



# FCC TEST REPORT

**Test report**  
**On Behalf of**  
**Shenzhen Dericam Technology Co., Ltd**  
**For**  
**IP Camera**  
**Model No.: S1, S1S, S1X, S2, S2S, S2X**

**FCC ID: 2AAEU-S1**

**Prepared for :** Shenzhen Dericam Technology Co., Ltd  
RM533, Building A, HuaFeng Internet Creative Park, Gong He Industrial Rd, Xi Xiang Bao'AN, ShenZhen

**Prepared By :** Shenzhen HUAKE Testing Technology Co., Ltd.  
F1-008, Tai Yi Building, No.1, Haicheng West Road, Xixiang Street, Bao'an District, Shenzhen City, China

**Date of Test:** August. 20, 2016 ~ August. 27, 2016  
**Date of Report:** August. 28, 2016  
**Report Number:** HK1600820024-E



## TEST RESULT CERTIFICATION

**Applicant's name** ..... : Shenzhen Dericam Technology Co., Ltd  
**Address** ..... : RM533, Building A, HuaFeng Internet Creative Park, Gong He Industrial Rd, Xi Xiang Bao'AN, ShenZhen  
**Manufacture's Name** ..... : Shenzhen Dericam Technology Co., Ltd  
**Address** ..... : RM533, Building A, HuaFeng Internet Creative Park, Gong He Industrial Rd, Xi Xiang Bao'AN, ShenZhen

### Product description

**Trade Mark:** DERICAM  
**Product name** ..... : IP Camera  
**Model and/or type reference** : S1, S1S, S1X, S2, S2S, S2X

**Standards** ..... : FCC Rules and Regulations Part 15 Subpart C Section 15.247  
ANSI C63.10: 2013

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen HUAKE Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen HUAKE Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

**Date of Test** ..... :  
**Date (s) of performance of tests** ..... : **August. 20, 2016 ~ August. 27, 2016**  
**Date of Issue** ..... : **August. 28, 2016**  
**Test Result** ..... : **Pass**

Testing Engineer :

(Eric Xie)

Technical Manager :

(Dora Qin)

Authorized Signatory :

(Kait Chen)



| <b>Table of Contents</b>                | <b>Page</b> |
|-----------------------------------------|-------------|
| 1 . TEST SUMMARY                        | 5           |
| 2 . GENERAL INFORMATION                 | 6           |
| 2.1 GENERAL DESCRIPTION OF EUT          | 6           |
| Operation of EUT during testing         | 7           |
| 2.2 DESCRIPTION OF TEST SETUP           | 7           |
| 2.3 MEASUREMENT INSTRUMENTS LIST        | 8           |
| 3 . CONDUCTED EMISSIONS TEST            | 9           |
| 3.1 Conducted Power Line Emission Limit | 9           |
| 3.2 Test Setup                          | 9           |
| 3.3 Test Procedure                      | 9           |
| 3.4 Test Result                         | 9           |
| 4 RADIATED EMISSION TEST                | 12          |
| 4.1 Radiation Limit                     | 12          |
| 4.2 Test Setup                          | 12          |
| 4.3 Test Procedure                      | 13          |
| 4.4 Test Result                         | 13          |
| 5 BAND EDGE                             | 28          |
| 5.1 Limits                              | 28          |
| 5.2 Test Procedure                      | 28          |
| 5.3 Test Result                         | 28          |
| 6 OCCUPIED BANDWIDTH MEASUREMENT        | 36          |
| 6.1 Test Limit                          | 36          |
| 6.2 Test Procedure                      | 36          |
| 6.3 Measurement Equipment Used          | 36          |
| 6.4 Test Result                         | 36          |
| 7 POWER SPECTRAL DENSITY TEST           | 45          |
| 7.1 Test Limit                          | 45          |
| 7.2 Test Procedure                      | 45          |
| 7.3 Measurement Equipment Used          | 45          |
| 7.4 Test Result                         | 45          |
| 8 PEAK OUTPUT POWER TEST                | 54          |
| 8.1 Test Limit                          | 54          |
| 8.2 Test Procedure                      | 54          |
| 8.3 Measurement Equipment Used          | 54          |



| <b>Table of Contents</b> | <b>Page</b> |
|--------------------------|-------------|
| 8.4 Test Result          | 54          |
| 9 ANTENNA REQUIREMENT    | 55          |
| 10 PHOTOGRAPH OF TEST    | 56          |
| 10.1 Radiated Emission   | 56          |
| 10.2 Conducted Emission  | 57          |



## 1. TEST SUMMARY

### 1.1 TEST PROCEDURES AND RESULTS

| DESCRIPTION OF TEST               | RESULT    |
|-----------------------------------|-----------|
| CONDUCTED EMISSIONS TEST          | COMPLIANT |
| RADIATED EMISSION TEST            | COMPLIANT |
| BAND EDGE                         | COMPLIANT |
| OCCUPIED BANDWIDTH MEASUREMENT    | COMPLIANT |
| POWER SPECTRAL DENSITY            | COMPLIANT |
| PEAK OUTPUT POWER <sub>Peak</sub> | COMPLIANT |
| ANTENNA REQUIREMENT               | COMPLIANT |

### 1.2 TEST FACILITY

Test Firm : Dongguan Dongdian Testing Service Co., Ltd  
Certificated by FCC, Registration No.: 270092  
Address No.17 Zongbu road 2, Songshan Lake Sci&Tech Park, DongGuan  
City, Guangdong province, 523808 China

### 1.3 MEASUREMENT UNCERTAINTY

|                                                       |               |
|-------------------------------------------------------|---------------|
| Measurement Uncertainty                               |               |
| Conducted Emission Expanded Uncertainty               | = 2.23dB, k=2 |
| Radiated emission expanded uncertainty(9kHz-30MHz)    | = 3.08dB, k=2 |
| Radiated emission expanded uncertainty(30MHz-1000MHz) | = 4.42dB, k=2 |
| Radiated emission expanded uncertainty(Above 1GHz)    | = 4.06dB, k=2 |



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                        |                                                                                                                                                   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment              | IP Camera                                                                                                                                         |
| Model Name             | S1                                                                                                                                                |
| Serial No              | S1S, S1X, S2, S2S, S2X                                                                                                                            |
| Model Difference       | All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: S1. |
| FCC ID                 | <b>2AAEU-S1</b>                                                                                                                                   |
| Antenna Type           | Integral Antenna                                                                                                                                  |
| Antenna Gain           | 1 dBi                                                                                                                                             |
| BT Operation frequency | 802.11b/g/n 20:2412~2462 MHz<br>802.11n 40: 2422~2452MHz                                                                                          |
| Number of Channels     | 802.11b/g/n20: 11CH<br>802.11n 40: 7CH                                                                                                            |
| Modulation Type        | CCK/OFDM/DBPSK/DAPSK                                                                                                                              |
| Power Source           | AC Adapter mode:ADS-25FSG-12 12018GPCN                                                                                                            |
| Power Rating           | DC 12V for adapter with AC 120V/60Hz                                                                                                              |



### 2.1.1 Carrier Frequency of Channels

| Channel List for 802.11b/g/n(20MHz) |                 |         |                 |         |                 |         |                 |
|-------------------------------------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel                             | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01                                  | 2412            | 04      | 2427            | 07      | 2442            | 10      | 2457            |
| 02                                  | 2417            | 05      | 2432            | 08      | 2447            | 11      | 2462            |
| 03                                  | 2422            | 06      | 2437            | 09      | 2452            |         |                 |

| Channel List for 802.11n(40MHz) |                 |         |                 |         |                 |         |                 |
|---------------------------------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel                         | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 03                              | 2422            | 06      | 2437            | 09      | 2452            |         |                 |
| 04                              | 2427            | 07      | 2442            |         |                 |         |                 |
| 05                              | 2432            | 08      | 2447            |         |                 |         |                 |

### Operation of EUT during testing

#### Operating Mode

The mode is used: **Transmitting mode for 802.11b/g/n(20MHz)**

Low Channel: 2412MHz

Middle Channel: 2437MHz

High Channel: 2462MHz

#### **Transmitting mode for 802.11n(40MHz)**

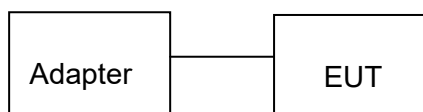
Low Channel: 2422MHz

Middle Channel: 2437MHz

High Channel: 2452MHz

## 2.2 DESCRIPTION OF TEST SETUP

Operation of EUT during conducted and Radiation testing:





## 2.3 MEASUREMENT INSTRUMENTS LIST

| Item | Equipment                        | Manufacturer         | Model No. | Serial No.    | Last Cal.     | Cal. Interval |
|------|----------------------------------|----------------------|-----------|---------------|---------------|---------------|
| 1.   | EMI Receiver                     | Rohde & Schwarz      | ESCI      | 100627        | Feb. 19, 2016 | 1 Year        |
| 2.   | LISN                             | SchwarzBeck          | NSLK 8126 | 8126377       | Feb. 19, 2016 | 1 Year        |
| 3.   | RF Switching Unit                | Compliance Direction | RSU-M2    | 38303         | Feb. 19, 2016 | 1 Year        |
| 4.   | EMI Test Software ES-K1          | Rohde & Schwarz      | N/A       | N/A           | N/A           | N/A           |
| 5.   | EMI Test Receiver                | Rohde & Schwarz      | ESCI      | 100627        | Feb. 19, 2016 | 1 Year        |
| 6.   | Trilog Broadband Antenna         | Schwarzbeck          | VULB9163  | VULB 9163-289 | Feb. 19, 2016 | 1 Year        |
| 7.   | Pre-amplifier                    | Compliance Direction | PAP-0203  | 22008         | Feb. 19, 2016 | 1 Year        |
| 8.   | EMI Test Software EZ-EMC         | SHURPLE              | N/A       | N/A           | N/A           | N/A           |
| 9.   | EMI Receiver                     | Rohde & Schwarz      | ESCI      | 100627        | Feb. 19, 2016 | 1 Year        |
| 10.  | LISN                             | SchwarzBeck          | NSLK 8126 | 8126377       | Feb. 19, 2016 | 1 Year        |
| 11.  | RF Switching Unit                | Compliance Direction | RSU-M2    | 38303         | Feb. 19, 2016 | 1 Year        |
| 12.  | EMI Test Software ES-K1          | Rohde & Schwarz      | N/A       | N/A           | N/A           | N/A           |
| 13.  | EMI Receiver                     | Rohde & Schwarz      | ESCI      | 100627        | Feb. 19, 2016 | 1 Year        |
| 14.  | EMI Receiver                     | Rohde & Schwarz      | ESCI      | 100627        | Feb. 19, 2016 | 1 Year        |
| 15.  | LISN                             | SchwarzBeck          | NSLK 8126 | 8126377       | Feb. 19, 2016 | 1 Year        |
| 16.  | RF Switching Unit                | Compliance Direction | RSU-M2    | 38303         | Feb. 19, 2016 | 1 Year        |
| 17.  | EMI Test Software ES-K1          | Rohde & Schwarz      | N/A       | N/A           | N/A           | N/A           |
| 18.  | Power Meter                      | R&S                  | NRVD      | SEL0069       | Feb. 19, 2016 | 1 Year        |
| 19.  | Power Sensor                     | R&S                  | URV5-Z2   | SEL0071       | Feb. 19, 2016 | 1 Year        |
| 20.  | Power Sensor                     | R&S                  | URV5-Z2   | SEL0072       | Feb. 19, 2016 | 1 Year        |
| 21.  | Software EMC32                   | R&S                  | EMC32-S   | SEL0082       | N/A           | N/A           |
| 22.  | Log-periodic Antenna             | Amplifier Reasearch  | AS180     | SEL0073       | N/A           | N/A           |
| 23.  | Antenna Tripod                   | Amplifier Reasearch  | TS1000A   | SEL0074       | N/A           | N/A           |
| 24.  | High Gain Horn Antenna(0.8-5GHz) | Amplifier Reasearch  | AT4002A   | SEL0075       | N/A           | N/A           |
| 25.  | Spectrum analyzer                | Agilent              | N9020A    | MY499110 048  | Feb. 19, 2016 | 1 Year        |
| 26.  | Spectrum analyzer                | Agilent              | E4407B    | MY461843 26   | Feb. 19, 2016 | 1 Year        |



### 3. CONDUCTED EMISSIONS TEST

#### 3.1 Conducted Power Line Emission Limit

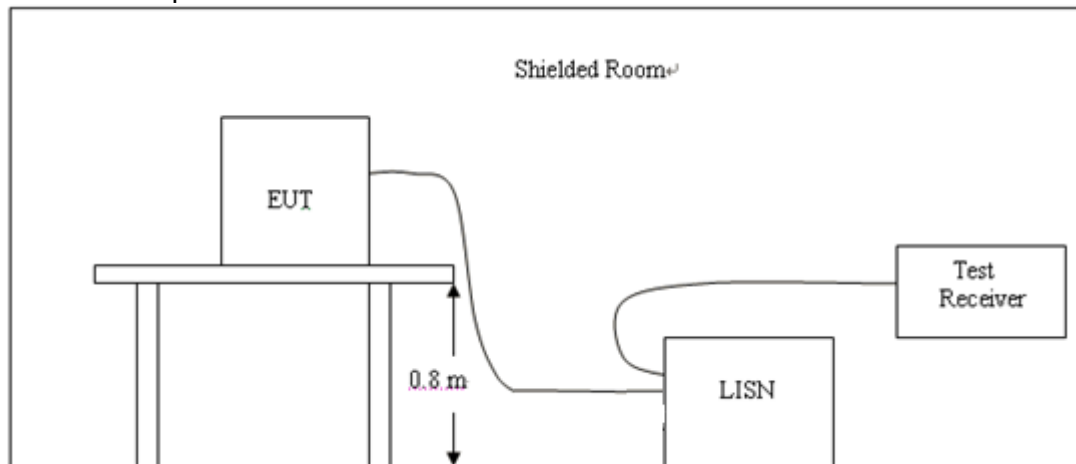
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

| Frequency (MHz) | Maximum RF Line Voltage (dBμV) |      |         |        |
|-----------------|--------------------------------|------|---------|--------|
|                 | CLASS A                        |      | CLASS B |        |
|                 | Q.P.                           | Ave. | Q.P.    | Ave.   |
| 0.15 - 0.50     | 79                             | 66   | 66-56*  | 56-46* |
| 0.50 - 5.00     | 73                             | 60   | 56      | 46     |
| 5.00 - 30.0     | 73                             | 60   | 60      | 50     |

\* Decreasing linearly with the logarithm of the frequency

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

#### 3.2 Test Setup



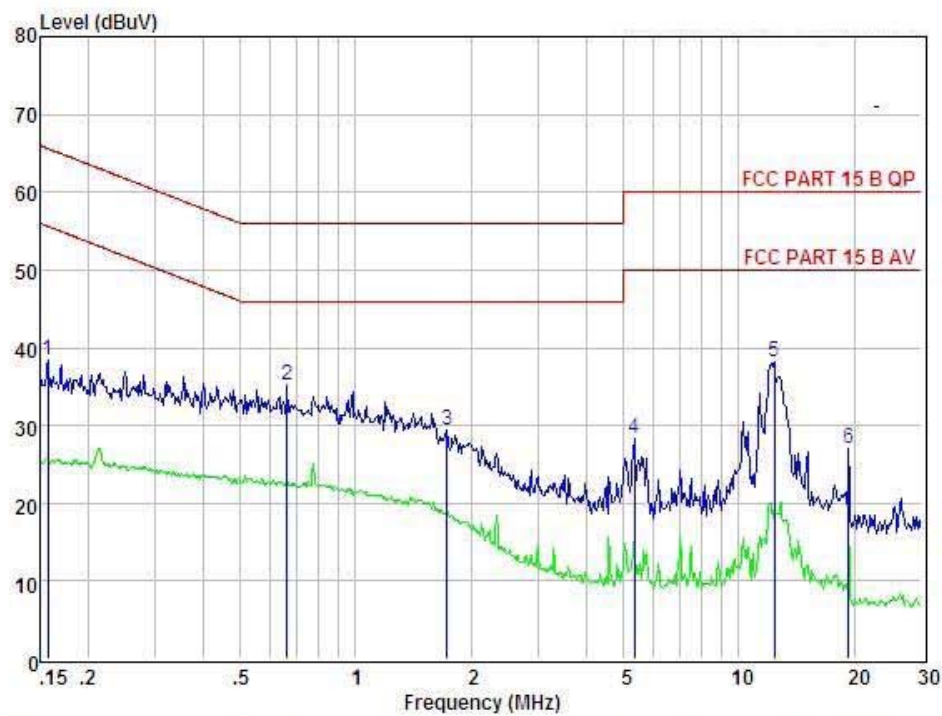
#### 3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

