

APPLICATION CERTIFICATION FCC Part 15C  
On Behalf of  
Blueair AB

Indoor Air Quality Sensor  
Model No.: AAWare

FCC ID: 2AEX3-AAWARE

Prepared for : Blueair AB  
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Report No. : ATE20151334  
Date of Test : Jun 17, 2015-July 09, 2015  
Date of Report : July 09, 2015

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## Test Report Certification

Applicant : Blueair AB  
Manufacturer : Shenzhen Mixwell Tech.Co.,Ltd  
EUT Description : Indoor Air Quality Sensor  
(A) MODEL NO.: AAware  
(B) Trade Name.: Aware  
(C) POWER SUPPLY: AC 120V/60Hz (Powered by Adapter)

Measurement Procedure Used:

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

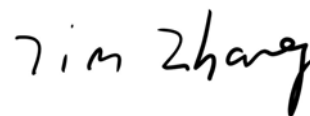
The EUT was tested according to DTS test procedure of Jun 05, 2014 KDB558074 D01 DTS Meas Guidance v03r02 for compliance to FCC 47CFR 15.247 requirements

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Jun 17, 2015-July 09, 2015

Prepared by :



(Tim.zhang, Engineer)

Approved & Authorized Signer :



( Sean Liu, Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                         |   |                                                                                                                   |
|-------------------------|---|-------------------------------------------------------------------------------------------------------------------|
| EUT                     | : | Indoor Air Quality Sensor                                                                                         |
| Model Number            | : | AAware                                                                                                            |
| 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                                                                      |
| Antenna Gain            | : | 2dBi                                                                                                              |
| Type of Antenna         | : | Integral Antenna                                                                                                  |
| Power Supply            | : | AC 120V/60Hz (Powered by Adapter)                                                                                 |
| Adapter information     | : | Model:GQ07-050100-AU<br>Input:100-240V~50/60Hz 0.3A Max<br>Output:5.0V 1.0A                                       |
| 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 150Mbps               |
| Modulation Type         | : | CCK, OFDM                                                                                                         |
| Applicant               | : | Blueair AB                                                                                                        |
| Address                 | : | Danderydsgatan 11, 114 26 Stockholm, Sweden                                                                       |
| Manufacturer            | : | Shenzhen Mixwell Tech.Co.,Ltd                                                                                     |
| Address                 | : | 3#F, the Second Jinmeiwei Industrial Park, Baoan<br>High-tech Park, HuanGuanNan Road, GuanLan,<br>Shenzhen, China |
| Date of sample received | : | Jun 17, 2015                                                                                                      |
| Date of Test            | : | Jun 17, 2015-July 09, 2015                                                                                        |

## 1.2.Carrier Frequency of Channels

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           | ---     | ---            |

802.11n (40MHz)

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

## 1.3.Accessory and Auxiliary Equipment

PC  
Manufacturer: LENOVO  
M/N: 4290-RT8  
S/N: R9-FW93G 11/08

## 1.4.Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC  
The Registration Number is 752051

Listed by Industry Canada  
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee  
for Laboratories  
The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD  
Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.  
Science & Industry Park, Nanshan, Shenzhen, Guangdong  
P.R. China

### 1.5.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. MEASURING DEVICE AND TEST EQUIPMENT

**Table 1: List of Test and Measurement Equipment**

| Kind of equipment  | Manufacturer              | Type                                    | S/N        | Calibrated dates | Calibrated until |
|--------------------|---------------------------|-----------------------------------------|------------|------------------|------------------|
| EMI Test Receiver  | Rohde&Schwarz             | ESCS30                                  | 100307     | Jan. 11, 2015    | Jan. 10, 2016    |
| EMI Test Receiver  | Rohde&Schwarz             | ESPI3                                   | 101526/003 | Jan. 11, 2015    | Jan. 10, 2016    |
| Spectrum Analyzer  | Agilent                   | E7405A                                  | MY45115511 | Jan. 11, 2015    | Jan. 10, 2016    |
| Pre-Amplifier      | Rohde&Schwarz             | CBLU118354<br>0-01                      | 3791       | Jan. 11, 2015    | Jan. 10, 2016    |
| Loop Antenna       | Schwarzbeck               | FMZB1516                                | 1516131    | Jan. 15, 2015    | Jan. 14, 2016    |
| Bilog Antenna      | Schwarzbeck               | VULB9163                                | 9163-323   | Jan. 15, 2015    | Jan. 14, 2016    |
| Horn Antenna       | Schwarzbeck               | BBHA9120D                               | 9120D-655  | Jan. 15, 2015    | Jan. 14, 2016    |
| Horn Antenna       | Schwarzbeck               | BBHA9170                                | 9170-359   | Jan. 15, 2015    | Jan. 14, 2016    |
| LISN               | Rohde&Schwarz             | ESH3-Z5                                 | 100305     | Jan. 11, 2015    | Jan. 10, 2016    |
| LISN               | Schwarzbeck               | NSLK8126                                | 8126431    | Jan. 11, 2015    | Jan. 10, 2016    |
| Highpass Filter    | Wainwright<br>Instruments | WHKX3.6/18<br>G-10SS                    | N/A        | Jan. 11, 2015    | Jan. 10, 2016    |
| Band Reject Filter | Wainwright<br>Instruments | WRCG2400/2<br>485-2375/2510<br>-60/11SS | N/A        | Jan. 11, 2015    | Jan. 10, 2016    |

### 3. OPERATION OF EUT DURING TESTING

#### 3.1. Operating Mode

The mode is used: **1.802.11b Transmitting mode**

Low Channel: 2412MHz

Middle Channel: 2437MHz

High Channel: 2462MHz

#### **2.802.11g Transmitting mode**

Low Channel: 2412MHz

Middle Channel: 2437MHz

High Channel: 2462MHz

#### **3.802.11n (20MHz) Transmitting mode**

Low Channel: 2412MHz

Middle Channel: 2437MHz

High Channel: 2462MHz

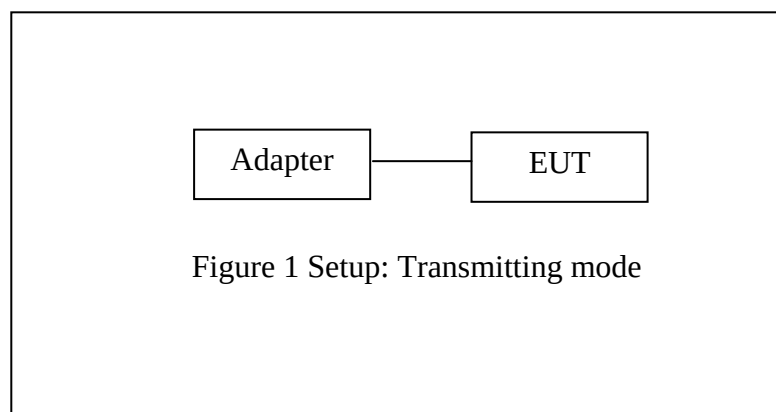
#### **4.802.11n (40MHz) Transmitting mode**

Low Channel: 2422MHz

Middle Channel: 2437MHz

High Channel: 2452MHz

#### 3.2. Configuration and peripherals

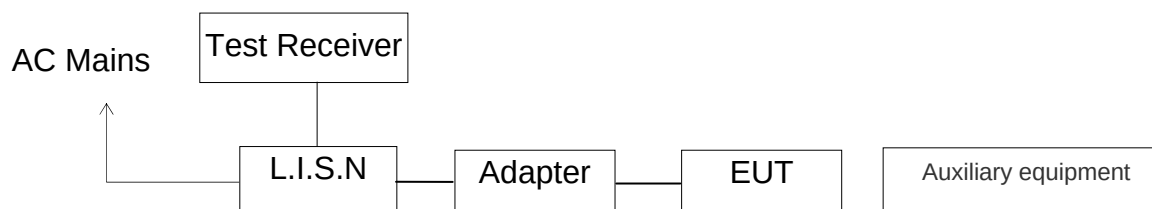


#### 4. TEST PROCEDURES AND RESULTS

| FCC Rules                           | Description of Test              | Result    |
|-------------------------------------|----------------------------------|-----------|
| Section 15.207                      | Power Line Conducted Emission    | Compliant |
| Section 15.247(a)(2)                | 6dB Bandwidth Test               | Compliant |
| Section 15.247(e)                   | Power Spectral Density Test      | Compliant |
| Section 15.247(b)(3)                | Maximum Peak Output Power Test   | Compliant |
| Section 15.247(d)                   | Band Edge Compliance Test        | Compliant |
| Section 15.247(d)<br>Section 15.209 | Radiated Spurious Emission Test  | Compliant |
| Section 15.247(d)                   | Conducted Spurious Emission Test | Compliant |
| Section 15.203                      | Antenna Requirement              | Compliant |

## 5. POWER LINE CONDUCTED MEASUREMENT

### 5.1. Block Diagram of Test Setup



(EUT: Indoor Air Quality Sensor)

### 5.2. Power Line Conducted Emission Measurement Limits

| Frequency<br>(MHz)                                                                                                                                                            | Limit dB(μV)     |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|
|                                                                                                                                                                               | Quasi-peak Level | Average Level |
| 0.15 - 0.50                                                                                                                                                                   | 66.0 – 56.0 *    | 56.0 – 46.0 * |
| 0.50 - 5.00                                                                                                                                                                   | 56.0             | 46.0          |
| 5.00 - 30.00                                                                                                                                                                  | 60.0             | 50.0          |
| NOTE1: The lower limit shall apply at the transition frequencies.<br>NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz. |                  |               |

### 5.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

### 5.4. Operating Condition of EUT

- 5.4.1. Setup the EUT and simulator as shown as Section 5.1.
- 5.4.2. Turn on the power of all equipment.
- 5.4.3. Let the EUT work in test mode and measure it.

### 5.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2014 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

## 5.6.Power Line Conducted Emission Measurement Results

**PASS.**

The frequency range from 150kHz to 30MHz is checked.

|                                              |               |              |               |              |          |      |     |
|----------------------------------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| Test mode : WIFI communicating(AC 120V/60Hz) |               |              |               |              |          |      |     |
| <b>MEASUREMENT RESULT: "JZH006_fin"</b>      |               |              |               |              |          |      |     |
| 2015-6-22 16:51                              |               |              |               |              |          |      |     |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
| 0.150000                                     | 59.50         | 10.3         | 66            | 6.5          | QP       | L1   | GND |
| 0.208000                                     | 51.40         | 10.7         | 63            | 11.9         | QP       | L1   | GND |
| 4.781000                                     | 37.40         | 11.8         | 56            | 18.6         | QP       | L1   | GND |
| <b>MEASUREMENT RESULT: "JZH006_fin2"</b>     |               |              |               |              |          |      |     |
| 2015-6-22 16:51                              |               |              |               |              |          |      |     |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
| 0.150000                                     | 42.80         | 10.3         | 56            | 13.2         | AV       | L1   | GND |
| 0.210000                                     | 34.50         | 10.7         | 53            | 18.7         | AV       | L1   | GND |
| 4.731500                                     | 24.60         | 11.8         | 46            | 21.4         | AV       | L1   | GND |
| <b>MEASUREMENT RESULT: "JZH007_fin"</b>      |               |              |               |              |          |      |     |
| 2015-6-22 16:53                              |               |              |               |              |          |      |     |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
| 0.152000                                     | 56.90         | 10.4         | 66            | 9.0          | QP       | N    | GND |
| 0.506000                                     | 47.40         | 11.5         | 56            | 8.6          | QP       | N    | GND |
| 14.685500                                    | 33.20         | 11.9         | 60            | 26.8         | QP       | N    | GND |
| <b>MEASUREMENT RESULT: "JZH007_fin2"</b>     |               |              |               |              |          |      |     |
| 2015-6-22 16:53                              |               |              |               |              |          |      |     |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
| 0.506000                                     | 36.30         | 11.5         | 46            | 9.7          | AV       | N    | GND |
| 0.924000                                     | 28.00         | 11.6         | 46            | 18.0         | AV       | N    | GND |
| 15.113000                                    | 23.10         | 11.9         | 50            | 26.9         | AV       | N    | GND |

|                                              |               |              |               |              |          |      |     |  |
|----------------------------------------------|---------------|--------------|---------------|--------------|----------|------|-----|--|
| Test mode : WIFI communicating(AC 240V/60Hz) |               |              |               |              |          |      |     |  |
| <b>MEASUREMENT RESULT: "JZH006_fin"</b>      |               |              |               |              |          |      |     |  |
| 2015-6-22 16:51                              |               |              |               |              |          |      |     |  |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |  |
| 0.150000                                     | 59.50         | 10.3         | 66            | 6.5          | QP       | L1   | GND |  |
| 0.208000                                     | 51.40         | 10.7         | 63            | 11.9         | QP       | L1   | GND |  |
| 4.781000                                     | 37.40         | 11.8         | 56            | 18.6         | QP       | L1   | GND |  |
| <b>MEASUREMENT RESULT: "JZH006_fin2"</b>     |               |              |               |              |          |      |     |  |
| 2015-6-22 16:51                              |               |              |               |              |          |      |     |  |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |  |
| 0.150000                                     | 42.80         | 10.3         | 56            | 13.2         | AV       | L1   | GND |  |
| 0.210000                                     | 34.50         | 10.7         | 53            | 18.7         | AV       | L1   | GND |  |
| 4.731500                                     | 24.60         | 11.8         | 46            | 21.4         | AV       | L1   | GND |  |
| <b>MEASUREMENT RESULT: "JZH007_fin"</b>      |               |              |               |              |          |      |     |  |
| 2015-6-22 16:53                              |               |              |               |              |          |      |     |  |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |  |
| 0.152000                                     | 56.90         | 10.4         | 66            | 9.0          | QP       | N    | GND |  |
| 0.506000                                     | 47.40         | 11.5         | 56            | 8.6          | QP       | N    | GND |  |
| 14.685500                                    | 33.20         | 11.9         | 60            | 26.8         | QP       | N    | GND |  |
| <b>MEASUREMENT RESULT: "JZH007_fin2"</b>     |               |              |               |              |          |      |     |  |
| 2015-6-22 16:53                              |               |              |               |              |          |      |     |  |
| Frequency<br>MHz                             | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |  |
| 0.506000                                     | 36.30         | 11.5         | 46            | 9.7          | AV       | N    | GND |  |
| 0.924000                                     | 28.00         | 11.6         | 46            | 18.0         | AV       | N    | GND |  |
| 15.113000                                    | 23.10         | 11.9         | 50            | 26.9         | AV       | N    | GND |  |

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

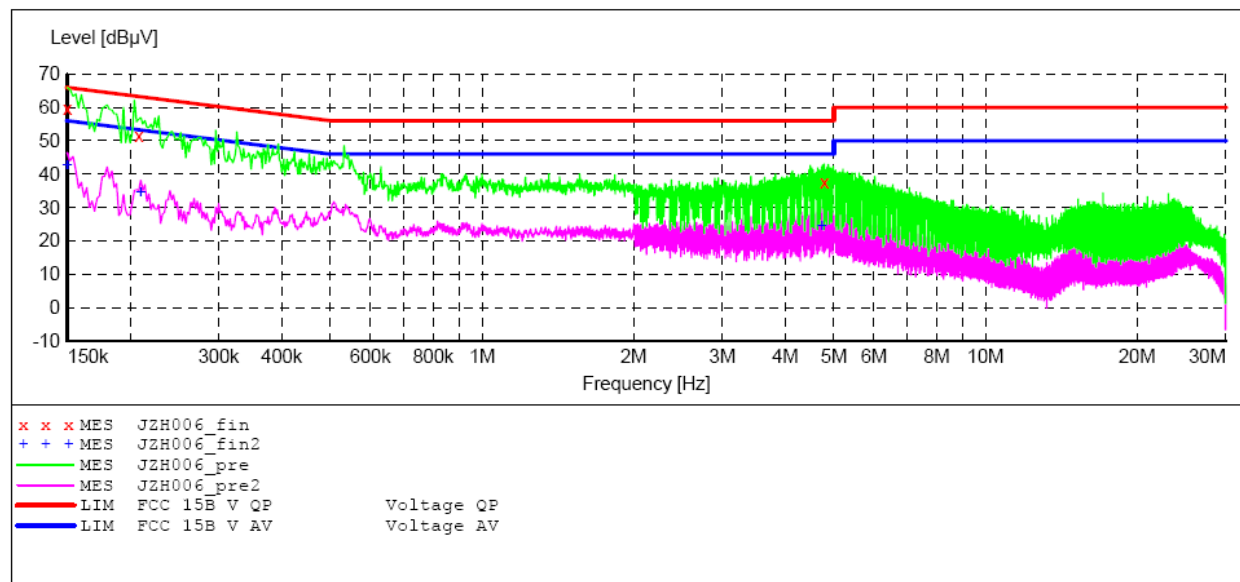
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Indoor Air Quality Sensor M/N:AAware  
 Manufacturer: Mixwell  
 Operating Condition: WIFI OPERATION  
 Test Site: 2#Shielding Room  
 Operator: star  
 Test Specification: L 120V/60Hz  
 Comment: Report No.:ATE20151334  
 Start of Test: 2015-6-22 / 16:49:10

#### SCAN TABLE: "V 150K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)  
 Average



#### MEASUREMENT RESULT: "JZH006\_fin"

2015-6-22 16:51

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.150000         | 59.50         | 10.3         | 66            | 6.5          | QP       | L1   | GND |
| 0.208000         | 51.40         | 10.7         | 63            | 11.9         | QP       | L1   | GND |
| 4.781000         | 37.40         | 11.8         | 56            | 18.6         | QP       | L1   | GND |

#### MEASUREMENT RESULT: "JZH006\_fin2"

2015-6-22 16:51

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.150000         | 42.80         | 10.3         | 56            | 13.2         | AV       | L1   | GND |
| 0.210000         | 34.50         | 10.7         | 53            | 18.7         | AV       | L1   | GND |
| 4.731500         | 24.60         | 11.8         | 46            | 21.4         | AV       | L1   | GND |

## ACCURATE TECHNOLOGY CO., LTD

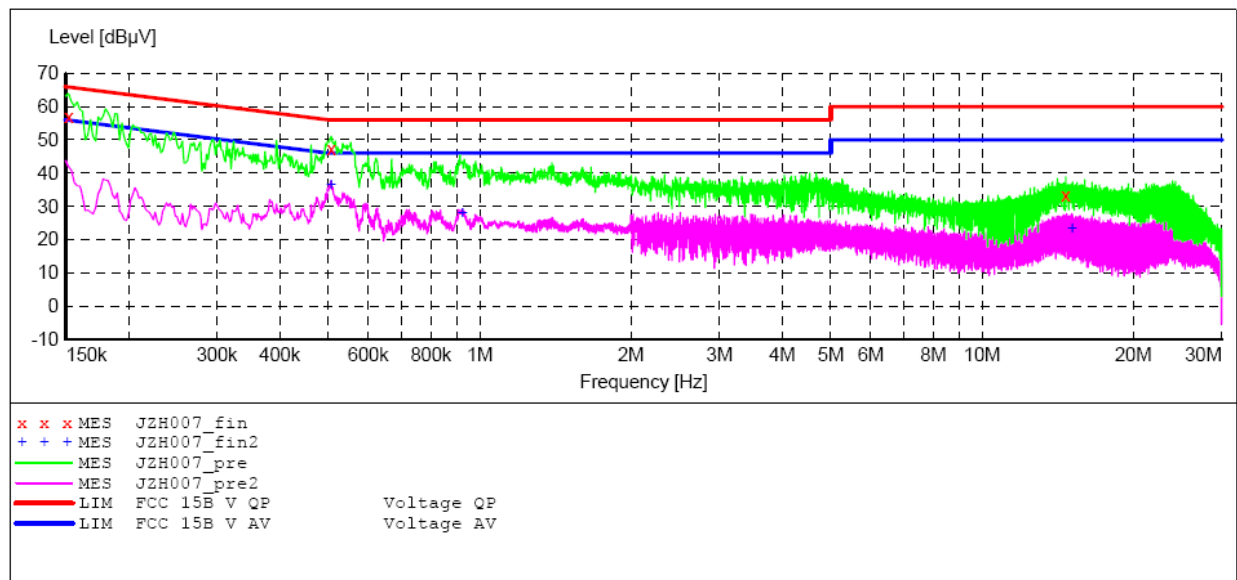
### CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Indoor Air Quality Sensor M/N:AAware
   
 Manufacturer: Mixwell
   
 Operating Condition: WIFI OPERATION
   
 Test Site: 2#Shielding Room
   
 Operator: star
   
 Test Specification: N 120V/60Hz
   
 Comment: Report No.:ATE20151334
   
 Start of Test: 2015-6-22 / 16:51:40

#### SCAN TABLE: "V 150K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70

| Start Frequency | Stop Frequency | Step Width | Detector  | Meas. Time | IF Bandw. | Transducer     |
|-----------------|----------------|------------|-----------|------------|-----------|----------------|
| 150.0 kHz       | 30.0 MHz       | 4.5 kHz    | QuasiPeak | 1.0 s      | 9 kHz     | LISN (ESH3-Z5) |
| Average         |                |            |           |            |           |                |



#### MEASUREMENT RESULT: "JZH007\_fin"

2015-6-22 16:53

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.152000      | 56.90      | 10.4      | 66         | 9.0       | QP       | N    | GND |
| 0.506000      | 47.40      | 11.5      | 56         | 8.6       | QP       | N    | GND |
| 14.685500     | 33.20      | 11.9      | 60         | 26.8      | QP       | N    | GND |

#### MEASUREMENT RESULT: "JZH007\_fin2"

2015-6-22 16:53

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.506000      | 36.30      | 11.5      | 46         | 9.7       | AV       | N    | GND |
| 0.924000      | 28.00      | 11.6      | 46         | 18.0      | AV       | N    | GND |
| 15.113000     | 23.10      | 11.9      | 50         | 26.9      | AV       | N    | GND |

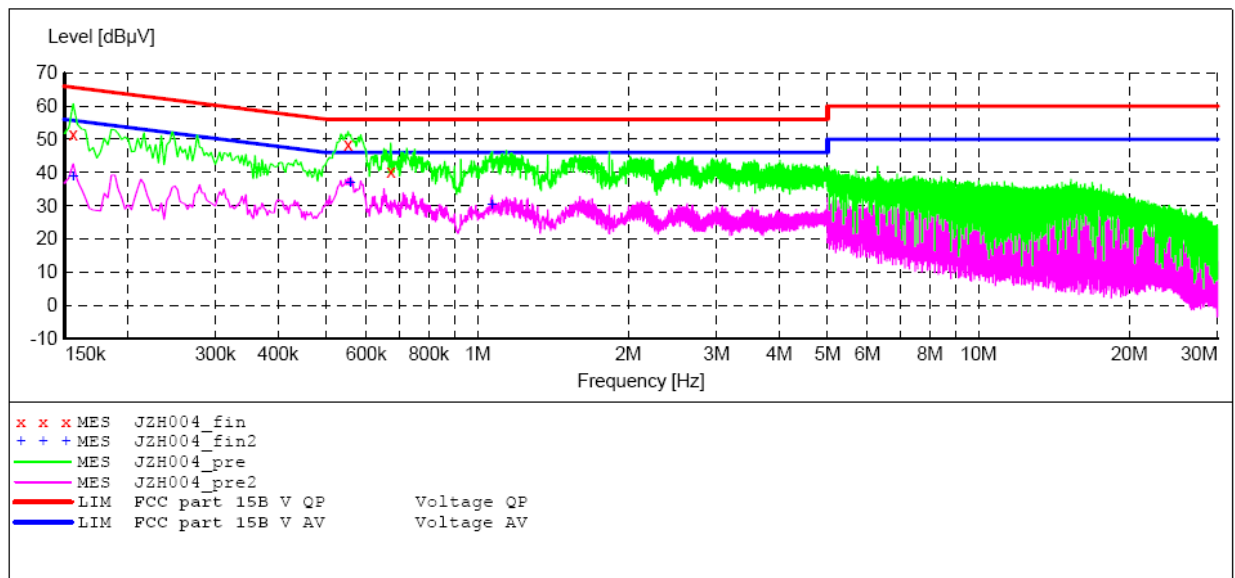
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Indoor Air Quality Sensor M/N:AAware  
 Manufacturer: Mixwell  
 Operating Condition: WIFI OPERATION  
 Test Site: 2#Shielding Room  
 Operator: star  
 Test Specification: N 240V/60Hz  
 Comment: Report No.:ATE20151334  
 Start of Test: 2015-6-22 / 16:43:48

#### SCAN TABLE: "V 150K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)  
 Average



#### MEASUREMENT RESULT: "JZH004\_fin"

2015-6-22 16:45

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.156000         | 51.50         | 10.4         | 66            | 14.2         | QP       | N    | GND |
| 0.552000         | 48.40         | 11.5         | 56            | 7.6          | QP       | N    | GND |
| 0.672000         | 40.40         | 11.5         | 56            | 15.6         | QP       | N    | GND |

#### MEASUREMENT RESULT: "JZH004\_fin2"

2015-6-22 16:45

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.156000         | 38.80         | 10.4         | 56            | 16.9         | AV       | N    | GND |
| 0.558000         | 36.80         | 11.5         | 46            | 9.2          | AV       | N    | GND |
| 1.071000         | 30.10         | 11.6         | 46            | 15.9         | AV       | N    | GND |

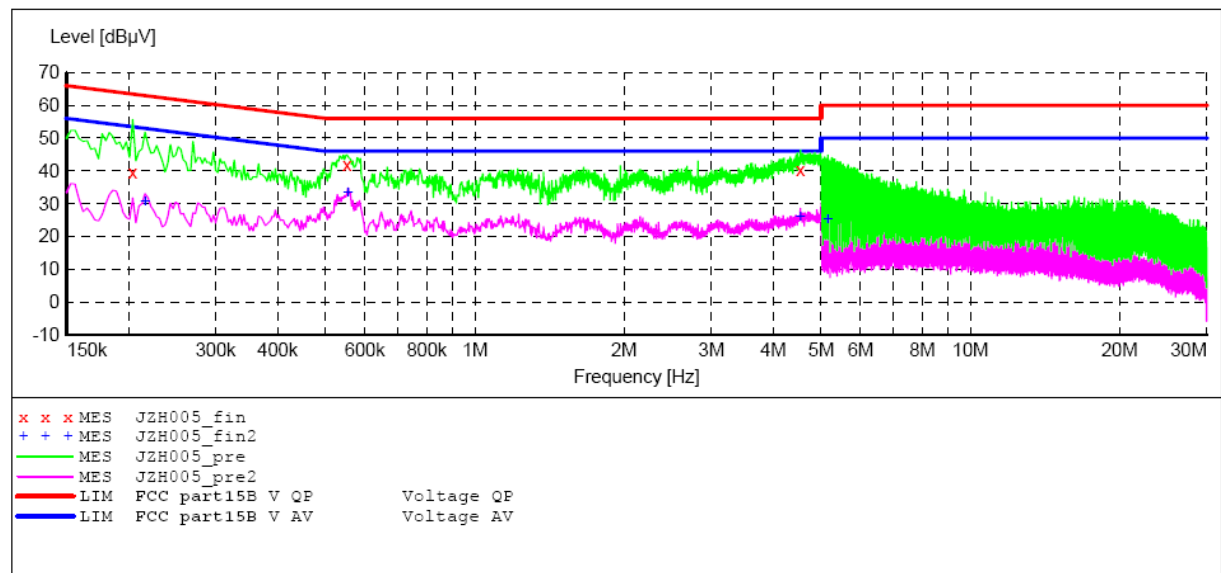
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15

