# CONFORMANCE TEST REPORT
# FOR
# FCC 47 CFR, Part 15 Subpart C

**Report No.: 07-12-MAS-065-01**

| | |
|---|---|
| Client: | PRO-NETS Technology Corp. |
| Product: | WIRELESS USB DONGLE |
| Model: | WU81RL1 |
| FCC ID: | RXZ-WU81RL1 |
| Manufacturer/supplier: | PRO-NETS Technology Corp. |

| | |
|---|---|
| Date test item received: | 2007/12/12 |
| Date test campaign completed: | 2008/01/22 |
| Date of issue: | 2008/01/22 |



*Total number of pages of this test report: 101 pages*

*Total number of pages of photos: External photos 1 pages*

*Internal photos 3 pages*

*Setup photos 3 pages*

| Test Engineer | Checked By | Approved By |
|---|---|---|
| James | James | Joe Hsieh |

ELECTRONICS TESTING CENTER, TAIWAN
NO.8, LANE 29, WENMING RD.,
LESHAN TSUEN, GUISHAN SHIANG,
TAOYUAN COUNTY, TAIWAN 33383,
R.O.C.TAIWAN, R.O.C.

TEL: (03) 3276170~4
INT: +886-3-3276170~4
FAX: (03) 3276188
INT: +886-3-3276188

| | |
|---|---|
| Client | : PRO-NETS Technology Corp. |
| Address | : 7F, No.95, Lide St,Chung Ho City 235,Taipei, Taiwan, R.O.C. |
| Manufacturer | : PRO-NETS Technology Corp. |
| Address | : 7F, No.95, Lide St,Chung Ho City 235,Taipei, Taiwan, R.O.C. |
| EUT | : WIRELESS USB DONGLE |
| Trade name | : PRO-NETS, Speed Com+, Jet Com, Medilink, Encore |
| Model No. | : WU81RL1 |
| Power Source | : DC 5V |
| Regulations applied | : FCC 47 CFR, Part 15 Subpart C (2006) |

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations.

The compliance test is only certified for the test equipment and the results of the testing report relate only to the item tested. The compliance test of this report was conducted in accordance with the appropriate standards. It's not intention to assure the quality and performance of the product. This report shall not be reproduced except in full, without the approval of ETC. This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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④ MRA: Australia, Hong Kong, New Zealand, Singapore, USA, Japan, Korea, China, APLAC through CNLA

⑤ FCC Registration Number: 90588, 91094, 91095

NVLAP Lab Code 200133-0

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# 1 GENERAL INFORMATION

## 1.1 Product Description

a) Type of EUT : WIRELESS USB DONGLE

b) Trade Name : PRO-NETS, Speed Com+, Jet Com, Medilink, Encore

c) Model No. : WU81RL1

d) FCC ID : RXZ-WU81RL1

## 1.2 Characteristics of Device

The EUT is a 2.4 GHz WIRELESS USB DONGLE. It conforms to the IEEE 802.11b/g/n protocal and operates in the unlicensed ISM Band at 2.4 GHz.

| | |
|---|---|
| RF chain | 1T2R |
| Frequency Range | IEEE 802.11b/g, 802.11n HT20: 2412MHz~2462MHz<br>IEEE 802.11n HT40: 2422MHz~2452MHz |
| Channel Spacing | IEEE 802.11b/g, 802.11n HT20/HT40: 5MHz |
| Channel Number | IEEE 802.11b/g, 802.11n HT20:11 Channels<br>IEEE 802.11n HT40: 7 Channels |
| Transmit Data Rate | IEEE 802.11b: 11, 5.5, 2, 1 Mbps<br>IEEE 802.11g: 54, 48, 36, 24, 18, 12, 11, 9, 6 Mbps<br>IEEE 802.11n HT20: 65, 58.5, 52, 39, 26, 19.5, 13, 6.5Mbps<br>IEEE 802.11n HT40: 135, 121.5, 108, 81, 54, 40.5, 27, 13.5 Mbps |
| Type of Modulation | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20/40: OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Emission Designators | IEEE 802.11b: 15M2G1D<br>IEEE 802.11g: 16M6W7D<br>IEEE 802.11n HT20: 17M3W7D<br>IEEE 802.11n HT40: 36M1W7D |

Two antennas are used for this device:

Antenna A: PIFA type (1.76dBi) for TX/RX

Antenna B: PIFA type (0.85dBi) for RX

## 1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.4 (2003) and FCC CFR 47 Part 2 and Part 15.

## 1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.

This site has been accreditation as a FCC filing site.

# 2 PROVISIONS APPLICABLE

## 2.1 Definition

**Unintentional radiator:**
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

**Intentional radiator:**
A device that intentionally generates and emits radio frequency energy by radiation or induction.

## 2.2 Requirement for Compliance

### (1) Conducted Emission Requirement

For unintentional device, according to §15.107(a) Line Conducted Emission Limits is as following:

| Frequency MHz | Quasi Peak dB μV | Average dB μV |
|---|---|---|
| 0.15 - 0.5 | 66-56* | 56-46* |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

*Decreases with the logarithm of the frequency.

For intentional device, according to §15.207(a) Line Conducted Emission Limits is same as above table.

### (2) Radiated Emission Requirement

For unintentional device, according to §15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency MHz | Distance Meters | Radiated dB μV/m | Radiated μV/m |
|---|---|---|---|
| 30 - 88 | 3 | 40.0 | 100 |
| 88 - 216 | 3 | 43.5 | 150 |
| 216 - 960 | 3 | 46.0 | 200 |
| above 960 | 3 | 54.0 | 500 |

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### (3) Antenna Requirement

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

**(4) Bandwidth Requirement**

According to 15.247 (a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

**(5) Output Power Requirement**

For systems using digital modulation , according to 15.247(b), the maximum peak output power of the intentional radiator shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**(6) Spurious Emissions Measurement**

According to 15.247 (c) , in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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)).

**(7) Power Density Requirement**

According to 15.247 (d) , for digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission..

## 2.3 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below :

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.25 |
| 0.495 - 0.505 ** | 16.69475 - 16.69525 | 608-614 | 5.35-5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 108-121.94 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475 - 156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2655-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | Above 38.6 |
| 13.36-13.41 | | | |

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

## 2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## 2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio / TV technician for help.

# 3. SYSTEM TEST CONFIGURATION

## 3.1 Devices for Tested System

| Device | Manufacture | Model No. | Cable Description |
|---|---|---|---|
| WIRELESS USB DONGLE* | PRO-NETS Technology Corp. | WU81RL1 | ---- |
| Notebook PC | HP | NX6320 | 3.3m Unshielded Power Line/Adaptor |

Note:

1.Remark "*" means equipment under test.

2.

| | | | |
|---|---|---|---|
| Test Software: | RT2870QA.exe | | |
| Power setting: | 802.11b/g/n HT20 | Low | TX power =(00)h |
| | | Mid | TX power =(00)h |
| | | High | TX power =(00)h |
| | 802.11b/g/n HT40 | Low | TX power =(06)h |
| | | Mid | TX power =(05)h |
| | | High | TX power =(04)h |

## 3.2 Dscription of Test modes

3.2.1 IEEE 802.11b, 802.11g, 802.11n HT20 mode:

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 1 | 2412 |
| Middle = 6 | 2437 |
| High = 11 | 2462 |

IEEE 802.11b mode: 1 Mbps data rateis the worse case for full testing.

IEEE 802.11g mode: 6 Mbps data rateis the worse case for full testing.

IEEE 802.11n HT20 mode: 6.5 Mbps data rateis the worse case for full testing.

3.2.2 IEEE 802.11n HT40 mode:

There are three channels have been tested as following:

| Channel | Frequency (MHz) |
|---|---|
| Low = 3 | 2422 |
| Middle = 6 | 2437 |
| High = 9 | 2452 |

IEEE 802.11n HT40 mode: 13.5 Mbps data rateis the worse case for full testing.

# 4 CONDUCTED EMISSION MEASUREMENT

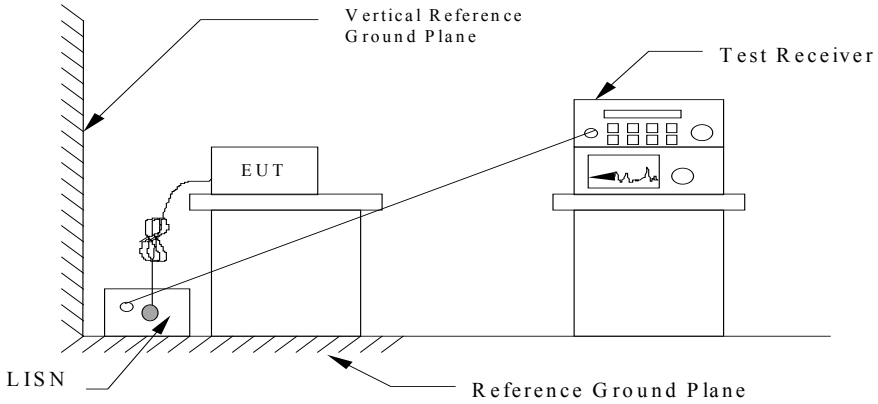
## 4.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and §15.207(a) respectively. Both Limits are identical specification.

## 4.2 Measurement Procedure

1. Setup the configuration per figure 1.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

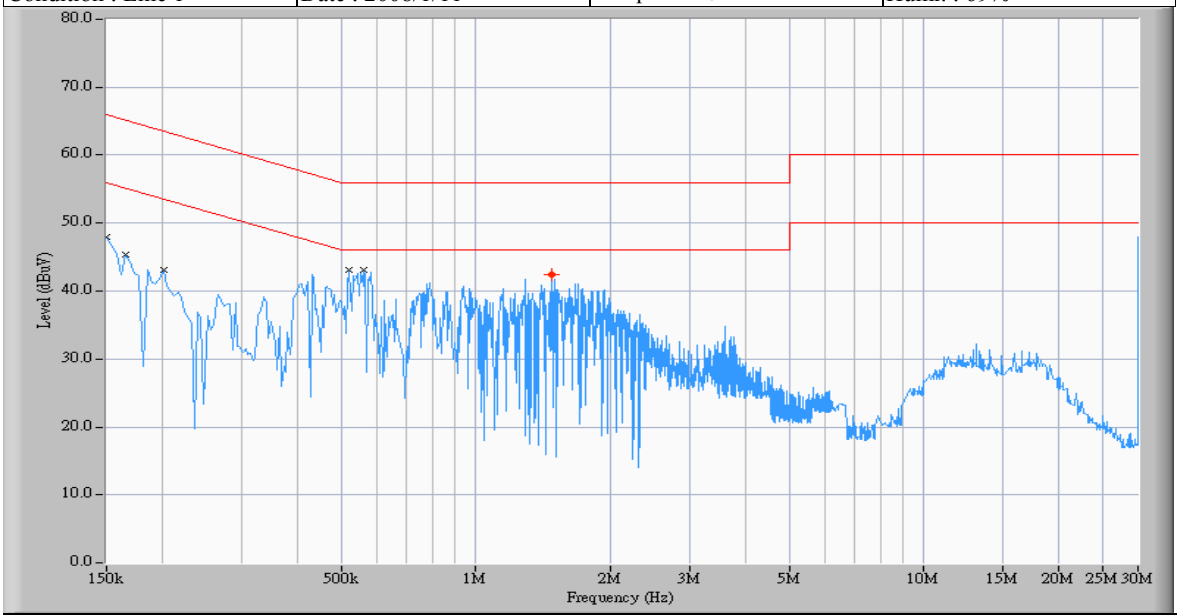
Figure 1 : Conducted emissions measurement configuration



## 4.3 Conducted Emission Data

### 4.3.1 Operation Mode: IEEE 802.11b

| EUT : | Model : | Status : 11b TX | |
|---|---|---|---|
| Condition : Line 1 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |

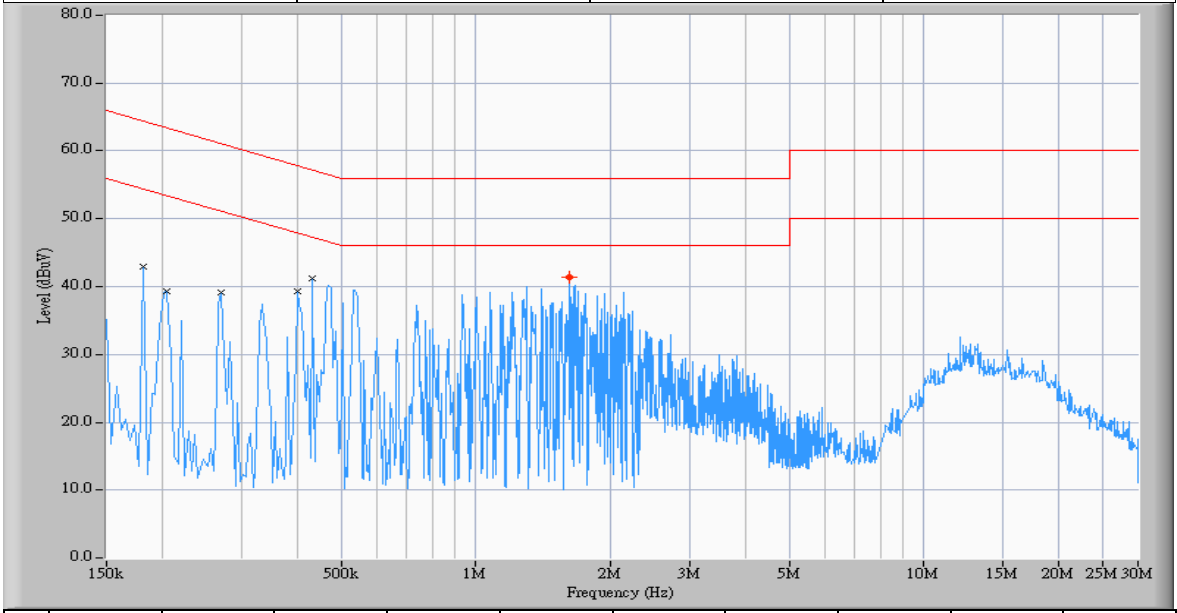



| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.150 | 48.0 | ---- | 0.2 | 48.2 | ---- | 66.0 | 56.0 | -17.8 | ---- |
| 2 | 0.166 | 45.3 | ---- | 0.2 | 45.5 | ---- | 65.2 | 55.2 | -19.7 | ---- |
| 3 | 0.201 | 43.1 | ---- | 0.2 | 43.3 | ---- | 63.6 | 53.6 | -20.3 | ---- |
| 4 | 0.521 | 43.1 | ---- | 0.2 | 43.3 | ---- | 56.0 | 46.0 | -12.7 | ---- |
| 5 | 0.564 | 43.0 | ---- | 0.2 | 43.2 | ---- | 56.0 | 46.0 | -12.8 | ---- |
| 6 | 1.477 | 42.5 | ---- | 0.2 | 42.7 | ---- | 56.0 | 46.0 | -13.3 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

| EUT : | Model : | Status : 11b TX | |
|---|---|---|---|
| Condition : Line 2 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |



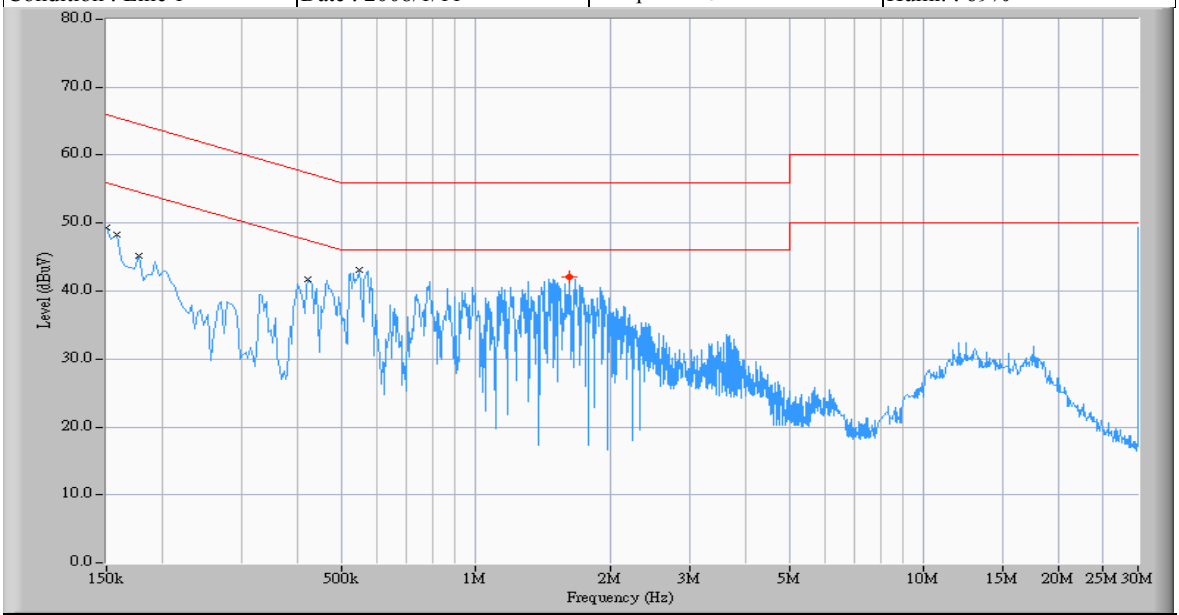

| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.181 | 42.9 | ---- | 0.2 | 43.1 | ---- | 64.4 | 54.4 | -21.3 | ---- |
| 2 | 0.205 | 39.4 | ---- | 0.2 | 39.6 | ---- | 63.4 | 53.4 | -23.8 | ---- |
| 3 | 0.271 | 39.1 | ---- | 0.2 | 39.3 | ---- | 61.1 | 51.1 | -21.8 | ---- |
| 4 | 0.400 | 39.3 | ---- | 0.2 | 39.5 | ---- | 57.9 | 47.9 | -18.4 | ---- |
| 5 | 0.431 | 41.3 | ---- | 0.2 | 41.5 | ---- | 57.2 | 47.2 | -15.7 | ---- |
| 6 | 1.623 | 41.4 | ---- | 0.2 | 41.6 | ---- | 56.0 | 46.0 | -14.4 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

## 4.3.2 Operation Mode: IEEE 802.11g

| EUT : | Model : | Status : 11g TX | |
|---|---|---|---|
| Condition : Line 1 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |

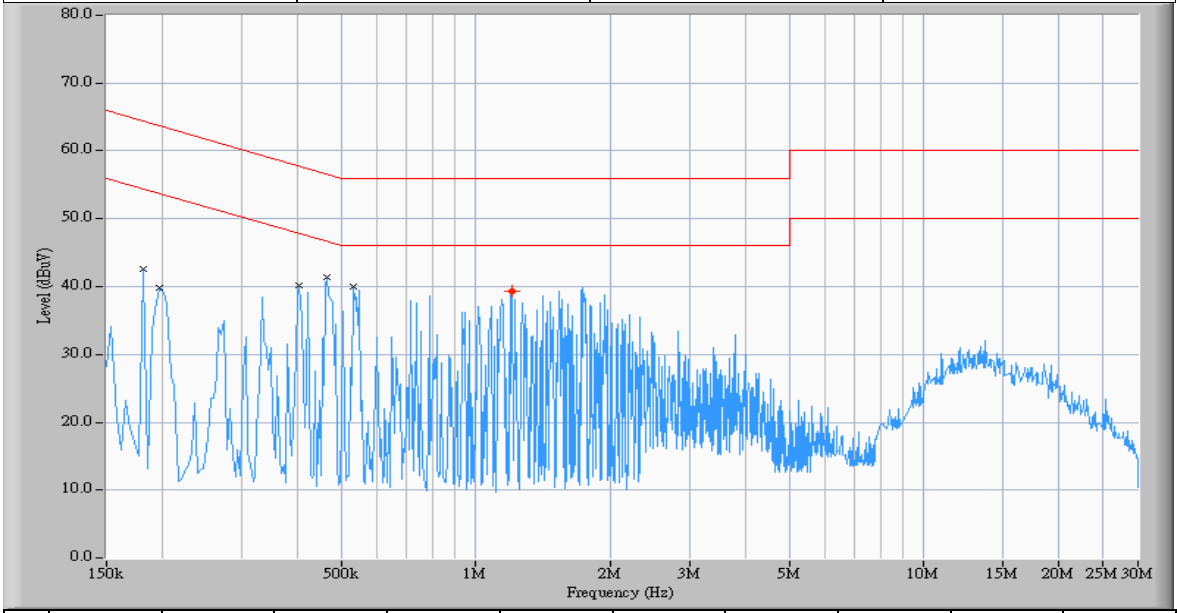



| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.150 | 49.4 | ---- | 0.2 | 49.6 | ---- | 66.0 | 56.0 | -16.4 | ---- |
| 2 | 0.158 | 48.3 | ---- | 0.2 | 48.5 | ---- | 65.6 | 55.6 | -17.1 | ---- |
| 3 | 0.177 | 45.2 | ---- | 0.2 | 45.4 | ---- | 64.6 | 54.6 | -19.2 | ---- |
| 4 | 0.423 | 41.7 | ---- | 0.2 | 41.9 | ---- | 57.4 | 47.4 | -15.5 | ---- |
| 5 | 0.548 | 43.1 | ---- | 0.2 | 43.3 | ---- | 56.0 | 46.0 | -12.7 | ---- |
| 6 | 1.617 | 42.0 | ---- | 0.2 | 42.2 | ---- | 56.0 | 46.0 | -13.8 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

| EUT : | Model : | Status : 11g TX | |
|---|---|---|---|
| Condition : Line 2 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |



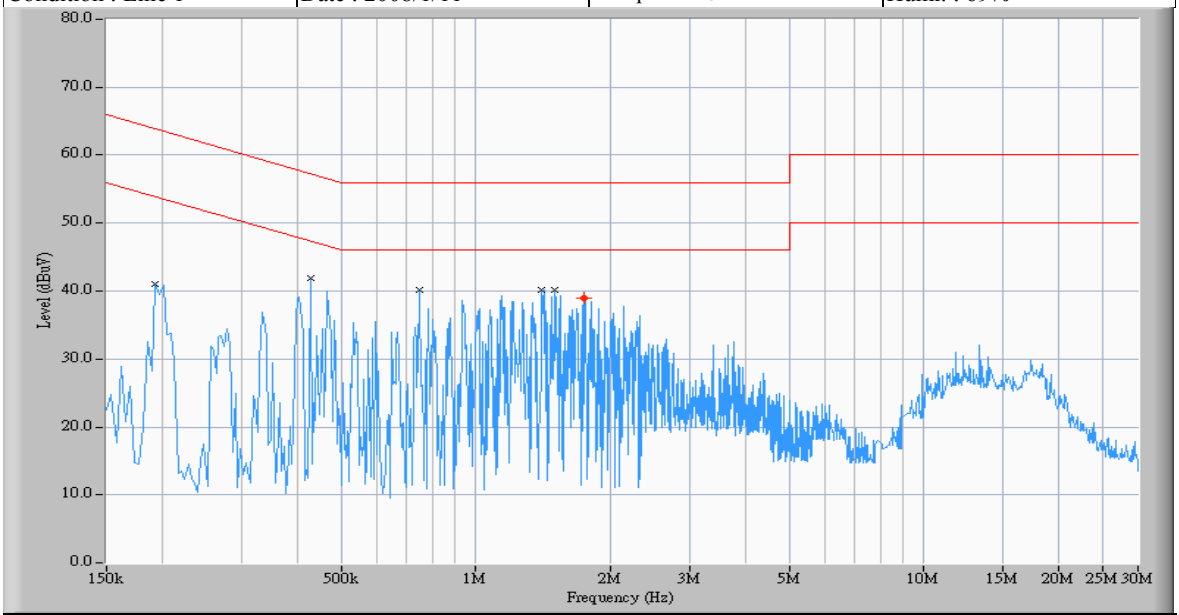

| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.181 | 42.6 | ---- | 0.2 | 42.8 | ---- | 64.4 | 54.4 | -21.6 | ---- |
| 2 | 0.197 | 39.8 | ---- | 0.2 | 40.0 | ---- | 63.7 | 53.7 | -23.7 | ---- |
| 3 | 0.404 | 40.2 | ---- | 0.2 | 40.4 | ---- | 57.8 | 47.8 | -17.4 | ---- |
| 4 | 0.466 | 41.3 | ---- | 0.2 | 41.5 | ---- | 56.6 | 46.6 | -15.1 | ---- |
| 5 | 0.533 | 40.1 | ---- | 0.2 | 40.3 | ---- | 56.0 | 46.0 | -15.7 | ---- |
| 6 | 1.201 | 39.3 | ---- | 0.2 | 39.5 | ---- | 56.0 | 46.0 | -16.5 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

### 4.3.3 Operation Mode: IEEE 802.11n, HT20

| EUT : | Model : | Status : 11n HT20 TX | |
|---|---|---|---|
| Condition : Line 1 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |

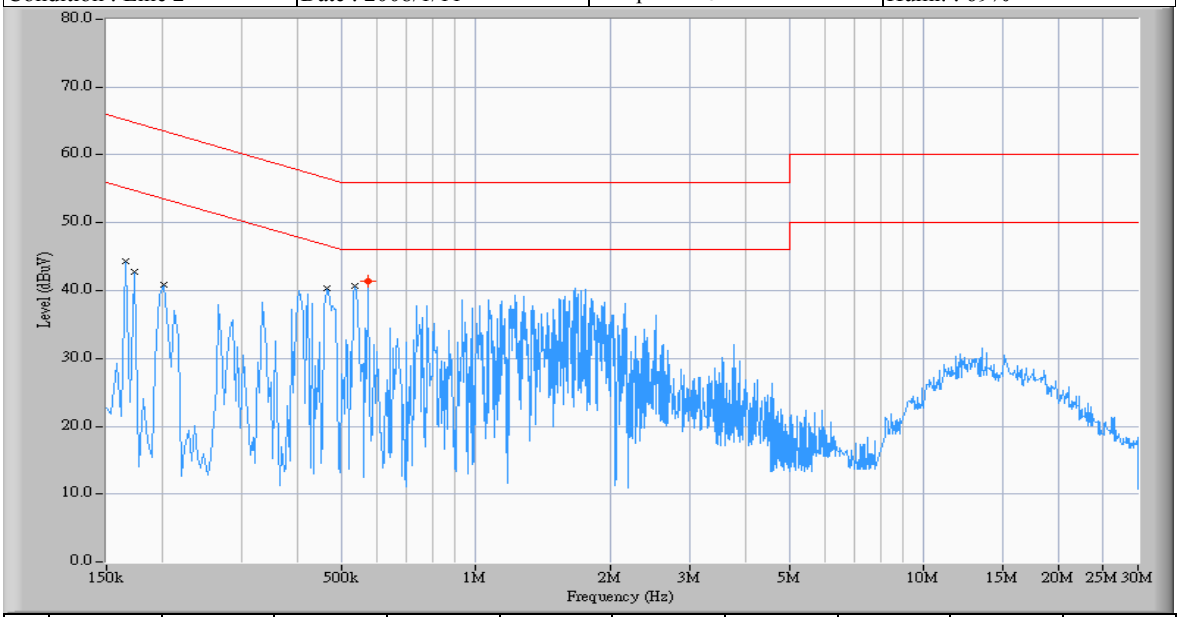



| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.193 | 41.0 | ---- | 0.2 | 41.2 | ---- | 63.9 | 53.9 | -22.7 | ---- |
| 2 | 0.427 | 41.8 | ---- | 0.2 | 42.0 | ---- | 57.3 | 47.3 | -15.3 | ---- |
| 3 | 0.748 | 40.2 | ---- | 0.2 | 40.4 | ---- | 56.0 | 46.0 | -15.6 | ---- |
| 4 | 1.404 | 40.2 | ---- | 0.2 | 40.4 | ---- | 56.0 | 46.0 | -15.6 | ---- |
| 5 | 1.498 | 40.2 | ---- | 0.2 | 40.4 | ---- | 56.0 | 46.0 | -15.6 | ---- |
| 6 | 1.740 | 38.9 | ---- | 0.2 | 39.1 | ---- | 56.0 | 46.0 | -16.9 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

| EUT : | Model : | Status : 11n HT20 TX | |
|---|---|---|---|
| Condition : Line 2 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |



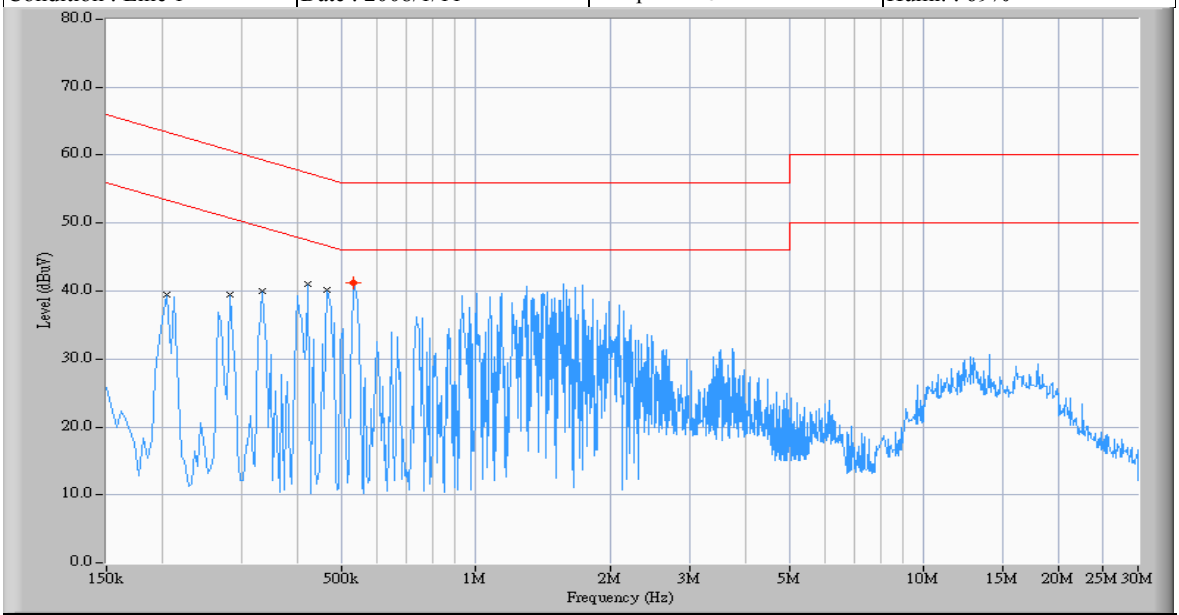

| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.166 | 44.3 | ---- | 0.2 | 44.5 | ---- | 65.2 | 55.2 | -20.7 | ---- |
| 2 | 0.173 | 42.7 | ---- | 0.2 | 42.9 | ---- | 64.8 | 54.8 | -21.9 | ---- |
| 3 | 0.201 | 40.8 | ---- | 0.2 | 41.0 | ---- | 63.6 | 53.6 | -22.6 | ---- |
| 4 | 0.466 | 40.4 | ---- | 0.2 | 40.6 | ---- | 56.6 | 46.6 | -16.0 | ---- |
| 5 | 0.537 | 40.7 | ---- | 0.2 | 40.9 | ---- | 56.0 | 46.0 | -15.1 | ---- |
| 6 | 0.576 | 41.4 | ---- | 0.2 | 41.6 | ---- | 56.0 | 46.0 | -14.4 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

## 4.3.4 Operation Mode: IEEE 802.11n, HT40

| EUT : | Model : | Status : 11n HT40 TX | |
|---|---|---|---|
| Condition : Line 1 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |

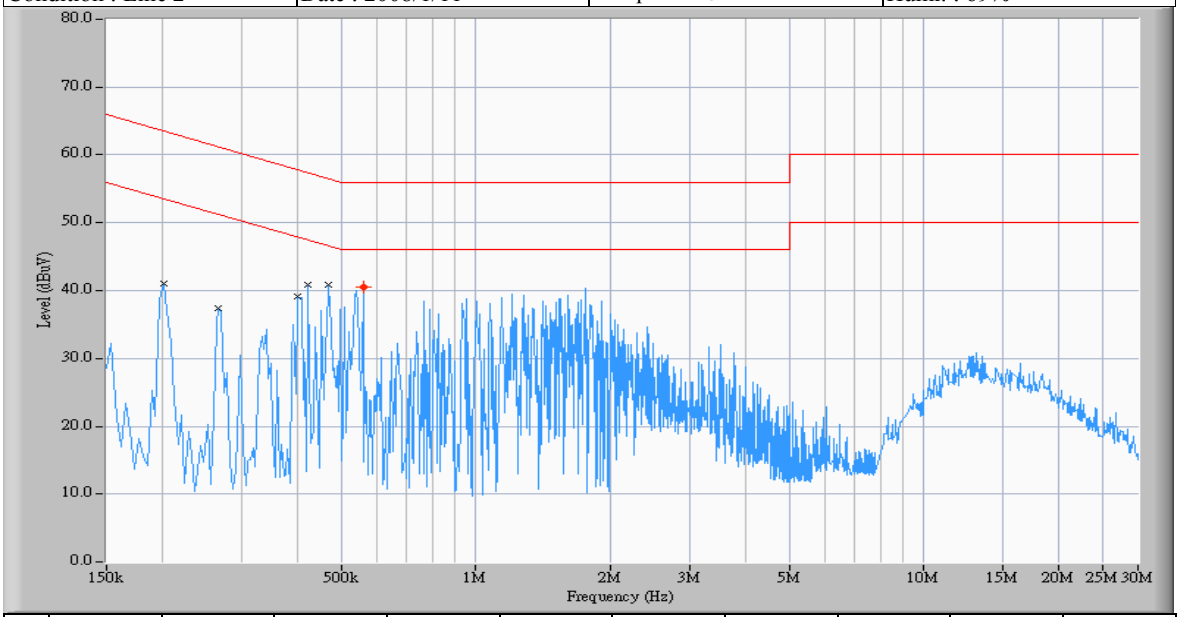



| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.205 | 39.5 | ---- | 0.2 | 39.7 | ---- | 63.4 | 53.4 | -23.7 | ---- |
| 2 | 0.283 | 39.4 | ---- | 0.2 | 39.6 | ---- | 60.7 | 50.7 | -21.1 | ---- |
| 3 | 0.334 | 39.9 | ---- | 0.2 | 40.1 | ---- | 59.4 | 49.4 | -19.3 | ---- |
| 4 | 0.423 | 41.0 | ---- | 0.2 | 41.2 | ---- | 57.4 | 47.4 | -16.2 | ---- |
| 5 | 0.466 | 40.2 | ---- | 0.2 | 40.4 | ---- | 56.6 | 46.6 | -16.2 | ---- |
| 6 | 0.533 | 41.1 | ---- | 0.2 | 41.3 | ---- | 56.0 | 46.0 | -14.7 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

| EUT : | Model : | Status : 11n HT40 TX | |
|---|---|---|---|
| Condition : Line 2 | Date : 2008/1/11 | Temp. : 22℃ | Humi. : 69% |




| | Freq (MHz) | QP Level (dBuV) | AVG Level (dBuV) | Factor (dB) | QP Result (dBuV) | AVG Result (dBuV) | QP Limit (dBuV) | AVG Limit (dBuV) | QP Margin (dB) | AVG Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.201 | 41.1 | ---- | 0.2 | 41.3 | ---- | 63.6 | 53.6 | -22.3 | ---- |
| 2 | 0.267 | 37.4 | ---- | 0.2 | 37.6 | ---- | 61.2 | 51.2 | -23.6 | ---- |
| 3 | 0.400 | 39.2 | ---- | 0.2 | 39.4 | ---- | 57.9 | 47.9 | -18.5 | ---- |
| 4 | 0.423 | 40.9 | ---- | 0.2 | 41.1 | ---- | 57.4 | 47.4 | -16.3 | ---- |
| 5 | 0.470 | 40.9 | ---- | 0.2 | 41.1 | ---- | 56.5 | 46.5 | -15.4 | ---- |
| 6 | 0.560 | 40.6 | ---- | 0.2 | 40.8 | ---- | 56.0 | 46.0 | -15.2 | ---- |

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

## 4.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

***RESULT = READING + LISN FACTOR (Included Cable Loss)***

## 4.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test.

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| RF Test Receiver | Rohde and Schwarz | ESCS30 | 08/07/2008 |
| LISN | TELEMETER | NNB-2/16Z | 03/30/2008 |

# 5 ANTENNA REQUIREMENT

## 5.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to §15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 5.2 Antenna Construction and Directional Gain

| | Antenna A | Antenna B |
|---|---|---|
| Antenna type | PIFA | PIFA |
| Antenna gain | 1.76 dBi | 0.85 dBi |

# 6 EMISSION BANDWIDTH MEASUREMENT

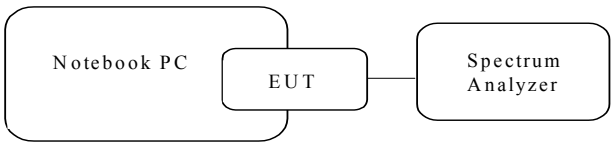
## 6.1 Standard Applicable

According to 15.247(a)(2), system using digital modulation techniques, the minimum 6dB bandwidth shall be at least 500 kHz.

## 6.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Figure 2: Emission bandwidth measurement configuration.




## 6.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | 8564EC | 10/10/2008 |

## 6.4 Measurement Data

### 6.4.1 IEEE 802.11b

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

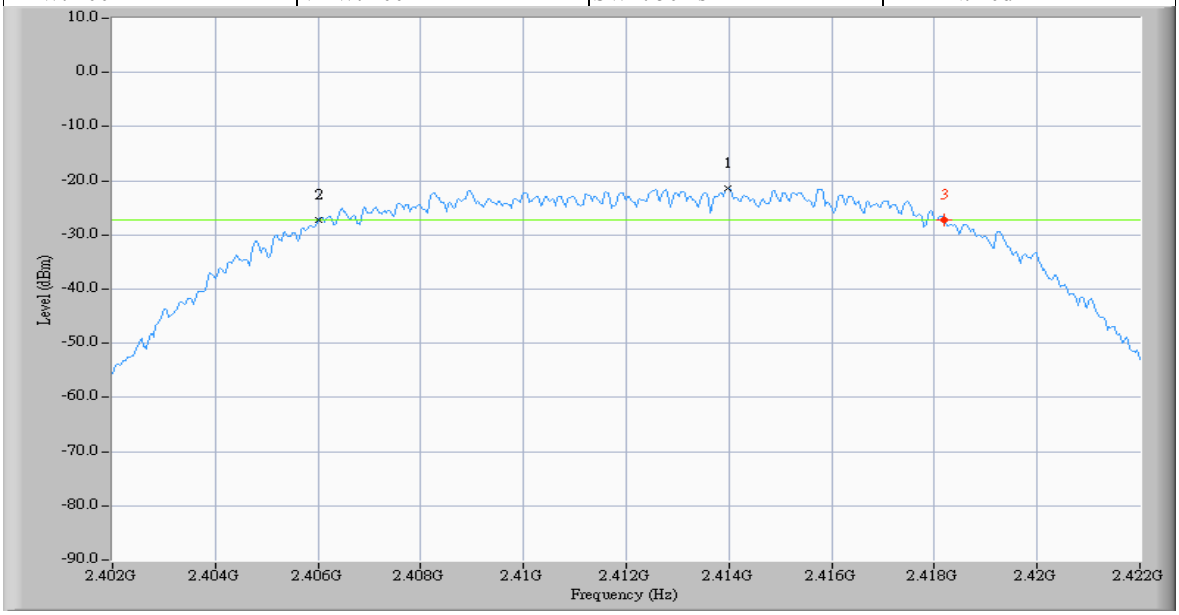
| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | 6dB Bandwidth (MHz) | FCC Limit (kHz) | Chart |
|---|---|---|---|---|---|
| 1 | 2412 | 1 | 12.200 | 500 | Page 25 |
| 6 | 2437 | 1 | 12.267 | 500 | Page 26 |
| 11 | 2462 | 1 | 12.333 | 500 | Page 27 |

***Note:***

*1.Please refer to page 25 to page 27 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*

| EUT : | Model : | Status : WLAN-11b-CH01-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

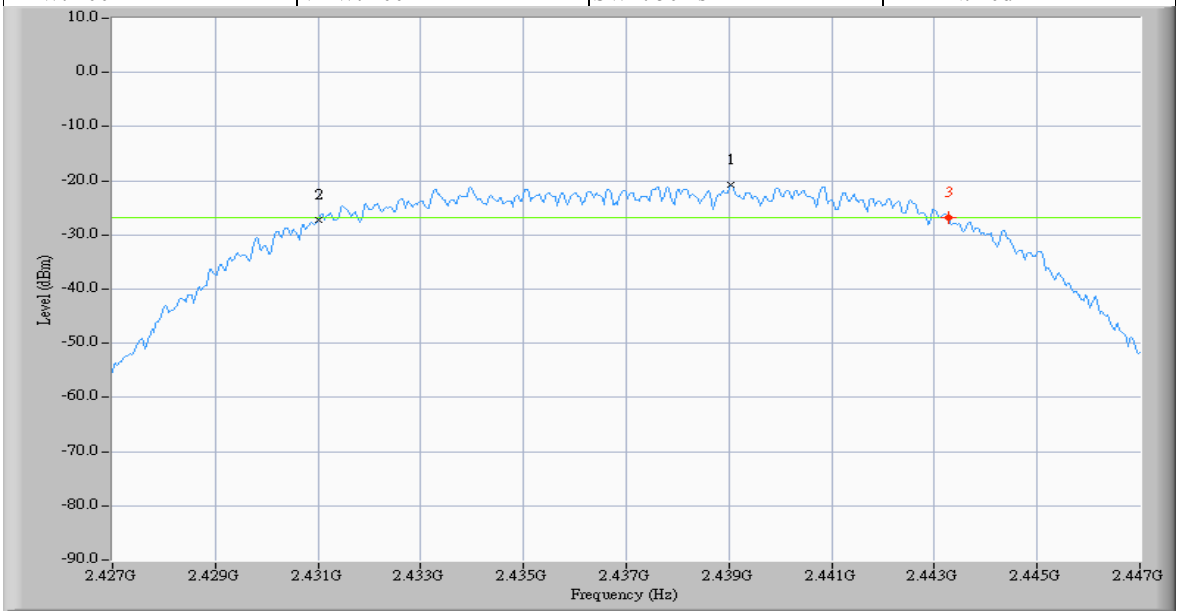



Test Request: (-27.3dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2413.967 | -21.3 |
| 2 | 2406.000 | -27.3 |
| 3 | 2418.200 | -27.3 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 12.200 | 0.0 |

| EUT : | Model : | Status : WLAN-11b-CH06-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

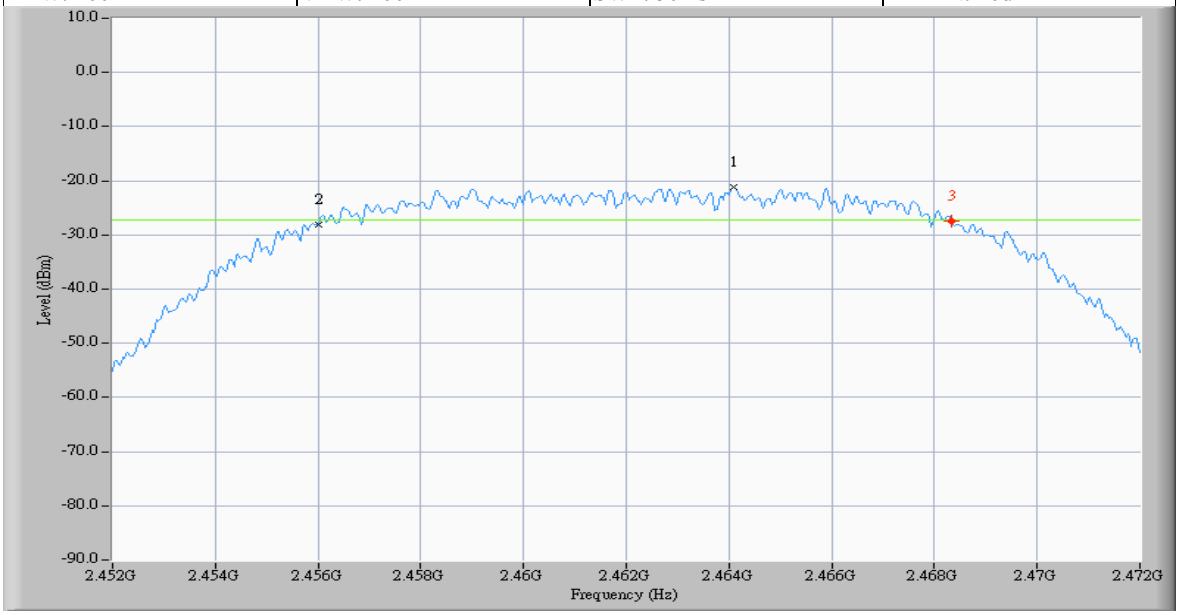



Test Request: (-26.8dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2439.033 | -20.8 |
| 2 | 2431.000 | -27.3 |
| 3 | 2443.267 | -26.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 12.267 | 0.5 |

| EUT : | Model : | Status : WLAN-11b-CH11-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |




Test Request: (-27.2dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2464.100 | -21.2 |
| 2 | 2456.000 | -28.0 |
| 3 | 2468.333 | -27.5 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 12.333 | 0.5 |

### 6.4.2 IEEE 802.11g

Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

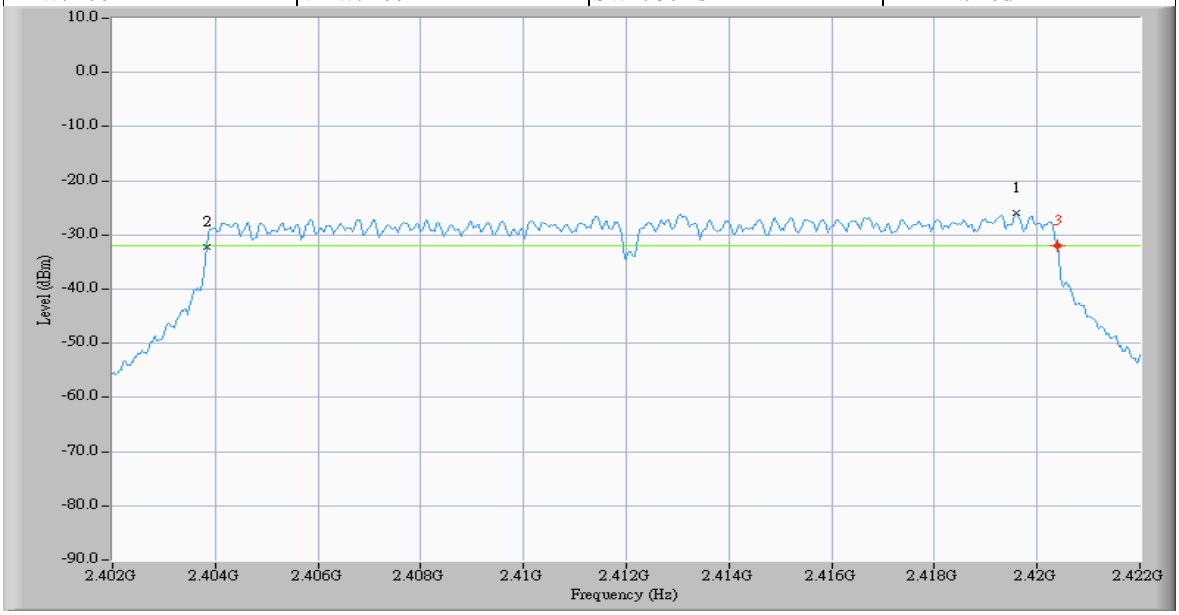
| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | 6dB Bandwidth (MHz) | FCC Limit (kHz) | Chart |
|---|---|---|---|---|---|
| 1 | 2412 | 6 | 16.567 | 500 | Page 29 |
| 6 | 2437 | 6 | 16.700 | 500 | Page 30 |
| 11 | 2462 | 6 | 16.734 | 500 | Page 31 |

***Note:***

*1.Please refer to page 29 to page 31 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*

| EUT : | Model : | Status : WLAN-11g-CH01-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

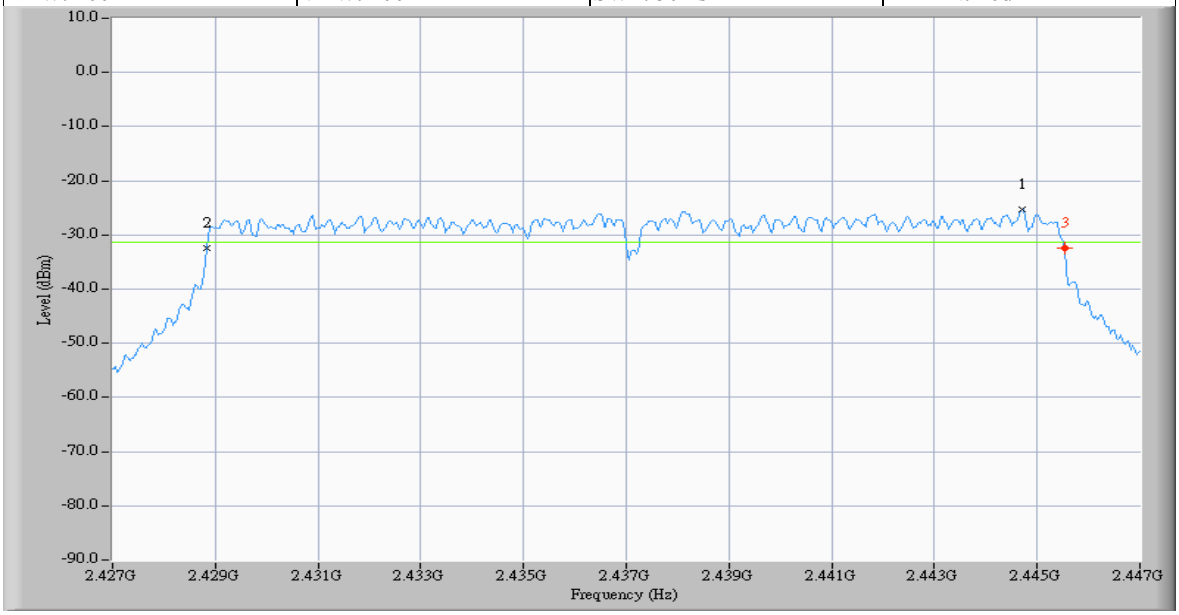



Test Request: (-32.0dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2419.600 | -26.0 |
| 2 | 2403.833 | -32.2 |
| 3 | 2420.400 | -32.0 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 16.567 | 0.2 |

| EUT : | Model : | Status : WLAN-11g-CH06-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

