



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

**Report No.: 14-12-MAS-218-03**

Client: FUJITSU TEN LIMITED  
Product: Car Audio  
Model: FT0045B  
FCC ID: BABFT0045B

Manufacturer/supplier: FUJITSU TEN LIMITED  
Date test item received: 2014/12/25  
Date test campaign completed: 2015/01/21  
Date of issue: 2015/01/21

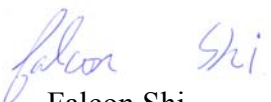
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Manufacturer : FUJITSU TEN LIMITED  
Address : 2-28, Goshō-dori, 1-chome, Hyogo-ku, Kobe 652-8510 Japan  
EUT : Car Audio  
Trade name : ----  
Model No. : FT0045B  
Power Source : 12Vdc battery  
  
Regulations applied : FCC 47 CFR, Part 15 Subpart C

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## 1 GENERAL INFORMATION

### 1.1 Product Description

- a) Type of EUT : Car Audio
- b) Trade Name : ----
- c) Model No. : FT0045B
- d) FCC ID : BABFT0045B

### 1.2 Characteristics of Device

The EUT is a Car Audio. It conforms to the IEEE 802.11b/g/n protocol and operates in the unlicensed ISM Band at 2.4 GHz.

|                    |                                                                                                                                                            |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RF chain           | 1T1R                                                                                                                                                       |
| Frequency Range    | IEEE 802.11b/g, 802.11gn HT20: 2412MHz~2462MHz                                                                                                             |
| Channel Spacing    | IEEE 802.11b/g, 802.11gn HT20: 5MHz                                                                                                                        |
| Channel Number     | IEEE 802.11b/g, 802.11gn HT20:11 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 802.11gn HT20:72.2 65, 58.5, 52, 39, 26, 19.5, 13, 6.5Mbps |
| Type of Modulation | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11gn HT20: OFDM (64QAM, 16QAM, QPSK, BPSK)             |

### 1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.10 (2009) and FCC CFR 47 Part 2 and Part 15 and KDB 558074 D01 v03r02.

### 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.

## 1.5 Test Summary

| Requirement               | FCC Paragraph # | Test Pass                           |
|---------------------------|-----------------|-------------------------------------|
| Antenna Requirement       | 15.203          | <input checked="" type="checkbox"/> |
| Conducted Emission        | 15.207          | N/A                                 |
| Emission Bandwidth        | 15.247 (a)(2)   | <input checked="" type="checkbox"/> |
| Output Power Requirement  | 15.247 (b)      | <input checked="" type="checkbox"/> |
| Power Density Requirement | 15.247 (e)      | <input checked="" type="checkbox"/> |
| Spurious Emissions        | 15.247 (d)      | <input checked="" type="checkbox"/> |
| Radiated Emission         | 15.247 (d)      | <input checked="" type="checkbox"/> |

Note: The test setup and measurement method for conductive output power measurements shown in this test report is different to the “Peak Output Power” test. Certain measurement uncertainty of peak power may be expected with the use of different power detection method or measuring equipment. Therefore, the conductive output power measurement results provided in this test report may be different to the specification of the device under test.

## 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 or 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<br>MHz | Quasi Peak<br>dB $\mu$ V | Average<br>dB $\mu$ V |
|------------------|--------------------------|-----------------------|
| 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<br>MHz | Distance<br>Meters | Radiated<br>dB $\mu$ V/m | Radiated<br>$\mu$ V/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 radiator device, according to §15.209(a), the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table::

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009-0.490        | 2400/F(kHz)                          | 300                              |
| 0.490-1.705        | 24000/F(kHz)                         | 30                               |
| 1.705-30.0         | 30                                   | 30                               |
| 30-88              | 100**                                | 3                                |
| 88-216             | 150**                                | 3                                |
| 216-960            | 200**                                | 3                                |
| Above 960          | 500                                  | 3                                |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.



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 (d) , 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 (e) , 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:

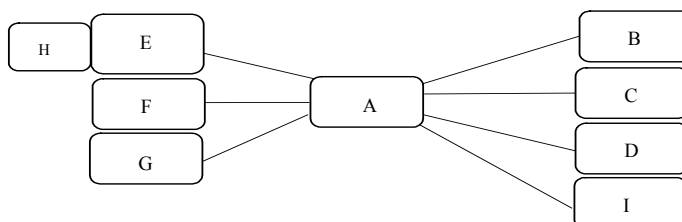
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

**3. SYSTEM TEST CONFIGURATION****3.1 Devices for Tested System**

| No | Device           | Manufacture         | Model No.   | Cable Description             |
|----|------------------|---------------------|-------------|-------------------------------|
| A  | * Car Navigation | FUJITSU TEN LIMITED | FT0045B     | ----                          |
| B  | Steering Switch  | N/A                 | N/A         | 2.8m*1 Unshielded Signal Line |
| C  | Rear Camera      | N/A                 | GP-KD5339RC | 2.8m*1 Unshielded Signal Line |
| D  | GPS Antenna      | TOYOTA              | 86860-22090 | 7.0m*1 Shielded Signal Line   |
| E  | USB Adapter      | N/A                 | N/A         | 2.0m*1 Unshielded Signal Line |
| F  | FM Radio Antenna | N/A                 | N/A         | 0.2m*1 Shielded Signal Line   |
| G  | Speaker*2        | N/A                 | ECLIPSE     | 3.0m*1 Unshielded Signal Line |
| H  | USB Dongle       | Transcend           | NK1939      | ----                          |
| I  | DC Power Supply  | GW                  | GPS-3030D   | 3.7m*1 Unshielded Power Line  |

## Remark

1. “\*” means equipment under test.



2.

|                |               |         |         |
|----------------|---------------|---------|---------|
| Test Software: | Tx Batch File |         |         |
| Power setting: | Mode          | Channel | Setting |
|                | b             | Low     | N/A     |
|                |               | Mid     | N/A     |
|                |               | High    | N/A     |
|                | g             | Low     | N/A     |
|                |               | Mid     | N/A     |
|                |               | High    | N/A     |
|                | gn HT20       | Low     | N/A     |
|                |               | Mid     | N/A     |
|                |               | High    | N/A     |

### 3.2 Description of Test modes

#### 3.2.1 IEEE 802.11b, 802.11g, 802.11gn 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 rate is the worse case for full testing.

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

IEEE 802.11gn HT20 mode: MCS0 6.5 Mbps data rate is the worse case for full testing.

## 3.2.2 Test Mode Description

## 3.2.2.1 Modulation Type

| Test Mode | Modulation                 | Note |
|-----------|----------------------------|------|
| A         | IEEE 802.11b               | -    |
| B         | IEEE 802.11g               | -    |
| C         | IEEE 802.11gn HT20 (note1) | -    |

| Mode             | IEEE 802.11b/g/gn HT20 |
|------------------|------------------------|
| Test Channel     | Frequency (MHz)        |
| Channel Low (L)  | 2412                   |
| Channel Mid (M)  | 2437                   |
| Channel High (H) | 2462                   |

## 3.2.2.2 Test Mode and Worse Case Determination

| Item | Test Item                      | Test Mode | Test Frequency (MHz) |
|------|--------------------------------|-----------|----------------------|
| 1    | Conducted Emission             | -         | -                    |
| 2    | Emission Bandwidth             | A , B , C | L , M , H            |
| 3    | Output Power Requirement       | A , B , C | L , M , H            |
| 4    | Power Density Requirement      | A , B , C | L , M , H            |
| 5    | Spurious Emissions             | A , B , C | L , M , H            |
| 6    | Radiated Emission              | A , B , C | L , M , H            |
| 6.1  | Radiated Emission (below 1GHz) | B (note1) | M (Worse Case1)      |
| 6.2  | Radiated Emission (above 1GHz) | A , B , C | L , M , H            |

note:

1. The worse case is determined as the modulation with highest output power.
2. The worse case is determined as the adaptor:1 with highest noise conducted emission.  
Choose that for final testing and record the result.

#### **4 CONDUCTED EMISSION MEASUREMENT**

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to §15.207 (d), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

## 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

The antennas is a Surface mounting Antenna

|                   |            |
|-------------------|------------|
| Antenna Type      | Inverted-F |
| Peak Antenna Gain | 1.47 dBi   |

The directional gain of antenna doesn't greater than 6 dBi, the power won't be reduced.



## 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. The testing follows FCC KDB 558074 D01 v03r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Position the EUT as shown in figure 1. 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.
4. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

Figure 1: Emission bandwidth measurement configuration.



### 6.3 Measurement Equipment

| Equipment         | Manufacturer | Model No. |
|-------------------|--------------|-----------|
| Spectrum Analyzer | Agilent      | E4446A    |

## 6.4 Measurement Data

### 6.4.1 IEEE 802.11b

Test Date: Jan. 15, 2015Temperature: 22°CHumidity: 60%

| Channel | 6dB Bandwidth<br>(MHz) | FCC Limit<br>(kHz) | Chart   |
|---------|------------------------|--------------------|---------|
| L       | 10.25                  | 500                | Page 19 |
| M       | 10.25                  | 500                | Page 20 |
| H       | 10.25                  | 500                | Page 21 |

**Note:**

1. Please refer to page 19 to page 21 for chart
2. The estimated measurement uncertainty of the result measurement is  $8.25 \times 10^{-7}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

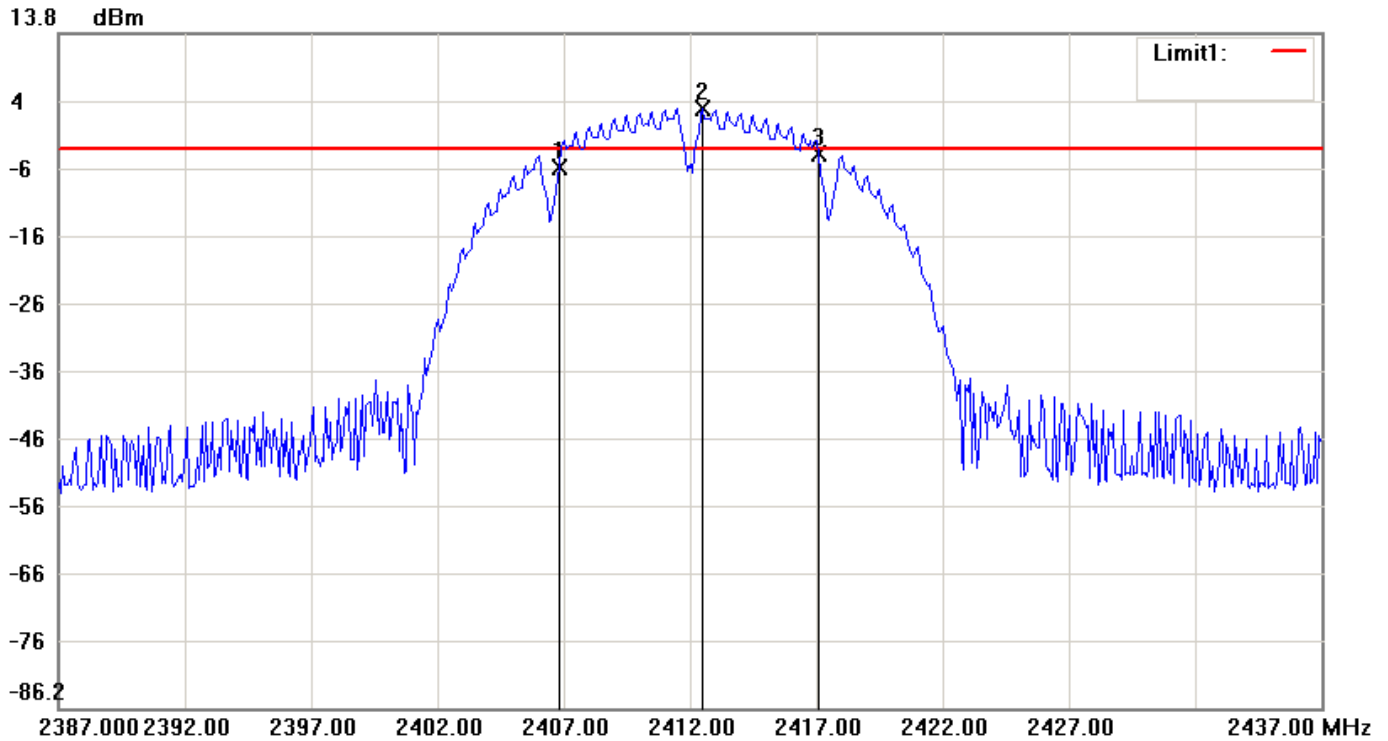
File: FT0045B wifi b Data: #1

Date: 2015/1/15

Temperature: 22 °C

Time: PM 02:15:46

Humidity: 60 %



Condition: -3.33dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 01-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2406.83330     | -5.96      |
| 2   | 2412.50000     | 2.67       |
| 3   | 2417.08330     | -3.98      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 10.25                   | 1.98               |

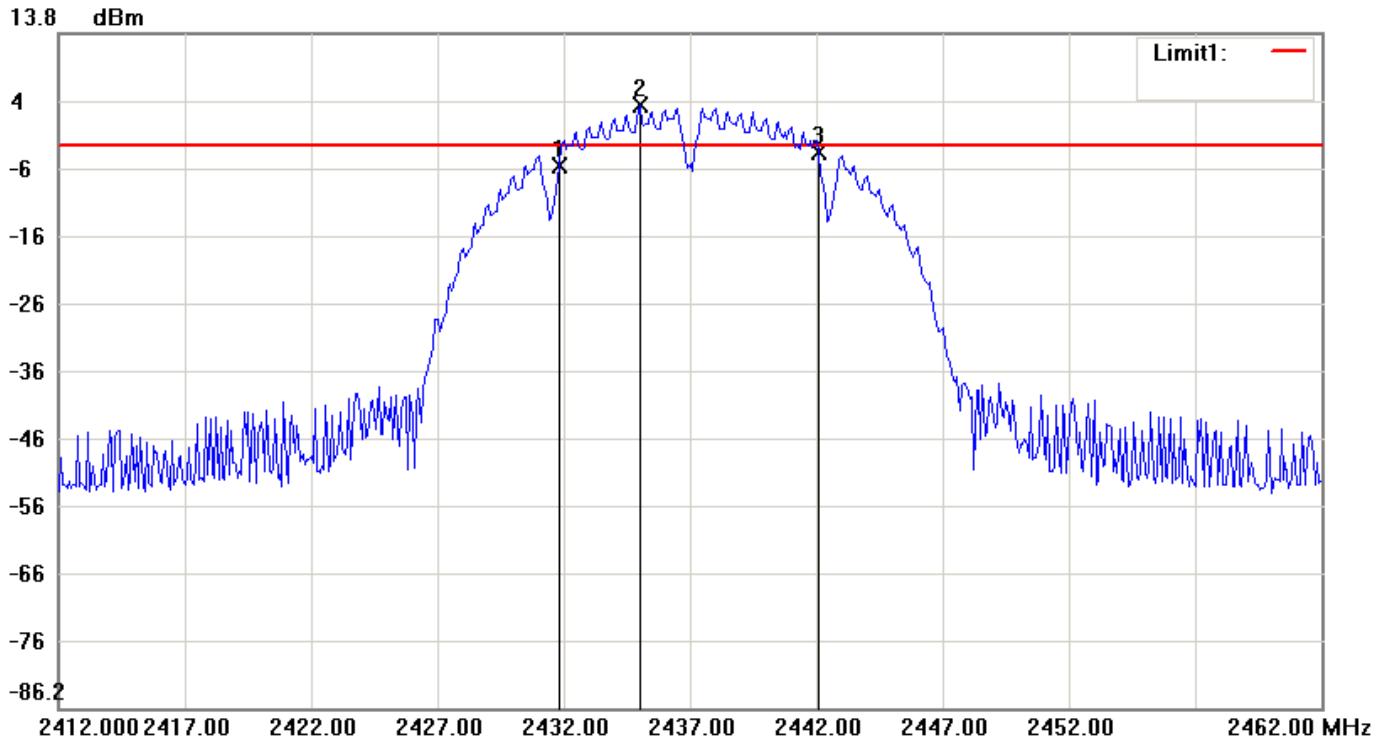
File: FT0045B wifi b Data: #6

Date: 2015/1/15

Temperature: 22 °C

Time: PM 02:23:09

Humidity: 60 %



Condition: -2.92dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 06-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2431.83330     | -5.85      |
| 2   | 2435.00000     | 3.08       |
| 3   | 2442.08330     | -3.79      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 10.25                   | 2.06               |

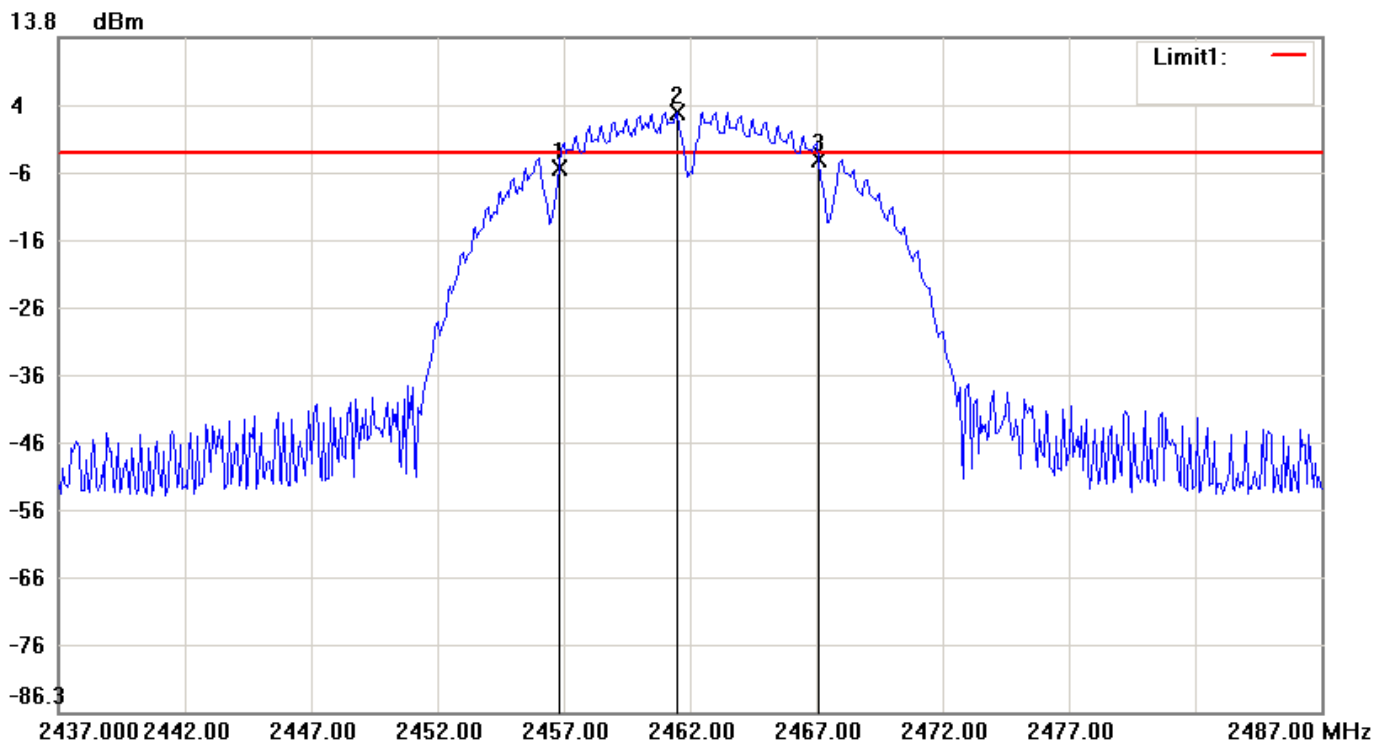
File: FT0045B wifi b Data: #10

Date: 2015/1/15

Temperature: 22 °C

Time: PM 02:31:28

Humidity: 60 %



Condition: -3.28dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 11-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2456.83330     | -5.73      |
| 2   | 2461.50000     | 2.72       |
| 3   | 2467.08330     | -4.31      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 10.25                   | 1.42               |

**6.4.2 IEEE 802.11g**Test Date: Jan. 15, 2015Temperature: 22°CHumidity: 60%

| Channel | 6dB Bandwidth<br>(MHz) | FCC Limit<br>(kHz) | Chart   |
|---------|------------------------|--------------------|---------|
| L       | 16.5                   | 500                | Page 23 |
| M       | 16.5                   | 500                | Page 24 |
| H       | 16.5                   | 500                | Page 25 |

**Note:**

1. Please refer to page 23 to page 25 for chart
2. The estimated measurement uncertainty of the result measurement is  $8.25 \times 10^{-7}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

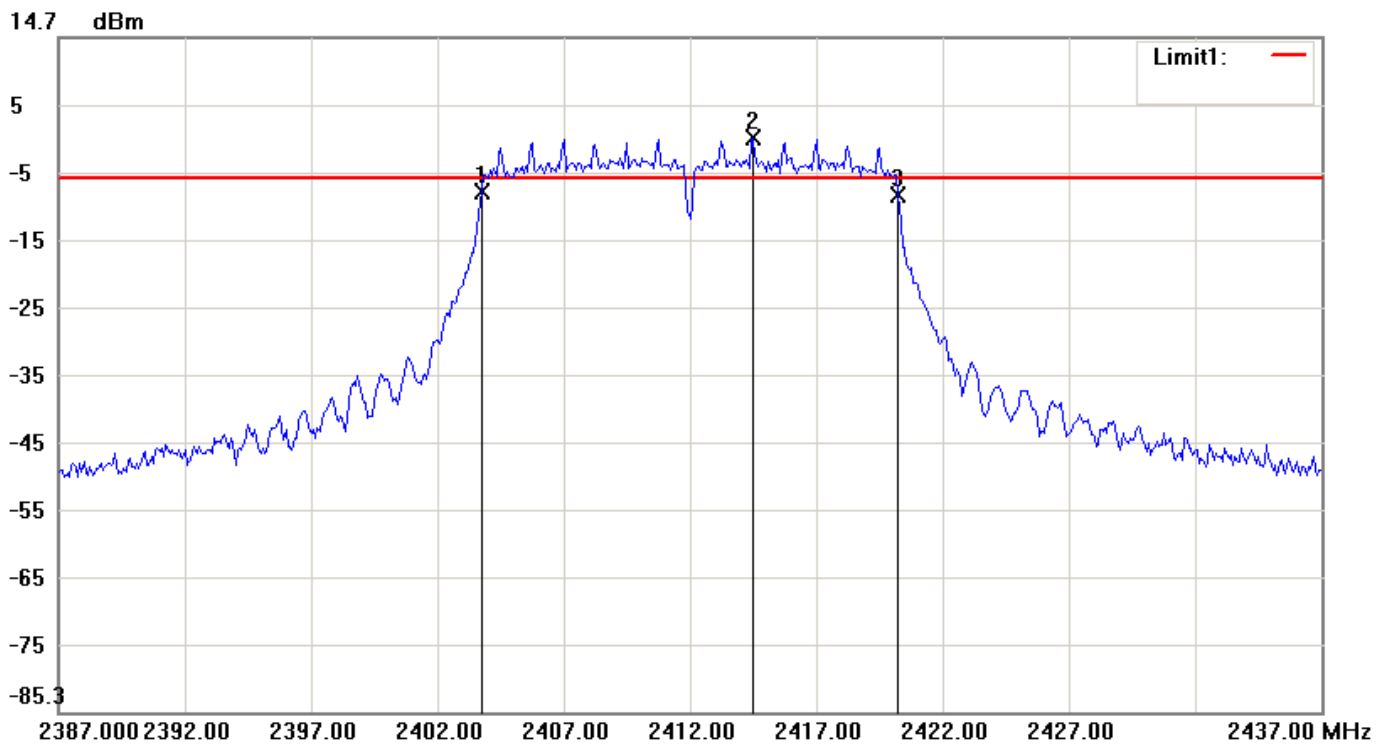
File: FT0045B wifi g Data: #1

Date: 2015/1/15

Temperature: 22 °C

Time: PM 02:39:57

Humidity: 60 %



Condition: -6.16dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

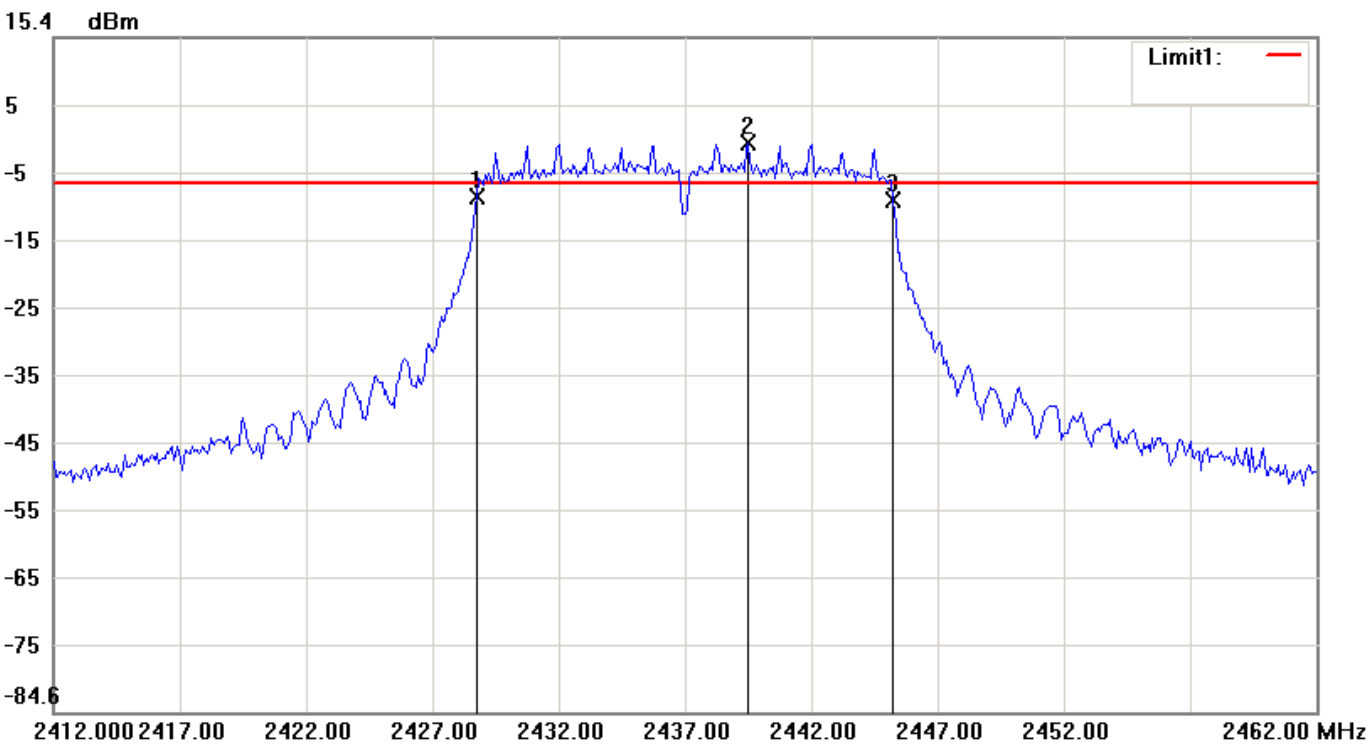
Test Mode:

Note: FCC-802.11g Channel 01-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2403.75000     | -8.33      |
| 2   | 2414.50000     | -0.16      |
| 3   | 2420.25000     | -8.74      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 16.5                    | -0.41              |

File: FT0045B wifi g    Data: #6    Date: 2015/1/15    Temperature: 22 °C  
Time: PM 02:47:53    Humidity: 60 %



Condition: -6.27dBm    RF Conducted  
EUT: Sweep Time: 500ms    Att.: 20dB  
Model: RBW: 100 KHz    VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11g Channel 06-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2428.75000     | -8.17      |
| 2   | 2439.50000     | -0.27      |
| 3   | 2445.25000     | -8.70      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 16.5                    | -0.53              |



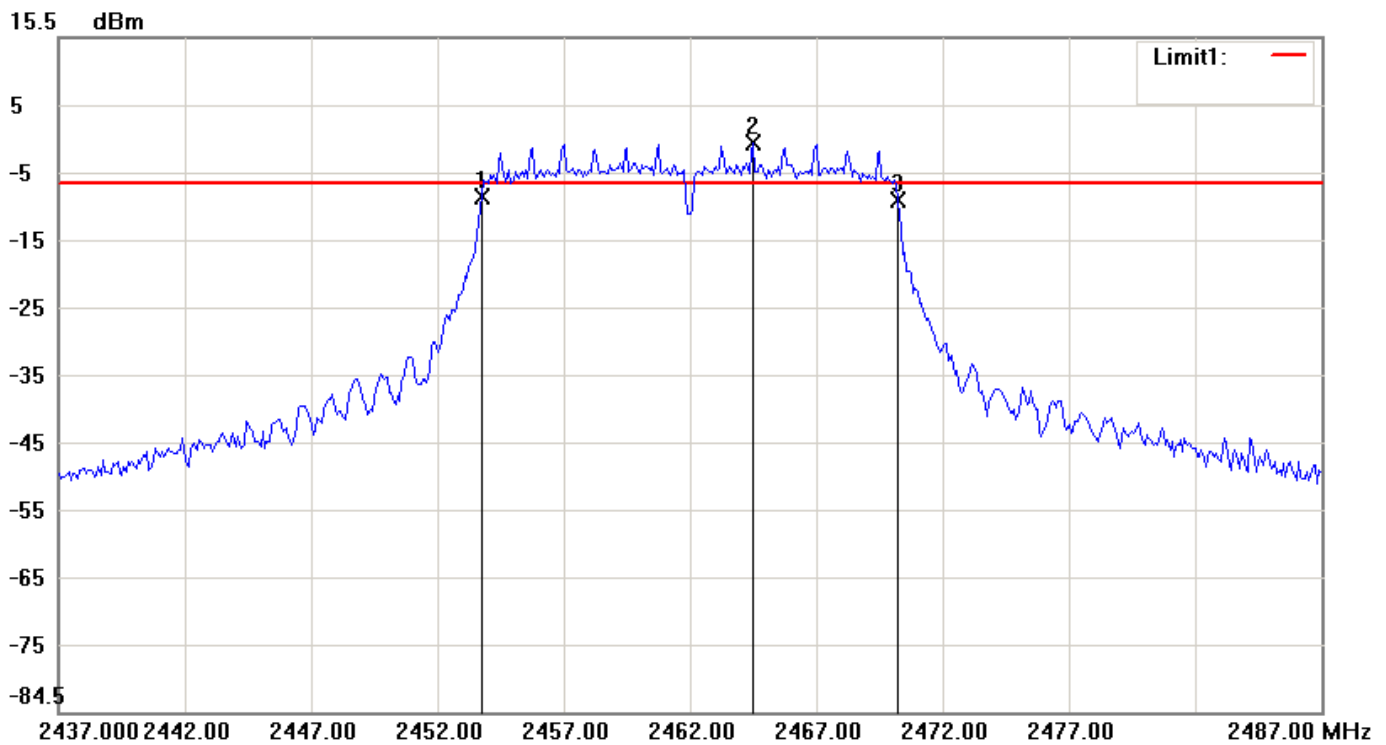
File: FT0045B wifi g Data: #10

Date: 2015/1/15

Temperature: 22 °C

Time: PM 02:55:17

Humidity: 60 %



Condition: -6.09dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 11-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2453.75000     | -8.22      |
| 2   | 2464.50000     | -0.09      |
| 3   | 2470.25000     | -8.56      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 16.5                    | -0.34              |

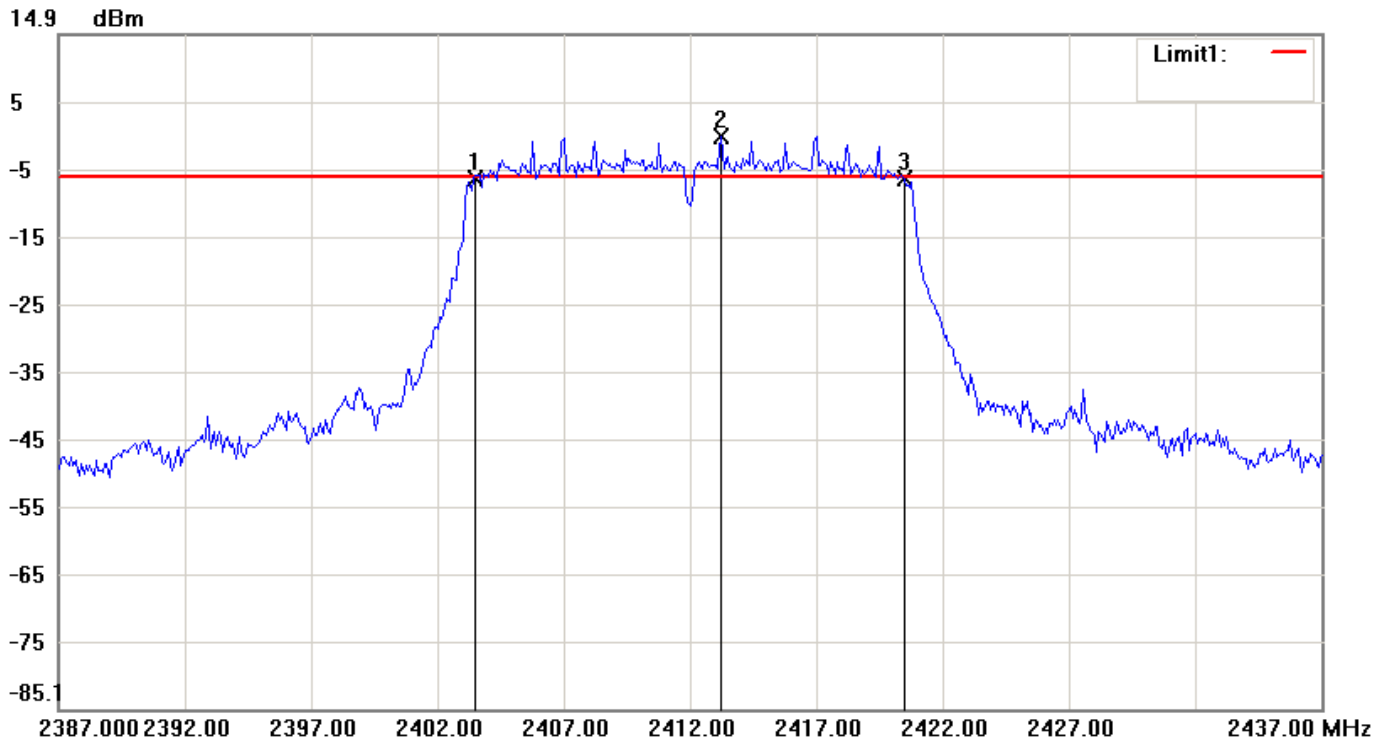
**6.4.3 IEEE 802.11gn, HT20**Test Date: Jan. 15, 2015Temperature: 22°CHumidity: 60%

| Channel | 6dB Bandwidth<br>(MHz) | FCC Limit<br>(kHz) | Chart   |
|---------|------------------------|--------------------|---------|
| L       | 17.0833                | 500                | Page 27 |
| M       | 17                     | 500                | Page 28 |
| H       | 17                     | 500                | Page 29 |