EUT: Indoor Air Quality Sensor M/N:AAware  
 Manufacturer: Mixwell  
 Operating Condition: WIFI OPERATION  
 Test Site: 2#Shielding Room  
 Operator: star  
 Test Specification: L 240V/60Hz  
 Comment: Report No.:ATE20151334  
 Start of Test: 2015-6-22 / 16:45:54

#### SCAN TABLE: "V 150K-30MHz fin"

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN(ESH3-Z5)  
 Average



#### MEASUREMENT RESULT: "JZH005\_fin"

2015-6-22 16:47

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.204000         | 39.50         | 10.6         | 63            | 23.9         | QP       | L1   | GND |
| 0.552000         | 42.00         | 11.5         | 56            | 14.0         | QP       | L1   | GND |
| 4.542000         | 40.40         | 11.8         | 56            | 15.6         | QP       | L1   | GND |

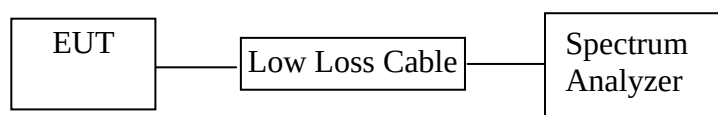
#### MEASUREMENT RESULT: "JZH005\_fin2"

2015-6-22 16:47

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.216000         | 30.80         | 10.7         | 53            | 22.2         | AV       | L1   | GND |
| 0.555000         | 33.40         | 11.5         | 46            | 12.6         | AV       | L1   | GND |
| 4.542000         | 25.80         | 11.8         | 46            | 20.2         | AV       | L1   | GND |
| 5.157500         | 25.00         | 11.8         | 50            | 25.0         | AV       | L1   | GND |

## 6. 6DB&20DB BANDWIDTH MEASUREMENT

### 6.1. Block Diagram of Test Setup



### 6.2. The Requirement For Section 15.247(a)(2)

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

### 6.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 5.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

### 6.5. Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

20dB bandwidth

1. Set resolution bandwidth (RBW) = 1%-5% OBW.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.

3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst-case (i.e., the widest) bandwidth. Unless otherwise specified for an unlicensed wireless device, measure the bandwidth at the - 20 dB levels with respect to the reference level

## 6.6.Test Result

| The test was performed with 802.11b |                 |                     |                      |             |
|-------------------------------------|-----------------|---------------------|----------------------|-------------|
| Channel                             | Frequency (MHz) | 6dB Bandwidth (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) |
| Low                                 | 2412            | 10.12               | 17.598               | > 0.5MHz    |
| Middle                              | 2437            | 10.12               | 17.135               | > 0.5MHz    |
| High                                | 2462            | 10.12               | 17.540               | > 0.5MHz    |

| The test was performed with 802.11g |                 |                     |                      |             |
|-------------------------------------|-----------------|---------------------|----------------------|-------------|
| Channel                             | Frequency (MHz) | 6dB Bandwidth (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) |
| Low                                 | 2412            | 16.60               | 19.740               | > 0.5MHz    |
| Middle                              | 2437            | 16.60               | 19.392               | > 0.5MHz    |
| High                                | 2462            | 16.60               | 19.624               | > 0.5MHz    |

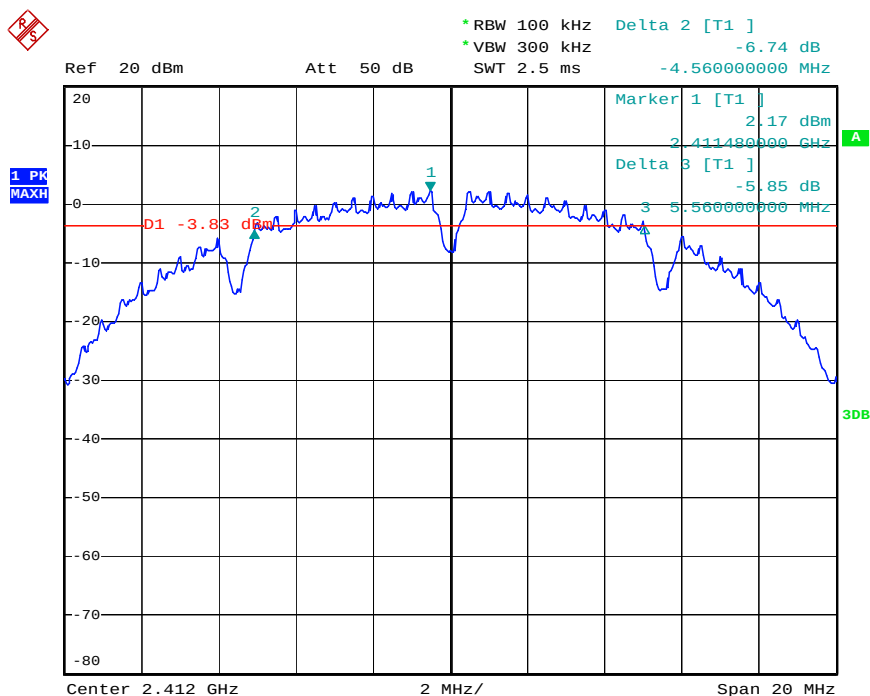
| The test was performed with 802.11n (Bandwidth: 20 MHz) |                 |                     |                      |             |
|---------------------------------------------------------|-----------------|---------------------|----------------------|-------------|
| Channel                                                 | Frequency (MHz) | 6dB Bandwidth (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) |
| Low                                                     | 2412            | 17.84               | 20.904               | > 0.5MHz    |
| Middle                                                  | 2437            | 17.84               | 20.123               | > 0.5MHz    |
| High                                                    | 2462            | 17.84               | 19.472               | > 0.5MHz    |

| The test was performed with 802.11n (Bandwidth: 40 MHz) |                 |                     |                      |             |
|---------------------------------------------------------|-----------------|---------------------|----------------------|-------------|
| Channel                                                 | Frequency (MHz) | 6dB Bandwidth (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) |
| Low                                                     | 2422            | 36.53               | 40.84                | > 0.5MHz    |
| Middle                                                  | 2437            | 36.53               | 40.96                | > 0.5MHz    |
| High                                                    | 2452            | 36.53               | 40.96                | > 0.5MHz    |

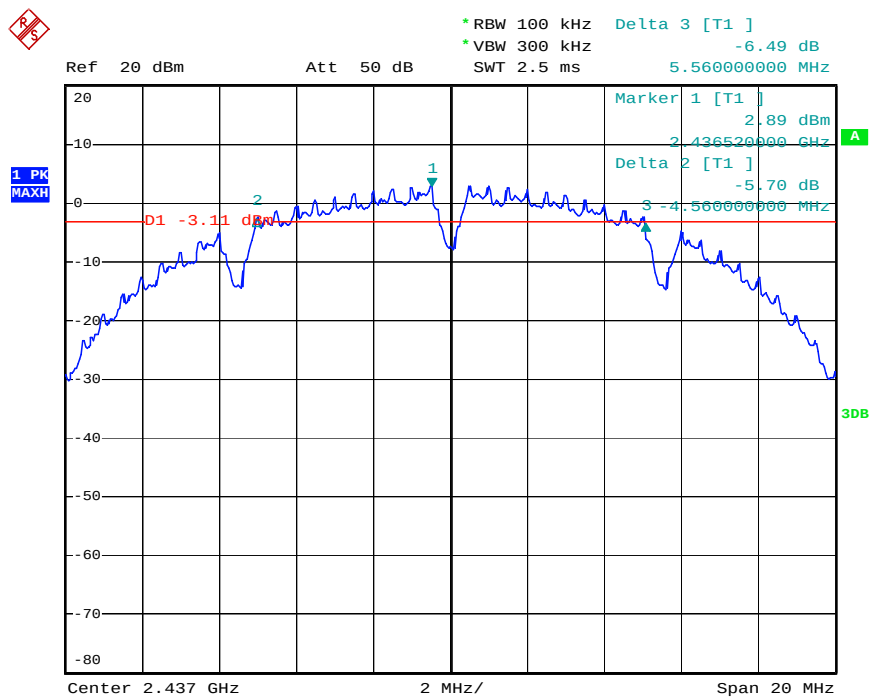
The spectrum analyzer plots are attached as below.

6dB Bandwidth

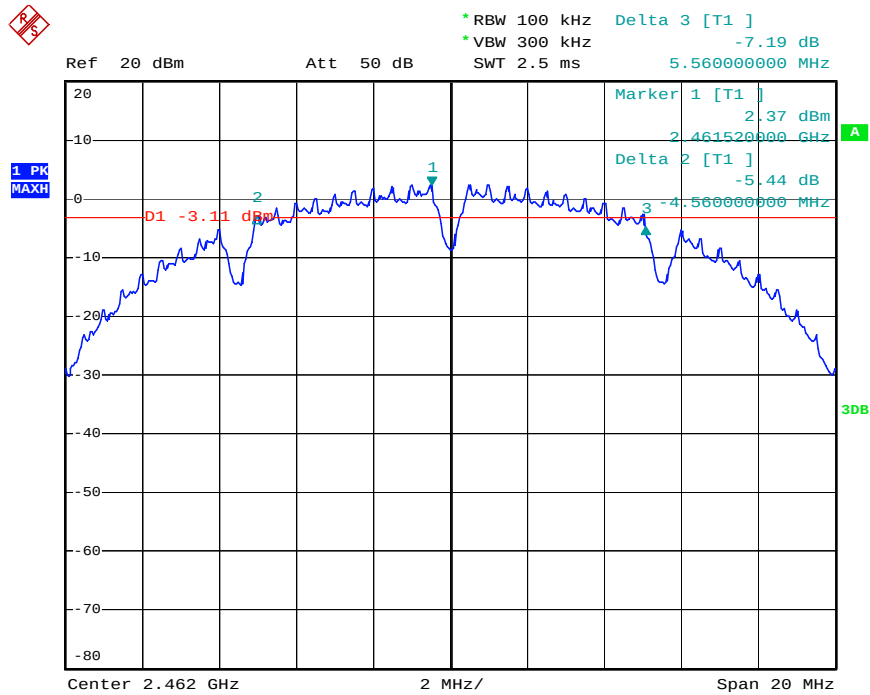
802.11b Channel Low 2412MHz



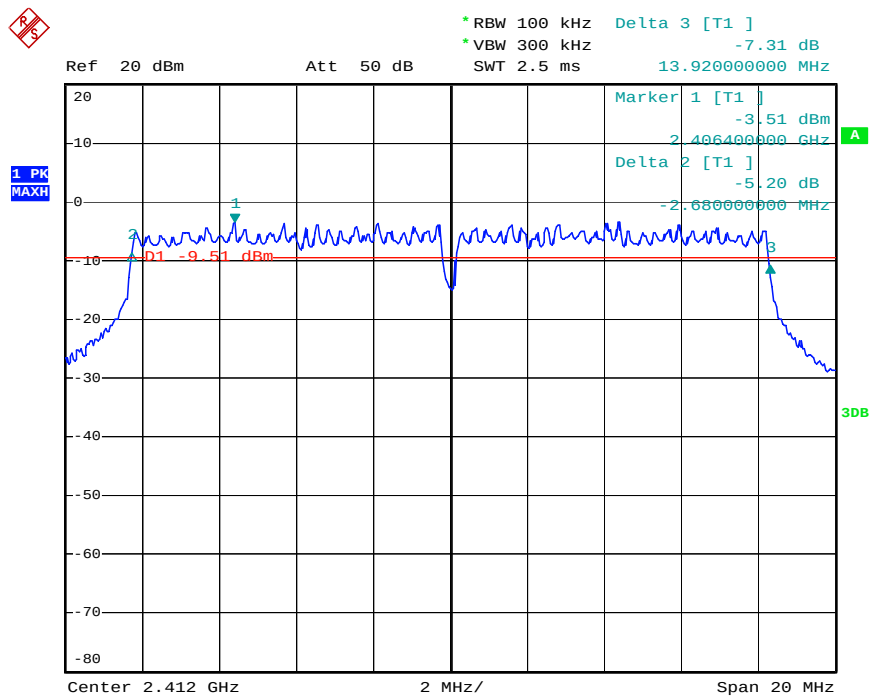
802.11b Channel Middle 2437MHz



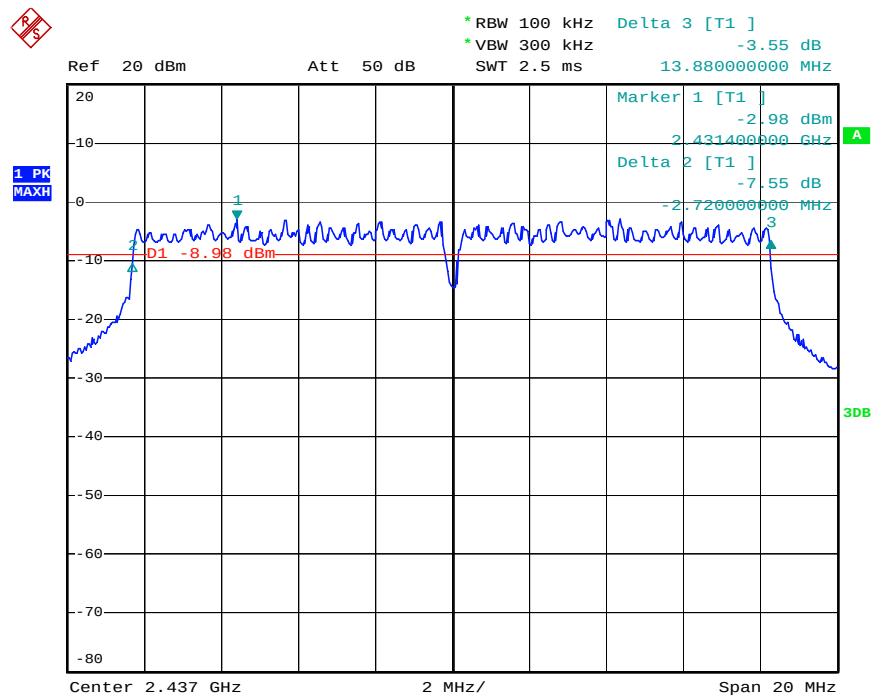
### 802.11b Channel High 2462MHz



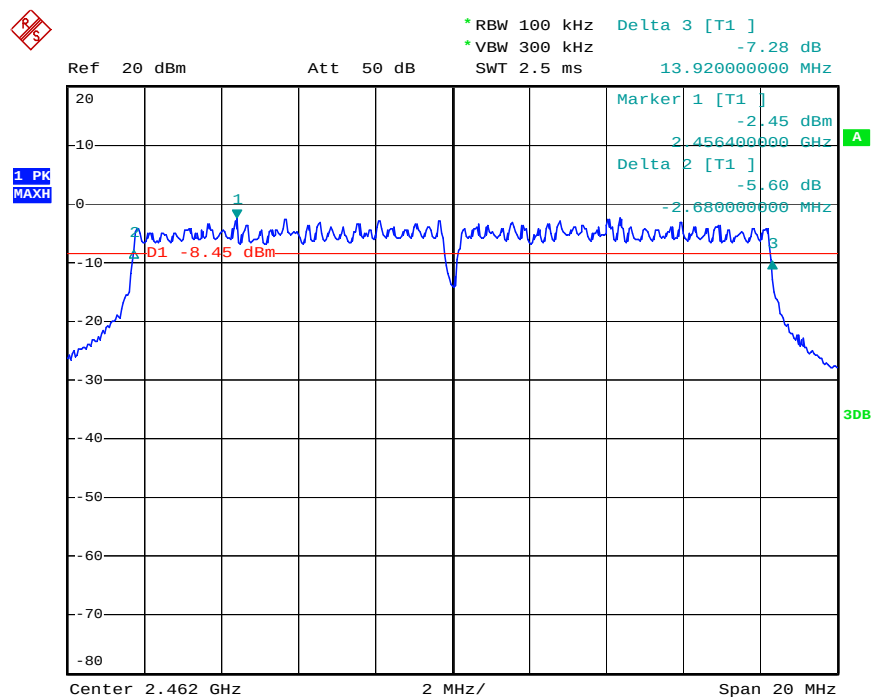
### 802.11g Channel Low 2412MHz



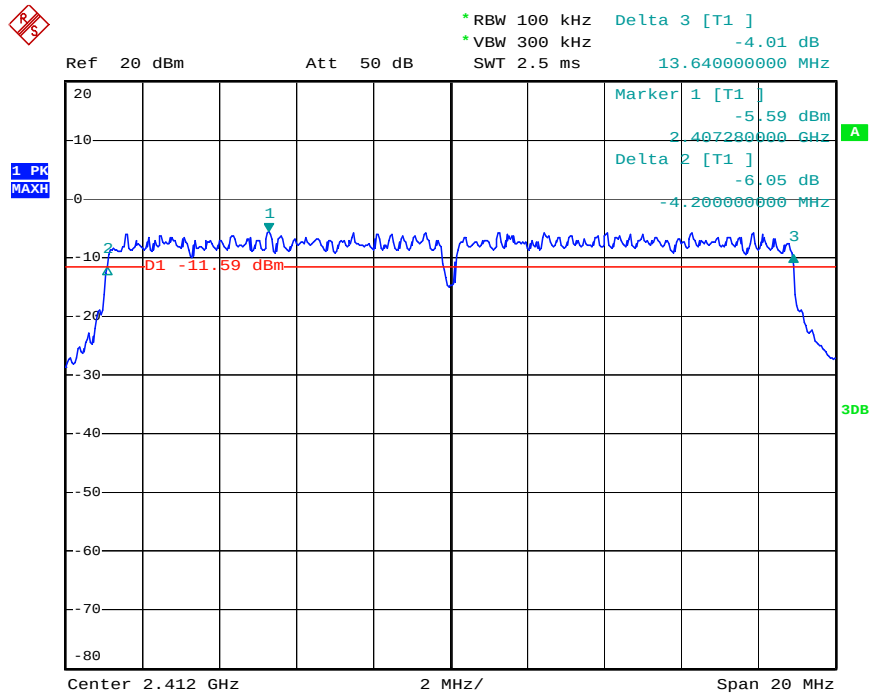
## 802.11g Channel Middle 2437MHz



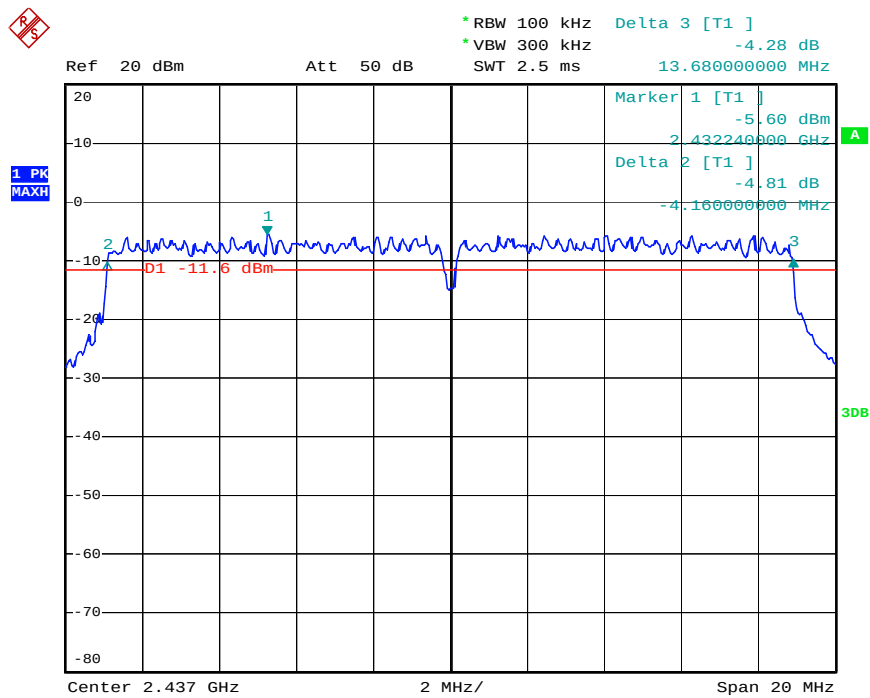
## 802.11g Channel High 2462MHz



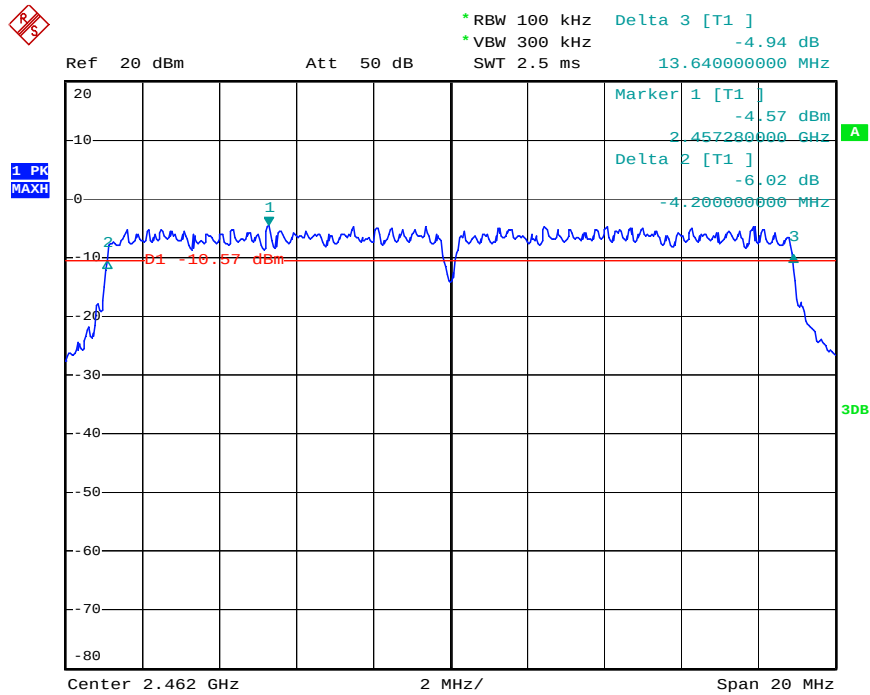
## 802.11n Channel Low 2412MHz (20MHz)



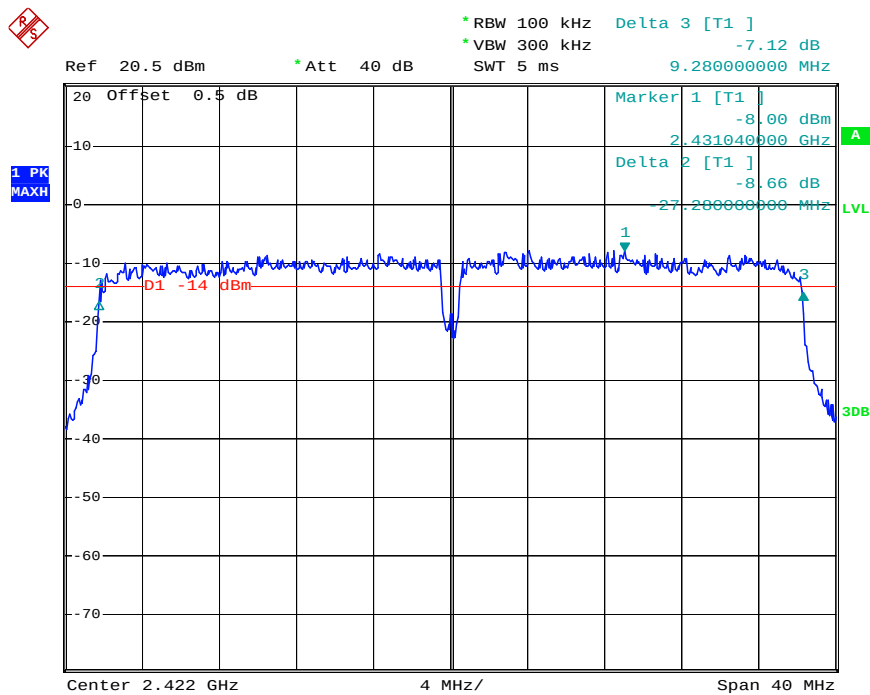
## 802.11n Channel Middle 2437MHz(20MHz)



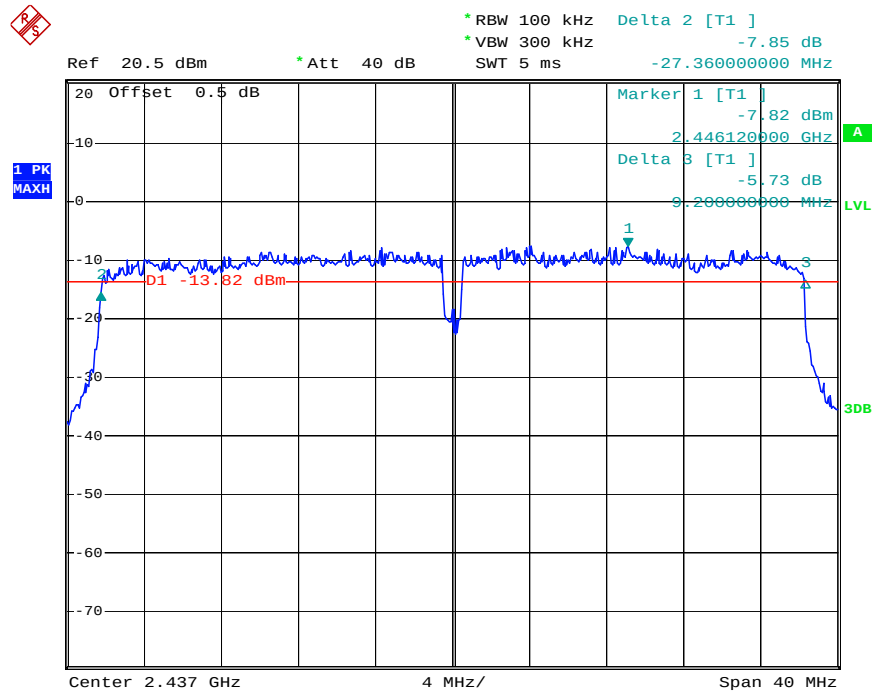
### 802.11n Channel High 2462MHz(20MHz)



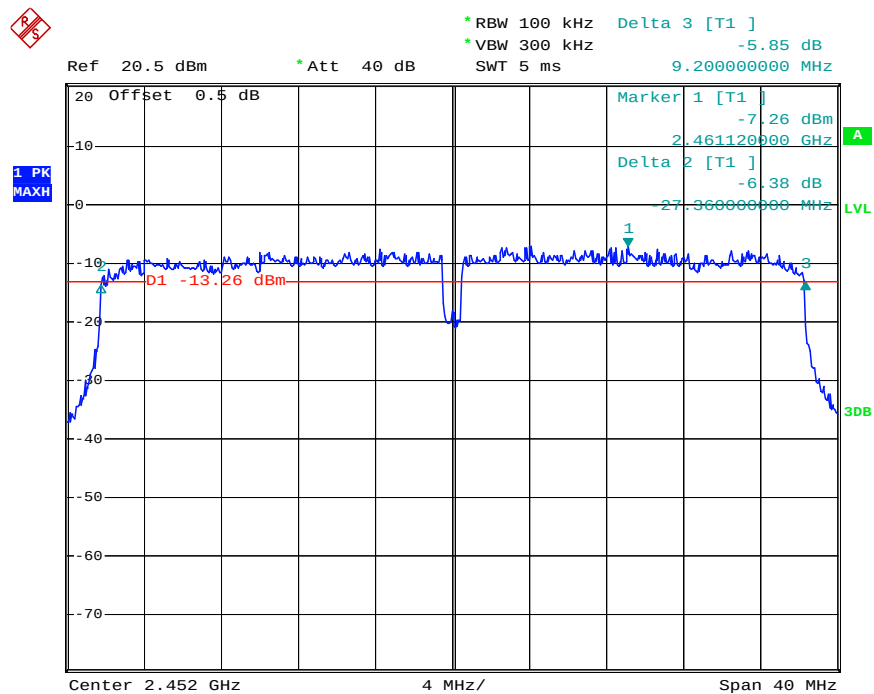
### 802.11n Channel Low 2422MHz (40MHz)



