

FCC PART 15C TEST REPORT FOR CERTIFICATION  
On Behalf of

Tymphany HK Limited

Portable Bluetooth Speaker

Model Number: Groove

FCC ID: 2AAGJGROOVE

Prepared for : Tymphany HK Limited  
Room 1307-8, Dominon Centre, 43-59 Queen's Road East,  
WanChai, Hong Kong

Prepared By : EST Technology Co., Ltd.  
Santun(guantai Road), Houjie Town, DongGuan City,  
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Report Number: ESTE-R1509003  
Date of Test : August 06~31,2015  
Date of Report : September 06, 2015

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## Test Report Verification

|  |  |  |                   |
|--|--|--|-------------------|
| <b>Applicant:</b>  | Tymphany HK Limited  |  |                   |
| <b>Address:</b>  | Room 1307-8, Dominon Centre, 43-59 Queen's Road East,<br>WanChai, Hong Kong  |  |                   |
| <b>Manufacturer</b>  | Klipsch Group, Inc.  |  |                   |
| <b>Address:</b>  | 3502 Woodview Trace, Indianapolis, IN 46268  |  |                   |
| <b>E.U.T:</b>  | Portable Bluetooth Speaker   |  |                   |
| <b>Model Number:</b>   | Groove   |  |                   |
| <b>Power Supply:</b>   | DC 5V From Adapter Input AC 100-240V~50/60Hz<br>Adapter 1: APP521-050100U; Adapter 2:DYS052-050100S-2  |  |                   |
| <b>Test Voltage:</b>   | AC 120V/60Hz<br>AC 240V/60Hz   |  |                   |
| <b>Trade Name:</b>   | Klipsch  | <b>Serial No.:</b>   | -----             |
| <b>Date of Receipt:</b>  | August 06 ,2015  | <b>Date of Test:</b>   | August 06~31,2015 |
| <b>Test Specification:</b>   | FCC Rules and Regulations Part 15 Subpart C:2014<br>ANSI C63.10:2013   |  |                   |
| <b>Test Result:</b>  | <p>The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the ETSI EN FCC Rules and Regulations Part 15 Subpart C requirements.</p> <p style="text-align: right;">This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.</p> <p style="text-align: right;">Date: September 06, 2015</p> |  |                   |
| <b>Prepared by:</b>  | <b>Tested by:</b>  | <b>Approved by:</b>  |                   |
| <br><hr style="width: 100px; margin: 0 auto;"/>   | <br><hr style="width: 100px; margin: 0 auto;"/>   | <br><hr style="width: 100px; margin: 0 auto;"/> |                   |
| Ada / Assistant  | Tony.Tang/ Engineer  | IcemanHu / Manager   |                   |
| <b>Other Aspects:</b>  | None.  |  |                   |
| <i>Abbreviations: OK/P=passed    fail/F=failed    n.a/N=not applicable    E.U.T=equipment under tested</i>   |  |  |                   |
| <i>This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.</i> |  |  |                   |



## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                            |   |   |    |
|----------------------------|---|---|----|
| <b>Product Name</b>        | : | Portable Bluetooth Speaker  |    |
| <b>Model Number</b>        | : | Groove  |    |
| <b>FCC ID</b>              | : | 2AAGJGROOVE   |    |
| <b>Operation frequency</b> | : | 2402MHz~2480MHz   |    |
| <b>Number of channel</b>   | : | 79  | 40 |
| <b>Antenna</b>             | : | Integrated PCB antenna, 0 dBi gain  |    |
| <b>Modulation</b>          | : | FHSS Bluetooth V4.0 BLE: GFSK<br>BT BDR: GFSK<br>BT EDR: $\pi/4$ -DQPSK<br>BT EDR: 8-DPSK |    |
| <b>Sample Type</b>         | : | Prototype production  |    |

## 2. SUMMARY OF TEST

### 2.1. Summary of test result

| Description of Test Item                  | Standard  | Results |
|---|---|---------|
| Power Line Conducted Emission             | FCC Part 15: 15.207<br>ANSI C63.10:2013               | PASS    |
| Radiated Emission                         | FCC Part 15: 15.209<br>ANSI C63.10:2013<br>KDB 558074 | PASS    |
| Band Edge Compliance                      | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>KDB 558074 | PASS    |
| Conducted spurious emissions              | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>KDB 558074 | PASS    |
| 6dB Bandwidth                             | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>KDB 558074 | PASS    |
| Peak Output Power                         | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>KDB 558074 | PASS    |
| Power Spectral Density                    | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>KDB 558074 | PASS    |
| Antenna requirement                       | FCC Part 15: 15.203                                   | PASS    |
| Note: 558074 D01 DTS Meas Guidance v03r02 |   |         |

## 2.2. Test Facilities

EMC Lab :      Certificated by CNAL, CHINA  
Registration No.: L5288  
Date of registration: November 13, 2014

Certificated by FCC, USA  
Registration No.: 989591  
Date of registration: November 20, 2013

Certificated by Industry Canada  
Registration No.: 46405-9405  
Test Side Number: 9405A-1  
Date of registration: January 03, 2013

Certificated by VCCI, Japan  
Registration No.: R-3663 & C-4103  
Date of registration: July 25, 2011

Certificated by TUV Rheinland, Germany  
Registration No.: UA 50195514 0001  
Date of registration: January 07, 2011

Certificated by TUV/PS, Shenzhen  
Registration No.: SCN1017  
Date of registration: January 27, 2011

Certificated by Intertek ETL SEMKO  
Registration No.: 2011-RTL-L1-18  
Date of registration: April 28, 2011

Certificated by Siemic, Inc.  
Registration No.: SLCN021  
Date of registration: November 8, 2011

Certificated by Nemko, Hong Kong  
Registration No.: 175193  
Date of registration: May 4, 2011

Name of Firm :      EST Technology Co., Ltd.

Site Location :      San Tun Management Zone, Houjie Town, Dongguan,  
Guangdong, China

### 2.3. Measurement uncertainty

| Test Item   | Uncertainty        |
|---|--------------------|
| Uncertainty for Conduction emission test                | 2.54dB             |
| Uncertainty for Radiation Emission test (30MHz-1GHz)    | 3.62               |
| Uncertainty for Radiation Emission test (1GHz to 18GHz) | 4.86               |
| Uncertainty for radio frequency                         | $7 \times 10^{-8}$ |
| Uncertainty for conducted RF Power                      | 0.20dB             |
| Uncertainty for Power density test                      | 0.26dB             |

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 2.4. Assistant equipment used for test

#### 2.4.1. Adapter 1

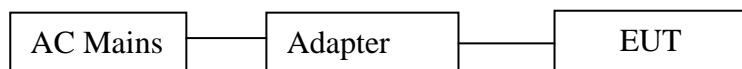
M / N : APP521-050100U  
 Manufacturer : DYS  
 INPUT : AC 100-240V, 50/60Hz, 0.45A Max.  
 OUTPUT : DC 5V, 1A

#### 2.4.2. Adapter 2

M / N : DYS052-050100S-2  
 Manufacturer : DYS  
 INPUT : AC 100-240V, 50/60Hz, 0.15A Max.  
 OUTPUT : DC 5V, 1A

### 2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was be set into BT test mode by software before test.



(EUT: Portable Bluetooth Speaker)



## 2.6. Test mode

A special test software was used to control EUT work in Continuous TX mode(100% duty cycle), and select test channel, wireless mode and data rate.

| Mode            | Channel | Frequency |
|-----------------|---------|-----------|
| BT 4.0-BLE GFSK | Low     | 2402MHz   |
|                 | Middle  | 2440MHz   |
|                 | High    | 2480MHz   |

## 2.7. Channel List for Bluetooth

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|
| 1           | 2402            | 2           | 2404            |
| 3           | 2406            | 4           | 2408            |
| 5           | 2410            | 6           | 2412            |
| 7           | 2414            | 8           | 2416            |
| 9           | 2418            | 10          | 2420            |
| 11          | 2422            | 12          | 2424            |
| 13          | 2426            | 14          | 2428            |
| 15          | 2430            | 16          | 2432            |
| 17          | 2434            | 18          | 2436            |
| 19          | 2438            | 20          | 2440            |
| 21          | 2442            | 22          | 2444            |
| 23          | 2446            | 24          | 2448            |
| 25          | 2450            | 26          | 2452            |
| 27          | 2454            | 28          | 2456            |
| 29          | 2458            | 30          | 2460            |
| 31          | 2462            | 32          | 2464            |
| 33          | 2466            | 34          | 2468            |
| 35          | 2470            | 36          | 2472            |
| 37          | 2474            | 38          | 2476            |
| 39          | 2478            | 40          | 2480            |

## 2.8. Test Equipment

### 2.8.1. For conducted emission test

| Equipment               | Manufacturer    | Model No. | Serial No. | Last Cal.  | Next Cal. |
|-------------------------|-----------------|-----------|------------|------------|-----------|
| EMI Test Receiver       | Rohde & Schwarz | ESHS30    | 832354     | June,28,15 | 1 Year    |
| Artificial Mains Networ | Rohde & Schwarz | ENV216    | 101260     | June,28,15 | 1 Year    |
| Pulse Limiter           | Rohde & Schwarz | ESH3-Z2   | 101100     | June,28,15 | 1 Year    |

### 2.8.2. For radiated emission test(30-1000MHz)

| Equipment         | Manufacturer    | Model No. | Serial No. | Last Cal.  | Next Cal. |
|-------------------|-----------------|-----------|------------|------------|-----------|
| EMI Test Receiver | Rohde & Schwarz | ESVS10    | 100004     | June,28,15 | 1 Year    |
| Spectrum Analyzer | Agilent         | E4411B    | MY50140697 | June,28,15 | 1 Year    |
| Bilog Antenna     | Teseq           | CBL 6111D | 27090      | June,28,15 | 1 Year    |
| Signal Amplifier  | Agilent         | 310N      | 187037     | June,28,15 | 1 Year    |

### 2.8.3. For radiated emission test(above 1GHz)

| Equipment                    | Manufacturer   | Model No.   | Serial No.    | Last Cal.  | Next Cal. |
|------------------------------|----------------|-------------|---------------|------------|-----------|
| Horn Antenna                 | SCHWARZBECK    | BBHA 9120 D | BBHA9120D1002 | June,28,15 | 1 Year    |
| Signal Amplifier             | SCHWARZBECK    | BBV9718     | 9718-212      | June,28,15 | 1 Year    |
| Spectrum Analyzer            | Agilent        | E4408B      | MY44211139    | June,28,15 | 1 Year    |
| Signal and Spectrum Analyzer | Rohde &Schwarz | FSV         | 103173        | June,28,15 | 1 Year    |

### 3 POWER LINE CONDUCTED EMISSION TEST

#### 3.1. Limit

| Frequency       | Maximum RF Line Voltage          |                               |
|-----------------|----------------------------------|-------------------------------|
|                 | Quasi-Peak Level<br>dB( $\mu$ V) | Average Level<br>dB( $\mu$ V) |
| 150kHz ~ 500kHz | 66 ~ 56*                         | 56 ~ 46*                      |
| 500kHz ~ 5MHz   | 56                               | 46                            |
| 5MHz ~ 30MHz    | 60                               | 50                            |

Notes: 1. \* Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

#### 3.3 Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

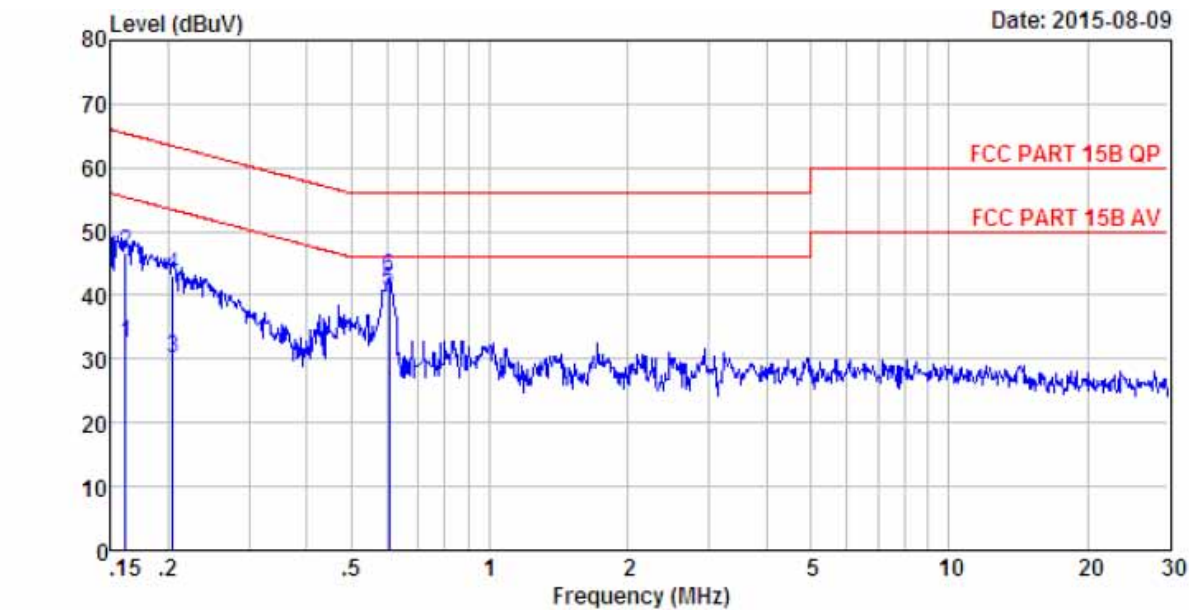
The bandwidth of test receiver (R & S ESHS30) is set at 10kHz.

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

#### 3.4. Test Result

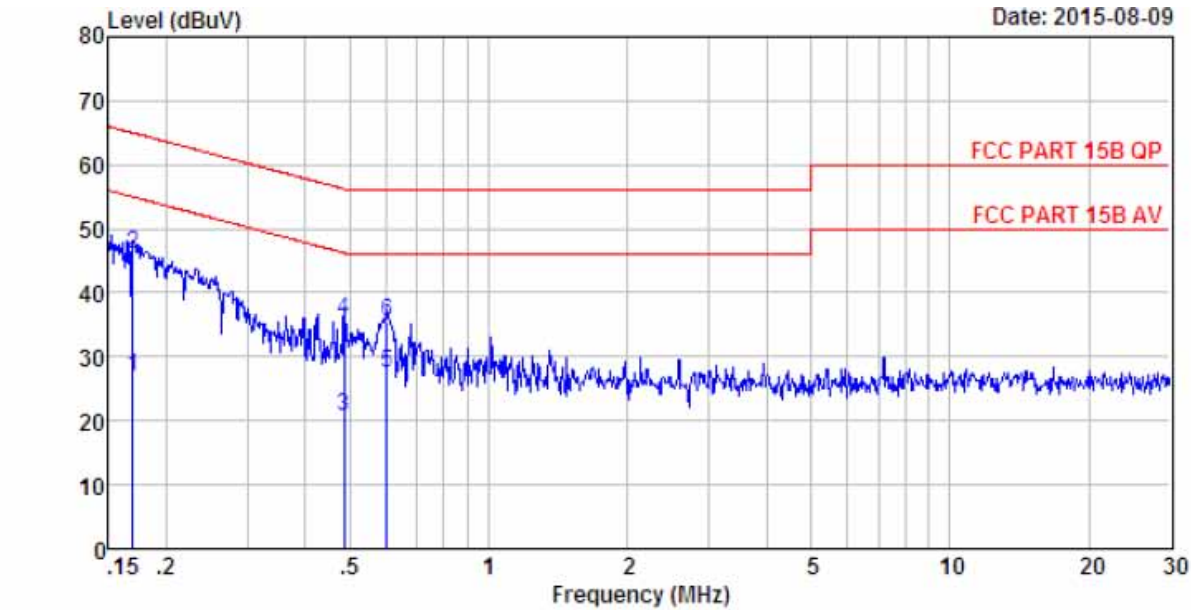
**PASS.** (All emissions not reported below are too low against the prescribed limits.)

3.5. Test data



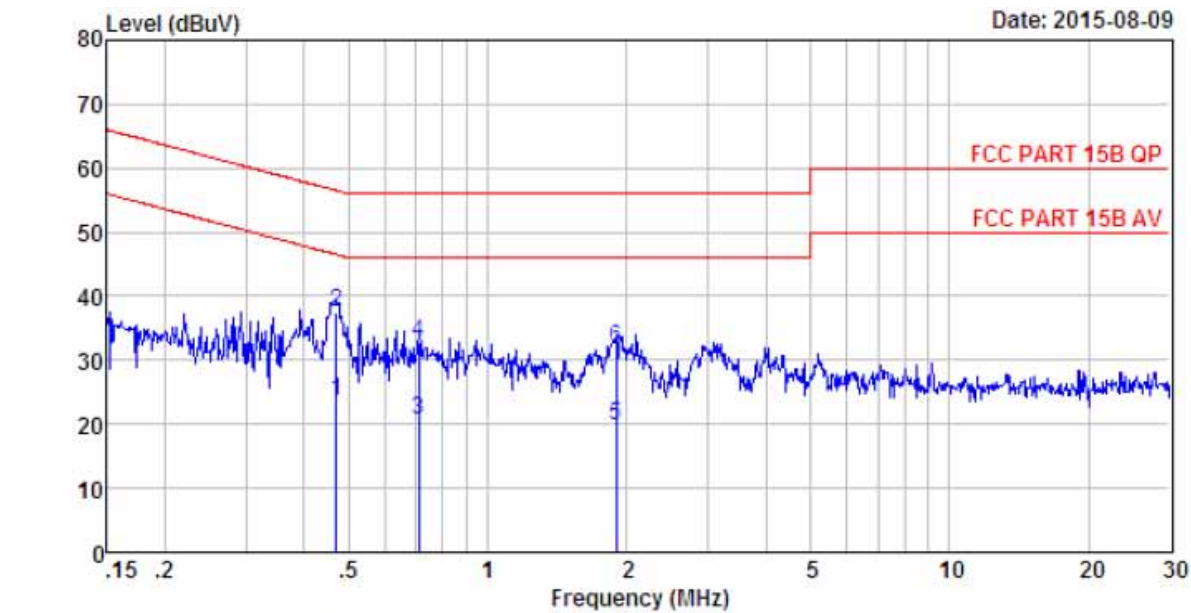
Site no : 844 Shield Room  
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa LINE  
Limit : FCC PART 15B QP  
Engineer : Tony  
EUT : Portable Bluetooth Speaker  
Power : DC 5V From Adapter Input AC 120V/60Hz  
M/N : Groove  
Test Mode : TX Mode  
Adapter 1

|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBUV) | Emission<br>Level<br>(dBUV) | Limits<br>(dBUV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.16           | 9.61                   | 9.81                  | 13.12             | 32.54                       | 55.38            | 22.84          | Average |
| 2 | 0.16           | 9.61                   | 9.81                  | 27.12             | 46.54                       | 65.38            | 18.84          | QP      |
| 3 | 0.20           | 9.61                   | 9.80                  | 10.65             | 30.06                       | 53.45            | 23.39          | Average |
| 4 | 0.20           | 9.61                   | 9.80                  | 23.65             | 43.06                       | 63.45            | 20.39          | QP      |
| 5 | 0.60           | 9.60                   | 9.82                  | 21.36             | 40.78                       | 46.00            | 5.22           | Average |
| 6 | 0.60           | 9.60                   | 9.82                  | 23.36             | 42.78                       | 56.00            | 13.22          | QP      |



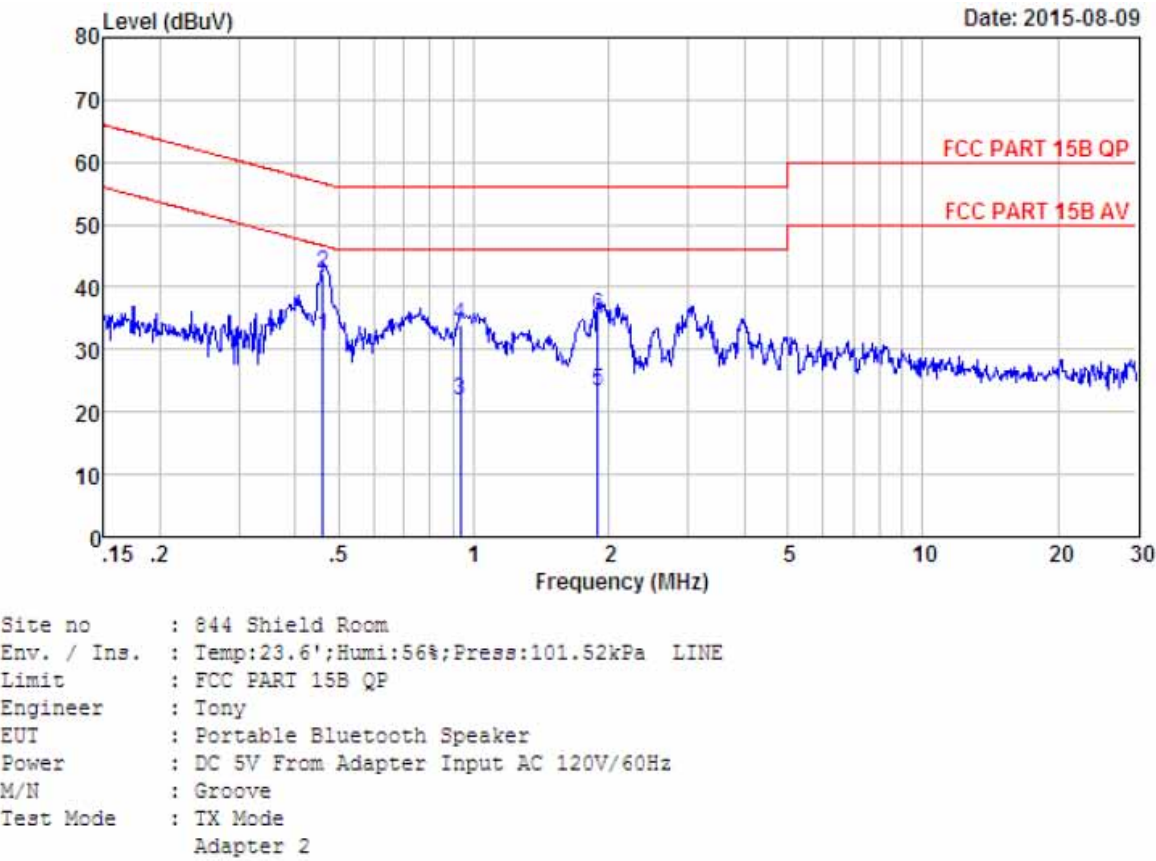
Site no : 844 Shield Room  
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa NEUTRAL  
Limit : FCC PART 15B QP  
Engineer : Tony  
EUT : Portable Bluetooth Speaker  
Power : DC 5V From Adapter Input AC 120V/60Hz  
M/N : Groove  
Test Mode : TX Mode  
Adapter 1

|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.17           | 9.52                   | 9.81                  | 7.67              | 27.00                       | 54.99            | 27.99          | Average |
| 2 | 0.17           | 9.52                   | 9.81                  | 26.67             | 46.00                       | 64.99            | 18.99          | QP      |
| 3 | 0.49           | 9.59                   | 9.81                  | 1.33              | 20.73                       | 46.23            | 25.50          | Average |
| 4 | 0.49           | 9.59                   | 9.81                  | 16.33             | 35.73                       | 56.23            | 20.50          | QP      |
| 5 | 0.60           | 9.61                   | 9.82                  | 7.98              | 27.41                       | 46.00            | 18.59          | Average |
| 6 | 0.60           | 9.61                   | 9.82                  | 15.98             | 35.41                       | 56.00            | 20.59          | QP      |



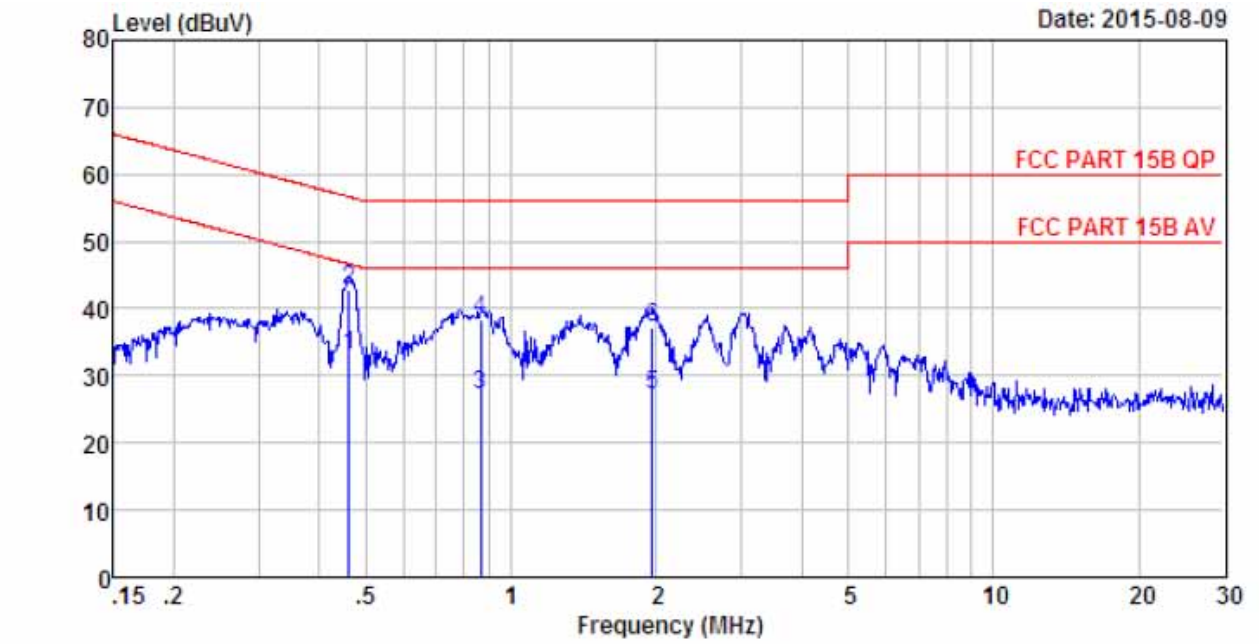
Site no : 844 Shield Room  
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa NEUTRAL  
Limit : FCC PART 15B QP  
Engineer : Tony  
EUT : Portable Bluetooth Speaker  
Power : DC 5V From Adapter Input AC 120V/60Hz  
M/N : Groove  
Test Mode : TX Mode  
Adapter 2

|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.47           | 9.59                   | 9.81                  | 4.17              | 23.57                       | 46.49            | 22.92          | Average |
| 2 | 0.47           | 9.59                   | 9.81                  | 18.17             | 37.57                       | 56.49            | 18.92          | QP      |
| 3 | 0.71           | 9.63                   | 9.81                  | 1.26              | 20.70                       | 46.00            | 25.30          | Average |
| 4 | 0.71           | 9.63                   | 9.81                  | 13.26             | 32.70                       | 56.00            | 23.30          | QP      |
| 5 | 1.90           | 9.62                   | 9.84                  | 0.36              | 19.82                       | 46.00            | 26.18          | Average |
| 6 | 1.90           | 9.62                   | 9.84                  | 12.36             | 31.82                       | 56.00            | 24.18          | QP      |



|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.46           | 9.61                   | 9.81                  | 12.67             | 32.09                       | 46.67            | 14.58          | Average |
| 2 | 0.46           | 9.61                   | 9.81                  | 22.67             | 42.09                       | 56.67            | 14.58          | QP      |
| 3 | 0.93           | 9.63                   | 9.82                  | 2.46              | 21.91                       | 46.00            | 24.09          | Average |
| 4 | 0.93           | 9.63                   | 9.82                  | 14.46             | 33.91                       | 56.00            | 22.09          | QP      |
| 5 | 1.89           | 9.61                   | 9.84                  | 3.97              | 23.42                       | 46.00            | 22.58          | Average |
| 6 | 1.89           | 9.61                   | 9.84                  | 15.97             | 35.42                       | 56.00            | 20.58          | QP      |

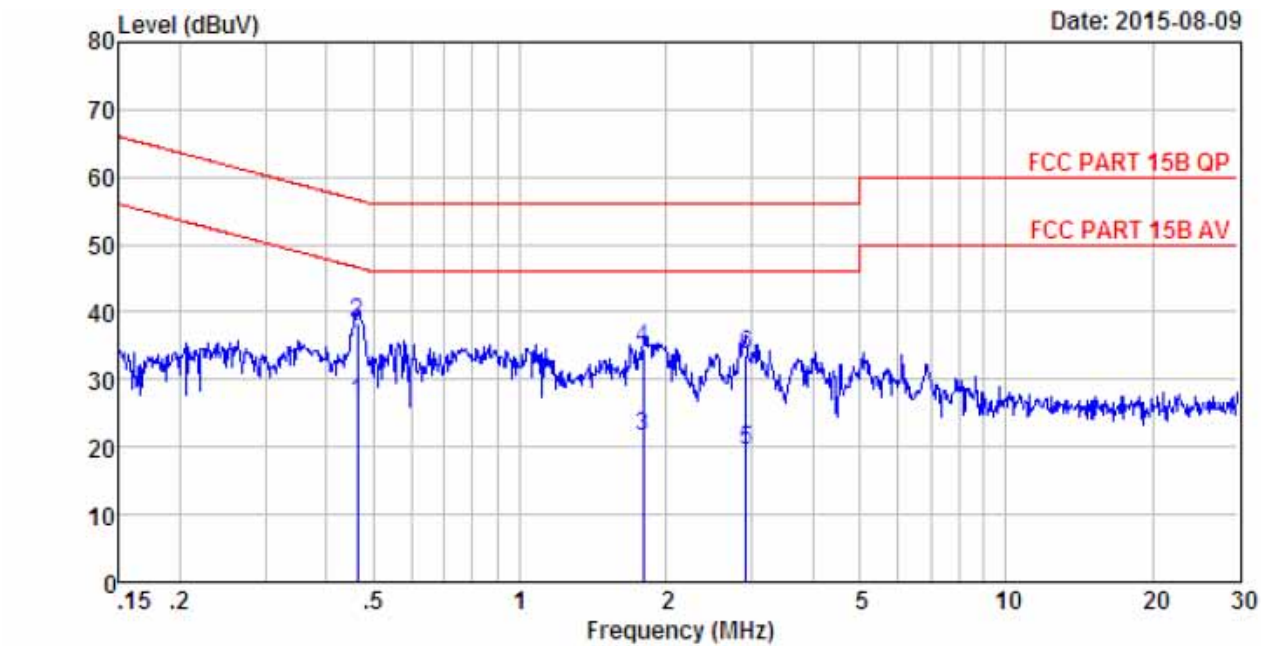




Site no : 844 Shield Room  
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa LINE  
Limit : FCC PART 15B QP  
Engineer : Tony  
EUT : Portable Bluetooth Speaker  
Power : DC 5V From Adapter Input AC 240V/60Hz  
M/N : Groove  
Test Mode : TX Mode  
Adapter 2

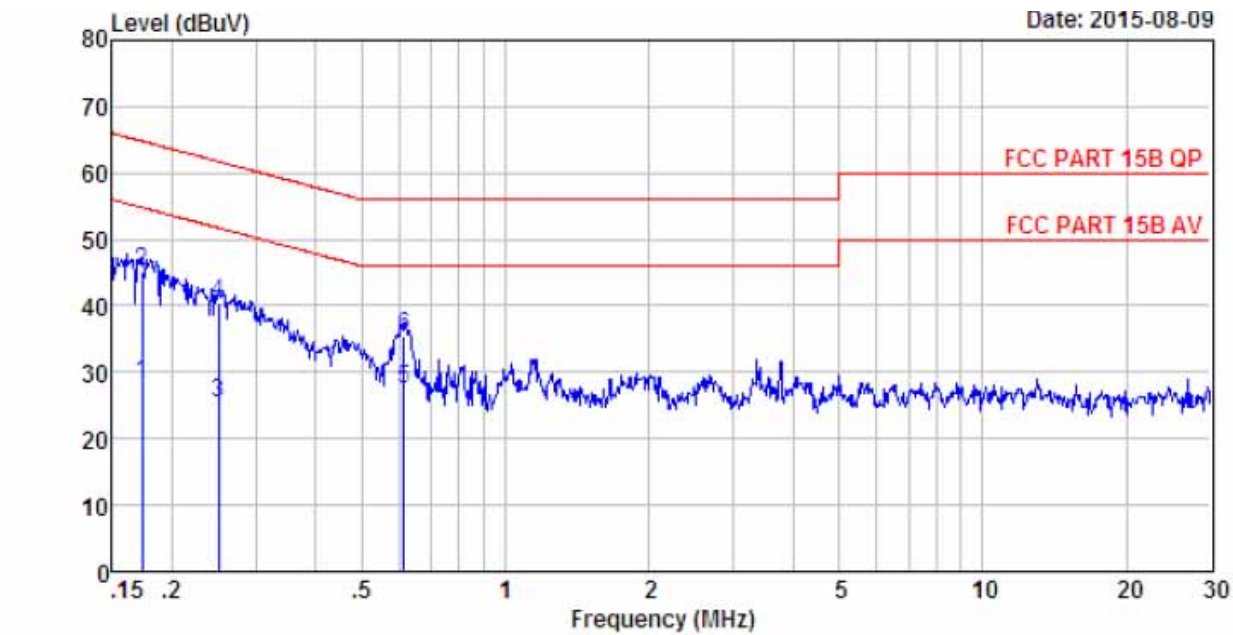
|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.46           | 9.61                   | 9.81                  | 13.51             | 32.93                       | 46.67            | 13.74          | Average |
| 2 | 0.46           | 9.61                   | 9.81                  | 23.51             | 42.93                       | 56.67            | 13.74          | QP      |
| 3 | 0.87           | 9.62                   | 9.82                  | 7.81              | 27.25                       | 46.00            | 18.75          | Average |
| 4 | 0.87           | 9.62                   | 9.82                  | 18.81             | 38.25                       | 56.00            | 17.75          | QP      |
| 5 | 1.96           | 9.61                   | 9.83                  | 7.70              | 27.14                       | 46.00            | 18.86          | Average |
| 6 | 1.96           | 9.61                   | 9.83                  | 17.70             | 37.14                       | 56.00            | 18.86          | QP      |





