

APPLICATION CERTIFICATION FCC Part 15C  
On Behalf of  
SRP COMPANIES

Water Resistant Wireless Speaker  
Model No.: EBT-654B

FCC ID: 2ATF5160499

Prepared for : SRP COMPANIES  
Address : 85 RIO GRANDE DRIVE, SECOND FLOOR, CASTLE ROCK,  
CO 80104, United States

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Report No. : ATE20190872  
Date of Test : June 2-June 4, 2019  
Date of Report : June 6, 2019

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## Test Report Certification

Applicant : SRP COMPANIES  
Address : 85 RIO GRANDE DRIVE, SECOND FLOOR, CASTLE ROCK,  
CO 80104, United States  
Product : Water Resistant Wireless Speaker  
Model No. : EBT-654B

Measurement Procedure Used:

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

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

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : June 2-June 4, 2019  
Date of Report : June 6, 2019

Prepared by : \_\_\_\_\_  
(Sean Yang, Engineer)

Approved &  
Authorized Signer : \_\_\_\_\_  
(Sean Liu, Manager)



## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                    |   |                                  |
|--------------------|---|----------------------------------|
| Product            | : | Water Resistant Wireless Speaker |
| Model Number       | : | EBT-654B                         |
| Bluetooth version  | : | V5.0                             |
| Frequency Range    | : | 2402-2480MHz                     |
| Channel Spacing    | : | 1MHz                             |
| Number of Channels | : | 79                               |
| Antenna Gain(Max)  | : | 0dBi                             |
| Antenna type       | : | Integral Antenna                 |
| Modulation mode    | : | GFSK, $\pi/4$ DQPSK              |
| Rating             | : | DC 3.7V                          |

### 1.2. General Disclaimer

The test results presented in this report relate only to the object tested.  
The information supplied by the customer can affect the validity of results

### 1.3. Accessory and Auxiliary Equipment

|              |                      |
|--------------|----------------------|
| Notebook PC: | Manufacturer: Lenovo |
|              | M/N: ThinkPad X240   |
|              | S/N: n.a             |

#### 1.4. Description of Test Facility

- EMC Lab : Recognition of accreditation by Federal Communications Commission (FCC)  
The Designation Number is CN1189  
The Registration Number is 708358
- Listed by Innovation, Science and Economic Development Canada (ISED)  
The Registration Number is 5077A-2
- Accredited by China National Accreditation Service for Conformity Assessment (CNAS)  
The Registration Number is CNAS L3193
- Accredited by American Association for Laboratory Accreditation (A2LA)  
The Certificate Number is 4297.01
- Name of Firm : Shenzhen Accurate Technology Co., Ltd.  
Site Location : 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

#### 1.5. Measurement Uncertainty

- Radiated Emission Expanded Uncertainty (9kHz-30MHz) : U=2.66dB, k=2
- Radiated Emission Expanded Uncertainty (30MHz-1000MHz) : U=4.28dB, k=2
- Radiated Emission Expanded Uncertainty (1G-18GHz) : U=4.98dB, k=2
- Radiated Emission Expanded Uncertainty (18G-26.5GHz) : U=5.06dB, k=2
- Conduction Emission Expanded Uncertainty (Mains ports, 9kHz-30MHz) : U=2.72dB, k=2

## 2. MEASURING DEVICE AND TEST EQUIPMENT

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

| Kind of equipment                                       | Manufacturer              | Type                                    | S/N       | Calibrated dates | Cal. Interval |
|---|---------------------------|---|-----------|------------------|---------------|
| EMI Test Receiver                                       | Rohde&Schwarz             | ESCS30                                  | 100307    | Jan. 05, 2019    | One Year      |
| EMI Test Receiver                                       | Rohde&Schwarz             | ESR                                     | 101817    | Jan. 05, 2019    | One Year      |
| Spectrum Analyzer                                       | Rohde&Schwarz             | FSV-40                                  | 101495    | Jan. 05, 2019    | One Year      |
| Pre-Amplifier<br>(Radiated Emission)                    | Compliance<br>Direction   | RSU-M2                                  | 38322     | Jan. 05, 2019    | One Year      |
| Pre-Amplifier<br>(Radiated Emission)                    | Agilent                   | 8447D                                   | 294A10619 | Jan. 05, 2019    | One Year      |
| Loop Antenna  | Schwarzbeck               | FMZB1516                                | 1516131   | Jan. 05, 2019    | One Year      |
| Bilog Antenna   | Schwarzbeck               | VULB9163                                | 9163-323  | Jan. 05, 2019    | One Year      |
| Horn Antenna  | Schwarzbeck               | BBHA9120D                               | 9120D-655 | Jan. 05, 2019    | One Year      |
| Horn Antenna  | Schwarzbeck               | BBHA9170                                | 9170-359  | Jan. 05, 2019    | One Year      |
| LISN  | Schwarzbeck               | NSLK8126                                | 8126431   | Jan. 05, 2019    | One Year      |
| Highpass Filter   | Wainwright<br>Instruments | WHKX3.6/18<br>G-10SS                    | N/A       | Jan. 05, 2019    | One Year      |
| Band Reject Filter                                      | Wainwright<br>Instruments | WRCG2400/2<br>485-2375/2510<br>-60/11SS | N/A       | Jan. 05, 2019    | One Year      |
| RF Coaxial Cable<br>(Conducted Emission)                | SUHNER                    | N-2m                                    | No.2      | Jan. 05, 2019    | One Year      |
| RF Coaxial Cable<br>(Radiated Emission)                 | RESENBERGER               | N-12m                                   | No.11     | Jan. 05, 2019    | One Year      |
| RF Coaxial Cable<br>(Radiated Emission)                 | RESENBERGER               | N-0.5m                                  | No.12     | Jan. 05, 2019    | One Year      |
| RF Coaxial Cable<br>(Radiated Emission)                 | SUHNER                    | N-2m                                    | No.13     | Jan. 05, 2019    | One Year      |
| RF Coaxial Cable<br>(Radiated Emission)                 | SUHNER                    | N-0.5m                                  | No.15     | Jan. 05, 2019    | One Year      |
| RF Coaxial Cable<br>(Radiated Emission)                 | SUHNER                    | N-2m                                    | No.16     | Jan. 05, 2019    | One Year      |
| RF Coaxial Cable<br>(Radiated Emission)                 | RESENBERGER               | N-6m                                    | No.17     | Jan. 05, 2019    | One Year      |
| Conducted Emission Measurement Software: ES-K1 V1.71    |                           |   |           |                  |               |
| Radiated Emission Measurement Software: EZ_EMV V1.1.4.2 |                           |   |           |                  |               |

### 3. OPERATION OF EUT DURING TESTING

#### 3.1. Operating Mode

The mode is used: Transmitting mode

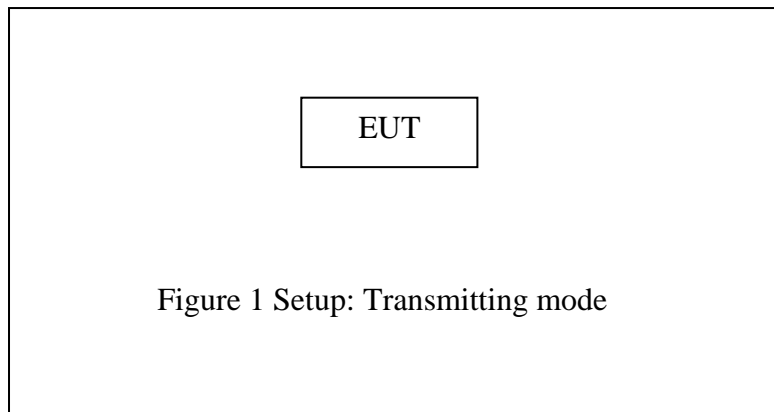
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

#### 3.2. Configuration and peripherals



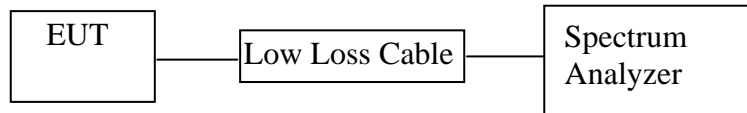


#### 4. TEST PROCEDURES AND RESULTS

| <b>FCC Rules</b>                    | <b>Description of Test</b>            | <b>Result</b> |
|-------------------------------------|---------------------------------------|---------------|
| Section 15.247(a)(1)                | 20dB Bandwidth Test                   | Compliant     |
| Section 15.247(a)(1)                | Carrier Frequency Separation Test     | Compliant     |
| Section 15.247(a)(1)(iii)           | Number Of Hopping Frequency Test      | Compliant     |
| Section 15.247(a)(1)(iii)           | Dwell Time Test                       | Compliant     |
| Section 15.247(b)(1)                | Maximum Peak Output Power Test        | Compliant     |
| Section 15.247(d)<br>Section 15.209 | Radiated Emission Test                | Compliant     |
| Section 15.247(d)                   | Band Edge Compliance Test             | Compliant     |
| Section 15.207                      | AC Power Line Conducted Emission Test | Compliant     |
| Section 15.247(d)                   | Conducted Spurious Emission Test      | Compliant     |
| Section 15.203                      | Antenna Requirement                   | Compliant     |

## 5. 20DB BANDWIDTH TEST

### 5.1. Block Diagram of Test Setup



### 5.2. The Requirement For Section 15.247(a)(1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

### 5.3. EUT Configuration on Measurement

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

### 5.4. Operating Condition of EUT

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

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

### 5.5. Test Procedure

5.5.1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

5.5.2. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.

5.5.3. RBW shall be in the range of 1% to 5% of the OBW and VBW shall be approximately three times RBW.

5.5.4. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

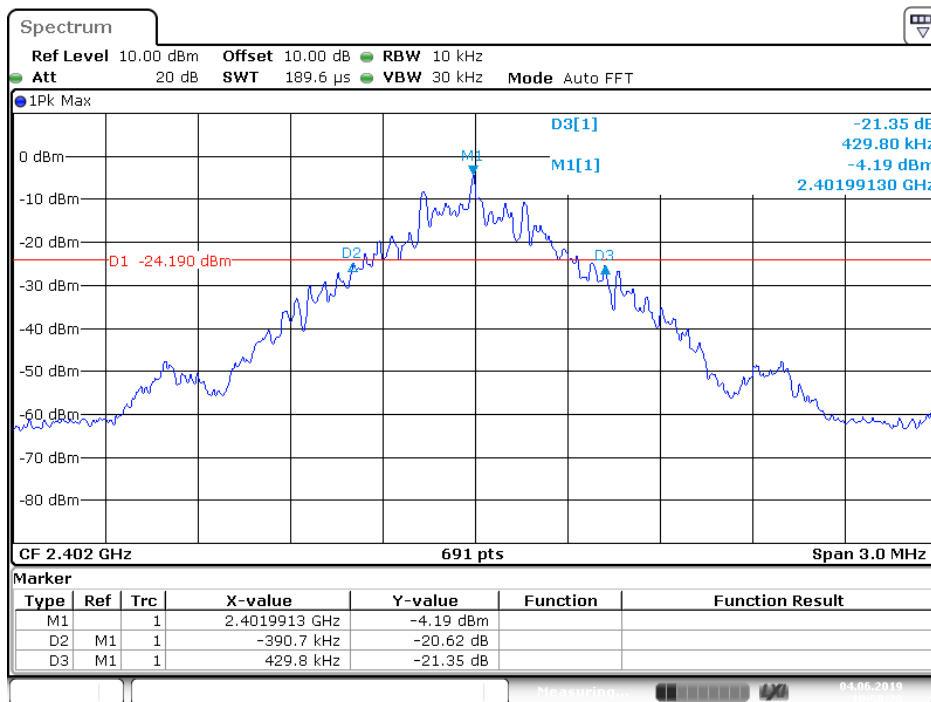
### 5.6. Test Result

| Channel | Frequency (MHz) | GFSK mode 20dB Bandwidth (MHz) | $\pi/4$ DQPSK mode 20dB Bandwidth (MHz) | Result |
|---------|-----------------|--------------------------------|---|--------|
| Low     | 2402            | 0.821                          | 1.242                                   | Pass   |
| Middle  | 2441            | 0.773                          | 1.246                                   | Pass   |
| High    | 2480            | 0.777                          | 1.246                                   | Pass   |

The spectrum analyzer plots are attached as below.

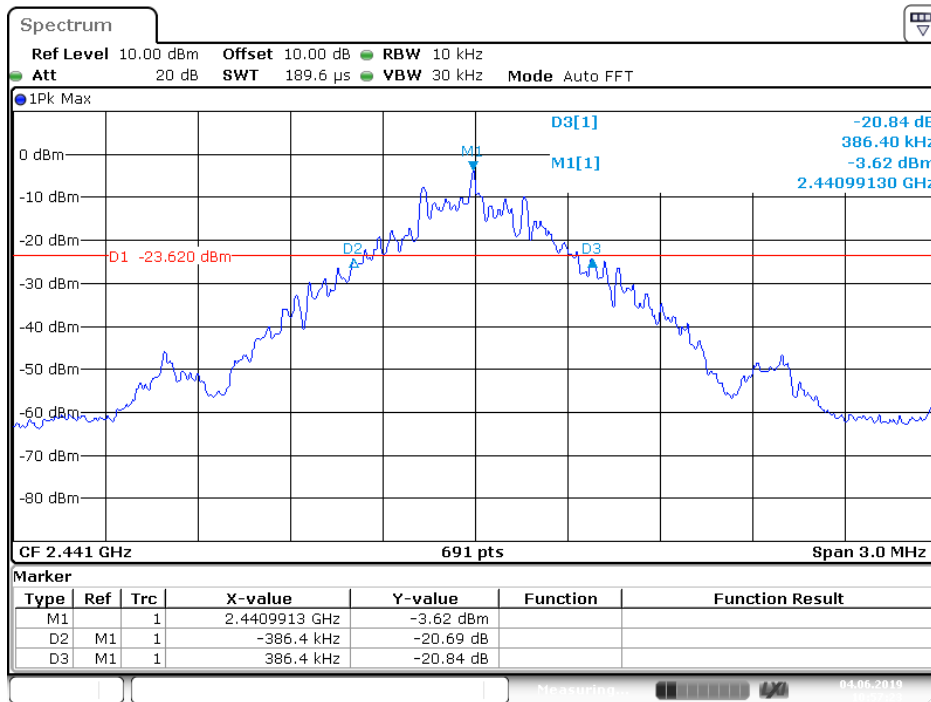
#### GFSK Mode

#### Low channel

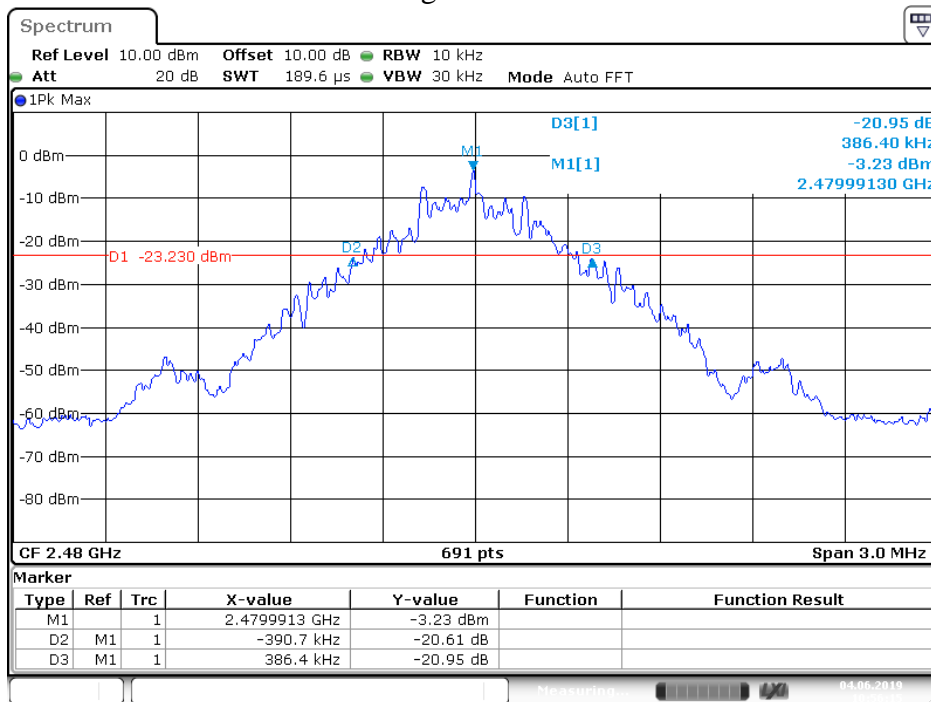


Date: 4.JUN.2019 10:58:29

## Middle channel

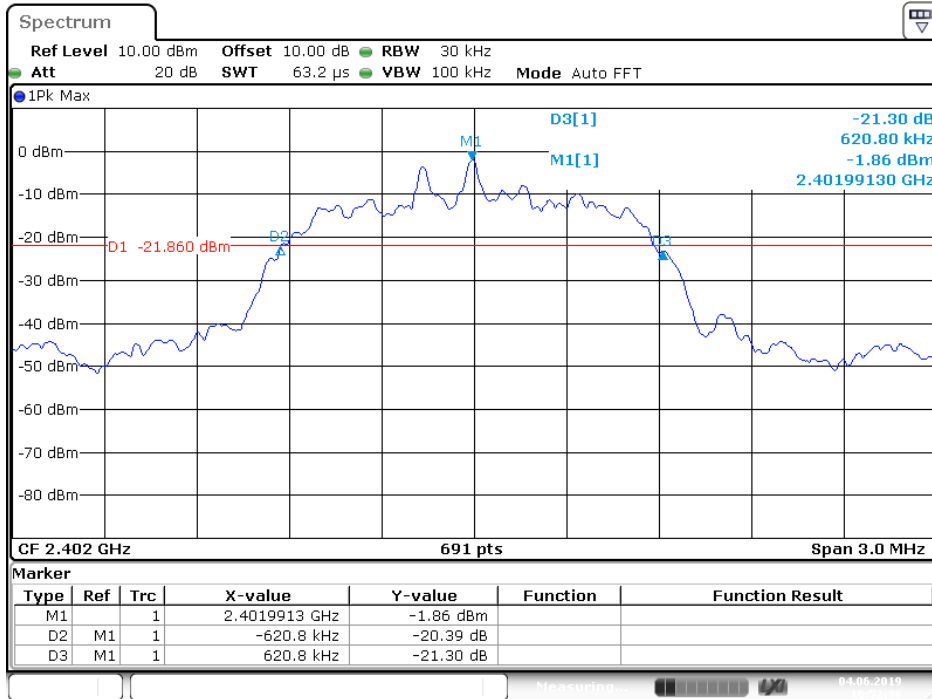


## High channel



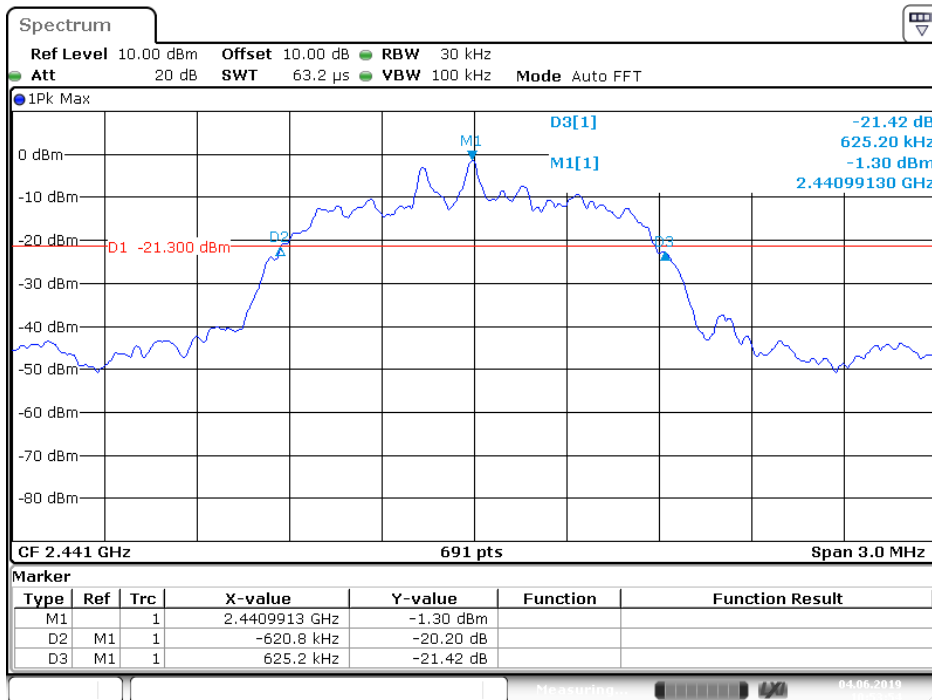
$\pi/4$  DQPSK Mode

Low channel



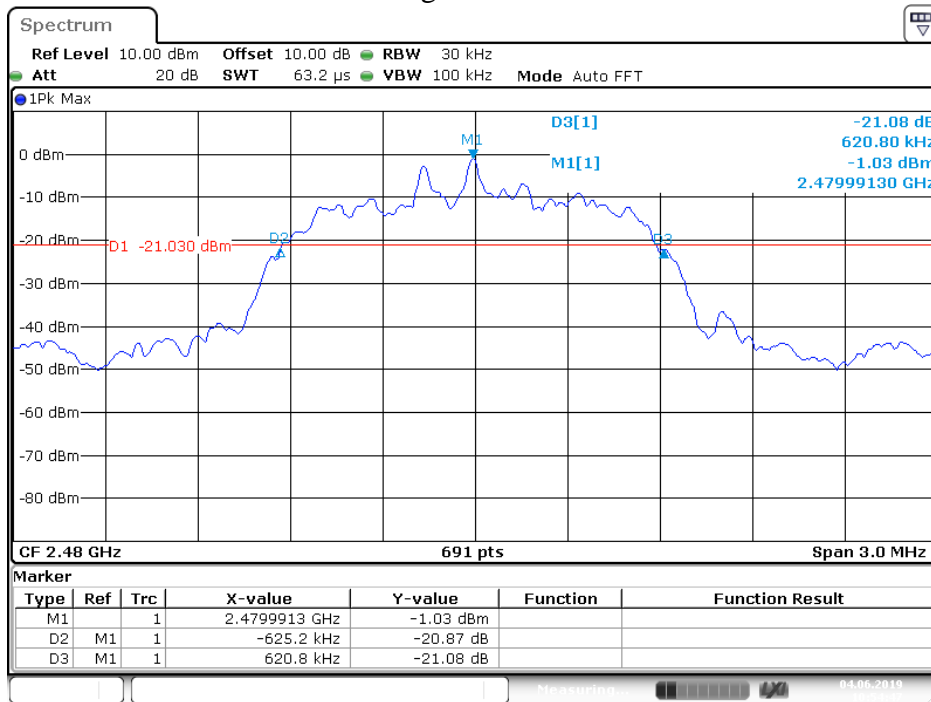
Date: 4.JUN.2019 10:52:39

Middle channel



Date: 4.JUN.2019 10:53:54

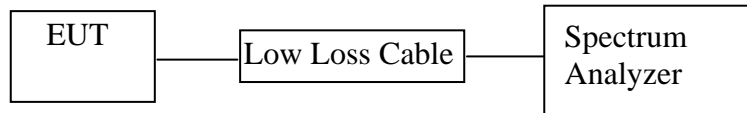
### High channel



Date: 4.JUN.2019 10:54:48

## 6. CARRIER FREQUENCY SEPARATION TEST

### 6.1. Block Diagram of Test Setup



### 6.2. The Requirement For Section 15.247(a)(1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

### 6.3. EUT Configuration on Measurement

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

### 6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

### 6.5. Test Procedure

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

6.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz. Adjust Span to 3MHz.

6.5.3. Set the adjacent channel of the EUT Maxhold another trace.

6.5.4. Measurement the channel separation

### 6.6. Test Result

#### GFSK mode

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2480            |                         |                             |        |

#### $\pi/4$ DQPSK Mode

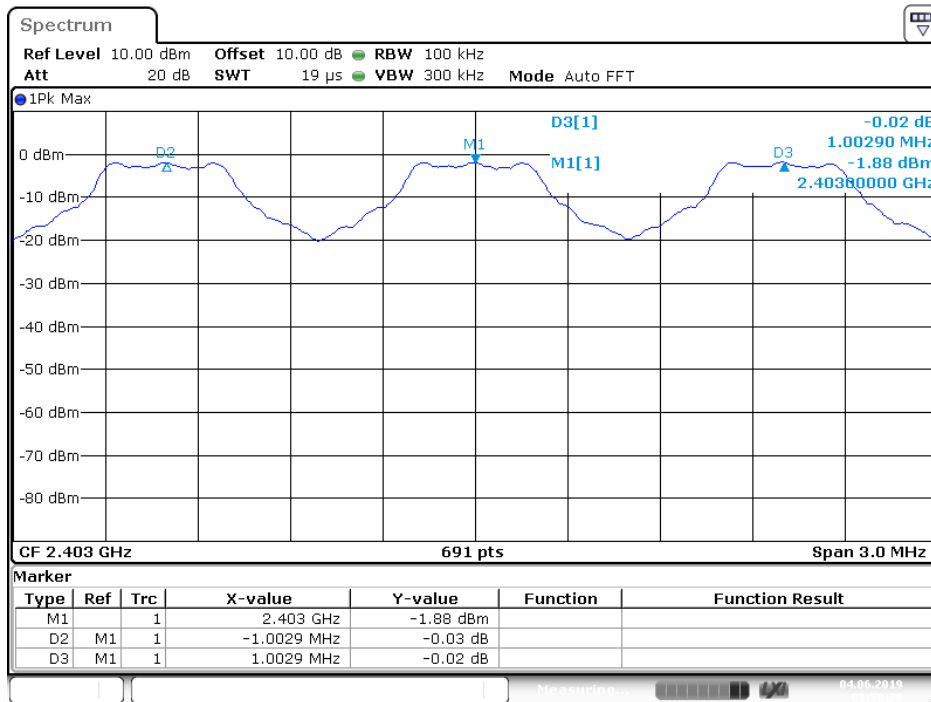
| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.0029                  | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2480            |                         |                             |        |

The spectrum analyzer plots are attached as below.