#### 3.4 Test Result

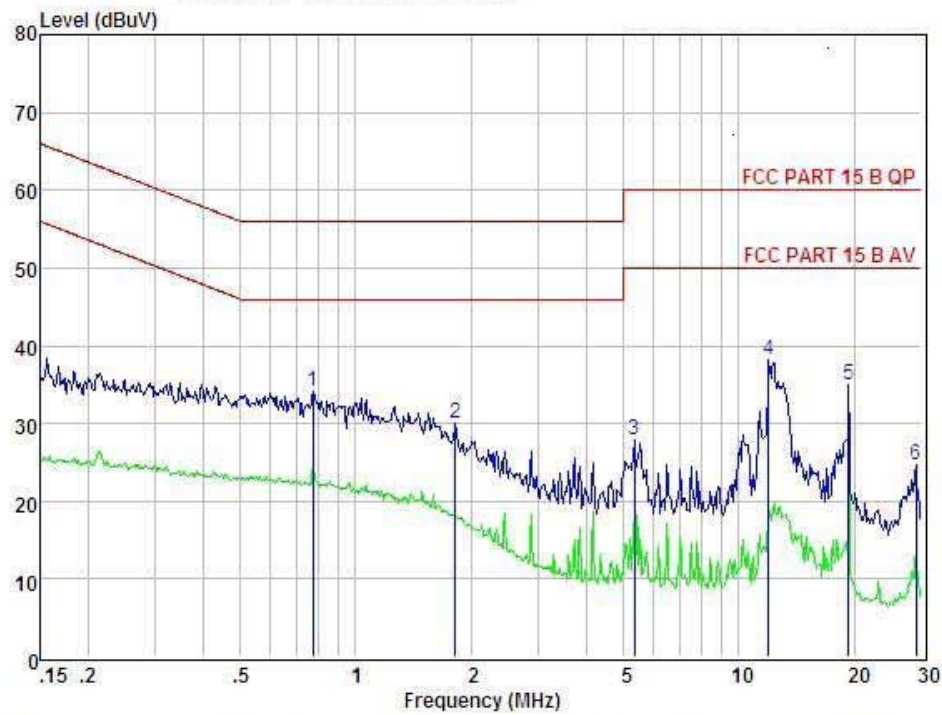
PASS

All the test modes completed for test.



| Condition |        | : FCC PART 15 B QP |      |        | POL: LINE |       | Temp: 25.7 °C |        | Hum: 51 % |  |
|-----------|--------|--------------------|------|--------|-----------|-------|---------------|--------|-----------|--|
| Item      | Freq   | Read               | LISN | Preamp | Cable     | Level | Limit         | Margin | Remark    |  |
|           | MHz    | dBuV               | dB   | dB     | dB        | dBuV  | dBuV          | dBuV   |           |  |
| 1         | 0.157  | 28.78              | 0.03 | -9.52  | 0.10      | 38.30 | 65.60         | -27.30 | Peak      |  |
| 2         | 0.661  | 25.58              | 0.00 | -9.59  | 0.10      | 35.17 | 56.00         | -20.83 | Peak      |  |
| 3         | 1.734  | 19.64              | 0.05 | -9.70  | 0.10      | 29.34 | 56.00         | -26.66 | Peak      |  |
| 4         | 5.333  | 18.47              | 0.08 | -9.94  | 0.12      | 28.41 | 60.00         | -31.59 | Peak      |  |
| 5         | 12.384 | 28.19              | 0.24 | -9.90  | 0.22      | 38.09 | 60.00         | -21.91 | Peak      |  |
| 6         | 19.326 | 17.19              | 0.37 | -9.81  | 0.38      | 27.00 | 60.00         | -33.00 | Peak      |  |

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss



| Condition : FCC PART 15 B QP POL: NEUTRAL Temp: 25.7 °C Hum: 51 % |        |       |        |        |       |       |       |        |        |
|-------------------------------------------------------------------|--------|-------|--------|--------|-------|-------|-------|--------|--------|
| Item                                                              | Freq   | Read  | LISN   | Preamp | Cable | Level | Limit | Margin | Remark |
|                                                                   | MHz    | Level | Factor | Factor | Loss  | dBuV  | dBuV  | dBuV   |        |
|                                                                   |        | dBuV  | dB     | dB     | dB    |       |       |        |        |
| 1                                                                 | 0.775  | 24.48 | 0.03   | -9.60  | 0.10  | 34.08 | 56.00 | -21.92 | Peak   |
| 2                                                                 | 1.819  | 20.22 | 0.00   | -9.70  | 0.10  | 29.92 | 56.00 | -26.08 | Peak   |
| 3                                                                 | 5.333  | 18.01 | 0.05   | -9.94  | 0.10  | 27.95 | 60.00 | -32.05 | Peak   |
| 4                                                                 | 11.996 | 28.22 | 0.08   | -9.90  | 0.12  | 38.12 | 60.00 | -21.88 | Peak   |
| 5                                                                 | 19.326 | 25.14 | 0.24   | -9.81  | 0.22  | 34.95 | 60.00 | -25.05 | Peak   |
| 6                                                                 | 29.061 | 14.70 | 0.37   | -9.86  | 0.38  | 24.56 | 60.00 | -35.44 | Peak   |

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

## 4 RADIATED EMISSION TEST

### 4.1 Radiation Limit

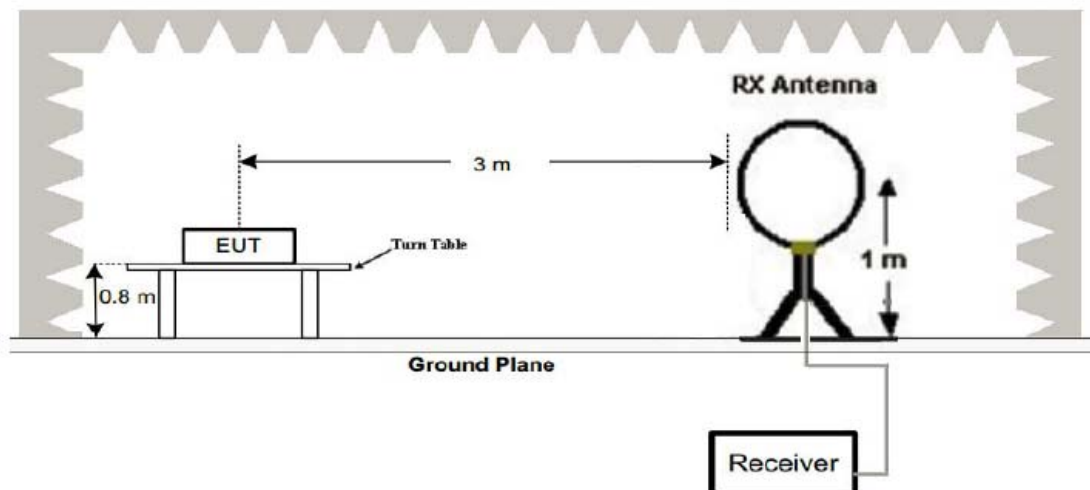
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency (MHz) | Distance (Meters) | Radiated (dB $\mu$ V/m) | Radiated ( $\mu$ V/m) |
|-----------------|-------------------|-------------------------|-----------------------|
| 30-88           | 3                 | 40                      | 100                   |
| 88-216          | 3                 | 43.5                    | 150                   |
| 216-960         | 3                 | 46                      | 200                   |
| Above 960       | 3                 | 54                      | 500                   |

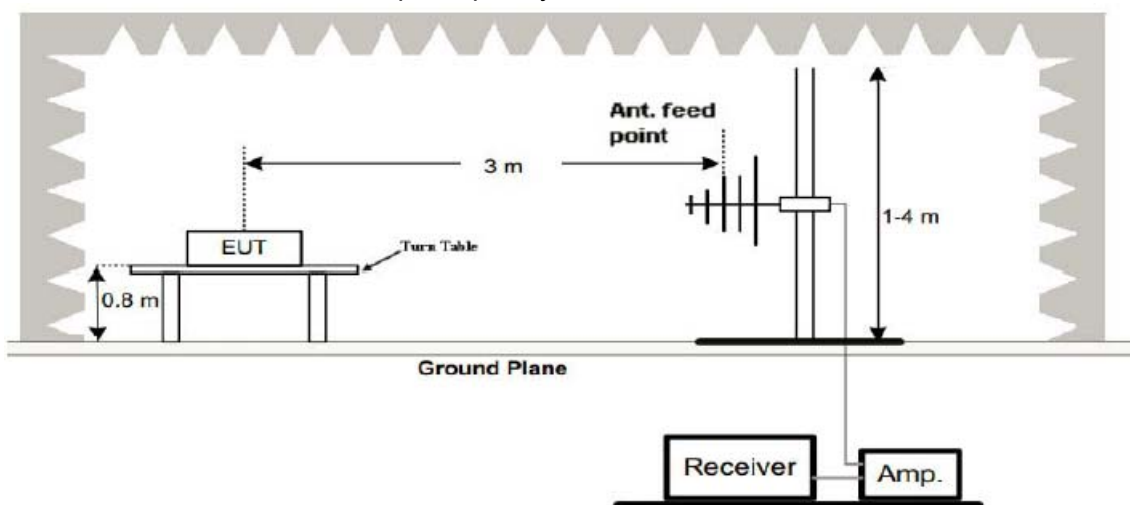
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### 4.2 Test Setup

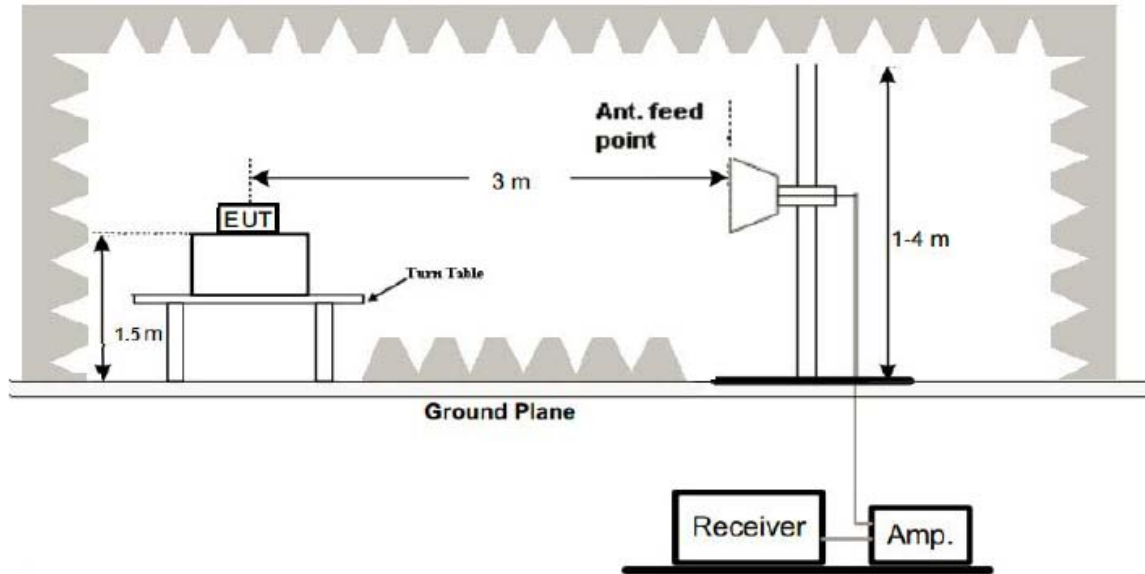
#### (1) Radiated Emission Test-Up Frequency Below 30MHz



#### (2) Radiated Emission Test-Up Frequency 30MHz~1GHz



### (3) Radiated Emission Test-Up Frequency Above 1GHz



#### 4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

#### Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

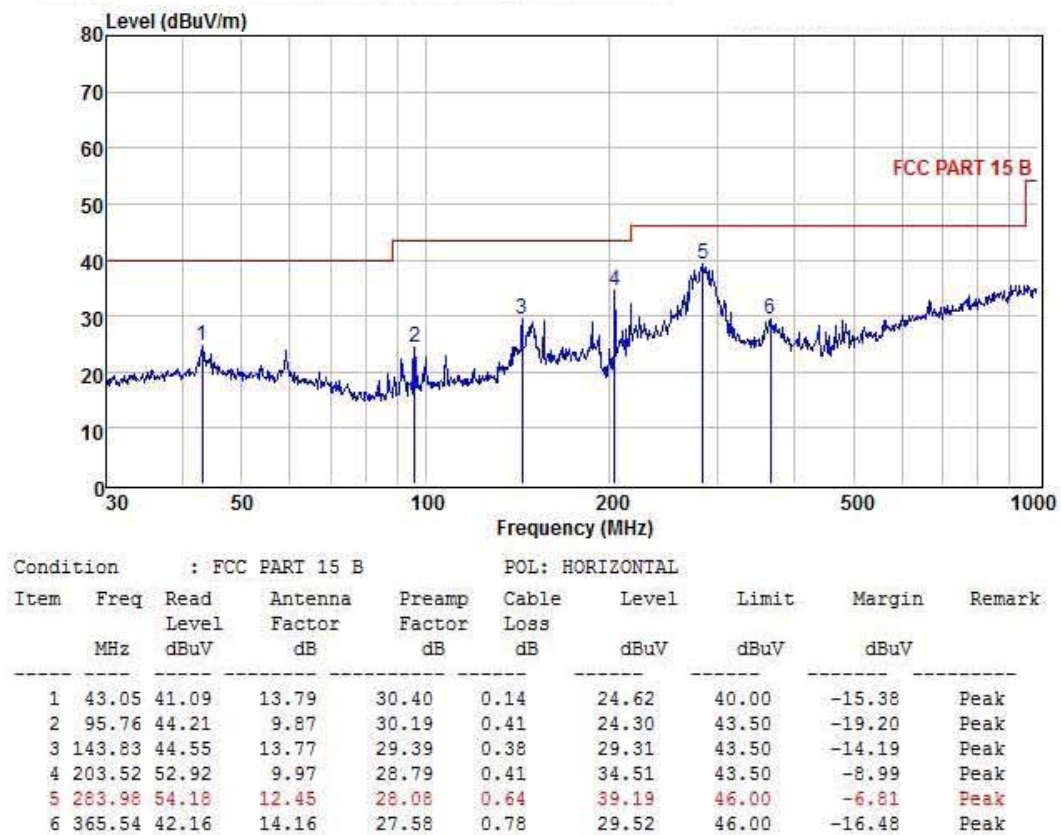
#### 4.4 Test Result

##### PASS

All the test modes completed for test. The worst case of Radiated Emission; the test data of this mode was reported.



Below 1GHz Test Results:  
Antenna polarity: H



Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Antenna polarity: V



Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.



