



# FCC TEST REPORT

According to

## FCC CFR Title 47 Part 15 Subpart C

Applicant : Zhejiang Dahua Vision Technology Co., Ltd.

Address : The 1<sup>st</sup> floor, building F, No.1199 Bin'an road, Changhe  
Street, Binjiang District, Hangzhou, P.R. China.

Equipment : IP CAMERA

Model No. : DH-IPC-HFW1200S\*-W-xxxx, DH-IPC-HFW1200S\*-WS-xxxx,  
IPC-HFW1200S\*-W-xxxx, IPC-HFW1200S\*-WS-xxxx,  
DH-IPC-HFW1000S\*-W-xxxx, DH-IPC-HFW1000S\*-WS-xxxx,  
IPC-HFW1000S\*-W-xxxx, IPC-HFW1000S\*-WS-xxxx,  
("\*" can be P, N, or blank; "xxxx" can be 0360B or 0600B)

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of **Cerpass Technology Corp.** the test report shall not be reproduced except in full.
- The test report must not be used by the clients to claim product certification approval by **NVLAP** or any agency of the Government.



## Table of Contents

|                                                            |           |
|------------------------------------------------------------|-----------|
| <b>1. Report of Measurements and Examinations .....</b>    | <b>6</b>  |
| 1.1 List of Measurements and Examinations .....            | 6         |
| <b>2. Test Configuration of Equipment under Test .....</b> | <b>7</b>  |
| 2.1 Feature of Equipment under Test .....                  | 7         |
| 2.2 Carrier Frequency of Channels .....                    | 9         |
| The power level setting for 802.11b/g/n .....              | 9         |
| 2.3 Test Manner .....                                      | 13        |
| 2.4 Description of Test System .....                       | 14        |
| 2.5 General Information of Test .....                      | 15        |
| 2.6 Measurement Uncertainty .....                          | 15        |
| <b>3. Antenna Requirements .....</b>                       | <b>16</b> |
| 3.1 Standard Applicable .....                              | 16        |
| 3.2 Antenna Construction and Directional Gain .....        | 16        |
| <b>4. Test of Conducted Emission .....</b>                 | <b>17</b> |
| 4.1 Test Limit .....                                       | 17        |
| 4.2 Test Procedures .....                                  | 17        |
| 4.3 Typical Test Setup .....                               | 18        |
| 4.4 Measurement Equipment .....                            | 18        |
| 4.5 Test Result and Data .....                             | 19        |
| <b>5. Test of Radiated Emission .....</b>                  | <b>21</b> |
| 5.1 Test Limit .....                                       | 21        |
| 5.2 Test Procedures .....                                  | 21        |
| 5.3 Typical Test Setup .....                               | 22        |
| 5.4 Measurement Equipment .....                            | 23        |
| 5.5 Test Result and Data .....                             | 24        |
| <b>6. Occupied Bandwidth .....</b>                         | <b>37</b> |
| 6.1 Test Limit .....                                       | 37        |
| 6.2 Test Procedures .....                                  | 37        |
| 6.3 Test Setup Layout .....                                | 37        |
| 6.4 Measurement Equipment .....                            | 37        |
| 6.5 Test Result and Data .....                             | 38        |
| <b>7. Maximum Peak Output Power .....</b>                  | <b>46</b> |
| 7.1 Test Limit .....                                       | 46        |
| 7.2 Test Procedure .....                                   | 46        |
| 7.3 Test Setup Layout .....                                | 46        |
| 7.4 Measurement Equipment .....                            | 46        |
| 7.5 Test Result and Data .....                             | 47        |
| <b>8. Band Edges Measurement .....</b>                     | <b>50</b> |



|            |                                            |           |
|------------|--------------------------------------------|-----------|
| 8.1        | Test Limit.....                            | 50        |
| 8.2        | Test Procedure .....                       | 50        |
| 8.3        | Test Setup Layout .....                    | 50        |
| 8.4        | Measurement Equipment .....                | 50        |
| 8.5        | Test Result and Data .....                 | 51        |
| <b>9.</b>  | <b>Power Spectral Density .....</b>        | <b>64</b> |
| 9.1        | Test Limit.....                            | 64        |
| 9.2        | Test Procedure .....                       | 64        |
| 9.3        | Test Setup Layout .....                    | 64        |
| 9.4        | Measurement Equipment .....                | 64        |
| 9.5        | Test Result and Data .....                 | 65        |
| <b>10.</b> | <b>Restricted Bands of Operation .....</b> | <b>73</b> |
| 10.1       | Labeling Requirement .....                 | 73        |

## Document history

[illegible]



# FCC TEST REPORT

according to

## FCC CFR Title 47 Part 15 Subpart C

Applicant : Zhejiang Dahua Vision Technology Co., Ltd.

Address : The 1<sup>st</sup> floor, building F, No.1199 Bin'an road, Changhe  
Street, Binjiang District, Hangzhou, P.R. China.

Equipment : IP CAMERA

Model No. : DH-IPC-HFW1200S\*-W-xxxx, DH-IPC-HFW1200S\*-WS-xxxx,  
IPC-HFW1200S\*-W-xxxx, IPC-HFW1200S\*-WS-xxxx,  
DH-IPC-HFW1000S\*-W-xxxx, DH-IPC-HFW1000S\*-WS-xxxx,  
IPC-HFW1000S\*-W-xxxx, IPC-HFW1000S\*-WS-xxxx,  
("\*" can be P, N, or blank; "xxxx" can be 0360B or 0600B)

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 – 2009** and the energy emitted by this equipment was **passed** **CISPR PUB. 22 and FCC Part 15** in both radiated and conducted emission class B limits.  
Testing was carried out on Apr, 21, 2015 at **CerpPASS Technology Corp.**

Signature

Miro Chueh/ Technical director



## 1. Report of Measurements and Examinations

### 1.1 List of Measurements and Examinations

| FCC Rule                             | Description of Test                        | Result |
|--------------------------------------|--------------------------------------------|--------|
| 15.203                               | . Antenna Requirement                      | Pass   |
| 15.207                               | . Conducted Emission                       | Pass   |
| 15.209<br>15.247(d)                  | . Radiated Emission                        | Pass   |
| 15.247(a)(2)                         | . 6dB Bandwidth                            | Pass   |
| 15.247(b)                            | . Maximum Peak Output Power                | Pass   |
| 15.247(d)                            | . 100kHz Bandwidth of Frequency Band Edges | Pass   |
| 15.247(e)                            | . Power Spectral Density                   | Pass   |
| 1.1307<br>1.1310<br>2.1091<br>2.1093 | . RF Exposure Compliance                   | Pass   |



## 2. Test Configuration of Equipment under Test

### 2.1 Feature of Equipment under Test

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Product Name:</b>      | IP CAMERA                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |
| <b>Model Name:</b>        | IPC-HFW1200S-W-0360B, IPC-HFW1000S-W-0360B                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |
| <b>Series Model:</b>      | DH-IPC-HFW1200S*-W-xxxx, DH-IPC-HFW1200S*-WS-xxxx,<br>IPC-HFW1200S*-W-xxxx, IPC-HFW1200S*-WS-xxxx,<br>DH-IPC-HFW1000S*-W-xxxx, DH-IPC-HFW1000S*-WS-xxxx,<br>IPC-HFW1000S*-W-xxxx, IPC-HFW1000S*-WS-xxxx,<br>("**" can be P, N, or blank); "xxxx" can be 0360B or 0600B                                                                                                                                                                                                        |                            |
| <b>Model Discrepancy:</b> | <ol style="list-style-type: none"><li>1) "**" can be P, N, or blank (different software formats); "xxxx" can be 0360B or 0600B (different lens).</li><li>2) IPC-HFW1200S-W uses the main chip of 368 platform with sensor AR0330; IPC-HFW1000S-W uses the main chip of Hisilicon with sensor OV9712.</li><li>3) The difference between IPC-HFW1X00S-W and IPC-HFW1X00S-WS is SD card function; IPC-HFW1X00S-WS is equipped with SD card while IPC-HFW1X00S-W isn't.</li></ol> |                            |
| <b>Housing material:</b>  | Metal case                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |
| <b>Adapter</b>            | Model No.:                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ADS-12B-12 12012Gz         |
|                           | Input:                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 100-240V~50/60Hz 0.3A Max. |
|                           | Output:                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12V,1.0A                   |

Note: Please refer to user manual.



|                    |                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------|
| WLAN               |                                                                                                        |
| Spreading          | 802.11b: CCK, DQPSK, DBPSK<br>802.11g: 64 QAM, 16 QAM, QPSK, BPSK<br>802.11n: BPSK, QPSK, 16QAM, 64QAM |
| Frequency Range    | 802.11b/g/n(20MHz): 2412-2462MHz<br>802.11n(40MHz): 2422-2452MHz                                       |
| Number of Channels | 802.11b/g/n (20MHz): 11<br>802.11n (40MHz): 7                                                          |
| Data Rate          | 802.11b: 11, 5.5, 2, 1 Mbps<br>802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps<br>802.11n: up to 300Mbps    |
| Antenna            | Dipole Antenna 2.0 dBi                                                                                 |



## 2.2 Carrier Frequency of Channels

For 2.4G 802.11b, 802.11g, 802.11n (20MHz)

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---------|----------------|---------|----------------|
| 01      | 2412           | 07      | 2442           |
| 02      | 2417           | 08      | 2447           |
| 03      | 2422           | 09      | 2452           |
| 04      | 2427           | 10      | 2457           |
| 05      | 2432           | 11      | 2462           |
| 06      | 2437           | ---     | ---            |

For 2.4G 802.11n (40MHz)

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---------|----------------|---------|----------------|
| 01      | ---            | 08      | 2447           |
| 02      | ---            | 09      | 2452           |
| 03      | 2422           | ---     | ---            |
| 04      | 2427           | ---     | ---            |
| 05      | 2432           | ---     | ---            |
| 06      | 2437           | ---     | ---            |
| 07      | 2442           | ---     | ---            |

### The power level setting for 802.11b/g/n

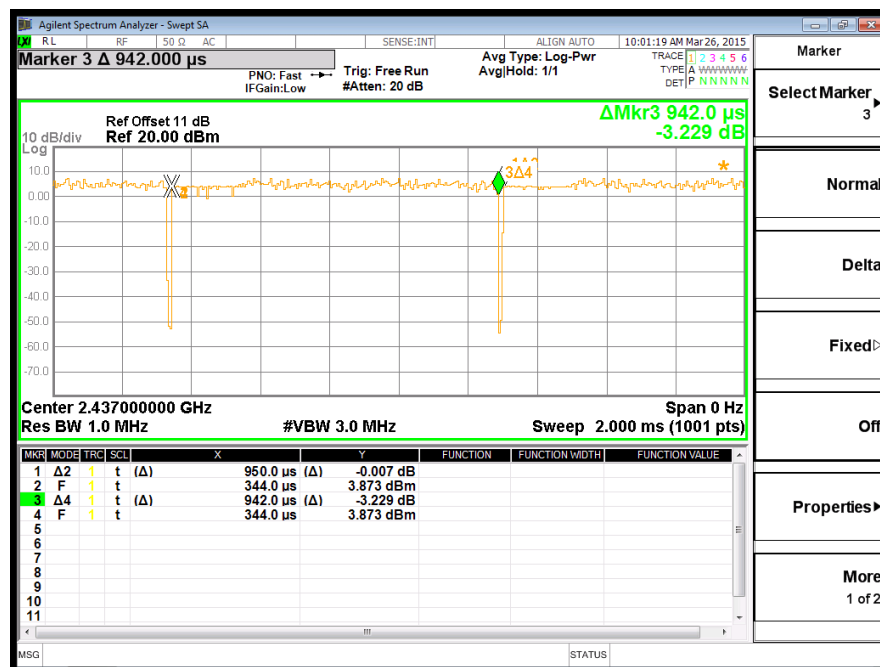
| Mode 1    | Frequency (MHz) | Setting |
|-----------|-----------------|---------|
| 802.11b   | 2412            | 40      |
|           | 2437            | 40      |
|           | 2462            | 40      |
| 802.11g   | 2412            | 26      |
|           | 2437            | 26      |
|           | 2462            | 26      |
| 802.11n20 | 2412            | 22      |
|           | 2437            | 22      |
|           | 2462            | 22      |
| 802.11n40 | 2422            | 14      |
|           | 2437            | 14      |
|           | 2452            | 14      |



|           |            |
|-----------|------------|
| Test Item | Duty cycle |
| Test Date | 2014-03-26 |

| Mode     | Frequency (MHz) | Measurement (%) |
|----------|-----------------|-----------------|
| b        | 2437            | 99              |
| g        | 2437            | 99              |
| n(20MHz) | 2437            | 99              |
| n(40MHz) | 2437            | 99              |

Transmit at channel 6 by 802.11b



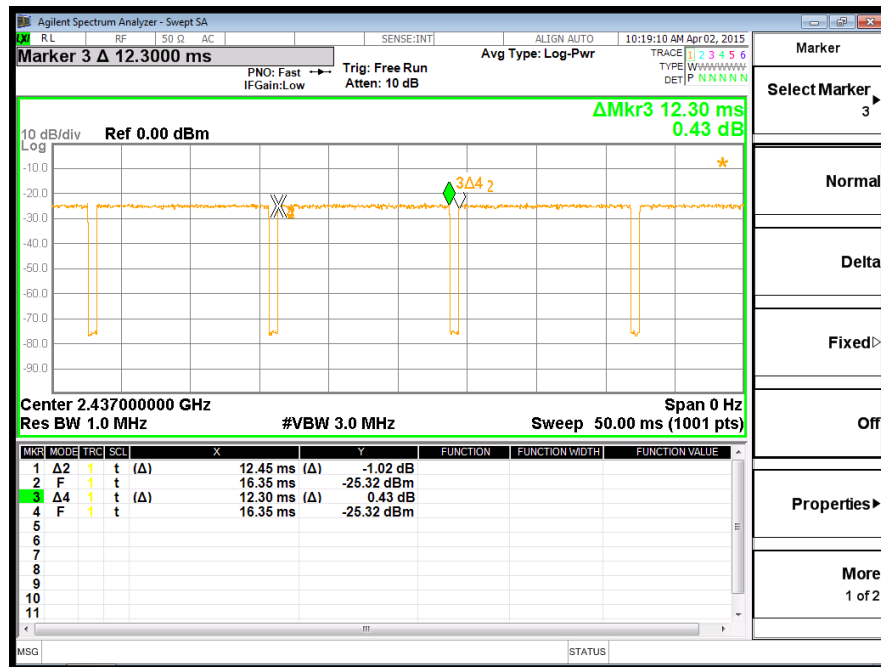


## Transmit at channel 6 by 802.11g

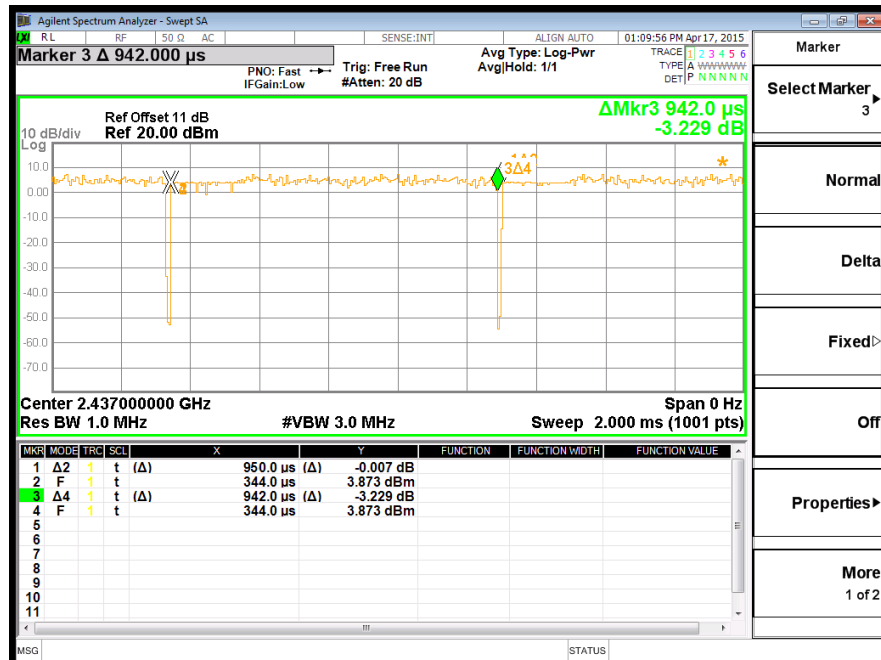




## Transmit at channel 6 by 802.11n(20MHz)



## Transmit at channel 6 by 802.11n(40MHz)





### 2.3 Test Manner

| Test Manner                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | During testing, the interface cables and equipment positions were varied according to 47 CFR, Part 2, Part 15 |
| b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Adjust the EUT at the test mode and the test channel. Then test.                                              |
| The test modes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                               |
| <p>The EUT transmitting and receiving with one antenna working at b/g/n mode.</p> <p>The chip set MT6627 supports 802.11 b/g/n configuration was finally used in this report.</p> <p>The worst-case data rates are determined to be as follows for each mode based on investigation by measuring the average power, peak power and PPSD across all data rates, bandwidths, and modulations.</p> <p>The worst-case data rates:</p> <p>IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.</p> <p>IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.</p> <p>IEEE 802.11n Standard-20 MHz Channel mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with MCS0 data rate were chosen for full testing.</p> <p>IEEE 802.11n Standard-40 MHz Channel mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with MCS0 data rate were chosen for full testing.</p> |                                                                                                               |

**2.4 Description of Test System**

| No | Device | Manufacturer | Model No. | Description |
|----|--------|--------------|-----------|-------------|
| 1  | N/A    | N/A          | N/A       | N/A         |

**Use Cable:**

| No. | Cable | Quantity | Description |
|-----|-------|----------|-------------|
| N/A | N/A   | N/A      | N/A         |



## 2.5 General Information of Test

|                            |                                                                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site:                 | CerpPASS Technology Corp.                                                                                                                                             |
| Performand Location :      | No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China                                                                                                  |
| NVLAP LAB Code :           | 200814-0                                                                                                                                                              |
| FCC Registration Number :  | 916572, 331395                                                                                                                                                        |
| IC Registration Number :   | 7290A-1, 7290A-2                                                                                                                                                      |
| VCCI Registration Number : | T-343 for Telecommunication Test<br>C-2919 for Conducted emission test<br>R-2670 for Radiated emission test below 1GHz<br>G-227 for Radiated emission test above 1GHz |

Laboratory accreditation

Laboratory Accreditation:

☐ CerpPASS Technology Corporation Test Laboratory



☒ CerpPASS Technology(SuZhou) Co., Ltd.



## 2.6 Measurement Uncertainty

| Measurement Item          | Measurement Frequency | Polarization | Uncertainty |
|---------------------------|-----------------------|--------------|-------------|
| Conducted Emission        | 9 kHz ~ 30 MHz        | LINE/NEUTRAL | ±2.71 dB    |
| Radiated Emission         | 30 MHz ~ 25GHz        | Vertical     | ±4.11 dB    |
|                           |                       | Horizontal   | ±4.10 dB    |
| Occupied Bandwidth        | ---                   | ---          | ±7500 Hz    |
| Maximum Peak Output Power | ---                   | ---          | ±1.4 dB     |
| Band Edges                | ---                   | ---          | ±2.2 dB     |
| Power Spectral Density    | ---                   | ---          | ±2.2 dB     |



### 3. Antenna Requirements

#### 3.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 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 FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

#### 3.2 Antenna Construction and Directional Gain

Antenna type: Dipole Antenna

Antenna Gain: 2.0 dBi



## 4. Test of Conducted Emission

### 4.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

| Frequency (MHz) | Quasi Peak (dB $\mu$ V) | Average (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.

### 4.2 Test Procedures

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

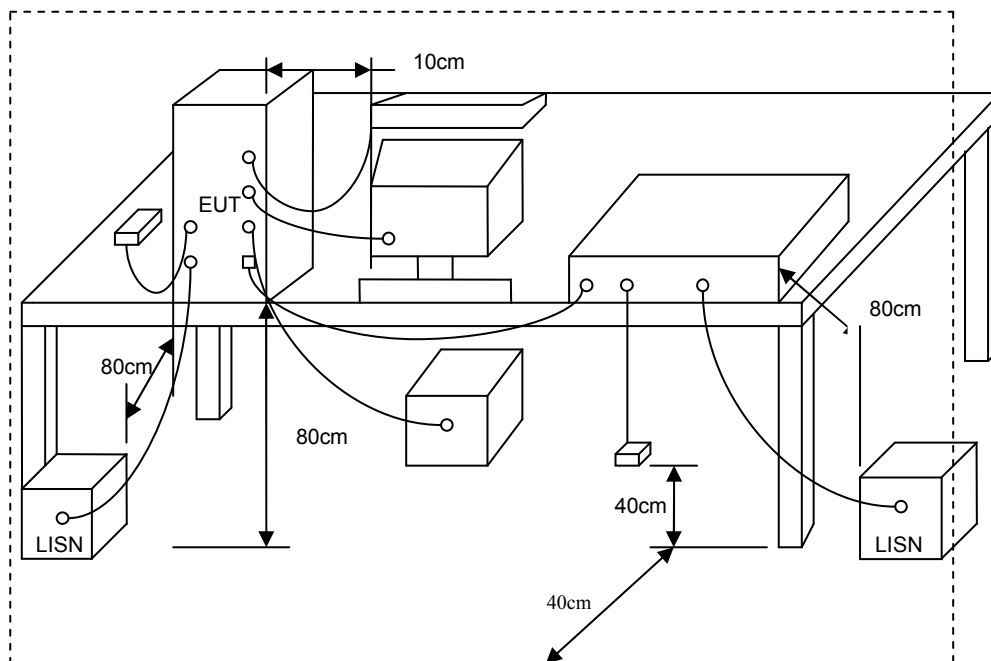
Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.