**Note:**

1. Please refer to page 27 to page 29 for chart
2. The estimated measurement uncertainty of the result measurement is  $8.25 \times 10^{-7}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

File: FT0045B wifi      Data: #1      Date: 2015/1/15      Temperature: 22 °C  
20n  
Time: PM 03:04:18      Humidity: 60 %



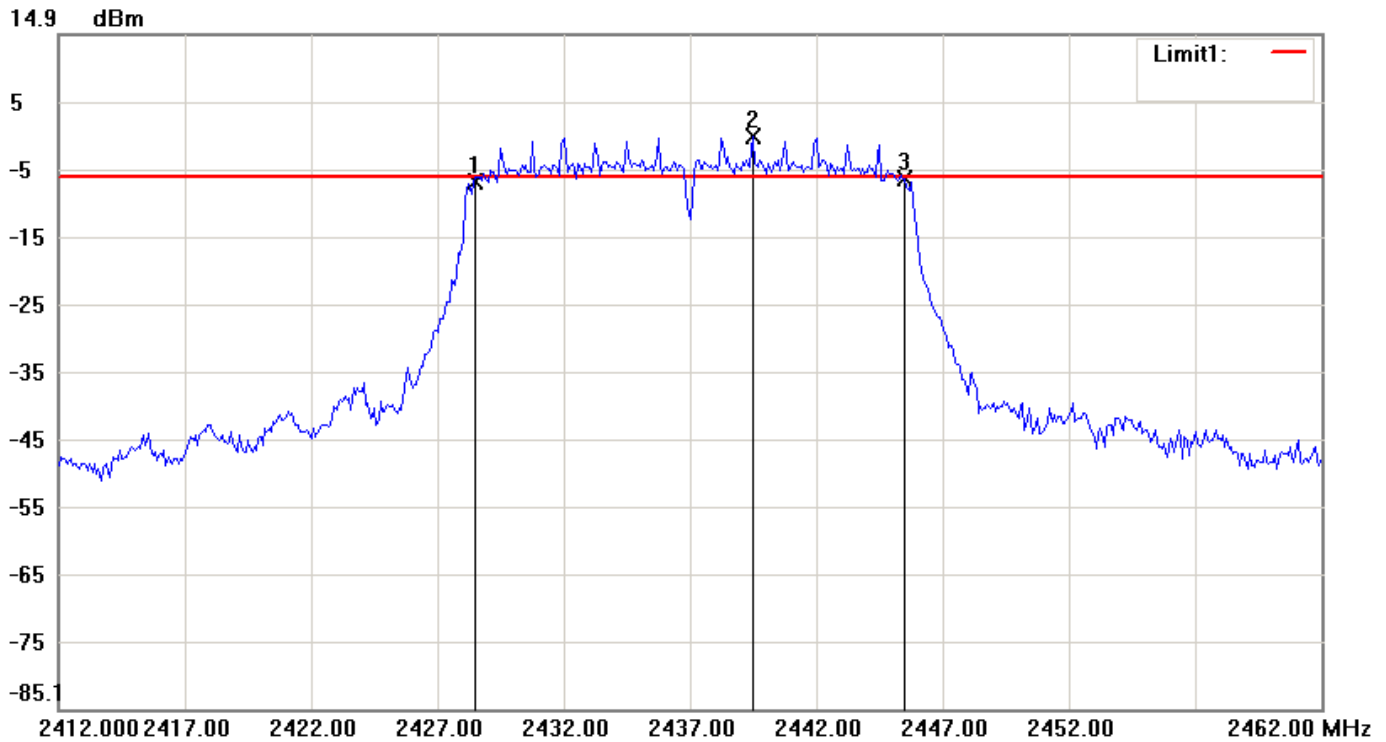
Condition: -6.35dBm      RF Conducted  
EUT: Sweep Time: 500ms    Att.: 20dB  
Model: RBW: 100 KHz      VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 01-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2403.41670     | -6.45      |
| 2   | 2413.25000     | -0.35      |
| 3   | 2420.50000     | -6.40      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 17.0833                 | 0.05               |

File: FT0045B wifi      Data: #6      Date: 2015/1/15      Temperature: 22 °C  
20n

Time: PM 03:11:47      Humidity: 60 %



Condition: -6.15dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

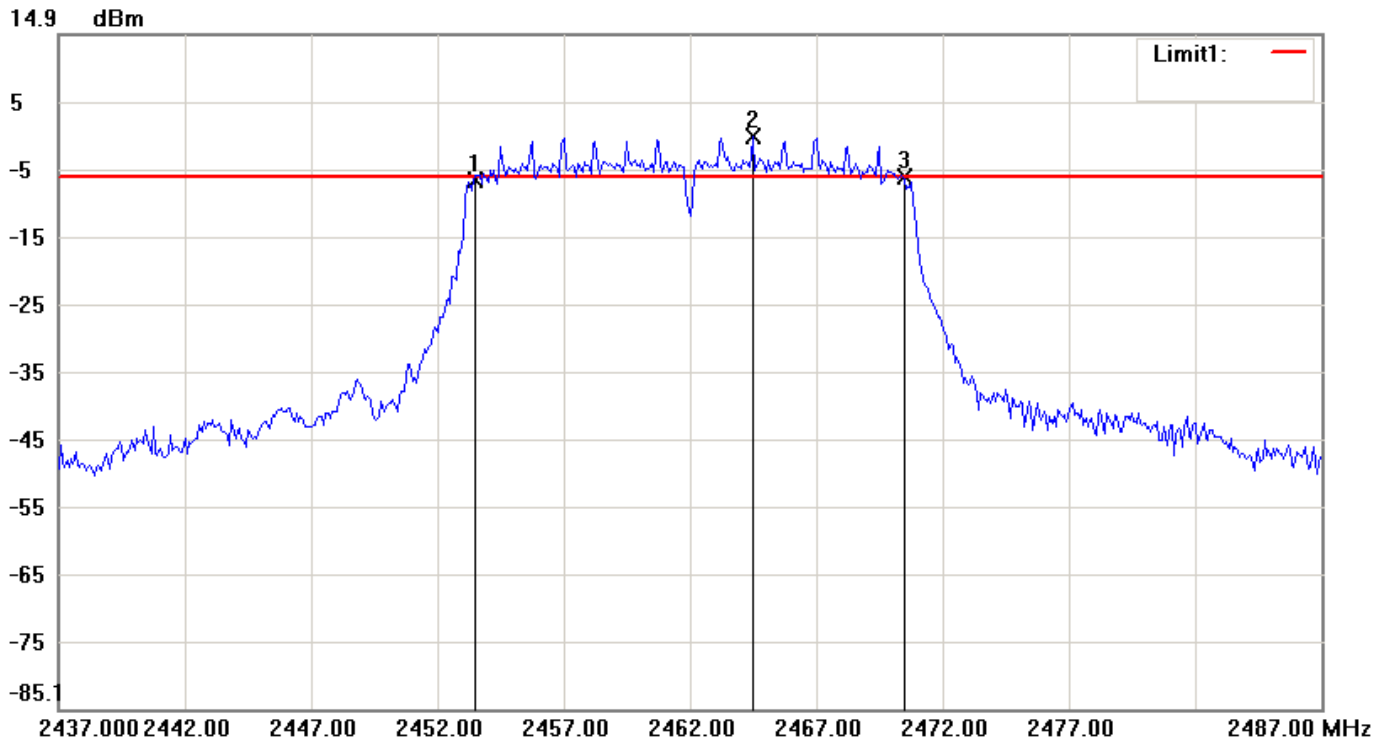
Test Mode:

Note: FCC-802.11gn\_HT20 Channel 06-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2428.41670     | -7.00      |
| 2   | 2439.50000     | -0.15      |
| 3   | 2445.41670     | -6.41      |

| No. |         | $\Delta$ Frequency(MHz) | $\Delta$ Level(dB) |
|-----|---------|-------------------------|--------------------|
| 1   | mk3-mk1 | 17                      | 0.59               |

File: FT0045B wifi      Data: #10      Date: 2015/1/15      Temperature: 22 °C  
20n  
Time: PM 03:19:33      Humidity: 60 %



Condition: -6.29dBm      RF Conducted

EUT:      Sweep Time: 500ms      Att.: 20dB

Model:      RBW: 100 KHz      VBW: 300 KHz

Test Mode:

Note: FCC-802.11gn\_HT20 Channel 11-6dB EBW

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2453.41670     | -6.72      |
| 2   | 2464.50000     | -0.29      |
| 3   | 2470.41670     | -6.34      |

| No. |         | ΔFrequency(MHz) | ΔLevel(dB) |
|-----|---------|-----------------|------------|
| 1   | mk3-mk1 | 17              | 0.38       |

## 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. The testing follows FCC KDB 558074 D01 v03r02.
2. The test is performed in accordance with FCC KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)
3. Position the EUT as shown in figure 1.

### 7.3 Measurement Equipment

| Equipment             | Manufacturer | Model No. |
|-----------------------|--------------|-----------|
| Power Meter           | Agilent      | N1912A    |
| Wideband Power Sensor | Agilent      | N1922A    |

## 7.4 Measurement Data

### 7.4.1 IEEE 802.11b

Test Date: Jan. 15, 2015Temperature: 22°CHumidity: 60%

| Channel | Maximum Peak<br>Output Power<br>(dBm) | FCC Limit<br>(dBm) | Chart |
|---------|---------------------------------------|--------------------|-------|
| L       | 15.78                                 | 30.0               | -     |
| M       | 15.82                                 | 30.0               | -     |
| H       | 15.98                                 | 30.0               | -     |

**Note:**

*The estimated measurement uncertainty of the result measurement is  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )*

**7.4.2 IEEE 802.11g**Test Date: Jan. 15, 2015Temperature: 22°CHumidity: 60%

| Channel | Maximum Peak<br>Output Power<br>(dBm) | FCC Limit<br>(dBm) | Chart |
|---------|---------------------------------------|--------------------|-------|
| L       | 20.07                                 | 30.0               | -     |
| M       | 20.14                                 | 30.0               | -     |
| H       | 20.54                                 | 30.0               | -     |

**Note:**

*The estimated measurement uncertainty of the result measurement is  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )*



**7.4.3 IEEE 802.11gn, HT20**Test Date: Jan. 15, 2015Temperature: 22°CHumidity: 60%

| Channel | Maximum Peak<br>Output Power<br>(dBm) | FCC Limit<br>(dBm) | Chart |
|---------|---------------------------------------|--------------------|-------|
| L       | 19.14                                 | 30.0               | -     |
| M       | 19.20                                 | 30.0               | -     |
| H       | 19.51                                 | 30.0               | -     |

**Note:**

*The estimated measurement uncertainty of the result measurement is  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )*

## 8 POWER DENSITY MEASUREMENT

### 8.1 Standard Applicable

According to 15.247(e), 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. The testing follows FCC KDB 558074 D01 v03r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Position the EUT as shown in figure 1. 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.
4. Adjust the center frequency of spectrum analyzer on highest level appearing on spectral display within a 300 kHz frequency span.
5. 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.
6. Repeat above procedures until all measured frequencies were complete.

### 8.3 Measurement Equipment

| Equipment         | Manufacturer | Model No. |
|-------------------|--------------|-----------|
| Spectrum Analyzer | Agilent      | E4446A    |

## 8.4 Measurement Data

### 8.4.1 IEEE 802.11b

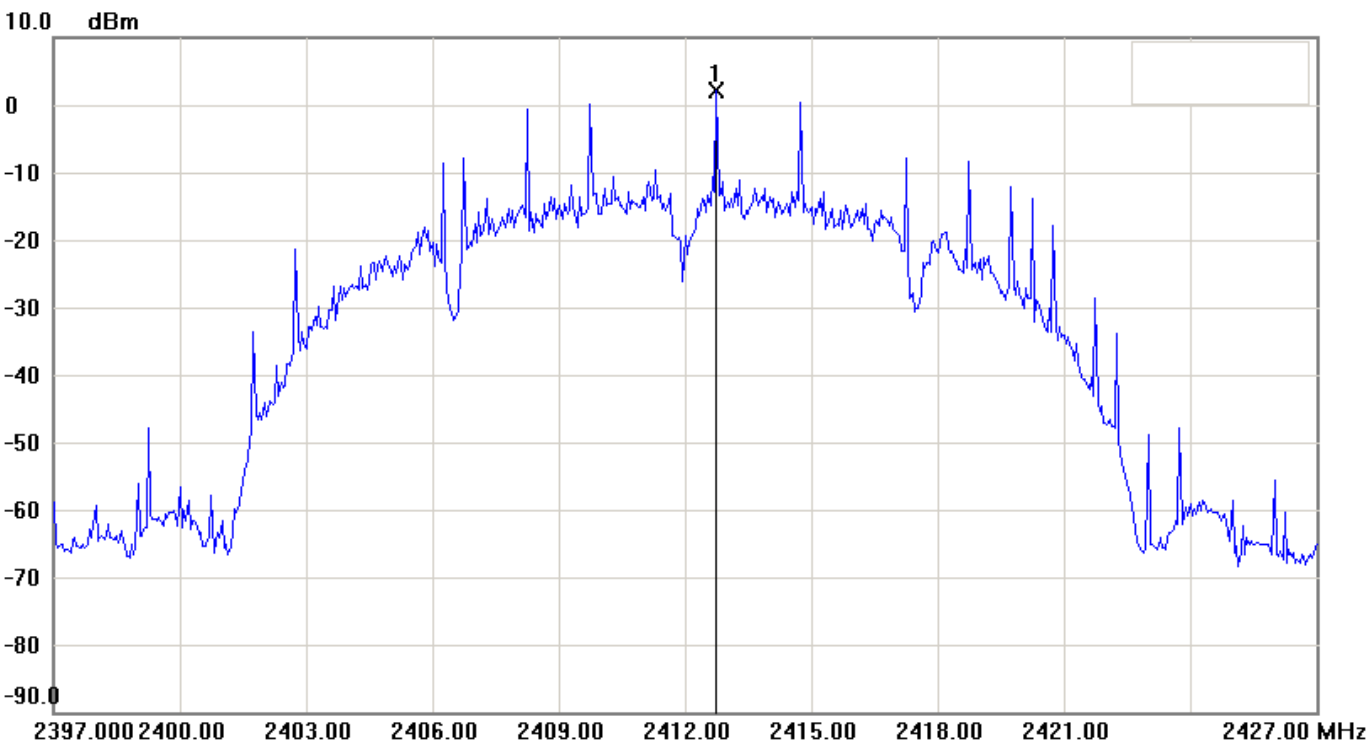
Test Date: Jan. 20, 2015Temperature: 22°CHumidity: 60%

| Channel | Peak Power Spectral Density (dBm) | FCC Limit (dBm) | Chart   |
|---------|-----------------------------------|-----------------|---------|
| L       | 2.17                              | 8               | Page 36 |
| M       | 2.12                              | 8               | Page 37 |
| H       | 1.15                              | 8               | Page 38 |

**Note:**

1. Please refer to page 36 to page 38 for chart
2. The estimated measurement uncertainty of the result measurement is  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

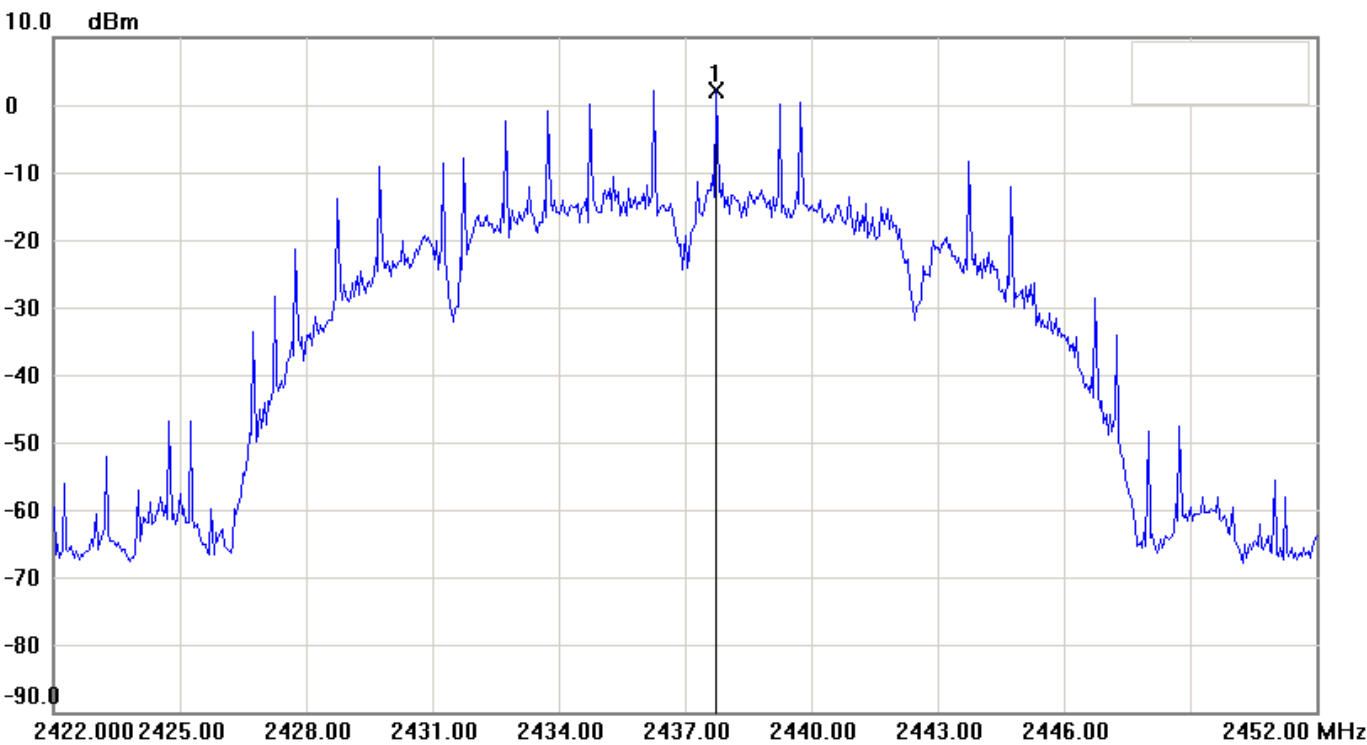
File: FT0045B      Data: #4      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:29:52      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: FCC-802.11 b Channel 01-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2412.75000     | 2.17       |

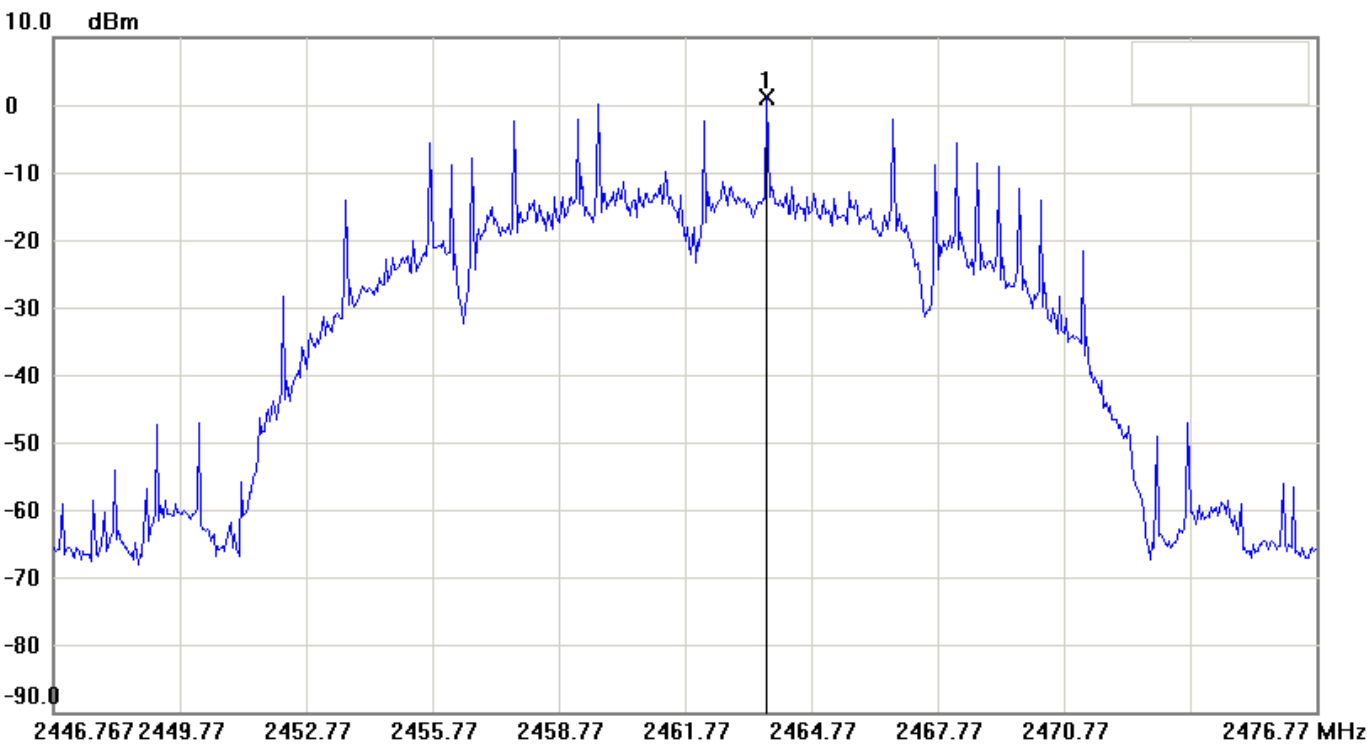
File: FT0045B      Data: #3      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:26:29      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: FCC-802.11 b Channel 06-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2437.75000     | 2.12       |

File: FT0045B      Data: #2      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:22:48      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: FCC-802.11 b Channel 11-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2463.71660     | 1.15       |

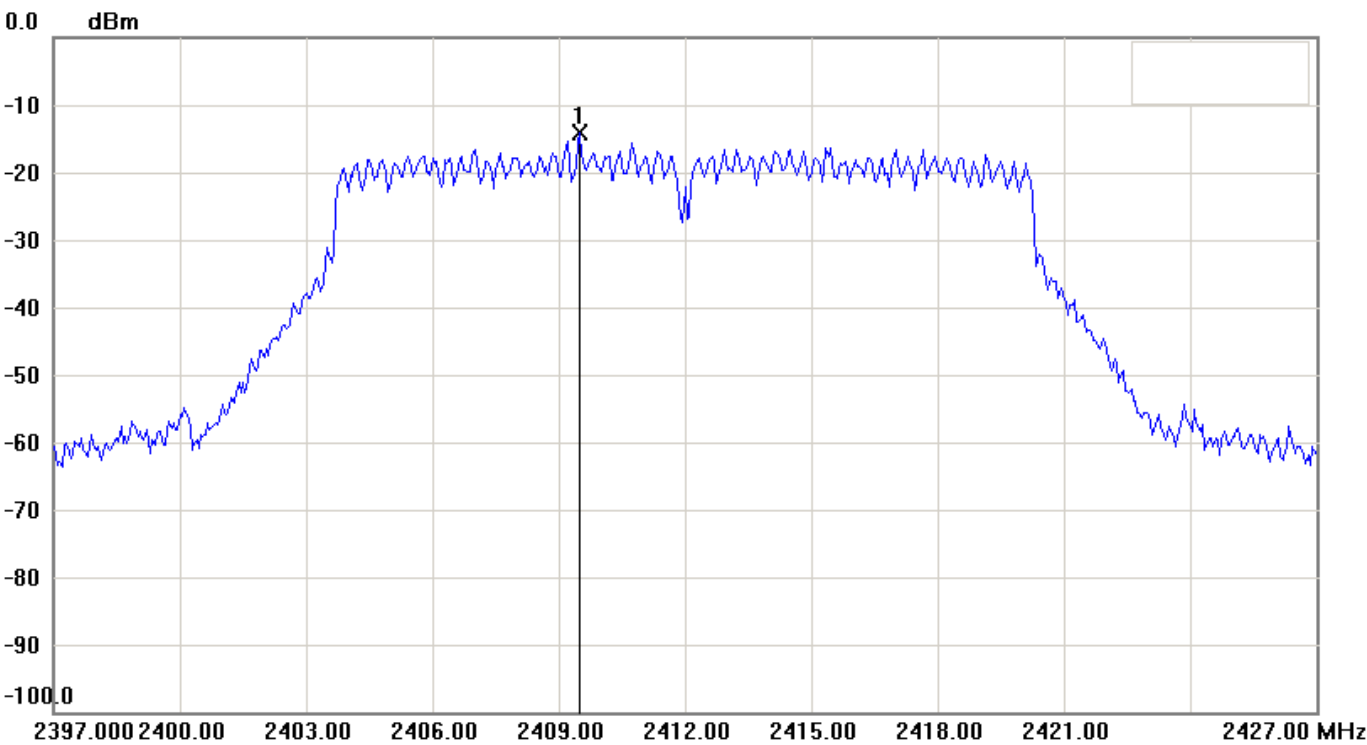
**8.4.2 IEEE 802.11g**Test Date: Jan. 20, 2015Temperature: 22°CHumidity: 60%

| Channel | Peak Power Spectral<br>Density<br>(dBm) | FCC Limit<br>(dBm) | Chart   |
|---------|-----------------------------------------|--------------------|---------|
| L       | -14.01                                  | 8                  | Page 40 |
| M       | -16.04                                  | 8                  | Page 41 |
| H       | -15.25                                  | 8                  | Page 42 |

**Note:**

1. Please refer to page 40 to page 42 for chart
2. The estimated measurement uncertainty of the result measurement is  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

File: FT0045B      Data: #5      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:31:17      Humidity: 60 %

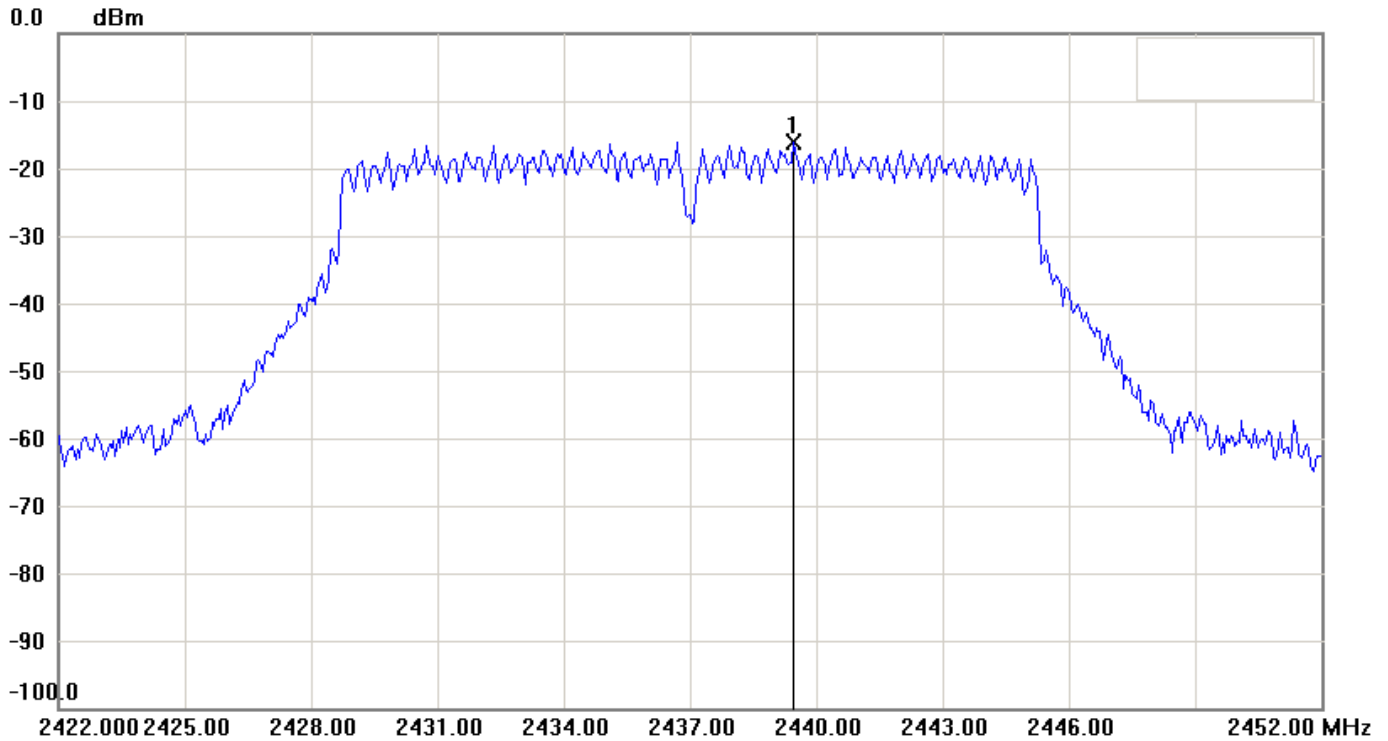


Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: F CC-802.11 g Channel 01-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2409.50000     | -14.01     |



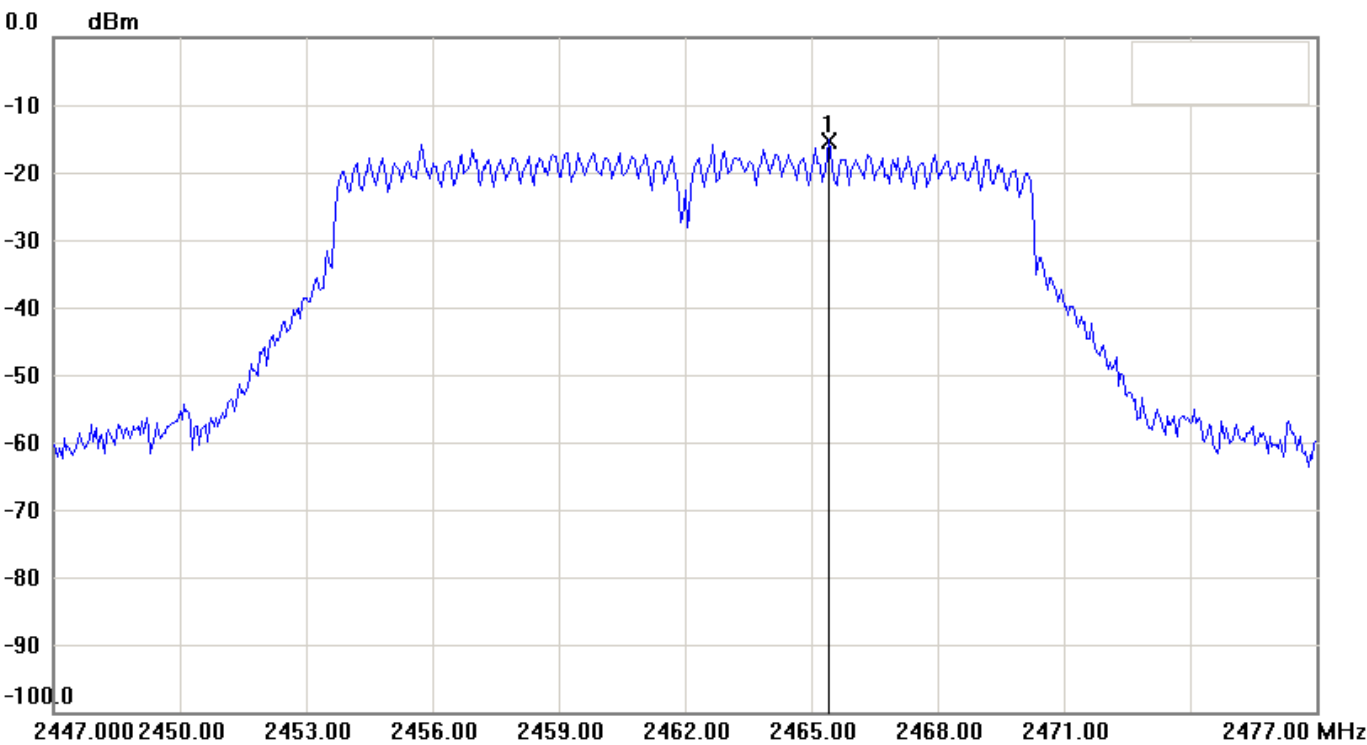
File: FT0045B      Data: #6      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:32:47      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: F CC-802.11 g Channel 06-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2439.45000     | -16.04     |

File: FT0045B      Data: #7      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:33:52      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: F CC-802.11 g Channel 11-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2465.40000     | -15.25     |