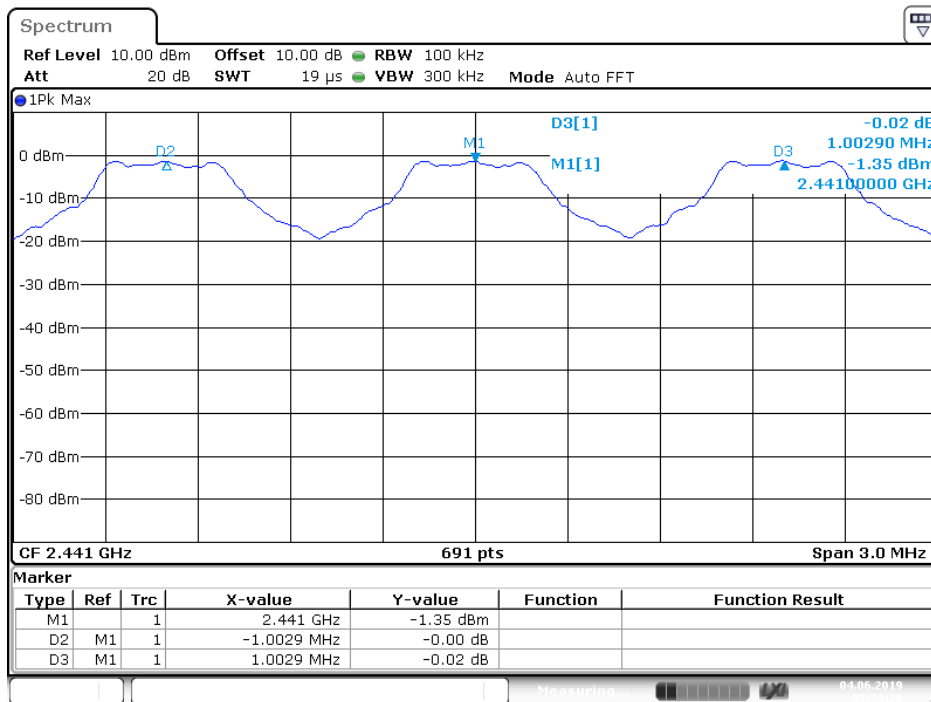
## GFSK Mode

### Low channel



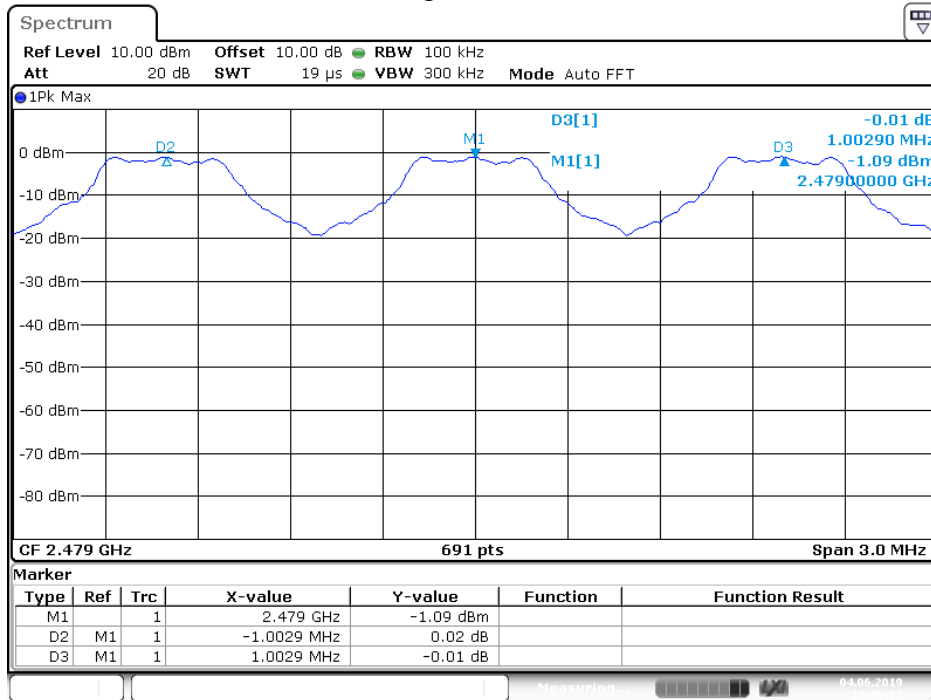
Date: 4.JUN.2019 09:58:29

### Middle channel



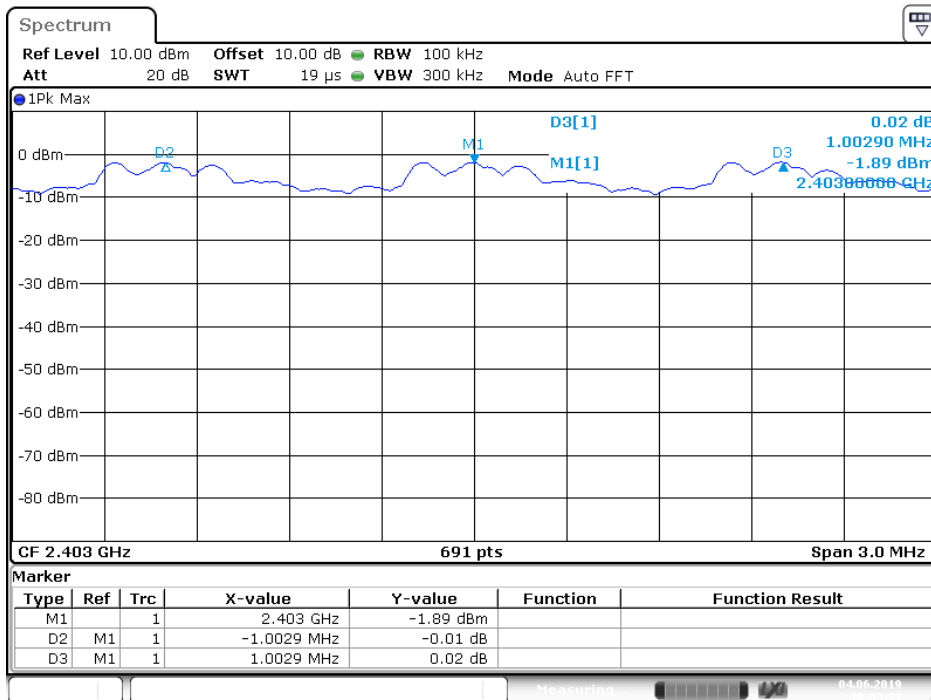
Date: 4.JUN.2019 09:59:20

### High channel

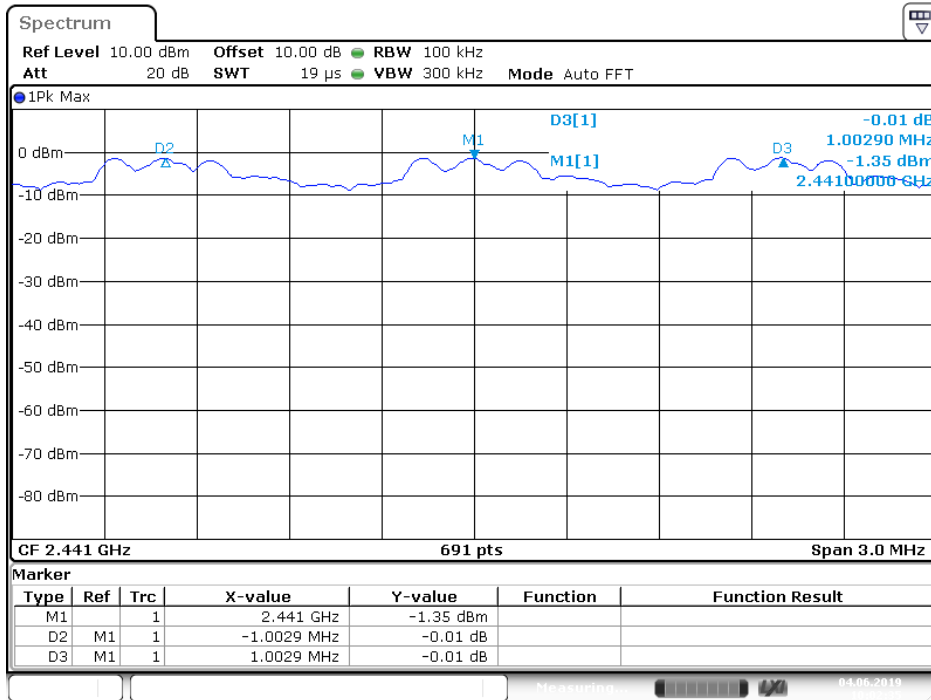


### $\pi/4$ DQPSK Mode

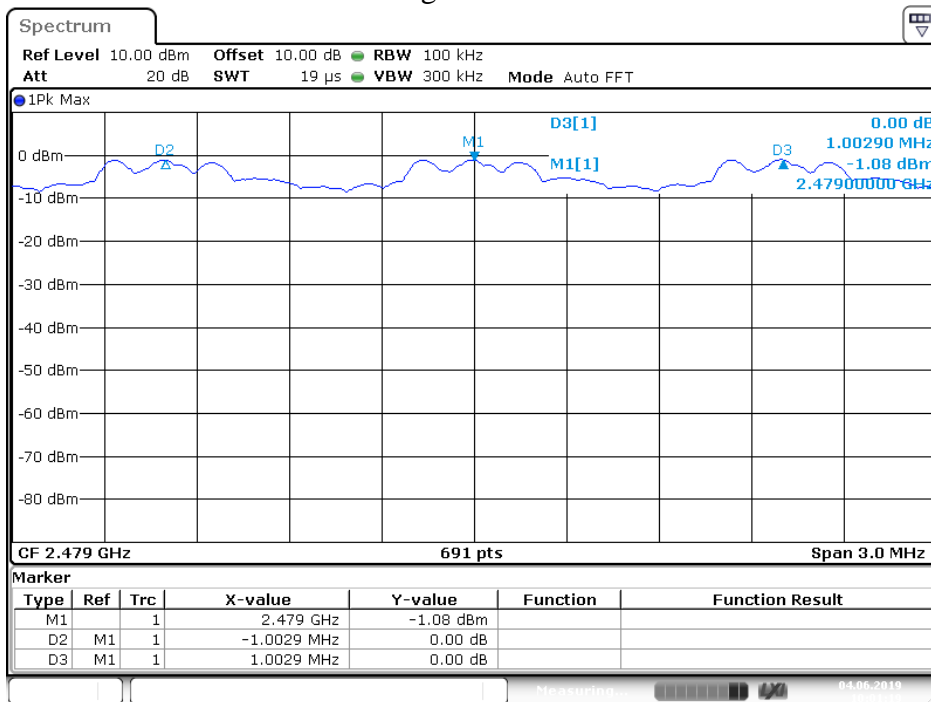
### Low channel



## Middle channel

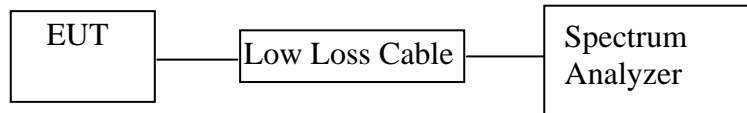


## High channel



## 7. NUMBER OF HOPPING FREQUENCY TEST

### 7.1. Block Diagram of Test Setup



### 7.2. The Requirement For Section 15.247(a)(1)(iii)

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

### 7.3. EUT Configuration on Measurement

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

### 7.4. Operating Condition of EUT

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

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

### 7.5. Test Procedure

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

7.5.2. Set the spectrum analyzer as Span=90MHz, RBW=100 kHz, VBW=300 kHz.

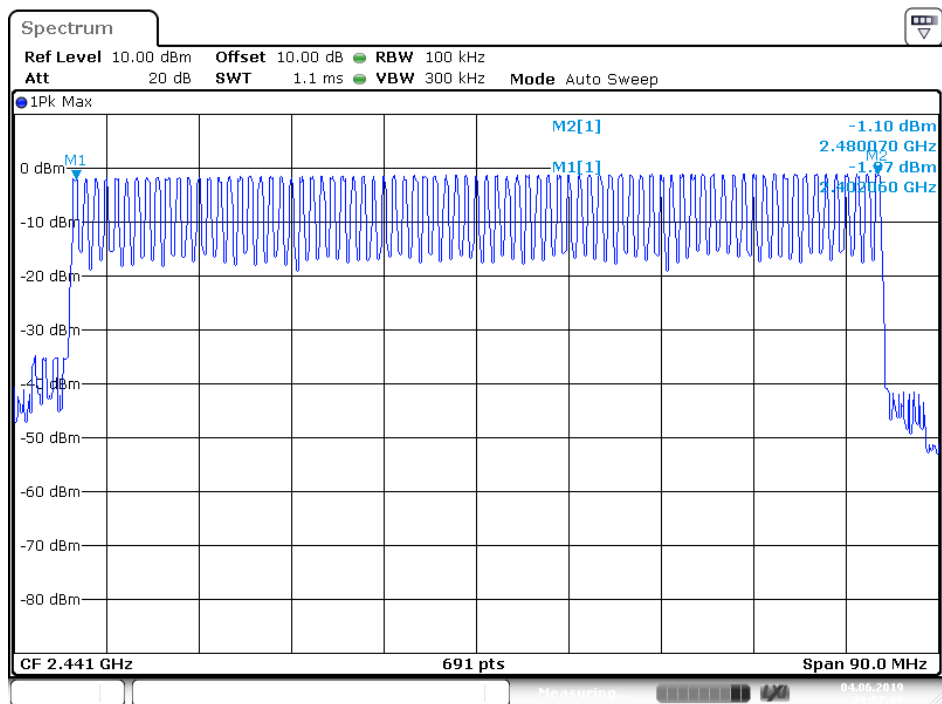
7.5.3. Max hold, view and count how many channel in the band.

### 7.6. Test Result

| Total number of hopping channel | Measurement result(CH) | Limit(CH) | Result |
|---------------------------------|------------------------|-----------|--------|
|                                 | 79                     | ≥15       | Pass   |

The spectrum analyzer plots are attached as below.

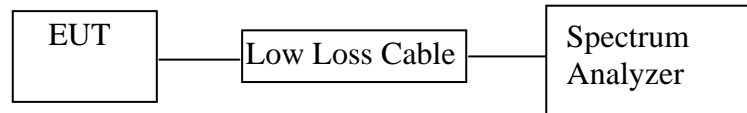
Number of hopping channels (GFSK Mode)



Date: 4.JUN.2019 09:57:10

## 8. DWELL TIME TEST

### 8.1. Block Diagram of Test Setup



### 8.2. The Requirement For Section 15.247(a)(1)(iii)

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 8.3. EUT Configuration on Measurement

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

### 8.4. Operating Condition of EUT

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

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

### 8.5. Test Procedure

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

8.5.2. Set center frequency of spectrum analyzer = operating frequency.

8.5.3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=5ms, 10ms, 15ms. Get the pulse time.

8.5.4. Repeat above procedures until all frequency measured were complete.

## 8.6. Test Result

### GFSK Mode

| Mode   | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|--|-------------------------|-----------------|-----------------|------------|
| DH1  | 2402                    | 0.428           | 136.96          | 400        |
|  | 2441                    | 0.428           | 136.96          | 400        |
|  | 2480                    | 0.428           | 136.96          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ |                         |                 |                 |            |
| DH3  | 2402                    | 1.696           | 271.36          | 400        |
|  | 2441                    | 1.696           | 271.36          | 400        |
|  | 2480                    | 1.696           | 271.36          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$ |                         |                 |                 |            |
| DH5  | 2402                    | 2.957           | 315.41          | 400        |
|  | 2441                    | 2.957           | 315.41          | 400        |
|  | 2480                    | 2.957           | 315.41          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ |                         |                 |                 |            |

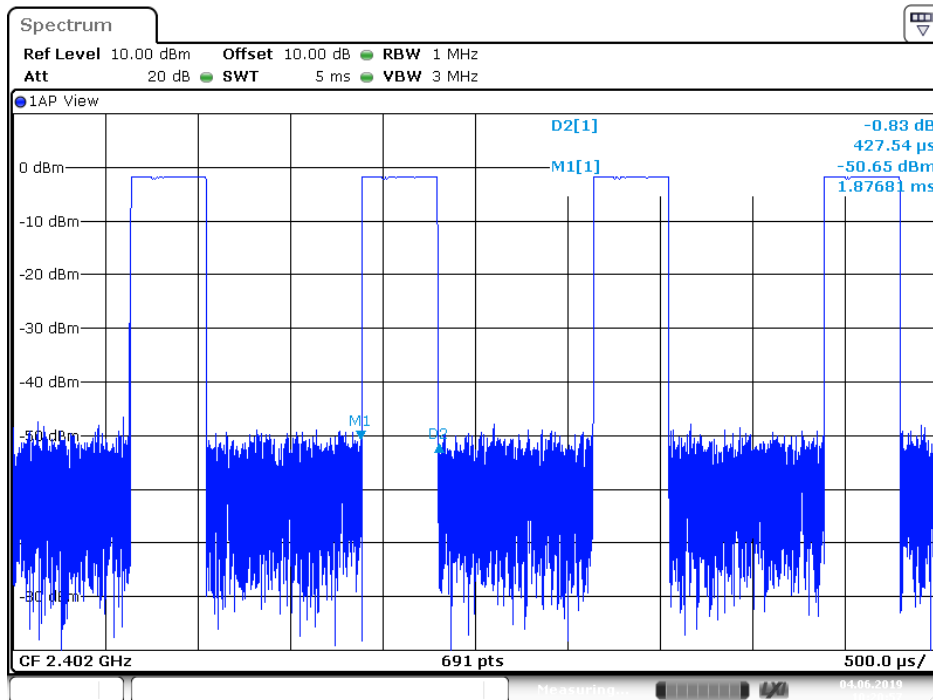
### $\pi/4$ DQPSK Mode

| Mode   | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|--|-------------------------|-----------------|-----------------|------------|
| 2DH1   | 2402                    | 0.435           | 139.20          | 400        |
|  | 2441                    | 0.442           | 141.44          | 400        |
|  | 2480                    | 0.435           | 139.20          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2*79)) \times 31.6$ |                         |                 |                 |            |
| 2DH3   | 2402                    | 1.696           | 271.36          | 400        |
|  | 2441                    | 1.696           | 271.36          | 400        |
|  | 2480                    | 1.710           | 273.60          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4*79)) \times 31.6$ |                         |                 |                 |            |
| 2DH5   | 2402                    | 2.978           | 317.65          | 400        |
|  | 2441                    | 2.978           | 317.65          | 400        |
|  | 2480                    | 2.957           | 315.41          | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6*79)) \times 31.6$ |                         |                 |                 |            |

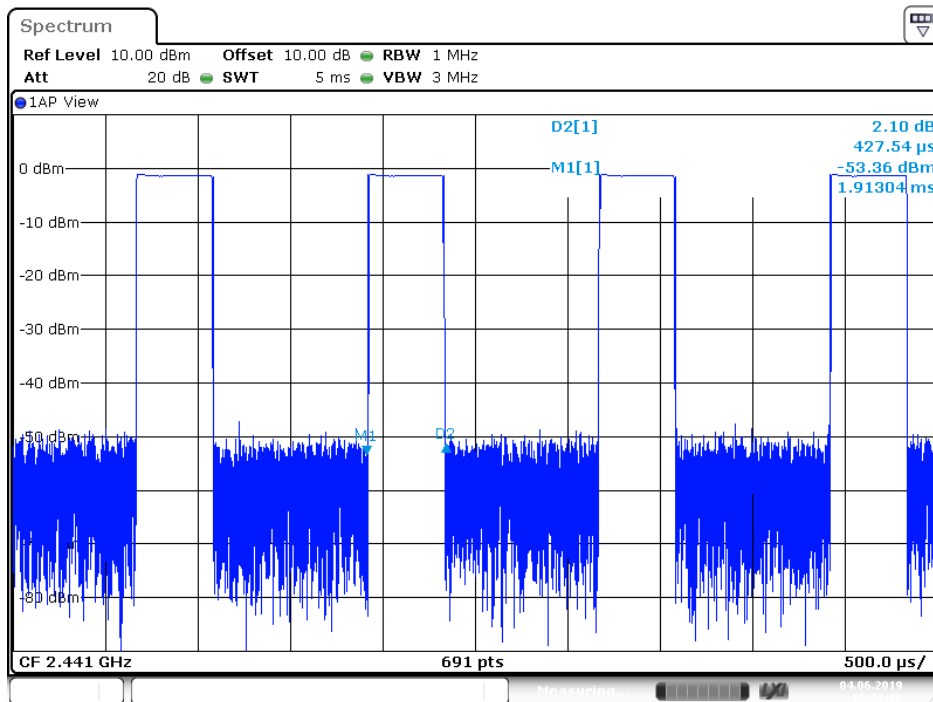
The spectrum analyzer plots are attached as below.

