



## Test Report

|                    |               |
|--------------------|---------------|
| Product Name       | Notebook      |
| Model No           | MS-N033, U123 |
| FCC ID.            | I4L-N-EM770MS |
| Transmitter Module | MSI / MS-6894 |

|           |   |
|-----------|---|
| 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 | Mar. 03, 2009      |
| Issue Date      | Apr. 27, 2009      |
| Report No.      | 093068R-RFUSP05V01 |
| Report Version  | V1.0               |

The test results relate only to the samples tested.

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# Test Report Certification

Issue Date: Apr. 27, 2009

Report No.: 093068R-RFUSP05V01



**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-N033, U123   |
| Rated Voltage       | AC 120V/60Hz  |
| Working Voltage     | AC 100-240V/ 50-60Hz  |
| Trade Name          | MSI   |
| Applicable Standard | FCC CFR Title 47 Part 15 Subpart C: 2007<br>ANSI C63.4: 2003  |
| Test Result         | Complied  |



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( Senior Adm. Specialist / Genie Chang )



Tested By : Dino Chen  
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Approved By : Vincent Lin  
( 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-N033, U123  |
| FCC ID.            | I4L-N-EM770MS  |
| Frequency Range    | 2412-2462MHz for 802.11b/g   |
| Number of Channels | 802.11b/g: 11  |
| Data Speed         | 802.11b: 1-11Mbps, 802.11g: 6-54Mbps   |
| Type of Modulation | 802.11b:DSSS<br>DBPSK, DQPSK, CCK<br>802.11g:OFDM<br>BPSK, QPSK, 16QAM, 64QAM  |
| Antenna Type       | PIFA   |
| Antenna Gain       | Refer to the table "Antenna List"  |
| Channel Control    | Auto   |
| Power Adapter      | MFR: DELTA, M/N: ADP-40MH BD<br>Input: AC 100-240V, 50-60Hz, 1.2A<br>Output: DC 20V, 2A<br>Cable IN: Non-Shielded, 1.8m, with one ferrite core bonded. |

#### Antenna List

| No. | Manufacturer | Part No.        | Peak Gain           |
|-----|--------------|-----------------|---------------------|
| 1.  | JOINSOON     | S79-1800F00-J51 | 1.75 dBi for 2.4GHz |
| 2.  | JI-HAW       | S79-1800L60-J36 | 1.30 dBi for 2.4GHz |

## 802.11b/g 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  |             |           |

## Note:

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

## 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 adapts direct sequence spread spectrum modulation. The antenna provides diversity function to improve the receiving function.

This Notebook, compliant with IEEE 802.11b/g, 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 Notebook Wired Equivalent Protection (WEP) algorithm is used. In addition, its standard compliance ensures that it can communicate with any IEEE 802.11b/g network.

|            |                                     |
|------------|-------------------------------------|
| Test Mode: | Mode 1: Transmitter (802.11b 1Mbps) |
|            | Mode 2: Transmitter (802.11g 6Mbps) |

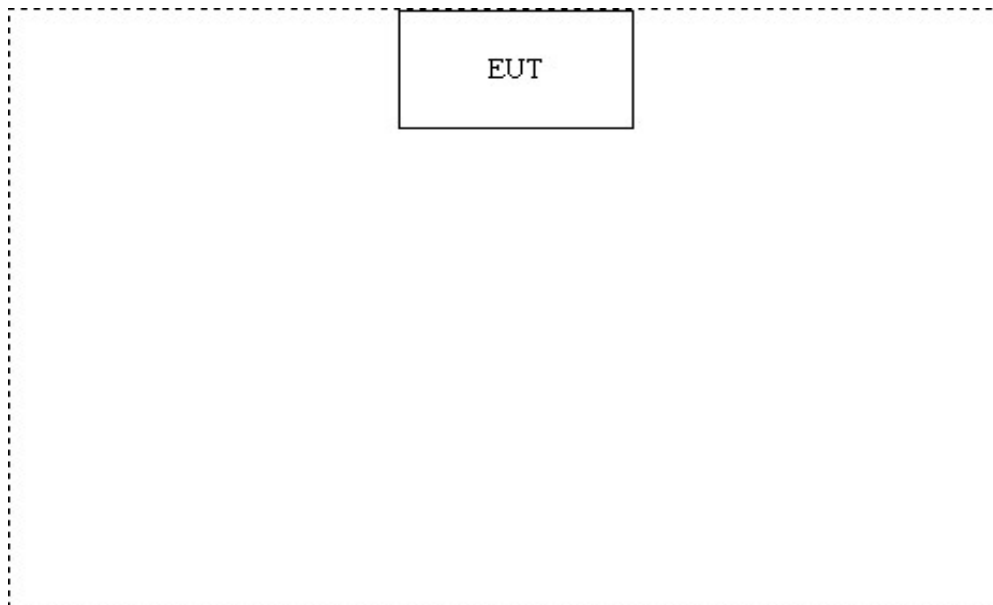
**1.3. Tested System Details**

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) | N/A     | N/A          | N/A       | N/A        | N/A        |

|   | Signal Cable Type | Signal cable Description |
|---|-------------------|--------------------------|
| A | N/A               | N/A                      |

**1.4. Configuration of Tested System**



**1.5. EUT Exercise Software**

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute “Realtek 8187SE MPV0030” 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  
 Federal Communications Commission  
 FCC Engineering Laboratory  
 7435 Oakland Mills Road  
 Columbia, MD 21046  
 Registration Number: 92195



Accreditation on NVLAP  
 NVLAP Lab Code: 200533-0



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FCC Accreditation Number: TW1014



## 2. Conducted Emission

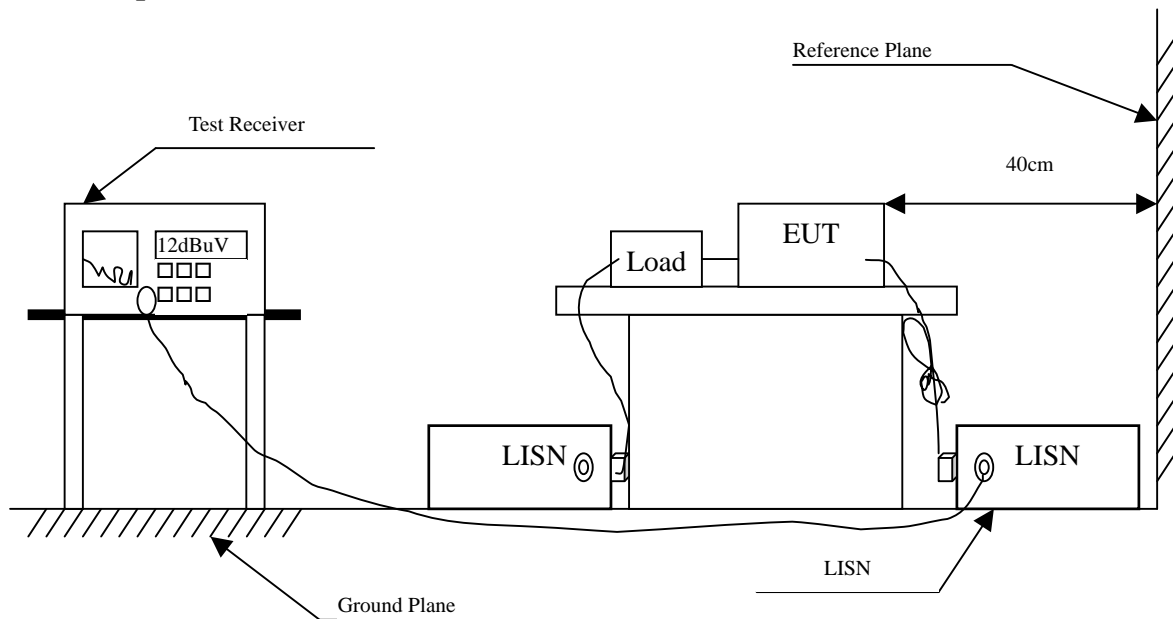
### 2.1. Test Equipment

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, 2008 |             |
| 2    | L.I.S.N.           | R & S        | ESH3-Z5/825016/6   | May, 2008 | EUT         |
| 3    | L.I.S.N.           | Kyoritsu     | KNW-407/8-1420-3   | May, 2008 | Peripherals |
| 4    | Pulse Limiter      | R & S        | ESH3-Z2            | May, 2008 |             |
| 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<br>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 1: Transmitter (802.11b 1Mbps) (2437MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV | Margin<br>dB | Limit<br>dBuV |
|-------------------|-------------------------|--------------------------|------------------------------|--------------|---------------|
| <b>Line 1</b>     |                         |                          |                              |              |               |
| <b>Quasi-Peak</b> |                         |                          |                              |              |               |
| 0.193             | 9.711                   | 36.280                   | 45.991                       | -18.780      | 64.771        |
| 0.263             | 9.667                   | 28.860                   | 38.527                       | -24.244      | 62.771        |
| 0.537             | 9.640                   | 32.380                   | 42.020                       | -13.980      | 56.000        |
| 1.345             | 9.670                   | 24.170                   | 33.840                       | -22.160      | 56.000        |
| 3.365             | 9.690                   | 25.120                   | 34.810                       | -21.190      | 56.000        |
| 22.564            | 9.930                   | 17.010                   | 26.940                       | -33.060      | 60.000        |
| <b>Average</b>    |                         |                          |                              |              |               |
| 0.193             | 9.711                   | 26.810                   | 36.521                       | -18.250      | 54.771        |
| 0.263             | 9.667                   | 24.400                   | 34.067                       | -18.704      | 52.771        |
| 0.537             | 9.640                   | 25.100                   | 34.740                       | -11.260      | 46.000        |
| 1.345             | 9.670                   | 9.890                    | 19.560                       | -26.440      | 46.000        |
| 3.365             | 9.690                   | 13.920                   | 23.610                       | -22.390      | 46.000        |
| 22.564            | 9.930                   | 10.060                   | 19.990                       | -30.010      | 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 1: Transmitter (802.11b 1Mbps) (2437MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV | Margin<br>dB | Limit<br>dBuV |
|-------------------|-------------------------|--------------------------|------------------------------|--------------|---------------|
| <b>Line 2</b>     |                         |                          |                              |              |               |
| <b>Quasi-Peak</b> |                         |                          |                              |              |               |
| 0.197             | 9.719                   | 37.620                   | 47.339                       | -17.318      | 64.657        |
| 0.533             | 9.640                   | 30.050                   | 39.690                       | -16.310      | 56.000        |
| 0.916             | 9.670                   | 20.850                   | 30.520                       | -25.480      | 56.000        |
| 2.224             | 9.680                   | 22.610                   | 32.290                       | -23.710      | 56.000        |
| 3.529             | 9.700                   | 20.110                   | 29.810                       | -26.190      | 56.000        |
| 18.103            | 10.020                  | 20.050                   | 30.070                       | -29.930      | 60.000        |
| <b>Average</b>    |                         |                          |                              |              |               |
| 0.197             | 9.719                   | 29.380                   | 39.099                       | -15.558      | 54.657        |
| 0.533             | 9.640                   | 24.290                   | 33.930                       | -12.070      | 46.000        |
| 0.916             | 9.670                   | 14.280                   | 23.950                       | -22.050      | 46.000        |
| 2.224             | 9.680                   | 13.090                   | 22.770                       | -23.230      | 46.000        |
| 3.529             | 9.700                   | 10.100                   | 19.800                       | -26.200      | 46.000        |
| 18.103            | 10.020                  | 13.170                   | 23.190                       | -26.810      | 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 1  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV | Margin<br>dB | Limit<br>dBuV |
|-------------------|-------------------------|--------------------------|------------------------------|--------------|---------------|
| <b>Line 1</b>     |                         |                          |                              |              |               |
| <b>Quasi-Peak</b> |                         |                          |                              |              |               |
| 0.193             | 9.711                   | 34.340                   | 44.051                       | -20.720      | 64.771        |
| 0.334             | 9.650                   | 27.270                   | 36.920                       | -23.823      | 60.743        |
| 0.591             | 9.636                   | 32.740                   | 42.376                       | -13.624      | 56.000        |
| 1.248             | 9.670                   | 25.000                   | 34.670                       | -21.330      | 56.000        |
| 3.212             | 9.690                   | 24.540                   | 34.230                       | -21.770      | 56.000        |
| 17.341            | 9.990                   | 20.330                   | 30.320                       | -29.680      | 60.000        |
| <b>Average</b>    |                         |                          |                              |              |               |
| 0.193             | 9.711                   | 25.580                   | 35.291                       | -19.480      | 54.771        |
| 0.334             | 9.650                   | 21.630                   | 31.280                       | -19.463      | 50.743        |
| 0.591             | 9.636                   | 26.730                   | 36.366                       | -9.634       | 46.000        |
| 1.248             | 9.670                   | 17.210                   | 26.880                       | -19.120      | 46.000        |
| 3.212             | 9.690                   | 16.330                   | 26.020                       | -19.980      | 46.000        |
| 17.341            | 9.990                   | 12.410                   | 22.400                       | -27.600      | 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 2: Transmitter (802.11g 6Mbps) (2437MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV | Margin<br>dB | Limit<br>dBuV |
|-------------------|-------------------------|--------------------------|------------------------------|--------------|---------------|
| <b>Line 2</b>     |                         |                          |                              |              |               |
| <b>Quasi-Peak</b> |                         |                          |                              |              |               |
| 0.197             | 9.719                   | 37.720                   | 47.439                       | -17.218      | 64.657        |
| 0.533             | 9.640                   | 30.470                   | 40.110                       | -15.890      | 56.000        |
| 1.002             | 9.670                   | 21.740                   | 31.410                       | -24.590      | 56.000        |
| 2.142             | 9.680                   | 19.220                   | 28.900                       | -27.100      | 56.000        |
| 18.045            | 10.020                  | 20.270                   | 30.290                       | -29.710      | 60.000        |
| 22.705            | 9.947                   | 16.190                   | 26.137                       | -33.863      | 60.000        |
| <b>Average</b>    |                         |                          |                              |              |               |
| 0.197             | 9.719                   | 29.190                   | 38.909                       | -15.748      | 54.657        |
| 0.533             | 9.640                   | 24.540                   | 34.180                       | -11.820      | 46.000        |
| 1.002             | 9.670                   | 13.070                   | 22.740                       | -23.260      | 46.000        |
| 2.142             | 9.680                   | 8.880                    | 18.560                       | -27.440      | 46.000        |
| 18.045            | 10.020                  | 13.320                   | 23.340                       | -26.660      | 50.000        |
| 22.705            | 9.947                   | 8.590                    | 18.537                       | -31.463      | 50.000        |