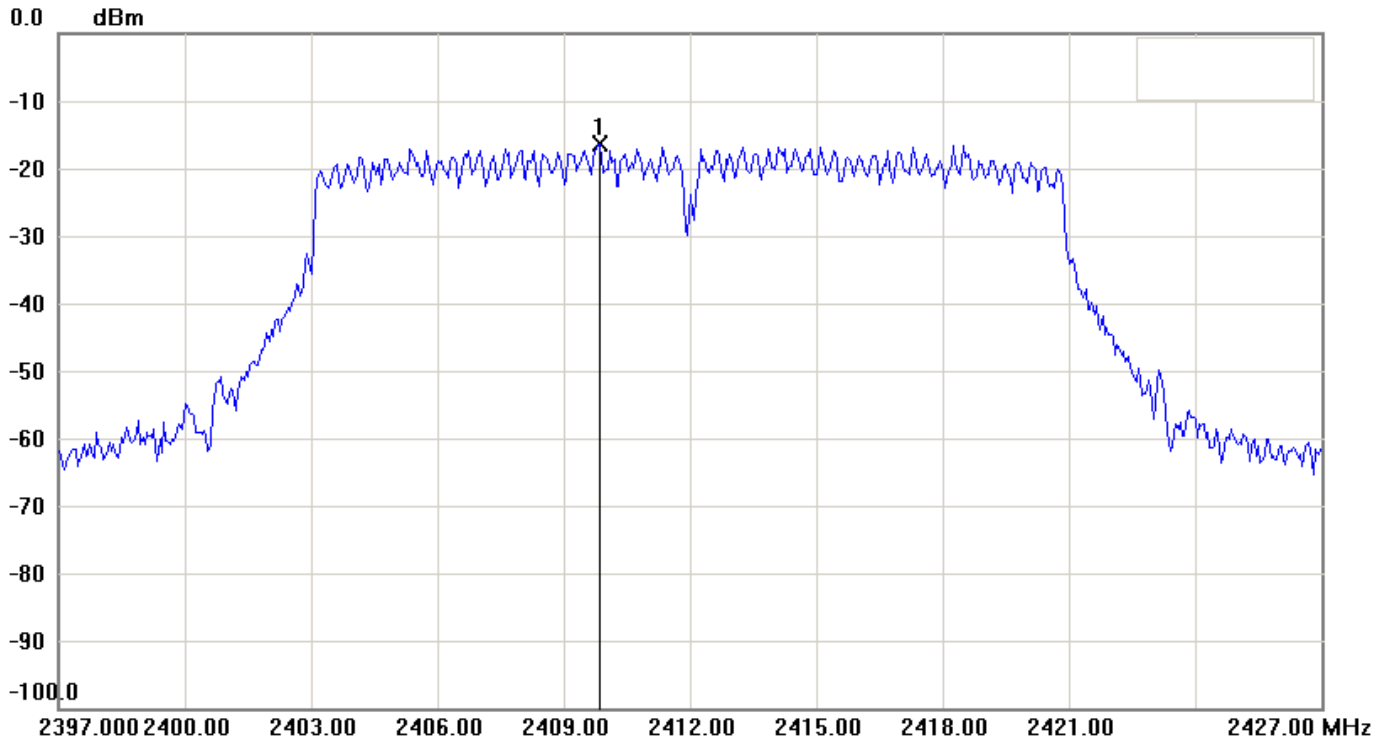
**8.4.3 IEEE 802.11gn, HT20**Test Date: Jan. 20, 2015Temperature: 22°CHumidity: 60%

| Channel | Peak Power Spectral<br>Density<br>(dBm) | FCC Limit<br>(dBm) | Chart   |
|---------|-----------------------------------------|--------------------|---------|
| L       | -16.32                                  | 8                  | Page 44 |
| M       | -15.93                                  | 8                  | Page 45 |
| H       | -15.00                                  | 8                  | Page 46 |

**Note:**

1. Please refer to page 44 to page 46 for chart
2. The estimated measurement uncertainty of the result measurement is  $\pm 1.5\text{dB}$  ( $1\text{GHz} \leq f \leq 18\text{GHz}$ )

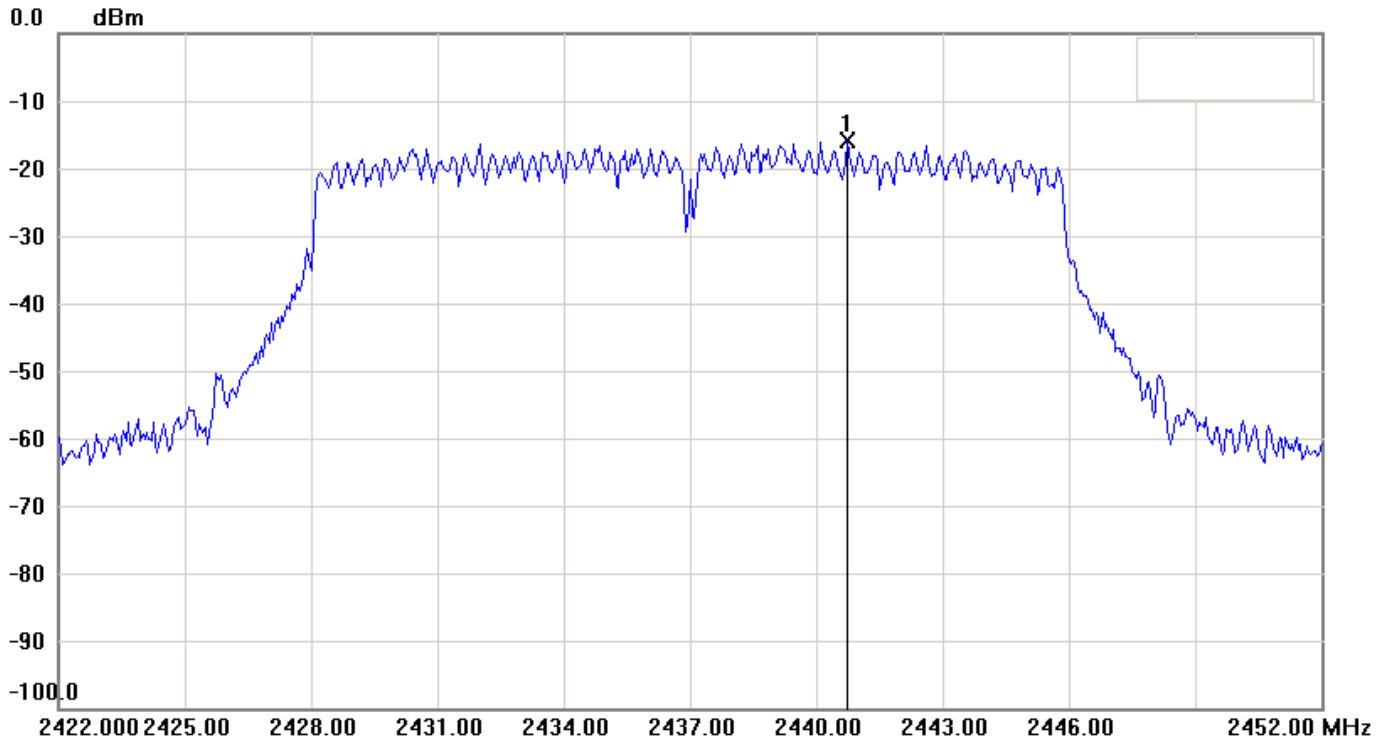
File: FT0045B      Data: #10      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:38:34      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: FCC-802.11 20n Channel 01-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2409.85000     | -16.32     |

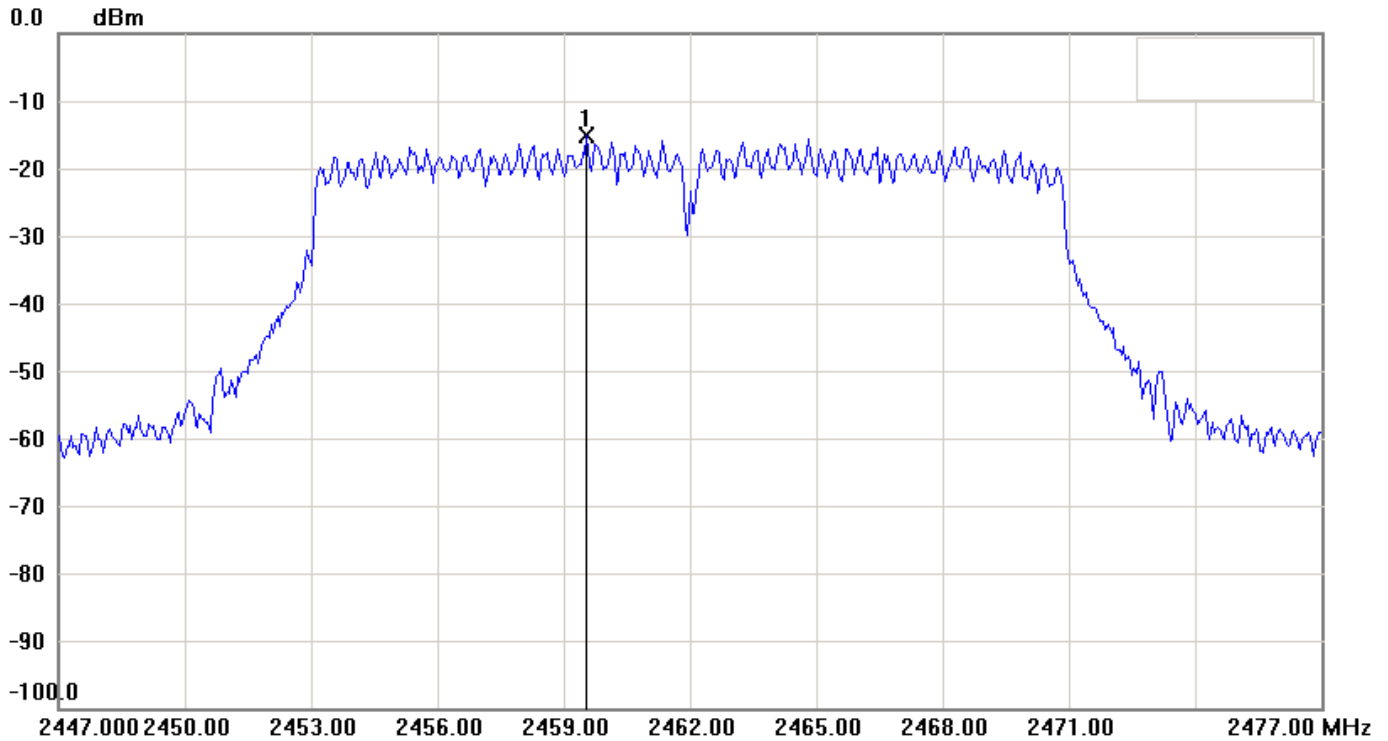
File: FT0045B      Data: #9      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:36:58      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: FCC-802.11 20n Channel 06-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2440.75000     | -15.93     |

File: FT0045B      Data: #8      Date: 2015/1/20      Temperature: 22 °C  
Time: PM 05:35:21      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 3163.2ms Att.: 10dB  
Model: RBW: 3 KHz VBW: 10 KHz  
Test Mode:  
Note: FCC-802.11 20n Channel 11-Power Density (PK)

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2459.55000     | -15.00     |

## 9 SPURIOUS EMISSION - RF CONDUCTED MEASUREMENT

### 9.1 Standard Applicable

According to 12.247 (d) , 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. The testing follows FCC KDB 558074 D01 v03r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Position the EUT as shown in figure 1. 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.
4. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
5. 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.
6. Repeat above procedures until all measured frequencies were complete.

### 9.3 Measurement Equipment

| Equipment         | Manufacturer | Model No. |
|-------------------|--------------|-----------|
| Spectrum Analyzer | Agilent      | E4446A    |

## 9.4 Measurement Data

### 9.4.1 IEEE 802.11b

Test Date: Jan. 15, 2015Temperature: 22°CHumidity: 60%Test Date: Jan. 21, 2015Temperature: 22°CHumidity: 60%

| Channel | Frequency(MHz) | Chart                     |
|---------|----------------|---------------------------|
| 1       | 2412           | Page 49, Page 51,52,53,54 |
| 6       | 2437           | Page 55,56,57,58          |
| 11      | 2462           | Page 50, Page 59,60,61,62 |

Frequency Band: 2400 MHz ~ 2483.5 MHz

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

*Note: 1. Please refer to page 49 to page 62 for chart*  
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

### 9.4.2 IEEE 802.11g

| Channel | Frequency(MHz) | Chart                     |
|---------|----------------|---------------------------|
| 1       | 2412           | Page 63, Page 65,66,67,68 |
| 6       | 2437           | Page 69,70,71,72          |
| 11      | 2462           | Page 64, Page 73,74,75,76 |

Frequency Band: 2400 MHz ~ 2483.5 MHz

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

*Note: 1. Please refer to page 63 to page 76 for chart*  
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*

### 9.4.3 IEEE 802.11gn, HT20

| Channel | Frequency(MHz) | Chart                     |
|---------|----------------|---------------------------|
| 1       | 2412           | Page 77, Page 79,80,81,82 |
| 6       | 2437           | Page 83,84,85,86          |
| 11      | 2462           | Page 78, Page 87,88,89,90 |

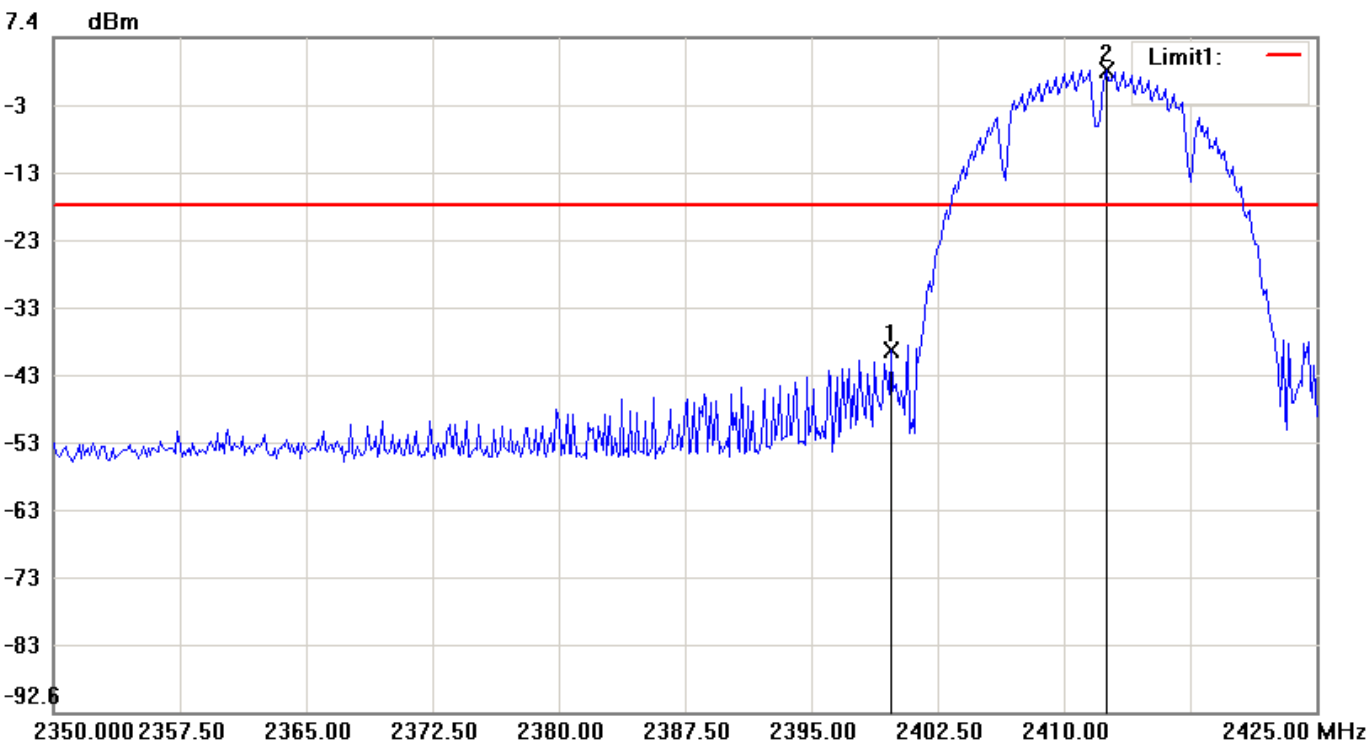
Frequency Band: 2400 MHz ~ 2483.5 MHz

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

*Note: 1. Please refer to page 77 to page 90 for chart*  
*2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.*



File: FT0045B wifi b    Data: #5    Date: 2015/1/15    Temperature: 22 °C  
Time: PM 02:20:52    Humidity: 60 %



Condition: -17.47dBm    RF Conducted  
EUT: Sweep Time: 500ms    Att.: 10dB  
Model: RBW: 100 KHz    VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11b Channel 01-Bandedge

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2399.75000     | -39.08     |
| 2   | 2412.50000     | 2.53       |

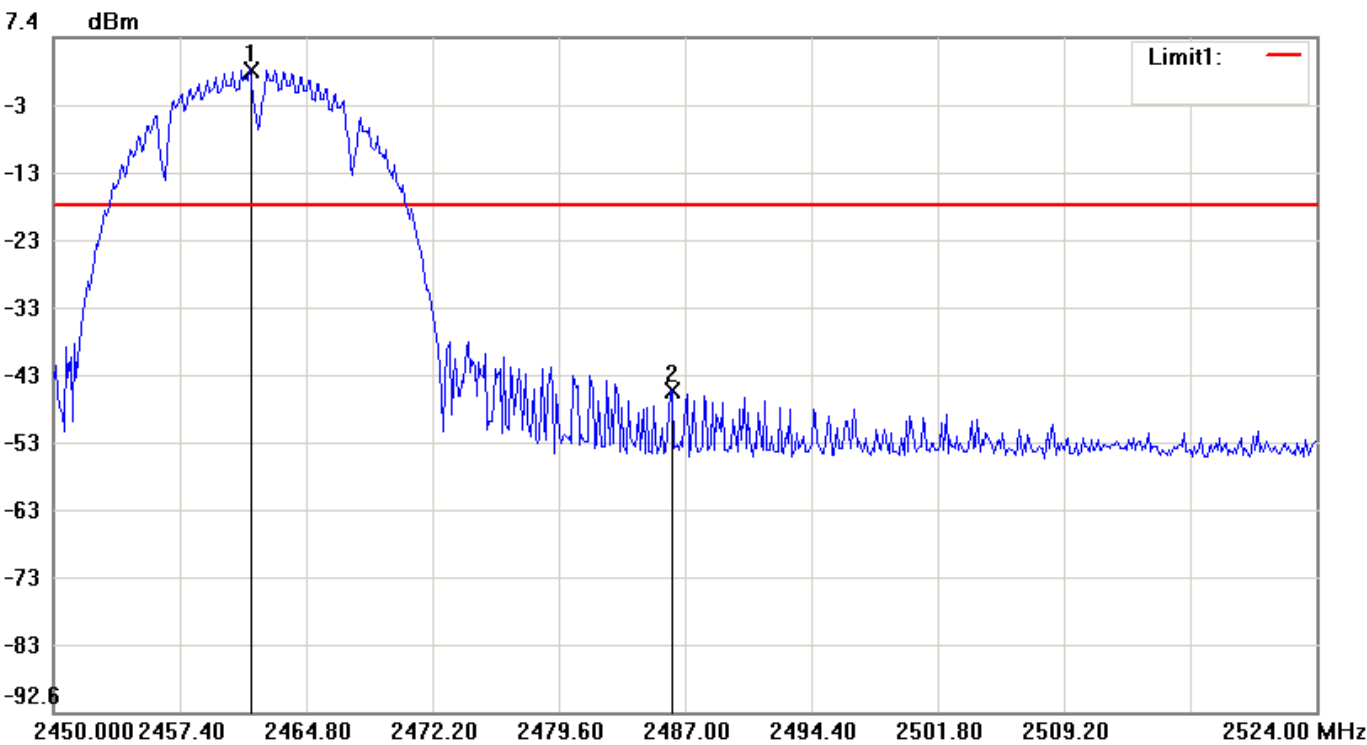
File: FT0045B wifi b Data: #14

Date: 2015/1/15

Temperature: 22 °C

Time: PM 02:36:59

Humidity: 60 %



Condition: -17.38dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 10dB

Model:

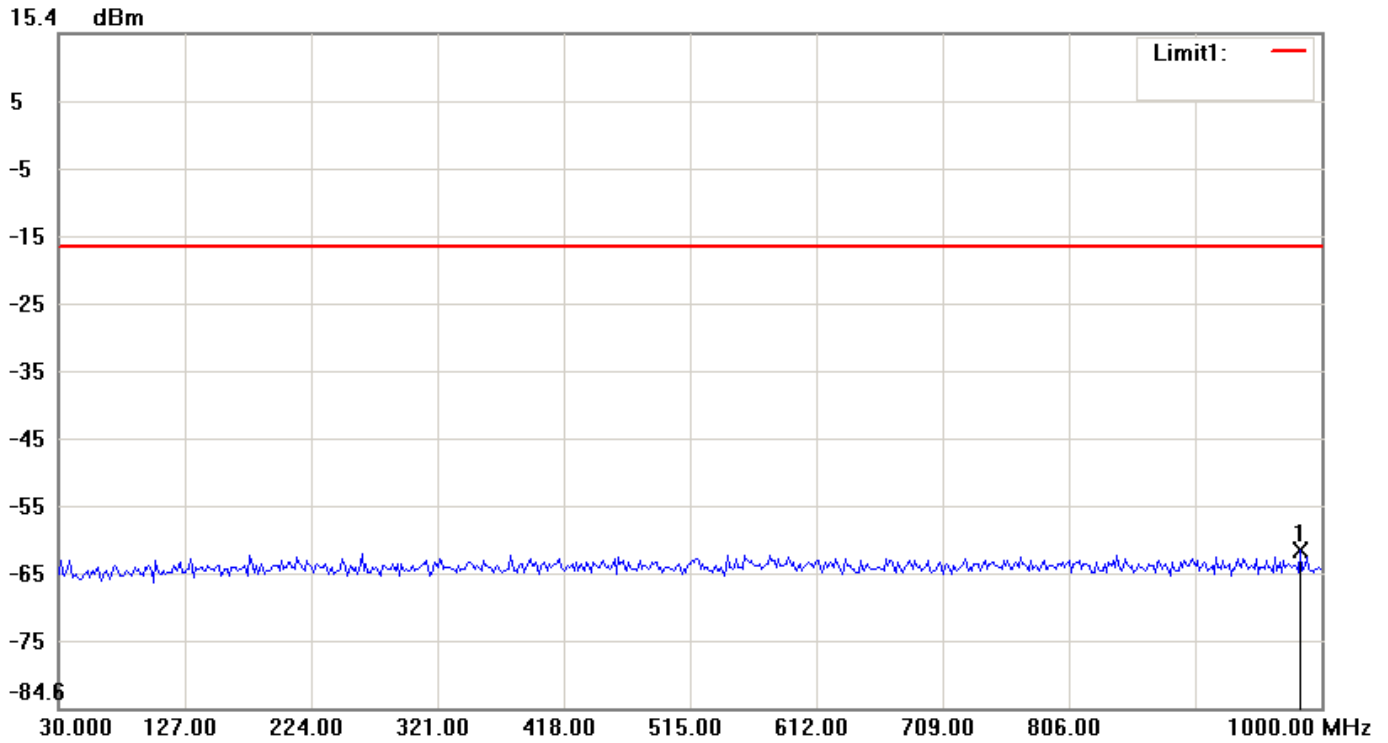
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 11-Bandedge

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2461.47000     | 2.62       |
| 2   | 2486.13670     | -44.90     |

File: FT0045B wifi b    Data: #15    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:35:04    Humidity: 60 %



Condition: -16.16    Horizontal

EUT:    Sweep Time: 92.72ms    Att.: 20dB

Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note:    FCC-802.11b Channel 01-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 983.8333       | -61.28     |

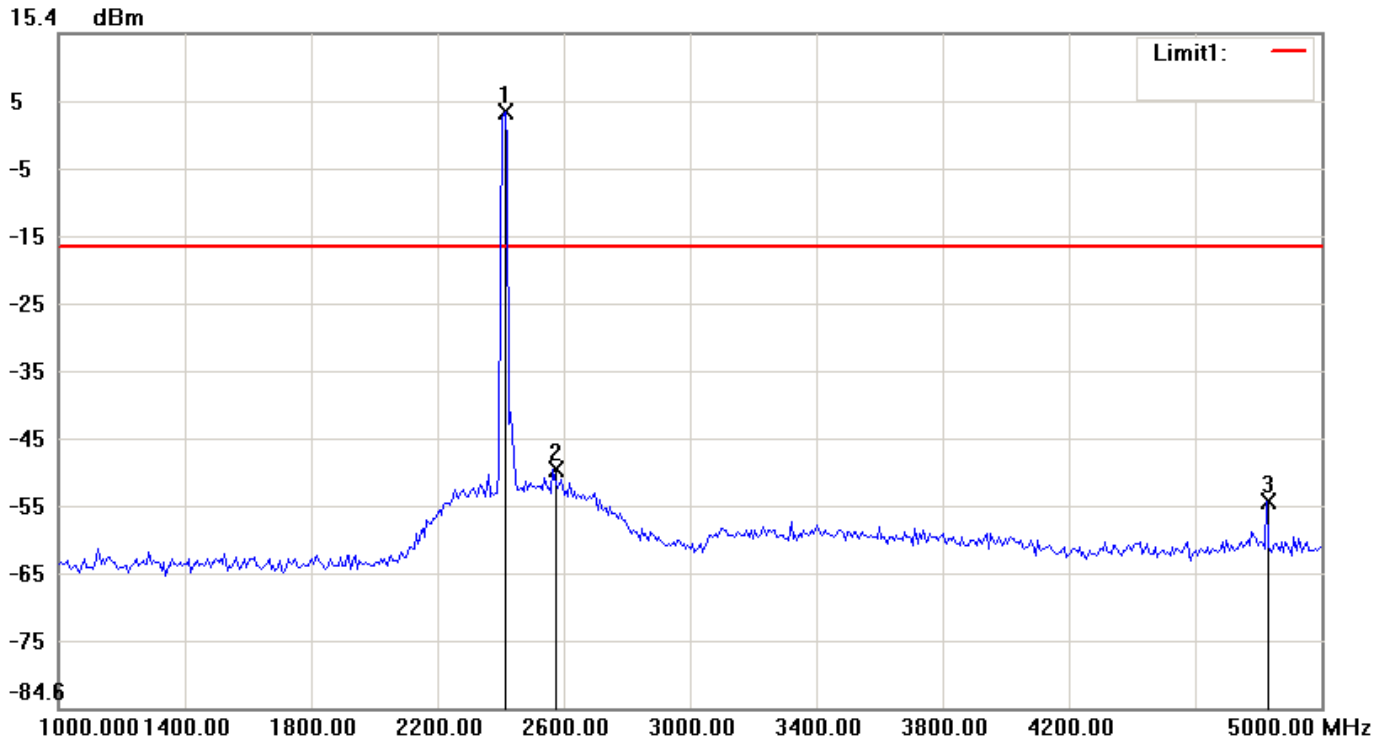
File: FT0045B wifi b Data: #16

Date: 2015/1/21

Temperature: 22 °C

Time: PM 03:35:42

Humidity: 60 %



Condition:

Horizontal

EUT:

Sweep Time: 382.28ms Att.: 20dB

Model:

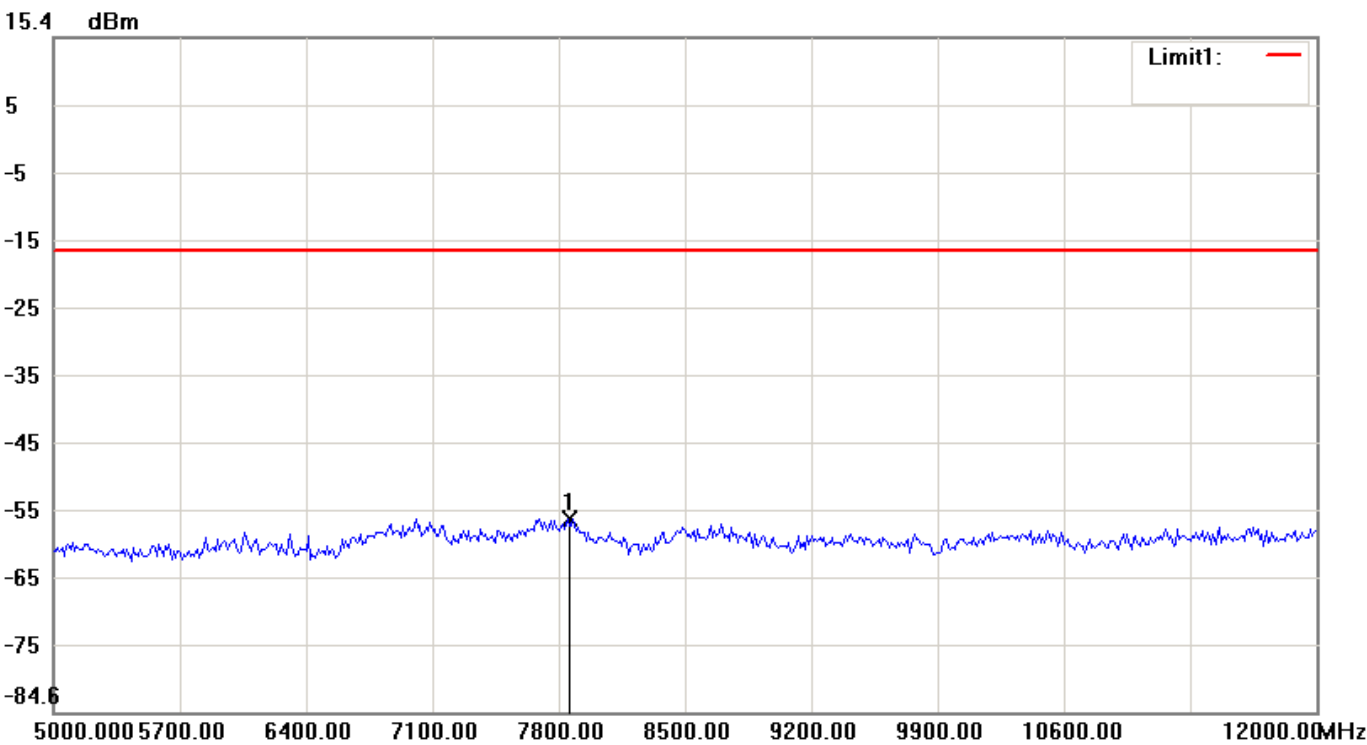
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 01-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2413.33320     | 3.84       |
| 2   | 2566.66670     | -49.29     |
| 3   | 4826.66670     | -54.04     |

File: FT0045B wifi b    Data:    #17    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:37:19    Humidity: 60 %



Condition: -16.16    Horizontal

EUT:    Sweep Time: 669ms    Att.: 20dB

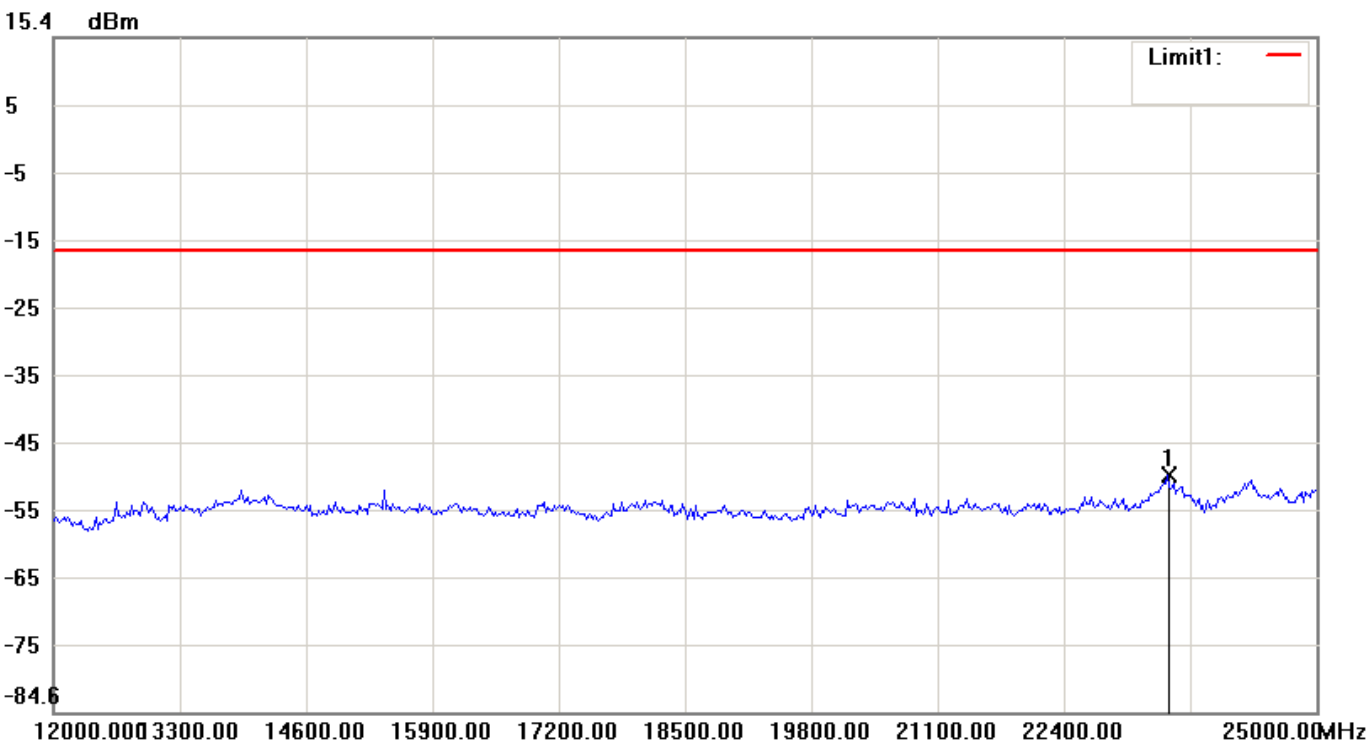
Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note:    FCC-802.11b Channel 01-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 7846.66670     | -55.94     |

File: FT0045B wifi b    Data: #18    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:46:17    Humidity: 60 %