## GFSK Mode

### DH1 Low channel

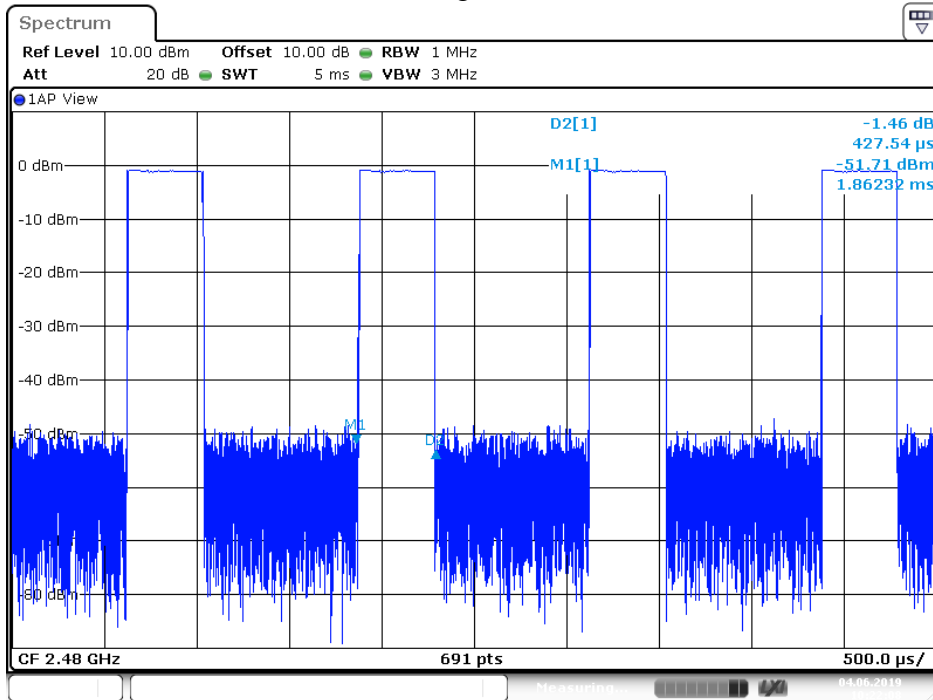


### DH1 Middle channel

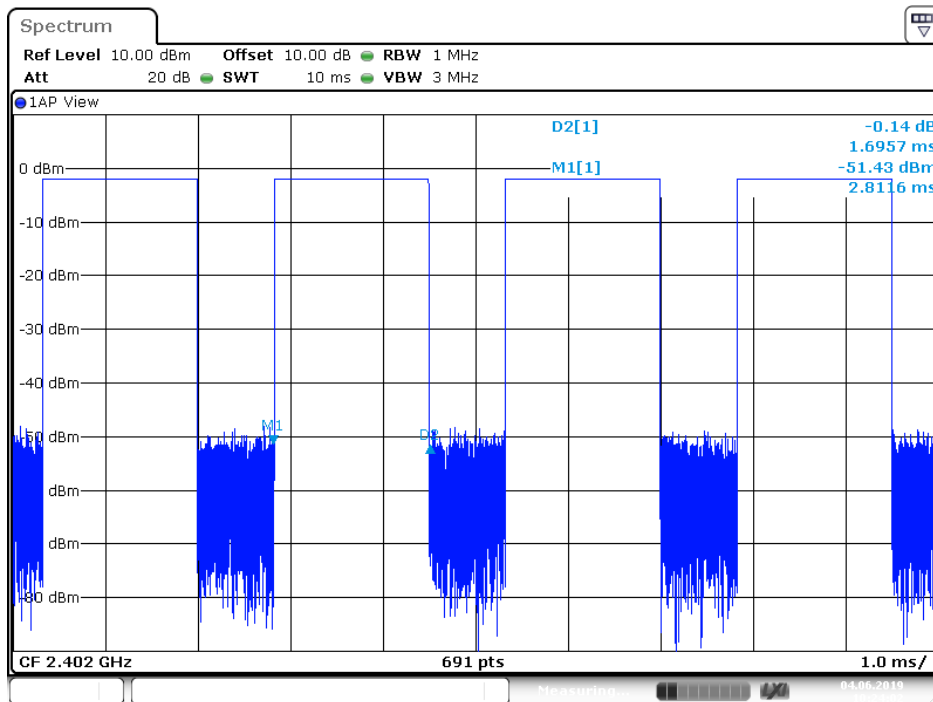




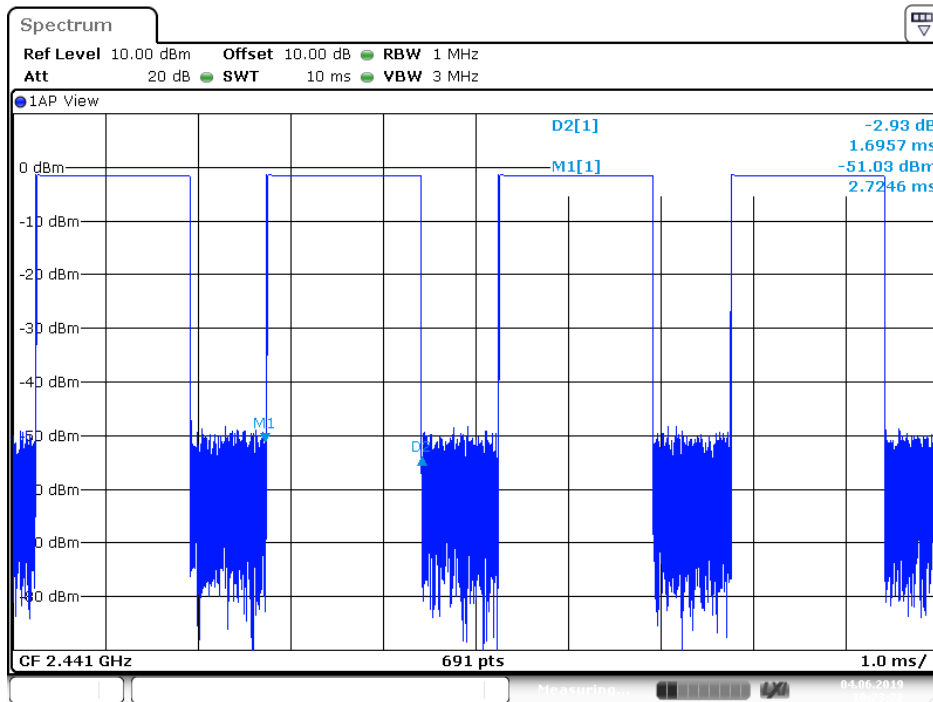
DH1 High channel



DH3 Low channel

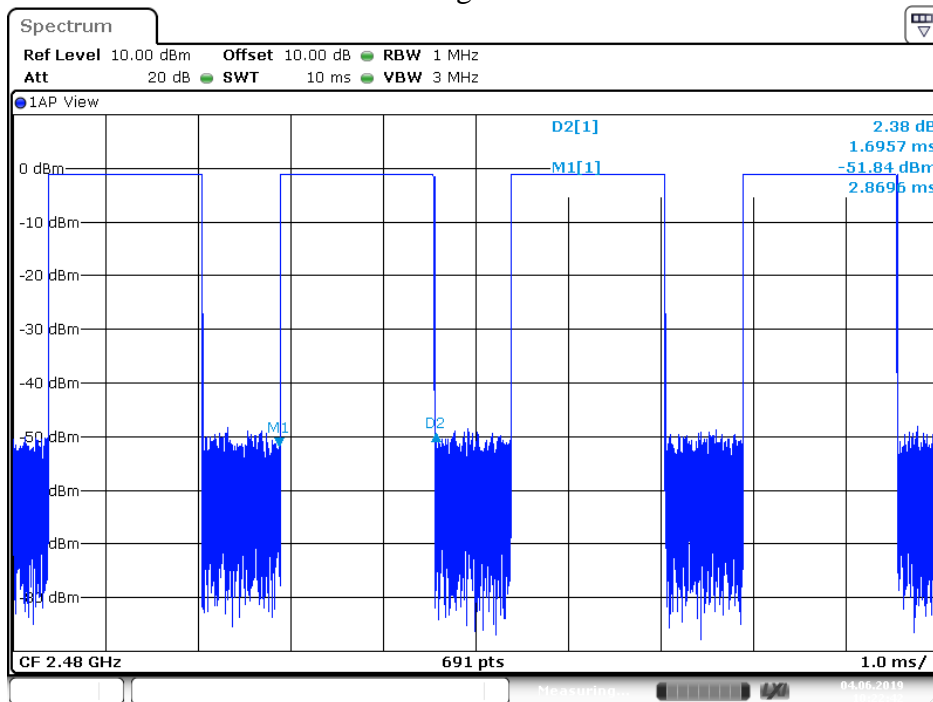


## DH3 Middle channel



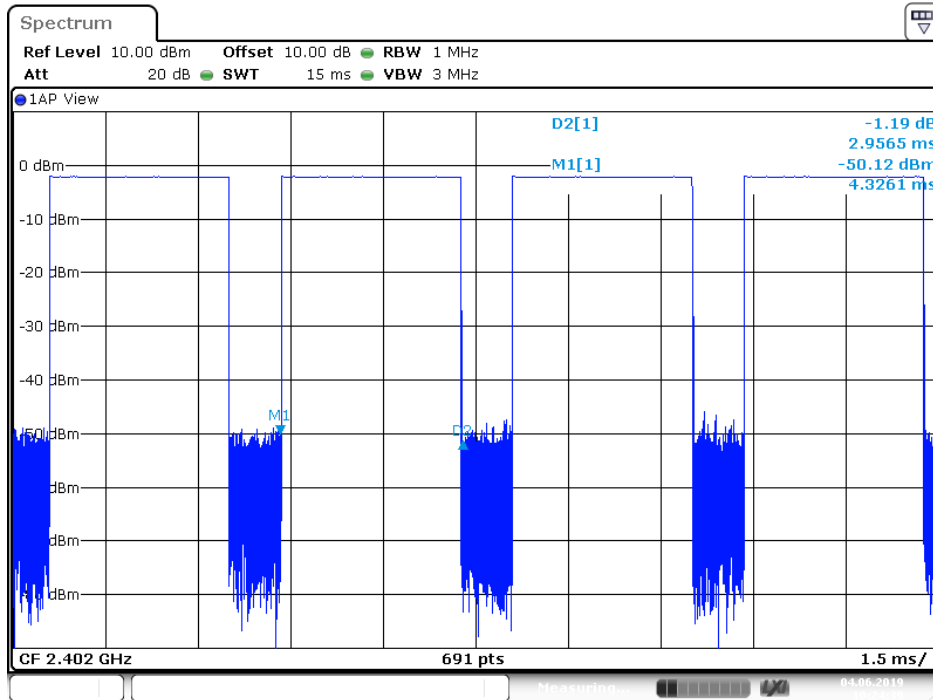
Date: 4.JUN.2019 10:23:23

## DH3 High channel



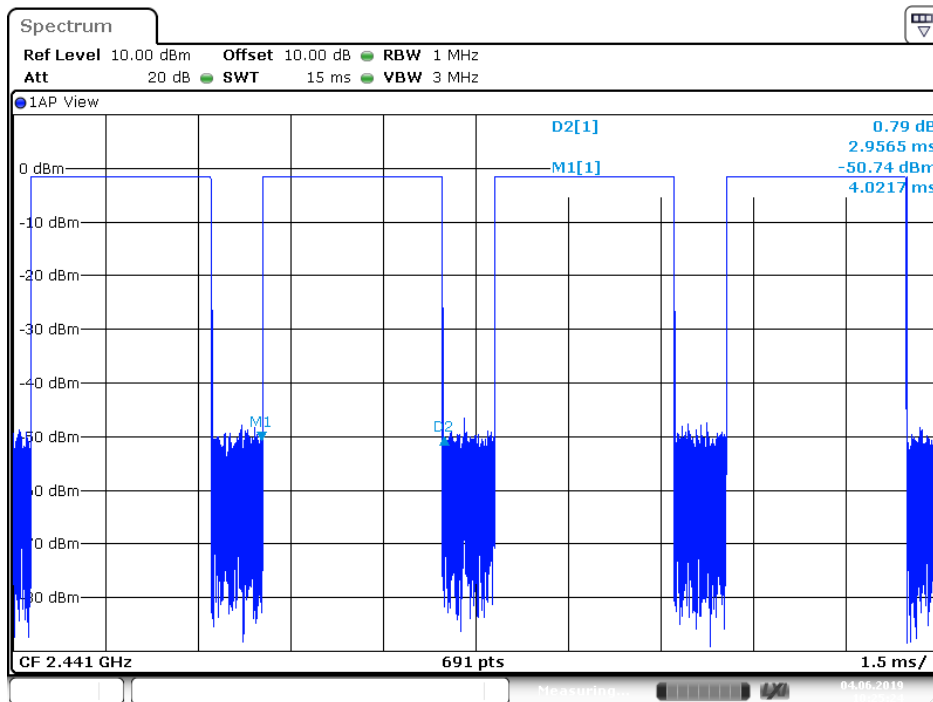
Date: 4.JUN.2019 10:22:43

DH5 Low channel



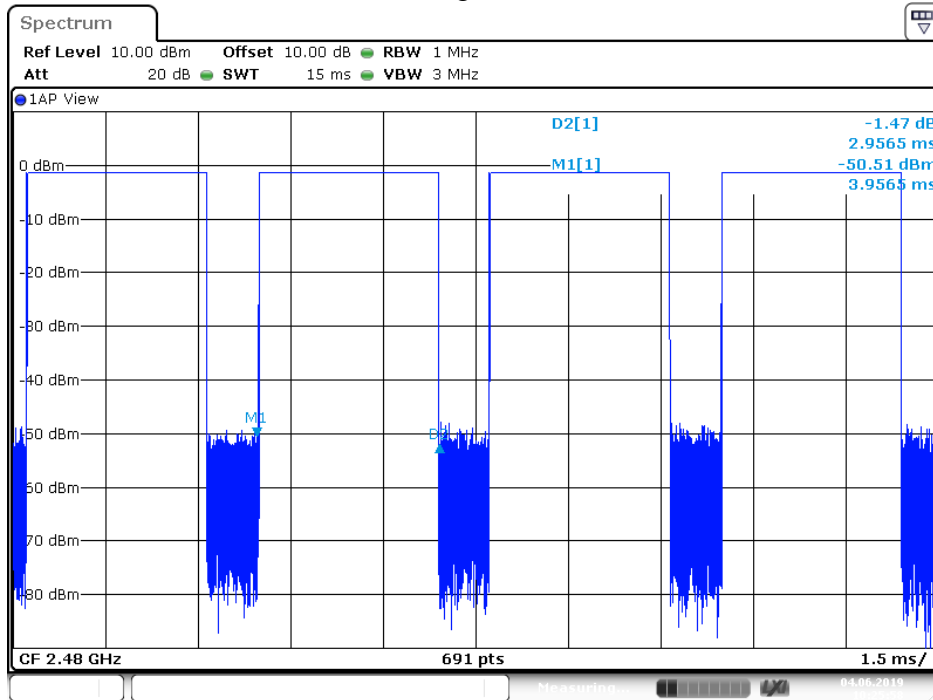
Date: 4.JUN.2019 10:24:40

DH5 Middle channel



Date: 4.JUN.2019 10:25:25

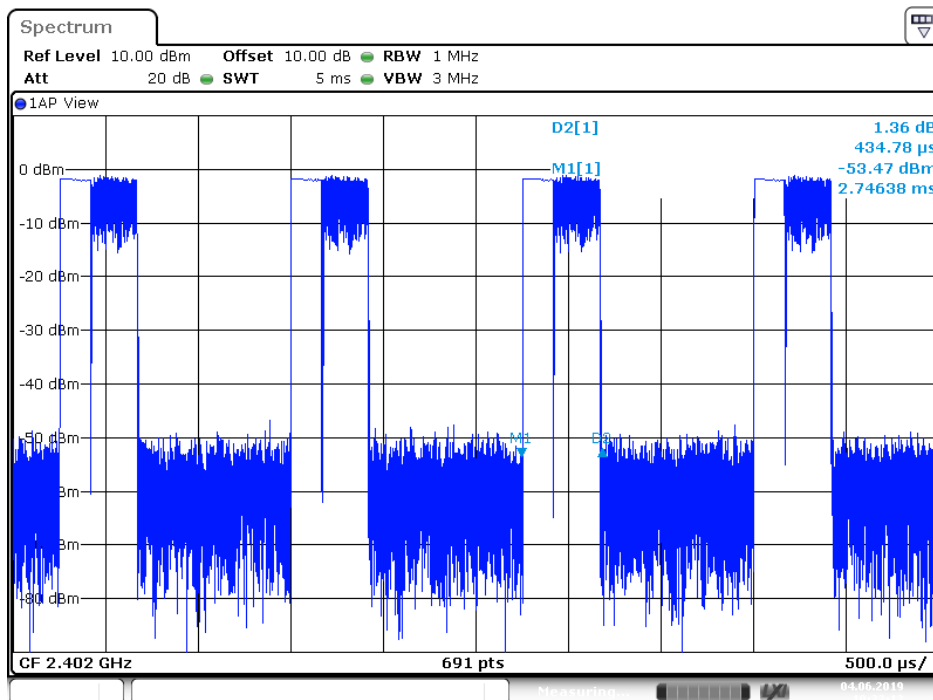
### DH5 High channel



Date: 4.JUN.2019 10:25:59

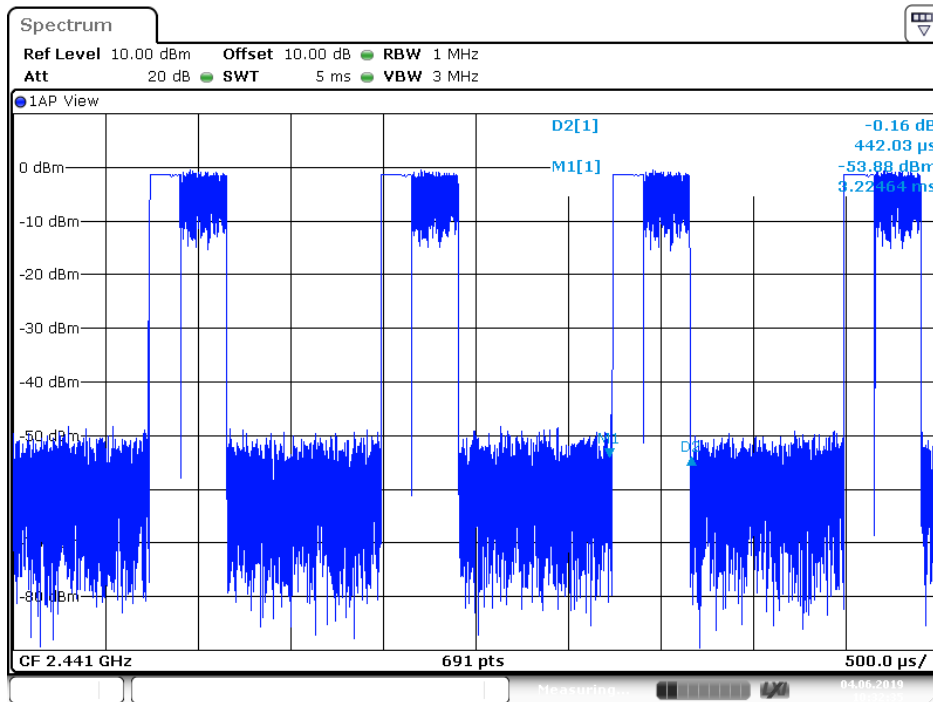
### $\pi/4$ DQPSK Mode

### 2DH1 Low channel

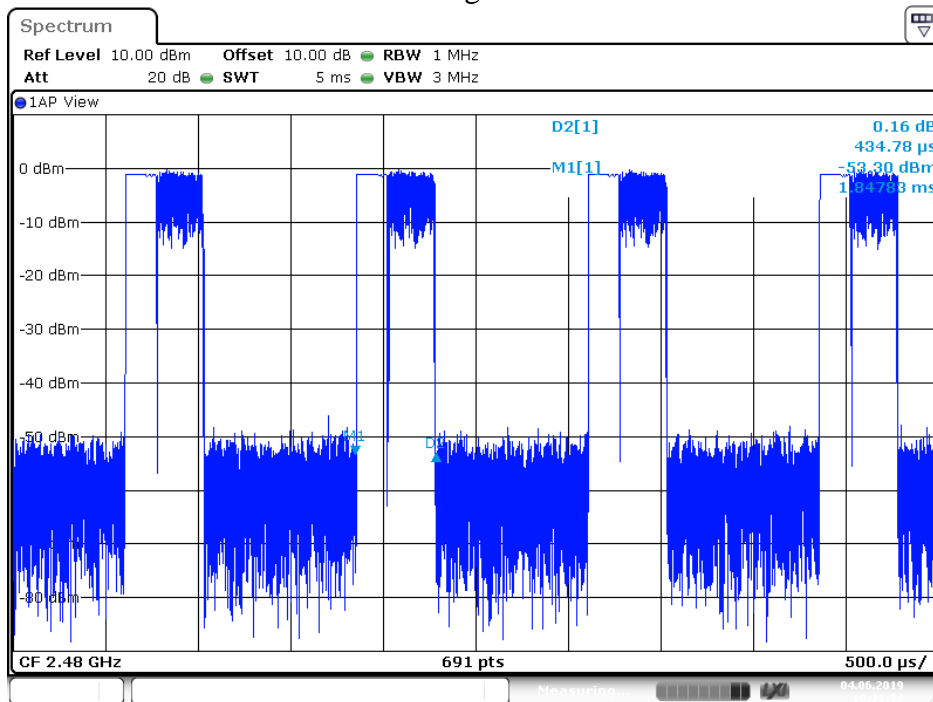


Date: 4.JUN.2019 10:33:13

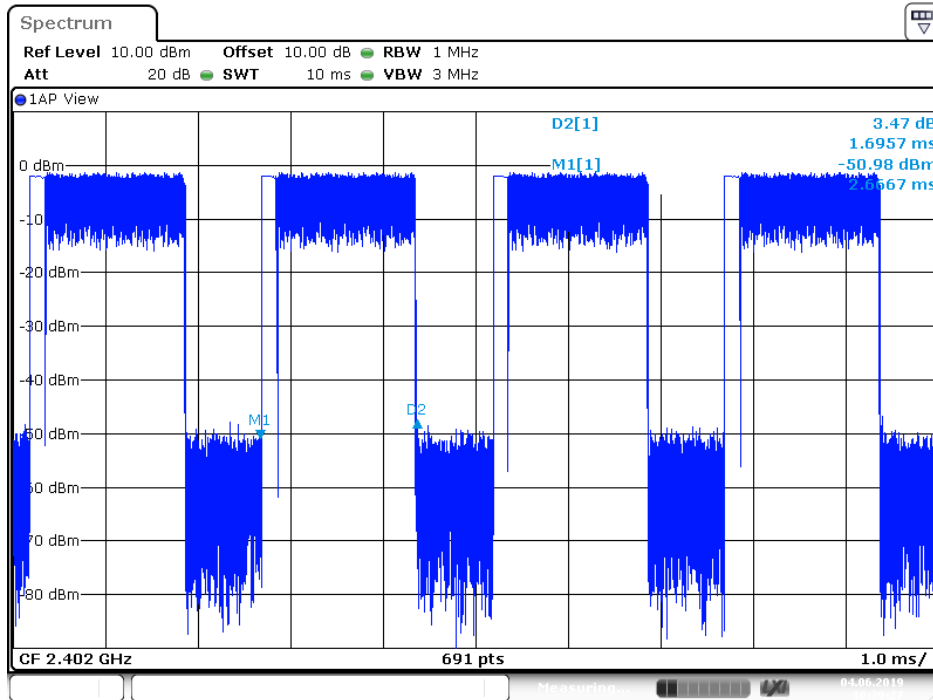
### 2DH1 Middle channel



### 2DH1 High channel

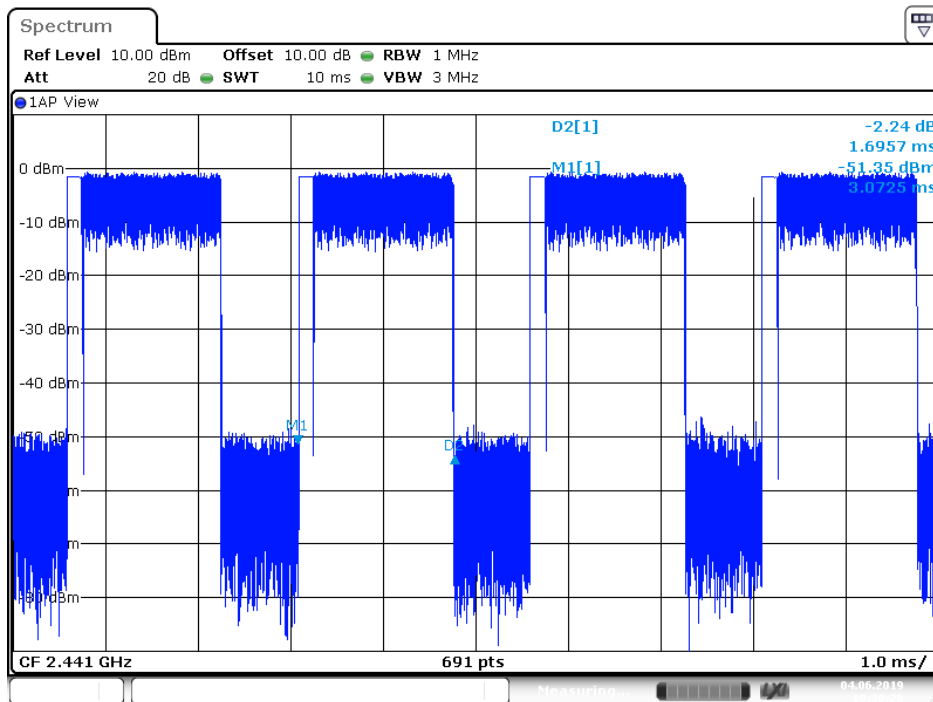


2DH3 Low channel



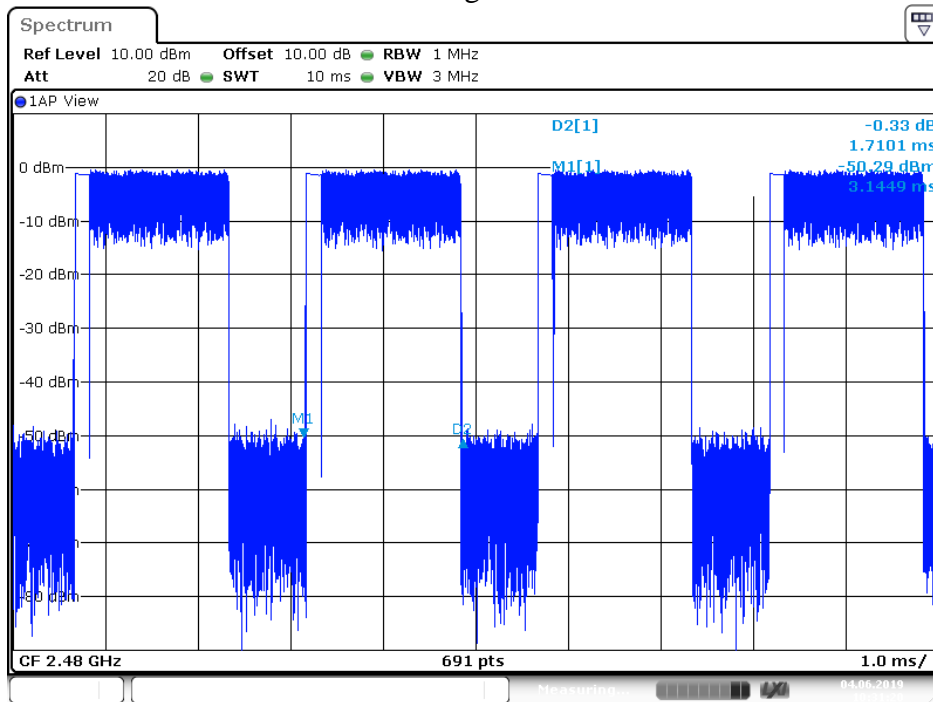
Date: 4.JUN.2019 10:29:27

2DH3 Middle channel



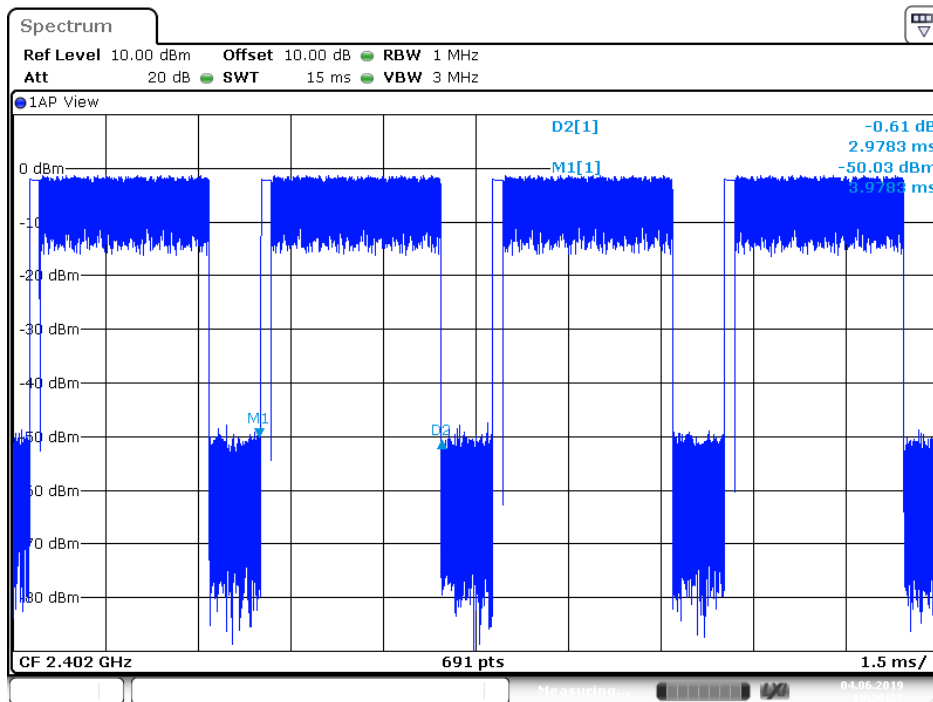
Date: 4.JUN.2019 10:30:27

### 2DH3 High channel



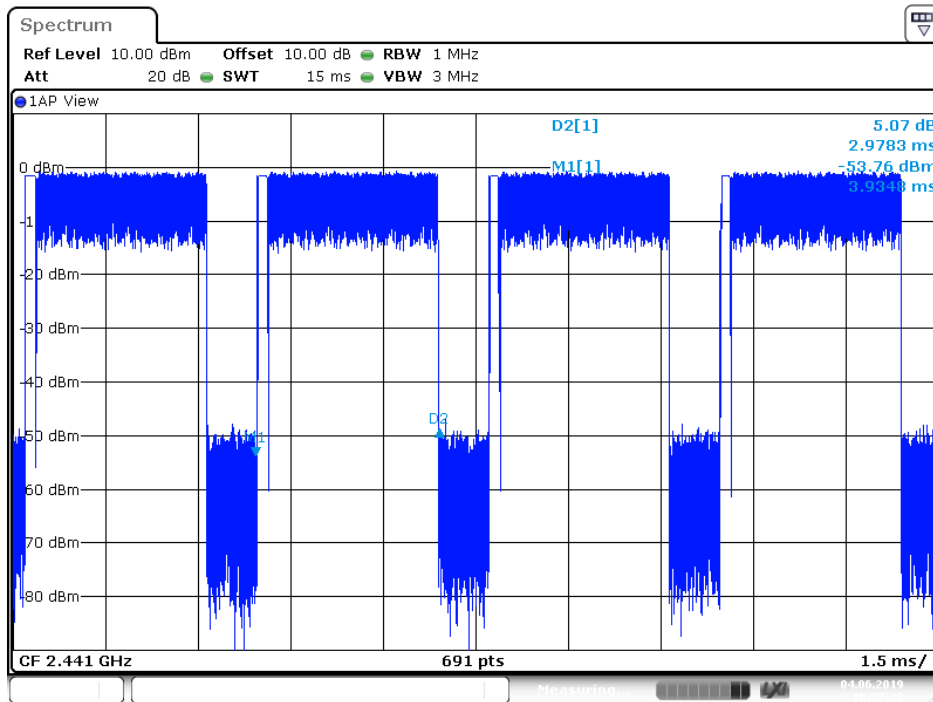
Date: 4.JUN.2019 10:31:21

### 2DH5 Low channel



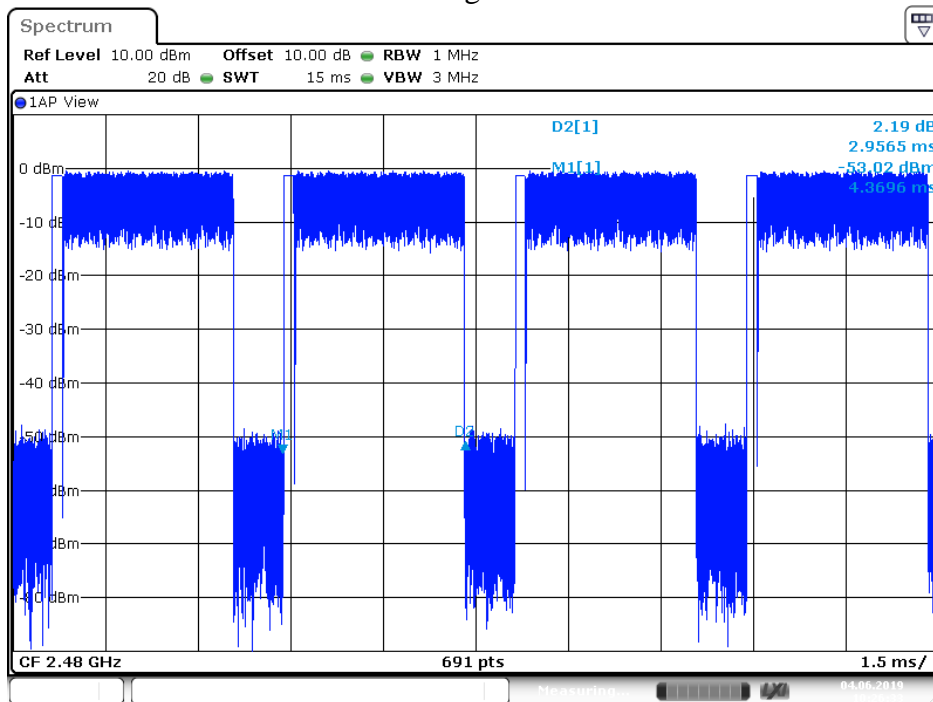
Date: 4.JUN.2019 10:28:27

### 2DH5 Middle channel



Date: 4.JUN.2019 10:27:34

### 2DH5 High channel

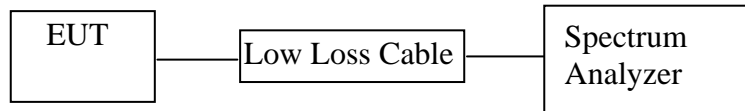


Date: 4.JUN.2019 10:26:34



## 9. MAXIMUM PEAK OUTPUT POWER TEST

### 9.1. Block Diagram of Test Setup



### 9.2. The Requirement For Section 15.247(b)(1)

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### 9.3. EUT Configuration on Measurement

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

### 9.4. Operating Condition of EUT

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

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

### 9.5. Test Procedure

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

9.5.2. Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz for GFSK mode

9.5.3. Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz for other mode

9.5.4. Measurement the maximum peak output power.

## 9.6. Test Result

### GFSK Mode

| Frequency (MHz) | Maximum peak conducted output power (dBm/W) | e.i.r.p. (dBm/W) | Limits dBm / W | Result |
|-----------------|---|------------------|----------------|--------|
| 2402            | -1.67/0.0007                                |                  | 21 / 0.125     | Pass   |
| 2441            | -1.25/0.0007                                |                  | 21 / 0.125     | Pass   |
| 2480            | -0.99/0.0008                                |                  | 21 / 0.125     | Pass   |

### $\pi/4$ DQPSK Mode

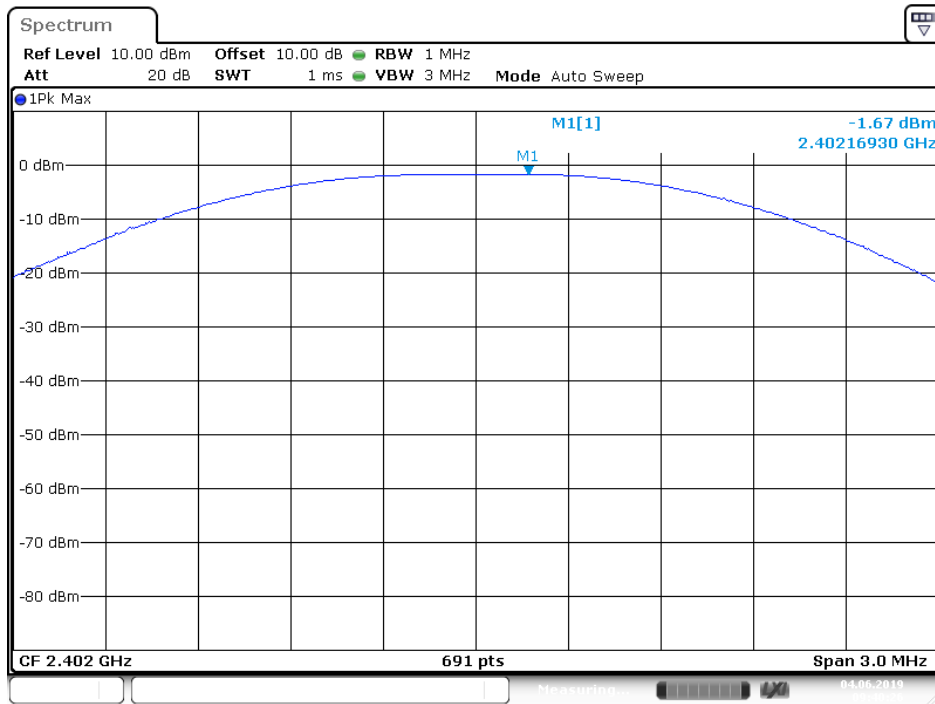
| Frequency (MHz) | Maximum peak conducted output power (dBm/W) | e.i.r.p. (dBm/W) | Limits dBm / W | Result |
|-----------------|---|------------------|----------------|--------|
| 2402            | -0.51/0.0009                                |                  | 21 / 0.125     | Pass   |
| 2441            | 0.05/0.0010                                 |                  | 21 / 0.125     | Pass   |
| 2480            | 0.36/0.0011                                 |                  | 21 / 0.125     | Pass   |

Note: e.i.r.p= Maximum peak conducted output power+antenna gain(XXXdBi)

The spectrum analyzer plots are attached as below.