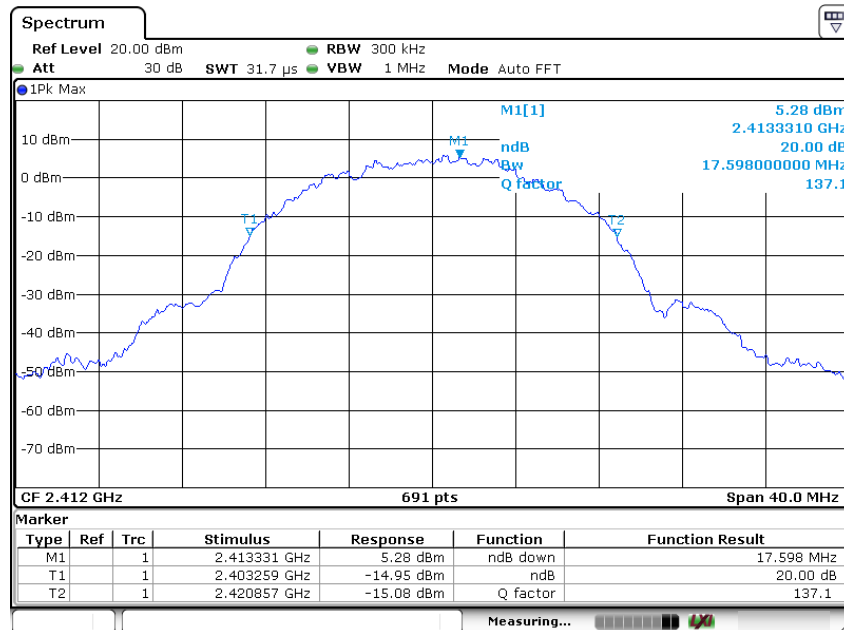
### 802.11n Channel Middle 2437MHz(40MHz)



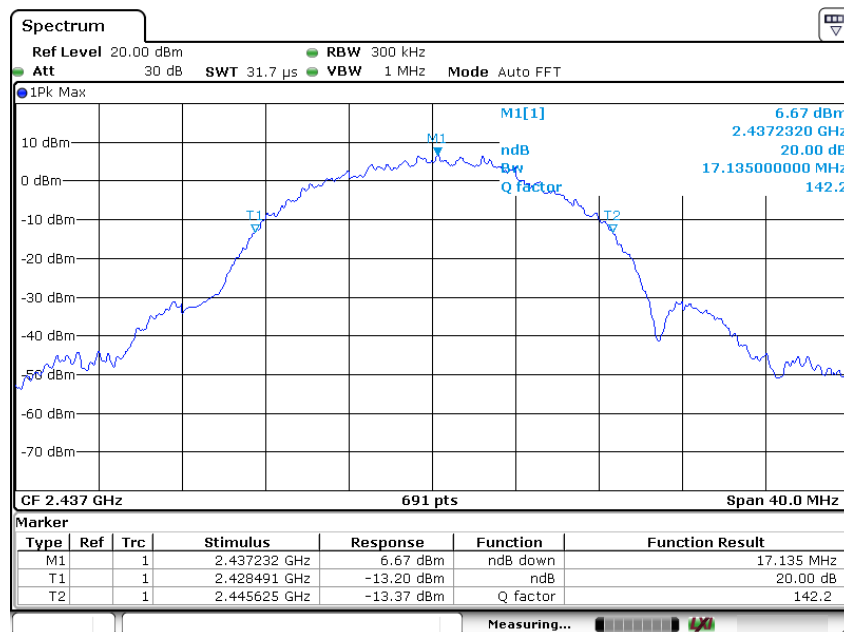
### 802.11n Channel High 2452MHz(40MHz)



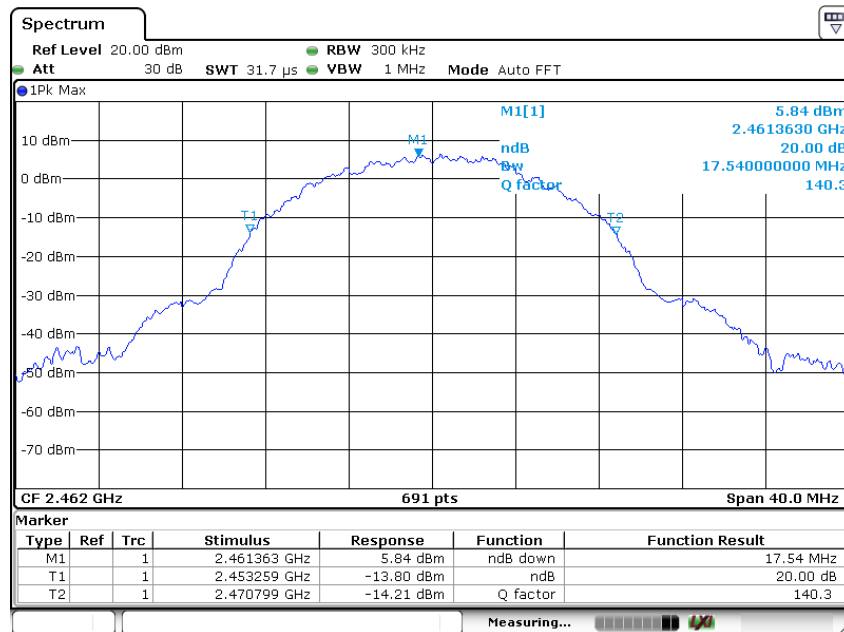
## 20dB Bandwidth 802.11b Channel Low 2412MHz



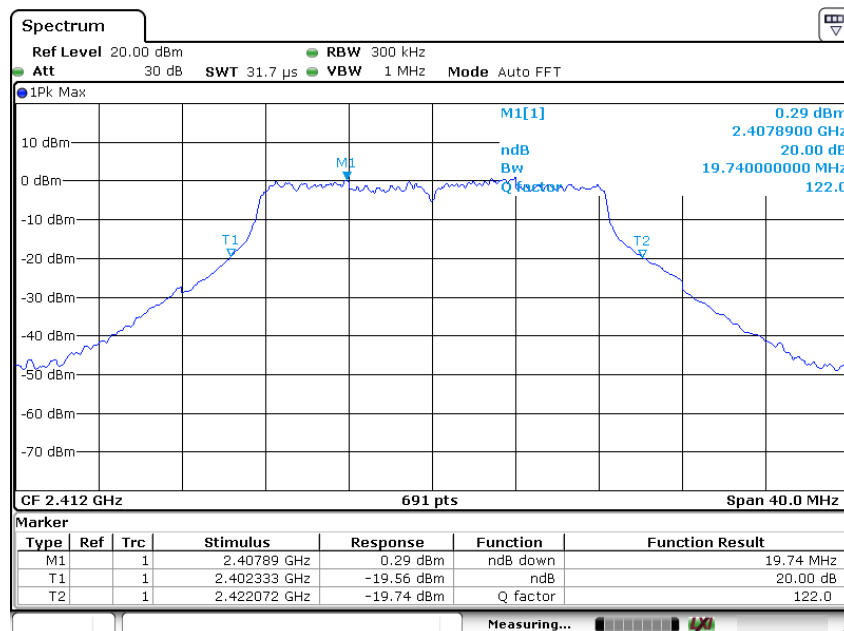
## 802.11b Channel Middle 2437MHz



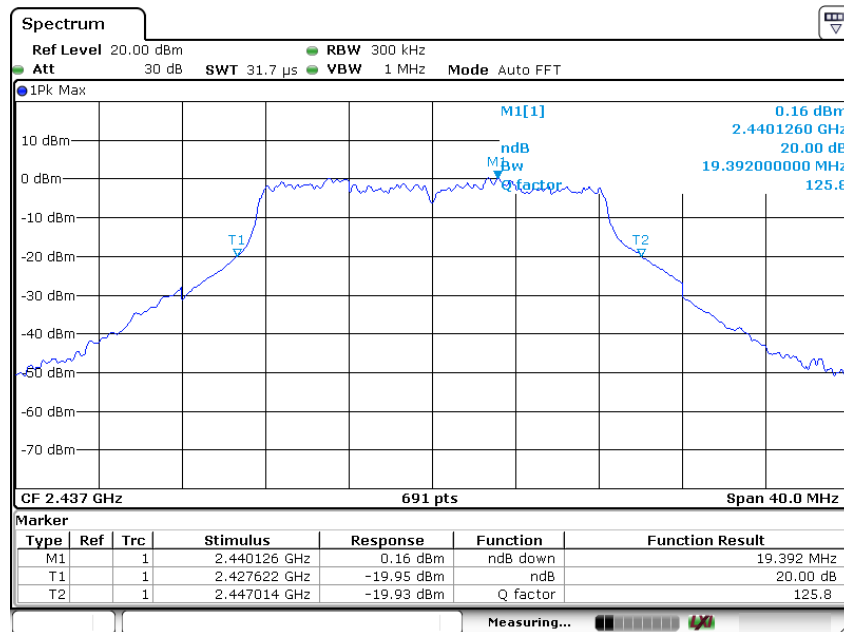
## 802.11b Channel High 2462MHz



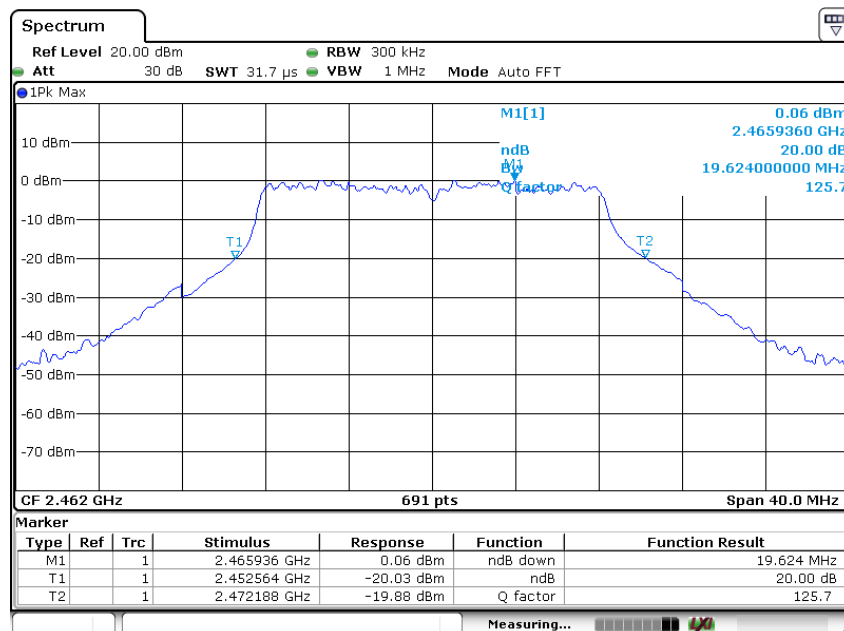
## 802.11g Channel Low 2412MHz



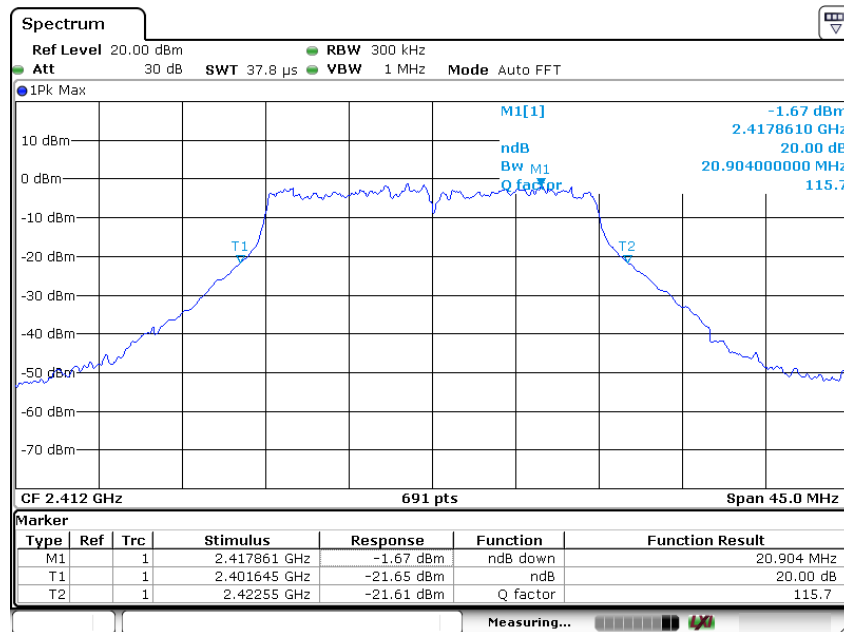
## 802.11g Channel Middle 2437MHz



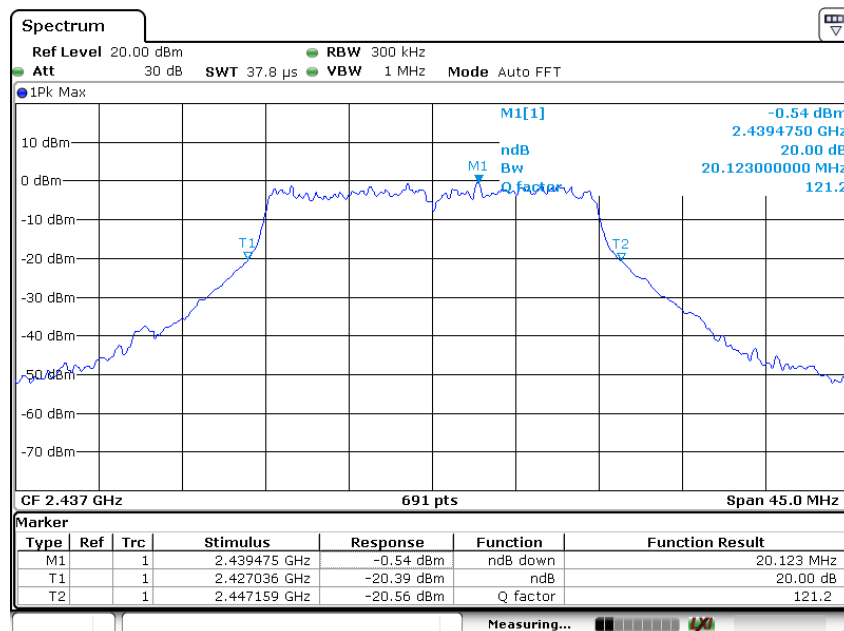
## 802.11g Channel High 2462MHz



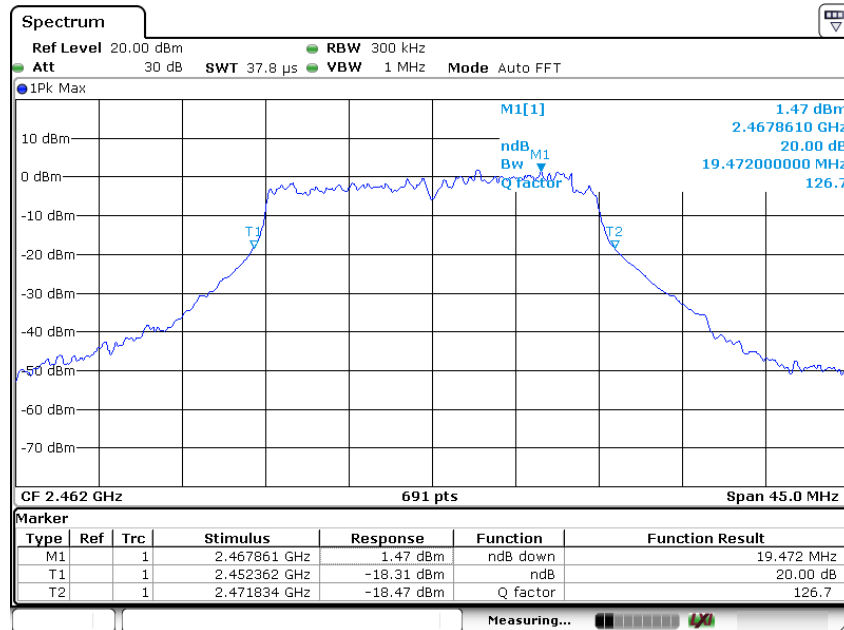
## 802.11n Channel Low 2412MHz (20MHz)



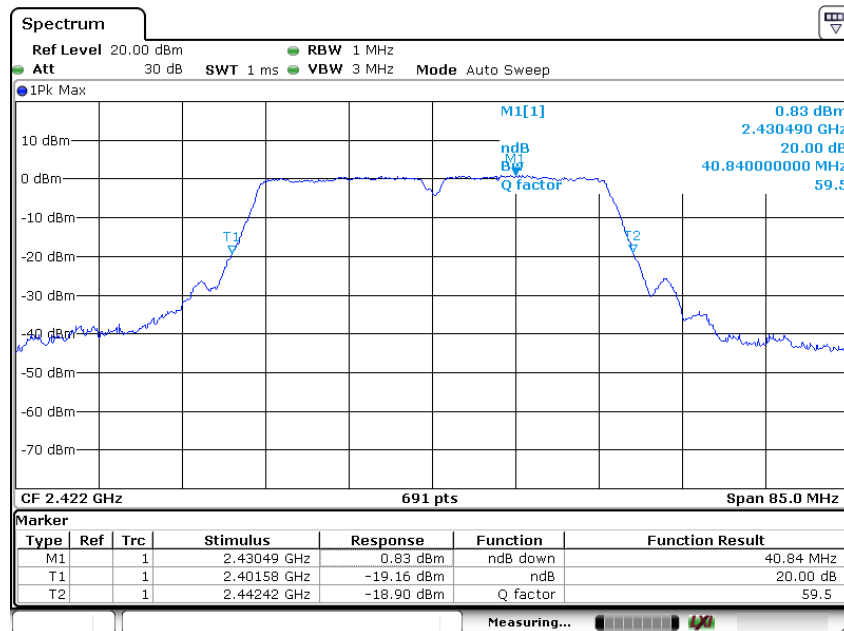
## 802.11n Channel Middle 2437MHz(20MHz)



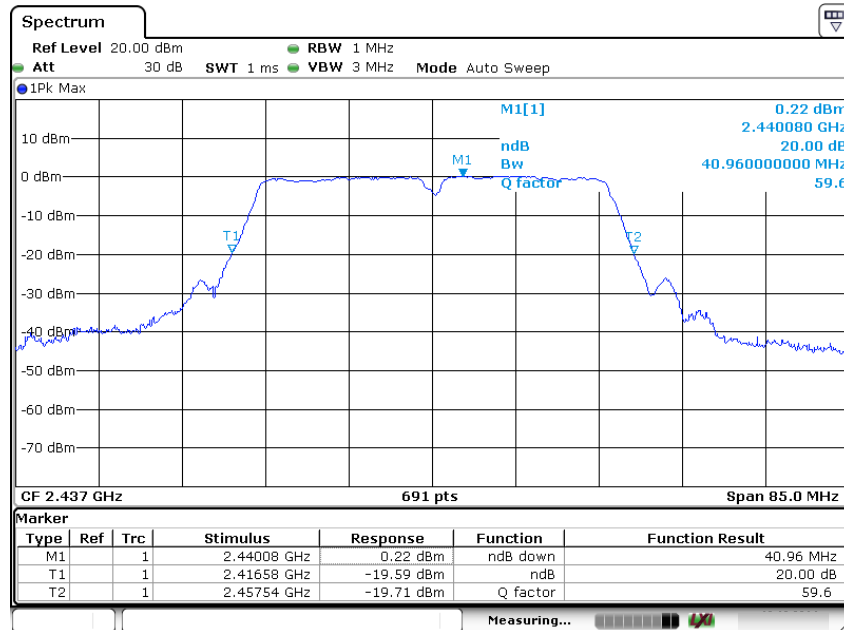
## 802.11n Channel High 2462MHz(20MHz)



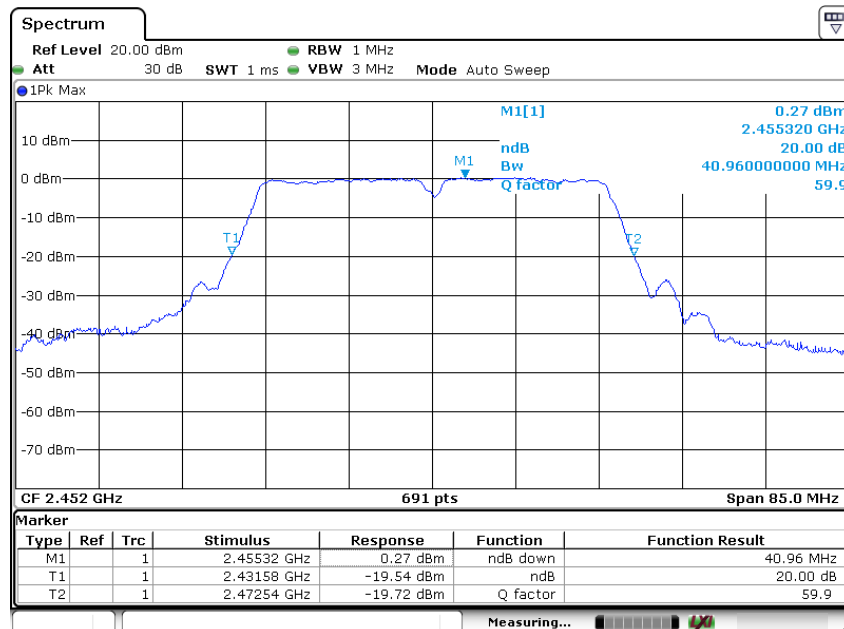
## 802.11n Channel Low 2422MHz (40MHz)



### 802.11n Channel Middle 2437MHz(40MHz)

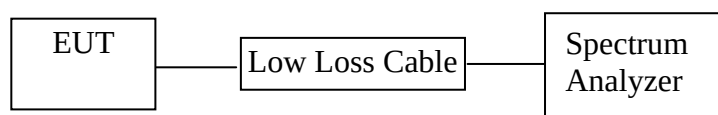


### 802.11n Channel High 2452MHz(40MHz)



## 7. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

### 7.1. Block Diagram of Test Setup



### 7.2. The Requirement For Section 15.247(b)(3)

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

### 7.3. EUT Configuration on Measurement

The equipment is installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

### 7.5. Test Procedure

7.5.1. The EUT was tested according to DTS test procedure of Jun 05, 2014 KDB558074 D01 DTS Meas Guidance v03r02 for compliance to FCC 47CFR 15.247 requirements.

7.5.2. The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.3. Set RBW = 1-5% of the OBW, not to exceed 1 MHz, VBW  $\geq$  3 x RBW, Sweep time = auto, Set span to at least 1.5 times the OBW, Detector = RMS.

7.5.4. Measurement the Maximum conducted (average) output power.

## 7.6.Test Result

| The test was performed with 802.11b |                 |                        |                       |                |
|-------------------------------------|-----------------|------------------------|-----------------------|----------------|
| Channel                             | Frequency (MHz) | Ave output power (dBm) | Ave output power (mW) | Limits dBm / W |
| Low                                 | 2412            | 17.04                  | 50.58                 | 30 dBm / 1 W   |
| Middle                              | 2437            | 16.95                  | 49.55                 | 30 dBm / 1 W   |
| High                                | 2462            | 16.66                  | 46.34                 | 30 dBm / 1 W   |

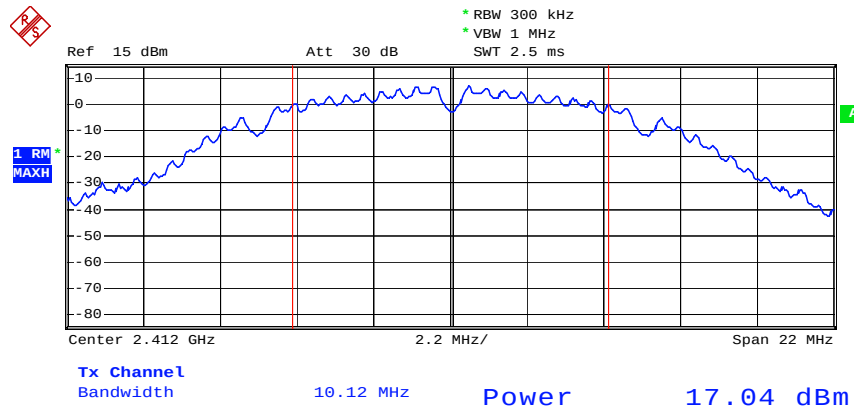
| The test was performed with 802.11g |                 |                        |                       |                |
|-------------------------------------|-----------------|------------------------|-----------------------|----------------|
| Channel                             | Frequency (MHz) | Ave output power (dBm) | Ave output power (mW) | Limits dBm / W |
| Low                                 | 2412            | 16.48                  | 44.46                 | 30 dBm / 1 W   |
| Middle                              | 2437            | 16.44                  | 44.06                 | 30 dBm / 1 W   |
| High                                | 2462            | 16.26                  | 42.27                 | 30 dBm / 1 W   |

| The test was performed with 802.11n (20MHz) |                 |                        |                       |                |
|---------------------------------------------|-----------------|------------------------|-----------------------|----------------|
| Channel                                     | Frequency (MHz) | Ave output power (dBm) | Ave output power (mW) | Limits dBm / W |
| Low                                         | 2412            | 15.72                  | 37.33                 | 30 dBm / 1 W   |
| Middle                                      | 2437            | 15.78                  | 37.84                 | 30 dBm / 1 W   |
| High                                        | 2462            | 16.82                  | 48.08                 | 30 dBm / 1 W   |

| The test was performed with 802.11n (40MHz) |                 |                        |                       |                |
|---------------------------------------------|-----------------|------------------------|-----------------------|----------------|
| Channel                                     | Frequency (MHz) | Ave output power (dBm) | Ave output power (mW) | Limits dBm / W |
| Low                                         | 2422            | 13.42                  | 21.98                 | 30 dBm / 1 W   |
| Middle                                      | 2437            | 13.65                  | 23.17                 | 30 dBm / 1 W   |
| High                                        | 2452            | 14.25                  | 26.61                 | 30 dBm / 1 W   |

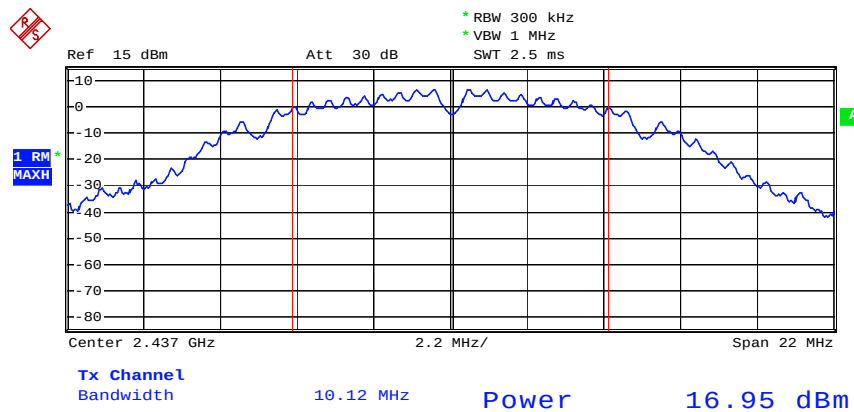
The spectrum analyzer plots are attached as below.

