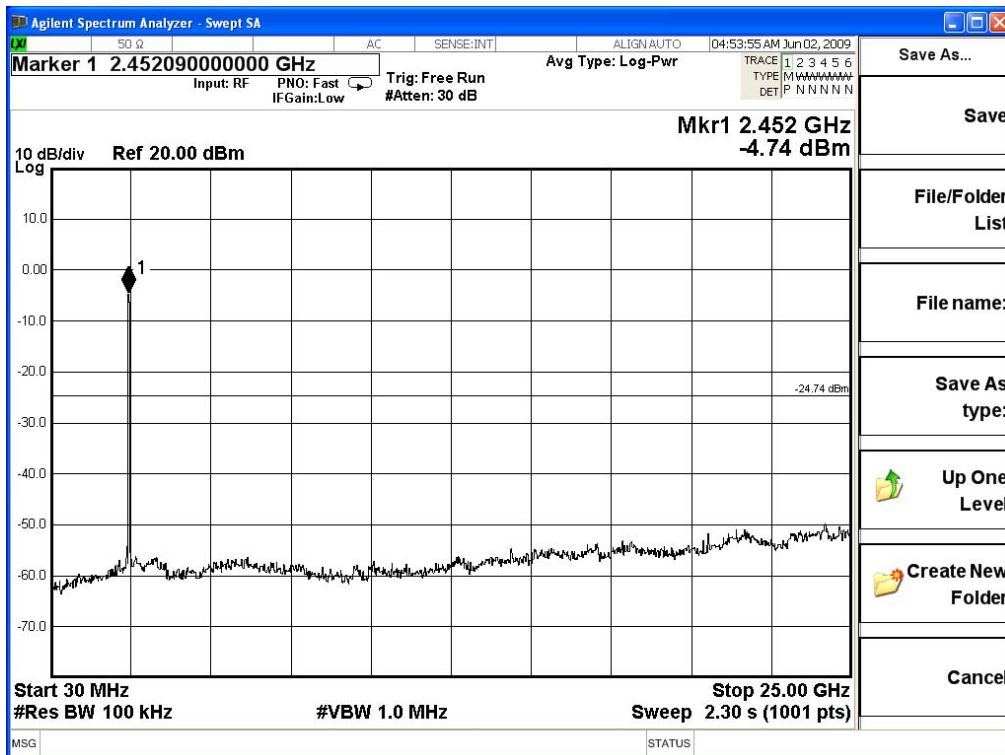
**Channel 01 (2412MHz) 30 MHz -25GHz**



**Channel 06 (2437MHz) 30 MHz -25GHz**

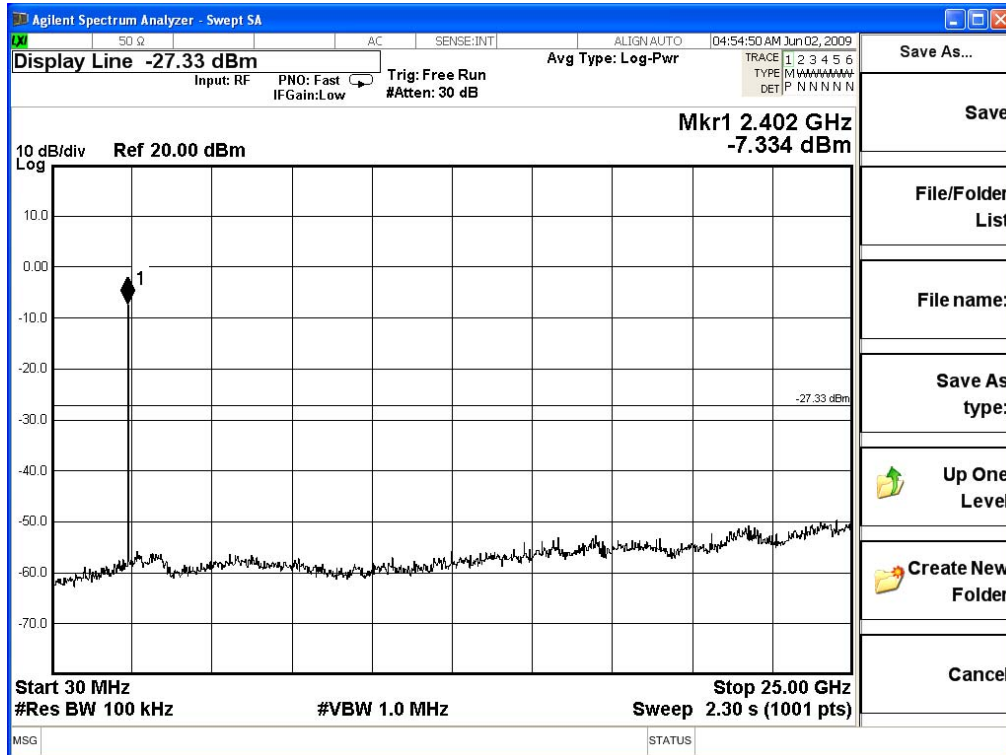


**Channel 11 (2462MHz) 30 MHz -25GHz**

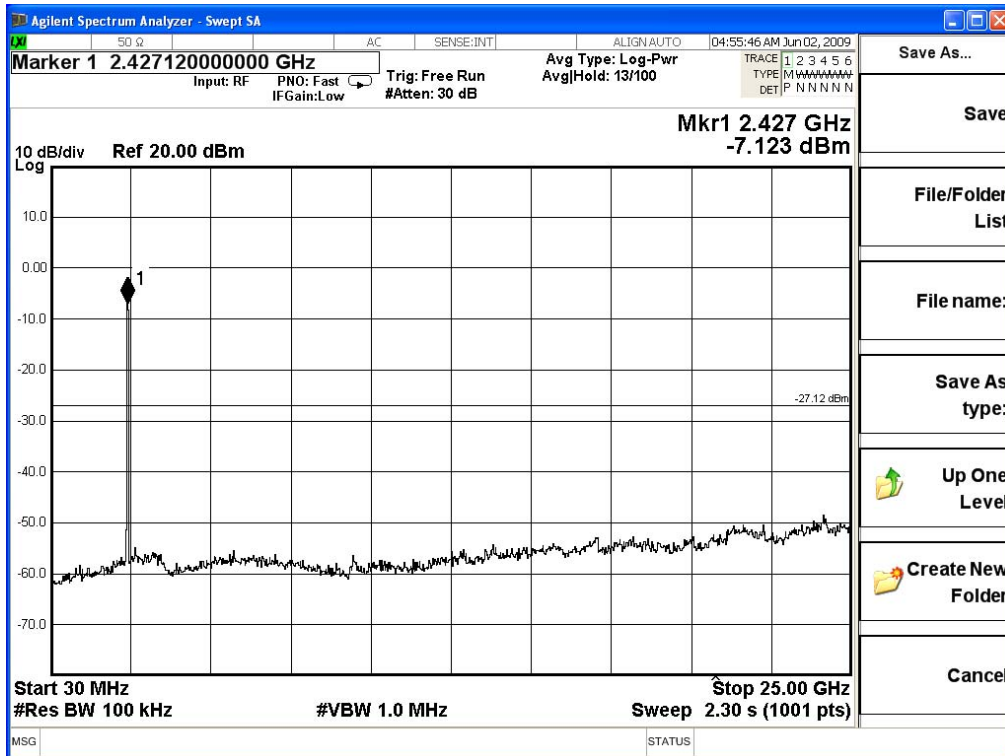


Product : Notebook  
 Test Item : RF Antenna Conducted Spurious  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 20M-BW)