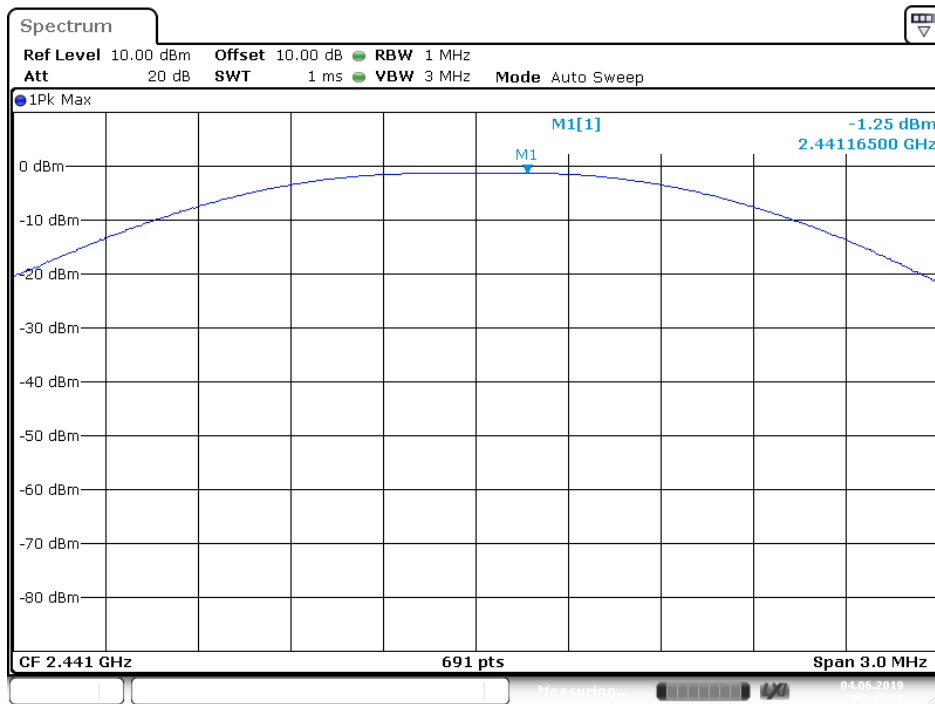
GFSK Mode

Low channel



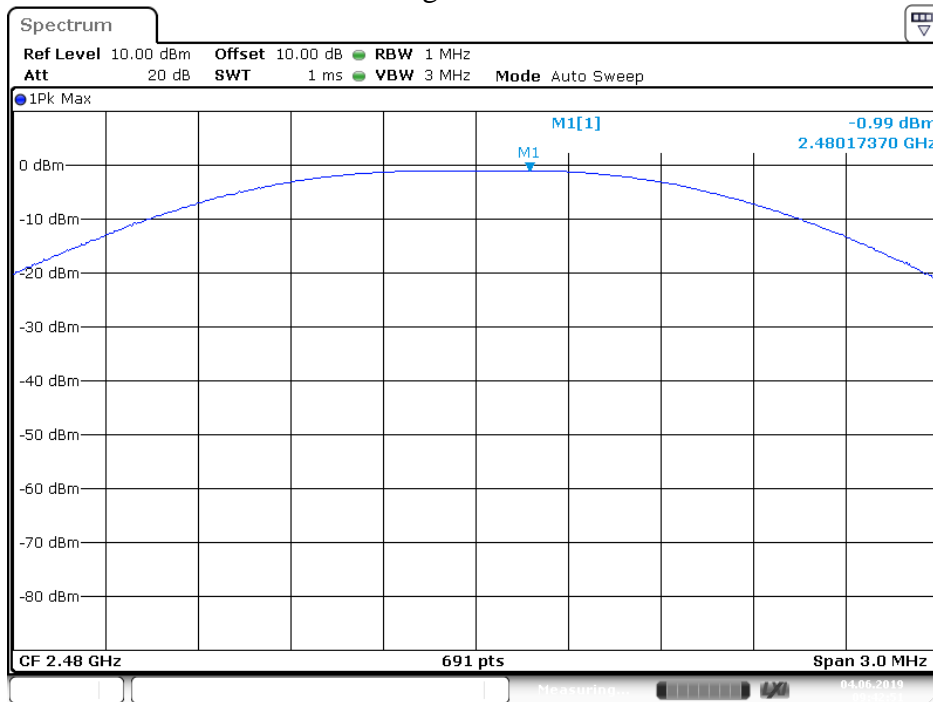
Date: 4.JUN.2019 09:40:27

Middle channel



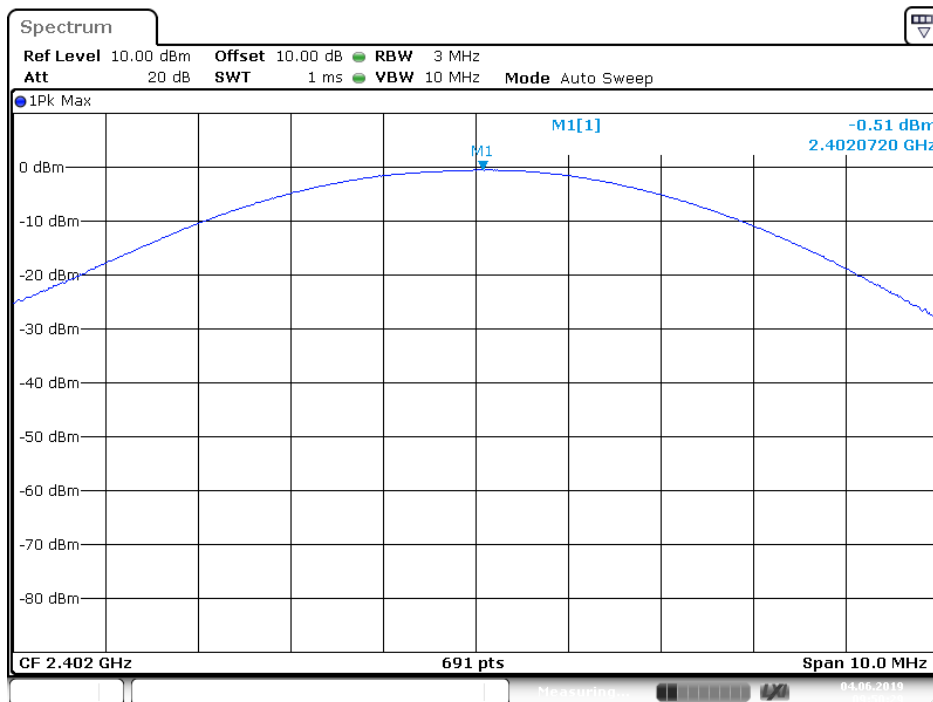
Date: 4.JUN.2019 09:41:22

### High channel

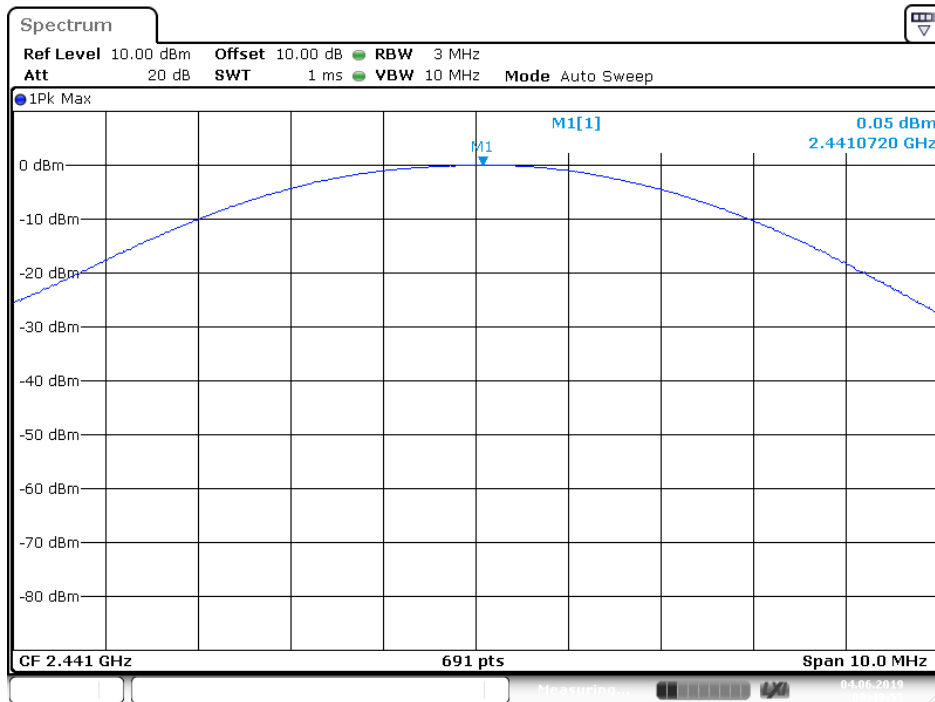


### $\pi/4$ DQPSK Mode

### Low channel

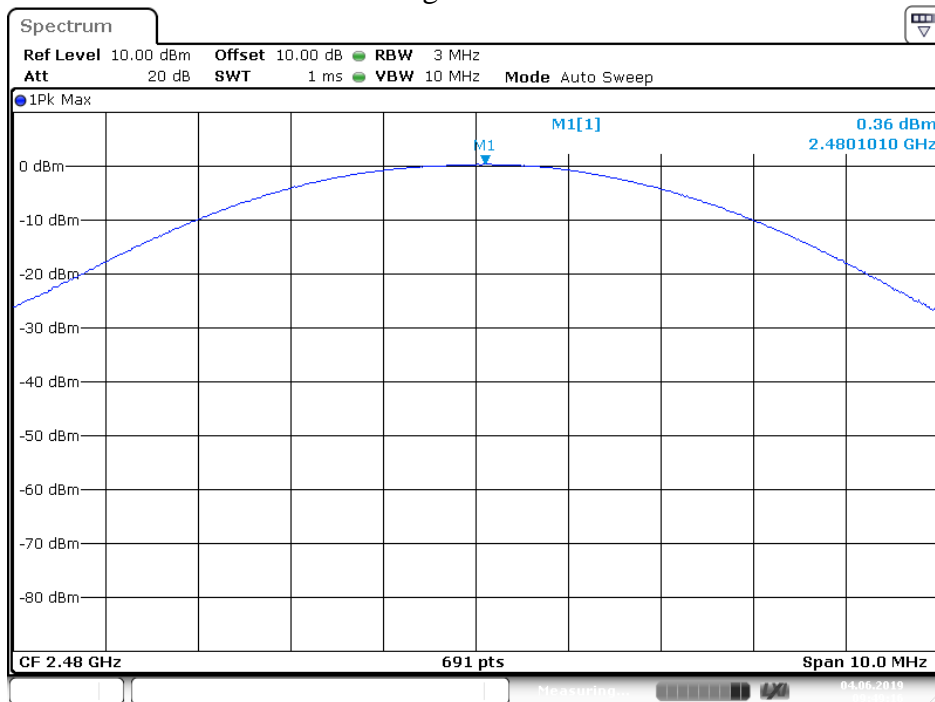


### Middle channel



Date: 4.JUN.2019 09:49:56

### High channel

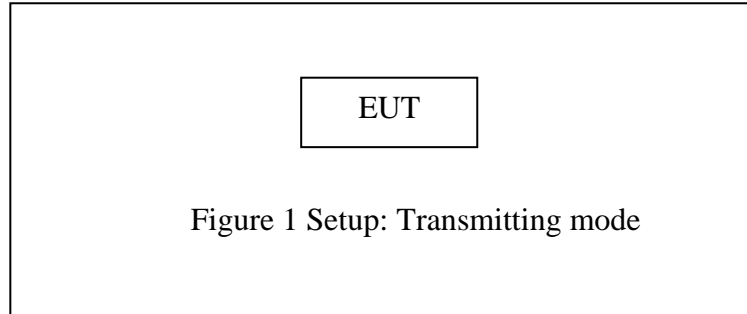


Date: 4.JUN.2019 09:49:17

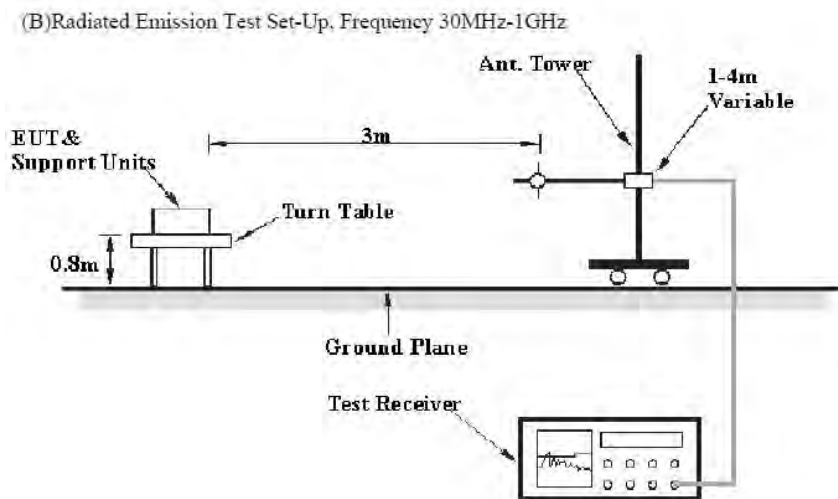
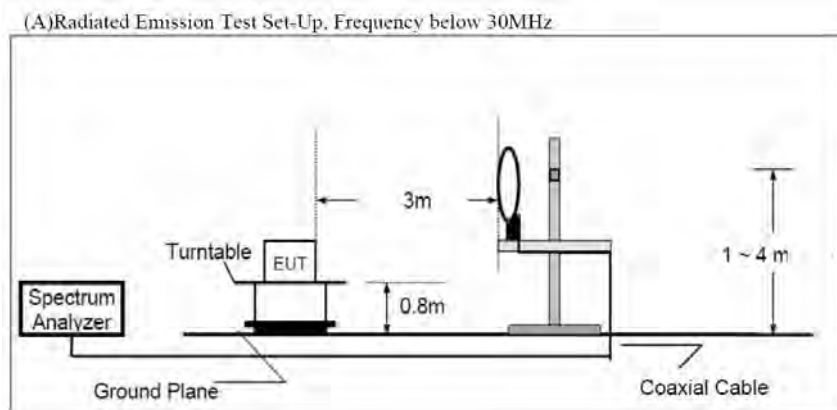
## 10. RADIATED EMISSION TEST

### 10.1. Block Diagram of Test Setup

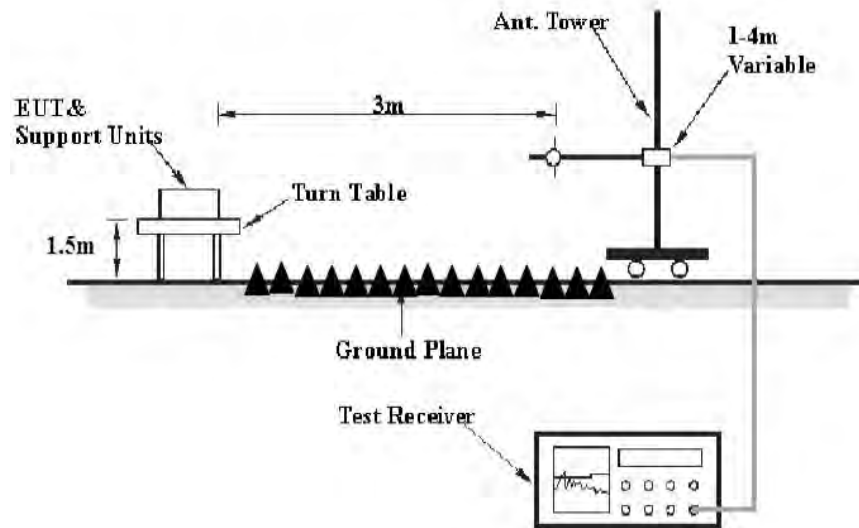
#### 10.1.1. Block diagram of connection between the EUT and peripherals



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



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



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

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

### 10.3. Transmitter Emission Limit

Radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

**Table 5 – General field strength limits at frequencies above 30 MHz**

| Frequency (MHz) | Field strength ( $\mu\text{V}/\text{m}$ at 3 m) |
|-----------------|---|
| 30 – 88         | 100   |
| 88 – 216        | 150   |
| 216 – 960       | 200   |
| Above 960       | 500   |

**Table 6 – General field strength limits at frequencies below 30 MHz**

| Frequency                | Magnetic field strength (H-Field) ( $\mu\text{A}/\text{m}$ ) | Measurement distance (m) |
|--------------------------|--|--------------------------|
| 9 - 490 kHz <sup>1</sup> | 6.37/F (F in kHz)  | 300                      |
| 490 - 1705 kHz           | 63.7/F (F in kHz)  | 30                       |
| 1.705 - 30 MHz           | 0.08   | 30                       |

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.



## 10.4.Restricted bands of operation

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

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

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

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

<sup>2</sup>Above 38.6

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

## 10.5.Configuration of EUT on Measurement

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

## 10.6. Test Procedure

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

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

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

### 10.7.Data Sample

| Frequency (MHz) | Reading (dB $\mu$ v) | Factor (dB/m) | Result (dB $\mu$ v/m) | Limit (dB $\mu$ v/m) | Margin (dB) | Remark |
|-----------------|----------------------|---------------|-----------------------|----------------------|-------------|--------|
| X.XX            | 48.69                | -13.35        | 35.34                 | 46                   | -10.66      | QP     |

Frequency(MHz) = Emission frequency in MHz

Reading(dB $\mu$ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB $\mu$ v/m) = Reading(dB $\mu$ v) + Factor(dB/m)

Limit (dB $\mu$ v/m) = Limit stated in standard

Margin (dB) = Result(dB $\mu$ v/m) - Limit (dB $\mu$ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB $\mu$ V/m)–Limit(dB $\mu$ V/m)

Result(dB $\mu$ V/m)= Reading(dB $\mu$ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

### 10.8.Test Result

**Pass.**

The frequency range from 9KHz to 26.5GHz is investigated.

Note: We tested GFSK mode,  $\pi/4$  DQPSK Mode, and recorded the worse case data ( $\pi/4$  DQPSK mode) for all test mode.

The spectrum analyzer plots are attached as below.

**9kHz-30MHz test data**

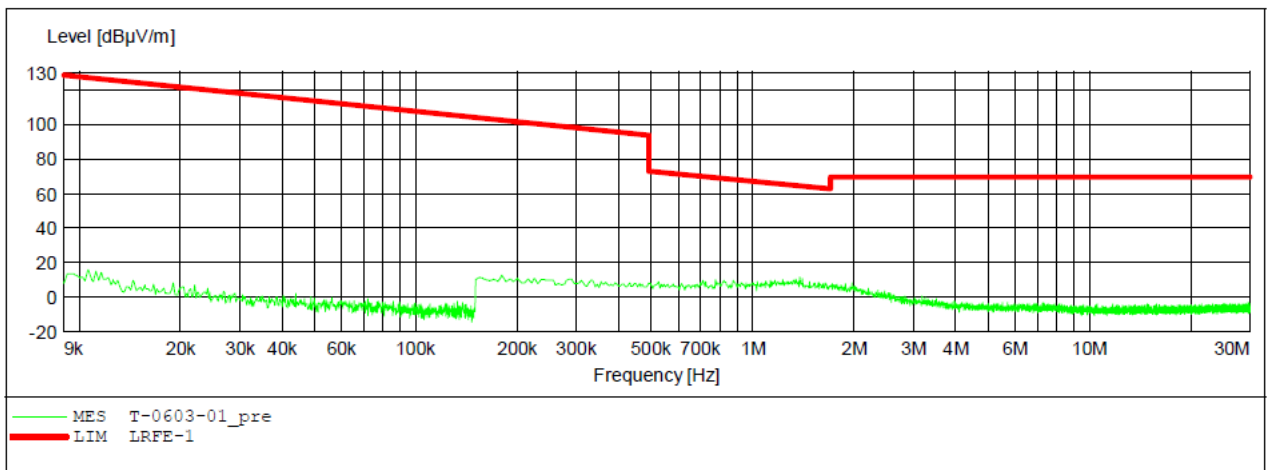
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2402MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: X  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Short Description: |           |          | _SUB_STD_VTERM2 1.70 |            |           |            |  |
|--------------------|-----------|----------|----------------------|------------|-----------|------------|--|
| Start              | Stop      | Step     | Detector             | Meas. Time | IF Bandw. | Transducer |  |
| 9.0 kHz            | 150.0 kHz | 100.0 Hz | QuasiPeak            | 1.0 s      | 200 Hz    | 1516M      |  |
| 150.0 kHz          | 30.0 MHz  | 5.0 kHz  | QuasiPeak            | 1.0 s      | 9 kHz     | 1516M      |  |



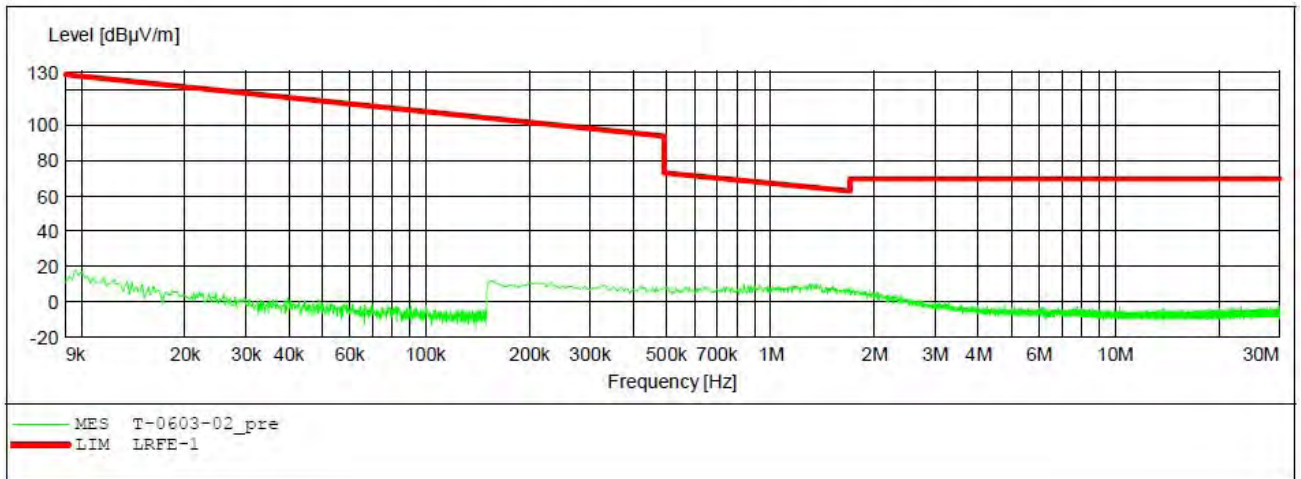
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2402MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: Y  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Short Description: _SUB_STD_VTERM2 1.70 |                |            | Detector  | Meas. Time | IF Bandw. | Transducer |
|---|----------------|------------|-----------|------------|-----------|------------|
| Start Frequency                         | Stop Frequency | Step Width |           |            |           |            |
| 9.0 kHz                                 | 150.0 kHz      | 100.0 Hz   | QuasiPeak | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz                               | 30.0 MHz       | 5.0 kHz    | QuasiPeak | 1.0 s      | 9 kHz     | 1516M      |



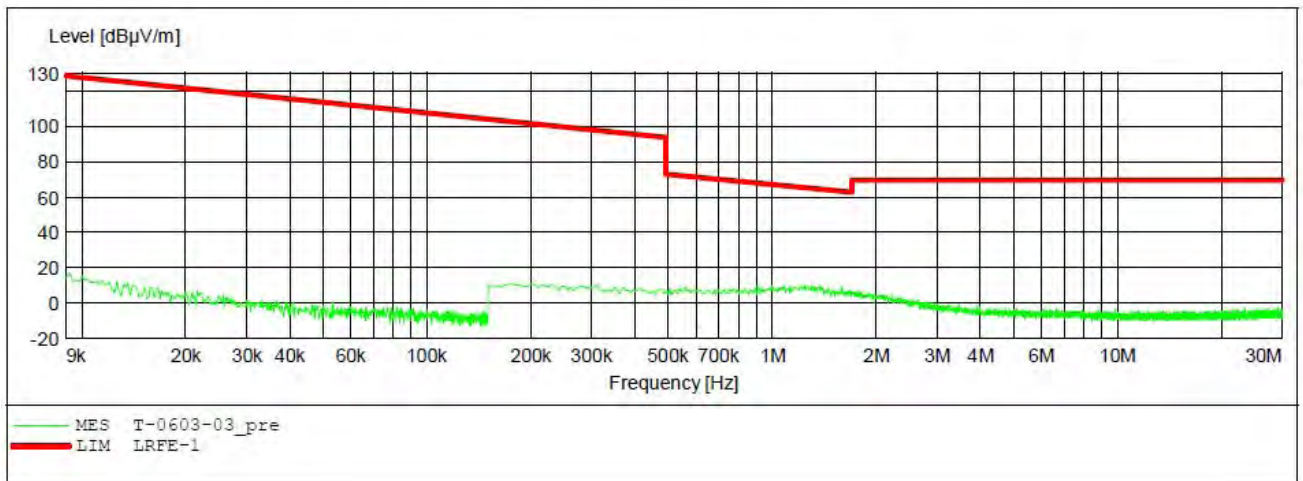
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2402MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: Z  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Start     | Stop      | Step     | Detector  | Meas. Time | IF Bandw. | Transducer |
|-----------|-----------|----------|-----------|------------|-----------|------------|
| 9.0 kHz   | 150.0 kHz | 100.0 Hz | QuasiPeak | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz | 30.0 MHz  | 5.0 kHz  | QuasiPeak | 1.0 s      | 9 kHz     | 1516M      |



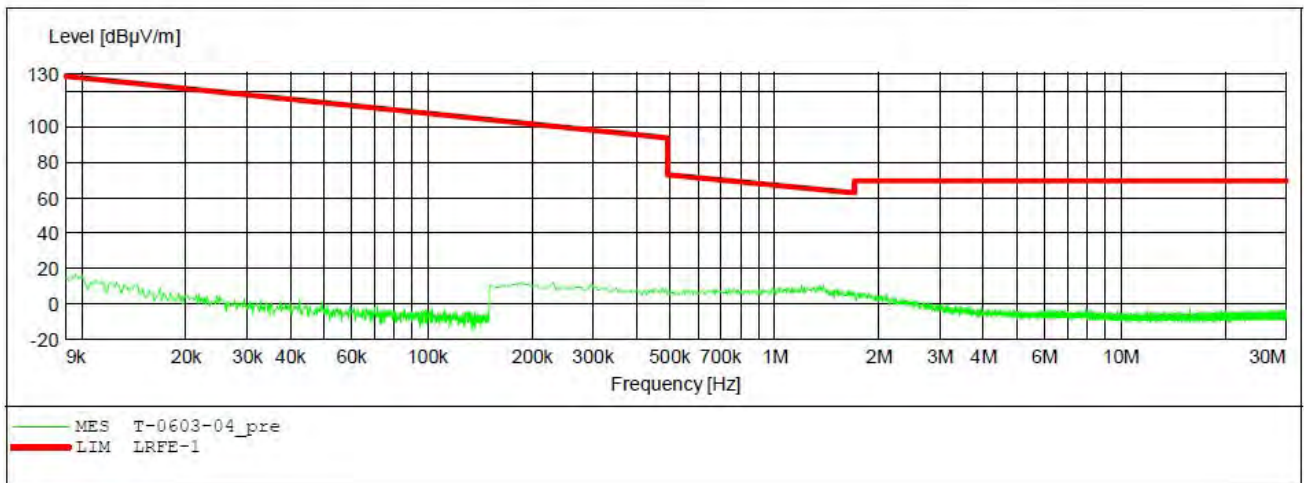
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2441MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: X  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LRFRE Fin"**

| Short Description: |           |          | _SUB_STD VTERM2 1.70 |            |           |            |
|--------------------|-----------|----------|----------------------|------------|-----------|------------|
| Start              | Stop      | Step     | Detector             | Meas. Time | IF Bandw. | Transducer |
| 9.0 kHz            | 150.0 kHz | 100.0 Hz | QuasiPeak            | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz          | 30.0 MHz  | 5.0 kHz  | QuasiPeak            | 1.0 s      | 9 kHz     | 1516M      |



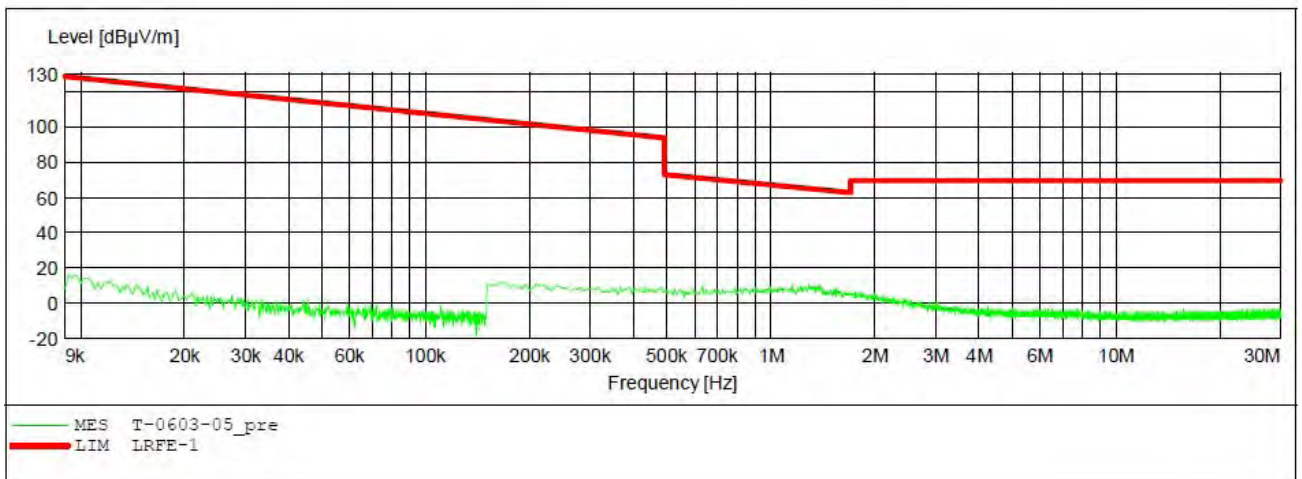
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2441MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: Y  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Short Description: _SUB_STD_VTERM2 1.70 |                |            | Detector  | Meas. Time | IF Bandw. | Transducer |
|---|----------------|------------|-----------|------------|-----------|------------|
| Start Frequency                         | Stop Frequency | Step Width |           |            |           |            |
| 9.0 kHz                                 | 150.0 kHz      | 100.0 Hz   | QuasiPeak | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz                               | 30.0 MHz       | 5.0 kHz    | QuasiPeak | 1.0 s      | 9 kHz     | 1516M      |





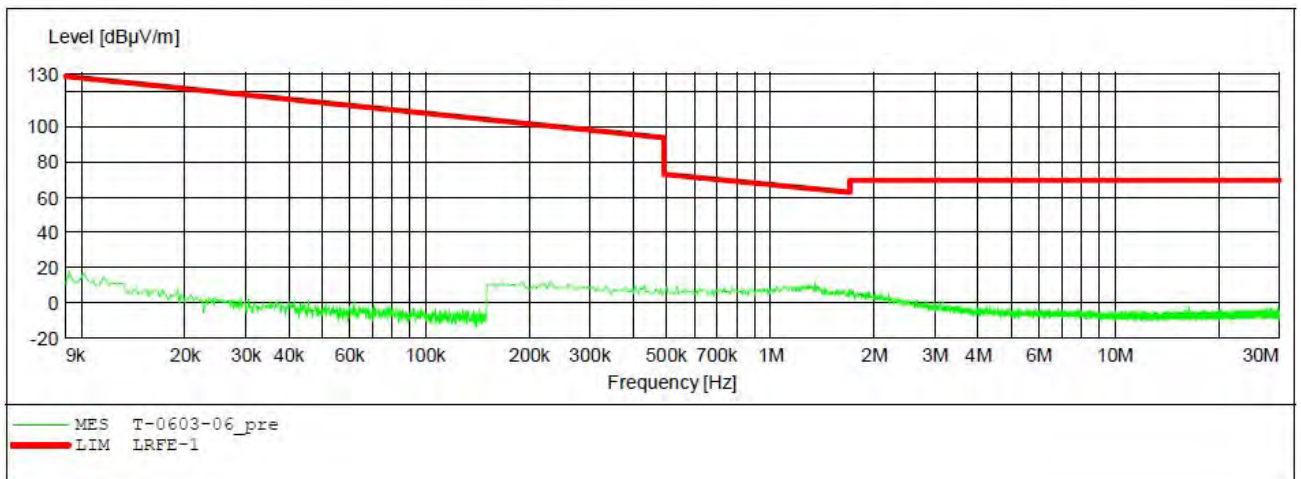
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2441MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: Z  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Start     | Stop      | Step     | Detector  | Meas. Time | IF Bandw. | Transducer |
|-----------|-----------|----------|-----------|------------|-----------|------------|
| 9.0 kHz   | 150.0 kHz | 100.0 Hz | QuasiPeak | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz | 30.0 MHz  | 5.0 kHz  | QuasiPeak | 1.0 s      | 9 kHz     | 1516M      |



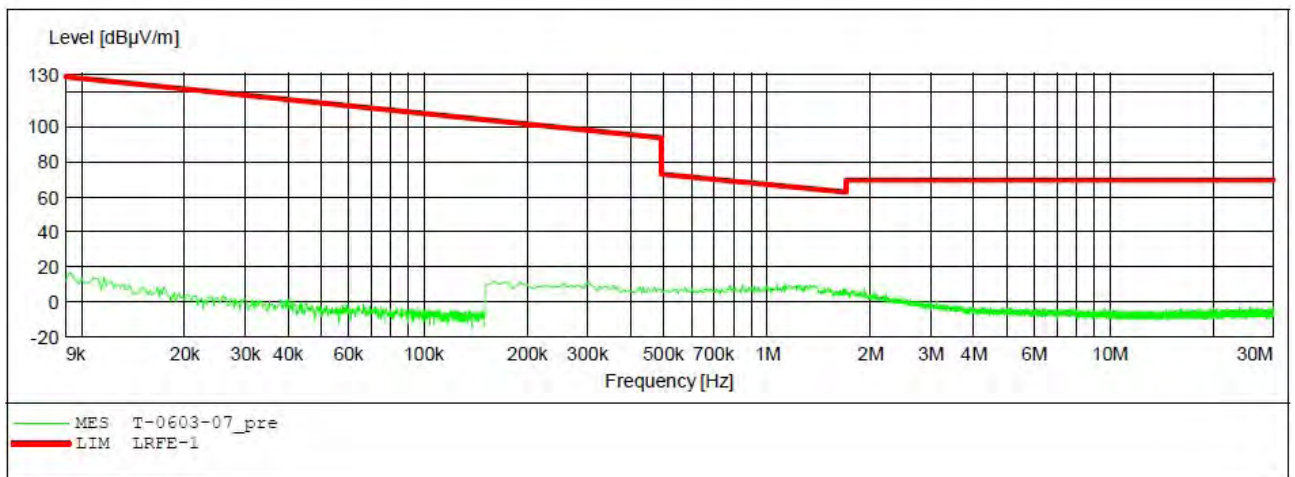
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2480MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: X  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Short Description: |           |          | _SUB_STD_VTERM2 1.70 |            |           |            |
|--------------------|-----------|----------|----------------------|------------|-----------|------------|
| Start              | Stop      | Step     | Detector             | Meas. Time | IF Bandw. | Transducer |
| 9.0 kHz            | 150.0 kHz | 100.0 Hz | QuasiPeak            | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz          | 30.0 MHz  | 5.0 kHz  | QuasiPeak            | 1.0 s      | 9 kHz     | 1516M      |



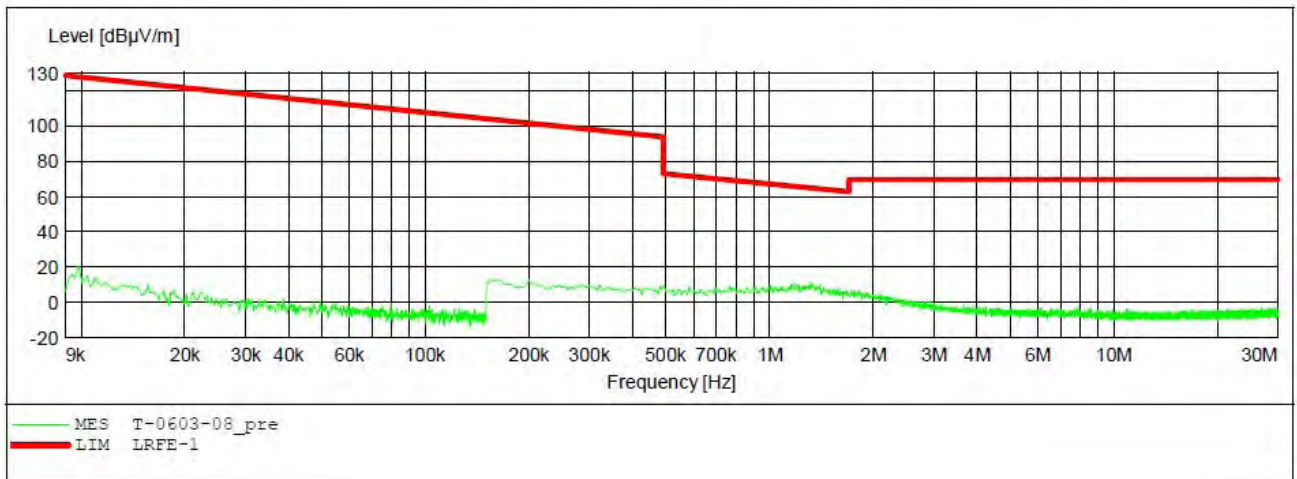
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2480MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: Y  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Short Description: _SUB_STD_VTERM2 1.70 |                |            | Detector  | Meas. Time | IF Bandw. | Transducer |
|---|----------------|------------|-----------|------------|-----------|------------|
| Start Frequency                         | Stop Frequency | Step Width |           |            |           |            |
| 9.0 kHz                                 | 150.0 kHz      | 100.0 Hz   | QuasiPeak | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz                               | 30.0 MHz       | 5.0 kHz    | QuasiPeak | 1.0 s      | 9 kHz     | 1516M      |



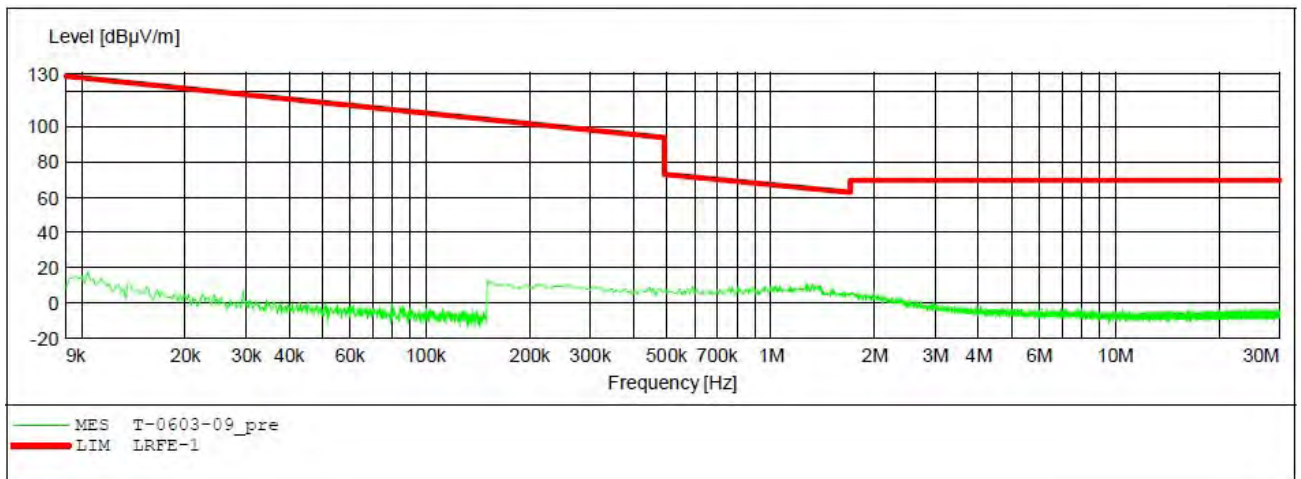
**ACCURATE TECHNOLOGY CO., LTD**

**FCC Part 15C 3m Radiated**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: TX 2480MHz  
 Test Site: 2# Chamber  
 Operator: WADE  
 Test Specification: DC 3.7V  
 Comment: Z  
 Start of Test: 2019-6-3 /

**SCAN TABLE: "LFRE Fin"**

| Start     | Stop      | Step     | Detector  | Meas. Time | IF Bandw. | Transducer |
|-----------|-----------|----------|-----------|------------|-----------|------------|
| 9.0 kHz   | 150.0 kHz | 100.0 Hz | QuasiPeak | 1.0 s      | 200 Hz    | 1516M      |
| 150.0 kHz | 30.0 MHz  | 5.0 kHz  | QuasiPeak | 1.0 s      | 9 kHz     | 1516M      |



### 30MHz-1GHz Test data



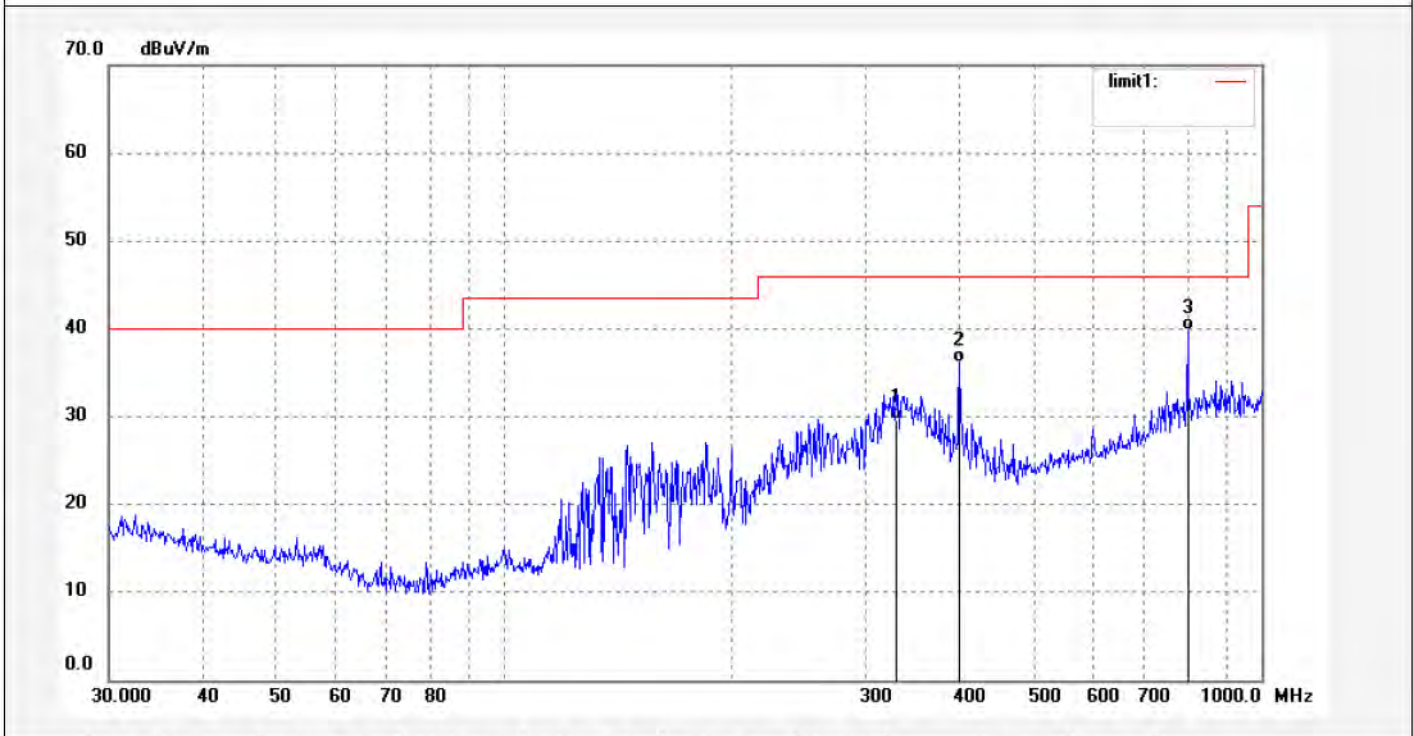
## ACCURATE TECHNOLOGY CO., LTD.