Condition: -16.16    Horizontal

EUT:    Sweep Time: 1242.44ms    Att.: 20dB

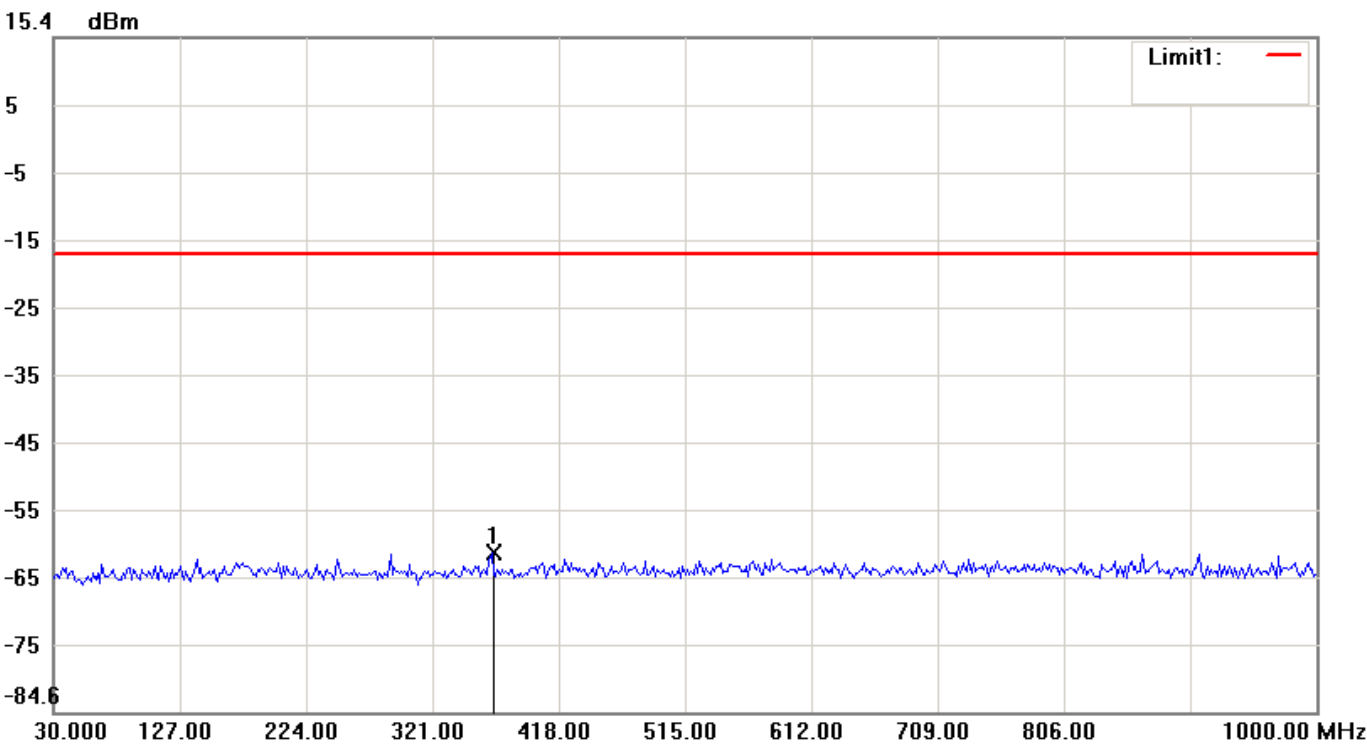
Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 01-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 23461.66670    | -49.38     |

File: FT0045B wifi b    Data: #19    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:52:31    Humidity: 60 %



Condition: -16.61    Horizontal

EUT:    Sweep Time: 92.72ms    Att.: 20dB

Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note:    FCC-802.11b Channel 06-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 366.2667       | -61.01     |

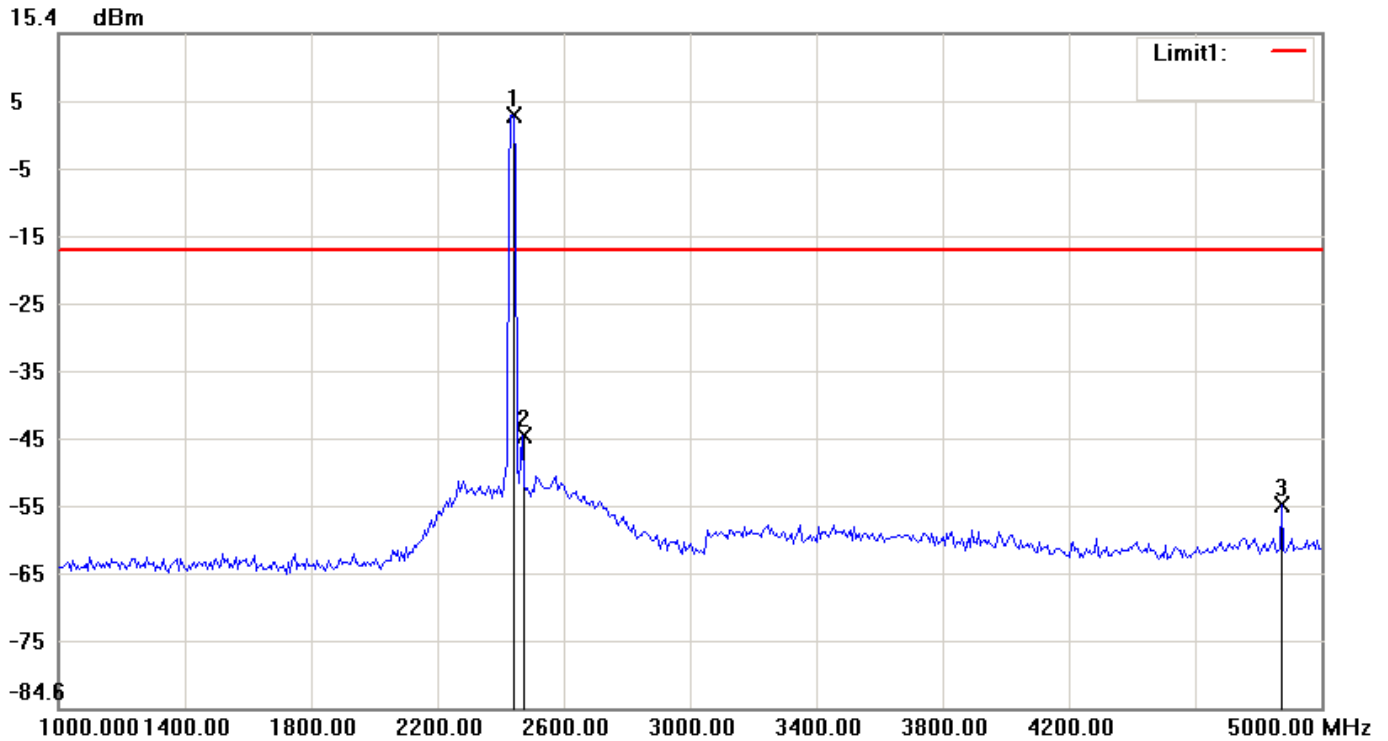
File: FT0045B wifi b Data: #20

Date: 2015/1/21

Temperature: 22 °C

Time: PM 03:53:29

Humidity: 60 %



Condition:

Horizontal

EUT:

Sweep Time: 382.28ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

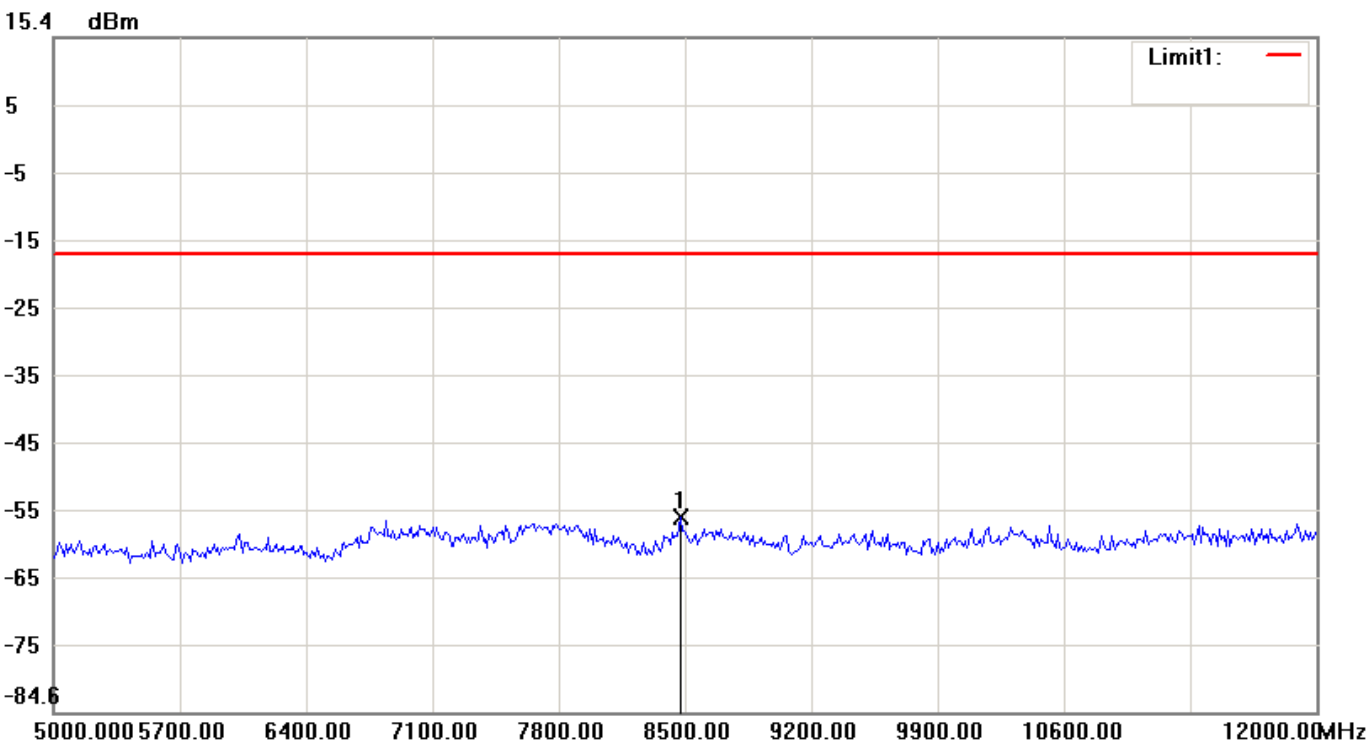
Test Mode:

Note: FCC-802.11b Channel 06-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2433.33330     | 3.38       |
| 2   | 2466.66670     | -44.30     |
| 3   | 4873.33330     | -54.54     |



File: FT0045B wifi b    Data: #21    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:54:18    Humidity: 60 %



Condition: -16.61    Horizontal

EUT:    Sweep Time: 669ms    Att.: 20dB

Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 06-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 8476.66660     | -55.64     |

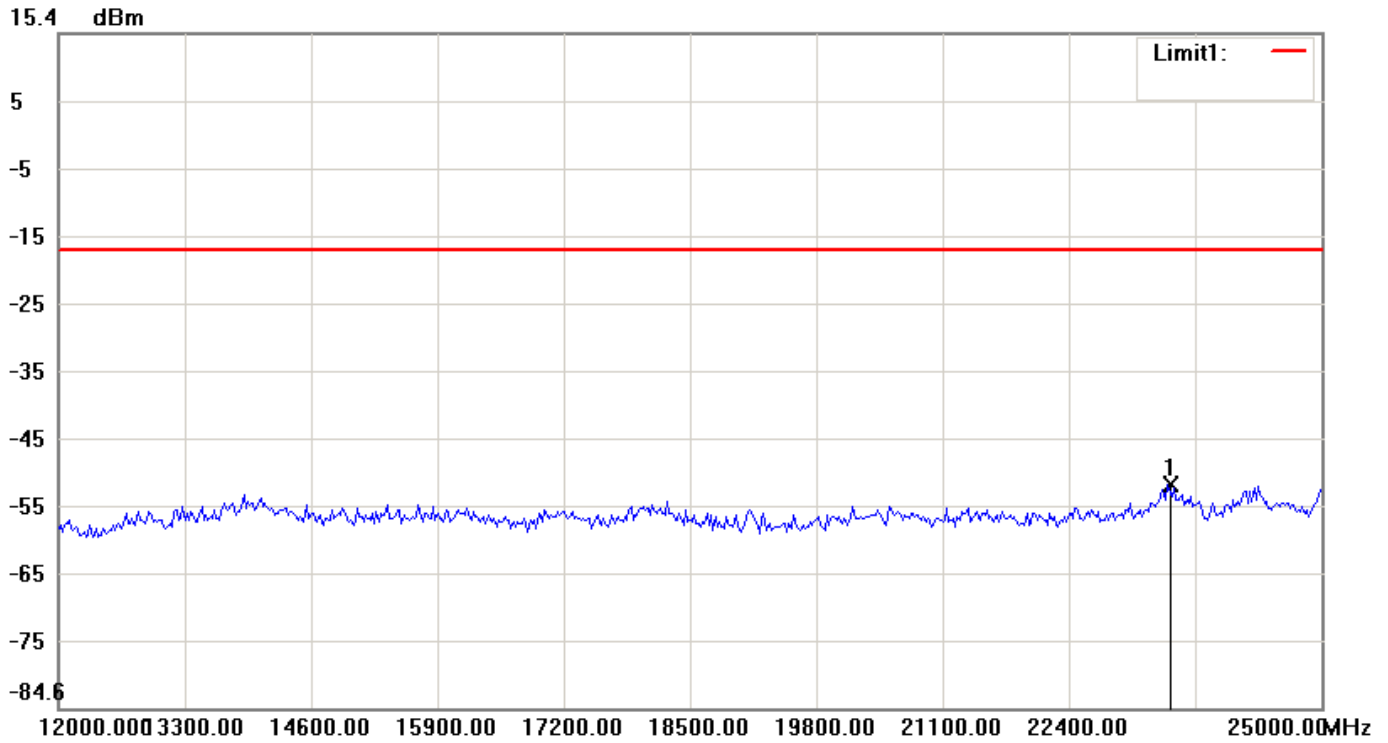
File: FT0045B wifi b Data: #22

Date: 2015/1/21

Temperature: 22 °C

Time: PM 03:55:07

Humidity: 60 %



Condition: -16.61

Horizontal

EUT:

Sweep Time: 1242.44ms Att.: 20dB

Model:

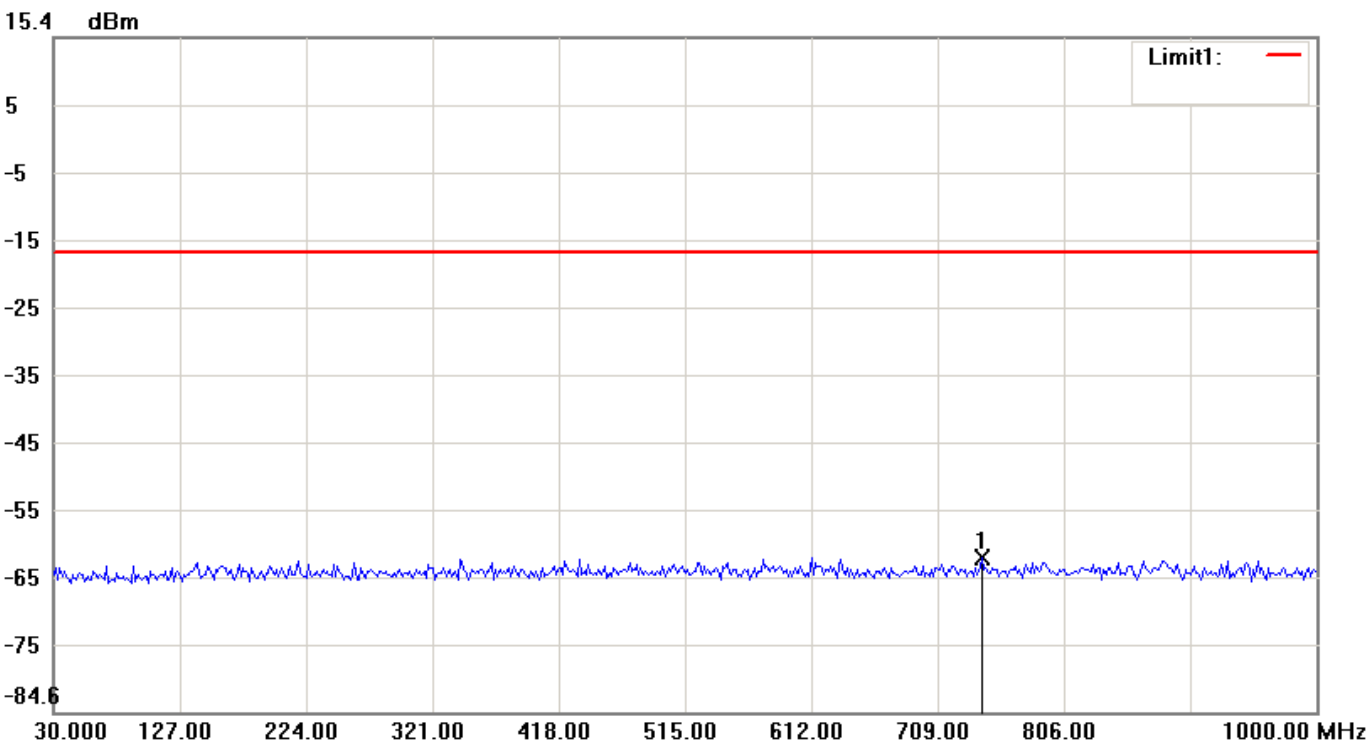
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 06-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 23418.33330    | -51.54     |

File: FT0045B wifi b    Data: #23    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:57:24    Humidity: 60 %



Condition: -16.59    Horizontal

EUT:    Sweep Time: 92.72ms    Att.: 20dB

Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note:    FCC-802.11b Channel 11-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 742.9500       | -61.70     |

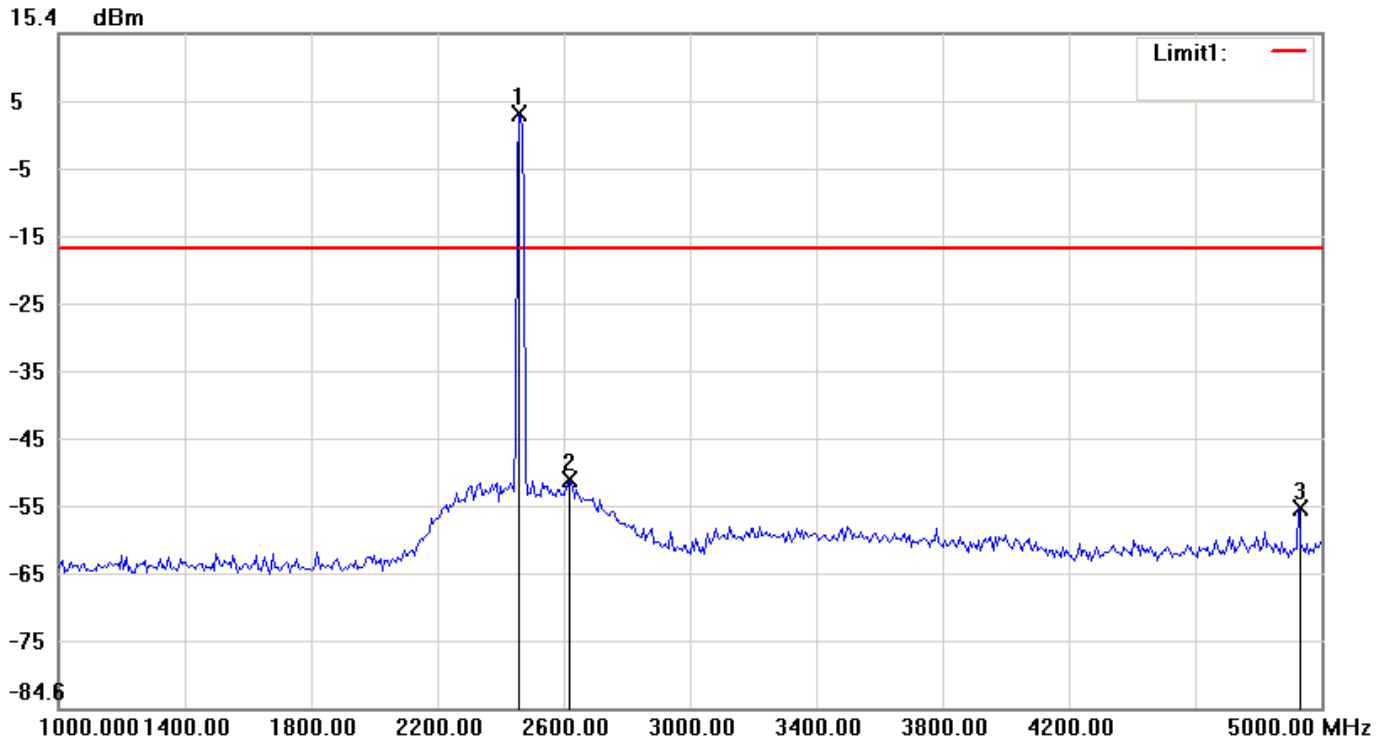
File: FT0045B wifi b Data: #24

Date: 2015/1/21

Temperature: 22 °C

Time: PM 03:58:06

Humidity: 60 %



Condition:

Horizontal

EUT:

Sweep Time: 382.28ms Att.: 20dB

Model:

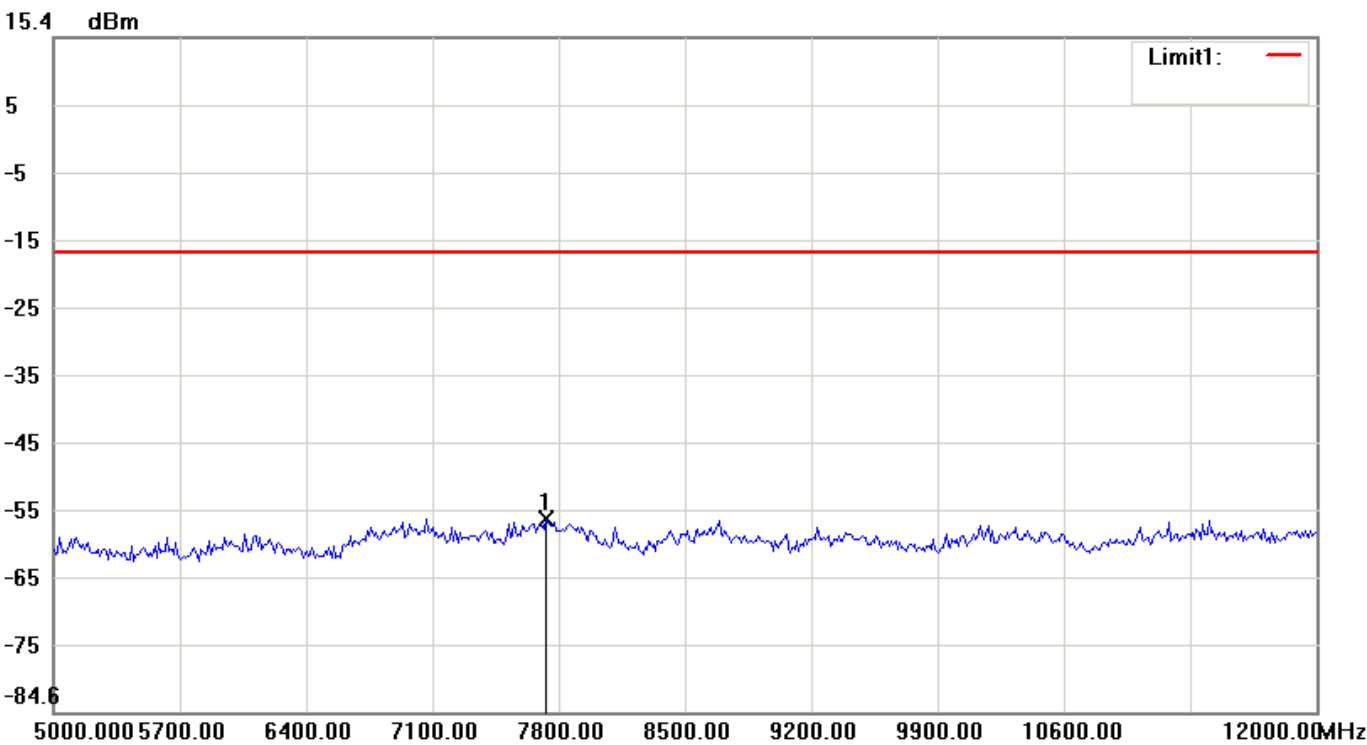
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11b Channel 11-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2460.00000     | 3.41       |
| 2   | 2620.00000     | -50.67     |
| 3   | 4926.66670     | -54.90     |

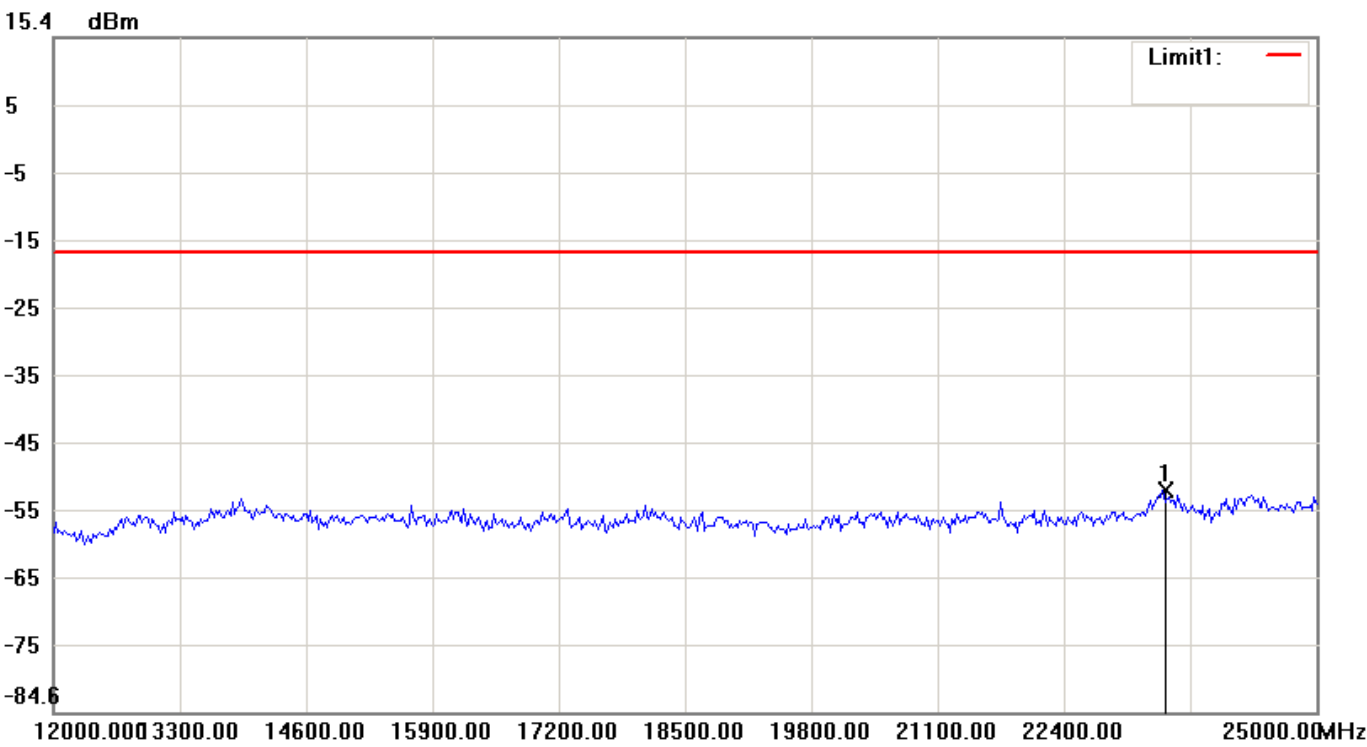
File: FT0045B wifi b    Data: #25    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:59:11    Humidity: 60 %



Condition: -16.59    Horizontal  
EUT: Sweep Time: 669ms    Att.: 20dB  
Model: RBW: 100 KHz    VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11b Channel 11-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 7730.00000     | -55.88     |

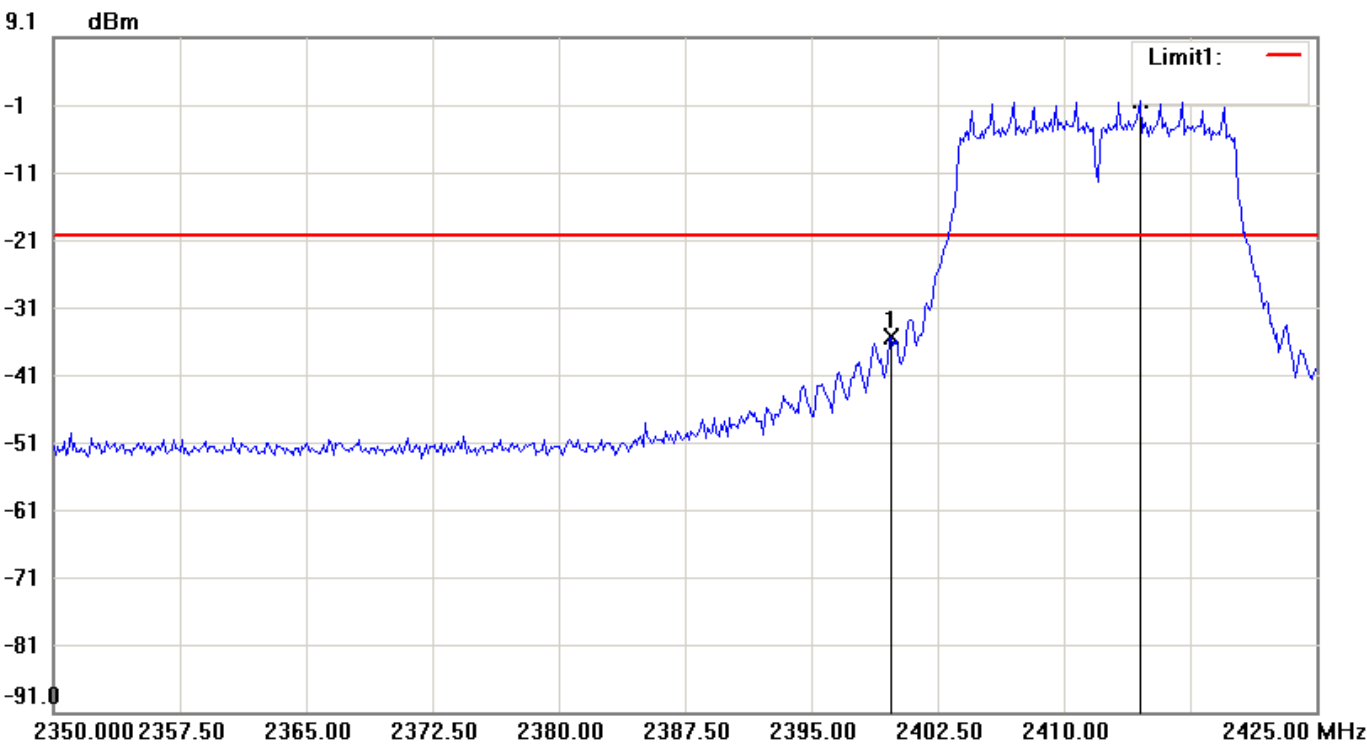
File: FT0045B wifi b    Data: #26    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 03:59:46    Humidity: 60 %



Condition: -16.59    Horizontal  
EUT: Sweep Time: 1242.44ms    Att.: 20dB  
Model: RBW: 100 KHz    VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11b Channel 11-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 23418.33330    | -51.80     |

File: FT0045B wifi g    Data: #5    Date: 2015/1/15    Temperature: 22 °C  
Time: PM 02:45:04    Humidity: 60 %



Condition: -20.33dBm    RF Conducted  
EUT: Sweep Time: 500ms Att.: 10dB  
Model: RBW: 100 KHz VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11g Channel 01-Bandedge

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2399.75000     | -35.27     |
| 2   | 2414.50000     | -0.33      |

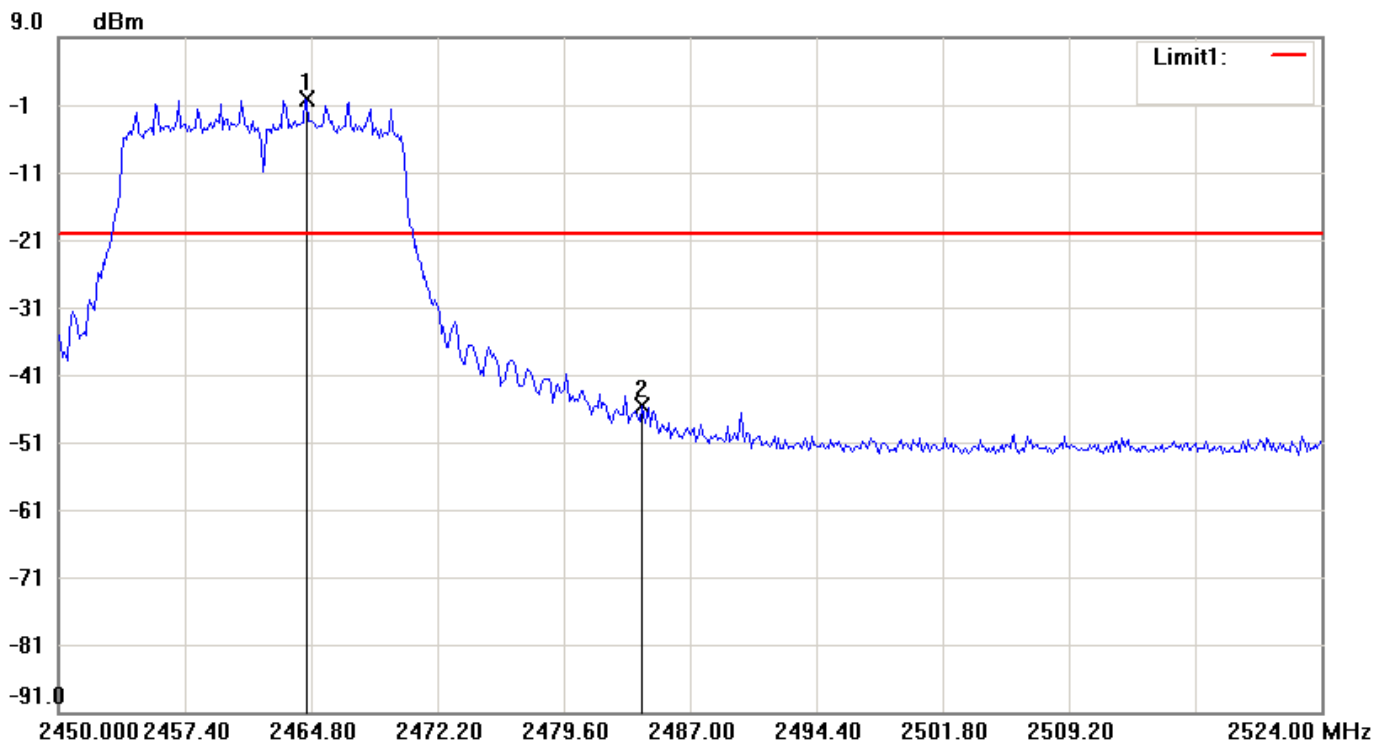
File: FT0045B wifi g Data: #14

Date: 2015/1/15

Temperature: 22 °C

Time: PM 03:00:45

Humidity: 60 %



Condition: -20.2dBm

RF Conducted

EUT:

Sweep Time: 500ms Att.: 10dB

Model:

RBW: 100 KHz VBW: 300 KHz

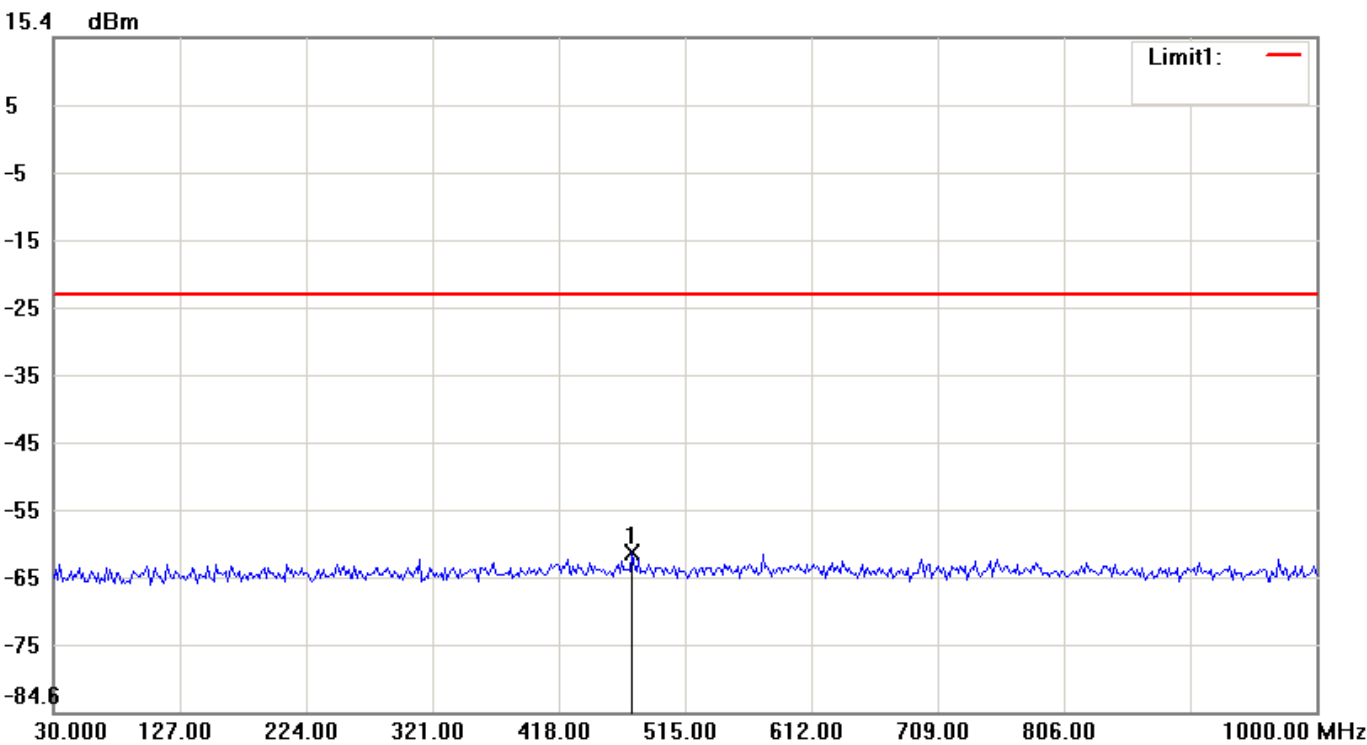
Test Mode:

Note: FCC-802.11g Channel 11-Bandedge

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2464.43000     | -0.20      |
| 2   | 2484.16330     | -45.65     |



File: FT0045B wifi g    Data: #15    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 04:11:11    Humidity: 60 %



Condition: -22.75    Horizontal  
EUT: Sweep Time: 92.72ms    Att.: 20dB  
Model: RBW: 100 KHz    VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11g Channel 01-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 474.5833       | -60.95     |

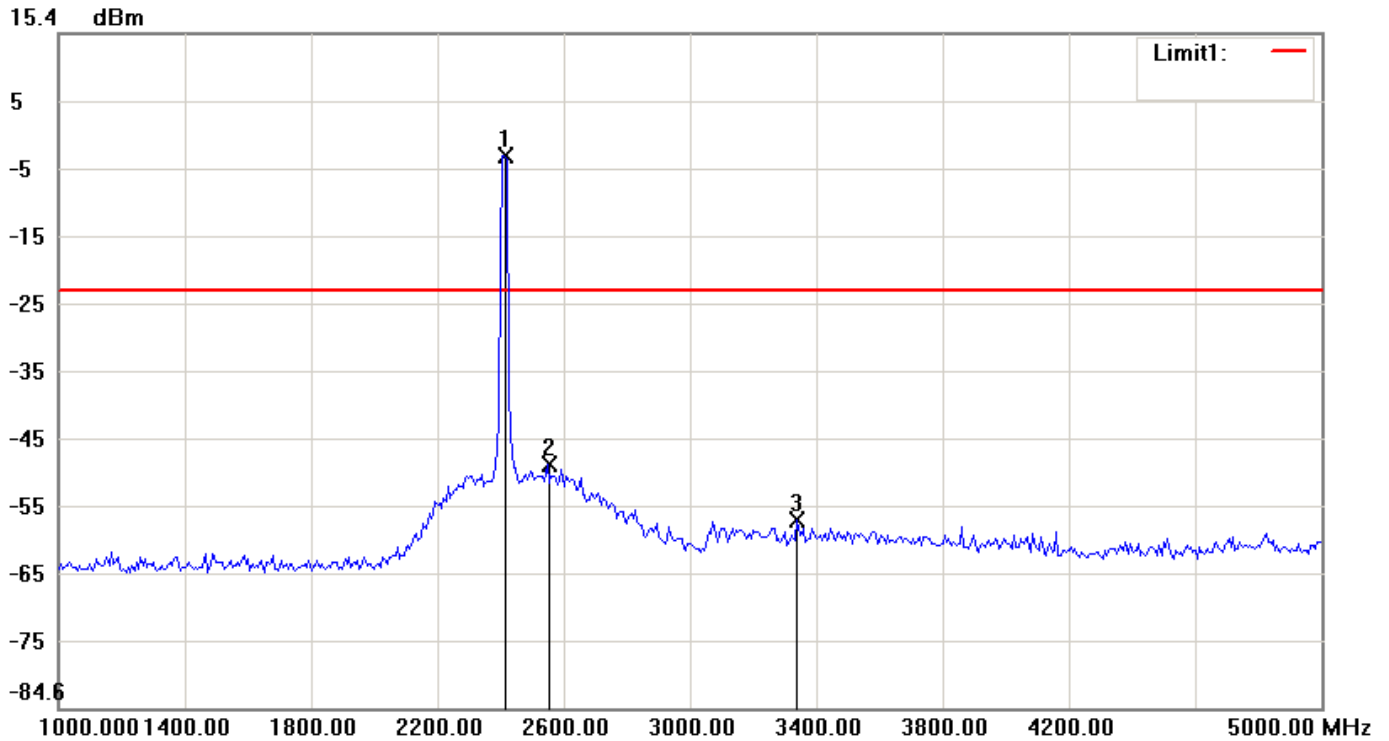
File: FT0045B wifi g Data: #16

Date: 2015/1/21

Temperature: 22 °C

Time: PM 04:11:46

Humidity: 60 %



Condition:

Horizontal

EUT:

Sweep Time: 382.28ms Att.: 20dB

Model:

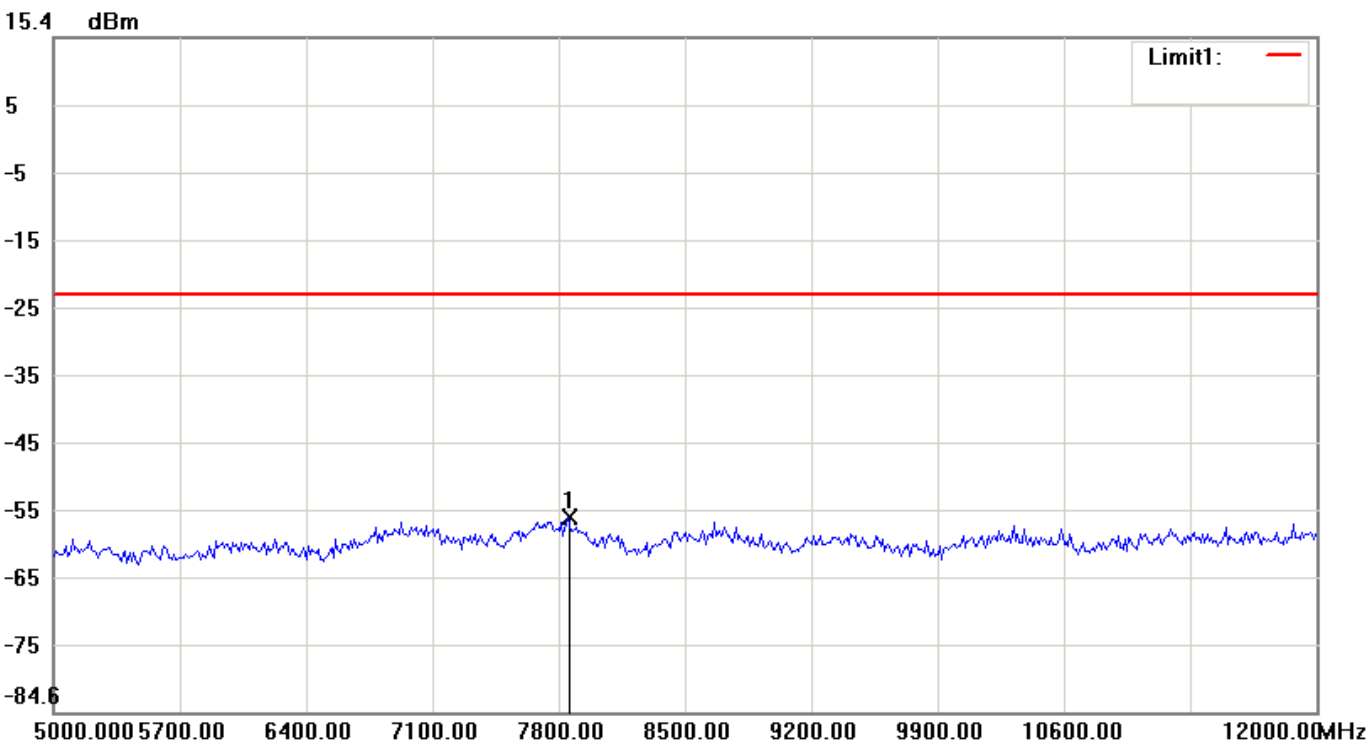
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 01-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2406.66670     | -2.75      |
| 2   | 2546.66670     | -48.45     |
| 3   | 3340.00000     | -56.83     |

File: FT0045B wifi g    Data:    #17    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 04:12:23    Humidity: 60 %



Condition: -22.75    Horizontal  
EUT: Sweep Time: 669ms Att.: 20dB  
Model: RBW: 100 KHz VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11g Channel 01-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 7846.66670     | -55.72     |

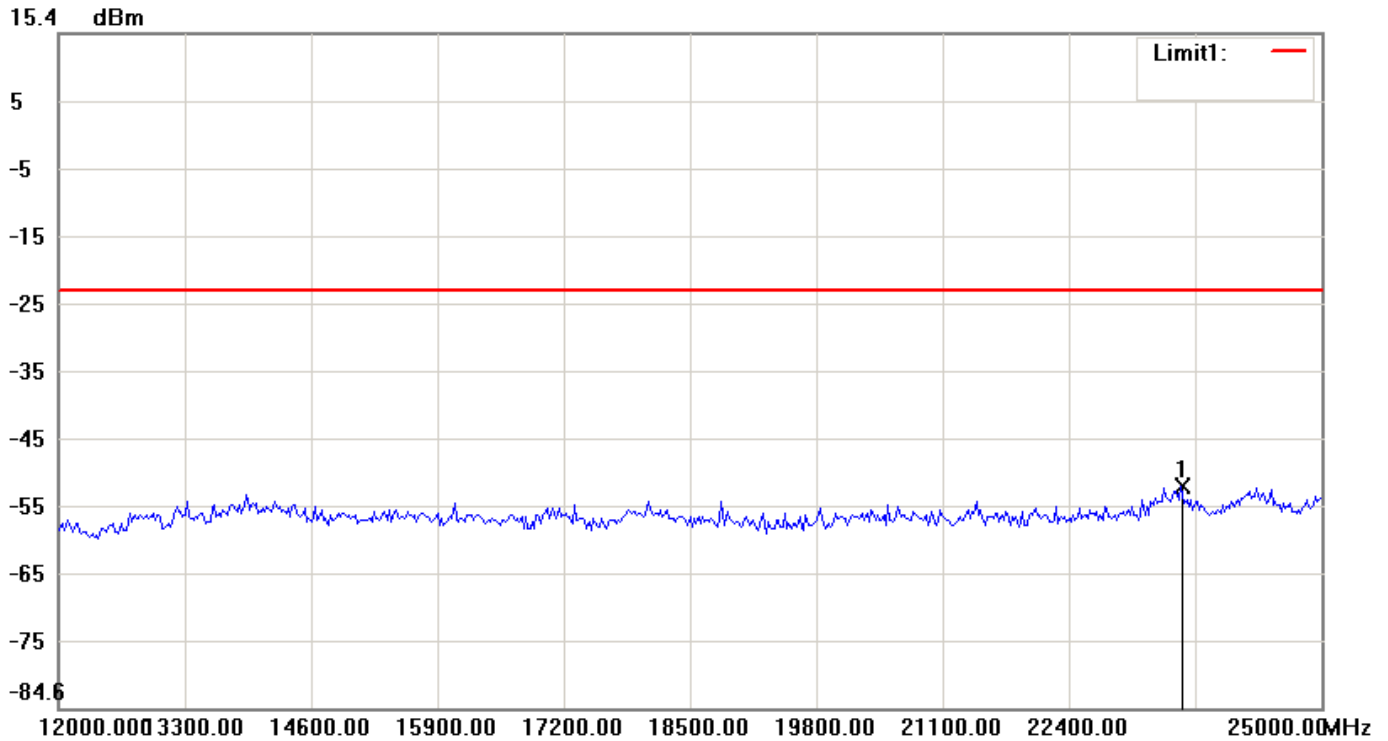
File: FT0045B wifi g Data: #18

Date: 2015/1/21

Temperature: 22 °C

Time: PM 04:12:47

Humidity: 60 %



Condition: -22.75

Horizontal

EUT:

Sweep Time: 1242.44ms Att.: 20dB

Model:

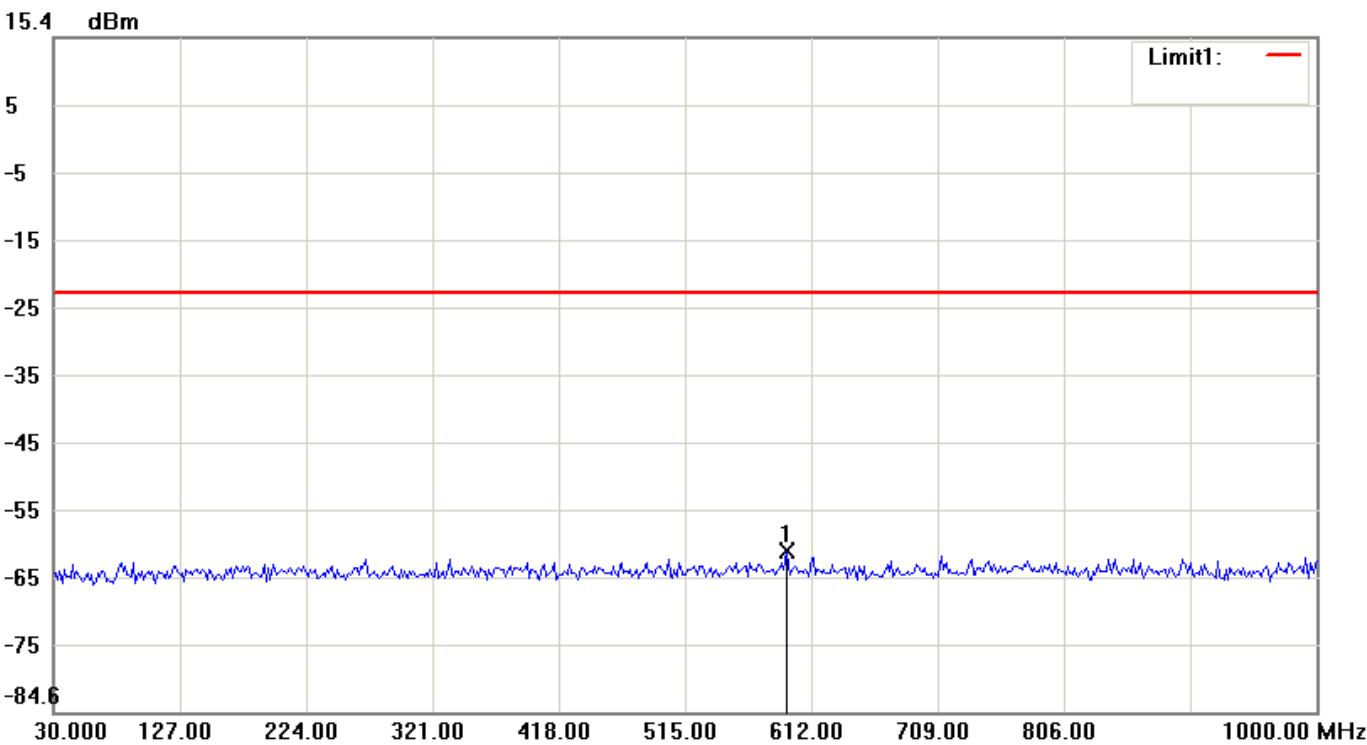
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 01-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 23548.33330    | -51.74     |

File: FT0045B wifi g    Data: #19    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 04:14:36    Humidity: 60 %



Condition: -22.42    Horizontal

EUT:    Sweep Time: 92.72ms    Att.: 20dB

Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note:    FCC-802.11g Channel 06-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 592.6000       | -60.70     |

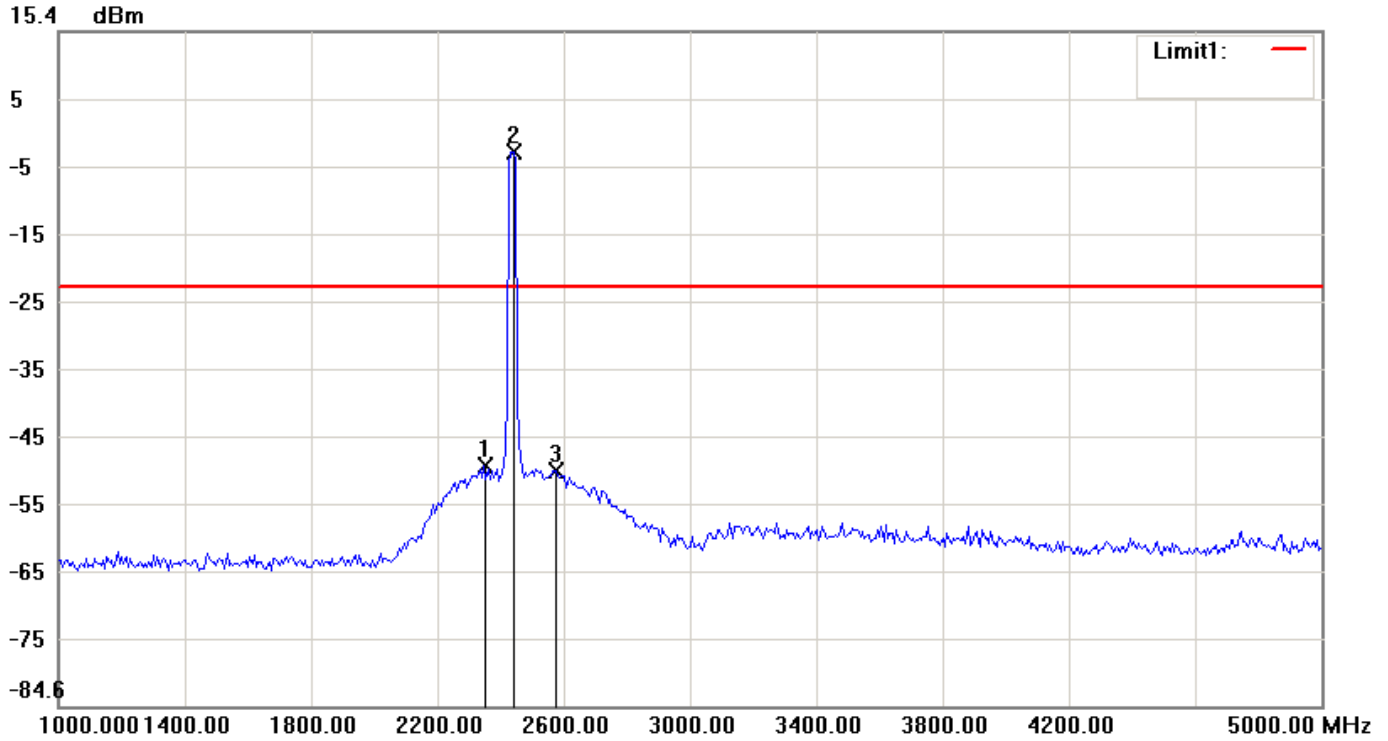
File: FT0045B wifi g Data: #20

Date: 2015/1/21

Temperature: 22 °C

Time: PM 04:15:11

Humidity: 60 %



Condition:

Horizontal

EUT:

Sweep Time: 382.28ms Att.: 20dB

Model:

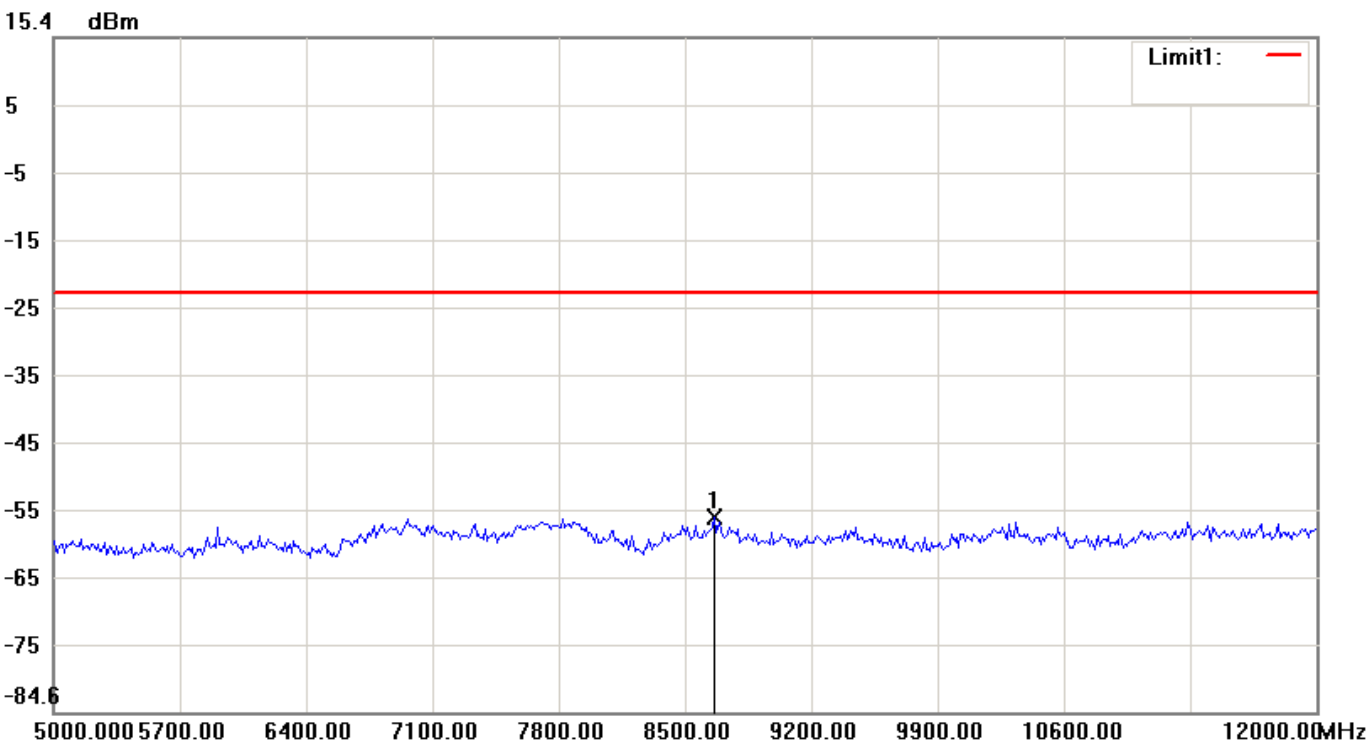
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 06-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2346.66670     | -48.96     |
| 2   | 2440.00000     | -2.42      |
| 3   | 2573.33320     | -49.68     |

File: FT0045B wifi g    Data: #21    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 04:16:23    Humidity: 60 %



Condition: -22.42    Horizontal

EUT:    Sweep Time: 669ms    Att.: 20dB

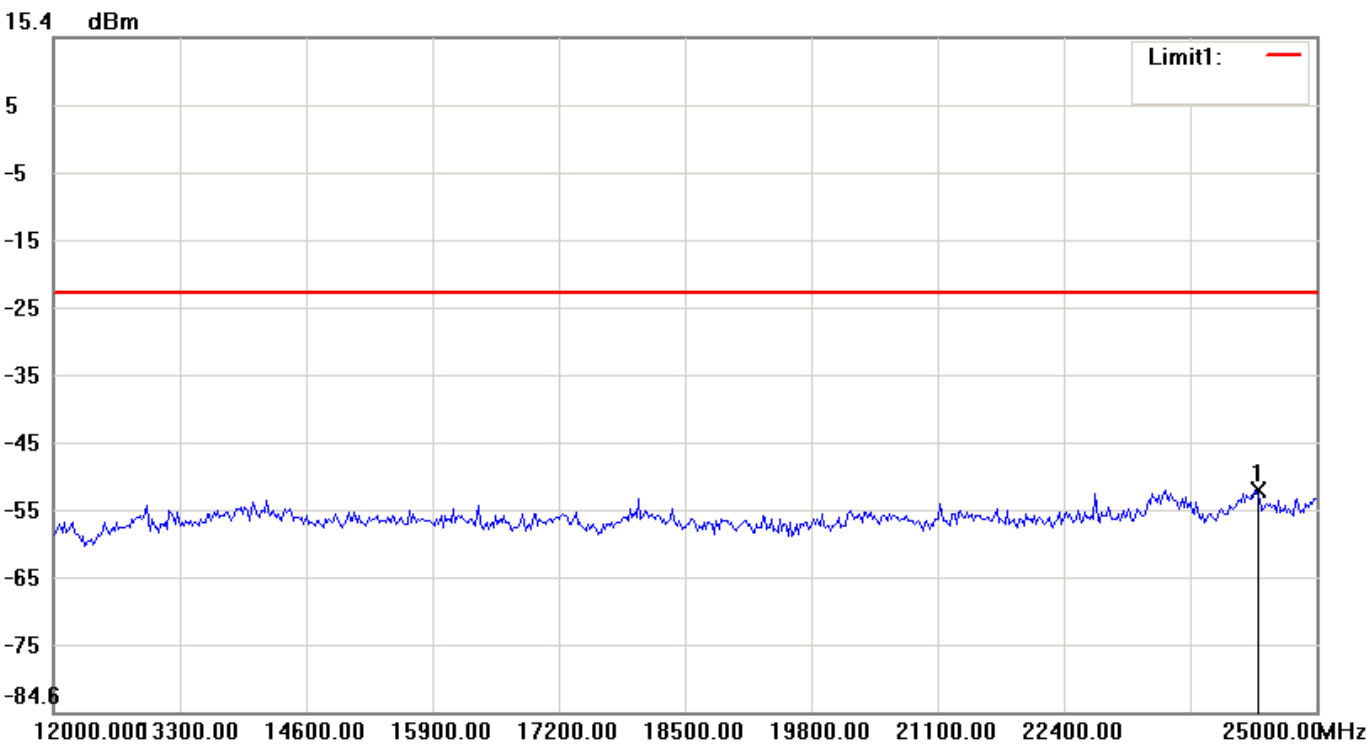
Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 06-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 8663.33330     | -55.73     |

File: FT0045B wifi g    Data: #22    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 04:16:59    Humidity: 60 %

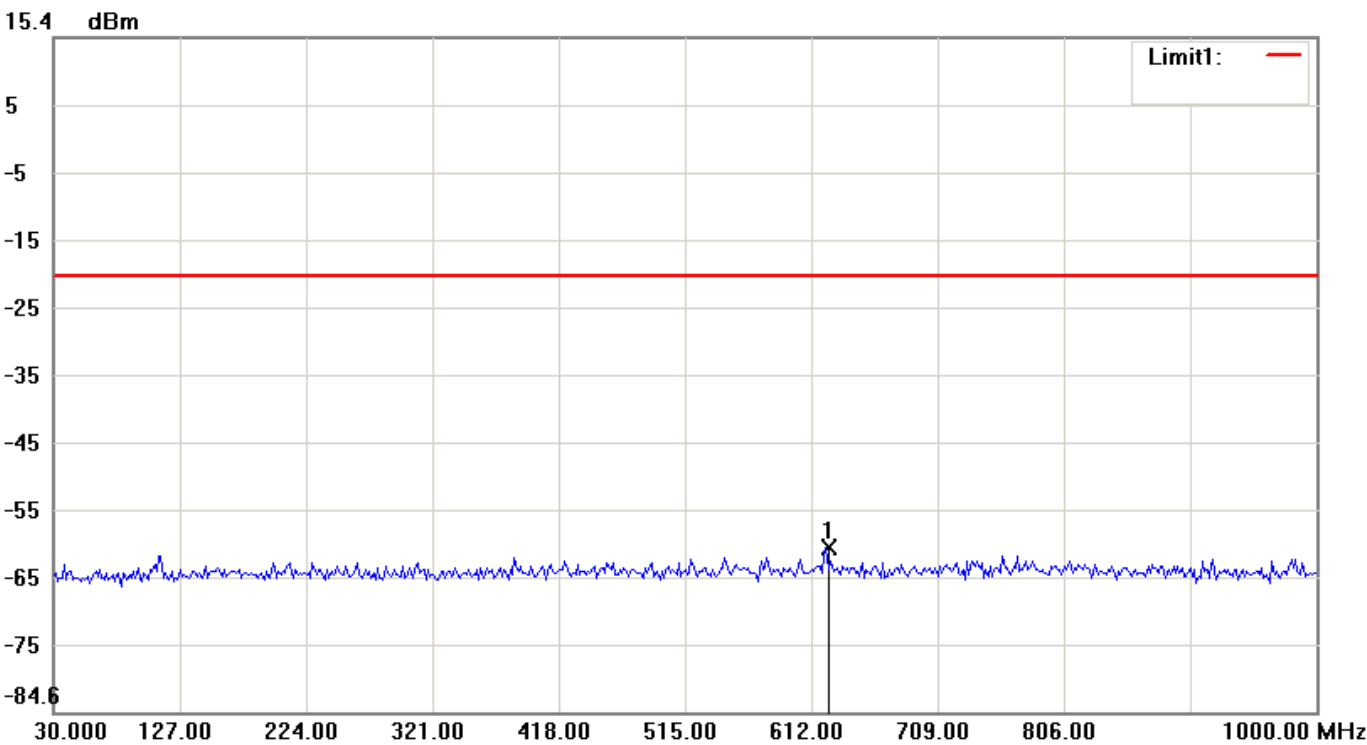


Condition: -22.42    Horizontal  
EUT:    Sweep Time: 1242.44ms    Att.: 20dB  
Model:    RBW: 100 KHz    VBW: 300 KHz  
Test Mode:  
Note:    FCC-802.11g Channel 06-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 24371.66670    | -51.74     |



File: FT0045B wifi g    Data: #23    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 04:18:17    Humidity: 60 %



Condition: -19.92    Horizontal

EUT:    Sweep Time: 92.72ms    Att.: 20dB

Model:    RBW: 100 KHz    VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 11-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 623.3167       | -60.12     |

