



# MEASUREMENT REPORT

## FCC PART 15 Subpart C Bluetooth v4.0

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**FCC ID:** 2AGN8-S21N11  
**IC:** 20888-S21N11  
**APPLICANT:** Sengled Co., Ltd.

**Application Type:** Certification  
**Product:** Bluetooth Speaker LED lamp  
**Model No.:** S21-N11, S21-N12  
**Brand Name:** sengled  
**FCC Classification:** Digital Transmission System (DTS)  
**FCC Rule Part(s):** Part 15 Subpart C (Section 15.247)  
**IC Rule(s):** RSS-Gen Issue 4, RSS-247 Issue 2  
**Test Procedure(s):** ANSI C63.10-2013, KDB 558074 D01v03r05  
**Test Date:** February 23 ~ March 07, 2017

Reviewed By : Robin Wu  
( Robin Wu )

Approved By : Marlin Chen  
( Marlin Chen )



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01v03r05. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

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### Revision History

Report No.	Version	Description	Issue Date	Note
1702RSU01902	Rev. 01	Initial report	03-08-2017	Valid

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## §2.1033 General Information

<b>Applicant:</b>	Sengled Co., Ltd.
<b>Applicant Address:</b>	Room 201/15, Building 1, No.498, Guoshoujing Road, Pilot Free Trade Zone, Shanghai City, P.R. China
<b>Manufacturer:</b>	Sengled Co., Ltd.
<b>Manufacturer Address:</b>	Room 201/15, Building 1, No.498, Guoshoujing Road, Pilot Free Trade Zone, Shanghai City, P.R. China
<b>Test Site:</b>	MRT Technology (Suzhou) Co., Ltd
<b>Test Site Address:</b>	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
<b>MRT FCC Registration No.:</b>	809388
<b>MRT IC Registration No.:</b>	11384A
<b>FCC Rule Part(s):</b>	Part 15.247
<b>IC Rule(s):</b>	RSS-247 & RSS-Gen
<b>Model No.:</b>	S21-N11, S21-N12
<b>Test Device Serial No.:</b>	N/A <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering
<b>FCC Classification:</b>	Digital Transmission System (DTS)

### Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.



# 1. INTRODUCTION

## 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

## 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



## 2. PRODUCT INFORMATION

### 2.1. Feature of Equipment under Test

Product Name	Bluetooth Speaker LED lamp
Model No.	S21-N11, S21-N12
Bluetooth Version	v3.0 + HS, v4.0

### 2.2. Product Specification Subjective to this Report

Bluetooth Frequency	2402~2480MHz
Bluetooth Version	v4.0
Type of modulation	FHSS
Data Rate	1Mbps(GFSK)
Antenna Type	PCB Antenna
Antenna Gain	2.5dBi

### 2.3. Operating Frequencies and Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	--	--	--	--

## 2.4. Device Capabilities

This device contains the following capabilities:

Bluetooth (v3.0 + HS, v4.0)

## 2.5. Test Configuration

The **Bluetooth Speaker LED lamp FCC ID: 2AGN8-S21N11** was tested per the guidance of KDB 558074 D01v03r05. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

## 2.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

## 2.7. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase.

However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

## 2.8. Test Software

The test utility software used during testing was "sscom32.exe".



### 3. DESCRIPTION OF TEST

#### 3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 558074 D01v03r05 were used in the measurement of the **Bluetooth Speaker LED lamp FCC ID: 2AGN8-S21N11**.

**Deviation from measurement procedure.....None**

#### 3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions were used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

Line conducted emissions test results are shown in Section 7.8.

### 3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the Antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable. For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive Antenna height using a broadband Antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn Antennas were used. For frequencies below 30MHz, a calibrated loop Antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband Antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive Antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn Antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive Antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive Antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn Antenna, the horn Antenna should be always directed to the EUT when rising height.

## 4. ANTENNA REQUIREMENTS

### Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the **Bluetooth Speaker LED lamp** is **permanently attached**.
- There are no provisions for connection to an external antenna.

### **Conclusion:**

The **Bluetooth Speaker LED lamp FCC ID: 2AGN8-S21N11** unit complies with the requirement of §15.203.

## 5. TEST EQUIPMENT CALIBRATION DATE

### Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	102030	1 year	2017/05/08
Two-Line V-Network	R&S	ENV216	101683	1 year	2017/06/21
Two-Line V-Network	R&S	ENV216	101684	1 year	2017/06/21
RF Cable	HUBER+SUHNER	Cable 04	102	1 year	2017/03/29
Temperature/Humidity Meter	Yuhuaze	HTC-2	N/A	1 year	2017/12/20
Shielding Anechoic Chamber	MIX-BEP	Chamber-SR2	N/A	1 year	2017/05/10

### Radiated Emissions - AC2

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210182	1 year	2017/08/03
EMI Test Receiver	R&S	ESR7	101209	1 year	2017/11/03
Preamplifier	Schwarzbeck	BBV 9721	9721-008	1 year	2017/04/16
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	1 year	2017/12/15
TRILOG Antenna	Schwarzbeck	VULB9168	662	1 year	2017/11/07
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	1 year	2017/11/07
Broadband Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170549	1 year	2017/11/07
RF Cable	HUBER+SUHNER	Cable 01	104	1 year	2017/03/29
RF Cable	HUBER+SUHNER	Cable 02	106	1 year	2017/03/29
Temperature/Humidity Meter	Yuhuaze	HTC-2	N/A	1 year	2017/12/20
Anechoic Chamber	RIKEN	Chamber-AC2	N/A	1 year	2017/05/10

## Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MY52090106	1 year	2017/05/08
Spectrum Analyzer	Agilent	E4447A	MY45300136	1 year	2017/12/08
USB Wideband Power Sensor	Boonton	55006	8911	1 year	2017/05/08
RF Cable	HUBER+SUHNER	Cable 03	N/A	1 year	2017/03/29
Attenuator	Woken	WATT-218FS-15	N/A	1 year	2017/03/29
Temperature/Humidity Meter	Yuhuaze	HTC-2	N/A	1 year	2017/12/20

Software	Version	Function
e3	V8.3.5	EMI Test Software

## 6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

<b>AC Conducted Emission Measurement - SR2</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 150kHz~30MHz: 3.46dB
<b>Radiated Emission Measurement - AC2</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB
<b>Spurious Emissions, Conducted - TR3</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 0.78dB
<b>Output Power - TR3</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 1.13dB
<b>Occupied Bandwidth - TR3</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 0.28%

## 7. TEST RESULT

### 7.1. Summary

**Company Name:** Sengled Co., Ltd.  
**FCC ID:** 2AGN8-S21N11  
**FCC Classification:** Digital Transmission System (DTS)  
**Data Rate(s) Tested:** 1Mbps(GFSK) (BLE)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	6dB Bandwidth	$\geq 500\text{kHz}$	Conducted	Pass	Section 7.2
15.247(b)(3)	Output Power	$\leq 1\text{Watt}$		Pass	Section 7.3
15.247(e)	Power Spectral Density	$\leq 8\text{dBm} / 3\text{kHz}$		Pass	Section 7.4
15.247(d)	Band Edge / Out-of-Band Emissions	$\geq 20\text{dBc(Peak)}$		Pass	Section 7.5
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.6 & 7.7
15.207	AC Conducted Emissions 150kHz - 30MHz	$< \text{FCC } 15.207 \text{ limits}$	Line Conducted	Pass	Section 7.8

IC Rule(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
RSS-247 [5.2]	6dB Bandwidth	$\geq 500\text{kHz}$	Conducted	Pass	Section 7.2
RSS-247 [5.4(d)]	Output Power	Conducted Output Power $\leq 30\text{dBm}$ E.I.R.P $\leq 36\text{dBm}$		Pass	Section 7.3
RSS-247 [5.2]	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$		Pass	Section 7.4
RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	$\geq 30\text{dBc(Peak)}$		Pass	Section 7.5
RSS-247 [5.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in RSS-Gen	Radiated	Pass	Section 7.6 & 7.7
RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	$< \text{RSS-Gen limits}$	Line Conducted	Pass	Section 7.8

**Notes:**

- 1) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.



## 7.2. 6dB Bandwidth Measurement

### 7.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

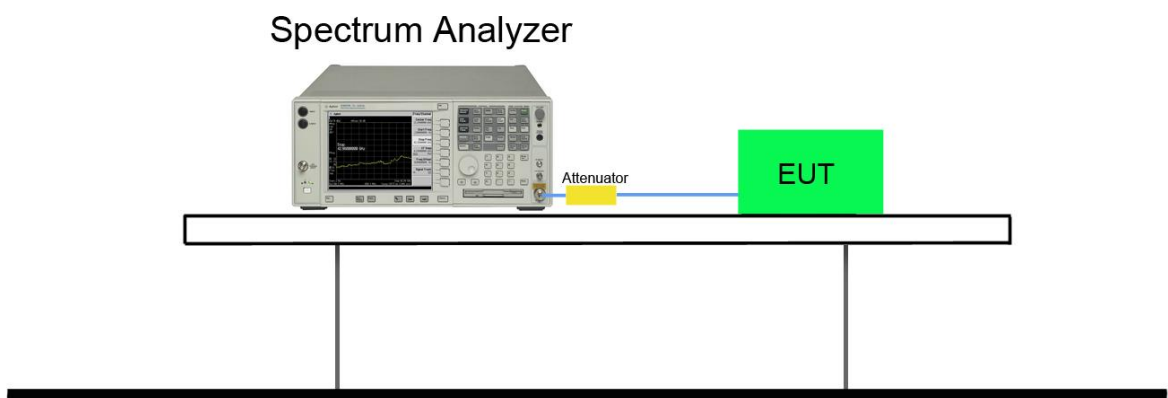
### 7.2.2. Test Procedure used

KDB 558074 D01v03r05 - Section 8.2 Option 2

### 7.2.3. Test Setting

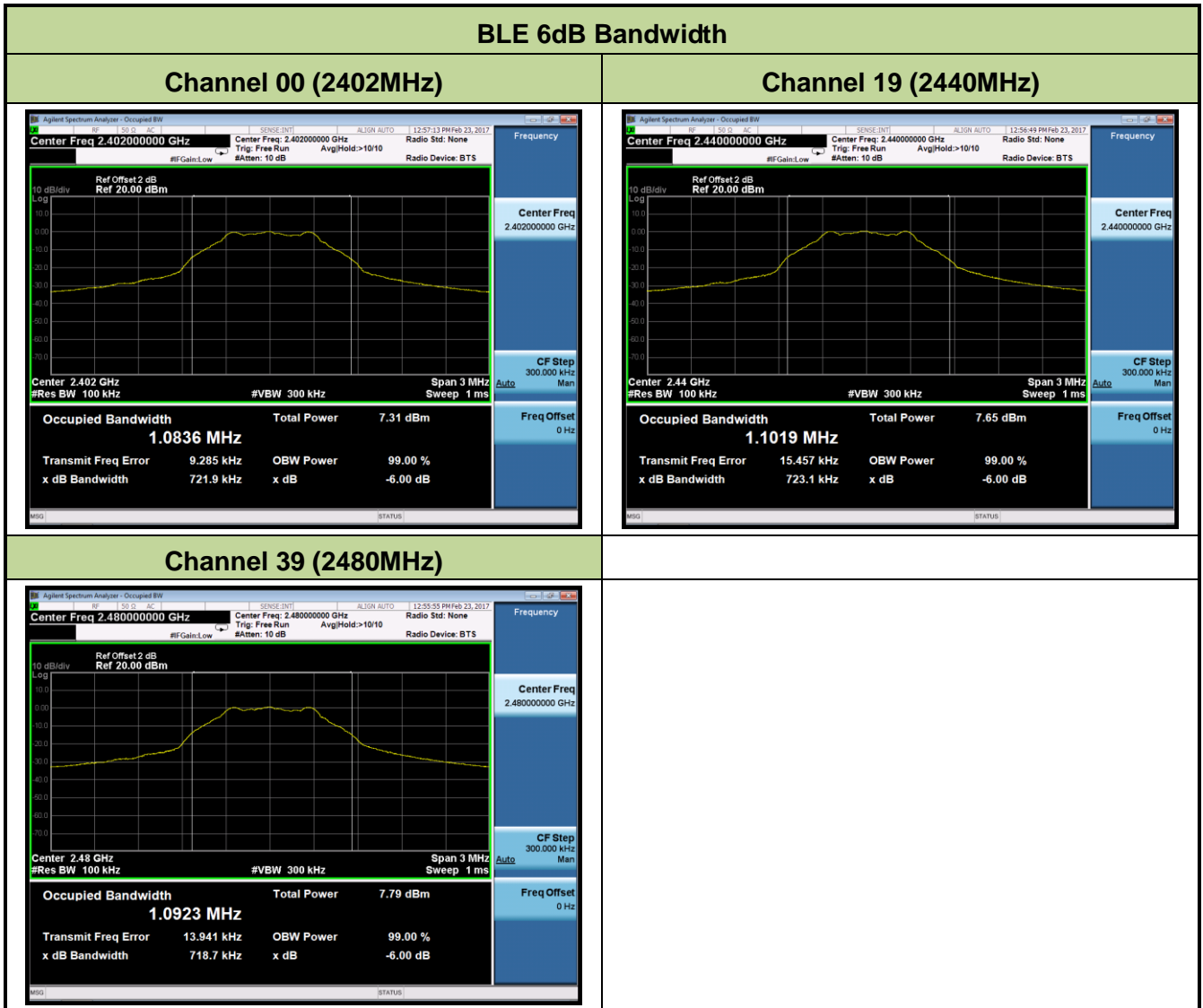
1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to  $X = 6$ . The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace was allowed to stabilize