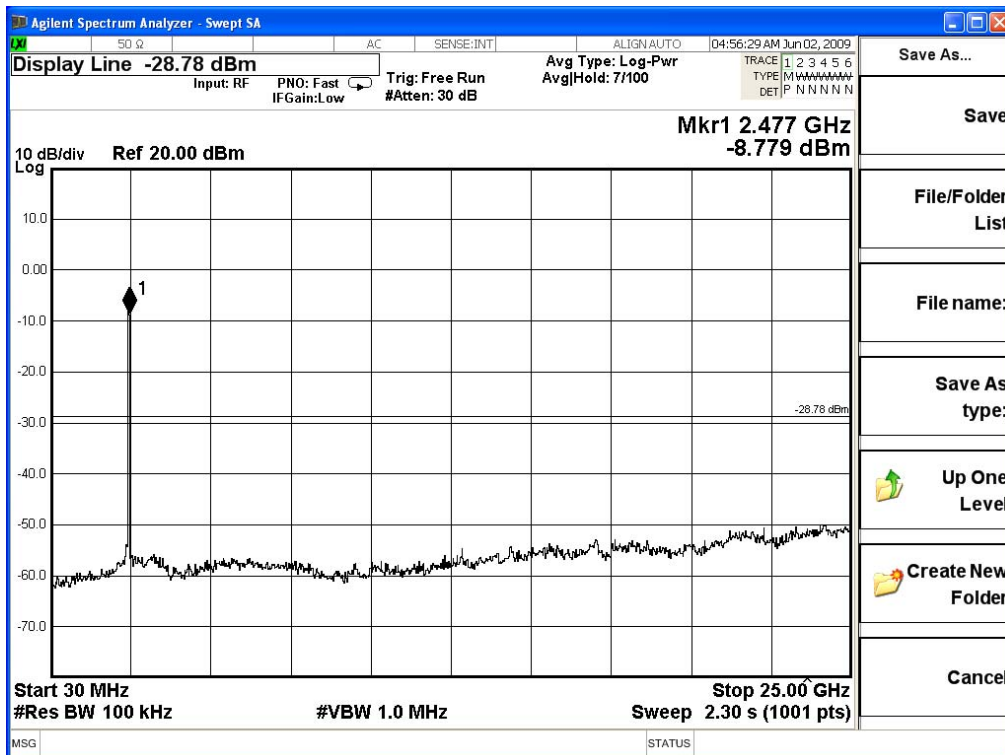
**Channel 01 (2412MHz) 30 MHz -25GHz**



**Channel 06 (2437MHz) 30 MHz -25GHz**

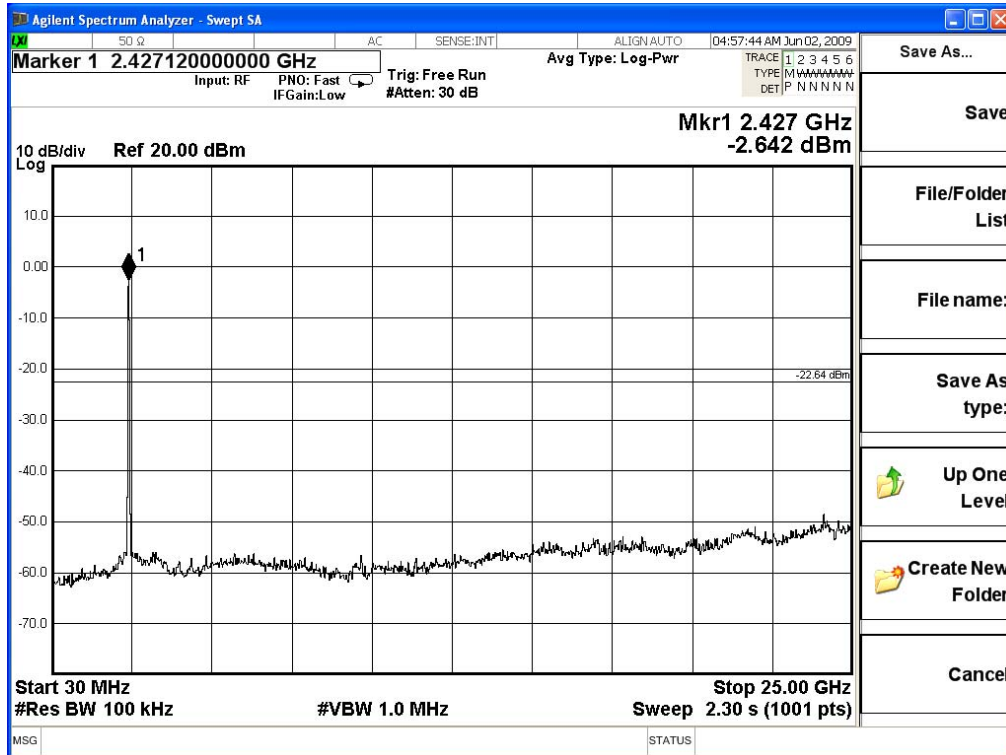


**Channel 11 (2462MHz) 30 MHz -25GHz**



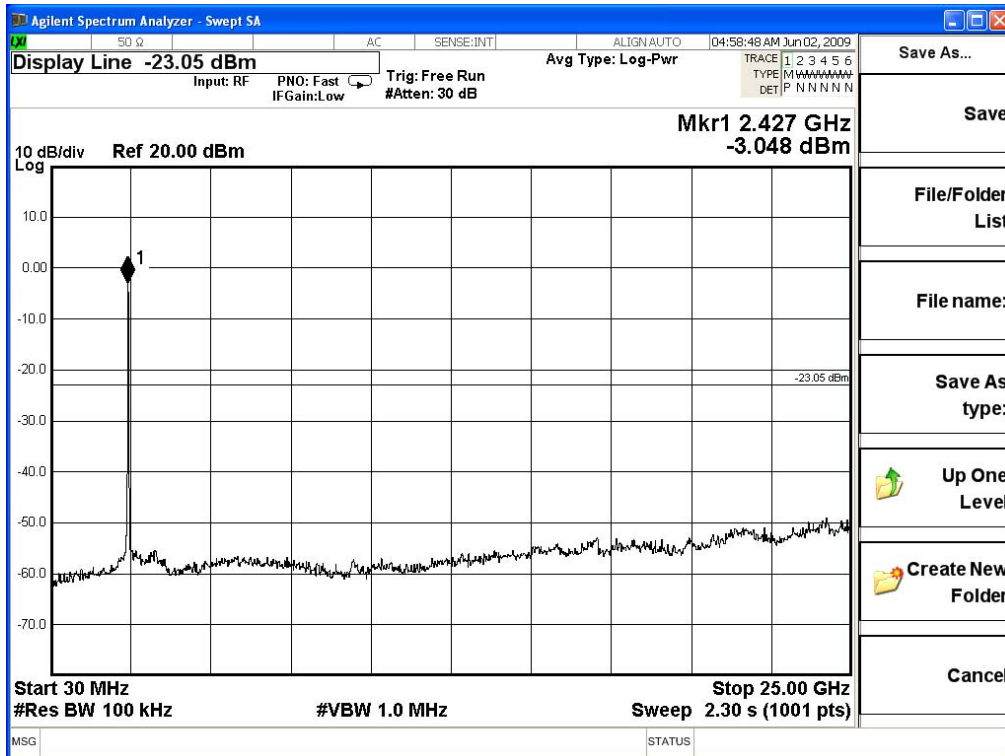
Product : Notebook  
 Test Item : RF Antenna Conducted Spurious  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 40M-BW)

