

# FCC Test Report

|              |                      |
|--------------|----------------------|
| Product Name | Wireless Motherboard |
| Model No     | TA10TA2              |
| FCC ID.      | WL6-TA1BC30TA1       |

|           |                                               |
|-----------|-----------------------------------------------|
| Applicant | ELITEGROUP COMPUTER SYSTEMS CO., LTD.         |
| Address   | No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan |

|                 |                     |
|-----------------|---------------------|
| Date of Receipt | Mar. 18, 2014       |
| Issue Date      | Apr. 02, 2014       |
| Report No.      | 1430325R-RFUSP27V00 |
| Report Version  | V1.0                |



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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# Test Report Certification

Issue Date: Apr. 02, 2014

Report No.: 1430325R-RFUSP27V00



|                     |                                                                           |
|---------------------|---------------------------------------------------------------------------|
| Product Name        | Wireless Motherboard                                                      |
| Applicant           | ELITEGROUP COMPUTER SYSTEMS CO., LTD.                                     |
| Address             | No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan                             |
| Manufacturer        | ELITEGROUP COMPUTER SYSTEMS CO., LTD.                                     |
| Model No.           | TA10TA2                                                                   |
| FCC ID.             | WL6-TA1BC30TA1                                                            |
| EUT Rated Voltage   | DC 3.7V (Power by Battery)                                                |
| EUT Test Voltage    | AC 120V/60Hz                                                              |
| Trade Name          | ECS                                                                       |
| Applicable Standard | FCC CFR Title 47 Part 15 Subpart C: 2012<br>ANSI C63.10: 2009, KDB 558074 |
| Test Result         | Complied                                                                  |


The test results relate only to the samples tested.

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Documented By :



( Senior Adm. Specialist / Joanne Lin )

Tested By :



( Engineer / Alan Chen )

Approved By :



( Director / 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       | Wireless Motherboard                                                          |
| Trade Name         | ECS                                                                           |
| Model No.          | TA10TA2                                                                       |
| FCC ID.            | WL6-TA1BC30TA1                                                                |
| Frequency Range    | 2412-2462MHz for 802.11b/g/n-20BW                                             |
| Number of Channels | 802.11b/g/n-20MHz: 11                                                         |
| Data Speed         | 802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 72.2Mbps                 |
| Type of Modulation | 802.11b:DSSS (DBPSK, DQPSK, CCK)<br>802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| Antenna Type       | PIFA Antenna                                                                  |
| Antenna Gain       | Refer to the table "Antenna List"                                             |
| Channel Control    | Auto                                                                          |

#### Antenna List

| No. | Manufacturer | Part No.      | Antenna Type | Peak Gain           |
|-----|--------------|---------------|--------------|---------------------|
| 1   | WGT          | 13H130-JV9050 | PIFA Antenna | 2.13 dBi for 2.4GHz |
| 2   | JEM          | 13H130-JV9070 | PIFA Antenna | 1.30 dBi for 2.4GHz |

Note: 1.The antenna of EUT is conform to FCC 15.203.

2.Only the higher gain antenna was tested and recorded in this report.

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  |             |           |

Note:

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

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

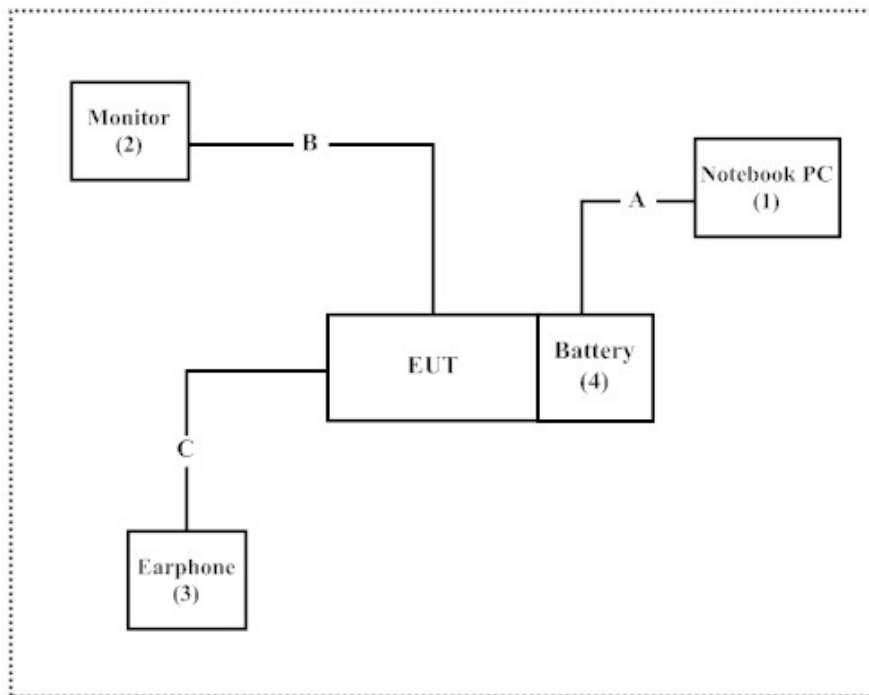
### 1.3. Tested System Details

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

| Product         | Manufacturer | Model No.         | Serial No.               | Power Cord         |
|-----------------|--------------|-------------------|--------------------------|--------------------|
| 1   Notebook PC | DELL         | PPT               | N/A                      | Non-Shielded, 0.8m |
| 2   Monitor     | DELL         | U2410f            | CN-082WXD-72872-16E-060L | Non-Shielded, 0.8m |
| 3   Earphone    | Dr.AV        | CD-806B           | N/A                      | N/A                |
| 4   Battery     | TCL          | TA10-1S5100-T1-T2 | N/A                      | N/A                |

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

### 1.4. Configuration of Tested System



### 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute program “adb.exe V1.0.29” on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (5) Verify that the EUT works properly.

## 1.6. Test Facility

Ambient conditions in the laboratory:

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

The related certificate for our laboratories about the test site and management system can be downloaded from

Quietek Corporation's Web Site: <http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site:

<http://www.quietek.com/>

Site Description: File on  
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FCC Engineering Laboratory  
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Registration Number: 92195

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FCC Accreditation Number: TW1014



## 2. Conducted Emission

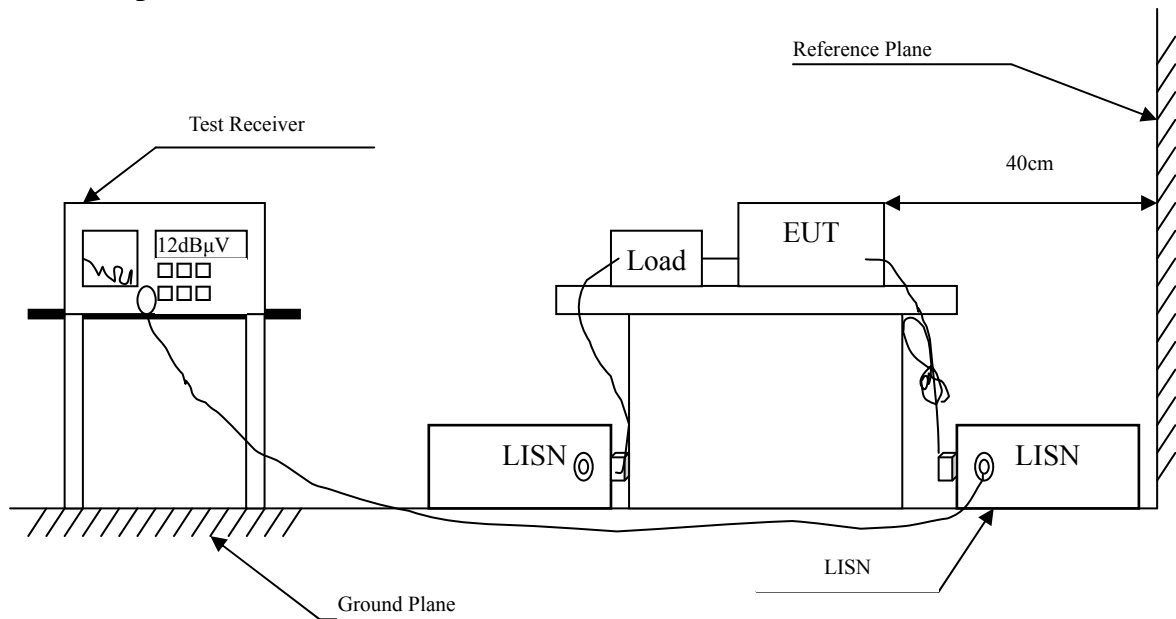
### 2.1. Test Equipment

|   | Equipment                | Manufacturer | Model No. / Serial No. | Last Cal.  | Remark      |
|---|--------------------------|--------------|------------------------|------------|-------------|
| X | Test Receiver            | R & S        | ESCS 30 / 825442/018   | Sep., 2013 |             |
| X | Artificial Mains Network | R & S        | ENV4200 / 848411/10    | Feb., 2014 | Peripherals |
| X | LISN                     | R & S        | ESH3-Z5 / 825562/002   | Feb., 2014 | EUT         |
|   | DC LISN                  | Schwarzbeck  | 8226 / 176             | Mar., 2014 | EUT         |
| X | Pulse Limiter            | R & S        | ESH3-Z2 / 357.8810.52  | Feb., 2014 |             |
|   | No.1 Shielded Room       |              |                        |            |             |

Note:

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

### 2.2. Test Setup



**2.3. Limits**

| <b>FCC Part 15 Subpart C Paragraph 15.207 (dBµV) 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 C63.10: 2009 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 : Wireless Motherboard  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V | Margin<br>dB | Limit<br>dB $\mu$ V |
|-------------------|-------------------------|--------------------------------|------------------------------------|--------------|---------------------|
| <b>Line 1</b>     |                         |                                |                                    |              |                     |
| <b>Quasi-Peak</b> |                         |                                |                                    |              |                     |
| 0.267             | 9.790                   | 25.660                         | 35.450                             | -27.207      | 62.657              |
| 0.627             | 9.790                   | 22.860                         | 32.650                             | -23.350      | 56.000              |
| 1.052             | 9.800                   | 18.570                         | 28.370                             | -27.630      | 56.000              |
| 1.650             | 9.810                   | 12.430                         | 22.240                             | -33.760      | 56.000              |
| 5.630             | 9.840                   | 22.900                         | 32.740                             | -27.260      | 60.000              |
| 7.173             | 9.850                   | 19.300                         | 29.150                             | -30.850      | 60.000              |
| <b>Average</b>    |                         |                                |                                    |              |                     |
| 0.267             | 9.790                   | 16.910                         | 26.700                             | -25.957      | 52.657              |
| 0.627             | 9.790                   | 10.220                         | 20.010                             | -25.990      | 46.000              |
| 1.052             | 9.800                   | 6.530                          | 16.330                             | -29.670      | 46.000              |
| 1.650             | 9.810                   | 2.170                          | 11.980                             | -34.020      | 46.000              |
| 5.630             | 9.840                   | 9.260                          | 19.100                             | -30.900      | 50.000              |
| 7.173             | 9.850                   | 4.970                          | 14.820                             | -35.180      | 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 : Wireless Motherboard  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V | Margin<br>dB | Limit<br>dB $\mu$ V |
|-------------------|-------------------------|--------------------------------|------------------------------------|--------------|---------------------|
| <b>Line 2</b>     |                         |                                |                                    |              |                     |
| <b>Quasi-Peak</b> |                         |                                |                                    |              |                     |
| 0.158             | 9.781                   | 29.350                         | 39.131                             | -26.640      | 65.771              |
| 0.232             | 9.780                   | 23.910                         | 33.690                             | -29.967      | 63.657              |
| 0.408             | 9.790                   | 22.360                         | 32.150                             | -26.479      | 58.629              |
| 0.685             | 9.790                   | 23.970                         | 33.760                             | -22.240      | 56.000              |
| 1.056             | 9.790                   | 18.910                         | 28.700                             | -27.300      | 56.000              |
| 7.689             | 9.870                   | 23.210                         | 33.080                             | -26.920      | 60.000              |
| <b>Average</b>    |                         |                                |                                    |              |                     |
| 0.158             | 9.781                   | 12.320                         | 22.101                             | -33.670      | 55.771              |
| 0.232             | 9.780                   | 7.580                          | 17.360                             | -36.297      | 53.657              |
| 0.408             | 9.790                   | 7.840                          | 17.630                             | -30.999      | 48.629              |
| 0.685             | 9.790                   | 8.860                          | 18.650                             | -27.350      | 46.000              |
| 1.056             | 9.790                   | 3.610                          | 13.400                             | -32.600      | 46.000              |
| 7.689             | 9.870                   | 8.700                          | 18.570                             | -31.430      | 50.000              |

Note:

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

### 3. Peak Power Output

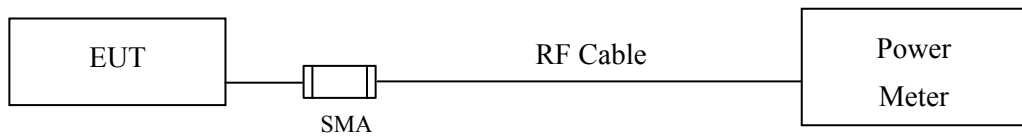
#### 3.1. Test Equipment

|   | Equipment    | Manufacturer | Model No./Serial No. | Last Cal.  |
|---|--------------|--------------|----------------------|------------|
| X | Power Meter  | Anritsu      | ML2495A/6K00003357   | May, 2013  |
| X | Power Sensor | Anritsu      | MA2411B/0738448      | Jun., 2013 |

Note:

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

#### 3.2. Test Setup



#### 3.3. Limits

The maximum peak power shall be less 1 Watt.

#### 3.4. Test Procedure

The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

#### 3.5. Uncertainty

± 1.27 dB

### 3.6. Test Result of Peak Power Output

Product : Wireless Motherboard  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

| Channel No | Frequency (MHz) | Average Power<br>For different Data Rate (Mbps) |       |       |       | Peak Power | Required Limit | Result |
|------------|-----------------|-------------------------------------------------|-------|-------|-------|------------|----------------|--------|
|            |                 | 1                                               | 2     | 5.5   | 11    |            |                |        |
|            |                 | Measurement Level (dBm)                         |       |       |       |            |                |        |
| 01         | 2412            | 11.92                                           | --    | --    | --    | 15.08      | <30dBm         | Pass   |
| 06         | 2437            | 11.80                                           | 11.78 | 11.64 | 11.58 | 15.08      | <30dBm         | Pass   |
| 11         | 2462            | 11.96                                           | --    | --    | --    | 15.19      | <30dBm         | Pass   |

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

Product : Wireless Motherboard  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

| Channel No | Frequency (MHz) | Average Power<br>For different Data Rate (Mbps) |       |       |       |       |       |       |       | Peak Power | Required Limit | Result |
|------------|-----------------|-------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|------------|----------------|--------|
|            |                 | 6                                               | 9     | 12    | 18    | 24    | 36    | 48    | 54    | 6          |                |        |
|            |                 | Measurement Level (dBm)                         |       |       |       |       |       |       |       |            |                |        |
| 01         | 2412            | 15.82                                           | --    | --    | --    | --    | --    | --    | --    | 23.68      | <30dBm         | Pass   |
| 06         | 2437            | 15.85                                           | 15.79 | 15.73 | 15.67 | 15.61 | 15.55 | 15.49 | 15.33 | 23.61      | <30dBm         | Pass   |
| 11         | 2462            | 14.89                                           | --    | --    | --    | --    | --    | --    | --    | 23.09      | <30dBm         | Pass   |

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

Product : Wireless Motherboard  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

| Channel No              | Frequency (MHz) | Average Power                  |       |       |       |       |       |       |       | Peak Power | Required Limit | Result |
|-------------------------|-----------------|--------------------------------|-------|-------|-------|-------|-------|-------|-------|------------|----------------|--------|
|                         |                 | For different Data Rate (Mbps) |       |       |       |       |       |       |       |            |                |        |
|                         |                 | 7.2                            | 14.4  | 21.7  | 28.9  | 43.3  | 57.8  | 65    | 72.2  | 7.2        |                |        |
| Measurement Level (dBm) |                 |                                |       |       |       |       |       |       |       |            |                |        |
| 01                      | 2412            | 14.78                          | --    | --    | --    | --    | --    | --    | --    | 23.02      | <30dBm         | Pass   |
| 06                      | 2437            | 14.69                          | 14.51 | 14.33 | 14.15 | 13.97 | 13.79 | 13.61 | 13.43 | 23.01      | <30dBm         | Pass   |
| 11                      | 2462            | 12.78                          | --    | --    | --    | --    | --    | --    | --    | 22.53      | <30dBm         | Pass   |

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



#### 4. Radiated Emission

##### 4.1. Test Equipment

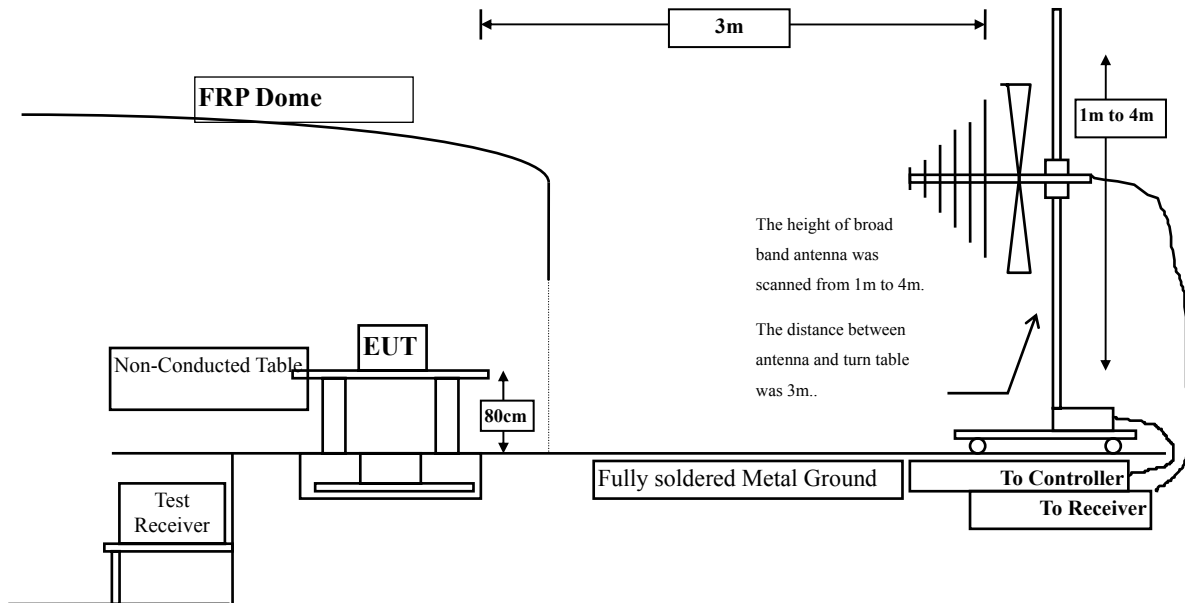
The following test equipment are used during the radiated emission test:

| Test Site  |   | Equipment         | Manufacturer    | Model No./Serial No. | Last Cal.  |
|------------|---|-------------------|-----------------|----------------------|------------|
| ☒ Site # 3 | X | Loop Antenna      | Teseq           | HLA6120 / 26739      | Jul., 2013 |
|            | X | Bilog Antenna     | Schaffner Chase | CBL6112B/2673        | Sep., 2013 |
|            | X | Horn Antenna      | Schwarzbeck     | BBHA9120D/D305       | Sep., 2013 |
|            | X | Horn Antenna      | Schwarzbeck     | BBHA9170/208         | Jul., 2013 |
|            | X | Pre-Amplifier     | Agilent         | 8447D/2944A09549     | Sep., 2013 |
|            | X | Spectrum Analyzer | Agilent         | E4407B / US39440758  | May, 2013  |
|            | X | Test Receiver     | R & S           | ESCS 30/ 825442/018  | Sep., 2013 |
|            | X | Coaxial Cable     | QuieTek         | QTK-CABLE/ CAB5      | Feb., 2014 |
|            | X | Controller        | QuieTek         | QTK-CONTROLLER/CTRL3 | N/A        |
|            | X | Coaxial Switch    | Anritsu         | MP59B/6200265729     | N/A        |