Note:

4. All Reading Levels are Quasi-Peak and average value.
5. "■" means the worst emission level.
6. Measurement Level = Reading Level + Correct Factor

### 3. Peak Power Output

#### 3.1. Test Equipment

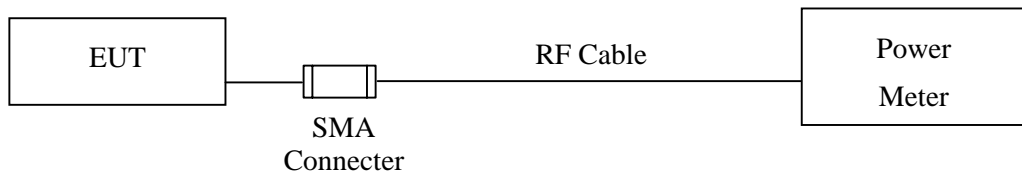
The following test equipments are used during the radiated emission tests:

| Equipment      | Manufacturer | Model No./Serial No. | Last Cal. |
|----------------|--------------|----------------------|-----------|
| X Power Meter  | Anritsu      | ML2495A/6K00003357   | May, 2008 |
| X Power Sensor | Anritsu      | MA2491A/034457       | May, 2008 |

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

#### 3.2. 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         | 20.76             | --    | --    | --   | 1Watt= 30 dBm  |
| 6                | 2437.00         | 20.81             | 20.76 | 20.73 | 20.7 | 1Watt= 30 dBm  |
| 11               | 2462.00         | 20.97             | --    | --    | --   | 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         | 22.12             | --    | --    | --    | --    | --    | --    | --    | 1Watt= 30 dBm  |
| 6                | 2437.00         | 21.99             | 21.91 | 21.85 | 21.81 | 21.77 | 21.73 | 21.69 | 21.65 | 1Watt= 30 dBm  |
| 11               | 2462.00         | 22.17             | --    | --    | --    | --    | --    | --    | --    | 1Watt= 30 dBm  |

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

#### 4. Radiated Emission

##### 4.1. Test Equipment

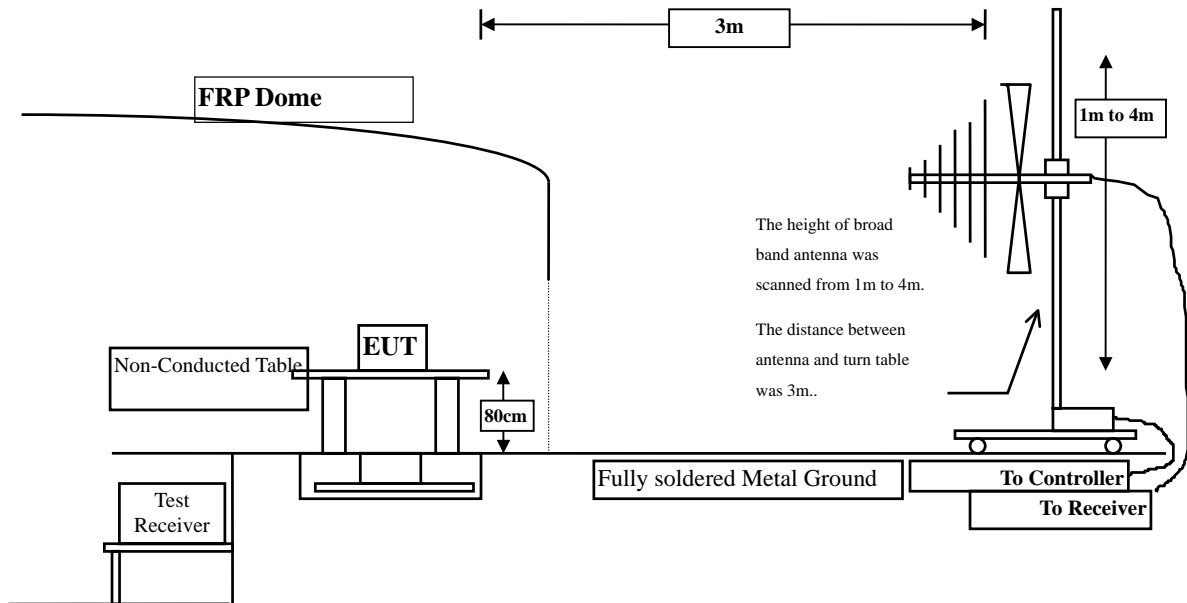
The following test equipment are used during the radiated emission test:

| 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., 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        |

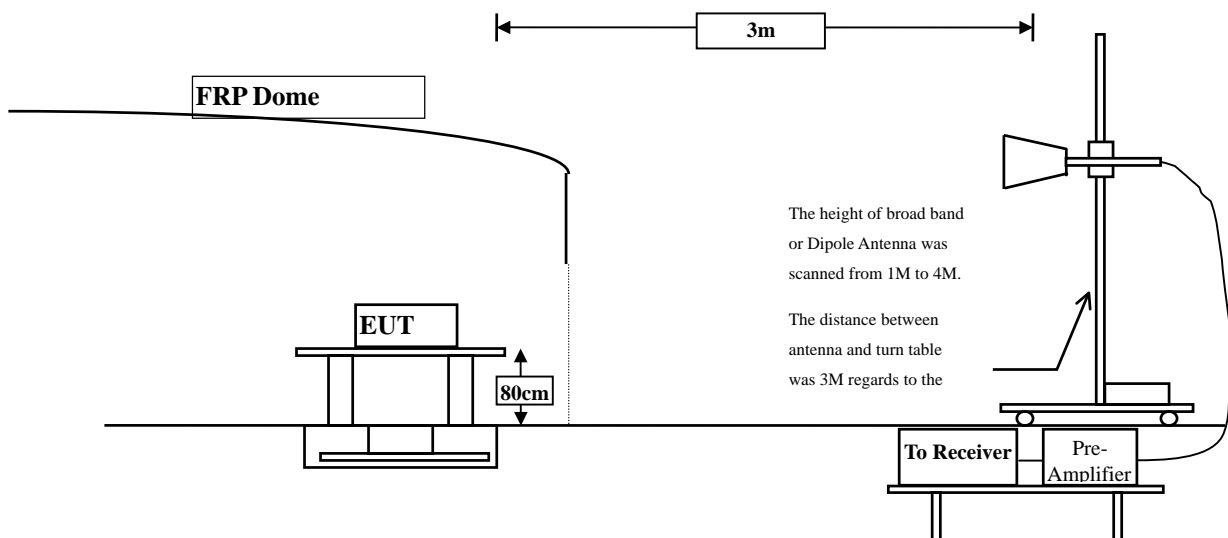
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

## 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<br>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 frequency range from 30MHz to 10th harmonics is checked.

#### 4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

#### 4.6. Test Result of Radiated Emission

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

| Frequency<br>MHz      | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>dB | Limit<br>dBuV/m |
|-----------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b>     |                         |                          |                                |              |                 |
| <b>Peak Detector:</b> |                         |                          |                                |              |                 |
| 4824.000              | 9.577                   | 43.670                   | 53.247                         | -20.753      | 74.000          |
| 7236.000              | 14.401                  | 40.480                   | 54.880                         | -19.120      | 74.000          |
| 9648.000              | 19.795                  | 36.320                   | 56.115                         | -17.885      | 74.000          |
| <b>Average</b>        |                         |                          |                                |              |                 |
| <b>Detector:</b>      |                         |                          |                                |              |                 |
| 7236.000              | 14.401                  | 32.970                   | 47.370                         | -26.630      | 54.000          |
| 9648.000              | 19.795                  | 22.430                   | 42.225                         | -31.775      | 54.000          |
| <b>Vertical</b>       |                         |                          |                                |              |                 |
| <b>Peak Detector:</b> |                         |                          |                                |              |                 |
| 4824.000              | 8.463                   | 42.190                   | 50.653                         | -23.347      | 74.000          |
| 7236.000              | 15.412                  | 39.410                   | 54.821                         | -19.179      | 74.000          |
| 9648.000              | 19.003                  | 35.880                   | 54.883                         | -19.117      | 74.000          |
| <b>Average</b>        |                         |                          |                                |              |                 |
| <b>Detector:</b>      |                         |                          |                                |              |                 |
| 7236.000              | 15.412                  | 30.210                   | 45.621                         | -8.379       | 54.000          |
| 9648.000              | 19.003                  | 22.530                   | 41.533                         | -12.467      | 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 : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2437 MHz)

| Frequency<br>MHz      | Correct<br>Factor<br>Db | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>Db | Limit<br>dBuV/m |
|-----------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b>     |                         |                          |                                |              |                 |
| <b>Peak Detector:</b> |                         |                          |                                |              |                 |
| 4874.000              | 9.471                   | 47.830                   | 57.301                         | -16.699      | 74.000          |
| 7311.000              | 14.540                  | 42.770                   | 57.310                         | -16.690      | 74.000          |
| 9748.000              | 20.023                  | 34.050                   | 54.073                         | -19.927      | 74.000          |
| <b>Average</b>        |                         |                          |                                |              |                 |
| <b>Detector:</b>      |                         |                          |                                |              |                 |
| 4874.000              | 9.471                   | 42.680                   | 52.151                         | -1.849       | 54.000          |
| 7311.000              | 14.540                  | 35.580                   | 50.120                         | -3.880       | 54.000          |
| 9748.000              | 20.023                  | 22.150                   | 42.173                         | -11.827      | 54.000          |
| <b>Vertical</b>       |                         |                          |                                |              |                 |
| <b>Peak Detector:</b> |                         |                          |                                |              |                 |
| 4874.000              | 8.878                   | 43.650                   | 52.528                         | -21.472      | 74.000          |
| 7311.000              | 15.282                  | 39.990                   | 55.271                         | -18.729      | 74.000          |
| 9748.000              | 19.229                  | 35.270                   | 54.500                         | -19.500      | 74.000          |
| <b>Average</b>        |                         |                          |                                |              |                 |
| <b>Detector:</b>      |                         |                          |                                |              |                 |
| 7311.000              | 15.282                  | 32.560                   | 47.841                         | -6.159       | 54.000          |
| 9748.000              | 19.229                  | 22.170                   | 41.400                         | -12.600      | 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 : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462 MHz)

| Frequency<br>MHz             | Correct<br>Factor<br>Db | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>Db | Limit<br>dBuV/m |
|------------------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b>            |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4924.000                     | 9.483                   | 47.040                   | 56.522                         | -17.478      | 74.000          |
| 7386.000                     | 14.798                  | 42.650                   | 57.448                         | -16.552      | 74.000          |
| 9848.000                     | 20.005                  | 34.560                   | 54.566                         | -19.434      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| 4924.000                     | 9.483                   | 42.560                   | 52.042                         | -1.958       | 54.000          |
| 7386.000                     | 14.798                  | 36.260                   | 51.058                         | -2.942       | 54.000          |
| 9848.000                     | 20.005                  | 22.030                   | 42.036                         | -11.964      | 54.000          |
| <b>Vertical</b>              |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4924.000                     | 9.411                   | 44.090                   | 53.501                         | -20.499      | 74.000          |
| 7386.000                     | 15.270                  | 42.520                   | 57.790                         | -16.210      | 74.000          |
| 9848.000                     | 19.187                  | 35.680                   | 54.867                         | -19.133      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| 4924.000                     | 9.411                   | 39.960                   | 49.371                         | -4.629       | 54.000          |
| 7386.000                     | 15.270                  | 35.560                   | 50.830                         | -3.170       | 54.000          |
| 9848.000                     | 19.187                  | 22.180                   | 41.367                         | -12.633      | 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 : Notebook  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2412MHz)

| Frequency<br>MHz             | Correct<br>Factor<br>Db | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>Db | Limit<br>dBuV/m |
|------------------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b>            |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4824.000                     | 9.577                   | 37.360                   | 46.937                         | -27.063      | 74.000          |
| 7236.000                     | 14.401                  | 34.740                   | 49.140                         | -24.860      | 74.000          |
| 9648.000                     | 19.795                  | 34.110                   | 53.905                         | -20.095      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| --                           |                         |                          |                                |              |                 |
| <b>Vertical</b>              |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4824.000                     | 8.463                   | 36.640                   | 45.103                         | -28.897      | 74.000          |
| 7236.000                     | 15.412                  | 35.760                   | 51.171                         | -22.829      | 74.000          |
| 9648.000                     | 19.003                  | 34.160                   | 53.163                         | -20.837      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| --                           |                         |                          |                                |              |                 |

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 : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437 MHz)

| Frequency<br>MHz             | Correct<br>Factor<br>Db | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>Db | Limit<br>dBuV/m |
|------------------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b>            |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4874.000                     | 9.471                   | 38.160                   | 47.631                         | -26.369      | 74.000          |
| 7311.000                     | 14.540                  | 34.940                   | 49.480                         | -24.520      | 74.000          |
| 9748.000                     | 20.023                  | 33.950                   | 53.973                         | -20.027      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| --                           |                         |                          |                                |              |                 |
| <b>Vertical</b>              |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4874.000                     | 8.878                   | 37.540                   | 46.418                         | -27.582      | 74.000          |
| 7311.000                     | 15.282                  | 35.680                   | 50.961                         | -23.039      | 74.000          |
| 9748.000                     | 19.229                  | 34.250                   | 53.480                         | -20.520      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| --                           |                         |                          |                                |              |                 |