**Channel 01 (2422MHz) 30 MHz -25GHz**

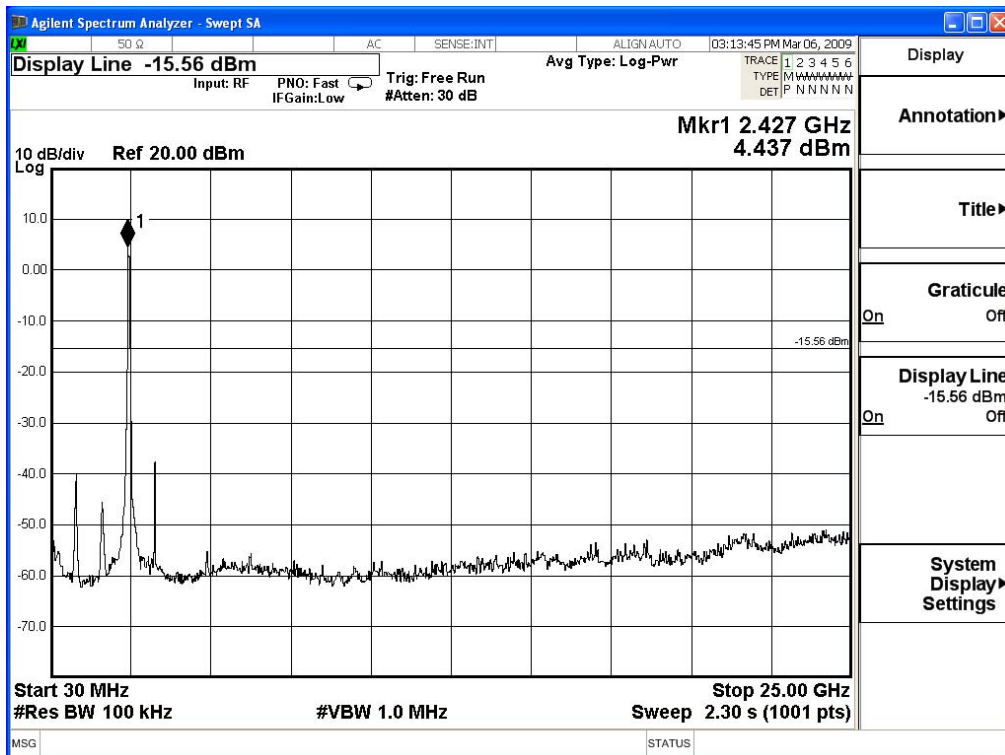




**Channel 04 (2437MHz) 30 MHz -25GHz**



**Channel 07 (2452MHz) 30MHz-25GHz**



## 6. Band Edge

### 6.1. Test Equipment

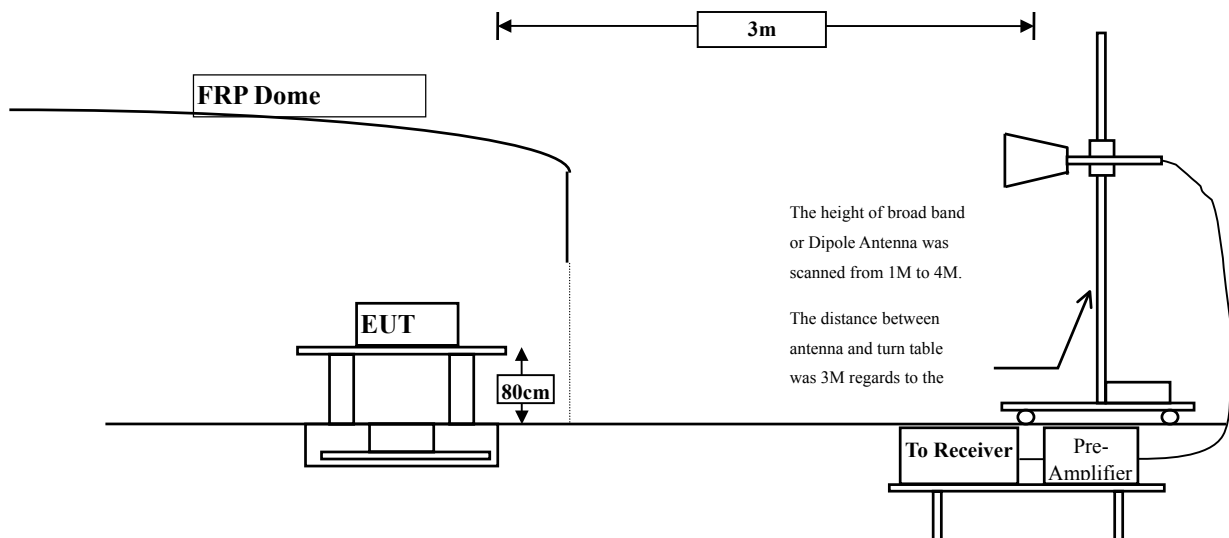
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr, 2009
	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2008
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2008
	X Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2008
	X Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2008
	X Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2008
	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.

### 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 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.

### **6.5. Uncertainty**

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

## 6.6. Test Result of Band Edge

Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2412MHz)

### Marker Delta Method (Low band)

#### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2412	33.202	74.997	108.199	Peak
Horizontal	2412	33.205	70.583	103.789	Average
Vertical	2412	33.214	72.672	105.886	Peak
Vertical	2412	33.223	69.864	103.086	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	2379.6	108.199	52.65	55.549	Peak
Horizontal	2379.5	103.789	57.84	45.949	Average
Vertical	2379.6	105.886	52.65	53.216	Peak
Vertical	2379.5	103.086	57.84	45.246	Average

Note:

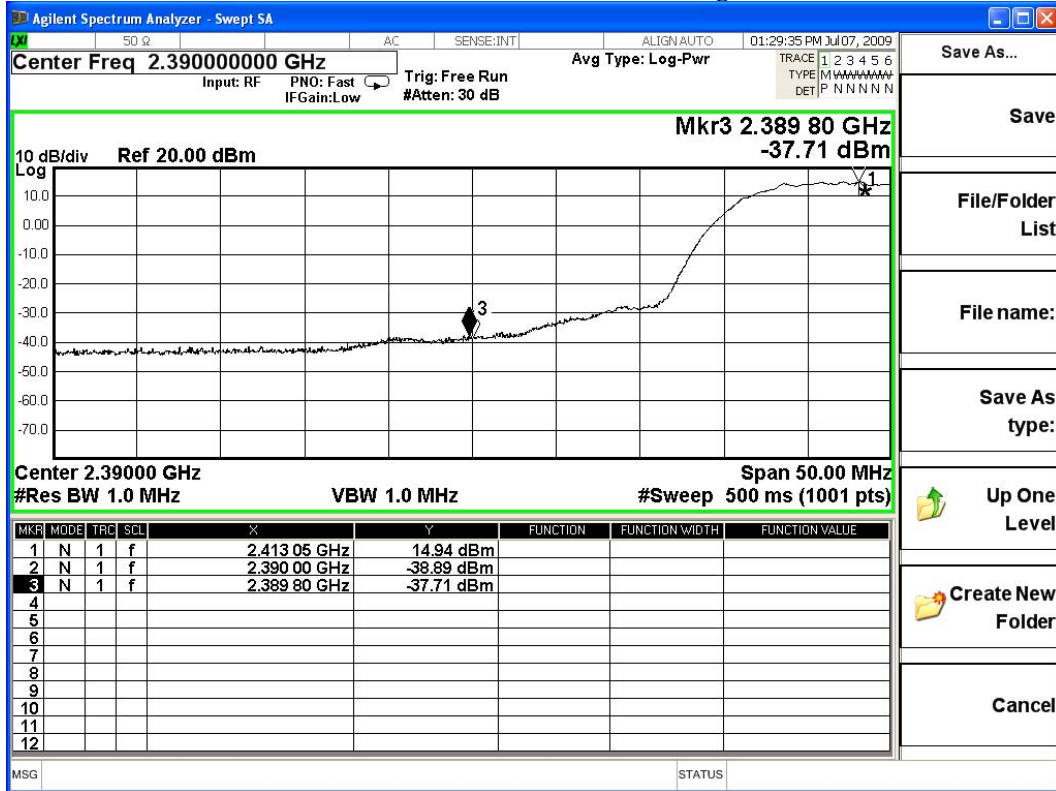
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

$$\text{Band Edge field Strength} = F - \Delta$$

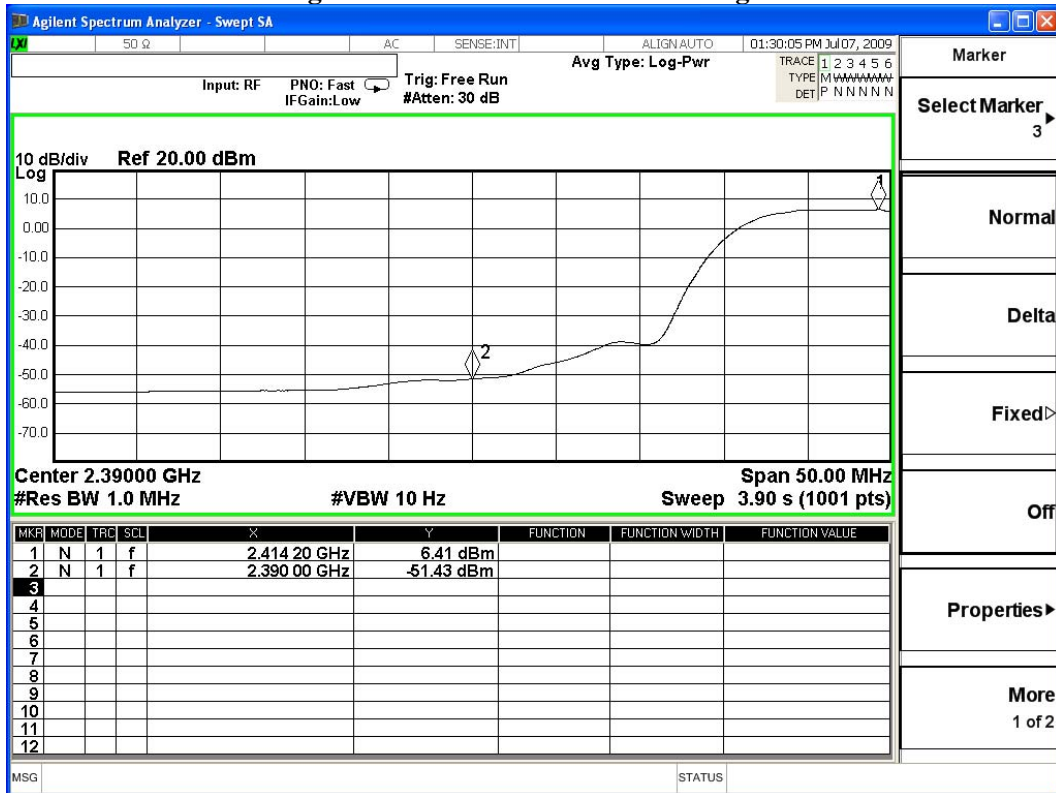
F = Fundamental field Strength (Peak or Average)

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

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462MHz)

### Marker Delta Method (Low band)

#### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2462	33.202	74.159	107.361	Peak
Horizontal	2462	33.197	70.612	103.809	Average
Vertical	2462	33.213	73.427	106.640	Peak
Vertical	2462	33.223	69.449	102.671	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	2494.7	107.361	53.25	54.111	Peak
Horizontal	2494.3	103.809	58.34	45.469	Average
Vertical	2494.7	106.640	53.25	53.39	Peak
Vertical	2494.3	102.671	58.34	44.331	Average

Note:

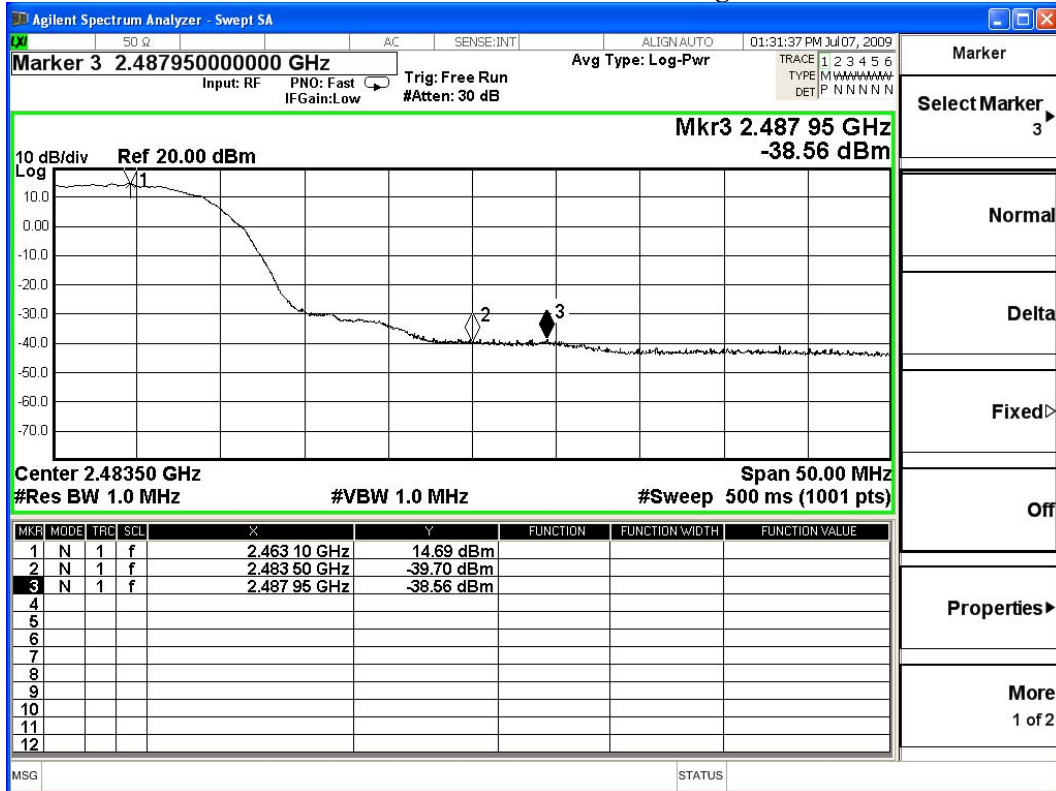
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