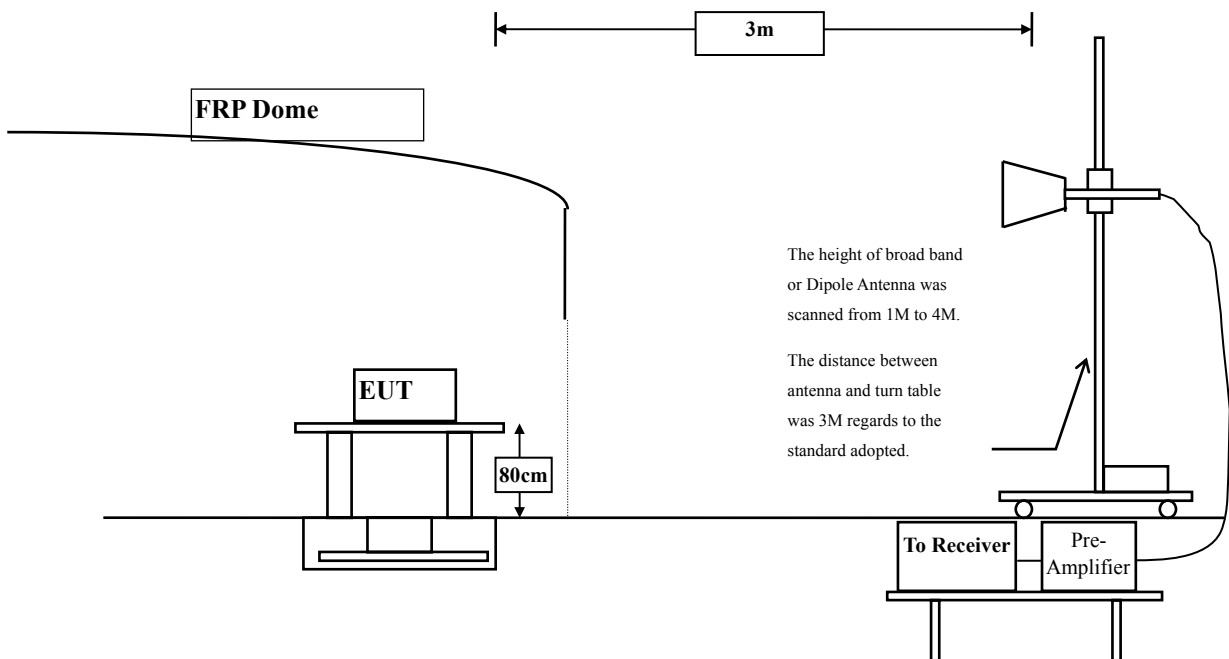
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

## 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                                        | Field strength<br>(microvolts/meter) | Measurement distance<br>(meter) |
| 0.009-0.490                                             | 2400/F(kHz)                          | 300                             |
| 0.490-1.705                                             | 24000/F(kHz)                         | 30                              |
| 1.705-30                                                | 30                                   | 30                              |
| 30-88                                                   | 100                                  | 3                               |
| 88-216                                                  | 150                                  | 3                               |
| 216-960                                                 | 200                                  | 3                               |
| Above 960                                               | 500                                  | 3                               |

Remarks: E field strength (dB $\mu$ V/m) = 20 log E field strength (uV/m)

#### 4.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2009 and tested according to DTS test procedure of KDB 558074 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 C63.10: 2009 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

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

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

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

The frequency range from 9kHz 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 : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4824.000                 | 3.261                   | 49.380                         | 52.641                               | -21.359      | 74.000                |
| 7236.000                 | 10.650                  | 37.560                         | 48.210                               | -25.790      | 74.000                |
| 9648.000                 | 13.337                  | 36.980                         | 50.316                               | -23.684      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| --                       |                         |                                |                                      |              |                       |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4824.000                 | 6.421                   | 49.880                         | 56.301                               | -17.699      | 74.000                |
| 7236.000                 | 11.495                  | 39.150                         | 50.645                               | -23.355      | 74.000                |
| 9648.000                 | 13.807                  | 37.590                         | 51.396                               | -22.604      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4824.000                 | 6.421                   | 45.470                         | 51.891                               | -2.109       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4874.000                 | 3.038                   | 48.590                         | 51.627                               | -22.373      | 74.000                |
| 7311.000                 | 11.795                  | 37.150                         | 48.944                               | -25.056      | 74.000                |
| 9748.000                 | 12.635                  | 36.590                         | 49.225                               | -24.775      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| --                       |                         |                                |                                      |              |                       |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4874.000                 | 5.812                   | 49.590                         | 55.401                               | -18.599      | 74.000                |
| 7311.000                 | 12.630                  | 36.980                         | 49.609                               | -24.391      | 74.000                |
| 9748.000                 | 13.126                  | 36.150                         | 49.276                               | -24.724      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4874.000                 | 5.812                   | 45.690                         | 51.501                               | -2.499       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4924.000                 | 2.858                   | 49.840                         | 52.697                               | -21.303      | 74.000                |
| 7386.000                 | 12.127                  | 37.560                         | 49.688                               | -24.312      | 74.000                |
| 9848.000                 | 12.852                  | 36.590                         | 49.443                               | -24.557      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| --                       |                         |                                |                                      |              |                       |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4924.000                 | 5.521                   | 49.290                         | 54.810                               | -19.190      | 74.000                |
| 7386.000                 | 13.254                  | 37.150                         | 50.404                               | -23.596      | 74.000                |
| 9848.000                 | 13.367                  | 36.590                         | 49.957                               | -24.043      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4924.000                 | 5.521                   | 45.790                         | 51.310                               | -2.690       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4824.000                 | 3.261                   | 51.390                         | 54.651                               | -19.349      | 74.000                |
| 7236.000                 | 10.650                  | 54.910                         | 65.560                               | -8.440       | 74.000                |
| 9648.000                 | 13.337                  | 37.590                         | 50.926                               | -23.074      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4824.000                 | 3.261                   | 36.220                         | 39.481                               | -14.519      | 54.000                |
| 7236.000                 | 10.650                  | 38.050                         | 48.700                               | -5.300       | 54.000                |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4824.000                 | 6.421                   | 51.590                         | 58.011                               | -15.989      | 74.000                |
| 7236.000                 | 11.495                  | 54.560                         | 66.055                               | -7.945       | 74.000                |
| 9648.000                 | 13.807                  | 37.150                         | 50.956                               | -23.044      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4824.000                 | 6.421                   | 36.940                         | 43.361                               | -10.639      | 54.000                |
| 7236.000                 | 11.495                  | 38.560                         | 50.055                               | -3.945       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4874.000                 | 3.038                   | 52.010                         | 55.047                               | -18.953      | 74.000                |
| 7311.000                 | 11.795                  | 54.560                         | 66.354                               | -7.646       | 74.000                |
| 9748.000                 | 12.635                  | 36.590                         | 49.225                               | -24.775      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4874.000                 | 3.038                   | 36.590                         | 39.627                               | -14.373      | 54.000                |
| 7311.000                 | 11.795                  | 39.560                         | 51.354                               | -2.646       | 54.000                |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4874.000                 | 5.812                   | 52.560                         | 58.371                               | -15.629      | 74.000                |
| 7386.000                 | 13.254                  | 55.150                         | 68.404                               | -5.596       | 74.000                |
| 9848.000                 | 13.367                  | 36.890                         | 50.257                               | -23.743      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4924.000                 | 5.521                   | 36.980                         | 42.500                               | -11.500      | 54.000                |
| 7386.000                 | 13.254                  | 38.150                         | 51.404                               | -2.596       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4924.000                 | 2.858                   | 51.450                         | 54.307                               | -19.693      | 74.000                |
| 7386.000                 | 12.127                  | 54.150                         | 66.278                               | -7.722       | 74.000                |
| 9848.000                 | 12.852                  | 36.590                         | 49.443                               | -24.557      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4924.000                 | 2.858                   | 36.580                         | 39.437                               | -14.563      | 54.000                |
| 7386.000                 | 12.127                  | 39.150                         | 51.278                               | -2.722       | 54.000                |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4924.000                 | 5.521                   | 52.380                         | 57.900                               | -16.100      | 74.000                |
| 7386.000                 | 13.254                  | 55.690                         | 68.944                               | -5.056       | 74.000                |
| 9848.000                 | 13.367                  | 37.150                         | 50.517                               | -23.483      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4924.000                 | 5.521                   | 36.890                         | 42.410                               | -11.590      | 54.000                |
| 7386.000                 | 13.254                  | 38.590                         | 51.844                               | -2.156       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4824.000                 | 3.261                   | 52.160                         | 55.421                               | -18.579      | 74.000                |
| 7236.000                 | 10.650                  | 54.260                         | 64.910                               | -9.090       | 74.000                |
| 9648.000                 | 13.337                  | 37.120                         | 50.456                               | -23.544      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4824.000                 | 3.261                   | 37.150                         | 40.411                               | -13.589      | 54.000                |
| 7236.000                 | 10.650                  | 37.150                         | 47.800                               | -6.200       | 54.000                |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4824.000                 | 6.421                   | 53.150                         | 59.571                               | -14.429      | 74.000                |
| 7236.000                 | 11.495                  | 55.150                         | 66.645                               | -7.355       | 74.000                |
| 9648.000                 | 13.807                  | 36.590                         | 50.396                               | -23.604      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4824.000                 | 6.421                   | 37.150                         | 43.571                               | -10.429      | 54.000                |
| 7236.000                 | 11.495                  | 38.260                         | 49.755                               | -4.245       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4874.000                 | 3.038                   | 52.560                         | 55.597                               | -18.403      | 74.000                |
| 7236.000                 | 10.650                  | 54.260                         | 64.910                               | -9.090       | 74.000                |
| 9648.000                 | 13.337                  | 36.130                         | 49.466                               | -24.534      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4824.000                 | 3.261                   | 37.150                         | 40.411                               | -13.589      | 54.000                |
| 7236.000                 | 10.650                  | 37.590                         | 48.240                               | -5.760       | 54.000                |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4874.000                 | 5.812                   | 53.560                         | 59.371                               | -14.629      | 74.000                |
| 7311.000                 | 12.630                  | 55.190                         | 67.819                               | -6.181       | 74.000                |
| 9748.000                 | 13.126                  | 36.970                         | 50.096                               | -23.904      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4874.000                 | 5.812                   | 38.560                         | 44.371                               | -9.629       | 54.000                |
| 7311.000                 | 12.630                  | 38.590                         | 51.219                               | -2.781       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)

| Frequency<br>MHz         | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|--------------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b>        |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4924.000                 | 2.858                   | 52.690                         | 55.547                               | -18.453      | 74.000                |
| 7386.000                 | 12.127                  | 54.550                         | 66.678                               | -7.322       | 74.000                |
| 9848.000                 | 12.852                  | 37.510                         | 50.363                               | -23.637      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4924.000                 | 2.858                   | 37.510                         | 40.367                               | -13.633      | 54.000                |
| 7386.000                 | 12.127                  | 37.150                         | 49.278                               | -4.722       | 54.000                |
| <b>Vertical</b>          |                         |                                |                                      |              |                       |
| <b>Peak Detector:</b>    |                         |                                |                                      |              |                       |
| 4924.000                 | 5.521                   | 53.540                         | 59.060                               | -14.940      | 74.000                |
| 7386.000                 | 13.254                  | 55.650                         | 68.904                               | -5.096       | 74.000                |
| 9848.000                 | 13.367                  | 37.140                         | 50.507                               | -23.493      | 74.000                |
| <b>Average Detector:</b> |                         |                                |                                      |              |                       |
| 4924.000                 | 5.521                   | 37.560                         | 43.080                               | -10.920      | 54.000                |
| 7386.000                 | 13.254                  | 38.560                         | 51.814                               | -2.186       | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Motherboard  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|-------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b> |                         |                                |                                      |              |                       |
| 148.340           | -7.806                  | 37.606                         | 29.800                               | -13.700      | 43.500                |
| 299.660           | -4.751                  | 36.061                         | 31.310                               | -14.690      | 46.000                |
| 460.680           | 4.030                   | 35.270                         | 39.300                               | -6.700       | 46.000                |
| 652.740           | 1.899                   | 35.481                         | 37.380                               | -8.620       | 46.000                |
| 825.400           | 7.346                   | 31.177                         | 38.523                               | -7.477       | 46.000                |
| 949.560           | 7.036                   | 33.892                         | 40.928                               | -5.072       | 46.000                |
| <b>Vertical</b>   |                         |                                |                                      |              |                       |
| 132.820           | -3.932                  | 38.829                         | 34.897                               | -8.603       | 43.500                |
| 299.660           | -4.061                  | 36.318                         | 32.257                               | -13.743      | 46.000                |
| 499.480           | -0.199                  | 37.665                         | 37.465                               | -8.535       | 46.000                |
| 689.600           | 2.302                   | 37.216                         | 39.518                               | -6.482       | 46.000                |
| 848.680           | 0.299                   | 34.123                         | 34.422                               | -11.578      | 46.000                |
| 949.560           | 3.156                   | 33.892                         | 37.048                               | -8.952       | 46.000                |

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Wireless Motherboard  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|-------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b> |                         |                                |                                      |              |                       |
| 132.820           | -7.442                  | 38.829                         | 31.387                               | -12.113      | 43.500                |
| 299.660           | -4.751                  | 36.318                         | 31.567                               | -14.433      | 46.000                |
| 431.580           | 0.757                   | 39.762                         | 40.519                               | -5.481       | 46.000                |
| 598.420           | 3.524                   | 33.283                         | 36.807                               | -9.193       | 46.000                |
| 755.560           | 5.039                   | 35.349                         | 40.388                               | -5.612       | 46.000                |
| 928.220           | 7.230                   | 32.854                         | 40.084                               | -5.916       | 46.000                |
| <b>Vertical</b>   |                         |                                |                                      |              |                       |
| 132.820           | -3.932                  | 38.829                         | 34.897                               | -8.603       | 43.500                |
| 299.660           | -4.061                  | 36.318                         | 32.257                               | -13.743      | 46.000                |
| 499.480           | -0.199                  | 37.665                         | 37.465                               | -8.535       | 46.000                |
| 693.480           | 1.748                   | 38.216                         | 39.964                               | -6.036       | 46.000                |
| 848.680           | 0.299                   | 34.123                         | 34.422                               | -11.578      | 46.000                |
| 967.020           | 3.889                   | 26.834                         | 30.723                               | -23.277      | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Wireless Motherboard  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dB $\mu$ V | Measurement<br>Level<br>dB $\mu$ V/m | Margin<br>dB | Limit<br>dB $\mu$ V/m |
|-------------------|-------------------------|--------------------------------|--------------------------------------|--------------|-----------------------|
| <b>Horizontal</b> |                         |                                |                                      |              |                       |
| 148.340           | -7.806                  | 37.606                         | 29.800                               | -13.700      | 43.500                |
| 299.660           | -4.751                  | 36.318                         | 31.567                               | -14.433      | 46.000                |
| 431.580           | 0.757                   | 39.762                         | 40.519                               | -5.481       | 46.000                |
| 598.420           | 3.524                   | 33.283                         | 36.807                               | -9.193       | 46.000                |
| 718.700           | 3.818                   | 37.849                         | 41.667                               | -4.333       | 46.000                |
| 926.280           | 6.832                   | 32.457                         | 39.289                               | -6.711       | 46.000                |
| <b>Vertical</b>   |                         |                                |                                      |              |                       |
| 132.820           | -3.932                  | 38.829                         | 34.897                               | -8.603       | 43.500                |
| 299.660           | -4.061                  | 36.329                         | 32.268                               | -13.732      | 46.000                |
| 460.680           | -1.930                  | 35.270                         | 33.340                               | -12.660      | 46.000                |
| 660.500           | -1.111                  | 35.328                         | 34.217                               | -11.783      | 46.000                |
| 840.920           | 2.284                   | 31.101                         | 33.385                               | -12.615      | 46.000                |
| 967.020           | 3.889                   | 26.914                         | 30.803                               | -23.197      | 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. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.



**5. RF antenna conducted test**

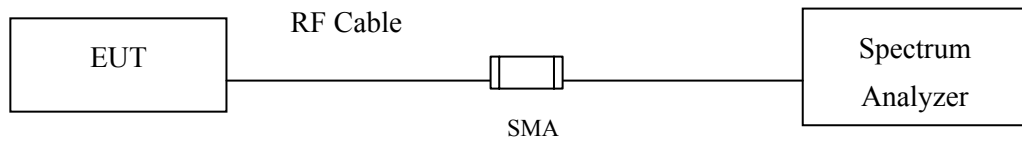
**5.1. Test Equipment**

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal.  |
|---|-------------------|--------------|----------------------|------------|
|   | Spectrum Analyzer | R&S          | FSP40 / 100170       | Jun., 2013 |
|   | Spectrum Analyzer | Agilent      | E4407B / US39440758  | Jun., 2013 |
| X | Spectrum Analyzer | Agilent      | N9010A / MY48030495  | Apr., 2014 |

- 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 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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

## 5.5. Uncertainty

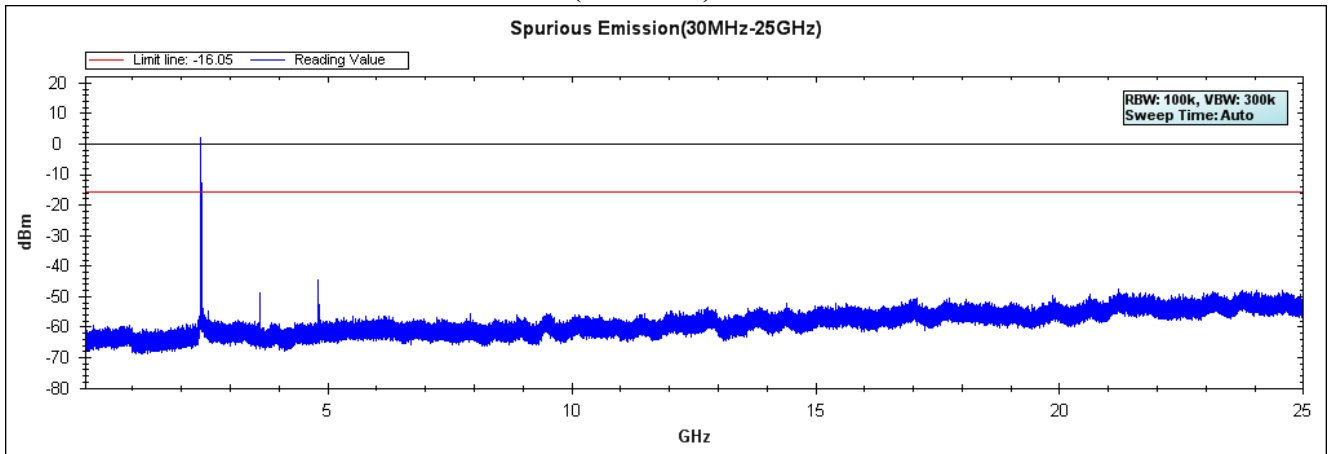
The measurement uncertainty

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

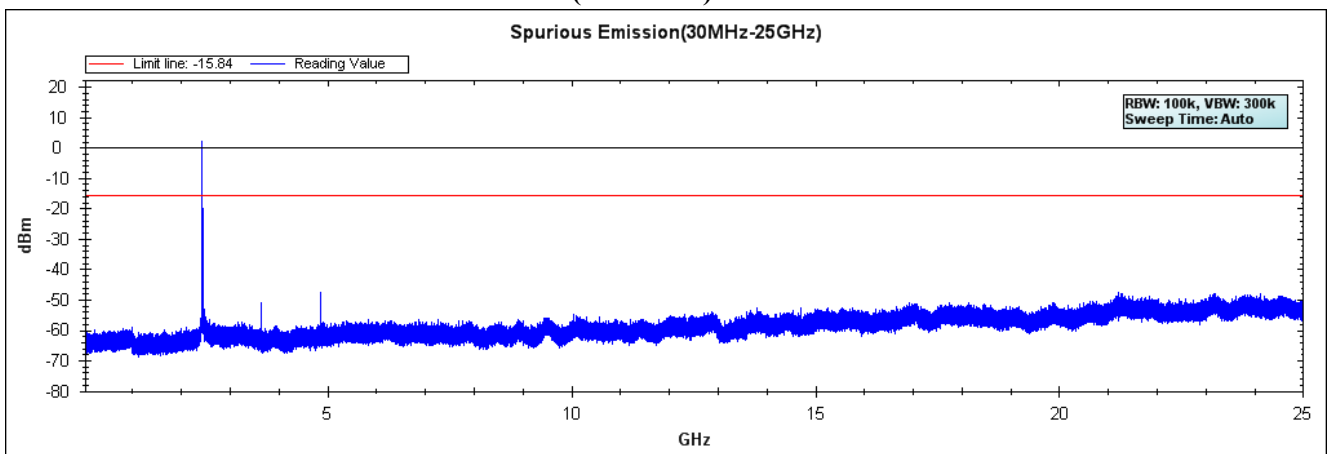
### 5.6. Test Result of RF antenna conducted test