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 : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2462 MHz)

| Frequency<br>MHz             | Correct<br>Factor<br>Db | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>Db | Limit<br>dBuV/m |
|------------------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b>            |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4924.000                     | 9.483                   | 39.590                   | 49.072                         | -24.928      | 74.000          |
| 7386.000                     | 14.798                  | 35.270                   | 50.068                         | -23.932      | 74.000          |
| 9848.000                     | 20.005                  | 33.870                   | 53.876                         | -20.124      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| --                           |                         |                          |                                |              |                 |
| <b>Vertical</b>              |                         |                          |                                |              |                 |
| <b>Peak Detector:</b>        |                         |                          |                                |              |                 |
| 4924.000                     | 9.411                   | 38.480                   | 47.891                         | -26.109      | 74.000          |
| 7386.000                     | 15.270                  | 34.500                   | 49.770                         | -24.230      | 74.000          |
| 9848.000                     | 19.187                  | 34.510                   | 53.697                         | -20.303      | 74.000          |
| <b>Average<br/>Detector:</b> |                         |                          |                                |              |                 |
| --                           |                         |                          |                                |              |                 |

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 1: Transmitter (802.11b 1Mbps)(2437 MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>dB | Limit<br>dBuV/m |
|-------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b> |                         |                          |                                |              |                 |
| 299.660           | -4.061                  | 37.983                   | 33.922                         | -12.078      | 46.000          |
| 357.860           | -2.509                  | 35.042                   | 32.533                         | -13.467      | 46.000          |
| 501.420           | -0.390                  | 32.032                   | 31.643                         | -14.357      | 46.000          |
| 674.080           | 2.353                   | 36.413                   | 38.766                         | -7.234       | 46.000          |
| 798.240           | 4.775                   | 31.538                   | 36.313                         | -9.687       | 46.000          |
| 903.000           | 5.186                   | 32.859                   | 38.045                         | -7.955       | 46.000          |
| <b>Vertical</b>   |                         |                          |                                |              |                 |
| 299.660           | -7.331                  | 35.426                   | 28.095                         | -17.905      | 46.000          |
| 355.920           | -3.898                  | 32.813                   | 28.915                         | -17.085      | 46.000          |
| 501.420           | -1.290                  | 34.061                   | 32.772                         | -13.228      | 46.000          |
| 676.020           | -0.399                  | 32.398                   | 31.999                         | -14.001      | 46.000          |
| 800.180           | 2.433                   | 33.371                   | 35.804                         | -10.196      | 46.000          |
| 967.020           | 7.541                   | 25.675                   | 33.216                         | -20.784      | 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 : Notebook  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps)(2437 MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV/m | Margin<br>dB | Limit<br>dBuV/m |
|-------------------|-------------------------|--------------------------|--------------------------------|--------------|-----------------|
| <b>Horizontal</b> |                         |                          |                                |              |                 |
| 299.660           | -4.061                  | 38.112                   | 34.051                         | -11.949      | 46.000          |
| 357.860           | -2.509                  | 33.849                   | 31.340                         | -14.660      | 46.000          |
| 501.420           | -0.390                  | 31.428                   | 31.039                         | -14.961      | 46.000          |
| 676.020           | 2.471                   | 34.650                   | 37.121                         | -8.879       | 46.000          |
| 800.180           | 4.773                   | 30.256                   | 35.029                         | -10.971      | 46.000          |
| 976.720           | 6.150                   | 24.222                   | 30.372                         | -23.628      | 54.000          |
| <b>Vertical</b>   |                         |                          |                                |              |                 |
| 299.660           | -7.331                  | 35.592                   | 28.261                         | -17.739      | 46.000          |
| 357.860           | -4.159                  | 33.809                   | 29.650                         | -16.350      | 46.000          |
| 501.420           | -1.290                  | 33.510                   | 32.221                         | -13.779      | 46.000          |
| 674.080           | -0.947                  | 31.334                   | 30.387                         | -15.613      | 46.000          |
| 802.120           | 2.799                   | 32.758                   | 35.557                         | -10.443      | 46.000          |
| 965.080           | 7.397                   | 24.336                   | 31.733                         | -22.267      | 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.

**5. RF antenna conducted test**

**5.1. Test Equipment**

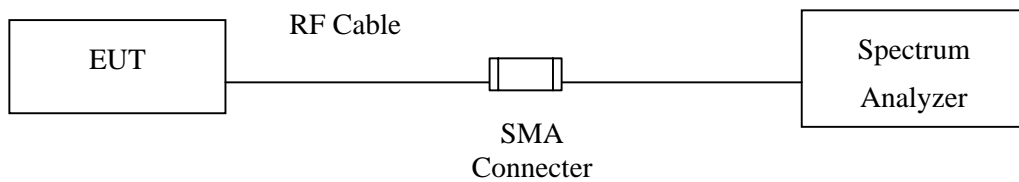
The following test equipments are used during the radiated emission tests:

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

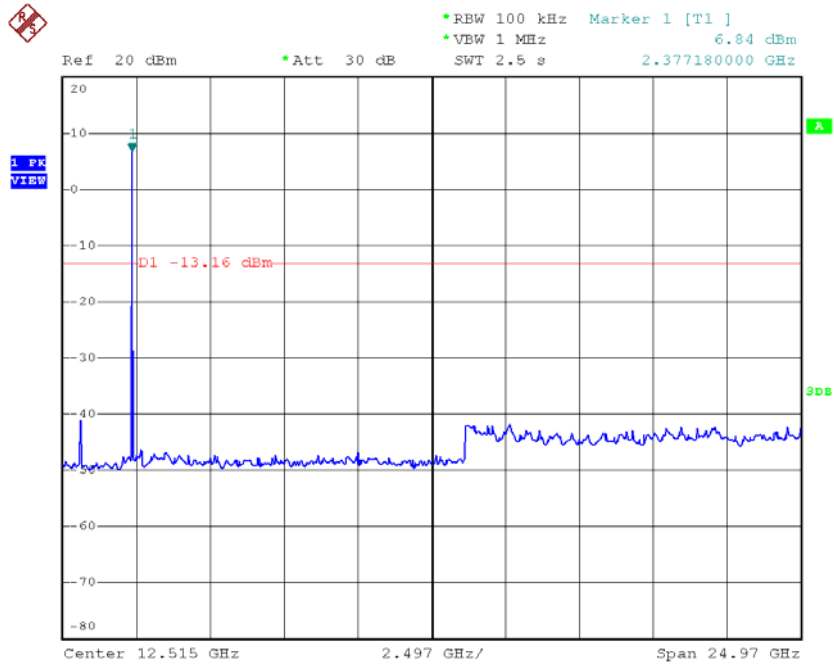
Conducted is defined as  $\pm 1.27\text{dB}$



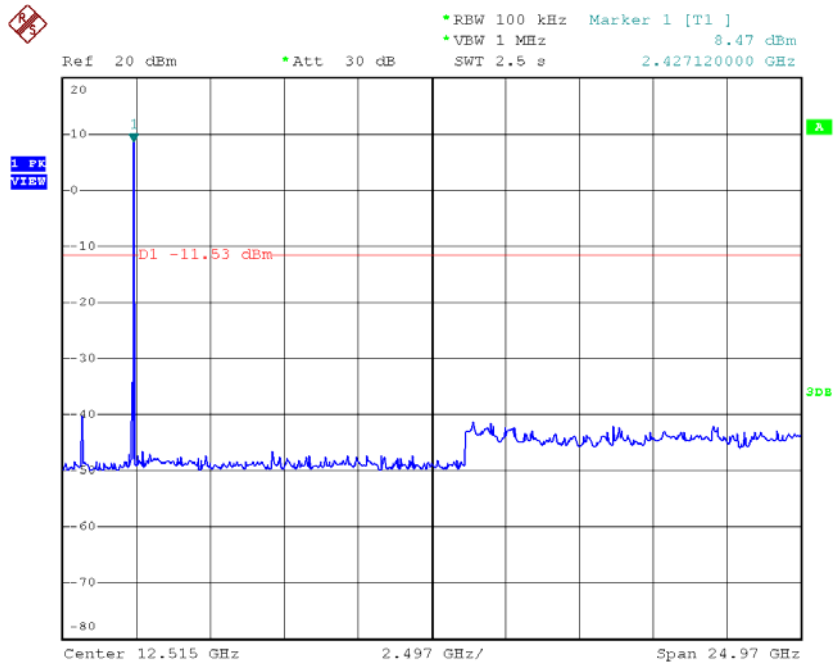
### 5.6. Test Result of RF antenna conducted test

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

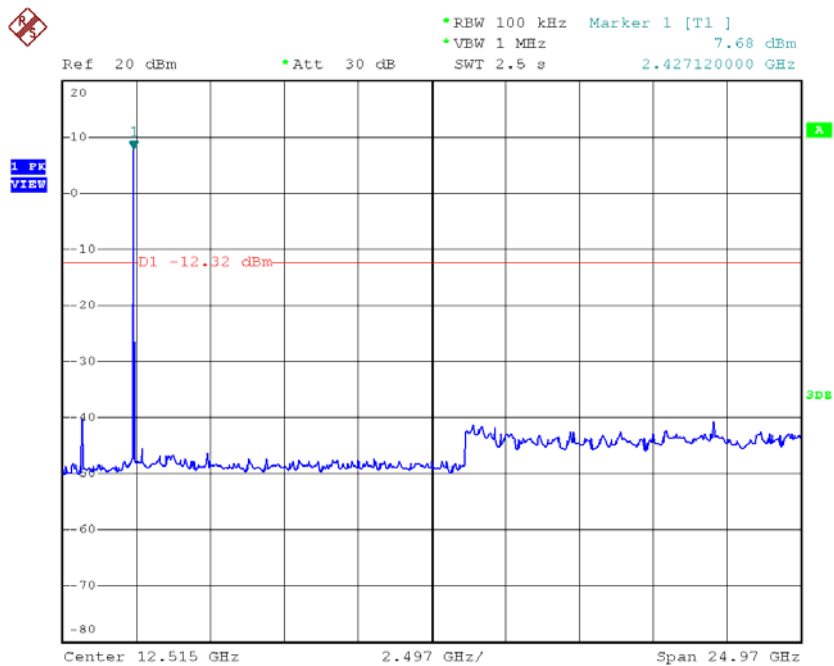
#### Channel 01 (2412MHz) 30-25GHz



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

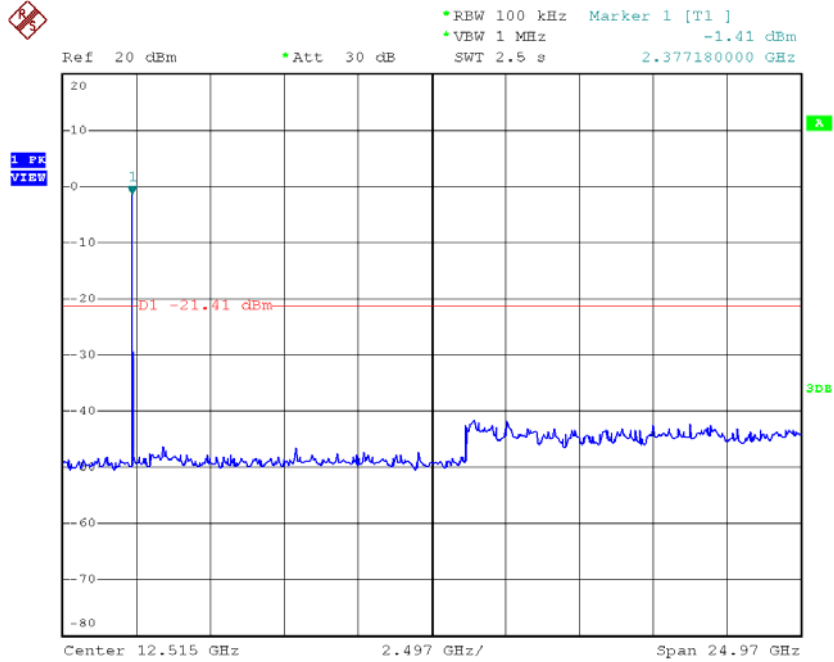


### Channel 11 (2462MHz) 30-25GHz

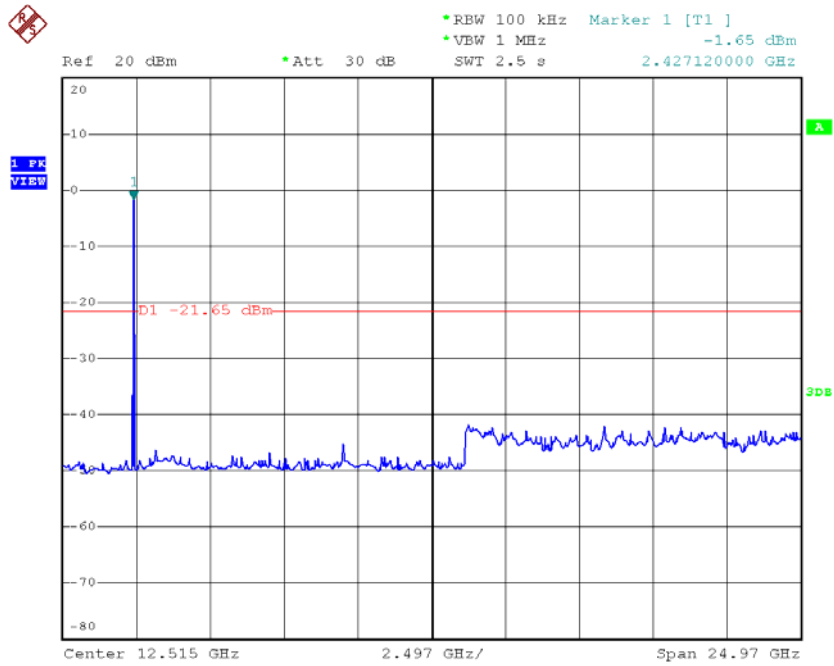


Product : Notebook  
Test Item : RF Antenna Conducted Spurious  
Test Site : No.3 OATS  
Test Mode : Mode 2: Transmitter (802.11g 6Mbps)