## Above 1 GHz Test Results:

LOW CH1 (802.11b Mode)/2412  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4824      | 59.81         | -3.64  | 56.17          | 74       | -17.83 | peak          |
| 4824      | 45.05         | -3.64  | 41.41          | 54       | -12.59 | AVG           |
| 7236      | 52.47         | -0.95  | 51.52          | 74       | -22.48 | peak          |
| 7236      | 37.30         | -0.95  | 36.35          | 54       | -17.65 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

## Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4824      | 58.68         | -3.64  | 55.04          | 74       | -18.96 | peak          |
| 4824      | 44.13         | -3.64  | 40.49          | 54       | -13.51 | AVG           |
| 7236      | 52.48         | -0.95  | 51.53          | 74       | -22.47 | peak          |
| 7236      | 37.91         | -0.95  | 36.96          | 54       | -17.04 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH6 (802.11b Mode)/2437  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 59.28         | -3.51  | 55.77          | 74       | -18.23 | peak          |
| 4874      | 43.76         | -3.51  | 40.25          | 54       | -13.75 | AVG           |
| 7311      | 53.64         | -0.82  | 52.82          | 74       | -21.18 | peak          |
| 7311      | 38.88         | -0.82  | 38.06          | 54       | -15.94 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 58.25         | -3.51  | 54.74          | 74       | -19.26 | peak          |
| 4874      | 42.14         | -3.51  | 38.63          | 54       | -15.37 | AVG           |
| 7311      | 54.57         | -0.82  | 53.75          | 74       | -20.25 | peak          |
| 7311      | 40.14         | -0.82  | 39.32          | 54       | -14.68 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



HIGH CH11 (802.11b Mode)/2462  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 60.08         | -3.43  | 56.65          | 74       | -17.35 | peak          |
| 4924      | 44.61         | -3.43  | 41.18          | 54       | -12.82 | AVG           |
| 7386      | 53.31         | -0.75  | 52.56          | 74       | -21.44 | peak          |
| 7386      | 38.68         | -0.75  | 37.93          | 54       | -16.07 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 58.27         | -3.43  | 54.84          | 74       | -19.16 | peak          |
| 4924      | 43.45         | -3.43  | 40.02          | 54       | -13.98 | AVG           |
| 7386      | 53.01         | -0.75  | 52.26          | 74       | -21.74 | peak          |
| 7386      | 39.32         | -0.75  | 38.57          | 54       | -15.43 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "—" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



LOW CH1 (802.11g Mode)/2412  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4824      | 58.20         | -3.64  | 54.56          | 74       | -19.44 | peak          |
| 4824      | 43.57         | -3.64  | 39.93          | 54       | -14.07 | AVG           |
| 7236      | 53.37         | -0.95  | 52.42          | 74       | -21.58 | peak          |
| 7236      | 38.60         | -0.95  | 37.65          | 54       | -16.35 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4824      | 57.21         | -3.64  | 53.57          | 74       | -20.43 | peak          |
| 4824      | 41.82         | -3.64  | 38.18          | 54       | -15.82 | AVG           |
| 7236      | 53.18         | -0.95  | 52.23          | 74       | -21.77 | peak          |
| 7236      | 38.98         | -0.95  | 38.03          | 54       | -15.97 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH6 (802.11g Mode)/2437  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 60.03         | -3.51  | 56.52          | 74       | -17.48 | peak          |
| 4874      | 44.35         | -3.51  | 40.84          | 54       | -13.16 | AVG           |
| 7311      | 53.29         | -0.82  | 52.47          | 74       | -21.53 | peak          |
| 7311      | 38.53         | -0.82  | 37.71          | 54       | -16.29 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 59.05         | -3.51  | 55.54          | 74       | -18.46 | peak          |
| 4874      | 44.68         | -3.51  | 41.17          | 54       | -12.83 | AVG           |
| 7311      | 52.33         | -0.82  | 51.51          | 74       | -22.49 | peak          |
| 7311      | 38.15         | -0.82  | 37.33          | 54       | -16.67 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



HIGH CH11 (802.11g Mode)/2462  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 59.19         | -3.43  | 55.76          | 74       | -18.24 | peak          |
| 4924      | 43.71         | -3.43  | 40.28          | 54       | -13.72 | AVG           |
| 7386      | 52.60         | -0.75  | 51.85          | 74       | -22.15 | peak          |
| 7386      | 38.71         | -0.75  | 37.96          | 54       | -16.04 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 58.51         | -3.43  | 55.08          | 74       | -18.92 | peak          |
| 4924      | 43.12         | -3.43  | 39.69          | 54       | -14.31 | AVG           |
| 7386      | 51.01         | -0.75  | 50.26          | 74       | -23.74 | peak          |
| 7386      | 37.86         | -0.75  | 37.11          | 54       | -16.89 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "—" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



LOW CH1 (802.11n/H20 Mode)/2412  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4824      | 58.57         | -3.64  | 54.93          | 74       | -19.07 | peak          |
| 4824      | 43.38         | -3.64  | 39.74          | 54       | -14.26 | AVG           |
| 7236      | 51.37         | -0.95  | 50.42          | 74       | -23.58 | peak          |
| 7236      | 37.63         | -0.95  | 36.68          | 54       | -17.32 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4824      | 57.36         | -3.64  | 53.72          | 74       | -20.28 | peak          |
| 4824      | 42.95         | -3.64  | 39.31          | 54       | -14.69 | AVG           |
| 7236      | 52.52         | -0.95  | 51.57          | 74       | -22.43 | peak          |
| 7236      | 38.23         | -0.95  | 37.28          | 54       | -16.72 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH6 (802.11n/H20 Mode)/2437  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 58.94         | -3.51  | 55.43          | 74       | -18.57 | peak          |
| 4874      | 43.90         | -3.51  | 40.39          | 54       | -13.61 | AVG           |
| 7311      | 53.07         | -0.82  | 52.25          | 74       | -21.75 | peak          |
| 7311      | 37.88         | -0.82  | 37.06          | 54       | -16.94 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 58.15         | -3.51  | 54.64          | 74       | -19.36 | peak          |
| 4874      | 43.23         | -3.51  | 39.72          | 54       | -14.28 | AVG           |
| 7311      | 54.05         | -0.82  | 53.23          | 74       | -20.77 | peak          |
| 7311      | 39.29         | -0.82  | 38.47          | 54       | -15.53 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



HIGH CH11 (802.11n/H20 Mode)/2462  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 57.49         | -3.43  | 54.06          | 74       | -19.94 | peak          |
| 4924      | 42.95         | -3.43  | 39.52          | 54       | -14.48 | AVG           |
| 7386      | 51.27         | -0.75  | 50.52          | 74       | -23.48 | peak          |
| 7386      | 37.04         | -0.75  | 36.29          | 54       | -17.71 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 55.37         | -3.43  | 51.94          | 74       | -22.06 | peak          |
| 4924      | 40.12         | -3.43  | 36.69          | 54       | -17.31 | AVG           |
| 7386      | 50.47         | -0.75  | 49.72          | 74       | -24.28 | peak          |
| 7386      | 35.93         | -0.75  | 35.18          | 54       | -18.82 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "—" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

LOW CH3 (802.11n/H40 Mode)/2422  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 59.89         | -3.63  | 56.26          | 74       | -17.74 | peak          |
| 4924      | 44.96         | -3.63  | 41.33          | 54       | -12.67 | AVG           |
| 7386      | 53.79         | -0.94  | 52.85          | 74       | -21.15 | peak          |
| 7386      | 39.35         | -0.94  | 38.41          | 54       | -15.59 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4924      | 58.01         | -3.63  | 54.38          | 74       | -19.62 | peak          |
| 4924      | 43.32         | -3.63  | 39.69          | 54       | -14.31 | AVG           |
| 7386      | 53.36         | -0.94  | 52.42          | 74       | -21.58 | peak          |
| 7386      | 38.47         | -0.94  | 37.53          | 54       | -16.47 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

MID CH6 (802.11n/H40 Mode)/2437  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 59.72         | -3.51  | 56.21          | 74       | -17.79 | peak          |
| 4874      | 44.68         | -3.51  | 41.17          | 54       | -12.83 | AVG           |
| 7311      | 53.38         | -0.82  | 52.56          | 74       | -21.44 | peak          |
| 7311      | 38.83         | -0.82  | 38.01          | 54       | -15.99 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4874      | 59.05         | -3.51  | 55.54          | 74       | -18.46 | peak          |
| 4874      | 44.80         | -3.51  | 41.29          | 54       | -12.71 | AVG           |
| 7311      | 52.67         | -0.82  | 51.85          | 74       | -22.15 | peak          |
| 7311      | 38.34         | -0.82  | 37.52          | 54       | -16.48 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



HIGH CH9 (802.11n/H40 Mode)/2452  
Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4904      | 59.09         | -3.43  | 55.66          | 74       | -18.34 | peak          |
| 4904      | 43.92         | -3.43  | 40.49          | 54       | -13.51 | AVG           |
| 7356      | 52.26         | -0.75  | 51.51          | 74       | -22.49 | peak          |
| 7356      | 38.57         | -0.75  | 37.82          | 54       | -16.18 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 4904      | 58.16         | -3.43  | 54.73          | 74       | -19.27 | peak          |
| 4904      | 43.74         | -3.43  | 40.31          | 54       | -13.69 | AVG           |
| 7356      | 52.92         | -0.75  | 52.17          | 74       | -21.83 | peak          |
| 7356      | 39.18         | -0.75  | 38.43          | 54       | -15.57 | AVG           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |
| ---       | ---           | ---    | ---            | ---      | ---    | ---           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



## 5 BAND EDGE

### 5.1 Limits

FCC PART 15.247 Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### 5.2 Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 100KHz and VBM to 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength. The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBW to 300 KHz, to measure the conducted peak band edge.

### 5.3 Test Result

#### PASS

Radiated Band Edge Test:

Operation Mode: 802.11b Mode TX CH Low (2412MHz)

Horizontal

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390      | 51.75         | -5.81  | 45.94          | 74       | -28.06 | peak          |
| 2390      | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400      | 61.35         | -5.84  | 55.51          | 74       | -18.49 | peak          |
| 2400      | 46.89         | -5.84  | 41.05          | 54       | -12.95 | AVG           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390      | 51.45         | -5.81  | 45.64          | 74       | -28.36 | peak          |
| 2390      | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400      | 56.90         | -5.84  | 51.06          | 74       | -22.94 | peak          |
| 2400      | /             | -5.84  | /              | 54       | /      | AVG           |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH High (2462MHz)  
Horizontal

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                        | 51.53         | -5.65  | 45.88          | 74       | -28.12 | peak          |
| 2483.5                                                        | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Vertical:

| Frequency                                                                                              | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|--------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                  | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                                                                 | 50.58         | -5.65  | 44.93          | 74       | -29.07 | peak          |
| 2483.5                                                                                                 | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.                                          |               |        |                |          |        |               |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit. |               |        |                |          |        |               |

Operation Mode: 802.11g Mode TX CH Low (2412MHz)  
Horizontal

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390                                                          | 50.68         | -5.81  | 44.87          | 74       | -29.13 | peak          |
| 2390                                                          | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400                                                          | 61.40         | -5.84  | 55.56          | 74       | -18.44 | peak          |
| 2400                                                          | 47.56         | -5.84  | 41.72          | 54       | -12.28 | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Vertical:

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390                                                          | 51.06         | -5.81  | 45.25          | 74       | -28.75 | peak          |
| 2390                                                          | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400                                                          | 59.92         | -5.84  | 54.08          | 74       | -19.92 | peak          |
| 2400                                                          | 44.67         | -5.84  | 38.83          | 54       | -15.17 | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |



Operation Mode: TX CH High (2462MHz)  
Horizontal

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                        | 51.29         | -5.65  | 45.64          | 74       | -28.36 | peak          |
| 2483.5                                                        | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Vertical:

| Frequency                                                                                              | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|--------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                  | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                                                                 | 50.90         | -5.65  | 45.25          | 74       | -28.75 | peak          |
| 2483.5                                                                                                 | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.                                          |               |        |                |          |        |               |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit. |               |        |                |          |        |               |

Operation Mode: 802.11n/H20 Mode TX CH Low (2412MHz)  
Horizontal

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390                                                          | 51.14         | -5.81  | 45.33          | 74       | -28.67 | peak          |
| 2390                                                          | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400                                                          | 58.41         | -5.84  | 52.57          | 74       | -21.43 | peak          |
| 2400                                                          | /             | -5.84  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Vertical:

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390                                                          | 50.75         | -5.81  | 44.94          | 74       | -29.06 | peak          |
| 2390                                                          | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400                                                          | 56.42         | -5.84  | 50.58          | 74       | -23.42 | peak          |
| 2400                                                          | /             | -5.84  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Operation Mode: TX CH High (2462MHz)  
Horizontal

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                        | 51.49         | -5.65  | 45.84          | 74       | -28.16 | peak          |
| 2483.5                                                        | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Vertical:

| Frequency                                                                                              | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|--------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                  | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                                                                 | 51.18         | -5.65  | 45.53          | 74       | -28.47 | peak          |
| 2483.5                                                                                                 | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.                                          |               |        |                |          |        |               |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit. |               |        |                |          |        |               |

Operation Mode: 802.11n/H40 Mode TX CH Low (2422MHz)  
Horizontal

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390                                                          | 51.18         | -5.81  | 45.37          | 74       | -28.63 | peak          |
| 2390                                                          | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400                                                          | 57.36         | -5.84  | 51.52          | 74       | -22.48 | peak          |
| 2400                                                          | /             | -5.84  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Vertical:

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2390                                                          | 51.27         | -5.81  | 44.65          | 74       | -29.35 | peak          |
| 2390                                                          | /             | -5.81  | /              | 54       | /      | AVG           |
| 2400                                                          | 57.35         | -5.84  | 50.26          | 74       | -23.74 | peak          |
| 2400                                                          | /             | -5.84  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Operation Mode: TX CH High (2452MHz)  
Horizontal

| Frequency                                                     | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|---------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                         | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                        | 51.13         | -5.65  | 45.48          | 74       | -28.52 | peak          |
| 2483.5                                                        | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. |               |        |                |          |        |               |

Vertical:

| Frequency                                                                                              | Meter Reading | Factor | Emission Level | Limits   | Margin | Detector Type |
|--------------------------------------------------------------------------------------------------------|---------------|--------|----------------|----------|--------|---------------|
| (MHz)                                                                                                  | (dBμV)        | (dB)   | (dBμV/m)       | (dBμV/m) | (dB)   |               |
| 2483.5                                                                                                 | 50.78         | -5.65  | 45.13          | 74       | -28.87 | peak          |
| 2483.5                                                                                                 | /             | -5.65  | /              | 54       | /      | AVG           |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.                                          |               |        |                |          |        |               |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit. |               |        |                |          |        |               |



## 6 OCCUPIED BANDWIDTH MEASUREMENT

### 6.1 Test Limit

| FCC Part15 (15.247) , Subpart C |           |                                         |                          |        |
|---------------------------------|-----------|-----------------------------------------|--------------------------|--------|
| Section                         | Test Item | Limit                                   | Frequency Range<br>(MHz) | Result |
| 15.247(a)(2)                    | Bandwidth | $\geq 500\text{KHz}$<br>(6dB bandwidth) | 2400-2483.5              | PASS   |

### 6.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.247: RBW= 100KHz. VBW= 300 KHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

### 6.3 Measurement Equipment Used

Same as Radiated Emission Measurement

### 6.4 Test Result

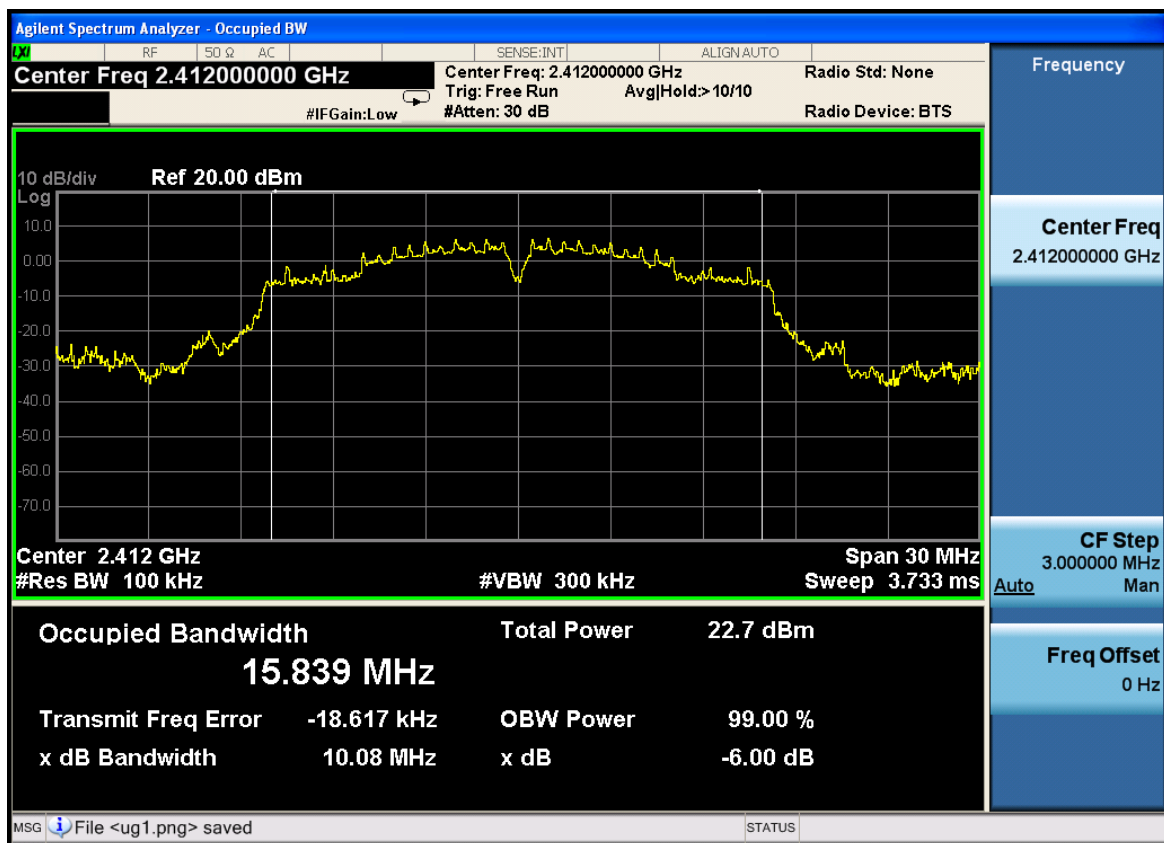
**PASS**

All the test modes completed for test.