### 7.2.4. Test Setup



### 7.2.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
BLE	1	00	2402	0.722	≥ 0.5	Pass
BLE	1	19	2440	0.723	≥ 0.5	Pass
BLE	1	39	2480	0.719	≥ 0.5	Pass



### 7.3. Output Power Measurement

#### 7.3.1. Test Limit

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

#### 7.3.2. Test Procedure Used

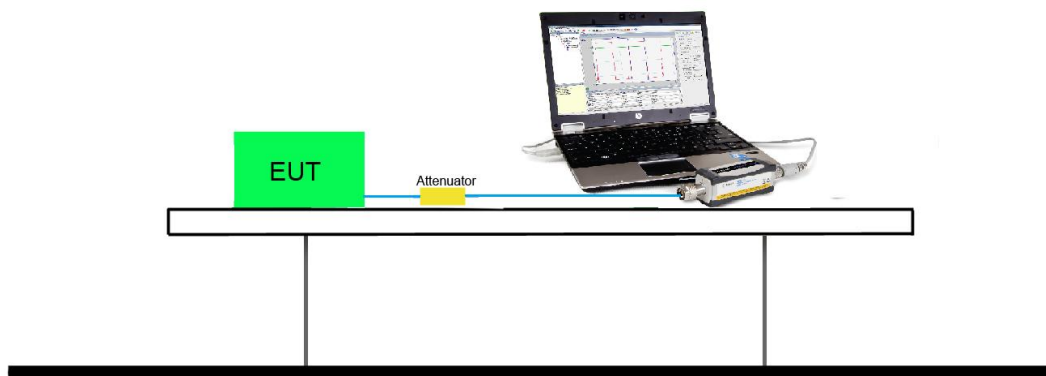
KDB 558074 D01v03r05 - Section 9.1.2 PKPM1 - Peak Power Method

#### 7.3.3. Test Setting

##### **Method PKPM1 (Peak Power Measurement of Signals with DTS BW $\leq$ 50MHz)**

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

#### 7.3.4. Test Setup



### 7.3.5. Test Result of Output Power

#### Test Result of Peak Output Power

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	EIRP (dBm)	Limit (dBm)	Result
BLE	1	00	2402	1.01	≤ 30	3.51	≤ 36	Pass
BLE	1	19	2440	1.20	≤ 30	3.70	≤ 36	Pass
BLE	1	39	2480	1.32	≤ 30	3.82	≤ 36	Pass

Note: EIRP (dBm) = Peak Power (dBm) + Antenna Gain (dBi).

#### Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	EIRP (dBm)	Limit (dBm)	Result
BLE	1	00	2402	0.79	≤ 30	3.29	≤ 36	Pass
BLE	1	19	2440	1.03	≤ 30	3.53	≤ 36	Pass
BLE	1	39	2480	1.15	≤ 30	3.65	≤ 36	Pass

Note: EIRP (dBm) = Average Power (dBm) + Antenna Gain (dBi).

## 7.4. Power Spectral Density Measurement

### 7.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

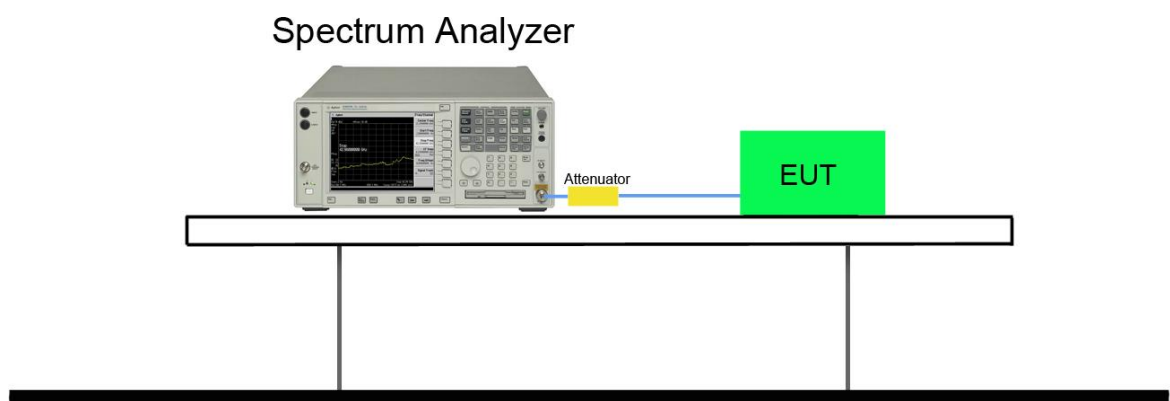
### 7.4.2. Test Procedure Used

KDB 558074 D01v03r05 - Section 10.2 Method PKPSD

### 7.4.3. Test Setting

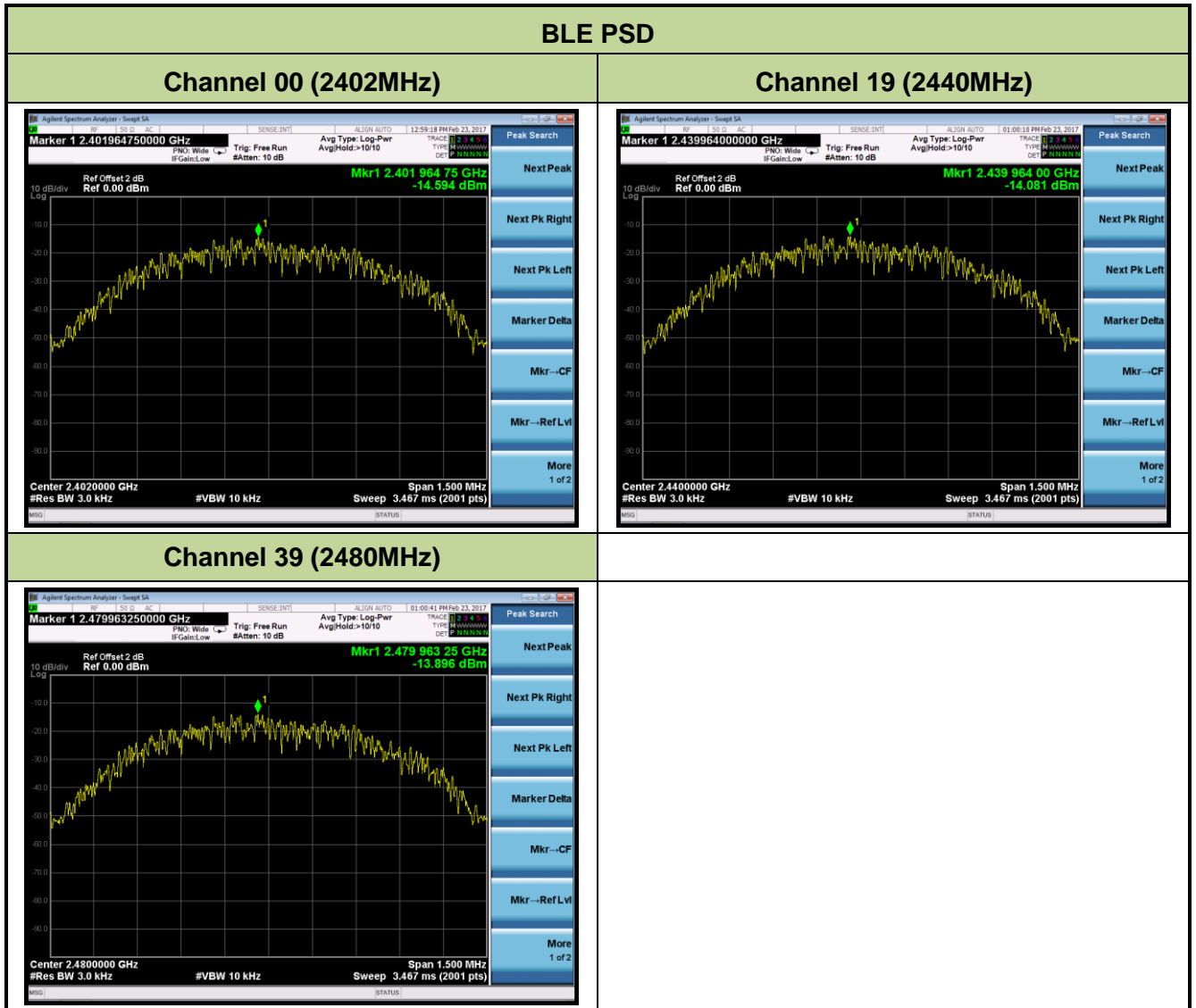
1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3kHz
4. VBW = 10kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

### 7.4.4. Test Setup



### 7.4.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1	00	2402	-14.59	≤ 8	Pass
BLE	1	19	2440	-14.08	≤ 8	Pass
BLE	1	39	2480	-13.90	≤ 8	Pass



## **7.5. Conducted Band Edge and Out-of-Band Emissions**

### **7.5.1. Test Limit**

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the PSD procedure.

