



## Test Report

Date : 2018-11-07

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No. : HMD18110009

**Applicant** : Shenzhen Belter Health Measurement and Analysis Technology Co. Ltd.  
702/704, Block C, Tsinghua Units Science Park, No 13 Langshan Rd,  
Hi-Tech Industrial park (North) Nashan District, Shenzhen,  
Guangdong, China

**Supplier / Manufacturer** : DongGuan Simple Industrial Co., Ltd.  
No 192, Shaxin Road, Science Message Park, TangXia Town,  
Dongguan, Guangdong, China

**Description of Sample(s)** : Submitted sample(s) said to be  
Product: BODY FAT SCALE  
Brand Name: N/A  
Model No.: eF-706W  
FCC ID: 2AAEE706W

**Date Samples Received** : 2018-10-26

**Date Tested** : 2018-11-01 to 2018-11-05

**Investigation Requested** : Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 and ANSI C63.10:2013 for FCC Certification.

**Conclusions** : The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks** : WIFI (802.11b, 802.11g, 802.11n20)

  
CHEUNG Chi, Kenneth  
Authorized Signatory



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### **1.0 General Details**

#### **1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
Head Office: 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong  
Telephone: 852 2666 1888  
Fax: 852 2664 4353

#### **1.2 Equipment Under Test [EUT]**

##### **Description of Sample(s)**

|               |                                                                                                                                |
|---------------|--------------------------------------------------------------------------------------------------------------------------------|
| Product:      | BODY FAT SCALE                                                                                                                 |
| Manufacturer: | DongGuan Simple Industrial Co., Ltd.<br>No 192, Shaxin Road, Science Message Park, TangXia Town,<br>Dongguan, Guangdong, China |
| Brand Name:   | N/A                                                                                                                            |
| Model Number: | eF-706W                                                                                                                        |
| Rating:       | 6Vd.c. (AAA battery*4)                                                                                                         |

#### **1.2.1 Description of EUT Operation**

The Equipment Under Test (EUT) is a BODY FAT SCALE. The transmission signal is digital modulated with channel frequency range 2412-2462MHz.

#### **1.3 Date of Order**

2018-10-26

#### **1.4 Submitted Sample(s):**

1 Sample

#### **1.5 Test Duration**

2018-11-01 to 2018-11-05

#### **1.6 Country of Origin**

China

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### 2.0 Technical Details

#### **2.1 Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10:2013 for FCC Certification.

#### **2.2 Test Standards and Results Summary Tables**

| <b>EMISSION<br/>Results Summary</b>      |                           |                  |                     |                                     |                          |                                     |
|------------------------------------------|---------------------------|------------------|---------------------|-------------------------------------|--------------------------|-------------------------------------|
| Test Condition                           | Test Requirement          | Test Method      | Class /<br>Severity | Test Result                         |                          |                                     |
|                                          |                           |                  |                     | Pass                                | Failed                   | N/A                                 |
| Output Power of<br>Fundamental Emissions | FCC 47CFR<br>15.247(b)(3) | ANSI C63.10:2013 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Radiated Emissions                       | FCC 47CFR 15.209          | ANSI C63.10:2013 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Conducted Emissions                      | FCC 47CFR 15.207          | ANSI C63.10:2013 | N/A                 | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Power Spectral Density                   | FCC 47CFR 15.247(e)       | N/A              | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| 6dB Bandwidth                            | FCC 47CFR<br>15.247(a)(2) | N/A              | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Band Edge Emissions                      | FCC 47CFR 15.247(d)       | N/A              | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Antenna requirement                      | FCC 47CFR 15.203          | N/A              | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

##### **3.1.1 Maximum Peak Output Power**

|                    |                        |
|--------------------|------------------------|
| Test Requirement:  | FCC 47CFR 15.247(b)(3) |
| Test Method:       | N/A                    |
| Test Date:         | 2018-11-01             |
| Mode of Operation: | Wifi mode              |

Ambient Temperature: 25°C

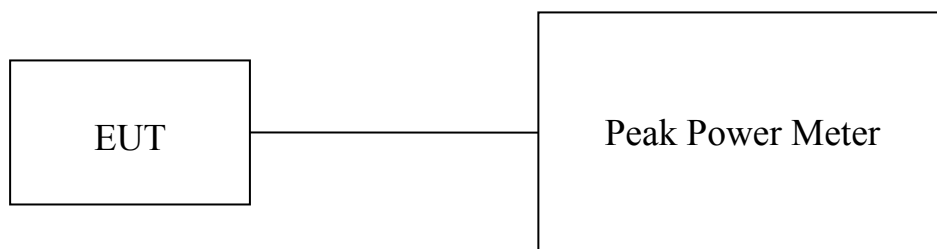
Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

#### **Test Method:**

The RF output of the EUT was connected to the peak power meter. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

#### **Test Setup:**



Note: a temporary antenna connector was soldered to the RF output.

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### Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

#### Results of WiFi mode 802.11 b, (2412MHz to 2462MHz) : Pass (TX Unit) Maximum conducted output power

| Channel | Frequency(MHz) | Output Power(Watt) |
|---------|----------------|--------------------|
| Low     | 2412           | 0.049136           |
| Middle  | 2437           | 0.048989           |
| High    | 2462           | 0.049102           |

#### Results of WiFi mode 802.11 g, (2412MHz to 2462MHz) : Pass (TX Unit) Maximum conducted output power

| Channel | Frequency(MHz) | Output Power(Watt) |
|---------|----------------|--------------------|
| Low     | 2412           | 0.048217           |
| Middle  | 2437           | 0.048428           |
| High    | 2462           | 0.048798           |

#### Results of WiFi mode 802.11 n20, (2412MHz to 2462MHz) : Pass (TX Unit) Maximum conducted output power

| Channel | Frequency(MHz) | Output Power(Watt) |
|---------|----------------|--------------------|
| Low     | 2412           | 0.047984           |
| Middle  | 2437           | 0.047152           |
| High    | 2462           | 0.048339           |

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB  
1GHz to 26GHz 1.7dB

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### **3.1.2 Radiated Emissions**

|                    |                     |
|--------------------|---------------------|
| Test Requirement:  | FCC 47CFR 15.209    |
| Test Method:       | ANSI C63.10:2013    |
| Test Date:         | 2018-11-01          |
| Mode of Operation: | Tx mode / Wifi mode |

|                           |                        |                               |
|---------------------------|------------------------|-------------------------------|
| Ambient Temperature: 24°C | Relative Humidity: 52% | Atmospheric Pressure: 101 kPa |
|---------------------------|------------------------|-------------------------------|

#### **Test Method:**

For emission measurements at or below 1 GHz, the sample was placed 0.01m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 0.01m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

- \* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

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### **Spectrum Analyzer Setting:**

9KHz – 30MHz (Pk & Av)

RBW: 10kHz  
VBW: 30kHz  
Sweep: Auto  
Span: Fully capture the emissions being measured  
Trace: Max. hold

30MHz – 1GHz (QP)

RBW: 120kHz  
VBW: 120kHz  
Sweep: Auto  
Span: Fully capture the emissions being measured  
Trace: Max. hold

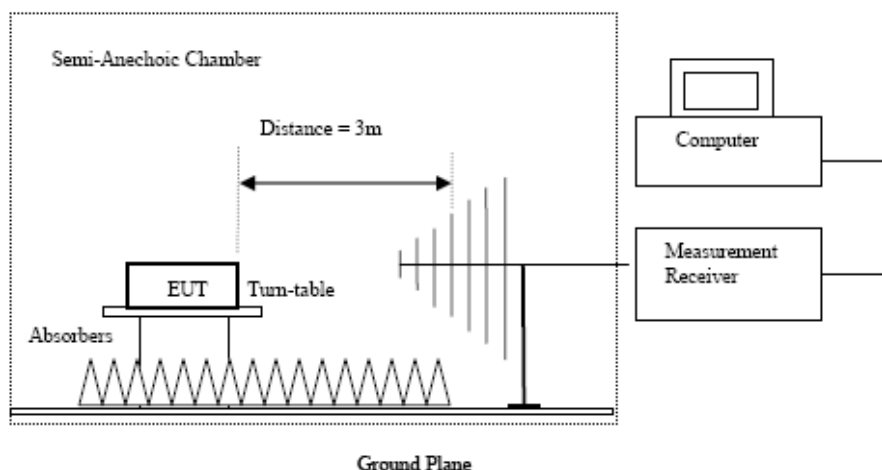
Above 1GHz (Pk)

RBW: 1MHz  
VBW: 1MHz  
Sweep: Auto  
Span: Fully capture the emissions being measured  
Trace: Max. hold

Above 1GHz (Av)

RBW: 1MHz  
VBW: 10Hz  
Sweep: Auto  
Span: Fully capture the emissions being measured  
Trace: Max. hold

### **Test Setup:**



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.

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**Limits for Radiated Emissions FCC 47 CFR 15.247 ]:**

| Frequency Range | Quasi-Peak Limits |
|-----------------|-------------------|
| [MHz]           | [ $\mu$ V/m]      |
| 0.009-0.490     | 2400/F (kHz)      |
| 0.490-1.705     | 24000/F (kHz)     |
| 1.705-30        | 30                |
| 30-88           | 100               |
| 88-216          | 150               |
| 216-960         | 200               |
| Above 960       | 500               |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Result of Tx mode (2412.0 MHz) (802.11b) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions                        |                |                   |                |                |           |                  |
|-------------------------------------------------------------|----------------|-------------------|----------------|----------------|-----------|------------------|
| Peak Value                                                  |                |                   |                |                |           |                  |
| Frequency                                                   | Measured Level | Correction Factor | Field Strength | Field Strength | Limit     | E-Field Polarity |
| MHz                                                         | dB $\mu$ V     | dB/m              | dB $\mu$ V/m   | $\mu$ V/m      | $\mu$ V/m |                  |
| Emissions detected are more than 20 dB below the FCC Limits |                |                   |                |                |           |                  |

**Result of Tx mode (2412.0 MHz) (802.11b) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions |                    |                   |                |              |        |                  |
|--------------------------------------|--------------------|-------------------|----------------|--------------|--------|------------------|
| Peak Value                           |                    |                   |                |              |        |                  |
| Frequency                            | Measured Level @3m | Correction Factor | Field Strength | Limit @3m    | Margin | E-Field Polarity |
| MHz                                  | dB $\mu$ V         | dB/m              | dB $\mu$ V/m   | dB $\mu$ V/m | dB     |                  |
| 4824.0                               | 15.0               | 41.5              | 56.5           | 74.0         | 17.5   | Vertical         |
| 4824.0                               | 13.4               | 42.4              | 55.8           | 74.0         | 18.2   | Horizontal       |
| 7236.0                               | 10.2               | 45.1              | 55.3           | 74.0         | 18.7   | Vertical         |
| 7236.0                               | 9.4                | 46.2              | 55.6           | 74.0         | 18.4   | Horizontal       |
| 9648.0                               | 7.5                | 48                | 55.5           | 74.0         | 18.5   | Vertical         |
| 9648.0                               | 7.1                | 48.8              | 55.9           | 74.0         | 18.1   | Horizontal       |
| 12060.0                              | 4.2                | 51.5              | 55.7           | 74.0         | 18.3   | Vertical         |
| 12060.0                              | 3.4                | 52.4              | 55.8           | 74.0         | 18.2   | Horizontal       |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4824.0                                                | 0.6                           | 41.5                         | 42.1                        | 54.0                   | 11.9         | Vertical            |
| 4824.0                                                | -1.2                          | 42.4                         | 41.2                        | 54.0                   | 12.8         | Horizontal          |
| 7236.0                                                | -4.3                          | 45.1                         | 40.8                        | 54.0                   | 13.2         | Vertical            |
| 7236.0                                                | -5.1                          | 46.2                         | 41.1                        | 54.0                   | 12.9         | Horizontal          |
| 9648.0                                                | -6.9                          | 48                           | 41.1                        | 54.0                   | 12.9         | Vertical            |
| 9648.0                                                | -8.2                          | 48.8                         | 40.6                        | 54.0                   | 13.4         | Horizontal          |
| 12060.0                                               | -10.2                         | 51.5                         | 41.3                        | 54.0                   | 12.7         | Vertical            |
| 12060.0                                               | -9.9                          | 52.4                         | 42.5                        | 54.0                   | 11.5         | Horizontal          |

**Result of Tx mode (2437.0 MHz) (802.11b) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value          |                           |                              |                             |                           |               |                     |
|-------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|---------------------------|---------------|---------------------|
| Frequency<br>MHz                                            | Measured<br>Level<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Field<br>Strength<br>uV/m | Limit<br>uV/m | E-Field<br>Polarity |
| Emissions detected are more than 20 dB below the FCC Limits |                           |                              |                             |                           |               |                     |

**Result of Tx mode (2437.0 MHz) (802.11b) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4874.0                                             | 15.2                          | 41.6                         | 56.8                        | 74.0                   | 17.2         | Vertical            |
| 4874.0                                             | 13.7                          | 42.5                         | 56.2                        | 74.0                   | 17.8         | Horizontal          |
| 7311.0                                             | 10.2                          | 45.2                         | 55.4                        | 74.0                   | 18.6         | Vertical            |
| 7311.0                                             | 8.8                           | 46.3                         | 55.1                        | 74.0                   | 18.9         | Horizontal          |
| 9748.0                                             | 7.2                           | 48.1                         | 55.3                        | 74.0                   | 18.7         | Vertical            |
| 9748.0                                             | 7.2                           | 48.9                         | 56.1                        | 74.0                   | 17.9         | Horizontal          |
| 12185.0                                            | 4.4                           | 51.6                         | 56.0                        | 74.0                   | 18.0         | Vertical            |
| 12185.0                                            | 3.3                           | 52.5                         | 55.8                        | 74.0                   | 18.2         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4874.0                                                | 0.6                           | 41.6                         | 42.2                        | 54.0                   | 11.8         | Vertical            |
| 4874.0                                                | -0.6                          | 42.5                         | 41.9                        | 54.0                   | 12.1         | Horizontal          |
| 7311.0                                                | -4.9                          | 45.2                         | 40.3                        | 54.0                   | 13.7         | Vertical            |
| 7311.0                                                | -5.9                          | 46.3                         | 40.4                        | 54.0                   | 13.6         | Horizontal          |
| 9748.0                                                | -7.0                          | 48.1                         | 41.1                        | 54.0                   | 12.9         | Vertical            |
| 9748.0                                                | -7.4                          | 48.9                         | 41.5                        | 54.0                   | 12.5         | Horizontal          |
| 12185.0                                               | -9.2                          | 51.6                         | 42.4                        | 54.0                   | 11.6         | Vertical            |
| 12185.0                                               | -10.4                         | 52.5                         | 42.1                        | 54.0                   | 11.9         | Horizontal          |

**Result of Tx mode (2462.0 MHz) (802.11b) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value          |                           |                              |                             |                           |               |                     |
|-------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|---------------------------|---------------|---------------------|
| Frequency<br>MHz                                            | Measured<br>Level<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Field<br>Strength<br>uV/m | Limit<br>uV/m | E-Field<br>Polarity |
| Emissions detected are more than 20 dB below the FCC Limits |                           |                              |                             |                           |               |                     |