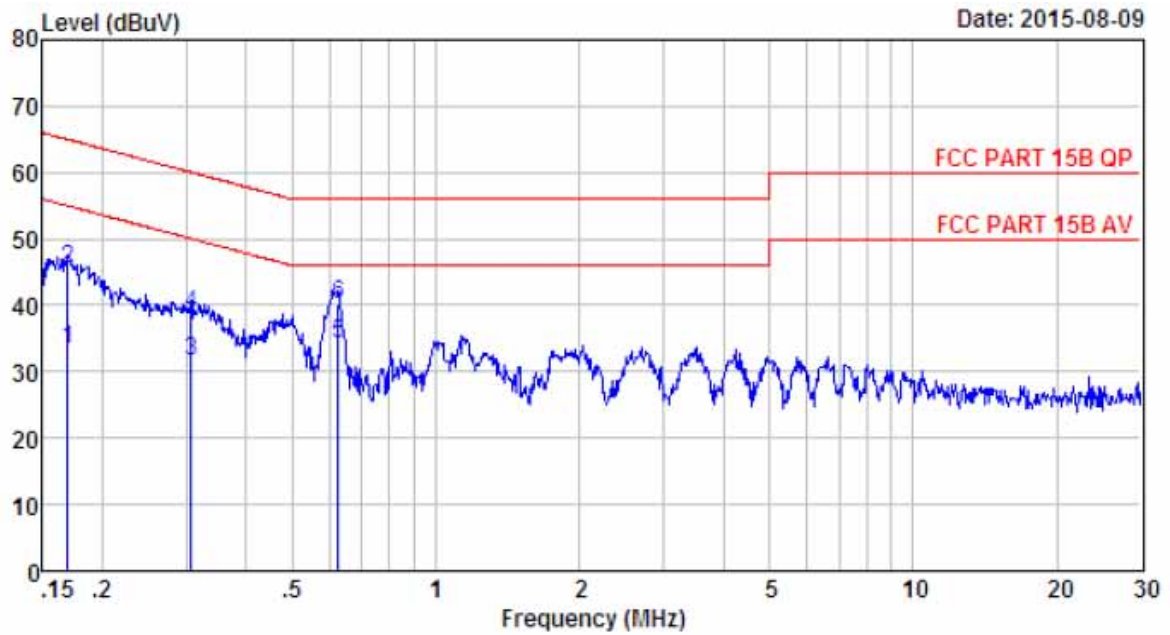
Site no : 844 Shield Room  
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa NEUTRAL  
Limit : FCC PART 15B QP  
Engineer : Tony  
EUT : Portable Bluetooth Speaker  
Power : DC 5V From Adapter Input AC 240V/60Hz  
M/N : Groove  
Test Mode : IX Mode  
Adapter 2

|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.46           | 9.59                   | 9.81                  | 7.12              | 26.52                       | 46.63            | 20.11          | Average |
| 2 | 0.46           | 9.59                   | 9.81                  | 19.12             | 38.52                       | 56.63            | 18.11          | QP      |
| 3 | 1.79           | 9.62                   | 9.81                  | 2.09              | 21.52                       | 46.00            | 24.48          | Average |
| 4 | 1.79           | 9.62                   | 9.81                  | 15.09             | 34.52                       | 56.00            | 21.48          | QP      |
| 5 | 2.92           | 9.63                   | 9.85                  | 0.13              | 19.61                       | 46.00            | 26.39          | Average |
| 6 | 2.92           | 9.63                   | 9.85                  | 14.13             | 33.61                       | 56.00            | 22.39          | QP      |



Site no : 844 Shield Room  
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa NEUTRAL  
Limit : FCC PART 15B QP  
Engineer : Tony  
EUT : Portable Bluetooth Speaker  
Power : DC 5V From Adapter Input AC 240V/60Hz  
M/N : Groove  
Test Mode : TX Mode  
Adapter 1

|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.17           | 9.53                   | 9.81                  | 8.94              | 28.28                       | 54.81            | 26.53          | Average |
| 2 | 0.17           | 9.53                   | 9.81                  | 25.94             | 45.28                       | 64.81            | 19.53          | QP      |
| 3 | 0.25           | 9.60                   | 9.82                  | 5.99              | 25.41                       | 51.73            | 26.32          | Average |
| 4 | 0.25           | 9.60                   | 9.82                  | 20.99             | 40.41                       | 61.73            | 21.32          | QP      |
| 5 | 0.61           | 9.61                   | 9.82                  | 7.95              | 27.38                       | 46.00            | 18.62          | Average |
| 6 | 0.61           | 9.61                   | 9.82                  | 15.95             | 35.38                       | 56.00            | 20.62          | QP      |



Site no : 844 Shield Room  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa LINE  
 Limit : FCC PART 15B QP  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 240V/60Hz  
 M/N : Groove  
 Test Mode : TX Mode  
 Adapter 1

|   | Freq.<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1 | 0.17           | 9.61                   | 9.81                  | 13.99             | 33.41                       | 54.99            | 21.58          | Average |
| 2 | 0.17           | 9.61                   | 9.81                  | 25.99             | 45.41                       | 64.99            | 19.58          | QP      |
| 3 | 0.31           | 9.61                   | 9.83                  | 12.19             | 31.63                       | 50.06            | 18.43          | Average |
| 4 | 0.31           | 9.61                   | 9.83                  | 19.19             | 38.63                       | 60.06            | 21.43          | QP      |
| 5 | 0.62           | 9.60                   | 9.81                  | 14.81             | 34.22                       | 46.00            | 11.78          | Average |
| 6 | 0.62           | 9.60                   | 9.81                  | 20.81             | 40.22                       | 56.00            | 15.78          | QP      |

## 4 RADIATED EMISSION TEST

### 4.1 Limit

#### 4.1.1 15.209 limits

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT   |                                   |
|------------------|--------------------|---|-----------------------------------|
|                  |                    | $\mu\text{V}/\text{m}$  | $\text{dB}(\mu\text{V})/\text{m}$ |
| 30 ~ 88          | 3                  | 100   | 40.0                              |
| 88 ~ 216         | 3                  | 150   | 43.5                              |
| 216 ~ 960        | 3                  | 200   | 46.0                              |
| 960 ~ 1000       | 3                  | 500   | 54.0                              |
| Above 1000       | 3                  | 74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak)<br>54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average) |                                   |

- Remark : (1) Emission level  $\text{dB}\mu\text{V} = 20 \log$  Emission level  $\mu\text{V}/\text{m}$   
 (2) The smaller limit shall apply at the cross point between two frequency bands.  
 (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

#### 4.1.2 15.205 Restricted bands of operation

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

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

## 4.2. Test Procedure

EUT was placed on a turn table, which is 0.8 meter high above ground for 30~1000MHz test, and which is 1.5 meter high above ground for above 1GHz test. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

PEAK detector, 1MHz/1MHz for PAEK measurement,  
PEAK detector, 1MHz/10Hz for Average measurement

The frequency range from 30MHz to 10<sup>th</sup> harmonic (25GHz) are checked.

## 4.3 Test Result

**PASS.**

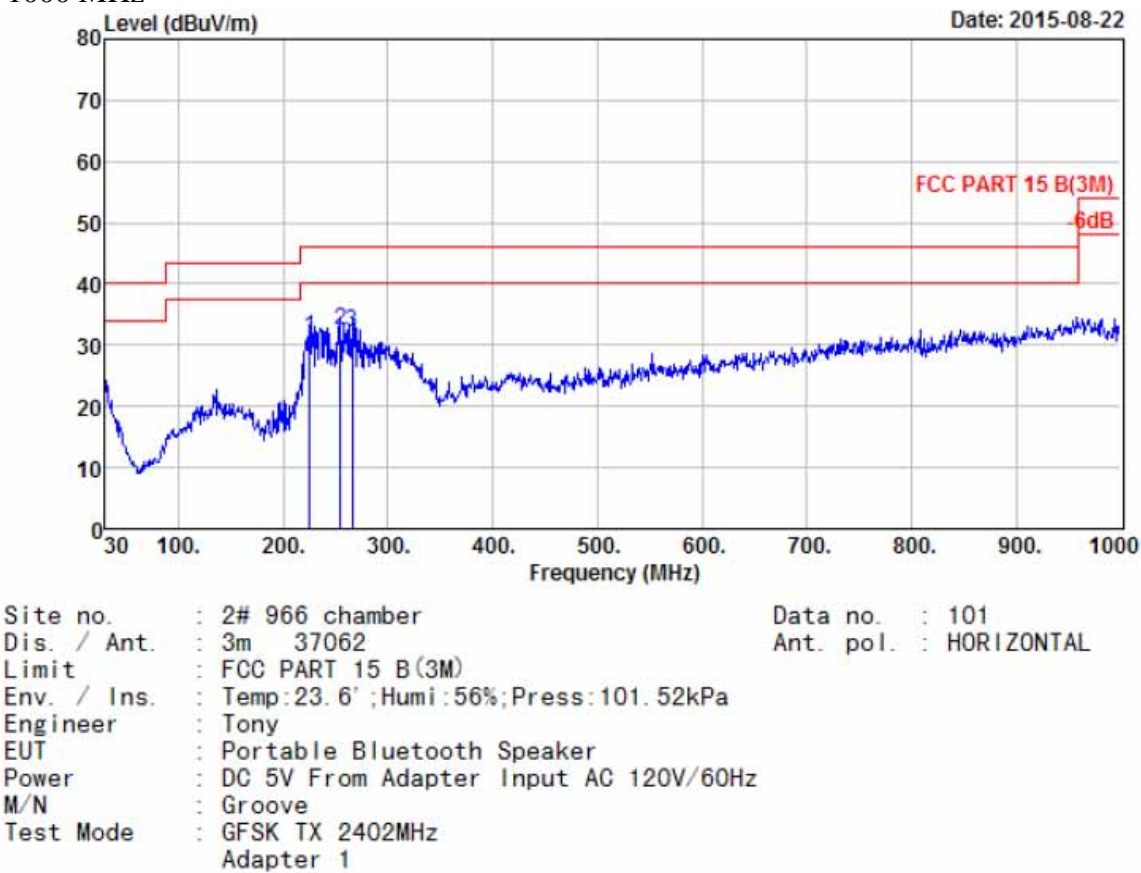
All the emissions from 30MHz to 25 GHz were comply with 15.209 limits.

Note: 1、 For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

2、 The frequency 2402MHz 、 2440MHz and 2480 MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

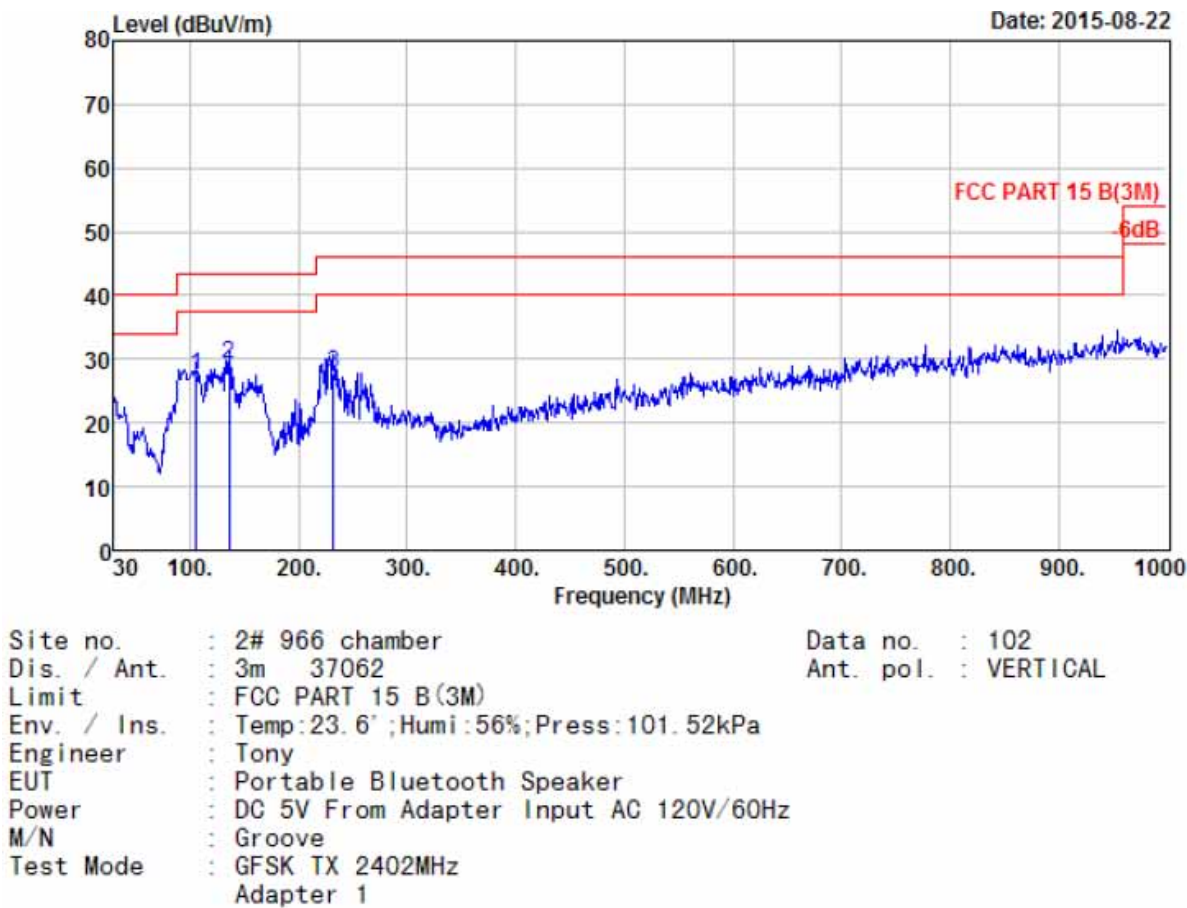
4.4 Test Data

30-1000 MHz

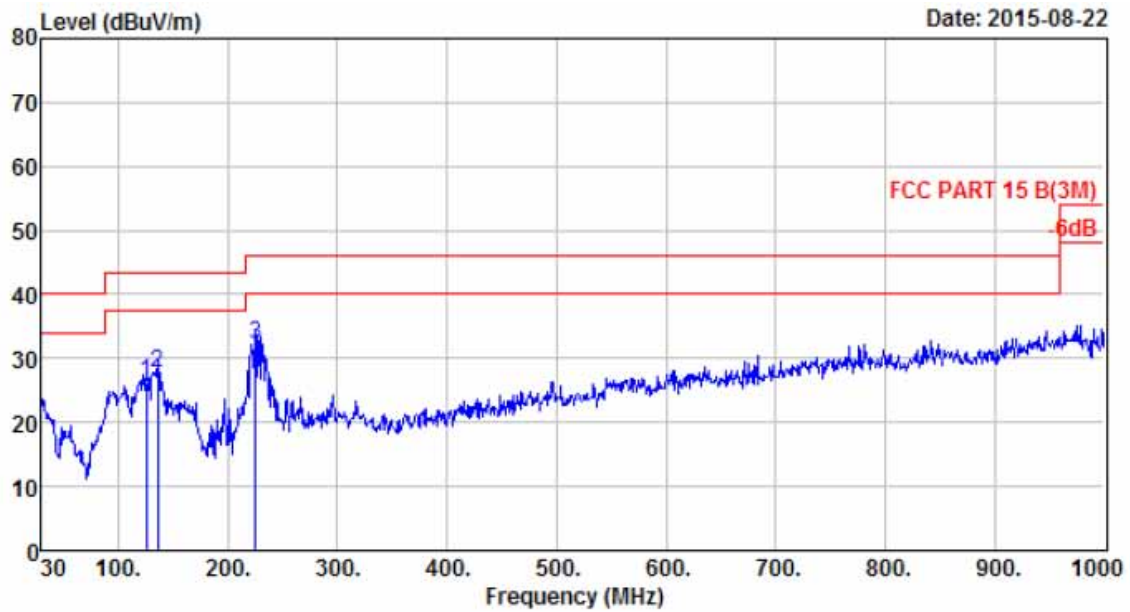


|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 224. 970       | 9. 29                   | 2. 27                 | 19. 71            | 31. 27                        | 46. 00            | 14. 73         | QP     |
| 2 | 255. 040       | 12. 72                  | 2. 22                 | 17. 44            | 32. 38                        | 46. 00            | 13. 62         | QP     |
| 3 | 265. 710       | 13. 24                  | 2. 32                 | 16. 67            | 32. 23                        | 46. 00            | 13. 77         | QP     |





|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 105.660        | 10.11                   | 1.50                  | 15.89             | 27.50                         | 43.50             | 16.00          | QP     |
| 2 | 135.730        | 11.31                   | 1.69                  | 16.25             | 29.25                         | 43.50             | 14.25          | QP     |
| 3 | 231.760        | 9.53                    | 2.19                  | 16.02             | 27.74                         | 46.00             | 18.26          | QP     |

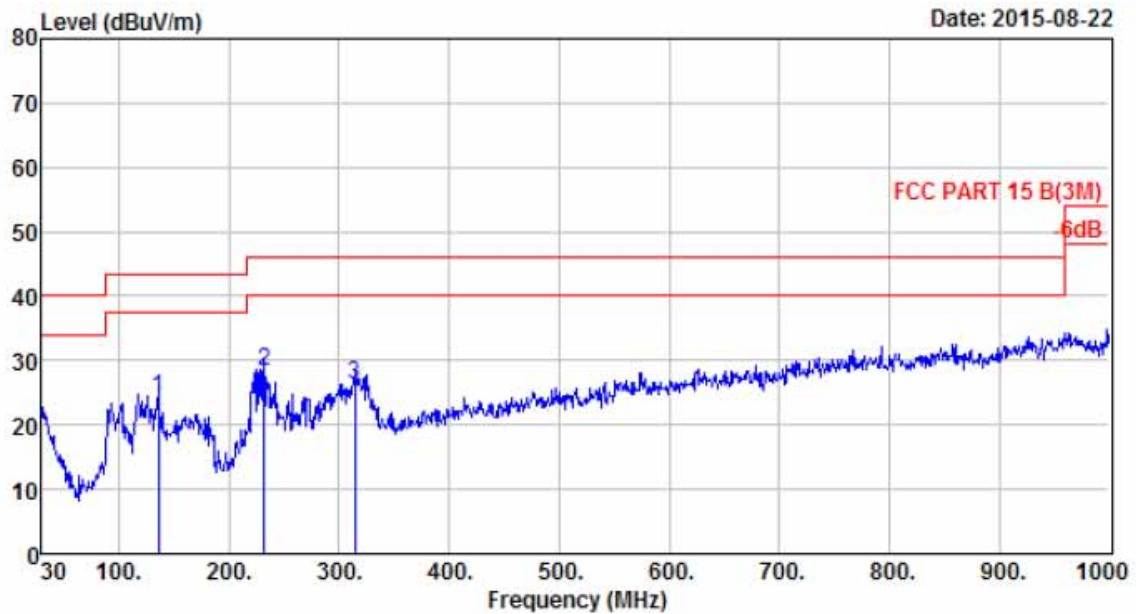


Site no. : 2# 966 chamber  
 Dis. / Ant. : 3m 37062  
 Limit : FCC PART 15 B(3M)  
 Env. / Ins. : Temp:23.6°;Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
 Adapter 1

Data no. : 103  
 Ant. pol. : VERTICAL

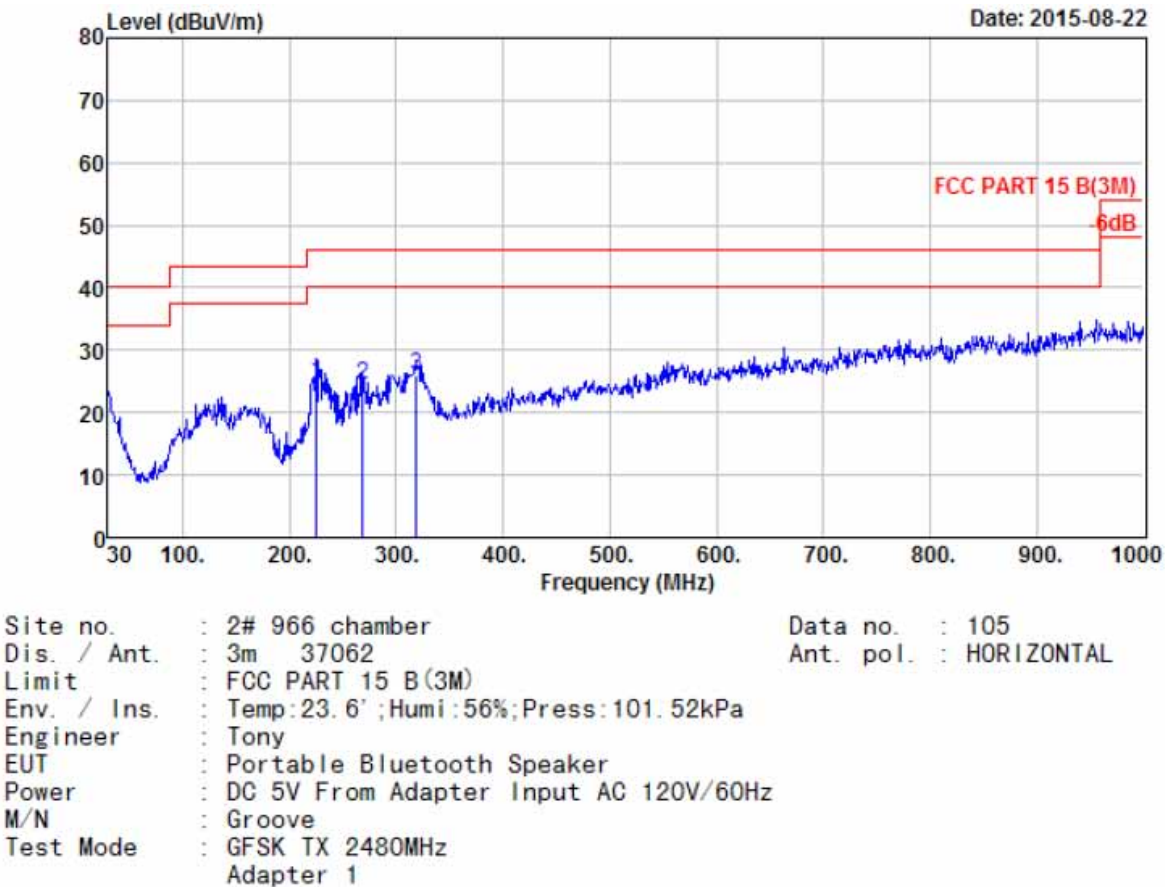
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 126.030        | 11.23                   | 1.48                  | 13.45             | 26.16                         | 43.50             | 17.34          | QP     |
| 2 | 135.730        | 11.31                   | 1.69                  | 14.72             | 27.72                         | 43.50             | 15.78          | QP     |
| 3 | 224.970        | 9.29                    | 2.27                  | 20.65             | 32.21                         | 46.00             | 13.79          | QP     |



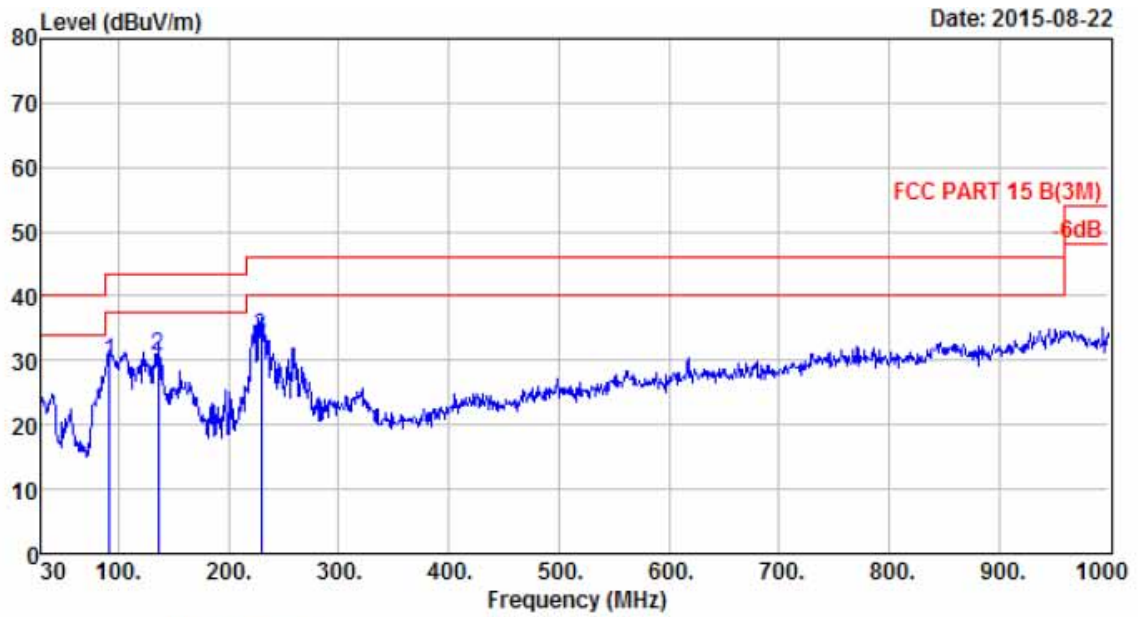


|             |  |           |              |
|-------------|--|-----------|--------------|
| Site no.    | : 2# 966 chamber                           | Data no.  | : 104        |
| Dis. / Ant. | : 3m 37062                                 | Ant. pol. | : HORIZONTAL |
| Limit       | : FCC PART 15 B(3M)                        |           |              |
| Env. / Ins. | : Temp: 23.6°; Humi: 56%; Press: 101.52kPa |           |              |
| Engineer    | : Tony                                     |           |              |
| EUT         | : Portable Bluetooth Speaker               |           |              |
| Power       | : DC 5V From Adapter Input AC 120V/60Hz    |           |              |
| M/N         | : Groove                                   |           |              |
| Test Mode   | : GFSK TX 2440MHz                          |           |              |
|             | : Adapter 1                                |           |              |

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 135.730        | 11.31                   | 1.69                  | 11.30             | 24.30                         | 43.50             | 19.20          | QP     |
| 2 | 231.760        | 9.53                    | 2.19                  | 16.69             | 28.41                         | 46.00             | 17.59          | QP     |
| 3 | 314.210        | 13.28                   | 2.44                  | 10.70             | 26.42                         | 46.00             | 19.58          | QP     |



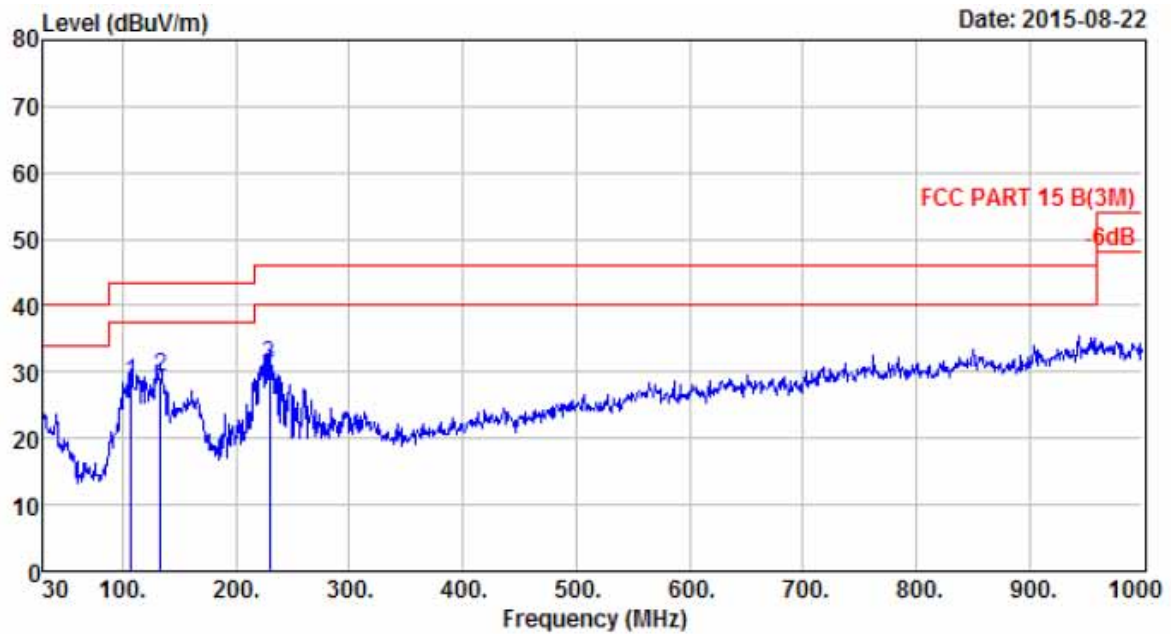
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 224.970        | 9.29                    | 2.27                  | 13.11             | 24.67                         | 46.00             | 21.33          | QP     |
| 2 | 268.620        | 12.83                   | 2.31                  | 9.27              | 24.41                         | 46.00             | 21.59          | QP     |
| 3 | 319.060        | 13.52                   | 2.57                  | 9.87              | 25.96                         | 46.00             | 20.04          | QP     |



Site no. : 2# 966 chamber  
 Dis. / Ant. : 3m 37062  
 Limit : FCC PART 15 B(3M)  
 Env. / Ins. : Temp: 23.6°; Humi: 56%; Press: 101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
 Adapter 1

Data no. : 106  
 Ant. pol. : VERTICAL

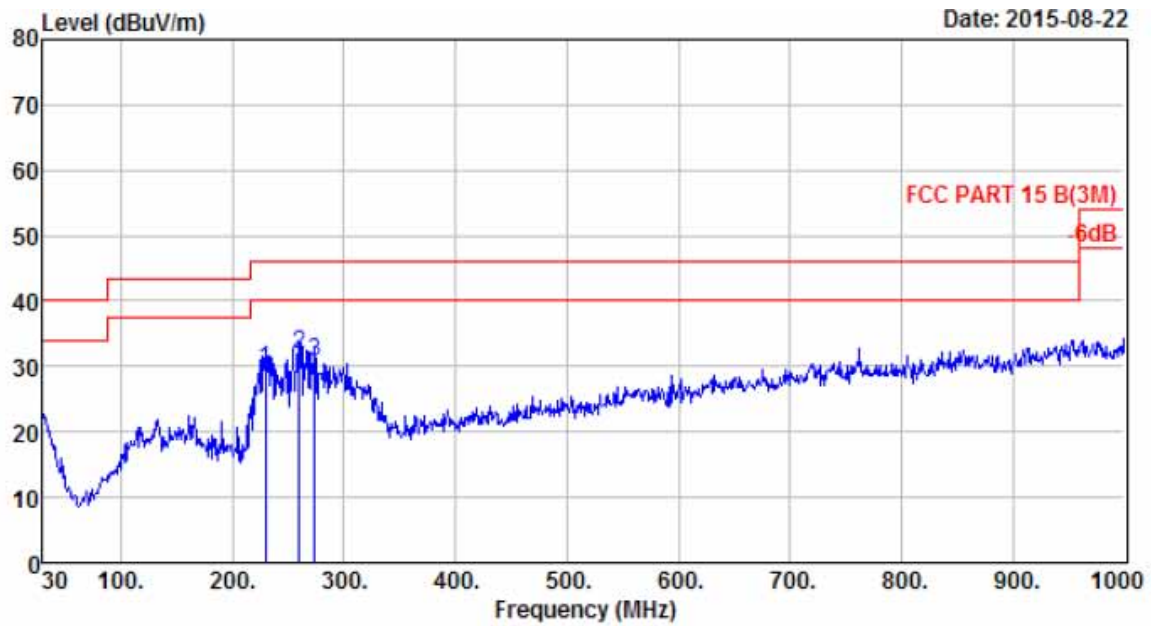
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 92.080         | 8.71                    | 1.64                  | 19.34             | 29.69                         | 43.50             | 13.81          | QP     |
| 2 | 135.730        | 11.31                   | 1.69                  | 17.78             | 30.78                         | 43.50             | 12.72          | QP     |
| 3 | 229.820        | 9.45                    | 2.21                  | 22.04             | 33.70                         | 46.00             | 12.30          | QP     |