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

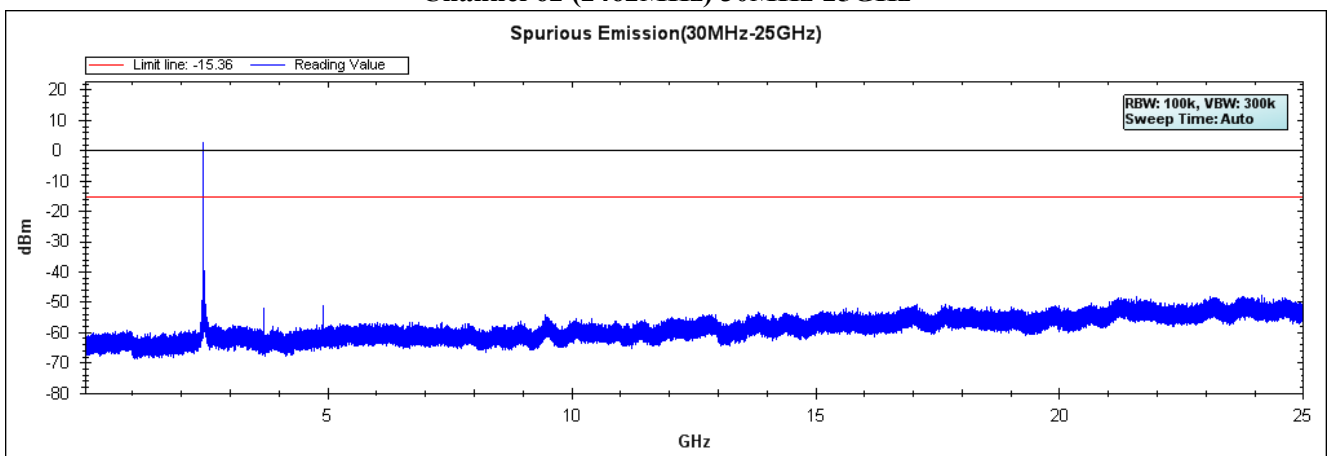
**Channel 01 (2412MHz) 30MHz-25GHz**



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



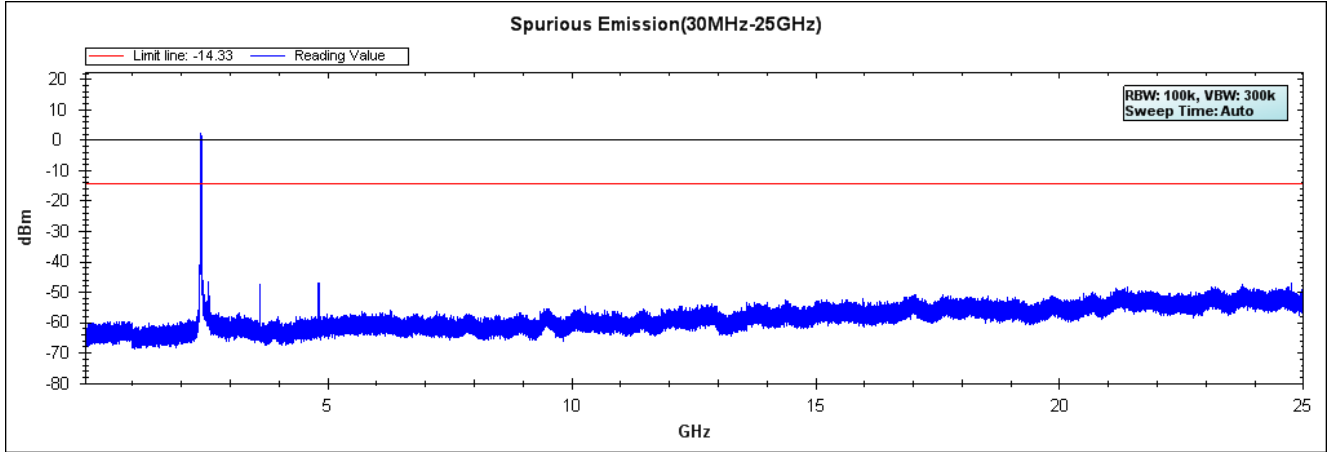
**Channel 62 (2462MHz) 30MHz-25GHz**



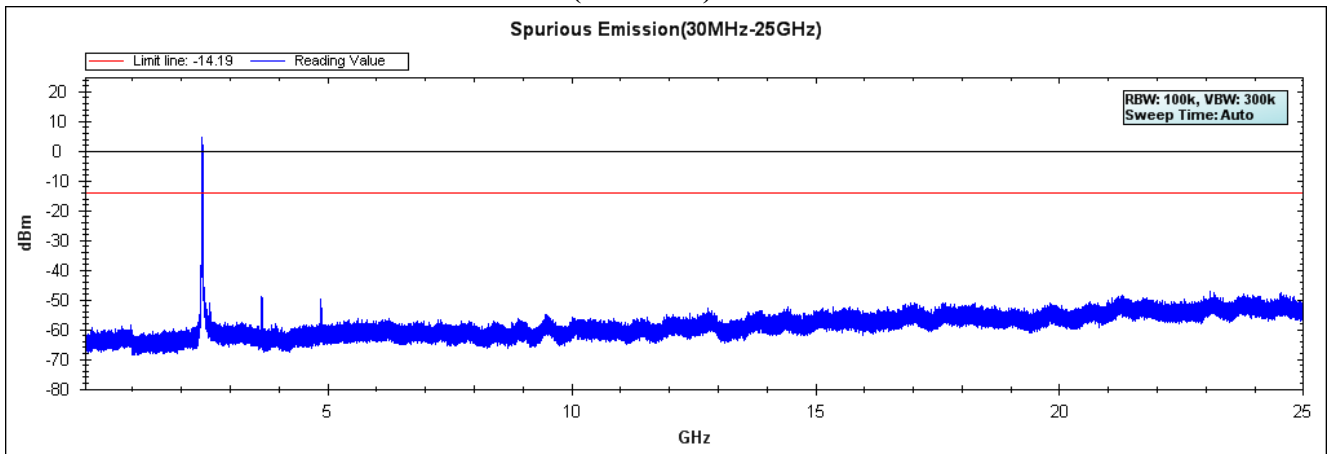
Note: The above test pattern is synthesized by multiple of the frequency range.

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

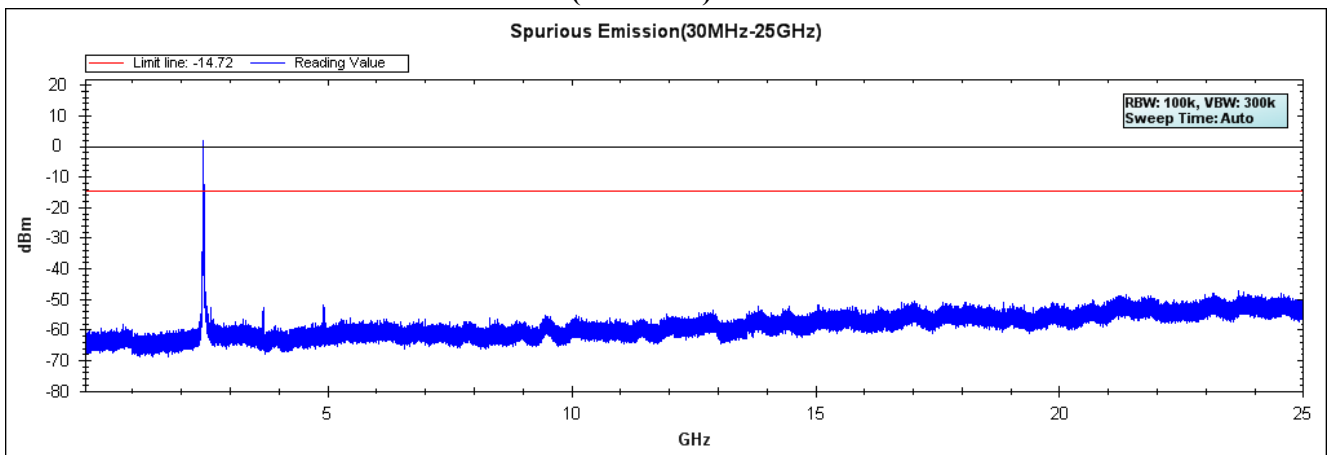
**Channel 01 (2412MHz) 30MHz-25GHz**



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



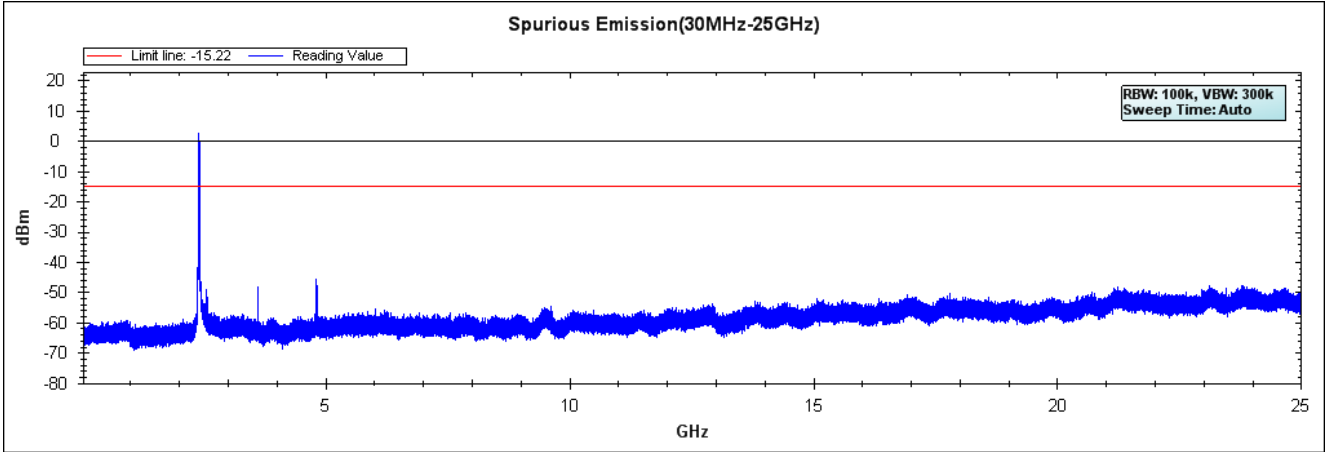
**Channel 11 (2462MHz) 30MHz-25GHz**



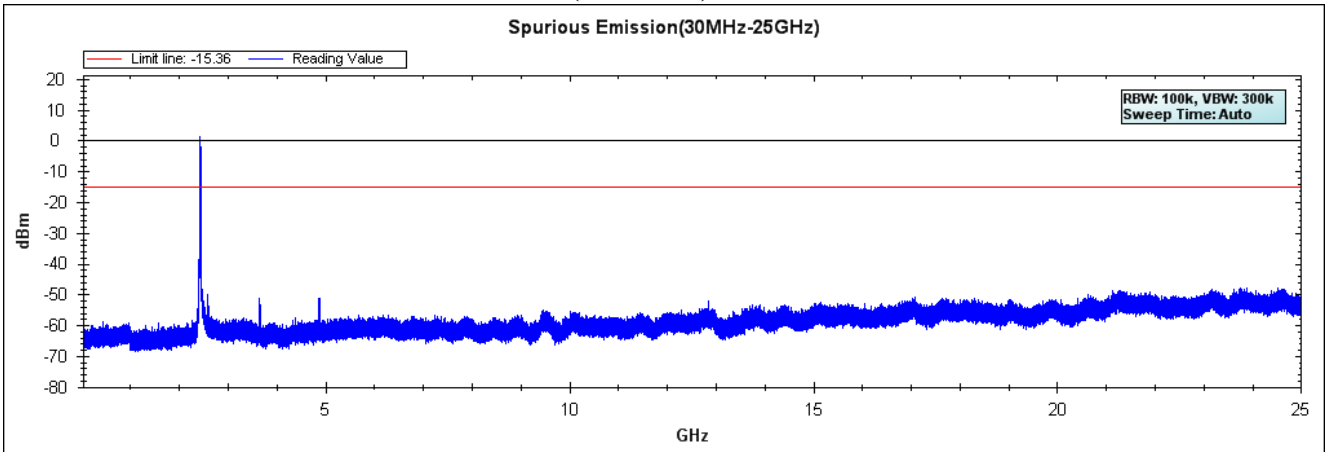
Note: The above test pattern is synthesized by multiple of the frequency range.

Product : Wireless Motherboard  
Test Item : RF Antenna Conducted Spurious  
Test Site : No.3 OATS  
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

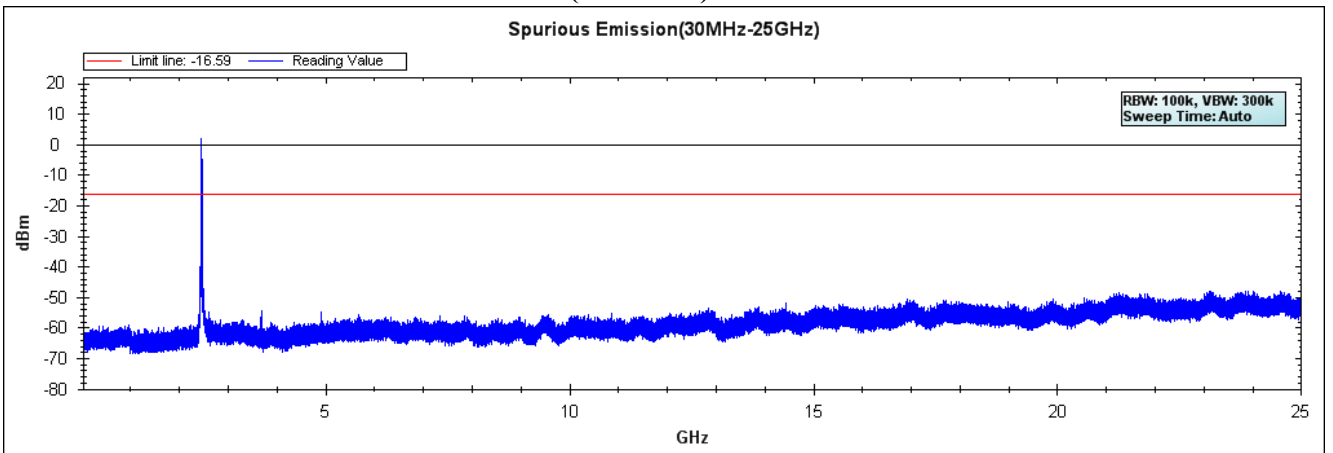
**Channel 01 (2412MHz) 30MHz-25GHz**



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



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



Note: The above test pattern is synthesized by multiple of the frequency range.

**6. Band Edge**

**6.1. Test Equipment**

**RF Radiated Measurement:**

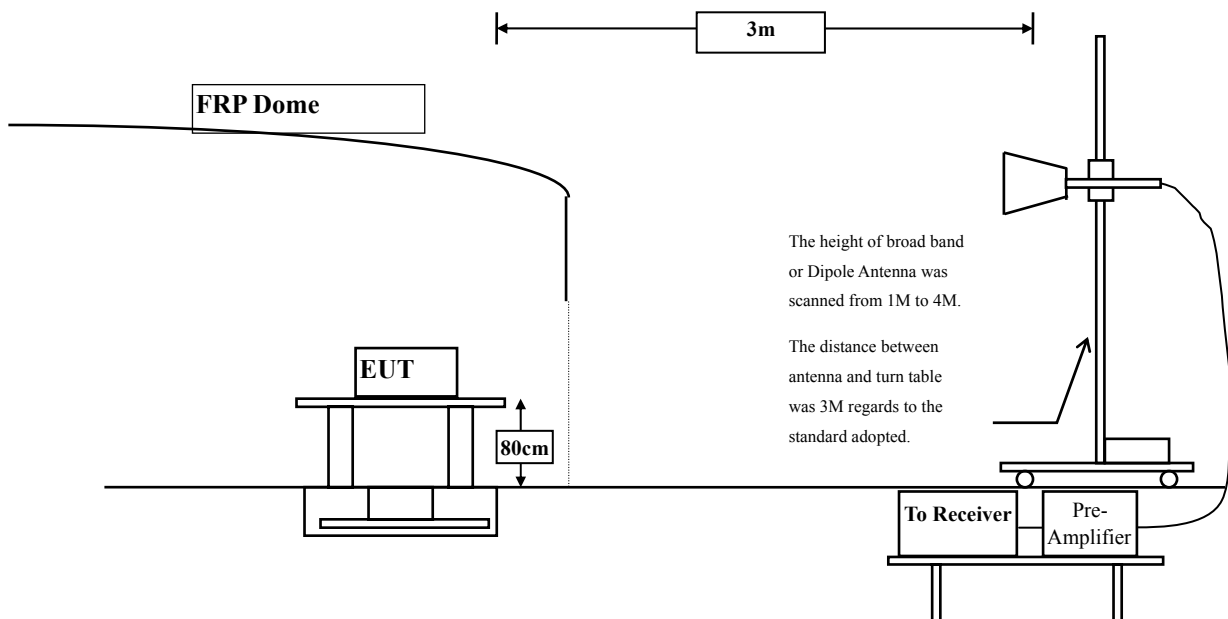
The following test equipments are used during the band edge tests:

| Test Site  | Equipment           | Manufacturer    | Model No./Serial No.  | Last Cal.  |
|------------|---------------------|-----------------|-----------------------|------------|
| ☒ Site # 3 | Bilog Antenna       | Schaffner Chase | CBL6112B/2673         | Sep., 2013 |
|            | X Horn Antenna      | Schwarzbeck     | BBHA9120D/D305        | Sep., 2013 |
|            | Horn Antenna        | Schwarzbeck     | BBHA9170/208          | Jul., 2013 |
|            | X Pre-Amplifier     | Agilent         | 8447D/2944A09549      | Sep., 2013 |
|            | X Spectrum Analyzer | Agilent         | E4407B / US39440758   | May, 2013  |
|            | Test Receiver       | R & S           | ESCS 30/ 825442/018   | Sep., 2013 |
|            | X Coaxial Cable     | Quietek         | QTK-CABLE/ CAB5       | Feb., 2014 |
|            | 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 C63.10: 2009 and tested according to DTS test procedure of 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 C63.10: 2009 on radiated measurement.