### **7.5.2. Test Procedure Used**

KDB 558074 D01v03r05 - Section 11.2 & Section 11.3

### **7.5.3. Test Setting**

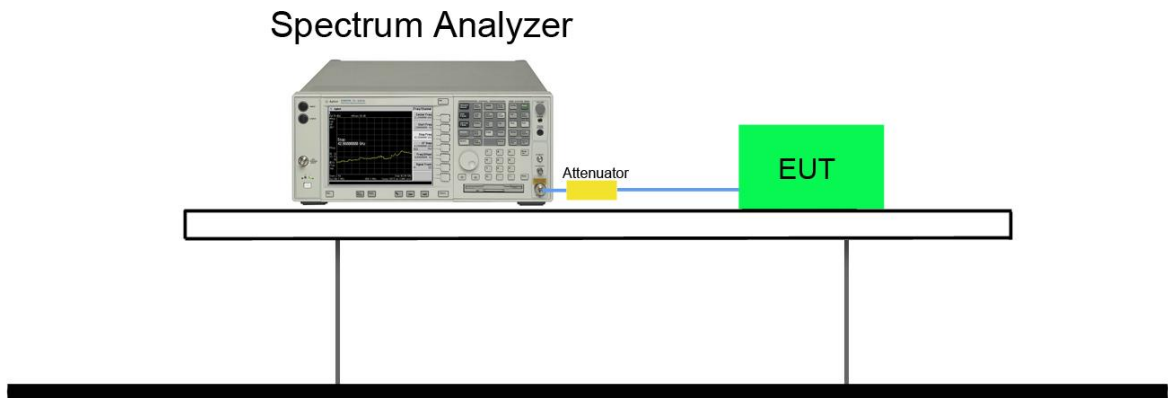
#### **1. Reference level measurement**

- (a) Set instrument center frequency to DTS channel center frequency
- (b) Set the span to  $\geq 1.5$  times the DTS bandwidth
- (c) Set the RBW = 100 kHz
- (d) Set the VBW  $\geq 3 \times$  RBW
- (e) Detector = peak
- (f) Sweep time = auto couple
- (g) Trace mode = max hold
- (h) Allow trace to fully stabilize

#### **2. Emission level measurement**

- (a) Set the center frequency and span to encompass frequency range to be measured
- (b) RBW = 100kHz
- (c) VBW = 300kHz
- (d) Detector = Peak
- (e) Number of sweep points  $\geq 2 \times$  Span/RBW
- (f) Trace mode = max hold
- (g) Sweep time = auto couple
- (h) The trace was allowed to stabilize

### 7.5.4. Test Setup





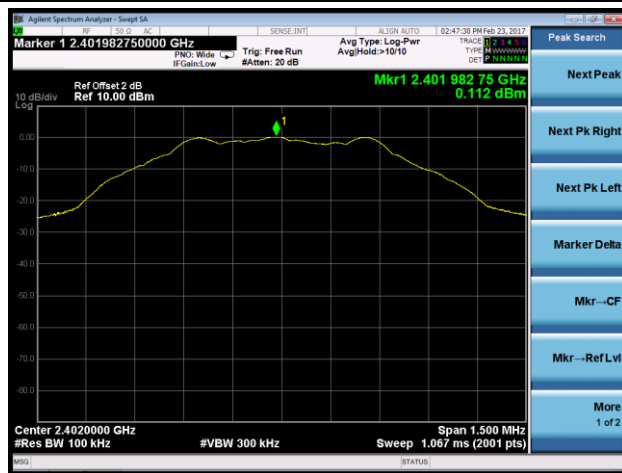
### 7.5.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
BLE	1	00	2402	20dBc	Pass
BLE	1	19	2440	20dBc	Pass
BLE	1	39	2480	20dBc	Pass

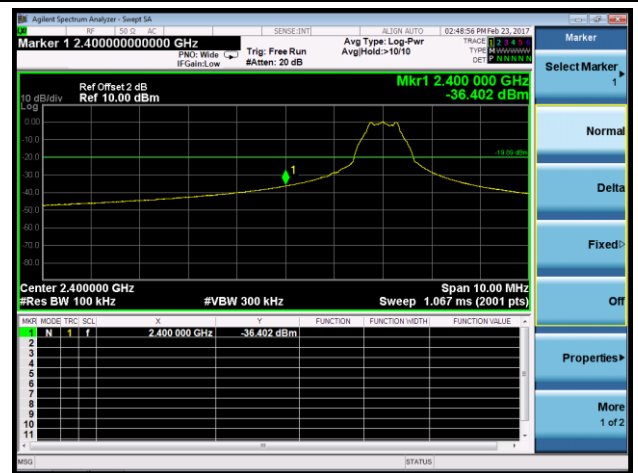
#### BLE Out-of-Band Emissions

##### Channel 00 (2402MHz)

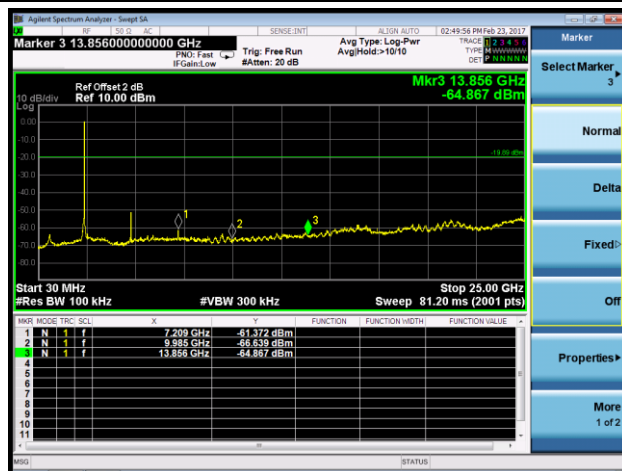
###### 100kHz PSD reference Level



###### Low Band Edge



###### Spurious Emission 30MHz ~ 25GHz

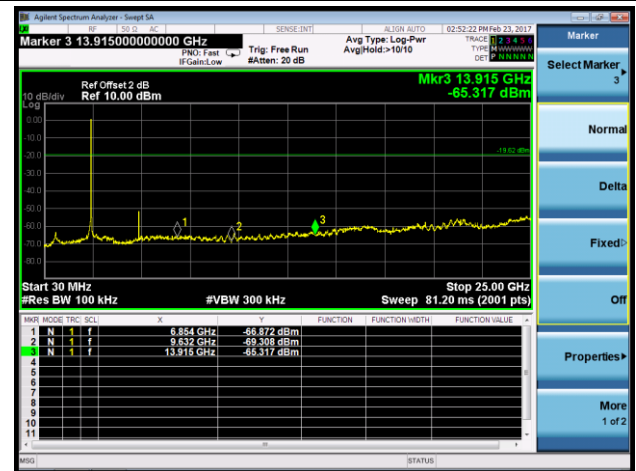


### Channel 19 (2440MHz)

#### 100kHz PSD reference Level

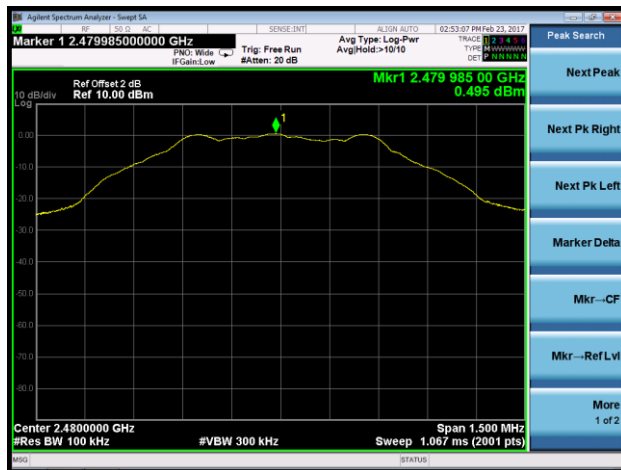


#### Spurious Emission 30MHz ~ 25GHz

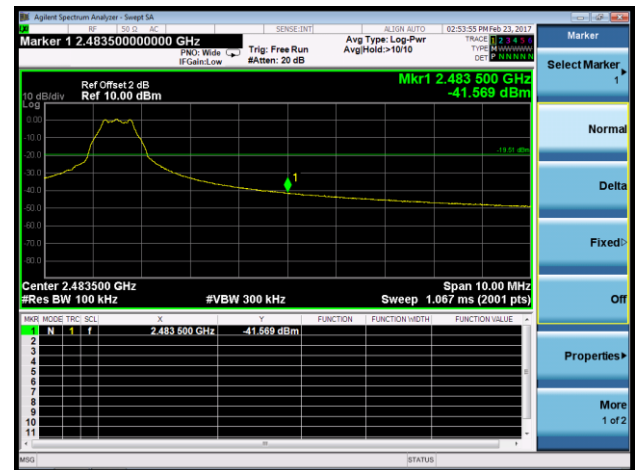


### Channel 39 (2480MHz)

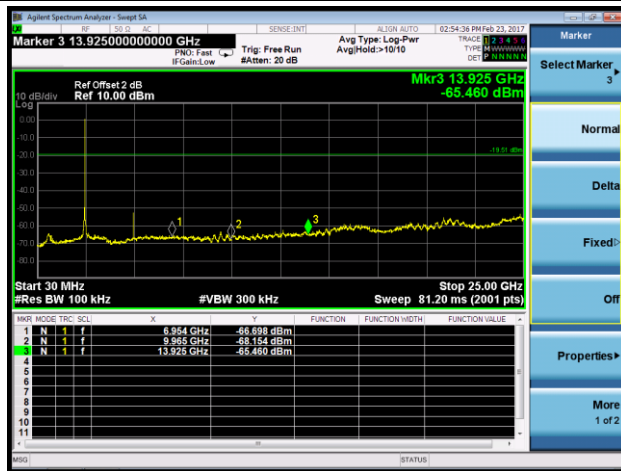
#### 100kHz PSD reference Level



#### High Band Edge



#### Spurious Emission 30MHz ~ 25GHz



## 7.6. Radiated Spurious Emission Measurement

### 7.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

### 7.6.2. Test Procedure Used

KDB 558074 D01v03r05 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r05 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r05 - Section 12.2.5 (average power measurements)

### 7.6.3. Test Setting

#### Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 D01v03r05

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple

6. Trace mode = max hold
7. Trace was allowed to stabilize

**Table 1 - RBW as a function of frequency**

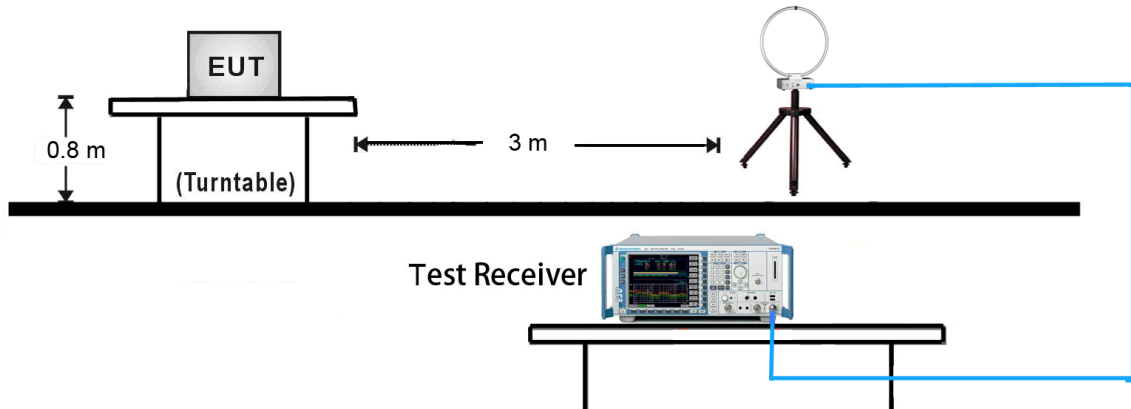
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

**Average Field Strength Measurements per Section 12.2.4 of KDB 558074 D01v03r05**

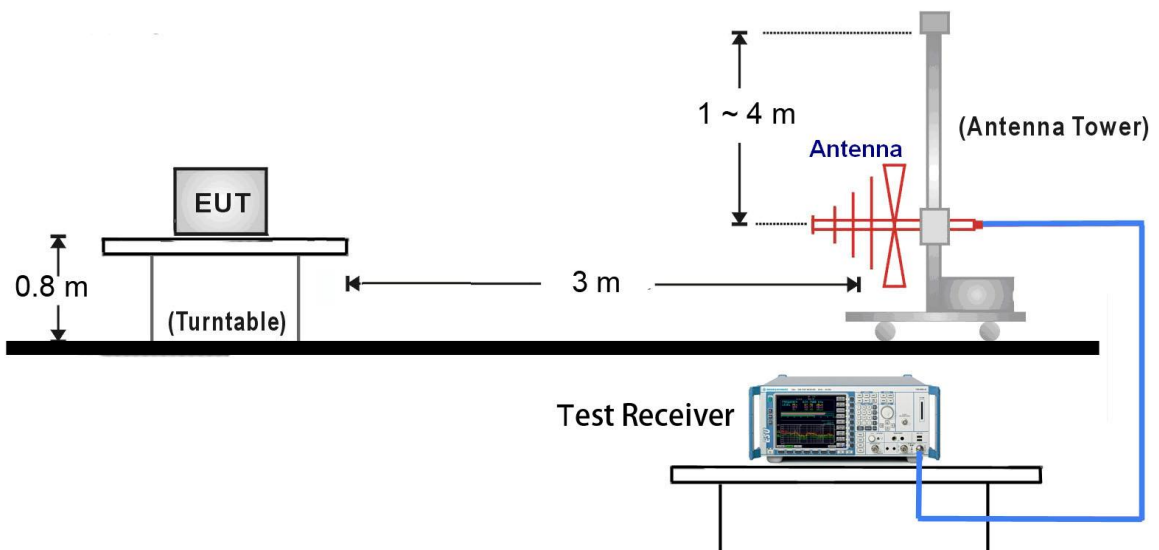
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW  $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