### 4.3 Typical Test Setup



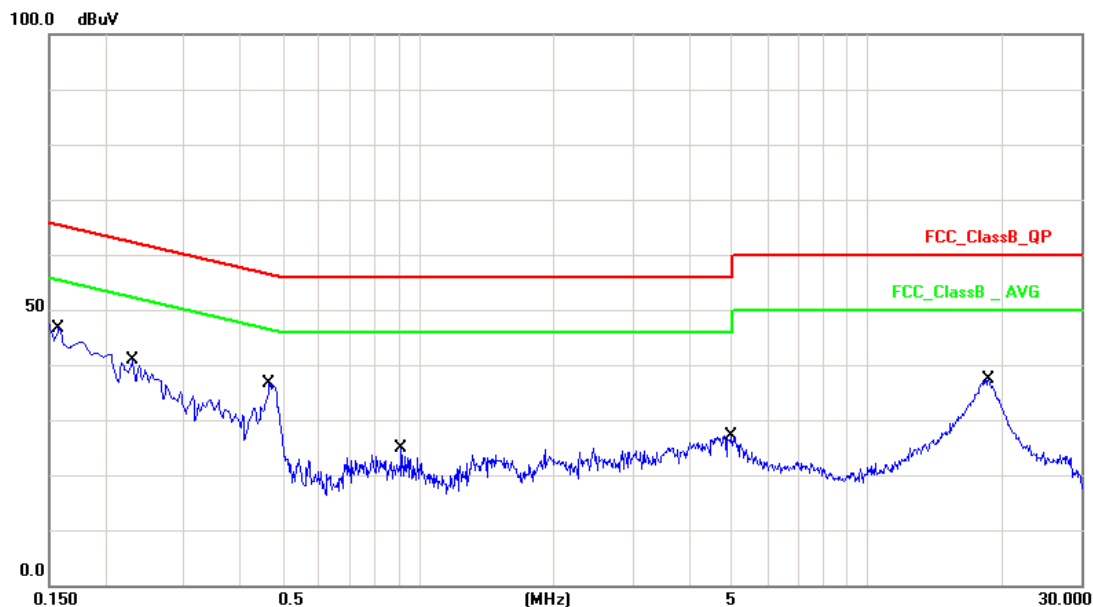
### 4.4 Measurement Equipment

| Instrument                     | Manufacturer | Model No.           | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|--------------|---------------------|------------|------------------|-------------|
| Test Receiver                  | R&S          | ESCI                | 100565     | 2015.03.24       | 2016.03.23  |
| AMN                            | R&S          | ESH2-Z5             | 100182     | 2014.09.04       | 2015.09.03  |
| Two-Line V-Network             | R&S          | ENV216              | 100325     | 2014.12.04       | 2015.12.03  |
| ISN                            | FCC          | FCC-TLISN-T<br>2-02 | 20379      | 2015.03.24       | 2016.03.23  |
| ISN                            | FCC          | FCC-TLISN-T<br>4-02 | 20380      | 2015.03.24       | 2016.03.23  |
| ISN                            | FCC          | FCC-TLISN-T<br>8-02 | 20381      | 2015.03.24       | 2016.03.23  |
| ISN                            | TESEQ        | ISN ST08            | 30175      | 2015.03.24       | 2016.03.23  |
| Current Probe                  | R&S          | EZ-17               | 100303     | 2015.04.04       | 2016.04.03  |
| Passive Voltage<br>Probe       | R&S          | ESH2-Z3             | 100026     | 2015.03.24       | 2016.03.23  |
| Pulse Limiter                  | R&S          | ESH3-Z2             | 100529     | 2015.03.24       | 2016.03.23  |
| Temperature/<br>Humidity Meter | Zhicheng     | ZC1-11              | CEP-TH-004 | 2015.03.31       | 2016.03.30  |



#### 4.5 Test Result and Data

|                  |                     |            |            |
|------------------|---------------------|------------|------------|
| Test Mode :      | Mode 1: Normal Link |            |            |
| AC Power :       | AC 120V/60Hz        | Phase :    | LINE       |
| Temperature :    | 26°C                | Humidity : | 60%        |
| Pressure(mbar) : | 1002                | Date :     | 2015/03/30 |

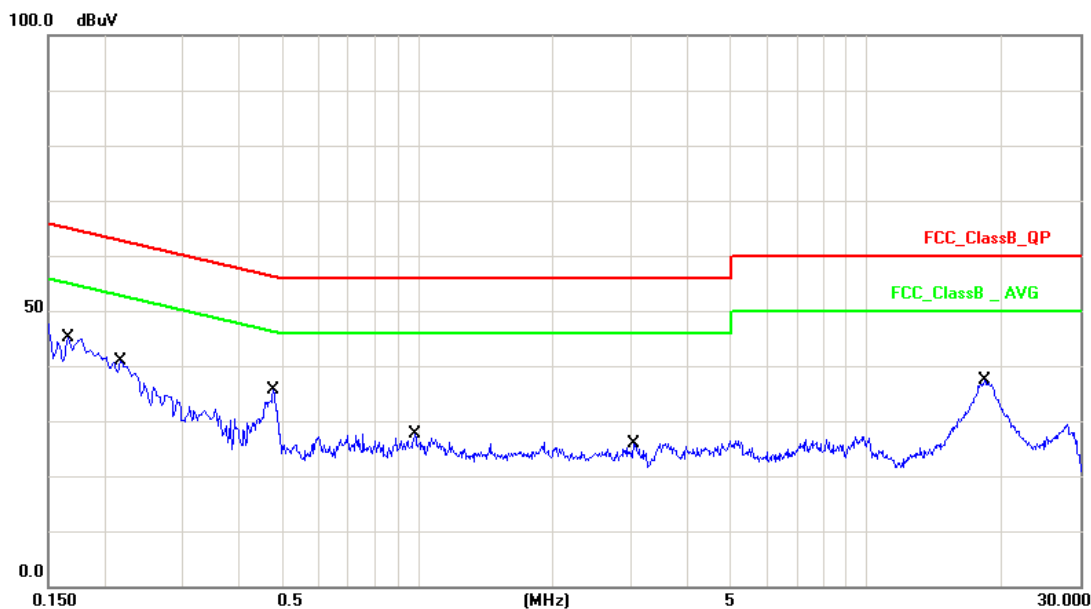


| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|
| 1   | 0.1580          | 10.13       | 29.37          | 39.50        | 65.56        | -26.06      | QP       |
| 2   | 0.1580          | 10.13       | 9.87           | 20.00        | 55.56        | -35.56      | AVG      |
| 3   | 0.2304          | 10.12       | 24.09          | 34.21        | 62.43        | -28.22      | QP       |
| 4   | 0.2304          | 10.12       | 10.77          | 20.89        | 52.43        | -31.54      | AVG      |
| 5   | 0.4660          | 10.16       | 22.86          | 33.02        | 56.58        | -23.56      | QP       |
| 6   | 0.4660          | 10.16       | 13.87          | 24.03        | 46.58        | -22.55      | AVG      |
| 7   | 0.9140          | 10.15       | 7.67           | 17.82        | 56.00        | -38.18      | QP       |
| 8   | 0.9140          | 10.15       | 1.16           | 11.31        | 46.00        | -34.69      | AVG      |
| 9   | 4.9820          | 10.24       | 9.44           | 19.68        | 56.00        | -36.32      | QP       |
| 10  | 4.9820          | 10.24       | 1.17           | 11.41        | 46.00        | -34.59      | AVG      |
| 11  | 18.6900         | 10.39       | 22.54          | 32.93        | 60.00        | -27.07      | QP       |
| 12  | 18.6900         | 10.39       | 15.43          | 25.82        | 50.00        | -24.18      | AVG      |

Note: Measurement Level = Reading Level + Correct Factor



|                  |                     |            |            |
|------------------|---------------------|------------|------------|
| Test Mode :      | Mode 1: Normal Link |            |            |
| AC Power :       | AC 120V/60Hz        | Phase :    | NEUTRAL    |
| Temperature :    | 26°C                | Humidity : | 60%        |
| Pressure(mbar) : | 1002                | Date :     | 2015/03/30 |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|
| 1   | 0.1660          | 10.13       | 30.18          | 40.31        | 65.16        | -24.85      | QP       |
| 2   | 0.1660          | 10.13       | 12.23          | 22.36        | 55.16        | -32.80      | AVG      |
| 3   | 0.2180          | 10.13       | 25.11          | 35.24        | 62.89        | -27.65      | QP       |
| 4   | 0.2180          | 10.13       | 11.85          | 21.98        | 52.89        | -30.91      | AVG      |
| 5   | 0.4780          | 10.15       | 20.02          | 30.17        | 56.37        | -26.20      | QP       |
| 6   | 0.4780          | 10.15       | 11.02          | 21.17        | 46.37        | -25.20      | AVG      |
| 7   | 0.9860          | 10.18       | 4.14           | 14.32        | 56.00        | -41.68      | QP       |
| 8   | 0.9860          | 10.18       | -0.62          | 9.56         | 46.00        | -36.44      | AVG      |
| 9   | 3.0260          | 10.20       | 4.14           | 14.34        | 56.00        | -41.66      | QP       |
| 10  | 3.0260          | 10.20       | -1.70          | 8.50         | 46.00        | -37.50      | AVG      |
| 11  | 18.3980         | 10.47       | 22.63          | 33.10        | 60.00        | -26.90      | QP       |
| 12  | 18.3980         | 10.47       | 15.45          | 25.92        | 50.00        | -24.08      | AVG      |

Note: Measurement Level = Reading Level + Correct Factor



## 5. Test of Radiated Emission

### 5.1 Test Limit

Radiated emissions from 9 KHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2003. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions. 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:

| FREQUENCIES(MHz) | FIELD STRENGTH<br>(microvolts/meter) | MEASUREMENT<br>DISTANCE(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                               |

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

| Frequency<br>(MHz) | Distance<br>Meters | Radiated<br>(dB $\mu$ V/ m) |
|--------------------|--------------------|-----------------------------|
| 30-230             | 10                 | 30                          |
| 230-1000           | 10                 | 37                          |

### 5.2 Test Procedures

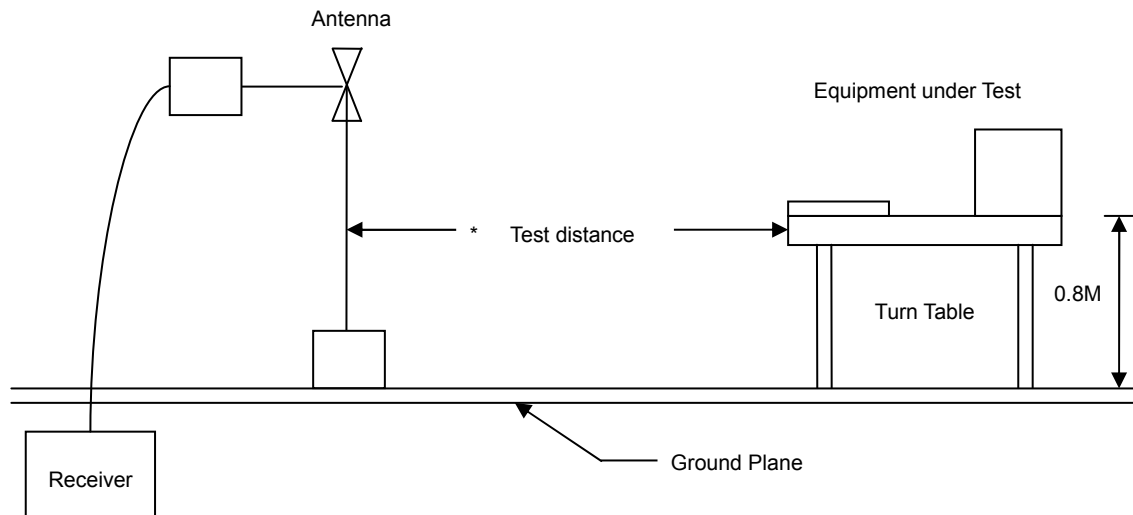
- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.



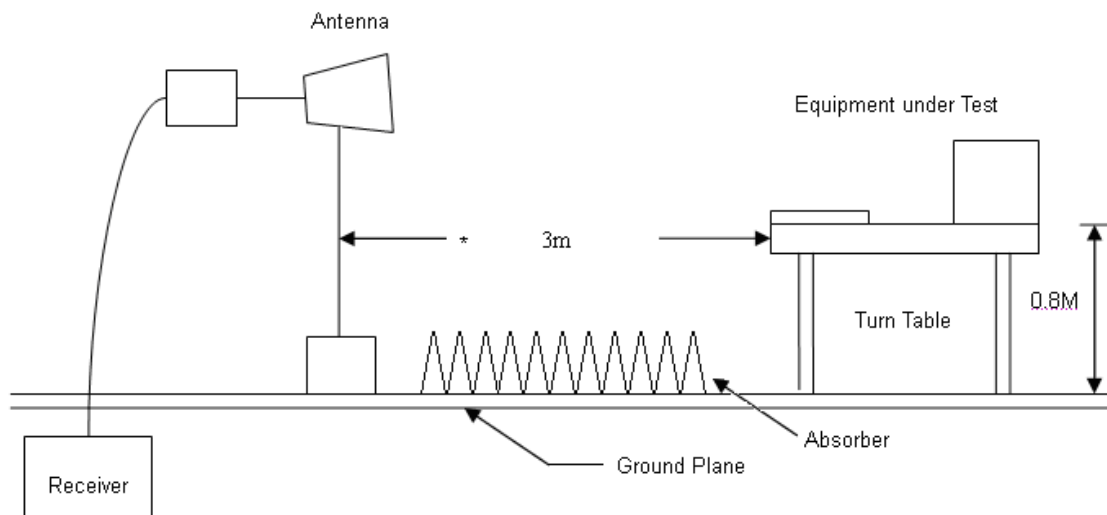
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 5.3 Typical Test Setup

#### Below 1GHz Test Setup



#### Above 1GHz Test Setup



**5.4 Measurement Equipment**

| Instrument                     | Model No.   | Manufacturer | Serial No. | Calibration Date | Valid Date |
|--------------------------------|-------------|--------------|------------|------------------|------------|
| EMI Test Receiver              | R&S         | ESCI         | 100563     | 2015.02.10       | 2016.02.09 |
| H64 Preamplifier               | HP          | 8447F        | 3113A05582 | 2015.03.24       | 2016.03.23 |
| Preamplifier                   | Agilent     | 8449B        | 3008A02342 | 2015.03.24       | 2016.03.23 |
| Ultra Broadband Antenna        | R&S         | HL562        | 100362     | 2014.05.24       | 2015.05.23 |
| Broad-Band Horn Antenna        | Schwarzbeck | BBHA9120D    | 9120D-619  | 2014.05.24       | 2015.05.23 |
| Broad-Band Horn Antenna        | Schwarzbeck | BBHA9170     | 9170-347   | 2014.05.24       | 2015.05.23 |
| Spectrum Analyzer              | R&S         | FSP40        | 100324     | 2015.03.23       | 2016.03.24 |
| Temperature/<br>Humidity Meter | Zhicheng    | ZC1-11       | CEP-TH-002 | 2015.03.31       | 2016.03.30 |



## 5.5 Test Result and Data

The 9kHz-30MHz spurious emission is under limit 20dB more.

### 5.5.1 Test Result and Data of Transmitter

Under 1G:

|                            |                              |
|----------------------------|------------------------------|
| Engineer :Wind             |                              |
| Site : EMC Lab AC 102      | Time : 2015-3-29             |
| Limit : FCC_CLASS_B_03M_QP | Margin : 6                   |
| EUT : IP CAMERA            | Probe : VERTICAL/ HORIZONTAL |
| Power : AC 120V/60Hz       | Note : Normal Link           |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 36.7899            | -7.68            | 35.69             | 28.01             | 40.00             | -11.99         | QP   | H              |
| 2   | 155.1299           | -13.57           | 41.80             | 28.23             | 40.00             | -11.77         | QP   | H              |
| 3   | 339.4300           | -9.11            | 35.12             | 26.01             | 47.00             | -20.99         | QP   | H              |
| 4   | 576.1100           | -7.68            | 33.70             | 26.02             | 47.00             | -20.98         | QP   | H              |
| 5   | 693.4800           | -6.18            | 28.96             | 22.78             | 47.00             | -24.22         | QP   | H              |
| 6   | 799.2100           | -4.72            | 29.01             | 24.29             | 47.00             | -22.71         | QP   | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 32.9100            | -7.00            | 34.34             | 27.34             | 40.00             | -12.66         | QP   | V              |
| 2   | 125.0600           | -13.82           | 41.61             | 27.79             | 40.00             | -12.21         | QP   | V              |
| 3   | 158.0399           | -13.51           | 36.05             | 22.54             | 40.00             | -17.46         | QP   | V              |
| 4   | 535.3700           | -8.56            | 31.34             | 22.78             | 47.00             | -24.22         | QP   | V              |
| 5   | 602.3000           | -6.88            | 31.37             | 24.49             | 47.00             | -22.51         | QP   | V              |
| 6   | 795.3300           | -4.66            | 27.80             | 23.14             | 47.00             | -23.86         | QP   | V              |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