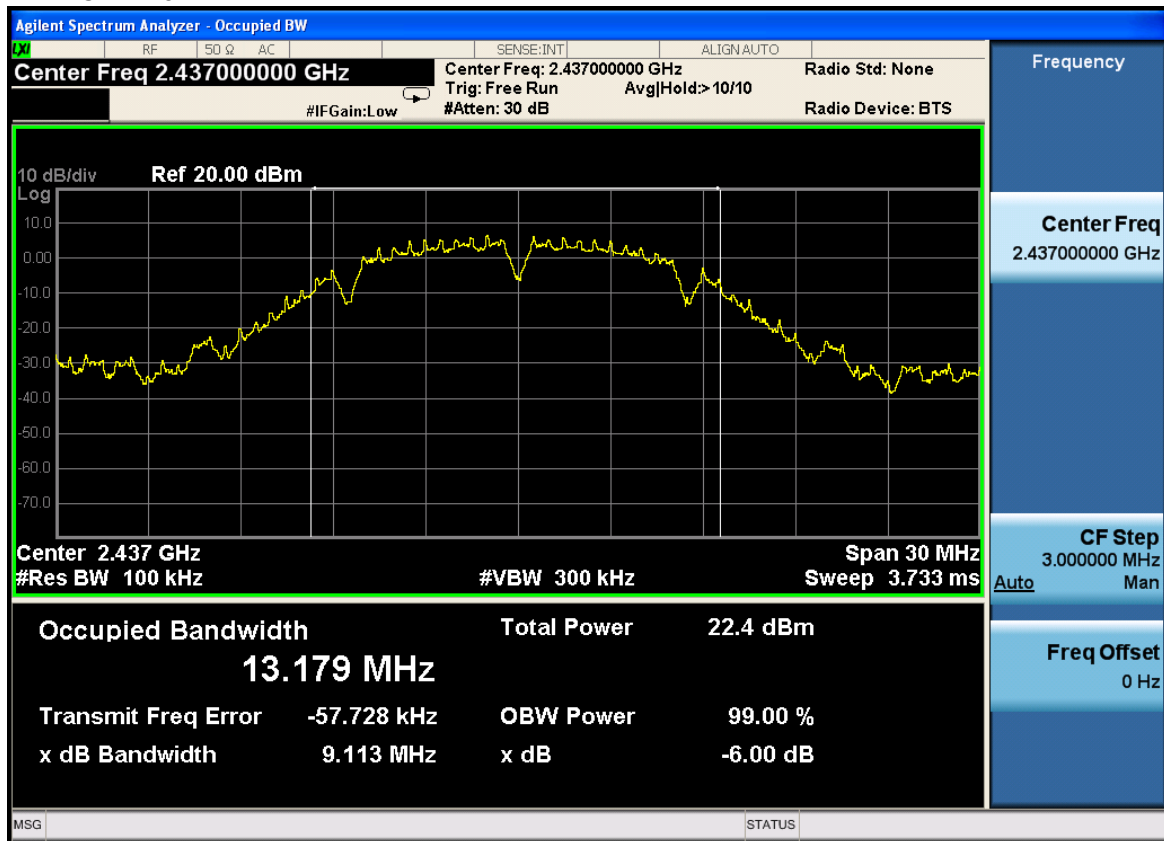
| TX 802.11b Mode |                     |                          |        |
|-----------------|---------------------|--------------------------|--------|
| Frequency       | 6dB Bandwidth (MHz) | Channel Separation (MHz) | Result |
| 2412 MHz        | 10.08               | >=500KHz                 | PASS   |
| 2437 MHz        | 9.113               | >=500KHz                 | PASS   |
| 2462 MHz        | 9.079               | >=500KHz                 | PASS   |

CH: 2412MHz

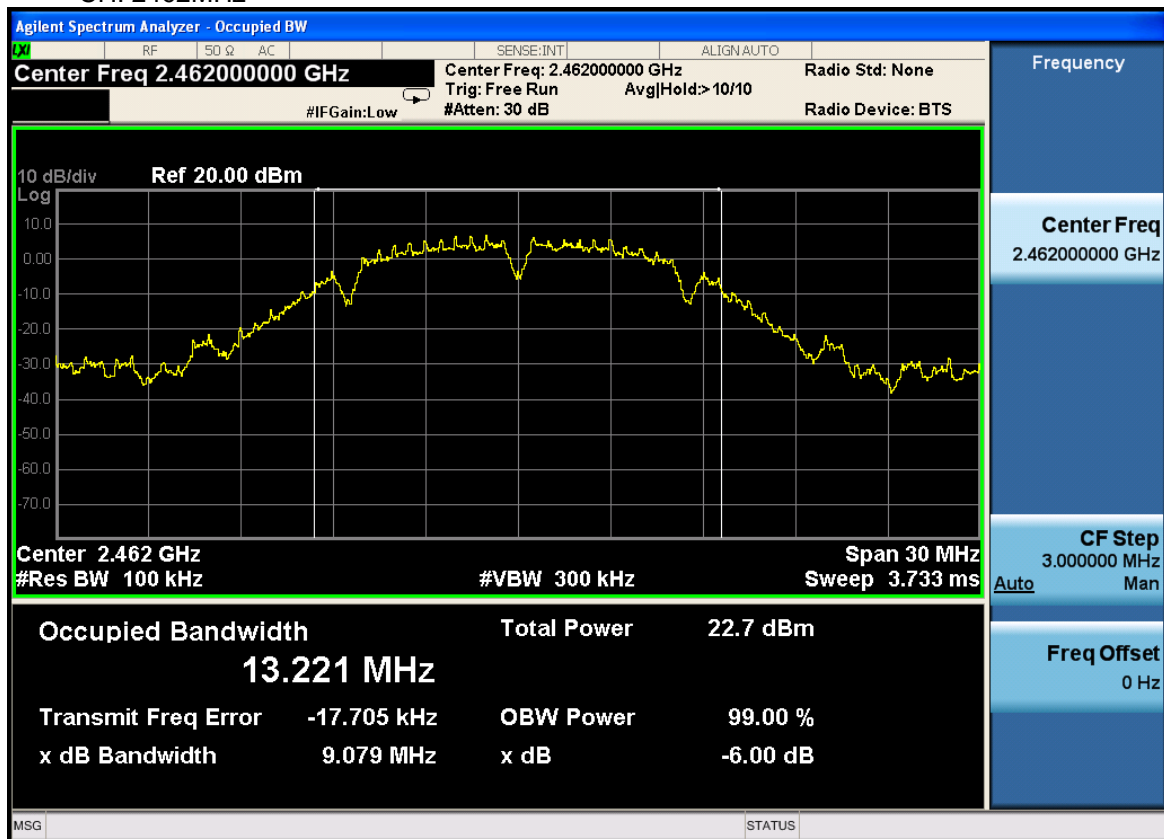




CH: 2437MHz



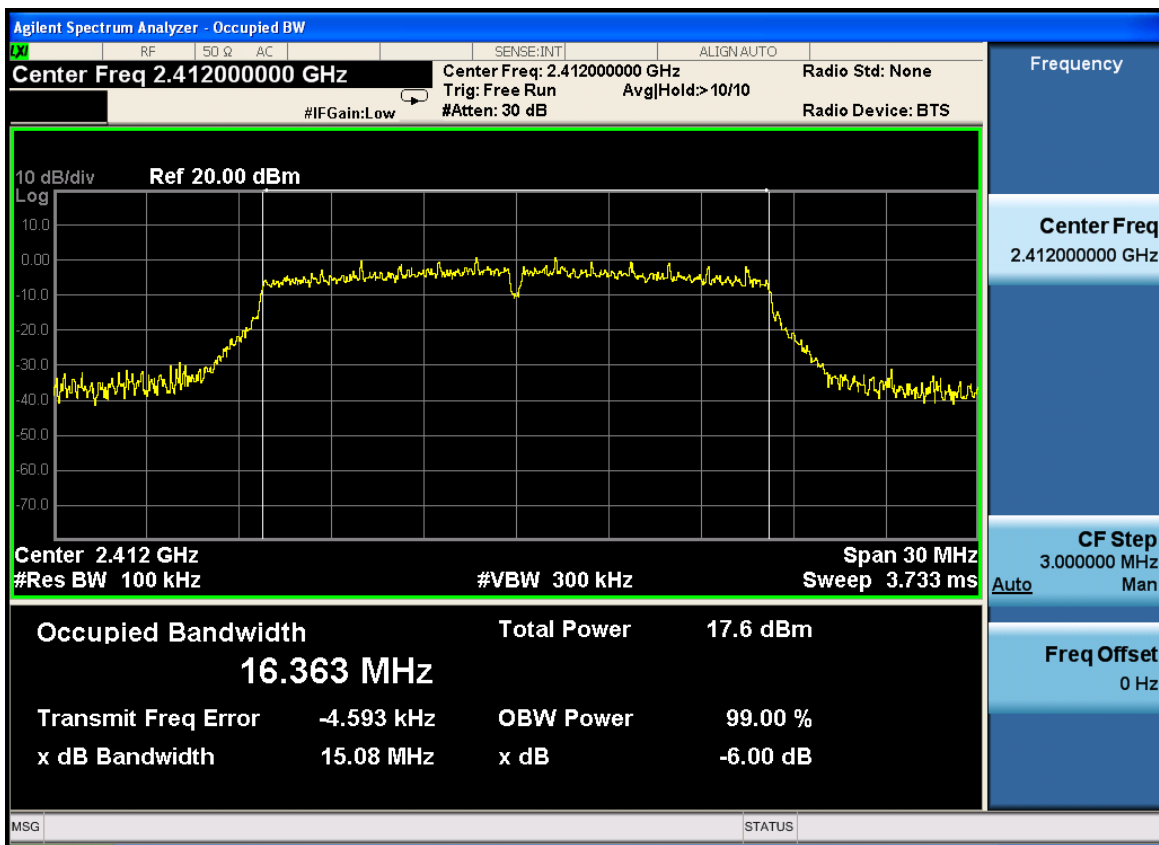
CH: 2462MHz





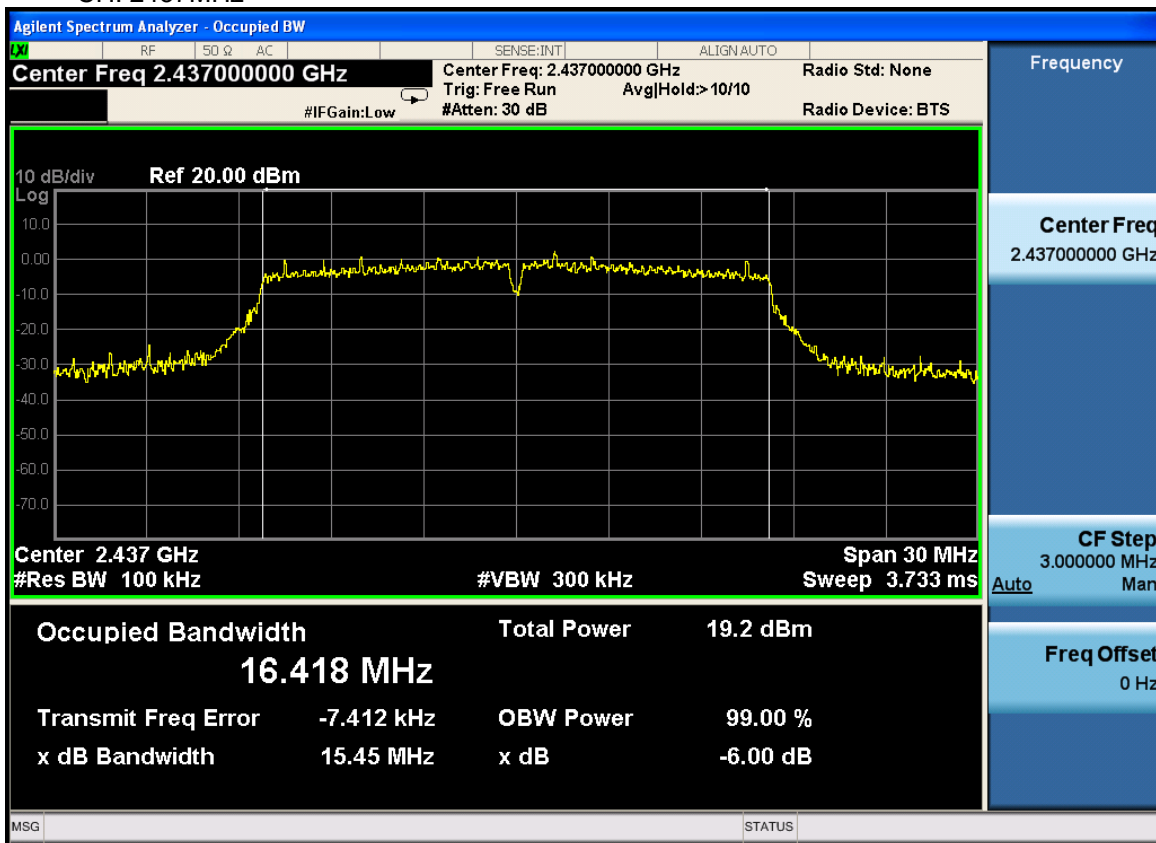
| TX 802.11g Mode |                     |                          |        |
|-----------------|---------------------|--------------------------|--------|
| Frequency       | 6dB Bandwidth (MHz) | Channel Separation (MHz) | Result |
| 2412 MHz        | 15.08               | >=500KHz                 | PASS   |
| 2437 MHz        | 15.45               | >=500KHz                 | PASS   |
| 2462 MHz        | 15.12               | >=500KHz                 | PASS   |