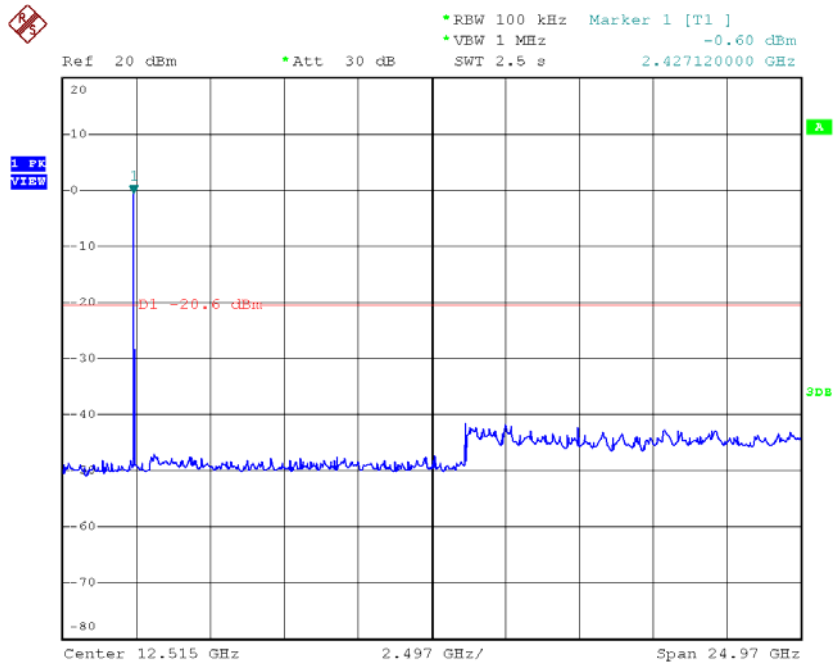
**Channel 01 (2412MHz) 30-25GHz**



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



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



## 6. Band Edge

### 6.1. Test Equipment

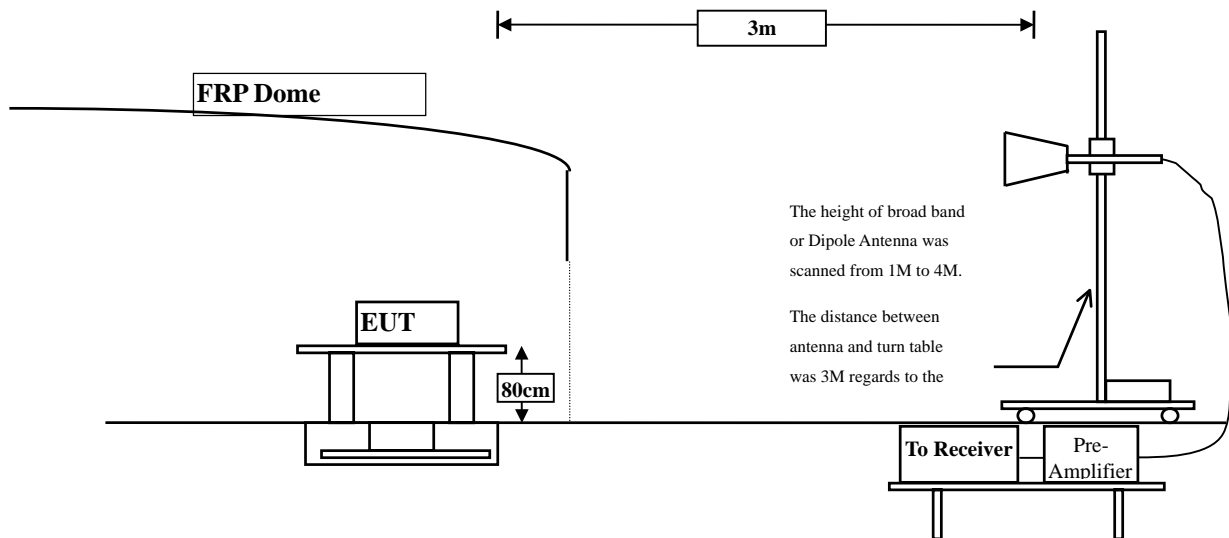
The following test equipments are used during the band edge tests:

| Test Site  | Equipment | Manufacturer      | Model No./Serial No. | Last Cal.             |            |
|------------|-----------|-------------------|----------------------|-----------------------|------------|
| ☒ Site # 3 |           | 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

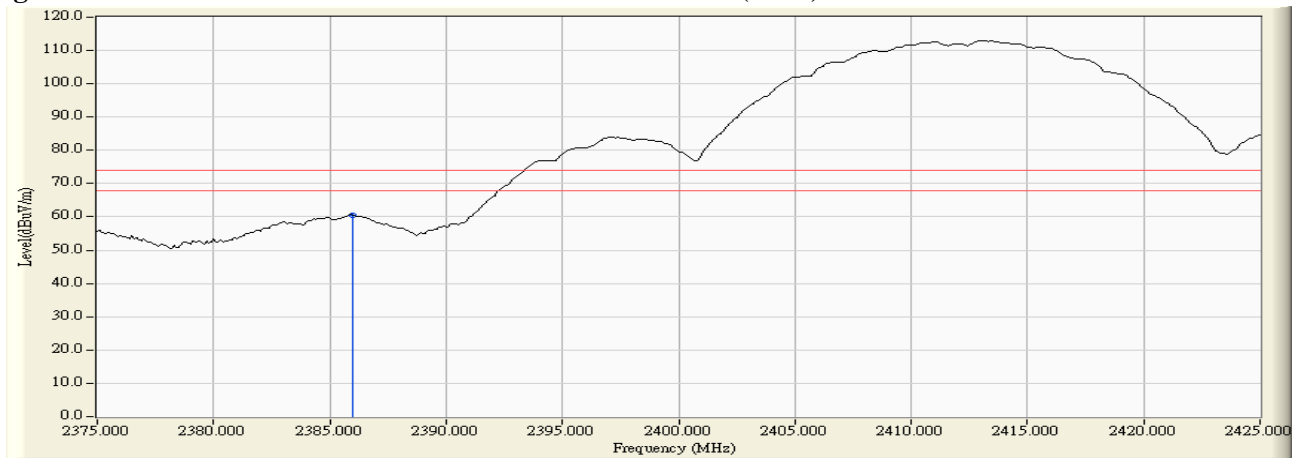
### 6.6. Test Result of Band Edge

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

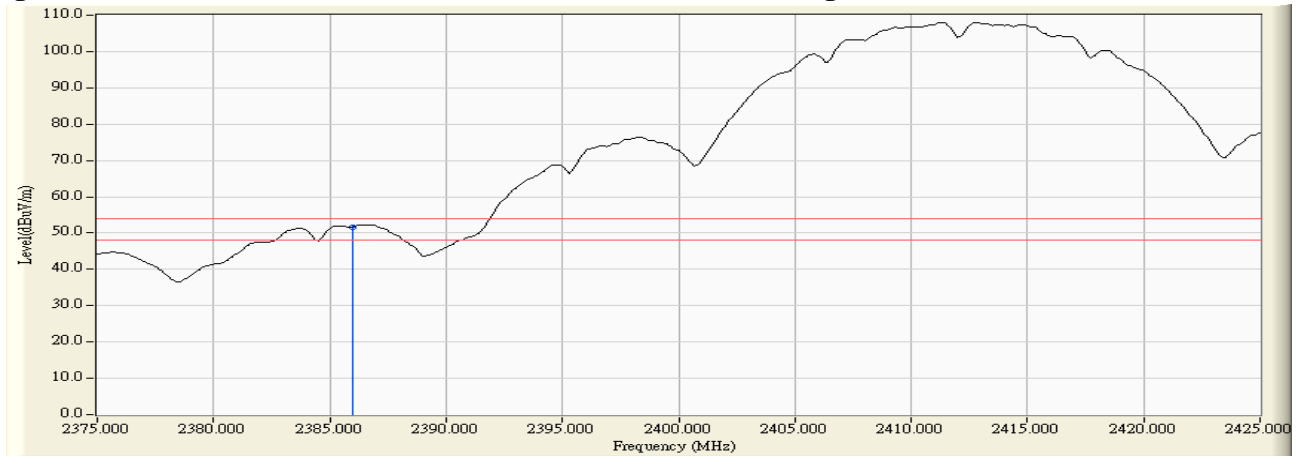
#### RF Radiated Measurement (Horizontal):

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2386.000        | 2.922               | 57.564               | 60.486                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2386.000        | 2.922               | 48.797               | 51.719                  | 74.00               | 54.00                  | Pass   |

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



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



**Note:**

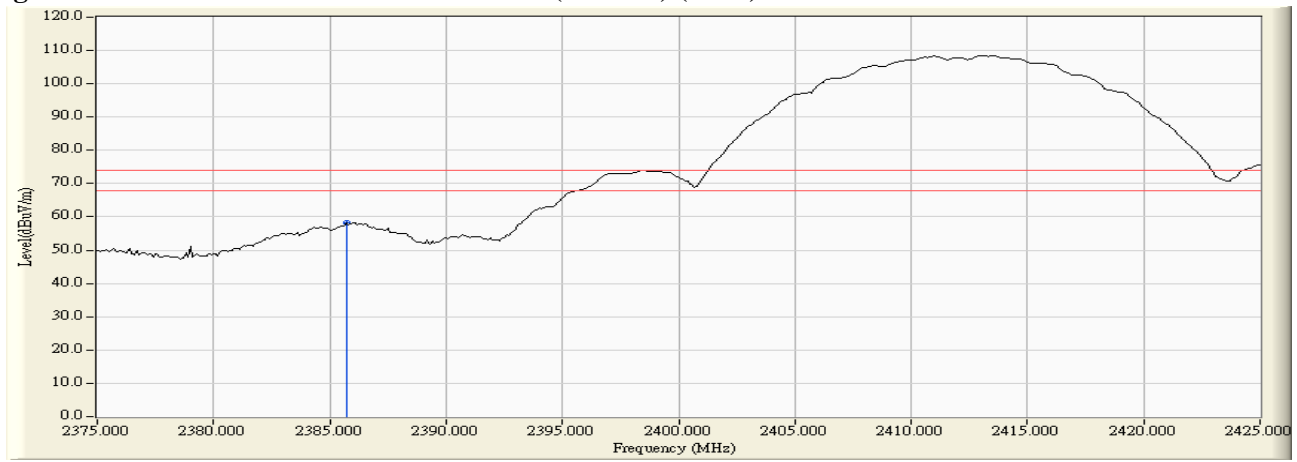
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

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

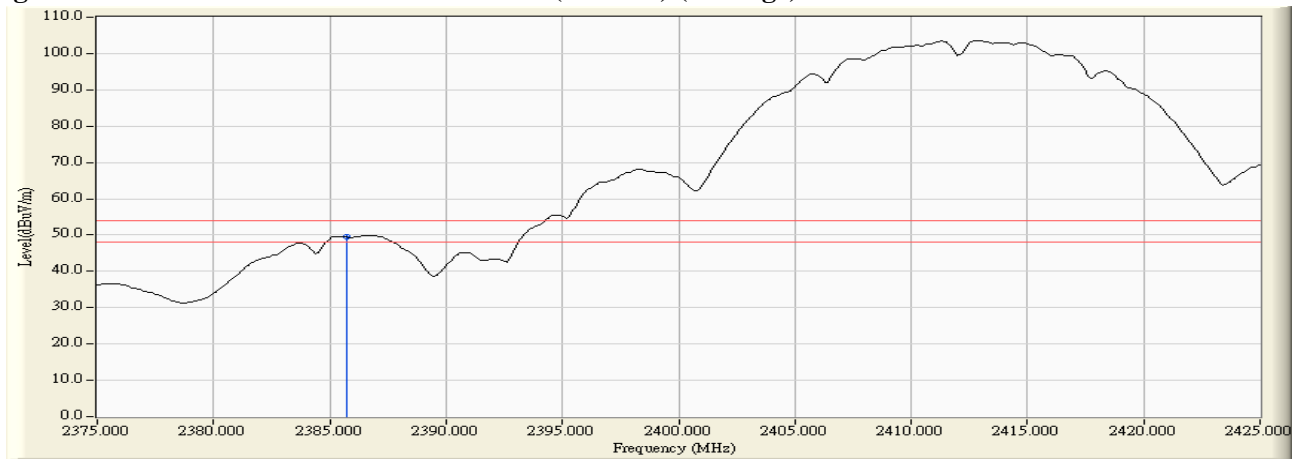
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2385.700        | 1.935               | 56.178               | 58.113                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2385.700        | 1.935               | 47.554               | 49.489                  | 74.00               | 54.00                  | Pass   |

**Figure Channel 01: (Vertical) (Peak)**



**Figure Channel 01: (Vertical) (Average)**



**Note:**

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

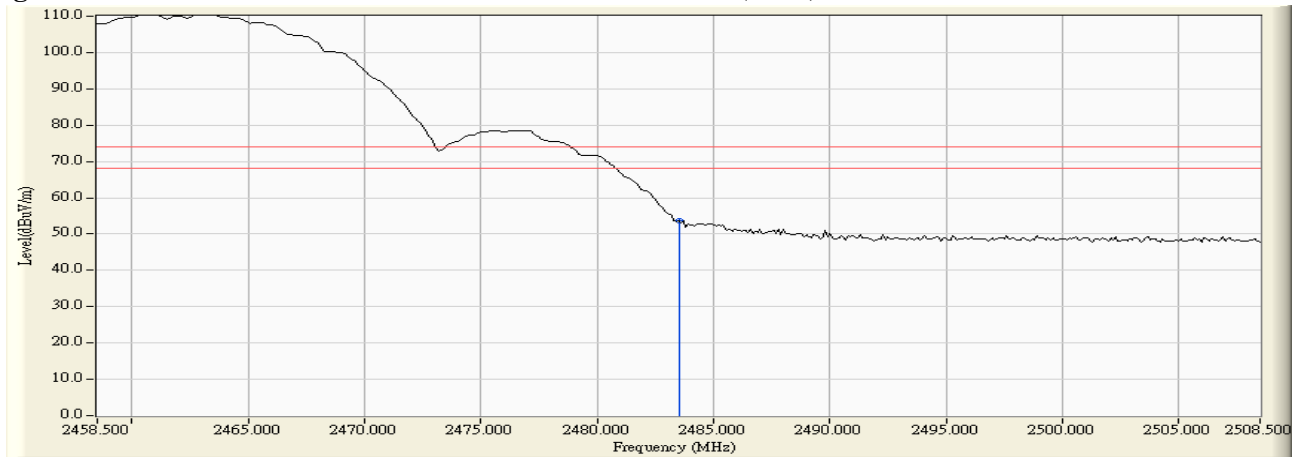


Product : Notebook  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps)