## 802.11b Channel Low 2412MHz



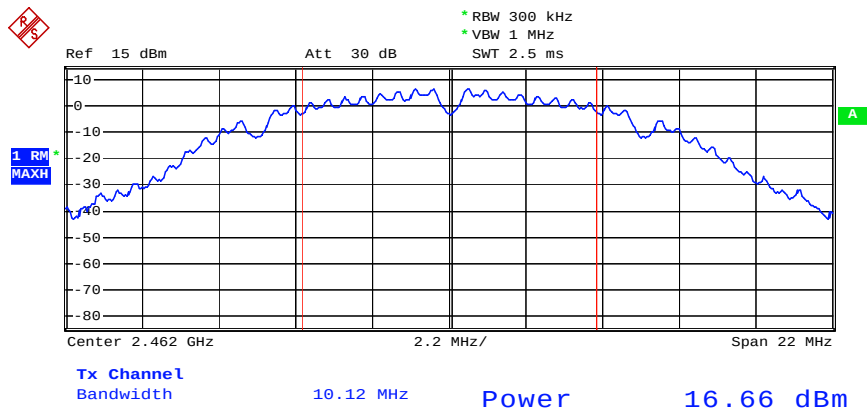
Date: 9.JUL.2015 18:06:55

## 802.11b Channel Middle 2437MHz



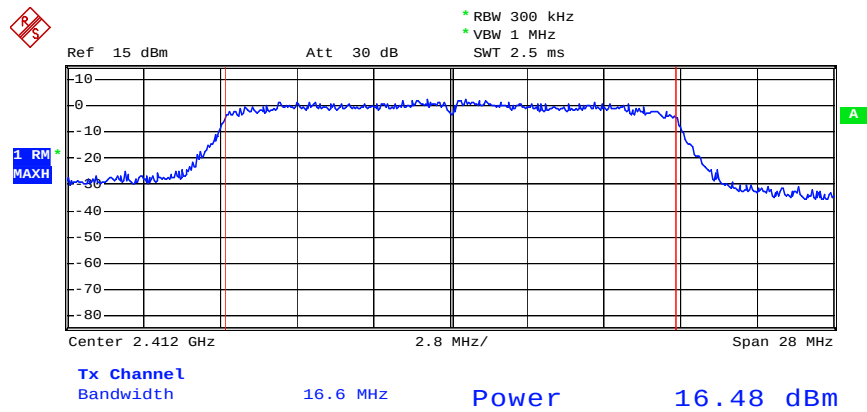
Date: 9.JUL.2015 18:07:59

### 802.11b Channel High 2462MHz



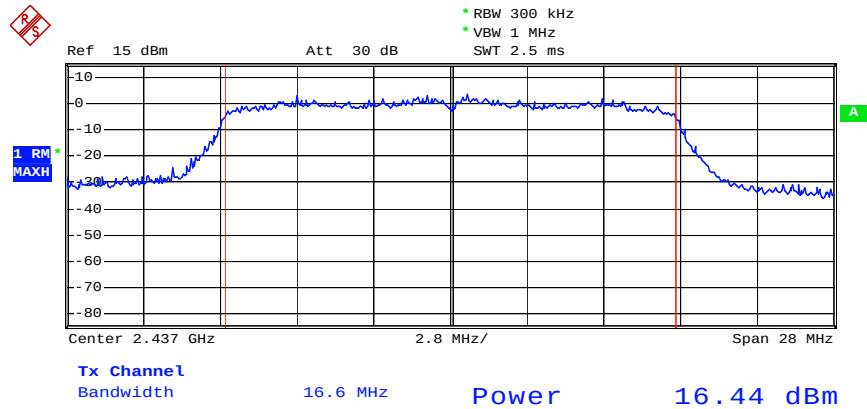
Date: 9.JUL.2015 18:08:43

### 802.11g Channel Low 2412MHz



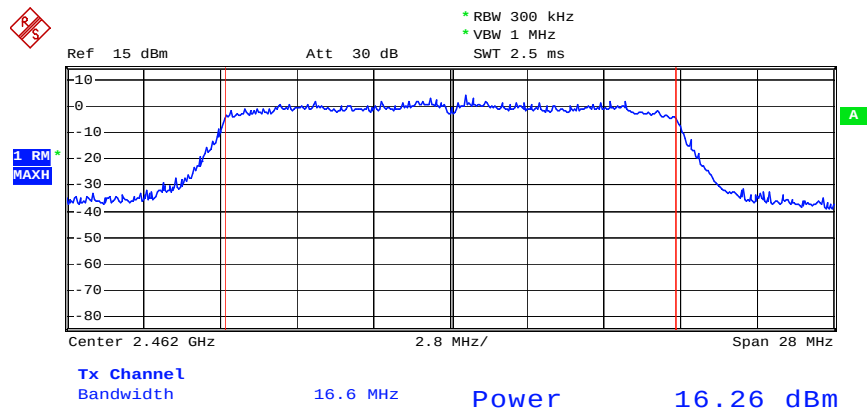
Date: 9.JUL.2015 18:14:25

### 802.11g Channel Middle 2437MHz



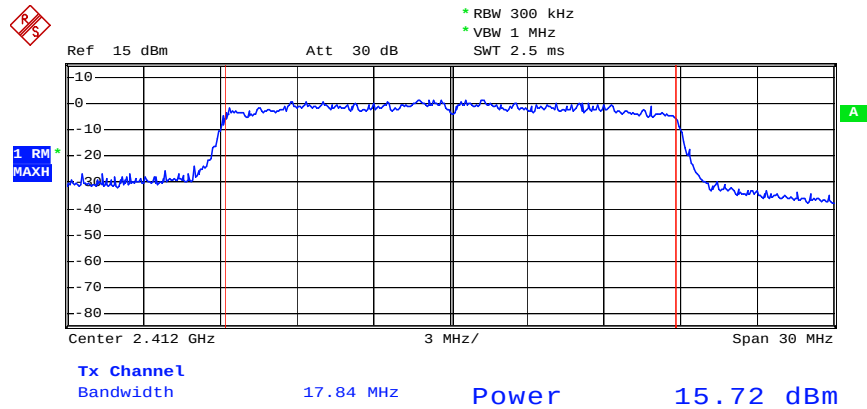
Date: 9.JUL.2015 18:13:33

### 802.11g Channel High 2462MHz



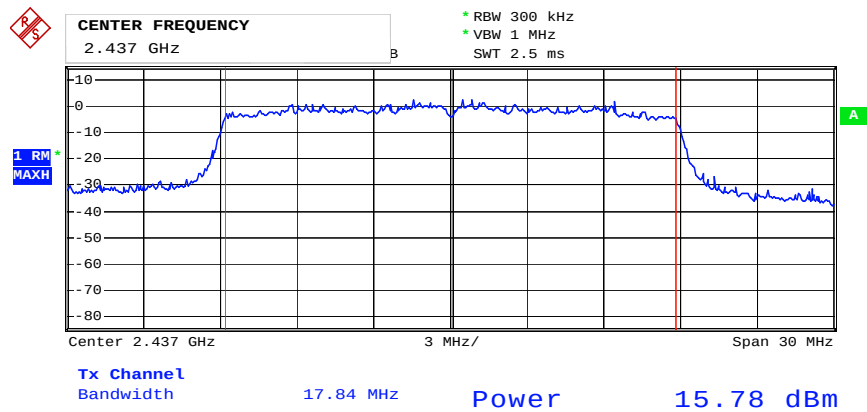
Date: 9.JUL.2015 18:12:28

### 802.11n Channel Low 2412MHz (20MHz)



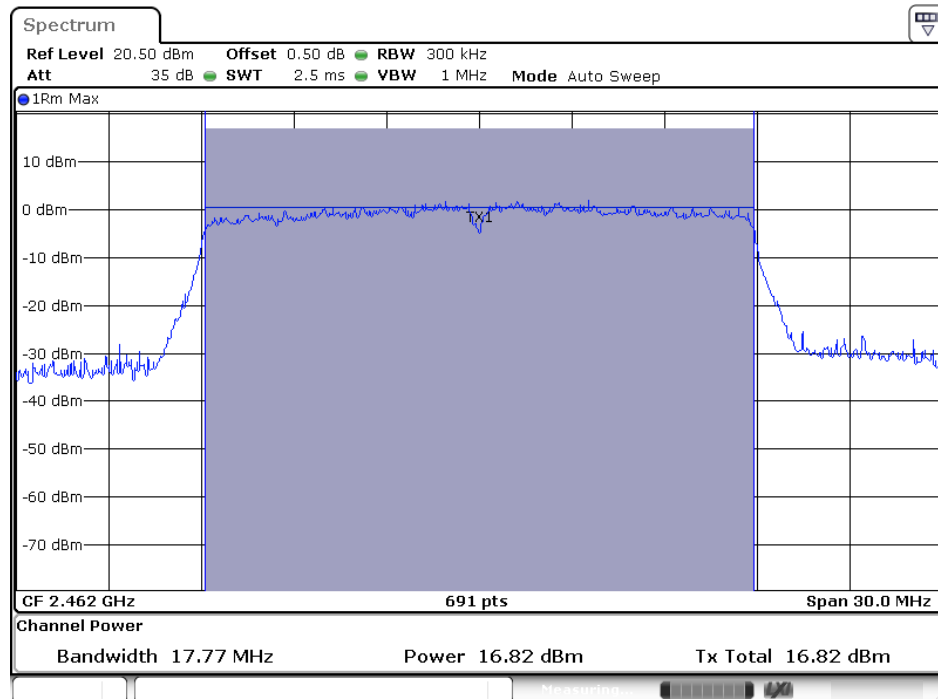
Date: 9.JUL.2015 18:17:10

### 802.11n Channel Middle 2437MHz (20MHz)



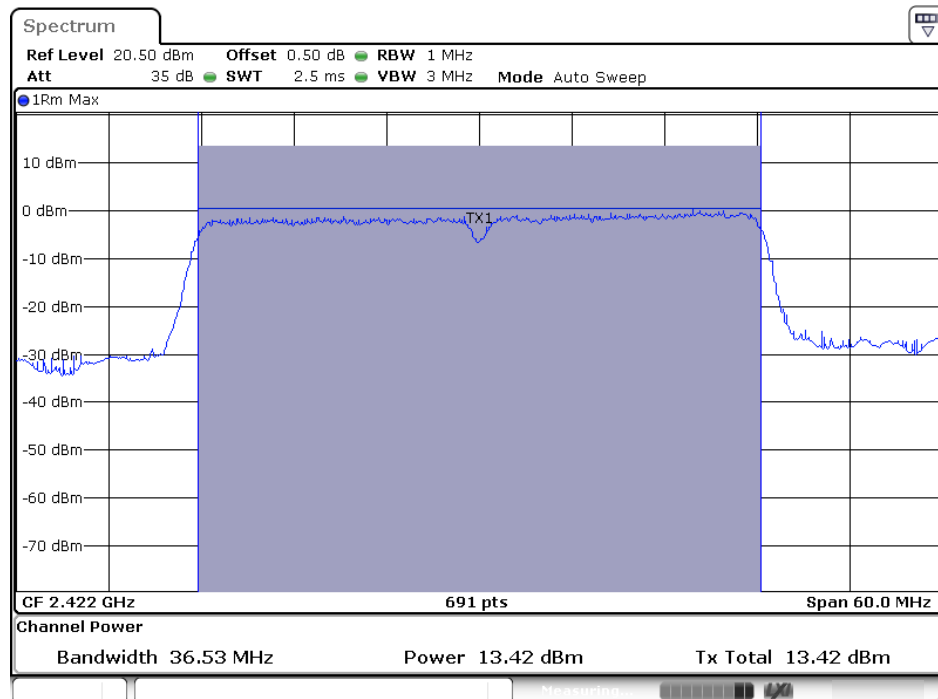
Date: 9.JUL.2015 18:18:05

### 802.11n Channel High 2462MHz (20MHz)



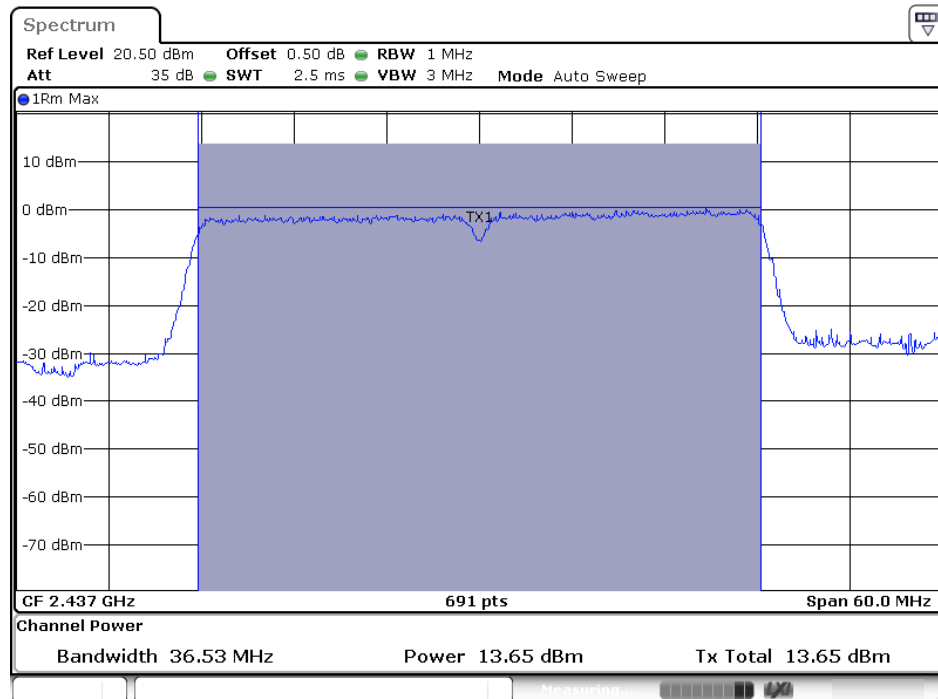
Date: 22.Jun.2015 19:00:36

### 802.11n Channel Low 2422MHz (40MHz)



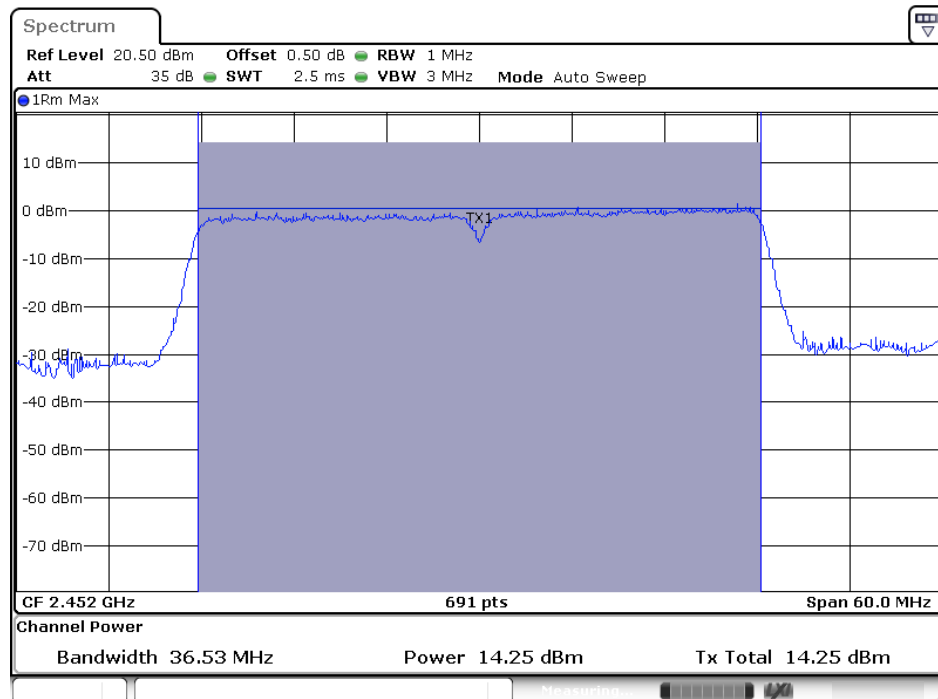
Date: 22.Jun.2015 19:02:48

### 802.11n Channel Middle 2437MHz (40MHz)



Date: 22.Jun.2015 19:03:57

### 802.11n Channel High 2452MHz (40MHz)



Date: 22.Jun.2015 19:05:11

## 8. POWER SPECTRAL DENSITY MEASUREMENT

### 8.1. Block Diagram of Test Setup



### 8.2. The Requirement For Section 15.247(e)

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

### 8.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

### 8.5. Test Procedure

8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2. Measurement Procedure PKPSD:

This procedure must be used if maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit, and is optional if the maximum (average) conducted output power was used to demonstrate compliance.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.

3. Set the RBW  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
4. Set the VBW  $\geq 3 \times \text{RBW}$ .
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### 8.5.3.Measurement the maximum power spectral density.

### 8.6.Test Result

| The test was performed with 802.11b |                 |                              |              |
|-------------------------------------|-----------------|------------------------------|--------------|
| Channel                             | Frequency (MHz) | Power Spectral Density (dBm) | Limits (dBm) |
| Low                                 | 2412            | -13.67                       | 8 dBm        |
| Middle                              | 2437            | -14.32                       | 8 dBm        |
| High                                | 2462            | -14.83                       | 8 dBm        |

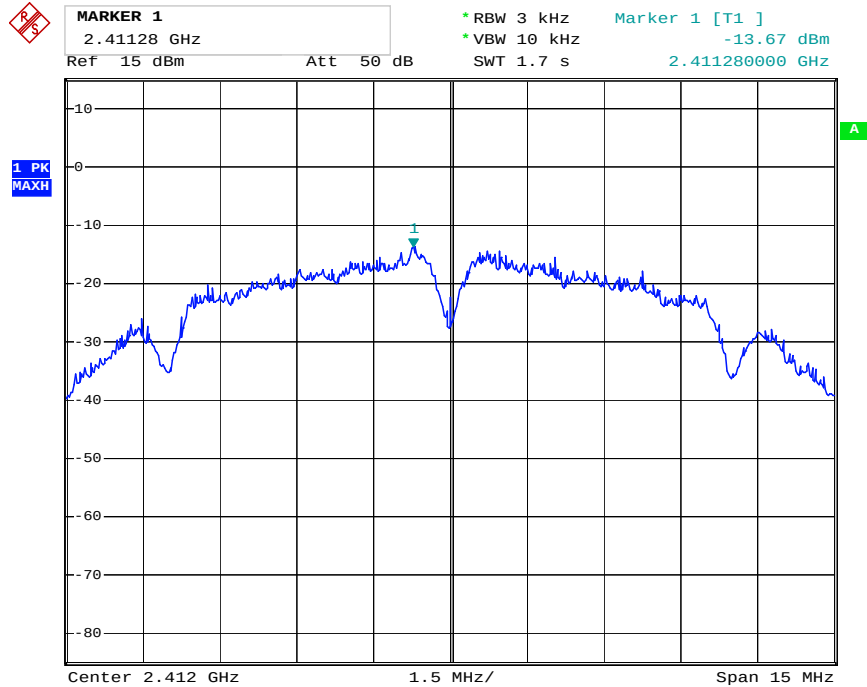
| The test was performed with 802.11g |                 |                              |              |
|-------------------------------------|-----------------|------------------------------|--------------|
| Channel                             | Frequency (MHz) | Power Spectral Density (dBm) | Limits (dBm) |
| Low                                 | 2412            | -17.79                       | 8 dBm        |
| Middle                              | 2437            | -17.17                       | 8 dBm        |
| High                                | 2462            | -17.74                       | 8 dBm        |

| The test was performed with 802.11n (20MHz) |                 |                              |              |
|---------------------------------------------|-----------------|------------------------------|--------------|
| Channel                                     | Frequency (MHz) | Power Spectral Density (dBm) | Limits (dBm) |
| Low                                         | 2412            | -18.56                       | 8 dBm        |
| Middle                                      | 2437            | -18.58                       | 8 dBm        |
| High                                        | 2462            | -17.65                       | 8 dBm        |

| The test was performed with 802.11n (40MHz) |                 |                              |              |
|---------------------------------------------|-----------------|------------------------------|--------------|
| Channel                                     | Frequency (MHz) | Power Spectral Density (dBm) | Limits (dBm) |
| Low                                         | 2422            | -22.88                       | 8 dBm        |
| Middle                                      | 2437            | -21.01                       | 8 dBm        |
| High                                        | 2452            | -21.16                       | 8 dBm        |

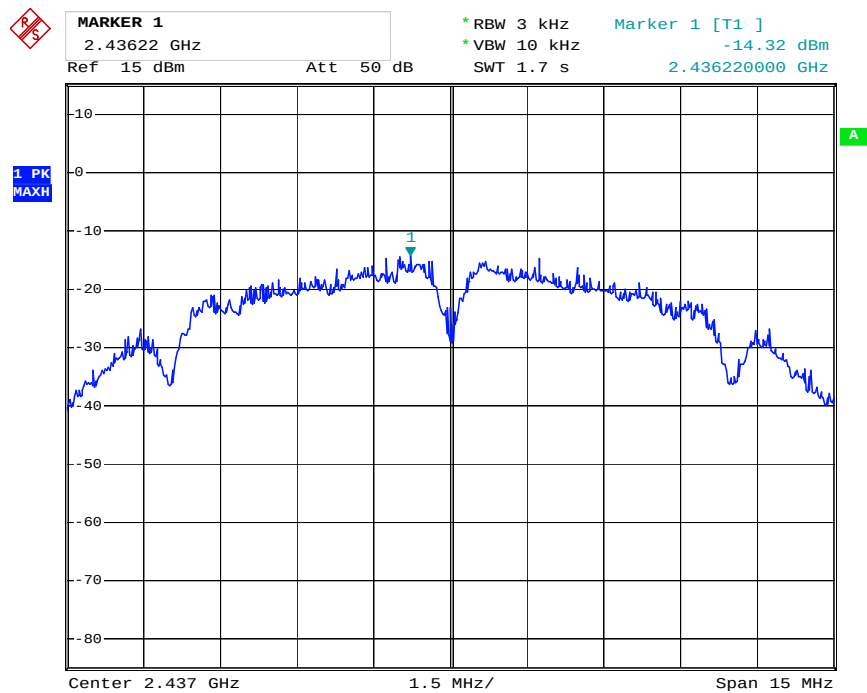
The spectrum analyzer plots are attached as below.