CH: 2412MHz

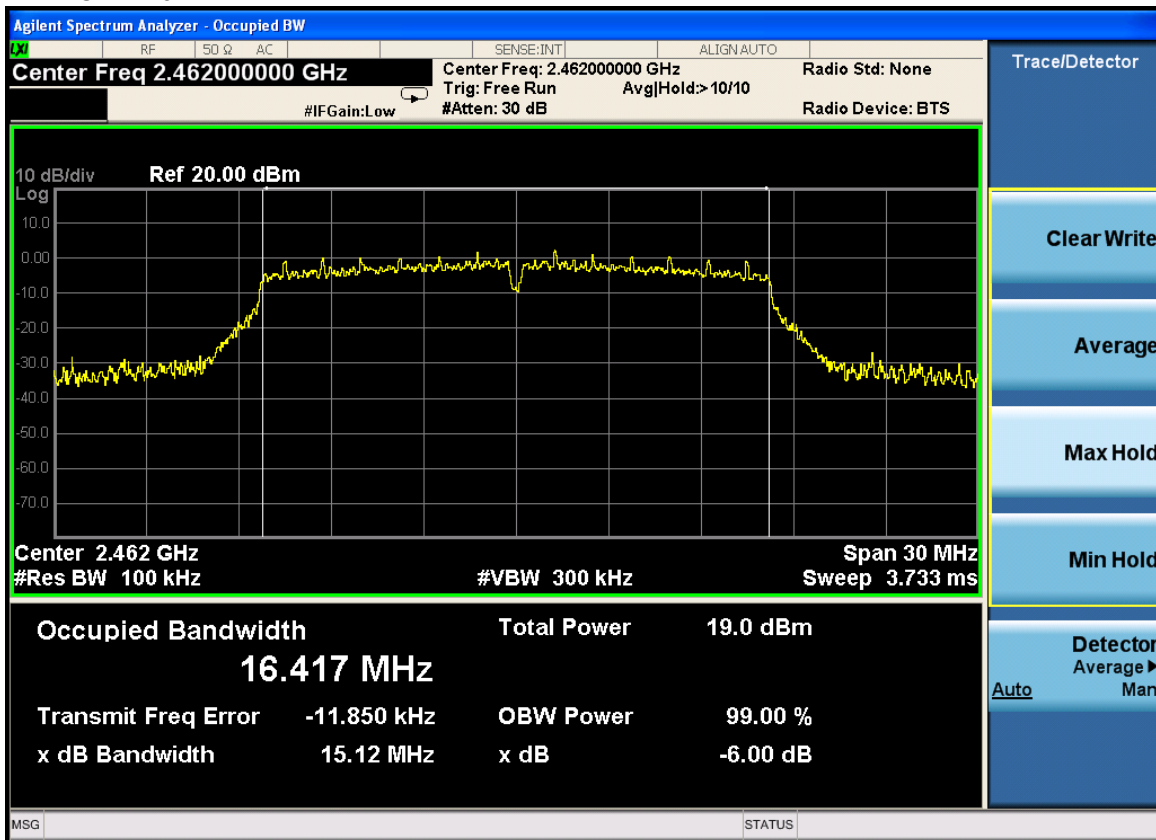




CH: 2437MHz



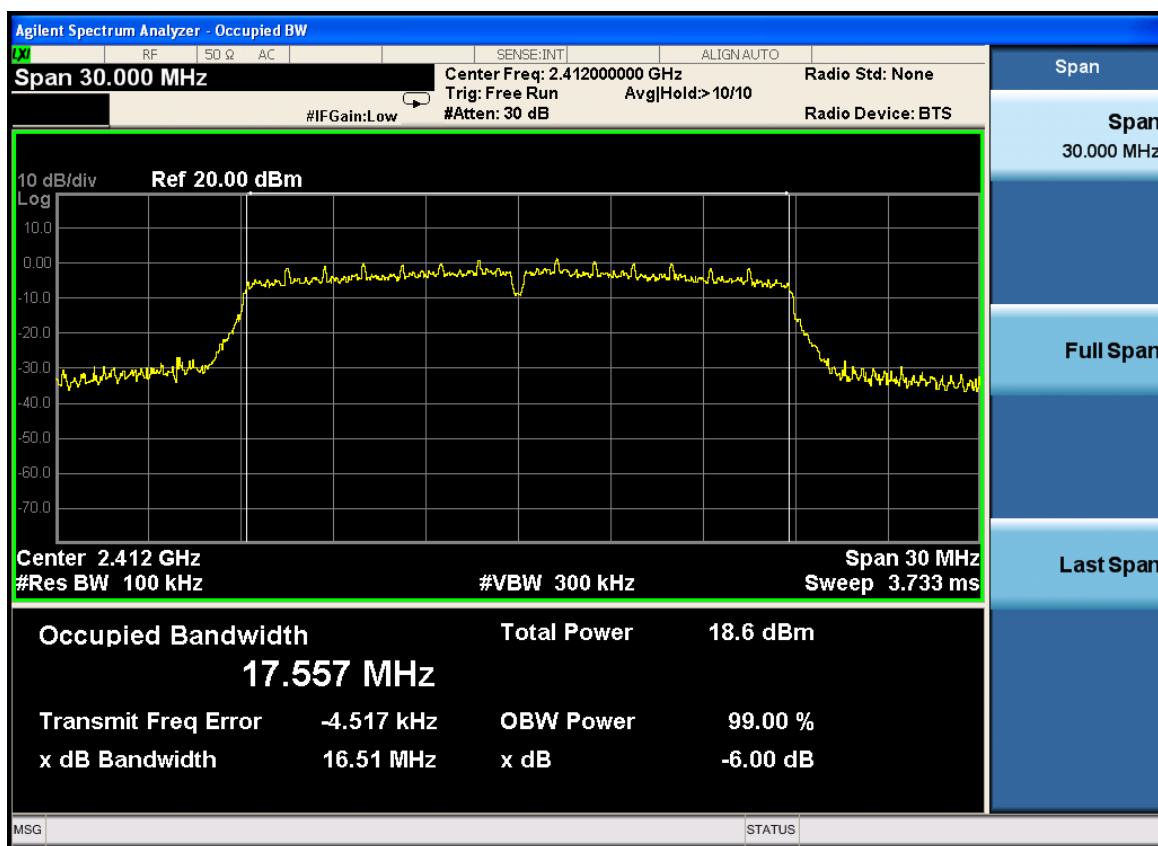
CH: 2462MHz





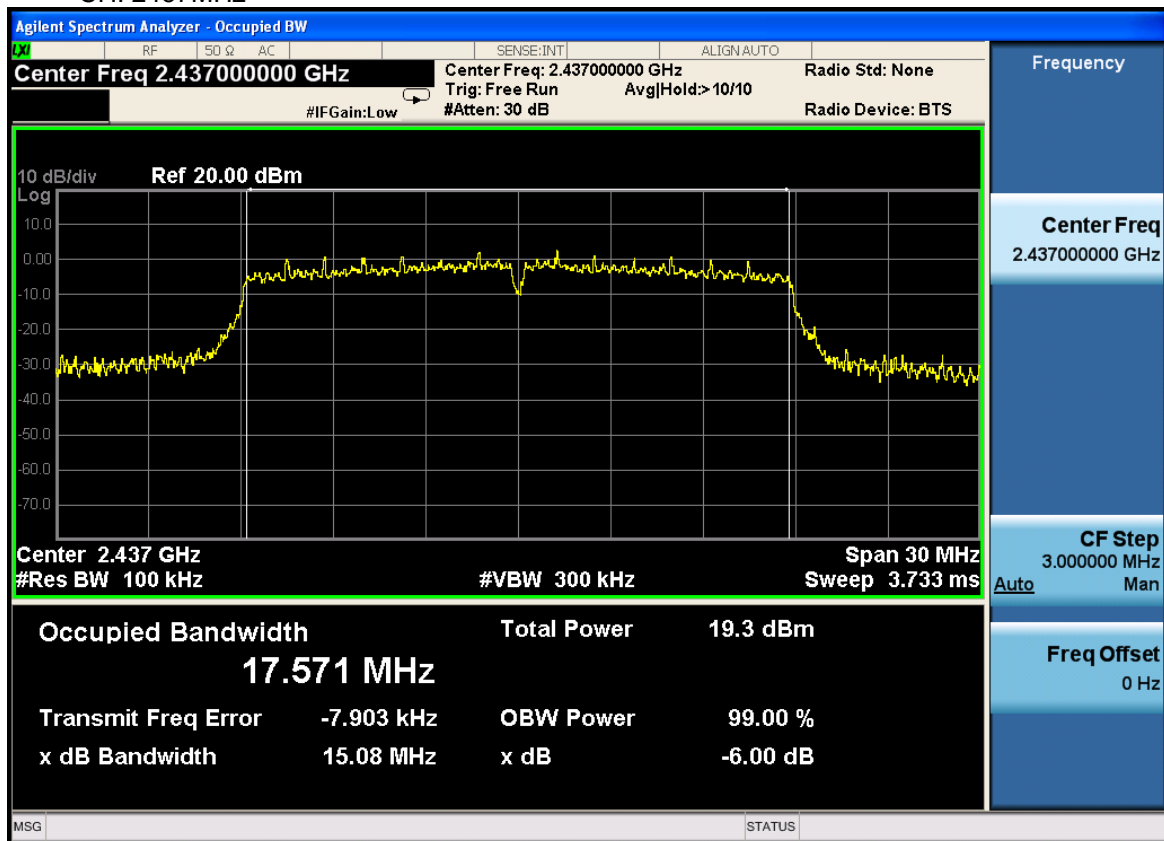
| TX 802.11n/HT20 Mode |                     |                          |        |
|----------------------|---------------------|--------------------------|--------|
| Frequency            | 6dB Bandwidth (MHz) | Channel Separation (MHz) | Result |
| 2412 MHz             | 16.51               | >=500KHz                 | PASS   |
| 2437 MHz             | 15.08               | >=500KHz                 | PASS   |
| 2462 MHz             | 15.05               | >=500KHz                 | PASS   |

CH: 2412MHz

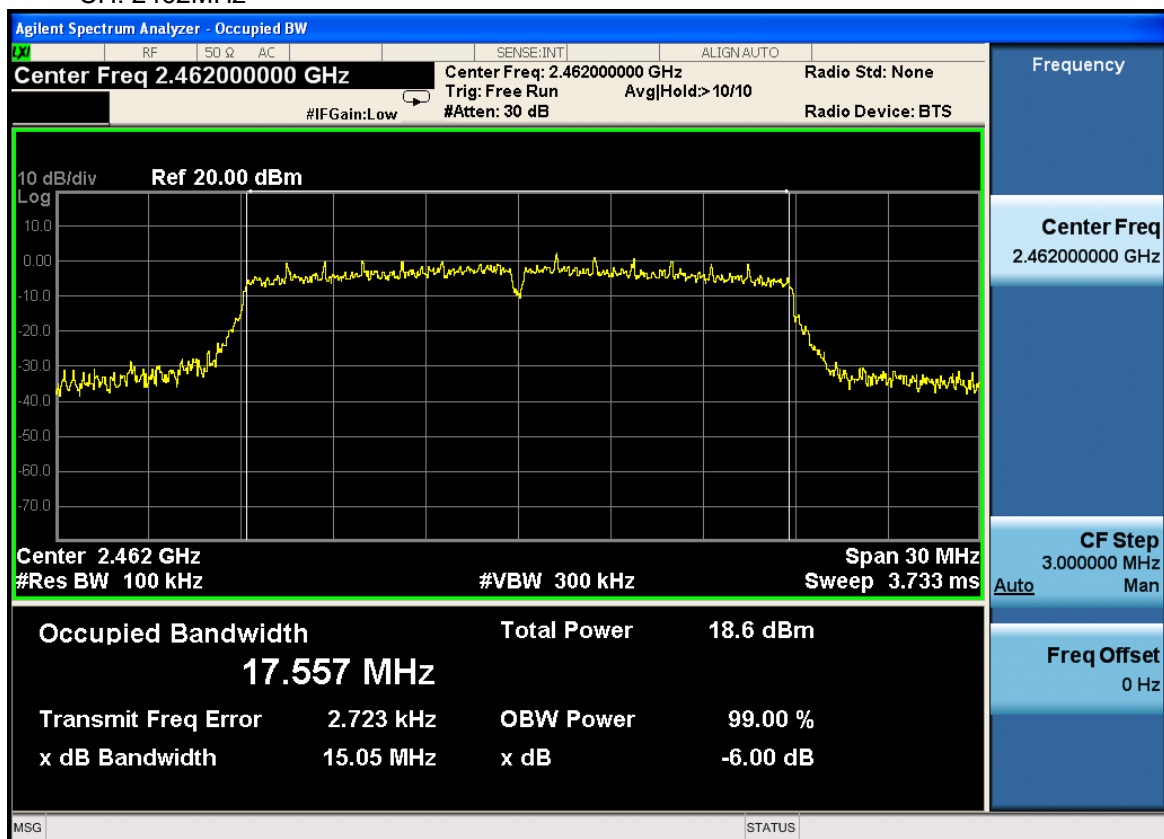




CH: 2437MHz



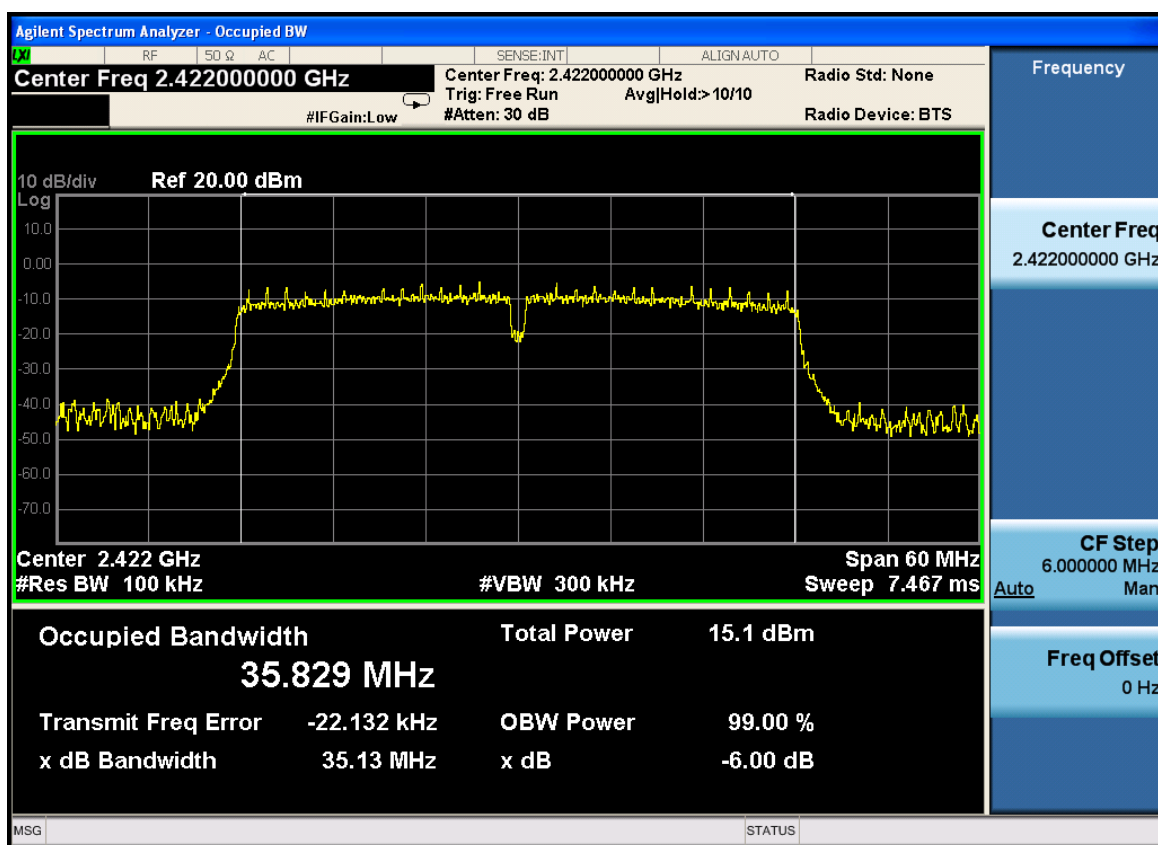
CH: 2462MHz





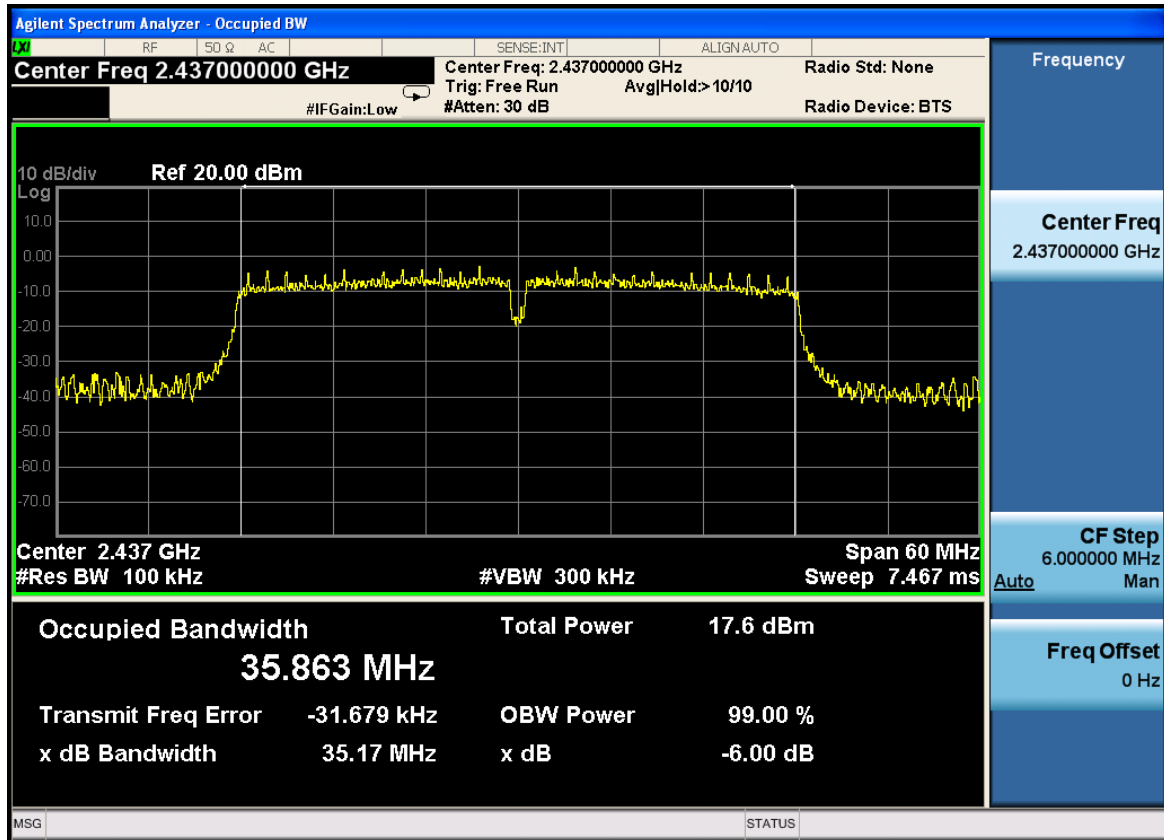
| TX 802.11n/HT40 Mode |                     |                          |        |
|----------------------|---------------------|--------------------------|--------|
| Frequency            | 6dB Bandwidth (MHz) | Channel Separation (MHz) | Result |
| 2422 MHz             | 35.13               | >=500KHz                 | PASS   |
| 2437 MHz             | 35.17               | >=500KHz                 | PASS   |
| 2452 MHz             | 35.19               | >=500KHz                 | PASS   |