Site no. : 2# 966 chamber  
 Dis. / Ant. : 3m 37062  
 Limit : FCC PART 15 B(3M)  
 Env. / Ins. : Temp:23.6°; Humi:56%; Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
 Adapter 2

Data no. : 79  
 Ant. pol. : VERTICAL

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 107.600        | 10.26                   | 1.50                  | 16.53             | 28.29                         | 43.50             | 15.21          | QP     |
| 2 | 133.790        | 11.29                   | 1.59                  | 16.35             | 29.23                         | 43.50             | 14.27          | QP     |
| 3 | 229.820        | 9.45                    | 2.21                  | 19.36             | 31.02                         | 46.00             | 14.98          | QP     |

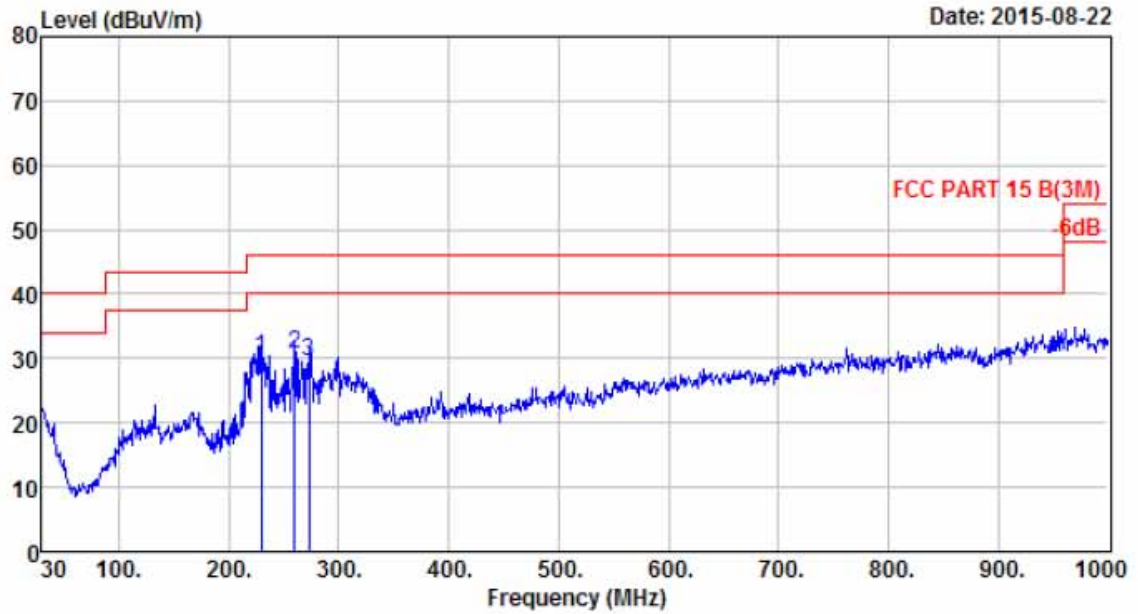


Site no. : 2# 966 chamber  
 Dis. / Ant. : 3m 37062  
 Limit : FCC PART 15 B(3M)  
 Env. / Ins. : Temp:23.6°;Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
 Adapter 2

Data no. : 80  
 Ant. pol. : HORIZONTAL

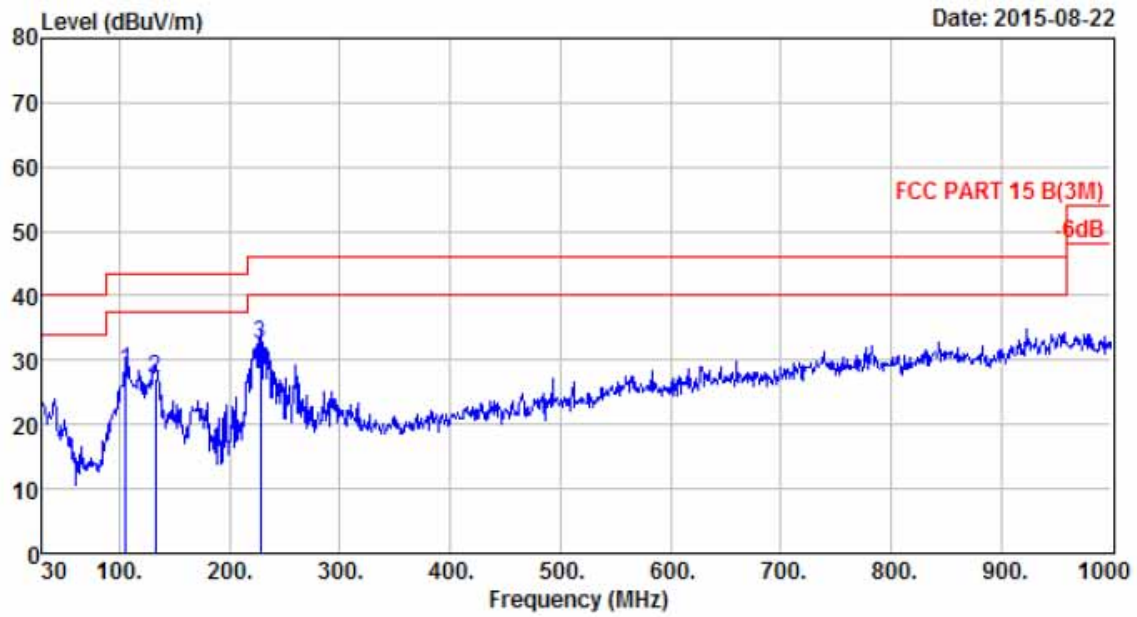
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 229.820        | 9.45                    | 2.21                  | 17.98             | 29.64                         | 46.00             | 16.36          | QP     |
| 2 | 259.890        | 13.40                   | 2.37                  | 16.14             | 31.91                         | 46.00             | 14.09          | QP     |
| 3 | 273.470        | 12.58                   | 2.36                  | 15.86             | 30.80                         | 46.00             | 15.20          | QP     |





|   |                        |
|---|------------------------|
| Site no. : 2# 966 chamber                         | Data no. : 81          |
| Dis. / Ant. : 3m 37062                            | Ant. pol. : HORIZONTAL |
| Limit : FCC PART 15 B(3M)                         |                        |
| Env. / Ins. : Temp:23.6°;Humi:56%;Press:101.52kPa |                        |
| Engineer : Tony                                   |                        |
| EUT : Portable Bluetooth Speaker                  |                        |
| Power : DC 5V From Adapter Input AC 120V/60Hz     |                        |
| M/N : Groove                                      |                        |
| Test Mode : GFSK TX 2440MHz                       |                        |
| Adapter 2   |                        |

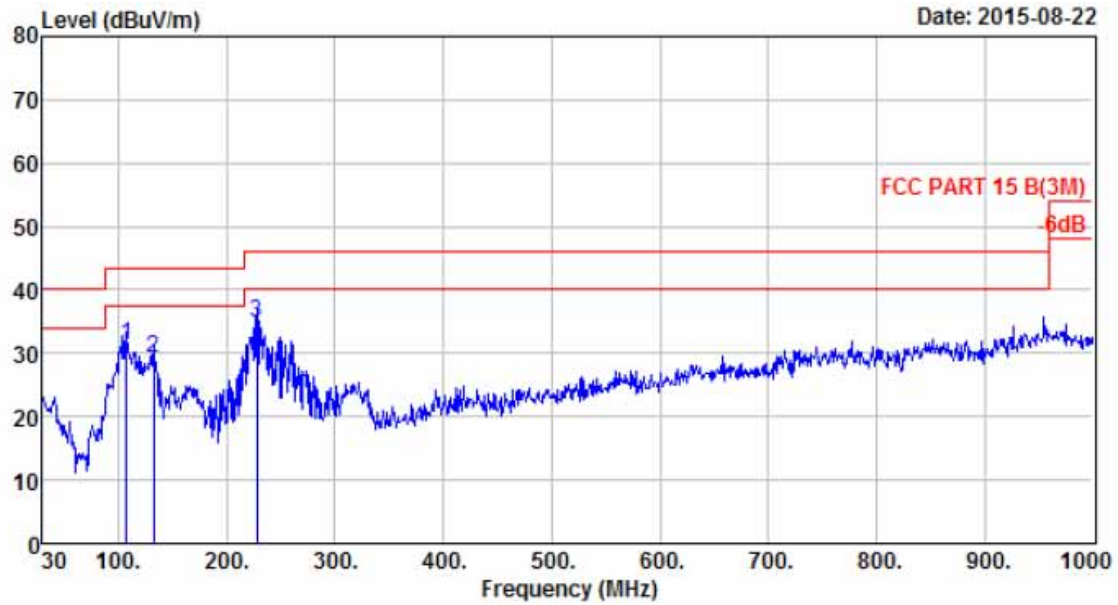
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 229.820        | 9.45                    | 2.21                  | 18.59             | 30.25                         | 46.00             | 15.75          | QP     |
| 2 | 259.890        | 13.40                   | 2.37                  | 15.01             | 30.78                         | 46.00             | 15.22          | QP     |
| 3 | 272.500        | 12.61                   | 2.36                  | 14.67             | 29.64                         | 46.00             | 16.36          | QP     |



Site no. : 2# 966 chamber  
 Dis. / Ant. : 3m 37062  
 Limit : FCC PART 15 B(3M)  
 Env. / Ins. : Temp:23.6°; Humi:56%; Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
 Adapter 2

Data no. : 82  
 Ant. pol. : VERTICAL

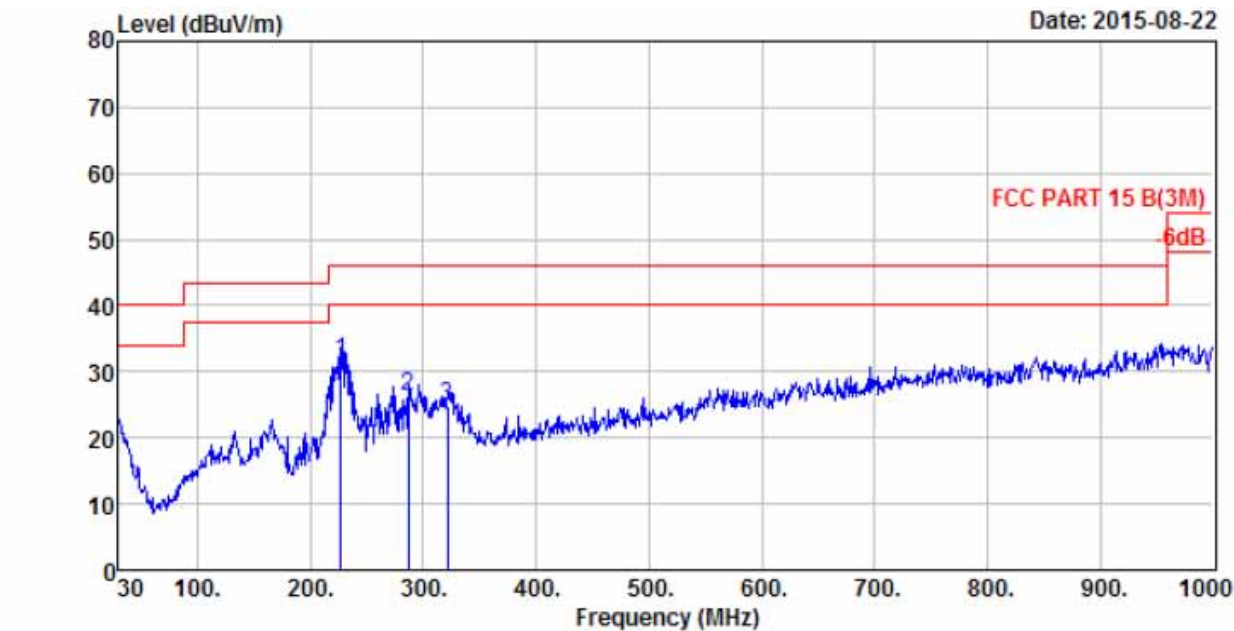
|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 105.660        | 10.11                   | 1.50                  | 16.80             | 28.41                         | 43.50             | 15.09          | QP     |
| 2 | 132.820        | 11.27                   | 1.53                  | 14.43             | 27.23                         | 43.50             | 16.27          | QP     |
| 3 | 227.880        | 9.39                    | 2.18                  | 20.98             | 32.55                         | 46.00             | 13.45          | QP     |



|             |  |           |            |
|-------------|--|-----------|------------|
| Site no.    | : 2# 966 chamber                           | Data no.  | : 83       |
| Dis. / Ant. | : 3m 37062                                 | Ant. pol. | : VERTICAL |
| Limit       | : FCC PART 15 B(3M)                        |           |            |
| Env. / Ins. | : Temp: 23.6°; Humi: 56%; Press: 101.52kPa |           |            |
| Engineer    | : Tony                                     |           |            |
| EUT         | : Portable Bluetooth Speaker               |           |            |
| Power       | : DC 5V From Adapter Input AC 120V/60Hz    |           |            |
| M/N         | : Groove                                   |           |            |
| Test Mode   | : GFSK TX 2480MHz                          |           |            |
|             | : Adapter 2                                |           |            |

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 107.600        | 10.26                   | 1.50                  | 19.67             | 31.43                         | 43.50             | 12.07          | QP     |
| 2 | 132.820        | 11.27                   | 1.53                  | 16.50             | 29.30                         | 43.50             | 14.20          | QP     |
| 3 | 227.880        | 9.39                    | 2.18                  | 23.30             | 34.87                         | 46.00             | 11.13          | QP     |

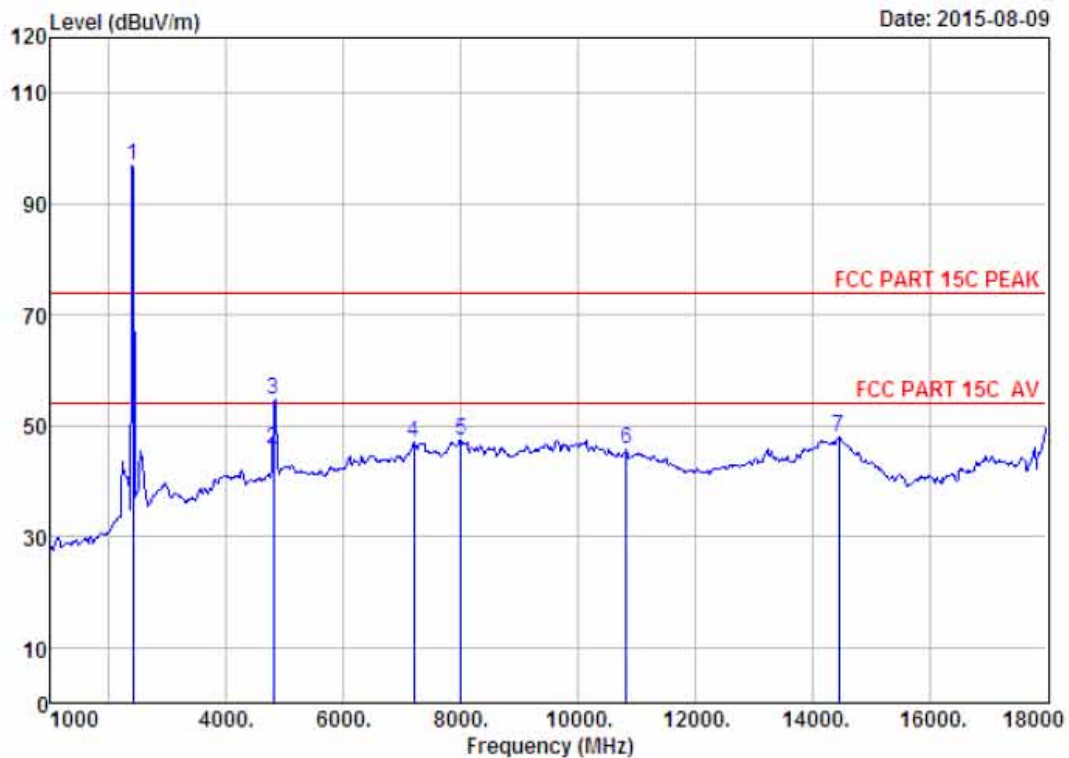




|             |   |           |              |
|-------------|---|-----------|--------------|
| Site no.    | : 2# 966 chamber                        | Data no.  | : 84         |
| Dis. / Ant. | : 3m 37062                              | Ant. pol. | : HORIZONTAL |
| Limit       | : FCC PART 15 B(3M)                     |           |              |
| Env. / Ins. | : Temp:23.6°;Humi:56%;Press:101.52kPa   |           |              |
| Engineer    | : Tony                                  |           |              |
| EUT         | : Portable Bluetooth Speaker            |           |              |
| Power       | : DC 5V From Adapter Input AC 120V/60Hz |           |              |
| M/N         | : Groove                                |           |              |
| Test Mode   | : GFSK TX 2480MHz                       |           |              |
|             | Adapter 2                               |           |              |

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 226.910        | 9.35                    | 2.27                  | 19.96             | 31.58                         | 46.00             | 14.42          | QP     |
| 2 | 287.050        | 12.57                   | 2.41                  | 11.18             | 26.16                         | 46.00             | 19.84          | QP     |
| 3 | 321.000        | 13.60                   | 2.62                  | 8.67              | 24.89                         | 46.00             | 21.11          | QP     |

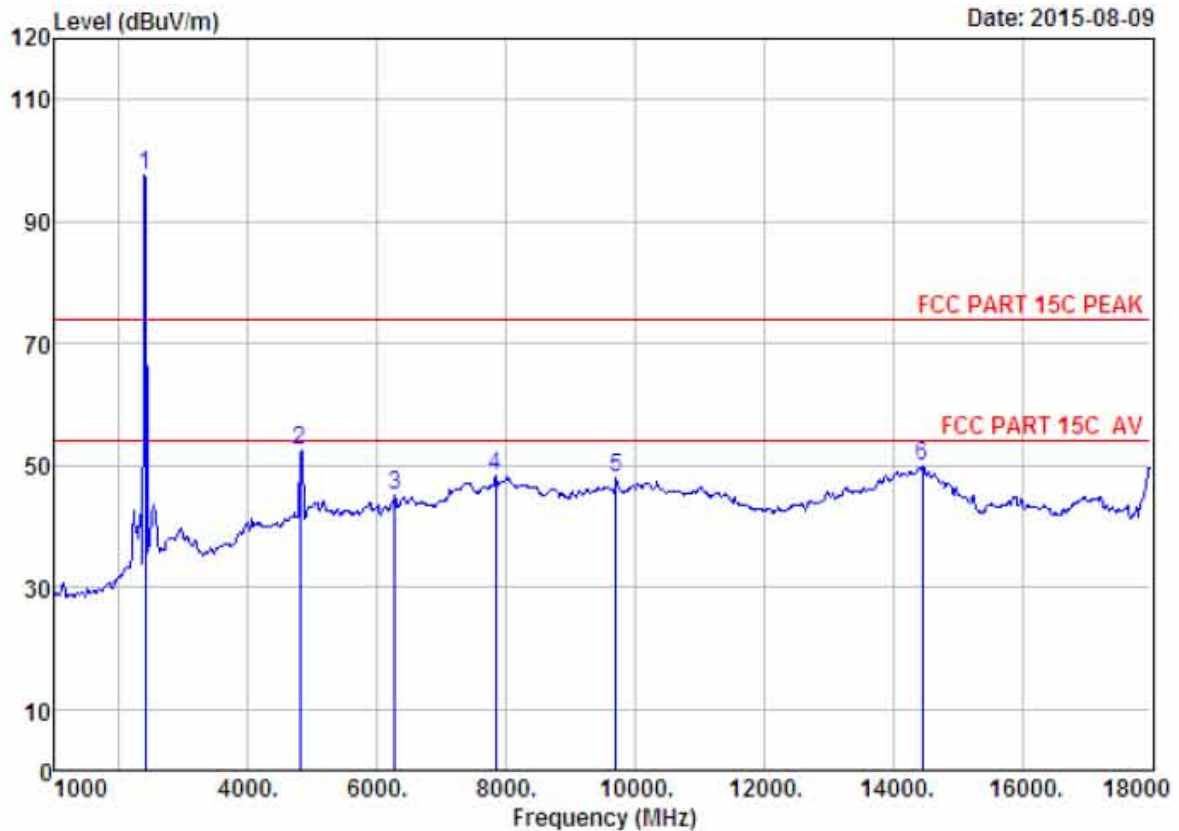
1000-18000 MHz



Site no. : 1# 966 chamber                      Data no. : 875  
 Dis. / Ant. : 3m ANT 1-18G                      Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1 | 2402.00        | 27.61                    | 6.62                  | 34.18                 | 96.83             | 96.88                         | 74.00              | -22.88         | Peak    |
| 2 | 4804.00        | 31.25                    | 11.77                 | 31.81                 | 34.50             | 45.71                         | 54.00              | 8.29           | Average |
| 3 | 4804.00        | 31.25                    | 11.77                 | 31.81                 | 43.49             | 54.70                         | 74.00              | 19.30          | Peak    |
| 4 | 7205.00        | 36.52                    | 11.54                 | 32.11                 | 31.19             | 47.14                         | 74.00              | 26.86          | Peak    |
| 5 | 8004.00        | 37.01                    | 11.40                 | 31.22                 | 30.09             | 47.28                         | 74.00              | 26.72          | Peak    |
| 6 | 10826.00       | 39.33                    | 11.30                 | 33.33                 | 28.57             | 45.87                         | 74.00              | 28.13          | Peak    |
| 7 | 14464.00       | 41.85                    | 10.93                 | 32.96                 | 28.16             | 47.98                         | 74.00              | 26.02          | Peak    |

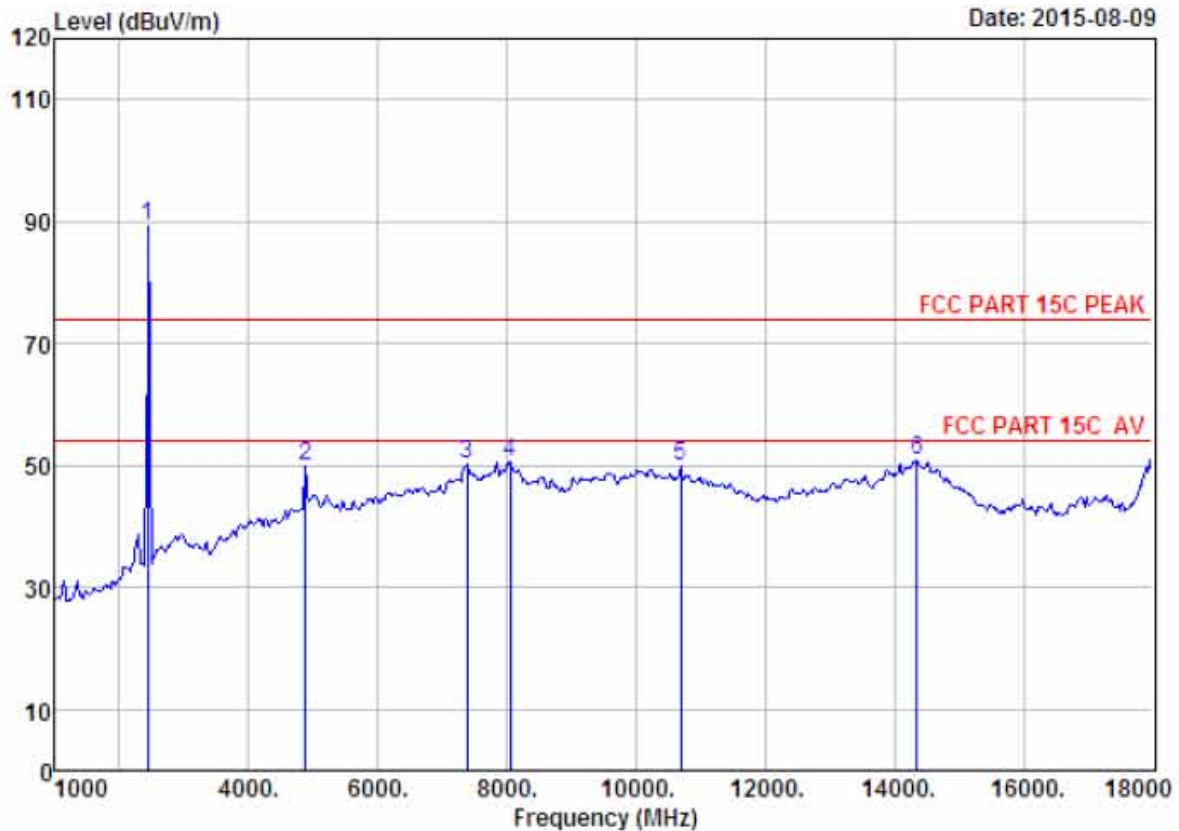
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 876  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUI : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2402.00        | 27.61                    | 6.62                  | 34.18                 | 97.44             | 97.49                         | 74.00              | -23.49         | Peak   |
| 2 | 4804.00        | 31.25                    | 11.77                 | 31.81                 | 41.24             | 52.45                         | 74.00              | 21.55          | Peak   |
| 3 | 6270.00        | 33.48                    | 12.18                 | 31.95                 | 31.39             | 45.10                         | 74.00              | 28.90          | Peak   |
| 4 | 7834.00        | 36.68                    | 11.47                 | 31.40                 | 31.66             | 48.41                         | 74.00              | 25.59          | Peak   |
| 5 | 9704.00        | 38.06                    | 11.66                 | 31.87                 | 30.09             | 47.94                         | 74.00              | 26.06          | Peak   |
| 6 | 14464.00       | 41.85                    | 10.93                 | 32.96                 | 30.25             | 50.07                         | 74.00              | 23.93          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

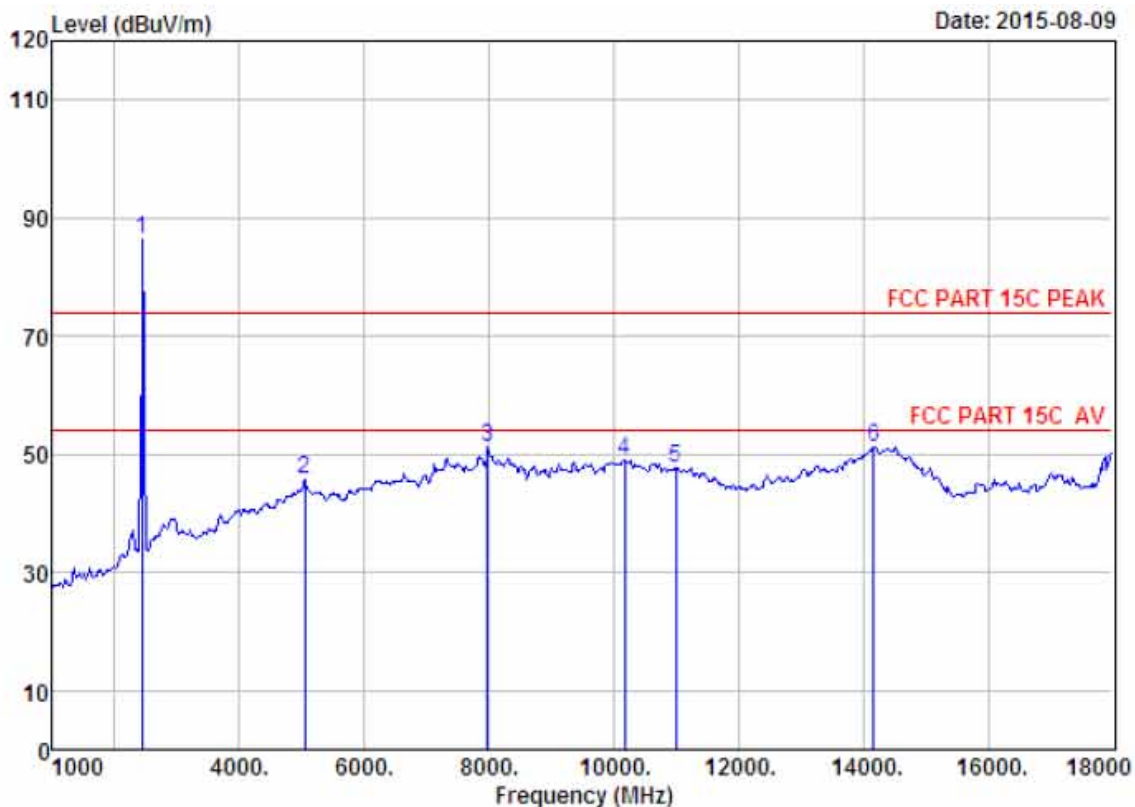


Site no. : 1# 966 chamber Data no. : 879  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2440.00        | 27.60                    | 6.67                  | 34.12                 | 89.27             | 89.42                         | 74.00              | -15.42         | Peak   |
| 2 | 4880.00        | 31.37                    | 12.07                 | 31.90                 | 38.50             | 50.04                         | 74.00              | 23.96          | Peak   |
| 3 | 7375.00        | 36.57                    | 11.59                 | 31.98                 | 33.91             | 50.09                         | 74.00              | 23.91          | Peak   |
| 4 | 8055.00        | 36.91                    | 11.41                 | 31.31                 | 33.55             | 50.56                         | 74.00              | 23.44          | Peak   |
| 5 | 10690.00       | 39.18                    | 11.30                 | 33.07                 | 32.42             | 49.83                         | 74.00              | 24.17          | Peak   |
| 6 | 14345.00       | 41.76                    | 10.92                 | 32.93                 | 31.05             | 50.80                         | 74.00              | 23.20          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

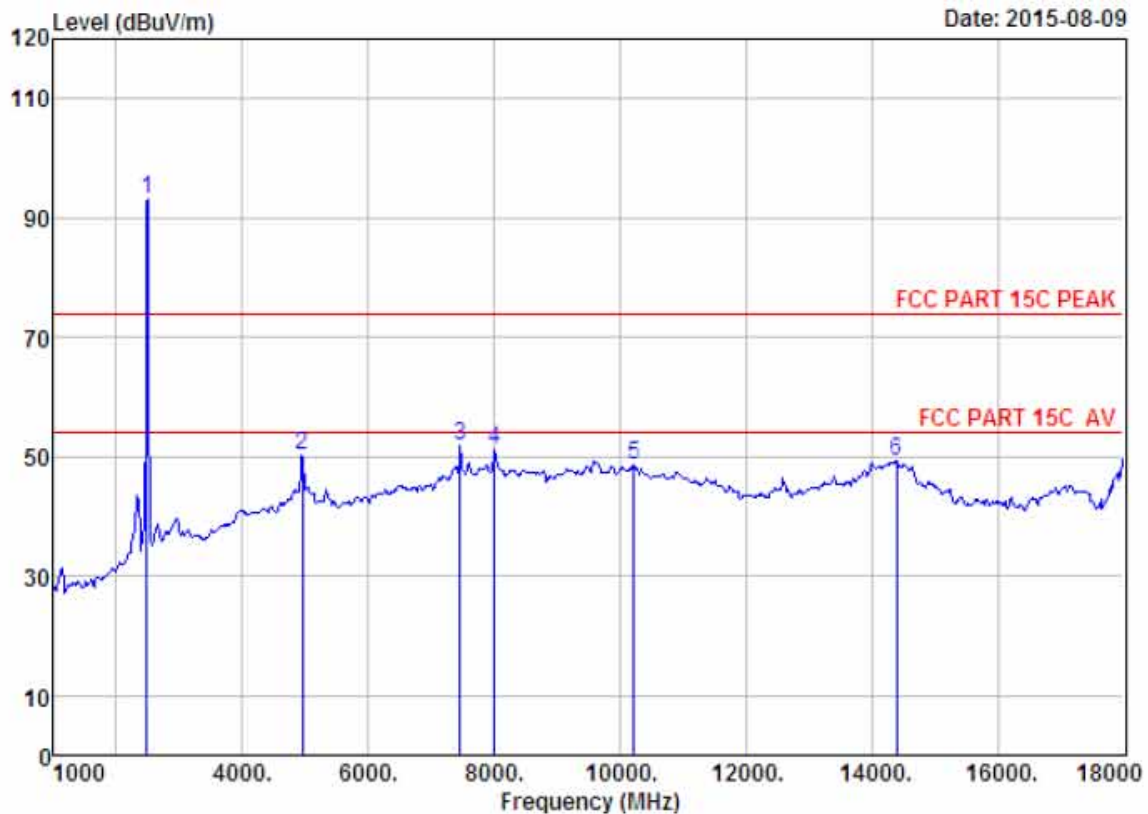




Site no. : 1# 966 chamber Data no. : 880  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUI : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2440.00        | 27.60                    | 6.67                  | 34.12                 | 86.35             | 86.50                         | 74.00              | -12.50         | Peak   |
| 2 | 5046.00        | 31.57                    | 12.53                 | 32.08                 | 33.82             | 45.84                         | 74.00              | 28.16          | Peak   |
| 3 | 7970.00        | 36.94                    | 11.41                 | 31.25                 | 34.10             | 51.20                         | 74.00              | 22.80          | Peak   |
| 4 | 10180.00       | 38.42                    | 11.49                 | 32.11                 | 31.16             | 48.96                         | 74.00              | 25.04          | Peak   |
| 5 | 10996.00       | 39.52                    | 11.29                 | 33.65                 | 30.55             | 47.71                         | 74.00              | 26.29          | Peak   |
| 6 | 14175.00       | 41.61                    | 10.91                 | 33.44                 | 32.25             | 51.33                         | 74.00              | 22.67          | Peak   |