Above 1G:

|                       |                                      |
|-----------------------|--------------------------------------|
| Engineer : Wind       |                                      |
| Site : EMC Lab AC 102 | Time : 2015-3-29                     |
| Limit : FCC_15_03M_PK | Margin : 6                           |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL         |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11b (2412MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4824.000           | 4.24             | 39.31             | 43.55             | 74.00             | -30.45         | peak | H              |
| 2   | 4824.000           | 4.24             | 39.77             | 44.01             | 54.00             | -9.99          | AVG  | H              |
| 3   | 7236.000           | 8.74             | 40.49             | 49.23             | 74.00             | -24.77         | peak | H              |
| 4   | 7236.000           | 8.74             | 35.22             | 43.96             | 54.00             | -10.04         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4824.000           | 4.24             | 39.42             | 43.66             | 74.00             | -30.34         | peak | V              |
| 2   | 4824.000           | 4.24             | 39.26             | 43.50             | 54.00             | -10.50         | AVG  | V              |
| 3   | 7236.000           | 8.74             | 40.53             | 49.27             | 74.00             | -24.73         | peak | V              |
| 4   | 7236.000           | 8.74             | 34.11             | 42.85             | 54.00             | -11.15         | AVG  | V              |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                      |
|-----------------------|--------------------------------------|
| Engineer : Wind       |                                      |
| Site : EMC Lab AC 102 | Time : 2015-3-29                     |
| Limit : FCC_15_03M_PK | Margin : 6                           |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL         |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11b (2437MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 4.09             | 41.11             | 45.20             | 74.00             | -28.80         | peak | H              |
| 2   | 4874.000           | 4.09             | 37.13             | 41.22             | 54.00             | -12.78         | AVG  | H              |
| 3   | 7311.000           | 8.96             | 39.67             | 48.63             | 74.00             | -25.37         | peak | H              |
| 4   | 7311.000           | 8.96             | 33.61             | 42.57             | 54.00             | -11.43         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 4.09             | 39.39             | 43.48             | 74.00             | -30.52         | peak | V              |
| 2   | 4874.000           | 4.09             | 36.29             | 40.38             | 54.00             | -13.62         | AVG  | V              |
| 3   | 7311.000           | 8.96             | 39.60             | 48.56             | 74.00             | -25.44         | peak | V              |
| 4   | 7311.000           | 8.96             | 32.58             | 41.54             | 54.00             | -12.46         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                      |
|-----------------------|--------------------------------------|
| Engineer : Wind       |                                      |
| Site : EMC Lab AC 102 | Time : 2015-3-29                     |
| Limit : FCC_15_03M_PK | Margin : 6                           |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL         |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11b (2462MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4924.000           | 4.18             | 38.49             | 42.67             | 74.00             | -31.33         | peak | H              |
| 2   | 4924.000           | 4.18             | 38.48             | 42.66             | 54.00             | -11.34         | AVG  | H              |
| 3   | 7386.000           | 9.07             | 38.58             | 47.65             | 74.00             | -26.35         | peak | H              |
| 4   | 7386.000           | 9.07             | 32.27             | 41.34             | 54.00             | -12.66         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4924.000           | 4.18             | 38.01             | 42.19             | 74.00             | -31.81         | peak | V              |
| 2   | 4924.000           | 4.18             | 38.15             | 42.33             | 54.00             | -11.67         | AVG  | V              |
| 3   | 7386.000           | 9.07             | 40.38             | 49.45             | 74.00             | -24.55         | peak | V              |
| 4   | 7386.000           | 9.07             | 32.89             | 41.96             | 54.00             | -12.04         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                      |
|-----------------------|--------------------------------------|
| Engineer : Wind       |                                      |
| Site : EMC Lab AC 102 | Time : 2015-3-29                     |
| Limit : FCC_15_03M_PK | Margin : 6                           |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL         |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11g (2412MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4824.000           | 4.24             | 39.30             | 43.54             | 74.00             | -30.46         | peak | H              |
| 2   | 4824.000           | 4.24             | 40.11             | 44.35             | 54.00             | -9.65          | AVG  | H              |
| 3   | 7236.000           | 8.74             | 39.09             | 47.83             | 74.00             | -26.17         | peak | H              |
| 4   | 7236.000           | 8.74             | 34.41             | 43.15             | 54.00             | -10.85         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4824.000           | 4.24             | 39.29             | 43.53             | 74.00             | -30.47         | peak | V              |
| 2   | 4824.000           | 4.24             | 40.32             | 44.56             | 54.00             | -9.44          | AVG  | V              |
| 3   | 7236.000           | 8.74             | 40.26             | 49.00             | 74.00             | -25.00         | peak | V              |
| 4   | 7236.000           | 8.74             | 34.93             | 43.67             | 54.00             | -10.33         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                      |
|-----------------------|--------------------------------------|
| Engineer : Wind       |                                      |
| Site : EMC Lab AC 102 | Time : 2015-3-29                     |
| Limit : FCC_15_03M_PK | Margin : 6                           |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL         |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11g (2437MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 4.09             | 39.81             | 43.90             | 74.00             | -30.10         | peak | H              |
| 2   | 7311.000           | 8.96             | 39.03             | 47.99             | 74.00             | -26.01         | peak | H              |
| 3   | 4874.000           | 4.09             | 38.00             | 42.09             | 54.00             | -11.91         | AVG  | H              |
| 4   | 7311.000           | 8.96             | 32.86             | 41.82             | 54.00             | -12.18         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 4.09             | 40.30             | 44.39             | 74.00             | -29.61         | peak | V              |
| 2   | 4874.000           | 4.09             | 35.58             | 39.67             | 54.00             | -14.33         | AVG  | V              |
| 3   | 7311.000           | 8.96             | 39.26             | 48.22             | 74.00             | -25.78         | peak | V              |
| 4   | 7311.000           | 8.96             | 31.36             | 40.32             | 54.00             | -13.68         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                      |
|-----------------------|--------------------------------------|
| Engineer : Wind       |                                      |
| Site : EMC Lab AC 102 | Time : 2015-3-29                     |
| Limit : FCC_15_03M_PK | Margin : 6                           |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL         |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11g (2462MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4924.000           | 4.18             | 39.20             | 43.38             | 74.00             | -30.62         | peak | H              |
| 2   | 4924.000           | 4.18             | 37.17             | 41.35             | 54.00             | -12.65         | AVG  | H              |
| 3   | 7386.000           | 9.07             | 39.94             | 49.01             | 74.00             | -24.99         | peak | H              |
| 4   | 7386.000           | 9.07             | 33.50             | 42.57             | 54.00             | -11.43         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 4.09             | 39.80             | 43.89             | 74.00             | -30.11         | peak | V              |
| 2   | 4874.000           | 4.09             | 39.56             | 43.65             | 54.00             | -10.35         | AVG  | V              |
| 3   | 7386.000           | 9.07             | 38.50             | 47.57             | 74.00             | -26.43         | peak | V              |
| 4   | 7386.000           | 9.07             | 33.79             | 42.86             | 54.00             | -11.14         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                              |
|-----------------------|----------------------------------------------|
| Engineer : Wind       |                                              |
| Site : EMC Lab AC 102 | Time : 2015-3-29                             |
| Limit : FCC_15_03M_PK | Margin : 6                                   |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL                 |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11n (20MHz) (2412MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4824.000           | 4.24             | 39.30             | 43.54             | 74.00             | -30.46         | peak | H              |
| 2   | 4824.000           | 4.24             | 38.37             | 42.61             | 54.00             | -11.39         | AVG  | H              |
| 3   | 7236.000           | 8.74             | 39.09             | 47.83             | 74.00             | -26.17         | peak | H              |
| 4   | 7236.000           | 8.74             | 34.51             | 43.25             | 54.00             | -10.75         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4824.000           | 4.24             | 39.29             | 43.53             | 74.00             | -30.47         | peak | V              |
| 2   | 4824.000           | 4.24             | 38.34             | 42.58             | 54.00             | -11.42         | AVG  | V              |
| 3   | 7236.000           | 8.74             | 41.26             | 50.00             | 74.00             | -24.00         | peak | V              |
| 4   | 7236.000           | 8.74             | 32.28             | 41.02             | 54.00             | -12.98         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                              |
|-----------------------|----------------------------------------------|
| Engineer : Wind       |                                              |
| Site : EMC Lab AC 102 | Time : 2015-3-29                             |
| Limit : FCC_15_03M_PK | Margin : 6                                   |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL                 |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11n (20MHz) (2437MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 4.09             | 39.81             | 43.90             | 74.00             | -30.10         | peak | H              |
| 2   | 4874.000           | 4.09             | 40.23             | 44.32             | 54.00             | -9.68          | AVG  | H              |
| 3   | 7311.000           | 8.96             | 39.03             | 47.99             | 74.00             | -26.01         | peak | H              |
| 4   | 7311.000           | 8.96             | 34.92             | 43.88             | 54.00             | -10.12         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 4.09             | 39.80             | 43.89             | 74.00             | -30.11         | peak | V              |
| 2   | 4874.000           | 4.09             | 38.06             | 42.15             | 54.00             | -11.85         | AVG  | V              |
| 3   | 7311.000           | 8.96             | 41.76             | 50.72             | 74.00             | -23.28         | peak | V              |
| 4   | 7311.000           | 8.96             | 34.56             | 43.52             | 54.00             | -10.48         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                              |
|-----------------------|----------------------------------------------|
| Engineer : Wind       |                                              |
| Site : EMC Lab AC 102 | Time : 2015-3-29                             |
| Limit : FCC_15_03M_PK | Margin : 6                                   |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL                 |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11n (20MHz) (2462MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4924.000           | 4.18             | 38.70             | 42.88             | 74.00             | -31.12         | peak | H              |
| 2   | 4924.000           | 4.18             | 40.17             | 44.35             | 54.00             | -9.65          | AVG  | H              |
| 3   | 7386.000           | 9.07             | 39.94             | 49.01             | 74.00             | -24.99         | peak | H              |
| 4   | 7386.000           | 9.07             | 34.67             | 43.74             | 54.00             | -10.26         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4924.000           | 4.18             | 39.87             | 44.05             | 74.00             | -29.95         | peak | V              |
| 2   | 4924.000           | 4.18             | 38.43             | 42.61             | 54.00             | -11.39         | AVG  | V              |
| 3   | 7386.000           | 9.07             | 38.50             | 47.57             | 74.00             | -26.43         | peak | V              |
| 4   | 7386.000           | 9.07             | 34.47             | 43.54             | 54.00             | -10.46         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                              |
|-----------------------|----------------------------------------------|
| Engineer : Wind       |                                              |
| Site : EMC Lab AC 102 | Time : 2015-3-29                             |
| Limit : FCC_15_03M_PK | Margin : 6                                   |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL                 |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11n (40MHz) (2422MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4844.000           | 6.46             | 40.32             | 46.78             | 74.00             | -27.22         | peak | H              |
| 2   | 4844.000           | 6.46             | 37.42             | 43.88             | 54.00             | -10.12         | AVG  | H              |
| 3   | 7236.000           | 12.54            | 39.33             | 51.87             | 74.00             | -22.13         | peak | H              |
| 4   | 7236.000           | 12.54            | 34.21             | 46.75             | 54.00             | -7.25          | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4844.000           | 6.46             | 39.34             | 45.8              | 74.00             | -28.2          | peak | V              |
| 2   | 4844.000           | 6.46             | 32.09             | 38.55             | 54.00             | -15.45         | AVG  | V              |
| 3   | 7236.000           | 12.54            | 38.22             | 50.76             | 74.00             | -23.24         | peak | V              |
| 4   | 7236.000           | 12.54            | 35.32             | 47.86             | 54.00             | -6.14          | AVG  | V              |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                              |
|-----------------------|----------------------------------------------|
| Engineer : Wind       |                                              |
| Site : EMC Lab AC 102 | Time : 2015-3-29                             |
| Limit : FCC_15_03M_PK | Margin : 6                                   |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL                 |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11n (40MHz) (2437MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 6.54             | 39.43             | 45.97             | 74.00             | -28.03         | peak | H              |
| 2   | 4874.000           | 6.54             | 35.32             | 41.86             | 54.00             | -12.14         | AVG  | H              |
| 3   | 7311.000           | 12.72            | 40.43             | 53.15             | 74.00             | -20.85         | peak | H              |
| 4   | 7311.000           | 12.72            | 30.94             | 43.66             | 54.00             | -10.34         | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4874.000           | 6.54             | 41.03             | 47.57             | 74.00             | -26.43         | peak | V              |
| 2   | 4874.000           | 6.54             | 30.42             | 36.96             | 54.00             | -17.04         | AVG  | V              |
| 3   | 7311.000           | 12.72            | 40.44             | 53.16             | 74.00             | -20.84         | peak | V              |
| 4   | 7311.000           | 12.72            | 31.23             | 43.95             | 54.00             | -10.05         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



|                       |                                              |
|-----------------------|----------------------------------------------|
| Engineer : Wind       |                                              |
| Site : EMC Lab AC 102 | Time : 2015-3-29                             |
| Limit : FCC_15_03M_PK | Margin : 6                                   |
| EUT : IP CAMERA       | Probe : VERTICAL/ HORIZONTAL                 |
| Power : AC 120V/60Hz  | Note : Transmit by 802.11n (40MHz) (2452MHz) |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4904.000           | 6.61             | 39.21             | 45.82             | 74.00             | -28.18         | peak | H              |
| 2   | 4904.000           | 6.61             | 33.69             | 40.3              | 54.00             | -13.7          | AVG  | H              |
| 3   | 7356.000           | 12.83            | 38.49             | 51.32             | 74.00             | -22.68         | peak | H              |
| 4   | 7356.000           | 12.83            | 32.3              | 45.13             | 54.00             | -8.87          | AVG  | H              |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 4904.000           | 6.61             | 40.89             | 47.5              | 74.00             | -26.50         | peak | V              |
| 2   | 4904.000           | 6.61             | 32.05             | 38.66             | 54.00             | -15.34         | AVG  | V              |
| 3   | 7356.000           | 12.83            | 40.08             | 52.91             | 74.00             | -21.09         | peak | V              |
| 4   | 7356.000           | 12.83            | 29.33             | 42.16             | 54.00             | -16.56         | AVG  | V              |

## Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor



## 6. Occupied Bandwidth

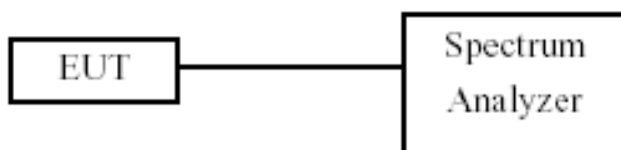
### 6.1 Test Limit

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725- 5850 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.

### 6.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 1~5% of the emission bandwidth and  $VBW \geq 3 \times RBW$ .
- The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
- The 6dB Bandwidth was measured and recorded.

### 6.3 Test Setup Layout



### 6.4 Measurement Equipment

| Instrument/Ancillary | Model No. | Manufacturer | Serial No. | Calibration Date | Valid Date |
|----------------------|-----------|--------------|------------|------------------|------------|
| Spectrum Analyzer    | N9010A    | Agilent      | MY51350515 | 2014.11.03       | 2015.11.03 |

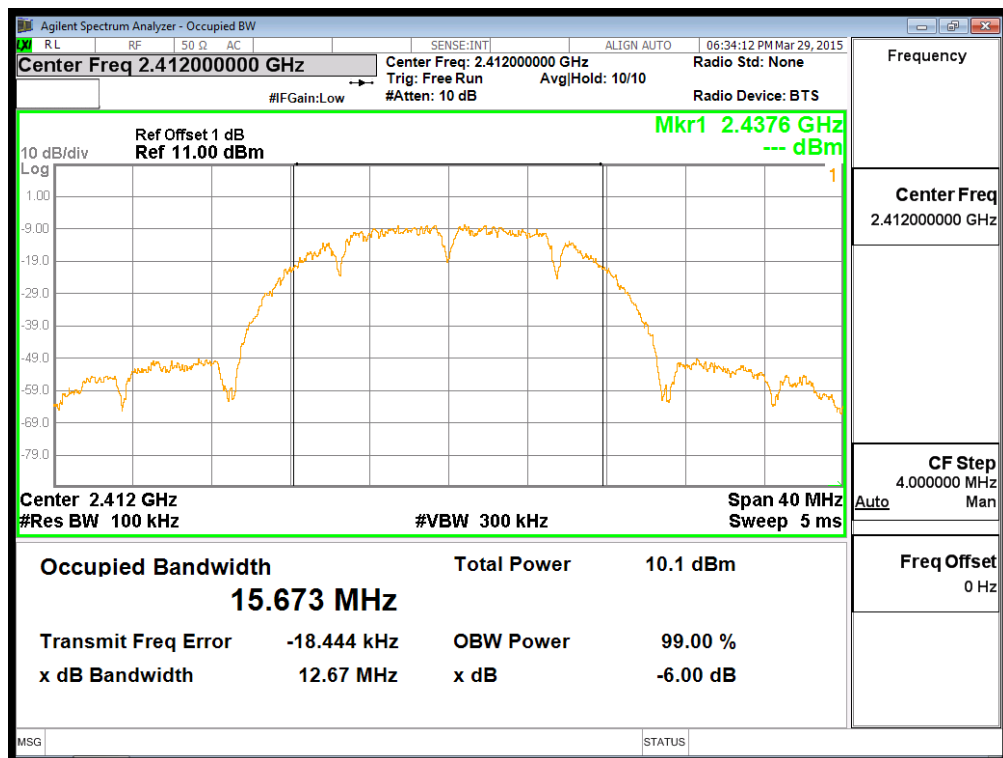


## 6.5 Test Result and Data

|           |                     |
|-----------|---------------------|
| Test Item | Occupied Bandwidth  |
| Test Mode | Transmit by 802.11b |
| Test Date | 2015-3-29           |

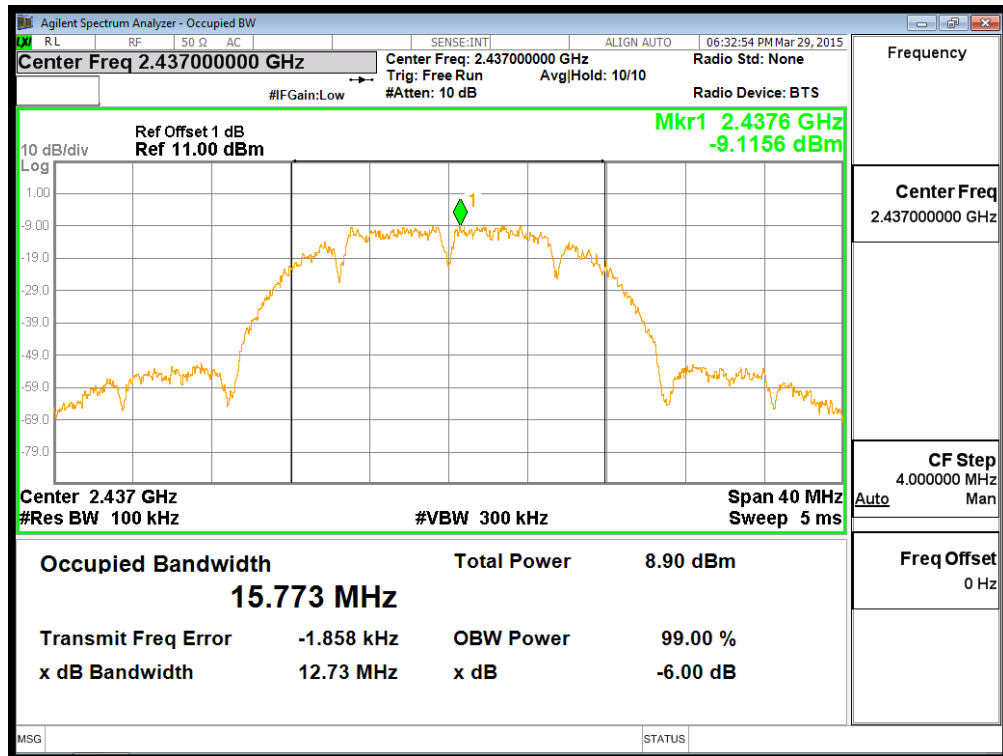
| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 01          | 2412            | 12670                   | 500                  | Pass   |
| 06          | 2437            | 12730                   | 500                  | Pass   |
| 11          | 2462            | 12660                   | 500                  | Pass   |

Channel 01 (2412MHz)

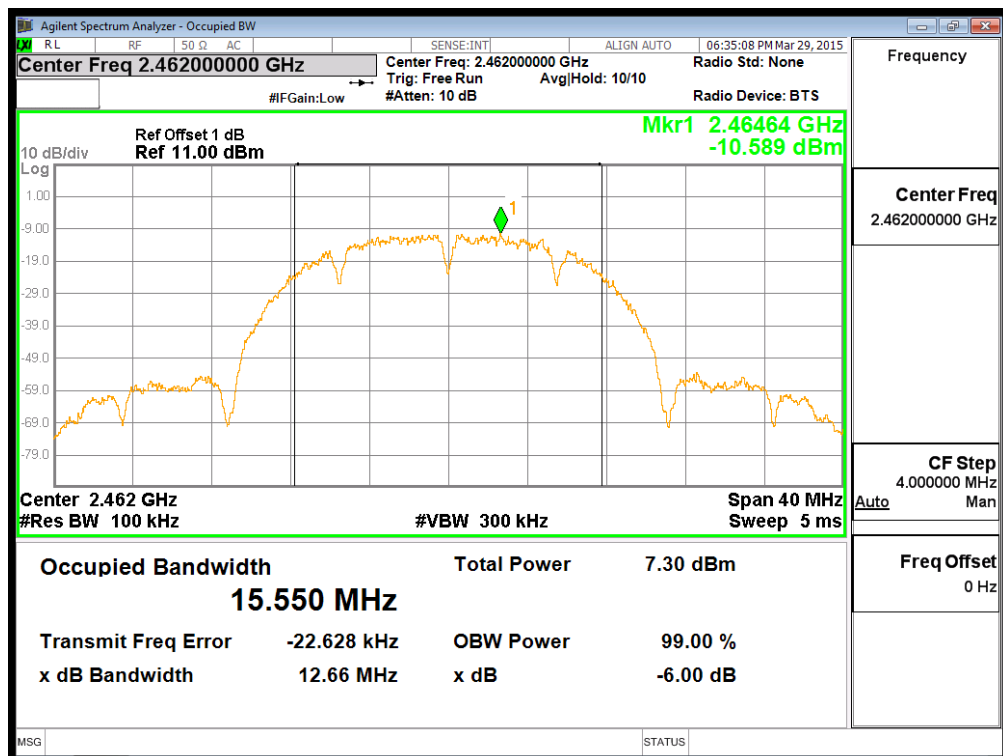




## Channel 06 (2437MHz)



## Channel11(2462MHz)

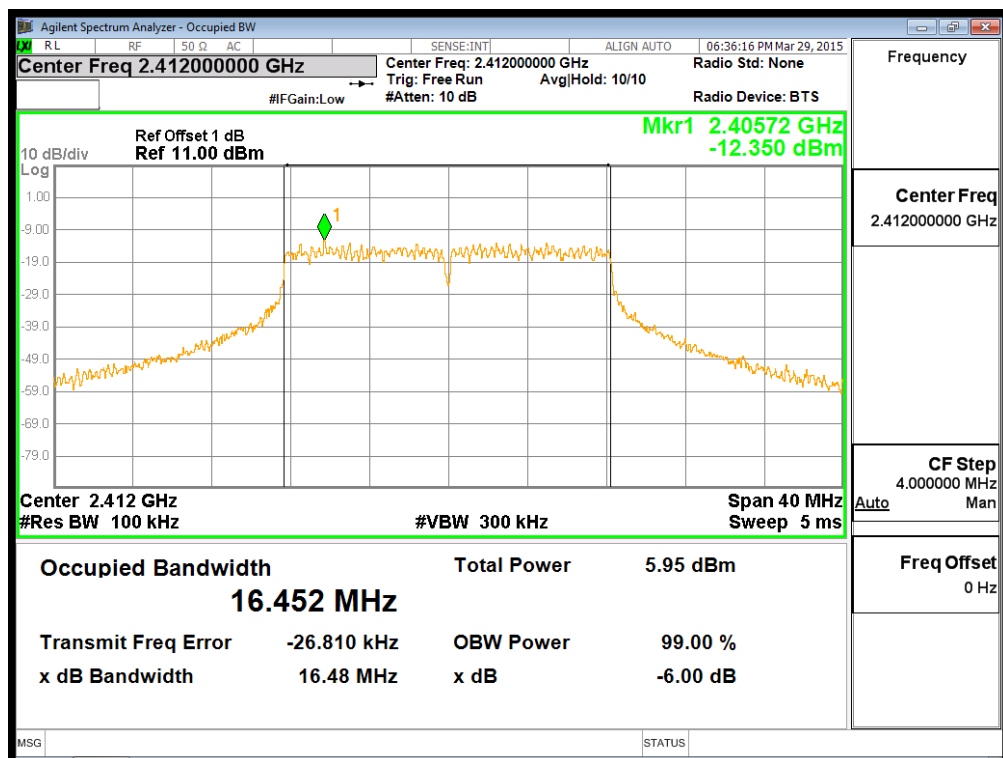




|           |                     |
|-----------|---------------------|
| Test Item | Occupied Bandwidth  |
| Test Mode | Transmit by 802.11g |
| Test Date | 2015-3-29           |