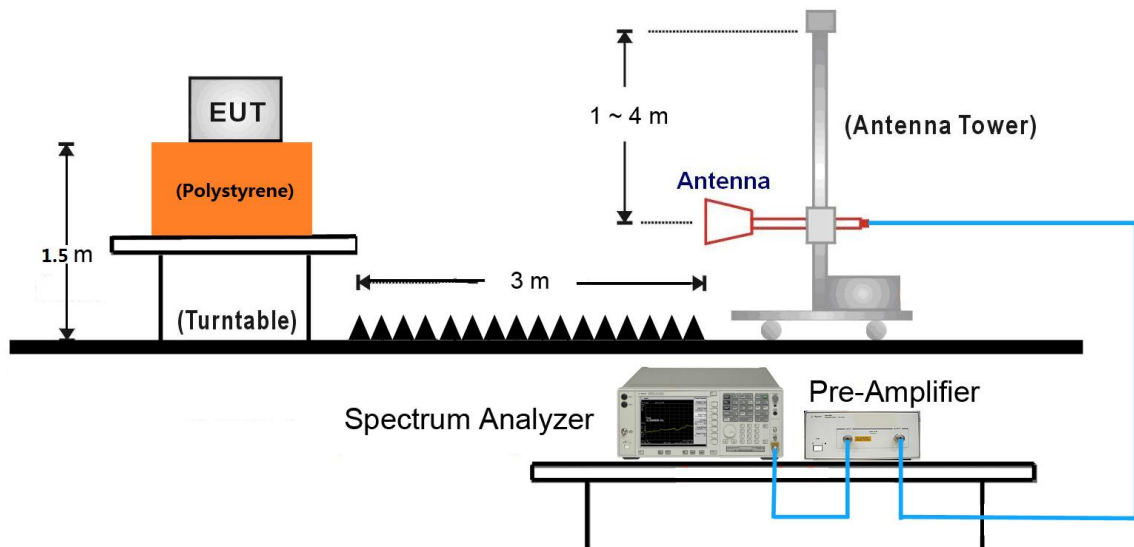
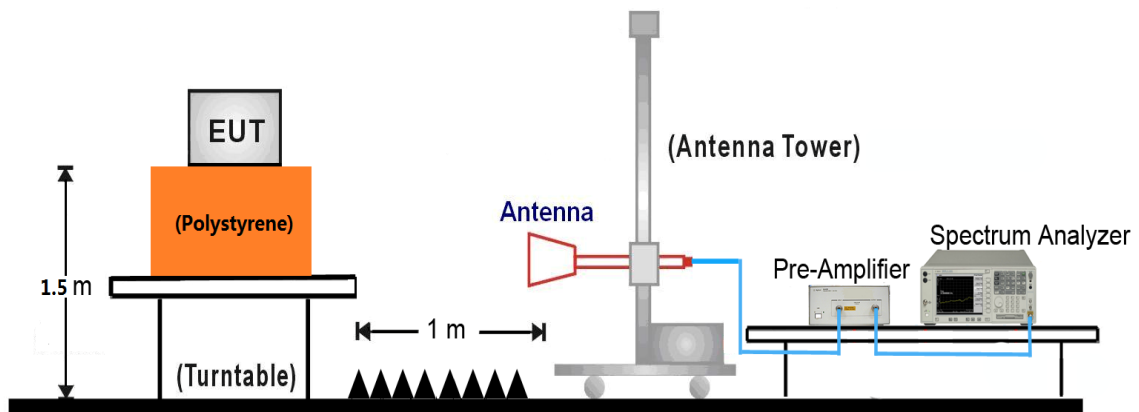
### 7.6.4. Test Setup

#### 9kHz ~ 30MHz Test Setup:



#### 30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:18GHz ~40GHz Test Setup:

**7.6.5. Test Result**

Test Mode:	BLE	Test Site:	AC2
Test Channel:	00	Test Engineer:	Lewis Huang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4799.5	34.8	2.8	37.6	74.0	-36.4	Peak	Horizontal
	7502.5	31.1	11.0	42.1	74.0	-31.9	Peak	Horizontal
*	8616.0	31.2	11.2	42.4	74.0	-31.6	Peak	Horizontal
*	9619.0	32.6	12.4	45.0	74.0	-29.0	Peak	Horizontal
	4799.5	36.1	2.8	38.9	74.0	-35.1	Peak	Vertical
	7375.0	31.2	10.8	42.0	74.0	-32.0	Peak	Vertical
*	8556.5	30.9	10.9	41.8	74.0	-32.2	Peak	Vertical
*	9610.5	31.2	12.5	43.7	74.0	-30.3	Peak	Vertical

Note 1: "\*" is not in restricted band, its limit is 20dBc of the fundamental emission level (86.3dBμV/m) or 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

Test Mode:	BLE	Test Site:	AC2
Test Channel:	19	Test Engineer:	Lewis Huang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	34.2	2.6	36.8	74.0	-37.2	Peak	Horizontal
	7655.5	31.4	10.6	42.0	74.0	-32.0	Peak	Horizontal
*	8514.0	31.7	10.8	42.5	74.0	-31.5	Peak	Horizontal
*	10299.0	31.0	14.8	45.8	74.0	-28.2	Peak	Horizontal
	4884.5	36.7	2.7	39.4	74.0	-34.6	Peak	Vertical
	7655.5	32.8	10.6	43.4	74.0	-30.6	Peak	Vertical
*	8607.5	31.3	11.1	42.4	74.0	-31.6	Peak	Vertical
*	9967.5	33.9	13.2	47.1	74.0	-26.9	Peak	Vertical

Note 1: "\*" is not in restricted band, its limit is 20dBc of the fundamental emission level (85.3dBμV/m) or 15.209 which is higher.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)



Test Mode:	BLE	Test Site:	AC2
Test Channel:	39	Test Engineer:	Lewis Huang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
	4986.5	36.0	2.7	38.7	74.0	-35.3	Peak	Horizontal
	7443.0	31.9	10.7	42.6	74.0	-31.4	Peak	Horizontal
*	8514.0	32.0	10.8	42.8	74.0	-31.2	Peak	Horizontal
*	10146.0	31.8	13.8	45.6	74.0	-28.4	Peak	Horizontal
	4995.0	39.8	2.6	42.4	74.0	-31.6	Peak	Vertical
	7392.0	31.4	10.7	42.1	74.0	-31.9	Peak	Vertical
*	8582.0	31.9	11.0	42.9	74.0	-31.1	Peak	Vertical
*	9976.0	33.9	13.1	47.0	74.0	-27.0	Peak	Vertical

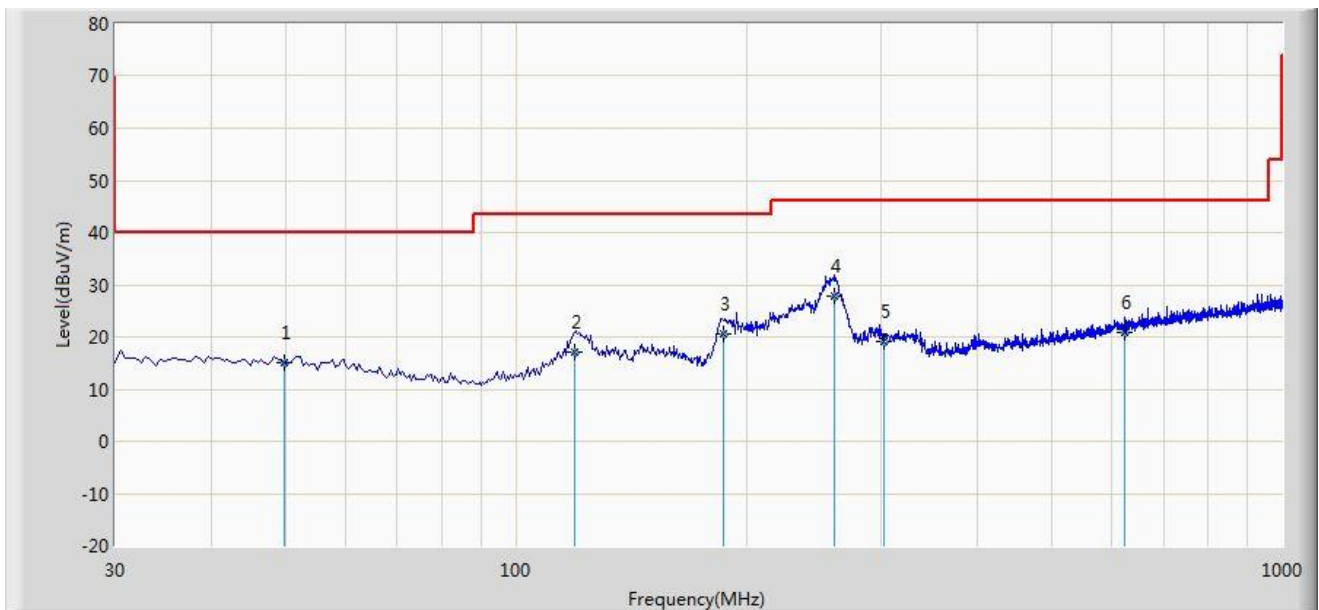
Note 1: "\*" is not in restricted band, its limit is 20dBc of the fundamental emission level (84.7dB $\mu$ V/m) or 15.209 which is higher.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

**The worst case of Radiated Emission below 1GHz:**

Site: AC2	Time: 2017/03/01 - 18:32
Limit: FCC_Part15.209_RE(3m)	Engineer: Alex Ma
Probe: VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
<b>Worse Case Mode:</b> Transmit by BLE at channel 2402MHz	

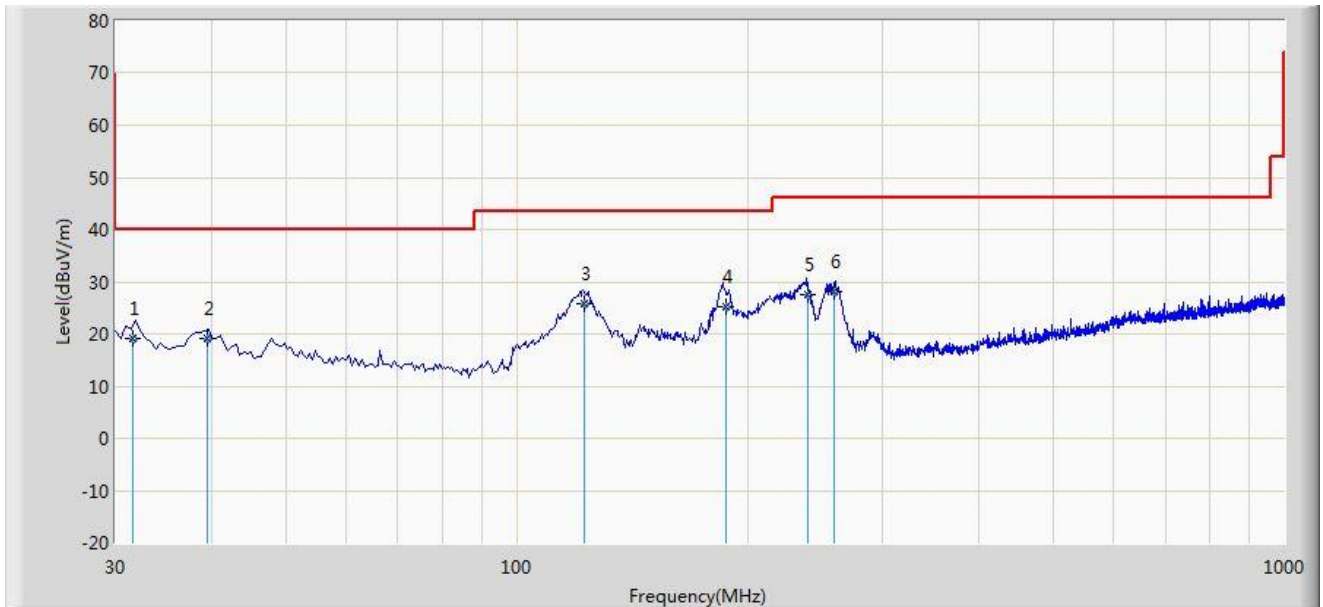


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			49.885	14.970	0.905	-25.030	40.000	14.065	QP
2			119.412	17.211	4.152	-26.289	43.500	13.059	QP
3			186.415	20.518	8.470	-22.982	43.500	12.049	QP
4		*	260.134	27.851	14.700	-18.149	46.000	13.150	QP
5			301.600	19.253	4.900	-26.747	46.000	14.353	QP
6			624.125	20.786	-0.233	-25.214	46.000	21.020	QP