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

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

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2136                | Polarization: Horizontal |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2402MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 329.0389    | 37.77            | -8.07       | 29.70           | 46.00          | -16.30      | QP       |             |               |        |
| 2   | 399.0300    | 42.67            | -6.48       | 36.19           | 46.00          | -9.81       | QP       |             |               |        |
| 3   | 798.9796    | 39.06            | 0.81        | 39.87           | 46.00          | -6.13       | QP       |             |               |        |


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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

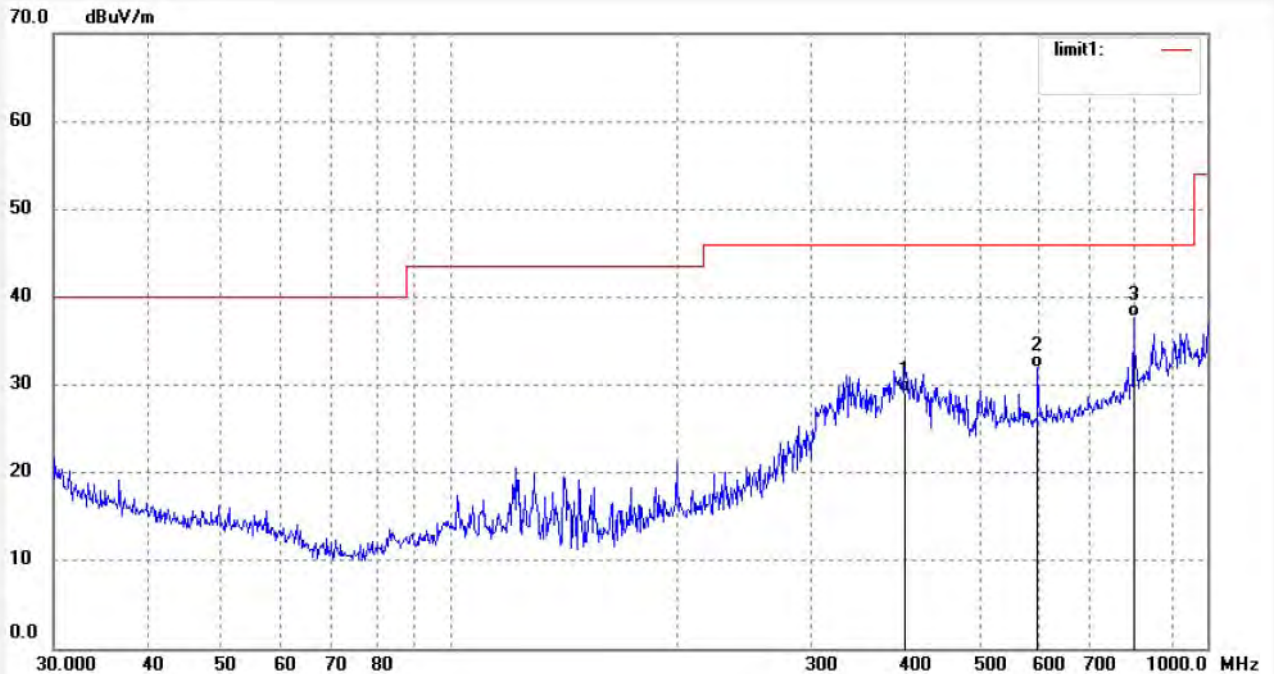
Tel:+86-0755-26503290

Fax:+86-0755-26503396

 Job No.: LGW2019 #2137  
 Standard: FCC Part 15C 3M Radiated  
 Test item: Radiation Test  
 Temp.( C)/Hum.(%) 23 C / 48 %  
 EUT: Water Resistant Wireless Speaker  
 Mode: TX 2402MHz  
 Model: EBT-654B  
 Manufacturer: SRP COMPANIES

 Polarization: Vertical  
 Power Source: DC 3.7V  
 Date: 19/06/04/  
 Time:  
 Engineer Signature: WADE  
 Distance: 3m

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 399.0300    | 35.67            | -6.48       | 29.19           | 46.00          | -16.81      | QP       |             |               |        |
| 2   | 597.2233    | 34.31            | -2.43       | 31.88           | 46.00          | -14.12      | QP       |             |               |        |
| 3   | 798.9796    | 36.93            | 0.81        | 37.74           | 46.00          | -8.26       | QP       |             |               |        |



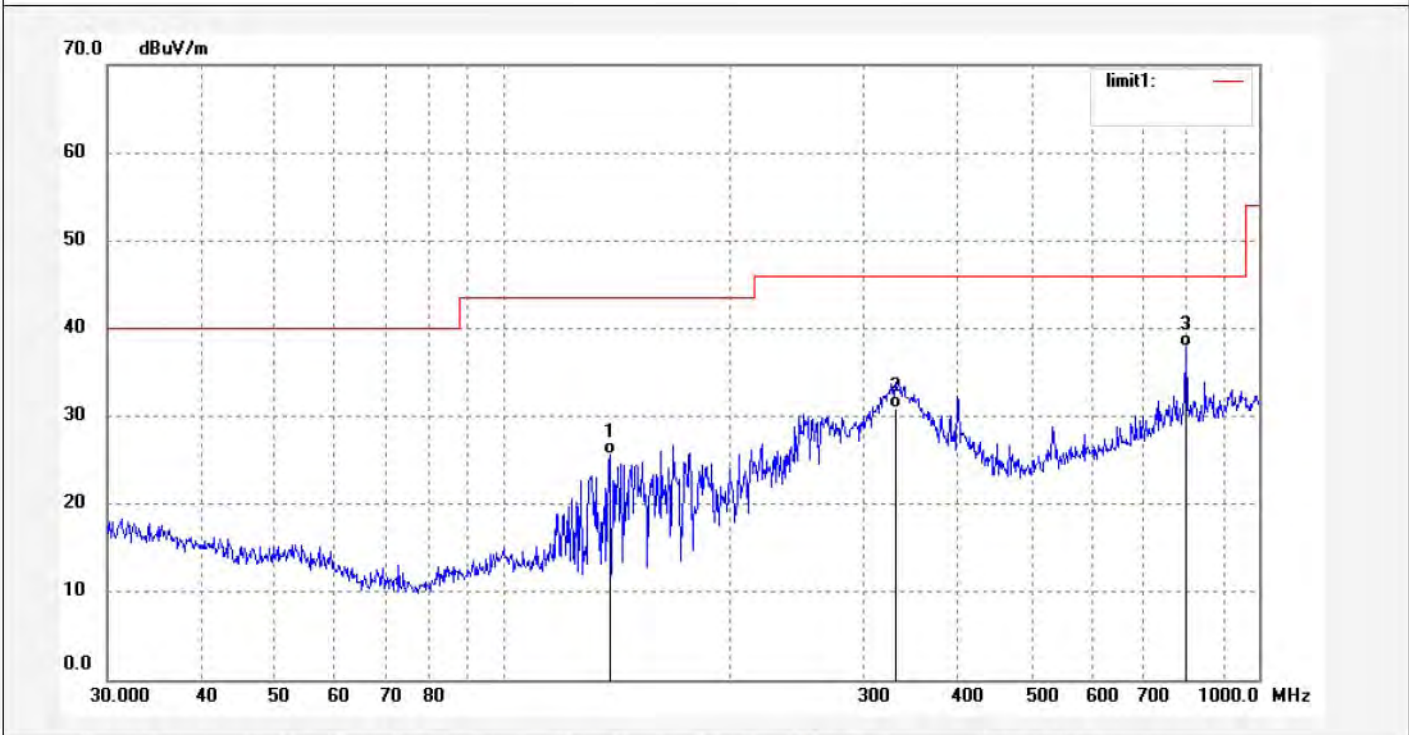
**ACCURATE TECHNOLOGY CO., LTD.**

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

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

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2139                | Polarization: Horizontal |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2441MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 138.3873    | 40.39            | -14.76      | 25.63           | 43.50          | -17.87      | QP       |             |               |        |
| 2   | 331.3546    | 38.94            | -8.01       | 30.93           | 46.00          | -15.07      | QP       |             |               |        |
| 3   | 798.9796    | 37.13            | 0.81        | 37.94           | 46.00          | -8.06       | QP       |             |               |        |


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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2019 #2138

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: Water Resistant Wireless Speaker

Mode: TX 2441MHz

Model: EBT-654B

Manufacturer: SRP COMPANIES

Polarization: Vertical

Power Source: DC 3.7V

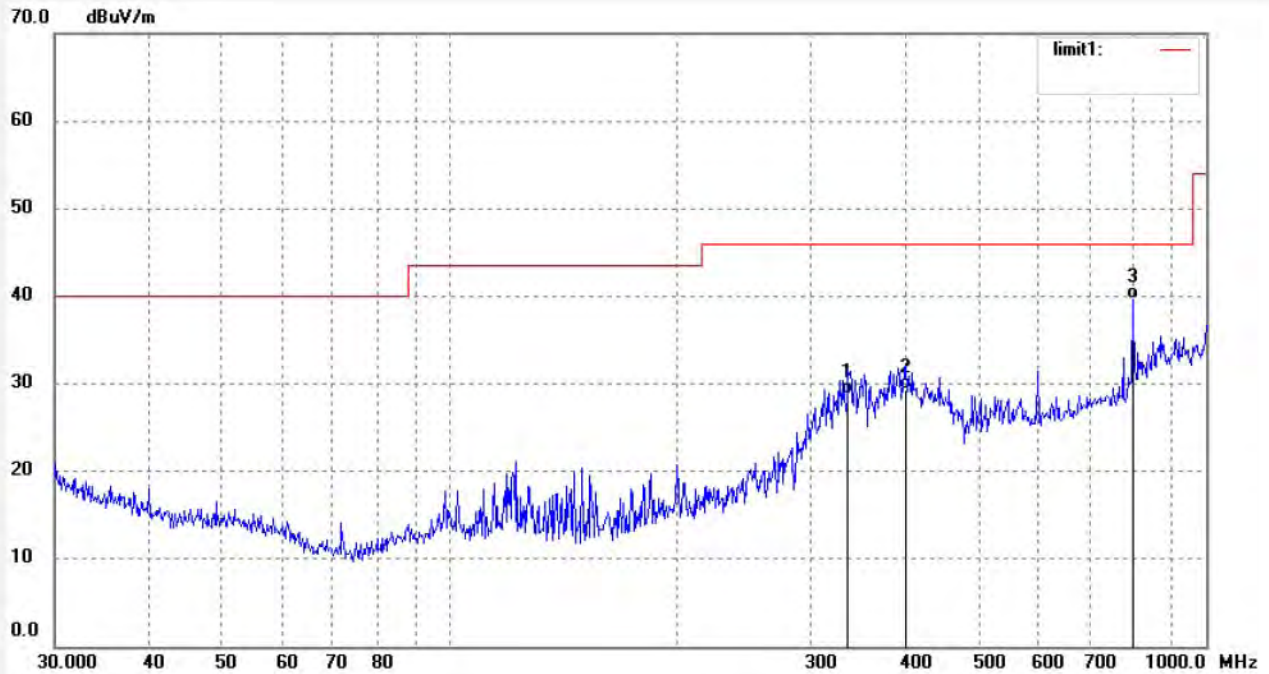
Date: 19/06/04/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 336.0351    | 36.63            | -7.91       | 28.72           | 46.00          | -17.28      | QP       |             |               |        |
| 2   | 400.4318    | 35.78            | -6.43       | 29.35           | 46.00          | -16.65      | QP       |             |               |        |
| 3   | 798.9796    | 38.84            | 0.81        | 39.65           | 46.00          | -6.35       | QP       |             |               |        |





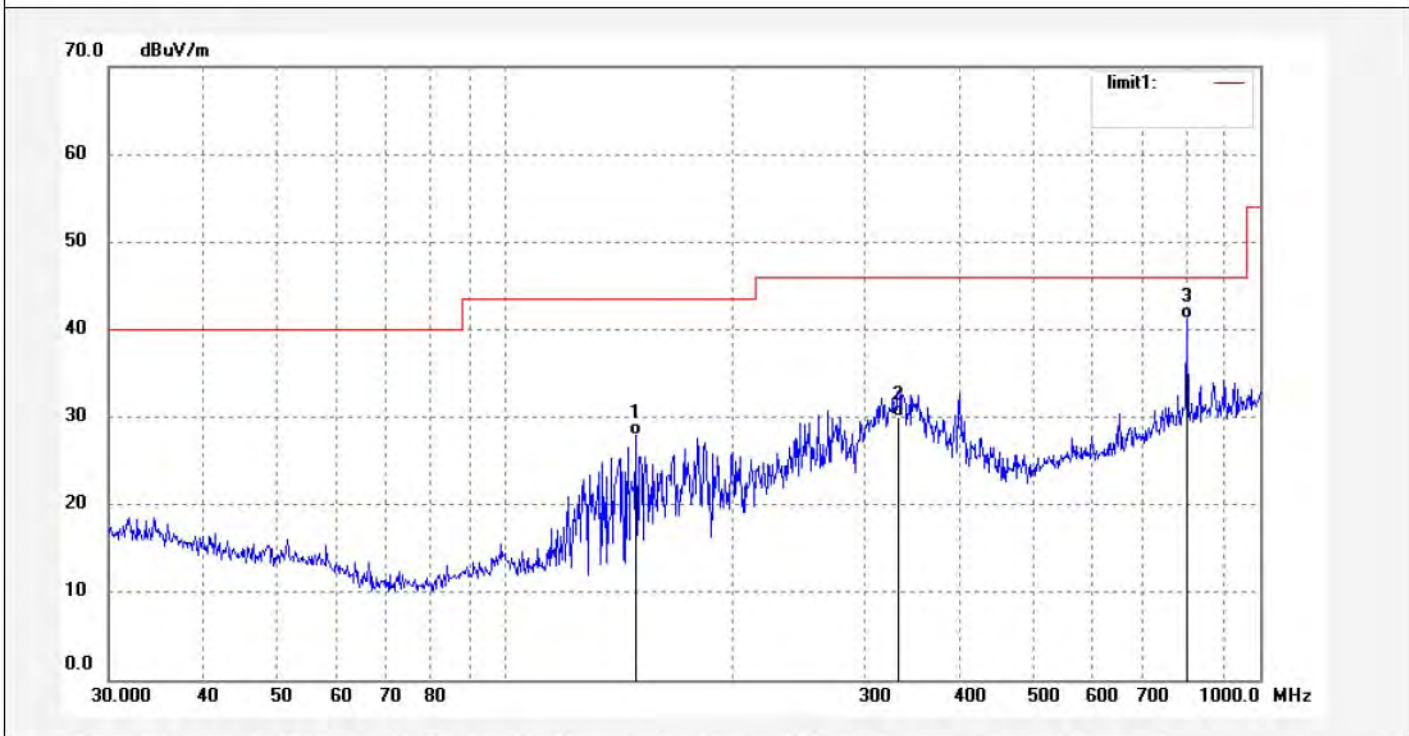
**ACCURATE TECHNOLOGY CO., LTD.**

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

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

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2140                | Polarization: Horizontal |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 149.4857    | 43.04            | -15.05      | 27.99           | 43.50          | -15.51      | QP       |             |               |        |
| 2   | 332.5187    | 37.92            | -7.99       | 29.93           | 46.00          | -16.07      | QP       |             |               |        |
| 3   | 798.9796    | 40.45            | 0.81        | 41.26           | 46.00          | -4.74       | QP       |             |               |        |



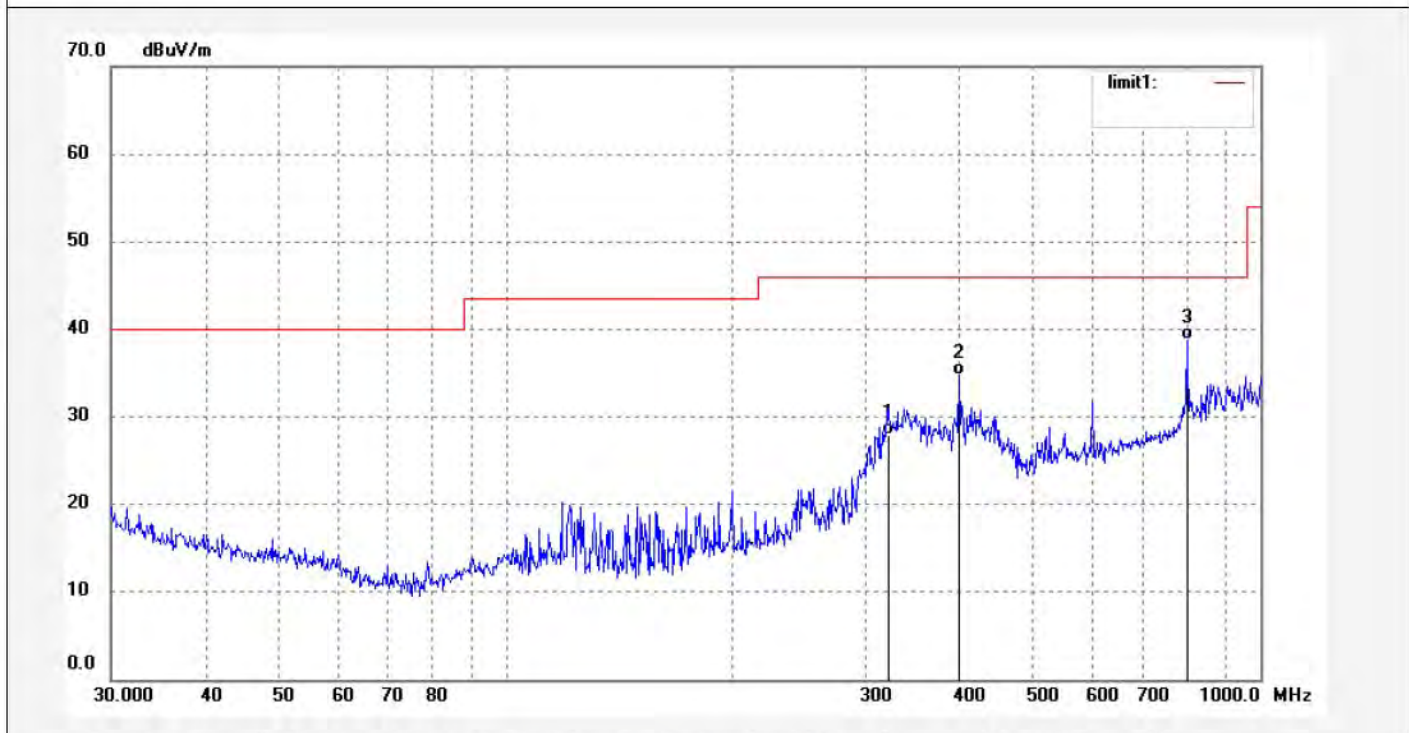
**ACCURATE TECHNOLOGY CO., LTD.**

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

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

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2141                | Polarization: Vertical   |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 321.0607    | 36.38            | -8.40       | 27.98           | 46.00          | -18.02      | QP       |             |               |        |
| 2   | 399.0300    | 41.22            | -6.48       | 34.74           | 46.00          | -11.26      | QP       |             |               |        |
| 3   | 798.9796    | 38.01            | 0.81        | 38.82           | 46.00          | -7.18       | QP       |             |               |        |

## 1GHz-18GHz test data


**ACCURATE TECHNOLOGY CO., LTD.**

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

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2019 #2120

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: Water Resistant Wireless Speaker

Mode: TX 2402MHz

Model: EBT-654B

Manufacturer: SRP COMPANIES

Polarization: Horizontal

Power Source: DC 3.7V

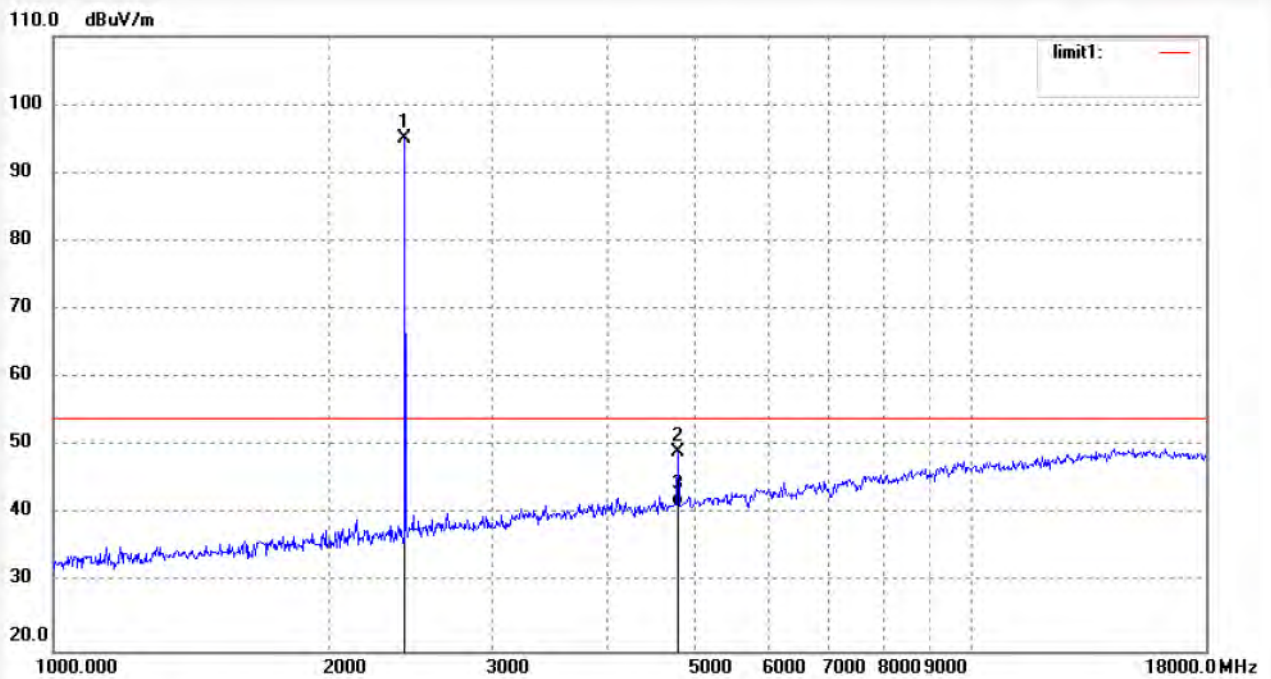
Date: 19/06/04/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2402.000    | 94.08            | 0.89        | 94.97           | /              | /           | peak     |             |               |        |
| 2   | 4804.026    | 41.74            | 7.40        | 49.14           | 74.00          | -24.86      | peak     |             |               |        |
| 3   | 4804.026    | 33.95            | 7.40        | 41.35           | 54.00          | -12.65      | AVG      |             |               |        |



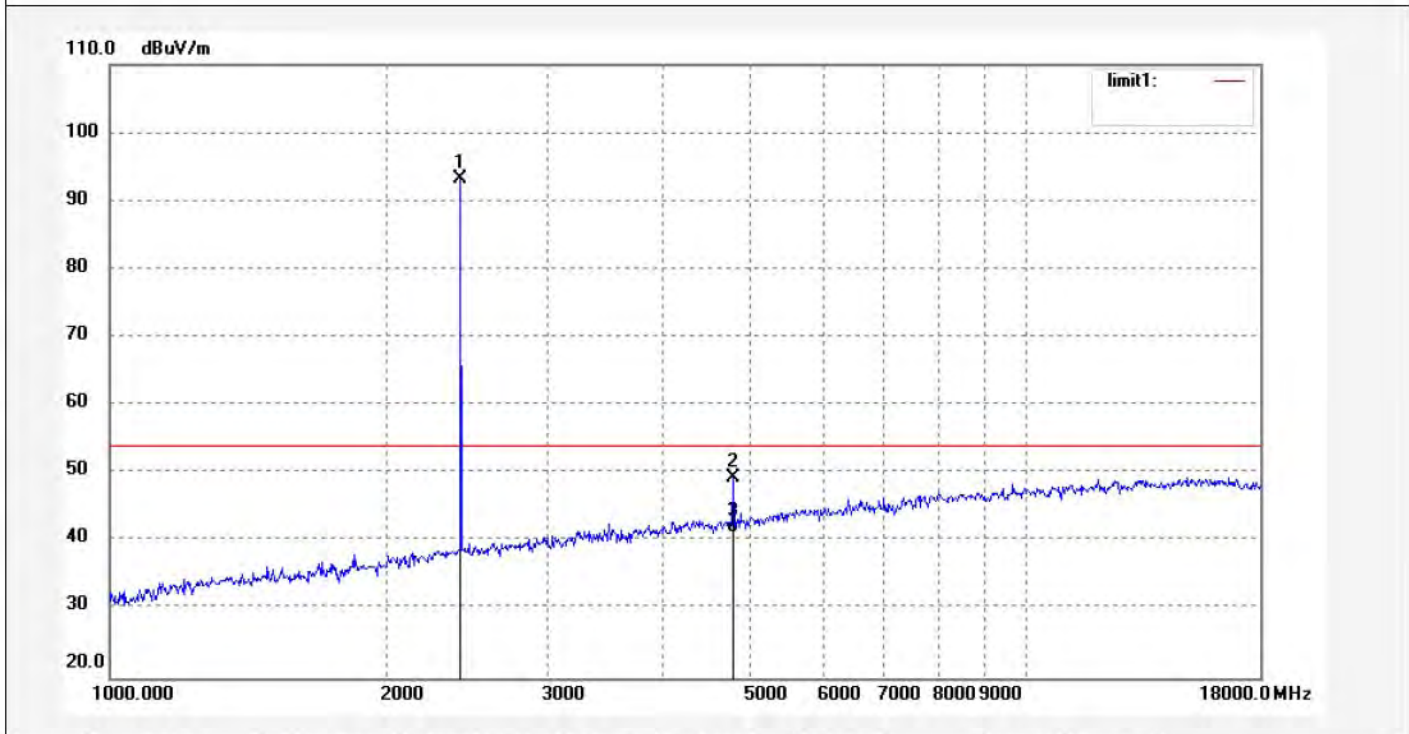
**ACCURATE TECHNOLOGY CO., LTD.**

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

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

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2121                | Polarization: Vertical   |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2402MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2402.000    | 92.27            | 0.89        | 93.16           | /              | /           | peak     |             |               |        |
| 2   | 4804.027    | 42.04            | 7.40        | 49.44           | 74.00          | -24.56      | peak     |             |               |        |
| 3   | 4804.027    | 33.95            | 7.40        | 41.35           | 54.00          | -12.65      | AVG      |             |               |        |