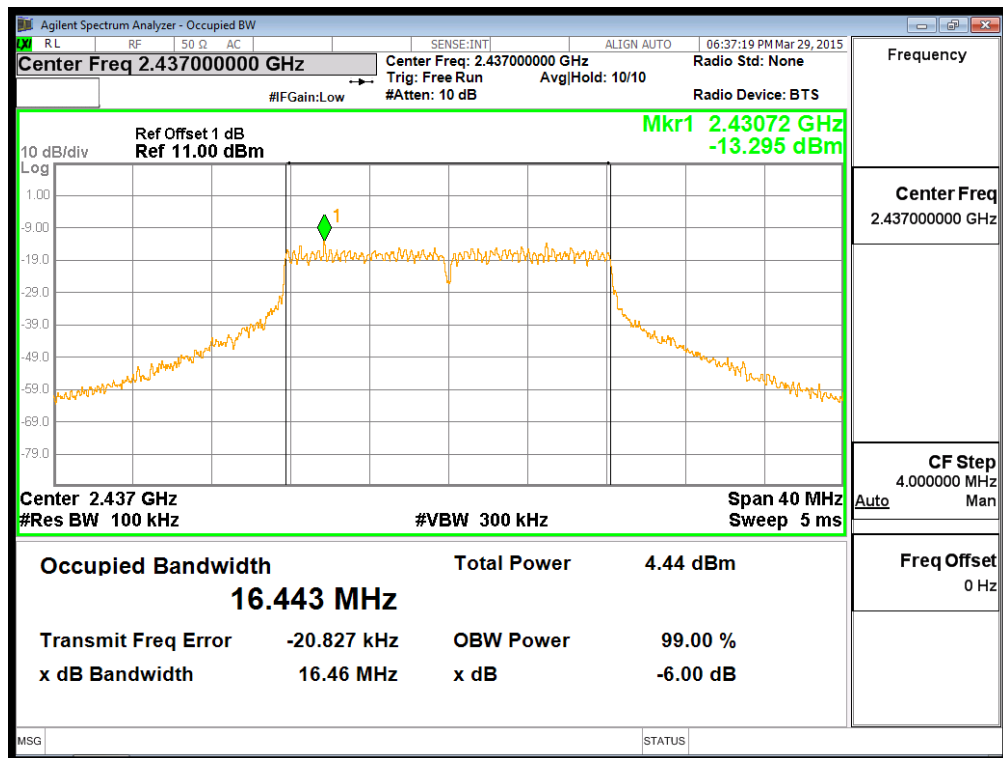
| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 01          | 2412            | 16480                   | 500                  | Pass   |
| 06          | 2437            | 16460                   | 500                  | Pass   |
| 11          | 2462            | 16500                   | 500                  | Pass   |

Channel 01 (2412MHz)

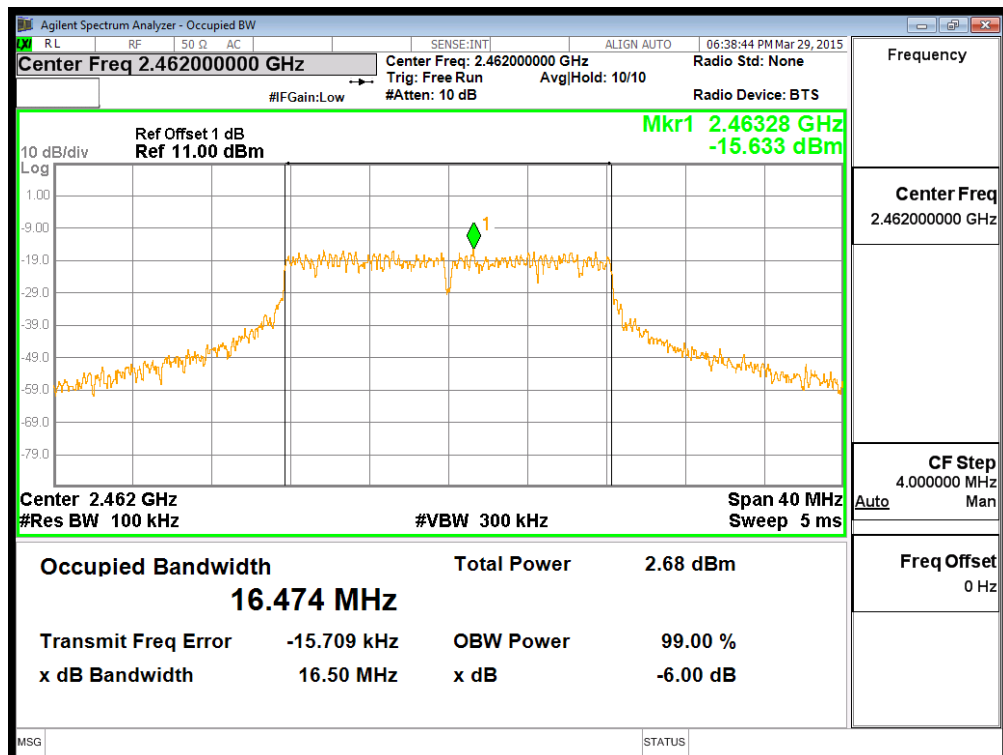




## Channel 06 (2437MHz)



## Channel 11 (2462MHz)

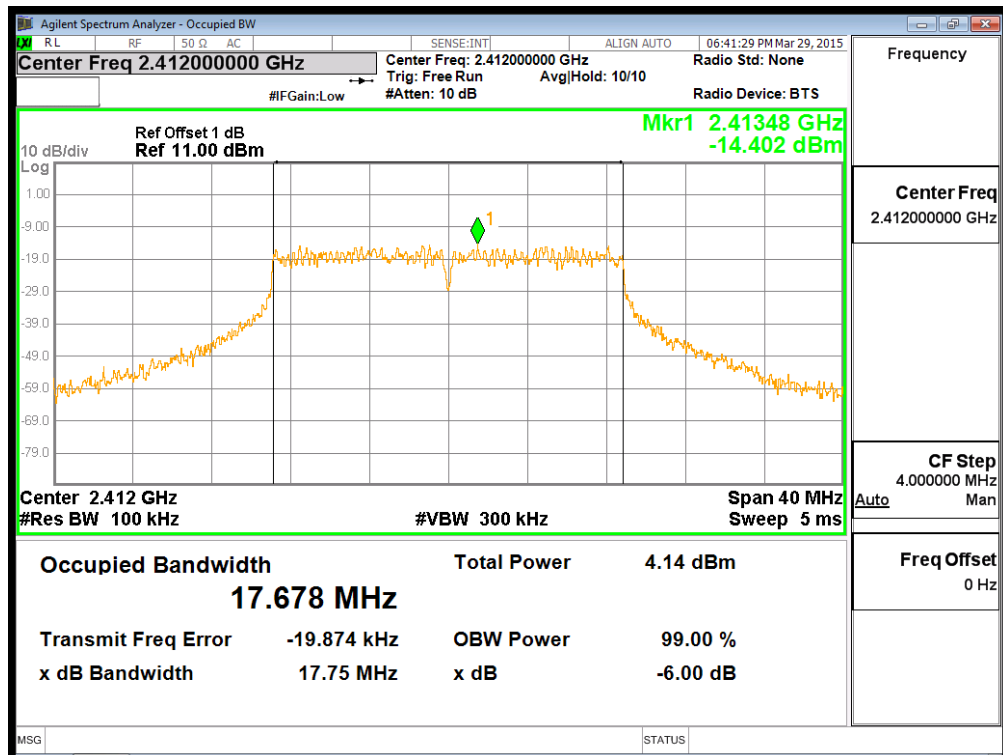




|           |                             |
|-----------|-----------------------------|
| Test Item | Occupied Bandwidth          |
| Test Mode | Transmit by 802.11n (20MHz) |
| Test Date | 2015-3-29                   |

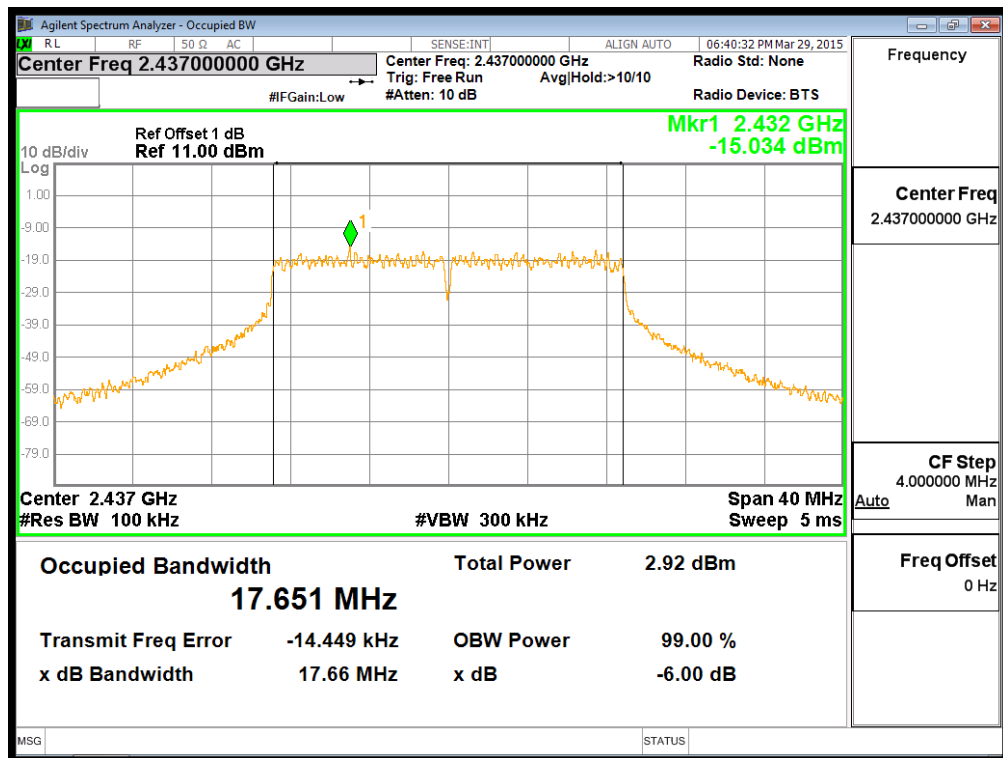
| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 01          | 2412            | 17750                   | 500                  | Pass   |
| 06          | 2437            | 17660                   | 500                  | Pass   |
| 11          | 2462            | 17700                   | 500                  | Pass   |

Channel 01 (2412MHz)

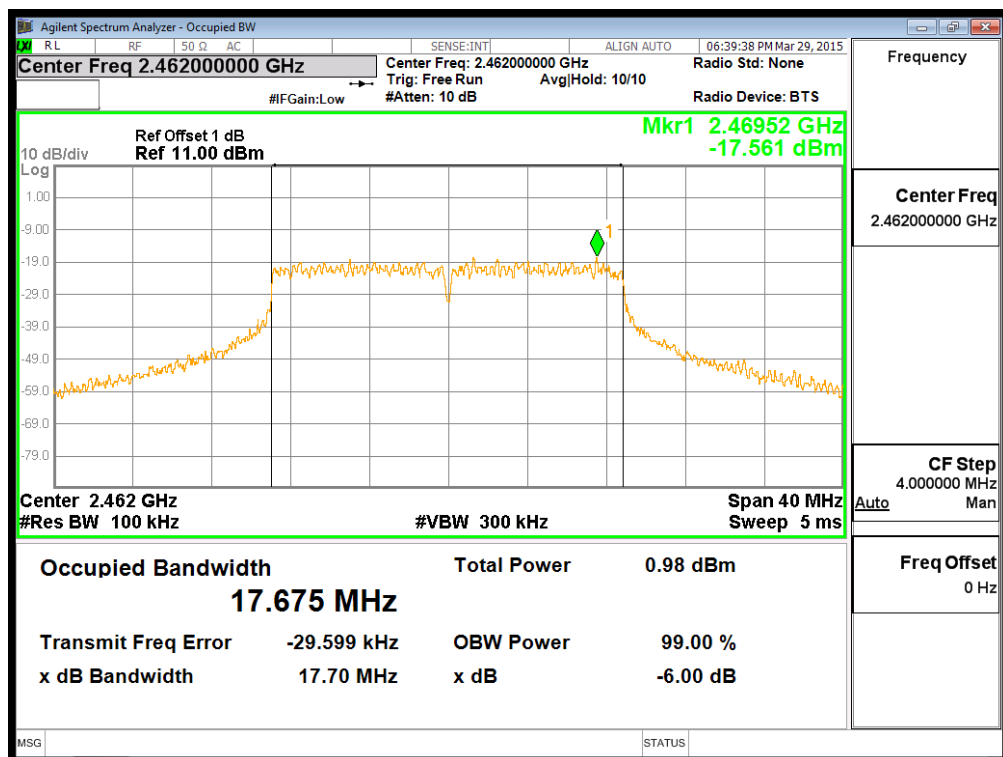




## Channel 06 (2437MHz)



## Channel 11 (2462MHz)

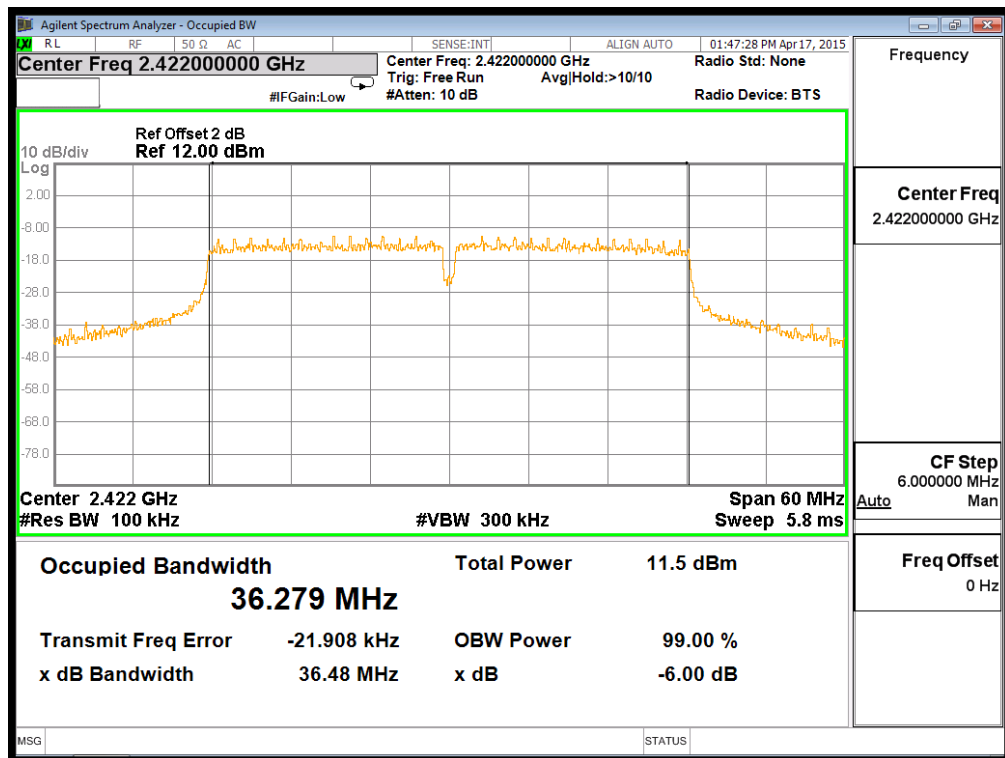




|           |                             |
|-----------|-----------------------------|
| Test Item | Occupied Bandwidth          |
| Test Mode | Transmit by 802.11n (40MHz) |
| Test Date | 2015-4-17                   |

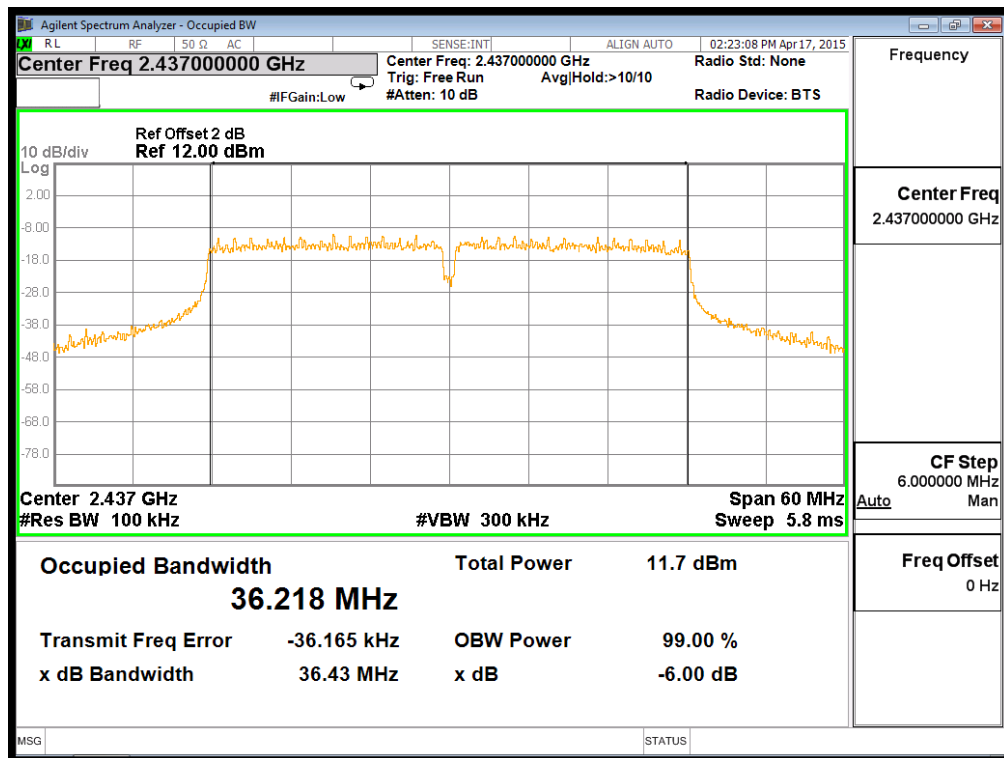
| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 03          | 2422            | 36480                   | 500                  | Pass   |
| 06          | 2437            | 36430                   | 500                  | Pass   |
| 09          | 2452            | 36510                   | 500                  | Pass   |

Channel 3 (2422MHz)

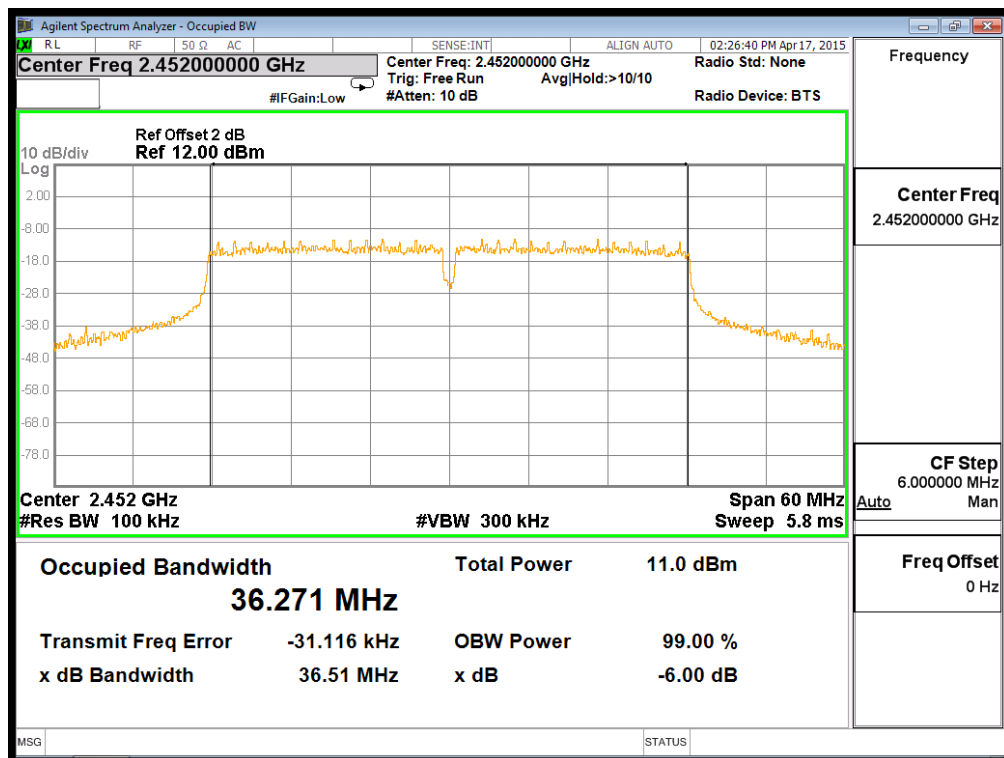




## Channel 6 (2437MHz)



## Channel 9 (2452MHz)





## 7. Maximum Peak Output Power

### 7.1 Test Limit

The maximum peak power shall be less 1Watt (30dBm).