**Result of Tx mode (2462.0 MHz) (802.11b) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 4924.0                                             | 15.6                          | 41.4                         | 57.0                        | 74.0                   | 17.0         | Vertical            |
| 4924.0                                             | 14.1                          | 42.7                         | 56.8                        | 74.0                   | 17.2         | Horizontal          |
| 7386.0                                             | 9.7                           | 45.6                         | 55.3                        | 74.0                   | 18.7         | Vertical            |
| 7386.0                                             | 9.2                           | 46.5                         | 55.7                        | 74.0                   | 18.3         | Horizontal          |
| 9848.0                                             | 6.5                           | 48.6                         | 55.1                        | 74.0                   | 18.9         | Vertical            |
| 9848.0                                             | 6.0                           | 49.7                         | 55.7                        | 74.0                   | 18.3         | Horizontal          |
| 12310.0                                            | 4.4                           | 51.7                         | 56.1                        | 74.0                   | 17.9         | Vertical            |
| 12310.0                                            | 3.0                           | 52.7                         | 55.7                        | 74.0                   | 18.3         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4924.0                                                | 1.3                           | 41.4                         | 42.7                        | 54.0                   | 11.3         | Vertical            |
| 4924.0                                                | -0.8                          | 42.7                         | 41.9                        | 54.0                   | 12.1         | Horizontal          |
| 7386.0                                                | -4.2                          | 45.6                         | 41.4                        | 54.0                   | 12.6         | Vertical            |
| 7386.0                                                | -4.5                          | 46.5                         | 42.0                        | 54.0                   | 12.0         | Horizontal          |
| 9848.0                                                | -7.4                          | 48.6                         | 41.2                        | 54.0                   | 12.8         | Vertical            |
| 9848.0                                                | -8.7                          | 49.7                         | 41.0                        | 54.0                   | 13.0         | Horizontal          |
| 12310.0                                               | -9.4                          | 51.7                         | 42.3                        | 54.0                   | 11.7         | Vertical            |
| 12310.0                                               | -11.0                         | 52.7                         | 41.7                        | 54.0                   | 12.3         | Horizontal          |

**Result of Tx mode (2412.0 MHz) (802.11g) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Average Value       |                           |                              |                             |                             |                 |                     |
|-------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|-----------------------------|-----------------|---------------------|
| Frequency<br>MHz                                            | Measured<br>Level<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>dBμV/m | Limit<br>dBμV/m | E-Field<br>Polarity |
| Emissions detected are more than 20 dB below the FCC Limits |                           |                              |                             |                             |                 |                     |

**Result of Tx mode (2412.0 MHz) (802.11g) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 4824.0                                             | 15.3                          | 41.5                         | 56.8                        | 74.0                   | 17.2         | Vertical            |
| 4824.0                                             | 14.1                          | 42.4                         | 56.5                        | 74.0                   | 17.5         | Horizontal          |
| 7236.0                                             | 10.8                          | 45.1                         | 55.9                        | 74.0                   | 18.1         | Vertical            |
| 7236.0                                             | 9.9                           | 46.2                         | 56.1                        | 74.0                   | 17.9         | Horizontal          |
| 9648.0                                             | 7.6                           | 48                           | 55.6                        | 74.0                   | 18.4         | Vertical            |
| 9648.0                                             | 7.1                           | 48.8                         | 55.9                        | 74.0                   | 18.1         | Horizontal          |
| 12060.0                                            | 4.5                           | 51.5                         | 56.0                        | 74.0                   | 18.0         | Vertical            |
| 12060.0                                            | 3.4                           | 52.4                         | 55.8                        | 74.0                   | 18.2         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4824.0                                                | 0.7                           | 41.5                         | 42.2                        | 54.0                   | 11.8         | Vertical            |
| 4824.0                                                | -0.7                          | 42.4                         | 41.7                        | 54.0                   | 12.3         | Horizontal          |
| 7236.0                                                | -2.8                          | 45.1                         | 42.3                        | 54.0                   | 11.7         | Vertical            |
| 7236.0                                                | -3.8                          | 46.2                         | 42.4                        | 54.0                   | 11.6         | Horizontal          |
| 9648.0                                                | -6.6                          | 48                           | 41.4                        | 54.0                   | 12.6         | Vertical            |
| 9648.0                                                | -7.7                          | 48.8                         | 41.1                        | 54.0                   | 12.9         | Horizontal          |
| 12060.0                                               | -9.5                          | 51.5                         | 42.0                        | 54.0                   | 12.0         | Vertical            |
| 12060.0                                               | -11.1                         | 52.4                         | 41.3                        | 54.0                   | 12.7         | Horizontal          |

**Result of Tx mode (2437.0 MHz) (802.11g) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Average Value              |                           |                              |                             |                             |                 |                     |
|--------------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|-----------------------------|-----------------|---------------------|
| Frequency<br>MHz                                                   | Measured<br>Level<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>dBμV/m | Limit<br>dBμV/m | E-Field<br>Polarity |
| <b>Emissions detected are more than 20 dB below the FCC Limits</b> |                           |                              |                             |                             |                 |                     |

**Result of Tx mode (2437.0 MHz) (802.11g) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4874.0                                             | 15.4                          | 41.6                         | 57.0                        | 74.0                   | 17.0         | Vertical            |
| 4874.0                                             | 13.9                          | 42.5                         | 56.4                        | 74.0                   | 17.6         | Horizontal          |
| 7311.0                                             | 10.6                          | 45.2                         | 55.8                        | 74.0                   | 18.2         | Vertical            |
| 7311.0                                             | 8.7                           | 46.3                         | 55.0                        | 74.0                   | 19.0         | Horizontal          |
| 9748.0                                             | 9.5                           | 48.1                         | 57.6                        | 74.0                   | 16.4         | Vertical            |
| 9748.0                                             | 7.3                           | 48.9                         | 56.2                        | 74.0                   | 17.8         | Horizontal          |
| 12185.0                                            | 4.3                           | 51.6                         | 55.9                        | 74.0                   | 18.1         | Vertical            |
| 12185.0                                            | 3.6                           | 52.5                         | 56.1                        | 74.0                   | 17.9         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4874.0                                                | 1.5                           | 41.6                         | 43.1                        | 54.0                   | 10.9         | Vertical            |
| 4874.0                                                | -0.2                          | 42.5                         | 42.3                        | 54.0                   | 11.7         | Horizontal          |
| 7311.0                                                | -4.2                          | 45.2                         | 41.0                        | 54.0                   | 13.0         | Vertical            |
| 7311.0                                                | -5.9                          | 46.3                         | 40.4                        | 54.0                   | 13.6         | Horizontal          |
| 9748.0                                                | -5.0                          | 48.1                         | 43.1                        | 54.0                   | 10.9         | Vertical            |
| 9748.0                                                | -6.7                          | 48.9                         | 42.2                        | 54.0                   | 11.8         | Horizontal          |
| 12185.0                                               | -10.2                         | 51.6                         | 41.4                        | 54.0                   | 12.6         | Vertical            |
| 12185.0                                               | -9.7                          | 52.5                         | 42.8                        | 54.0                   | 11.2         | Horizontal          |

**Result of Tx mode (2462.0 MHz) (802.11g) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Average Value              |                           |                              |                             |                             |                 |                     |
|--------------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|-----------------------------|-----------------|---------------------|
| Frequency<br>MHz                                                   | Measured<br>Level<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>dBμV/m | Limit<br>dBμV/m | E-Field<br>Polarity |
| <b>Emissions detected are more than 20 dB below the FCC Limits</b> |                           |                              |                             |                             |                 |                     |

**Result of Tx mode (2462.0 MHz) (802.11g) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 4924.0                                             | 15.4                          | 41.4                         | 56.8                        | 74.0                   | 17.2         | Vertical            |
| 4924.0                                             | 13.6                          | 42.7                         | 56.3                        | 74.0                   | 17.7         | Horizontal          |
| 7386.0                                             | 9.8                           | 45.6                         | 55.4                        | 74.0                   | 18.6         | Vertical            |
| 7386.0                                             | 8.7                           | 46.5                         | 55.2                        | 74.0                   | 18.8         | Horizontal          |
| 9848.0                                             | 7.4                           | 48.6                         | 56.0                        | 74.0                   | 18.0         | Vertical            |
| 9848.0                                             | 5.5                           | 49.7                         | 55.2                        | 74.0                   | 18.8         | Horizontal          |
| 12310.0                                            | 4.2                           | 51.7                         | 55.9                        | 74.0                   | 18.1         | Vertical            |
| 12310.0                                            | 3.4                           | 52.7                         | 56.1                        | 74.0                   | 17.9         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4924.0                                                | 1.3                           | 41.4                         | 42.7                        | 54.0                   | 11.3         | Vertical            |
| 4924.0                                                | -0.6                          | 42.7                         | 42.1                        | 54.0                   | 11.9         | Horizontal          |
| 7386.0                                                | -4.0                          | 45.6                         | 41.6                        | 54.0                   | 12.4         | Vertical            |
| 7386.0                                                | -5.6                          | 46.5                         | 40.9                        | 54.0                   | 13.1         | Horizontal          |
| 9848.0                                                | -7.3                          | 48.6                         | 41.3                        | 54.0                   | 12.7         | Vertical            |
| 9848.0                                                | -8.6                          | 49.7                         | 41.1                        | 54.0                   | 12.9         | Horizontal          |
| 12310.0                                               | -9.6                          | 51.7                         | 42.1                        | 54.0                   | 11.9         | Vertical            |
| 12310.0                                               | -10.7                         | 52.7                         | 42.0                        | 54.0                   | 12.0         | Horizontal          |

**Result of Tx mode (2412.0 MHz) (802.11n20) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Average Value       |                           |                              |                             |                             |                 |                     |
|-------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|-----------------------------|-----------------|---------------------|
| Frequency<br>MHz                                            | Measured<br>Level<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>dBμV/m | Limit<br>dBμV/m | E-Field<br>Polarity |
| Emissions detected are more than 20 dB below the FCC Limits |                           |                              |                             |                             |                 |                     |

**Result of Tx mode (2412.0 MHz) (802.11n20) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 4824.0                                             | 15.4                          | 41.5                         | 56.9                        | 74.0                   | 17.1         | Vertical            |
| 4824.0                                             | 13.4                          | 42.4                         | 55.8                        | 74.0                   | 18.2         | Horizontal          |
| 7236.0                                             | 10.3                          | 45.1                         | 55.4                        | 74.0                   | 18.6         | Vertical            |
| 7236.0                                             | 9.7                           | 46.2                         | 55.9                        | 74.0                   | 18.1         | Horizontal          |
| 9648.0                                             | 7.4                           | 48                           | 55.4                        | 74.0                   | 18.6         | Vertical            |
| 9648.0                                             | 6.9                           | 48.8                         | 55.7                        | 74.0                   | 18.3         | Horizontal          |
| 12060.0                                            | 4.6                           | 51.5                         | 56.1                        | 74.0                   | 17.9         | Vertical            |
| 12060.0                                            | 3.0                           | 52.4                         | 55.4                        | 74.0                   | 18.6         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4824.0                                                | 0.9                           | 41.5                         | 42.4                        | 54.0                   | 11.6         | Vertical            |
| 4824.0                                                | -0.4                          | 42.4                         | 42.0                        | 54.0                   | 12.0         | Horizontal          |
| 7236.0                                                | -3.1                          | 45.1                         | 42.0                        | 54.0                   | 12.0         | Vertical            |
| 7236.0                                                | -4.0                          | 46.2                         | 42.2                        | 54.0                   | 11.8         | Horizontal          |
| 9648.0                                                | -7.4                          | 48                           | 40.6                        | 54.0                   | 13.4         | Vertical            |
| 9648.0                                                | -7.7                          | 48.8                         | 41.1                        | 54.0                   | 12.9         | Horizontal          |
| 12060.0                                               | -9.7                          | 51.5                         | 41.8                        | 54.0                   | 12.2         | Vertical            |
| 12060.0                                               | -11.1                         | 52.4                         | 41.3                        | 54.0                   | 12.7         | Horizontal          |

**Result of Tx mode (2437.0 MHz) (802.11n20) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Average Value              |                           |                              |                             |                             |                 |                     |
|--------------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|-----------------------------|-----------------|---------------------|
| Frequency<br>MHz                                                   | Measured<br>Level<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>dBμV/m | Limit<br>dBμV/m | E-Field<br>Polarity |
| <b>Emissions detected are more than 20 dB below the FCC Limits</b> |                           |                              |                             |                             |                 |                     |

**Result of Tx mode (2437.0 MHz) (802.11n20) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 4874.0                                             | 15.0                          | 41.6                         | 56.6                        | 74.0                   | 17.4         | Vertical            |
| 4874.0                                             | 13.8                          | 42.5                         | 56.3                        | 74.0                   | 17.7         | Horizontal          |
| 7311.0                                             | 10.5                          | 45.2                         | 55.7                        | 74.0                   | 18.3         | Vertical            |
| 7311.0                                             | 9.6                           | 46.3                         | 55.9                        | 74.0                   | 18.1         | Horizontal          |
| 9748.0                                             | 8.0                           | 48.1                         | 56.1                        | 74.0                   | 17.9         | Vertical            |
| 9748.0                                             | 7.4                           | 48.9                         | 56.3                        | 74.0                   | 17.7         | Horizontal          |
| 12185.0                                            | 4.2                           | 51.6                         | 55.8                        | 74.0                   | 18.2         | Vertical            |
| 12185.0                                            | 3.5                           | 52.5                         | 56.0                        | 74.0                   | 18.0         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4874.0                                                | -0.5                          | 41.6                         | 41.1                        | 54.0                   | 12.9         | Vertical            |
| 4874.0                                                | -1.0                          | 42.5                         | 41.5                        | 54.0                   | 12.5         | Horizontal          |
| 7311.0                                                | -3.8                          | 45.2                         | 41.4                        | 54.0                   | 12.6         | Vertical            |
| 7311.0                                                | -5.0                          | 46.3                         | 41.3                        | 54.0                   | 12.7         | Horizontal          |
| 9748.0                                                | -6.0                          | 48.1                         | 42.1                        | 54.0                   | 11.9         | Vertical            |
| 9748.0                                                | -6.9                          | 48.9                         | 42.0                        | 54.0                   | 12.0         | Horizontal          |
| 12185.0                                               | -10.0                         | 51.6                         | 41.6                        | 54.0                   | 12.4         | Vertical            |
| 12185.0                                               | -10.8                         | 52.5                         | 41.7                        | 54.0                   | 12.3         | Horizontal          |

**Result of Tx mode (2462.0 MHz) (802.11n20) (9kHz – 30MHz): Pass**

| Field Strength of Spurious Emissions<br>Average Value              |                           |                              |                             |                             |                 |                     |
|--------------------------------------------------------------------|---------------------------|------------------------------|-----------------------------|-----------------------------|-----------------|---------------------|
| Frequency<br>MHz                                                   | Measured<br>Level<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>dBμV/m | Limit<br>dBμV/m | E-Field<br>Polarity |
| <b>Emissions detected are more than 20 dB below the FCC Limits</b> |                           |                              |                             |                             |                 |                     |