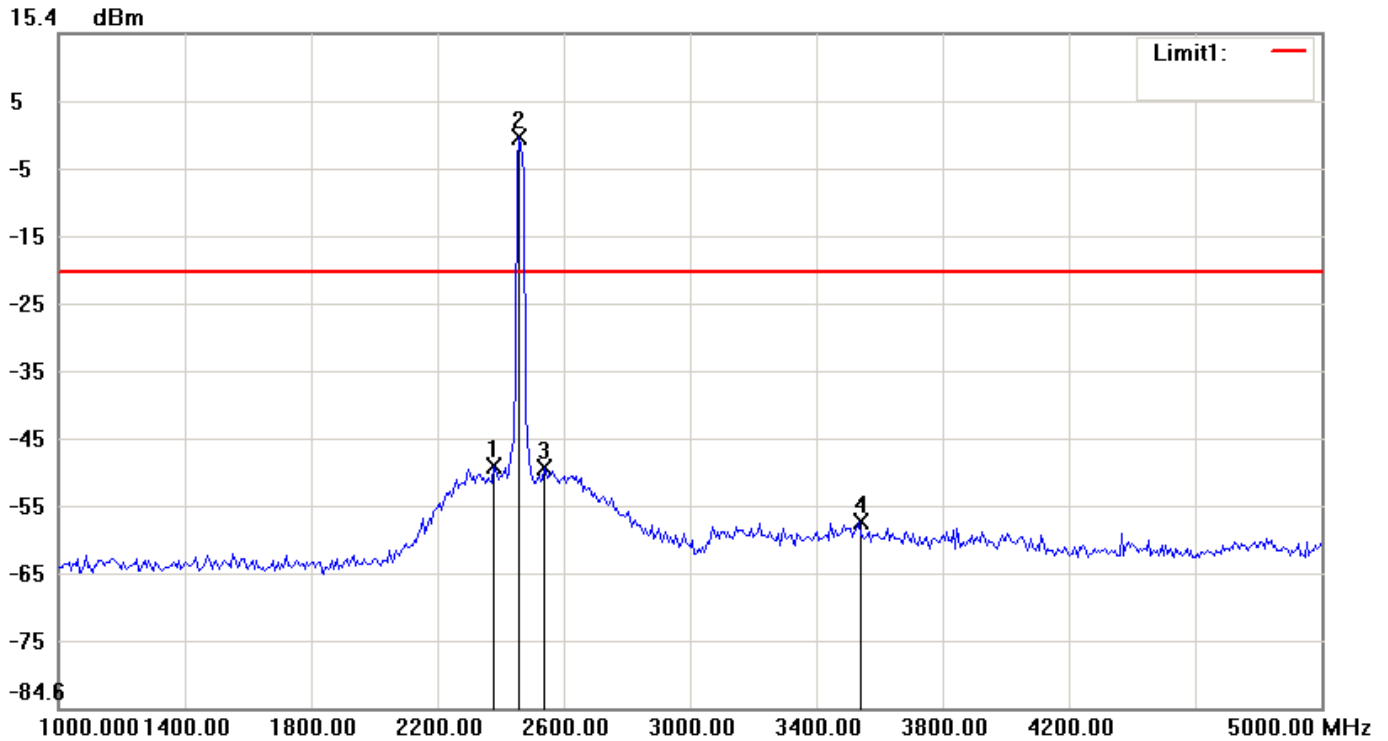
File: FT0045B wifi g Data: #24

Date: 2015/1/21

Temperature: 22 °C

Time: PM 04:18:50

Humidity: 60 %



Condition:

Horizontal

EUT:

Sweep Time: 382.28ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 11-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2380.00000     | -48.80     |
| 2   | 2460.00000     | 0.08       |
| 3   | 2540.00000     | -49.04     |
| 4   | 3533.33330     | -57.03     |

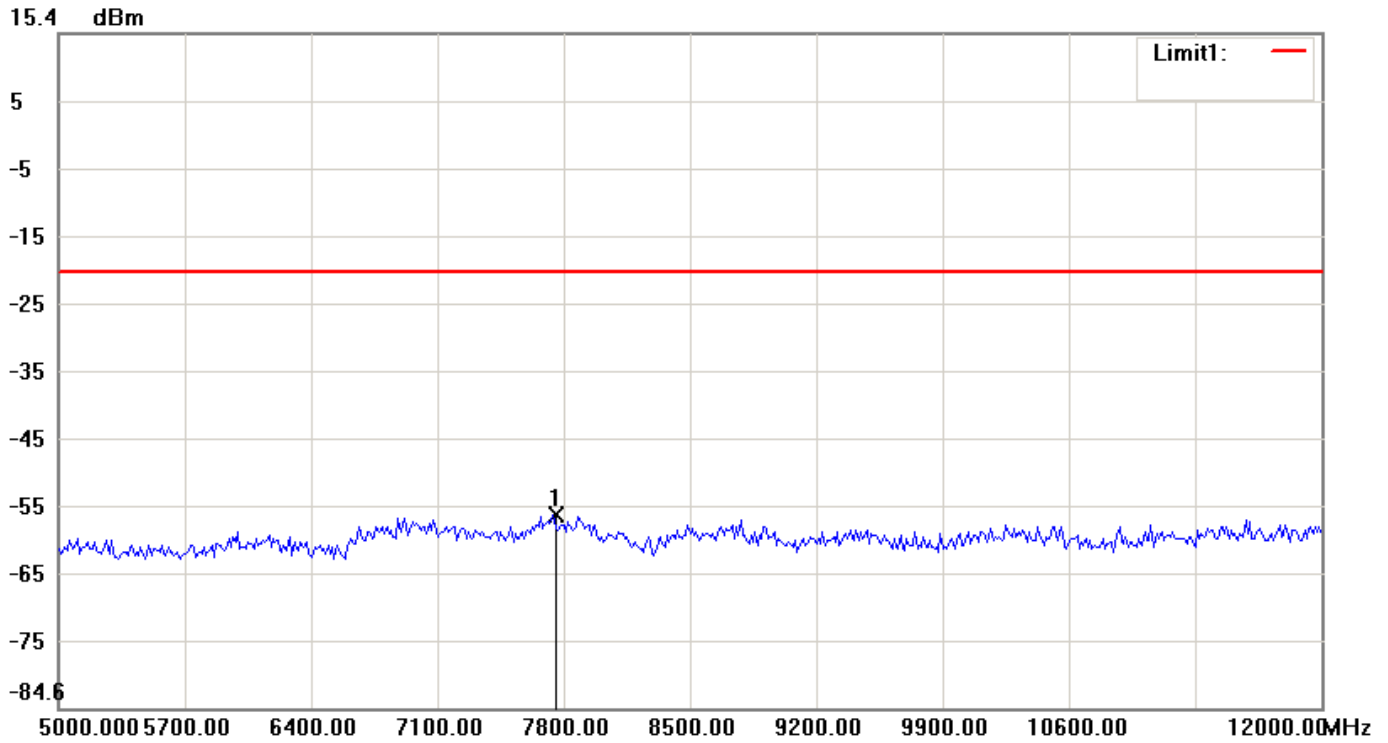
File: FT0045B wifi g Data: #25

Date: 2015/1/21

Temperature: 22 °C

Time: PM 04:20:00

Humidity: 60 %



Condition: -19.92

Horizontal

EUT:

Sweep Time: 669ms Att.: 20dB

Model:

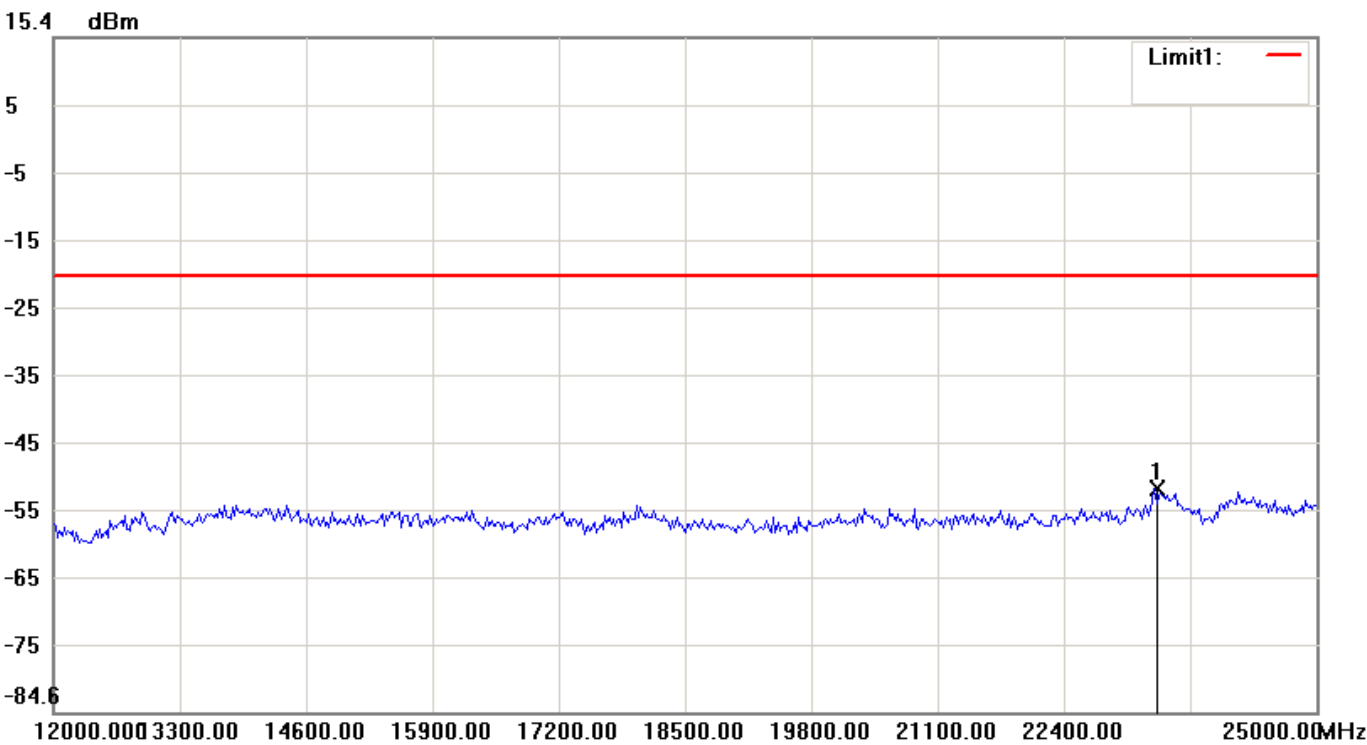
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11g Channel 11-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 7741.66670     | -56.01     |

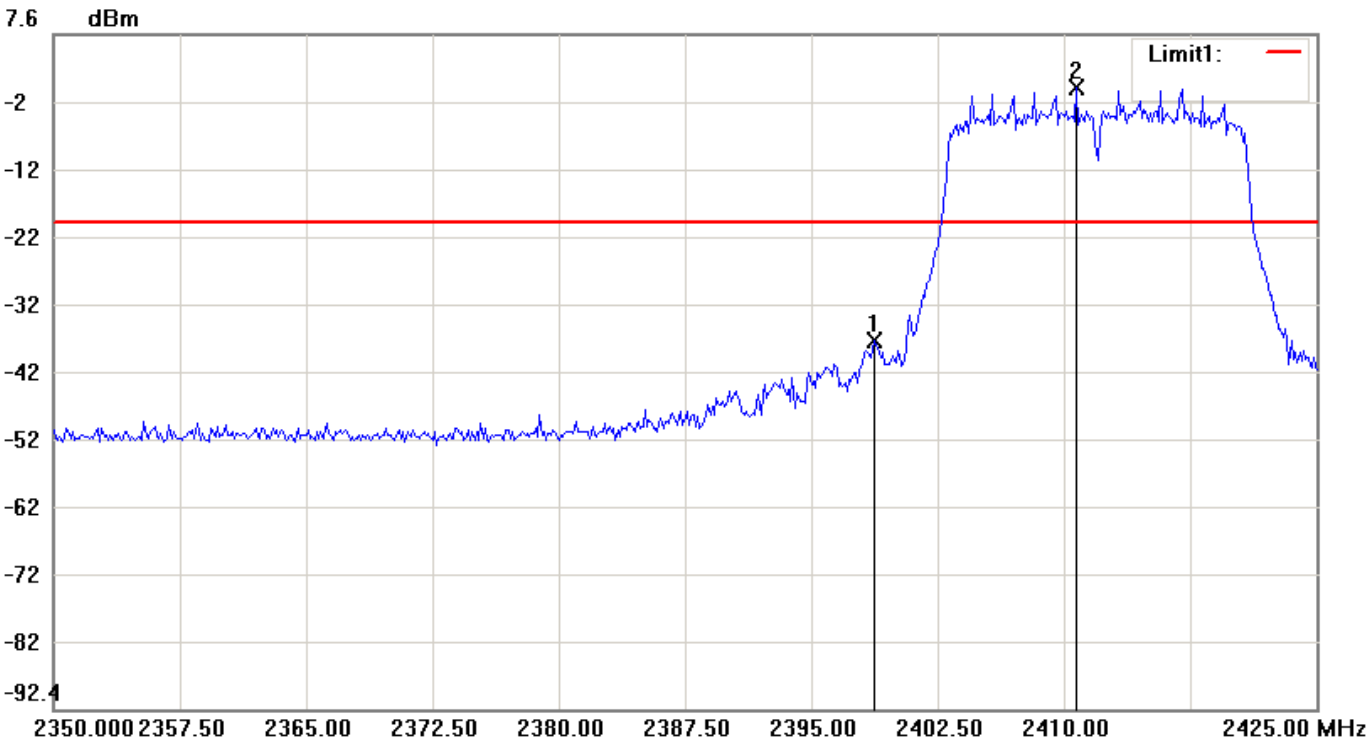
File: FT0045B wifi g    Data: #26    Date: 2015/1/21    Temperature: 22 °C  
Time: PM 04:20:27    Humidity: 60 %



Condition: -19.92    Horizontal  
EUT: Sweep Time: 1242.44ms    Att.: 20dB  
Model: RBW: 100 KHz    VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11g Channel 11-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 23331.66670    | -51.59     |

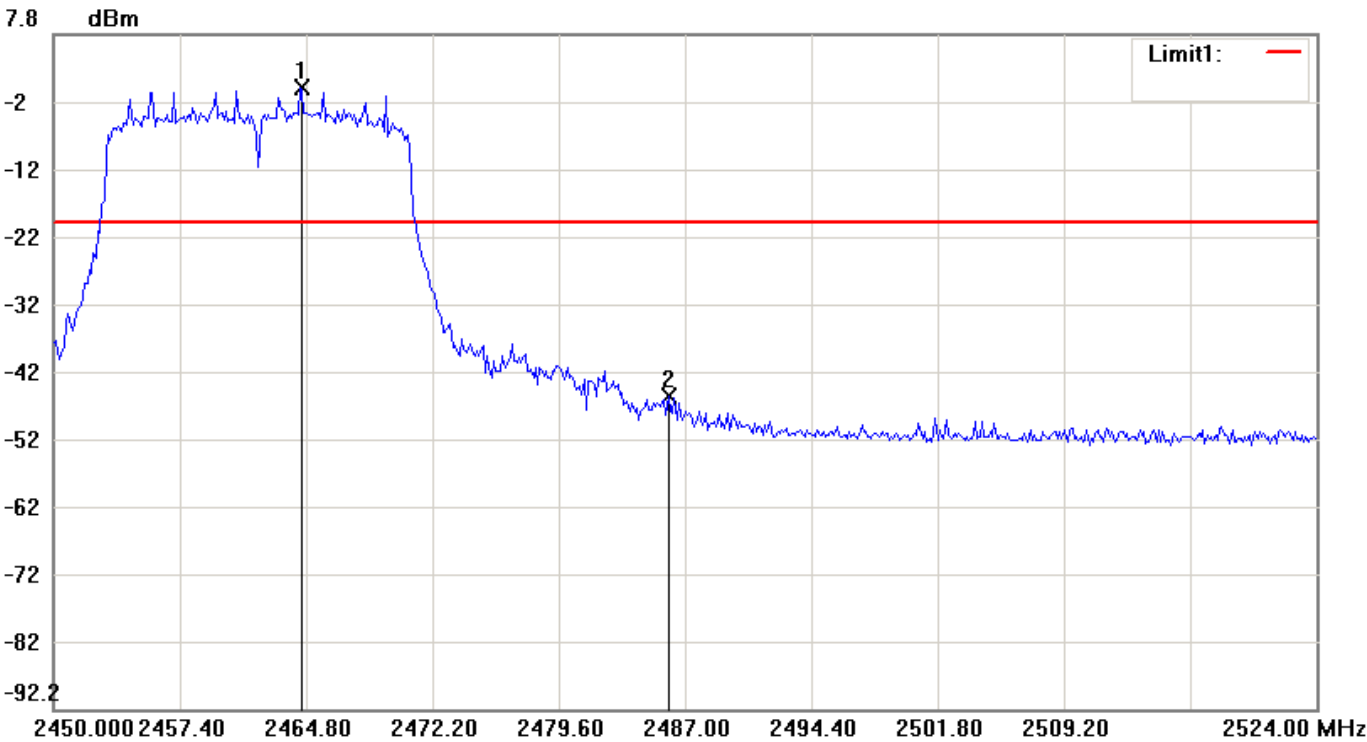
File: FT0045B wifi      Data: #5      Date: 2015/1/15      Temperature: 22 °C  
20n  
Time: PM 03:09:26      Humidity: 60 %



Condition: -20.41dBm      RF Conducted  
EUT: Sweep Time: 500ms Att.: 10dB  
Model: RBW: 100 KHz VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 01-Bandedge

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2398.75000     | -37.77     |
| 2   | 2410.75000     | -0.41      |

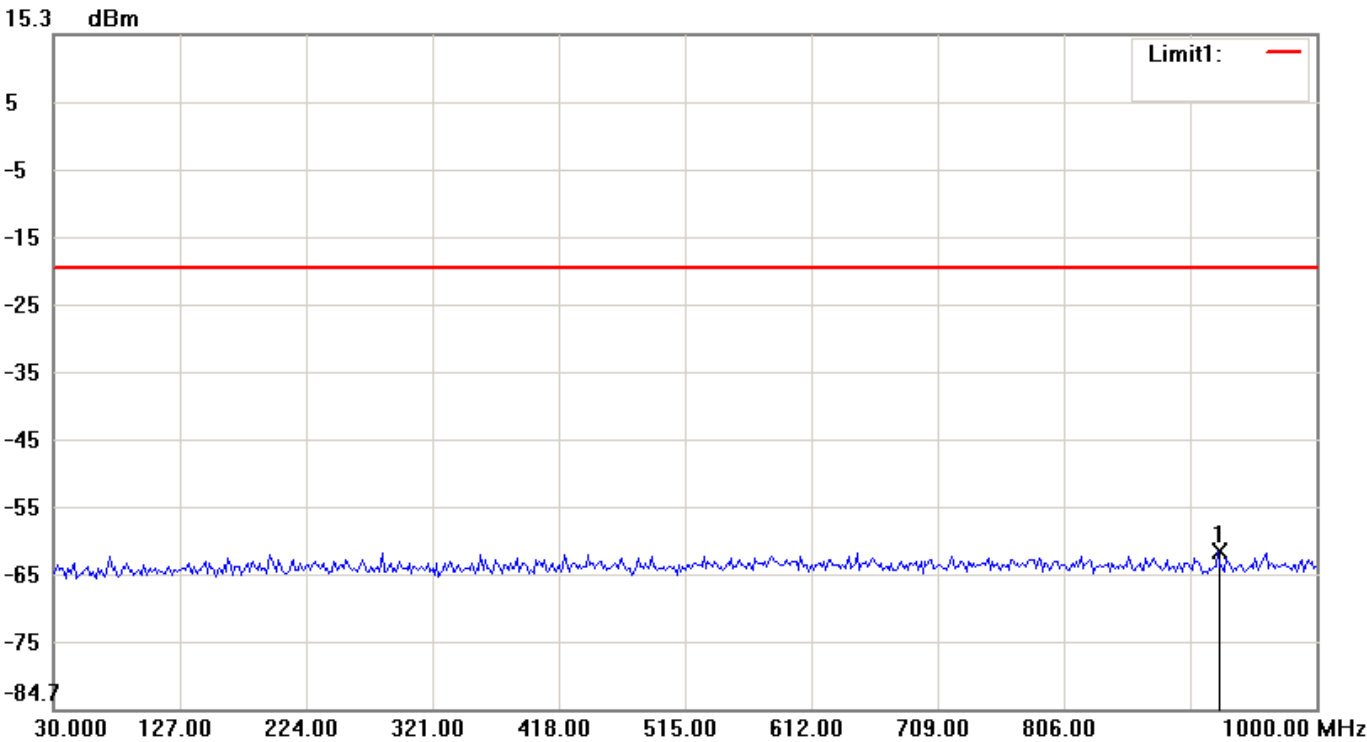
File: FT0045B wifi      Data: #14      Date: 2015/1/15      Temperature: 22 °C  
20n  
Time: PM 03:25:01      Humidity: 60 %



Condition: -20.19dBm      RF Conducted  
EUT: Sweep Time: 500ms    Att.: 10dB  
Model: RBW: 100 KHz      VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 11-Bandedge

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2464.43000     | -0.19      |
| 2   | 2486.01330     | -45.76     |

File: FT0045B wifi      Data: #15      Date: 2015/1/21      Temperature: 22 °C  
20n  
Time: PM 04:27:32      Humidity: 60 %



Condition: -19.39      Horizontal

EUT:      Sweep Time: 92.72ms      Att.: 20dB

Model:      RBW: 100 KHz      VBW: 300 KHz

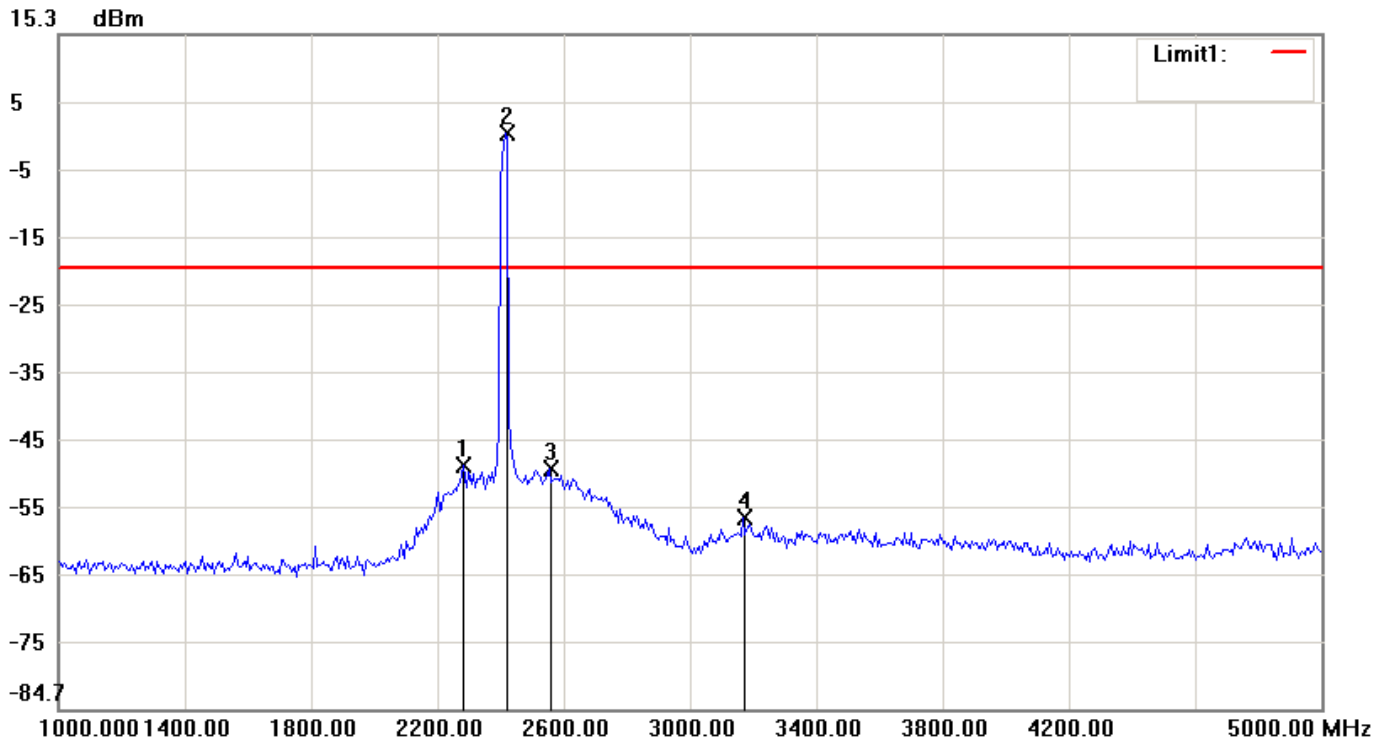
Test Mode:

Note:      FCC-802.11gn\_HT20 Channel 01-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 924.0167       | -61.28     |

File: FT0045B wifi      Data: #16      Date: 2015/1/21      Temperature: 22 °C  
20n

Time: PM 04:28:04      Humidity: 60 %



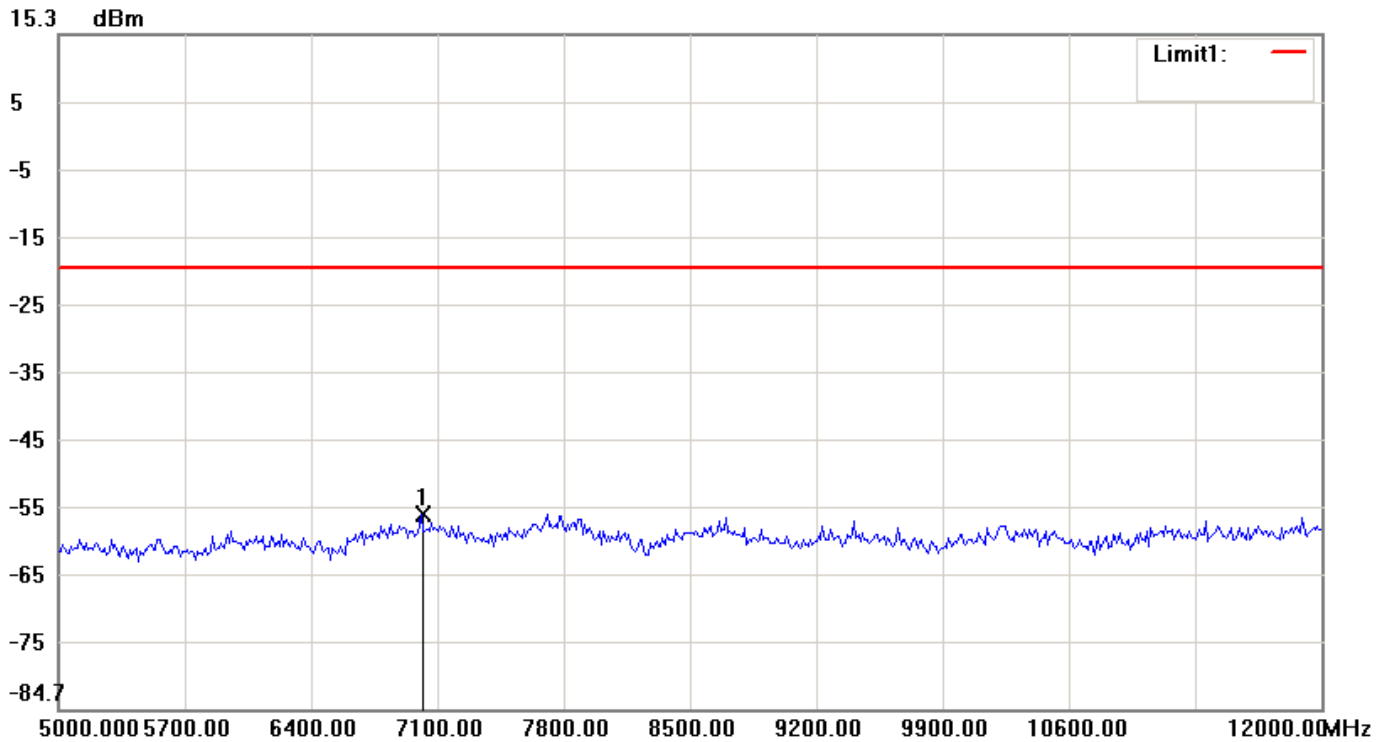
Condition: Horizontal  
EUT: Sweep Time: 382.28ms Att.: 20dB  
Model: RBW: 100 KHz VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 01-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2280.00000     | -48.58     |
| 2   | 2413.33330     | 0.61       |
| 3   | 2553.33330     | -48.97     |
| 4   | 3166.66670     | -56.24     |



File: FT0045B wifi      Data: #17      Date: 2015/1/21      Temperature: 22 °C  
20n

Time: PM 04:28:52      Humidity: 60 %



Condition: -19.39

Horizontal

EUT:

Sweep Time: 669ms Att.: 20dB

Model:

RBW: 100 KHz

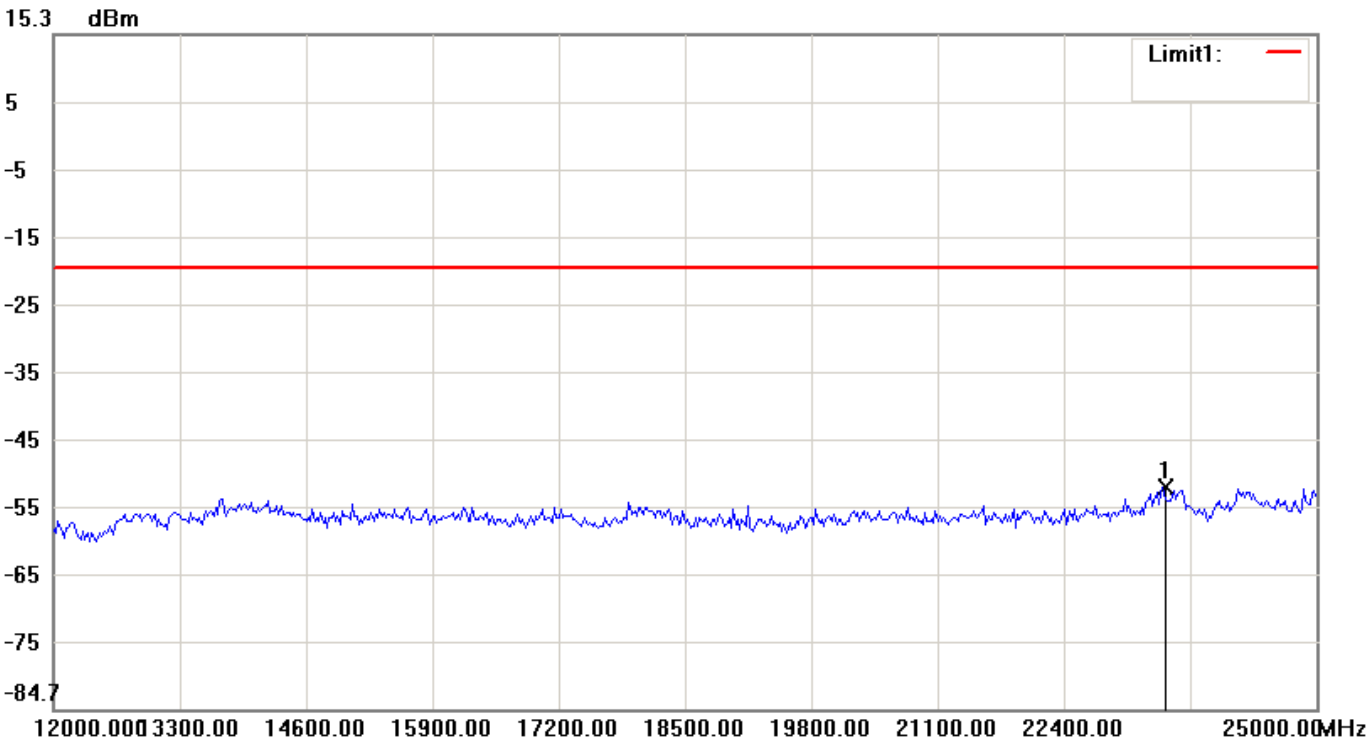
VBW: 300 KHz

Test Mode:

Note: FCC-802.11gn\_HT20 Channel 01-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 7006.66670     | -55.77     |

File: FT0045B wifi      Data: #18      Date: 2015/1/21      Temperature: 22 °C  
20n  
Time: PM 04:29:21      Humidity: 60 %

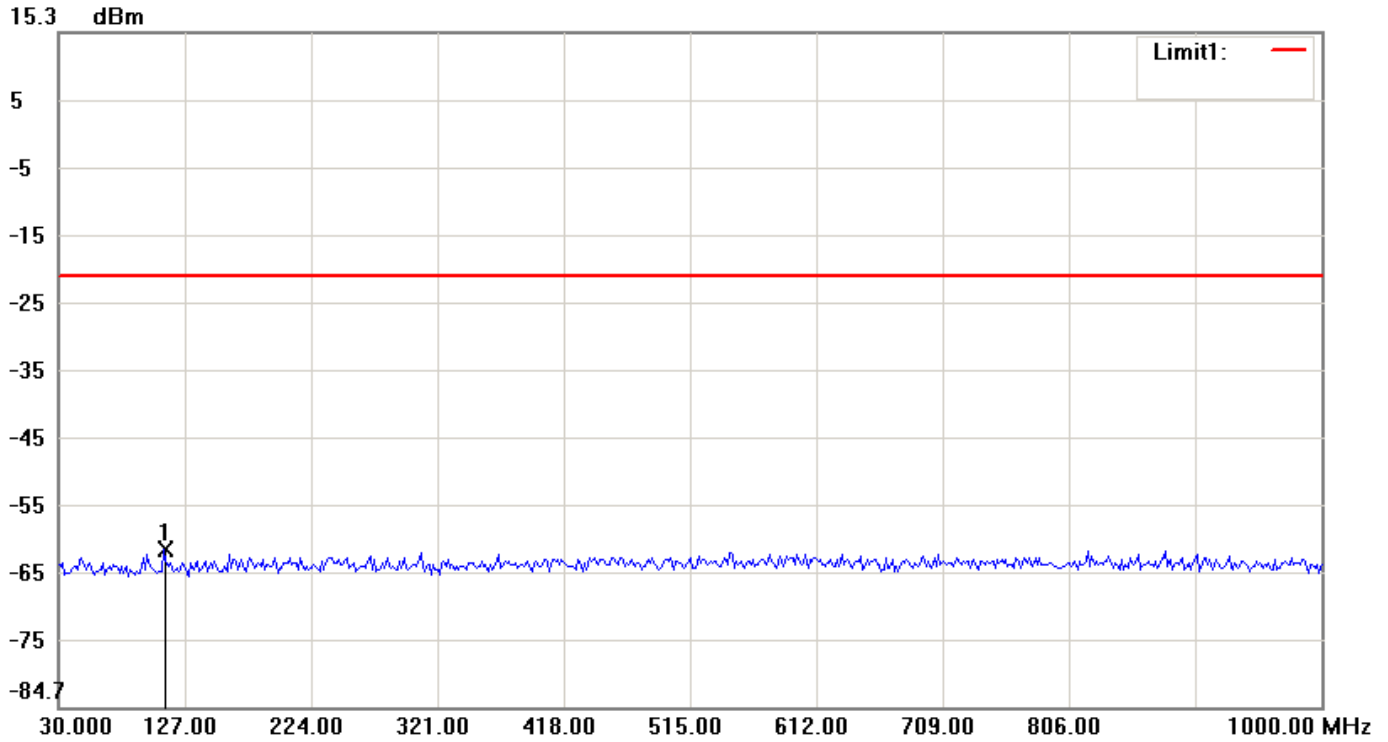


Condition: -19.39      Horizontal  
EUT:      Sweep Time: 1242.44ms      Att.: 20dB  
Model:      RBW: 100 KHz      VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 01-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 23418.33330    | -51.80     |