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2017/03/01 - 18:33
Limit: FCC_Part15.209_RE(3m)	Engineer: Alex Ma
Probe: VULB 9168 _20-2000MHz	Polarity: Vertical
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
<b>Worse Case Mode:</b> Transmit by BLE at channel 2402MHz	

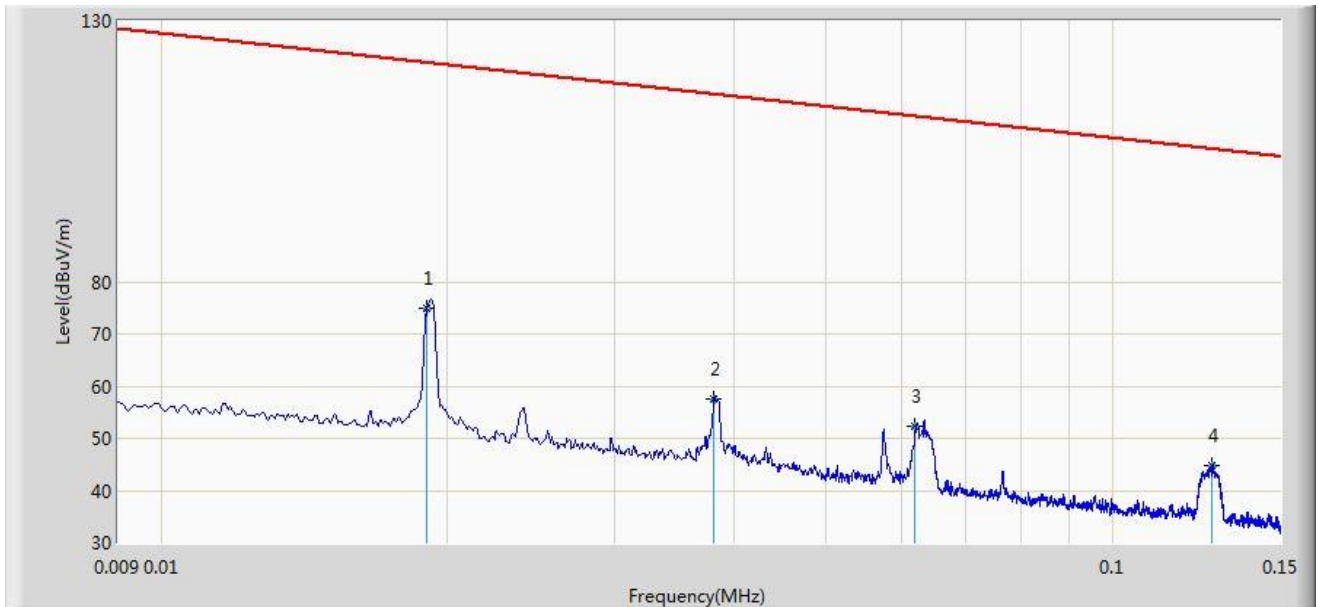


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			31.580	19.087	5.412	-20.913	40.000	13.676	QP
2			39.478	19.003	4.526	-20.997	40.000	14.476	QP
3		*	122.415	25.923	12.630	-17.577	43.500	13.293	QP
4			187.600	25.114	13.200	-18.386	43.500	11.914	QP
5			239.480	27.625	14.875	-18.375	46.000	12.750	QP
6			259.780	28.101	14.960	-17.899	46.000	13.141	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2017/03/02 - 15:31
Limit: FCC_Part15.209_RE(3m)	Engineer: Alex Ma
Probe: FMZB1519_0.009-30MHz	Polarity: Face On
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
<b>Note: There is the ambient noise within frequency range 9kHz~30MHz.</b>	

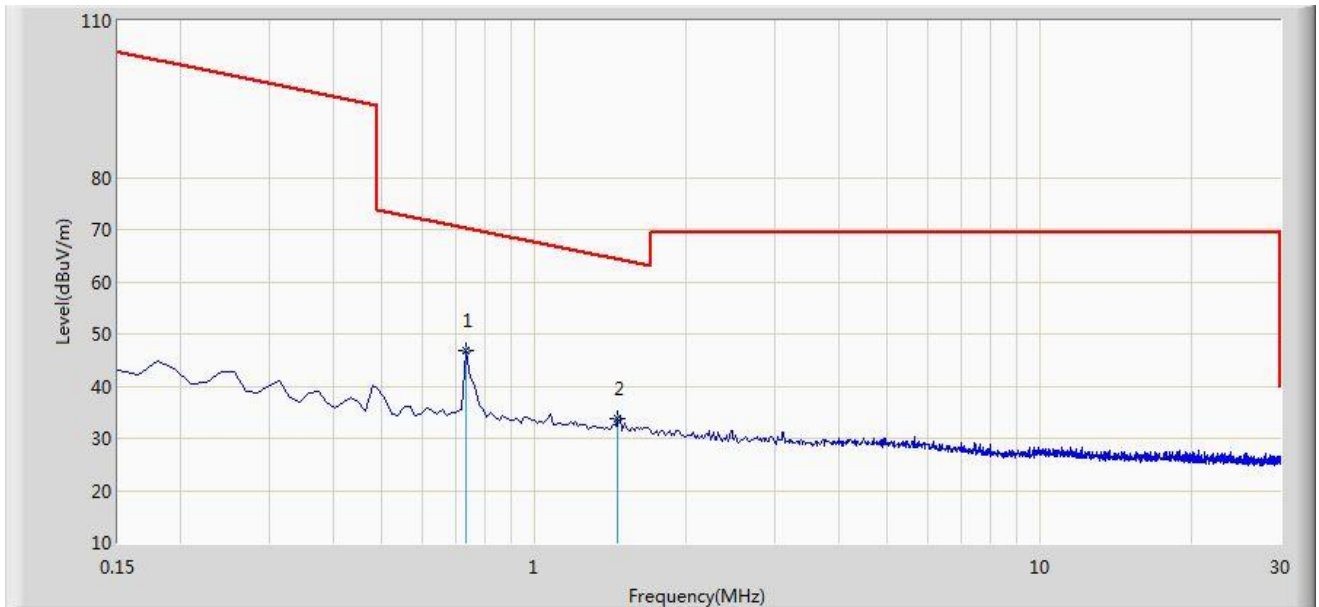


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	0.020	75.066	53.772	-46.948	122.013	21.294	AV
2			0.037	57.677	36.848	-58.319	115.996	20.829	AV
3			0.062	52.258	31.950	-59.488	111.746	20.308	AV
4			0.128	44.638	24.450	-60.883	105.521	20.188	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2017/03/02 - 15:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Alex Ma
Probe: FMZB1519_0.009-30MHz	Polarity: Face On
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
<b>Note: There is the ambient noise within frequency range 9kHz~30MHz.</b>	

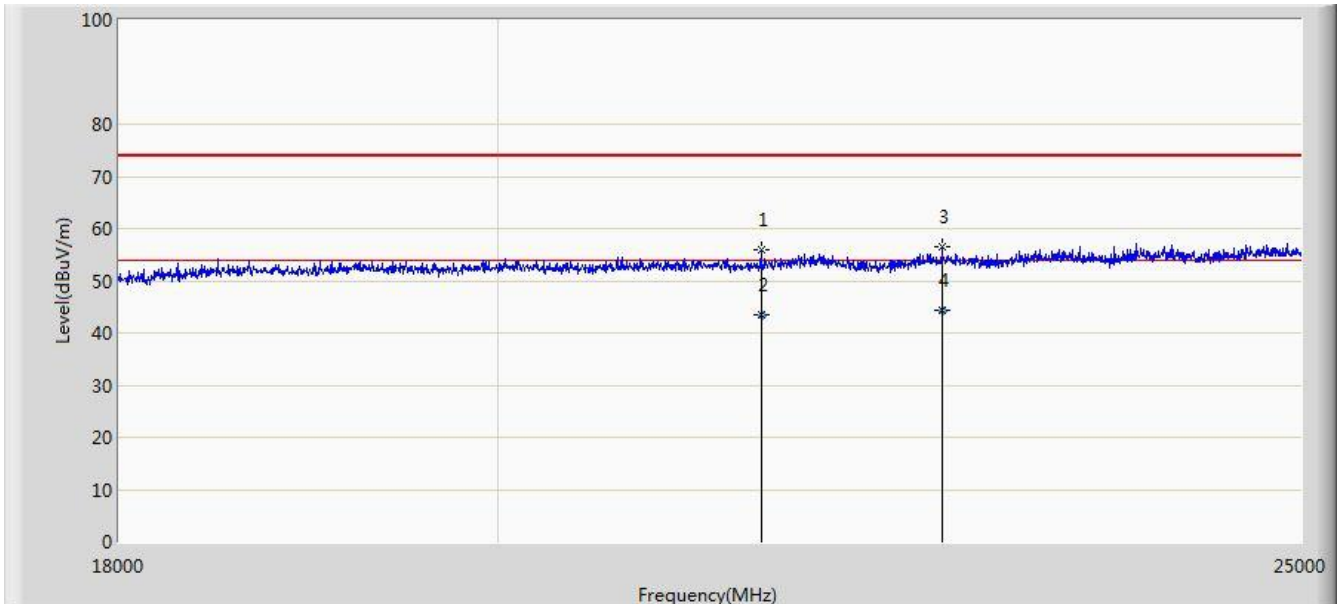


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	0.731	46.878	26.317	-23.446	70.324	20.561	QP
2			1.464	33.741	13.277	-30.585	64.326	20.464	QP

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2017/03/03 - 19:45
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9170_18-40GHz	Polarity: Horizontal
EUT: Bluetooth Speaker LED lamp	Power: By Battery
<b>Note: There is the ambient noise within frequency range 18GHz~25GHz.</b>	