**Result of Tx mode (2462.0 MHz) (802.11n20) (1GHz-25GHz): Pass**

| Field Strength of Spurious Emissions<br>Peak Value |                               |                              |                             |                        |              |                     |
|----------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 4924.0                                             | 15.2                          | 41.4                         | 56.6                        | 74.0                   | 17.4         | Vertical            |
| 4924.0                                             | 13.1                          | 42.7                         | 55.8                        | 74.0                   | 18.2         | Horizontal          |
| 7386.0                                             | 9.5                           | 45.6                         | 55.1                        | 74.0                   | 18.9         | Vertical            |
| 7386.0                                             | 8.9                           | 46.5                         | 55.4                        | 74.0                   | 18.6         | Horizontal          |
| 9848.0                                             | 7.1                           | 48.6                         | 55.7                        | 74.0                   | 18.3         | Vertical            |
| 9848.0                                             | 5.5                           | 49.7                         | 55.2                        | 74.0                   | 18.8         | Horizontal          |
| 12310.0                                            | 4.2                           | 51.7                         | 55.9                        | 74.0                   | 18.1         | Vertical            |
| 12310.0                                            | 3.6                           | 52.7                         | 56.3                        | 74.0                   | 17.7         | Horizontal          |

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| Field Strength of Spurious Emissions<br>Average Value |                               |                              |                             |                        |              |                     |
|-------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBuV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB | E-Field<br>Polarity |
| 4924.0                                                | 0.6                           | 41.4                         | 42.0                        | 54.0                   | 12.0         | Vertical            |
| 4924.0                                                | -1.1                          | 42.7                         | 41.6                        | 54.0                   | 12.4         | Horizontal          |
| 7386.0                                                | -4.9                          | 45.6                         | 40.7                        | 54.0                   | 13.3         | Vertical            |
| 7386.0                                                | -6.2                          | 46.5                         | 40.3                        | 54.0                   | 13.7         | Horizontal          |
| 9848.0                                                | -7.5                          | 48.6                         | 41.1                        | 54.0                   | 12.9         | Vertical            |
| 9848.0                                                | -8.4                          | 49.7                         | 41.3                        | 54.0                   | 12.7         | Horizontal          |
| 12310.0                                               | -10.0                         | 51.7                         | 41.7                        | 54.0                   | 12.3         | Vertical            |
| 12310.0                                               | -10.5                         | 52.7                         | 42.2                        | 54.0                   | 11.8         | Horizontal          |

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\* Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement (9kHz-30MHz): 2.0dB

uncertainty (30MHz -1GHz): 4.9dB

(1GHz -26GHz): 4.02dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### Radiated Emissions Measurement:

#### Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).

#### Result: RF Radiated Emissions (Lowest)-802.11b

| Field Strength of Band-edge Compliance<br>Peak Value |                               |                              |                             |                        |              |                     |
|------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                     | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2390.0                                               | 11.8                          | 36.8                         | 48.6                        | 74.0                   | 25.4         | Vertical            |

| Field Strength of Band-edge Compliance<br>Average Value |                               |                              |                             |                        |              |                     |
|---------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                        | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2390.0                                                  | 2.3                           | 36.8                         | 39.1                        | 54.0                   | 14.9         | Vertical            |

#### Result: RF Radiated Emissions (Highest) -802.11b

| Field Strength of Band-edge Compliance<br>Peak Value |                               |                              |                             |                        |              |                     |
|------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                     | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2483.5                                               | 10.7                          | 36.4                         | 47.1                        | 74.0                   | 26.9         | Horizontal          |

| Field Strength of Band-edge Compliance<br>Average Value |                               |                              |                             |                        |              |                     |
|---------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                        | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2483.5                                                  | 3.5                           | 36.4                         | 39.9                        | 54.0                   | 14.1         | Horizontal          |

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**Result: RF Radiated Emissions (Lowest)-802.11g**

| Field Strength of Band-edge Compliance |                    |                   |                |           |        |                  |
|----------------------------------------|--------------------|-------------------|----------------|-----------|--------|------------------|
| Peak Value                             |                    |                   |                |           |        |                  |
| Frequency                              | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz                                    | dBμV               | dB/m              | dBμV/m         | dBμV/m    | dB     |                  |
| 2390.0                                 | 17.9               | 36.8              | 54.7           | 74.0      | 19.3   | Vertical         |

| Field Strength of Band-edge Compliance |                    |                   |                |           |        |                  |
|----------------------------------------|--------------------|-------------------|----------------|-----------|--------|------------------|
| Average Value                          |                    |                   |                |           |        |                  |
| Frequency                              | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz                                    | dBμV               | dB/m              | dBμV/m         | dBμV/m    | dB     |                  |
| 2390.0                                 | 5.3                | 36.8              | 42.1           | 54.0      | 11.9   | Vertical         |

**Result: RF Radiated Emissions (Highest) -802.11g**

| Field Strength of Band-edge Compliance |                    |                   |                |           |        |                  |
|----------------------------------------|--------------------|-------------------|----------------|-----------|--------|------------------|
| Peak Value                             |                    |                   |                |           |        |                  |
| Frequency                              | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz                                    | dBμV               | dB/m              | dBμV/m         | dBμV/m    | dB     |                  |
| 2483.5                                 | 12.9               | 36.4              | 49.3           | 74.0      | 24.7   | Horizontal       |

| Field Strength of Band-edge Compliance |                    |                   |                |           |        |                  |
|----------------------------------------|--------------------|-------------------|----------------|-----------|--------|------------------|
| Average Value                          |                    |                   |                |           |        |                  |
| Frequency                              | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz                                    | dBμV               | dB/m              | dBμV/m         | dBμV/m    | dB     |                  |
| 2483.5                                 | 3.3                | 36.4              | 39.7           | 54.0      | 14.3   | Horizontal       |

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**Result: RF Radiated Emissions (Lowest)-802.11n20**

| Field Strength of Band-edge Compliance<br>Peak Value |                               |                              |                             |                        |              |                     |
|------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                     | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2390.0                                               | 19.9                          | 36.8                         | 56.7                        | 74.0                   | 17.3         | Vertical            |

| Field Strength of Band-edge Compliance<br>Average Value |                               |                              |                             |                        |              |                     |
|---------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                        | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2390.0                                                  | 6.1                           | 36.8                         | 42.9                        | 54.0                   | 11.1         | Vertical            |

**Result: RF Radiated Emissions (Highest) -802.11n20**

| Field Strength of Band-edge Compliance<br>Peak Value |                               |                              |                             |                        |              |                     |
|------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                     | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2483.5                                               | 14.7                          | 36.4                         | 51.1                        | 74.0                   | 22.9         | Horizontal          |

| Field Strength of Band-edge Compliance<br>Average Value |                               |                              |                             |                        |              |                     |
|---------------------------------------------------------|-------------------------------|------------------------------|-----------------------------|------------------------|--------------|---------------------|
| Frequency<br>MHz                                        | Measured<br>Level @3m<br>dBμV | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB | E-Field<br>Polarity |
| 2483.5                                                  | 4.0                           | 36.4                         | 40.4                        | 54.0                   | 13.6         | Horizontal          |

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**Limits for Radiated Emissions FCC 47 CFR 15.247]:**

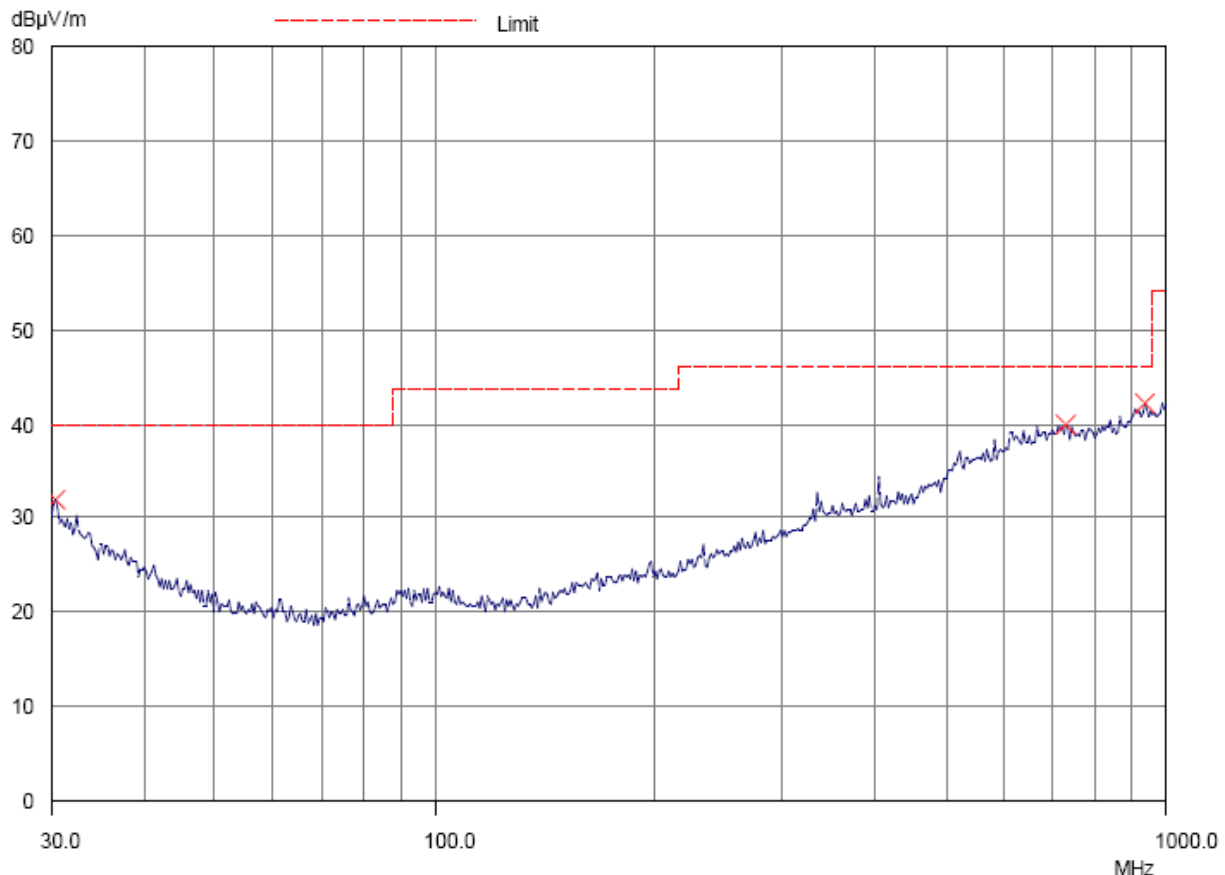
| Frequency Range | Quasi-Peak Limits   |
|-----------------|---------------------|
| [MHz]           | [ $\mu\text{V/m}$ ] |
| 0.009-0.490     | 2400/F (kHz)        |
| 0.490-1.705     | 24000/F (kHz)       |
| 1.705-30        | 30                  |
| 30-88           | 100                 |
| 88-216          | 150                 |
| 216-960         | 200                 |
| Above 960       | 500                 |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Results of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass**

Please refer to the following table for result details(The data is the worst cases)

Horizontal



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**Result of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass**

| Radiated Emissions           |                     |                              |                              |                           |                           |
|------------------------------|---------------------|------------------------------|------------------------------|---------------------------|---------------------------|
| Quasi-Peak                   |                     |                              |                              |                           |                           |
| Emission<br>Frequency<br>MHz | E-Field<br>Polarity | Level<br>@3m<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Level<br>@3m<br>$\mu$ V/m | Limit<br>@3m<br>$\mu$ V/m |
| 30.2                         | Horizontal          | 28.9                         | 40.0                         | 27.9                      | 100                       |
| 728.1                        | Horizontal          | 35.9                         | 46.0                         | 62.4                      | 200                       |
| 932.3                        | Horizontal          | 36.6                         | 46.0                         | 67.6                      | 200                       |

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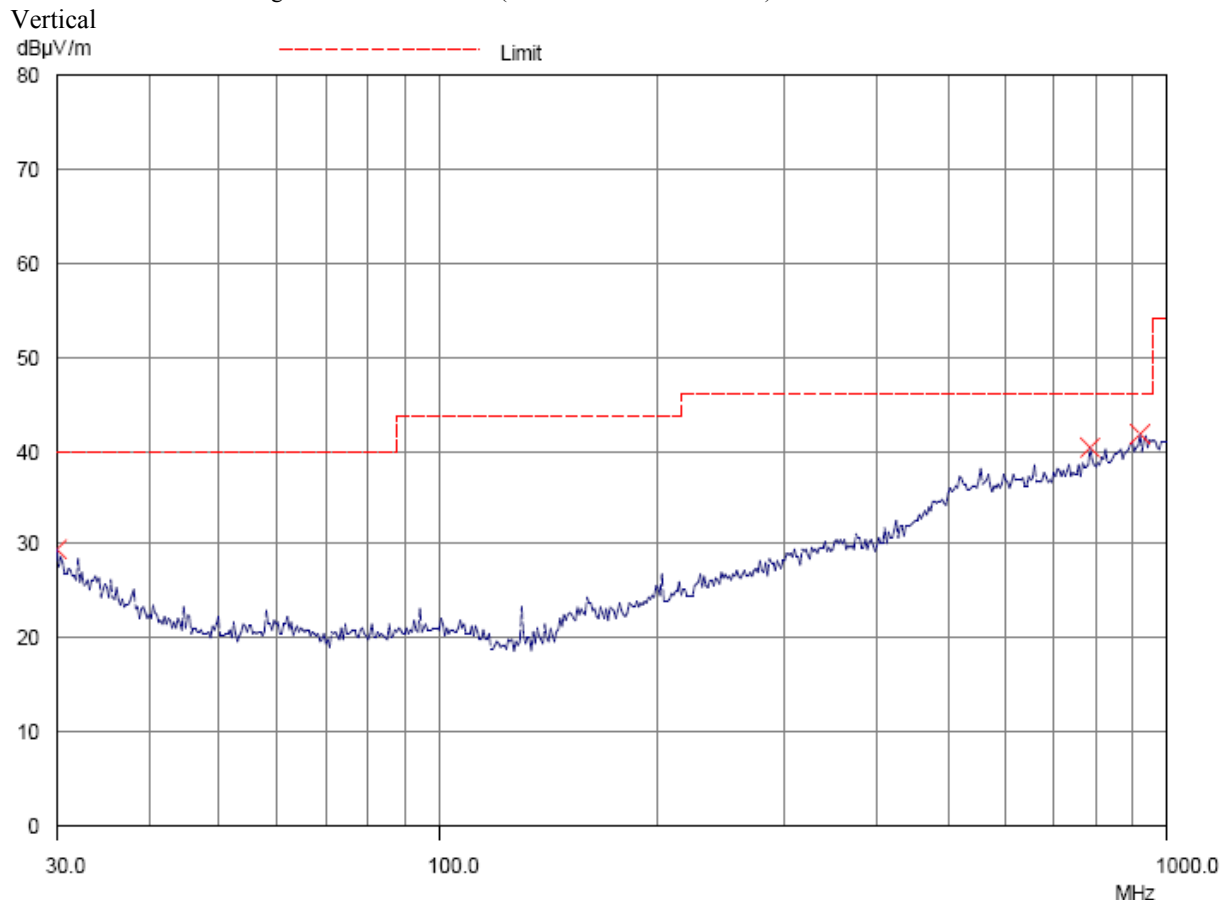
**Limits for Radiated Emissions FCC 47 CFR 15.247 Class B]:**

| Frequency Range | Quasi-Peak Limits   |
|-----------------|---------------------|
| [MHz]           | [ $\mu\text{V/m}$ ] |
| 0.009-0.490     | 2400/F (kHz)        |
| 0.490-1.705     | 24000/F (kHz)       |
| 1.705-30        | 30                  |
| 30-88           | 100                 |
| 88-216          | 150                 |
| 216-960         | 200                 |
| Above 960       | 500                 |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Results of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass**

Please refer to the following table for result details(The data is the worst cases)



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### **Result of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass**

| <b>Radiated Emissions</b>    |                     |                        |                        |                      |                      |
|------------------------------|---------------------|------------------------|------------------------|----------------------|----------------------|
| <b>Quasi-Peak</b>            |                     |                        |                        |                      |                      |
| Emission<br>Frequency<br>MHz | E-Field<br>Polarity | Level<br>@3m<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Level<br>@3m<br>μV/m | Limit<br>@3m<br>μV/m |
| 30.0                         | Vertical            | 26.4                   | 40.0                   | 20.9                 | 100                  |
| 783.3                        | Vertical            | 36.0                   | 46.0                   | 63.1                 | 200                  |
| 916.6                        | Vertical            | 36.5                   | 46.0                   | 66.8                 | 200                  |

#### Remarks:

Calculated measurement uncertainty (30MHz – 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### **3.1.3 Power Spectral Density**

Test Requirement: FCC 47CFR 15.247(e)  
Test Method: ANSI C63.10:2013  
Test Date: 2018-11-01  
Mode of Operation: Wifi mode

Ambient Temperature: 25°C      Relative Humidity: 51%      Atmospheric Pressure: 101 kPa

#### **Test Method:**

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=100kHz , VBW= 300KHz , Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple , Trace mode = max hold. Measure the Power Spectral Density (PSD) and record the results in dBm.