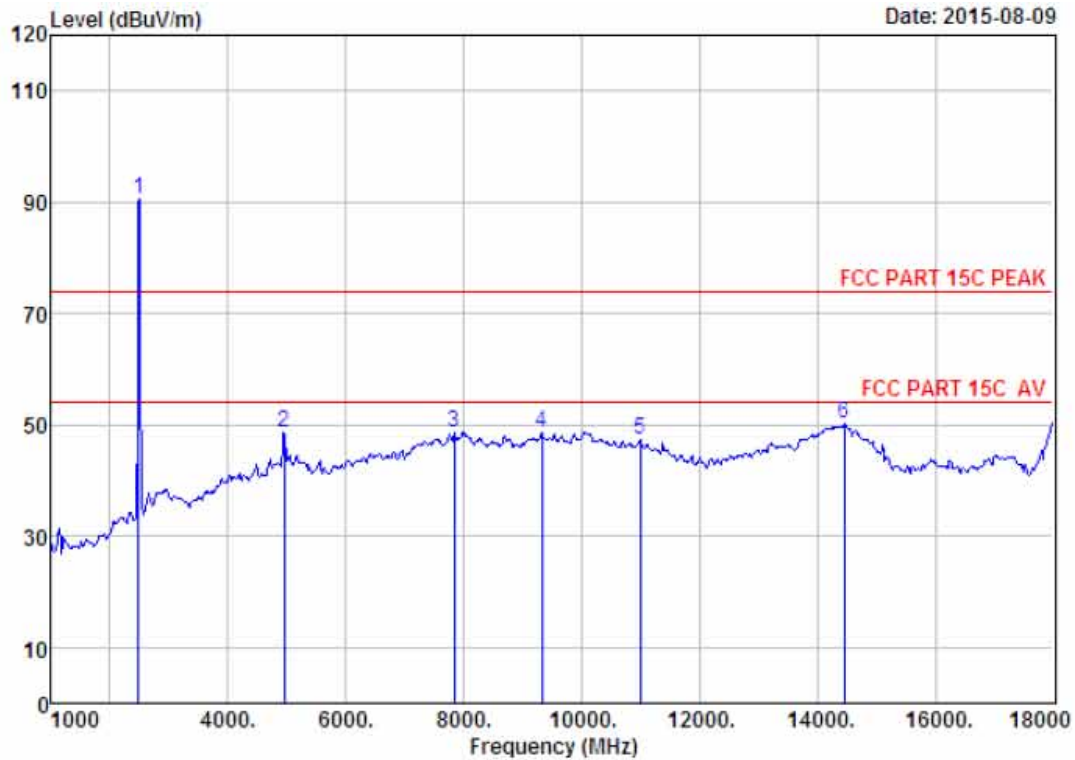
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 881  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6°;Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2480.00        | 27.58                    | 6.71                  | 34.03                 | 92.78             | 93.04                         | 74.00              | -19.04         | Peak   |
| 2 | 4960.00        | 31.49                    | 12.44                 | 31.97                 | 38.32             | 50.28                         | 74.00              | 23.72          | Peak   |
| 3 | 7460.00        | 36.52                    | 11.61                 | 31.91                 | 35.69             | 51.91                         | 74.00              | 22.09          | Peak   |
| 4 | 8004.00        | 37.01                    | 11.40                 | 31.22                 | 33.87             | 51.06                         | 74.00              | 22.94          | Peak   |
| 5 | 10214.00       | 38.48                    | 11.47                 | 32.17                 | 30.74             | 48.52                         | 74.00              | 25.48          | Peak   |
| 6 | 14396.00       | 41.79                    | 10.92                 | 32.83                 | 29.45             | 49.33                         | 74.00              | 24.67          | Peak   |

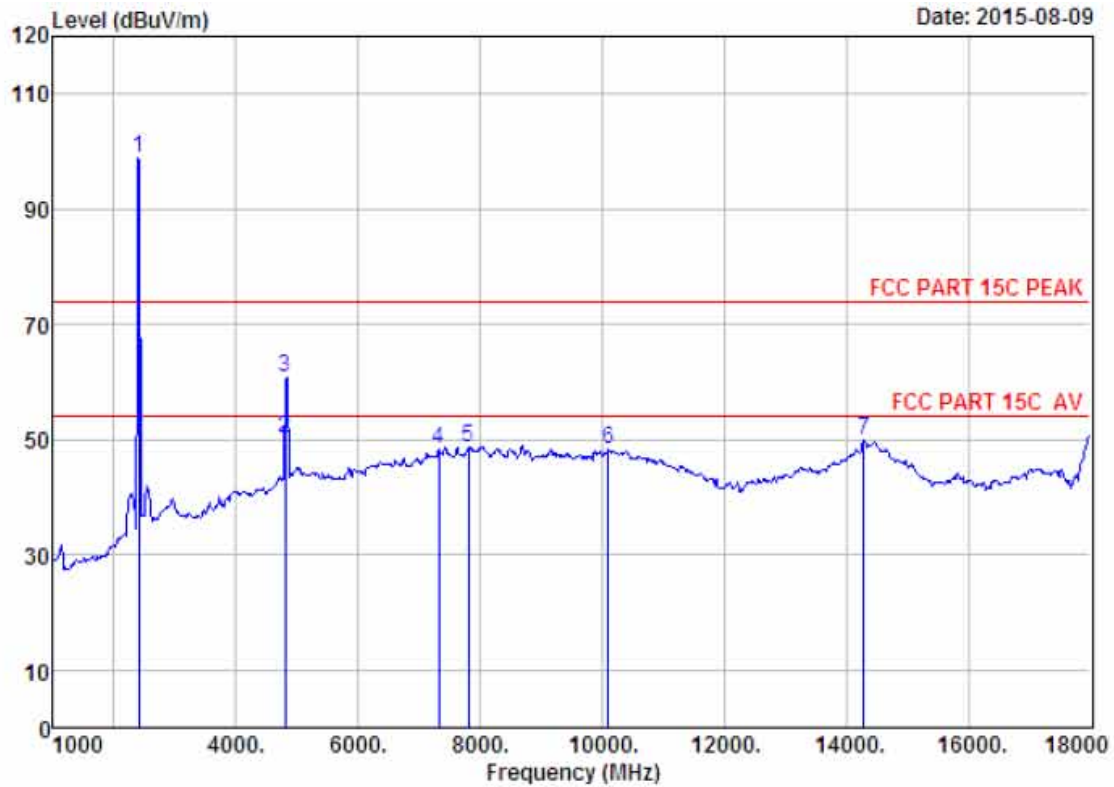
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 882  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUI : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
 Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2480.00        | 27.58                    | 6.71                  | 34.03                 | 90.33             | 90.59                         | 74.00              | -16.59         | Peak   |
| 2 | 4960.00        | 31.49                    | 12.44                 | 31.97                 | 36.84             | 48.80                         | 74.00              | 25.20          | Peak   |
| 3 | 7834.00        | 36.68                    | 11.47                 | 31.40                 | 31.96             | 48.71                         | 74.00              | 25.29          | Peak   |
| 4 | 9330.00        | 37.97                    | 11.62                 | 32.12                 | 31.28             | 48.75                         | 74.00              | 25.25          | Peak   |
| 5 | 10996.00       | 39.52                    | 11.29                 | 33.65                 | 30.11             | 47.27                         | 74.00              | 26.73          | Peak   |
| 6 | 14464.00       | 41.85                    | 10.93                 | 32.96                 | 30.45             | 50.27                         | 74.00              | 23.73          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

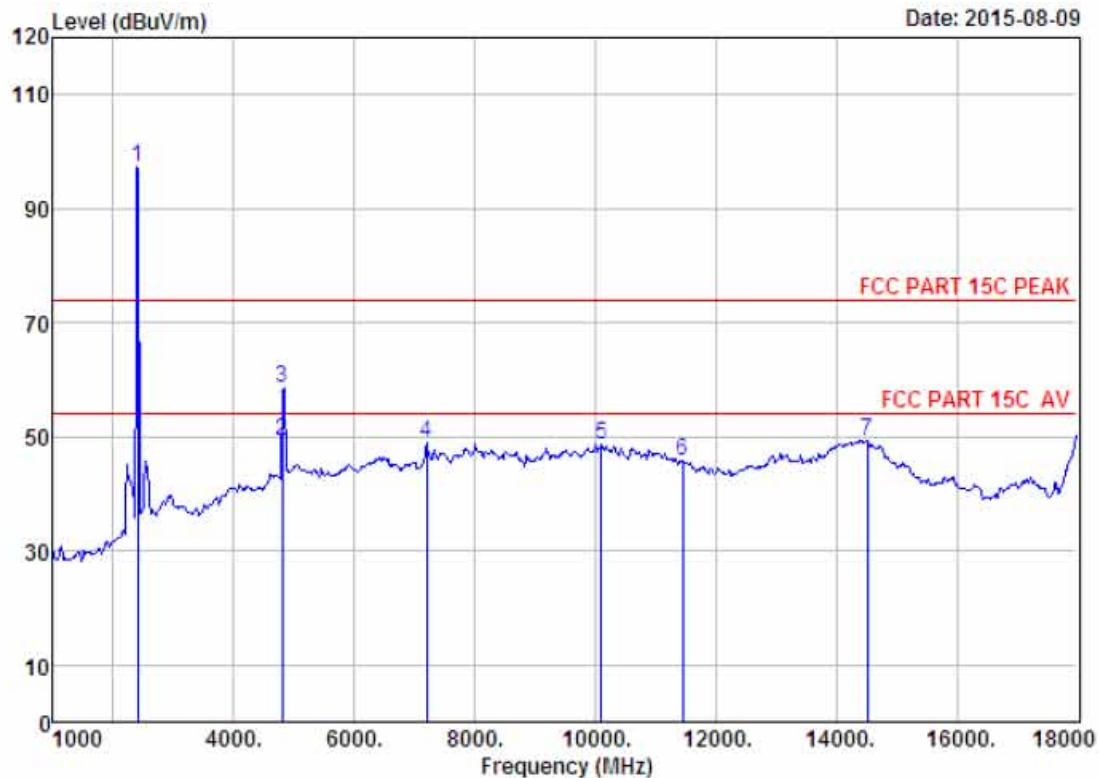


Site no. : 1# 966 chamber Data no. : 935  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
 Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1 | 2402.00        | 27.61                    | 6.62                  | 34.18                 | 98.78             | 98.83                         | 74.00              | -24.83         | Peak    |
| 2 | 4804.00        | 31.25                    | 11.77                 | 31.81                 | 39.01             | 50.22                         | 54.00              | 3.78           | Average |
| 3 | 4804.00        | 31.25                    | 11.77                 | 31.81                 | 49.56             | 60.77                         | 74.00              | 13.23          | Peak    |
| 4 | 7324.00        | 36.55                    | 11.57                 | 31.99                 | 32.30             | 48.43                         | 74.00              | 25.57          | Peak    |
| 5 | 7800.00        | 36.61                    | 11.49                 | 31.44                 | 32.06             | 48.72                         | 74.00              | 25.28          | Peak    |
| 6 | 10095.00       | 38.27                    | 11.53                 | 31.95                 | 30.47             | 48.32                         | 74.00              | 25.68          | Peak    |
| 7 | 14294.00       | 41.71                    | 10.92                 | 33.08                 | 30.50             | 50.05                         | 74.00              | 23.95          | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

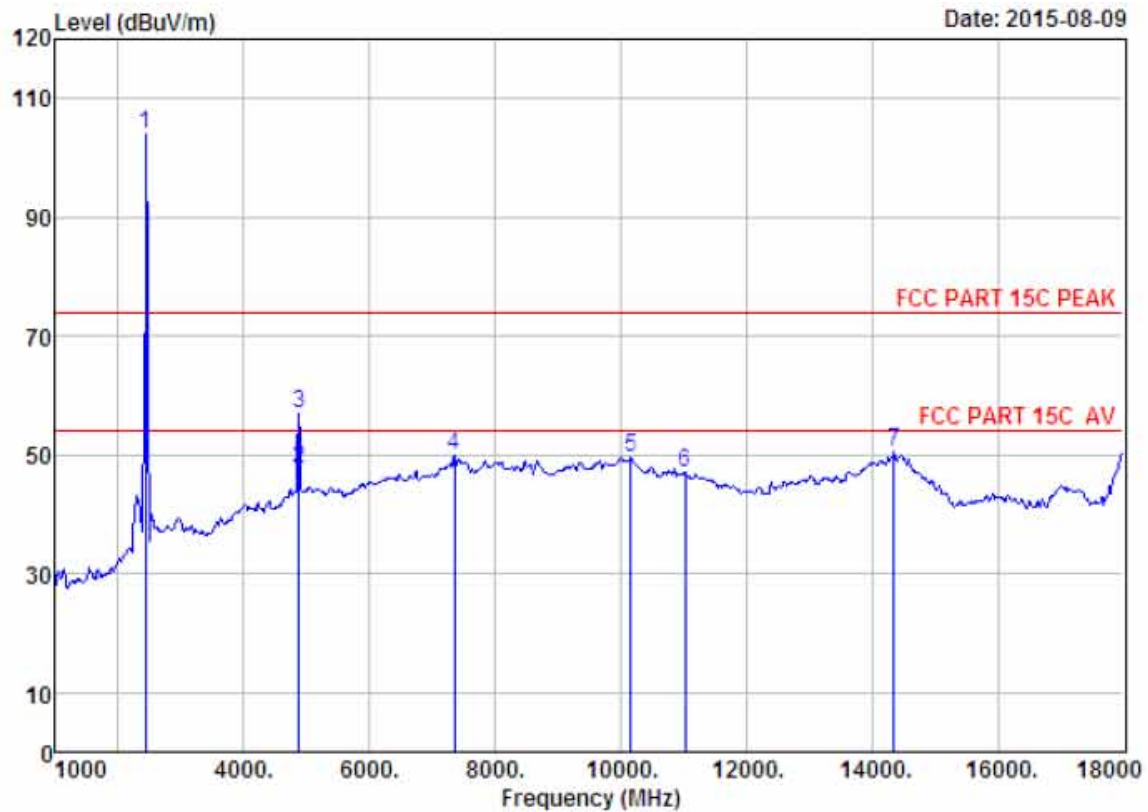




Site no. : 1# 966 chamber Data no. : 936  
 Dis. / Ant. : 3m ANI 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
 Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1 | 2402.00        | 27.61                    | 6.62                  | 34.18                 | 97.22             | 97.27                         | 74.00              | -23.27         | Peak    |
| 2 | 4804.00        | 31.25                    | 11.77                 | 31.81                 | 38.02             | 49.23                         | 54.00              | 4.77           | Average |
| 3 | 4804.00        | 31.25                    | 11.77                 | 31.81                 | 47.38             | 58.59                         | 74.00              | 15.41          | Peak    |
| 4 | 7205.00        | 36.52                    | 11.54                 | 32.11                 | 33.17             | 49.12                         | 74.00              | 24.88          | Peak    |
| 5 | 10095.00       | 38.27                    | 11.53                 | 31.95                 | 30.86             | 48.71                         | 74.00              | 25.29          | Peak    |
| 6 | 11455.00       | 39.23                    | 10.96                 | 34.48                 | 30.14             | 45.85                         | 74.00              | 28.15          | Peak    |
| 7 | 14515.00       | 41.89                    | 10.93                 | 33.14                 | 29.70             | 49.38                         | 74.00              | 24.62          | Peak    |

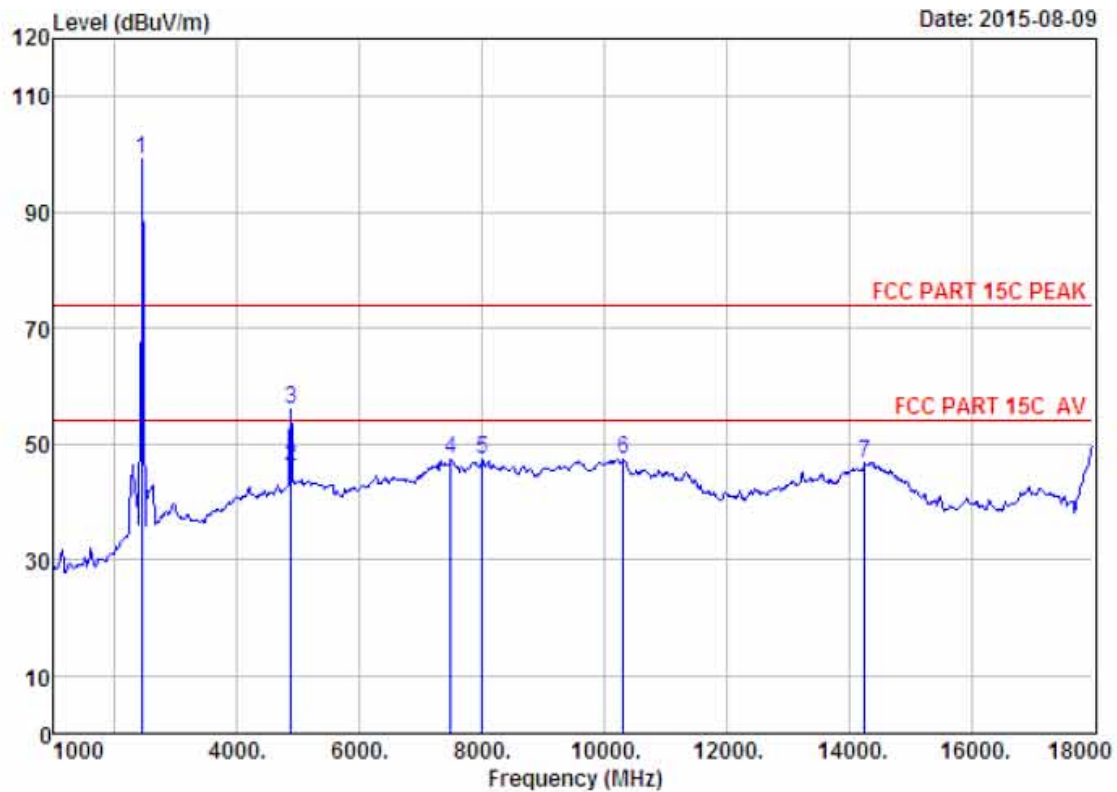
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 939  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
               Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1 | 2440.00        | 27.60                    | 6.67                  | 34.12                 | 103.97            | 104.12                        | 74.00              | -30.12         | Peak    |
| 2 | 4880.00        | 31.37                    | 12.07                 | 31.90                 | 36.02             | 47.56                         | 54.00              | 6.44           | Average |
| 3 | 4880.00        | 31.37                    | 12.07                 | 31.90                 | 45.32             | 56.86                         | 74.00              | 17.14          | Peak    |
| 4 | 7358.00        | 36.56                    | 11.58                 | 31.99                 | 33.80             | 49.95                         | 74.00              | 24.05          | Peak    |
| 5 | 10163.00       | 38.39                    | 11.50                 | 32.08                 | 31.85             | 49.66                         | 74.00              | 24.34          | Peak    |
| 6 | 11030.00       | 39.50                    | 11.27                 | 33.71                 | 29.93             | 46.99                         | 74.00              | 27.01          | Peak    |
| 7 | 14345.00       | 41.76                    | 10.92                 | 32.93                 | 30.79             | 50.54                         | 74.00              | 23.46          | Peak    |

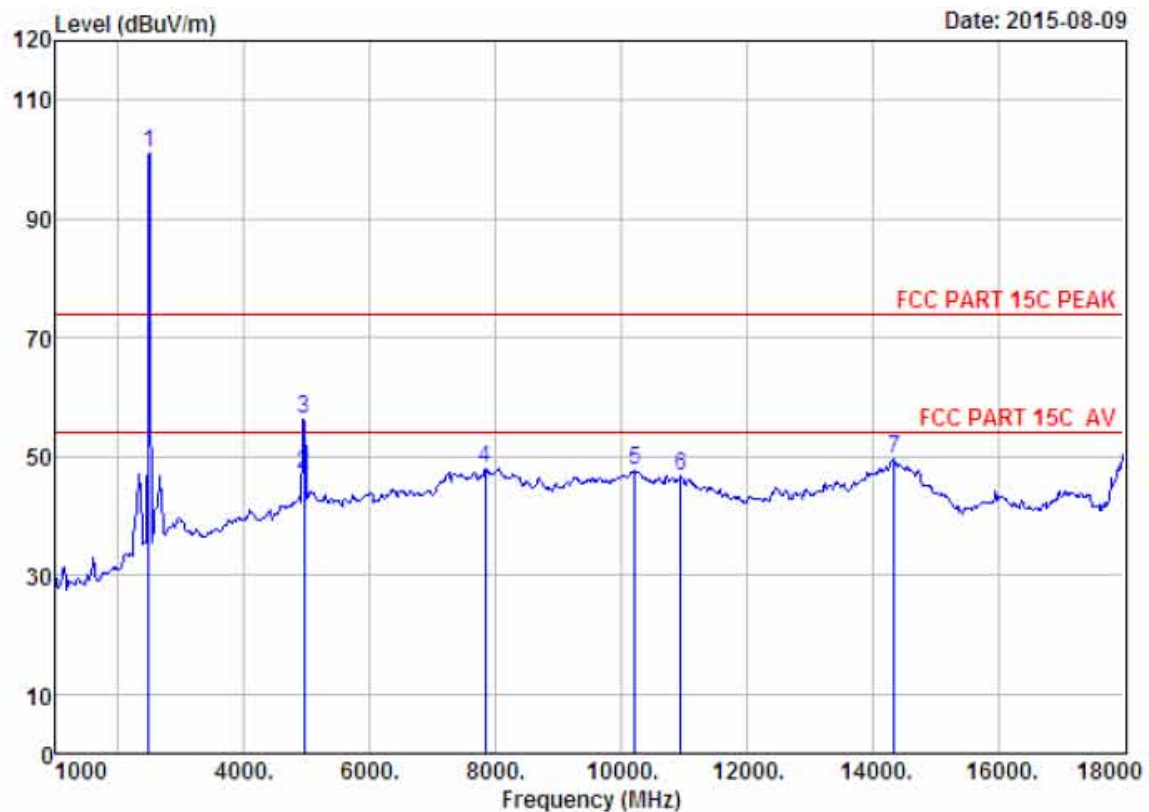
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 940  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6'; Humi:56%; Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
               Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1 | 2440.00        | 27.60                    | 6.67                  | 34.12                 | 98.91             | 99.06                         | 74.00              | -25.06         | Peak    |
| 2 | 4880.00        | 31.37                    | 12.07                 | 31.90                 | 34.66             | 46.20                         | 54.00              | 7.80           | Average |
| 3 | 4880.00        | 31.37                    | 12.07                 | 31.90                 | 44.33             | 55.87                         | 74.00              | 18.13          | Peak    |
| 4 | 7494.00        | 36.48                    | 11.62                 | 31.87                 | 31.09             | 47.32                         | 74.00              | 26.68          | Peak    |
| 5 | 8004.00        | 37.01                    | 11.40                 | 31.22                 | 30.28             | 47.47                         | 74.00              | 26.53          | Peak    |
| 6 | 10316.00       | 38.65                    | 11.41                 | 32.37                 | 29.61             | 47.30                         | 74.00              | 26.70          | Peak    |
| 7 | 14260.00       | 41.68                    | 10.92                 | 33.19                 | 27.30             | 46.71                         | 74.00              | 27.29          | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

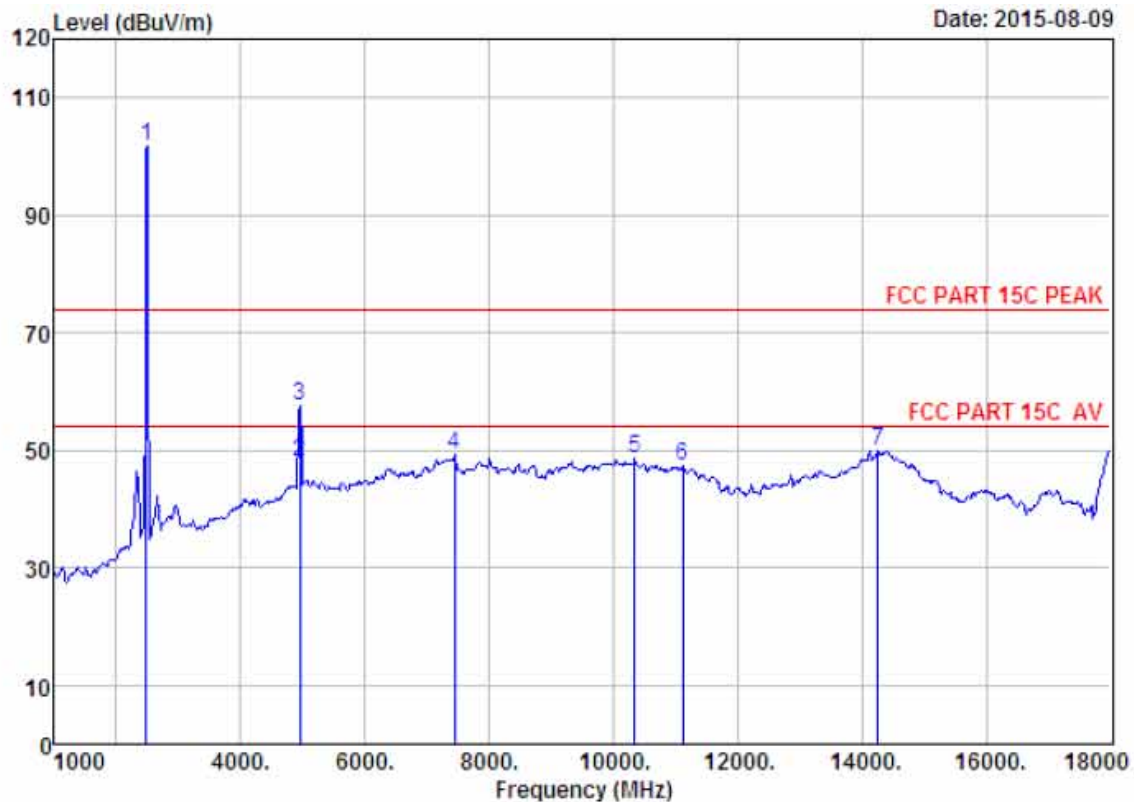


Site no. : 1# 966 chamber Data no. : 941  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUI : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
               Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1 | 2480.00        | 27.58                    | 6.71                  | 34.03                 | 100.82            | 101.08                        | 74.00              | -27.08         | Peak    |
| 2 | 4960.00        | 31.49                    | 12.44                 | 31.97                 | 35.01             | 46.97                         | 54.00              | 7.03           | Average |
| 3 | 4960.00        | 31.49                    | 12.44                 | 31.97                 | 44.24             | 56.20                         | 74.00              | 17.80          | Peak    |
| 4 | 7834.00        | 36.68                    | 11.47                 | 31.40                 | 31.37             | 48.12                         | 74.00              | 25.88          | Peak    |
| 5 | 10214.00       | 38.48                    | 11.47                 | 32.17                 | 29.74             | 47.52                         | 74.00              | 26.48          | Peak    |
| 6 | 10945.00       | 39.46                    | 11.29                 | 33.55                 | 29.46             | 46.66                         | 74.00              | 27.34          | Peak    |
| 7 | 14345.00       | 41.76                    | 10.92                 | 32.93                 | 29.70             | 49.45                         | 74.00              | 24.55          | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



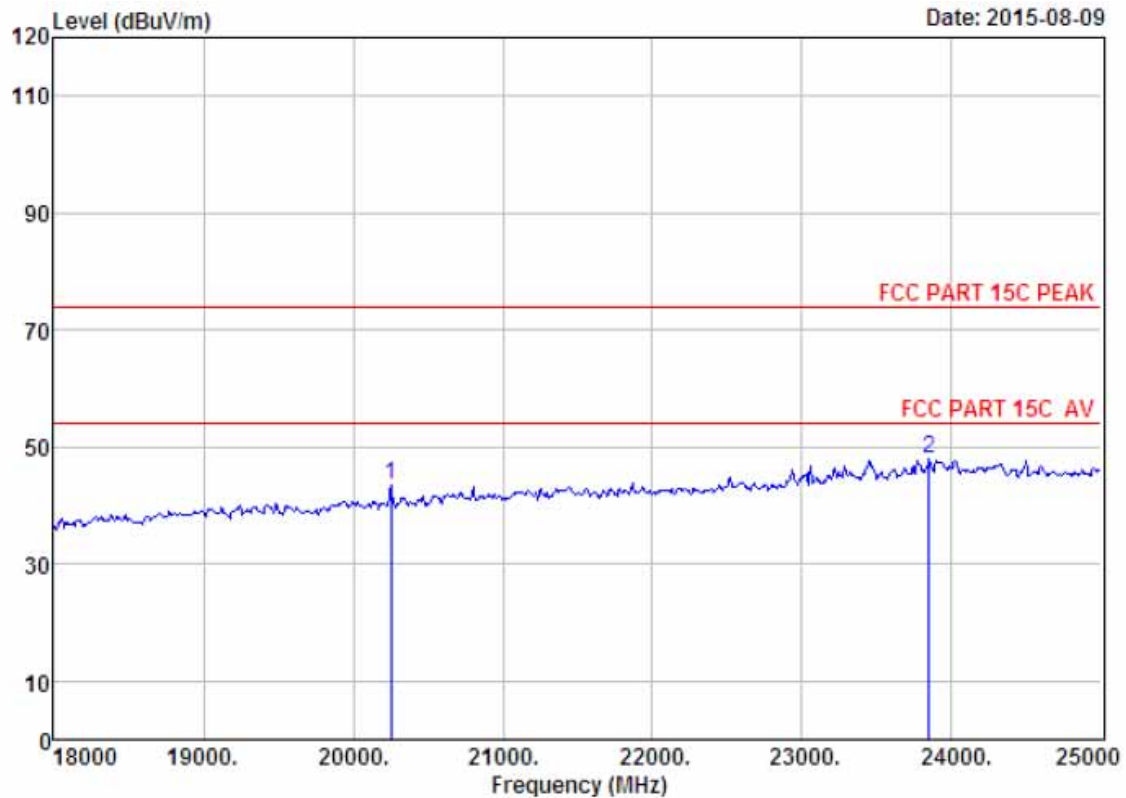


Site no. : 1# 966 chamber Data no. : 942  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
               Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark  |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|---------|
| 1 | 2480.00        | 27.58                    | 6.71                  | 34.03                 | 101.54            | 101.80                        | 74.00              | -27.80         | Peak    |
| 2 | 4960.00        | 31.49                    | 12.44                 | 31.97                 | 36.03             | 47.99                         | 54.00              | 6.01           | Average |
| 3 | 4960.00        | 31.49                    | 12.44                 | 31.97                 | 45.63             | 57.59                         | 74.00              | 16.41          | Peak    |
| 4 | 7443.00        | 36.54                    | 11.61                 | 31.93                 | 33.14             | 49.36                         | 74.00              | 24.64          | Peak    |
| 5 | 10350.00       | 38.71                    | 11.39                 | 32.43                 | 31.00             | 48.67                         | 74.00              | 25.33          | Peak    |
| 6 | 11115.00       | 39.44                    | 11.20                 | 33.87                 | 30.55             | 47.32                         | 74.00              | 26.68          | Peak    |
| 7 | 14260.00       | 41.68                    | 10.92                 | 33.19                 | 30.54             | 49.95                         | 74.00              | 24.05          | Peak    |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