The conducted output power limits specified in §15.247(b) are based on the use of transmit antennae with directional gains that do not exceed 6 dBi. If transmit antennae with an effective directional gain greater than 6 dBi are used, then the conducted output power from the EUT shall be reduced as specified in §15.247(b) and (c).

### 7.2 Test Procedure

The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 D01 DTS Meas Guidance v03r02 section 9.1.2 Peak power meter method.

### 7.3 Test Setup Layout



### 7.4 Measurement Equipment

| Instrument/Ancillary | Model No. | Manufacturer | Serial No. | Calibration Date | Valid Date |
|----------------------|-----------|--------------|------------|------------------|------------|
| SERIES POWER METER   | ANRITSU   | ML2495A      | 1224005    | 2015/03/27       | 2016/03/26 |
| POWER SENSOR         | ANRITSU   | MA2411B      | 1207295    | 2015/03/27       | 2016/03/26 |



## 7.5 Test Result and Data

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (blue marker) for final test of each channel.

| MCS Index<br>for<br>802.11n | Spatial<br>Streams | Data Rate (Mbps) |         |                 |          |                 |          |
|-----------------------------|--------------------|------------------|---------|-----------------|----------|-----------------|----------|
|                             |                    | 802.11b          | 802.11g | 20MHz Bandwidth |          | 40MHz Bandwidth |          |
|                             |                    |                  |         | 800ns GI        | 400ns GI | 800ns<br>GI     | 400ns GI |
| 0                           | 1                  | 1                | 6       | 6.5             | 7.2      | 13.5            | 15.0     |
| 1                           | 1                  | 2                | 9       | 13.0            | 14.4     | 27.0            | 30.0     |
| 2                           | 1                  | 5.5              | 12      | 19.5            | 21.7     | 40.5            | 45.0     |
| 3                           | 1                  | 11               | 18      | 26.0            | 28.9     | 54.0            | 60.0     |
| 4                           | 1                  | --               | 24      | 39.0            | 43.3     | 81.0            | 90.0     |
| 5                           | 1                  | --               | 36      | 52.0            | 57.8     | 108.0           | 120.0    |
| 6                           | 1                  | --               | 48      | 58.5            | 65.0     | 121.5           | 135.0    |
| 7                           | 1                  | --               | 54      | 65.0            | 72.2     | 135.0           | 150.0    |
| 8                           | 2                  | --               | --      | 13.0            | 14.4     | 27.0            | 30.0     |
| 9                           | 2                  | --               | --      | 26.0            | 28.9     | 54.0            | 60.0     |
| 10                          | 2                  | --               | --      | 39.0            | 43.3     | 81.0            | 90.0     |
| 11                          | 2                  | --               | --      | 52.0            | 57.8     | 108.0           | 120.0    |
| 12                          | 2                  | --               | --      | 78.0            | 86.7     | 162.0           | 180.0    |
| 13                          | 2                  | --               | --      | 104.0           | 115.6    | 216.0           | 240.0    |
| 14                          | 2                  | --               | --      | 117.0           | 130.0    | 243.0           | 270.0    |
| 15                          | 2                  | --               | --      | 130.0           | 144.0    | 270.0           | 300.0    |



|            |                           |
|------------|---------------------------|
| Test Item  | Maximum Peak Output Power |
| Test Mode  | Transmit by 802.11b       |
| Duty cycle | 99%                       |
| Test Date  | 2015-3-29                 |

| Channel No. | Frequency<br>(MHz) | Measurement (dBm) | Required Limit<br>(dBm) | Result |
|-------------|--------------------|-------------------|-------------------------|--------|
|             |                    | Peak              |                         |        |
| 01          | 2412               | 13.04             | 30                      | Pass   |
| 06          | 2437               | 11.98             | 30                      | Pass   |
| 11          | 2462               | 10.56             | 30                      | Pass   |

|            |                           |
|------------|---------------------------|
| Test Item  | Maximum Peak Output Power |
| Test Mode  | Transmit by 802.11g       |
| Duty cycle | 99%                       |
| Test Date  | 2015-3-29                 |

| Channel No. | Frequency<br>(MHz) | Measurement (dBm) | Required Limit<br>(dBm) | Result |
|-------------|--------------------|-------------------|-------------------------|--------|
|             |                    | Peak              |                         |        |
| 01          | 2412               | 15.27             | 30                      | Pass   |
| 06          | 2437               | 14.30             | 30                      | Pass   |
| 11          | 2462               | 12.22             | 30                      | Pass   |

|            |                             |
|------------|-----------------------------|
| Test Item  | Maximum Peak Output Power   |
| Test Mode  | Transmit by 802.11n (20MHz) |
| Duty cycle | 99%                         |
| Test Date  | 2015-3-29                   |

| Channel No. | Frequency<br>(MHz) | Measurement (dBm) | Required Limit<br>(dBm) | Result |
|-------------|--------------------|-------------------|-------------------------|--------|
|             |                    | Peak              |                         |        |
| 01          | 2412               | 13.60             | 30                      | Pass   |
| 06          | 2437               | 12.49             | 30                      | Pass   |
| 11          | 2462               | 10.43             | 30                      | Pass   |



|            |                             |
|------------|-----------------------------|
| Test Item  | Maximum Peak Output Power   |
| Test Mode  | Transmit by 802.11n (40MHz) |
| Duty cycle | 99%                         |
| Test Date  | 2015-4-17                   |

| Channel No. | Frequency<br>(MHz) | Measurement (dBm) | Required Limit<br>(dBm) | Result |
|-------------|--------------------|-------------------|-------------------------|--------|
|             |                    | Peak              |                         |        |
| 01          | 2412               | 11.14             | 30                      | Pass   |
| 06          | 2437               | 11.21             | 30                      | Pass   |
| 11          | 2462               | 10.61             | 30                      | Pass   |



## 8. Band Edges Measurement

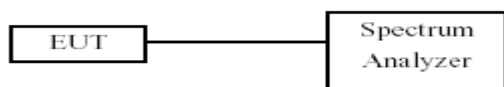
### 8.1 Test Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 8.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer via a low loss cable.
- Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- The band edges was measured and recorded.

### 8.3 Test Setup Layout



### 8.4 Measurement Equipment

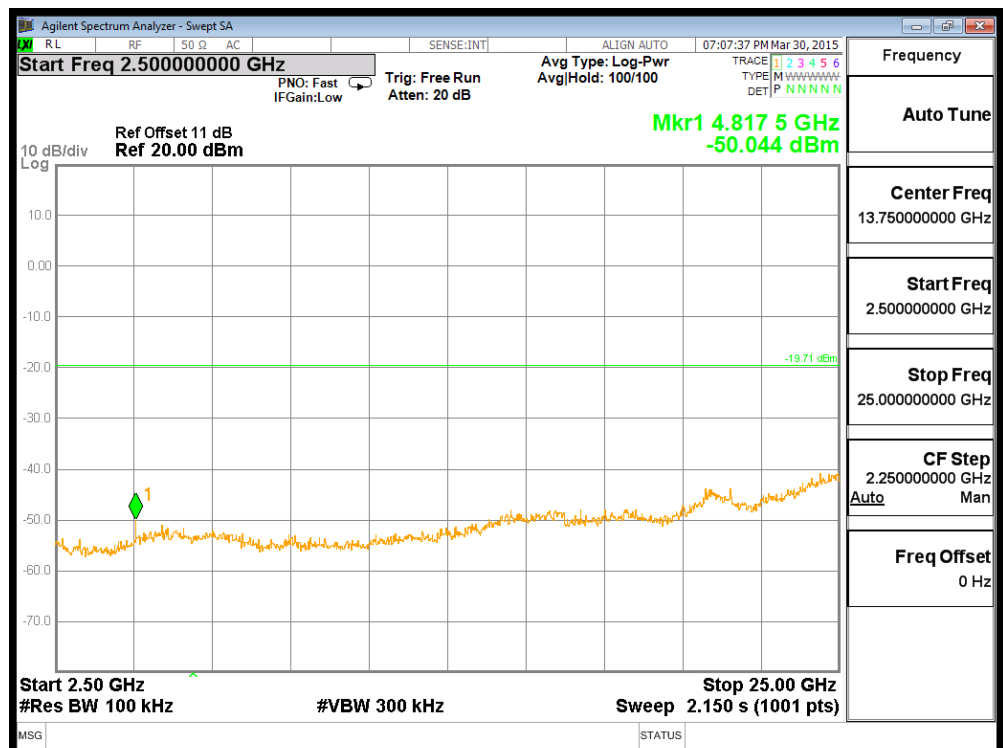
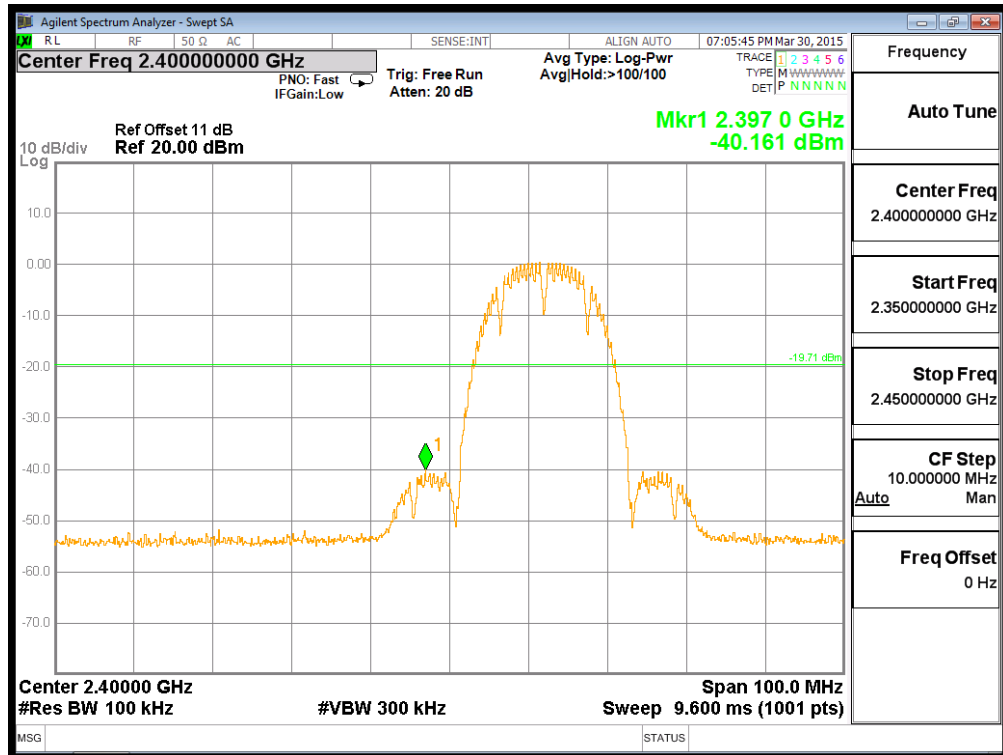
| Instrument/Ancillary | Model No. | Manufacturer | Serial No. | Calibration Date | Valid Date |
|----------------------|-----------|--------------|------------|------------------|------------|
| Spectrum Analyzer    | N9010A    | Agilent      | MY51350515 | 2014.11.03       | 2015.11.03 |

**8.5 Test Result and Data**

| Modulation Standard | Channel | Frequency (MHz) | maximum value in frequency (MHz) | maximum value(dBm) | Limit (dBm) |
|---------------------|---------|-----------------|----------------------------------|--------------------|-------------|
| 802.11b             | 01      | 2412            | 2397.00                          | -40.161            | -13.60      |
|                     | 11      | 2462            | 2483.50                          | -52.425            | -18.70      |
| 802.11g             | 01      | 2412            | 2400.00                          | -28.739            | -20.79      |
|                     | 11      | 2462            | 2483.50                          | -55.121            | -25.80      |
| 802.11n HT20        | 01      | 2412            | 2400.00                          | -44.014            | -31.50      |
|                     | 11      | 2462            | 2483.50                          | -59.523            | -30.30      |
| 802.11n HT40        | 03      | 2422            | 2496.5                           | -44.660            | -11.03      |
|                     | 09      | 2452            | 2484.5                           | -40.251            | -11.83      |

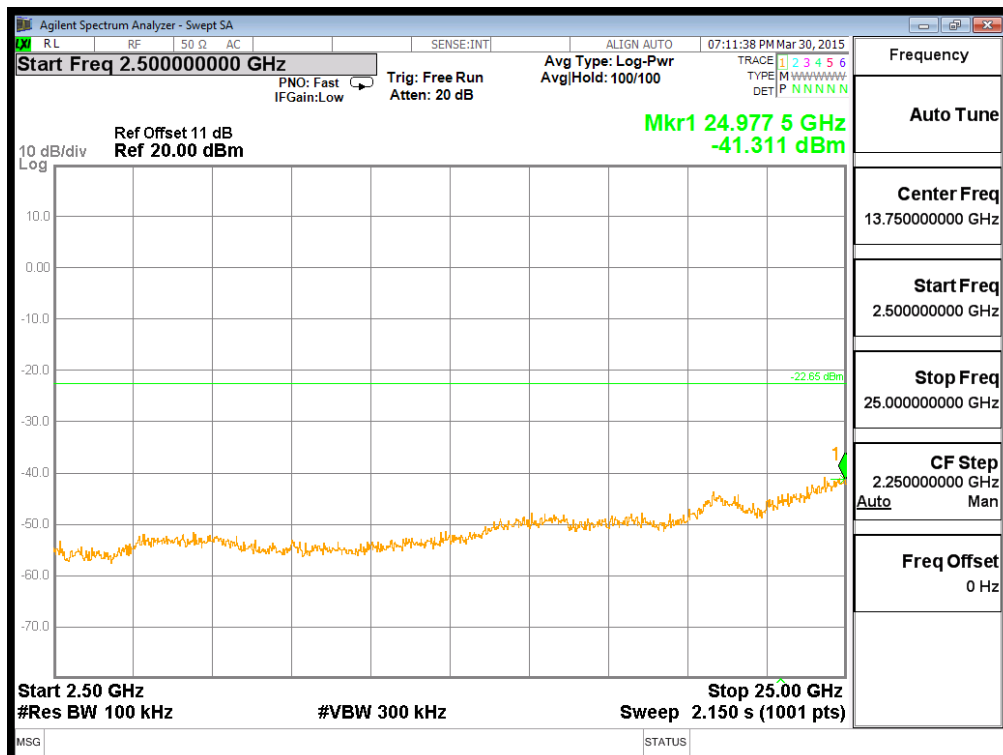
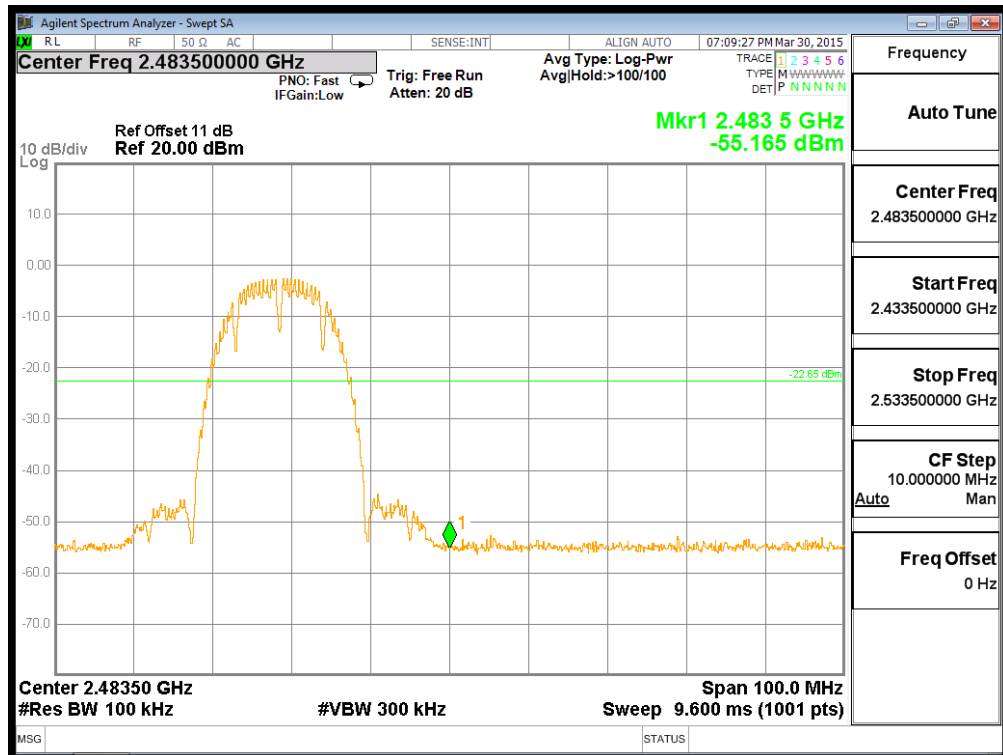


## Transmit by 802.11b Channel 1



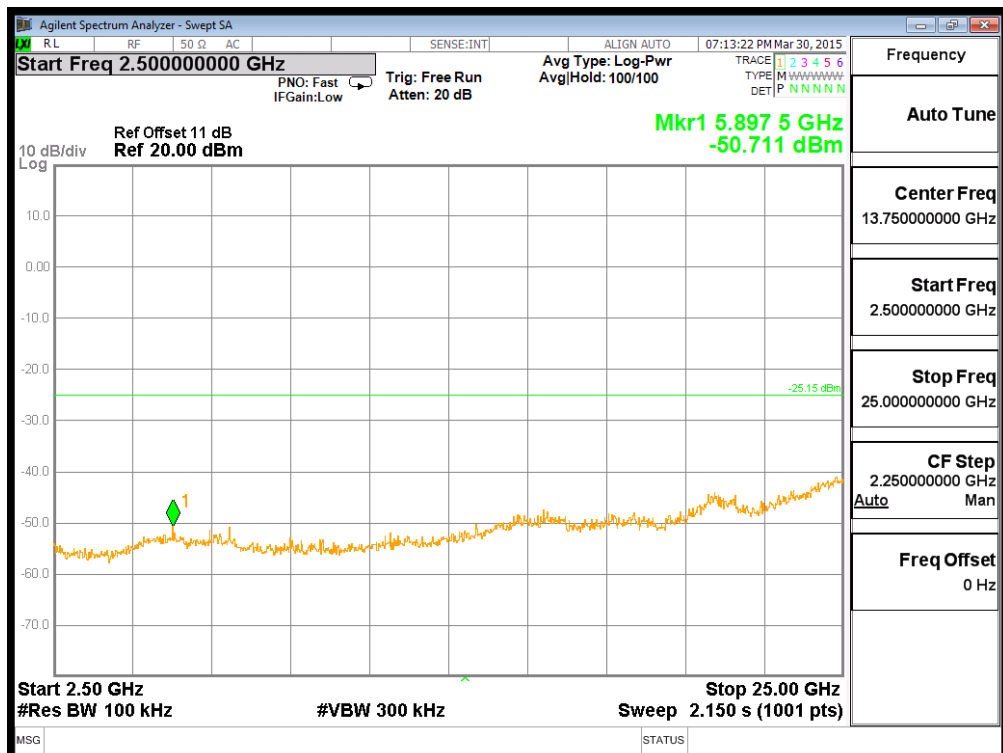
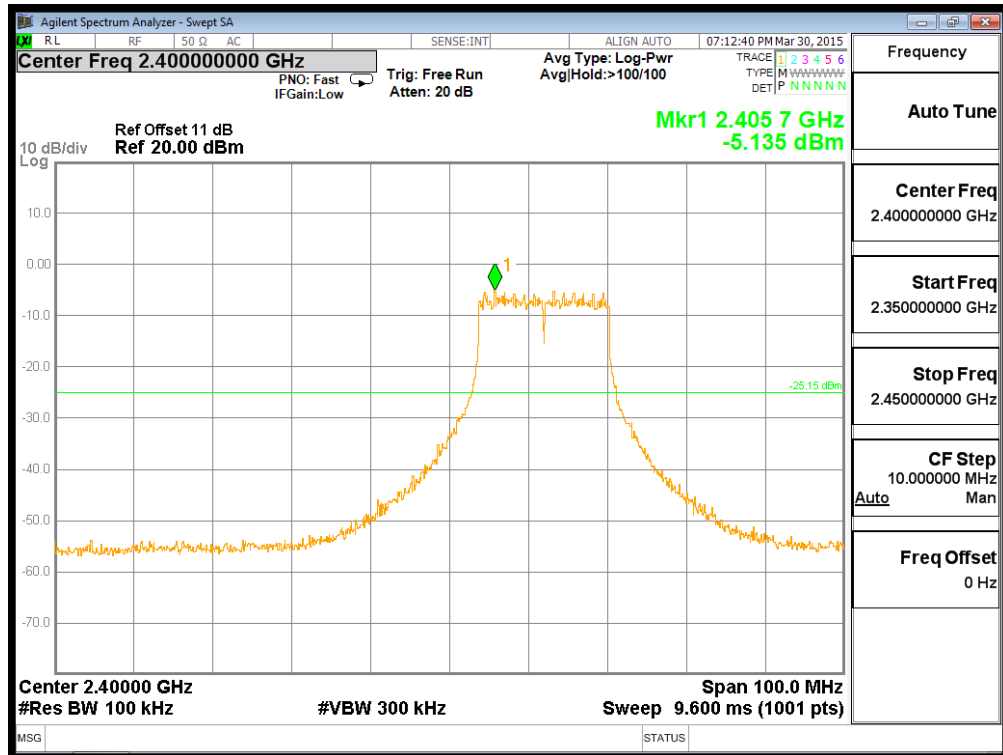