**RF Radiated Measurement (Horizontal):**

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)   | 2483.500        | 3.076               | 50.619               | 53.694                  | 74.00               | 54.00                  | Pass   |
| 11(Average) | --              | --                  | --                   | --                      | 74.00               | 54.00                  | Pass   |

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



**Note:**

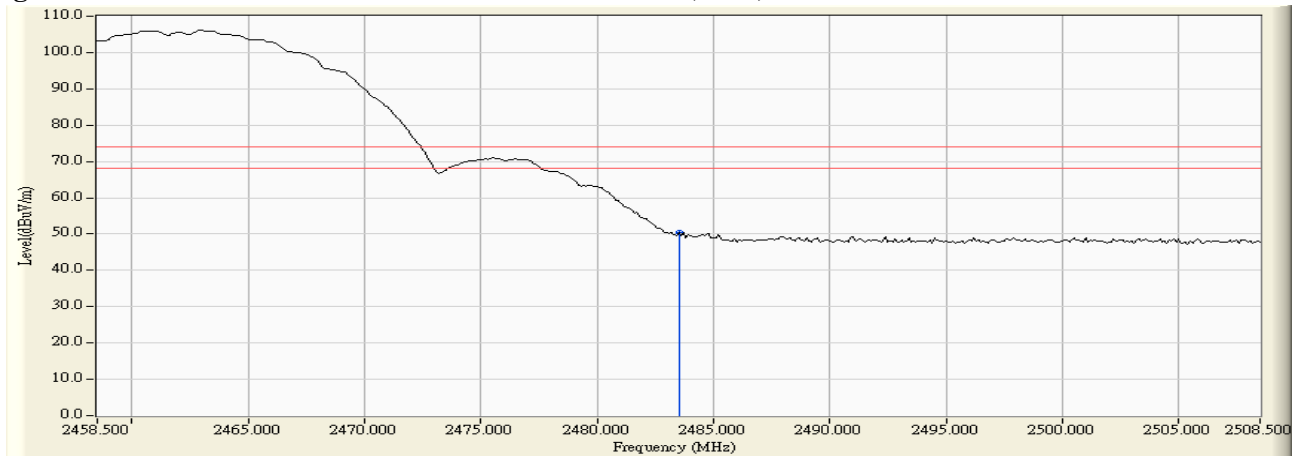
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

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

**RF Radiated Measurement (Vertical):**

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)   | 2483.500        | 2.552               | 47.814               | 50.366                  | 74.00               | 54.00                  | Pass   |
| 11(Average) | --              | --                  | --                   | --                      | 74.00               | 54.00                  | Pass   |

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



Note:

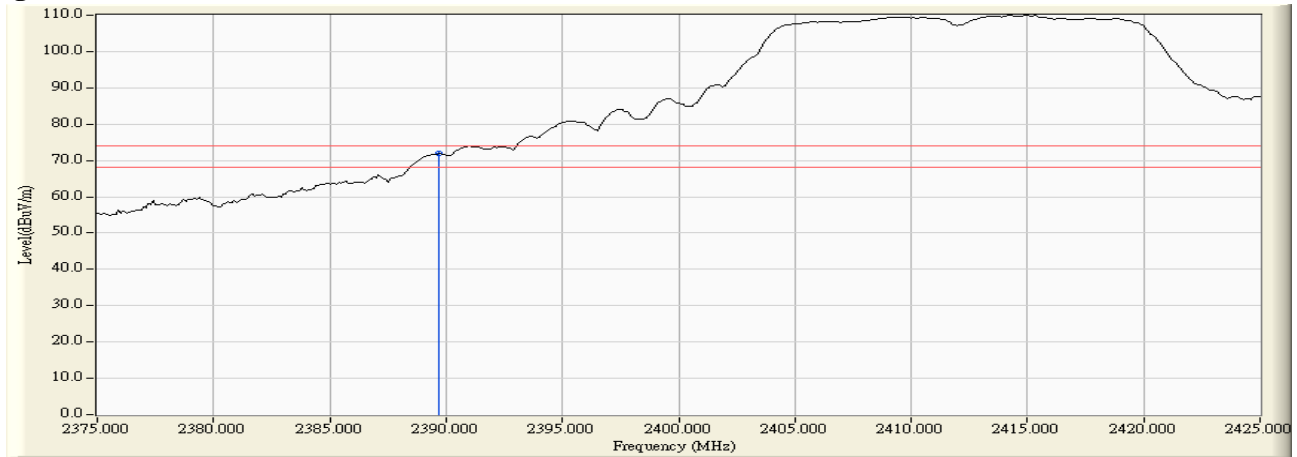
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

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

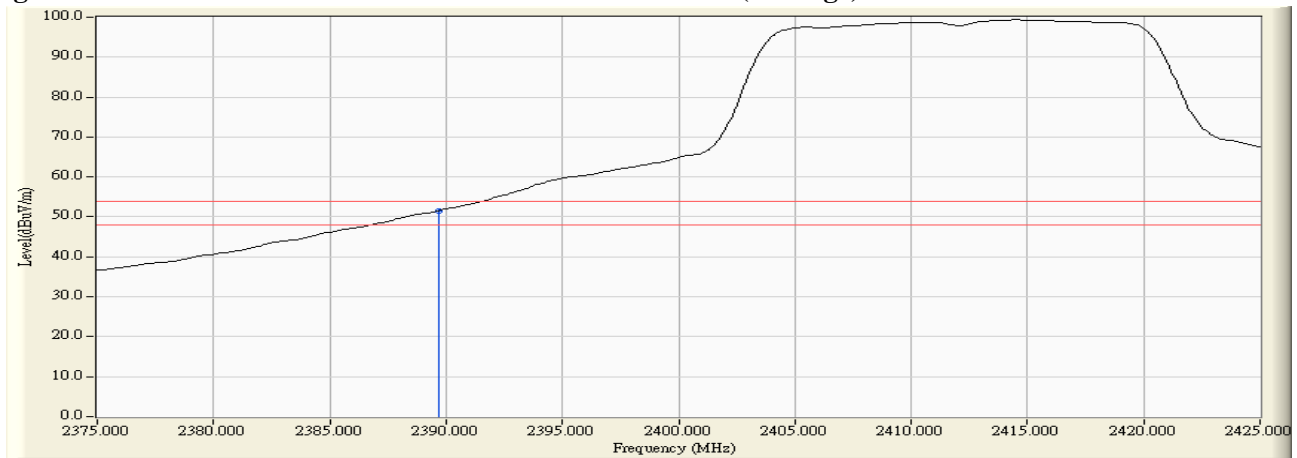
**RF Radiated Measurement (Horizontal):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2389.700        | 2.936               | 68.912               | 71.848                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2389.700        | 2.936               | 48.650               | 51.586                  | 74.00               | 54.00                  | Pass   |

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



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



**Note:**

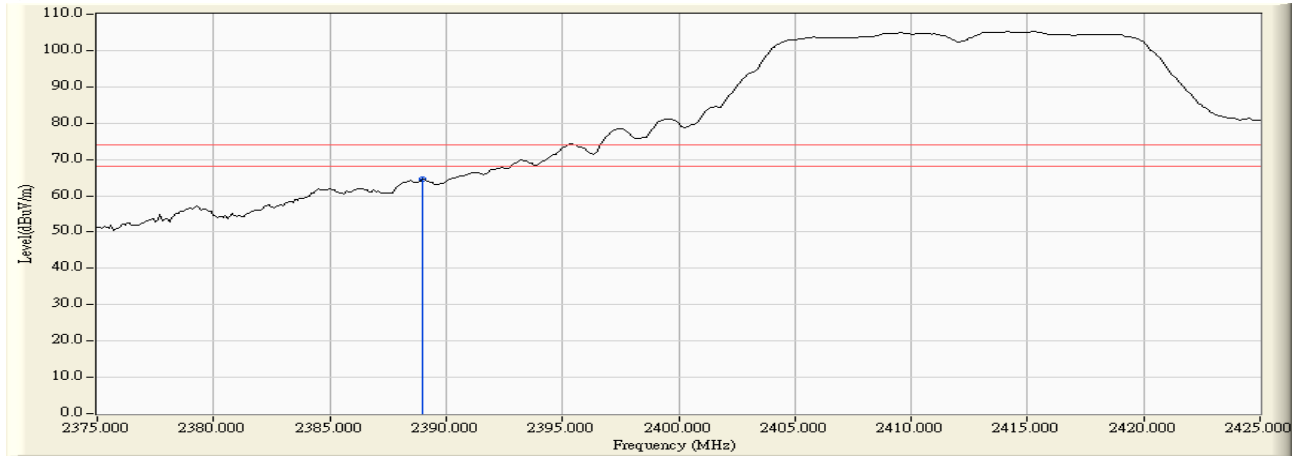
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

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

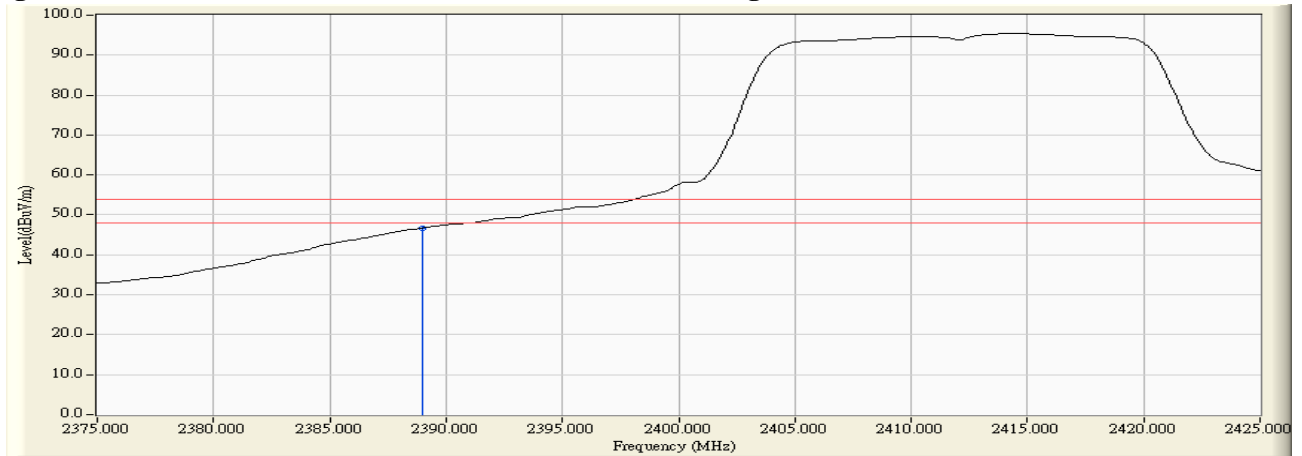
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2389.000        | 1.931               | 62.548               | 64.479                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2389.000        | 1.931               | 44.837               | 46.768                  | 74.00               | 54.00                  | Pass   |

**Figure Channel 01: (Vertical) (Peak)**



**Figure Channel 01: (Vertical) (Average)**



**Note:**

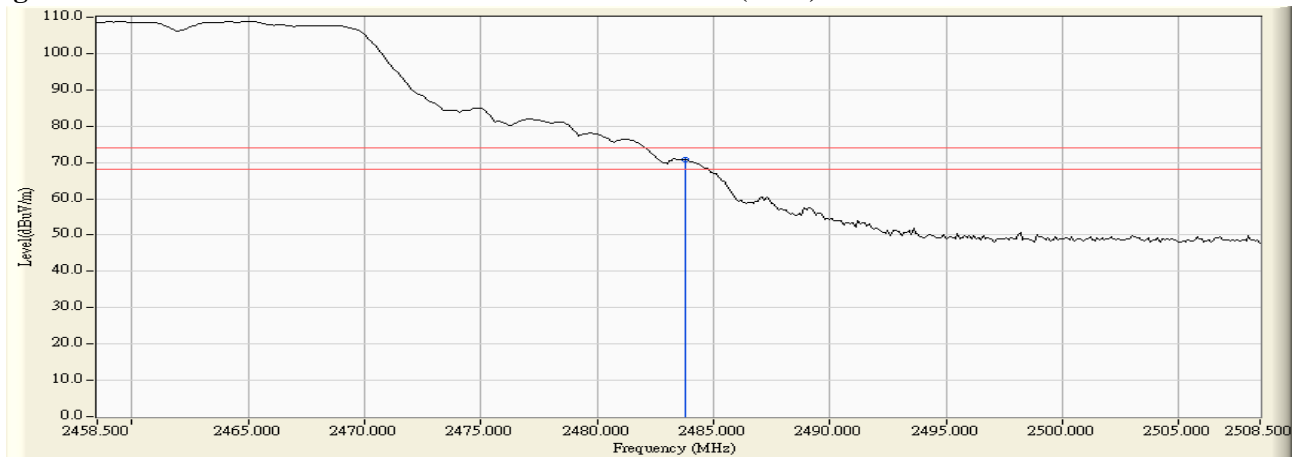
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