### 802.11b Channel Low 2412MHz



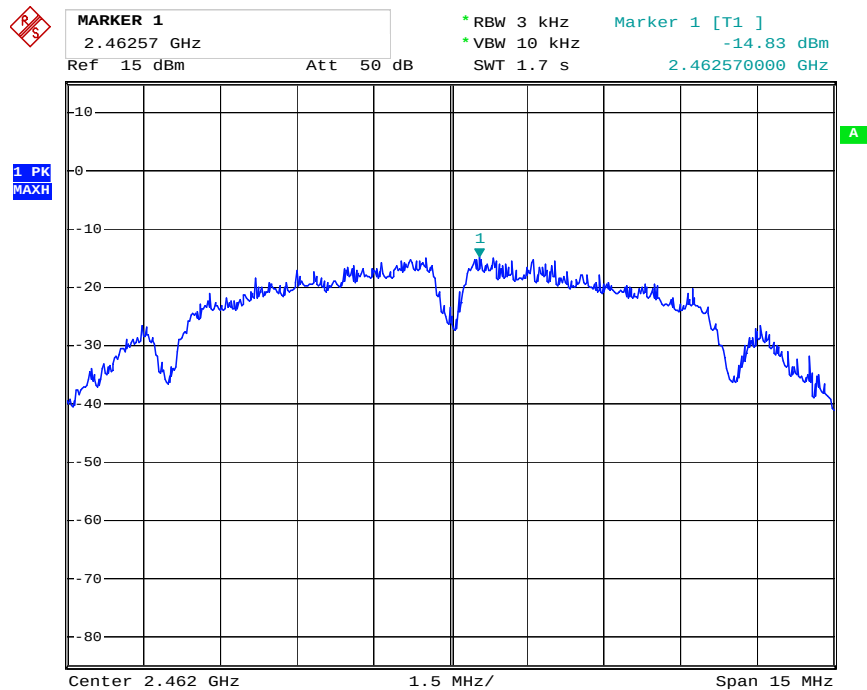
Date: 9.JUL.2015 18:46:12

### 802.11b Channel Middle 2437MHz



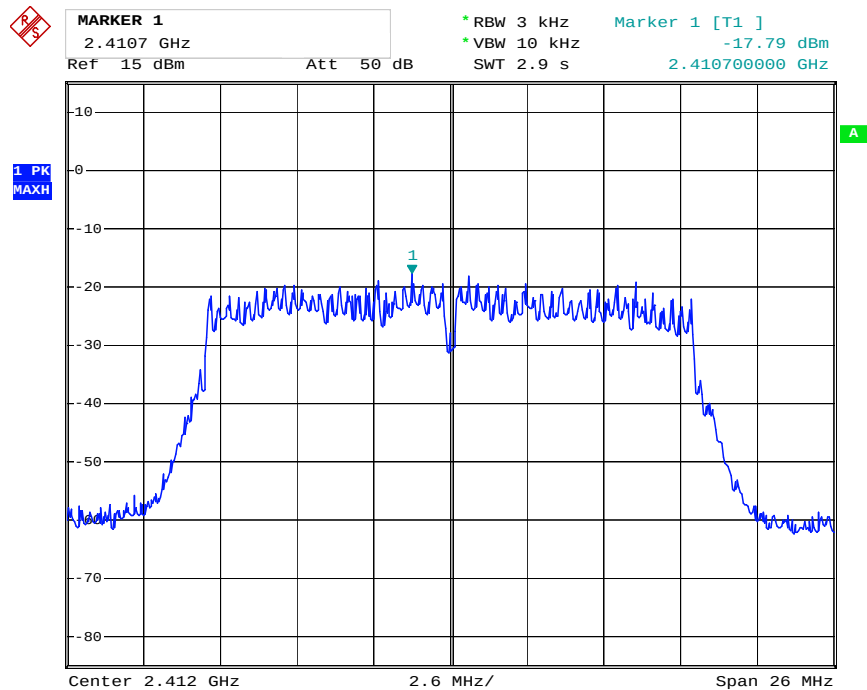
Date: 9.JUL.2015 18:46:58

## 802.11b Channel High 2462MHz



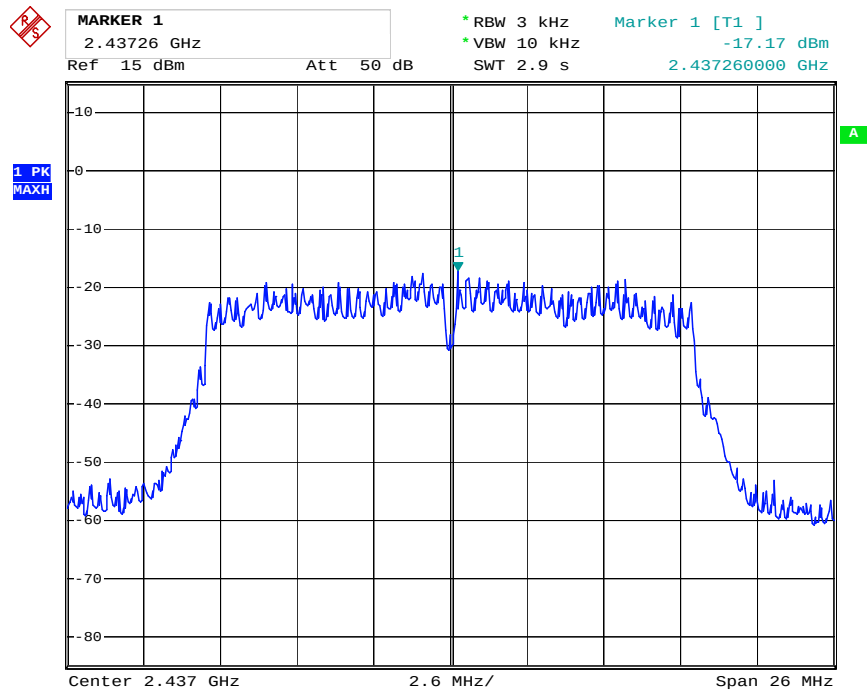
Date: 9.JUL.2015 18:47:36

## 802.11g Channel Low 2412MHz



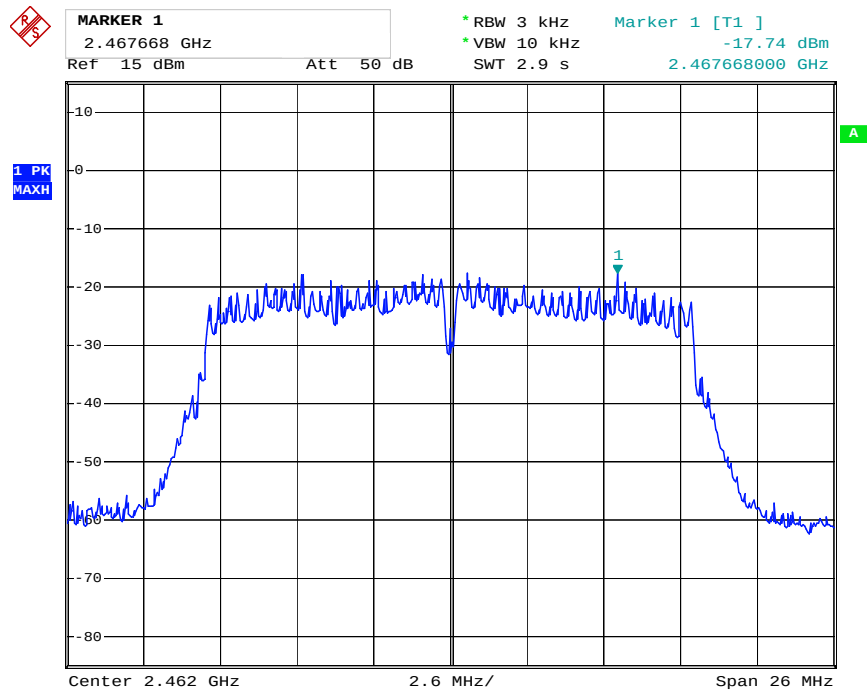
Date: 9.JUL.2015 18:49:01

## 802.11g Channel Middle 2437MHz



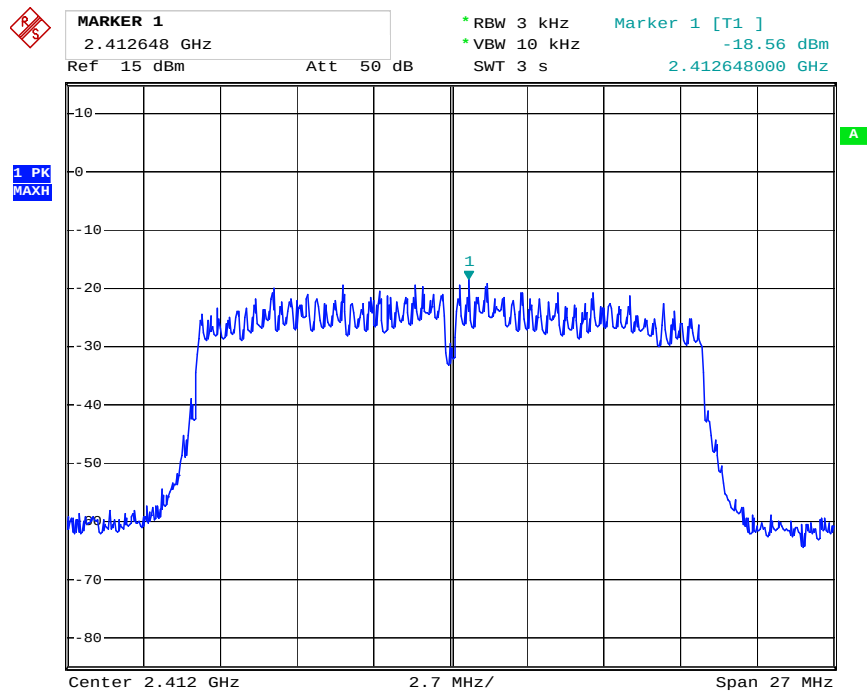
Date: 9.JUL.2015 18:49:30

## 802.11g Channel High 2462MHz



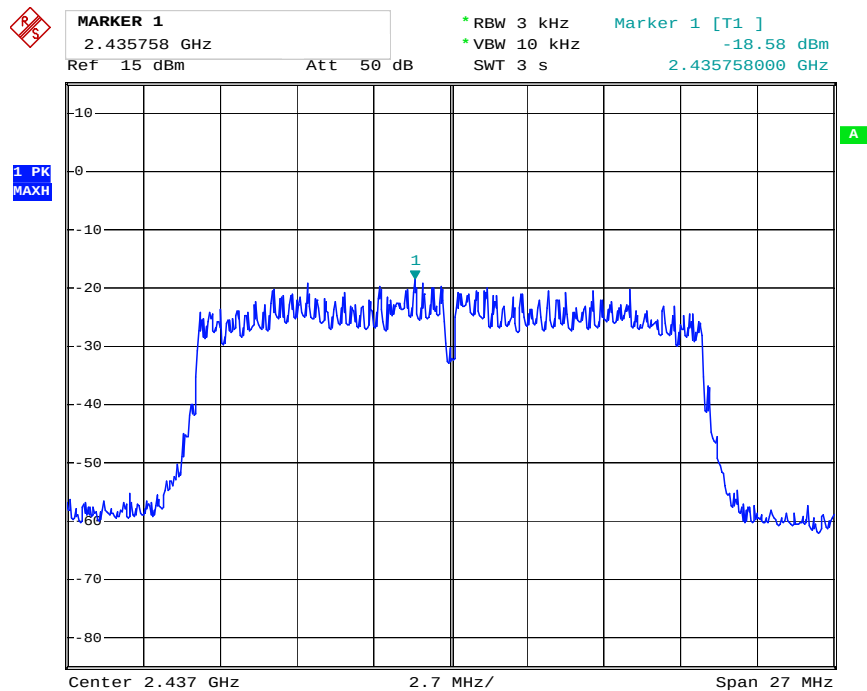
Date: 9.JUL.2015 18:50:00

## 802.11n Channel Low 2412MHz (20MHz)



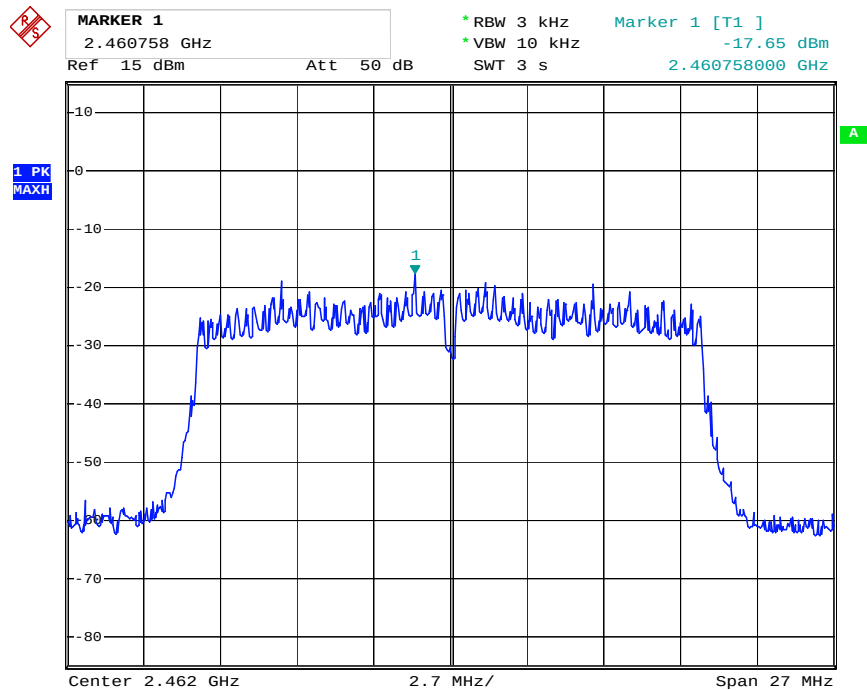
Date: 9.JUL.2015 18:51:53

## 802.11n Channel Middle 2437MHz (20MHz)



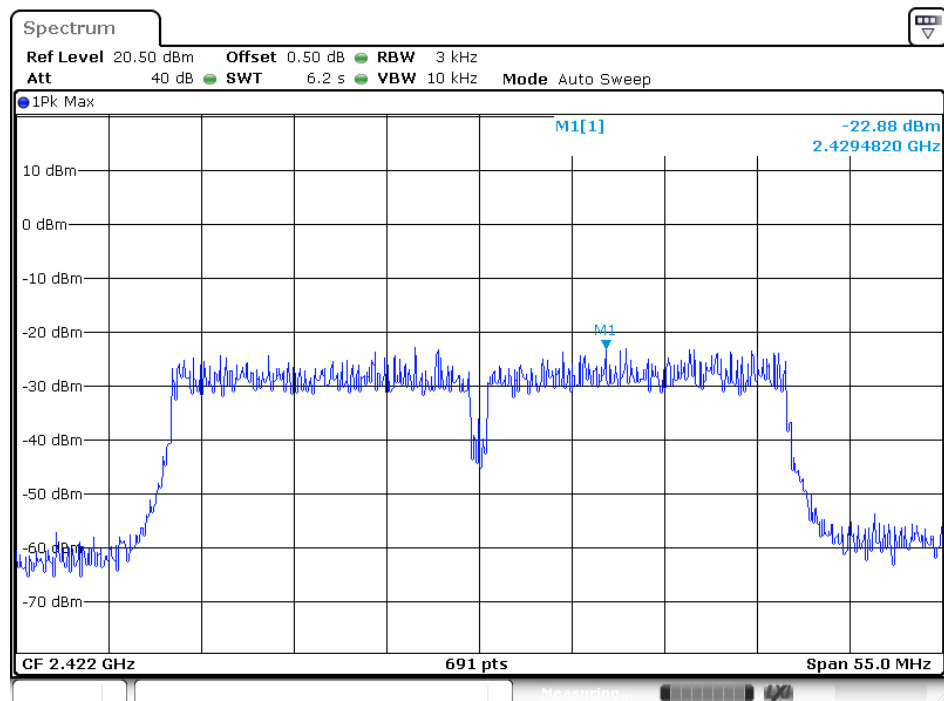
Date: 9.JUL.2015 18:52:30

## 802.11n Channel High 2462MHz(20MHz)



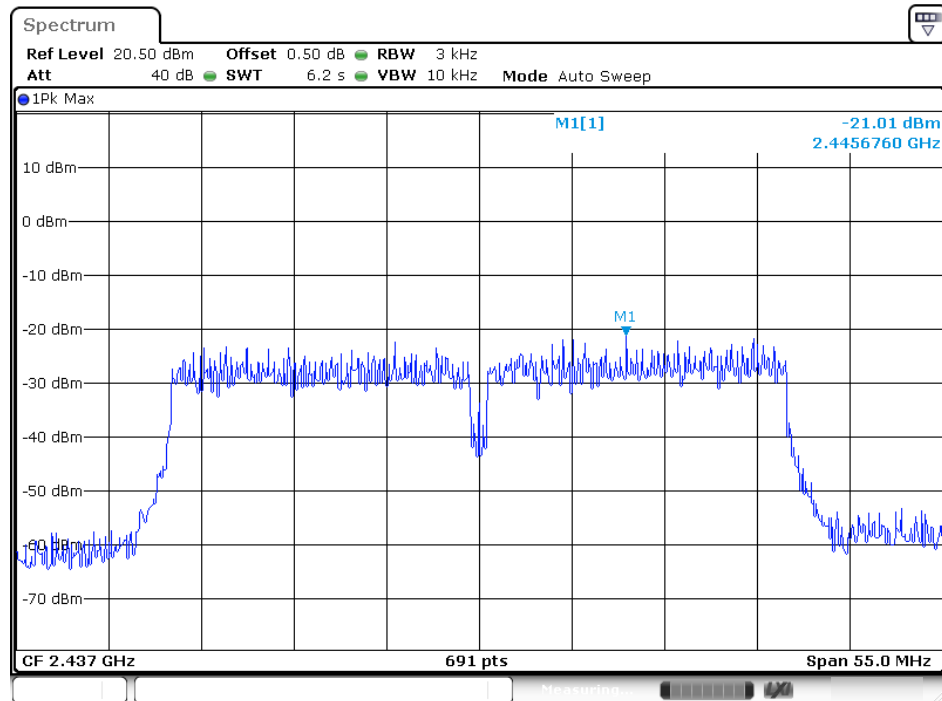
Date: 9.JUL.2015 18:53:12

## 802.11n Channel Low 2422MHz (40MHz)



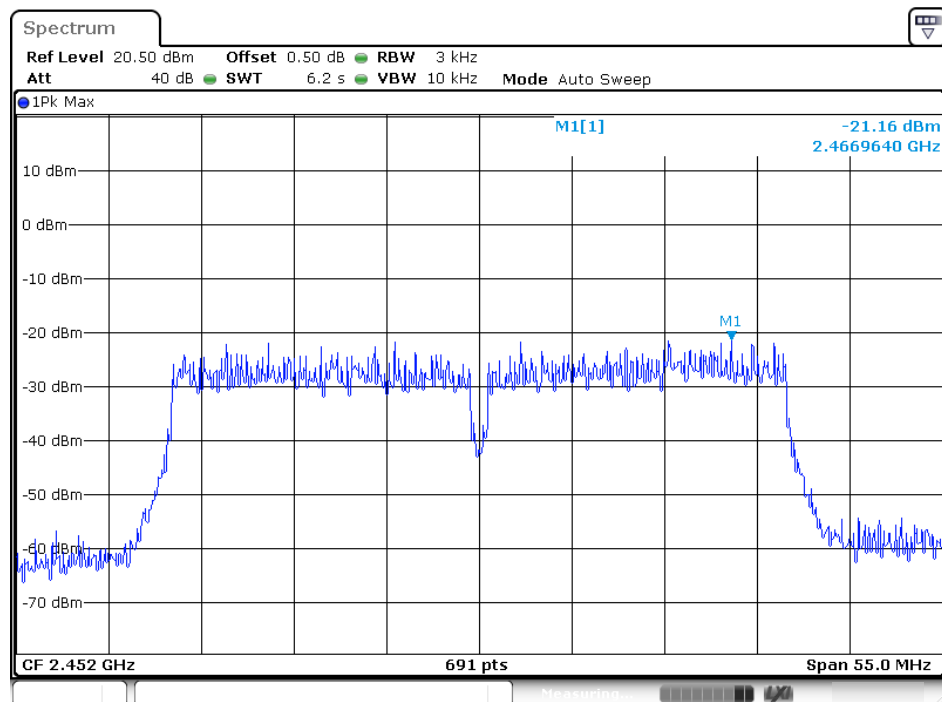
Date: 22.Jun.2015 19:20:02

### 802.11n Channel Middle 2437MHz(40MHz)



Date: 22.Jun.2015 19:23:17

### 802.11n Channel High 2452MHz(40MHz)



Date: 22.Jun.2015 19:25:28

## 9. BAND EDGE COMPLIANCE TEST

### 9.1. Block Diagram of Test Setup



### 9.2. The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 9.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz MHz. We select 2412MHz, 2462MHz and 2422MHz, 2452MHz TX frequency to transmit.

### 9.5. Test Procedure

Conducted Band Edge:

9.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

9.5.3. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.

9.5.4. The turntable was rotated for 360 degrees to determine the position of maximum emission level.

9.5.5. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

9.5.6. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

9.5.7. RBW=1MHz, VBW=1MHz

9.5.8. The band edges were measured and recorded.

## 9.6. Test Result

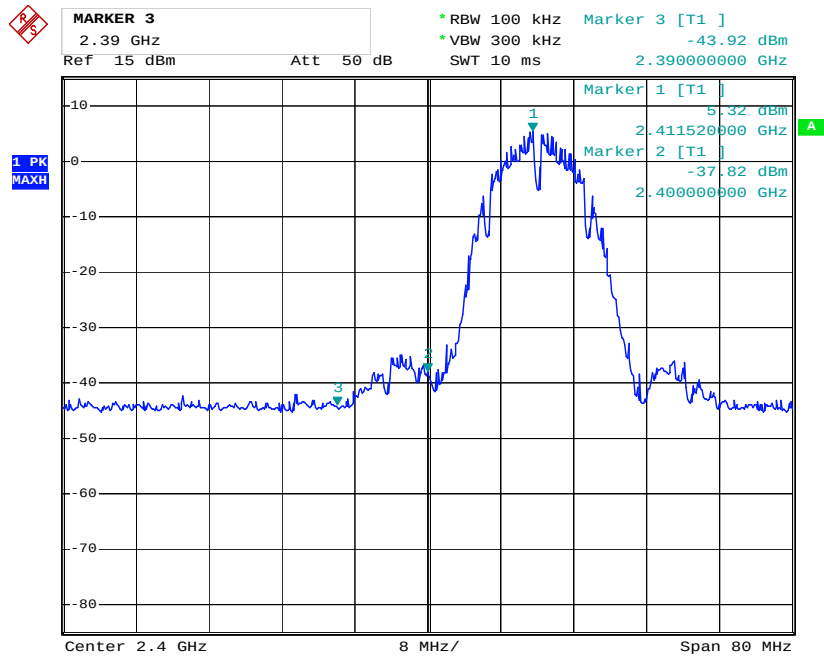
| The test was performed with 802.11b |                           |                          |
|-------------------------------------|---------------------------|--------------------------|
| Frequency (MHz)                     | Result of Band Edge (dBc) | Limit of Band Edge (dBc) |
| 2412                                | 43.14                     | > 20dBc                  |
| 2462                                | 50.33                     | > 20dBc                  |

| The test was performed with 802.11g |                           |                          |
|-------------------------------------|---------------------------|--------------------------|
| Frequency (MHz)                     | Result of Band Edge (dBc) | Limit of Band Edge (dBc) |
| 2412                                | 30.08                     | > 20dBc                  |
| 2462                                | 45.56                     | > 20dBc                  |

| The test was performed with 802.11n (20MHz) |                           |                          |
|---------------------------------------------|---------------------------|--------------------------|
| Frequency (MHz)                             | Result of Band Edge (dBc) | Limit of Band Edge (dBc) |
| 2412                                        | 31.26                     | > 20dBc                  |
| 2462                                        | 44.10                     | > 20dBc                  |

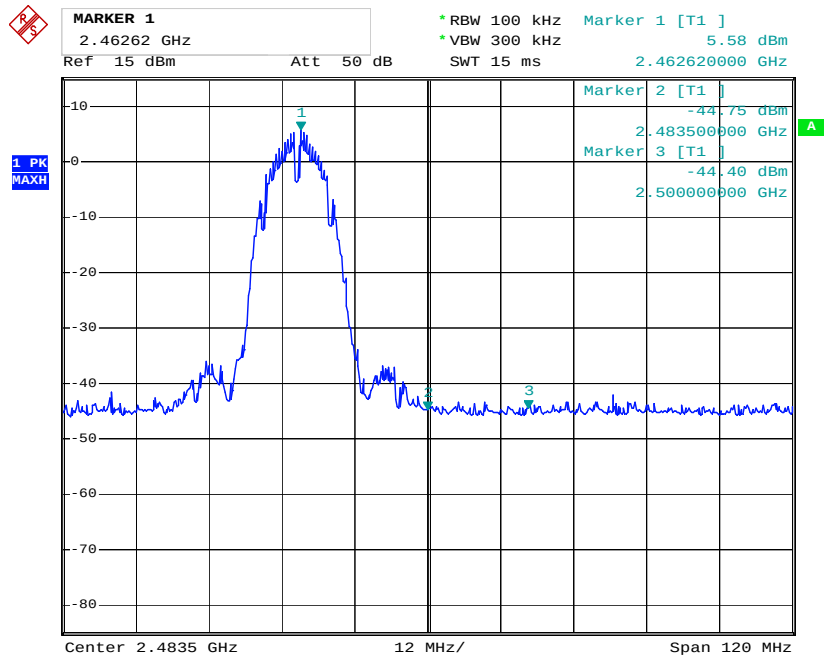
| The test was performed with 802.11n (40MHz) |                           |                          |
|---------------------------------------------|---------------------------|--------------------------|
| Frequency (MHz)                             | Result of Band Edge (dBc) | Limit of Band Edge (dBc) |
| 2422                                        | 34.51                     | > 20dBc                  |
| 2452                                        | 29.77                     | > 20dBc                  |