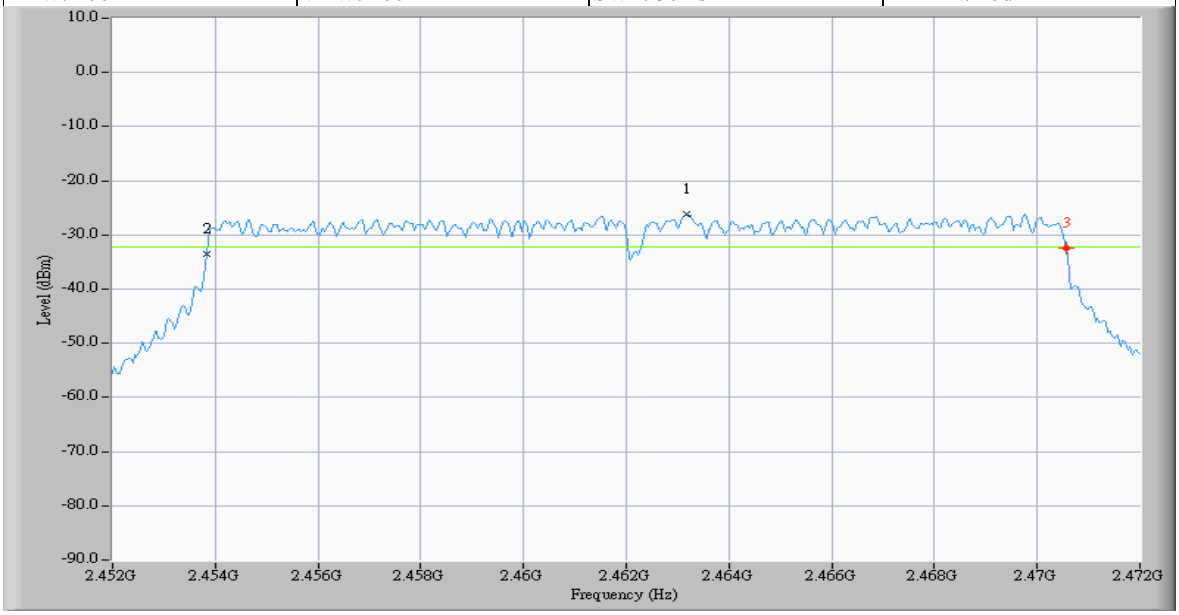



Test Request: (-31.3dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2444.700 | -25.3 |
| 2 | 2428.833 | -32.3 |
| 3 | 2445.533 | -32.5 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 16.700 | -0.2 |

| EUT : | Model : | Status : WLAN-11g-CH11-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |




Test Request: (-32.2dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2463.167 | -26.2 |
| 2 | 2453.833 | -33.5 |
| 3 | 2470.567 | -32.3 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 16.734 | 1.2 |

### 6.4.3 IEEE 802.11n, HT20

Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

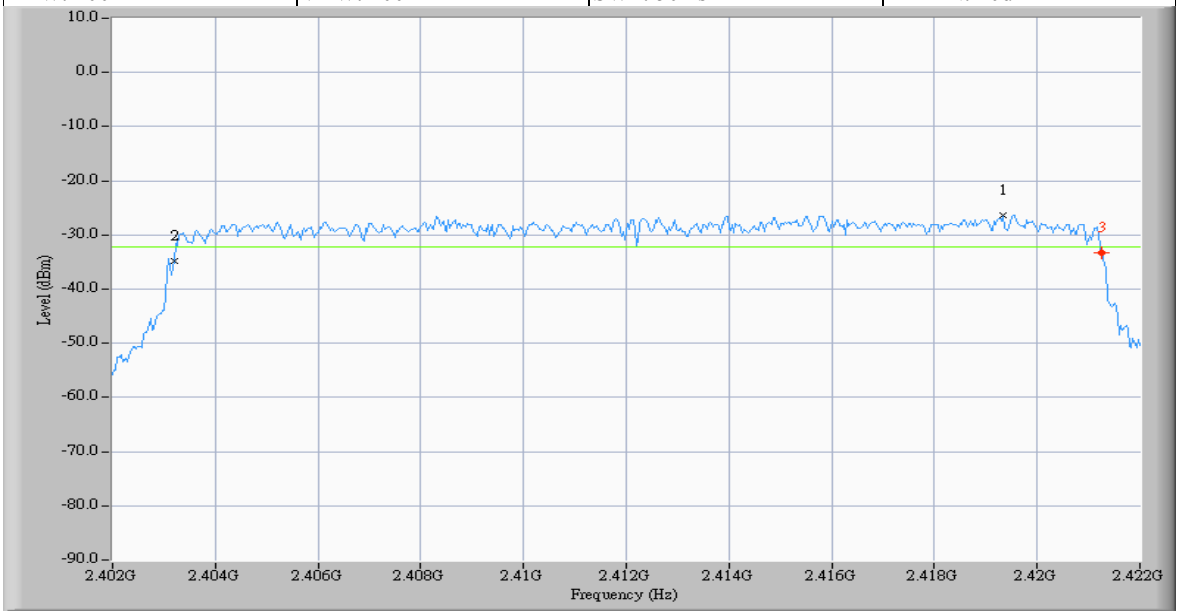
| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | 6dB Bandwidth (MHz) | FCC Limit (kHz) | Chart |
|---|---|---|---|---|---|
| 1 | 2412 | 6.5 | 18.067 | 500 | Page 33 |
| 6 | 2437 | 6.5 | 17.833 | 500 | Page 34 |
| 11 | 2462 | 6.5 | 17.900 | 500 | Page 35 |

***Note:***

*1.Please refer to page 33 to page 35 for chart*

*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz≦f≦ 18GHz)*

| EUT : | Model : | Status : WLAN-11n-CH01-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

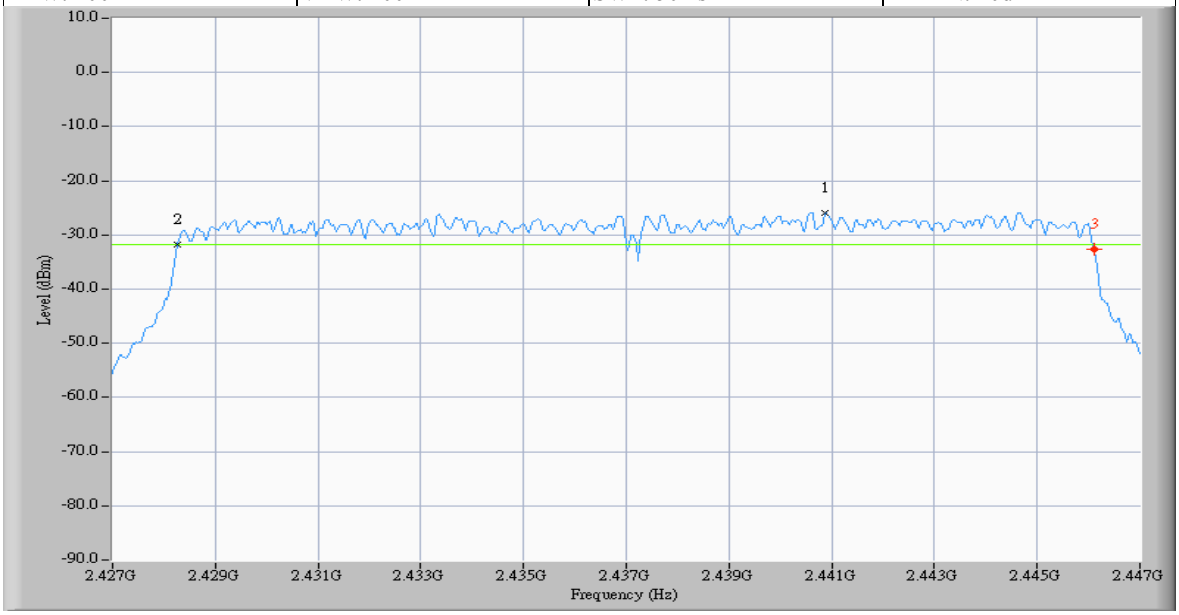



Test Request: (-32.3dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2419.333 | -26.3 |
| 2 | 2403.200 | -34.8 |
| 3 | 2421.267 | -33.3 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 18.067 | 1.5 |

| EUT : | Model : | Status : WLAN-11n -CH06-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

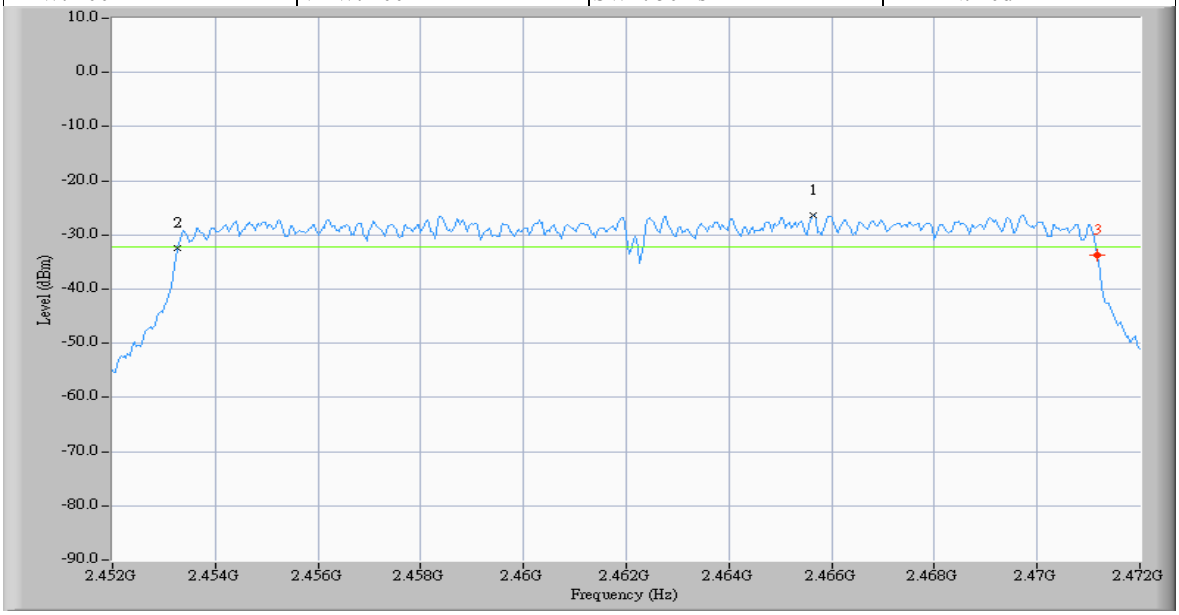



Test Request: (-31.8dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2440.867 | -25.8 |
| 2 | 2428.267 | -31.8 |
| 3 | 2446.100 | -32.7 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 17.833 | -0.9 |

| EUT : | Model : | Status : WLAN-11n -CH11-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |




Test Request: (-32.3dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2465.633 | -26.3 |
| 2 | 2453.267 | -32.3 |
| 3 | 2471.167 | -33.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 17.900 | -1.5 |

### 6.4.4 IEEE 802.11n, HT40

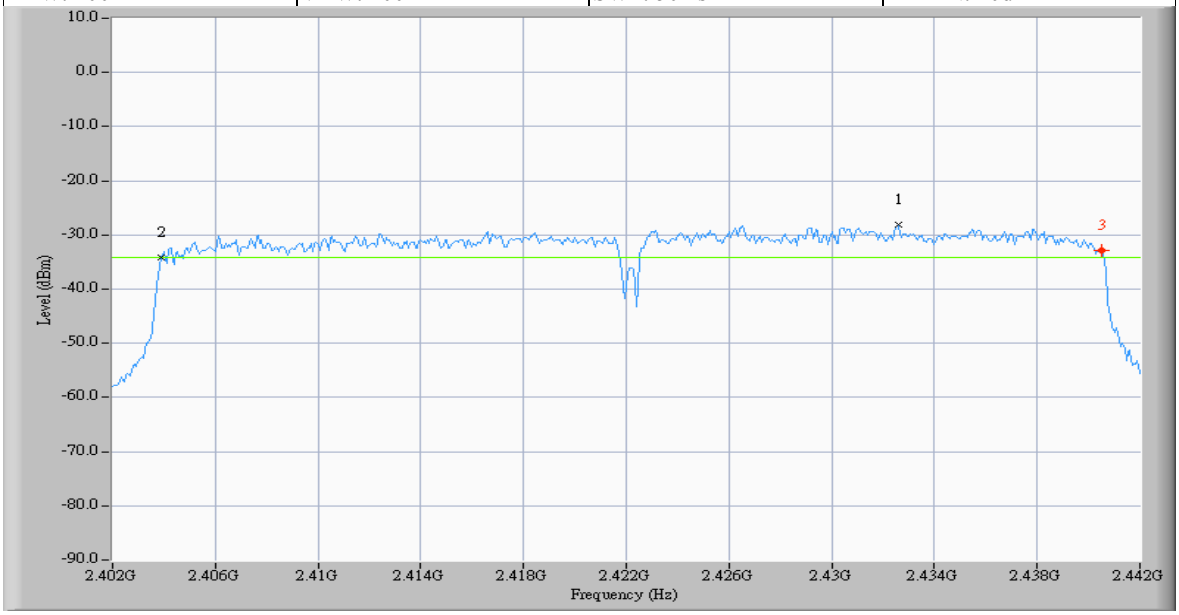
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | 6dB Bandwidth (MHz) | FCC Limit (kHz) | Chart |
|---|---|---|---|---|---|
| 3 | 2422 | 13.5 | 36.666 | 500 | Page 37 |
| 6 | 2437 | 13.5 | 36.800 | 500 | Page 38 |
| 9 | 2452 | 13.5 | 37.067 | 500 | Page 39 |

***Note:***

*1.Please refer to page 37 to page 39 for chart*
*2. The estimated measurement uncertainty of the result measurement is* $8.25 \times 10^{-7}$ *(1GHz* $\leqq f \leqq$ *18GHz)*

| EUT : | Model : | Status : WLAN-11n-CH03-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

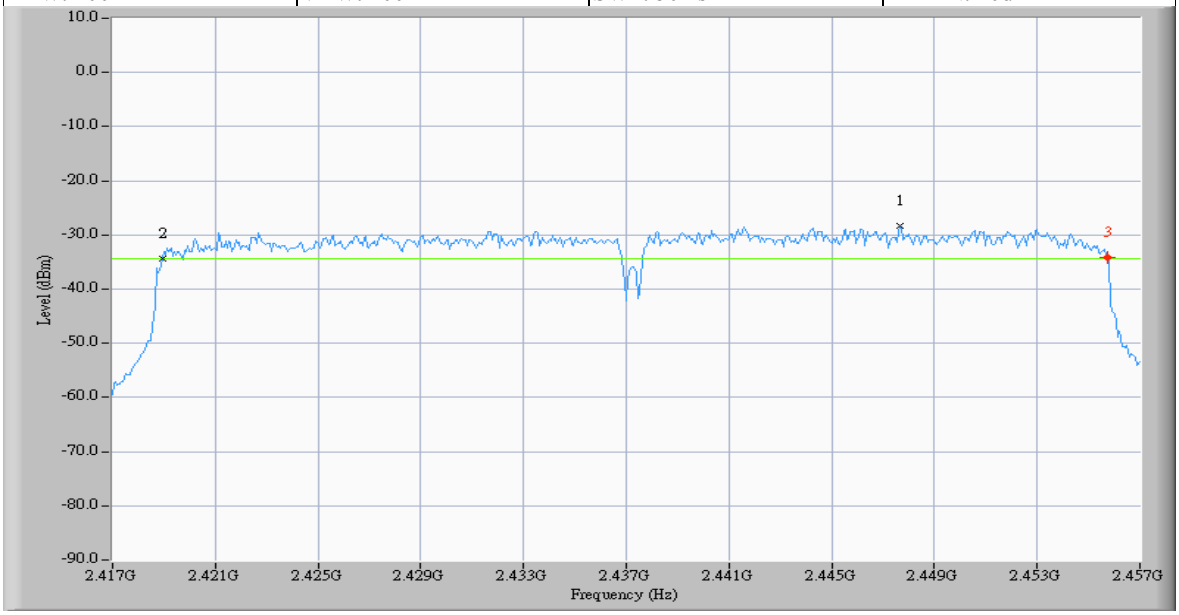



Test Request: (-34.16dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2432.600 | -28.2 |
| 2 | 2403.867 | -34.2 |
| 3 | 2440.533 | -32.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 36.666 | 1.4 |

| EUT : | Model : | Status : WLAN-11n-CH06-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |

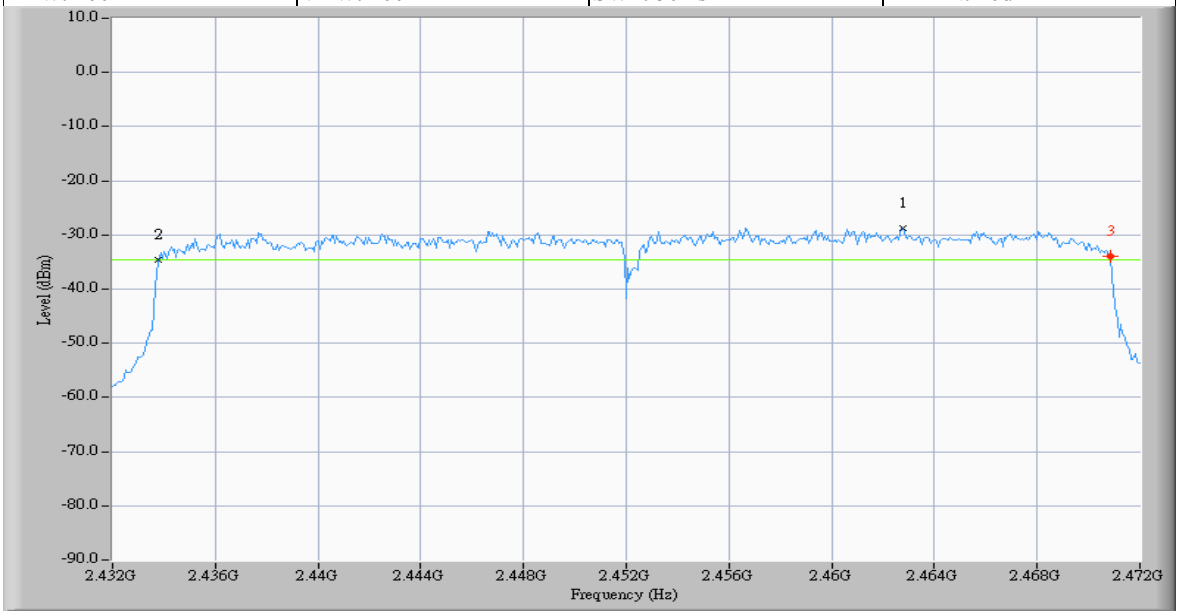



Test Request: (-34.33dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2447.667 | -28.3 |
| 2 | 2418.933 | -34.3 |
| 3 | 2455.733 | -34.2 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 36.800 | 0.1 |

| EUT : | Model : | Status : WLAN-11n-CH09-6dB-BW | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 100 kHz | SWP: 50ms | ATTEN: 20dB |




Test Request: (-34.66dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2462.800 | -28.7 |
| 2 | 2433.800 | -34.7 |
| 3 | 2470.867 | -34.0 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 3 - Mkr 2 | 37.067 | 0.7 |

# 7 OUTPUT POWER MEASUREMENT

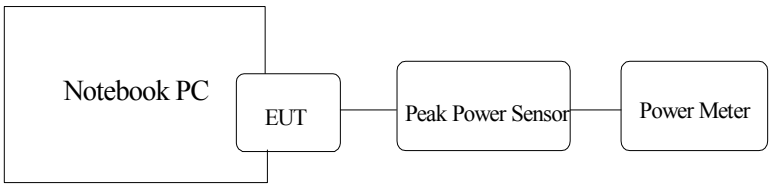
## 7.1 Standard Applicable

For direct sequence system, according to 15.247(b), the maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 7.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 3. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range.
3. Measure the highest value appearing on power meter and record the level to calculate result data.
4. Repeat above procedures until all frequencies measured were complete.

Figure 3: Output power measurement configuration.




## 7.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | 8564EC | 10/10/2008 |
| Power Meter | Boonton | 4532-0102 | 05/08/2008 |
| Peak Power Sensor | Boonton | 56518 | 05/08/2008 |

## 7.4 Measurement Data

### 7.4.1 IEEE 802.11b

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Attenuator & Cable Loss (dB) | Maximum Peak Output Power (dBm) | Maximum Peak Output Power (mW) | FCC Limit (mW) | Chart |
|---|---|---|---|---|---|---|---|---|
| 1 | 2412 | 1 | -8.93 | 20.0 | 11.07 | 12.79 | 1000 | - |
| 6 | 2437 | 1 | -8.56 | 20.0 | 11.44 | 13.93 | 1000 | - |
| 11 | 2462 | 1 | -8.59 | 20.0 | 11.41 | 13.84 | 1000 | - |

***Note:***

***The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)***

### 7.4.2 IEEE 802.11g

Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Attenuator & Cable Loss (dB) | Maximum Peak Output Power (dBm) | Maximum Peak Output Power (mW) | FCC Limit (mW) | Chart |
|---|---|---|---|---|---|---|---|---|
| 1 | 2412 | 6 | -7.00 | 20.0 | 13.00 | 19.95 | 1000 | - |
| 6 | 2437 | 6 | -6.53 | 20.0 | 13.47 | 22.23 | 1000 | - |
| 11 | 2462 | 6 | -6.22 | 20.0 | 13.78 | 23.88 | 1000 | - |

***Note:***

***The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)***

### 7.4.3 IEEE 802.11n, HT20

Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Attenuator & Cable Loss (dB) | Maximum Peak Output Power (dBm) | Maximum Peak Output Power (mW) | FCC Limit (mW) | Chart |
|---|---|---|---|---|---|---|---|---|
| 1 | 2412 | 6.5 | -6.59 | 20.0 | 13.41 | 21.93 | 1000 | - |
| 6 | 2437 | 6.5 | -6.62 | 20.0 | 13.38 | 21.78 | 1000 | - |
| 11 | 2462 | 6.5 | -6.31 | 20.0 | 13.69 | 23.39 | 1000 | - |

***Note:***

***The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)***

### 7.4.4 IEEE 802.11n, HT40

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Attenuator & Cable Loss (dB) | Maximum Peak Output Power (dBm) | Maximum Peak Output Power (mW) | FCC Limit (mW) | Chart |
|---|---|---|---|---|---|---|---|---|
| 3 | 2422 | 13.5 | -6.22 | 20.0 | 13.78 | 23.88 | 1000 | - |
| 6 | 2437 | 13.5 | -6.17 | 20.0 | 13.83 | 24.15 | 1000 | - |
| 9 | 2452 | 13.5 | -6.17 | 20.0 | 13.83 | 24.15 | 1000 | - |

***Note:***

***The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)***

# 8 POWER DENSITY MEASUREMENT

## 8.1 Standard Applicable

According to 15.247(d), for direct sequence systems, the transmitted power density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

## 8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set EUT to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of spectrum analyzer on highest level appearing on spectral display within a 300 kHz frequency span.
4. Set the spectrum analyzer on a 3 kHz resolution bandwidth and 10 kHz video bandwidth as well as max. hold function, then record the measurement result.
5. Repeat above procedures until all measured frequencies were complete.