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

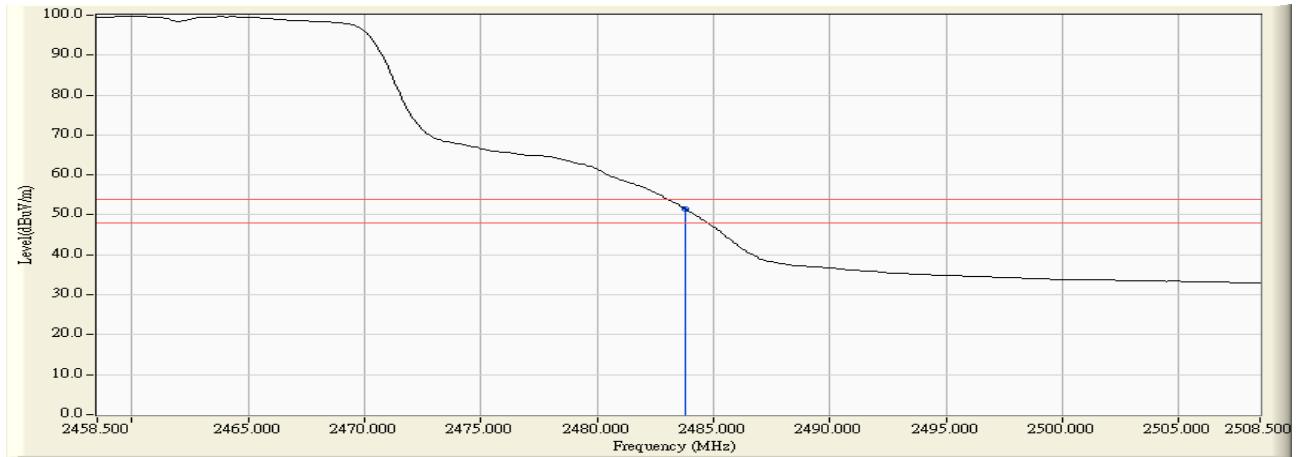
**RF Radiated Measurement (Horizontal):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2483.800        | 3.075               | 67.660               | 70.735                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2483.800        | 3.075               | 48.315               | 51.390                  | 74.00               | 54.00                  | Pass   |

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



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



**Note:**

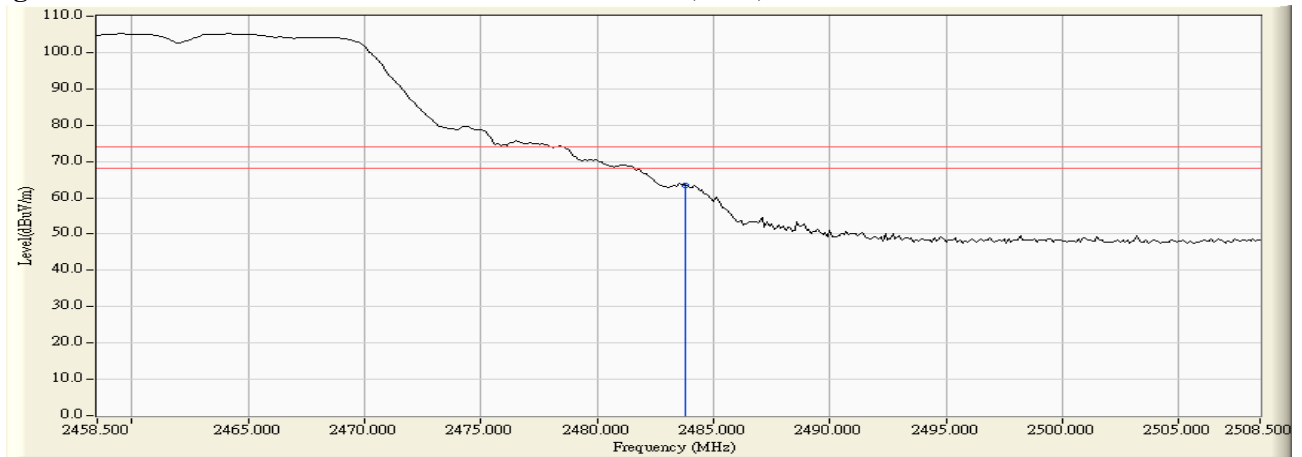
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

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

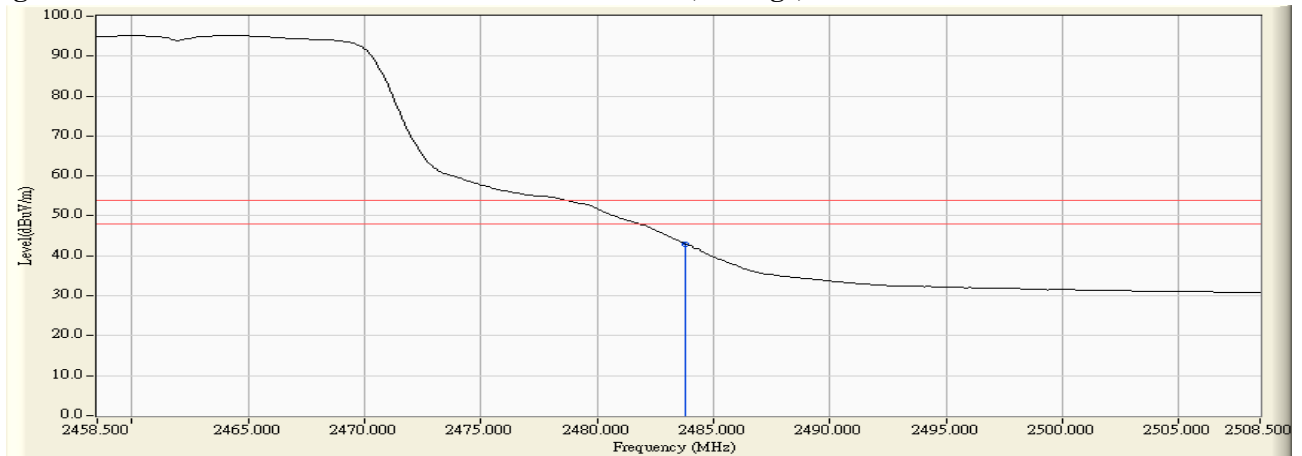
**RF Radiated Measurement (Vertical):**

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)   | 2483.800        | 2.554               | 60.955               | 63.509                  | 74.00               | 54.00                  | Pass   |
| 11(Average) | 2483.800        | 2.554               | 40.467               | 43.021                  | 74.00               | 54.00                  | Pass   |

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



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



**Note:**

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

## 7. Occupied Bandwidth

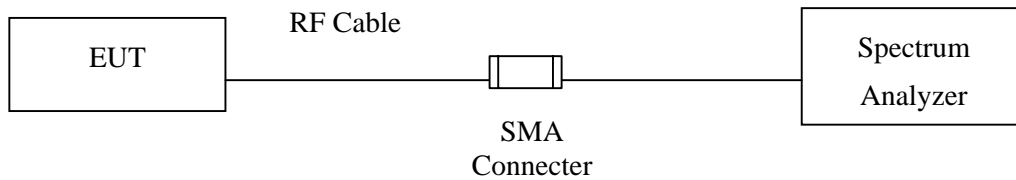
### 7.1. Test Equipment

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

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal. |
|---|-------------------|--------------|----------------------|-----------|
| X | Spectrum Analyzer | Agilent      | N4407B / US39440758  | Jun, 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.

### 7.2. Test Setup



### 7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

### 7.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

### 7.5. Uncertainty

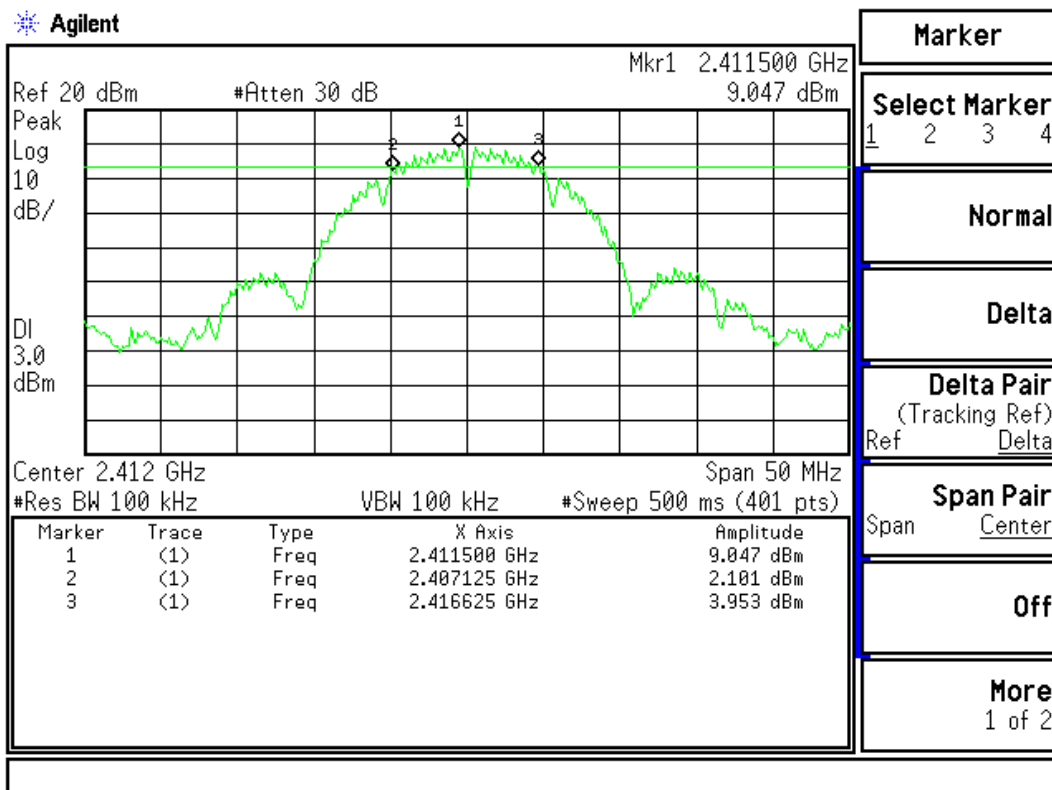
± 150Hz

### 7.6. Test Result of Occupied Bandwidth

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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 1           | 2412.00         | 9500                    | >500                 | Pass   |

**Figure Channel 1:**

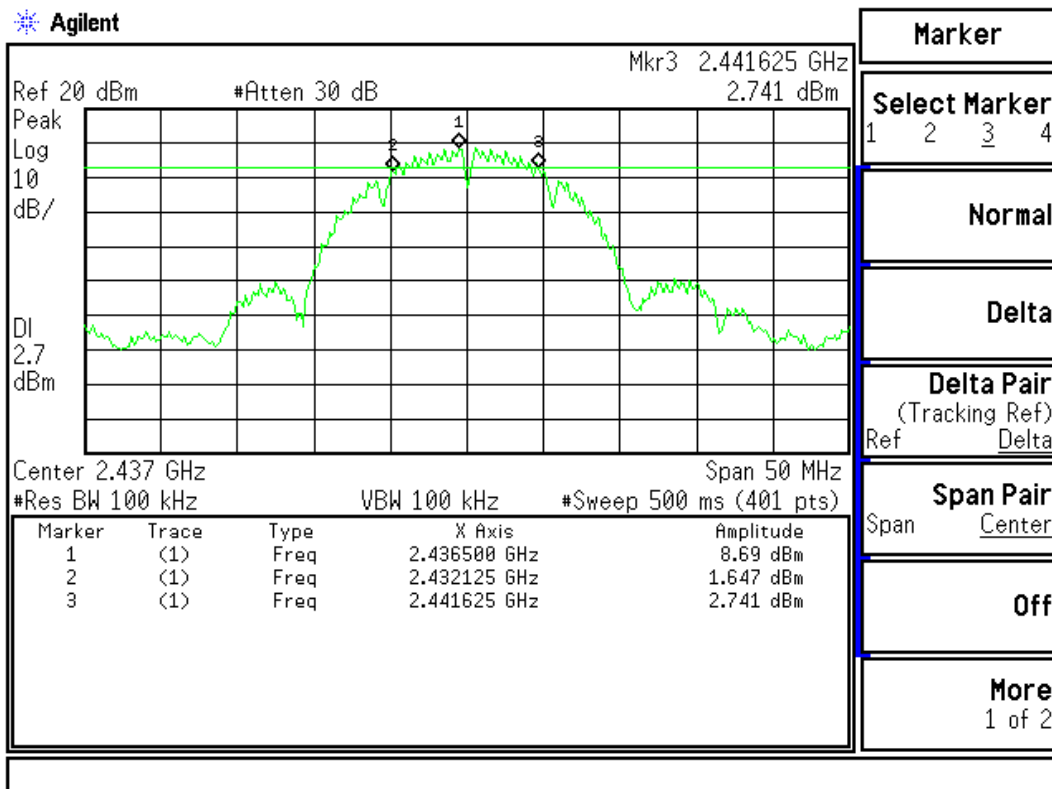




Product : Notebook  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2437MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437.00         | 9500                    | >500                 | Pass   |