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

#### **Test Limit:**

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10 \log (3 \text{ kHz} / 100 \text{ kHz}) = -15.2 \text{ dB}$

#### **Results of WiFi Mode 802.11 b (Tx:2412MHz to 2462MHz) : Pass (TX Unit)**

##### **Maximum power spectral density**

| Transmitter Frequency<br>(MHz) | Maximum Power spectral density<br>level / 3kHz band<br>(dBm) | Maximum Power spectral density /<br>3kHz band limit |
|--------------------------------|--------------------------------------------------------------|-----------------------------------------------------|
| 2412.0                         | -9.16                                                        | 8dBm                                                |
| 2437.0                         | -9.40                                                        | 8dBm                                                |
| 2462.0                         | -10.42                                                       | 8dBm                                                |

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**Results of WiFi Mode 802.11 g (Tx:2412MHz to 2462MHz) : Pass (TX Unit)**

**Maximum power spectral density**

| Transmitter Frequency<br>(MHz) | Maximum Power spectral density<br>level / 3kHz band<br>(dBm) | Maximum Power spectral density /<br>3kHz band limit |
|--------------------------------|--------------------------------------------------------------|-----------------------------------------------------|
| 2412.0                         | -12.91                                                       | 8dBm                                                |
| 2437.0                         | -13.42                                                       | 8dBm                                                |
| 2462.0                         | -14.41                                                       | 8dBm                                                |

**Results of WiFi Mode 802.11 n20 (Tx:2412MHz to 2462MHz) : Pass (TX Unit)**

**Maximum power spectral density**

| Transmitter Frequency<br>(MHz) | Maximum Power spectral density<br>level / 3kHz band<br>(dBm) | Maximum Power spectral density /<br>3kHz band limit |
|--------------------------------|--------------------------------------------------------------|-----------------------------------------------------|
| 2412.0                         | -13.43                                                       | 8dBm                                                |
| 2437.0                         | -13.38                                                       | 8dBm                                                |
| 2462.0                         | -16.27                                                       | 8dBm                                                |

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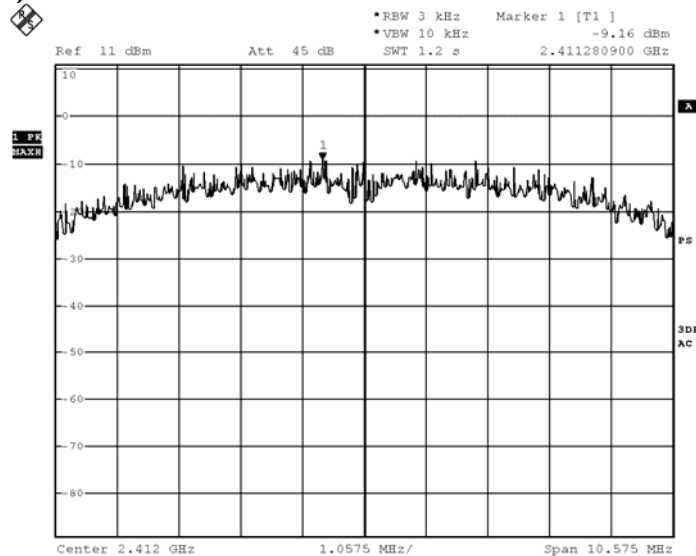


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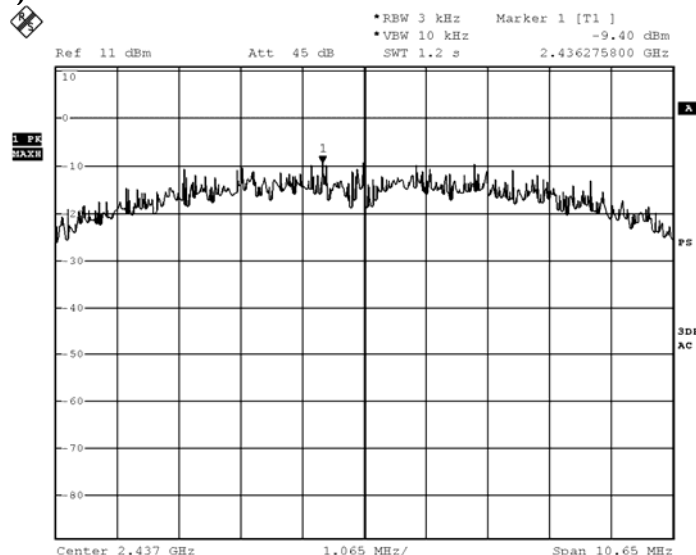
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WiFi mode 802.11 b, (Tx: 2412MHz to 2462MHz)  
CH 1 (2412.0 MHz)



CH 6 (2437.0 MHz)



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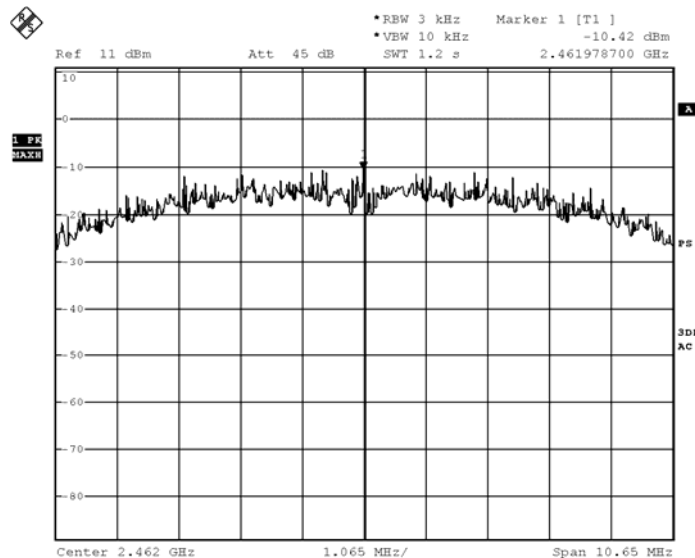


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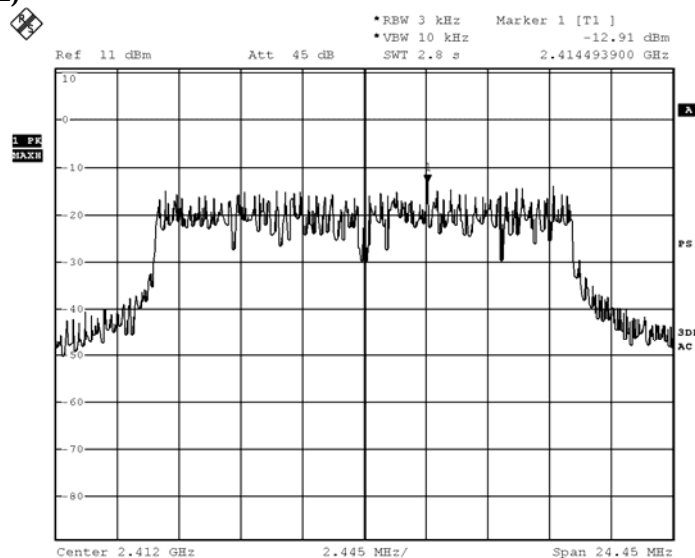
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CH 11 (2462.0 MHz)



WiFi mode 802.11 g, (Tx:2412MHz to 2462MHz)  
Ch 1 (2412.0 MHz)



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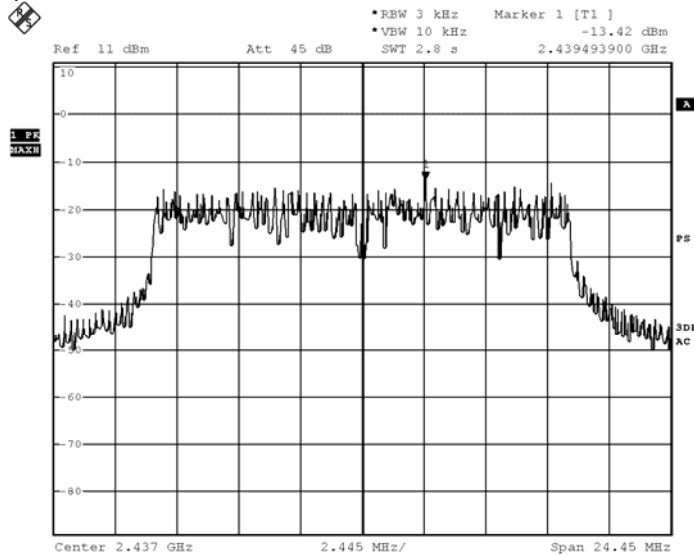


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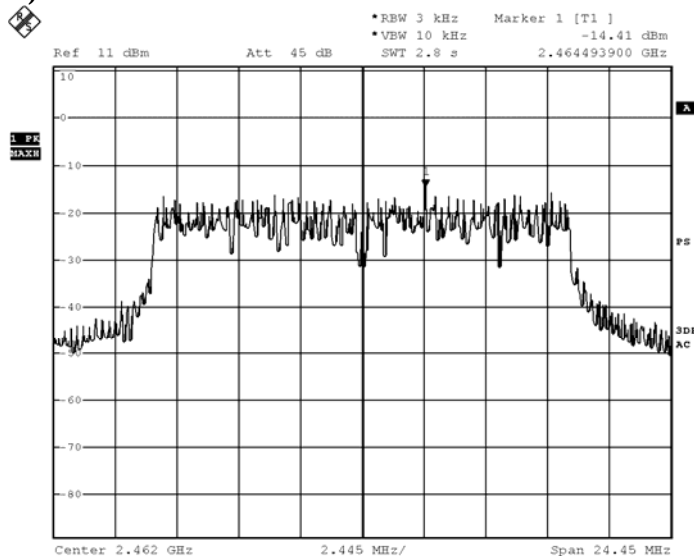
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### CH 6 (2437.0 MHz)



### CH 11 (2462.0 MHz)



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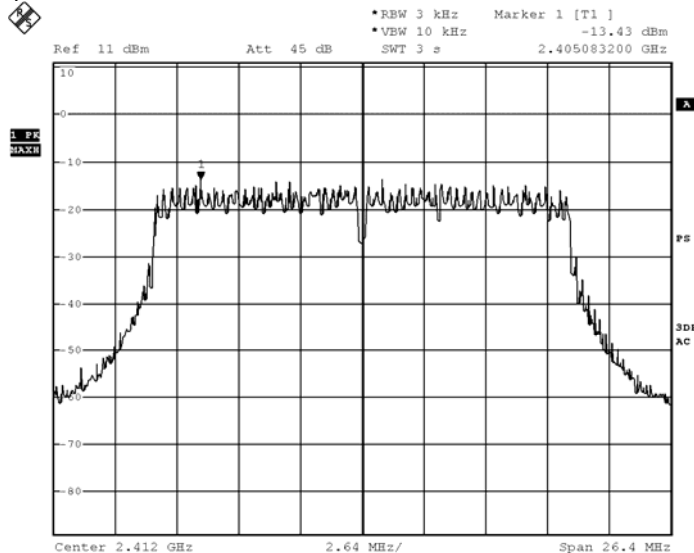
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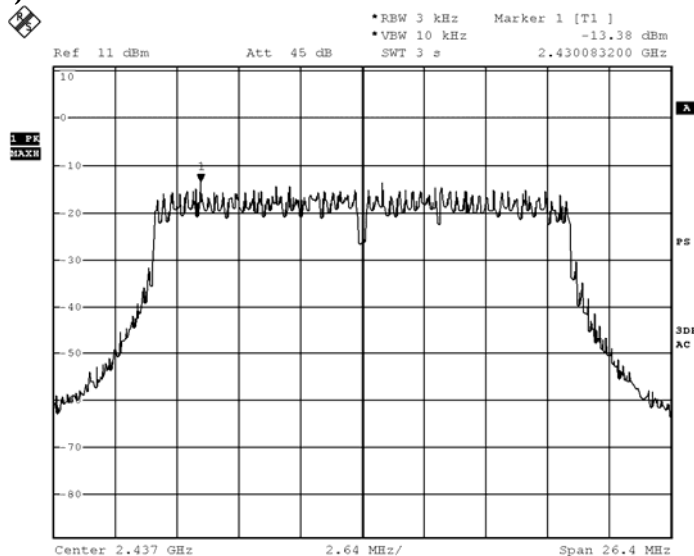
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WiFi mode 802.11 n20, (Tx: 2412MHz to 2462MHz)

CH 1 (2412.0 MHz)



CH 6 (2437.0 MHz)



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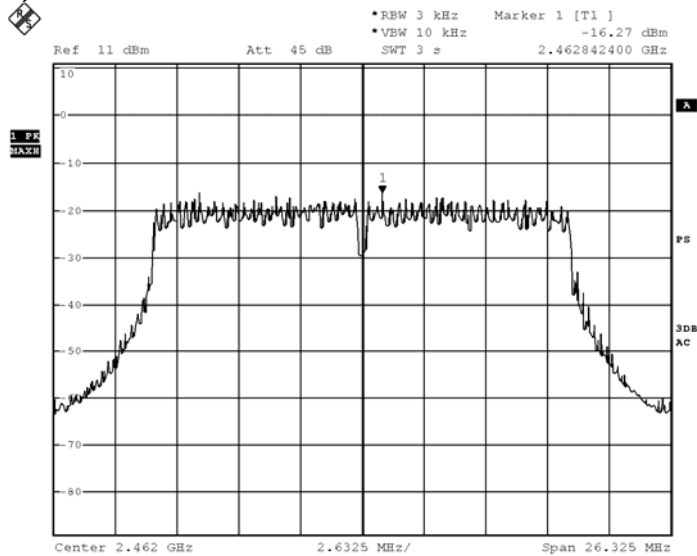