### 6.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

### 6.6. Test Result of Band Edge

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

#### RF Radiated Measurement (Horizontal):

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2389.400        | 31.507              | 25.942               | 57.449                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2390.000        | 31.509              | 24.973               | 56.482                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2400.000        | 31.561              | 32.547               | 64.108                  | --                  | --                     | Pass   |
| 01 (Peak)    | 2413.000        | 31.646              | 74.393               | 106.039                 | --                  | --                     | Pass   |
| 01 (Average) | 2388.400        | 31.503              | 14.268               | 45.771                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2390.000        | 31.509              | 13.786               | 45.295                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2400.000        | 31.561              | 26.635               | 58.196                  | --                  | --                     | Pass   |
| 01 (Average) | 2412.800        | 31.645              | 69.847               | 101.491                 | --                  | --                     | Pass   |

Figure Channel 01: Horizontal (Peak)

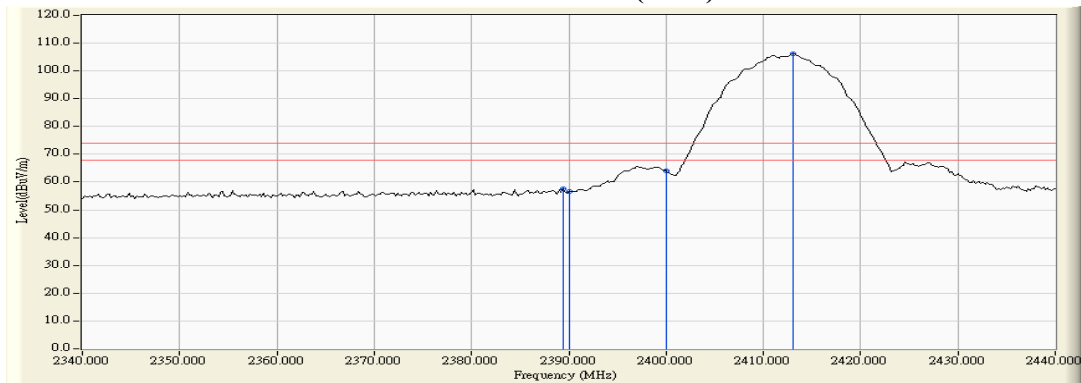
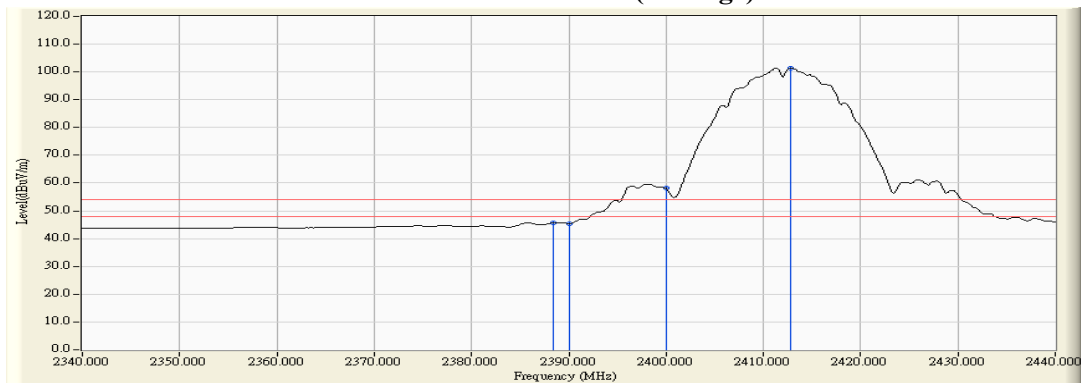


Figure Channel 01: Horizontal (Average)



- 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.

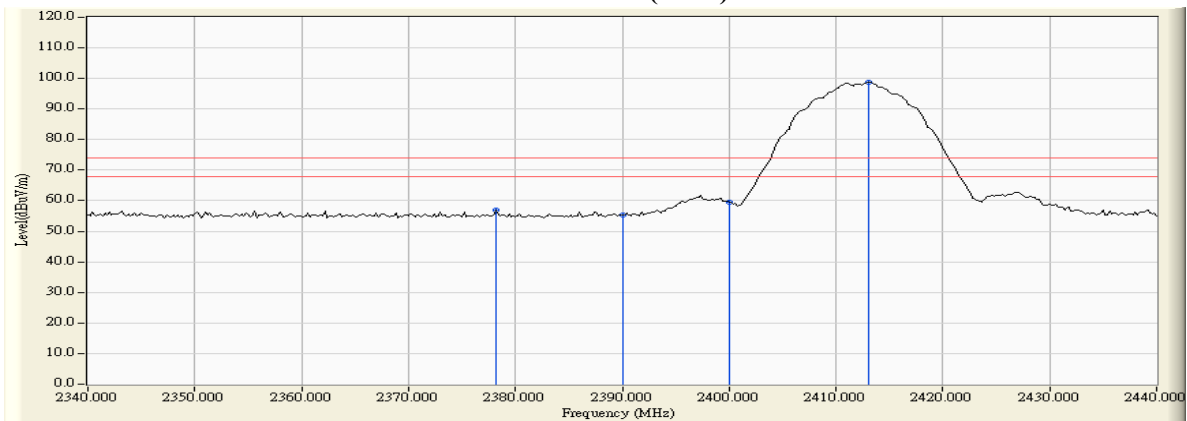


Product : Wireless Motherboard  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

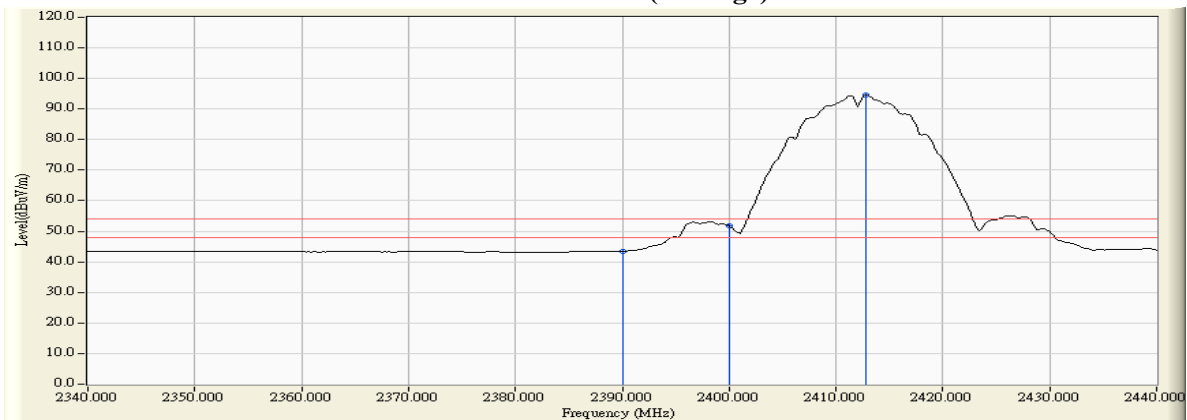
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2378.200        | 30.970              | 26.040               | 57.010                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2390.000        | 30.915              | 24.574               | 55.489                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2400.000        | 30.912              | 28.743               | 59.655                  | --                  | --                     | Pass   |
| 01 (Peak)    | 2413.000        | 30.956              | 67.824               | 98.780                  | --                  | --                     | Pass   |
| 01 (Average) | 2390.000        | 30.915              | 12.557               | 43.472                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2400.000        | 30.912              | 20.748               | 51.660                  | --                  | --                     | Pass   |
| 01 (Average) | 2412.800        | 30.955              | 63.550               | 94.505                  | --                  | --                     | Pass   |

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



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



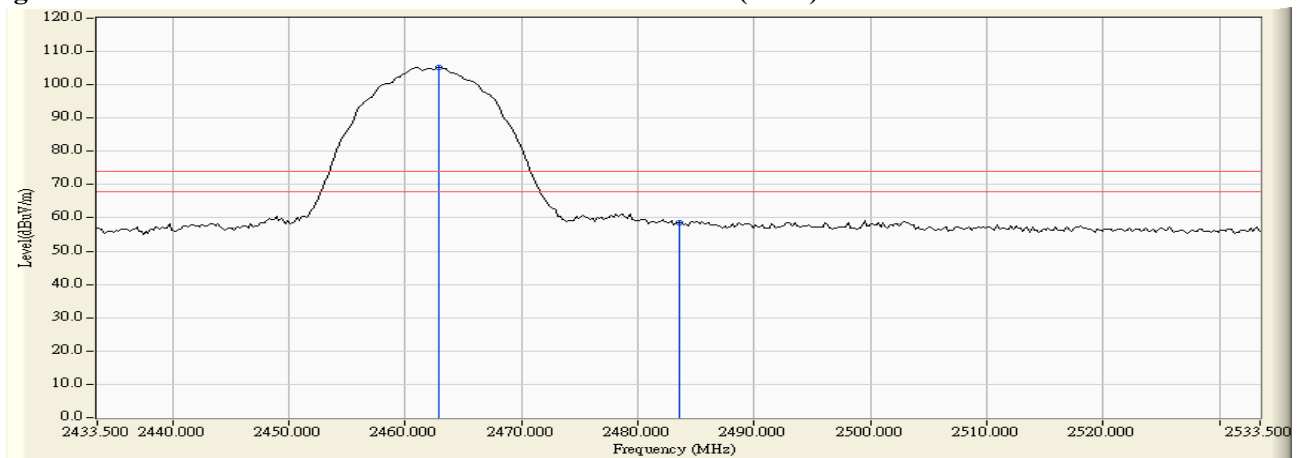
- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.  
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.  
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.  
 4. “ \* ”, means this data is the worst emission level.  
 5. Measurement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

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

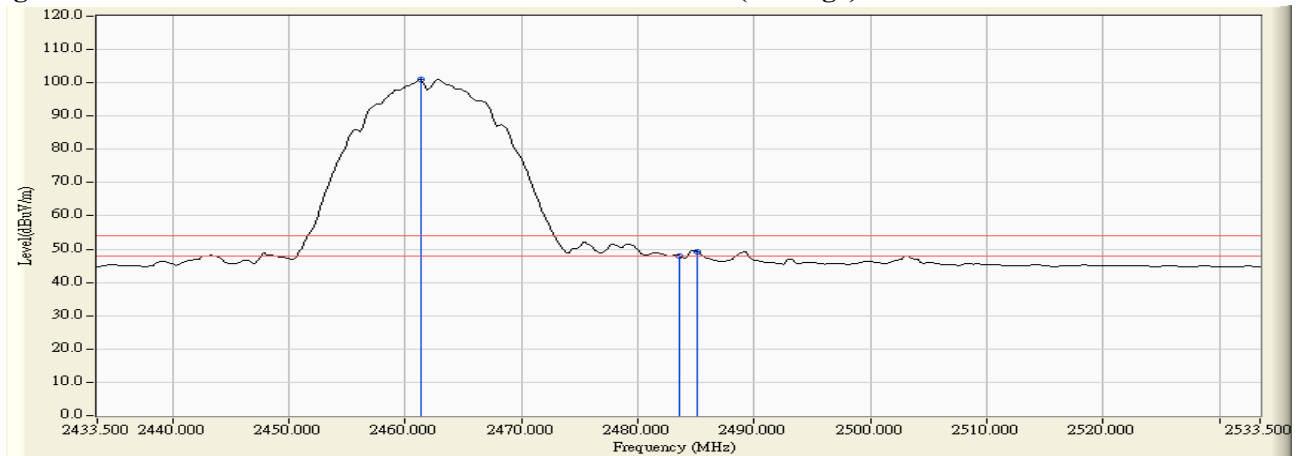
**RF Radiated Measurement (Horizontal):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2462.900        | 32.026              | 73.333               | 105.359                 | --                  | --                     | Pass   |
| 11 (Peak)    | 2483.500        | 32.182              | 26.303               | 58.485                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2461.300        | 32.014              | 68.947               | 100.961                 | --                  | --                     | Pass   |
| 11 (Average) | 2483.500        | 32.182              | 15.833               | 48.015                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2485.100        | 32.194              | 17.068               | 49.262                  | 74.00               | 54.00                  | Pass   |

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



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



**Note:**

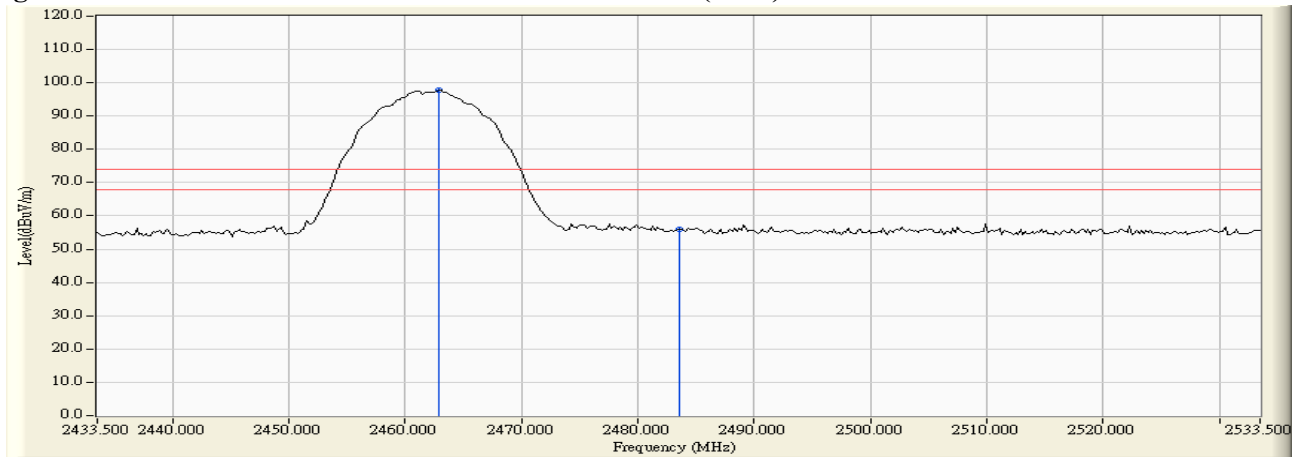
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

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

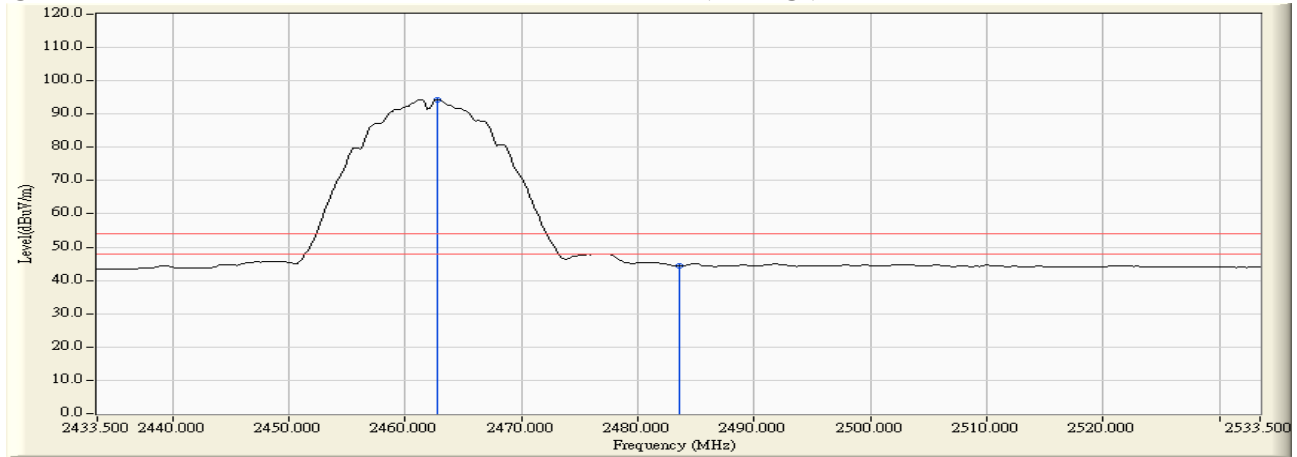
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2462.900        | 31.296              | 66.458               | 97.754                  | --                  | --                     | Pass   |
| 11 (Peak)    | 2483.500        | 31.435              | 24.643               | 56.078                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2462.700        | 31.295              | 63.119               | 94.414                  | --                  | --                     | Pass   |
| 11 (Average) | 2483.500        | 31.435              | 12.913               | 44.348                  | 74.00               | 54.00                  | Pass   |

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



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



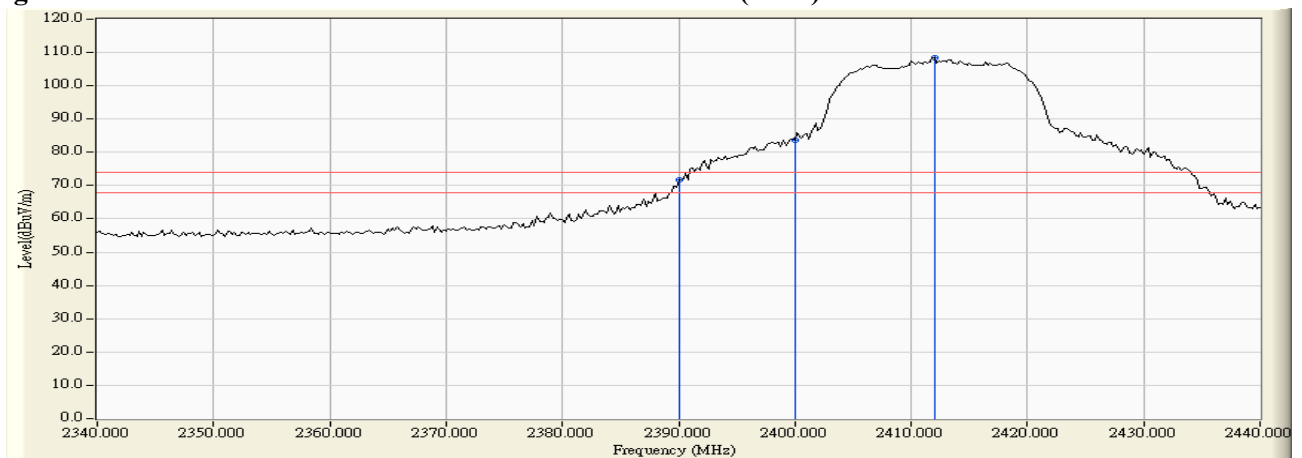
- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.  
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.  
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.  
 4. “ \* ”, means this data is the worst emission level.  
 5. Measurement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

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

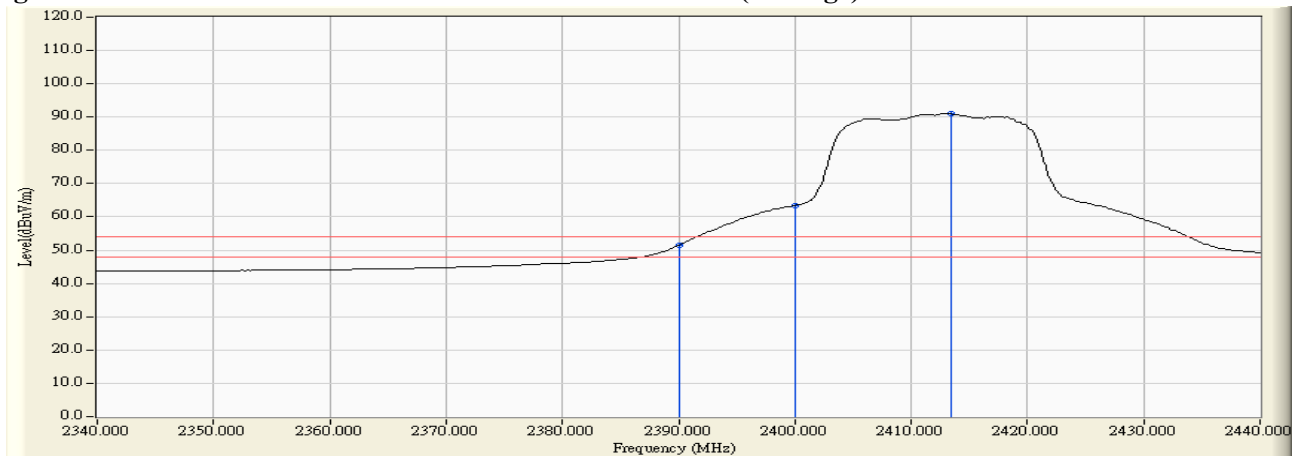
**RF Radiated Measurement (Horizontal):**

| Channel No. | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|-------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)   | 2390.000        | 31.509              | 40.167               | 71.676                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)   | 2400.000        | 31.561              | 52.230               | 83.791                  | --                  | --                     | Pass   |
| 01 (Peak)   | 2412.000        | 31.639              | 76.915               | 108.553                 | --                  | --                     | Pass   |
| 01(Average) | 2390.000        | 31.509              | 19.856               | 51.365                  | 74.00               | 54.00                  | Pass   |
| 01(Average) | 2400.000        | 31.561              | 31.864               | 63.425                  | --                  | --                     | Pass   |
| 01(Average) | 2413.400        | 31.649              | 59.479               | 91.128                  | --                  | --                     | Pass   |