## 8.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | 8564EC | 10/10/2008 |

## 8.4 Measurement Data

### 8.4.1 IEEE 802.11b

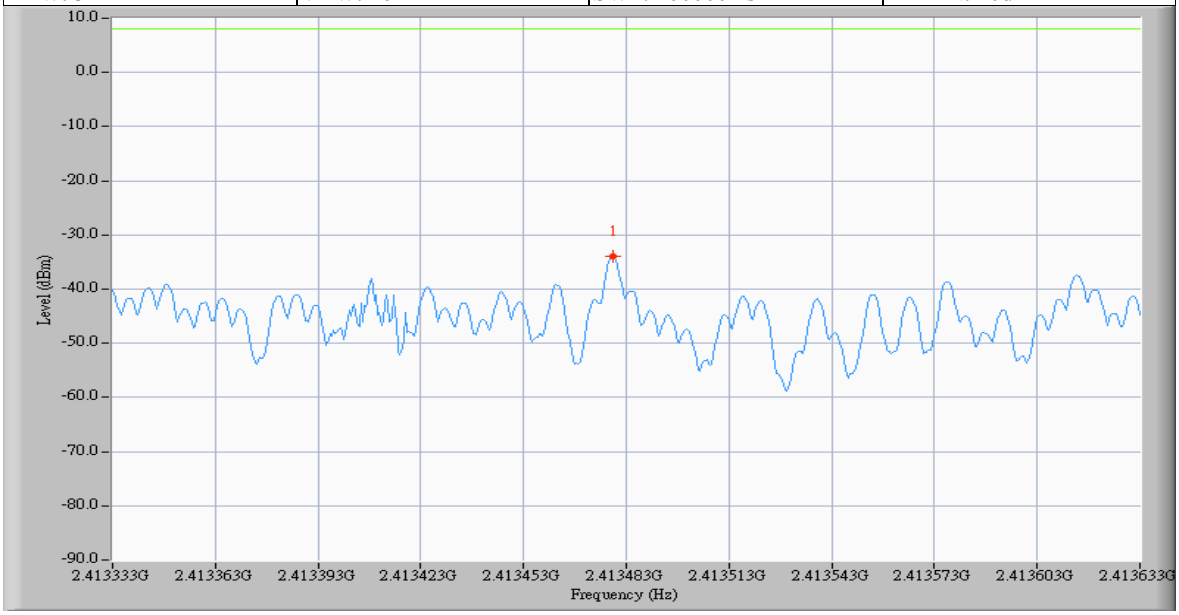
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Cable Loss (dB) | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|---|
| 1 | 2412 | 1 | -34.0 | 20.0 | -14.0 | 8 | Page 47 |
| 6 | 2437 | 1 | -33.5 | 20.0 | -13.5 | 8 | Page 48 |
| 11 | 2462 | 1 | 33.8 | 20.0 | -13.8 | 8 | Page 49 |

***Note:***

1. *Please refer to page 47 to page 49 for chart*
2. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦ 18GHz)*

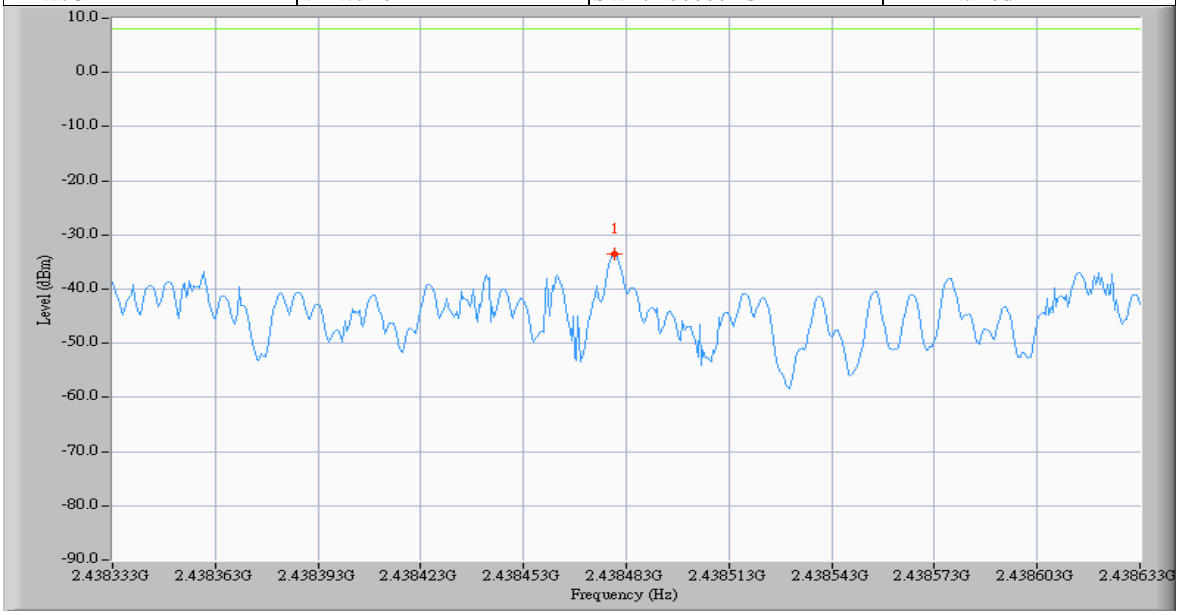
| EUT : | Model : | Status : WLAN-11b-CH01-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2413.479 | -34.0 | 20.0 | -14.0 | 8.0 | -22.0 |

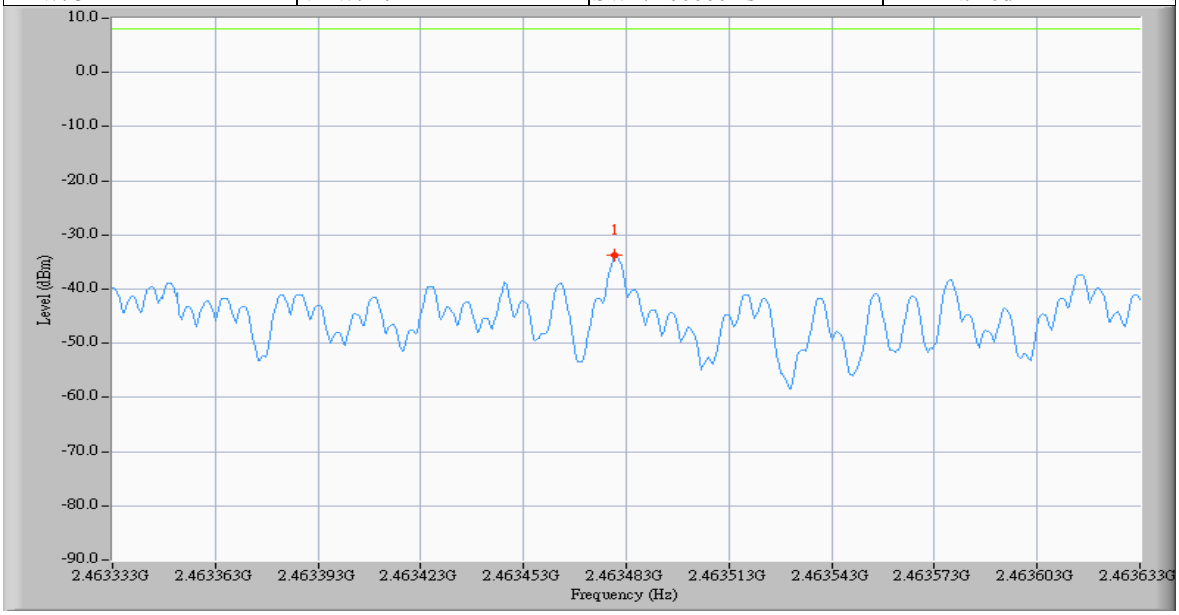
| EUT : | Model : | Status : WLAN-11b-CH06-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2438.480 | -33.5 | 20.0 | -13.5 | 8.0 | -21.5 |

| EUT : | Model : | Status : WLAN-11b-CH11-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2463.480 | -33.8 | 20.0 | -13.8 | 8.0 | -21.8 |

### 8.4.2 IEEE 802.11g

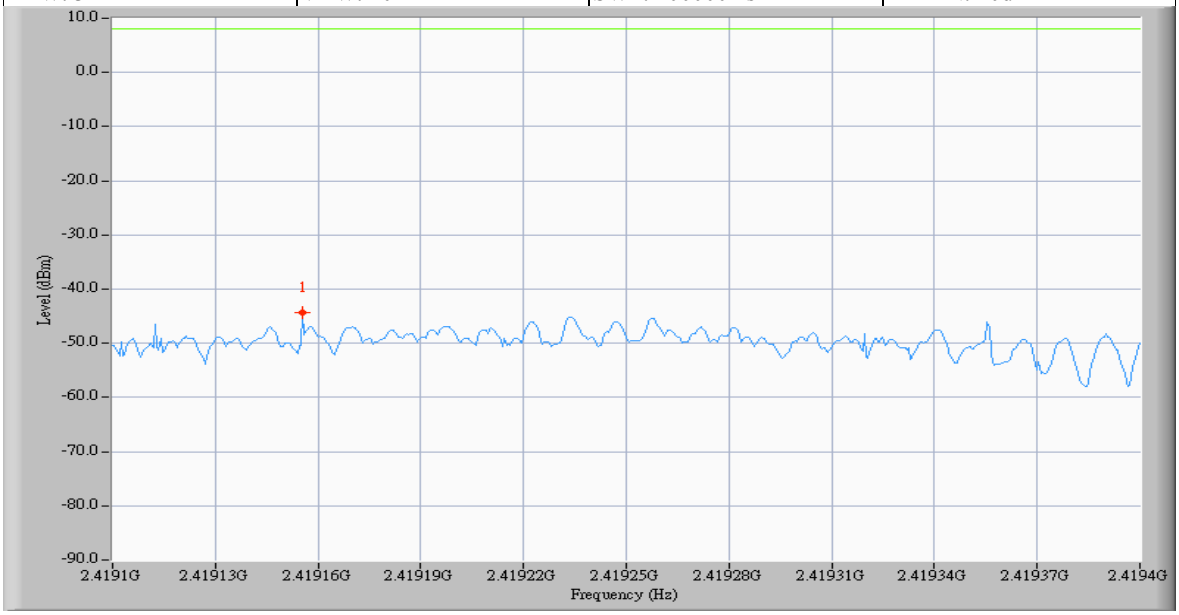
Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Cable Loss (dB) | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|---|
| 1 | 2412 | 6 | -44.3 | 20.0 | -24.3 | 8 | Page 51 |
| 6 | 2437 | 6 | -42.2 | 20.0 | -22.2 | 8 | Page 52 |
| 11 | 2462 | 6 | -41.7 | 20.0 | -21.7 | 8 | Page 53 |

***Note:***

1. *Please refer to page 51 to page 53 for chart*
2. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦ 18GHz)*

| EUT : | Model : | Status : WLAN-11g-CH01-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |

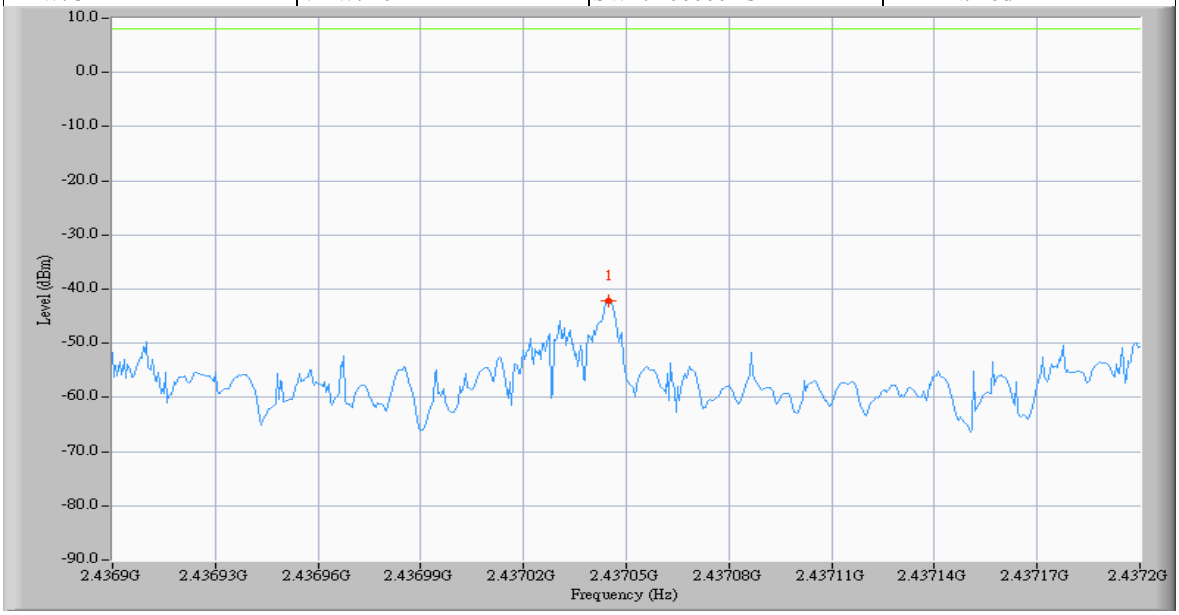



Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2419.155 | -44.3 | 20.0 | -24.3 | 8.0 | -32.3 |

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2419.155 | -44.3 |

| EUT : | Model : | Status : WLAN-11g-CH06-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |

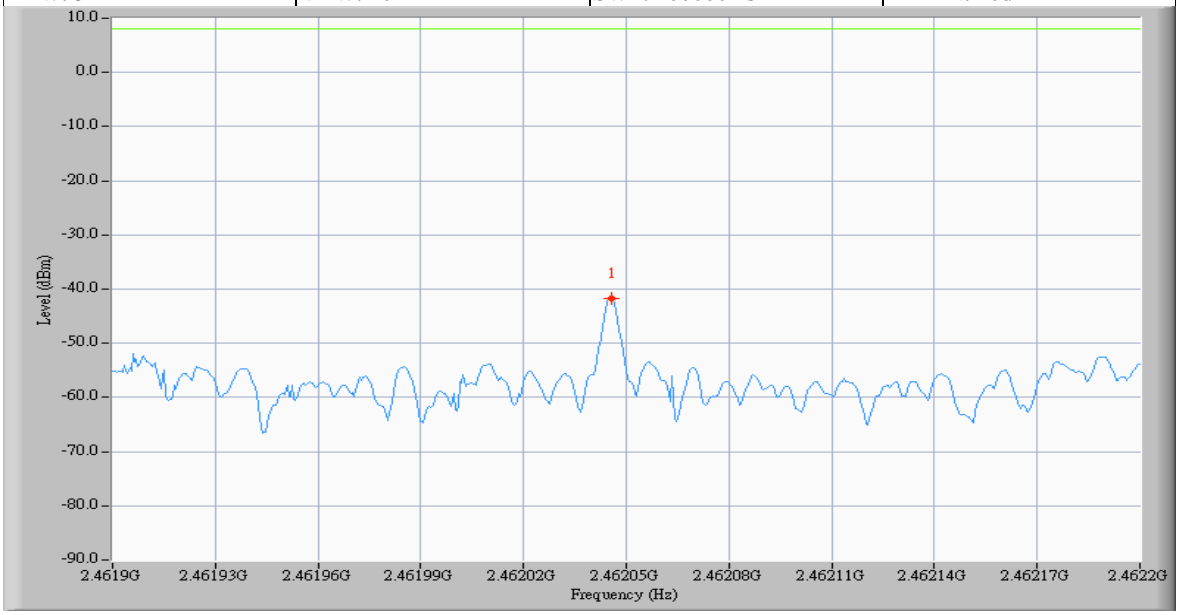



Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2437.045 | -42.2 | 20.0 | -22.2 | 8.0 | -30.2 |

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2437.045 | -42.2 |

| | | | |
|---|---|---|---|
| EUT : | Model : | Status : WLAN-11g-CH11-PwrDensity | |
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2462.046 | -41.7 | 20.0 | -21.7 | 8.0 | -29.7 |

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2462.046 | -41.7 |

### 8.4.3 IEEE 802.11n, HT20

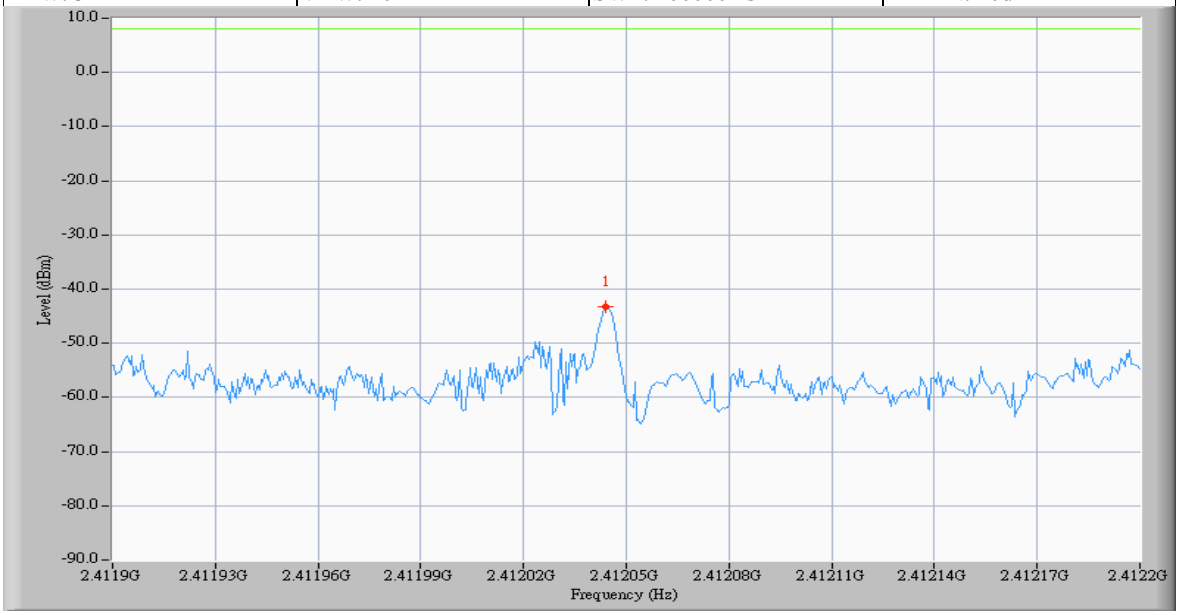
Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Cable Loss (dB) | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|---|
| 1 | 2412 | 6.5 | -43.3 | 20.0 | -23.3 | 8 | Page 55 |
| 6 | 2437 | 6.5 | -42.3 | 20.0 | -22.3 | 8 | Page 56 |
| 11 | 2462 | 6.5 | -41.8 | 20.0 | -21.8 | 8 | Page 57 |

***Note:***

1. *Please refer to page 55 to page 57 for chart*
2. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦ 18GHz)*

| EUT : | Model : | Status : WLAN-11n-CH01-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |

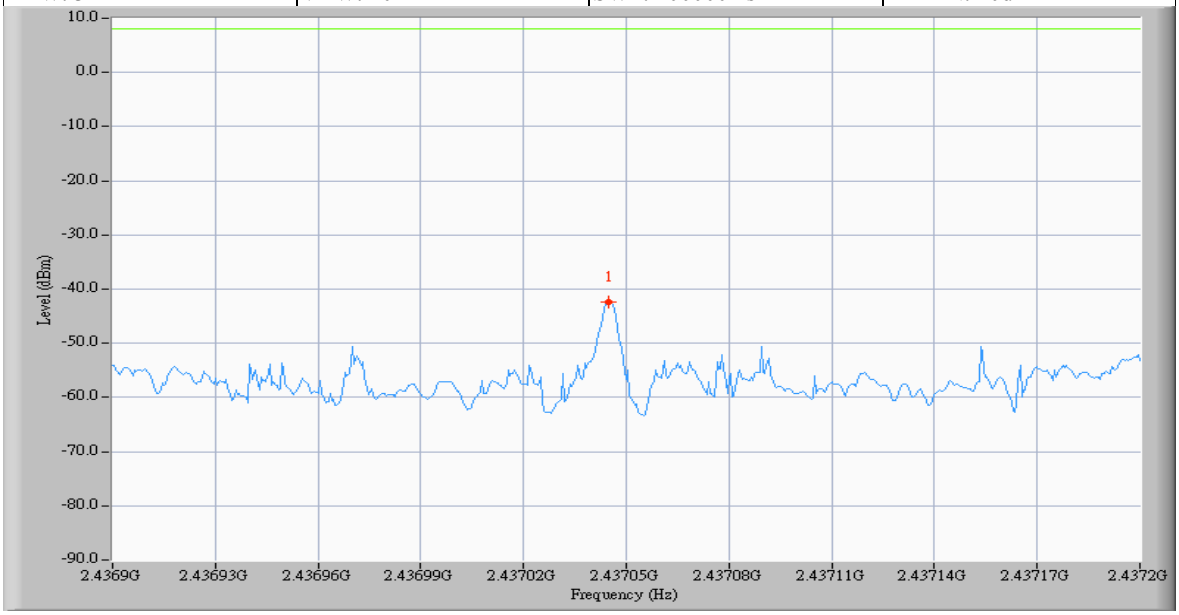



Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2412.044 | -43.3 | 20.0 | -23.3 | 8.0 | -31.3 |

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2412.044 | -43.3 |

| EUT : | Model : | Status : WLAN-11n-CH06-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |

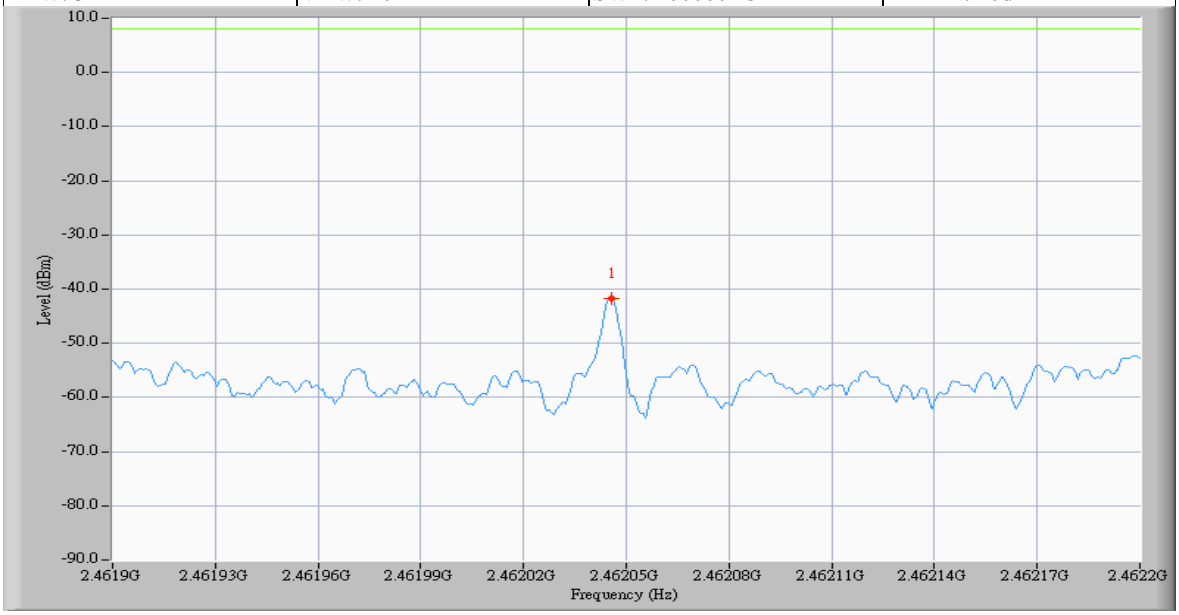



Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2437.045 | -42.3 | 20.0 | -22.3 | 8.0 | -30.3 |

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2437.045 | -42.3 |

| EUT : | Model : | Status : WLAN-11n-CH11-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2462.046 | -41.8 | 20.0 | -21.8 | 8.0 | -29.8 |

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2462.046 | -41.8 |

### 8.4.4 IEEE 802.11n, HT40

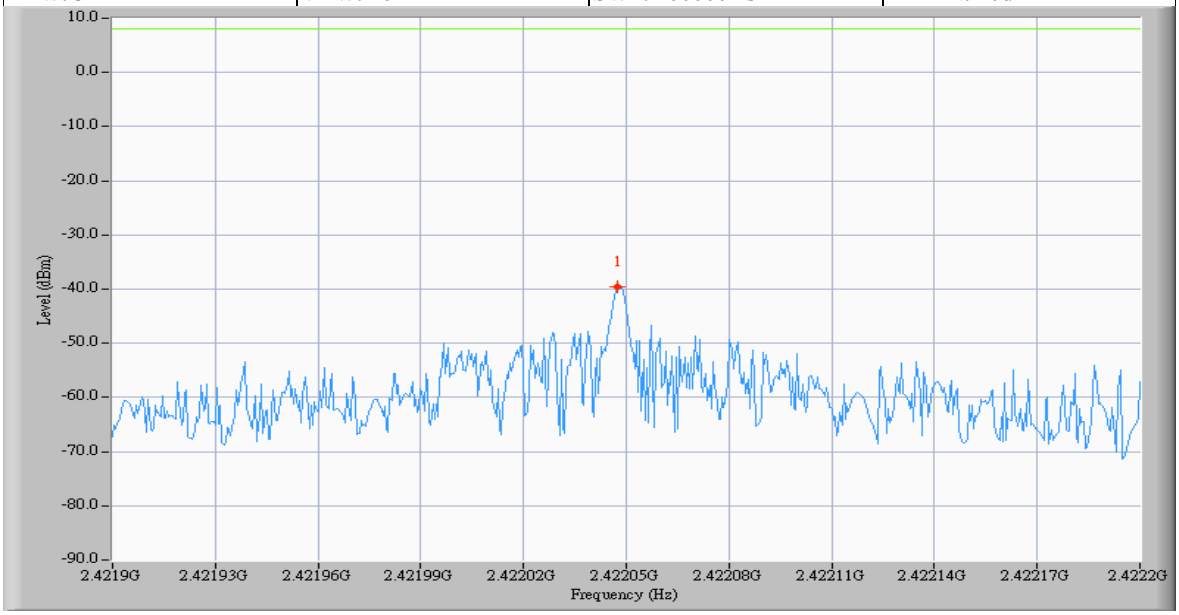
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

| Channel | Frequency (MHz) | Data Transfer Rate (Mbps) | Reading (dBm) | Cable Loss (dB) | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart |
|---|---|---|---|---|---|---|---|
| 3 | 2422 | 13.5 | -39.5 | 20.0 | -19.5 | 8 | Page 59 |
| 6 | 2437 | 13.5 | -39.5 | 20.0 | -19.5 | 8 | Page 60 |
| 9 | 2452 | 13.5 | 39.5 | 20.0 | -19.7 | 8 | Page 61 |