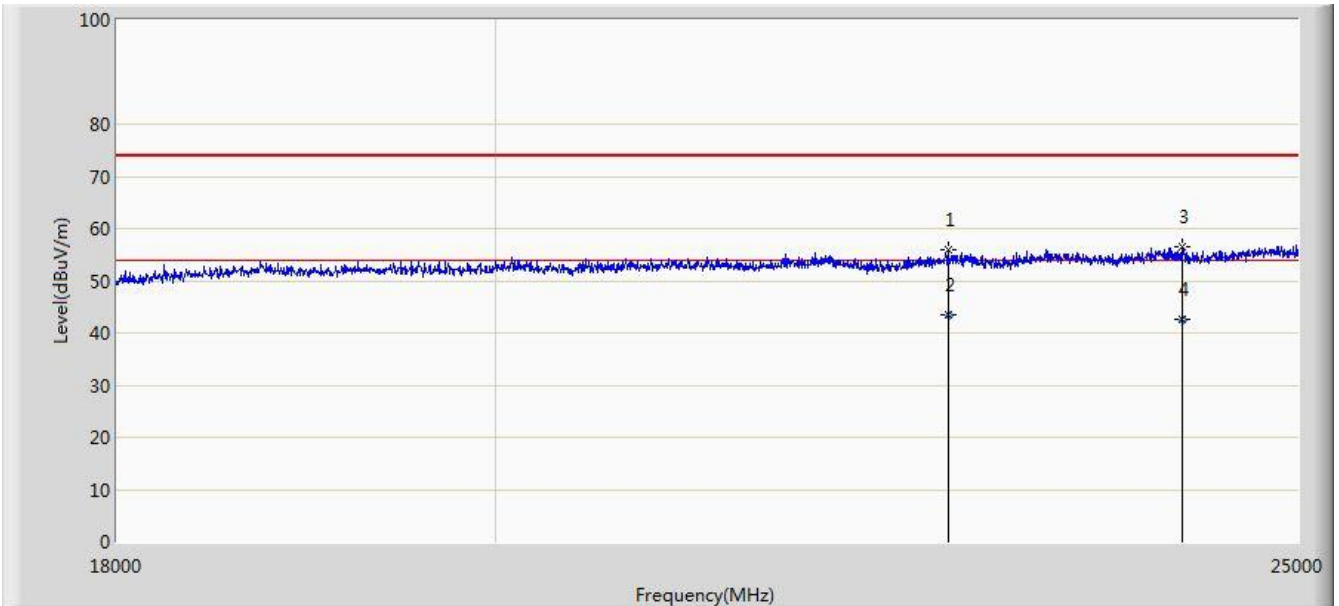


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			21517.500	55.869	17.883	-18.131	74.000	37.986	PK
2			21517.650	43.351	5.365	-10.649	54.000	37.986	AV
3			22630.500	56.509	18.223	-17.491	74.000	38.286	PK
4		*	22630.540	44.310	6.024	-9.690	54.000	38.286	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

Site: AC2	Time: 2017/03/03 - 19:48
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9170_18-40GHz	Polarity: Vertical
EUT: Bluetooth Speaker LED lamp	Power: By Battery
<b>Note: There is the ambient noise within frequency range 18GHz~25GHz.</b>	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			22686.500	55.811	17.457	-18.189	74.000	38.354	PK
2			22686.540	43.598	5.244	-10.402	54.000	38.354	AV
3			24205.500	56.430	17.607	-17.570	74.000	38.823	PK
4		*	24205.658	42.518	3.695	-11.482	54.000	38.823	AV

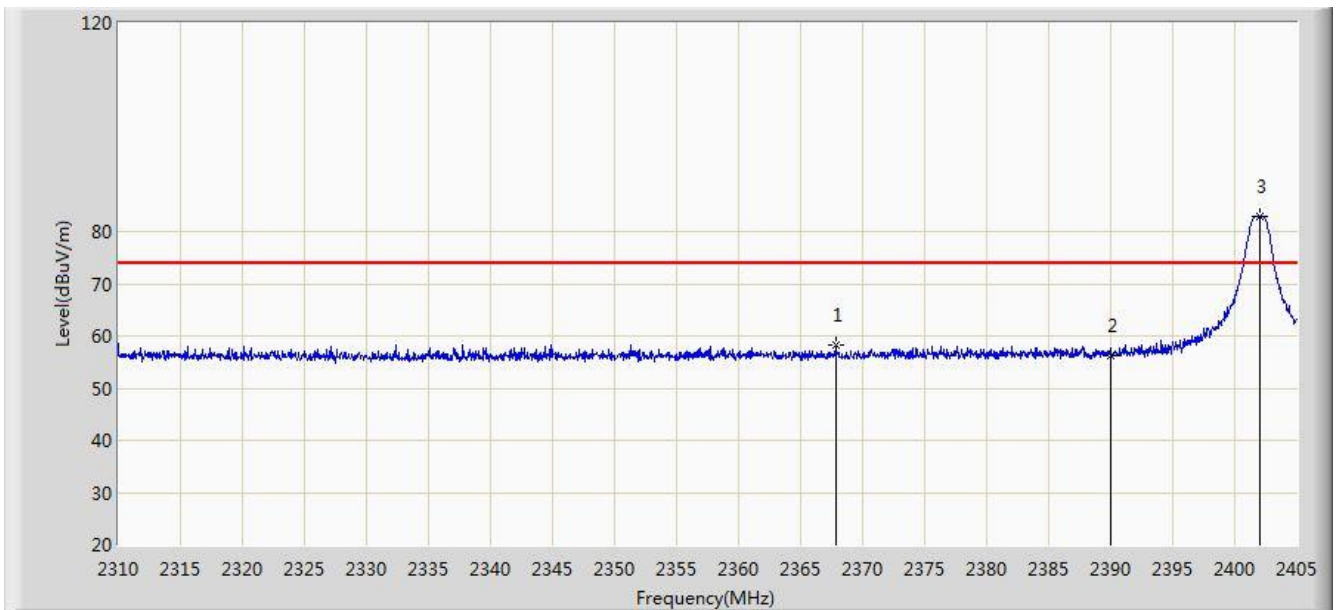
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

## 7.7. Radiated Restricted Band Edge Measurement

### 7.7.1. Test Result

Site: AC1	Time: 2017/03/01 - 03:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2402MHz	



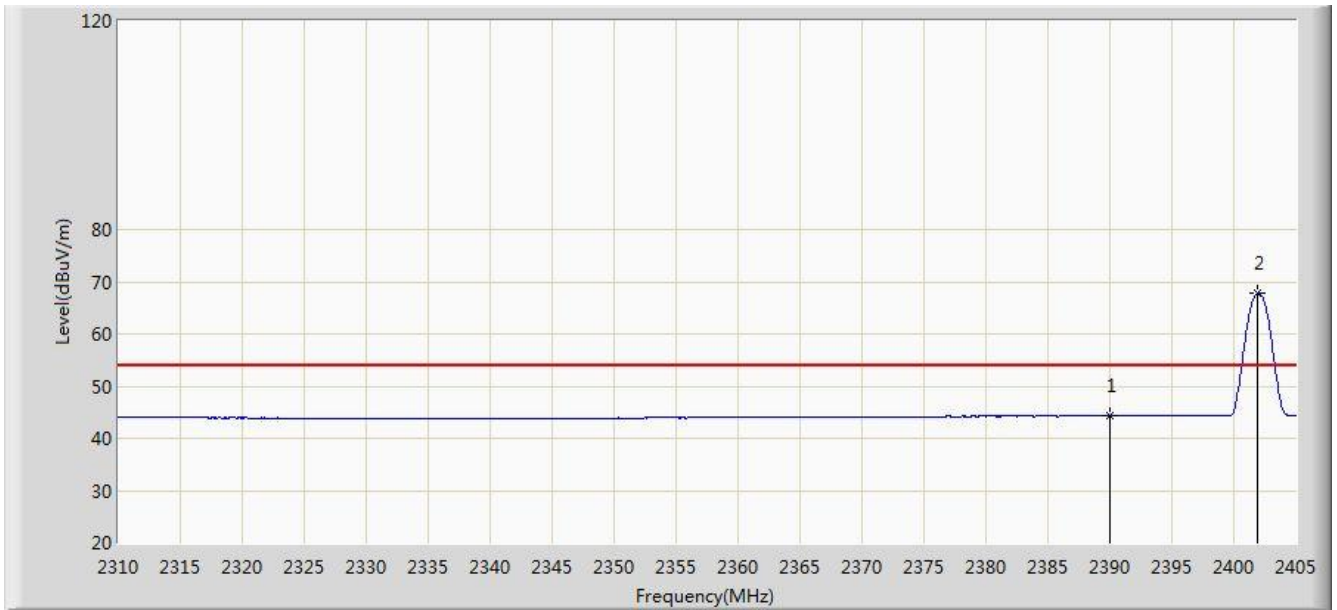
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2367.808	58.289	27.045	-15.711	74.000	31.244	PK
2			2390.000	56.158	24.955	-17.842	74.000	31.203	PK
3		*	2402.008	82.907	51.723	N/A	N/A	31.184	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)



Site: AC1	Time: 2017/03/01 - 03:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2402MHz	

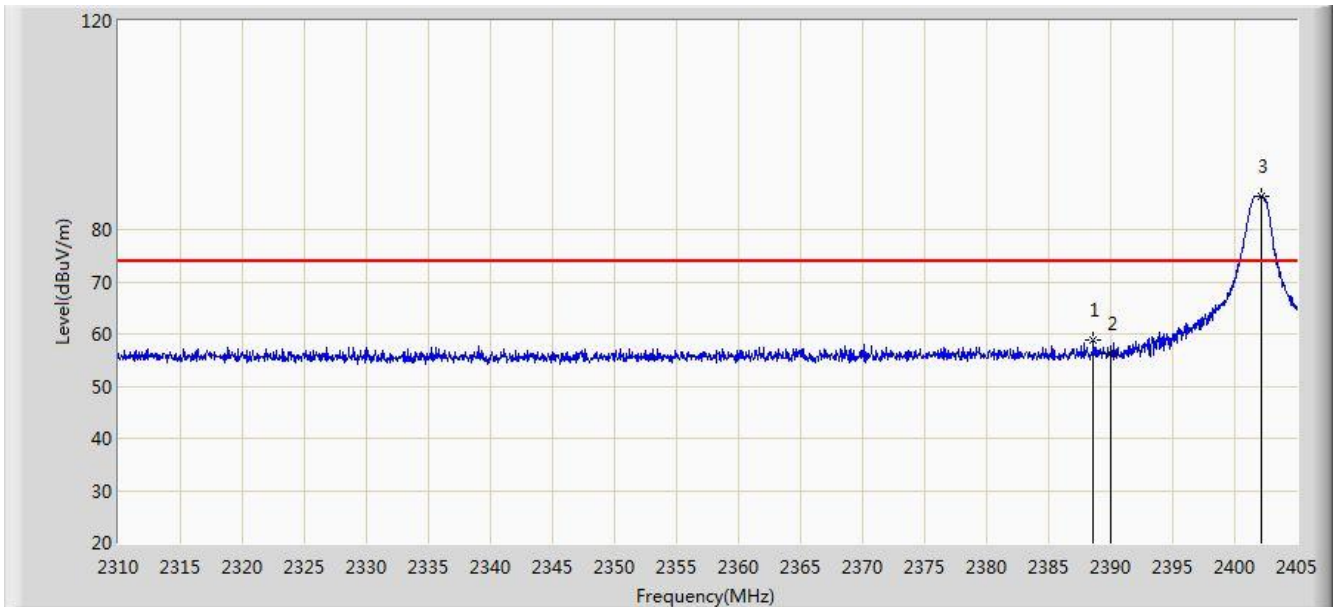


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	44.342	13.139	-9.658	54.000	31.203	AV
2		*	2401.865	67.695	36.511	N/A	N/A	31.184	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2017/03/01 - 03:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2402MHz	