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



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



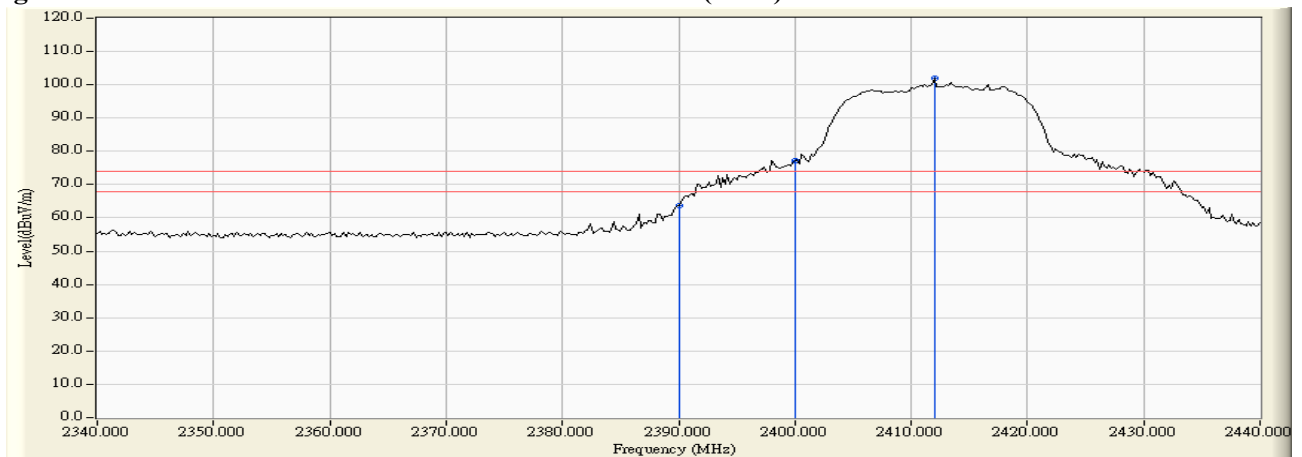
- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.  
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.  
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.  
 4. “ \* ”, means this data is the worst emission level.  
 5. Measurement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

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

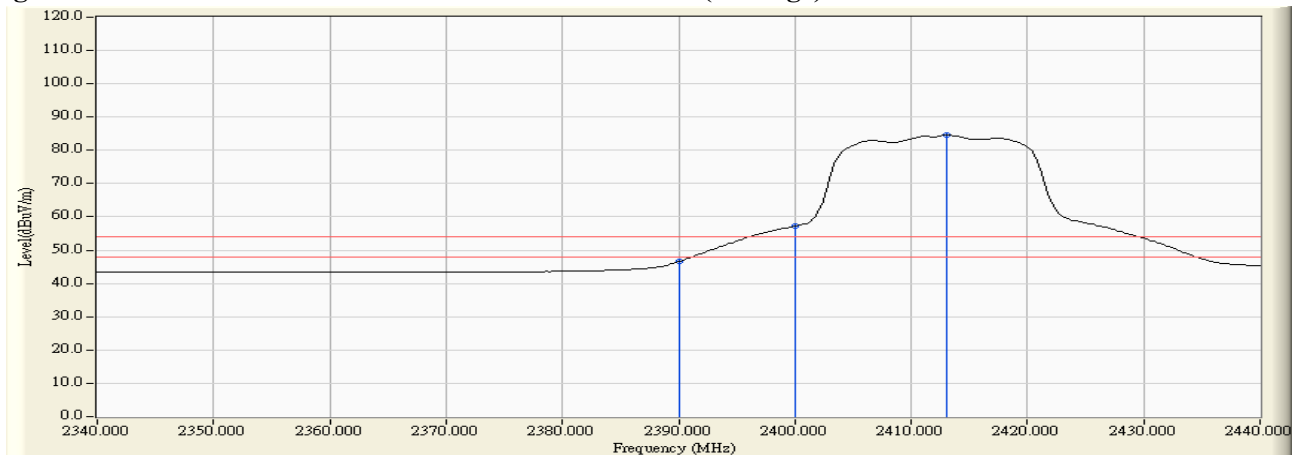
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2390.000        | 30.915              | 32.922               | 63.837                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2400.000        | 30.912              | 46.398               | 77.310                  | --                  | --                     | Pass   |
| 01 (Peak)    | 2412.000        | 30.950              | 70.999               | 101.948                 | --                  | --                     | Pass   |
| 01 (Average) | 2390.000        | 30.915              | 15.593               | 46.508                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2400.000        | 30.912              | 26.220               | 57.132                  | --                  | --                     | Pass   |
| 01 (Average) | 2413.000        | 30.956              | 53.584               | 84.540                  | --                  | --                     | Pass   |

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



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



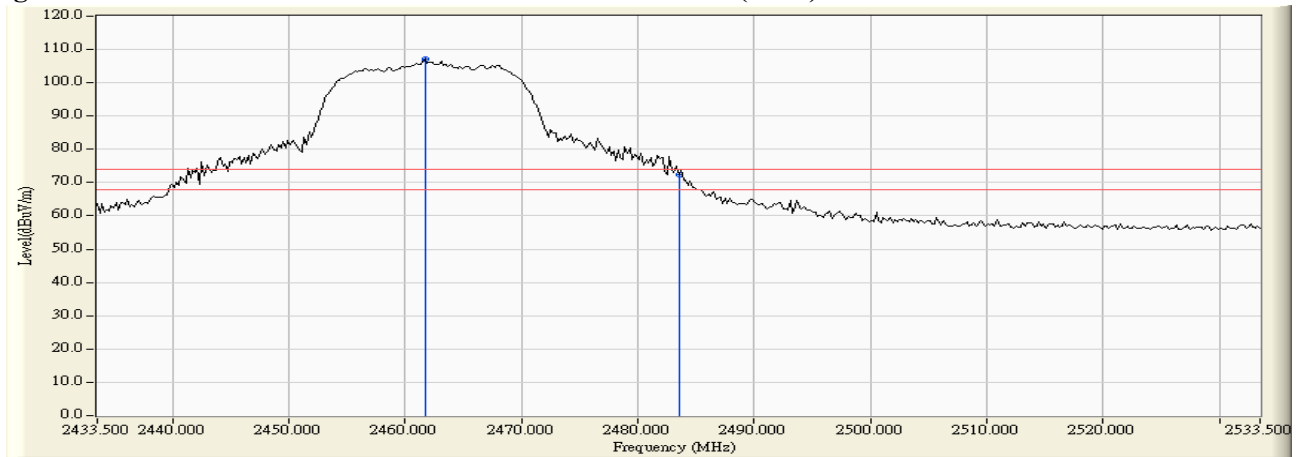
- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.  
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.  
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.  
 4. “ \* ”, means this data is the worst emission level.  
 5. Measurement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

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

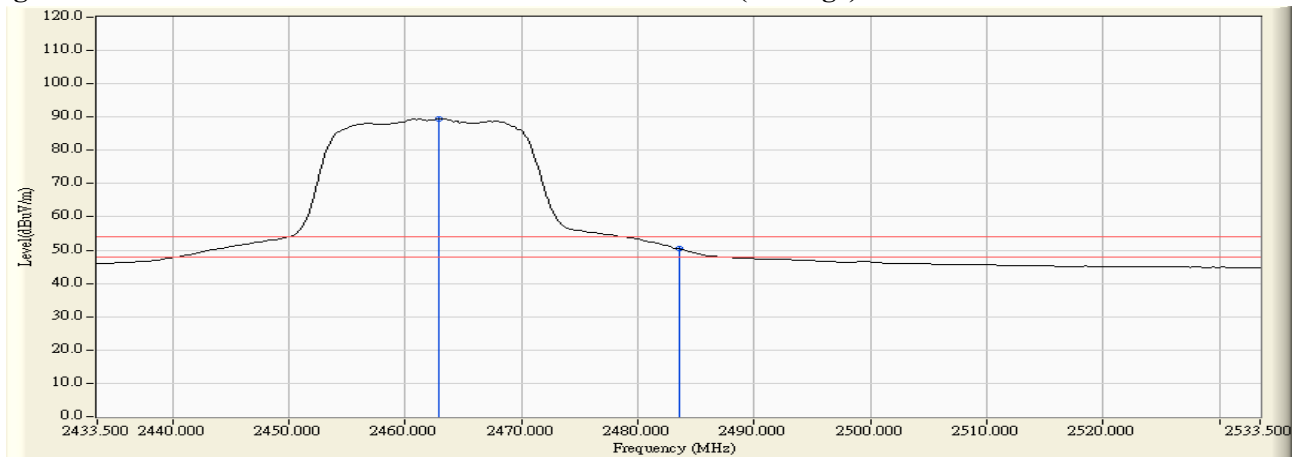
**RF Radiated Measurement (Horizontal):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2461.700        | 32.017              | 75.052               | 107.069                 | --                  | --                     | Pass   |
| 11 (Peak)    | 2483.500        | 32.182              | 40.326               | 72.508                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2462.900        | 32.026              | 57.486               | 89.512                  | --                  | --                     | Pass   |
| 11 (Average) | 2483.500        | 32.182              | 18.208               | 50.390                  | 74.00               | 54.00                  | Pass   |

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



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



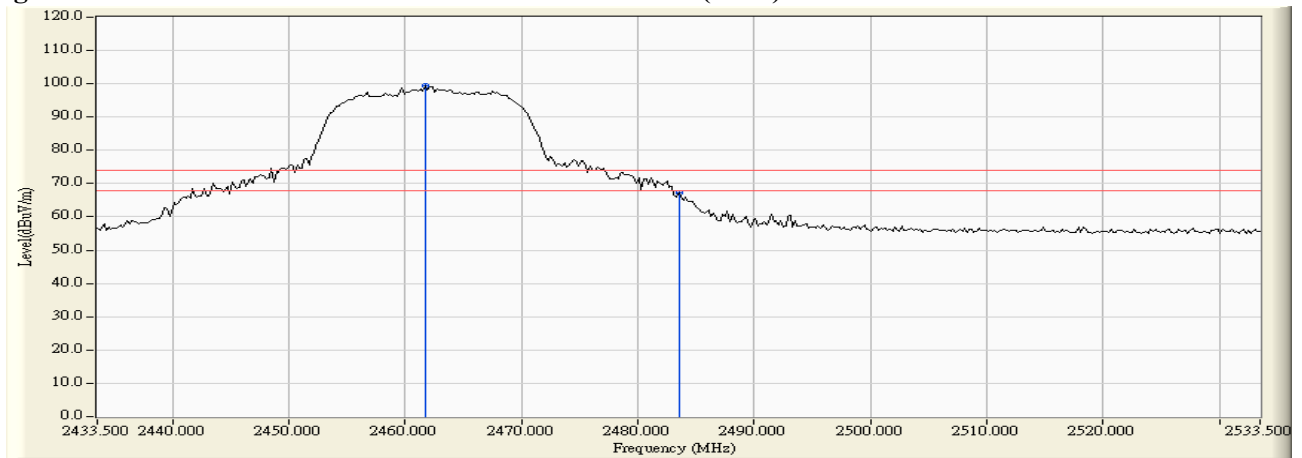
- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.  
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.  
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.  
 4. “ \* ”, means this data is the worst emission level.  
 5. Measurement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

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

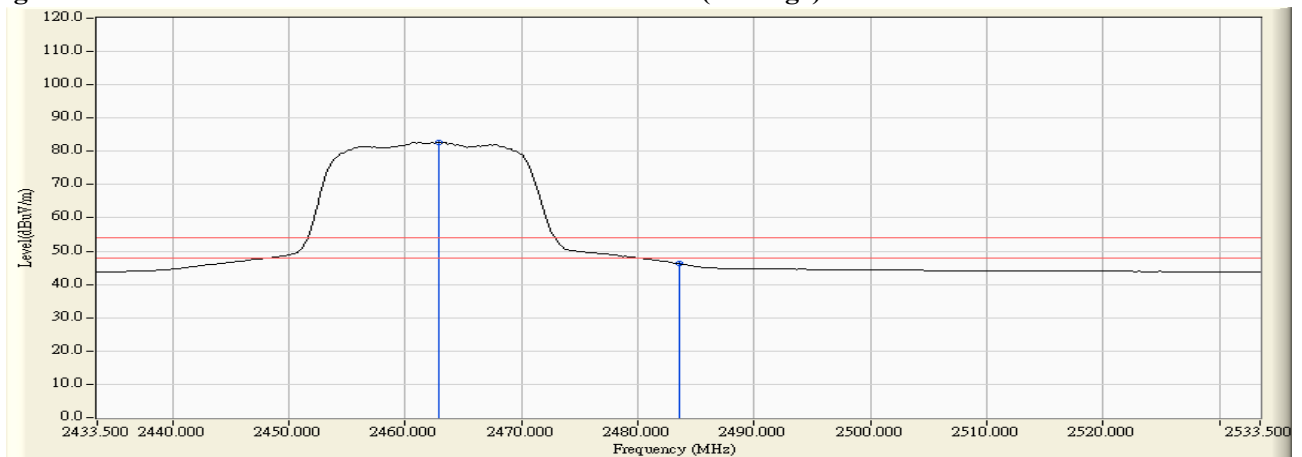
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2461.700        | 31.288              | 68.267               | 99.555                  | --                  | --                     | Pass   |
| 11 (Peak)    | 2483.500        | 31.435              | 35.657               | 67.092                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2462.900        | 31.296              | 51.510               | 82.806                  | --                  | --                     | Pass   |
| 11 (Average) | 2483.500        | 31.435              | 14.757               | 46.192                  | 74.00               | 54.00                  | Pass   |

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



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



Note:

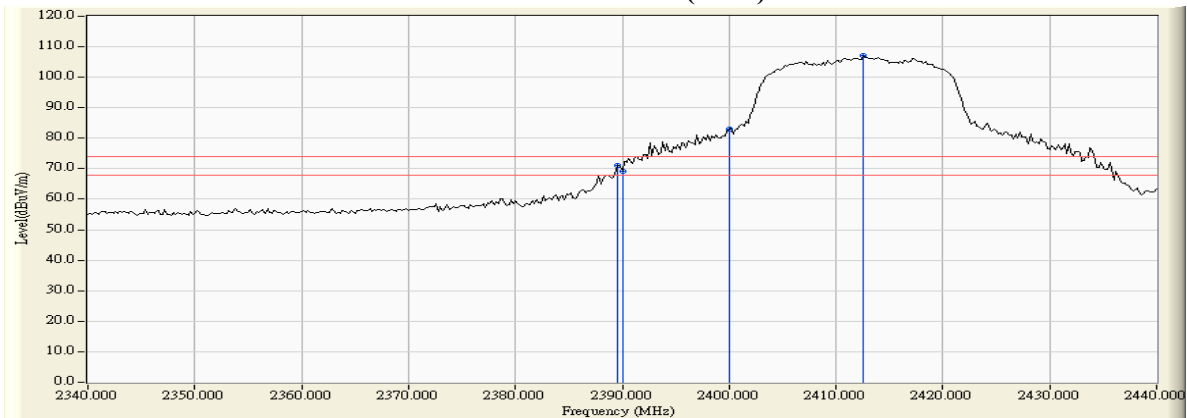
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : Wireless Motherboard  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

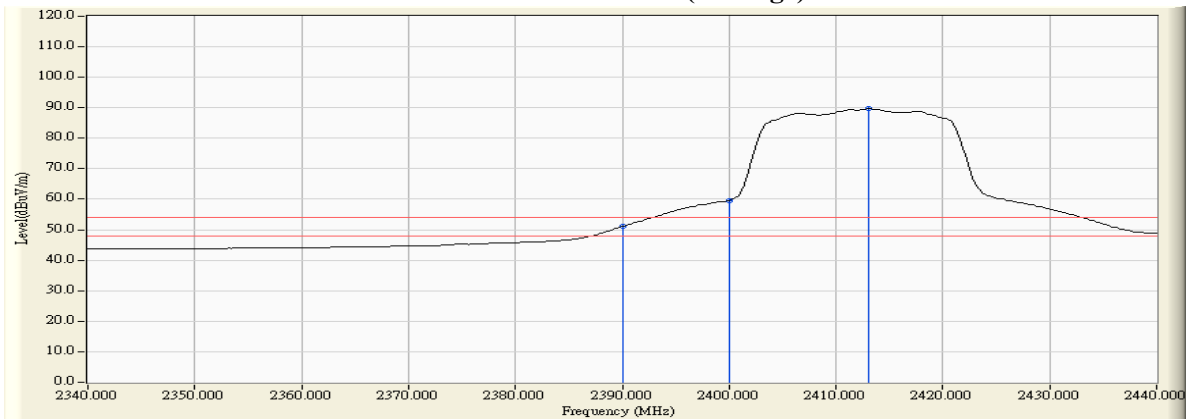
**RF Radiated Measurement (Horizontal):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2389.600        | 31.508              | 39.667               | 71.175                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2390.000        | 31.509              | 37.696               | 69.205                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2400.000        | 31.561              | 51.439               | 83.000                  | --                  | --                     | Pass   |
| 01 (Peak)    | 2412.600        | 31.642              | 75.462               | 107.105                 | --                  | --                     | Pass   |
| 01 (Average) | 2390.000        | 31.509              | 19.488               | 50.997                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2400.000        | 31.561              | 28.021               | 59.582                  | --                  | --                     | Pass   |
| 01 (Average) | 2413.000        | 31.646              | 58.034               | 89.680                  | --                  | --                     | 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.

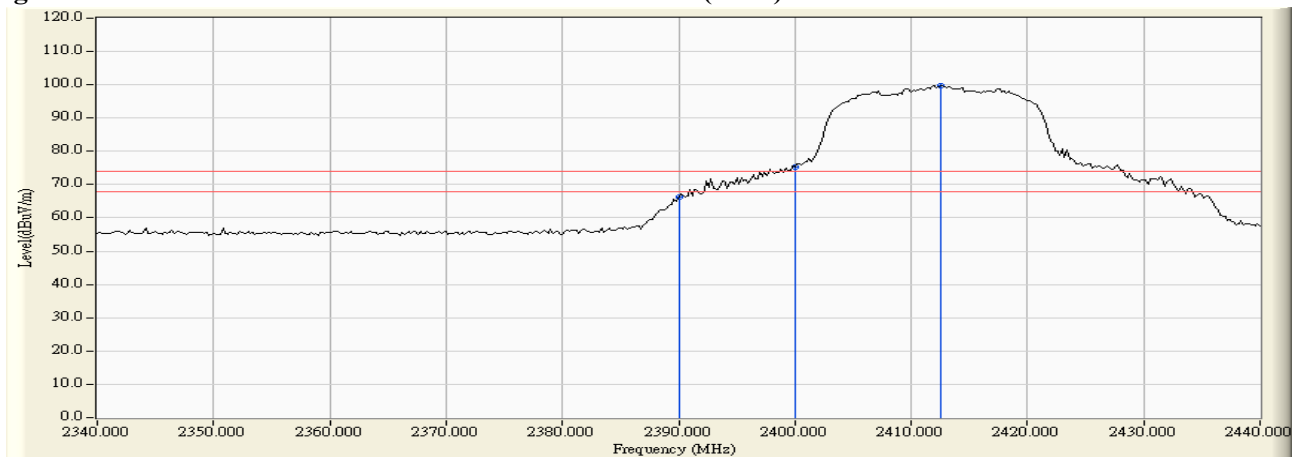


Product : Wireless Motherboard  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