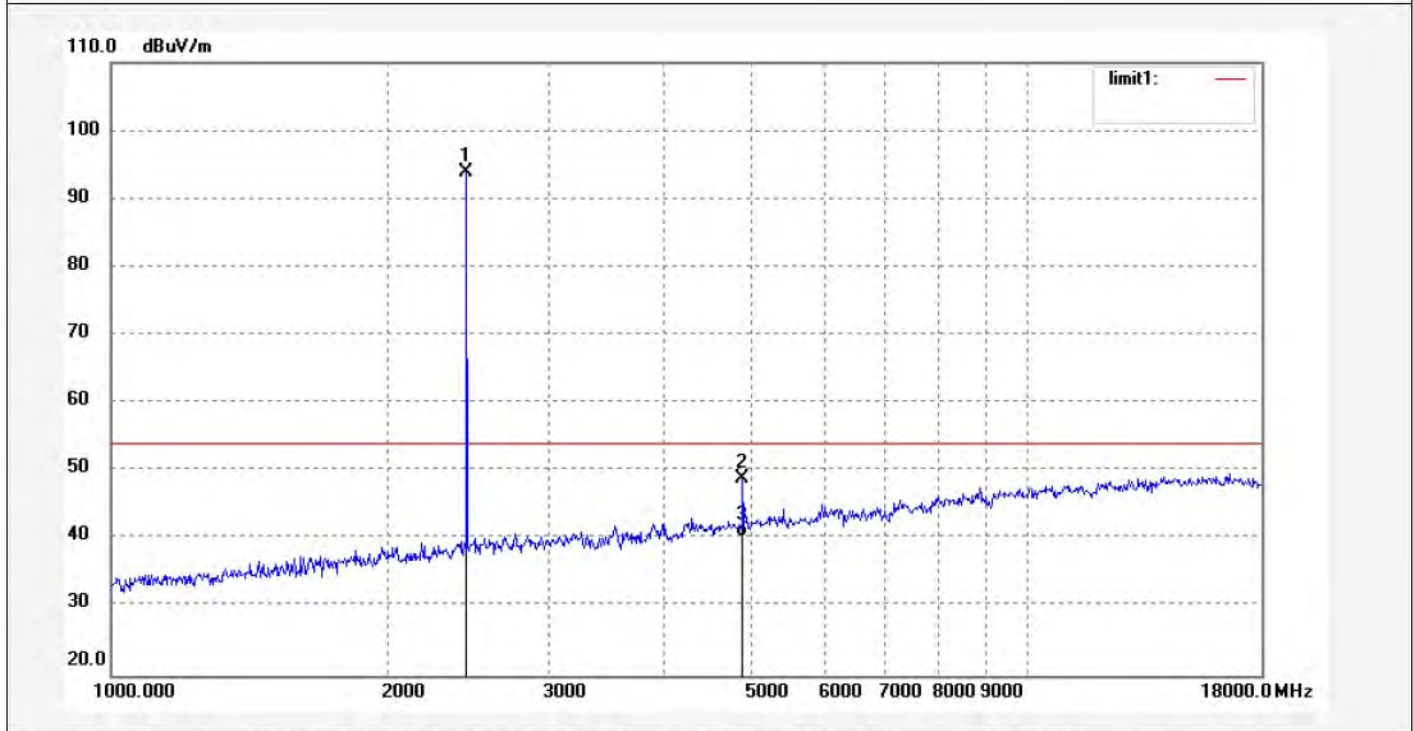
**ACCURATE TECHNOLOGY CO., LTD.**

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

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

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2124                | Polarization: Horizontal |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2441MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2441.000    | 92.88            | 1.06        | 93.94           | /              | /           | peak     |             |               |        |
| 2   | 4882.029    | 40.79            | 8.11        | 48.90           | 74.00          | -25.10      | peak     |             |               |        |
| 3   | 4882.029    | 32.22            | 8.11        | 40.33           | 54.00          | -13.67      | AVG      |             |               |        |



## ACCURATE TECHNOLOGY CO., LTD.

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

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2019 #2125

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: Water Resistant Wireless Speaker

Mode: TX 2441MHz

Model: EBT-654B

Manufacturer: SRP COMPANIES

Polarization: Vertical

Power Source: DC 3.7V

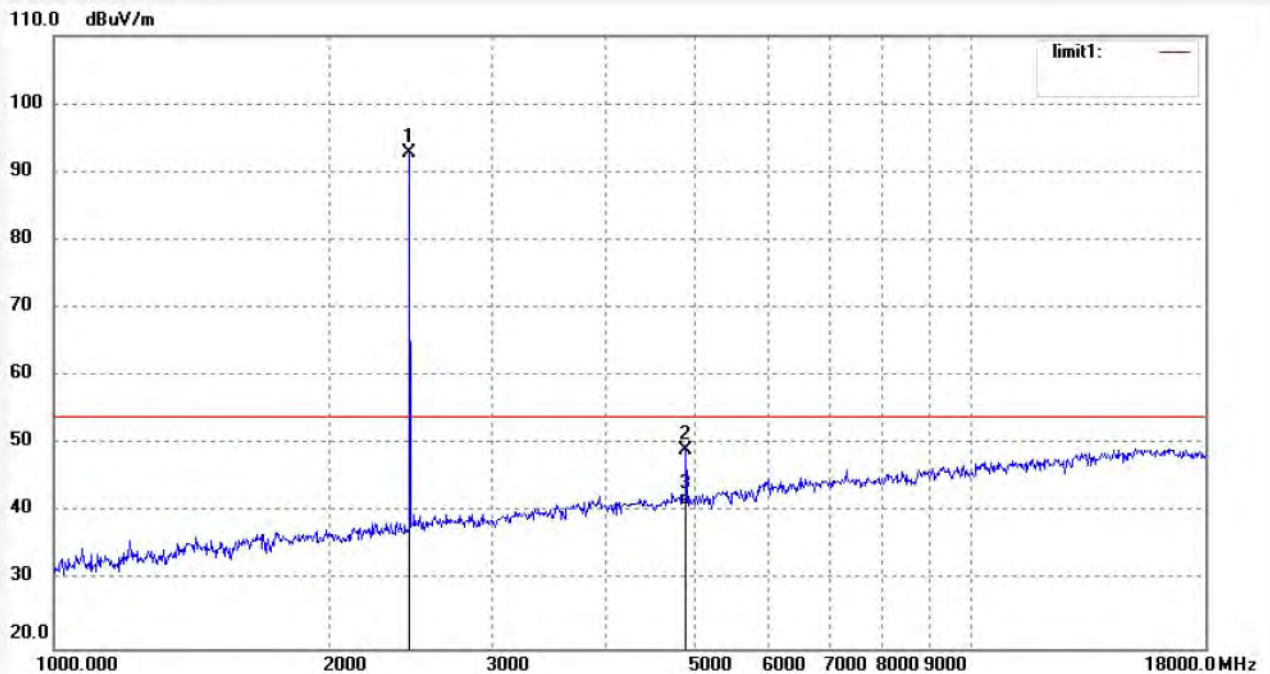
Date: 19/06/04/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2441.000    | 91.76            | 1.06        | 92.82           | /              | /           | peak     |             |               |        |
| 2   | 4882.026    | 41.14            | 8.11        | 49.25           | 74.00          | -24.75      | peak     |             |               |        |
| 3   | 4882.026    | 33.01            | 8.11        | 41.12           | 54.00          | -12.88      | AVG      |             |               |        |



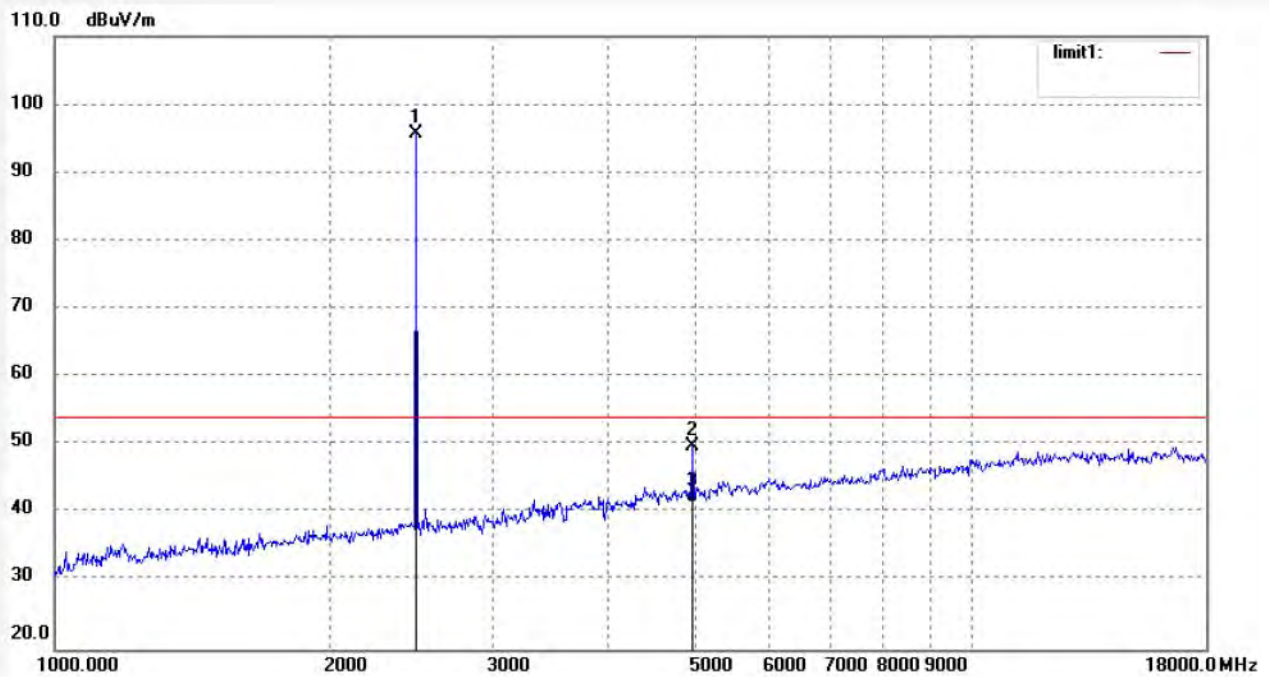
**ACCURATE TECHNOLOGY CO., LTD.**

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

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

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2127                | Polarization: Horizontal |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2480.000    | 94.60            | 1.10        | 95.70           | /              | /           | peak     |             |               |        |
| 2   | 4960.027    | 41.32            | 8.60        | 49.92           | 74.00          | -24.08      | peak     |             |               |        |
| 3   | 4960.027    | 32.97            | 8.60        | 41.57           | 54.00          | -12.43      | AVG      |             |               |        |



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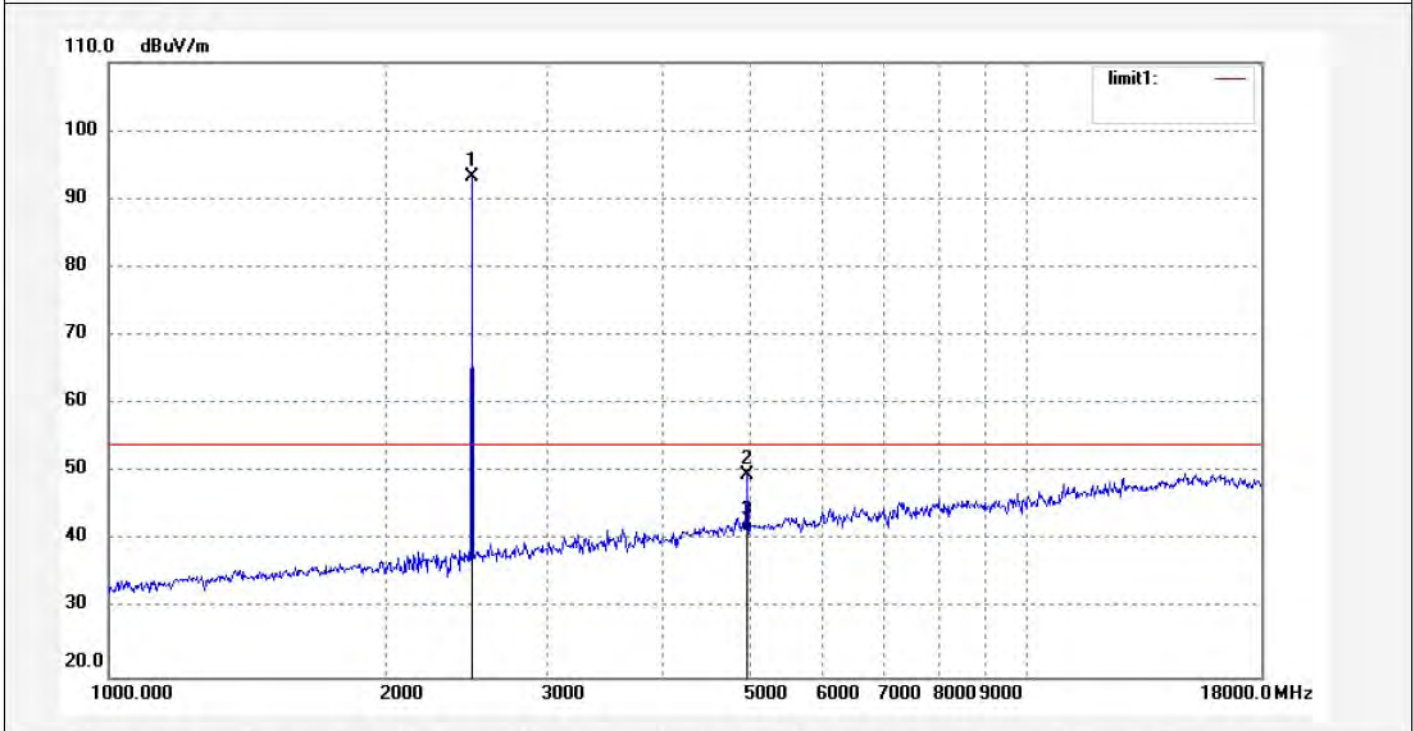
Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2126                | Polarization: Vertical   |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2480.000    | 92.12            | 1.10        | 93.22           | /              | /           | peak     |             |               |        |
| 2   | 4960.029    | 40.91            | 8.60        | 49.51           | 74.00          | -24.49      | peak     |             |               |        |
| 3   | 4960.029    | 32.64            | 8.60        | 41.24           | 54.00          | -12.76      | AVG      |             |               |        |



## 18GHz-26.5GHz test data


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Job No.: LGW2019 #2131

Standard: FCC Part 15C 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 23 C / 48 %

EUT: Water Resistant Wireless Speaker

Mode: TX 2402MHz

Model: EBT-654B

Manufacturer: SRP COMPANIES

Polarization: Horizontal

Power Source: DC 3.7V

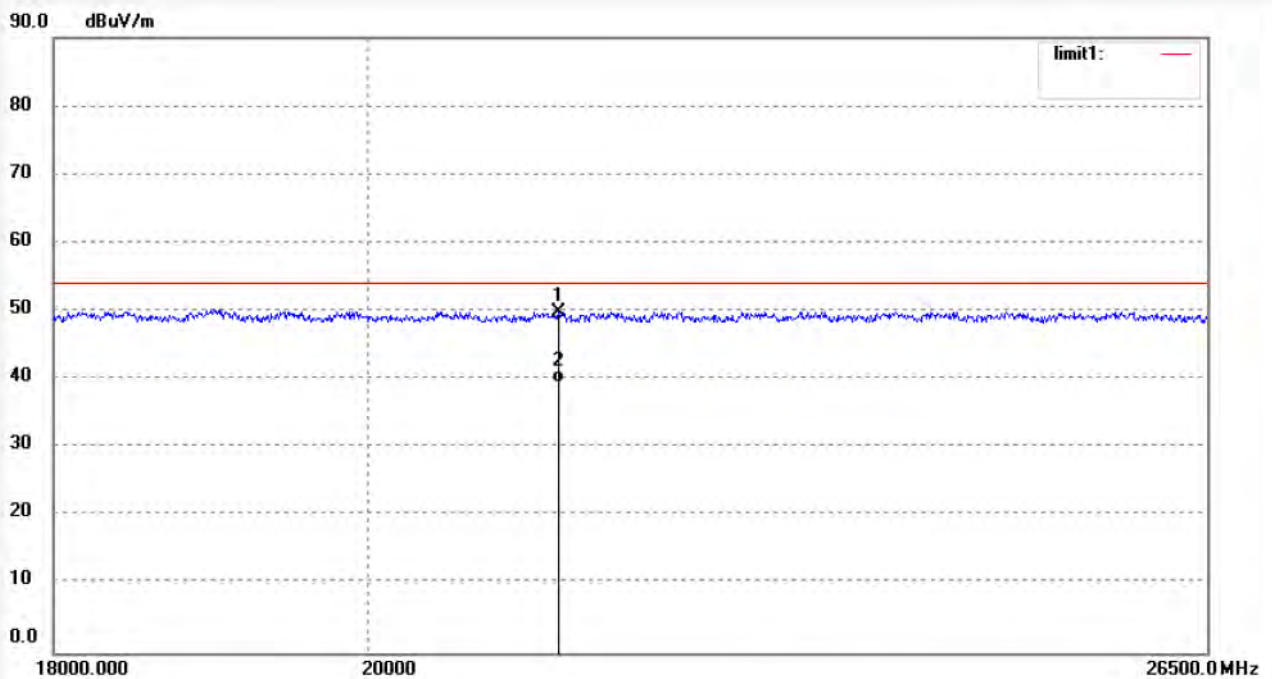
Date: 19/06/04/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 21322.830   | 18.45            | 31.37       | 49.82           | 74.00          | -24.18      | peak     |             |               |        |
| 2   | 21322.830   | 8.17             | 31.37       | 39.54           | 54.00          | -14.46      | AVG      |             |               |        |



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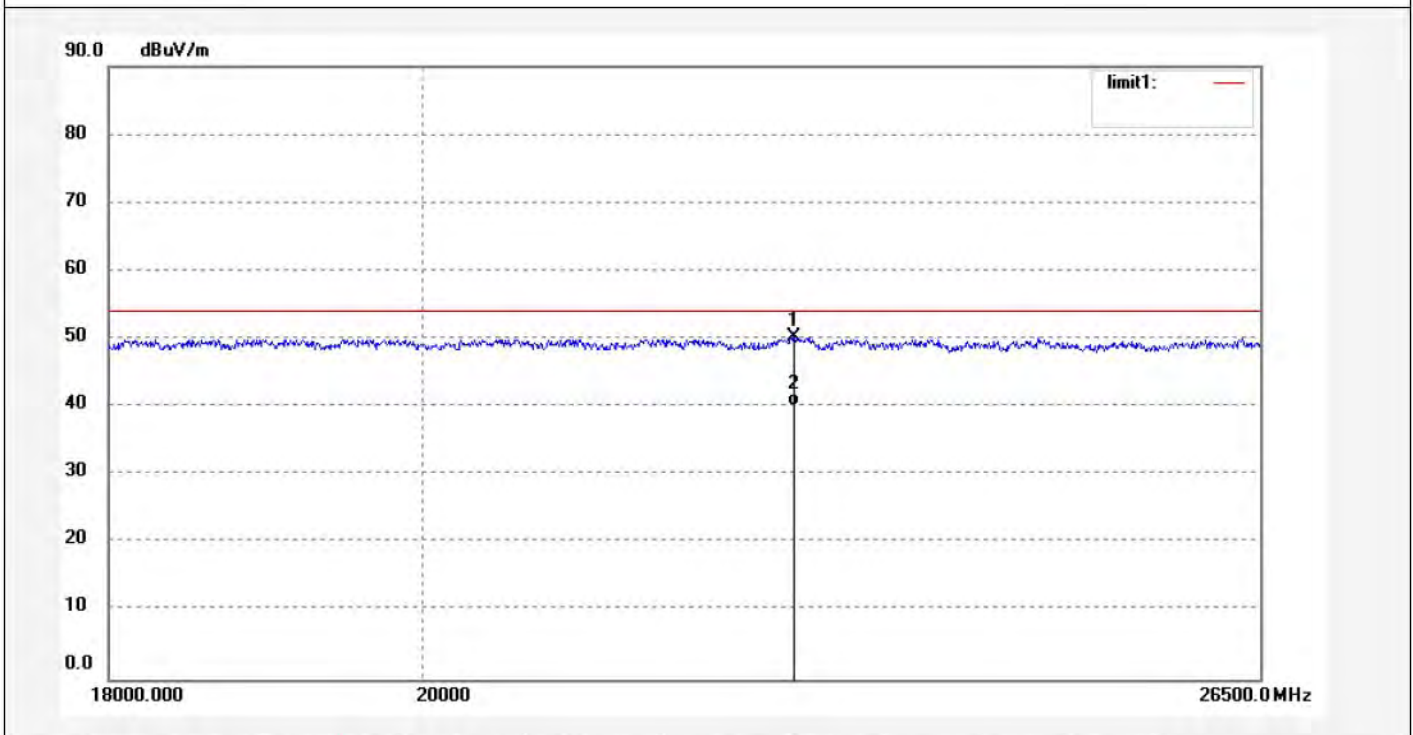
Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2130                | Polarization: Vertical   |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2402MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 22657.744   | 18.18            | 32.18       | 50.36           | 74.00          | -23.64      | peak     |             |               |        |
| 2   | 22657.744   | 8.06             | 32.18       | 40.24           | 54.00          | -13.76      | AVG      |             |               |        |



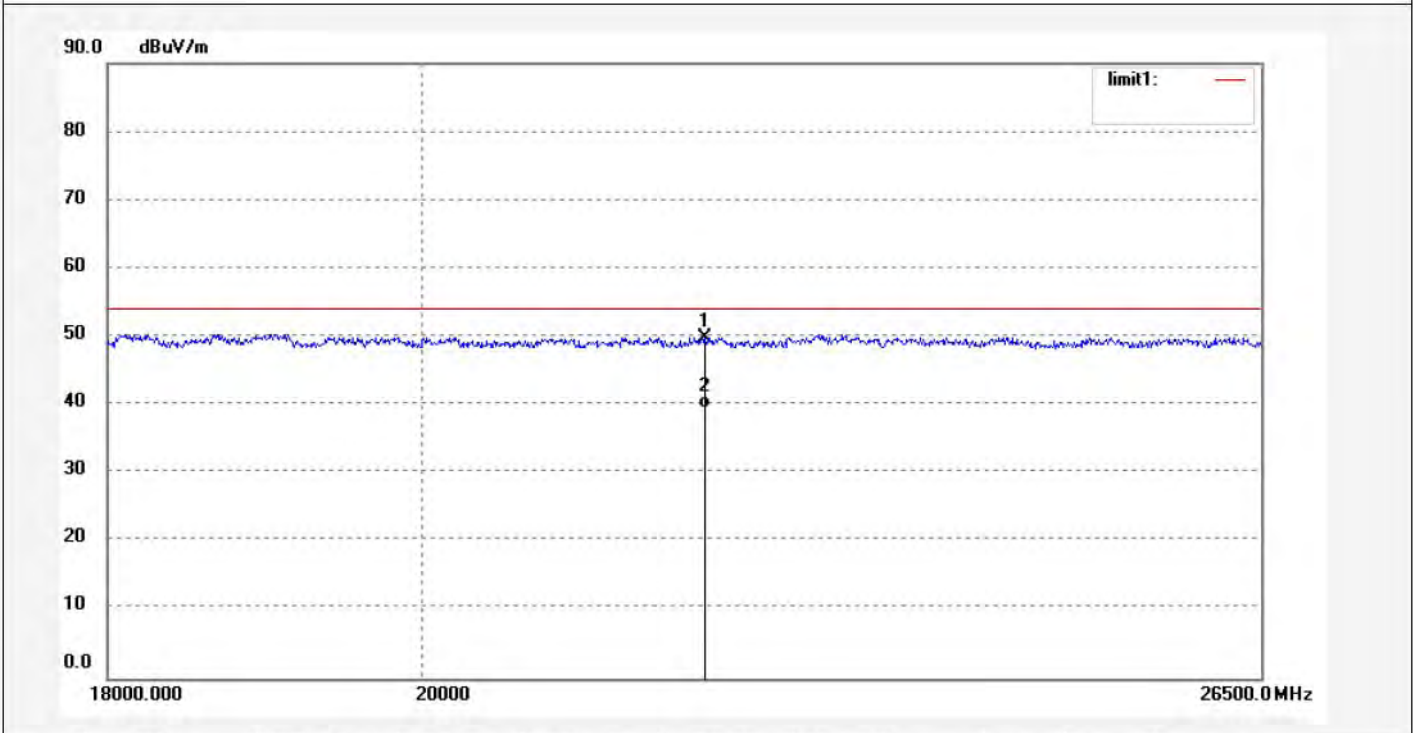
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|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2132                | Polarization: Horizontal |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2441MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 21992.911   | 17.69            | 32.17       | 49.86           | 74.00          | -24.14      | peak     |             |               |        |
| 2   | 21992.911   | 7.28             | 32.17       | 39.45           | 54.00          | -14.55      | AVG      |             |               |        |



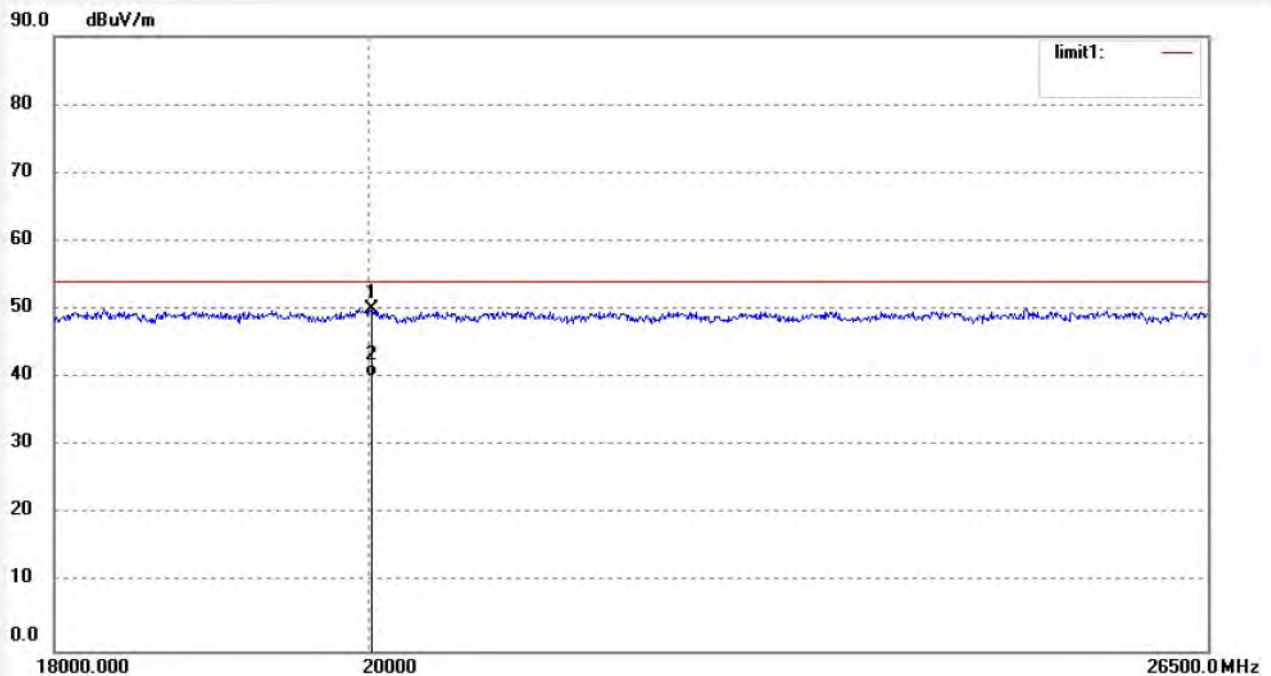
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|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2133                | Polarization: Vertical   |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2441MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 20020.051   | 17.93            | 32.10       | 50.03           | 74.00          | -23.97      | peak     |             |               |        |
| 2   | 20020.051   | 8.15             | 32.10       | 40.25           | 54.00          | -13.75      | AVG      |             |               |        |



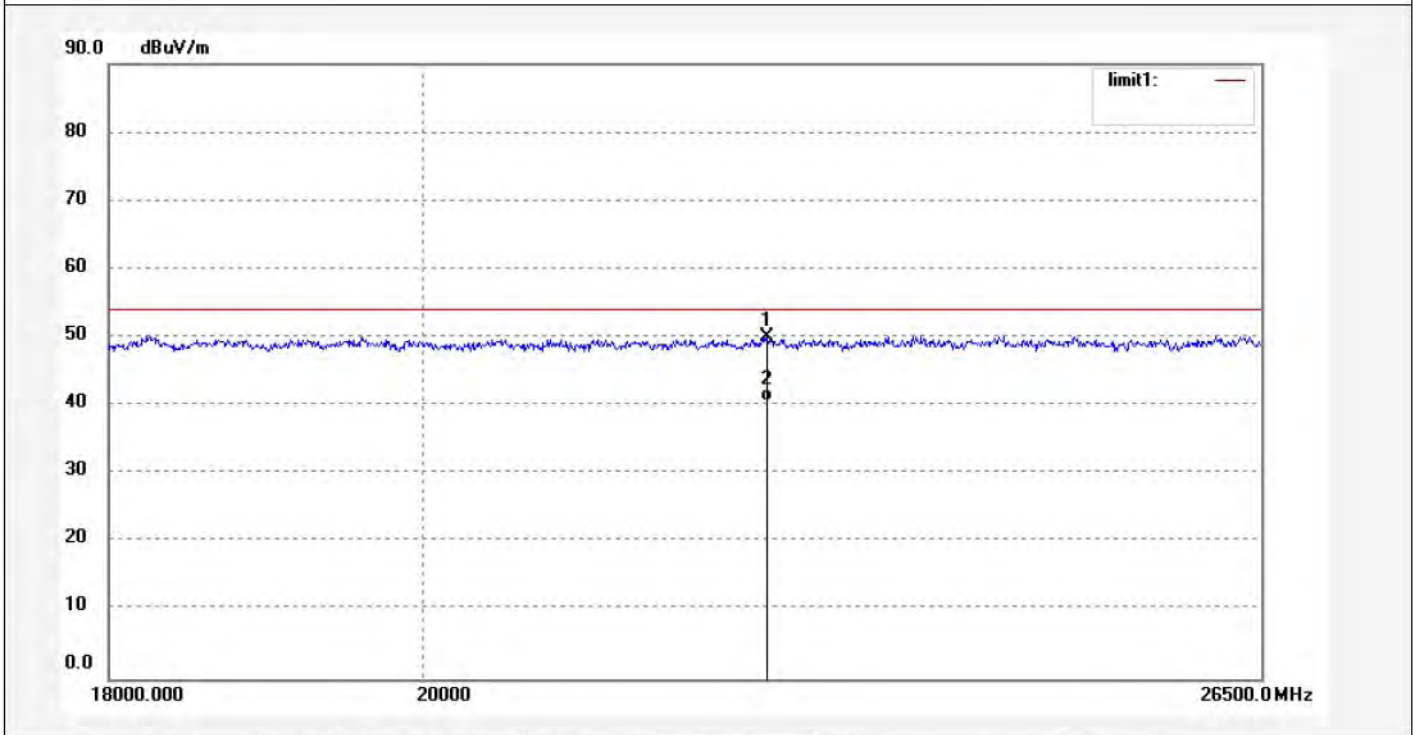
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Site: 2# Chamber  
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|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2135                | Polarization: Horizontal |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

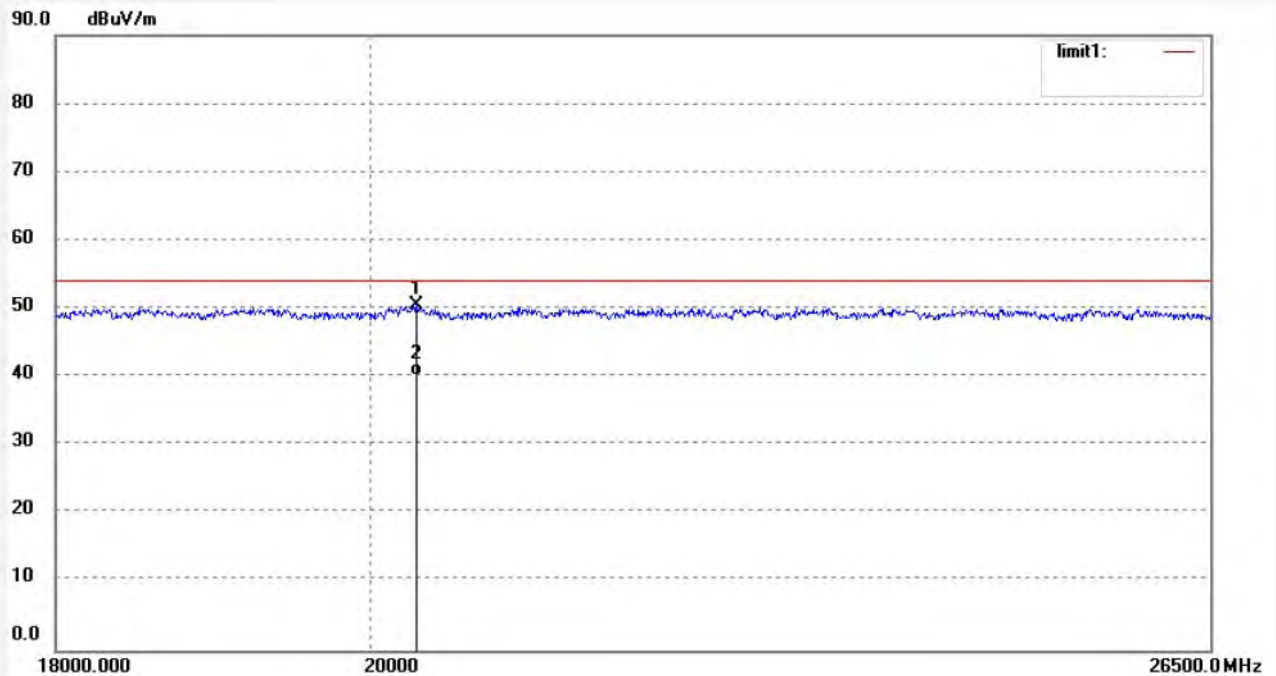
Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 22448.395   | 17.59            | 32.49       | 50.08           | 74.00          | -23.92      | peak     |             |               |        |
| 2   | 22448.395   | 8.06             | 32.49       | 40.55           | 54.00          | -13.45      | AVG      |             |               |        |