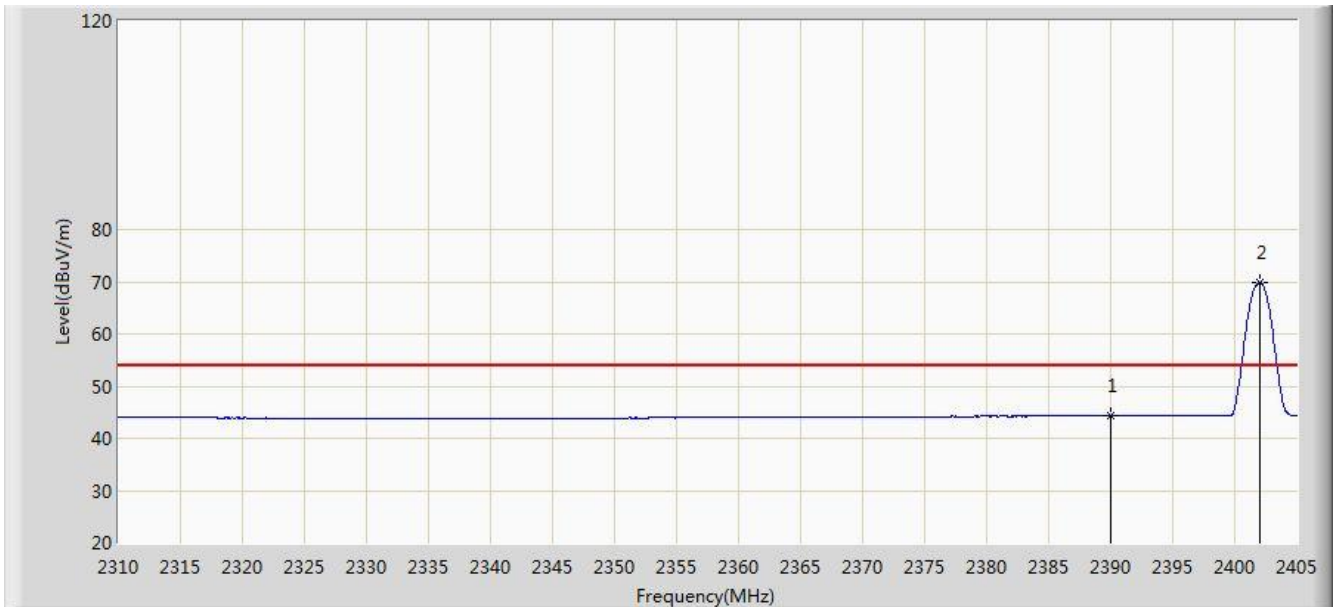


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2388.613	58.845	27.640	-15.155	74.000	31.205	PK
2			2390.000	56.223	25.020	-17.777	74.000	31.203	PK
3		*	2402.198	86.314	55.130	N/A	N/A	31.184	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2017/03/01 - 03:19
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2402MHz	

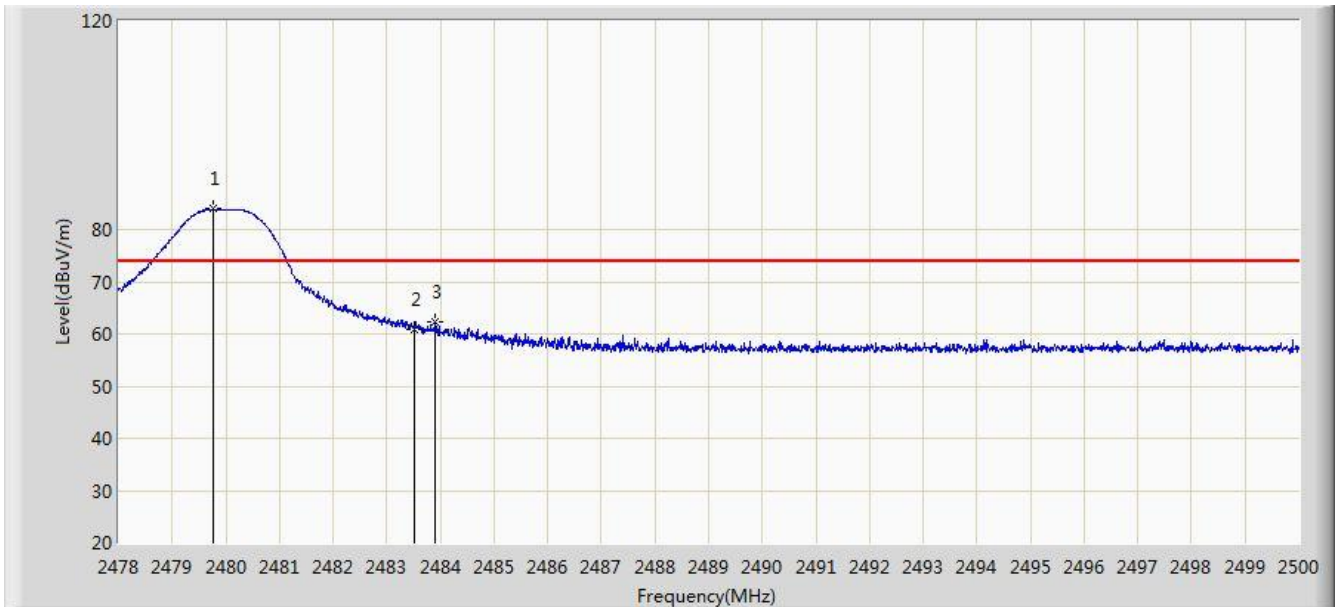


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	44.261	13.058	-9.739	54.000	31.203	AV
2		*	2402.008	69.917	38.733	N/A	N/A	31.184	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2017/03/01 - 03:20
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2480MHz	

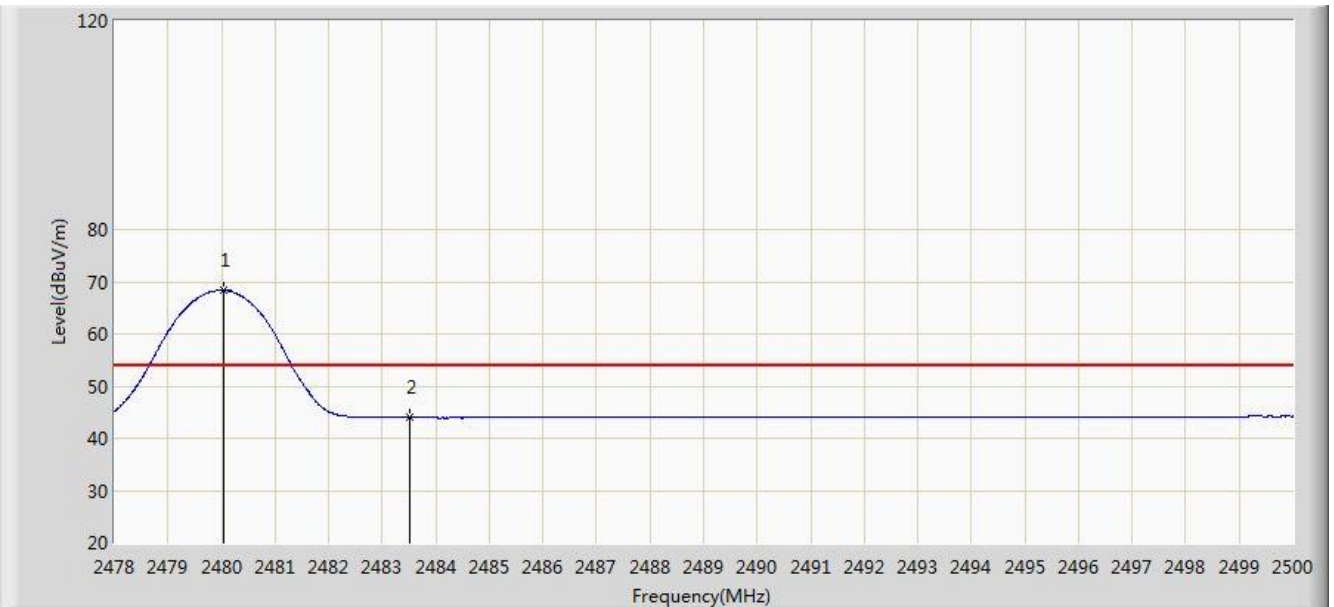


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.771	83.946	52.762	N/A	N/A	31.184	PK
2			2483.500	60.970	29.777	-13.030	74.000	31.194	PK
3			2483.907	62.392	31.198	-11.608	74.000	31.194	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2017/03/01 - 03:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2480MHz	

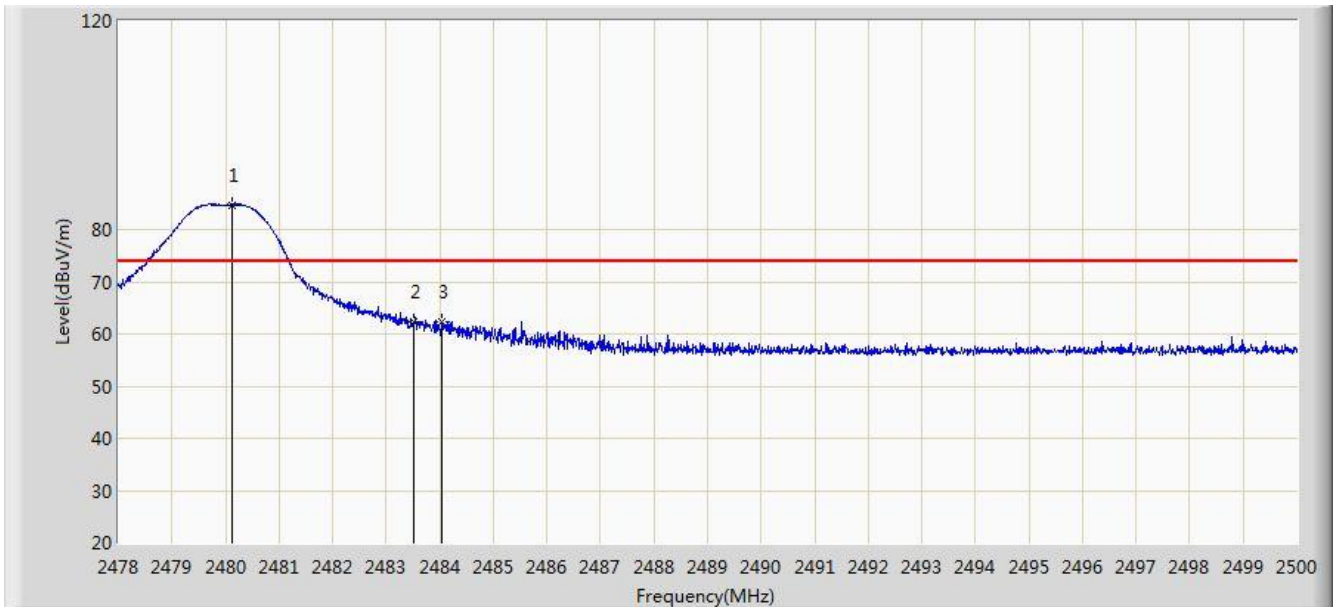


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.046	68.345	37.161	N/A	N/A	31.184	AV
2			2483.500	43.950	12.757	-10.050	54.000	31.194	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2017/03/01 - 03:24
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2480MHz	