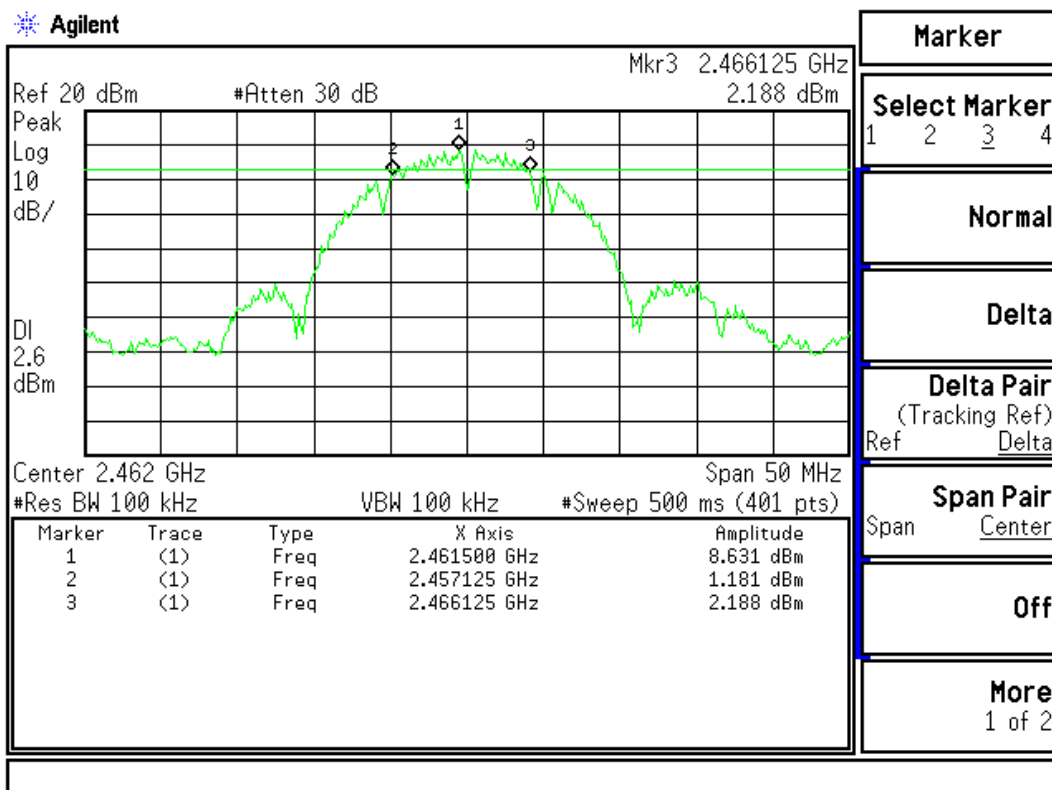
**Figure Channel 6:**



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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462.00         | 9500                    | >500                 | Pass   |

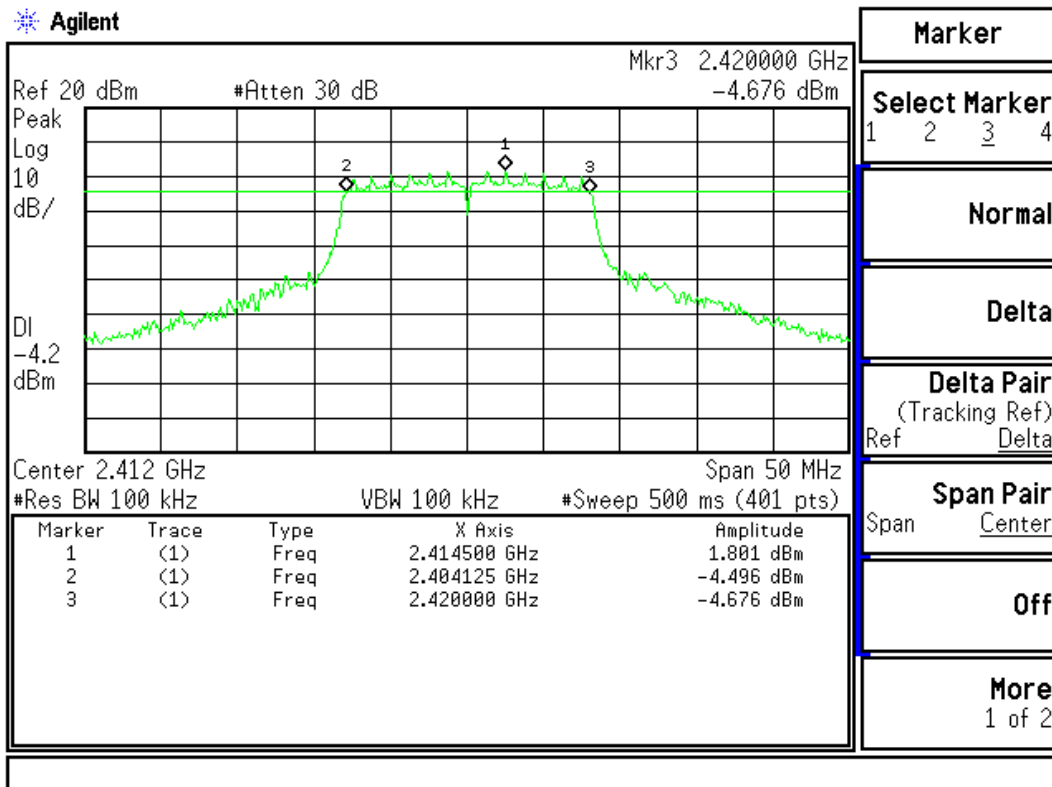
**Figure Channel 11:**



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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 1           | 2412.00         | 15875                   | >500                 | Pass   |

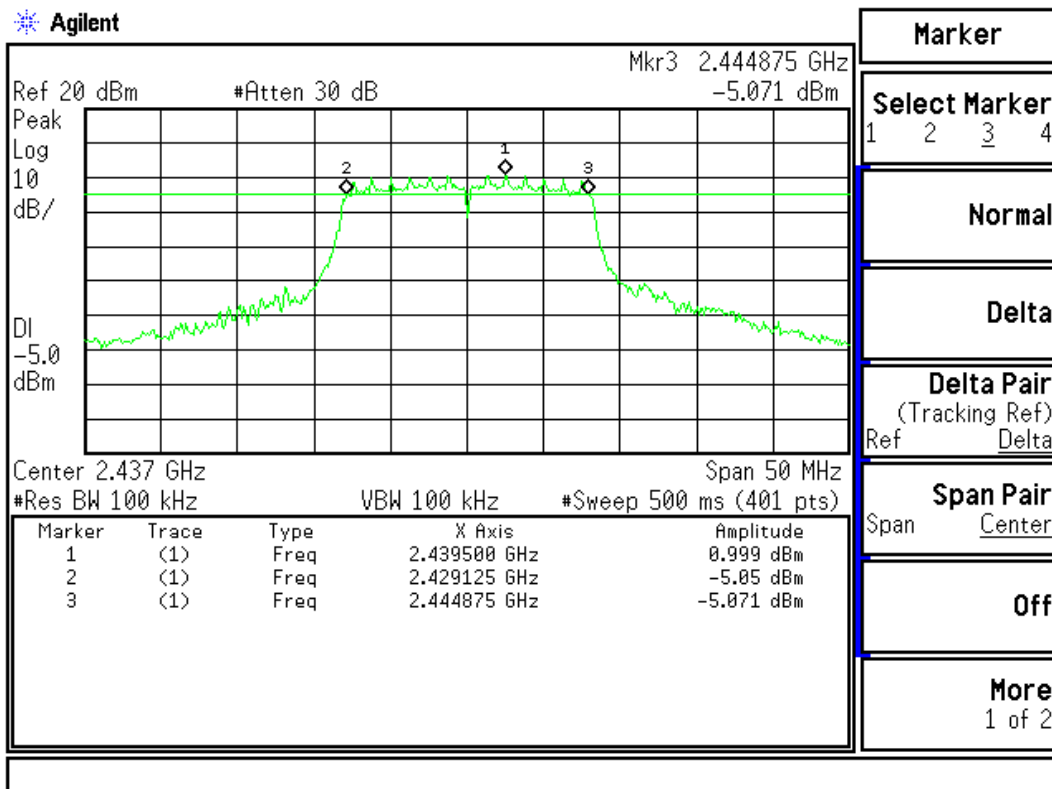
**Figure Channel 1:**



Product : Notebook  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437.00         | 15750                   | >500                 | Pass   |

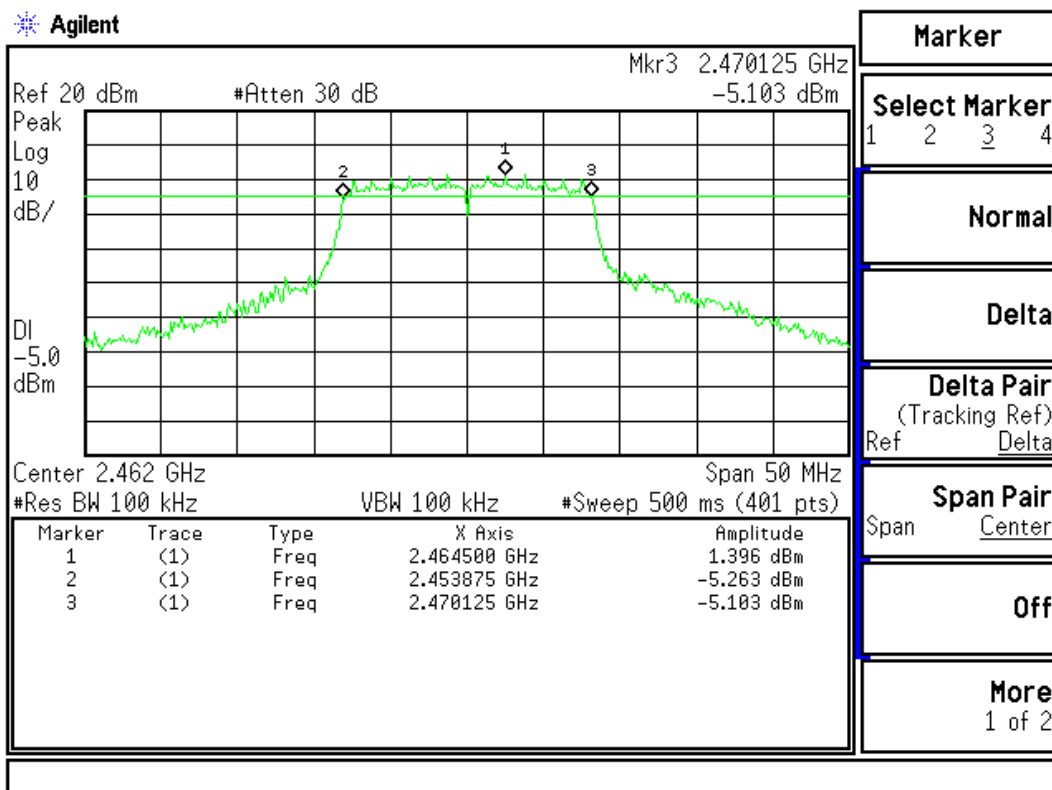
**Figure Channel 6:**



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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462.00         | 16250                   | >500                 | Pass   |

**Figure Channel 11:**



## 8. Power Density

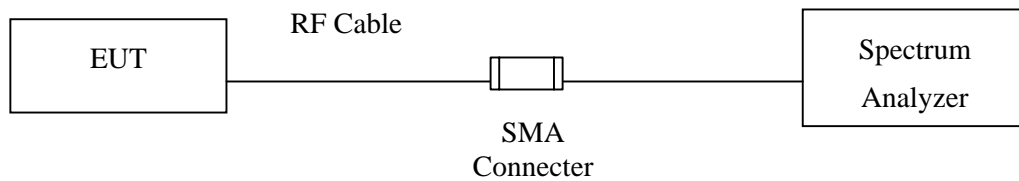
### 8.1. Test Equipment

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

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal. |
|---|-------------------|--------------|----------------------|-----------|
| X | Spectrum Analyzer | Agilent      | N4407B / US39440758  | Jun, 2009 |

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

### 8.2. Test Setup



### 8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

### 8.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 3 kHz, VBW=10KHz, Sweep time=(SPAN/3KHz), detector=Peak detector

### 8.5. Uncertainty

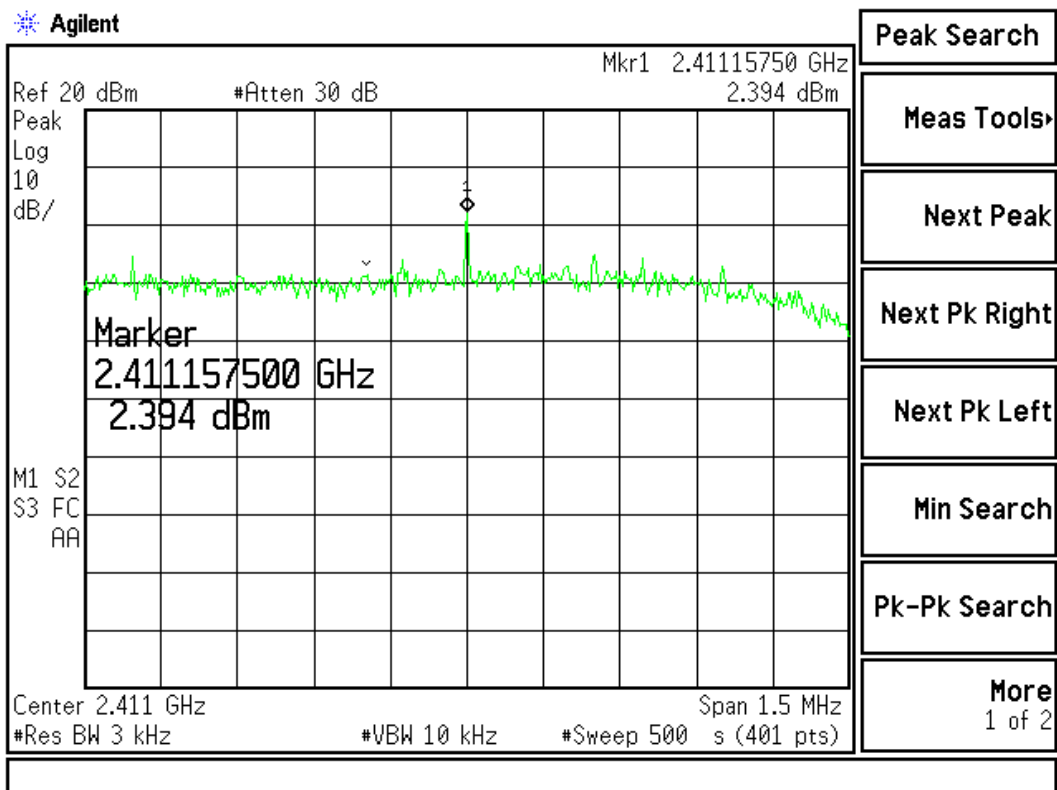
± 1.27 dB

### 8.6. Test Result of Power Density

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

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 1           | 2412.00         | 2.394               | < 8dBm      | Pass   |