File: FT0045B wifi      Data: #19      Date: 2015/1/21      Temperature: 22 °C  
20n

Time: PM 04:31:13      Humidity: 60 %



Condition: -20.71

Horizontal

EUT:

Sweep Time: 92.72ms Att.: 20dB

Model:

RBW: 100 KHz VBW: 300 KHz

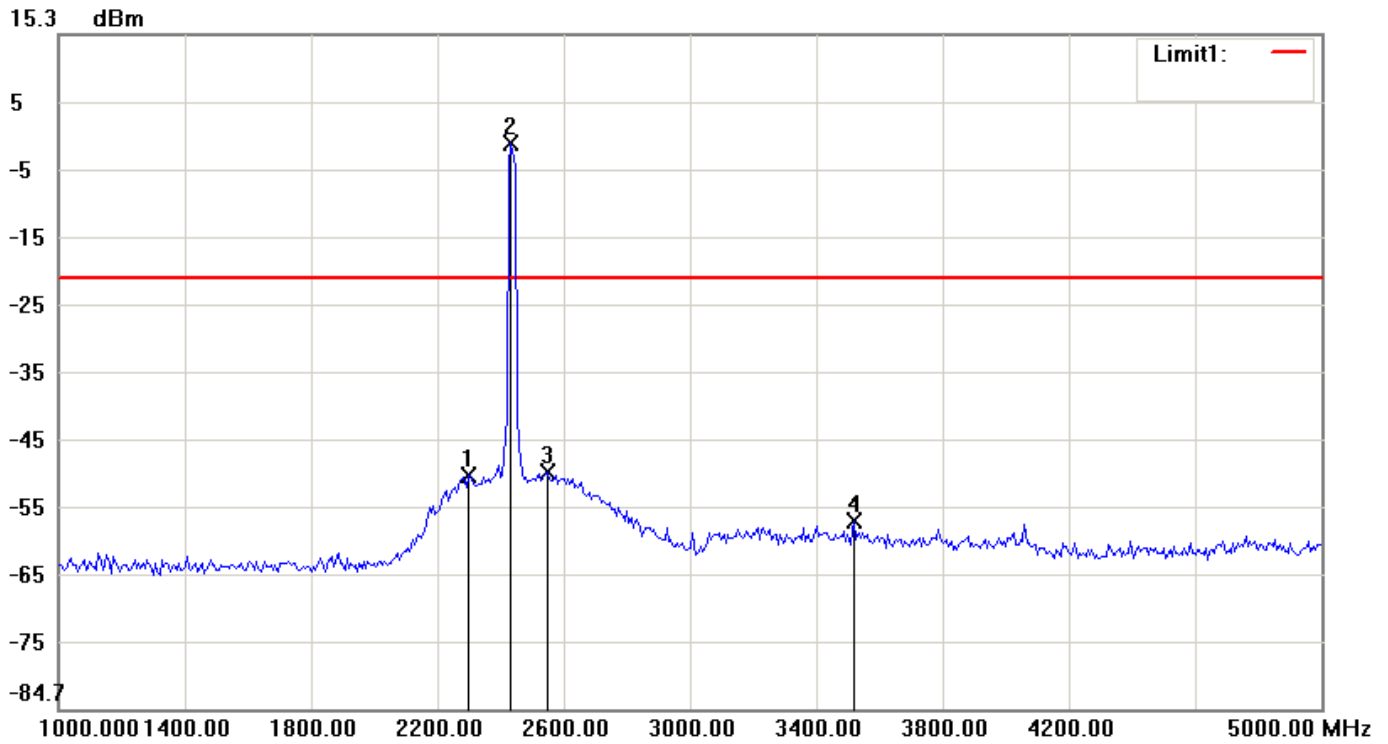
Test Mode:

Note: FCC-802.11gn\_HT20 Channel 06-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 110.8333       | -61.42     |

File: FT0045B wifi      Data: #20      Date: 2015/1/21      Temperature: 22 °C  
20n

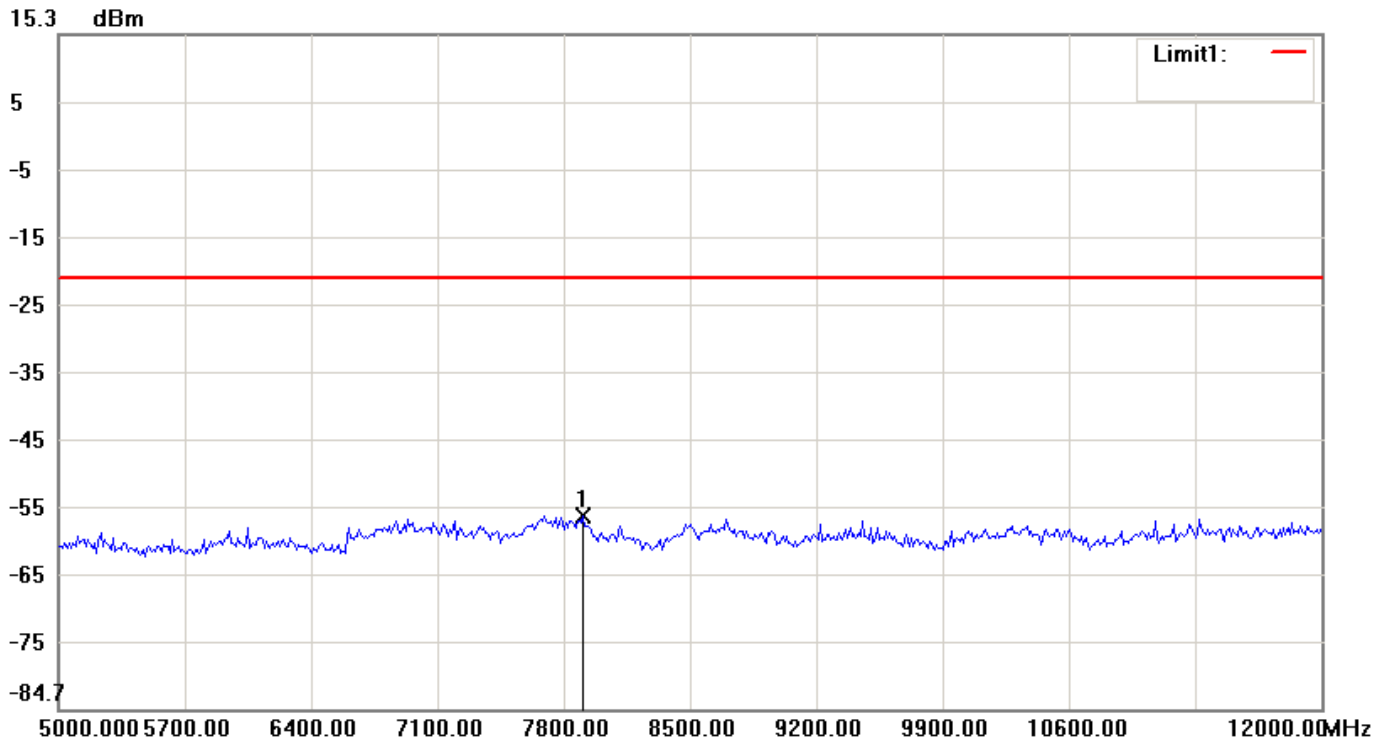
Time: PM 04:34:03      Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 382.28ms Att.: 20dB  
Model: RBW: 100 KHz VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 06-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2300.00000     | -50.08     |
| 2   | 2433.33320     | -0.71      |
| 3   | 2546.66660     | -49.56     |
| 4   | 3520.00000     | -56.88     |

File: FT0045B wifi      Data: #21      Date: 2015/1/21      Temperature: 22 °C  
20n  
Time: PM 04:35:42      Humidity: 60 %

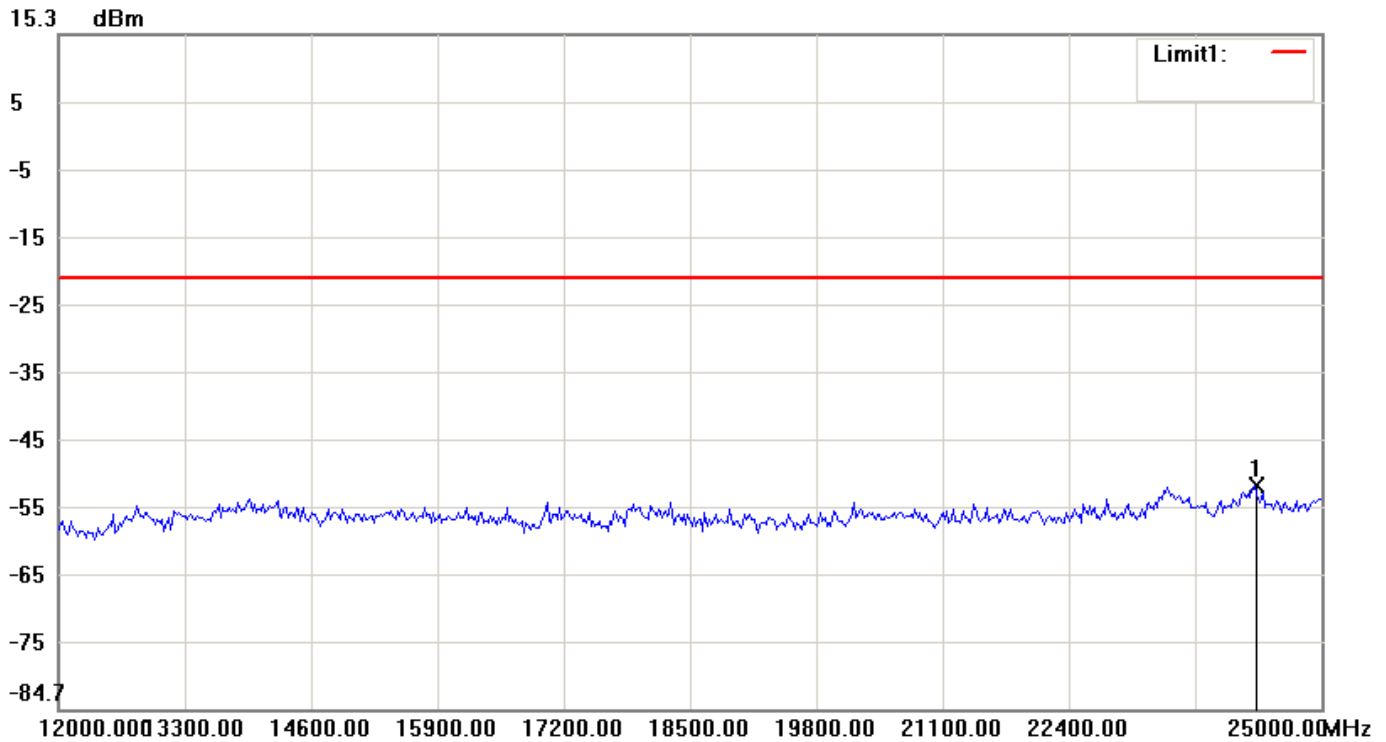


Condition: -20.71      Horizontal  
EUT:      Sweep Time: 669ms      Att.: 20dB  
Model:      RBW: 100 KHz      VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 06-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 7905.00000     | -56.04     |

File: FT0045B wifi      Data: #22      Date: 2015/1/21      Temperature: 22 °C  
20n

Time: PM 04:36:18      Humidity: 60 %



Condition: -20.71

Horizontal

EUT:

Sweep Time: 1242.44ms Att.: 20dB

Model:

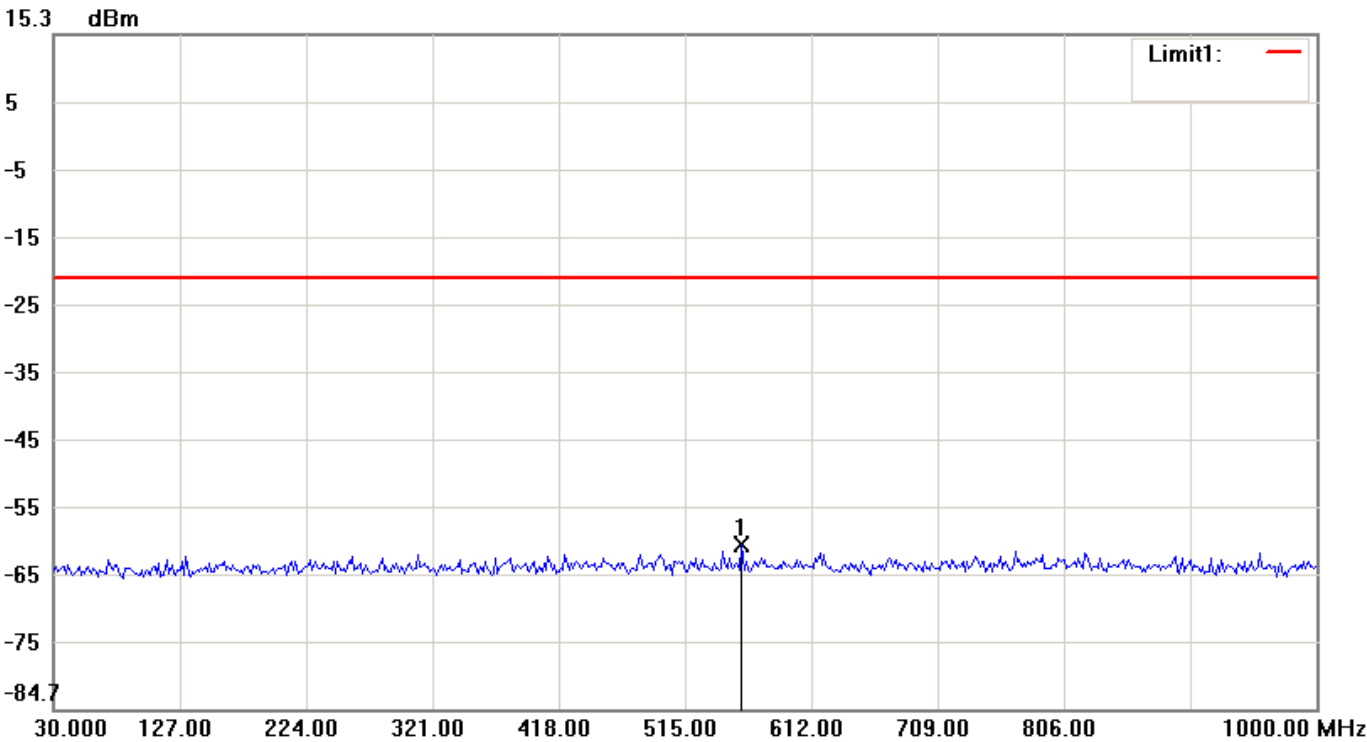
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11gn\_HT20 Channel 06-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 24306.66670    | -51.63     |

File: FT0045B wifi      Data: #23      Date: 2015/1/21      Temperature: 22 °C  
20n  
Time: PM 04:39:11      Humidity: 60 %



Condition: -20.91      Horizontal  
EUT:      Sweep Time: 92.72ms      Att.: 20dB  
Model:      RBW: 100 KHz      VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 11-Conducted Spurious-1

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 558.6500       | -60.37     |

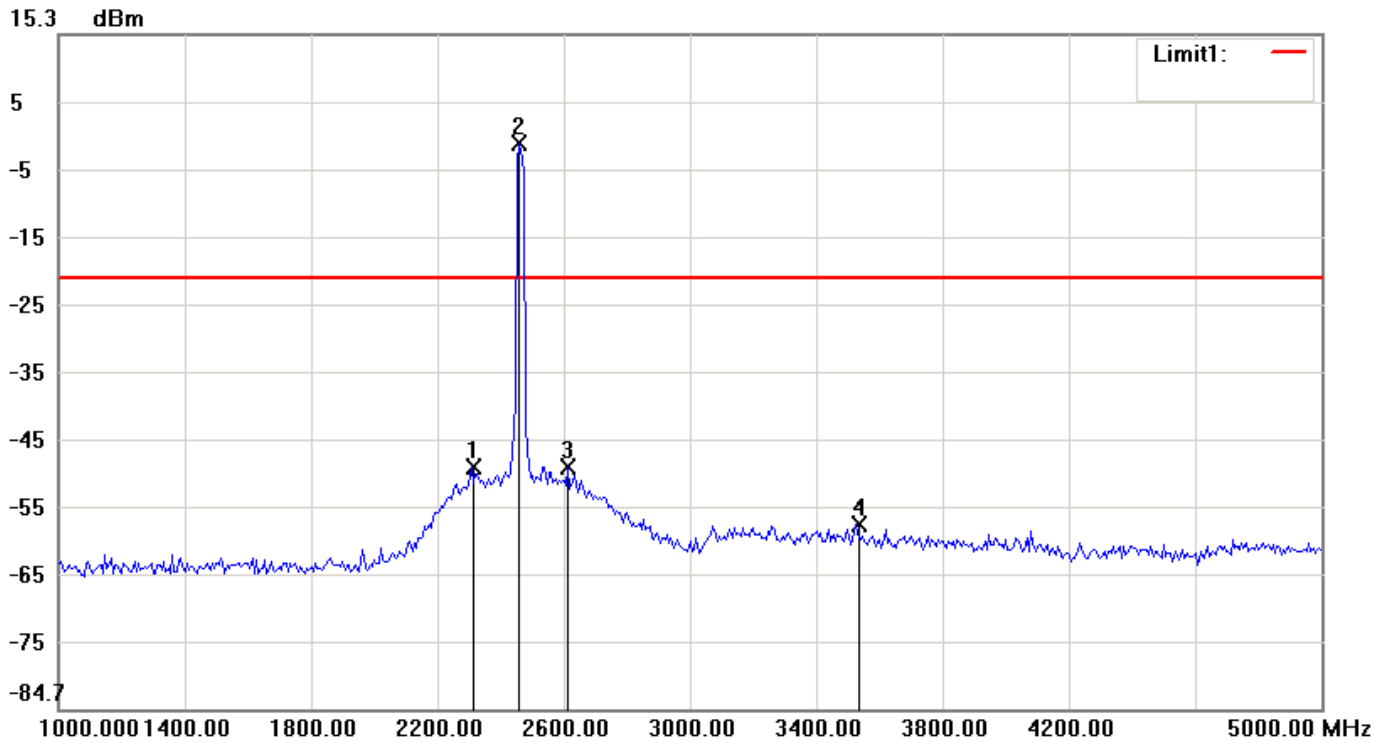
File: FT0045B wifi  
Data: #24

Date: 2015/1/21

Temperature: 22 °C

Time: PM 04:39:37

Humidity: 60 %



Condition:

Horizontal

EUT:

Sweep Time: 382.28ms Att.: 20dB

Model:

RBW: 100 KHz

VBW: 300 KHz

Test Mode:

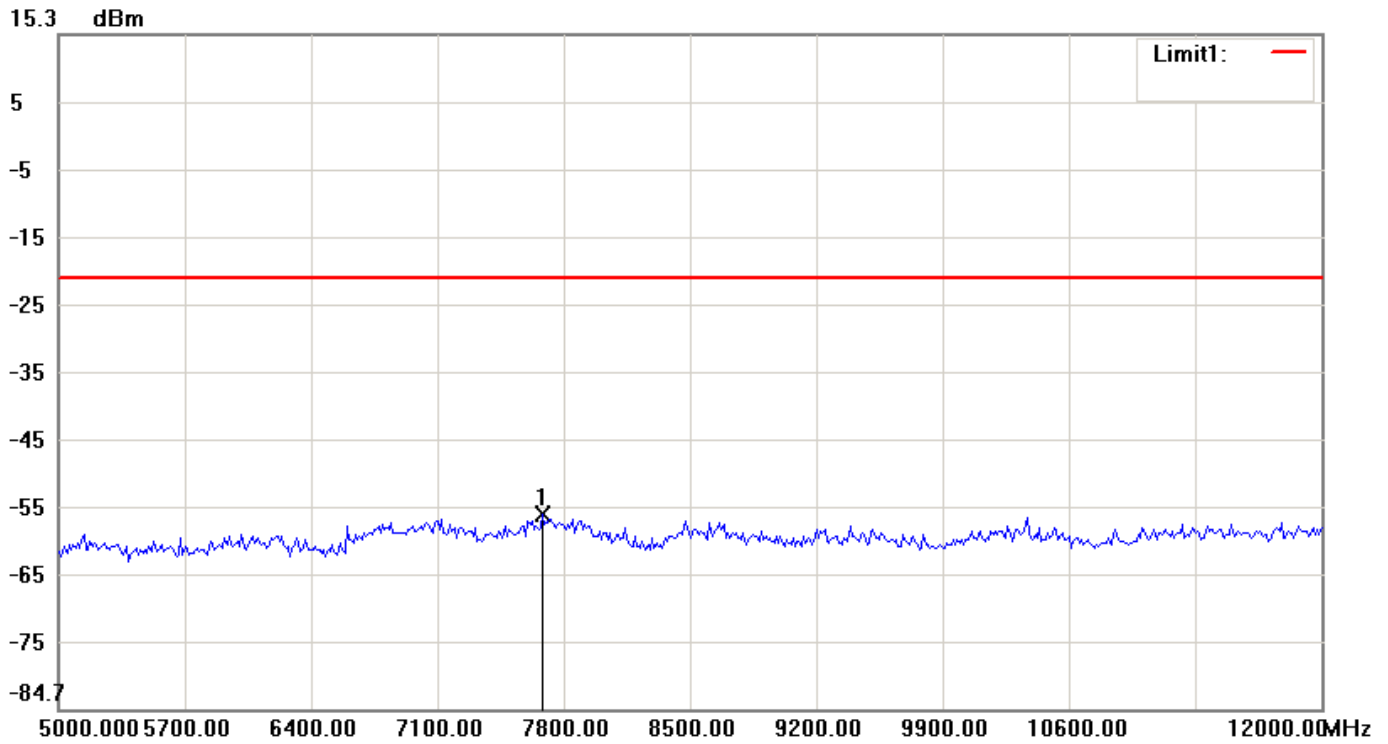
Note: FCC-802.11gn\_HT20 Channel 11-Conducted Spurious-2

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 2306.66670     | -48.78     |
| 2   | 2460.00000     | -0.91      |
| 3   | 2613.33330     | -48.89     |
| 4   | 3526.66670     | -57.41     |



File: FT0045B wifi      Data: #25      Date: 2015/1/21      Temperature: 22 °C  
20n

Time: PM 04:40:46      Humidity: 60 %



Condition: -20.91

Horizontal

EUT:

Sweep Time: 669ms Att.: 20dB

Model:

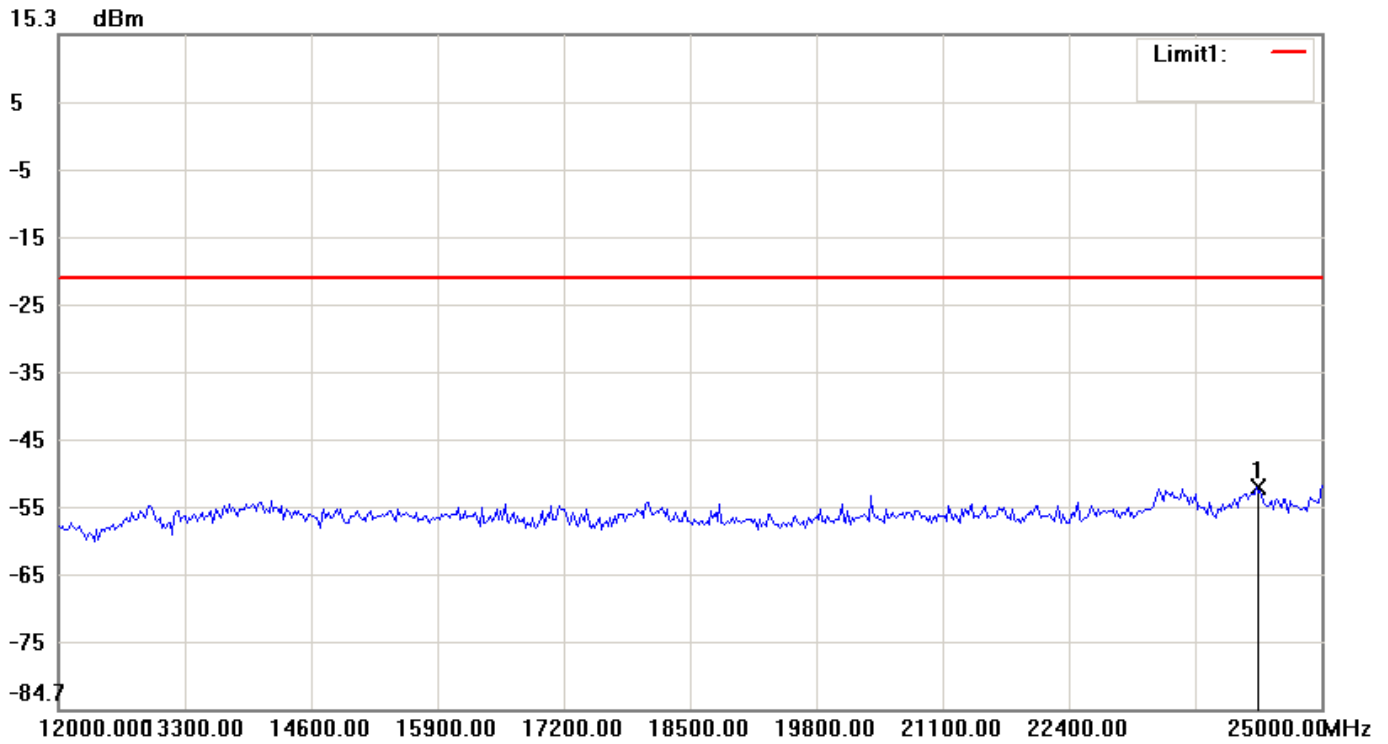
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-802.11gn\_HT20 Channel 11-Conducted Spurious-3

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 7683.33330     | -55.83     |

File: FT0045B wifi      Data: #26      Date: 2015/1/21      Temperature: 22 °C  
20n  
Time: PM 04:41:29      Humidity: 60 %



Condition: -20.91      Horizontal  
EUT: Sweep Time: 1242.44ms    Att.: 20dB  
Model: RBW: 100 KHz      VBW: 300 KHz  
Test Mode:  
Note: FCC-802.11gn\_HT20 Channel 11-Conducted Spurious-4

| No. | Frequency(MHz) | Level(dBm) |
|-----|----------------|------------|
| 1   | 24328.33330    | -51.83     |

## 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 (d)

### 10.2 Measurement Procedure

The testing follows FCC KDB 558074 D01 v03r02.

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively. Turn on EUT and make sure that it is in continuous operating function.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions and then each selected frequency is precisely measured. As the same purpose, for emission measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission 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.

Figure 2 : Frequencies measured below 1 GHz configuration

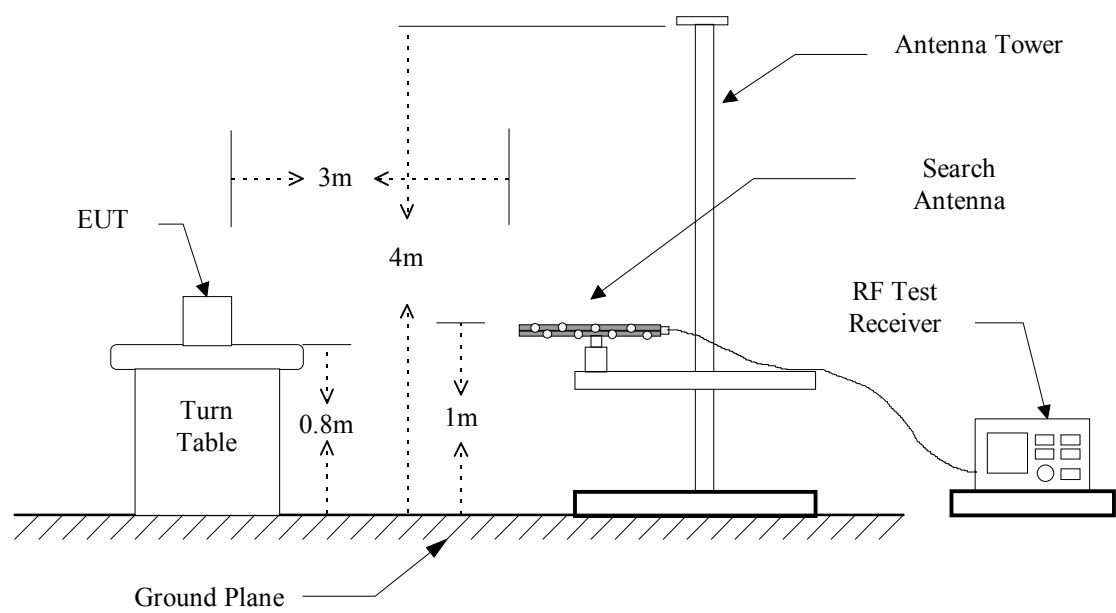
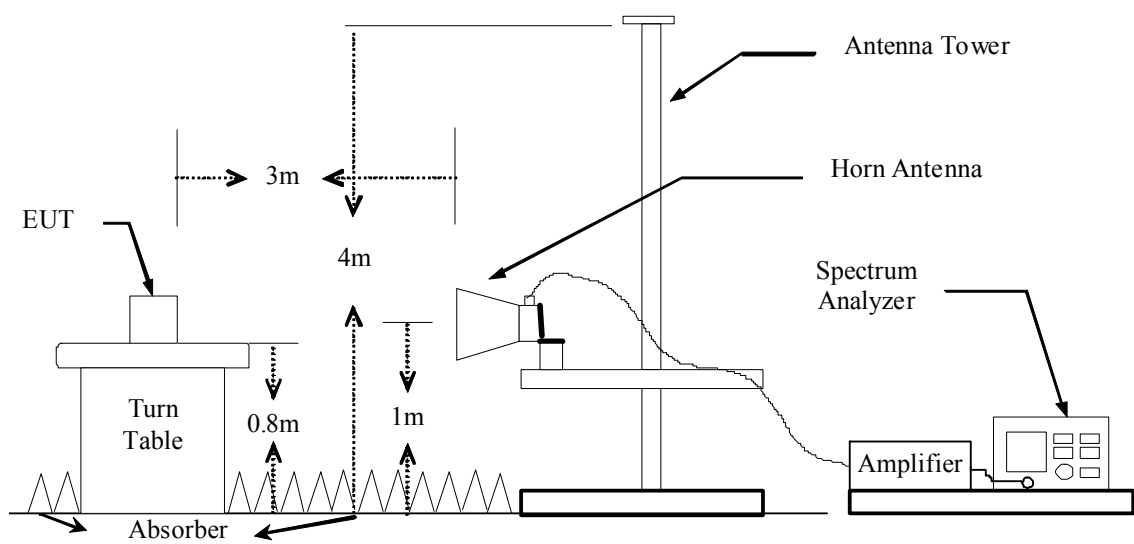


Figure 3 : Frequencies measured above 1 GHz configuration



### 10.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

| Equipment         | Manufacturer    | Model No. |
|-------------------|-----------------|-----------|
| EMI Test Receiver | R&S             | ESIB7     |
| Spectrum Analyzer | R&S             | FSV 40    |
| Horn Antenna      | EMCO            | 3115      |
| BiLog Antenna     | ETC             | MCTD2786  |
| Horn Antenna      | EMCO            | 3116      |
| Preamplifier      | Hewlett-Packard | 8449B     |
| Loop Antenna      | EMCO            | 6512      |
| PRE-Amplifier     | EMCI            | PA303N    |

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

| Frequency Band<br>(MHz) | Instrument        | Function   | Resolution<br>Bandwidth | Video<br>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                   | VBW_avg<br>(Note)  |

**Note:For average measurement**

| Condition                                                                                                                                                                                           | VBW_avg            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Duty cycle is no less than 98 percent                                                                                                                                                               | 10 Hz              |
| Duty cycle is less than 98 percent, T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation | $\geq \frac{1}{T}$ |
| Current use                                                                                                                                                                                         | 10Hz               |

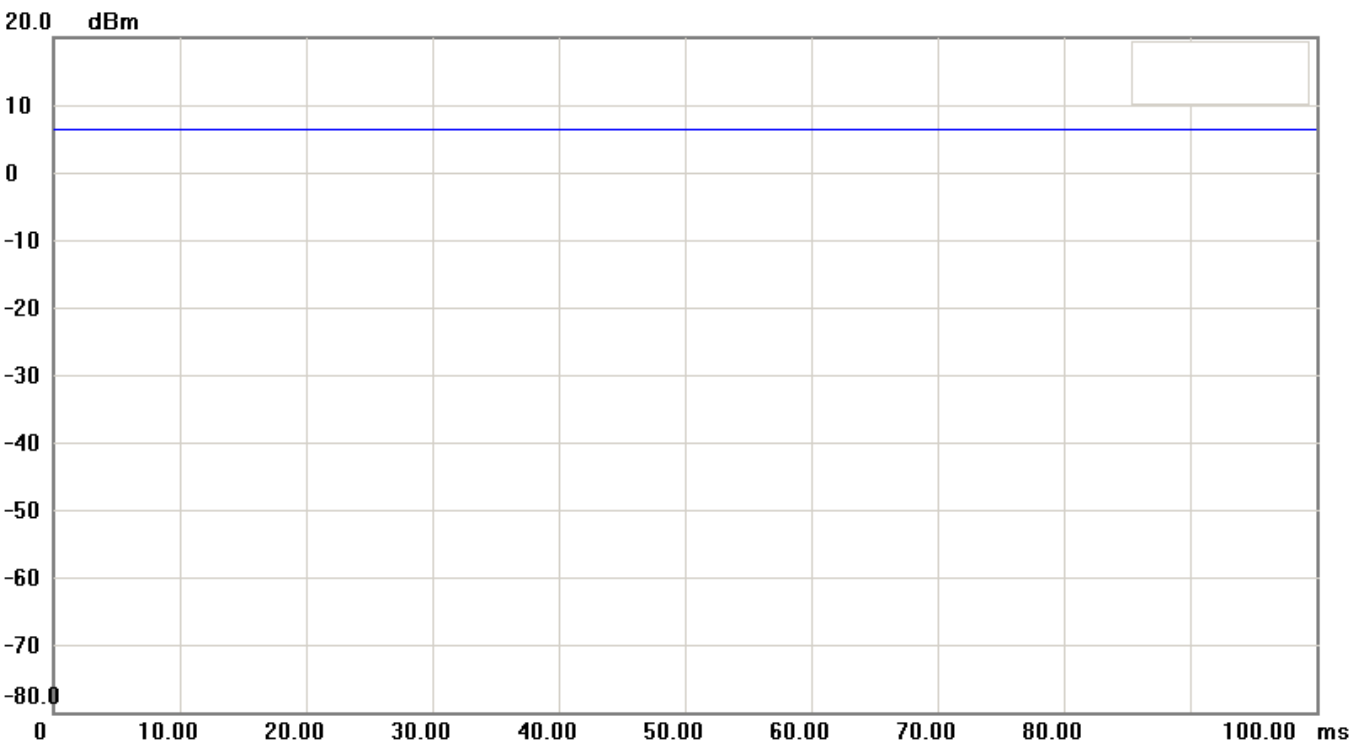
Duty Cycle Calculation :

Duty Cycle (%) > 98%

The plotted graph of Duty Cycle please see page 94 ~ 95.

|                   |                          |                      |
|-------------------|--------------------------|----------------------|
| <b>Condition:</b> | <b>Horizontal</b>        |                      |
| <b>EUT:</b>       | <b>Sweep Time: 500ms</b> | <b>Att.: 20dB</b>    |
| <b>Model:</b>     | <b>RBW: 1000 KHz</b>     | <b>VBW: 1000 KHz</b> |
| <b>Test Mode:</b> | <b>500ms</b>             |                      |
| <b>Note:</b>      |                          |                      |

File: Data: #2 Date: 2015/1/20 Temperature: 22 °C  
Time: Humidity: 60 %



Condition: Horizontal  
EUT: Sweep Time: 100ms Att.: 20dB  
Model: RBW: 1000 KHz VBW: 1000 KHz  
Test Mode: 100ms  
Note:

## 10.4 Radiated Emission Data

### 10.4.1 Harmonic

10.4.1.1 Operation Mode: Tx

10.4.1.1.1 IEEE 802.11b

Test Date: Jan. 07, 2015Temperature: 22°CHumidity: 60%

a) Channel 1

Fundamental Frequency: 2412 MHz

| Frequency  | Ant Pol | Reading<br>(dBuV/m)@3m |     | Correct Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|---------|------------------------|-----|----------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V     | Peak                   | AVG | (dB)           | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4824.0000  | H       | 51.9                   | --- | -1.87          | 50.0                  | --- | 74.0                 | 54.0 | -4.0              |
| 4824.0000  | V       | 55.0                   | --- | -1.87          | 53.1                  | --- | 74.0                 | 54.0 | -0.9              |
| 7236.0000  | H       | ---                    | --- | 1.23           | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7236.0000  | V       | ---                    | --- | 1.23           | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9648.0000  | H       | ---                    | --- | 2.69           | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9648.0000  | V       | ---                    | --- | 2.69           | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12060.0000 | H       | ---                    | --- | 5.03           | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12060.0000 | V       | ---                    | --- | 5.03           | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14472.0000 | H       | ---                    | --- | 9.84           | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14472.0000 | V       | ---                    | --- | 9.84           | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.