$$\text{Band Edge field Strength} = F - \Delta$$

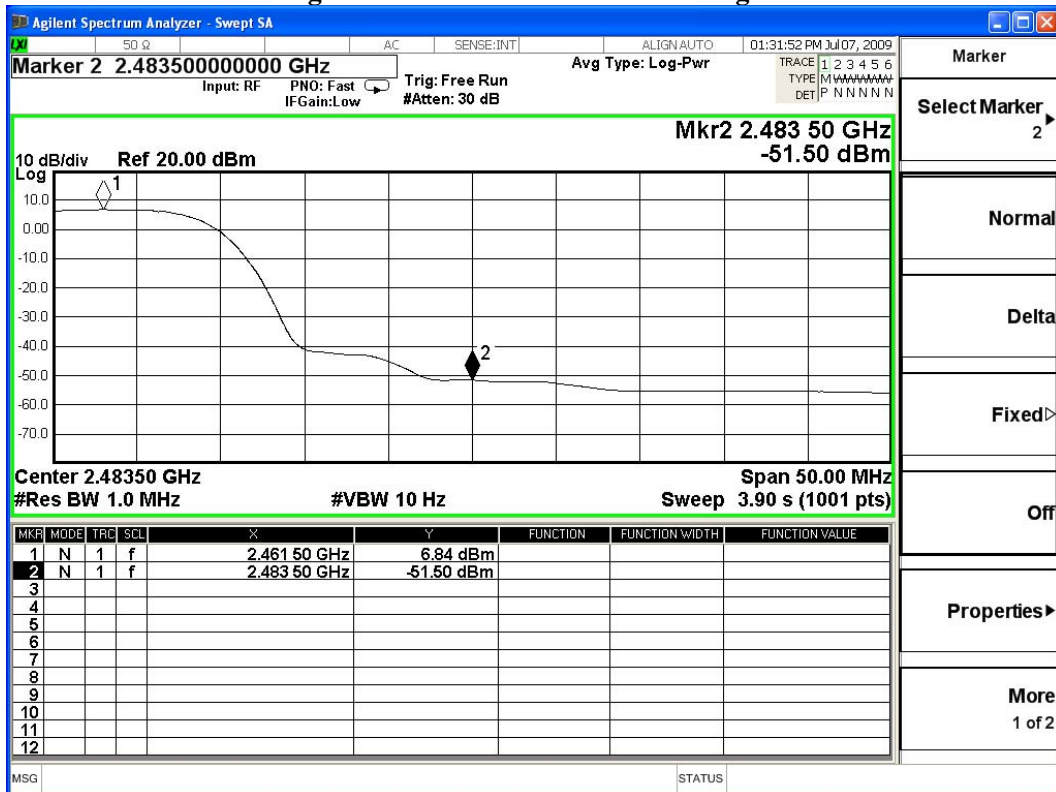
F = Fundamental field Strength (Peak or Average)

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

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2412MHz)

### Marker Delta Method (Low band)

#### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2412	36.061	69.335	105.396	Peak
Horizontal	2412	36.066	60.403	96.470	Average
Vertical	2412	35.321	66.533	101.853	Peak
Vertical	2412	35.329	57.295	92.625	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	2389.75	105.396	52.17	53.226	Peak
Horizontal	2390.0	96.470	55.54	40.93	Average
Vertical	2389.75	101.853	52.17	49.683	Peak
Vertical	2390.0	92.625	55.54	37.085	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:

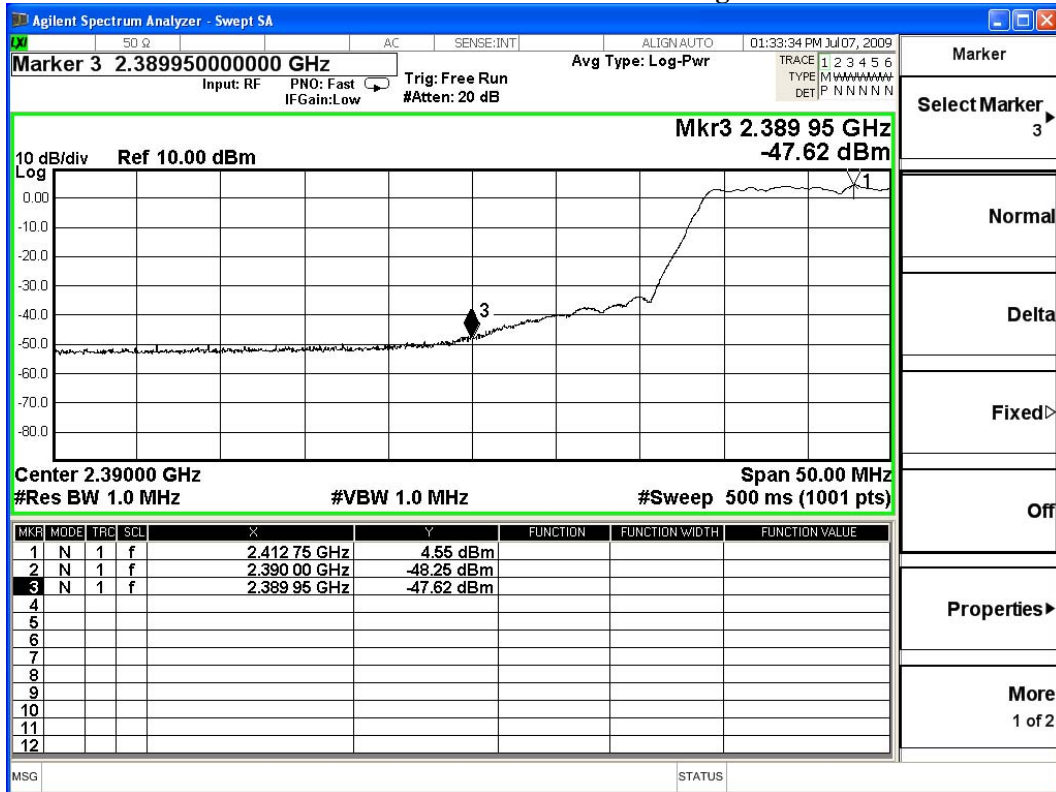
$$\text{Band Edge field Strength} = F - \Delta$$

F = Fundamental field Strength (Peak or Average)