CH: 2422MHz

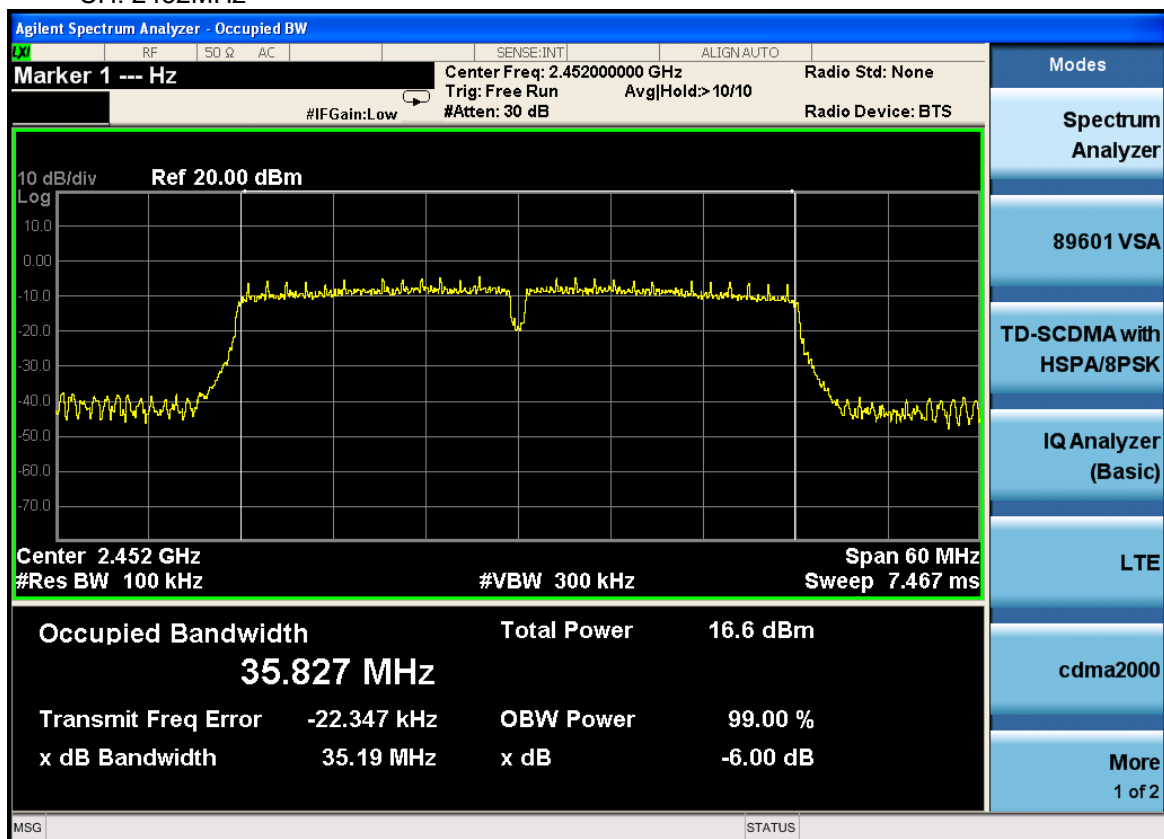




CH: 2437MHz



CH: 2452MHz





## 7 POWER SPECTRAL DENSITY TEST

### 7.1 Test Limit

| FCC Part15 (15.247) , Subpart C |                           |                        |                          |        |
|---------------------------------|---------------------------|------------------------|--------------------------|--------|
| Section                         | Test Item                 | Limit                  | Frequency Range<br>(MHz) | Result |
| 15.247                          | Power Spectral<br>Density | 8 dBm<br>(in any 3KHz) | 2400-2483.5              | PASS   |

### 7.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.247: RBW= 3KHz. VBW= 10 KHz, Span=3MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

### 7.3 Measurement Equipment Used

Same as Radiated Emission Measurement

### 7.4 Test Result

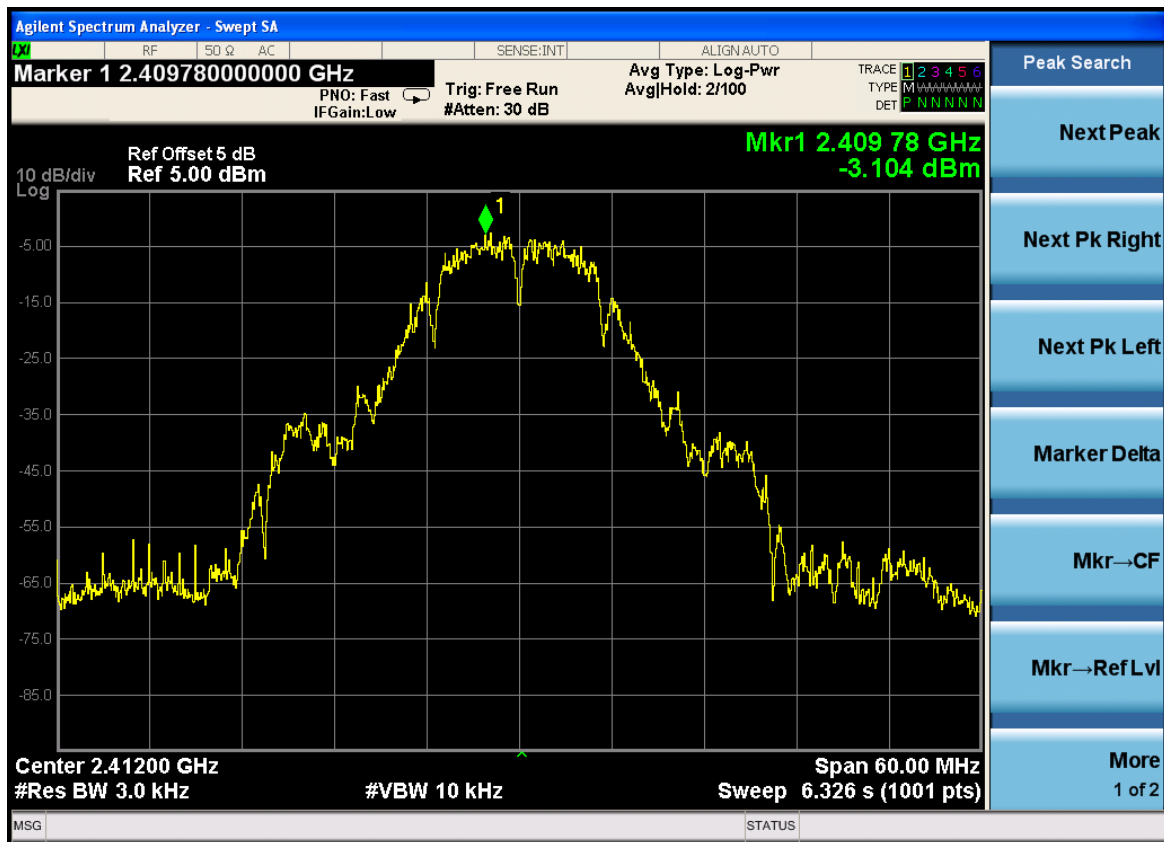
**PASS**

All the test modes completed for test.



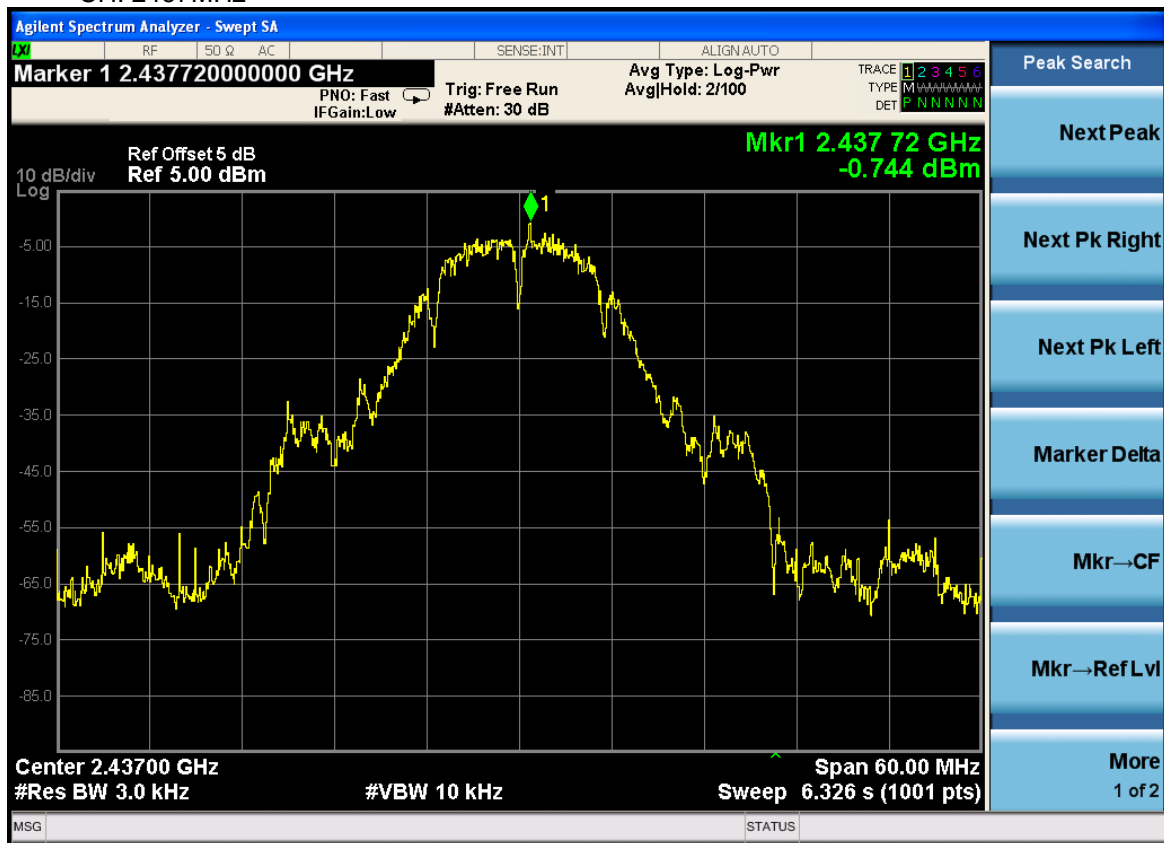
| TX 802.11b Mode |                     |             |        |
|-----------------|---------------------|-------------|--------|
| Frequency       | Power Density (dBm) | Limit (dBm) | Result |
| 2412 MHz        | -3.104              | 8           | PASS   |
| 2437 MHz        | -0.744              | 8           | PASS   |
| 2462 MHz        | -2.920              | 8           | PASS   |