## 802.11b Channel Low 2412MHz



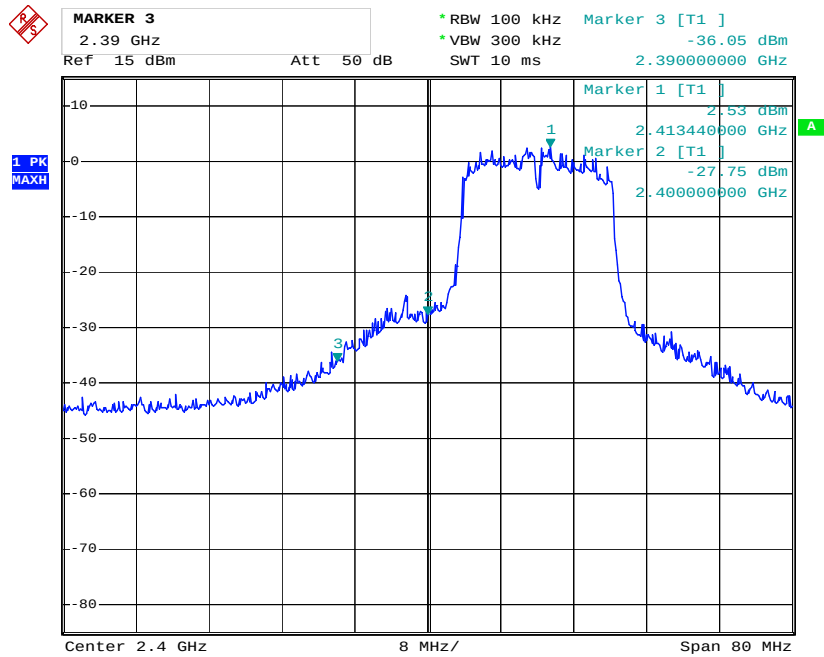
Date: 9.JUL.2015 17:47:16

## 802.11b Channel High 2462MHz



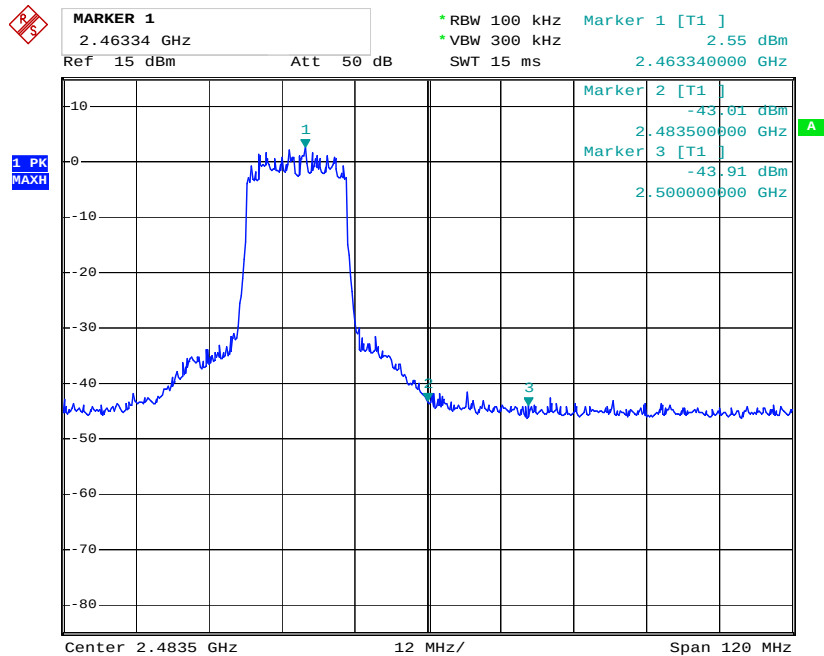
Date: 9.JUL.2015 17:48:40

## 802.11g Channel Low 2412MHz



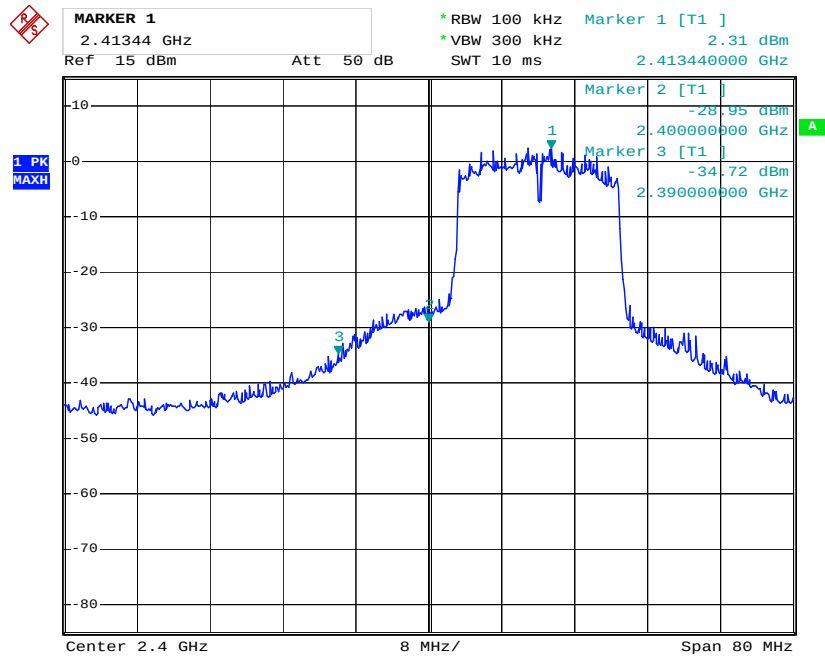
Date: 9.JUL.2015 17:49:44

## 802.11g Channel High 2462MHz



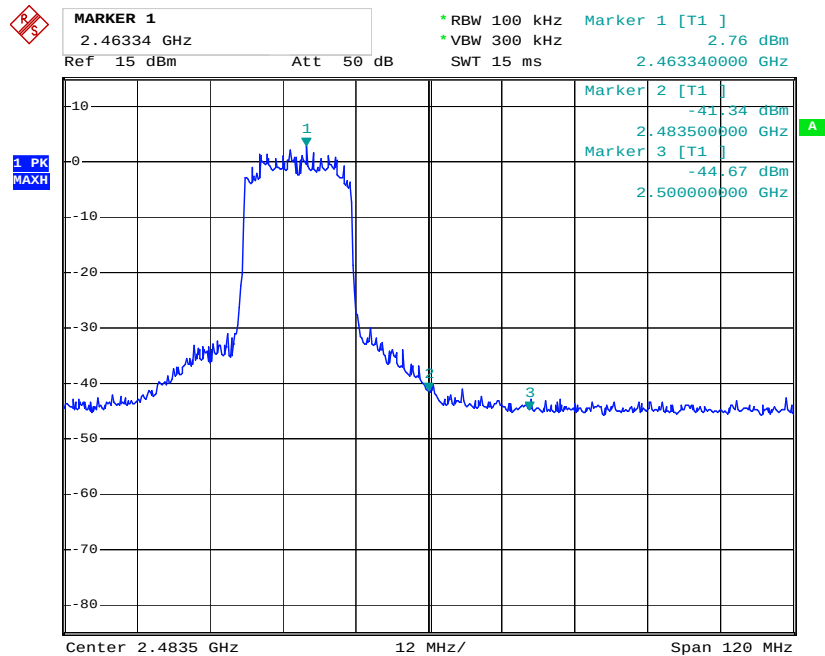
Date: 9.JUL.2015 17:49:09

## 802.11n Channel Low 2412MHz (20MHz)



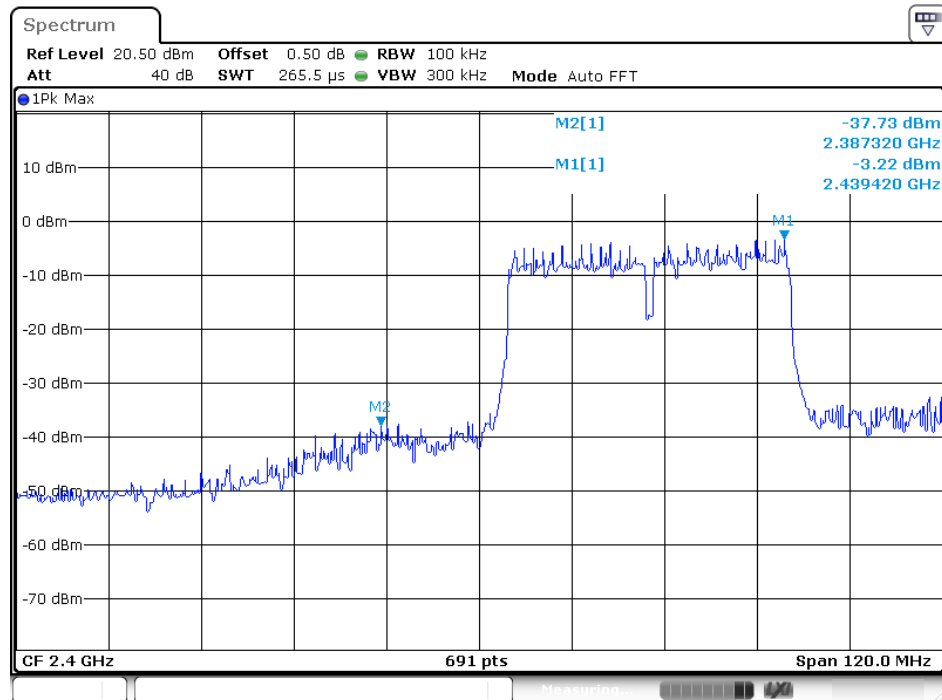
Date: 9.JUL.2015 17:50:20

## 802.11n Channel High 2462MHz (20MHz)



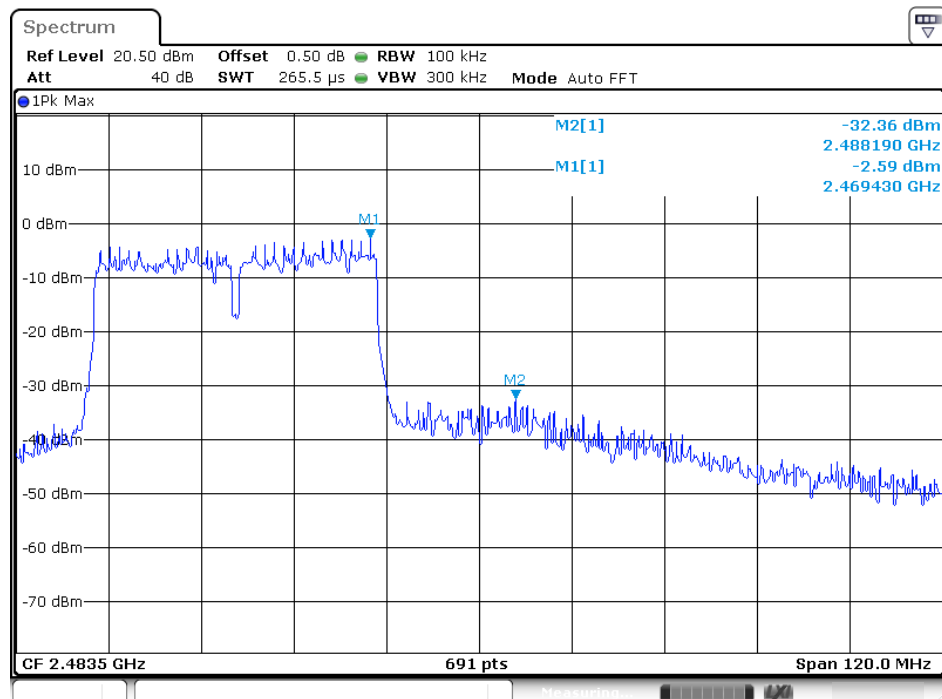
Date: 9.JUL.2015 17:51:14

## 802.11n Channel Low 2422MHz (40MHz)



Date: 22.Jun.2015 19:37:04

## 802.11n Channel High 2452MHz (40MHz)



Date: 22.Jun.2015 19:41:08

## Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX modes then measure it.

We select 2412MHz, 2462MHz TX frequency to transmit(802.11b/g/n20 mode).

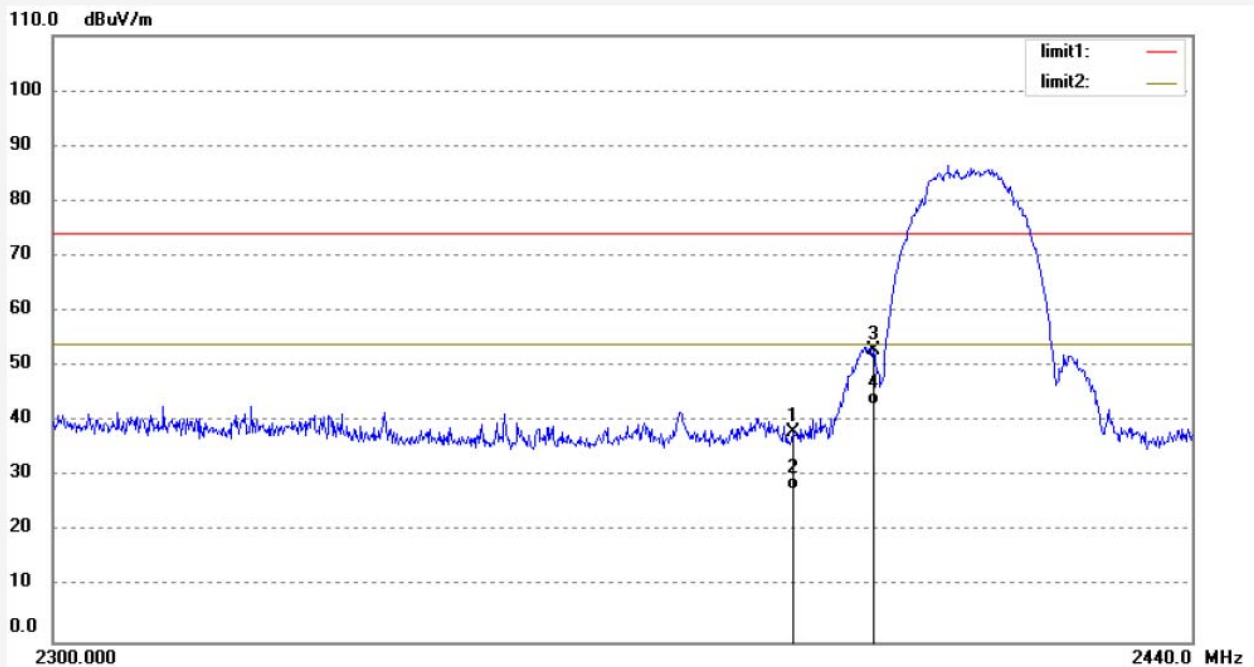
We select 2422MHz, 2452MHz TX frequency to transmit(802.11n40 mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:

- 1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 3.All modes of operation were investigated and the worst-case emissions are reported.

|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #387         | Polarization: Horizontal   |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/14/26              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 1(802.11b)    | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 45.67            | -7.53       | 38.14           | 74.00          | -35.86      | peak     |             |               |        |
| 2   | 2390.000    | 35.23            | -7.53       | 27.70           | 54.00          | -26.30      | peak     |             |               |        |
| 3   | 2400.000    | 60.52            | -7.46       | 53.06           | 74.00          | -20.94      | peak     |             |               |        |
| 4   | 2400.000    | 50.60            | -7.46       | 43.14           | 54.00          | -10.86      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

Job No.: Star\_tmp #386

Standard: FCC 15C PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 49 %

EUT: Indoor Air Quality Sensor

Mode: TX Channel 1(802.11b)

Model: AAware

Manufacturer: Mixwell

Polarization: Vertical

Power Source: AC 120V/60Hz

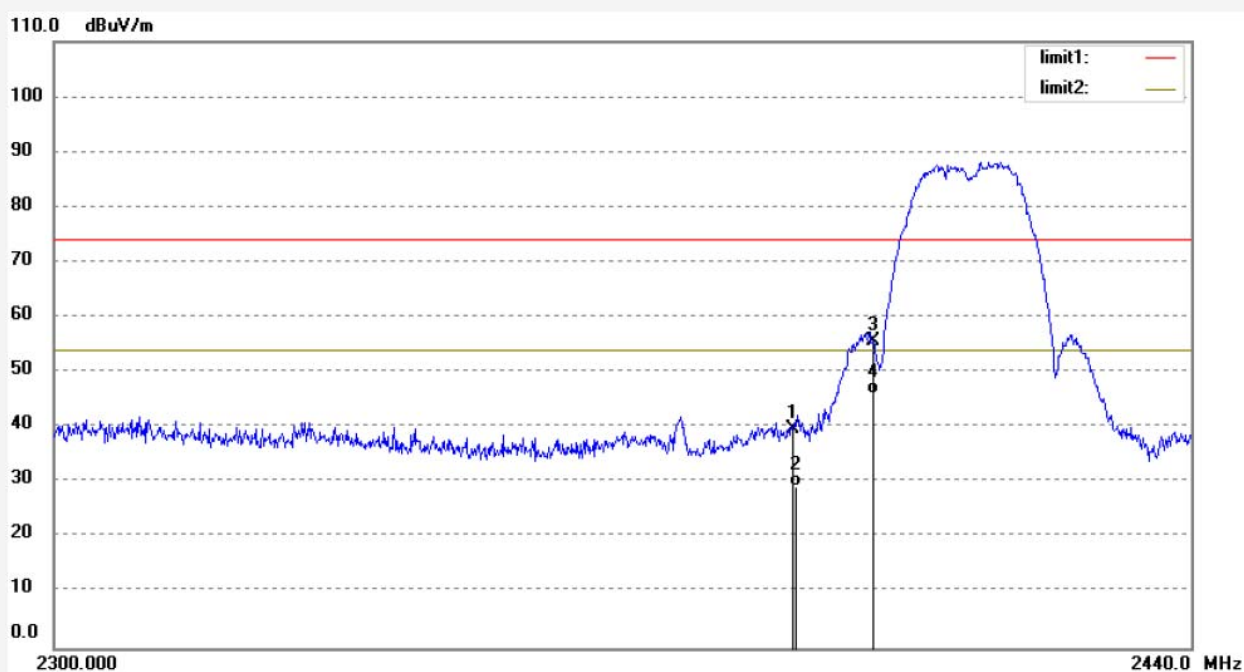
Date: 15/06/24/

Time: 4/12/47

Engineer Signature: Star

Distance: 3m

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 47.28            | -7.53       | 39.75           | 74.00          | -34.25      | peak     |             |               |        |
| 2   | 2390.000    | 36.70            | -7.53       | 29.17           | 54.00          | -24.83      | peak     |             |               |        |
| 3   | 2400.000    | 63.15            | -7.46       | 55.69           | 74.00          | -18.31      | peak     |             |               |        |
| 4   | 2400.000    | 53.60            | -7.46       | 46.14           | 54.00          | -7.86       | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

Job No.: Star\_tmp #384

Standard: FCC 15C PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 49 %

EUT: Indoor Air Quality Sensor

Mode: TX Channel 11(802.11b)

Model: AAware

Manufacturer: Mixwell

Polarization: Horizontal

Power Source: AC 120V/60Hz

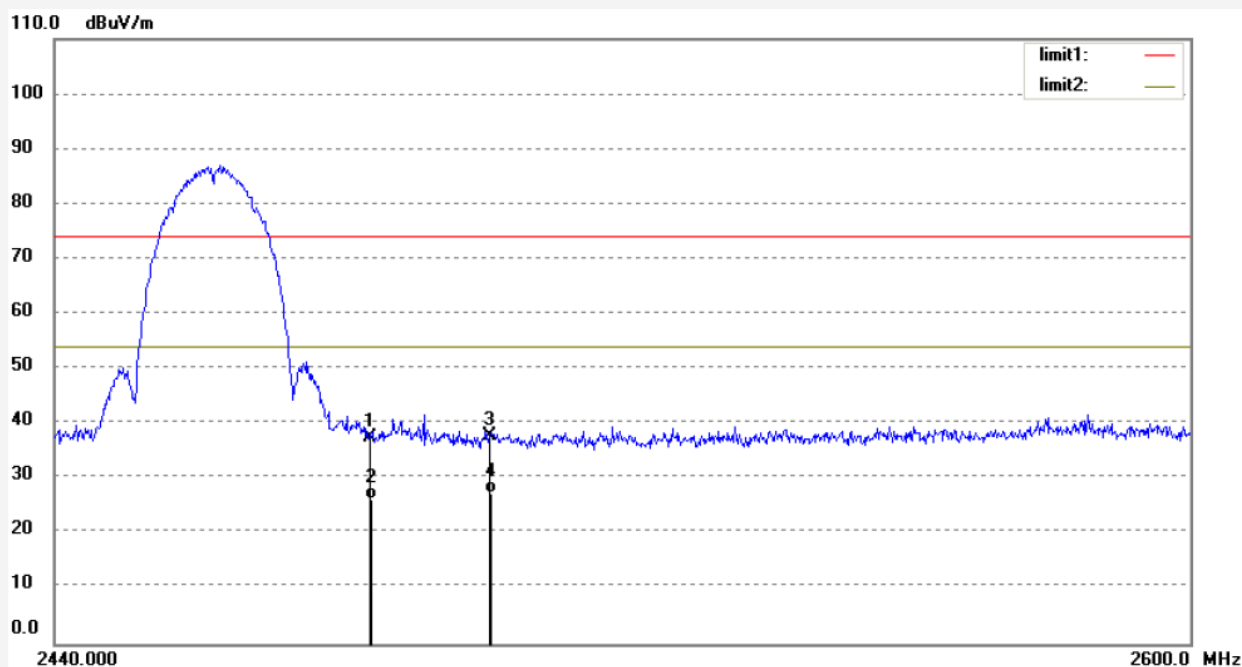
Date: 15/06/24/

Time: 4/08/56

Engineer Signature: Star

Distance: 3m

Note: Report No.:ATE20151334

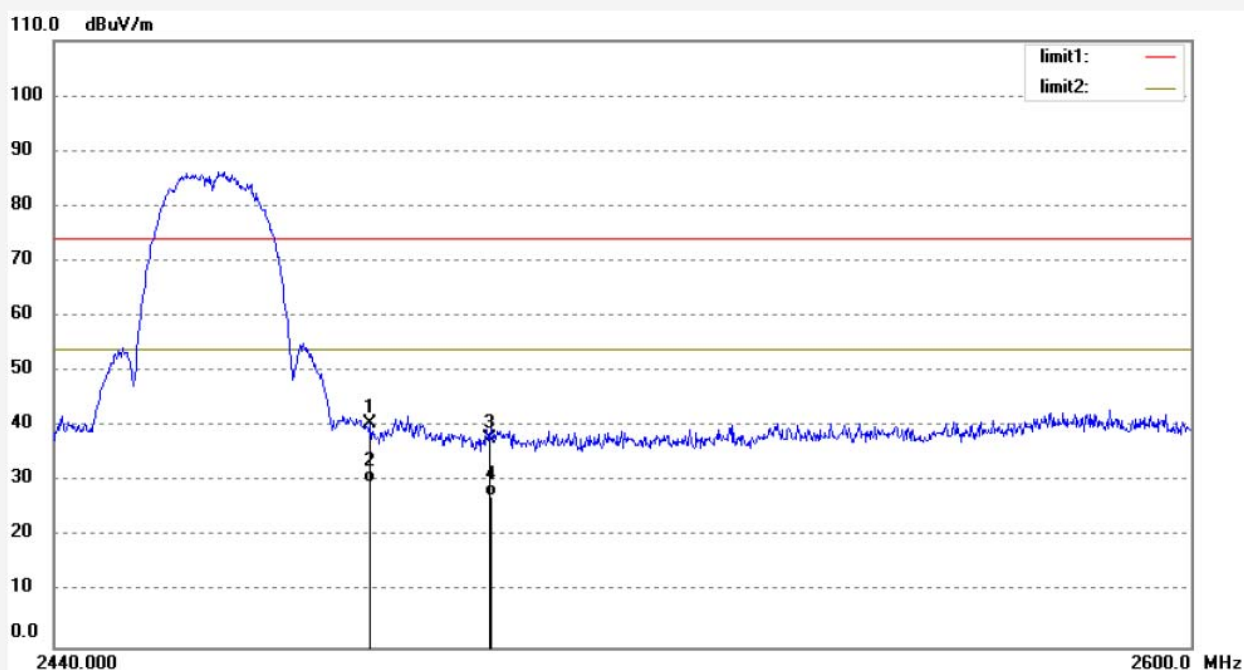


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 44.94            | -7.37       | 37.57           | 74.00          | -36.43      | peak     |             |               |        |
| 2   | 2483.500    | 33.61            | -7.37       | 26.24           | 54.00          | -27.76      | peak     |             |               |        |
| 3   | 2500.000    | 45.20            | -7.40       | 37.80           | 74.00          | -36.20      | peak     |             |               |        |
| 4   | 2500.000    | 34.73            | -7.40       | 27.33           | 54.00          | -26.67      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #385         | Polarization: Vertical     |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/10/12              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 11(802.11b)   | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 47.94            | -7.37       | 40.57           | 74.00          | -33.43      | peak     |             |               |        |
| 2   | 2483.500    | 37.14            | -7.37       | 29.77           | 54.00          | -24.23      | peak     |             |               |        |
| 3   | 2500.000    | 45.17            | -7.40       | 37.77           | 74.00          | -36.23      | peak     |             |               |        |
| 4   | 2500.000    | 34.64            | -7.40       | 27.24           | 54.00          | -26.76      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4



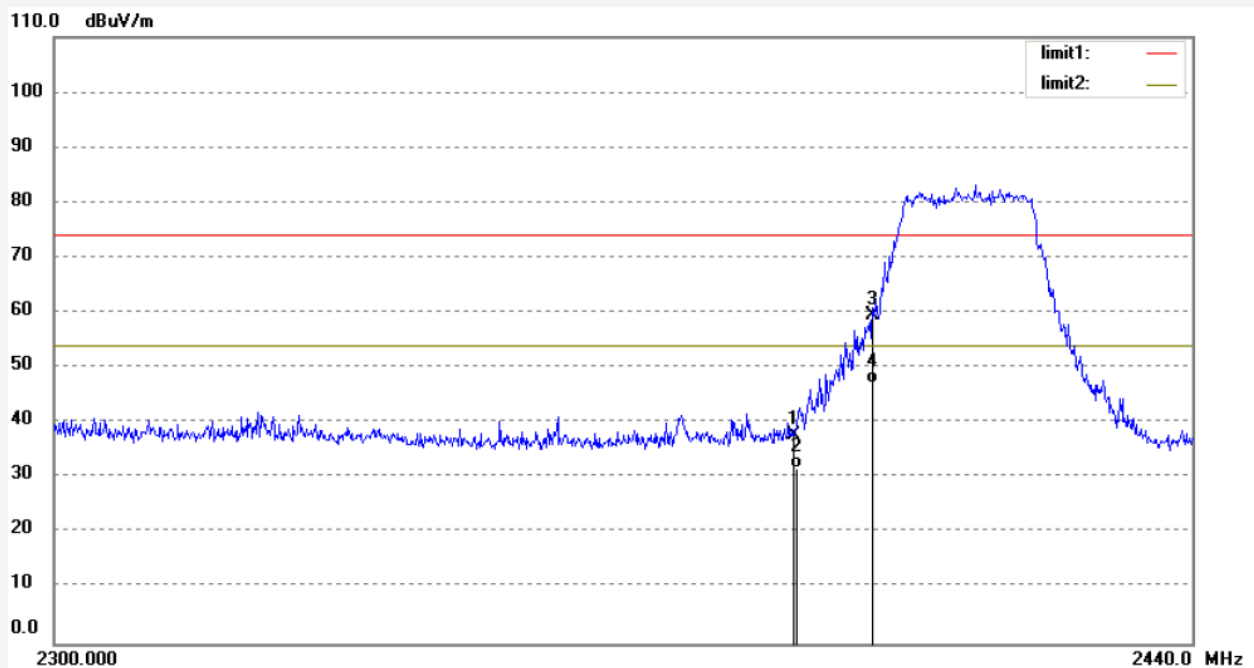
**ACCURATE TECHNOLOGY CO., LTD.**

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
 Tel:+86-0755-26503290  
 Fax:+86-0755-26503396

|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #380         | Polarization: Horizontal   |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/01/53              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 1(802.11g)    | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334

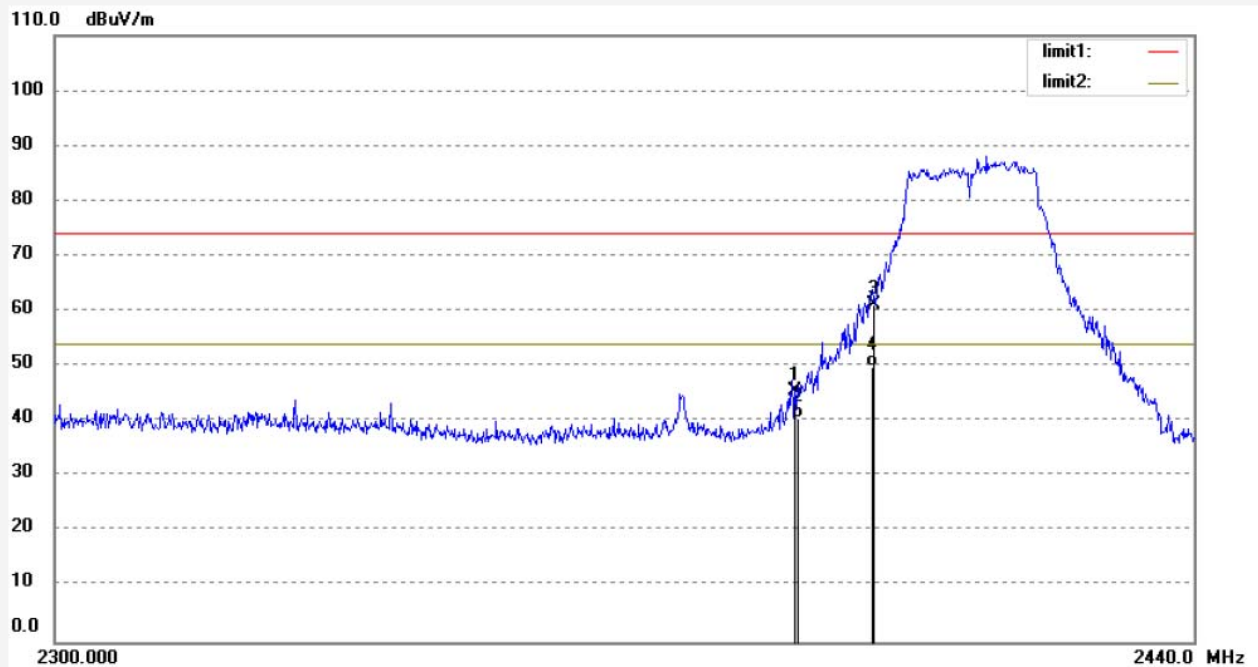


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 45.46            | -7.53       | 37.93           | 74.00          | -36.07      | peak     |             |               |        |
| 2   | 2390.000    | 39.17            | -7.53       | 31.64           | 54.00          | -22.36      | peak     |             |               |        |
| 3   | 2400.000    | 66.90            | -7.46       | 59.44           | 74.00          | -14.56      | peak     |             |               |        |
| 4   | 2400.000    | 54.67            | -7.46       | 47.21           | 54.00          | -6.79       | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #381         | Polarization: Vertical     |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/03/06              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 1(802.11g)    | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 53.15            | -7.53       | 45.62           | 74.00          | -28.38      | peak     |             |               |        |
| 2   | 2390.000    | 47.98            | -7.53       | 40.45           | 54.00          | -13.55      | peak     |             |               |        |
| 3   | 2400.000    | 68.57            | -7.46       | 61.11           | 74.00          | -12.89      | peak     |             |               |        |
| 4   | 2400.000    | 57.40            | -7.46       | 49.94           | 54.00          | -4.06       | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4