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Ch 11 (2462.0 MHz)



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## Test Report

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### **3.1.4 6dB Spectrum Bandwidth Measurement**

Test Requirement: FCC 47CFR 15.247(a)(2)  
Test Method: ANSI C63.10:2013  
Test Date: 2018-11-02  
Mode of Operation: WiFi mode

Ambient Temperature: 25°C      Relative Humidity: 51%      Atmospheric Pressure: 101 kPa

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

#### **Spectrum Analyzer Setting:**

RBW = 100kHz, VBW  $\geq 3 \times$  RBW, Sweep = Auto couple  
Detector = Peak, Trace = Max. hold

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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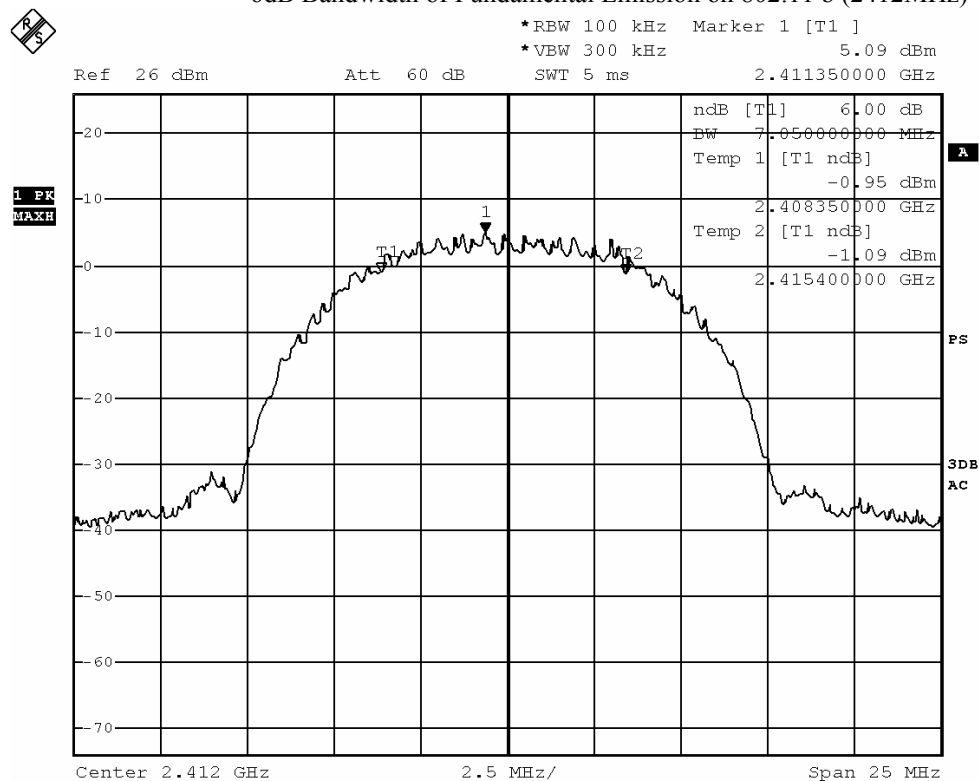
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Center Frequency<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|---------------------------|------------------------|---------------------|
| 2412.0                    | 7.05                   | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 b (2412MHz)



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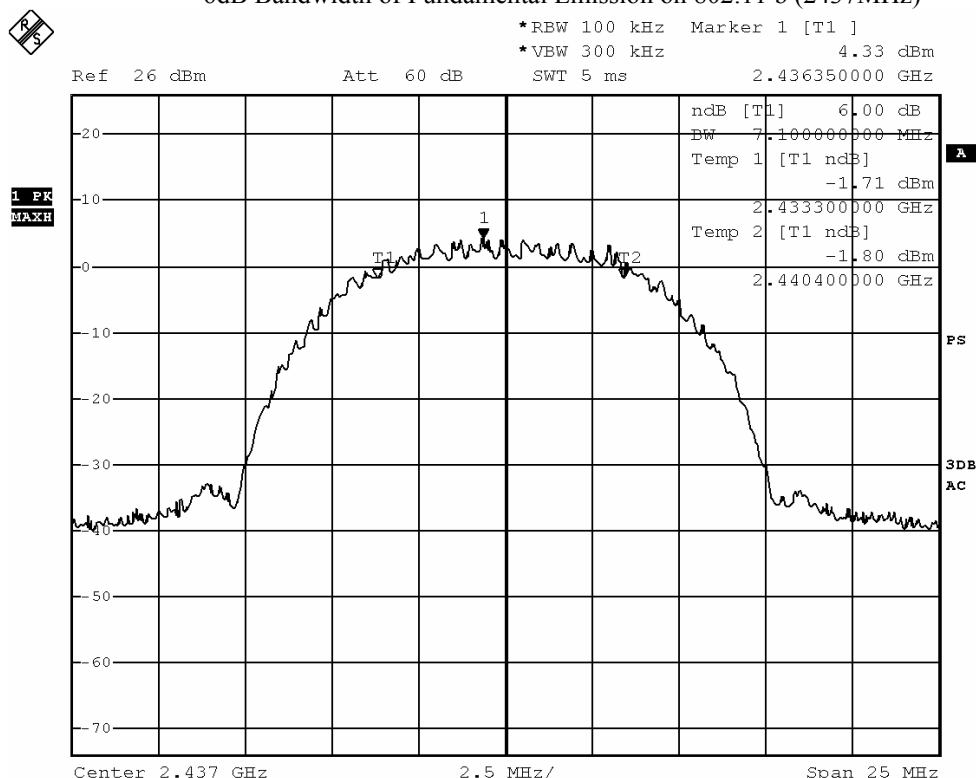
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|--------------------------|------------------------|---------------------|
| 2437.0                   | 7.10                   | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 b (2437MHz)



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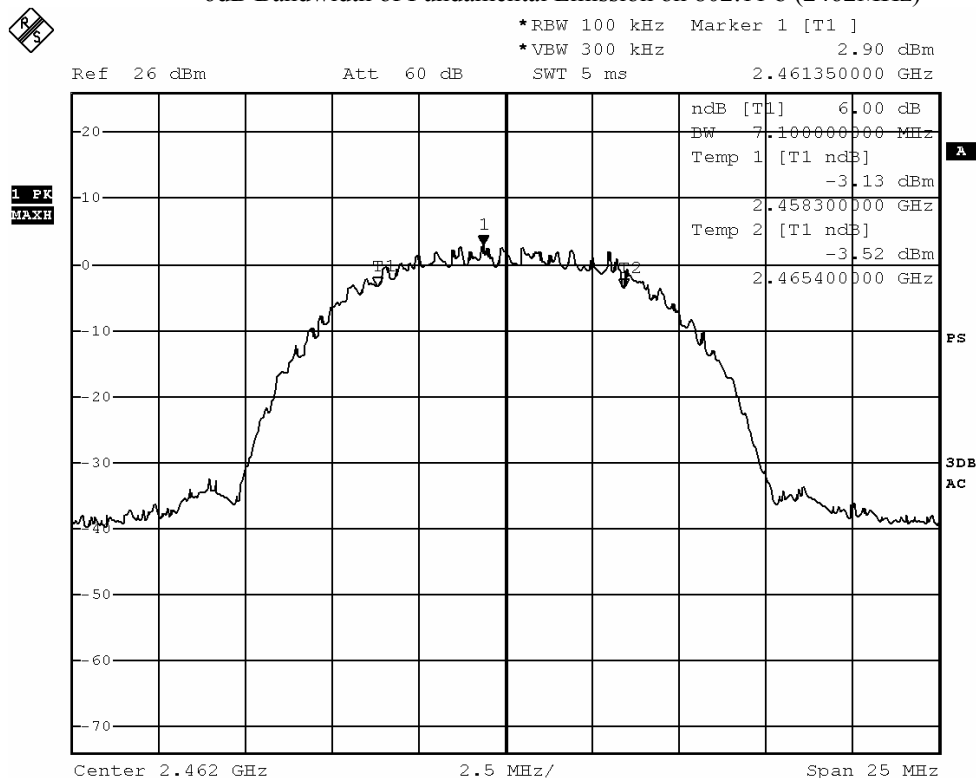
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|--------------------------|------------------------|---------------------|
| 2462.0                   | 7.10                   | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 b (2462MHz)



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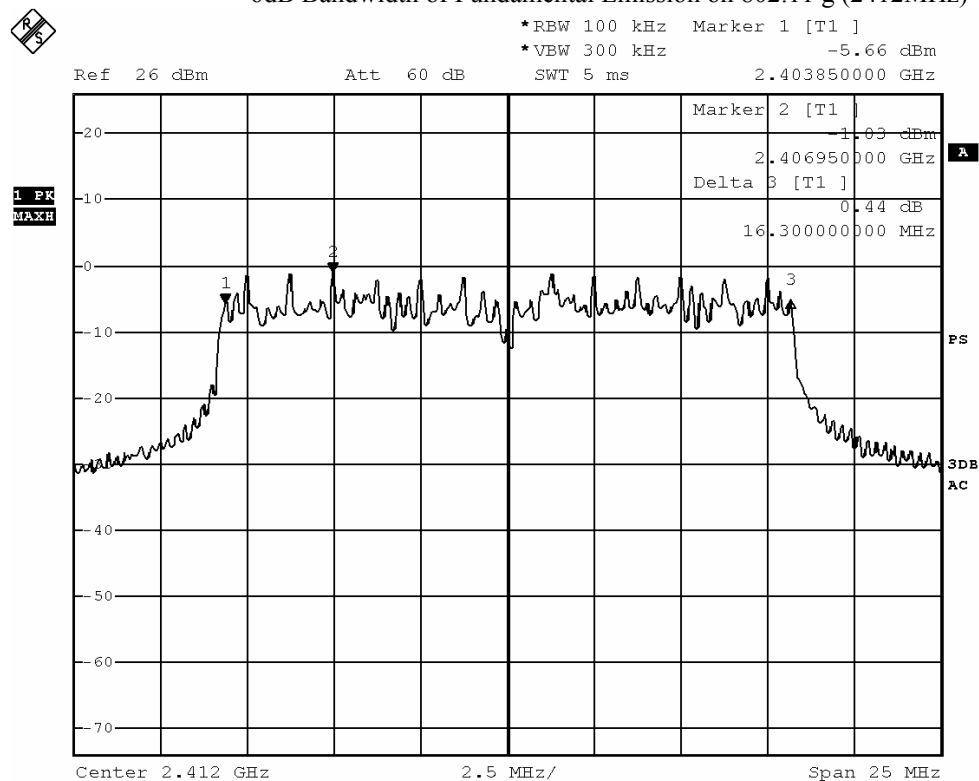
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Center Frequency<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|---------------------------|------------------------|---------------------|
| 2412.0                    | 16.30                  | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 g (2412MHz)



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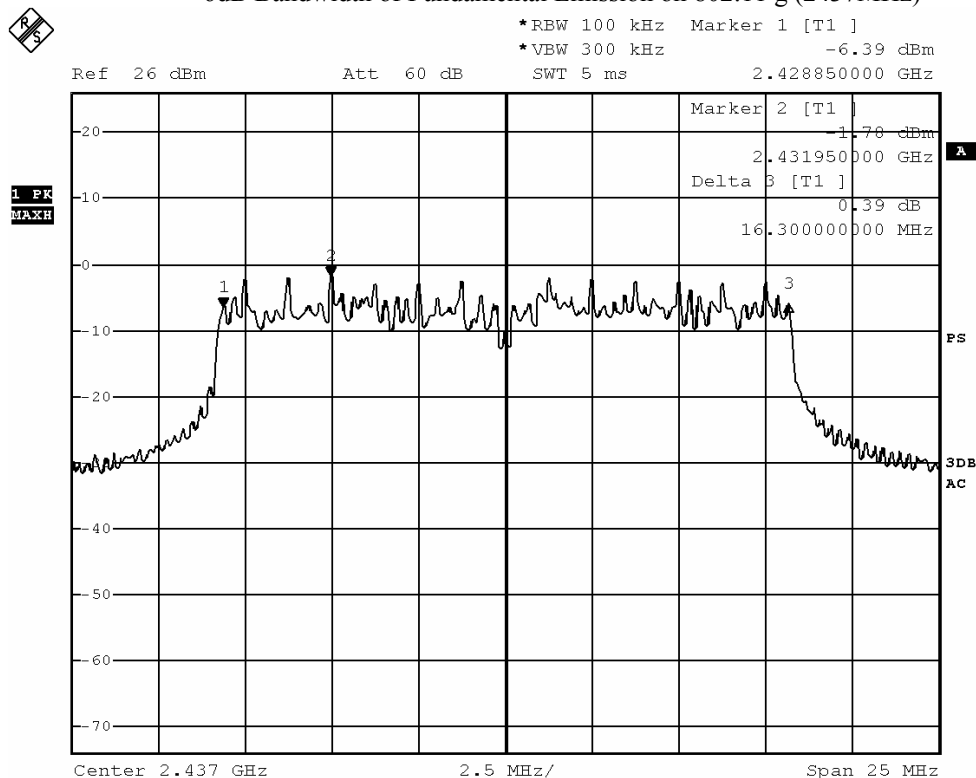
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|--------------------------|------------------------|---------------------|
| 2437.0                   | 16.30                  | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 g (2437MHz)



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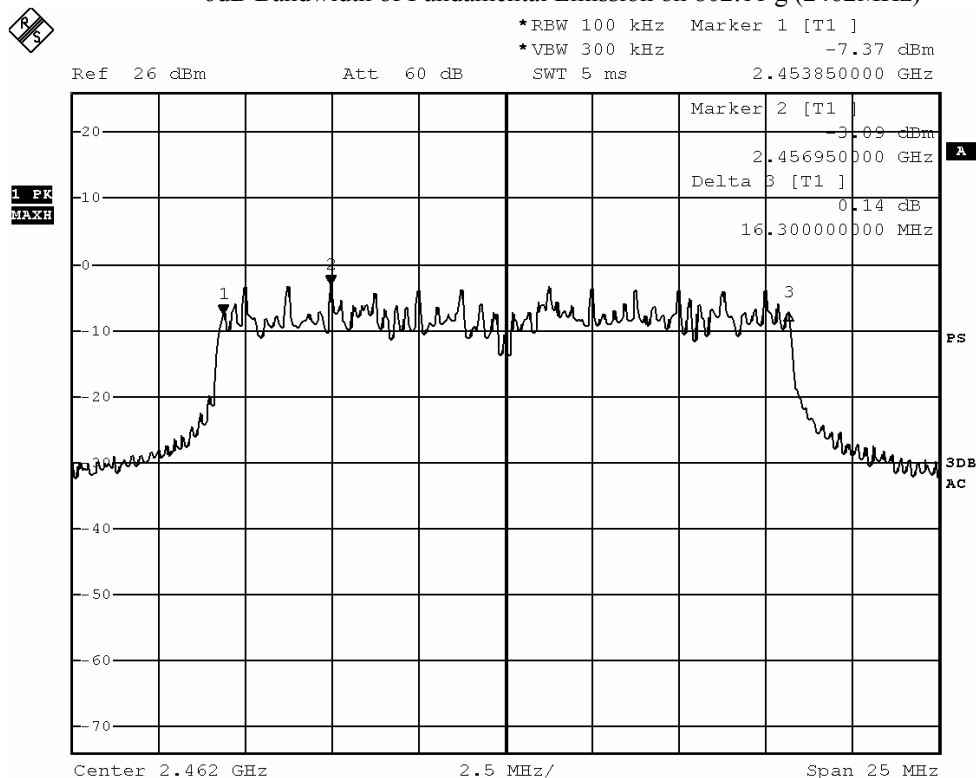
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|--------------------------|------------------------|---------------------|
| 2462.0                   | 16.30                  | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 g (2462MHz)