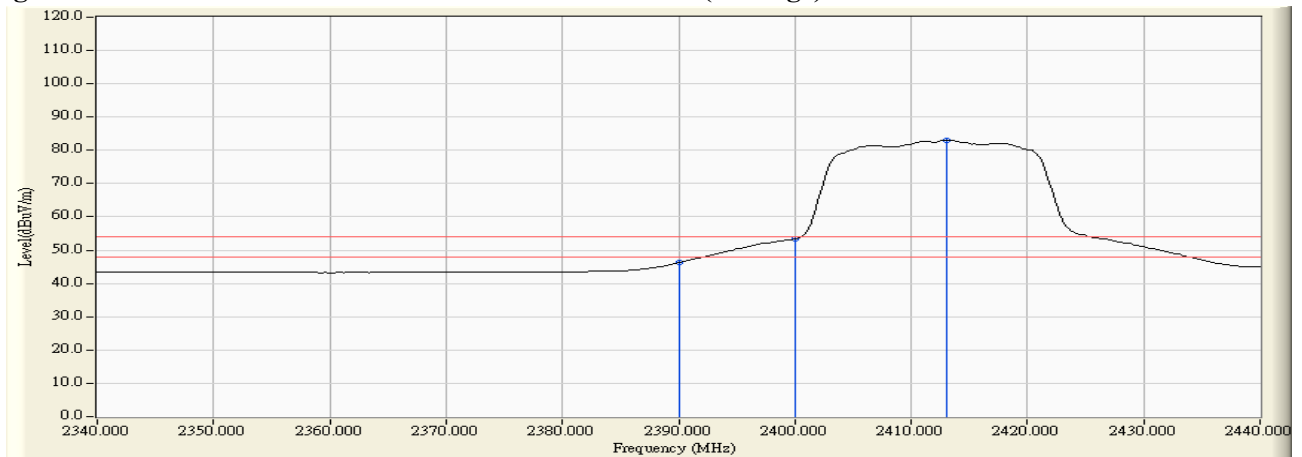
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 01 (Peak)    | 2390.000        | 30.915              | 35.200               | 66.115                  | 74.00               | 54.00                  | Pass   |
| 01 (Peak)    | 2400.000        | 30.912              | 44.244               | 75.156                  | --                  | --                     | Pass   |
| 01 (Peak)    | 2412.600        | 30.953              | 68.860               | 99.813                  | --                  | --                     | Pass   |
| 01 (Average) | 2390.000        | 30.915              | 15.337               | 46.252                  | 74.00               | 54.00                  | Pass   |
| 01 (Average) | 2400.000        | 30.912              | 22.361               | 53.273                  | --                  | --                     | Pass   |
| 01 (Average) | 2413.000        | 30.956              | 52.173               | 83.129                  | --                  | --                     | Pass   |

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



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



Note:

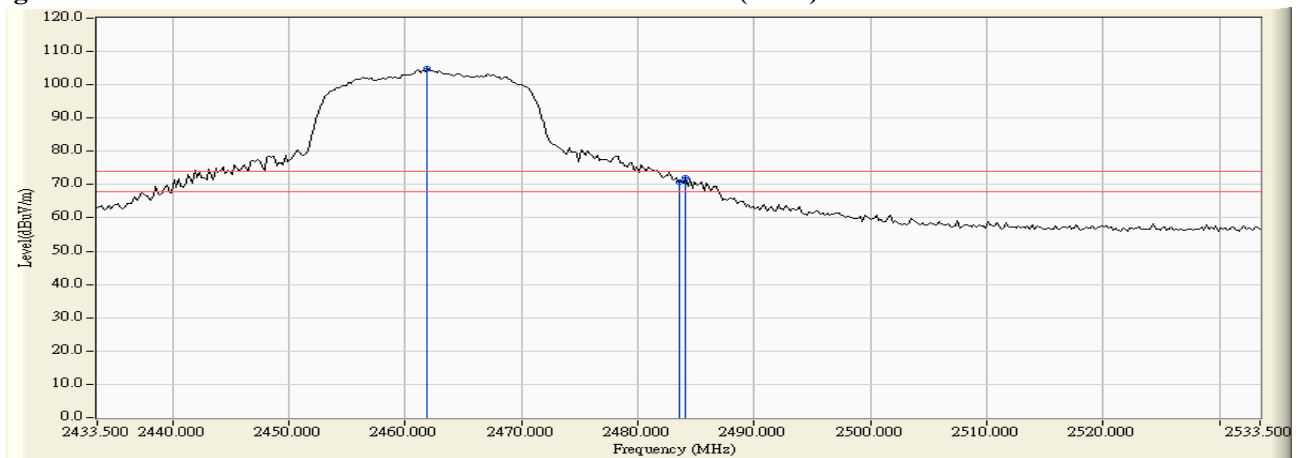
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : Wireless Motherboard  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

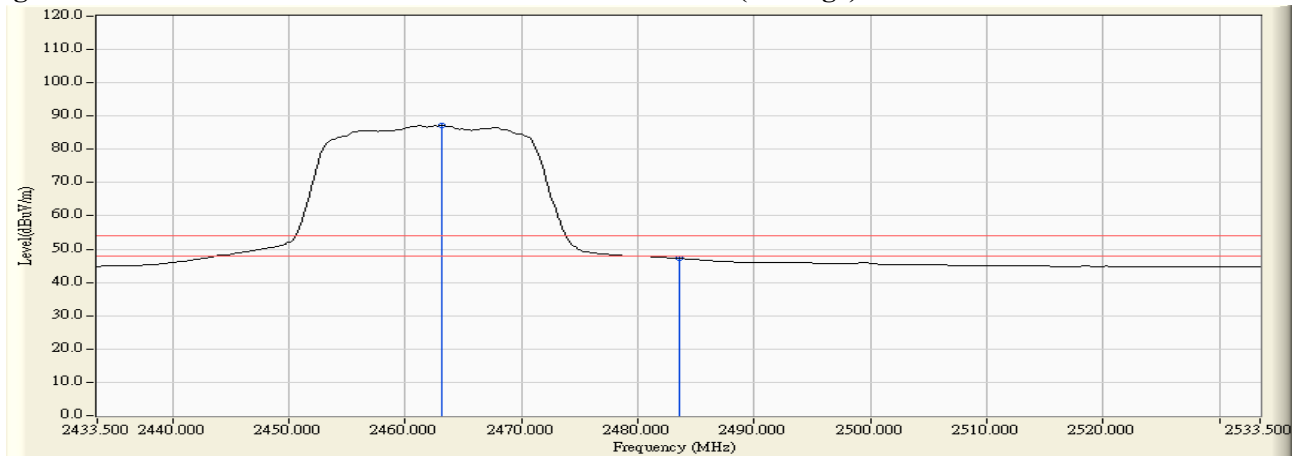
**RF Radiated Measurement (Horizontal):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2461.900        | 32.018              | 72.896               | 104.915                 | --                  | --                     | Pass   |
| 11 (Peak)    | 2483.500        | 32.182              | 38.445               | 70.627                  | 74.00               | 54.00                  | Pass   |
| 11 (Peak)    | 2484.100        | 32.186              | 39.891               | 72.078                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2463.100        | 32.028              | 55.150               | 87.178                  | --                  | --                     | Pass   |
| 11 (Average) | 2483.500        | 32.182              | 15.071               | 47.253                  | 74.00               | 54.00                  | Pass   |

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



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



Note:

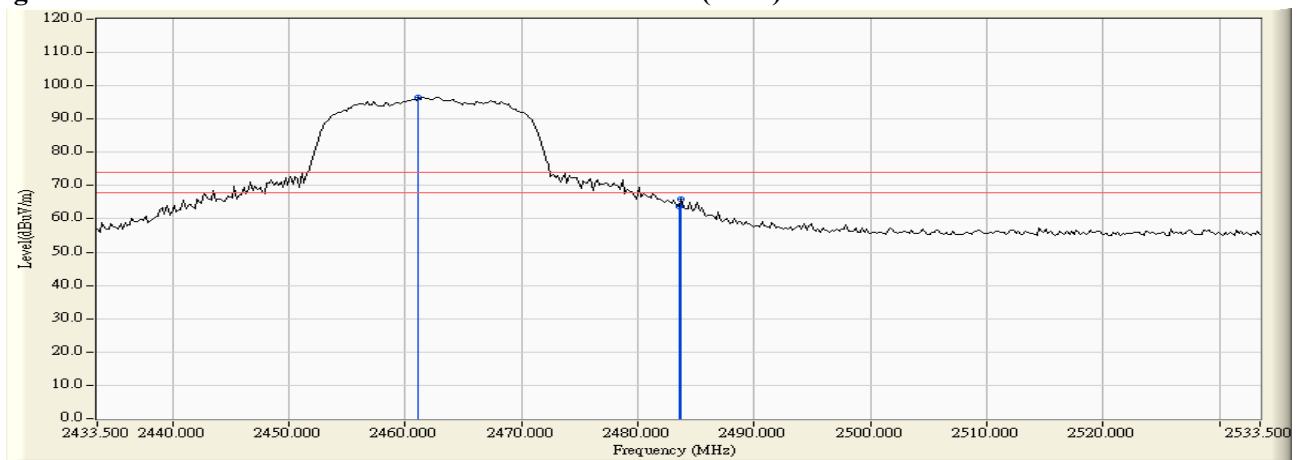
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : Wireless Motherboard  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

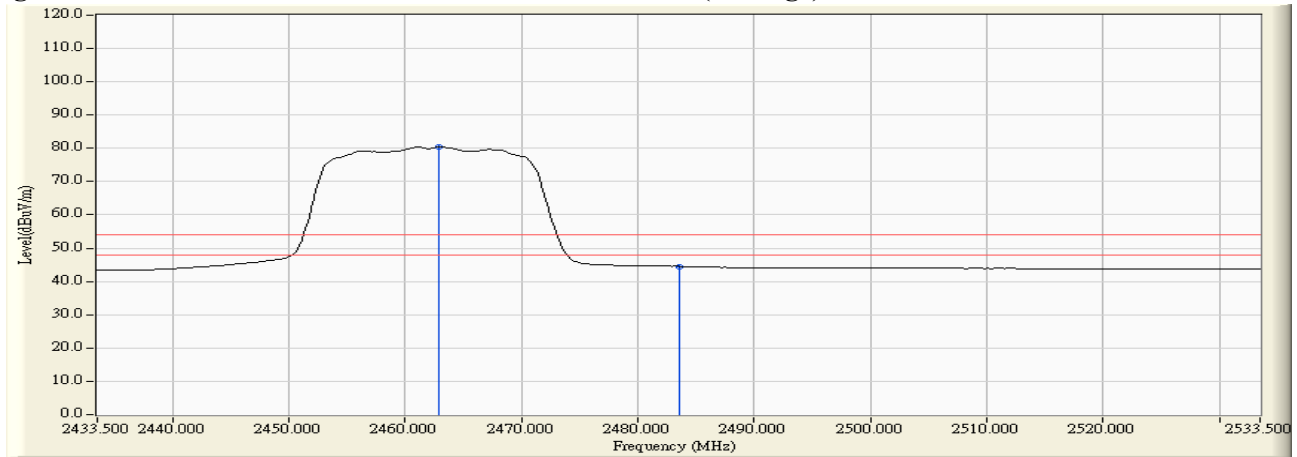
**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Correct Factor (dB) | Reading Level (dBμV) | Emission Level (dBμV/m) | Peak Limit (dBμV/m) | Average Limit (dBμV/m) | Result |
|--------------|-----------------|---------------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2461.100        | 31.285              | 65.351               | 96.635                  | --                  | --                     | Pass   |
| 11 (Peak)    | 2483.500        | 31.435              | 32.213               | 63.648                  | 74.00               | 54.00                  | Pass   |
| 11 (Peak)    | 2483.700        | 31.437              | 34.476               | 65.913                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | 2462.900        | 31.296              | 49.144               | 80.440                  | --                  | --                     | Pass   |
| 11 (Average) | 2483.500        | 31.435              | 13.121               | 44.556                  | 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

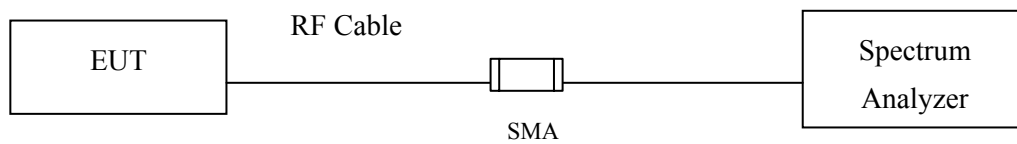
### 7.1. Test Equipment

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal.  |
|---|-------------------|--------------|----------------------|------------|
|   | Spectrum Analyzer | R&S          | FSP40 / 100170       | Jun., 2013 |
|   | Spectrum Analyzer | Agilent      | E4407B / US39440758  | Jun., 2013 |
| X | Spectrum Analyzer | Agilent      | N9010A / MY48030495  | Apr., 2014 |

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.

### 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 C63.10: 2009; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

### 7.5. Uncertainty

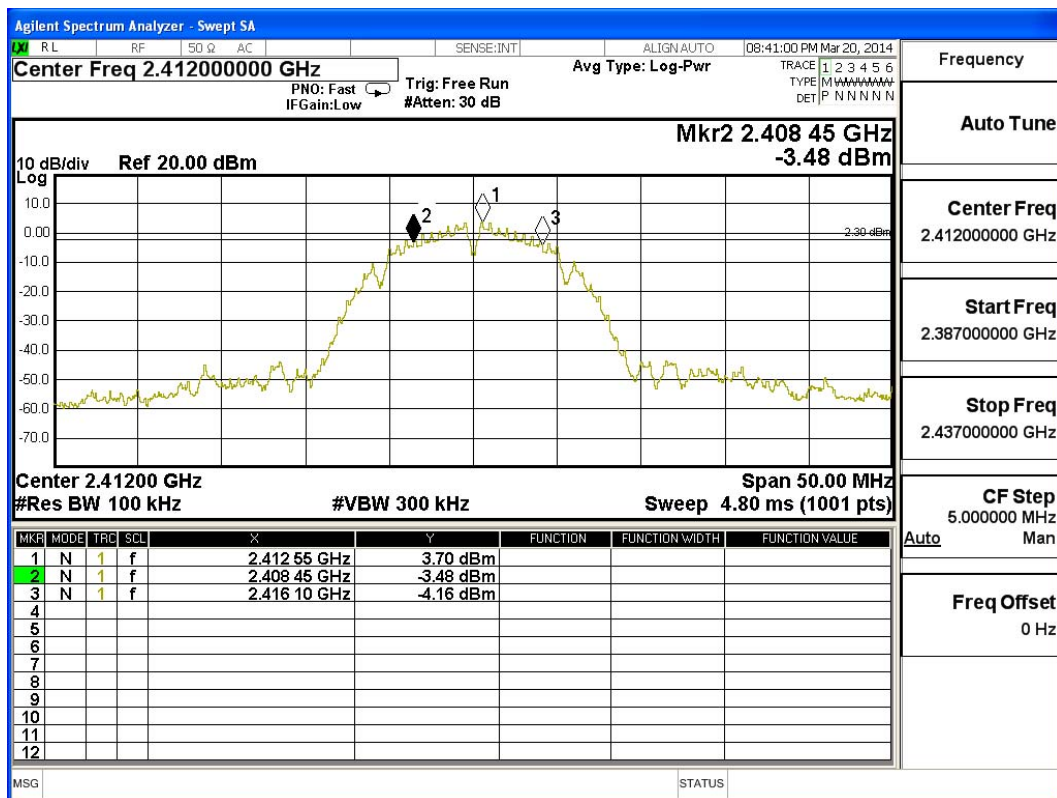
± 150Hz

### 7.6. Test Result of Occupied Bandwidth

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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 1           | 2412            | 7650                    | >500                 | Pass   |

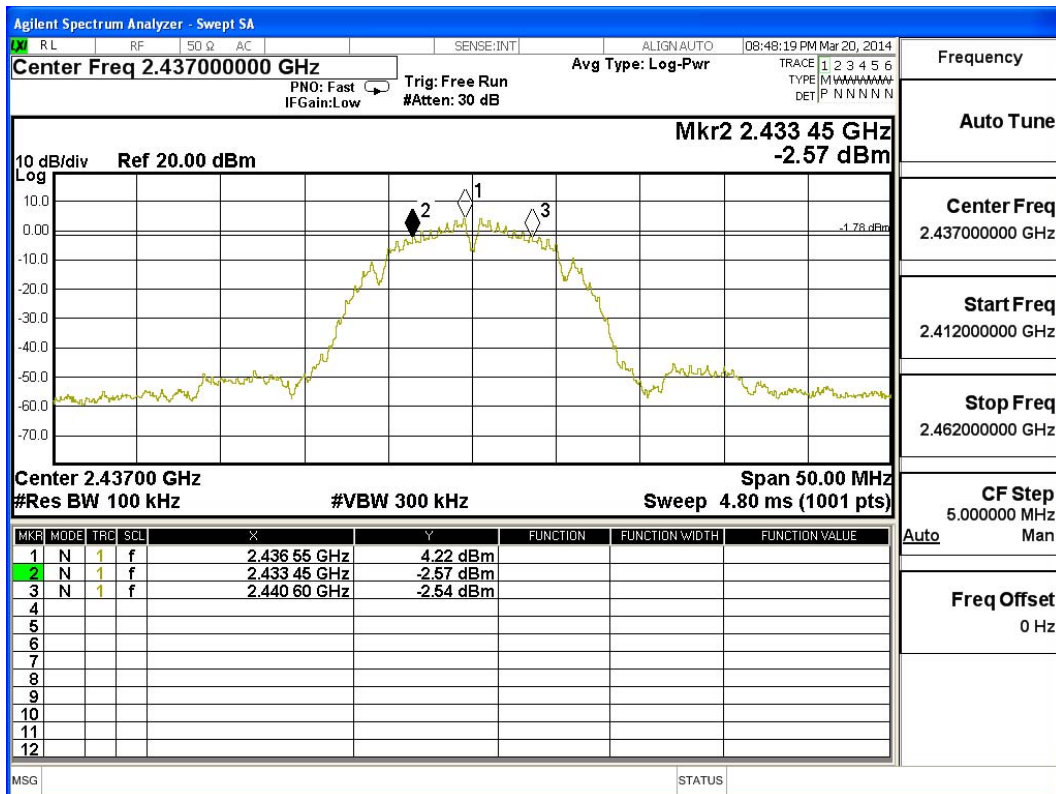
Figure Channel 1:



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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437            | 7150                    | >500                 | Pass   |

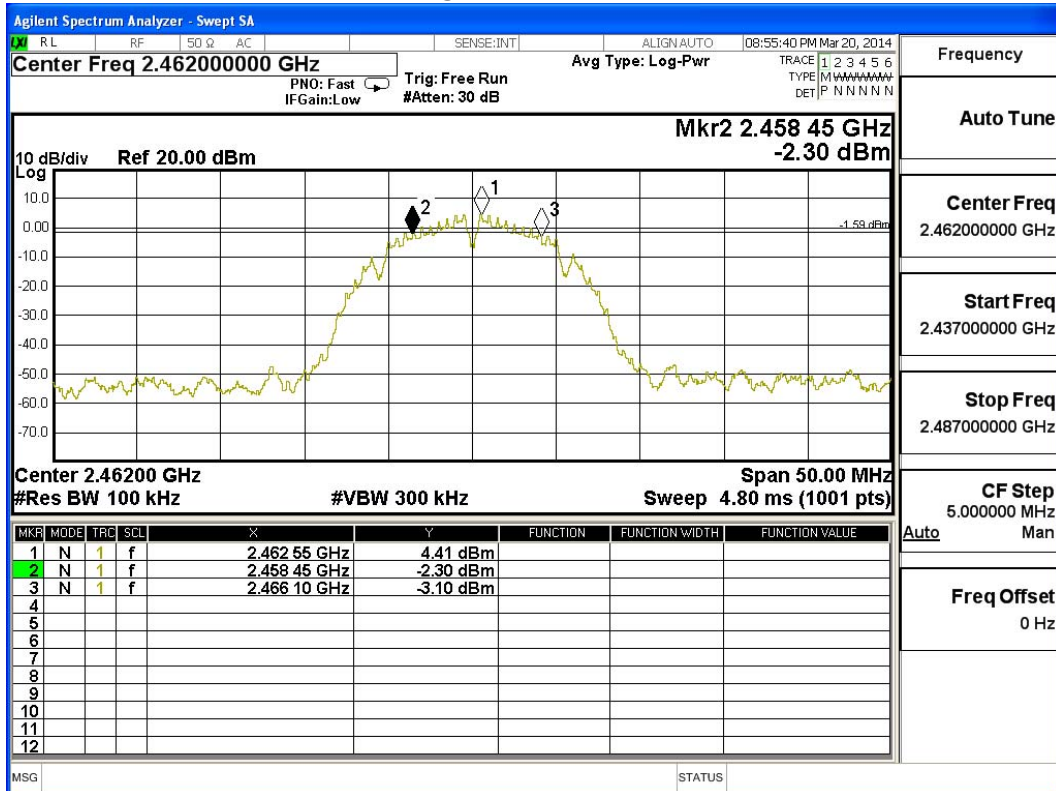
Figure Channel 6:



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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462            | 7650                    | >500                 | Pass   |

**Figure Channel 11:**



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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 1           | 2412            | 15200                   | >500                 | Pass   |