CH: 2412MHz

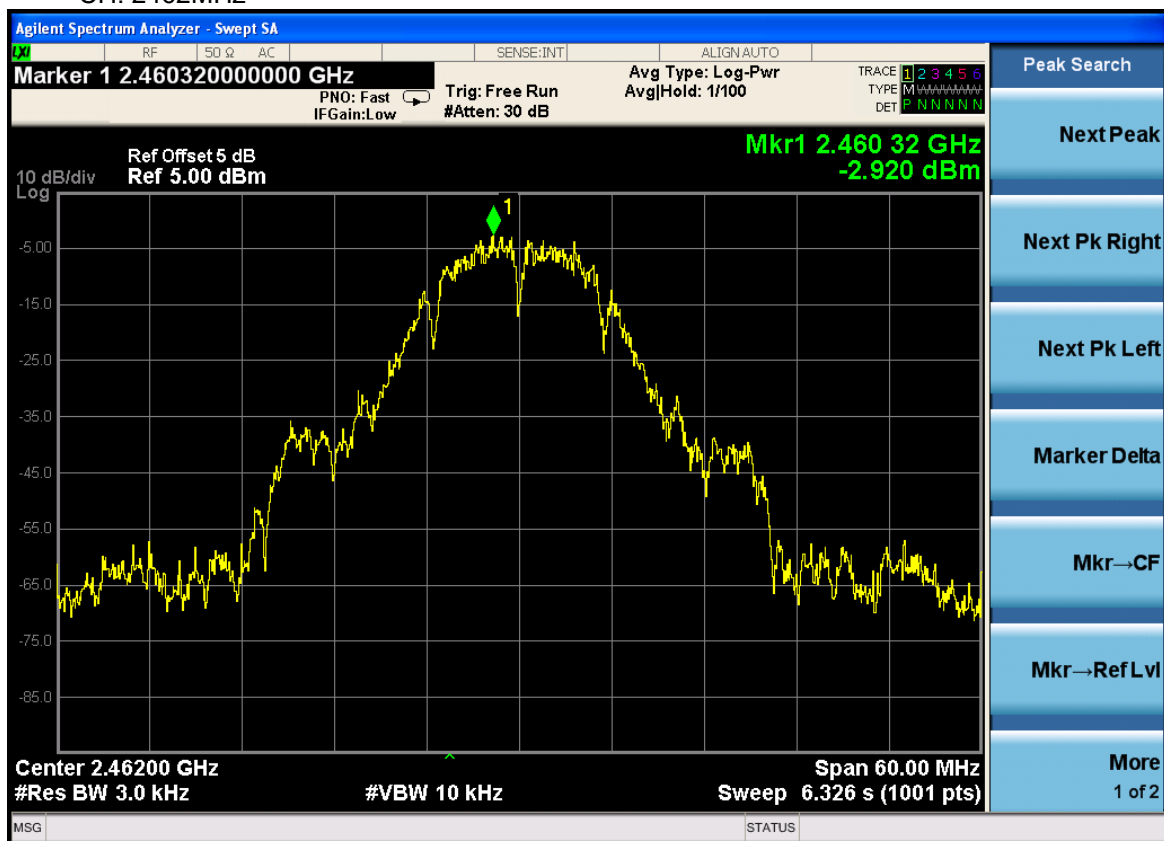




CH: 2437MHz



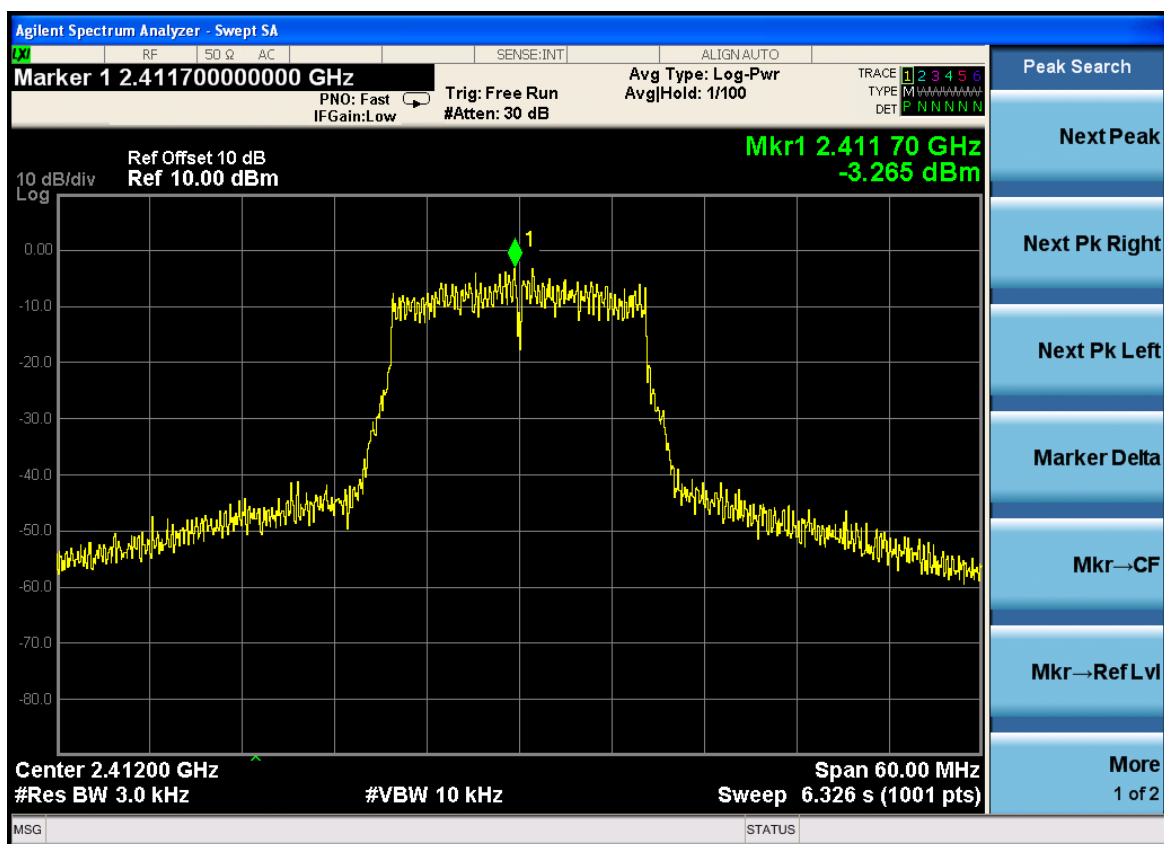
CH: 2462MHz





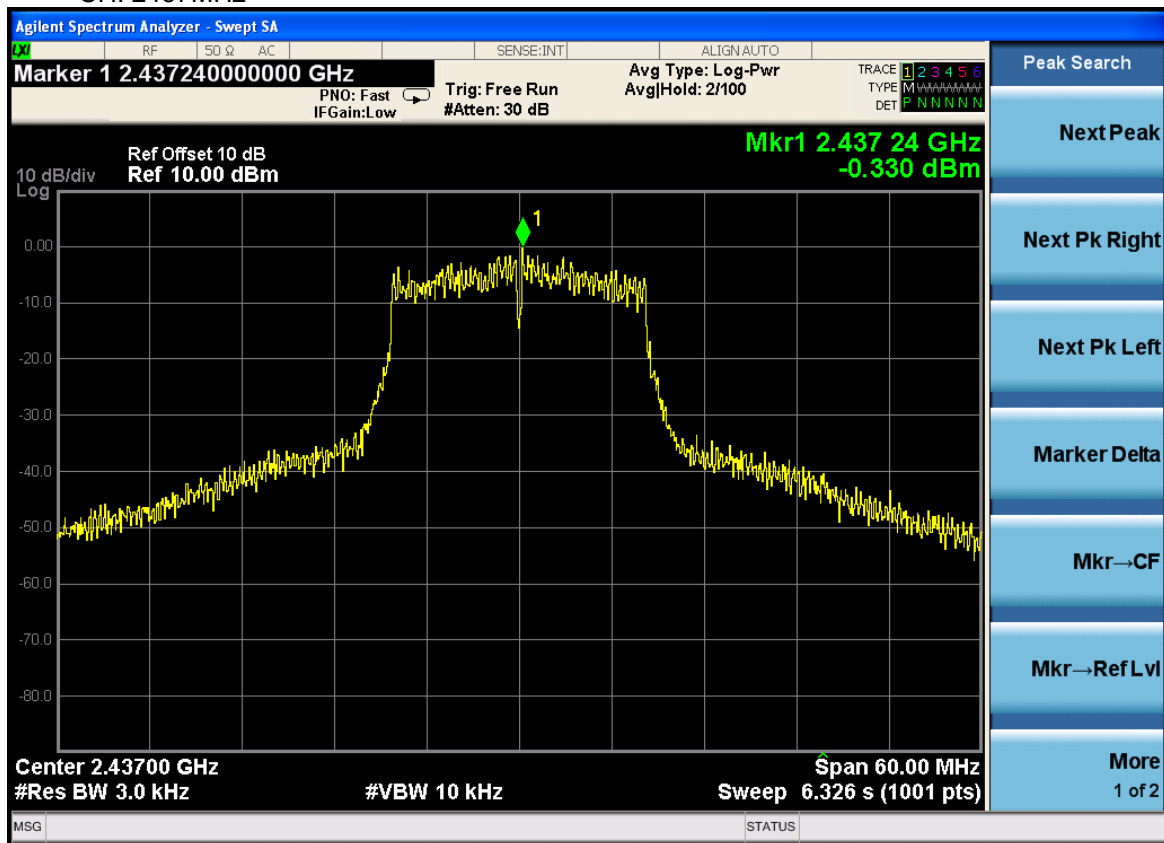
| TX 802.11g Mode |                     |             |        |
|-----------------|---------------------|-------------|--------|
| Frequency       | Power Density (dBm) | Limit (dBm) | Result |
| 2412 MHz        | -3.265              | 8           | PASS   |
| 2437 MHz        | -0.330              | 8           | PASS   |
| 2462 MHz        | -2.848              | 8           | PASS   |

CH: 2412MHz

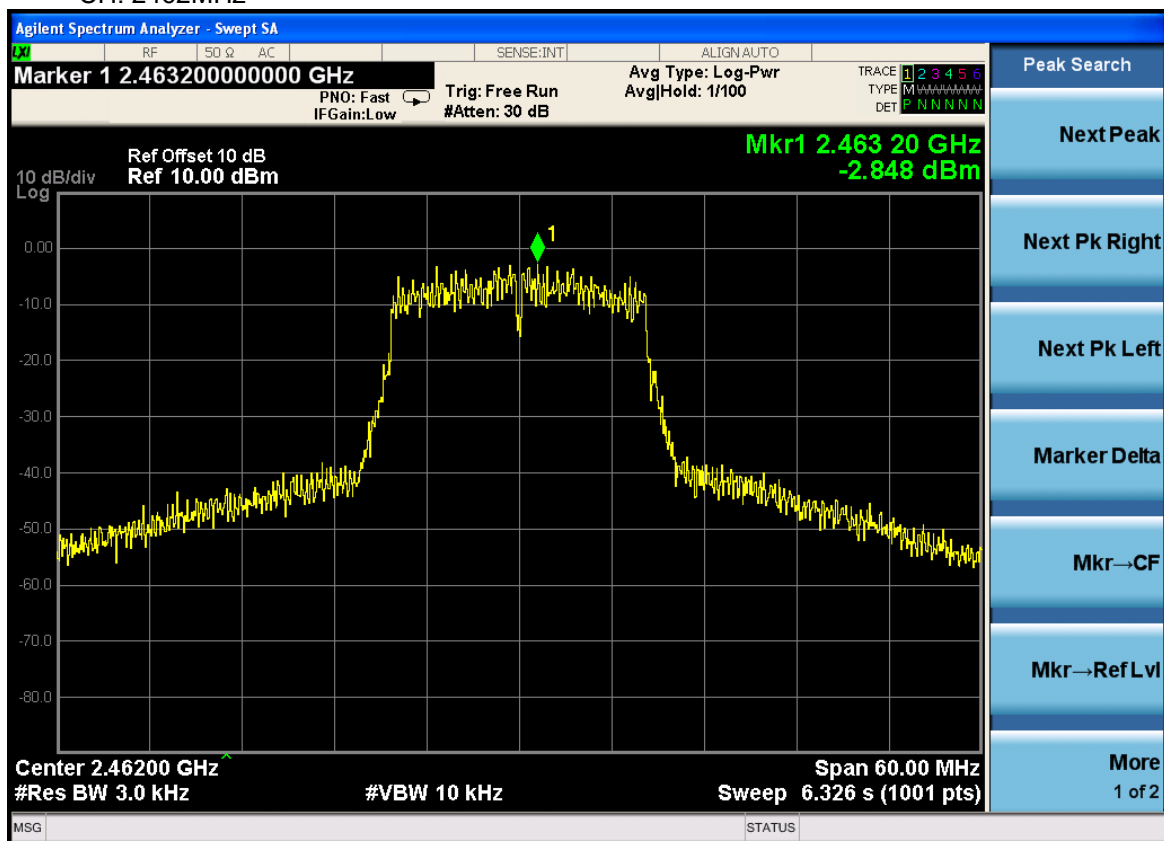




CH: 2437MHz



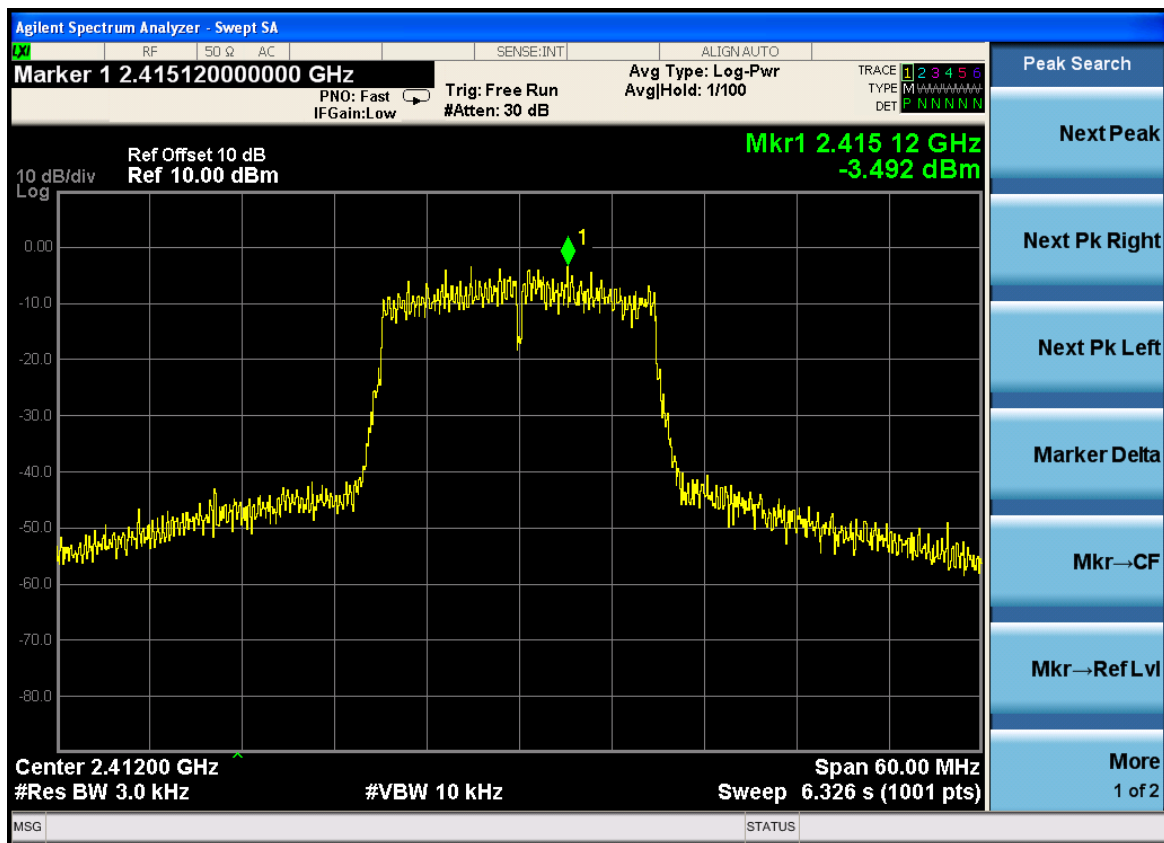
CH: 2462MHz





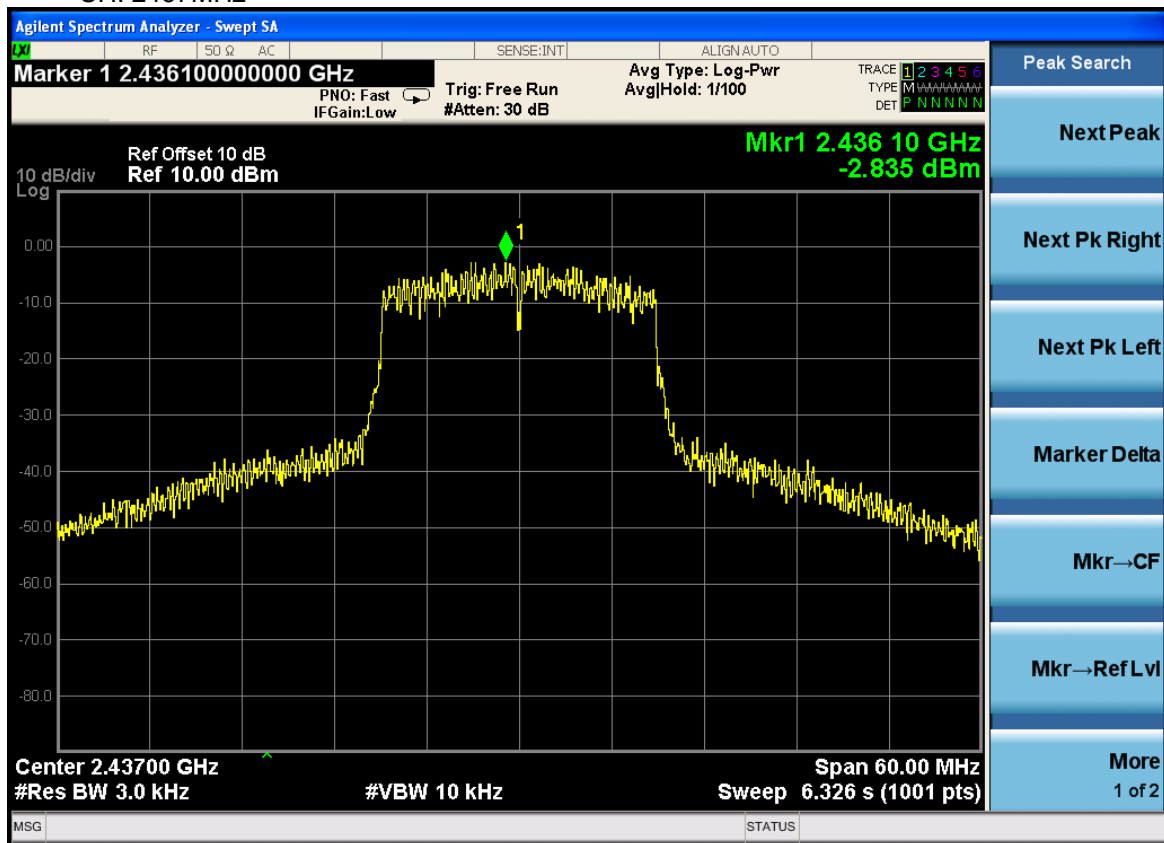
| TX 802.11n/HT20 Mode |                     |             |        |
|----------------------|---------------------|-------------|--------|
| Frequency            | Power Density (dBm) | Limit (dBm) | Result |
| 2412 MHz             | -3.492              | 8           | PASS   |
| 2437 MHz             | -2.835              | 8           | PASS   |
| 2462 MHz             | -0.673              | 8           | PASS   |