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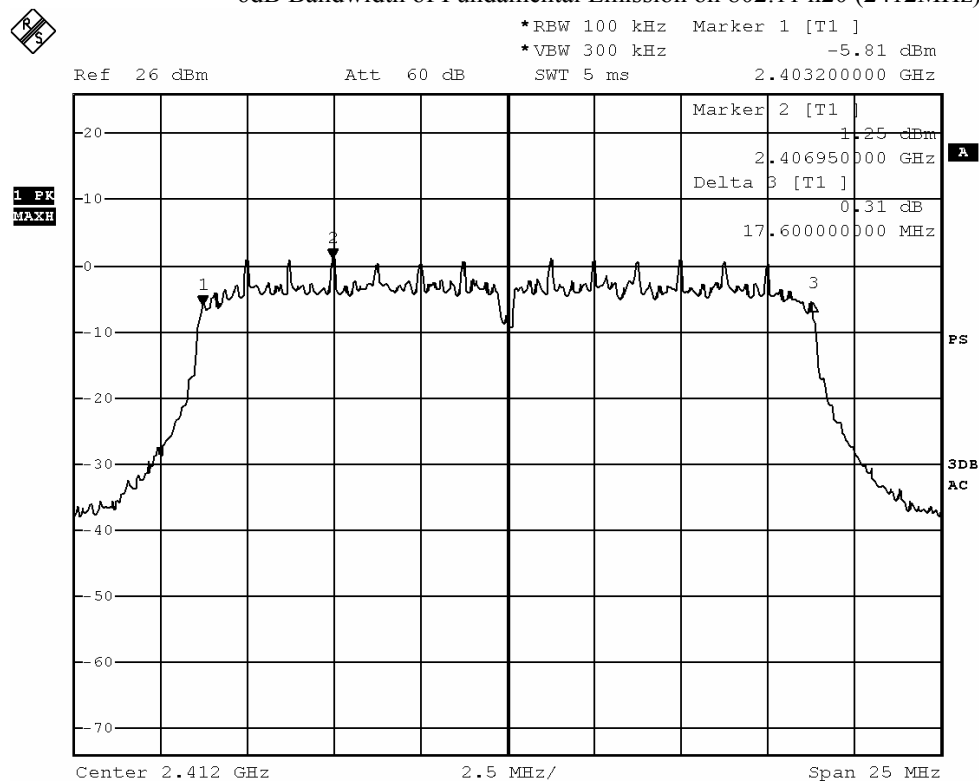
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Center Frequency<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|---------------------------|------------------------|---------------------|
| 2412.0                    | 17.60                  | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 n20 (2412MHz)



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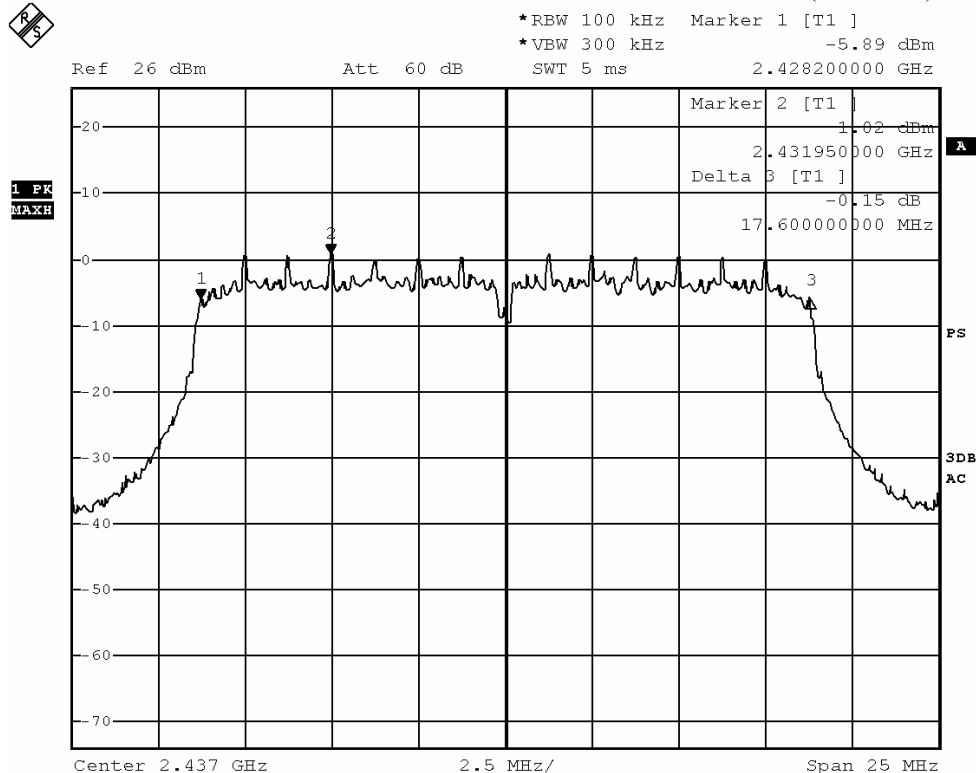
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
|--------------------------|------------------------|---------------------|
| 2437.0                   | 17.60                  | > 500               |



### 6dB Bandwidth of Fundamental Emission on 802.11 n20 (2437MHz)



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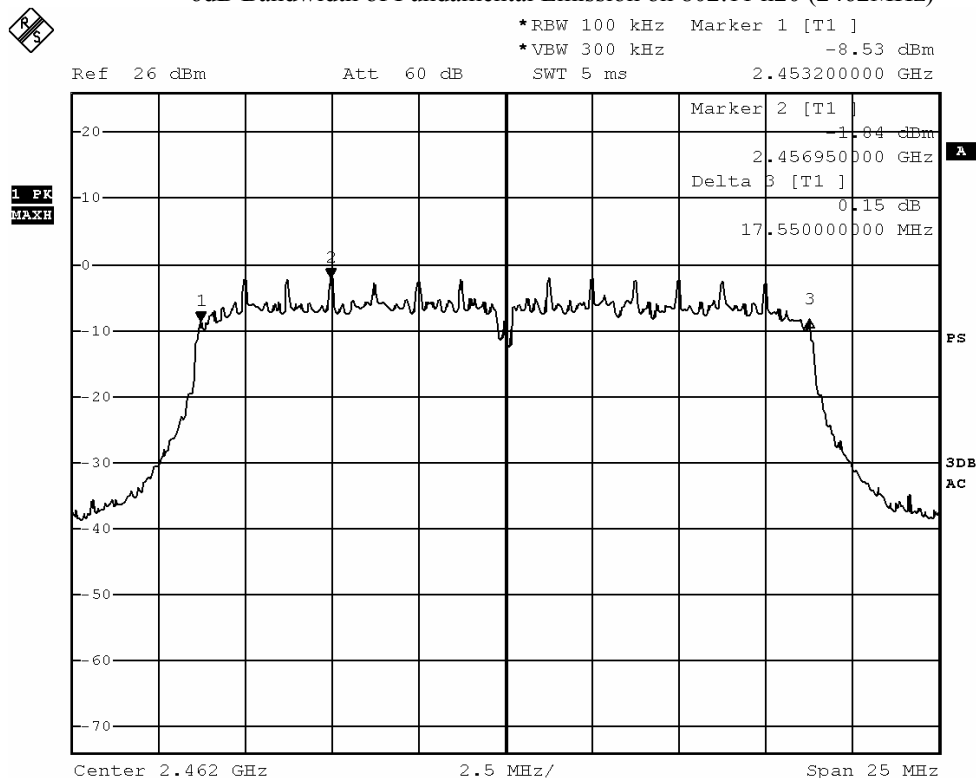
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### Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range<br>[MHz] | 6dB Bandwidth<br>[MHz] | FCC Limits<br>[kHz] |
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| 2462.0                   | 17.55                  | > 500               |

### 6dB Bandwidth of Fundamental Emission on 802.11 n20 (2462MHz)



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## Test Report

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### **3.1.5 Band Edges Measurement**

Test Requirement: FCC 47CFR 15.247  
Test Method: ANSI C63.10:2013  
Test Date: 2018-11-02  
Mode of Operation: Wifi mode

Ambient Temperature: 25°C      Relative Humidity: 51%      Atmospheric Pressure: 101 kPa

#### **Test Method:**

The band edge is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. The RBW are set to 100kHz and VBW are set to 300kHz for this measurement.

#### **Test Setup:**

As Test Setup of clause 3.1.2 in this test report.

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### Band-edge Compliance of RF Conducted Emissions Measurement:

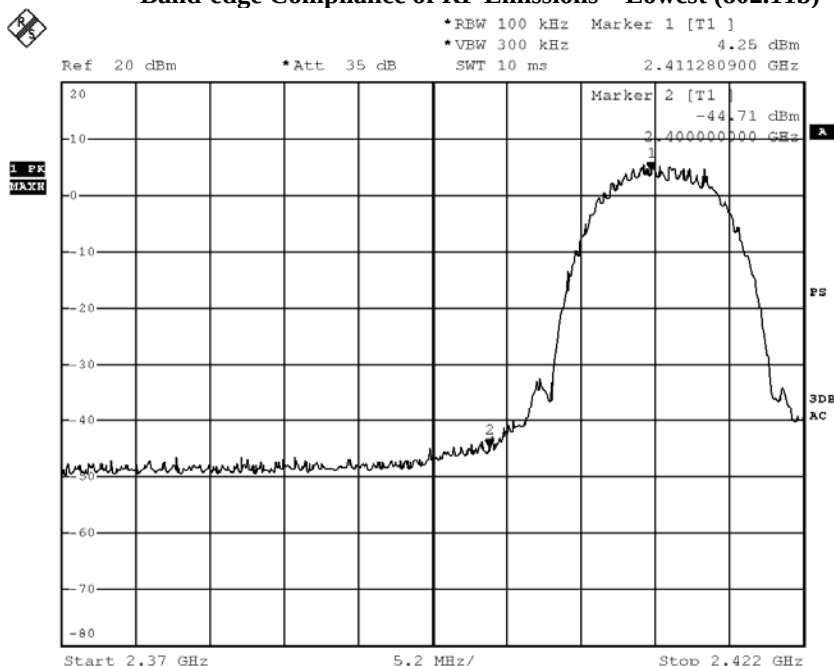
#### Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

| Frequency Range                  | Conducted Emission Attenuated below the Fundamental |
|----------------------------------|-----------------------------------------------------|
| [MHz]                            | [dB]                                                |
| 2400 – Lowest Fundamental (2402) | 48.96                                               |

### Band-edge Compliance of RF Emissions – Lowest (802.11b)



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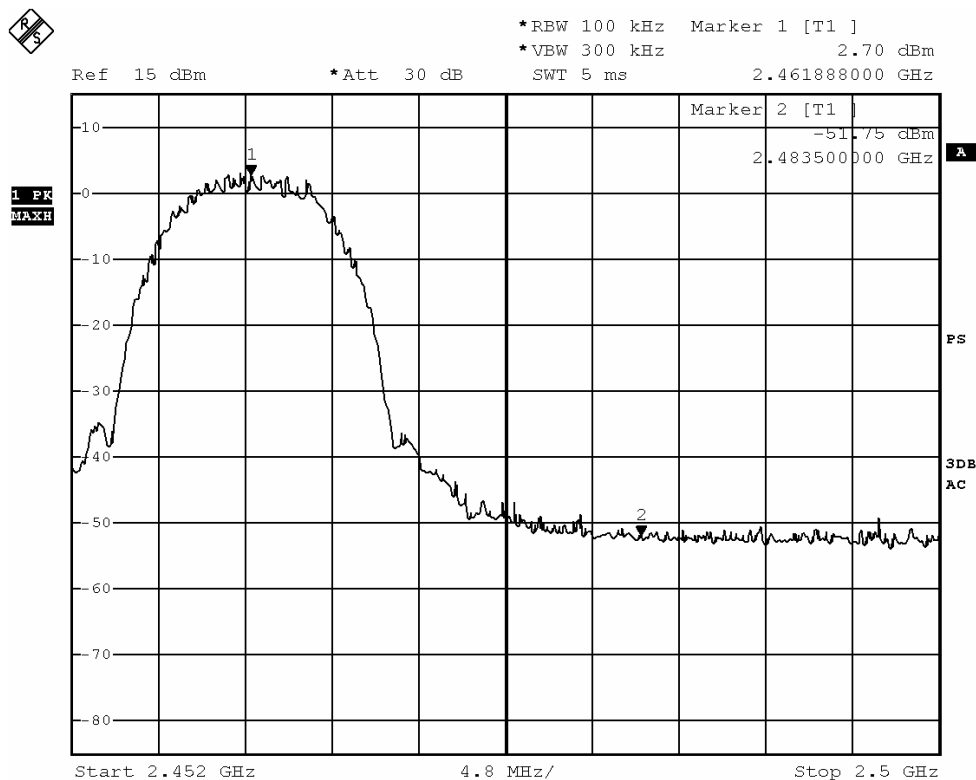
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### Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range<br>[MHz]            | Conducted Emission Attenuated below the<br>Fundamental<br>[dB] |
|-------------------------------------|----------------------------------------------------------------|
| 2483.5 - Highest Fundamental (2480) | 54.45                                                          |