***Note:***

1. *Please refer to page 59 to page 61 for chart*
2. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦ 18GHz)*

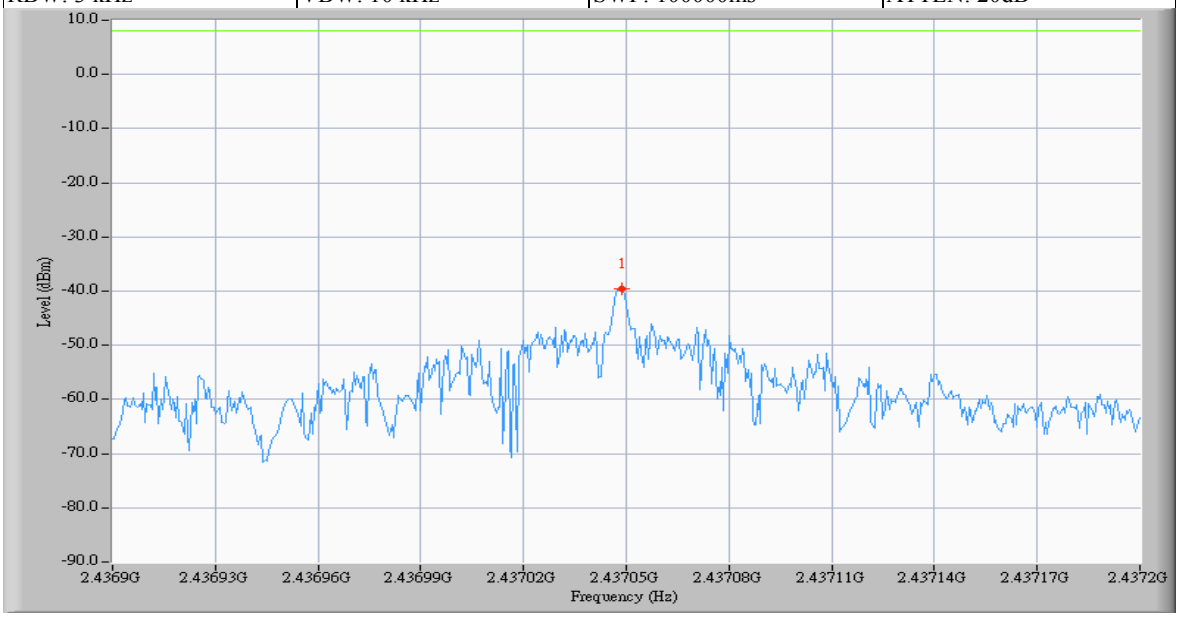
| EUT : | Model : | Status : WLAN-11n-CH03-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2422.047 | -39.5 | 20.0 | -19.5 | 8.0 | -27.5 |

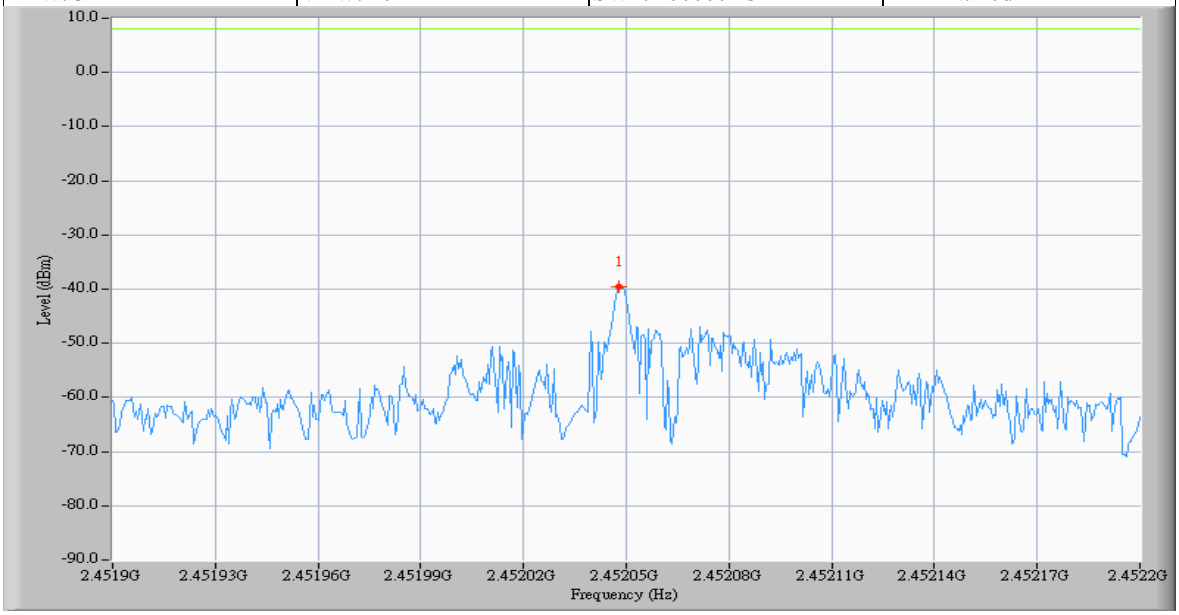
| EUT : | Model : | Status : WLAN-11n-CH06-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2437.048 | -39.5 | 20.0 | -19.5 | 8.0 | -27.5 |

| EUT : | Model : | Status : WLAN-11n-CH09-PwrDensity | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 3 kHz | VBW: 10 kHz | SWP: 100000ms | ATTEN: 20dB |




Test Request: (8dBm)

| | Freq (MHz) | PK Level (dBm) | Factor (dB) | PK Result (dBm) | PK Limit (dBm) | PK Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 2452.048 | -39.7 | 20.0 | -19.7 | 8.0 | -27.7 |

# 9 SPURIOUS EMISSION - RF CONDUCTED MEASUREMENT

## 9.1 Standard Applicable

According to 12.247 (c) , in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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)).

## 9.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

## 9.3 Measurement Equipment

| Equipment | Manufacturer | Model No. | Next Cal. Due |
|---|---|---|---|
| Spectrum Analyzer | Agilent | 8564EC | 10/10/2008 |

## 9.4 Measurement Data

### 9.4.1 IEEE 802.11b

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 1 | 2412 | Page 65, Page 67 |
| 6 | 2437 | Page 68 |
| 11 | 2462 | Page 66, Page 69 |

All out-of –band conducted emissions were more than 20dB below the carrier.

***Note: Please refer to page 65 to page 69 for chart***

### 9.4.2 IEEE 802.11g

Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 1 | 2412 | Page 70, Page 72 |
| 6 | 2437 | Page 73 |
| 11 | 2462 | Page 71, Page 74 |

All out-of –band conducted emissions were more than 20dB below the carrier.

***Note: Please refer to page 70 to page 74 for chart***

### 9.4.3 IEEE 802.11n, HT20

Test Date: Jan. 22, 2008 Temperature: 18℃ Humidity: 62%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 1 | 2412 | Page 75, Page 77 |
| 6 | 2437 | Page 78 |
| 11 | 2462 | Page 76 Page 79 |

All out-of –band conducted emissions were more than 20dB below the carrier.

***Note: Please refer to page 75 to page 79 for chart***

### 9.4.4 IEEE 802.11n, HT40

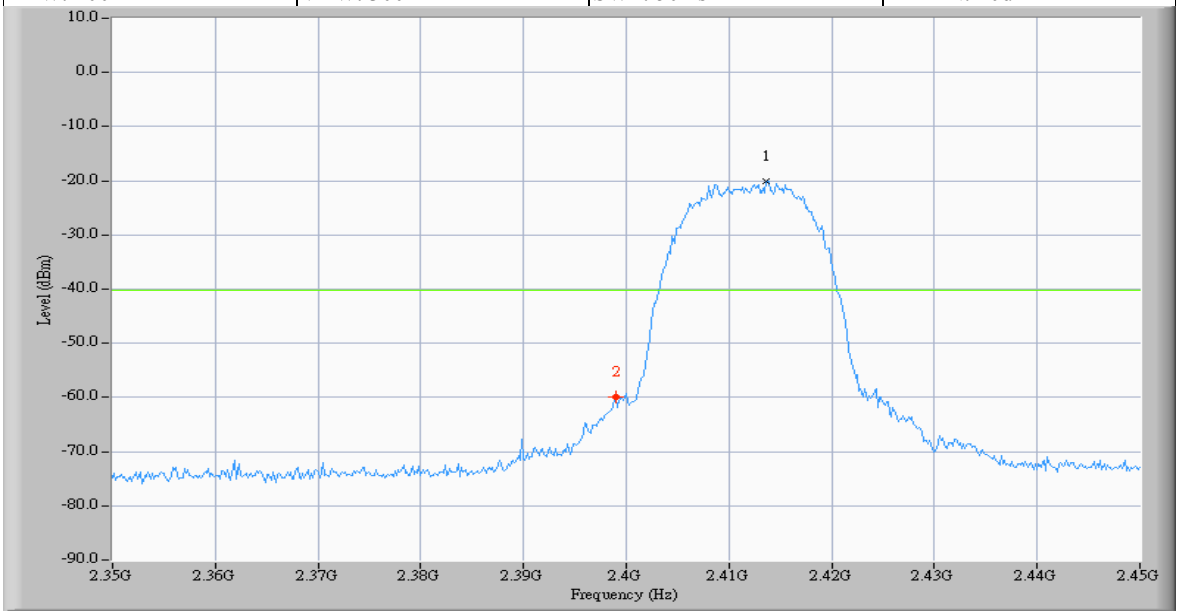
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

| Channel | Frequency(MHz) | Chart |
|---|---|---|
| 3 | 2422 | Page 80, Page 82 |
| 6 | 2437 | Page 83 |
| 9 | 2452 | Page 81, Page 84 |

All out-of –band conducted emissions were more than 20dB below the carrier.

***Note: Please refer to page 80 to page 84 for chart***

| EUT : | Model : | Status : WLAN-11b-CH01-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

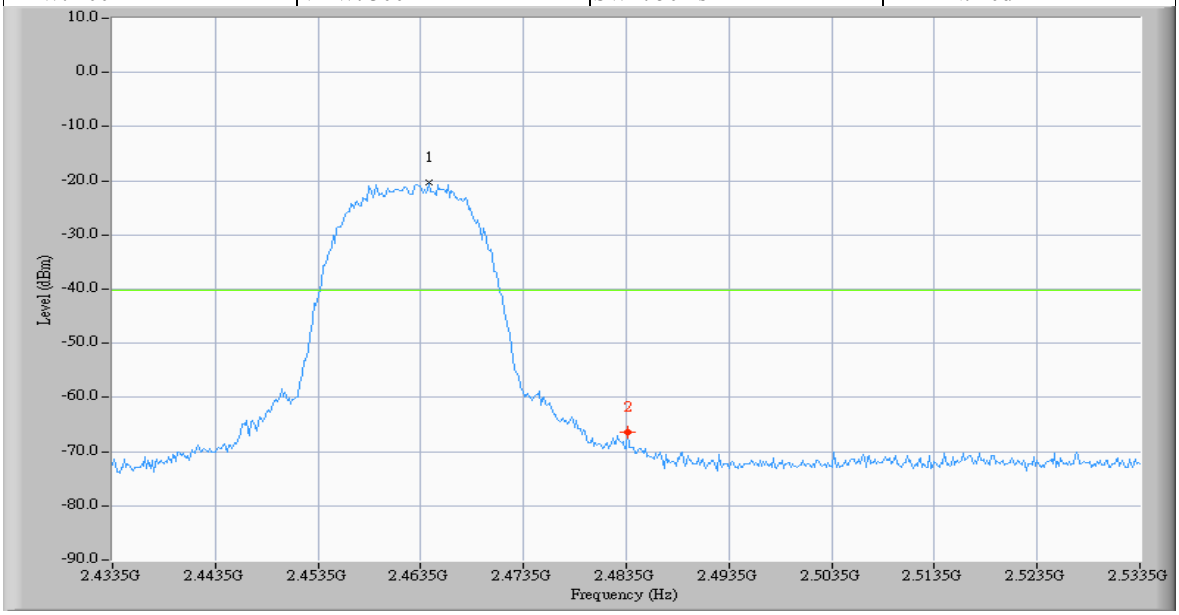



Test Request: (-40.2dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2413.667 | -20.2 |
| 2 | 2399.000 | -59.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | 14.667 | 39.6 |

| EUT : | Model : | Status : WLAN-11b-CH11-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

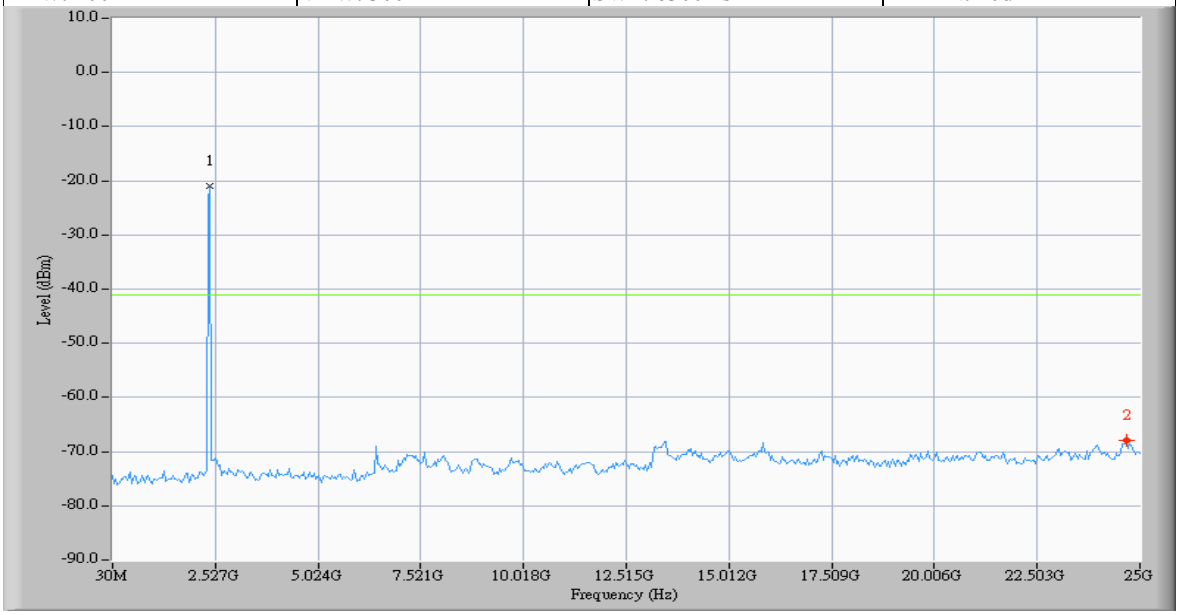



Test Request: (-40.3dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2464.333 | -20.3 |
| 2 | 2483.667 | -66.5 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -19.334 | 46.2 |

| EUT : | Model : | Status : WLAN-11b-CH01-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

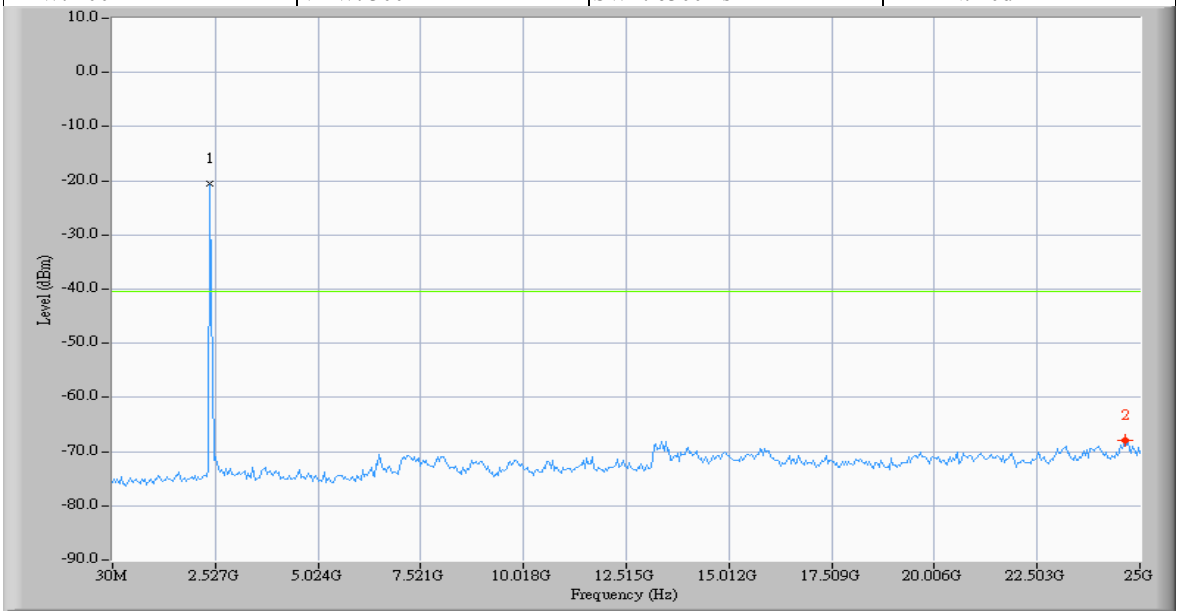



Test Request: (-41.0dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -21.0 |
| 2 | 24667.067 | -68.0 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22264.917 | 47.0 |

| EUT : | Model : | Status : WLAN-11b-CH06-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

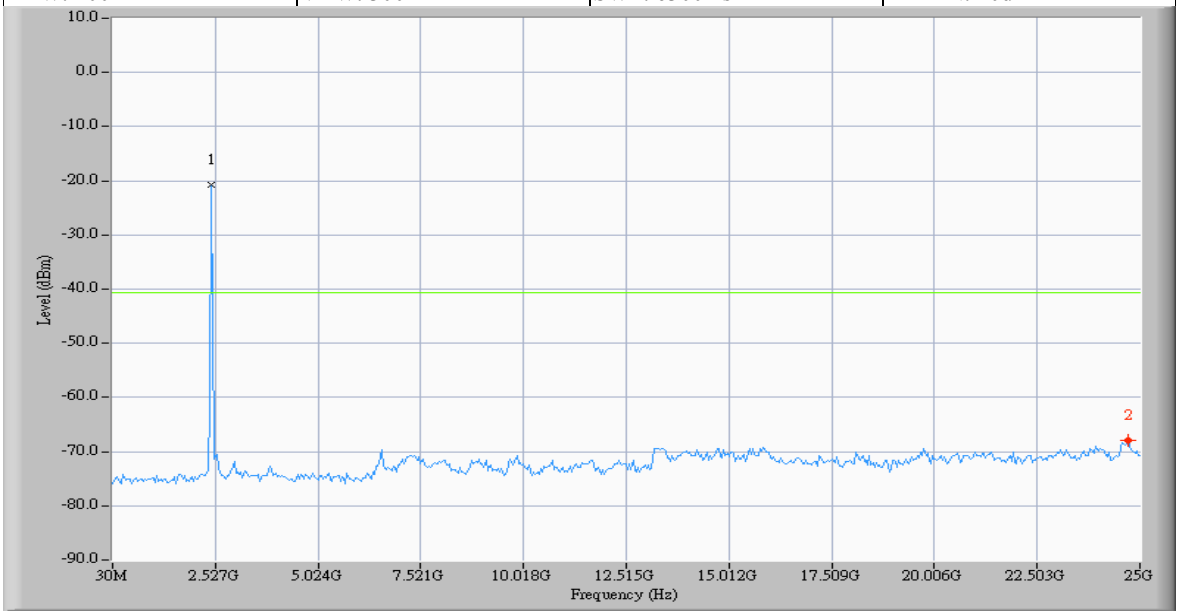



Test Request: (-40.5dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -20.5 |
| 2 | 24625.450 | -68.0 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22223.300 | 47.5 |

| EUT : | Model : | Status : WLAN-11b-CH11-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

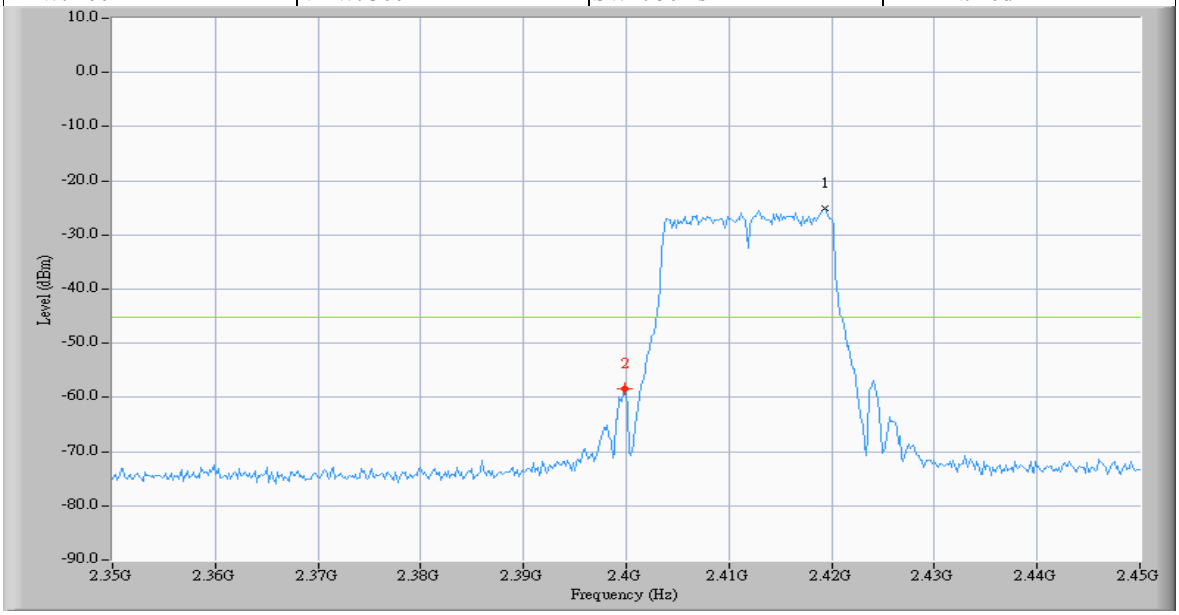



Test Request: (-40.7dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2443.767 | -20.7 |
| 2 | 24708.683 | -67.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22264.916 | 47.1 |

| EUT : | Model : | Status : WLAN-11g-CH01-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

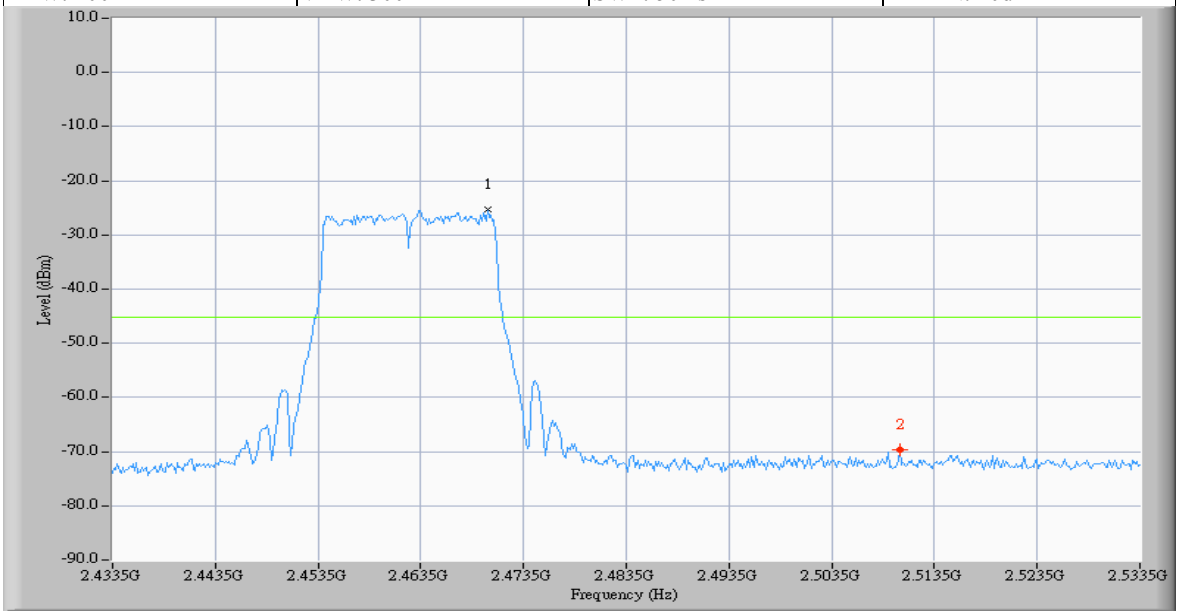



Test Request: (-45.2dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2419.333 | -25.2 |
| 2 | 2399.833 | -58.5 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | 19.500 | 33.3 |

| EUT : | Model : | Status : WLAN-11g-CH11-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