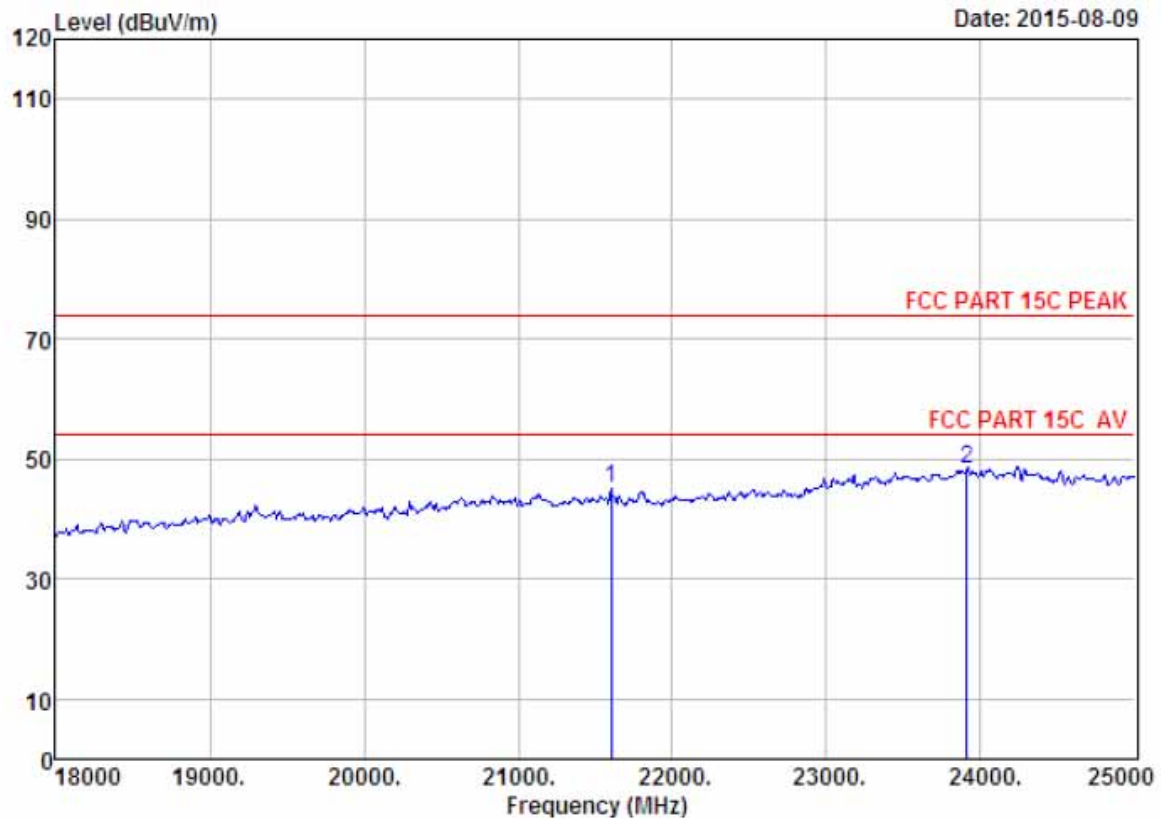
18000-25000 MHz



Site no. : 1# 966 chamber      Data no. : 869  
 Dis. / Ant. : 3m ANT ABOVE 18G      Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
              Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 20254.00       | 46.05                    | 19.79                 | 36.48                 | 14.11             | 43.47                         | 74.00              | 30.53          | Peak   |
| 2 | 23845.00       | 45.63                    | 21.90                 | 32.96                 | 13.38             | 47.95                         | 74.00              | 26.05          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

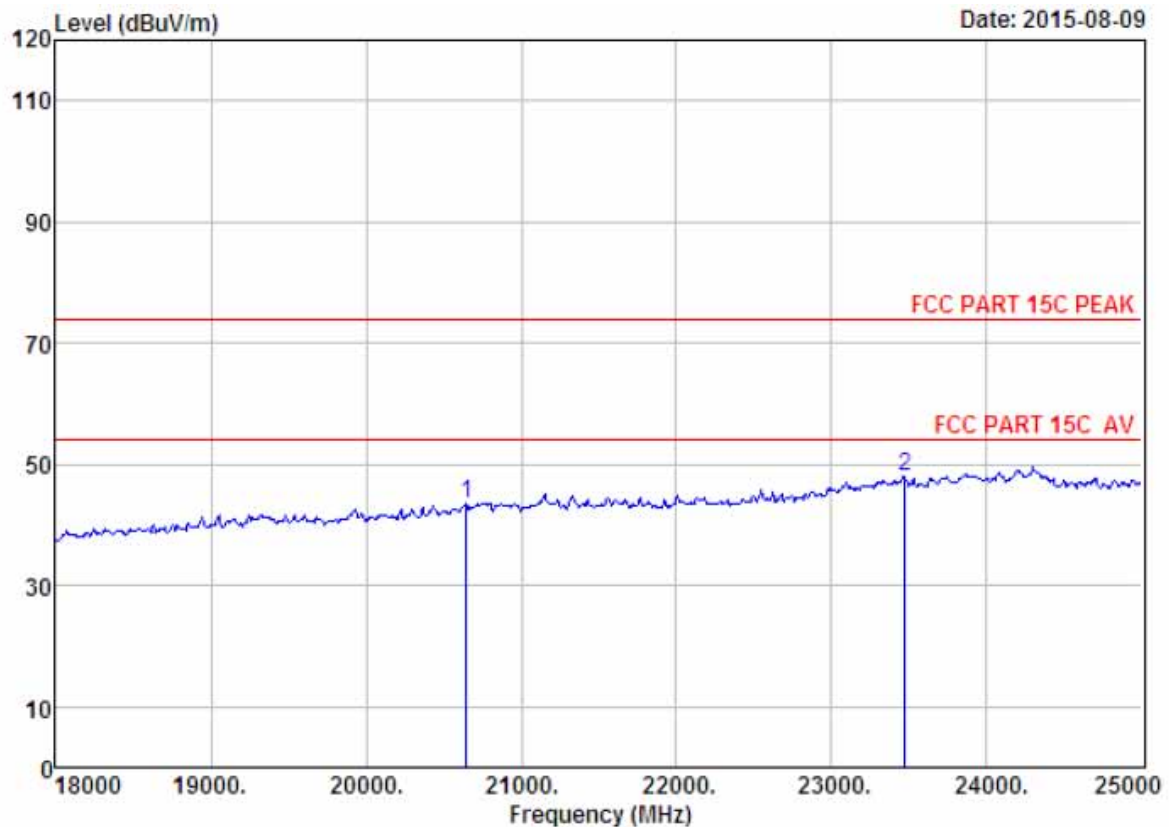


Site no. : 1# 966 chamber Data no. : 870  
 Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUI : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
           Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 21605.00       | 45.93                    | 20.39                 | 35.26                 | 13.94             | 45.00                         | 74.00              | 29.00          | Peak   |
| 2 | 23908.00       | 45.62                    | 21.96                 | 32.90                 | 13.55             | 48.23                         | 74.00              | 25.77          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

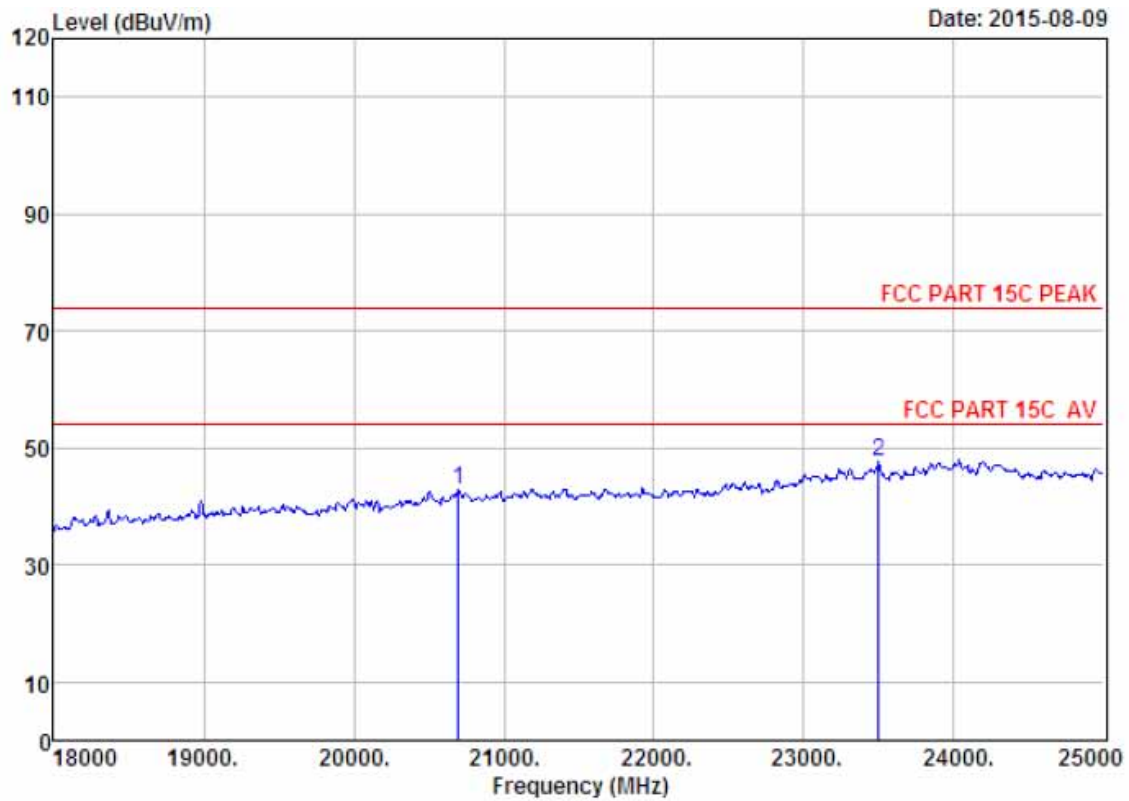




Site no. : 1# 966 chamber                      Data no. : 871  
 Dis. / Ant. : 3m ANT ABOVE 18G              Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 20646.00       | 46.08                    | 19.97                 | 36.12                 | 13.65             | 43.58                         | 74.00              | 30.42          | Peak   |
| 2 | 23474.00       | 45.70                    | 21.57                 | 33.35                 | 14.01             | 47.93                         | 74.00              | 26.07          | Peak   |

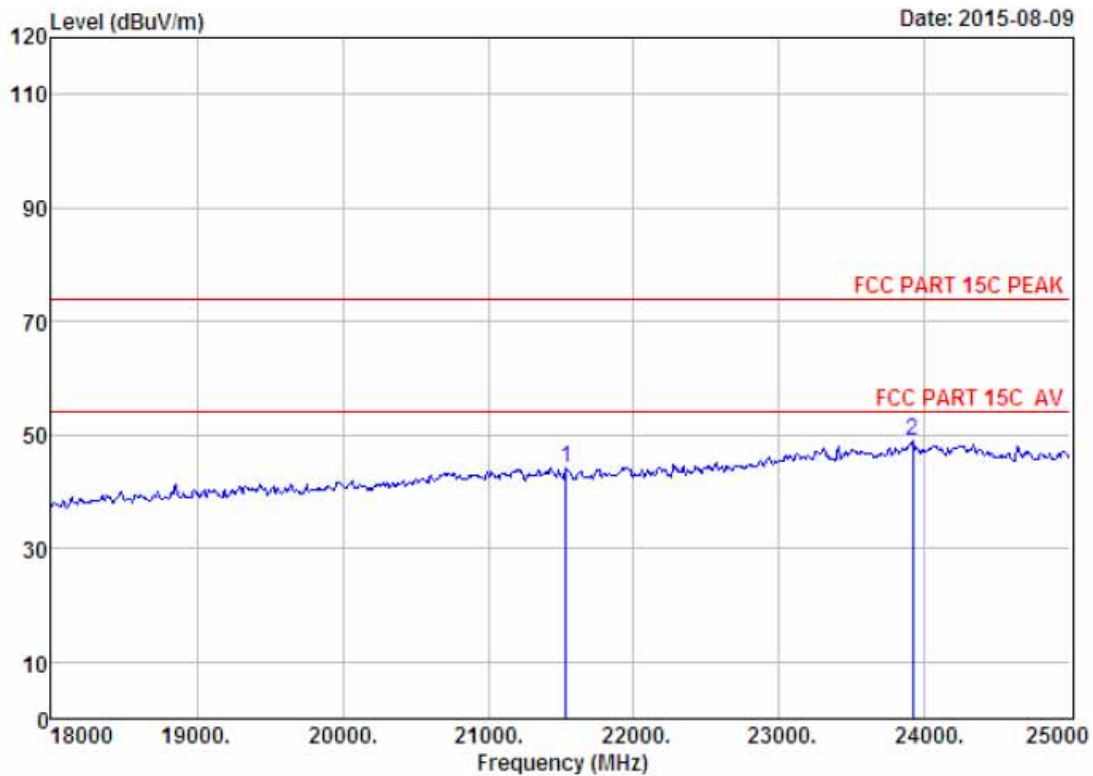
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber                      Data no. : 872  
 Dis. / Ant. : 3m ANT ABOVE 18G              Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 20695.00       | 46.11                    | 19.99                 | 36.07                 | 12.95             | 42.98                         | 74.00              | 31.02          | Peak   |
| 2 | 23495.00       | 45.70                    | 21.60                 | 33.33                 | 13.84             | 47.81                         | 74.00              | 26.19          | Peak   |

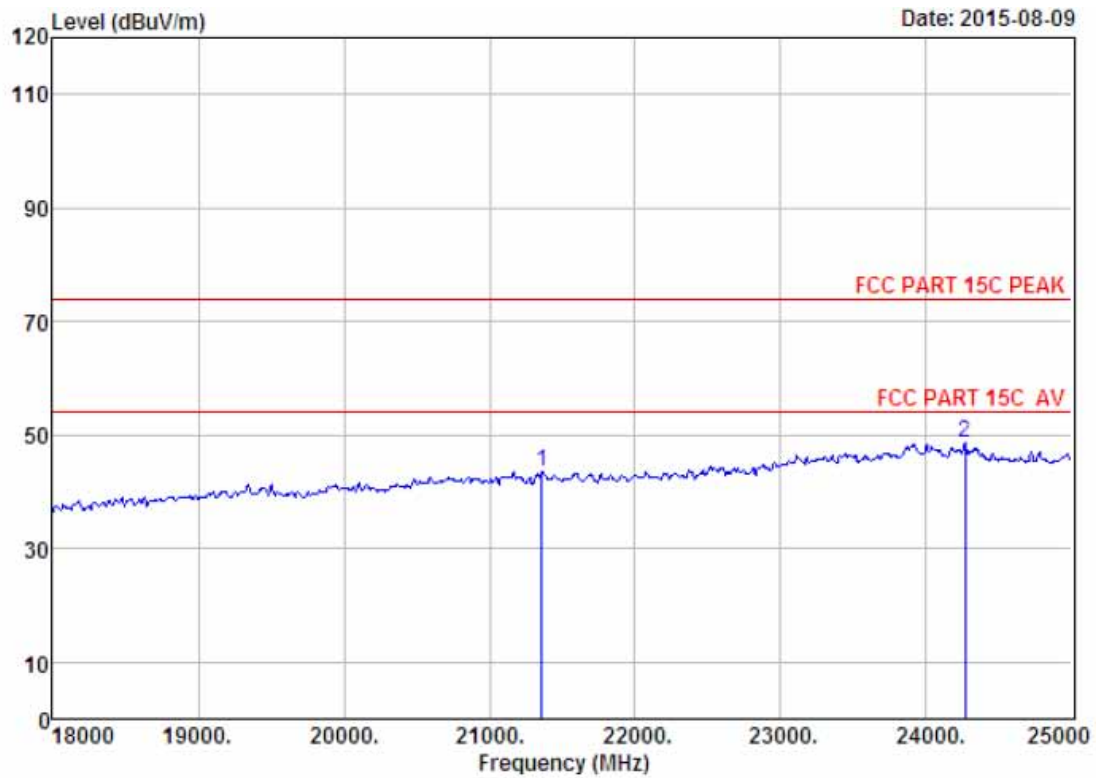
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official  
               limit are not reported.



Site no. : 1# 966 chamber      Data no. : 873  
 Dis. / Ant. : 3m ANT ABOVE 18G      Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
              Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 21535.00       | 45.97                    | 20.36                 | 35.33                 | 13.30             | 44.30                         | 74.00              | 29.70          | Peak   |
| 2 | 23915.00       | 45.62                    | 21.97                 | 32.88                 | 14.14             | 48.85                         | 74.00              | 25.15          | Peak   |

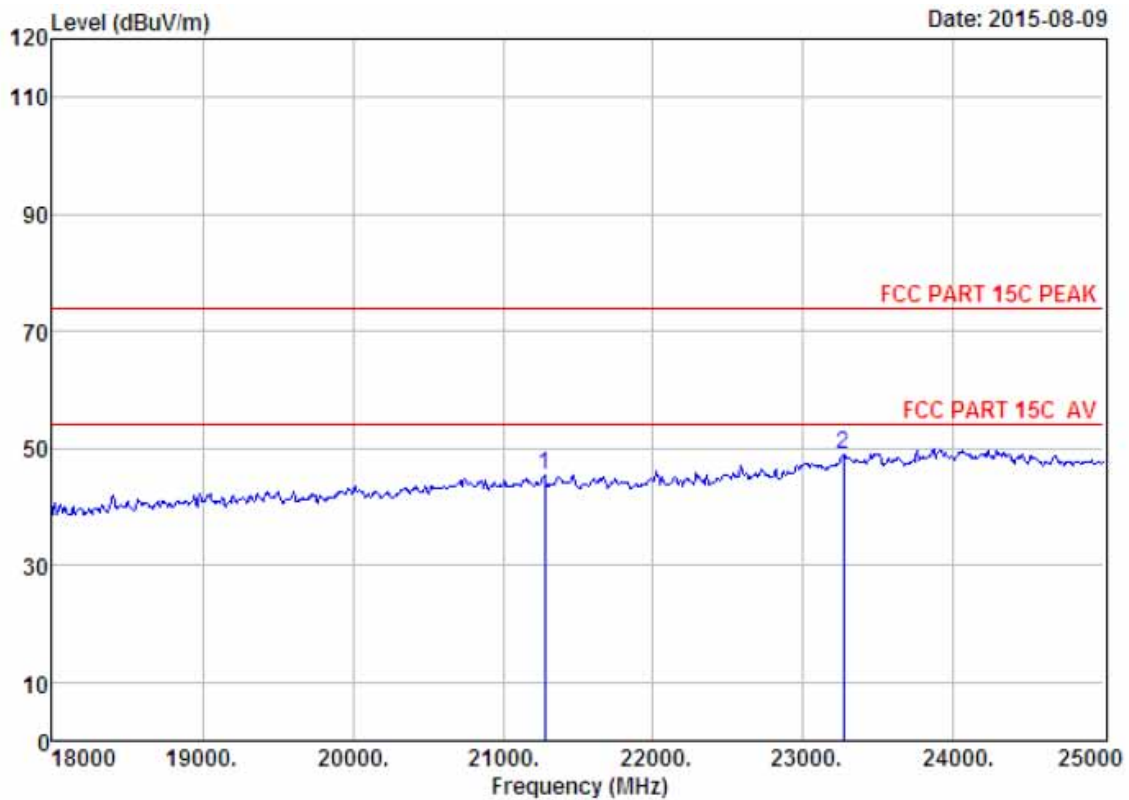
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 874  
 Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
           Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 21360.00       | 46.08                    | 20.28                 | 35.49                 | 12.80             | 43.67                         | 74.00              | 30.33          | Peak   |
| 2 | 24265.00       | 45.65                    | 22.19                 | 33.23                 | 14.15             | 48.76                         | 74.00              | 25.24          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

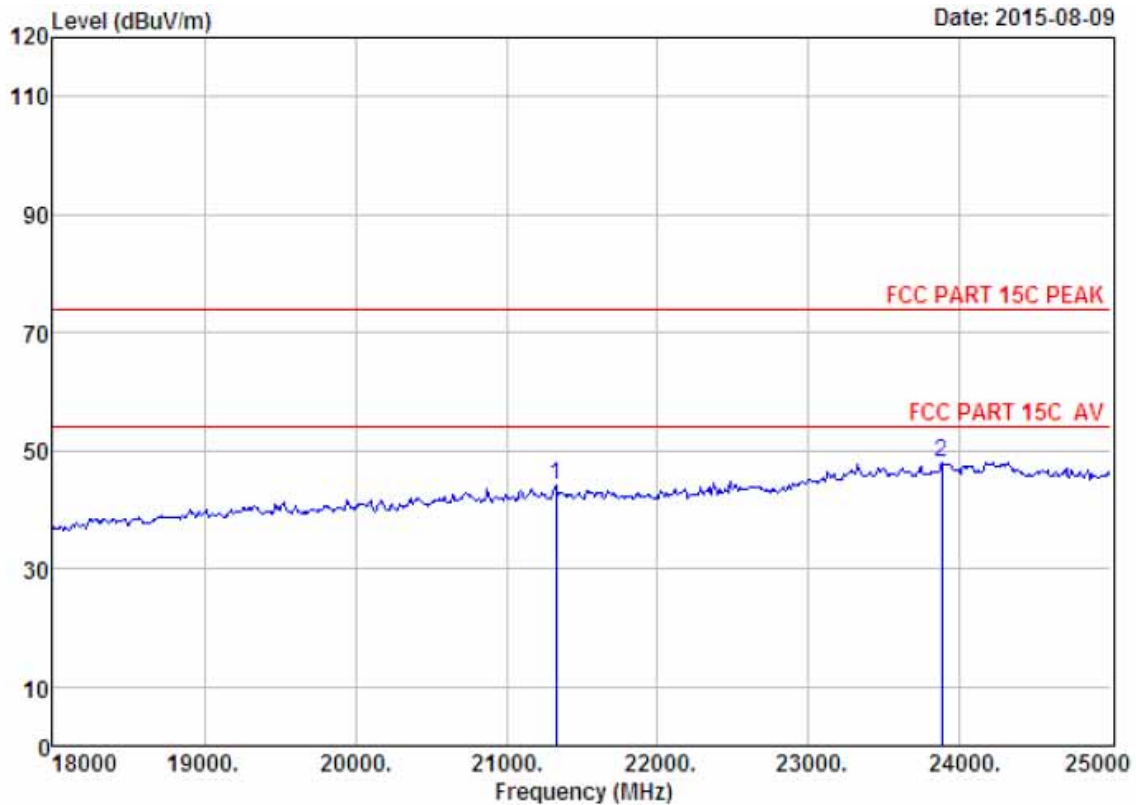


Site no. : 1# 966 chamber                      Data no. : 960  
 Dis. / Ant. : 3m ANT ABOVE 18G              Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : 8-DPSK TX 2480MHz  
                  Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 21276.00       | 46.13                    | 20.25                 | 35.55                 | 14.76             | 45.59                         | 74.00              | 28.41          | Peak   |
| 2 | 23264.00       | 45.65                    | 21.39                 | 33.56                 | 15.58             | 49.06                         | 74.00              | 24.94          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official  
                  limit are not reported.

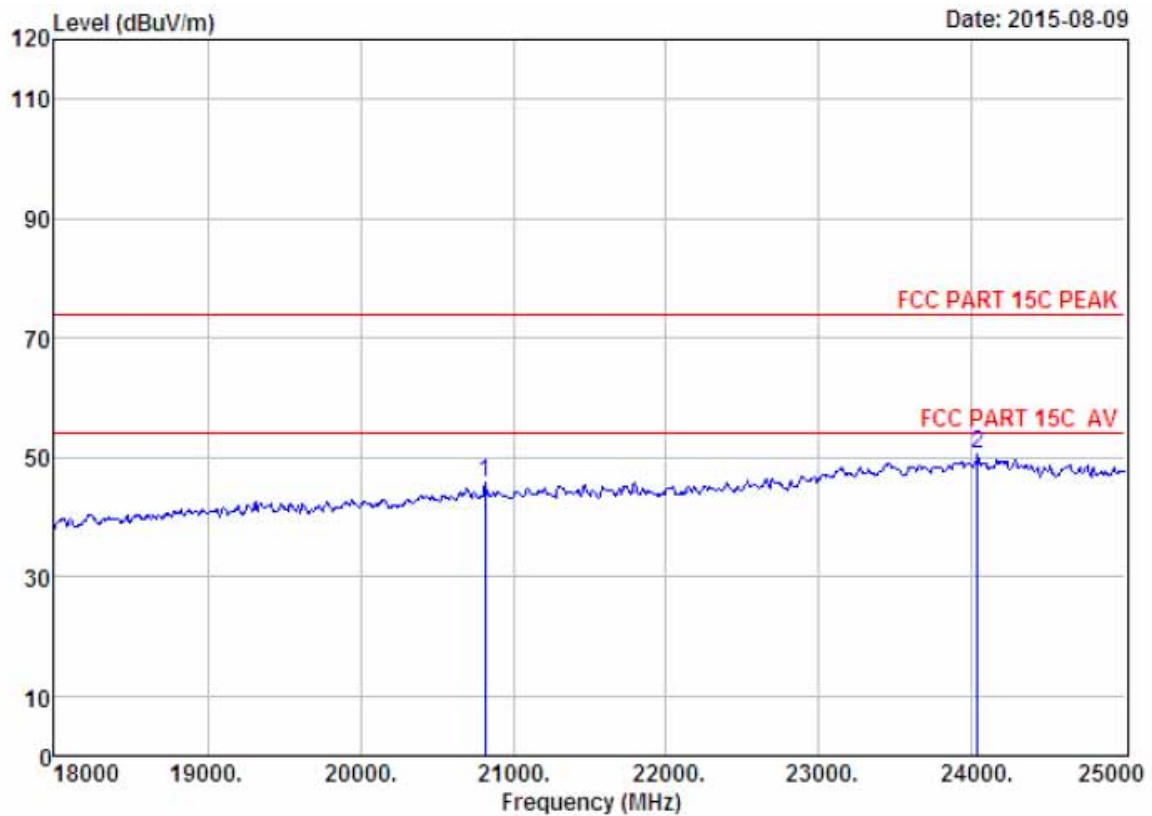




Site no. : 1# 966 chamber Data no. : 961  
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
               Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 21325.00       | 46.10                    | 20.27                 | 35.51                 | 13.29             | 44.15                         | 74.00              | 29.85          | Peak   |
| 2 | 23880.00       | 45.63                    | 21.94                 | 32.93                 | 13.32             | 47.96                         | 74.00              | 26.04          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

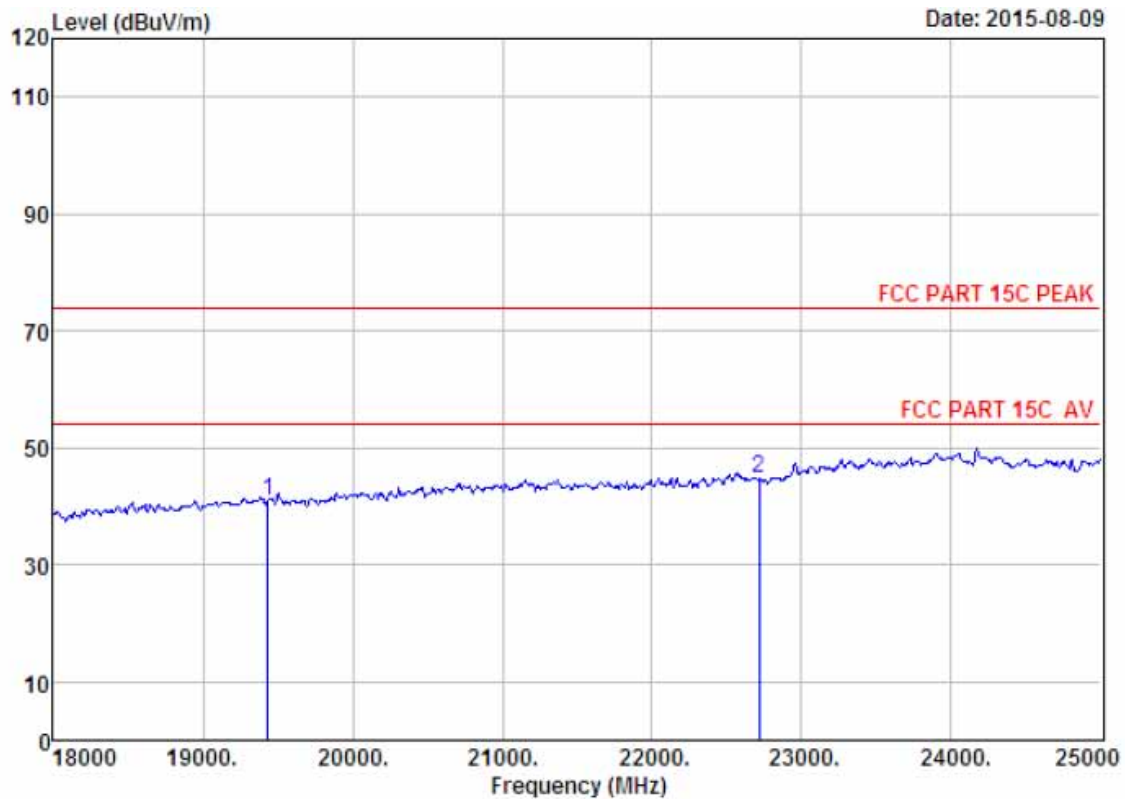


Site no. : 1# 966 chamber      Data no. : 962  
 Dis. / Ant. : 3m ANT ABVOE 18G      Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
              Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 20814.00       | 46.19                    | 20.05                 | 35.96                 | 15.35             | 45.63                         | 74.00              | 28.37          | Peak   |
| 2 | 24034.00       | 45.60                    | 22.06                 | 32.84                 | 15.77             | 50.59                         | 74.00              | 23.41          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

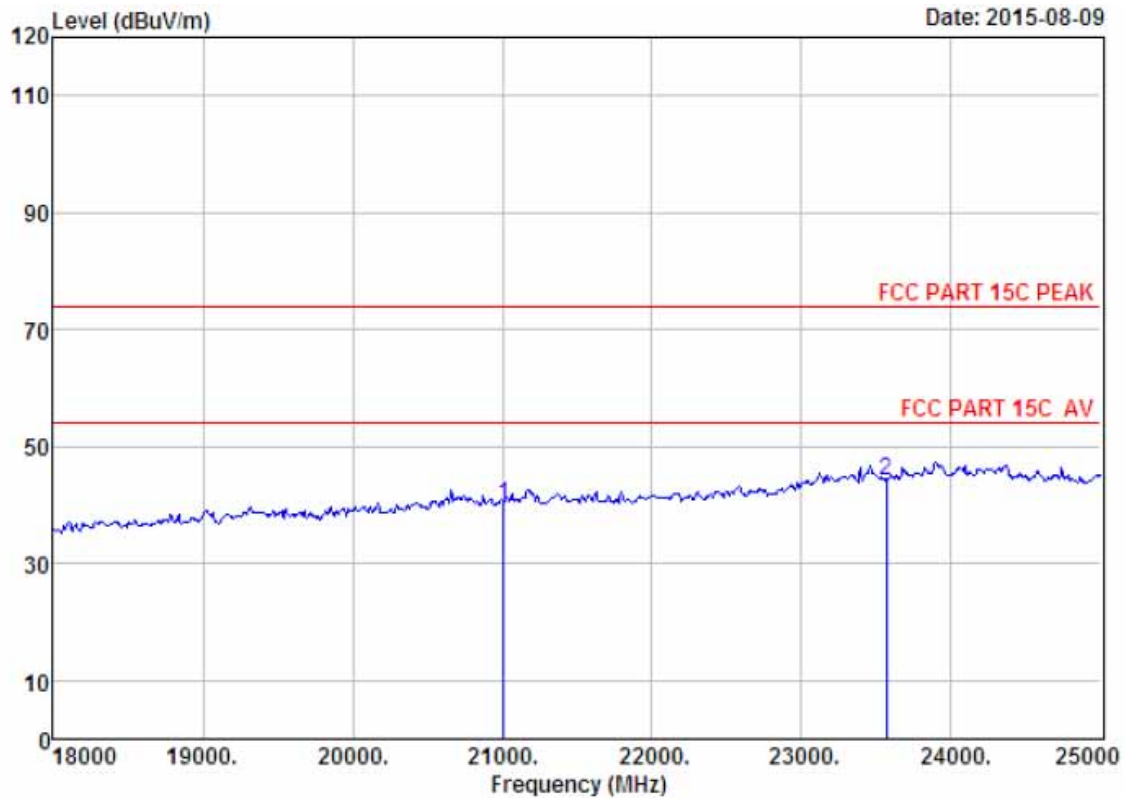




Site no. : 1# 966 chamber                      Data no. : 963  
 Dis. / Ant. : 3m ANT ABVOE 18G              Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
             Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 19435.00       | 45.83                    | 19.03                 | 36.21                 | 12.45             | 41.10                         | 74.00              | 32.90          | Peak   |
| 2 | 22718.00       | 45.72                    | 20.98                 | 34.14                 | 12.12             | 44.68                         | 74.00              | 29.32          | Peak   |