Transmit by 802.11b Channel 11



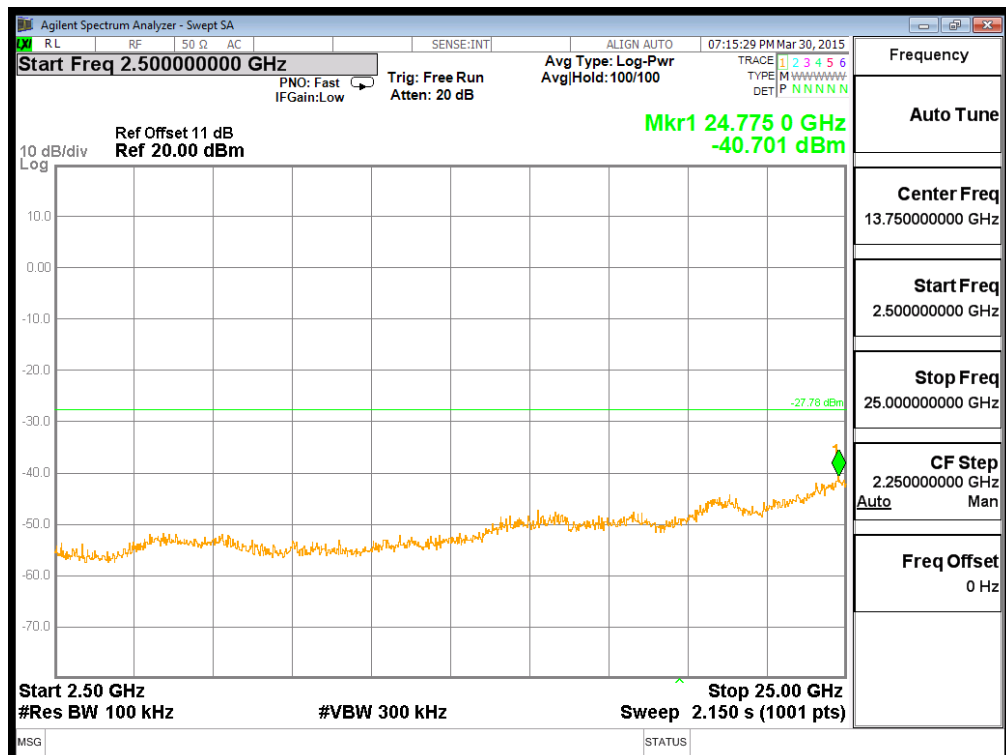
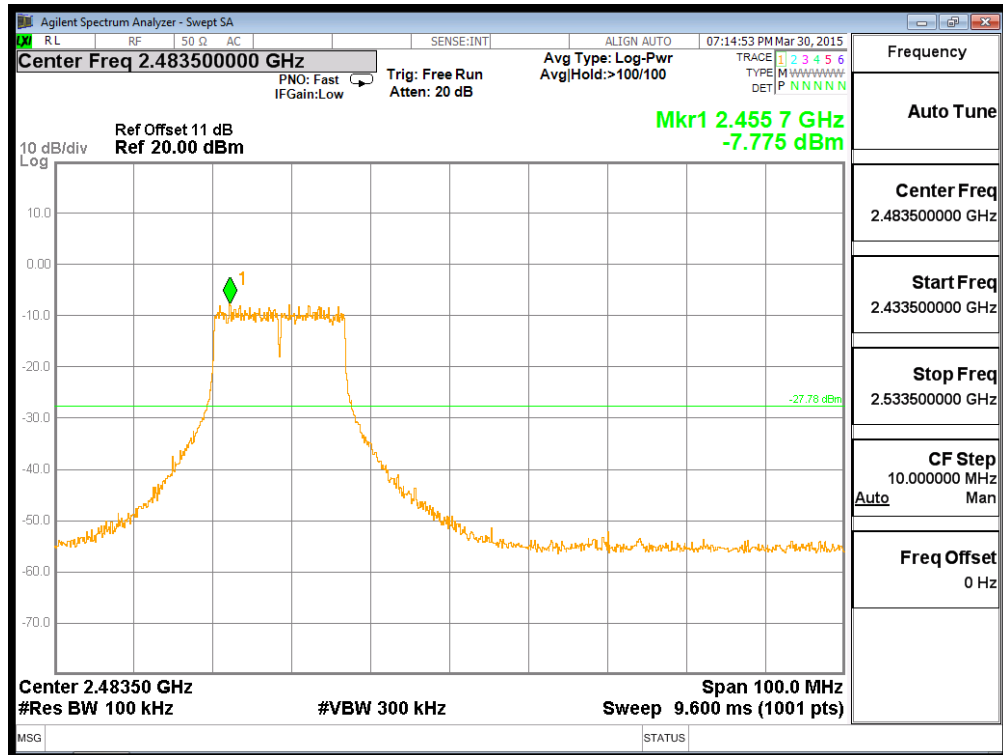


Transmit by 802.11g Channel 1



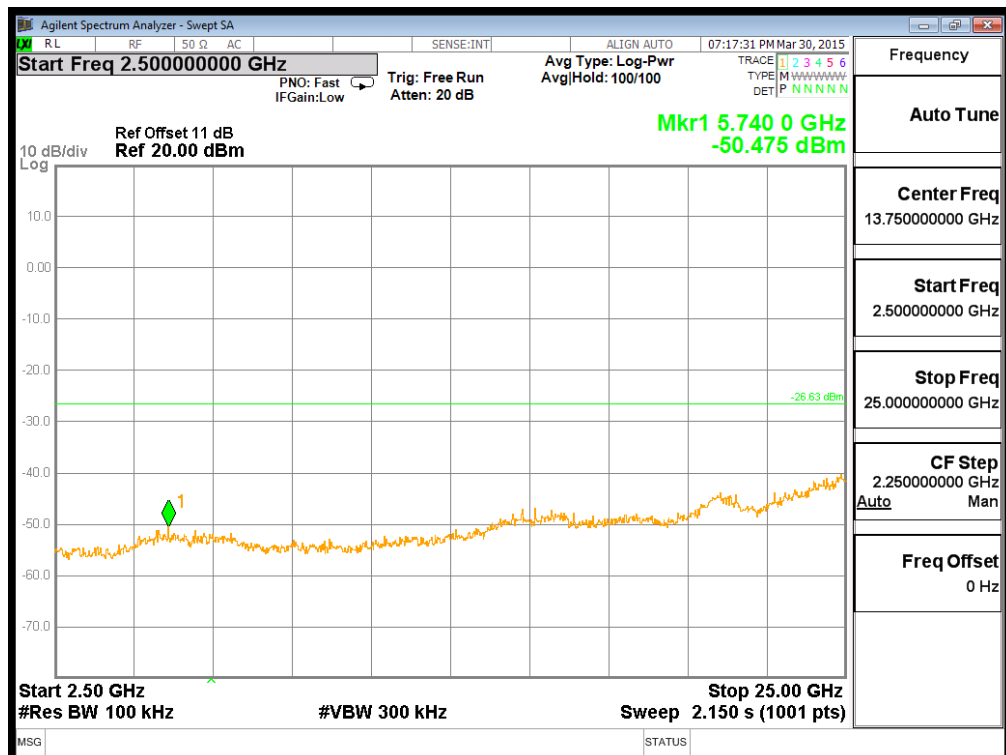
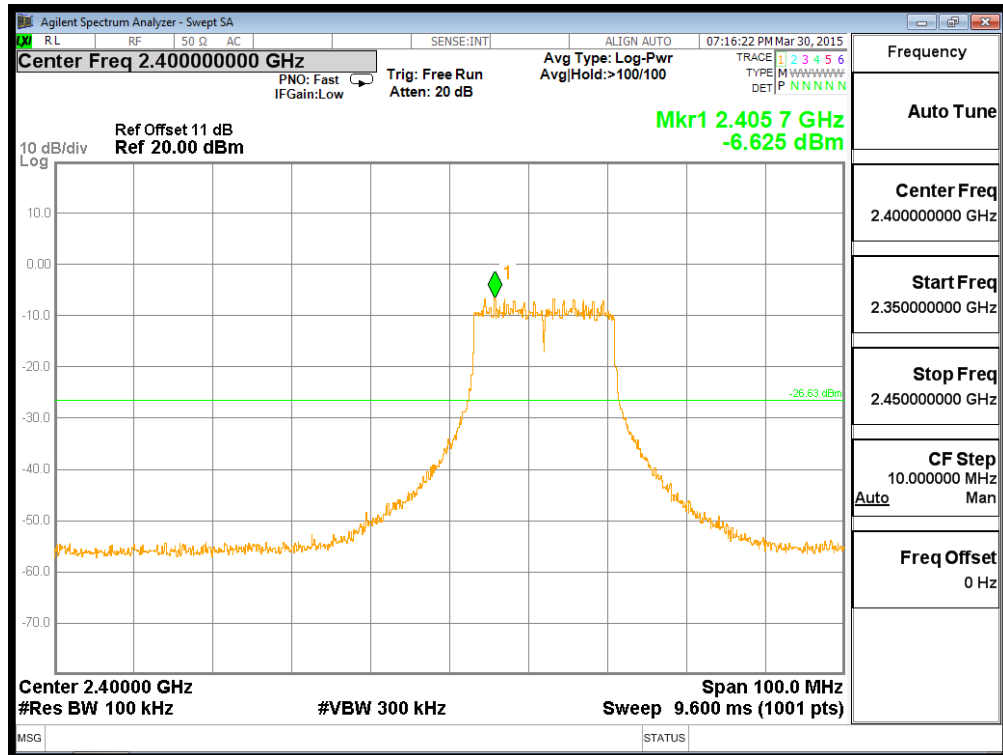


## Transmit by 802.11g Channel 11



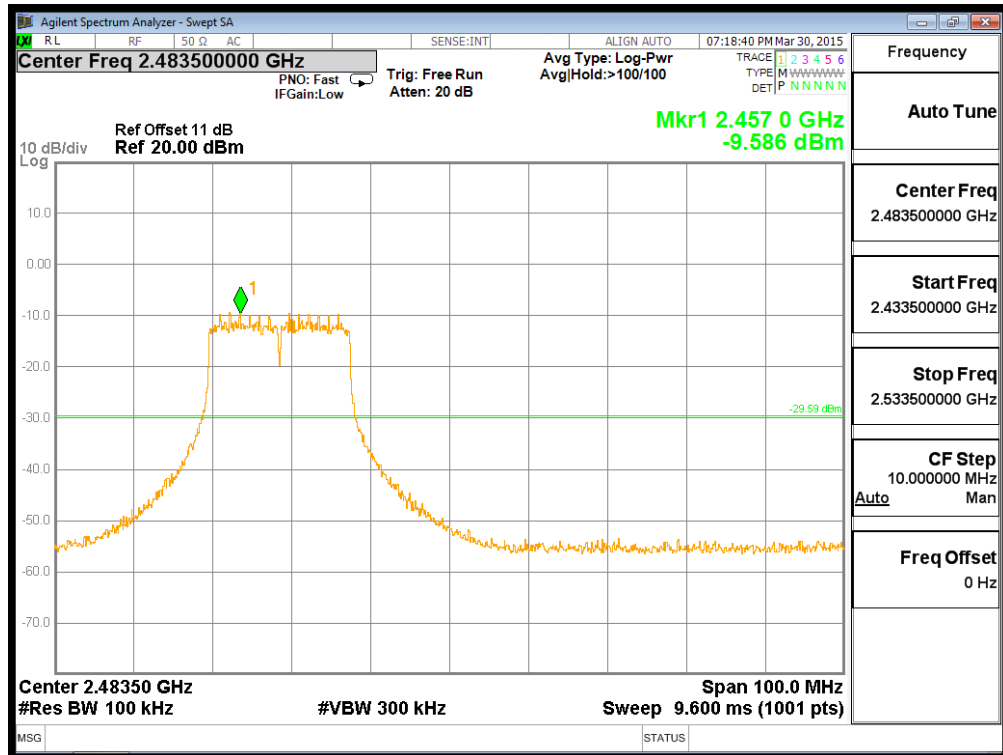


Transmit by 802.11n HT20 Channel 1



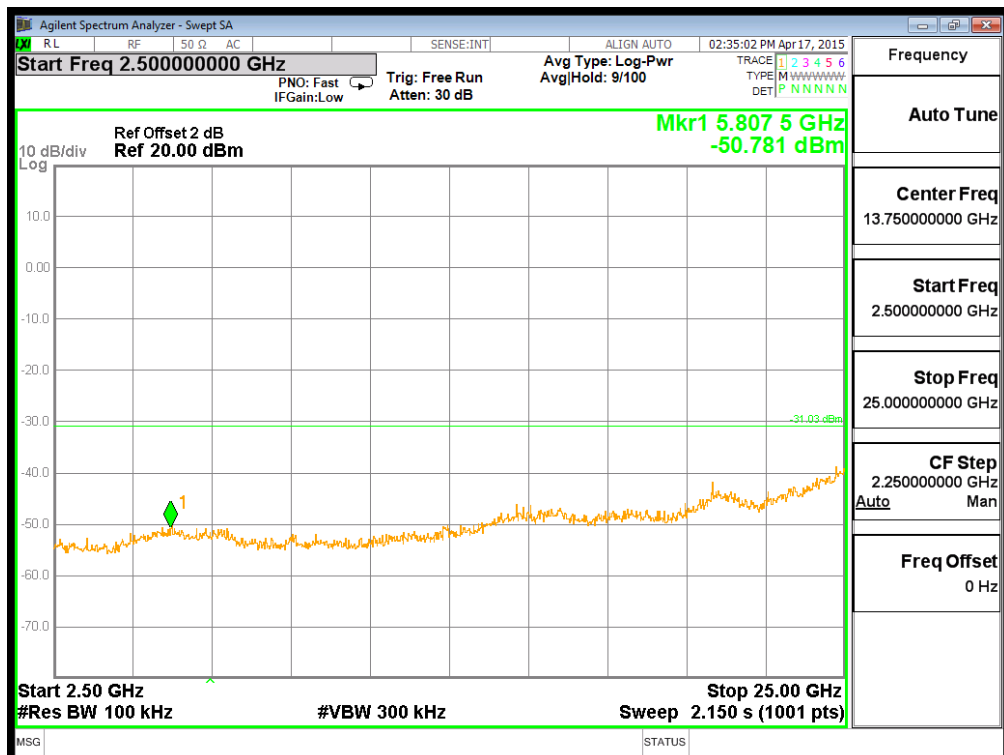
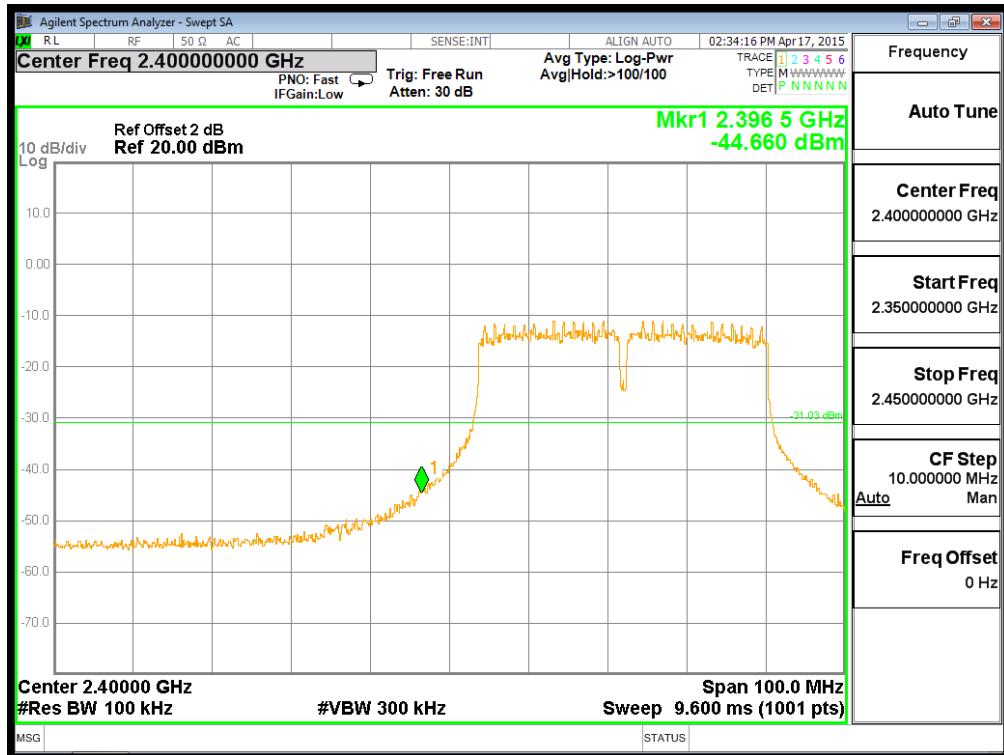