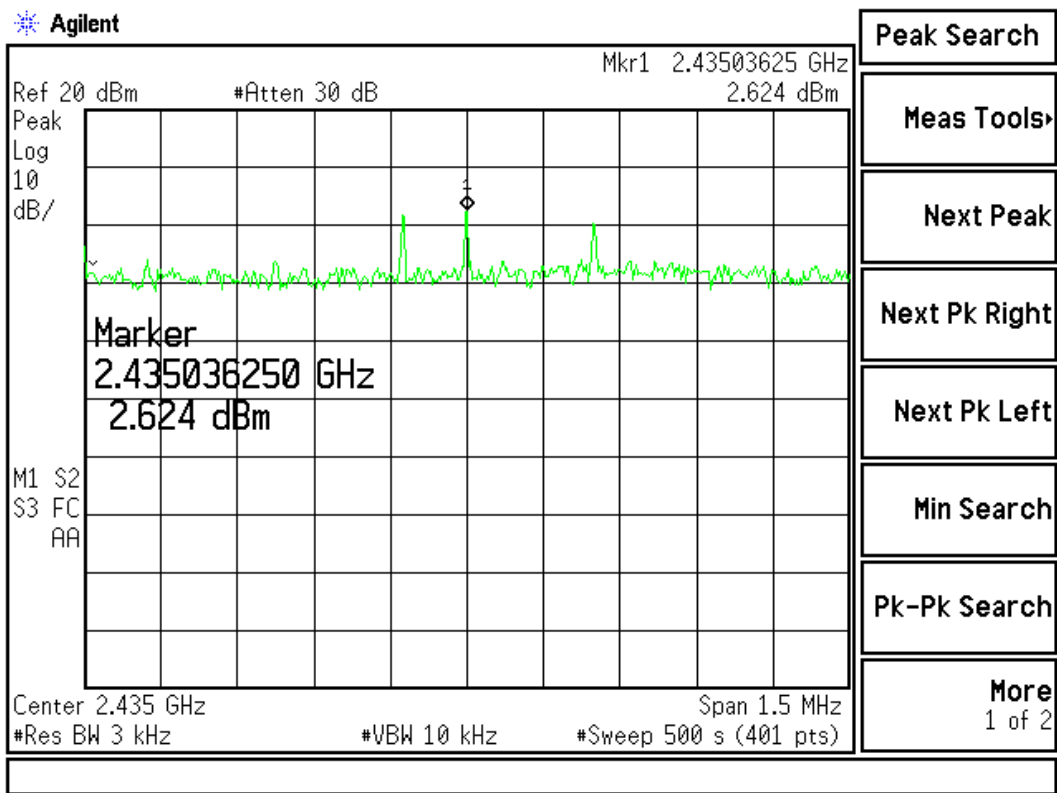
**Figure Channel 1:**



Product : Notebook  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2437MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437.000        | 2.624                   | < 8dBm               | Pass   |

**Figure Channel 6:**

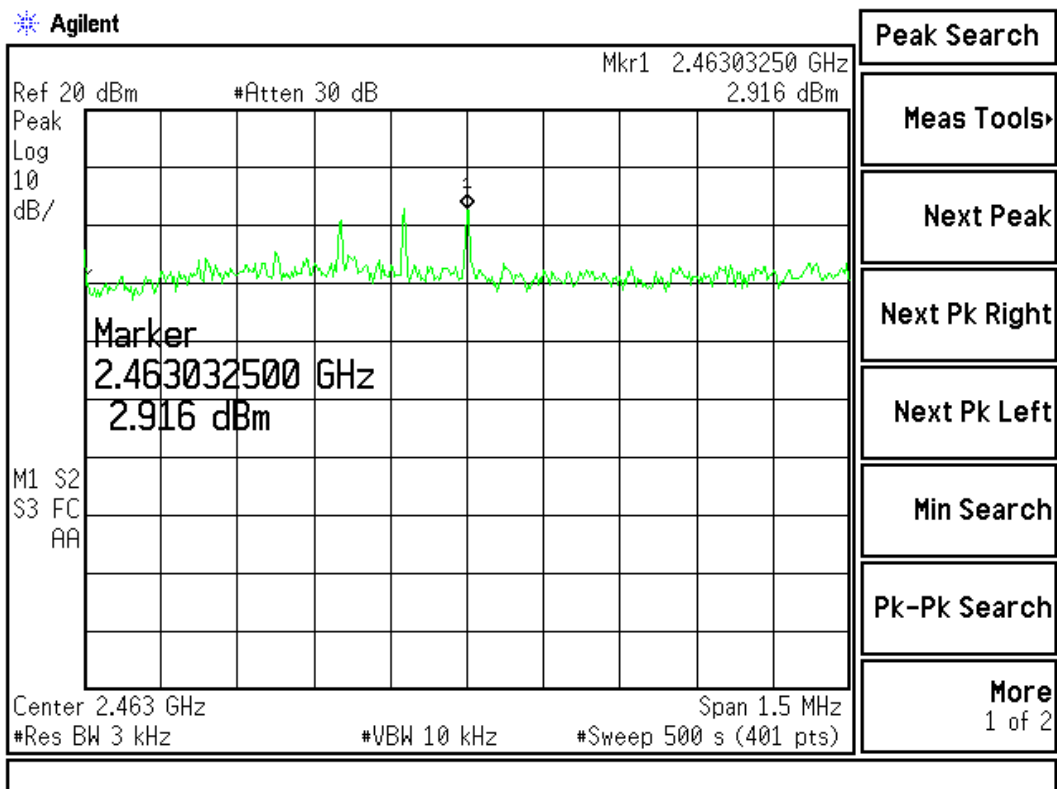




Product : Notebook  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462.00         | 2.916                   | < 8dBm               | Pass   |

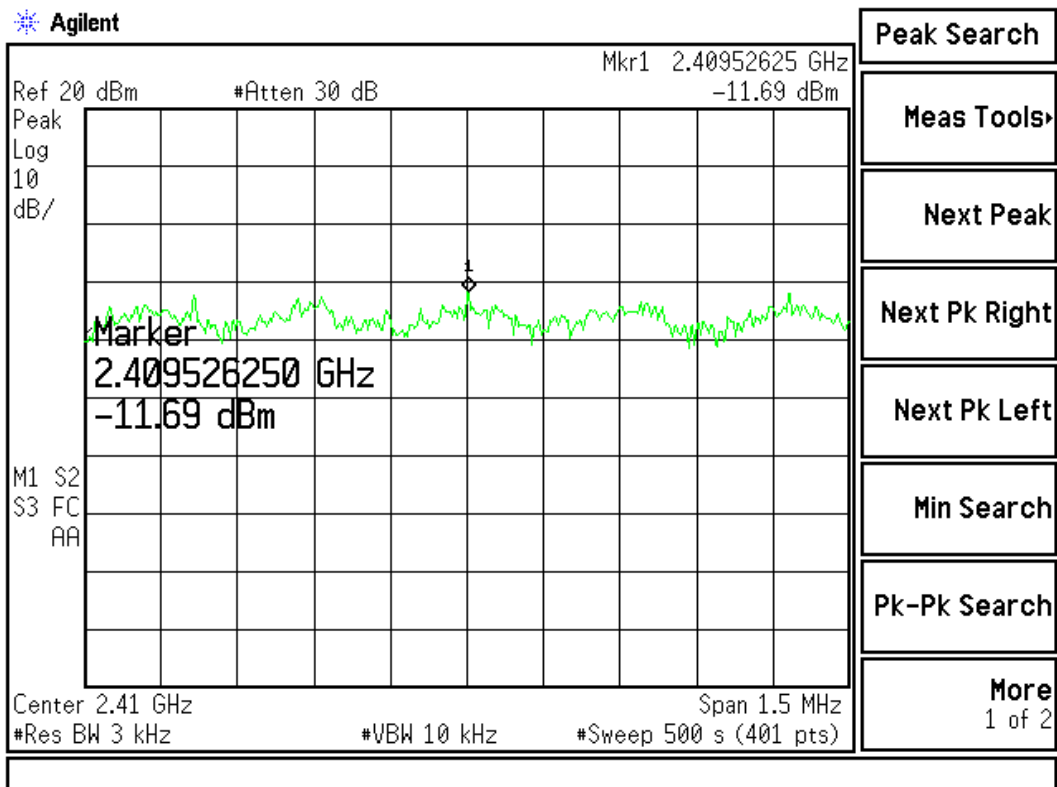
**Figure Channel 11:**



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

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 1           | 2412.00         | -11.690             | < 8dBm      | Pass   |

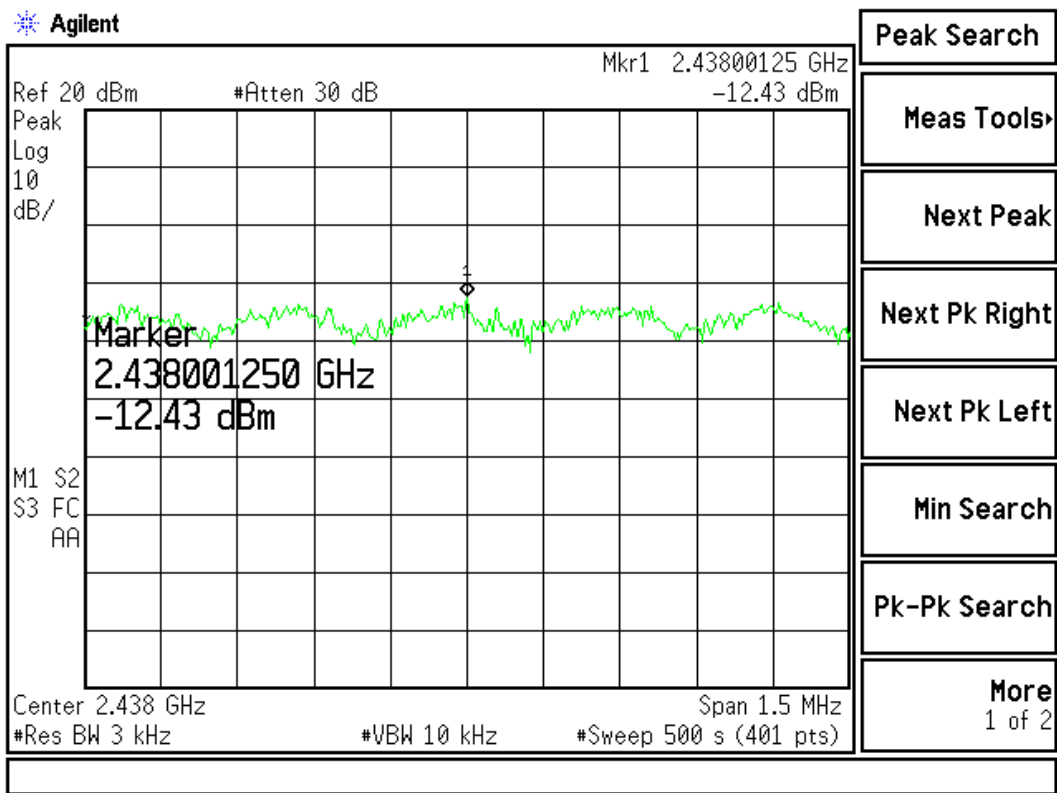
**Figure Channel 1:**



Product : Notebook  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437.000        | -12.430                 | < 8dBm               | Pass   |

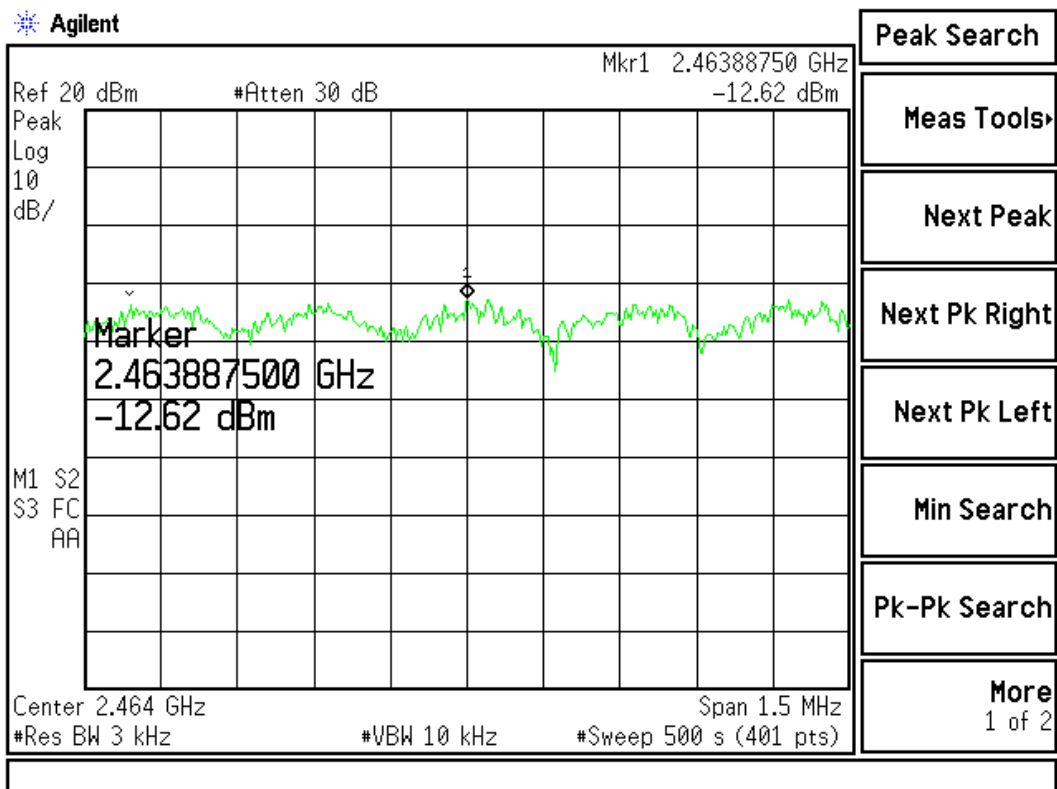
**Figure Channel 6:**



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

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462.00         | -12.620                 | < 8dBm               | Pass   |

**Figure Channel 11:**



## **9. EMI Reduction Method During Compliance Testing**

No modification was made during testing.