## b) Channel 6

Fundamental Frequency: 2437 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4874.0000  | H          | 52.2                   | --- | -1.76             | 50.4                  | --- | 74.0                 | 54.0 | -3.6              |
| 4874.0000  | V          | 54.9                   | --- | -1.76             | 53.1                  | --- | 74.0                 | 54.0 | -0.9              |
| 7311.0000  | H          | ---                    | --- | 1.41              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7311.0000  | V          | ---                    | --- | 1.41              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9748.0000  | H          | ---                    | --- | 2.80              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9748.0000  | V          | ---                    | --- | 2.80              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12185.0000 | H          | ---                    | --- | 5.11              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12185.0000 | V          | ---                    | --- | 5.11              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14622.0000 | H          | ---                    | --- | 9.10              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14622.0000 | V          | ---                    | --- | 9.10              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

## c) Channel 11

Fundamental Frequency: 2462 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4924.0000  | H          | 48.0                   | --- | -1.65             | 46.4                  | --- | 74.0                 | 54.0 | -7.6              |
| 4924.0000  | V          | 50.8                   | --- | -1.65             | 49.2                  | --- | 74.0                 | 54.0 | -4.8              |
| 7386.0000  | H          | ---                    | --- | 1.59              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7386.0000  | V          | ---                    | --- | 1.59              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9848.0000  | H          | ---                    | --- | 2.91              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9848.0000  | V          | ---                    | --- | 2.91              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12310.0000 | H          | ---                    | --- | 5.20              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12310.0000 | V          | ---                    | --- | 5.20              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14772.0000 | H          | ---                    | --- | 8.25              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14772.0000 | V          | ---                    | --- | 8.25              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

## 10.4.1.1.2 IEEE 802.11g

Test Date: Jan. 07, 2015Temperature: 22°CHumidity: 60%

a) Channel 1

Fundamental Frequency: 2412 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4824.0000  | H          | 48.3                   | --- | -1.87             | 46.4                  | --- | 74.0                 | 54.0 | -7.6              |
| 4824.0000  | V          | 51.8                   | --- | -1.87             | 49.9                  | --- | 74.0                 | 54.0 | -4.1              |
| 7236.0000  | H          | ---                    | --- | 1.23              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7236.0000  | V          | ---                    | --- | 1.23              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9648.0000  | H          | ---                    | --- | 2.69              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9648.0000  | V          | ---                    | --- | 2.69              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12060.0000 | H          | ---                    | --- | 5.03              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12060.0000 | V          | ---                    | --- | 5.03              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14472.0000 | H          | ---                    | --- | 9.84              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14472.0000 | V          | ---                    | --- | 9.84              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

## b) Channel 6

Fundamental Frequency: 2437 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4874.0000  | H          | 46.9                   | --- | -1.76             | 45.1                  | --- | 74.0                 | 54.0 | -8.9              |
| 4874.0000  | V          | 49.3                   | --- | -1.76             | 47.5                  | --- | 74.0                 | 54.0 | -6.5              |
| 7311.0000  | H          | ---                    | --- | 1.41              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7311.0000  | V          | ---                    | --- | 1.41              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9748.0000  | H          | ---                    | --- | 2.80              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9748.0000  | V          | ---                    | --- | 2.80              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12185.0000 | H          | ---                    | --- | 5.11              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12185.0000 | V          | ---                    | --- | 5.11              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14622.0000 | H          | ---                    | --- | 9.10              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14622.0000 | V          | ---                    | --- | 9.10              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

## c) Channel 11

Fundamental Frequency: 2462 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4924.0000  | H          | 44.0                   | --- | -1.65             | 42.4                  | --- | 74.0                 | 54.0 | -11.6             |
| 4924.0000  | V          | 46.1                   | --- | -1.65             | 44.5                  | --- | 74.0                 | 54.0 | -9.5              |
| 7386.0000  | H          | ---                    | --- | 1.59              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7386.0000  | V          | ---                    | --- | 1.59              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9848.0000  | H          | ---                    | --- | 2.91              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9848.0000  | V          | ---                    | --- | 2.91              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12310.0000 | H          | ---                    | --- | 5.20              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12310.0000 | V          | ---                    | --- | 5.20              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14772.0000 | H          | ---                    | --- | 8.25              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14772.0000 | V          | ---                    | --- | 8.25              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

## 10.4.1.1.3 IEEE 802.11gn, HT20

Test Date: Jan. 07, 2015Temperature: 22°CHumidity: 60%

a) Channel 1

Fundamental Frequency: 2412 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4824.0000  | H          | 45.8                   | --- | -1.87             | ---                   | --- | 74.0                 | 54.0 | -10.1             |
| 4824.0000  | V          | 51.2                   | --- | -1.87             | 49.3                  | --- | 74.0                 | 54.0 | -4.7              |
| 7236.0000  | H          | ---                    | --- | 1.23              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7236.0000  | V          | ---                    | --- | 1.23              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9648.0000  | H          | ---                    | --- | 2.69              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9648.0000  | V          | ---                    | --- | 2.69              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12060.0000 | H          | ---                    | --- | 5.03              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12060.0000 | V          | ---                    | --- | 5.03              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14472.0000 | H          | ---                    | --- | 9.84              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14472.0000 | V          | ---                    | --- | 9.84              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

## b) Channel 6

Fundamental Frequency: 2437 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4874.0000  | H          | 46.4                   | --- | -1.76             | 44.6                  | --- | 74.0                 | 54.0 | -9.4              |
| 4874.0000  | V          | 47.9                   | --- | -1.76             | 46.1                  | --- | 74.0                 | 54.0 | -7.9              |
| 7311.0000  | H          | ---                    | --- | 1.41              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7311.0000  | V          | ---                    | --- | 1.41              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9748.0000  | H          | ---                    | --- | 2.80              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9748.0000  | V          | ---                    | --- | 2.80              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12185.0000 | H          | ---                    | --- | 5.11              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12185.0000 | V          | ---                    | --- | 5.11              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14622.0000 | H          | ---                    | --- | 9.10              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14622.0000 | V          | ---                    | --- | 9.10              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

## c) Channel 11

Fundamental Frequency: 2462 MHz

| Frequency  | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|------------|------------|------------------------|-----|-------------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)      | H/V        | Peak                   | AVG | (dB)              | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 4924.0000  | H          | ---                    | --- | -1.65             | ---                   | --- | 74.0                 | 54.0 | ---               |
| 4924.0000  | V          | 44.8                   | --- | -1.65             | 43.2                  | --- | 74.0                 | 54.0 | -10.8             |
| 7386.0000  | H          | ---                    | --- | 1.59              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 7386.0000  | V          | ---                    | --- | 1.59              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9848.0000  | H          | ---                    | --- | 2.91              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 9848.0000  | V          | ---                    | --- | 2.91              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12310.0000 | H          | ---                    | --- | 5.20              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 12310.0000 | V          | ---                    | --- | 5.20              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14772.0000 | H          | ---                    | --- | 8.25              | ---                   | --- | 74.0                 | 54.0 | ---               |
| 14772.0000 | V          | ---                    | --- | 8.25              | ---                   | --- | 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.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item “Margin” referred to “peak result – average limit”.
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

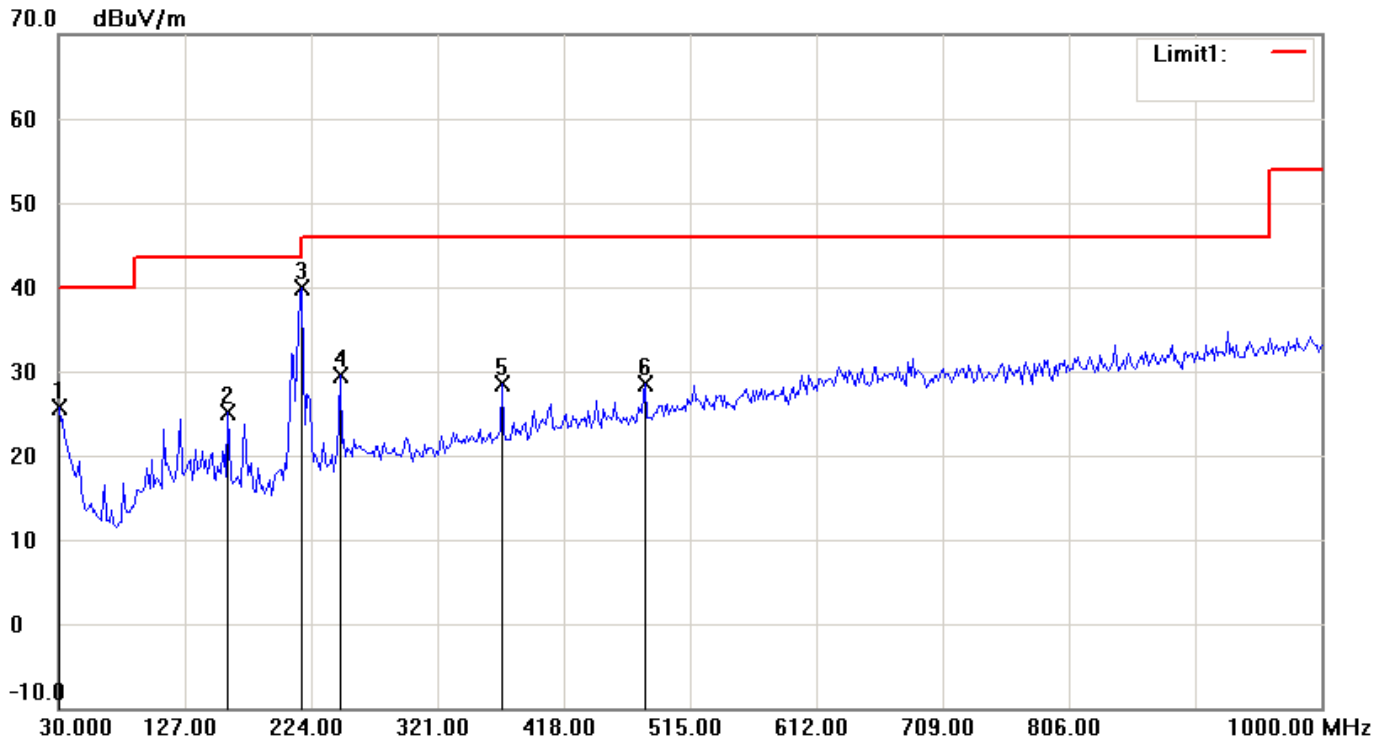


## 10.4.2 Spurious Emission

Operation Mode: Tx

## 10.4.2.1 30MHz to 1GHz

File: Data: Date: 2015/1/7 Temperature: 22 °C  
Time: Humidity: 60 %



Condition: FCC\_30-1000MHz

Polarization: Horizontal

EUT:

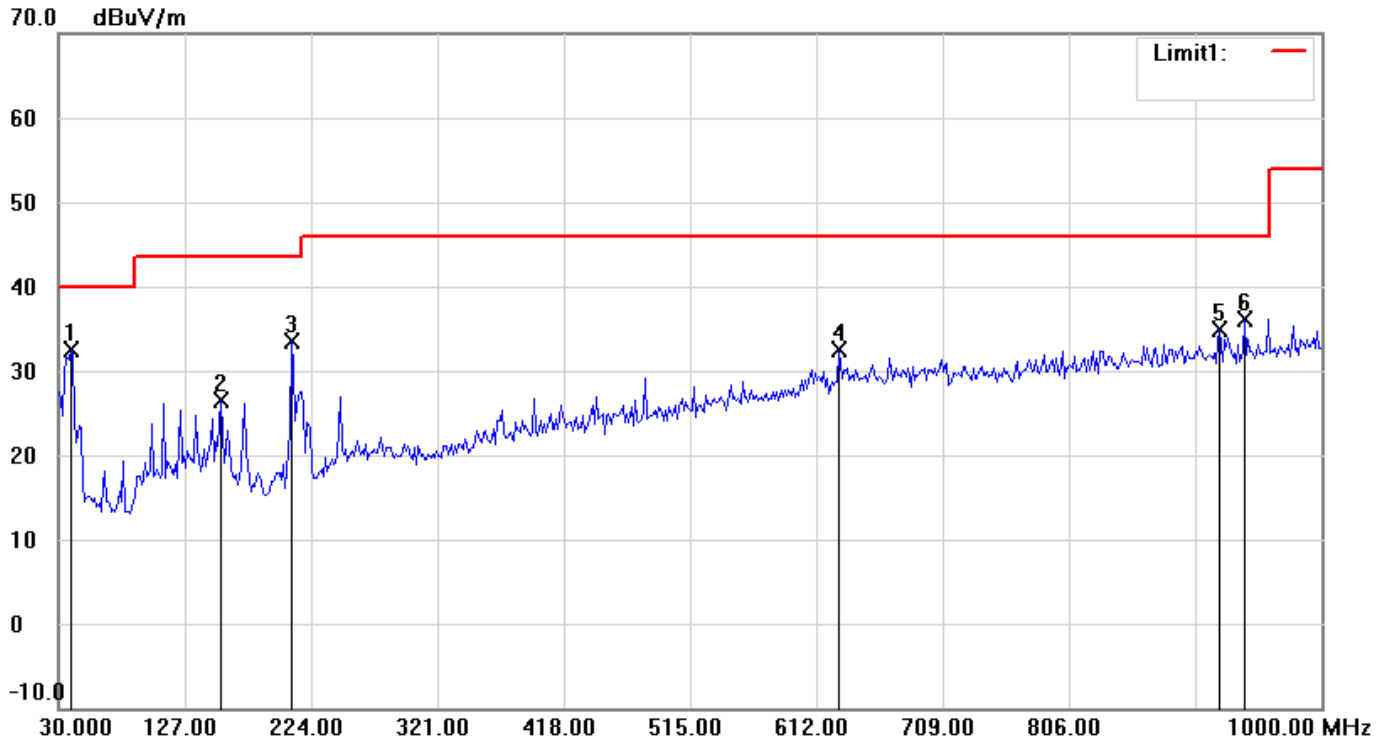
Distance: 3m

Model:

Test Mode:

| No. | Frequency | Reading  | Detector | Corrected | Result   | Limit    | Margin |
|-----|-----------|----------|----------|-----------|----------|----------|--------|
|     | (MHz)     | (dBuV/m) |          | dB/m      | (dBuV/m) | (dBuV/m) | (dB)   |
| 1   | 30.0000   | 5.01     | QP       | 20.69     | 25.70    | 40.00    | -14.30 |
| 2   | 160.5767  | 12.76    | QP       | 12.36     | 25.12    | 43.50    | -18.38 |
| 3   | 216.5383  | 27.30    | QP       | 12.67     | 39.97    | 46.00    | -6.03  |
| 4   | 246.0737  | 14.56    | QP       | 14.89     | 29.45    | 46.00    | -16.55 |
| 5   | 370.4327  | 10.00    | QP       | 18.47     | 28.47    | 46.00    | -17.53 |
| 6   | 480.8013  | 7.67     | QP       | 20.74     | 28.41    | 46.00    | -17.59 |

File: Data: Date: 2015/1/7 Temperature: 22 °C  
Time: Humidity: 60 %



Condition: FCC\_30-1000MHz Polarization: Vertical  
EUT: Distance: 3m  
Model:  
Test Mode:  
Note:

| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Detector | Corrected<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|-----|--------------------|---------------------|----------|-------------------|--------------------|-------------------|----------------|
| 1   | 39.3270            | 17.02               | QP       | 15.47             | 32.49              | 40.00             | -7.51          |
| 2   | 154.3590           | 13.80               | QP       | 12.71             | 26.51              | 43.50             | -16.99         |
| 3   | 208.7660           | 21.02               | QP       | 12.52             | 33.54              | 43.50             | -9.96          |
| 4   | 630.0321           | 9.69                | QP       | 22.88             | 32.57              | 46.00             | -13.43         |
| 5   | 922.2756           | 8.78                | QP       | 26.14             | 34.92              | 46.00             | -11.08         |
| 6   | 940.9293           | 9.78                | QP       | 26.31             | 36.09              | 46.00             | -9.91          |

## 10.4.2.2 above 1GHz

## 10.4.2.2.1 IEEE 802.11b

## 10.4.2.2.1.1 Fundamental Frequency: 2412 MHz

| Frequency<br>(MHz) | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor<br>(dB) | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse)<br>(dB) |
|--------------------|------------|------------------------|-----|---------------------------|-----------------------|-----|----------------------|------|---------------------------|
|                    |            | Peak                   | AVG |                           | Peak                  | AVG | Peak                 | AVG  |                           |
| 1887.4616          | H          | 51.7                   | --- | -9.75                     | 42.0                  | --- | 74.0                 | 54.0 | -12.0                     |
| 1888.4614          | V          | 50.6                   | --- | -9.75                     | 40.9                  | --- | 74.0                 | 54.0 | -13.1                     |
| 2269.8717          | H          | 52.5                   | --- | -8.29                     | 44.2                  | --- | 74.0                 | 54.0 | -9.8                      |
| 2256.4103          | V          | 48.1                   | --- | -8.33                     | 39.8                  | --- | 74.0                 | 54.0 | -14.2                     |

## 10.4.2.2.1.2 Fundamental Frequency: 2437 MHz

| Frequency<br>(MHz) | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor<br>(dB) | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse)<br>(dB) |
|--------------------|------------|------------------------|-----|---------------------------|-----------------------|-----|----------------------|------|---------------------------|
|                    |            | Peak                   | AVG |                           | Peak                  | AVG | Peak                 | AVG  |                           |
| 1888.4616          | H          | 52.3                   | --- | -9.75                     | 42.6                  | --- | 74.0                 | 54.0 | -11.4                     |
| 2281.0804          | H          | 54.0                   | --- | -8.26                     | 45.7                  | --- | 74.0                 | 54.0 | -8.3                      |
| 3130.0207          | V          | 48.1                   | --- | -5.50                     | 42.6                  | --- | 74.0                 | 54.0 | -11.4                     |

## 10.4.2.2.1.3 Fundamental Frequency: 2462 MHz

| Frequency<br>(MHz) | Ant<br>Pol | Reading<br>(dBuV/m)@3m |     | Correct<br>Factor<br>(dB) | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse)<br>(dB) |
|--------------------|------------|------------------------|-----|---------------------------|-----------------------|-----|----------------------|------|---------------------------|
|                    |            | Peak                   | AVG |                           | Peak                  | AVG | Peak                 | AVG  |                           |
| 1888.4616          | H          | 51.5                   | --- | -9.75                     | 41.8                  | --- | 74.0                 | 54.0 | -12.2                     |
| 2276.6026          | H          | 52.4                   | --- | -8.28                     | 44.1                  | --- | 74.0                 | 54.0 | -9.9                      |
| 3130.0207          | V          | 48.2                   | --- | -5.50                     | 42.7                  | --- | 74.0                 | 54.0 | -11.3                     |

Note: 1. Place of Measurement: Measuring site of the ETC.

2. Item of margin shown in above table refer to average limit.

3. Remark “---” means that the emissions level is too low to be measured.

4. If the peak result is under the average limit, that is deemed to meet the average limit.

5. If there is only peak result, item “Margin” referred to “peak result – average limit”.

6. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

7. The estimated measurement uncertainty of the result measurement is

±4.2dB ( $9\text{kHz} \leq f \leq 30\text{MHz}$ )

±4.6dB ( $30\text{MHz} \leq f < 300\text{MHz}$ ).

±4.4dB ( $300\text{MHz} \leq f < 1000\text{MHz}$ ).

±2.9dB ( $1\text{GHz} \leq f < 18\text{GHz}$ ).

±3.5dB ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ).

## 10.4.2.2.2 IEEE 802.11g

## 10.4.2.2.2.1 Fundamental Frequency: 2412 MHz

| Frequency | Ant Pol | Reading<br>(dBuV/m)@3m |     | Correct Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|-----------|---------|------------------------|-----|----------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)     | H/V     | Peak                   | AVG | (dB)           | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 1887.4616 | H       | 53.3                   | --- | -9.75          | 43.6                  | --- | 74.0                 | 54.0 | -10.4             |
| 1890.7050 | V       | 48.8                   | --- | -9.74          | 39.1                  | --- | 74.0                 | 54.0 | -14.9             |
| 2269.8717 | H       | 54.6                   | --- | -8.29          | 46.3                  | --- | 74.0                 | 54.0 | -7.7              |
| 2254.1667 | V       | 48.3                   | --- | -8.34          | 40.0                  | --- | 74.0                 | 54.0 | -14.0             |

## 10.4.2.2.2.2 Fundamental Frequency: 2437 MHz

| Frequency | Ant Pol | Reading<br>(dBuV/m)@3m |     | Correct Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|-----------|---------|------------------------|-----|----------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)     | H/V     | Peak                   | AVG | (dB)           | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 1888.4616 | H       | 51.8                   | --- | -9.75          | 42.1                  | --- | 74.0                 | 54.0 | -11.9             |
| 1888.4616 | V       | 51.5                   | --- | -9.75          | 41.8                  | --- | 74.0                 | 54.0 | -12.2             |
| 2287.8204 | H       | 54.3                   | --- | -8.24          | 46.1                  | --- | 74.0                 | 54.0 | -7.9              |
| 2283.3332 | V       | 48.4                   | --- | -8.26          | 40.1                  | --- | 74.0                 | 54.0 | -13.9             |
| 3154.8870 | V       | 48.9                   | --- | -5.44          | 43.5                  | --- | 74.0                 | 54.0 | -10.5             |

## 10.4.2.2.2.3 Fundamental Frequency: 2462 MHz

| Frequency | Ant Pol | Reading<br>(dBuV/m)@3m |     | Correct Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|-----------|---------|------------------------|-----|----------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)     | H/V     | Peak                   | AVG | (dB)           | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 1888.4616 | H       | 52.8                   | --- | -9.75          | 43.1                  | --- | 74.0                 | 54.0 | -10.9             |
| 1888.4616 | V       | 50.5                   | --- | -9.75          | 40.8                  | --- | 74.0                 | 54.0 | -13.2             |
| 2276.6026 | H       | 54.1                   | --- | -8.28          | 45.8                  | --- | 74.0                 | 54.0 | -8.2              |
| 2285.5770 | V       | 48.2                   | --- | -8.25          | 40.0                  | --- | 74.0                 | 54.0 | -14.0             |
| 3378.6826 | H       | 47.5                   | --- | -4.79          | 42.7                  | --- | 74.0                 | 54.0 | -11.3             |

Note: 1. Place of Measurement: Measuring site of the ETC.

2. Item of margin shown in above table refer to average limit.

3. Remark “---” means that the emissions level is too low to be measured.

4. If the peak result is under the average limit, that is deemed to meet the average limit.

5. If there is only peak result, item “Margin” referred to “peak result – average limit”.

6. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

7. The estimated measurement uncertainty of the result measurement is

±4.2dB (9kHz ≤ f ≤ 30MHz)

±4.6dB (30MHz ≤ f < 300MHz).

±4.4dB (300MHz ≤ f < 1000MHz).

±2.9dB (1GHz ≤ f < 18GHz).

±3.5dB (18GHz ≤ f ≤ 40GHz).

## 10.4.2.2.3 IEEE 802.11gn, HT20

## 10.4.2.2.3.1 Fundamental Frequency: 2412 MHz

| Frequency | Ant Pol | Reading<br>(dBuV/m)@3m |     | Correct Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|-----------|---------|------------------------|-----|----------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)     | H/V     | Peak                   | AVG | (dB)           | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 1150.3205 | H       | 48.8                   | --- | -13.50         | 35.3                  | --- | 74.0                 | 54.0 | -18.7             |
| 1161.5308 | V       | 48.5                   | --- | -13.45         | 35.1                  | --- | 74.0                 | 54.0 | -18.9             |
| 1888.4616 | H       | 48.5                   | --- | -9.75          | 38.8                  | --- | 74.0                 | 54.0 | -15.2             |
| 2260.8973 | H       | 49.2                   | --- | -8.32          | 40.9                  | --- | 74.0                 | 54.0 | -13.1             |

## 10.4.2.2.3.2 Fundamental Frequency: 2437 MHz

| Frequency | Ant Pol | Reading<br>(dBuV/m)@3m |     | Correct Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|-----------|---------|------------------------|-----|----------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)     | H/V     | Peak                   | AVG | (dB)           | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 1888.4616 | H       | 49.2                   | --- | -9.75          | 39.5                  | --- | 74.0                 | 54.0 | -14.5             |
| 1888.4616 | V       | 46.7                   | --- | -9.75          | 37.0                  | --- | 74.0                 | 54.0 | -17.0             |
| 2285.0804 | H       | 51.3                   | --- | -8.25          | 43.1                  | --- | 74.0                 | 54.0 | -10.9             |
| 2249.6798 | V       | 45.8                   | --- | -8.36          | 37.4                  | --- | 74.0                 | 54.0 | -16.6             |

## 10.4.2.2.3.3 Fundamental Frequency: 2462 MHz

| Frequency | Ant Pol | Reading<br>(dBuV/m)@3m |     | Correct Factor | Result<br>(dBuV/m)@3m |     | Limit<br>(dBuV/m)@3m |      | Margin<br>(worse) |
|-----------|---------|------------------------|-----|----------------|-----------------------|-----|----------------------|------|-------------------|
| (MHz)     | H/V     | Peak                   | AVG | (dB)           | Peak                  | AVG | Peak                 | AVG  | (dB)              |
| 1888.4616 | H       | 49.5                   | --- | -9.75          | 39.8                  | --- | 74.0                 | 54.0 | -14.2             |
| 1888.4616 | V       | 46.7                   | --- | -9.75          | 37.0                  | --- | 74.0                 | 54.0 | -17.0             |
| 2281.0896 | H       | 50.6                   | --- | -8.26          | 42.3                  | --- | 74.0                 | 54.0 | -11.7             |

Note: 1. Place of Measurement: Measuring site of the ETC.

2. Item of margin shown in above table refer to average limit.

3. Remark “---” means that the emissions level is too low to be measured.

4. If the peak result is under the average limit, that is deemed to meet the average limit.

5. If there is only peak result, item “Margin” referred to “peak result – average limit”.

6. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

7. The estimated measurement uncertainty of the result measurement is

±4.2dB ( $9\text{kHz} \leq f \leq 30\text{MHz}$ )

±4.6dB ( $30\text{MHz} \leq f < 300\text{MHz}$ ).

±4.4dB ( $300\text{MHz} \leq f < 1000\text{MHz}$ ).

±2.9dB ( $1\text{GHz} \leq f < 18\text{GHz}$ ).

±3.5dB ( $18\text{GHz} \leq f \leq 40\text{GHz}$ ).

**10.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies and co-location**Test Date: Jan. 07, 2015Temperature: 22°CHumidity: 60%**10.4.3.1 Operation Mode: Tx****10.4.3.1.1 IEEE 802.11b**

| Operation Channel | Frequenc | Reading @3m (dBuV/m) |      |      |      | Factor | Result   |      | Limit @3m |     | Margin (worse) |      |
|-------------------|----------|----------------------|------|------|------|--------|----------|------|-----------|-----|----------------|------|
|                   |          | H                    |      | V    |      |        | (dBuV/m) |      | (dBuV/m)  |     | (dB)           |      |
|                   | (MHz)    | Peak                 | Ave  | Peak | Ave  | (dB)   | Peak     | Ave  | Peak      | Ave | Peak           | Ave  |
| Low               | 2390.000 | 37.6                 | 16.7 | 32.9 | 13.1 | 29.8   | 67.4     | 46.5 | 74        | 54  | -6.6           | -7.5 |
| High              | 2483.500 | 38.6                 | 15.6 | 32.6 | 13.1 | 29.8   | 68.4     | 45.4 | 74        | 54  | -5.6           | -8.6 |

**10.4.3.1.2 IEEE 802.11g**

| Operation Channel | Frequenc | Reading @3m (dBuV/m) |      |      |      | Factor | Result   |      | Limit @3m |     | Margin (worse) |      |
|-------------------|----------|----------------------|------|------|------|--------|----------|------|-----------|-----|----------------|------|
|                   |          | H                    |      | V    |      |        | (dBuV/m) |      | (dBuV/m)  |     | (dB)           |      |
|                   | (MHz)    | Peak                 | Ave  | Peak | Ave  | (dB)   | Peak     | Ave  | Peak      | Ave | Peak           | Ave  |
| Low               | 2390.000 | 35.6                 | 18.4 | 28.7 | 14.0 | 29.8   | 65.4     | 48.2 | 74        | 54  | -8.6           | -5.8 |
| High              | 2483.500 | 39.6                 | 20.9 | 32.7 | 15.7 | 29.8   | 69.4     | 50.7 | 74        | 54  | -4.7           | -3.3 |

**10.4.3.1.3 IEEE 802.11gn, HT20**

| Operation Channel | Frequenc | Reading @3m (dBuV/m) |      |      |      | Factor | Result   |      | Limit @3m |     | Margin (worse) |      |
|-------------------|----------|----------------------|------|------|------|--------|----------|------|-----------|-----|----------------|------|
|                   |          | H                    |      | V    |      |        | (dBuV/m) |      | (dBuV/m)  |     | (dB)           |      |
|                   | (MHz)    | Peak                 | Ave  | Peak | Ave  | (dB)   | Peak     | Ave  | Peak      | Ave | Peak           | Ave  |
| Low               | 2390.000 | 40.2                 | 18.7 | 32.7 | 14.1 | 29.8   | 70.0     | 48.5 | 74        | 54  | -4.0           | -5.5 |
| High              | 2483.500 | 40.5                 | 21.0 | 34.6 | 16.1 | 29.8   | 70.3     | 50.8 | 74        | 54  | -3.7           | -3.2 |

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:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

where

$$\text{Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$

**11. EQUIPMENTS LIST FOR TESTING**

| <b>Equipment</b>  | <b>Manufacturer</b> | <b>Model No.</b> | <b>S/N</b>   | <b>Calibration Date</b> | <b>Next Cal. Due</b> |
|-------------------|---------------------|------------------|--------------|-------------------------|----------------------|
| Spectrum Analyzer | Agilent             | E4446A           | 13052013-001 | 10/07/2014              | 10/06/2015           |
| Power Meter       | Agilent             | N1922A           | 13053523-001 | 12/04/2014              | 12/05/2015           |
| Peak Power Sensor | Agilent             | N1912A           | 13050625-001 | 12/04/2014              | 12/05/2015           |
| EMI Receiver      | R&S                 | ESIB 7           | 13054414-001 | 07/20/2014              | 07/19/2015           |
| Spectrum Analyzer | R&S                 | FSV 40           | 13052017-001 | 02/07/2014              | 02/06/2015           |
| Horn Antenna      | EMCO                | 3115             | 13059201-001 | 07/22/2014              | 07/21/2015           |
| BiLog Antenna     | ETC                 | MCTD2786         | BL09D01004   | 02/07/2014              | 02/06/2015           |
| Hom Antenna       | EMCO                | 3116             | 13059202-001 | 08/22/2014              | 08/21/2015           |
| PRE-Amplifier     | Agilent             | 8449B            | 13040709-001 | 11/21/2014              | 11/20/2015           |
| Loop Antenna      | EMCO                | 6512             | 13054104-001 | 07/01/2014              | 06/30/2015           |
| PRE-Amplifier     | EMCI                | PA303N           | 13040720-001 | 07/03/2014              | 07/02/2015           |