## Transmit by 802.11n HT20 Channel 11



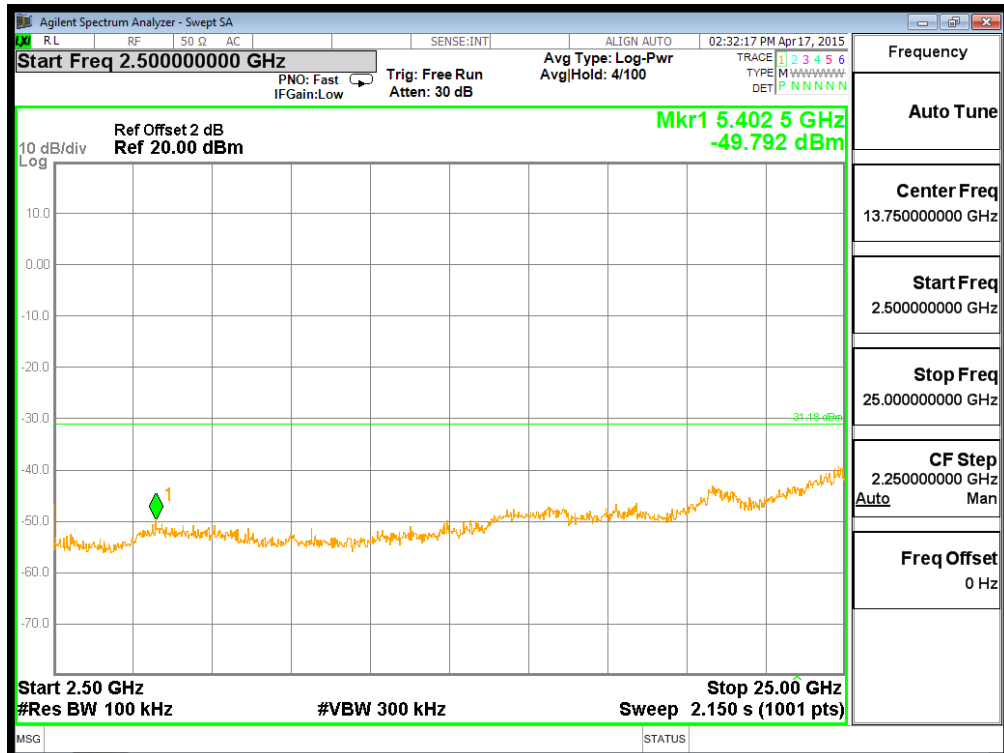
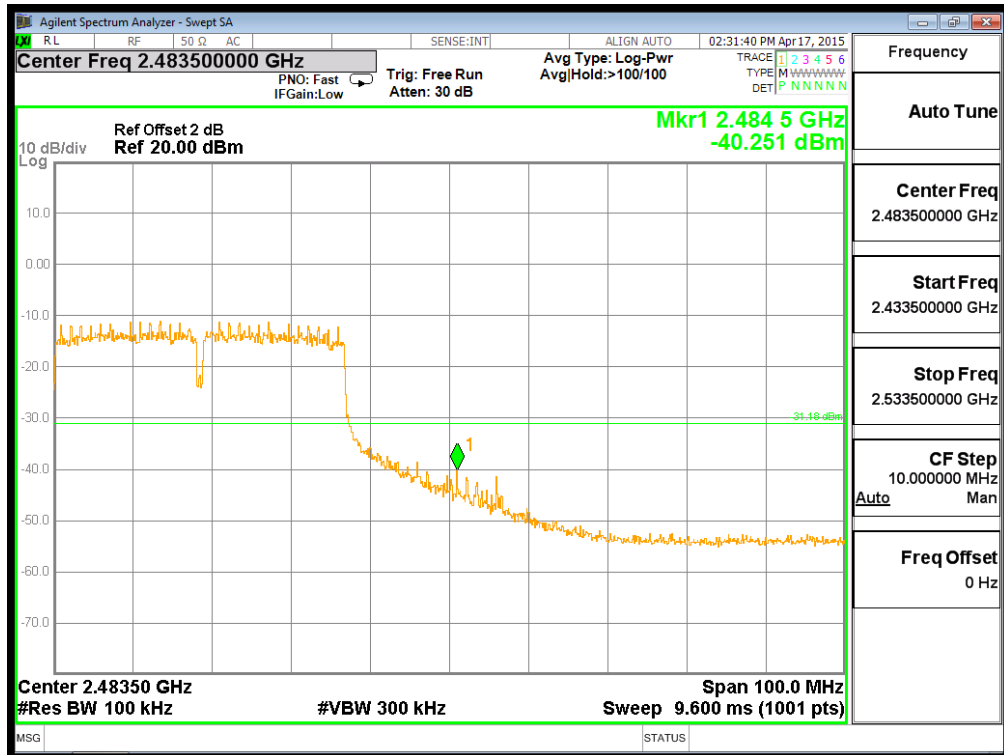


Transmit by 802.11n HT40 Channel 3





Transmit by 802.11n HT40 Channel 9



**Restrict Band Emission Measurement Data**

Test Date : 2015-3-29  
Temperature : 24 °C  
Humidity : 52 %  
Atmospheric Pressure : 1023 hPa

Modulation Standard: IEEE 802.11b

**Channel 1**

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2390.000           | -4.11            | 34.30             | 30.19             | 74.00             | -43.81         | peak | H              |
| 2   | 2390.000           | -4.11            | 28.46             | 24.35             | 54.00             | -29.65         | AVG  | H              |
| 1   | 2390.000           | -4.11            | 33.84             | 29.73             | 74.00             | -44.27         | peak | V              |
| 2   | 2390.000           | -4.11            | 26.52             | 22.41             | 54.00             | -31.59         | AVG  | V              |

**Channel 11**

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2483.500           | -3.52            | 36.38             | 32.86             | 74.00             | -41.14         | peak | H              |
| 2   | 2483.500           | -3.52            | 25.62             | 22.10             | 54.00             | -31.90         | AVG  | H              |
| 1   | 2483.500           | -3.52            | 33.88             | 30.36             | 74.00             | -43.64         | peak | V              |
| 2   | 2483.500           | -3.52            | 23.06             | 19.54             | 54.00             | -34.46         | AVG  | V              |



Modulation Standard: IEEE 802.11g

Channel 1

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2390.000           | -4.11            | 37.21             | 33.10             | 74.00             | -40.90         | peak | H              |
| 2   | 2390.000           | -4.11            | 28.21             | 24.10             | 54.00             | -29.90         | AVG  | H              |
| 1   | 2390.000           | -4.11            | 37.55             | 33.44             | 74.00             | -40.56         | peak | V              |
| 2   | 2390.000           | -4.11            | 28.41             | 24.30             | 54.00             | -29.70         | AVG  | V              |

Channel 11

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2483.500           | -3.52            | 40.01             | 36.49             | 74.00             | -37.51         | peak | H              |
| 2   | 2483.500           | -3.52            | 28.39             | 24.87             | 54.00             | -29.13         | AVG  | H              |
| 1   | 2483.500           | -3.52            | 35.75             | 32.23             | 74.00             | -41.77         | peak | V              |
| 2   | 2483.500           | -3.52            | 29.36             | 25.84             | 54.00             | -28.16         | AVG  | V              |



Modulation Standard: IEEE 802.11n HT20

Channel 1

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2390.000           | -4.11            | 38.87             | 34.76             | 74.00             | -39.24         | peak | H              |
| 2   | 2390.000           | -4.11            | 27.79             | 23.68             | 54.00             | -30.32         | AVG  | H              |
| 1   | 2390.000           | -4.11            | 40.07             | 35.96             | 74.00             | -38.04         | peak | V              |
| 2   | 2390.000           | -4.11            | 28.68             | 24.57             | 54.00             | -29.43         | AVG  | V              |

Channel 11

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2483.500           | -3.52            | 38.90             | 35.38             | 74.00             | -38.62         | peak | H              |
| 2   | 2483.500           | -3.52            | 28.36             | 24.84             | 54.00             | -29.16         | AVG  | H              |
| 3   | 2483.500           | -3.52            | 36.49             | 32.97             | 74.00             | -41.03         | peak | V              |
| 4   | 2483.500           | -3.52            | 28.88             | 25.36             | 54.00             | -28.64         | AVG  | V              |



Modulation Standard: IEEE 802.11n HT40

## Channel 3

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2390.000           | -4.11            | 36.32             | 32.21             | 74.00             | -41.79         | peak | H              |
| 2   | 2390.000           | -4.11            | 25.36             | 21.25             | 54.00             | -32.75         | AVG  | H              |
| 1   | 2390.000           | -4.11            | 39.06             | 34.95             | 74.00             | -39.05         | peak | V              |
| 2   | 2390.000           | -4.11            | 25.32             | 21.21             | 54.00             | -32.79         | AVG  | V              |

## Channel 9

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | AntPol.<br>H/V |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|
| 1   | 2483.500           | -3.52            | 36.88             | 33.36             | 74.00             | -40.64         | peak | H              |
| 2   | 2483.500           | -3.52            | 23.75             | 20.23             | 54.00             | -33.77         | AVG  | H              |
| 3   | 2483.500           | -3.52            | 37.65             | 34.13             | 74.00             | -39.87         | peak | V              |
| 4   | 2483.500           | -3.52            | 25.64             | 22.12             | 54.00             | -31.88         | AVG  | V              |

Notes: 1. Result = Meter Reading + Factor

2. Factor = Antenna Factor + Cable Loss – Amplifier

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz.

4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.



## 9. Power Spectral Density

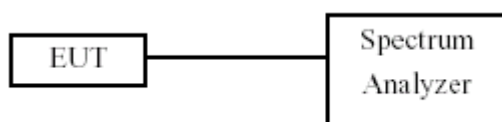
### 9.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

### 9.2 Test Procedure

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set VBW  $\geq 3 \times \text{RBW}$ .
- e) Detector = power averaging (RMS) or sample detector (when RMS not available).
- f) Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span/RBW}$ .
- g) Sweep time = auto couple.
- h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
- i) Use the peak marker function to determine the maximum amplitude level.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

### 9.3 Test Setup Layout



### 9.4 Measurement Equipment

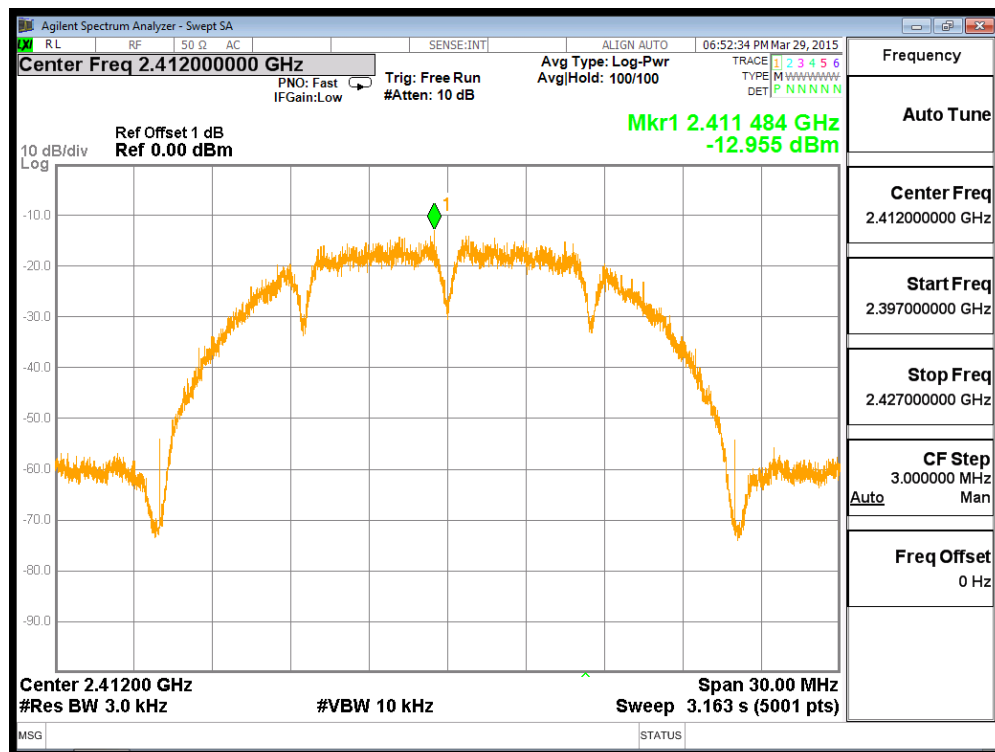
| Instrument/Ancillary | Model No. | Manufacturer | Serial No. | Calibration Date | Valid Date |
|----------------------|-----------|--------------|------------|------------------|------------|
| Spectrum Analyzer    | N9010A    | Agilent      | MY51350515 | 2014.11.03       | 2015.11.03 |

## 9.5 Test Result and Data

|           |                        |
|-----------|------------------------|
| Test Item | Power Spectral Density |
| Test Mode | Transmit by 802.11b    |
| Test Date | 2015-3-29              |

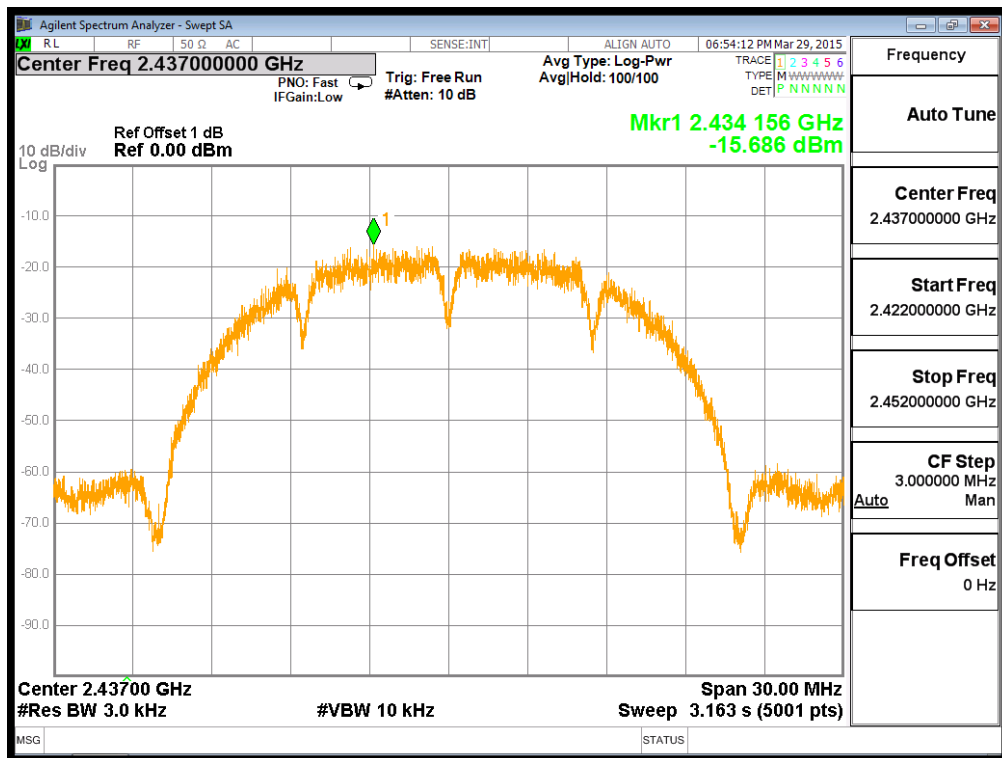
| Channel | Frequency<br>(MHz) | Power Spectral Density<br>(dBm/3kHz) | Limit<br>(dBm/3kHz) | Result |
|---------|--------------------|--------------------------------------|---------------------|--------|
| 01      | 2412               | -12.956                              | 8                   | Pass   |
| 06      | 2437               | -15.686                              | 8                   | Pass   |
| 11      | 2462               | -16.310                              | 8                   | Pass   |

Channel 01 (2412MHz)

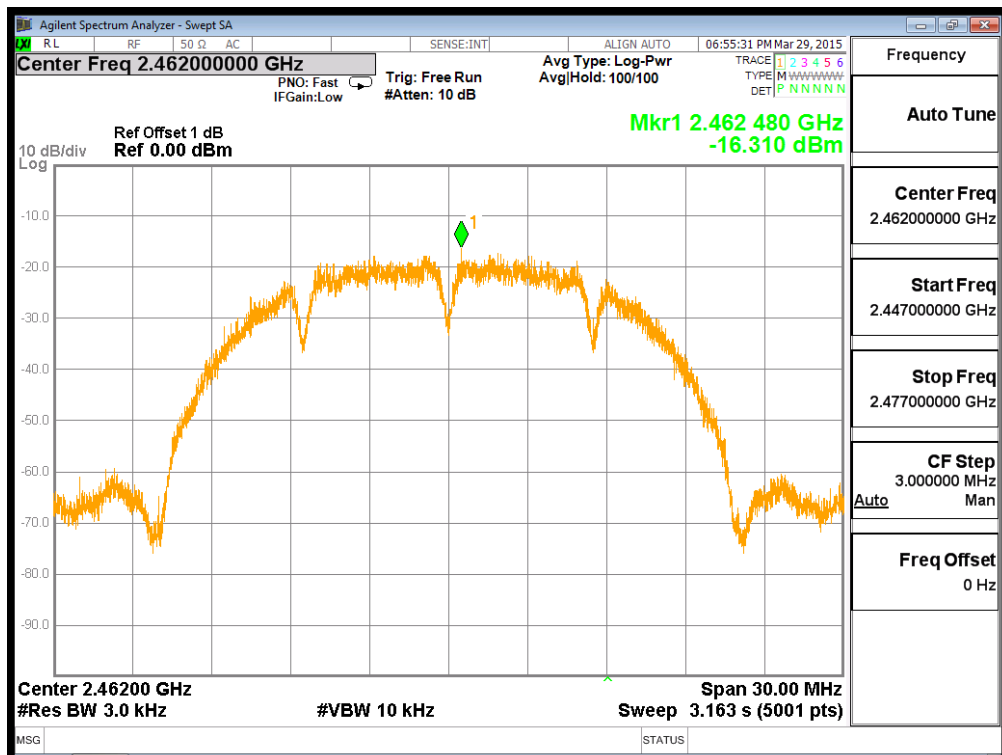




Channel 06 (2437MHz)



Channel 11 (2462MHz)

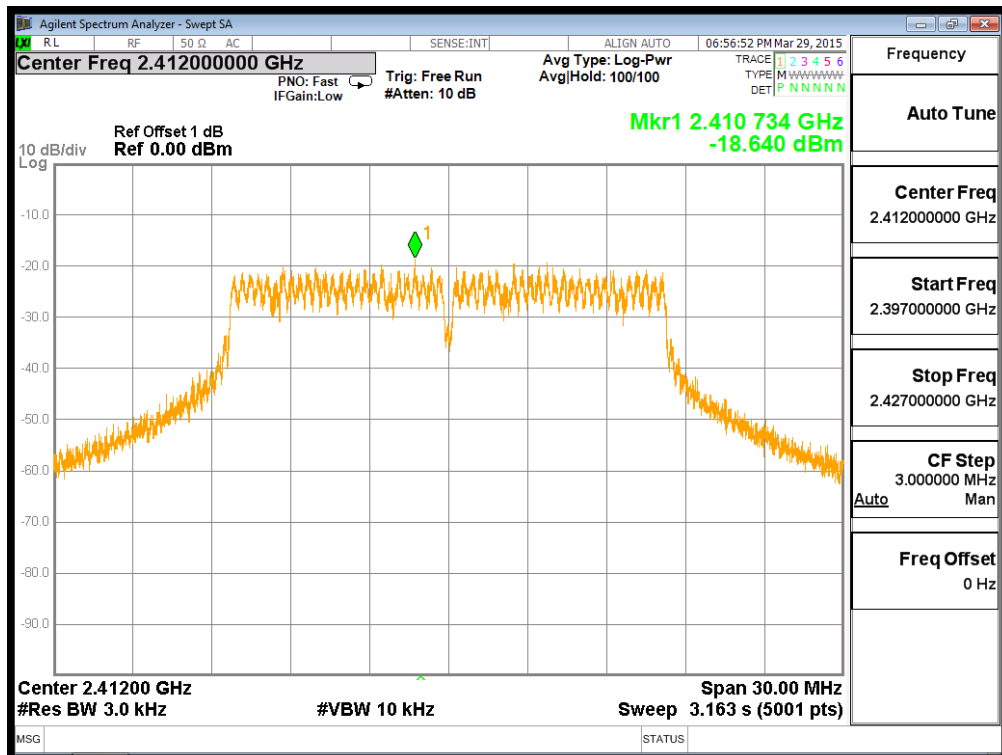




|           |                        |
|-----------|------------------------|
| Test Item | Power Spectral Density |
| Test Mode | Transmit by 802.11g    |
| Test Date | 2015-3-29              |

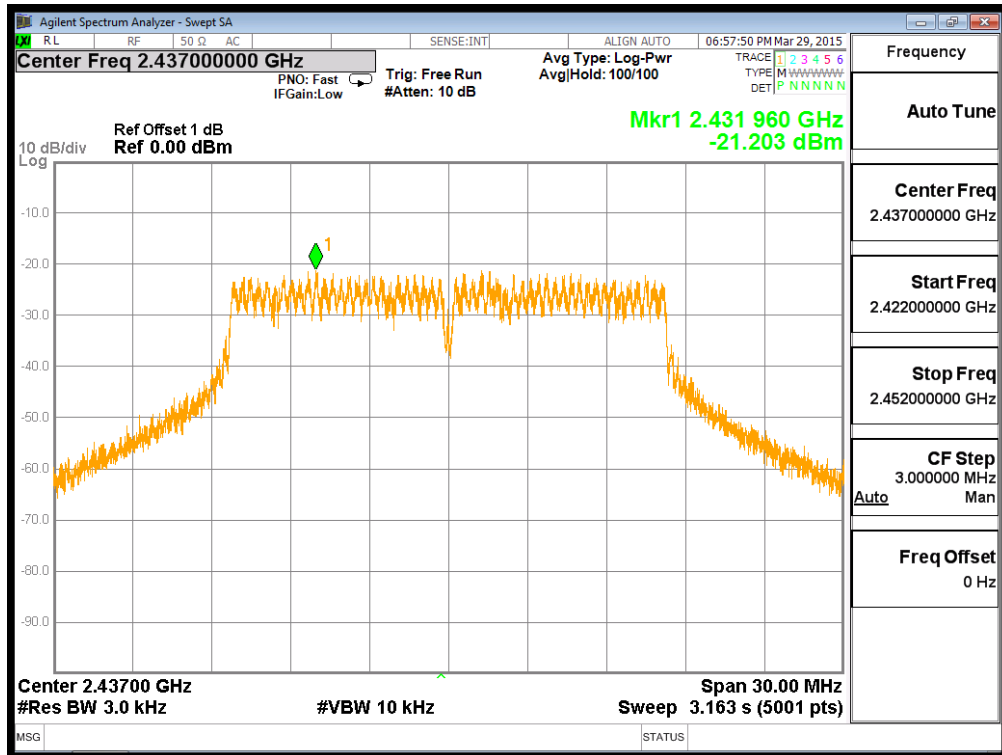
| Channel | Frequency (MHz) | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|---------|-----------------|-----------------------------------|------------------|--------|
| 01      | 2412            | -18.840                           | 8                | Pass   |
| 06      | 2437            | -21.203                           | 8                | Pass   |
| 11      | 2462            | -23.203                           | 8                | Pass   |