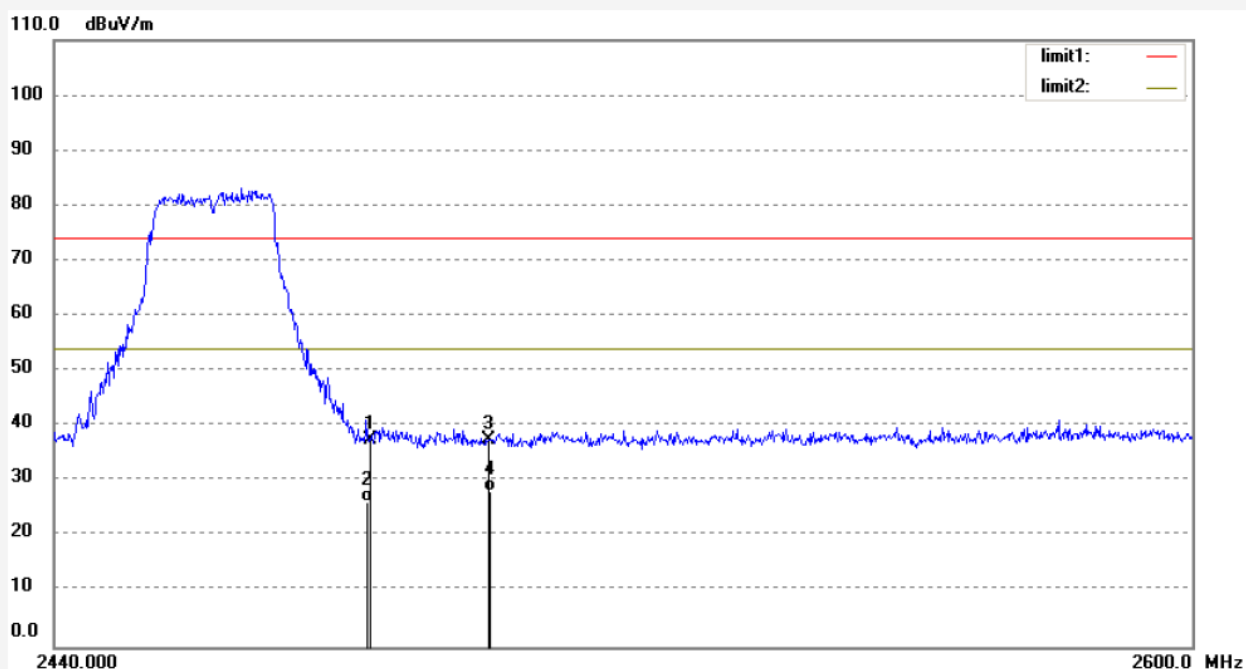
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Site: 2# Chamber  
 Tel:+86-0755-26503290  
 Fax:+86-0755-26503396

|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #383         | Polarization: Horizontal   |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/06/59              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 11(802.11g)   | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 44.98            | -7.37       | 37.61           | 74.00          | -36.39      | peak     |             |               |        |
| 2   | 2483.500    | 33.70            | -7.37       | 26.33           | 54.00          | -27.67      | peak     |             |               |        |
| 3   | 2500.000    | 44.90            | -7.40       | 37.50           | 74.00          | -36.50      | peak     |             |               |        |
| 4   | 2500.000    | 35.60            | -7.40       | 28.20           | 54.00          | -25.80      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4



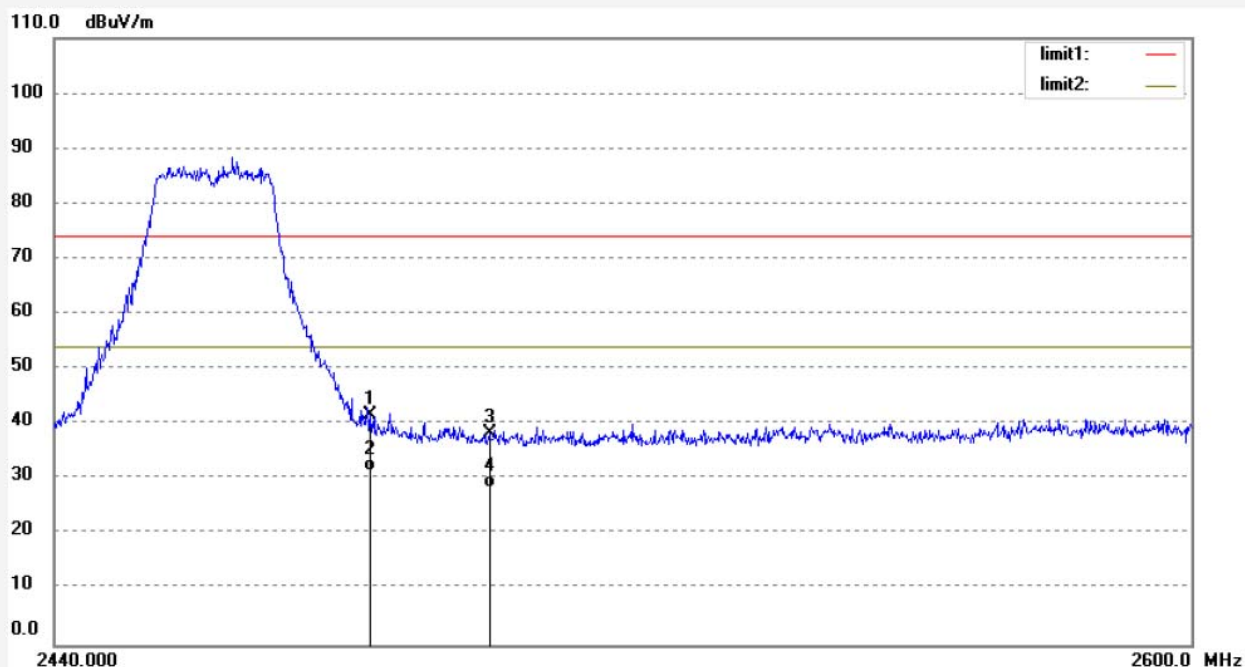
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|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #382         | Polarization: Vertical     |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/05/08              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 11(802.11g)   | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 49.00            | -7.37       | 41.63           | 74.00          | -32.37      | peak     |             |               |        |
| 2   | 2483.500    | 38.97            | -7.37       | 31.60           | 54.00          | -22.40      | peak     |             |               |        |
| 3   | 2500.000    | 45.77            | -7.40       | 38.37           | 74.00          | -35.63      | peak     |             |               |        |
| 4   | 2500.000    | 36.00            | -7.40       | 28.60           | 54.00          | -25.40      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4



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Job No.: Star\_tmp #388

Standard: FCC 15C PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 49 %

EUT: Indoor Air Quality Sensor

Mode: TX Channel 1(802.11n20)

Model: AAware

Manufacturer: Mixwell

Polarization: Horizontal

Power Source: AC 120V/60Hz

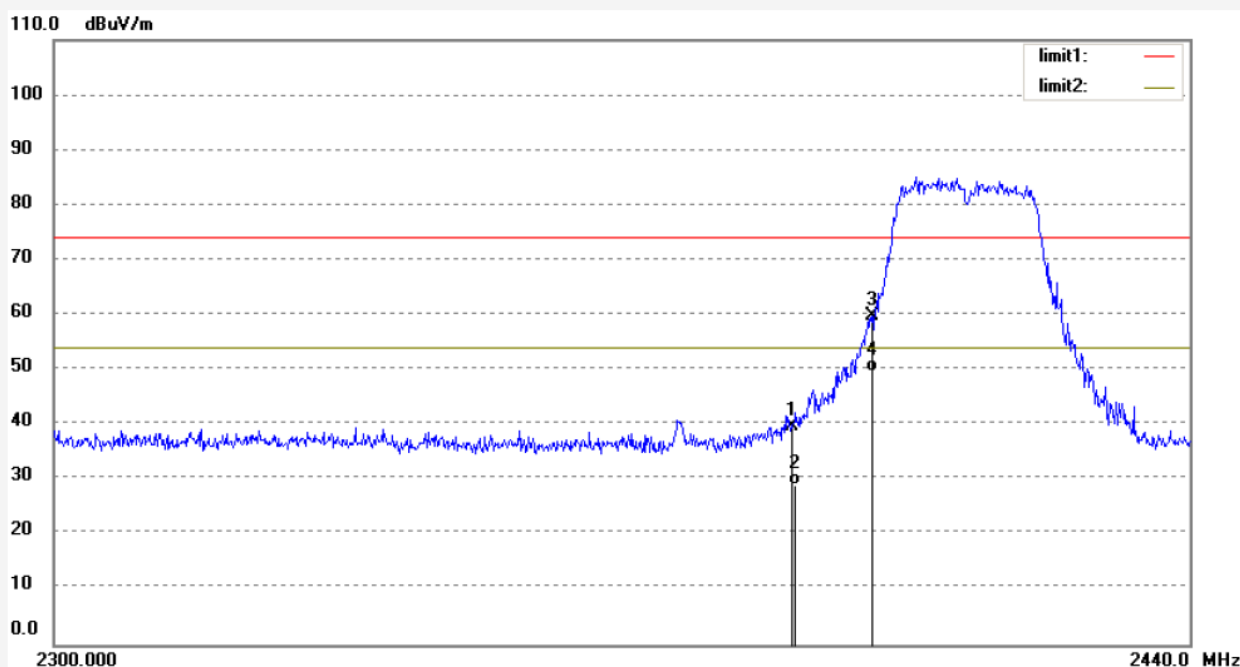
Date: 15/06/24/

Time: 4/16/12

Engineer Signature: Star

Distance: 3m

Note: Report No.:ATE20151334

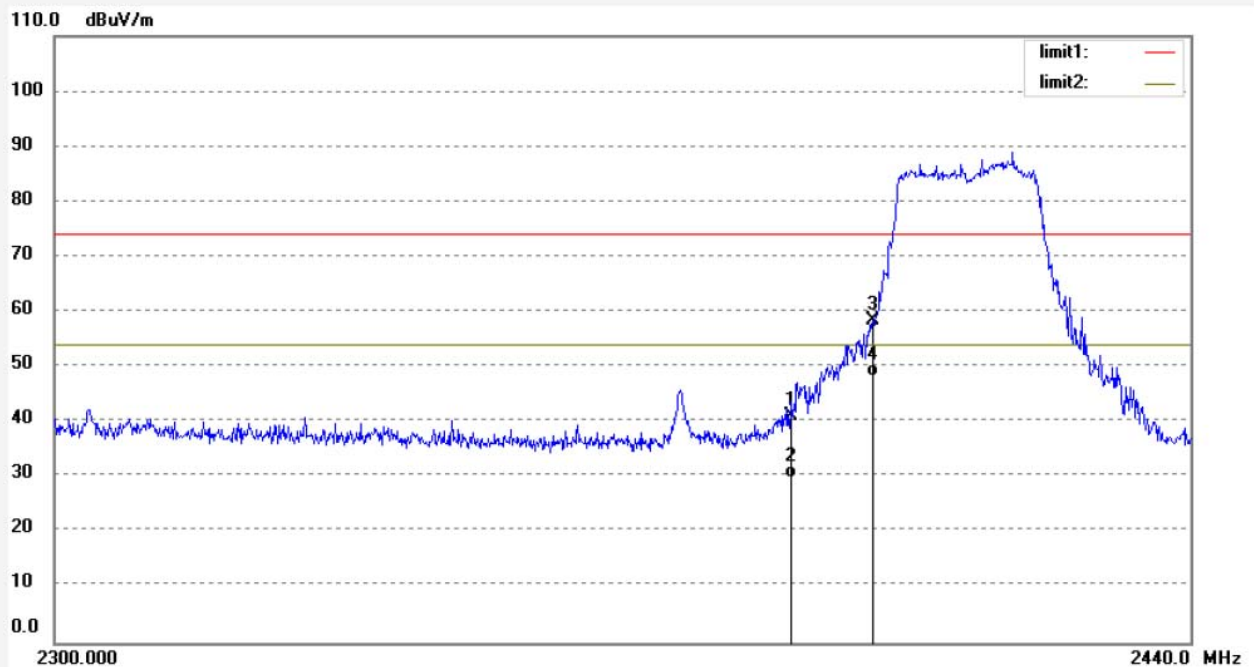


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 47.35            | -7.53       | 39.82           | 74.00          | -34.18      | peak     |             |               |        |
| 2   | 2390.000    | 36.57            | -7.53       | 29.04           | 54.00          | -24.96      | peak     |             |               |        |
| 3   | 2400.000    | 67.22            | -7.46       | 59.76           | 74.00          | -14.24      | peak     |             |               |        |
| 4   | 2400.000    | 56.97            | -7.46       | 49.51           | 54.00          | -4.49       | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #389         | Polarization: Vertical     |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/17/39              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 1(802.11n20)  | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 48.73            | -7.53       | 41.20           | 74.00          | -32.80      | peak     |             |               |        |
| 2   | 2390.000    | 37.41            | -7.53       | 29.88           | 54.00          | -24.12      | peak     |             |               |        |
| 3   | 2400.000    | 65.86            | -7.46       | 58.40           | 74.00          | -15.60      | peak     |             |               |        |
| 4   | 2400.000    | 55.70            | -7.46       | 48.24           | 54.00          | -5.76       | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4



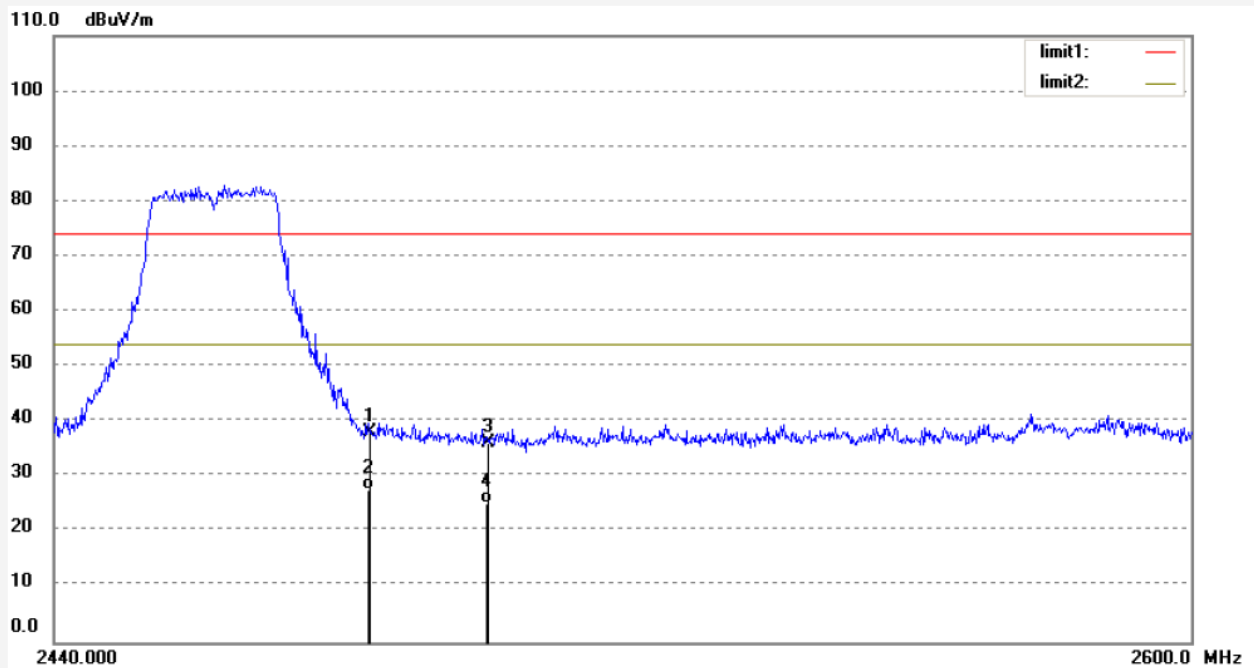
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 Fax:+86-0755-26503396

|                                |                            |
|--------------------------------|----------------------------|
| Job No.: Star_tmp #391         | Polarization: Horizontal   |
| Standard: FCC 15C PK           | Power Source: AC 120V/60Hz |
| Test item: Radiation Test      | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %  | Time: 4/20/42              |
| EUT: Indoor Air Quality Sensor | Engineer Signature: Star   |
| Mode: TX Channel 11(802.11n20) | Distance: 3m               |
| Model: AAware                  |                            |
| Manufacturer: Mixwell          |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 45.35            | -7.37       | 37.98           | 74.00          | -36.02      | peak     |             |               |        |
| 2   | 2483.500    | 35.11            | -7.37       | 27.74           | 54.00          | -26.26      | peak     |             |               |        |
| 3   | 2500.000    | 43.69            | -7.40       | 36.29           | 74.00          | -37.71      | peak     |             |               |        |
| 4   | 2500.000    | 32.47            | -7.40       | 25.07           | 54.00          | -28.93      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4



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Tel:+86-0755-26503290

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Job No.: Star\_tmp #390

Standard: FCC 15C PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 49 %

EUT: Indoor Air Quality Sensor

Mode: TX Channel 11(802.11n20)

Model: AAware

Manufacturer: Mixwell

Polarization: Vertical

Power Source: AC 120V/60Hz

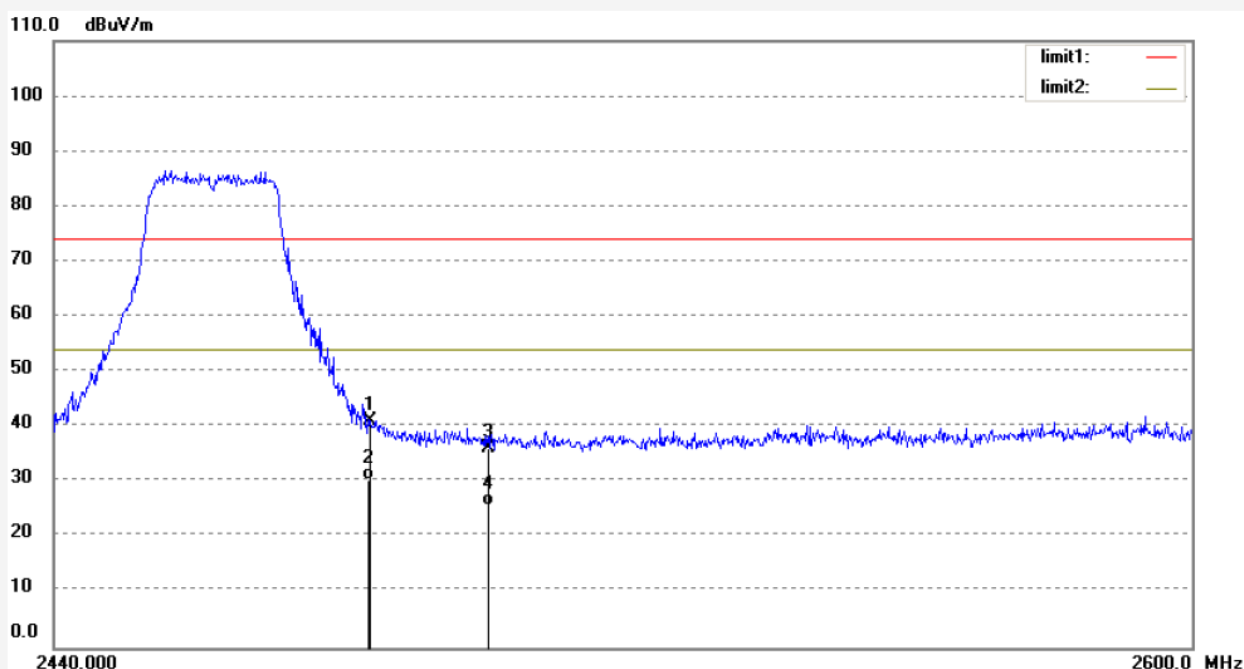
Date: 15/06/24/

Time: 4/19/30

Engineer Signature: Star

Distance: 3m

Note: Report No.:ATE20151334



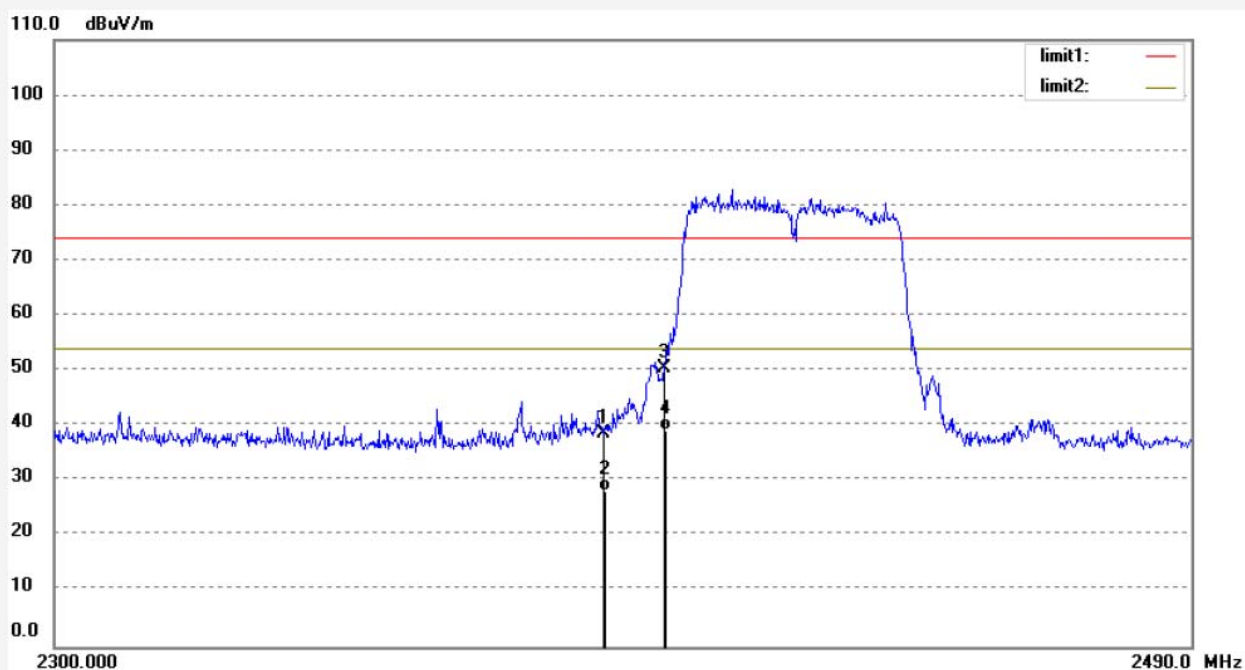
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 48.47            | -7.37       | 41.10           | 74.00          | -32.90      | peak     |             |               |        |
| 2   | 2483.500    | 37.81            | -7.37       | 30.44           | 54.00          | -23.56      | peak     |             |               |        |
| 3   | 2500.000    | 43.62            | -7.40       | 36.22           | 74.00          | -37.78      | peak     |             |               |        |
| 4   | 2500.000    | 33.22            | -7.40       | 25.82           | 54.00          | -28.18      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

Job No.: Star\_tmp #395  
 Standard: FCC 15C PK  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 49 %  
 EUT: Indoor Air Quality Sensor  
 Mode: TX Channel 3(802.11n)40MHz  
 Model: AAware  
 Manufacturer: Mixwell

Polarization: Horizontal  
 Power Source: AC 120V/60Hz  
 Date: 15/06/24/  
 Time: 4/26/16  
 Engineer Signature: Star  
 Distance: 3m

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 46.24            | -7.53       | 38.71           | 74.00          | -35.29      | peak     |             |               |        |
| 2   | 2390.000    | 35.60            | -7.53       | 28.07           | 54.00          | -25.93      | peak     |             |               |        |
| 3   | 2400.000    | 57.97            | -7.46       | 50.51           | 74.00          | -23.49      | peak     |             |               |        |
| 4   | 2400.000    | 46.57            | -7.46       | 39.11           | 54.00          | -14.89      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4



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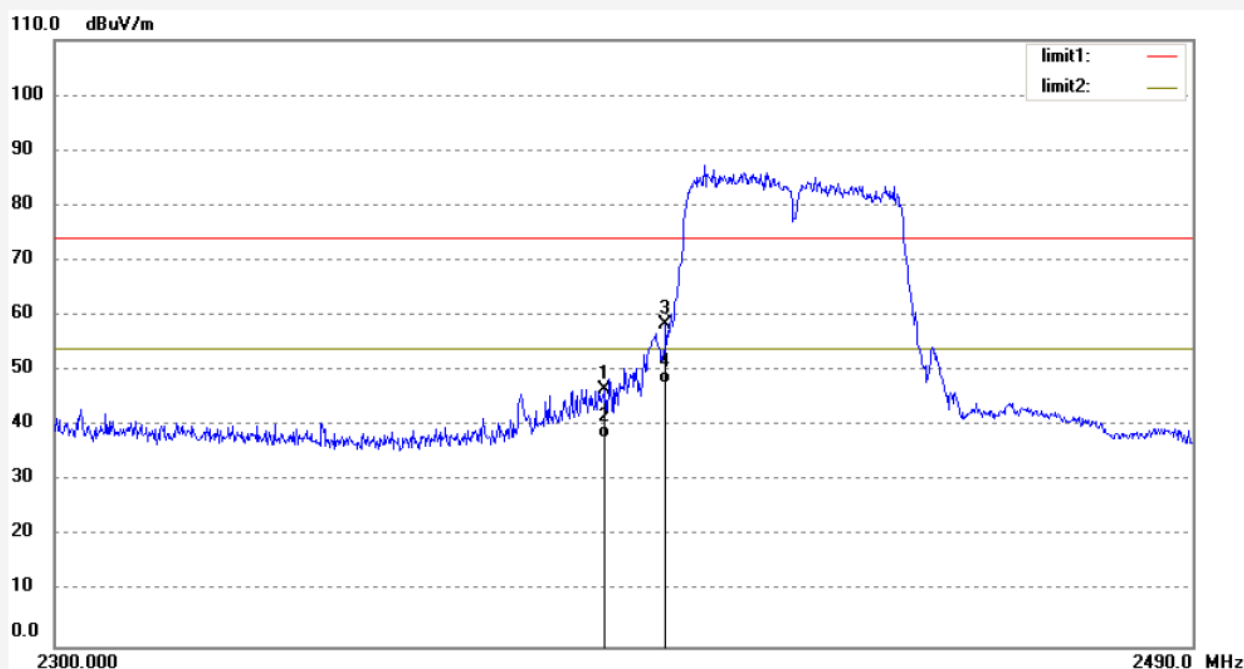
Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

|                                  |                            |
|----------------------------------|----------------------------|
| Job No.: Star_tmp #394           | Polarization: Vertical     |
| Standard: FCC 15C PK             | Power Source: AC 120V/60Hz |
| Test item: Radiation Test        | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %    | Time: 4/25/04              |
| EUT: Indoor Air Quality Sensor   | Engineer Signature: Star   |
| Mode: TX Channel 3(802.11n)40MHz | Distance: 3m               |
| Model: AAware                    |                            |
| Manufacturer: Mixwell            |                            |