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2134                | Polarization: Vertical   |
| Standard: FCC Part 15C 3M Radiated    | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

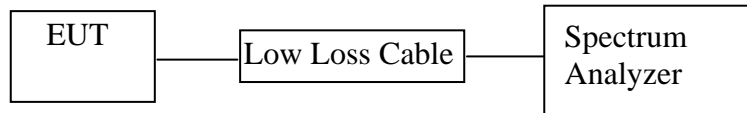
Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 20308.610   | 18.84            | 31.62       | 50.46           | 74.00          | -23.54      | peak     |             |               |        |
| 2   | 20308.610   | 8.62             | 31.62       | 40.24           | 54.00          | -13.76      | AVG      |             |               |        |

## 11.BAND EDGE COMPLIANCE TEST

### 11.1.Block Diagram of Test Setup



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

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

### 11.3.EUT Configuration on Measurement

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

### 11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

## 11.5. Test Procedure

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

11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

## 11.6. Test Result

### Non-hopping mode

| Frequency (MHz)    | Result of Band Edge (dBc) | Limit of Band Edge (dBc) | Result |
|--------------------|---------------------------|--------------------------|--------|
| GFSK mode          |                           |                          |        |
| 2400.00            | 32.8                      | > 20dBc                  | Pass   |
| 2483.50            | 40.43                     | > 20dBc                  | Pass   |
| $\pi/4$ DQPSK mode |                           |                          |        |
| 2400.00            | 32.87                     | > 20dBc                  | Pass   |
| 2483.50            | 40.06                     | > 20dBc                  | Pass   |

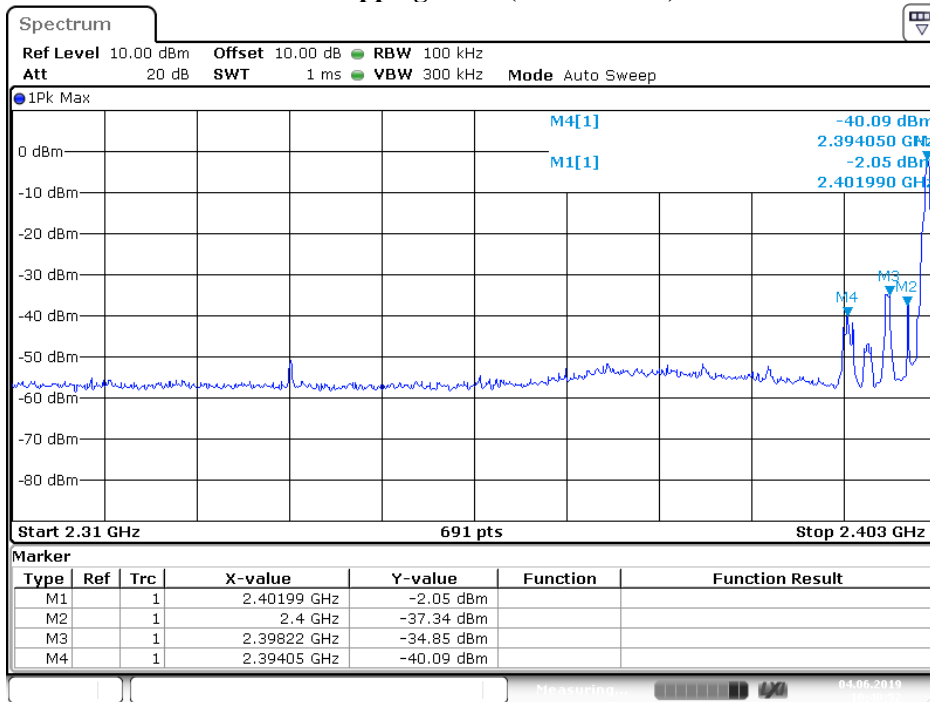
### Hopping mode

| Frequency (MHz)    | Result of Band Edge (dBc) | Limit of Band Edge (dBc) | Result |
|--------------------|---------------------------|--------------------------|--------|
| GFSK mode          |                           |                          |        |
| 2400.00            | 33.61                     | > 20dBc                  | Pass   |
| 2483.94            | 41.15                     | > 20dBc                  | Pass   |
| $\pi/4$ DQPSK mode |                           |                          |        |
| 2400.00            | 33.65                     | > 20dBc                  | Pass   |
| 2483.91            | 40.17                     | > 20dBc                  | Pass   |

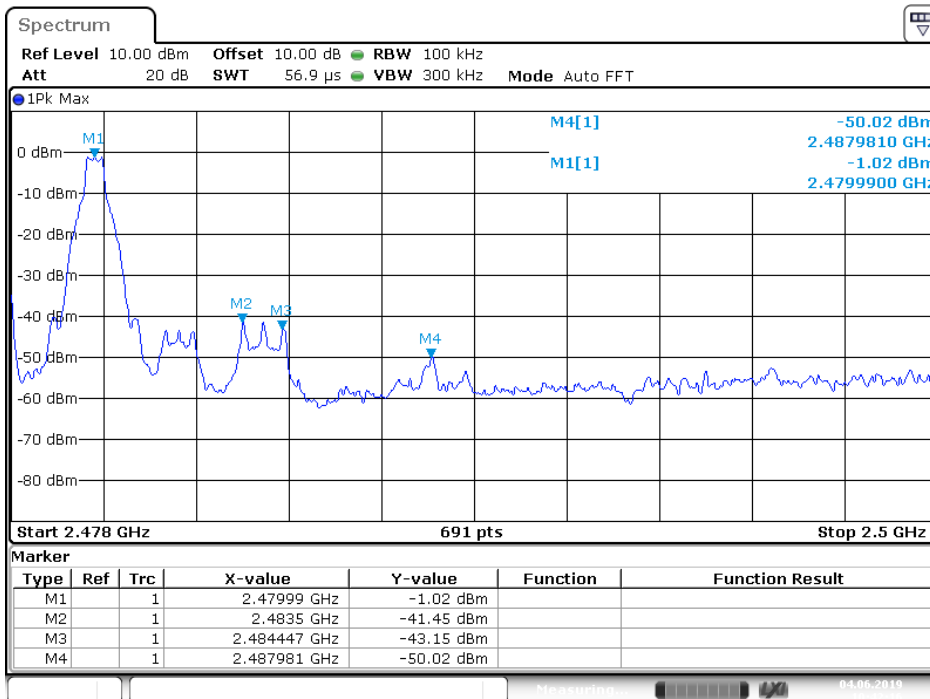
The spectrum analyzer plots are attached as below.



## Non-hopping mode (GFSK Mode)

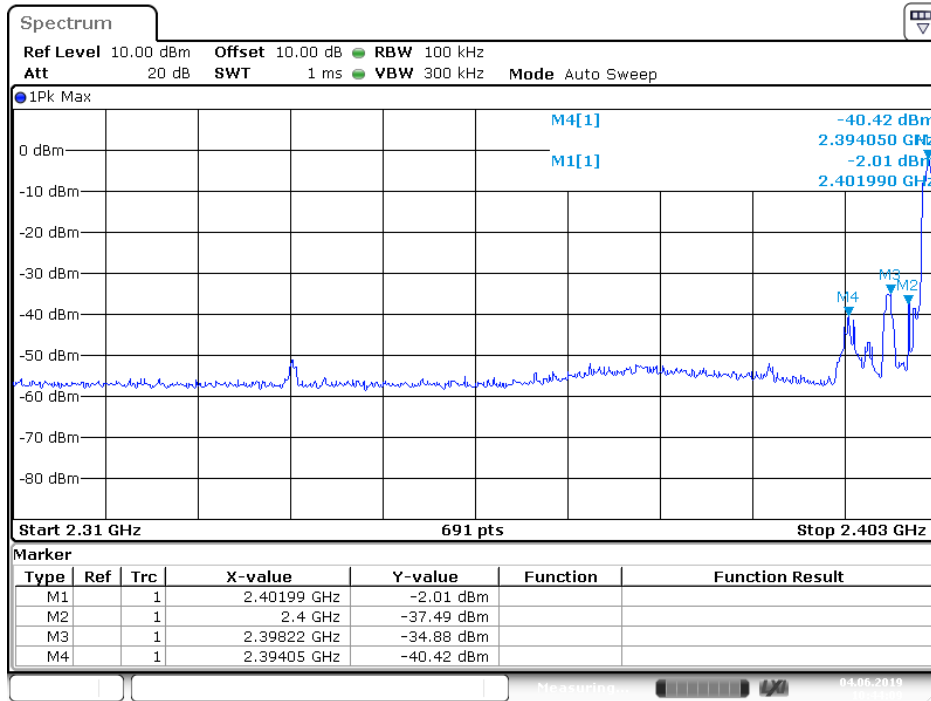


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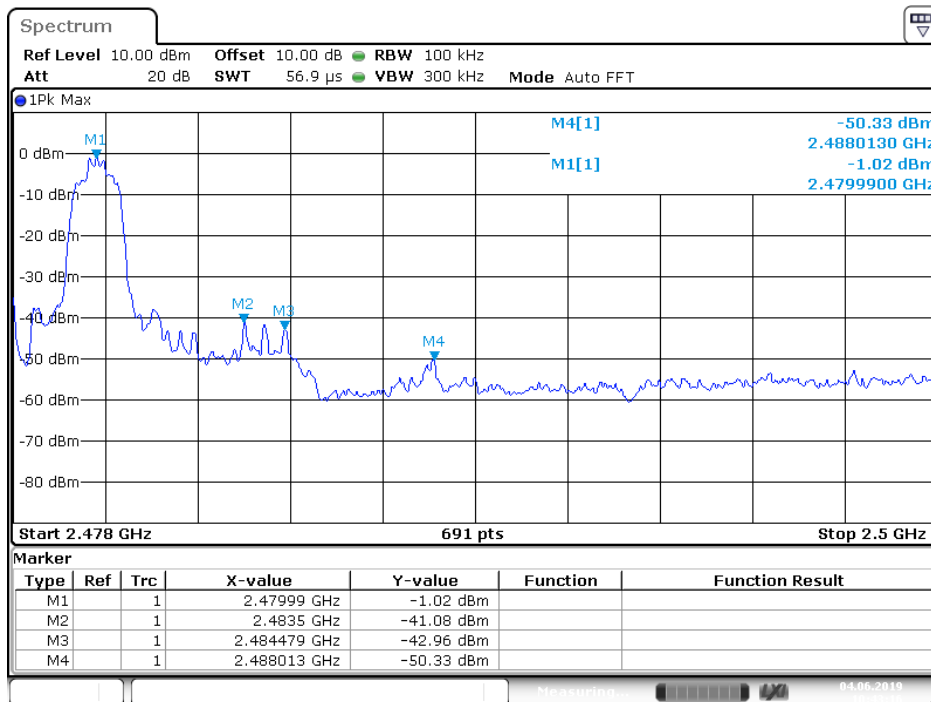


Date: 4.JUN.2019 10:42:17

### Non-hopping mode ( $\pi/4$ DQPSK Mode)

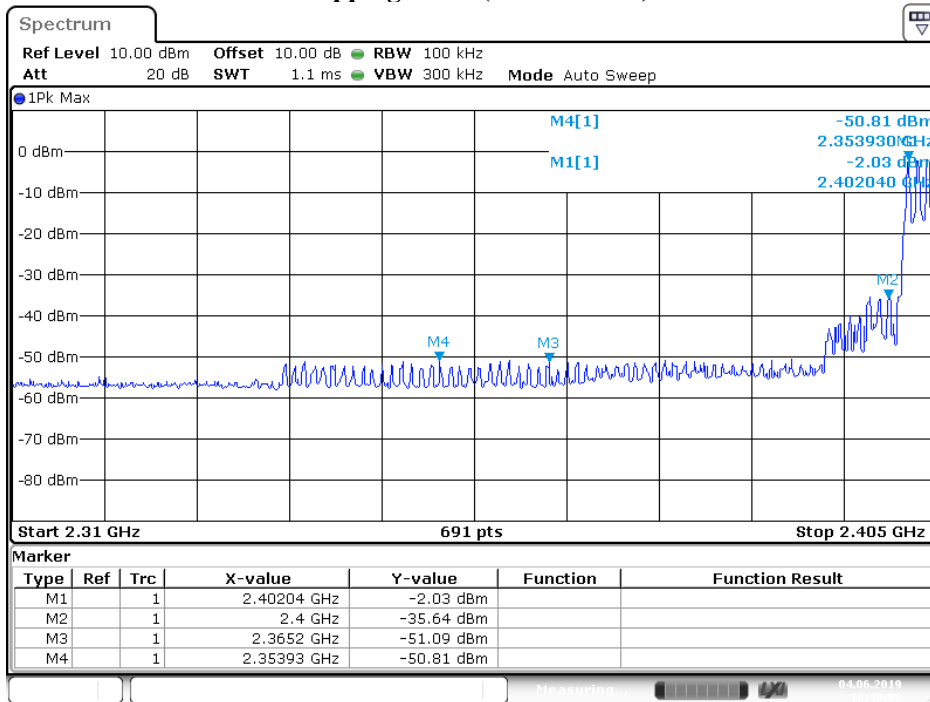


Date: 4.JUN.2019 10:44:10

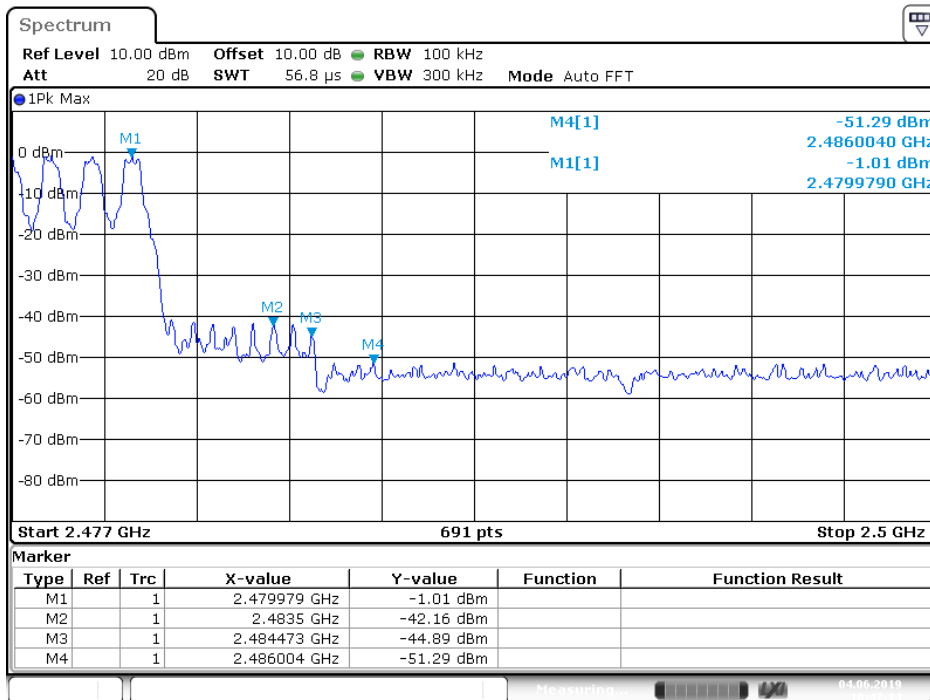


Date: 4.JUN.2019 10:43:16

## Hopping mode (GFSK Mode)

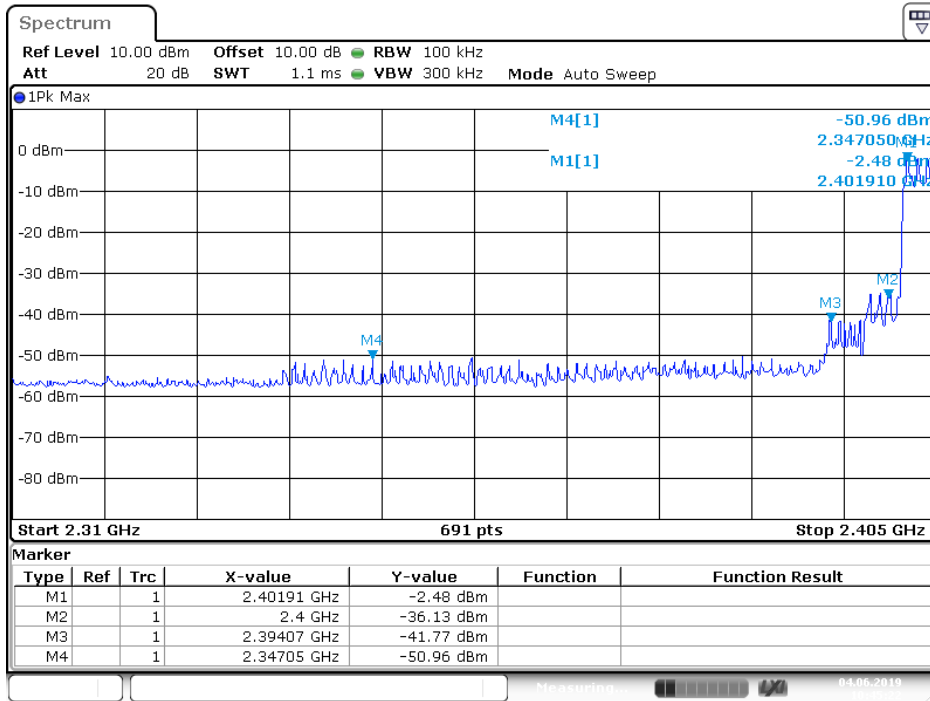


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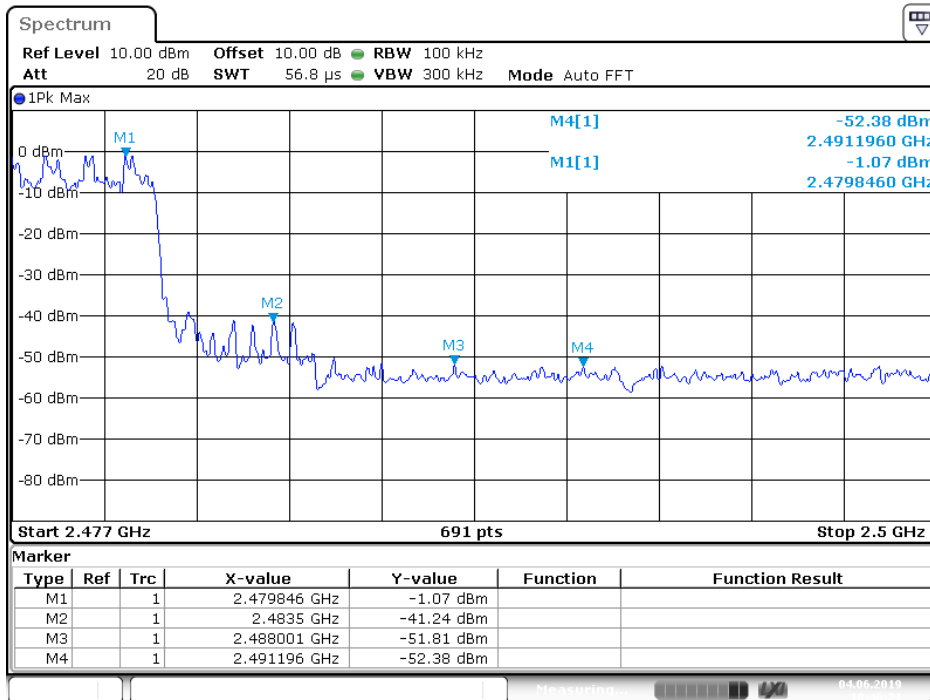


Date: 4.JUN.2019 10:47:15

### Hopping mode ( $\pi/4$ DQPSK Mode)



Date: 4.JUN.2019 10:45:23



Date: 4.JUN.2019 10:46:22

## Radiated Band Edge Result

Note:

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

Test Procedure:

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

Let the EUT work in TX (Hopping off, Hopping on) modes measure it.  
We select 2402MHz, 2480MHz TX frequency to transmit(Hopping off mode).  
We select 2402-2480MHz TX frequency to transmit(Hopping on mode).

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

- 1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 3.All modes of operation were investigated and the worse case( $\pi/4$  DQPSK Mode) emissions are reported.

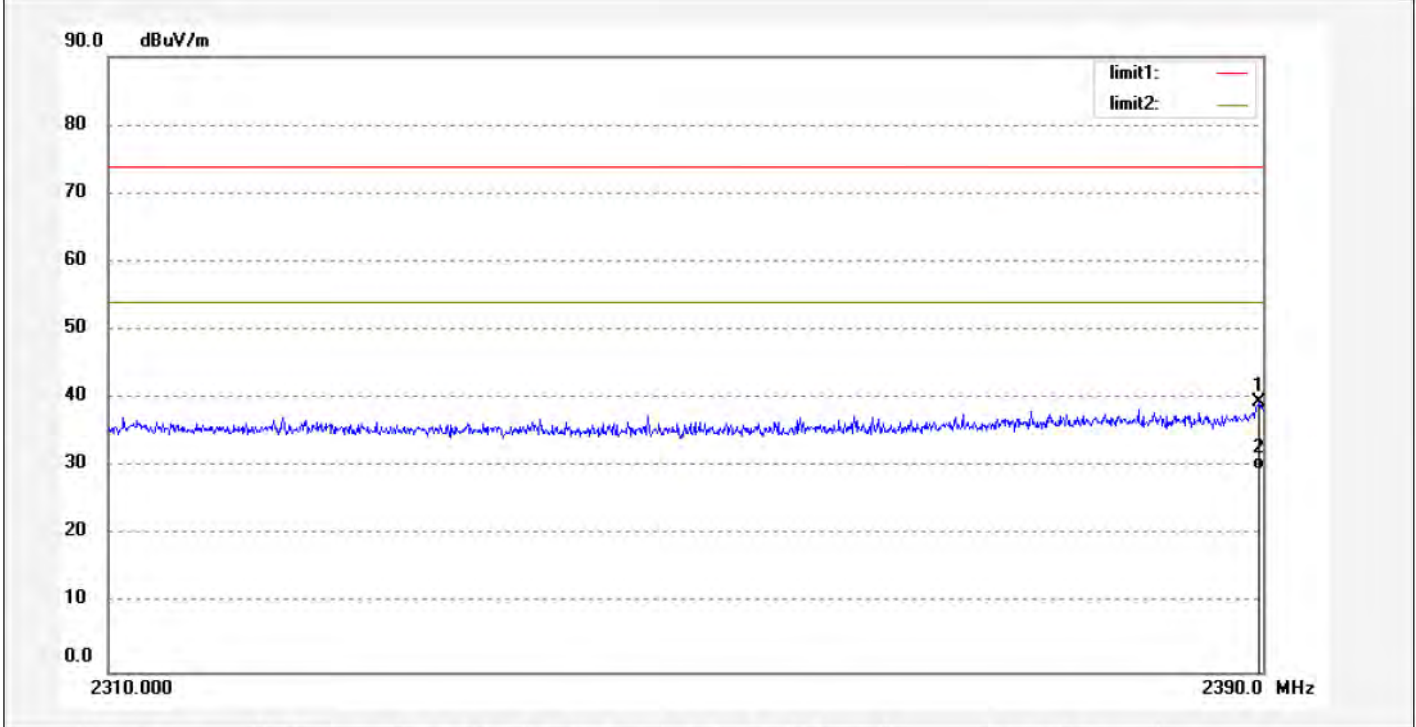


**Non-hopping mode**  
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Site: 2# Chamber  
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 Fax:+86-0755-26503396

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2123                | Polarization: Horizontal |
| Standard: FCC (Band Edge)             | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2402MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2389.760    | 38.76            | 0.79        | 39.55           | 74.00          | -34.45      | peak     |             |               |        |
| 2   | 2389.760    | 28.77            | 0.79        | 29.56           | 54.00          | -24.44      | AVG      |             |               |        |



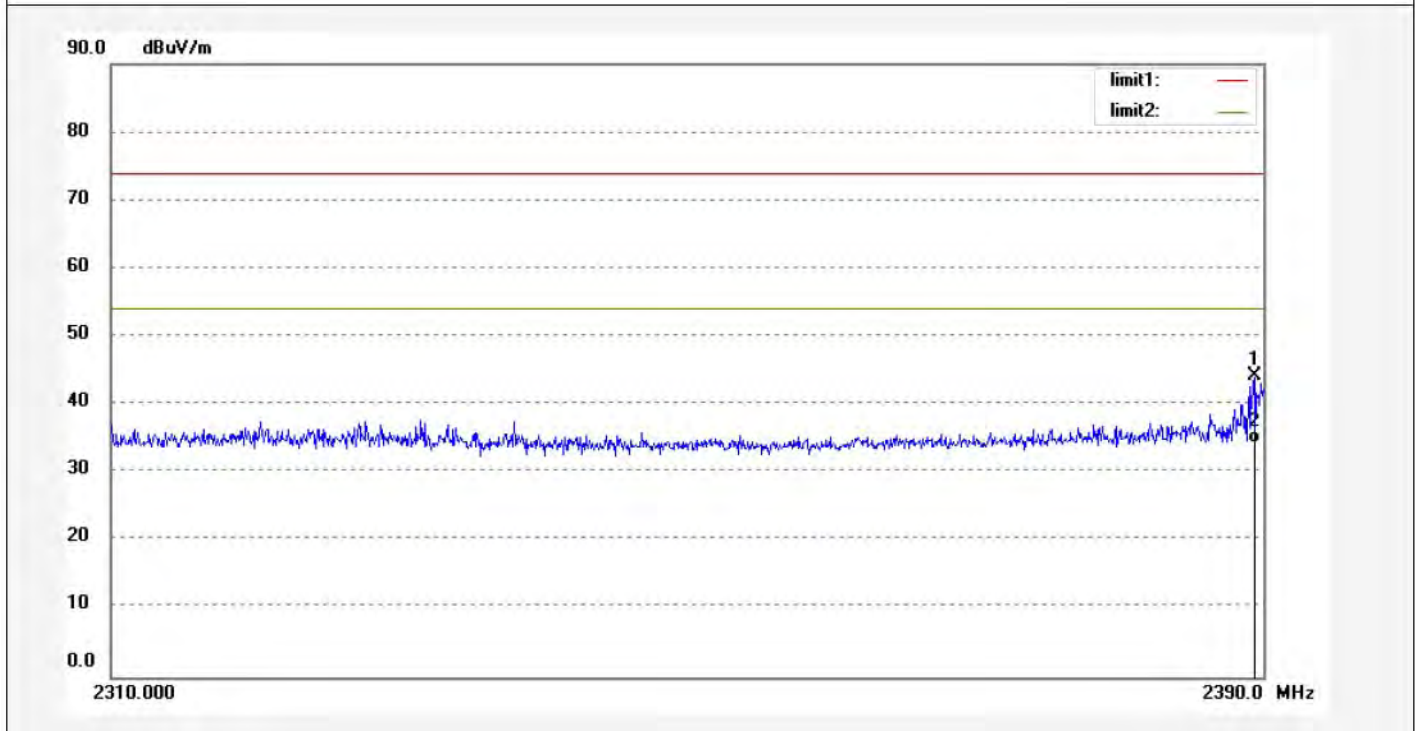
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|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2122                | Polarization: Vertical   |
| Standard: FCC (Band Edge)             | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2402MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2389.360    | 43.31            | 0.79        | 44.10           | 74.00          | -29.90      | peak     |             |               |        |
| 2   | 2389.360    | 33.45            | 0.79        | 34.24           | 54.00          | -19.76      | AVG      |             |               |        |



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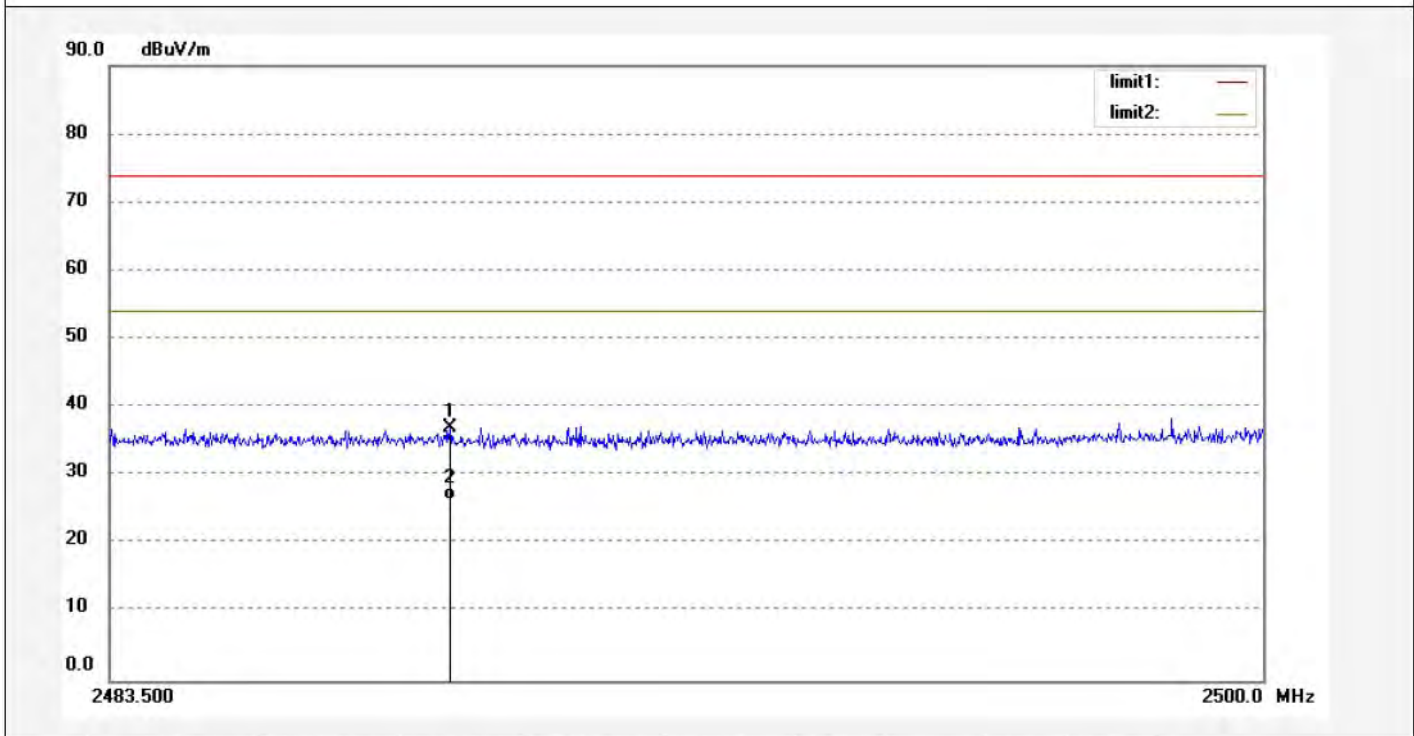
Site: 2# Chamber