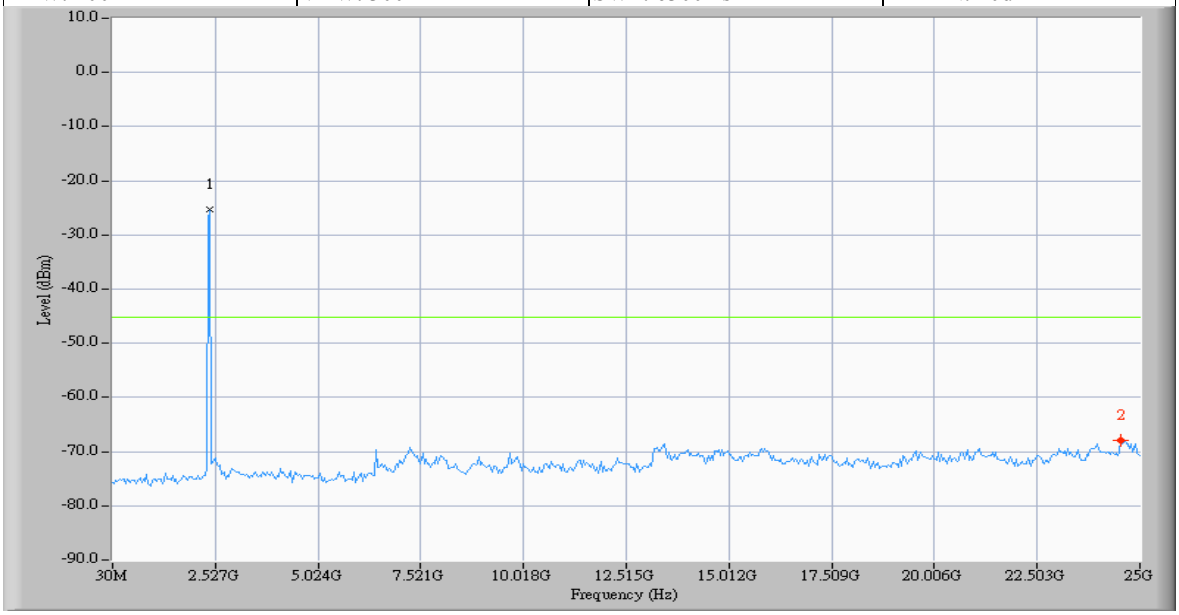



Test Request: (-45.3dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2470.000 | -25.3 |
| 2 | 2510.167 | -69.7 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -40.167 | 44.4 |

| EUT : | Model : | Status : WLAN-11g-CH01-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

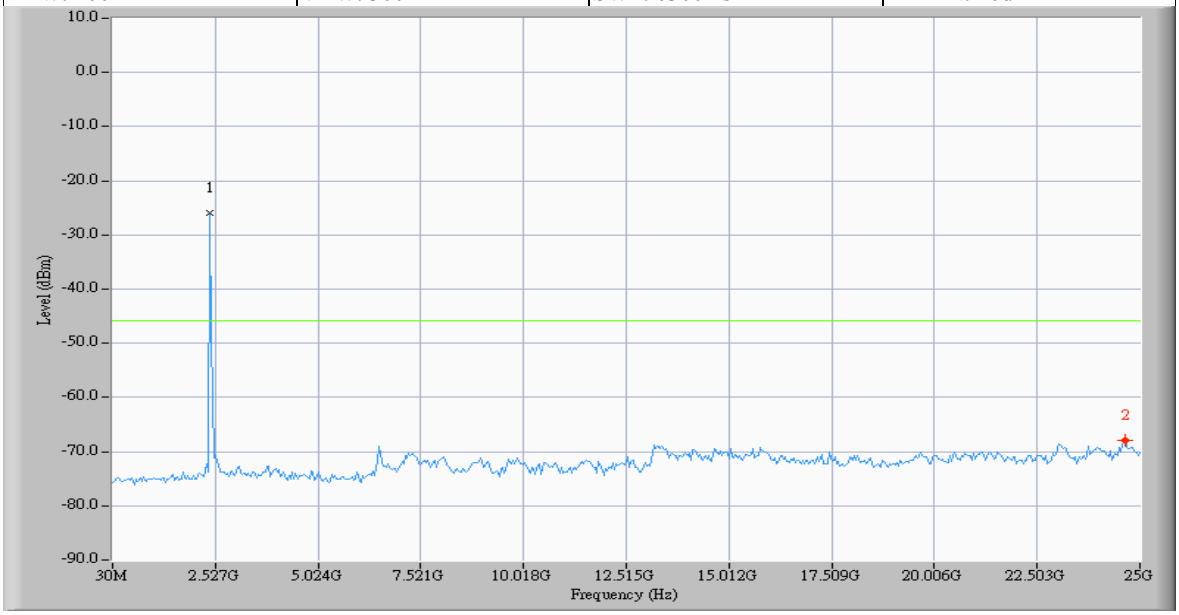



Test Request: (-45.3dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -25.3 |
| 2 | 24542.217 | -67.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22140.067 | 42.5 |

| EUT : | Model : | Status : WLAN-11g-CH06-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

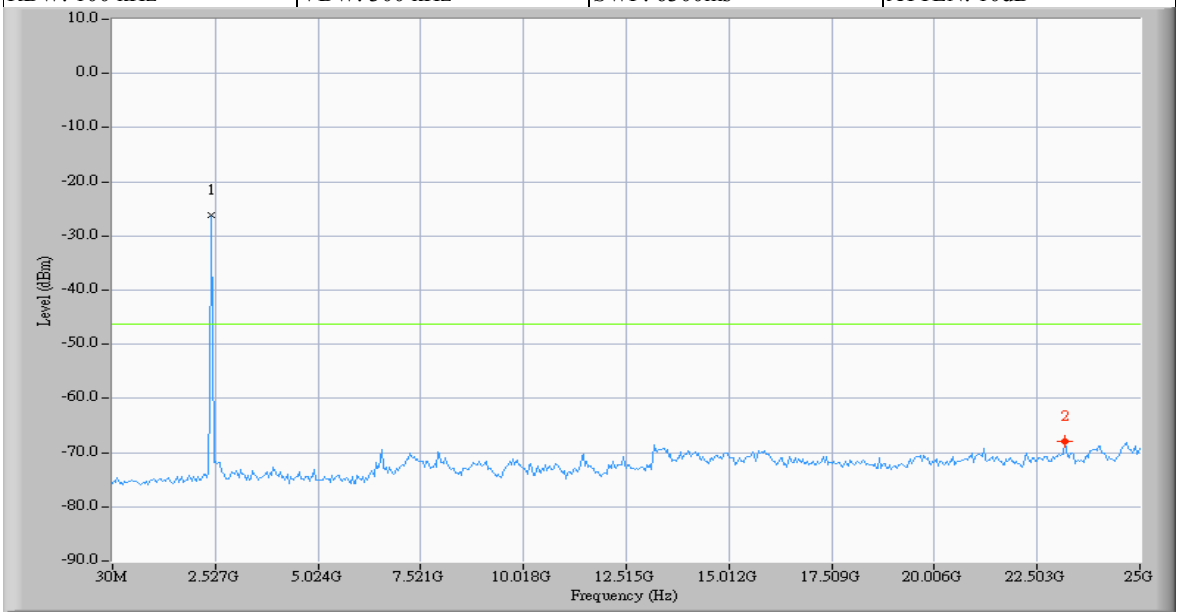



Test Request: (-45.8dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -25.8 |
| 2 | 24625.450 | -67.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22223.300 | 42.0 |

| EUT : | Model : | Status : WLAN-11g-CH11-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

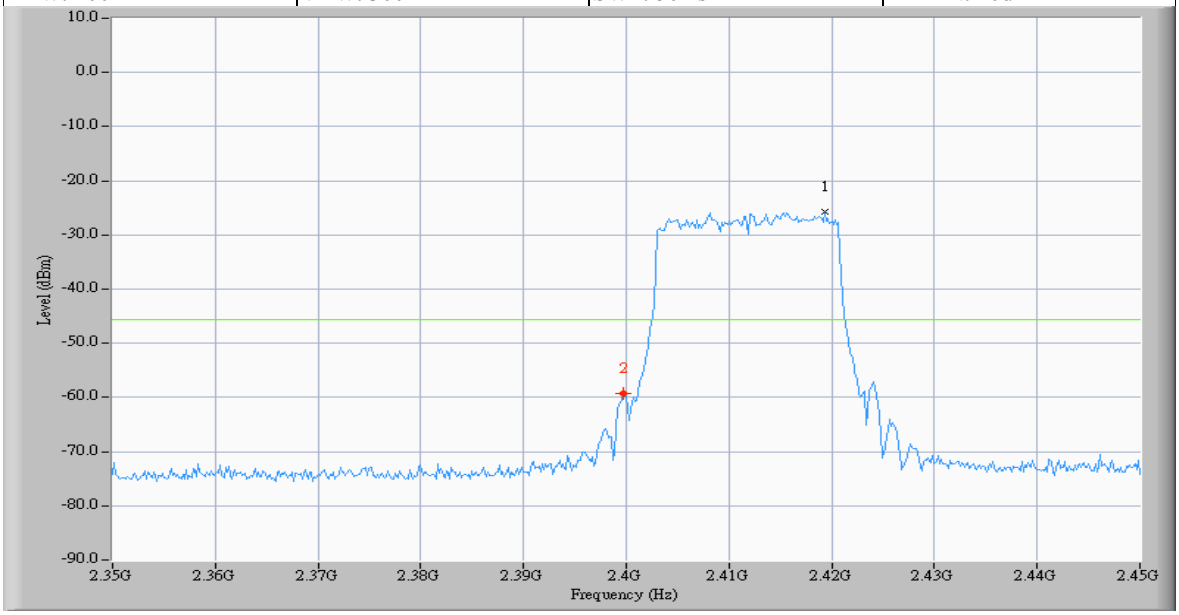



Test Request: (-46.2dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2443.767 | -26.2 |
| 2 | 23168.867 | -68.0 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -20725.100 | 41.8 |

| EUT : | Model : | Status : WLAN-11n -CH01-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

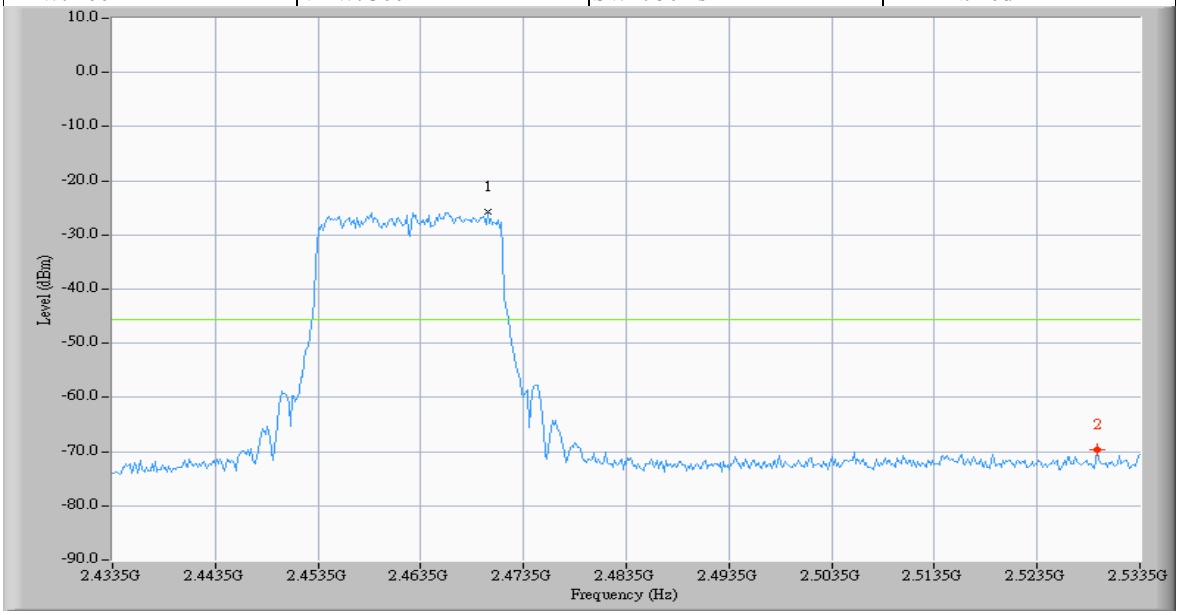



Test Request: (-45.7dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2419.333 | -25.7 |
| 2 | 2399.667 | -59.3 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | 19.666 | 33.6 |

| EUT : | Model : | Status : WLAN-11n -CH11-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

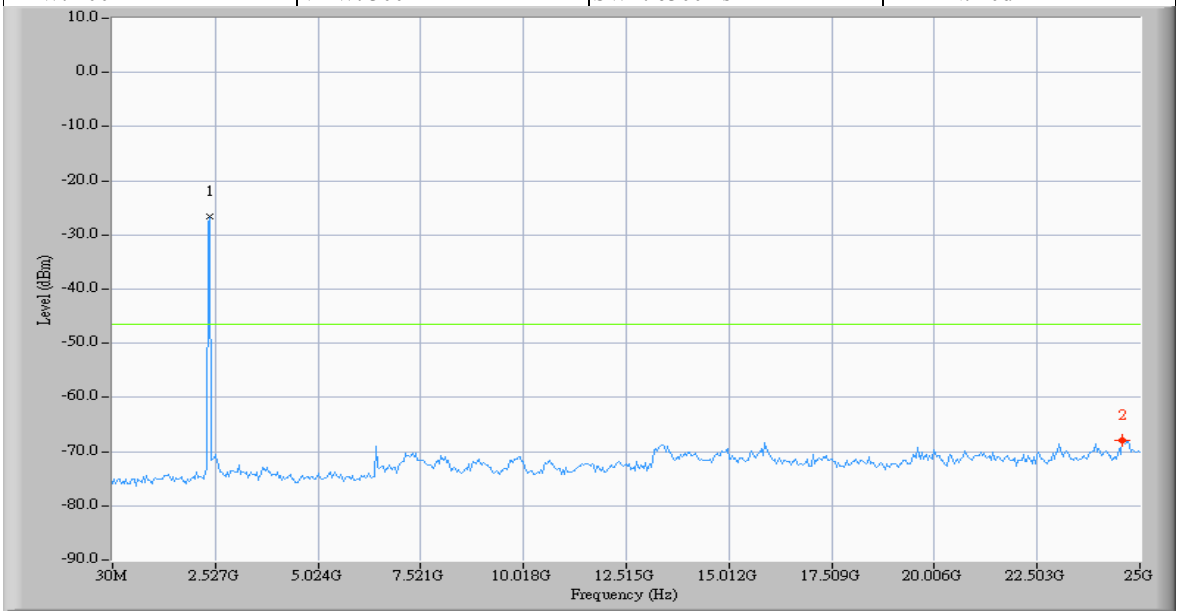



Test Request: (-45.7dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2470.000 | -25.7 |
| 2 | 2529.333 | -69.7 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -59.333 | 44.0 |

| EUT : | Model : | Status : WLAN-11n -CH01-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

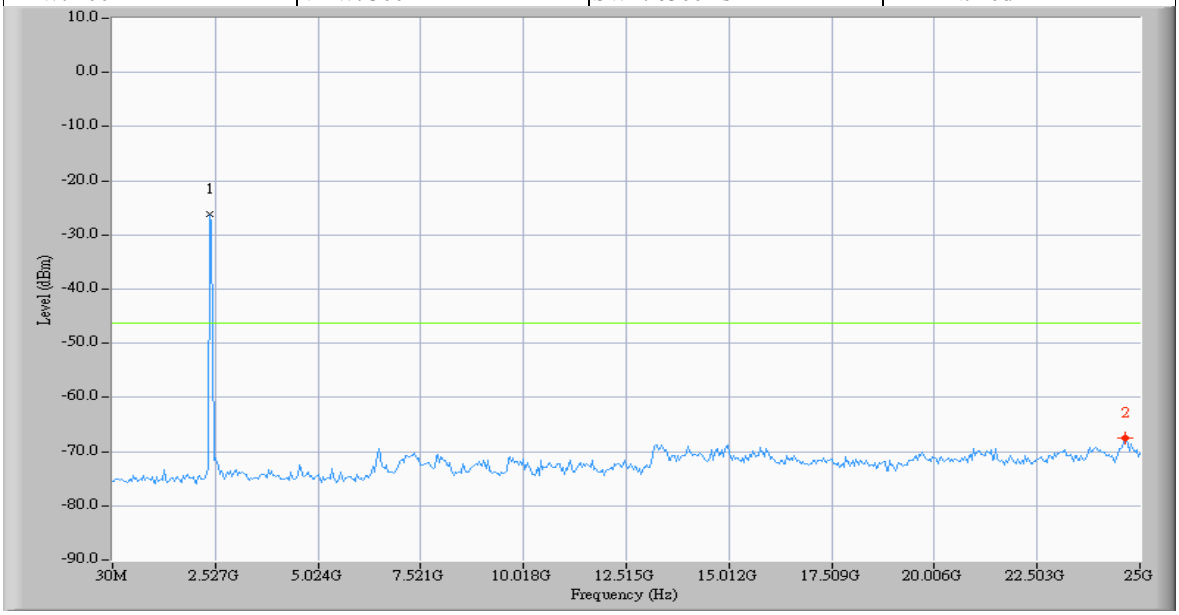



Test Request: (-46.5dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -26.5 |
| 2 | 24583.833 | -67.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22181.683 | 41.3 |

| EUT : | Model : | Status : WLAN-11n -CH06-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

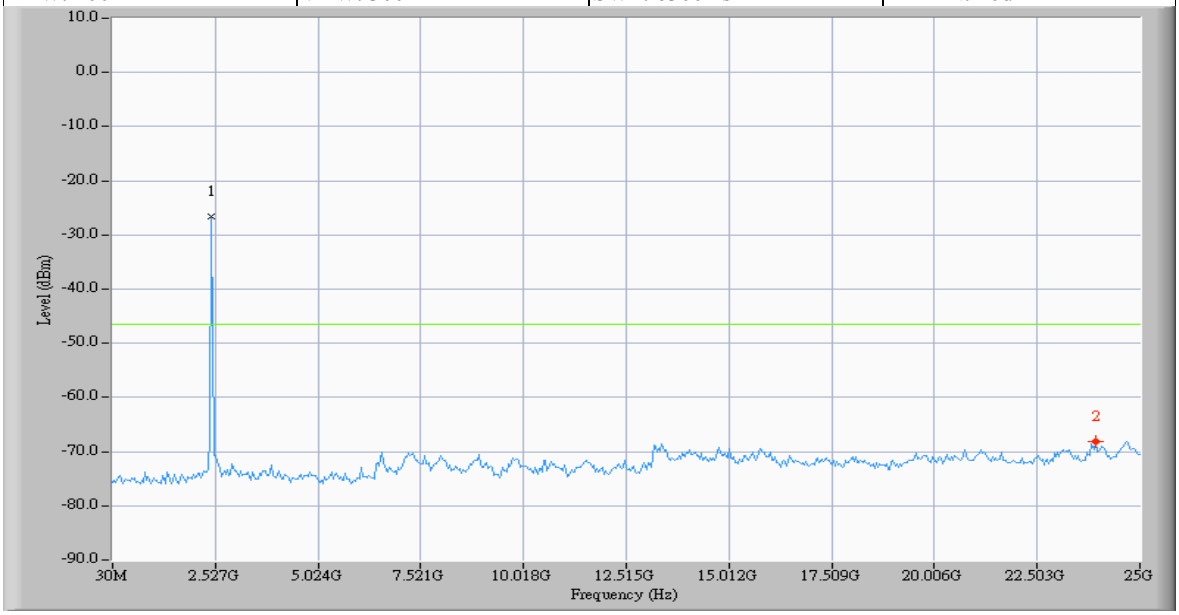



Test Request: (-46.2dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -26.2 |
| 2 | 24625.450 | -67.5 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22223.300 | 41.3 |

| EUT : | Model : | Status : WLAN-11n -CH11-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2008/1/22 | Temp. : 18℃ | Humi. : 62% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

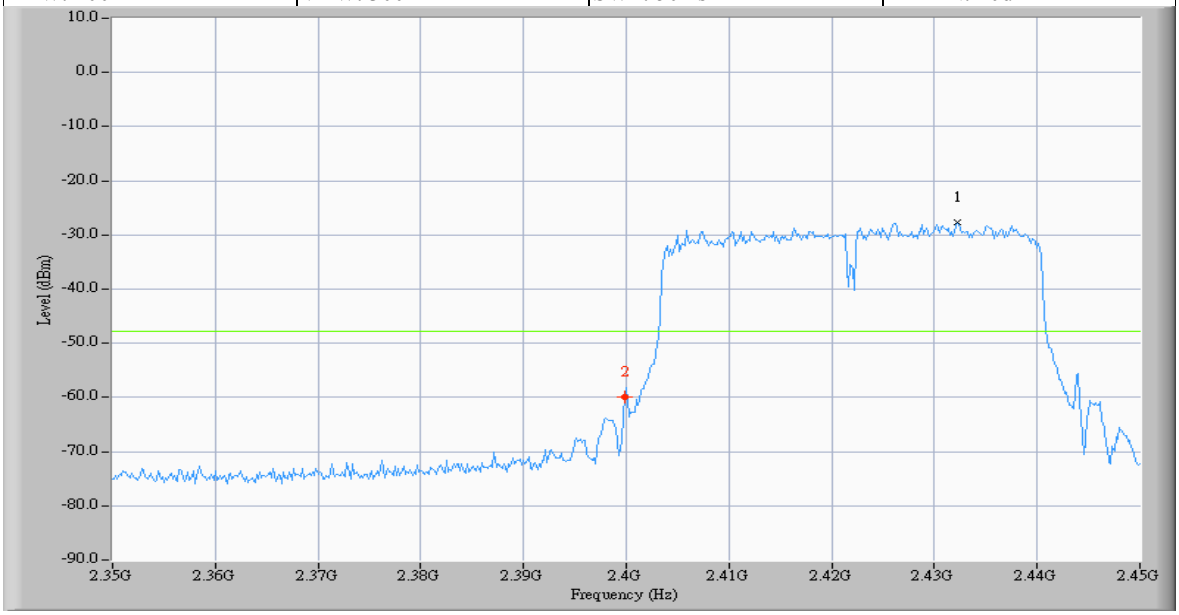



Test Request: (-46.5dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2443.767 | -26.5 |
| 2 | 23917.967 | -68.2 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -21474.200 | 41.7 |

| EUT : | Model : | Status : WLAN-11n-CH03-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