CH: 2412MHz

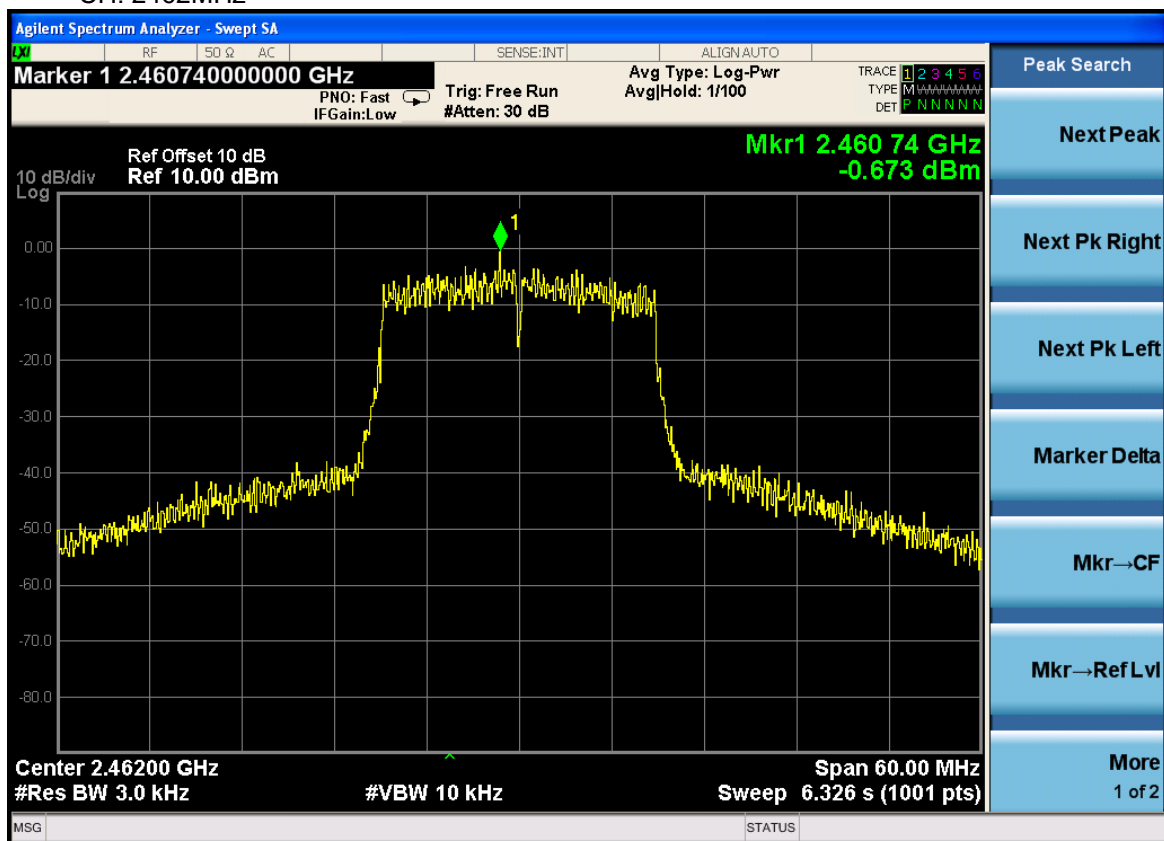




CH: 2437MHz



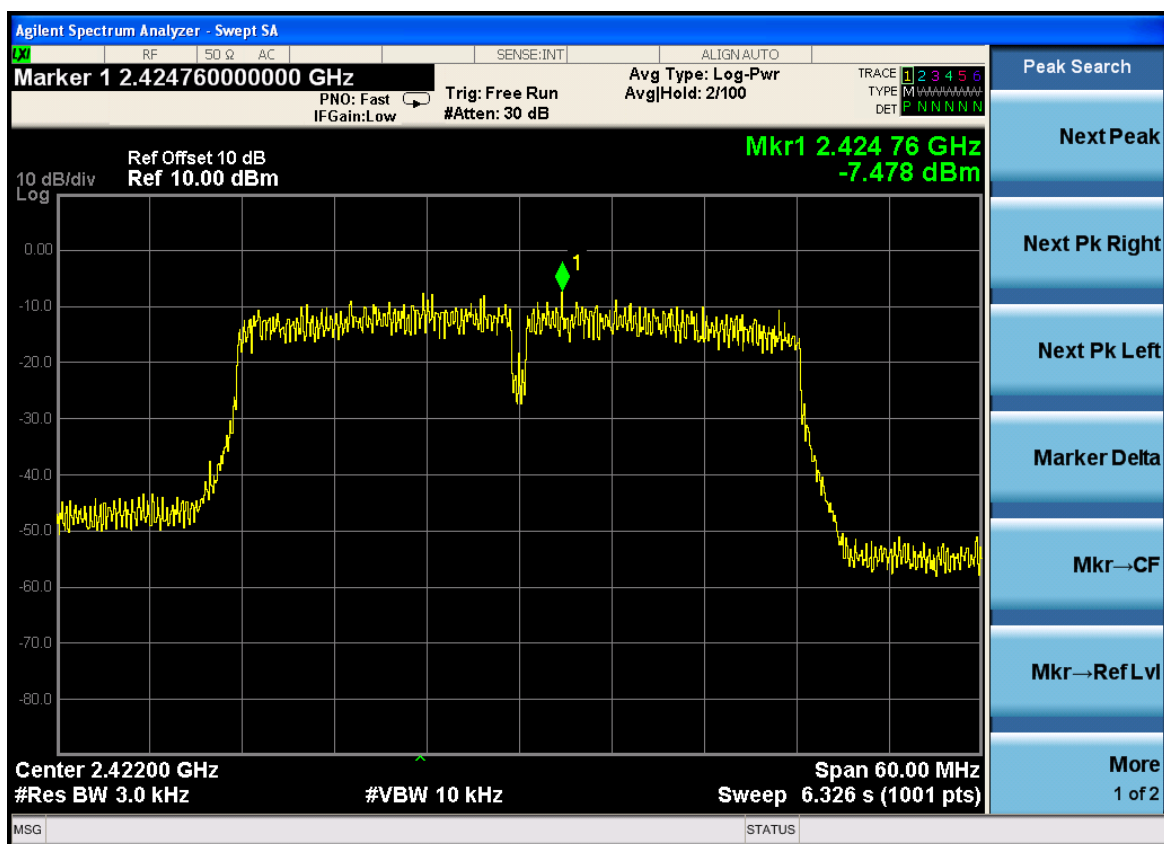
CH: 2462MHz





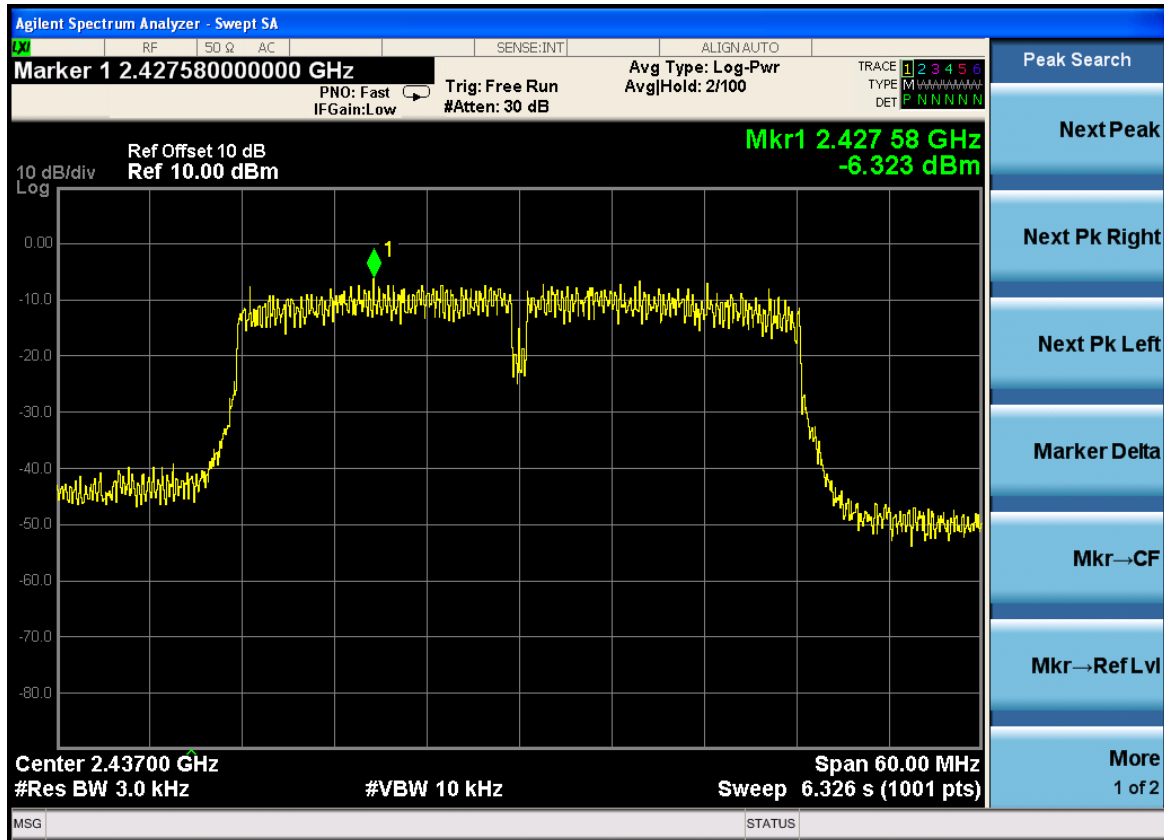
| TX 802.11n/HT40 Mode |                     |             |        |
|----------------------|---------------------|-------------|--------|
| Frequency            | Power Density (dBm) | Limit (dBm) | Result |
| 2422 MHz             | -7.478              | 8           | PASS   |
| 2437 MHz             | -6.323              | 8           | PASS   |
| 2452 MHz             | -8.541              | 8           | PASS   |

CH: 2422MHz

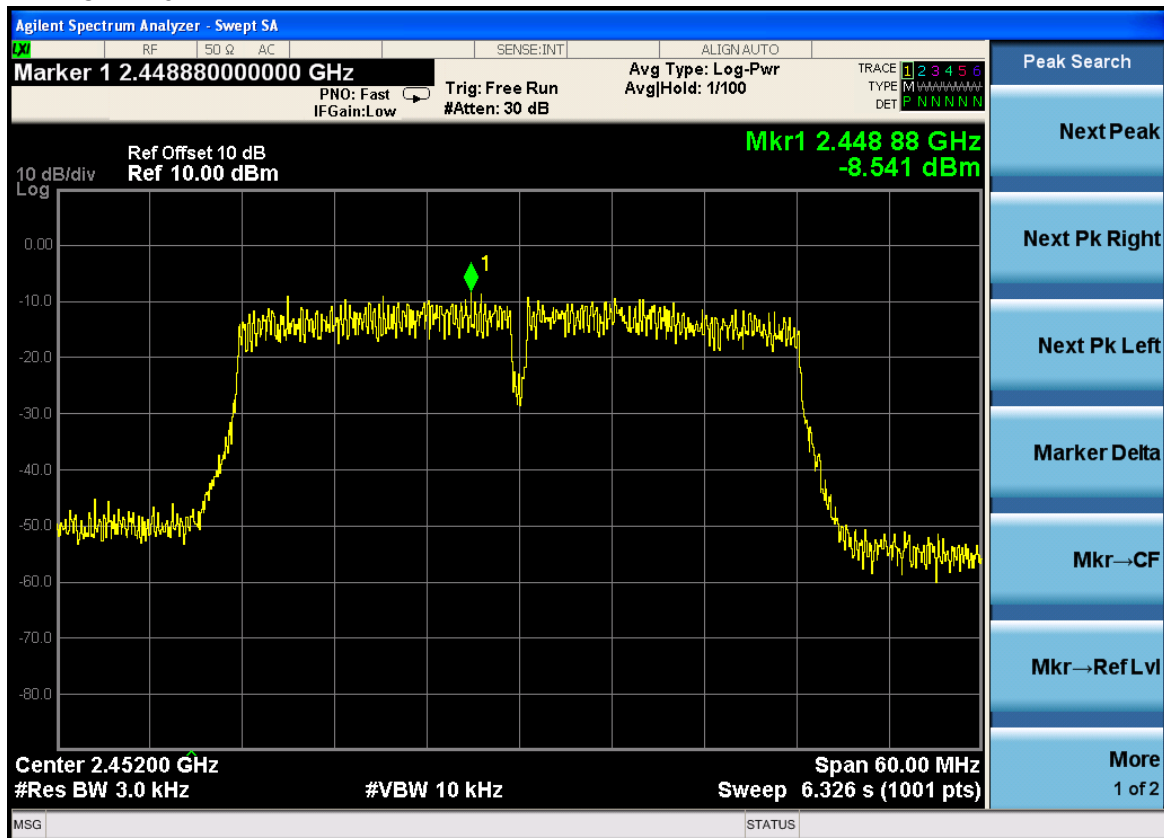




CH: 2437MHz



CH: 2452MHz





## 8 PEAK OUTPUT POWER TEST

### 8.1 Test Limit

| FCC Part15 (15.247) , Subpart C |                   |                 |                       |        |
|---------------------------------|-------------------|-----------------|-----------------------|--------|
| Section                         | Test Item         | Limit           | Frequency Range (MHz) | Result |
| 15.247(b)(3)                    | Peak Output Power | 1 watt or 30dBm | 2400-2483.5           | PASS   |

### 8.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The EUT was directly connected to the Power meter.

### 8.3 Measurement Equipment Used

Same as Radiated Emission Measurement

### 8.4 Test Result

**PASS**

All the test modes completed for test.

| TX 802.11b Mode   |           |                                     |       |
|-------------------|-----------|-------------------------------------|-------|
| Test              | Frequency | Maximum Peak Conducted Output Power | LIMIT |
| Channe            | (MHz)     | (dBm)                               | dBm   |
| CH01              | 2412      | 16.17                               | 30    |
| CH06              | 2437      | 16.58                               | 30    |
| CH11              | 2462      | 16.26                               | 30    |
| TX 802.11g Mode   |           |                                     |       |
| CH01              | 2412      | 14.51                               | 30    |
| CH06              | 2437      | 14.47                               | 30    |
| CH11              | 2462      | 14.68                               | 30    |
| TX 802.11n20 Mode |           |                                     |       |
| CH01              | 2412      | 14.33                               | 30    |
| CH06              | 2437      | 14.42                               | 30    |
| CH11              | 2462      | 14.31                               | 30    |
| TX 802.11n40 Mode |           |                                     |       |
| CH03              | 2422      | 12.15                               | 30    |
| CH06              | 2437      | 12.13                               | 30    |
| CH09              | 2452      | 12.26                               | 30    |

## 9 ANTENNA REQUIREMENT

### 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 15.249, 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.

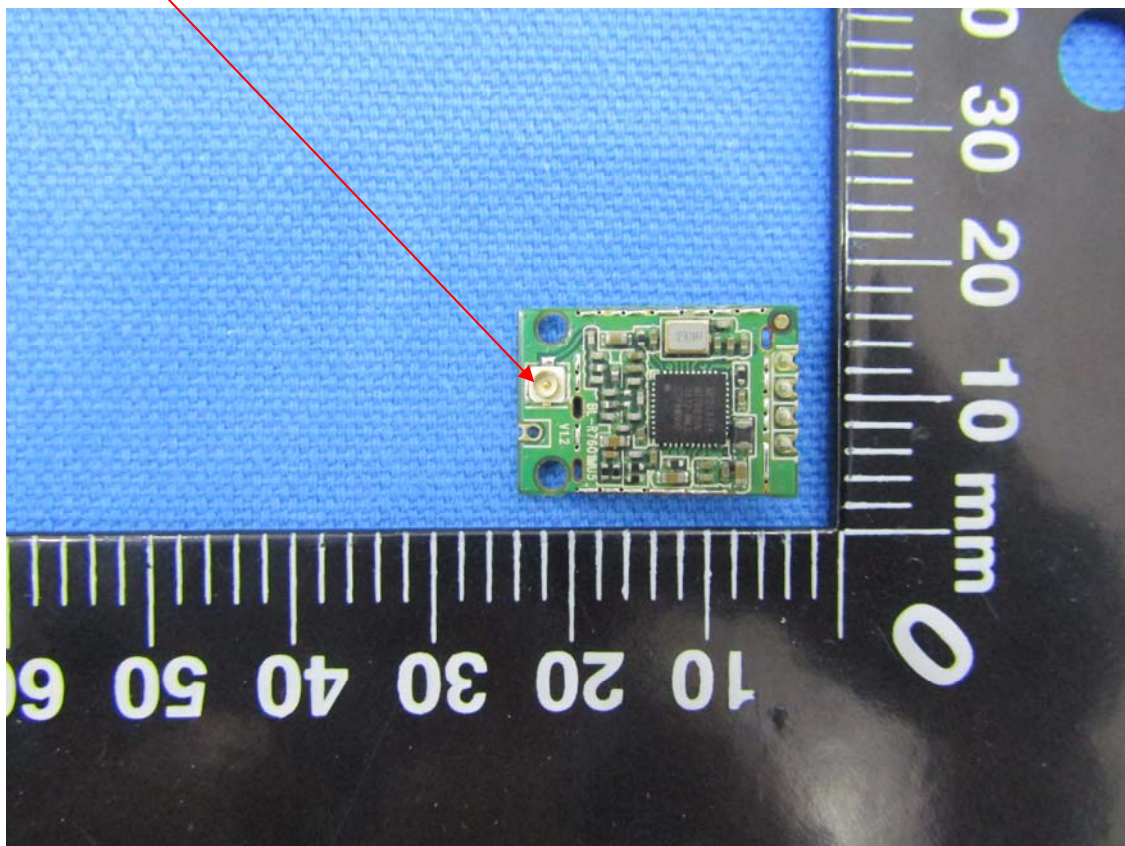
### Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### Antenna Connected Construction

The antenna used in this product is a Integral Antenna, The directional gains of antenna used for transmitting is 1dBi.

### ANTENNA





## 10 PHOTOGRAPH OF TEST

### 10.1 Radiated Emission





## 10.2 Conducted Emission