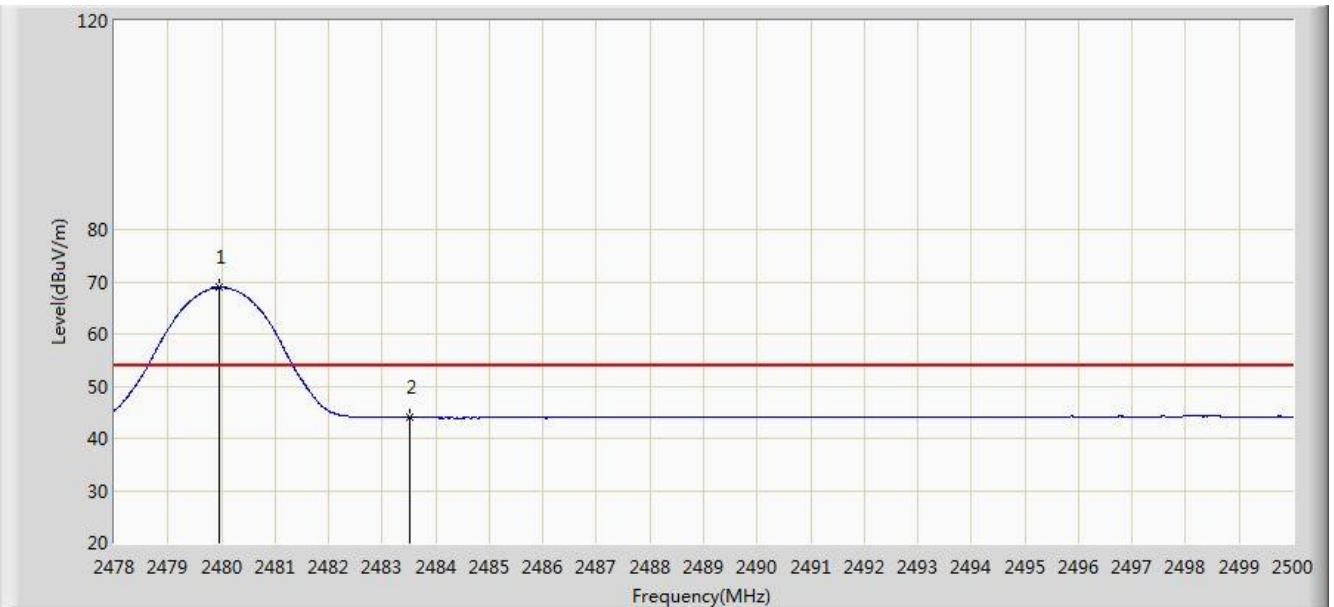


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.112	84.741	53.557	N/A	N/A	31.184	PK
2			2483.500	62.323	31.130	-11.677	74.000	31.194	PK
3			2484.028	62.459	31.264	-11.541	74.000	31.195	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2017/03/01 - 03:25
Limit: FCC_Part15.209_RE(3m)	Engineer: Will Yan
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Bluetooth Speaker LED lamp	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at channel 2480MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.969	68.886	37.702	N/A	N/A	31.184	AV
2			2483.500	43.955	12.762	-10.045	54.000	31.194	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

## 7.8. AC Conducted Emissions Measurement

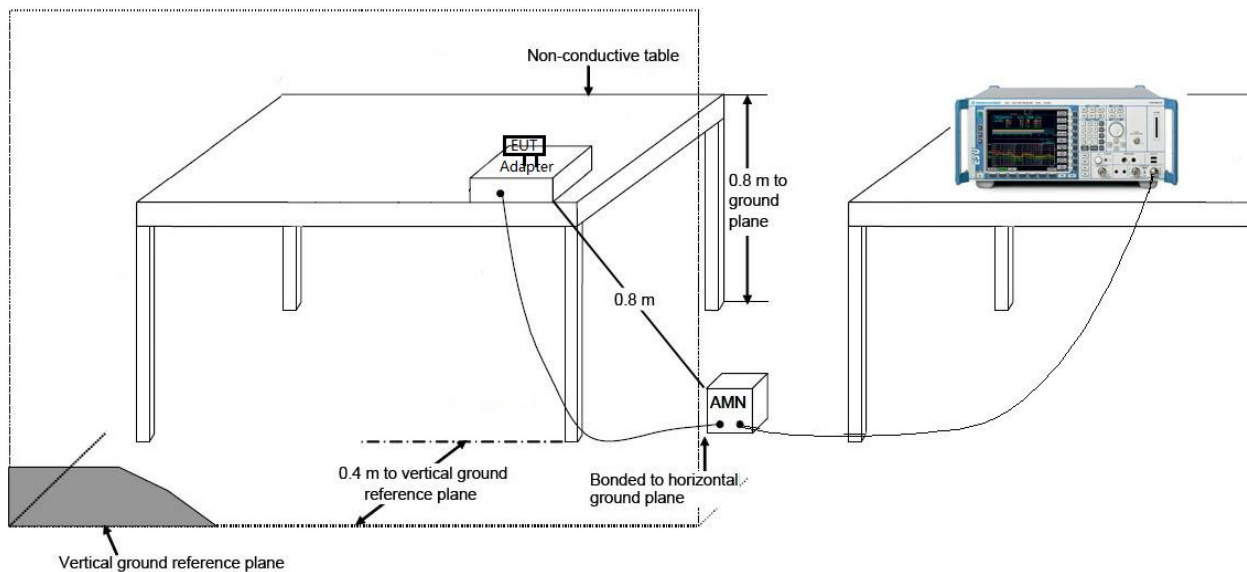
### 7.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

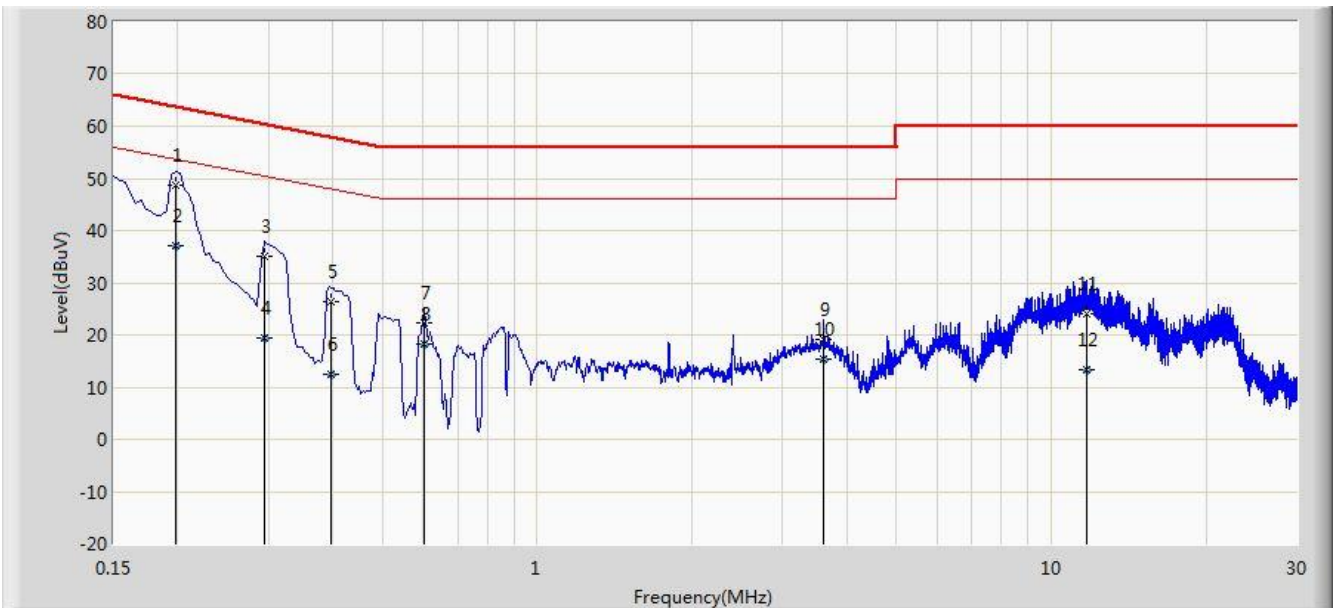
### 7.8.2. Test Setup





### 7.8.3. Test Result

Site: SR2	Time: 2017/03/02 - 13:45
Limit: FCC_Part15.207_CE_AC Power	Engineer: Bruce Wang
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: LED Lamp-SOLO2	Power: AC 120V/60Hz
<b>Test Mode:</b> Transmit by BLE at channel 2402MHz	

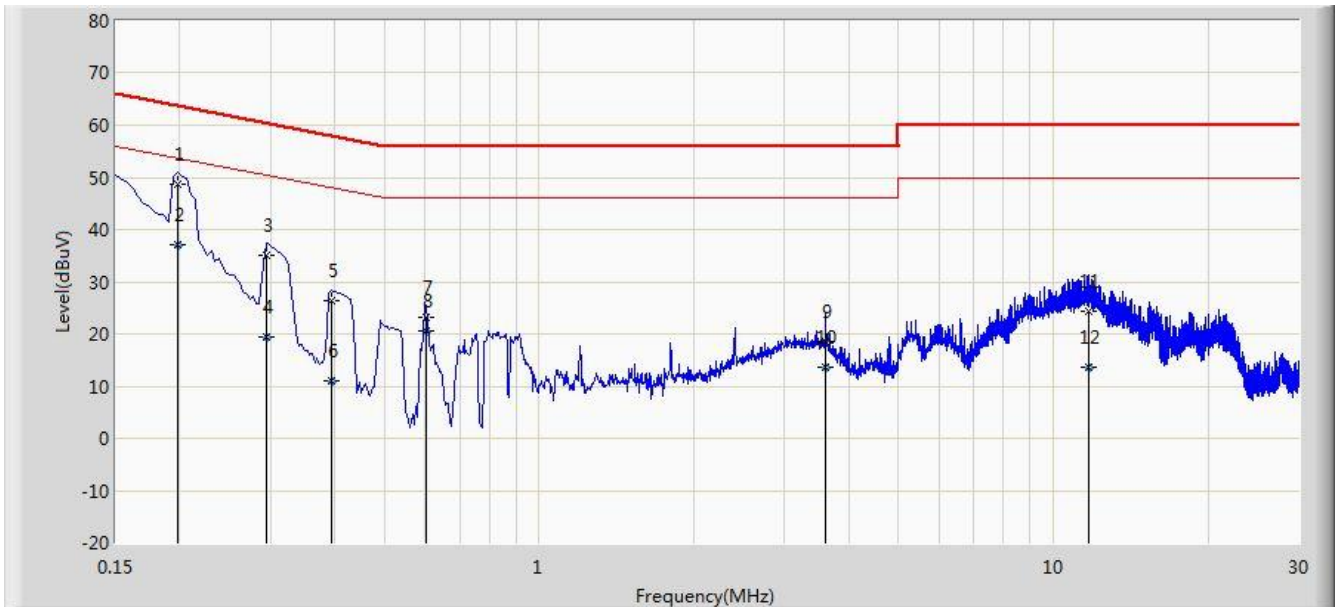


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.198	48.691	38.686	-15.003	63.694	10.005	QP
2			0.198	37.137	27.132	-16.557	53.694	10.005	AV
3			0.294	35.193	25.194	-25.218	60.411	9.999	QP
4			0.294	19.380	9.381	-31.031	50.411	9.999	AV
5			0.398	26.346	16.263	-31.549	57.895	10.084	QP
6			0.398	12.339	2.256	-35.556	47.895	10.084	AV
7			0.602	22.207	12.093	-33.793	56.000	10.114	QP
8			0.602	18.323	8.209	-27.677	46.000	10.114	AV
9			3.602	19.157	9.240	-36.843	56.000	9.917	QP
10			3.602	15.371	5.453	-30.629	46.000	9.917	AV
11			11.746	24.082	13.999	-35.918	60.000	10.083	QP
12			11.746	13.257	3.174	-36.743	50.000	10.083	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2017/03/02 - 13:50
Limit: FCC_Part15.207_CE_AC Power	Engineer: Bruce Wang
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: LED Lamp-SOLO2	Power: AC 120V/60Hz
<b>Test Mode:</b> Transmit by BLE at channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.198	48.651	38.636	-15.043	63.694	10.015	QP
2			0.198	37.075	27.061	-16.619	53.694	10.015	AV
3			0.294	35.069	25.036	-25.341	60.411	10.033	QP
4			0.294	19.345	9.312	-31.065	50.411	10.033	AV
5			0.394	26.278	16.170	-31.701	57.979	10.108	QP
6			0.394	11.053	0.945	-36.926	47.979	10.108	AV
7			0.602	23.201	13.071	-32.799	56.000	10.130	QP
8			0.602	20.467	10.337	-25.533	46.000	10.130	AV
9			3.606	18.614	8.689	-37.386	56.000	9.925	QP
10			3.606	13.489	3.564	-32.511	46.000	9.925	AV
11			11.746	24.306	14.192	-35.694	60.000	10.113	QP
12			11.746	13.500	3.387	-36.500	50.000	10.113	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

## 8. CONCLUSION

The data collected relate only the item(s) tested and show that the **Bluetooth Speaker LED lamp**

**FCC ID: 2AGN8-S21N11** is in compliance with Part 15C of the FCC Rules.

————— The End —————