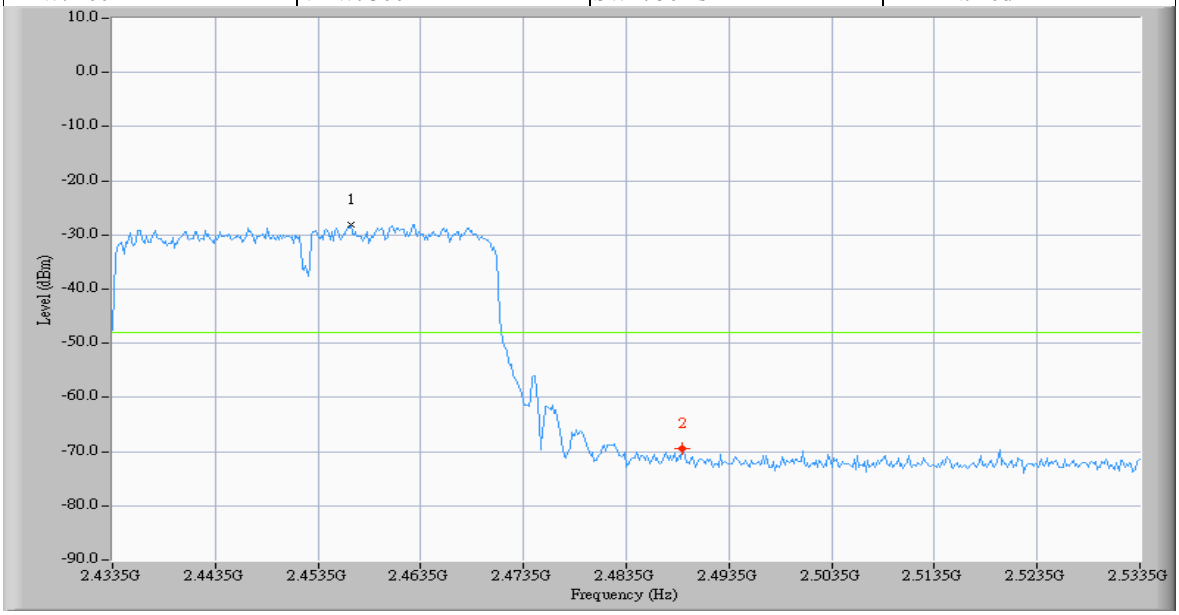



Test Request: (-47.7dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2432.167 | -27.7 |
| 2 | 2399.833 | -60.0 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | 32.334 | 32.3 |

| EUT : | Model : | Status : WLAN-11n-CH09-Band Edge | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 50ms | ATTEN: 10dB |

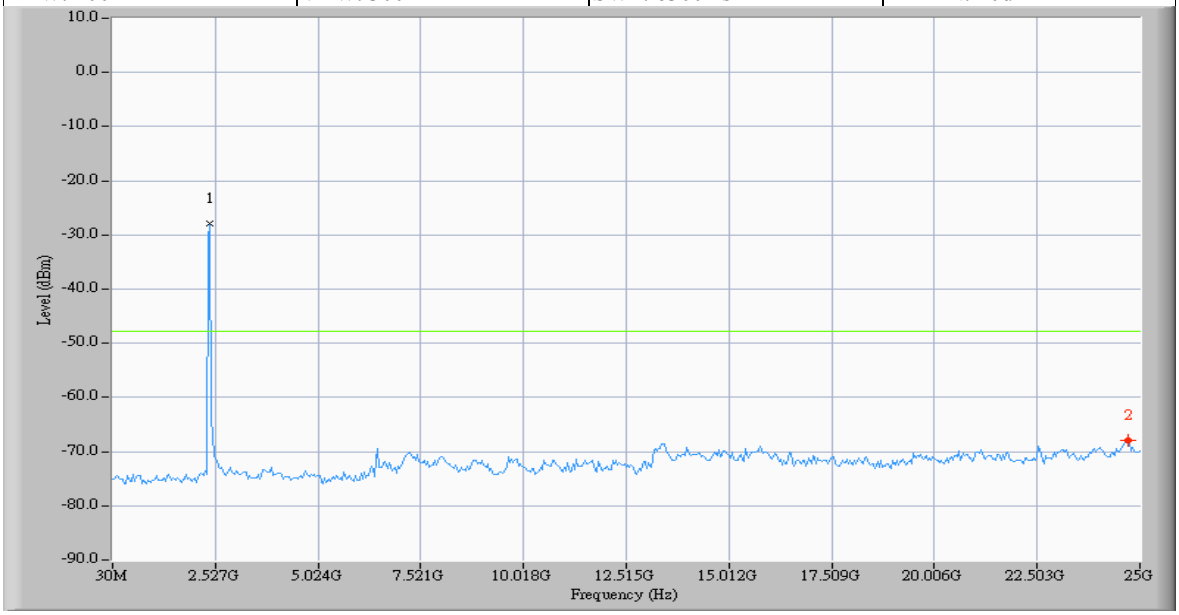



Test Request: (-48.0dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2456.667 | -28.0 |
| 2 | 2489.000 | -69.5 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -32.333 | 41.5 |

| EUT : | Model : | Status : WLAN-11n-CH03-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

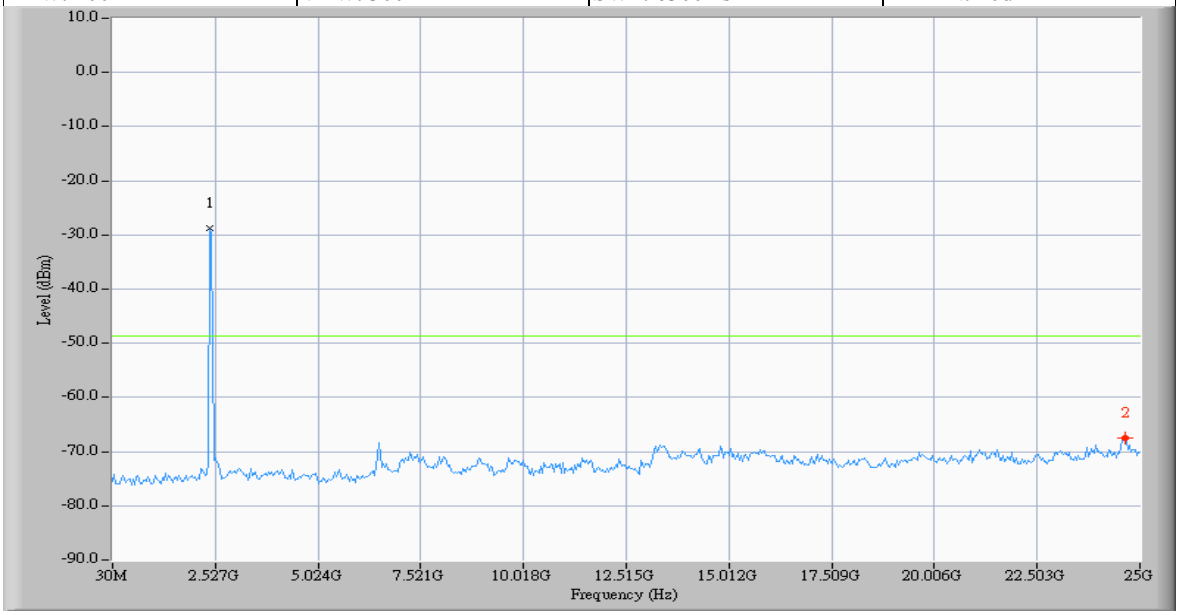



Test Request: (-47.8dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -27.8 |
| 2 | 24708.683 | -67.8 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22306.533 | 40.0 |

| EUT : | Model : | Status : WLAN-11n-CH06-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |

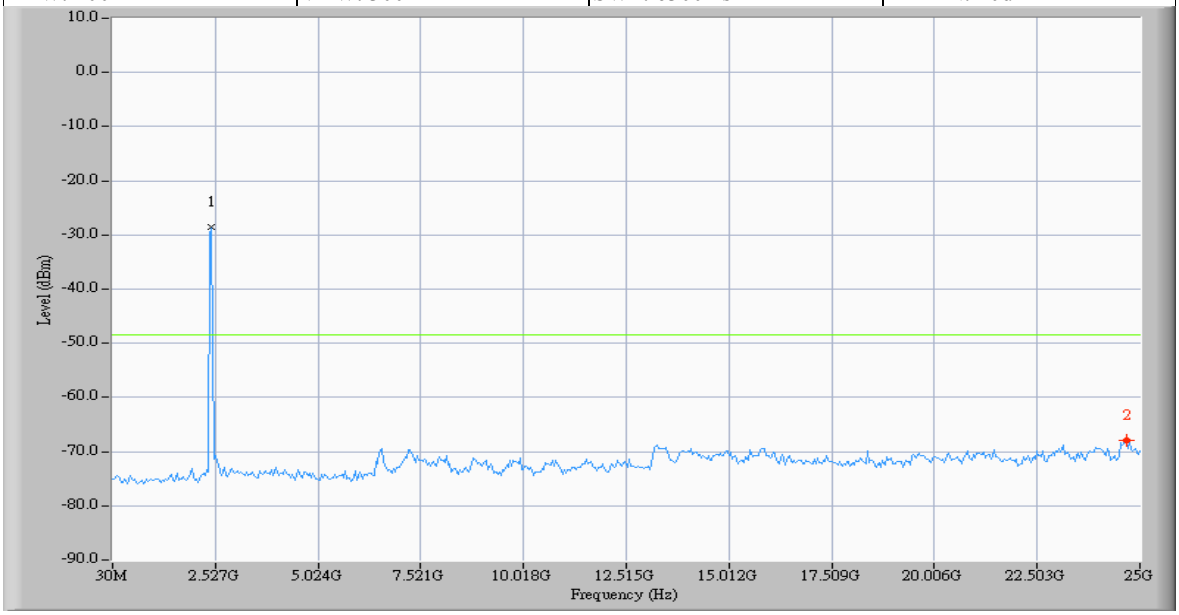



Test Request: (-48.7dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2402.150 | -28.7 |
| 2 | 24625.450 | -67.5 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22223.300 | 38.8 |

| EUT : | Model : | Status : WLAN-11n-CH09-BandEdge_All | |
|---|---|---|---|
| Condition : RF Conduction | Date : 2007/12/4 | Temp. : 20℃ | Humi. : 60% |
| RBW: 100 kHz | VBW: 300 kHz | SWP: 6300ms | ATTEN: 10dB |




Test Request: (-48.5dBm)

| Mkr | Frequency (MHz) | Level (dBm) |
|---|---|---|
| 1 | 2443.767 | -28.5 |
| 2 | 24667.067 | -68.0 |

| | | △Frequency (MHz) | △Level (dB) |
|---|---|---|---|
| 1 | Mkr 1 - Mkr 2 | -22223.300 | 39.5 |

# 10 RADIATED EMISSION MEASUREMENT

## 10.1 Standard Applicable

For unintentional radiator, the radiated emission shall comply with §15.109(a).

For intentional radiators, according to §15.247 (a), operation under this provision is limited to frequency hopping and direct sequence spread spectrum, and the out band emission shall be comply with §15.247 (c)

## 10.2 Measurement Procedure

**A.Preliminary Measurement For Portable Devices.**

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT (X and Y axis):

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. The axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.
4. The position in which the maximum noise occurred was “X axis”. (Please see the test setup photos)

**B. Final Measurement**

1. Setup the configuration per figure 3 and 4 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, it is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions. For emission frequencies measured above 1 GHz, a pre-scan be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

   Note : A filter was used to avoid pre-amplifier saturated when measure TX operation mode.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the datarate, placement of ANT. cables associated with EUT to obtain the worse case and record the result.

Figure 3 : Frequencies measured below 1 GHz configuration

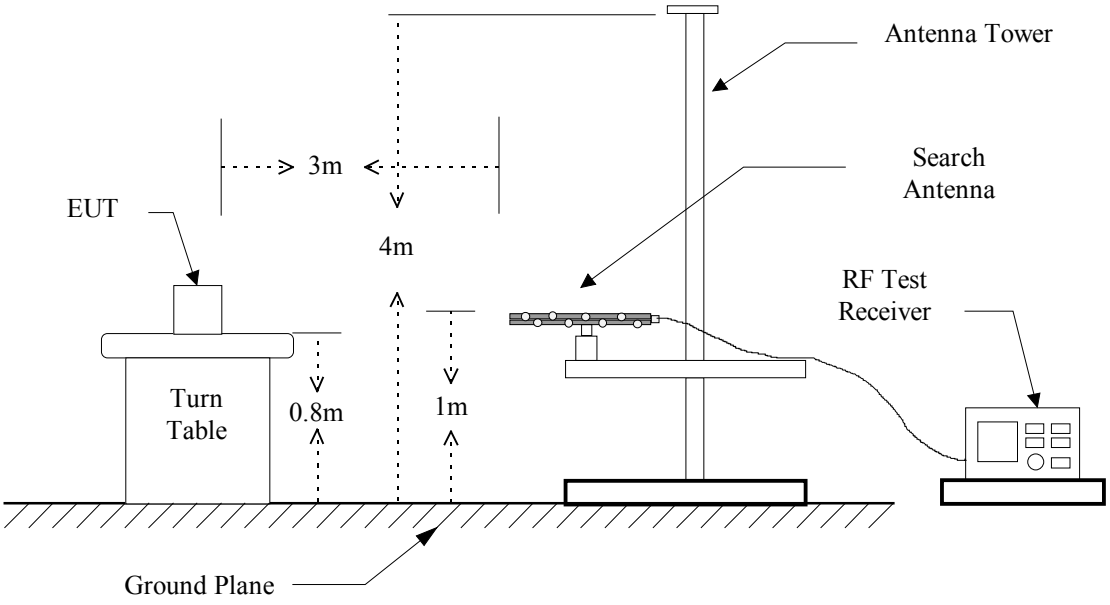
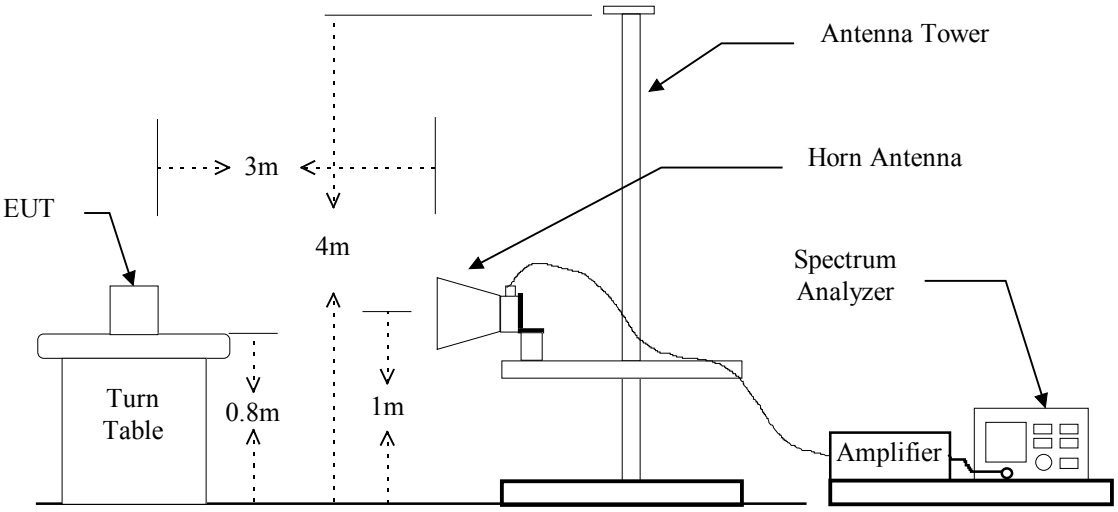



Figure 4 : Frequencies measured above 1 GHz configuration



## 10.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

| Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
|---|---|---|---|---|
| EMI Receiver | R&S | ESIB 7 | 100328 | May 18, 2008 |
| BiLog Antenna | Schaffner | CBL 6112B | 2927 | Jun. 19, 2008 |
| Horn Antenna | EMCO | 3115 | 9107-3729 | Jul. 06, 2008 |
| PRE-Amplifier | Agilent | 8449B | 3008A01648 | Sep. 20, 2008 |
| Spectrum Analyzer | R&S | FSU46 | 13040904-001 | Nov. 23, 2008 |
| Spectrum Analyzer | Agilent | 8564EC | 4123A00585 | Oct. 10, 2008 |

Measuring instrument setup in measured frequency band when specified detector function is used :

| Frequency Band (MHz) | Instrument | Function | Resolution Bandwidth | Video Bandwidth |
|---|---|---|---|---|
| 30 to 1000 | RF Test Receiver | Quasi-Peak | 120 kHz | 300 kHz |
| | Spectrum Analyzer | Peak | 120 kHz | 300 kHz |
| Above 1000 | Spectrum Analyzer | Peak | 1 MHz | 1 MHz |
| | Spectrum Analyzer | Average | 1 MHz | 10 Hz |

## 10.4 Radiated Emission Data

### 10.4.1 Harmonic

10.4.1.1 IEEE 802.11b
Operation Mode: TX
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

a) Channel 1
Fundamental Frequency: 2412 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4824.000 | 54.0 | 50.7 | 50.1 | 47.2 | 0.5 | 54.5 | 51.2 | 74.0 | 54.0 |
| 12060.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 14472.000 | --- | --- | --- | --- | 10.5 | --- | --- | 74.0 | 54.0 |
| 19296.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

b) Channel 6
Fundamental Frequency: 2437 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4874.000 | 52.5 | 49.8 | 50.1 | 43.1 | 0.5 | 53.0 | 50.3 | 74.0 | 54.0 |
| 7311.000 | 50.0 | 43.3 | 50.1 | 42.9 | 3.7 | 53.8 | 47.0 | 74.0 | 54.0 |
| 12185.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 19496.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

c) Channel 11
Fundamental Frequency: 2462 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4924.000 | 54.2 | 49.4 | 51.0 | 49.0 | 0.5 | 54.7 | 49.9 | 74.0 | 54.0 |
| 7386.000 | --- | --- | --- | --- | 3.7 | --- | --- | 74.0 | 54.0 |
| 12310.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 19696.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |
| 22158.000 | --- | --- | --- | --- | 13.5 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

10.4.1.2 IEEE 802.11g
Operation Mode: TX
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

a) Channel 1
Fundamental Frequency: 2412 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4824.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 12060.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 14472.000 | --- | --- | --- | --- | 10.5 | --- | --- | 74.0 | 54.0 |
| 19296.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

b) Channel 6
Fundamental Frequency: 2437 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4874.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 7311.000 | 52.7 | 41.7 | 55.7 | 46.5 | 3.7 | 59.4 | 50.2 | 74.0 | 54.0 |
| 12185.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 19496.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

c) Channel 11
Fundamental Frequency: 2462 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4924.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 7386.000 | 51.5 | 42.7 | 56.2 | 45.5 | 3.7 | 59.9 | 49.2 | 74.0 | 54.0 |
| 12310.000 | 50.1 | 36.9 | 54.7 | 39.8 | 5.8 | 60.5 | 45.6 | 74.0 | 54.0 |
| 19696.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |
| 22158.000 | --- | --- | --- | --- | 13.5 | --- | --- | 74.0 | 54.0 |

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

10.4.1.3 IEEE 802.11n, HT20
Operation Mode: TX
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

a) Channel 1
Fundamental Frequency: 2412 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4824.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 12060.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 14472.000 | --- | --- | --- | --- | 10.5 | --- | --- | 74.0 | 54.0 |
| 19296.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

b) Channel 6
Fundamental Frequency: 2437 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4874.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 7311.000 | 49.8 | 40.2 | 57.1 | 44.7 | 3.7 | 60.8 | 48.4 | 74.0 | 54.0 |
| 12185.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 19496.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

c) Channel 11
Fundamental Frequency: 2462 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4924.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 7386.000 | 50.9 | 40.1 | 57.2 | 42.9 | 3.7 | 60.9 | 46.6 | 74.0 | 54.0 |
| 12310.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 19696.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |
| 22158.000 | --- | --- | --- | --- | 13.5 | --- | --- | 74.0 | 54.0 |

Note :
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

10.4.1.4 IEEE 802.11n, HT40
Operation Mode: TX
Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

a) Channel 3
Fundamental Frequency: 2422 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4844.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 7266.000 | --- | --- | 52.9 | 44.1 | 5.8 | 58.7 | 47.8 | 74.0 | 54.0 |
| 12110.000 | --- | --- | --- | --- | 10.5 | --- | --- | 74.0 | 54.0 |
| 19376.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

b) Channel 6
Fundamental Frequency: 2437 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4874.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 7311.000 | --- | --- | 54.0 | 45.7 | 3.7 | 57.7 | 49.4 | 74.0 | 54.0 |
| 12185.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 19496.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |

c) Channel 9
Fundamental Frequency: 2452 MHz

| Frequency | Reading (dBuV) | | | | Factor | Result @3m | | Limit @3m | |
|---|---|---|---|---|---|---|---|---|---|
| | H | | V | | (dB) | (dBuV/m) | | (dBuV/m) | |
| (MHz) | Peak | Ave | Peak | Ave | Corr. | Peak | Ave | Peak | Ave. |
| 4904.000 | --- | --- | --- | --- | 0.5 | --- | --- | 74.0 | 54.0 |
| 7356.000 | --- | --- | --- | --- | 3.7 | --- | --- | 74.0 | 54.0 |
| 12260.000 | --- | --- | --- | --- | 5.8 | --- | --- | 74.0 | 54.0 |
| 19616.000 | --- | --- | --- | --- | 13.3 | --- | --- | 74.0 | 54.0 |
| 22068.000 | --- | --- | --- | --- | 13.5 | --- | --- | 74.0 | 54.0 |

Note :

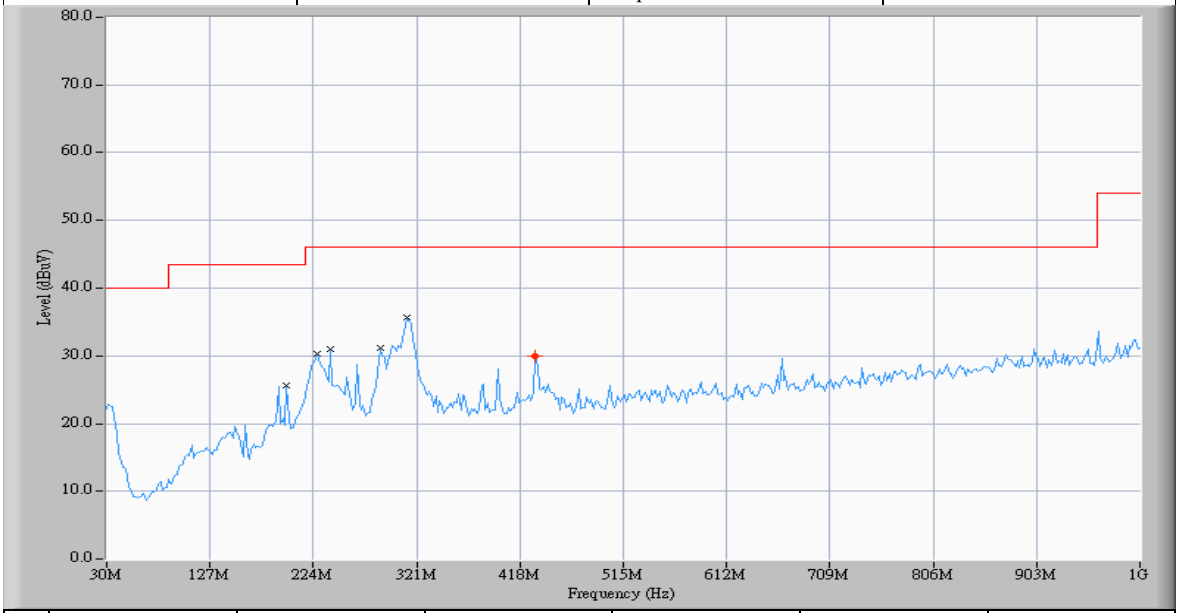
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

## 10.4.2 Spurious Emission

### 10.4.2.1 Operation Mode: IEEE 802.11b

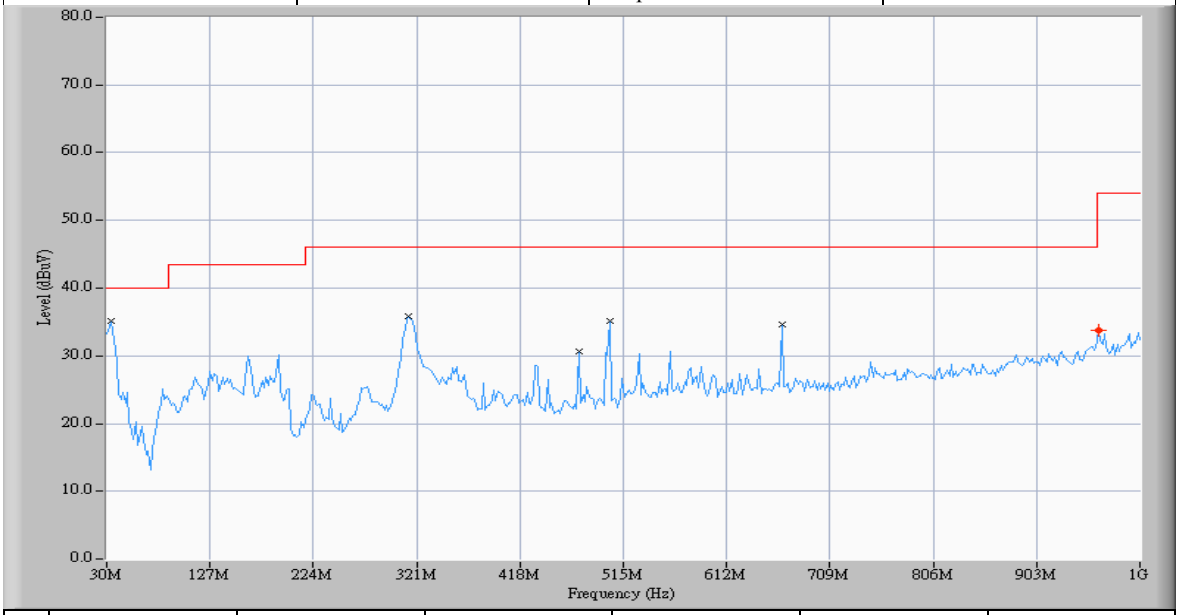
a) Emission frequencies below 1 GHz

| EUT : | Model : | Status : 11b TX | |
|---|---|---|---|
| Condition : Horizontal | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 199.118 | 13.1 | 12.5 | 25.6 | 43.5 | -17.9 |
| 2 | 228.277 | 16.6 | 13.8 | 30.4 | 46.0 | -15.6 |
| 3 | 239.940 | 16.2 | 14.8 | 31.0 | 46.0 | -15.0 |
| 4 | 286.593 | 14.5 | 16.6 | 31.1 | 46.0 | -14.9 |
| 5 | 311.864 | 18.4 | 17.3 | 35.7 | 46.0 | -10.3 |
| 6 | 432.385 | 9.3 | 20.7 | 30.0 | 46.0 | -16.0 |

| EUT : | Model : | Status : 11b TX | |
|---|---|---|---|
| Condition : Vertical | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 33.888 | 17.3 | 17.9 | 35.2 | 40.0 | -4.8 |
| 2 | 313.808 | 18.6 | 17.3 | 35.9 | 46.0 | -10.1 |
| 3 | 473.206 | 9.0 | 21.6 | 30.6 | 46.0 | -15.4 |
| 4 | 502.365 | 13.2 | 22.0 | 35.2 | 46.0 | -10.8 |
| 5 | 663.707 | 10.2 | 24.5 | 34.7 | 46.0 | -11.3 |
| 6 | 961.122 | 5.6 | 28.2 | 33.8 | 54.0 | -20.2 |

b) Emission frequencies above 1 GHz

| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result @3m (dBuV/m) | Limit @3m (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| Radiated emission frequencies above 1 GHz to 25 GHz were too low to be measured. | | | | | | |