Figure Channel 1:

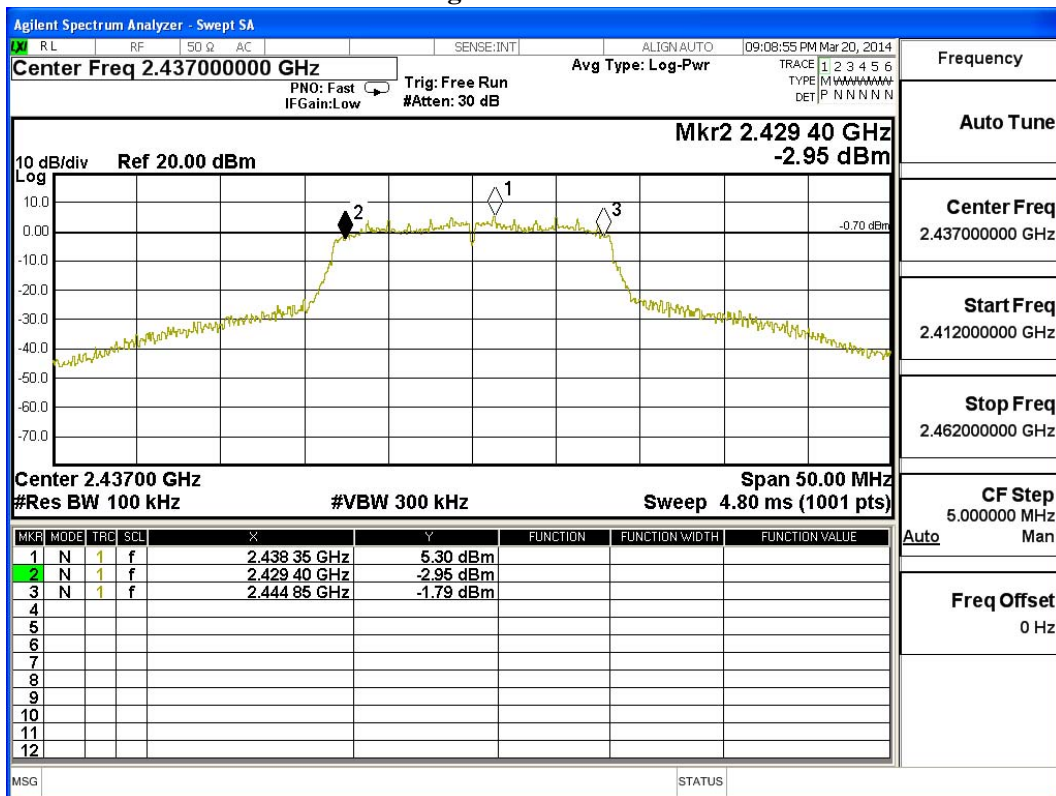




Product : Wireless Motherboard  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437            | 15450                   | >500                 | Pass   |

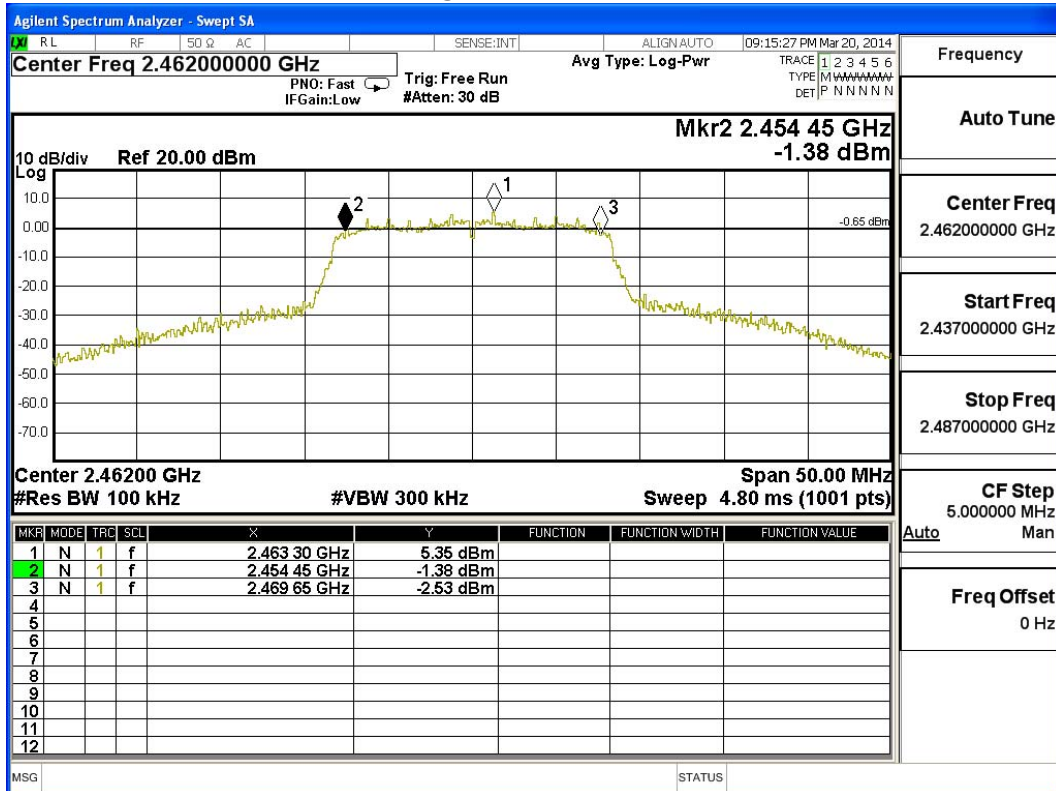
**Figure Channel 6:**



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

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462            | 15200                   | >500                 | Pass   |

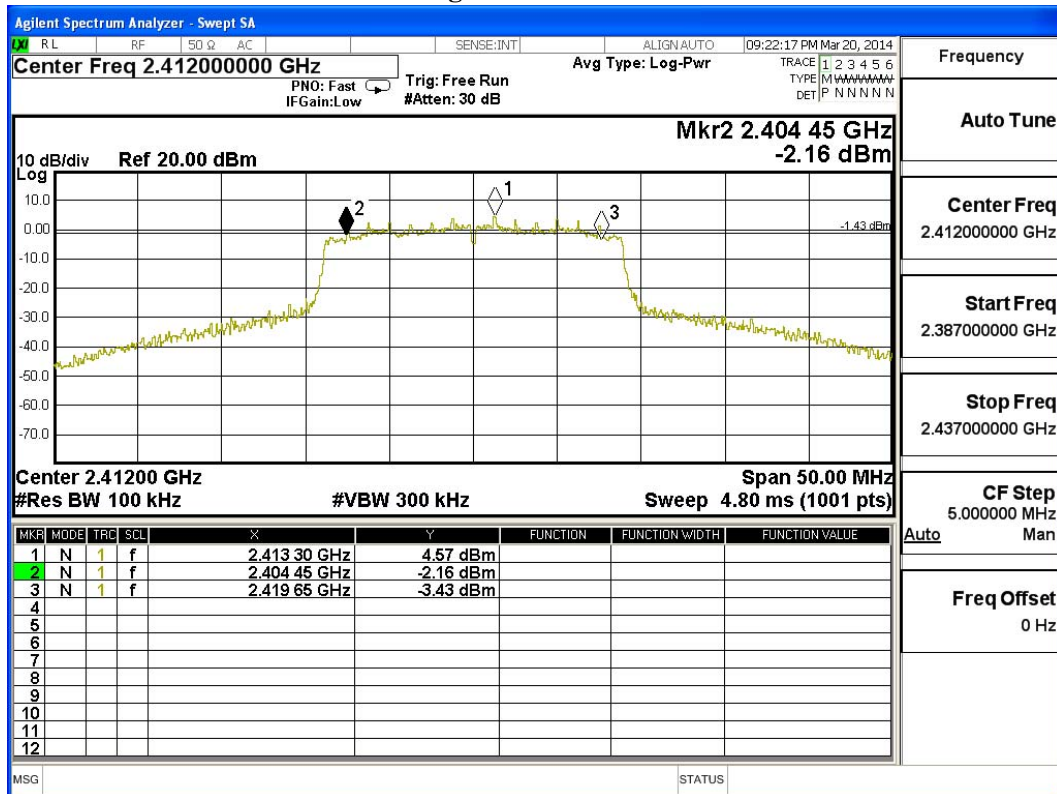
**Figure Channel 11:**



Product : Wireless Motherboard  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 1           | 2412            | 15200                   | >500                 | Pass   |

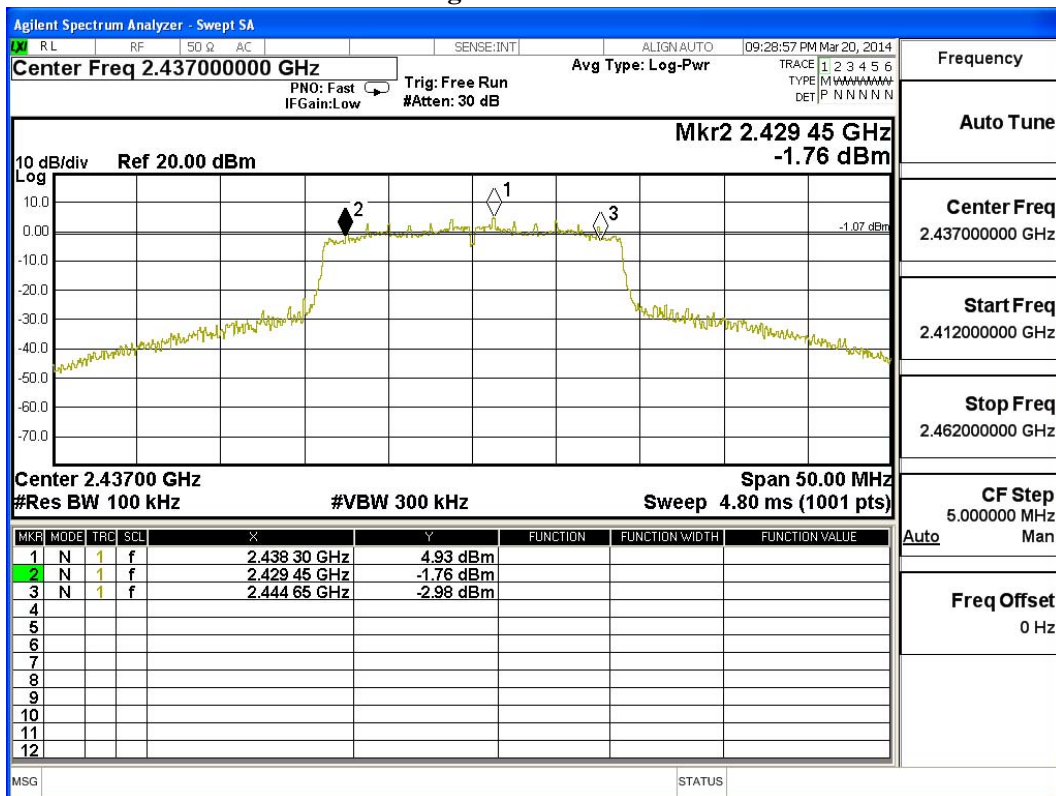
**Figure Channel 1:**



Product : Wireless Motherboard  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437            | 15200                   | >500                 | Pass   |

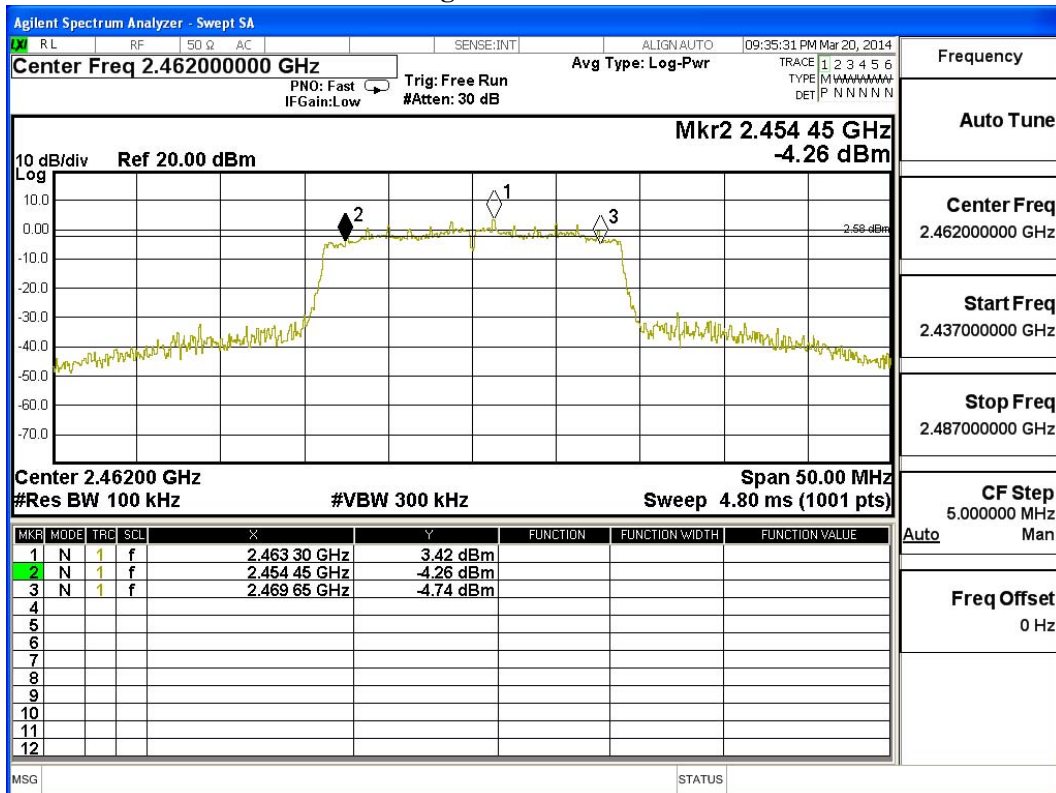
**Figure Channel 6:**



Product : Wireless Motherboard  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462            | 15200                   | >500                 | Pass   |

**Figure Channel 11:**



## 8. Power Density

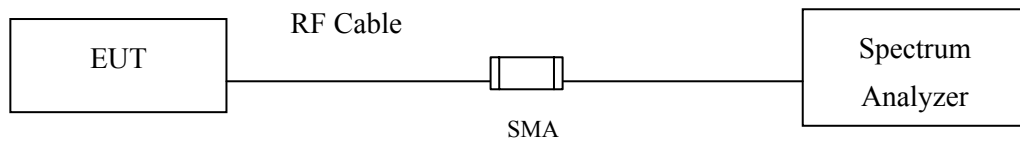
### 8.1. Test Equipment

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal.  |
|---|-------------------|--------------|----------------------|------------|
|   | Spectrum Analyzer | R&S          | FSP40 / 100170       | Jun., 2013 |
|   | Spectrum Analyzer | Agilent      | E4407B / US39440758  | Jun., 2013 |
| X | Spectrum Analyzer | Agilent      | N9010A / MY48030495  | Apr., 2014 |

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.

### 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 C63.10, 2009; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

### 8.5. Uncertainty

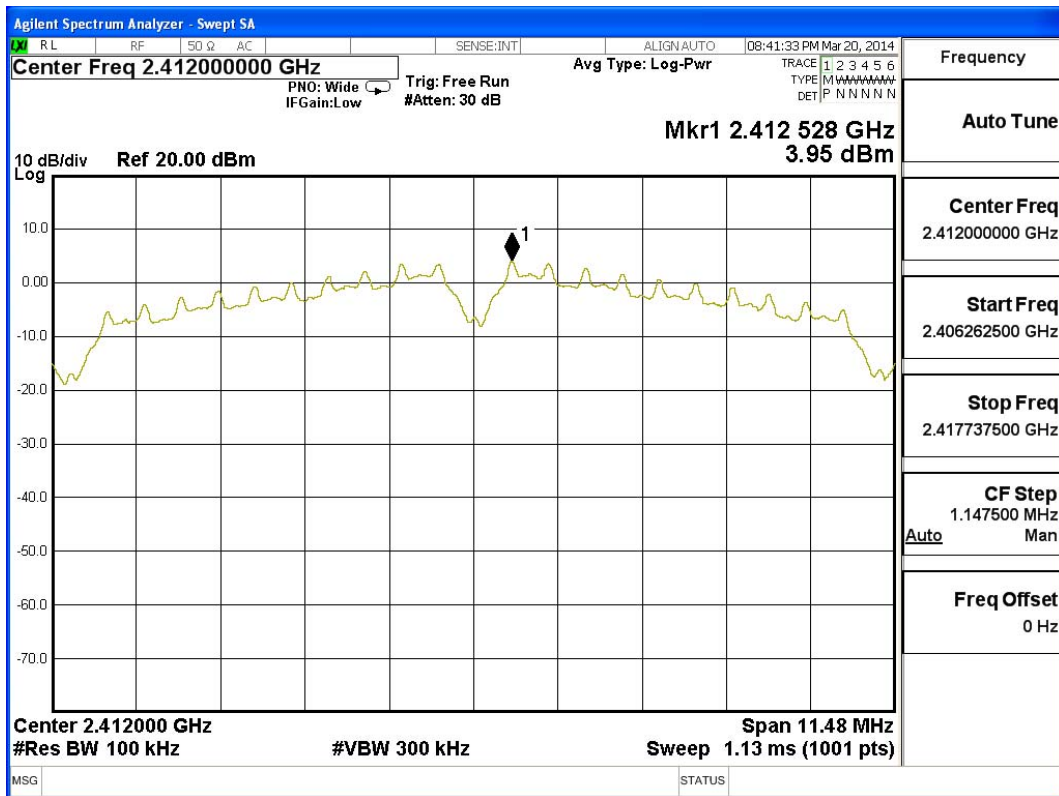
± 1.27 dB

### 8.6. Test Result of Power Density

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

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 1           | 2412            | 3.950               | < 8dBm      | Pass   |

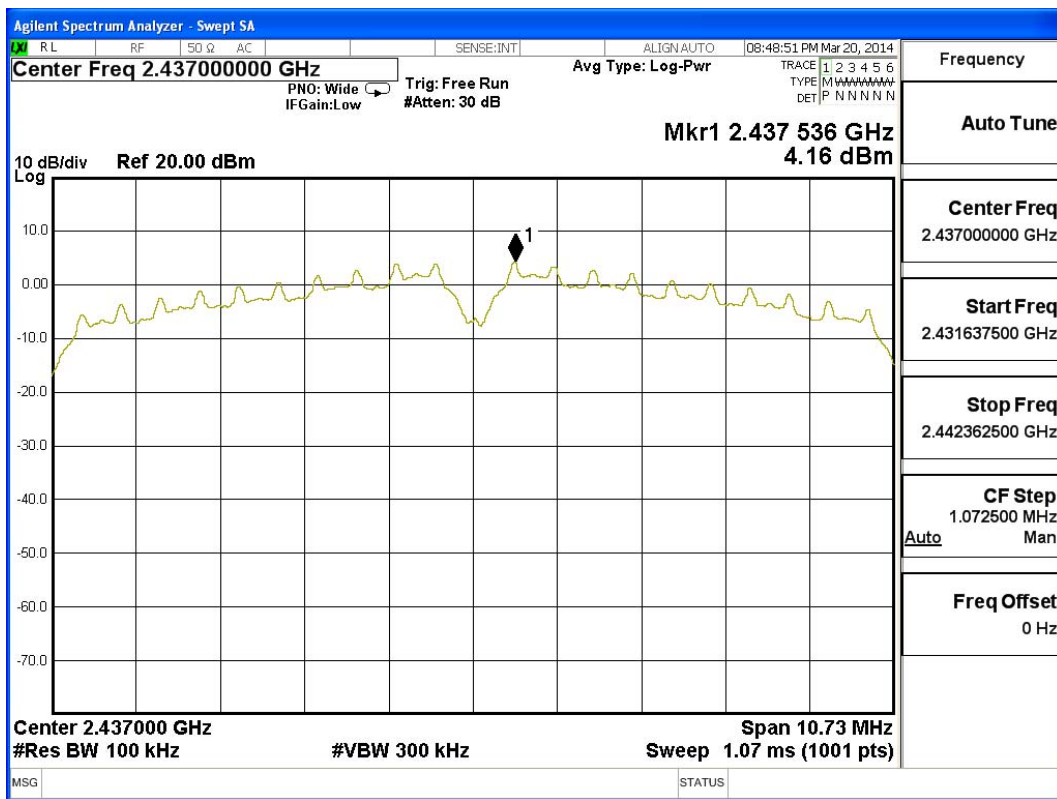
Figure Channel 1:



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

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437            | 4.160                   | < 8dBm               | Pass   |

**Figure Channel 6:**

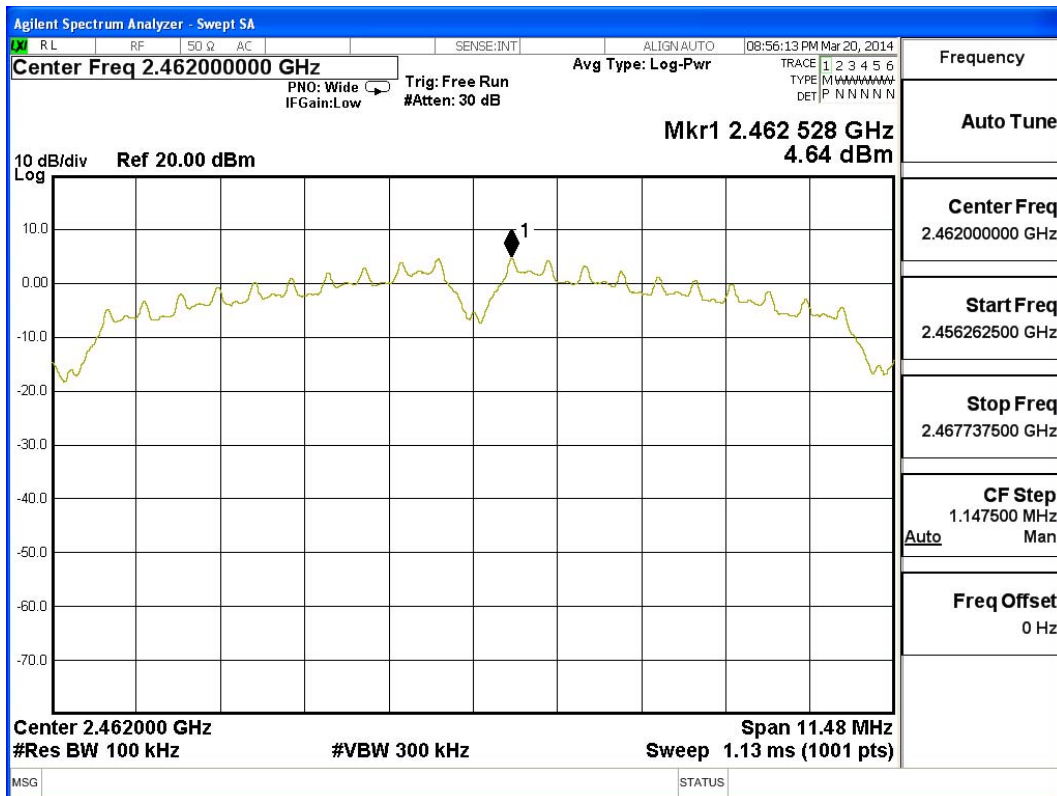




Product : Wireless Motherboard  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462            | 4.640                   | < 8dBm               | Pass   |

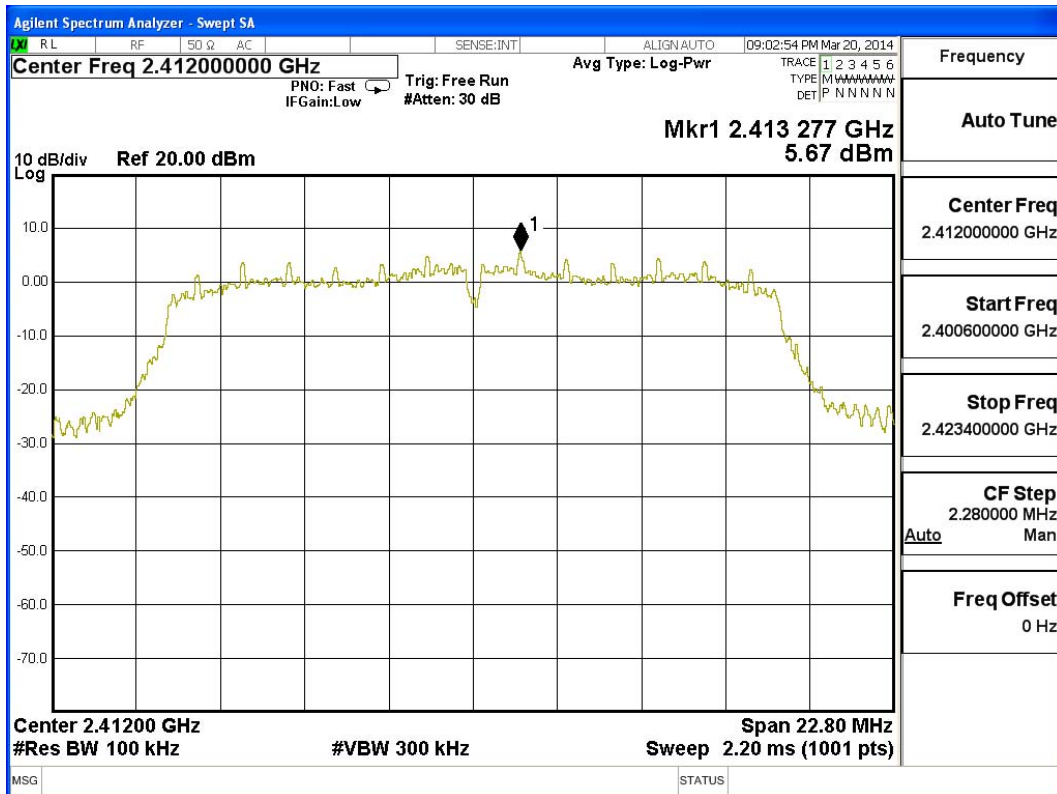
**Figure Channel 11:**



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

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 1           | 2412            | 5.670               | < 8dBm      | Pass   |

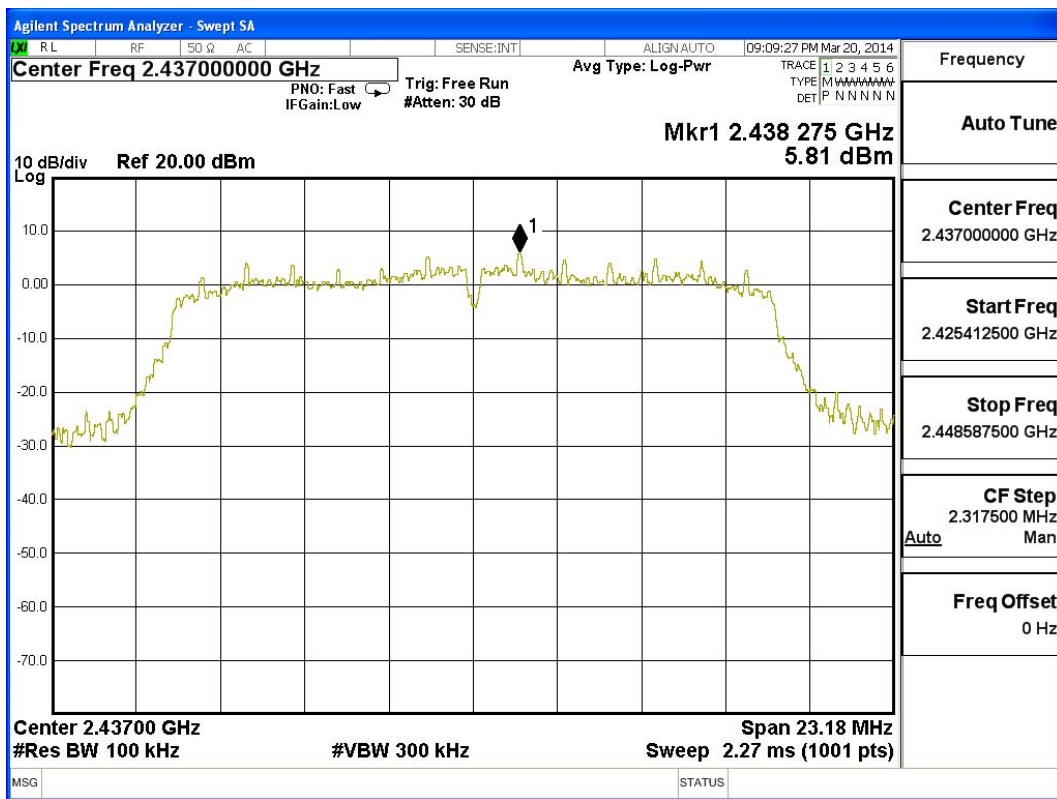
**Figure Channel 1:**



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

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437            | 5.810                   | < 8dBm               | Pass   |

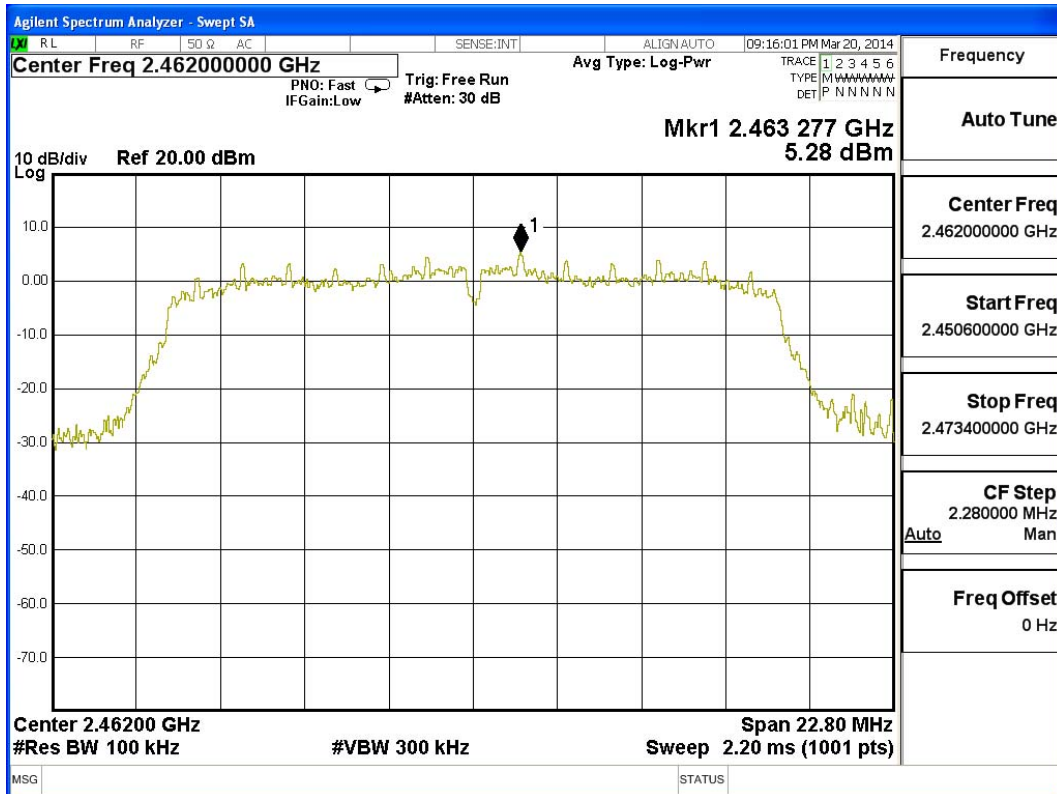
**Figure Channel 6:**



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

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462            | 5.280                   | < 8dBm               | Pass   |

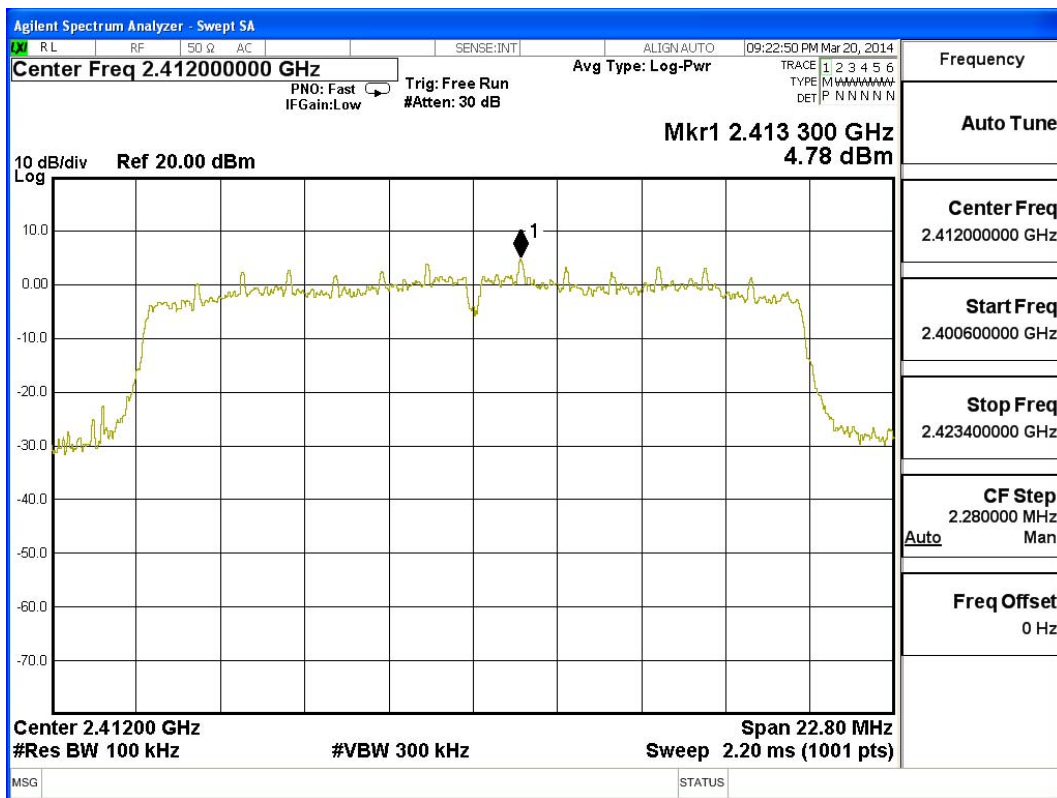
**Figure Channel 11:**



Product : Wireless Motherboard  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 1           | 2412            | 4.780               | < 8dBm      | Pass   |

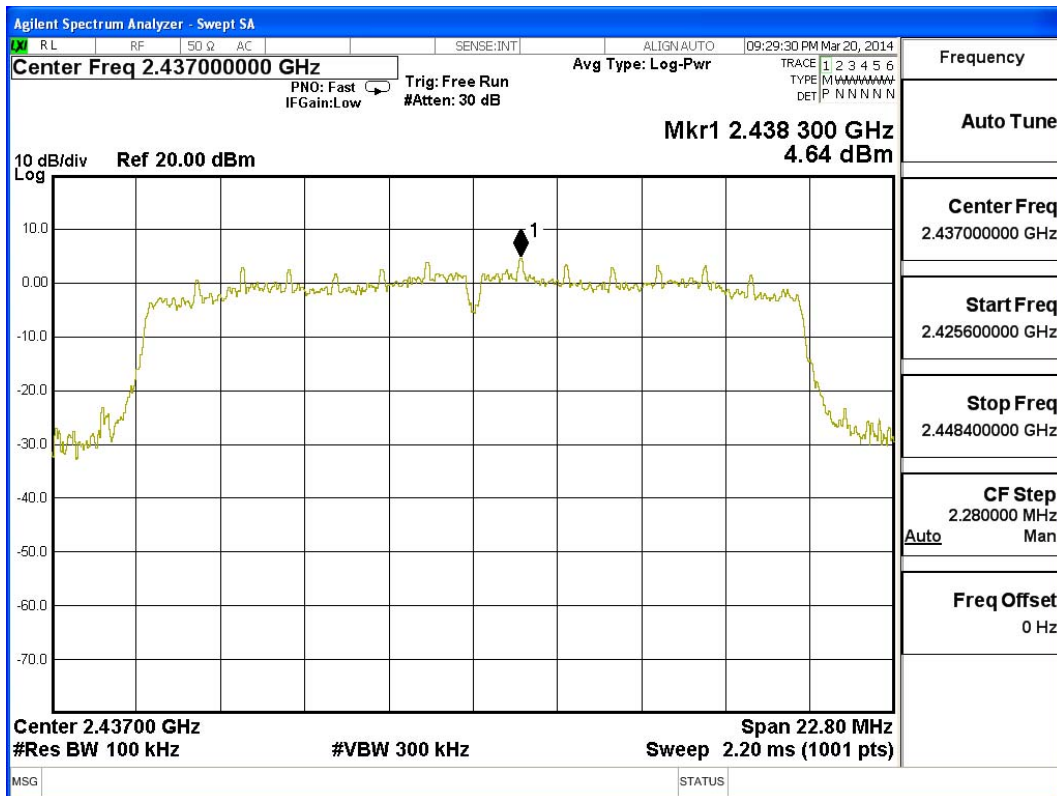
**Figure Channel 1:**



Product : Wireless Motherboard  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6           | 2437            | 4.640                   | < 8dBm               | Pass   |

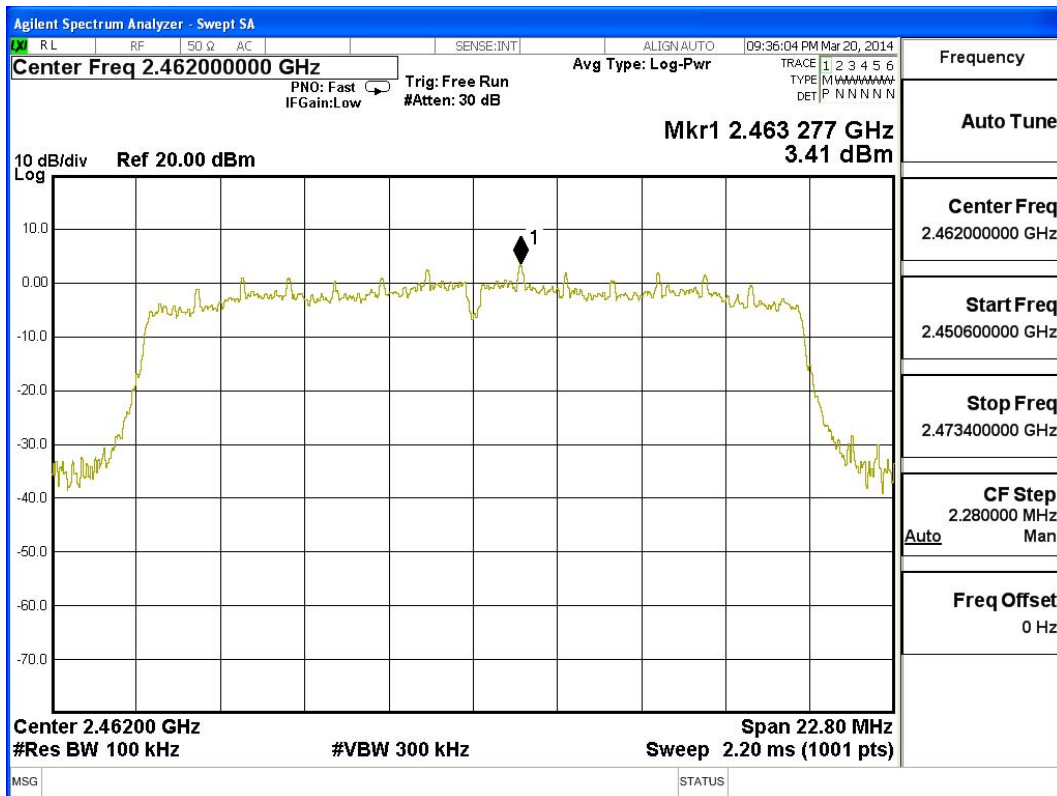
**Figure Channel 6:**



Product : Wireless Motherboard  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11          | 2462            | 3.410                   | < 8dBm               | Pass   |

**Figure Channel 11:**



## 9. EMI Reduction Method During Compliance Testing

No modification was made during testing.



## Attachment 1: EUT Test Photographs

## Attachment 2: EUT Detailed Photographs