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|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2128                | Polarization: Horizontal |
| Standard: FCC (Band Edge)             | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

Note:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2488.367    | 35.85            | 1.10        | 36.95           | 74.00          | -37.05      | peak     |             |               |        |
| 2   | 2488.367    | 25.35            | 1.10        | 26.45           | 54.00          | -27.55      | AVG      |             |               |        |




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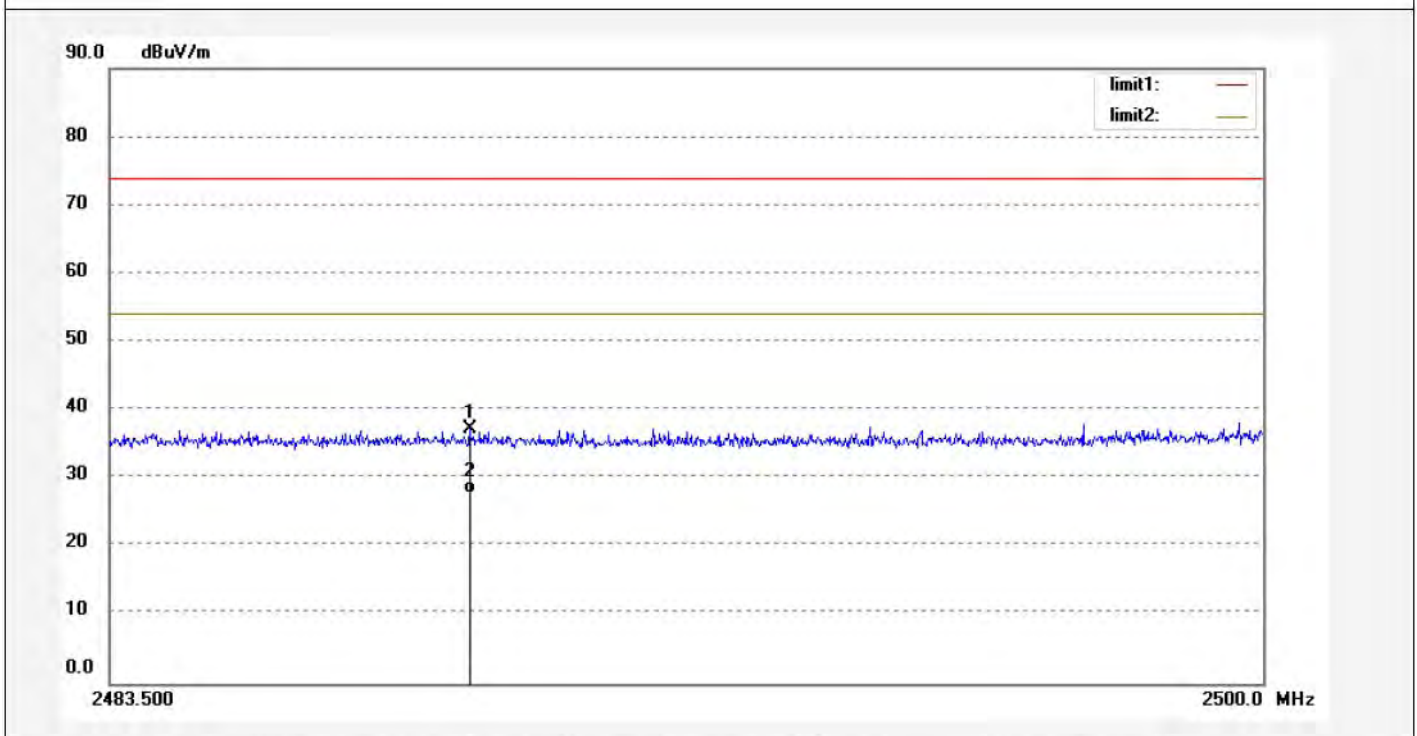
Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

|                                       |                          |
|---------------------------------------|--------------------------|
| Job No.: LGW2019 #2129                | Polarization: Vertical   |
| Standard: FCC (Band Edge)             | Power Source: DC 3.7V    |
| Test item: Radiation Test             | Date: 19/06/04/          |
| Temp.( C)/Hum.(%) 23 C / 48 %         | Time:                    |
| EUT: Water Resistant Wireless Speaker | Engineer Signature: WADE |
| Mode: TX 2480MHz                      | Distance: 3m             |
| Model: EBT-654B                       |                          |
| Manufacturer: SRP COMPANIES           |                          |

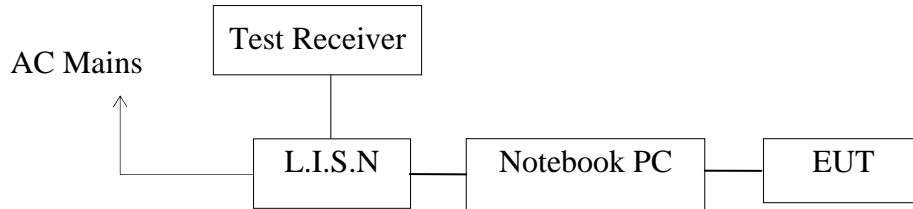
Note:



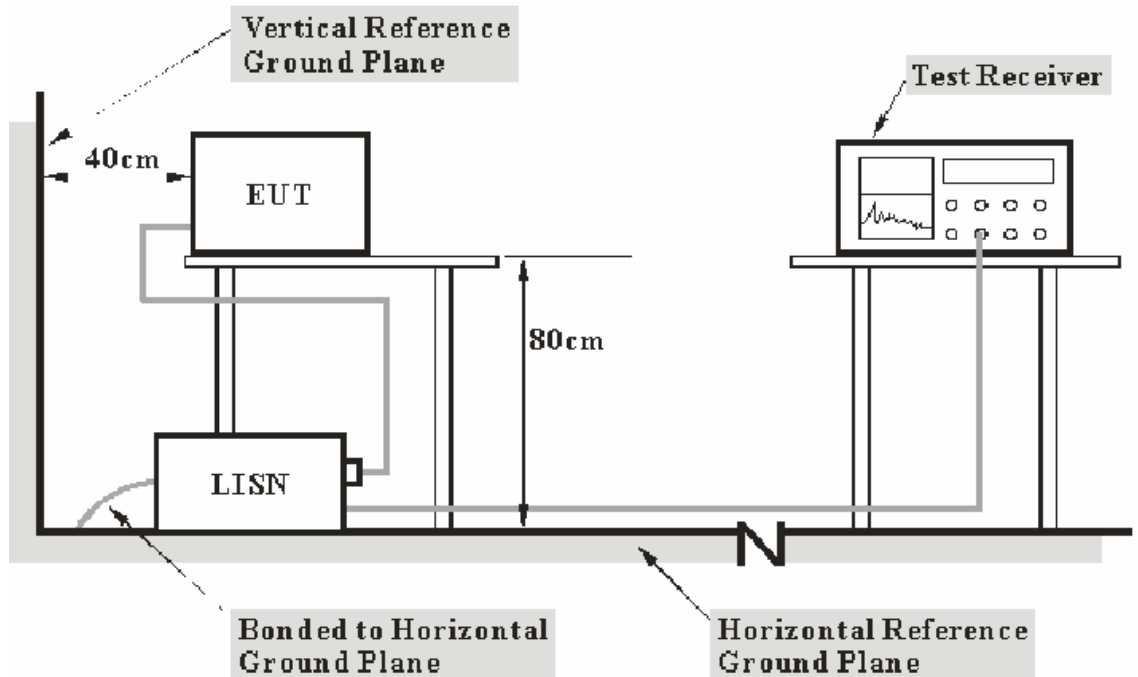
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2488.648    | 36.03            | 1.10        | 37.13           | 74.00          | -36.87      | peak     |             |               |        |
| 2   | 2488.648    | 26.58            | 1.10        | 27.68           | 54.00          | -26.32      | AVG      |             |               |        |

## 12.AC POWER LINE CONDUCTED EMISSION TEST

### 12.1.Block Diagram of Test Setup



### 12.2.Test System Setup



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

### 12.3. Test Limits

| Frequency<br>(MHz) | Limit dB(μV)     |               |
|--------------------|------------------|---------------|
|                    | Quasi-peak Level | Average Level |
| 0.15 - 0.50        | 66.0 – 56.0 *    | 56.0 – 46.0 * |
| 0.50 - 5.00        | 56.0             | 46.0          |
| 5.00 - 30.00       | 60.0             | 50.0          |

NOTE1: The lower limit shall apply at the transition frequencies.  
 NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

### 12.4. Configuration of EUT on Measurement

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

### 12.5. Operating Condition of EUT

12.5.1. Setup the EUT and simulator as shown as Section 12.1.

12.5.2. Turn on the power of all equipment.

12.5.3. Let the EUT work in test mode and measure it.

### 12.6. Test Procedure

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

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

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

### 12.7.Data Sample

| Frequency (MHz) | Transducer value (dB) | QuasiPeak Level (dB $\mu$ V) | Average Level (dB $\mu$ V) | QuasiPeak Limit (dB $\mu$ V) | Average Limit (dB $\mu$ V) | QuasiPeak Margin (dB) | Average Margin (dB) | Remark (Pass/Fail) |
|-----------------|-----------------------|------------------------------|----------------------------|------------------------------|----------------------------|-----------------------|---------------------|--------------------|
| X.XX            | 10.5                  | 51.1                         | 34.2                       | 56.0                         | 46.0                       | 4.9                   | 11.8                | Pass               |

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dB $\mu$ V) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dB $\mu$ V) = Limit stated in standard

Calculation Formula:

Margin = Limit (dB $\mu$ V) - Level (dB $\mu$ V)

### 12.8.Test Result

**Pass.**

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

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

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

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

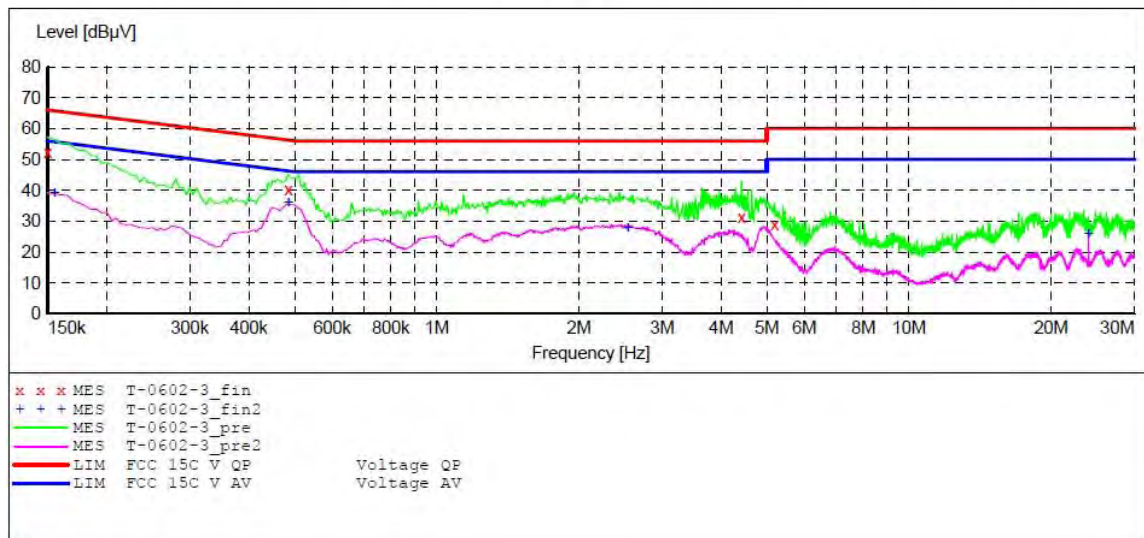
**ACCURATE TECHNOLOGY CO., LTD**

**CONDUCTED EMISSION STANDARD FCC PART 15 C**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: BT Communication  
 Test Site: 1#Shielding Room  
 Operator: WADE  
 Test Specification: N 120V/60Hz  
 Comment:  
 Start of Test: 6/2/2019 /

**SCAN TABLE: "V 9K-30MHz fin"**

| Start Frequency | Stop Frequency | Step Width | Detector  | Meas. Time | IF Bandw. | Transducer    |
|-----------------|----------------|------------|-----------|------------|-----------|---------------|
| 9.0 kHz         | 150.0 kHz      | 100.0 Hz   | QuasiPeak | 1.0 s      | 200 Hz    | NSLK8126 2008 |
| 150.0 kHz       | 30.0 MHz       | 5.0 kHz    | Average   |            |           |               |
|                 |                |            | QuasiPeak | 1.0 s      | 9 kHz     | NSLK8126 2008 |
|                 |                |            | Average   |            |           |               |



**MEASUREMENT RESULT: "T-0602-3\_fin"**

6/2/2019

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.150000      | 52.20      | 10.5      | 66         | 13.8      | QP       | N    | GND |
| 0.485000      | 40.40      | 10.7      | 56         | 15.9      | QP       | N    | GND |
| 4.420000      | 31.30      | 11.1      | 56         | 24.7      | QP       | N    | GND |
| 5.190000      | 29.00      | 11.2      | 60         | 31.0      | QP       | N    | GND |

**MEASUREMENT RESULT: "T-0602-3\_fin2"**

6/2/2019

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.155000      | 39.10      | 10.5      | 56         | 16.6      | AV       | N    | GND |
| 0.485000      | 36.00      | 10.7      | 46         | 10.3      | AV       | N    | GND |
| 2.540000      | 27.80      | 11.0      | 46         | 18.2      | AV       | N    | GND |
| 23.995000     | 26.00      | 11.5      | 50         | 24.0      | AV       | N    | GND |

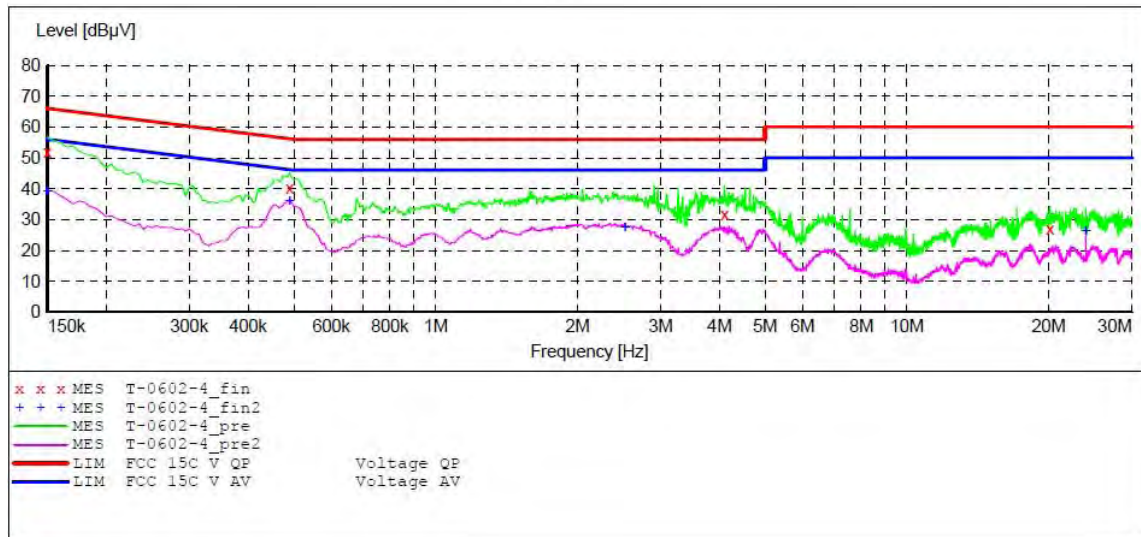
**ACCURATE TECHNOLOGY CO., LTD**

**CONDUCTED EMISSION STANDARD FCC PART 15 C**

EUT: Water Resistant Wireless Speaker M/N:EBT-654B  
 Manufacturer: SRP COMPANIES  
 Operating Condition: BT Communication  
 Test Site: 1#Shielding Room  
 Operator: WADE  
 Test Specification: L 120V/60Hz  
 Comment:  
 Start of Test: 6/2/2019 /

**SCAN TABLE: "V 9K-30MHz fin"**

| Start     | Stop      | Step     | Detector  | Meas. Time | IF Bandw. | Transducer    |
|-----------|-----------|----------|-----------|------------|-----------|---------------|
| 9.0 kHz   | 150.0 kHz | 100.0 Hz | QuasiPeak | 1.0 s      | 200 Hz    | NSLK8126 2008 |
| 150.0 kHz | 30.0 MHz  | 5.0 kHz  | Average   | 1.0 s      | 9 kHz     | NSLK8126 2008 |



**MEASUREMENT RESULT: "T-0602-4\_fin"**

6/2/2019

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.150000      | 51.90      | 10.5      | 66         | 14.1      | QP       | L1   | GND |
| 0.490000      | 40.40      | 10.7      | 56         | 15.8      | QP       | L1   | GND |
| 4.100000      | 31.80      | 11.1      | 56         | 24.2      | QP       | L1   | GND |
| 20.125000     | 26.90      | 11.4      | 60         | 33.1      | QP       | L1   | GND |

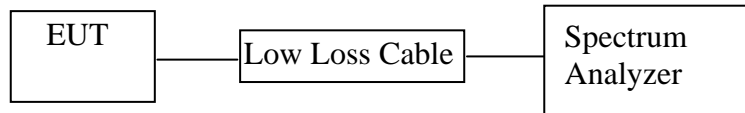
**MEASUREMENT RESULT: "T-0602-4\_fin2"**

6/2/2019

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE  |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.150000      | 39.00      | 10.5      | 56         | 17.0      | AV       | L1   | GND |
| 0.490000      | 36.00      | 10.7      | 46         | 10.2      | AV       | L1   | GND |
| 2.520000      | 27.20      | 11.0      | 46         | 18.8      | AV       | L1   | GND |
| 23.995000     | 26.20      | 11.5      | 50         | 23.8      | AV       | L1   | GND |

## 13. CONDUCTED SPURIOUS EMISSION COMPLIANCE TEST

### 13.1. Block Diagram of Test Setup



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

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

### 13.3. EUT Configuration on Measurement

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

### 13.4. Operating Condition of EUT

13.4.1. Setup the EUT and simulator as shown as Section 13.1.

13.4.2. Turn on the power of all equipment.

13.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480 MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

### 13.5. Test Procedure

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

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

13.5.3. The Conducted Spurious Emission was measured and recorded.

### 13.6. Test Result

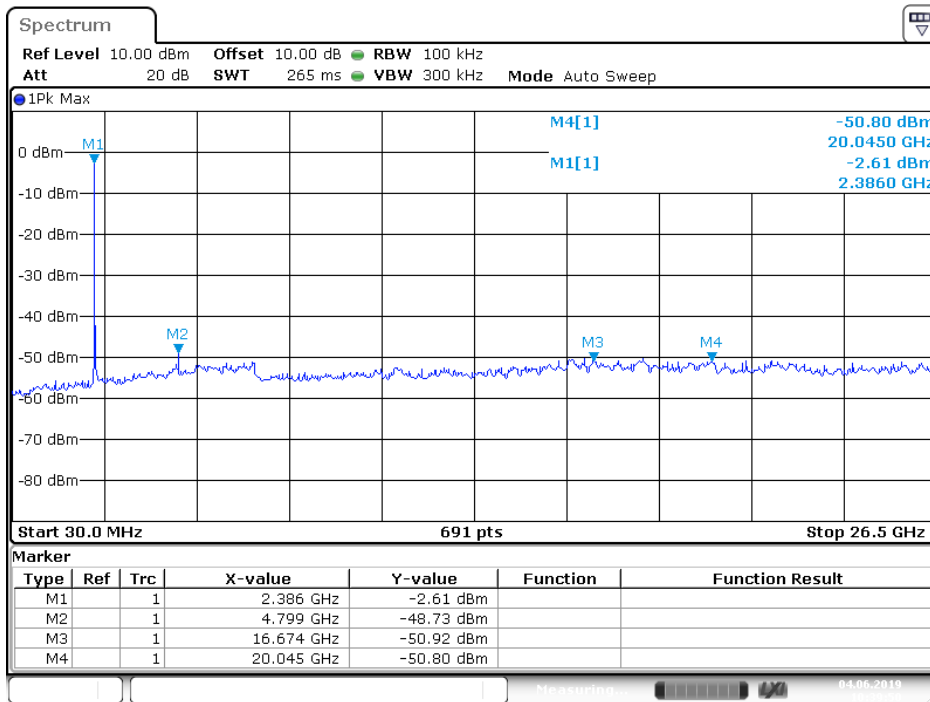
**Pass.**

The spectrum analyzer plots are attached as below.



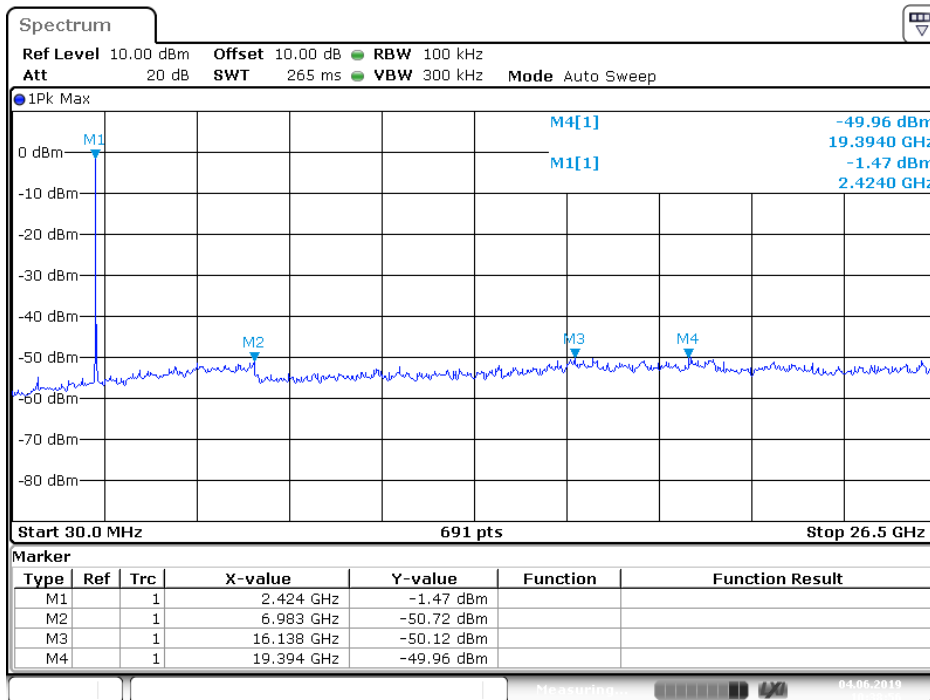
### GFSK mode

### Low Channel



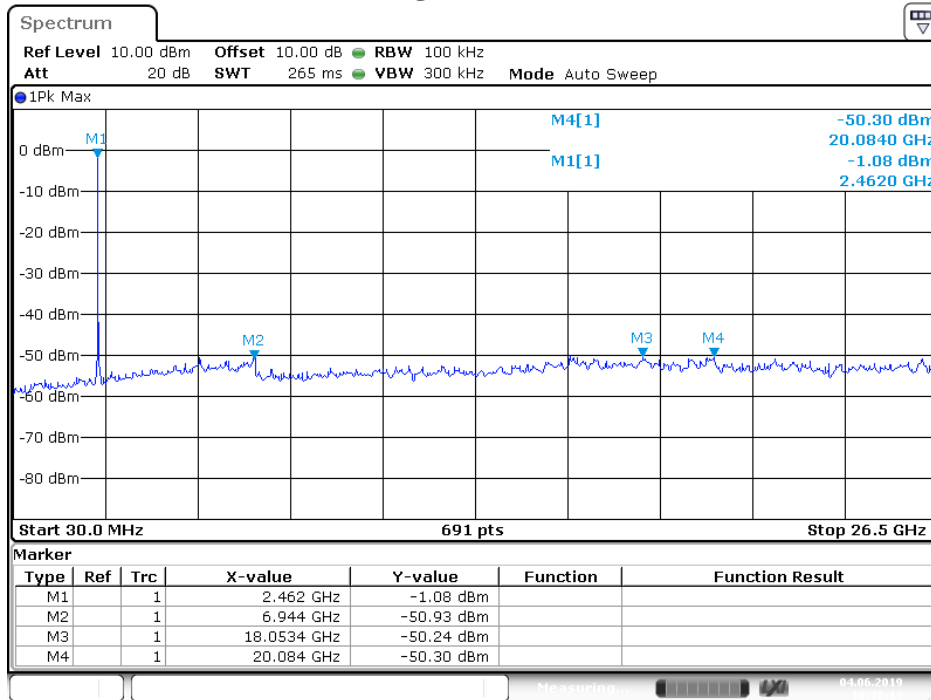
Date: 4.JUN.2019 10:39:51

### Middle Channel



Date: 4.JUN.2019 10:38:57

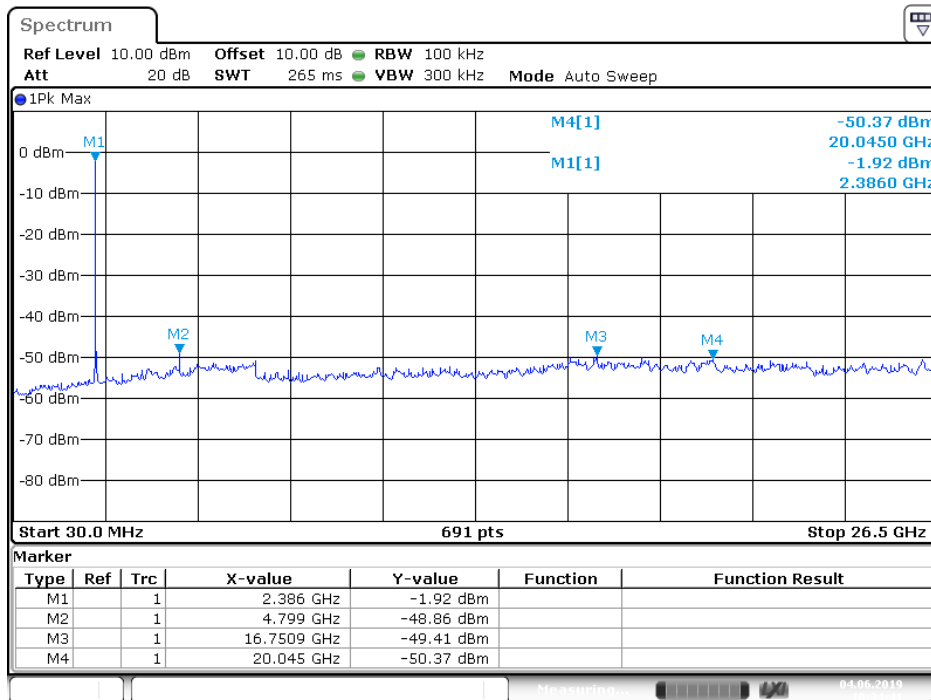
### High Channel



Date: 4.JUN.2019 10:38:13

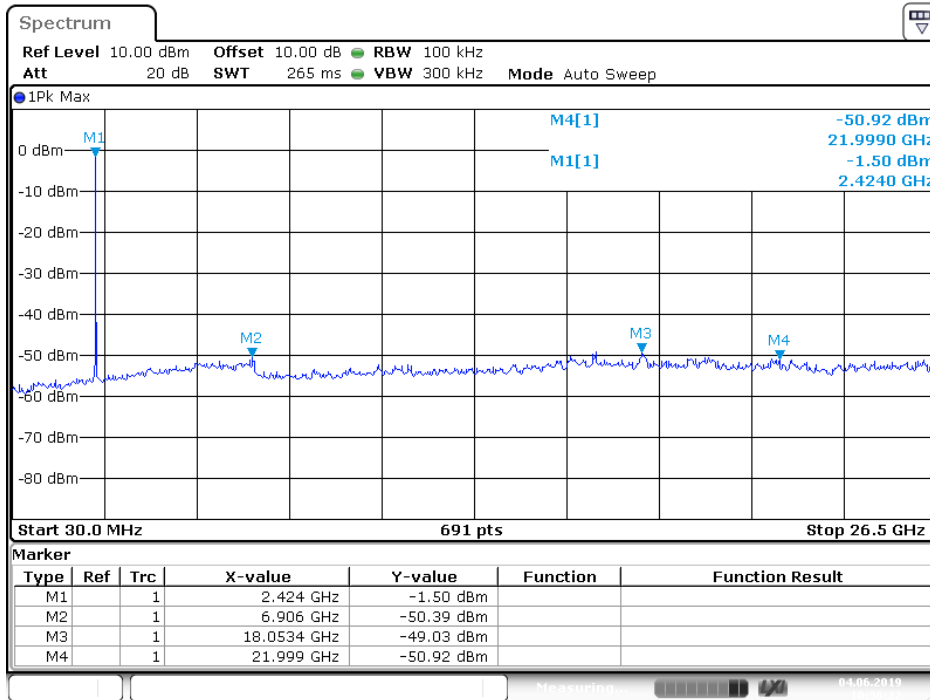
### $\pi/4$ DQPSK mode

### Low Channel



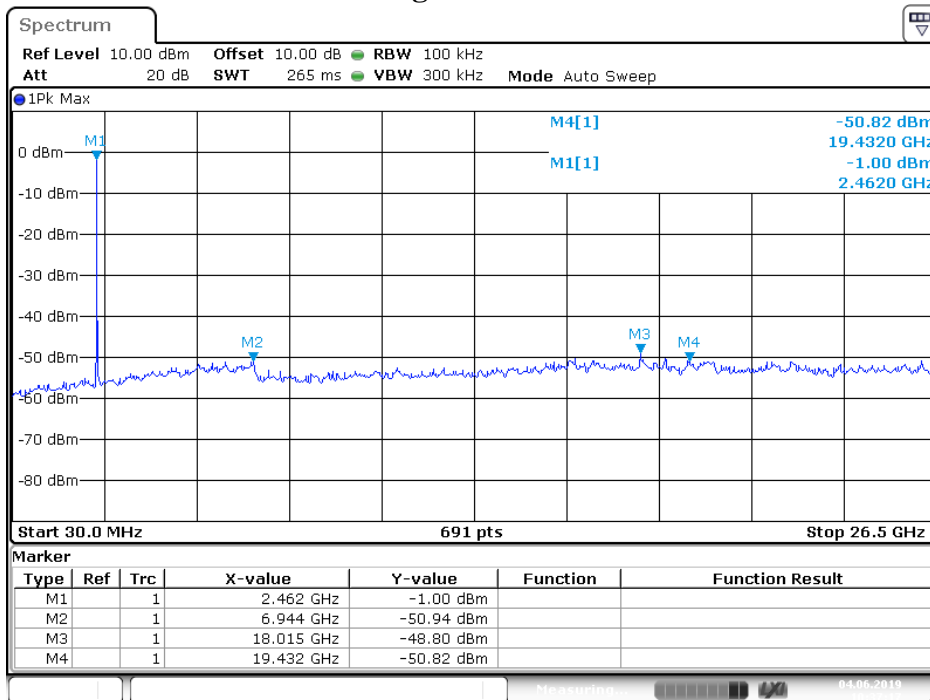
Date: 4.JUN.2019 10:34:42

### Middle Channel



Date: 4.JUN.2019 10:36:23

### High Channel



Date: 4.JUN.2019 10:37:18

## 14. ANTENNA REQUIREMENT

### 14.1. The Requirement

According to 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.

### 14.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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