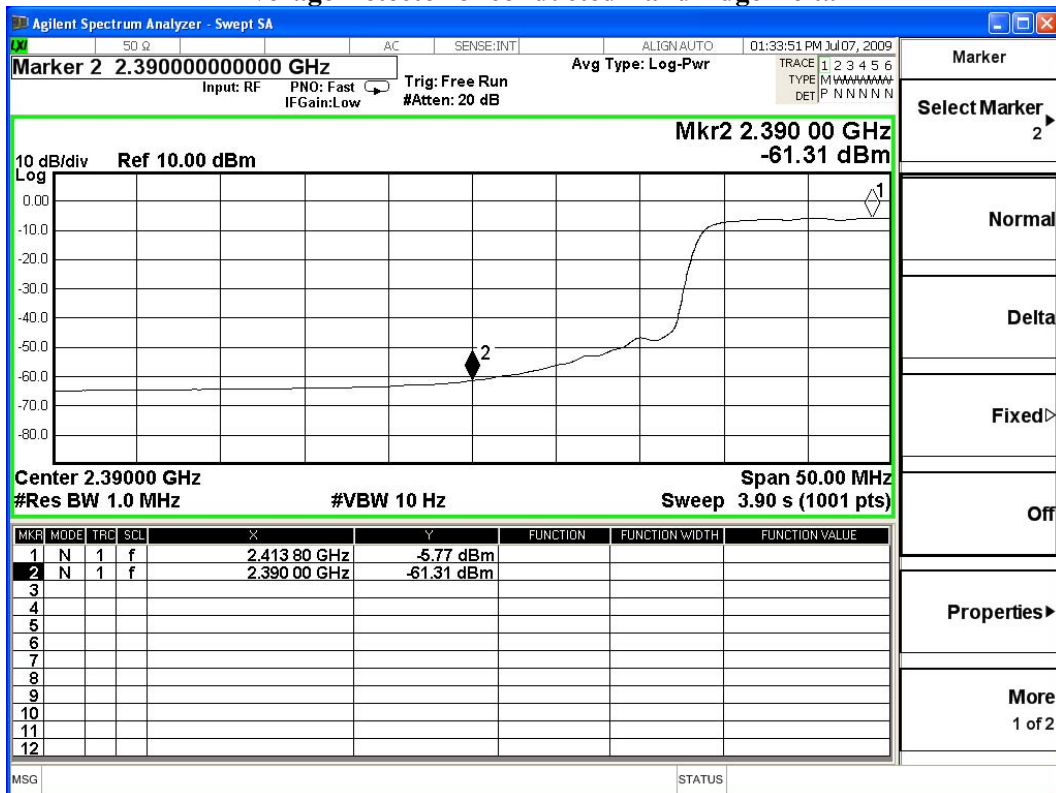
$\Delta$  = Conducted Band Edge Delta (Peak or Average)



### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2462MHz)

### Marker Delta Method (Low band)

#### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2462	36.331	67.764	104.096	Peak
Horizontal	2462	36.324	58.900	95.223	Average
Vertical	2462	35.885	65.633	101.518	Peak
Vertical	2462	35.873	56.728	92.601	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	104.096	46.72	57.376	Peak
Horizontal	2483.5	95.223	54.64	40.583	Average
Vertical	2483.7	101.518	46.72	54.798	Peak
Vertical	2483.5	92.601	54.64	37.961	Average

Note:

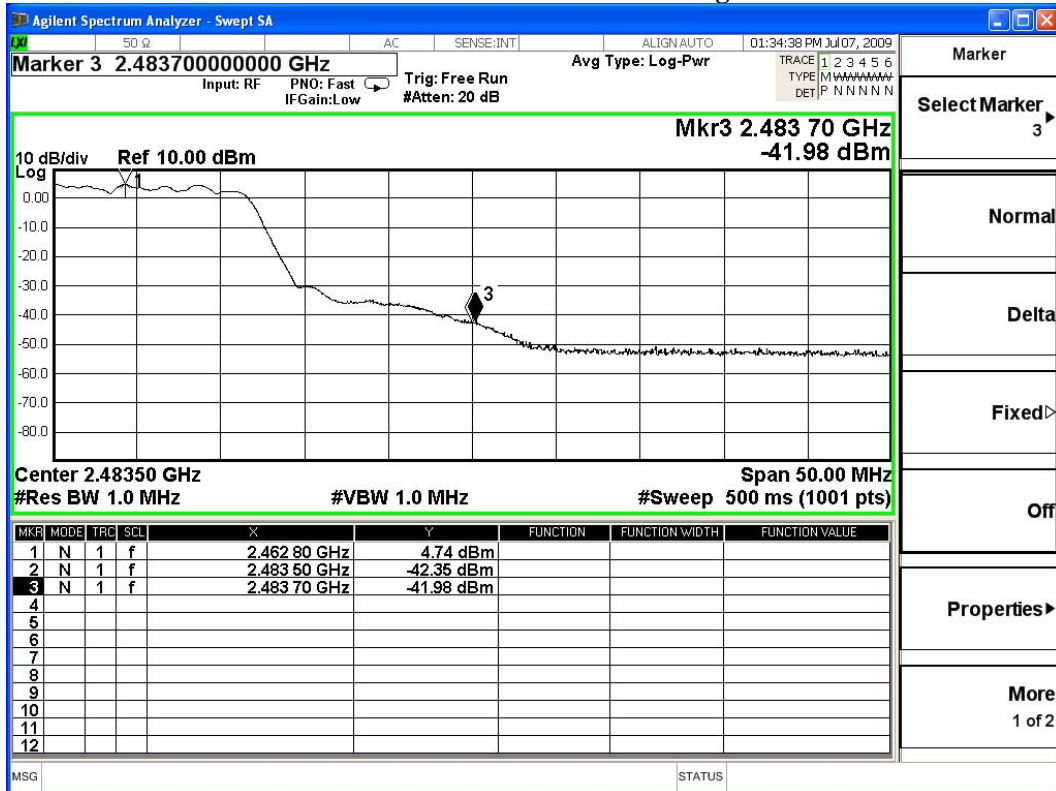
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