Note: Report No.:ATE20151334



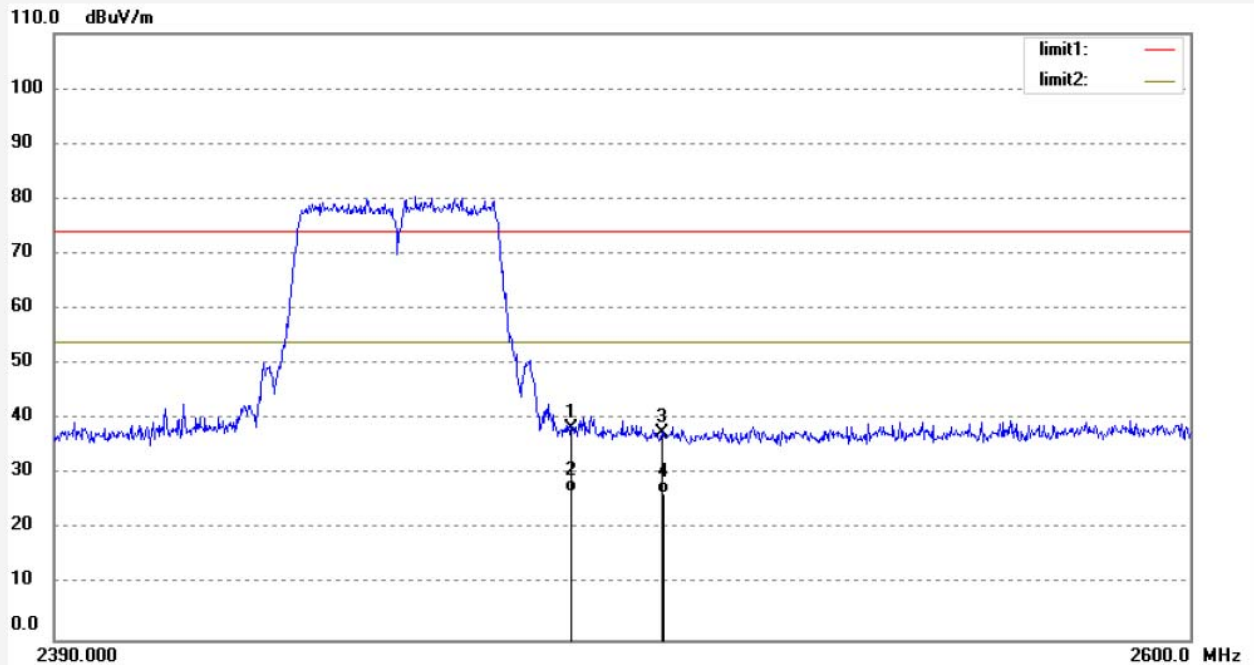
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 54.18            | -7.53       | 46.65           | 74.00          | -27.35      | peak     |             |               |        |
| 2   | 2390.000    | 45.31            | -7.53       | 37.78           | 54.00          | -16.22      | peak     |             |               |        |
| 3   | 2400.000    | 65.90            | -7.46       | 58.44           | 74.00          | -15.56      | peak     |             |               |        |
| 4   | 2400.000    | 55.10            | -7.46       | 47.64           | 54.00          | -6.36       | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

Job No.: Star\_tmp #392  
 Standard: FCC 15C PK  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 49 %  
 EUT: Indoor Air Quality Sensor  
 Mode: TX Channel 9(802.11n)40MHz  
 Model: AAware  
 Manufacturer: Mixwell

Polarization: Horizontal  
 Power Source: AC 120V/60Hz  
 Date: 15/06/24/  
 Time: 4/22/19  
 Engineer Signature: Star  
 Distance: 3m

Note: Report No.:ATE20151334

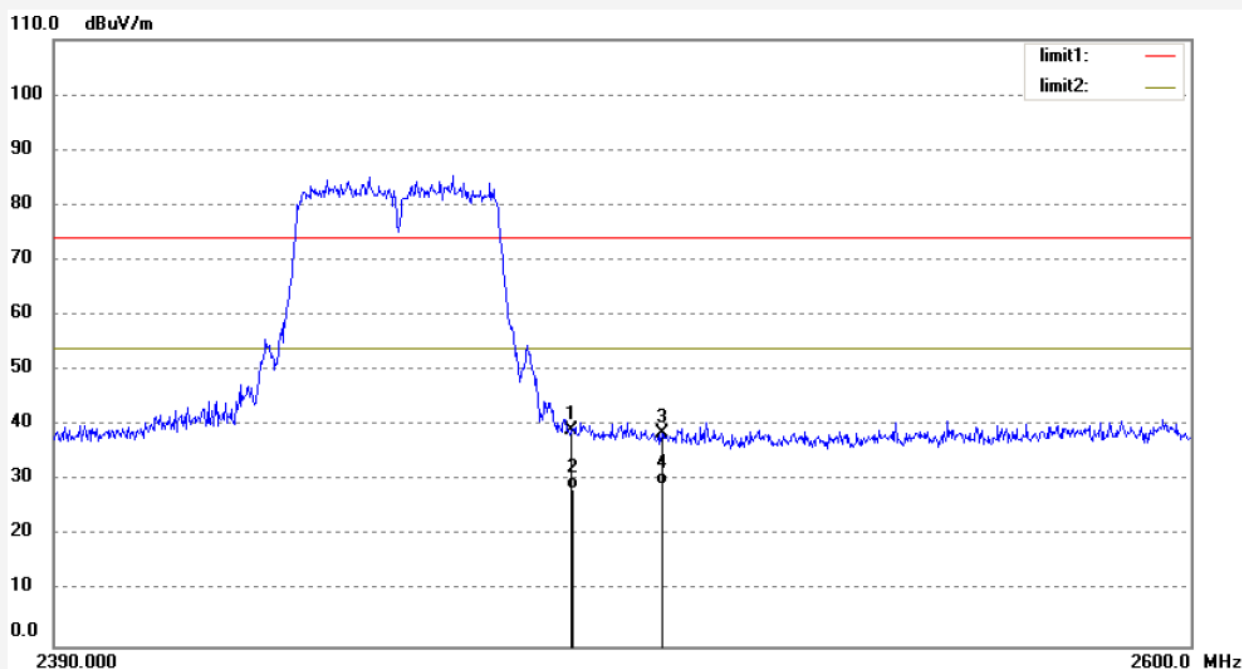


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 45.82            | -7.37       | 38.45           | 74.00          | -35.55      | peak     |             |               |        |
| 2   | 2483.500    | 34.21            | -7.37       | 26.84           | 54.00          | -27.16      | peak     |             |               |        |
| 3   | 2500.000    | 44.83            | -7.40       | 37.43           | 74.00          | -36.57      | peak     |             |               |        |
| 4   | 2500.000    | 33.97            | -7.40       | 26.57           | 54.00          | -27.43      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

|                                  |                            |
|----------------------------------|----------------------------|
| Job No.: Star_tmp #393           | Polarization: Vertical     |
| Standard: FCC 15C PK             | Power Source: AC 120V/60Hz |
| Test item: Radiation Test        | Date: 15/06/24/            |
| Temp.( C)/Hum.(%) 23 C / 49 %    | Time: 4/23/32              |
| EUT: Indoor Air Quality Sensor   | Engineer Signature: Star   |
| Mode: TX Channel 9(802.11n)40MHz | Distance: 3m               |
| Model: AAware                    |                            |
| Manufacturer: Mixwell            |                            |

Note: Report No.:ATE20151334



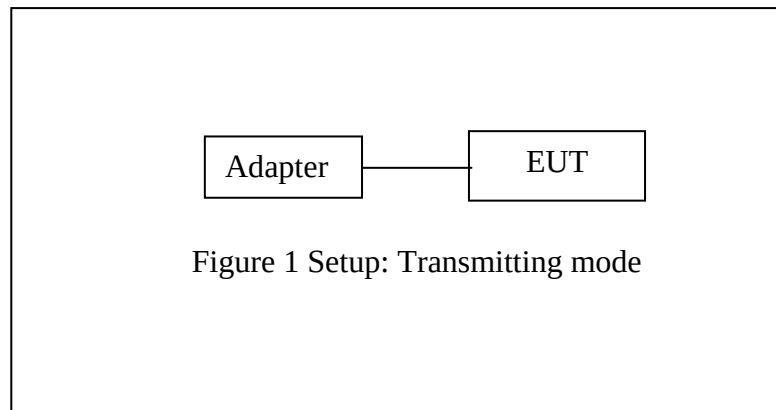
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 46.57            | -7.37       | 39.20           | 74.00          | -34.80      | peak     |             |               |        |
| 2   | 2483.500    | 35.70            | -7.37       | 28.33           | 54.00          | -25.67      | peak     |             |               |        |
| 3   | 2500.000    | 46.05            | -7.40       | 38.65           | 74.00          | -35.35      | peak     |             |               |        |
| 4   | 2500.000    | 36.61            | -7.40       | 29.21           | 54.00          | -24.79      | peak     |             |               |        |

Note: Average measurement with peak detection at No.2&4

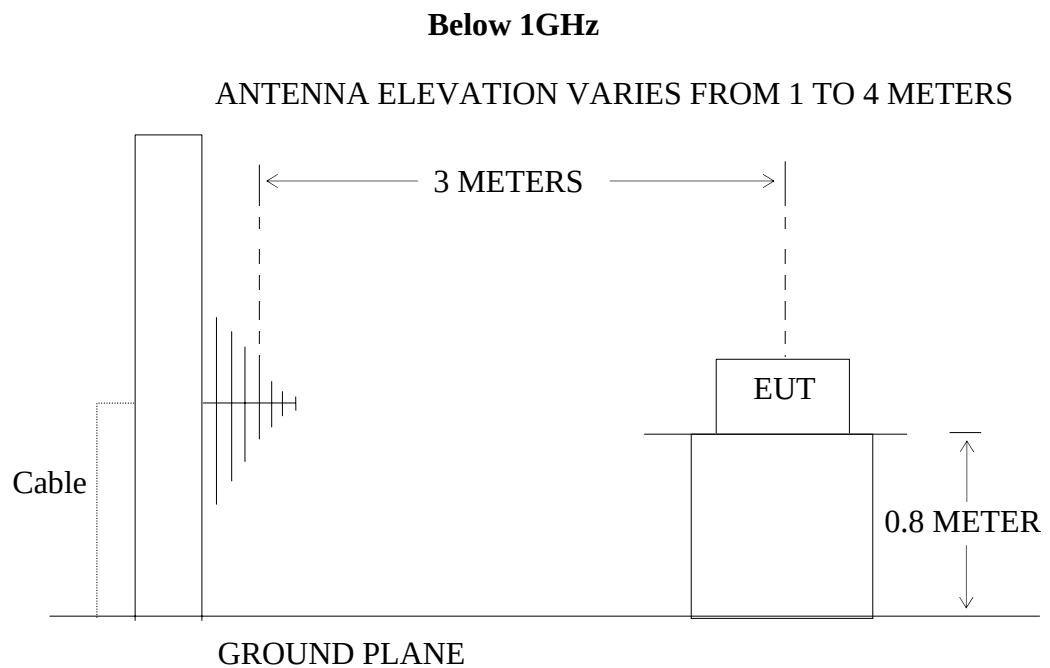
## 10.RADIATED SPURIOUS EMISSION TEST

### 10.1.Block Diagram of Test Setup

#### 10.1.1.Block diagram of connection between the EUT and peripherals

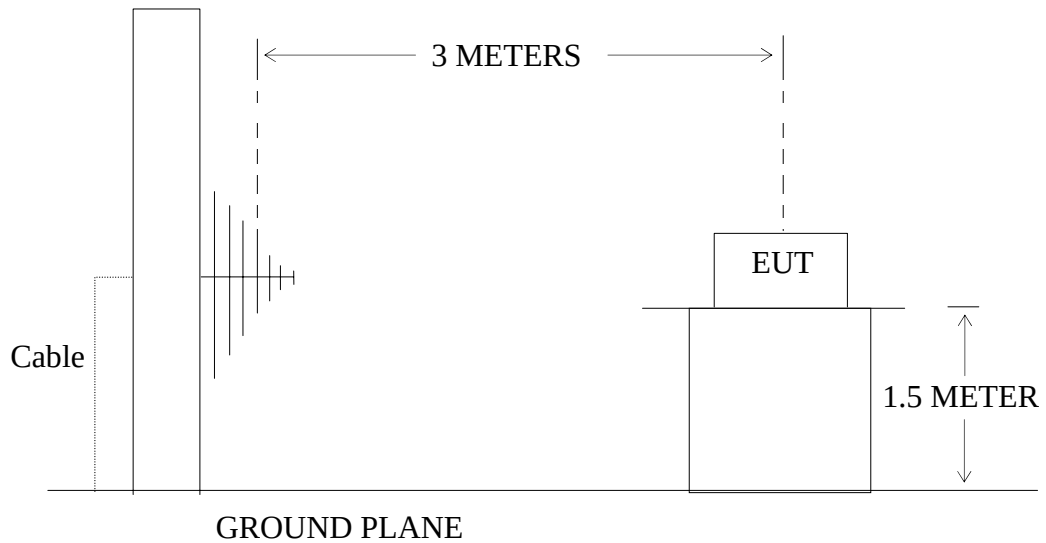


#### 10.1.2.Semi-Anechoic Chamber Test Setup Diagram



### Above 1GHz

ANTENNA ELEVATION VARIES FROM 1 TO 4 METERS



#### 10.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 10.3.Restricted bands of operation

#### 10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905            | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128              | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.17725-4.17775          | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.20725-4.20775          | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218              | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225          | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294              | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366              | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675          | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475          | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293             | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025        | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725        | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510

<sup>2</sup>Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

### 10.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

## 10.5. Operating Condition of EUT

10.5.1. Setup the EUT and simulator as shown as Section 10.1.

10.5.2. Turn on the power of all equipment.

10.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

## 10.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground (Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground (Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The worst-case data rate for this channel to be 1Mbps for 802.11b mode and 6Mbps for 802.11g mode and 150Mbps for 802.11n mode, based on previous with 802.11 WLAN product design architectures.

The frequency range from 30MHz to 25000MHz is checked.

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

## 10.7.The Field Strength of Radiation Emission Measurement Results

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. \*: Denotes restricted band of operation.

3. The fundamental radiated emissions were reduced by Band Reject Filter in the attached plots.

4. The EUT is tested radiation emission at each test mode (802.11 b/g/n) in three axes. The worst emissions are reported in all test mode and channels.

5. The radiation emissions from 18-25GHz are not reported, because the test values lower than the limits of 20dB.

## Below 1G



### ACCURATE TECHNOLOGY CO., LTD.

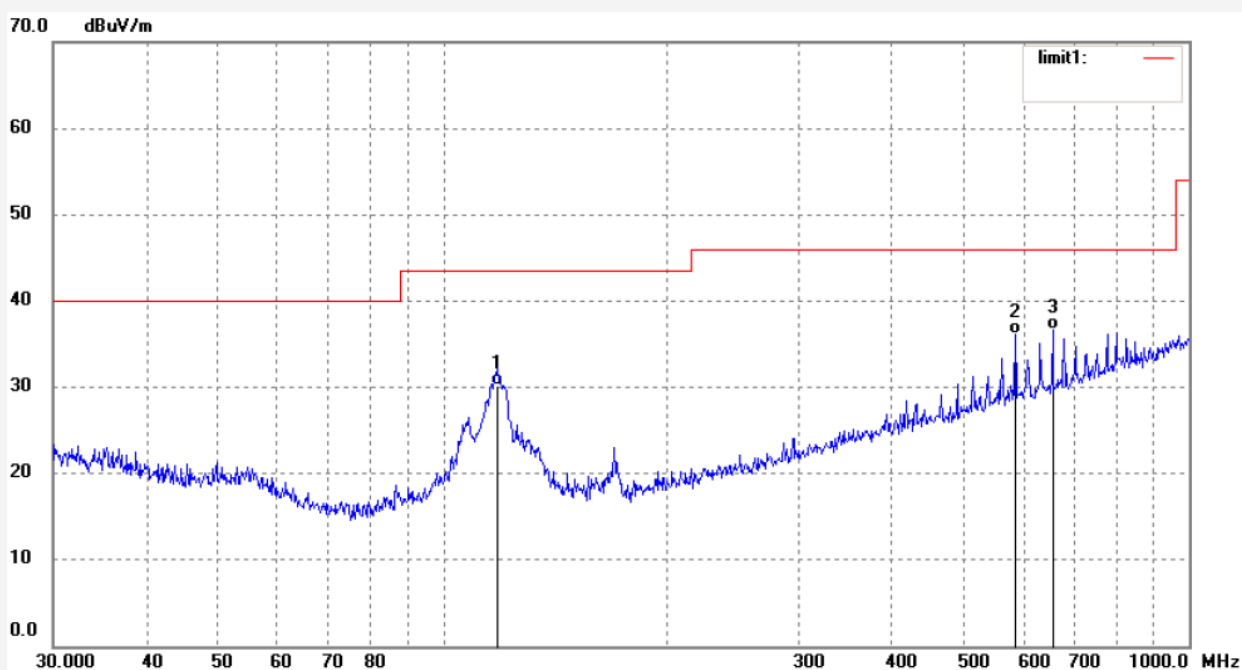
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: star2015 #276  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 23 C / 48 %  
EUT: Indoor Air Quality Sensor  
Mode: TX Channel 1(802.11b)  
Model: AAware  
Manufacturer: Mixwell

Polarization: Horizontal  
Power Source: AC 120V/60Hz  
Date: 2015/06/22  
Time: 15:33:08  
Engineer Signature: Star  
Distance: 3m

Note: Report No.:ATE20151334

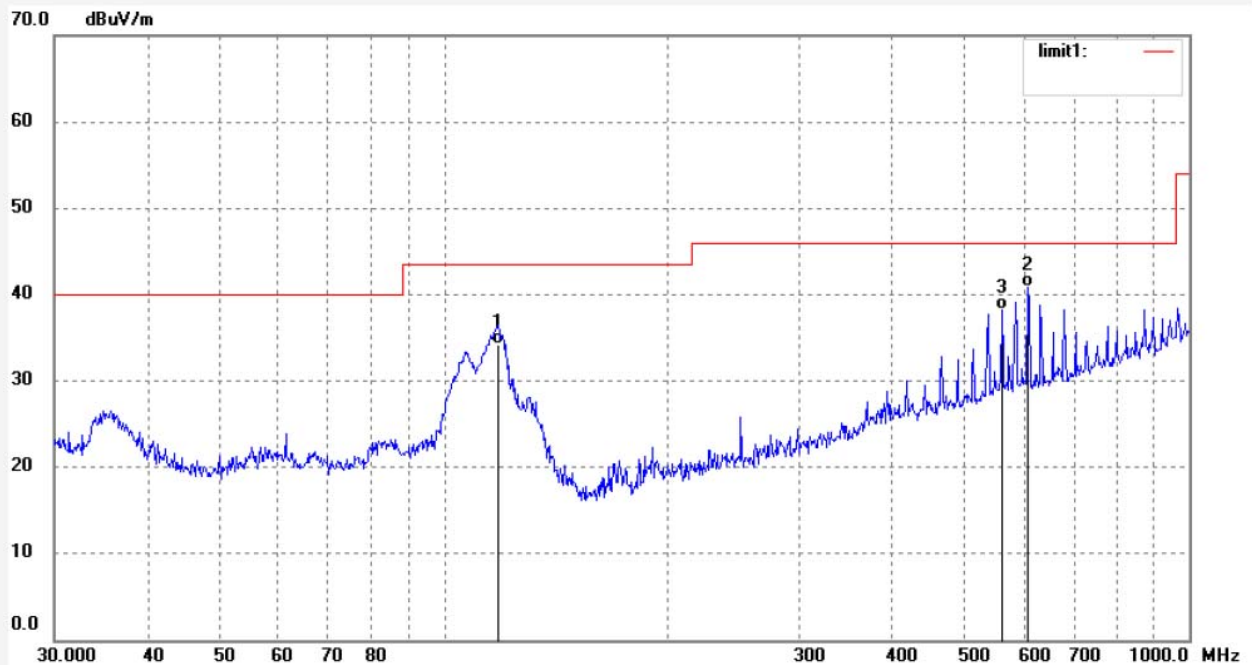


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 118.1862    | 44.31            | -14.15      | 30.16           | 43.50          | -13.34      | QP       |             |               |        |
| 2   | 584.7895    | 40.21            | -4.10       | 36.11           | 46.00          | -9.89       | QP       |             |               |        |
| 3   | 656.5300    | 39.96            | -3.31       | 36.65           | 46.00          | -9.35       | QP       |             |               |        |

Job No.: star2015 #275  
 Standard: FCC Class B 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 48 %  
 EUT: Indoor Air Quality Sensor  
 Mode: TX Channel 1(802.11b)  
 Model: AAware  
 Manufacturer: Mixwell

Polarization: Vertical  
 Power Source: AC 120V/60Hz  
 Date: 2015/06/22  
 Time: 15:30:18  
 Engineer Signature: Star  
 Distance: 3m

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 118.1861    | 48.30            | -14.15      | 34.15           | 43.50          | -9.35       | QP       |             |               |        |
| 2   | 607.7866    | 44.72            | -3.84       | 40.88           | 46.00          | -5.12       | QP       |             |               |        |
| 3   | 560.6928    | 42.76            | -4.45       | 38.31           | 46.00          | -7.69       | QP       |             |               |        |



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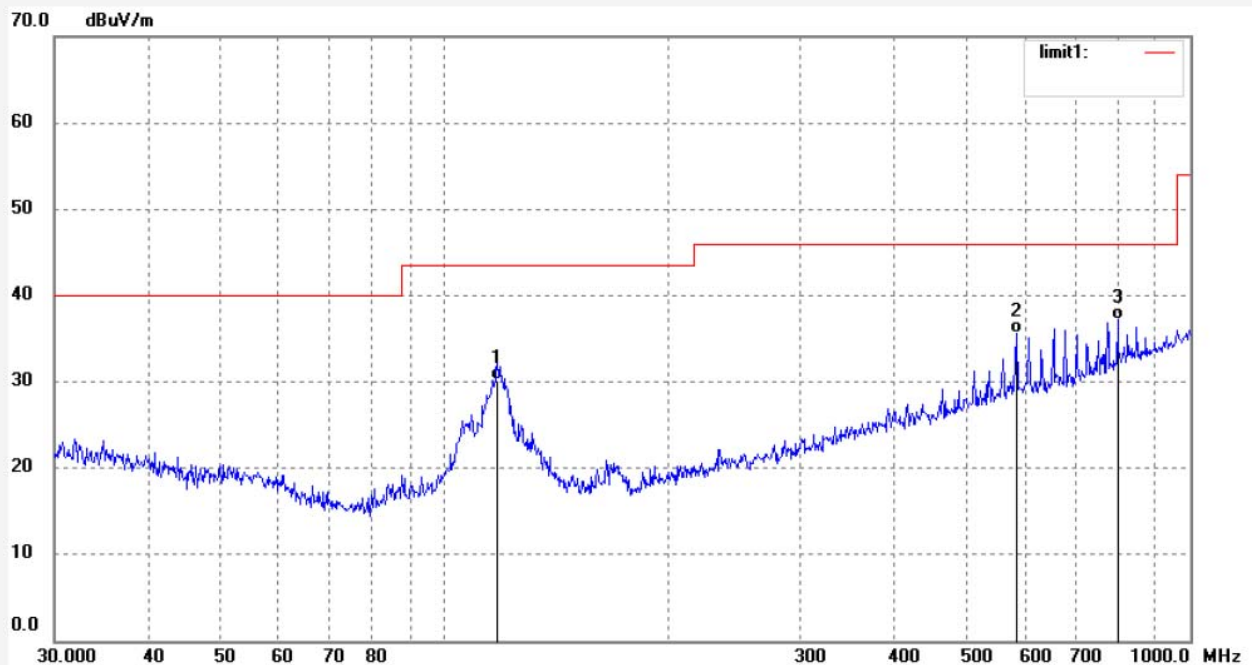
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: star2015 #277  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 23 C / 48 %  
EUT: Indoor Air Quality Sensor  
Mode: TX Channel 6(802.11b)  
Model: AAware  
Manufacturer: Mixwell

Polarization: Horizontal  
Power Source: AC 120V/60Hz  
Date: 2015/06/22  
Time: 15:37:51  
Engineer Signature: Star  
Distance: 3m

Note: Report No.:ATE20151334



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 117.7724       | 44.30               | -14.14         | 30.16              | 43.50             | -13.34         | QP       |                |                  |        |
| 2   | 584.7894       | 39.72               | -4.09          | 35.63              | 46.00             | -10.37         | QP       |                |                  |        |
| 3   | 798.9796       | 38.18               | -0.98          | 37.20              | 46.00             | -8.80          | QP       |                |                  |        |



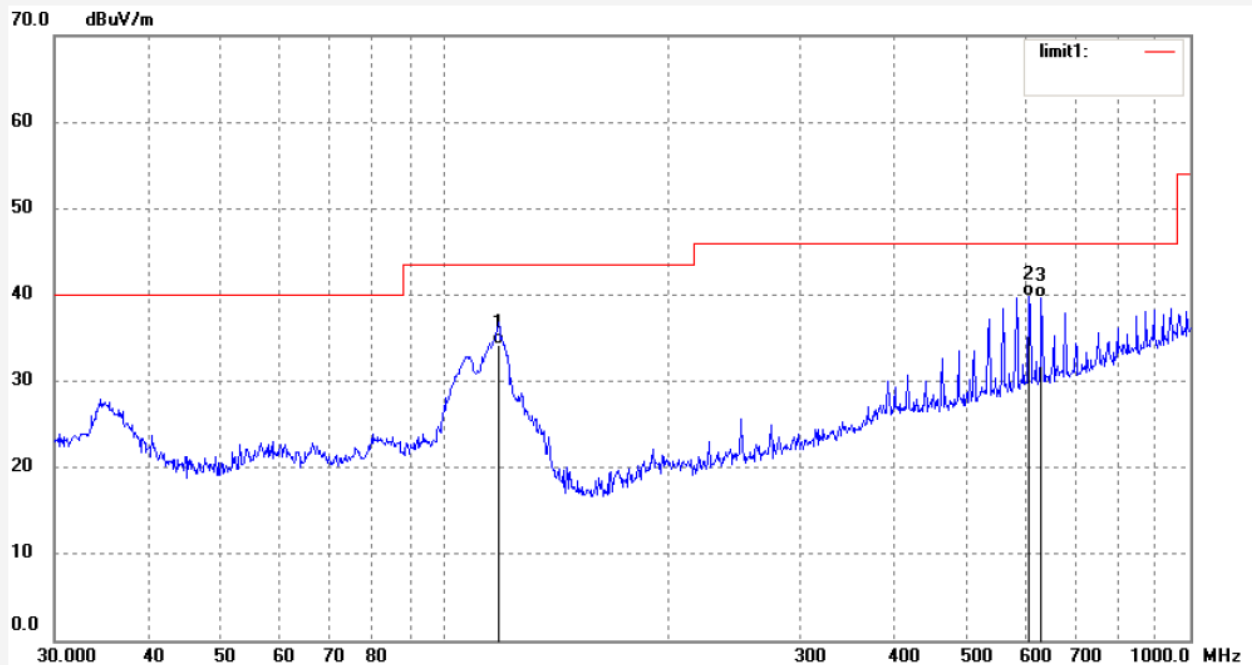
**ACCURATE TECHNOLOGY CO., LTD.**

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber  
 Tel:+86-0755-26503290  
 Fax:+86-0755-26503396

|                                   |                            |
|-----------------------------------|----------------------------|
| Job No.: star2015 #278            | Polarization: Vertical     |
| Standard: FCC Class B 3M Radiated | Power Source: AC 120V/60Hz |
| Test item: Radiation Test         | Date: 2015/06/22           |
| Temp.( C)/Hum.(%) 23 C / 48 %     | Time: 15:40:08             |
| EUT: Indoor Air Quality Sensor    | Engineer Signature: Star   |
| Mode: TX Channel 6(802.11b)       | Distance: 3m               |
| Model: AAware                     |                            |
| Manufacturer: Mixwell             |                            |

Note: Report No.:ATE20151334



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 118.1861    | 48.30            | -14.15      | 34.15           | 43.50          | -9.35       | QP       |             |               |        |
| 2   | 607.7866    | 43.72            | -3.84       | 39.88           | 46.00          | -6.12       | QP       |             |               |        |
| 3   | 631.6884    | 43.20            | -3.57       | 39.63           | 46.00          | -6.37       | QP       |             |               |        |