Channel 01 (2412MHz)

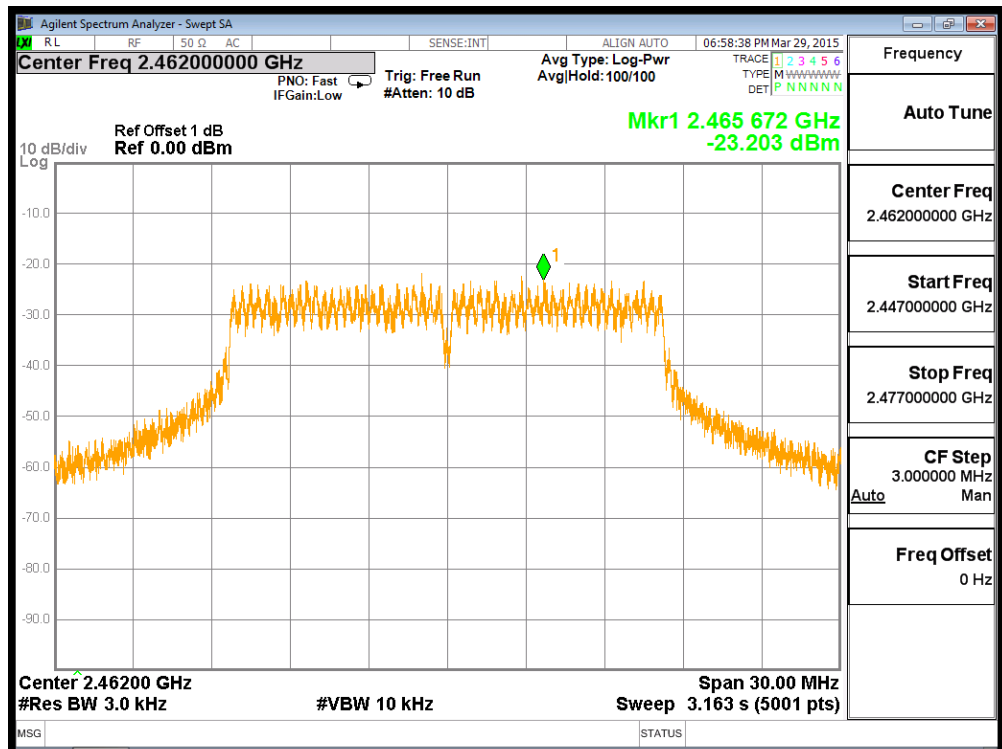




Channel 06 (2437MHz)



Channel 11 (2462MHz)

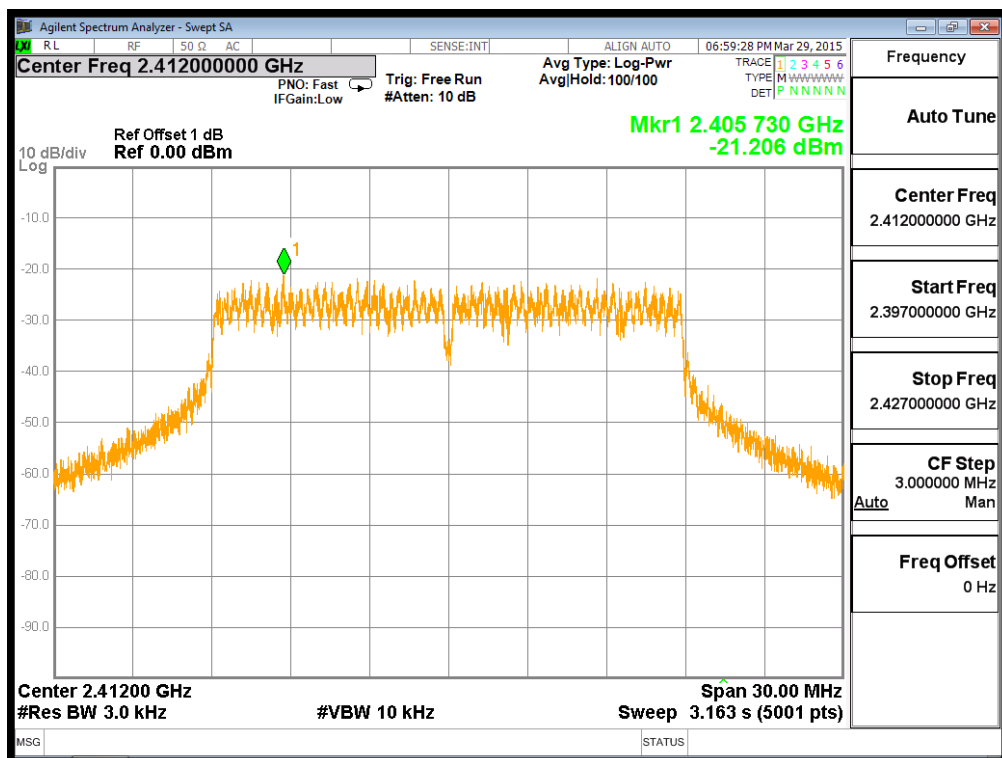




|           |                             |
|-----------|-----------------------------|
| Test Item | Power Spectral Density      |
| Test Mode | Transmit by 802.11n (20MHz) |
| Test Date | 2015-3-29                   |

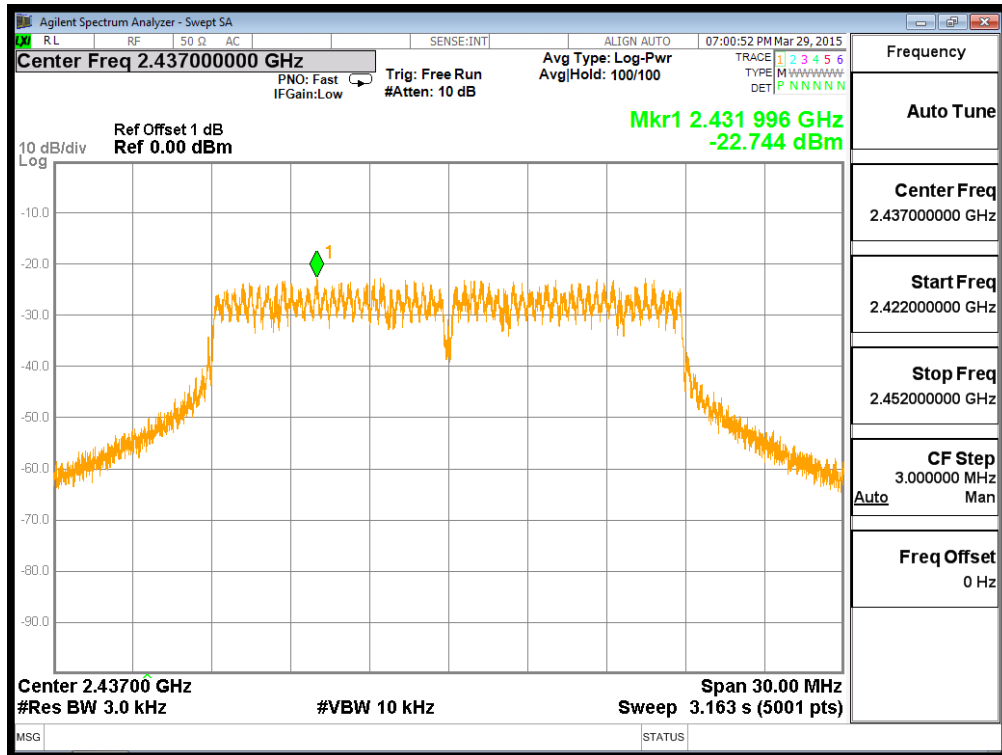
| Channel | Frequency (MHz) | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|---------|-----------------|-----------------------------------|------------------|--------|
| 01      | 2412            | -21.206                           | 8                | Pass   |
| 06      | 2437            | -22.744                           | 8                | Pass   |
| 11      | 2462            | -23.328                           | 8                | Pass   |

Channel 01 (2412MHz)

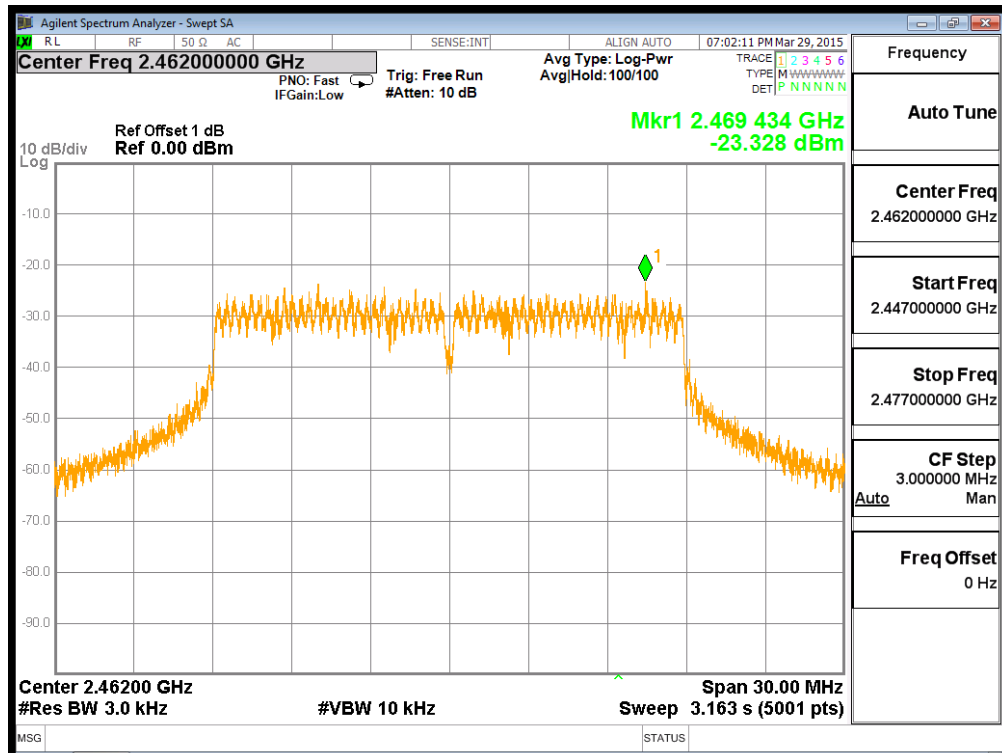




Channel 06 (2437MHz)



Channel 11 (2462MHz)

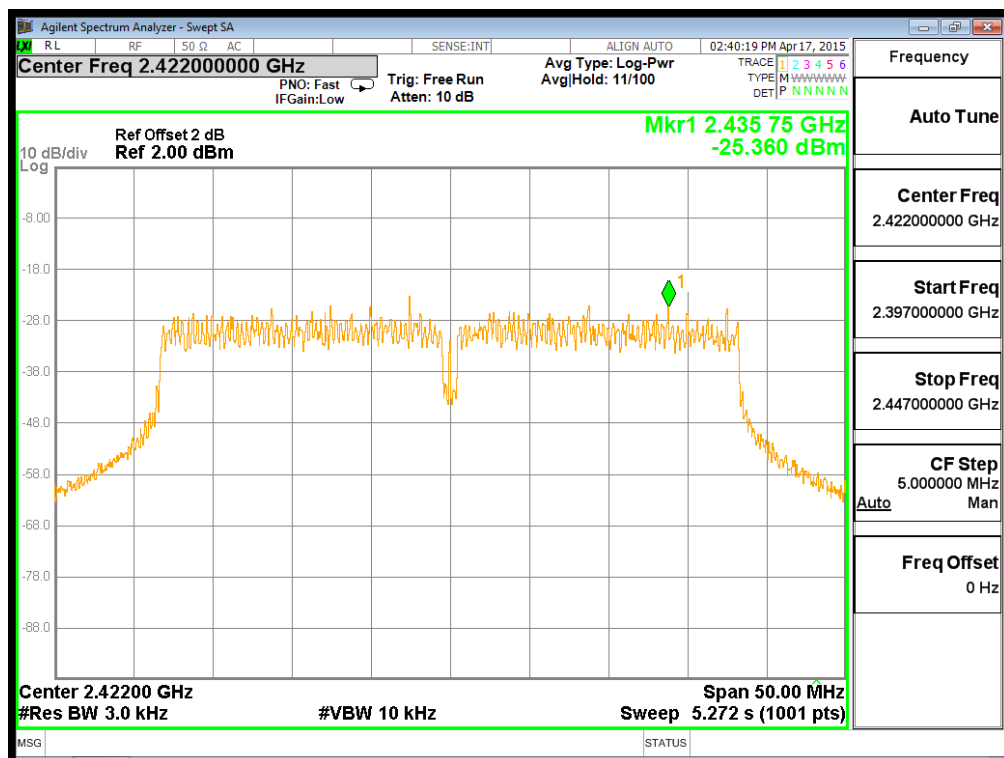




|           |                             |
|-----------|-----------------------------|
| Test Item | Power Spectral Density      |
| Test Mode | Transmit by 802.11n (40MHz) |
| Test Date | 2015-4-16                   |

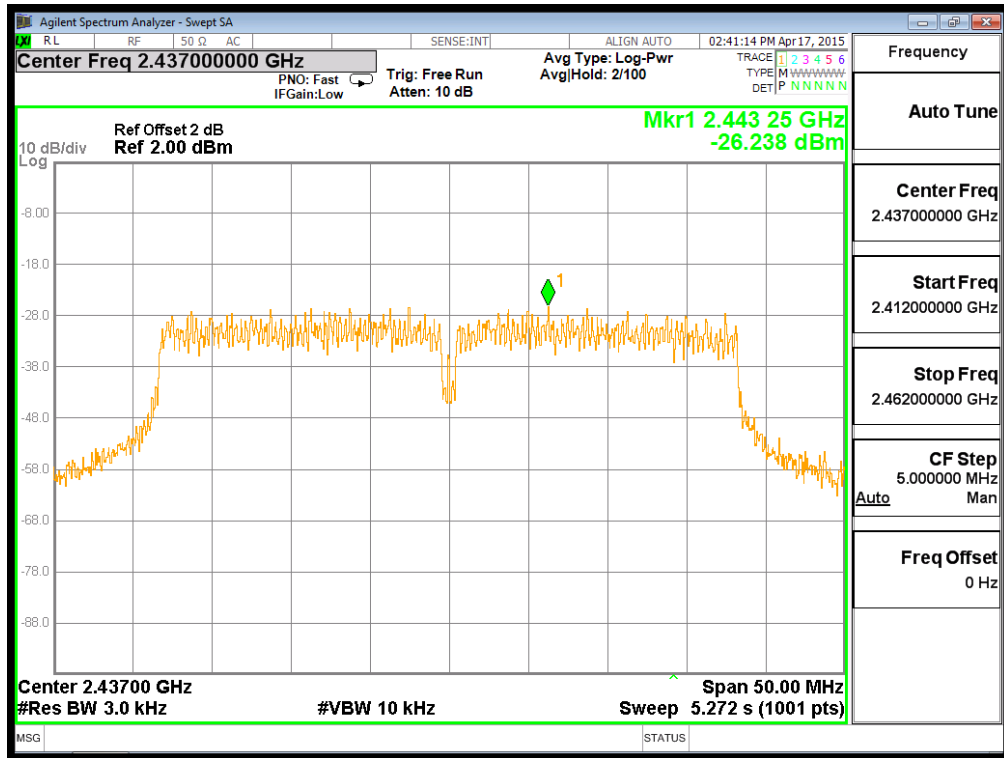
| Channel | Frequency (MHz) | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|---------|-----------------|-----------------------------------|------------------|--------|
| 03      | 2422            | -25.360                           | 8                | Pass   |
| 06      | 2437            | -26.238                           | 8                | Pass   |
| 09      | 2452            | -25.790                           | 8                | Pass   |

Channel 03 (2422MHz)

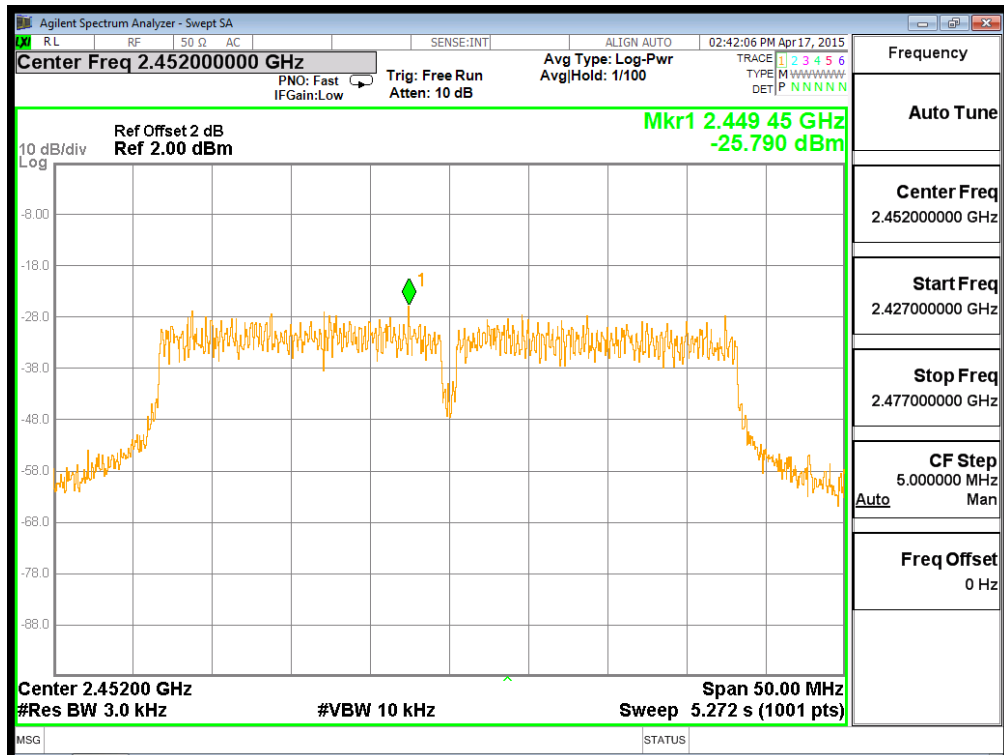




Channel 06 (2437MHz)



Channel 9 (2452MHz)





## 10. Restricted Bands of Operation

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

| MHz                 | MHz                   | MHz             | GHz             |
|---------------------|-----------------------|-----------------|-----------------|
| 0.09000 – 0.11000   | 16.42000 – 16.42300   | 399.9 – 410.0   | 4.500 – 5.250   |
| 0.49500 – 0.505**   | 16.69475 – 16.69525   | 608.0 – 614.0   | 5.350 – 5.460   |
| 2.17350 – 2.19050   | 16.80425 – 16.80475   | 960.0 – 1240.0  | 7.250 – 7.750   |
| 4.12500 – 4.12800   | 25.50000 – 25.67000   | 1300.0 – 1427.0 | 8.025 – 8.500   |
| 4.17725 – 4.17775   | 37.50000 – 38.25000   | 1435.0 – 1626.5 | 9.000 – 9.200   |
| 4.20725 – 4.20775   | 73.00000 – 74.60000   | 1645.5 – 1646.5 | 9.300 – 9.500   |
| 6.21500 – 6.21800   | 74.80000 – 75.20000   | 1660.0 – 1710.0 | 10.600 – 12.700 |
| 6.26775 – 6.26825   | 108.00000 – 121.94000 | 1718.8 – 1722.2 | 13.250 – 13.400 |
| 6.31175 – 6.31225   | 123.00000 – 138.00000 | 2200.0 – 2300.0 | 14.470 – 14.500 |
| 8.29100 – 8.29400   | 149.90000 – 150.05000 | 2310.0 – 2390.0 | 15.350 – 16.200 |
| 8.36200 – 8.36600   | 156.52475 – 156.52525 | 2483.5 – 2500.0 | 17.700 – 21.400 |
| 8.37625 – 8.38675   | 156.70000 – 156.90000 | 2655.0 – 2900.0 | 22.010 – 23.120 |
| 8.41425 – 8.41475   | 162.01250 – 167.17000 | 3260.0 – 3267.0 | 23.600 – 24.000 |
| 12.29000 – 12.29300 | 167.72000 – 173.20000 | 3332.0 – 3339.0 | 31.200 – 31.800 |
| 12.51975 – 12.52025 | 240.00000 – 285.00000 | 3345.8 – 3358.0 | 36.430 – 36.500 |
| 12.57675 – 12.57725 | 322.00000 – 335.40000 | 3600.0 – 4400.0 | Above 38.6      |
| 13.36000 – 13.41000 |                       |                 |                 |

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

### 10.1 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.