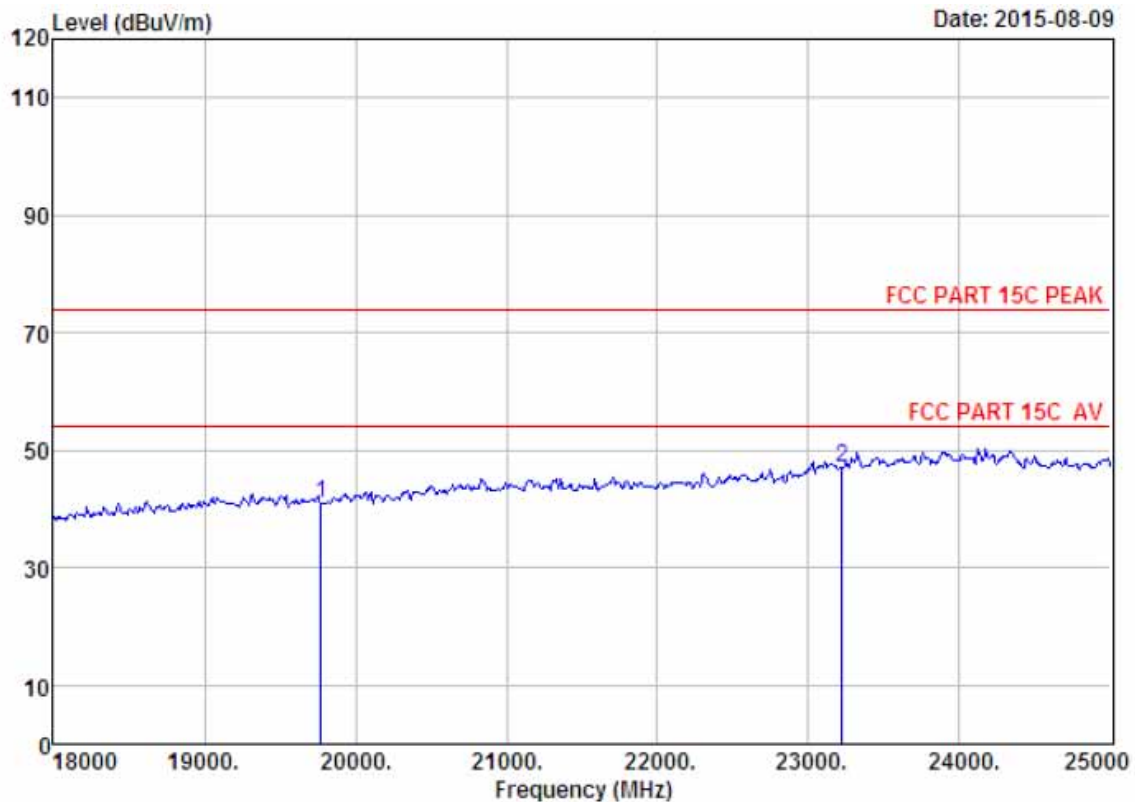
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber                      Data no. : 964  
 Dis. / Ant. : 3m ANT ABOVE 18G              Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2440MHz  
             Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 21010.00       | 46.29                    | 20.13                 | 35.80                 | 9.37              | 39.99                         | 74.00              | 34.01          | Peak   |
| 2 | 23565.00       | 45.69                    | 21.65                 | 33.25                 | 10.10             | 44.19                         | 74.00              | 29.81          | Peak   |

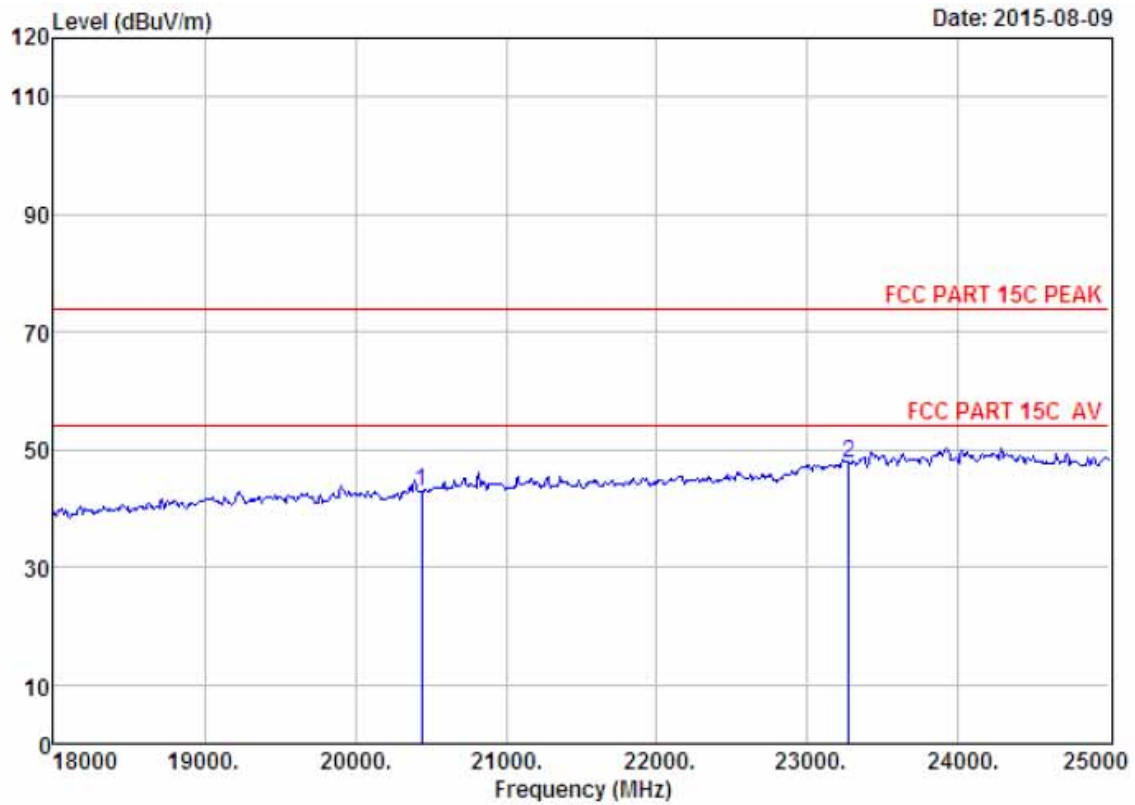
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official  
             limit are not reported.



Site no. : 1# 966 chamber                      Data no. : 965  
 Dis. / Ant. : 3m ANT ABOVE 18G              Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
               Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 19771.00       | 46.00                    | 19.42                 | 36.51                 | 12.05             | 40.96                         | 74.00              | 33.04          | Peak   |
| 2 | 23222.00       | 45.64                    | 21.34                 | 33.61                 | 13.78             | 47.15                         | 74.00              | 26.85          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official  
               limit are not reported.



Site no. : 1# 966 chamber Data no. : 966  
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
 Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 20443.00       | 46.01                    | 19.88                 | 36.30                 | 13.30             | 42.89                         | 74.00              | 31.11          | Peak   |
| 2 | 23271.00       | 45.66                    | 21.39                 | 33.56                 | 14.29             | 47.78                         | 74.00              | 26.22          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

## 5 BAND EDGE COMPLIANCE TEST

### 5.1 Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits

### 5.2 Test Procedure

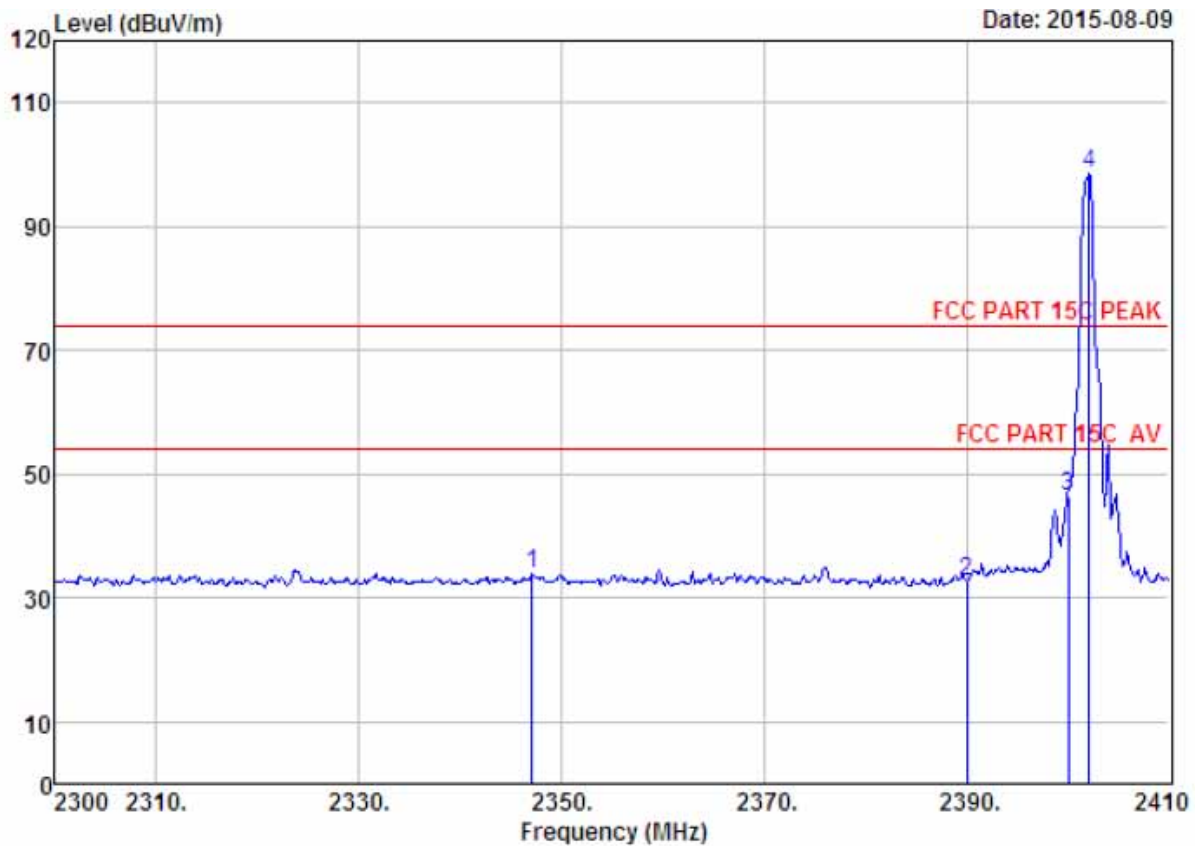
1. The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) Peak : RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto
  - (b) AV : RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto

### 5.3 Test Result

Pass (The testing data was attached in the next pages.)

- Note: 1、 For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
- 2、 The frequency 2402MHz and 2480 MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

## 5.4 Test Data

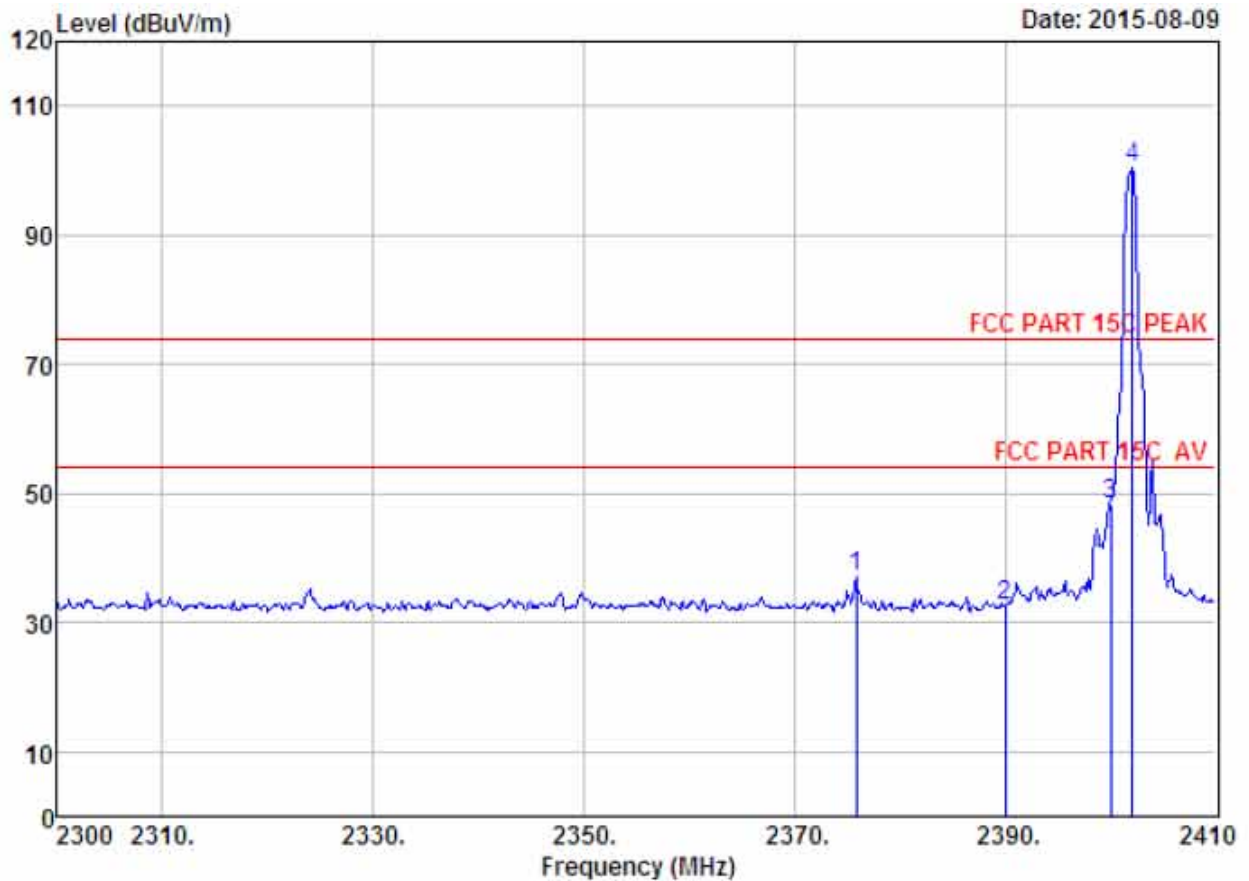


Site no. : 1# 966 chamber                      Data no. : 877  
 Dis. / Ant. : 3m ANT 1-18G                      Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUI : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2347.08        | 27.70                    | 6.56                  | 34.22                 | 33.89             | 33.93                         | 74.00              | 40.07          | Peak   |
| 2 | 2390.00        | 27.64                    | 6.62                  | 34.19                 | 32.52             | 32.59                         | 74.00              | 41.41          | Peak   |
| 3 | 2400.00        | 27.61                    | 6.62                  | 34.18                 | 46.40             | 46.45                         | 74.00              | 27.55          | Peak   |
| 4 | 2402.08        | 27.61                    | 6.62                  | 34.18                 | 98.51             | 98.56                         | 74.00              | -24.56         | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official  
               limit are not reported.



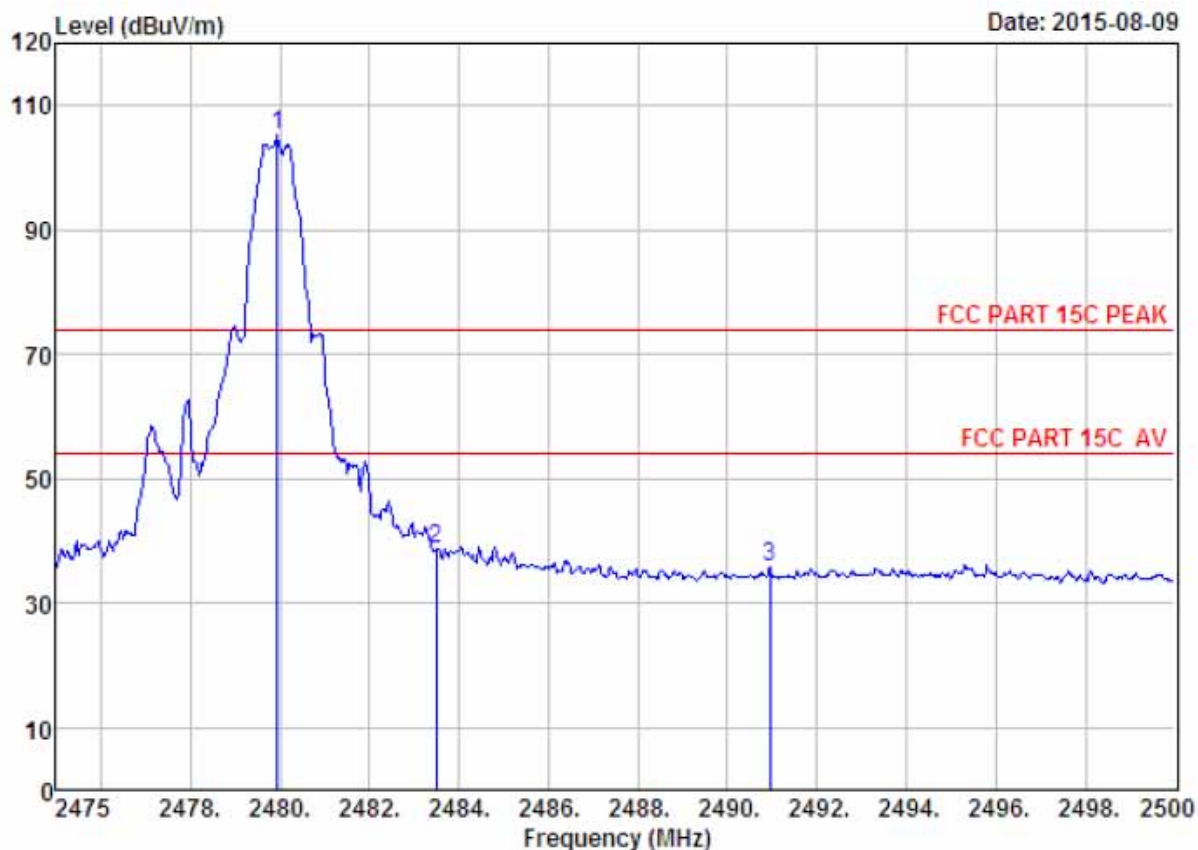


Site no. : 1# 966 chamber Data no. : 878  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
 Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2375.90        | 27.64                    | 6.60                  | 34.19                 | 37.04             | 37.09                         | 74.00              | 36.91          | Peak   |
| 2 | 2390.00        | 27.64                    | 6.62                  | 34.19                 | 32.55             | 32.62                         | 74.00              | 41.38          | Peak   |
| 3 | 2400.00        | 27.61                    | 6.62                  | 34.18                 | 48.39             | 48.44                         | 74.00              | 25.56          | Peak   |
| 4 | 2402.08        | 27.61                    | 6.62                  | 34.18                 | 100.51            | 100.56                        | 74.00              | -26.56         | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

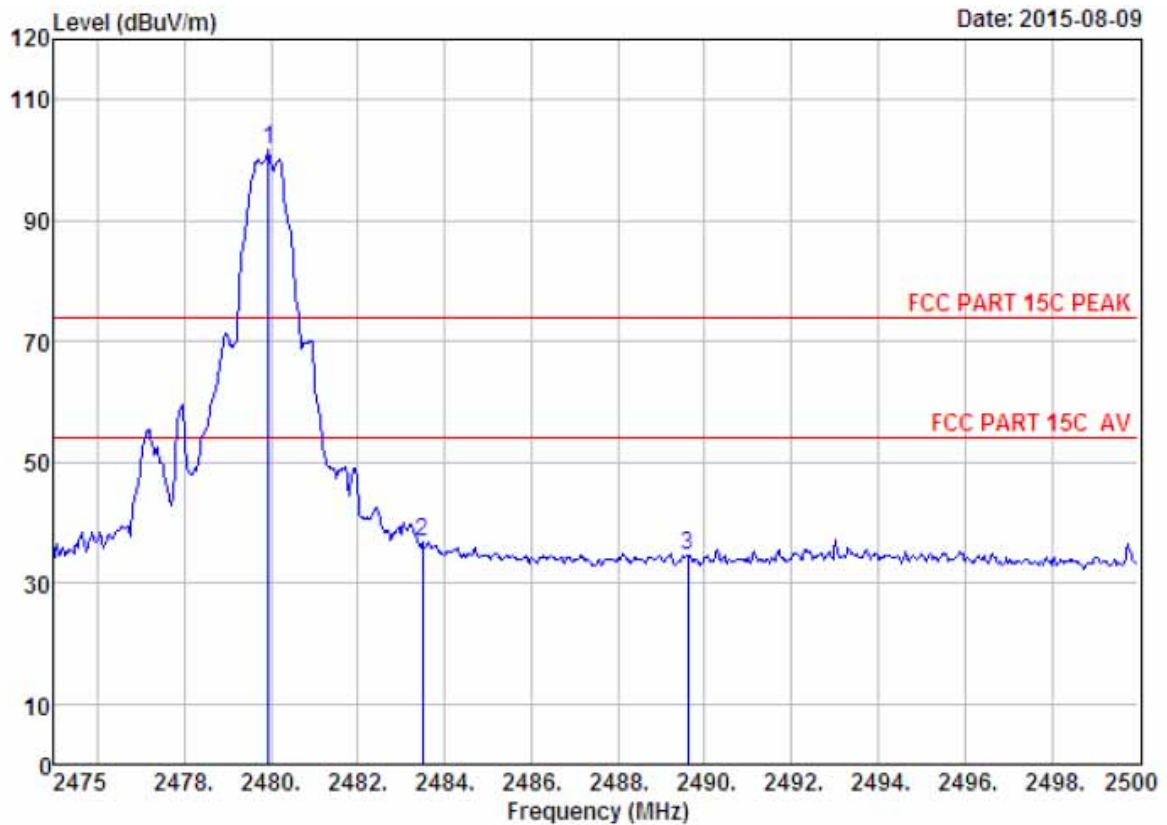




|             |   |           |              |
|-------------|---|-----------|--------------|
| Site no.    | : 1# 966 chamber                        | Data no.  | : 903        |
| Dis. / Ant. | : 3m ANT 1-18G                          | Ant. pol. | : HORIZONTAL |
| Limit       | : FCC PART 15C PEAK                     |           |              |
| Env. / Ins. | : Temp:23.6';Humi:56%;Press:101.52kPa   |           |              |
| Engineer    | : Tony                                  |           |              |
| EUT         | : Portable Bluetooth Speaker            |           |              |
| Power       | : DC 5V From Adapter Input AC 120V/60Hz |           |              |
| M/N         | : Groove                                |           |              |
| Test Mode   | : GFSK TX 2480MHz                       |           |              |
|             | Adapter 1                               |           |              |

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2479.95        | 27.58                    | 6.71                  | 34.03                 | 105.11            | 105.37                        | 74.00              | -31.37         | Peak   |
| 2 | 2483.50        | 27.58                    | 6.71                  | 34.03                 | 38.33             | 38.59                         | 74.00              | 35.41          | Peak   |
| 3 | 2490.95        | 27.58                    | 6.73                  | 34.03                 | 35.58             | 35.86                         | 74.00              | 38.14          | Peak   |

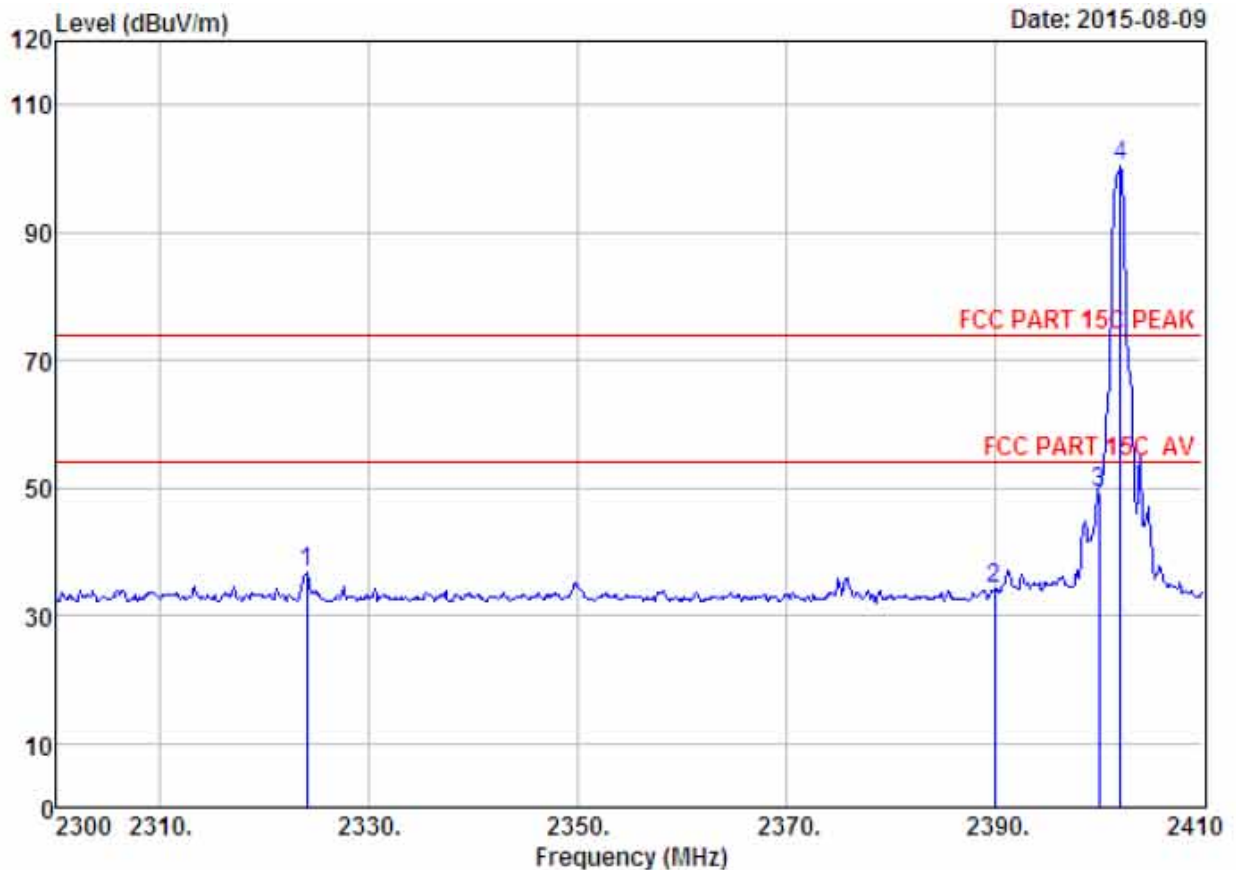
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 904  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
               Adapter 1

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2479.95        | 27.58                    | 6.71                  | 34.03                 | 101.62            | 101.88                        | 74.00              | -27.88         | Peak   |
| 2 | 2483.50        | 27.58                    | 6.71                  | 34.03                 | 36.41             | 36.67                         | 74.00              | 37.33          | Peak   |
| 3 | 2489.60        | 27.58                    | 6.73                  | 34.03                 | 34.28             | 34.56                         | 74.00              | 39.44          | Peak   |

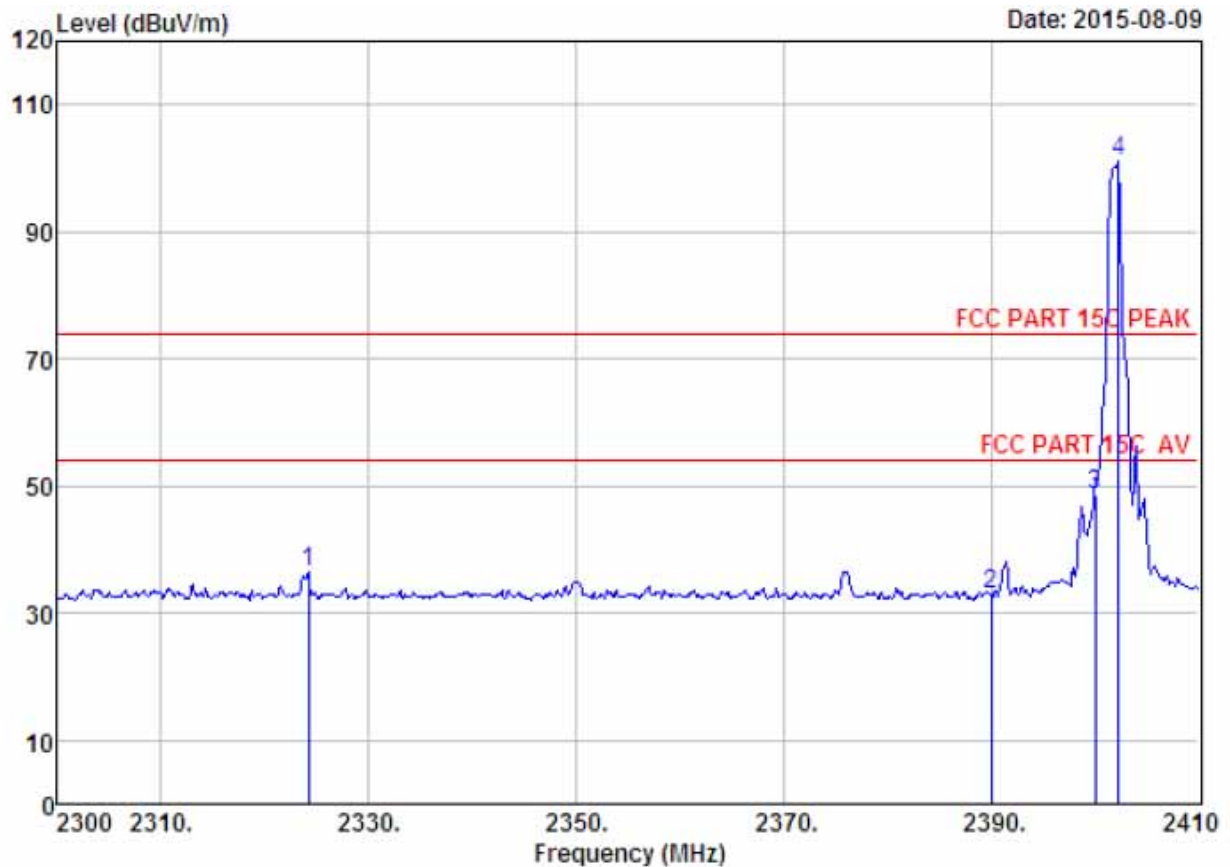
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber      Data no. : 937  
 Dis. / Ant. : 3m ANT 1-18G      Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
             Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2323.98        | 27.73                    | 6.54                  | 34.23                 | 36.74             | 36.78                         | 74.00              | 37.22          | Peak   |
| 2 | 2390.00        | 27.64                    | 6.62                  | 34.19                 | 34.02             | 34.09                         | 74.00              | 39.91          | Peak   |
| 3 | 2400.00        | 27.61                    | 6.62                  | 34.18                 | 49.33             | 49.38                         | 74.00              | 24.62          | Peak   |
| 4 | 2402.08        | 27.61                    | 6.62                  | 34.18                 | 100.29            | 100.34                        | 74.00              | -26.34         | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