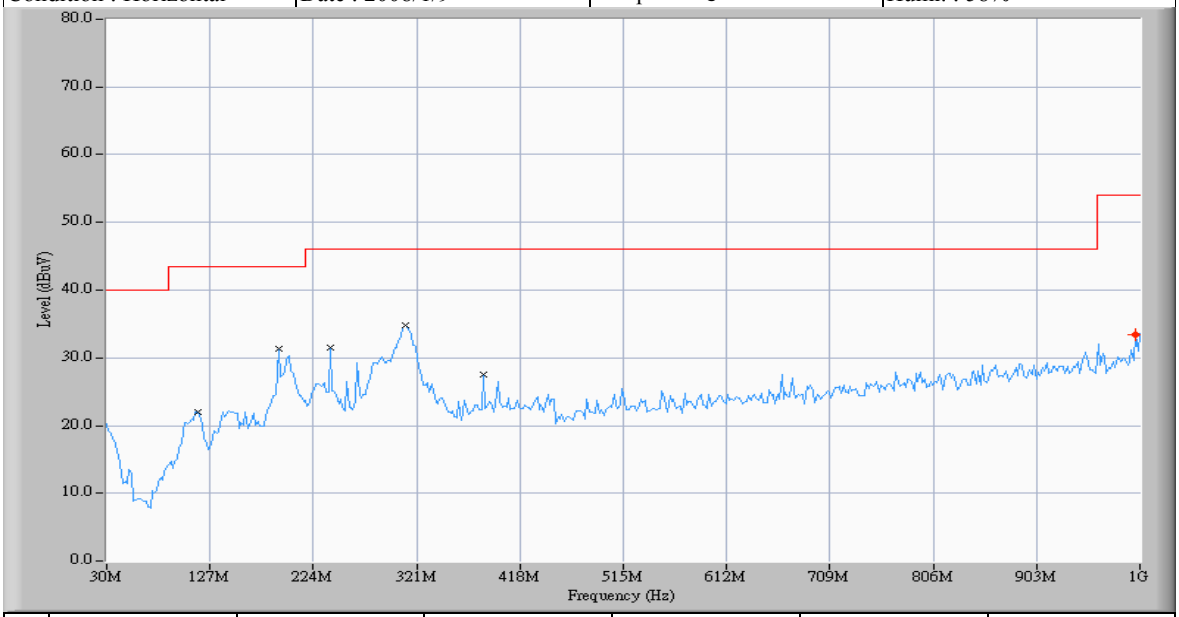
Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).

## 10.4.2.2 Operation Mode: IEEE 802.11g

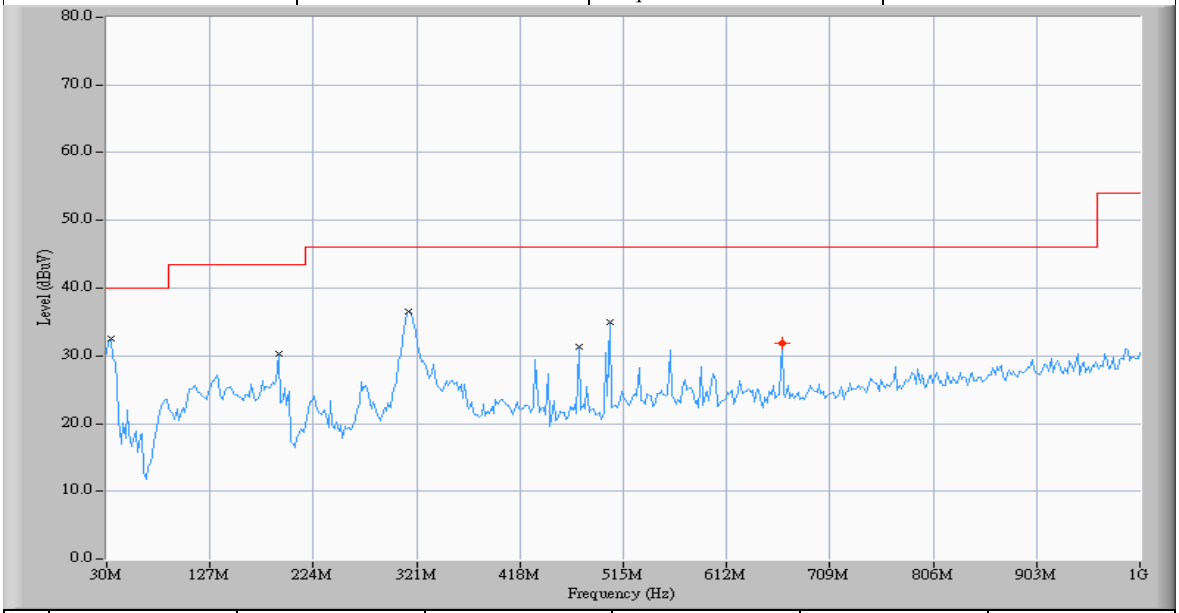
### a) Emission frequencies below 1 GHz

| | | | |
|---|---|---|---|
| EUT : | Model : | Status : 11g TX | |
| Condition : Horizontal | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 115.531 | 7.7 | 14.3 | 22.0 | 43.5 | -21.5 |
| 2 | 191.343 | 19.2 | 12.1 | 31.3 | 43.5 | -12.2 |
| 3 | 239.940 | 16.7 | 14.8 | 31.5 | 46.0 | -14.5 |
| 4 | 309.920 | 17.6 | 17.2 | 34.8 | 46.0 | -11.2 |
| 5 | 383.788 | 7.8 | 19.7 | 27.5 | 46.0 | -18.5 |
| 6 | 996.112 | 4.8 | 28.7 | 33.5 | 54.0 | -20.5 |

| EUT : | Model : | Status : 11g TX | |
|---|---|---|---|
| Condition : Vertical | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 33.888 | 14.7 | 17.9 | 32.6 | 40.0 | -7.4 |
| 2 | 191.343 | 18.2 | 12.1 | 30.3 | 43.5 | -13.2 |
| 3 | 313.808 | 19.3 | 17.3 | 36.6 | 46.0 | -9.4 |
| 4 | 473.206 | 9.8 | 21.6 | 31.4 | 46.0 | -14.6 |
| 5 | 502.365 | 13.0 | 22.0 | 35.0 | 46.0 | -11.0 |
| 6 | 663.707 | 7.3 | 24.5 | 31.8 | 46.0 | -14.2 |

b) Emission frequencies above 1 GHz

| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result @3m (dBuV/m) | Limit @3m (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| Radiated emission frequencies above 1 GHz to 25 GHz were too low to be measured. | | | | | | |

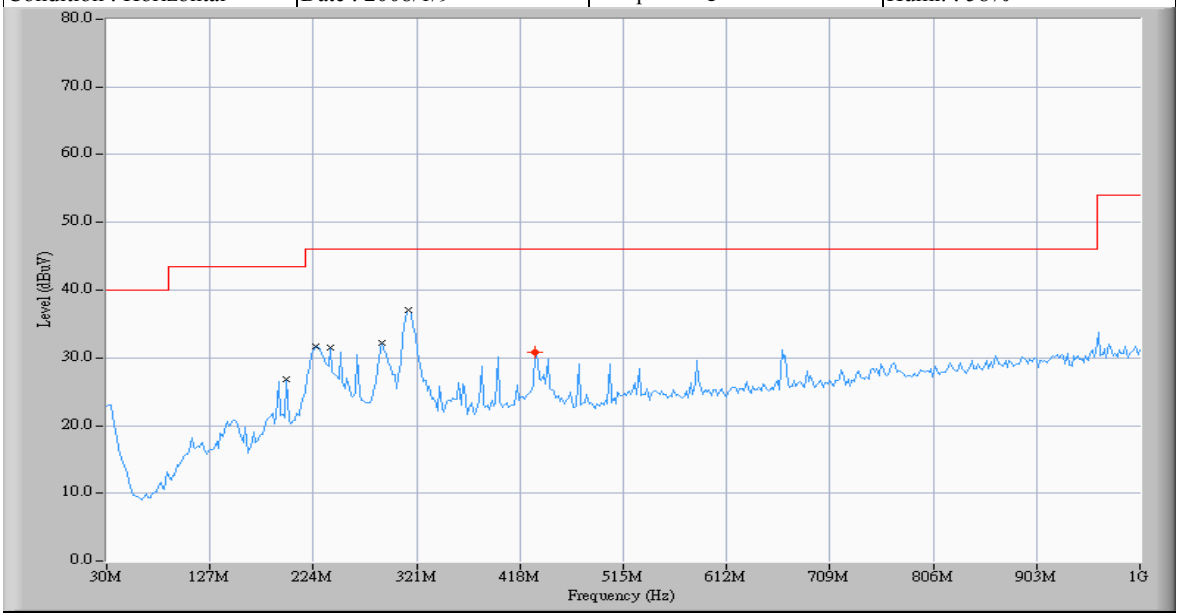
Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).

## 10.4.2.3 Operation Mode: IEEE 802.11n, HT20

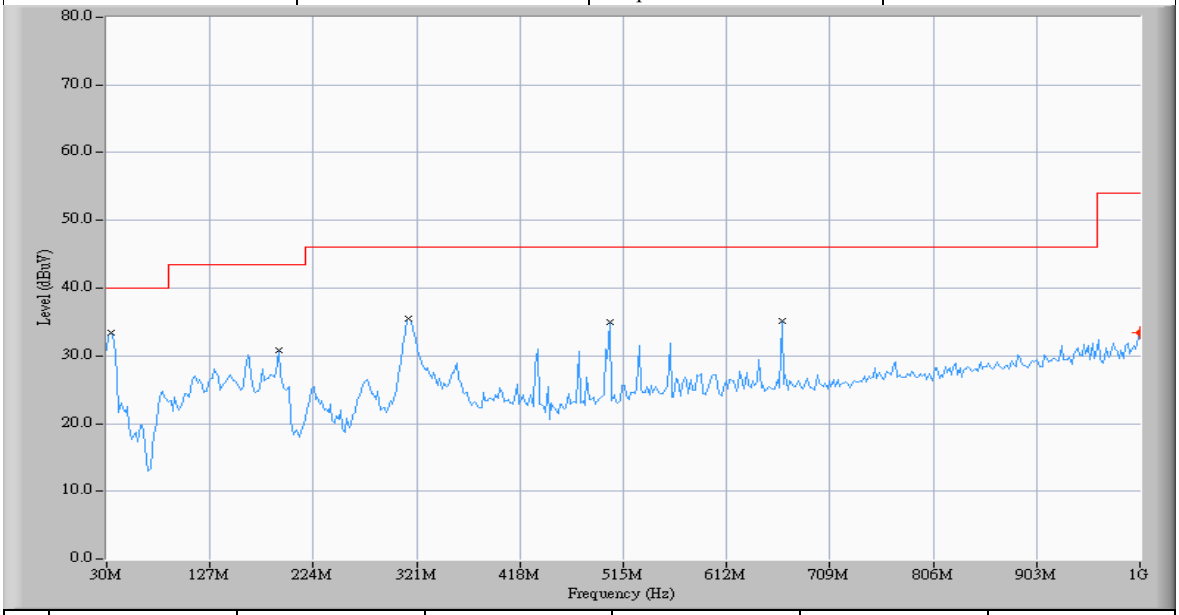
### a) Emission frequencies below 1 GHz

| | | | |
|---|---|---|---|
| EUT : | Model : | Status : 11n HT20 TX | |
| Condition : Horizontal | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 199.118 | 14.4 | 12.5 | 26.9 | 43.5 | -16.6 |
| 2 | 226.333 | 18.1 | 13.6 | 31.7 | 46.0 | -14.3 |
| 3 | 239.940 | 16.8 | 14.8 | 31.6 | 46.0 | -14.4 |
| 4 | 288.537 | 15.6 | 16.6 | 32.2 | 46.0 | -13.8 |
| 5 | 313.808 | 19.7 | 17.3 | 37.0 | 46.0 | -9.0 |
| 6 | 432.385 | 10.2 | 20.7 | 30.9 | 46.0 | -15.1 |

| EUT : | Model : | Status : 11n HT20 TX | |
|---|---|---|---|
| Condition : Vertical | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 33.888 | 15.6 | 17.9 | 33.5 | 40.0 | -6.5 |
| 2 | 191.343 | 18.8 | 12.1 | 30.9 | 43.5 | -12.6 |
| 3 | 313.808 | 18.2 | 17.3 | 35.5 | 46.0 | -10.5 |
| 4 | 502.365 | 13.0 | 22.0 | 35.0 | 46.0 | -11.0 |
| 5 | 663.707 | 10.6 | 24.5 | 35.1 | 46.0 | -10.9 |
| 6 | 1000.000 | 4.7 | 28.7 | 33.4 | 54.0 | -20.6 |

b) Emission frequencies above 1 GHz

| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result @3m (dBuV/m) | Limit @3m (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| Radiated emission frequencies above 1 GHz to 25 GHz were too low to be measured. | | | | | | |

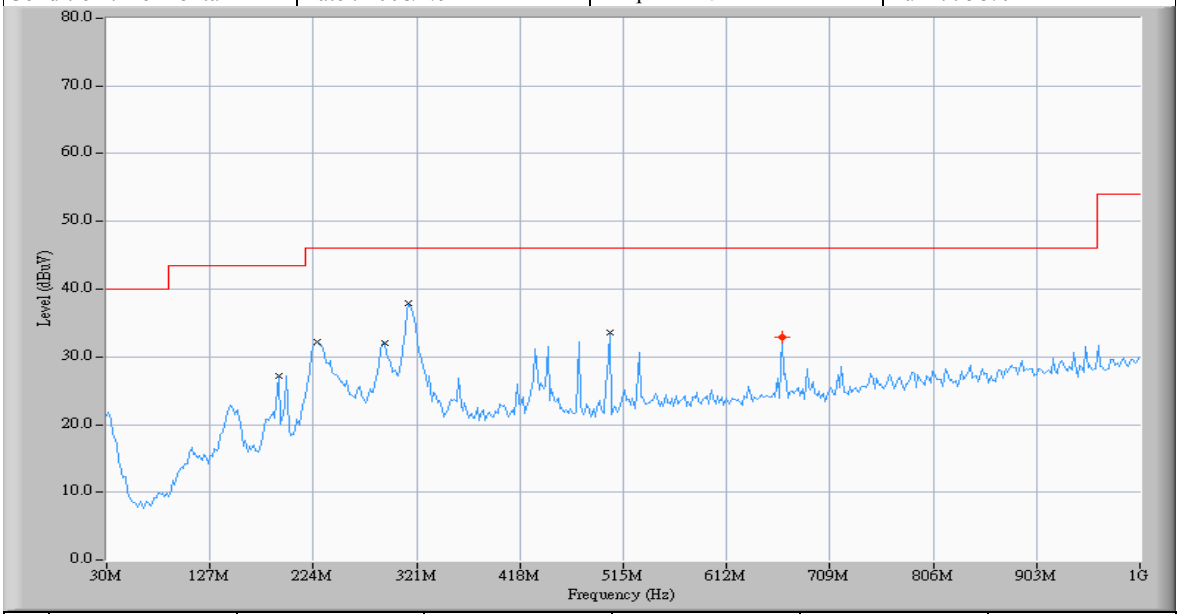
Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).

## 10.4.2.4 Operation Mode: IEEE 802.11n, HT40

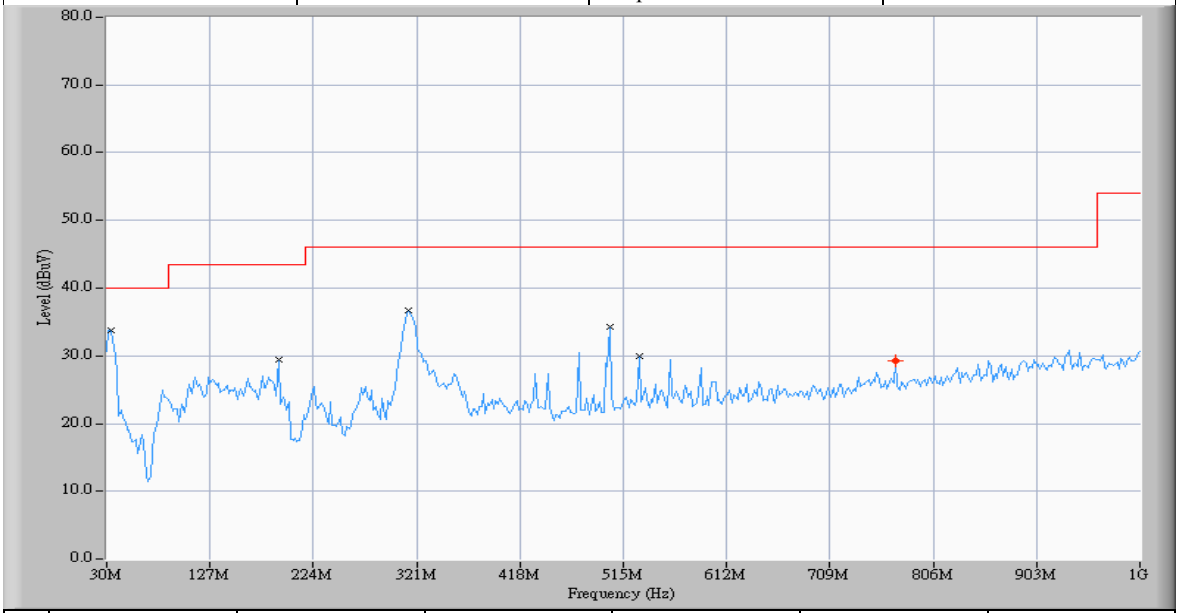
### a) Emission frequencies below 1 GHz

| EUT : | Model : | Status : 11n HT40 TX | |
|---|---|---|---|
| Condition : Horizontal | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 191.343 | 15.0 | 12.1 | 27.1 | 43.5 | -16.4 |
| 2 | 228.277 | 18.4 | 13.8 | 32.2 | 46.0 | -13.8 |
| 3 | 290.481 | 15.3 | 16.7 | 32.0 | 46.0 | -14.0 |
| 4 | 313.808 | 20.5 | 17.3 | 37.8 | 46.0 | -8.2 |
| 5 | 502.365 | 11.6 | 22.0 | 33.6 | 46.0 | -12.4 |
| 6 | 663.707 | 8.5 | 24.5 | 33.0 | 46.0 | -13.0 |

| EUT : | Model : | Status : 11n HT40 TX | |
|---|---|---|---|
| Condition : Vertical | Date : 2008/1/9 | Temp. : 18℃ | Humi. : 58% |




| | Freq (MHz) | QP Level (dBuV) | Factor (dB/m) | QP Result (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dB) |
|---|---|---|---|---|---|---|
| 1 | 33.888 | 15.9 | 17.9 | 33.8 | 40.0 | -6.2 |
| 2 | 191.343 | 17.4 | 12.1 | 29.5 | 43.5 | -14.0 |
| 3 | 313.808 | 19.4 | 17.3 | 36.7 | 46.0 | -9.3 |
| 4 | 502.365 | 12.2 | 22.0 | 34.2 | 46.0 | -11.8 |
| 5 | 529.579 | 7.1 | 22.9 | 30.0 | 46.0 | -16.0 |
| 6 | 770.621 | 3.5 | 25.7 | 29.2 | 46.0 | -16.8 |

b) Emission frequencies above 1 GHz

| Frequency (MHz) | Ant-Pol H/V | Meter Reading (dBuV) | Corrected Factor (dB) | Result @3m (dBuV/m) | Limit @3m (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|
| Radiated emission frequencies above 1 GHz to 25 GHz were too low to be measured. | | | | | | |

Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).

10.4.2.5 IEEE 802.11b

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

Operation Mode: TX

| Operation Channel | Test Frequency (MHz) | Reading (dBuV) H Peak | H Ave | V Peak | V Ave | Factor (dB) Corr. | Result @3m (dBuV/m) Peak | Result @3m (dBuV/m) Ave | Limit @3m (dBuV/m) Peak | Limit @3m (dBuV/m) Ave. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2376.522 | 34.9 | 19.1 | 34.3 | 19.0 | 30.3 | 65.2 | 49.4 | 74.0 | 54.0 |
| 11 | 2487.521 | 35.1 | 19.1 | 34.6 | 18.9 | 30.3 | 65.4 | 49.4 | 74.0 | 54.0 |

10.4.2.6 IEEE 802.11g

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

Operation Mode: TX

| Operation Channel | Test Frequency (MHz) | Reading (dBuV) H Peak | H Ave | V Peak | V Ave | Factor (dB) Corr. | Result @3m (dBuV/m) Peak | Result @3m (dBuV/m) Ave | Limit @3m (dBuV/m) Peak | Limit @3m (dBuV/m) Ave. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2388.272 | 34.6 | 18.7 | 34.2 | 18.1 | 30.3 | 64.9 | 49.0 | 74.0 | 54.0 |
| 11 | 2485.126 | 35.1 | 19.2 | 34.5 | 18.7 | 30.3 | 65.4 | 49.5 | 74.0 | 54.0 |

Note :

1. Remark "---" means that the emissions level is too low to be measured.
2. The result is the highest value of radiated emission from restrict band of 2310 ~ 2390 MHz and 2483.5 ~ 2500 MHz.

10.4.2.7 IEEE 802.11n, HT20

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

Operation Mode: TX

| Operation Channel | Test Frequency (MHz) | Reading (dBuV) H Peak | H Ave | V Peak | V Ave | Factor (dB) Corr. | Result @3m (dBuV/m) Peak | Result @3m (dBuV/m) Ave | Limit @3m (dBuV/m) Peak | Limit @3m (dBuV/m) Ave. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2389.156 | 34.9 | 19.1 | 34.2 | 19.0 | 30.3 | 65.2 | 49.4 | 74.0 | 54.0 |
| 11 | 2487.512 | 35.2 | 19.1 | 34.5 | 19.0 | 30.3 | 65.5 | 49.4 | 74.0 | 54.0 |

10.4.2.8 IEEE 802.11n, HT40

Test Date: Dec. 04, 2007 Temperature: 20℃ Humidity: 60%

Operation Mode: TX

| Operation Channel | Test Frequency (MHz) | Reading (dBuV) H Peak | H Ave | V Peak | V Ave | Factor (dB) Corr. | Result @3m (dBuV/m) Peak | Result @3m (dBuV/m) Ave | Limit @3m (dBuV/m) Peak | Limit @3m (dBuV/m) Ave. |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 2395.117 | 34.9 | 19.0 | 34.4 | 18.7 | 30.3 | 65.2 | 49.3 | 74.0 | 54.0 |
| 9 | 2487.553 | 35.0 | 19.0 | 34.3 | 18.8 | 30.3 | 65.3 | 49.3 | 74.0 | 54.0 |

Note :

1. Remark "---" means that the emissions level is too low to be measured.
2. The result is the highest value of radiated emission from restrict band of 2310 ~ 2390 MHz and 2483.5 ~ 2500 MHz.

## 10.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

***Result = Reading + Corrected Factor***

where

Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Amplifier Gain