### Band-edge Compliance of RF Emissions – Highest (802.11b)



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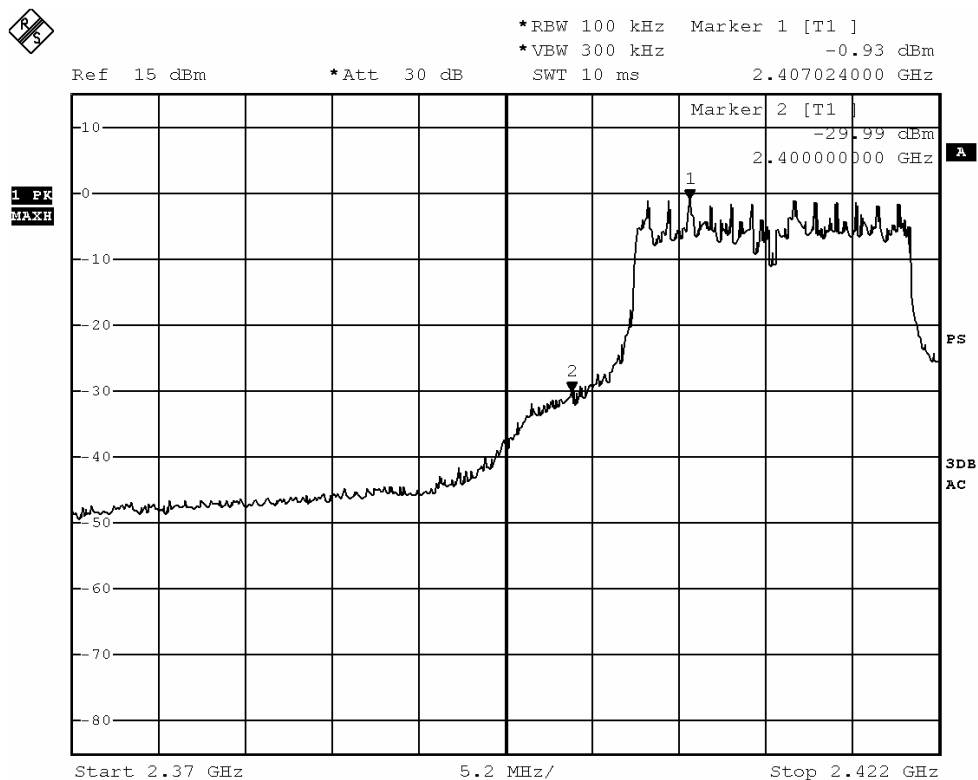
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### Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range<br>[MHz]         | Conducted Emission Attenuated below the<br>Fundamental<br>[dB] |
|----------------------------------|----------------------------------------------------------------|
| 2400 - Lowest Fundamental (2402) | 29.06                                                          |

### Band-edge Compliance of RF Emissions – Lowest (802.11g)



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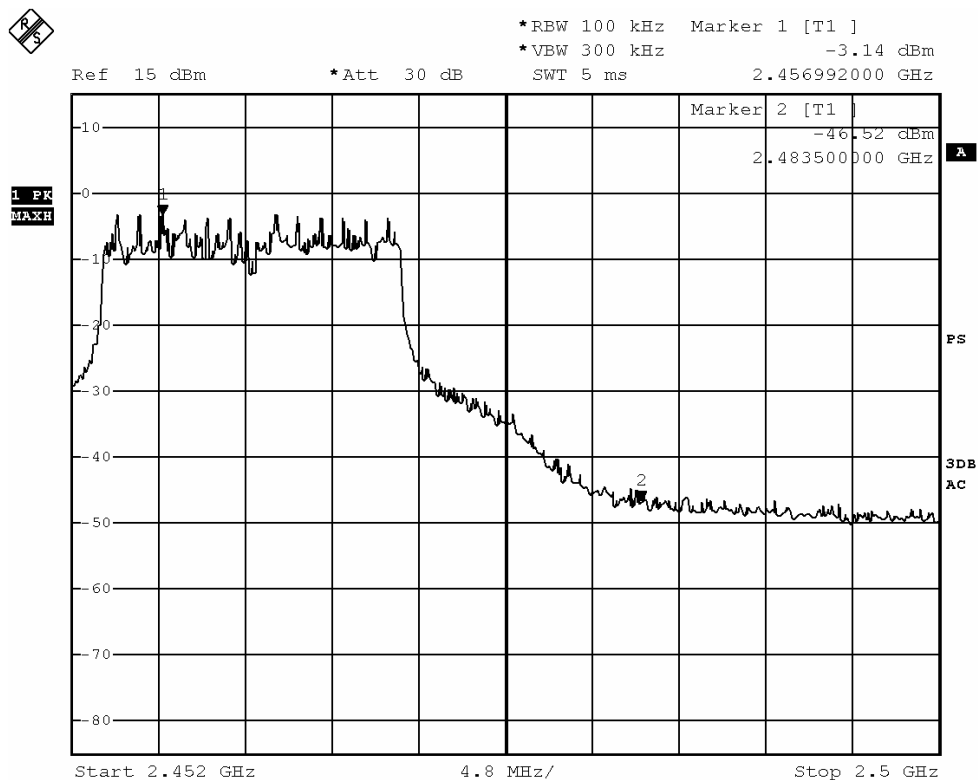
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### Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range<br>[MHz]            | Conducted Emission Attenuated below the<br>Fundamental<br>[dB] |
|-------------------------------------|----------------------------------------------------------------|
| 2483.5 - Highest Fundamental (2480) | 43.38                                                          |

### Band-edge Compliance of RF Emissions – Highest (802.11g)



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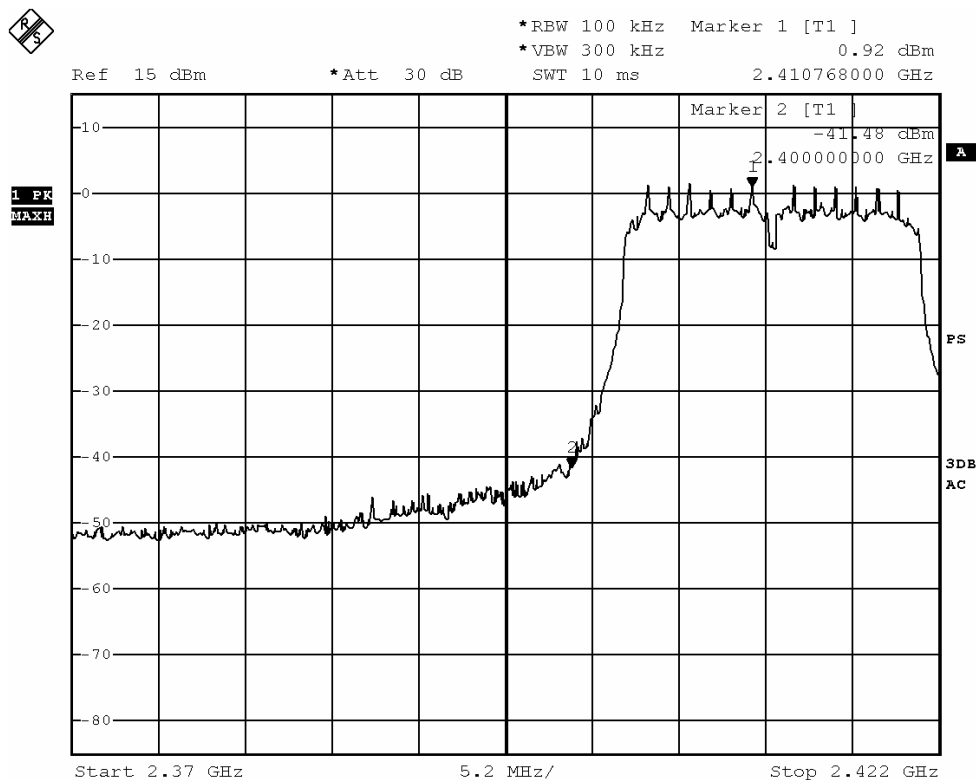
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### Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range<br>[MHz]         | Conducted Emission Attenuated below the<br>Fundamental<br>[dB] |
|----------------------------------|----------------------------------------------------------------|
| 2400 - Lowest Fundamental (2402) | 42.40                                                          |

### Band-edge Compliance of RF Emissions – Lowest (802.11n20)



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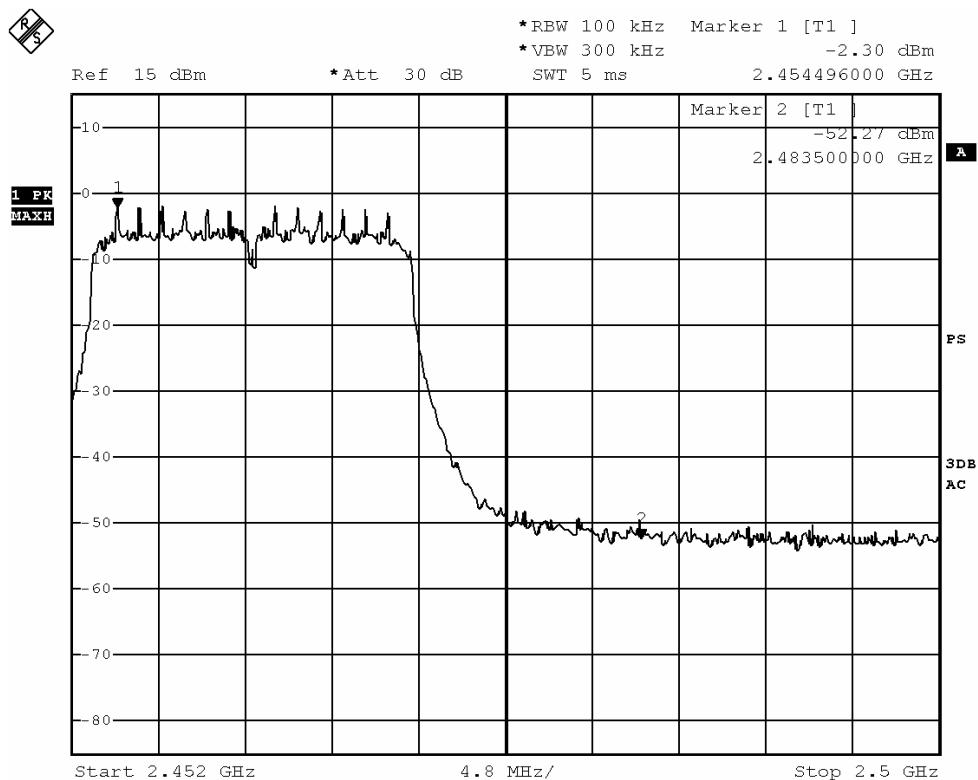
Date : 2018-11-07  
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### Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range<br>[MHz]            | Conducted Emission Attenuated below the<br>Fundamental<br>[dB] |
|-------------------------------------|----------------------------------------------------------------|
| 2483.5 - Highest Fundamental (2480) | 49.97                                                          |

### Band-edge Compliance of RF Emissions – Highest (802.11n20)



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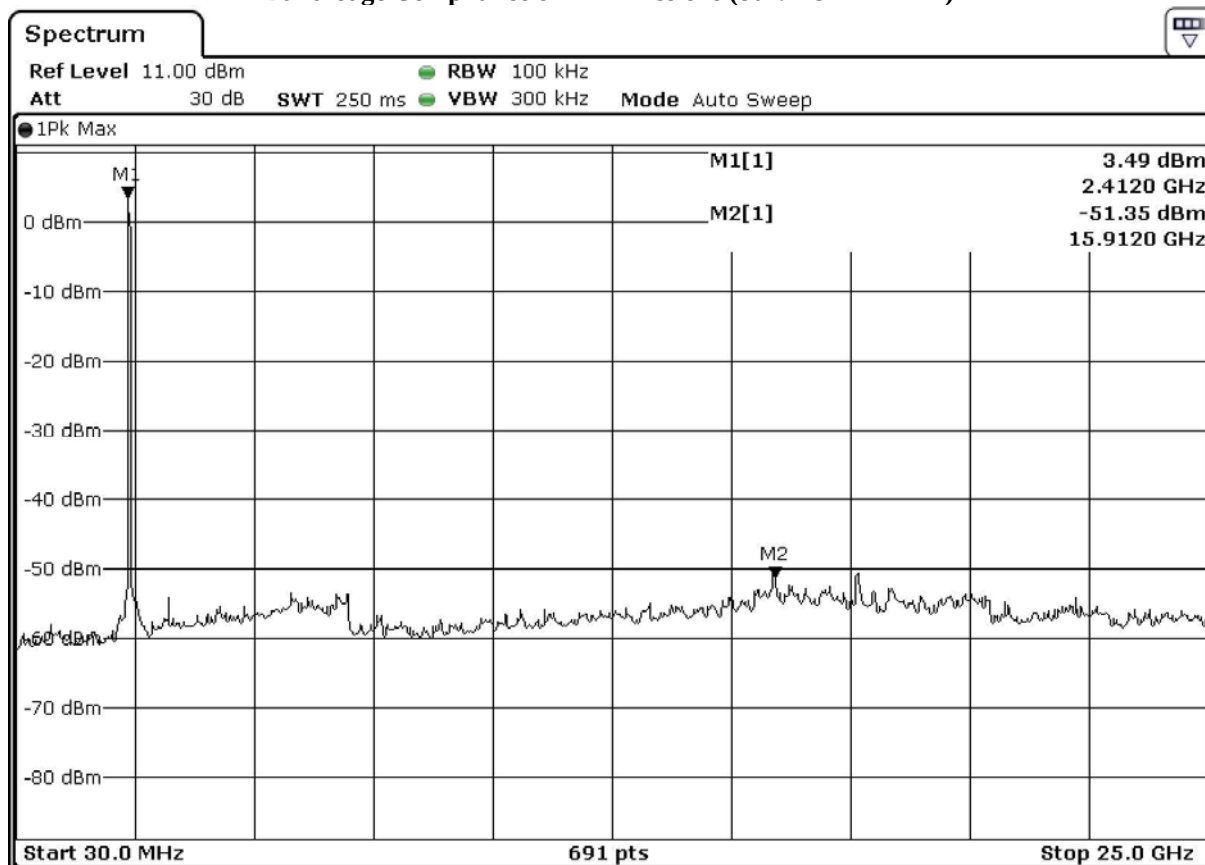
### Band-edge Compliance of RF Conducted Emissions Measurement:

#### Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

### Band-edge Compliance of RF Emissions (802.11b 2412MHz)



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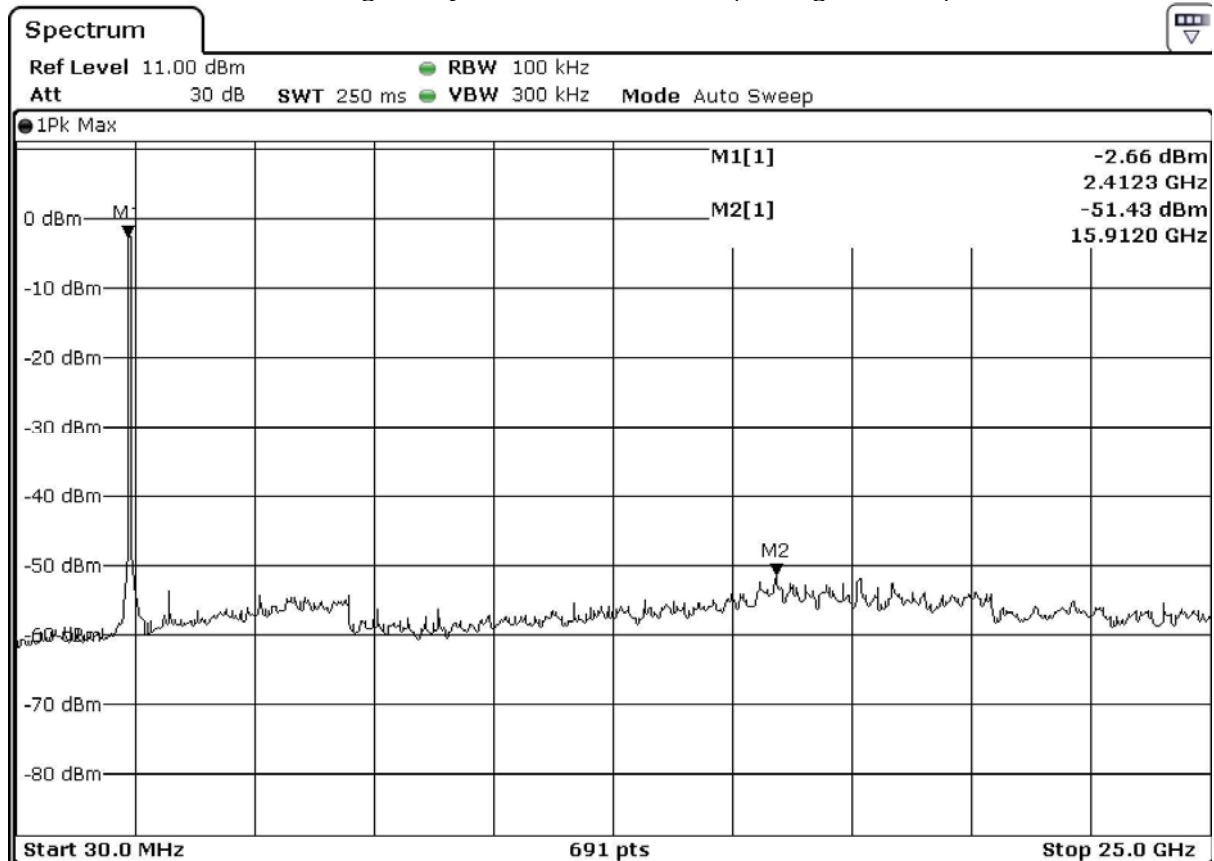