$$\text{Band Edge field Strength} = F - \Delta$$

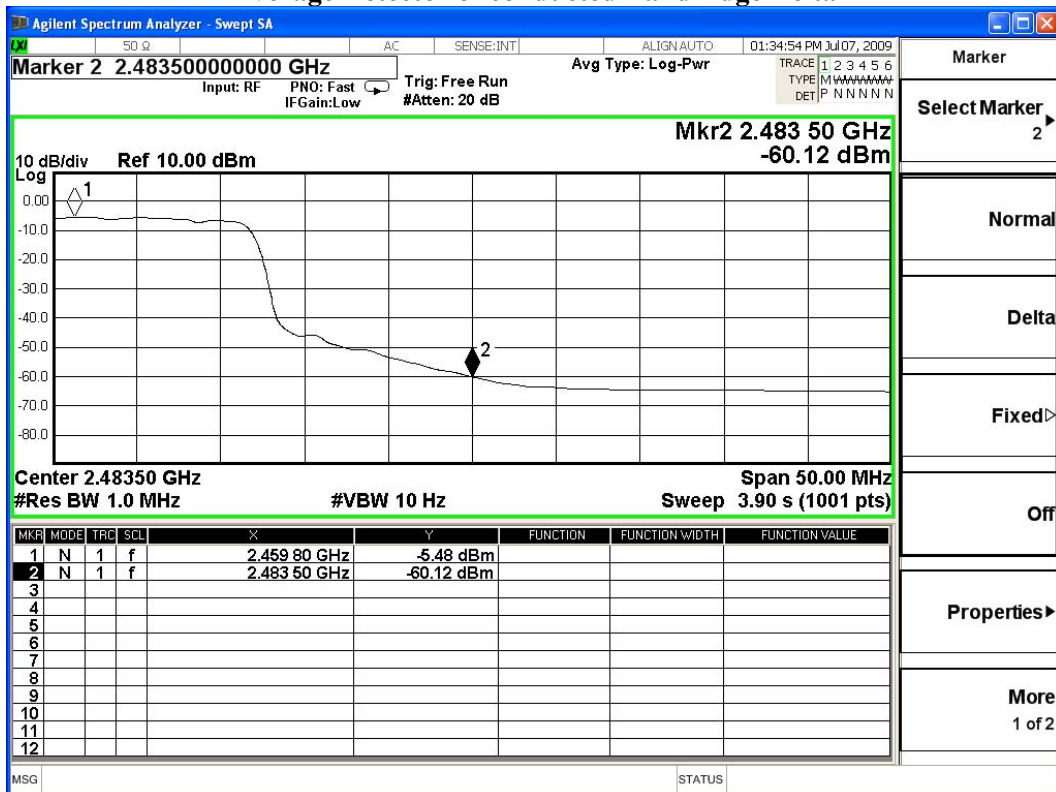
F = Fundamental field Strength (Peak or Average)

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

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 20M-BW) (2412MHz)

**Marker Delta Method (Low band)**

## Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2412	36.062	70.223	106.285	Peak
Horizontal	2412	36.056	60.854	96.911	Average
Vertical	2412	35.318	67.110	102.428	Peak
Vertical	2412	35.321	57.892	92.212	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	106.285	48.7	57.585	Peak
Horizontal	2390.0	96.911	54.68	42.231	Average
Vertical	2390.0	102.428	48.7	53.728	Peak
Vertical	2390.0	92.212	54.68	37.532	Average

Note:

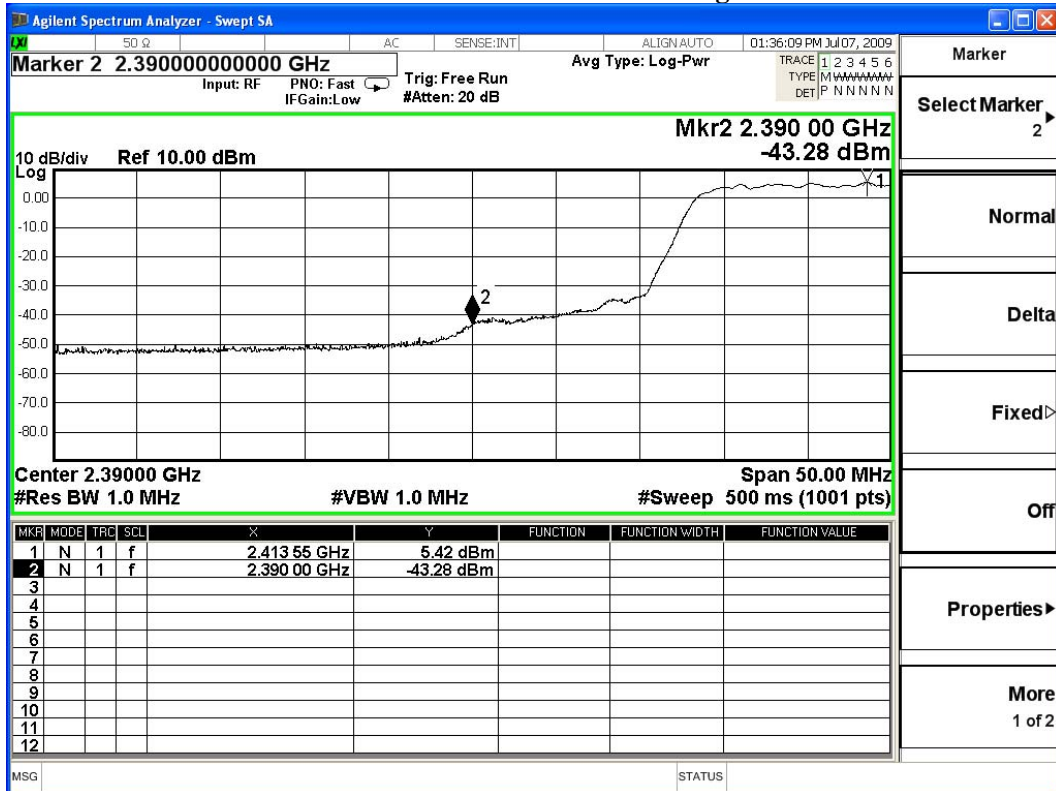
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

$$\text{Band Edge field Strength} = F - \Delta$$

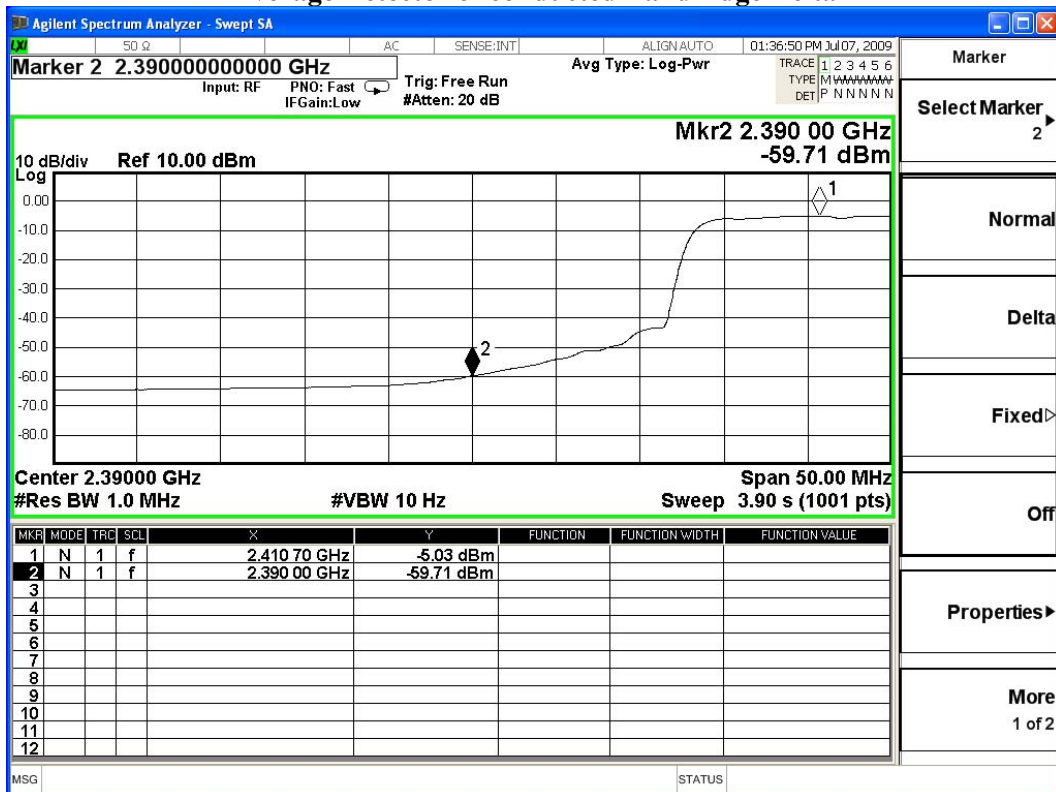
F = Fundamental field Strength (Peak or Average)