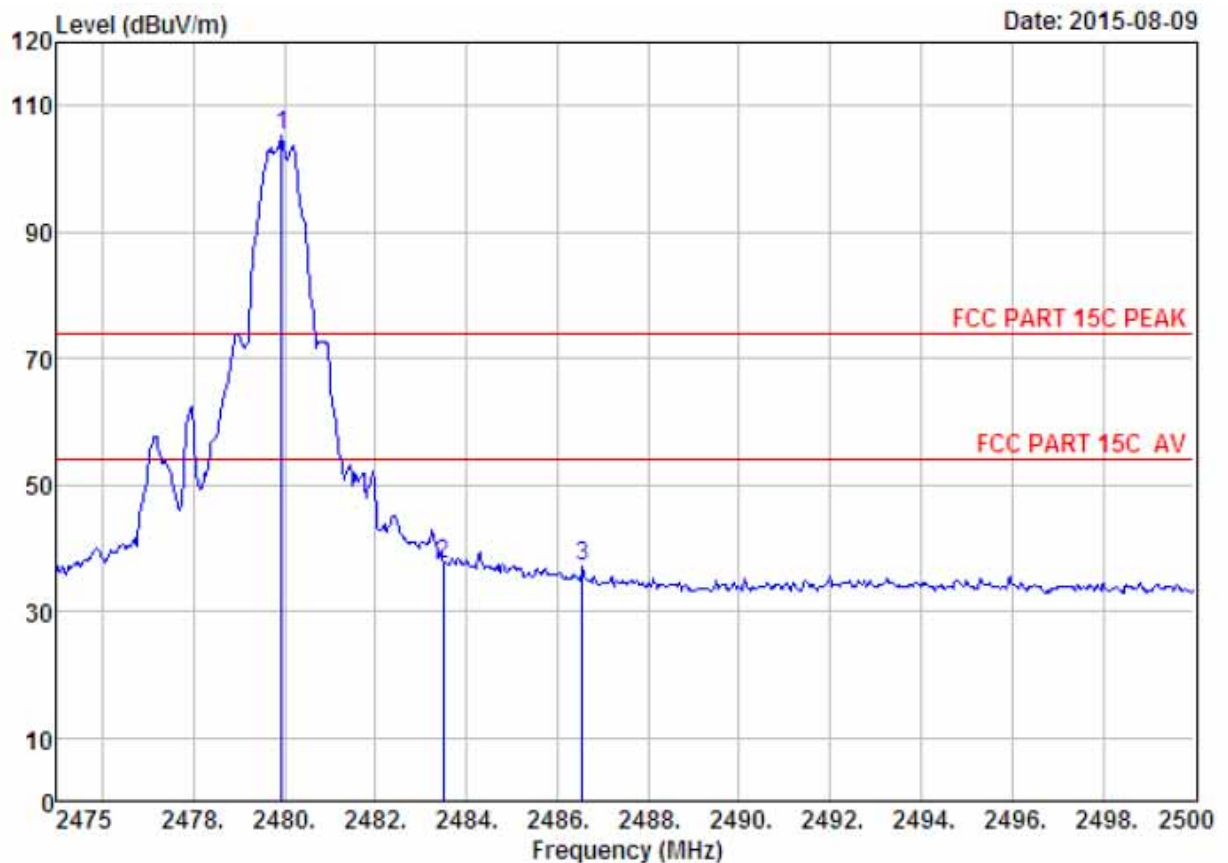


Site no. : 1# 966 chamber      Data no. : 938  
 Dis. / Ant. : 3m ANT 1-18G      Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2402MHz  
               Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2324.20        | 27.73                    | 6.54                  | 34.23                 | 36.47             | 36.51                         | 74.00              | 37.49          | Peak   |
| 2 | 2390.00        | 27.64                    | 6.62                  | 34.19                 | 32.82             | 32.89                         | 74.00              | 41.11          | Peak   |
| 3 | 2400.00        | 27.61                    | 6.62                  | 34.18                 | 48.67             | 48.72                         | 74.00              | 25.28          | Peak   |
| 4 | 2402.30        | 27.61                    | 6.62                  | 34.18                 | 101.00            | 101.05                        | 74.00              | -27.05         | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

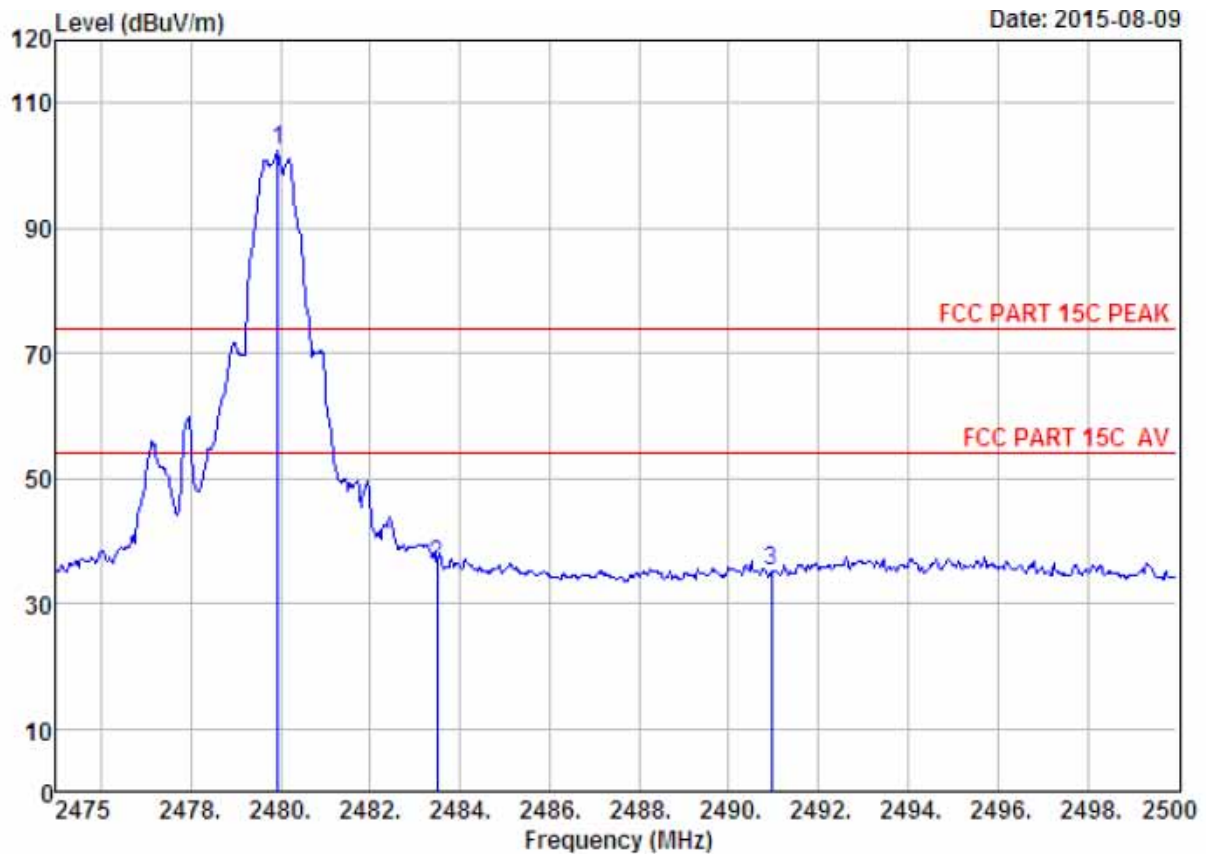




Site no. : 1# 966 chamber Data no. : 943  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
 Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBUV) | Emission<br>Level<br>(dBUV/m) | Limits<br>(dBUV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2479.95        | 27.58                    | 6.71                  | 34.03                 | 104.94            | 105.20                        | 74.00              | -31.20         | Peak   |
| 2 | 2483.50        | 27.58                    | 6.71                  | 34.03                 | 37.25             | 37.51                         | 74.00              | 36.49          | Peak   |
| 3 | 2486.55        | 27.58                    | 6.71                  | 34.03                 | 36.90             | 37.16                         | 74.00              | 36.84          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 944  
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK  
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa  
 Engineer : Tony  
 EUT : Portable Bluetooth Speaker  
 Power : DC 5V From Adapter Input AC 120V/60Hz  
 M/N : Groove  
 Test Mode : GFSK TX 2480MHz  
                   Adapter 2

|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Amp<br>Factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2479.95        | 27.58                    | 6.71                  | 34.03                 | 102.10            | 102.36                        | 74.00              | -28.36         | Peak   |
| 2 | 2483.50        | 27.58                    | 6.71                  | 34.03                 | 35.96             | 36.22                         | 74.00              | 37.78          | Peak   |
| 3 | 2490.95        | 27.58                    | 6.73                  | 34.03                 | 34.83             | 35.11                         | 74.00              | 38.89          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



## 6 6dB Bandwidth Test

### 6.1 Limit

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

### 6.2 Test Procedure

- 1, Connected the EUT's antenna port to spectrum analyzer device.
- 2, Follow the test procedure as described in KDB 558074
  - (1). Set resolution bandwidth (RBW) = 100 kHz.
  - (2). Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
  - (3). Detector = Peak.
  - (4). Trace mode = max hold.
  - (5). Sweep = auto couple.
  - (6). Allow the trace to stabilize.
  - (7). Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

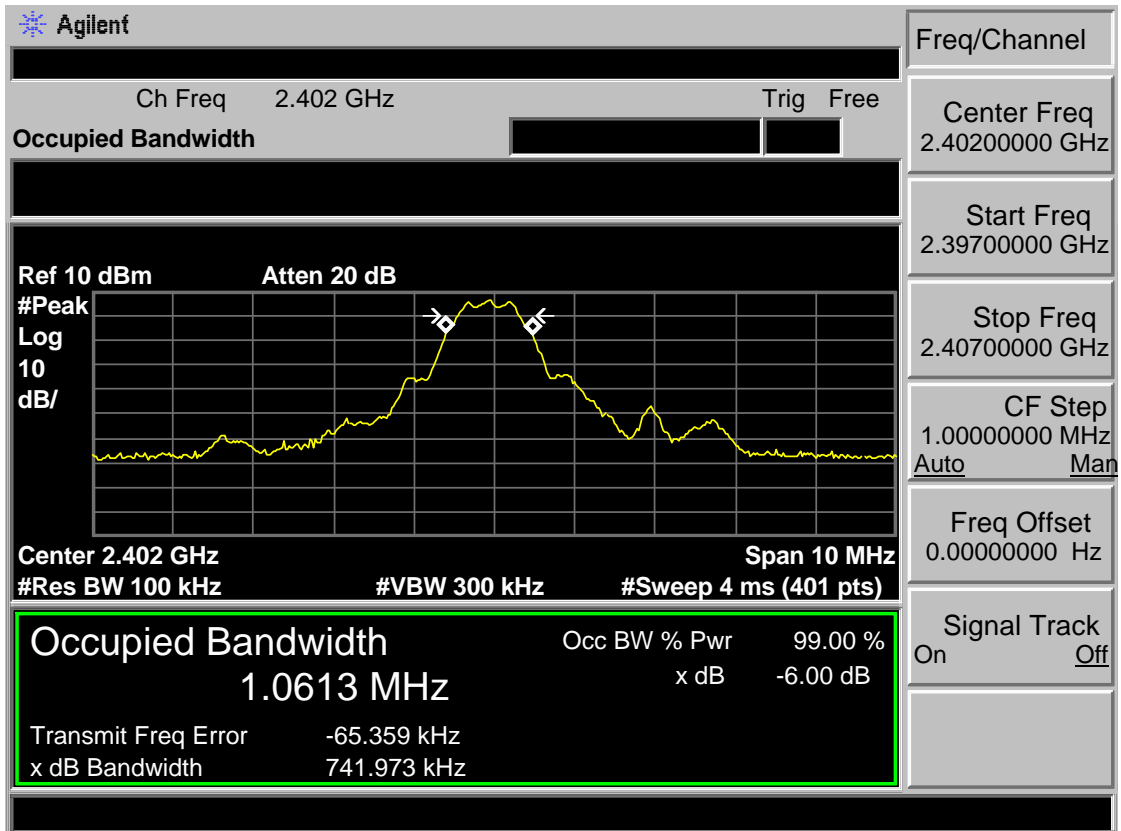
### 6.3 Test Result

|                                 |      |                          |                    |
|---------------------------------|------|--------------------------|--------------------|
| EUT: Portable Bluetooth Speaker |      |                          |                    |
| M/N: Groove                     |      |                          |                    |
| Test date: 2015-08-20           |      | Tested by: Tony.Tang     | Test site: RF Site |
| Test Mode                       | CH   | 6dB bandwidth<br>( MHz ) | Limit<br>(KHz)     |
| Adapter 1                       |      |                          |                    |
| BT 4.0-BLE<br>GFSK              | CH1  | 0.742                    | >500               |
|                                 | CH20 | 0.751                    | >500               |
|                                 | CH40 | 0.747                    | >500               |
| Adapter 2                       |      |                          |                    |
| BT 4.0-BLE<br>GFSK              | CH1  | 0.759                    | >500               |
|                                 | CH20 | 0.758                    | >500               |
|                                 | CH40 | 0.762                    | >500               |
| Conclusion : PASS               |      |                          |                    |

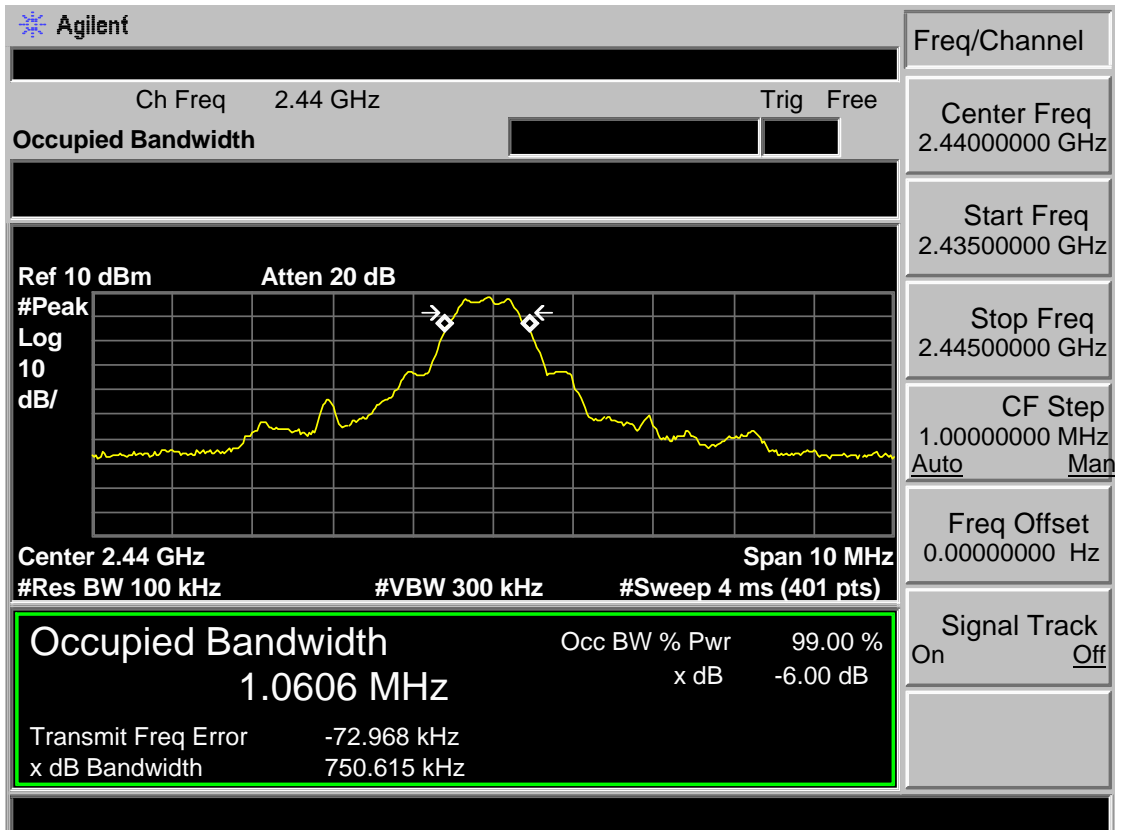
## 6.4 Test Data

Adapter 1

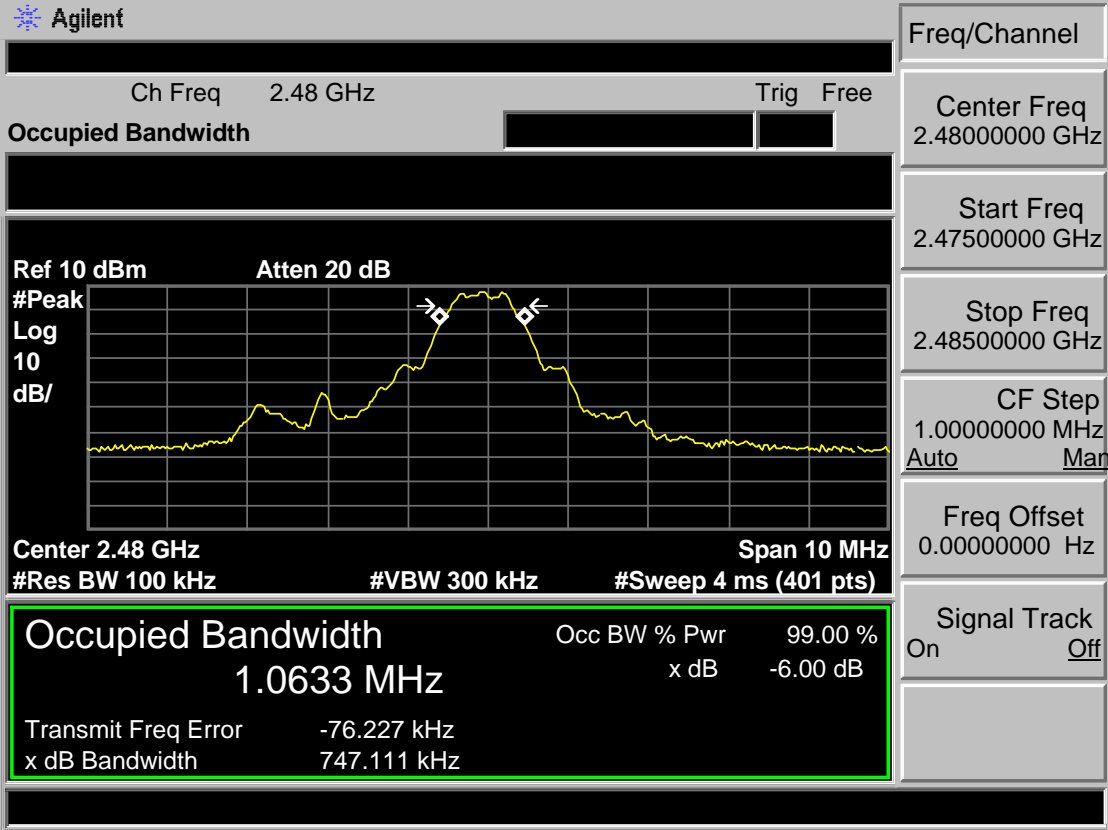
Test Mode: BT 4.0-BLE GFSK 2402MHz



Test Mode: BT 4.0-BLE GFSK 2440MHz

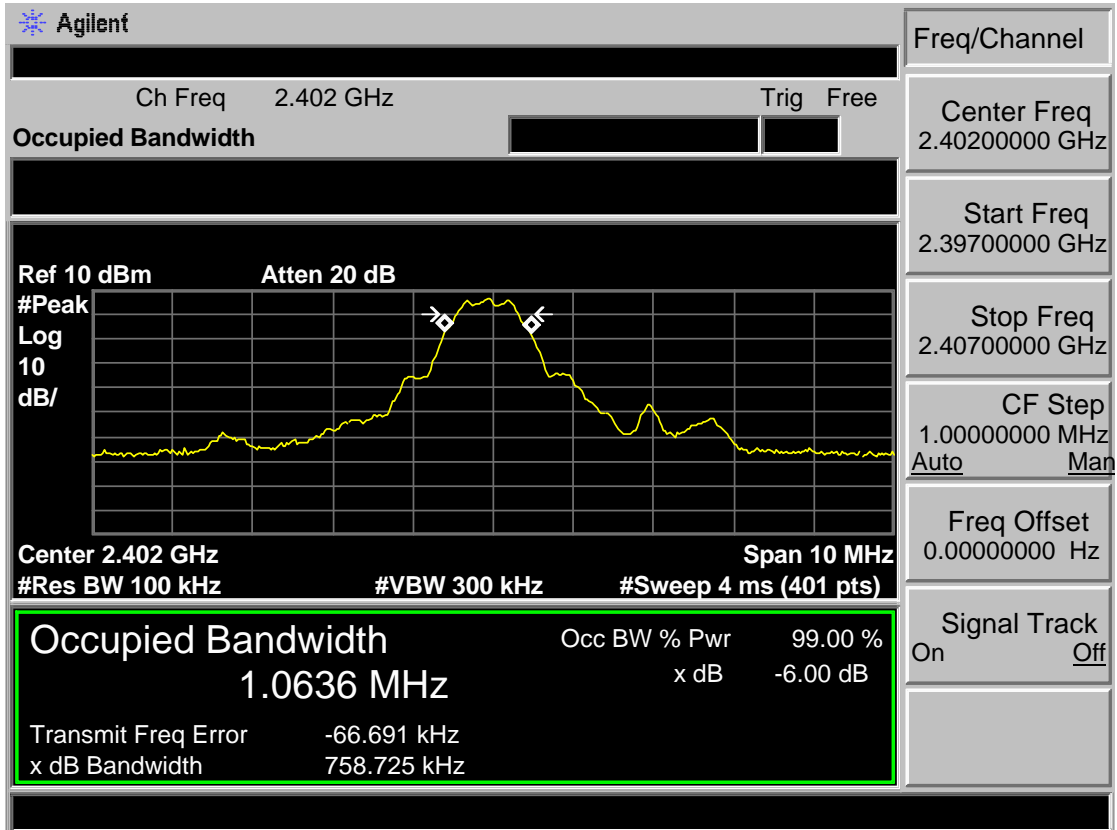


Test Mode: BT 4.0-BLE GFSK 2480MHz

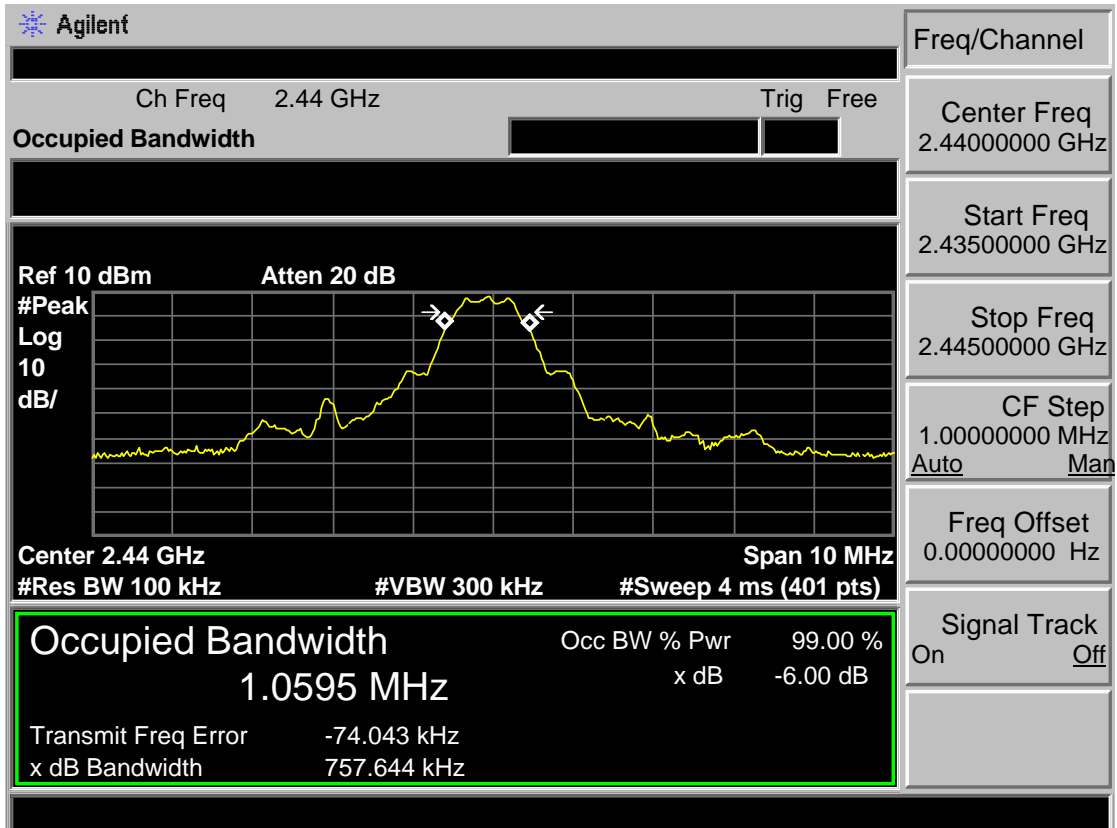


## Adapter 2

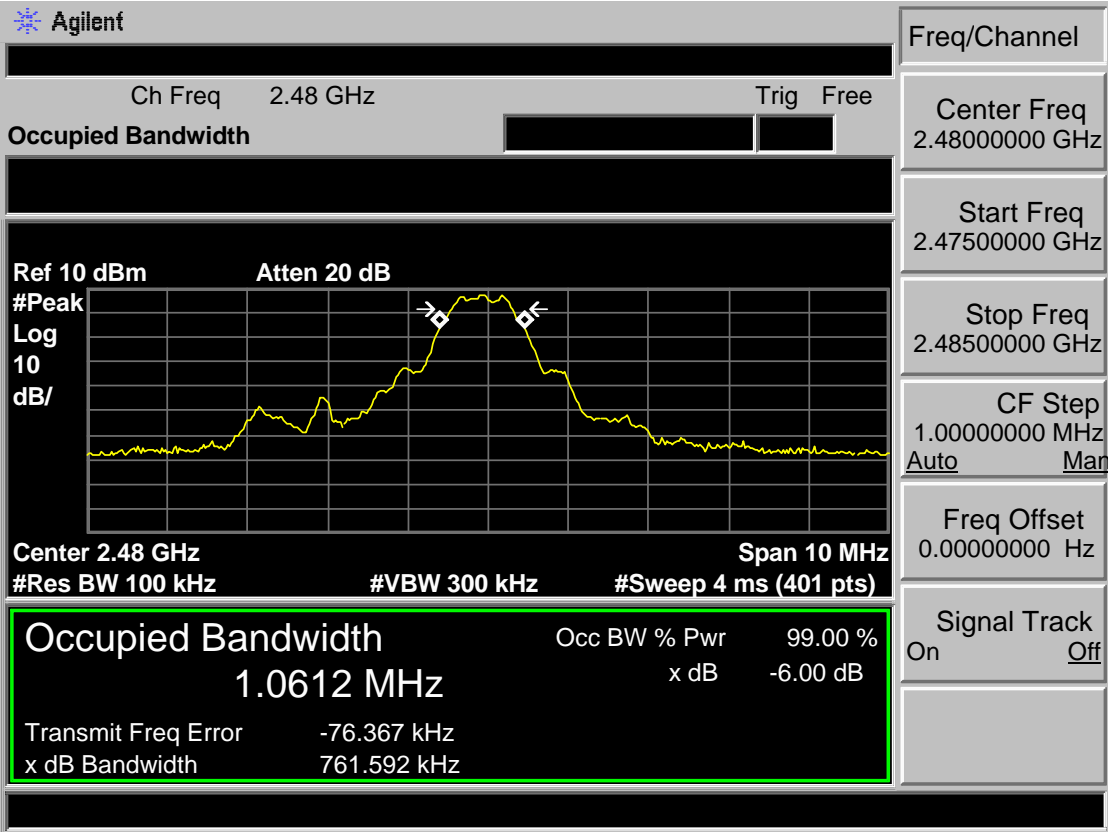
Test Mode: BT 4.0-BLE GFSK 2402MHz



Test Mode: BT 4.0-BLE GFSK 2440MHz



Test Mode: BT 4.0-BLE GFSK 2480MHz





## 7 OUTPUT POWER TEST

### 7.1 Limit

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

### 7.2 Test Procedure

#### 7.3 Test Procedure

- 1, Connected the EUT's antenna port to spectrum analyzer device.
- 2, Follow the test procedure as described in KDB 558074
  - (1). Set the RBW  $\geq$  DTS bandwidth.
  - (2). Set VBW  $\geq$  3 x RBW.
  - (3). Set span  $\geq$  3 x RBW.
  - (4). Sweep time = auto couple.
  - (5). Detector = peak.
  - (6). Trace mode = max hold.
  - (7). Allow trace to fully stabilize.
  - (8). Use peak marker function to determine the peak amplitude level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

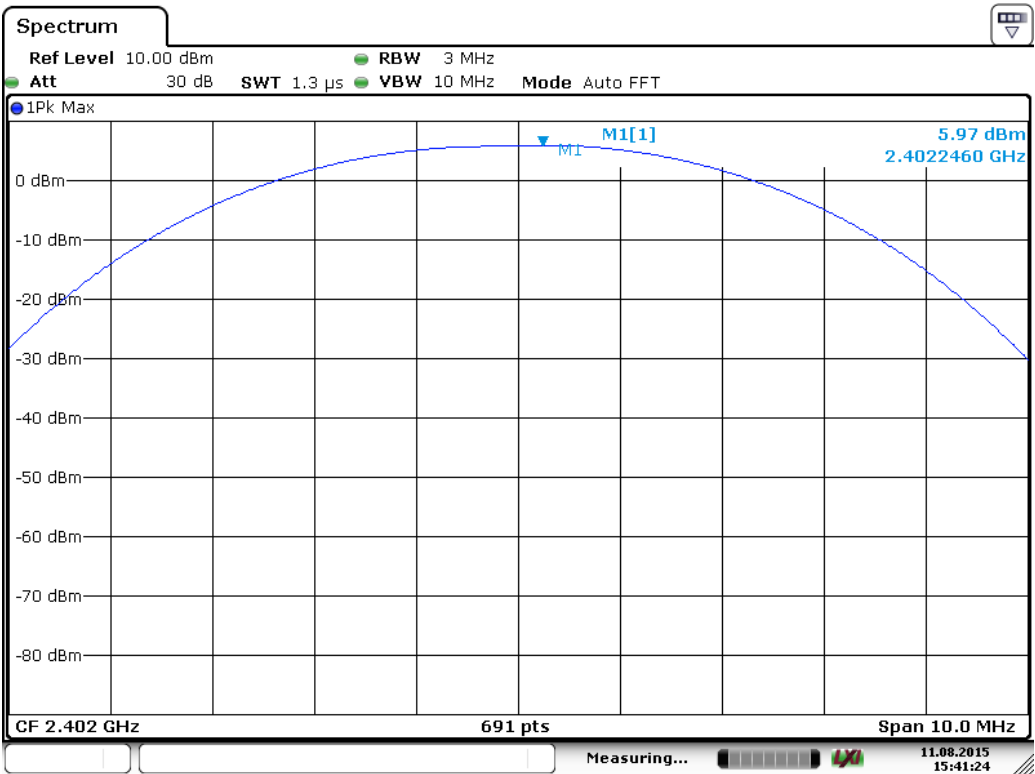
## 7.4 Test Result

|                                 |      |                              |                      |
|---------------------------------|------|------------------------------|----------------------|
| EUT: Portable Bluetooth Speaker |      |                              |                      |
| M/N: Groove                     |      |                              |                      |
| Test date: 2015-08-11           |      | Test site: 3m Chamber        | Tested by: Tony Tang |
| Test Mode                       | CH   | Peak output Power<br>( dBm ) | Limit<br>(dBm)       |
| Adapter 1                       |      |                              |                      |
| BT 4.0-BLE<br>GFSK              | CH1  | 5.97                         | 30                   |
|                                 | CH20 | 5.51                         | 30                   |
|                                 | CH40 | 4.87                         | 30                   |
| Adapter 2                       |      |                              |                      |
| BT 4.0-BLE<br>GFSK              | CH1  | 5.92                         | 30                   |
|                                 | CH20 | 5.37                         | 30                   |
|                                 | CH40 | 4.95                         | 30                   |
| Conclusion : PASS               |      |                              |                      |