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### Band-edge Compliance of RF Emissions (802.11g 2412MHz)



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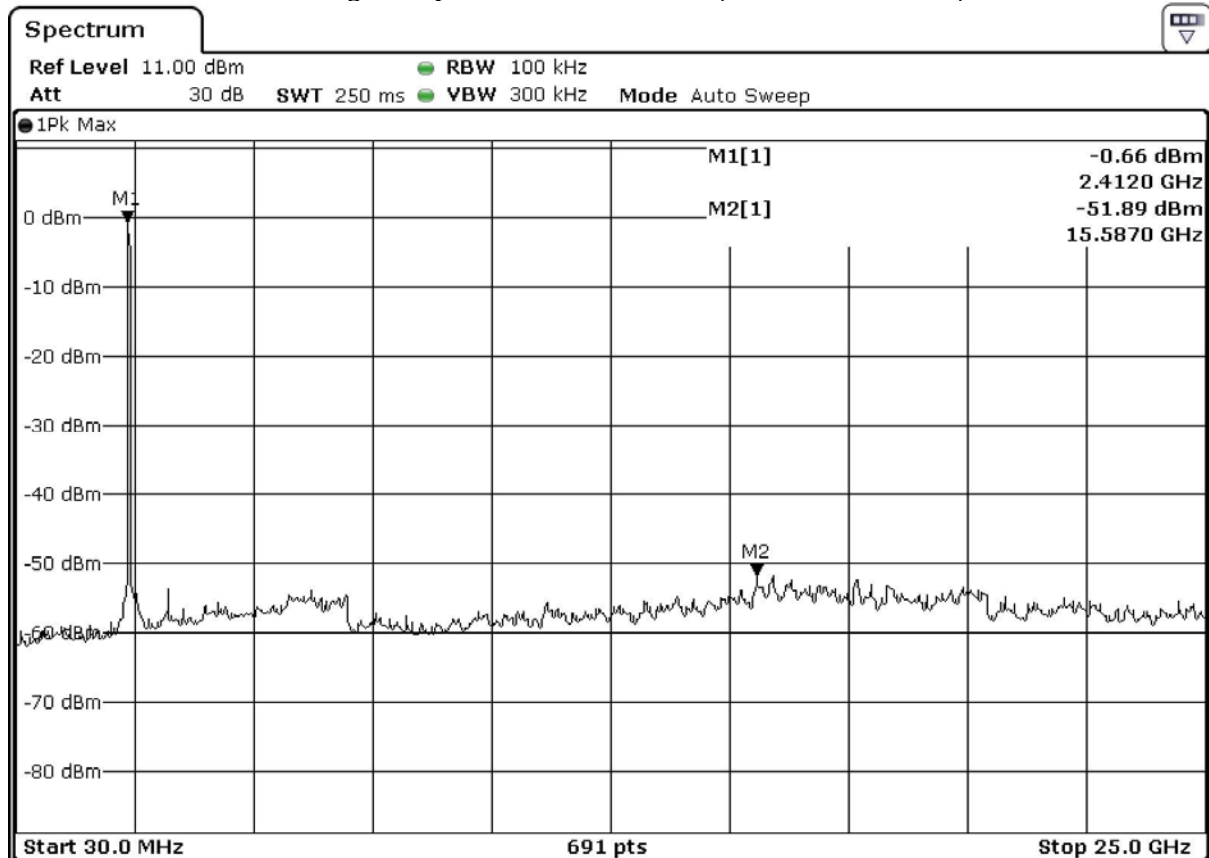


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### Band-edge Compliance of RF Emissions (802.11n20 2412MHz)



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### **3.1.6 Antenna Requirement**

Ambient Temperature: 25°C

Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

**Test Requirements: § 15.203**

#### **Test Specification:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### **Test Results:**

This is PCB antenna. There is no external antenna, the 2014MHz antenna gain = 2.33dBi, the 2437MHz antenna gain = 2.56dBi, the 2462MHz antenna gain = 2.69dBi. User is unable to remove or changed the Antenna.

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### Appendix A

#### List of Measurement Equipment

##### Radiated Emission

| EQP NO. | DESCRIPTION                                  | MANUFACTURER             | MODEL NO.       | SERIAL NO.     | LAST CAL   | DUE CAL    |
|---------|----------------------------------------------|--------------------------|-----------------|----------------|------------|------------|
| EM215   | MULTIDEVICE CONTROLLER                       | EMCO                     | 2090            | 00024676       | N/A        | N/A        |
| EM217   | ELECTRIC POWERED TURNTABLE                   | EMCO                     | 2088            | 00029144       | N/A        | N/A        |
| EM218   | ANECHOIC CHAMBER                             | ETS-LINDGREN             | FACT-3          | --             | 2018/01/24 | 2019/01/24 |
| EM356   | ANTENNA POSITIONING TOWER                    | ETS-LINDGREN             | 2171B           | 00150346       | N/A        | N/A        |
| EM354   | BICONILOG ANTENNA                            | ETS-LINDGREN             | 3143B           | 00142073       | 2018/03/29 | 2020/03/29 |
| EM229   | EMI TEST RECEIVER                            | R&S                      | ESIB40          | 100248         | 2018/06/01 | 2019/06/01 |
| EM276   | BROADBAND HORN ANTENNA                       | A-INFOMW                 | JXTXLB-10180-SF | J2031090903007 | 2018/04/27 | 2020/04/27 |
| EM300   | PYRAMIDAL STANDARD GAIN HORN ANTENNA         | ETS-LINDGREN             | 3160-09         | 00130130       | 2018/05/13 | 2019/05/13 |
| EM301   | PYRAMIDAL STANDARD GAIN HORN ANTENNA         | ETS-LINDGREN             | 3160-10         | 00130988       | 2018/05/13 | 2019/05/13 |
| EM302   | PRECISION OMNIDIRECTIONAL DIPOLE (1 – 6GHZ)  | SEIBERSDORF LABORATORIES | POD 16          | 161806/L       | 2018/05/11 | 2020/05/11 |
| EM303   | PRECISION OMNIDIRECTIONAL DIPOLE (6 – 18GHZ) | SEIBERSDORF LABORATORIES | POD 618         | 6181908/L      | 2018/05/11 | 2020/05/11 |
| EM353   | LOOP ANTENNA                                 | ETS LINDGREN             | 6502            | 00206533       | 2018/04/16 | 2020/04/16 |
| EM045   | POWER METER                                  | ROHDE & SCHWARZ          | NRVD            | 843246/028     | 2018/10/14 | 2019/10/14 |

#### Remarks:-

CM Corrective Maintenance  
N/A Not Applicable  
TBD To Be Determined

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### Appendix B

#### Photographs of EUT

**Front View of the product**



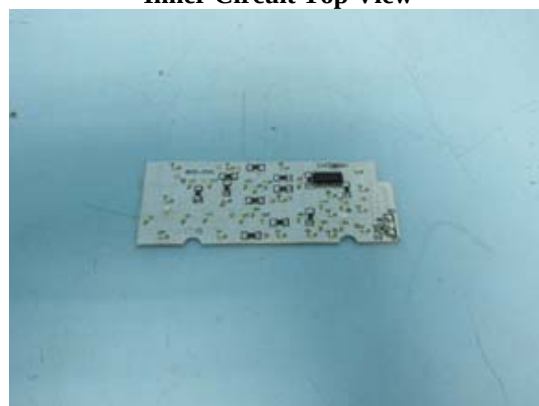
**Rear View of the product**



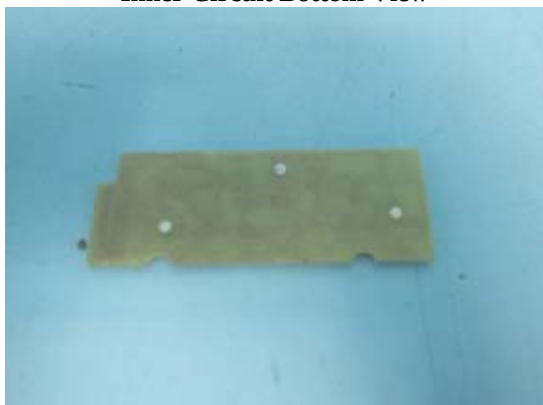
**Inside View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



**Inner Circuit Top View**



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### Appendix B

#### Photographs of EUT

##### Inner Circuit Bottom View



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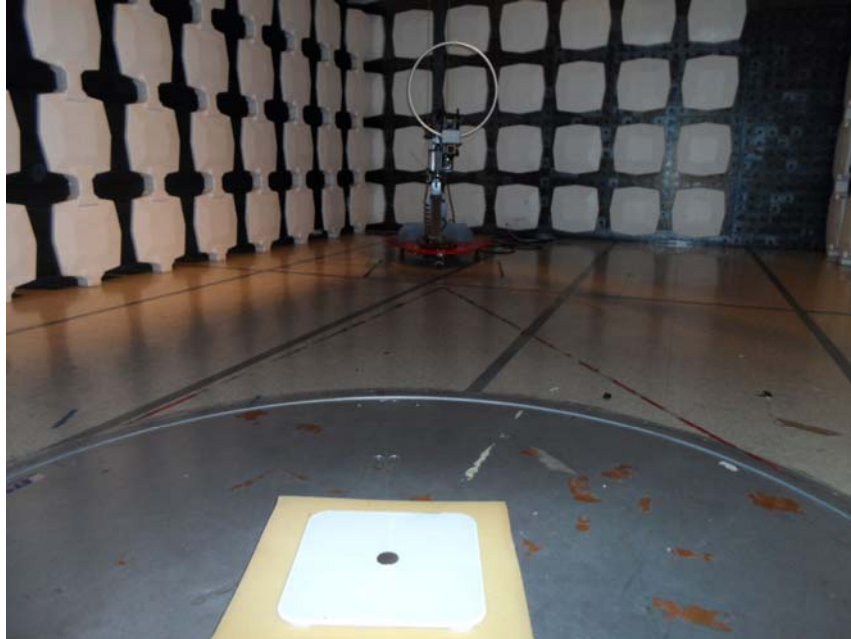
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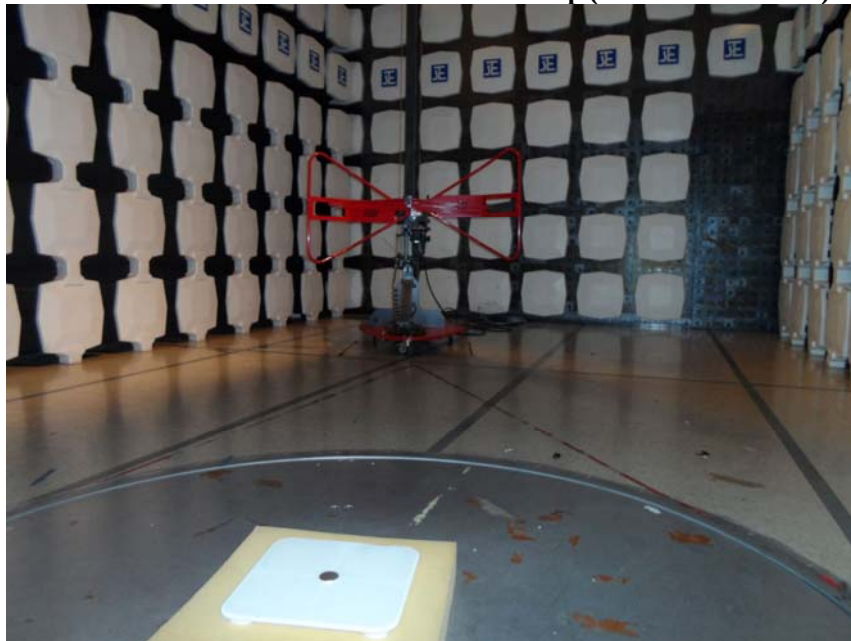
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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up (9kHz – 30MHz)**



**Measurement of Radiated Emission Test Set Up (30MHz – 1000MHz)**



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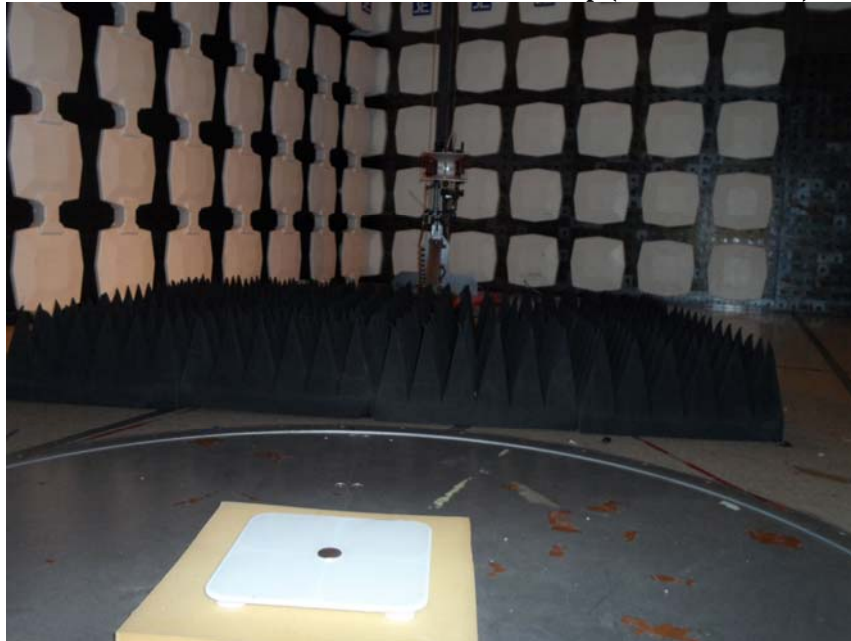
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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up (above 1000MHz)**



**\*\*\*\*\* End of Test Report \*\*\*\*\***

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