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

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmitter (802.11n MCS8 7.2Mbps 20M-BW) (2462MHz)

### Marker Delta Method (Low band)

#### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2462	36.327	68.026	104.353	Peak
Horizontal	2462	36.325	58.095	94.420	Average
Vertical	2462	35.875	65.235	101.109	Peak
Vertical	2462	35.944	55.898	91.842	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	2483.85	104.353	46.65	57.703	Peak
Horizontal	2483.5	94.420	53.18	41.240	Average
Vertical	2483.85	101.109	46.65	54.459	Peak
Vertical	2483.5	91.842	53.18	38.662	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:

$$\text{Band Edge field Strength} = F - \Delta$$

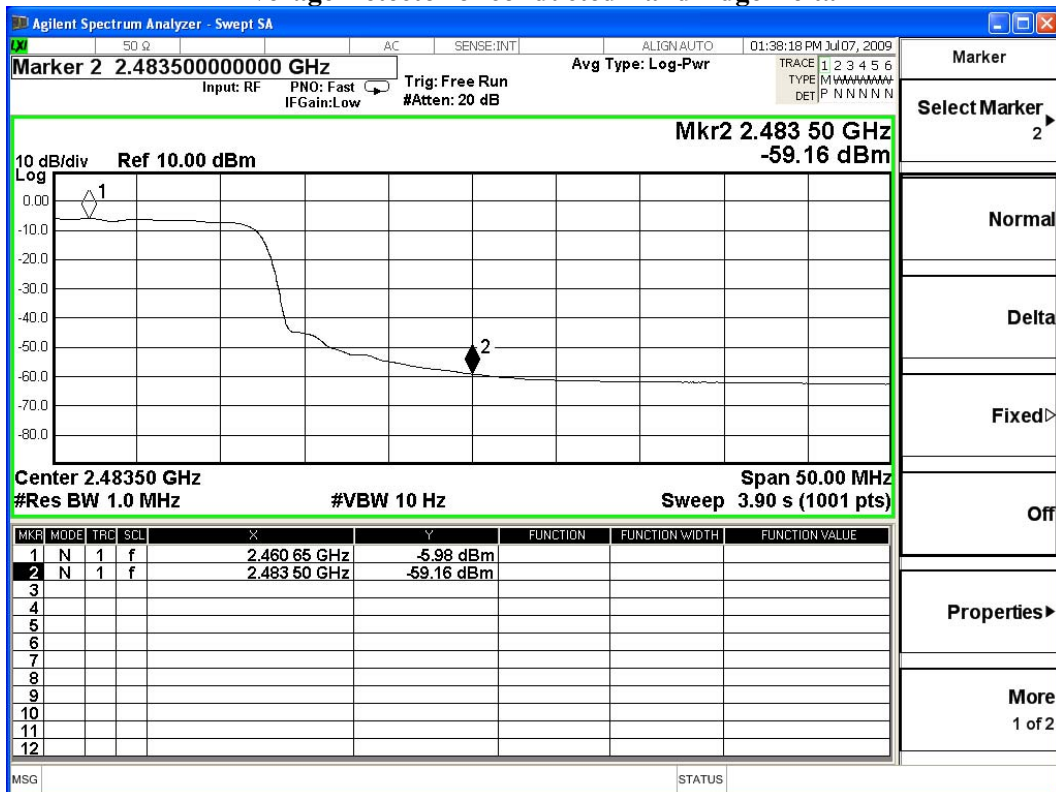
F = Fundamental field Strength (Peak or Average)

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

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 4: Transmitter (802.11n MCS8 15Mbps 40M-BW) (2422MHz)

**Marker Delta Method (Low band)**

## Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2422	36.151	68.815	104.967	Peak
Horizontal	2422	36.071	60.058	96.129	Average
Vertical	2422	35.528	65.900	101.429	Peak
Vertical	2422	35.340	57.195	92.534	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	2388	104.967	50.06	54.907	Peak
Horizontal	2390	96.129	51.91	44.219	Average
Vertical	2388	101.429	50.06	51.369	Peak
Vertical	2390	92.534	51.91	40.624	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:

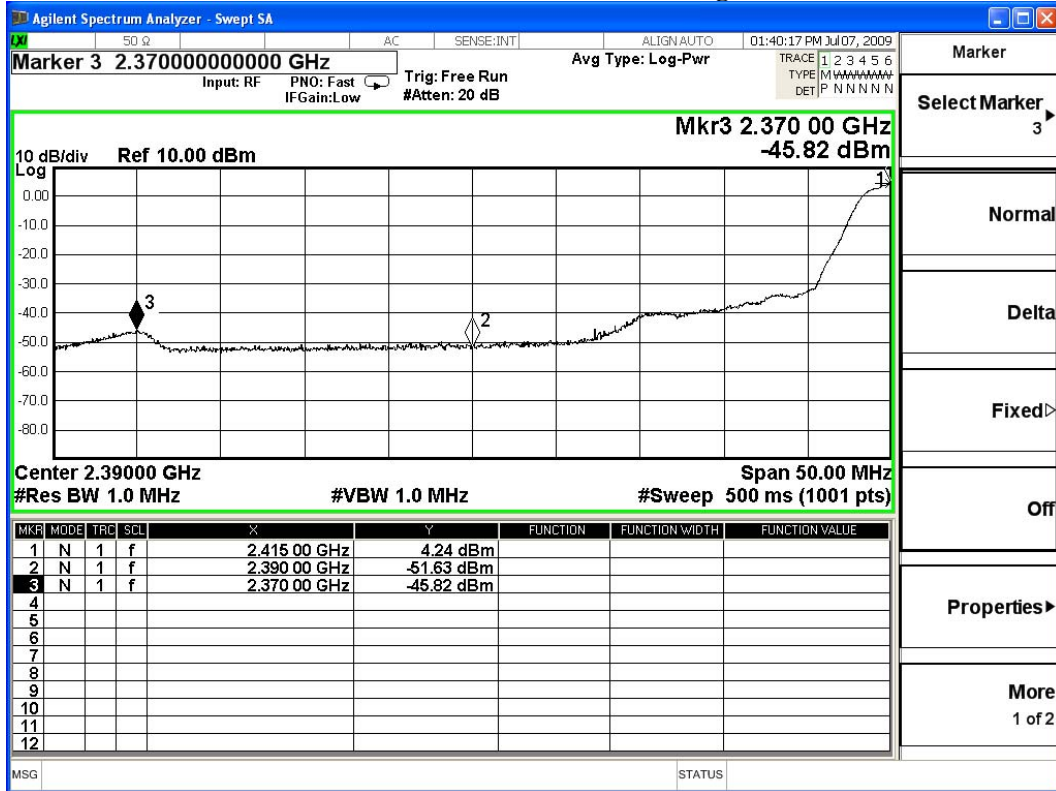
$$\text{Band Edge field Strength} = F - \Delta$$

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