7.5 Test Data

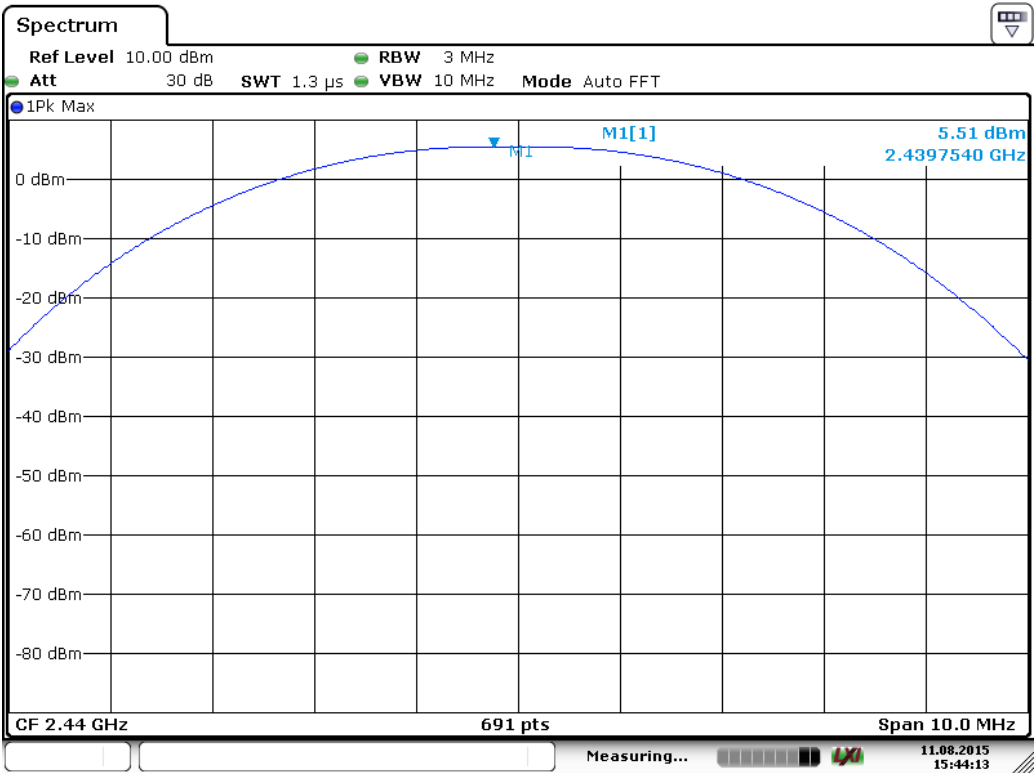
Adapter 1

Test Mode: BT 4.0-BLE GFSK 2402MHz



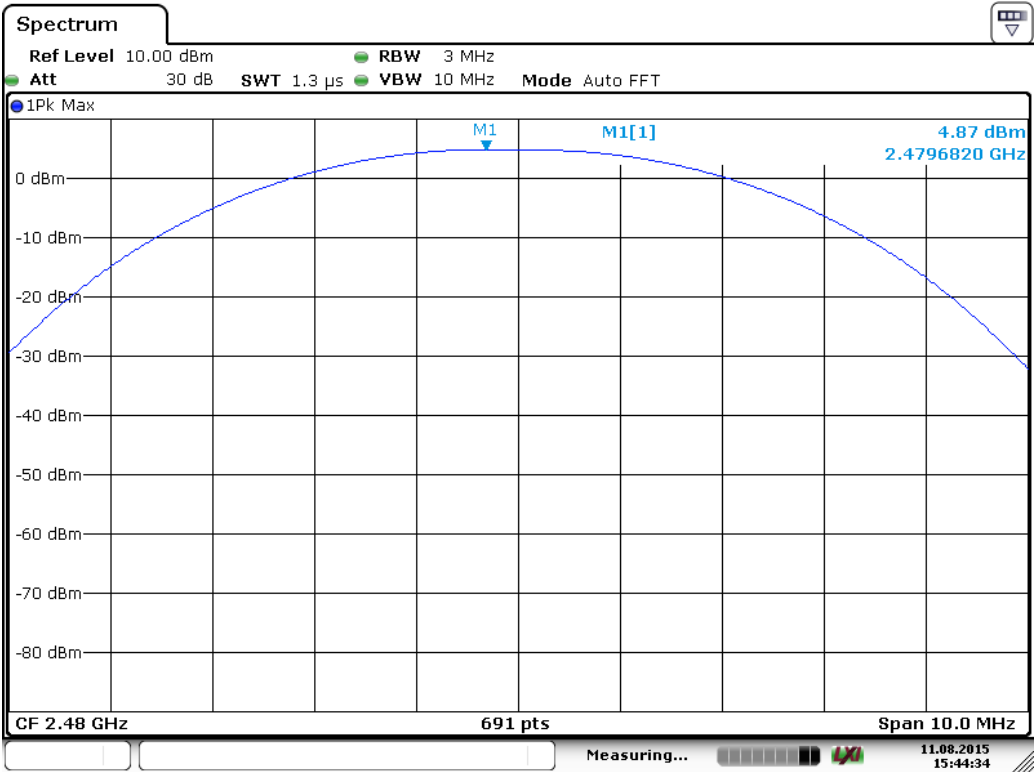
Date:11 AUG.2015 15:41:24

Test Mode: BT 4.0-BLE GFSK 2440MHz



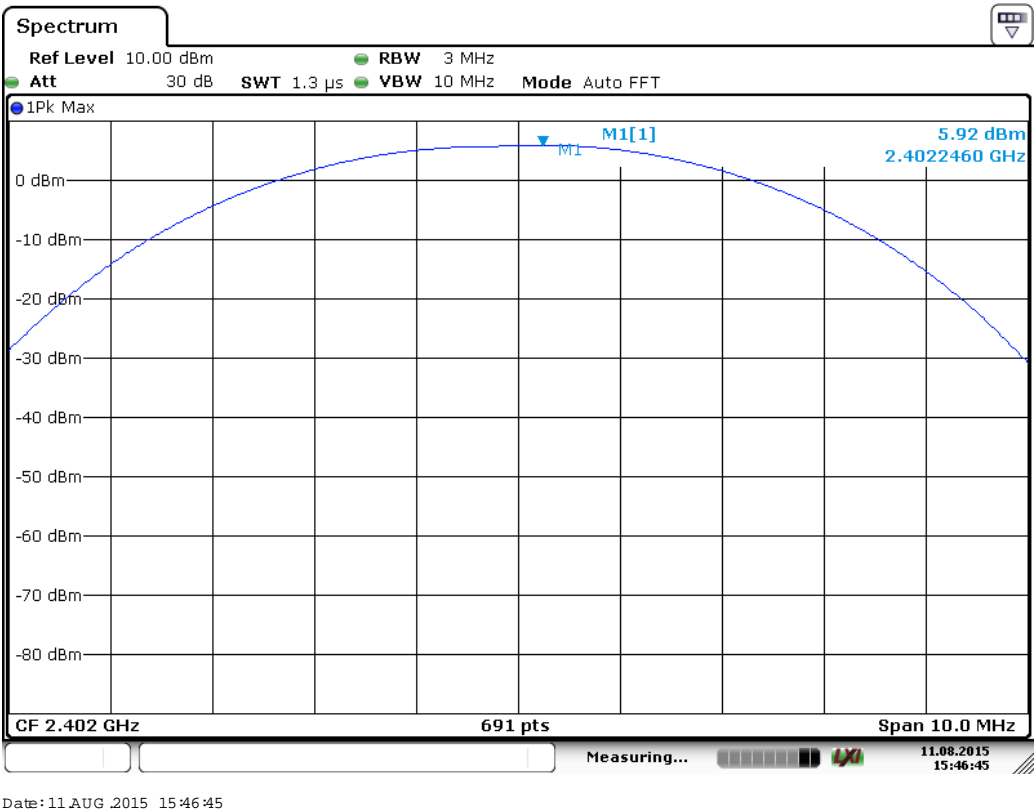
Date:11 AUG.2015 15:44:13

Test Mode: BT 4.0-BLE GFSK 2480MHz

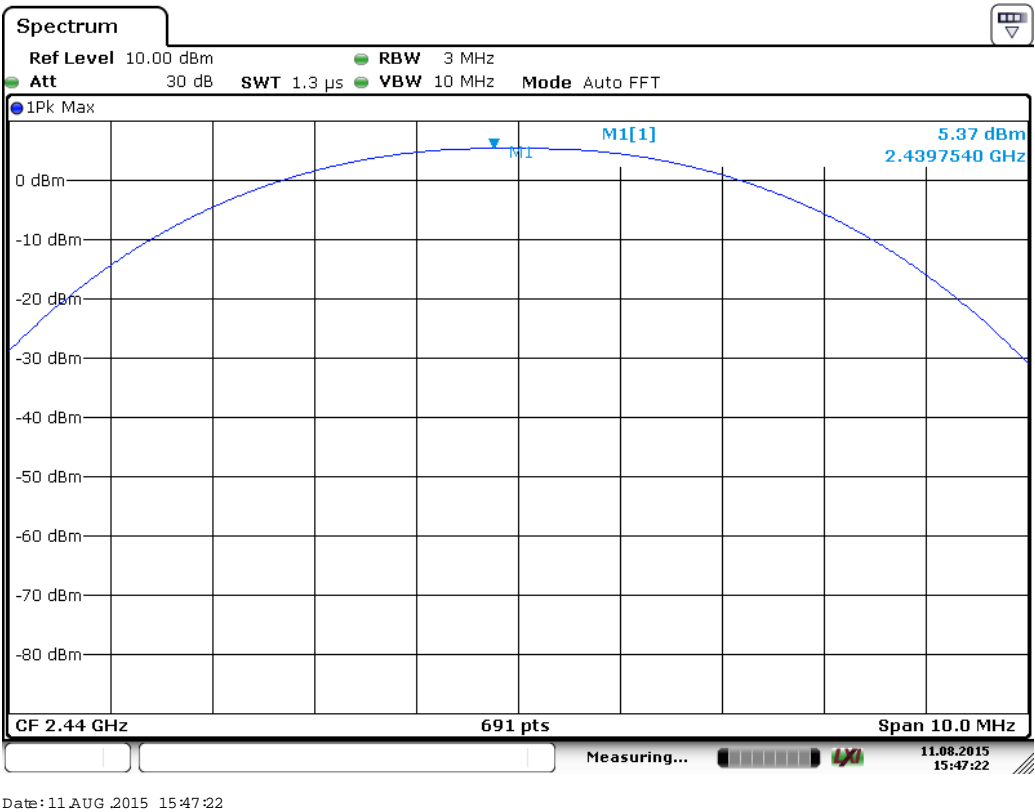


Date: 11 AUG 2015 15:44:34

Adapter 2  
Test Mode: BT 4.0-BLE GFSK 2402MHz

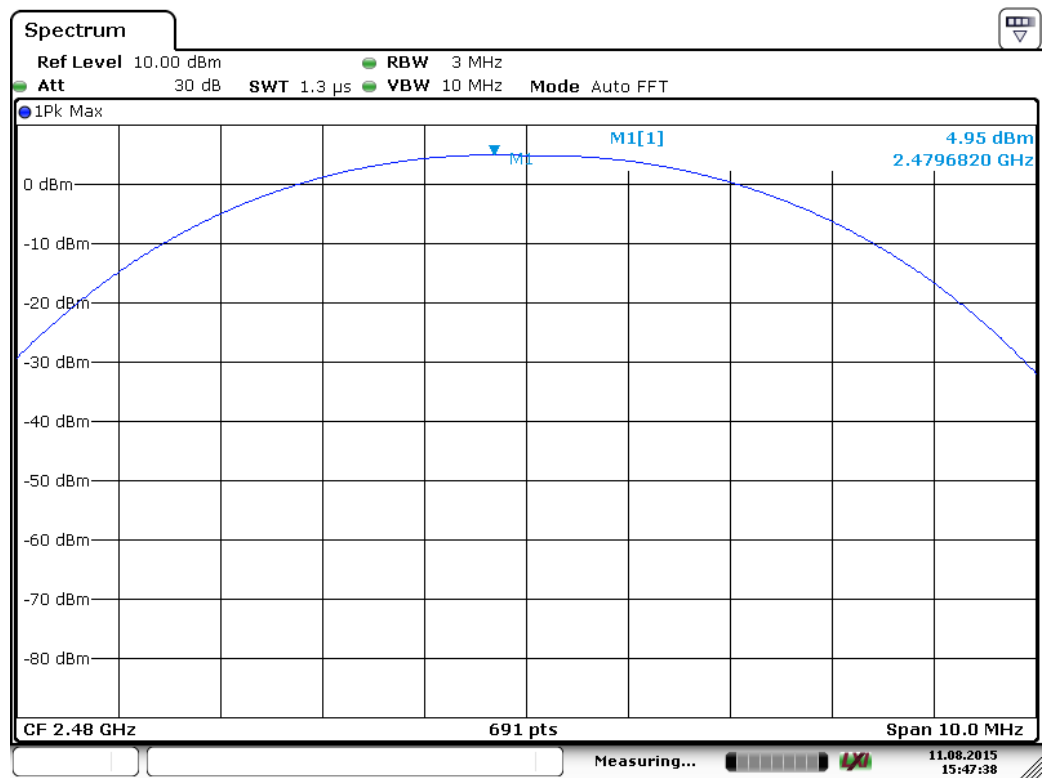


Test Mode: BT 4.0-BLE GFSK 2440MHz





Test Mode: BT 4.0-BLE GFSK 2480MHz



Date: 11 AUG 2015 15:47:38

## 8 POWER SPECTRAL DENSITY TEST

### 8.1 Limit

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

### 8.2 Test Procedure

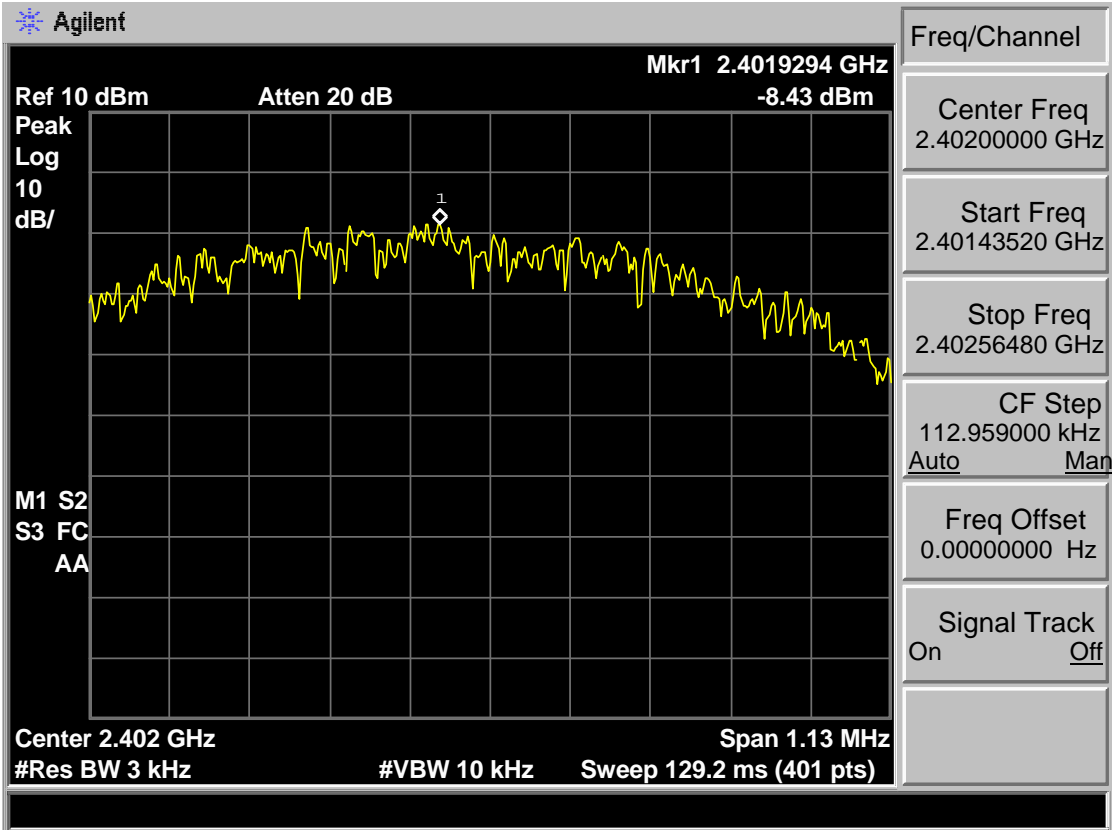
- 1, Connected the EUT's antenna port to spectrum analyzer device.
- 2, Follow the test procedure as described in KDB 558074
  - (1). Set analyzer center frequency to DTS channel center frequency.
  - (2). Set the span to 1.5 times the DTS bandwidth.
  - (3). Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
  - (4). Set the VBW  $\geq 3 \text{ RBW}$ .
  - (5). Detector = peak.
  - (6). Sweep time = auto couple.
  - (7). Trace mode = max hold.
  - (8). Allow trace to fully stabilize.
  - (9). Use the peak marker function to determine the maximum amplitude level.
  - (10). If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

## 8.3 Test Result

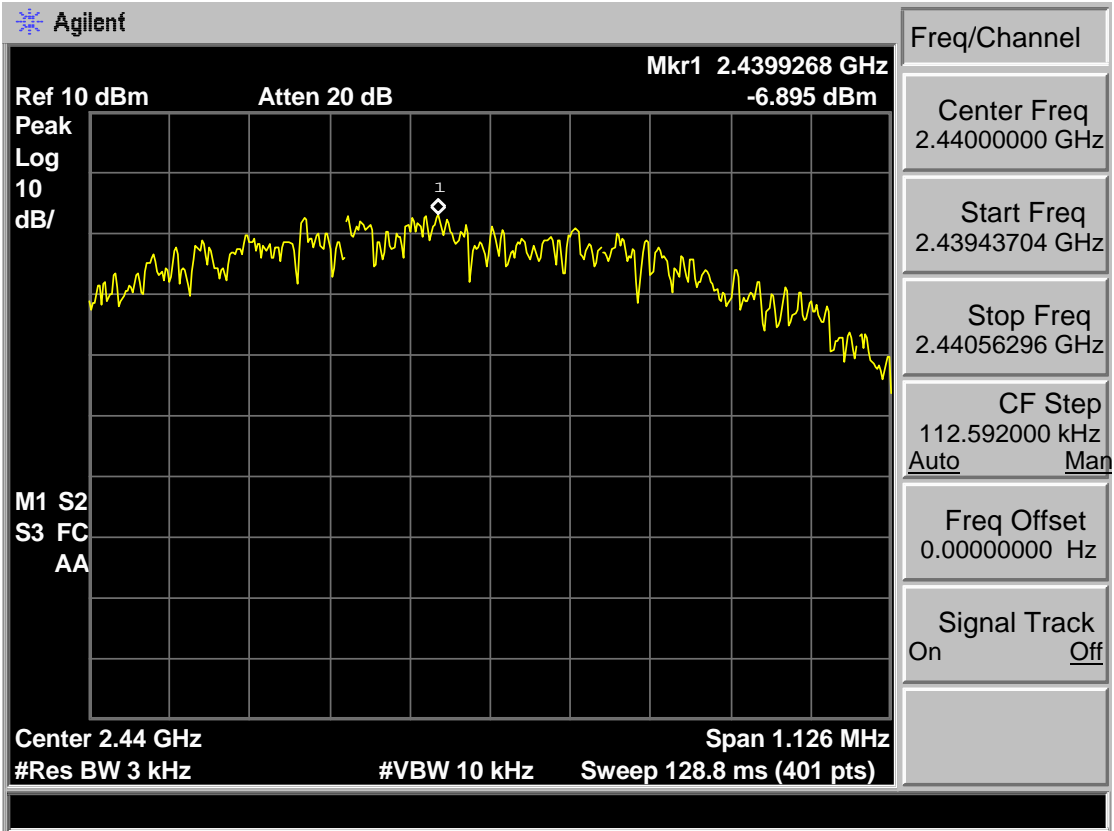
|                                 |      |                              |                      |
|---------------------------------|------|------------------------------|----------------------|
| EUT: Portable Bluetooth Speaker |      |                              |                      |
| M/N: Groove                     |      |                              |                      |
| Test date: 2015-08-20           |      | Test site: 3m Chamber        | Tested by: Tony Tang |
| Test Mode                       | CH   | Power density<br>(dBm/3kHz ) | Limit<br>(dBm/3kHz)  |
| Adapter 1                       |      |                              |                      |
| BT 4.0-BLE<br>GFSK              | CH1  | -8.43                        | 8                    |
|                                 | CH20 | -6.90                        | 8                    |
|                                 | CH40 | -7.27                        | 8                    |
| Adapter 2                       |      |                              |                      |
| BT 4.0-BLE<br>GFSK              | CH1  | -8.54                        | 8                    |
|                                 | CH20 | -6.91                        | 8                    |
|                                 | CH40 | -7.28                        | 8                    |
| Conclusion : PASS               |      |                              |                      |

8.4 Test Data

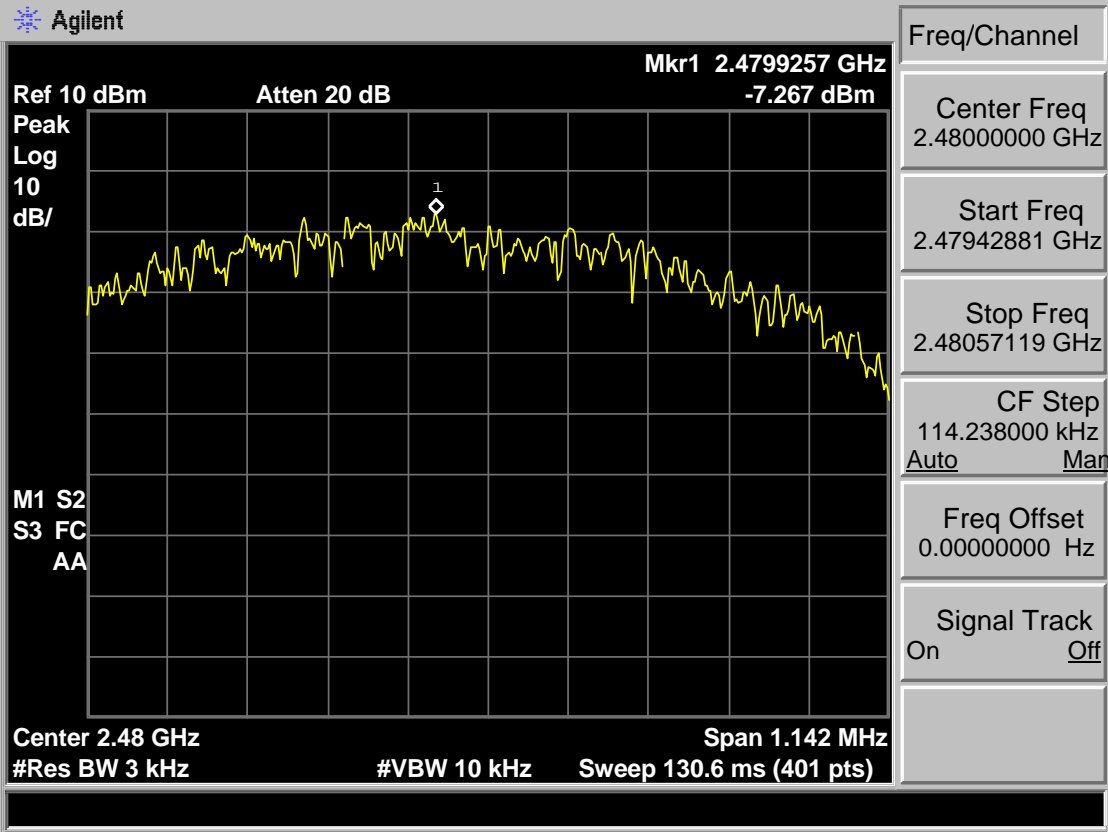
Adapter 1  
Test Mode: BT 4.0-BLE GFSK 2402MHz



Test Mode: BT 4.0-BLE GFSK 2440MHz



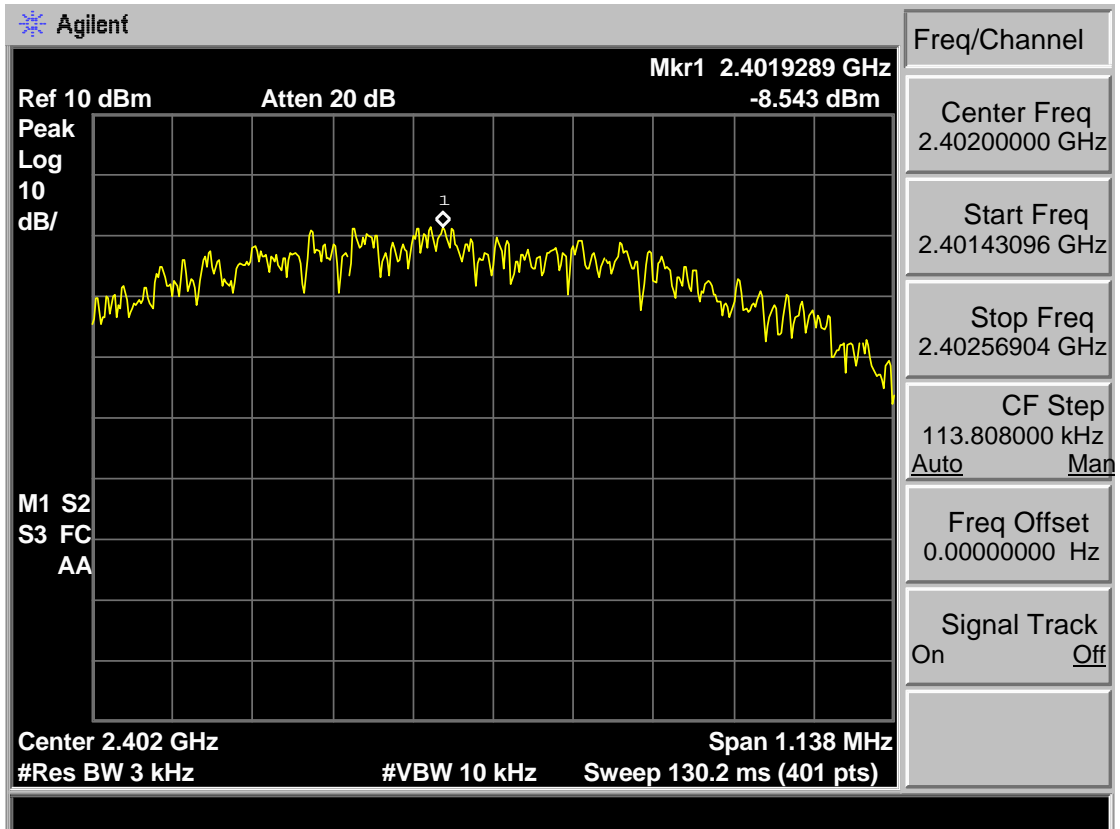
Test Mode: BT 4.0-BLE GFSK 2480MHz



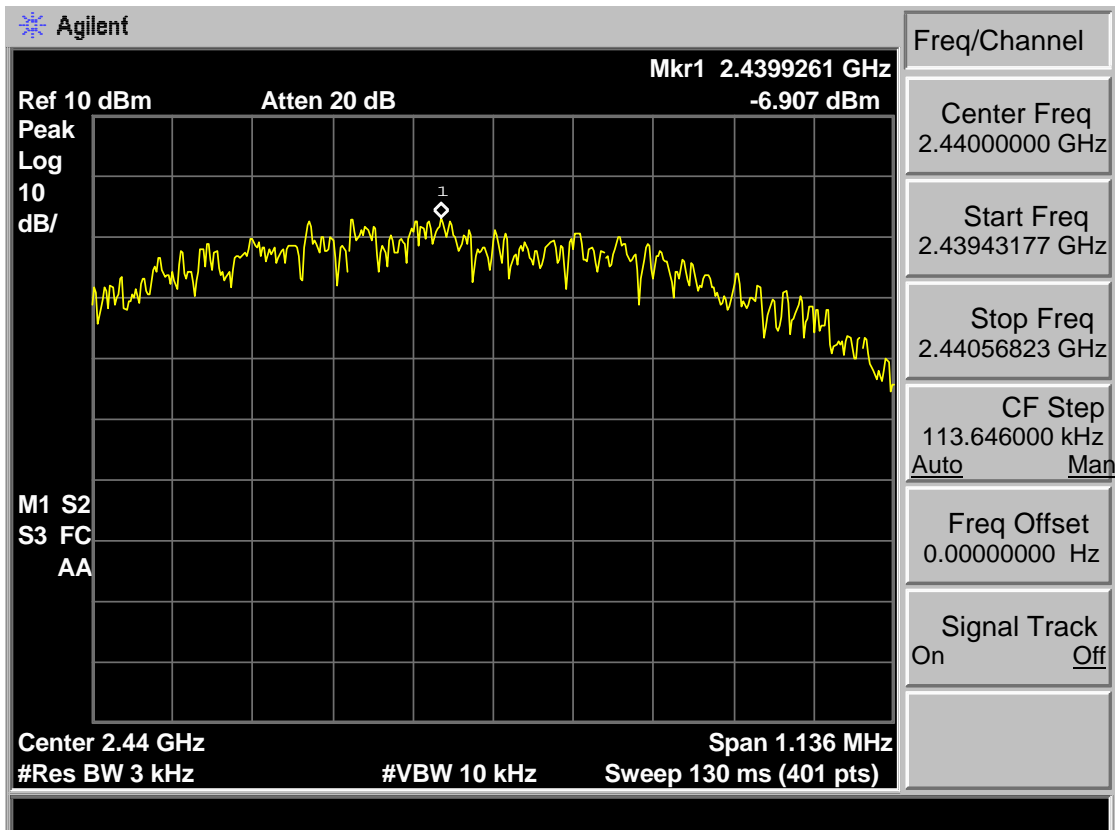


## Adapter 2

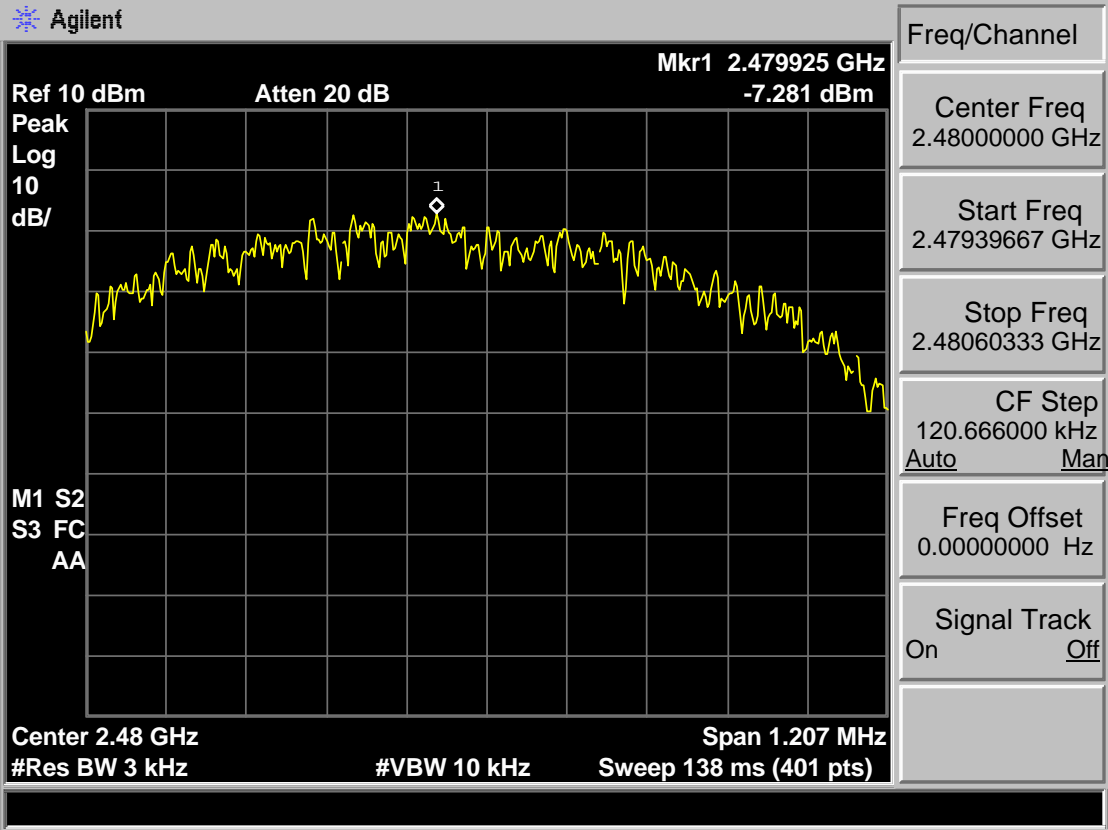
Test Mode: BT 4.0-BLE GFSK 2402MHz



Test Mode: BT 4.0-BLE GFSK 2440MHz



Test Mode: BT 4.0-BLE GFSK 2480MHz



## 9 ANTENNA REQUIREMENTS

### 9.1 Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 9.2 Result

The antennas used for this product are Integrated PCB antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 0 dBi.